RRU
V100R015C10
Technical Specifications

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1 RRU Technical Specifications

About This Chapter

This document describes the technical specifications and engineering specifications of remote radio units (RRUs).

NOTE

- Unless otherwise specified, in this document, **LTE** and **eNodeB** always include FDD, TDD, and NB-IoT. In scenarios where they need to be distinguished, **LTE FDD**, **LTE TDD**, and **LTE NB-IoT** are used. The same rules apply to eNodeB.
- In this document, **G** is short for **GSM**, **U** is short for **UMTS**, **L** is short for **LTE FDD**, **T** is short for **LTE TDD**, **M** is short for **LTE NB-IoT**. **N** is short for **NR**.

Product Version

The following table lists the 3900 series base station product versions related to this document.

Product Name	Solution Version	Product Version
DBS3900	● SRAN15.1 ● GBSS21.1 ● RAN21.1 ● eRAN15.1 ● eRAN TDD 15.1 ● 5G RAN2.1	V100R015C10
BTS3900C	● SRAN15.1 ● RAN21.1	

The following table lists the 5900 series base station product versions related to this document.

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Product Name	Solution Version	Product Version
DBS5900	● SRAN15.1 ● GBSS21.1 ● RAN21.1 ● eRAN15.1 ● eRAN TDD 15.1 ● 5G RAN2.1	V100R015C10

Intended Audience

This document is intended for:

- Network planning engineers
- Onsite engineers
- System engineers

Organization

1.1 Changes in RRU Technical Specifications
This section describes the changes in *RRU Technical Specifications*.

1.2 RRU Overview
This section lists the types, frequency bands, and supported modes of RRUs.

1.3 Technical Specifications of RRUs
This section describes the technical specifications of RRUs, including supported modes, frequency bands, RF specifications, engineering specifications, specifications of CPRI ports, and antenna capabilities.

1.4 Typical Power Configuration Reference for RF Modules
This section describes the power configuration principles and typical power configurations for RF modules.

Base Station Power Consumption (Configured with the 3000 Series RRU)

1.1 Changes in RRU Technical Specifications

This section describes the changes in *RRU Technical Specifications*.

03 (2019-07-20)

This is the third commercial release.

Compared with Issue 02 (2019-06-29), this issue includes the following new topics:

- **1.3.19 RRU5308 Technical Specifications**
- **1.3.10 RRU5836E Technical Specifications**

Compared with Issue 02 (2019-06-29), this issue includes the following changes.

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Topic	Change Description
1.3.11 RRU5509t Technical Specifications	● Revised descriptions in this document. ● Modified the power configurations.
● **1.3.40 RRU3942 Technical Specifications** ● **1.3.41 RRU3939 Technical Specifications** ● **1.3.42 RRU3938 Technical Specifications** ● **1.3.43 RRU3936 Technical Specifications** ● **1.3.45 RRU3929 Technical Specifications** ● **1.3.46 RRU3928 Technical Specifications** ● **1.3.47 RRU3926 Technical Specifications** ● **1.3.71 RRU3269 Technical Specifications** ● **1.3.72 RRU3268 Technical Specifications**	Modified the capacity specifications and power configurations for the RRU working in NB-IoT mode.
1.3.7 RRU5903 Technical Specifications	Added the specifications of the RRU5903 (1900 MHz).

Compared with Issue 02 (2019-06-29), this issue does not exclude any topics.

02 (2019-06-29)

This is the second commercial release.

Compared with Issue 01 (2019-06-06), this issue does not include any new topics.

Compared with Issue 01 (2019-06-06), this issue includes the following changes.

Topic	Change Description
All RRUs	Optimized the description of the RRU volume.
1.3.65 RRU3668 Technical Specifications	Modified the weight of the RRU3668.
1.3.24 RRU5258 Technical Specifications	Modified the power configuration of the RRU5258.

Compared with Issue 01 (2019-06-06), this issue does not exclude any topics.

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01 (2019-06-06)

This is the first commercial release.

Compared with Draft D (2019-05-10), this issue includes the following new information:

1.3.26 RRU5251 Technical Specifications

Compared with Draft D (2019-05-10), this issue includes the following changes.

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Topic	Change Description
• 1.3.1 RRU5909s Technical Specifications • 1.3.2 RRU5909 Technical Specifications • 1.3.4 RRU5905 Technical Specifications • 1.3.9 RRU5901 Technical Specifications • 1.3.11 RRU5509t Technical Specifications • 1.3.12 RRU5508 Technical Specifications • 1.3.14 RRU5505 Technical Specifications • 1.3.15 RRU5502 Technical Specifications • 1.3.17 RRU5309w Technical Specifications • 1.3.18 RRU5309 Technical Specifications • 1.3.27 RRU3971a Technical Specifications • 1.3.28 RRU3971 Technical Specifications • 1.3.32 RRU3959a Technical Specifications • 1.3.34 RRU3959 Technical Specifications • 1.3.37 RRU3953 Technical Specifications • 1.3.39 RRU3952 Technical Specifications • 1.3.40 RRU3942 Technical Specifications • 1.3.41 RRU3939 Technical Specifications • 1.3.42 RRU3938 Technical Specifications • 1.3.43 RRU3936 Technical Specifications • 1.3.45 RRU3929 Technical Specifications • 1.3.46 RRU3928 Technical Specifications	Modified the capacity specifications and power configurations for the RRU working in NB-IoT mode.

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Topic	Change Description
● 1.3.47 RRU3926 Technical Specifications ● 1.3.71 RRU3269 Technical Specifications ● 1.3.72 RRU3268 Technical Specifications ● 1.3.73 RRU3262 Technical Specifications	
1.3.2 RRU5909 Technical Specifications	● Added the specifications of the RRU5909 (700 MHz). ● Modified the power configuration of the RRU5909 (900 MHz) working in GLM mode.
1.3.6 RRU5904 Technical Specifications	Modified the typical power consumption of the RRU5904 (2100 MHz).
1.3.11 RRU5509t Technical Specifications	Modified the description related to PIM3.
1.3.12 RRU5508 Technical Specifications	Added the description related to PIM3.
1.3.15 RRU5502 Technical Specifications	Added the specifications of the RRU5502 (AWS+PCS).
1.3.18 RRU5309 Technical Specifications	Added the specifications of the RRU5309 (700 MHz).
1.3.24 RRU5258 Technical Specifications	Modified the OBW of the RRU5258 (3500 MHz) and RRU5258 (3700 MHz).
1.3.34 RRU3959 Technical Specifications	Modified the power configuration of the RRU3959 (900 MHz) working in GLM mode.

Compared with Draft D (2019-05-10), this issue excludes the following topics:

RRU5903w Technical Specifications

Draft D (2019-05-10)

This is a draft.

Compared with Draft C (2019-04-10), this issue includes the following new topics:

- 1.10.9-RRU5903w Technical Specifications

Compared with Draft C (2019-04-10), this issue includes the following changes.

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Topic	Change Description
1.3.54 RRU3832 Technical Specifications	Added the maximum number of carriers supported by the RRU3832 when it works in the AWS-3 band of LTE FDD.
● **1.4.1 Power Configuration Principles for RF Modules** ● **1.4.2 GSM Available Power Supported by RRUs**	Revised descriptions in this document.
1.3.11 RRU5509t Technical Specifications	Modified the specifications of the RRU5509t.
● **1.3.2 RRU5909 Technical Specifications** ● **1.3.4 RRU5905 Technical Specifications** ● **1.3.32 RRU3959a Technical Specifications** ● **1.3.34 RRU3959 Technical Specifications** ● **1.3.37 RRU3953 Technical Specifications** ● **1.3.42 RRU3938 Technical Specifications** ● **1.3.45 RRU3929 Technical Specifications** ● **1.3.46 RRU3928 Technical Specifications**	Added support for GULM by the RRUs working on the 900 MHz frequency band.

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Topic	Change Description
• 1.3.24 RRU5258 Technical Specifications • 1.3.25 RRU5254 Technical Specifications • 1.3.67 RRU3279 Technical Specifications • 1.3.68 RRU3278u Technical Specifications • 1.3.69 RRU3278 Technical Specifications • 1.3.70 RRU3276 Technical Specifications • 1.3.75 RRU3259 Technical Specifications • 1.3.76 RRU3256 Technical Specifications • 1.3.77 RRU3253 Technical Specifications • 1.3.78 RRU3252 Technical Specifications • 1.3.79 RRU3251 Technical Specifications • 1.3.82 RRU3236E Technical Specifications • 1.3.83 RRU3232 Technical Specifications	Added the receiver sensitivity.

Compared with Draft C (2019-04-10), this issue does not exclude any topics.

Draft C (2019-04-10)

This is a draft.

Compared with Draft B (2019-02-22), this issue does not include any new topics.

Compared with Draft B (2019-02-22), this issue includes the following changes.

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Topic	Change Description
● 1.3.3 RRU5905w Technical Specifications ● 1.3.5 RRU5904w Technical Specifications ● 1.3.8 RRU5901w Technical Specifications ● 1.3.12 RRU5508 Technical Specifications ● 1.3.13 RRU5507 Technical Specifications ● 1.3.14 RRU5505 Technical Specifications	Added the carrier specifications of the RRUs (1800 MHz) working in NR SUL mode.
● 1.3.12 RRU5508 Technical Specifications ● 1.3.13 RRU5507 Technical Specifications ● 1.3.14 RRU5505 Technical Specifications ● 1.3.28 RRU3971 Technical Specifications ● 1.3.30 RRU3962 Technical Specifications	Added the carrier specifications of the RRUs (2100 MHz) working in NR SUL mode.
● 1.3.11 RRU5509t Technical Specifications ● 1.3.12 RRU5508 Technical Specifications	Added the carrier specifications of the RRUs (700 MHz) working in NR SUL mode.
1.3.11 RRU5509t Technical Specifications	Added the carrier specifications of the RRU5509t (800 MHz) working in NR SUL mode.
1.3.12 RRU5508 Technical Specifications	● Added the specifications of the RRU5508 (700 MHz+850 MHz). ● Updated the power configuration of the RRU5508 (700 MHz+900 MHz).
1.3.14 RRU5505 Technical Specifications	Rectified the power configuration and deleted the GU specifications of the RRU5505.
1.3.23 RRU5301 Technical Specifications	Added the specifications of the RRU5301 (1400 MHz).
● 1.3.28 RRU3971 Technical Specifications ● 1.3.51 RRU3841 Technical Specifications	Added the LM specifications of an RRU working in the AWS frequency band.

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Topic	Change Description
1.3.24 RRU5258 Technical Specifications	● Modified the specifications of the RRU5258 (2600 MHz). ● Modified specifications of CPRI ports on the RRU.
1.3.25 RRU5254 Technical Specifications	Modified specifications of CPRI ports on the RRU.

Compared with Draft B (2019-02-22), this issue does not exclude any topics.

Draft B (2019-02-22)

This is a draft.

Compared with Draft A (2018-12-30), this issue includes the following new topics:

- 1.3.11 RRU5509t Technical Specifications
- 1.3.14 RRU5505 Technical Specifications

Compared with Draft A (2018-12-30), this issue includes the following changes.

Topic	Change Description
1.3.12 RRU5508 Technical Specifications	Added the specifications of the RRU5508 (700 MHz+900 MHz).
1.3.38 RRU3952m Technical Specifications	Added the specifications of the RRU3952m (1800 MHz) working in LM mode.
1.3.42 RRU3938 Technical Specifications	● Added the power configuration of the RRU3938 (900 MHz) working in GUL mode. ● Added the power configuration of the RRU3938 (1800 MHz) working in GLM mode. ● Updated the power configuration of the RRU3938 (1800 MHz) working in LM mode.
● 1.3.45 RRU3929 Technical Specifications ● 1.3.46 RRU3928 Technical Specifications	Added the power configuration of the RRUs (900 MHz) working in GUL mode.
1.3.72 RRU3268 Technical Specifications	Modified the power configuration of the RRU3268 working in LM mode.

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Topic	Change Description
• 1.3.1 RRU5909s Technical Specifications • 1.3.2 RRU5909 Technical Specifications • 1.3.15 RRU5502 Technical Specifications • 1.3.16 RRU5501 Technical Specifications • 1.3.32 RRU3959a Technical Specifications • 1.3.34 RRU3959 Technical Specifications • 1.3.35 RRU3958 Technical Specifications • 1.3.38 RRU3952m Technical Specifications • 1.3.39 RRU3952 Technical Specifications	Added the carrier specifications of the RRUs (2100 MHz) working in NR SUL mode.
• 1.3.1 RRU5909s Technical Specifications • 1.3.33 RRU3959w Technical Specifications • 1.3.36 RRU3953w Technical Specifications • 1.3.38 RRU3952m Technical Specifications	Added the carrier specifications of the RRUs (1800 MHz) working in NR SUL mode.
• 1.3.17 RRU5309w Technical Specifications • 1.3.23 RRU5301 Technical Specifications • 1.3.29 RRU3965 Technical Specifications	Added the carrier specifications of the RRUs (800 MHz) working in NR SUL mode.
1.3.73 RRU3262 Technical Specifications	Added the carrier specifications of the RRUs (700 MHz) working in NR SUL mode.

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Topic	Change Description
● 1.3.4 RRU5905 Technical Specifications ● 1.3.6 RRU5904 Technical Specifications ● 1.3.9 RRU5901 Technical Specifications ● 1.3.18 RRU5309 Technical Specifications ● 1.3.27 RRU3971a Technical Specifications ● 1.3.28 RRU3971 Technical Specifications ● 1.3.37 RRU3953 Technical Specifications	Optimized the descriptions of NR SUL carrier configurations.
1.3.24 RRU5258 Technical Specifications	Deleted the specifications of the RRU5258 (3480 – 3685 MHz) and the RRU5258 (2350 – 2390 MHz).

Compared with Draft A (2018-12-30), this issue does not exclude any topics.

Draft A (2018-12-30)

This is a draft.

RRU Technical Specifications is an independent document created for this release. Its content derives from the "Technical Specifications of RRUs" section of *3900 Series Base Station Technical Description/5900 Series Base Station Technical Description*. In this and subsequent releases, this content is removed from *3900 Series Base Station Technical Description/5900 Series Base Station Technical Description* and constitutes a separate document.

Compared with the "Technical Specifications of RRUs" section of *3900 Series Base Station Technical Description/5900 Series Base Station Technical Description* Issue 05 (2018-08-27) of V100R013C10, this issue includes the following new topics:

- 1.3.21 RRU5304w Technical Specifications
- 1.3.25 RRU5254 Technical Specifications
- 1.3.29 RRU3965 Technical Specifications

Compared with the "Technical Specifications of RRUs" section of *3900 Series Base Station Technical Description/5900 Series Base Station Technical Description* Issue 05 (2018-08-27) of V100R013C10, this issue includes the following changes.

Topic	Change Description
1.3.2 RRU5909 Technical Specifications	● Modified the power configuration of the RRU5909. ● Optimized the descriptions of NR SUL carrier configurations.

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Topic	Change Description
1.3.3 RRU5905w Technical Specifications	● Added the specifications of the RRU5905w (1800 MHz) working in GM/GLM mode. ● Updated the specifications of the RRU5905w (1800 MHz) working in LM mode.
1.3.4 RRU5905 Technical Specifications	● Modified the power configuration of the RRU5905. ● Optimized the descriptions of NR SUL carrier configurations.
1.3.5 RRU5904w Technical Specifications	● Modified the power configuration of the RRU5904w working in GUL mode. ● Added the specifications of the RRU5904w working in the 1800 MHz frequency band.
1.3.6 RRU5904 Technical Specifications	Added the NR SUL carrier configuration of the RRU5904 (2100 MHz).
● 1.3.9 RRU5901 Technical Specifications ● 1.3.15 RRU5502 Technical Specifications ● 1.3.27 RRU3971a Technical Specifications ● 1.3.28 RRU3971 Technical Specifications ● 1.3.32 RRU3959a Technical Specifications ● 1.3.30 RRU3962 Technical Specifications	Optimized the descriptions of NR SUL carrier configurations.
1.3.13 RRU5507 Technical Specifications	Added the NB-IoT typical power configuration of the RRU5507 (1800 MHz) working in LM mode and the RRU5507 (2100 MHz) working in UMTS mode.
1.3.16 RRU5501 Technical Specifications	Added the NR SUL carrier configuration of the RRU5501 (2100 MHz).
1.3.18 RRU5309 Technical Specifications	Added the NR SUL carrier configuration of the RRU5309 (800 MHz).
1.3.23 RRU5301 Technical Specifications	Added the specifications of the RRU5301 (800 MHz).
1.3.24 RRU5258 Technical Specifications	● Added the specifications of the RRU5258 (2600 MHz, band 38). ● Modified NR specifications and added support for two NR carriers.
1.3.25 RRU5254 Technical Specifications	Modified the power consumption of a single RRU5254.

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Topic	Change Description
1.3.28 RRU3971 Technical Specifications	Added the NR SUL carrier configuration of the RRU3971 (AWS).
1.3.34 RRU3959 Technical Specifications	● Modified the power configuration of the RRU3959 working in GUL mode. ● Optimized the descriptions of NR SUL carrier configurations.
1.3.36 RRU3953w Technical Specifications	Modified the specifications of the RRU3953w (1800 MHz) working in GM/LM/GLM mode.
1.3.37 RRU3953 Technical Specifications	● Added the power configuration of the RRU3953 (1900 MHz) working in UM/LM/ULM/GULM mode. ● Added NR SUL carrier configurations of the RRU3953 (1800 MHz)/RRU3953 (2100 MHz).
1.3.40 RRU3942 Technical Specifications	Added the power configuration of the RRU3942 (1900 MHz) working in UM/LM/ULM mode.
1.3.41 RRU3939 Technical Specifications	Deleted the descriptions of NR SUL carrier configurations.
1.3.42 RRU3938 Technical Specifications	● Modified the power configuration of the RRU3938. ● Deleted the descriptions of NR SUL carrier configurations.
1.3.90 RRU3203 Technical Specifications	Modified the descriptions of the frequency bands supported by the RRU3203.
1.4 Typical Power Configuration Reference for RF Modules	Presented typical power configurations in Excel files, including *Typical Power Configuration Reference for RRU (Excluding NB-IoT)* and *NB-IoT Typical Power Configurations (RRU)*.
Power consumption table	Changed the name to *Base Station Power Consumption Specifications (Configured with 3000 Series RRUs)*.
1.4.1 Power Configuration Principles for RF Modules	Revised descriptions in this document.
1.4.2 GSM Available Power Supported by RRUs	Revised descriptions in this document.

Compared with the "Technical Specifications of RRUs" section of *3900 Series Base Station Technical Description/5900 Series Base Station Technical Description* Issue 05 (2018-08-27) of V100R013C10, this issue excludes the following topic.

- *NB-IoT (inband & guardband) Power Configuration Combination*. For details, see the "L+M Configuration Combination" sheet in *NB-IoT Typical Power Configurations (RRU)*.

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1.2 RRU Overview

This section lists the types, frequency bands, and supported modes of RRUs.

RRU Introduction

As a radio frequency (RF) module in a distributed base station, the RRU modulates and demodulates baseband and RF signals, processes data, and combines and divides baseband or RF signals.

For details about the functions, ports, indicators, and power cable specifications of an RRU, see RRU hardware description of the corresponding model.

For the mapping between the RRUs and cabinets, see the section related to cabinet applications supported by the corresponding base station in *3900 & 5900 Series Base Station Hardware Description*.

For the upper-level circuit breakers and power cables of the RRUs, see the section related to configurations of upper-level circuit breakers and power cables in the corresponding base station in *3900 & 5900 Series Base Station Hardware Description*.

NOTE

- If the FDD+TDD carrier aggregation (CA) function is enabled and LTE TDD cells are configured with a frame offset, the same frame offset must be specified for the LTE FDD cells involved in CA. Therefore, LTE FDD RF modules must support the setting of frame offset. In the current version, all the LTE FDD RRUs support the setting of frame offset.
- None of the 5000 series RRUs can work together with the GTMUa.
- To obtain the preceding reference documents, choose **Base Station Product Documentation** > **Description** > **Hardware Description**.

RRU Type

The following table lists RRU types.

Table 1-1 RRU types

Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU5909s	1800	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	2T2R	**1.3.1 RRU5909s Technical Specifications**
RRU5909s	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T2R	**1.3.1 RRU5909s Technical Specifications**
RRU5909	1800	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	2T2R	**1.3.2 RRU5909 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU5909	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	2T2R	**1.3.2 RRU5909 Technical Specifications**
RRU5909	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T2R	**1.3.2 RRU5909 Technical Specifications**
RRU5909	EU 700	LTE FDD, LM, NR (SUL)	2T2R	**1.3.2 RRU5909 Technical Specifications**
RRU5905	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	2T2R	**1.3.4 RRU5905 Technical Specifications**
RRU5905	1800	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	2T2R	**1.3.4 RRU5905 Technical Specifications**
RRU5905w	1800	GSM, LTE FDD, GL, GM, LM, GLM, LN (SUL), GLN (SUL)	2T2R	**1.3.3 RRU5905w Technical Specifications**
RRU5904w	1900	UMTS, LTE FDD, GU, GL, UL, GUL	4T4R	**1.3.5 RRU5904w Technical Specifications**
RRU5904w	1800	GSM, LTE FDD, GL, LTE NB-IoT, GM, LM, GLM, LN (SUL), GLN (SUL)	4T4R	**1.3.5 RRU5904w Technical Specifications**
RRU5904	1800	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	4T4R	**1.3.6 RRU5904 Technical Specifications**
RRU5904	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	4T4R	**1.3.6 RRU5904 Technical Specifications**
RRU5903	850	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GLM, ULM, GUM, GULM	2T4R	**1.3.7 RRU5903 Technical Specifications**
RRU5903	1900	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, UM, LM, ULM	2T4R	**1.3.7 RRU5903 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU5901w	1800	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	4T4R	**1.3.8 RRU5901w Technical Specifications**
RRU5901	1800	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	4T4R	**1.3.9 RRU5901 Technical Specifications**
RRU5836E	3700	NR TDD	4T4R	**1.3.10 RRU5836E Technical Specifications**
RRU5509t	700+800+900	700 MHz/800 MHz: LTE FDD, LM, LN (SUL) 900 MHz: GSM, UMTS, LTE FDD, GU, GL, UL, GUL, GM, UM, LM, GUM, GLM, ULM 700 MHz+800 MHz: LTE FDD, LM, LN (SUL) 700 MHz+900 MHz/800 MHz +900 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL) 700 MHz+800 MHz+900 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T4R	**1.3.11 RRU5509t Technical Specifications**
RRU5508	700+900	700 MHz: LTE FDD, LM, LN (SUL) 900 MHz: GSM, UMTS, LTE FDD, GU, GL, UL, GUL, GM, UM, LM, GUM, GLM, ULM 700 MHz+900 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T4R	**1.3.12 RRU5508 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU5508	700+850	700 MHz: LTE FDD, LM, LN (SUL) 850 MHz: GSM, UMTS, LTE FDD, GU, GL, UL, GUL, GM, UM, LM, GUM, GLM, ULM 700 MHz+850 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T4R	**1.3.12 RRU5508 Technical Specifications**
RRU5508	1800+2100	1800 MHz: LTE FDD, GL, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T4R	**1.3.12 RRU5508 Technical Specifications**
RRU5507	1800+2100	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T4R	**1.3.13 RRU5507 Technical Specifications**
RRU5505	1800+2100	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T2R	**1.3.14 RRU5505 Technical Specifications**
RRU5502	1800+2100	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	4T4R	**1.3.15 RRU5502 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU5502	AWS +PCS	AWS: UMTS, LTE FDD, UL, LN (SUL) PCS: UMTS, LTE FDD, GU, GL, UL, LM, GLM, ULM, GULM AWS+PCS: UMTS, LTE FDD, GL, UL, GUL, LM, GLM, ULM GULM, LN (SUL), GLN (SUL), ULN (SUL)	4T4R	**1.3.15 RRU5502 Technical Specifications**
RRU5501	1800+2100	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	4T4R	**1.3.16 RRU5501 Technical Specifications**
RRU5309w	800	LTE FDD, LTE NB-IoT, LM, LN (SUL)	2T2R	**1.3.17 RRU5309w Technical Specifications**
RRU5309	700	LTE FDD, LM, LN (SUL)	2T2R	**1.3.18 RRU5309 Technical Specifications**
RRU5309	800	LTE FDD, LTE NB-IoT, LM, LN (SUL)	2T2R	**1.3.18 RRU5309 Technical Specifications**
RRU5308	800	LTE FDD, LM, LN (SUL)	2T2R	**1.3.19 RRU5308 Technical Specifications**
RRU5305	1400	LTE FDD	2T0R	**1.3.20 RRU5305 Technical Specifications**
RRU5304w	2600	LTE FDD	4T4R	**1.3.21 RRU5304w Technical Specifications**
RRU5304	2600	LTE FDD	4T4R	**1.3.22 RRU5304 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU5301	2600	LTE FDD	4T4R	1.3.23 RRU5301 Technical Specifications
RRU5301	1400	LTE FDD	4T0R	1.3.23 RRU5301 Technical Specifications
RRU5301	800	LTE FDD, LM, LN (SUL)	4T4R	1.3.23 RRU5301 Technical Specifications
RRU5258	3500 (Band 42/ n78)	LTE TDD, NR TDD	8T8R	1.3.24 RRU5258 Technical Specifications
RRU5258	3700 (Band 43/ n78)	LTE TDD, NR TDD	8T8R	1.3.24 RRU5258 Technical Specifications
RRU5258	3650 (Band 42, Band 43)	LTE TDD	8T8R	1.3.24 RRU5258 Technical Specifications
RRU5258	2300 (Band 40)	LTE TDD	8T8R	1.3.24 RRU5258 Technical Specifications
RRU5258	2600 (Band 38)	LTE TDD	8T8R	1.3.24 RRU5258 Technical Specifications
RRU5254	2300 (Band 40)+2600 (Band 41)	LTE TDD	4T4R	1.3.25 RRU5254 Technical Specifications
RRU5251	2300 (Band 40)	LTE TDD	4T4R	1.3.26 RRU5251 Technical Specifications
RRU3971a	1800	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	4T4R	1.3.27 RRU3971a Technical Specifications
RRU3971	1800	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	4T4R	1.3.28 RRU3971 Technical Specifications

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3971	1900	UMTS, LTE FDD, GU, GL, UL, GUL	4T4R	**1.3.28 RRU3971 Technical Specifications**
RRU3971	AWS	UMTS, LTE FDD, UL, LM, LN (SUL), ULN (SUL)	4T4R	**1.3.28 RRU3971 Technical Specifications**
RRU3971	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	4T4R	**1.3.28 RRU3971 Technical Specifications**
RRU3965	800+900 EGSM	800 MHz: LTE FDD, LM, LN (SUL) 900 EGSM: UMTS, LTE FDD, GU, GL, UL, GUL, GUM, GULM 800 MHz+900 EGSM: LTE FDD, GL, UL, GUL, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T2R	**1.3.29 RRU3965 Technical Specifications**
RRU3962	1800+2100	1800 MHz: LTE FDD, GL, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	2T4R	**1.3.30 RRU3962 Technical Specifications**
RRU3961	800+900 EGSM	800 MHz: LTE FDD, LTE NB-IoT, LM 900 EGSM: GSM, UMTS, GU 800 MHz+900 EGSM: GL, UL, GUL	2T2R	**1.3.31 RRU3961 Technical Specifications**
RRU3959a	1800	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	2T2R	**1.3.32 RRU3959a Technical Specifications**
RRU3959a	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GLM, GUM, ULM, GULM	2T2R	**1.3.32 RRU3959a Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3959a	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T2R	**1.3.32 RRU3959a Technical Specifications**
RRU3959w	1800	GSM, LTE FDD, GL, GM, LM, GLM, LN (SUL), GLN (SUL)	2T2R	**1.3.33 RRU3959w Technical Specifications**
RRU3959	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	2T2R	**1.3.34 RRU3959 Technical Specifications**
RRU3959	1800	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	2T2R	**1.3.34 RRU3959 Technical Specifications**
RRU3959	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T2R	**1.3.34 RRU3959 Technical Specifications**
RRU3958	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T2R	**1.3.35 RRU3958 Technical Specifications**
RRU3953w	1800	GSM, LTE FDD, GL, GM, LM, GLM, LN (SUL), GLN (SUL)	2T4R	**1.3.36 RRU3953w Technical Specifications**
RRU3953	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	2T4R	**1.3.37 RRU3953 Technical Specifications**
RRU3953	1800	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	2T4R	**1.3.37 RRU3953 Technical Specifications**
RRU3953	1900	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, UM, LM, ULM	2T4R	**1.3.37 RRU3953 Technical Specifications**
RRU3953	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T4R	**1.3.37 RRU3953 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3952m	1800	GSM, LTE FDD, GL, LM, LN (SUL), GLN (SUL)	2T4R	**1.3.38 RRU3952m Technical Specifications**
RRU3952m	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T4R	**1.3.38 RRU3952m Technical Specifications**
RRU3952	850 (Band 5)	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	2T4R	**1.3.39 RRU3952 Technical Specifications**
RRU3952	850 (Band 26)	LTE FDD	2T4R	**1.3.39 RRU3952 Technical Specifications**
RRU3952	2100	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	2T4R	**1.3.39 RRU3952 Technical Specifications**
RRU3942	1900	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, UM, LM, ULM, GULM	2T4R	**1.3.40 RRU3942 Technical Specifications**
RRU3942	850	GSM, UMTS, LTE FDD, GU, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	2T4R	**1.3.40 RRU3942 Technical Specifications**
RRU3939	1800	GSM, LTE FDD, GL, LM, GLM	2T2R	**1.3.41 RRU3939 Technical Specifications**
RRU3938	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	2T2R	**1.3.42 RRU3938 Technical Specifications**
RRU3938	1800	GSM, LTE FDD, GL, LM, GLM	2T2R	**1.3.42 RRU3938 Technical Specifications**
RRU3936	850	GSM, UMTS, GU, LTE FDD, GL, UL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	1T2R	**1.3.43 RRU3936 Technical Specifications**
RRU3936	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	1T2R	**1.3.43 RRU3936 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3936	1900	GSM, UMTS, LTE FDD, GU, GL, UL	1T2R	1.3.43 RRU3936 Technical Specifications
RRU3936	1800	GSM, LTE FDD, GL, LM, GLM	1T2R	1.3.43 RRU3936 Technical Specifications
RRU3930E	2100	UMTS, LTE FDD, UL	2T2R	1.3.44 RRU3930E Technical Specifications
RRU3929	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	2T2R	1.3.45 RRU3929 Technical Specifications
RRU3929	1800	GSM, LTE FDD, GL, LM, GLM	2T2R	1.3.45 RRU3929 Technical Specifications
RRU3928	900 EGSM	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	2T2R	1.3.46 RRU3928 Technical Specifications
RRU3928	1800	GSM, LTE FDD, GL	2T2R	1.3.46 RRU3928 Technical Specifications
RRU3926	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, UL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	1T2R	1.3.47 RRU3926 Technical Specifications
RRU3926	1800	GSM, LTE FDD, GL, LM, GLM	1T2R	1.3.47 RRU3926 Technical Specifications
RRU3908 DC V2	850	GSM, UMTS, GU	2T2R	1.3.48 RRU3908 V2 Technical Specifications
RRU3908 DC V2	900 EGSM/900 PGSM	GSM, UMTS, LTE FDD, GU, GL, LTE NB-IoT, GM, UM, LM	2T2R	1.3.48 RRU3908 V2 Technical Specifications
RRU3908 AC V2	900 PGSM	GSM, UMTS, LTE FDD, GU, GL, LTE NB-IoT, GM, UM, LM	2T2R	1.3.48 RRU3908 V2 Technical Specifications

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3908 V1	850	GSM, UMTS	2T2R	1.3.49 RRU3908 V1 Technical Specifications
RRU3908 V1	900 EGSM/900 PGSM	GSM, UMTS, GU	2T2R	1.3.49 RRU3908 V1 Technical Specifications
RRU3908 V1	1800	GSM, LTE FDD, GL	2T2R	1.3.49 RRU3908 V1 Technical Specifications
RRU3908 V1	1900	GSM, UMTS	2T2R	1.3.49 RRU3908 V1 Technical Specifications
RRU3853	2100	UMTS	2T4R	1.3.50 RRU3853 Technical Specifications
RRU3841	AWS (Band 4)	LTE FDD, LM	4T4R	1.3.51 RRU3841 Technical Specifications
RRU3839	2100	UMTS	2T2R	1.3.52 RRU3839 Technical Specifications
RRU3838	2100	UMTS	2T2R	1.3.53 RRU3838 Technical Specifications
RRU3832	2100	UMTS	2T4R	1.3.54 RRU3832 Technical Specifications
RRU3832	AWS/ AWS-3	UMTS, LTE FDD, UL	2T4R	1.3.54 RRU3832 Technical Specifications
RRU3829	2100	UMTS	2T2R	1.3.55 RRU3829 Technical Specifications
RRU3828	2100	UMTS	2T2R	1.3.56 RRU3828 Technical Specifications

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3826	2100	UMTS	1T2R	1.3.57 RRU3826 Technical Specifications
RRU3824	2100	UMTS	1T2R	1.3.58 RRU3824 Technical Specifications
RRU3821E	1800	LTE FDD	2T2R	1.3.59 RRU3821E Technical Specifications
RRU3808	2100	UMTS, LTE FDD, UL	2T2R	1.3.60 RRU3808 Technical Specifications
RRU3808	AWS	UMTS	2T2R	1.3.60 RRU3808 Technical Specifications
RRU3806	2100	UMTS	1T2R	1.3.61 RRU3806 Technical Specifications
RRU3805	1900	UMTS	2T2R	1.3.62 RRU3805 Technical Specifications
RRU3805	850	UMTS	2T2R	1.3.62 RRU3805 Technical Specifications
RRU3804	2100	UMTS	1T2R	1.3.63 RRU3804 Technical Specifications
RRU3804	1900	UMTS	1T2R	1.3.63 RRU3804 Technical Specifications
RRU3804	AWS	UMTS	1T2R	1.3.63 RRU3804 Technical Specifications
RRU3804	850	UMTS	1T2R	1.3.63 RRU3804 Technical Specifications

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3801E	850	UMTS	1T2R	1.3.64 RRU3801E Technical Specifications
RRU3801E	1900	UMTS	1T2R	1.3.64 RRU3801E Technical Specifications
RRU3801E	2100	UMTS	1T2R	1.3.64 RRU3801E Technical Specifications
RRU3668	450	LTE FDD	2T2R	1.3.65 RRU3668 Technical Specifications
RRU3281	2600 (Band 7)	LTE FDD	4T4R	1.3.66 RRU3281 Technical Specifications
RRU3279	2300 (Band 40)/ 2500 (Band 41)/ 2600 (Band 38)	LTE TDD	8T8R	1.3.67 RRU3279 Technical Specifications
RRU3278u	3500 (Band 42)	LTE TDD	8T8R	1.3.68 RRU3278u Technical Specifications
RRU3278	3500 (Band 42)/ 3700 (Band 43)	LTE TDD	8T8R	1.3.69 RRU3278 Technical Specifications
RRU3276	2300 (Band 40)/ 2600 (Band 41)/ 2600 (Band 38)	LTE TDD	4T4R	1.3.70 RRU3276 Technical Specifications

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3269	700 (Band 12 and Band 13)	LTE FDD, LM	2T2R	**1.3.71 RRU3269 Technical Specifications**
RRU3268	2600 (Band 7)	LTE FDD	2T2R	**1.3.72 RRU3268 Technical Specifications**
RRU3268	700 (Band 28)/EU 700	LTE FDD, LM	2T2R	**1.3.72 RRU3268 Technical Specifications**
RRU3268	800	LTE FDD, LM	2T2R	**1.3.72 RRU3268 Technical Specifications**
RRU3262	700 (Band 28)	LTE FDD, LM, LN (SUL)	2T4R	**1.3.73 RRU3262 Technical Specifications**
RRU3262	2600 (Band 7)	LTE FDD	2T4R	**1.3.73 RRU3262 Technical Specifications**
RRU3262	850	LTE FDD	2T4R	**1.3.73 RRU3262 Technical Specifications**
RRU3260	2600 (Band 7)	LTE FDD	2T4R	**1.3.74 RRU3260 Technical Specifications**
RRU3259	2600	LTE TDD	8T8R	**1.3.75 RRU3259 Technical Specifications**
RRU3256	2300 (Band 40)/ 2500 (Band 41)/ 2600 (Band 38)/ 3500 (Band 42/43)	LTE TDD	4T4R	**1.3.76 RRU3256 Technical Specifications**
RRU3253	2600 (Band 38)	LTE TDD	8T8R	**1.3.77 RRU3253 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3252	2300 (Band 40)/ 2500 (Band 41)/ 2600 (Band 38)	LTE TDD	4T4R	**1.3.78 RRU3252 Technical Specifications**
RRU3251	2300 (Band 40)	LTE TDD	2T2R	**1.3.79 RRU3251 Technical Specifications**
RRU3249	700 (Band 12)	LTE FDD	2T2R	**1.3.80 RRU3249 Technical Specifications**
RRU3240	2600 (Band 7)	LTE FDD	2T4R	**1.3.81 RRU3240 Technical Specifications**
RRU3236E	2300 (Band 40)/ 3500 (Band 42)	LTE TDD	2T2R	**1.3.82 RRU3236E Technical Specifications**
RRU3232	2600 (Band 38)/ 2500 (Band 41)/ 2300 (Band 40)/ 3500/1800	LTE TDD	4T4R	**1.3.83 RRU3232 Technical Specifications**
RRU3230E	2600 (Band 7)	LTE FDD	2T2R	**1.3.84 RRU3230E Technical Specifications**
RRU3230E	1800 (Band 3)	LTE FDD, LTE NB-IoT, LM	2T2R	**1.3.84 RRU3230E Technical Specifications**
RRU3229	2600 (Band 7)	LTE FDD	2T2R	**1.3.85 RRU3229 Technical Specifications**
RRU3222	800 (Band 20)	LTE FDD, LM	2T2R	**1.3.86 RRU3222 Technical Specifications**

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Module	Supported Frequency Band (MHz)	Applicable Mode	TX/RX Channel	Technical Specifications
RRU3221	2600 (Band 7)	LTE FDD	2T2R	1.3.87 RRU3221 Technical Specifications
RRU3220E	1800 (Band 3)	LTE FDD	2T2R	1.3.88 RRU3220E Technical Specifications
RRU3220	800 (Band 20)	LTE FDD, LM	2T2R	1.3.89 RRU3220 Technical Specifications
RRU3203	700 (Band 12)	LTE FDD	2T2R	1.3.90 RRU3203 Technical Specifications
RRU3201	700 (Band 13)/2600 (Band 7)	LTE FDD	2T2R	1.3.91 RRU3201 Technical Specifications
RRU3168	1900	LTE TDD	8T8R	1.3.92 RRU3168 Technical Specifications
RRU3008	850	GSM	2T2R	1.3.93 RRU3008 Technical Specifications
RRU3008	900 EGSM/900 PGSM/900 CMCC	GSM	2T2R	1.3.93 RRU3008 Technical Specifications
RRU3008	1800	GSM	2T2R	1.3.93 RRU3008 Technical Specifications
RRU3008	1900	GSM	2T2R	1.3.93 RRU3008 Technical Specifications
RRU3004	900 EGSM/900 PGSM	GSM	2T2R	1.3.94 RRU3004 Technical Specifications
RRU3004	1800	GSM	2T2R	1.3.94 RRU3004 Technical Specifications

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1.3 Technical Specifications of RRUs

This section describes the technical specifications of RRUs, including supported modes, frequency bands, RF specifications, engineering specifications, specifications of CPRI ports, and antenna capabilities.

1.3.1 RRU5909s Technical Specifications

The RRU5909s is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5909s can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5909s.

Table 1-2 Modes and frequency bands supported by an RRU5909s

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5909s	1800	1710 to 1785	1805 to 1880	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45
RRU5909s	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

RF Specifications

The following tables list RF specifications of an RRU5909s.

Table 1-3 Receiver sensitivity of an RRU5909s

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5909s	2T2R	GSM: -114.0 UMTS: -126.1 LTE FDD: -107.0 LTE NB-IoT: -127.3	GSM: -116.8 UMTS: -128.9 LTE FDD: -109.8 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-4 Capacity and output power of an RRU5909s

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5909s (1800 MHz)	GSM: 6 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5909s (2100 MHz)	UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

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Table 1-5 SUL carrier configuration of an RRU5909s (LN, 1800 MHz/2100 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-6 SUL carrier configuration of an RRU5909s (GLN, 1800 MHz, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Table 1-7 SUL carrier configuration of an RRU5909s (ULN, 2100 MHz, 2R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5909s.

Table 1-8 Input power of an RRU5909s

Type	Power
RRU5909s	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-9 Dimensions and weight of an RRU5909s

Type	Dimensions (H x W x D)	Weight (kg)
RRU5909s	400 mm x 300 mm x 70 mm (8L, without the housing)	12 (without the housing)

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Table 1-10 Power consumption of an RRU5909s

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5909s	1800	240
RRU5909s	2100	230

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5909s.

Table 1-11 Environmental specifications of an RRU5909s

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5909s	- Without solar radiation: -40°C to +55°C - With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5909s.

Table 1-12 Compliance standards for an RRU5909s

Item	Standard
RF	- 3GPP TS 45.005 - 3GPP TS 25.141 - 3GPP TS 36.141 - 3GPP TS 38.104 - 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5909s.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-13 Surge protection specifications of ports on an RRU5909s

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5909s.

Table 1-14 Specifications of CPRI ports on an RRU5909s

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5909s	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-15 RRU5909s CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5909s	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5909s.

Table 1-16 Antenna capability of an RRU5909s

Type	TMA Support	RET Antenna Support
RRU5909s	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.2 RRU5909 Technical Specifications

An RRU5909 is a multimode remote radio unit. With the SDR technology, the RRU5909 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5909.

Table 1-17 Modes and frequency bands supported by an RRU5909

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5909	EU 700	703 to 733	758 to 788	LTE FDD, LM, NR (SUL)	25
RRU5909	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	35
RRU5909	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	25
RRU5909	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45
RRU5909	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz. In the following sections, EU 700 MHz is referred to as 700 MHz.

RF Specifications

The following tables list RF specifications of an RRU5909.

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Table 1-18 Receiver sensitivity of an RRU5909

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5909	2T2R	GSM: ● 900 EGSM: -113.8 ● 900 PGSM: -113.8 ● 1800 MHz: -114.0 UMTS: ● 900 EGSM: -125.9 ● 900 PGSM: -125.9 ● 2100 MHz: -126.1 LTE FDD: ● 700 MHz: -106.5 ● 900 EGSM: -106.9 ● 900 PGSM: -106.9 ● 1800 MHz: -106.6 ● 2100 MHz: -106.9 LTE NB-IoT: -127.3	GSM: ● 900 EGSM: -116.6 ● 900 PGSM: -116.6 ● 1800 MHz: -116.8 UMTS: ● 900 EGSM: -128.7 ● 900 PGSM: -128.7 ● 2100 MHz: -128.9 LTE FDD: ● 700 MHz: -109.3 ● 900 EGSM: -109.7 ● 900 PGSM: -109.7 ● 1800 MHz: -109.4 ● 2100 MHz: -109.7 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-19 Capacity and output power of an RRU5909

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5909 (700 MHz)	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU5909 (900 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5909 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5909 (2100 MHz)	UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

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Table 1-20 SUL carrier configuration of an RRU5909 (NR, 700 MHz, 2R)

Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
1	10, 20

Table 1-21 SUL carrier configuration of an RRU5909 (LN, 1800 MHz/2100 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-22 SUL carrier configuration of an RRU5909 (GLN, 1800 MHz, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Table 1-23 SUL carrier configuration of an RRU5909 (ULN, 2100 MHz, 2R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5909.

Table 1-24 Input power of an RRU5909

Type	Power
RRU5909	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-25 Dimensions and weight of an RRU5909

Type	Dimensions (H x W x D)	Weight (kg)
RRU5909	400 mm x 300 mm x 100 mm (12 L, without the housing)	● 900 PGSM: 14 (without the housing) ● 900 EGSM: 14 (without the housing) ● 1800 MHz: 14 (without the housing) ● 2100 MHz: 15 (without the housing) ● 700 MHz: 15 (without the housing)

Table 1-26 Power consumption of an RRU5909

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5909	700	270
RRU5909	900 EGSM	276
RRU5909	900 PGSM	276
RRU5909	1800	270
RRU5909	2100	265

NOTE

- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.
- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU5909.

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Table 1-27 Environmental specifications of an RRU5909

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5909	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5909.

Table 1-28 Compliance standards for an RRU5909

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5909.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-29 Surge protection specifications of ports on an RRU5909

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5909.

Table 1-30 Specifications of CPRI ports on an RRU5909

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5909	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-31 RRU5909 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5909	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5909.

Table 1-32 Antenna capability of an RRU5909

Type	TMA Support	RET Antenna Support
RRU5909	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.3 RRU5905w Technical Specifications

The RRU5905w is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5905w can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5905w.

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Table 1-33 Modes and frequency bands supported by an RRU5905w

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5905w	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, GM, LM, GLM, LN (SUL), GLN (SUL)	75

NOTE

The RRU5905w provides the passive intermodulation (PIM) cancellation function.

- Passive intermodulation (PIM) refers to the intermodulation effect caused by nonlinearities in the passive components of an antenna system when high-power signals of multiple frequencies are transmitted. This intermodulation effect decreases the uplink sensitivity and negatively affects the network quality.
- The maximum gain of PIM cancellation can reach 15 dB. This function reduces the negative impact of the intermodulation effect on the system. The following factors impact PIM cancellation performance:
  - Antennas: For example, the antenna experiences water corrosion, the antenna is aged, or the screws inside the antenna are loose.
  - Connectors: For example, the jumper connector is not securely connected, and the jumper port is corroded by water or aged.
  - External PIM issues: For example, metal obstacles (steel rope of the guyed mast, metal fence, lightning protection ground bar, or billboard) exist near the radiation surface of the antenna.
  - Other factors that may cause PIM.
- An RRU must be used in a simple antenna networking scenario where the RRU uses a fixed-length jumper (≤ 6 m) to directly connect to the antenna. In this scenario, there is no intermediate component such as a combiner between the RRU and the antenna. The fixed-length jumper is used because it can effectively mitigate the PIM effect.

RF Specifications

The following tables list RF specifications of an RRU5905w.

Table 1-34 Receiver sensitivity of an RRU5905w

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5905w	2T2R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-35 Capacity and output power of an RRU5905w

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5905w	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-36 SUL carrier configuration of an RRU5905w (LN, 1800 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

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Table 1-37 SUL carrier configuration of an RRU5905w (GLN, 1800 MHz, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5905w.

Table 1-38 Input power of an RRU5905w

Type	Power
RRU5905w	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-39 Dimensions and weight of an RRU5905w

Type	Dimensions (H x W x D)	Weight (kg)
RRU5905w	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-40 Power consumption of an RRU5905w

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5905w	1800	370

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5905w.

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Table 1-41 Environmental specifications of an RRU5905w

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5905w	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5905w.

Table 1-42 Compliance standards for an RRU5905w

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5905w.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-43 Surge protection specifications of ports on an RRU5905w

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5905w.

Table 1-44 Specifications of CPRI ports on an RRU5905w

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5905w	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-45 RRU5905w CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5905w	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5905w.

Table 1-46 Antenna capability of an RRU5905w

Type	TMA Support	RET Antenna Support
RRU5905w	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.4 RRU5905 Technical Specifications

The RRU5905 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5905 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5905.

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Table 1-47 Modes and frequency bands supported by an RRU5905

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5905	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	35
RRU5905	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	25
RRU5905	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

RF Specifications

The following tables list RF specifications of an RRU5905.

Table 1-48 Receiver sensitivity of an RRU5905

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5905	2T2R	GSM: -114.0 UMTS: -125.9 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 UMTS: -128.7 LTE FDD: -109.4 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-49 Capacity and output power of an RRU5905

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5905 (900 MHz)	GSM: 8 carriers UMTS: ● 7 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5905 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not

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enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-50 SUL carrier configuration of an RRU5905 (LN, 1800 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-51 SUL carrier configuration of an RRU5905 (GLN, 1800 MHz, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5905.

Table 1-52 Input power of an RRU5905

Type	Power
RRU5905	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-53 Dimensions and weight of an RRU5905

Type	Dimensions (H x W x D)	Weight (kg)
RRU5905	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-54 Power consumption of an RRU5905

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5905	1800	370
RRU5905	900 PGSM	370
RRU5905	900 EGSM	370

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NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5905.

Table 1-55 Environmental specifications of an RRU5905

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5905	- Without solar radiation: -40°C to +55°C - With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5905.

Table 1-56 Compliance standards for an RRU5905

Item	Standard
RF	- 3GPP TS 45.005 - 3GPP TS 25.141 - 3GPP TS 36.141 - 3GPP TS 38.104 - 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** - The validity period is one year. - The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4

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Item	Standard
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5905.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-57 Surge protection specifications of ports on an RRU5905

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5905.

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Table 1-58 Specifications of CPRI ports on an RRU5905

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5905	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-59 RRU5905 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5905	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5905.

Table 1-60 Antenna capability of an RRU5905

Type	TMA Support	RET Antenna Support
RRU5905	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.5 RRU5904w Technical Specifications

The RRU5904w is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5904w can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5904w.

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Table 1-61 Modes and frequency bands supported by an RRU5904w

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5904w	1900	1850 to 1910	1930 to 1990	UMTS, LTE FDD, GU, GL, UL, GUL	60
RRU5904w	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LTE NB-IoT, GM, LM, GLM, LN (SUL), GLN (SUL)	75

NOTE

The RRU5904w provides the passive intermodulation (PIM) cancellation function.

- Passive intermodulation (PIM) refers to the intermodulation effect caused by nonlinearities in the passive components of an antenna system when high-power signals of multiple frequencies are transmitted. This intermodulation effect decreases the uplink sensitivity and negatively affects the network quality.
- The maximum gain of PIM cancellation can reach 15 dB. This function reduces the negative impact of the intermodulation effect on the system. The following factors impact PIM cancellation performance:
  - Antennas: For example, the antenna experiences water corrosion, the antenna is aged, or the screws inside the antenna are loose.
  - Connectors: For example, the jumper connector is not securely connected, and the jumper port is corroded by water or aged.
  - External PIM issues: For example, metal obstacles (steel rope of the guyed mast, metal fence, lightning protection ground bar, or billboard) exist near the radiation surface of the antenna.
  - Other factors that may cause PIM.
- An RRU must be used in a simple antenna networking scenario where the RRU uses a fixed-length jumper (≤ 6 m) to directly connect to the antenna. In this scenario, there is no intermediate component such as a combiner between the RRU and the antenna. The fixed-length jumper is used because it can effectively mitigate the PIM effect.

RF Specifications

The following tables list RF specifications of an RRU5904w.

Table 1-62 Receiver sensitivity of an RRU5904w

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5904w (1900 MHz)	4T4R	GSM: -113.7 UMTS: -125.7 LTE FDD: -106.5	GSM: -116.5 UMTS: -128.5 LTE FDD: -109.3	GSM: -119.2 (theoretical value) UMTS: -131.2 LTE FDD: -112.0

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Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU590 4w (1800 MHz)	4T4R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) LTE FDD: -112.1 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-63 Capacity and output power of an RRU5904w

Type	Capacity	Maximum Output Power	Typical Output Power
RRU590 4w (1900 MHz)	GSM: 8 carriers UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .
RRU590 4w (1800 MHz)	GSM: 8 carriers LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	4x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-64 SUL carrier configuration of an RRU5904w (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-65 SUL carrier configuration of an RRU5904w (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	2 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5904w.

Table 1-66 Input power of an RRU5904w

Type	Power
RRU5904w	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-67 Dimensions and weight of an RRU5904w

Type	Dimensions (H x W x D)	Weight (kg)
RRU5904w	400 mm x 300 mm x 150 mm (18 L, without the housing)	22 (without the housing)

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Table 1-68 Power consumption of an RRU5904w

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5904w	1900	495
RRU5904w	1800	495

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5904w.

Table 1-69 Environmental specifications of an RRU5904w

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5904w	- Without solar radiation: -40°C to +55°C - With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5904w.

Table 1-70 Compliance standards for an RRU5904w

Item	Standard
RF	- 3GPP TS 45.005 - 3GPP TS 25.141 - 3GPP TS 36.141 - 3GPP TS 38.104 - 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5904w.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-71 Surge protection specifications of ports on an RRU5904w

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5904w.

Table 1-72 Specifications of CPRI ports on an RRU5904w

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5904w	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-73 RRU5904w CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5904w	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5904w.

Table 1-74 Antenna capability of an RRU5904w

Type	TMA Support	RET Antenna Support
RRU5904w	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.6 RRU5904 Technical Specifications

The RRU5904 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5904 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5904.

Table 1-75 Modes and frequency bands supported by an RRU5904

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5904	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45
RRU5904	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

RF Specifications

The following tables list RF specifications of an RRU5904.

Table 1-76 Receiver sensitivity of an RRU5904

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5904	4T4R	GSM: -114.0 UMTS: -126.1 LTE FDD: ● 1800 MHz: -106.6 ● 2100 MHz: -106.9 LTE NB-IoT: -127.3	GSM: -116.8 UMTS: -128.9 LTE FDD: ● 1800 MHz: -109.4 ● 2100 MHz: -109.7 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) UMTS: -131.6 LTE FDD: ● 1800 MHz: -112.1 ● 2100 MHz: -112.4 LTE NB-IoT: -132.8

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-77 Capacity and output power of an RRU5904

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5904 (1800 MHz)	GSM: 8 carriers LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	4x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5904 (2100 MHz)	UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	4x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

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Table 1-78 SUL carrier configuration of an RRU5904 (LN, 1800 MHz/2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-79 SUL carrier configuration of an RRU5904 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	2 (MIMO)	1	15, 20

Table 1-80 SUL carrier configuration of an RRU5904 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	2 (MIMO)	1	15, 20
2 (MIMO)	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5904.

Table 1-81 Input power of an RRU5904

Type	Power
RRU5904	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-82 Equipment specifications of an RRU5904

Type	Dimensions (H x W x D)	Weight (kg)
RRU5904	400 mm x 300 mm x 150 mm (18 L, without the housing)	22 (without the housing)

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Table 1-83 Power consumption of an RRU5904

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5904	1800	492
RRU5904	2100	492

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5904.

Table 1-84 Environmental specifications of an RRU5904

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5904	- Without solar radiation: -40°C to +55°C - With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5904.

Table 1-85 Compliance standards for an RRU5904

Item	Standard
RF	- 3GPP TS 45.005 - 3GPP TS 25.141 - 3GPP TS 36.141 - 3GPP TS 38.104 - 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5904.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-86 Surge protection specifications of ports on an RRU5904

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5904.

Table 1-87 Specifications of CPRI ports on an RRU5904

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5904	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-88 RRU5904 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5904	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5904.

Table 1-89 Antenna capability of an RRU5904

Type	TMA Support	RET Antenna Support
RRU5904	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.7 RRU5903 Technical Specifications

An RRU5903 is a multimode remote radio unit. With the SDR technology, the RRU5903 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5903.

Table 1-90 Modes and frequency bands supported by an RRU5903

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5903	850	824 to 849	869 to 894	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GLM, ULM, GUM, GULM	25
RRU5903	1900	1850 to 1910	1930 to 1990	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, UM, LM, ULM	40

RF Specifications

The following tables list RF specifications of an RRU5903.

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Table 1-91 Receiver sensitivity of an RRU5903

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5903	2T4R	GSM: ● 850 MHz: –113.4 ● 1900 MHz: –113.7 UMTS: ● 850 MHz: –125.5 ● 1900 MHz: –125.7 LTE FDD: ● 850 MHz: –106.0 ● 1900 MHz: –106.5 LTE NB-IoT: –127.3	GSM: ● 1900 MHz: –116.5 UMTS: ● 850 MHz: –128.3 ● 1900 MHz: –128.5 LTE FDD: ● 850 MHz: –108.8 ● 1900 MHz: –109.3 LTE NB-IoT: –130.1	GSM: ● 850 MHz: –118.9 (theoretical value) ● 1900 MHz: –119.2 (theoretical value) UMTS: ● 850 MHz: –131.0 ● 1900 MHz: –131.2 LTE FDD: ● 850 MHz: –111.5 ● 1900 MHz: –112.0 LTE NB-IoT: –132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-92 Capacity and output power of an RRU5903

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5903 (850 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 3 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5903 (1900 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

- When the RRU5903 (850 MHz) works on 869 MHz to 874 MHz or 889 MHz to 894 MHz, the maximum output power per channel is 60 W.
- When the RRU5903 works only in GSM mode, it supports the maximum configuration of 2x60 W or the configuration of 80 W on only one channel. It does not support the configuration of 2x80 W.
- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU5903.

Table 1-93 Input power of an RRU5903

Type	Power
RRU5903	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-94 Dimensions and weight of an RRU5903

Type	Dimensions (H x W x D)	Weight (kg)
RRU5903	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-95 Power consumption of an RRU5903

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5903	850	330
RRU5903	1900	390

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5903.

Table 1-96 Environmental specifications of an RRU5903

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5903	- Without solar radiation: –40°C to +55°C - With solar radiation: –40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5903.

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Table 1-97 Compliance standards for an RRU5903

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5903.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-98 Surge protection specifications of ports on an RRU5903

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5903.

Table 1-99 Specifications of CPRI ports on an RRU5903

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5903	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-100 RRU5903 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5903	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU5903.

Table 1-101 Antenna capability of an RRU5903

Type	TMA Support	RET Antenna Support
RRU5903	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.8 RRU5901w Technical Specifications

The RRU5901w is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5901w can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5901w.

Table 1-102 Modes and frequency bands supported by an RRU5901w

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5901w	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	75

NOTE

The RRU5901w provides the passive intermodulation (PIM) cancellation function.

- Passive intermodulation (PIM) refers to the intermodulation effect caused by nonlinearities in the passive components of an antenna system when high-power signals of multiple frequencies are transmitted. This intermodulation effect decreases the uplink sensitivity and negatively affects the network quality.
- The maximum gain of PIM cancellation can reach 15 dB. This function reduces the negative impact of the intermodulation effect on the system. The following factors impact PIM cancellation performance:
  - Antennas: For example, the antenna experiences water corrosion, the antenna is aged, or the screws inside the antenna are loose.
  - Connectors: For example, the jumper connector is not securely connected, and the jumper port is corroded by water or aged.
  - External PIM issues: For example, metal obstacles (steel rope of the guyed mast, metal fence, lightning protection ground bar, or billboard) exist near the radiation surface of the antenna.
  - Other factors that may cause PIM.
- An RRU must be used in a simple antenna networking scenario where the RRU uses a fixed-length jumper (≤ 6 m) to directly connect to the antenna. In this scenario, there is no intermediate component such as a combiner between the RRU and the antenna. The fixed-length jumper is used because it can effectively mitigate the PIM effect.

RF Specifications

The following tables list RF specifications of an RRU5901w.

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Table 1-103 Receiver sensitivity of an RRU5901w

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5901w	4T4R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) LTE FDD: -112.1 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-104 Capacity and output power of an RRU5901w

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5901w	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	4x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

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Table 1-105 SUL carrier configuration of an RRU5901w (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-106 SUL carrier configuration of an RRU5901w (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	2 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5901w.

Table 1-107 Input power of an RRU5901w

Type	Power
RRU5901w	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-108 Dimensions and weight of an RRU5901w

Type	Dimensions (H x W x D)	Weight (kg)
RRU5901w	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-109 Power consumption of an RRU5901w

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5901w	1800	337

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

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The following table lists the environmental specifications of an RRU5901w.

Table 1-110 Environmental specifications of an RRU5901w

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5901w	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5901w.

Table 1-111 Compliance standards for an RRU5901w

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5901w.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-112 Surge protection specifications of ports on an RRU5901w

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5901w.

Table 1-113 Specifications of CPRI ports on an RRU5901w

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5901w	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-114 RRU5901w CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5901w	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5901w.

Table 1-115 Antenna capability of an RRU5901w

Type	TMA Support	RET Antenna Support
RRU5901w	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.9 RRU5901 Technical Specifications

The RRU5901 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5901 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5901.

Table 1-116 Modes and frequency bands supported by an RRU5901

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5901	1800	1710 to 1785	1805 to 1880	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45

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RF Specifications

The following tables list RF specifications of an RRU5901.

Table 1-117 Receiver sensitivity of an RRU5901

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5901	4T4R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) LTE FDD: -112.1 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-118 Capacity and output power of an RRU5901

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5901 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	4x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

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NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-119 SUL carrier configuration of an RRU5901 (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-120 SUL carrier configuration of an RRU5901 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	2 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU5901.

Table 1-121 Input power of an RRU5901

Type	Power
RRU5901	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-122 Dimensions and weight of an RRU5901

Type	Dimensions (H x W x D)	Weight (kg)
RRU5901	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-123 Power consumption of an RRU5901

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5901	1800	337

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NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5901.

Table 1-124 Environmental specifications of an RRU5901

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5901	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5901.

Table 1-125 Compliance standards for an RRU5901

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5901.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-126 Surge protection specifications of ports on an RRU5901

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5901.

Table 1-127 Specifications of CPRI ports on an RRU5901

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5901	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-128 RRU5901 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5901	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5901.

Table 1-129 Antenna capability of an RRU5901

Type	TMA Support	RET Antenna Support
RRU5901	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.10 RRU5836E Technical Specifications

The RRU5836E is a remote radio unit working in NR TDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5836E.

Table 1-130 Modes and frequency bands supported by an RRU5836E

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU5836E	3700 (N78)	3600 to 3800	NR TDD	200	100

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RF Specifications

The following tables list RF specifications of an RRU5836E.

Table 1-131 Receiver sensitivity of an RRU5836E

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)
RRU5836E	3700 (N78)	4T4R	–98 for 1 RX

Table 1-132 Capacity and output power of an RRU5836E

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5836E	1 carrier. The bandwidth per carrier is 100 MHz.	4x7.5 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU5836E.

Table 1-133 Input power of an RRU5836E

Type	Power
RRU5836E	220 V AC; voltage range: 90 V AC to 290 V AC

Table 1-134 Dimensions and weight of an RRU5836E

Type	Dimensions (H x W x D)	Weight (kg)
RRU5836E	350 mm x 210 mm x 84 mm (6 L)	≤ 8 (without mounting kits)

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Table 1-135 Power consumption of an RRU5836E

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5836E	3700	115

NOTE

The typical power consumption of a module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5836E.

Table 1-136 Environmental specifications of an RRU5836E

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5836E	Without solar radiation: -40°C to +50°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU5836E.

Table 1-137 Compliance standards for an RRU5836E

Item	Standard
RF	3GPP TS 36.104 3GPP TS 36.141 3GPP TS 38.104
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-138 lists the surge protection specifications of ports on an RRU5836E.

Table 1-138 Surge protection specifications of ports on an RRU5836E

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5836E.

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Table 1-139 Specifications of CPRI ports on an RRU5836E

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5836E	2	4.9152, 9.8304, 10.1376, or 24.33024	Star

Table 1-140 RRU5836E CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5836E	Cascading not supported	The length of optical fibers between the BBU and RRU must be less than 10 km.

Antenna Capability

The following table lists the antenna capability of an RRU5836E.

Table 1-141 Antenna capability of an RRU5836E

Type	TMA Support	RET Antenna Support
RRU5836E	Not supported	Not supported

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.11 RRU5509t Technical Specifications

An RRU5509t is a multimode remote radio unit. With the SDR technology, the RRU5509t can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5509t.

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Table 1-142 Modes and frequency bands supported by an RRU5509t

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5509t	700+800+900	700: 703 to 733 800: 832 to 862 900: 880 to 915	700: 758 to 788 800: 791 to 821 900: 925 to 960	700 MHz/800 MHz: LTE FDD, LM, LN (SUL) 900 MHz: GSM, UMTS, LTE FDD, GU, GL, UL, GUL, GM, UM, LM, GUM, GLM, ULM 700 MHz+800 MHz: LTE FDD, LM, LN (SUL) 700 MHz+900 MHz/800 MHz+900 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL) 700 MHz+800 MHz +900 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	700: 30 800: 30 900: 35

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NOTE

- An RRU5509t can work in the 700 MHz frequency band, 800 MHz frequency band, 900 MHz frequency band, any two of these frequency bands, or all these frequency bands.
- In this section, when the RRU5509t works in one frequency band, *frequency band* is used to indicate the band. When the RRU5509t works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* or *frequency band 1+frequency band 2+frequency band 3* is used to indicate the bands. For example: RRU5509t (700 MHz+800 MHz).
- When the RRU5509t works in 2T4R mode, it can be avoided that the third-order passive intermodulation (PIM3) of TX signals affects RX frequency bands if the RRU5509t meets the following requirements:
  - IBW of the RRU5509t (700 MHz) ≤ 27.5 MHz
  - IBW of the RRU5509t (800 MHz) ≤ 20.1 MHz
  - IBW of the RRU5509t (900 MHz) ≤ 22.5 MHz
  - IBW of the RRU5509t (700 MHz+900 MHz) (that is, the sum of the IBW of the RRU5509t working in 700 MHz only and that of the RRU5509t working in 900 MHz only) ≤ 45 MHz
- When the RRU5509t works in 2T4R mode, the PIM3 of TX signals may affect the RX frequency bands. The affected frequency bands can only work in 2T2R with a four-port antenna, and the RX signals and TX signals must be configured on different ports. For details, see the following:
  - RRU5509t (700 MHz): 2T is configured on RF ports A and B, and 2R is configured on RF ports C and D.
  - RRU5509t (800 MHz): 2T is configured on RF ports C and D, and 2R is configured on RF ports A and B.
  - RRU5509t (900 MHz): 2T is configured on RF ports A and B, and 2R is configured on RF ports C and D.

RF Specifications

The following tables list RF specifications of an RRU5509t.

Table 1-143 Receiver sensitivity of an RRU5509t

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5509t	2T4R	GSM: -113.7 UMTS: -125.7 LTE FDD: -106.5 LTE NB-IoT: -127.3	GSM: -116.5 UMTS: -128.5 LTE FDD: -109.3 LTE NB-IoT: -130.1	GSM: -119.2 (theoretical value) UMTS: -131.2 LTE FDD: -112.0 LTE NB-IoT: -132.8

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-144 Capacity and output power of an RRU5509t

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5509t	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: Each RRU supports two carriers in one frequency band, four carriers in two frequency bands, and six carriers in three frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: Each RRU supports 8 carriers in one frequency band and 16 carriers in two or three frequency bands. NR (SUL): 1 carrier	2x140 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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NOTE

- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.
- When the RRU5509t works only in a single frequency band or works in 700 MHz+800 MHz frequency bands, the maximum output power is 2x80 W. When the RRU5509t works in other frequency band combinations, the maximum output power is 2x140 W.
- Within an RRU5509t, the RRU5509t (700 MHz+800 MHz) and RRU5509t (900 MHz) work on different RF channels. Therefore, as long as the maximum output power of the RRU5509t does not exceed 2x140 W:
  - The RRU5509t (700 MHz+900 MHz) supports any power configuration combinations of single frequency bands 700 MHz and 900 MHz. The power configurations include the number of configurable carriers and the output power configurable per carrier. For example, the typical power configuration of GL (700 MHz LTE FDD+900 MHz GL) can be any combination of 700 MHz LTE FDD and 900 MHz GL power configurations. For the power configuration of 700 MHz or 900 MHz, see "Typical Output Power" in the preceding table.
  - The RRU5509t (800 MHz+900 MHz) supports any power configuration combinations of single frequency bands 800 MHz and 900 MHz. The power configurations include the number of configurable carriers and the output power configurable per carrier. For example, the typical power configuration of GL (800 MHz LTE FDD+900 MHz GL) can be any combination of 800 MHz LTE FDD and 900 MHz GL power configurations. For the power configuration of 800 MHz or 900 MHz, see "Typical Output Power" in the preceding table.
  - The RRU5509t (700 MHz+800 MHz+900 MHz) supports any power configuration combinations of 700 MHz+800 MHz (dual frequency bands) and 900 MHz (single frequency band). The power configurations include the number of configurable carriers and the output power configurable per carrier. For example, the typical power configuration of GL (700 MHz+800 MHz LTE FDD+900 MHz GL) can be any combination of 700 MHz+800 MHz LTE FDD and 900 MHz GL power configurations. For the power configuration of 700 MHz+800 MHz or 900 MHz, see "Typical Output Power" in the preceding table.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU5509t (700 MHz)

Table 1-145 SUL carrier configuration of an RRU5509t (LN, 700 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	10

RRU5509t (800 MHz)

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Table 1-146 SUL carrier configuration of an RRU5509t (LN, 800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	10

RRU5509t (700 MHz+800 MHz)

Table 1-147 SUL carrier configuration of an RRU5509t (LN, 700 MHz LN+800 MHz LTE FDD, 4R)

700 MHz			800 MHz
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of LTE FDD Carriers
2 (MIMO)	1	10	2 (MIMO)

Table 1-148 SUL carrier configuration of an RRU5509t (LN, 800 MHz LN+700 MHz LTE FDD, 4R)

800 MHz			700 MHz
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of LTE FDD Carriers
2 (MIMO)	1	10	2 (MIMO)

RRU5509t (700 MHz+900 MHz)

For the RRU5509t (700 MHz+900 MHz), NR SUL carriers can be configured only in the 700 MHz band in the uplink.

Table 1-145 lists the number of NR SUL carriers that can be configured for the 700 MHz uplink.

The carrier configuration for the 900 MHz in the uplink is the same as that in the downlink. For details, see the power configuration of the RRU5509t (900 MHz) in "Typical Output Power".

RRU5509t (800 MHz+900 MHz)

For the RRU5509t (800 MHz+900 MHz), NR SUL carriers can be configured only in the 800 MHz band in the uplink.

Table 1-146 lists the number of NR SUL carriers that can be configured for the 800 MHz uplink.

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The carrier configuration for the 900 MHz in the uplink is the same as that in the downlink. For details, see the power configuration of the RRU5509t (900 MHz) in "Typical Output Power".

RRU5509t (700 MHz+800 MHz+900 MHz)

For the RRU5509t (700 MHz+800 MHz+900 MHz), NR SUL carriers can be configured only in the 700 MHz or 800 MHz band in the uplink, and cannot be configured in the 700 MHz and 800 MHz bands in the uplink at the same time.

Table 1-147 and Table 1-148 list the number of NR SUL carriers that can be configured for the RRU5509t (700 MHz+800 MHz) uplink.

The carrier configuration for the 900 MHz in the uplink is the same as that in the downlink. For details, see the power configuration of the RRU5509t (900 MHz) in "Typical Output Power".

Engineering Specifications

The following tables list the equipment specifications of an RRU5509t.

Table 1-149 Input power of an RRU5509t

Type	Power
RRU5509t	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-150 Dimensions and weight of an RRU5509t

Type	Dimensions (H x W x D)	Weight (kg)
RRU5509t	480 mm x 356 mm x 140 mm (24 L, without the housing)	25 (without the housing)

Table 1-151 Power consumption of an RRU5509t

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5509t	700+800+900	560

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5509t.

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Table 1-152 Environmental specifications of an RRU5509t

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5509t	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5509t.

Table 1-153 Compliance standards for an RRU5509t

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5509t.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-154 Surge protection specifications of ports on an RRU5509t

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5509t.

Table 1-155 Specifications of CPRI ports on an RRU5509t

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5509t	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-156 RRU5509t CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5509t	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5509t.

Table 1-157 Antenna capability of an RRU5509t

Type	TMA Support	RET Antenna Support
RRU5509t	Supported	AISG2.0

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.12 RRU5508 Technical Specifications

An RRU5508 is a multimode remote radio unit. With the SDR technology, the RRU5508 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5508.

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Table 1-158 Modes and frequency bands supported by an RRU5508

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5508	1800+2100	1800: 1710 to 1785 2100: 1920 to 1980	1800: 1805 to 1880 2100: 2110 to 2170	1800 MHz: LTE FDD, GL, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	1800: 40 2100: 40
RRU5508	700+900	700: 703 to 748 900: 885 to 915	700: 758 to 803 900: 930 to 960	700 MHz: LTE FDD, LM, LN (SUL) 900 MHz: GSM, UMTS, LTE FDD, GU, GL, UL, GUL, GM, UM, LM, GUM, GLM, ULM 700 MHz+900 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	700: 45 900: 30
RRU5508	700+850	700: 703 to 748 850: 824 to 849	700: 758 to 803 850: 869 to 894	700 MHz: LTE FDD, LM, LN (SUL) 850 MHz: GSM, UMTS, LTE FDD, GU, GL, UL, GUL, GM, UM, LM, GUM, GLM, ULM 700 MHz+850 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	700: 45 850: 25

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NOTE

- An RRU5508 (1800 MHz+2100 MHz) can work in the 1800 MHz frequency band, 2100 MHz frequency band, or both frequency bands.
- An RRU5508 (700 MHz+900 MHz) can work in the 700 MHz frequency band, 900 MHz frequency band, or both frequency bands.
- An RRU5508 (700 MHz+850 MHz) can work in the 700 MHz frequency band, 850 MHz frequency band, or both frequency bands.
- In this section, when the RRU5508 works in one frequency band, *frequency band* is used to indicate the band. When the RRU5508 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. For example, RRU5508 (1800 MHz+2100 MHz).
- When the RRU5508 (700 MHz+900 MHz) or RRU5508 (700 MHz+850 MHz) works in 2T4R mode, it can be avoided that the third-order passive intermodulation (PIM3) of TX signals affects RX frequency bands if the RRU5508 meets the following requirements:
  - IBW of the RRU5508 (700 MHz) ≤ 25 MHz
  - IBW of the RRU5508 (900 MHz) ≤ 25 MHz
- When the RRU5508 (700 MHz+900 MHz) or RRU5508 (700 MHz+850 MHz) works in 2T4R mode, the PIM3 of TX signals may affect the RX frequency bands. The affected frequency bands can only work in 2T2R with a four-port antenna, and the RX signals and TX signals must be configured on different ports. For details, see the following:
  - RRU5508 (700 MHz): 2T is configured on RF ports A and B, and 2R is configured on RF ports C and D.
  - RRU5508 (900 MHz): 2T is configured on RF ports A and B, and 2R is configured on RF ports C and D.

RF Specifications

The following tables list RF specifications of an RRU5508.

Table 1-159 Receiver sensitivity of an RRU5508

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5508 (1800 MHz +2100 MHz)	2T4R	GSM: -114.0 UMTS: -126.1 LTE FDD: -106.9	GSM: -116.8 UMTS: -128.9 LTE FDD: -109.7	GSM: -119.5 (theoretical value) UMTS: -131.6 LTE FDD: -112.4
RRU5508 (700 MHz +900 MHz)	2T4R	GSM: -113.7 UMTS: -125.7 LTE FDD: -106.5 LTE NB-IoT: -127.3	GSM: -116.5 UMTS: -128.5 LTE FDD: -109.3 LTE NB-IoT: -130.1	GSM: -119.2 (theoretical value) UMTS: -131.2 LTE FDD: -112.0 LTE NB-IoT: -132.8

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Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5508 (700 MHz +850 MHz)	2T4R	GSM: -113.4 UMTS: -125.5 LTE FDD: ● 850 MHz: -106.0 ● 700 MHz: -106.5 LTE NB-IoT: -127.3	GSM: -116.2 UMTS: -128.3 LTE FDD: ● 850 MHz: -108.8 ● 700 MHz: -109.3 LTE NB-IoT: -130.1	GSM: -118.9 (theoretical value) UMTS: -131.0 LTE FDD: ● 850 MHz: -111.5 ● 700 MHz: -112.0 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-160 Capacity and output power of an RRU5508

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5508 (1800 MHz +2100 MHz)	UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: Each RRU supports two carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x120 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU5508 (700 MHz +900 MHz)	GSM: 8 carriers UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: ● 700 MHz, 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. ● 900 MHz, 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. ● 700 MHz+900 MHz, 4 carriers LTE NB-IoT: Each RRU supports 8 carriers in one frequency band and 16 carriers in two frequency bands. NR (SUL): 1 carrier	2x120 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU5508 (700 MHz +850 MHz)	GSM: 8 carriers UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: ● 700 MHz, 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. ● 850 MHz, 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. ● 700 MHz+850 MHz, 4 carriers LTE NB-IoT: Each RRU supports 8 carriers in one frequency band and 16 carriers in two frequency bands. NR (SUL): 1 carrier	2x120 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.
- RRU5508 (1800 MHz+2100 MHz): When it works only in a single frequency band, the maximum output power is 2x80 W. When it works in dual frequency bands, the maximum output power is 2x120 W.
- RRU5508 (700 MHz+900 MHz): When it works only in a single frequency band 700 MHz, the maximum output power is 2x60 W. When it works only in a single frequency band 900 MHz, the maximum output power is 2x80 W. When it works in dual frequency bands, the maximum output power is 2x120 W.
- Any power configuration combinations of the RRU5508 (700 MHz) and RRU5508 (900 MHz) is supported provided that the total output power of the RRU5508 (700 MHz+900 MHz) does not exceed 2x120 W. The power configurations include the number of configurable carriers and the output power configurable per carrier. For example, the typical power configuration of GLM (700 MHz LTE FDD+900 MHz GM) can be any combination of 700 MHz LTE FDD and 900 MHz GM power configurations. For the power configuration of 700 MHz or 900 MHz, see "Typical Output Power" in the preceding table.
- The power configuration rules for the RRU5508 (700 MHz+850 MHz) are the same as those for the RRU5508 (700 MHz+900 MHz).
- When the RRU5508 (700 MHz+850 MHz) works on 869 MHz to 874 MHz or 889 MHz to 894 MHz, the maximum output power per channel is 60 W.
- The PIM3 of TX signals may affect the RX frequency bands of the RRU5508 (700 MHz+900 MHz)/ RRU5508 (700 MHz+850 MHz) when the sum of the bandwidths of the two LTE carriers exceeds 25 MHz. Therefore, the TX and RX channels of the RRU5508 (700 MHz+900 MHz)/RRU5508 (700 MHz +850 MHz) must be configured as 2T2R rather than 2T4R.

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NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU5508 (1800 MHz)

Table 1-161 SUL carrier configuration of an RRU5508 (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-162 SUL carrier configuration of an RRU5508 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20

RRU5508 (2100 MHz)

Table 1-163 SUL carrier configuration of an RRU5508 (LN, 2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-164 SUL carrier configuration of an RRU5508 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
6	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20
2 (MIMO)	2 (MIMO)	1	15, 20

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RRU5508 (1800 MHz+2100 MHz)

Table 1-165 SUL carrier configuration of an RRU5508 (LN, 1800 MHz LN+2100 MHz LTE FDD, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-166 SUL carrier configuration of an RRU5508 (LN, 2100 MHz LN+1800 MHz LTE FDD, 4R)

2100 MHz			1800 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-167 SUL carrier configuration of an RRU5508 (GLN, 1800 MHz GLN+2100 MHz LTE FDD, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	1 (MIMO)
6	1 (MIMO)	1	15, 20	1 (MIMO)
2	1 (MIMO)	1	15, 20	2 (MIMO)

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Table 1-168 SUL carrier configuration of an RRU5508 (GLN, 1800 MHz GL+2100 MHz LN, 4R)

1800 MHz		2100 MHz		
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**
4	2 (MIMO)	1 (MIMO)	1	15, 20
6	1 (MIMO)	1 (MIMO)	1	15, 20
2	1 (MIMO)	2 (MIMO)	1	15, 20

Table 1-169 SUL carrier configuration of an RRU5508 (ULN, 1800 MHz LN+2100 MHz UMTS, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
2 (MIMO)	1	15, 20	4
1 (MIMO)	1	15, 20	6
2 (MIMO)	1	15, 20	2 (MIMO)
1 (MIMO)	1	15, 20	3 (MIMO)

Table 1-170 SUL carrier configuration of an RRU5508 (ULN, 1800 MHz LN+2100 MHz UL, 4R)

1800 MHz			2100 MHz	
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	4	1 (MIMO)
2 (MIMO)	1	15, 20	2 (MIMO)	1 (MIMO)
2 (MIMO)	1	15, 20	2	2 (MIMO)
2 (MIMO)	1	15, 20	1 (MIMO)	2 (MIMO)

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Table 1-171 SUL carrier configuration of an RRU5508 (ULN, 2100 MHz ULN+1800 MHz LTE FDD, 4R)

2100 MHz				1800 MHz
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	2 (MIMO)
2 (MIMO)	1 (MIMO)	1	15, 20	2 (MIMO)
2	2 (MIMO)	1	15, 20	2 (MIMO)
1 (MIMO)	2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-172 SUL carrier configuration of an RRU5508 (GULN, 1800 MHz GLN+2100 MHz UMTS, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
6	1 (MIMO)	1	15, 20	2 (MIMO)
6	1 (MIMO)	1	15, 20	2

Table 1-173 SUL carrier configuration of an RRU5508 (GULN, 1800 MHz GLN+2100 MHz UL, 4R)

1800 MHz				2100 MHz	
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	2 (MIMO)	1 (MIMO)
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
6	1 (MIMO)	1	15, 20	1 (MIMO)	1 (MIMO)
6	1 (MIMO)	1	15, 20	2	1 (MIMO)

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Table 1-174 SUL carrier configuration of an RRU5508 (GULN, 2100 MHz ULN+1800 MHz GL, 4R)

2100 MHz				1800 MHz	
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1 (MIMO)	1	15, 20	4	1 (MIMO)
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
1 (MIMO)	1 (MIMO)	1	15, 20	6	1 (MIMO)
2	1 (MIMO)	1	15, 20	6	1 (MIMO)

RRU5508 (700 MHz)

Table 1-175 SUL carrier configuration of an RRU5508 (LN, 700 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	10

RRU5508 (700 MHz+900 MHz)

For the RRU5508 (700 MHz+900 MHz), NR SUL carriers can be configured only in the 700 MHz band in the uplink.

Table 1-175 lists the number of NR SUL carriers that can be configured for the 700 MHz uplink.

The carrier configuration for the 900 MHz in the uplink is the same as that in the downlink. For details, see the power configuration of the RRU5508 (900 MHz) in "Typical Output Power".

RRU5508 (700 MHz+850 MHz)

For the RRU5508 (700 MHz+850 MHz), NR SUL carriers can be configured only in the 700 MHz band in the uplink.

Table 1-175 lists the number of NR SUL carriers that can be configured for the 700 MHz uplink.

The carrier configuration for the 850 MHz in the uplink is the same as that in the downlink. For details, see the power configuration of the RRU5508 (850 MHz) in "Typical Output Power".

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Engineering Specifications

The following tables list the equipment specifications of an RRU5508.

Table 1-176 Input power of an RRU5508

Type	Power
RRU5508	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-177 Dimensions and weight of an RRU5508

Type	Dimensions (H x W x D)	Weight (kg)
RRU5508 (1800 MHz +2100 MHz)	400 mm x 300 mm x 150 mm (18 L, without the housing)	21 (without the housing)
RRU5508 (700 MHz +900 MHz)	480 mm x 356 mm x 140 mm (24 L, without the housing)	25 (without the housing)
RRU5508 (700 MHz +850 MHz)	480 mm x 356 mm x 140 mm (24 L, without the housing)	25 (without the housing)

Table 1-178 Power consumption of an RRU5508

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5508	1800+2100	560
RRU5508	700+900	510
RRU5508	700+850	510

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5508.

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Table 1-179 Environmental specifications of an RRU5508

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5508 (1800 MHz +2100 MHz)	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa
RRU5508 (700 MHz +900 MHz)	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa
RRU5508 (700 MHz +850 MHz)	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5508.

Table 1-180 Compliance standards for an RRU5508

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5508.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-181 Surge protection specifications of ports on an RRU5508

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5508.

Table 1-182 Specifications of CPRI ports on an RRU5508

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5508	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-183 RRU5508 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5508	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5508.

Table 1-184 Antenna capability of an RRU5508

Type	TMA Support	RET Antenna Support
RRU5508	Supported	AISG2.0

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.13 RRU5507 Technical Specifications

The RRU5507 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5507 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5507.

Table 1-185 Modes and frequency bands supported by an RRU5507

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5507	1800+2100	1800: 1710 to 1785 2100: 1920 to 1980	1800: 1805 to 1880 2100: 2110 to 2170	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	1800: 40 2100: 40

NOTE

- An RRU5507 can work in the 1800 MHz frequency band, 2100 MHz frequency band, or both frequency bands.
- In this section, when the RRU5507 works in one frequency band, *frequency band* is used to indicate the band. When the RRU5507 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. For example: RRU5507 (1800 MHz+2100 MHz).

RF Specifications

The following tables list RF specifications of an RRU5507.

Table 1-186 Receiver sensitivity of an RRU5507

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5507	2T4R	GSM: -114.0 UMTS: -126.1 LTE FDD: -106.9 LTE NB-IoT: -127.3	GSM: -116.8 UMTS: -128.9 LTE FDD: -109.7 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) UMTS: -131.6 LTE FDD: -112.4 LTE NB-IoT: -132.8

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-187 Capacity and output power of an RRU5507

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5507	UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: Each RRU supports two carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	2x100 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.
- RRU5507 (1800 MHz+2100 MHz): When it works only in a single frequency band, the maximum output power is 2x80 W. When it works in dual frequency bands, the maximum output power is 2x100 W.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU5507 (1800 MHz)

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Table 1-188 SUL carrier configuration of an RRU5507 (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-189 SUL carrier configuration of an RRU5507 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
6	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20

RRU5507 (2100 MHz)

Table 1-190 SUL carrier configuration of an RRU5507 (LN, 2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-191 SUL carrier configuration of an RRU5507 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
6	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20
2 (MIMO)	2 (MIMO)	1	15, 20

RRU5507 (1800 MHz+2100 MHz)

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Table 1-192 SUL carrier configuration of an RRU5507 (LN, 1800 MHz LN+2100 MHz LTE FDD, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-193 SUL carrier configuration of an RRU5507 (LN, 2100 MHz LN+1800 MHz LTE FDD, 4R)

2100 MHz			1800 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-194 SUL carrier configuration of an RRU5507 (GLN, 1800 MHz GLN+2100 MHz LTE FDD, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	1 (MIMO)
6	1 (MIMO)	1	15, 20	1 (MIMO)
2	1 (MIMO)	1	15, 20	2 (MIMO)

Table 1-195 SUL carrier configuration of an RRU5507 (GLN, 1800 MHz GL+2100 MHz LN, 4R)

1800 MHz		2100 MHz		
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**
4	2 (MIMO)	1 (MIMO)	1	15, 20

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1800 MHz		2100 MHz		
Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
6	1 (MIMO)	1 (MIMO)	1	15, 20
2	1 (MIMO)	2 (MIMO)	1	15, 20

Table 1-196 SUL carrier configuration of an RRU5507 (ULN, 1800 MHz LN+2100 MHz UMTS, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of UMTS Carriers
2 (MIMO)	1	15, 20	6
2 (MIMO)	1	15, 20	1 (MIMO)

Table 1-197 SUL carrier configuration of an RRU5507 (ULN, 1800 MHz LN+2100 MHz UL, 4R)

1800 MHz			2100 MHz	
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of UMTS Carriers	Total Number of LTE FDD Carriers
2 (MIMO)	1	15, 20	2	2 (MIMO)
1 (MIMO)	1	15, 20	4	1 (MIMO)
2 (MIMO)	1	15, 20	1 (MIMO)	2 (MIMO)
1 (MIMO)	1	15, 20	2 (MIMO)	1 (MIMO)

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Table 1-198 SUL carrier configuration of an RRU5507 (ULN, 2100 MHz ULN+1800 MHz LTE FDD, 4R)

2100 MHz				1800 MHz
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2	2 (MIMO)	1	15, 20	2 (MIMO)
4	1 (MIMO)	1	15, 20	1 (MIMO)
1 (MIMO)	2 (MIMO)	1	15, 20	2 (MIMO)
2 (MIMO)	1 (MIMO)	1	15, 20	1 (MIMO)

Table 1-199 SUL carrier configuration of an RRU5507 (GULN, 1800 MHz GLN+2100 MHz UMTS, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
4	1 (MIMO)	1	15, 20	4
6	1 (MIMO)	1	15, 20	2
6	1 (MIMO)	1	15, 20	2 (MIMO)

Table 1-200 SUL carrier configuration of an RRU5507 (GULN, 1800 MHz GLN+2100 MHz UL, 4R)

1800 MHz				2100 MHz	
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
1	1 (MIMO)	1	15, 20	3	1 (MIMO)
4	1 (MIMO)	1	15, 20	2	1 (MIMO)
6	1 (MIMO)	1	15, 20	1 (MIMO)	1 (MIMO)

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Table 1-201 SUL carrier configuration of an RRU5507 (GULN, 2100 MHz ULN+1800 MHz GL, 4R)

2100 MHz				1800 MHz	
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
3	1 (MIMO)	1	15, 20	1	1 (MIMO)
2	1 (MIMO)	1	15, 20	4	1 (MIMO)
1 (MIMO)	1 (MIMO)	1	15, 20	6	1 (MIMO)

Engineering Specifications

The following tables list the equipment specifications of an RRU5507.

Table 1-202 Input power of an RRU5507

Type	Power
RRU5507	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-203 Dimensions and weight of an RRU5507

Type	Dimensions (H x W x D)	Weight (kg)
RRU5507	400 mm x 300 mm x 150 mm (18 L, without the housing)	21 (without the housing)

Table 1-204 Power consumption of an RRU5507

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5507	1800+2100	450

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NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5507.

Table 1-205 Environmental specifications of an RRU5507

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5507	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5507.

Table 1-206 Compliance standards for an RRU5507

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4

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Item	Standard
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5507.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-207 Surge protection specifications of ports on an RRU5507

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5507.

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Table 1-208 Specifications of CPRI ports on an RRU5507

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5507	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-209 RRU5507 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5507	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5507.

Table 1-210 Antenna capability of an RRU5507

Type	TMA Support	RET Antenna Support
RRU5507	Supported	AISG2.0

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.14 RRU5505 Technical Specifications

The RRU5505 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5505 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5505.

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Table 1-211 Modes and frequency bands supported by an RRU5505

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5505	1800+2100	1800: 1710 to 1785 2100: 1920 to 1980	1800: 1805 to 1880 2100: 2110 to 2170	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, ULM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	1800: 40 2100: 40

NOTE

- An RRU5505 can work in the 1800 MHz frequency band, 2100 MHz frequency band, or both frequency bands.
- In this section, when the RRU5505 works in one frequency band, *frequency band* is used to indicate the band. When the RRU5505 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. For example: RRU5505 (1800 MHz+2100 MHz).

RF Specifications

The following tables list RF specifications of an RRU5505.

Table 1-212 Receiver sensitivity of an RRU5505

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5505	2T2R	GSM: -114.0 UMTS: -126.1 LTE FDD: -106.9 LTE NB-IoT: -127.3	GSM: -116.8 UMTS: -128.9 LTE FDD: -109.7 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-213 Capacity and output power of an RRU5505

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5505	GSM: 8 carriers UMTS: ● 8 carriers without MIMO ● 4 carriers with MIMO LTE FDD: Each RRU supports two carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x120 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.
- RRU5505 (1800 MHz+2100 MHz): When it works only in a single frequency band, the maximum output power is 2x80 W. When it works in dual frequency bands, the maximum output power is 2x120 W.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU5505 (1800 MHz)

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Table 1-214 SUL carrier configuration of an RRU5505 (LN, 1800 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-215 SUL carrier configuration of an RRU5505 (GLN, 1800 MHz, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20

RRU5505 (2100 MHz)

Table 1-216 SUL carrier configuration of an RRU5505 (LN, 2100 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-217 SUL carrier configuration of an RRU5505 (ULN, 2100 MHz, 2R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
6	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20
2 (MIMO)	2 (MIMO)	1	15, 20

RRU5505 (1800 MHz+2100 MHz)

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Table 1-218 SUL carrier configuration of an RRU5505 (LN, 1800 MHz LN+2100 MHz LTE FDD, 2R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-219 SUL carrier configuration of an RRU5505 (LN, 2100 MHz LN+1800 MHz LTE FDD, 2R)

2100 MHz			1800 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-220 SUL carrier configuration of an RRU5505 (GLN, 1800 MHz GLN+2100 MHz LTE FDD, 2R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	1 (MIMO)
6	1 (MIMO)	1	15, 20	1 (MIMO)
2	1 (MIMO)	1	15, 20	2 (MIMO)

Table 1-221 SUL carrier configuration of an RRU5505 (GLN, 1800 MHz GL+2100 MHz LN, 2R)

1800 MHz		2100 MHz		
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**
4	2 (MIMO)	1 (MIMO)	1	15, 20

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1800 MHz		2100 MHz		
Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
6	1 (MIMO)	1 (MIMO)	1	15, 20
2	1 (MIMO)	2 (MIMO)	1	15, 20

Table 1-222 SUL carrier configuration of an RRU5505 (ULN, 1800 MHz LN+2100 MHz UMTS, 2R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of UMTS Carriers
2 (MIMO)	1	15, 20	4
1 (MIMO)	1	15, 20	6
2 (MIMO)	1	15, 20	2 (MIMO)
1 (MIMO)	1	15, 20	3 (MIMO)

Table 1-223 SUL carrier configuration of an RRU5505 (ULN, 1800 MHz LN+2100 MHz UL, 2R)

1800 MHz			2100 MHz	
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of UMTS Carriers	Total Number of LTE FDD Carriers
2 (MIMO)	1	15, 20	4	1 (MIMO)
2 (MIMO)	1	15, 20	2 (MIMO)	1 (MIMO)
2 (MIMO)	1	15, 20	2	2 (MIMO)
2 (MIMO)	1	15, 20	1 (MIMO)	2 (MIMO)

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Table 1-224 SUL carrier configuration of an RRU5505 (ULN, 2100 MHz ULN+1800 MHz LTE FDD, 2R)

2100 MHz				1800 MHz
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	2 (MIMO)
2 (MIMO)	1 (MIMO)	1	15, 20	2 (MIMO)
2	2 (MIMO)	1	15, 20	2 (MIMO)
1 (MIMO)	2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-225 SUL carrier configuration of an RRU5505 (GULN, 1800 MHz GLN+2100 MHz UMTS, 2R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
6	1 (MIMO)	1	15, 20	2 (MIMO)
6	1 (MIMO)	1	15, 20	2

Table 1-226 SUL carrier configuration of an RRU5505 (GULN, 1800 MHz GLN+2100 MHz UL, 2R)

1800 MHz				2100 MHz	
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	2 (MIMO)	1 (MIMO)
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
6	1 (MIMO)	1	15, 20	1 (MIMO)	1 (MIMO)
6	1 (MIMO)	1	15, 20	2	1 (MIMO)

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Table 1-227 SUL carrier configuration of an RRU5505 (GULN, 2100 MHz ULN+1800 MHz GL, 2R)

2100 MHz				1800 MHz	
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1 (MIMO)	1	15, 20	4	1 (MIMO)
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
1 (MIMO)	1 (MIMO)	1	15, 20	6	1 (MIMO)
2	1 (MIMO)	1	15, 20	6	1 (MIMO)

Engineering Specifications

The following tables list the equipment specifications of an RRU5505.

Table 1-228 Input power of an RRU5505

Type	Power
RRU5505	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-229 Dimensions and weight of an RRU5505

Type	Dimensions (H x W x D)	Weight (kg)
RRU5505	400 mm x 300 mm x 150 mm (18 L, without the housing)	21 (without the housing)

Table 1-230 Power consumption of an RRU5505

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5505	1800+2100	600

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NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5505.

Table 1-231 Environmental specifications of an RRU5505

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5505	- Without solar radiation: -40°C to +50°C - With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5505.

Table 1-232 Compliance standards for an RRU5505

Item	Standard
RF	- 3GPP TS 45.005 - 3GPP TS 25.141 - 3GPP TS 36.141 - 3GPP TS 38.104 - 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** - The validity period is one year. - The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4

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Item	Standard
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5505.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-233 Surge protection specifications of ports on an RRU5505

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5505.

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Table 1-234 Specifications of CPRI ports on an RRU5505

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5505	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-235 RRU5505 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5505	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5505.

Table 1-236 Antenna capability of an RRU5505

Type	TMA Support	RET Antenna Support
RRU5505	Supported	AISG2.0

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.15 RRU5502 Technical Specifications

An RRU5502 is a multimode remote radio unit. With the SDR technology, the RRU5502 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5502.

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Table 1-237 Modes and frequency bands supported by an RRU5502

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5502	1800+2100	1800: 1710 to 1785 2100: 1920 to 1980	1800: 1805 to 1880 2100: 2110 to 2170	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	1800: 40 2100: 40
RRU5502	AWS+PCS	AWS: 1710 to 1780 PCS: 1850 to 1910	AWS: 2110 to 2180 PCS: 1930 to 1990	AWS: UMTS, LTE FDD, UL, LN (SUL) PCS: UMTS, LTE FDD, GU, GL, UL, LM, GLM, ULM, GULM AWS+PCS: UMTS, LTE FDD, GL, UL, GUL, LM, GLM, ULM GULM, LN (SUL), GLN (SUL), ULN (SUL)	AWS: 40 PCS: 40

NOTE

- An RRU5502 can work in the 1800 MHz frequency band, 2100 MHz frequency band, or both frequency bands.
- An RRU5502 can work in the AWS frequency band, PCS frequency band, or both frequency bands.
- In this section, when the RRU5502 works in one frequency band, *frequency band* is used to indicate the band. When the RRU5502 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. An example is the RRU5502 (1800 MHz+2100 MHz).

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RF Specifications

The following tables list RF specifications of an RRU5502.

Table 1-238 Receiver sensitivity of an RRU5502

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5502 (1800 MHz +2100 MHz)	4T4R	GSM: -114.0 UMTS: -125.8 LTE FDD: -106.7 LTE NB-IoT: -127.3	GSM: -116.8 UMTS: -128.6 LTE FDD: -109.5 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) UMTS: -131.3 LTE FDD: -112.2 LTE NB-IoT: -132.8
RRU5502 (AWS +PCS)	4T4R	GSM: -113.6 UMTS: -125.6 LTE FDD: -106.5 LTE NB-IoT: -127.3	GSM: -116.4 UMTS: -128.4 LTE FDD: -109.3 LTE NB-IoT: -130.1	GSM: -119.1 (theoretical value) UMTS: -131.1 LTE FDD: -112.0 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-239 Capacity and output power of an RRU5502

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5502 (1800 MHz +2100 MHz)	GSM: 8 carriers UMTS: 8 carriers LTE FDD: Each RRU supports three carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	4x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5502 (AWS +PCS)	GSM: 8 carriers UMTS: 8 carriers LTE FDD: Each RRU supports three carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	4x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU5502 (1800 MHz)

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Table 1-240 SUL carrier configuration of an RRU5502 (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-241 SUL carrier configuration of an RRU5502 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	2 (MIMO)	1	15, 20

RRU5502 (2100 MHz)

Table 1-242 SUL carrier configuration of an RRU5502 (LN, 2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-243 SUL carrier configuration of an RRU5502 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20
1 (MIMO)	2 (MIMO)	1	15, 20

RRU5502 (1800 MHz+2100 MHz)

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Table 1-244 SUL carrier configuration of an RRU5502 (LN, 1800 MHz LN+2100 MHz LTE FDD, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-245 SUL carrier configuration of an RRU5502 (LN, 2100 MHz LN+1800 MHz LTE FDD, 4R)

2100 MHz			1800 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-246 SUL carrier configuration of an RRU5502 (GLN, 1800 MHz GLN+2100 MHz LTE FDD, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	2 (MIMO)
8	1 (MIMO)	1	15, 20	1 (MIMO)
4	1 (MIMO)	1	15, 20	2 (MIMO)

Table 1-247 SUL carrier configuration of an RRU5502 (GLN, 1800 MHz GL+2100 MHz LN, 4R)

1800 MHz		2100 MHz		
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**
4	2 (MIMO)	2 (MIMO)	1	15, 20

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1800 MHz		2100 MHz		
Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	1 (MIMO)	1 (MIMO)	1	15, 20
4	1 (MIMO)	2 (MIMO)	1	15, 20

Table 1-248 SUL carrier configuration of an RRU5502 (ULN, 1800 MHz LN+2100 MHz UMTS, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of UMTS Carriers
2 (MIMO)	1	15, 20	4
1 (MIMO)	1	15, 20	8
1 (MIMO)	1	15, 20	2 (MIMO)
2 (MIMO)	1	15, 20	1 (MIMO)

Table 1-249 SUL carrier configuration of an RRU5502 (ULN, 1800 MHz LN+2100 MHz UL, 4R)

1800 MHz			2100 MHz	
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of UMTS Carriers	Total Number of LTE FDD Carriers
2 (MIMO)	1	15, 20	4	2 (MIMO)
2 (MIMO)	1	15, 20	1 (MIMO)	2 (MIMO)

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Table 1-250 SUL carrier configuration of an RRU5502 (ULN, 2100 MHz ULN+1800 MHz LTE FDD, 4R)

2100 MHz				1800 MHz
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	2 (MIMO)
1 (MIMO)	2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-251 SUL carrier configuration of an RRU5502 (GULN, 1800 MHz GLN+2100 MHz UMTS, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
2	1 (MIMO)	1	15, 20	2+1 (MIMO)
8	1 (MIMO)	1	15, 20	4
8	1 (MIMO)	1	15, 20	1 (MIMO)
2	2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-252 SUL carrier configuration of an RRU5502 (GULN, 1800 MHz GLN+2100 MHz UL, 4R)

1800 MHz				2100 MHz	
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
2	2 (MIMO)	1	15, 20	2	2 (MIMO)
4	1 (MIMO)	1	15, 20	1 (MIMO)	1 (MIMO)

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Table 1-253 SUL carrier configuration of an RRU5502 (GULN, 2100 MHz ULN+1800 MHz GL, 4R)

2100 MHz				1800 MHz	
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
2	2 (MIMO)	1	15, 20	2	2 (MIMO)
1 (MIMO)	1 (MIMO)	1	15, 20	4	1 (MIMO)

RRU5502 (AWS)

Table 1-254 SUL carrier configuration of the RRU5502 (LN, AWS, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-255 SUL carrier configuration of the RRU5502 (ULN, AWS, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20
1 (MIMO)	2 (MIMO)	1	15, 20

RRU5502 (AWS+PCS)

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Table 1-256 SUL carrier configuration of the RRU5502 (LN, AWS LN+PCS LTE FDD, 4R)

AWS			PCS
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-257 SUL carrier configuration of the RRU5502 (GLN, AWS LN+PCS GL, 4R)

AWS			PCS	
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
1 (MIMO)	1	15, 20	8	1 (MIMO)
2 (MIMO)	1	15, 20	4	2 (MIMO)

Table 1-258 SUL carrier configuration of the RRU5502 (ULN, AWS LN+PCS UMTS, 4R)

AWS			PCS
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
2 (MIMO)	1	15, 20	4
1 (MIMO)	1	15, 20	8
1 (MIMO)	1	15, 20	2 (MIMO)
2 (MIMO)	1	15, 20	1 (MIMO)

Table 1-259 SUL carrier configuration of the RRU5502 (ULN, AWS ULN+PCS UMTS, 4R)

AWS				PCS
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
4	2 (MIMO)	1	15, 20	8

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Table 1-260 SUL carrier configuration of the RRU5502 (ULN, AWS ULN+PCS UL, 4R)

AWS				PCS	
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	8	1 (MIMO)

Engineering Specifications

The following tables list the equipment specifications of an RRU5502.

Table 1-261 Input power of an RRU5502

Type	Power
RRU5502	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-262 Dimensions and weight of an RRU5502

Type	Dimensions (H x W x D)	Weight (kg)
RRU5502	480 mm x 356 mm x 140 mm (24 L, without the housing)	25 (without the housing)

Table 1-263 Power consumption of an RRU5502

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5502	1800+2100	735
RRU5502	AWS+PCS	700

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5502.

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Table 1-264 Environmental specifications of an RRU5502

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5502	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5502.

Table 1-265 Compliance standards for an RRU5502

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5502.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-266 Surge protection specifications of ports on an RRU5502

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5502.

Table 1-267 Specifications of CPRI ports on an RRU5502

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5502	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-268 RRU5502 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5502	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5502.

Table 1-269 Antenna capability of an RRU5502

Type	TMA Support	RET Antenna Support
RRU5502	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.16 RRU5501 Technical Specifications

The RRU5501 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5501 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5501.

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Table 1-270 Modes and frequency bands supported by an RRU5501

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5501	1800+2100	1800: 1710 to 1785 2100: 1920 to 1980	1800: 1805 to 1880 2100: 2110 to 2170	1800 MHz: LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LM, GLM, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	1800: 40 2100: 40

NOTE

- An RRU5501 can work in the 1800 MHz frequency band, 2100 MHz frequency band, or both frequency bands.
- In this section, when the RRU5501 works in one frequency band, *frequency band* is used to indicate the band. When the RRU5501 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. For example: RRU5501 (1800 MHz+2100 MHz).

RF Specifications

The following tables list RF specifications of an RRU5501.

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Table 1-271 Receiver sensitivity of an RRU5501

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5501	4T4R	GSM: -114.0 UMTS: -125.8 LTE FDD: -106.7 LTE NB-IoT: -127.3	GSM: -116.8 UMTS: -128.6 LTE FDD: -109.5 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) UMTS: -131.3 LTE FDD: -112.2 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-272 Capacity and output power of an RRU5501

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5501	GSM: 8 carriers UMTS: 8 carriers LTE FDD: Each RRU supports three carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	4x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

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NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU5501 (1800 MHz)

Table 1-273 SUL carrier configuration of an RRU5501 (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-274 SUL carrier configuration of an RRU5501 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20

RRU5501 (2100 MHz)

Table 1-275 SUL carrier configuration of an RRU5501 (LN, 2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-276 SUL carrier configuration of an RRU5501 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
8	1 (MIMO)	1	15, 20

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RRU5501 (1800 MHz+2100 MHz)

Table 1-277 SUL carrier configuration of an RRU5501 (LN, 1800 MHz LN+2100 MHz LTE FDD, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-278 SUL carrier configuration of an RRU5501 (LN, 2100 MHz LN+1800 MHz LTE FDD, 4R)

2100 MHz			1800 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-279 SUL carrier configuration of an RRU5501 (GLN, 1800 MHz GLN+2100 MHz LTE FDD, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	1 (MIMO)
8	1 (MIMO)	1	15, 20	1 (MIMO)
4	1 (MIMO)	1	15, 20	2 (MIMO)

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Table 1-280 SUL carrier configuration of an RRU5501 (GLN, 2100 MHz LN+1800 MHz GL, 4R)

2100 MHz			1800 MHz	
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
1 (MIMO)	1	15, 20	4	2 (MIMO)
1 (MIMO)	1	15, 20	8	1 (MIMO)
2 (MIMO)	1	15, 20	4	1 (MIMO)

Table 1-281 SUL carrier configuration of an RRU5501 (ULN, 1800 MHz LN+2100 MHz UMTS, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
1 (MIMO)	1	15, 20	8
2 (MIMO)	1	15, 20	4

Table 1-282 SUL carrier configuration of an RRU5501 (ULN, 1800 MHz LN+2100 MHz UL, 4R)

1800 MHz			2100 MHz	
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
1 (MIMO)	1	15, 20	4	2 (MIMO)
2 (MIMO)	1	15, 20	4	1 (MIMO)

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Table 1-283 SUL carrier configuration of an RRU5501 (ULN, 2100 MHz ULN+1800 MHz LTE FDD, 4R)

2100 MHz				1800 MHz
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	2 (MIMO)	1	15, 20	1 (MIMO)
4	1 (MIMO)	1	15, 20	2 (MIMO)

Table 1-284 SUL carrier configuration of an RRU5501 (GULN, 1800 MHz GLN+2100 MHz UMTS, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
2 (MIMO)	2 (MIMO)	1	15, 20	2
8	1 (MIMO)	1	15, 20	4

Table 1-285 SUL carrier configuration of an RRU5501 (GULN, 1800 MHz GLN+2100 MHz UL, 4R)

1800 MHz				2100 MHz	
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
2	2 (MIMO)	1	15, 20	2	1 (MIMO)
2	1 (MIMO)	1	15, 20	2	2 (MIMO)

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Table 1-286 SUL carrier configuration of an RRU5501 (GULN, 2100 MHz ULN+1800 MHz GL, 4R)

2100 MHz				1800 MHz	
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	4	1 (MIMO)
2	1 (MIMO)	1	15, 20	2	2 (MIMO)
2	2 (MIMO)	1	15, 20	2	1 (MIMO)

Engineering Specifications

The following tables list the equipment specifications of an RRU5501.

Table 1-287 Input power of an RRU5501

Type	Power
RRU5501	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-288 Dimensions and weight of an RRU5501

Type	Dimensions (H x W x D)	Weight (kg)
RRU5501	480 mm x 356 mm x 140 mm (24 L, without the housing)	25 (without the housing)

Table 1-289 Power consumption of an RRU5501

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5501	1800+2100	650

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

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The following table lists the environmental specifications of an RRU5501.

Table 1-290 Environmental specifications of an RRU5501

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5501	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5501.

Table 1-291 Compliance standards for an RRU5501

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5501.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-292 Surge protection specifications of ports on an RRU5501

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5501.

Table 1-293 Specifications of CPRI ports on an RRU5501

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5501	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-294 RRU5501 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5501	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5501.

Table 1-295 Antenna capability of an RRU5501

Type	TMA Support	RET Antenna Support
RRU5501	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.17 RRU5309w Technical Specifications

The RRU5309w is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5309w can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5309w.

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Table 1-296 Modes and frequency bands supported by an RRU5309w

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5309w	800	832 to 862	791 to 821	LTE FDD, LTE NB-IoT, LM, LN (SUL)	30

NOTE

The RRU5309w provides the passive intermodulation (PIM) cancellation function.

- Passive intermodulation (PIM) refers to the intermodulation effect caused by nonlinearities in the passive components of an antenna system when high-power signals of multiple frequencies are transmitted. This intermodulation effect decreases the uplink sensitivity and negatively affects the network quality.
- The maximum gain of PIM cancellation can reach 15 dB. This function reduces the negative impact of the intermodulation effect on the system. The following factors impact PIM cancellation performance:
  - Antennas: For example, the antenna experiences water corrosion, the antenna is aged, or the screws inside the antenna are loose.
  - Connectors: For example, the jumper connector is not securely connected, and the jumper port is corroded by water or aged.
  - External PIM issues: For example, metal obstacles (steel rope of the guyed mast, metal fence, lightning protection ground bar, or billboard) exist near the radiation surface of the antenna.
  - Other factors that may cause PIM.
- An RRU must be used in a simple antenna networking scenario where the RRU uses a fixed-length jumper (≤ 6 m) to directly connect to the antenna. In this scenario, there is no intermediate component such as a combiner between the RRU and the antenna. The fixed-length jumper is used because it can effectively mitigate the PIM effect.

RF Specifications

The following tables list RF specifications of an RRU5309w.

Table 1-297 Receiver sensitivity of an RRU5309w

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5309w	2T2R	LTE FDD: -106.9 LTE NB-IoT: -127.3	LTE FDD: -109.7 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-298 Capacity and output power of an RRU5309w

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5309w	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-299 SUL carrier configuration of an RRU5309w (800 MHz, LN, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	10

Engineering Specifications

The following tables list the equipment specifications of an RRU5309w.

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Table 1-300 Input power of an RRU5309w

Type	Power
RRU5309w	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-301 Dimensions and weight of an RRU5309w

Type	Dimensions (H x W x D)	Weight (kg)
RRU5309w	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-302 Power consumption of an RRU5309w

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5309w	800	270

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5309w.

Table 1-303 Environmental specifications of an RRU5309w

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5309w	- Without solar radiation: -40°C to +55°C - With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5309w.

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Table 1-304 Compliance standards for an RRU5309w

Item	Standard
RF	● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5309w.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-305 Surge protection specifications of ports on an RRU5309w

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5309w.

Table 1-306 Specifications of CPRI ports on an RRU5309w

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5309w	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-307 RRU5309w CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5309w	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU5309w.

Table 1-308 Antenna capability of an RRU5309w

Type	TMA Support	RET Antenna Support
RRU5309w	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.18 RRU5309 Technical Specifications

The RRU5309 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5309 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5309.

Table 1-309 Modes and frequency bands supported by an RRU5309

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5309	800	832 to 862	791 to 821	LTE FDD, LTE NB-IoT, LM, LN (SUL)	20
RRU5309	700	703 to 748	758 to 803	LTE FDD, LM, LN (SUL)	25

RF Specifications

The following tables list RF specifications of an RRU5309.

Table 1-310 Receiver sensitivity of an RRU5309

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5309	2T2R	LTE FDD: ● 800 MHz: -106.9 ● 700 MHz: -106.5 LTE NB-IoT: -127.3	LTE FDD: ● 800 MHz: -109.7 ● 700 MHz: -109.3 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-311 Capacity and output power of an RRU5309

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5309 (800 MHz)	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5309 (700 MHz)	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-312 SUL carrier configuration of an RRU5309 (LN, 800 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	10

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Table 1-313 SUL carrier configuration of an RRU5309 (LN, 700 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	10

Engineering Specifications

The following tables list the equipment specifications of an RRU5309.

Table 1-314 Input power of an RRU5309

Type	Power
RRU5309	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-315 Dimensions and weight of an RRU5309

Type	Dimensions (H x W x D)	Weight (kg)
RRU5309	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-316 Power consumption of an RRU5309

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5309	700	270
RRU5309	800	270

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5309.

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Table 1-317 Environmental specifications of an RRU5309

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5309	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5309.

Table 1-318 Compliance standards for an RRU5309

Item	Standard
RF	● 3GPP TS 36.141 ● 3GPP TS 37.141 ● 3GPP TS 38.104
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5309.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-319 Surge protection specifications of ports on an RRU5309

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5309.

Table 1-320 Specifications of CPRI ports on an RRU5309

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5309	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-321 RRU5309 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5309	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5309.

Table 1-322 Antenna capability of an RRU5309

Type	TMA Support	RET Antenna Support
RRU5309	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.19 RRU5308 Technical Specifications

The RRU5308 is a multimode remote radio unit. With the SDR technology, the RRU5308 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5308.

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Table 1-323 Modes and frequency bands supported by an RRU5308

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5308	800	832 to 862	791 to 821	LTE FDD, LM, LN (SUL)	20

RF Specifications

The following tables list RF specifications of an RRU5308.

Table 1-324 Receiver sensitivity of an RRU5308

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5308	2T2R	LTE FDD: -106.9 LTE NB-IoT: -127.3	LTE FDD: -109.7 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-325 Capacity and output power of an RRU5308

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5308	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

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NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-326 SUL carrier configuration of an RRU5308 (LN, 800 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	10

Engineering Specifications

The following tables list the equipment specifications of an RRU5308.

Table 1-327 Input power of an RRU5308

Type	Power
RRU5308	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-328 Dimensions and weight of an RRU5308

Type	Dimensions (H x W x D)	Weight (kg)
RRU5308	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-329 Power consumption of an RRU5308

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5308	800	205

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5308.

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Table 1-330 Environmental specifications of an RRU5308

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5308	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5308.

Table 1-331 Compliance standards for an RRU5308

Item	Standard
RF	● 3GPP TS 36.141 ● 3GPP TS 37.141 ● 3GPP TS 38.104
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5308.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-332 Surge protection specifications of ports on an RRU5308

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5308.

Table 1-333 Specifications of CPRI ports on an RRU5308

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5308	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-334 RRU5308 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5308	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5308.

Table 1-335 Antenna capability of an RRU5308

Type	TMA Support	RET Antenna Support
RRU5308	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.20 RRU5305 Technical Specifications

The RRU5305 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5305.

Table 1-336 Modes and frequency bands supported by an RRU5305

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5305	1400	None	1452 to 1492	LTE FDD	40

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RF Specifications

The following tables list RF specifications of an RRU5305.

Table 1-337 Receiver sensitivity of an RRU5305

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU5305	2T0R	-	-

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-338 Capacity and output power of an RRU5305

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5305	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU5305.

Table 1-339 Input power of an RRU5305

Type	Power
RRU5305	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-340 Dimensions and weight of an RRU5305

Type	Dimensions (H x W x D)	Weight (kg)
RRU5305	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-341 Power consumption of an RRU5305

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5305	1400	370

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5305.

Table 1-342 Environmental specifications of an RRU5305

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5305	- Without solar radiation: -40°C to +55°C - With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5305.

Table 1-343 Compliance standards for an RRU5305

Item	Standard
RF	3GPP TS 36.141

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Item	Standard
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5305.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-344 Surge protection specifications of ports on an RRU5305

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5305.

Table 1-345 Specifications of CPRI ports on an RRU5305

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5305	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-346 RRU5305 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5305	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU5305.

Table 1-347 Antenna capability of an RRU5305

Type	TMA Support	RET Antenna Support
RRU5305	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.21 RRU5304w Technical Specifications

The RRU5304w is a remote radio unit working in LTE FDD mode.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5304w.

Table 1-348 Modes and frequency bands supported by an RRU5304w

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5304w	2600	2500 to 2570	2620 to 2690	LTE FDD	70

NOTE

The RRU5304w provides the passive intermodulation (PIM) cancellation function.

- Passive intermodulation (PIM) refers to the intermodulation effect caused by nonlinearities in the passive components of an antenna system when high-power signals of multiple frequencies are transmitted. This intermodulation effect decreases the uplink sensitivity and negatively affects the network quality.
- The maximum gain of PIM cancellation can reach 15 dB. This function reduces the negative impact of the intermodulation effect on the system. The following factors impact PIM cancellation performance:
  - Antennas: For example, the antenna experiences water corrosion, the antenna is aged, or the screws inside the antenna are loose.
  - Connectors: For example, the jumper connector is not securely connected, and the jumper port is corroded by water or aged.
  - External PIM issues: For example, metal obstacles (steel rope of the guyed mast, metal fence, lightning protection ground bar, or billboard) exist near the radiation surface of the antenna.
  - Other factors that may cause PIM.
- An RRU must be used in a simple antenna networking scenario where the RRU uses a fixed-length jumper (≤ 6 m) to directly connect to the antenna. In this scenario, there is no intermediate component such as a combiner between the RRU and the antenna. The fixed-length jumper is used because it can effectively mitigate the PIM effect.

RF Specifications

The following tables list RF specifications of an RRU5304w.

Table 1-349 Receiver sensitivity of an RRU5304w

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5304w	4T4R	-106.3	-109.1	-111.8

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-350 Capacity and output power of an RRU5304w

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5304w	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU5304w.

Table 1-351 Input power of an RRU5304w

Type	Power
RRU5304w	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-352 Dimensions and weight of an RRU5304w

Type	Dimensions (H x W x D)	Weight (kg)
RRU5304w	400 mm x 300 mm x 150 mm (18 L, without the housing)	22 (without the housing)

Table 1-353 Power consumption of an RRU5304w

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5304w	2600	520

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NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5304w.

Table 1-354 Environmental specifications of an RRU5304w

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5304w	• Without solar radiation: -40°C to +55°C • With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5304w.

Table 1-355 Compliance standards for an RRU5304w

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** • The validity period is one year. • The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5304w.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-356 Surge protection specifications of ports on an RRU5304w

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5304w.

Table 1-357 Specifications of CPRI ports on an RRU5304w

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5304w	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-358 RRU5304w CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5304w	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU5304w.

Table 1-359 Antenna capability of an RRU5304w

Type	TMA Support	RET Antenna Support
RRU5304w	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.22 RRU5304 Technical Specifications

The RRU5304 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5304.

Table 1-360 Modes and frequency bands supported by an RRU5304

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5304	2600	2510 to 2570	2630 to 2690	LTE FDD	60

RF Specifications

The following tables list RF specifications of an RRU5304.

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Table 1-361 Receiver sensitivity of an RRU5304

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5304	4T4R	-106.3	-109.1	-111.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-362 Capacity and output power of an RRU5304

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5304	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU5304.

Table 1-363 Input power of an RRU5304

Type	Power
RRU5304	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-364 Dimensions and weight of an RRU5304

Type	Dimensions (H x W x D)	Weight (kg)
RRU5304	400 mm x 300 mm x 150 mm (18 L, without the housing)	22 (without the housing)

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Table 1-365 Power consumption of an RRU5304

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5304	2600	520

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5304.

Table 1-366 Environmental specifications of an RRU5304

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5304	- Without solar radiation: -40°C to +55°C - With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5304.

Table 1-367 Compliance standards for an RRU5304

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** - The validity period is one year. - The product can function properly within the validity period if the storage environment meets the preceding standards.

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Item	Standard
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5304.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-368 Surge protection specifications of ports on an RRU5304

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5304.

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Table 1-369 Specifications of CPRI ports on an RRU5304

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5304	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-370 RRU5304 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5304	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU5304.

Table 1-371 Antenna capability of an RRU5304

Type	TMA Support	RET Antenna Support
RRU5304	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.23 RRU5301 Technical Specifications

The RRU5301 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU5301 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5301.

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Table 1-372 Modes and frequency bands supported by an RRU5301

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU5301	800	832 to 862	791 to 821	LTE FDD, LM, LN (SUL)	20
RRU5301	1400	None	1452 to 1492	LTE FDD	40
RRU5301	2600	2500 to 2570	2620 to 2690	LTE FDD	60

RF Specifications

The following tables list RF specifications of an RRU5301.

Table 1-373 Receiver sensitivity of an RRU5301

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5301 (800 MHz)	4T4R	LTE FDD: -106.3 LTE NB-IoT: -127.3	LTE FDD: -109.1 LTE NB-IoT: -130.1	LTE FDD: -111.8 LTE NB-IoT: -132.8
RRU5301 (1400 MHz)	4T0R	-	-	-
RRU5301 (2600 MHz)	4T4R	-106.3	-109.1	-111.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-374 Capacity and output power of an RRU5301

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5301 (800 MHz)	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	4x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU5301 (1400 MHz)	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .
RRU5301 (2600 MHz)	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-375 SUL carrier configuration of an RRU5301 (800 MHz, LN, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	10

Engineering Specifications

The following tables list the equipment specifications of an RRU5301.

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Table 1-376 Input power of an RRU5301

Type	Power
RRU5301	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-377 Dimensions and weight of an RRU5301

Type	Dimensions (H x W x D)	Weight (kg)
RRU5301 (800 MHz)	400 mm x 300 mm x 150 mm (18 L, without the housing)	22 (without the housing)
RRU5301 (1400 MHz)	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)
RRU5301 (2600 MHz)	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-378 Power consumption of an RRU5301

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5301	800	390
RRU5301	1400	340
RRU5301	2600	358

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5301.

Table 1-379 Environmental specifications of an RRU5301

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5301	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

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NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU5301.

Table 1-380 Compliance standards for an RRU5301

Item	Standard
RF	● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU5301.

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NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-381 Surge protection specifications of ports on an RRU5301

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5301.

Table 1-382 Specifications of CPRI ports on an RRU5301

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5301	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-383 RRU5301 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5301	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU5301.

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Table 1-384 Antenna capability of an RRU5301

Type	TMA Support	RET Antenna Support
RRU5301	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.24 RRU5258 Technical Specifications

The RRU5258 is a remote radio unit working in LTE TDD or NR TDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5258.

Table 1-385 Modes and frequency bands supported by an RRU5258

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU5258	3500 (Band 42/n78)	3400 to 3600	LTE TDD, NR TDD	200	NR: 200 LTE TDD: 120
RRU5258	3700 (Band 43/n78)	3600 to 3800	LTE TDD, NR TDD	200	NR: 200 LTE TDD: 120
RRU5258	3650 (Band 42, Band 43)	3475 to 3700	LTE TDD	200	100
RRU5258	2300 (Band 40)	2300 to 2400	LTE TDD	100	100
RRU5258	2600 (Band 38)	2575 to 2615	LTE TDD	40	40

RF Specifications

The following tables list RF specifications of an RRU5258.

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Table 1-386 Receiver sensitivity of an RRU5258

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)	Receiver Sensitivity with Eight Antennas (dBm)
RRU5258	3500 (Band 42/n78)	8T8R	-105.5	-108.27	-110.97	-113.8
RRU5258	3700 (Band 43/n78)	8T8R	-105.5	-108.27	-110.97	-113.8
RRU5258	3650 (Band 42, Band 43)	8T8R	-105.5	-108.27	-110.97	-113.8
RRU5258	2300 (Band 40)	8T8R	-106	-108.77	-111.47	-114.3
RRU5258	2600 (Band 38)	8T8R	-106	-108.77	-111.47	-114.3

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-387 Capacity and output power of an RRU5258

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5258	● LTE TDD: – 3500/3700/3650 MHz: 6 carriers. The bandwidth per carrier is 10, 15, or 20 MHz. – 2300 MHz: 5 carriers. The bandwidth per carrier is 10, 15, or 20 MHz. – 2600 MHz: 2 carriers. The bandwidth per carrier is 10, 15, or 20 MHz. ● NR TDD: – 3500/3700 MHz: 2 carriers. The bandwidth per carrier can be 20, 30, 40, 50, 60, 70, 80, 90, 100 MHz, or any combination of them. The sum of carrier bandwidths must be less than or equal to 120 MHz or equal to 200 MHz.	● 3500/3700/3650/2600 MHz: 8x30 W ● 2300 MHz: 8x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU5258.

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Table 1-388 Input power of an RRU5258

Type	Power
RRU5258	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-389 Dimensions and weight of an RRU5258

Type	Dimensions (H x W x D)	Weight (kg)
RRU5258	480 mm x 356 mm x 140 mm (24 L)	≤ 25

Table 1-390 Power consumption of an RRU5258

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5258	3500/3700/3650	540
RRU5258	2300	575
RRU5258	2600	532

NOTE

The typical power consumption of a module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5258.

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Table 1-391 Environmental specifications of an RRU5258

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5258	● With solar radiation of 1120 W/m^2: -40°C to +50°C ● Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU5258.

Table 1-392 Compliance standards for an RRU5258

Item	Standard
RF	3GPP TS 36.104 3GPP TS 36.141 3GPP TS 38.104
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-393 lists the surge protection specifications of ports on an RRU5258.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-393 Surge protection specifications of ports on an RRU5258

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5258.

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Table 1-394 Specifications of CPRI ports on an RRU5258

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5258	2	24.33024, 10.1376, 9.8304, or 4.9152	Load sharing or star

Table 1-395 RRU5258 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5258	NR: 2 LTE TDD: cascading not supported	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU5258.

Table 1-396 Antenna capability of an RRU5258

Type	TMA Support	RET Antenna Support
RRU5258	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.25 RRU5254 Technical Specifications

The RRU5254 is a remote radio unit working in LTE TDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5254.

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Table 1-397 Modes and frequency bands supported by an RRU5254

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU5254	2300 (Band 40)+2600 (Band 41)	2300: 2300 to 2400 2600: 2496 to 2690	LTE TDD	2300: 100 2600: 194	2300: 100 2600: 120

NOTE

- The RRU5254 is a dual-band module.
- The RRU5254 does not support cells with different subframe configurations. All cells served by this RRU must use the same uplink-downlink subframe configuration, special subframe configuration, frame offset, and CP type.

RF Specifications

The following tables list RF specifications of an RRU5254.

Table 1-398 Receiver sensitivity of an RRU5254

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5254	2300 (Band 40)+2600 (Band 41)	4T4R	-106	-108.77	-111.47

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-399 Capacity and output power of an RRU5254

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5254	8 carriers. The bandwidth per carrier is 10, 15, or 20 MHz.	4x(40 W+40 W)	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- 4T4R refers to dual-band 4T4R, that is, each of the two frequency bands supports 4T4R.

Engineering Specifications

The following tables list the equipment specifications of an RRU5254.

Table 1-400 Input power of an RRU5254

Type	Power
RRU5254	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-401 Dimensions and weight of an RRU5254

Type	Dimensions (H x W x D)	Weight (kg)
RRU5254	480 mm x 356 mm x 140 mm (24 L)	≤ 25

Table 1-402 Power consumption of an RRU5254

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5254	2300	384
RRU5254	2600	410
RRU5254	2300+2600	580

NOTE

The typical power consumption of a module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5254.

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Table 1-403 Environmental specifications of an RRU5254

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5254	• With solar radiation of 1120 W/m^2: -40°C to +50°C • Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU5254.

Table 1-404 Compliance standards for an RRU5254

Item	Standard
RF	3GPP TS 36.104 3GPP TS 36.141 3GPP TS 38.104
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** • The validity period is one year. • The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4

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Item	Standard
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-405 lists the surge protection specifications of ports on an RRU5254.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-405 Surge protection specifications of ports on an RRU5254

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5254.

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Table 1-406 Specifications of CPRI ports on an RRU5254

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5254	2	24.33024/10.1376/9.8304/4.9152	Load sharing or star

Table 1-407 RRU5254 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5254	Not supported	The length of optical fibers between the BBU and RRU must be less than 10 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU5254.

Table 1-408 Antenna capability of an RRU5254

Type	TMA Support	RET Antenna Support
RRU5254	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.26 RRU5251 Technical Specifications

The RRU5251 is a remote radio unit working in LTE TDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU5251.

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Table 1-409 Modes and frequency bands supported by an RRU5251

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU5251	2300 (Band 40)	2300 to 2400	LTE TDD	100	100

RF Specifications

The following tables list RF specifications of an RRU5251.

Table 1-410 Receiver sensitivity of an RRU5251

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU5251	2300 (Band 40)	4T4R	-106	-108.77	-111.47

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-411 Capacity and output power of an RRU5251

Type	Capacity	Maximum Output Power	Typical Output Power
RRU5251	5 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x50 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU5251.

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Table 1-412 Input power of an RRU5251

Type	Power
RRU5251	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-413 Dimensions and weight of an RRU5251

Type	Dimensions (H x W x D)	Weight (kg)
RRU5251	400 mm x 300 mm x 150 mm (18 L)	≤ 20

Table 1-414 Power consumption of an RRU5251

Type	Frequency Band (MHz)	Typical Power Consumption (W)
RRU5251	2300	337

NOTE

The typical power consumption of a module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU5251.

Table 1-415 Environmental specifications of an RRU5251

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU5251	● With solar radiation of 1120 W/m^2: -40°C to +50°C ● Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

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The following table lists the compliance standards for an RRU5251.

Table 1-416 Compliance standards for an RRU5251

Item	Standard
RF	3GPP TS 36.104 3GPP TS 36.141 3GPP TS 38.104
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-417 lists the surge protection specifications of ports on an RRU5251.

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NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-417 Surge protection specifications of ports on an RRU5251

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU5251.

Table 1-418 Specifications of CPRI ports on an RRU5251

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU5251	2	10.1376, 9.8304, or 4.9152	Star, chain, or load sharing

Table 1-419 RRU5251 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU5251	4	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU5251.

Table 1-420 Antenna capability of an RRU5251

Type	TMA Support	RET Antenna Support
RRU5251	Not supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.27 RRU3971a Technical Specifications

The RRU3971a is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3971a can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3971a.

Table 1-421 Modes and frequency bands supported by an RRU3971a

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3971a	1800	1710 to 1785	1805 to 1880	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45

RF Specifications

The following tables list RF specifications of an RRU3971a.

Table 1-422 Receiver sensitivity of an RRU3971a

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3971a	4T4R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) LTE FDD: -112.1 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-423 Capacity and output power of an RRU3971a

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3971a	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	4x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-424 SUL carrier configuration of an RRU3971a (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-425 SUL carrier configuration of an RRU3971a (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	2 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3971a.

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Table 1-426 Input power of an RRU3971a

Type	Power
RRU3971a	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-427 Dimensions and weight of an RRU3971a

Type	Dimensions (H x W x D)	Weight (kg)
RRU3971a	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-428 Power consumption of the entire base station (configured with an RRU3971a)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3971a** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3971a.

Table 1-429 Environmental specifications of an RRU3971a

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3971a	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3971a.

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Table 1-430 Compliance standards for an RRU3971a

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3971a.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-431 Surge protection specifications of ports on an RRU3971a

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3971a.

Table 1-432 Specifications of CPRI ports on an RRU3971a

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3971a	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-433 RRU3971a CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3971a	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3971a.

Table 1-434 Antenna capability of an RRU3971a

Type	TMA Support	RET Antenna Support
RRU3971a	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.28 RRU3971 Technical Specifications

The RRU3971 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3971 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3971.

Table 1-435 Modes and frequency bands supported by an RRU3971

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3971	1800	1710 to 1785	1805 to 1880	LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45
RRU3971	1900	1850 to 1910	1930 to 1990	UMTS, LTE FDD, GU, GL, UL, GUL	40
RRU3971	AWS	1710 to 1780	2110 to 2180	UMTS, LTE FDD, UL, LM, LN (SUL), ULN (SUL)	70
RRU3971	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

RF Specifications

The following tables list RF specifications of an RRU3971.

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Table 1-436 Receiver sensitivity of an RRU3971

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3971	4T4R	GSM: -113.4 UMTS: -125.8 LTE FDD: -106.0 LTE NB-IoT: -127.3	GSM: -116.2 UMTS: -128.6 LTE FDD: -108.8 LTE NB-IoT: -130.1	GSM: -118.9 (theoretical value) UMTS: -131.3 LTE FDD: -111.5 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-437 Capacity and output power of an RRU3971

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3971 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	4x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3971 (1900 MHz)	GSM: 8 carriers UMTS: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU3971 (AWS)	UMTS: 8 carriers LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	4x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3971 (2100 MHz)	UMTS: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	4x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-438 SUL carrier configuration of an RRU3971 (LN, 1800 MHz/2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-439 SUL carrier configuration of an RRU3971 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
8	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20

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Table 1-440 SUL carrier configuration of an RRU3971 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20

Table 1-441 SUL carrier configuration of an RRU3971 (LN, AWS, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1	15, 20

Table 1-442 SUL carrier configuration of an RRU3971 (ULN, AWS, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3971.

Table 1-443 Input power of an RRU3971

Type	Power
RRU3971	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-444 Dimensions and weight of an RRU3971

Type	Dimensions (H x W x D)	Weight (kg)
RRU3971	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

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Table 1-445 Power consumption of the entire base station (configured with an RRU3971)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3971** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3971.

Table 1-446 Environmental specifications of an RRU3971

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3971	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3971.

Table 1-447 Compliance standards for an RRU3971

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3971.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-448 Surge protection specifications of ports on an RRU3971

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3971.

Table 1-449 Specifications of CPRI ports on an RRU3971

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3971	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-450 RRU3971 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3971	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3971.

Table 1-451 Antenna capability of an RRU3971

Type	TMA Support	RET Antenna Support
RRU3971	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.29 RRU3965 Technical Specifications

The RRU3965 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3965 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3965.

Table 1-452 Modes and frequency bands supported by an RRU3965

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3965	800+900 EGSM	800: 832 to 862 900 EGSM: 880 to 915	800: 791 to 821 900 EGSM: 925 to 960	800 MHz: LTE FDD, LM, LN (SUL) 900 EGSM: UMTS, LTE FDD, GU, GL, UL, GUL, GUM, GULM 800 MHz+900 EGSM: LTE FDD, GL, UL, GUL, GULM, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	800: 20 900 EGSM: 35

NOTE

- An RRU3965 can work in the 800 MHz frequency band, 900 EGSM frequency band, or both frequency bands.
- In this section, when the RRU3965 works in one frequency band, *frequency band* is used to indicate the band. When the RRU3965 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. For example: RRU3965 (800 MHz+900 EGSM).

RF Specifications

The following tables list RF specifications of an RRU3965.

Table 1-453 Receiver sensitivity of an RRU3965

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3965	2T2R	GSM: -113.4 UMTS: -125.5 LTE FDD: - 800 MHz: -105.8 - 900 EGSM: -106.3 LTE NB-IoT: -127.3	GSM: -116.2 UMTS: -128.3 LTE FDD: - 800 MHz: -108.6 - 900 EGSM: -109.1 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-454 Capacity and output power of an RRU3965

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3965	GSM: 6 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: Each RRU supports two carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU3965 (800 MHz)

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Table 1-455 SUL carrier configuration of an RRU3965 (LN, 800 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	10

RRU3965 (800 MHz+900 EGSM)

Table 1-456 SUL carrier configuration of an RRU3965 (LN, 800 MHz LN+900 EGSM LTE FDD, 2R)

800 MHz			900 MHz
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of LTE FDD Carriers
2 (MIMO)	1	10	2 (MIMO)

Table 1-457 SUL carrier configuration of an RRU3965 (GLN, 800 MHz LN+900 EGSM GL, 2R)

800 MHz			900 MHz	
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of GSM Carriers	Total Number of LTE FDD Carriers
1 (MIMO)	1	15, 20	4	1 (MIMO)
2 (MIMO)	1	15, 20	2	1 (MIMO)

Table 1-458 SUL carrier configuration of an RRU3965 (ULN, 800 MHz LN+900 EGSM UL, 2R)

800 MHz			900 MHz	
Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)	Total Number of UMTS Carriers	Total Number of LTE FDD Carriers
1 (MIMO)	1	15, 20	4	1 (MIMO)
2 (MIMO)	1	15, 20	2 (MIMO)	2 (MIMO)

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Table 1-459 SUL carrier configuration of an RRU3965 (GULN, 800 MHz LN+900 EGSM GU, 2R)

800 MHz			900 MHz	
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of UMTS Carriers**
1 (MIMO)	1	15, 20	4	2
2 (MIMO)	1	15, 20	2	2

Table 1-460 SUL carrier configuration of an RRU3965 (GULN, 800 MHz LN+900 EGSM GUL, 2R)

800 MHz			900 MHz		
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
1 (MIMO)	1	15, 20	3	1	1 (MIMO)
1 (MIMO)	1	15, 20	2	2	1 (MIMO)

Engineering Specifications

The following tables list the equipment specifications of an RRU3965.

Table 1-461 Input power of an RRU3965

Type	Power
RRU3965	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-462 Dimensions and weight of an RRU3965

Type	Dimensions (H x W x D)	Weight (kg)
RRU3965	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)

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Table 1-463 Power consumption of the entire base station (configured with an RRU3965)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3965** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3965.

Table 1-464 Environmental specifications of an RRU3965

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3965	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3965.

Table 1-465 Compliance standards for an RRU3965

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3965.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-466 Surge protection specifications of ports on an RRU3965

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3965.

Table 1-467 Specifications of CPRI ports on an RRU3965

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3965	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-468 RRU3965 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3965	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3965.

Table 1-469 Antenna capability of an RRU3965

Type	TMA Support	RET Antenna Support
RRU3965	Supported	AISG2.0

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.30 RRU3962 Technical Specifications

The RRU3962 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3962 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3962.

Table 1-470 Modes and frequency bands supported by an RRU3962

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3962	1800+2100	1800: 1710 to 1785 2100: 1920 to 1980	1800: 1805 to 1880 2100: 2110 to 2170	1800 MHz: LTE FDD, GL, LN (SUL), GLN (SUL) 2100 MHz: UMTS, LTE FDD, UL, LN (SUL), ULN (SUL) 1800 MHz+2100 MHz: LTE FDD, GL, UL, GUL, LN (SUL), GLN (SUL), ULN (SUL), GULN (SUL)	1800: 40 2100: 40

NOTE

- An RRU3962 can work in the 1800 MHz frequency band, 2100 MHz frequency band, or both frequency bands.
- In this section, when the RRU3962 works in one frequency band, *frequency band* is used to indicate the band. When the RRU3962 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. For example: RRU3962 (1800 MHz+2100 MHz).

RF Specifications

The following tables list RF specifications of an RRU3962.

Table 1-471 Receiver sensitivity of an RRU3962

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3962	2T4R	GSM: -113.8 UMTS: -125.9 LTE FDD: -106.7	GSM: -116.6 UMTS: -128.7 LTE FDD: -109.5	GSM: -119.3 UMTS: -131.4 LTE FDD: -112.2

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-472 Capacity and output power of an RRU3962

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3962	GSM: 6 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: Each RRU supports two carriers in one frequency band and four carriers in two frequency bands. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

RRU3962 (1800 MHz)

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Table 1-473 SUL carrier configuration of an RRU3962 (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-474 SUL carrier configuration of an RRU3962 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

RRU3962 (2100 MHz)

Table 1-475 SUL carrier configuration of an RRU3962 (LN, 2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-476 SUL carrier configuration of an RRU3962 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20
2 (MIMO)	2 (MIMO)	1	15, 20

RRU3962 (1800 MHz+2100 MHz)

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Table 1-477 SUL carrier configuration of an RRU3962 (LN, 1800 MHz LN+2100 MHz LTE FDD, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-478 SUL carrier configuration of an RRU3962 (LN, 2100 MHz LN+1800 MHz LTE FDD, 4R)

2100 MHz			1800 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-479 SUL carrier configuration of an RRU3962 (GLN, 1800 MHz GLN+2100 MHz LTE FDD, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
5	1 (MIMO)	1	15, 20	1 (MIMO)
2	1 (MIMO)	1	15, 20	2 (MIMO)

Table 1-480 SUL carrier configuration of an RRU3962 (GLN, 1800 MHz GL+2100 MHz LN, 4R)

1800 MHz		2100 MHz		
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**
5	1 (MIMO)	1 (MIMO)	1	15, 20
2	1 (MIMO)	2 (MIMO)	1	15, 20

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Table 1-481 SUL carrier configuration of an RRU3962 (ULN, 1800 MHz LN+2100 MHz UMTS, 4R)

1800 MHz			2100 MHz
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
1 (MIMO)	1	15, 20	6
2 (MIMO)	1	15, 20	2
2 (MIMO)	1	15, 20	2 (MIMO)

Table 1-482 SUL carrier configuration of an RRU3962 (ULN, 1800 MHz LN+2100 MHz UL, 4R)

1800 MHz			2100 MHz	
Total Number of LTE FDD Carriers	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
2 (MIMO)	1	15, 20	4	1 (MIMO)
1 (MIMO)	1	15, 20	2 (MIMO)	1 (MIMO)
2 (MIMO)	1	15, 20	1 (MIMO)	1 (MIMO)

Table 1-483 SUL carrier configuration of an RRU3962 (ULN, 2100 MHz ULN+1800 MHz LTE FDD, 4R)

2100 MHz				1800 MHz
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of LTE FDD Carriers**
4	1 (MIMO)	1	15, 20	2 (MIMO)
2 (MIMO)	1 (MIMO)	1	15, 20	1 (MIMO)
1 (MIMO)	1 (MIMO)	1	15, 20	2 (MIMO)

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Table 1-484 SUL carrier configuration of an RRU3962 (GULN, 1800 MHz GLN+2100 MHz UMTS, 4R)

1800 MHz				2100 MHz
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**
6	1 (MIMO)	1	15, 20	2
3	1 (MIMO)	1	15, 20	3
2	1 (MIMO)	1	15, 20	4

Table 1-485 SUL carrier configuration of an RRU3962 (GULN, 1800 MHz GLN+2100 MHz UL, 4R)

1800 MHz				2100 MHz	
Total Number of GSM Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of UMTS Carriers**	**Total Number of LTE FDD Carriers**
6	1 (MIMO)	1	15, 20	2	1 (MIMO)
3	1 (MIMO)	1	15, 20	3	1 (MIMO)
2	1 (MIMO)	1	15, 20	4	1 (MIMO)

Table 1-486 SUL carrier configuration of an RRU3962 (GULN, 2100 MHz ULN+1800 MHz GL, 4R)

2100 MHz				1800 MHz	
Total Number of UMTS Carriers	**Total Number of LTE FDD Carriers**	**Total Number of NR SUL Carriers**	**Bandwidth per NR SUL Carrier (MHz)**	**Total Number of GSM Carriers**	**Total Number of LTE FDD Carriers**
2	1 (MIMO)	1	15, 20	6	1 (MIMO)
3	1 (MIMO)	1	15, 20	3	1 (MIMO)
4	1 (MIMO)	1	15, 20	2	1 (MIMO)

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Engineering Specifications

The following tables list the equipment specifications of an RRU3962.

Table 1-487 Input power of an RRU3962

Type	Power
RRU3962	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-488 Dimensions and weight of an RRU3962

Type	Dimensions (H x W x D)	Weight (kg)
RRU3962	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)

Table 1-489 Power consumption of the entire base station (configured with an RRU3962)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3962** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3962.

Table 1-490 Environmental specifications of an RRU3962

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3962	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

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NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3962.

Table 1-491 Compliance standards for an RRU3962

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

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The following table lists the surge protection specifications of ports on an RRU3962.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-492 Surge protection specifications of ports on an RRU3962

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3962.

Table 1-493 Specifications of CPRI ports on an RRU3962

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3962	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-494 RRU3962 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3962	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3962.

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Table 1-495 Antenna capability of an RRU3962

Type	TMA Support	RET Antenna Support
RRU3962	Supported	AISG2.0

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.31 RRU3961 Technical Specifications

The RRU3961 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3961 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3961.

Table 1-496 Modes and frequency bands supported by an RRU3961

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3961	800+900 EGSM	800: 832 to 862 900 EGSM: 880 to 915	800: 791 to 821 900 EGSM: 925 to 960	800 MHz: LTE FDD, LTE NB-IoT, LM 900 EGSM: GSM, UMTS, GU 800 MHz+900 EGSM: GL, UL, GUL	800: 20 900 EGSM: 35

NOTE

- An RRU3961 can work in the 900 EGSM frequency band, 800 MHz frequency band, or both frequency bands.
- In this section, when the RRU3961 works in one frequency band, *frequency band* is used to indicate the band. When the RRU3961 works in multiple frequency bands at the same time, *frequency band 1+frequency band 2* is used to indicate the bands. For example: RRU3961 (800 MHz+900 EGSM).

RF Specifications

The following tables list RF specifications of an RRU3961.

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Table 1-497 Receiver sensitivity of an RRU3961

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3961	2T2R	GSM: -113.7 UMTS: -125.8 LTE FDD: -106.3 LTE NB-IoT: -127.3	GSM: -116.5 UMTS: -128.6 LTE FDD: -109.1 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-498 Capacity and output power of an RRU3961

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3961	GSM: 8 carriers UMTS: 4 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 10 or 20 MHz. LTE NB-IoT: 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3961.

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Table 1-499 Input power of an RRU3961

Type	Power
RRU3961	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-500 Dimensions and weight of an RRU3961

Type	Dimensions (H x W x D)	Weight (kg)
RRU3961	● 485 mm x 380 mm x 170 mm (with the housing) ● 485 mm x 356 mm x 140 mm (without the housing)	● 25 (with the housing) ● 23.5 (without the housing)

Table 1-501 Power consumption of the entire base station (configured with an RRU3961)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3961** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3961.

Table 1-502 Environmental specifications of an RRU3961

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3961	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3961.

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Table 1-503 Compliance standards for an RRU3961

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3961.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-504 Surge protection specifications of ports on an RRU3961

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3961.

Table 1-505 Specifications of CPRI ports on an RRU3961

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3961	2	1.25 or 2.5	Star, chain, or dual-star

Table 1-506 RRU3961 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3961	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3961.

Table 1-507 Antenna capability of an RRU3961

Type	TMA Support	RET Antenna Support
RRU3961	Supported	AISG2.0

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.32 RRU3959a Technical Specifications

The RRU3959a is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3959a can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3959a.

Table 1-508 Modes and frequency bands supported by an RRU3959a

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3959a	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GLM, GUM, ULM, GULM	35
RRU3959a	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GLM, GUM, ULM, GULM	25
RRU3959a	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45
RRU3959a	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

RF Specifications

The following tables list RF specifications of an RRU3959a.

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Table 1-509 Receiver sensitivity of an RRU3959a

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3959a	2T2R	GSM: ● 900 EGSM: -113.8 ● 900 PGSM: -113.8 ● 1800 MHz: -114.0 UMTS: ● 900 EGSM: -125.9 ● 900 PGSM: -125.9 ● 2100 MHz: -126.1 LTE FDD: ● 900 EGSM: -106.9 ● 900 PGSM: -106.9 ● 1800 MHz: -106.6 ● 2100 MHz: -106.9 LTE NB-IoT: -127.3	GSM: ● 900 EGSM: -116.6 ● 900 PGSM: -116.6 ● 1800 MHz: -116.8 UMTS: ● 900 EGSM: -128.7 ● 900 PGSM: -128.7 ● 2100 MHz: -128.9 LTE FDD: ● 900 EGSM: -109.7 ● 900 PGSM: -109.7 ● 1800 MHz: -109.4 ● 2100 MHz: -109.7 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-510 Capacity and output power of an RRU3959a

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3959a (900 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3959a (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3959a (2100 MHz)	UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

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Table 1-511 SUL carrier configuration of an RRU3959a (LN, 1800 MHz/2100 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-512 SUL carrier configuration of an RRU3959a (GLN, 1800 MHz, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Table 1-513 SUL carrier configuration of an RRU3959a (ULN, 2100 MHz, 2R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3959a.

Table 1-514 Input power of an RRU3959a

Type	Power
RRU3959a	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-515 Dimensions and weight of an RRU3959a

Type	Dimensions (H x W x D)	Weight (kg)
RRU3959a	400 mm x 300 mm x 100 mm (12 L, without the housing)	● 900 MHz: 14 (without the housing) ● 1800 MHz: 14 (without the housing) ● 2100 MHz: 15 (without the housing)

Table 1-516 Power consumption of the entire base station (configured with an RRU3959a)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3959a** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3959a.

Table 1-517 Environmental specifications of an RRU3959a

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3959a	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3959a.

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Table 1-518 Compliance standards for an RRU3959a

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3959a.

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NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-519 Surge protection specifications of ports on an RRU3959a

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3959a.

Table 1-520 Specifications of CPRI ports on an RRU3959a

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3959a	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-521 RRU3959a CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3959a	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3959a.

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Table 1-522 Antenna capability of an RRU3959a

Type	TMA Support	RET Antenna Support
RRU3959a	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.33 RRU3959w Technical Specifications

The RRU3959w is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3959w can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3959w.

Table 1-523 Modes and frequency bands supported by an RRU3959w

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3959w	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, GM, LM, GLM, LN (SUL), GLN (SUL)	75

RF Specifications

The following tables list RF specifications of an RRU3959w.

Table 1-524 Receiver sensitivity of an RRU3959w

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3959w	2T2R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-525 Capacity and output power of an RRU3959w

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3959w	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-526 SUL carrier configuration of an RRU3959w (1800 MHz, LN, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

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Table 1-527 SUL carrier configuration of an RRU3959w (1800 MHz, GLN, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3959w.

Table 1-528 Input power of an RRU3959w

Type	Power
RRU3959w	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-529 Dimensions and weight of an RRU3959w

Type	Dimensions (H x W x D)	Weight (kg)
RRU3959w	400 mm x 300 mm x 100 mm (12 L, without the housing)	14 (without the housing)

Table 1-530 Power consumption of the entire base station (configured with an RRU3959w)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3959w** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3959w.

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Table 1-531 Environmental specifications of an RRU3959w

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3959w	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3959w.

Table 1-532 Compliance standards for an RRU3959w

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3959w.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-533 Surge protection specifications of ports on an RRU3959w

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3959w.

Table 1-534 Specifications of CPRI ports on an RRU3959w

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3959w	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-535 RRU3959w CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3959w	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3959w.

Table 1-536 Antenna capability of an RRU3959w

Type	TMA Support	RET Antenna Support
RRU3959w	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.34 RRU3959 Technical Specifications

The RRU3959 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3959 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3959.

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Table 1-537 Modes and frequency bands supported by an RRU3959

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3959	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	25
RRU3959	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	35
RRU3959	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45
RRU3959	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

RF Specifications

The following tables list RF specifications of an RRU3959.

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Table 1-538 Receiver sensitivity of an RRU3959

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3959	2T2R	GSM: ● 900 MHz: -113.7 ● 1800 MHz: -114.0 UMTS: ● 900 MHz: -125.8 ● 2100 MHz: -126.1 LTE FDD: ● 900 MHz: -106.3 ● 1800 MHz: -106.6 ● 2100 MHz: -106.9 LTE NB-IoT: -127.3	GSM: ● 900 MHz: -116.5 ● 1800 MHz: -116.8 UMTS: ● 900 MHz: -128.6 ● 2100 MHz: -128.9 LTE FDD: ● 900 MHz: -109.1 ● 1800 MHz: -109.4 ● 2100 MHz: -109.7 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-539 Capacity and output power of an RRU3959

Type	Frequency Band (MHz)	Capacity	Maximum Output Power	Typical Output Power
RRU3959	900	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3959	1800	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3959	2100	UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-540 SUL carrier configuration of an RRU3959 (1800 MHz, LN, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-541 SUL carrier configuration of an RRU3959 (2100 MHz, LN, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-542 SUL carrier configuration of an RRU3959 (1800 MHz, GLN, 2R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Table 1-543 SUL carrier configuration of an RRU3959 (ULN, 2100 MHz, 2R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

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Engineering Specifications

The following tables list the equipment specifications of an RRU3959.

Table 1-544 Input power of an RRU3959

Type	Power
RRU3959	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-545 Dimensions and weight of an RRU3959

Type	Dimensions (H x W x D)	Weight (kg)
RRU3959	400 mm x 300 mm x 100 mm (12 L, without the housing)	● 900 MHz: 14 (without the housing) ● 1800 MHz: 14 (without the housing) ● 2100 MHz: 15 (without the housing)

Table 1-546 Power consumption of the entire base station (configured with an RRU3959)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3959** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3959.

Table 1-547 Environmental specifications of an RRU3959

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3959	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

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NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3959.

Table 1-548 Compliance standards for an RRU3959

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

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The following table lists the surge protection specifications of ports on an RRU3959.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-549 Surge protection specifications of ports on an RRU3959

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3959.

Table 1-550 Specifications of CPRI ports on an RRU3959

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3959	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-551 Specifications of CPRI ports on an RRU3959

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3959	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3959.

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Table 1-552 Antenna capability of an RRU3959

Type	TMA Support	RET Antenna Support
RRU3959	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.35 RRU3958 Technical Specifications

The RRU3958 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3958 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3958.

Table 1-553 Modes and frequency bands supported by an RRU3958

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3958	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

RF Specifications

The following tables list RF specifications of an RRU3958.

Table 1-554 Receiver sensitivity of an RRU3958

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3958	2T2R	UMTS: -126.1 LTE FDD: -106.9	UMTS: -128.9 LTE FDD: -109.7

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-555 Capacity and output power of an RRU3958

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3958	UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-556 SUL carrier configuration of an RRU3958 (LN, 2100 MHz, 2R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

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Table 1-557 SUL carrier configuration of an RRU3958 (ULN, 2100 MHz, 2R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3958.

Table 1-558 Input power of an RRU3958

Type	Power
RRU3958	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-559 Dimensions and weight of an RRU3958

Type	Dimensions (H x W x D)	Weight (kg)
RRU3958	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-560 Power consumption of the entire base station (configured with an RRU3958)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3958** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3958.

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Table 1-561 Environmental specifications of an RRU3958

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3958	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3958.

Table 1-562 Compliance standards for an RRU3958

Item	Standard
RF	● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3958.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-563 Surge protection specifications of ports on an RRU3958

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3958.

Table 1-564 Specifications of CPRI ports on an RRU3958

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3958	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-565 RRU3958 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3958	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3958.

Table 1-566 Antenna capability of an RRU3958

Type	TMA Support	RET Antenna Support
RRU3958	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.36 RRU3953w Technical Specifications

The RRU3953w is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3953w can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3953w.

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Table 1-567 Modes and frequency bands supported by an RRU3953w

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3953w	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, GM, LM, GLM, LN (SUL), GLN (SUL)	75

RF Specifications

The following tables list RF specifications of an RRU3953w.

Table 1-568 Receiver sensitivity of an RRU3953w

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3953w	2T4R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1	GSM: -119.5 (theoretical value) LTE FDD: -112.1 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-569 Capacity and output power of an RRU3953w

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3953w	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier NR (SUL): 1 carrier	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

- When the RRU3953w works only in GSM mode, it supports a maximum configuration of 2x60 W or the configuration of 80 W on only one channel (PA2). It does not support the configuration of 2x80 W. For details about the power configuration, see *Typical Power Configuration for RRUs (Excluding NB-IoT)*.
- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-570 SUL carrier configuration of an RRU3953w (LN, 1800 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-571 SUL carrier configuration of an RRU3953w (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3953w.

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Table 1-572 Input power of an RRU3953w

Type	Power
RRU3953w	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-573 Dimensions and weight of an RRU3953w

Type	Dimensions (H x W x D)	Weight (kg)
RRU3953w	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)

Table 1-574 Power consumption of the entire base station (configured with an RRU3953w)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3953w** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3953w.

Table 1-575 Environmental specifications of an RRU3953w

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3953w	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3953w.

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Table 1-576 Compliance standards for an RRU3953w

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3953w.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-577 Surge protection specifications of ports on an RRU3953w

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3953w.

Table 1-578 Specifications of CPRI ports on an RRU3953w

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3953w	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-579 RRU3953w CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3953w	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3953w.

Table 1-580 Antenna capability of an RRU3953w

Type	TMA Support	RET Antenna Support
RRU3953w	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.37 RRU3953 Technical Specifications

The RRU3953 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3953 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3953.

Table 1-581 Modes and frequency bands supported by an RRU3953

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3953	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	35
RRU3953	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	25
RRU3953	1900	1850 to 1910	1930 to 1990	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, UM, LM, ULM	40
RRU3953	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60
RRU3953	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM, LN (SUL), GLN (SUL)	45

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

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RF Specifications

The following tables list RF specifications of an RRU3953.

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Table 1-582 Receiver sensitivity of an RRU3953

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3953	2T4R	GSM: ● 900 EGSM: -113.8 ● 900 PGSM: -113.6 ● 1800 MHz: -114.0 ● 1900 MHz: -113.7 UMTS: ● 900 EGSM: -125.9 ● 900 PGSM: -125.7 ● 1900 MHz: -125.8 ● 2100 MHz: -125.8 LTE FDD: ● 900 EGSM: -106.9 ● 900 PGSM: -106.9 ● 1800 MHz: -106.6 ● 1900 MHz: -106.3 ● 2100 MHz: -106.5 LTE NB-IoT: -127.3	GSM: ● 900 EGSM: -116.6 ● 900 PGSM: -116.4 ● 1800 MHz: -116.8 ● 1900 MHz: -116.5 UMTS: ● 900 EGSM: -128.7 ● 900 PGSM: -128.5 ● 1900 MHz: -128.6 ● 2100 MHz: -128.6 LTE FDD: ● 900 EGSM: -109.7 ● 900 PGSM: -109.7 ● 1800 MHz: -109.4 ● 1900 MHz: -109.1 ● 2100 MHz: -109.3 LTE NB-IoT: -130.1	GSM: ● 900 EGSM: -119.3 (theoretical value) ● 900 PGSM: -119.1 (theoretical value) ● 1800 MHz: -119.5 (theoretical value) ● 1900 MHz: -119.2 (theoretical value) UMTS: ● 900 EGSM: -131.4 ● 900 PGSM: -131.2 ● 1900 MHz: -131.3 ● 2100 MHz: -131.3 LTE FDD: ● 900 EGSM: -122.4 ● 900 PGSM: -122.4 ● 1800 MHz: -112.1 ● 1900 MHz: -111.8 ● 2100 MHz: -112.0 LTE NB-IoT: -132.8

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-583 Capacity and output power of an RRU3953

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3953 (900 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3953 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3953 (1900 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz.	2x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU3953 (2100 MHz)	UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- When the RRU3953 works only in GSM mode, it supports a maximum configuration of 2x60 W or the configuration of 80 W on only one channel (PA2). It does not support the configuration of 2x80 W. For details about the power configuration, see "Typical Output Power" in the preceding table.
- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-584 SUL carrier configuration of an RRU3953 (LN, 1800 MHz/2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-585 SUL carrier configuration of an RRU3953 (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
8	1 (MIMO)	1	15, 20

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Table 1-586 SUL carrier configuration of an RRU3953 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
3 (MIMO)	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3953.

Table 1-587 Input power of an RRU3953

Type	Power
RRU3953	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-588 Dimensions and weight of an RRU3953

Type	Dimensions (H x W x D)	Weight (kg)
RRU3953	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)

Table 1-589 Power consumption of the entire base station (configured with an RRU3953)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3953** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3953.

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Table 1-590 Environmental specifications of an RRU3953

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3953	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3953.

Table 1-591 Compliance standards for an RRU3953

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3953.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-592 Surge protection specifications of ports on an RRU3953

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3953.

Table 1-593 Specifications of CPRI ports on an RRU3953

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3953	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

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Table 1-594 RRU3953 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3953	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3953.

Table 1-595 Antenna capability of an RRU3953

Type	TMA Support	RET Antenna Support
RRU3953	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.38 RRU3952m Technical Specifications

The RRU3952m is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3952m can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3952m.

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Table 1-596 Modes and frequency bands supported by an RRU3952m

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3952m	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, LN (SUL), GLN (SUL)	● 1800 MHz 2T4R: 45 ● 1800 MHz 2T2R +2100 MHz 2R: 40
RRU3952m	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

NOTE

- The RRU3952m (1800 MHz) supports two work modes: 1800 MHz 2T4R and 1800 MHz 2T2R+2100 MHz 2R.
- The RRU3952m (2100 MHz) supports two work modes: 2100 MHz 2T4R and 2100 MHz 2T2R+1800 MHz 2R.

RF Specifications

The following tables list RF specifications of an RRU3952m.

Table 1-597 Receiver sensitivity of an RRU3952m

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3952m	2T4R	GSM: -113.9 UMTS: -126.0 LTE FDD: -106.8 LTE NB-IoT: -127.3	GSM: -116.7 UMTS: -128.8 LTE FDD: -109.6 LTE NB-IoT: -130.1	GSM: -119.4 (theoretical value) UMTS: -131.5 LTE FDD: -112.3 LTE NB-IoT: -132.8

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-598 Capacity and output power of an RRU3952m

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3952m (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 2 carriers NR (SUL): 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3952m (2100 MHz)	UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

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Table 1-599 SUL carrier configuration of an RRU3952m (LN, 1800 MHz/2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-600 SUL carrier configuration of an RRU3952m (GLN, 1800 MHz, 4R)

Total Number of GSM Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	2 (MIMO)	1	15, 20
6	1 (MIMO)	1	15, 20

Table 1-601 SUL carrier configuration of an RRU3952m (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
4	1 (MIMO)	1	15, 20
2	2 (MIMO)	1	15, 20
1 (MIMO)	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3952m.

Table 1-602 Input power of an RRU3952m

Type	Power
RRU3952m	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-603 Dimensions and weight of an RRU3952m

Type	Dimensions (H x W x D)	Weight (kg)
RRU3952m	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

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Table 1-604 Power consumption of the entire base station (configured with an RRU3952m)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3952m** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3952m.

Table 1-605 Environmental specifications of an RRU3952m

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3952m	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3952m.

Table 1-606 Compliance standards for an RRU3952m

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3952m.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-607 Surge protection specifications of ports on an RRU3952m

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3952m.

Table 1-608 Specifications of CPRI ports on an RRU3952m

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3952m	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-609 RRU3952m CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3952m	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3952m.

Table 1-610 Antenna capability of an RRU3952m

Type	TMA Support	RET Antenna Support
RRU3952m	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.39 RRU3952 Technical Specifications

The RRU3952 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3952 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3952.

Table 1-611 Modes and frequency bands supported by an RRU3952

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3952	850 (Band 5)	824 to 849	869 to 894	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	25
RRU3952	850 (Band 26)	814 to 834	859 to 879	LTE FDD	20
RRU3952	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL, LN (SUL), ULN (SUL)	60

RF Specifications

The following tables list RF specifications of an RRU3952.

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Table 1-612 Receiver sensitivity of an RRU3952

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3952	2T4R	GSM: ● 850 MHz: -113.4 UMTS: ● 850 MHz: -125.5 ● 2100 MHz: -126.1 LTE FDD: ● 850 MHz: -106.0 ● 2100 MHz: -106.9 LTE NB-IoT: -127.3	GSM: ● 850 MHz: -116.2 UMTS: ● 850 MHz: -128.3 ● 2100 MHz: -128.9 LTE FDD: ● 850 MHz: -108.8 ● 2100 MHz: -109.7 LTE NB-IoT: -130.1	GSM: ● 850 MHz: -118.9 (theoretical value) UMTS: ● 850 MHz: -131.0 ● 2100 MHz: -131.6 LTE FDD: ● 850 MHz: -111.5 ● 2100 MHz: -112.4 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-613 Capacity and output power of an RRU3952

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3952 (850 MHz, Band 5)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W or 40 W+80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3952 (850 MHz, Band 26)	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .
RRU3952 (2100 MHz)	UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. NR (SUL): 1 carrier	2x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- When the maximum power is 2x60 W, unless otherwise specified, values of PA1 and PA2 are interchangeable. When the maximum power is 40 W+80 W, only PA2 can be configured with 80 W output power, and values of PA1 and PA2 are not interchangeable.
- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

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Table 1-614 SUL carrier configuration of an RRU3952 (LN, 2100 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	15, 20

Table 1-615 SUL carrier configuration of an RRU3952 (ULN, 2100 MHz, 4R)

Total Number of UMTS Carriers	Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
6	1 (MIMO)	1	15, 20
4	2 (MIMO)	1	15, 20
3 (MIMO)	1 (MIMO)	1	15, 20

Engineering Specifications

The following tables list the equipment specifications of an RRU3952.

Table 1-616 Input power of an RRU3952

Type	Power
RRU3952	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-617 Dimensions and weight of an RRU3952

Type	Dimensions (H x W x D)	Weight (kg)
RRU3952 (850 MHz)	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)
RRU3952 (2100 MHz)	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

Table 1-618 Power consumption of the entire base station (configured with an RRU3952)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3952** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

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NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3952.

Table 1-619 Environmental specifications of an RRU3952

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3952	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3952.

Table 1-620 Compliance standards for an RRU3952

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 38.104 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4

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Item	Standard
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3952.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-621 Surge protection specifications of ports on an RRU3952

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3952.

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Table 1-622 Specifications of CPRI ports on an RRU3952

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3952	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star

Table 1-623 RRU3952 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3952	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3952.

Table 1-624 Antenna capability of an RRU3952

Type	TMA Support	RET Antenna Support
RRU3952	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.40 RRU3942 Technical Specifications

The RRU3942 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3942 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3942.

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Table 1-625 Modes and frequency bands supported by an RRU3942

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3942	1900	1850 to 1910	1930 to 1990	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, UM, LM, ULM, GULM	● With GSM: 35 ● Without GSM: 40
RRU3942	850	824 to 849	869 to 894	GSM, UMTS, LTE FDD, GU, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	25

RF Specifications

The following tables list RF specifications of an RRU3942.

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Table 1-626 Receiver sensitivity of an RRU3942

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3942	2T4R	GSM: ● 850 MHz: -113.4 ● 1900 MHz: -113.7 UMTS: ● 850 MHz: -125.5 ● 1900 MHz: -125.8 LTE FDD: ● 850 MHz: -106.0 ● 1900 MHz: -106.3 LTE NB-IoT: -127.3	GSM: ● 850 MHz: -116.2 ● 1900 MHz: -116.5 UMTS: ● 850 MHz: -128.3 ● 1900 MHz: -128.6 LTE FDD: ● 850 MHz: -108.8 ● 1900 MHz: -109.1 LTE NB-IoT: -130.1	GSM: ● 850 MHz: -118.9 (theoretical value) ● 1900 MHz: -119.2 (theoretical value) UMTS: ● 850 MHz: -131.0 ● 1900 MHz: -131.3 LTE FDD: ● 850 MHz: -111.5 ● 1900 MHz: -111.8 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-627 Capacity and output power of an RRU3942

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3942 (850 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x60 W or 40 W +80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3942 (1900 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x60 W or 40 W +80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

- When the maximum power is 2x60 W, unless otherwise specified, values of PA1 and PA2 are interchangeable. When the maximum power is 40 W+80 W, only PA2 can be configured with 80 W output power, and values of PA1 and PA2 are not interchangeable.
- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3942.

Table 1-628 Input power of an RRU3942

Type	Power
RRU3942	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-629 Dimensions and weight of an RRU3942

Type	Dimensions (H x W x D)	Weight (kg)
RRU3942	● 485 mm x 380 mm x 170 mm (with the housing) ● 485 mm x 356 mm x 140 mm (without the housing)	● 25 (with the housing) ● 23.5 (without the housing)

Table 1-630 Power consumption of the entire base station (configured with an RRU3942)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3942** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3942.

Table 1-631 Environmental specifications of an RRU3942

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3942	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3942.

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Table 1-632 Compliance standards for an RRU3942

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3942.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-633 Surge protection specifications of ports on an RRU3942

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3942.

Table 1-634 Specifications of CPRI ports on an RRU3942

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3942	2	1.25, 2.5, or 4.9	Star, chain, or dual-star

Table 1-635 RRU3942 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3942	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3942.

Table 1-636 Antenna capability of an RRU3942

Type	TMA Support	RET Antenna Support
RRU3942	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.41 RRU3939 Technical Specifications

The RRU3939 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3939 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3939.

Table 1-637 Modes and frequency bands supported by an RRU3939

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3939	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM	● With GSM: 35 ● Without GSM: 40

RF Specifications

The following tables list RF specifications of an RRU3939.

Table 1-638 Receiver sensitivity of an RRU3939

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3939	2T2R	GSM: -114.0 LTE FDD: -106.6 LTE NB-IoT: -127.3	GSM: -116.8 LTE FDD: -109.4 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-639 Capacity and output power of an RRU3939

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3939	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3939.

Table 1-640 Input power of an RRU3939

Type	Power
RRU3939	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-641 Dimensions and weight of an RRU3939

Type	Dimensions (H x W x D)	Weight (kg)
RRU3939	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)

Table 1-642 Power consumption of the entire base station (configured with an RRU3939)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3939** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

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The following table lists the environmental specifications of an RRU3939.

Table 1-643 Environmental specifications of an RRU3939

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3939	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3939.

Table 1-644 Compliance standards for an RRU3939

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3939.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-645 Surge protection specifications of ports on an RRU3939

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3939.

Table 1-646 Specifications of CPRI ports on an RRU3939

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3939	2	1.25, 2.5, or 4.9	Star, chain, or dual-star

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Table 1-647 RRU3939 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3939	Multimode (excluding GU) CPRI MUX: 4 levels	Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3939.

Table 1-648 Antenna capability of an RRU3939

Type	TMA Support	RET Antenna Support
RRU3939	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.42 RRU3938 Technical Specifications

An RRU3938 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3938 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3938.

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Table 1-649 Modes and frequency bands supported by an RRU3938

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3938	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	25
RRU3938	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	35
RRU3938	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM	● With GSM: 35 ● Without GSM: 40

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

RF Specifications

The following tables list RF specifications of an RRU3938.

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Table 1-650 Receiver sensitivity of an RRU3938

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3938	2T2R	GSM: ● 900 PGSM: -113.7 ● 900 EGSM: -113.7 ● 1800 MHz: -114.0 UMTS: -125.8 LTE FDD: ● 900 PGSM: -106.3 ● 900 EGSM: -106.3 ● 1800 MHz: -106.6 LTE NB-IoT: -127.3	GSM: ● 900 PGSM: -116.5 ● 900 EGSM: -116.5 ● 1800 MHz: -116.8 UMTS: -128.6 LTE FDD: ● 900 PGSM: -109.1 ● 900 EGSM: -109.1 ● 1800 MHz: -109.4 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-651 Capacity and output power of an RRU3938

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3938 (900 MHz)	GSM: 8 carriers UMTS: 4 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU3938 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3938.

Table 1-652 Input power of an RRU3938

Type	Power
RRU3938	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-653 Dimensions and weight of an RRU3938

Type	Dimensions (H x W x D)	Weight (kg)
RRU3938	400 mm x 300 mm x 100 mm (12 L, without the housing)	14 (without the housing)

Table 1-654 Power consumption of the entire base station (configured with an RRU3938)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3938** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3938.

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Table 1-655 Environmental specifications of an RRU3938

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3938	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3938.

Table 1-656 Compliance standards for an RRU3938

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3938.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-657 Surge protection specifications of ports on an RRU3938

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3938.

Table 1-658 Specifications of CPRI ports on an RRU3938

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3938	2	1.25, 2.5, or 4.9	Star, chain, or dual-star

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Table 1-659 RRU3938 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3938	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3938.

Table 1-660 Antenna capability of an RRU3938

Type	TMA Support	RET Antenna Support
RRU3938	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.43 RRU3936 Technical Specifications

The RRU3936 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3936 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3936.

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Table 1-661 Modes and frequency bands supported by an RRU3936

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3936	850	824 to 849	869 to 894	GSM, UMTS, GU, LTE FDD, GL, UL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	25
RRU3936	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	35
RRU3936	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	25
RRU3936	1900	1850 to 1910	1930 to 1990	GSM, UMTS, LTE FDD, GU, GL, UL	● With GSM: 35 ● Without GSM: 40
RRU3936	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM	● With GSM: 35 ● Without GSM: 40

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

RF Specifications

The following tables list RF specifications of an RRU3936.

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Table 1-662 Receiver sensitivity of an RRU3936

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3936	1T2R	GSM: ● 850 MHz: -113.4 ● 900 PGSM: -113.7 ● 900 EGSM: -113.7 ● 1800 MHz: -114.0 ● 1900 MHz: -113.7 UMTS: ● 850 MHz: -125.5 ● 900 PGSM: -125.8 ● 900 EGSM: -125.8 ● 1900 MHz: -125.8 LTE FDD: ● 850 MHz: -106.0 ● 900 PGSM: -106.3 ● 900 EGSM: -106.3 ● 1800 MHz: -106.6 ● 1900 MHz: -106.3 LTE NB-IoT: -127.3	GSM: ● 850 MHz: -116.2 ● 900 PGSM: -116.5 ● 900 EGSM: -116.5 ● 1800 MHz: -116.8 ● 1900 MHz: -116.5 UMTS: ● 850 MHz: -128.3 ● 900 PGSM: -128.6 ● 900 EGSM: -128.6 ● 1900 MHz: -128.6 LTE FDD: ● 850 MHz: -108.8 ● 900 PGSM: -109.1 ● 900 EGSM: -109.1 ● 1800 MHz: -109.4 ● 1900 MHz: -109.1 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-663 Capacity and output power of an RRU3936

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3936 (850 MHz)	GSM: 8 carriers UMTS: 6 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	1x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3936 (900 MHz)	GSM: 8 carriers UMTS: 6 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	1x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3936 (1900 MHz)	GSM: 8 carriers UMTS: 6 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz.	1x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .
RRU3936 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	1x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3936.

Table 1-664 Input power of an RRU3936

Type	Power
RRU3936	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-665 Dimensions and weight of an RRU3936

Type	Dimensions (H x W x D)	Weight (kg)
RRU3936	400 mm x 300 mm x 100 mm (12 L, without the housing)	14 (without the housing)

Table 1-666 Power consumption of the entire base station (configured with an RRU3936)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3936** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3936.

Table 1-667 Environmental specifications of an RRU3936

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3936	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3936.

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Table 1-668 Compliance standards for an RRU3936

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3936.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-669 Surge protection specifications of ports on an RRU3936

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3936.

Table 1-670 Specifications of CPRI ports on an RRU3936

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3936	2	1.25 or 2.5	Star, chain, or dual-star

Table 1-671 RRU3936 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3936	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3936.

Table 1-672 Antenna capability of an RRU3936

Type	TMA Support	RET Antenna Support
RRU3936	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.44 RRU3930E Technical Specifications

The RRU3930E is a low-power RRU. It applies to continuous coverage solutions of micro base stations in high traffic hotspots. It features easy site acquisition and easy deployment. Multiple RRU3930Es can be deployed together for capacity expansion. With the software-defined radio (SDR) technology, the RRU3930E can work in UL dual-mode through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3930E.

Table 1-673 Modes and frequency bands supported by an RRU3930E

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3930E	2100	1920 to 1980	2110 to 2170	UMTS, LTE FDD, UL	40

RF Specifications

The following tables list RF specifications of an RRU3930E.

Table 1-674 Receiver sensitivity of an RRU3930E

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3930E	UMTS: 1T1R/ 1T2R LTE FDD: 2T2R	UMTS: -123 LTE FDD: ● IBW ≤ 20 MHz: -105 ● 20 MHz < IBW ≤ 40 MHz: -103	UMTS: – 125.8 LTE FDD: ● IBW ≤ 20 MHz: -107.8 ● 20 MHz < IBW ≤ 40 MHz: -105.8

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-675 Capacity and output power of an RRU3930E

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3930E	● UMTS: 4 carriers ● LTE FDD: 2 carriers. ● UL: 2 UMTS carriers + 1 LTE carrier	2x5 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Antenna Specifications

An RRU3930E can use internal or external antennas. The following table lists the electrical specifications of internal antennas.

NOTE

The RRU using internal antennas does not provide ports for connecting external antennas and cannot be reconstructed to use external antennas.

Table 1-676 Electrical specifications of internal antennas

Item	Indicator	Specifications
Internal antenna	Frequency range (MHz)	1710 MHz to 2170 MHz
	Polarization mode	±45°
	Gain (dBi)	11
	Horizontal half-power beamwidth (°)	65±10
	Vertical half-power beamwidth (°)	33±3
	Power capacity of each port (W)	10

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Item	Indicator	Specifications
Equipment VSWR	VSWR	< 2.0
	VSWR threshold	The VSWR varies according to the application environment. To reduce the probability of false alarms, it is recommended to set the VSWR threshold to 3 in normal scenarios or 4.5 in the worst case.

Engineering Specifications

The following tables list the equipment specifications of an RRU3930E.

Table 1-677 Input power of an RRU3930E

Type	Power
RRU3930E	● Maximum operating voltage: 90 V AC to 290 V AC ● Rated operating voltage: 100 V AC to 240 V AC

Table 1-678 Dimensions and weight of an RRU3930E

Type	Dimensions (H x W x D)	Weight (kg)
RRU3930E	● 290 mm x 210 mm x 68 mm (4 L, without antennas) ● 290 mm x 210 mm x 101 mm (6 L, with antennas)	● 5 (without antennas) ● 6 (with antennas)

Table 1-679 Power consumption of an RRU3930E

Type	Frequency Band (MHz)	Power Consumption
RRU3930E	2100	When the output power is 2x5 W, the power consumption of an RRU3930E is as follows: ● Typical power consumption: 70 W ● Maximum power consumption: 90 W

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NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.
- The maximum power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 100%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU3930E.

Table 1-680 Environmental specifications of an RRU3930E

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3930E	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 95% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3930E.

Table 1-681 Compliance standards for an RRU3930E

Item	Standard
RF	● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3930E.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-682 Surge protection specifications of ports on an RRU3930E

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3930E.

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Table 1-683 Specifications of CPRI ports on an RRU3930E

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3930E	2	● Cascaded to BBU: 2.5, 4.9, or 9.8 ● Cascaded to Micro BTS3900: 2.5 or 4.9	● Cascaded to BBU: star, chain, or ring ● Cascaded to Micro BTS3900: chain

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Table 1-684 RRU3930E CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance (km)
RRU3930E	● Cascaded to BBU: – UMTS: 6 levels – LTE FDD: When the CPRI data rate is 2.5 Gbit/s: Cell bandwidth ≤ 5 MHz: 3 levels Cell bandwidth = 10 MHz: 2 levels Cell bandwidth ≥ 15 MHz: cascading not supported When the CPRI data rate is 4.9 Gbit/s: Cell bandwidth ≤ 5 MHz: 6 levels Cell bandwidth = 10 MHz: 4 levels Cell bandwidth ≥ 15 MHz: 3 levels When the CPRI data rate is 9.8 Gbit/s: 6 levels – UL: Single-band or dual-band, two UMTS carriers and one LTE carrier, CPRI data rate at 9.8 Gbit/s, and enhanced CPRI compression used for LTE FDD: 6 levels Dual-band, four UMTS carriers and two LTE carriers, CPRI data rate at 9.8 Gbit/s, and enhanced CPRI compression used for LTE FDD: 3 levels ● Cascaded to Micro BTS3900: 2 levels	● Cascaded to BBU: – UMTS: 40 – LTE FDD/UL: The maximum distance varies depending on the LTE baseband processing unit. When the LBBPd1 or UBBPd3 is configured: 20 When the LBBPd2 or UBBPd4 is configured: 40 When the LBBPd3, UBBPd5, or UBBPd6 is configured: Number of cells ≤ 3: 40 Number of cells ≥ 4: 20 ● Cascaded to Micro BTS3900: 5

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Antenna Capability

The following table lists the antenna capability of an RRU3930E.

Table 1-685 Antenna capability of an RRU3930E

Type	TMA Support	RET Antenna Support
RRU3930E	Not supported	Not supported

1.3.45 RRU3929 Technical Specifications

The RRU3929 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3929 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3929.

Table 1-686 Modes and frequency bands supported by an RRU3929

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3929	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	35
RRU3929	900 PGSM	890 to 915	935 to 960		25
RRU3929	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM	• With GSM: 35 • Without GSM: 40

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

RF Specifications

The following tables list RF specifications of an RRU3929.

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Table 1-687 Receiver sensitivity of an RRU3929

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3929	2T2R	GSM: ● 900 MHz: -113.7 ● 1800 MHz: -114.0 UMTS: ● 900 MHz: -125.8 LTE FDD: ● 900 MHz: -106.3 ● 1800 MHz: -106.6 LTE NB-IoT: -127.3	GSM: ● 900 MHz: -116.5 ● 1800 MHz: -116.8 UMTS: ● 900 MHz: -128.6 LTE FDD: ● 900 MHz: -109.1 ● 1800 MHz: -109.4 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-688 Capacity and output power of an RRU3929

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3929 (900 MHz)	GSM: 8 carriers UMTS: ● 6 carriers without MIMO ● 4 carriers with MIMO LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU3929 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x60W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3929.

Table 1-689 Input power of an RRU3929

Type	Power
RRU3929	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-690 Dimensions and weight of an RRU3929

Type	Dimensions (H x W x D)	Weight (kg)
RRU3929	● 485 mm x 380 mm x 170 mm (with the housing) ● 485 mm x 356 mm x 140 mm (without the housing)	● 25 (with the housing) ● 23.5 (without the housing)

Table 1-691 Power consumption of the entire base station (configured with an RRU3929)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3929** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

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The following table lists the environmental specifications of an RRU3929.

Table 1-692 Environmental specifications of an RRU3929

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3929	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3929.

Table 1-693 Compliance standards for an RRU3929

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3929.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-694 Surge protection specifications of ports on an RRU3929

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3929.

Table 1-695 Specifications of CPRI ports on an RRU3929

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3929	2	1.25, 2.5, or 4.9	Star, chain, or dual-star

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Table 1-696 RRU3929 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3929	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3929.

Table 1-697 Antenna capability of an RRU3929

Type	TMA Support	RET Antenna Support
RRU3929	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.46 RRU3928 Technical Specifications

The RRU3928 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3928 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3928.

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Table 1-698 Modes and frequency bands supported by an RRU3928

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3928	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, GUL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM, GULM	35
RRU3928	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL	● With GSM: 35 ● Without GSM: 40

RF Specifications

The following tables list RF specifications of an RRU3928.

Table 1-699 Receiver sensitivity of an RRU3928

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3928	2T2R	GSM: ● 900 EGSM: -113.7 ● 1800 MHz: -114.0 UMTS: ● 900 EGSM: -125.8 LTE FDD: ● 900 EGSM: -106.3 ● 1800 MHz: -106.6 LTE NB-IoT: -127.3	GSM: ● 900 EGSM: -116.5 ● 1800 MHz: -116.8 UMTS: ● 900 EGSM: -128.6 LTE FDD: ● 900 EGSM: -109.1 ● 1800 MHz: -109.4 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-700 Capacity and output power of an RRU3928

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3928 (900 EGSM)	GSM: 8 carriers UMTS: 4 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3928 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3928.

Table 1-701 Input power of an RRU3928

Type	Power
RRU3928	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-702 Dimensions and weight of an RRU3928

Type	Dimensions (H x W x D)	Weight (kg)
RRU3928	● 400 mm x 240 mm x 160 mm (with the housing) ● 400 mm x 220 mm x 140 mm (without the housing)	● 15 (with the housing) ● 13.5 (without the housing)

Table 1-703 Power consumption of the entire base station (configured with an RRU3928)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3928** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3928.

Table 1-704 Environmental specifications of an RRU3928

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3928	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3928.

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Table 1-705 Compliance standards for an RRU3928

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3928.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-706 Surge protection specifications of ports on an RRU3928

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3928.

Table 1-707 Specifications of CPRI ports on an RRU3928

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3928	2	1.25, 2.5, or 4.9	Star, chain, or dual-star

Table 1-708 RRU3928 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3928	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3928.

Table 1-709 Antenna capability of an RRU3928

Type	TMA Support	RET Antenna Support
RRU3928	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.47 RRU3926 Technical Specifications

The RRU3926 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3926 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3926.

Table 1-710 Modes and frequency bands supported by an RRU3926

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3926	900 EGSM	880 to 915	925 to 960	GSM, UMTS, LTE FDD, GU, GL, UL, LTE NB-IoT, GM, UM, LM, GUM, GLM, ULM	35
RRU3926	900 PGSM	890 to 915	935 to 960		25
RRU3926	1800	1710 to 1785	1805 to 1880	GSM, LTE FDD, GL, LM, GLM	• With GSM: 35 • Without GSM: 40

NOTE

In the following sections, 900 EGSM and 900 PGSM are also referred to as 900 MHz.

RF Specifications

The following tables list RF specifications of an RRU3926.

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Table 1-711 Receiver sensitivity of an RRU3926

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3926	1T2R	GSM: ● 900 EGSM: -113.7 ● 900 PGSM: -113.7 ● 1800 MHz: -114.0 UMTS: -125.8 LTE FDD: ● 900 EGSM: -106.3 ● 900 PGSM: -106.3 ● 1800 MHz: -106.6 LTE NB-IoT: -127.3	GSM: ● 900 EGSM: -116.5 ● 900 PGSM: -116.5 ● 1800 MHz: -116.8 UMTS: -128.6 LTE FDD: ● 900 EGSM: -109.1 ● 900 PGSM: -109.1 ● 1800 MHz: -109.4 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-712 Capacity and output power of an RRU3926

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3926 (900 MHz)	GSM: 8 carriers UMTS: 6 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	1x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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Type	Capacity	Maximum Output Power	Typical Output Power
RRU3926 (1800 MHz)	GSM: 8 carriers LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	1x80W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3926.

Table 1-713 Input power of an RRU3926

Type	Power
RRU3926	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-714 Dimensions and weight of an RRU3926

Type	Dimensions (H x W x D)	Weight (kg)
RRU3926	● 400 mm x 240 mm x 160 mm (with the housing) ● 400 mm x 220 mm x 140 mm (without the housing)	● 15 (with the housing) ● 13.5 (without the housing)

Table 1-715 Power consumption of the entire base station (configured with an RRU3926)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3926** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

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NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3926.

Table 1-716 Environmental specifications of an RRU3926

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3926	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3926.

Table 1-717 Compliance standards for an RRU3926

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3926.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-718 Surge protection specifications of ports on an RRU3926

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3926.

Table 1-719 Specifications of CPRI ports on an RRU3926

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3926	2	1.25 or 2.5	Star, chain, ring, or dual-star

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NOTE

When the number of RRU cascading levels is greater than 6, the data rate of configured optical modules must be not lower than 2.5 Gbit/s.

Table 1-720 RRU3926 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3926	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3926.

Table 1-721 Antenna capability of an RRU3926

Type	TMA Support	RET Antenna Support
RRU3926	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.48 RRU3908 V2 Technical Specifications

The RRU3908 V2 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3908 V2 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3908 V2.

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Table 1-722 Modes and frequency bands supported by an RRU3908 V2

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3908 DC V2	850	824 to 849	869 to 894	GSM, UMTS, GU	● With GSM: 20 ● Without GSM: 25
RRU3908 DC V2	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, LTE NB-IoT, GM, UM, LM	● With GSM: 20 ● Without GSM: 25
RRU3908 DC V2	900 EGSM	880 to 915	925 to 960		
RRU3908 AC V2	900 PGSM	890 to 915	935 to 960	GSM, UMTS, LTE FDD, GU, GL, LTE NB-IoT, GM, UM, LM	● With GSM: 20 ● Without GSM: 25

NOTE

The RRU3908 DC V2/RRU3908 AC V2 provides only hardware support for LTE when working in the 900 PGSM/900 EGSM frequency band, and therefore cannot be directly used. Contact a Huawei engineer before using this configuration.

RF Specifications

The following tables list RF specifications of an RRU3908 V2.

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Table 1-723 Receiver sensitivity of an RRU3908 V2

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3908 DC V2	2T2R	GSM: ● 850 MHz: -113.5 ● 900 PGSM: -113.5 ● 900 EGSM: -113.3 UMTS: ● 850 MHz: -125.5 ● 900 PGSM: -125.5 ● 900 EGSM: -125.3 LTE FDD: ● 900 PGSM: -106.3 ● 900 EGSM: -106.1 LTE NB-IoT: -127.3	GSM: ● 850 MHz: -116.3 ● 900 PGSM: -116.3 ● 900 EGSM: -116.1 UMTS: ● 850 MHz: -128.3 ● 900 PGSM: -128.3 ● 900 EGSM: -128.1 LTE FDD: ● 900 PGSM: -109.1 ● 900 EGSM: -108.9 LTE NB-IoT: -130.1
RRU3908 AC V2	2T2R	GSM: -113.5 UMTS: -125.5 LTE FDD: -106.3 LTE NB-IoT: -127.3	GSM: -116.3 UMTS: -128.3 LTE FDD: -109.1 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-724 Capacity and output power of an RRU3908 V2

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3908 DC V2	GSM: 8 TRXs UMTS: ● 850 MHz: 2 carriers ● 900 PGSM: 4 carriers ● 900 EGSM: 4 carriers LTE FDD: 1 carrier. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3908 AC V2	GSM: 8 TRXs UMTS: 4 carriers LTE FDD: 1 carrier. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3908 V2.

Table 1-725 Input power of an RRU3908 V2

Type	Power
RRU3908 DC V2	-48 V DC; voltage range: -36 V DC to -57 V DC
RRU3908 AC V2	● 220 V AC single-phase; voltage range: 176 V AC to 290 V AC ● 110 V AC dual-live-wire; voltage range: 90/180 V AC to 135/270 V AC

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Table 1-726 Dimensions and weight of an RRU3908 V2

Type	Dimensions (H x W x D)	Weight (kg)
RRU3908 DC V2	485 mm x 380 mm x 170 mm (with the housing)	23 (with the housing)
RRU3908 AC V2	485 mm x 380 mm x 250 mm (with the housing)	29 (with the housing)

Table 1-727 Power consumption of the entire base station (configured with an RRU3908 V2)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3908 V2** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3908 V2.

Table 1-728 Environmental specifications of an RRU3908 V2

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3908 DC V2	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa
RRU3908 AC V2	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3908 V2.

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Table 1-729 Compliance standards for an RRU3908 V2

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141 ● ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3908 V2.

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NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-730 Surge protection specifications of ports on an RRU3908 V2

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	40 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3908 V2.

Table 1-731 Specifications of CPRI ports on an RRU3908 V2

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3908 DC V2	2	1.25 or 2.5	Star, chain, or dual-star
RRU3908 AC V2	2	1.25 or 2.5	Star, chain, or dual-star

Table 1-732 RRU3908 V2 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3908 AC V2/RRU3908 DC V2	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

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Antenna Capability

The following table lists the antenna capability of an RRU3908 V2.

Table 1-733 Antenna capability of an RRU3908 V2

Type	TMA Support	RET Antenna Support
RRU3908 DC V2	Supported	AISG2.0 and AISG1.1
RRU3908 AC V2	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.49 RRU3908 V1 Technical Specifications

The RRU3908 V1 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3908 V1 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3908 V1

Table 1-734 Modes and frequency bands supported by an RRU3908 V1

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3908 AC V1/ RRU3908 DC V1	850	824 to 849	869 to 894	GSM, UMTS	12.5
RRU3908 AC V1/ RRU3908 DC V1	900 PGSM	890 to 915	935 to 960	GSM, UMTS, GU	12.5
RRU3908 AC V1/ RRU3908 DC V1	900 EGSM	880 to 905	925 to 950		
RRU3908 AC V1/ RRU3908 DC V1	1800	1710 to 1755	1805 to 1850	GSM, LTE FDD, GL	● With GSM: 15 ● Without GSM: 20

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Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3908 AC V1/ RRU3908 DC V1	1800	1740 to 1785	1835 to 1880		
RRU3908 AC V1/ RRU3908 DC V1	1900	1850 to 1890	1930 to 1970	GSM, UMTS	12.5
RRU3908 AC V1/ RRU3908 DC V1	1900	1870 to 1910	1950 to 1990		

RF Specifications

The following tables list RF specifications of an RRU3908 V1.

Table 1-735 Receiver sensitivity of an RRU3908 V1

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3908 AC V1/RRU3908 DC V1	2T2R	GSM: -113.0 UMTS: -125.5 LTE FDD: -106.3	GSM: -115.8 UMTS: -128.3 LTE FDD: -109.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The GSM receiver sensitivity, as recommended in 3GPP TS 51.021, is measured at the antenna connector assuming that the channel rate is 13 kbit/s and the bit error rate (BER) is lower than or equal to 2%.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-736 Capacity and output power of an RRU3908 V1

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3908 AC V1/RRU3908 DC V1	GSM: 6 carriers UMTS: 4 carriers LTE FDD: 1 carrier. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3908 V1.

Table 1-737 Input power of an RRU3908 V1

Type	Power
RRU3908 DC V1	-48 V DC; voltage range: -36 V DC to -57 V DC
RRU3908 AC V1	● 220 V AC single-phase; voltage range: 176 V AC to 290 V AC ● 110 V AC dual-live-wire; voltage range: 90/180 V AC to 135/270 V AC

Table 1-738 Dimensions and weight of an RRU3908 V1

Type	Dimensions (H x W x D)	Weight (kg)
RRU3908 DC V1	485 mm x 380 mm x 170 mm (with the housing)	23 (with the housing)
RRU3908 AC V1	485 mm x 380 mm x 250 mm (with the housing)	29 (with the housing)

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Table 1-739 Power consumption of the entire base station (configured with an RRU3908 V1)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3908 V1** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3908 V1.

Table 1-740 Environmental specifications of an RRU3908 V1

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3908 AC V1/RRU3908 DC V1	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3908 V1.

Table 1-741 Compliance standards for an RRU3908 V1

Item	Standard
RF	● 3GPP TS 45.005 ● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141 ● ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3908 V1.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-742 Surge protection specifications of ports on an RRU3908 V1

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	40 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3908 V1.

Table 1-743 Specifications of CPRI ports on an RRU3908 V1

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3908 AC V1/RRU3908 DC V1	2	● 850 MHz: 1.25 ● 900 EGSM: 1.25 ● 900 PGSM: 1.25 ● 1900 MHz: 1.25 ● 1800 MHz: 1.25 or 2.5	Star, chain, or dual-star

Table 1-744 RRU3908 V1 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3908 AC V1/RRU3908 DC V1	GU CPRI MUX: 6 levels Multimode (excluding GU) CPRI MUX: 4 levels	GU: 40 Multimode (GL, UL, or GUL): ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3908 V1.

Table 1-745 Antenna capability of an RRU3908 V1

Type	TMA Support	RET Antenna Support
RRU3908 AC V1/RRU3908 DC V1	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

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1.3.50 RRU3853 Technical Specifications

The RRU3853, which is a remote radio unit, supports a maximum of six carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3853.

Table 1-746 Modes and frequency bands supported by an RRU3853

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3853	2100	1920 to 1980	2110 to 2170	UMTS	60

RF Specifications

The following tables list RF specifications of an RRU3853.

Table 1-747 Receiver sensitivity of an RRU3853

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3853	2T4R	-125.8	-128.6	-131.3

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.

Table 1-748 Capacity and output power of an RRU3853

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3853	• 4 carriers with MIMO • 4 carriers without MIMO	2x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3853.

Table 1-749 Input power of an RRU3853

Type	Power
RRU3853	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3853 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

Table 1-750 Dimensions and weight of an RRU3853

Type	Dimensions (H x W x D)	Weight (kg)
RRU3853	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)

Table 1-751 Power consumption of the entire base station (configured with an RRU3853)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3853** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3853.

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Table 1-752 Environmental specifications of an RRU3853

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3853	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of some RRUs may temporarily decrease when they work in the highest 10°C temperature range.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3853.

Table 1-753 Compliance standards for an RRU3853

Item	Standard
RF	3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3853.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-754 Surge protection specifications of ports on an RRU3853

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3853.

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Table 1-755 Specifications of CPRI ports on an RRU3853

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology	Cascading Level	Maximum Distance from the BBU (km)
RRU3853	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or dual-star	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s, 4.9 Gbit/s, or 9.8 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3853.

Table 1-756 Antenna capability of an RRU3853

Type	TMA Support	RET Antenna Support
RRU3853	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.51 RRU3841 Technical Specifications

An RRU3841 is a remote radio unit for LTE.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3841.

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Table 1-757 Modes and frequency bands supported by an RRU3841

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3841	AWS (Band 4)	1710 to 1755	2110 to 2155	LTE FDD, LM	40

RF Specifications

The following tables list RF specifications of an RRU3841.

Table 1-758 Receiver sensitivity of an RRU3841

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3841	4T4R	LTE FDD: -106.3 LTE NB-IoT: -127.3	LTE FDD: -109.1 LTE NB-IoT: -130.1	LTE FDD: -111.8 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-759 Capacity and output power of an RRU3841

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3841	LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier	4x30 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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Table 1-760 RF port combination of an RRU3841 (LTE, AWS)

TX/RX Channel	RF Port Combination	Maximum Output Power (W)
1T2R	Port A or C works as the TX port. Ports A and C work as the RX ports. Port B or D works as the TX port. Ports B and D work as the RX ports.	1x60 when port A or B works as the TX port 1x30 when port C or D works as the TX port
2T2R	Ports A and B work as both the TX and RX ports.	2x60
	Ports A and C work as both the TX and RX ports. Ports B and D work as both the TX and RX ports.	2x30
2T2R+2T2R (two sectors)	Ports A and C work as both the TX and RX ports. Ports B and D work as both the TX and RX ports.	2x30+2x30
2T4R	Ports A and B work as the TX ports. Ports A, B, C, and D work as the RX ports.	2x60
4T4R	Ports A, B, C, and D work as both the TX and RX ports.	4x30

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3841.

Table 1-761 Input power of an RRU3841

Type	Power
RRU3841	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-762 Dimensions and weight of an RRU3841

Type	Dimensions (H x W x D)	Weight (kg)
RRU3841	● 480 mm x 356 mm x 140 mm (24 L, without the housing) ● 485 mm x 380 mm x 170 mm (31 L, with the housing)	● ≤ 24.5 (without the housing) ● ≤ 26 (with the housing)

Table 1-763 Power consumption of the entire base station (configured with an RRU3841)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3841** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3841.

Table 1-764 Environmental specifications of an RRU3841

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3841	Configured with 4T4R channels: ● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C Not configured with 4T4R channels: ● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

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NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3841.

Table 1-765 Compliance standards for an RRU3841

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3841.

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NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-766 Surge protection specifications of ports on an RRU3841

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3841.

Table 1-767 Specifications of CPRI ports on an RRU3841

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3841	2	1.25, 2.5, or 4.9	Star, chain, or ring

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Table 1-768 RRU3841 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3841	LTE FDD ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s: – Cell bandwidth ≤ 5 MHz: 2 levels – Cell bandwidth ≥ 10 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s: – Cell bandwidth ≤ 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended Multimode (excluding GU) CPRI MUX: 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3841.

Table 1-769 Antenna capability of an RRU3841

Type	TMA Support	RET Antenna Support
RRU3841	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.52 RRU3839 Technical Specifications

The RRU3839 is a type of remote radio unit. An RRU3839 supports a maximum of six carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3839.

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Table 1-770 Modes and frequency bands supported by an RRU3839

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3839	2100	1920 to 1980	2110 to 2170	UMTS	60

RF Specifications

The following tables list RF specifications of an RRU3839.

Table 1-771 Receiver sensitivity of an RRU3839

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3839	2T2R	-126.1	-128.9	-131.6

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.

Table 1-772 Capacity and output power of an RRU3839

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3839	- 4 carriers with MIMO - 6 carriers without MIMO	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

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Table 1-773 Carrier combinations supported by RRU3839 in hybrid configurations

Number of MIMO Carriers	Number of Single-Output Carriers
1	5
2	4
3	2

Engineering Specifications

The following tables list the equipment specifications of an RRU3839.

Table 1-774 Input power of an RRU3839

Type	Power
RRU3839	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3839 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

Table 1-775 Dimensions and weight of an RRU3839

Type	Dimensions (H x W x D)	Weight (kg)
RRU3839	400 mm x 300 mm x 100 mm (12 L, without the housing)	14 (without the housing)

Table 1-776 Power consumption of the entire base station (configured with an RRU3839)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3839** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3839.

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Table 1-777 Environmental specifications of an RRU3839

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3839	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3839.

Table 1-778 Compliance standards for an RRU3839

Item	Standard
RF	3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3839.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-779 Surge protection specifications of ports on an RRU3839

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3839.

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Table 1-780 Specifications of CPRI ports on an RRU3839

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology	Cascading Level	Maximum Distance from the BBU (km)
RRU3839	2	1.25, 2.5, or 4.9	Star, chain, or ring	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s or 4.9 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3839.

Table 1-781 Antenna capability of an RRU3839

Type	TMA Support	RET Antenna Support
RRU3839	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.53 RRU3838 Technical Specifications

The RRU3838 is a remote radio unit. An RRU3838 supports a maximum of six carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3838.

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Table 1-782 Modes and frequency bands supported by an RRU3838

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3838	2100	1920 to 1980	2110 to 2170	UMTS	60

RF Specifications

The following tables list RF specifications of an RRU3838.

Table 1-783 Receiver sensitivity of an RRU3838

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3838	2T2R	-126.1	-128.9	-131.6

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.

Table 1-784 Capacity and output power of an RRU3838

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3838	● 4 carriers with MIMO ● 6 carriers without MIMO	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

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Table 1-785 Carrier combinations supported by RRU3838 in hybrid configurations

Number of MIMO Carriers	Number of Single-Output Carriers
1	5
2	4
3	2

Engineering Specifications

The following tables list the equipment specifications of an RRU3838.

NOTE

The RRU3838 has no housing by default.

Table 1-786 Input power of an RRU3838

Type	Power
RRU3838	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3838 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

Table 1-787 Dimensions and weight of an RRU3838

Type	Dimensions (H x W x D)	Weight (kg)
RRU3838	400 mm x 300 mm x 100 mm (12 L, without the housing)	14 (without the housing)

Table 1-788 Power consumption of the entire base station (configured with an RRU3838)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3838** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3838.

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Table 1-789 Environmental specifications of an RRU3838

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3838	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3838.

Table 1-790 Compliance standards for an RRU3838

Item	Standard
RF	3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3838.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-791 Surge protection specifications of ports on an RRU3838

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following table lists the specifications of CPRI ports on an RRU3838.

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Table 1-792 Specifications of CPRI ports on an RRU3838

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology	Cascading Level	Maximum Distance from the BBU (km)
RRU3838	2	1.25 or 2.5	Star, chain, or ring	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3838.

Table 1-793 Antenna capability of an RRU3838

Type	TMA Support	RET Antenna Support
RRU3838	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.54 RRU3832 Technical Specifications

The RRU3832 is a multimode remote radio unit. An RRU3832 supports a maximum of 6 carriers when working in UMTS. It supports a maximum of 2 carriers when working in the AWS band and 3 carriers when working in the AWS-3 band of LTE FDD.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3832.

Table 1-794 Modes and frequency bands supported by an RRU3832

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3832	2100	1920 to 1980	2110 to 2170	UMTS	60
RRU3832	AWS	1710 to 1755	2110 to 2155	UMTS, LTE FDD, UL	45
RRU3832	AWS-3	1710 to 1780	2110 to 2180	UMTS, LTE FDD, UL	70

RF Specifications

The following tables list RF specifications of an RRU3832.

Table 1-795 Receiver sensitivity of an RRU3832

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3832	2T4R	UMTS: ● 2100 MHz/AWS: -126.1 ● AWS-3: -125.9 LTE FDD: ● 2100 MHz/AWS: -106.5 ● AWS-3: -106.7	UMTS: ● 2100 MHz/ AWS: -128.9 ● AWS-3: -128.7 LTE FDD: ● 2100 MHz/ AWS: -109.3 ● AWS-3: -109.5	UMTS: ● 2100 MHz/ AWS: -131.6 ● AWS-3: -131.4 LTE FDD: ● 2100 MHz/ AWS: -112.0 ● AWS-3: -112.2

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity, as recommended in 3GPP TS 25.104, is measured at the antenna connector assuming that the channel rate is 12.2 kbit/s and the BER is lower than or equal to 0.001.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-796 Capacity and output power of an RRU3832

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3832	UMTS: ● 4 carriers with MIMO ● 6 carriers without MIMO LTE FDD: ● AWS: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. ● AWS-3: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3832.

Table 1-797 Input power of an RRU3832

Type	Power
RRU3832	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3832 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

Table 1-798 Dimensions and weight of an RRU3832

Type	Dimensions (H x W x D)	Weight (kg)
RRU3832	400 mm x 300 mm x 100 mm (12 L, without the housing)	15 (without the housing)

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NOTE

The RRU3832 has no housing by default.

Table 1-799 Power consumption of the entire base station (configured with an RRU3832)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3832** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3832.

Table 1-800 Environmental specifications of an RRU3832

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3832	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3832.

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Table 1-801 Compliance standards for an RRU3832

Item	Standard
RF	● 3GPP TS 25.141 ● 3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3832.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-802 Surge protection specifications of ports on an RRU3832

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3832.

Table 1-803 Specifications of CPRI ports on an RRU3832

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3832	2	● 2100 MHz/AWS: 1.25, 2.5, or 4.9 ● AWS-3: 2.5, 4.9, or 9.8	Star, chain, ring, or dual-star

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Table 1-804 RRU3832 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3832	UMTS: ● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s or 4.9 Gbit/s: 8 levels LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 2 levels – Cell bandwidth ≥ 10 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended UL CPRI MUX: 4	UMTS: 40 LTE FDD/UL: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3832.

Table 1-805 Antenna capability of an RRU3832

Type	TMA Support	RET Antenna Support
RRU3832	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.55 RRU3829 Technical Specifications

The RRU3829 is a type of remote radio unit. An RRU3829 working in UMTS mode supports a maximum of six carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3829.

Table 1-806 Modes and frequency bands supported by an RRU3829

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3829	2100	1920 to 1980	2110 to 2170	UMTS	● RRU3829: 40 ● RRU3829 (Optimized version): 60

RF Specifications

The following tables list RF specifications of an RRU3829.

Table 1-807 Receiver sensitivity of an RRU3829

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3829	2T2R	-126.1	-128.9	-131.6

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.

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Table 1-808 RF specifications of an RRU3829

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3829	● 4 carriers with MIMO ● 6 carriers without MIMO	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Table 1-809 Carrier combinations supported by RRU3829 in hybrid configurations

Number of MIMO Carriers	Number of Single-Output Carriers
1	5
2	4
3	2

Engineering Specifications

The following tables list the equipment specifications of an RRU3829.

Table 1-810 Input power of an RRU3829

Type	Power
RRU3829	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3829 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

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Table 1-811 Dimensions and weight of an RRU3829

Type	Dimensions (H x W x D)	Weight (kg)
RRU3829	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 300 mm x 170 mm (24.7 L, with the housing)	● 20 (without the housing) ● 22 (with the housing)

Table 1-812 Power consumption of the entire base station (configured with an RRU3829)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3829** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3829.

Table 1-813 Environmental specifications of an RRU3829

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3829	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3829.

Table 1-814 Compliance standards for an RRU3829

Item	Standard
RF	● 3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3829.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-815 Surge protection specifications of ports on an RRU3829

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3829.

Table 1-816 Specifications of CPRI ports on an RRU3829

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology	Cascading Level	Maximum Distance from the BBU (km)
RRU3829	2	1.25 or 2.5	Star, chain, or ring	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3829.

Table 1-817 Antenna capability of an RRU3829

Type	TMA Support	RET Antenna Support
RRU3829	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.56 RRU3828 Technical Specifications

The RRU3828 is a type of remote radio unit. An RRU3828 working in UMTS mode supports a maximum of six carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3828.

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Table 1-818 Modes and frequency bands supported by an RRU3828

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3828	2100	1920 to 1980	2110 to 2170	UMTS	● RRU3828: 40 ● RRU3828 (Optimized version): 60

RF Specifications

The following tables list RF specifications of an RRU3828.

Table 1-819 Receiver sensitivity of an RRU3828

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3828	2T2R	-126.1	-128.9	-131.6

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.

Table 1-820 Capacity and output power of an RRU3828

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3828	● 4 carriers with MIMO ● 6 carriers without MIMO	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Table 1-821 Carrier combinations supported by RRU3828 in hybrid configurations

Number of MIMO Carriers	Number of Single-Output Carriers
1	5
2	4
3	2

Engineering Specifications

The following tables list the equipment specifications of an RRU3828.

Table 1-822 Input power of an RRU3828

Type	Power
RRU3828	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3828 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

Table 1-823 Dimensions and weight of an RRU3828

Type	Dimensions (H x W x D)	Weight (kg)
RRU3828	● 400 mm x 220 mm x 140 mm (12.32 L, without the housing) ● 400 mm x 240 mm x 160 mm (15 L, with the housing)	● 14 (without the housing) ● 15 (with the housing)

Table 1-824 Power consumption of the entire base station (configured with an RRU3828)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3828** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

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The following table lists the environmental specifications of an RRU3828.

Table 1-825 Environmental specifications of an RRU3828

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3828	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3828.

Table 1-826 Compliance standards for an RRU3828

Item	Standard
RF	● 3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3828.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-827 Surge protection specifications of ports on an RRU3828

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3828.

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Table 1-828 Specifications of CPRI ports on an RRU3828

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology	Cascading Level	Maximum Distance from the BBU (km)
RRU3828	2	1.25 or 2.5	Star, chain, or ring	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3828.

Table 1-829 Antenna capability of an RRU3828

Type	TMA Support	RET Antenna Support
RRU3828	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.57 RRU3826 Technical Specifications

The RRU3826 is a type of remote radio unit. An RRU3826 working in UMTS mode supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3826.

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Table 1-830 Modes and frequency bands supported by an RRU3826

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3826	2100	1920 to 1980	2110 to 2170	UMTS	● RRU3826: 30 ● RRU3826 (Optimized version): 40

RF Specifications

The following tables list RF specifications of an RRU3826.

Table 1-831 Receiver sensitivity of an RRU3826

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3826	1T2R	-125.8	-128.6	-131.3

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.

Table 1-832 Capacity and output power of an RRU3826

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3826	4 carriers	1x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3826.

Table 1-833 Input power of an RRU3826

Type	Power
RRU3826	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3826 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

Table 1-834 Dimensions and weight of an RRU3826

Type	Dimensions (H x W x D)	Weight (kg)
RRU3826	400 mm x 300 mm x 100 mm (12 L, without the housing)	14 (without the housing)

NOTE

The RRU3826 has no housing by default.

Table 1-835 Power consumption of the entire base station (configured with an RRU3826)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3826** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3826.

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Table 1-836 Environmental specifications of an RRU3826

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3826	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3826.

Table 1-837 Compliance standards for an RRU3826

Item	Standard
RF	● 3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3826.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-838 Surge protection specifications of ports on an RRU3826

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3826.

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Table 1-839 Specifications of CPRI ports on an RRU3826

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3826	2	RRU3826 modules of different BOM codes support different CPRI data rates: ● RRU3826 modules of 02310UPA, 02310YMC, 02311EFE, 02311NLY, 02310YSU, 02311AWW, 02311AHM, 02311ASY, 02311AWH, and 02311JAQ support 1.25 Gbit/s, 2.5 Gbit/s and 4.9 Gbit/s. ● RRU3826 modules of other BOM codes support 1.25 Gbit/s and 2.5 Gbit/s.	Star, chain, or ring

Table 1-840 RRU3826 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3826	UMTS: ● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s or 4.9 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3826.

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Table 1-841 Antenna capability of an RRU3826

Type	TMA Support	RET Antenna Support
RRU3826	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.58 RRU3824 Technical Specifications

The RRU3824 is a type of remote radio unit. An RRU3824 working in UMTS mode supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3824.

Table 1-842 Modes and frequency bands supported by an RRU3824

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3824	2100	1920 to 1980	2110 to 2170	UMTS	● RRU3824: 30 ● RRU3824 (Optimized version): 40

RF Specifications

The following tables list RF specifications of an RRU3824.

Table 1-843 Receiver sensitivity of an RRU3824

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3824	1T2R	-125.8	-128.6	-131.3

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.

Table 1-844 Capacity and output power of an RRU3824

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3824	4 carriers	1x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3824.

Table 1-845 Input power of an RRU3824

Type	Power
RRU3824	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3824 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

Table 1-846 Dimensions and weight of an RRU3824

Type	Dimensions (H x W x D)	Weight (kg)
RRU3824	400 mm x 300 mm x 100 mm (12 L, without the housing)	14 (without the housing)

NOTE

The RRU3824 has no housing by default.

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Table 1-847 Power consumption of the entire base station (configured with an RRU3824)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3824** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3824.

Table 1-848 Environmental specifications of an RRU3824

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3824	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3824.

Table 1-849 Compliance standards for an RRU3824

Item	Standard
RF	● 3GPP TS 25.141

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Item	Standard
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3824.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-850 Surge protection specifications of ports on an RRU3824

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3824.

Table 1-851 Specifications of CPRI ports on an RRU3824

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3824	2	RRU3824 modules of different BOM codes support different CPRI data rates: ● RRU3824 modules of 02310UNY, 02310YMA, 02311NLX and 02310YST support 1.25 Gbit/s, 2.5 Gbit/s and 4.9 Gbit/s. ● RRU3824 modules of other BOM codes support 1.25 Gbit/s and 2.5 Gbit/s.	Star, chain, or ring

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Table 1-852 RRU3824 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3824	UMTS: ● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s or 4.9 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3824.

Table 1-853 Antenna capability of an RRU3824

Type	TMA Support	RET Antenna Support
RRU3824	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.59 RRU3821E Technical Specifications

The RRU3821E is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3821E.

Table 1-854 Modes and frequency bands supported by an RRU3821E

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode
RRU3821E	1800	1744.9 to 1764.9	1839.9 to 1859.9	LTE FDD

RF Specifications

The following tables list RF specifications of an RRU3821E.

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Table 1-855 Receiver sensitivity of an RRU3821E

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3821E	2T2R	LTE FDD: -100.0	LTE FDD: -102.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-856 Capacity and output power of an RRU3821E

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3821E	LTE FDD: 1 carrier. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x5 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3821E.

Table 1-857 Input power of an RRU3821E

Type	Power
RRU3821E	● -48 V DC; voltage range: -36 V DC to -57 V DC ● 100 V AC to 240 V AC; voltage range: 100 V AC to 240 V AC

Table 1-858 Dimensions and weight of an RRU3821E

Type	Dimensions (H x W x D)	Weight (kg)
RRU3821E	300 mm x 240 mm x 110 mm (with the housing)	10 (with the housing)

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Table 1-859 Power consumption of an RRU3821E

Type	Frequency Band (MHz)	Power Consumption (W)
RRU3821E	1800	● When the output power is 2x1 W: 75 (DC); 80 (AC) ● When the output power is 2x5 W: 120 (AC)

The following table lists the environmental specifications of an RRU3821E.

Table 1-860 Environmental specifications of an RRU3821E

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3821E	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3821E.

Table 1-861 Compliance standards for an RRU3821E

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.

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Item	Standard
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	● IP65 (outdoor) ● IP30 (indoor)
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3821E.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-862 Surge protection specifications of ports on an RRU3821E

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3821E.

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Table 1-863 Specifications of CPRI ports on an RRU3821E

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3821E	2	1.25, 2.5, or 4.9	Star, chain, or ring

Table 1-864 RRU3821E CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3821E	LTE FDD (When the CPRI data rate is 4.9 Gbit/s): ● Uncompressed CPRI – 2T2R: cell bandwidth ≤ 10 MHz, 4 levels; cell bandwidth ≥ 15 MHz, 2 levels – 1T2R: cell bandwidth ≥ 10 MHz, 4 levels ● Compressed CPRI – 2T2R: cell bandwidth ≥ 15 MHz, 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 **NOTE** The RRU3821E supports a maximum distance of 20 km from the BBU in signal combination scenarios.

Antenna Capability

The following table lists the antenna capability of an RRU3821E.

Table 1-865 Antenna capability of an RRU3821E

Type	TMA Support	RET Antenna Support
RRU3821E	Not supported	Not supported

1.3.60 RRU3808 Technical Specifications

The RRU3808 is a type of remote radio unit. An RRU3808 working in UMTS mode supports a maximum of four carriers. If it works in LTE FDD mode, it supports a maximum of two carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3808.

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Table 1-866 Modes and frequency bands supported by an RRU3808

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3808	2100	1920 to 1980	2110 to 2170	UMTS	30 (per channel)
RRU3808	AWS	1710 to 1755	2110 to 2155	UMTS, LTE FDD, UL	UMTS/UL: 30 (per channel) LTE FDD: 20 (per channel)

RF Specifications

The following tables list RF specifications of an RRU3808.

Table 1-867 Receiver sensitivity of an RRU3808

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3808	2T2R	UMTS: -125.8 LTE FDD: -106.5	UMTS: -128.6 LTE FDD: -109.3	UMTS: -131.3 LTE FDD: -112.0

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-868 Capacity and output power of an RRU3808

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3808	UMTS: 4 carriers LTE FDD: 2 carriers. When one carrier is configured, the bandwidth per carrier is 5, 10, 15, or 20 MHz. When two carriers are configured, the bandwidth per carrier is 5 or 10 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- UMTS: supports configurations of single-output, MIMO, or the combination of the two, and uneven power configurations. For configurations in hybrid configuration scenarios, see **Carrier combinations supported by RRU3808 in hybrid configurations**. In these scenarios, one RRU3808 supports a maximum of four carriers. Each TX channel supports a maximum of four carriers and the maximum output power of each TX channel is 40 W.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Table 1-869 Carrier combinations supported by RRU3808 (UMTS) in hybrid configurations

Number of MIMO Carriers	Number of Single-Output Carriers
1	3
2	3
3	1

Engineering Specifications

The following tables list the equipment specifications of an RRU3808.

Table 1-870 Input power of an RRU3808

Type	Power
RRU3808	-48 V DC; voltage range: -36 V DC to -57 V DC **NOTE** The RRU3808 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see *AC/DC Power Module User Guide* and *OPM15M User Guide*.

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Table 1-871 Dimensions and weight of an RRU3808

Type	Dimensions (H x W x D)	Weight (kg)
RRU3808	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 285 mm x 170 mm (23.5 L, with the housing)	● 17 (without the housing) ● 19 (with the housing)

Table 1-872 Power consumption of the entire base station (configured with an RRU3808)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3808** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3808.

Table 1-873 Environmental specifications of an RRU3808

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3808	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3808.

Table 1-874 Compliance standards for an RRU3808

Item	Standard
RF	● 3GPP TS 25.141 ● 3GPP TS 36.141 ● 3GPP TS 37.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3808.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-875 Surge protection specifications of ports on an RRU3808

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3808.

Table 1-876 Specifications of CPRI ports on an RRU3808

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3808	2	1.25 or 2.5	Star, chain, ring, or dual-star

Table 1-877 RRU3808 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3808	UMTS: ● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s: 8 levels LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended UL: ● CPRI MUX: 4	UMTS: 40 LTE FDD/UL: The maximum distance from a BBU varies with the types of LTE baseband processing units configured: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3808.

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Table 1-878 Antenna capability of an RRU3808

Type	TMA Support	RET Antenna Support
RRU3808	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.61 RRU3806 Technical Specifications

The RRU3806 is a type of remote radio unit. An RRU3806 working in UMTS mode supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3806.

Table 1-879 Modes and frequency bands supported by an RRU3806

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3806 DC	2100	1920 to 1980	2110 to 2170	UMTS	25
RRU3806 AC	2100	1920 to 1980	2110 to 2170	UMTS	25

RF Specifications

The following tables list RF specifications of an RRU3806.

Table 1-880 Receiver sensitivity of an RRU3806

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3806	1T2R	-125.8	-128.6	-131.3

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.

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Table 1-881 Capacity and output power of an RRU3806

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3806	4 carriers	1x80 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3806.

Table 1-882 Input power of an RRU3806

Type	Power
RRU3806 DC	-48 V DC; voltage range: -36 V DC to -57 V DC
RRU3806 AC	● 200 V AC to 240 V AC single-phase; voltage range: 176 V AC to 290 V AC ● 100/200 V AC to 120/240 V AC dual-phase; voltage range: 90/180 V AC to 135/270 V AC

Table 1-883 Dimensions and weight of an RRU3806

Type	Dimensions (H x W x D)	Weight (kg)
RRU3806 DC	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 285 mm x 170 mm (23.5 L, with the housing)	● 15 (without the housing) ● 17 (with the housing)
RRU3806 AC	● 480 mm x 270 mm x 220 mm (28.5 L, without the housing) ● 485 mm x 285 mm x 250 mm (34.6 L, with the housing)	● 20.5 (without the housing) ● 22.5 (with the housing)

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Table 1-884 Power consumption of the entire base station (configured with an RRU3806)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3806** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3806.

Table 1-885 Environmental specifications of an RRU3806

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3806 DC RRU3806 AC	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3806.

Table 1-886 Compliance standards for an RRU3806

Item	Standard
RF	● 3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	● RRU3806 (DC): IP65 ● RRU3806 (AC): IP55

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3806.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-887 Surge protection specifications of ports on an RRU3806

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	40 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3806.

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Table 1-888 Specifications of CPRI ports on an RRU3806

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3806	2	1.25 or 2.5	Star, chain, or ring

Table 1-889 RRU3806 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3806	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3806.

Table 1-890 Antenna capability of an RRU3806

Type	TMA Support	RET Antenna Support
RRU3806	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.62 RRU3805 Technical Specifications

The RRU3805 is a type of remote radio unit. An RRU3805 working in UMTS mode supports a maximum of two carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3805.

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Table 1-891 Modes and frequency bands supported by an RRU3805

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3805	1900	1850 to 1890	1930 to 1970	UMTS	12.5 (per channel)
RRU3805	1900	1870 to 1910	1950 to 1990		
RRU3805	850	835 to 849	880 to 894	UMTS	

RF Specifications

The following tables list RF specifications of an RRU3805.

Table 1-892 Receiver sensitivity of an RRU3805

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3805	2T2R	–125.2	–128.0	–130.7

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-893 Capacity and output power of an RRU3805

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3805	1900 MHz: 2 carriers 850 MHz: 2 carriers	2x30 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3805.

Table 1-894 Input power of an RRU3805

Type	Power
RRU3805	1900 MHz/850 MHz: -48 V DC; voltage range: -38.4 V DC to -57 V DC

Table 1-895 Dimensions and weight of an RRU3805

Type	Dimensions (H x W x D)	Weight (kg)
RRU3805	● 485 mm x 356 mm x 140 mm (24.2 L, without the housing) ● 485 mm x 380 mm x 170 mm (31.3 L, with the housing)	● 22 (without the housing) ● 24 (with the housing)

Table 1-896 Power consumption of the entire base station (configured with an RRU3805)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3805** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3805.

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Table 1-897 Environmental specifications of an RRU3805

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3805	● Without solar radiation: –40°C to +50°C ● With 1120 W/m^2 solar radiation: –40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3805.

Table 1-898 Compliance standards for an RRU3805

Item	Standard
RF	● 3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3805.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-899 Surge protection specifications of ports on an RRU3805

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3805.

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Table 1-900 Specifications of CPRI ports on an RRU3805

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3805	2	1.25	Star, chain, or ring

Table 1-901 RRU3805 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3805	4	40

Antenna Capability

The following table lists the antenna capability of an RRU3805.

Table 1-902 Antenna capability of an RRU3805

Type	TMA Support	RET Antenna Support
RRU3805	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.63 RRU3804 Technical Specifications

The RRU3804 is a type of remote radio unit. An RRU3804 working in UMTS mode supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3804.

Table 1-903 Modes and frequency bands supported by an RRU3804

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3804 DC	2100	1920 to 1980	2110 to 2170	UMTS	● RRU3804: 20 ● RRU3804 (Optimiz
RRU3804 DC	1900	1850 to 1910	1930 to 1990	UMTS	

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Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3804 DC	AWS	1710 to 1755	2110 to 2155	UMTS	ed version): 25
RRU3804 DC	850	824 to 849	869 to 894	UMTS	
RRU3804 DC	850	835 to 849	880 to 894	UMTS	10
RRU3804 AC	2100	1920 to 1980	2110 to 2170	UMTS	● RRU3804: 20 ● RRU3804 (Optimized version): 25
RRU3804 AC	850	824 to 849	869 to 894	UMTS	20

RF Specifications

The following tables list RF specifications of an RRU3804.

Table 1-904 Receiver sensitivity of an RRU3804

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3804 DC	1T2R	● 2100 MHz or AWS: -125.8 ● 1900 MHz: -125.3 ● 850 MHz: -125.6	● 2100 MHz or AWS: -128.6 ● 1900 MHz: -128.1 ● 850 MHz: -128.4	● 2100 MHz/ AWS: -131.3 ● 1900 MHz: -130.8 ● 850 MHz: -131.1
RRU3804 AC	1T2R			

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity on the 850 MHz frequency band is measured on its subbands.

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Table 1-905 Capacity and output power of an RRU3804

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3804 DC	4 carriers	1x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .
RRU3804 AC	4 carriers		

NOTE

- For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3804.

Table 1-906 Input power of an RRU3804

Type	Power
RRU3804 DC	-48 V DC; voltage range: -36 V DC to -57 V DC
RRU3804 AC	● 200 V AC to 240 V AC single-phase; voltage range: 176 V AC to 290 V AC ● 100/200 V AC to 120/240 V AC dual-phase; voltage range: 90/180 V AC to 135/270 V AC

Table 1-907 Dimensions and weight of an RRU3804

Type	Dimensions (H x W x D)	Weight (kg)
RRU3804 DC	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 285 mm x 170 mm (23.5 L, with the housing)	● 15 (without the housing) ● 17 (with the housing)
RRU3804 AC	● 480 mm x 270 mm x 220 mm (28.5 L, without the housing) ● 485 mm x 285 mm x 250 mm (34.6 L, with the housing)	● 20.5 (without the housing) ● 22.5 (with the housing)

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Table 1-908 Power consumption of the entire base station (configured with an RRU3804)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3804** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3804.

Table 1-909 Environmental specifications of an RRU3804

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3804 DC RRU3804 AC	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3804.

Table 1-910 Compliance standards for an RRU3804

Item	Standard
RF	● 3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	● RRU3804 (DC): IP65 ● RRU3804 (AC): IP55

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3804.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-911 Surge protection specifications of ports on an RRU3804

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	40 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3804.

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Table 1-912 Specifications of CPRI ports on an RRU3804

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3804	2	RRU3804 modules of different BOM codes support different CPRI data rates: ● RRU3804 modules of 02315927, 0231597, 002316116, 02315467, 02316203, and 02316863 support only 1.25 Gbit/s. ● RRU3804 modules of other BOM codes support 1.25 Gbit/s and 2.5 Gbit/s.	Star, chain, or ring

Table 1-913 RRU3804 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3804	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3804.

Table 1-914 Antenna capability of an RRU3804

Type	TMA Support	RET Antenna Support
RRU3804	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.64 RRU3801E Technical Specifications

The RRU3801E is a type of remote radio unit working in UMTS mode. An RRU3801E supports a maximum of two carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3801E.

Table 1-915 Modes and frequency bands supported by an RRU3801E

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3801E DC	2100	1920 to 1980	2110 to 2170	UMTS	25
RRU3801E DC	1900	1850 to 1910	1930 to 1990		25
RRU3801E DC	850	824 to 835	869 to 880		25
RRU3801E AC	2100	1920 to 1980	2110 to 2170		25

RF Specifications

The following tables list RF specifications of an RRU3801E.

Table 1-916 Receiver sensitivity of an RRU3801E

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3801E	1T2R	● 2100 MHz: -125.8 ● 1900 MHz: -125.3 ● 850 MHz: -125.6	● 2100 MHz: -128.6 ● 1900 MHz: -128.1 ● 850 MHz: -128.4	● 2100 MHz: -131.3 ● 1900 MHz: -130.8 ● 850 MHz: -131.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The UMTS receiver sensitivity on the 850 MHz frequency band is measured on its subbands.

Table 1-917 Capacity and output power of an RRU3801E

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3801E	2 carriers	1x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The maximum output power equals the maximum output power of the power amplifier (PA) minus the internal loss. The maximum output power is measured at the antenna port on the RF module.

Engineering Specifications

The following tables list the equipment specifications of an RRU3801E.

Table 1-918 Input power of an RRU3801E

Type	Power
RRU3801E DC	● -48 V DC; voltage range: -36 V DC to -57 V DC
RRU3801E AC	● 200 V AC to 240 V AC single-phase; voltage range: 176 V AC to 290 V AC ● 100/200 V AC to 120/240 V AC dual-phase; voltage range: 90/180 V AC to 135/270 V AC

Table 1-919 Dimensions and weight of an RRU3801E

Type	Dimensions (H x W x D)	Weight (kg)
RRU3801E DC	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 285 mm x 170 mm (23.5 L, with the housing)	● 15 (without the housing) ● 17 (with the housing)

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Type	Dimensions (H x W x D)	Weight (kg)
RRU3801E AC	● 480 mm x 270 mm x 220 mm (28.5 L, without the housing) ● 485 mm x 285 mm x 250 mm (34.6 L, with the housing)	● 20.5 (without the housing) ● 22.5 (with the housing)

Table 1-920 Power consumption of the entire base station (configured with an RRU3801E)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3801E** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3801E.

Table 1-921 Environmental specifications of an RRU3801E

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3801E	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3801E.

Table 1-922 Compliance standards for an RRU3801E

Item	Standard
RF	3GPP TS 25.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	● RRU3801E (DC): IP65 ● RRU3801E (AC): IP55
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3801E.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-923 Surge protection specifications of ports on an RRU3801E

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	40 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3801E.

Table 1-924 Specifications of CPRI ports on an RRU3801E

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology	Cascading Level	Maximum Distance from the BBU (km)
RRU3801E	2	1.25 or 2.5	Star, chain, or ring	● When the CPRI data rate is 1.25 Gbit/s: 4 levels ● When the CPRI data rate is 2.5 Gbit/s: 8 levels	40

Antenna Capability

The following table lists the antenna capability of an RRU3801E.

Table 1-925 Antenna capability of an RRU3801E

Type	TMA Support	RET Antenna Support
RRU3801E	Supported	AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

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1.3.65 RRU3668 Technical Specifications

The RRU3668 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3668.

Table 1-926 Modes and frequency bands supported by an RRU3668

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3668	450	452.5 to 457.5	462.5 to 467.5	LTE FDD	5

RF Specifications

The following tables list RF specifications of an RRU3668.

Table 1-927 Receiver sensitivity of an RRU3668

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3668	2T2R	-101.5	-104.3

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-928 Capacity and output power of an RRU3668

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3668	LTE FDD: 1 carrier. The bandwidth per carrier is 1.4, 3, or 5 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3668.

Table 1-929 Input power of an RRU3668

Type	Power
RRU3668	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-930 Dimensions and weight of an RRU3668

Type	Dimensions (H x W x D)	Weight (kg)
RRU3668	400 mm x 300 mm x 150 mm (18 L, without the housing)	20 (without the housing)

Table 1-931 Power consumption of the entire base station (configured with an RRU3668)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3668** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3668.

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Table 1-932 Environmental specifications of an RRU3668

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3668	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3668.

Table 1-933 Compliance standards for an RRU3668

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3668.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-934 Surge protection specifications of ports on an RRU3668

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3668.

Table 1-935 Specifications of CPRI ports on an RRU3668

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3668	2	1.25, 2.5, or 4.9	Star, chain, or ring

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Table 1-936 RRU3668 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3668	4	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3668.

Table 1-937 Antenna capability of an RRU3668

Type	TMA Support	RET Antenna Support
RRU3668	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.66 RRU3281 Technical Specifications

The RRU3281 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3281.

Table 1-938 Modes and frequency bands supported by an RRU3281

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3281	2600 (Band 7)	2500 to 2570	2620 to 2690	LTE FDD	60

RF Specifications

The following tables list RF specifications of an RRU3281.

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Table 1-939 Receiver sensitivity of an RRU3281

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3281	4T4R	-106.3	-109.1	-111.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-940 Capacity and output power of an RRU3281

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3281	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3281.

Table 1-941 Input power of an RRU3281

Type	Power
RRU3281	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-942 Dimensions and weight of an RRU3281

Type	Dimensions (H x W x D)	Weight (kg)
RRU3281	400 mm x 300 mm x 150 mm (18 L, without the housing)	≤ 21 (without the housing)

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Table 1-943 Power consumption of the entire base station (configured with an RRU3281)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3281** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3281.

Table 1-944 Environmental specifications of an RRU3281

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3281	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3281.

Table 1-945 Compliance standards for an RRU3281

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.

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Item	Standard
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3281.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-946 Surge protection specifications of an RRU3281

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3281.

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Table 1-947 Specifications of CPRI ports on an RRU3281

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3281	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or ring

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Table 1-948 RRU3281 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3281	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s: – Cell bandwidth ≤ 5 MHz: 2 levels – Cell bandwidth ≥ 10 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s: – Cell bandwidth ≤ 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended ● When the CPRI rate is 9.8 Gbit/s: – Cell bandwidth ≤ 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

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Antenna Capability

The following table lists the antenna capability of an RRU3281.

Table 1-949 Antenna capability of an RRU3281

Type	TMA Support	RET Antenna Support
RRU3281	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.67 RRU3279 Technical Specifications

The RRU3279 is a remote radio unit working in LTE TDD mode. An RRU3279 supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3279.

Table 1-950 Modes and frequency bands supported by an RRU3279

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3279	2300 (Band 40)	2300 to 2400	LTE TDD	80	80
RRU3279	2500 (Band 41)	2496 to 2690	LTE TDD	80	80
RRU3279	2600 (Band 38)	2575 to 2615	LTE TDD	40	40

RF Specifications

The following tables list RF specifications of an RRU3279.

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Table 1-951 Receiver sensitivity of an RRU3279

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)	Receiver Sensitivity with Eight Antennas (dBm)
RRU3279	2300	8T8R	-105.5	-108.27	-110.97	-113.8
RRU3279	2500	8T8R	-105.5	-108.27	-110.97	-113.8
RRU3279	2600	8T8R	-105	-107.77	-110.47	-113.3

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-952 Capacity and output power of an RRU3279

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3279	● 2300 MHz: 4 carriers. The bandwidth per carrier is 10, 15, or 20 MHz. ● 2500 MHz: 4 carriers. The bandwidth per carrier is 10, 15, or 20 MHz. ● 2600 MHz: 3 carriers. The bandwidth per carrier is 10, 15, or 20 MHz.	8x20 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- The output power varies with filters and uplink-downlink subframe configurations.
- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3279.

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Table 1-953 Input power of an RRU3279

Type	Power
RRU3279	-48 V DC; voltage range: -32 V DC to -60 V DC

Table 1-954 Dimensions and weight of an RRU3279

Type	Dimensions (H x W x D)	Weight (kg)
RRU3279	480 mm x 300 mm x 120 mm (17 L, without the housing)	≤ 18 (without the housing)

Table 1-955 Power consumption of the entire base station (configured with an RRU3279)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3279** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3279.

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Table 1-956 Environmental specifications of an RRU3279

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3279	• With solar radiation of 1120 W/m^2: -40°C to +50°C • Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3279.

Table 1-957 Compliance standards for an RRU3279

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** • The validity period is one year. • The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4

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Item	Standard
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-958 lists the surge protection specifications of ports on an RRU3279.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-958 Surge protection specifications of ports on an RRU3279

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3279.

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Table 1-959 Specifications of CPRI ports on an RRU3279

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3279	2	4.9 or 9.8	Star or ring

Table 1-960 RRU3279 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3279	Not supported	≤ 10

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3279.

Table 1-961 Antenna capability of an RRU3279

Type	TMA Support	RET Antenna Support
RRU3279	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.68 RRU3278u Technical Specifications

The RRU3278u is a remote radio unit working in LTE TDD mode. An RRU3278u supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3278u.

Table 1-962 Modes and frequency bands supported by an RRU3278u

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3278u	3500 (Band 42)	3520 to 3600	LTE TDD	80	80

RF Specifications

The following tables list RF specifications of an RRU3278u.

Table 1-963 Receiver sensitivity of an RRU3278u

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)	Receiver Sensitivity with Eight Antennas (dBm)
RRU3278u	3500	8T8R	-105	-107.77	-110.47	-113.3

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-964 Capacity and output power of an RRU3278u

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3278u	3500 MHz: 4 carriers. The bandwidth per carrier is 10, 15, or 20 MHz.	8x20 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3278u.

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Table 1-965 Input power of an RRU3278u

Type	Power
RRU3278u	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-966 Dimensions and weight of an RRU3278u

Type	Dimensions (H x W x D)	Weight (kg)
RRU3278u	480 mm x 356 mm x 140 mm (24 L, without the housing)	≤ 25 (without the housing)

Table 1-967 Power consumption of the entire base station (configured with an RRU3278u)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3278u** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3278u.

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Table 1-968 Environmental specifications of an RRU3278u

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3278u	• With solar radiation of 1120 W/m^2: -40°C to +50°C • Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3278u.

Table 1-969 Compliance standards for an RRU3278u

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** • The validity period is one year. • The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-970 lists the surge protection specifications of ports on an RRU3278u.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-970 Surge protection specifications of ports on an RRU3278u

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3278u.

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Table 1-971 Specifications of CPRI ports on an RRU3278u

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3278u	2	4.9 or 9.8	Star or ring

Table 1-972 RRU3278u cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3278u	Not supported	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3278u.

Table 1-973 Antenna capability of an RRU3278u

Type	TMA Support	RET Antenna Support
RRU3278u	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.69 RRU3278 Technical Specifications

The RRU3278 is a remote radio unit working in LTE TDD mode. An RRU3278 supports a maximum of five carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3278.

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Table 1-974 Modes and frequency bands supported by an RRU3278

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3278	3500 (Band 42)	3400 to 3600	LTE TDD	160	80
RRU3278	3700 (Band 43)	3600 to 3800	LTE TDD	160	100
RRU3278	3650 (Band 42 and Band 43)	3475 to 3650	LTE TDD	175	100
RRU3278	3650 (Band 42 and Band 43)	3550 to 3700	LTE TDD	150	100

RF Specifications

The following tables list RF specifications of an RRU3278.

Table 1-975 Receiver sensitivity of an RRU3278

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)	Receiver Sensitivity with Eight Antennas (dBm)
RRU3278	3500	8T8R	-105	-107.77	-110.47	-113.3
RRU3278	3700	8T8R	-105	-107.77	-110.47	-113.3
RRU3278	3650	8T8R	-105	-107.77	-110.47	-113.3

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-976 Capacity and output power of an RRU3278

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3278	● 3500 MHz: 4 carriers. The bandwidth per carrier is 10, 15, or 20 MHz. ● 3700 MHz: 5 carriers. The bandwidth per carrier is 10, 15, or 20 MHz. ● 3650 MHz: 5 carriers. The bandwidth per carrier is 10, 15, or 20 MHz.	8x16 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The output power varies with filters and uplink-downlink subframe configurations.

Engineering Specifications

The following tables list the equipment specifications of an RRU3278.

Table 1-977 Input power of an RRU3278

Type	Power
RRU3278	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-978 Dimensions and weight of an RRU3278

Type	Dimensions (H x W x D)	Weight (kg)
RRU3278	480 mm x 356 mm x 140 mm (24 L, without the housing)	≤ 25 (without the housing)

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Table 1-979 Power consumption of the entire base station (configured with an RRU3278)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3278** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3278.

Table 1-980 Environmental specifications of an RRU3278

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3278	● With solar radiation of 1120 W/m^2: -40°C to +50°C ● Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3278.

Table 1-981 Compliance standards for an RRU3278

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-982 lists the surge protection specifications of ports on an RRU3278.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-982 Surge protection specifications of ports on an RRU3278

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3278.

Table 1-983 Specifications of CPRI ports on an RRU3278

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3278	2	4.9 or 9.8	Star or ring

Table 1-984 RRU3278 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3278	Not supported	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3278.

Table 1-985 Antenna capability of an RRU3278

Type	TMA Support	RET Antenna Support
RRU3278	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.70 RRU3276 Technical Specifications

The RRU3276 is a remote radio unit working in LTE TDD mode. An RRU3276 supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3276.

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Table 1-986 Modes and frequency bands supported by an RRU3276

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3276	2300 (Band 40)	2300 to 2400	LTE TDD	100	80
RRU3276	2600 (Band 41)	2496 to 2690	LTE TDD	150	80
RRU3276	2600 (Band 41)	2520 to 2620	LTE TDD	100	80
RRU3276	2600 (Band 38)	2575 to 2615	LTE TDD	40	40

RF Specifications

The following tables list RF specifications of an RRU3276.

Table 1-987 Receiver sensitivity of an RRU3276

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3276	2300 (Band 40)	4T4R	-105.5	-108.27	-110.97
RRU3276	2600 (Band 41)	4T4R	-105.5	-108.27	-110.97
RRU3276	2600 (Band 41)	4T4R	-105.5	-108.27	-110.97
RRU3276	2600 (Band 38)	4T4R	-105	-107.77	-110.47

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-988 Capacity and output power of an RRU3276

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3276	● 2300 MHz: 4 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. ● 2600 MHz: 4 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.
- The output power varies with filters and uplink-downlink subframe configurations.

Engineering Specifications

The following tables list the equipment specifications of an RRU3276.

Table 1-989 Input power of an RRU3276

Type	Power
RRU3276	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-990 Dimensions and weight of an RRU3276

Type	Dimensions (H x W x D)	Weight (kg)
RRU3276	400 mm x 300 mm x 150 mm (18 L, without the housing)	≤ 20 (without the housing)

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Table 1-991 Power consumption of the entire base station (configured with an RRU3276)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3276** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3276.

Table 1-992 Environmental specifications of an RRU3276

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3276	● With solar radiation of 1120 W/m^2: -40°C to +50°C ● Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3276.

Table 1-993 Compliance standards for an RRU3276

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-994 lists the surge protection specifications of ports on an RRU3276.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-994 Surge protection specifications of ports on an RRU3276

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3276.

Table 1-995 Specifications of CPRI ports on an RRU3276

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3276	2	4.9 or 9.8	Star, chain, or ring

Table 1-996 RRU3276 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3276	4	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3276.

Table 1-997 Antenna capability of an RRU3276

Type	TMA Support	RET Antenna Support
RRU3276	Not supported	AISG1.1, AISG2.0, and AISG2.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.71 RRU3269 Technical Specifications

The RRU3269 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3269 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3269.

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Table 1-998 Modes and frequency bands supported by an RRU3269

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3269	700 (Band 12 and Band 13)	Band 12: 699 to 715 Band 13: 777 to 787	Band 12: 729 to 745 Band 13: 746 to 756	LTE FDD, LM	● 700 (Band 12): 15 ● 700 (Band 13): 10 ● 700 (Band 12 and Band 13): 16

RF Specifications

The following tables list RF specifications of an RRU3269.

Table 1-999 Receiver sensitivity of an RRU3269

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3269	2T2R	LTE FDD: ● 700 MHz (Band 12), -105.8 ● 700 MHz (Band 13), -106.2 LTE NB-IoT: -127.3	LTE FDD: ● 700 MHz (Band 12), -108.6 ● 700 MHz (Band 13), -109.0 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-1000 Capacity and output power of an RRU3269

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3269	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, or 15 MHz. LTE NB-IoT: 1 carrier	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3269.

Table 1-1001 Input power of an RRU3269

Type	Power
RRU3269	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1002 Dimensions and weight of an RRU3269

Type	Dimensions (H x W x D)	Weight (kg)
RRU3269	400 mm x 300 mm x 150 mm (18 L, without the housing)	≤ 20 (without the housing)

Table 1-1003 Power consumption of the entire base station (configured with an RRU3269)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3269** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

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NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3269.

Table 1-1004 Environmental specifications of an RRU3269

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3269	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3269.

Table 1-1005 Compliance standards for an RRU3269

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3269.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1006 Surge protection specifications of an RRU3269

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3269.

Table 1-1007 Specifications of CPRI ports on an RRU3269

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3269	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or load sharing

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Table 1-1008 RRU3269 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3269	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 4 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not supported ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels ● When the CPRI data rate is 9.8 Gbit/s: 4 levels Multimode (excluding GU) CPRI MUX: 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3269.

Table 1-1009 Antenna capability of an RRU3269

Type	TMA Support	RET Antenna Support
RRU3269	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.72 RRU3268 Technical Specifications

The RRU3268 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3268 can work in multiple modes through software configuration.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3268.

Table 1-1010 Modes and frequency bands supported by an RRU3268

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3268	2600 (Band 7)	2500 to 2570	2620 to 2690	LTE FDD	50
RRU3268	700 (Band 28)	703 to 743	758 to 798	LTE FDD, LM	25
RRU3268	700 (Band 28)	718 to 748	773 to 803	LTE FDD, LM	25
RRU3268	EU 700	703 to 733	758 to 788	LTE FDD, LM	25
RRU3268	800	832 to 862	791 to 821	LTE FDD, LM	20

RF Specifications

The following tables list RF specifications of an RRU3268.

Table 1-1011 Receiver sensitivity of an RRU3268

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3268	2T2R	LTE FDD: ● 2600 MHz: -106.5 ● 700 MHz: -106.0 ● 800 MHz: -106.4 LTE NB-IoT: -127.3	LTE FDD: ● 2600 MHz: -109.3 ● 700 MHz: -108.8 ● 800 MHz: -109.2 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

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Table 1-1012 Capacity and output power of an RRU3268

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3268 (2600 MHz)	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .
RRU3268 (700 MHz)	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 2 carriers	2x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3268 (800 MHz)	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 2 carriers	2x40W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3268.

Table 1-1013 Input power of an RRU3268

Type	Power
RRU3268	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1014 Dimensions and weight of an RRU3268

Type	Dimensions (H x W x D)	Weight (kg)
RRU3268	400 mm x 300 mm x 100 mm (12 L, without the housing)	≤ 14 (without the housing)

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Table 1-1015 Power consumption of the entire base station (configured with an RRU3268)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3268** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3268.

Table 1-1016 Environmental specifications of an RRU3268

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3268	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3268.

Table 1-1017 Compliance standards for an RRU3268

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.

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Item	Standard
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3268.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1018 Surge protection specifications of ports on an RRU3268

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3268.

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Table 1-1019 Specifications of CPRI ports on an RRU3268

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3268	2	RRU3268 modules of 02311KVB, 02311KWV, 02311KWW, 02311PKG, and 02311LDE support 1.25/2.5/4.9/9.8. RRU3268 modules of other BOM codes support 1.25/2.5/4.9.	Star, chain, or ring

Table 1-1020 RRU3268 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3268	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels ● When the CPRI data rate is 9.8 Gbit/s: 4 levels Multimode (excluding GU) CPRI MUX: 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3268.

Table 1-1021 Antenna capability of an RRU3268

Type	TMA Support	RET Antenna Support
RRU3268	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.73 RRU3262 Technical Specifications

The RRU3262 is a multimode remote radio unit. With the SDR technology, the RRU3262 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3262.

Table 1-1022 Modes and frequency bands supported by an RRU3262

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3262	2600 (Band 7)	2500 to 2570	2620 to 2690	LTE FDD	60
RRU3262	700 (Band 28)	703 to 748	758 to 803	LTE FDD, LM, LN (SUL)	45
RRU3262	850 (Band 27)	807 to 824	852 to 869	LTE FDD	45

NOTE

- When the RRU3262 (700 MHz) is used at a maximum IBW of 25 MHz, the PIM3 of TX signals can be prevented from affecting RX frequency bands.
- When the RRU3262 (700 MHz) works in 2T4R mode, the PIM3 of TX signals may affect RX frequency bands. In this case, the RX and TX channels of the RRU3262 (700 MHz) can be configured only as 2T2R and four-port antennas are required. 2T is configured on RF ports A and B, and 2R is configured on RF ports C and D.

RF Specifications

The following tables list RF specifications of an RRU3262.

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Table 1-1023 Receiver sensitivity of an RRU3262

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3262	2T4R	LTE FDD: ● 2600 MHz: -106.5 ● 700 MHz: -106.0 ● 850 MHz: -106.0 LTE NB-IoT: -127.3	LTE FDD: ● 2600 MHz: -109.3 ● 700 MHz: -108.8 ● 850 MHz: -108.8 LTE NB-IoT: -130.1	LTE FDD: ● 2600 MHz: -112.0 ● 700 MHz: -111.5 ● 850 MHz: -111.5 LTE NB-IoT: -132.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-1024 Capacity and output power of an RRU3262

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3262 (2600 MHz)	LTE FDD: 3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).
RRU3262 (700 MHz)	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 8 carriers NR (SUL): 1 carrier	2x60 W	
RRU3262 (850 MHz)	LTE FDD: 3 carriers. The bandwidth per carrier is 3, 5, 10, or 15 MHz.	2x60 W	

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NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

NR SUL Carrier Configuration

When NR SUL carriers are configured, the uplink bandwidth of LTE carriers enabled with LTE and NR uplink spectrum sharing must be the same as the uplink bandwidth of NR carriers. The following table lists the bandwidths. The uplink bandwidth of LTE carriers not enabled with uplink spectrum sharing is the same as their downlink bandwidth. For details about the downlink bandwidth, see "Typical Output Power".

Table 1-1025 SUL carrier configuration of an RRU3262 (LN, 700 MHz, 4R)

Total Number of LTE FDD Carriers	Total Number of NR SUL Carriers	Bandwidth per NR SUL Carrier (MHz)
2 (MIMO)	1	10

Engineering Specifications

The following tables list the equipment specifications of an RRU3262.

Table 1-1026 Input power of an RRU3262

Type	Power
RRU3262	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1027 Dimensions and weight of an RRU3262

Type	Dimensions (H x W x D)	Weight (kg)
RRU3262 (2600 MHz)	400 mm x 300 mm x 100 mm (12 L, without the housing)	≤ 15 (without the housing)
RRU3262 (700 MHz)	400 mm x 300 mm x 150 mm (18 L, without the housing)	≤ 20 (without the housing)
RRU3262 (850 MHz)	400 mm x 300 mm x 150 mm (18 L, without the housing)	≤ 20 (without the housing)

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Table 1-1028 Power consumption of the entire base station (configured with an RRU3262)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3262** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3262.

Table 1-1029 Environmental specifications of an RRU3262

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3262	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3262.

Table 1-1030 Compliance standards for an RRU3262

Item	Standard
RF	3GPP TS 36.141 3GPP TS 38.104
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.

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Item	Standard
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3262.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1031 Surge protection specifications of ports on an RRU3262

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3262.

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Table 1-1032 Specifications of CPRI ports on an RRU3262

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3262	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or ring

Table 1-1033 RRU3262 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3262	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 2 levels – Cell bandwidth ≥ 10 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended ● When the CPRI data rate is 9.8 Gbit/s: 4 levels Multimode (excluding GU) CPRI MUX: 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20 Multimode (including NR): 20

Antenna Capability

The following table lists the antenna capability of an RRU3262.

Table 1-1034 Antenna capability of an RRU3262

Type	TMA Support	RET Antenna Support
RRU3262	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

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1.3.74 RRU3260 Technical Specifications

The RRU3260 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3260.

Table 1-1035 Modes and frequency bands supported by an RRU3260

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3260	2600 (Band 7)	2500 to 2570	2620 to 2690	LTE FDD	50

RF Specifications

The following tables list RF specifications of an RRU3260.

Table 1-1036 Receiver sensitivity of an RRU3260

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3260	2T4R	-106.5	-109.3	-112.0

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1037 Capacity and output power of an RRU3260

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3260	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3260.

Table 1-1038 Input power of an RRU3260

Type	Power
RRU3260	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1039 Dimensions and weight of an RRU3260

Type	Dimensions (H x W x D)	Weight (kg)
RRU3260	400 mm x 300 mm x 100 mm (12 L, without the housing)	≤ 15 (without the housing)

Table 1-1040 Power consumption of the entire base station (configured with an RRU3260)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3260** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3260.

Table 1-1041 Environmental specifications of an RRU3260

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3260	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

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NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3260.

Table 1-1042 Compliance standards for an RRU3260

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3260.

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NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1043 Surge protection specifications of ports on an RRU3260

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3260.

Table 1-1044 Specifications of CPRI ports on an RRU3260

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3260	2	RRU3260 modules with different BOM codes support different CPRI data rates: - RRU3260 modules with 02311KVA support 1.25 Gbit/s, 2.5 Gbit/s, 4.9 Gbit/s, or 9.8 Gbit/s. - RRU3260 modules with other BOM codes support 1.25 Gbit/s, 2.5 Gbit/s, or 4.9 Gbit/s.	Star, chain, or ring

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Table 1-1045 RRU3260 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3260	● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s: – Cell bandwidth ≤ 5 MHz: 2 levels – Cell bandwidth ≥ 10 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s: – Cell bandwidth ≤ 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended ● When the CPRI rate is 9.8 Gbit/s: – Cell bandwidth ≤ 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3260.

Table 1-1046 Antenna capability of an RRU3260

Type	TMA Support	RET Antenna Support
RRU3260	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.75 RRU3259 Technical Specifications

The RRU3259 is a remote radio unit working in LTE TDD mode. An RRU3259 supports a maximum of three carriers.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3259.

Table 1-1047 Modes and frequency bands supported by an RRU3259

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3259	2600	2545 to 2625	LTE TDD	60	60

RF Specifications

The following tables list RF specifications of an RRU3259.

Table 1-1048 Receiver sensitivity of an RRU3259

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)	Receiver Sensitivity with Eight Antennas (dBm)
RRU3259	2600	8T8R	-105	-107.77	-110.47	-113.3

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1049 Capacity and output power of an RRU3259

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3259	3 carriers. The bandwidth per carrier is 10 or 20 MHz.	8x12.5 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

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Engineering Specifications

The following tables list the equipment specifications of an RRU3259.

Table 1-1050 Input power of an RRU3259

Type	Power
RRU3259	-48 V DC; voltage range: -32 V DC to -60 V DC

Table 1-1051 Dimensions and weight of an RRU3259

Type	Dimensions (H x W x D)	Weight (kg)
RRU3259	550 mm x 320 mm x 135 mm (24 L, without the housing)	≤ 24 (without the housing)

Table 1-1052 Power consumption of the entire base station (configured with an RRU3259)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3259** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3259.

Table 1-1053 Environmental specifications of an RRU3259

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3259	● With solar radiation of 1120 W/m^2: -40°C to +45°C ● Without solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3259.

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Table 1-1054 Compliance standards for an RRU3259

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1055 lists the surge protection specifications of ports on an RRU3259.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-1055 Surge protection specifications of ports on an RRU3259

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3259.

Table 1-1056 Specifications of CPRI ports on an RRU3259

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3259	2	4.9 or 9.8	Star

Table 1-1057 RRU3259 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3259	N/A	10

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3259.

Table 1-1058 Antenna capability of an RRU3259

Type	TMA Support	RET Antenna Support
RRU3259	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

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1.3.76 RRU3256 Technical Specifications

The RRU3256 is a remote radio unit working in LTE TDD mode. An RRU3256 supports a maximum of four carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3256.

Table 1-1059 Modes and frequency bands supported by an RRU3256

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3256	2300 (Band 40)	2300 to 2400	LTE TDD	100	80
RRU3256	2500 (Band 41)	2496 to 2690	LTE TDD	115	80
RRU3256	2600 (Band 38)	2575 to 2615	LTE TDD	40	40
RRU3256	3500 (Band 42/Band 43)	3400 to 3700	LTE TDD	80	80

RF Specifications

The following tables list RF specifications of an RRU3256.

Table 1-1060 Receiver sensitivity of an RRU3256

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3256	2300 (Band 40)	4T4R	-105.5	-108.27	-110.97
RRU3256	2500 (Band 41)	4T4R	-105.5	-108.27	-110.97
RRU3256	2600 (Band 38)	4T4R	-105	-107.77	-110.47
RRU3256	3500 (Band 42/Band 43)	4T4R	-105	-107.77	-110.47

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NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1061 Capacity and output power of an RRU3256

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3256	4 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	● 2300 MHz: 4x30 W ● 2500 MHz: 4x30 W ● 2600 MHz: 4x30 W ● 3500 MHz: 4x15 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3256.

Table 1-1062 Input power of an RRU3256

Type	Power
RRU3256	-48 V DC; voltage range: -32 V DC to -60 V DC

Table 1-1063 Dimensions and weight of an RRU3256

Type	Dimensions (H x W x D)	Weight (kg)
RRU3256	● 485 mm x 300 mm x 170 mm (24.7 L, with the housing) ● 480 mm x 270 mm x 140 mm (18 L, without the housing)	● ≤ 21 (with the housing) ● ≤ 19.5 (without the housing)

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Table 1-1064 Power consumption of the entire base station (configured with an RRU3256)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3256** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3256.

Table 1-1065 Environmental specifications of an RRU3256

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3256	● With solar radiation of 1120 W/m^2: -40°C to +50°C ● Without solar radiation: -40°C to +55°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3256.

Table 1-1066 Compliance standards for an RRU3256

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1067 lists the surge protection specifications of ports on an RRU3256.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1067 Surge protection specifications of ports on an RRU3256

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3256.

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Table 1-1068 Specifications of CPRI ports on an RRU3256

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3256	2	2.5, 4.9, or 9.8	Star, chain, or ring

Table 1-1069 RRU3256 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3256	4	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3256.

Table 1-1070 Antenna capability of an RRU3256

Type	TMA Support	RET Antenna Support
RRU3256	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.77 RRU3253 Technical Specifications

The RRU3253 is a remote radio unit working in LTE TDD mode. An RRU3253 supports a maximum of two carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3253.

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Table 1-1071 Modes and frequency bands supported by an RRU3253

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3253	2600 (Band 38)	2575 to 2615	LTE TDD	40	40

RF Specifications

The following tables list RF specifications of an RRU3253.

Table 1-1072 Receiver sensitivity of an RRU3253

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)	Receiver Sensitivity with Eight Antennas (dBm)
RRU3253	2600	8T8R	-105	-107.77	-110.47	-113.3

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1073 Capacity and output power of an RRU3253

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3253	2 carriers. The bandwidth per carrier is 10 or 20 MHz.	● 8x16 W when the uplink-downlink subframe configuration is 2:2 ● 8x12 W when the uplink-downlink subframe configuration is 3:1	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

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Engineering Specifications

The following tables list the equipment specifications of an RRU3253.

Table 1-1074 Input power of an RRU3253

Type	Power
RRU3253	-48 V DC; voltage range: -32 V DC to -60 V DC

Table 1-1075 Dimensions and weight of an RRU3253

Type	Dimensions (H x W x D)	Weight (kg)
RRU3253	550 mm x 320 mm x 135 mm (24 L, without the housing)	≤ 24 (without the housing)

Table 1-1076 Power consumption of the entire base station (configured with an RRU3253)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3253** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3253.

Table 1-1077 Environmental specifications of an RRU3253

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3253	● With solar radiation of 1120 W/m^2: -40°C to +45°C ● Without solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3253.

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Table 1-1078 Compliance standards for an RRU3253

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1079 lists the surge protection specifications of ports on an RRU3253.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-1079 Surge protection specifications of ports on an RRU3253

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3253.

Table 1-1080 Specifications of CPRI ports on an RRU3253

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3253	2	2.5, 4.9, or 9.8	Star

Table 1-1081 RRU3253 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3253	N/A	10

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3253.

Table 1-1082 Antenna capability of an RRU3253

Type	TMA Support	RET Antenna Support
RRU3253	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

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1.3.78 RRU3252 Technical Specifications

The RRU3252 is a remote radio unit working in LTE TDD mode. An RRU3252 supports a maximum of two carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3252.

Table 1-1083 Modes and frequency bands supported by an RRU3252

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3252 DC	2300 (Band 40)	2300 to 2400	LTE TDD	80	40
RRU3252 DC	2500 (Band 41)	2496 to 2690	LTE TDD	80	40
RRU3252 DC	2600 (Band 38)	2575 to 2615	LTE TDD	40	40
RRU3252 AC	2300 (Band 40)	2300 to 2400	LTE TDD	80	40

RF Specifications

The following tables list RF specifications of an RRU3252.

Table 1-1084 Receiver sensitivity of an RRU3252

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3252 DC	2300 (Band 40)	4T4R	-105	-107.77	-110.47
RRU3252 DC	2500 (Band 41)	4T4R	-105	-107.77	-110.47
RRU3252 DC	2600 (Band 38)	4T4R	-105	-107.77	-110.47
RRU3252 AC	2300 (Band 40)	4T4R	-105	-107.77	-110.47

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NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1085 Capacity and output power of an RRU3252

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3252	2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	4x20 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3252.

Table 1-1086 Input power of an RRU3252

Type	Power
RRU3252 DC	-48 V DC; voltage range: -32 V DC to -60 V DC
RRU3252 AC	Voltage range: 90 V AC to 290 V AC

Table 1-1087 Dimensions and weight of an RRU3252

Type	Dimensions (H x W x D)	Weight (kg)
RRU3252 DC	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 300 mm x 170 mm (24.7 L, with the housing)	● ≤ 19.5 (without the housing) ● ≤ 21 (with the housing)
RRU3252 AC	480 mm x 270 mm x 140 mm (18 L, without the housing)	≤ 19.5 (without the housing)

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Table 1-1088 Power consumption of the entire base station (configured with an RRU3252)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3252** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3252.

Table 1-1089 Environmental specifications of an RRU3252

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3252	● With solar radiation of 1120 W/m^2: -40°C to +50°C ● Without solar radiation: -40°C to +55°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3252.

Table 1-1090 Compliance standards for an RRU3252

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011 Lightning protection requirements and test methods for Radio Base Stations (RBSs) ● GB 50689-2011 Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1091 lists the surge protection specifications of ports on an RRU3252.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1091 Surge protection specifications of ports on an RRU3252

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3252.

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Table 1-1092 Specifications of CPRI ports on an RRU3252

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3252	2	2.5 or 4.9	Star, chain, or ring

Table 1-1093 RRU3252 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3252	4	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3252.

Table 1-1094 Antenna capability of an RRU3252

Type	TMA Support	RET Antenna Support
RRU3252	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.79 RRU3251 Technical Specifications

The RRU3251 is a remote radio unit working in LTE TDD mode. An RRU3251 supports a maximum of three carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3251.

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Table 1-1095 Modes and frequency bands supported by an RRU3251

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3251	2300 (Band 40)	2300 to 2400	LTE TDD	60	60

RF Specifications

The following tables list RF specifications of an RRU3251.

Table 1-1096 Receiver sensitivity of an RRU3251

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3251	2300	2T2R	-105	-107.77

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1097 Capacity and output power of an RRU3251

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3251	3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x50 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- The maximum output power is 2x50 W when the RRU operating temperature does not exceed 45°C, and is 2x40 W when the RRU operating temperature is between 45°C and 50°C.
- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3251.

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Table 1-1098 Input power of an RRU3251

Type	Power
RRU3251	-48 V DC; voltage range: -34 V DC to -60 V DC

Table 1-1099 Dimensions and weight of an RRU3251

Type	Dimensions (H x W x D)	Weight (kg)
RRU3251	● 400 mm x 220 mm x 140 mm (12.32 L, without the housing) ● 400 mm x 249 mm x 162 mm (16.15 L, with the housing)	● ≤ 13.5 (without the housing) ● ≤ 14.5 (with the housing)

Table 1-1100 Power consumption of the entire base station (configured with an RRU3251)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3251** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3251.

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Table 1-1101 Environmental specifications of an RRU3251

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3251	● When the maximum output power is 2x50 W: – With solar radiation of 1120 W/m^2: -40°C to +45°C – Without solar radiation: -40°C to +50°C ● When the maximum output power is 2x40 W: – With solar radiation of 1120 W/m^2: -40°C to +50°C – Without solar radiation: -40°C to +55°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3251.

Table 1-1102 Compliance standards for an RRU3251

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1103 lists the surge protection specifications of ports on an RRU3251.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1103 Surge protection specifications of ports on an RRU3251

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3251.

Table 1-1104 Specifications of CPRI ports on an RRU3251

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3251	2	2.5 or 4.9	Star, chain, or ring

Table 1-1105 RRU3251 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3251	4	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3251.

Table 1-1106 Antenna capability of an RRU3251

Type	TMA Support	RET Antenna Support
RRU3251	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.80 RRU3249 Technical Specifications

The RRU3249 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3249.

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Table 1-1107 Modes and frequency bands supported by an RRU3249

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3249	700 (Band 12)	699 to 716	729 to 746	LTE FDD	15

RF Specifications

The following tables list RF specifications of an RRU3249.

Table 1-1108 Receiver sensitivity of an RRU3249

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3249	2T2R	LTE FDD: -105.8	LTE FDD: -108.6

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1109 Capacity and output power of an RRU3249

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3249	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, or 15 MHz.	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3249.

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Table 1-1110 Input power of an RRU3249

Type	Power
RRU3249	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1111 Dimensions and weight of an RRU3249

Type	Dimensions (H x W x D)	Weight (kg)
RRU3249	400 mm x 300 mm x 150 mm (18 L, without the housing)	≤ 20 (without the housing)

Table 1-1112 Power consumption of the entire base station (configured with an RRU3249)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3249** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3249.

Table 1-1113 Environmental specifications of an RRU3249

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3249	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3249.

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Table 1-1114 Compliance standards for an RRU3249

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3249.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-1115 Surge protection specifications of ports on an RRU3249

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3249.

Table 1-1116 Specifications of CPRI ports on an RRU3249

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3249	2	1.25, 2.5, 4.9, or 9.8	Star, chain, or load sharing

Table 1-1117 RRU3249 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3249	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 4 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not supported ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels ● When the CPRI data rate is 9.8 Gbit/s: 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

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Antenna Capability

The following table lists the antenna capability of an RRU3249.

Table 1-1118 Antenna capability of an RRU3249

Type	TMA Support	RET Antenna Support
RRU3249	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.81 RRU3240 Technical Specifications

The RRU3240 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3240.

Table 1-1119 Modes and frequency bands supported by an RRU3240

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3240	2600 (Band 7)	2500 to 2570	2620 to 2690	LTE FDD	40

RF Specifications

The following tables list RF specifications of an RRU3240.

Table 1-1120 Receiver sensitivity of an RRU3240

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3240	2T4R	-106.0	-108.8	-111.5

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1121 Capacity and output power of an RRU3240

Type	Capacity	Maximum Output Power	Typical Power Configuration
RRU3240	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3240.

Table 1-1122 Input power of an RRU3240

Type	Power
RRU3240	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1123 Dimensions and weight of an RRU3240

Type	Dimensions (H x W x D)	Weight (kg)
RRU3240	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 300 mm x 170 mm (25 L, with the housing)	● ≤ 20 (without the housing) ● ≤ 22 (with the housing)

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Table 1-1124 Power consumption of the entire base station (configured with an RRU3240)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3240** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3240.

Table 1-1125 Environmental specifications of an RRU3240

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3240	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3240.

Table 1-1126 Compliance standards for an RRU3240

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.

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Item	Standard
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3240.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1127 Surge protection specifications of ports on an RRU3240

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3240.

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Table 1-1128 Specifications of CPRI ports on an RRU3240

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3240	2	1.25, 2.5, or 4.9	Star, chain, or ring

Table 1-1129 RRU3240 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3240	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 2 levels – Cell bandwidth ≥ 10 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3240.

Table 1-1130 Antenna capability of an RRU3240

Type	TMA Support	RET Antenna Support
RRU3240	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.82 RRU3236E Technical Specifications

The RRU3236E is a remote radio unit working in LTE TDD mode. An RRU3236E supports a maximum of three carriers.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3236E.

Table 1-1131 Modes and frequency bands supported by an RRU3236E

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3236E	2300 (Band 40)	2300 to 2360	LTE TDD	60	60
RRU3236E	3500 (Band 42)	3400 to 3600	LTE TDD	60	60

NOTE

When the RRU3236E operates in Band 42 (3500 MHz) with the carrier configuration of 10 MHz+10 MHz or 10 MHz+15 MHz, its IBW is 40 MHz.

RF Specifications

The following tables list RF specifications of an RRU3236E.

Table 1-1132 Receiver sensitivity of an RRU3236E

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3236E	2300	2T2R	-104.5	-107.27
RRU3236E	3500	2T2R	-104.5	-107.27

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1133 Capacity and output power of an RRU3236E

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3236E	3 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	● 2300 MHz: 2x5 W ● 3500 MHz: 2x10 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3236E.

Table 1-1134 Input power of an RRU3236E

Type	Power
RRU3236E	● 2300 MHz: 140 V AC to 300 V AC ● 3500 MHz: 90 V AC to 290 V AC

Table 1-1135 Dimensions and weight of an RRU3236E

Type	Dimensions (H x W x D)	Weight (kg)
RRU3236E	290 mm x 210 mm x 102 mm (6 L)	≤ 6

Table 1-1136 Power consumption of the entire base station (configured with an RRU3236E)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3236E** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3236E.

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Table 1-1137 Environmental specifications of an RRU3236E

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3236E	● With solar radiation: -40°C to +50°C ● Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3236E.

Table 1-1138 Compliance standards for an RRU3236E

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1139 lists the surge protection specifications of ports on an RRU3236E.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1139 Surge protection specifications of ports on an RRU3236E

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3236E.

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Table 1-1140 Specifications of CPRI ports on an RRU3236E

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3236E	2	4.9 or 9.8	Star, chain, or ring

Table 1-1141 RRU3236E CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3236E	4	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

When both CPRI ports are used, the CPRI data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3236E.

Table 1-1142 Antenna capability of an RRU3236E

Type	TMA Support	RET Antenna Support
RRU3236E	Not supported	Not supported

1.3.83 RRU3232 Technical Specifications

The RRU3232 is a remote radio unit working in LTE TDD mode. An RRU3232 supports a maximum of two carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3232.

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Table 1-1143 Modes and frequency bands supported by an RRU3232

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3232	2600 (Band 38)	2575 to 2615	LTE TDD	40	40
RRU3232	2500 (Band 41)	2496 to 2690	LTE TDD	40	40
RRU3232	2300 (Band 40)	2300 to 2400	LTE TDD	40	40
RRU3232	3500	3400 to 3700	LTE TDD	40	40
RRU3232	1800	1755 to 1920	LTE TDD	40	40

RF Specifications

The following tables list RF specifications of an RRU3232.

Table 1-1144 Receiver sensitivity of an RRU3232

Type	Frequency Band (MHz)	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)	Receiver Sensitivity with Four Antennas (dBm)
RRU3232	2600	4T4R	-105	-107.77	-110.47
RRU3232	2500	4T4R	-105	-107.77	-110.47
RRU3232	2300	4T4R	-105	-107.77	-110.47
RRU3232	3500	4T4R	-105	-107.77	-110.47
RRU3232	1800	4T4R	-105	-107.77	-110.47

NOTE

LTE TDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-1145 Capacity and output power of an RRU3232

Type	TX/RX Channel	Capacity	Maximum Output Power	Typical Output Power
RRU3232	4T4R	2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	● 1800 MHz: 4x20 W ● 2300 MHz: 4x20 W ● 2500 MHz: 4x20 W ● 2600 MHz: 4x20 W ● 3500 MHz: 4x10 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3232.

Table 1-1146 Input power of an RRU3232

Type	Power
RRU3232	-48 V DC; voltage range: -36 V DC to -60 V DC

Table 1-1147 Dimensions and weight of an RRU3232

Type	Dimensions (H x W x D)	Weight (kg)
RRU3232	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 300 mm x 170 mm (24.7 L, with the housing)	● ≤ 19.5 (without the housing) ● ≤ 21 (with the housing)

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Table 1-1148 Power consumption of the entire base station (configured with an RRU3232)

Base Station Type	Power Consumption of the Entire Base Station
DBS	For details, see the **RRU3232** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3232.

Table 1-1149 Environmental specifications of an RRU3232

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3232	● With solar radiation of 1120 W/m^2: -40°C to +50°C ● Without solar radiation: -40°C to +55°C **NOTE** According to the installation scenario, traffic load, and carrier configuration, the output power of an RRU decreases when the RRU reaches a temperature 10°C less than its maximum operating temperature.	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3232.

Table 1-1150 Compliance standards for an RRU3232

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1151 lists the surge protection specifications of ports on an RRU3232.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1151 Surge protection specifications of ports on an RRU3232

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3232.

Table 1-1152 Specifications of CPRI ports on an RRU3232

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3232	2	2.5 or 4.9	Star, chain, or ring

Table 1-1153 RRU3232 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3232	4	The distance between the BBU and an RRU or between two RRUs cannot exceed 10 km. The distance between the BBU and the farthest cascaded RRU cannot exceed 20 km.

NOTE

If two CPRI ports of an RRU3232 are connected to the WiMAX baseband processing unit (BBP) and LTE TDD BBP, respectively, the data rates of the two CPRI ports can be different. If two CPRI ports are used in other scenarios, their data rates must be the same.

Antenna Capability

The following table lists the antenna capability of an RRU3232.

Table 1-1154 Antenna capability of an RRU3232

Type	TMA Support	RET Antenna Support
RRU3232	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.84 RRU3230E Technical Specifications

The RRU3230E is a low-power RRU. It applies to continuous coverage solutions of micro base stations in high traffic hotspots. It features easy site acquisition and easy deployment. Multiple RRU3230Es can be deployed together for capacity expansion.

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Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3230E.

Table 1-1155 Modes and frequency bands supported by an RRU3230E

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3230E	1800 (Band 3)	1710 to 1770	1805 to 1865	LTE FDD, LTE NB-IoT, LM	40
RRU3230E	1800 (Band 3)	1735 to 1785	1830 to 1880	LTE FDD, LTE NB-IoT, LM	40
RRU3230E	2600 (Band 7)	2500 to 2560	2620 to 2680	LTE FDD	40

RF Specifications

The following tables list RF specifications of an RRU3230E.

Table 1-1156 Receiver sensitivity of an RRU3230E

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3230E	2T2R	LTE FDD: ● 1800 MHz: IBW ≤ 20 MHz, -105.0 20 MHz < IBW ≤ 40 MHz, -103.0 ● 2600 MHz: IBW ≤ 20 MHz, -104.0 20 MHz < IBW ≤ 40 MHz, -102.0 LTE NB-IoT: -127.3	LTE FDD: ● 1800 MHz: IBW ≤ 20 MHz, -107.8 20 MHz < IBW ≤ 40 MHz, -105.8 ● 2600 MHz: IBW ≤ 20 MHz, -106.8 20 MHz < IBW ≤ 40 MHz, -104.8 LTE NB-IoT: -130.1

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-1157 Capacity and output power of an RRU3230E

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3230E	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz. LTE NB-IoT: 1 carrier. The bandwidth per carrier is 0.2 MHz. LM: 2 LTE carriers + 1 NB-IoT carrier	2x5 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Antenna Specifications

An RRU3230E can use internal or external antennas. The following table lists the electrical specifications of internal antennas.

NOTE

- The RRU using internal antennas does not provide ports for connecting external antennas and cannot be reconstructed to use external antennas.
- Internal antennas cannot work in the 2600 MHz frequency band.

Table 1-1158 Electrical specifications of internal antennas

Item	Indicator	Specifications
Internal antenna	Frequency range (MHz)	1710 MHz to 2170 MHz
	Polarization mode	±45°
	Gain (dBi)	11
	Horizontal half-power beamwidth (°)	65±10

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Item	Indicator	Specifications
	Vertical half-power beamwidth (°)	33±3
	Power capacity of each port (W)	10
Equipment VSWR	VSWR	< 2.0
	VSWR threshold	The VSWR varies according to the application environment. To reduce the probability of false alarms, it is recommended to set the VSWR threshold to 3 in normal scenarios or 4.5 in the worst case.

Engineering Specifications

The following tables list the equipment specifications of an RRU3230E.

Table 1-1159 Input power of an RRU3230E

Type	Power
RRU3230E	● Maximum operating voltage: 90 V AC to 290 V AC ● Rated operating voltage: 100 V AC to 240 V AC

Table 1-1160 Dimensions and weight of an RRU3230E

Type	Dimensions (H x W x D)	Weight (kg)
RRU3230E	● 290 mm x 210 mm x 68 mm (4 L, without antennas) ● 290 mm x 210 mm x 101 mm (6 L, with antennas)	● 5 (without antennas) ● 6 (with antennas)

Table 1-1161 Power consumption of an RRU3230E

Type	Frequency Band (MHz)	Power Consumption
RRU3230E	1800	When the output power is 2x5 W, the power consumption of an RRU3230E is as follows: ● Typical power consumption: 70 W ● Maximum power consumption: 90 W

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Type	Frequency Band (MHz)	Power Consumption
RRU3230E	2600	When the output power is 2x5 W, the power consumption of an RRU3230E is as follows: ● Typical power consumption: 70 W ● Maximum power consumption: 90 W

NOTE

- DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.
- The typical power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value.
- The maximum power consumption of an RF module is measured when the ambient temperature is 25°C and the traffic load reaches 100%. The actual power consumption has a 10% deviation from this value.

The following table lists the environmental specifications of an RRU3230E.

Table 1-1162 Environmental specifications of an RRU3230E

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3230E	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 95% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3230E.

Table 1-1163 Compliance standards for an RRU3230E

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3230E.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1164 Surge protection specifications of ports on an RRU3230E

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3230E.

Table 1-1165 Specifications of CPRI ports on an RRU3230E

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3230E	2	● Cascaded to BBU: 2.5, 4.9, or 9.8 ● Cascaded to Micro BTS3900: 2.5 or 4.9	● Cascaded to BBU: star, chain, or ring ● Cascaded to Micro BTS3900: chain

Table 1-1166 RRU3230E CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance (km)
RRU3230E	Cascaded to BBU: ● When the CPRI data rate is 2.5 Gbit/s: Cell bandwidth ≤ 5 MHz: 3 levels Cell bandwidth = 10 MHz: 2 levels Cell bandwidth ≥ 15 MHz: cascading not supported ● When the CPRI data rate is 4.9 Gbit/s: Cell bandwidth ≤ 5 MHz: 6 levels Cell bandwidth = 10 MHz: 4 levels Cell bandwidth ≥ 15 MHz: 3 levels ● When the CPRI data rate is 9.8 Gbit/s: 6 levels Cascaded to Micro BTS3900: 2 levels	Cascaded to BBU: ● When the LBBPd1 or UBBPd3 is configured: 20 ● When the LBBPd2 or UBBPd4 is configured: 40 ● When the LBBPd3, UBBPd5, or UBBPd6 is configured: Number of cells ≤ 3: 40 Number of cells ≥ 4: 20 ● LM: 20 Cascaded to Micro BTS3900: 5

Antenna Capability

The following table lists the antenna capability of an RRU3230E.

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Table 1-1167 Antenna capability of an RRU3230E

Type	TMA Support	RET Antenna Support
RRU3230E	Not supported	Not supported

1.3.85 RRU3229 Technical Specifications

The RRU3229 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3229.

Table 1-1168 Modes and frequency bands supported by an RRU3229

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3229	2600 (Band 7)	2500 to 2570	2620 to 2690	LTE FDD	40

RF Specifications

The following tables list RF specifications of an RRU3229.

Table 1-1169 Receiver sensitivity of an RRU3229

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3229	2T2R	-106.0	-108.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-1170 Capacity and output power of an RRU3229

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3229	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x60 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3229.

Table 1-1171 Input power of an RRU3229

Type	Power
RRU3229	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1172 Dimensions and weight of an RRU3229

Type	Dimensions (H x W x D)	Weight (kg)
RRU3229	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 300 mm x 170 mm (25 L, with the housing)	● ≤ 20 (without the housing) ● ≤ 22 (with the housing)

Table 1-1173 Power consumption of the entire base station (configured with an RRU3229)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3229** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3229.

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Table 1-1174 Environmental specifications of an RRU3229

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3229	● Without solar radiation: -40°C to +55°C ● With solar radiation of 1120 W/m^2: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3229.

Table 1-1175 Compliance standards for an RRU3229

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3229.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1176 Surge protection specifications of ports on an RRU3229

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3229.

Table 1-1177 Specifications of CPRI ports on an RRU3229

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3229	2	1.25, 2.5, or 4.9	Star, chain, or ring

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Table 1-1178 RRU3229 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3229	● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3229.

Table 1-1179 Antenna capability of an RRU3229

Type	TMA Support	RET Antenna Support
RRU3229	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.86 RRU3222 Technical Specifications

The RRU3222 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3222 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3222.

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Table 1-1180 Modes and frequency bands supported by an RRU3222

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3222	800 (Band 20)	832 to 862	791 to 821	LTE FDD, LM	20

RF Specifications

The following tables list RF specifications of an RRU3222.

Table 1-1181 Receiver sensitivity of an RRU3222

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3222	2T2R	LTE FDD: -106.4 LTE NB-IoT: -127.3	LTE FDD: -109.2 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-1182 Capacity and output power of an RRU3222

Type	Capacity	Maximum Output Power	Typical Power Configuration
RRU3222	LTE FDD: 1 carrier (with a bandwidth of 1.4, 3, 5, 10, 15, or 20 MHz); 2 carriers (each with a bandwidth of 10 MHz) LTE NB-IoT: 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3222.

Table 1-1183 Input power of an RRU3222

Type	Power
RRU3222	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1184 Dimensions and weight of an RRU3222

Type	Dimensions (H x W x D)	Weight (kg)
RRU3222	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 300 mm x 170 mm (25 L, with the housing)	● ≤ 17.5 (without the housing) ● ≤ 20 (with the housing)

Table 1-1185 Power consumption of the entire base station (configured with an RRU3222)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3222** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3222.

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Table 1-1186 Environmental specifications of an RRU3222

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3222	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3222.

Table 1-1187 Compliance standards for an RRU3222

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3222.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1188 Surge protection specifications of ports on an RRU3222

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3222.

Table 1-1189 Specifications of CPRI ports on an RRU3222

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3222	2	1.25 or 2.5	Star, chain, or ring

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Table 1-1190 RRU3222 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3222	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended Multimode (excluding GU) CPRI MUX: 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

Antenna Capability

The following table lists the antenna capability of an RRU3222.

Table 1-1191 Antenna capability of an RRU3222

Type	TMA Support	RET Antenna Support
RRU3222	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.87 RRU3221 Technical Specifications

The RRU3221 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3221.

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Table 1-1192 Modes and frequency bands supported by an RRU3221

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3221	2600 (Band 7)	2500 to 2570	2620 to 2690	LTE FDD	40

RF Specifications

The following tables list RF specifications of an RRU3221.

Table 1-1193 Receiver sensitivity of an RRU3221

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3221	2T2R	-106.0	-108.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1194 Capacity and output power of an RRU3221

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3221	LTE FDD: 2 carriers. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3221.

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Table 1-1195 Input power of an RRU3221

Type	Power
RRU3221	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1196 Dimensions and weight of an RRU3221

Type	Dimensions (H x W x D)	Weight (kg)
RRU3221	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 300 mm x 170 mm (25 L, with the housing)	● ≤ 20 (without the housing) ● ≤ 22 (with the housing)

Table 1-1197 Power consumption of the entire base station (configured with an RRU3221)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3221** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3221.

Table 1-1198 Environmental specifications of an RRU3221

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3221	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

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The following table lists the compliance standards for an RRU3221.

Table 1-1199 Compliance standards for an RRU3221

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3221.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-1200 Surge protection specifications of ports on an RRU3221

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3221.

Table 1-1201 Specifications of CPRI ports on an RRU3221

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3221	2	1.25, 2.5, or 4.9	Star, chain, or ring

Table 1-1202 RRU3221 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3221	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended ● When the CPRI data rate is 4.9 Gbit/s – Cell bandwidth ≤ 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3221.

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Table 1-1203 Antenna capability of an RRU3221

Type	TMA Support	RET Antenna Support
RRU3221	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.88 RRU3220E Technical Specifications

The RRU3220E is a low-power RRU. It applies to continuous coverage solutions of micro base stations in high traffic hotspots. It features easy site acquisition and easy deployment. Multiple RRU3220Es can be deployed together for capacity expansion.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3220E.

Table 1-1204 Modes and frequency bands supported by an RRU3220E

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3220E	1800 (Band 3)	1710 to 1770	1805 to 1865	LTE FDD	20

RF Specifications

The following tables list RF specifications of an RRU3220E.

Table 1-1205 Receiver sensitivity of an RRU3220E

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3220E	2T2R	-103.0	-105.8

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

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Table 1-1206 Capacity and output power of an RRU3220E

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3220E	LTE FDD: 1 carrier. The bandwidth per carrier is 5, 10, 15, or 20 MHz.	2x5 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3220E.

Table 1-1207 Input power of an RRU3220E

Type	Power
RRU3220E	● 220 V AC single-phase; voltage range: 176 V AC to 290 V AC ● 110 V AC dual-live-wire; voltage range: 90/180 V AC to 135/270 V AC

Table 1-1208 Dimensions and weight of an RRU3220E

Type	Dimensions (H x W x D)	Weight (kg)
RRU3220E	290 mm x 210 mm x 60 mm (3.6 L, without antennas)	4.5 (without antennas)

Table 1-1209 Power consumption of the entire base station (configured with an RRU3220E)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3220E** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3220E.

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Table 1-1210 Environmental specifications of an RRU3220E

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3220E	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3220E.

Table 1-1211 Compliance standards for an RRU3220E

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3220E.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1212 Surge protection specifications of ports on an RRU3220E

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3220E.

Table 1-1213 Specifications of CPRI ports on an RRU3220E

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3220E	2	2.5/4.9	Star or chain

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Table 1-1214 RRU3220E CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3220E	● When the CPRI data rate is 2.5 Gbit/s: – Cell bandwidth ≤ 5 MHz: 4 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not supported ● When the CPRI data rate is 4.9 Gbit/s: – Cell bandwidth ≤ 5 MHz: 4 levels – Cell bandwidth = 10 MHz: 4 levels – Cell bandwidth ≥ 15 MHz: 2 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3220E.

Table 1-1215 Antenna capability of an RRU3220E

Type	TMA Support	RET Antenna Support
RRU3220E	Not supported	Not supported

1.3.89 RRU3220 Technical Specifications

The RRU3220 is a multimode remote radio unit. With the software-defined radio (SDR) technology, the RRU3220 can work in multiple modes through software configuration.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3220.

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Table 1-1216 Modes and frequency bands supported by an RRU3220

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3220	800 (Band 20)	832 to 847	791 to 806	LTE FDD, LM	15
RRU3220	800 (Band 20)	842 to 862	801 to 821	LTE FDD, LM	20

RF Specifications

The following tables list RF specifications of an RRU3220.

Table 1-1217 Receiver sensitivity of an RRU3220

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3220	2T2R	LTE FDD: -106.1 LTE NB-IoT: -127.3	LTE FDD: -108.9 LTE NB-IoT: -130.1

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- The LTE NB-IoT receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 200 kHz bandwidth and a 15 kHz subcarrier spacing based on the FRC A14-1 in Annex A.14 (π/2 BPSK, R = 1/3, one RB) standard.

Table 1-1218 Capacity and output power of an RRU3220

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3220	LTE FDD: 1 carrier (with a bandwidth of 5, 10, 15, or 20 MHz); 2 carriers (each with a bandwidth of 10 MHz) LTE NB-IoT: 1 carrier	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) and NB-IoT Typical Power Configurations (RRU).

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NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3220.

Table 1-1219 Input power of an RRU3220

Type	Power
RRU3220	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1220 Dimensions and weight of an RRU3220

Type	Dimensions (H x W x D)	Weight (kg)
RRU3220	● 400 mm x 220 mm x 140 mm (12 L, without the housing) ● 400 mm x 240 mm x 160 mm (15 L, with the housing)	● ≤ 13.5 (without the housing) ● ≤ 15 (with the housing)

Table 1-1221 Power consumption of the entire base station (configured with an RRU3220)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3220** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3220.

Table 1-1222 Environmental specifications of an RRU3220

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3220	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

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NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3220.

Table 1-1223 Compliance standards for an RRU3220

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3220.

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NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1224 Surge protection specifications of ports on an RRU3220

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3220.

Table 1-1225 Specifications of CPRI ports on an RRU3220

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3220	2	1.25 or 2.5	Star, chain, or ring

Table 1-1226 RRU3220 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3220	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended Multimode (excluding GU) CPRI MUX: 4 levels	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20 Multimode (including NB-IoT): 20

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Antenna Capability

The following table lists the antenna capability of an RRU3220.

Table 1-1227 Antenna capability of an RRU3220

Type	TMA Support	RET Antenna Support
RRU3220	Not supported	AISG2.0 and AISG1.1

NOTE

- When an RRU3220 uses a tower mounted amplifier (TMA), an external bias tee (BT) is required.
- For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.90 RRU3203 Technical Specifications

The RRU3203 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3203.

Table 1-1228 Modes and frequency bands supported by an RRU3203

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3203	700 (Band 12)	699.25 to 714.75	729.25 to 744.75	LTE FDD	Single-carrier: 15 Dual-carrier: 11

RF Specifications

The following tables list RF specifications of an RRU3203.

Table 1-1229 Receiver sensitivity of an RRU3203

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3203	2T2R	LTE FDD: -105.8	LTE FDD: -108.6

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NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1230 Capacity and output power of an RRU3203

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3203	LTE FDD: 2 carriers. The bandwidth per carrier is 1.4, 3, 5, 10, or 15 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3203.

Table 1-1231 Input power of an RRU3203

Type	Power
RRU3203	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1232 Dimensions and weight of an RRU3203

Type	Dimensions (H x W x D)	Weight (kg)
RRU3203	● 480 mm x 356 mm x 140 mm (24 L, without the housing) ● 485 mm x 381 mm x 170 mm (31.4 L, with the housing)	● ≤ 21 (without the housing) ● ≤ 24 (with the housing)

Table 1-1233 Power consumption of the entire base station (configured with an RRU3203)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3203** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

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NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3203.

Table 1-1234 Environmental specifications of an RRU3203

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3203	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

The following table lists the compliance standards for an RRU3203.

Table 1-1235 Compliance standards for an RRU3203

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65

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Item	Standard
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3203.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1236 Surge protection specifications of ports on an RRU3203

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3203.

Table 1-1237 Specifications of CPRI ports on an RRU3203

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3203	2	1.25 or 2.5	Star, chain, or ring

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Table 1-1238 RRU3203 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3203	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3203.

Table 1-1239 Antenna capability of an RRU3203

Type	TMA Support	RET Antenna Support
RRU3203	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.91 RRU3201 Technical Specifications

The RRU3201 is a remote radio unit working in LTE FDD mode.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3201.

Table 1-1240 Modes and frequency bands supported by an RRU3201

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3201	700 (Band 13)	777 to 787	746 to 756	LTE FDD	10
RRU3201	2600 (Band 7)	2500 to 2520	2620 to 2640	LTE FDD	30

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Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3201	2600 (Band 7)	2510 to 2560	2630 to 2680	LTE FDD	30
RRU3201	2600 (Band 7)	2550 to 2570	2670 to 2690	LTE FDD	30

RF Specifications

The following tables list RF specifications of an RRU3201.

Table 1-1241 Receiver sensitivity of an RRU3201

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3201	2T2R	-105.8	-108.6

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- The LTE FDD receiver sensitivity, as recommended in 3GPP TS 36.104, is measured under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

Table 1-1242 Capacity and output power of an RRU3201

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3201 (700 MHz)	LTE FDD: 1 carrier. The bandwidth per carrier is 1.4, 3, 5, or 10 MHz.	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .
RRU3201 (2600 MHz)	LTE FDD: 2 carriers. The bandwidth per carrier is 10, 15, or 20 MHz.	2x40W	

NOTE

For details about power configuration principles for RF modules, see **1.4.1 Power Configuration Principles for RF Modules**.

Engineering Specifications

The following tables list the equipment specifications of an RRU3201.

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Table 1-1243 Input power of an RRU3201

Type	Power
RRU3201	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1244 Dimensions and weight of an RRU3201

Type	Dimensions (H x W x D)	Weight (kg)
RRU3201	● 480 mm x 270 mm x 140 mm (18 L, without the housing) ● 485 mm x 285 mm x 170 mm (23.5 L, with the housing)	● ≤ 17.5 (without the housing) ● ≤ 19 (with the housing)

Table 1-1245 Power consumption of the entire base station (configured with an RRU3201)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3201** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

NOTE

DC RRUs can use external power modules (such as AC/DC power modules, OPM15M, and OPM50M) to support AC scenarios. For details about the external power modules, see user guides of the corresponding models.

The following table lists the environmental specifications of an RRU3201.

Table 1-1246 Environmental specifications of an RRU3201

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3201	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of an RF module decreases when the RF module reaches a temperature 10°C less than its maximum operating temperature.

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The following table lists the compliance standards for an RRU3201.

Table 1-1247 Compliance standards for an RRU3201

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3201.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-1248 Surge protection specifications of ports on an RRU3201

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3201.

Table 1-1249 Specifications of CPRI ports on an RRU3201

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3201	2	1.25 or 2.5	Star, chain, or ring

Table 1-1250 RRU3201 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3201	LTE FDD: ● When the CPRI data rate is 1.25 Gbit/s: cascading not supported ● When the CPRI data rate is 2.5 Gbit/s – Cell bandwidth ≤ 5 MHz: 3 levels – Cell bandwidth = 10 MHz: 2 levels – Cell bandwidth ≥ 15 MHz: cascading not recommended	LTE FDD: ● When the LBBPc or LBBPd1 is configured: 20 ● When the LBBPd2, UBBPd3, UBBPd4, UBBPd5, UBBPd6, UBBPg, or UBBPe is configured: 40 ● When the LBBPd3 is configured: – Number of cells ≤ 3: 40 – Number of cells ≥ 4: 20

Antenna Capability

The following table lists the antenna capability of an RRU3201.

Table 1-1251 Antenna capability of an RRU3201

Type	TMA Support	RET Antenna Support
RRU3201	Supported	AISG2.0 and AISG1.1

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NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.92 RRU3168 Technical Specifications

The RRU3168 is a remote radio unit working in LTE TDD mode. An RRU3168 supports only one carrier.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3168.

Table 1-1252 Modes and frequency bands supported by an RRU3168

Type	Frequency Band (MHz)	Frequency Range (MHz)	Mode	IBW (MHz)	OBW (MHz)
RRU3168	1900	1900 to 1920	LTE TDD	20	20

RF Specifications

Table 1-1253 lists radio frequency (RF) specifications of an RRU3168.

Table 1-1253 RF specifications of an RRU3168

Type	TX/RX Channel	Capacity	Maximum Output Power	Typical Output Power
RRU3168	8T8R	1 carrier. The carrier bandwidth is 20 MHz.	8x10 W when the uplink-downlink subframe configuration is 3:1	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

- **ATBR** in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.
- **CxD W** in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3168.

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Table 1-1254 Input power of an RRU3168

Type	Power
RRU3168	-48 V DC; voltage range: -36 V DC to -60 V DC

Table 1-1255 Dimensions and weight of an RRU3168

Type	Dimensions (H x W x D)	Weight (kg)
RRU3168	550 mm x 320 mm x 135 mm (24 L, without the housing)	≤ 24 (without the housing)

Table 1-1256 Power consumption of the entire base station (configured with an RRU3168)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3168** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3168.

Table 1-1257 Environmental specifications of an RRU3168

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3168	● With solar radiation of 1120 W/m^2: -40°C to +45°C ● Without solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3168.

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Table 1-1258 Compliance standards for an RRU3168

Item	Standard
RF	3GPP TS 36.141
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

Table 1-1259 lists the surge protection specifications of ports on an RRU3168.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-1259 Surge protection specifications of ports on an RRU3168

Port	Surge Protection Mode	Surge Protection Specifications
Power supply port	Surge current	20 kA

Specifications of IR Ports

The following tables list the specifications of IR ports on an RRU3168.

Table 1-1260 Specifications of IR ports on an RRU3168

Type	Number of IR Ports	IR Data Rate (Gbit/s)	IR Topology
RRU3168	2	9.8	Star, chain, or load sharing

Table 1-1261 RRU3168 IR cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3168	N/A	10

Antenna Capability

The following table lists the antenna capability of an RRU3168.

Table 1-1262 Antenna capability of an RRU3168

Type	TMA Support	RET Antenna Support
RRU3168	Not supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.93 RRU3008 Technical Specifications

The RRU3008 is a type of remote radio unit working in GSM mode. An RRU3008 supports a maximum of eight carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3008.

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Table 1-1263 Modes and frequency bands supported by an RRU3008

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3008 AC V1/ RRU3008 DC V1	850	824 to 849	869 to 894	GSM	12.5
RRU3008 AC V1/ RRU3008 DC V1	900 EGSM	880 to 915	925 to 960	GSM	12.5
RRU3008 AC V1/ RRU3008 DC V1	900 EGSM	880 to 905	925 to 950	GSM	12.5
RRU3008 AC V1/ RRU3008 DC V1	900 PGSM	890 to 915	935 to 960	GSM	12.5
RRU3008 AC V1/ RRU3008 DC V1	900 CMCC	885 to 910	930 to 955	GSM	12.5
RRU3008 AC V1/ RRU3008 DC V1	1800	1710 to 1755	1805 to 1850	GSM	15
RRU3008 AC V1/ RRU3008 DC V1	1800	1740 to 1785	1835 to 1880	GSM	15

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Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode	IBW (MHz)
RRU3008 AC V1/ RRU3008 DC V1	1900	1850 to 1890	1930 to 1970	GSM	15
RRU3008 AC V1/ RRU3008 DC V1	1900	1870 to 1910	1950 to 1990	GSM	15
RRU3008 AC V2/ RRU3008 DC V2	900 EGSM	880 to 915	925 to 960	GSM	20
RRU3008 AC V2/ RRU3008 DC V2	900 PGSM	890 to 915	935 to 960	GSM	20
RRU3008 AC V2/ RRU3008 DC V2	900 CMCC	885 to 910	930 to 955	GSM	20

RF Specifications

The following tables list RF specifications of an RRU3008.

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Table 1-1264 Receiver sensitivity of an RRU3008

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3008 AC V1/RRU3008 DC V1	2T2R	-113.0	-115.8
RRU3008 AC V2/RRU3008 DC V2	2T2R	● 900 EGSM: -113.3 ● 900 PGSM: -113.5 ● 900 CMCC: -113.5	● 900 EGSM: -116.1 ● 900 PGSM: -116.3 ● 900 CMCC: -116.3

NOTE

ATBR in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.

Table 1-1265 Capacity and output power of an RRU3008

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3008	8 carriers	2x40 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

NOTE

CxD W in the **Output Power** column indicates that the RF module has *C* transmit channels and the maximum output power of each transmit channel is *D* W.

Engineering Specifications

The following tables list the equipment specifications of an RRU3008.

Table 1-1266 Input power of an RRU3008

Type	Power
RRU3008 DC V1/ RRU3008 DC V2	-48 V DC; voltage range: -36 V DC to -57 V DC

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Table 1-1267 Dimensions and weight of an RRU3008

Type	Dimensions (H x W x D)	Weight (kg)
RRU3008	● 485 mm x 380 mm x 170 mm (32 L, with the housing) ● 480 mm x 356 mm x 140 mm (24 L, without the housing)	● 25 (with the housing) ● 23 (without the housing)

Table 1-1268 Power consumption of the entire base station (configured with an RRU3008)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3008** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3008.

Table 1-1269 Environmental specifications of an RRU3008

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3008 AC V1/RRU3008 DC V1	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa
RRU3008 AC V2/RRU3008 DC V2	● Without solar radiation: -40°C to +55°C ● With solar radiation: -40°C to +50°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3008.

Table 1-1270 Compliance standards for an RRU3008

Item	Standard
RF	3GPP TS 45.005
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"

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Item	Standard
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3008.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

Table 1-1271 Surge protection specifications of ports on an RRU3008

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	40 kA

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Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3008.

Table 1-1272 Specifications of CPRI ports on an RRU3008

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3008 AC V1/ RRU3008 DC V1	2	● 850 MHz/1900 MHz: 1.25 ● 900 MHz: 1.25 ● 1800 MHz: 1.25 or 2.5	Star, chain, or ring
RRU3008 AC V2/ RRU3008 DC V2	2	1.25 or 2.5	Star, chain, or ring

Table 1-1273 RRU3008 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3008	6	40

Antenna Capability

The following table lists the antenna capability of an RRU3008.

Table 1-1274 Antenna capability of an RRU3008

Type	TMA Support	RET Antenna Support
RRU3008	Supported	AISG2.0 and AISG1.1

NOTE

For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

1.3.94 RRU3004 Technical Specifications

The RRU3004 is a type of remote radio unit working in GSM mode. An RRU3004 supports a maximum of two carriers.

Supported Modes and Frequency Bands

The following table lists the modes and frequency bands supported by an RRU3004.

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Table 1-1275 Modes and frequency bands supported by an RRU3004

Type	Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	Mode
RRU3004 DC/RRU3004 AC	900 EGSM	880 to 915	925 to 960	GSM
RRU3004 DC/RRU3004 AC	900 PGSM	890 to 915	935 to 960	GSM
RRU3004 DC/RRU3004 AC	1800	1710 to 1785	1805 to 1880	GSM

RF Specifications

The following tables list RF specifications of an RRU3004.

Table 1-1276 Receiver sensitivity of an RRU3004

Type	TX/RX Channel	Receiver Sensitivity with One Antenna (dBm)	Receiver Sensitivity with Two Antennas (dBm)
RRU3004	2T2R	-113.0	-115.8

NOTE

ATBR in the **TX/RX Channel** column indicates that the RF module uses *A* transmit channels and *B* receive channels.

Table 1-1277 Capacity and output power of an RRU3004

Type	Capacity	Maximum Output Power	Typical Output Power
RRU3004	2 carriers	● 900 EGSM: 2x30 W ● 900 PGSM: 2x30 W ● 1800 MHz: 2x20 W	For details, see Typical Power Configuration Reference for RRU (Excluding NB-IoT) .

Engineering Specifications

The following tables list the equipment specifications of an RRU3004.

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Table 1-1278 Input power of an RRU3004

Type	Power
RRU3004 DC	-48 V DC; voltage range: -36 V DC to -57 V DC

Table 1-1279 Dimensions and weight of an RRU3004

Type	Dimensions (H x W x D)	Weight (kg)
RRU3004	● 485 mm x 380 mm x 130 mm (24 L, with the housing) ● 480 mm x 356 mm x 100 mm (18 L, without the housing)	● 17 (with the housing) ● 15 (without the housing)

Table 1-1280 Power consumption of the entire base station (configured with an RRU3004)

Base Station Type	Power Consumption of the Entire Base Station
DBS	See the **RRU3004** sheet in Base Station Power Consumption Specifications (Configured with 3000 Series RRUs).

The following table lists the environmental specifications of an RRU3004.

Table 1-1281 Environmental specifications of an RRU3004

Type	Operating Temperature	Relative Humidity	Absolute Humidity	Atmospheric Pressure
RRU3004	● Without solar radiation: -40°C to +50°C ● With solar radiation: -40°C to +45°C	5% RH to 100% RH	1 g/m^3 to 30 g/m^3	70 kPa to 106 kPa

The following table lists the compliance standards for an RRU3004.

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Table 1-1282 Compliance standards for an RRU3004

Item	Standard
RF	3GPP TS 45.005
Operating environment	ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations"
Storage environment	ETSI EN300019-1-1 V2.1.4 (2003-04) Class 1.2: "Weatherprotected, not temperature-controlled storage locations" **NOTE** ● The validity period is one year. ● The product can function properly within the validity period if the storage environment meets the preceding standards.
Shockproof protection	NEBS GR63 zone4
Ingress protection rating	IP65
Surge protection	● IEC 62305-1 Protection against lightning - Part 1: General principles ● IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard ● IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures ● ITU-T K.35 Bonding configurations and earthing at remote electronic sites ● ITU-T K.56 Protection of radio base stations against lightning discharges ● ITU-T K.97 Lightning protection of distributed base stations ● ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers ● YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations ● GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations)

The following table lists the surge protection specifications of ports on an RRU3004.

NOTE

- Unless otherwise specified, the surge protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

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Table 1-1283 Surge protection specifications of ports on an RRU3004

Port	Surge Protection Mode	Surge Protection Specifications
DC power supply port	Surge current	20 kA
AC power supply port	Surge current	40 kA

Specifications of CPRI Ports

The following tables list the specifications of CPRI ports on an RRU3004.

Table 1-1284 Specifications of CPRI ports on an RRU3004

Type	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	CPRI Topology
RRU3004	2	1.25	Star, chain, or ring

Table 1-1285 RRU3004 CPRI cascading levels and maximum distance from the BBU

Type	Cascading Level	Maximum Distance from the BBU (km)
RRU3004	6	40

Antenna Capability

The following table lists the antenna capability of an RRU3004.

Table 1-1286 Antenna capability of an RRU3004

Type	TMA Support	RET Antenna Support
RRU3004	Not supported	AISG1.1

NOTE

- An external BT is required if an RRU3004 needs to be configured with a tower-mounted amplifier (TMA).
- For RF modules supporting RET antennas, the feeding voltage is 12 V and feeding current is 2.3 A.

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1.4 Typical Power Configuration Reference for RF Modules

This section describes the power configuration principles and typical power configurations for RF modules.

1.4.1 Power Configuration Principles for RF Modules

This section describes the power specifications of RF modules, RF channel configuration principles, and remarks.

RF Specifications

When you configure power for RF modules, comply with the following power specifications:

- GSM: multi-carrier base transceiver station (MCBTS) in 3GPP TS 45.005
- UMTS: 3GPP TS 25.141
- LTE: 3GPP TS 36.141
- NR: 3GPP TS 38.104
- RF modules serving multiple modes: multi-standard radio (MSR) in 3GPP TS 37.141

RF Channel Configuration Principles

Common Principles

- In this document, each value in the **Output Power per Carrier (W)** column indicates the maximum output power of each carrier under the corresponding configuration while ensuring the network performance. The actually configured carrier power of RF modules can be less than or equal to the value in the **Output Power per Carrier (W)** column in this document. The specifications that are not supported in this document may be configurable. Only the performance with the configuration within the committed specification scope is ensured.
- In this document, a transmit channel is represented by PA. For example, *n* transmit channels of an RF module are represented by PA1, PA2, ..., and PA*n*. The two transmit channels of a 2T RF module are represented by PA1 and PA2. Unless otherwise specified, the power configuration values of all PAs of an RF module can be interchanged.
- In MIMO carrier scenarios, **MxN W** indicates that an MIMO carrier is configured in *M* PAs, and each PA is configured with power of *N* W.
- For a *n*TX RF module (*n* is 2, 4, or 8), the restriction is as follows:
  $\sum_{i=1}^{N} PAi \times Pi \le PAt \times P$, where PAi indicates the number of carriers of transmit channel i; Pi indicates the output power of each carrier of transmit channel i; PAt indicates the total number of carriers configured in this RF module; P indicates the maximum output power supported by each carrier.
- The output power is 1 dB less than the standard power when an RF module is located at a height of 3500 m to 4500 m; and is 2 dB less than the standard power when the RF module is located at a height of 4500 m to 6000 m.

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GSM Configuration Principles

- The typical configuration tables for PAs of GSM RF modules provided in this document only list power values in GSMK mode because power values in 8PSK mode cannot be configured.
- **Output Power per GSM Carrier With Dynamic Power Sharing** is the available maximum output power for every carrier during dynamic power sharing. If this power is exceeded, the system cannot guarantee the network performance and will report an alarm.

  NOTE

  - Before using the power sharing function, ensure that the license for Resource-BSC6900-LGMIDPS-Dynamic Power Sharing (per TRX) has been purchased.
  - To enable the power sharing function, run the **SET GCELLCHMGAD** command with **QTRUPWRSHARE** set to **DYNAMIC** and **MultiGSMDynPWShareSW** set to **ON**.
  - Power sharing assumes a random distribution of UEs in the cell.
  - Power sharing cannot be used together with the GBFD-117002 IBCA (Interference Based Channel Allocation), GBFD-117001 Flex MAIO, GBFD-118701 RAN Sharing, and GBFD-114001 Extended Cell features.
- If the output power per carrier on a single PA is required to be 60 W, the corresponding power license must be purchased.
- The output power per carrier of an RF module in a GBTS is the same as that of the same RF module in an eGBTS. For GBTSs, the unit of the output power per carrier is W. For eGBTSs, the unit of the output power per carrier is dBm. For details about GSM available power, see **1.4.2 GSM Available Power Supported by RRUs**.
- The conversion relationship between unit W and unit dBm is as follows: dBm = 10 x log (1000 x W, 10) For example, when there is only one carrier on RRU3929 (GSM, 1800 MHz), the output power per carrier for a GBTS is 60 W (GMSK), and that for an eGBTS is 47.8 dBm (GMSK) after rounding off the result of the following formula: 10 x log (1000 x 60, 10).

LTE Configuration Principles

- When two LTE FDD carriers are configured, it is recommended that the power spectrum density (PSD) of the two carriers be set to the same value. PSD = Carrier output power/ Carrier bandwidth (1.4 MHz and 3 MHz bandwidths are considered as 5 MHz bandwidth in this formula.)
- The formulas for calculating the minimum NB-IoT power per PA for an RF module are as follows:
  - Minimum NB-IoT power per PA for an RF module when NB-IoT cells work in guardband or inband mode= Total rated power per PA/10000
  - Minimum NB-IoT power per PA for an RF module when NB-IoT cells work in standalone mode= Total rated power per PA/100

  NOTE

  For example, an RRU5909 supports a maximum output power configuration of 2x60 W. The minimum NB-IoT power per PA for an RRU5909 when NB-IoT cells work in standalone mode is calculated as follows: Minimum NB-IoT power per PA for an RRU5909 = 60 W/100 = 0.6 W.
- When two LTE NB-IoT carriers are configured, the bandwidth spacing between the two NB-IoT carriers cannot be greater than 300 kHz.

Multi-RAT Configuration Principles

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- At most two RATs of carriers can be configured on a single channel. Power of two transmit channels must be balanced if possible.
- Non-MSR and MSR
  - Non-MSR: Multiple RATs cannot be configured on one RF channel. For example, for RF module A supporting GU, GSM carriers are carried over channel PA1 while UMTS carriers are carried over channel PA2.
  - MSR: One RF channel can be configured with two RATs.
- The GU frequency spacing can be calculated using the following formula: GU frequency spacing ≥ [(GSM bandwidth/2) + (UMTS bandwidth/2)].

1.4.2 GSM Available Power Supported by RRUs

This section describes GSM RF power configurations supported by RRUs.

The following table lists the available power configurations for each carrier of GSM RF modules.

The "Output Power per Carrier" is the same for an RF module working in either a GBTS or an eGBTS. For a GBTS, the unit of "Output Power per Carrier" is W. For an eGBTS, the unit of "Output Power per Carrier" is dBm.

Table 1-1287 Available power configurations for each carrier of GSM RF modules

Output Power per Carrier (Unit: W)	Output Power per Carrier (Unit: dBm)
80.0	49.0
60.0	47.8
40.0	46.0
31.0	44.9
30.0	44.8
27.0	44.3
25.0	44.0
20.0	43.0
16.0	42.0
15.0	41.8
14.0	41.5
13.3	41.2
13.0	41.1
12.0	40.8
11.0	40.4
10.0	40.0

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Output Power per Carrier (Unit: W)	Output Power per Carrier (Unit: dBm)
9.5	39.8
9.0	39.5
8.5	39.3
8.0	39.0
7.5	38.8
7.0	38.5
6.0	37.8
5.5	37.4
5.0	37.0
4.0	36.0
3.7	35.7
3.1	34.9
3.0	34.8
2.5	34.0
2.0	33.0
1.5	31.8
1.0	30.0

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