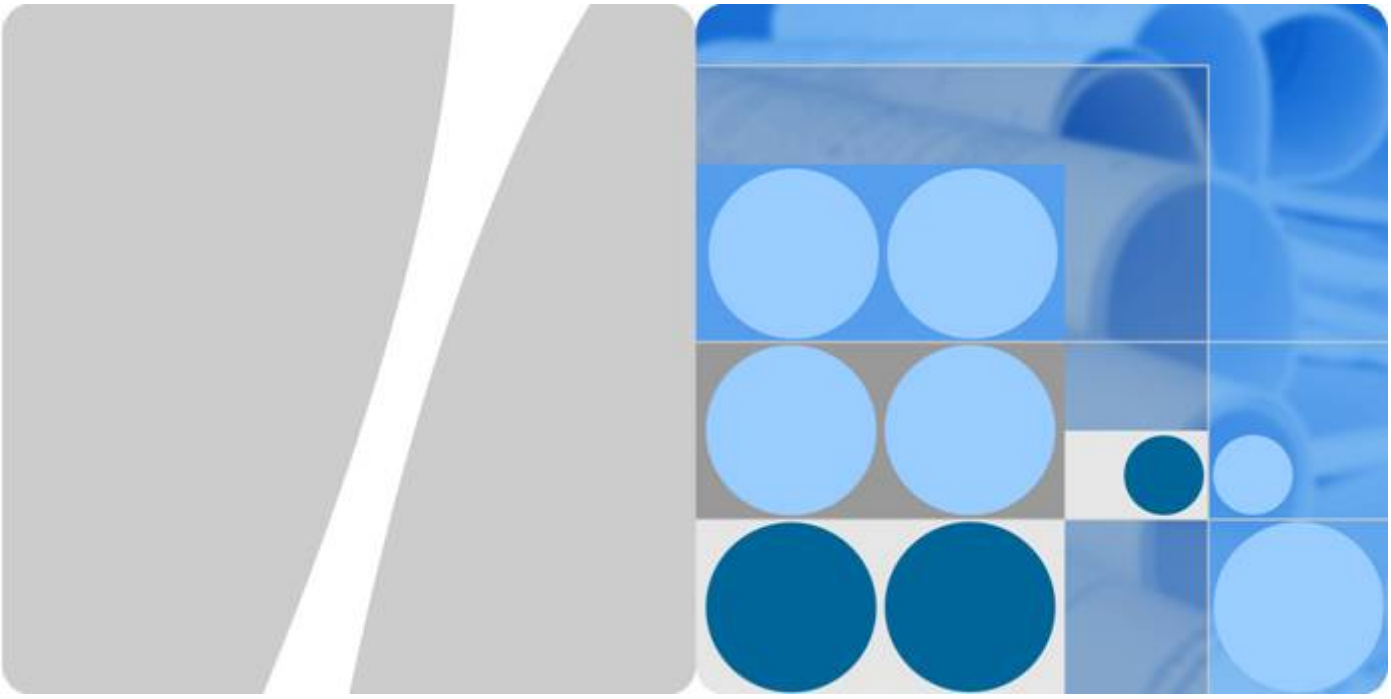

SingleRAN

SRAN11.1

3900 Series Base Station Configuration Principles

Issue 05

Date 2016-08-01

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1 3900 Series Base Station Configuration Principles

Overview

This document describes the principles for configuring hardware in 3900 series base stations. Based on the specific configuration requirements in this document, the quantities of components to be configured in a base station can be calculated and planned.

The exteriors of components or cables in this document are for reference only. The actual exteriors may be different.

Product Version

Product	Solution Version	Product Version
BTS3900	● SRAN11.1 ● GBSS18.1 ● RAN18.1 ● eRAN11.1	V100R011C10
BTS3900A		
BTS3900L		
BTS3900AL		
DBS3900		
BTS3900C		

Intended Audience

This document is intended for:

- Technical support engineers
- System engineers

1.1 Changes in 3900 Series Base Station Configuration Principles

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1.1 Changes in 3900 Series Base Station Configuration Principles

This chapter describes changes in *3900 Series Base Station Configuration Principles* of each version.

05 (2016-08-01)

Compared with Issue 04 (2016-06-25) of SRAN11.1, this issue does not include any new topics or exclude any topics.

Compared with Issue 04 (2016-06-25) of SRAN11.1, this issue includes the following changes.

Topic	Change Description
4.3.7 RF Modules Working at Band 1 (2100 MHz)	Added the RRU3953.

04 (2016-06-25)

Compared with Issue 03 (2016-05-31) of SRAN11.1, this issue does not include any new topics or exclude any topics.

Compared with Issue 03 (2016-05-31) of SRAN11.1, this issue includes the following changes.

Topic	Change Description
4.3.7 RF Modules Working at Band 1 (2100 MHz)	Added the RRU3971.

03 (2016-05-31)

Compared with Issue 02 (2016-04-20) of SRAN11.1, this issue does not include any new topics or exclude any topics.

Compared with Issue 02 (2016-04-20) of SRAN11.1, this issue includes the following changes.

Topic	Change Description
4.2.3.4 Common Board Configurations	Added the UMPTe and UBBPe.

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02 (2016-04-20)

Compared with Issue 01 (2016-03-07) of SRAN11.1, this issue includes the following new topic:

4.4.6 AAU3961 Configurations

Compared with Issue 01 (2016-03-07) of SRAN11.1, this issue includes the following changes.

Topic	Change Description
4.4.3 AAU3940 Configurations	Added the AAU3940 operating in AWS and PCS.

Compared with Issue 01 (2016-03-07) of SRAN11.1, this issue does not exclude any topics.

01 (2016-03-07)

Compared with Draft A (2015-12-30) of SRAN11.1, this issue does not include any changes.

Draft A (2015-12-30)

Compared with Issue 05 (2015-10-30) of SRAN10.1, this issue includes the following new topic:

Topic	Change Description
4.3.3 RF Modules Working at Band 8 (900 MHz)	Added the MRFU V6.
4.3.6 RF Modules Working at Band 2 (1900 MHz)	Added the RRU3971.
4.3.7 RF Modules Working at Band 1 (2100 MHz)	Added the RRU3952 and RRU3958.
4.3.9 RF Modules Working at Band 4 (AWS)	Added the RRU3971.
Hardware License Configurations of Multimode Base Stations	Updated descriptions of multimode licenses for RRUs and AAUs.

Compared with Issue 05 (2015-10-30) of SRAN10.1, this issue does not include any changes or exclude any topics.

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2 Overview

This document describes the principles for configuring single-mode and multimode 3900 series base stations.

NOTE

Definition for high-power RRUs/RFUs, ultra-high-power RRUs, and low-power RRUs/RFUs are as follows:

- For each low-power RFU, the sum of the maximum transmit power of all channels is less than or equal to 125 W.
- For each high-power RFU, the sum of the maximum transmit power of all channels is equal to 160 W.
- For each low-power RRU, the sum of the maximum transmit power of all channels is less than or equal to 80 W.
- For each high-power RRU, the sum of the maximum transmit power of all channels is equal to 120 W.
- For each ultra-high-power RRU, the sum of the maximum transmit power of all channels is equal to 160 W.

Introduction to 3900 Series Base Stations

3900 series base stations, which use baseband units (BBUs) and RF modules as the main devices, adopt the industry-leading modular design to support multiple RATs and application forms, and therefore are applicable to various installation scenarios, greatly reducing costs in site acquisition, capacity expansion, and environment protection during network deployment and operation. In addition, 3900 series base stations support multiple solutions for evolution from GSM to UMTS and then to LTE.

- The BBU supports multimode applications.

  When being configured with boards supporting GSM, UMTS, and LTE, a BBU can support these modes. In separate-MPT scenarios, one BBU supports two modes, and two BBUs support three or four modes. In co-MPT scenarios, one BBU supports three or four modes.

  NOTE

  The BBUs in this document include the BBU3900, BBU3910, and BBU3910A.

- RRUs and RFUs are radio frequency units and support multimode and multiband applications.
  - To meet operators' requirements, the software defined radio (SDR) technology is introduced, which enables RF modules to support any two or three modes among

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GSM, UMTS, and LTE using different software configurations. A base station can be configured with single-mode RF modules of GSM, UMTS, and LTE and multimode RF modules to support any single mode as well as two or three modes including GSM, UMTS, and LTE.

- RF modules working in different frequency bands can be used together to support multi-band applications.
- High-power RFUs are as follows: MRFUd/MRFUe/WRFUd/WRFUe/LRFUe/CRFUd/CRFUe. These RFUs are used together with the BTS3900 (Ver.C)/(Ver.D)/(Ver.E) cabinets.
- High-power RRUs are as follows: RRU3829/RRU3929/RRU3942/RRU3841/RRU3961/RRU3832/RRU3839/RRU3939/RRU3952/RRU3959/RRU3262/RRU3953/RRU3962/RRU3962d/RRU3965/RRU3965d. These RRUs are used together with the DCDU-11B or DCDU-12B. Ultra-high-power RRUs are used together with the DCDU-12B. Except the preceding RRUs, other RRUs are low-power ones. In addition, the 2100 MHz AAU3910, AWS AAU3910, AAU3920, AAU3940, and AAU3911 are also high-power modules.
- Blade RRUs are as follows: RRU3962/RRU3965/RRU3936/RRU3938/RRU3939/RRU3953/RRU3952/RRU3959/RRU3958/RRU3971/RRU3668/RRU3824/RRU3826/RRU3838/RRU3832/RRU3839, and RRU3268/RRU3260/RRU3262/RRU3249/RRU3269/RRU3281.

Description

The following table describes the meanings of some symbols and phrases in this document.

Table 2-1 Symbol meanings

Symbol	Meaning
&	It is used between different modes in a separate-MPT base station. For example, GSM&UMTS, which can be shortened to GU, indicates a separate-MPT GU dual-mode base station.
*	It is used between different modes in a co-MPT base station. For example, GSM*UMTS, which can be shortened to G*U, indicates a co-MPT GU dual-mode base station.
+	It is used between different modes for the two BBUs in a separate-MPT base station. For example, GSM&UMTS+LTE, which can be shortened to GU+L, indicates a separate-MPT GUL triple-mode base station.
[]	[] contains co-MPT modes. For example, GSM[UMTS*LTE] can be shortened to G[U*L].
_	The underline and letters following a board's name is the actual configuration of the board such as the co-MPT configuration of a UMPT and the baseband concurrency configuration of a UBBP. For example, UMPT_GUL refers to a UMPT supporting GUL triple modes; UBBP_UL refers to a UBBP supporting UL dual modes.
GU SDR	GSM and UMTS share RF modules.
GL SDR	GSM and LTE share RF modules.
UL SDR	UMTS and LTE share RF modules.
GUL SDR	GSM, UMTS, and LTE share RF modules.

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3 Version Difference

SRAN11.1

The single-mode versions for SRAN11.1 are GBSS18.1, RAN18.1, and eRAN11.1. Compared with SRAN11.0, SRAN11.1 includes the following changes:

- Added the UMPTe (multimode main control board) and UBBPe (multimode baseband processing board). The FE/GE surge protection package is not required when a UMPTe is configured.
- Added RF modules: 900 MHz 1x80 W MRFU V6 and 1800 MHz 1x80 W MRFU V6.
- Added the following RF modules: 4x40 W RRU3971 working at AWS, 4x40 W RRU3971 working at 1900 MHz, 4x40 W RRU3971 working at 2100 MHz, 2x60 W RRU3952 working at 2100 MHz, 2x60 W RRU3958 working at 2100 MHz, and 4x40 W RRU3281 working at 2600 MHz (delivered in SRAN11.1, supported from SRAN9.0).
- Added the AAU3940 working at AWS and PCS frequency bands and the AAU3961.
- Added the OPM30M.

SRAN11.0

The single-mode versions for SRAN11.0 are GBSS18.0, RAN18.0, and eRAN11.0. Compared with SRAN10.1, SRAN11.0 includes the following changes:

- Added Ver.E cabinets.
- Added the GTMUc.
- Added the MRFUd V6 working at 1800 MHz.
- Added the LRFUe working at DD 800 MHz.

SRAN10.1

The single-mode versions for SRAN10.1 are GBSS17.1, RAN17.1, and eRAN8.1. Compared with SRAN10.0, SRAN10.1 includes the following changes:

- Added the AAU3920 and AAU3940.
- Added the GTMUb to support SingleOM.
- Added the following RF modules: 850 MHz 2T4R 2x60 W RRU3952 (delivered in SRAN10.1, supported from SRAN8.0), 1900 MHz 2T4R 2x80 W RRU3953 (delivered in SRAN10.1, supported from SRAN8.0), 1800 MHz 2T2R 2x60 W RRU3959

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(delivered in SRAN10.1, supported from SRAN8.0), 1800 MHz 2T2R 2x60 W RRU3959w (delivered in SRAN10.1, supported from SRAN8.0), 700 MHz 2T4R 2x60 W RRU3262, 2600 MHz 2T2R 2x60 W LRFUe, 700 MHz band 12 RRU3249, and 700 MHz band 12&13 RRU3269.

- Added the BBU3900A1 and BBU3910A2.
- Added distributed Cloud BB scenarios.

SRAN10.0

The single-mode versions for SRAN10.0 are GBSS17.0, RAN17.0, and eRAN8.0. Compared with SRAN9.0, SRAN10.0 includes the following changes:

- Added the BBU3910A3.
- Added the AAU3911.
- Added power modules: OPM50M and IBBS20D.
- Added the USU3910 for Cloud BB.

SRAN9.0

The single-mode versions for SRAN9.0 are GBSS16.0, RAN16.0, and eRAN7.0. Compared with SRAN8.0, SRAN9.0 includes the following changes:

- Added the AAU3902 working as a 1.8 A module in GL mode.
- Added the UBBP and BBU3910. A BBU3910 can be installed in the following cabinets: BTS3900 (Ver.D), BTS3900L (Ver.D), BTS3900A (Ver.D), APM30H (Ver.D), TMC11H (Ver.D), IMB03, OMB (Ver.C) (applies to DBS3900 and BTS3900C [Ver.C]), and BTS3900AL (Ver.A). Added the RRU3262 working in 2600 MHz and APT700M LRFUe.
- Added the multimode baseband license.
- Added the ODM and OFD.

SRAN8.1

The single-mode versions for SRAN8.1 are GBSS15.1, RAN15.1, and eRAN6.1. Compared with SRAN8.0, SRAN8.1 includes the following changes:

- Added the following RF modules: RRU3938 working at the EGSM, PGSM, and 1800 MHz frequency bands and enhanced MRFUd working at the EGSM, PGSM, and 1800 MHz frequency bands
- Added the RRU3268 working at 800 MHz for eRAN6.1.
- Added the AAU3902 working as a 1.8 A module in LO mode.
- Added the support for the GULT quadruple mode.

SRAN8.0

The single-mode versions for SRAN8.0 are GBSS15.0, RAN15.0, and eRAN6.0. Compared with SRAN7.0, SRAN8.0 includes the following changes:

- Added the following BBU boards: UBRIb, UMPTb1, LBBPd3 (LTE baseband processing unit), UTRPa (UMTS transmission processing unit), and UBBPd1/UBBPd2/UBBPd3/UBBPd4 (UMTS baseband processing unit).

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- Added the AAU3910, which can serve as an active unit of 1800 MHz, 2100 MHz, 2600 MHz, or AWS.
- Added the AAU3902 working at 2100 MHz.
- Added the RRU3926 in GL mode.
- Clarified the number of HSPA UEs that can be carried by a WBBP.
- Added the GU/GL/UL/GUL co-MPT configurations.
- Added the following RF modules: 2.6 GHz RRU3260, 2.6 GHz RRU3268, 1800 MHz RRU3939, 850 MHz and 1900 MHz RRU3936, 1.8 GHz RRU3953, 1.8 GHz RRU3953w, and 900 MHz RRU3959.
- Added the AAU3910, which can serve as an active unit of 1800 MHz, 2100 MHz, 2600 MHz, or AWS in SRAN8.0.
- Added the RRU3808 (AWS) in UL mode.
- Added the scenario that a LampSite base station and a DBS3900 share BBUs.

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4 Product Configuration

This chapter describes the principles for configuring various components in 3900 series base stations.

3900 series base stations use modular design. A macro base station consists of the cabinet, BBU, and RF modules. The minimum configuration of a macro base station includes the minimum configurations of cabinets, baseband processing boards, main control boards, and RF modules. A distributed base station consists of the BBU and RF modules. The minimum configuration of a distributed base station includes the minimum configurations of baseband processing boards, main control boards, and RF modules. Baseband processing boards, RF modules, and transmission ports can be expanded smoothly by adding new boards and RF modules or licenses.

4.1 3900 Series Base Station Configurations

4.2 BBU Configurations

4.3 RF Module Configurations

4.4 AAU Configurations

4.5 Configurations of Enhanced Cabinets

4.6 Power Module Configurations

4.7 RET Module Configurations

4.8 Hardware License Configuration

4.9 Equipment and Product Auxiliary Material Configuration

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4.1 3900 Series Base Station Configurations

4.1.1 BTS3900 Configurations

This section describes the principles for configuring cabinets, BBUs, and RF modules in a BTS3900.

BTS3900 Configuration Principles

The following table lists the BTS3900 configuration principles.

Table 4-1 BTS3900 configuration principles

Single-, Dual-, or Triple-Mode Base Station	Maximum Number of Cabinets	Number of BBUs	Maximum Number of RF Modules	Description
Single- or dual-mode base station	2	1	● If the base station is configured with RFUs but without RRUs, a maximum of 12 RFUs are supported. ● If RFUs and RRUs are configured, a maximum of 12 RFUs and 6 RRUs are supported.	-
Separate-MPT triple-mode base station	2	2	If the base station is configured with RFUs but without RRUs, a maximum of 12 RFUs are supported. If RFUs and RRUs are configured: ● A BTS3900 using the BTS3900 (Ver.B/Ver.C) cabinet supports a maximum of 12 RFUs and 6 RRUs. The DCDU supplying power to RRUs must be installed on a wall. ● A site using the Ver.D cabinet supports a maximum of 12 RFUs, 6 high-power RRUs, and 3 low-power RRUs. The DCDU supplying power to RRUs can be installed in the BTS3900 cabinet.	For details about high-power RRUs, see **2 Overview**.
Co-MPT triple-mode base station	2	1	If the base station is configured with RFUs but without RRUs, a maximum of 12 RFUs are supported. If RFUs and RRUs are configured, a maximum of 12 RFUs and 6 RRUs are supported.	-

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NOTE

- A single Ver.B or Ver.C AC cabinet can house a maximum of one BBU. A single Ver.D cabinet can house a maximum of two BBUs.
- If the MRFUd, WRFUd, WRFUe, or MRFUe is configured, a Ver.C or Ver.D cabinet must be used.
- If RFUs and high-power RRUs are configured, a Ver.C or Ver.D cabinet must be used.
- The BTS3900 (Ver.B) or (Ver.C) AC cabinet and +24 V DC BTS3900 (Ver.B) cabinet can neither be configured as a separate-MPT triple-mode base station nor be configured with RFUs and RRUs together. The Ver.D AC cabinet can be configured with a maximum of 6 RFUs and 9 RRUs.

BTS3900 Configuration List

The following table lists BTS3900 cabinets and components in the cabinets.

Table 4-2 Configuration list

Model	Description	Configuration Principle
WD2B48RACK00	BTS3900 Cabinet (DC -48 V)	Indoor macro cabinet BTS3900 (-48 V DC), which houses the BBU case and RFUs and applies to the AC scenarios with backup power.
WD2B48RACK03	BTS3900 Cabinet (Ver.C, DC -48 V)	
WD2B048CAB10	BTS3900 Cabinet (Ver.D, DC -48 V)	In scenarios of 220 V with backup power, 110 V with backup power, and 110 V without backup power, the BTS3900 cabinet supplied with -48 V DC power must be used to house the BBU and RFUs. One piece of DC cabinet can be configured in 220 V AC scenarios without backup power when the site needs to be configured with 7 to 12 RFUs.
WD2PACRACK00	BTS3900 Cabinet (AC 220 V/110 V)	An indoor macro BTS3900 cabinet (220 V/110 V AC) is used to house the BBU, RFUs, and power devices.
WD2BACRACK01	BTS3900 Cabinet (Ver.C, AC 220 V/110 V)	
WD2P220CAB00	BTS3900 Cabinet (Ver.D, 220 V AC)	A BTS3900 cabinet supplied with 220 V AC power is used for stacking with the IMS06, which houses the power equipment of 5 U. The BTS3900L (Ver.D) cabinet supplied with 220 V AC power is supported from SRAN6.0 onwards. In 220 V AC scenarios without backup power, one package is configured by default. When two cabinets need to be configured, the site can be configured with one AC cabinet and one DC cabinet.

NOTE

When the BTS3900 is stacked on two IMS06s, an EPU05A and a group of batteries (92 Ah) or an EPU05A and two transmission devices can be installed.

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4.1.2 BTS3900A Configurations

This section describes the principles for configuring the cabinets, BBUs, and RF modules at a BTS3900A site.

BTS3900A Configuration Principles

The following table lists the BTS3900A configuration principles.

Table 4-3 BTS3900A configuration principles

Single-, Dual-, or Triple-Mode Base Station	Maximum Number of Cabinets	Number of BBUs	Maximum Number of RF Modules	Description
Single- or dual-mode base station	● The BTS3900A (Ver.B) or BTS3900A (Ver.C) supports a maximum of two sets of APM30H +RFC. ● The BTS3900A (Ver.D) supports a maximum of one APM30H and two RFCs. ● The BTS3900A (Ver.E) supports a maximum of one APM30H and two RFCs.	1	● If the base station is configured with RFUs but without RRUs, a maximum of 12 RFUs are supported. ● If RFUs and RRUs are configured: A BTS3900A site that uses Ver.B or Ver.C cabinets supports a maximum of 6 RFUs and 6 RRUs. A BTS3900A site that uses Ver.D cabinets supports a maximum of 6 RFUs, 6 high-power RRUs, and 3 low-power RRUs. A BTS3900A site that uses Ver.E cabinets supports a maximum of 6 RFUs and 15 RRUs, or 12 RFUs and 9 RRUs.	For details about high-power RRUs, see **2 Overview**.
Separate-MPT triple-mode base station		2		
Co-MPT triple-mode base station		1		

NOTE

- If the MRFUd, WRFUd, WRFUe, LRFUe, or MRFUe is configured, a Ver.C/Ver.D/Ver.E cabinet must be used.
- If RFUs and high-power RRUs are configured, a Ver.C/Ver.D/Ver.E cabinet must be used.

BTS3900A Configuration List

The following table lists BTS3900A cabinets and their internal devices.

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Table 4-4 Configuration list

Model	Description	Configuration Principle
WD2P022APM03	Advanced Power Module for BTS3900A (APM30, 220 V AC)	Outdoor cabinet (APM30) for a BTS3900A site supplied with 220 V AC power By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 1600 W, an additional PSU (AC/DC) is required.
WD2P022APM04	Advanced Power Module for BTS3900A (APM30, 220 V AC)	
WD2P022APM05	Advanced Power Module for BTS3900A (APM30, 220 V AC)	Outdoor cabinet (APM30) equipped with a heater and used for a BTS3900A site supplied with 220 V AC power By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 1600 W, an additional PSU (AC/DC) is required. The cabinet of the 05/06 type is used in cold areas with a temperature below -20°C.
WD2P022APM06	Advanced Power Module for BTS3900A (APM30, 220 V AC)	
WD2P011APM03	Advanced Power Module for BTS3900A (APM30, 110 V AC)	Outdoor cabinet (APM30) for a BTS3900A site supplied with 110 V AC power By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 1600 W, an additional PSU (AC/DC) is required.
WD2B048APM03	Advanced Power Module for BTS3900A (APM30, -48 V DC)	Outdoor cabinet (APM30) for a BTS3900A site supplied with -48 V DC power
WD2B048APM04	Advanced Power Module for BTS3900A (APM30, -48 V DC)	
WD2B048APM07	Advanced Power Module for BTS3900A (APM30, -48 V DC)	Outdoor cabinet (APM30) equipped with a heater and used for a BTS3900A site supplied with -48 V DC power To use a cabinet with a heater, the customer needs to provide independent power supply for the heater.
WD2B048APM06	Advanced Power Module for BTS3900A (APM30, -48 V DC)	
WD2B226RFU03	BTS3900A RFU Cabinet	Outdoor macro cabinet for a BTS3900A site, used for housing RFUs
WD2B226RFU04	BTS3900A RFU Cabinet	

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Model	Description	Configuration Principle
WD2B116RFU03	BTS3900A RFU Cabinet	BTS3900A outdoor macro cabinet used for housing RFUs at a site with 110 V AC power supply
WD2P022CAB00	BTS3900A Cabinet (Ver.C, 220 V AC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with 220 V AC power. It contains an APM30 and an RFC. It is configured at a site with the 220 V AC power supply. Each site can be configured with a maximum of two cabinets. One BTS3900A site is configured with one APM30 and one RFC. By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 2900 W, an additional PSU (AC/DC) is required. The cabinet of the 01 type is used in cold areas with a temperature below -20°C.
WD2P022CAB01	BTS3900A Cabinet (Ver.C, 220 V AC)	
WD2P011CAB00	BTS3900A Cabinet (Ver.C, 110 V AC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with 110 V AC power. It contains an APM30 and an RFC. A site supports a maximum of two cabinets. One BTS3900A site is configured with one APM30 and one RFC. By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 2900 W, an additional PSU (AC/DC) is required.
WD2P048CAB00	BTS3900A Cabinet (Ver.C, -48 V DC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with -48 V DC power. It contains an APM30 and an RFC. A site supports a maximum of two cabinets. One BTS3900A site is configured with one APM30 and one RFC. The cabinet of the 01 type is used in cold areas with a temperature below -20°C.
WD2P048CAB01	BTS3900A Cabinet (Ver.C, -48 V DC)	
WD2B226RFU05	BTS3900A RFU Cabinet (Ver.C)	Outdoor macro cabinet for a BTS3900A site, used for housing RFUs ● When high-power RFUs are used, this cabinet must be configured. ● The cabinet is configured when no APM30 is required. ● At newly deployed sites, it needs to be configured when high-power RRUs are used.

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Model	Description	Configuration Principle
WD2P022CAB21	BTS3900A Cabinet (Ver.D, 220 V AC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with 220 V AC power. It contains an APM30 and an RFC. A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required. By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 3000 W, an additional PSU (AC/DC) is required.
WD2P022CAB22	BTS3900A Cabinet (Ver.D, 220 V AC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with 220 V AC power. It contains an APM30 and an RFC. A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required. By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 3000 W, an additional PSU (AC/DC) is required.
WD2P011CAB23	BTS3900A Cabinet (Ver.D, 110 V AC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with 110 V AC power. It contains an APM30 and an RFC. A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required. By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 3000 W, an additional PSU (AC/DC) is required.
WD2P048CAB24	BTS3900A Cabinet (Ver.D, -48 V DC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with -48 V DC power. It contains an APM30 and an RFC. A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required.
WD2P048CAB25	BTS3900A Cabinet (Ver.D, -48 V DC)	A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required.
WD2B226RFU11	BTS3900A RFU Cabinet (Ver.D, -48 V DC)	Outdoor macro cabinet for a BTS3900A site, used for housing RFUs ● The cabinet is configured when no APM30 is required. ● At newly deployed sites, it needs to be configured when high-power RRUs are used.

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Model	Description	Configuration Principle
WD2P022CAB03	BTS3900A Cabinet (Ver.E, 220 V AC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with 220 V AC power. It contains an APM30 and an RFC. A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required. By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 3000 W, an additional PSU (AC/DC) is required.
WD2P011CAB25	BTS3900A Cabinet (Ver.E, 110 V AC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with 110 V AC power. It contains an APM30 and an RFC. A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required. By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 3000 W, an additional PSU (AC/DC) is required.
WD2P048CAB26	BTS3900A Cabinet (Ver.E, -48 V DC)	Outdoor cabinet for stacked installation for a BTS3900A site supplied with -48 V DC power. It contains an APM30 and an RFC. A site supports a maximum of one cabinet. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required.
WD2P048CAB28	BTS3900A Cabinet (Ver.E, -48 V DC)	A site supports a maximum of two cabinets. When more than six RFUs are used, one cabinet for stacked installation and one RFC are required.
WD2B486RFU09	BTS3900A RFU Cabinet (Ver.E, -48 V DC)	Outdoor macro cabinet for a BTS3900A site, used for housing RFUs The cabinet is configured when no APM30 is required.

4.1.3 BTS3900L Configurations

This section describes the principles for configuring the cabinets, BBUs, and RF modules at a BTS3900L site.

BTS3900L Configuration Principles

The following table lists the BTS3900L configuration principles.

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Table 4-5 BTS3900L configuration principles

Single-, Dual-, or Triple-Mode Base Station	Maximum Number of Cabinets	Number of BBUs	Maximum Number of RF Modules	Description
Single- or dual-mode base station	1	1	● If the base station is configured with RFUs but without RRUs, a maximum of 12 RFUs are supported. ● If RFUs and RRUs are configured, a maximum of 12 RFUs and 6 RRUs are supported.	-
Separate-MPT triple-mode base station	1	2	● If the base station is configured with RFUs but without RRUs, a maximum of 12 RFUs are supported. ● If RFUs and RRUs are configured: A BTS3900L site that uses Ver.B or Ver.C cabinets supports a maximum of 12 RFUs and 6 RRUs. A BTS3900L site that uses Ver.D cabinets supports a maximum of 12 RFUs, 6 high-power RRUs, and 3 low-power RRUs.	For details about high-power RRUs, see **2 Overview**.
Co-MPT triple-mode base station	1	1	● If the base station is configured with RFUs but without RRUs, a maximum of 12 RFUs are supported. ● If RFUs and RRUs are configured, a maximum of 12 RFUs and 6 RRUs are supported.	-

NOTE

- If the MRFUd, WRFUd, WRFUe, or MRFUe is configured, a Ver.C or Ver.D cabinet must be used.
- If RFUs and high-power RRUs are configured, a Ver.C or Ver.D cabinet must be used.

BTS3900L Configuration List

The following table lists BTS3900L cabinets and their internal devices.

Table 4-6 Configuration list

Model	Description	Function
WD2B48RACK01	BTS3900L Cabinet (DC -48 V)	-48 V DC BTS3900L (Ver.B) indoor macro cabinet, which houses BBUs and RFUs and applies to the 220 V AC or 110 V AC scenarios with or without backup power.
WD2B48RACK04	BTS3900L Cabinet (Ver.C, DC -48 V)	-48 V DC BTS3900L (Ver.C) indoor macro cabinet, which houses BBUs and RFUs and applies to the 220 V AC or 110 V AC scenarios with or without backup power.

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Model	Description	Function
WD2B048CABL1	BTS3900L Cabinet (Ver.D, DC -48 V)	-48 V DC BTS3900L (Ver.D) indoor macro cabinet, which houses BBUs and RFUs and applies to the 220 V AC scenarios with backup power and 110 V AC scenarios with or without backup power.
WD2P220CAB01	BTS3900L Cabinet (Ver.D, 220 V AC)	220 V AC BTS3900L (Ver.D) indoor macro base station, which consists of a BTS3900L cabinet stacked on an IMS06. It houses the EPU05A, BBUs, and RFUs. It is supported from SRAN6.0 onwards.

4.1.4 BTS3900AL Configurations

This section describes the principles for configuring cabinets, BBUs, and RF modules in a BTS3900AL.

BTS3900AL Configuration Principles

The following table lists the BTS3900AL configuration principles.

Table 4-7 BTS3900AL configuration principles

Single-, Dual-, or Triple-Mode Base Station	Maximum Number of Cabinets	Number of BBUs	Maximum Number of RF Modules	Description
Single- or dual-mode base station	A maximum of two BTS3900AL cabinets (1 BTS3900AL AC cabinet+1 BTS3900AL DC cabinet) can be configured.	1	If RFUs are configured but without RRUs, a maximum of 18 RFUs are supported. If RFUs and RRUs are configured, a maximum of 9 RFUs and 9 RRUs are supported.	For details about high-power RRUs, see **2 Overview**.
Separate-MPT triple-mode base station		2	If RFUs are configured but without RRUs, a maximum of 18 RFUs are supported. If RFUs and RRUs are configured, a maximum of 9 RFUs and 12 RRUs are supported.	
Co-MPT triple-mode base station		1	If RFUs are configured but without RRUs, a maximum of 18 RFUs are supported. If RFUs and RRUs are configured, a maximum of 9 RFUs and 9 RRUs are supported.	

NOTE

If two BTS3900AL cabinets are configured at a site, the two cabinets must be installed side by side with the BTS3900AL DC cabinet on the right.

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BTS3900AL Configuration List

The following table lists BTS3900AL cabinets and their internal devices.

Table 4-8 Configuration list

Model	Description	Function
WD5P0ACCAB00	BTS3900AL Cabinet (AC 220 V/110 V)	BTS3900AL 220 V/110 V outdoor cabinet A site supports a maximum of two cabinets (one AC cabinet and one DC cabinet). By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 2900 W, an additional PSU (AC/DC) is required. Each cabinet can be configured with a maximum of nine RFUs and two BBUs.
WD5P0ACCAB01	BTS3900AL Cabinet (AC 220 V/110 V)	BTS3900AL 220 V/110 V outdoor cabinet, used in cold areas. A site supports a maximum of two cabinets (one AC cabinet and one DC cabinet). By default, a cabinet contains two PSUs (AC/DC). When the total power consumption of a single cabinet exceeds 2900 W, an additional PSU (AC/DC) is required. Each cabinet can be configured with a maximum of nine RFUs and two BBUs.
WD5P0DCCAB00	BTS3900AL Cabinet (DC -48 V)	BTS3900AL -48 V DC outdoor cabinet This cabinet is required when more than 9 RFUs are configured at a site. In scenarios of BTS3900AL AC cabinet+BTS3900AL DC cabinet or BTS3900AL DC cabinet+BTS3900AL DC cabinet, a maximum of 18 RFUs can be configured. The BTS3900AL AC cabinet supplies power to the BTS3900AL DC cabinet. Each cabinet can be configured with a maximum of nine RFUs.
WD5P0DCCAB01	BTS3900AL Cabinet (DC -48 V)	BTS3900AL -48 V DC outdoor cabinet, used in cold areas This cabinet is required when more than 9 RFUs are configured at a site. In scenarios of BTS3900AL AC cabinet+BTS3900AL DC cabinet or BTS3900AL DC cabinet+BTS3900AL DC cabinet, a maximum of 18 RFUs can be configured. The BTS3900AL AC cabinet supplies power to the BTS3900AL DC cabinet. Each cabinet can be configured with a maximum of nine RFUs.

4.1.5 DBS3900 Configurations

The OMB is a cabinet used for the DBS3900 site and does not support power backup. It cannot be configured at the same site as APM30 series power supply cabinets.

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OMB Configuration List

The following table lists the cabinets used by the OMB and their internal devices.

Table 4-9 Configuration list

Model	Description	Function
QWMB0OMBAC00	OMB Cabinet (Ver.C, 220/110 V AC)	An OMB (Ver.C) cabinet supplied with 220 V AC single-phase or 110 V AC dual-live-wire power. Each cabinet supports a maximum of six RRUs and one BBU. A maximum of one cabinet can be configured for each site.
QWMB0OMBDC00	OMB Cabinet (Ver.C, -48 V DC)	An OMB (Ver.C) cabinet supplied with -48 V DC power. Each cabinet supports a maximum of six RRUs and one BBU. A maximum of one cabinet can be configured for each site.
WD2MR4850G00	PSU Module (AC/DC)	Power supply unit (PSU) One OMB (Ver.C) AC cabinet is configured for every four to six DC RRUs.

4.1.6 BTS3900C Configurations

This section describes the principles for configuring the cabinets, BBUs, and RF modules at a BTS3900C site.

BTS3900C Configuration Principles

The following table lists the BTS3900C configuration principles.

Table 4-10 BTS3900C configuration principles

Cabinet Configuration	Maximum Number of BBUs	RF Module Configuration	Remarks
BTS3900C (Ver.C), consisting of an OMB (Ver.C) and an RRU subrack	1	Only one RRU can be configured.	This configuration principle applies to a single- or multi-mode base station.

BTS3900C Configuration List

The following table lists the cabinets used by the BTS3900C and their internal devices.

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Table 4-11 Configuration list

Model	Description	Function
QWMB0OMBAC00	OMB Cabinet (Ver.C, 220/110 V AC)	An OMB (Ver.C) cabinet supplied with 220 V AC single-phase or 110 V AC dual-live-wire power
QWMB0OMBDC00	OMB Cabinet (Ver.C, -48 V DC)	An OMB (Ver.C) cabinet supplied with -48 V DC power

4.2 BBU Configurations

This section describes the number of BBUs configured in various types of base stations, the number of different types of boards in the BBU, and the slot assignment principles.

4.2.1 BBU Case Configurations

The BBU is a mandatory component in a 3900 series base station. The BBU case configurations vary according to the type of base station.

The following table lists the principles for configuring BBU cases in single-, dual-, triple-, and quadruple-mode base stations.

Table 4-12 BBU Case Configuration Principles

Single/Dual/ Triple-Mode Base Station	Configured Mode	BBU Case Configuration Principles
Single-mode base station	GSM	One BBU is configured.
	UMTS	One BBU is configured.
	LTE	One BBU is configured.
Dual-mode base station	GU	Two modes share one BBU configured in GTMU/UMPT_G+WMPT/ UMPT_U mode.
	G*U	Two modes share one BBU in which the UMPT_G*U is configured.
	GL	Two modes share one BBU configured in GTMU/UMPT_G+LMPT/ UMPT_L mode.
	G*L	Two modes share one BBU in which the UMPT_G*L is configured.
	UL	Two modes share one BBU configured in WMPT/UMPT_U+LMPT/ UMPT_L mode.
	U*L	Two modes share one BBU in which the UMPT_U*L is configured.

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Single/Dual/Triple-Mode Base Station	Configured Mode	BBU Case Configuration Principles
	UT	Two modes share one BBU configured in WMPT/UMPT_U+LMPT/UMPT_T mode.
	L*T	Two modes share one BBU in which the UMPT_L*T is configured.
Separate-MPT triple-mode base station	GU+L	Two BBUs are configured, one shared by GSM and UMTS modes and the other independently used by the LTE mode.
	GL+U	Two BBUs are configured, one shared by GSM and LTE modes and the other independently used by the UMTS mode.
	GU+UL	Two BBUs are configured, one shared by GSM and UMTS modes and the other shared by UMTS and LTE modes.
	GU+L(G)	Two BBUs are configured, one shared by GSM and UMTS modes and the other independently used by the LTE mode. The two BBUs are interconnected.
	GL+U(G)	Two BBUs are configured, one shared by GSM and LTE modes and the other independently used by the UMTS mode. The two BBUs are interconnected.
	GU+UL(G)	Two BBUs are configured, one shared by GSM and UMTS modes and the other shared by UMTS and LTE modes. The two BBUs are interconnected.
	G[U*L]	Three modes share one BBU. The UMTS and LTE FDD modes share the UMPT_U*L while the GSM mode uses the GTMU.
	G[L*T]	Three modes share one BBU. The LTE FDD and LTE TDD modes share the UMPT_L*T while the GSM mode uses the GTMU.
	U[L*T]	Three modes share one BBU. The LTE FDD and LTE TDD modes share the UMPT_L*T while the UMTS mode uses the WMPT/UMPT_U.
	G[U*T]	Three modes share one BBU. The UMTS and LTE TDD modes share the UMPT_U*T while the GSM mode uses the GTMU.
	L[G*U]	Three modes share one BBU. The GSM and UMTS modes share the UMPT_G*U while the GSM mode uses the LMPT/UMPT_L.
Co-MPT triple-mode base station	G*U*L	Three modes share one BBU in which the UMPT_G*U*L is configured.
	G*U*T	Three modes share one BBU in which the UMPT_G*U*T is configured.
	G*L*T	Three modes share one BBU in which the UMPT_G*L*T is configured.
	U*L*T	Three modes share one BBU in which the UMPT_U*L*T is configured.
Co-MPT quadruple-mode base station	G*U*L*T	Four modes share one BBU in which the UMPT_G*U*L*T is configured.
	GU+[L*T](G)	Two BBUs are configured, one shared by GSM and UMTS modes and the other shared by LTE FDD and LTE TDD modes. GSM and UMTS are deployed on different main control boards, and LTE FDD and LTE TDD are deployed on the same main control board. The two BBUs are interconnected.

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Table 4-13 BBU case configuration list

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M048BBU01	BBU3900 Box	BBU case Used for housing baseband processing boards	At a BTS3900 / BTS3900 A/ BTS3900 L/ BTS3900 AL/ DBS3900 site: 2 At a BTS3900 C site: 1	Optional. In separate-MPT scenarios, two BBUs must be configured to support triple modes. In co-MPT scenarios, one BBU can support triple modes. A BBU provides eight slots for boards including the baseband processing board and one slot for the UPEUc. The UPEUc can provide 360 W power.
WD2M048BBU10	BBU3910 Box	BBU case Used for housing baseband processing boards	At a BTS3900 / BTS3900 A/ BTS3900 L/ BTS3900 AL/ DBS3900 site: 2 At a BTS3900 C site: 1	Optional. In separate-MPT scenarios, two BBUs must be configured to support triple modes. In co-MPT or hybrid-MPT scenarios, one BBU can support triple modes. A BBU provides one slot for the UPEUd, one slot for the FANd/FANe, and eight slots for boards including the baseband processing board. Each UPEUd provides 650 W power. If two UPEUd boards are configured, 1000 W power can be provided.
WD2M048BBU1A	BBU3910 A3	Outdoor integrated baseband module	At a DBS3900 site: 1	Optional. A maximum of one BBU3910A can be configured to provide one port for -48 V DC power input. Its power consumption is less than or equal to 150 W (not including power consumption of PoE). Its volume is less than or equal to 12 L (10.56 quart) and its weight is less than or equal to 12 kg (26.46 lb). The BBU3910A provides six CPRI ports, which support a rate of 1.25 Gbit/s, 2.5 Gbit/s, 4.9 Gbit/s, or 9.8 Gbit/s. The BBU3910A also provides an FE/GE electrical port, an FE/GE optical port, an E1/T1 port, and a GPS clock port.
WD2M3910A100	BBU3910 A1	Outdoor integrated baseband module	At a DBS3900 site: 1	
WD2M3910A200	BBU3910 A2	Outdoor integrated baseband module	At a DBS3900 site: 1	

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4.2.2 Typical BBU Configurations

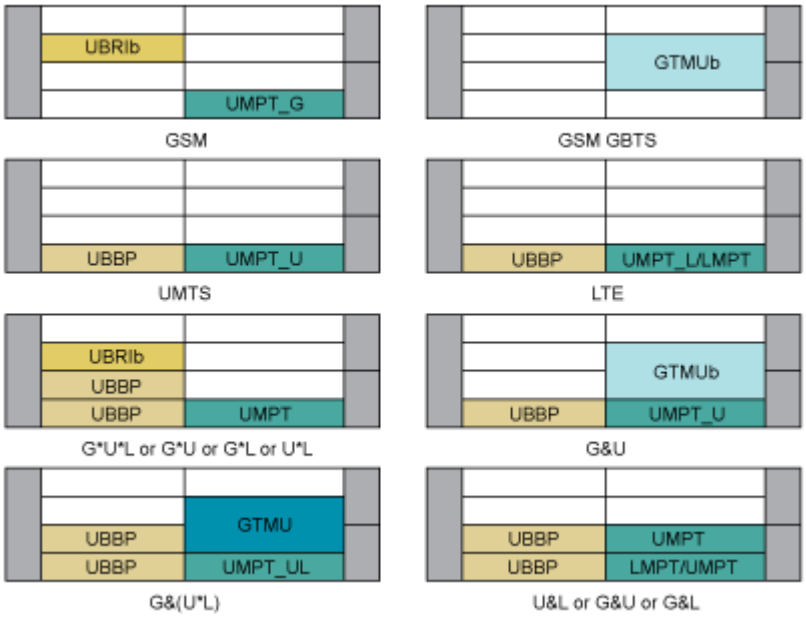
Typical BBU Configurations

In SRAN9.0 and later versions, the BBU3910 is recommended in GO, UO, LO, and multimode base stations. Unless otherwise specified, the configuration scheme applies to both the BBU3900 and BBU3910.

For details about boards and cabinets supported by a BBU3900 and a BBU3910, see *BBU Hardware Description*.

The following figure shows the typical BBU configurations in new deployment scenarios.

Figure 4-1 Typical BBU configurations in new deployment scenarios



The following figure shows the typical BBU configurations in scenarios where existing GSM base stations are to be restructured.

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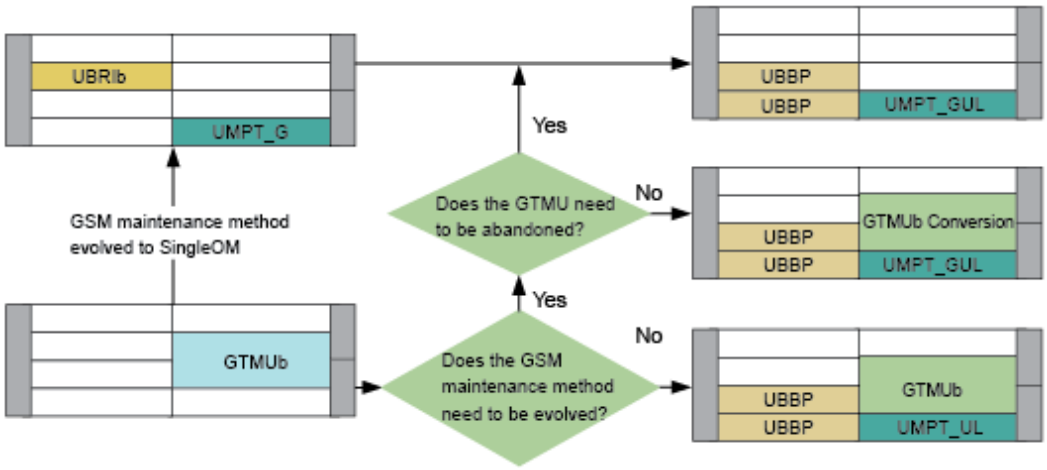
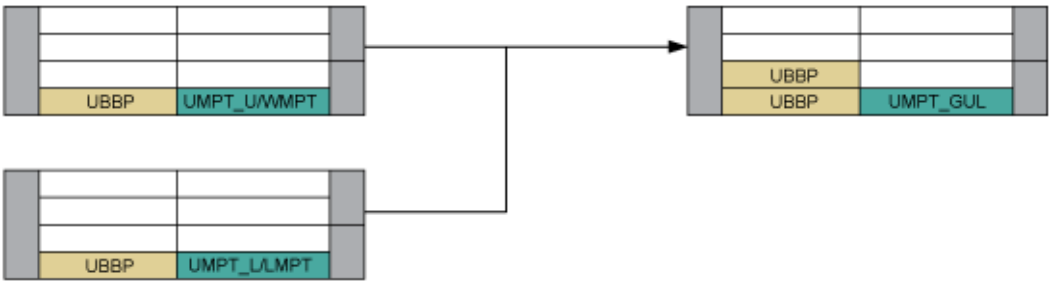
Figure 4-2 Typical BBU configurations in scenarios where existing GSM base stations are to be restructured



The following figure shows the typical BBU configurations in scenarios where existing UMTS and LTE base stations are to be restructured.

Figure 4-3 Typical BBU configurations in scenarios where existing UMTS and LTE base stations are to be restructured



The following figure shows the typical BBU configurations in scenarios with extended signaling capabilities.

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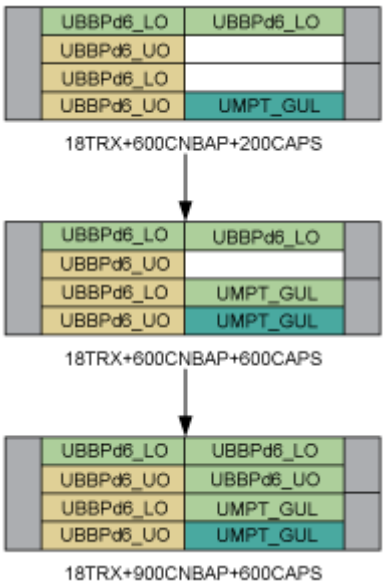
Figure 4-4 Typical BBU configurations in scenarios with signaling extension



The following table lists the features supported by BBUs of different versions.

Version	Supported Feature
SRAN6.0	GU+L (BBUs not interconnected) and GL+U (BBUs not interconnected) are supported.
SRAN7.0	GU+L(GSM), GL+U(GSM), GU+UL, and GU+UL(GSM) are supported. SDR RF modules are connected to two BBU3900s. Therefore, BBU3900s need to be interconnected. In this case, the two BBU3900s are interconnected by connecting the UCIU in the root BBU and the UMPT in the leaf BBU.
SRAN8.0	From SRAN8.0 onwards, the multimode co-MPT application is supported, including the following configurations: G*U, G*L, U*L, G*U*L, and G[U*L]. In SRAN8.0, a single BBU3900 is recommended for the co-MPT solution. If two BBUs are required for the co-MPT solution, only the basic interconnection through UCIU+UMPT can be used.
SRAN8.1	The GULT quadruple-mode application and the basic interconnection through UMPT+UMPT are supported.

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Version	Supported Feature
SRAN9.0	● The BBU3910 (with a fully-interconnected backplane) is supported and it supports enhanced board interconnection technologies. ● Co-MPT and hybrid-MPT dual-BBU base stations support applications such as [G*U*L]+[G*U*L] and G[U*L]+[U*L]. If each BBU is configured with a UMPT, the UMPT+UMPT interconnection mode is recommended as an alternative for the UCIU+UMPT interconnection mode, which is supported since SRAN7.0. ● The GUL co-BBP technique is supported, which means that multiple modes including GSM, UMTS, and LTE can be concurrently configured on one baseband processing board. The co-BBP technique is supported only by co-MPT base stations, not by separate-MPT base stations.
SRAN10.0	The BBU3910A3 is supported, which can work in GSM only, UMTS only, or LTE only mode and the three modes can be reconfigured to one another. In addition, the BBU3910A3 can work in GU/GL/UL/GUL co-MPT and co-BBP modes.
SRAN10.1	● LTE FDD and LTE TDD co-MPT is supported. ● The BBU3910A1 and BBU3910A2 are supported, which can work in GSM only, UMTS only, or LTE only mode and the three modes can be reconfigured to one another. In addition, the BBU3910A1 and BBU3910A2 can work in GU/GL/UL co-MPT mode. **NOTE** In SRAN10.0 and SRAN10.1, a BBU3910A cannot be interconnected with a BBU3900, BBU3910, or BBU3910A.
SRAN11.0	The GTMUc is supported.
SRAN11.1	The multimode co-MPT board UMPTe and multimode co-BBP board UBBPe are supported.

CPRI Networking Configurations

The slot constraints and limitations in CPRI networking configuration apply only to the BBU3900.

CPRI networking configurations in separate-MPT scenarios

In separate-MPT scenarios where multimode SDR RF modules are used, the dual-star CPRI networking topology is recommended. In this networking topology, a CPRI fiber optic cable from the baseband processing board of each mode is connected to its corresponding RF modules.

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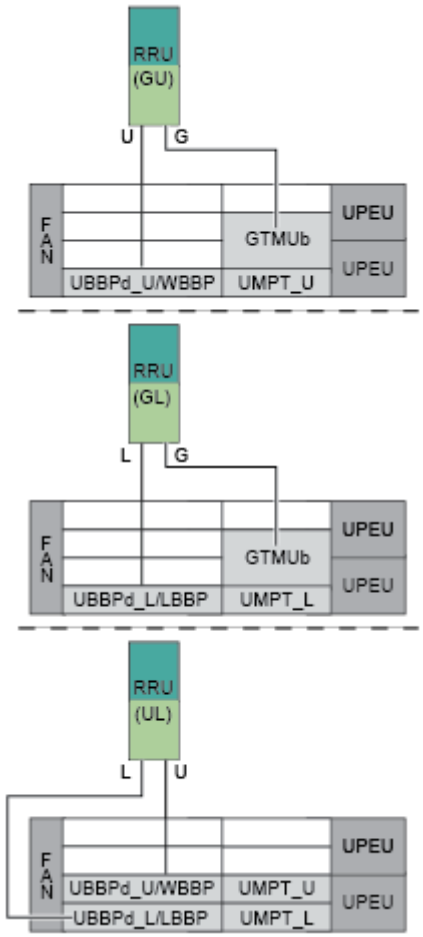
Figure 4-5 CPRI networking configurations in separate-MPT scenarios



In separate-MPT scenarios where multimode SDR RF modules are used, the CPRI MUX networking topology can be used in special circumstances. Both RF modules and baseband processing boards must support this networking topology. The RF modules and baseband processing boards are as follows:

- The WBBPf/UBBPd_U and GTMUb must be configured to support the GU CPRI MUX networking topology. CPRI fiber optic cables for transmitting both GSM and UMTS signals are connected to the WBBPf/UBBPd_U in slot 2 or 3.
- The LBBPd/UBBPd_L and GTMUb must be configured to support the GL CPRI MUX networking topology. CPRI fiber optic cables for transmitting both GSM and LTE signals are connected to the LBBPd/UBBPd_L in slot 2 or 3.
- The WBBPf/UBBPd_U and LBBPd/UBBPd_L must be configured to support the UL CPRI MUX networking topology. CPRI fiber optic cables for transmitting both UMTS and LTE signals are connected to the WBBPf/UBBPd_U or LBBPd/UBBPd_L in slot 2 or 3.

CPRI networking configurations in co-MPT scenarios

The following figure shows the CPRI networking configurations in co-MPT scenarios.

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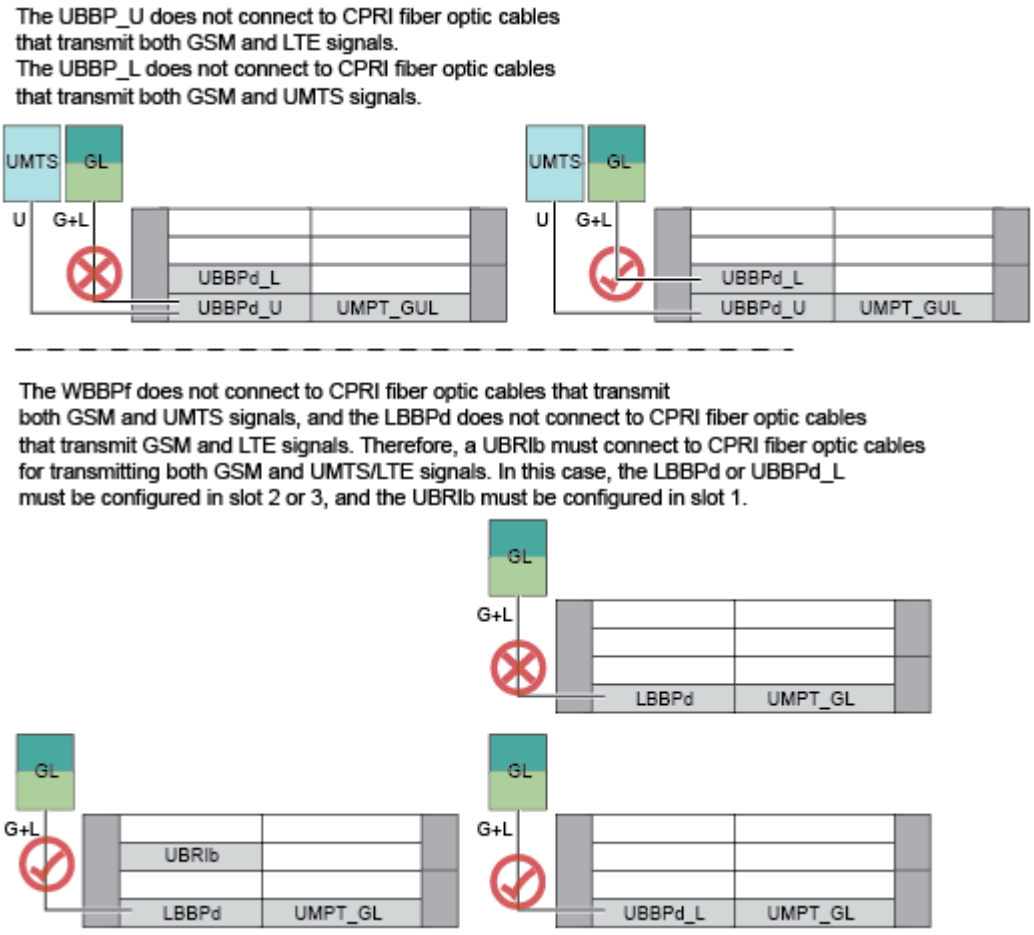
Figure 4-6 CPRI networking configurations in co-MPT scenarios



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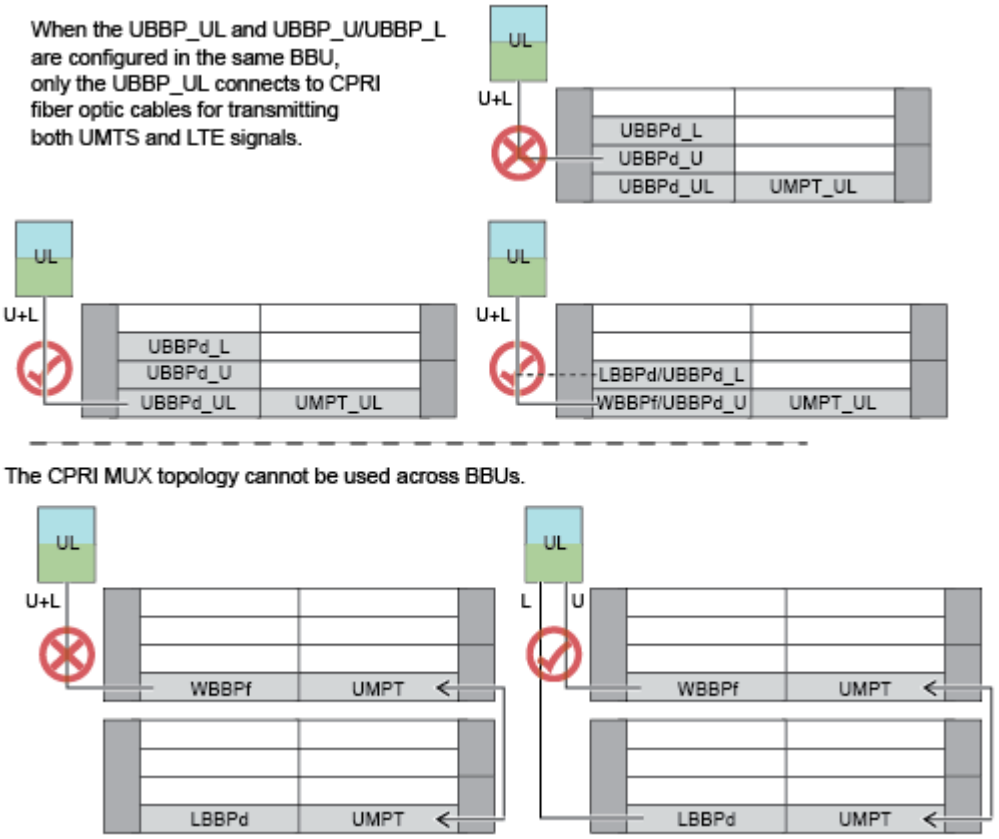

4.2.3 BBU Board Configurations

This section describes the principles for configuring various types of boards in the BBU.

4.2.3.1 GSM BBU Board Configurations

The following table lists the principles for configuring GSM BBU boards.

NOTE

For the board specifications, see section "GSM Specifications" in *3900 Series Base Station Technical Specifications*.

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Table 4-14 GSM BBU board configurations

Model	Description	Function	Maximum Quantity	Configuration Principle
GM5D00 GTMU01	Main Control and Transport Unit (4 E1 & 1 electrical FE & 1 optical FE)	GTMUb: GSM transmission & timing & management unit type b ● Provides four E1s. ● Provides one FE electrical port. ● Provides one FE optical port. ● Provides six CPRI ports.	1	For SRAN7.0 and earlier versions, one GTMUb must be configured in any of the following base stations: ● GBTS ● Separate-MPT multimode base station including a GBTS The GTMUb supports SingleOM from SRAN10.1. The GTMUb SingleOM is used only for restructuring of existing sites. At newly deployed sites, the UMPT serves as the main control transmission board of GSM. The GTMUb SingleOM is subject to the following restrictions: 1. It does not support IPSec, PKI, link aggregation, or built-in firewall by default, but can support IPSec and PKI through GTMUb+LMPT/UMPT mode. 2. It does not support the UTRP or UTRPc. 3. In a BBU interconnection scenario, the GTMUb can only be installed in the primary BBU. 4. A single site supports a maximum of 24 carriers and the multi-site cell supports a maximum of 36 subsite carriers. 5. The GTMUb SingleOM only supports GSM mode. 6. The transport network, CPRI networking, and clock configuration need to be aligned with those in the GTMUb LegacyOM scenario. 7. The UMPT working in GSM mode cannot be configured in the BBU where the GTMUb SingleOM is configured. 8. The GTMUb SingleOM license (per BTS) needs to be purchased if the GTMUb SingleOM is to be deployed.

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Model	Description	Function	Maximum Quantity	Configuration Principle
GM5D0GTMUC00	Main Control and Transport Unit (4 E1 & 1 electrical FE/GE & 1 optical FE/GE)	GTMUc: GSM transmission & timing & management unit type c ● Provides four E1s. ● Provides one FE electrical port. ● Provides one FE optical port. ● Provides six CPRI ports.	1	In SRAN11.0, the GTMUc is introduced, which incorporates all functions of the GTMUb, except that the GTMUc supports neither the UTRPc nor the GU CPRI panel convergence function and does not support SingleOM or GTMUc conversion. SingleOM is supported from SRAN11.1 onwards. The GTMUc is also incorporated into SRAN9.0 and SRAN10.1, with the same restrictions as SRAN11.0.
GM5D00UBRI00	Universal BaseBand Radio Interface Board (6 CPRI ports)	UBRI: universal baseband radio interface unit for GSM Provides six CPRI ports.	1	A UBRI must be configured in the following scenarios: ● More than six CPRI ports are required by GSM. ● RFUs and RRUs are configured, which include RRUs or RFUs in GSM mode. ● This board must be configured to provide CPRI ports if the GSM mode is deployed on the UMPT where separate-MPT is applied.
GM5D0UBRIB00	Universal BaseBand Radio Interface Board (UBRIb, 6 CPRI ports)	UBRIb: universal baseband radio interface unit Provides six CPRI ports.	In separate-MPT scenarios: 11 In co-MPT scenarios: 22	A UBRIb needs to be configured in the following scenarios: ● More than six CPRI ports are required by GSM. ● RFUs and RRUs are configured, which include RRUs or RFUs in GSM mode. ● In SRAN8.0 and earlier versions, this board must be configured to provide CPRI ports if the GSM mode is deployed on the UMPT where co-MPT is applied. In SRAN9.0 and later versions, the UBBPd can provide CPRI ports for GSM RF modules. This board is used to provide CPRI ports for GSM RF modules only when the UBBPd cannot provide enough CPRI ports. ● This board can be configured to provide CPRI ports if the GSM mode is deployed on the UMPT.

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4.2.3.2 UMTS BBU Board Configurations

NOTE

For specifications of BBU boards, see UMTS Specifications in *3900 Series Base Station Technical Description*.

The following table lists the UMTS BBU board configurations.

Table 4-15 UMTS BBU board configurations

Model	Description	Function	Maximum Number in a BBU	Configuration Principle
WD2D0UMPT100	Universal Main Processing and Transmission Board(4E1&1Electrical FE/GE&1Optical FE/GE, UMPTa1)	UMPTa1: universal main processing and transmission unit type a1 ● Provides four E1s/T1s. ● Provides one FE/GE optical port. ● Provides one FE/GE electrical port. ● Provides one CI port.	1	One UMPT must be configured when UMTS is used. The main control board can be used in 1+1 backup mode for UMTS only. When 1+1 backup is used, a BBU can be configured with two main control boards. The main control board can be used in 1+1 backup mode for GU or UL in SRAN9.0 or a later version. In SRAN8.0, the UMPTa1 allows any two or three modes of GSM, UMTS, and LTE to share one main control board.
QWMDWBBPF101	Baseband Processing Unit (6 Cells, CE: UL 192/DL 256)	Baseband processing board in UMTS mode ● A WBBPf*x* board provides six CPRI ports and one HEI port.	6	The number of WBBP boards to be configured in a base station depends on the number of cells, number of uplink and downlink CEs, signaling processing capability, and number of CPRI ports to be supported by the base station. When the DC-HSDPA+MIMO feature is used: ● If the WBBPf1, WBBPf2, or WBBPf3 is used, each sector must be configured with one WBBP. ● If the WBBPf4 is used, every three sectors are configured with one WBBP.
QWMDWBBPF201	Baseband Processing Unit (6 Cells, CE: UL 256/DL 384)			

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Model	Description	Function	Maximum Number in a BBU	Configuration Principle
QWMDWBBPF301	Baseband Processing Unit (6 Cells, CE: UL 384/DL 512)			The WBBPf board is recommended from RAN14.0 onwards. To support DC-HSDPA+MIMO, each sector must be configured with one WBBPf1, WBBPf2, or WBBPf3. The WBBPf4 supports DC-HSDPA+MIMO for three sectors. When Independent Demodulation of Signals from Multiple RRUs in One Cell is enabled, the WBBPf supports a maximum of six RRUs (with two transmit channels each) in one cell.
QWMDWBBPF400	Baseband Processing Unit (6 Cells, CE: UL 512/DL 768)			

4.2.3.3 LTE BBU Board Configurations

This section describes the principles for configuring LTE BBU boards.

The following table describes the LTE BBU board configurations.

NOTE

For specifications of BBU boards, see LTE (FDD) Specifications and LTE (TDD) Specifications in *3900 Series Base Station Technical Description*.

Table 4-16 LTE BBU board configurations

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2D00UMPT01	Universal Main Processing & Transmission Unit (4E1&1Electrical FE/GE&1Optical FE/GE, UMPTa2)	Universal main processing and transmission board (UMPTa2) ● Provides one FE/GE electrical port. ● Provides one FE/GE optical port. ● Provides four E1s/T1s.	1	One UMPT must be configured when LTE is used. An LTE single-mode main control board supports the 1+1 configuration. In SRAN9.0 and later versions, a main control board working in GL or UL mode supports 1+1 configuration. In LTE and SRAN scenarios, a signaling resource pool can be shared by two UMPTs. In SRAN8.0, the UMPTa2 board can be shared by any two or three modes of GSM, UMTS, and LTE.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2DLBBPD100	LTE Baseband Processing Unit D1	An LBBPd1 provides six CPRI ports and one HEI port.	6	The number of LBBP boards to be configured in a base station that supports LTE depends on the number of cells, bandwidths, antenna configurations, and the number of CPRI ports to be supported by the base station. Each BBU working in LTE mode needs to be configured with at least one LBBP and each LBBP supports six RF modules. When the LBBPd board is configured: ● Each LBBPd1 supports a maximum of three 2x2 MIMO cells with scalable bandwidth of 1.4/3/5/10/15/20 MHz. ● Each LBBPd2 supports a maximum of three cells working in 2x2 MIMO, 4x2 MIMO, or 4-Antenna Receive Diversity mode, with scalable bandwidth of 1.4/3/5/10/15/20 MHz. ● Each LBBPd2 supports mixed configuration of 2T2R and 2T4R/4T4R cells and a maximum of three carriers. ● Each LBBPd3 supports a maximum of six 2x2 MIMO cells with scalable bandwidth of 1.4/3/5/10/15/20 MHz.
WD2DLBBPD101	LTE Baseband Processing Unit D1	An LBBPd1 provides six CPRI ports and one HEI port.		
WD2D0LBBPD02	LTE Baseband Processing Unit D2	An LBBPd2 provides six CPRI ports and one HEI port.		
WD2D0LBBPD03	LTE Baseband Processing Unit D3	An LBBPd3 provides six CPRI ports and one HEI port.		

4.2.3.4 Common Board Configurations

This section describes the principles for configuring common boards in a BBU.

The following table lists the principles for configuring common boards in the BBU.

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Table 4-17 Common board configurations

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M000PEU03	Power and Environment interface Unit (-48 V)	Power environment interface unit 360 W power module in the BBU	2	New deployment scenarios: A BBU contains one UPEUc by default, which supports power supply of 360 W. If backup power (less than or equal to 360 W) or high power (greater than 360 W and less than or equal to 650 W) is required, a second UPEUc needs to be configured. Capacity expansion scenario: If one or two UPEUa boards have been configured before the expansion, replace the one or two UPEUa boards with two UPEUc boards. If one UPEUc board has been configured before the expansion, add a UPEUc board. The UPEUa and UPEUc boards cannot be configured together. The UPEUa and UPEUc use different designs and therefore have different power supply capabilities from 330 W to 360 W. Assuming that one UPEUa and one UPEUc are used together and the total power consumption of the BBU is 360 W: If the UPEUc malfunctions, all power is provided by the UPEUa, which can only supply 330 W power, resulting in shutdown of the entire BBU.
WD2M00PEIUD2	Power and Environment interface Unit (-48 V)	Power environment interface unit 650 W power module in the BBU	2	New deployment scenarios: A BBU contains one UPEUd by default, which supports power supply of 650 W. If power supply of 1000 W or power backup of less than or equal to 650 W is required, a second UPEUd needs to be configured. Capacity expansion scenarios: Circuit breakers in existing cabinets need to be changed, so the power capacity of circuit breakers needs to be considered (must be greater than or equal to 20 A).

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2DUMPTB100	Universal Main Processing and Transmission Board (4 E1s & 1 Electrical FE/GE port & 1 Optical FE/GE port, UMPTb1)	Universal main processing and transmission board (UMPTb1) ● Provides four E1s/T1s. ● Provides one FE/GE optical port. ● Provides one FE/GE electrical port. ● Provides one CI port.	In a co-MPT/hybrid-MPT base station configured with a single BBU: 1 In a co-MPT/hybrid-MPT base station configured with two BBUs: 2 In separate-MPT scenarios: ● Single BBU: 2 ● BBU interconnection: 2	In SRAN8.0 and later versions, the UMPTb1 is recommended for GSM mode. The configuration principles for the UMPTb1 in UMTS only mode are as follows: ● From RAN14.0 onwards, this board can be configured to support the UMTS mode. ● To support the IPSec and PKI features, the UMPTb1 can be configured. ● If the signaling capacity exceeds 170 CNBAP/s, the UMPTb1 can be configured. ● If UMTS-to-LTE evolution is required in the future, the UMPTb1 can be configured. ● The UMPTb1 working in UMTS mode cannot be configured in the BBU where a WMPT is configured. The configuration principles for the UMPTb1 in LTE only mode are as follows: ● In eRAN8.1, two UMPTs in a BBU can work in co-MPT cold backup mode or transmission extension mode, but they cannot work in the two modes at the same time. 1. Co-MPT cold backup: The two main control boards must be the same, either two UMPTa boards or two UMPTb boards. 2. Transmission extension: There is a limitation on digital certificate sharing that IPsec must be deployed on the same board as the digital certificate. Therefore, in the configuration of UMPT+UMPT or UMPT+UTRPc, only one board supports IPsec with RSA authentication mode. The configuration principles for the UMPTb1 in multiple modes are as follows: ● From SRAN8.0 onwards, the UMPTb1 board is recommended for single-mode and multimode base stations. ● A UMPTb1 is mandatory in a co-MPT multimode base station. ● The UMPTb1 can be configured when the base station uses GU or GL co-transmission and needs to support IPSec and PKI for GSM.

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Model	Description	Function	Maximum Quantity	Configuration Principle
				● When two BBUs in a separate-MPT multimode base station are interconnected in UCIU+UMPT mode, a UMPTb1 must be configured in BBU 1 (secondary BBU).
WD2D0UMPTB01	Universal Main Processing & Transmission unit with 4E1 and 2FE/GE interface UMPTb2	Universal main processing and transmission board (UMPTb2) ● Provides one FE/GE electrical port. ● Provides one FE/GE optical port. ● Provides four E1s/T1s. ● Provides one CI port (for BBU interconnection). ● Provides the GPS clock port.	In a co-MPT/hybrid-MPT base station configured with a single BBU: 1 In a co-MPT/hybrid-MPT base station configured with two BBUs: 2 In separate-MPT scenarios: ● Single BBU: 2 ● BBU interconnection: 2	● The UMPTb2 supports GPS synchronization. For a newly deployed SRAN or LTE FDD site that requires GPS clock, a UMPTb2 is preferentially configured. ● For a newly deployed GSM only (eGBTS) or UMTS only site that requires GPS clock, a USCU is preferentially configured or a UMPTb2 can be configured alternatively.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2DUMPTE100	Universal Main Processing & Transmission unit with 2FE/GE 2FE/GE/XGE and 1CI interface	UMPTe1: Universal main processing and transmission board ● Provides two FE/GE electrical ports. ● Provides two FE/GE/XGE optical ports. ● Provides one CI port (for BBU interconnection).	In a co-MPT/hybrid-MPT base station configured with a single BBU: 1 In a co-MPT/hybrid-MPT base station configured with two BBUs: 2 In separate-MPT scenarios: ● Single BBU: 2 ● BBU interconnection: 2	From SRAN11.1 onwards, the UMPTe1 board can be configured. ● The UMPTe is recommended for LTE only mode. ● The UMPTe is optional in the GSM only mode and UMTS only mode where there is no E1. ● In multimode scenarios: – For a newly deployed or relocated site, the co-MPT UMPTe is recommended when there is no E1 requirement and the co-MPT UMPTb is recommended when there are E1 requirements. – In scenarios where LTE needs to be deployed on existing sites: The UMPTe can be configured to replace the existing main control board. ● Cold standby is not supported between the UMPTe and any one of the following boards: WMPT, LMPT, UMPTa, and UMPTb. It is supported only between two UMPTe boards. ● Transmission: (1) The UMPTe is recommended when two GE/XGE optical ports or two FE/GE electrical ports are required. (2) The UMPTe must be configured when XGE optical ports are used. (3) The UMPTe is recommended when the throughput exceeds 1 Gbit/s.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2DUMPTE200	Universal Main Processing & Transmission unit with 2FE/GE 2FE/GE/XGE and 1CI interface	UMPTe2: Universal main processing and transmission board ● Provides two FE/GE electrical ports. ● Provides two FE/GE/XGE optical ports. ● Provides one CI port (for BBU interconnection). ● Provides the GPS clock port.	In a co-MPT/hybrid-MPT base station configured with a single BBU: 1 In a co-MPT/hybrid-MPT base station configured with two BBUs: 2 In separate-MPT scenarios: ● Single BBU: 2 ● BBU interconnection: 2	● From SRAN11.1 onwards, the UMPTe2 board can be configured. ● The UMPTe2 supports GPS synchronization. For a newly deployed SRAN, LTE FDD, GSM only, or UMTS only site that requires GPS clock, a UMPTe2 is preferentially configured.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2D00 UCCU00	Universal Inter-Connection Infrastructure Unit (UCIU)	UCCU: interconnection and coordination board ● Provides one QSFP+ port, which connects to the upper-level USU through 1*2X sRIO +2*1X sCPRI channels. ● Provides two SFP+ ports, which connect to the upper-level USU through 10GE channels. ● Provides three QSFP+ ports, which connect to the BBU boards (either in the same or different BBUs) through 1*2X sRIO +2*1X sCPRI channels.	In Cloud BB scenarios, a UCCU is configured in the BBU.	From SRAN10.1 onwards, the UCCU is recommended when a distributed Cloud BB scenario uses LTE FDD mode, LTE TDD mode, or multiple modes containing LTE. The UCCU is installed in a service BBU and connected to a remote USU through its upper-level interconnection port. From SRAN11.1 onwards, the UBBPe is recommended in the distributed Cloud BB scenarios. If the UBBPe is configured in the new deployment scenario, the UCCU does not need to be configured and the UBBPe is used to connect the BBU to the USU. If a UCCU is originally configured in the capacity expansion scenario, retain the connection between the UCCU and USU instead of connecting the HEI port on the UBBPe to the USU.
WD2DU BBPD100	Universal Baseband Processing Unit d1	UBBPd1, which provides six CPRI ports	GSM: If the main control board is a GTMUb, a maximum of five baseband processing boards can be	From SRAN9.0 onwards, the UBBPd is recommended for UMTS only and LTE only modes. The UBBPd supports a single mode or multiple modes. The UBBPd can be configured with the WBBP or LBBP together.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2DUBBPD200	Universal Baseband Processing Unit d2	UBBPd2, which provides six CPRI ports	configured. If the main control board is a UMPT, a maximum of six baseband processing boards can be configured. UMTS/LTE: A maximum of six baseband processing boards can be configured.	During capacity expansion, it is recommended that the existing baseband processing boards be configured with the maximum capacity and the UBBPd be configured if the required capacity is not reached. GSM only mode: ● From GBSS16.0 onwards, the UBBP must be configured when the VAMOS FR, VAMOS II, 4-Antenna Receive Diversity, Antenna Frequency Hopping, and MICC features need to be supported. UMTS only mode: ● From RAN15.0 onwards, the UBBPd is recommended for UMTS only mode. LTE only mode: ● In eRAN7.0, the following UBBP boards support LTE only mode: UBBPd3, UBBPd4, UBBPd5, and UBBPd6. ● From eRAN7.0/eRAN8.1/eRAN11.0 (SRAN9.0/SRAN10.1/SRAN11.0) onwards, the cell configuration principles for the UBBPd4, UBBPd5, and UBBPd6 in LTE only mode are as follows: – A UBBPd4 does not support a hybrid configuration of 1R and 4R cells, or 2R and 4R cells. – In SRAN9.0 (V100R009C00SPC210) or later, a UBBPd5 supports a hybrid configuration of 1R and 4R cells, or 2R and 4R cells. In a hybrid configuration, a maximum of three cells are supported. – In SRAN9.0 (V100R009C00SPC210) or later, a UBBPd6 supports a hybrid configuration of 1R and 4R cells, or 2R and 4R cells. In a hybrid configuration, a maximum of three 1R or 2R cells and three 4R cells are supported. – After being converted from a non-hybrid configuration to a hybrid configuration of 2R and 4R cells, the UBBPd6 must be reset. ● In eRAN8.0/SRAN10.0, the cell configuration principles for the UBBPd4, UBBPd5, and UBBPd6 in LTE only mode are as follows:
WD2DUBBPD300	Universal Baseband Processing Unit d3	UBBPd3, which provides six CPRI ports		
WD2DUBBPD400	Universal Baseband Processing Unit d4	UBBPd4, which provides six CPRI ports		
WD2DUBBPD500	Universal Baseband Processing Unit d5	UBBPd5, which provides six CPRI ports		

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2DUBBPD600	Universal Baseband Processing Unit d6	UBBPd6, which provides six CPRI ports		– The UBBPd cannot be configured with 2R and 4R cells together. ● In eRAN11.1/SRAN11.1 and later, the sector configuration principles for the UBBPd4, UBBPd5, and UBBPd6 in LTE only mode are as follows: – The UBBPd4/UBBPd5/UBBPd6 can be configured any hybrid configuration of 2R and 4R cells within the specifications. In co-BBP multimode scenarios: ● To support GU mode, the UBBPd1, UBBPd2, UBBPd3, UBBPd4, UBBPd5, or UBBPd6 must be configured. ● To support GL mode, the UBBPd3, UBBPd4, UBBPd5, or UBBPd6 must be configured. ● To support UL/GUL mode, the UBBPd6 or UBBPe must be configured. – In versions earlier than SRAN11.1, a UBBPd6 working in UL/GUL mode cannot be configured with 2T2R and 2T4R or 2T2R and 4T4R cells together. In SRAN11.1 and later, a UBBPd6 working in LTE mode can be configured with 2T2R, 2T4R, and 4T4R sectors together. A UBBP in the centralized Cloud BB scenario cannot work in multiple modes.
WD2DUBBPE100	Universal Baseband Processing Unit e1	UBBPe1, which provides six CPRI ports	In UMTS or LTE mode, a maximum of six boards can be configured.	From SRAN11.1 onwards, the UBBPe can serve UO, LO, UL, and FT modes. The UBBPe supports a single mode or multiple modes. The UBBPe cannot process GSM baseband signals. Any board from the UBBPe1 to UBBPe4 can be configured in the BBU3900 or BBU3910. Any board from the UBBPe1 to UBBPe4 can be configured with the UBBPd, WBBP, and LBBP together. ● UMTS only mode: From RAN18.1 onwards, a UMTS only base station serving six or fewer cells can be configured with the UBBPe1 or UBBPe2. For a UMTS only base station serving 12 cells, the
WD2DUBBPE200	Universal Baseband Processing Unit e2	UBBPe2, which provides six CPRI ports	In UMTS or LTE mode, a maximum of six boards can be configured.	

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2DUBBPE300	Universal Baseband Processing Unit e3	UBBPe3, which provides six CPRI ports	In UMTS or LTE mode, a maximum of six boards can be configured.	UBBPe3 is recommended or the UBBPe4 can be configured for the sake of transition to LTE. ● LTE only mode: -From eRAN11.1 onwards, the UBBPe1 or UBBPe2 can be configured to support three cells in LTE FDD mode and the UBBPe3 or UBBPe4 is recommended for the configuration of six cells in LTE FDD mode. -For the LTE FDD mode, the UBBPe2 or UBBPe4 supports any hybrid configurations of 2R and 4R cells within the specifications of the board. ● In co-BBP multimode scenarios: -To support UL baseband concurrency, the UBBPe3 or UBBPe4 is recommended. -For the LTE FDD mode, the UBBPe2 or UBBPe4 supports any hybrid configurations of 2R and 4R cells within the specifications of the board. A UBBP in the centralized Cloud BB scenario cannot work in multiple modes.
WD2DUBBPE400	Universal Baseband Processing Unit e4	UBBPe4, which provides six CPRI ports	In UMTS or LTE mode, a maximum of six boards can be configured.	

4.2.3.5 Clock and Transmission Board Configurations

This section describes the principles for configuring clock and transmission boards in a BBU.

In SRAN6.0, three modes can be deployed in two BBUs, which work in GU+L or GL+U mode. The two BBUs do not support co-transmission or co-clock. In GU+L mode, L is regarded as LTE only mode. In GL+U mode, U is regarded as UMTS only mode.

In SRAN7.0, two BBUs can be interconnected to support three modes, such as GU+L(G) and GL+U(G). In addition, co-clock and co-transmission are supported in BBU interconnection scenarios. In SRAN7.0, the UMPT is introduced to support the mainstream solution of co-transmission. The UTRPc is used for the alternative solution of co-transmission.

In RAN14.0, the UTRPa is introduced (used only for UMTS) to replace the UTRP3 and UTRP4, which will enter the EOM phase.

In SRAN8.0, co-MPT is introduced. In co-MPT scenarios, co-transmission is recommended.

The following table lists the principles for configuring clock and transmission boards in a BBU.

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Table 4-18 Principles for configuring clock and transmission boards in a BBU

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2D00USCU00	Universal Satellite Clock Unit	USCUb11: clock board used for LTE, without a satellite card	1	This board needs to be configured for the LTE mode when any of the following conditions is met: ● A BITS reference clock is used for LTE mode. ● The LTE mode is not configured on a main control board that has a built-in GPS satellite card but the LTE mode requires the GPS function. ● The 1PPS or RGPS clock is used for the LTE mode.
WD2D0USCU300	Universal Synchronization Clock Unit Supporting GPS and BITS	USCUb14: USCU satellite card clock board, with a built-in u-blox GPS satellite card	1	This board is optional and can be configured from SRAN7.0, GBSS14.0, RAN14.0, or eRAN5.0 onwards. ● This board is required when GPS or BITS clock synchronization is used for the GSM or UMTS mode. ● This board is required when a BITS reference clock is used for LTE mode. ● This board is configured when the LTE mode is not configured with a main control board that has a built-in GPS satellite card but requires the GPS or OTDOA function. ● This board is configured when the UMTS mode requires the OTDOA function. ● In GU/GL/UL dual-mode base station, this board is configured when GPS or BITS clock synchronization is used for GSM or UMTS, or when BITS clock synchronization is used for LTE. ● This board is configured in a GU/GL/UL dual-mode base station where the Common Clock feature is activated and GPS or BITS clock synchronization is used. ● This board is required in either a single-mode or multimode base station when the 1PPS or RGPS clock is used for the LTE mode.
WD2D00UCIU00	Universal inter-Connection Infrastructure Unit	UCIU: interface board for BBU interconnection	1	For a separate-MPT triple-mode base station, BBU 0 needs to be configured with the UCIU if the two BBUs are interconnected by connecting the UCIU in one BBU and the UMPT in the other BBU.

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Model	Description	Function	Maximum Quantity	Configuration Principle
GM5DUTRPB400	GSM TDM over E1/T1 Interface Unit	UTRPb4: GSM transmission extension board Provides eight TDM over E1/T1 ports.	1	This board is configured when five to eight E1/T1s are required by GSM mode.
QWMD0UTRP300	Iub ATM Interface Unit (8 E1s)	UTRP3: UMTS transmission extension board Provides eight ATM over E1 ports.	4	This board is required when the E1/T1 ports on the main processing and transmission board in UMTS mode support ATM transmission and more than four ATM over E1/T1 ports are required.
QWMP0UTRP400	Iub IP Interface Unit (8 E1s)	UTRP4: UMTS transmission extension board Provides eight IP over E1 ports.	4	This board is required when the E1 ports on the main processing and transmission board in UMTS mode support IP transmission and more than four IP over E1 ports are required.
QWMP0UTRP900	Iub IP Interface Unit (4 FE/GE Electrical ports)	UTRP9: UMTS transmission extension board Provides four FE/GE electrical ports.	4	This board is required when two or more FE/GE electrical ports are used by UMTS. Each board provides four FE/GE electrical ports, and the number of the boards to be configured is determined by the required number of FE/GE electrical ports.
QWMP0UTRP200	Iub IP Interface Unit (2 FE/GE Optical ports)	UTRP2: UMTS transmission extension board Provides two FE/GE optical ports.	4	This board is required when two or more FE/GE optical ports are used by UMTS.
QWMD0UTRP600	Iub ATM Interface Unit (1 Unchannelized STM-1)	UTRP6: UMTS transmission extension board Provides one unchannelized STM-1 port.	4	This board is required when unchannelized STM-1 transmission is used by UMTS.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMD0UTRPA00	Universal Transmission Resource Processing Unit (8 E1s/T1s)	UTRPa: UMTS transmission extension board Provides eight ATM or IP over E1 ports.	4	● This board is required when the E1/T1 ports on the main processing and transmission board in UMTS mode support ATM or IP transmission and more than four E1/T1 ports are required. ● Each board provides eight E1/T1 ports, and the number of the boards to be configured is determined by the required number of E1/T1 ports. ● The ATM transmission and IP transmission cannot be used together. ● The UTRPa board supports the plug-and-play function only in RAN14.0/RAN14.1, and this board cannot be customized. This board can be supported only by specific software versions of RAN15.0 and later.
QWMD0UTRPC00	Universal Transmission Resource Processing Unit (4 Electrical FE/GE ports & 2 Optical FE/GE ports)	UTRPc: UMTS transmission extension board ● Works in GSM, UMTS, or LTE mode. ● Provides four FE/GE electrical ports. ● Provides two FE/GE optical ports.	1	Optional. The UTRPc is introduced in SRAN7.0/GBSS14.0/RAN14.0/eRAN5.0. It can be shared by GSM, UMTS, and LTE. Since SRAN7.0, the UTRPc is recommended for increasing FE/GE ports in all modes. Since SRAN8.0, the UTRPc is not recommended for increasing FE/GE ports in GSM mode. When the GTMUa board is used, the UTRPc board cannot be used for transmission capacity expansion. ● This board is required when a triple-mode base station that uses co-transmission is not configured with a UMPT board, or is configured with a UMPT board but requires transmission capacity expansion. ● This board is required when IPsec is used for UMTS and no UMPT is configured for UMTS.
QCUBBBULIG01	Lightening Arrester Box	SLPU: surge protection box for transmission	1	● Each surge protection box is configured with a maximum of four surge protection boards. ● A BTS3900AL cabinet contains one surge protection box. One piece needs to be configured when more than four surge protection boards are required.
WD2P00UELP00	Universal E1/T1 Lightening Protection Unit	UELP: universal E1/T1 lightening protection unit	-	● Every four E1 ports are configured with one surge protection package. ● A BTS3900AL AC cabinet contains two E1 surge protection packages. This board needs to be configured when more than two E1 surge protection packages are required.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2P0UFLPB00	Universal FE/GE Lightening Protection Unit	UFLPb: universal FE/GE lightening protection unit	-	● Every two FE/GE electrical ports are configured with one surge protection package. ● A BTS3900AL AC cabinet contains one FE/GE surge protection package. This board needs to be configured when more than one FE/GE surge protection package is required. ● The FE/GE surge protection package is not required when a UMPTe is configured.
WD2P0UFLPC00	Universal FE/GE Lightening Protection Unit	UFLPc: universal FE/GE lightening protection unit	-	● Every two FE/GE electrical ports are configured with one surge protection package. ● A BTS3900AL AC cabinet contains one FE/GE surge protection package. This board needs to be configured when more than one FE/GE surge protection package is required. ● The FE/GE surge protection package is not required when a UMPTe is configured.

4.3 RF Module Configurations

This section describes the principles for configuring RF modules in a 3900 series base station.

4.3.1 RF Module Configurations

The type of RF modules to be used is determined by the frequency band. Each sector is configured with at least one RF module. The number of RF modules to be configured depends on the number of sectors, number of carriers, and output power.

The following table lists the relationships between sectors and RF modules.

Table 4-19 RF module configurations

Configuration Scenario	RF Module Configuration
Transmit diversity 2x2 MIMO MIMO Prime	Two TX channels are required for one sector: ● Two 1T modules[a] are configured for one sector. ● One 2T[b] or 4T module is configured for one sector.
DL 4x2 MIMO DL 4x4 MIMO	Four TX channels are required for one sector: ● Two 2T modules are configured for one sector. ● One 4T module is configured for one sector. **NOTE** 1T modules cannot be used in this configuration scenario.

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Configuration Scenario	RF Module Configuration
UL 4-way Diversity UL 2x4 multi-user MIMO (MU-MIMO)	Four RX channels are required for one sector: ● Two 2R modules are configured for one sector. ● One 4R module is configured for one sector.
a: In versions earlier than SRAN6.0, when two 1T RF modules are configured to support MIMO, the two RF modules must be cascaded by connecting CPRI ports. From SRAN6.0 onwards, it is recommended that the two RF modules be cascaded by connecting CPRI ports. b: For 2T RF modules that support UMTS mode among other modes, the UMTS mode of two 2T RF modules serving one sector supports UL 4-way diversity but does not support carrier or power expansion. If RFUs and RRUs are used in the same base station, they cannot operate in the same frequency band.	

The application scenarios supported by RF modules vary according to the working mode of the RF modules, as shown in the following table.

Table 4-20 RF module configuration restrictions

Mode	Restriction
GSM	● The DRFUs support UL 4-way diversity. ● From GBSS16.0/SRAN9.0 onwards, UL 4-way diversity is supported by a base station where GSM baseband signals are processed by the UBBPd. ● The RRU3004, DRFU, and 2T RF modules support the transmit diversity. ● When UL 4-way diversity is used, two DRFUs must be configured. ● When PBT or transmit diversity is used, each DRFU or RRU3004 supports only one TRX. Each cell served by the DRFU or RRU3004 supports a maximum of two TRXs. When transmit diversity is used, the maximum number of carriers supported by each GSM RF module with two transmit channels decreases by half. ● The DRFU or RRU3004 supporting transmit diversity does not support PBT. ● When UL 4-way diversity is used, the DRFU does not support TMA. When 4-way diversity is used, each cell supports a maximum of two TRXs. **NOTE** The DRFU or RRU3004 cannot be used in an eGBTS.
UMTS	● RFUs support transmit diversity, 2x2 MIMO, and UL 4-way diversity. ● RRUs support DL transmit diversity, 2x2 MIMO, and UL 4-way diversity.
LTE	The following configuration scenarios are supported: 2x2 MIMO, SIMO, UL 4-way diversity, DL 4x2 MIMO, UL 2x4 MU-MIMO, and DL 4x4 MIMO. When DL 4x2 MIMO or DL 4x4 MIMO is used, two cascaded 2T RF modules or one 4T RF module is required. 1T RF modules do not support DL 4x2 MIMO or DL 4x4 MIMO.
NOTE When the SingleOM solution is used, GSM RF signals do not support transmit diversity.	

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4.3.2 RF Modules Working at Band 31 (450 MHz)

This section describes the principles for configuring RF modules working at band 31 (450 MHz).

RF Modules Working at Band 31 (450 MHz)

The following table lists RRU configurations.

Table 4-21 RRU configurations

Model	Description	Function	Configuration Principle
WD5M450RRU05	RRU3668 for multimode 450 MHz (2x40 W)	RRU3668 working at band 31 (450 MHz): ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 452.5 MHz to 457.5 MHz; DL: 462.5 MHz to 467.5 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.3 RF Modules Working at Band 8 (900 MHz)

This section describes the principles for configuring RF modules working at band 8 (900 MHz).

RFUs Working at Band 8 (900 MHz)

The following table lists RFU configurations.

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Table 4-22 RFU configurations

Model	Description	Function	Configuration Principle
● WD5M9EMRFU05 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P9EMRFU04 (applying to the BTS3900AL)	MRFUe for Multi-Mode 900 MHz EGSM	MRFUe working at the 900 MHz EGSM band: ● The module has one transmit channel and its maximum output power is 125 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GSM, UMTS, LTE (supported only in multimode base stations), GU SDR, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
● WD5M9EMRFU07 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P9EMRFU05 (applying to the BTS3900AL)	RF Unit V2 for Multi-Mode 900 MHz EGSM	MRFU V2 working at the 900 MHz EGSM band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GL SDR, UMTS, or LTE mode	
● WD5M9PMRFU02 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P9PMRFU02 (applying to the BTS3900AL)	RF Unit V2 for multi-mode 900 MHz PGSM	MRFU V2 working at the 900 MHz PGSM band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	

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Model	Description	Function	Configuration Principle
● WD5M9EMRFU02 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P9EMRFU02 (applying to the BTS3900AL)	RF Unit V2 for Multi-Mode 900 MHz EGSM	MRFU V2 working at the 900 MHz EGSM band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	
WD5M9PMRFU08 (applying to the BTS3900, BTS3900A, and BTS3900L) WD5P9PMRFU08 (applying to the BTS3900AL)	MRFU V6 for Multi-Mode 900 MHz PGSM (1x80 W)	MRFU V6 working at the 900 MHz PGSM band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GSM, UMTS, or GU SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
WD5M9EMRFU08 (applying to the BTS3900, BTS3900A, and BTS3900L) WD5P9EMRFU08 (applying to the BTS3900AL)	MRFU V6 for Multi-Mode 900 MHz PGSM (1x80 W)	MRFU V6 working at the 900 MHz EGSM band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GSM, UMTS, or GU SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.

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Model	Description	Function	Configuration Principle
● WD5M9EMRFU06 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5M9EMRFU13 (applying to the BTS3900AL)	MRFUd for Multi-Mode 900MHz EGSM	Enhanced MRFUd working at the 900 MHz EGSM band: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
● WD5M9PMRFU06 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5M9PMRFU13 (applying to the BTS3900AL)	MRFUd for Multi-Mode 900 MHz PGSM	Enhanced MRFUd working at the 900 MHz PGSM band: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	
● GM5M9PGRFU02 (applying to the BTS3900, BTS3900A, and BTS3900L) ● GM5P9PGRFU02 (applying to the BTS3900AL)	GRFU V2 900 MHz PGSM	Multi-carrier RFU working at the 900 MHz PGSM band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GSM mode.	

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Model	Description	Function	Configuration Principle
● GM5M9EGRFU04 (applying to the BTS3900, BTS3900A, and BTS3900L) ● GM5P9EGRFU04 (applying to the BTS3900AL)	GRFU V2 900 MHz EGSM	Multi-carrier RFU working at the 900 MHz EGSM band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GSM mode.	

RRUs Working at Band 8 (900 MHz)

The following table lists RRU configurations.

Table 4-23 RRU configurations

Model	Description	Function	Configuration Principle
WD5M9P395900	RRU3959 for Multi-mode 900 MHz PGSM	RRU3959, blade RRU working at the 900 MHz PGSM band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M9E395900	RRU3959 for Multi-mode 900 MHz EGSM	RRU3959, blade RRU working at the 900 MHz EGSM band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	

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Model	Description	Function	Configuration Principle
WD5M9E395300	RRU3953 for Multi-Mode 900 MHz EGSM	RRU3953, blade RRU working at the 900 MHz EGSM band: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M9P392900	RRU3929 for Multi-mode 900 MHz PGSM	RRU3929 working at the 900 MHz PGSM band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	
WD5M9E392931	RRU3929 for Multi-mode 900 MHz EGSM	RRU3929 working at the 900 MHz EGSM band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	

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Model	Description	Function	Configuration Principle
WD5M9E392800	RRU3928 for Multi-mode 900 MHz EGSM	RRU3928 working at the 900 MHz EGSM band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
GM6M9PDRRU00	RRU3004 900 MHz PGSM	RRU3004 working at the 900 MHz PGSM band: ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GSM mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
GM6M9EDRRU00	RRU3004 900 MHz EGSM	RRU3004 working at the 900 MHz EGSM band: ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GSM mode.	
GM6M9PGRRU04	RRU3008 900 MHz PGSM	RRU3008 V2 working at the 900 MHz PGSM band: ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GSM mode.	
GM6M9EGRRU06	RRU3008 900 MHz EGSM	RRU3008 V2 working at the 900 MHz EGSM band: ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GSM mode.	

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Model	Description	Function	Configuration Principle
WD5M9P393600	RRU3936 for Multi-mode 900 MHz PGSM	RRU3936, blade RRU working at the 900 MHz PGSM band: ● The module has one transmit channel and its maximum output power is 1x80 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M9E393600	RRU3936 for Multi-mode 900 MHz EGSM	RRU3936, blade RRU working at the 900 MHz EGSM band: ● The module has one transmit channel and its maximum output power is 1x80 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, or UMTS mode.	
WD5M9P393800	RRU3938 for Multi-mode 900 MHz PGSM	RRU3938, blade RRU working at the 900 MHz PGSM band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 890 MHz to 915 MHz; DL: 935 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M9E393800	RRU3938 for Multi-mode 900 MHz EGSM	RRU3938, blade RRU working at the 900 MHz EGSM band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 880 MHz to 915 MHz; DL: 925 MHz to 960 MHz ● It can work in GU SDR, GL SDR, GSM, UMTS, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.4 RF Modules Working at Band 3 (1800 MHz)

This section describes the principles for configuring RF modules working at band 3 (1800 MHz).

RFUs Working at Band 3 (1800 MHz)

The following table lists RFU configurations.

Table 4-24 RFU configurations

Model	Description	Function	Configuration Principle
● WD5M18MRFU32 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P18MRFU32 (applying to the BTS3900AL)	MRFUe for Multi-Mode 1800 MHz	Multimode RF module working at the full 1800 MHz band: ● The module has one transmit channel and its maximum output power is 125 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.

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Model	Description	Function	Configuration Principle
● WD5M18MRFU07 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5MP18MRFU15 (applying to the BTS3900AL)	MRFUd for Multi-Mode 1800 MHz	Enhanced MRFUd working at the 1800 MHz band: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	
WD5M18MRFU10 (applying to the BTS3900, BTS3900A, and BTS3900L) WD5P18MRFU10 (applying to the BTS3900AL)	MRFUd for Multi-Mode 1800 MHz	MRFUd V6 working at 1800 MHz: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	
WD5MMFUH8301 (applying to the BTS3900, BTS3900A, and BTS3900L) WD5P9PMRFU09 (applying to the BTS3900AL)	MRFU V6 for Multi-Mode 1800 MHz (1x80 W)	MRFU V6 working at 1800 MHz: ● The module has one transmit channel and two receive channels, and its maximum output power is 1x80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.

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Model	Description	Function	Configuration Principle
● WD5M18MRFU06 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P18MRFU06 (applying to the BTS3900AL)	RF Unit V2 for multi-mode 1800 MHz	Multimode RF module working at the full 1800 MHz band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	
● GM5M18GRFU05 (applying to the BTS3900, BTS3900A, and BTS3900L) ● GM5P18GRFU05 (applying to the BTS3900AL)	GRFU V2 1800 MHz	Multi-carrier RFU working at the full 1800 MHz band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.

RRUs Working at Band 3 (1800 MHz)

The following table lists RRU configurations.

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Table 4-25 RRU configurations

Model	Description	Function	Configuration Principle
WD5M18397100	RRU3971 for Multi-Mode 1800 MHz	Blade RRU working at the full 1800 MHz band: ● The module has four transmit channels and four receive channels and its maximum output power is 4x40 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M18395300	RRU3953 for Multi-Mode 1800 MHz	Blade RRU working at the full 1800 MHz band: ● The module has two transmit channels and four receive channels and its maximum output power is 2x80 W. In GO mode, its maximum output power is 2x60 W. In other modes, its maximum output power is 2x80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M183953W0	RRU3953w for Multi-Mode 1800 MHz	Blade RRU working at the full 1800 MHz band: ● The module has two transmit channels and four receive channels and its maximum output power is 2x80 W. In GO mode, its maximum output power is 2x60 W. In other modes, its maximum output power is 2x80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode. ● The instantaneous bandwidth is 75 MHz. Before using it, apply for an RM workflow to determine whether there is PIM interference onsite.	
WD5M18392931	RRU3929 for Multi-Mode 1800 MHz	Multimode RF module working at the full 1800 MHz band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M18393900	RRU3939 for Multi-Mode 1800 MHz	RRU3939, blade RRU working at the full 1800 MHz band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M18395900	RRU3959 for Multi-Mode 1800 MHz	RRU3959, blade RRU working at the full 1800 MHz band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GL SDR, GSM, or LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M183959W0	RRU3959w for Multi-Mode 1800 MHz	RRU3959w, blade RRU working at the full 1800 MHz band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GL SDR, GSM, or LTE mode. ● The instantaneous bandwidth is 75 MHz. Before using it, apply for an RM workflow to determine whether there is PIM interference onsite.	
GM6M18DRRU00	RRU3004 1800 MHz	RRU3004 1800 MHz: ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M18GRRU00	RRU3008 1800 MHz A	RRU3008 V1 working in the lower 45 MHz segment of the 1800 MHz band: ● UL: 1710 MHz to 1755 MHz; DL: 1805 MHz to 1850 MHz ● It can work in GSM mode.	

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Model	Description	Function	Configuration Principle
WD5M18GRRU01	RRU3008 1800 MHz B	RRU3008 V1 working in the higher 45 MHz segment of the 1800 MHz band: ● UL: 1740 MHz to 1785 MHz; DL: 1835 MHz to 1880 MHz ● It can work in GSM mode.	
WD5M18393600	RRU3936 for Multi-Mode 1800 MHz	RRU3936, multimode blade RRU working at the full 1800 MHz band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M18393800	RRU3938 for Multi-Mode 1800 MHz	RRU3938 working at the full 1800 MHz band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M2P3952M0	RRU3952m for 1800 MHz 2T2R +2100 MHz 2R (2x60 W)	The RRU3952m is a multimode RF module supporting mutual aid and working at 1800 MHz +2100 MHz. It supports 1800 MHz 2T4R or 1800 MHz 2T2R +2100 MHz 2R. Its maximum output power is 2x60 W. The frequency bands are as follows: ● 1800 MHz: UL: 1710 MHz to 1785 MHz DL: 1805 MHz to 1880 MHz ● 2100 MHz: UL: 1920 MHz to 1980 MHz DL: 2110 MHz to 2170 MHz It can work in GO/UO/LO/GL/GU/UL/GUL mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.5 RF Modules Working at Band 5 (850 MHz)

This section describes the principles for configuring RF modules working at band 5 (850 MHz).

RFUs Working at Band 5 (850 MHz)

The following table lists RFU configurations.

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Table 4-26 RFU configurations

Model	Description	Function	Configuration Principle
● WD5M85MRFU00 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P85MRFU00 (applying to the BTS3900AL)	RF Unit V2 for multi-mode 850 MHz	MRFU V2 working at the 850 MHz band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 824 MHz to 846.5 MHz; DL: 869 MHz to 891.5 MHz ● It can work in GSM, UMTS, GU SDR, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
● QWMMWRFU8500 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QWMPWRFU8500 (applying to the BTS3900AL)	RF Unit for UMTS 850 MHz (80 W)	WRFU working at segment A of the 850 MHz band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 824 MHz to 835 MHz; DL: 869 MHz to 880 MHz ● It can work in UMTS mode.	

RRUs Working at Band 5 (850 MHz)

The following table lists RRU configurations.

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Table 4-27 RRU configurations

Model	Description	Function	Configuration Principle
WD5M85393600	RRU3936 for Multi-Mode 850 MHz	RRU3936, multimode blade RRU working at the full 850 MHz band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 824 MHz to 849 MHz; DL: 869 MHz to 894 MHz ● It can work in GSM, UMTS, LTE, GU SDR, or GUL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M85395200	RRU3952 for Multi-Mode 850 MHz	Blade RRU, RRU3952 working at the 850 MHz frequency band: ● The module has two transmit channels and four receive channels and its maximum output power is 2x60 W. ● UL: 824 MHz to 849 MHz; DL: 869 MHz to 894 MHz ● It can work in GSM, UMTS, LTE, GU SDR, GL SDR, UL SDR, or GUL SDR mode. ● It supports four carriers and four antennas.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M85394200	RRU3942 for Multi-Mode 850 MHz	RRU3942 working at the 850 MHz frequency band: ● The module has two transmit channels and four receive channels and its maximum output power is 2x60 W. ● UL: 824 MHz to 849 MHz; DL: 869 MHz to 894 MHz ● It can work in GU SDR, UL SDR, GUL SDR, GSM, or UMTS mode. ● It supports four carriers and four antennas.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
QWEMRRU5A300	RRU for UMTS 850 MHz (40 W)	RRU3801E working at the 850 MHz frequency band: ● UL: 824 MHz to 834 MHz; DL: 869 MHz to 879 MHz ● It can work in UMTS mode. ● It supports a maximum of two carriers and its output power is 40 W.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
QWEMRRU50200	RRU for UMTS 850 MHz (60 W)	RRU3804 working at the 850 MHz frequency band: ● UL: 824 MHz to 849 MHz; DL: 869 MHz to 894 MHz ● It supports a maximum of four carriers and its output power is 60 W. ● It can work in UMTS mode.	
WD5M85MRRU02	RRU V2 for Multi-Mode 850 MHz	RRU3908 V2, multimode RF module working at 850 MHz: ● UL: 824 MHz to 849 MHz; DL: 869 MHz to 894 MHz ● It can work in GSM, UMTS, LTE, UL SDR, GL SDR, or GU SDR mode.	

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Model	Description	Function	Configuration Principle
GM6M85GRRU00	RRU3008 850 MHz	RRU3008 V1 working at 850 MHz: ● UL: 824 MHz to 849 MHz; DL: 869 MHz to 894 MHz ● It can work in GSM mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.6 RF Modules Working at Band 2 (1900 MHz)

This section describes the principles for configuring RF modules working at band 2 (1900 MHz).

RFUs Working at Band 2 (1900 MHz)

The following table lists RFU configurations.

Table 4-28 RFU configurations

Model	Description	Function	Configuration Principle
● WD5M19MRFU01 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P19MRFU01 (applying to the BTS3900AL)	RF Unit for multi-mode 1900 MHz A	MRFU V1 working at segment A of the 1900 MHz frequency band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1850 MHz to 1890 MHz; DL: 1930 MHz to 1970 MHz ● It can work in GSM, UMTS, or GU SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.

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Model	Description	Function	Configuration Principle
● WD5M19MRFU02 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P19MRFU02 (applying to the BTS3900AL)	RF Unit for multi-mode 1900 MHz B	MRFU V1 working at segment B of the 1900 MHz frequency band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1870 MHz to 1910 MHz; DL: 1950 MHz to 1990 MHz ● It can work in GSM, UMTS, or GU SDR mode.	
● GM5M19GRFU00 (applying to the BTS3900, BTS3900A, and BTS3900L) ● GM5P19GRFU00 (applying to the BTS3900AL)	GRFU 1900 MHz A	Multi-carrier RF module working at segment A of the 1900 MHz frequency band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1850 MHz to 1890 MHz; DL: 1930 MHz to 1970 MHz ● It can work in GSM mode.	
● GM5M19GRFU01 (applying to the BTS3900, BTS3900A, and BTS3900L) ● GM5P19GRFU01 (applying to the BTS3900AL)	GRFU 1900 MHz B	Multi-carrier RF module working at segment B of the 1900 MHz frequency band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1870 MHz to 1910 MHz; DL: 1950 MHz to 1990 MHz ● It can work in GSM mode.	

RRUs Working at Band 2 (1900 MHz)

The following table lists RRU configurations.

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Table 4-29 RRU configurations

Model	Description	Function	Configuration Principle
WD5M19397100	RRU3971 for Multi-Mode 1900 MHz	Blade RRU working at the full 1900 MHz band: ● The module has four transmit channels and four receive channels and its maximum output power is 4x40 W. ● UL: 1870 MHz to 1910 MHz; DL: 1950 MHz to 1990 MHz ● It can work in UMTS, LTE, GU, GL, UL, or GUL mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
GM6M19GRRU00	RRU3008 1900 MHz A	RRU3008 V1 working at the lower 40 MHz segment of the 1900 MHz frequency band: ● UL: 1850 MHz to 1890 MHz; DL: 1930 MHz to 1970 MHz ● It can work in GSM mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
GM6M19GRRU01	RRU3008 1900 MHz B	RRU3008 V1 working at the higher 40 MHz segment of the 1900 MHz frequency band: ● UL: 1870 MHz to 1910 MHz; DL: 1950 MHz to 1990 MHz ● It can work in GSM mode.	
WD5M19MRRU01	RRU for Multi-Mode 1900 MHz A	RRU3908 V1, multimode RF module working at the lower 40 MHz segment of the 1900 MHz frequency band: ● UL: 1850 MHz to 1890 MHz; DL: 1930 MHz to 1970 MHz ● It can work in GSM, UMTS, or GU SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M19MRRU02	RRU for Multi-Mode 1900 MHz B	RRU3908 V1, multimode RF module working at the higher 40 MHz segment of the 1900 MHz frequency band: ● UL: 1870 MHz to 1910 MHz; DL: 1950 MHz to 1990 MHz ● It can work in GSM, UMTS, or GU SDR mode.	

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Model	Description	Function	Configuration Principle
QWEMRRU20300	RRU for UMTS 1900 MHz (40 W)	RRU3801E working at the 1900 MHz frequency band: ● UL: 1850 MHz to 1910 MHz; DL: 1930 MHz to 1990 MHz ● It supports a maximum of two carriers and its output power is 40 W. ● It can work in UMTS mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
QWEMRRU20200	RRU for UMTS 1900 MHz (60 W)	RRU3804 working at the 1900 MHz frequency band: ● UL: 1850 MHz to 1910 MHz; DL: 1930 MHz to 1990 MHz ● It supports a maximum of four carriers and its output power is 60 W. ● It can work in UMTS mode.	
WD5M19394200	RRU3942 for Multi-Mode 1900 MHz	RRU3942 working at the 1900 MHz frequency band: ● The module has two transmit channels and four receive channels and its maximum output power is 2x60 W. ● It supports a maximum of two sectors in 1T2R mode. ● UL: 1850 MHz to 1910 MHz; DL: 1930 MHz to 1990 MHz ● It can work in GSM, UMTS, LTE, GU SDR, GL SDR, UL SDR, or GUL SDR mode. ● It supports four carriers and four antennas.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M19395300	RRU3953 for Multi-Mode 1900 MHz	RRU3953, blade RRU working at the 1900 MHz frequency band: ● It works in 2T4R mode and provides the maximum output power of 2x80 W. When working in GO mode, its maximum output power is 2x60 W or 40 W+80 W. In other modes, its maximum output power is 2x80 W. ● It supports a maximum of two sectors in 1T2R mode. ● UL: 1850 MHz to 1910 MHz; DL: 1930 MHz to 1990 MHz ● It can work in GSM, UMTS, LTE, GU SDR, GL SDR, or UL SDR mode. ● It supports four carriers and four antennas.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M19393600	RRU3936 for Multi-Mode 1900 MHz	RRU3936, multimode blade RRU working at the full 1900 MHz band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1850 MHz to 1910 MHz; DL: 1930 MHz to 1990 MHz ● It can work in GSM, UMTS, LTE, GU SDR, GL SDR, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.7 RF Modules Working at Band 1 (2100 MHz)

This section describes the principles for configuring RF modules working at band 1 (2100 MHz).

RFUs Working at Band 1 (2100 MHz)

The following table lists RFU configurations.

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Table 4-30 RFU configurations

Model	Description	Function	Configuration Principle
WD5M21MRFUC00	MRFUc for WCDMA 2100 MHz (2x60 W)	RF module working at the 2100 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
WD5M21MRFU01	MRFUd for WCDMA 2100 MHz (2x80 W)	RF module working at the 2100 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS, LTE, or UL SDR mode.	
● QWMMWRFUA100 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QWMPWRFUA100 (applying to the BTS3900AL)	WRFUa for WCDMA 2100 MHz (1x100 W)	RF module working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 100 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.

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Model	Description	Function	Configuration Principle
● WD5MIFUHA100 (applying to the BTS3900, BTS3900A, and BTS3900L) ● ● WD5PIFUH8101 ● (applying to the BTS3900AL)	WRFUa V6 for WCDMA 2100 MHz (1x100 W)	RF module working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 100 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode. It supports a maximum of four carriers.	
● QWMMWRFU8101 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QWMPWRFU2100 (applying to the BTS3900AL)	WRFUe for WCDMA 2100 MHz (2x80 W)	RF module working at the 2100 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	
● QWMMWRFU6100 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QWMPWRFU6100 (applying to the BTS3900AL)	WRFUd for WCDMA 2100 MHz (2x60 W)	RF module working at the 2100 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	

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Model	Description	Function	Configuration Principle
● QWMMWRFU8102 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QWMPWRFU1101 (applying to the BTS3900AL)	RF Unit for WCDMA 2100 MHz (80 W)	RF module working at the 2100 MHz frequency band (enhanced module of the WRFU whose output power is 80 W): ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	
● QWMMWRFU4100 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QWMPWRFU4100 (applying to the BTS3900AL)	RF Unit for WCDMA 2100 MHz (40 W)	RF module working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 40 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	
● QWMMWRFU8100 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QWMPWRFU8100 (applying to the BTS3900AL)	RF Unit for WCDMA 2100 MHz (80 W)	RF module working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	

RRUs Working at Band 1 (2100 MHz)

The following table lists RRU configurations.

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Table 4-31 RRU configurations

Model	Description	Function	Configuration Principle
WD5M21395200	RRU3952 for multimode 2100 MHz	RRU3952, blade RRU working at the full 2100 MHz band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M21395800	RRU3958 for multimode 2100 MHz	RRU3958, blade RRU working at the full 2100 MHz band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS, LTE, or UL SDR mode.	
WD5M21397100	RRU3971 for multimode 2100 MHz	RRU3971, blade RRU working at the full 2100 MHz band: ● The module has four transmit channels and four receive channels and its maximum output power is 4x40 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M21395900	RRU3959 for multimode 2100 MHz	RRU3959, blade RRU working at the full 2100 MHz band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M21382400	RRU3824 for WCDMA 2100 MHz (60 W)	RRU3824, blade RRU working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M21382401	RRU3824 for WCDMA 2100 MHz (60 W)	Enhanced RRU3824, blade RRU working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	
WD5M21382600	RRU3826 for WCDMA 2100 MHz (80 W)	RRU3826, blade RRU working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	

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Model	Description	Function	Configuration Principle
WD5M21382601	RRU3826 for WCDMA 2100 MHz (80 W)	Enhanced RRU3826, blade RRU working at the 2100 MHz frequency band: ● The module has one transmit channel and its maximum output power is 80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	
WD5M21383200	RRU3832 for WCDMA 2100 MHz (2x60 W)	RRU3832, blade RRU working at the 2100 MHz frequency band: ● The module has two transmit channels and four receive channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode. **NOTE** The RRU3832 supports two receive channels in RAN12.0 and RAN13.0. The RRU3832 supports only four carriers in RAN12.0.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M21383900	RRU3839 for WCDMA 2100 MHz (2x60 W)	RRU3839, blade RRU working at the 2100 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M21383800	RRU3838 for WCDMA/LTE 2100 MHz (2x40 W)	RRU3838, blade RRU working at the 2100 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode. **NOTE** The RRU3838 supports only four carriers in RAN12.0.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M2P3832M0	RRU3952m for multimode 2100 MHz	RRU3952m, multimode RF module supporting inter-frequency mutual aid and working at 1800 MHz and 2100 MHz: ● It supports 2100 MHz 2T4R or 2100 MHz 2T2R+1800 MHz 2R. Its maximum output power is 2x60 W. ● The frequency bands are as follows: 1800 MHz: UL: 1710 MHz to 1785 MHz DL: 1805 MHz to 1880 MHz It can work in GO/LO/GL mode. 2100 MHz: UL: 1920 MHz to 1980 MHz DL: 2110 MHz to 2170 MHz It can work in UO mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M21382900	RRU for WCDMA/LTE 2100 MHz (2x60 W)	RRU3829 working at the 2100 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode. **NOTE** The RRU3829 supports only four carriers in RAN12.0.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications. It supports a maximum of six UMTS carriers and its output power is 2x60 W.
WD5M21385300	RRU for WCDMA 2100 MHz (2x80 W)	2100 MHz RRU3853: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UO mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M21395300	RRU for WCDMA 2100 MHz (2x80 W)	2100 MHz RRU3953: ● The module has two transmit channels and its maximum output power is 2x80 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UO/LO/UL mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.8 RF Modules Working at Band 7 (2600 MHz)

This section describes the principles for configuring RF modules working at band 7 (2600 MHz).

RFUs Working at Band 7 (2600 MHz)

The following table lists RFU configurations.

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Table 4-32 RFU configurations

Model	Description	Function	Configuration Principle
● WD5MLRFUE260 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5PLRFUE260 (applying to the BTS3900AL)	RFU for LTE 2600 MHz (2x60 W)	LRFUe working at 2600 MHz: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
● WD5M26LRFU0C (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P26LRFU0C (applying to the BTS3900AL)	RFU for LTE 2600 MHz C (2x40 W)	LRFU working at segment C of the 2600 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 2500 MHz to 2520 MHz; DL: 2620 MHz to 2640 MHz ● It can work in LTE mode.	
● WD5M26LRFU0E (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P26LRFU0E (applying to the BTS3900AL)	RFU for LTE 2600 MHz E (2x40 W)	LRFU working at segment E of the 2600 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 2550 MHz to 2570 MHz; DL: 2670 MHz to 2690 MHz ● It can work in LTE mode.	

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Model	Description	Function	Configuration Principle
● WD5M26LRFU00 (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P26LRFU00 (applying to the BTS3900AL)	RFU for LTE 2600 MHz D (2x40 W)	LRFU working at segment D of the 2600 MHz frequency band: ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 2510 MHz to 2560 MHz; DL: 2630 MHz to 2680 MHz ● It can work in LTE mode.	

RRUs Working at Band 7 (2600 MHz)

The following table lists RRU configurations.

Table 4-33 RRU configurations

Model	Description	Function	Configuration Principle
WD5M26328100	RRU for LTE 2600 MHz (4x40 W)	RRU3281 working at the 2600 MHz full band: ● It works in 4T4R mode and its maximum output power is 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M26324000	RRU for LTE 2600 MHz (2x40 W)	RRU3240 working at the 2600 MHz frequency band: ● It works in 2T4R mode and its maximum output power is 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5M26LRRU68	RRU3268 for LTE 2600 MHz (2x40 W)	RRU3268, blade RRU working at the 2600 MHz full band: ● Its maximum output power is 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M26326000	RRU3260 for LTE 2600 MHz (2x40 W)	RRU3260, blade RRU working at the 2600 MHz frequency band: ● It works in 2T4R mode and its maximum output power is 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	
WD5M26326200	RRU3262 for LTE 2600 MHz (2x60 W)	RRU3262, blade RRU working at the 2600 MHz frequency band: ● It works in 2T4R mode and its maximum output power is 2x60 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.9 RF Modules Working at Band 4 (AWS)

This section describes the principles for configuring RF modules working at band 4 (AWS frequency band).

RFUs Working at Band 4 (AWS Frequency Band)

The following table lists RFU configurations.

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Table 4-34 RFU configurations

Model	Description	Function	Configuration Principle
● QCYMAWSRFU01 (applying to the BTS3900, BTS3900A, and BTS3900L) ● QCYPAWSRFU01 (applying to the BTS3900AL)	CRFUd for LTE AWS (2x60 W)	RF module working at the AWS frequency band: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.

RRUs Working at Band 4 (AWS Frequency Band)

The following table lists RRU configurations.

Table 4-35 RRU configurations

Model	Description	Function	Configuration Principle
WD5MAWS39710	RRU3971 for AWS (4x40 W)	RRU3971 working at the AWS frequency band: ● The module has four transmit channels and four receive channels and its maximum output power is 4x40 W. ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5MAW384100	RRU for LTE AWS (4T4R, 2x60 W/4x30 W)	RRU3841 working at the AWS frequency band: ● The module has four transmit channels and four receive channels and its maximum output power is 2x60 W or 4x30 W. ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
QWEMRRU40800	RRU for UMTS/LTE AWS (2x40 W)	RRU3808 working at the AWS frequency band: ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M21383200	RRU3832 for WCDMA/LTE AWS (2x60 W)	RRU3832, blade RRU working at the AWS frequency band: ● The module has two transmit channels and four receive channels and its maximum output power is 2x60 W. ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.10 RF Modules Working at Band 66 (AWS-3)

RRUs Working at Band 66 (AWS-3)

The following table lists RRU configurations.

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Table 4-36 RRU configurations

Model	Description	Function	Configuration Principle
WD5MAWS39710	RRU3971 for AWS-3 (4x40 W)	RRU3971 working at the AWS-3 frequency band: ● The module has four transmit channels and four receive channels and its maximum output power is 4x40 W. ● UL: 1710 MHz to 1780 MHz; DL: 2110 MHz to 2180 MHz ● It can work in UMTS, LTE, or UL SDR mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.11 RF Modules Working at Band 12 (700 MHz)

This section describes the principles for configuring RF modules working at band 12 (700 MHz).

RRUs Working at Band 12 (700 MHz)

The following table lists RRU configurations.

Table 4-37 RRU configurations

Model	Description	Function	Configuration Principle
WD5M07LRRU00	RRU for LTE 700 MHz (2x40 W)	RRU3203 working at band 12 (700 MHz frequency band): ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 698 MHz to 716 MHz; DL: 728 MHz to 746 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M07324900	RRU3249 for LTE 700 MHz (2x60 W)	RRU3249 working at band 12 (700 MHz frequency band): ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 699 MHz to 716 MHz; DL: 729 MHz to 746 MHz ● It can work in LTE mode.	

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4.3.12 RF Modules Working at Band 13 (700 MHz)

This section describes the principles for configuring RF modules working at band 13 (700 MHz).

RRUs Working at Band 13 (700 MHz)

The following table lists RRU configurations.

Table 4-38 RRU configurations

Model	Description	Function	Configuration Principle
WD5M07LRRU01	RRU for LTE 700 MHz (2x40 W)	RRU3201 working at band 13 (700 MHz): ● The module has two transmit channels and its maximum output power is 2x40 W. ● UL: 776 MHz to 787 MHz; DL: 746 MHz to 757 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M07326900	RRU for LTE 700 MHz (2x60 W)	700 MHz dual-band (band 12&13) RRU3269: ● The module has two transmit channels and its maximum output power is 2x60 W. ● Band 13: 776 MHz to 787 MHz (UL); 746 MHz to 757 MHz (DL) ● Band 12: 699 MHz to 716 MHz (UL); 729 MHz to 746 MHz (DL) ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.13 RF Modules Working at Band 20 (800 MHz)

This section describes the principles for configuring RF modules working at band 20 (800 MHz).

RFUs Working at Band 20 (800 MHz)

The following table lists RFU configurations.

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Table 4-39 RFU configurations

Model	Description	Function	Configuration Principle
● WD5M08LRFU0E (applying to the BTS3900, BTS3900A, and BTS3900L) ● WD5P08LRFU0E (applying to the BTS3900AL)	LRFU for LTE 800 MHz (2x60 W)	LRFUe working at 800 MHz: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 832 MHz to 862 MHz; DL: 791 MHz to 821 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
WD5M08LRFUE1 (applying to the BTS3900, BTS3900A, and BTS3900L) WD5P08LRFUE0 (applying to the BTS3900AL)	LRFU for LTE 800 MHz (2x60 W)	LRFUe working at 800 MHz: ● The module has two transmit channels and its maximum output power is 2x60 W. ● UL: 832 MHz to 862 MHz; DL: 791 MHz to 821 MHz ● It can work in LTE mode.	

RRUs Working at Band 20 (800 MHz)

The following table lists RRU configurations.

Table 4-40 RRU configurations

Model	Description	Function	Configuration Principle
WD5MD8LRRU0A	RRU for LTE 800 MHz A (2x40 W)	RRU3220 working at segment A of 800 MHz: ● The module has two transmit channels and two receive channels and its maximum output power is 2x40 W. ● UL: 832 MHz to 847 MHz; DL: 791 MHz to 806 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

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Model	Description	Function	Configuration Principle
WD5MD8LRRU0B	RRU for LTE 800 MHz B (2x40 W)	RRU3220 working at segment B of 800 MHz: ● The module has two transmit channels and two receive channels and its maximum output power is 2x40 W. ● UL: 842 MHz to 862 MHz; DL: 801 MHz to 821 MHz ● It can work in LTE mode.	
WD5MD8LRRU00	RRU for LTE 800 MHz (2x40 W)	RRU3222 working at the full 800 MHz band: ● The module has two transmit channels and two receive channels and its maximum output power is 2x40 W. ● UL: 832 MHz to 862 MHz; DL: 791 MHz to 821 MHz ● It can work in LTE mode.	
WD5M08LRRU68	RRU3268 for LTE 800 MHz (2x40 W)	RRU3268, blade RRU working at the 800 MHz full band: ● The module has two transmit channels and two receive channels and its maximum output power is 2x40 W. ● UL: 832 MHz to 862 MHz; DL: 791 MHz to 821 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.

4.3.14 RF Modules Working at Band 28 (APT700 MHz)

This section describes the principles for configuring RF modules working at band 28 (APT700 MHz).

RFUs Working at Band 28 (APT700 MHz)

The following table lists RFU configurations.

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Table 4-41 RFU configurations

Model	Description	Function	Configuration Principle
WD5M07LRFU01	RFU for LTE APT700 (2T2R, 2x80 W)	LRFUe working at the APT700 band: It works in 2T2R mode and its maximum output power is 2x80 W. ● UL: 703 MHz to 743 MHz DL: 758 MHz to 798 MHz ● It can work in LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For details about the specifications, see RFU Technical Specifications.
WD5M07LRFU02	RFU for LTE APT700 (2T2R, 2x80 W)	LRFUe working at the APT700 band: It works in 2T2R mode and its maximum output power is 2x40 W. ● UL: 718 MHz to 748 MHz DL: 773 MHz to 803 MHz ● It can work in LTE mode.	

RRUs Working at Band 28 (APT700)

The following table lists RRU configurations.

Table 4-42 RRU configurations

Model	Description	Function	Configuration Principle
WD5M07326200	RRU3262 for LTE APT700 (2x60 W)	RRU3262 working at the APT700 band: It works in 2T4R mode and its maximum output power is 2x60 W. ● UL: 703 MHz to 748 MHz DL: 758 MHz to 803 MHz ● Supports the LTE mode.	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. For detailed specifications, see RRU Technical Specifications.
WD5M07LRRU02	RRU3268 for LTE APT700 (2x40 W)	RRU3268 working at the APT700 band: It works in 2T2R mode and its maximum output power is 2x40 W. ● UL: 703 MHz to 743 MHz DL: 758 MHz to 798 MHz ● Supports the LTE mode.	

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Model	Description	Function	Configuration Principle
WD5M07LRRU03	RRU3268 for LTE APT700 (2x40W)	RRU3268 working at the APT700 band: It works in 2T2R mode and its maximum output power is 2x40 W. ● UL: 718 MHz to 748 MHz DL: 773 MHz to 803 MHz ● Supports the LTE mode.	

4.4 AAU Configurations

This section describes the AAU configuration principles.

4.4.1 AAU3910 Configurations

This section describes the AAU3910 configuration principles.

RF Modules Working at Band 3 (1800 MHz)

The following table lists configuration principles for RF modules working at band 3 (1800 MHz).

Table 4-43 Principles for configuring RF modules working at band 3 (1800 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7M18MAAU00	AAU3910 1800 MHz (2T2R, 2x63 dBm), 1710 to 1880 MHz (UP), 1920 to 2170 MHZ/2500 to 2690 MHz (DOWN)	1.8 A (2T2R)+2.1/2.6 P: ● An RU3938 is used, which works in 2T2R mode and provides the maximum output power of 2x40 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM or LTE mode. ● It can provide a 4-port wideband antenna of 2100 MHz/2600 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3938, see technical specifications of the RRU3938.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MJTAA2000	AAU3910 1800 MHz (4T4R, 2x63 dBm), 1710 to 1880 MHz (UP), 1920 to 2170 MHZ/2500 to 2690 MHz (DOWN)	1.8A (4T4R)+2.1/2.6 P: ● An RU3971 is used, which works in 4T4R mode and provides the maximum output power of 4x40 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in LTE or GL mode. ● It can provide a 4-port wideband antenna of 2100 MHz/2600 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3971, see technical specifications of the RRU3971.

RF Modules Working at Band 1 (2100 MHz)

The following table lists configuration principles for RF modules working at band 1 (2100 MHz).

Table 4-44 Principles for configuring RF modules working at band 1 (2100 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7M21WAAU00	AAU3910 2100 MHz (2T4R, 2x65 dBm), 1920 to 2170 MHz (UP), 1710 to 1880 MHz/2500 to 2690 MHZ (DOWN)	2.1A (2T4R)+1.8/2.6 P: ● An RU3832 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode. ● It can provide a 4-port wideband antenna of 1800 MHz/2600 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3832, see technical specifications of the RRU3832.

RF Modules Working at Band 7 (2600 MHz)

The following table lists configuration principles for RF modules working at band 7 (2600 MHz).

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Table 4-45 Principles for configuring RF modules working at band 7 (2600 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7M26LAAU00	AAU3910 2600 MHz (2T4R, 2x63 dBm), 2500 to 2690 MHz (UP), 1710 to 2170 MHz (DOWN)	2.6 A (2T4R)+PCS/1.8/2.1/AWS P: ● An RU3260 is used, which works in 2T4R mode and provides the maximum output power of 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode. ● It can provide a 4-port wideband antenna of PCS/1800 MHz/2100 MHz/AWS for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3260, see technical specifications of the RRU3260.
WD7M26LAAU01	AAU3910 2600 MHz (2T2R, 2x63 dBm), 2500 to 2690 MHz (UP), 1710 to 2170 MHz (DOWN)	2.6 A (2T2R)+PCS/1.8/2.1/AWS P: ● An RU3268 is used, which works in 2T2R mode and provides the maximum output power of 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode. ● It can provide a 4-port wideband antenna of PCS/1800 MHz/2100 MHz/AWS for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3268, see technical specifications of the RRU3268.

RF Modules Working at Band 4 (AWS)

The following table lists configuration principles for RF modules working at band 4 (AWS).

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Table 4-46 Principles for configuring RF modules working at band 4 (AWS)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAWSAAU00	AAU3910 AWS (2T4R, 2x65 dBm), 1710 to 1770 MHz/2110 to 2170 MHz (UP), 1850 to 1990 MHz (DOWN)	AWS A (2T4R)+PCS P: ● An RU3832 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in UMTS, LTE, or UL SDR mode. ● It can provide a 4-port antenna of PCS for external RRUs or RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3832, see technical specifications of the RRU3832.

RF Modules Working at Mixed Frequency Bands

RUs working at 1800 MHz, 2100 MHz, and 2600 MHz can form 2A configurations (high-frequency module in the upper slot and low-frequency module in the lower slot), as listed in the following table.

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Table 4-47 Principles for configuring RF modules working in mixed frequency bands

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MWMJAAU00	AAU3910 2100 MHz+1800 MHz (2T4R, 2x65 dBm, 2T2R, 2x63 dBm), 1920 to 2170 MHz (UP), 1710 to 1880 MHz/ 2500 to 2690 MHz (DOWN)	2.1 A (2T4R)+1.8 A (2T2R) An RU3938 is used as a 1.8 A RF module: ● The module has two transmit channels and two receive channels and its maximum output power is 2x40 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in LTE mode. An RU3832 is used as a 2.1 A RF module: ● The module has two transmit channels and four receive channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3938 and RU3832, see technical specifications of the RRU3938 and RRU3832, respectively.
WD7MWLJAAU00	AAU3910 2600 MHz+2100 MHz (2T4R, 2x63 dBm, 2T4R, 2x65 dBm), 2500 to 2690 MHz (UP), 1710 to 2170 MHz (DOWN)	2.6 A (2T4R) + 2.1 A (2T4R) An RU3832 is used as a 2.1 A RF module: ● The module has two transmit channels and four receive channels and its maximum output power is 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode. An RU3260 is used as a 2.6 A RF module: ● The module has two transmit channels and four receive channels and its maximum output power is 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3832 and RU3260, see technical specifications of the RRU3832 and RRU3260.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MLMJAAU00	AAU3910 2600 MHz+1800 MHz (2T4R, 2x63 dBm, 2T4R, 2x63 dBm), 2500 to 2690 MHz (UP), 1710 to 2170 MHz (DOWN)	2.6 A (2T4R)+1.8 A (2T2R) An RU3938 is used as a 1.8 A RF module: ● The module has two transmit channels and two receive channels and its maximum output power is 2x40 W. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in LTE mode. An RU3260 is used as a 2.6 A RF module: ● The module has two transmit channels and four receive channels and its maximum output power is 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3938 and RU3260, see technical specifications of the RRU3938 and RRU3260, respectively.

4.4.2 AAU3902 Configurations

This section describes configuration principles and typical configurations.

Principles for configuring an AAU3902

The AAU3902 configuration principles are as follows:

- Each sector needs to be configured with an AAU3902. The number of RF modules is determined by the number of sectors, number of carriers, and output power.
- The AAU3902 is an antenna with horizontal beamwidth of 65°, and therefore does not apply to an omni-directional site.
- The 4RXD mode (1T4R/2T4R/4T4R) does not support sector splitting. Therefore, the configuration of six sectors is not supported.
- For an RU44-2.1G:
  - If a sector is not split, an AAU3902 supports one sector with a horizontal beamwidth of 65 degrees, and an RU44-2.1G supports a maximum of eight 1T2R carriers or four 2T2R/2T4R carriers.
  - If a sector is split vertically, an AAU3902 supports two sectors, each with a horizontal beamwidth of 65 degrees, and an RU44-2.1G supports a maximum of four 1T2R carriers or four 2T2R carriers. The RU44-2.1G does not support 1T4R, 2T4R, or 4T4R carriers.
  - It is recommended that the WBBPf1, WBBPf2, WBBPf3, or WBBPf4 be configured as the baseband processing board. In 4RX mode, the WBBPb and

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WBBPd only support small specifications, and they do not support CPRI MUX. Therefore, the WBBPf is recommended in 4RX mode.

- For an RU44-1.8G:
  - In LTE mode, vertical cell splitting and vertical 4-way receive diversity are supported.
  - In GSM mode, vertical cell splitting and vertical 4-way receive diversity are not supported.
  - The RU44-1.8G does not contain a GSM baseband processing unit. Therefore, a UBBP is recommended in multimode scenarios.
  - An AAU3902 can be used in an eGBTS but cannot be used in a GBTS. Therefore, a UMPT must be installed in the slot for a main control board.

Typical configurations of an AAU3902

The following table lists the typical configurations of an AAU3902.

Table 4-48 Typical configurations of an AAU3902

Typical Configurations	MU02	RU44-2.1G	RU44-1.8G	PU22	CU01	Supporting Version
2100 A+(790 to 960) P+(1710 to 2690) P	1	1	0	1	1	SRAN8.0
2100 A+1800 A+(790 to 960) P +(1710 to 2690) P	1	1	1	1	0	SRAN9.0
1800 A+(790 to 960) P+(1710 to 2690) P	1	0	1	1	0	SRAN9.0

The 2100 A+(790 to 960) P+(1710 to 2690) P configuration contains an RU44 of 2100 MHz. It can connect to a high-frequency RRU/RFU and a low-frequency RRU/RFU. The following table lists the configurations.

Table 4-49 Principles for configuring an AAU3902

Model	Description	Function	Configuration Principle
WD7MR44M0200	2100 A+(790 to 960) P +(1710 to 2690) P	AAU3902 RU44-2100 MHz (2x63 dBm), 790 to 960 MHz, 1710 to 2690 MHz	The number of packages to be configured is determined by the number of sectors, number of carriers, and output power. A package consists of an AU02V, a 2100 MHz RU44, an MU02, a PU22, and a CU.
WD7MR44M0218	1800 A+(790 to 960) P +(1710 to 2690) P	AAU3902 RU44-1800 MHz (2x63 dBm), 790 to 960 MHz, 1710 to 2690 MHz	

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4.4.3 AAU3940 Configurations

This section describes configuration principles and typical configurations of the AAU3940.

Principles for Configuring an AAU3940

The AAU3940 configuration principles are as follows:

- Each sector needs to be configured with an AAU3940. The number of RF modules is determined by the number of sectors, number of carriers, and output power.
- The AAU3940 has an antenna with horizontal beamwidth of 70°, and therefore does not apply to an omni-directional site.
- The AAU3940 only applies to sectorized cells. Each sector requires at most one AAU3940.
- The AAU3940 does not support mechanical tilt but only supports electrical tilt. The horizontal angle of the AAU3940 is adjusted using mounting kits.
- The AAU3940 supports one AC or DC power input. The AAU3940 also supports 10 kA differential mode and 20 kA common mode with surge protection capabilities.
- The AAU3940 can be used together with the BBU3900, BBU3910, or BBU3910A.

Configuration principles of CPRI ports

- The AAU3940 provides two CPRI ports, which support a rate of 1.25 Gbit/s, 2.5 Gbit/s, 4.9 Gbit/s, or 9.8 Gbit/s.
- The AAU3940 supports dual-band and UL dual-mode. The dual-star, star, and chain topologies are used for CPRI connection.
- In remote networking scenarios, the star topology for CPRI connections is recommended for a base station located on a rooftop. A cascading topology is recommended for a base station located along the streets to reduce fiber optic cables.
- Optical modules supporting a CPRI rate of 9.8 Gbit/s are recommended.

Typical Configurations of an AAU3940

The following table lists the carrier configuration of the AAU3940.

Table 4-50 Carrier specifications of AAU3940

Description	Function	Working Mode	Configuration Capacity
1.8 GHz (LTE) +2.1 GHz (LTE +UMTS)	1.8 GHz (UL: 1710 MHz to 1785 MHz, DL: 1805 MHz to 1880 MHz) + 2.1 GHz (UL: 1920 MHz to 1980 MHz, DL: 2110 MHz to 2170 MHz)	UMTS only	Six 1T2R carriers or four 2T2R carriers
		LTE only	2x20 MHz 2T2R
		UL	Four UMTS 1T2R carriers and two LTE 20 MHz 2T2R carriers Two UMTS 2T2R carriers and two LTE 20 MHz 2T2R carriers
AWS (LTE)+PCS (LTE+UMTS)	AWS (UL: 1710 MHz to 1755 MHz, DL: 2110 MHz to 2155	UMTS only	6C 1T2R or 4C 2T2R

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Description	Function	Working Mode	Configuration Capacity
	MHz)+PCS (UL: 1850 MHz to 1910 MHz, DL: 1930 MHz to 1990 MHz)	LTE only	2x20 MHz 2T2R
		UL	Four UMTS 1T2R carriers and two LTE 20 MHz 2T2R carriers Two UMTS 2T2R carriers and two LTE 20 MHz 2T2R carriers

The following table lists the AAU3940 configurations.

Table 4-51 AAU3940 configurations

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAAU39400	Function Module, AAU3940, FDD Multi-carriers Band Transceiver (TX: 1805-1880 MHz, RX: 1710-1785 MHz/TX: 2110-2170 MHz, RX: 1920-1980 MHz, 10 G, 220 V AC, 14/14.5 dBi, -3-12 deg RET)	1800 MHz+2100 MHz (2T2R): ● The wideband module (2T2R) is used and its maximum output power is 2x40 W. ● TX: 1805 MHz to 1880 MHz, RX: 1710 MHz to 1785 MHz/TX: 2110 MHz to 2170 MHz, RX: 1920 MHz to 1980 MHz ● It can work in UMTS, LTE, or UL mode. ● Power supply: 220 V AC	6	Each sector is configured with one AAU. For carrier power specifications of the AAU3940, see technical specifications of the AAU3940.
WD7MIRTB7M0C	Function Module-AAU3940-FDD Multi-carriers Band Transceiver (TX: 1825-1875 MHz, RX: 1730-1780 MHz/TX: 2110-2170 MHz, RX: 1920-1980 MHz, 10 Gbit/s, DC, 2T2R)	1800 MHz+2100 MHz (2T2R): ● The wideband module (2T2R) is used and its maximum output power is 2x40 W. ● TX: 1805 MHz to 1880 MHz, RX: 1710 MHz to 1785 MHz/TX: 2110 MHz to 2170 MHz, RX: 1920 MHz to 1980 MHz ● It can work in UMTS, LTE, or UL mode. ● Power supply: -48 V DC	6	Each sector is configured with one AAU. For carrier power specifications of the AAU3940, see technical specifications of the AAU3940.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAWS39400	Function Module, AAU3940, FDD Multi-carriers Band Transceiver (TX: 2110 MHz-2155 MHz, RX: 1710 MHz-1755 MHz/TX: 1930 MHz-1990 MHz, RX: 1850 MHz-1910 MHz, 10 G, DC, 14/14.5 dBi, -3-12 deg RET)	AWS+PCS (2T2R): ● The wideband module (2T2R) is used and its maximum output power is 2x40 W. ● AWS (UL: 1710 MHz to 1755 MHz, DL: 2110 MHz to 2155 MHz)+PCS (UL: 1850 MHz to 1910 MHz, DL: 1930 MHz to 1990 MHz) ● It can work in UMTS, LTE, or UL mode. ● Power supply: -48 V DC	6	Each sector is configured with one AAU. For carrier power specifications of the AAU3940, see technical specifications of the AAU3940.

4.4.4 AAU3920 Configurations

This section describes configuration principles and typical configurations of the AAU3920.

Principles for Configuring an AAU3920

The AAU3920 configuration principles are as follows:

- The baseband processing boards can be configured for UMTS are WBBPb1 to WBBPb4, WBBPd1 to WBBPd3, and WBBPf1 to WBBPf4. In 4RX mode, the WBBPb and WBBPd only support small specifications, and they do not support CPRI MUX. Therefore, the WBBPf is recommended in 4RX mode.
- A UBBPd can be configured as a baseband processing board in LTE mode to support UL mode in the future.
- The AAU3920 supports a -48 V DC power supply socket and does not support power cascading.
- The passive antennas of the AAU3920 can be used on devices provided by Huawei or a third party.

The AAU3920 CPRI configuration principles are as follows:

- The active RU configured on the AAU3920 provides two CPRI ports to connect to BBUs. Each CPRI port supports a rate of 9.8 Gbit/s. For LO/UL base stations in wideband 2x2T4R mode, the 2:1 Compression and CPRI MUX features need to be supported.
- Multiple AAU3920s cannot be cascaded because of bandwidth limitation. In small bandwidth configuration scenarios, a maximum of four cascading levels must be supported. During the cascading, you need to consider the number of cells supported by CPRI bandwidth and CPRI port adaptive capabilities.

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- It is not recommended that active and passive modules be cascaded by connecting CPRI ports.
- The AAU3920 is configured with 9.8 Gbit/s optical modules preferentially.

The AAU3920 electrical tilt configuration principles are as follows:

- Different modes using the same frequency band must use the same downtilt.
- The electrical tilt is adjusted independently on 2T working at 1.8 GHz and 2.1 GHz.
- The downtilt of the 2.6 GHz 2T cannot be independently adjusted in RET mode. 2.6 GHz 2T must use the same downtilt with 1.8 GHz 2T. For 2.6 GHz 4T, one 2.6 GHz 2T must use the same downtilt as 1.8 GHz 2T, and the other 2.6 GHz 2T must use the same downtilt as 2.1 GHz 2T.
- Determine the principles for sharing the same downtilt and independent electrical tilt according to the network planning and optimization requirements.

Typical Configurations of an AAU3920

The following table lists the carrier configuration of the AAU3920.

Table 4-52 Carrier configuration of the AAU3920

Description	Function	Working Mode	Configuration Capacity
1.8 GHz (GSM +LTE)+2.1 GHz (LTE+UMTS)	1.8 GHz (UL: 1710 MHz to 1785 MHz, DL: 1805 MHz to 1880 MHz) + 2.1 GHz (UL: 1920 MHz to 1980 MHz, DL: 2110 MHz to 2170 MHz)	Single band mode (1.8 GHz)	GSM 8C 1T2R+LTE 1C 2x20 MHz 2T4R or 2T2R
			GSM 4C 1T2R+LTE 2C 2x20 MHz 2T4R or 2T2R
		Single band mode (2.1 GHz)	UMTS 4C 2T4R or 2T2R
			UMTS 8C 1T2R or 1T4R
		Dual band mode (1.8 GHz+2.1 GHz)	1.8 GHz LTE 2C+2.1 GHz UMTS 4C (without MIMO)
			1.8 GHz LTE 2C+2.1 GHz UMTS 2C (MIMO)
			1.8 GHz GSM 6C+LTE 1C+2.1 GHz UMTS 2C (without MIMO)
			1.8 GHz GSM 6C+LTE 1C+2.1 GHz UMTS 1C (MIMO)
			1.8 GHz GSM 4C+LTE 1C+2.1 GHz UMTS 4C (without MIMO)
			1.8 GHz GSM 4C+LTE 1C+2.1 GHz UMTS 3C (MIMO)
			1.8 GHz GSM 3C+LTE 1C+2.1 GHz UMTS 3C (without MIMO)

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The following table lists the configurations of the AAU3920.

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAAU39200	Functional module-AAU3920-RUa3920-1800 MHz+2100 MHz(2x67 dBm), 2500 MHz-2690 MHz	1800 MHz+2100 MHz (2T4R): ● The wideband 2T4R module is used and its maximum output power is 2x80 W. ● TX: 1805 MHz to 1880 MHz, RX: 1710 MHz to 1785 MHz/TX: 2110 MHz to 2170 MHz, RX: 1920 MHz to 1980 MHz ● It can work in UMTS or LTE mode.	6	Each sector is configured with one AAU. For carrier power specifications of the AAU3920, see technical specifications of the AAU3920.

4.4.5 AAU3911 Configurations

Configurations of RF Module 1A Working at Band 3 (1800 MHz)

The following table lists configuration principles for RF modules working at band 3 (1800 MHz).

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Table 4-53 RF modules working at band 3 (1800 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7METBN2000	AAU3911, 1800 MHz 2T4R', 2x60 W (UP)+1.8 GHz/2.1 GHz Combiner 4 path (DOWN); Antenna 1710 MHz to 2170 MHz (UP), 2500 MHz to 2690 MHz/690 MHz to 960 MHz (DOWN)	1.8 GHz A 2T4R' 2x60 W (RU3952m)+2.1 GHz P (4-port)+2.6 GHz P (4-port) 700 to 900 P (2-port): ● The RU3952m is used to support inter-frequency mutual aid. Its maximum output power is 2x60 W and it works at 1800 MHz in 2T4R mode. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in GSM, LTE, or GL SDR mode. ● It can provide the following wideband antennas for external RRUs or RFUs: 4-port 2.1 GHz antenna (the ports are provided by the 1.8/2.1 GHz external combiner in the lower slot), 4-port 2.6 GHz antenna (the ports are on the bottom of the antenna), and 2-port 700 MHz/900 MHz antenna (the ports are on the bottom of the antenna).	6	The RU3952m is configured to work at a single frequency band (1.8 GHz) in 2T4R mode. It uses four DIN connectors (A/B/C/D). Its configuration scheme is the same as the 2T4R module. The 2.1 GHz 2R channel of the RU3952m is not functional. For carrier power specifications of the RU3952m, see technical specifications of the RRU3952m.

Configurations of RF Module 1A Working at Band 1 (2100 MHz)

The following table lists configuration principles for RF modules working at band 1 (2100 MHz).

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Table 4-54 Principles for configuring RF modules working at band 1 (2100 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MITBO2000	AAU3911, 2100 MHz 2T4R', 2x60 W (UP)+1.8 GHz/2.1 GHz Combiner 4 path (DOWN); Antenna 1710~2170 MHz (UP), 2500~2690 MHz/690~960 MHz (DOWN)	2.1 GHz A 2T4R' 2x60 W (RU3832m)+1.8 GHz P (4-port)+2.6 GHz P (4-port) 700 to 900 P (2-port): ● The RU3952m is used to support inter-frequency mutual aid. Its maximum output power is 2x60 W and it works at 2100 MHz in 2T4R mode. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS, LTE, or UL SDR mode. ● It can provide the following wideband antennas for external RRUs or RFUs: 4-port 1.8 GHz antenna (the ports are provided by the 1.8/2.1 GHz external combiner in the lower slot), 4-port 2.6 GHz antenna (the ports are on the bottom of the antenna), and 2-port 700-900 MHz antenna (the ports are on the bottom of the antenna).	6	The RU3952m is configured to work at a single frequency band (1.8 GHz) in 2T4R mode. It uses four DIN connectors (A/B/C/D). Its configuration scheme is the same as the 2T4R module. The 2.1 GHz 2R channel of the RU3952m is not functional. For carrier power specifications of the RU3952m, see technical specifications of the RRU3952m.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAAU39113	AAU3911, 2100 MHz 2T4R, 2x60 W (UP)+1920 to 2170 MHz/ 1710 to 1880 MHz Combiner 4 path (DOWN); Antenna 1710 to 2690 MHz (UP), 690 to 960 MHz (DOWN)	2.1 G A 2T4R 2x60 W (RU3832)+1.8 P (four ports) +700 to 900 P (two ports): ● An RU3832 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. ● UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UMTS mode. ● It can provide a 4-port wideband antenna of 1800 MHz and a 2-port wideband antenna of 700 MHz or 900 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3832, see technical specifications of the RRU3832.

Configurations of RF Module 1A Working at Band 7 (2600 MHz)

The following table lists configuration principles for RF modules working at band 7 (2600 MHz).

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Table 4-55 Principles for configuring RF modules working at band 7 (2600 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAAU39111	AAU3911, 2600 MHz 2T4R, 2x40 W (UP); Antenna 2500 to 2690 MHz (UP), 1710 to 2170 MHz/690 to 960 MHz (DOWN)	2.6 A 2T4R 2x40 W (RU3260)+1.8 to 2.1 P (four ports)+700 to 900 P (two ports) ● An RU3260 is used, which works in 2T4R mode and provides the maximum output power of 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode. ● It can provide a 4-port wideband antenna of 1800 MHz or 2100 MHz and a 2-port wideband antenna of 700 MHz or 900 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3260, see technical specifications of the RRU3260.

Configurations of RF Module 1A Working at Band 4 (AWS)

The following table lists configuration principles for RF modules working at band 4 (AWS).

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Table 4-56 Principles for configuring RF modules working at band 4 (AWS)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAAU39110	AAU3911, AWS 2T4R, 2x60 W (UP) +AWS/PCS Combiner 4 path (DOWN); Antenna 1710 to 2690 MHz (UP), 690 to 960 MHz (DOWN)	AWS A 2T4R 2x60 W (RU3832)+PCS P (4-port) +700 to 900 P (2-port): ● An RU3832 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in UMTS, LTE, or UL SDR mode. ● It can provide a 4-port antenna of PCS and a 2-port wideband antenna of 700 MHz or 900 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3832, see technical specifications of the RRU3832.
WD7MAAU39114	AAU3911, AWS 2T4R, 2x60 W (DOWN); Antenna 2500 to 2690 MHz (UP), 1710 to 2170 MHz/690 to 960 MHz (DOWN)	AWS A 2T4R 2x60 W (RU3832)+700 to 900 P (2-port): ● An RU3832 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. ● UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in UMTS, LTE, or UL SDR mode.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3832, see technical specifications of the RRU3832.

Configurations of RF Module 1A Working at Band 2 (PCS)

The following table lists configuration principles for RF modules working at band 2 (PCS).

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Table 4-57 Principles for configuring RF modules working at band 2 (PCS)

Model	Description	Function	Maximum Quantity	Configuration Principle
Function module-AAS-WD7MJTBU2000-AAU3911 PCS 2T4R, 2x60 W (lower slot); Antenna:	Function module-AAS-WD7MJTBU2000-AAU3911 PCS 2T4R, 2x60 W (lower slot); Antenna: 2500 MHz to 2690 MHz (UP), 1710 MHz to 2170 MHz/690 MHz to 960 MHz (DOWN)	PCS A 2T4R 2x60 W (RU3952)+PCS P (4-port) +700 to 900 P (2-port): ● An RU3952 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. ● UL: 1850 MHz to 1910 MHz; DL: 1930 MHz to 1990 MHz ● It can work in UMTS, LTE, GU, GL, UL, or GUL mode. ● It can provide a 2-port wideband antenna of 700 MHz/900 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3952, see technical specifications of the RRU3952.

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Configurations of RF Module 2A

Table 4-58 Configurations of RF module 2A

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MAAU39112	AAU3911, 2600 MHz 2T4R, 2x40 W (UP) + AWS 2T4R, 2x60 W (DOWN); Antenna 2500 to 2690 MHz (UP), 1710 to 2170 MHz/690 to 960 MHz (DOWN)	2.6 A 2T4R 2x40 W (RU3260)+AWS A 2T4R 2x60 W (RU3832)+700 to 900 P (2-port) An RU3260 is used as a 2.6 A RF module: ● An RU3260 is used, which works in 2T4R mode and provides the maximum output power of 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode. An RU3832 is used as an AWS A RF module: ● An RU3832 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. UL: 1710 MHz to 1755 MHz; DL: 2110 MHz to 2155 MHz ● It can work in UMTS, LTE, or UL SDR mode. ● It can provide a 2-port wideband antenna of 700 MHz/900 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3260, see technical specifications of the RRU3260. For carrier power specifications of the RU3832, see technical specifications of the RRU3832.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MJTBK3000	AU3911, 2.1 GHz 2T4R', 2x60 W (UP) +1.8 GHz 2T4R', 2x60 W (DOWN); Antenna 1710 MHz to 2170 MHz (UP), 2500 MHz to 2690 MHz/690 MHz to 960 MHz (DOWN)	The RU3952m is used by 2.1 GHz to support inter-frequency mutual aid. It provides the maximum output power of 2x60 W, works in 2.1 GHz 2T2R+1.8 GHz 2R mode, and uses only A/B ports. The RU3952m is used by 1.8 GHz to support inter-frequency mutual aid. It provides the maximum output power of 2x60 W, works in 1.8 GHz 2T2R+2.1 GHz 2R mode, and uses only A/B ports. Working frequency bands: 2.1 GHz: UL 1920 MHz to 1980 MHz; DL 2110 MHz to 2170 MHz 1.8 GHz: UL 1710 MHz to 1785 MHz; DL 1805 MHz to 1880 MHz ● 1.8 GHz supports the GSM, LTE, or GL SDR mode. 2.1 GHz supports the UMTS mode. ● It can provide the following wideband antennas for external RRUs or RFUs: 4-port 2.6 GHz antenna (the ports are on the bottom of the antenna), and 2-port 700 MHz to 900 MHz antenna (the ports are on the bottom of the antenna).	6	Each sector is configured with one AAU. For carrier power specifications of the RU3952m, see technical specifications of the RRU3952m.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MJTBR3000	AAU3911, 2600 MHz 2T4R, 2x40 W (UP)+PCS 2T4R, 2x60 W (DOWN); Antenna: 2500 to 2690 MHz (UP), 1710 to 2170 MHz/690 to 960 MHz (DOWN)	2.6 A 2T4R 2x40 W (RU3260)+PCS A 2T4R 2x60 W (RU3952)+700 to 900 P (2-port) An RU3260 is used as a 2.6 A RF module: ● An RU3260 is used, which works in 2T4R mode and provides the maximum output power of 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode. An RU3952 is used as a PCS A RF module: ● An RU3952 is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. UL: 1850 MHz to 1910 MHz; DL: 1930 MHz to 1990 MHz ● It can work in GSM, UMTS, LTE, GU, GL, UL, or GUL mode. ● It can provide a 2-port wideband antenna of 700 MHz/900 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3260, see technical specifications of the RRU3260. For carrier power specifications of the RU3952, see technical specifications of the RRU3952.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MJTBV2000	AAU3911, 2600 MHz 2T4R, 2x40 W (UP)+2.1 GHz 2T4R', 2x60 W (DOWN); Antenna: 2500 to 2690 MHz (UP), 1710 to 2170 MHz/690 to 960 MHz (DOWN)	2.6 A 2T4R 2x40W (RU3260)+2.1 GHz A 2T4R' 2x60 W (RU3952m)+700 to 900 P(two ports) An RU3260 is used as a 2.6 A RF module: ● An RU3260 is used, which works in 2T4R mode and provides the maximum output power of 2x40 W. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode. An RU3952m is used as a 2.1 GHz A module: ● An RU3952m is used, which works in 2T4R mode and provides the maximum output power of 2x60 W. UL: 1920 MHz to 1980 MHz; DL: 2110 MHz to 2170 MHz ● It can work in UO or UL mode. ● It can provide a 2-port wideband antenna of 700 MHz/900 MHz for external RRUs and RFUs.	6	Each sector is configured with one AAU. For carrier power specifications of the RU3260, see technical specifications of the RRU3260. For carrier power specifications of the RU3952m, see technical specifications of the RRU3952m.

4.4.6 AAU3961 Configurations

Configurations of RF Module 1A Working at Band 3 (1800 MHz)

The following table lists configuration principles for RF modules working at band 3 (1800 MHz).

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Table 4-59 RF modules working at band 3 (1800 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MLTHB2000	AAU3961: 1800 A 4T4R 160 W, 690 MHz to 960 MHz P, 1710 MHz to 2690 MHz P	1.8 G A 4T4R 4x40 W (RU3971)+1710 MHz to 2690 MHz P (two ports)+690 MHz to 960 MHz P (two ports): The RU3971 is configured in the upper slot. Its maximum power is 4x40 W, working at 1800 MHz with 4T4R supported. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in LTE or GL SDR mode. The AAU can provide the following wideband antennas (using DIN connectors) for external RRUs or RFUs: 2-port 1710 MHz to 2690 MHz antenna, and 2-port 690 MHz to 960 MHz antenna.	6	For carrier power specifications of the RU3971, see technical specifications of the RRU3971.

Configurations of RF Module 2A Working at Band 3 (1800 MHz) and Band 7 (2600 MHz)

The following table lists configuration principles for RF modules working at band 3 (1800 MHz) and band 7 (2600 MHz).

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Table 4-60 RF module 2A working at band 3 (1800 MHz) and band 7 (2600 MHz)

Model	Description	Function	Maximum Quantity	Configuration Principle
WD7MLTHC3000	AAU3961: 1800 A 4T4R 160 W, 2600 A 4T4R 80 W, 690 MHz to 960 MHz P, 1710 MHz to 2690 MHz P	1.8 G A 4T4R 4x40 W (RU3971)+2.6 G A 4T4R 4x20 W (RU3261)+1710 MHz to 2690 MHz P (two ports)+690 MHz to 960 MHz P (two ports): The RU3971 is configured in the upper slot: ● Its maximum power is 4x40 W, working at 1800 MHz with 4T4R supported. ● UL: 1710 MHz to 1785 MHz; DL: 1805 MHz to 1880 MHz ● It can work in LTE or GL SDR mode. The RU3261 is configured in the lower slot: ● Its maximum power is 4x20 W, working at 2600 MHz with 4T4R supported. ● UL: 2500 MHz to 2570 MHz; DL: 2620 MHz to 2690 MHz ● It can work in LTE mode. The AAU can provide the following wideband antennas (using DIN connectors) for external RRUs or RFUs: 2-port 1710 MHz to 2690 MHz antenna, and 2-port 690 MHz to 960 MHz antenna.	6	For carrier power specifications of the RU3971 and RU3261, see technical specifications of the RRU3971 and RRU3261.

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4.5 Configurations of Enhanced Cabinets

To meet requirements of SingleRAN, existing cabinets can be enhanced to have the same power supply, power distribution, and heat dissipation capabilities as Ver.D or Ver.E cabinets. The enhancement is implemented by replacing components in the cabinets.

BTS3900

The following table lists the packages used for enhancement of existing BTS3900 cabinets.

Table 4-61 Packages used for enhancement of existing BTS3900 cabinets

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B00AD4800	BTS3900 Cabinet Upgrade Package (Ver.A to Ver.D, -48 V DC)	Package for enhancing a BTS3900 -48 V Ver.A cabinet	2	● Optional. ● One package is configured for each BTS3900 -48 V (Ver.A) cabinet to be enhanced. ● Each package contains all materials that are required for enhancing a BTS3900 cabinet, that is, a DCDU and a fan unit.
WD2B00BD4800	BTS3900 Cabinet Upgrade Package (Ver.B to Ver.D, -48 V DC)	Package for enhancing a BTS3900 -48 V (Ver.B) cabinet	2	● Optional. ● One package is configured for each BTS3900 -48 V (Ver.B) cabinet to be enhanced. ● Each package contains all materials that are required for enhancing a BTS3900 cabinet, that is, a DCDU and a fan unit.

BTS3900L

The following table lists the packages used for enhancement of existing BTS3900L cabinets.

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Table 4-62 Packages used for enhancement of existing BTS3900L cabinets

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B0LBD4800	BTS3900L Cabinet Upgrade Package (Ver.B to Ver.D, -48 V DC)	Package for enhancing a BTS3900L -48 V (Ver.B) cabinet	1	● Optional. ● One package is configured for each BTS3900L -48 V (Ver.B) cabinet to be enhanced. ● Each package contains all materials that are required for enhancing a BTS3900L cabinet, that is, a DCDU and a fan unit.

BTS3900A

The following table lists the packages used for enhancement of existing BTS3900A cabinets.

Table 4-63 Packages used for enhancement of existing BTS3900A (Ver.A) cabinets

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B220A2D00	APM30H Cabinet Upgrade Package (Ver.A.1 to Ver.D, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.A 301) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each 220 V APM30 (Ver.A 301) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B110A2D00	APM30H Cabinet Upgrade Package (Ver.A.1 to Ver.D, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.A 301) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 110 V (Ver.A 301) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BA48A2D00	APM30H Cabinet Upgrade Package (Ver.A.1 to Ver.D, -48 V DC, TMC11H, BTS3900A)	Package for enhancing a -48 V APM30 (Ver.A 301) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 -48 V (Ver.A 301) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit.
WD2B220A2D02	APM30H Cabinet Upgrade Package (Ver.A.2 to Ver.D, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.A 302) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each 220 V APM30 (Ver.A 302) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B110A2D02	APM30H Cabinet Upgrade Package (Ver.A.2 to Ver.D, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.A 302) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 110 V (Ver.A 302) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BA48A2D02	APM30H Cabinet Upgrade Package (Ver.A.2 to Ver.D, -48 V DC, TMC11H, BTS3900A)	Package for enhancing a -48 V APM30 (Ver.A 302) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 -48 V (Ver.A 302) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit.
WD2BR48A2D00	BTS3900A RFU Cabinet Upgrade Package (Ver.A to Ver.D, -48 V DC)	Package for enhancing an RFC (Ver.A) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each RFC (Ver.A) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an RFC cabinet, such as a DCDU and a fan unit.
WD2B220A2E00	APM30H Cabinet Upgrade Package (Ver.A.1 to Ver.E, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.A 301) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 220 V APM30 (Ver.A 301) cabinet to a Ver.E cabinet at a BTS3900A site contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B110A2E00	APM30H Cabinet Upgrade Package (Ver.A.1 to Ver.E, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.A 301) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 110 V APM30 (Ver.A 301) cabinet to a Ver.E cabinet at a BTS3900A site contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BA48A2E00	APM30H Cabinet Upgrade Package (Ver.A.1 to Ver.E, -48 V DC, TMC11H, BTS3900A)	Package for enhancing a -48 V APM30 (Ver.A 301) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing a -48 V APM30 (Ver.A 301) cabinet to a Ver.E cabinet at a BTS3900A site on the live network
WD2B220A2E02	APM30H Cabinet Upgrade Package (Ver.A.2 to Ver.E, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.A 302) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 220 V APM30 (Ver.A 302) cabinet to a Ver.E cabinet at a BTS3900A site contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently. ●
WD2B110A2E02	APM30H Cabinet Upgrade Package (Ver.A.2 to Ver.E, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.A 302) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 110 V APM30 (Ver.A 302) cabinet to a Ver.E cabinet at a BTS3900A site contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BA48A2E02	APM30H Cabinet Upgrade Package (Ver.A.2 to Ver.E, -48 V DC, TMC11H, BTS3900A)	Package for enhancing a -48 V APM30 (Ver.A 302) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing a -48 V APM30 (Ver.A 302) cabinet to a Ver.E cabinet at a BTS3900A site on the live network
WD2BR48A2E00	BTS3900A RFU Cabinet Upgrade Package (Ver.A to Ver.E, -48 V DC)	Package for enhancing an RFC (Ver.A) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing an RFC (Ver.A) cabinet to an RFC (Ver.E) cabinet at a BTS3900A site on the live network

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Table 4-64 Packages used for enhancement of existing BTS3900A (Ver.B) cabinets

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B220B2D00	APM30H Cabinet Upgrade Package (Ver.B to Ver.D, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.B) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each 220 V APM30 (Ver.B) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2B110B2D00	APM30H Cabinet Upgrade Package (Ver.B to Ver.D, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.B) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 110 V (Ver.B) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BN48B2D00	APM30H Cabinet Upgrade Package (Ver.B to Ver.D, -48 V DC, TMC11H, BTS3900A)	Package for enhancing a -48 V APM30 (Ver.B) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 -48 V (Ver.B) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2BR48B2D00	BTS3900A RFU Cabinet Upgrade Package (Ver.B to Ver.D, -48 V DC)	Package for enhancing an RFC (Ver.B) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each RFC (Ver.B) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an RFC cabinet, such as a DCDU and a fan unit.
WD2B220BD2E0	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 220 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2B110BD2E0	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 110 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BC48BCD2E	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, -48 V DC, TMC11H)	Package for enhancing a -48 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing a -48 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network
WD2BR48BD2E0	BTS3900A RFU Cabinet Upgrade Package (Ver.B~D to Ver.E, -48 V DC)	Package for enhancing an RFC (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing an RFC (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network

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Table 4-65 Packages used for enhancement of existing BTS3900A (Ver.C) cabinets

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B220C2D00	APM30H Cabinet Upgrade Package (Ver.C to Ver.D, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.C) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each 220 V APM30 (Ver.C) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2B110C2D00	APM30H Cabinet Upgrade Package (Ver.C to Ver.D, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.C) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 110 V (Ver.C) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit as well as two PSUs and one PMU. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BC48C2D00	APM30H Cabinet Upgrade Package (Ver.C to Ver.D, -48 V DC, TMC11H, BTS3900A)	Package for enhancing a -48 V APM30 (Ver.C) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each APM30 -48 V (Ver.C) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an APM30 cabinet, that is, a door, an AC/DC system, and a fan unit.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2BR48C2D00	BTS3900A RFU Cabinet Upgrade Package (Ver.C to Ver.D, -48 V DC)	Package for enhancing an RFC (Ver.C) cabinet at a BTS3900A site	2	● Optional. ● One package is configured for each RFC (Ver.C) cabinet to be enhanced at a BTS3900A site, regardless of whether the cabinet is stacked with another cabinet. ● Each package contains all materials that are required for enhancing an RFC cabinet, such as a DCDU and a fan unit.
WD2B220BD2E0	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 220 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2B110BD2E0	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 110 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BC48BCD2E	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, -48 V DC, TMC11H)	Package for enhancing a -48 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing a -48 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network
WD2BR48BD2E0	BTS3900A RFU Cabinet Upgrade Package (Ver.B~D to Ver.E, -48 V DC)	Package for enhancing an RFC (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing an RFC (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network

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Table 4-66 Packages used for enhancement of existing BTS3900A (Ver.D) cabinets

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2B220BD2E0	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, 220 V AC, BTS3900A)	Package for enhancing a 220 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 220 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2B110BD2E0	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, 110 V AC, BTS3900A)	Package for enhancing a 110 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● The package for enhancing a 110 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network contains two PSUs by default. If more than two PSUs are required, the additional PSUs need to be quoted independently.
WD2BC48BCD2E	APM30H Cabinet Upgrade Package (Ver.B~D to Ver.E, -48 V DC, TMC11H)	Package for enhancing a -48 V APM30 (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● Package for enhancing a -48 V APM30 (Ver.B/Ver.C/Ver.D) cabinet to a Ver.E cabinet at a BTS3900A site on the live network
WD2BR48BD2E0	BTS3900A RFU Cabinet Upgrade Package (Ver.B~D to Ver.E, -48 V DC)	Package for enhancing an RFC (Ver.B/Ver.C/Ver.D) cabinet at a BTS3900A site	2	● Optional. ● It is used for enhancing an RFC from Ver.B/Ver.C/Ver.D to Ver.E.

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4.6 Power Module Configurations

This section describes the principles for configuring power modules used by 3900 series base stations

BTS3900

The following table lists the principles for configuring power modules in the BTS3900.

Table 4-67 Principles for configuring power modules in the BTS3900

Model	Description	Function	Maximum Quantity	Configuration Principle
DCDU03B00000	DC Power Distribution Unit	DCDU-03B. It provides three 12 A DC outputs and six 20 A DC outputs.	1	● Optional. ● DCDU-03B. It provides power for low-power RRUs. It cannot provide power for the following high-power RRUs: RRU3829/RRU3929/RRU3942/RRU3841/RRU3961/RRU3832/RRU3939/RRU3839. ● Each DCDU provides 6x20 A+3x12 A power outputs. ● Each DCDU provides power for six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
DCDU11B00000	DC Power Distribution Unit	DCDU-11B. It provides ten 25 A DC power outputs.	1	● Optional. ● The DCDU-11B is used when both RFUs and RRUs are configured. ● Each DCDU supports ten 25 A power output ports, among which six ports use big tool-less female connectors (pressfit type) and four ports use small tool-less female connectors (pressfit type). ● Each DCDU provides power for six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
TD1MDCDU12B0	DC Power Distribution Unit	DCDU-12B. It provides ten 30 A circuit breakers when used in a DC cabinet.	1	● Optional. ● The DCDU-12B is used when both RFUs and RRUs are configured. ● Each DCDU provides ten 30 A circuit breakers (using six EPC5 connectors and four EPC4 connectors).

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Model	Description	Function	Maximum Quantity	Configuration Principle
W0ACPSU00	PSU Module (AC/DC), 30 A	Power supply module, used for converting AC power to -48 V DC power.	1	● The PSU is optionally configured in AC cabinets of Ver.B. ● In AC input scenarios, the power supply system already contains two PSUs. When more than two PSUs are required, one or more PSU packages need to be configured. ● Each package contains one PSU.
WPSU50A01	PSU Module (AC/DC), 50 A	Power supply module, used for converting AC power to -48 V DC power.	1	● The PSU is optionally configured in AC cabinets of Ver.C. ● A PSU provides power of 2900 W and can be configured according to the requirement for total power consumption. ● In AC input scenarios, the power supply system already contains two PSUs, and a maximum of one PSU can be added in a single cabinet.
WD2MR4850G00	PSU Module (AC/DC)	Power supply module, used for converting AC power to -48 V DC power.	3	● The PSU is optionally configured in AC cabinets of Ver.D. ● A PSU provides power of 3000 W and can be configured according to the requirement for total power consumption. ● In AC input scenarios, the power supply system already contains two PSUs, and a maximum of three PSUs can be added in a single cabinet.
W0DCPSU00	PSU Module (DC/DC)	Power supply module, used for converting +24 V DC power to -48 V DC power.	2	● Optional. PSU used in a +24 V DC cabinet of Ver.B ● In +24 V input scenarios, the power supply system already contains two PSUs. When more than two PSUs are required, this module needs to be configured and a maximum of two PSUs can be added in a single cabinet. ● Each package contains one PSU.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M000PEU03	-48 V Power and Environment interface Unit	BBU power module UPEUc, which provides power of 360 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports.	2	● Optional. ● One piece of this power module is configured in the BBU3900 by default. One more power module is required if the total power consumption of boards in the BBU3900 is more than 360 W or the BBU3900 requires backup power of less than or equal to 360 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.
WD2M00PEIUD2	Power and Environment interface Unit (-48 V)	BBU power module UPEUd, which provides power of 650 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports. It is used only in the BBU3910.	2	● Optional. ● One piece of this power module is configured in the BBU3910 by default. One more power module is required if the total power consumption of boards in the BBU3910 is more than 650 W or the BBU3910 requires backup power of less than or equal to 650 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.

BTS3900L

The following table lists the principles for configuring power modules in the BTS3900L.

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Table 4-68 Principles for configuring power modules in the BTS3900L

Model	Description	Function	Maximum Quantity	Configuration Principle
DCDU03B00000	DC Power Distribution Unit	DCDU-03B. It provides three 12 A DC outputs and six 20 A DC outputs.	1	● Optional. ● DCDU-03B. It provides power for low-power RRUs. It cannot provide power for the following high-power RRUs: RRU3829/RRU3929/RRU3942/RRU3841/RRU3961/RRU3832/RRU3939/RRU3839. ● Each DCDU provides 6x20 A+3x12 A power outputs. ● Each DCDU provides power for six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
DCDU11B00000	DC Power Distribution Unit	DCDU-11B. It provides ten 25 A DC power outputs.	1	● Optional. ● The DCDU-11B is used when both RFUs and RRUs are configured. ● Each DCDU supports ten 25 A power output ports, among which six ports use big tool-less female connectors (pressfit type) and four ports use small tool-less female connectors (pressfit type). ● Each DCDU provides power for six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
TD1MDCDU12B0	DC Power Distribution Unit	DCDU-12B. It provides ten 30 A circuit breakers.	1	● Optional. ● The DCDU-12B is used when both RFUs and RRUs are configured. ● Each DCDU provides ten 30 A circuit breakers (using six EPC5 connectors and four EPC4 connectors).
WD2MR4850G00	PSU Module (AC/DC)	Power supply module, used for converting AC power to -48 V DC power.	3	● The PSU is optionally configured in AC cabinets of Ver.D. ● A PSU provides power of 3000 W and can be configured according to the requirement for total power consumption. ● In AC input scenarios, the power supply system already contains two PSUs, and a maximum of three PSUs can be added in a single cabinet.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M000PEU03	-48 V Power and Environment interface Unit	BBU power module UPEUc, which provides power of 360 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports.	2	● Optional. ● One piece of this power module is configured in the BBU3900 by default. One more power module is required if the total power consumption of boards in the BBU3900 is more than 360 W or the BBU3900 requires backup power of less than or equal to 360 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.
WD2M000PEIUD2	Power and Environment interface Unit (-48 V)	BBU power module UPEUd, which provides power of 650 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports. It is used only in the BBU3910.	2	● Optional. ● One piece of this power module is configured in the BBU3910 by default. One more power module is required if the total power consumption of boards in the BBU3910 is more than 650 W or the BBU3910 requires backup power of less than or equal to 650 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.

BTS3900A

The following table lists the principles for configuring power modules in the BTS3900A.

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Table 4-69 Principles for configuring power modules in the BTS3900A

Model	Description	Function	Maximum Quantity	Configuration Principle
DCDU03B00000	DC Power Distribution Unit	DCDU-03B. It provides three 12 A DC outputs and six 20 A DC outputs.	1	● Optional. ● DCDU-03B. It provides power for low-power RRUs. It cannot provide power for the following high-power RRUs: RRU3829/RRU3929/RRU3942/RRU3841/RRU3961/RRU3832/RRU3939/RRU3839. ● Each DCDU provides 6x20 A+3x12 A power outputs. ● Each DCDU provides power for six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
DCDU11B00000	DC Power Distribution Unit	DCDU-11B. It provides ten 25 A DC power outputs.	1	● Optional. ● The DCDU-11B is used when both RFUs and RRUs are configured. ● Each DCDU supports ten 25 A power output ports, among which six ports use big tool-less female connectors (pressfit type) and four ports use small tool-less female connectors (pressfit type). ● Each DCDU provides power for six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
TD1MDCDU12B0	DC Power Distribution Unit	DCDU-12B. It provides ten 30 A circuit breakers.	1	● Optional. ● The DCDU-12B is used when both RFUs and RRUs are configured. ● Each DCDU provides ten 30 A circuit breakers (using six EPC5 connectors and four EPC4 connectors).
WD2ME1PDU01D	Power Distribution Unit	DC power distribution box (PDU01D-01)	1	● Optional. ● A PDU01D-01 can be used together with an ODM to supply power to a maximum of six RRUs. ● Each PDU01D-01 supports 1x100 A power.
WD2ME2PDU03D	Power Distribution Unit	DC power distribution box (PDU03D-02)	3	● Optional. ● Each PDU03D-02 provides power for a maximum of three RRUs. ● Each PDU03D-02 supports 3x30 A power.

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Model	Description	Function	Maximum Quantity	Configuration Principle
W0ACPSU00	PSU Module (AC/DC), 30 A	Power supply module, used for converting AC power to -48 V DC power.	A maximum of one piece can be configured for a single cabinet.	● The PSU is optionally configured in AC cabinets of Ver.B. ● In AC input scenarios, the power supply system already contains two PSUs, and a maximum of one PSU can be added in a single cabinet. ● A PSU provides a power supply of 1600 W. The number of PSUs to be configured depends on the total power consumption of the equipment. One PSU must be added at a site where a diesel generator is used.
WPSU50A01	PSU Module (AC/DC), 50 A	Power supply module, used for converting AC power to -48 V DC power.	A maximum of one piece can be configured for a single cabinet.	● The PSU is optionally configured in AC cabinets of Ver.C. ● In AC input scenarios, the power supply system already contains two PSUs, and a maximum of one PSU can be added in a single cabinet. ● A PSU provides a power supply of 2900 W. The number of PSUs to be configured depends on the total power consumption of the equipment. One PSU must be added at a site where a diesel generator is used.
WD2MR4850G00	PSU Module (AC/DC)	Power supply module, used for converting AC power to -48 V DC power.	A maximum of three pieces can be configured in each cabinet.	● The PSU is optionally configured in AC cabinets of Ver.D. ● In AC input scenarios, the power supply system already contains two PSUs, and a maximum of three PSUs can be added in a single cabinet. ● A PSU provides a power supply of 3000 W. The number of PSUs to be configured depends on the total power consumption of the equipment. For a site that uses a diesel generator, each AC cabinet must be configured with at least three PSUs (including two original PSUs contained in the power supply system).
WD2M000PEU03	-48 V Power and Environment interface Unit	BBU power module UPEUc, which provides power of 360 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports.	2	● Optional. ● One piece of this board (UPEU) is configured in the BBU3900 by default. One more UPEU is required if the total power consumption of boards in the BBU3900 is more than 360 W or the BBU3900 requires backup power of less than or equal to 360 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M00PEIUD2	Power and Environment interface Unit (-48 V)	BBU power module UPEUd, which provides power of 650 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports. It is used only in the BBU3910.	2	● Optional. ● One piece of this power module is configured in the BBU3910 by default. One more power module is required if the total power consumption of boards in the BBU3910 is more than 650 W or the BBU3910 requires backup power of less than or equal to 650 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.

BTS3900AL

The following table lists the principles for configuring power modules in the BTS3900AL.

Table 4-70 Principles for configuring power modules in the BTS3900AL

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2P000PEU00	Power and Environment interface Unit (-48 V)	BBU power module UPEUc, which provides power of 360 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports.	2	● Optional. ● One piece of this power module is configured in the BBU3900 by default. One more power module is required if the total power consumption of boards in the BBU3900 is more than 360 W or the BBU3900 requires backup power of less than or equal to 360 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2P00PEUD00	Power and Environment interface Unit (-48 V)	BBU power module UPEUd, which provides power of 650 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports. It is used only in the BBU3910.	2	● Optional. ● One piece of this power module is configured in the BBU3910 by default. One more power module is required if the total power consumption of boards in the BBU3910 is more than 650 W or the BBU3910 requires backup power of less than or equal to 650 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.
WD2MR4850G00	PSU Module (AC/DC), 50 A	Power supply module, used for converting AC power to -48 V DC power.	A maximum of five pieces can be configured in each cabinet.	● It is optionally configured in an AC cabinet. ● A PSU provides power of 3000 W and can be configured according to the requirement for total power consumption. ● In AC input scenarios, the power supply system already contains two PSUs, and a maximum of five PSUs can be added in a single cabinet. ● For a site that uses a diesel generator, each AC cabinet must be configured with at least three PSUs (including two original PSUs contained in the power supply system).
DCDU12BPAC00	DC Power Distribution Unit (AC Cabinet)	DCDU-12B. This module provides ten 30 A circuit breakers when used in an AC cabinet.	2	● Optional. ● DCDU-12B. One piece is configured for each six DC RRUs when an AC-powered BTS3900AL cabinet is configured with DC RRUs. ● Each DCDU provides ten 30 A circuit breakers (using six EPC5 connectors and four EPC4 connectors).
DCDU12BPDC00	DC Power Distribution Unit (DC Cabinet)	DCDU-12B. It provides ten 30 A circuit breakers when used in a DC cabinet.	2	● Optional. ● DCDU-12B. One piece is configured for each six DC RRUs when a DC-powered BTS3900AL cabinet is configured with DC RRUs. ● Each DCDU provides ten 30 A circuit breakers (using six EPC5 connectors and four EPC4 connectors).

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DBS3900

The following table lists the principles for configuring power modules in the DBS3900.

Table 4-71 Principles for configuring power modules in the DBS3900

Model	Description	Function	Maximum Quantity	Configuration Principle
DCDU03B00000	DC Power Distribution Unit	DC power distribution box (DCDU-03B)	3	● Optional. ● DCDU-03B. It is optionally configured when the site is not configured with the following RRUs: RRU3829, RRU3929, RRU3942, RRU3841, RRU3961, RRU3832, RRU3939, and RRU3839. ● Each DCDU provides 6x20 A+3x12 A power outputs. ● One piece is configured for every six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
DCDU11B00000	DC Power Distribution Unit	DCDU-11B. It provides ten 25 A DC power outputs. Each DCDU supports a maximum of six groups of power cables for DC RRUs.	3	● Optional. ● DCDU-11B. It is required when the base station is configured with the following RRUs: RRU3829/RRU3929/RRU3942/RRU3841/ RRU3961/RRU3832/RRU3939/RRU3839. ● Each DCDU provides ten 25 A circuit breakers (using six EPC5 connectors and four EPC4 connectors). ● One piece is configured for every six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU.
TD1MDCDU12B0	DC Power Distribution Unit	DC power distribution box (DCDU-12B). Each DCDU provides ten 30 A circuit breakers.	3	● Optional. ● DCDU-12B. One piece is configured for every six DC RRUs. Two RRU3004s serving the same sector are regarded as one RRU. ● Each DCDU provides ten 30 A circuit breakers (using six EPC5 connectors and four EPC4 connectors).

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2ME1PDU01D	Power Distribution Unit	The -48 V power distribution module PDU01D-01 is used in the APM30H (Ver.E) and each PDU01D-01 must be used together with an ODM06D to provide power for six RRUs.	2	● Optional. ● The PDU01D-01 must be configured with the ODM06D. ● One piece is configured for each 16 to 21 DC RF modules when the AC APM30H (Ver.E) cabinet is used. ● One piece is configured for 10 to 15 DC RF modules and two pieces are configured for 16 to 21 DC RF modules when the AC APM30H (Ver.E_B), APM30H (Ver.E_C), or APM30H (Ver.E_D) cabinet upgrade package is configured.
WD2ME2PDU03D	Power Distribution Unit	The -48 V PDU03D-02 is used for the AC APM30H (Ver.E). Each PDU03D-02 provides power for a maximum of three RRUs.	3	● Optional. ● Each PDU03D-02 provides power for a maximum of three RRUs. ● When an AC APM30H (Ver.E) is used, one piece is configured for three RF modules starting from the seventh RF module if there are more than six RF modules. A maximum of three pieces can be configured. ● One piece is configured when there are more than six DC RF modules and the AC APM30H (Ver.E_B), APM30H (Ver.E_C), or APM30H (Ver.E_D) cabinet upgrade package is configured.
WD5PMPW80000	AC/DC RRU Power Module	AC/DC RRU power module	-	● Optional. ● One package is quoted for each AC RRU that is to be formed by an AC/DC RRU power module and one of the following RRUs: RRU3824/RRU3826/RRU3929/RRU3926/RRU3936/RRU3838/RRU3832/RRU3260/RRU3268/RRU3938/RRU3939/RRU3668. ● WD5PMPW80000 is replaced by WD5PACDCPM00.
WD5PACDCPM00	AC/DC RRU Power Module	AC/DC power module for a blade RRU	-	

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M000PEU03	-48 V Power and Environment interface Unit	BBU power module UPEUc, which provides power of 360 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports.	2	● Optional. ● One piece of this power module is configured in the BBU3900 by default. One more power module is required if the total power consumption of boards in the BBU3900 is more than 360 W or the BBU3900 requires backup power of less than or equal to 360 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.
WD2M00PEIUD2	Power and Environment interface Unit (-48 V)	BBU power module UPEUd, which provides power of 650 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports. It is used only in the BBU3910.	2	● Optional. ● One piece of this power module is configured in the BBU3910 by default. One more power module is required if the total power consumption of boards in the BBU3910 is more than 650 W or the BBU3910 requires backup power of less than or equal to 650 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.
WD5PACDCOPM0	OPM50M AC Power Module With 6DC Outputs	Blade power system OPM50M (3000 W)	1	● Optional. ● An OPM50M can supply power to one DC BBU3910A, three DC RRUs, and one piece of transmission equipment.
WD5PBPSOPM30	OPM30M AC Module With 4DC Outputs	Blade power system OPM30M (1500 W)	1	● Optional. ● Each OPM30M can supply power to four DC RRUs.

BTS3900C

The following table lists the principles for configuring power modules in the BTS3900C.

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Table 4-72 Principles for configuring power modules in the BTS3900C

Model	Description	Function	Maximum Quantity	Configuration Principle
WD2P000PEU01	-48 V Power and Environment interface Unit	BBU power module UPEUc, which provides power of 360 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports.	1	● Optional. ● One piece of this power module is configured in the BBU3900 by default. One more power module is required if the total power consumption of boards in the BBU3900 is more than 360 W or the BBU3900 requires backup power of less than or equal to 360 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.
WD2P00PEUD01	Power and Environment interface Unit (-48 V)	BBU power module UPEUd, which provides power of 650 W for boards in the BBU. In addition, it provides eight external dry contact alarm ports. It is used only in the BBU3910.	1	● Optional. ● One piece of this board (UPEU) is configured in the BBU3910 by default. One more UPEU is required if the total power consumption of boards in the BBU3910 is more than 650 W or the BBU3910 requires backup power of less than or equal to 650 W. ● The second power module is configured in the slot assigned to the UEIU. If the second power module is configured, a UEIU does not need to be configured in the BBU.

4.7 RET Module Configurations

The following table lists the configurations of an RET module.

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Table 4-73 Configurations of an RET module

External Model	Description	Function	Maximum Quantity	Configuration Principle
GM5M00GATM00	Antenna and TMA Control Unit	RET antenna and TMA control module GSM board	2	This module is configured when DRFUs have been configured for GSM mode and a TMA or RET antenna is in use. When DRFUs are configured at a site and the TMA function is required, the GATM must be configured. Each GATM supplies power to six BiasTees. When DRFUs are configured at a site and the RET antenna is required, the GATM must be configured. Each GATM supplies power to three BiasTees.

NOTE

In GSM mode, a common TMA cannot be used with an RET antenna, because the overcurrent of RET antenna adjustment will mistakenly cause a TMA alarm. GBSS12.0 supports a smart TMA which can be used with an RET antenna.

4.8 Hardware License Configuration

This section describes the principles for configuring the hardware licenses for each type of base station.

4.8.1 Hardware License Configuration of GSM Base Stations

This section describes the principles for configuring the hardware licenses for GSM base stations.

The following table lists the principles for configuring the hardware licenses for GSM base stations.

Table 4-74 Hardware license configuration of GSM base stations

Model	License Package Description	Function	Configuration Principle
GMMS0DRFUT00	3900 series DRFU transceiver (per TRX)	License for the TRX of a DRFU in GSM mode	Each DRFU contains one TRX by default. One license is configured for each excess TRX. This license applies to DRFUs.

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Model	License Package Description	Function	Configuration Principle
GMMS0GRFUT00	3900 series GRFU transceiver (per TRX)	License for providing multiple TRXs for a GRFU	Each GRFU contains one TRX by default. One license is configured for each excess TRX. This license applies to GRFUs.
WDMSMULTIT00	GSM Multiple Transceiver for the 2nd TRX of Multi-Mode Module	License for the second GSM TRX of a multimode RF module	The second GSM TRX of each multimode module needs to be configured with this license. This license applies to multimode RFUs and RRUs.
WDMSMULTIT01	GSM Multiple Transceiver for Multi-Mode Module	License for multiple GSM TRXs of a multimode RF module	For a multimode module configured with more than two GSM TRXs, the number of such licenses to be configured is equal to the number of GSM TRXs configured for the module minus 2. This license applies to multimode RFUs and RRUs.
GMMS0DRRUT00	3900 series RRU3004 transceiver (per TRX)	RRU3004 dual transceiver license	Each RRU3004 supports one TRX by default. An RRU3004 supporting two TRXs needs to be configured with one dual TRX license.
GMMS0GRRUT00	3900 series RRU3008 transceiver (per TRX)	RRU3008 multi-TRX license	Each RRU3008 supports one TRX by default. The number of multi-TRX licenses to be configured for an RRU3008 equals the number of TRXs configured for the RRU3008 minus 1.
GMMSMC60HP00	Multi Carrier 60 W High Power License (per TRX)	Each TRX of a multi-carrier module supports 60 W transmit power.	One package is configured for each GSM TRX whose transmit power is greater than or equal to 60 W and is less than 80 W. Each RF module whose TX channel's transmit power is greater than or equal to 60 W supports the license for 60 W power.
GMMSMC80HP00	Multi Carrier 80 W High Power License (per TRX)	Each TRX of a multi-carrier module supports 80 W transmit power.	One package is configured for each GSM TRX whose transmit power is greater than or equal to 80 W. This package does not contain the license package of Multi Carrier 60 W High Power License for Blade RRU or AAU (per TRX). Each RF module whose TX channel's transmit power is greater than or equal to 80 W supports the license for 80 W power.
WDMSMULTIT03	GSM Multiple Transceiver for the 2nd TRX of Multi-Mode Blade&AAU	License for the second GSM TRX of a multimode RF module (AAU or blade RRU)	The second GSM TRX of each multimode module needs to be configured with this license. This license applies to an AAU or a blade RRU.

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Model	License Package Description	Function	Configuration Principle
WDMSMULTIT02	GSM Multiple Transceiver for Multi-Mode Blade&AAU	License for multiple GSM TRXs of a multimode RF module (AAU or blade RRU)	Each multimode module with more than two GSM TRXs is configured with this license. The number of licenses to be configured equals the number of GSM TRXs minus 2. This license applies to an AAU or a blade RRU.
GMMSMC60HP01	Multi Carrier 60 W High Power License for Blade&AAU (per TRX)	Each TRX of a multi-carrier module (AAU or blade RRU) supports 60 W transmit power.	One package is configured for each GSM TRX whose transmit power is greater than or equal to 60 W and is less than 80 W. This license applies to an AAU or a blade RRU.
GMMSMC80HP01	Multi Carrier 80 W High Power License for Blade&AAU (per TRX)	Each TRX of a multi-carrier module (AAU or blade RRU) supports 80 W transmit power.	One package is configured for each GSM TRX whose transmit power is greater than or equal to 80 W. This package does not contain the license package of Multi Carrier 60 W High Power License for Blade RRU or AAU (per TRX). Each RF module whose TX channel's transmit power is greater than or equal to 80 W supports the license for 80 W power. This license applies to an AAU or a blade RRU.

4.8.2 Hardware License Configuration of UMTS Base Stations

This section describes the principles for configuring the hardware licenses for UMTS base stations.

The following table lists the principles for configuring the hardware licenses for UMTS base stations.

Table 4-75 Hardware license configuration of UMTS base stations

Model	License Package Description	Function	Configuration Principle
QWMS000UCE01	UL CE License for 0 CEs to 64 CEs (per 16 CEs)	Uplink UMTS CE license package, and configured when the UMTS mode needs to be supported	Each license includes 16 CEs and a maximum of 4 licenses can be configured. ● It is configured when less than or equal to 64 CEs are required. ● Four licenses are configured when more than 64 CEs are required.

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Model	License Package Description	Function	Configuration Principle
QWMS000UCE02	UL CE License for 64 CEs to 128 CEs (per 16 CEs)		Each license includes 16 CEs and a maximum of 4 licenses can be configured. It is configured for the 65th to 128th CEs.
QWMS000UCE03	UL CE License for 128 CEs to 192 CEs (per 16 CEs)		Each license includes 16 CEs and a maximum of 4 licenses can be configured. It is configured for the 129th to 192nd CEs.
QWMS000UCE04	UL CE License for more than 192 CEs (per 16 CEs)		Each license includes 16 CEs and a maximum of 4 licenses can be configured. It is configured when more than 192 CEs are required.
QWMS000DCE01	DL CE License for 0 CEs to 64 CEs (per 16 CEs)	Downlink UMTS CE license package, and configured when the UMTS mode needs to be supported	Each license includes 16 CEs and a maximum of 4 licenses can be configured. ● It is configured when less than or equal to 64 CEs are required. ● Four licenses are configured when more than 64 CEs are required.
QWMS000DCE02	DL CE License for 64 CEs to 128 CEs (per 16 CEs)		Each license includes 16 CEs and a maximum of 4 licenses can be configured. It is configured for the 65th to 128th CEs.
QWMS000DCE03	DL CE License for 128 CEs to 192 CEs (per 16 CEs)		Each license includes 16 CEs and a maximum of 4 licenses can be configured. It is configured for the 129th to 192nd CEs.
QWMS000DCE04	DL CE License for more than 192 CEs (per 16 CEs)		Each license includes 16 CEs and a maximum of 4 licenses can be configured. It is configured when more than 192 CEs are required.
QWMS0HDPAC00	HSDPA Code (per Code)	HSDPA code resources	HSDPA is a mandatory function and needs to be configured based on the total number of codes required by each base station. Each package is one HSDPA code. The minimum configuration is five HSDPA codes. For a base station, the maximum number of HSDPA codes that can be configured equals the number of cells on the base station multiplied by 15.

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Model	License Package Description	Function	Configuration Principle
QWMS000MCA00	Multi Carrier License (per Carrier)	Multi-carrier function for the UMTS mode	The hardware quotation of each RF module includes the license for one carrier. When a module contains more than one carrier, each excess carrier needs to be configured with one package. This license applies to the WRFU, WRFUd, and RRU in UMTS mode.
QWMS0000PA00	Power License (per 20 W)	License package for 20 W power	The hardware quotation of each RF module includes the license for 20 W power. When a module supports over 20 W power, each 20 W part of excess power needs to be configured with one package.
WDMS000MCA00	UMTS Multi Carrier License for the 1st Carrier of Multi-Mode Module (per Carrier)	License for the first carrier of the UMTS mode in a multimode RF module	A multimode module does not contain the license for UMTS carriers. The highest-priority carrier of each module needs to be configured with one package. This license applies to multimode RF modules.
WDMS000MCA01	UMTS Multi Carrier License for Multi-Mode Module (per Carrier)	License for multiple UMTS carriers of a multimode RF module	A multimode module does not contain the license for UMTS carriers. Each UMTS carrier among the second to fourth carriers of a module needs to be configured with one package. This license applies to multimode RF modules.
QWMS00UNSC00	UMTS NodeB Signaling Capacity License (per 50 CNBAP/s)	UMTS signaling capacity license	When the base station's signaling capability is stronger than 350 CNBAP/s, the signaling license needs to be configured. Each license package supports 50 CNBAP/s. This license is supported from SRAN7.0/RAN14.0 onwards.
QWMS000MCA01	Multi Carrier License for Blade RRU&AAU (per Carrier)	Multi-carrier function for the UMTS mode of an AAU or blade RRU	The hardware quotation of each RF module includes the license for one carrier. When a module contains more than one carrier, each excess carrier needs to be configured with one package. This license applies to an AAU or a blade RRU.
QWMS0000PA01	Power License for Blade RRU&AAU (per 20W)	License package for 20 W power of an AAU or blade RRU	The hardware quotation of each RF module includes the license for 20 W power. When a module supports over 20 W power, each 20 W part of excess power needs to be configured with one package. This license applies to an AAU or a blade RRU.

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Model	License Package Description	Function	Configuration Principle
WDMS000MCA03	UMTS Multi Carrier License for the 1st Carrier of Multi-Mode Blade RRU&AAU (per Carrier)	License for the first UMTS carrier of a multimode RF module (AAU or blade RRU)	The license package for each UMTS carrier is not included in a multi-mode module. Configured for the 1st carrier for each multi-mode module. One license is required for each UMTS carrier. This package applies to blade RRUs or multimode AAUs.
WDMS000MCA02	UMTS Multi Carrier License for Multi-Mode Blade RRU&AAU (per Carrier)	License for multiple UMTS carriers of a multimode RF module (AAU or blade RRU)	The license package for each UMTS carrier is not included in a multi-mode module. Configured for the 1st carrier for each multi-mode module. One license is required for each UMTS carrier. This package applies to blade RRUs or multimode AAUs.

4.8.3 Hardware License Configuration of LTE Base Stations

This section describes the principles for configuring the hardware licenses for LTE base stations.

The following table lists the principles for configuring the hardware licenses for LTE base stations.

Table 4-76 Hardware license configuration of LTE base stations

Model	License Package Description	Function	Configuration Principle
LT1S0000PA00	RF Output Power (per 20 W)	Power license package for RF modules	The power of each RF module in the quotation list is 20 W. If the output power of an RF module exceeds 20 W, one license package must be configured for each 20 W part of excess power.
LT1S000MCA00	LTE Multi Carrier (per Carrier)	Multi-carrier license package for RF modules	Each RF module provides one carrier by default. If more than one carrier is used by an RF module, one license package is configured for each additional carrier. This license applies to RF modules with multiple carriers.

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Model	License Package Description	Function	Configuration Principle
LT1S005MHZ00	Carrier Bandwidth - 0 MHz to 5 MHz	Carrier bandwidth license (per cell) for RF modules	● Each cell is configured with one piece when 5 MHz or lower bandwidth is required. ● Each cell is configured with one piece when 10 MHz bandwidth is required. ● Each cell is configured with one piece when 15 MHz bandwidth is required. ● Each cell is configured with one piece when 20 MHz bandwidth is required. This license applies to multimode RFUs and RRUs.
LT1S010MHZ00	Carrier Bandwidth - 5 MHz to 10 MHz	Carrier bandwidth license (per cell) for RF modules	● Each cell is configured with one piece when 10 MHz bandwidth is required. ● Each cell is configured with one piece when 15 MHz bandwidth is required. ● Each cell is configured with one piece when 20 MHz bandwidth is required. This license applies to multimode RFUs and RRUs.
LT1S015MHZ00	Carrier Bandwidth - 10 MHz to 15 MHz	Carrier bandwidth license (per cell) for RF modules	● Each cell is configured with one piece when 15 MHz bandwidth is required. ● Each cell is configured with one piece when 20 MHz bandwidth is required.
LT1S020MHZ00	Carrier Bandwidth - 15 MHz to 20 MHz	Carrier bandwidth license (per cell) for RF modules	Each cell is configured with one piece when 20 MHz bandwidth is required.
LT1S0ACTUS00	RRC connected User	License for the baseband processing capacity of RRC_connected users (per RRC_connected user)	This package is configured based on the network plan. Each cell is initially configured with a minimum number of 6 RRC_connected users, and the license is sold on a step of 6. A maximum number of 5400 RRC_connected users can be configured. For example, an S1/1/1 base station is configured with a minimum of 18 (equal to 3 x 6) RRC_connected users.
LT1S0THROU00	Throughput Capacity	License for the throughput capacity of the baseband processing module (per Mbit/s)	This package is configured based on the network plan. Each cell is initially configured with the minimum throughput of 5 Mbit/s, and the license is sold on a step of 5 Mbit/s. The maximum throughput of 750 Mbit/s can be configured. For example, an S1/1/1 base station is configured with the minimum throughput of 15 Mbit/s (equal to 3 x 5 Mbit/s).

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Model	License Package Description	Function	Configuration Principle
LT1S0000RB00	Resource Block	Resource Block (per RB)	Number of licenses = N x Number of cells, where N varies with bandwidths ● 1.4 MHz: N is 6. ● 3 MHz: N is 15. ● 5 MHz: N is 25. ● 10 MHz: N is 50. ● 15 MHz: N is 75. ● 20 MHz: N is 100. In multi-carrier scenarios, the number of resource blocks is calculated on a per carrier basis. The total number is the sum of the resource blocks required by all carriers. This package applies only to the LBBPd and UBBPd.
LT1S00BBTC00	BB Transmit Channel	BB Transmit Channel (per Channel)	This package is configured when more than two transmit channels are required. Each baseband processing board has been configured with two transmit channels per cell. Therefore, one package is required for each added transmit channel. The number of required packages is calculated using the following formula: Number of packages required for one baseband processing board = Number of sectors with more than two transmit channels x (Number of transmit channels - 2) x Number of carriers This license only applies to the LBBPc, LBBPd2, UBBPd4, UBBPd5, and UBBPd6.
LT1S00BBRC00	BB Receive Channel	BB Receive Channel (per Channel)	This package is configured when more than two receive channels are required. Each baseband processing board has been configured with two receive channels per cell. Therefore, one package is required for each added receive channel. The number of required packages is calculated using the following formula: Number of packages required for one baseband processing board = Number of sectors with more than two receive channels x (Number of receive channels - 2) x Number of carriers This license only applies to the LBBPc, LBBPd2, UBBPd4, UBBPd5, and UBBPd6.

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Model	License Package Description	Function	Configuration Principle
LT1S00RFTC00	RF Transmit Channel	RF Transmit Channel (per Channel)	This package is required when the RF module has more than two transmit channels. Each RF module has been configured with two transmit channels. Therefore, one package is required for each added transmit channel. The number of required packages is calculated using the following formula: Number of packages required = Number of RRUs that have more than two transmit channels x (Number of channels on a single RRU - 2). This license only applies to RF modules configured with four transmit channels.
LT1S00RFRC00	RF Receive Channel	RF Receive Channel (per Channel)	This package is required when the RF module has more than two receive channels. Each RF module has been configured with two receive channels. Therefore, one package is required for each added receive channel. The number of required packages is calculated using the following formula: Number of packages required = Number of RRUs that have more than two receive channels x (Number of channels on a single RRU - 2). This license only applies to RF modules configured with four receive channels.
LT1S0000PA01	RF Output Power Blade RRU and AAU (per 20 W)	Power license package for an AAU or blade RRU	The power of each RF module in the quotation list is 20 W. If the output power of an RF module exceeds 20 W, one license package must be configured for each 20 W part of excess power. This package applies to blade RRUs or multimode AAUs.
LT1S000MCA01	RF Multi Carrier for Blade RRU and AAU (per carrier)	Multi-carrier license package for an AAU or blade RRU	Each RF module provides one carrier by default. If more than one carrier is used by an RF module, one license package is configured for each additional carrier. This package applies to blade RRUs or multimode AAUs.
LT1S005MHZ01	Carrier Bandwidth - 0 MHz to 5 MHz for Blade RRU and AAU	Carrier bandwidth license (per cell) for an AAU or blade RRU	Each cell is configured with one piece if the channel bandwidth is 5 MHz or lower, 10 MHz, 15 MHz, or 20 MHz. This package applies to blade RRUs or multimode AAUs.
LT1S010MHZ01	Carrier Bandwidth - 5 MHz to 10 MHz for Blade RRU and AAU	Carrier bandwidth license (per cell) for an AAU or blade RRU	Each cell is configured with one piece if the cell bandwidth is 10 MHz, 15 MHz, or 20 MHz. This package applies to blade RRUs or multimode AAUs.

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Model	License Package Description	Function	Configuration Principle
LT1S015MHZ01	Carrier Bandwidth - 10 MHz to 15 MHz for Blade RRU and AAU	Carrier bandwidth license (per cell) for an AAU or blade RRU	Each cell is configured with one piece if the cell bandwidth is 15 MHz or 20 MHz. This package applies to blade RRUs or multimode AAUs.
LT1S020MHZ01	Carrier Bandwidth - 15 MHz to 20 MHz for Blade RRU and AAU	Carrier bandwidth license (per cell) for an AAU or blade RRU	Each cell is configured with one piece if the cell bandwidth is 20 MHz. This package applies to blade RRUs or multimode AAUs.
LT1S00RFTC01	RF Transmit Channel for Blade RRU and AAU	Blade RRU and AAU RF Transmit Channel(per Channel)	This package is required when the RF module has more than two transmit channels. Each RF module has been configured with two transmit channels. Therefore, one package is required for each added transmit channel. The number of required packages is calculated using the following formula: Number of packages required = Number of RRUs that have more than two transmit channels x (Number of channels on a single RRU - 2). This license only applies to RF modules configured with four transmit channels. This package applies to blade RRUs or multimode AAUs.
LT1S00RFRC01	RF Receive Channel for Blade RRU and AAU	Blade RRU and AAU RF Receive Channel (per Channel)	This package is required when the RF module has more than two receive channels. Each RF module has been configured with two receive channels. Therefore, one package is required for each added receive channel. The number of required packages is calculated using the following formula: Number of packages required = Number of RRUs that have more than two receive channels x (Number of channels on a single RRU - 2). This license only applies to RF modules configured with four receive channels. This package applies to blade RRUs or multimode AAUs.

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NOTE

In MIMO scenarios, the output power per module is calculated using this formula: Output power per module = Number of MIMO channels per module x Output power per channel

- In the case of 2x2 MIMO (2x30 W), each RRU requires the output power of 60 W and two licenses for RF output power must be configured.
- In the case of 2x2 MIMO (2x40 W), each RRU requires the output power of 80 W and three licenses for RF output power must be configured.
- In the case of 4x2 MIMO (4x40 W), each RRU requires the output power of 80 W and three licenses for RF output power must be configured.

The BBU3900 supports hybrid configuration of the LBBPc, LBBPd1, LBBPd2, LBBPd3, UBBPd3, UBBPd4, UBBPd5, and UBBPd6.

4.8.4 License Configurations of Multimode Base Stations

This section describes the principles for configuring hardware licenses, co-MPT licenses, and co-BBP licenses for multimode base stations.

Hardware License Configurations of Multimode Base Stations

The following table lists the principles for configuring hardware licenses for multimode base stations.

Table 4-77 Principles for configuring hardware licenses for multimode base stations

Model	License Package Description	Function	Configuration Principle
WDMS00GUDM00	RF GSM/UMTS Dual Mode license (per sector)	Dual-mode license for GU RF modules	In GU SDR mode, each sector is configured with one package.
WDMS00GLDM00	RF GSM/LTE Dual Mode license (per sector)	Dual-mode license for GL RF modules	In GL SDR mode, each sector is configured with one package.
WDMS00ULDM00	RF UMTS/LTE Dual Mode license (per sector)	Dual-mode license for UL RF modules	In UL SDR mode, each sector is configured with one package.
WDMS00GUDM01	GSM/UMTS Dual Mode license for Blade RRU and AAU (per sector)	GSM/UMTS RF multimode license for the AAU and blade RRU	In GU SDR mode, each sector is configured with one package. This package applies to blade RRUs or multimode AAUs.
WDMS00GLDM01	GSM/LTE Dual Mode license for Blade RRU and AAU (per sector)	GSM/LTE RF multimode license for the AAU and blade RRU	In GL SDR mode, each sector is configured with one package. This package applies to blade RRUs or multimode AAUs.
WDMS00ULDM01	UMTS/LTE Dual Mode license for Blade RRU and AAU (per sector)	UMTS/LTE RF multimode license for the AAU and blade RRU	In UL SDR mode, each sector is configured with one package. This package applies to blade RRUs or multimode AAUs.

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Model	License Package Description	Function	Configuration Principle
WDMSFMFBMBG0	First Mode First Band License for Multi-Band RF Module (GSM) (Per Band per RRU)	Multi-Mode Multi-Band License for Multi-Band RF Module (GSM)	GSM is sold as the first mode and its corresponding band is sold as the first band of the multi-band RF module. Each multi-band RF module supports one first-mode first-band license (GSM).
WDMSMMMBMBG0	Multi-Mode Multi-Band License for Multi-Band RF Module (GSM) (Per Band per RRU)	Multi-Mode Multi-Band License for Multi-Band RF Module (GSM)	When GSM is sold as a newly added mode and its corresponding band is sold as a newly added band (in mode conversion, multimode co-BBP, band conversion, and multi-band co-BBP scenarios), the number of licenses for GSM mode and band equals the number of bands to be used by GSM.
WDMSFMFBMBU0	First Mode First Band License for Multi-Band RF Module (UMTS) (Per Band per RRU)	Multi-Mode Multi-Band License for Multi-Band RF Module (UMTS)	UMTS is sold as the first mode and its corresponding band is sold as the first band of the multi-band RF module. Each multi-band RF module supports one first-mode first-band license (UMTS).
WDMSMMMBMBU0	Multi-Mode Multi-Band License for Multi-Band RF Module (UMTS) (Per Band per RRU)	Multi-Mode Multi-Band License for Multi-Band RF Module (UMTS)	When UMTS is sold as a newly added mode and its corresponding band is sold as a newly added band (in mode conversion, multimode co-BBP, band conversion, and multi-band co-BBP scenarios), the number of licenses for UMTS mode and band equals the number of bands to be used by UMTS.
WDMSFMFBMBL0	First Mode First Band License for Multi-Band RF Module (LTE FDD) (Per Band per RRU)	Multi-Mode Multi-Band License for Multi-Band RF Module (LTE FDD)	LTE FDD is sold as the first mode and its corresponding band is sold as the first band of the multi-band RF module. Each multi-band RF module supports one first-mode first-band license (LTE FDD).
WDMSMMMBMBL0	Multi-Mode Multi-Band License for Multi-Band RF Module (LTE FDD) (Per Band per RRU)	Multi-Mode Multi-Band License for Multi-Band RF Module (LTE FDD)	When LTE FDD is sold as a newly added mode and its corresponding band is sold as a newly added band (in mode conversion, multimode co-BBP, band conversion, and multi-band co-BBP scenarios), the number of licenses for LTE FDD mode and band equals the number of bands to be used by LTE FDD.

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NOTE

(1) For deployment of a single mode and a single band, the First Mode First Band License for Multi-Band RF Module must be quoted for each multi-band module.

(2) For deployment of multiple modes and multiple bands, first purchase licenses (Multi-Mode Multi-Band License for Multi-Band RF Module) for the latest mode, then licenses (First Mode First Band License for Multi-Band RF Module) for the earliest mode on each wideband module, and finally licenses for the second earliest mode. By default, the modes are arranged from the earliest to the latest in the following sequence: GSM < UMTS < LTE (FDD).

(3) For the mode or band conversion scenarios, purchase licenses for the newly added mode according to the number of bands used by the newly added mode.

(4) Deployment of single-frequency triple-mode concurrency: Purchase GSM/UMTS and GSM/LTE dual-mode licenses for the single-frequency triple-mode cells to be deployed. The license combination to be purchased is either of the following ones: RF GSM/UMTS Dual Mode license and RF GSM/LTE Dual Mode license, or GSM/UMTS Dual Mode license for Blade RRU and AAU and GSM/LTE Dual Mode license for Blade RRU and AAU.

(5) For capacity expansion of triple modes and a single band, purchase dual-mode licenses for the newly added mode according to the dual-mode licenses that have been purchased.

- If a GU dual-mode license (RF GSM/UMTS Dual Mode license or GSM/UMTS Dual Mode license for Blade RRU and AAU) has been purchased, purchase a GL dual-mode license (RF GSM/LTE Dual Mode license or GSM/LTE Dual Mode license for Blade RRU and AAU).
- If a GL dual-mode license (RF GSM/LTE Dual Mode license or GSM/LTE Dual Mode license for Blade RRU and AAU) has been purchased, purchase a GU dual-mode license (RF GSM/UMTS Dual Mode license or GSM/UMTS Dual Mode license for Blade RRU and AAU).

(6) For the SDR module supporting inter-frequency mutual aid, if a single mode is in the transmit channel, the multimode license is not required. For example, if LTE mode is in the transmit channel while UMTS mode is in the receive channel, this module is regarded as an LTE only module supporting LTE and the multimode license is not required.

Co-MPT License Configurations of Multimode Base Stations

The following table lists the principles for configuring co-MPT licenses for multimode base stations.

Table 4-78 Principles for configuring co-MPT licenses for multimode base stations

Model	License Package Description	Function	Configuration Principle
WDMS0UMMG00	MPT Multi Mode license (GSM) (Per UMPT)	Co-MPT license for GSM	The number of GSM license supported by each UMPT(1): Each base station is configured with a maximum of one such license.
WDMS0UMMU00	MPT Multi Mode license (UMTS) (Per UMPT)	Co-MPT license for UMTS	The number of UMTS license supported by each UMPT(1): Each base station is configured with a maximum of one such license.
WDMS0UMML00	MPT Multi Mode license (LTE FDD) (Per UMPT)	Co-MPT license for LTE	This license indicates the number of LTE modes supported by each UMPT(1). Each base station is configured with a maximum of one LTE FDD co-MPT license.
LT1UMPTMMS00	MPT Multi Mode license (LTE TDD) (per UMPT)	Co-MPT license for LTE	The number of LTE license supported by each UMPT(1): Each base station is configured with a maximum of one LTE TDD co-MPT license.

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NOTE

(1) Each UMPT supports one mode by default. One license needs to be added for each additional mode. When multiple modes are configured on a UMPT, first quote a UMPT for the earliest mode and then add licenses for later modes. The GSM, UMTS, and LTE modes are arranged from the earliest to the latest as follows: GSM < UMTS < LTE (FDD) < LTE (TDD).

Co-BBP License Configurations of Multimode Base Stations

The following table lists the principles for configuring co-BBP licenses for multimode base stations.

Table 4-79 Principles for configuring co-BBP licenses for multimode base stations

Model	License Package Description	Function	Configuration Principle
WDMS00UFMG00	UBBP First-Mode license (GSM) (Per UBBP)	License for the first mode (GSM) of the UBBP	When GSM is used as the first mode, each UBBP is configured with one such license.
WDMS00UMMG00	UBBP Multi-Mode license (GSM) (Per UBBP)	License for adding a new mode (GSM) of the UBBP	When GSM is added as a new mode (either replacing the first mode or concurrent with the first mode), each UBBP is configured with one such license.
WDMS00UFMU00	UBBP First-Mode license (UMTS) (Per UBBP)	License for the first mode (UMTS) of the UBBP	When UMTS is used as the first mode, each UBBP is configured with one such license.
WDMS00UMMU00	UBBP Multi-Mode license (UMTS) (Per UBBP)	License for adding a new mode (UMTS) of the UBBP	When UMTS is added as a new mode (either replacing the first mode or concurrent with the first mode), each UBBP is configured with one such license.
WDMS0UFMLF00	UBBP First-Mode license (LTE FDD) (per UBBP)	License for the first mode (LTE FDD) of the UBBP	When LTE FDD is used as the first mode, each UBBP is configured with one such license.
WDMS0UMMLF00	UBBP Multi-Mode license (LTE FDD) (Per UBBP)	License for adding a new mode (LTE FDD) of the UBBP	When LTE FDD is added as a new mode (either replacing the first mode or concurrent with the first mode), each UBBP is configured with one such license.
LT1SUMMLFL01	UBBP First-Mode license (LTE TDD) (per UBBP)	License for the first mode (LTE TDD) of the UBBP	When LTE TDD is used as the first mode, each UBBP is configured with one first mode license for LTE TDD.

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Model	License Package Description	Function	Configuration Principle
LT1SUMMLFL00	UBBP Multi-Mode license (LTE TDD) (per UBBP)	Multimode license (LTE TDD) of the UBBP	When LTE TDD is added as a new mode (either replacing the first mode or concurrent with the first mode), each UBBP is configured with one multimode license for LTE TDD.
(1) Deployment of a single mode: A first-mode license needs to be quoted for each single-mode UBBP. (2) Deployment of multimode concurrency: First purchase the multimode license for the latest mode and then configure the first-mode license for the earliest mode. Different modes are arranged in the following sequence from the earliest to the latest: GSM < UMTS < LTE (FDD) < LTE (TDD). (3) Conversion of the mode: A multimode license needs to be purchased for the newly added mode in this scenario, which involves converting one mode to another mode, converting a single mode to multimode concurrency, or adding a mode in a multimode concurrency scenario.			

4.9 Equipment and Product Auxiliary Material Configuration

This section describes the principles for configuring the installation and site auxiliary materials.

4.9.1 Installation Auxiliary Materials

This section describes the principles for configuring the auxiliary materials used for installing 3900 series base stations.

Transmission Cables/Packages

The following table lists transmission cables and transmission packages for 3900 series macro base stations.

Table 4-80 Installation auxiliary materials for 3900 series macro base stations

Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0004E100	Trunk Cable (75 Ohm, 4 E1, 10 m)	E1 electrical cable	-	● It needs to be configured when 75 ohm E1 transmission or E1 line clock is used. ● One package is configured for every four E1s.
QWMP0004E101	Trunk Cable (120 Ohm, 4 E1, 10 m)	E1 electrical cable	-	● It needs to be configured when 120 ohm E1 transmission or E1 line clock is used. ● One package is configured for every four E1s.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0000FE00	Ethernet Cable	FE/GE fiber optic cable	-	● It needs to be configured when FE/GE electrical ports are used. ● One package is configured for every FE/GE.
LTIP000FBR00	Optical Fiber	FE/GE fiber optic cable	-	● It needs to be configured when FE/GE optical ports are used. ● One package is configured for every FE/GE (only for Ver.B or Ver.C cabinets).
QWMP0000FE02	Optical Fiber (FE/STM-1)	FE/STM-1 optical transmission package	-	● It needs to be configured when FE/STM-1 optical ports are used. ● One package is configured for every FE/STM-1 (only for Ver.D or Ver.E cabinets).
QWMP0000GE00	Optical Fiber (GE)	GE optical transmission package	-	● It needs to be configured when GE optical ports are used. ● One package is configured for every GE (only for Ver.D or Ver.E cabinets).
QWMP0010GE00	10GE Optical Transmission Materials	10GE optical transmission package	-	● It needs to be configured when 10GE optical ports are used. ● One package is configured for each 10GE. ● It is used for the BBU3900 and BBU3910.

The following table lists transmission cables and transmission packages for the DBS3900.

Table 4-81 Installation auxiliary materials for DBS3900 series base stations

Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0004E100	Trunk Cable (75 Ohm, 4 E1, 10 m)	E1 electrical cable	-	● It needs to be configured when 75 ohm E1 transmission or E1 line clock is used. ● One package is configured for every four E1s. ● It is used for the BBU3900 and BBU3910.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0004E101	Trunk Cable (120 Ohm, 4 E1, 10 m)	E1 electrical cable	-	● It needs to be configured when 120 ohm E1 transmission or E1 line clock is used. ● One package is configured for every four E1s. ● It is used for the BBU3900 and BBU3910.
QWMP0004E103	BBU3910A Trunk Cable (75 Ohm, 4 E1, 20 m)	E1 electrical cable	-	● It needs to be configured when 75 ohm E1 transmission or E1 line clock is used. ● One package is configured for every four E1s. ● It is used for the BBU3910A.
QWMP0004E104	BBU3910A Trunk Cable (120 Ohm, 4 E1, 20 m)	E1 electrical cable	-	● It needs to be configured when 120 ohm E1 transmission or E1 line clock is used. ● One package is configured for every four E1s. ● It is used for the BBU3910A.
QWMP0000FE00	Ethernet Cable	FE/GE fiber optic cable	-	● It needs to be configured when FE/GE electrical ports are used. ● One package is configured for every FE/GE. ● It is used for the BBU3900 and BBU3910.
QWMP0000FE03	BBU3910A Ethernet Cable	FE/GE fiber optic cable	-	● One package is configured for each FE/GE electrical port. ● It is used for the BBU3910A.
LTIP000FBR00	Optical Fiber	FE/GE fiber optic cable	-	● It needs to be configured when FE/GE optical ports are used. ● One package is configured for every FE/GE (only for Ver.B or Ver.C cabinets). ● It is used for the BBU3900 and BBU3910.
QWMP0000FE02	Optical Fiber (FE/STM-1)	FE/STM-1 optical transmission package	-	● It needs to be configured when FE/STM-1 optical ports are used. ● One package is configured for every FE/STM-1 (only for Ver.D or Ver.E cabinets). ● It is used for the BBU3900 and BBU3910.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0000GE00	Optical Fiber (GE)	GE optical transmission package	-	● It needs to be configured when GE optical ports are used. ● One package is configured for every GE (only for Ver.D or Ver.E cabinets). ● It is used for the BBU3900 and BBU3910.
QWMP0010GE00	10GE Optical Transmission Materials	10GE optical transmission package	-	● It needs to be configured when 10GE optical ports are used. ● One package is configured for each 10GE. ● It is used for the BBU3900 and BBU3910.
QWMP0000FE04	BBU3910A Optical Fiber (FE)	FE Optical Transmission Package	-	● One package is configured for every FE optical port. ● It is used for the BBU3910A.
QWMP0000GE03	BBU3910A Optical Fiber (GE)	GE optical transmission package	-	● One package is configured for every GE optical port. ● It is used for the BBU3910A.

Jumper Packages

The following table lists jumper packages for 3900 series base stations.

Table 4-82 Jumper packages for 3900 series base stations

Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP000JMP00	Top Jumper Cable Unit for RFU	Fixed-length jumper on the top of the cabinet	-	● Each antenna is configured with one package when the base station is configured with RFUs. ● The number of packages is determined by the number of antennas(1).
QWMP000JMP02	Top Jumper Cable Unit for RRU	Jumper package for common areas	-	● This package is used in common areas. Each antenna in a distributed base station is configured with one package. ● The number of packages is determined by the number of antennas(1).

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP000JMP03	Top Jumper Cable Unit for RRU	Jumper package for cold areas	-	● This package is used in cold areas. Each antenna in a distributed base station is configured with one package. ● The number of packages is determined by the number of antennas(1).
QWMP4310JMP0	Top Jumper Cable Unit for 4.3-10 Interface RRU	Jumper package on the top of the cabinet for common areas (4.3-10 RRU)	-	● The package is used in common areas for RRUs with 4.3-10 RF connectors. Each antenna is configured with one package.
QWMP4310JMP1	Top Jumper Cable Unit for 4.3-10 Interface RRU	Jumper package on the top of the cabinet for cold areas (4.3-10 RRU)	-	● The package is used in cold areas for RRUs with 4.3-10 RF connectors. Each antenna is configured with one package.
QWMP4310AAU0	DIN~4.3-10 Adapter Jumper Kit	DIN~4.3-10 transfer jumper package	-	● Each AAU3961 is configured with two packages.

NOTE

(1) The number of antennas to be used in a 4-way receive diversity scenario is twice the number of antennas used in other scenarios.

Installation Packages for BBU Interconnection

The following table lists installation packages for BBU interconnection in 3900 series base stations.

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Table 4-83 Installation packages for BBU interconnection

Model	Description	Function	Maximum Quantity	Configuration Principle
WD5PUCIUIM00	UCIU Interconnecting Materials (Internal Cabinet)	Materials (including fiber optical cables and optical modules) required for UCIU interconnection in a 3900 series base station	1	This package is optional for a BTS3900L/ BTS3900AL. It is required when BBUs are interconnected by connecting UCIUs.
WD5PUCIUIM01	UCIU Interconnecting Materials (Internal Cabinet)	Materials (including fiber optical cables and optical modules) required for interconnection between UCIUs in different 3900 series base stations	1	This package is optional for a BTS3900/ BTS3900A/DBS3900. It is required when BBUs are interconnected by connecting UCIUs.
WD5PUMPTIN02	UMPT Interconnection Cable, 2.0 m	Cable of 2 m (6.56 ft) for UMPT interconnection in a 3900 series base station	1	This package is optional. It is required when BBUs are interconnected by connecting UMPTs. This package is used when two BBUs are installed in the same cabinet.
WD5PUMPTIN05	UMPT Interconnection Cable, 5.0 m	Cable of 5 m (16.40 ft) for connecting UMPTs in different cabinets in a 3900 series base station	1	This package is optional. It is required when BBUs are interconnected by connecting UMPTs. This package is used when the BBUs are installed in different cabinets.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD5P20CPRI00	QSFP Interconnect Cable between BBU&USU(for BTS)	Cable for connecting the BBU to the first-level USU through QSFP ports (on the base station side)	1	This package is optional. It is used in distributed Cloud BB scenarios. It is the cable package for the interconnection between BBU3900s/BBU3910s and the first-level USU. One package is configured for each UCCU.

RRU Virtual Installation Material Packages

The following table lists RRU virtual installation material packages.

Table 4-84 RRU virtual installation material packages

Model	Description	Function	Maximum Quantity	Configuration Principle
QWMPRRUINS01	RRU Installation Materials	RRU installation material package	-	● This package is optional. Different auxiliary material packages are selected for multimode and single-mode fiber optic cables. ● This package applies to an RRU3004/RRU3008/RU3801E/RRU3804/RRU3806/RRU3808/RRU3201/RRU3203/RRU3220/RRU3222. ● Each RRU is configured with one package, which includes RRU power cables, RRU fiber optic cables, and CPRI optical modules.
QWMPRRUINS04	RRU Installation Materials(Single Mode)	RRU installation material package (single-mode)	-	
QWMPRRUINS02	RRU Installation Materials, B	RRU installation material package	-	● This package is optional. It is used for multimode RRUs, and different auxiliary material packages are selected for multimode and single-mode fiber optic cables. ● This package applies to an RRU3908/RRU3928/RRU3929/RRU3828/RRU3829/RRU3926 and is configured when RRUs use a 2.5 Gbit/s CPRI port rate.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMPRRUINS05	RRU Installation Materials(Single Mode)	RRU installation material package (single-mode)	-	● Each RRU is configured with one package, which includes RRU power cables, RRU fiber optic cables, and CPRI optical modules.
QWMPRRUINS03	RRU Installation Materials	RRU installation materials (including 4.9 Gbit/s optical modules)	-	● This package is optional. A maximum of 4.9 Gbit/s data rate is supported and different auxiliary material packages are selected for multimode and single-mode fiber optic cables. ● Each RRU3240/RRU3942/RRU3841 is configured with one package. ● For other RRUs, one package is configured for each RRU when a 4.9 Gbit/s CPRI port rate is used.
QWMPRRUINS06	RRU Installation Materials(Single Mode)	RRU installation material package (single-mode, 4.9 Gbit/s optical module)	-	

RRU Power Cable Installation Packages

The following table lists RRU power cable installation packages.

Table 4-85 RRU power cable installation packages

Model	Description	Function	Maximum Quantity	Configuration Principle
QW7PRRUCAP01	RRU Cable Package (<=50m)	RRU cable package (<= 50 m)	1	● Optional. Each of the following DC RRUs is configured with one package, which includes the DC RRU power cable and ground cable: RRU3936/ RRU3824/RRU3826/RRU3838/ RRU3832/RRU3268/RRU3260/ RRU3938/RRU3939/RRU3839/ RRU3262/RRU3959/RRU3959w/ RRU3952/RRU3269/RRU3952m/ RRU3249/RRU3261/RRU3668/ RRU3958. ● This package applies to a BTS3900/ BTS3900L/BTS3900A/DBS3900.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QW7PRRUCAP02	RRU Cable Package (for >= 160 W RRU, <= 100 m)	RRU cable package (configured for an RRU supporting power of more than or equal to 160 W and installed within 100 m away from the BBU)	1	● Optional. One package is configured for each DC RRU/AAU3920 supporting power of more than or equal to 160 W. It includes the DC RRU power cable and ground cable. ● This package applies to a BTS3900/BTS3900L/BTS3900A/DBS3900.
QW7PRRUCAP00	RRU Cable Package (<= 100)	RRU cable package for a BTS3900AL (less than or equal to 100 m)	-	● This package is optional. Each RRU is configured with one package. ● This package applies to a BTS3900AL.
QW7PAAUCAP01	RU Cable Package for AAU (<= 100 m)	RU cable package (less than or equal to 100 m)	-	Optional. Each RU in an AAU3910/AAU3911/AAU3961 is configured with one package. Each DC AAU3940 is configured with one package. It includes the DC RRU power cable and ground cable.
LT1PRUCPAC00	RU Cable Package for AC AAU	AC AAU cable package	-	Optional. Each AC AAU3940 is configured with one package. It includes the AC RRU power cable and ground cable.

RRU CPRI Installation Material Packages (BBU3900/BBU3910)

The CPRI optical transmission material packages apply to the RRU3936/RRU3824/RRU3826/RRU3838/RRU3832/RRU3268/RRU3260/RRU3938/RRU3939/RRU3839/RRU3668 and RU3260/RU3268/RU3832.

- The 2.5 Gbit/s or 4.9 Gbit/s CPRI installation material package is optionally configured according to the application scenario and port rate of an RRU/RU.
- The multimode or single-mode material package is configured according to the type of the CPRI fiber optic cable.

The following table lists RRU CPRI installation material packages.

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Table 4-86 RRU CPRI installation material packages

Model	Description	Function	Maximum Quantity	Configuration Principle
WD5P25CPRI02	CPRI Optical Transmission Materials (2.5G) (Multi Mode)	Multimode optical transmission material package for RRUs with a 2.5 Gbit/s CPRI port rate	-	● This package is optional. ● When using a 2.5 Gbit/s data rate, each CPRI port on an RRU is configured with one package. This package applies to a BTS3900/BTS3900L/BTS3900A/BTS3900AL/DBS3900.
WD5P25CPRI01	CPRI Optical Transmission Materials (2.5 Gbit/s) (Single Mode)	Single-mode optical transmission material package for RRUs with a 2.5 Gbit/s CPRI port rate	-	
WD5P49CPRI02	CPRI Optical Transmission Materials (4.9G) (Multi Mode)	Multimode optical transmission material package for RRUs with a 4.9 Gbit/s CPRI port rate	-	● This package is optional. ● When using a 4.9 Gbit/s data rate, each CPRI port on an RRU is configured with one package. This package applies to a BTS3900/BTS3900L/BTS3900A/BTS3900AL/DBS3900.
WD5P49CPRI01	CPRI Optical Transmission Materials (4.9 Gbit/s) (Single Mode)	Single-mode optical transmission material package for RRUs with a 4.9 Gbit/s CPRI port rate	-	
LT1PCOTMDC00	CPRI Optical Transmission Materials (Single-mode, 9.8 Gbit/s)	Single-mode optical transmission material package for RRUs with a 9.8 Gbit/s CPRI port rate	-	● This package is optional. ● When using a 9.8 Gbit/s data rate, each CPRI port on an RRU is configured with one package. This package contains only single-mode fiber optic cables and optical modules. This package applies to a BTS3900/BTS3900L/BTS3900A/BTS3900AL/DBS3900.

Auxiliary Material Packages for AAU3902 Installation

The following table lists the auxiliary material packages for AAU3902 installation.

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Table 4-87 Auxiliary material packages for AAU3902 installation

Model	Description	Function	Maximum Quantity	Configuration Principle
QW7PAAUCAP00	AAU Power Cable Package (<=100m)	AAU power cable package (<= 100 m)	-	One package is configured for each AAU3902. The package includes AAU3902 power cables and PGND cables.
WD5P49CPRI02	CPRI Optical Transmission Materials (4.9G) (Multi Mode)	CPRI multimode optical transmission materials (4.9 Gbit/s)	-	When using multimode fiber optic cables and optical modules, each AAU3902 is configured with one package. The package includes one fiber optic cable and two optical modules, which support a maximum rate of 4.9 Gbit/s.
WD5P49CPRI01	CPRI Optical Transmission Materials (4.9 Gbit/s) (Single Mode)	CPRI single-mode optical transmission materials (4.9 Gbit/s)	-	When using single-mode fiber optic cables and optical modules, each AAU3902 is configured with one package. The package includes one fiber optic cable and two optical modules, which support a maximum rate of 4.9 Gbit/s.

CPRI Installation Material Packages (BBU3910A)

CPRI optical transmission material package. It is configured when the BBU3910A is used and applies to all RRUs, RU, and AAU.

- The 2.5 Gbit/s or 4.9 Gbit/s CPRI installation material package is optionally configured according to the application scenario and port rate of an RRU/RU/AAU.
- The multimode or single-mode material package is configured according to the type of the CPRI fiber optic cable.

The following table lists CPRI installation material packages.

Table 4-88 CPRI installation material packages

Model	Description	Function	Maximum Quantity	Configuration Principle
WD5P25CPRI06	BBU3910A CPRI Optical Transmission Materials (2.5G) (Multi Mode)	Multimode optical transmission material package for RRUs with a 2.5 Gbit/s CPRI port rate	-	● This package is optional. ● When using a 2.5 Gbit/s data rate, each CPRI port on an RRU is configured with one package. ● It is used when RRUs/RUs/AAUs are used together with a BBU3910A.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD5P25CPRI05	BBU3910A CPRI Optical Transmission Materials (2.5G) (Single Mode)	Single-mode optical transmission material package for RRUs with a 2.5 Gbit/s CPRI port rate	-	
WD5P49CPRI06	BBU3910A CPRI Optical Transmission Materials (4.9 Gbit/s) (Multi Mode)	Multimode optical transmission material package for RRUs with a 4.9 Gbit/s CPRI port rate	-	● This package is optional. ● When using a 4.9 Gbit/s data rate, each CPRI port on an RRU is configured with one package. ● It is used when RRUs/RUs/AAUs are used together with a BBU3910A.
WD5P49CPRI05	BBU3910A CPRI Optical Transmission Materials (4.9G) (Single Mode)	Single-mode optical transmission material package for RRUs with a 4.9 Gbit/s CPRI port rate	-	
WD5P98CPRI01	BBU3910A CPRI Optical Transmission Materials (9.8G) (Single Mode)	Single-mode optical transmission material package for RRUs with a 9.8 Gbit/s CPRI port rate	-	● This package is optional. ● When using a 9.8 Gbit/s data rate, each CPRI port on an RRU is configured with one package. This package contains only single-mode fiber optic cables and optical modules. ● It is used when RRUs/RUs/AAUs are used together with a BBU3910A.

Materials for an APM30 (Ver.D) to Be Configured with 15 RRUs

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Table 4-89 Materials for an APM30 (Ver.D) to be configured with 15 RRUs

Model	Description	Function	Maximum Quantity	Configuration Principle
QWMPODMINS00	ODM Installation Materials	The outdoor -48 V power distribution box (ODM) is used to distribute power to RRUs.	1	● One package is configured for an outdoor DBS3900 site that uses APM30 (Ver.D) cabinets and more than 12 DC RF modules. ● Each package includes one ODM, one mounting kit, and auxiliary installation materials. ● DC RF modules include the RRUs, RUs, and fully integrated DC AAUs.
QWMPOFDOFM00	OFD and Optical Fiber (Multi-mode)	Outdoor fiber distribution box (OFD) and 12-core multimode fiber optic cable, which support interconnection of CPRI fiber optic cables.	1	● One package is configured for an outdoor DBS3900 site that uses APM30 (Ver.D) cabinets and more than 12 DC RF modules with more than 21 fiber optic cables. ● Each package includes one OFD and one 12-core multimode fiber optic cable. ● It is configured when multimode fiber optic cables are used for CPRI ports. ● DC RF modules include the RRUs, RUs, and fully integrated DC AAUs.
QWMPOFDOFS00	OFD and Optical Fiber (Single mode)	OFD and 12-core single-mode fiber optic cable, which support interconnection of CPRI fiber optic cables.	1	● One package is configured for an outdoor DBS3900 site that uses APM30 (Ver.D) cabinets and more than 12 DC RF modules with more than 21 fiber optic cables. ● Each package includes one OFD and one 12-core single-mode fiber optic cable. ● It is configured when single-mode fiber optic cables are used for CPRI ports. ● DC RF modules include the RRUs, RUs, and fully integrated DC AAUs.

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Materials for an APM30H (Ver.E) to Be Configured with 21 RRUs

Table 4-90 Materials for an APM30H (Ver.E) to be configured with 21 RRUs

Model	Description	Function	Maximum Quantity	Configuration Principle
QWMPODMINS00	ODM Installation Materials	The outdoor -48 V power distribution box (ODM) is used to distribute power to RRUs.	1	● One package is configured for an outdoor DBS3900 site that uses APM30 (Ver.E) cabinets and more than 15 DC RF modules. ● DC RF modules include the RRUs, RUs, and fully integrated DC AAUs.
QWMPOFDOFM00	OFD and Optical Fiber (Multi-mode)	Outdoor fiber distribution box (OFD) and 12-core multimode fiber optic cable, which support interconnection of CPRI fiber optic cables.	1	● One package is configured for an outdoor DBS3900 site that uses APM30H (Ver.E) cabinets and more than 15 DC RF modules with more than 21 fiber optic cables. ● Each package includes one OFD and one 12-core multimode fiber optic cable. ● It is configured when multimode fiber optic cables are used for CPRI ports. ● DC RF modules include the RRUs, RUs, and fully integrated DC AAUs.
QWMPOFDOFS00	OFD and Optical Fiber (Single mode)	OFD and 12-core single-mode fiber optic cable, which support interconnection of CPRI fiber optic cables.	1	● One package is configured for an outdoor DBS3900 site that uses APM30H (Ver.D) cabinets and more than 15 DC RF modules with more than 21 fiber optic cables. ● Each package includes one OFD and one 12-core single-mode fiber optic cable. ● It is configured when single-mode fiber optic cables are used for CPRI ports. ● DC RF modules include the RRUs, RUs, and fully integrated DC AAUs.

Site Installation Material Packages

The following table lists the material packages for site installation.

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Table 4-91 Material packages for macro base station installation

Model	Description	Function	Maximum Quantity	Configuration Principle
WD5P0INSMT00	Installation Materials for BTS3900 Ver.B	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900 (Ver.B) cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT06	Installation Materials for BTS3900 Ver.C	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900 (Ver.C) cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT20	Installation Materials for BTS3900 Ver.D	Installation materials	2	● This package is optional. It is a site installation material package used for BTS3900 (Ver.D) cabinets. ● One package is configured for each site configured with a BTS3900 (Ver.D) cabinet. It includes the base, auxiliary cable, and low-value installation material.
QWMP0INSMT24	Installation Materials for BTS3900A (Ver.D, 220 V AC)	Installation materials	2	● This package is optional. It is a site installation material package used for BTS3900 (Ver.D) 220 V AC cabinets. ● Each BTS3900 (Ver.D) cabinet supplied with 220 V AC power is configured with one package. The package includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT05	Installation Materials for BTS3900L (Ver.B)	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900L (Ver.B) cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0INSMT07	Installation Materials for BTS3900L (Ver.C)	Installation materials	1	● Optional. It is a site installation material package used for BTS3900L (Ver.C) cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT21	Installation Materials for BTS3900L Ver.D	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900L (Ver.D) cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT24	Installation Materials for BTS3900L (Ver.D, 220 V AC)	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900L (Ver.D) 220 V AC cabinets. ● Each BTS3900L (Ver.D) AC cabinet is configured with one package. The package includes the base, cables, and low-value installation auxiliary materials.
WD5P0INSMT01	Installation Materials for BTS3900A Ver.B	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900A sites configured with Ver.B cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT08	Installation Materials for BTS3900A Ver.C	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900A sites configured with Ver.C cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0INSMT22	Installation Materials for BTS3900A (Ver.D, -48 V DC)	Installation material package for BTS3900A sites configured with Ver.D cabinets and supplied with -48 V DC power	2	● This package is optional. It is a site installation material package used for BTS3900A sites configured with Ver.D cabinets. ● Each cabinet must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT23	Installation Materials for BTS3900A (Ver.D, 220 V/110 V AC)	Installation material package for BTS3900A sites configured with Ver.D cabinets and supplied with 220/110 V AC power	2	
QWMP0INSMT26	Installation Materials for BTS3900A (Ver.E, -48 V DC)	BTS3900A installation material package (Ver.E, -48 V DC)	2	● This package is optional. It is configured for BTS3900A sites configured with Ver.E cabinets and supplied with -48 V DC power. ● Each cabinet must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT27	Installation Materials for BTS3900A (Ver.E, 220 V/110 V AC)	BTS3900A installation material package (Ver.E, 220 V AC/110 V AC)	2	● This package is optional. It is configured for BTS3900A sites configured with Ver.E cabinets and supplied with 220 V AC or 110 V AC power. ● Each cabinet must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD5P0INSMT09	Installation Materials for BTS3900AL	Installation materials	1	● This package is optional. It is a site installation material package used for BTS3900AL cabinets. ● Each site must be configured with one package, which includes the base, cables, and low-value installation auxiliary materials.
QWMP0INSMT03	Installation Materials for DBS3900	Installation materials	1	Each macro+distributed site must be configured with one package, which includes cables and low-value installation auxiliary materials.

Table 4-92 Material Packages for DBS3900 Installation

Model	Description	Function	Maximum Quantity	Configuration Principle
WD5P0INSMT03	Installation Materials for DBS3900	Installation materials	1	Each distributed site must be configured with one package. The package includes the cables and low-value installation auxiliary materials.
QWMP0INSMT13	OMB Cabinet Installation Materials (Ver.C, DC)	Installation materials for an OMB DC cabinet	1	This package is optional for the OMB (Ver.C) DC cabinet. Each OMB (Ver.C) DC cabinet is configured with one package.
QWMP0INSMT09	OMB Cabinet Installation Materials (Ver.C, AC)	Installation materials for an OMB AC cabinet	1	This package is optional for the OMB (Ver.C) AC cabinet. Each OMB (Ver.C) AC cabinet is configured with one package.

Table 4-93 Auxiliary Material Packages for BTS3900C Installation

Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0004E100	Trunk Cable (75 Ohm, 4 E1, 10 m)	E1 electrical cable	-	It needs to be configured when 75 ohm E1 transmission or E1 line clock is used. One package is configured for every four E1s.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0004E101	Trunk Cable (120 Ohm, 4 E1, 10 m)	E1 electrical cable	-	It needs to be configured when 120 ohm E1 transmission or E1 line clock is used. One package is configured for every four E1s.
QWMP0000FE00	Ethernet Cable	FE/GE fiber optic cable	-	One package is configured for each FE/GE electrical port.
QWMP0000FE02	Optical Fiber (FE/STM-1)	FE/STM-1 optical transmission package	-	One package is configured for each FE/STM-1 optical port when the FE/STM-1 optical port is used. FE/STM-1 fiber optic cables work with only BTS3900C (Ver.C) cabinets.
QWMP0000GE00	Optical Fiber (GE)	GE optical transmission package	-	One package is configured for each GE optical port when the GE optical port is used. GE optical fibers work with only BTS3900C (Ver.C) cabinets.
QWMP000JMP02	Top Jumper Cable Unit for RRU	Jumper package for common areas	-	Jumper package used for distributed base stations in common areas. Each antenna is configured with one package. Note: The number of antennas to be used in a 4-way receive diversity or RRU backup scenario is twice the number of antennas used in other scenarios.
QWMP000JMP03	Top Jumper Cable Unit for RRU	Jumper package for cold areas	-	This package is used in cold areas. Each antenna in a distributed base station is configured with one package. Note: The number of antennas to be used in a 4-way receive diversity or RRU backup scenario is twice the number of antennas used in other scenarios.
WD5P25CPRI0C	CPRI Optical Transmission Materials (2.5G)	CPRI optical transmission materials (2.5 Gbit/s)	-	Optional. Multimode optical transmission material package (CPRI 2.5 Gbit/s) for the RRU. One package is configured for each 2.5 Gbit/s CPRI port.
WD5P49CPRI0C	CPRI Optical Transmission Materials (4.9G)	CPRI optical transmission materials (4.9 Gbit/s)	-	Optional. Multimode optical transmission material package (CPRI 4.9 Gbit/s) for the RRU. One package is configured for each 4.9 Gbit/s CPRI port.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QWMP0INSMT0C	Installation Materials for BTS3900C AC Cabinet	Installation material package for a BTS3900C AC cabinet	1	Optional. Site installation material package for the BTS3900C AC cabinet. One package is configured for each BTS3900C AC cabinet.
QWMP0INSMT1C	Installation Materials for BTS3900C DC Cabinet	Installation material package for a BTS3900C DC cabinet	1	Optional. Site installation material package for the BTS3900C DC cabinet. One package is configured for each BTS3900C DC cabinet.

4.9.2 Auxiliary Site Materials

This section describes the principles for configuring the auxiliary materials on the sites of 3900 series base stations.

BTS3900 or BTS3900L

The following table lists the principles for configuring the auxiliary materials on a BTS3900 or BTS3900L site.

Table 4-94 Principles for configuring the auxiliary materials on a BTS3900 or BTS3900L site

Model	Description	Function	Maximum Quantity	Configuration Principle
A000GPS04	GPS Antenna/Feeder Package	GPS antenna/ feeder package	1	One package is configured when a GPS antenna is required.
GM1X00IDDF01	Embedded DDF Box (75 ohm, 8 E1)	Indoor wall-mounted DDF of 75 ohm	-	● When Huawei needs to provide 75 ohm DDFs according to the duty division, it is recommended that one package is configured at each newly deployed indoor site. ● Each package supports 8 E1s.
GM1X00IDDF02	Embedded DDF Box (120 ohm, 8 E1)	Indoor wall-mounted DDF of 120 ohm	-	● When Huawei needs to provide 120 ohm DDFs according to the duty division, it is recommended that one package is configured at each newly deployed indoor site. ● Each package supports 8 E1s.

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Model	Description	Function	Maximum Quantity	Configuration Principle
QW7PRRUCEP02	RRU Cable Extension Package (50 m to 100 m)	RRU cable extension package (50 m to 100 m)	-	Optional. One package needs to be configured for an RRU if the distance between the RRU and the BBU is longer than 50 m and shorter than 100 m.
QW7PRRUCEP03	RRU Cable Extension Package (100 m to 150 m)	RRU cable extension package (100 m to 150 m)	-	Optional. One package needs to be configured for an RRU if the distance between the RRU and the BBU is longer than 100 m and shorter than 150 m.
E000ICL00	Indoor Cable Ladder (2.5 m)	Indoor cable ladder	-	Configured according to the actual requirement of onsite deployment.
WDCDBOX01	Outdoor Cable Ladder (2.5 m)	Outdoor cable ladder	-	Configured according to the actual requirement of onsite deployment.
EFEDWID01	Thru-Wall Encapsulated Wiring Window	Feeder window	-	● Configured according to the actual requirement of onsite deployment. ● A maximum of one package can be configured for each site.
E000IGU00	Grounding Unit	Ground Bar	2	● Ground bar. One package is configured for each indoor site. If the antenna is provided by Huawei, two packages are configured for each site. ● Optional. This package is configured according to the requirements for a new site. One package is configured for each outdoor site.
EDOWNKIT0	Downtilt Kit-F	Downtilt supporting arm	-	Mechanical downtilt supporting arm for the AAU3911/AAU3920. Each AAU is configured with one package.
GM1E00IEMU01	Embedded Environment Monitoring Unit	EMU	1	One package is configured when there are 17 to 32 indoor Boolean value alarm inputs.
QW7MEMUKIT01	Environment Monitoring Unit (with sensors)	EMU with sensors	1	● One piece is configured if the environment (such as the liquid level, smoke, door status, temperature, and humidity) of the equipment room needs to be monitored. ● It can support 32 Boolean alarm inputs. ● GM1E00IEMU01 does not need to be configured when this suite is configured.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M00EEUM01	Embedded Environment Monitoring Unit	EMUB, dry contact alarm expansion suite (without any sensor)	1	Optional. Used only in UK. It needs to be configured when there are 17 to 32 Boolean value alarm inputs.
AANTIFLTER01	Anti-Interference Filter,Dual_band pass,RX: 824-849MHz;TX: 869-894,851-856MHz;856-860MHz; 898.5-915MHz, 0.9(824-846.5MHz); 1.2dB(846.5-848MHz); 1.9dB(848-849MHz); 0.9dB(869-891.5MHz); 1.2dB(891.5-894MHz),54dB.,double,DIN female,Outdoor,DC Pass	Anti-interference filter, used in a base station working at the 850 MHz frequency	-	● This filter applies only to a base station working at the 850 MHz frequency. ● It is used when the field RNP personnel find interference from the 800 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER02	Anti-Interference Filter,dual_band pass filter,RX: 880-905MHz;TX: 925-950MHz, 869-878.5MHz,RX: 2.1dB;TX:0.4dB, 40dB.,double unit, 7/16DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 880-905 MHz TX: 925-950 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.

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Model	Description	Function	Maximum Quantity	Configuration Principle
AANTIFLTER03	Anti-Interference Filter,dual_band pass filter,RX: 885-910MHz;TX: 930-955MHz, 869-883.5MHz,RX: 2.1dB;TX:0.4dB, 40dB.,double unit, 7/16 DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 885-910 MHz TX: 930-955 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER04	Anti-Interference Filter,dual_band pass filter,RX: 890-915MHz;TX: 935-960MHz, 869-888.5MHz,RX: 2.1dB;TX:0.4dB, 40dB.,double unit, 7/16 DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 895.8-915 MHz TX: 940-960 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER05	Anti-Interference Filter,dual_band pass filter,RX: 895.8-915MHz;TX: 940-960MHz, 869-894MHz,RX: 1.7dB;TX:0.4dB, 40dB.,double unit, 7/16 DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 895.8-915 MHz TX: 940-960 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.

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Model	Description	Function	Maximum Quantity	Configuration Principle
ATMAKIT00	TMA(No AISG) Auxiliary Materials Kit(Not include TMA),GU	Installation material package for an anti-interference filter	-	● Auxiliary installation material package for an anti-interference filter. Configured together with anti-interference filters on a 1:1 ratio.

BTS3900A or BTS3900AL

The following table lists the principles for configuring the auxiliary materials on a BTS3900A or BTS3900AL site.

Table 4-95 Principles for configuring the auxiliary materials on a BTS3900A or BTS3900AL site

Model	Description	Function	Maximum Quantity	Configuration Principle
A000GPS04	GPS Antenna/Feeder Package	GPS antenna/ feeder package	1	One package is configured when a GPS antenna is required.
QW7P00EDDF00	Embedded DDF Box (75 Ohm,8E1)	Embedded DDF (75 ohm, 8 E1)	1	Optional. One package is configured for a new indoor macro site.
E00EDDF02	Embedded DDF Box (120ohm,8E1)	Embedded DDF (120 ohm, 8 E1)	1	Optional. One package is configured for a new indoor macro site.
QW7PRRUCEP02	RRU Cable Extension Package (50 m to 100 m)	RRU cable extension package (50 m to 100 m)	-	Optional. One package needs to be configured for an RRU if the distance between the RRU and the BBU is longer than 50 m and shorter than 100 m.
QW7PRRUCEP03	RRU Cable Extension Package (100 m to 150 m)	RRU cable extension package (100 m to 150 m)	-	Optional. One package needs to be configured for an RRU if the distance between the RRU and the BBU is longer than 100 m and shorter than 150 m.
WDCDBOX01	Outdoor Cable Ladder (2.5 m)	Outdoor cable ladder (2.5 m)	1	Optional. When it needs to be provided by Huawei for a new site, configure it according to the actual requirement.
E000IGU00	Grounding Unit	Grounding unit	1	Optional. This package is configured according to the requirements for a new site. One package is configured for each outdoor site.

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Model	Description	Function	Maximum Quantity	Configuration Principle
EDOWNKIT0	Downtilt Kit-F	Downtilt supporting arm	-	Mechanical downtilt supporting arm for the AAU3911/AAU3920. Each AAU is configured with one package.
GM5X00SLPU00	Embedded Environment Monitoring Unit (1 to 16 Boolean Alarm)	Environment monitoring unit (1 to 16 Boolean alarm inputs)	1	Optional. Configured when an outdoor macro base station needs to collect 1 to 16 Boolean alarm inputs from devices outside the cabinet.
WD2M00EEUM00	Embedded Environment Monitoring Unit	Extended environment monitoring unit (EMUB)	1	Optional. Configured when an outdoor macro base station needs to collect 16 to 32 Boolean alarm inputs from devices outside the cabinet.
WD2M00EEUM01	Embedded Environment Monitoring Unit	EMUB, dry contact alarm expansion suite (without any sensor)	1	Optional. Used only in UK. It needs to be configured when there are 17 to 32 Boolean value alarm inputs.
WD2K000EIK01	Outdoor Adjusted Plinth (Width 600mm)	Outdoor adjusted plinth for a BTS3900A site	-	Optional. The OAP600 is configured for installing BTS3900A cabinets on steel rails. The spacing between steel rails can be adjusted in a range from 535 mm to 750 mm. One package is configured for each RFC (either stacked or independent).
WD2K000EIK02	Outdoor Adjusted Plinth (Width 800 mm)	Outdoor adjusted plinth for a BTS3900AL site	-	Optional. The OAP800 is configured for installing BTS3900AL cabinets on steel rails. ● The width of an OAP800 can be adjusted in a range from 480 mm to 780 mm. The depth of an OAP800 can be adjusted in a range from 500 mm to 750 mm. ● One package is configured for each BTS3900AL by default.

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Model	Description	Function	Maximum Quantity	Configuration Principle
AANTIFLTER01	Anti-Interference Filter,Dual_band pass,RX: 824-849MHz;TX: 869-894,851-856MHz;856-860MHz; 898.5-915MHz, 0.9(824-846.5MHz); 1.2dB(846.5-848MHz); 1.9dB(848-849MHz); 0.9dB(869-891.5MHz); 1.2dB(891.5-894MHz),54dB.,double,DIN female,Outdoor,DC Pass	Anti-interference filter, used in a base station working at the 850 MHz frequency	-	● This filter applies only to a base station working at the 850 MHz frequency. ● It is used when the field RNP personnel find interference from the 800 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER02	Anti-Interference Filter,dual_band pass filter,RX: 880-905MHz;TX: 925-950MHz, 869-878.5MHz,RX: 2.1dB;TX:0.4dB, 40dB.,double unit, 7/16DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 880-905 MHz TX: 925-950 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.

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Model	Description	Function	Maximum Quantity	Configuration Principle
AANTIFLTER03	Anti-Interference Filter,dual_band pass filter,RX: 885-910MHz;TX: 930-955MHz, 869-883.5MHz,RX: 2.1dB;TX:0.4dB, 40dB.,double unit, 7/16 DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 885-910 MHz TX: 930-955 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER04	Anti-Interference Filter,dual_band pass filter,RX: 890-915MHz;TX: 935-960MHz, 869-888.5MHz,RX: 2.1dB;TX:0.4dB, 40dB.,double unit, 7/16 DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 895.8-915 MHz TX: 940-960 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.

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Model	Description	Function	Maximum Quantity	Configuration Principle
AANTIFLTER05	Anti-Interference Filter,dual_band pass filter,RX: 895.8-915MHz;TX: 940-960MHz, 869-894MHz,RX: 1.7dB;TX:0.4dB, 40dB.,double unit, 7/16 DIN female,Outdoor,DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 895.8-915 MHz TX: 940-960 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
ATMAKIT00	TMA(No AISG) Auxiliary Materials Kit(Not include TMA),GU	Installation material package for an anti-interference filter	-	● Auxiliary installation material package for an anti-interference filter. Configured together with anti-interference filters on a 1:1 ratio.

DBS3900

The following table lists the principles for configuring the auxiliary materials on a DBS3900 site.

Table 4-96 Principles for configuring the auxiliary materials on a DBS3900 site

Model	Description	Function	Maximum Quantity	Configuration Principle
A000GPS04	GPS Antenna/ Feeder Package	GPS antenna/ feeder package	1	One package is configured when a GPS antenna is required.
QW7P00EDDF00	Embedded DDF Box (75 ohm, 8 E1)	Embedded DDF (75 ohm, 8 E1)	1	Optional. When it needs to be provided by Huawei, one package needs to be configured for a newly deployed distributed base station.
E00EDDF02	Embedded DDF Box (120ohm, 8E1)	Embedded DDF (120 ohm, 8 E1)	1	Optional. When it needs to be provided by Huawei, one package needs to be configured for a newly deployed distributed base station.

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Model	Description	Function	Maximum Quantity	Configuration Principle
E000IGU00	Grounding Unit	Grounding unit	2	● Ground bar. Optional. One package is configured for each indoor site. If the antenna is provided by Huawei, two packages are configured for each site. ● One or two packages are configured at each site.
QW7PRRUCEP02	RRU Cable Extension Package (50 m to 100 m)	RRU cable extension package (50 m to 100 m)	-	Optional. One package needs to be configured for an RRU if the distance between the RRU and the BBU is longer than 50 m and shorter than 100 m.
QW7PRRUCEP03	RRU Cable Extension Package (100 m to 150 m)	RRU cable extension package (100 m to 150 m)	-	Optional. One package needs to be configured for an RRU if the distance between the RRU and the BBU is longer than 100 m and shorter than 150 m.
E000ICL00	Indoor Cable Ladder (2.5 m)	Indoor cable ladder of 2.5 m	-	Optional. Configured for a newly deployed distributed base station according to the requirement when the BBU is installed indoors.
WDCDBOX01	Outdoor Cable Ladder (2.5 m)	Outdoor cable ladder (2.5 m)	-	Optional. When it needs to be provided by Huawei for a new site, configure it according to the actual requirement.
EDOWNKIT0	Downtilt Kit-F	Downtilt supporting arm	-	Mechanical downtilt supporting arm for the AAU3911/AAU3920. Each AAU is configured with one package.
GM5X00SLPU00	Embedded Environment Monitoring Unit (1 to 16 Boolean Alarm)	Environment monitoring unit (1 to 16 Boolean alarm inputs)	1	Optional. Configured for a distributed base station when the BBU is installed outdoors and there are 1 to 16 Boolean alarm inputs.
WD2M00EEUM00	Embedded Environment Monitoring Unit	EMUB, dry contact alarm expansion suite (without any sensor)	1	Optional. Configured for a distributed base station that needs to support 17 to 32 Boolean alarm inputs or a distributed base station that is supplied with +24 V DC power and needs to support 1 to 16 Boolean alarm inputs.
QW7MEEMUKIT0	Embedded Environment Monitoring Unit (with sensors)	EMUB, environment monitoring and dry contact alarm suite (with sensors)	1	Optional. Configured when the BBU is installed indoors and the environment (liquid level, smoke, door status, temperature and humidity) of the customer's equipment room needs to be monitored. It can support 32 Boolean alarm inputs.

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Model	Description	Function	Maximum Quantity	Configuration Principle
WD2M00EEUM01	Embedded Environment Monitoring Unit	EMUB, dry contact alarm expansion suite (without any sensor)	1	Optional. Used only in UK. It needs to be configured when there are 17 to 32 Boolean value alarm inputs.
AANTIFLTER01	Anti-Interference Filter,Dual_band pass,RX: 824-849MHz;TX: 869-894,851-856 MHz; 856-860MHz; 898.5-915MHz, 0.9(824-846.5MHz); 1.2dB(846.5-848 MHz); 1.9dB(848-849MHz); 0.9dB(869-891.5 MHz); 1.2dB(891.5-894 MHz), 54dB.,double,DIN female,Outdoor, DC Pass	Anti-interference filter, used in a base station working at the 850 MHz frequency	-	● This filter applies only to a base station working at the 850 MHz frequency. ● It is used when the field RNP personnel find interference from the 800 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER02	Anti-Interference Filter,dual_band pass filter,RX: 880-905MHz;TX:925-950MHz, 869-878.5MHz,RX:2.1dB;TX: 0.4dB, 40dB.,double unit,7/16DIN female,Outdoor, DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 880-905 MHz TX: 925-950 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.

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Model	Description	Function	Maximum Quantity	Configuration Principle
AANTIFLTER03	Anti-Interference Filter,dual_band pass filter,RX: 885-910MHz;TX :930-955MHz, 869-883.5MHz,RX:2.1dB;TX: 0.4dB, 40dB.,double unit,7/16 DIN female,Outdoor, DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 885-910 MHz TX: 930-955 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER04	Anti-Interference Filter,dual_band pass filter,RX: 890-915MHz;TX :935-960MHz, 869-888.5MHz,RX:2.1dB;TX: 0.4dB, 40dB.,double unit,7/16 DIN female,Outdoor, DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 895.8-915 MHz TX: 940-960 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.
AANTIFLTER05	Anti-Interference Filter,dual_band pass filter,RX: 895.8-915MHz;TX:940-960MHz, 869-894MHz,RX :1.7dB;TX: 0.4dB, 40dB.,double unit,7/16 DIN female,Outdoor, DC Pass	Anti-interference filter	-	● This filter applies only to a base station working at the 900 MHz frequency band. It is used when the carriers of a base station are configured as follows: RX: 895.8-915 MHz TX: 940-960 MHz. ● It is used when the field RNP personnel find interference of CDMA, GSM or UMTS signals from the 850 MHz iDEN band. ● It is a dual-unit filter. Each set of antenna is configured with one such filter, and each sector with four antennas is configured with two such filters.

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Model	Description	Function	Maximum Quantity	Configuration Principle
ATMAKIT00	TMA(No AISG) Auxiliary Materials Kit(Not include TMA),GU	Installation material package for an anti-interference filter	-	● Auxiliary installation material package for an anti-interference filter. Configured together with anti-interference filters on a 1:1 ratio.

BTS3900C

The following table lists the principles for configuring the auxiliary materials on a BTS3900C site.

Table 4-97 Auxiliary materials for a BTS3900C site

Model	Description	Function	Maximum Quantity	Configuration Principle
E000IGU00	Grounding Unit	Grounding unit	1	Optional. This package is configured according to the requirements for a new site. One package is configured for each outdoor site.
A000GPS04	GPS Antenna/ Feeder Package	GPS antenna/feeder package	1	One package is configured when a GPS antenna is required.

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5 Typical Configurations and Capacity Expansion

This section describes the typical configuration scenarios and capacity expansion scenarios of 3900 series base stations.

5.1 Typical Configurations

5.2 Capacity Expansion Principles

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5.1 Typical Configurations

This section describes the typical configurations of a 3900 series base station in various application scenarios.

5.1.1 Single Mode

This section describes the typical configurations of a 3900 series base station working in GSM, UMTS, or LTE mode and using RRUs.

Typical Configuration of a GSM Base Station

The following describes typical configuration of a base station working in GSM 900 MHz S4/4/4 mode.

Table 5-1 Typical configuration of a GSM base station

Product Configuration	Quantity
BBU	1
GTMUc	1
RRU	3
GSM Multiple Transceiver for Multi-Mode Module	3
GSM Multiple Transceiver for the 2nd TRX of Multi-Mode Module	6

Typical Configuration of a UMTS Base Station

The following describes typical configurations in scenarios of S2/2/2 non-MIMO and S2/2/2/2/2/2 non-MIMO.

NOTE

When MIMO is not used, each carrier provides output power of 20 W.

Table 5-2 Typical configuration of a UMTS base station

Product Configuration	Quantity (S2/2/2 Non-MIMO)	Quantity (S2/2/2/2/2/2 Non-MIMO)
BBU	1	1
UMPTb1	1	1
UBBPd4	1	2
RRU	3	6
Multi Carrier License (per Carrier)	3	6

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Product Configuration	Quantity (S2/2/2 Non-MIMO)	Quantity (S2/2/2/2/2/2 Non-MIMO)
Power License (per 20W)	3	6
UBBP First-Mode license (UMTS) (per UBBP)	1	2

Typical Configuration of an LTE Base Station

The following describes typical configurations in scenarios of S1/1/1 20 MHz (DL 2x2 MIMO) and S1/1/1 20 MHz (DL 4x4 MIMO).

NOTE

This section assumes that each channel provides 20 W power.

Table 5-3 Typical configurations of an LTE base station using the RRU3201

Product Configuration	Quantity (S1/1/1 20 MHz [DL 2x2 MIMO])	Quantity (S1/1/1 20 MHz [DL 4x4 MIMO])
BBU	1	1
UMPTb1	1	1
UBBPd6	1	1
RRU (2T2R)	3	6
RF Output Power (per 20W)	3	6
Carrier Bandwidth - 0 MHz to 5 MHz	3	3
Carrier Bandwidth - 5 MHz to 10 MHz	3	3
Carrier Bandwidth - 10 MHz to 15 MHz	3	3
Carrier Bandwidth - 15 MHz to 20 MHz	3	3
Resource Block (per RB)	150	150

5.1.2 GU Dual Mode

This section describes the typical configurations of a 3900 series base station working in the mode of GSM 900 MHz S4/4/4+UMTS 900 MHz S2/2/2 (non-MIMO).

NOTE

Each UMTS carrier supports 20 W power.

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Table 5-4 Typical configurations of a base station using GU SDR modules and working in the mode of GSM 900 MHz S4/4/4+UMTS 900 MHz S2/2/2 (non-MIMO)

Product Configuration	Quantity
BBU	1
UMPTb1	1
UBBPd4	1
RRU(GU SDR)	3
GSM/UMTS Dual Mode license (per sector)	3
GSM Multiple Transceiver for the 2nd TRX of Multi-Mode Module	6
GSM Multiple Transceiver for Multi-Mode Module	6
UMTS Multi Carrier License for the 1st Carrier of Multi-Mode (per Carrier)	3
UMTS Multi Carrier License for Multi-Mode Module (per Carrier)	3
RF Output Power (per 20W)	3
UBBP First-Mode license (UMTS) (per UBBP)	1
UMPT Multi Mode license(UMTS) (per UMPT)	1

5.1.3 GL Dual Mode

This section describes the typical configurations of a 3900 series base station working in the mode of GSM 1800 MHz S4/4/4+LTE 1800 MHz S1/1/1 20 MHz (2x2 MIMO).

NOTE

- The following configurations assume that each LTE channel provides 20 W transmit power.
- The following configurations assume that each GSM carrier provides 20 W transmit power.

Table 5-5 Typical configurations of a base station working in the mode of GSM 1800 MHz S4/4/4+LTE 1800 MHz S1/1/1 20 MHz (2x2 MIMO)

Product Configuration	Quantity
BBU	1
UMPTb1	1
UBBPd6	1
RRU(GL SDR)	3
RF Output Power (per 20 W)	3

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Product Configuration	Quantity
Carrier Bandwidth - 0 MHz to 5 MHz	3
Carrier Bandwidth - 5 MHz to 10 MHz	3
Carrier Bandwidth - 10 MHz to 15 MHz	3
Carrier Bandwidth - 15 MHz to 20 MHz	3
GSM/UMTS Dual Mode license (per sector)	3
GSM Multiple Transceiver for the 2nd TRX of Multi-Mode Module	6
Resource Block (per RB)	150
UMPT Multi Mode license(LTE FDD) (per UMPT)	1
UBBP First-Mode license (LTE FDD) (per UBBP)	1
GSM/LTE Dual Mode license (per Sector)	3

5.1.4 UL Dual Mode

This section describes the typical configurations of a 3900 series base station working in the mode of UMTS 2100 MHz S2/2/2 (non-MIMO)+LTE 2100 MHz S1/1/1 20 MHz (2x2 MIMO).

NOTE

The following configurations assume that each LTE channel provides 20 W transmit power.

The following configurations assume that each UMTS carrier provides 20 W transmit power.

Table 5-6 Typical configurations in a UL scenario of UMTS 2100 MHz S2/2/2 (non-MIMO)+LTE 2100 MHz S1/1/1 20 MHz (2x2 MIMO)

Product Configuration	Quantity
BBU	1
UMPTb1	1
UBBPd6	1
RRU (UL SDR)	3
UMTS/LTE Dual Mode license (per sector)	3
UMTS Multi Carrier License for the 1st Carrier of Multi-Mode Module (per Carrier)	3
UMTS Multi Carrier License for Multi-Mode Module (per Carrier)	3

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Product Configuration	Quantity
Power License (per 20 W)	3
UBBP First-Mode license (UMTS) (Per UBBP)	1
UBBP Multi-Mode license (LTE FDD) (per UBBP)	1
Carrier Bandwidth - 0 MHz to 5 MHz	3
Carrier Bandwidth - 5 MHz to 10 MHz	3
Carrier Bandwidth - 10 MHz to 15 MHz	0
Carrier Bandwidth - 15 MHz to 20 MHz	0
Resource Block	150
UMPT Multi Mode license (LTE FDD) (per UMPT)	1

5.1.5 GUL Triple Modes

This section describes the typical configurations of a 3900 series base station working in triple modes.

NOTE

- For the non-MIMO configuration of UMTS, each carrier provides 20 W output power. For MIMO configuration of UMTS, each carrier provides 40 W (2x20 W) output power.
- The following configurations assume that each LTE channel provides 20 W transmit power.

The following table describes the typical configurations of a base station working in the mode of GSM 900 MHz S2/2/2+UMTS 900 MHz S2/2/2 (non-MIMO)+LTE 2600 MHz S1/1/1 10 MHz (DL 2x2 MIMO).

Table 5-7 Typical configurations of a base station in which GU SDR modules are used and GU and LTE are deployed on two BBUs

Product Configuration	Quantity
BBU	2
GTMU	1
UMPTb1	2
UBBPd4	1
UBBPd6	1
RRU (GU SDR)	3
RRU (LO)	3
GSM/UMTS Dual Mode license (per sector)	3

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Product Configuration	Quantity
GSM Multiple Transceiver for the 2nd TRX of Multi-Mode Module	3
GSM Multiple Transceiver for Multi-Mode Module	0
UMTS Multi Carrier License for the 1st Carrier of Multi-Mode Module (per Carrier)	3
UMTS Multi Carrier License for Multi-Mode Module (per Carrier)	3
UMTS Multi Carrier License for Multi-Mode Module (per Carrier)	3
Power License (per 20 W)	3
RF Output Power (per 20 W)	0
Carrier Bandwidth: 0 MHz to 5 MHz	3
Carrier Bandwidth: 5 MHz to 10 MHz	3
Carrier Bandwidth: 10 MHz to 15 MHz	0
Carrier Bandwidth: 15 MHz to 20 MHz	0
Resource Block	150
UBBP First-Mode license (LTE FDD) (per UBBP)	1

The following table describes the typical configurations of a base station working in the mode of GSM 1800 MHz S3/3/3+UMTS 2100 MHz S2/2/2 (non-MIMO)+LTE 1800 MHz S1/1/1 10 MHz (DL 2x2 MIMO).

Table 5-8 Typical configurations of a co-MPT GUL triple-mode base station using GL SDR modules

Product Configuration	Quantity
BBU	1
UMPTb1	1
UBRIb	1
UBBPd4	1
UBBPd6	1
RRU (GL SDR)	3
RRU (UO)	3
GSM/UMTS Dual Mode license (per sector)	0
GSM/LTE Dual Mode license (per sector)	3

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Product Configuration	Quantity
GSM Multiple Transceiver for the 2nd TRX of Multi-Mode Module	3
GSM Multiple Transceiver for Multi-Mode Module	3
UMTS Multi Carrier License for the 1st Carrier of Multi-Mode Module (per Carrier)	3
UMTS Multi Carrier License for Multi-Mode Module (per Carrier)	3
UMTS Multi Carrier License for Multi-Mode Module (per Carrier)	3
Power License (per 20 W)	3
Multi Carrier License (per Carrier)	3
RF Output Power (per 20 W)	3
Carrier Bandwidth: 0 MHz to 5 MHz	3
Carrier Bandwidth: 5 MHz to 10 MHz	3
Carrier Bandwidth: 10 MHz to 15 MHz	0
Carrier Bandwidth: 15 MHz to 20 MHz	0
Resource Block	150
MPT Multi Mode license (LTE)	1
MPT Multi Mode license (UMTS)	1

5.2 Capacity Expansion Principles

This section describes the capacity expansion principles for 3900 series base stations.

The following table lists the capacity expansion principles for 3900 series base stations.

Table 5-9 Capacity expansion principles

Expansion Item	Principle
Radio frequency capacity	If the capacity after expansion does not exceed the hardware capability, first expand the multi-carrier license and power, and then add RFUs and RRUs.
Baseband capacity	If the capacity after expansion does not exceed the hardware capability, first expand the license, and then add baseband processing boards.
Transmission capacity expansion	If more than four E1s/T1s or more than one FE electrical or optical port is required, add UTRP boards to provide more transmission ports.

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NOTE

For the typical configurations after capacity expansion, see **5.1 Typical Configurations**.

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