

# RRU3268 Description

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# 1 Introduction

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The RRU3268 is the outdoor remote radio unit which is powered by a power cabinet. It is the radio frequency (RF) module of the distributed eNodeB and is installed close to the antenna. The RRU3268 provides the following functions:

- Modulates and demodulates baseband signals and RF signals
- Processes data
- Amplifies power
- Detects standing waves

RRU3268 is newly designed to support the 2T2R mode, improving output power and carrier capacity.

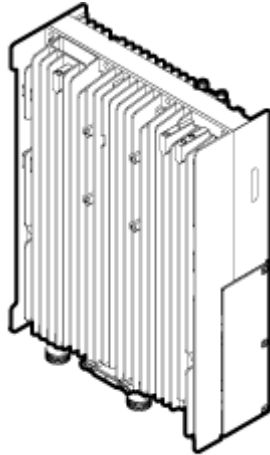
The RRU3268 is configured with the bias tee (BT). The internal BT couples RF signals and OOK signals and transmits them through the TX/RX port A. The internal BT also supplies power to the tower mounted amplifier (TMA).

The software of the RRU3268 (not including LTE (NB-IoT)) is backward compatible with the eNodeB and OSS of the N-1 and N-2 versions, where N indicates the current version number, for example, SRAN10.0/eRAN8.0 in this document. In addition, the software package of the three versions includes the RRU3268 software components. Therefore, the RRU3268 of SRAN8.0/eRAN6.0 can be used for SRAN6.0/eRAN2.1, SRAN7.0/eRAN3.0, SRAN8.0/eRAN6.0, and SRAN9.0/eRAN7.0, without affecting KPIs.

The software package of the RRU3268 (including LTE (NB-IoT)) is SRAN12.0.

## 1.1 Appearance

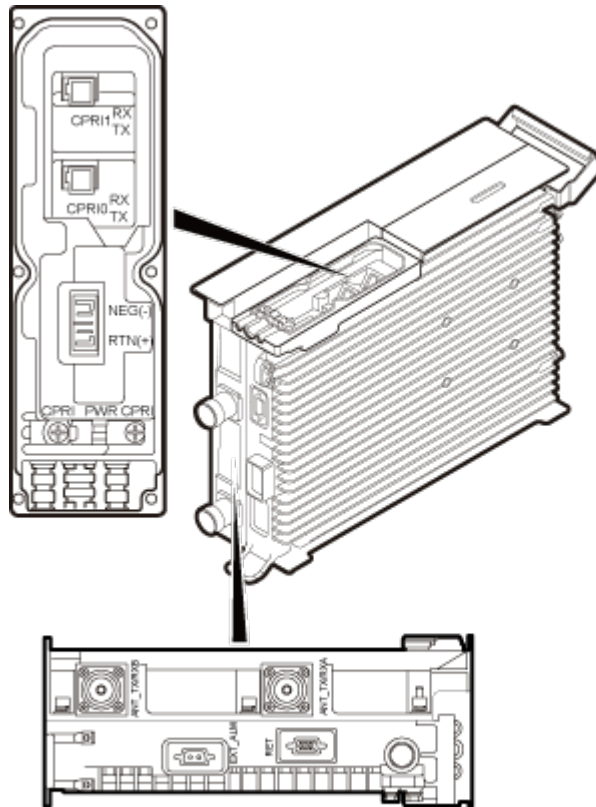
Figure 1-1 shows the appearance of the RRU3268.

**Figure 1-1** Appearance of the RRU3268

PAR53C0001

## 1.2 Physical Ports

RRUs have a modular design. Its external ports are located in the cabling cavity or at the bottom of the module.

**Figure 1-2** Ports on the RRU3268 panels

PAR47C0002

**Table 1-1** Physical ports on the RRU3268

Port	Connector	Quantity	Function
Power supply socket	Tool-less male connector (pressfit type)	1	Receives -48 V DC power
Common public radio interface (CPRI) port	DLC	2	Connects to the baseband unit (BBU3900), or to another RRU for cascading
RF port	DIN, female	2	Connects to an antenna to transmit and receive RF signals
RET port	DB9	1	Connects to a remote control unit (RCU)
Alarm port	DB15	1	Receives external alarm signals

A BBU3900 and RRU3268 are connected through a CPRI port using an optical cable to transmit CPRI signals.

# 2 Technical Description

## 2.1 Frequency Band

**Table 2-1** Frequency band

Frequency Band(MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)	IBW (MHz)
2600 (band 7)	2500 to 2570	2620 to 2690	50
700 (band 28)	Band A: 703 to 743 Band B: 718 to 748	Band A: 758 to 798 Band B: 773 to 803	25
EU700 (band 28)	703~733	758~788	25
DD 800 (band 20)	832 to 862	791 to 821	20

## 2.2 Capacity

**Table 2-2** Single-mode Capacity

Mode	Frequency Band(MHz)	Capacity
LTE (FDD)	2600/700/DD 800	Each RRU3268 supports two carriers.
LTE (NB-IoT)	700/DD 800	Each RRU3268 supports one carrier.

**Table 2-3** Multi-mode capacity

Mode	Capacity
LTE (FDD)+ LTE (NB-IoT)	For detailed specifications, see Table 2-8 and Table 2-9, .

## 2.3 Receiver Sensitivity

**Table 2-4** Receiver sensitivity

Mode	Frequency Band (MHz)	1-Way Receiver Sensitivity (dBm)	2-Way Receiver Sensitivity (dBm)
LTE (FDD)	2600	-106.5	-109.3
	700	-106.0	-108.8
	DD 800	-106.4	-109.2
LTE (NB-IoT)	700/DD 800	-127.3	-130.1

 **NOTE**

- LTE FDD receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.
- LTE (NB-IoT) receiver sensitivity is measured, as recommended in 3GPP TS 36.104, under a 200 KHz channel bandwidth and a 15 KHz subcarrier spacing based on the FRC A14-1 in Annex A.14 ( $\pi/2$  BPSK, R = 1/3, 1 RB) standard.

## 2.4 Typical Output Power

 **NOTE**

The output power per carrier in the output power table provides the maximum output power possible while ensuring the network performance.

**Table 2-5** Typical output power(RRU3268, 700 MHz/2600 MHz/DD 800 MHz, LTE (FDD))

Number of LTE (FDD) Carriers	Output Power per LTE (FDD) Carrier (W)	Bandwidth of LTE (FDD) Carrier (MHz)
1	2 x 40	5, 10, 15, 20
2	2 x 20	5, 10, 15, 20
2	carrier 1: 2 x 13 carrier 2: 2 x 27	carrier 1: 5, 10 carrier 2: 10, 20
2	carrier 1: 2 x 10 carrier 2: 2 x 30	carrier 1: 5 carrier 2: 15



2	carrier 1: 2 x 8 carrier 2: 2 x 32	carrier 1: 5 carrier 2: 20
2	carrier 1: 2 x 16 carrier 2: 2 x 24	carrier 1: 10 carrier 2: 15
2	carrier 1: 2 x 17 carrier 2: 2 x 23	carrier 1: 15 carrier 2: 20

**Table 2-6** Typical output power (RRU3268, DD 800 MHz, LTE (NB-IoT))

Number of LTE (NB-IoT) Carriers	Output Power per LTE (NB-IoT) Carrier (W)
1	10
1 (SFB)	2x10

**Table 2-7** Typical output power (RRU3268, 700 MHz, LTE (NB-IoT))

Number of LTE (NB-IoT) Carriers	Output Power per LTE (NB-IoT) Carrier (W)
1	6.4
1 (SFB)	2x6.4

**Table 2-8** Typical output power (RRU3268, DD 800 MHz, LM)

Number of LTE (FDD) Carriers	Number of LTE (NB-IoT) Carriers	Output Power per LTE (FDD) Carrier (W)	Output Power per LTE (NB-IoT) Carrier (W)	Bandwidth of LTE (FDD) Carrier (MHz)
1 (MIMO)	1	2x30	10	5
1 (MIMO)	1	2x30	5	10
1 (MIMO)	1	2x30	3	20
2 (MIMO)	1	Carrier 1: 2x20 Carrier 2: 2x16.8	3.2	Carrier 1: 10 Carrier 2: 10
2 (MIMO)	2	2x16.8	3.2	10
1 (MIMO)	1 (SFB)	2x30	2x10	5
1 (MIMO)	1 (SFB)	2x30	2x5	10
1 (MIMO)	1 (SFB)	2x30	2x3	20

Number of LTE (FDD) Carriers	Number of LTE (NB-IoT) Carriers	Output Power per LTE (FDD) Carrier (W)	Output Power per LTE (NB-IoT) Carrier (W)	Bandwidth of LTE (FDD) Carrier (MHz)
2 (MIMO)	1 (SFB)	Carrier 1: 2x20 Carrier 2: 2x16.8	2x3.2	Carrier 1: 10 Carrier 2: 10
2 (MIMO)	2 (SFB)	2x16.8	2x3.2	10

**Table 2-9** Typical output power (RRU3268, 700 MHz, LM)

Number of LTE (FDD) Carriers	Number of LTE (NB-IoT) Carriers	Output Power per LTE (FDD) Carrier (W)	Output Power per LTE (NB-IoT) Carrier (W)	Bandwidth of LTE (FDD) Carrier (MHz)
1 (MIMO)	1	2x30	6.4	5
1 (MIMO)	1	2x30	3.2	10
1 (MIMO)	1	2x30	2	15
1 (MIMO)	1	2x30	1.6	20
1 (MIMO)	1 (SFB)	2x30	2x6.4	5
1 (MIMO)	1 (SFB)	2x30	2x3.2	10
1 (MIMO)	1 (SFB)	2x30	2x2	15
1 (MIMO)	1 (SFB)	2x30	2x1.6	20

## 2.5 Power Consumption

### NOTE

The output power per carrier in the output power table provides the maximum output power possible while ensuring the network performance.

**Table 2-10** Power consumption of the DBS3900(Ver.D) (-48V) (configured with RRU3628, 2600 MHz, LTE (FDD))

Configuration	Output Power (W)	Typical Power Consumption (W)	Maximum Power Consumption (W)
3 x 20 MHz 2T2R	2 x 40	869	1085

**Table 2-11** Power consumption of the DBS3900(Ver.D) (-48V) (configured with RRU3628, 700 MHz, LTE (FDD))


Configuration	Output Power (W)	Typical Power Consumption (W)	Maximum Power Consumption (W)
3 x 20 MHz 2T2R	2 x 40	860	1100

**Table 2-12** Power consumption of the DBS3900(Ver.D) (-48V) (configured with RRU3628, DD 800 MHz, LTE (FDD))

Configuration	Output Power (W)	Typical Power Consumption (W)	Maximum Power Consumption (W)
3 x 20 MHz 2T2R	2 x 40	845	1085

## 2.6 Input Power

**Table 2-13** Input power

Item	Specification
Input power	-48 V DC; voltage range: -36 V DC to -57 V DC  <b>NOTE</b> The RRU3926 supports AC power supply when connected to an external AC/DC power module or an OPM15M. For details, see <i>AC/DC Power Module User Guide</i> and <i>OPM15M User Guide</i> .

## 2.7 Equipment Specifications

**Table 2-14** Equipment specifications

Item	Specification
Dimensions (H x W x D)	400 mm x 300 mm x 100 mm (12 L)
Weight	≤ 14 kg

## 2.8 CPRI Port Specifications

**Table 2-15** CPRI port specifications

Item	Specification
Number of CPRI ports	2
CPRI data rate	<p>RRU3268 modules of different BOM codes support different CPRI data rates:</p> <ul style="list-style-type: none"> <li>• RRU3268 modules of 02311KVB, 02311KWV, 02311KWW, 02311KWU, and 02311LDE support 1.25 Gbit/s, 2.5 Gbit/s, 4.9 Gbit/s, or 9.8 Gbit/s;</li> <li>• RRU3268 modules of other BOM codes support 1.25 Gbit/s, 2.5 Gbit/s, or 4.9 Gbit/s.</li> </ul>
Topology	Star, chain, or ring
Cascading capability	<ul style="list-style-type: none"> <li>• When the rate at the CPRI port is 1.25 Gbit/s: Cascading is not supported.</li> <li>• When the rate at the CPRI port is 2.5 Gbit/s: <ul style="list-style-type: none"> <li>- Three levels are supported if the cell bandwidth is less than or equal to 5 MHz.</li> <li>- Two levels are supported if the cell bandwidth is 10 MHz.</li> <li>- Cascading is not recommended if the cell bandwidth is greater than or equal to 15 MHz.</li> </ul> </li> <li>• When the rate at the CPRI port is 4.9 Gbit/s: <ul style="list-style-type: none"> <li>- Four levels are supported if the cell bandwidth is less than or equal to 10 MHz.</li> <li>- Two levels are supported if the cell bandwidth is greater than or equal to 15 MHz.</li> </ul> </li> <li>• (Only the RRU3268 with the BOM code 02311KVB, 02311KWV, 02311KWW, 02311KWU, or 02311LDE supported) When the rate at the CPRI port is 9.8 Gbit/s: Four levels are supported.</li> </ul>
Maximum Distance from the BBU	<ul style="list-style-type: none"> <li>• The maximum distances of the RRUs from the BBU vary with the types of BBP in LTE (FDD) mode as follows: <ul style="list-style-type: none"> <li>• When the LBBPc, LBBPd1 or UBBPd3 is configured: 20 km</li> <li>• When the LBBPd2 or UBBPd4 is configured: 40 km</li> <li>• When the LBBPd3, UBBPd5, or UBBPd6 is configured: <ul style="list-style-type: none"> <li>- Cell quantity <math>\leq</math> 3: 40 km</li> <li>- Cell quantity <math>\geq</math> 4: 20 km</li> </ul> </li> </ul> </li> <li>• LM: 20 km</li> </ul>

## 2.9 Environment Specifications

### NOTE

According to the installation scenario, traffic load, and carrier configuration, the output power of RRU3268 may temporarily decrease when they work in the highest 10°C temperature range.

**Table 2-16** Environment specifications

Item	Specification
Operating temperature	–40°C to +50°C (with solar radiation of 1120 W/m <sup>2</sup> ) –40°C to +55°C (without solar radiation)
Relative humidity	5% RH to 100% RH
Absolute humidity	1 g/m <sup>3</sup> –30 g/m <sup>3</sup>
Atmospheric pressure	70 kPa to 106 kPa
Operating environment	Compliance standards: <ul style="list-style-type: none"> <li>• 3GPP TS 36.141</li> <li>• ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weather protected locations"</li> </ul>
Shockproof protection	NEBS GR63 zone4
Ingress Protection (IP) rating	IP65

# 3 Acronyms and Abbreviations

Abbreviation	Full Name
APM	Advanced Power Module
BBU	BaseBand control Unit
BT	Bias Tee
CPRI	Common Public Radio Interface
DC	Direct Current
RCU	Remote Control Unit
RET	Remote Electrical Tilt
RF	Radio Frequency
RRU	Remote Radio Unit
TMC	Transmission Cabinet