

# **RAN12.2 3900 Series NodeB**

## **Product Description**

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# 1 Introduction

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## 1.1 Product Positioning

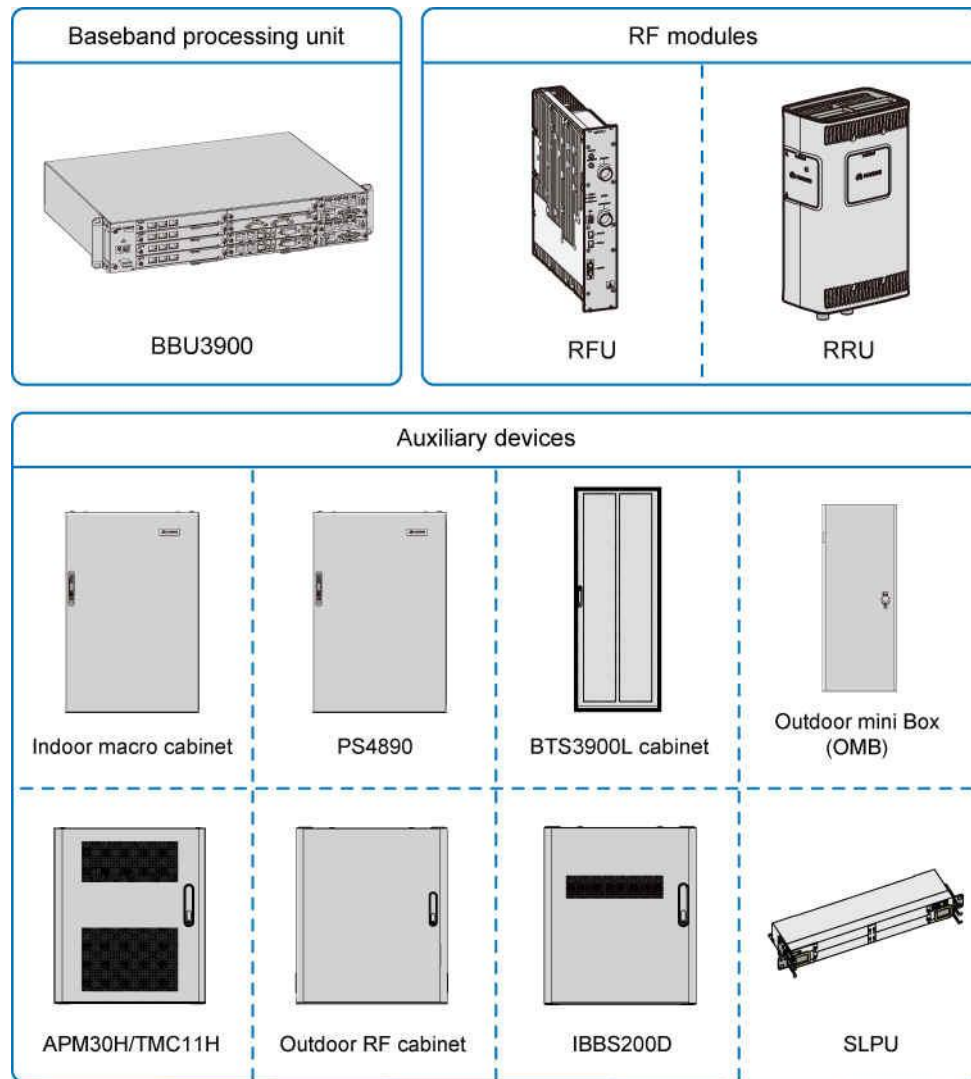
The mobile communications industry has been surging forward by establishing a dynamic growth with the development of technologies and products. The growing trend of mobile communications comprises a series of evolution, from GSM to Enhanced Data rates for GSM Evolution (EDGE) to EDGE+ and from WCDMA to High Speed Packet Access (HSPA) to HSPA+ and Long Term Evolution (LTE), and it is worth mentioning that WiMAX also joins the 3G family. To follow the trend, the network operators have to contribute more CAPEX and OPEX to the dramatic change of technologies, and therefore they are currently focusing on merging multiple network systems into a more cost-effective one.

After the transition of mobile networks, the network operators target at the Blue Ocean Strategy and invite innovative and responsive partners. Being customer-oriented and innovative, Huawei advocates four basic technological concepts: green, merge, wideband, and evolution. Huawei will take the lead in developing the next-generation base stations and the 3900 series NodeBs, which are Huawei's SingleBTSSs. This will outclass other base stations to benefit operators with future-oriented networks.

Huawei unveils cutting-edge techniques in the 3900 series NodeBs, such as wideband, multi-mode system, and modular design. The 3900 series NodeBs consist of only three basic functional modules, characterized by compact structure, high integration, low power consumption, and easy and quick deployment. Flexible combinations of functional modules and auxiliary devices enable Huawei to diversify the products. More importantly, the modules of different modes (GSM/UMTS/LTE) can be installed in one cabinet to work as a base station adapting to different scenarios. Huawei also introduces new frequency bands and technologies to efficiently meet operators' requirement for a compact multi-mode mobile network system.

Figure 1-1 shows the basic functional modules and auxiliary devices of the 3900 series NodeBs.

**Figure 1-1** Basic functional modules and auxiliary devices



## 1.2 Product Features

### Adaptable to Diversified Radio Environments

Different combinations of functional modules and auxiliary devices diversify the NodeB products. For example, there are macro NodeB, distributed NodeB, and mini compact NodeB, which operate in different scenarios to efficiently meet different network deployment requirements.

The 3900 series NodeBs provide a platform for the Huawei wireless products. Specifically, the base stations of different network systems such as GSM, WCDMA, CDMA, and WiMAX can share the same cabinet or even share one functional module at the same frequency band (based on the Software Definable Radio (SDR) technology), which makes it easy for network operators to choose a site type.

## Greatly Reduced Total Cost of Ownership (TCO)

The 3900 series NodeBs have many advantages, such as flexible installation, easy site selection, cost-effective solution, and fast network construction. The baseband module (BBU3900) is only 19 inches wide and 2 U high, taking a very small indoor space or taking a place in an outdoor cabinet. The RF module (RRU) can be installed close to the antenna without taking any space of the equipment room.

The RRU3806 supports up to four carriers with an output power of 80 W, known as the highest output power of the RRU in the telecom industry. The outstanding performance ensures wide coverage and high throughput. When two carriers are configured for the RRU3806, the number of sites can be reduced by 40%.

Based on the IP switch and multi-carrier technologies, the 3900 series NodeBs support multiple transmission ports, which keep up with the fast growing mobile data services and provide users with the higher data transmission rate.

## Low Power Consumption and Energy-Saving

The 3900 series NodeBs use the high-efficiency digital Power Amplifier (PA), which greatly reduces power consumption and helps build a green communication network. Compared with the traditional NodeB, the macro NodeB (BTS3900) has its power consumption reduced by 30%; compared with the traditional macro NodeB, the BTS3900A cabinet, which is in direct-ventilation, has its power consumption reduced by 40%. The power consumption of the NodeBs is greatly reduced, which makes it possible to be powered by the green energy such as the solar energy.

The 3900 series NodeBs also monitor and manage the solar and diesel power devices, which improves the maintainability and operability of the NodeB. Thus, NodeBs can be more environment friendly.

## Smooth Evolution to Future Radio Network Systems

The 3900 series NodeBs support HSPA+ and LTE in terms of hardware, and smooth evolution to HSPA+ and LTE is supported through software upgrade in future, thus fully protecting the investment of network operators.

# 2 System Architecture

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## 2.1 Product Overview

The RAN12.0 3900 series NodeBs comply with the 3GPP R8 protocols (2009, March). The NodeBs feature a modular design. The basic functional modules are the baseband unit (BBU3900), indoor RF unit (RFU), and outdoor remote RF unit (RRU). The BBU is connected to the RRU or RFU through CPRI ports and CPRI cables. The auxiliary devices for the NodeBs are as follows:

- APM30H(Ver.B) (herein after referred to as APM30H)
- TMC11H
- Outdoor RF cabinet
- IBBS200D
- Indoor macro cabinet
- PS4890
- BTS3900L cabinet
- Outdoor mini cabinet (OMB)
- Signal lightning protection unit (SLPU)

The variable combinations of functional modules and auxiliary devices provide flexible site solutions for different scenarios. For example, the BBU and RRU constitute a distributed NodeB, BBU, RFU, and indoor macro cabinet constitute an indoor macro NodeB, or BBU, RFU, APM, and outdoor RF cabinet constitute an outdoor macro NodeB.

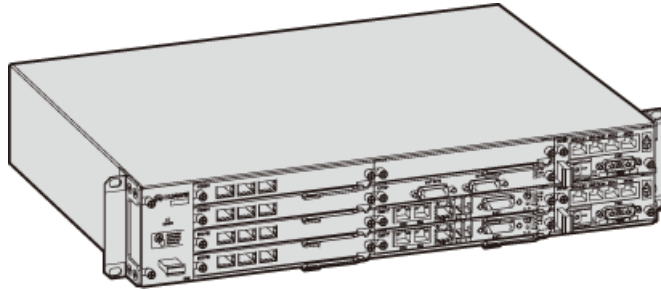
## 2.2 BBU3900

### 2.2.1 Appearance of the BBU3900

The BBU3900 features a compact case structure that requires a 19-inch-wide and 2 U-high space. It can be installed on a wall, on a staircase, in a storeroom, or in an outdoor cabinet in the existing network. Figure 2-1 shows the BBU3900.



**Figure 2-1** BBU3900



## 2.2.2 Hardware Units of the BBU3900

The BBU3900 is a baseband unit that performs the following functions:

- Transfers signals between the NodeB and the RNC
- Provides the system clock
- Manages the entire NodeB system in terms of OM and signaling processing
- Provides an OM channel for connection to the LMT or M2000

### Mandatory Hardware Units

The mandatory hardware units of the BBU3900 are as follows:

- WCDMA Main Processing Transmission (WMPT) unit
- WCDMA BaseBand Processing (WBBP) unit
- FAN unit
- Power module (UPEU)

All the boards support the plug-and-play function and can be configured in the slots as required.

### Optional Hardware Units

The optional hardware units of the BBU3900 are as follows:

- Universal Satellite card and Clock Unit (USCU)
- Universal Transmission Processing (UTRP) unit
- Universal Environment Interface Unit (UEIU)

The BBU3900 supports a maximum of 24 cells and supports diverse configurations from  $1 \times 1$  to  $6 \times 4$  or  $3 \times 8$ .



#### **NOTE**

$N \times M$  = sector  $\times$  carrier. For example,  $3 \times 1$  indicates that each of the three sectors has one carrier.


## 2.2.3 Ports on the BBU3900

**Table 2-1** Ports on the mandatory hardware units of the BBU3900

Board	Port	Quantity	Connector Type	Remarks
WMPT	E1 port	1	DB26 connector	One port supporting four E1s
	FE electrical port	1	RJ-45 connector	–
	FE optical port	1	SFP connector	–
	USB port for loading	1	USB connector	Port for software loading
	TST port	1	USB connector	Test port
	Serial port for commissioning	1	RJ-45 connector	NodeB local maintenance
WBBP	CPRI port	3/6	SFP connector	The WBBPb supports three CPRI ports, and the WBBPd supports six CPRI ports.
UPEU	PWR port	1	3V3 connector	–48 V DC power input or +24 V DC power input
	MON0 port	1	RJ-45 connector	Providing two RS485 monitoring ports; connecting to the external monitoring device
	MON1 port	1	RJ-45 connector	
	EXT-ALM0 port	1	RJ-45 connector	Providing eight dry contact alarm inputs; connecting to the external alarm device
	EXT-ALM1 port	1	RJ-45 connector	

**Table 2-2** Ports on the optional hardware units of the BBU3900

Board	Port	Quantity	Connector Type	Remarks
USCU	GPS antenna port	1	SMA connector	Port for RF signal input from the satellite card
	RGPS port	2	PCB welded wiring terminal	Connecting to the RGPS signal cable
	TOD port	2	RJ-45 connector	Connecting to the TOD equipment
	M-1PPS port	1	SMA connector	Connecting to the Metro 1000 equipment
	BITS port	1	SMA connector	Connecting to the BITS clock
UTRP	E1/T1 port	2	DB26 connector	Providing eight ATM over E1s/T1s or eight IP over E1s/T1s
	Unchannelized STM-1/OC-3 port	1	SFP connector	Providing one unchannelized STM-1/OC-3 port
	FE/GE electrical port	4	RJ-45 connector	Providing four 10M/100M/1000M Ethernet electrical ports

Board	Port	Quantity	Connector Type	Remarks
	FE/GE optical port	2	SFP connector	Providing two 100M/1000M Ethernet optical ports
UEIU	MON port	1	RJ-45 connector	Providing two RS485 monitoring ports; connecting to the external monitoring device
	MON1 port	1	RJ-45 connector	
	EXT-ALM0 port	1	RJ-45 connector	Providing eight dry contact alarm inputs; connecting to the external alarm device
	EXT-ALM1 port	1	RJ-45 connector	
	 <b>NOTE</b> The UEIU is a monitoring and dry contact extension board for the UPEU.			

## 2.3 RRU

The RRU is the outdoor remote radio unit. The RRU is the RF module of the distributed NodeB and is installed close to the antenna.

### 2.3.1 Specifications of the RRU

Based on power and processing capabilities, there are different types of RRUs, namely the RRU3804, RRU3801E, RRU3801C, RRU3808, RRU3806, RRU3908 V2 and RRU3828. Table 2-3 describes the specifications of RRUs.

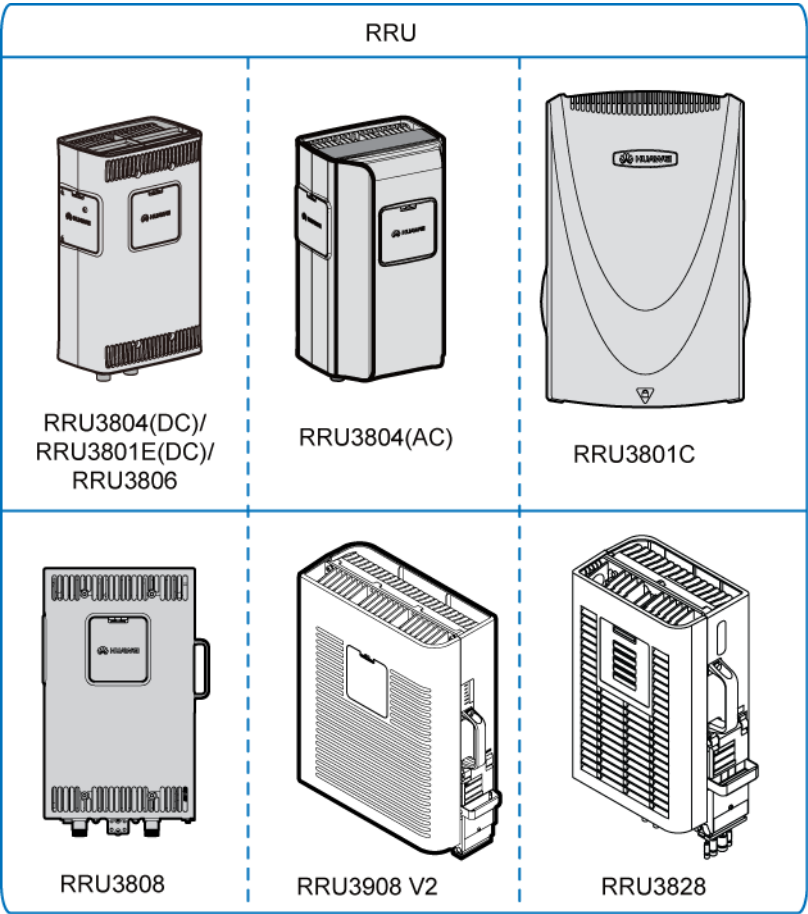
**Table 2-3** Specifications of RRUs

Type	Maximum Output Power	Number of Supported Carriers
RRU3804	60 W	4
RRU3801E	40 W	2
RRU3801C	40 W	2
RRU3808	2 × 40 W	4
RRU3806	80 W	4
RRU3908	2 × 40W	4
RRU3828	2 × 40W	4

### 2.3.2 Appearance of the RRUs

The BBU3900, together with the RRUs of different types, can form the DBS3900 system. Figure 2-2 shows the RRUs.

Figure 2-2 RRU



2.3.3 Ports on the RRU

The ports on the RRU are located at the bottom and in the cabling cavity of the RRU. The RRU has the following ports:

- Power supply sockets
- Transmission ports
- Alarm ports

Table 2-4 Ports on the DC RRU3804, DC RRU3801E, or RRU3806

Port	Connector	Quantity	Remarks
Power supply port	OT terminal	1	–48 V DC power supply port
Optical ports	DLC connector	2	Transport ports
Alarm port	DB15 connector	1	Providing two dry contact alarm signals and one RS485 signal
Main transmission and receiving port	DIN round waterproof connector	1	RF ports

Port	Connector	Quantity	Remarks
Diversity receiving port	DIN round waterproof connector	1	Other ports
RRU interconnection port	2W2 connector	1	
RET antenna communication port	DB9 connector	1	

**Table 2-5** Ports on the AC RRU3804

Port	Connector	Quantity	Remarks
Power input port	3PIN round waterproof connector	1	AC power input port
Power output port	AC output cable already connected before delivery	1	DC power output port for the AC/DC module
Optical ports	DLC connector	2	Transport ports
Alarm port	DB15 connector	1	Providing two dry contact alarm signals and one RS485 signal
Main transmission and receiving port	DIN round waterproof connector	1	RF ports
Diversity receiving port	DIN round waterproof connector	1	
RRU interconnection port	2W2 connector	1	Other ports
RET antenna communication port	DB15 connector	1	

**Table 2-6** Ports on the RRU3801C

Port	Connector	Quantity	Remarks
Power supply port	9-pin round waterproof connector	1	220 V DC or –48 V DC power supply port
Optical ports	DLC connector	2	Transport ports
Alarm port	DB15 connector, shared with the fan port	1	Providing four dry contact alarm signals
Main transmission and receiving port	DIN round waterproof connector	1	RF ports
Diversity receiving port	DIN round waterproof connector	1	

Port	Connector	Quantity	Remarks
RRU interconnection port	2W2 connector	1	Other ports
RET antenna communication port	DB9 connector	1	
Commissioning port	RJ45 connector	1	

**Table 2-7** Ports on the RRU3808

Port	Connector	Quantity	Remarks
Power supply port	OT terminal	1	–48 V DC power supply port
Optical ports	DLC connector	2	Transport ports
RET antenna communication port	DB9 connector	1	Other ports
Main transmission and receiving port	DIN waterproof female connector	1	RF ports
Diversity transmission and receiving port	DIN waterproof female connector	1	
Commissioning port	RJ45 connector	1	Other ports

**Table 2-8** Ports on the RRU3908 V2

Port	Connector	Quantity	Remarks
Power supply port	Pressfit type connector	1	–48 V DC power supply port
Optical ports	DLC connector	2	Transport ports
RET antenna communication port	DB9 connector	1	Other ports
Main transmission and receiving port	DIN waterproof female connector	1	RF ports
Diversity transmission and receiving port	DIN waterproof female connector	1	
RF interconnection port	2W2 connector	1	RF ports
Alarm port	DB15 connector, shared with the fan port	1	Providing dry contact alarm signal

**Table 2-9** Ports on the RRU3828

Port	Connector	Quantity	Remarks
Power supply port	Pressfit type connector	1	–48 V DC power supply port
Optical ports	DLC connector	2	Transport ports
RET antenna communication port	DB9 connector	1	Other ports
Main transmission and receiving port	DIN waterproof female connector	1	RF ports
Diversity transmission and receiving port	DIN waterproof female connector	1	
Alarm port	DB15 connector, shared with the fan port	1	Providing dry contact alarm signal

## 2.4 WRFU

The WCDMA Radio Filter Unit (WRFU) is an indoor RF unit and is the RF module of the macro NodeB.

### 2.4.1 Specifications of the WRFU

The WRFU is classified into 40 W WRFU and 80 W WRFU based on different output power and processing capabilities. The 40 W WRFU and 80 W WRFU have the same physical structure, dimensions, weight, and physical ports.

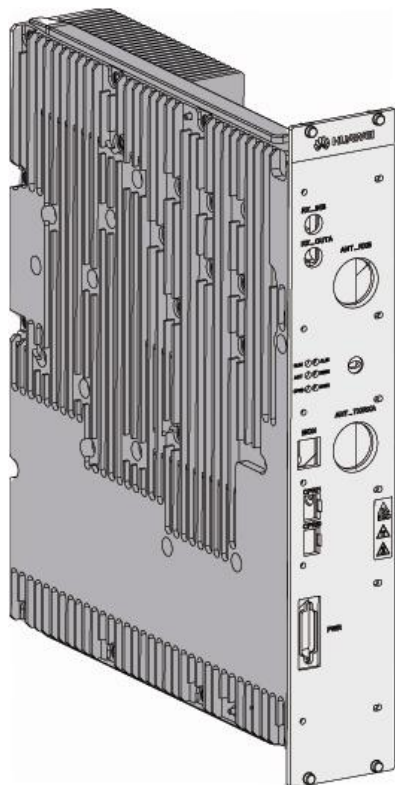
**Table 2-10** Specifications of the WRFU

WRFU Type	80 W WRFU	40 W WRFU
Maximum Output Power	80 W	40 W
Number of Carriers Supported	4	2

### 2.4.2 Appearance of the WRFU

The WRFU can be housed in an indoor cabinet or an outdoor cabinet. Figure 2-3 shows the WRFU.

Figure 2-3 WRFU



2.4.3 Ports on the WRFU

Table 2-11 Ports on the WRFU

Port	Connector Type	Quantity	Remarks
Power supply socket	3V3 connector	1	Port for –48 V DC power input
Port for transceiving antenna signals	DIN female connector	2	Port for connecting the antenna system
CPRI port	SFP female connector	2	Ports for connecting the BBU or cascading WRFUs
Interconnection port for RF RX signals	QMA female connector	2	Antenna channel port
Commissioning port	RJ-45 connector	1	Commissioning port



## 2.5 MRFU

### 2.5.1 Specifications of the MRFU



#### NOTE

The output power of the MRFU V2 operating in the 850 MHz band can be lowered by 0.7 dB for the edge 2.5 MHz band, compared with other frequency bands. The edge 2.5 MHz band refers to 824-826.6 and 844-846.5 in the uplink and 869-871.5 and 889-891.5 in the downlink.

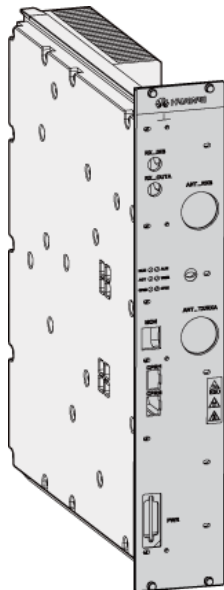
**Table 2-12** Specifications of the MRFU V2

RFU Type	Maximum Output Power	Number of Carriers Supported
MRFU V2	60 (W)	4

### 2.5.2 Appearance of the MRFU

The MRFU can be installed in an indoor cabinet or a protective outdoor cabinet. Figure 2-4 shows the MRFU.

**Figure 2-4** MRFU



### 2.5.3 Ports on the MRFU

The MRFU features a modular structure. Table 2-13 describes the ports on the MRFU.

**Table 2-13** Ports on the MRFU

Port	Connector	Quantity	Description
Power supply socket	3V3 power connector	1	Introducing power input
RF Port	DIN connector	2	Antenna port for connection to the antenna system
CPRI interface	SFP female connector	2	Port for connection to the BBU or cascaded MRFU
Inter-MRFU RF signal port	QMA female connector	2	Input port for diversity receive and output port for main receive
Monitoring port	RJ-45 connector	1	Port for monitoring and maintenance

## 2.6 Auxiliary Devices

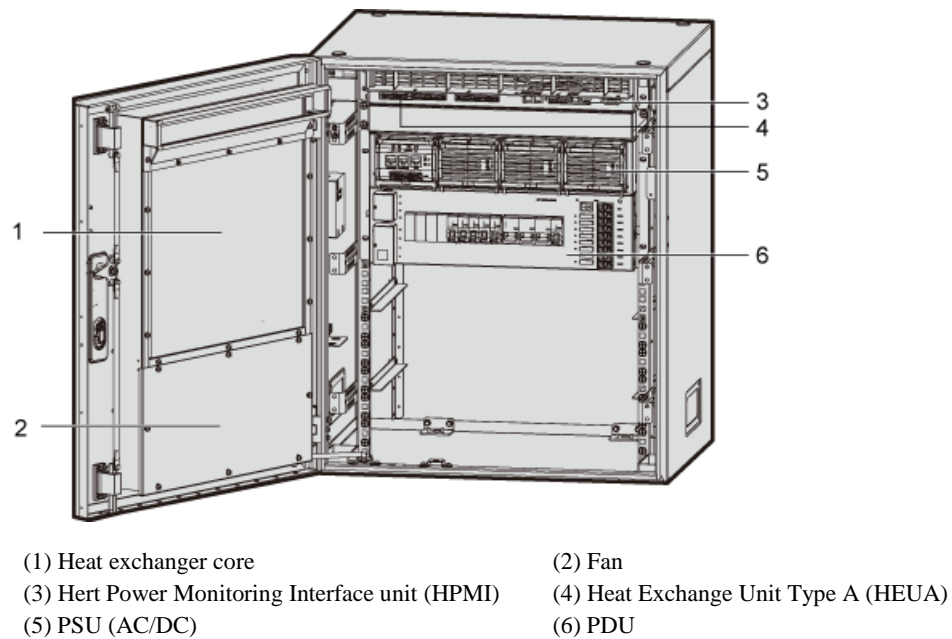
The auxiliary devices of the 3900 series NodeBs include the power cabinet APM30H, TMC11H, outdoor RF cabinet, battery cabinet IBBS200D, indoor macro cabinet, indoor power cabinet PS4890, indoor BTS3900L cabinet, Outdoor Mini Cabinet (OMB), and Signal Lightning Protection Unit (SLPU).

### 2.6.1 APM30H

The advanced power module APM30H is an outdoor power backup system. The APM30H provides –48 V DC power and backup power for distributed NodeBs, outdoor macro NodeBs, and mini NodeBs. In addition, it provides installation space for the BBU3900 and customer equipment.

The APM30H features a compact and lightweight design. It can be installed on a pole or on the ground. Figure 2-5 shows the structure of the APM30H.

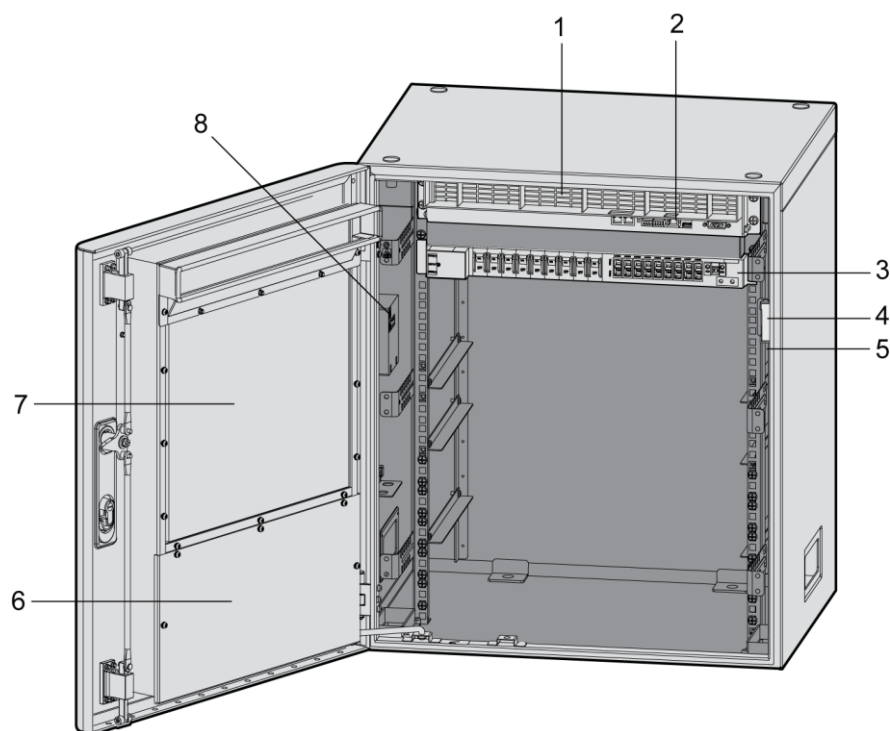
**Figure 2-5** Structure of the APM30H



## 2.6.2 TMC11H

The TMC11H provides installation space for the BBU3900 and transmission equipment, thus meeting the requirements of quick network construction. The TMC11H is applied to outdoor scenarios with adverse environment. It features compact design and easy transport. Figure 2-6 shows the structure of the TMC11H.

**Figure 2-6** Structure of the TMC11H

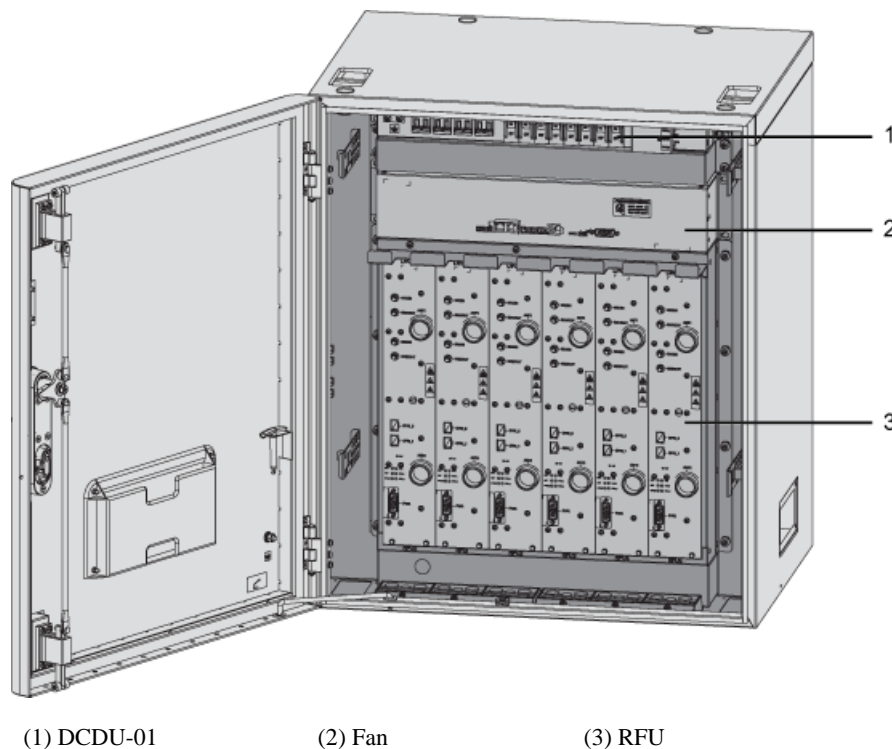


- |                              |   |
|------------------------------|---|
| (1) Fan (internal recycling) | (2) CMUA (Central Monitoring Unit type A) |
| (3) PDU-03                   | (4) Door status sensor                    |
| (5) ELU                      | (6) Fan (external recycling)              |
| (7) Heat exchanger core      | (8) AC power distribution box             |

## 2.6.3 Outdoor RF Cabinet

The outdoor RF cabinet can form an outdoor macro NodeB by stacking with the APM30H cabinet. The RF cabinet provides protection and performs functions such as power distribution and surge protection for the RFU. The RF cabinet can be configured with a maximum of six RFUs, as shown in Figure 2-7.

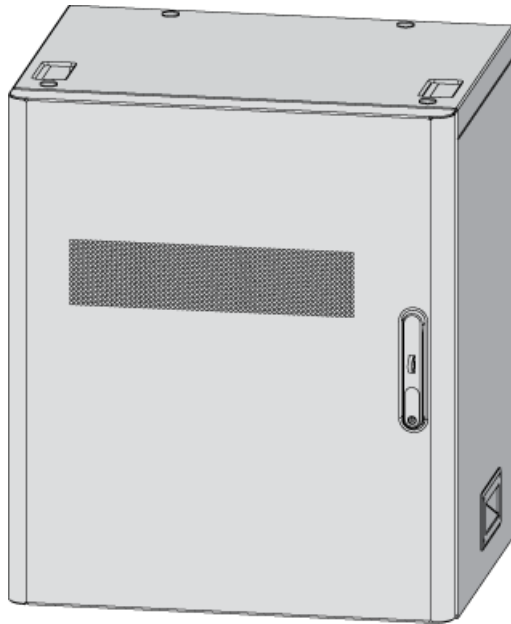
**Figure 2-7** Structure of the outdoor RF cabinet



## 2.6.4 IBBS200D

The IBBS200D is a battery cabinet applied to outdoor scenarios. It features compact design and easy transport. The IBBS200D can be configured with batteries of different capacity as required, such as 48 V 92 Ah, and 48 V 184 Ah. Figure 2-8 shows the IBBS200D.

**Figure 2-8 IBBS200D**



## 2.6.5 Indoor Macro Cabinet

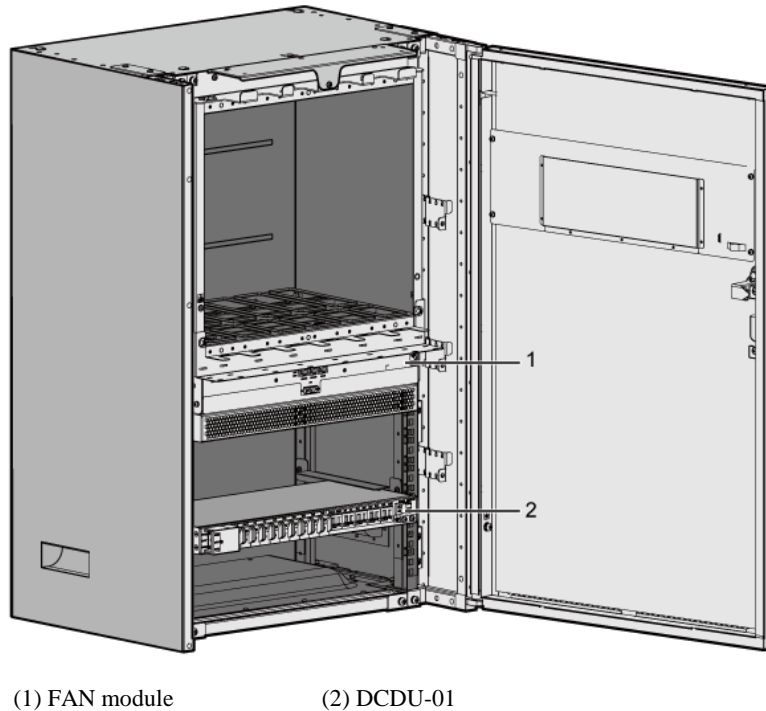
The indoor macro cabinet houses the BBU3900 and the RFU, and provides functions such as power distribution and surge protection. The indoor macro cabinet takes a small footprint and is easy to install. In addition, two cabinets can be installed in stack mode. All these features cater to the requirements of indoor centralized installation and quick network construction.

An indoor macro cabinet accommodates up to six RFUs. The indoor macro cabinet supports all the technologies (UMTS, GSM, and LTE) of the BTS3900, thus reducing installation space and facilitating smooth evolution.

The indoor macro cabinet supports  $-48\text{ V DC}$ ,  $+24\text{ V DC}$ , and  $220\text{ V AC}$  power inputs. If configured with suitable power modules, the  $+24\text{ V DC}$  or  $220\text{ V AC}$  power is converted into  $-48\text{ V DC}$  power for the RFU and BBU.

Figure 2-9 shows the structure of the indoor macro cabinet.

**Figure 2-9** Structure of the indoor macro cabinet



(1) FAN module

(2) DCDU-01

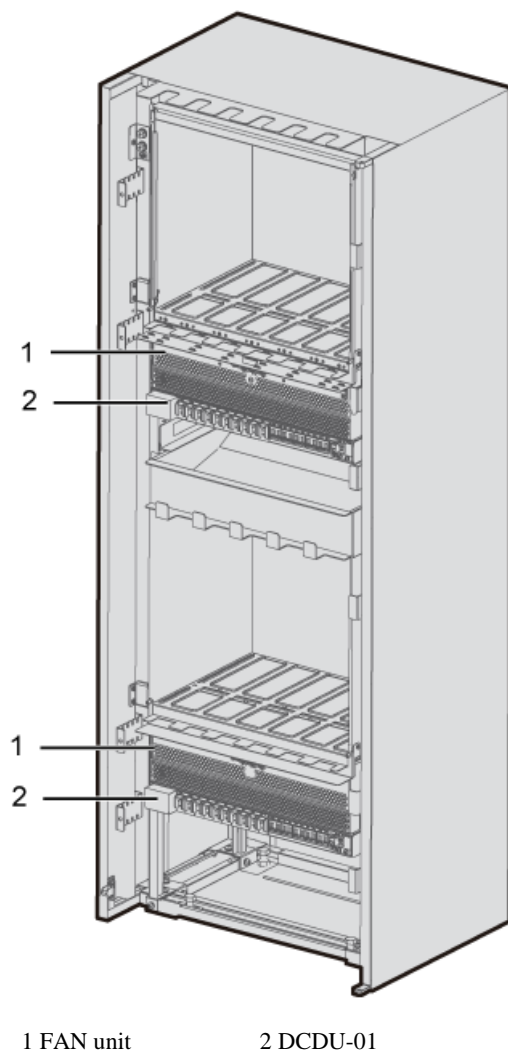
## 2.6.6 Indoor BTS3900L Cabinet

The BTS3900L cabinet houses the BBU3900 and RFUs and provides environment of power supply and heat dissipation for all modules. In addition, it provides the functions such as power distribution and surge protection. The BTS3900L cabinet provides 4 U space at the bottom for customer equipment.

A single BTS3900L cabinet can be installed with up to 12 RF modules and 1 BBU3900, which saves installation space and facilitates smooth evolution.

The BTS3900L supports two inputs of  $-48\text{ V DC}$  power supply. Figure 2-10 shows the internal structure.

**Figure 2-10** Structure of the BTS3900L cabinet

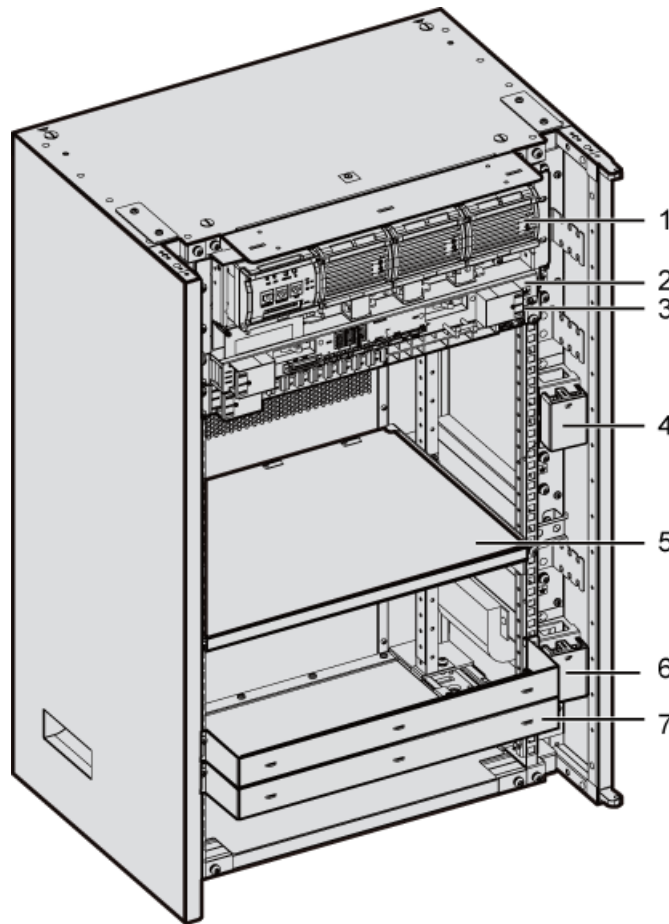


## 2.6.7 PS4890

The PS4890, an indoor power cabinet, provides DC power and power backup for the distributed NodeBs or BTS3900s. The PS4890 also provides installation space for the BBU3900 and transmission equipment.

The PS4890 features compact design and light weight. It can be installed on a pole or on the ground. In addition, the PS4890 houses the batteries. Figure 2-11 shows the structure of the PS4890.

**Figure 2-11** Structure of the PS4890



- (1) Power system (AC/DC)
- (2) DCDU-04
- (3) DCDU-03
- (4) Wiring copper bar for the negative poles of the batteries
- (5) Support plate for the battery group
- (6) Baffle for the battery group
- (7) Wiring copper bar for the positive poles of the batteries

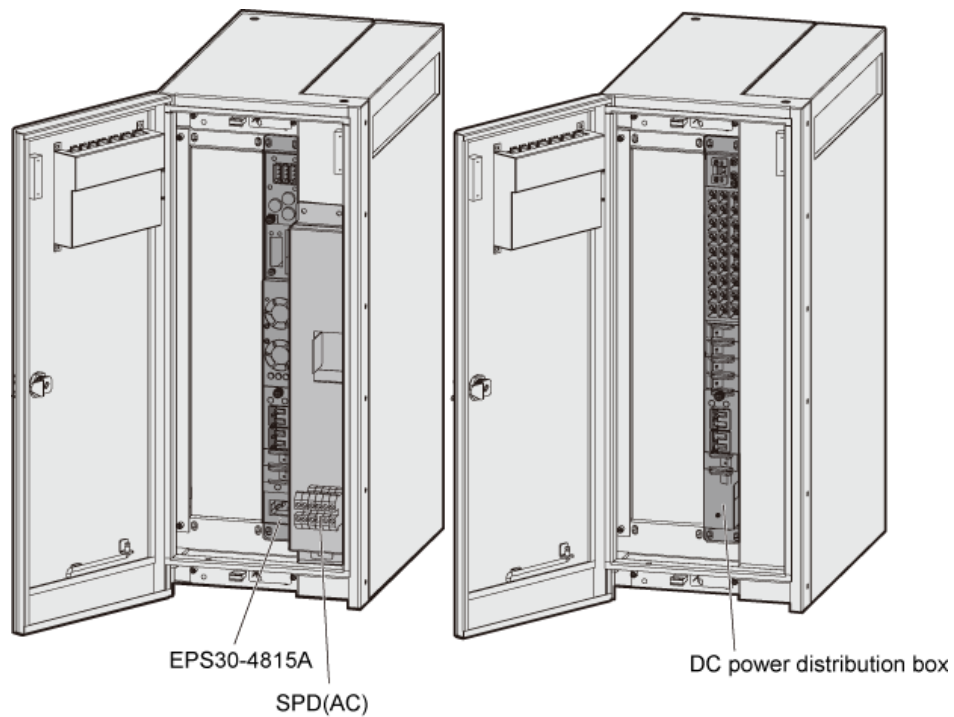
## 2.6.8 OMB

The OMB provides functions such as power distribution and surge protection for the BBU3900. When the BBU3900 is installed in an outdoor mini cabinet, it works as a component of the compact mini NodeB in outdoor application.

The OMB has a built-in heat exchanger. If the AC power is used, the cabinet must be configured with an EPS30-4815A and an SPD (AC); if the DC power is used, the cabinet must be configured with a DC power distribution box. Figure 2-12 shows the internal structure of the outdoor mini NodeB in different power configurations.



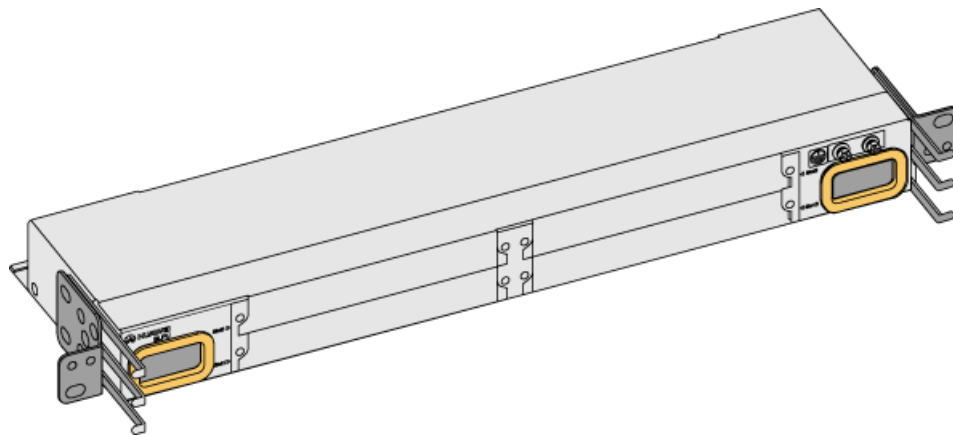
**Figure 2-12** Structure of the OMB in different power configurations



## 2.6.9 SLPU

The SLPU provides the signal surge protection for the NodeB. Figure 2-13 shows the SLPU.

**Figure 2-13** SLPU



The optional hardware units of the SLPU are as follows:

- Universal E1/T1 Lightning Protection unit (UELP)
- Universal FE Lightning Protection unit (UFLP)
- Universal Signal Lightning Protection unit 2 (USLP2)

**Table 2-14** Ports on the optional hardware units of the BBU3900

Board	Port	Quantity	Connector Type	Remarks
UELP	INSIDE port	1	DB25 connector	Port for four E1/T1 signal inputs
	OUTSIDE port	1	DB26 connector	Port for four E1/T1 signal outputs
UFLP	FE0 and FE1 (INSIDE) ports	2	RJ-45 connector	Connecting to the FE0 port on WMPT
	FE0 and FE1 (OUTSIDE) ports	2	RJ-45 connector	Connecting to the external device
USLP2	OUT0 and OUT1 ports	2	RJ-45 connector	Connecting to the surge protection transfer cable from the main control board
	IN0, IN1, IN2, and IN3 ports	4	4-pin connector	Connecting to the external device

# 3 Application Scenarios

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## 3.1 Overview

Huawei 3900 series NodeB products can be configured in different ways. Therefore, these products can be deployed in different application scenarios, thus providing a perfect whole-network solution for operators. The Huawei 3900 series NodeBs consist of the indoor macro NodeB (BTS3900 and BTS3900L), outdoor macro NodeB (BTS3900A), distributed NodeB (DBS3900), and mini NodeB (BTS3900C).

The application scenarios are as follows:

- The BTS3900 and BTS3900L are mainly applicable to indoor installation scenarios where traffic is heavy, equipment room rental is high, and space is limited.
- The BTS3900A is mainly applicable to outdoor scenarios where large-capacity coverage is required in urban, suburban, and rural areas.
- The DBS3900 is mainly applicable to outdoor application scenarios where wide coverage is required and site construction is difficult.
- The BTS3900C is mainly applicable to outdoor coverage and hot-spot coverage.

## 3.2 Application Scenarios

### 3.2.1 Distributed NodeB – DBS3900

As there are increasing concerns about environmental protection and lease cost, site selection has become a bottleneck in network deployment. It is increasingly difficult to adopt 2G/3G co-siting or to select a new site.

The distributed NodeB (DBS3900) developed by Huawei features high integration, easy installation, and low power consumption. All these features facilitate site reselection and 2G/3G co-siting. In addition, the RRU can be installed close to the antenna. In this way, the feeder consumption is reduced and system coverage is improved.

The DBS3900 provides flexible applications for different scenarios and facilitates quick network construction.

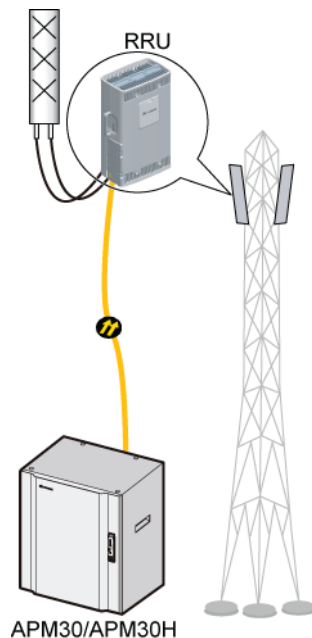
## Outdoor Integrated Application

If only the AC power is available at a new outdoor 3G site and power backup device is required, the combination of DBS3900 and APM can function as an outdoor macro NodeB. Figure 3-1 shows the typical configuration of DBS3900+APM.

This configuration has the following features:

- The BBU3900 and transmission equipment are installed in the APM cabinet and the RRU is installed close to the antenna.
- The APM provides installation space and outdoor protection for the BBU3900 and supplies -48 V DC power to the BBU3900 and the RRU. In addition, the APM performs management and monitoring for batteries, and provides surge protection for the entire cabinet.

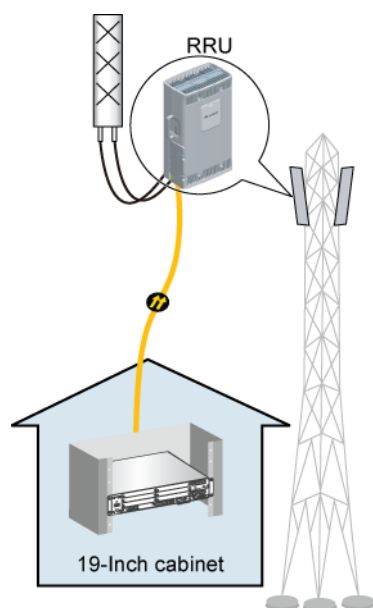
**Figure 3-1** Typical configuration of DBS3900+APM



## Embedded Application with Existing Site Equipment

For the 2G/3G co-siting scenario, the BBU3900 is installed in a standard 19-inch-wide and 2 U-high cabinet, and the RRU is installed close to the antenna, as shown in Figure 3-2. The BBU3900 and the RRU share the power backup system, transmission system, and antenna system of the BTS in the 2G network. In this way, operators can launch 3G services on the existing 2G network at a very low cost.

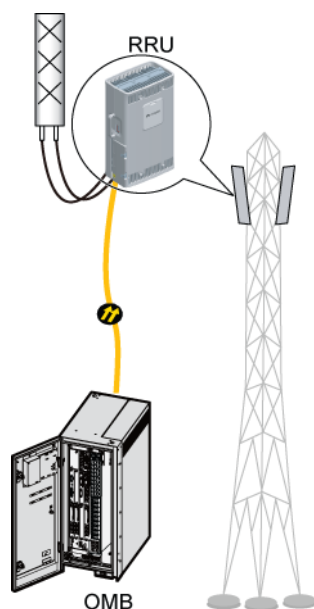
**Figure 3-2** Embedded application based on existing site equipment



## Outdoor BBU Application

For the 2G/3G co-siting scenario, the BBU3900 is installed in the outdoor mini cabinet to function as an outdoor BBU, and the RRU is installed close to the antenna, as shown in Figure 3-3. The outdoor BBU application facilitates easy and quick deployment.

**Figure 3-3** Outdoor BBU application

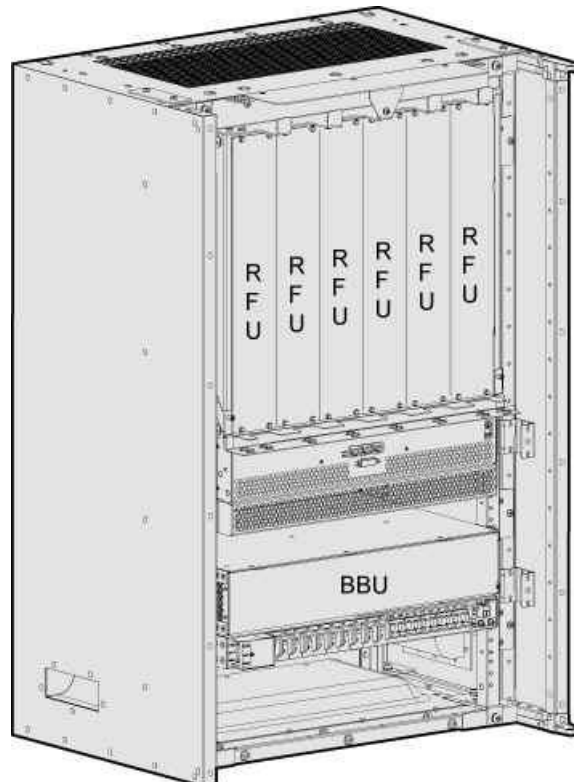


### 3.2.2 Indoor Macro NodeB – BTS3900

The BTS3900, as one of the most compact indoor macro NodeBs in the telecommunication industry, boasts large and expandable capacity. It has a small footprint and supports mixed applications of UMTS, GSM and LTE.

The BTS3900, as shown in Figure 3-4, is applicable to indoor scenarios such as centralized installation and relocation.

**Figure 3-4** Indoor macro NodeB - BTS3900

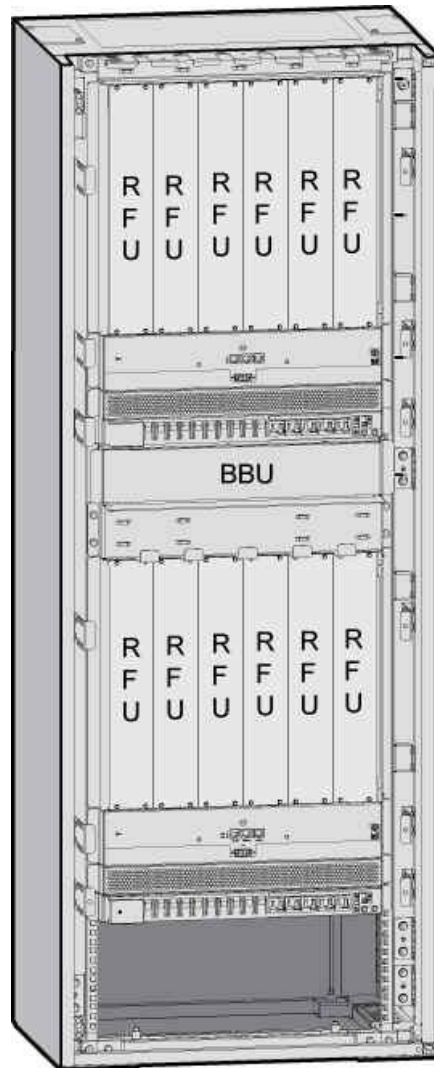


### 3.2.3 Indoor Macro NodeB – BTS3900L

The BTS3900L provides large capacity and small footprint. A maximum of 12 RFUs and 1 BBU3900 can be configured in the BTS3900L, which saves installation space and facilitates smooth evolution.

The BTS3900L cabinet is applicable to indoor centralized scenarios. Figure 3-5 shows the application scenarios of a single BTS3900L cabinet.

**Figure 3-5** Single BTS3900L cabinet



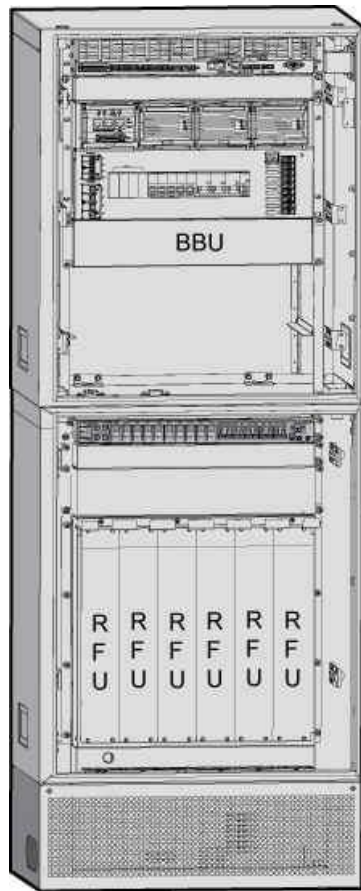
### 3.2.4 Outdoor Macro NodeB – BTS3900A

As the most compact outdoor cabinet macro NodeB product in the industry, the BTS3900A features light weight and easy transportation thanks to its stack design. The RF modules in GSM, UMTS, and LTE modes can share one RF cabinet, which reduces installation space and facilitates smooth evolution.

The BTS3900A is applicable to outdoor scenarios such as centralized installation and replacement of the macro NodeB.

The BBU3900 is built in the APM30H, and the RFU is installed in the outdoor RF cabinet. Huawei recommends that these two types of cabinets be installed in stack mode, as shown in Figure 3-6.

**Figure 3-6** Outdoor macro NodeB - BTS3900A



### 3.2.5 Outdoor Mini NodeB – BTS3900C

The BTS3900C is applicable to the new outdoor 3G site in environments such as tunnels, hot spots, places without equipment rooms, and edge networks. The BTS3900C can be installed on a pole, against a wall, or on the ground. The stand or support of other types can be applied to installation of the BTS3900C on the ground.

For the BTS3900C, the BBU3900 is installed in the OMB, and the RRU is installed in the RRU rack. The RRU can be the RRU3804, RRU3801E, RRU3801C, or RRU3806.

The BTS3900C supports –48 V DC power and 220 V AC power.

- If –48 V DC power is used, the mini cabinet must be configured with a DC power distribution box, as shown in Figure 3-7.
- If 220 V AC power is used, the mini cabinet must be configured with an EPS30-4815A and an SPD (AC), as shown in Figure 3-8.



Figure 3-7 Outdoor mini NodeB with -48 V DC power

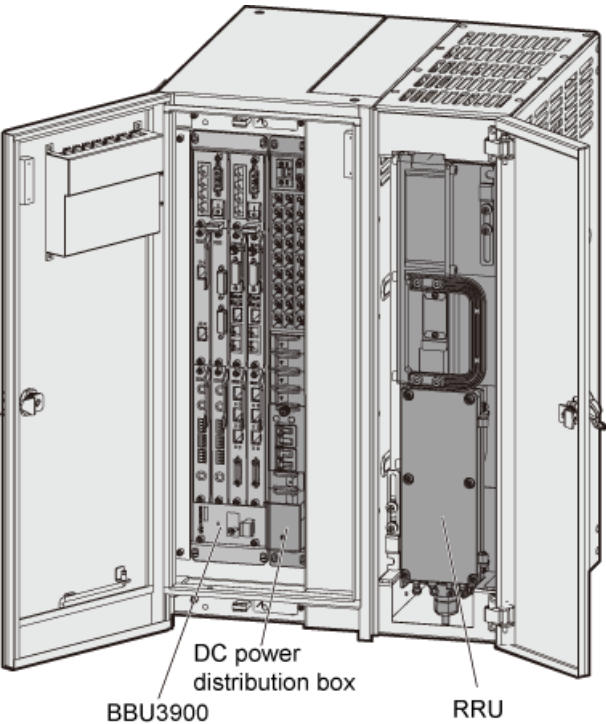
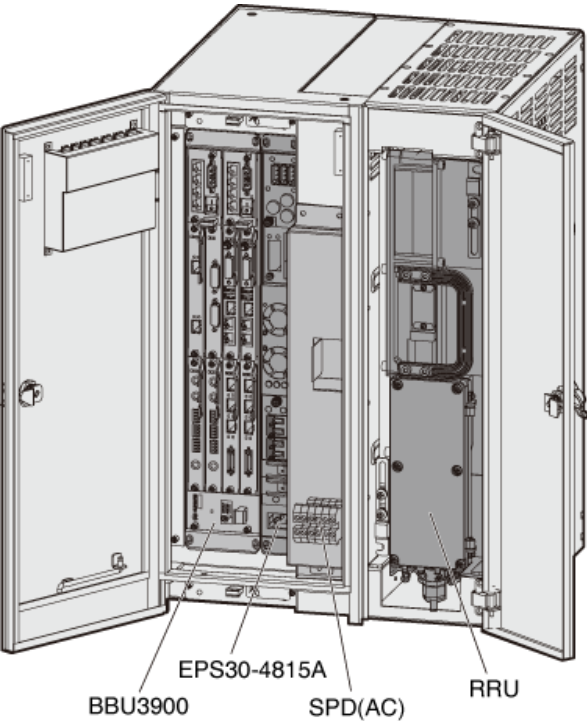


Figure 3-8 Outdoor mini NodeB with 220 V AC power



### 3.2.6 Multi-Mode Co-Cabinet Base Station

The 3900 series NodeBs feature a unified platform and a modular design. Therefore, co-siting of modules in GSM, UMTS, or LTE mode can be supported, the baseband processing units and RF modules can share the same hardware platform, and modules in different modes can be located in one cabinet to support multi-mode application. This helps implement smooth evolution from GSM to UMTS and further to LTE.

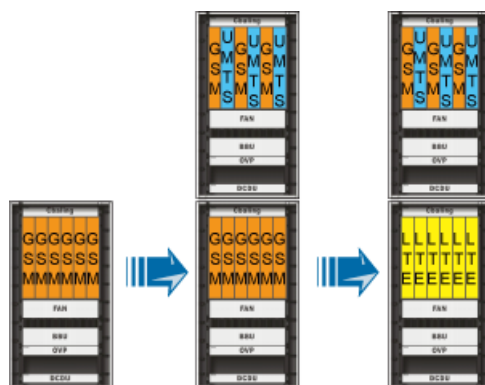
With baseband modules for different modes configured in one BBU, together with other modules configured, the base station can support the GSM mode, UMTS mode, or GSM/UMTS dual mode. In addition, with the baseband modules for LTE mode configured in the future, the base station can support the GSM/UMTS/LTE multi-mode application.

With RF modules for different modes configured in one cabinet, the base station can support the GSM mode, UMTS mode, or GSM/UMTS dual mode.

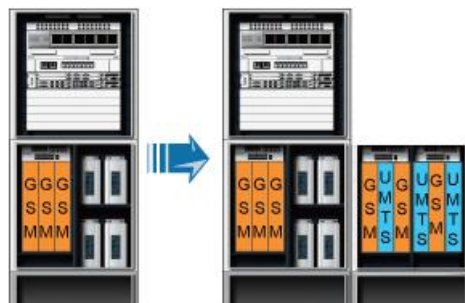
The RRU3808 and RRU3806 are LTE-ready in hardware. Thus, the base station can support UMTS/LTE dual-mode through software upgrade if the RF modules in UMTS mode and those in LTE mode work at the same frequency band.

Figure 3-9 and Figure 3-10 show the multi-mode base stations for indoor and outdoor applications respectively.

**Figure 3-9** Multi-mode base station for indoor application



**Figure 3-10** Multi-mode base station for outdoor application








# 4 Technical Specifications


## 4.1 Technical Specifications of the BTS3900

Table 4-1 Technical specifications of the BTS3900

Item	Specification		
Band	Frequency band(WRFU)	RX band (MHz)	TX band (MHz)
	2100MHz	1920 to 1980	2110 to 2170
	850MHz	824 to 835	869 to 880
	Frequency band(MRFU V2)	RX band (MHz)	TX band (MHz)
	850MHz	824 to 846.5	869 to 891.5
	900MHz	890 to 915	935 to 960
		880 to 915	925 to 960
	1,800MHz	1,710 to 1,770	1,805 to 1,865
		1,725 to 1,785	1,820 to 1,880
Capacity	24 cells Maximum configuration: 6 ×4, 3 ×8 Uplink: 1536 CEs Downlink: 1536 CEs		

Item	Specification			
Output power	80 W WRFU	<p>The WRFU supports four carriers, and its output power at the antenna port reaches 80 W.</p> <ul style="list-style-type: none"> <li>• The carrier supports a maximum of 60 W in case of 1-carrier configuration.</li> <li>• Each carrier supports a maximum of 40 W in case of 2-carrier configuration. *</li> <li>• Each carrier supports a maximum of 20 W in case of 3-carrier or 4-carrier configuration.</li> <li>• Uneven power configuration is supported.</li> </ul> <p> <b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Maximum output power = Maximum output power of the PA - Internal losses. The maximum output power is measured at the antenna port of the RF module.</li> <li>• * indicates the maximum output power in the typical configuration.</li> </ul>		
	40 W WRFU	<p>The WRFU supports two carriers, and its output power at the antenna port reaches 40 W.</p> <p> <b>NOTE</b></p> <p>The 40 W WRFU supports only the 2100 MHz band class.</p>		
	MRFU V2	<p>The MRFU V2 supports 4 carriers, and its output power at the antenna port reaches 60 W.</p> <ul style="list-style-type: none"> <li>• The carrier supports a maximum of 60 W in case of 1-carrier configuration.</li> <li>• Each carrier supports a maximum of 40 W in case of 2-carrier configuration.</li> <li>• Each carrier supports a maximum of 27 W in case of 3-carrier configuration*.</li> <li>• Each carrier supports a maximum of 20 W in case of 4-carrier configuration*.</li> <li>• Uneven power configuration is supported.</li> </ul> <p> <b>NOTE</b></p> <p>The symbol * indicates that the UMTS mode is supported in terms of hardware.</p>		
Receiver sensitivity(WRFU)	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	850 MHz***	-125.6*	-128.4*	-131.1*
		-126.3**	-129.1**	-131.8**
	<p> <b>NOTE</b></p> <ul style="list-style-type: none"> <li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li> <li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li> <li>• ***: Measurement value of the sub-band at 850 MHz.</li> </ul>			

Item	Specification					
Receiver sensitivity (MRFU V2)	Frequency band			1-way receiver sensitivity (dBm)		
	1800MHz			−125.5*		
				−126.2**		
	900MHz (890~915, 935~960)			−125.5*		
				−126.2**		
	900MHz (880~915, 925~960)			−125.3*		
				−126.0**		
	850MHz			−124*		
				−124.7**		
	<div> <b>NOTE</b></div> <ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li></ul>					
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port					
Clock synchronization	Clock extracted from the Iub interface, GPS clock, OCXO free-run clock, IP clock, BITS clock Accuracy: 0.05 ppm					
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BTS3900 without the base: 900 mm × 600 mm × 450 mm</li><li>• Base: 40 mm × 600 mm × 420 mm</li></ul>					
Weight	<ul style="list-style-type: none"><li>• Empty cabinet: ≤ 70 kg</li><li>• BTS3900 in 3 × 1 configuration: ≤ 120 kg</li><li>• BTS3900 in full configuration: ≤ 160 kg</li></ul>					
Input power	<ul style="list-style-type: none"><li>• −48 V DC, permissible voltage range: −38.4 V DC to −57 V DC</li><li>• +24 V DC, permissible voltage range: +21.6 V DC to +29 V DC</li><li>• 110V AC, permissible voltage range: 90V AC to 135V AC</li><li>• 220V AC, permissible voltage range: 176V AC to 290V AC</li></ul>					
Power consumption (WRFU)	Power consumption (W)			Power backup duration based on new batteries and typical power consumption (hour)		
	Configuration	Typical power consumption	Maximum power consumption	50 Ah	92 Ah	184Ah
	3×1	410	520	5.2	10.8	21.5

Item	Specification					
	3×2	470	670	4.4	9.2	18.8
	3×3	610	830	3.3	6.9	14.5
	3×4	760	1110	2.5	5.1	11.62
	<div> <b>NOTE</b></div> <ul style="list-style-type: none"><li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900 works with a 40% load at 25 °C ambient temperature.</li><li>• The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900 works with a 100% load at 25 °C ambient temperature.</li><li>• Power consumption in the table above is determined on the basis of a NodeB configured with the WBBPb.</li></ul>					
Power consumption (MRFU V2)	Frequency band: 850MHz/900MHz/1800MHz, −48V					
	Configuration	Output Power per Carrier (W)		Typical power consumption(W)		Maximum power consumption(W)
	3 × 1	20		610		770
	3 × 2	20		660		940
	<b>NOTE</b> The typical power consumption is reached when the base station works with 40% load. The maximum power consumption is reached when the base station works with 100% load.					
Temperature	<ul style="list-style-type: none"><li>• Long-term: −20 °C to +50 °C</li><li>• Short-term: −20 °C to +55 °C</li></ul>					
Relative humidity	5% RH to 95% RH					
Absolute humidity	1–25 g/m <sup>3</sup>					
Air pressure	70 kPa to 106 kPa					
IP rating	IP20					
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations"					
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"					
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.					

Item	Specification
EMC	<p>The BTS3900 meets the Electromagnetic compatibility (EMC) requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The BTS3900 is Conformance Européenne (CE) certified.</p>



## 4.2 Technical Specifications of the BTS3900L


**Table 4-2** Technical specifications of the BTS3900L

Item	Specification		
Band	Frequency band(WRFU)	RX band (MHz)	TX band (MHz)
	2100 MHz	1920 to 1980	2110 to 2170
	850 MHz	824 to 835	869 to 880
	Frequency band(MRFU V2)	RX band (MHz)	TX band (MHz)
	850MHz	824 to 846.5	869 to 891.5
	900MHz	890 to 915	935 to 960
		880 to 915	925 to 960
	1,800MHz	1,710 to 1,770	1,805 to 1,865
		1,725 to 1,785	1,820 to 1,880
Capacity	<p>24 cells</p> <p>Maximum configuration: 6 × 4, 3 × 8</p> <p>Uplink: 1536 CEs</p> <p>Downlink: 1536 CEs</p>		

Item	Specification			
Output power	80 W WRFU	<p>The WRFU supports four carriers, and its output power at the antenna port reaches 80 W.</p> <ul style="list-style-type: none"> <li>• The carrier supports a maximum of 60 W in case of 1-carrier configuration.</li> <li>• Each carrier supports a maximum of 40 W in case of 2-carrier configuration. *</li> <li>• Each carrier supports a maximum of 20 W in case of 3-carrier or 4-carrier configuration.</li> <li>• Uneven power configuration is supported.</li> </ul> <p> <b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Maximum output power = Maximum output power of the PA - Internal losses. The maximum output power is measured at the antenna port of the RF module.</li> <li>• * indicates the maximum output power in the typical configuration.</li> </ul>		
	40 W WRFU	<p>The WRFU supports two carriers, and its output power at the antenna port reaches 40 W.</p> <p> <b>NOTE</b></p> <p>The 40 W WRFU supports only the 2100 MHz band class.</p>		
	MRFU V2	<p>The MRFU V2 supports 4 carriers, and its output power at the antenna port reaches 60 W.</p> <ul style="list-style-type: none"> <li>• The carrier supports a maximum of 60 W in case of 1-carrier configuration.</li> <li>• Each carrier supports a maximum of 40 W in case of 2-carrier configuration.</li> <li>• Each carrier supports a maximum of 27 W in case of 3-carrier configuration*.</li> <li>• Each carrier supports a maximum of 20 W in case of 4-carrier configuration*.</li> <li>• Uneven power configuration is supported.</li> </ul> <p> <b>NOTE</b></p> <p>The symbol * indicates that the UMTS mode is supported in terms of hardware.</p>		
Receiver sensitivity(WRFU)	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	850 MHz***	-125.6*	-128.4*	-131.1*
		-126.3**	-129.1**	-131.8**



Item	Specification		
	<div> <b>NOTE</b></div> <ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li><li>• ***: Measurement value of the sub-band at 850 MHz.</li></ul>		
Receiver sensitivity (MRFU V2)	Frequency band	1-way receiver sensitivity (dBm)	
	1800MHz	-125.5*	
		-126.2**	
	900MHz (890~915, 935~960)	-125.5*	
		-126.2**	
	900MHz (880~915, 925~960)	-125.3*	
		-126.0**	
	850MHz	-124*	
		-124.7**	
		<div> <b>NOTE</b></div> <ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li></ul>	
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port		
Clock synchronization	Clock extracted from the Iub interface, GPS clock, OCXO free-run clock, IP clock, BITS clock Accuracy: 0.05 ppm		
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BTS3900L without the base: 1600 mm × 600 mm × 450 mm</li><li>• Base: 40 mm × 600 mm × 450 mm</li></ul>		
Weight	<ul style="list-style-type: none"><li>• Empty cabinet: ≤ 75 kg</li><li>• Cabinet in 3 × 1 configuration: ≤ 140 kg</li><li>• Cabinet in full configuration: ≤ 235 kg</li></ul>		
Input power	-48 V DC, permissible voltage range: -38.4 V DC to -57 V DC		
Power consumption(WRFU)	Configuration	Typical power consumption (W)	Maximum power consumption (W)
	3×1	430	570
	3×2	500	720





Item	Specification			
	3×3	640		880
	3×4	790		1170
	<div> <b>NOTE</b></div> <ul style="list-style-type: none"><li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900L works with a 40% load at 25 °C ambient temperature.</li><li>• The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900L works with a 100% load at 25 °C ambient temperature.</li><li>• Power consumption in the table above is determined on the basis of a NodeB configured with the WBBPb.</li></ul>			
Power consumption (MRFU V2)	Frequency band: 850MHz/900MHz/1800MHz, –48V			
	Configuration	Output Power per Carrier (W)	Typical power consumption(W)	Maximum power consumption(W)
	3 × 1	20	600	790
	3 × 2	20	690	1,000
	<b>NOTE</b> The typical power consumption is reached when the base station works with 40% load. The maximum power consumption is reached when the base station works with 100% load.			
Temperature	<ul style="list-style-type: none"><li>• Long-term: –20 °C to +50 °C</li><li>• Short-term: –20 °C to +55 °C</li></ul>			
Relative humidity	5% RH to 95% RH			
Air pressure	70 kPa to 106 kPa			
IP rating	IP20			
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations"			
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"			
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.			


Item	Specification
EMC	<p>The BTS3900 meets the Electromagnetic compatibility (EMC) requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The BTS3900L is CE certified.</p>


## 4.3 Technical Specifications of the BTS3900A

**Table 4-3** Technical specifications of the BTS3900A

Item	Specification		
Band	Frequency band(WRFU)	RX Band (MHz)	TX Band (MHz)
	2100 MHz	1920 to 1980	2110 to 2170
	850 MHz	824 to 835	869 to 880
	Frequency band(MRFU V2)	RX Band (MHz)	TX Band (MHz)
	850MHz	824 to 846.5	869 to 891.5
	900MHz	890 to 915	935 to 960
		880 to 915	925 to 960
	1,800MHz	1,710 to 1,770	1,805 to 1,865
		1,725 to 1,785	1,820 to 1,880
Capacity	<p>24 cells</p> <p>Maximum configuration: <math>6 \times 4, 3 \times 8</math></p> <p>Uplink: 1536 CEs</p> <p>Downlink: 1536 CEs</p>		

Item	Specification			
Output power	80 W WRFU	<p>The WRFU supports four carriers, and its output power at the antenna port reaches 80 W.</p> <ul style="list-style-type: none"> <li>• The carrier a maximum of 60 W in case of 1-carrier configuration.</li> <li>• Each carrier supports a maximum of 40 W in case of 2-carrier configuration. *</li> <li>• Each carrier supports a maximum of 20 W in case of 3-carrier or 4-carrier configuration.</li> <li>• Uneven power configuration is supported.</li> </ul> <p> <b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Maximum output power = Maximum output power of the PA - Internal losses. The maximum output power is measured at the antenna port of the RF module.</li> <li>• * indicates the maximum output power in the typical configuration.</li> </ul>		
	40 W WRFU	<p>The WRFU supports two carriers, and its output power at the antenna port reaches 40 W.</p> <p> <b>NOTE</b></p> <p>The 40 W WRFU supports only the 2100 MHz band class.</p>		
	MRFU V2	<p>The MRFU V2 supports 4 carriers, and its output power at the antenna port reaches 60 W.</p> <ul style="list-style-type: none"> <li>• The carrier supports a maximum of 60 W in case of 1-carrier configuration.</li> <li>• Each carrier supports a maximum of 40 W in case of 2-carrier configuration.</li> <li>• Each carrier supports a maximum of 27 W in case of 3-carrier configuration*.</li> <li>• Each carrier supports a maximum of 20 W in case of 4-carrier configuration*.</li> <li>• Uneven power configuration is supported.</li> </ul> <p> <b>NOTE</b></p> <p>The symbol * indicates that the UMTS mode is supported in terms of hardware.</p>		
Receiver sensitivity (WRFU)	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	850 MHz***	-125.6*	-128.4*	-131.1*
		-126.3**	-129.1**	-131.8**
	<p> <b>NOTE</b></p> <ul style="list-style-type: none"> <li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li> <li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li> <li>• ***: Measurement value of the sub-band at 850 MHz.</li> </ul>			
Receiver	Frequency band	1-way receiver sensitivity (dBm)		

Item	Specification					
sensitivity (MRFU V2)	1800MHz			−125.5*		
				−126.2**		
	900MHz (890~915, 935~960)			−125.5*		
				−126.2**		
	900MHz (880~915, 925~960)			−125.3*		
				−126.0**		
	850MHz			−124*		
				−124.7**		
	<div> <b>NOTE</b></div> <ul style="list-style-type: none"><li>*: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>**: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li></ul>					
	Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port				
Clock synchronization	Clock extracted from the Iub interface, GPS clock, OCXO free-run clock, IP clock, and BITS clock Accuracy: 0.05 ppm					
Dimensions (height × width × depth)	RF cabinet/APM30H/TMC/BBC: <ul style="list-style-type: none"><li>Without the base: 700 mm × 600 mm × 480 mm</li><li>Base: 200 mm × 600 mm × 480 mm</li></ul>					
Weight	<ul style="list-style-type: none"><li>RF cabinet: ≤ 55 kg</li><li>APM30H cabinet: ≤ 65kg</li><li>BTS3900A in typical 3 × 1 configuration: ≤ 165 kg (without batteries)</li><li>BTS3900A in full configuration: ≤ 210 kg (RF cabinet with 6 RFUs and without batteries)</li></ul>					
Input power	<ul style="list-style-type: none"><li>−48 V DC, permissible voltage range: −38.4 V DC to −57 V DC</li><li>110V AC, permissible voltage range: 90V AC to 135V AC</li><li>220V AC, permissible voltage range:176V AC to 290V AC</li></ul>					
Power consumption (WRFU)	Power consumption (W)			Power backup duration based on the battery capacity and typical power consumption (hour)		
	Configuration	Typical power consumption	Maximum power consumption	50 Ah	92 Ah	184 Ah
	3×1	455	525	4.7	9.5	19.4

Item	Specification					
	3×2	525	690	3.9	8.2	16.8
	3×3	680	870	2.9	6.0	13.0
	3×4	845	1180	2.2	4.5	10.5
	 <b>NOTE</b> <ul style="list-style-type: none"><li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900A works with a 40% load at 25 °C ambient temperature.</li><li>• The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900A works with a 100% load at 25 °C ambient temperature.</li><li>• Power consumption in the table above is determined on the basis of a NodeB configured with the WBBPb.</li></ul>					
Power consumption (MRFU V2)	Frequency band: 850MHz/900MHz/1800MHz, –48V					
	Configuration	Output Power per Carrier (W)		Typical power consumption(W)		Maximum power consumption(W)
	3 × 1	20		570		750
	3 × 2	20		670		960
	<b>NOTE</b> The typical power consumption is reached when the base station works with 40% load. The maximum power consumption is reached when the base station works with 100% load.					
Temperature	–40 °C to +50 °C (with solar radiation, APM30H configured)					
Relative humidity	5% RH to 100% RH					
Air pressure	70 kPa to 106 kPa					
IP rating	IP55					
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations"					
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"					
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing - Part 2-57: Tests – Test Ff: Vibration – Time-history method.					



Item	Specification
EMC	<p>The BTS3900A meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The BTS3900A is CE certified.</p>

## 4.4 Technical Specifications of the DBS3900

The DBS3900 consists of the BBU3900 and the RRUs of different types. The following tables list the technical specifications of the DBS3900 configured with different RRUs.

**Table 4-4** Technical specifications of the DBS3900 (BBU3900 + RRU3804)

Item	Specification		
Band	DC RRU3804 Frequency band	RX band (MHz)	TX band (MHz)
	2100 MHz	1920 to 1980	2110 to 2170
	1900 MHz	1850 to 1910	1930 to 1990
	AWS	1710 to 1755	2110 to 2155
	850 MHz	824 to 849	869 to 894
	AC RRU3804 Frequency band	RX band (MHz)	TX band (MHz)
	2100 MHz	1920 to 1980	2110 to 2170
Capacity	<p>24 cells</p> <p>Maximum configuration: <math>6 \times 4</math>, <math>3 \times 8</math></p> <p>Uplink: 1536 CEs</p> <p>Downlink: 1536 CEs</p>		



Item	Specification			
Output power	<p>A single RRU3804 supports up to four carriers with a 60 W output power at the antenna port with four carriers.</p> <ul style="list-style-type: none"><li>• One-carrier configuration: maximum output power of 60 W per carrier</li><li>• Two-carrier configuration: maximum output power of 30 W per carrier</li><li>• Three-carrier configuration: maximum output power of 20 W per carrier</li><li>• Four-carrier configuration: maximum output power of 15 W per carrier</li><li>• Supporting differentiated power configured for different carriers</li></ul> <p> <b>NOTE</b> Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.</p>			
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz/ AWS	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	1900 MHz	-125.3*	-128.1*	-130.8*
		-126.0**	-128.8**	-131.5**
	850 MHz***	-125.6*	-128.4*	-131.1*
		-126.3**	-129.1**	-131.8**
<p> <b>NOTE</b></p> <ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li><li>• ***: Measurement value of the sub-band at 850 MHz.</li></ul>				
Transmission port	<p>Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port</p> <p>Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port</p>			
Clock synchronization	<p>Clock extracted from the Iub interface, GPS clock , OCXO free-run clock, IP clock, BITS clock</p> <p>Accuracy: 0.05 ppm</p>			
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BBU3900: 86 mm × 442 mm × 310 mm</li><li>• DC RRU3804<ul style="list-style-type: none"><li>– 480 mm × 270 mm × 140 mm (without housing and connectors)</li><li>– 485 mm × 285 mm × 170 mm (with housing)</li></ul></li><li>• AC RRU3804<ul style="list-style-type: none"><li>– 480 mm × 270 mm × 220 mm (without housing and connectors)</li><li>– 485 mm × 285 mm × 250 mm (with housing)</li></ul></li></ul>			




Item	Specification				
Weight	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– In full configuration: 11 kg</li> <li>– In typical configuration (1 PSU, 1 WBBP, 1 WMPT): 7 kg</li> </ul> </li> <li>• DC RRU3804 <ul style="list-style-type: none"> <li>– Without housing: 15 kg</li> <li>– With housing: 17 kg</li> </ul> </li> <li>• AC RRU3804 <ul style="list-style-type: none"> <li>– Without housing: 20.5 kg</li> <li>– With housing: 22.5 kg</li> </ul> </li> </ul>				
Input voltage	<ul style="list-style-type: none"> <li>• BBU3900: <ul style="list-style-type: none"> <li>– +24V DC, voltage range: +21.6 V DC to +29 V DC</li> <li>– -48V DC, voltage range: -38.4 V DC to -57 V DC</li> </ul> </li> <li>• RRU3804 <ul style="list-style-type: none"> <li>– -48 V DC, voltage range: -36 V DC to -57 V DC</li> <li>– 200 V AC to 240 V AC single phase, voltage range: 176 V AC to 290 V AC</li> <li>– 100/200 V AC to 120/240 V AC two phases, voltage range: 90/180 V AC to 135/270 V AC</li> </ul> </li> </ul>				
Power consumption	DC RRU3804 Power consumption (W)			Power backup duration based on the battery capacity and typical power consumption (hour)	
	Configuration	Typical power consumption (40% load)	Maximum power consumption (100% load)	24 Ah	92 Ah
	3×1	390	480	2.4	11.3
	3×2	480	650	1.7	9.0
	3×3	630	860	1.2	6.7
	3×4	630	860	1.2	6.7
	AC RRU3804 Power consumption (W)			Power backup duration based on the battery capacity and typical power consumption (hour)	
	Configuration	Typical power consumption (40% load)	Maximum power consumption (100% load)	24 Ah	92 Ah
	3×1	435	540	2.0	10.1
	3×2	555	740	1.5	7.8
	3×3	720	980	1.0	5.6
	3×4	720	980	1.0	5.6

Item	Specification
	<b>NOTE</b> <ul style="list-style-type: none"> <li>The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 40% load at 25 °C ambient temperature.</li> <li>The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 100% load at 25 °C ambient temperature.</li> <li>In 3 x4 configurations, the typical and maximum power consumption are reached when the output power per carrier at the antenna port is 15 W</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>BBU3900: -20 °C to +55 °C</li> <li>RRU3804: <ul style="list-style-type: none"> <li>-40 °C to +50 °C (with 1120 W/m<sup>2</sup> solar radiation)</li> <li>-40 °C to +55 °C (without solar radiation)</li> </ul> </li> </ul>
Relative humidity	<ul style="list-style-type: none"> <li>BBU3900: 5% RH to 95% RH</li> <li>RRU3804: 5% RH to 100% RH</li> </ul>
Absolute humidity	<ul style="list-style-type: none"> <li>BBU3900: 1–25 g/m<sup>3</sup></li> <li>RRU3804: 1–30 g/m<sup>3</sup></li> </ul>
Air pressure	70 kPa to 106 kPa
IP rating	<ul style="list-style-type: none"> <li>BBU3900: IP20</li> <li>DC RRU3804: IP65</li> <li>AC RRU3804: IP55</li> </ul>
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations".
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.
EMC	<p>The NodeB meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>CISPR 22 (1997)</li> <li>EN 55022 (1998)</li> <li>EN 301 489-23 V1.2.1 (2002-11)</li> <li>CISPR 24 (1998)</li> <li>IEC 61000-4-2</li> <li>IEC 61000-4-3</li> <li>IEC 61000-4-4</li> <li>IEC 61000-4-5</li> <li>IEC 61000-4-6</li> <li>IEC 61000-4-29</li> <li>ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>FCC Part 15</li> </ul> <p>The DBS3900 is CE certified.</p>


**Table 4-5** Technical specifications of the DBS3900 (BBU3900 + RRU3801E)


Item	Specification			
Band	Frequency band	RX band (MHz)		TX band (MHz)
	2100 MHz	1920 to 1980		2110 to 2170
Capacity	12 cells Maximum configuration: 6 × 2, 3 × 4 Uplink: 1536 CEs Downlink: 1536 CEs			
Output power	One RRU3801E supports two carriers with 40 W output power at the antenna port of the RF module. <ul style="list-style-type: none"><li>• One-carrier configuration: 40 W per carrier</li><li>• Two-carrier configuration: 20 W per carrier</li></ul>  <b>NOTE</b> Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.			
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	 <b>NOTE</b> <ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li></ul>			
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port			
Clock synchronization	Clock on the Iub interface, GPS clock, OCXO free-run clock, IP clock, BITS clock Accuracy: 0.05 ppm			
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BBU3900: 86 mm × 442 mm × 310 mm</li><li>• DC RRU3801E:<ul style="list-style-type: none"><li>- 480 mm × 270 mm × 140 mm (without housing and connectors)</li><li>- 485 mm × 285 mm × 170 mm (with housing)</li></ul></li></ul>			
Weight	<ul style="list-style-type: none"><li>• BBU3900<ul style="list-style-type: none"><li>- In full configuration: 11 kg</li><li>- In typical configuration (1 PSU, 1 WBBP, and 1 WMPT): 7 kg</li></ul></li><li>• DC RRU3801E<ul style="list-style-type: none"><li>- Without housing: 15 kg</li><li>- With housing: 17 kg</li></ul></li></ul>			


Item	Specification				
Input power	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– +24 V DC, voltage range: +21.6 V DC to +29 V DC</li> <li>– –48 V DC, voltage range: –38.4 V DC to –57 V DC</li> </ul> </li> <li>• RRU3801E <ul style="list-style-type: none"> <li>– –48 V DC, voltage range: –36 V DC to –57 V DC</li> </ul> </li> </ul>				
Power consumption	Power consumption (W)			Power backup duration based on the battery capacity and typical power consumption (hour)	
	Configuration	Typical power consumption (40% load)	Maximum power consumption (100% load)	24 Ah	92 Ah
	3×1	390	480	2.4	11.3
	3×2	480	650	1.7	9.0
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 40% load at 25 °C ambient temperature.</li> <li>• The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 100% load at 25 °C ambient temperature.</li> </ul>				
Temperature	<ul style="list-style-type: none"> <li>• BBU3900: –20 °C to +55 °C</li> <li>• RRU3801E: <ul style="list-style-type: none"> <li>– –40 °C to +50 °C (with 1120 W/m<sup>2</sup> solar radiation)</li> <li>– –40 °C to +55 °C (without solar radiation)</li> </ul> </li> </ul>				
Relative humidity	<ul style="list-style-type: none"> <li>• BBU3900: 5% RH to 95% RH</li> <li>• RRU3801E: 5% RH to 100% RH</li> </ul>				
Absolute humidity	<ul style="list-style-type: none"> <li>• BBU3900: 1–25 g/m<sup>3</sup></li> <li>• RRU3801E: 1–30 g/m<sup>3</sup></li> </ul>				
Air pressure	70 kPa to 106 kPa				
IP rating	<ul style="list-style-type: none"> <li>• BBU3900: IP20</li> <li>• DC RRU3801E: IP65</li> </ul>				
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class 1.2 "Weather protected, not temperature-controlled storage locations"				
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"				
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.				

Item	Specification
EMC	<p>The DBS3900 meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The DBS3900 is CE certified.</p>



**Table 4-6** Technical specifications of the DBS3900 (BBU3900 + RRU3801C)

Item	Specification
Band	Frequency band
	RX band (MHz)
	TX band (MHz)
	2100 MHz
	1920 to 1980
	2110 to 2170
	1900 MHz
	1850 to 1910
Capacity	1800 MHz
	1710 to 1785
	1805 to 1880
	AWS
	1710 to 1755
	2110 to 2155
	850 MHz
	824 to 834
Output power	869 to 879
	850 MHz
	839 to 849
	884 to 894
	900 MHz
	880 to 915
	925 to 960
	12 cells
Output power	Maximum configuration: 6 × 2, 3 × 4
	Uplink: 1536 CEs
	Downlink: 1536 CEs
	One RRU3801C supports two carriers with 40 W output power at the antenna port of the RF module.
	• One-carrier configuration: maximum output power of 40 W per carrier
	• Two-carrier configuration: maximum output power of 20 W per carrier
	 <b>NOTE</b>
	Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.


Item	Specification				
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)	
	2100 MHz	−125.8*	−128.6*	−131.3*	
		−126.5**	−129.3**	−132.0**	
	Other band	−125.6*	−128.4*	−131.1*	
		−126.3**	−129.1**	−131.8**	
	<div> <b>NOTE</b></div> <ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li></ul>				
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port				
Clock synchronization	Clock on the Iub interface, GPS clock, OCXO free-run clock, IP clock, and BITS clock Accuracy: 0.05 ppm				
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BBU3900: 86 mm × 442 mm × 310 mm</li><li>• RRU3801C<ul style="list-style-type: none"><li>– 480 mm × 365 mm × 145 mm (without rack and housing)</li><li>– 610 mm × 380 mm × 200 mm (with rack and housing)</li></ul></li></ul>				
Weight	<ul style="list-style-type: none"><li>• BBU3900<ul style="list-style-type: none"><li>– In full configuration: 11 kg</li><li>– In typical configuration (1 PSU, 1 WBBP, and 1 WMPT): 7 kg</li></ul></li><li>• RRU3801C<ul style="list-style-type: none"><li>– Without housing: 20 kg</li><li>– With housing: 22 kg</li></ul></li></ul>				
Input power	<ul style="list-style-type: none"><li>• BBU3900<ul style="list-style-type: none"><li>– +24 V DC, voltage range: +21.6 V DC to +29 V DC</li><li>– −48 V DC, voltage range: −38.4 V DC to −57 V DC</li></ul></li><li>• RRU3801C<ul style="list-style-type: none"><li>– −48 V DC, voltage range: −40 V DC to −60 V DC</li><li>– 200 V AC to 240 V AC single phase, voltage range: 150 V AC to 300 V AC</li></ul></li></ul>				
Power consumption	Power consumption (W)			Power backup duration based on the battery capacity and typical power consumption (hour)	
	Configuration	Typical power consumption (50% load)	Maximum power consumption (100% load)	24 Ah	92 Ah


Item	Specification				
	3 × 1	540	620	1.5	8.0
	3 × 2	680	830	1.1	5.9
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 50% load at 25 °C ambient temperature.</li> <li>The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 100% load at 25 °C ambient temperature.</li> </ul>				
Temperature	<ul style="list-style-type: none"> <li>• BBU3900: -20 °C to +55 °C</li> <li>• RRU3801C <ul style="list-style-type: none"> <li>- -40 °C to +50 °C (with 1120 W/m<sup>2</sup> solar radiation)</li> <li>- -40 °C to +55 °C (without solar radiation)</li> </ul> </li> </ul>				
Relative humidity	<ul style="list-style-type: none"> <li>• BBU3900: 5% RH to 95% RH</li> <li>• RRU3801C: 5% RH to 100% RH</li> </ul>				
Absolute humidity	<ul style="list-style-type: none"> <li>• BBU3900: 1–25 g/m<sup>3</sup></li> <li>• RRU3801C: 1–30 g/m<sup>3</sup></li> </ul>				
Air pressure	70 kPa to 106 kPa				
IP rating	<ul style="list-style-type: none"> <li>• BBU3900: IP20</li> <li>• RRU3801C: IP65</li> </ul>				
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations"				
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"				
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.				
EMC	<p>The DBS3900 meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The DBS3900 is CE certified.</p>				

**Table 4-7** Technical specifications of the DBS3900 (BBU3900 + RRU3808)



Item	Specification			
Band	Frequency band	RX band (MHz)		TX band (MHz)
	2100 MHz	1920 to 1980		2110 to 2170
	AWS	1710 to 1755		2110 to 2155
Capacity	24 cells Maximum configuration in the case of one TX channel and two RX channels: 6 × 2, 3 × 8 Maximum configuration in the case of MIMO: 6 × 2, 3 × 4 Uplink: 1536 CEs Downlink: 1536 CEs			
Output power	One RRU3808 supports four carriers with 2*40 W output power at the antenna port of the RF module. <ul style="list-style-type: none"><li>• The RRU3808 supports one TX channel, MIMO, and combination of one TX channel and MIMO.<ul style="list-style-type: none"><li>– One TX channel: maximum output power of a TX channel reaching 40 W</li><li>– MIMO: maximum output power reaching 40 W + 40 W</li><li>– Combination of one TX channel and MIMO: maximum output power of a TX channel reaching 40 W</li></ul></li><li>• The RRU3808 supports differentiated power configured for each carrier.</li></ul> <div> <b>NOTE</b> Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.</div>			
Receiver sensitivity	Band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz/AWS	−125.8*	−128.6*	−131.3*
		−126.5**	−129.3**	−132.0**
	<div> <b>NOTE</b><ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li></ul></div>			
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port			
Clock synchronization	Clock on the Iub interface, GPS clock, OCXO free-run clock, IP clock, and BITS clock Accuracy: 0.05 ppm			
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BBU3900: 86 mm × 442 mm × 310 mm</li><li>• RRU3808<ul style="list-style-type: none"><li>– 480 mm × 270 mm × 140 mm (without connectors and housing)</li><li>– 485 mm × 285 mm × 170 mm (with connectors)</li></ul></li></ul>			




Item	Specification		
Weight	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– In full configuration: 11 kg</li> <li>– In typical configuration (1 PSU, 1 WBBP, and 1 WMPT): 7 kg</li> </ul> </li> <li>• RRU3808 <ul style="list-style-type: none"> <li>– Without housing: 17 kg</li> <li>– With housing: 19 kg</li> </ul> </li> </ul>		
Input power	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– +24 V DC, voltage range: +21.6 V DC to +29 V DC</li> <li>– –48 V DC, voltage range: –38.4 V DC to –57 V DC</li> </ul> </li> <li>• RRU3808 <ul style="list-style-type: none"> <li>– –48 V DC, voltage range: –36 V DC to –57 V DC</li> </ul> </li> </ul>		
Power consumption	Power consumption in MIMO configuration (W)		Power backup duration based on the battery capacity and typical power consumption (hour)
	Configuration	Typical power consumption (40% load)	Maximum power consumption (100% load)
	3×1	460	570
	3×2	580	730
	3×3	730	950
	3×4	800	1060
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>• The typical power consumption is reached when the output power at the antenna port per carrier is 10 W + 10 W and the DBS3900 works with a 40% load at 25 °C ambient temperature.</li> <li>• The maximum power consumption is reached when the output power at the antenna port per carrier is 10 W + 10 W and the DBS3900 works with a 100% load at 25 °C ambient temperature.</li> </ul>		
	Power consumption in non-MIMO configuration (W)		Power backup duration based on the battery capacity and typical power consumption (hour)
	Configuration	Typical power consumption (40% load)	Maximum power consumption (100% load)
	3×1	415	490
	3×2	510	640
	3×3	740	950
	3×4	800	1060

Item	Specification
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 40% load at 25 °C ambient temperature.</li> <li>The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 100% load at 25 °C ambient temperature.</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>BBU3900: -20 °C to +55 °C</li> <li>RRU3808 <ul style="list-style-type: none"> <li>-40 °C to +50 °C (with 1120 W/m<sup>2</sup> solar radiation)</li> <li>-40 °C to +55 °C (without solar radiation)</li> </ul> </li> </ul>
Relative humidity	<ul style="list-style-type: none"> <li>BBU3900: 5% RH to 95% RH</li> <li>RRU3808: 5% RH to 100% RH</li> </ul>
Absolute humidity	<ul style="list-style-type: none"> <li>BBU3900: 1–25 g/m<sup>3</sup></li> <li>RRU3808: 1–30 g/m<sup>3</sup></li> </ul>
Air pressure	70 kPa to 106 kPa
IP rating	<ul style="list-style-type: none"> <li>BBU3900: IP20</li> <li>RRU3808: IP65</li> </ul>
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations"
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.
EMC	<p>The DBS3900 meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>CISPR 22 (1997)</li> <li>EN 55022 (1998)</li> <li>EN 301 489-23 V1.2.1 (2002-11)</li> <li>CISPR 24 (1998)</li> <li>IEC 61000-4-2</li> <li>IEC 61000-4-3</li> <li>IEC 61000-4-4</li> <li>IEC 61000-4-5</li> <li>IEC 61000-4-6</li> <li>IEC 61000-4-29</li> <li>ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>FCC Part 15</li> </ul> <p>The DBS3900 is CE certified.</p>

**Table 4-8** Technical specifications of the DBS3900 (BBU3900+RRU3806)



Item	Specification			
Band	Frequency band	RX band (MHz)		TX band (MHz)
	2100MHz	1920 to 1980		2110 to 2170
Capacity	24 cells Maximum configuration:6 × 4, 3 × 8 Uplink: 1,536 CEs Downlink:1,536 CEs			
Output power	<p>The RRU3806 supports four carriers, and its output power at the antenna connector reaches 80 W.</p> <ul style="list-style-type: none"><li>• The carrier a maximum of 80 W in case of 1-carrier configuration.</li><li>• Each carrier a maximum of 40 W in case of 2-carrier configuration.</li><li>• Each carrier a maximum of 26 W in case of 3-carrier configuration.</li><li>• Each carrier a maximum of 20 W in case of 4-carrier configuration.</li><li>• Uneven power configuration is supported.</li></ul> <p> <b>NOTE</b> Maximum output power = Maximum output power of the PA - Internal losses. The maximum output power is measured at the antenna port of the RF module.</p>			
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	<p> <b>NOTE</b></p> <ul style="list-style-type: none"><li>• The receiver sensitivity is measured, as recommended in 3GPP TS 25.104, over the full band at the antenna connector provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) does not exceed 0.001.</li><li>• The receiver sensitivity is measured on the center frequency at the antenna connector provided that 12.2 kbit/s Adaptive Multi Rate (AMR) service is in progress and the BER does not exceed 0.001.</li></ul>			
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port			
Clock synchronization	Line clock extracted from the Iub interface, GPS clock, BITS clock, clock of the OCXO in free-run mode, and IP clock Precision:0.05 ppm			
Dimensions (height × width × depth)	BBU3900:86 mm × 442 mm × 310 mm RRU3806: <ul style="list-style-type: none"><li>• 480 mm × 270 mm × 140 mm (without housing and connectors)</li><li>• 485 mm × 285 mm × 170 mm (with housing)</li></ul>			



Weight	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– In full configuration: 11 kg</li> <li>– In typical configuration (1 PSU, 1 WBBP, and 1 WMPT): 7 kg</li> </ul> </li> <li>• RRU3806 <ul style="list-style-type: none"> <li>– Without housing: 15 kg</li> <li>– With housing: 17 kg</li> </ul> </li> </ul>		
Input power	<ul style="list-style-type: none"> <li>• BBU3900: <ul style="list-style-type: none"> <li>– +24 V DC, voltage range: +21.6 V DC to +29 V DC</li> <li>– –48 V DC, voltage range: –38.4 V DC to –57 V DC</li> </ul> </li> <li>• RRU3806: –48 V DC, voltage range: –36 V DC to –57 V DC</li> </ul>		
Power consumption	Power consumption (W)		Power backup duration based on new batteries and typical power consumption (hour)
	Configuration	Typical power consumption (with a 40% load)	Maximum power consumption (with a 100% load)
	3×1	400	480
	3×2	490	650
	3×3	630	860
	3×4	710	1030
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the equipment works with a 40% load at 25 °C ambient temperature.</li> <li>• The maximum power consumption is reached when the output power each carrier at the antenna port is 20 W, the equipment works with 100% load, and the ambient temperature is 25 °C.</li> </ul>		
Temperature	BBU3900: –20 °C to +55 °C RRU3806: –40 °C to +50 °C (with 1120 W/m <sup>2</sup> solar radiation) –40 °C to +55 °C (without solar radiation)		
Relative humidity	BBU3900: 5% RH to 95% RH RRU3806: 5% RH to 100% RH		
Absolute humidity	BBU3900: 1–25 g/m <sup>3</sup> RRU3806: 1–30 g/m <sup>3</sup>		
Air pressure	70 kPa to 106 kPa		
IP rating	BBU3900: IP20 RRU3806: IP65		

Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations".
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation".
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method. YD5083-99:Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment (telecom industry standard in People's Republic of China)
EMC	The DBS3900 (BBU3900+RRU3806) meets the EMC requirements and complies with the following standards: <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• GB 9254-1998</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> The DBS3900 is CE certified.

**Table 4-9** Technical specifications of the DBS3900 (BBU3900 + RRU3908 V2)

Item	Specification		
Band	Frequency band	RX band (MHz)	TX band (MHz)
	900 MHz	890 to 915	935 to 960
	900 MHz	880 to 915	925 to 960
Capacity	24 cells Maximum configuration in the case of one TX channel and two RX channels: $6 \times 4$ , $3 \times 8$ Uplink: 1536 CEs Downlink: 1536 CEs		



Item	Specification		
Output power	<p>One RRU3908 supports four carriers with 2*40 W output power at the antenna port of the RF module.</p> <ul style="list-style-type: none"> <li>• The RRU3908 supports one TX channel, MIMO, and combination of one TX channel and MIMO.</li> <li>• One TX channel: maximum output power of a TX channel reaching 40 W</li> <li>• MIMO: maximum output power reaching 40 W + 40 W</li> <li>• Combination of one TX channel and MIMO: maximum output power of a TX channel reaching 40 W</li> <li>• The RRU3908 supports differentiated power configured for each carrier.</li> </ul> <p> <b>NOTE</b> Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.</p>		
Receiver sensitivity	Band	receiver sensitivity (dBm)	
	900MHz (890 to 915, 935 to 960)	-125.5*	-126.2**
	900MHz (880 to 915, 925 to 960)	-125.3*	-126.0**
	<p> <b>NOTE</b></p> <ul style="list-style-type: none"> <li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li> <li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li> </ul>		
Transmission port	<p>Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port</p> <p>Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port</p>		
Clock synchronization	<p>Clock on the Iub interface, GPS clock, OCXO free-run clock, IP clock, and BITS clock</p> <p>Accuracy: 0.05 ppm</p>		
Dimensions (height × width × depth)	<ul style="list-style-type: none"> <li>• BBU3900: 86 mm × 442 mm × 310 mm</li> <li>• RRU3908 <ul style="list-style-type: none"> <li>– 485mm × 380 mm × 170 mm (without connectors and housing)</li> <li>– 480 mm × 356 mm × 140 mm (with connectors)</li> </ul> </li> </ul>		
Weight	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– In full configuration: 11 kg</li> <li>– In typical configuration (1 PSU, 1 WBBP, and 1 WMPT): 7 kg</li> </ul> </li> <li>• RRU3908 <ul style="list-style-type: none"> <li>– Without housing: 21 kg</li> <li>– With housing: 23 kg</li> </ul> </li> </ul>		

Item	Specification		
Input power	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– +24 V DC, voltage range: +21.6 V DC to +29 V DC</li> <li>– –48 V DC, voltage range: –38.4 V DC to –57 V DC</li> </ul> </li> <li>• RRU3908 <ul style="list-style-type: none"> <li>– –48 V DC, voltage range: –36 V DC to –57 V DC</li> </ul> </li> </ul>		
Power consumption	Power consumption in MIMO configuration (W)		Power backup duration based on the battery capacity and typical power consumption (hour)
	Configuration	Typical power consumption (40% load)	Maximum power consumption (100% load)
	3×1	490	580
	3×2	565	745
	3×3	710	980
	3×4	800	1160
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 40% load at 25 °C ambient temperature.</li> <li>• The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 100% load at 25 °C ambient temperature.</li> </ul>		
	Power consumption in non-MIMO configuration (W)		Power backup duration based on the battery capacity and typical power consumption (hour)
	Configuration	Typical power consumption (40% load)	Maximum power consumption (100% load)
	3×1	415	490
	3×2	510	640
	3×3	740	950
	3×4	800	1060
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 40% load at 25 °C ambient temperature.</li> </ul> <p>The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the DBS3900 works with a 100% load at 25 °C ambient temperature.</p>		

Item	Specification
Temperature	<ul style="list-style-type: none"> <li>• BBU3900: -20 °C to +55 °C</li> <li>• RRU3908 <ul style="list-style-type: none"> <li>- -40 °C to +50 °C (with 1120 W/m<sup>2</sup> solar radiation)</li> <li>- -40 °C to +55 °C (without solar radiation)</li> </ul> </li> </ul>
Relative humidity	<ul style="list-style-type: none"> <li>• BBU3900: 5% RH to 95% RH</li> <li>• RRU3908: 5% RH to 100% RH</li> </ul>
Absolute humidity	<ul style="list-style-type: none"> <li>• BBU3900: 1-25 g/m<sup>3</sup></li> <li>• RRU3908: 1-30 g/m<sup>3</sup></li> </ul>
Air pressure	70 kPa to 106 kPa
IP rating	<ul style="list-style-type: none"> <li>• BBU3900: IP20</li> <li>• RRU3908: IP65</li> </ul>
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations"
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"
Anti-seismic performance	<p>IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.</p> <p>YD5083-99:Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment (telecom industry standard in People's Republic of China)</p>
EMC	<p>The DBS3900 meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• GB 9254-1998</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The DBS3900 is CE certified.</p>



**Table 4-10** Technical specifications of the DBS3900 (BBU3900 + RRU3828)

Item	Specification		
Band	Frequency band	RX band (MHz)	TX band (MHz)
	2100MHz	1920~1980	2110~2170
Capacity	24 cells Maximum configuration in the case of one TX channel and two RX channels: $6 \times 4$ Uplink: 1536 CEs Downlink: 1536 CEs		
Output power	One RRU3828 supports four carriers with $2 \times 40$ W output power at the antenna port of the RF module. <ul style="list-style-type: none"> <li>• The RRU3828 supports one TX channel, MIMO, and combination of one TX channel and MIMO.</li> <li>• One TX channel: maximum output power of a TX channel reaching 40 W</li> <li>• MIMO: maximum output power reaching 40 W + 40 W</li> <li>• Combination of one TX channel and MIMO: maximum output power of a TX channel reaching 40 W</li> <li>• The RRU3828 supports differentiated power configured for each carrier.</li> </ul> <div>  <b>NOTE</b>            Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.         </div>		
Receiver sensitivity	Band	receiver sensitivity (dBm)	
	2100MHz	-125.8*	-126.5**
	<div>  <b>NOTE</b> <ul style="list-style-type: none"> <li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li> <li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li> </ul> </div>		
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port		
Clock synchronization	Clock on the Iub interface, GPS clock, OCXO free-run clock, IP clock, and BITS clock Accuracy: 0.05 ppm		
Dimensions (height × width × depth)	<ul style="list-style-type: none"> <li>• BBU3900: 86 mm × 442 mm × 310 mm</li> <li>• RRU3828               <ul style="list-style-type: none"> <li>– 400 mm × 240 mm × 160 mm (with connectors)</li> </ul> </li> </ul>		
Weight	<ul style="list-style-type: none"> <li>• BBU3900               <ul style="list-style-type: none"> <li>– In full configuration: 11 kg</li> <li>– In typical configuration (1 PSU, 1 WBBP, and 1 WMPT): 7 kg</li> </ul> </li> <li>• RRU3828               <ul style="list-style-type: none"> <li>– With housing: 15 kg</li> </ul> </li> </ul>		



Item	Specification	
Input power	<ul style="list-style-type: none"> <li>• BBU3900 <ul style="list-style-type: none"> <li>– +24 V DC, voltage range: +21.6 V DC to +29 V DC</li> <li>– –48 V DC, voltage range: –38.4 V DC to –57 V DC</li> </ul> </li> <li>• RRU3828 <ul style="list-style-type: none"> <li>– –48 V DC, voltage range: –36 V DC to –57 V DC</li> </ul> </li> </ul>	
Power consumption	Power consumption in MIMO configuration (W)	Power backup duration based on the battery capacity and typical power consumption (hour)
	The maximum power consumption of RRU3828 is 335W.	
Temperature	<ul style="list-style-type: none"> <li>• BBU3900: –20 °C to +55 °C</li> <li>• RRU3828 <ul style="list-style-type: none"> <li>– –40 °C to +50 °C (with 1120 W/m<sup>2</sup> solar radiation)</li> <li>– –40 °C to +55 °C (without solar radiation)</li> </ul> </li> </ul>	
Relative humidity	<ul style="list-style-type: none"> <li>• BBU3900: 5% RH to 95% RH</li> <li>• RRU3828: 5% RH to 100% RH</li> </ul>	
Absolute humidity	<ul style="list-style-type: none"> <li>• BBU3900: 1–25 g/m<sup>3</sup></li> <li>• RRU3828: 1–30 g/m<sup>3</sup></li> </ul>	
Air pressure	70 kPa to 106 kPa	
IP rating	<ul style="list-style-type: none"> <li>• BBU3900: IP20</li> <li>• RRU3828: IP65</li> </ul>	
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations"	
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"	
Anti-seismic performance	<p>IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.</p> <p>YD5083-99:Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment (telecom industry standard in People's Republic of China)</p>	


Item	Specification
EMC	<p>The DBS3900 meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• GB 9254-1998</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The DBS3900 is CE certified.</p>

## 4.5 Technical Specifications of the BTS3900C



**Table 4-11** Technical specifications of the BTS3900C (BBU3900 + DC RRU3804)


Item	Specification		
Band	Frequency band	RX band (MHz)	TX band (MHz)
	2100 MHz	1920 to 1980	2110 to 2170
	1900 MHz	1850 to 1910	1930 to 1990
	850 MHz	824 to 849	869 to 894
	AWS	1710 to 1755	2110 to 2155
Capacity	<p>Three cells</p> <p>Maximum configuration: 1 × 3</p> <p>Uplink: 384 CEs</p> <p>Downlink: 384 CEs</p>		

Item	Specification			
Output power	<p>The RRU3804 supports four carriers with a 60 W output power at the antenna port.</p> <ul style="list-style-type: none"><li>• One-carrier configuration: 60 W per carrier</li><li>• Two-carrier configuration: 30 W* per carrier</li><li>• Three-carrier configuration: 20 W per carrier</li><li>• Four-carrier configuration: 15 W per carrier</li><li>• Supporting the 20 W + 40 W or 10 W +50 W configuration through software upgrade</li></ul> <p> <b>NOTE</b></p> <ul style="list-style-type: none"><li>• Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.</li><li>• * refers to the maximum output power in typical configurations.</li></ul>			
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz/ AWS	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	1900 MHz	-125.3*	-128.1*	-130.8*
		-126.0**	-128.8**	-131.5**
	850 MHz***	-125.6*	-128.4*	-131.1*
		-126.3**	-129.1**	-131.8**
<p> <b>NOTE</b></p> <ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li><li>• ***: Measurement value of the sub-band at 850 MHz.</li></ul>				
Transmission port	<p>Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port</p> <p>Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port</p>			
Clock synchronization	<p>Clock extracted from the Iub interface, GPS clock , OCXO free-run clock, IP clock, BITS clock</p> <p>Accuracy: 0.05 ppm</p>			
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BTS3900C: 600 mm × 400 mm × 390 mm</li><li>• OMB: 600 mm × 240 mm × 390 mm</li></ul>			
Weight	<ul style="list-style-type: none"><li>• AC BTS3900C: ≤ 50 kg</li><li>• DC BTS3900C: ≤ 48 kg</li></ul>			
Input voltage	<ul style="list-style-type: none"><li>• -48 V DC, voltage range: -38.4 V DC to -57 V DC</li><li>• 200 V AC to 240 V AC single phase, voltage range: 176 V AC to 290 V AC</li><li>• 100/200 V AC to 120/240 V AC dual-live-wire power cable; voltage range: 90/180 V AC to 135/270 V AC</li></ul>			



Item	Specification		
Power consumption	Configuration	Typical power consumption	Maximum power consumption
	1 ×1	190 W	240 W
	1 ×2	220 W	290 W
	1 ×3	260 W	350 W
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900C works with a 40% load at 25 °C ambient temperature.</li> <li>The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900C works with a 100% load at 25 °C ambient temperature.</li> </ul>		
Temperature	<ul style="list-style-type: none"> <li>–40 °C to +45 °C (with solar radiation)</li> <li>–40 °C to +50 °C (without solar radiation)</li> </ul>		
Relative humidity	5% RH to 100% RH		
Absolute humidity	1–30 g/m <sup>3</sup>		
Air pressure	70 kPa to 106 kPa		
IP rating	IP55		
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations".		
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"		
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.		
EMC	<p>The BTS3900C meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The BTS3900C is CE certified.</p>		

**Table 4-12** Technical specifications of the BTS3900C (BBU3900 + RRU3801E)


Item	Specification			
Band	Frequency band	RX band (MHz)		TX band (MHz)
	2100 MHz	1920 to 1980		2110 to 2170
Capacity	Two cells Maximum configuration: 1 × 2 Uplink: 384 CEs Downlink: 384 CEs			
Output power	The RRU3801E supports two carriers with a 40 W output power at the antenna port. <ul style="list-style-type: none"><li>• One-carrier configuration: 40 W per carrier</li><li>• Two-carrier configuration: 20 W per carrier</li></ul> <div> <b>NOTE</b><ul style="list-style-type: none"><li>• Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.</li><li>• * refers to the maximum output power in typical configurations.</li></ul></div>			
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	<div> <b>NOTE</b><ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li><li>• ***: Measurement value of the sub-band at 850 MHz.</li></ul></div>			
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port			
Clock synchronization	Clock extracted from the Iub interface, GPS clock , OCXO free-run clock, IP clock, BITS clock Accuracy: 0.05 ppm			
Dimensions (height × width × depth)	<ul style="list-style-type: none"><li>• BTS3900C: 600 mm × 400 mm × 390 mm</li><li>• OMB: 600 mm × 240 mm × 390 mm</li></ul>			
Weight	<ul style="list-style-type: none"><li>• AC BTS3900C: ≤ 50 kg</li><li>• DC BTS3900C: ≤ 48 kg</li></ul>			
Input voltage	<ul style="list-style-type: none"><li>• -48 V DC, voltage range: -38.4 V DC to -57 V DC</li><li>• 200 V AC to 240 V AC single phase, voltage range: 176 V AC to 290 V AC</li><li>• 100/200 V AC to 120/240 V AC dual-live-wire power cable; voltage range: 90/180 V AC to 135/270 V AC</li></ul>			

Item	Specification		
Power consumption	Configuration	Typical power consumption	Maximum power consumption
	1×1	190 W	240 W
	1×2	220 W	290 W
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900C works with a 40% load at 25 °C ambient temperature.</li> <li>The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900C works with a 100% load at 25 °C ambient temperature.</li> </ul>		
Temperature	<ul style="list-style-type: none"> <li>–40 °C to +45 °C (with solar radiation)</li> <li>–40 °C to +50 °C (without solar radiation)</li> </ul>		
Relative humidity	5% RH to 100% RH		
Absolute humidity	1–30 g/m <sup>3</sup>		
Air pressure	70 kPa to 106 kPa		
IP rating	IP65		
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations".		
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"		
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.		
EMC	<p>The BTS3900C meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The BTS3900C is CE certified.</p>		

**Table 4-13** Technical specifications of the BTS3900C (BBU3900 + RRU3801C)


Item	Specification			
Band	Frequency band	RX band (MHz)		TX band (MHz)
	2100 MHz	1920 to 1980		2110 to 2170
	1900 MHz	1850 to 1910		1930 to 1990
	1800 MHz	1710 to 1785		1805 to 1880
	AWS	1710 to 1755		2110 to 2155
	850 MHz	824 to 834		869 to 879
	850 MHz	839 to 849		884 to 894
	900 MHz	880 to 915		925 to 960
Capacity	Two cells Maximum configuration: 1 × 2 Uplink: 384 CEs Downlink: 384 CEs			
Output power	The RRU3801C supports two carriers with a 40 W output power at the antenna port. <ul style="list-style-type: none"><li>• One-carrier configuration: maximum output power of 40 W per carrier</li><li>• Two-carrier configuration: maximum output power of 20 W per carrier</li></ul> <div> <b>NOTE</b> Maximum output power = Maximum output power of the PA - Internal loss. The maximum output power is measured at the antenna port of the RF module.</div>			
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100 MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**
	Other bands	-125.6*	-128.4*	-131.1*
		-126.3**	-129.1**	-131.8**
	<div> <b>NOTE</b><ul style="list-style-type: none"><li>• *: As recommended in 3GPP TS25.104, the receiver sensitivity (full band) is measured at the antenna port provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) is within 0.001.</li><li>• **: The receiver sensitivity (at the centre frequency) is measured at the antenna port provided that the AMR service at 12.2 kbit/s is used and the BER is within 0.001.</li></ul></div>			
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port			
Clock synchronization	Clock extracted from the Iub interface, GPS clock , OCXO free-run clock, IP clock, BITS clock Accuracy: 0.05 ppm			





Item	Specification		
Dimensions (height × width × depth)	<ul style="list-style-type: none"> <li>• BTS3900C: 600 mm × 400 mm × 390 mm</li> <li>• OMB: 600 mm × 240 mm × 390 mm</li> </ul>		
Weight	<ul style="list-style-type: none"> <li>• AC BTS3900C: ≤ 55 kg</li> <li>• DC BTS3900C: ≤ 53 kg</li> </ul>		
Input voltage	<ul style="list-style-type: none"> <li>• -48 V DC, voltage range: -38.4 V DC to -57 V DC</li> <li>• 200 V AC to 240 V AC single phase, voltage range: 176 V AC to 290 V AC</li> <li>• 100/200 V AC to 120/240 V AC dual-live-wire power cable; voltage range: 90/180 V AC to 135/270 V AC</li> </ul>		
Power consumption	Configuration	Typical power consumption	Maximum power consumption
	1 × 1	280 W	300 W
	1 × 2	320 W	370 W
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>• The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900C works with a 50% load at 25 °C ambient temperature.</li> <li>• The maximum power consumption is reached when the output power at the antenna port per carrier is 20 W and the BTS3900C works with a 100% load at 25 °C ambient temperature.</li> </ul>		
Temperature	<ul style="list-style-type: none"> <li>• -40 °C to +45 °C (with 1120 W/m<sup>2</sup> solar radiation)</li> <li>• -40 °C to +50 °C (without solar radiation)</li> </ul>		
Relative humidity	5% RH to 100% RH		
Absolute humidity	1–30 g/m <sup>3</sup>		
Air pressure	70 kPa to 106 kPa		
IP rating	IP55		
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations".		
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation"		
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method.		

Item	Specification
EMC	<p>The BTS3900C meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The BTS3900C is CE certified.</p>

**Table 4-14** Technical specifications of the BTS3900C (BBU3900+RRU3806)

Item	Specification			
Band	Frequency band	RX Band (MHz)		TX Band (MHz)
	2100 MHz	1920 to 1980		2110 to 2170
Capacity	3 cells Maximum configuration:1 ×3 Uplink: 384 CEs Downlink:384 CEs			
Output power	<p>The RRU3806 supports four carriers, and its output power at the antenna connector reaches 80 W.</p> <ul style="list-style-type: none"><li>• The carrier a maximum of 80 W in case of 1-carrier configuration.</li><li>• Each carrier a maximum of 40 W in case of 2-carrier configuration.</li><li>• Each carrier a maximum of 26 W in case of 3-carrier configuration.</li><li>• Each carrier a maximum of 20 W in case of 4-carrier configuration.</li><li>• Uneven power configuration is supported.</li></ul> <p> <b>NOTE</b> Maximum output power = Maximum output power of the PA - Internal losses. The maximum output power is measured at the antenna port of the RF module.</p>			
Receiver sensitivity	Frequency band	1-way receiver sensitivity (dBm)	2-way receiver sensitivity (dBm)	4-way receiver sensitivity (dBm)
	2100MHz	-125.8*	-128.6*	-131.3*
		-126.5**	-129.3**	-132.0**

Item	Specification		
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>The receiver sensitivity is measured, as recommended in 3GPP TS 25.104, over the full band at the antenna connector provided that the channel rate reaches 12.2 kbit/s and the Bit Error Rate (BER) does not exceed 0.001.</li> <li>The receiver sensitivity is measured on the center frequency at the antenna connector provided that 12.2 kbit/s Adaptive Multi Rate (AMR) service is in progress and the BER does not exceed 0.001.</li> </ul>		
Transmission port	Mandatory hardware units provide E1/T1 port, FE electrical port, and FE optical port Optional hardware units provide unchannelized STM-1 port, GE electrical port, and GE optical port		
Clock synchronization	Line clock extracted from the Iub interface, GPS clock, BITS clock, clock of the OCXO in free-run mode, and IP clock Precision: 0.05 ppm		
Dimensions (height × width × depth)	600 mm × 400 mm × 390 mm OMB: 600 mm × 240 mm × 390 mm		
Weight	<ul style="list-style-type: none"> <li>AC BTS3900C: ≤ 50 kg</li> <li>DC BTS3900C: ≤ 48 kg</li> </ul>		
Input voltage	−48 V DC, voltage range: −38.4 V DC to −57 V DC 200 V AC to 240 V AC single-phase power cable, voltage range: 176 V AC to 290 V AC 100/200 V AC to 120/240 V AC dual live line power cable, voltage range: 90/180 V AC to 135/270 V AC		
Power consumption	Configuration	Typical power consumption	Maximum power consumption
	1 × 1	190	240
	1 × 2	220	290
	1 × 3	260	350
	 <b>NOTE</b> <ul style="list-style-type: none"> <li>The typical power consumption is reached when the output power at the antenna port per carrier is 20 W and the equipment works with a 40% load at 25 °C ambient temperature.</li> <li>The maximum power consumption is reached when the output power each carrier at the antenna port is 20 W, the equipment works with 100% load, and the ambient temperature is 25 °C.</li> </ul>		
Temperature	−40 °C to +45 °C (with solar radiation) −40 °C to +50 °C (without solar radiation)		
Relative humidity	5% RH to 100% RH		
Absolute humidity	1–30 g/m <sup>3</sup>		
Air pressure	70 kPa to 106 kPa		
IP rating	IP65		

Item	Specification
Storage	ETSI EN300019-1-1 V2.1.4 (2003-04) class1.2 "Weather protected, not temperature-controlled storage locations".
Transportation	ETSI EN300019-1-2 V2.1.4 (2003-04) class 2.3 "Public transportation".
Anti-seismic performance	IEC 60068-2-57 (1999-11) Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method. YD5083-99: Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment (telecom industry standard in People's Republic of China)
EMC	<p>The BTS3900C (BBU3900+RRU3806) meets the EMC requirements and complies with the following standards:</p> <ul style="list-style-type: none"> <li>• CISPR 22 (1997)</li> <li>• EN 55022 (1998)</li> <li>• EN 301 489-23 V1.2.1 (2002-11)</li> <li>• CISPR 24 (1998)</li> <li>• IEC 61000-4-2</li> <li>• IEC 61000-4-3</li> <li>• IEC 61000-4-4</li> <li>• IEC 61000-4-5</li> <li>• IEC 61000-4-6</li> <li>• IEC 61000-4-29</li> <li>• GB 9254-1998</li> <li>• ETSI 301 489-1 V1.3.1 (2001-09)</li> <li>• FCC Part 15</li> </ul> <p>The BTS3900C is CE certified.</p>

# 5

## Acronyms and Abbreviations

Acronym and Abbreviation	Full Spelling
AMR	Adaptive Multi Rate
APM	Advanced Power Module
APMI	APM Power unit Interface Board
BBU	BaseBand control Unit
CMUA	Central Monitoring Unit type A
CPRI	Common public radio interface
EDGE	Enhanced Data rates for GSM Evolution
ELU	Electronic Lable Unit
FE	Fast Ethernet
GE	Gigabit Ethernet
GSM	Global System for Mobile Communications
HSPA	High Speed Packet Access
LTE	Long Term Evolution
MRFU	Multi-Mode Radio Frequency Unit
NodeB	NodeB
PDU	Power Distribution Unit
PMU	Power Monitoring Unit
PSU	Power Supply Unit
RNC	Radio Network Controller
RRU	Radio Remote Unit
SLPU	Signal lightning protection unit
STM-1	Synchronous Transport Mode-1

Acronym and Abbreviation	Full Spelling
UEIU	Universal Environment Interface Unit
UELP	Universal E1/T1 Lightning Protection unit
UFLP	Universal FE Lightning Protection unit
UMTS	Universal Mobile Telecommunications System
USCU	Universal Satellite card and Clock Unit
USLP2	Universal Signal Lightning Protection unit 2
UTRP	Universal TRansmission Processing unit
WBBP	WCDMA BaseBand Process unit
WCDMA	Wideband Code Division Multiple Access
WMPT	WCDMA Main Processing and Transmission unit
WRFU	WCDMA Radio Filter Unit