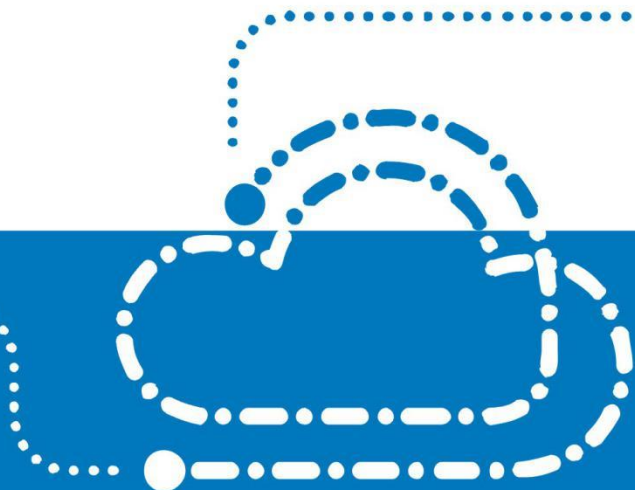




Operator Logo

**ZXSDR R8854 S2600 Product**  
**Description**

UniRAN 16/LTE single-mode





## ZXSDR R8854 S2600 Product Description

Version	Date	Author	Reviewer	Notes

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# 1 Overview

## 1.1 Introduction

This document provides a high level description of ZTE ZXSDR R8854 S2600 (hereinafter R8854 S2600), which is the new compact 4T4R RRU (Remote Radio Unit) used in ZTE wireless total solution. R8854 S2600 provides 4-way transmission and 4-way reception to implement LTE 2\*4, 4\*2 or 4\*4 MIMO. The RRU is based on ZTE common RRU platform, and can work in LTE single mode.

Figure 1-1 Physical Appearance



The document is designed to give an overview of R8854 S2600 characteristics, its key benefits, the architecture, functionality and services, as well as the system capabilities.

This device is restricted to use and put into service due to the need for a spectrum license and/or the conditions attached to authorization for the use of frequencies within all European Union countries (BE/BG/CZ/DK/DE/EE/IE/EL/ES/FR/HR/IT/CY/LV/LT/LU/HU/MT/NL/AT/PL/PT/RO/SI/SK/FI/SE/UK).

## 1.2 Benefits

- **4T4R Supported, Better Performance**



With four-way transmitting channels and four-way receiving channels, R8854 S2600 supports LTE 4\*4 MIMO to improve coverage, data throughput and peak download speed. With 4\*4 MIMO technology and CA solution, the peak downlink throughput of single user achieves higher than 1 Gbps.

- **Faster deployment**

R8854 S2600 is 12L in volume and 17 kg in weight. It is portable to transport and flexible to install on the pole, tower and wall, thus reducing OPEX.

- **High Efficiency, Lower TCO**

It supports dynamic adaptive PA power supply due to the output power, which reduces power consumption.

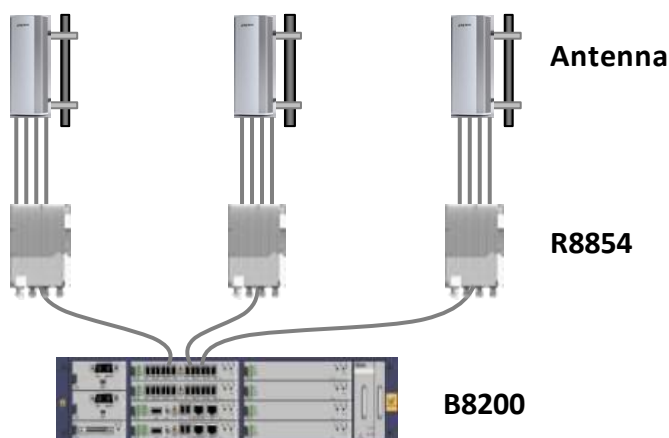
The passive dissipation solution helps to save power consumption and reduce environment noise.

## 1.3 Application Scenarios

Radio unit R8854 S2600 and baseband unit ZXSDR B8200 comprise distributed macro eNodeB. It is mostly used in LTE application with high order MIMO requirements.

Typical application scenario of R8854 S2600 is shown in the following figure.

Figure 1-2 Application Scenarios

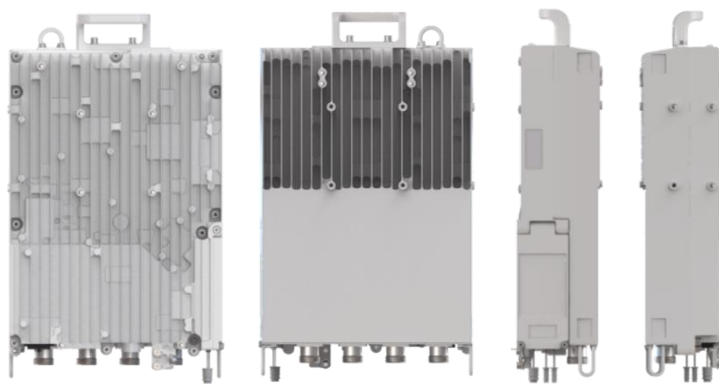


## 2 Product Architecture

### 2.1 Physical Appearance

The physical appearances of R8854 S2600 are shown in the following figure.

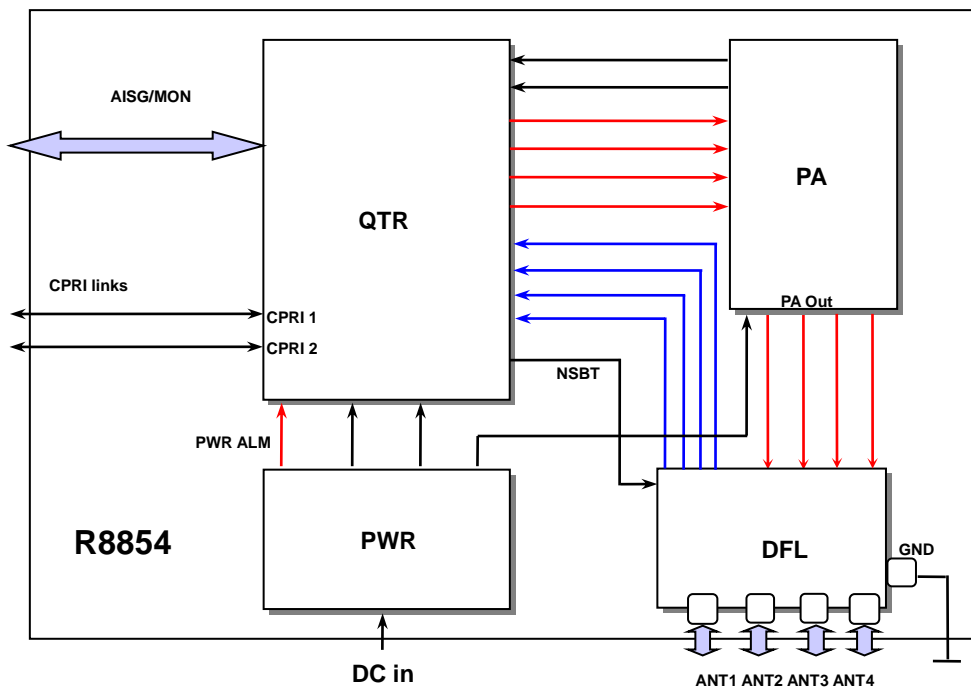
Figure 2-1 Appearance



### 2.2 Hardware Architecture

The hardware architecture of R8854 S2600 is shown in Figure 2-2.

Figure 2-2 System Structure



Notes: QTR means Quad-channel Transceiver used for 4T4R.

R8854 S2600 includes four main hardware modules.

- Quad-channel Transceiver (QTR)
- Duplex Filters (DFL)
- Power Amplifier (PA)
- Power module (PWR)

### 2.2.1 QTR

The QTR has following functions:

- Provides 4 receiving signals and 4 transmitting signals;
- Converts uplink/downlink radio signal;
- Multiplexes downlink IQ signal and de-multiplexes uplink IQ signal;

- Amplifies and filters signals and implements A/D & D/A conversion;
- Implements low noise amplifier (LNA) function;
- Converts optical and electric signal;
- Captures reference clock signal from baseband unit and provides clock signal to other units;
- Measures and reports voltage standing wave ratio (VSWR);
- Implements hardware failure self-detection and alarm;
- Detects and alarms over-heat situation;
- Implements low noise amplifier function;
- Provides communication interfaces of 2 CPRI interfaces, 1 DB15 interface for dry contacts of external monitor equipment communication or AISG connection;
- Implements reset function.

### **2.2.2 DFL**

The DFL has following functions:

- Combines and isolates transmitted and received signals;
- Filters the transmitted signal and received signal;

### **2.2.3 PA**

The PA has following functions:

- Performs radio signal amplifying function;
- Reports temperature information;
- Implements over-heat, over-power and over-standing wave protecting function.

### 2.2.4 PWR

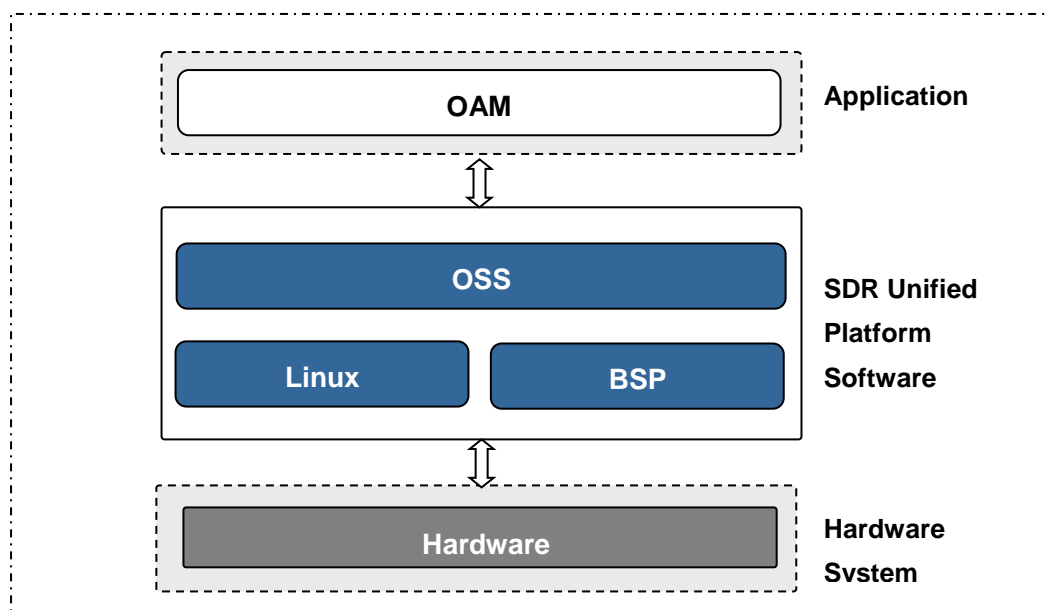
The PWR has following functions:

- Provides power supply function;
- Monitors input over-voltage/under-voltage, input power outage, output over-voltage/under-voltage, output over-current alarm, and reports these situations to QTR board.

## 2.3 Software Architecture

The software architecture of R8854 S2600 can be divided into two layers: SDR Unified Platform Software and Application Software. The architecture is shown in the following figure:

Figure 2-3 Software Architecture



The Operating and Maintenance (OAM) sub-system is the application layer. Its main functions are software downloading, configuration, management, system maintenance and measurement.

The Operation Support Sub-system (OSS) is the supporting layer in this entire framework. It is a hardware independent layer that provides basic functions such as scheduling, timer, and memory management, communication, sequencing control, monitoring, alarming and logging.

The Board Support Package (BSP) provides device driver & initialization and supports basic functions like alarming and monitoring. It also provides the related interfaces and services to the Operating System.

## 2.4 Functionality

R8854 S2600 is the remote radio unit of distributed base station. The signal is transmitted and received through R8854 S2600 to/from base band processing unit for further processing via standard CPRI interface.

By applying the distributed system, the feeder loss will be eliminated when the radio unit is positioned close to the antenna. The coverage is enlarged with this solution.

The functions of R8854 S2600 include:

- Supports E-UTRA operating bands of B7;
- Supports LTE configuration of 5/10/15/20 MHz in B7;
- Supports 4T4R in one box which can optimize spectrum efficiency greatly and improve network uplink performance;
- Support 64QAM modulation in LTE downlink and 64QAM in uplink;
- Supports transmit power report function for every carrier;
- Supports overload protection function for power amplifier;
- Supports transmit channel switching on/off function;
- Supports non-disruptive system services of BBU and other RRUs in case of software failure in R8854 S2600 connecting with them.

### 3 Technical Specifications

#### 3.1 Physical Indices

Table 3-1 Physical Indices

Item	Indices
Size (Length*Width*Depth)	415 * 296 * 104 mm, 12L
Weight	17 kg
Color	Silver gray

#### 3.2 Performance Indices

##### 3.2.1 Operation Frequency Band

Table 3-2 Operation Frequency Band

Band	Operation Radio Frequency Band
B7	Rx: 2500 – 2570 MHz Tx: 2620 – 2690 MHz

##### 3.2.2 Capacity

Table 3-3 Capacity

Mode	Band	RRU Capacity
LTE single mode	B7	2 LTE 4T4R cells, or 2 LTE 2T4R cells, or 4 LTE 2T2R cells

### 3.2.3 Bandwidth

R8854 S2600 supports all LTE bandwidth.

Table 3-4 LTE Cell Bandwidth

Band	LTE Bandwidth
B7	5/10/15/20 MHz

### 3.2.4 ToC Output Power

Table 3-5 ToC Output Power

Type	TOC Output Power [1]
R8854 S2600	4*40W

### 3.2.5 Receiver Sensitivity

The receiver sensitivity of R8854 S2600 is shown as following table.

Table 3-6 Receiver Sensitivity

Mode	Frequency Spectrum(MHz)	Single Antenna (dBm)	Dual Antennas (dBm)	Four Antennas (dBm)
LTE	B7	-106.0	-108.8	-111.6

### 3.2.6 Version Information

Table 3-7 Version Information

Item	Specification
Software version	4.1
Hardware version	1.0

<sup>1</sup> The TOC here means the max capability of the hardware. The specific TOC output power is limited by the license.



### 3.3 Power Indices

#### 3.3.1 Power Requirements

The following table describes the power supply and the fluctuation range.

Table 3-8 Power Supply

Item	Index
Power Supply	DC: -48 V (-37 V – -60 V DC)

R8854 S2600 supports integrated lightning protection module for DC power supply. Its protection level is 20 KA.

#### 3.3.2 Power Consumption

Power consumption of R8854 S2600 in LTE single mode is shown in the table below.

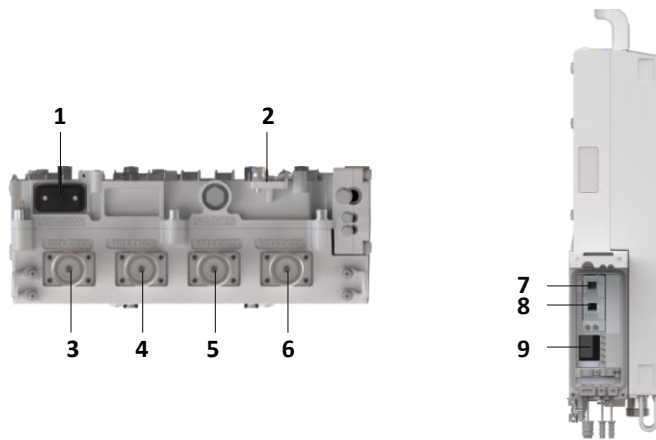
Table 3-9 Power Consumption in LTE Single Mode

Configuration: 2L 4T4R, 4PA, 4*20W/LTE, Total 4*40W		
Module	Average PC (W)	Peak PC (W)
R8854 S2600	315	560

### 3.4 Interface Indices

The external interfaces of the R8854 S2600 are located at the bottom and on the front side of the chassis.

Figure 3-1 External Interfaces Demonstration



For a description of the external interfaces at the bottom of the R8854 S2600 chassis, refer to Table 3-10.

Table 3-10 Description of the External Interfaces at the Bottom

No.	Label	Interface	Interface Type/Connector
1	AISG/MON	AISG equipment interface MON external monitoring interface LMT O&M Ethernet interface	DB15 connector
2	GND	Protective grounding interface	16 mm <sup>2</sup> yellow-green round terminal
3	ANT1 (TX/RX)	TX/RX antenna interface Built-in NSBT	50 Ω DIN-mode connector
4	ANT2 (TX/RX)	TX/RX antenna interface	50 Ω DIN-mode connector
5	ANT3 (TX/RX)	TX/RX antenna interface	50 Ω DIN-mode connector
6	ANT4 (TX/RX)	TX/RX antenna interface	50 Ω DIN-mode connector

For a description of the external interfaces on the right side of the R8854 S2600 chassis, refer to Table 3-11.

Table 3-11 Description of the External Interfaces on the Right Side

No.	Label	Interface	Interface Type/Connector
7	OPT1	Communication between RRU and BBU, or RRU cascading interface	LC-type optical interface (IEC 874)
8	OPT2	RRU cascading interface	LC-type optical interface (IEC 874)
9	PWR	Power input interface	2-pin customized connector

Additionally, R8854 S2600 provides 6 LED indicators. The indicators on the R8854 S2600 panel indicate the operating status of the RRU.

## 3.5 Transmission

R8854 S2600 is connected to BBU through CPRI interfaces. For more information about CPRI interfaces, refer to Table 3-12.

Table 3-12 CPRI Interfaces

Item	Value	Interface Type	Speed	Standard
CPRI interface	2	SFP (LC)	9.8 Gbps <sup>[2]</sup>	CPRI V5.0

## 3.6 Working Environment Indices

Table 3-13 Environment Indices

Item	Characteristics
Temperature	-40 to +55 °C

<sup>2</sup> The speed here refers to the max capability of the hardware. The specific speed depends on the optical module configuration.

Item	Characteristics
Relative Humidity	5% to 100%
Waterproof/Dustproof	IP65
Ground	$\leq 5 \Omega$ ; earth resistance can be less than $10 \Omega$ in thunder-less area where thunderstorm days is less than 20 per year.

### 3.7 Electromagnetic Compatibility Indices

Table 3-14 Electromagnetic Compatibility Indices

Item	Characteristics
Static Discharge Immunity	Contact Discharge: $\pm 6000V$ Air Discharge: $\pm 8000V$
Surge Impact Immunity	DC Power port Line(Ground): $\pm 2000V$

### 3.8 Reliability Indices

R8854 S2600 system reliability conforms to the national military GJB/Z299B Electronic Equipment Reliability Estimation Manual and US military handbook MIL-HDBK-217F Electronic Equipment Reliability Estimation.

Table 3-15 Reliability Characteristics

Item	R8854 S2600
MTBF	$\geq 499,000$ hours
MTTR	1 hour
Availability index	$\geq 99.999800\%$
Down duration	$\leq 1.053$ min/year

## 4 Glossary

Abbreviations	Full Name
3GPP	3 <sup>rd</sup> Generation Partnership Project
BBU	Base Band processing Unit
BSP	Board Support Package
CAPEX	Capital Expenditure
CPRI	Common Public Radio Interface
DIF	Digital Intermediate Frequency
DL	Downlink
DFL	Duplexer & Filters
DPD	Digital Pre-Distortion
EUTRAN	Evolved Universal Mobile Telecommunications System
HSPA+	HSPA Evolution
LMT	Local Maintenance Terminal
LNA	Low-Noise-Amplifier
LTE	Long Term Evolution
MCPA	Multi-Carrier Power Amplifier
MIMO	Multi Input Multi Output
MTBF	Mean Time Between Failures
MTTR	Mean Time To Recovery
OAM	Operating And Maintenance
OFDMA	Orthogonal Frequency Division Multiple Access
OPEX	Operation Expenditure
OSS	Operation Support Sub-system
PA	Power Amplifier
PWR	Power
QTR	Quad-channel Transceiver
RF	Radio Frequency
RRU	Remote Radio Unit
SC-FDMA	Single Carrier Frequency Division Multiple Access

<b>Abbreviations</b>	<b>Full Name</b>
SDR	Software Defined Radio
ToC	Top of Cabinet
UE	User Equipment
UL	Uplink
VSWR	Voltage Standing Wave Ratio