RF Report

(Licensed Equipment)

Product Name: Remote Radio Unit

FCC Product Model: RRU3278

FCC ID: QISRRU3278

Report Number: SYBH(R)06705945-1

Global Compliance and Testing Center of Huawei Technologies Co., Ltd.

(Reliability Laboratory of Huawei Technologies Co., Ltd.)

No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C.
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NOTICE

1. The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.
4. The laboratory has been recognized by the Innovation, Science and Economic Development Canada (ISED) to test to Canadian radio equipment requirements. The CAB identifier is CN0003, and the ISED# is 21741.
5. The laboratory (Reliability Laboratory of Huawei Technologies Co., Ltd.) is also named as "Global Compliance and Testing Center of Huawei Technologies Co., Ltd."; the both names have coexisted since 2009.
6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
7. The test report is invalid if there is any evidence of erasure and/or falsification.
8. The test report is only valid for the test samples.
9. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
10. All dates in the test report, including attachment document(s) (if applicable), have the format of “yyyy-MM-dd”.
11. If any question about this report, please contact the laboratory (PublicGCTC@huawei.com).

Applicant:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Product Name:	Remote Radio Unit
FCC Product Model:	RRU3278
FCC ID:	QISRRU3278
Date of Receipt Sample:	2020-06-30
Start Date of Test:	2020-06-30
End Date of Test:	2020-07-23
Test Result:	Pass

Approved by Senior Engineer:	2020-07-27	Zhang Xinghai	Zhang Xing hai
	Date	Name	Signature
Prepared by:	2020-07-27	Guo Zilin	Guo Zilin
	Date	Name	Signature

MODIFICATION RECORD

No.	Report No.	Modification Description
1	SYBH(R)06705945-1	First release.

CONTENT

1 General Information

1.1 Applied Standard

FCC Rules / ISED Radio Standards Specifications:	47CFR FCC Part 2	(Note)
	47CFR FCC Part 96	(Note)

Note: The most up to date FCC rules are applied, see http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title47/47tab_02.tpl.

Test Methods: ANSI C63.26-2015
FCC KDB Publication 971168 D01 v03r01(04/09/2018)
FCC KDB Publication 662911 D01 v02r01 (10/31/2013)
FCC KDB Publication 940660 D01 v02 (04/19/2019)

1.2 Test Location

☒ TL#DG1: Global Compliance and Testing Center of Huawei Technologies Co., Ltd.
(Reliability Laboratory of Huawei Technologies Co., Ltd.)
No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C.

☐ TL#DG2: Global Compliance and Testing Center of Huawei Technologies Co., Ltd.
(Reliability Laboratory of Huawei Technologies Co., Ltd.)
No.1, Gaoxiong Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C.

Note: The house number of Huawei R&D laboratory was changed from “No.18, Alishan Avenue” to “No.1, Gaoxiong Avenue” by Songshan Lake Branch of Dongguan Public Security Bureau.

2 Test Summary

NOTE 1: The detailed TEST RECORDS (TEST INFORMATION, TEST PLANS and TEST RESULTS) for the following test items are contained in the attachment document(s).

NOTE 2: The test locations for each test items are listed in TEST RECORDS.

NOTE 3: In the following table(s),

- Pass : Test results comply with the requirements
- Pass* : Test results, based on those in historical report(s), comply with the requirements
- NA : Not applicable
- NC : No conclusion

2.1 CBSD band

TEST RECORDS#: SYBH(R)06705945-1-TR1

Test Item	Requirements	Method	Verdict
RF power output	● FCC §2.1046, §96.41(b), §96.41(g)	● ANSI C63.26 §5.2 ● ANSI C63.26 §6.4	Pass
Peak-to average Ratio	● FCC §96.41(g)	● ANSI C63.26 §5.2	Pass
Modulation characteristics	● FCC §2.1047, §96.41(a)	● ANSI C63.26 §5.3	Pass
Bandwidth	● FCC §2.1049, §96.41(e)(3)	● ANSI C63.26 §5.4	Pass
Band Edges Compliance / Emission Mask	● FCC §2.1051, §96.41(e)	● ANSI C63.26 §5.7 ● ANSI C63.26 §6.4	Pass
Spurious emissions at antenna terminals	● FCC §2.1051, §2.1057, §96.41(e)	● ANSI C63.26 §5.7 ● ANSI C63.26 §6.4	Pass
Field strength of spurious radiation	● FCC §2.1053, §2.1057, §96.41(e)	● ANSI C63.26 §5.5	Pass
Frequency stability	● FCC §2.1055	● ANSI C63.26 §5.6	Pass

3 Description of the EUT

3.1 General Description

The RRU3278 is a type of radio remote unit. It implements conversion between baseband signals, IF signals, and RF signals, demodulates the received radio signals, and modulates the signals to be transmitted, and amplifies the transmit power of the signals.

3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

3.2.1 Board

Name	Hardware Version	Description
WD5BPRX8DXM	Ver.A	Manufactured Board,DBS3900 LTE TDD, WD5BPRX8DXM,IRF RRU Unit

3.2.2 Sub-Assembly

Name	Model	Manufacturer	Description
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3.3 Technical Specification

NOTE: For the detailed technical descriptions, see the applicant/manufacturer's specifications or user manual.

3.3.1 General

Characteristics	Description	
Radio System Type	☐ GSM ☐ UMTS ☒ LTE ☐ LTE with NB-IoT ☐ NB-IoT standalone ☐ NR	
Supported Frequency Range	Band 48: Downlink: Uplink:	 3550 to 3700 MHz 3550 to 3700 MHz
TX and RX Antenna Ports	Band 48: TX & RX: TX-only: RX-only:	 8 (ANT1, …, ANT8) 0 0
Supported Channel Bandwidth	LTE: Band 48:	 20 MHz
Type of Modulation	LTE:	QPSK, 16QAM, 64QAM, 256QAM
Supported Maximum Multiple-Carriers Number	Band 48: LTE:	 4
Maximum RF bandwidth	Band 48:	☒ Contiguous spectrum: 150 MHz ☒ Non-contiguous spectrum: 150 MHz
TX Output Power (General)	Band 48:	Max. 0.64 W (per antenna port) Max. 5.12 W (Eight antenna ports)
Lowest Internal Frequency	30.72 MHz	
Power Supply	Power supply type	☐ External AC mains ☒ External DC mains ☐ AC/DC Adapter ☐ Powered over Ethernet (PoE)
	Nominal voltage, input to EUT	-48 VDC
	Voltage range, input to EUT	-36 to -57 VDC
Working/Operating Environment	Temperature	-40 to +55 °C
	Relative humidity	5 to 100 %

3.3.2 Antenna System

NOTE 1: In this document, the “detachable antenna” is the antenna that can be removed and replaced with other antenna, it could be one of the following:
(1) No antenna supplied – the antenna is not supplied or equipped by the equipment manufacturer on sale; OR
(2) Dedicated antenna – the removable antenna supplied with the equipment, designed as an indispensable part of equipment, using an antenna connector with or without a cable and which has been designed or developed for one or more specific types of equipment.

NOTE 2: In this document, the “integral antenna” refers to the antenna designed as a permanent fixed part of the equipment, without the use of an external connector and which cannot be disconnected from the equipment by a user with the intent to connect another antenna. For the testing purpose, a temporary RF connector may be provided.

3.3.2.1 Antenna types list for transmitters with detachable antenna

NOTE 1: The following information comes from user manual. The maximum permissible antenna gain shall include the effect of array gain (see ANSI C63.26 §6.4 and FCC KDB publication 662911).

#	Type	Maximum permissible antenna gain	Required impedance
1	Directional / Omni-directional / Cluster	17dBi	50 Ohm

3.3.3 Special for Operating Bands

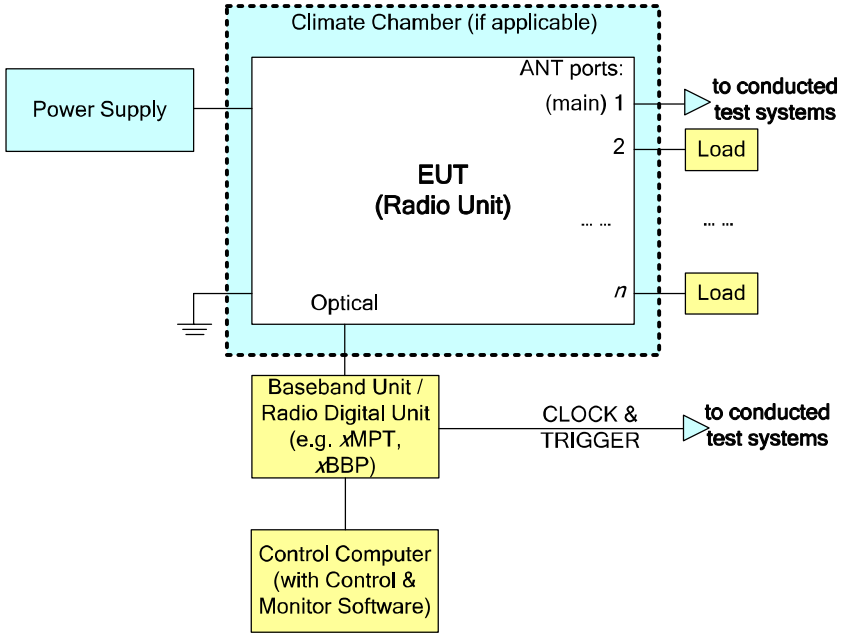
3.3.3.1 CBSD band

Parameters	Description
Equipment type	☐ End User Device ☐ Category A CBSD ☒ Category B CBSD

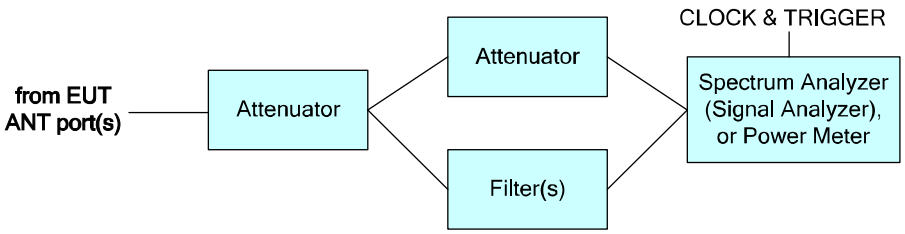
4 Test Setups and Test Procedures

4.1 Test Setup for Conducted Test Items

4.1.1 EUT Arrangement

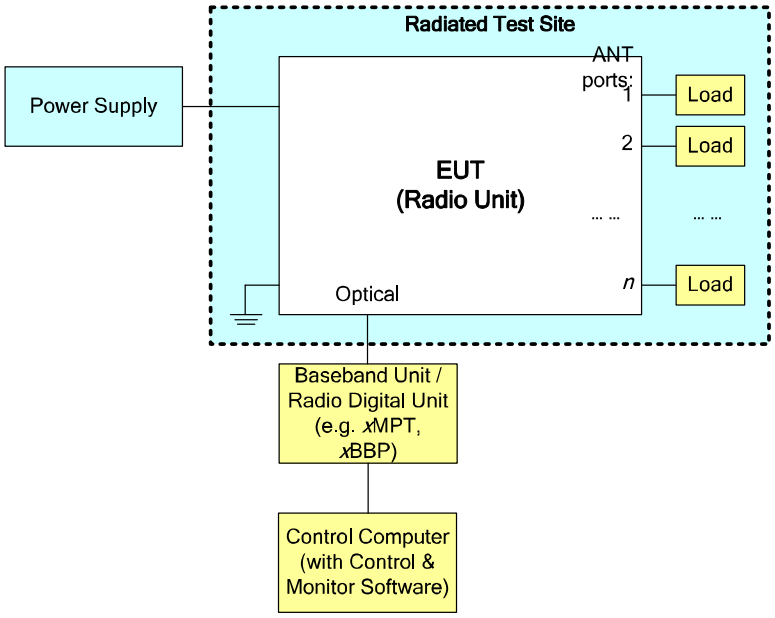


4.1.2 Test Setup



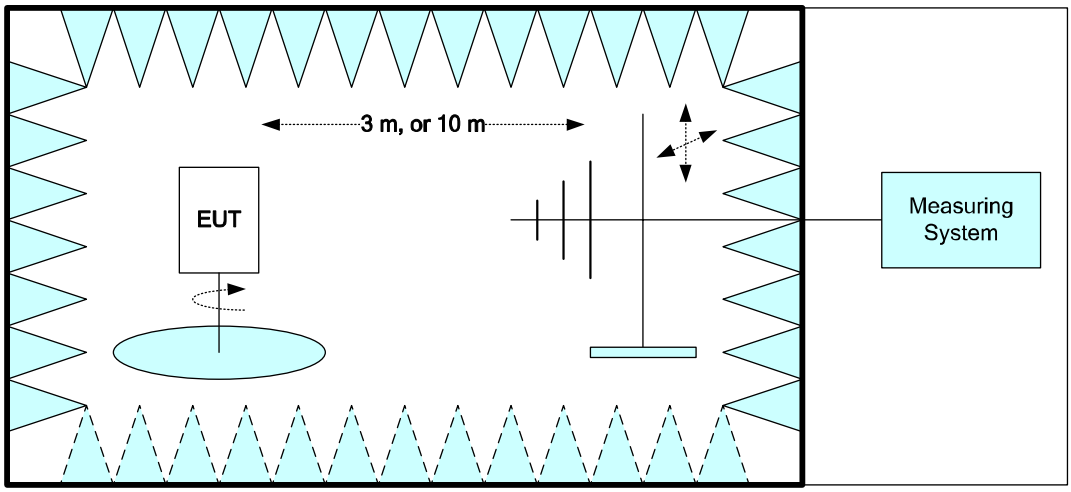
4.2 Test Setup for Radiated Test Items (ERP/EIRP)

4.2.1 EUT Arrangement

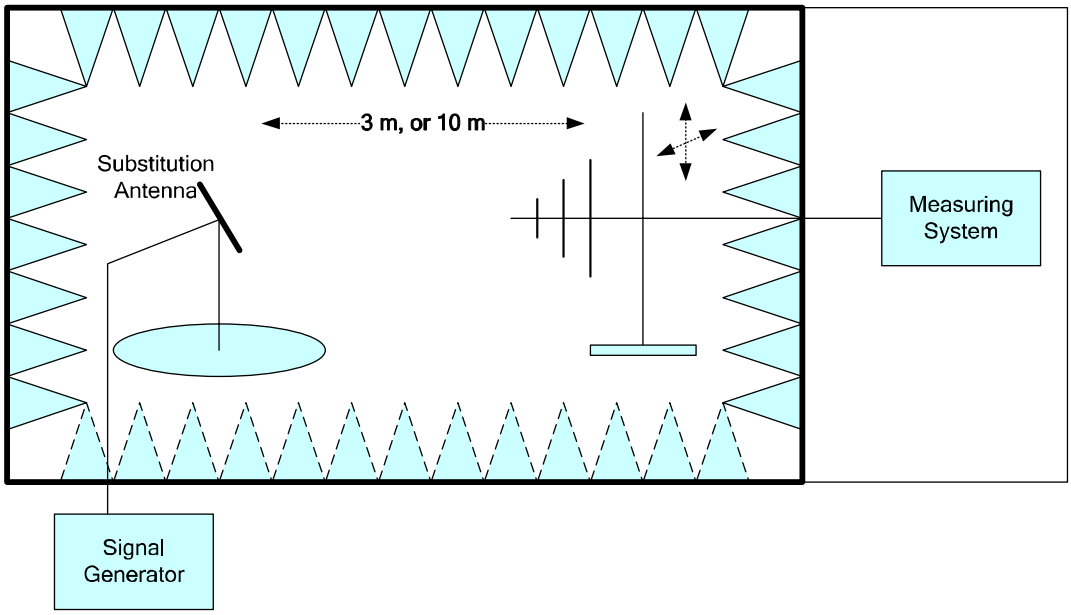


4.2.2 Test Setup

(1) Pre-test:



(2) Substitution method to verify the maximum ERP/EIRP:


3 m, or 10 m
Substitution Antenna
Measuring System
Signal Generator

5 System Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
Transmitter Output Power	Power [dBm]	U = 0.39 dB
Bandwidth	Magnitude [%]	U = 0.2%
Band Edge Compliance	Disturbance Power [dBm]	U = 2.0 dB
Spurious Emissions, Conducted	Disturbance Power [dBm]	U = 2.0 dB
Radiation Emission	Power [dBm] / Field Strength [dBμV/m]	For 3 m Chamber: U = 4.15 dB (30 MHz-1 GHz) U = 3.64 dB (1 GHz-18 GHz) U = 3.26 dB (18 GHz-26.5 GHz) U = 3.83 dB (26.5 GHz-40 GHz)
Frequency Stability	Frequency Accuracy [ppm]	U = 0.21 ppm

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