



RF Test Report

Product Name: Remote Radio Unit

Product Model: RRU3942-850

Report Number: SYBH(R)00666679EB-1

FCC ID: QISRRU3942-850

IC ID: 6369A-3942B5

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

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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 listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1 and 6369A-3.
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Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
 Bantian, Longgang District, Shenzhen, 518129, P.R.C
Product Name: Remote Radio Unit
Product Model: RRU3942-850

Date of Receipt Sample: 2012-05-24
Start Date of Test: 2012-05-24
End Date of Test: 2012-11-08

Test Result: Pass

Approved by Senior Engineer:	2012-11-08	Zhang Xinghai	<i>Zhang Xing hai</i>
	Date	Name	Signature

Prepared by:	2012-11-08	Hu Wei	<i>Hu Wei</i>
	Date	Name	Signature



Modification Record

No.	Last Report No.	Modification Description
1	---	First report.



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1 General Information

1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 02 (10-1-11 Edition)
47 CFR FCC Part 22 (10-1-11 Edition)
IC RSS-Gen (Issue 3, December 2010)
IC RSS-132 (Issue 2, September 2005)

Test Method: FCC KDB 971168 D01 Power Meas License Digital Systems v01
FCC KDB 662911 D01 Multiple Transmitter Output v01

1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.3 Test Environment Condition

Ambient Temperature: 22 to 26 °C
Ambient Relative Humidity: 54 to 70 %
Atmospheric Pressure: Not applicable



2 Test Summary

2.1 Cellular Band (824-849 MHz paired with 869-894 MHz)

2.1.1 Non-measurement Technical Requirements

Description	FCC Rule No.	IC Rule No.	Requirements	Test Result	Verdict (NOTE)
Modulation Characteristics	§2.1047	RSS-132, §4.2	Digital modulation.	See technical specification description.	Comply
NOTE: For the verdict, the "N/A" denotes "not applicable".					

2.1.2 Base Station

Test Item	FCC Rule No.	IC Rule No.	Requirements	Test Result	Verdict (NOTE 2)
RF Power Output	§2.1046, §22.913	RSS-Gen, §4.8; RSS-132, §4.4	FCC: ERP ≤ 500 W. IC: EIRP ≤ 820 W.	Appendix A	Pass
Bandwidth	§2.1049, §22.917	RSS-Gen, §4.6	OBW: No limit. EBW: No limit.	Appendix B	Pass
Band Edges Compliance	§2.1051, §22.917	RSS-Gen, §4.9; RSS-132, §4.5	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix C	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917	RSS-Gen, §4.9; RSS-132, §4.5	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges. IC: ≤ -13 dBm/100 kHz (for EBW ≤ 4 MHz) or ≤ -13 dBm/1 MHz (for EBW > 4 MHz), from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Appendix D	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917	RSS-Gen, §4.9; RSS-132, §4.5	FCC: ≤ -13 dBm/100 kHz. IC: ≤ -13 dBm/100 kHz (for EBW ≤ 4 MHz) or ≤ -13 dBm/1 MHz (for EBW > 4 MHz).	Appendix E	Pass
Frequency Stability	§2.1055, §22.355	RSS-Gen, §4.7; RSS-132, §4.3	≤ ±1.5ppm.	Appendix F	Pass
Receiver Spurious Emissions	---	RSS-Gen, §4.10; RSS-Gen, §6;	Radiated limit: RSS-Gen, §6.1 field strength limit. Conducted limit: ≤ -57 dBm/120 kHz	Appendix G	Pass



Test Item	FCC Rule No.	IC Rule No.	Requirements	Test Result	Verdict (NOTE 2)
(NOTE 1)		RSS-132, §4.6	(CISPR-QP), from 30 MHz to 1000 MHz, and ≤ -53 dBm/1 MHz (AV), from 1 GHz to 3 rd harmonics.		
Photos of Test Setups	---	---	---	Appendix H	---
<p>NOTE 1: For Receiver Spurious Emissions, If the receiver has a detachable antenna of known impedance, antenna conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method is recommended. The antenna conducted test shall be performed with the antenna disconnected and the receiver antenna terminals connected to a measuring instrument having equal impedance to that specified for the antenna.</p> <p>NOTE 2: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".</p>					



3 Description of the Equipment under Test (EUT)

3.1 General Description

The RRU is an outdoor remote radio unit. It is the radio frequency (RF) part of a distributed base station and can be located near antennas. The RRU can modulate, demodulate, combine, and divide baseband and RF signals. It also processes baseband and RF signal data.

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

Board		
Board Name	Hardware Version	Description
WD5GMRAC50	Ver.A	Power Amplifier Board
WD5GMRXC50	Ver.A	Transceiver Board

3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
WBBP	--	Huawei	NodeB baseband Unit
WMPT	--	Huawei	Main Processing Unit
GTMU	--	Huawei	GBTS baseband Unit



3.3 Technical Specification

Characteristics	Description
Radio System Type	Single Radio Access <input checked="" type="checkbox"/> GSM Technology <input checked="" type="checkbox"/> UMTS (Single-RAT): <input type="checkbox"/> LTE <input type="checkbox"/> CDMA <input type="checkbox"/> WiMAX Multi-Standard Radio <input checked="" type="checkbox"/> GSM & UMTS (MSR): <input type="checkbox"/> GSM & LTE <input type="checkbox"/> GSM & UMTS & LTE <input type="checkbox"/> WiMAX & LTE <input type="checkbox"/> CDMA & LTE
Equipment Type	<input checked="" type="checkbox"/> Base Station, <input type="checkbox"/> Subscriber Station, <input type="checkbox"/> Fixed Station, <input type="checkbox"/> Mobile Station, <input type="checkbox"/> Portable Station
Supported Frequency Range	Transmission (TX): 869 to 894 MHz Receiving (RX): 824 to 849 MHz
TX and RX Antenna Ports	TX & RX port: 2 TX-only port: 0 RX-only port: 2
Multiple Carrier Supported	8
Maximum RF Bandwidth	25 MHz
TX Output Power	Max. 120 W (two antenna ports)
Supported Channel Bandwidth	GSM system: <input checked="" type="checkbox"/> 200 kHz UMTS system: <input checked="" type="checkbox"/> 5 MHz LTE system: <input type="checkbox"/> 1.4 MHz, <input type="checkbox"/> 3 MHz, <input type="checkbox"/> 5 MHz, <input type="checkbox"/> 10 MHz, <input type="checkbox"/> 15 MHz, <input type="checkbox"/> 20 MHz CDMA system: <input type="checkbox"/> 1.23 MHz, <input type="checkbox"/> 1.25 MHz WiMAX system: <input type="checkbox"/> 5 MHz, <input type="checkbox"/> 7 MHz, <input type="checkbox"/> 10 MHz
Modulation Type	Base-band: GMSK, 8PSK, QPSK, 16QAM, 64QAM Carrier: FDMA, CDMA
Designation of Emissions (Note: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.)	GSM system: 247KGXW, 254KG7W UMTS system: 4M17F9W LTE system: Not applicable CDMA system: Not applicable WiMAX system: Not applicable
Power Supply	Power Supply Type: <input type="checkbox"/> External AC mains, <input checked="" type="checkbox"/> External DC mains, <input type="checkbox"/> AC/DC Adapter, <input type="checkbox"/> Powered over Ethernet (PoE) Nominal Voltage, -48 VDC



Characteristics	Description
	Input to EUT: Voltage Range, -36 to -57 VDC Input to EUT:
Antenna Assembles	Antenna Type: <input checked="" type="checkbox"/> External <input type="checkbox"/> Integrated Smart Antenna: <input checked="" type="checkbox"/> MIMO <input type="checkbox"/> Non MIMO Antenna Gain: 7 dBi (per antenna port, max.) Remark: When the EUT is put into service, the combination of the practical output power and the practical antenna gain should NOT exceed the required ERP/EIRP limit.



4 General Test Conditions / Configurations

4.1 Test Modes

NOTE: The test mode(s) are selected according to relevant radio technology specifications.

Test Mode	Test Modes Description
GSM/GMSK	GSM system, GSM/GPRS, GMSK modulation
GSM/8PSK	GSM system, EDGE, 8PSK modulation
UMTS/TM1	UMTS system, 3GPP TS 25.141 clause 6.1.1, Test Model 1, QPSK modulation
GU/TM1	MSR system, 3GPP TS 37.141 clause 4.9.2 (GSM/GMSK; UMTS/TM1)
GU/TM2	MSR system, 3GPP TS 37.141 clause 4.9.2 (GSM/8PSK; UMTS/TM1)



4.2 EUT Configurations

4.2.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, <ul style="list-style-type: none"> - All TX tests are ONLY performed at the main TX antenna port (e.g. TRXA, TXA or similar) of the EUT, and - All RX tests are ONLY performed at the main RX antenna port (e.g. TRXA, RXB or similar) of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

4.2.2 Customized Configurations

NOTE: For the carrier configurations, the description of “n*TxxxM(yyyW)@zzz” denotes the n * multiple carriers of the radio system type T (G - GSM system, U - UMTS system, L - LTE system, C - CDMA system, W - WiMAX system), for which the channel bandwidth of each carrier is xxx MHz (applicable for T supporting various channel bandwidths) and the power level of each carrier is yyy Watts, at the antenna port zzz (if specified). While the combinations of several “n*TxxxM(yyyW)@zzz”s denotes the carrier configurations of the MSR system.

EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
1U_B	B	1*U(80W) @TRXB	871.4	826.4	5	49	UMTS/TM1
1U_M	M	1*U(80W) @TRXB	881.4	836.4	5	49	UMTS/TM1
1U_T	T	1*U(80W) @TRXB	891.6	846.6	5	49	UMTS/TM1
2U_B	B	2*U(40W) @TRXB	871.4,876.4	826.4,831.4	5,5	46,46	UMTS/TM1
2U_M	M	2*U(40W) @TRXB	879,884	834,839	5,5	46,46	UMTS/TM1
2U_T	T	2*U(40W) @TRXB	886.6,891.6	841.6,846.6	5,5	46,46	UMTS/TM1
3U_B	B	3*U(20W) @TRXB	871.4,876.4,881.4	826.4,831.4,836.4	5,5,5	43,43,43	UMTS/TM1
3U_T	T	3*U(20W) @TRXB	881.6,886.6,891.6	836.6,841.6,846.6	5,5,5	43,43,43	UMTS/TM1
1G_GMSK_B	B	1*G(80W) @TRXB	869.4	824.4	0.2	49	GSM/G



EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
							MSK
1G_GMSK_M	M	1*G(80W) @TRXB	881.4	836.4	0.2	49	GSM/G MSK
1G_GMSK_T	T	1*G(80W) @TRXB	893.6	848.6	0.2	49	GSM/G MSK
1G_8PSK_B	B	1*G(80W) @TRXB	869.4	824.4	0.2	49	GSM/8 PSK
1G_8PSK_M	M	1*G(80W) @TRXB	881.4	836.4	0.2	49	GSM/8 PSK
1G_8PSK_T	T	1*G(80W) @TRXB	893.6	848.6	0.2	49	GSM/8 PSK
2G_GMSK_B	B	2*G(40W) @TRXB	869.4,870	824.4,825	0.2,0.2	46,46	GSM/G MSK
2G_GMSK_M	M	2*G(40W) @TRXB	881.2,881.8	836.2,836.8	0.2,0.2	46,46	GSM/G MSK
2G_GMSK_T	T	2*G(40W) @TRXB	893,893.60	848,848.60	0.2,0.2	46,46	GSM/G MSK
2G_8PSK_B	B	2*G(40W) @TRXB	869.4,870	824.4,825	0.2,0.2	46,46	GSM/8 PSK
2G_8PSK_M	M	2*G(40W) @TRXB	881.2,881.8	836.2,836.8	0.2,0.2	46,46	GSM/8 PSK
2G_8PSK_T	T	2*G(40W) @TRXB	893,893.60	848,848.60	0.2,0.2	46,46	GSM/8 PSK
3G_GMSK_B	B	3*G(27W) @TRXB	869.4,870,870.6	824.4,825,825.6	0.2,0.2,0.2	44.3,44.3,44.3	GSM/G MSK
3G_GMSK_M	M	3*G(27W) @TRXB	880.8,881.4,882	835.8,836.4,837	0.2,0.2,0.2	44.3,44.3,44.3	GSM/G MSK
3G_GMSK_T	T	3*G(27W) @TRXB	892.4,893,893.6	847.4,848,848.6	0.2,0.2,0.2	44.3,44.3,44.3	GSM/G MSK
3G_8PSK_B	B	3*G(27W) @TRXB	869.4,870,870.6	824.4,825,825.6	0.2,0.2,0.2	44.3,44.3,44.3	GSM/8 PSK
3G_8PSK_M	M	3*G(27W) @TRXB	880.8,881.4,882	835.8,836.4,837	0.2,0.2,0.2	44.3,44.3,44.3	GSM/8 PSK
3G_8PSK_T	T	3*G(27W) @TRXB	892.4,893,893.6	847.4,848,848.6	0.2,0.2,0.2	44.3,44.3,44.3	GSM/8 PSK
4G_GMSK_B	B	4*G(20W) @TRXB	869.4,870,870.6,871.2	824.4,825,825.6,826.2	0.2,0.2,0.2,0.2	43,43,43,43	GSM/G MSK
4G_GMSK_M	M	4*G(20W) @TRXB	880.6,881.2,881.8,882.4	835.6,836.2,836.8,837.4	0.2,0.2,0.2,0.2	43,43,43,43	GSM/G MSK
4G_GMSK_T	T	4*G(20W) @TRXB	891.8,892.4,893	846.8,847.4,848	0.2,0.2,0.2,0.2	43,43,43,43	GSM/G



EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
			,893.6	8,848.6	0.2	43	MSK
4G_8PSK_B	B	4*G(20W) @TRXB	869.4,870,870.6 ,871.2	824.4,825,825. 6,826.2	0.2,0.2,0.2, 0.2	43,43,43, 43	GSM/8 PSK
4G_8PSK_M	M	4*G(20W) @TRXB	880.6,881.2,881 .8,882.4	835.6,836.2,83 6,8,837.4	0.2,0.2,0.2, 0.2	43,43,43, 43	GSM/8 PSK
4G_8PSK_T	T	4*G(20W) @TRXB	891.8,892.4,893 ,893.6	846.8,847.4,84 8,848.6	0.2,0.2,0.2, 0.2	43,43,43, 43	GSM/8 PSK
5G_GMSK_B	B	5*G(16W) @TRXB	869.4,870,870.6 ,871.2,871.8	824.4,825,825. 6,826.2,826.8	0.2,0.2,0.2, 0.2,0.2	42,42,42, 42,42	GSM/G MSK
5G_GMSK_M	M	5*G(16W) @TRXB	880.2,880.8,881 .4,882,882.6	835.2,835.8,83 6.4,837,837.6	0.2,0.2,0.2, 0.2,0.2	42,42,42, 42,42	GSM/G MSK
5G_GMSK_T	T	5*G(16W) @TRXB	891.2,891.8,892 .4,893,893.6	846.2,846.8,84 7.4,848,848.6	0.2,0.2,0.2, 0.2,0.2	42,42,42, 42,42	GSM/G MSK
5G_8PSK_B	B	5*G(16W) @TRXB	869.4,870,870.6 ,871.2,871.8	824.4,825,825. 6,826.2,826.8	0.2,0.2,0.2, 0.2,0.2	42,42,42, 42,42	GSM/8 PSK
5G_8PSK_M	M	5*G(16W) @TRXB	880.2,880.8,881 .4,882,882.6	835.2,835.8,83 6.4,837,837.6	0.2,0.2,0.2, 0.2,0.2	42,42,42, 42,42	GSM/8 PSK
5G_8PSK_T	T	5*G(16W) @TRXB	891.2,891.8,892 .4,893,893.6	846.2,846.8,84 7.4,848,848.6	0.2,0.2,0.2, 0.2,0.2	42,42,42, 42,42	GSM/8 PSK
6G_GMSK_B	B	6*G(12W) @TRXB	869.4,870,870.6 ,871.2,871.8,87 2.4	824.4,825,825. 6,826.2,826.8,8 27.4	0.2,0.2,0.2, 0.2,0.2,0.2	40.8,40.8, 40.8,40.8, 40.8,40.8	GSM/G MSK
6G_GMSK_M	M	6*G(12W) @TRXB	880,880.6,881.2 ,881.8,882.4,88 3	835,835.6,836. 2,836.8,837.4,8 38	0.2,0.2,0.2, 0.2,0.2,0.2	40.8,40.8, 40.8,40.8, 40.8,40.8	GSM/G MSK
6G_GMSK_T	T	6*G(12W) @TRXB	890.6,891.2,891 .8,892.4,893,89 3.6	845.6,846.2,84 6.8,847.4,848,8 48.6	0.2,0.2,0.2, 0.2,0.2,0.2	40.8,40.8, 40.8,40.8, 40.8,40.8	GSM/G MSK
6G_8PSK_B	B	6*G(12W) @TRXB	869.4,870,870.6 ,871.2,871.8,87 2.4	824.4,825,825. 6,826.2,826.8,8 27.4	0.2,0.2,0.2, 0.2,0.2,0.2	40.8,40.8, 40.8,40.8, 40.8,40.8	GSM/8 PSK
6G_8PSK_M	M	6*G(12W) @TRXB	880,880.6,881.2 ,881.8,882.4,88 3	835,835.6,836. 2,836.8,837.4,8 38	0.2,0.2,0.2, 0.2,0.2,0.2	40.8,40.8, 40.8,40.8, 40.8,40.8	GSM/8 PSK
6G_8PSK_T	T	6*G(12W) @TRXB	890.6,891.2,891 .8,892.4,893,89 3.6	845.6,846.2,84 6.8,847.4,848,8 48.6	0.2,0.2,0.2, 0.2,0.2,0.2	40.8,40.8, 40.8,40.8, 40.8,40.8	GSM/8 PSK
7G_GMSK_B	B	7*G(6W) @TRXB	869.4,870,870.6 ,871.2,871.8,87 2.4,873	824.4,825,825. 6,826.2,826.8,8 27.4,828	0.2,0.2,0.2, 0.2,0.2,0.2, 0.2	37.8,37.8, 37.8,37.8, 37.8,37.8,	GSM/G MSK



EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
						37.8	
7G_GMSK_M	M	7*G(6W) @TRXB	879.6,880.2,880.8,881.4,882,882.6,883.2	834.6,835.2,835.8,836.4,837,837.6,838.2	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37.8,37.8,37.8,37.8,37.8,37.8,37.8	GSM/GMSK
7G_GMSK_T	T	7*G(6W) @TRXB	890,890.6,891.2,891.8,892.4,893,893.6	845,845.6,846.2,846.8,847.4,848,848.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37.8,37.8,37.8,37.8,37.8,37.8,37.8	GSM/GMSK
7G_8PSK_B	B	7*G(6W) @TRXB	869.4,870,870.6,871.2,871.8,872.4,873	824.4,825,825.6,826.2,826.8,827.4,828	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37.8,37.8,37.8,37.8,37.8,37.8,37.8	GSM/8PSK
7G_8PSK_M	M	7*G(6W) @TRXB	879.6,880.2,880.8,881.4,882,882.6,883.2	834.6,835.2,835.8,836.4,837,837.6,838.2	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37.8,37.8,37.8,37.8,37.8,37.8,37.8	GSM/8PSK
7G_8PSK_T	T	7*G(6W) @TRXB	890,890.6,891.2,891.8,892.4,893,893.6	845,845.6,846.2,846.8,847.4,848,848.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37.8,37.8,37.8,37.8,37.8,37.8,37.8	GSM/8PSK
8G_GMSK_B	B	8*G(5W) @TRXB	869.4,870,870.6,871.2,871.8,872.4,873,873.6	824.4,825,825.6,826.2,826.8,827.4,828,828.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37,37,37,37,37,37,37	GSM/GMSK
8G_GMSK_M	M	8*G(5W) @TRXB	879.4,880,880.6,881.2,881.8,882.4,883,883.6	834.4,835,835.6,836.2,836.8,837.4,838,838.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37,37,37,37,37,37,37	GSM/GMSK
8G_GMSK_T	T	8*G(5W) @TRXB	889.4,890,890.6,891.2,891.8,892.4,893,893.6	844.4,845,845.6,846.2,846.8,847.4,848,848.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37,37,37,37,37,37,37	GSM/GMSK
8G_8PSK_B	B	8*G(5W) @TRXB	869.4,870,870.6,871.2,871.8,872.4,873,873.6	824.4,825,825.6,826.2,826.8,827.4,828,828.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37,37,37,37,37,37,37	GSM/8PSK
8G_8PSK_M	M	8*G(5W) @TRXB	879.4,880,880.6,881.2,881.8,882.4,883,883.6	834.4,835,835.6,836.2,836.8,837.4,838,838.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37,37,37,37,37,37,37	GSM/8PSK
8G_8PSK_T	T	8*G(5W) @TRXB	889.4,890,890.6,891.2,891.8,892.4,893,893.6	844.4,845,845.6,846.2,846.8,847.4,848,848.6	0.2,0.2,0.2,0.2,0.2,0.2,0.2	37,37,37,37,37,37,37	GSM/8PSK
1G1U_B	B	1*G(40W) @TRXB 1*U(40W) @TRXB	869.4,878.8	824.4,833.8	0.2,5	46,46	GU/TM 1



EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
1G1U_T	T	1*G(40W) @TRXB 1*U(40W) @TRXB	884.2,893.6	839.2,848.6	5,0.2	46,46	GU/TM 1
1G2U_B	B	1*G(40W) @TRXB 2*U(20W) @TRXB	869.4,872.6,877 .6	824.4,827.6,83 2.6	0.2,5,5	46,43,43	GU/TM 1
1G2U_T	T	1*G(40W) @TRXB 2*U(20W) @TRXB	885.2,890.2,893 .6	840.2,845.2,84 8.6	5,5,0.2	43,43,46	GU/TM 1
2G1U_B	B	2*G(30W) @TRXB 1*U(20W) @TRXB	869.4,875.2,881	824.4,830.2,83 6	0.2,5,0.2	44.8,43,4 4.8	GU/TM 1
2G1U_T	T	2*G(30W) @TRXB 1*U(20W) @TRXB	882,887.8,893.6	837,842.8,848. 6	0.2,5,0.2	44.8,43,4 4.8	GU/TM 1
3G1U_B	B	3*G(20W) @TRXB 1*U(20W) @TRXB	869.4,870,875.2 ,881	824.4,825,830. 2,836	0.2,0.2,5,0. 2	43,43,43, 43	GU/TM 1
3G1U_T	T	3*G(20W) @TRXB 1*U(20W) @TRXB	882,887.8,893,8 93.6	837,842.8,848, 848.6	0.2,5,0.2,0. 2	43,43,43, 43	GU/TM 1

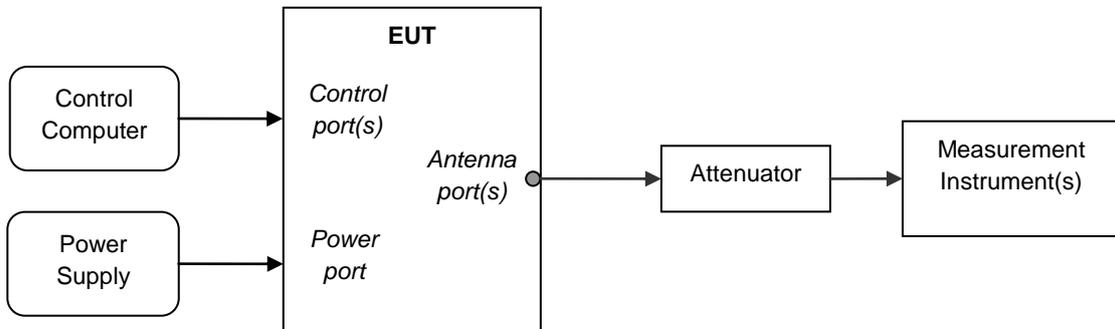


4.3 Test Environments

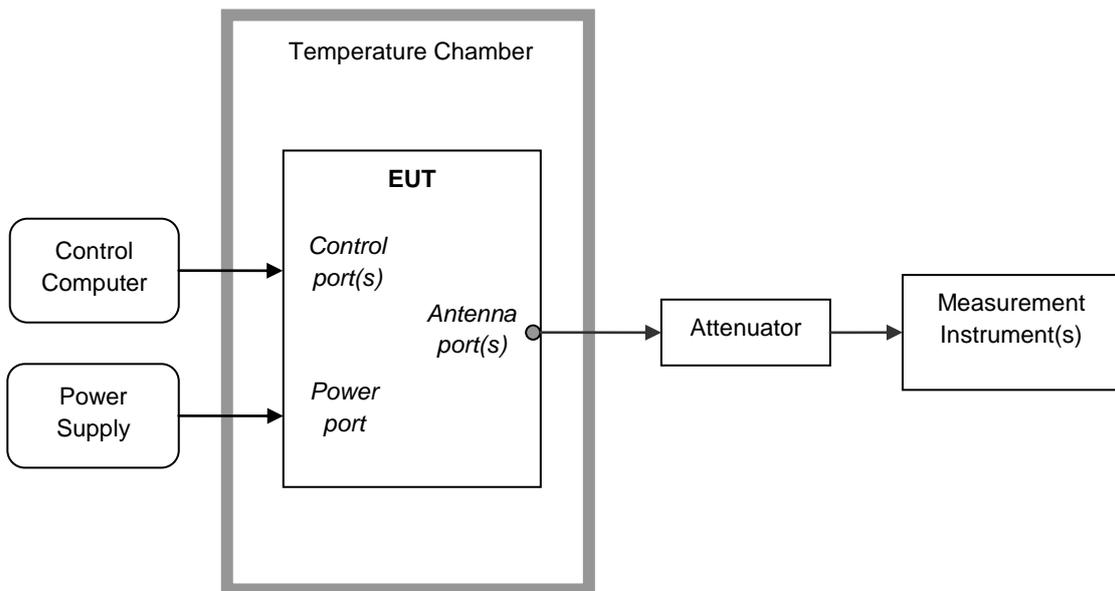
Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
Ambient Climate	Ambient	---	Ambient
Rated Voltage	---	-48 VDC	---

4.4 Test Setups

4.4.1 Test Setup 1



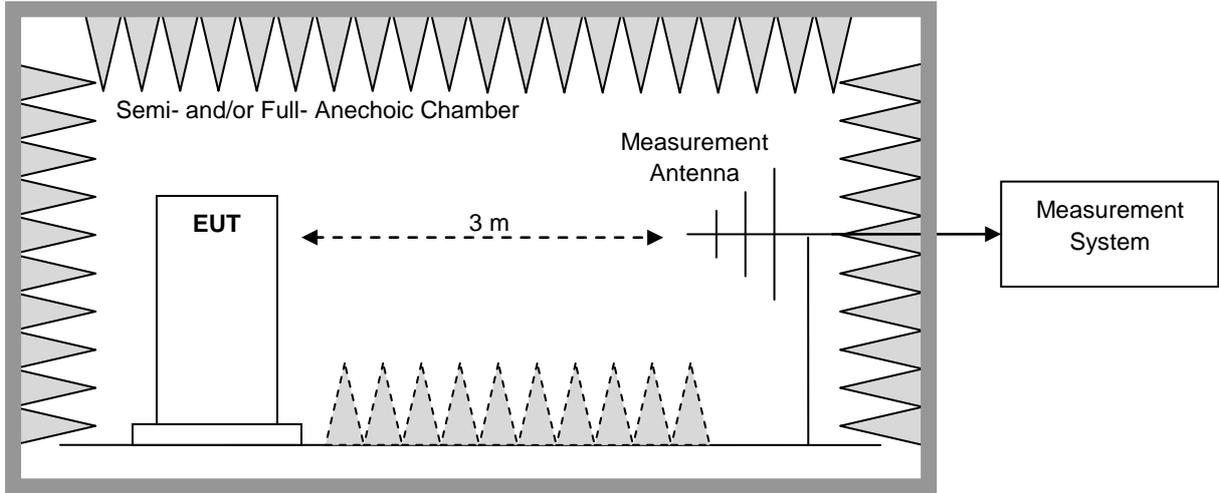
4.4.2 Test Setup 2



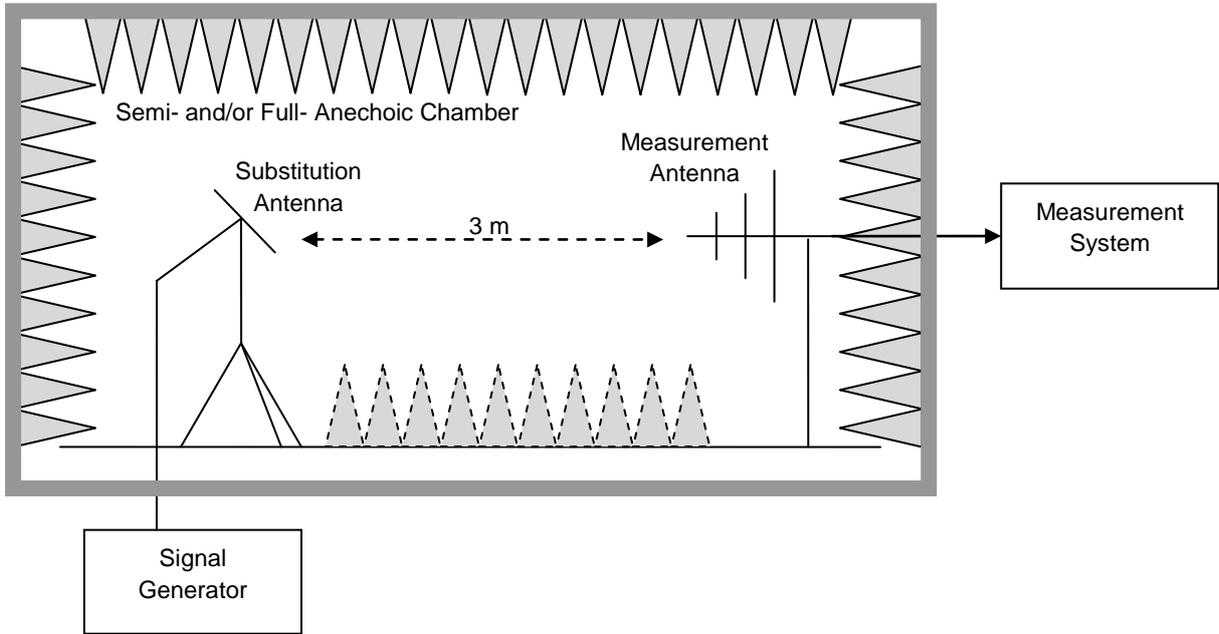
4.4.3 Test Setup 3

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

4.4.3.1 Step 1: Pre-test



4.4.3.2 Step 2: Substitution method to verify the maximum ERP



4.5 Test Conditions

Test Case		Test Conditions		
Transmitter Output Power	Average Power, Total	Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 1	
		EUT Conf.	1U_B, 1U_M, 1U_T 2U_B, 2U_M, 2U_T 3U_B, 3U_T 1G_GMSK_B, 1G_GMSK_M, 1G_GMSK_T 2G_GMSK_B, 2G_GMSK_M, 2G_GMSK_T 3G_GMSK_B, 3G_GMSK_M, 3G_GMSK_T 4G_GMSK_B, 4G_GMSK_M, 4G_GMSK_T 5G_GMSK_B, 5G_GMSK_M, 5G_GMSK_T 6G_GMSK_B, 6G_GMSK_M, 6G_GMSK_T 7G_GMSK_B, 7G_GMSK_M, 7G_GMSK_T 8G_GMSK_B, 8G_GMSK_M, 8G_GMSK_T 1G_8PSK_B, 1G_8PSK_M, 1G_8PSK_T 2G_8PSK_B, 2G_8PSK_M, 2G_8PSK_T 3G_8PSK_B, 3G_8PSK_M, 3G_8PSK_T 4G_8PSK_B, 4G_8PSK_M, 4G_8PSK_T 5G_8PSK_B, 5G_8PSK_M, 5G_8PSK_T 6G_8PSK_B, 6G_8PSK_M, 6G_8PSK_T 7G_8PSK_B, 7G_8PSK_M, 7G_8PSK_T 8G_8PSK_B, 8G_8PSK_M, 8G_8PSK_T 1G1U_B, 1G1U_T 1G2U_B, 1G2U_T 2G1U_B, 2G1U_T 3G1U_B, 3G1U_T	
	Average Power, Spectral Density (if required)	Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 1	
		EUT Conf.	Not applicable	
	Peak-to-Average Ratio (if required)	Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 1	
		EUT Conf.	Not applicable	
	Bandwidth	Occupied Bandwidth	Test Env.	Ambient Climate & Rated Voltage
			Test Setup	Test Seup 1
			EUT Conf.	1U_B, 1U_M, 1U_T 1G_GMSK_B, 1G_GMSK_M, 1G_GMSK_T 1G_8PSK_B, 1G_8PSK_M, 1G_8PSK_T
Emission Bandwidth (if required)		Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 1	
		EUT Conf.	Not applicable	



Test Case	Test Conditions	
Band Edges Compliance	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 1
	EUT Conf.	1U_B, 1U_T 2U_B, 2U_T 3U_B, 3U_T 1G_GMSK_B, 1G_GMSK_T 8G_GMSK_B, 8G_GMSK_T 1G1U_B, 1G1U_T 3G1U_B, 3G1U_T
Spurious Emission at Antenna Terminals	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 1
	EUT Conf.	1U_B, 1U_M, 1U_T 2U_B, 2U_M, 2U_T 3U_B, 3U_T 1G_GMSK_B, 1G_GMSK_M, 1G_GMSK_T 8G_GMSK_B, 8G_GMSK_T 1G1U_B, 1G1U_T 3G1U_B, 3G1U_T
Field Strength of Spurious Radiation	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 3
	EUT Conf.	1G_GMSK_M NOTE: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.
Frequency Stability	Test Env.	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) 85%, 100% and 115% of Rated Voltage at Ambient Climate.
	Test Setup	Test Seup 2
	EUT Conf.	1G_GMSK_M NOTE: A representative EUT configuration was selected since the un-modulation carrier configuration was required by the standards/rules.
Receiver Spurious Emissions	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 1
	EUT Conf.	1U_M 1G_GMSK_M



5 Main Test Instruments

Equipment Name	Manufacturer	Model	Serial Number	Cal. Due
Test Setup 1 & 2				
Spectrum Analyzer	Agilent	N9020A	MY50110169	2012-09-19
Spectrum Analyzer	R&S	FSQ26	201006	2012-11-21
Temperature Chamber	Chongqingyinhe	ESS-SDJ62	2006001	2013-07-03
Power Supply	KIKUSUI	PVS 100-28	FG000012	2012-10-14
Test Setup 3				
3m Semi Anechoic Chamber	S+M	---	---	---
EMI Test Receiver	R&S	ESU40	100144	2013-05-13
Bilog Antenna	Schaffner	CBL 6112B	2536	2013-01-12
Horn Antenna	R&S	HF906	359287/005	2014-3-23



6 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
RF Power Output	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
Field Strength of Spurious Radiation	ERP [dBm]	For 3 m Chamber: U = 4.6 dB (30 MHz to 1GHz) U = 3.0 dB (above 1 GHz) For 10 m Chamber: U = 4.6 dB (30 MHz to 1GHz) U = 3.0 dB (above 1 GHz)
Frequency Stability	Frequency Accuracy [ppm]	U = 0.21 ppm

END