



RF Test Report

Product Name: Remote Radio Unit

Product Model: RRU3203

Report Number: SYBH(R)01197794EB-1

FCC ID: QISRRU3203-B12

IC: 6369A-3203B12

Reliability Laboratory of Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,
Shenzhen, 518129, P.R.C

Tel: +86 755 28780808 Fax: +86 755 89652518



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 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, 6369A-2 and 6369A-3.
5. The laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers of test site No.1 are R-3892, G-415, C-4361, and T-1348, and the accreditation numbers of test site No.2 are R-3760, G-485, C-4210 and T-1237.
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.



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: RRU3203

Date of Receipt Sample: 2013-12-28
Start Date of Test: 2014-01-02
End Date of Test: 2014-01-10

Test Result: Pass

Approved by Senior Engineer:	2014-01-14	Zhang Xinghai	<i>Zhang Xing hai</i>
	Date	Name	Signature

Prepared by:	2014-01-14	Li Guo	<i>Li Guo</i>
	Date	Name	Signature



Modification Record

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

Declaration

Type	Description
Multiple Models Applications	<p><input checked="" type="checkbox"/> The present report applies to single model.</p> <p><input type="checkbox"/> The present report applies to several models. The practical measurements are performed with the model <u>XXXXX</u>.</p> <p>These models utilize the similar radio design, shielding, interface, physical layout and so on. The differences and modifications between these models are declared by the applicant and showed as below:</p> <ul style="list-style-type: none">● Difference XXX.● Difference XXX.● All others between these models are identical. <p>(Also see clause 3 for more information, if available)</p> <p>The present report only presents the worst test results of all these models, see relevant test results for detailed.</p>



CONTENT

1	General Information.....	7
1.1	Applied Standard.....	7
1.2	Test Location	7
1.3	Test Environment Condition.....	7
2	Test Summary	8
2.1	MBS 700 MHz Lower Band (698-746 MHz)	8
3	Description of the Equipment under Test (EUT).....	11
3.1	General Description	11
3.2	EUT Identity	11
3.3	Technical Specification	12
4	General Test Conditions / Configurations	14
4.1	Test Modes	14
4.2	EUT Configurations.....	15
4.3	Test Environments	16
4.4	Test Setups.....	17
4.5	Test Conditions	19
5	Main Test Instruments	21
6	Measurement Uncertainty.....	22



1 General Information

1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 27 (10-1-12 Edition)
47 CFR FCC Part 90 (10-1-12 Edition)

IC RSS-Gen (Issue 3, December 2010)
IC RSS-130 (Issue 1, October 2013)

Test Method: FCC KDB 971168 D01 Power Meas License Digital Systems v02r01
FCC KDB 662911 D01 Multiple Transmitter Output v01r02 (if applicable)
FCC KDB 662911 D02 MIMO with Cross-Polarized Antennas v01 (if applicable)

1.2 Test Location

Test Location 1 (TL1): Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Test Location 2 (TL2): Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: No.2222, Xin Jinqiao Road, Pudong New Area, Shanghai, 201206, P.R.C

Test Location 3 (TL3): Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: Tianfu Software Park, 801#, Tianfu Road, High-Tech Zone, Chengdu, 610041, P.R.C

1.3 Test Environment Condition

Temperature: 15 to 30 °C (Ambient)
Relative Humidity: 20 to 85 % (Ambient)
Atmospheric Pressure: Not applicable

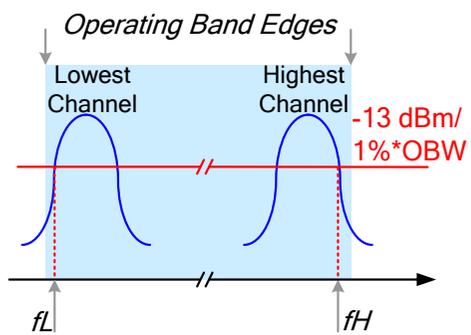


2 Test Summary

2.1 MBS 700 MHz Lower Band (698-746 MHz)

2.1.1 Measurement Technical Requirements

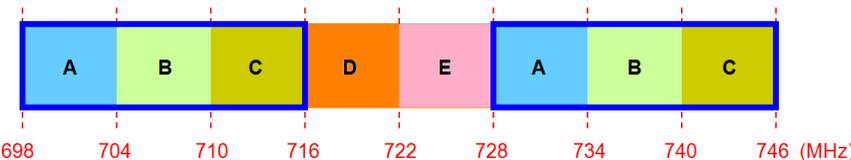
Test Item	FCC Rule	IC Rule	Requirements			Test Result	Verdict	Test Location
Transmitter Output Power	§2.1046, §27.50(c)	RSS-Gen,§4.8; RSS-130,§4.4	FCC	Fixed Station / Base Station	<ul style="list-style-type: none"> Avg ERP Power ≤ 1000 W (for EBW ≤ 1 MHz). Avg ERP PD ≤ 1000 W/MHz (for EBW > 1 MHz). 	Annex A	Pass	TL1
				Control Station / Mobile Station	Avg ERP Power ≤ 30 W.			
				Portable Station	Avg ERP Power ≤ 3 W.			
			IC	Fixed Station / Base Station	<ul style="list-style-type: none"> 716-746MHz (block D, E, A+, B+, C+): Avg EIRP Power ≤ 1640 W (for ChBW ≤ 1 MHz). 716-746MHz (block D,E,A+,B+,C+): Avg EIRP PD ≤ 1640 W/MHz (for ChBW > 1 MHz). PAPR ≤ 13 dB. 			
				Mobile Station / Fixed Subscriber Station (outdoor)	<ul style="list-style-type: none"> 698-716MHz (block A-, B-, C-): Avg EIRP Power ≤ 50 W. PAPR ≤ 13 dB. 			
				Portable Station / Fixed Subscriber Station (indoor)	<ul style="list-style-type: none"> 698-716MHz (block A-, B-, C-): Avg EIRP Power ≤ 5 W. PAPR ≤ 13 dB. 			
Bandwidth	§2.1049	RSS-Gen,§4.6	FCC	<ul style="list-style-type: none"> OBW: No limit. EBW: No limit. 		Annex B	Pass	TL1
			IC	OBW: No limit.				

Test Item	FCC Rule	IC Rule	Requirements	Test Result	Verdict	Test Location	
Band Edges Compliance	§2.1051, §27.53(g)	RSS-Gen, §4.9; RSS-130, §4.6	≤ -13 dBm/30 kHz, in 100 kHz bands immediately outside and adjacent to the frequency blocks.	Annex C	Pass	TL1	
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	RSS-Gen, §4.9; RSS-130, §4.6	≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Annex D	Pass	TL1	
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	RSS-Gen, §4.9; RSS-130, §4.6	≤ -13 dBm/100 kHz.	Annex E	Pass	TL1	
Frequency Stability	§2.1055, §27.54	RSS-Gen, §4.7; RSS-130, §4.3	FCC	Within authorized bands of operation/frequency block.	Annex F	Pass	TL1
			IC	<ul style="list-style-type: none"> f(offset): no limit. $f_L - f(\text{offset}) > \text{Operating Band Left Edge}$, $f_H + f(\text{offset}) < \text{Operating Band Right Edge}$. 			
Receiver Spurious Emissions (Note 1, 2)	---	RSS-Gen, §4.10; RSS-Gen, §6	<ul style="list-style-type: none"> Radiated limit: RSS-Gen, §6.1 field strength limit. Conducted limit: ≤ -57 dBm/120 kHz (CISPR-QP), from 30 MHz to 1000 MHz, and ≤ -53 dBm/1 MHz (AV), from 1 GHz to 3rd harmonics. 	Annex G	Pass, ---	TL1, ---	
Photos of Test Setups	---	---	---	Annex 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</p>							



Test Item	FCC Rule	IC Rule	Requirements	Test Result	Verdict	Test Location
<p>the receiver antenna terminals connected to a measuring instrument having equal impedance to that specified for the antenna.</p> <p>Note 2: According to IC NOTICE 2012-DRS0126, only radio communication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to IC requirements. All other receivers are excluded from any IC certification, testing, labelling and reporting requirements.</p>						

2.1.2 Non-measurement Technical Requirements

Description	FCC Rule	IC Rule	Requirements	Test Result	Verdict																								
Frequency Plan	§27.5(c)	RSS-130,§4.2	<p>698-746 MHz:</p>  <table border="1" data-bbox="784 798 1590 1029"> <thead> <tr> <th>Block</th> <th>Total Spectrum</th> <th>Lower Sub-band</th> <th>Upper Sub-band</th> </tr> </thead> <tbody> <tr> <td>Paired Block A</td> <td>12 MHz</td> <td>698-704 MHz</td> <td>728-734 MHz</td> </tr> <tr> <td>Paired Block B</td> <td>12 MHz</td> <td>704-710 MHz</td> <td>734-740 MHz</td> </tr> <tr> <td>Paired Block C</td> <td>12 MHz</td> <td>710-716 MHz</td> <td>740-746 MHz</td> </tr> <tr> <td>Unpaired Block D</td> <td>6 MHz</td> <td>716-722 MHz</td> <td>-</td> </tr> <tr> <td>Unpaired Block E</td> <td>6 MHz</td> <td>722-728 MHz</td> <td>-</td> </tr> </tbody> </table>	Block	Total Spectrum	Lower Sub-band	Upper Sub-band	Paired Block A	12 MHz	698-704 MHz	728-734 MHz	Paired Block B	12 MHz	704-710 MHz	734-740 MHz	Paired Block C	12 MHz	710-716 MHz	740-746 MHz	Unpaired Block D	6 MHz	716-722 MHz	-	Unpaired Block E	6 MHz	722-728 MHz	-	See technical specification description.	Comply
Block	Total Spectrum	Lower Sub-band	Upper Sub-band																										
Paired Block A	12 MHz	698-704 MHz	728-734 MHz																										
Paired Block B	12 MHz	704-710 MHz	734-740 MHz																										
Paired Block C	12 MHz	710-716 MHz	740-746 MHz																										
Unpaired Block D	6 MHz	716-722 MHz	-																										
Unpaired Block E	6 MHz	722-728 MHz	-																										
Modulation Characteristics	§2.1047	RSS-130,§4.1	Digital modulation.	See technical specification description.	Comply																								
Equipment with Multiple Antennas	---	RSS-130,§4.5	Multiple Antennas EIRP: Correlated transmission - Aggregate power + Gmax + 10 log ₁₀ N; Uncorrelated transmission - Aggregate power + Gmax.	Considered during "Transmitter Output Power" test.	Comply																								



3 Description of the Equipment under Test (EUT)

3.1 General Description

The RRU3203 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 RRU3203 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
LRRU PowerAmplifier Board	Ver.C	WD51IRA8D,LRRU PA BOARD(728~768,2*40W),1*1
IRF TRX Board	Ver.D	DBS3900 LTE,WD51IRX8C,IRF TRX Board,1*1
Duplexer	---	Duplexer-DBS3900-TX:729.25~744.75MHz,RX:699.25~714.75MHz-1.7dB.-3.2dB.-1.3-DIN(female)

3.2.2 Sub-Assembly

Sub-Assembly Name	Description
LMPTb	LTE Main Processing & Transmission Unit
LBBPb	LTE baseband Processing Unit



3.3 Technical Specification

Characteristics	Description	
Radio System Type	Single Radio Access Technology (Single-RAT):	<input type="checkbox"/> GSM <input type="checkbox"/> UMTS <input checked="" type="checkbox"/> LTE <input type="checkbox"/> CDMA <input type="checkbox"/> WiMAX
	Multi-Standard Radio (MSR):	<input type="checkbox"/> GSM & UMTS <input type="checkbox"/> GSM & LTE <input type="checkbox"/> GSM & UMTS & LTE <input type="checkbox"/> WiMAX & LTE <input type="checkbox"/> CDMA & LTE
Equipment Type	#1	<input checked="" type="checkbox"/> Base Station <input type="checkbox"/> Subscriber Station
	#2	<input type="checkbox"/> Fixed Station <input type="checkbox"/> Mobile Station <input type="checkbox"/> Portable Station
	#3	<input type="checkbox"/> Indoor Station <input type="checkbox"/> Outdoor Station
Supported Frequency Range	Transmission (TX):	729.25 to 744.75 MHz
	Receiving (RX):	699.25 to 714.75 MHz
TX and RX Antenna Ports	TX & RX port:	2
	TX-only port:	0
	RX-only port:	0
Multiple Carrier Supported	Single carrier	
Maximum RF Bandwidth	15 MHz	
TX Output Power	Max. 40 W (per antenna port) Max. 80 W (two antenna ports)	
Supported Channel Bandwidth	GSM system:	<input type="checkbox"/> 200 kHz
	UMTS system:	<input type="checkbox"/> 5 MHz
	LTE system:	<input checked="" type="checkbox"/> 1.4 MHz, <input checked="" type="checkbox"/> 3 MHz, <input checked="" type="checkbox"/> 5 MHz, <input checked="" type="checkbox"/> 10 MHz, <input checked="" 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	GSM system:	--
	UMTS system:	--
	LTE system:	Base-band: QPSK, 16QAM, 64QAM Carrier: OFDM/OFDMA
	CDMA system:	--
	WiMAX system:	--
Designation of Emissions	GSM system:	--



Characteristics	Description	
(Note: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.)	UMTS system:	--
	LTE system:	1M12D9W, 2M71D9W, 4M53D9W, 9M02D9W, 13M5D9W,
	CDMA system:	--
	WiMAX system:	--
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, Input to EUT:	-48 VDC
	Voltage Range, Input to EUT:	-36 to -57 VDC
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: 11 dBi (per antenna port, max.) Remark: When the EUT is put into service, the practical maximum antenna gain should NOT exceed the value as described above, and if exceed, 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
LTE/TM1.1	LTE system, 3GPP TS 36.141 clause 6.1.1, E-TM 1.1
--	--



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
1L_1.4M_E-TM1.1_B	B	1L(40W)	730	700	1.4	46.0	LTE/TM1.1
1L_1.4M_E-TM1.1_M	M	1L(40W)	737	707	1.4	46.0	LTE/TM1.1
1L_1.4M_E-TM1.1_T	T	1L(40W)	744	714	1.4	46.0	LTE/TM1.1
1L_3M_E-TM1.1_B	B	1L(40W)	730.8	700.8	3	46.0	LTE/TM1.1
1L_3M_E-TM1.1_M	M	1L(40W)	737	707	3	46.0	LTE/TM1.1
1L_3M_E-TM1.1_T	T	1L(40W)	743.2	713.2	3	46.0	LTE/TM1.1
1L_5M_E-TM1.1_B	B	1L(40W)	731.8	701.8	5	46.0	LTE/TM1.1
1L_5M_E-TM1.1_M	M	1L(40W)	737	707	5	46.0	LTE/TM1.1
1L_5M_E-TM1.1_T	T	1L(40W)	742.2	712.2	5	46.0	LTE/TM1.1
1L_10M_E-TM1.1_B	B	1L(40W)	734.3	704.3	10	46.0	LTE/TM1.1
1L_10M_E-TM1.1_M	M	1L(40W)	737	707	10	46.0	LTE/TM1.1
1L_10M_E-TM1.1_T	T	1L(40W)	739.7	709.7	10	46.0	LTE/TM1.1
1L_15M_E-TM1.1_B	B	1L(40W)	736.8	706.8	15	46.0	LTE/TM1.1
1L_15M_E-TM1.1_M	M	1L(40W)	737	707	15	46.0	LTE/TM1.1
1L_15M_E-TM1.1_T	T	1L(40W)	737.2	707.2	15	46.0	LTE/TM1.1

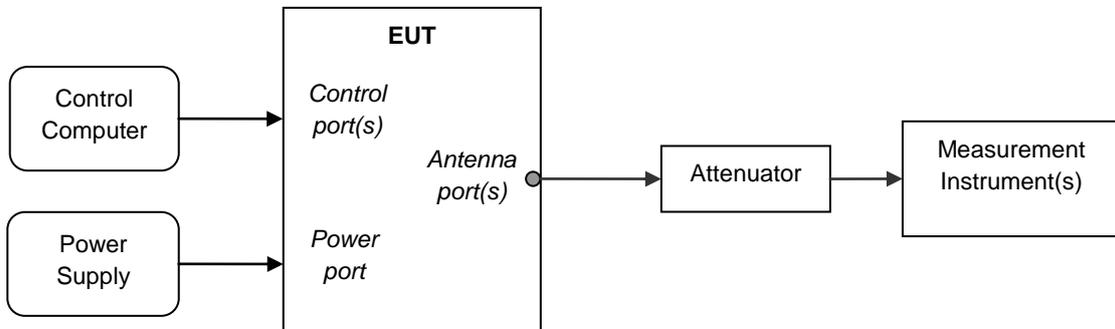


4.3 Test Environments

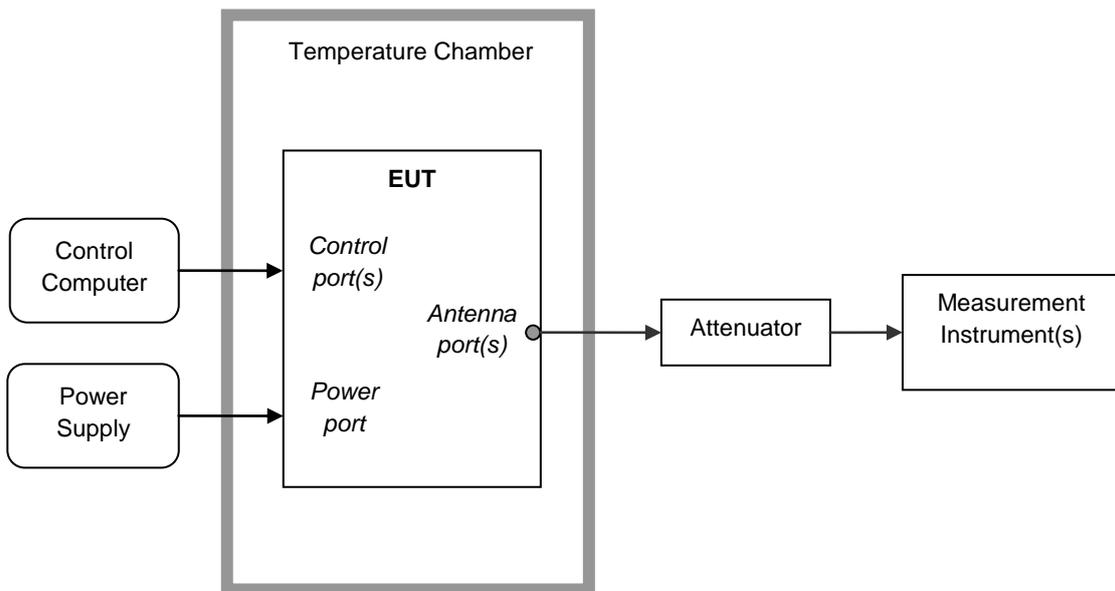
Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
Ambient Climate	Ambient	---	Ambient
Rated Voltage	---	-48 VDC	---

4.4 Test Setups

4.4.1 Test Setup 1



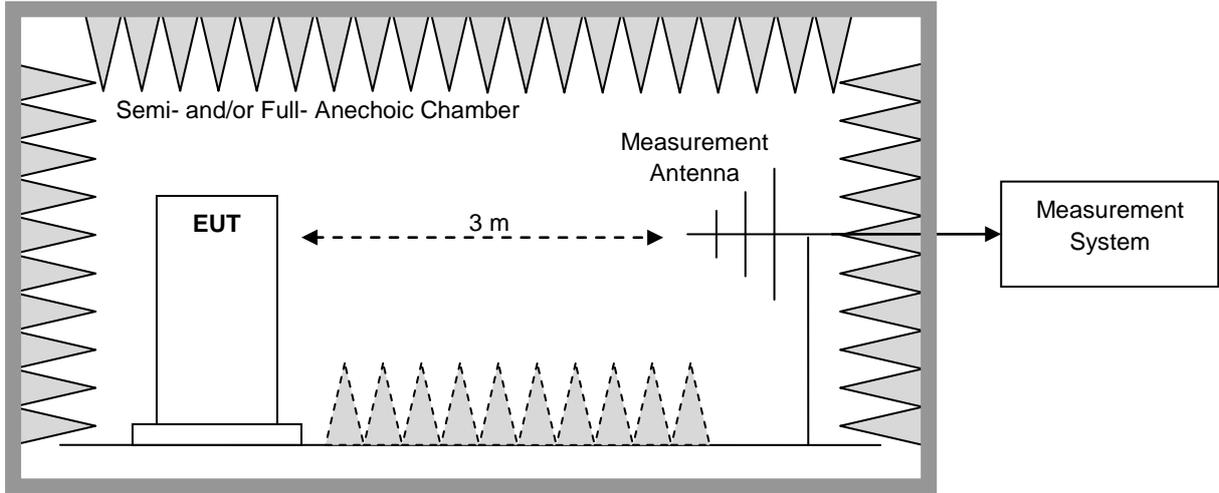
4.4.2 Test Setup 2



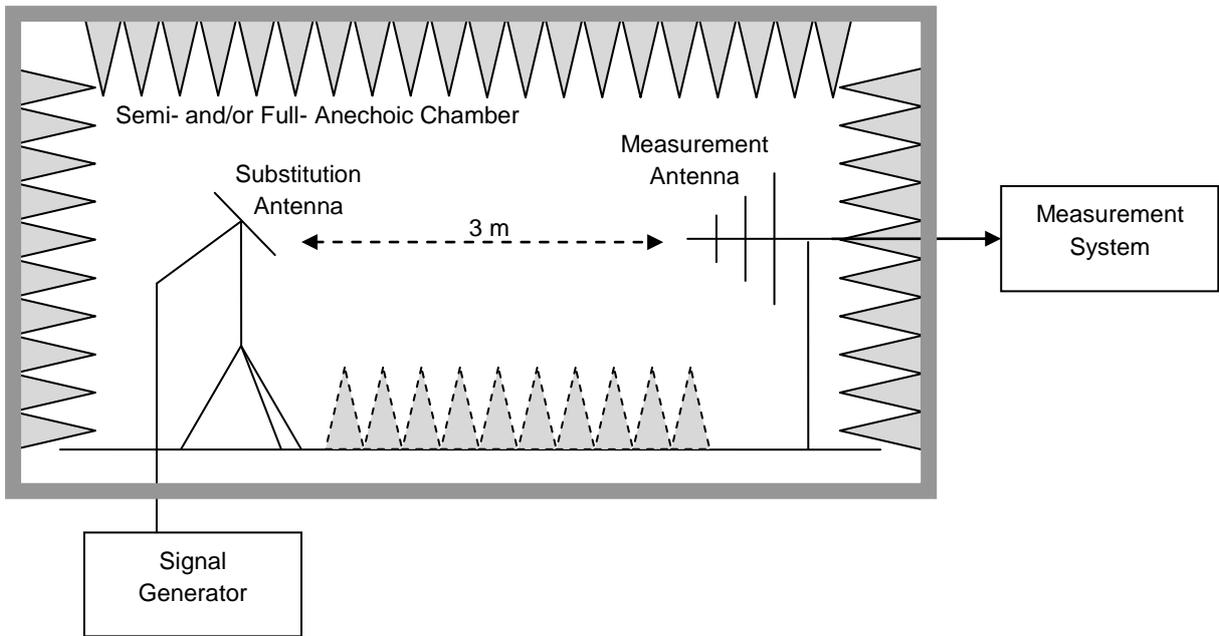
4.4.3 Test Setup 3

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

Notes: Channel A and channel B of the EUT are similar, so only channel A is selected to test.

Test Case		Test Conditions	
Transmitter Output Power	Channel Power, Total	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_M, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B, 1L_3M_E-TM1.1_M, 1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_M, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T,
	Power Spectral Density (if required)	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_M, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B, 1L_3M_E-TM1.1_M, 1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_M, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T,
	Peak-to-Average Ratio (if required)	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_M, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B, 1L_3M_E-TM1.1_M, 1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_M, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T,
Bandwidth	Occupied Bandwidth	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_M, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B, 1L_3M_E-TM1.1_M, 1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_M, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T,
	Emission Bandwidth (if required)	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_M, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B, 1L_3M_E-TM1.1_M, 1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_M, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T,
Band Edges Compliance	Test Env.	Ambient Climate & Rated Voltage	
	Test Setup	Test Seup 1	
	EUT Conf.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B,	



Test Case	Test Conditions	
		1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T,
Spurious Emission at Antenna Terminals	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 1
	EUT Conf.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_M, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B, 1L_3M_E-TM1.1_M, 1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_M, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T,
Field Strength of Spurious Radiation	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 3
	EUT Conf.	1L_1.4M_E-TM1.1_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.	1L_1.4M_E-TM1.1_B, 1L_1.4M_E-TM1.1_T, 1L_3M_E-TM1.1_B, 1L_3M_E-TM1.1_T, 1L_5M_E-TM1.1_B, 1L_5M_E-TM1.1_T, 1L_10M_E-TM1.1_B, 1L_10M_E-TM1.1_T, 1L_15M_E-TM1.1_B, 1L_15M_E-TM1.1_T, 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.	NA



5 Main Test Instruments

NOTE: Unless otherwise specified, the calibration intervals for test instruments were Annual (per year). The other intervals, if applicable, are marked with (##y), which denotes ## years calibration interval.

Equipment Name	Manufacturer	Model	Serial Number	Cal. Due
Test Setup 1 & 2				
Spectrum Analyzer	R&S	FSQ40	100025	2014-11-26
Spectrum Analyzer	Agilent	N9030A	MY49431033	2014-05-19
Signal Generator	Agilent	E8257D	MY51110541	2014-04-14
Power Meter	Agilent	E4417A	GB41292113	2014-05-12
Temperature Chamber	ESPEC	EW0470S	12113066	2014-12-25
Test Setup 3				
EMI Test receiver	Agilent	N9038A	MY52260169	2014-12-01
Bilog Antenna	TESEQ	CBL6112B	35239	2015-12-01(2y)
Horn Antenna	SWARZBECK	BBHA	1078	2015-12-01 (2y)



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
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
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