



# RF Test Report

**Product Name: Remote Radio Unit**

**Product Model: RRU3804 1900**

**Report Number: SYBH(R)01314849EB-1**

**FCC ID: QISRRU3804B2**

**IC: 6369A-3804B2**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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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 listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number for the test site located in Shenzhen is 97456, and the recognition numbers for the test site located in Shanghai is 684868.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers are 6369A-1 for the 3m chamber test site located at G2 building, 6369A-2 for the 3m chamber test site located at K3 building and 6369A-3 for the 10m chamber test site located at K3 building in Shenzhen; the recognition numbers are 6369D-1 for the 3m chamber test site and 6369D-2 for the 10m chamber test site located in Shanghai.
5. The laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers for the test site No.1 located at G2 building in Shenzhen are R-3892, G-415, C-4361, and T-1348, and the accreditation numbers for the test site No.2 located at K3 building in Shenzhen 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:** RRU3804 1900

**Date of Receipt Sample:** 2014-03-31  
**Start Date of Test:** 2014-03-31  
**End Date of Test:** 2014-04-16

**Test Result:** Pass

<b>Approved by Senior Engineer:</b>	2014-04-28	Zhang Xinghai	<i>Zhang Xing hai</i>
	Date	Name	Signature

<b>Prepared by:</b>	2014-04-28	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 2 (10-1-13 Edition)  
47 CFR FCC Part 24 (10-1-13 Edition)  
IC RSS-Gen (Issue 3, December 2010)  
IC RSS-133 (Issue 6, January 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 PCS Band (1850-1915 MHz paired with 1930-1995 MHz)

#### 2.1.1 Measurement Technical Requirements

Test Item	FCC Rule	IC Rule	Requirements			Test Result	Verdict	Test Location
Transmitter Output Power	§2.1046, §24.232	RSS-Gen, §4.8; RSS-133, §6.4; RSS-133, §4.1	FCC	Base Station	<ul style="list-style-type: none"> <li>Average EIRP Power <math>\leq</math> 1640 W (for EBW <math>\leq</math> 1 MHz).</li> <li>Average EIRP PD <math>\leq</math> 1640 W/MHz (for EBW <math>&gt;</math> 1 MHz).</li> <li>PAPR <math>\leq</math> 13 dB@0.1%.</li> </ul>	Annex A	Pass	TL1
				Mobile Station / Portable Station	<ul style="list-style-type: none"> <li>Average EIRP <math>\leq</math> 2 W.</li> <li>PAPR <math>\leq</math> 13 dB@0.1%.</li> </ul>			
			IC	Base Station	<ul style="list-style-type: none"> <li>Average EIRP Power <math>\leq</math> 1640 W (for ChBW <math>\leq</math> 1 MHz).</li> <li>Average EIRP PD <math>\leq</math> 1640 W/MHz (for ChBW <math>&gt;</math> 1 MHz).</li> <li>Average Conducted Power <math>\leq</math> 100 W.</li> <li>PAPR <math>\leq</math> 13 dB@0.1%.</li> </ul>			
				Mobile Station / Hand-held Portable Station	<ul style="list-style-type: none"> <li>Average EIRP Power <math>\leq</math> 2 W.</li> <li>PAPR <math>\leq</math> 13 dB@0.1%.</li> </ul>			
Bandwidth	§2.1049, §24.238	RSS-Gen, §4.6; RSS-133, §2.3	FCC	<ul style="list-style-type: none"> <li>OBW: No limit.</li> <li>EBW (-26 dBc): No limit.</li> </ul>		Annex B	Pass	TL1
			IC	<ul style="list-style-type: none"> <li>OBW: No limit, may in lieu of EBW (-20 dBc).</li> </ul>				



Test Item	FCC Rule	IC Rule	Requirements	Test Result	Verdict	Test Location		
			<ul style="list-style-type: none"> <li>EBW (-20 dBc): No limit.</li> </ul>					
Band Edges Compliance	§2.1051, §24.238	RSS-Gen, §4.9; RSS-133, §6.5	FCC	$\leq -13$ dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. (EBW is -26 dBc EBW)	Annex C	Pass	TL1	
			IC	$\leq -13$ dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. (EBW is -20 dBc EBW, or OBW)				
Spurious Emission at Antenna Terminals	§2.1051, §24.238	RSS-Gen, §4.9; RSS-133, §6.5	$\leq -13$ dBm/1 MHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency blocks.	Annex D	Pass	TL1		
Field Strength of Spurious Radiation	§2.1053, §24.238	RSS-Gen, §4.9; RSS-133, §6.5	$\leq -13$ dBm/1 MHz.	Annex E	Pass	TL2		
Frequency Stability	§2.1055, §24.235	RSS-Gen, §4.7; RSS-133, §6.3	FCC	<ul style="list-style-type: none"> <li>Test method: Fundamental emissions (Fc_meas) within the authorized frequency block.</li> <li>Test conditions: (1) NV, -30°C/.../+50°C step=+10°C. (2) NT, <math>\pm 15\%</math>*NV.</li> </ul>	Annex F	Pass	TL1	
			IC	Base Station				<ul style="list-style-type: none"> <li>Test method option #1:                (Fc_meas - Fc_meas@20°C&amp;NV) / Fc_meas@20°C&amp;NV <math>\leq \pm 1.0</math> ppm.</li> <li>Test method option#2:                EBW (EBW_lower to EBW_higher) within frequency block.</li> <li>Test conditions: (1) NV, -30°C/+20°C/+50°C. (2) +20°C, <math>\pm 15\%</math>*NV.                (EBW is -20 dBc EBW, or OBW)</li> </ul>
				Mobile Station				<ul style="list-style-type: none"> <li>Test method option #1:                (Fc_meas - Fc_meas@20°C&amp;NV) / Fc_meas@20°C&amp;NV <math>\leq \pm 2.5</math> ppm.</li> </ul>



Test Item	FCC Rule	IC Rule	Requirements	Test Result	Verdict	Test Location
			<ul style="list-style-type: none"> <li>Test method option #2: EBW (EBW_lower to EBW_higher) within frequency block.</li> <li>Test conditions: (1) NV, -30°C/+20°C/+50°C. (2) +20°C, ±15%*NV. (EBW is -20 dBc EBW, or OBW)</li> </ul>			
Receiver Spurious Emissions	---	IC NOTICE 2012-DRS0126	---	Annex G	---	---
Photos of Test Setups	---	---	---	Annex H	---	---

### 2.1.2 Non-measurement Technical Requirements

Description	FCC Rule	IC Rule	Requirements	Test Result	Verdict
Frequency Plan	§24.229	RSS-133,§6.1	1850-1915 MHz paired with 1930-1995 MHz: 	See technical specification description.	Comply
Modulation Characteristics	§2.1047	RSS-133,§6.2	Digital modulation.	See technical specification description.	Comply



### 3 Description of the Equipment under Test (EUT)

#### 3.1 General Description

The RRU3804 is the outdoor remote radio unit. It is installed close to the antenna.

The RRU3804 performs modulation, demodulation, data processing, and combination and division of baseband signals and RF 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

Board		
Board Name	Hardware Version	Description
WD32TRX8C	Ver.B	Multi-Carrier Transceiver Board,2.5G (for 1900M)
WD32TRXA1	Ver.B	Multi-Carrier Transceiver Board (for 1900M)

##### 3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
WMPT	WMPT	HUAWEI	HERT BBU, WD22WMPT, WCDMA Main Processing & Transmission unit (4E1 + 2FE), 1*1
WBBP	WBBPb3	HUAWEI	BBU3900,QWL1WBBPB3,WCDMA BaseBand Processing&Interface Unit
LMPT	LMPTc	HUAWEI	HERT BBU, WD22LMPT1, LTE Main Processing & Transmission Unit C(2*FE/GE RJ-45 or 2*FE/GE SFP), With M12M GPS Card
LBBP	LBBPc	HUAWEI	HERT BBU,WD22LBBPD,HERT BBU Baseband Processing and Interface Unit,1*1



### 3.3 Technical Specification

Characteristics	Description
Radio System Type	Single Radio <input type="checkbox"/> GSM Access Technology <input checked="" type="checkbox"/> UMTS (Single-RAT): <input checked="" type="checkbox"/> LTE <input type="checkbox"/> CDMA <input type="checkbox"/> WiMAX Multi-Standard <input type="checkbox"/> GSM & UMTS Radio <input type="checkbox"/> GSM & LTE (MSR): <input type="checkbox"/> GSM & UMTS & LTE <input checked="" type="checkbox"/> UMTS & LTE <input type="checkbox"/> WiMAX & LTE <input type="checkbox"/> CDMA & LTE
Equipment Type	#1 <input checked="" type="checkbox"/> Base Station <input type="checkbox"/> CPE (Customer Premises Equipment) Station <input type="checkbox"/> Subscriber Station (User Equipment) #2 <input checked="" type="checkbox"/> Fixed Station <input type="checkbox"/> Mobile Station <input type="checkbox"/> Portable Station #3 <input type="checkbox"/> Indoor Station <input checked="" type="checkbox"/> Outdoor Station
Supported Frequency Range	Transmission (TX): 1930 to 1990 MHz Receiving (RX): 1850 to 1910 MHz
TX and RX Antenna Ports	TX & RX port: 1 TX-only port: 0 RX-only port: 1
Multiple Carrier Supported	4
Maximum RF Bandwidth	UMTS: 20 MHz, 25 MHz(Optimized version) U&L: 20 MHz
TX Output Power	Max. 60 W
Supported Channel Bandwidth	GSM system: <input 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 checked="" type="checkbox"/> 5 MHz, <input checked="" type="checkbox"/> 10 MHz, <input checked="" type="checkbox"/> 15 MHz, <input checked="" 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: Not applicable UMTS system: Base-band: QPSK, 16QAM, 64QAM Carrier: CDMA LTE system: Base-band: QPSK, 16QAM, 64QAM Carrier: OFDM/OFDMA



Characteristics	Description
	CDMA system: Not applicable WiMAX system: Not applicable
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: Not applicable UMTS system: 4M17F9W LTE system: 4M51D9W, 9M09D9W, 13M5D9W, 17M9D9W CDMA system: Not applicable WiMAX system: Not applicable
Power Supply	Power Supply Type: <ul style="list-style-type: none"> <li><input type="checkbox"/> External AC mains,</li> <li><input checked="" type="checkbox"/> External DC mains,</li> <li><input type="checkbox"/> AC/DC Adapter,</li> <li><input type="checkbox"/> Powered over Ethernet (PoE)</li> </ul> Nominal Voltage, Input to EUT: -48 VDC Voltage Range, Input to EUT: -36 to -57 VDC
Antenna Assembles	Antenna Type: <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> External</li> <li><input type="checkbox"/> Integrated</li> </ul> Smart Antenna: <ul style="list-style-type: none"> <li><input type="checkbox"/> MIMO</li> <li><input checked="" type="checkbox"/> Non MIMO</li> </ul> Antenna Gain: 17 dBi (per antenna port, max.) Remark: When the EUT is put into service, the practical maximum antenna gain may 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
UMTS/TM1	UMTS system, 3GPP TS 25.141 clause 6.1.1, Test Model 1, QPSK modulation
LTE/TM1.1	LTE system, 3GPP TS 36.141 clause 6.1.1, E-TM 1.1
LTE/TM1.2	LTE system, 3GPP TS 36.141 clause 6.1.1, E-TM 1.2
UL/TM1	MSR system (UMTS/TM1; LTE/TM1.1)



## 4.2 EUT Configurations

### 4.2.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, <ul style="list-style-type: none"> <li>All TX tests are ONLY performed at the main TX antenna port (e.g. TRXA, TXA or similar) of the EUT, and</li> <li>All RX tests are ONLY performed at the main RX antenna port (e.g. TRXA, RXB or similar) of the EUT.</li> </ul>
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.	RX Freq. [MHz]	TX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
1L5M_B	B	1852.5	1932.5	5	47.8	LTE/TM1.1
1L5M_M	M	1880	1960	5	47.8	LTE/TM1.1
1L5M_T	T	1907.5	1987.5	5	47.8	LTE/TM1.1
1L10M_B	B	1855	1935	10	47.8	LTE/TM1.1
1L10M_M	M	1880	1960	10	47.8	LTE/TM1.1
1L10M_T	T	1905	1985	10	47.8	LTE/TM1.1
1L15M_B	B	1857.5	1937.5	15	47.8	LTE/TM1.1
1L15M_M	M	1880	1960	15	47.8	LTE/TM1.1
1L15M_T	T	1902.5	1982.5	15	47.8	LTE/TM1.1
1L20M_B	B	1860	1940	20	47.8	LTE/TM1.1
1L20M_M	M	1880	1960	20	47.8	LTE/TM1.1
1L20M_T	T	1900	1980	20	47.8	LTE/TM1.1
1U_B	B	1852.4	1932.4	5	47.8	UMTS/TM1
1U_M	M	1880	1960	5	47.8	UMTS/TM1
1U_T	T	1907.6	1987.6	5	47.8	UMTS/TM1
2U_20_B	B	1852.4,1867.4	1932.4,1947.4	5,5	44.7,44.7	UMTS/TM1
2U_20_M	M	1872.4,1887.4	1952.4,1967.4	5,5	44.7,44.7	UMTS/TM1
2U_20_T	T	1892.6,1907.6	1972.6,1987.6	5,5	44.7,44.7	UMTS/TM1



EUT Conf.	RF Ch.	RX Freq. [MHz]	TX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
3U_20_B	B	1852.4,1857.4,1867.4	1932.4,1937.4,1947.4	5,5,5	43,43,43	UMTS/TM1
3U_20_M	M	1872.4,1877.4,1887.4	1952.4,1957.4,1967.4	5,5,5	43,43,43	UMTS/TM1
3U_20_T	T	1892.6,1897.6,1907.6	1972.6,1977.6,1987.6	5,5,5	43,43,43	UMTS/TM1
4U_20_B	B	1852.4,1857.4,1962.4,1867.4	1932.4,1937.4,1942.4,1947.4	5,5,5,5	41.7,41.7,41.7,41.7	UMTS/TM1
4U_20_M	M	1872.4,1877.4,1882.4,1887.4	1952.4,1957.4,1962.4,1967.4	5,5,5,5	41.7,41.7,41.7,41.7	UMTS/TM1
4U_20_T	T	1892.6,1897.6,1902.6,1907.6	1972.6,1977.6,1982.6,1987.6	5,5,5,5	41.7,41.7,41.7,41.7	UMTS/TM1
2U_25_B	B	1852.4,1872.4	1932.4,1952.4	5,5	44.7,44.7	UMTS/TM1
2U_25_M	M	1870,1890	1950,1970	5,5	44.7,44.7	UMTS/TM1
2U_25_T	T	1887.6,1907.6	1967.6,1987.6	5,5	44.7,44.7	UMTS/TM1
3U_25_B	B	1852.4,1857.4,1872.4	1932.4,1937.4,1952.4	5,5,5	43,43,43	UMTS/TM1
3U_25_M	M	1870,1875,1890	1950,1955,1970	5,5,5	43,43,43	UMTS/TM1
3U_25_T	T	1887.6,1992.6,1907.6	1967.6,1972.6,1987.6	5,5,5	43,43,43	UMTS/TM1
4U_25_B	B	1852.4,1857.4,1862.4,1872.4	1932.4,1937.4,1942.4,1952.4	5,5,5,5	41.7,41.7,41.7,41.7	UMTS/TM1
4U_25_M	M	1870,1875,1880,1890	1950,1955,1960,1970	5,5,5,5	41.7,41.7,41.7,41.7	UMTS/TM1
4U_25_T	T	1887.6,1892.6,1897.6,1907.6	1967.6,1972.6,1977.6,1987.6	5,5,5,5	41.7,41.7,41.7,41.7	UMTS/TM1
1U1L5M_30+30_B	B	1852.4,1867.4	1932.4,1947.4	5,5	44.7,44.7	UL/TM1
1U1L5M_30+30_M	M	1872.4,1887.4	1952.4,1967.4	5,5	44.7,44.7	UL/TM1
1U1L5M_30+30_T	T	1892.6,1907.6	1972.6,1987.6	5,5	44.7,44.7	UL/TM1
1U1L10M_30+30_B	B	1852.4,1864.9	1932.4,1944.9	5,10	44.7,44.7	UL/TM1
1U1L10M_30+30_M	M	1872.4,1884.9	1952.4,1964.9	5,10	44.7,44.7	UL/TM1
1U1L10M_30+30_T	T	1895.1,1907.6	1975.1,1987.6	10,5	44.7,44.7	UL/TM1
1U1L15M_30+30_B	B	1852.4,1862.4	1932.4,1942.4	5,15	44.7,44.7	UL/TM1
1U1L15M_30+30_M	M	1872.4,1882.4	1952.4,1962.4	5,15	44.7,44.7	UL/TM1
1U1L15M_30+30_T	T	1897.6,1907.6	1977.6,1987.6	15,5	44.7,44.7	UL/TM1
1U1L5M_20+40_B	B	1852.4,1867.4	1932.4,1947.4	5,5	43,46	UL/TM1
1U1L5M_20+40_M	M	1872.4,1887.4	1952.4,1967.4	5,5	43,46	UL/TM1
1U1L5M_20+40_T	T	1892.6,1907.6	1972.6,1987.6	5,5	46,43	UL/TM1
1U1L10M_20+40_B	B	1852.4,1864.9	1932.4,1944.9	5,10	43,46	UL/TM1
1U1L10M_20+40_M	M	1872.4,1884.9	1952.4,1964.9	5,10	43,46	UL/TM1
1U1L10M_20+40_T	T	1895.1,1907.6	1975.1,1987.6	10,5	46,43	UL/TM1



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EUT Conf.	RF Ch.	RX Freq. [MHz]	TX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
1U1L15M_20+40_B	B	1852.4,1862.4	1932.4,1942.4	5,15	43,46	UL/TM1
1U1L15M_20+40_M	M	1872.4,1882.4	1952.4,1962.4	5,15	43,46	UL/TM1
1U1L15M_20+40_T	T	1897.6,1907.6	1977.6,1987.6	15,5	46,43	UL/TM1

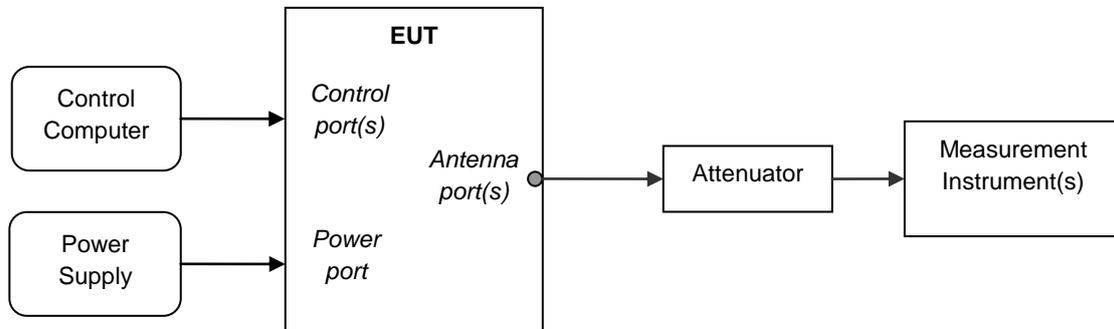


### 4.3 Test Environments

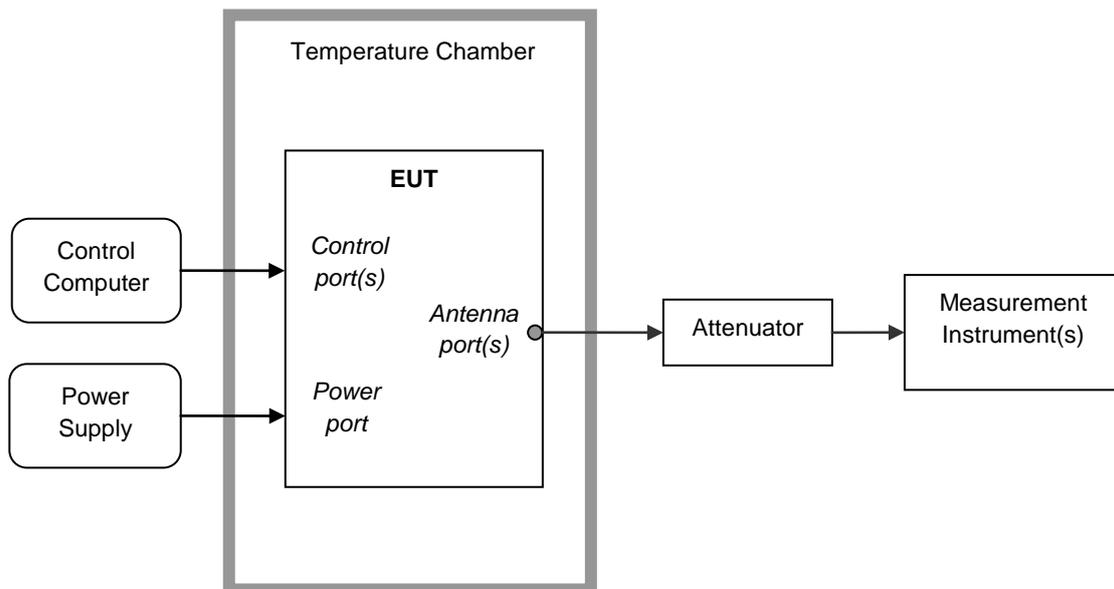
Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
Ambient Climate	Ambient	---	Ambient
Rated Voltage	---	-48 VDC	---

## 4.4 Test Setups

### 4.4.1 Test Setup 1



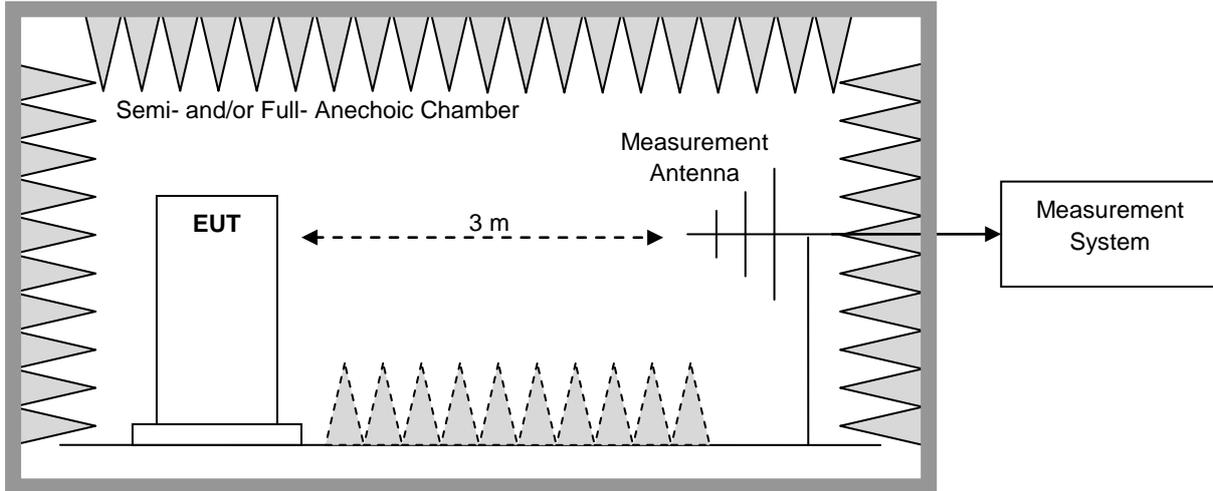
### 4.4.2 Test Setup 2



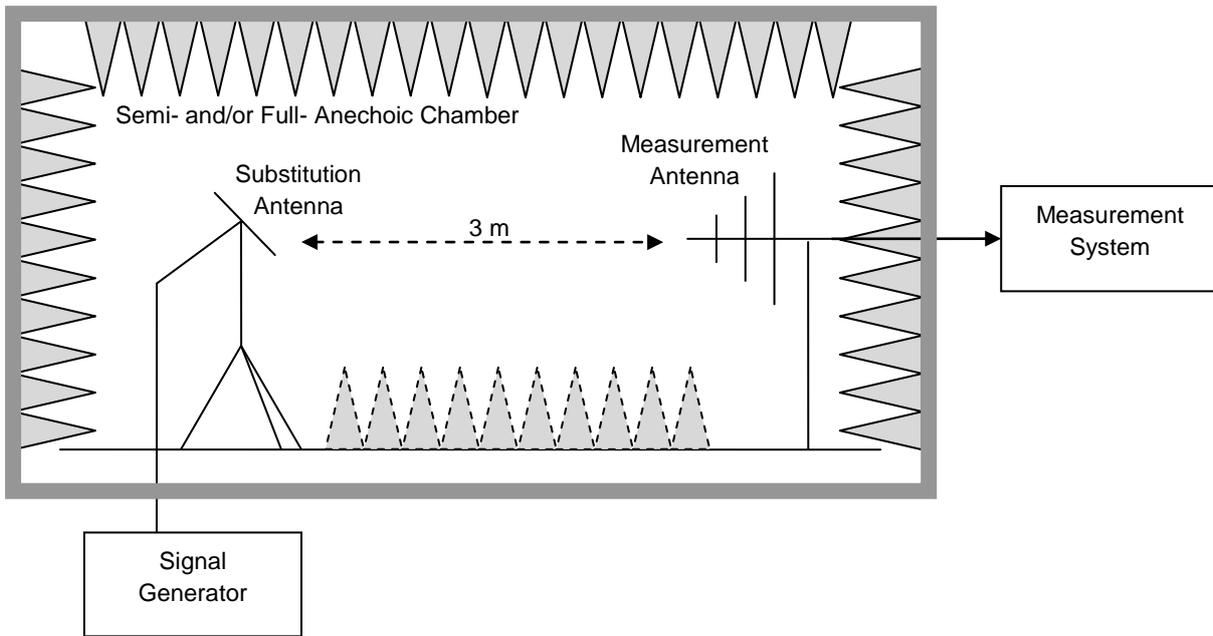
### 4.4.3 Test Setup 3

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	Channel Power, Total	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L5M_B,1L5M_M,1L5M_T 1L10M_B,1L10M_M,1L10M_T 1L15M_B,1L15M_M,1L15M_T 1L20M_B,1L20M_M,1L20M_T 1U_B,1U_M,1U_T 2U_20_B,2U_20_M,2U_20_T 3U_20_B,3U_20_M,3U_20_T 4U_20_B,4U_20_M,4U_20_T 2U_25_B,2U_25_M,2U_25_T 3U_25_B,3U_25_M,3U_25_T 4U_25_B,4U_25_M,4U_25_T 1U1L5M_30+30_B,1U1L5M_30+30_M,1U1L5M_30+30_T 1U1L10M_30+30_B,1U1L10M_30+30_M,1U1L10M_30+30_T 1U1L15M_30+30_B,1U1L15M_30+30_M,1U1L15M_30+30_T 1U1L5M_20+40_B,1U1L5M_20+40_M,1U1L5M_20+40_T 1U1L10M_20+40_B,1U1L10M_20+40_M,1U1L10M_20+40_T 1U1L15M_20+40_B,1U1L15M_20+40_M,1U1L15M_20+40_T
	Power Spectral Density	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L5M_B,1L5M_M,1L5M_T 1U_B,1U_M,1U_T
	Peak-to-Average Ratio	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L5M_B,1L5M_M,1L5M_T 1U_B,1U_M,1U_T
Bandwidth	Occupied Bandwidth	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L5M_B,1L5M_M,1L5M_T 1L10M_B,1L10M_M,1L10M_T 1L15M_B,1L15M_M,1L15M_T 1L20M_B,1L20M_M,1L20M_T 1U_B,1U_M,1U_T
	Emission Bandwidth	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L5M_B,1L5M_M,1L5M_T 1L10M_B,1L10M_M,1L10M_T 1L15M_B,1L15M_M,1L15M_T



Test Case		Test Conditions	
			1L20M_B,1L20M_M,1L20M_T 1U_B,1U_M,1U_T
Band Edges Compliance		Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L5M_B, 1L5M_T 1L20M_B, 1L20M_T 1U_B, 1U_T 1U1L5M_30+30_B,1U1L5M_30+30_T 1U1L5M_20+40_B,1U1L5M_20+40_T
Spurious Emission at Antenna Terminals		Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	1L5M_B,1L5M_T 1U_B,1U_T 1U1L5M_30+30_B,1U1L5M_30+30_T
Field Strength of Spurious Radiation		Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 3
		EUT Conf.	1L5M_M, 1U_M, 1U1L5M_30+30_M  NOTE: If applicable, the EUT Conf. that has maximum power density (based on the equivalent power level) is selected.
Frequency Stability	Frequency Error	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.	1L5M_M  NOTE: A representative EUT Conf. was selected since the un-modulation carrier configuration was required by the standards/rules.
	Frequency Range (if required)	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 2
		EUT Conf.	Not applicable
Receiver Spurious Emissions		Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Conf.	Not applicable



## 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	FSQ26	200845	2014-12-06
Spectrum Analyzer	Agilent	N9020A	MY51240619	2015-02-18
Vector Signal Generator	Agilent	E8257D	MY49281095	2014-09-21
Temperature Chamber	ESPEC	EW0470S	12113066	2014-12-25
Test Setup 3				
EMI Test receiver	R&S	ESU40	100303/040	2015-01-12
Bilog Antenna	SCHWARZBECK	VULB 9163	9163-480	2015-05-10 (2y)
Horn Antenna	SCHWARZBECK	BBHA 9120	9120D-878	2015-03-20 (2y)
Chamber _NSA	Albatross	3m chamber	---	2014-12-01 (3y)



## 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