



中国认可
国际互认
检测
TESTING
CNAS L0310



FCC

RF Test Report

Product Name: Mobile WiFi

Model Number: HWD34

Report No: SYBH(Z-RF)003032016-2001

FCC ID: QISHWD34

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.
5. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
8. 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.
9. The laboratory (Reliability Lab 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.

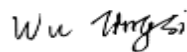


Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Receipt Sample: 2016-03-07
Start Date of Test: 2016-03-07
End Date of Test: 2016-03-12

Test Result: Pass

Approved by Senior Engineer:	2016-03-12	Liu Chunlin	
	Date	Name	Signature

Prepared by:	2016-03-12	Wu Tingsi	
	Date	Name	Signature



Modification Record

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

CONTENT

1	General Information	6
1.1	Applied Standard	6
1.2	Test Location	6
1.3	Test Environment Condition	6
2	Test Summary	7
2.1	Cellular Band (824-849 MHz paired with 869-894 MHz)	7
2.2	PCS Band (1850-1910 MHz paired with 1930-1990 MHz)	8
2.3	Band17 (704-716MHz paired with 734-746 MHz)	9
3	Description of the Equipment under Test (EUT)	10
3.1	General Description	10
3.2	EUT Identity	10
3.3	Technical Specification	11
4	General Test Conditions / Configurations	12
4.1	Test Modes	12
4.2	Test Environment	12
4.3	Test Frequency	13
4.4	DESCRIPTION OF TESTS	15
4.5	Test Setups	21
4.6	Test Conditions	24
5	Main Test Instruments	26
6	Measurement Uncertainty	27

1 General Information

1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 02:2014
 47 CFR FCC Part 22: 2014
 47 CFR FCC Part 24: 2014
 47 CFR FCC Part 27: 2014

Test Method: FCC KDB 971168 D01 Power Meas License Digital Systems v02r02

1.2 Test Location

Test Location : 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: 19.5 to 25 °C
Ambient Relative Humidity: 40 to 55 %
Atmospheric Pressure: Not applicable

2 Test Summary

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

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913	FCC: ERP $\leq$ 7 W.	Appendix A	Pass
Peak-Average Ratio	---	---	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §22.917	$\leq$ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917	FCC: $\leq$ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917	FCC: $\leq$ -13 dBm/100 kHz.	Appendix G	Pass
Frequency Stability	§2.1055, §22.355	$\leq \pm 2.5$ ppm.	Appendix H	Pass
NOTE 1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".				

2.2 PCS Band (1850-1910 MHz paired with 1930-1990 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	$EIRP \leq 2 \text{ W}$	Appendix A	Pass
Peak-Average Ratio	§2.1046, §24.232	FCC: Limit $\leq 13 \text{ dB}$	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §24.238	$\leq -13 \text{ dBm}/1\% \cdot \text{EBW}$, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238	$\leq -13 \text{ dBm}/1 \text{ MHz}$, from 9 kHz to 10^{th} harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238	$\leq -13 \text{ dBm}/1 \text{ MHz}$.	Appendix G	Pass
Frequency Stability	§2.1055, §24.235	FCC: within authorized frequency block.	Appendix H	Pass
NOTE 1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".				

2.3 Band17 (704-716MHz paired with 734-746 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§27.50(c)	FCC: ERP $\leq$ 3 W.	Appendix A	Pass
Peak-Average Ratio	§2.1046, §27.50(c)	---	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1047	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1049,	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1051, §27.53(g)	FCC: ≤ -13 dBm/100 kHz.	Appendix G	Pass
Frequency Stability	§2.1053, §27.53(g)	$\leq \pm 2.5$ ppm.	Appendix H	Pass
NOTE 1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".				

3 Description of the Equipment under Test (EUT)

3.1 General Description

The Mobile WiFi implements such functions as RF signal receiving/transmitting, LTE/UMTS protocol processing, NFC(Just receive) ,WiFi and Bluetooth. About UMTS wireless mode, it supports WCDMA and HSDPA/HSUPA/HSPA+/ DC-HSDPA, operating in Band1,Band2 and Band5, but only Band2 and Band5 test data included in this report; and the 4G LTE, operating in Band1,Band3,Band5,Band17, Band18. but only Band5 and Band17 test data included in this report .The WiFi is 2X2 and the frequency are 2.4GHz. The Bluetooth support BT4.0. HWD34 supports 1Tx2Rx for 3G WCDMA and 4G LTE.

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		
Description	Hardware Version	Software Version
Main Board	CL1KD08UM	11.420.01.21.824

3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050200U01	Huawei Technologies Co., Ltd.	Input: AC100V-240V,0.5 ,50/60Hz, Output Voltage:  5.0V 2.0A
Battery	HB494590EBC-B	Huawei Technologies Co., Ltd.	Rated capacity: 3000mAh Nominal Voltage:  +3.8V
USB Cable	---	Huawei Technologies Co., Ltd.	Signal Cable,USB data cable,White intermediate high-end,1m,USBAM,OD3.2,MicroBplug,5V2A, Terminal Dedicated

3.3 Technical Specification

Characteristics	Description	
Radio System Type	☒ UMTS ☒ LTE	
Supported Frequency Range	WCDMA850	Transmission (TX): 824 to 849 MHz
		Receiving (RX): 869 to 894 MHz
	WCDMA1900	Transmission (TX): 1850 to 1910 MHz
		Receiving (RX): 1930 to 1990 MHz
	LTE BAND5	Transmission (TX): 824 to 849 MHz
		Receiving (RX): 869 to 894 MHz
TX and RX Antenna Ports	TX & RX port:	1
		0
	RX-only port:	1
Target TX Output Power	UMTS850: 22 dBm UMTS1900: 22 dBm LTE BAND5: 22dBm LTE BAND17: 22dBm	
Supported Channel Bandwidth	UMTS system:	☒ 5 MHz
	LTE band 5	☒ 5 MHz, ☒ 10 MHz
	LTE band 17	☒ 5 MHz, ☒ 10 MHz
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.)	UMTS850:	4M17F9W
	UMTS1900:	4M16F9W
	LTE BAND5:	4M50G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 9M00G7D (10 MHz QPSK modulation), 8M99W7D (10 MHz 16QAM modulation)
	LTE BAND17:	4M50G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 9M00G7D (10 MHz QPSK modulation), 8M99W7D (10 MHz 16QAM modulation)

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	WCDMA system, QPSK modulation
UMTS/TM2	HSDPA system, QPSK modulation
UMTS/TM3	HSUPA system, QPSK modulation
LTE/TM1	LTE system, QPSK modulation
LTE/TM2	LTE system, 16QAM modulation

4.2 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.6V
	VN	3.8V
	VH	4.2V

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

TN= normal temperature

4.3 Test Frequency

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA850	TX	Channel 4132	Channel 4182	Channel 4233
		826.4MHz	836.4MHz	846.6MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4MHz	881.4MHz	891.6MHz
Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA1900	TX	Channel 9262	Channel9400	Channel9538
		1852.4MHz	1880.0MHz	1907.6MHz
	RX	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 5	TX(5M)	Channel 20425	Channel 20525	Channel 20625
		826.5 MHz	836.5 MHz	846.5 MHz
	TX(10M)	Channel 20450	Channel 20525	Channel 20600
		829 MHz	836.5 MHz	844 MHz
	RX(5M)	Channel 2425	Channel 2525	Channel 2625
		871.5 MHz	881.5 MHz	891.5 MHz
	RX (10M)	Channel 2450	Channel 2525	Channel 2600
		874 MHz	881.5 MHz	889 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 17	TX (5M)	Channel 23755	Channel 23790	Channel 23825
		706.5 MHz	710 MHz	713.5 MHz
	TX (10M)	Channel 23780	Channel 23790	Channel 23800
		709 MHz	710 MHz	711 MHz
	RX (5M)	Channel 5755	Channel 5790	Channel 5825
		736.5 MHz	740 MHz	743.5 MHz
	RX (10M)	Channel 5780	Channel 5790	Channel 5800

4.4 DESCRIPTION OF TESTS

4.4.1 Radiated Power and Radiated Spurious Emissions

Radiated spurious emissions are investigated indoors in a semi-anechoic chamber to determine the frequencies producing the worst case emissions. Final measurements for radiated power and radiated spurious emissions are performed on the 3 meter OATS per the guidelines of ANSI/TIA-603-C-2004. The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Emissions are also investigated with the receive antenna horizontally and vertically polarized.

A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other non-metallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized. Measure the EUT maximum RF power and record the result.

A half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT.

The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$.

Test Procedures Used

KDB 971168 v02r02-Section 5.2.1 / KDB 971168 v02R02-Section 5.8

ANSI/TIA-603-C-2004-Section 2.2.17 / ANSI/TIA-603-C-2004-Section 2.2.12

Note: Reference test setup 3

4.4.2 Peak-Average Ratio

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

Test Procedures Used

KDB 971168 v02r02-Section 5.7.1

Test Settings

- 1、 The signal analyzer's CCDF measurement profile enabled
- 2、 Frequency= carrier center frequency
- 3、 Measurement BW > EBW of signal
- 4、 for continuous transmissions, set to 1ms
- 5、 Record the maximum PAPR level associated with a probability of 0.1%.

Note: Reference test setup 1

4.4.3 Occupied Bandwidth

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

Test Procedures Used

KDB 971168 v02r02-Section 4.2

Test Settings

- 1、 SET RBW=1-5% of OBW
- 2、 SET VBW $\geq 3 \times$ RBW
- 3、 Detector: Peak
- 4、 Trace mode= max hold.
- 5、 Sweep= auto couple
- 6、 Steps 1-5 were repeated after it is stable

Note: Reference test setup 1.

4.4.4 Band Edge Compliance

the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission power must be attenuated below the transmitting power (P) by a factor of at least $43+10\log_{10}P$ dB.

Test Procedures Used

KDB 971168 v02r02-Section 6.0

Test Settings

- 1、 SET RBW $\geq 1\%$ of Emission BW.
- 2、 SET VBW about three times of RBW
- 3、 Detector: RMS
- 4、 Trace mode= max hold.
- 5、 Span= 2MHz

Note: Reference test setup 1.

4.4.5 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

Test Procedures Used

KDB 971168 v02r02-Section 6.0

Test Settings

- 1、 9kHz~150kHz, $RBW = 1\text{KHz}$, $VBW \geq 3 \times RBW$,

150kHz~30MHz, $RBW = 10\text{KHz}$, $VBW \geq 3 \times RBW$,

30MHz~1GHz, $RBW = 100\text{ kHz}$, $VBW = 300\text{ kHz}$.

Above 1GHz, $RBW = 1\text{ MHz}$, $VBW = 3\text{ MHz}$.

2、 Detector: Peak

3、 Trace mode= max hold.

Note: Reference test setup 1.

4.4.6 Frequency Stability / Temperature Variation

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

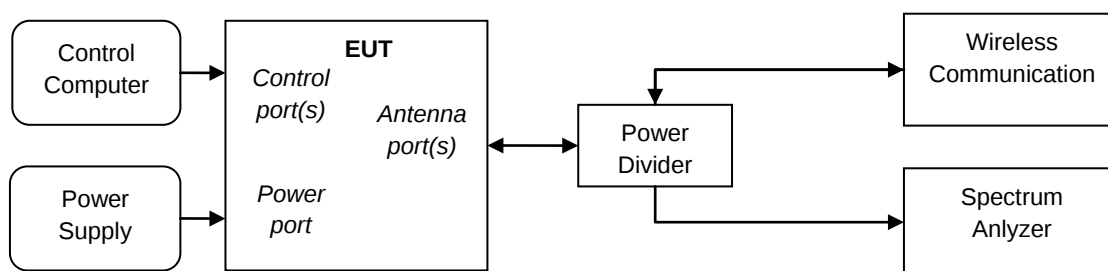
Test Procedures Used

ANSI/TIA-603-C-2004

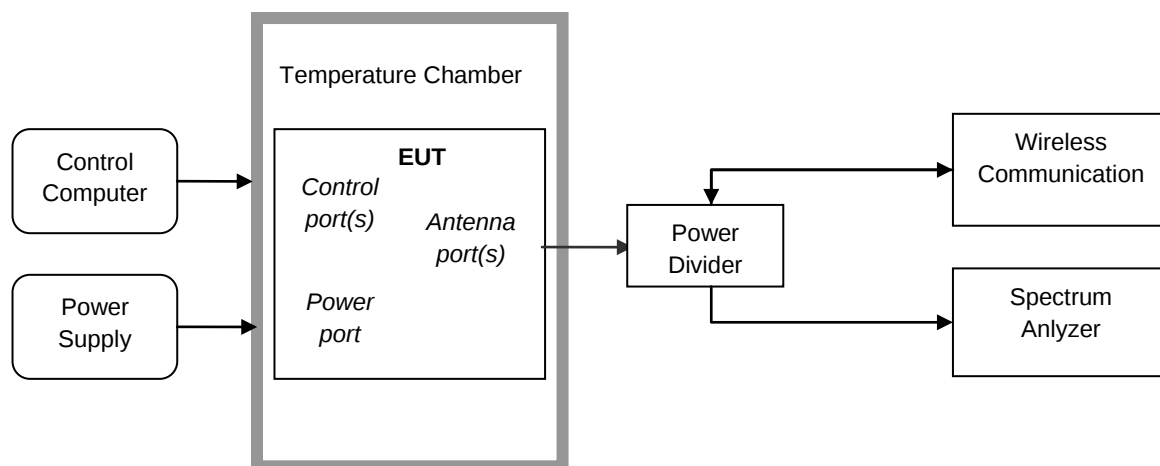
Note: Reference test setup 2.

4.5 Test Setups

4.5.1 Test Setup 1



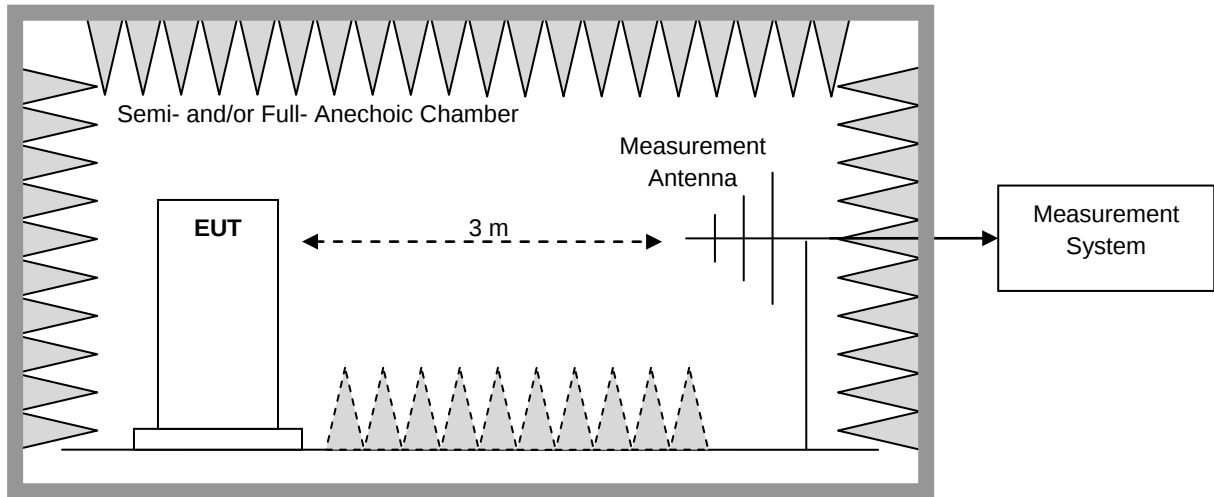
4.5.2 Test Setup 2



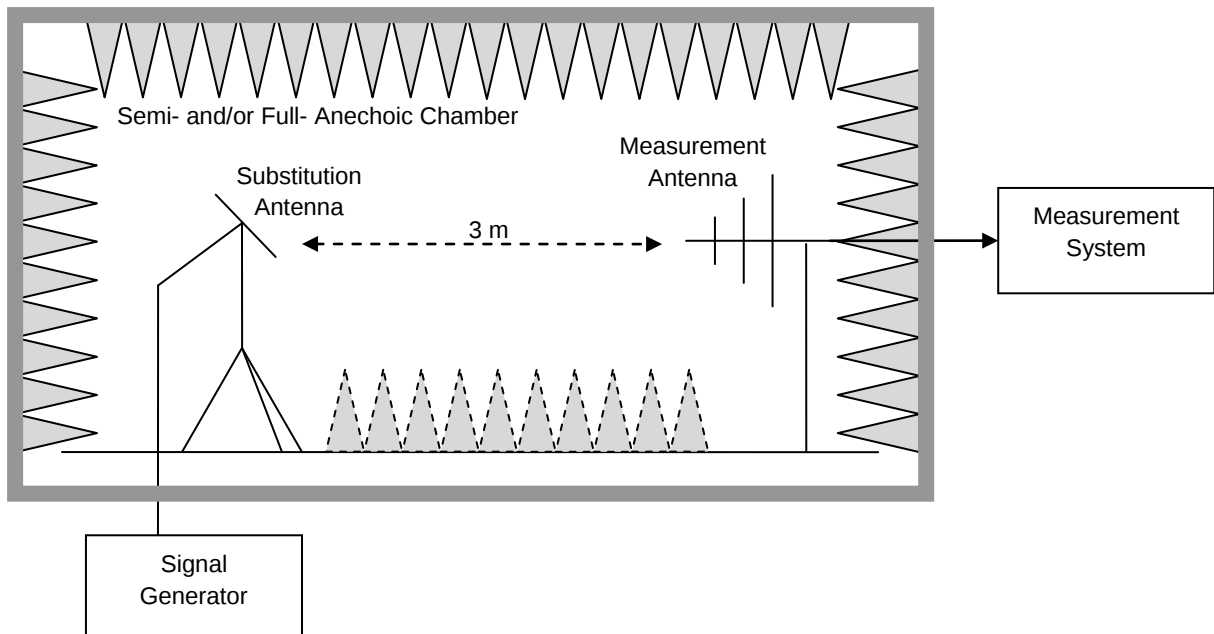
4.5.3 Test Setup 3

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

4.5.3.1 Step 1: Pre-test



4.5.3.2 Step 2: Substitution method to verify the maximum ERP/EIRP



4.6 Test Conditions

Test Case		Test Conditions	
Transmit Output Power Data	Average Power, Total	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	,UMTS/TM1,LTE/TM1,LTE/TM2
	Average Power, Spectral Density (if required)	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
Peak-to-Average Ratio (if required)		Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
Modulation Characteristics		Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		RF Channels (TX)	M (L= low channel, M= middle channel, H= high channel)
		Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
Bandwidth	Occupied Bandwidth	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
	Emission Bandwidth (if required)	Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
Band Edges Compliance		Test Env.	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		RF	L, H

Test Case	Test Conditions	
	Channels (TX)	(L= low channel, M= middle channel, H= high channel)
	Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
Spurious Emission at Antenna Terminals	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 1
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
	Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
Field Strength of Spurious Radiation	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 3
	Test Mode	UMTS/TM1/TM2/TM3,LTE/TM1,LTE/TM2 NOTE: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
Frequency Stability	Test Env.	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) VL, VN and VH of Rated Voltage at Ambient Climate.
	Test Setup	Test Seup 2
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
	Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2

5 Main Test Instruments

Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	1342889	2015-09-16	2017-09-15
Wireless Communication Test set	Agilent	N4010A	MY49081592	2015-10-30	2016-10-29
Universal Radio Communication Tester	R&S	CMU200	123299	2015-10-30	2016-10-29
Spectrum Analyzer	Agilent	N9020A	MY52090652	2015-07-08	2016-07-07
Universal Radio Communication Tester	R & S	CMW500	126854	2016-01-08	2017-01-07
Spectrum Analyzer	Agilent	E4440A	MY48250119	2015-07-08	2016-07-07
Signal Analyzer	R&S	FSQ31	200021	2015-10-30	2016-10-29
Spectrum Analyzer	Agilent	N9030A	MY49431698	2015-10-30	2016-10-29
Temperature Chamber	WEISS	WKL64	56246002940010	2016-01-21	2017-01-20
Signal generator	Agilent	E8257D	MY49281095	2015-10-30	2016-10-29
Vector Signal Generator	R&S	SMU200A	104162	2015-10-30	2016-10-29
Test receiver	R&S	ESU26	100387	2015-6-24	2016-06-23
Test receiver	R&S	ESCI	101163	2015-6-24	2016-06-23
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2015-4-30	2017-4-29
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100263	2015-4-30	2017-4-29
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-490	2015-4-30	2017-4-29
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-520	2015-4-30	2017-4-29
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2015-4-30	2017-4-29
double ridged horn antenna (0.8G-18GHz)	R&S	HF907	100305	2015-4-30	2017-4-29
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	5140299	2015-7-15	2017-7-14
Artificial Main Network	R&S	ENV4200	100134	2015-6-24	2016-6-23
Line Impedance Stabilization Network	R&S	ENV216	100382	2015-6-24	2016-6-23
Power Detecting & Sampling Unit	R&S	OSP-B157	100914	2015-07-27	2016-07-26

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
Transmit Output Power Data	Power [dBm]	U = 0.42 dB
Bandwidth	Magnitude [%]	U = 0.2%
Band Edge Compliance	Disturbance Power [dBm]	U = 1.24 dB
Spurious Emissions, Conducted	Disturbance Power [dBm]	U = 1.62 dB
Field Strength of Spurious Radiation	ERP [dBm]	For 3 m Chamber: U = 4.9 dB (30 MHz to 26.5GHz)
Frequency Stability	Frequency Accuracy [ppm]	U = 0.017 ppm

END