



FCC RF Test Report

Product Name: Mobile WiFi

Model Number: HWD37

Report No.: SYBH(Z-RF)20180903005001-2001

FCC ID: QISRUCOLA

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

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2. The Laboratory of Sporton International (Shenzhen) Inc has passed the accreditation by National Voluntary Laboratory Accreditation Program (NVLAP). The NVLAP LAB CODE is 600156-0.
3. The Reliability Laboratory of Huawei Technologies Co., Ltd has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.
4. The Laboratory of Sporton International (Shenzhen) Inc has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN5018, and the Test Firm Registration Number is 251365.
5. The Reliability Laboratory of Huawei Technologies Co., Ltd has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.
6. The Reliability Laboratory of Huawei Technologies Co., Ltd is also named "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.
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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

Date of Receipt Sample: 2018-09-13
Start Date of Test: 2018-09-20
End Date of Test: 2018-10-23

Test Result: Pass

Approved by Senior Engineer:	2018-10-23	He Hao	<i>He Hao</i>
	Date	Name	Signature

Prepared by:	2018-10-23	ZhouLingbo	<i>zhou ling bo</i>
	Date	Name	Signature



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1 General Information

1.1 Applied Standard

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

Test Method: FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
 ANSI C63.26

1.2 Test Location

Test Location : Reliability Laboratory of Huawei Technologies Co., Ltd.
Address1: No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan,
 Guangdong, P.R.C
Address2: Sporton International (Shenzhen) Inc
 1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan District,
 Shenzhen City, Guangdong Province

1.3 Test Environment Condition

Ambient Temperature: 0 to 35 °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 (Note1)	Test Address
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913	ERP ≤ 7 W.	Appendix A	Pass	Location 1
Peak-Average Ratio	---	Limit≤13 dB	Appendix B	Pass	Location 1
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass	Location 1
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass	Location 1
Band Edges Compliance	§2.1051, §22.917	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. Note 1): EBW is -26 dBc EBW.	Appendix E	Pass	Location 1
Spurious Emission at Antenna Terminals	§2.1051, §22.917	≤ -13 dBm/RefBW, from max(lowest internal frequency, 9 kHz) to min(10 * highest fundamental frequency, 40 GHz), after 1 MHz bands immediately outside and adjacent to the frequency block. (RefBW: ≥100 kHz for frequency below 1 GHz, and =1 MHz above 1 GHz)	Appendix F	Pass	Location 1
Field Strength of Spurious Radiation	§2.1053, §22.917	≤ -13 dBm/RefBW, from max(lowest internal frequency, 9 kHz) to min(10 * highest fundamental frequency, 40 GHz), after 1 MHz bands immediately outside and adjacent to the frequency block. (RefBW: ≥100 kHz for frequency below 1 GHz, and =1 MHz above 1 GHz)	Appendix G	Pass	Location 1(above 30MHz)&2(9K-30MHz)
Frequency Stability	§2.1055, §22.355	≤ ±2.5ppm	Appendix H	Pass	Location 1

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

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)	Test Address
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	$EIRP \leq 2\text{ W}$	Appendix A	Pass	Location 1
Peak-Average Ratio	§2.1046, §24.232	Limit $\leq 13\text{ dB}$	Appendix B	Pass	Location 1
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass	Location 1
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass	Location 1
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. Note 1): EBW is -26 dBc EBW.	Appendix E	Pass	Location 1
Spurious Emission at Antenna Terminals	§2.1051, §24.238	$\leq -13\text{ dBm}/1\text{ MHz}$, from max(lowest internal frequency, 9 kHz) to min($10 \cdot$ highest fundamental frequency, 40 GHz) but outside authorized operating frequency blocks.	Appendix F	Pass	Location 1
Field Strength of Spurious Radiation	§2.1053, §24.238	$\leq -13\text{ dBm}/1\text{ MHz}$, from max(lowest internal frequency, 9 kHz) to min($10 \cdot$ highest fundamental frequency, 40 GHz) but outside authorized operating frequency blocks.	Appendix G	Pass	Location 1 (above 30MHz) & 2(9K-30MHz)
Frequency Stability	§2.1055, §24.235	Within authorized bands of operation/frequency block.	Appendix H	Pass	Location 1

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

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)	Test Address
Effective (Isotropic) Radiated Power Output Data	§27.50(c).	ERP ≤ 3 W.	Appendix A	Pass	Location 1
Peak-Average Ratio	§2.1046, §27.50(c)	Limit≤13 dB	Appendix B	Pass	Location 1
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass	Location 1
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass	Location 1
Band Edges Compliance	§2.1051, §27.53(g)	≤ -13 dBm/30 kHz, in 100 kHz bands immediately outside and adjacent to the frequency blocks.	Appendix E	Pass	Location 1
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Appendix F	Pass	Location 1
Field Strength of Spurious Radiation	§2.1051, §27.53(g)	≤ -13 dBm/100 kHz.	Appendix G	Pass	Location 1(above 30MHz)&2(9K-30MHz)
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Appendix H	Pass	Location 1



3 Description of the Equipment under Test (EUT)

3.1 General Description

HWD37 which supports LTE B5,B17,and DC-HSDPA/HSPA+/HSDPA/HSUPA/WCDMA band2/B5 is subscriber equipment in the LTE/WCDMA system HWD37 implement such functions as RF signal receiving/ transmitting, LTE/UMTS protocol processing, data service etc, and it can act as a Wi-Fi hotspot for user accessing to internet. Externally it provides USB interface (to connect to the notebook etc.), USIM card interface. The WiFi is 2X2 and the frequency are 2.4GHz HWD37 support BLE.

Note: Only UMTS B2 and B5, LTE B5 and B17 bands test data included in this report.

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	CL2KD20M VER. B	8.0.1.31(H25SP5C824)



3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Rechargeable Li-ion	HB494590EBC-B	Huawei Technologies Co.,Ltd	Rated capacity: 3000mAh Nominal Voltage:  +3.80V Charging Voltage:  +4.35V

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
		1
Target TX Output Power	UMTS850 22.5dBm UMTS1900: 22.5dBm LTE BAND5: 22.5dBm LTE BAND17: 22.5dBm	
Supported Channel Bandwidth	UMTS system:	☒ 5 MHz
	LTE band 5	☒ 5MHz, ☒ 10MHz
	LTE band 17	☒ 5MHz, ☒ 10MHz
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:	4M16F9W
	UMTS1900:	4M17F9W
	LTE BAND5:	4M52G7D (5 MHz QPSK modulation), 4M52W7D (5 MHz 16QAM modulation) 9M01G7D (10 MHz QPSK modulation), 9M00W7D (10 MHz 16QAM modulation)
	LTE BAND17:	4M52G7D (5 MHz QPSK modulation), 4M53W7D (5 MHz 16QAM modulation) 8M99G7D (10 MHz QPSK modulation), 9M01W7D (10 MHz 16QAM modulation)



4 General Test Conditions / Configurations

4.1 Test Modes

NOTE1: The test mode(s) are selected according to relevant radio technology specifications.

NOTE2: The power of LTE system 64QAM modulation is lower than that of 16QAM, so we did not test 64QAM modulation.

Test Mode	Test Modes Description
UMTS/TM1	WCDMA 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	3.45V
	VN	3.80V
	VH	4.25V

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)
GSM850	TX	Channel 128	Channel 190	Channel 251
		824.2MHz	836.6MHz	848.8MHz
	RX	Channel 128	Channel 190	Channel 251
		869.2MHz	881.6MHz	893.8MHz
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)
GSM1900	TX	Channel 512	Channel 661	Channel 810
		1850.2MHz	1880.0MHz	1909.8MHz
	RX	Channel 512	Channel 661	Channel 810
		1930.2 MHz	1960.0 MHz	1989.8 MHz
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



Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
	TX(10M)	826.5 MHz	836.5 MHz	846.5 MHz
		Channel 20450	Channel 20525	Channel 20600
	RX(5M)	829 MHz	836.5 MHz	844 MHz
		Channel 2425	Channel 2525	Channel 2625
	RX (10M)	871.5 MHz	881.5 MHz	891.5 MHz
		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 full-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-E-2016. The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 150cm 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 3GHz, 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 $43 + 10\log_{10}(\text{Power [Watts]})$.

Test Procedures Used

KDB 971168 D01 v03r01-Section 5.2.2 / KDB 971168 D01 v03r01-Section 5.8

ANSI/TIA-603-E-2016-Section 2.2.17 / ANSI/TIA-603-E-2016-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. 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.

Test Procedures Used

KDB 971168 D01 v03r01-Section 5.7.2

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 D01 v03r01-Section 4.3

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 test complies with the requirements in clause 2 of the present report according to test procedures in KDB 971168 D01 v03r01-Section 6 with corresponding test settings.

Note: Reference test setup 1.



4.4.5 Spurious and Harmonic Emissions at Antenna Terminal

The test complies with the requirements in clause 2 of the present report according to test procedures in KDB 971168 D01 v03r01-Section 6 with corresponding test settings.

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-E-2016. 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.

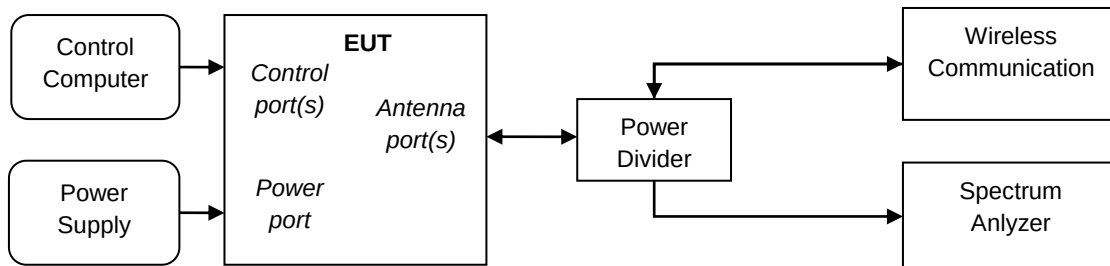
Test Procedures Used

ANSI/TIA-603-E-2016

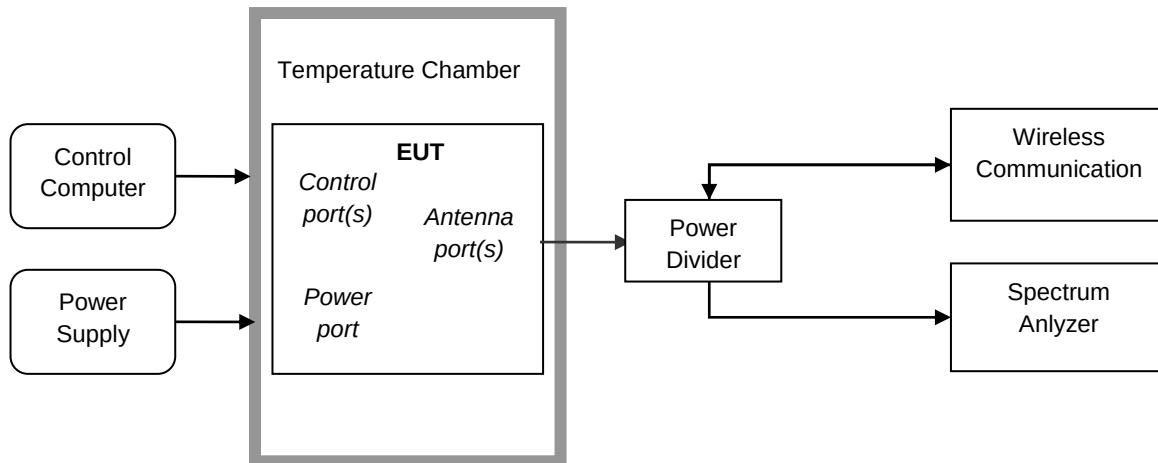
Note: Reference test setup 2.

4.5 Test Setups

4.5.1 Test Setup 1



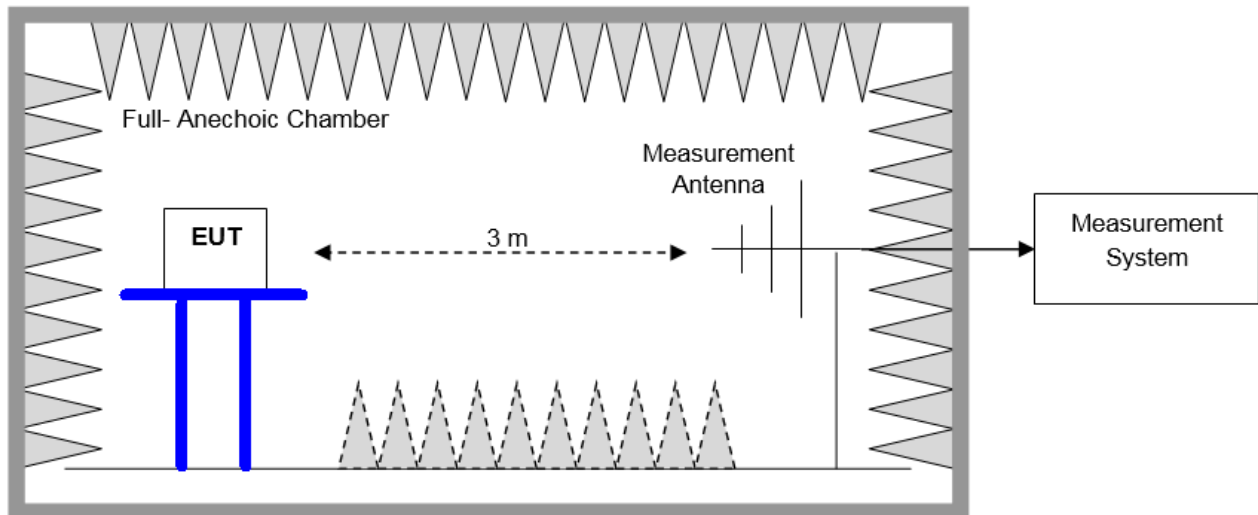
4.5.2 Test Setup 2



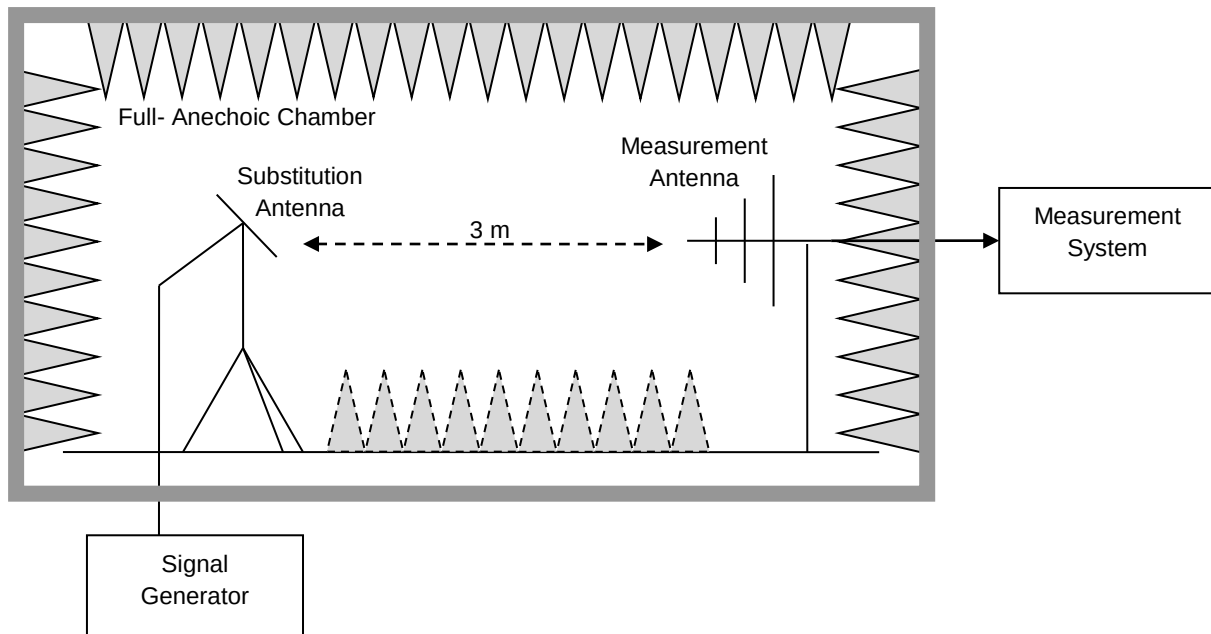
4.5.3 Test Setup 3

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 Setup 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 Setup 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 Setup 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 Setup 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 Setup 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 Setup 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 Setup 1
		RF Channels (TX)	L, H (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 Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)



Test Case	Test Conditions	
	Test Mode	UMTS/TM1,LTE/TM1,LTE/TM2
Field Strength of Spurious Radiation	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Setup 3
	Test Mode	GSM/TM1,GSM/TM2,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 Setup 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

Location 1:

Conducted:

Main Test Equipments					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	1342889	2017/10/24	2018/10/24
Universal Radio Communication Tester	R&S	CMU200	110932	2018/4/27	2019/4/27
Universal Radio Communication Tester	R & S	CMW500	159302	2018/7/23	2019/7/23
Signal Analyzer	R&S	FSQ31	200021	2018/7/23	2019/7/23
Spectrum Analyzer	Agilent	N9030A	MY49431698	2018/7/23	2019/7/23
Temperature Chamber	WEISS	WKL64	56246002940010	2017/12/13	2018/12/13
Signal generator	Agilent	E8257D	MY49281095	2018/7/23	2019/7/23
Vector Signal Generator	R&S	SMU200A	104162	2018/7/23	2019/7/23
Power Detecting & Samplig Unit	R&S	OSP-B157	101429	2018/7/23	2019/7/23
Spectrum Analyzer	Keysight	N9040B	MY57212529	2018/6/28	2019/6/28

Radiation:

Main Test Equipments					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Universal Radio Communication Tester	R&S	CMU200	117385	2018/05/08	2019/05/07
Universal Radio Communication Tester	R&S	MT8821C	6261760791	2018/04/02	2019/04/01
Test receiver	R&S	ESU26	100387	2018/1/20	2019/1/19
Test receiver	R&S	ESCI	101163	2018/1/20	2019/1/19
Test receiver	R&S	ESU26	100150	2018/1/20	2019/1/19
Spectrum analyzer	R&S	FSU3	200474	2018/1/20	2019/1/19
Spectrum analyzer	R&S	FSU43	100144	2018/1/20	2019/1/19
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2017/6/15	2019/6/14
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100263	2017/8/21	2019/8/20
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-490	2017/3/29	2019/3/28
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-521	2018/4/9	2020/4/8
Trilog Broadband Antenna	SCHWARZBECK	VULB	9163-357	2017/4/21	2019/4/20



(30M~3GHz)		9163			
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2017/5/27	2019/5/26
double ridged horn antenna (0.8G-18GHz)	R&S	HF907	100305	2017/4/21	2019/4/20
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	5140299	2017/7/20	2019/7/19
Pyramidal Horn Antenna(26.5GHz-40GHz)	ETS-Lindgren	3160-10	00205695	2018/4/20	2020/4/19
Pyramidal Horn Antenna(26.5GHz-40GHz)	ETS-Lindgren	3160-10	LM5947	2017/7/20	2019/7/19
Artificial Main Network	R&S	ENV4200	100134	2018/5/8	2019/5/7
Line Impedance Stabilization Network	R&S	ENV216	100382	2018/5/8	2019/5/7
Software Information					
Test Item	Software Name		Manufacturer		Version
RSE	EMC32		R&S		V8.40.0

Test Location 2:

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMI Test Receiver&SA	Agilent	N9038A	MY52260185	20Hz~26.5GHz	Aug. 30, 2018	Aug.29, 2019	Radiation (03CH01-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270104	0.5GHz~26.5Ghz	Dec.27, 2017	Dec 26, 2018	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	Jun. 5, 2018	Jun. 4, 2019	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	119436	1GHz~18GHz	Jun. 28, 2018	Jun. 27, 2019	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Mar.30, 2018	Mar.29, 2019	Radiation (03CH01-SZ)
LF Amplifier	Burgeon	BPA-530	102209	0.01~3000Mhz	Apr. 20, 2018	Apr.19, 2019	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul.17.2018	Jul.16.2019	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	NCR	Radiation (03CH01-SZ)

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 Conducted	Power [dBm]	U = 0.64 dB
RF Power Density, Conducted	Power [dBm]	U = 0.64 dB
Bandwidth	Magnitude [kHz]	200kHz: U=9.06kHz 1.4MHz: U=9.48kHz 3MHz: U=10.86kHz 5MHz: U=13.84kHz 10MHz: U=22.32kHz 15MHz: U=31.9kHz 20MHz: U=41.78kHz
Band Edge Compliance	Disturbance Power [dBm]	U = 0.9 dB
Spurious Emissions, Conducted	Disturbance Power [dBm]	20MHz~3.6GHz: U=0.88dB 3.6GHz~8.4GHz: U=1.08dB 8.4GHz~13.6GHz: U=1.24dB 13.6GHz~22GHz: U=1.34dB 22GHz~26.5GHz: U=1.36dB
Field Strength of Spurious Radiation	ERP/EIRP [dBm]	For 3 m Chamber: U = 5.94 dB (30 MHz to 3GHz) U = 5.54 dB (3GHz to 18GHz) U = 4.94 dB (18GHz to 26.5GHz)
Frequency Stability	Frequency Accuracy [Hz]	800MHz: U=24.08Hz 900MHz: U=24.54Hz 1900MHz: U=34.7Hz 2100MHz: U=36.96Hz 2300MHz: U=39.24Hz 2500MHz: U=41.58Hz 2600MHz: U=42.74Hz



7 Appendixes

Appendix No.	Description
SYBH(Z-RF)20180903005001-2001-A	Appendix_for_LTE Band5
SYBH(Z-RF)20180903005001-2001-B	Appendix_for_LTE Band17
SYBH(Z-RF)20180903005001-2001-C	Appendix_for_WCDMA

Appendix	Description
Appendix A	Effective (Isotropic) Radiated Power Output Data
Appendix B	Peak-Average Ratio
Appendix C	Modulation Characteristics
Appendix D	Bandwidth
Appendix E	Band Edges Compliance
Appendix F	Spurious Emission at Antenna Terminals
Appendix G	Field Strength of Spurious Radiation
Appendix H	Frequency Stability

END