FCC Test Report

Report No.: AGC09372170201FE07

FCC ID	:	2AK8BM10
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	iQsim Mobile WiFi Hotspot
BRAND NAME	:	iQsim
MODEL NAME	:	M10
CLIENT	:	IQSIM
DATE OF ISSUE	:	Mar. 27, 2017
STANDARD(S)	:	FCC Part 22 Rules FCC Part 24 Rules FCC Part 27 Rules
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd.

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 27, 2017	Valid	Original Report

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1.VERIFICATION OF COMPLIANCE

Applicant	IQSIM
Address	Les Algorithmes Aristote A - 2000 Route des Lucioles- 06410 BIOT - FRANCE
Manufacturer	IQSIM
Address	Les Algorithmes Aristote A - 2000 Route des Lucioles- 06410 BIOT - FRANCE
Product Designation	iQsim Mobile WiFi Hotspot
Brand Name	iQsim
Test Model	M10
Date of test	Mar. 06, 2017~Mar. 27, 2017
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA- 603-D-2010. The sample tested as described in this report is in compliance with the FCC Rules Part22, Part24 and Pant27.
The test results of this report relate only to the tested sample identified in this report.

Tested By	Dota Zhang(Zhang Jianfeng)	Mar. 27, 2017
Reviewed By	Bart Xie(Xie Xiaobin)	Mar. 27, 2017
Approved By	Solger Zhang(Zhang Hongyi) Authorized Officer	Mar. 27, 2017

2. GENERAL INFORMATION

2.1 Product Description

A major technical description of EUT is described as following:

Radio System Type:	LTE	
Hardware version:	V1	
Software version:	V1.0	
Frequency Bands:	☒FDD Band 2 ☒FDD Band 4 ☒FDD Band 5 ☐FDD Band 19 ☒FDD Band 17 ☐FDD Band 25 ☐FDD Band 26 ☐TDD Band 41 (U.S. Bands) ☒FDD Band 1 ☒FDD Band 3 ☒FDD Band 7 ☒FDD Band 8 ☒FDD Band 20 ☐TDD Band 33 ☐TDD Band 34 ☒TDD Band 38 ☒FDD Band 40 ☐FDD Band 42 ☐FDD Band 43 (Non-U.S. Bands)	
Frequency Range	LTE Band 2	Transmission (TX): 1850 to 1910 MHz
		Receiving (RX): 1930 to 1990 MHz
	LTE Band 4	Transmission (TX): 1710 to 1755 MHz
		Receiving (RX): 2110 to 2155 MHz
	LTE Band 5	Transmission (TX): 824 to 849 MHz
		Receiving (RX): 869 to 893.9 MHz
	LTE Band 17	Transmission (TX): 704 to 716 MHz
		Receiving (RX): 734 ~ 746 MHz
Supported Channel Bandwidth	LTE Band 2	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz
	LTE Band 4	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz
	LTE Band 5	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz
	LTE Band 17	☒ 5 MHz ☒ 10 MHz
Antenna:	PIFA Antenna	
Type of Modulation	QPSK/16QAM	
Antenna gain:	-0.5dBi(LTE band 2),-0.7dBi(LTE band 4), -1.0dBi(LTE band 5), -1.0dBi(LTE band 17),	
Diversity Antenna Gain	-0.7dBi(LTE band 2),-0.9dBi(LTE band 4), -1.3dBi(LTE band 5), -1.3dBi(LTE band 17),	
Power Supply:	DC 3.7V by battery	
Battery parameter:	DC3.7V/5000mAh	
Single Card:	WCDMA/GSM/LTE Card Slot	

Power Class	3
Voltage range	DC3.4 V to 4.2 V (Normal: DC3.7 V)
Temperature range	-10℃ to +50℃
*** Note: The High Voltage DC4.2V and Low Voltage DC3.4V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage.	

2.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AK8BM10**, filing to comply with the FCC Part22, Part24 Pant27 requirements.

2.3 Test Methodology

The radiated emission testing was performed according to the procedures of ANSI/TIA-603-D-2010, and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

KDB 971168 D01 Power Meas License Digital Systems v02r02

2.4 Test Facility

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,
FCC Registration No.	371540
Description	The test site is constructed and calibrated to meet the FCC requirements in documents of ANSI/TIA-603-D-2010.

2.5 Measurement Instruments

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 3, 2016	July 2, 2017
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9168	D69250	Mar 1, 2016	Feb 28, 2018
Trilog Broadband Antenna(substituted antenna) (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 3, 2016	July 2, 2018
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 3, 2016	July 2, 2017
RF Cable	SCHWARZBECK	AK9515E	96221	July 3, 2016	July 2, 2017
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 5, 2016	June 4, 2017
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 5, 2016	June 4, 2018
Spectrum analyzer	Agilent	E4407B	MY46185649	June 5, 2016	June 4, 2017
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 10, 2016	July 9, 2018
Horn Antenna(substituted antenna) (1G-18GHz)	ETS LINDGREN	3117	00034609	Mar 1, 2016	Feb 28, 2018
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 3, 2016	July 2, 2017
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 6, 2016	July 5, 2017
RF Cable	SCHWARZBECK	AK9515H	96220	July 7, 2016	July 6, 2017
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170	9170-181	June 5, 2016	June 4, 2017
Artificial Mains Network	Narda	L2-16B	000WX31025	July 7, 2016	July 6, 2017
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 7, 2016	July 6, 2017
RF Cable	SCHWARZBECK	AK9515E	96222	July 3, 2016	July 2, 2017
Shielded Room	CHENGYU	843	PTS-002	June 5, 2016	June 4, 2017
COMMUNICATION TESTER	AGILENT	8960	GB46490550	July 24,2016	July 23, 2017
RF attenuator	N/A	RFA20db	68	N/A	N/A
Signal Generator	AGILENT	N5182A	MY50140530	Oct 16,2015	Oct 15,2016
Signal Generator(substituted equipment)	AGILENT	E8257D	MY45141029	Oct 16,2015	Oct 15,2016

2.6 Special Accessories

The battery was supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

2.7 Equipment Modifications

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

3.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	2.1046/27.50(d)/ 27.50(c)
		Radiated output power	
2	Peak-to-Average Ratio	Peak-to-Average Ratio	27.50(d)
3	Spurious Emission	Conducted spurious emission	2.1051 / 27.53(h)/ 27.53(g)
		Radiated spurious emission	
4	Frequency Stability		2.1055/27.54
5	Occupied Bandwidth		2.1049 (h)(i)
6	Emission Bandwidth		2.1049/27.53(h)/ 27.53(g)
7	Band Edge		27.53(h)/ 27.53(g)
8	Mains Conducted Emission		15.107 / 15.207

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different.

3.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

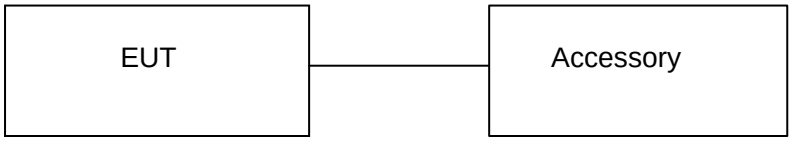


Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	iQsim Mobile WiFi Hotspot	M10	FCC ID: 2AK8BM10	EUT
2	Battery	6858102PL	DC3.7V/ 5000mAh	Accessory

****Note: All the accessories have been used during the test. The following "EUT" in setup diagram means EUT system.*

4. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	2.1046/27.50(d)/ 27.50(c)	Pass
		Radiated Output Power		
2	Peak-to-Average Ratio	Peak-to-Average Ratio	27.50(d)	Pass
3	Spurious Emission	Conducted Spurious Emission	2.1051 / 27.53(h)/ 27.53(g)	Pass
		Radiated Spurious Emission		
4	Frequency Stability		2.1055/27.54	Pass
5	Occupied Bandwidth		2.1049 (h)(i)	Pass
6	Emission Bandwidth		2.1049/27.53(h)/ 27.53(g)	Pass
7	Band Edge		27.53(h)/ 27.53(g)	Pass
8	Mains Conducted Emission		15.107 / 15.207	Pass

5. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMW 500) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both LTE frequency band.

*****Note:** LTE band 2, LTE band 4, LTE band 5, and LTE band 17 mode have been tested during the test. The worst condition was recorded in the test report if no other modes test data.

Test Mode	Test Modes Description
LTE	LTE system, QPSK modulation
LTE	LTE system, 16QAM modulation

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 2	TX (1.4M)	Channel 18607	Channel 18900	Channel 19193
		1850.7 MHz	1880 MHz	1909.3 MHz
	TX (3M)	Channel 18615	Channel 18900	Channel 19185
		1851.5 MHz	1880 MHz	1908.5 MHz
	TX (5M)	Channel 18625	Channel 18900	Channel 19175
		1852.5 MHz	1880 MHz	1907.5 MHz
	TX (10M)	Channel 18650	Channel 18900	Channel 19150
		1855.0 MHz	1880 MHz	1905.0 MHz
	TX (15M)	Channel 18675	Channel 18900	Channel 19125
		1857.5 MHz	1880 MHz	1902.5 MHz
	TX (20M)	Channel 18700	Channel 18900	Channel 19100
		1860.0 MHz	1880 MHz	1900.0 MHz
	RX (1.4M)	Channel 607	Channel 900	Channel 1193
		1930.7 MHz	1960 MHz	1989.3 MHz
	RX (3M)	Channel 615	Channel 900	Channel 1185
		1931.5 MHz	1960 MHz	1988.5 MHz
	RX (5M)	Channel 625	Channel 900	Channel 1175
		1932.5 MHz	1960 MHz	1987.5 MHz
	RX (10M)	Channel 650	Channel 900	Channel 1150
		1935 MHz	1960 MHz	1985 MHz
	RX (15M)	Channel 675	Channel 900	Channel 1125
		1937.5 MHz	1960 MHz	1982.5 MHz
	RX (20M)	Channel 700	Channel 900	Channel 1100
		1940 MHz	1960 MHz	1980 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 4	TX (1.4M)	Channel 19957	Channel 20175	Channel 20393
		1710.7 MHz	1732.5 MHz	1754.3 MHz
	TX (3M)	Channel 19965	Channel 20175	Channel 20385
		1711.5 MHz	1732.5 MHz	1753.5 MHz
	TX (5M)	Channel 19975	Channel 20175	Channel 20375
		1712.5 MHz	1732.5 MHz	1752.5 MHz
	TX (10M)	Channel 20000	Channel 20175	Channel 20350
		1715 MHz	1732.5 MHz	1750 MHz
	TX (15M)	Channel 20025	Channel 20175	Channel 20325
		1717.5 MHz	1732.5 MHz	1747.5 MHz
	TX (20M)	Channel 20050	Channel 20175	Channel 20300
		1720 MHz	1732.5 MHz	1745 MHz
	RX (1.4M)	Channel 1957	Channel 2175	Channel 2393
		2110.7 MHz	2132.5 MHz	2154.3 MHz
	RX (3M)	Channel 1965	Channel 2175	Channel 2385
		2111.5 MHz	2132.5 MHz	2153.5 MHz
	RX (5M)	Channel 1975	Channel 2175	Channel 2375
		2112.5 MHz	2132.5 MHz	2152.5 MHz
	RX (10M)	Channel 2000	Channel 2175	Channel 2350
		2115 MHz	2132.5 MHz	2150 MHz
	RX (15M)	Channel 2025	Channel 2175	Channel 2325
		2117.5 MHz	2132.5 MHz	2147.5 MHz
	RX (20M)	Channel 2050	Channel 2175	Channel 2300
		2120 MHz	2132.5 MHz	2145 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 5	TX (1.4M)	Channel 20407	Channel 20525	Channel 20643
		824.7 MHz	836.5 MHz	848.3 MHz
	TX (3M)	Channel 20415	Channel 20525	Channel 20635
		825.5 MHz	836.5 MHz	847.5 MHz
	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 (1.4M)	Channel 2404	Channel 2525	Channel 2463
		869.4 MHz	881.5 MHz	893.3 MHz
	RX (3M)	Channel 2415	Channel 2525	Channel 2635
		870.5 MHz	881.5 MHz	892.5 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
		739 MHz	740 MHz	743.5 MHz

6. OUTPUT POWER

6.1 Conducted Output Power

6.1.1 Procedures: (According with KDB 971168)

The transmitter output port was connected to base station.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Measure the maximum burst average power and average power for other modulation signal.

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes (LTE Band 4) at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The instrument must have an available measurement/resolution bandwidth that is equal to or exceeds the OBW. If this capability is available, then the following procedure can be used to determine the total peak output power.

a) Set the RBW ≥ OBW.

b) Set VBW ≥ 3 × RBW. c)

Set span ≥ 2 x RBW

d) Sweep time = auto couple.

e) Detector = peak.

f) Ensure that the number of measurement points ≥ span/RBW.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

1) Use the peak marker function to determine the peak amplitude level.

6.1.2 MEASUREMENT RESULT

Conducted Output Power Limits		
Mode	**Average Power**	**Tolerance(dB)**
LTE	23 dBm (0.2W)	± 2.7

LTE Band 2

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
20MHz	18700	1860.0	QPSK	1	0	0	23.07
				1	49	0	23.90
				1	99	0	23.68
				50	0	1	23.23
				50	25	1	22.90
				50	49	1	22.63
				100	0	1	22.54
			16QAM	1	0	1	22.14
				1	49	1	22.76
				1	99	1	22.68
				50	0	2	22.42

				50	25	2	22.45
				50	49	2	22.12
				100	0	2	22.89
	18900	1880.0	QPSK	1	0	0	23.64
				1	49	0	23.72
				1	99	0	24.33
				50	0	1	23.27
				50	25	1	23.73
				50	49	1	23.16
				100	0	1	23.18
			16QAM	1	0	1	22.66
				1	49	1	23.19
				1	99	1	23.17
				50	0	2	22.49
				50	25	2	22.89
				50	49	2	22.14
				100	0	2	22.34
	19100	1900.0	QPSK	1	0	0	24.21
				1	49	0	24.25
				1	99	0	24.07
				50	0	1	23.67
				50	25	1	23.75
				50	49	1	23.29
				100	0	1	23.54
			16QAM	1	0	1	23.62
				1	49	1	23.52
				1	99	1	23.53
				50	0	2	22.96
				50	25	2	22.46
				50	49	2	22.38
				100	0	2	22.31

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
15MHz	18675	1857.5	QPSK	1	0	0	23.07
				1	37	0	23.59
				1	74	0	23.27
				36	0	1	23.03
				36	16	1	23.47
				36	35	1	22.83
				75	0	1	22.63
			16QAM	1	0	1	22.46
				1	37	1	22.63
				1	74	1	22.89
				36	0	2	22.25
				36	16	2	21.96
				36	35	2	21.71
				75	0	2	22.10

	18900	1880.0	QPSK	1	0	0	23.61
				1	37	0	24.21
				1	74	0	24.39
				36	0	1	23.76
				36	16	1	23.81
				36	35	1	23.28
				75	0	1	23.30
			16QAM	1	0	1	23.17
				1	37	1	23.02
				1	74	1	23.28
				36	0	2	23.05
				36	16	2	22.09
				36	35	2	22.72
				75	0	2	22.08
	19125	1902.5	QPSK	1	0	0	24.40
				1	37	0	24.48
				1	74	0	24.01
				36	0	1	23.88
				36	16	1	23.71
				36	35	1	23.38
				75	0	1	23.14
			16QAM	1	0	1	23.62
				1	37	1	23.81
				1	74	1	23.42
				36	0	2	22.95
				36	16	2	22.20
				36	35	2	22.50
				75	0	2	22.55

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	18650	1855.0	QPSK	1	0	0	23.79
				1	24	0	23.48
				1	49	0	23.45
				25	0	1	23.14
				25	12	1	23.49
				25	25	1	22.62
				50	0	1	22.88
			16QAM	1	0	1	22.57
				1	24	1	22.25
				1	49	1	22.51
				25	0	2	21.91
				25	12	2	22.48
				25	25	2	21.83
				50	0	2	21.89
	18900	1880.0	QPSK	1	0	0	23.61
				1	24	0	24.24
				1	49	0	23.93
				25	0	1	23.70
				25	12	1	23.59

				25	25	1	23.53
				50	0	1	23.08
			16QAM	1	0	1	23.85
				1	24	1	24.00
				1	49	1	23.69
				25	0	2	22.69
				25	12	2	22.40
				25	25	2	22.46
				50	0	2	22.69
	19150	1905.0	QPSK	1	0	0	23.45
				1	24	0	23.02
				1	49	0	23.43
				25	0	1	22.63
				25	12	1	22.92
				25	25	1	22.88
				50	0	1	22.84
			16QAM	1	0	1	23.18
				1	24	1	22.98
				1	49	1	23.49
				25	0	2	22.78
				25	12	2	22.58
				25	25	2	22.98
				50	0	2	22.61

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	18625	1852.5	QPSK	1	0	0	23.82
				1	12	0	24.10
				1	24	0	23.94
				12	0	1	24.19
				12	6	1	24.14
				12	11	1	23.79
				25	0	1	24.22
			16QAM	1	0	1	24.14
				1	12	1	23.92
				1	24	1	23.93
				12	0	2	23.83
				12	6	2	23.81
				12	11	2	23.81
				25	0	2	23.91
	18900	1880.0	QPSK	1	0	0	23.38
				1	12	0	23.30
				1	24	0	23.51
				12	0	1	23.73
				12	6	1	23.57
				12	11	1	23.86
				25	0	1	23.45

			16QAM	1	0	1	23.64
				1	12	1	23.76
				1	24	1	23.64
				12	0	2	23.92
				12	6	2	23.87
				12	11	2	23.94
				25	0	2	23.76
	19175	1907.5	QPSK	1	0	0	23.92
				1	12	0	24.03
				1	24	0	24.32
				12	0	1	23.90
				12	6	1	24.04
				12	11	1	24.11
				25	0	1	24.07
			16QAM	1	0	1	23.57
				1	12	1	24.00
				1	24	1	24.18
				12	0	2	23.74
				12	6	2	24.17
				12	11	2	24.27
				25	0	2	23.82

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
3MHz	18615	1851.5	QPSK	1	0	0	23.65
				1	7	0	23.91
				1	14	0	23.58
				8	0	1	23.82
				8	4	1	23.72
				8	7	1	24.09
				15	0	1	23.73
			16QAM	1	0	1	24.00
				1	7	1	23.82
				1	14	1	23.70
				8	0	2	22.13
				8	4	2	22.11
				8	7	2	22.28
				15	0	2	22.74
	18900	1880.0	QPSK	1	0	0	23.19
				1	7	0	23.68
				1	14	0	23.38
				8	0	1	23.14
				8	4	1	22.31
				8	7	1	22.25

				15	0	1	21.90
			16QAM	1	0	1	23.59
				1	7	1	23.88
				1	14	1	22.64
				8	0	2	22.24
				8	4	2	22.05
				8	7	2	22.19
				15	0	2	22.77
	19185	1908.5	QPSK	1	0	0	23.84
				1	7	0	23.89
				1	14	0	24.18
				8	0	1	24.27
				8	4	1	23.33
				8	7	1	23.29
				15	0	1	23.31
			16QAM	1	0	1	24.30
				1	7	1	22.96
				1	14	1	24.05
				8	0	2	22.93
				8	4	2	22.97
				8	7	2	22.95
				15	0	2	23.11

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
1.4MHz	18607	1850.7	QPSK	1	0	0	23.27
				1	3	0	23.53
				1	5	0	23.64
				3	0	0	23.41
				3	2	0	23.36
				3	3	0	23.33
				6	0	1	22.36
			16QAM	1	0	1	23.24
				1	2	1	24.00
				1	5	1	24.02
				3	0	1	23.98
				3	1	1	22.79
				3	2	1	22.69
				6	0	2	22.09
	18900	1880.0	QPSK	1	0	0	23.40
				1	2	0	23.26
				1	5	0	23.63
				3	0	0	23.60
				3	1	0	22.16

				3	2	0	22.18
				6	0	1	22.59
			16QAM	1	0	1	23.50
				1	2	1	23.60
				1	5	1	23.56
				3	0	1	22.18
				3	1	1	22.41
				3	2	1	22.28
				6	0	2	22.67
	19193	1909.3	QPSK	1	0	0	23.44
				1	2	0	23.15
				1	5	0	23.27
				3	0	0	22.81
				3	1	0	22.73
				3	2	0	22.39
				6	0	1	22.41
			16QAM	1	0	1	23.49
				1	2	1	23.39
				1	5	1	23.08
				3	0	1	21.89
				3	1	1	22.06
				3	2	1	22.15
				6	0	2	22.07

LTE Band 4

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
20MHz	20050	1720.0	QPSK	1	0	0	23.35
				1	49	0	24.14
				1	99	0	23.41
				50	0	1	24.15
				50	25	1	23.60
				50	49	1	23.76
				100	0	1	22.81
			16QAM	1	0	1	23.23
				1	49	1	24.36
				1	99	1	24.00
				50	0	2	23.18
				50	25	2	22.82
				50	49	2	23.13
				100	0	2	23.12
	20175	1732.5	QPSK	1	0	0	23.87
				1	49	0	23.43
				1	99	0	23.15
				50	0	1	22.86
				50	25	1	22.29
				50	49	1	22.68
				100	0	1	22.83
			16QAM	1	0	1	23.58
				1	49	1	23.71
				1	99	1	24.06
				50	0	2	23.16
				50	25	2	23.24
				50	49	2	23.55
				100	0	2	22.89
	20300	1745.0	QPSK	1	0	0	23.66
				1	49	0	23.76
				1	99	0	23.48
				50	0	1	22.38
				50	25	1	22.64
				50	49	1	22.50
				100	0	1	22.33
			16QAM	1	0	1	24.01
				1	49	1	23.88
				1	99	1	23.80
				50	0	2	23.54
				50	25	2	23.52
				50	49	2	22.61
				100	0	2	22.40

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
15MHz	20025	1717.5	QPSK	1	0	0	23.21
				1	37	0	23.35
				1	74	0	23.85
				36	0	1	23.14
				36	16	1	22.22
				36	35	1	23.08
				75	0	1	22.60
			16QAM	1	0	1	23.31
				1	37	1	23.41
				1	74	1	23.93
				36	0	2	22.57
				36	16	2	22.94
				36	35	2	22.92
				75	0	2	21.87
	20175	1732.5	QPSK	1	0	0	23.60
				1	37	0	23.86
				1	74	0	23.33
				36	0	1	23.62
				36	16	1	22.85
				36	35	1	22.40
				75	0	1	22.34
			16QAM	1	0	1	23.06
				1	37	1	23.53
				1	74	1	23.47
				36	0	2	22.78
				36	16	2	22.13
				36	35	2	22.44
				75	0	2	22.43
	20325	1747.5	QPSK	1	0	0	23.60
				1	37	0	24.03
				1	74	0	23.78
				36	0	1	23.82
				36	16	1	22.79
				36	35	1	23.28
				75	0	1	23.03
			16QAM	1	0	1	23.80
				1	37	1	24.03
				1	74	1	24.09
				36	0	2	23.90
				36	16	2	23.35
				36	35	2	23.50
				75	0	2	23.10

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	20000	1715.0	QPSK	1	0	0	23.76
				1	24	0	24.10
				1	49	0	23.66
				25	0	1	23.78
				25	12	1	23.95
				25	25	1	23.61
				50	0	1	23.75
			16QAM	1	0	1	23.89
				1	24	1	23.93
				1	49	1	23.91
				25	0	2	23.78
				25	12	2	23.97
				25	25	2	23.92
				50	0	2	23.77
	20175	1732.5	QPSK	1	0	0	23.46
				1	24	0	23.63
				1	49	0	23.61
				25	0	1	23.57
				25	12	1	23.42
				25	25	1	23.71
				50	0	1	23.46
			16QAM	1	0	1	23.56
				1	24	1	23.91
				1	49	1	23.91
				25	0	2	23.47
				25	12	2	23.55
				25	25	2	23.55
				50	0	2	23.45
	20350	1750.0	QPSK	1	0	0	23.48
				1	24	0	23.93
				1	49	0	24.14
				25	0	1	23.96
				25	12	1	23.77
				25	25	1	23.90
				50	0	1	24.08
			16QAM	1	0	1	23.92
				1	24	1	24.14
				1	49	1	24.18
				25	0	2	23.49
				25	12	2	23.79
				25	25	2	23.68
				50	0	2	23.53

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	19975	1712.5	QPSK	1	0	0	22.86
				1	12	0	23.28
				1	24	0	23.10
				12	0	1	23.65
				12	6	1	23.54
				12	11	1	23.47
				25	0	1	23.33
			16QAM	1	0	1	23.83
				1	12	1	23.67
				1	24	1	23.39
				12	0	2	23.13
				12	6	2	23.37
				12	11	2	23.35
				25	0	2	23.33
	20175	1732.5	QPSK	1	0	0	22.95
				1	12	0	22.99
				1	24	0	22.96
				12	0	1	23.64
				12	6	1	22.91
				12	11	1	22.70
				25	0	1	22.74
			16QAM	1	0	1	23.41
				1	12	1	22.93
				1	24	1	23.24
				12	0	2	23.27
				12	6	2	22.99
				12	11	2	23.12
				25	0	2	22.91
	20375	1752.5	QPSK	1	0	0	23.88
				1	12	0	23.63
				1	24	0	24.43
				12	0	1	23.87
				12	6	1	23.77
				12	11	1	23.30
				25	0	1	23.74
			16QAM	1	0	1	23.23
				1	12	1	23.55
				1	24	1	23.50
				12	0	2	22.96
				12	6	2	23.24
				12	11	2	23.62
				25	0	2	23.31

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
3MHz	19965	1711.5	QPSK	1	0	0	23.20
				1	7	0	23.53
				1	14	0	23.38
				8	0	1	23.32
				8	4	1	23.49
				8	7	1	23.15
				15	0	1	23.78
			16QAM	1	0	1	23.51
				1	7	1	23.72
				1	14	1	23.31
				8	0	2	23.21
				8	4	2	23.02
				8	7	2	23.28
				15	0	2	23.10
	20175	1732.5	QPSK	1	0	0	23.53
				1	7	0	23.71
				1	14	0	24.25
				8	0	1	24.07
				8	4	1	23.84
				8	7	1	23.34
				15	0	1	23.80
			16QAM	1	0	1	23.53
				1	7	1	23.80
				1	14	1	23.58
				8	0	2	23.39
				8	4	2	23.54
				8	7	2	23.73
				15	0	2	23.47
	20385	1753.5	QPSK	1	0	0	23.04
				1	7	0	23.16
				1	14	0	23.72
				8	0	1	23.55
				8	4	1	23.82
				8	7	1	22.83
				15	0	1	23.64
			16QAM	1	0	1	23.73
				1	7	1	23.28
				1	14	1	23.23
				8	0	2	22.86
				8	4	2	23.21
				8	7	2	23.26

				15	0	2	23.11

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
1.4MHz	19957	1710.7	QPSK	1	0	0	23.24
				1	2	0	23.02
				1	5	0	23.19
				3	0	0	23.20
				3	1	0	23.04
				3	2	0	22.61
				6	0	1	23.25
			16QAM	1	0	1	23.18
				1	2	1	23.57
				1	5	1	23.41
				3	0	1	22.64
				3	1	1	23.03
				3	2	1	22.89
				6	0	2	22.95
	20175	1732.5	QPSK	1	0	0	23.63
				1	2	0	24.01
				1	5	0	24.10
				3	0	0	23.60
				3	1	0	24.06
				3	2	0	23.26
				6	0	1	24.00
			16QAM	1	0	1	23.67
				1	2	1	23.96
				1	5	1	23.63
				3	0	1	23.04
				3	1	1	23.28
				3	2	1	23.43
				6	0	2	23.69
	20393	1754.3	QPSK	1	0	0	23.17
				1	2	0	23.42
				1	5	0	24.11
				3	0	0	23.25
				3	1	0	23.63
				3	2	0	22.39
				6	0	1	23.68
			16QAM	1	0	1	23.16
				1	2	1	23.45
				1	5	1	22.91
				3	0	1	22.66
				3	1	1	22.54

				3	2	1	23.32
				6	0	2	23.35

LTE Band 5

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	20450	829	QPSK	1	0	0	23.47
				1	24	0	23.74
				1	49	0	23.62
				25	0	1	23.77
				25	12	1	24.04
				25	25	1	23.87
				50	0	1	22.99
			16QAM	1	0	1	23.35
				1	24	1	23.20
				1	49	1	23.58
				25	0	2	23.48
				25	12	2	22.99
				25	25	2	22.71
				50	0	2	21.62
	20525	836.5	QPSK	1	0	0	23.04
				1	24	0	23.60
				1	49	0	23.00
				25	0	1	23.08
				25	12	1	22.84
				25	25	1	22.64
				50	0	1	21.58
			16QAM	1	0	1	23.27
				1	24	1	23.30
				1	49	1	22.59
				25	0	2	23.08
				25	12	2	22.75
				25	25	2	22.97
				50	0	2	21.57
	20600	844	QPSK	1	0	0	23.24
				1	24	0	23.20
				1	49	0	23.15
				25	0	1	22.95
				25	12	1	22.96
				25	25	1	23.24
				50	0	1	21.90
			16QAM	1	0	1	23.58
				1	24	1	22.68
				1	49	1	23.74
				25	0	2	22.21
				25	12	2	22.32
				25	25	2	21.93
				50	0	2	21.31

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	20425	826.5	QPSK	1	0	0	23.40
				1	12	0	22.98
				1	24	0	23.22
				12	0	1	23.20
				12	6	1	23.28
				12	11	1	22.07
				25	0	1	22.08
			16QAM	1	0	1	23.92
				1	12	1	23.20
				1	24	1	23.26
				12	0	2	22.88
				12	6	2	23.01
				12	11	2	22.25
				25	0	2	21.90
	20525	836.5	QPSK	1	0	0	22.91
				1	12	0	23.19
				1	24	0	23.74
				12	0	1	23.08
				12	6	1	22.85
				12	11	1	22.42
				25	0	1	21.90
			16QAM	1	0	1	23.00
				1	12	1	22.84
				1	24	1	23.56
				12	0	2	23.31
				12	6	2	23.73
				12	11	2	23.48
				25	0	2	22.45
	20625	846.5	QPSK	1	0	0	23.42
				1	12	0	23.41
				1	24	0	23.59
				12	0	1	22.53
				12	6	1	22.63
				12	11	1	22.91
				25	0	1	22.61
			16QAM	1	0	1	22.75
				1	12	1	23.27
				1	24	1	22.90
				12	0	2	23.61
				12	6	2	23.34

				12	11	2	22.01
				25	0	2	22.54

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
3MHz	20415	825.5	QPSK	1	0	0	23.22
				1	7	0	23.75
				1	14	0	23.21
				8	0	1	22.62
				8	4	1	22.80
				8	7	1	22.43
				15	0	1	22.15
			16QAM	1	0	1	23.12
				1	7	1	23.25
				1	14	1	23.13
				8	0	2	23.44
				8	4	2	23.28
				8	7	2	22.87
				15	0	2	21.35
	20525	836.5	QPSK	1	0	0	23.27
				1	7	0	23.50
				1	14	0	23.43
				8	0	1	23.42
				8	4	1	22.34
				8	7	1	22.94
				15	0	1	21.92
			16QAM	1	0	1	23.43
				1	7	1	23.65
				1	14	1	23.58
				8	0	2	23.22
				8	4	2	23.37
				8	7	2	22.81
				15	0	2	22.21
	20635	847.5	QPSK	1	0	0	23.55
				1	7	0	22.92
				1	14	0	23.86
				8	0	1	22.27
				8	4	1	22.62
				8	7	1	23.35
				15	0	1	21.57
			16QAM	1	0	1	23.63
				1	7	1	23.83
				1	14	1	23.42
				8	0	2	23.17

				8	4	2	21.95
				8	7	2	22.59
				15	0	2	22.06

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
1.4MHz	20407	824.7	QPSK	1	0	0	23.27
				1	2	0	23.80
				1	5	0	23.75
				3	0	0	23.14
				3	1	0	21.95
				3	2	0	22.00
				6	0	1	21.71
			16QAM	1	0	1	23.44
				1	2	1	23.79
				1	5	1	23.68
				3	0	1	22.65
				3	1	1	22.25
				3	2	1	22.93
				6	0	2	21.80
	20525	836.5	QPSK	1	0	0	23.18
				1	2	0	23.94
				1	5	0	23.00
				3	0	0	23.69
				3	1	0	22.26
				3	2	0	23.16
				6	0	1	21.93
			16QAM	1	0	1	23.00
				1	2	1	23.50
				1	5	1	23.53
				3	0	1	23.45
				3	1	1	22.93
				3	2	1	22.78
				6	0	2	21.98
	20643	848.3	QPSK	1	0	0	23.36
				1	2	0	23.05
				1	5	0	23.69
				3	0	0	23.58
				3	1	0	22.95
				3	2	0	22.27
				6	0	1	21.88
			16QAM	1	0	1	23.06
				1	2	1	22.90
				1	5	1	23.53

				3	0	1	22.66
				3	1	1	22.50
				3	2	1	23.01
				6	0	2	21.87

LTE Band 17

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	23780	709	QPSK	1	0	0	23.08
				1	24	0	23.63
				1	49	0	23.12
				25	0	1	22.71
				25	12	1	22.24
				25	25	1	21.84
				50	0	1	22.44
			16QAM	1	0	1	22.63
				1	24	1	22.25
				1	49	1	22.17
				25	0	2	22.51
				25	12	2	22.12
				25	25	2	22.26
				50	0	2	22.23
	23790	710	QPSK	1	0	0	23.32
				1	24	0	23.50
				1	49	0	23.96
				25	0	1	22.84
				25	12	1	22.52
				25	25	1	21.91
				50	0	1	22.50
			16QAM	1	0	1	22.98
				1	24	1	22.82
				1	49	1	22.87
				25	0	2	22.17
				25	12	2	22.48
				25	25	2	22.55
				50	0	2	22.72
	23800	711	QPSK	1	0	0	23.18
				1	24	0	23.33
				1	49	0	22.95
				25	0	1	22.45
				25	12	1	22.12
				25	25	1	21.81
				50	0	1	21.94
			16QAM	1	0	1	22.24
				1	24	1	22.11
				1	49	1	21.94
				25	0	2	22.06
				25	12	2	21.95

				25	25	2	22.19
				50	0	2	22.42

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	23755	706.5	QPSK	1	0	0	23.34
				1	12	0	23.56
				1	24	0	23.01
				12	0	1	22.16
				12	6	1	22.12
				12	11	1	21.46
				25	0	1	22.09
			16QAM	1	0	1	22.55
				1	12	1	22.95
				1	24	1	22.25
				12	0	2	22.36
				12	6	2	22.00
				12	11	2	22.40
				25	0	2	22.43
	23790	710	QPSK	1	0	0	23.16
				1	12	0	23.16
				1	24	0	23.71
				12	0	1	22.48
				12	6	1	22.60
				12	11	1	21.92
				25	0	1	22.27
			16QAM	1	0	1	22.73
				1	12	1	22.29
				1	24	1	22.49
				12	0	2	22.02
				12	6	2	22.27
				12	11	2	22.10
				25	0	2	22.82
	23825	713.5	QPSK	1	0	0	23.27
				1	12	0	23.15
				1	24	0	23.51
				12	0	1	22.16
				12	6	1	22.18
				12	11	1	22.06
				25	0	1	22.25
			16QAM	1	0	1	23.03
				1	12	1	22.47
				1	24	1	22.25
				12	0	2	21.81

				12	6	2	21.91
				12	11	2	22.39
				25	0	2	22.44

According to 3GPP 36.521 sub-clause 6.2.3.3, the maximum output power is allowed to be reduced by following the table.

Table 6.2.3.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	**Channel bandwidth / Transmission bandwidth configuration [RB]**						**MPR (dB)**
	1.4 MHz	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (For PRACH, PUCCH and SRS transmission, the allowed MPR is according to that specified for PUSCH QPSK modulation for the corresponding transmission bandwidth.).

When PRACH, PUCCH are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

For each subframe, the MPR is evaluated per slot and given by the maximum value taken over the transmission(s) within the slot, the maximum MPR over the two slots is then applied for the entire subframe.

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply. The normative reference for this requirement is TS 36.101 clause 6.2.3.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

6.2 RADIATED OUTPUT POWER

6.2.1 MEASUREMENT METHOD

The measurements procedures specified in ANSI/TIA-603-D-2010 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 27.50(d)(4). The "reference path loss" from Step1 is added to this result.

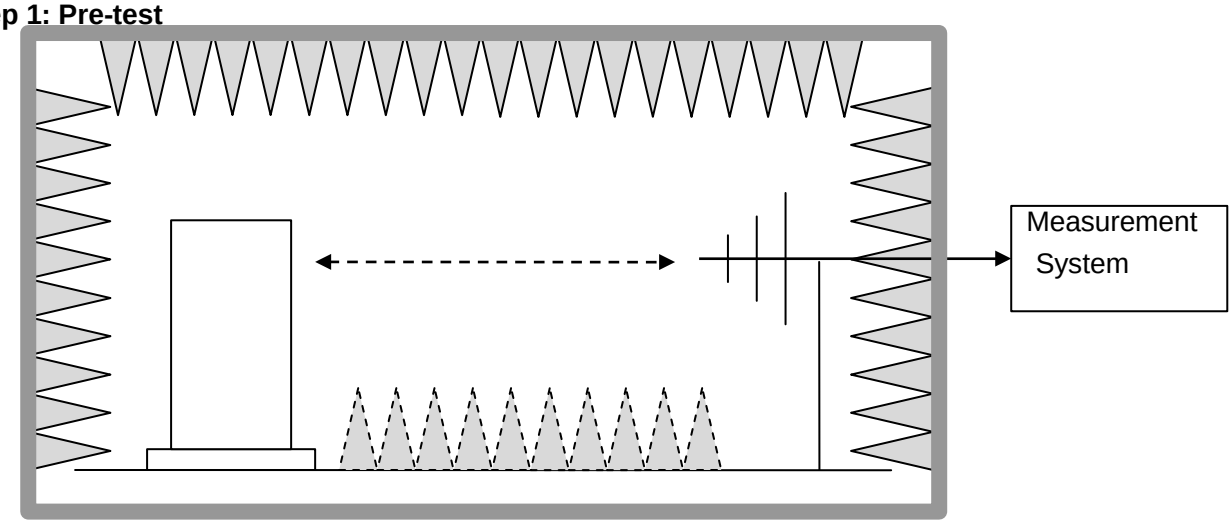
7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

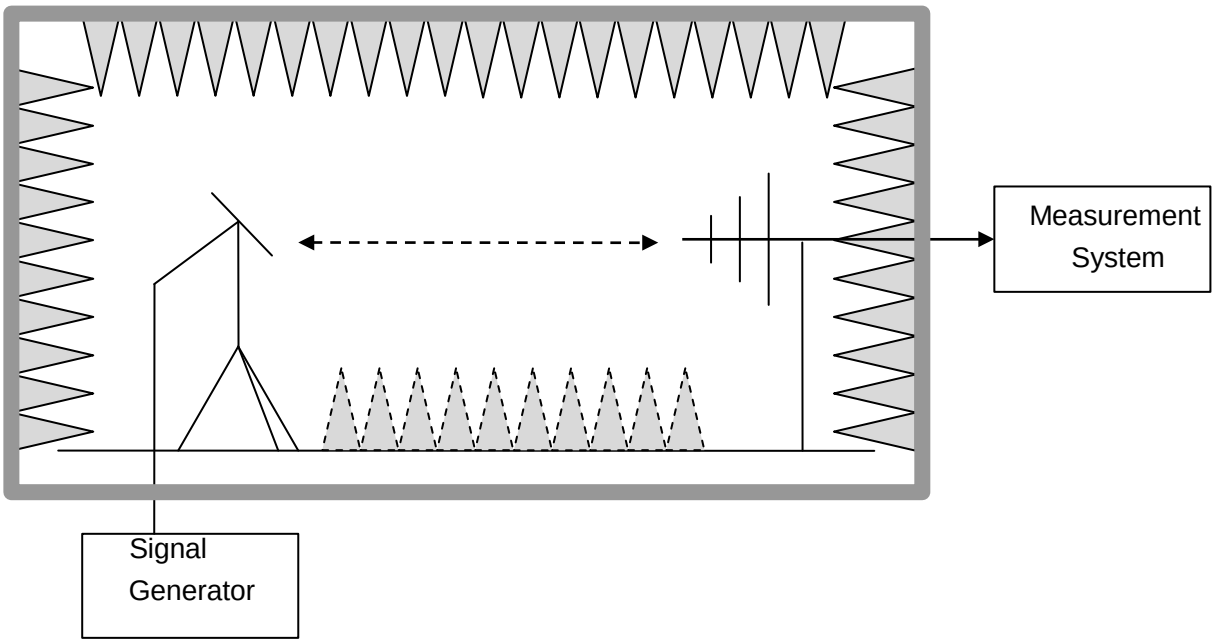
Test Setup

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

Step 1: Pre-test



Step 2: Substitution method to verify the maximum ERP



6.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 27.50(d) specifies, "Mobile/portable stations are limited to 1 watts e.i.r.p.

Rule Part 27.50(c)(10) specifies "Portable stations (hand-held devices) are limited to 3 watts ERP".

Mode	Nominal Peak Power
LTE Band 2	<=30 dBm (1W)
LTE Band 4	<=30 dBm (1W)
LTE Band 5	<=34.77dBm(3W)
LTE Band 17	<=34.77dBm(3W)

6.2.3 MEASUREMENT RESULT

EIRP for LTE Band2 (Part 27)

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1850.7	1.4	QPSK	1/0	11.84	V	7.95	0.79	19.00	30
1880.0	1.4	QPSK	1/0	11.88	V	7.95	0.79	19.04	30
1909.3	1.4	QPSK	1/0	12.56	V	7.95	0.79	19.72	30
1850.7	1.4	QPSK	1/0	11.65	H	7.95	0.79	18.81	30
1880.0	1.4	QPSK	1/0	11.34	H	7.95	0.79	18.50	30
1909.3	1.4	QPSK	1/0	11.46	H	7.95	0.79	18.62	30
1850.7	1.4	16-QAM	1/5	12.62	V	7.95	0.79	19.78	30
1880.0	1.4	16-QAM	1/0	12.06	V	7.95	0.79	19.22	30
1909.3	1.4	16-QAM	1/0	11.98	V	7.95	0.79	19.14	30
1850.7	1.4	16-QAM	1/5	11.27	H	7.95	0.79	18.43	30
1880.0	1.4	16-QAM	1/0	12.17	H	7.95	0.79	19.33	30
1909.3	1.4	16-QAM	1/0	10.79	H	7.95	0.79	17.95	30
1851.5	3	QPSK	1/0	11.71	V	7.95	0.79	18.87	30
1880.0	3	QPSK	1/0	12.32	V	7.95	0.79	19.48	30
1908.5	3	QPSK	1/0	13.07	V	7.95	0.79	20.23	30
1851.5	3	QPSK	1/0	10.77	H	7.95	0.79	17.93	30
1880.0	3	QPSK	1/0	11.19	H	7.95	0.79	18.35	30
1908.5	3	QPSK	1/0	11.25	H	7.95	0.79	18.41	30
1851.5	3	16-QAM	1/0	12.79	V	7.95	0.79	19.95	30
1880.0	3	16-QAM	1/0	12.15	V	7.95	0.79	19.31	30
1908.5	3	16-QAM	1/0	12.07	V	7.95	0.79	19.23	30
1851.5	3	16-QAM	1/0	11.13	H	7.95	0.79	18.29	30
1880.0	3	16-QAM	1/0	12.36	H	7.95	0.79	19.52	30
1908.5	3	16-QAM	1/0	11.48	H	7.95	0.79	18.64	30
1852.5	5	QPSK	1/0	12.00	V	7.95	0.79	19.16	30
1880.0	5	QPSK	1/0	12.62	V	7.95	0.79	19.78	30
1907.5	5	QPSK	1/24	12.37	V	7.95	0.79	19.53	30
1852.5	5	QPSK	1/0	11.99	H	7.95	0.79	19.15	30
1880.0	5	QPSK	1/0	11.82	H	7.95	0.79	18.98	30
1907.5	5	QPSK	1/24	10.88	H	7.95	0.79	18.04	30
1852.5	5	16-QAM	1/0	12.94	V	7.95	0.79	20.10	30
1880.0	5	16-QAM	1/0	12.39	V	7.95	0.79	19.55	30
1907.5	5	16-QAM	1/24	12.09	V	7.95	0.79	19.25	30
1852.5	5	16-QAM	1/0	10.88	H	7.95	0.79	18.04	30
1880.0	5	16-QAM	1/0	12.07	H	7.95	0.79	19.23	30

1907.5	5	16-QAM	1/24	11.13	H	7.95	0.79	18.29	30
1855	10	QPSK	1/0	12.07	V	7.95	0.79	19.23	30
1880	10	QPSK	1/49	12.52	V	7.95	0.79	19.68	30
1905	10	QPSK	1/0	13.11	V	7.95	0.79	20.27	30
1855	10	QPSK	1/0	11.51	H	7.95	0.79	18.67	30
1880	10	QPSK	1/49	11.83	H	7.95	0.79	18.99	30
1905	10	QPSK	1/0	11.59	H	7.95	0.79	18.75	30
1855	10	16-QAM	1/0	12.44	V	7.95	0.79	19.60	30
1880	10	16-QAM	1/49	12.95	V	7.95	0.79	20.11	30
1905	10	16-QAM	1/0	12.72	V	7.95	0.79	19.88	30
Frequency	Channel BW	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1855	10	16-QAM	1/0	11.14	H	7.95	0.79	18.30	30
1880	10	16-QAM	1/49	11.78	H	7.95	0.79	18.94	30
1905	10	16-QAM	1/0	11.18	H	7.95	0.79	18.34	30
1857.5	15	QPSK	1/0	12.87	V	7.95	0.79	20.03	30
1880	15	QPSK	1/74	12.15	V	7.95	0.79	19.31	30
1902.5	15	QPSK	1/0	12.25	V	7.95	0.79	19.41	30
1857.5	15	QPSK	1/0	12.19	H	7.95	0.79	19.35	30
1880	15	QPSK	1/74	11.74	H	7.95	0.79	18.90	30
1902.5	15	QPSK	1/0	11.45	H	7.95	0.79	18.61	30
1857.5	15	16-QAM	1/0	11.70	V	7.95	0.79	18.86	30
1880	15	16-QAM	1/74	13.63	V	7.95	0.79	20.79	30
1902.5	15	16-QAM	1/0	12.40	V	7.95	0.79	19.56	30
1857.5	15	16-QAM	1/0	11.04	H	7.95	0.79	18.20	30
1880	15	16-QAM	1/74	11.30	H	7.95	0.79	18.46	30
1902.5	15	16-QAM	1/0	11.92	H	7.95	0.79	19.08	30
1860	20	QPSK	1/99	12.17	V	7.95	0.79	19.33	30
1880	20	QPSK	1/99	12.42	V	7.95	0.79	19.58	30
1900	20	QPSK	1/0	12.59	V	7.95	0.79	19.75	30
1860	20	QPSK	1/99	11.14	H	7.95	0.79	18.30	30
1880	20	QPSK	1/99	11.78	H	7.95	0.79	18.94	30
1900	20	QPSK	1/0	11.18	H	7.95	0.79	18.34	30
1860	20	16-QAM	1/99	12.47	V	7.95	0.79	19.63	30
1880	20	16-QAM	1/99	12.65	V	7.95	0.79	19.81	30
1900	20	16-QAM	1/0	11.97	V	7.95	0.79	19.13	30
1860	20	16-QAM	1/99	12.07	H	7.95	0.79	19.23	30
1880	20	16-QAM	1/99	11.29	H	7.95	0.79	18.45	30
1900	20	16-QAM	1/0	11.67	H	7.95	0.79	18.83	30

EIRP for LTE Band4 (Part 27)

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1710.7	1.4	QPSK	1/0	12.58	V	7.95	0.79	19.74	30
1732.5	1.4	QPSK	1/0	12.37	V	7.95	0.79	19.53	30
1754.3	1.4	QPSK	1/0	12.61	V	7.95	0.79	19.77	30
1710.7	1.4	QPSK	1/0	11.86	H	7.95	0.79	19.02	30
1732.5	1.4	QPSK	1/0	11.02	H	7.95	0.79	18.18	30
1754.3	1.4	QPSK	1/0	10.91	H	7.95	0.79	18.07	30
1710.7	1.4	16-QAM	1/5	13.04	V	7.95	0.79	20.20	30
1732.5	1.4	16-QAM	1/0	11.68	V	7.95	0.79	18.84	30
1754.3	1.4	16-QAM	1/0	13.40	V	7.95	0.79	20.56	30
1710.7	1.4	16-QAM	1/5	10.87	H	7.95	0.79	18.03	30
1732.5	1.4	16-QAM	1/0	10.77	H	7.95	0.79	17.93	30
1754.3	1.4	16-QAM	1/0	10.97	H	7.95	0.79	18.13	30
1711.5	3	QPSK	1/0	12.55	V	7.95	0.79	19.71	30
1732.5	3	QPSK	1/0	11.94	V	7.95	0.79	19.10	30
1753.5	3	QPSK	1/0	13.01	V	7.95	0.79	20.17	30
1711.5	3	QPSK	1/0	11.14	H	7.95	0.79	18.30	30
1732.5	3	QPSK	1/0	12.00	H	7.95	0.79	19.16	30
1753.5	3	QPSK	1/0	11.81	H	7.95	0.79	18.97	30
1711.5	3	16-QAM	1/0	12.77	V	7.95	0.79	19.93	30
1732.5	3	16-QAM	1/0	12.56	V	7.95	0.79	19.72	30
1753.5	3	16-QAM	1/0	12.95	V	7.95	0.79	20.11	30
1711.5	3	16-QAM	1/0	11.09	H	7.95	0.79	18.25	30
1732.5	3	16-QAM	1/0	11.71	H	7.95	0.79	18.87	30
1753.5	3	16-QAM	1/0	11.57	H	7.95	0.79	18.73	30
1712.5	5	QPSK	1/0	12.72	V	7.95	0.79	19.88	30
1732.5	5	QPSK	1/0	12.45	V	7.95	0.79	19.61	30
1752.5	5	QPSK	1/24	13.16	V	7.95	0.79	20.32	30
1712.5	5	QPSK	1/0	12.14	H	7.95	0.79	19.30	30
1732.5	5	QPSK	1/0	11.58	H	7.95	0.79	18.74	30
1752.5	5	QPSK	1/24	11.17	H	7.95	0.79	18.33	30
1712.5	5	16-QAM	1/0	13.23	V	7.95	0.79	20.39	30
1732.5	5	16-QAM	1/0	12.75	V	7.95	0.79	19.91	30
1752.5	5	16-QAM	1/24	12.90	V	7.95	0.79	20.06	30
1712.5	5	16-QAM	1/0	11.05	H	7.95	0.79	18.21	30
1732.5	5	16-QAM	1/0	11.25	H	7.95	0.79	18.41	30
1752.5	5	16-QAM	1/24	10.89	H	7.95	0.79	18.05	30

1715	10	QPSK	1/0	13.29	V	7.95	0.79	20.45	30
1732.5	10	QPSK	1/49	12.59	V	7.95	0.79	19.75	30
1750	10	QPSK	1/0	12.61	V	7.95	0.79	19.77	30
1715	10	QPSK	1/0	11.92	H	7.95	0.79	19.08	30
1732.5	10	QPSK	1/49	11.45	H	7.95	0.79	18.61	30
1750	10	QPSK	1/0	11.79	H	7.95	0.79	18.95	30
1715	10	16-QAM	1/0	12.56	V	7.95	0.79	19.72	30
1732.5	10	16-QAM	1/49	12.40	V	7.95	0.79	19.56	30
1750	10	16-QAM	1/0	12.56	V	7.95	0.79	19.72	30
1715	10	16-QAM	1/0	12.62	H	7.95	0.79	19.78	30
1732.5	10	16-QAM	1/49	11.25	H	7.95	0.79	18.41	30
1750	10	16-QAM	1/0	11.69	H	7.95	0.79	18.85	30
1717.5	15	QPSK	1/0	13.00	V	7.95	0.79	20.16	30
1732.5	15	QPSK	1/74	12.38	V	7.95	0.79	19.54	30
1747.5	15	QPSK	1/0	12.15	V	7.95	0.79	19.31	30
1717.5	15	QPSK	1/0	11.97	H	7.95	0.79	19.13	30
1732.5	15	QPSK	1/74	11.52	H	7.95	0.79	18.68	30
1747.5	15	QPSK	1/0	10.89	H	7.95	0.79	18.05	30
1717.5	15	16-QAM	1/0	11.69	V	7.95	0.79	18.85	30
1732.5	15	16-QAM	1/74	11.46	V	7.95	0.79	18.62	30
1747.5	15	16-QAM	1/0	12.56	V	7.95	0.79	19.72	30
1717.5	15	16-QAM	1/0	12.26	H	7.95	0.79	19.42	30
1732.5	15	16-QAM	1/74	11.40	H	7.95	0.79	18.56	30
1747.5	15	16-QAM	1/0	11.94	H	7.95	0.79	19.10	30
1720	20	QPSK	1/99	12.19	V	7.95	0.79	19.35	30
1732.5	20	QPSK	1/99	13.49	V	7.95	0.79	20.65	30
1745	20	QPSK	1/0	12.08	V	7.95	0.79	19.24	30
1720	20	QPSK	1/99	11.84	H	7.95	0.79	19.00	30
1732.5	20	QPSK	1/99	11.27	H	7.95	0.79	18.43	30
1745	20	QPSK	1/0	12.32	H	7.95	0.79	19.48	30
1720	20	16-QAM	1/99	12.48	V	7.95	0.79	19.64	30
1732.5	20	16-QAM	1/99	12.71	V	7.95	0.79	19.87	30
1745	20	16-QAM	1/0	12.63	V	7.95	0.79	19.79	30
1720	20	16-QAM	1/99	11.52	H	7.95	0.79	18.68	30
1732.5	20	16-QAM	1/99	12.28	H	7.95	0.79	19.44	30
1745	20	16-QAM	1/0	11.87	H	7.95	0.79	19.03	30

EIRP for LTE Band5 (Part 27)

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
824.7	1.4	QPSK	1/0	14.65	V	6.7	0.49	20.86	34.77
836.5	1.4	QPSK	1/0	13.15	V	6.7	0.49	19.36	34.77
848.3	1.4	QPSK	1/0	14.64	V	6.7	0.49	20.85	34.77
824.7	1.4	QPSK	1/0	12.80	H	6.7	0.49	19.01	34.77
836.5	1.4	QPSK	1/0	12.99	H	6.7	0.49	19.20	34.77
848.3	1.4	QPSK	1/0	13.24	H	6.7	0.49	19.45	34.77
824.7	1.4	16-QAM	1/0	10.94	V	6.7	0.49	17.15	34.77
836.5	1.4	16-QAM	1/0	13.36	V	6.7	0.49	19.57	34.77
848.3	1.4	16-QAM	1/0	14.58	V	6.7	0.49	20.79	34.77
824.7	1.4	16-QAM	1/0	13.09	H	6.7	0.49	19.30	34.77
836.5	1.4	16-QAM	1/0	12.67	H	6.7	0.49	18.88	34.77
848.3	1.4	16-QAM	1/0	9.47	H	6.7	0.49	15.68	34.77
825.5	3	QPSK	1/0	10.79	V	6.7	0.49	17.00	34.77
836.5	3	QPSK	1/0	10.09	V	6.7	0.49	16.30	34.77
847.5	3	QPSK	1/0	11.86	V	6.7	0.49	18.07	34.77
825.5	3	QPSK	1/0	12.59	H	6.7	0.49	18.80	34.77
836.5	3	QPSK	1/0	13.39	H	6.7	0.49	19.60	34.77
847.5	3	QPSK	1/0	10.46	H	6.7	0.49	16.67	34.77
825.5	3	16-QAM	1/0	11.69	V	6.7	0.49	17.90	34.77
836.5	3	16-QAM	1/0	13.42	V	6.7	0.49	19.63	34.77
847.5	3	16-QAM	1/0	11.32	V	6.7	0.49	17.53	34.77
825.5	3	16-QAM	1/0	9.84	H	6.7	0.49	16.05	34.77
836.5	3	16-QAM	1/0	12.90	H	6.7	0.49	19.11	34.77
847.5	3	16-QAM	1/0	11.12	H	6.7	0.49	17.33	34.77
826.5	5	QPSK	1/0	14.47	V	6.7	0.49	20.68	34.77
836.5	5	QPSK	1/0	11.09	V	6.7	0.49	17.30	34.77
846.5	5	QPSK	1/0	11.21	V	6.7	0.49	17.42	34.77
826.5	5	QPSK	1/0	11.49	H	6.7	0.49	17.70	34.77
836.5	5	QPSK	1/0	10.24	H	6.7	0.49	16.45	34.77
846.5	5	QPSK	1/0	11.14	H	6.7	0.49	17.35	34.77
826.5	5	16-QAM	1/0	11.76	V	6.7	0.49	17.97	34.77
836.5	5	16-QAM	1/0	10.54	V	6.7	0.49	16.75	34.77
846.5	5	16-QAM	1/0	14.52	V	6.7	0.49	20.73	34.77
826.5	5	16-QAM	1/0	12.33	H	6.7	0.49	18.54	34.77
836.5	5	16-QAM	1/0	11.27	H	6.7	0.49	17.48	34.77
846.5	5	16-QAM	1/0	10.65	H	6.7	0.49	16.86	34.77

829	10	QPSK	1/0	11.76	V	6.7	0.49	17.97	34.77
836.5	10	QPSK	1/0	11.71	V	6.7	0.49	17.92	34.77
844	10	QPSK	1/0	11.03	V	6.7	0.49	17.24	34.77
829	10	QPSK	1/0	13.46	H	6.7	0.49	19.67	34.77
836.5	10	QPSK	1/0	9.52	H	6.7	0.49	15.73	34.77
844	10	QPSK	1/0	10.99	H	6.7	0.49	17.20	34.77
829	10	16-QAM	1/0	11.42	V	6.7	0.49	17.63	34.77
836.5	10	16-QAM	1/0	11.08	V	6.7	0.49	17.29	34.77
844	10	16-QAM	1/0	12.19	V	6.7	0.49	18.40	34.77
829	10	16-QAM	1/0	11.40	H	6.7	0.49	17.61	34.77
836.5	10	16-QAM	1/0	11.51	H	6.7	0.49	17.72	34.77
844	10	16-QAM	1/0	12.24	H	6.7	0.49	18.45	34.77

ERP for LTE Band17 (Part 27)

Frequency	Channel BW	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
706.5	5	QPSK	1/0	12.25	H	6.7	0.49	18.46	34.77
710	5	QPSK	1/0	11.61	H	6.7	0.49	17.82	34.77
713.5	5	QPSK	1/0	11.92	H	6.7	0.49	18.13	34.77
706.5	5	QPSK	1/0	12.88	V	6.7	0.49	19.09	34.77
710	5	QPSK	1/0	12.10	V	6.7	0.49	18.31	34.77
713.5	5	QPSK	1/0	12.00	V	6.7	0.49	18.21	34.77
706.5	5	16-QAM	1/0	12.11	H	6.7	0.49	18.32	34.77
710	5	16-QAM	1/0	11.66	H	6.7	0.49	17.87	34.77
713.5	5	16-QAM	1/0	11.88	H	6.7	0.49	18.09	34.77
706.5	5	16-QAM	1/0	12.01	V	6.7	0.49	18.22	34.77
710	5	16-QAM	1/0	11.85	V	6.7	0.49	18.06	34.77
713.5	5	16-QAM	1/0	12.19	V	6.7	0.49	18.40	34.77

Frequency	Channel BW	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
709	10	QPSK	1/0	12.50	H	6.7	0.49	18.71	34.77
710	10	QPSK	1/0	11.45	H	6.7	0.49	17.66	34.77
711	10	QPSK	1/0	11.72	H	6.7	0.49	17.93	34.77
709	10	QPSK	1/0	11.97	V	6.7	0.49	18.18	34.77
710	10	QPSK	1/0	13.11	V	6.7	0.49	19.32	34.77
711	10	QPSK	1/0	12.03	V	6.7	0.49	18.24	34.77
709	10	16-QAM	1/0	12.18	H	6.7	0.49	18.39	34.77
710	10	16-QAM	1/0	11.48	H	6.7	0.49	17.69	34.77

711	10	16-QAM	1/0	11.87	H	6.7	0.49	18.08	34.77
709	10	16-QAM	1/0	12.68	V	6.7	0.49	18.89	34.77
710	10	16-QAM	1/0	12.72	V	6.7	0.49	18.93	34.77
711	10	16-QAM	1/0	12.92	V	6.7	0.49	19.13	34.77

Note: Above is the worst mode data.

6.3. Peak-to-Average Ratio

6.3.1 MEASUREMENT METHOD

FCC: 27.50(a)

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 v02r01 5.7.1:

a)Refer to instrument’s analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ≥ signal’s occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1 ms

e)Record the maximum PAPR level associated with a probability of 0.1%

6.3.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument’s resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

6.3.3 MEASUREMENT RESULT

LTE Band 2 (Part 27)

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.01	<13	PASS
		1	3	4.15	<13	PASS
		1	5	4.24	<13	PASS
		3	0	4.32	<13	PASS
		3	2	4.26	<13	PASS
		3	3	4.25	<13	PASS
		6	0	4.61	<13	PASS

	MCH	1	0	4.09	<13	PASS
		1	3	4.15	<13	PASS
		1	5	4.22	<13	PASS
		3	0	4.16	<13	PASS
		3	2	4.15	<13	PASS
		3	3	4.21	<13	PASS
		6	0	4.91	<13	PASS
	HCH	1	0	3.91	<13	PASS
		1	3	3.96	<13	PASS
		1	5	4.00	<13	PASS
		3	0	4.35	<13	PASS
		3	2	4.62	<13	PASS
		3	3	4.16	<13	PASS
		6	0	4.67	<13	PASS
16QAM	LCH	1	0	4.68	<13	PASS
		1	3	4.95	<13	PASS
		1	5	5.13	<13	PASS
		3	0	5.18	<13	PASS
		3	2	5.12	<13	PASS
		3	3	5.19	<13	PASS
		6	0	5.58	<13	PASS
	MCH	1	0	5.43	<13	PASS
		1	3	5.41	<13	PASS
		1	5	5.32	<13	PASS
		3	0	5.31	<13	PASS
		3	2	5.29	<13	PASS
		3	3	5.25	<13	PASS
		6	0	5.64	<13	PASS
	HCH	1	0	4.84	<13	PASS
		1	3	4.92	<13	PASS
		1	5	4.97	<13	PASS
		3	0	4.86	<13	PASS
		3	2	4.91	<13	PASS
		3	3	4.94	<13	PASS
		6	0	5.57	<13	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			

QPSK	LCH	1	0	3.88	<13	PASS
		1	7	3.95	<13	PASS
		1	14	4.25	<13	PASS
		8	0	4.62	<13	PASS
		8	4	4.35	<13	PASS
		8	7	4.86	<13	PASS
		15	0	4.78	<13	PASS
	MCH	1	0	4.25	<13	PASS
		1	7	4.24	<13	PASS
		1	14	4.22	<13	PASS
		8	0	4.52	<13	PASS
		8	4	4.63	<13	PASS
		8	7	4.82	<13	PASS
		15	0	4.83	<13	PASS
	HCH	1	0	4.08	<13	PASS
		1	7	4.12	<13	PASS
		1	14	3.94	<13	PASS
		8	0	4.05	<13	PASS
		8	4	4.26	<13	PASS
		8	7	4.63	<13	PASS
		15	0	4.63	<13	PASS
16QAM	LCH	1	0	5.05	<13	PASS
		1	7	5.01	<13	PASS
		1	14	5.03	<13	PASS
		8	0	5.06	<13	PASS
		8	4	5.10	<13	PASS
		8	7	5.49	<13	PASS
		15	0	5.51	<13	PASS
	MCH	1	0	5.22	<13	PASS
		1	7	5.26	<13	PASS
		1	14	5.47	<13	PASS
		8	0	5.36	<13	PASS
		8	4	5.48	<13	PASS
		8	7	5.54	<13	PASS
		15	0	5.73	<13	PASS
	HCH	1	0	4.72	<13	PASS
		1	7	4.76	<13	PASS
		1	14	4.89	<13	PASS
		8	0	4.92	<13	PASS
		8	4	5.15	<13	PASS

		8	7	5.35	<13	PASS
		15	0	5.49	<13	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	3.92	<13	PASS
		1	12	4.05	<13	PASS
		1	24	3.89	<13	PASS
		12	0	4.15	<13	PASS
		12	6	4.20	<13	PASS
		12	13	4.77	<13	PASS
		25	0	5.06	<13	PASS
	MCH	1	0	3.82	<13	PASS
		1	12	3.85	<13	PASS
		1	24	3.48	<13	PASS
		12	0	4.32	<13	PASS
		12	6	4.52	<13	PASS
		12	13	4.67	<13	PASS
		25	0	4.93	<13	PASS
	HCH	1	0	4.38	<13	PASS
		1	12	4.22	<13	PASS
		1	24	3.92	<13	PASS
		12	0	3.99	<13	PASS
		12	6	4.51	<13	PASS
		12	13	4.55	<13	PASS
		25	0	4.79	<13	PASS
16QAM	LCH	1	0	5.16	<13	PASS
		1	12	5.22	<13	PASS
		1	24	5.26	<13	PASS
		12	0	5.42	<13	PASS
		12	6	5.37	<13	PASS
		12	13	5.59	<13	PASS
		25	0	5.8	<13	PASS
	MCH	1	0	5.17	<13	PASS
		1	12	4.86	<13	PASS
		1	24	4.77	<13	PASS
		12	0	4.92	<13	PASS
		12	6	5.24	<13	PASS
		12	13	5.47	<13	PASS

		25	0	5.61	<13	PASS
	HCH	1	0	5.47	<13	PASS
		1	12	5.24	<13	PASS
		1	24	5.03	<13	PASS
		12	0	5.41	<13	PASS
		12	6	5.34	<13	PASS
		12	13	5.49	<13	PASS
		25	0	5.47	<13	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.19	<13	PASS
		1	24	4.25	<13	PASS
		1	49	4.39	<13	PASS
		25	0	4.61	<13	PASS
		25	12	4.52	<13	PASS
		25	25	4.85	<13	PASS
		50	0	4.89	<13	PASS
	MCH	1	0	4.46	<13	PASS
		1	24	4.15	<13	PASS
		1	49	4.08	<13	PASS
		25	0	4.52	<13	PASS
		25	12	4.16	<13	PASS
		25	25	4.7	<13	PASS
		50	0	4.91	<13	PASS
	HCH	1	0	4.1	<13	PASS
		1	24	4.09	<13	PASS
		1	49	4.08	<13	PASS
		25	0	4.21	<13	PASS
		25	12	4.15	<13	PASS
		25	25	4.54	<13	PASS
		50	0	4.8	<13	PASS
16QAM	LCH	1	0	5.05	<13	PASS
		1	24	5.24	<13	PASS
		1	49	5.57	<13	PASS
		25	0	5.26	<13	PASS
		25	12	5.48	<13	PASS
		25	25	5.55	<13	PASS

		50	0	5.62	<13	PASS
	MCH	1	0	5.65	<13	PASS
		1	24	5.43	<13	PASS
		1	49	5.2	<13	PASS
		25	0	5.62	<13	PASS
		25	12	5.14	<13	PASS
		25	25	5.33	<13	PASS
		50	0	5.63	<13	PASS
	HCH	1	0	4.9	<13	PASS
		1	24	4.74	<13	PASS
		1	49	4.67	<13	PASS
		25	0	5.42	<13	PASS
		25	12	5.45	<13	PASS
		25	25	5.52	<13	PASS
		50	0	5.59	<13	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.43	<13	PASS
		1	37	4.4	<13	PASS
		1	74	4.41	<13	PASS
		37	0	4.56	<13	PASS
		37	18	4.61	<13	PASS
		37	38	4.88	<13	PASS
		75	0	5.21	<13	PASS
	MCH	1	0	4.45	<13	PASS
		1	37	4.21	<13	PASS
		1	74	3.99	<13	PASS
		37	0	4.03	<13	PASS
		37	18	4.58	<13	PASS
		37	38	4.88	<13	PASS
		75	0	5.34	<13	PASS
	HCH	1	0	3.89	<13	PASS
		1	37	4.1	<13	PASS
		1	74	4.09	<13	PASS
		37	0	4.52	<13	PASS
		37	18	4.69	<13	PASS
		37	38	4.79	<13	PASS

		75	0	5.01	<13	PASS
16QAM	LCH	1	0	5.53	<13	PASS
		1	37	5.46	<13	PASS
		1	74	5.66	<13	PASS
		37	0	5.55	<13	PASS
		37	18	5.62	<13	PASS
		37	38	5.56	<13	PASS
		75	0	5.87	<13	PASS
	MCH	1	0	5.29	<13	PASS
		1	37	5.14	<13	PASS
		1	74	4.94	<13	PASS
		37	0	5.06	<13	PASS
		37	18	5.41	<13	PASS
		37	38	5.71	<13	PASS
		75	0	5.96	<13	PASS
	HCH	1	0	4.92	<13	PASS
		1	37	5.02	<13	PASS
		1	74	5.05	<13	PASS
		37	0	5.48	<13	PASS
		37	18	5.75	<13	PASS
		37	38	5.72	<13	PASS
		75	0	5.68	<13	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.25	<13	PASS
		1	49	4.35	<13	PASS
		1	99	4.59	<13	PASS
		50	0	4.89	<13	PASS
		50	25	4.99	<13	PASS
		50	50	5.11	<13	PASS
		100	0	5.12	<13	PASS
	MCH	1	0	4.39	<13	PASS
		1	49	4.21	<13	PASS
		1	99	3.89	<13	PASS
		50	0	4.02	<13	PASS
		50	25	4.56	<13	PASS
		50	50	4.96	<13	PASS

		100	0	5.25	<13	PASS
	HCH	1	0	3.94	<13	PASS
		1	49	4.01	<13	PASS
		1	99	3.88	<13	PASS
		50	0	4.25	<13	PASS
		50	25	4.62	<13	PASS
		50	50	4.97	<13	PASS
		100	0	5.01	<13	PASS
16QAM	LCH	1	0	5.12	<13	PASS
		1	49	4.3	<13	PASS
		1	99	5.48	<13	PASS
		50	0	5.36	<13	PASS
		50	25	4.59	<13	PASS
		50	50	5.91	<13	PASS
		100	0	5.85	<13	PASS
	MCH	1	0	5.36	<13	PASS
		1	49	5.02	<13	PASS
		1	99	4.92	<13	PASS
		50	0	5.26	<13	PASS
		50	25	5.41	<13	PASS
		50	50	5.72	<13	PASS
		100	0	5.96	<13	PASS
	HCH	1	0	5.19	<13	PASS
		1	49	5.63	<13	PASS
		1	99	5	<13	PASS
		50	0	5.52	<13	PASS
		50	25	5.48	<13	PASS
		50	50	5.7	<13	PASS
		100	0	5.84	<13	PASS

LTE Band 4 (Part 27)
Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.44	<13	PASS
		1	3	4.66	<13	PASS
		1	5	4.78	<13	PASS
		3	0	4.84	<13	PASS
		3	2	5.01	<13	PASS
		3	3	4.58	<13	PASS
		6	0	5.1	<13	PASS
	MCH	1	0	4.87	<13	PASS
		1	3	4.93	<13	PASS
		1	5	4.84	<13	PASS
		3	0	4.74	<13	PASS
		3	2	4.85	<13	PASS
		3	3	4.87	<13	PASS
		6	0	5.3	<13	PASS
	HCH	1	0	5.12	<13	PASS
		1	3	5.08	<13	PASS
		1	5	5.04	<13	PASS
		3	0	5.11	<13	PASS
		3	2	5.08	<13	PASS
		3	3	5.19	<13	PASS
		6	0	5.41	<13	PASS
16QAM	LCH	1	0	5.78	<13	PASS
		1	3	5.62	<13	PASS
		1	5	5.78	<13	PASS
		3	0	5.74	<13	PASS
		3	2	5.65	<13	PASS
		3	3	5.59	<13	PASS
		6	0	5.88	<13	PASS
	MCH	1	0	5.96	<13	PASS
		1	3	5.74	<13	PASS
		1	5	5.88	<13	PASS
		3	0	5.91	<13	PASS
		3	2	5.78	<13	PASS
		3	3	5.92	<13	PASS
		6	0	6.15	<13	PASS

	HCH	1	0	5.93	<13	PASS
		1	3	5.97	<13	PASS
		1	5	6.08	<13	PASS
		3	0	5.84	<13	PASS
		3	2	6.1	<13	PASS
		3	3	5.84	<13	PASS
		6	0	6.3	<13	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.7	<13	PASS
		1	7	4.53	<13	PASS
		1	14	4.69	<13	PASS
		8	0	4.62	<13	PASS
		8	4	4.95	<13	PASS
		8	7	5.18	<13	PASS
		15	0	5.21	<13	PASS
	MCH	1	0	4.89	<13	PASS
		1	7	4.79	<13	PASS
		1	14	4.86	<13	PASS
		8	0	4.82	<13	PASS
		8	4	4.68	<13	PASS
		8	7	5.47	<13	PASS
		15	0	5.23	<13	PASS
	HCH	1	0	4.84	<13	PASS
		1	7	4.81	<13	PASS
		1	14	4.73	<13	PASS
		8	0	4.95	<13	PASS
		8	4	5.14	<13	PASS
		8	7	5.32	<13	PASS
		15	0	5.45	<13	PASS
16QAM	LCH	1	0	5.67	<13	PASS
		1	7	5.72	<13	PASS
		1	14	5.69	<13	PASS
		8	0	5.59	<13	PASS
		8	4	5.48	<13	PASS

		8	7	5.93	<13	PASS
		15	0	6.13	<13	PASS
	MCH	1	0	6.05	<13	PASS
		1	7	6.12	<13	PASS
		1	14	5.78	<13	PASS
		8	0	5.84	<13	PASS
		8	4	5.37	<13	PASS
		8	7	6.11	<13	PASS
		15	0	6.21	<13	PASS
	HCH	1	0	5.96	<13	PASS
		1	7	6.11	<13	PASS
		1	14	6	<13	PASS
		8	0	6.26	<13	PASS
		8	4	6.48	<13	PASS
		8	7	6.3	<13	PASS
		15	0	6.27	<13	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.48	<13	PASS
		1	12	4.55	<13	PASS
		1	24	4.28	<13	PASS
		12	0	4.82	<13	PASS
		12	6	4.71	<13	PASS
		12	13	5.1	<13	PASS
		25	0	5.35	<13	PASS
	MCH	1	0	4.73	<13	PASS
		1	12	5.14	<13	PASS
		1	24	4.52	<13	PASS
		12	0	5.16	<13	PASS
		12	6	5.22	<13	PASS
		12	13	5.28	<13	PASS
		25	0	5.37	<13	PASS
	HCH	1	0	4.96	<13	PASS
		1	12	4.8	<13	PASS
		1	24	4.74	<13	PASS
		12	0	4.89	<13	PASS

		12	6	5.25	<13	PASS
		12	13	5.32	<13	PASS
		25	0	5.57	<13	PASS
16QAM	LCH	1	0	5.77	<13	PASS
		1	12	5.69	<13	PASS
		1	24	5.69	<13	PASS
		12	0	5.48	<13	PASS
		12	6	5.99	<13	PASS
		12	13	6.03	<13	PASS
		25	0	6.01	<13	PASS
	MCH	1	0	6.03	<13	PASS
		1	12	5.87	<13	PASS
		1	24	5.84	<13	PASS
		12	0	5.94	<13	PASS
		12	6	5.92	<13	PASS
		12	13	6	<13	PASS
		25	0	6.21	<13	PASS
	HCH	1	0	6	<13	PASS
		1	12	6.14	<13	PASS
		1	24	5.71	<13	PASS
		12	0	5.81	<13	PASS
		12	6	6.24	<13	PASS
		12	13	6.37	<13	PASS
		25	0	6.43	<13	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.75	<13	PASS
		1	24	4.81	<13	PASS
		1	49	4.94	<13	PASS
		25	0	5.26	<13	PASS
		25	12	4.92	<13	PASS
		25	25	5.18	<13	PASS
		50	0	6.41	<13	PASS
	MCH	1	0	5.49	<13	PASS
		1	24	5.52	<13	PASS
		1	49	5.47	<13	PASS

		25	0	6.15	<13	PASS
		25	12	5.92	<13	PASS
		25	25	5.87	<13	PASS
		50	0	6.04	<13	PASS
	HCH	1	0	5.87	<13	PASS
		1	24	5.75	<13	PASS
		1	49	5.96	<13	PASS
		25	0	6.11	<13	PASS
		25	12	6.14	<13	PASS
		25	25	6.32	<13	PASS
		50	0	6.19	<13	PASS
16QAM	LCH	1	0	5.95	<13	PASS
		1	24	5.86	<13	PASS
		1	49	5.74	<13	PASS
		25	0	6.12	<13	PASS
		25	12	6.38	<13	PASS
		25	25	6.24	<13	PASS
		50	0	6.41	<13	PASS
	MCH	1	0	5.74	<13	PASS
		1	24	5.49	<13	PASS
		1	49	5.83	<13	PASS
		25	0	5.74	<13	PASS
		25	12	6.01	<13	PASS
		25	25	6.03	<13	PASS
		50	0	6.35	<13	PASS
	HCH	1	0	6.18	<13	PASS
		1	24	6.41	<13	PASS
		1	49	5.89	<13	PASS
		25	0	5.84	<13	PASS
		25	12	5.84	<13	PASS
		25	25	6.42	<13	PASS
		50	0	6.18	<13	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	5.84	<13	PASS
		1	37	5.67	<13	PASS
		1	74	5.92	<13	PASS

		37	0	5.41	<13	PASS
		37	18	5.68	<13	PASS
		37	38	5.19	<13	PASS
		75	0	5.86	<13	PASS
	MCH	1	0	6.12	<13	PASS
		1	37	6.15	<13	PASS
		1	74	6.04	<13	PASS
		37	0	6.25	<13	PASS
		37	18	5.89	<13	PASS
		37	38	5.84	<13	PASS
		75	0	5.76	<13	PASS
	HCH	1	0	5.48	<13	PASS
		1	37	5.46	<13	PASS
		1	74	5.74	<13	PASS
		37	0	6.05	<13	PASS
		37	18	6.2	<13	PASS
		37	38	5.91	<13	PASS
		75	0	6	<13	PASS
16QAM	LCH	1	0	6.41	<13	PASS
		1	37	6.21	<13	PASS
		1	74	6.51	<13	PASS
		37	0	6.42	<13	PASS
		37	18	5.89	<13	PASS
		37	38	5.46	<13	PASS
		75	0	5.75	<13	PASS
	MCH	1	0	5.48	<13	PASS
		1	37	5.67	<13	PASS
		1	74	6.12	<13	PASS
		37	0	6.41	<13	PASS
		37	18	6.3	<13	PASS
		37	38	5.86	<13	PASS
		75	0	5.76	<13	PASS
	HCH	1	0	5.49	<13	PASS
		1	37	6.41	<13	PASS
		1	74	5.78	<13	PASS
		37	0	5.94	<13	PASS
		37	18	5.74	<13	PASS
		37	38	6.24	<13	PASS
		75	0	6.14	<13	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.86	<13	PASS
		1	49	4.75	<13	PASS
		1	99	4.92	<13	PASS
		50	0	5.18	<13	PASS
		50	25	5.64	<13	PASS
		50	50	5.26	<13	PASS
		100	0	4.95	<13	PASS
	MCH	1	0	4.75	<13	PASS
		1	49	4.85	<13	PASS
		1	99	5.14	<13	PASS
		50	0	5.06	<13	PASS
		50	25	5.1	<13	PASS
		50	50	5.86	<13	PASS
		100	0	5.92	<13	PASS
	HCH	1	0	5.67	<13	PASS
		1	49	5.37	<13	PASS
		1	99	5.86	<13	PASS
		50	0	6.02	<13	PASS
		50	25	6.01	<13	PASS
		50	50	5.87	<13	PASS
		100	0	5.92	<13	PASS
16QAM	LCH	1	0	4.95	<13	PASS
		1	49	4.56	<13	PASS
		1	99	5.14	<13	PASS
		50	0	5.26	<13	PASS
		50	25	5.34	<13	PASS
		50	50	6.12	<13	PASS
		100	0	6.35	<13	PASS
	MCH	1	0	6.18	<13	PASS
		1	49	6.4	<13	PASS
		1	99	5.81	<13	PASS
		50	0	5.94	<13	PASS
		50	25	6.11	<13	PASS
		50	50	6.24	<13	PASS
		100	0	6.05	<13	PASS

	HCH	1	0	5.74	<13	PASS
		1	49	5.49	<13	PASS
		1	99	5.78	<13	PASS
		50	0	5.66	<13	PASS
		50	25	4.89	<13	PASS
		50	50	4.85	<13	PASS
		100	0	5.26	<13	PASS

LTE Band 5 (Part 27)
Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.44	<13	PASS
		1	3	4.67	<13	PASS
		1	5	4.78	<13	PASS
		3	0	4.92	<13	PASS
		3	2	4.65	<13	PASS
		3	3	4.58	<13	PASS
		6	0	5.1	<13	PASS
	MCH	1	0	4.87	<13	PASS
		1	3	5.01	<13	PASS
		1	5	4.84	<13	PASS
		3	0	4.94	<13	PASS
		3	2	4.85	<13	PASS
		3	3	4.87	<13	PASS
		6	0	5.3	<13	PASS
	HCH	1	0	5.12	<13	PASS
		1	3	5.09	<13	PASS
		1	5	5.04	<13	PASS
		3	0	5.1	<13	PASS
		3	2	5.24	<13	PASS
		3	3	5.19	<13	PASS
		6	0	5.41	<13	PASS
16QAM	LCH	1	0	5.78	<13	PASS
		1	3	5.55	<13	PASS
		1	5	5.78	<13	PASS
		3	0	5.67	<13	PASS
		3	2	5.64	<13	PASS
		3	3	5.59	<13	PASS
		6	0	5.88	<13	PASS
	MCH	1	0	5.96	<13	PASS
		1	3	5.78	<13	PASS
		1	5	5.88	<13	PASS
		3	0	5.95	<13	PASS
		3	2	5.74	<13	PASS
		3	3	5.92	<13	PASS
		6	0	6.15	<13	PASS

	HCH	1	0	5.93	<13	PASS
		1	3	5.89	<13	PASS
		1	5	6.08	<13	PASS
		3	0	5.94	<13	PASS
		3	2	5.88	<13	PASS
		3	3	5.84	<13	PASS
		6	0	6.3	<13	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.7	<13	PASS
		1	7	4.81	<13	PASS
		1	14	4.69	<13	PASS
		8	0	4.95	<13	PASS
		8	4	5.08	<13	PASS
		8	7	5.18	<13	PASS
		15	0	5.21	<13	PASS
	MCH	1	0	4.89	<13	PASS
		1	7	4.81	<13	PASS
		1	14	4.86	<13	PASS
		8	0	5.24	<13	PASS
		8	4	5.14	<13	PASS
		8	7	5.47	<13	PASS
		15	0	5.23	<13	PASS
	HCH	1	0	4.84	<13	PASS
		1	7	4.76	<13	PASS
		1	14	4.73	<13	PASS
		8	0	4.9	<13	PASS
		8	4	5.08	<13	PASS
		8	7	5.32	<13	PASS
		15	0	5.45	<13	PASS
16QAM	LCH	1	0	5.67	<13	PASS
		1	7	5.48	<13	PASS
		1	14	5.69	<13	PASS
		8	0	5.34	<13	PASS
		8	4	5.44	<13	PASS
		8	7	5.93	<13	PASS
		15	0	6.13	<13	PASS

	MCH	1	0	6.05	<13	PASS
		1	7	5.83	<13	PASS
		1	14	5.78	<13	PASS
		8	0	5.76	<13	PASS
		8	4	5.85	<13	PASS
		8	7	6.11	<13	PASS
		15	0	6.21	<13	PASS
	HCH	1	0	5.96	<13	PASS
		1	7	5.86	<13	PASS
		1	14	6	<13	PASS
		8	0	6.1	<13	PASS
		8	4	6.47	<13	PASS
		8	7	6.3	<13	PASS
		15	0	6.27	<13	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.48	<13	PASS
		1	12	4.57	<13	PASS
		1	24	4.28	<13	PASS
		12	0	4.67	<13	PASS
		12	6	5.14	<13	PASS
		12	13	5.1	<13	PASS
		25	0	5.35	<13	PASS
	MCH	1	0	4.73	<13	PASS
		1	12	4.89	<13	PASS
		1	24	4.52	<13	PASS
		12	0	5.14	<13	PASS
		12	6	5.22	<13	PASS
		12	13	5.28	<13	PASS
		25	0	5.37	<13	PASS
	HCH	1	0	4.96	<13	PASS
		1	12	4.89	<13	PASS
		1	24	4.74	<13	PASS
		12	0	5.08	<13	PASS
		12	6	5.4	<13	PASS
		12	13	5.32	<13	PASS
		25	0	5.57	<13	PASS
16QAM	LCH	1	0	5.77	<13	PASS

		1	12	5.47	<13	PASS
		1	24	5.69	<13	PASS
		12	0	5.82	<13	PASS
		12	6	5.98	<13	PASS
		12	13	6.03	<13	PASS
		25	0	6.01	<13	PASS
	MCH	1	0	6.03	<13	PASS
		1	12	5.94	<13	PASS
		1	24	5.84	<13	PASS
		12	0	6.05	<13	PASS
		12	6	6.24	<13	PASS
		12	13	6	<13	PASS
		25	0	6.21	<13	PASS
	HCH	1	0	6	<13	PASS
		1	12	5.79	<13	PASS
		1	24	5.71	<13	PASS
		12	0	6.15	<13	PASS
		12	6	6.23	<13	PASS
		12	13	6.37	<13	PASS
		25	0	6.43	<13	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	4.75	<13	PASS
		1	24	4.81	<13	PASS
		1	49	4.94	<13	PASS
		25	0	5.26	<13	PASS
		25	12	5.34	<13	PASS
		25	25	5.26	<13	PASS
		50	0	5.35	<13	PASS
	MCH	1	0	4.86	<13	PASS
		1	24	4.59	<13	PASS
		1	49	4.84	<13	PASS
		25	0	5.14	<13	PASS
		25	12	5.2	<13	PASS
		25	25	5.32	<13	PASS
		50	0	5.27	<13	PASS
	HCH	1	0	4.86	<13	PASS

		1	24	4.62	<13	PASS
		1	49	4.67	<13	PASS
		25	0	5.23	<13	PASS
		25	12	5.48	<13	PASS
		25	25	5.49	<13	PASS
		50	0	5.41	<13	PASS
16QAM	LCH	1	0	5.54	<13	PASS
		1	24	5.74	<13	PASS
		1	49	5.71	<13	PASS
		25	0	5.94	<13	PASS
		25	12	5.98	<13	PASS
		25	25	6.14	<13	PASS
		50	0	6.11	<13	PASS
	MCH	1	0	5.62	<13	PASS
		1	24	5.74	<13	PASS
		1	49	5.52	<13	PASS
		25	0	6.14	<13	PASS
		25	12	6.25	<13	PASS
		25	25	6.24	<13	PASS
		50	0	6.3	<13	PASS
	HCH	1	0	5.96	<13	PASS
		1	24	5.47	<13	PASS
		1	49	5.41	<13	PASS
		25	0	6.04	<13	PASS
		25	12	6.11	<13	PASS
		25	25	6.21	<13	PASS
		50	0	6.41	<13	PASS

LTE Band 17 (Part 27)

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	3.81	<13	PASS
		1	12	3.67	<13	PASS
		1	24	3.37	<13	PASS
		12	0	4.24	<13	PASS
		12	6	4.43	<13	PASS
		12	13	4.36	<13	PASS
		25	0	4.48	<13	PASS
	MCH	1	0	3.28	<13	PASS
		1	12	2.95	<13	PASS
		1	24	2.17	<13	PASS
		12	0	3.47	<13	PASS
		12	6	3.84	<13	PASS
		12	13	3.93	<13	PASS
		25	0	4.11	<13	PASS
	HCH	1	0	2.47	<13	PASS
		1	12	3.12	<13	PASS
		1	24	3.55	<13	PASS
		12	0	3.68	<13	PASS
		12	6	3.48	<13	PASS
		12	13	4.07	<13	PASS
		25	0	4.08	<13	PASS
16QAM	LCH	1	0	4.87	<13	PASS
		1	12	4.54	<13	PASS
		1	24	4.58	<13	PASS
		12	0	4.47	<13	PASS
		12	6	4.62	<13	PASS
		12	13	5.23	<13	PASS
		25	0	5.33	<13	PASS
	MCH	1	0	4.83	<13	PASS
		1	12	4.6	<13	PASS
		1	24	4.36	<13	PASS
		12	0	4.57	<13	PASS
		12	6	4.86	<13	PASS
		12	13	4.8	<13	PASS

		25	0	5.23	<13	PASS
	HCH	1	0	4.34	<13	PASS
		1	12	4.68	<13	PASS
		1	24	4.57	<13	PASS
		12	0	4.61	<13	PASS
		12	6	4.88	<13	PASS
		12	13	5.06	<13	PASS
		25	0	5	<13	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Peak-to-Average Ratio [dB]	Limit [dB]	Verdict
		Size	Offset			
QPSK	LCH	1	0	3.65	<13	PASS
		1	24	4.09	<13	PASS
		1	49	4.25	<13	PASS
		25	0	4.32	<13	PASS
		25	12	4.33	<13	PASS
		25	25	4.36	<13	PASS
		50	0	4.48	<13	PASS
	MCH	1	0	3.36	<13	PASS
		1	24	3.54	<13	PASS
		1	49	3.58	<13	PASS
		25	0	4.25	<13	PASS
		25	12	4.26	<13	PASS
		25	25	4.15	<13	PASS
		50	0	4.35	<13	PASS
	HCH	1	0	3.84	<13	PASS
		1	24	3.52	<13	PASS
		1	49	3.25	<13	PASS
		25	0	4.12	<13	PASS
		25	12	4.21	<13	PASS
		25	25	4.35	<13	PASS
		50	0	4.26	<13	PASS
16QAM	LCH	1	0	3.58	<13	PASS
		1	24	3.48	<13	PASS
		1	49	3.76	<13	PASS
		25	0	4.5	<13	PASS
		25	12	4.2	<13	PASS
		25	25	5.45	<13	PASS

		50	0	4.64	<13	PASS
	MCH	1	0	3.48	<13	PASS
		1	24	3.25	<13	PASS
		1	49	3.64	<13	PASS
		25	0	4.53	<13	PASS
		25	12	4.26	<13	PASS
		25	25	4.44	<13	PASS
		50	0	4.38	<13	PASS
	HCH	1	0	2.89	<13	PASS
		1	24	2.95	<13	PASS
		1	49	3.05	<13	PASS
		25	0	3.16	<13	PASS
		25	12	3.37	<13	PASS
		25	25	3.32	<13	PASS
		50	0	3.34	<13	PASS

7. SPURIOUS EMISSION

7.1 CONDUCTED SPURIOUS EMISSION

7.1.1 MEASUREMENT METHOD

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. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

Test Procedure Used

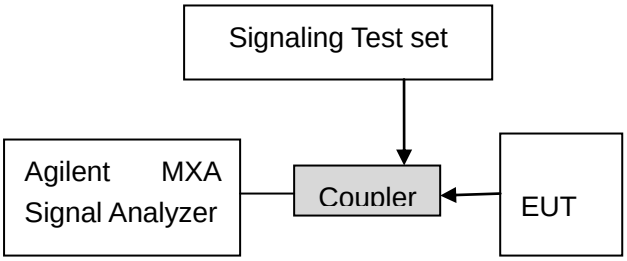
KDB 971168 v02r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = max hold
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Test Instrument & Measurement Setup

shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

Test Note

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. 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.

7.1.2 MEASUREMENT RESULT

PLEASE REFER TO: APPENDIX A TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

Note: 1. No emission found in standby or receive mode, no recording in this report.

7.2 Radiated Spurious Emission

7.2.1 TEST OVERVIEW

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 v02r01 – Section 5.8
ANSI/TIA-603-C-2004 – Section 2.2.12

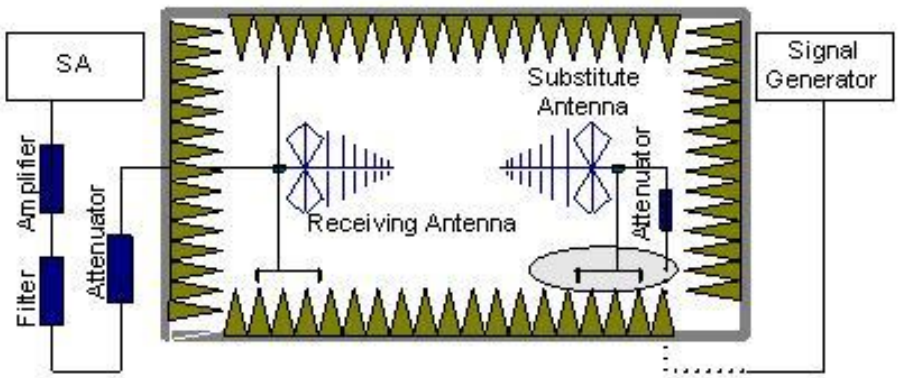
Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points > 2 x span / RBW
5. Detector = Peak
6. Trace mode = max hold
7. The trace was allowed to stabilize

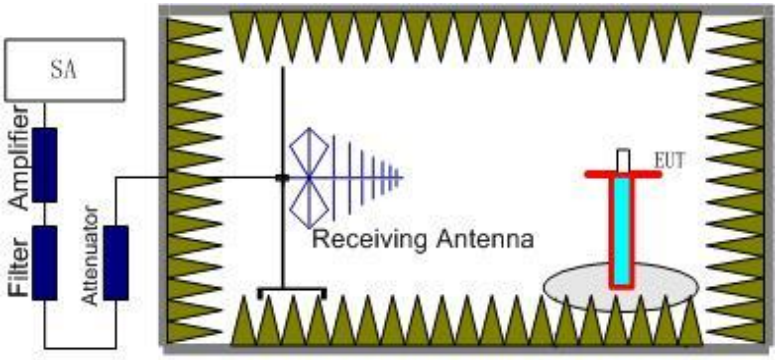
Test Setup

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE band 2, the LTE band 4 and LTE band 17. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power=P_{Mea}+A_{Rpl}$

7.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: Only record the worst condition of each test mode:

7.2.3 MEASUREMENT RESULT

LTE Band 2 (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3720	-46.38	V	10.06	2.52	-38.84	-13	-25.61
3720	-47.15	H	10.06	2.52	-39.61	-13	-26.46
257.2	-52.21	V	6.7	0.24	-45.75	-13	-32.77
640.2	-48.95	H	6.5	0.39	-42.84	-13	-29.96

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-47.73	V	10.06	2.52	-40.19	-13	-27.19
3760	-47.11	H	10.06	2.52	-39.57	-13	-26.57
256.9	-56.81	V	6.7	0.24	-50.35	-13	-37.35
639.8	-49.07	H	6.5	0.39	-42.96	-13	-29.96

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3800	-49.33	V	10.06	2.52	-41.79	-13	-28.79
3800	-49.30	H	10.06	2.52	-41.76	-13	-28.76
254.6	-55.66	V	6.7	0.24	-49.20	-13	-36.20
639.4	-49.02	H	6.5	0.39	-42.91	-13	-29.91

LTE Band 4 (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3440	-48.87	V	10.06	2.52	-41.33	-13	-28.33
3440	-47.98	H	10.06	2.52	-40.44	-13	-27.44
257.4	-55.48	V	6.7	0.24	-49.02	-13	-36.02
640.2	-51.89	H	6.5	0.39	-45.78	-13	-32.78

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3465	-48.97	V	10.06	2.52	-41.43	-13	-28.43
3465	-48.06	H	10.06	2.52	-40.52	-13	-27.52
256.9	-55.50	V	6.7	0.24	-49.04	-13	-36.04
639.8	-50.07	H	6.5	0.39	-43.96	-13	-30.96

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3490	-48.94	V	10.06	2.52	-41.40	-13	-28.40
3490	-46.00	H	10.06	2.52	-38.46	-13	-25.46
254.6	-58.48	V	6.7	0.24	-52.02	-13	-39.02
639.4	-48.23	H	6.5	0.39	-42.12	-13	-29.12

LTE Band 5 (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1658	-49.96	V	10.72	1.65	-42.42	-13	-29.42
1658	-44.71	H	10.72	1.65	-37.17	-13	-24.17
255.2	-52.28	V	6.7	0.24	-45.82	-13	-32.82
641.1	-49.06	H	6.5	0.39	-42.95	-13	-29.95

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673	-48.77	V	10.72	1.65	-41.23	-13	-28.23
1673	-48.13	H	10.72	1.65	-40.59	-13	-27.59
254.5	-56.19	V	6.7	0.24	-49.73	-13	-36.73
640.2	-50.67	H	6.5	0.39	-44.56	-13	-31.56

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1688	-47.00	V	10.72	1.65	-39.46	-13	-26.46
1688	-47.22	H	10.72	1.65	-39.68	-13	-26.68
254.2	-53.61	V	6.7	0.24	-47.15	-13	-34.15
640.8	-50.85	H	6.5	0.39	-44.74	-13	-31.74

LTE Band 17 (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1418	-49.31	V	10.72	1.65	-41.77	-13	-28.77
1418	-46.68	H	10.72	1.65	-39.14	-13	-26.14
253.8	-53.93	V	6.7	0.24	-47.47	-13	-34.47
640.5	-54.87	H	6.5	0.39	-48.76	-13	-35.76

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1420	-48.28	V	10.72	1.65	-40.74	-13	-27.74
1420	-48.70	H	10.72	1.65	-41.16	-13	-28.16
253.8	-54.49	V	6.7	0.24	-48.03	-13	-35.03
639.7	-50.90	H	6.5	0.39	-44.79	-13	-31.79

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1422	-50.61	V	10.72	1.65	-43.07	-13	-30.07
1422	-47.40	H	10.72	1.65	-39.86	-13	-26.86
254.5	-51.87	V	6.7	0.24	-45.41	-13	-32.41
639.4	-50.19	H	6.5	0.39	-44.08	-13	-31.08

Note: 1. EUT Field Strength (dBm) = Reading (Signal generator) + Antenna Gain (substitution antenna) - Cable loss (From Signal Generator to substitution antenna).

2. Below 30MHZ no Spurious found and the QPSK modes is the worst condition.

8. FREQUENCY STABILITY

8.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1 , Measure the carrier frequency at room temperature.

2 , Subject the EUT to overnight soak at -10℃.

, With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

3 , Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

4 , Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

5 , Subject the EUT to overnight soak at +50℃.

6 , With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7 , Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

8 , At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

8.2 PROVISIONS APPLICABLE

8.2.1 For Hand carried battery powered equipment

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.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

8.2.2 For equipment powered by primary supply voltage

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.

8.3 MEASUREMENT RESULT (WORST)

LTE Band 2 (Part 27)

Middle Channel, f_O = 1880 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-2.85	-0.001538	±2.5
0		2.75	0.001484	±2.5
10		6.22	0.003362	±2.5
20		-5.64	-0.003045	±2.5
30		-2.85	-0.001538	±2.5
40		2.75	0.001484	±2.5
50		6.22	0.003362	±2.5
55		2.72	0.001446	±2.5
-25	4.2	-3.38	-0.001796	±2.5
	3.5	-5.84	-0.003105	±2.5

LTE Band 4 (Part 27)

Middle Channel, f_O = 1732.5 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-0.09	-0.000050	±2.5
0		1.57	0.000908	±2.5
10		1.60	0.000925	±2.5
20		2.27	0.001313	±2.5
30		3.58	0.002049	±2.5
40		3.62	0.002074	±2.5
50		5.38	0.003082	±2.5
55		2.92	0.001672	±2.5

- 25	4.2	0.21	0.000125	±2.5
	3.5	2.25	0.001306	±2.5

LTE Band 5 (Part 27)

Middle Channel, f_O = 836.5 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-0.10	-0.000058	±2.5
0		0.21	0.000125	±2.5
10		2.25	0.001306	±2.5
20		-3.19	-0.001855	±2.5
30		-0.99	-0.000570	±2.5
40		-1.22	-0.000702	±2.5
50		2.43	0.001404	±2.5
55		3.58	0.002049	±2.5
- 25	4.2	3.62	0.002074	±2.5
	3.5	5.38	0.003082	±2.5

LTE Band 17 (Part 27)

Middle Channel, f_O = 710 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-1.79	-0.002519	±2.5
0		-2.52	-0.003546	±2.5
10		-2.56	-0.003607	±2.5
20		0.44	0.000625	±2.5
30		0.11	0.000162	±2.5
40		-0.64	-0.000911	±2.5
50		-0.16	-0.000223	±2.5
55		-0.33	-0.000466	±2.5
25	4.2	-0.40	-0.000567	±2.5
	3.5	1.40	0.001984	±2.5

Note: The EUT doesn't work below -10℃

9. OCCUPIED BANDWIDTH

9.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

9.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

9.3 MEASUREMENT RESULT

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. All modes of operation were investigated and the worst case configuration results are reported in this section.

LTE Band 2 (Part 27)

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0792	PASS
	MCH	6	0	1.0804	PASS
	HCH	6	0	1.0792	PASS
16QAM	LCH	6	0	1.0817	PASS
	MCH	6	0	1.0811	PASS
	HCH	6	0	1.0813	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6848	PASS
	MCH	15	0	2.6833	PASS
	HCH	15	0	2.6854	PASS
16QAM	LCH	15	0	2.6840	PASS
	MCH	15	0	2.6825	PASS
	HCH	15	0	2.6864	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		

QPSK	LCH	25	0	4.4807	PASS
	MCH	25	0	4.4769	PASS
	HCH	25	0	4.4726	PASS
16QAM	LCH	25	0	4.4710	PASS
	MCH	25	0	4.4779	PASS
	HCH	25	0	4.4741	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9382	PASS
	MCH	50	0	8.9435	PASS
	HCH	50	0	8.9514	PASS
16QAM	LCH	50	0	8.9271	PASS
	MCH	50	0	8.9470	PASS
	HCH	50	0	8.9438	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	13.382	PASS
	MCH	75	0	13.384	PASS
	HCH	75	0	13.413	PASS
16QAM	LCH	75	0	13.361	PASS
	MCH	75	0	13.391	PASS
	HCH	75	0	13.396	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	17.772	PASS
	MCH	100	0	17.845	PASS
	HCH	100	0	17.818	PASS
16QAM	LCH	100	0	17.781	PASS
	MCH	100	0	17.861	PASS
	HCH	100	0	17.821	PASS

LTE Band 4 (Part 27)

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0785	PASS
	MCH	6	0	1.0749	PASS
	HCH	6	0	1.0779	PASS
16QAM	LCH	6	0	1.0786	PASS
	MCH	6	0	1.0782	PASS
	HCH	6	0	1.0772	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6854	PASS
	MCH	15	0	2.6826	PASS
	HCH	15	0	2.6847	PASS
16QAM	LCH	15	0	2.6798	PASS
	MCH	15	0	2.6834	PASS
	HCH	15	0	2.6848	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4674	PASS
	MCH	25	0	4.4756	PASS
	HCH	25	0	4.4720	PASS
16QAM	LCH	25	0	4.4709	PASS
	MCH	25	0	4.4710	PASS
	HCH	25	0	4.4792	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9352	PASS

	MCH	50	0	8.9325	PASS
	HCH	50	0	8.9287	PASS
16QAM	LCH	50	0	8.9347	PASS
	MCH	50	0	8.9306	PASS
	HCH	50	0	8.9338	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	13.390	PASS
	MCH	75	0	13.373	PASS
	HCH	75	0	13.377	PASS
16QAM	LCH	75	0	13.396	PASS
	MCH	75	0	13.378	PASS
	HCH	75	0	13.363	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	17.835	PASS
	MCH	100	0	17.813	PASS
	HCH	100	0	17.802	PASS
16QAM	LCH	100	0	17.823	PASS
	MCH	100	0	17.809	PASS
	HCH	100	0	17.805	PASS

LTE Band 5 (Part 27)

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0765	PASS
	MCH	6	0	1.0760	PASS
	HCH	6	0	1.0762	PASS
16QAM	LCH	6	0	1.0805	PASS
	MCH	6	0	1.0812	PASS
	HCH	6	0	1.0809	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6820	PASS
	MCH	15	0	2.6832	PASS
	HCH	15	0	2.6861	PASS
16QAM	LCH	15	0	2.6832	PASS
	MCH	15	0	2.6799	PASS
	HCH	15	0	2.6837	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4713	PASS
	MCH	25	0	4.4687	PASS
	HCH	25	0	4.4712	PASS
16QAM	LCH	25	0	4.4668	PASS
	MCH	25	0	4.4679	PASS
	HCH	25	0	4.4676	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9501	PASS
	MCH	50	0	8.9137	PASS
	HCH	50	0	8.9395	PASS
16QAM	LCH	50	0	8.9404	PASS
	MCH	50	0	8.9070	PASS
	HCH	50	0	8.9322	PASS

LTE Band 17 (Part 27)

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4864	PASS
	MCH	25	0	4.4820	PASS
	HCH	25	0	4.4976	PASS
16QAM	LCH	25	0	4.4804	PASS
	MCH	25	0	4.4753	PASS
	HCH	25	0	4.4952	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9462	PASS
	MCH	50	0	8.9615	PASS
	HCH	50	0	8.9589	PASS
16QAM	LCH	50	0	8.9396	PASS
	MCH	50	0	8.9498	PASS
	HCH	50	0	8.9425	PASS

Note: Please refers to Appendix B for compliance test plots for Occupied Bandwidth (99%)

10. EMISSION BANDWIDTH

10.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

10.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

10.3 MEASUREMENT RESULT

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. All modes of operation were investigated and the worst case configuration results are reported in this section.

LTE Band 2 (Part 27)

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.309	PASS
	MCH	6	0	1.309	PASS
	HCH	6	0	1.267	PASS
16QAM	LCH	6	0	1.279	PASS
	MCH	6	0	1.274	PASS
	HCH	6	0	1.238	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.882	PASS
	MCH	15	0	2.904	PASS
	HCH	15	0	2.905	PASS
16QAM	LCH	15	0	2.898	PASS
	MCH	15	0	2.938	PASS
	HCH	15	0	2.895	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		

QPSK	LCH	25	0	4.809	PASS
	MCH	25	0	4.772	PASS
	HCH	25	0	4.839	PASS
16QAM	LCH	25	0	4.802	PASS
	MCH	25	0	4.798	PASS
	HCH	25	0	4.847	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.485	PASS
	MCH	50	0	9.508	PASS
	HCH	50	0	9.532	PASS
16QAM	LCH	50	0	9.408	PASS
	MCH	50	0	9.515	PASS
	HCH	50	0	9.556	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	13.99	PASS
	MCH	75	0	14.08	PASS
	HCH	75	0	14.09	PASS
16QAM	LCH	75	0	14.00	PASS
	MCH	75	0	14.06	PASS
	HCH	75	0	14.02	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	18.51	PASS
	MCH	100	0	18.66	PASS
	HCH	100	0	18.59	PASS
16QAM	LCH	100	0	18.52	PASS
	MCH	100	0	18.59	PASS
	HCH	100	0	18.55	PASS

LTE Band 4 (Part 27)

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.237	PASS
	MCH	6	0	1.223	PASS
	HCH	6	0	1.248	PASS
16QAM	LCH	6	0	1.261	PASS
	MCH	6	0	1.236	PASS
	HCH	6	0	1.239	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.875	PASS
	MCH	15	0	2.874	PASS
	HCH	15	0	2.905	PASS
16QAM	LCH	15	0	2.914	PASS
	MCH	15	0	2.894	PASS
	HCH	15	0	2.902	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.779	PASS
	MCH	25	0	4.805	PASS
	HCH	25	0	4.785	PASS
16QAM	LCH	25	0	4.801	PASS
	MCH	25	0	4.789	PASS
	HCH	25	0	4.788	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.496	PASS
	MCH	50	0	9.481	PASS

	HCH	50	0	9.474	PASS
16QAM	LCH	50	0	9.483	PASS
	MCH	50	0	9.439	PASS
	HCH	50	0	9.387	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	14.00	PASS
	MCH	75	0	14.01	PASS
	HCH	75	0	13.96	PASS
16QAM	LCH	75	0	14.00	PASS
	MCH	75	0	13.97	PASS
	HCH	75	0	14.02	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	18.56	PASS
	MCH	100	0	18.57	PASS
	HCH	100	0	18.61	PASS
16QAM	LCH	100	0	18.53	PASS
	MCH	100	0	18.57	PASS
	HCH	100	0	18.61	PASS

LTE Band 5 (Part 27)

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
- QPSK	LCH	6	0	1.219	PASS
	MCH	6	0	1.231	PASS
	HCH	6	0	1.229	PASS
16QAM	LCH	6	0	1.233	PASS
	MCH	6	0	1.226	PASS
	HCH	6	0	1.259	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz				
Modulation	Channel	RB Configuration	26dB Bandwidth (MHz)	Verdict

		Size	Offset		
QPSK	LCH	15	0	2.875	PASS
	MCH	15	0	2.888	PASS
	HCH	15	0	2.878	PASS
16QAM	LCH	15	0	2.889	PASS
	MCH	15	0	2.862	PASS
	HCH	15	0	2.880	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.788	PASS
	MCH	25	0	4.797	PASS
	HCH	25	0	4.770	PASS
16QAM	LCH	25	0	4.797	PASS
	MCH	25	0	4.821	PASS
	HCH	25	0	4.825	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.499	PASS
	MCH	50	0	9.460	PASS
	HCH	50	0	9.458	PASS
16QAM	LCH	50	0	9.469	PASS
	MCH	50	0	9.421	PASS
	HCH	50	0	9.426	PASS

LTE Band 17 (Part 27)

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.827	PASS
	MCH	25	0	4.905	PASS
	HCH	25	0	5.283	PASS
16QAM	LCH	25	0	4.840	PASS
	MCH	25	0	4.898	PASS

	HCH	25	0	5.267	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.752	PASS
	MCH	50	0	9.599	PASS
	HCH	50	0	9.990	PASS
16QAM	LCH	50	0	9.510	PASS
	MCH	50	0	9.479	PASS
	HCH	50	0	9.507	PASS

Note: Please refers to Appendix B for compliance test plots for emission bandwidth (-26dBc)

11. BAND EDGE

11.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

11.2 PROVISIONS APPLICABLE

As Specified in FCC rules of §2.1051 §24.238(a) §27.53(e) §27.53(g)
KDB 971168 v02r01 – Section 6.0

11.3 MEASUREMENT RESULT

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequency. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.
Please refers to Appendix III for compliance test plots for band edge

12. MAINS CONDUCTED EMISSION

12.1 MEASUREMENT METHOD

The measurement procedure specified in ANSI/TIA-603-D-2010 was used for testing. Conducted Emission was measured with travel charger.

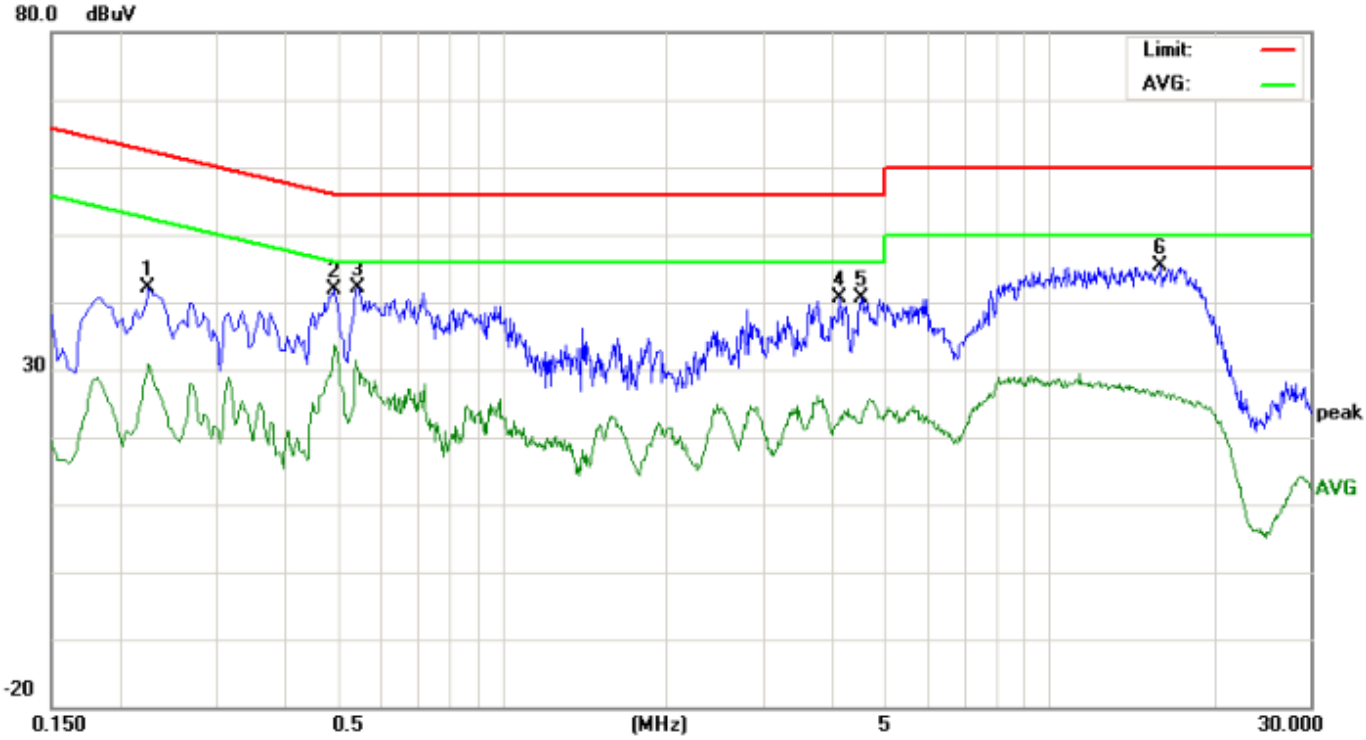
12.2 PROVISIONS APPLICABLE

Frequency of Emission (MHz)	Conducted Limit(dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50
*Decreases with the logarithm of the frequency. *The lower limit shall apply at the transition frequency.		

Note: The FDD Band 2 mode is the worst condition and the test result as following:

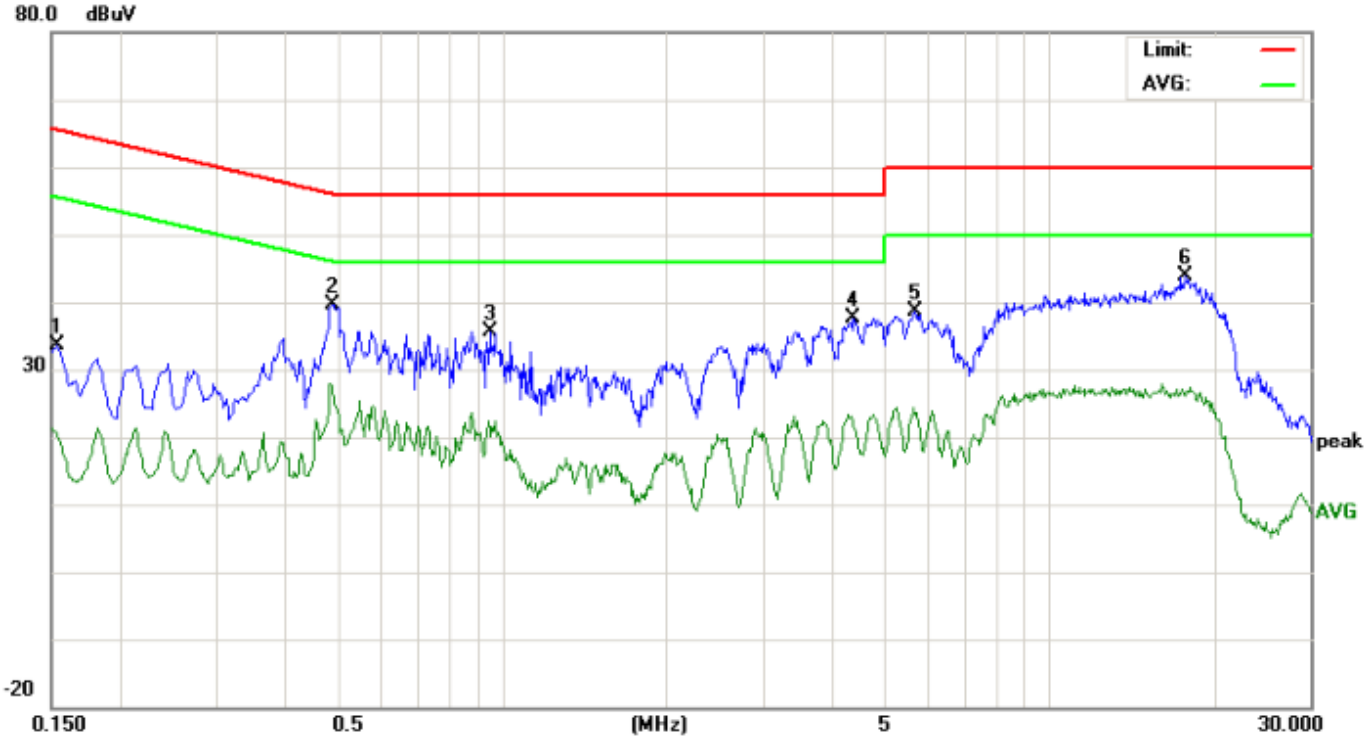
12.3 MEASUREMENT RESULT

LINE CONDUCTED EMISSION – L



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2260	42.21		30.93	0.00	42.21		30.93	62.59	52.59	-20.38	-21.66	P	
2	0.4939	41.76		33.63	0.00	41.76		33.63	56.10	46.10	-14.34	-12.47	P	
3	0.5460	42.10		29.89	0.00	42.10		29.89	56.00	46.00	-13.90	-16.11	P	
4	4.1379	40.58		22.66	0.00	40.58		22.66	56.00	46.00	-15.42	-23.34	P	
5	4.5259	40.69		22.20	0.00	40.69		22.20	56.00	46.00	-15.31	-23.80	P	
6	15.9859	45.28		26.18	0.00	45.28		26.18	60.00	50.00	-14.72	-23.82	P	

LINE CONDUCTED EMISSION – N



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1539	33.54		20.39	0.00	33.54		20.39	65.78	55.78	-32.24	-35.39	P	
2	0.4899	39.74		27.67	0.00	39.74		27.67	56.17	46.17	-16.43	-18.50	P	
3	0.9499	35.60		21.16	0.00	35.60		21.16	56.00	46.00	-20.40	-24.84	P	
4	4.4058	37.66		21.90	0.00	37.66		21.90	56.00	46.00	-18.34	-24.10	P	
5	5.6939	38.75		23.47	0.00	38.75		23.47	60.00	50.00	-21.25	-26.53	P	
6	17.6858	43.98		26.25	0.00	43.98		26.25	60.00	50.00	-16.02	-23.75	P	

Note: The FDD Band 2 mode is the worst condition.