

# FCC Test Report

Report No.: AGC00767180503FE07

**FCC ID** : P46-VOLT5XL  
**APPLICATION PURPOSE** : Original Equipment  
**PRODUCT DESIGNATION** : Smartphone  
**BRAND NAME** : SURGE  
**MODEL NAME** : VOLT\_5XL  
**CLIENT** : Unimax Communications  
**DATE OF ISSUE** : Jun. 20, 2018  
**STANDARD(S)** : FCC Part 22 Rules  
FCC Part 24 Rules  
FCC Part 27 Rules  
**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

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**REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 20, 2018	Valid	Initial Release

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**1. VERIFICATION OF COMPLIANCE**

<b>Applicant</b>	Unimax Communications
<b>Address</b>	18201 McDermott St. West Suite E, Irvine, CA 92614
<b>Manufacturer</b>	Shenzhen TENSEN Industrial Co., Ltd.
<b>Address</b>	4th Floor, Yufeng Building, Jinhai Road No.6-9, Xixiang Street, Bao'an District, Shenzhen
<b>Product Designation</b>	Smartphone
<b>Brand Name</b>	SURGE
<b>Test Model</b>	VOLT_5XL
<b>Date of test</b>	May 17, 2018~ Jun. 20, 2018
<b>Deviation</b>	None
<b>Condition of Test Sample</b>	Normal

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance(Shenzhen) 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-E-2016. The sample tested as described in this report is in compliance with the FCC Rules Part 22, 24 and 27.

The test results of this report relate only to the tested sample identified in this report.

Tested By



Donjon Huang(Huang Dongyang)

Jun. 20, 2018

Reviewed By



Bart Xie(Xie Xiaobin)

Jun. 20, 2018

Approved By



Forrest Lei(Lei Yonggang)  
 Authorized Officer

Jun. 20, 2018

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## 2. GENERAL INFORMATION

### 2.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Radio System Type:	LTE	
Hardware version:	A969-37-MB-V2.0	
Software version:	VOLT_5XL_V1.0	
Frequency Bands:	<input checked="" type="checkbox"/> FDD Band 2 <input checked="" type="checkbox"/> FDD Band 4 <input checked="" type="checkbox"/> FDD Band 5 <input type="checkbox"/> FDD Band 7 <input checked="" type="checkbox"/> FDD Band 12 <input type="checkbox"/> FDD Band 17 <input type="checkbox"/> FDD Band 26 <input type="checkbox"/> TDD Band 41 (U.S. Bands) <input type="checkbox"/> FDD Band 1 <input type="checkbox"/> FDD Band 3 <input type="checkbox"/> FDD Band 7 <input type="checkbox"/> FDD Band 8 <input type="checkbox"/> FDD Band 20 <input type="checkbox"/> TDD Band 33 <input type="checkbox"/> TDD Band 34 <input type="checkbox"/> TDD Band 38 <input type="checkbox"/> FDD Band 40 <input type="checkbox"/> FDD Band 42 <input type="checkbox"/> FDD Band 43 (Non-U.S. Bands)	
Frequency Range	LTE Band 2	Transmission (TX): 1850 to 1909.9 MHz Receiving (RX): 1930 to 1989.9 MHz
	LTE Band 4	Transmission (TX): 1710 to 1754.9 MHz Receiving (RX): 2110 to 2154.9 MHz
	LTE Band 5	Transmission (TX): 824 to 848.9 MHz Receiving (RX): 869 to 893.9 MHz
	LTE Band 12	Transmission (TX): 699 to 715.9 MHz Receiving (RX): 729 to 745.9 MHz
Supported Channel Bandwidth	LTE Band 2	<input checked="" type="checkbox"/> 1.4 MHz <input checked="" type="checkbox"/> 3 MHz <input checked="" type="checkbox"/> 5 MHz <input checked="" type="checkbox"/> 10 MHz <input checked="" type="checkbox"/> 15 MHz <input checked="" type="checkbox"/> 20 MHz
	LTE Band 4	<input checked="" type="checkbox"/> 1.4 MHz <input checked="" type="checkbox"/> 3 MHz <input checked="" type="checkbox"/> 5 MHz <input checked="" type="checkbox"/> 10 MHz <input checked="" type="checkbox"/> 15 MHz <input checked="" type="checkbox"/> 20 MHz
	LTE Band 5	<input checked="" type="checkbox"/> 1.4 MHz <input checked="" type="checkbox"/> 3 MHz <input checked="" type="checkbox"/> 5 MHz <input checked="" type="checkbox"/> 10 MHz
	LTE Band 12	<input checked="" type="checkbox"/> 1.4 MHz <input checked="" type="checkbox"/> 3 MHz <input checked="" type="checkbox"/> 5 MHz <input checked="" type="checkbox"/> 10 MHz
Antenna:	PIFA Antenna	
Type of Modulation	QPSK/16QAM	
Antenna gain:	Band 2: -0.3dBi; Band 4: -0.7dBi; Band 5: -0.9dBi; Band 12: -1.2dBi	
Diversity Antenna Gain	Band 2: -0.5dBi; Band 4: -0.9dBi; Band 5: -1.0dBi; Band 12: -1.5dBi	
Power Supply:	DC 3.8V by battery	
Dual Card:	GSM/WCDMA/LTE Card Slot	
Power Class	3	

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Extreme Vol. Limits:	DC3.4V to 4.35 V (Normal: 3.8 V)
Temperature range	-10°C to +50°C
<b>Note1:</b> The High Voltage DC4.35V and Low Voltage DC3.4V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage.	

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## 2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: P46-VOLT5XL**, filing to comply with the FCC Part22, Part24 and Part27 requirements

## 2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI/TIA-603-E-2016, and FCC KDB 971168 D01 Power Means License Digital Systems V03R01.

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**2.4 TEST FACILITY**

<b>Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	1-2F., Bldg.2, No.1-4, ChaxiSanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, BaoanBldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012
<b>NVLAP LAB CODE</b>	600153-0
<b>Designation Number</b>	CN5028
<b>Description</b>	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

**ALL TEST EQUIPMENT LIST**

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun.20, 2017	Jun.19, 2018
TEST RECEIVER	R&S	ESPI	101206	Jun.12, 2018	Jun.11, 2019
LISN	R&S	ESH2-Z5	100086	Aug.21, 2017	Aug.20, 2018
TEST RECEIVER	R&S	ESCI	10096	Jun.20, 2017	Jun.19, 2018
TEST RECEIVER	R&S	ESCI	10096	Jun.12, 2018	Jun.11, 2019
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.08, 2017	Dec.07, 2018
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.20, 2017	Sep.19, 2018
preamplifier	ChengYi	EMC184045SE	980508	Sep.15, 2017	Sep.14, 2018
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May.18, 2017	May.17, 2019
Broadband Preampfier	SCHWARZBECK	BBV 9718	9718-205	Jun.20, 2017	Jun.19, 2018
Broadband Preampfier	SCHWARZBECK	BBV 9718	9718-205	Jun.12, 2018	Jun.11, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2018
SIGNAL ANALYZER	Agilent	N9020A	MY52090123	Sep. 21, 2017	Sep. 20, 2018
USB Wideband Power Sensor	Agilent	U2021XA	MY54110007	Sep. 21, 2017	Sep. 20, 2018
Universal Radio Communication Tester	R&S	CMU200	120237	Mar.01,2018	Feb.28,2019
Universal Radio Communication Tester	Agilent	8960	GB46200384	July 16,2017	July 15,2018
Wireless communication test	R&S	CMW500	120909	July 13, 2017	July 12, 2018

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Power Splitter	Agilent	11636A	34	Sep.21,2017	Sep.20,2018
Attenuator	JFW	50FHC-006-50	N/A	June 20, 2017	June 19, 2018
Attenuator	JFW	50FHC-006-50	N/A	Jun.12, 2018	Jun.11, 2019
LOOP ANTENNA	A.H	SAS-562B	/	Mar.01,2018	Feb.28, 2019

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## 2.5 SPECIAL ACCESSORIES

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

## 2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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### 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)

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

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### 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	Smartphone	VOLT_5XL	P46-VOLT5XL	EUT
2	Adapter	VOLT_5XL	DC 5.0V 1500mA	Accessory
3	Battery	N/A	DC3.8V/ 2000mAh	Accessory
4	USB Cable	N/A	N/A	Accessory

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

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**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

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## 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.

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	1900.0MHz
	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	
	1940.0 MHz	1960.0 MHz	1980.0 MHz	

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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	

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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

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Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 12	TX (1.4M)	Channel 23017	Channel 23095	Channel 23173
		699.7MHz	707.5MHz	715.3MHz
	TX (3M)	Channel 23025	Channel 23095	Channel 23165
		700.5MHz	707.5MHz	714.5MHz
	TX (5M)	Channel 23035	Channel 23095	Channel 23155
		701.5MHz	707.5MHz	713.5MHz
	TX (10M)	Channel 23060	Channel 23095	Channel 23130
		704 MHz	707.5 MHz	711 MHz
	RX (1.4M)	Channel 5017	Channel 5095	Channel 5173
		729.7MHz	737.5MHz	745.3MHz
	RX (3M)	Channel 5025	Channel 5095	Channel 5165
		730.5MHz	737.5MHz	744.5MHz
RX (5M)	Channel 5035	Channel 5095	Channel 5155	
	731.5MHz	737.5MHz	743.5MHz	
RX (10M)	Channel 5060	Channel 5095	Channel 5130	
	734MHz	737.5MHz	741MHz	

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## 6. OUTPUT POWER

### 6.1 CONDUCTED OUTPUT POWER

#### 6.1.1 MEASUREMENT METHOD

The EUT is coupled to the SS with attenuator through power splitter; the RF load attached to EUT antenna terminal is 50ohm, the path loss as the factor is calibrated to correct the reading. A system simulator was used to establish communication with the EUT , Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported. The measurements were performed on all modes at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

#### 6.1.2 MEASUREMENT RESULT

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

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**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	<b>22.53</b>
				1	49	0	21.45
				1	99	0	21.18
				50	0	1	20.12
				50	25	1	20.08
				50	49	1	20.04
			16QAM	100	0	1	20.40
				1	0	1	22.07
				1	49	1	22.13
				1	99	1	22.30
				50	0	2	21.17
				50	25	2	21.34
	18900	1880.0	QPSK	50	49	2	21.42
				100	0	2	21.39
				1	0	0	22.68
				1	49	0	21.77
				1	99	0	20.43
				50	0	1	19.87
			16QAM	50	25	1	19.92
				50	49	1	19.96
				100	0	1	20.67
				1	0	1	20.97
				1	49	1	20.63
				1	99	1	20.40
	19100	1900.0	QPSK	50	0	2	18.93
				50	25	2	18.99
				50	49	2	19.06
				100	0	2	19.42
				1	0	0	22.50
				1	49	0	21.25
16QAM			1	99	0	21.53	
			50	0	1	20.21	
			50	25	1	20.33	
			50	49	1	20.47	
			100	0	1	20.44	
			1	0	1	22.03	
16QAM	1	49	1	21.11			
	1	99	1	19.52			
	50	0	2	18.96			
	50	25	2	19.02			
	50	49	2	19.09			
	100	0	2	19.80			

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
15MHz	18675	1857.5	QPSK	1	0	0	21.66
				1	37	0	21.28
				1	74	0	20.87
				36	0	1	20.06
				36	16	1	21.14
				36	35	1	20.27
			16QAM	75	0	1	20.56
				1	0	1	22.30
				1	37	1	22.32
				1	74	1	22.35
				36	0	2	21.34
				36	16	2	21.39
	18900	1880.0	QPSK	36	35	2	21.48
				36	0	2	21.45
				75	0	2	21.45
				1	0	0	22.23
				1	37	0	21.58
				1	74	0	20.13
			16QAM	36	0	1	19.64
				36	16	1	19.75
				36	35	1	19.87
				75	0	1	20.41
				1	0	1	20.91
				1	37	1	20.47
	19125	1902.5	QPSK	1	74	1	20.24
				36	0	2	19.02
				36	16	2	19.15
				36	35	2	19.29
				75	0	2	19.60
				1	0	0	21.54
			16QAM	1	37	0	21.63
				1	74	0	21.71
				36	0	1	20.21
				36	16	1	20.33
				36	35	1	20.54
				75	0	1	20.51
16QAM	1	0	1	21.54			
	1	37	1	20.56			
	1	74	1	19.51			
	36	0	2	18.66			
	36	16	2	18.78			
	36	35	2	18.94			
				75	0	2	19.47

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	18650	1855.0	QPSK	1	0	0	21.57
				1	24	0	21.36
				1	49	0	21.13
				25	0	1	20.55
				25	12	1	20.59
				25	25	1	20.63
				50	0	1	20.82
			16QAM	1	0	1	22.45
				1	24	1	22.38
				1	49	1	22.30
				25	0	2	21.21
				25	12	2	21.34
				25	25	2	21.55
				50	0	2	21.57
	18900	1880.0	QPSK	1	0	0	21.51
				1	24	0	20.69
				1	49	0	20.02
				25	0	1	19.76
				25	12	1	19.79
				25	25	1	19.82
				50	0	1	20.15
			16QAM	1	0	1	20.87
				1	24	1	20.65
				1	49	1	20.44
				25	0	2	19.58
				25	12	2	19.62
				25	25	2	19.69
				50	0	2	19.85
	19150	1905.0	QPSK	1	0	0	21.73
				1	24	0	21.71
1				49	0	21.67	
25				0	1	20.52	
25				12	1	20.58	
25				25	1	20.63	
50				0	1	20.62	
16QAM			1	0	1	20.89	
			1	24	1	20.15	
			1	49	1	19.54	
			25	0	2	18.86	
			25	12	2	18.89	
			25	25	2	18.93	
			50	0	2	19.26	

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	18625	1852.5	QPSK	1	0	0	21.77
				1	12	0	21.82
				1	24	0	21.88
				12	0	1	20.74
				12	6	1	20.83
				12	11	1	20.88
				25	0	1	20.78
			16QAM	1	0	1	23.19
				1	12	1	23.11
				1	24	1	23.00
				12	0	2	21.74
				12	6	2	21.79
				12	11	2	21.85
				25	0	2	21.81
	18900	1880.0	QPSK	1	0	0	21.56
				1	12	0	20.97
				1	24	0	20.71
				12	0	1	19.67
				12	6	1	19.75
				12	11	1	19.82
				25	0	1	20.06
			16QAM	1	0	1	20.94
				1	12	1	21.03
				1	24	1	21.09
				12	0	2	19.88
				12	6	2	19.92
				12	11	2	19.96
				25	0	2	19.76
	19175	1907.5	QPSK	1	0	0	22.50
				1	12	0	22.46
1				24	0	22.41	
12				0	1	20.86	
12				6	1	20.96	
12				11	1	21.02	
25				0	1	20.85	
16QAM			1	0	1	20.54	
			1	12	1	19.96	
			1	24	1	19.79	
			12	0	2	18.84	
			12	6	2	18.92	
			12	11	2	18.95	
			25	0	2	19.16	

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)		
3MHz	18615	1851.5	QPSK	1	0	0	22.25		
				1	7	0	22.21		
				1	14	0	22.17		
				8	0	1	21.22		
				8	4	1	21.29		
				8	7	1	21.37		
			15	0	1	21.34			
			16QAM	1	0	1	22.20		
				1	7	1	22.19		
				1	14	1	22.18		
				8	0	2	21.32		
				8	4	2	21.37		
				8	7	2	21.39		
			18900	1880.0	QPSK	1	0	0	21.74
						1	7	0	21.55
	1	14				0	21.12		
	8	0				1	20.23		
	8	4				1	20.36		
	8	7				1	20.57		
	15	0			1	20.67			
	16QAM	1			0	1	21.41		
		1			7	1	21.39		
		1			14	1	21.31		
		8			0	2	20.12		
		8			4	2	20.24		
		8			7	2	20.33		
	19185	1908.5			QPSK	1	0	0	21.48
						1	7	0	21.46
			1	14		0	21.47		
			8	0		1	20.35		
8			4	1		20.41			
8			7	1		20.47			
15			0	1	20.37				
16QAM			1	0	1	21.08			
			1	7	1	20.88			
			1	14	1	20.61			
			8	0	2	19.52			
			8	4	2	19.57			
			8	7	2	19.64			
15			0	2	19.75				

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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	22.33
				1	3	0	22.31
				1	5	0	22.28
				3	0	0	22.11
				3	2	0	22.18
				3	3	0	22.24
			6	0	1	21.43	
			16QAM	1	0	1	22.41
				1	2	1	22.39
				1	5	1	22.36
				3	0	1	22.31
				3	1	1	22.36
	3	2		1	22.40		
	6	0	2	21.47			
	18900	1880.0	QPSK	1	0	0	21.80
				1	2	0	21.65
				1	5	0	21.51
				3	0	0	21.43
				3	1	0	21.48
				3	2	0	21.52
			6	0	1	20.79	
			16QAM	1	0	1	21.34
				1	2	1	21.35
				1	5	1	21.33
				3	0	1	21.05
				3	1	1	21.18
	3	2		1	21.26		
	6	0	2	20.26			
	19193	1909.3	QPSK	1	0	0	21.69
				1	2	0	21.66
				1	5	0	21.64
				3	0	0	21.25
				3	1	0	21.29
				3	2	0	21.36
			6	0	1	20.40	
			16QAM	1	0	1	21.04
1				2	1	20.97	
1				5	1	20.86	
3				0	1	20.44	
3				1	1	20.57	
3	2	1		20.65			
6	0	2	19.96				

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**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	22.83
				1	49	0	22.25
				1	99	0	21.83
				50	0	1	21.22
				50	25	1	21.29
				50	49	1	21.34
			16QAM	100	0	1	21.45
				1	0	1	22.56
				1	49	1	22.03
				1	99	1	21.86
				50	0	2	20.88
				50	25	2	20.93
	20175	1732.5	QPSK	50	49	2	20.97
				100	0	2	21.43
				1	0	0	22.76
				1	49	0	22.45
				1	99	0	22.71
				50	0	1	21.34
			16QAM	50	25	1	21.46
				50	49	1	21.52
				100	0	1	21.57
				1	0	1	21.95
				1	49	1	21.63
				1	99	1	21.07
	20300	1745.0	QPSK	50	0	2	20.01
				50	25	2	20.17
				50	49	2	20.23
				100	0	2	20.36
				1	0	0	22.50
				1	49	0	21.34
16QAM			1	99	0	21.11	
			50	0	1	19.87	
			50	25	1	19.95	
			50	49	1	20.07	
			100	0	1	20.46	
			1	0	1	21.25	
	1	49	1	21.44			
	1	99	1	21.79			
	50	0	2	20.23			
	50	25	2	20.38			
	50	49	2	20.51			
	100	0	2	20.54			

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
15MHz	20025	1717.5	QPSK	1	0	0	22.64
				1	37	0	22.35
				1	74	0	22.16
				36	0	1	21.24
				36	16	1	21.38
				36	35	1	21.57
			16QAM	75	0	1	21.67
				1	0	1	22.26
				1	37	1	21.94
				1	74	1	21.63
				36	0	2	20.56
				36	16	2	20.87
				36	35	2	20.92
				75	0	2	21.32
	20175	1732.5	QPSK	1	0	0	22.08
				1	37	0	22.33
				1	74	0	22.63
				36	0	1	21.47
				36	16	1	21.53
				36	35	1	21.60
			16QAM	75	0	1	21.69
				1	0	1	21.92
				1	37	1	21.64
				1	74	1	21.42
				36	0	2	20.31
				36	16	2	20.39
				36	35	2	20.44
				75	0	2	20.55
	20325	1747.5	QPSK	1	0	0	21.48
				1	37	0	21.28
1				74	0	21.05	
36				0	1	20.05	
36				16	1	20.11	
36				35	1	20.14	
16QAM			75	0	1	20.63	
			1	0	1	21.29	
			1	37	1	21.36	
			1	74	1	21.62	
			36	0	2	20.45	
			36	16	2	20.51	
			36	35	2	20.55	
			75	0	2	20.59	

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	20000	1715.0	QPSK	1	0	0	22.53
				1	24	0	22.46
				1	49	0	22.37
				25	0	1	21.23
				25	12	1	21.35
				25	25	1	21.48
			16QAM	50	0	1	21.60
				1	0	1	21.89
				1	24	1	21.67
				1	49	1	21.32
				25	0	2	20.84
				25	12	2	20.93
				25	25	2	20.98
				50	0	2	21.38
				20175	1732.5	QPSK	1
	1	24	0				22.52
	1	49	0				22.55
	25	0	1				21.37
	25	12	1				21.42
	25	25	1				21.46
	16QAM	50	0			1	21.47
		1	0			1	21.91
		1	24			1	21.65
		1	49			1	21.49
		25	0			2	20.13
		25	12			2	20.35
		25	25			2	20.42
		50	0			2	20.55
		20350	1750.0			QPSK	1
	1			24	0		21.03
1	49			0	20.79		
25	0			1	20.02		
25	12			1	20.09		
25	25			1	20.18		
16QAM	50			0	1	20.42	
	1			0	1	21.76	
	1			24	1	21.71	
	1			49	1	21.69	
	25			0	2	20.34	
	25			12	2	20.39	
	25			25	2	20.43	
	50			0	2	20.46	

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	19975	1712.5	QPSK	1	0	0	22.83
				1	12	0	22.74
				1	24	0	22.61
				12	0	1	21.64
				12	6	1	21.69
				12	11	1	21.75
			16QAM	25	0	1	21.74
				1	0	1	22.02
				1	12	1	21.93
				1	24	1	21.80
				12	0	2	21.12
				12	6	2	21.17
				12	11	2	21.21
				25	0	2	21.37
				20175	1732.5	QPSK	1
	1	12	0				22.63
	1	24	0				22.67
	12	0	1				21.43
	12	6	1				21.52
	12	11	1				21.55
	16QAM	25	0			1	21.48
		1	0			1	22.02
		1	12			1	21.96
		1	24			1	21.82
		12	0			2	20.77
		12	6			2	20.79
		12	11			2	20.82
		25	0			2	20.71
		20375	1752.5			QPSK	1
	1			12	0		21.36
1	24			0	21.25		
12	0			1	20.31		
12	6			1	20.37		
12	11			1	20.43		
16QAM	25			0	1	20.44	
	1			0	1	21.39	
	1			12	1	21.37	
	1			24	1	21.38	
	12			0	2	20.46	
	12			6	2	20.55	
	12			11	2	20.60	
	25			0	2	20.45	

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
3MHz	19965	1711.5	QPSK	1	0	0	22.66
				1	7	0	22.61
				1	14	0	22.59
				8	0	1	21.67
				8	4	1	21.74
				8	7	1	21.81
			15	0	1	21.80	
			16QAM	1	0	1	21.96
				1	7	1	21.77
				1	14	1	21.69
				8	0	2	21.43
				8	4	2	21.52
				8	7	2	21.56
			15	0	2	21.58	
			20175	1732.5	QPSK	1	0
	1	7				0	22.49
	1	14				0	22.55
	8	0				1	21.52
	8	4				1	21.58
	8	7				1	21.63
	15	0			1	21.50	
	16QAM	1			0	1	21.84
		1			7	1	21.82
		1			14	1	21.78
		8			0	2	20.56
		8			4	2	20.65
		8			7	2	20.77
	15	0			2	20.69	
	20385	1753.5			QPSK	1	0
			1	7		0	21.38
1			14	0		21.24	
8			0	1		20.47	
8			4	1		20.53	
8			7	1		20.56	
15			0	1	20.40		
16QAM			1	0	1	21.61	
			1	7	1	21.62	
			1	14	1	21.63	
			8	0	2	20.42	
			8	4	2	20.48	
			8	7	2	20.52	
15			0	2	20.42		

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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	22.87
				1	2	0	22.85
				1	5	0	22.83
				3	0	0	22.43
				3	1	0	22.57
				3	2	0	22.76
			16QAM	1	0	1	22.06
				1	2	1	22.01
				1	5	1	21.97
				3	0	1	22.03
				3	1	1	22.11
				3	2	1	22.19
	20175	1732.5	QPSK	6	0	2	21.68
				1	0	0	22.46
				1	2	0	22.49
				1	5	0	22.53
				3	0	0	22.33
				3	1	0	22.39
			16QAM	3	2	0	22.45
				6	0	1	21.64
				1	0	1	21.88
				1	2	1	21.87
				1	5	1	21.86
				3	0	1	21.63
	20393	1754.3	QPSK	3	1	1	21.75
				3	2	1	21.77
				6	0	2	20.75
				1	0	0	21.63
				1	2	0	21.62
				1	5	0	21.58
			16QAM	3	0	0	21.12
				3	1	0	21.24
				3	2	0	21.29
				6	0	1	20.47
				1	0	1	21.51
				1	2	1	21.53
16QAM	1	5	1	21.55			
	3	0	1	21.23			
	3	1	1	21.33			
	3	2	1	21.39			
	6	0	2	20.58			

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**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	20.62
				1	24	0	20.76
				1	49	0	20.99
				25	0	1	19.64
				25	12	1	19.77
				25	25	1	19.79
			16QAM	50	0	1	19.59
				1	0	1	20.42
				1	24	1	20.61
				1	49	1	20.81
				25	0	2	19.99
				25	12	2	20.05
				25	25	2	21.08
				50	0	2	20.97
				20525	836.5	QPSK	1
	1	24	0				21.58
	1	49	0				21.25
	25	0	1				20.25
	25	12	1				20.36
	25	25	1				20.41
	16QAM	50	0			1	20.39
		1	0			1	19.71
		1	24			1	20.04
		1	49			1	20.16
		25	0			2	18.78
		25	12			2	18.86
		25	25			2	18.91
		50	0			2	18.55
		20600	844			QPSK	1
	1			24	0		21.17
1	49			0	21.22		
25	0			1	19.92		
25	12			1	19.98		
25	25			1	20.07		
16QAM	50			0	1	19.93	
	1			0	1	20.51	
	1			24	1	20.27	
	1			49	1	20.22	
	25			0	2	19.06	
	25			12	2	19.23	
	25			25	2	19.31	
	50			0	2	19.33	

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	20425	826.5	QPSK	1	0	0	20.60
				1	12	0	20.75
				1	24	0	20.98
				12	0	1	19.62
				12	6	1	19.73
				12	11	1	19.77
			16QAM	25	0	1	19.56
				1	0	1	20.41
				1	12	1	20.58
				1	24	1	20.78
				12	0	2	19.97
				12	6	2	20.02
	20525	836.5	QPSK	12	11	2	21.06
				25	0	2	20.96
				1	0	0	21.70
				1	12	0	21.55
				1	24	0	21.24
				12	0	1	20.24
			16QAM	12	6	1	20.32
				12	11	1	20.37
				25	0	1	20.43
				1	0	1	19.74
				1	12	1	20.07
				1	24	1	20.13
20625	846.5	QPSK	12	0	2	18.75	
			12	6	2	18.83	
			12	11	2	18.88	
			25	0	2	18.57	
			1	0	0	21.09	
			1	12	0	21.14	
		16QAM	1	24	0	21.18	
			12	0	1	19.88	
			12	6	1	19.95	
			12	11	1	20.05	
			25	0	1	19.90	
			1	0	1	20.49	
16QAM	1	12	1	20.29			
	1	24	1	20.19			
	12	0	2	19.05			
	12	6	2	19.21			
	12	11	2	19.27			
	25	0	2	19.31			

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)		
3MHz	20415	825.5	QPSK	1	0	0	20.45		
				1	7	0	20.47		
				1	14	0	20.50		
				8	0	1	19.45		
				8	4	1	19.49		
				8	7	1	19.52		
			15	0	1	19.46			
			16QAM	1	0	1	21.82		
				1	7	1	21.87		
				1	14	1	21.91		
				8	0	2	20.89		
				8	4	2	20.96		
				8	7	2	21.07		
			20525	836.5	QPSK	15	0	2	20.98
						1	0	0	21.42
	1	7				0	21.37		
	1	14				0	21.32		
	8	0				1	20.34		
	8	4				1	20.40		
	16QAM	8			7	1	20.44		
		15			0	1	20.35		
		1			0	1	19.53		
		1			7	1	19.57		
		1			14	1	19.60		
		8			0	2	18.35		
	20635	847.5			QPSK	8	4	2	18.42
						8	7	2	18.49
						15	0	2	18.40
			1	0		0	20.94		
			1	7		0	20.99		
1			14	0		21.03			
16QAM			8	0	1	19.89			
			8	4	1	19.92			
			8	7	1	19.96			
			15	0	1	19.85			
			1	0	1	20.55			
			1	7	1	20.49			
16QAM			1	14	1	20.41			
			8	0	2	19.03			
			8	4	2	19.18			
	8	7	2	19.25					
	15	0	2	19.22					

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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	20.51
				1	2	0	20.49
				1	5	0	20.47
				3	0	0	20.33
				3	1	0	20.39
				3	2	0	20.41
			16QAM	1	0	1	21.96
				1	2	1	21.99
				1	5	1	22.00
				3	0	1	21.87
				3	1	1	21.93
				3	2	1	21.96
	20525	836.5	QPSK	6	0	2	21.07
				1	0	0	21.34
				1	2	0	21.33
				1	5	0	21.34
				3	0	0	21.12
				3	1	0	21.23
			16QAM	3	2	0	21.26
				6	0	1	20.49
				1	0	1	19.46
				1	2	1	19.45
				1	5	1	19.43
				3	0	1	19.27
	20643	848.3	QPSK	3	1	1	19.31
				3	2	1	19.36
				6	0	2	18.35
				1	0	0	21.14
				1	2	0	21.15
				1	5	0	21.17
			16QAM	3	0	0	20.77
				3	1	0	20.85
				3	2	0	20.87
				6	0	1	19.86
				1	0	1	20.49
				1	2	1	20.43
				1	5	1	20.38
				3	0	1	20.05
				3	1	1	20.16
				3	2	1	20.21
				6	0	2	19.36

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**LTE Band 12**

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)			
10MHz	23060	704	QPSK	1	0	0	25.66			
				1	24	0	25.55			
				1	49	0	25.33			
				25	0	1	24.59			
				25	12	1	24.64			
				25	25	1	24.71			
			16QAM	50	0	1	24.63			
				1	0	1	24.45			
				1	24	1	23.61			
				1	49	1	22.84			
				25	0	2	22.02			
				25	12	2	22.09			
	23095	707.5	QPSK	25	25	2	22.15			
				50	0	2	22.62			
				1	0	0	23.63			
				1	24	0	22.15			
				1	49	0	21.95			
				25	0	1	21.17			
				25	12	1	21.31			
				25	25	1	21.42			
				50	0	1	21.54			
			16QAM	1	0	1	24.92			
				1	24	1	24.69			
				1	49	1	24.53			
				25	0	2	23.56			
				25	12	2	23.63			
				25	25	2	23.65			
				50	0	2	23.61			
				23130	711	QPSK	1	0	0	23.88
							1	24	0	23.07
1	49	0	22.56							
25	0	1	21.23							
25	12	1	21.21							
25	25	1	21.33							
16QAM	50	0	1			21.59				
	1	0	1			21.53				
	1	24	1			21.37				
	1	49	1			21.14				
	25	0	2			20.38				
	25	12	2			20.41				
25	25	2	20.47							
50	0	2	20.49							

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	23035	701.5	QPSK	1	0	0	25.64
				1	12	0	25.57
				1	24	0	25.31
				12	0	1	24.56
				12	6	1	24.62
				12	11	1	24.68
				25	0	1	24.65
			16QAM	1	0	1	24.43
				1	12	1	23.57
				1	24	1	22.86
				12	0	2	22.06
				12	6	2	22.12
				12	11	2	22.18
				25	0	2	22.65
	23095	707.5	QPSK	1	0	0	22.66
				1	12	0	22.13
				1	24	0	21.92
				12	0	1	21.15
				12	6	1	21.29
				12	11	1	21.38
				25	0	1	21.56
			16QAM	1	0	1	24.90
				1	12	1	24.67
				1	24	1	24.51
				12	0	2	23.51
				12	6	2	23.57
				12	11	2	23.61
				25	0	2	23.58
	23155	713.5	QPSK	1	0	0	23.78
				1	12	0	23.02
				1	24	0	22.07
				12	0	1	21.11
				12	6	1	21.18
				12	11	1	21.26
				25	0	1	21.64
			16QAM	1	0	1	21.51
1				12	1	21.34	
1				24	1	21.02	
12				0	2	20.35	
12				6	2	20.39	
12				11	2	20.45	
25				0	2	20.47	

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
3MHz	23025	700.5	QPSK	1	0	0	25.48
				1	7	0	25.56
				1	14	0	25.73
				8	0	1	24.75
				8	4	1	24.82
				8	7	1	24.87
			15	0	1	24.71	
			16QAM	1	0	1	24.03
				1	7	1	23.77
				1	14	1	22.98
				8	0	2	22.12
				8	4	2	22.36
				8	7	2	22.40
			15	0	2	22.59	
			23095	707.5	QPSK	1	0
	1	7				0	22.03
	1	14				0	21.94
	8	0				1	21.45
	8	4				1	21.53
	8	7				1	21.57
	15	0			1	21.51	
	16QAM	1			0	1	24.68
		1			7	1	24.69
		1			14	1	24.71
		8			0	2	23.66
		8			4	2	23.72
		8			7	2	23.75
	15	0			2	23.65	
	23165	714.5			QPSK	1	0
			1	7		0	22.87
1			14	0		22.05	
8			0	1		21.12	
8			4	1		21.26	
8			7	1		21.34	
15			0	1	21.46		
16QAM			1	0	1	21.60	
			1	7	1	21.55	
			1	14	1	21.41	
			8	0	2	20.45	
			8	4	2	20.53	
			8	7	2	20.55	
15			0	2	20.39		

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BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
1.4MHz	23017	699.7	QPSK	1	0	0	25.37
				1	2	0	25.44
				1	5	0	25.49
				3	0	0	25.21
				3	1	0	25.29
				3	2	0	25.36
			6	0	1	24.46	
			16QAM	1	0	1	23.83
				1	2	1	23.56
				1	5	1	23.41
				3	0	1	23.23
				3	1	1	23.31
	3	2		1	23.39		
	23095	707.5	QPSK	1	0	0	21.90
				1	2	0	21.87
				1	5	0	21.85
				3	0	0	21.92
				3	1	0	21.98
				3	2	0	22.01
			6	0	1	21.50	
			16QAM	1	0	1	24.39
				1	2	1	24.42
				1	5	1	24.45
				3	0	1	24.28
				3	1	1	24.33
	3	2		1	24.39		
	23173	715.3	QPSK	1	0	0	22.83
				1	2	0	22.64
				1	5	0	22.46
				3	0	0	22.12
				3	1	0	22.18
				3	2	0	22.24
			6	0	1	21.43	
			16QAM	1	0	1	21.31
				1	2	1	21.30
				1	5	1	21.28
3				0	1	21.06	
3				1	1	21.13	
3	2	1		21.18			
6	0	2	20.67				

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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.

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## 6.2 RADIATED OUTPUT POWER

### 6.2.1 MEASUREMENT METHOD

The measurements procedures specified in ANSI/TIA-603-E-2016 were applied.

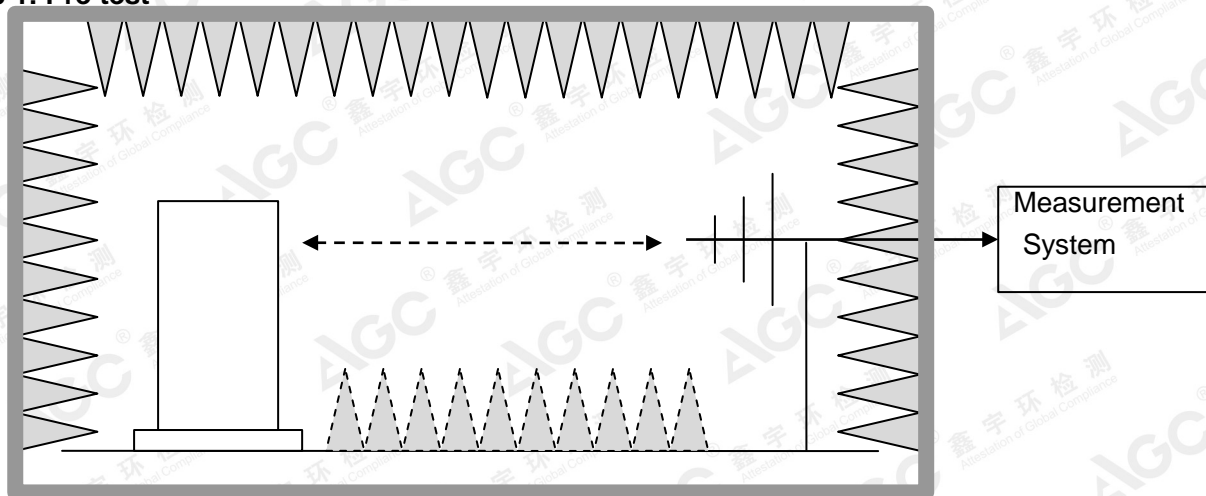
- 1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power ( $P_{in}$ ) is applied to the input of the dipole, and the power received ( $P_r$ ) 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  $AR_{pl} = P_{in} - P_r$ . The  $AR_{pl}$  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:  $Power = P_{Mea} + AR_{pl}$
- 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 Step 1 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 ( $P_{in}$ ).
- 8 ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15dBi$ .

#### Test Setup

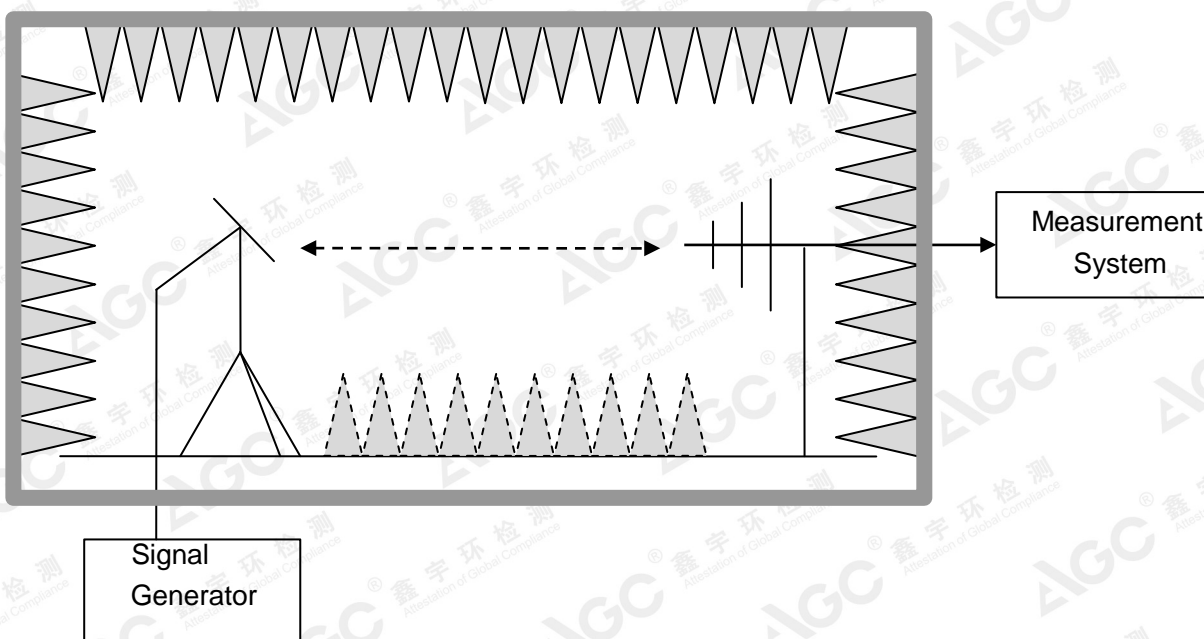
NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

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**Step 1: Pre-test**



**Step 2: Substitution method to verify the maximum ERP**



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**6.2.2 PROVISIONS APPLICABLE**

Mode	FCC Part Section(s)	Nominal Peak Power
LTE Band 2	24.232(c)	<=33dBm (2W)
LTE Band 4	27.50(d)(4)	<=30dBm (1W)
LTE Band 5	22.913(a)(2)	<=38.45dBm (7W)
LTE Band 12	27.50(b)(10)	<=34.77dBm(3W)

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**6.2.3 MEASUREMENT RESULT**
**EIRP for LTE Band2**

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	12.82	V	7.95	0.79	20.03	33
1880.0	1.4	QPSK	1/0	12.31	V	7.95	0.79	18.36	33
1909.3	1.4	QPSK	1/0	12.75	V	7.95	0.79	18.80	33
1850.7	1.4	QPSK	1/0	12.28	H	7.95	0.79	19.33	33
1880.0	1.4	QPSK	1/0	12.48	H	7.95	0.79	17.53	33
1909.3	1.4	QPSK	1/0	12.75	H	7.95	0.79	18.80	33
1850.7	1.4	16-QAM	1/5	12.03	V	7.95	0.79	19.08	33
1880.0	1.4	16-QAM	1/0	12.92	V	7.95	0.79	16.97	33
1909.3	1.4	16-QAM	1/0	10.58	V	7.95	0.79	17.63	33
1850.7	1.4	16-QAM	1/5	12.3	H	7.95	0.79	19.35	33
1880.0	1.4	16-QAM	1/0	11.27	H	7.95	0.79	18.32	33
1909.3	1.4	16-QAM	1/0	11.09	H	7.95	0.79	17.14	33
1851.5	3	QPSK	1/0	11.03	V	7.95	0.79	17.08	33
1880.0	3	QPSK	1/0	12.88	V	7.95	0.79	20.08	33
1908.5	3	QPSK	1/0	12.92	V	7.95	0.79	19.97	33
1851.5	3	QPSK	1/0	12.34	H	7.95	0.79	19.39	33
1880.0	3	QPSK	1/0	10.8	H	7.95	0.79	16.85	33
1908.5	3	QPSK	1/0	10.32	H	7.95	0.79	17.37	33
1851.5	3	16-QAM	1/0	11.24	V	7.95	0.79	18.29	33
1880.0	3	16-QAM	1/0	10.8	V	7.95	0.79	17.85	33
1908.5	3	16-QAM	1/0	11.13	V	7.95	0.79	18.18	33
1851.5	3	16-QAM	1/0	11.19	H	7.95	0.79	18.24	33
1880.0	3	16-QAM	1/0	12.08	H	7.95	0.79	19.13	33
1908.5	3	16-QAM	1/0	12.38	H	7.95	0.79	20.43	33
1852.5	5	QPSK	1/0	12.22	V	7.95	0.79	20.27	33
1880.0	5	QPSK	1/0	12.58	V	7.95	0.79	19.63	33
1907.5	5	QPSK	1/24	11.88	V	7.95	0.79	20.93	33
1852.5	5	QPSK	1/0	11.86	H	7.95	0.79	20.91	33
1880.0	5	QPSK	1/0	11.9	H	7.95	0.79	18.95	33
1907.5	5	QPSK	1/24	11.92	H	7.95	0.79	18.97	33
1852.5	5	16-QAM	1/0	12.17	V	7.95	0.79	19.22	33
1880.0	5	16-QAM	1/0	12.3	V	7.95	0.79	19.35	33

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1907.5	5	16-QAM	1/24	10.74	V	7.95	0.79	17.79	33
1852.5	5	16-QAM	1/0	21.12	H	7.95	0.79	17.54	33
1880.0	5	16-QAM	1/0	12.14	H	7.95	0.79	20.19	33
1907.5	5	16-QAM	1/24	11.19	H	7.95	0.79	18.24	33
1855	10	QPSK	1/0	11.25	V	7.95	0.79	18.30	33
1880	10	QPSK	1/49	10.98	V	7.95	0.79	18.03	33
1905	10	QPSK	1/0	11.31	V	7.95	0.79	18.36	33
1855	10	QPSK	1/0	11.23	H	7.95	0.79	18.28	33
1880	10	QPSK	1/49	12.19	H	7.95	0.79	19.24	33
1905	10	QPSK	1/0	11.83	H	7.95	0.79	18.88	33
1855	10	16-QAM	1/0	12.66	V	7.95	0.79	19.71	33
1880	10	16-QAM	1/49	11.51	V	7.95	0.79	18.56	33
1905	10	16-QAM	1/0	12.35	V	7.95	0.79	19.40	33
1855	10	16-QAM	1/0	12.91	H	7.95	0.79	19.96	33
1880	10	16-QAM	1/49	12.51	H	7.95	0.79	19.56	33
1905	10	16-QAM	1/0	12.48	H	7.95	0.79	19.53	33
1920	15	QPSK	1/0	12.36	V	7.95	0.79	19.52	33
1950	15	QPSK	1/74	12.27	V	7.95	0.79	19.43	33
1920	15	QPSK	1/0	12.71	V	7.95	0.79	19.87	33
1920	15	QPSK	1/0	12.24	H	7.95	0.79	19.4	33
1950	15	QPSK	1/74	12.44	H	7.95	0.79	19.6	33
1920	15	QPSK	1/0	12.71	H	7.95	0.79	19.87	33
1920	15	16-QAM	1/0	11.99	V	7.95	0.79	19.15	33
1950	15	16-QAM	1/74	12.88	V	7.95	0.79	20.04	33
1920	15	16-QAM	1/0	10.54	V	7.95	0.79	17.7	33
1920	15	16-QAM	1/0	12.26	H	7.95	0.79	19.42	33
1950	15	16-QAM	1/74	11.23	H	7.95	0.79	18.39	33
1920	15	16-QAM	1/0	11.05	H	7.95	0.79	18.21	33
1930	20	QPSK	1/99	10.99	V	7.95	0.79	18.15	33
1950	20	QPSK	1/99	12.84	V	7.95	0.79	20	33
1970	20	QPSK	1/0	12.88	V	7.95	0.79	20.04	33
1930	20	QPSK	1/99	12.3	H	7.95	0.79	19.46	33
1950	20	QPSK	1/99	10.76	H	7.95	0.79	17.92	33
1970	20	QPSK	1/0	10.28	H	7.95	0.79	17.44	33
1930	20	16-QAM	1/99	11.2	V	7.95	0.79	18.36	33
1950	20	16-QAM	1/99	10.76	V	7.95	0.79	17.92	33

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1970	20	16-QAM	1/0	11.09	V	7.95	0.79	18.25	33
1930	20	16-QAM	1/99	11.15	H	7.95	0.79	18.31	33
1950	20	16-QAM	1/99	12.04	H	7.95	0.79	19.2	33
1970	20	16-QAM	1/0	12.34	H	7.95	0.79	19.5	33

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**EIRP for LTE Band 4**

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	11.23	V	7.95	0.79	18.39	30
1732.5	1.4	QPSK	1/0	11.31	V	7.95	0.79	18.47	30
1754.3	1.4	QPSK	1/0	11.39	V	7.95	0.79	18.55	30
1710.7	1.4	QPSK	1/0	11.24	H	7.95	0.79	18.4	30
1732.5	1.4	QPSK	1/0	11.15	H	7.95	0.79	18.31	30
1754.3	1.4	QPSK	1/0	10.87	H	7.95	0.79	18.03	30
1710.7	1.4	16-QAM	1/5	11.19	V	7.95	0.79	18.35	30
1732.5	1.4	16-QAM	1/0	11.27	V	7.95	0.79	18.43	30
1754.3	1.4	16-QAM	1/0	11.08	V	7.95	0.79	18.24	30
1710.7	1.4	16-QAM	1/5	10.86	H	7.95	0.79	18.02	30
1732.5	1.4	16-QAM	1/0	11.11	H	7.95	0.79	18.27	30
1754.3	1.4	16-QAM	1/0	11.31	H	7.95	0.79	18.47	30
1711.5	3	QPSK	1/0	11.36	V	7.95	0.79	18.52	30
1732.5	3	QPSK	1/0	11.28	V	7.95	0.79	18.44	30
1753.5	3	QPSK	1/0	11.24	V	7.95	0.79	18.4	30
1711.5	3	QPSK	1/0	10.93	H	7.95	0.79	18.09	30
1732.5	3	QPSK	1/0	11.34	H	7.95	0.79	18.5	30
1753.5	3	QPSK	1/0	10.68	H	7.95	0.79	17.84	30
1711.5	3	16-QAM	1/0	11.41	V	7.95	0.79	18.57	30
1732.5	3	16-QAM	1/0	10.87	V	7.95	0.79	18.03	30
1753.5	3	16-QAM	1/0	11.12	V	7.95	0.79	18.28	30
1711.5	3	16-QAM	1/0	11.33	H	7.95	0.79	18.49	30
1732.5	3	16-QAM	1/0	11.06	H	7.95	0.79	18.22	30
1753.5	3	16-QAM	1/0	10.81	H	7.95	0.79	17.97	30
1712.5	5	QPSK	1/0	10.45	V	7.95	0.79	17.61	30
1732.5	5	QPSK	1/0	10.6	V	7.95	0.79	17.76	30
1752.5	5	QPSK	1/24	11.25	V	7.95	0.79	18.41	30
1712.5	5	QPSK	1/0	10.49	H	7.95	0.79	17.65	30
1732.5	5	QPSK	1/0	10.44	H	7.95	0.79	17.6	30
1752.5	5	QPSK	1/24	10.87	H	7.95	0.79	18.03	30
1712.5	5	16-QAM	1/0	10.89	V	7.95	0.79	18.05	30
1732.5	5	16-QAM	1/0	10.51	V	7.95	0.79	17.67	30
1752.5	5	16-QAM	1/24	10.66	V	7.95	0.79	17.82	30
1712.5	5	16-QAM	1/0	10.86	H	7.95	0.79	18.02	30
1732.5	5	16-QAM	1/0	10.88	H	7.95	0.79	18.04	30
1752.5	5	16-QAM	1/24	11.31	H	7.95	0.79	18.47	30

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1715	10	QPSK	1/0	11.36	V	7.95	0.79	18.52	30
1732.5	10	QPSK	1/49	11.28	V	7.95	0.79	18.44	30
1750	10	QPSK	1/0	10.48	V	7.95	0.79	17.64	30
1715	10	QPSK	1/0	10.93	H	7.95	0.79	18.09	30
1732.5	10	QPSK	1/49	11.34	H	7.95	0.79	18.5	30
1750	10	QPSK	1/0	11.68	H	7.95	0.79	18.84	30
1715	10	16-QAM	1/0	11.41	V	7.95	0.79	18.57	30
1732.5	10	16-QAM	1/49	10.88	V	7.95	0.79	18.04	30
1750	10	16-QAM	1/0	11.12	V	7.95	0.79	18.28	30
1715	10	16-QAM	1/0	10.42	H	7.95	0.79	17.58	30
1732.5	10	16-QAM	1/49	11.06	H	7.95	0.79	18.22	30
1750	10	16-QAM	1/0	10.81	H	7.95	0.79	17.97	30
1717.5	15	QPSK	1/0	10.45	V	7.95	0.79	17.61	30
1732.5	15	QPSK	1/74	10.6	V	7.95	0.79	17.76	30
1747.5	15	QPSK	1/0	11.25	V	7.95	0.79	18.41	30
1717.5	15	QPSK	1/0	10.49	H	7.95	0.79	17.65	30
1732.5	15	QPSK	1/74	10.44	H	7.95	0.79	17.6	30
1747.5	15	QPSK	1/0	10.87	H	7.95	0.79	18.03	30
1717.5	15	16-QAM	1/0	10.89	V	7.95	0.79	18.05	30
1732.5	15	16-QAM	1/74	10.51	V	7.95	0.79	17.67	30
1747.5	15	16-QAM	1/0	10.66	V	7.95	0.79	17.82	30
1717.5	15	16-QAM	1/0	10.86	H	7.95	0.79	18.02	30
1732.5	15	16-QAM	1/74	10.88	H	7.95	0.79	18.04	30
1747.5	15	16-QAM	1/0	11.31	H	7.95	0.79	18.47	30
1720	20	QPSK	1/99	11.36	V	7.95	0.79	18.52	30
1732.5	20	QPSK	1/99	11.28	V	7.95	0.79	18.44	30
1745	20	QPSK	1/0	10.48	V	7.95	0.79	17.64	30
1720	20	QPSK	1/99	10.93	H	7.95	0.79	18.09	30
1732.5	20	QPSK	1/99	11.34	H	7.95	0.79	18.5	30
1745	20	QPSK	1/0	10.68	H	7.95	0.79	17.84	30
1720	20	16-QAM	1/99	11.41	V	7.95	0.79	18.57	30
1732.5	20	16-QAM	1/99	10.85	V	7.95	0.79	18.01	30
1745	20	16-QAM	1/0	10.12	V	7.95	0.79	17.28	30
1720	20	16-QAM	1/99	10.42	H	7.95	0.79	17.58	30
1732.5	20	16-QAM	1/99	11.06	H	7.95	0.79	18.22	30
1745	20	16-QAM	1/0	10.81	H	7.95	0.79	17.97	30

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**EIRP for LTE Band5**

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	13.56	V	6.7	0.49	19.77	38.45
836.5	1.4	QPSK	1/0	12.71	V	6.7	0.49	18.92	38.45
848.3	1.4	QPSK	1/0	13.36	V	6.7	0.49	19.57	38.45
824.7	1.4	QPSK	1/0	12.6	H	6.7	0.49	18.81	38.45
836.5	1.4	QPSK	1/0	12.55	H	6.7	0.49	18.76	38.45
848.3	1.4	QPSK	1/0	10.98	H	6.7	0.49	17.19	38.45
824.7	1.4	16-QAM	1/0	12	V	6.7	0.49	18.21	38.45
836.5	1.4	16-QAM	1/0	13.62	V	6.7	0.49	19.83	38.45
848.3	1.4	16-QAM	1/0	11.77	V	6.7	0.49	17.98	38.45
824.7	1.4	16-QAM	1/0	10.97	H	6.7	0.49	17.18	38.45
836.5	1.4	16-QAM	1/0	12.99	H	6.7	0.49	19.2	38.45
848.3	1.4	16-QAM	1/0	11.42	H	6.7	0.49	17.63	38.45
825.5	3	QPSK	1/0	11.47	V	6.7	0.49	17.68	38.45
836.5	3	QPSK	1/0	12.39	V	6.7	0.49	18.6	38.45
847.5	3	QPSK	1/0	12.59	V	6.7	0.49	18.8	38.45
825.5	3	QPSK	1/0	12.04	H	6.7	0.49	18.25	38.45
836.5	3	QPSK	1/0	12.45	H	6.7	0.49	18.66	38.45
847.5	3	QPSK	1/0	11.79	H	6.7	0.49	18	38.45
825.5	3	16-QAM	1/0	11.52	V	6.7	0.49	17.73	38.45
836.5	3	16-QAM	1/0	12.98	V	6.7	0.49	19.19	38.45
847.5	3	16-QAM	1/0	13.23	V	6.7	0.49	19.44	38.45
825.5	3	16-QAM	1/0	12.53	H	6.7	0.49	18.74	38.45
836.5	3	16-QAM	1/0	12.17	H	6.7	0.49	18.38	38.45
847.5	3	16-QAM	1/0	11.92	H	6.7	0.49	18.13	38.45
826.5	5	QPSK	1/0	13.56	V	6.7	0.49	19.77	38.45
836.5	5	QPSK	1/0	12.71	V	6.7	0.49	18.92	38.45
846.5	5	QPSK	1/0	13.36	V	6.7	0.49	19.57	38.45
826.5	5	QPSK	1/0	12.6	H	6.7	0.49	18.81	38.45
836.5	5	QPSK	1/0	12.55	H	6.7	0.49	18.76	38.45
846.5	5	QPSK	1/0	10.98	H	6.7	0.49	17.19	38.45
826.5	5	16-QAM	1/0	12	V	6.7	0.49	18.21	38.45
836.5	5	16-QAM	1/0	13.62	V	6.7	0.49	19.83	38.45
846.5	5	16-QAM	1/0	11.77	V	6.7	0.49	17.98	38.45
826.5	5	16-QAM	1/0	10.97	H	6.7	0.49	17.18	38.45
836.5	5	16-QAM	1/0	12.99	H	6.7	0.49	19.2	38.45
846.5	5	16-QAM	1/0	11.42	H	6.7	0.49	17.63	38.45

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829	10	QPSK	1/0	11.47	V	6.7	0.49	17.68	38.45
836.5	10	QPSK	1/0	12.39	V	6.7	0.49	18.6	38.45
844	10	QPSK	1/0	12.59	V	6.7	0.49	18.8	38.45
829	10	QPSK	1/0	12.04	H	6.7	0.49	18.25	38.45
836.5	10	QPSK	1/0	12.45	H	6.7	0.49	18.66	38.45
844	10	QPSK	1/0	11.79	H	6.7	0.49	18	38.45
829	10	16-QAM	1/0	11.52	V	6.7	0.49	17.73	38.45
836.5	10	16-QAM	1/0	12.98	V	6.7	0.49	19.19	38.45
844	10	16-QAM	1/0	13.23	V	6.7	0.49	19.44	38.45
829	10	16-QAM	1/0	12.53	H	6.7	0.49	18.74	38.45
836.5	10	16-QAM	1/0	12.17	H	6.7	0.49	18.38	38.45
844	10	16-QAM	1/0	11.92	H	6.7	0.49	18.13	38.45

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**EIRP for LTE Band 12**

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
699.7	1.4	QPSK	1/0	13.52	V	6.7	0.49	19.73	34.77
707.5	1.4	QPSK	1/0	12.67	V	6.7	0.49	18.88	34.77
715.3	1.4	QPSK	1/0	13.32	V	6.7	0.49	19.53	34.77
699.7	1.4	QPSK	1/0	12.56	H	6.7	0.49	18.77	34.77
707.5	1.4	QPSK	1/0	12.51	H	6.7	0.49	18.72	34.77
715.3	1.4	QPSK	1/0	10.94	H	6.7	0.49	17.15	34.77
699.7	1.4	16-QAM	1/0	11.96	V	6.7	0.49	18.17	34.77
707.5	1.4	16-QAM	1/0	13.58	V	6.7	0.49	19.79	34.77
715.3	1.4	16-QAM	1/0	11.73	V	6.7	0.49	17.94	34.77
699.7	1.4	16-QAM	1/0	10.93	H	6.7	0.49	17.14	34.77
707.5	1.4	16-QAM	1/0	12.95	H	6.7	0.49	19.16	34.77
715.3	1.4	16-QAM	1/0	11.38	H	6.7	0.49	17.59	34.77
700.5	3	QPSK	1/0	11.43	V	6.7	0.49	17.64	34.77
707.5	3	QPSK	1/0	12.35	V	6.7	0.49	18.56	34.77
714.5	3	QPSK	1/0	12.55	V	6.7	0.49	18.76	34.77
700.5	3	QPSK	1/0	12	H	6.7	0.49	18.21	34.77
707.5	3	QPSK	1/0	12.41	H	6.7	0.49	18.62	34.77
714.5	3	QPSK	1/0	11.75	H	6.7	0.49	17.96	34.77
700.5	3	16-QAM	1/0	11.48	V	6.7	0.49	17.69	34.77
707.5	3	16-QAM	1/0	12.94	V	6.7	0.49	19.15	34.77
714.5	3	16-QAM	1/0	13.19	V	6.7	0.49	19.4	34.77
700.5	3	16-QAM	1/0	12.49	H	6.7	0.49	18.7	34.77
707.5	3	16-QAM	1/0	12.13	H	6.7	0.49	18.34	34.77
714.5	3	16-QAM	1/0	11.88	H	6.7	0.49	18.09	34.77
701.5	5	QPSK	1/0	13.52	V	6.7	0.49	19.73	34.77
707.5	5	QPSK	1/0	12.67	V	6.7	0.49	18.88	34.77
713.5	5	QPSK	1/0	13.32	V	6.7	0.49	19.53	34.77
701.5	5	QPSK	1/0	12.56	H	6.7	0.49	18.77	34.77
707.5	5	QPSK	1/0	12.51	H	6.7	0.49	18.72	34.77
713.5	5	QPSK	1/0	10.94	H	6.7	0.49	17.15	34.77
701.5	5	16-QAM	1/0	11.96	V	6.7	0.49	18.17	34.77
707.5	5	16-QAM	1/0	13.58	V	6.7	0.49	19.79	34.77
713.5	5	16-QAM	1/0	11.73	V	6.7	0.49	17.94	34.77
701.5	5	16-QAM	1/0	10.93	H	6.7	0.49	17.14	34.77
707.5	5	16-QAM	1/0	12.95	H	6.7	0.49	19.16	34.77
713.5	5	16-QAM	1/0	11.38	H	6.7	0.49	17.59	34.77

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704	10	QPSK	1/0	11.43	V	6.7	0.49	17.64	34.77
707.5	10	QPSK	1/0	12.35	V	6.7	0.49	18.56	34.77
711	10	QPSK	1/0	12.55	V	6.7	0.49	18.76	34.77
704	10	QPSK	1/0	12	H	6.7	0.49	18.21	34.77
707.5	10	QPSK	1/0	12.41	H	6.7	0.49	18.62	34.77
711	10	QPSK	1/0	11.75	H	6.7	0.49	17.96	34.77
704	10	16-QAM	1/0	11.48	V	6.7	0.49	17.69	34.77
707.5	10	16-QAM	1/0	12.94	V	6.7	0.49	19.15	34.77
711	10	16-QAM	1/0	13.19	V	6.7	0.49	19.4	34.77
704	10	16-QAM	1/0	12.49	H	6.7	0.49	18.7	34.77
707.5	10	16-QAM	1/0	12.13	H	6.7	0.49	18.34	34.77
711	10	16-QAM	1/0	11.88	H	6.7	0.49	18.09	34.77

Note: Above is the worst mode data.

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### 6.3. PEAK-TO-AVERAGE RATIO

#### 6.3.1 MEASUREMENT METHOD

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 D01V03R01 - Section 5.7:

- a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics /CCDF function;
- b) Set resolution/measurement bandwidth  $\geq$  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.

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**6.3.3 MEASUREMENT RESULT**
**LTE Band 2**  
**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	2.75	<13	PASS	
		1	3	2.78	<13	PASS	
		1	5	2.8	<13	PASS	
		3	0	2.85	<13	PASS	
		3	2	2.82	<13	PASS	
		3	3	2.88	<13	PASS	
	MCH	6	0	3.68	<13	PASS	
		1	0	3.83	<13	PASS	
		1	3	3.79	<13	PASS	
		1	5	3.72	<13	PASS	
		3	0	3.78	<13	PASS	
		3	2	3.74	<13	PASS	
	HCH	3	3	3.81	<13	PASS	
		6	0	4.4	<13	PASS	
		1	0	3.49	<13	PASS	
		1	3	3.56	<13	PASS	
		1	5	3.72	<13	PASS	
		3	0	3.73	<13	PASS	
	16QAM	LCH	3	2	3.8	<13	PASS
			3	3	3.81	<13	PASS
			6	0	4.4	<13	PASS
1			0	3.79	<13	PASS	
1			3	3.71	<13	PASS	
1			5	3.75	<13	PASS	
MCH		3	0	3.82	<13	PASS	
		3	2	3.84	<13	PASS	
		3	3	3.86	<13	PASS	
		6	0	4.6	<13	PASS	
		1	0	4.61	<13	PASS	
		1	3	4.59	<13	PASS	
		1	5	4.58	<13	PASS	
		3	0	4.62	<13	PASS	
		3	2	4.65	<13	PASS	

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HCH	3	3	4.69	<13	PASS
	6	0	5.06	<13	PASS
	1	0	4.44	<13	PASS
	1	3	4.51	<13	PASS
	1	5	4.53	<13	PASS
	3	0	4.46	<13	PASS
	3	2	4.41	<13	PASS
	3	3	4.48	<13	PASS
	6	0	5.2	<13	PASS

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**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	2.76	<13	PASS
		1	7	2.88	<13	PASS
		1	14	2.94	<13	PASS
		8	0	3.69	<13	PASS
		8	4	3.73	<13	PASS
		8	7	3.78	<13	PASS
		15	0	3.83	<13	PASS
	MCH	1	0	3.71	<13	PASS
		1	7	3.64	<13	PASS
		1	14	3.62	<13	PASS
		8	0	4.28	<13	PASS
		8	4	4.36	<13	PASS
		8	7	4.39	<13	PASS
		15	0	4.54	<13	PASS
	HCH	1	0	3.26	<13	PASS
		1	7	3.55	<13	PASS
		1	14	3.64	<13	PASS
		8	0	4.28	<13	PASS
		8	4	4.39	<13	PASS
		8	7	4.43	<13	PASS
		15	0	4.45	<13	PASS
16QAM	LCH	1	0	3.84	<13	PASS
		1	7	3.92	<13	PASS
		1	14	3.95	<13	PASS
		8	0	4.64	<13	PASS
		8	4	4.57	<13	PASS
		8	7	4.67	<13	PASS
		15	0	4.74	<13	PASS
	MCH	1	0	4.4	<13	PASS
		1	7	4.47	<13	PASS
		1	14	4.53	<13	PASS
		8	0	5.11	<13	PASS

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HCH	8	4	5.14	<13	PASS
	8	7	5.2	<13	PASS
	15	0	5.32	<13	PASS
	1	0	4.02	<13	PASS
	1	7	4.33	<13	PASS
	1	14	4.51	<13	PASS
	8	0	4.99	<13	PASS
	8	4	5.07	<13	PASS
	8	7	5.15	<13	PASS
	15	0	5.2	<13	PASS

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**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	2.73	<13	PASS
		1	12	2.88	<13	PASS
		1	24	3.1	<13	PASS
		12	0	3.86	<13	PASS
		12	6	3.95	<13	PASS
		12	13	4.04	<13	PASS
		25	0	4.22	<13	PASS
	MCH	1	0	3.74	<13	PASS
		1	12	3.66	<13	PASS
		1	24	3.58	<13	PASS
		12	0	4.37	<13	PASS
		12	6	4.42	<13	PASS
		12	13	4.47	<13	PASS
		25	0	4.8	<13	PASS
	HCH	1	0	3.26	<13	PASS
		1	12	3.58	<13	PASS
		1	24	3.76	<13	PASS
		12	0	4.53	<13	PASS
		12	6	4.59	<13	PASS
		12	13	4.64	<13	PASS
		25	0	4.65	<13	PASS
16QAM	LCH	1	0	3.9	<13	PASS
		1	12	3.92	<13	PASS
		1	24	3.98	<13	PASS
		12	0	4.67	<13	PASS
		12	6	4.74	<13	PASS
		12	13	4.88	<13	PASS
		25	0	5.03	<13	PASS
	MCH	1	0	4.5	<13	PASS
		1	12	4.4	<13	PASS
		1	24	4.3	<13	PASS
		12	0	5.27	<13	PASS

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HCH	12	6	5.33	<13	PASS
	12	13	5.39	<13	PASS
	25	0	5.57	<13	PASS
	1	0	3.97	<13	PASS
	1	12	4.16	<13	PASS
	1	24	4.48	<13	PASS
	12	0	5.27	<13	PASS
	12	6	5.34	<13	PASS
	12	13	5.51	<13	PASS
	25	0	5.34	<13	PASS

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**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	3.01	<13	PASS
		1	24	3.65	<13	PASS
		1	49	3.98	<13	PASS
		25	0	4.18	<13	PASS
		25	12	4.27	<13	PASS
		25	25	4.36	<13	PASS
		50	0	4.21	<13	PASS
	MCH	1	0	4.38	<13	PASS
		1	24	4.16	<13	PASS
		1	49	3.93	<13	PASS
		25	0	4.24	<13	PASS
		25	12	4.38	<13	PASS
		25	25	4.66	<13	PASS
		50	0	4.76	<13	PASS
	HCH	1	0	3.18	<13	PASS
		1	24	3.44	<13	PASS
		1	49	3.95	<13	PASS
		25	0	4.12	<13	PASS
		25	12	4.36	<13	PASS
		25	25	4.57	<13	PASS
		50	0	4.41	<13	PASS
16QAM	LCH	1	0	3.85	<13	PASS
		1	24	4.03	<13	PASS
		1	49	4.58	<13	PASS
		25	0	4.89	<13	PASS
		25	12	5.07	<13	PASS
		25	25	5.23	<13	PASS
		50	0	5.02	<13	PASS
	MCH	1	0	5.13	<13	PASS
		1	24	4.99	<13	PASS
		1	49	4.75	<13	PASS
		25	0	5.42	<13	PASS

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		25	12	5.15	<13	PASS
		25	25	5.37	<13	PASS
		50	0	5.5	<13	PASS
	HCH	1	0	4.03	<13	PASS
		1	24	4.36	<13	PASS
		1	49	4.71	<13	PASS
		25	0	5.01	<13	PASS
		25	12	5.13	<13	PASS
		25	25	5.35	<13	PASS
		50	0	5.22	<13	PASS

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**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	2.84	<13	PASS
		1	37	3.77	<13	PASS
		1	74	4.15	<13	PASS
		37	0	4.23	<13	PASS
		37	18	4.38	<13	PASS
		37	38	4.74	<13	PASS
		75	0	4.8	<13	PASS
	MCH	1	0	4.25	<13	PASS
		1	37	3.96	<13	PASS
		1	74	3.72	<13	PASS
		37	0	4.21	<13	PASS
		37	18	4.39	<13	PASS
		37	38	4.6	<13	PASS
		75	0	5.07	<13	PASS
	HCH	1	0	3.28	<13	PASS
		1	37	3.55	<13	PASS
		1	74	3.92	<13	PASS
		37	0	4.02	<13	PASS
		37	18	4.15	<13	PASS
		37	38	4.47	<13	PASS
		75	0	4.65	<13	PASS
16QAM	LCH	1	0	3.58	<13	PASS
		1	37	4.64	<13	PASS
		1	74	5.25	<13	PASS
		37	0	5.12	<13	PASS
		37	18	5.06	<13	PASS
		37	38	5.58	<13	PASS
		75	0	5.51	<13	PASS
	MCH	1	0	4.8	<13	PASS
		1	37	4.73	<13	PASS
		1	74	4.67	<13	PASS
		37	0	4.87	<13	PASS
		37	18	4.99	<13	PASS
		37	38	5.36	<13	PASS
		75	0	5.72	<13	PASS

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HCH	1	0	4.03	<13	PASS
	1	37	4.35	<13	PASS
	1	74	4.79	<13	PASS
	37	0	4.85	<13	PASS
	37	18	4.99	<13	PASS
	37	38	5.28	<13	PASS
	75	0	5.31	<13	PASS

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**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	2.9	<13	PASS
		1	49	3.87	<13	PASS
		1	99	4.52	<13	PASS
		50	0	4.25	<13	PASS
		50	25	4.39	<13	PASS
		50	50	4.94	<13	PASS
		100	0	5.02	<13	PASS
	MCH	1	0	4.3	<13	PASS
		1	49	3.86	<13	PASS
		1	99	3.57	<13	PASS
		50	0	4.12	<13	PASS
		50	25	4.34	<13	PASS
		50	50	4.58	<13	PASS
		100	0	5.01	<13	PASS
	HCH	1	0	3.35	<13	PASS
		1	49	3.62	<13	PASS
		1	99	3.94	<13	PASS
		50	0	3.98	<13	PASS
		50	25	4.17	<13	PASS
		50	50	4.4	<13	PASS
		100	0	4.68	<13	PASS
16QAM	LCH	1	0	3.66	<13	PASS
		1	49	4.17	<13	PASS
		1	99	5.02	<13	PASS
		50	0	5.23	<13	PASS
		50	25	5.54	<13	PASS
		50	50	5.86	<13	PASS
		100	0	5.73	<13	PASS
	MCH	1	0	5.29	<13	PASS
		1	49	4.88	<13	PASS
		1	99	4.41	<13	PASS
		50	0	5.03	<13	PASS
		50	25	5.37	<13	PASS
		50	50	5.42	<13	PASS
		100	0	5.68	<13	PASS

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HCH	1	0	4.18	<13	PASS
	1	49	4.35	<13	PASS
	1	99	4.59	<13	PASS
	50	0	4.87	<13	PASS
	50	25	4.07	<13	PASS
	50	50	5.18	<13	PASS
	100	0	5.39	<13	PASS

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**LTE Band 4**  
**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	2.99	<13	PASS
		1	3	2.92	<13	PASS
		1	5	2.89	<13	PASS
		3	0	3.13	<13	PASS
		3	2	3.19	<13	PASS
		3	3	3.25	<13	PASS
		6	0	4.1	<13	PASS
	MCH	1	0	2.12	<13	PASS
		1	3	2.07	<13	PASS
		1	5	2.25	<13	PASS
		3	0	2.19	<13	PASS
		3	2	2.08	<13	PASS
		3	3	2.23	<13	PASS
		6	0	2.74	<13	PASS
	HCH	1	0	2.53	<13	PASS
		1	3	2.46	<13	PASS
		1	5	2.31	<13	PASS
		3	0	2.57	<13	PASS
		3	2	2.44	<13	PASS
		3	3	2.63	<13	PASS
		6	0	3.52	<13	PASS
16QAM	LCH	1	0	3.87	<13	PASS
		1	3	3.74	<13	PASS
		1	5	3.94	<13	PASS
		3	0	3.97	<13	PASS
		3	2	4.11	<13	PASS
		3	3	4.25	<13	PASS
		6	0	5.03	<13	PASS
	MCH	1	0	2.96	<13	PASS
		1	3	2.86	<13	PASS
		1	5	2.92	<13	PASS
		3	0	2.87	<13	PASS
		3	2	2.69	<13	PASS
		3	3	2.92	<13	PASS

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		6	0	3.74	<13	PASS
	HCH	1	0	3.53	<13	PASS
		1	3	3.38	<13	PASS
		1	5	3.49	<13	PASS
		3	0	3.37	<13	PASS
		3	2	3.46	<13	PASS
		3	3	3.59	<13	PASS
		6	0	4.5	<13	PASS

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**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	2.85	<13	PASS
		1	7	2.93	<13	PASS
		1	14	3.05	<13	PASS
		8	0	4.04	<13	PASS
		8	4	4.12	<13	PASS
		8	7	4.22	<13	PASS
		15	0	4.25	<13	PASS
	MCH	1	0	2.02	<13	PASS
		1	7	2.33	<13	PASS
		1	14	2.51	<13	PASS
		8	0	2.75	<13	PASS
		8	4	2.81	<13	PASS
		8	7	2.86	<13	PASS
		15	0	2.84	<13	PASS
	HCH	1	0	2.75	<13	PASS
		1	7	2.56	<13	PASS
		1	14	2.35	<13	PASS
		8	0	3.55	<13	PASS
		8	4	3.62	<13	PASS
		8	7	3.64	<13	PASS
		15	0	3.81	<13	PASS
16QAM	LCH	1	0	3.8	<13	PASS
		1	7	3.9	<13	PASS
		1	14	4	<13	PASS
		8	0	4.92	<13	PASS
		8	4	5.01	<13	PASS
		8	7	5.05	<13	PASS
		15	0	5.12	<13	PASS
	MCH	1	0	2.79	<13	PASS
		1	7	2.84	<13	PASS
		1	14	3.11	<13	PASS
		8	0	3.57	<13	PASS
		8	4	3.64	<13	PASS
		8	7	3.71	<13	PASS
		15	0	3.87	<13	PASS

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HCH	1	0	3.98	<13	PASS
	1	7	3.69	<13	PASS
	1	14	3.55	<13	PASS
	8	0	4.48	<13	PASS
	8	4	4.52	<13	PASS
	8	7	4.56	<13	PASS
	15	0	4.82	<13	PASS

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**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	2.76	<13	PASS
		1	12	2.83	<13	PASS
		1	24	2.88	<13	PASS
		12	0	3.99	<13	PASS
		12	6	4.14	<13	PASS
		12	13	4.29	<13	PASS
		25	0	4.48	<13	PASS
	MCH	1	0	1.97	<13	PASS
		1	12	2.32	<13	PASS
		1	24	2.51	<13	PASS
		12	0	3.01	<13	PASS
		12	6	3.13	<13	PASS
		12	13	3.2	<13	PASS
		25	0	3.2	<13	PASS
	HCH	1	0	2.89	<13	PASS
		1	12	2.78	<13	PASS
		1	24	2.35	<13	PASS
		12	0	3.68	<13	PASS
		12	6	3.72	<13	PASS
		12	13	3.76	<13	PASS
		25	0	4.22	<13	PASS
16QAM	LCH	1	0	3.73	<13	PASS
		1	12	3.85	<13	PASS
		1	24	4.01	<13	PASS
		12	0	5.03	<13	PASS
		12	6	5.09	<13	PASS
		12	13	5.14	<13	PASS
		25	0	5.33	<13	PASS
	MCH	1	0	2.68	<13	PASS
		1	12	2.97	<13	PASS
		1	24	3.26	<13	PASS
		12	0	3.67	<13	PASS
		12	6	3.84	<13	PASS
		12	13	3.96	<13	PASS
		25	0	4.02	<13	PASS

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HCH	1	0	3.77	<13	PASS
	1	12	3.63	<13	PASS
	1	24	3.5	<13	PASS
	12	0	4.74	<13	PASS
	12	6	4.79	<13	PASS
	12	13	4.82	<13	PASS
	25	0	5.04	<13	PASS

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**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	3.08	<13	PASS
		1	24	2.87	<13	PASS
		1	49	2.58	<13	PASS
		25	0	3.69	<13	PASS
		25	12	3.88	<13	PASS
		25	25	4.09	<13	PASS
		50	0	4.27	<13	PASS
	MCH	1	0	2.01	<13	PASS
		1	24	2.56	<13	PASS
		1	49	3.2	<13	PASS
		25	0	3.13	<13	PASS
		25	12	3.27	<13	PASS
		25	25	3.48	<13	PASS
		50	0	3.01	<13	PASS
	HCH	1	0	2.86	<13	PASS
		1	24	2.45	<13	PASS
		1	49	2.26	<13	PASS
		25	0	3.26	<13	PASS
		25	12	3.63	<13	PASS
		25	25	4.04	<13	PASS
		50	0	4.24	<13	PASS
16QAM	LCH	1	0	3.8	<13	PASS
		1	24	3.56	<13	PASS
		1	49	3.73	<13	PASS
		25	0	4.84	<13	PASS
		25	12	4.92	<13	PASS
		25	25	4.99	<13	PASS
		50	0	5.1	<13	PASS
	MCH	1	0	2.88	<13	PASS
		1	24	3.54	<13	PASS
		1	49	3.75	<13	PASS
		25	0	3.33	<13	PASS

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HCH	25	12	3.86	<13	PASS
	25	25	4.17	<13	PASS
	50	0	3.91	<13	PASS
	1	0	4.2	<13	PASS
	1	24	3.86	<13	PASS
	1	49	3.45	<13	PASS
	25	0	4.82	<13	PASS
	25	12	4.89	<13	PASS
	25	25	4.96	<13	PASS
	50	0	5.14	<13	PASS

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**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	2.98	<13	PASS
		1	37	2.75	<13	PASS
		1	74	2.01	<13	PASS
		37	0	3.14	<13	PASS
		37	18	3.26	<13	PASS
		37	38	3.5	<13	PASS
		75	0	4.24	<13	PASS
	MCH	1	0	1.96	<13	PASS
		1	37	2.74	<13	PASS
		1	74	3.1	<13	PASS
		37	0	3.12	<13	PASS
		37	18	3.33	<13	PASS
		37	38	3.52	<13	PASS
		75	0	3.61	<13	PASS
	HCH	1	0	3.13	<13	PASS
		1	37	2.87	<13	PASS
		1	74	2.43	<13	PASS
		37	0	3.97	<13	PASS
		37	18	4.02	<13	PASS
		37	38	4.07	<13	PASS
		75	0	4.51	<13	PASS
16QAM	LCH	1	0	3.96	<13	PASS
		1	37	3.76	<13	PASS
		1	74	3.08	<13	PASS
		37	0	4.23	<13	PASS
		37	18	4.46	<13	PASS
		37	38	4.51	<13	PASS
		75	0	5.09	<13	PASS
	MCH	1	0	2.84	<13	PASS
		1	37	3.32	<13	PASS
		1	74	3.81	<13	PASS
		37	0	4.11	<13	PASS
		37	18	4.14	<13	PASS
		37	38	4.27	<13	PASS
		75	0	4.26	<13	PASS

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HCH	1	0	3.92	<13	PASS
	1	37	3.75	<13	PASS
	1	74	3.48	<13	PASS
	37	0	4.96	<13	PASS
	37	18	5.01	<13	PASS
	37	38	5.08	<13	PASS
	75	0	5.29	<13	PASS

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**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	3.2	<13	PASS
		1	49	3.1	<13	PASS
		1	99	2.3	<13	PASS
		50	0	3.12	<13	PASS
		50	25	3.25	<13	PASS
		50	50	3.39	<13	PASS
		100	0	4.07	<13	PASS
	MCH	1	0	1.86	<13	PASS
		1	49	2.73	<13	PASS
		1	99	3.6	<13	PASS
		50	0	3.87	<13	PASS
		50	25	3.96	<13	PASS
		50	50	4.01	<13	PASS
		100	0	4	<13	PASS
	HCH	1	0	2.83	<13	PASS
		1	49	2.74	<13	PASS
		1	99	2.43	<13	PASS
		50	0	4.12	<13	PASS
		50	25	4.28	<13	PASS
		50	50	4.37	<13	PASS
		100	0	4.79	<13	PASS
16QAM	LCH	1	0	3.95	<13	PASS
		1	49	3.84	<13	PASS
		1	99	3.17	<13	PASS
		50	0	4.12	<13	PASS
		50	25	4.27	<13	PASS
		50	50	4.31	<13	PASS
		100	0	4.92	<13	PASS
	MCH	1	0	3.18	<13	PASS
		1	49	3.89	<13	PASS
		1	99	4.19	<13	PASS
		50	0	4.56	<13	PASS
		50	25	4.64	<13	PASS
		50	50	4.83	<13	PASS
		100	0	4.65	<13	PASS

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HCH	1	0	3.65	<13	PASS
	1	49	3.51	<13	PASS
	1	99	3.45	<13	PASS
	50	0	5.12	<13	PASS
	50	25	5.17	<13	PASS
	50	50	5.22	<13	PASS
	100	0	5.5	<13	PASS

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**LTE BAND 5**  
**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	2.98	<13	PASS
		1	3	2.91	<13	PASS
		1	5	2.9	<13	PASS
		3	0	2.99	<13	PASS
		3	2	2.93	<13	PASS
		3	3	3.05	<13	PASS
		6	0	4.02	<13	PASS
	MCH	1	0	2.99	<13	PASS
		1	3	2.9	<13	PASS
		1	5	3.02	<13	PASS
		3	0	3.08	<13	PASS
		3	2	3.09	<13	PASS
		3	3	3.11	<13	PASS
		6	0	3.95	<13	PASS
	HCH	1	0	2.66	<13	PASS
		1	3	2.65	<13	PASS
		1	5	2.64	<13	PASS
		3	0	2.65	<13	PASS
		3	2	2.73	<13	PASS
		3	3	2.79	<13	PASS
		6	0	3.55	<13	PASS
16QAM	LCH	1	0	4.13	<13	PASS
		1	3	4.06	<13	PASS
		1	5	3.97	<13	PASS
		3	0	3.96	<13	PASS
		3	2	4.05	<13	PASS
		3	3	4.1	<13	PASS
		6	0	4.95	<13	PASS
	MCH	1	0	3.94	<13	PASS
		1	3	4.11	<13	PASS
		1	5	4.26	<13	PASS
		3	0	3.98	<13	PASS
		3	2	4.07	<13	PASS
		3	3	4.13	<13	PASS

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		6	0	4.83	<13	PASS
	HCH	1	0	3.64	<13	PASS
		1	3	3.68	<13	PASS
		1	5	3.7	<13	PASS
		3	0	3.51	<13	PASS
		3	2	3.47	<13	PASS
		3	3	3.58	<13	PASS
		6	0	4.5	<13	PASS

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**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	2.96	<13	PASS	
		1	7	3.03	<13	PASS	
		1	14	3.13	<13	PASS	
		8	0	3.89	<13	PASS	
		8	4	3.95	<13	PASS	
		8	7	4.07	<13	PASS	
		15	0	4.13	<13	PASS	
	MCH	1	0	3	<13	PASS	
		1	7	3.04	<13	PASS	
		1	14	3.16	<13	PASS	
		8	0	3.77	<13	PASS	
		8	4	3.95	<13	PASS	
		8	7	4.06	<13	PASS	
		15	0	4.02	<13	PASS	
	HCH	1	0	2.72	<13	PASS	
		1	7	2.66	<13	PASS	
		1	14	2.59	<13	PASS	
		8	0	3.43	<13	PASS	
		8	4	3.52	<13	PASS	
		8	7	3.59	<13	PASS	
		15	0	3.76	<13	PASS	
16QAM	LCH	1	0	4.05	<13	PASS	
		1	7	4.11	<13	PASS	
		1	14	4.2	<13	PASS	
		8	0	4.74	<13	PASS	
		8	4	4.86	<13	PASS	
		8	7	4.91	<13	PASS	
		15	0	5.09	<13	PASS	
	MCH	1	0	4.03	<13	PASS	
		1	7	4.01	<13	PASS	
		1	14	4.05	<13	PASS	
		8	0	4.69	<13	PASS	
		8	4	4.73	<13	PASS	
		8	7	4.78	<13	PASS	
		15	0	4.96	<13	PASS	

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HCH	1	0	3.89	<13	PASS
	1	7	3.82	<13	PASS
	1	14	3.75	<13	PASS
	8	0	4.51	<13	PASS
	8	4	4.57	<13	PASS
	8	7	4.6	<13	PASS
	15	0	4.69	<13	PASS

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**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	2.83	<13	PASS
		1	12	2.95	<13	PASS
		1	24	3.12	<13	PASS
		12	0	4.02	<13	PASS
		12	6	4.13	<13	PASS
		12	13	4.19	<13	PASS
		25	0	4.44	<13	PASS
	MCH	1	0	2.75	<13	PASS
		1	12	2.82	<13	PASS
		1	24	3.1	<13	PASS
		12	0	4.01	<13	PASS
		12	6	4.09	<13	PASS
		12	13	4.13	<13	PASS
		25	0	4.26	<13	PASS
	HCH	1	0	2.92	<13	PASS
		1	12	2.78	<13	PASS
		1	24	2.83	<13	PASS
		12	0	3.55	<13	PASS
		12	6	3.62	<13	PASS
		12	13	3.71	<13	PASS
		25	0	4	<13	PASS
16QAM	LCH	1	0	3.8	<13	PASS
		1	12	4.08	<13	PASS
		1	24	4.16	<13	PASS
		12	0	4.76	<13	PASS
		12	6	4.89	<13	PASS
		12	13	5.03	<13	PASS
		25	0	5.23	<13	PASS
	MCH	1	0	3.82	<13	PASS
		1	12	3.93	<13	PASS
		1	24	4.2	<13	PASS
		12	0	4.97	<13	PASS
		12	6	4.85	<13	PASS
		12	13	5.03	<13	PASS
		25	0	5.09	<13	PASS

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HCH	1	0	3.8	<13	PASS
	1	12	3.6	<13	PASS
	1	24	3.4	<13	PASS
	12	0	4.55	<13	PASS
	12	6	4.63	<13	PASS
	12	13	4.72	<13	PASS
	25	0	4.92	<13	PASS

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**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	2.85	<13	PASS
		1	24	2.91	<13	PASS
		1	49	3	<13	PASS
		25	0	3.84	<13	PASS
		25	12	3.99	<13	PASS
		25	25	4.09	<13	PASS
		50	0	4.77	<13	PASS
	MCH	1	0	2.70	<13	PASS
		1	24	2.95	<13	PASS
		1	49	3.28	<13	PASS
		25	0	4.01	<13	PASS
		25	12	4.09	<13	PASS
		25	25	4.14	<13	PASS
		50	0	4.29	<13	PASS
	HCH	1	0	3.17	<13	PASS
		1	24	3.06	<13	PASS
		1	49	2.93	<13	PASS
		25	0	3.56	<13	PASS
		25	12	3.64	<13	PASS
		25	25	3.87	<13	PASS
		50	0	4.16	<13	PASS
16QAM	LCH	1	0	3.91	<13	PASS
		1	24	3.87	<13	PASS
		1	49	3.83	<13	PASS
		25	0	4.88	<13	PASS
		25	12	4.90	<13	PASS
		25	25	4.93	<13	PASS
		50	0	5.54	<13	PASS
	MCH	1	0	3.80	<13	PASS
		1	24	3.96	<13	PASS
		1	49	4.32	<13	PASS
		25	0	4.87	<13	PASS
		25	12	4.92	<13	PASS
		25	25	5.02	<13	PASS
		50	0	5.21	<13	PASS

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HCH	1	0	3.83	<13	PASS
	1	24	4.03	<13	PASS
	1	49	4.15	<13	PASS
	25	0	4.57	<13	PASS
	25	12	4.88	<13	PASS
	25	25	5.03	<13	PASS
	50	0	5.25	<13	PASS

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**LTE BAND 12**  
**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	3.23	<13	PASS
		1	3	3.17	<13	PASS
		1	5	2.84	<13	PASS
		3	0	2.94	<13	PASS
		3	2	2.97	<13	PASS
		3	3	3	<13	PASS
		6	0	4.02	<13	PASS
	MCH	1	0	2	<13	PASS
		1	3	2.17	<13	PASS
		1	5	2.26	<13	PASS
		3	0	2.16	<13	PASS
		3	2	2.34	<13	PASS
		3	3	2.39	<13	PASS
		6	0	3.08	<13	PASS
	HCH	1	0	1.65	<13	PASS
		1	3	1.64	<13	PASS
		1	5	1.63	<13	PASS
		3	0	1.52	<13	PASS
		3	2	1.57	<13	PASS
		3	3	1.58	<13	PASS
		6	0	2.05	<13	PASS
16QAM	LCH	1	0	4.23	<13	PASS
		1	3	4.13	<13	PASS
		1	5	3.9	<13	PASS
		3	0	3.91	<13	PASS
		3	2	3.95	<13	PASS
		3	3	3.98	<13	PASS
		6	0	4.99	<13	PASS
	MCH	1	0	3.17	<13	PASS
		1	3	3.32	<13	PASS
		1	5	3.48	<13	PASS
		3	0	3.27	<13	PASS
		3	2	3.33	<13	PASS
		3	3	3.4	<13	PASS

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HCH	6	0	4.2	<13	PASS
	1	0	2.35	<13	PASS
	1	3	2.34	<13	PASS
	1	5	2.33	<13	PASS
	3	0	2.17	<13	PASS
	3	2	2.24	<13	PASS
	3	3	2.32	<13	PASS
	6	0	2.92	<13	PASS

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**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	3.27	<13	PASS
		1	7	2.68	<13	PASS
		1	14	1.86	<13	PASS
		8	0	2.97	<13	PASS
		8	4	3.05	<13	PASS
		8	7	3.17	<13	PASS
		15	0	3.67	<13	PASS
	MCH	1	0	1.91	<13	PASS
		1	7	2.45	<13	PASS
		1	14	2.73	<13	PASS
		8	0	2.81	<13	PASS
		8	4	2.97	<13	PASS
		8	7	3.35	<13	PASS
		15	0	3.25	<13	PASS
	HCH	1	0	2.15	<13	PASS
		1	7	1.97	<13	PASS
		1	14	1.53	<13	PASS
		8	0	1.64	<13	PASS
		8	4	1.87	<13	PASS
		8	7	2.07	<13	PASS
		15	0	2.79	<13	PASS
16QAM	LCH	1	0	4.18	<13	PASS
		1	7	3.57	<13	PASS
		1	14	2.98	<13	PASS
		8	0	4.02	<13	PASS
		8	4	4.11	<13	PASS
		8	7	4.17	<13	PASS
		15	0	4.64	<13	PASS
	MCH	1	0	2.91	<13	PASS
		1	7	3.25	<13	PASS
		1	14	3.64	<13	PASS
		8	0	3.56	<13	PASS
		8	4	3.87	<13	PASS
		8	7	4.25	<13	PASS
		15	0	4.29	<13	PASS

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HCH	1	0	3.29	<13	PASS
	1	7	2.88	<13	PASS
	1	14	2.35	<13	PASS
	8	0	2.88	<13	PASS
	8	4	2.97	<13	PASS
	8	7	3.04	<13	PASS
	15	0	3.75	<13	PASS

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**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	3.08	<13	PASS	
		1	12	2.34	<13	PASS	
		1	24	1.6	<13	PASS	
		12	0	2.61	<13	PASS	
		12	6	2.65	<13	PASS	
		12	13	2.72	<13	PASS	
		25	0	3.54	<13	PASS	
	MCH	1	0	1.81	<13	PASS	
		1	12	2.15	<13	PASS	
		1	24	2.93	<13	PASS	
		12	0	3.41	<13	PASS	
		12	6	3.54	<13	PASS	
		12	13	3.66	<13	PASS	
		25	0	3.54	<13	PASS	
	HCH	1	0	3.3	<13	PASS	
		1	12	2.74	<13	PASS	
		1	24	1.68	<13	PASS	
		12	0	2.41	<13	PASS	
		12	6	2.49	<13	PASS	
		12	13	2.54	<13	PASS	
		25	0	3.72	<13	PASS	
16QAM	LCH	1	0	4.15	<13	PASS	
		1	12	3.77	<13	PASS	
		1	24	2.79	<13	PASS	
		12	0	3.23	<13	PASS	
		12	6	3.54	<13	PASS	
		12	13	3.71	<13	PASS	
		25	0	4.41	<13	PASS	
	MCH	1	0	2.73	<13	PASS	
		1	12	3.54	<13	PASS	
		1	24	4.1	<13	PASS	
		12	0	4.35	<13	PASS	
		12	6	4.46	<13	PASS	
		12	13	4.57	<13	PASS	
		25	0	4.46	<13	PASS	

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HCH	1	0	3.96	<13	PASS
	1	12	3.58	<13	PASS
	1	24	2.34	<13	PASS
	12	0	3.23	<13	PASS
	12	6	3.37	<13	PASS
	12	13	3.45	<13	PASS
	25	0	4.65	<13	PASS

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**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	3.05	<13	PASS
		1	24	2.88	<13	PASS
		1	49	2.65	<13	PASS
		25	0	2.63	<13	PASS
		25	12	2.57	<13	PASS
		25	25	2.99	<13	PASS
		50	0	3.40	<13	PASS
	MCH	1	0	1.49	<13	PASS
		1	24	2.85	<13	PASS
		1	49	3.09	<13	PASS
		25	0	3.87	<13	PASS
		25	12	3.92	<13	PASS
		25	25	4.01	<13	PASS
		50	0	3.63	<13	PASS
	HCH	1	0	1.94	<13	PASS
		1	24	1.92	<13	PASS
		1	49	1.93	<13	PASS
		25	0	3.44	<13	PASS
		25	12	3.47	<13	PASS
		25	25	3.53	<13	PASS
		50	0	4.09	<13	PASS
16QAM	LCH	1	0	4.24	<13	PASS
		1	24	3.84	<13	PASS
		1	49	3.59	<13	PASS
		25	0	3.81	<13	PASS
		25	12	3.92	<13	PASS
		25	25	3.99	<13	PASS
		50	0	4.36	<13	PASS
	MCH	1	0	2.56	<13	PASS
		1	24	3.59	<13	PASS
		1	49	4.02	<13	PASS
		25	0	4.87	<13	PASS
		25	12	4.91	<13	PASS
		25	25	4.94	<13	PASS
		50	0	4.55	<13	PASS
HCH	1	0	2.62	<13	PASS	

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		1	24	3.42	<13	PASS
		1	49	4.11	<13	PASS
		25	0	4.97	<13	PASS
		25	12	5.01	<13	PASS
		25	25	5.09	<13	PASS
		50	0	5.13	<13	PASS

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## 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  $43 + \log_{10}(P[\text{Watts}])$ , where P is the transmitter power in Watts.**

Test Procedure Used

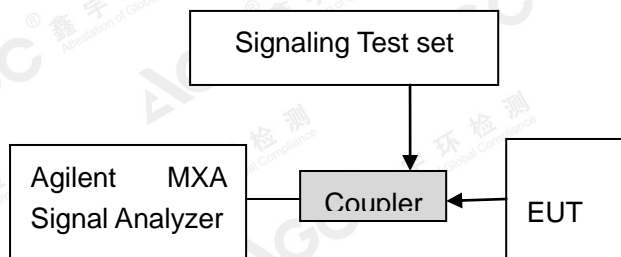
KDB 971168 D01V03R01– Section 6.0

#### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least  $10 \times$  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  $43 + 10 \log_{10}(P)$  dB. For all power levels +30dBm to 0dBm, this becomes a constant specification limit of -13dBm.

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### 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.

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## 7.2 RADIATED SPURIOUS EMISSION

### 7.2.1. MEASUREMENT PROCEDURE

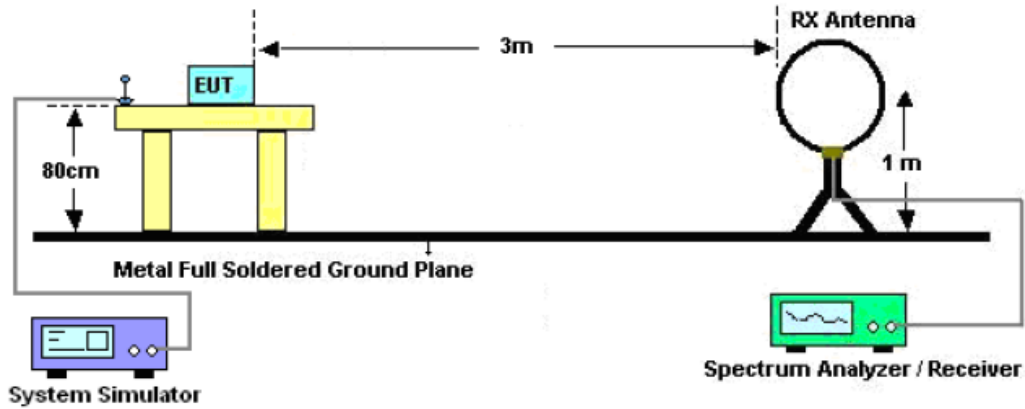
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

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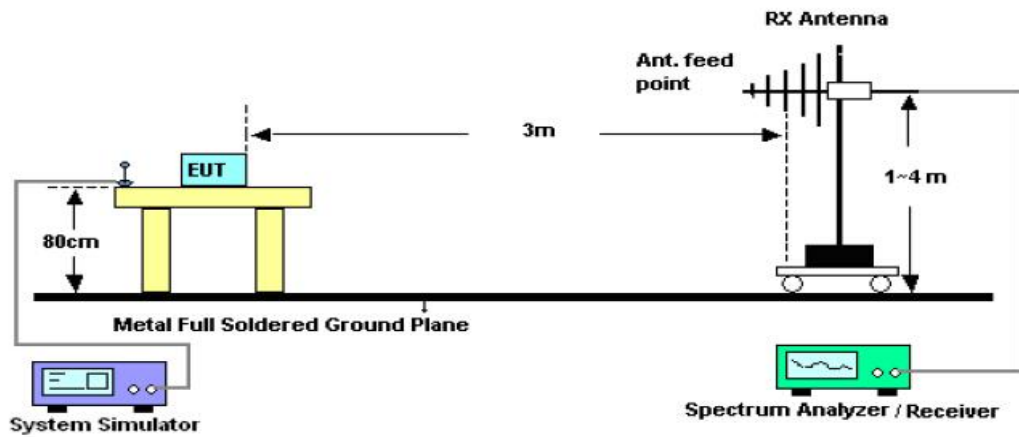


**7.2.2. TEST SETUP**

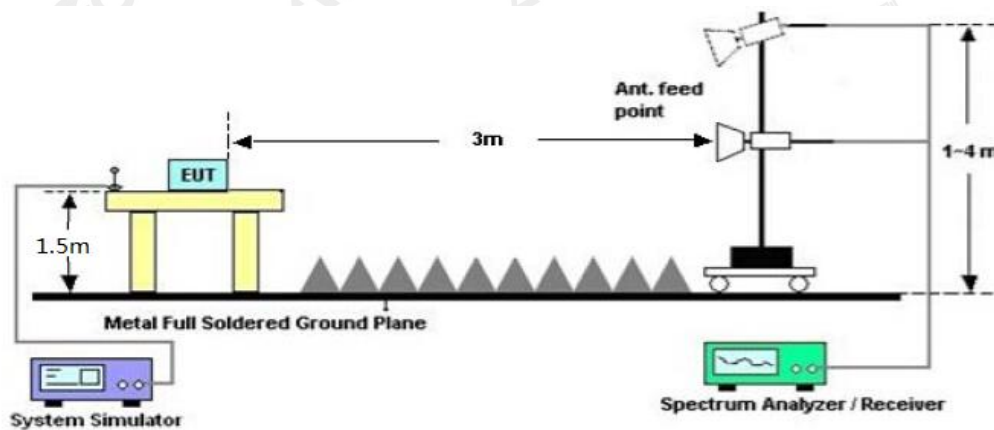
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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### 7.2.3 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  $43+10\log(P)$  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 -13dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30dBm (1 W) carrier becomes a limit of -13dBm. At 0.001 W (0dBm) the minimum attenuation is 13 dB, which again yields a limit of -13dBm. 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:

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**7.2.4 MEASUREMENT RESULT**
**LTE Band 2  
Low channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3720	V	-47.55	-13	-34.55
748.3	V	-34.82	-13	-21.82
257.2	V	-37.45	-13	-24.45
3720	H	-48.63	-13	-35.63
640.2	H	-36.50	-13	-23.50
221.4	H	-37.23	-13	-24.23

**Middle channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3760	V	-47.48	-13	-34.48
533.1	V	-34.71	-13	-21.71
256.5	V	-37.35	-13	-24.35
3760	H	-48.55	-13	-35.55
850.2	H	-36.41	-13	-23.41
451.4	H	-37.29	-13	-24.29

**High channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3800	V	-47.71	-13	-34.71
611.1	V	-34.84	-13	-21.84
256.5	V	-37.46	-13	-24.46
3800	H	-48.57	-13	-35.57
586.2	H	-36.47	-13	-23.47
351.4	H	-37.33	-13	-24.33

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**LTE Band 4  
 Low channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3440	V	-47.14	-13	-34.14
896.6	V	-34.50	-13	-21.50
487.5	V	-37.16	-13	-24.16
3440	H	-48.10	-13	-35.10
789.3	H	-36.09	-13	-23.09
545.6	H	-37.04	-13	-24.04

**Middle channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3465	V	-47.09	-13	-34.09
859.4	V	-34.38	-13	-21.38
765.9	V	-37.04	-13	-24.04
3465	H	-48.19	-13	-35.19
564.5	H	-36.14	-13	-23.14
265.9	H	-37.07	-13	-24.07

**High channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3490	V	-47.33	-13	-34.33
687.4	V	-34.55	-13	-21.55
586.4	V	-37.08	-13	-24.08
3490	H	-48.23	-13	-35.23
489.5	H	-36.18	-13	-23.18
357.1	H	-37.13	-13	-24.13

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**LTE Band 5**  
**Low channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1658	V	-47.07	-13	-34.07
564.5	V	-34.35	-13	-21.35
364.3	V	-36.93	-13	-23.93
1658	H	-47.97	-13	-34.97
578.3	H	-35.95	-13	-22.95
354.1	H	-36.94	-13	-23.94

**Middle channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1673	V	-47.16	-13	-34.16
896.3	V	-34.44	-13	-21.44
784.1	V	-37.04	-13	-24.04
1673	H	-48.18	-13	-35.18
564.1	H	-36.04	-13	-23.04
285.6	H	-37.03	-13	-24.03

**High channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1688	V	-47.28	-13	-34.28
563.5	V	-34.55	-13	-21.55
345.1	V	-37.16	-13	-24.16
1688	H	-48.27	-13	-35.27
354.1	H	-36.16	-13	-23.16
253.6	H	-37.15	-13	-24.15

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**LTE Band 12**  
**Low channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1408	V	-47.33	-13	-34.33
715.2	V	-34.62	-13	-21.62
684.5	V	-37.20	-13	-24.20
1408	H	-48.24	-13	-35.24
476.3	H	-36.25	-13	-23.25
359.6	H	-37.24	-13	-24.24

**Middle channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1415	V	-47.46	-13	-34.46
712.4	V	-34.69	-13	-21.69
694.7	V	-37.28	-13	-24.28
1415	H	-48.29	-13	-35.29
489.2	H	-36.33	-13	-23.33
364.8	H	-37.32	-13	-24.32

**High channel**

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1422	V	-47.53	-13	-34.53
724.9	V	-34.82	-13	-21.82
695.8	V	-37.39	-13	-24.39
1422	H	-48.44	-13	-35.44
487.5	H	-36.51	-13	-23.51
364.8	H	-37.51	-13	-24.51

**Note:** 1. Margin = Emission Level -Limit

2. (30MHz-20GHz) Below 30MHZ no Spurious found and the QPSK modes is the worst condition.

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## 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°C. 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°C increments from -10°C to +50°C. 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°C.
- 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°C increments from +50°C to -10°C. 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°C during the measurement procedure.

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## 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-E-2016. The frequency stability of the transmitter is measured by:

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

For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  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 -10°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

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**8.3 MEASUREMENT RESULT (WORST)**
**LTE Band 2**

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-2.46	-0.001309	±2.5
0		-2.35	-0.001248	±2.5
10		1.67	0.000890	±2.5
20		-3.35	-0.001781	±2.5
30		-4.35	-0.002313	±2.5
40		0.20	0.000107	±2.5
50		-5.16	-0.002747	±2.5
25	4.35	-1.39	-0.000738	±2.5
	3.4	-0.39	-0.000205	±2.5

**LTE Band 4**

Middle Channel, $f_0 = 1732.5$ MHz				
Temperature (°C)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-5.05	-0.002915	±2.5
0		-2.55	-0.001470	±2.5
10		-2.37	-0.001371	±2.5
20		0.37	0.000215	±2.5
30		1.36	0.000784	±2.5
40		-3.65	-0.002106	±2.5
50		-2.40	-0.001387	±2.5
25	4.35	-1.59	-0.000917	±2.5
	3.4	-1.00	-0.000578	±2.5

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**LTE Band 5**

Middle Channel, $f_0 = 836.5$ MHz				
Temperature (°C)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-0.69	-0.000821	±2.5
0		-0.93	-0.001112	±2.5
10		-1.22	-0.001454	±2.5
20		-0.47	-0.000564	±2.5
30		-2.47	-0.003001	±2.5
40		-0.17	-0.000208	±2.5
50		-1.47	-0.001787	±2.5
25	4.35	3.68	0.004454	±2.5
	3.4	2.62	0.003171	±2.5

**LTE Band 12**

Middle Channel, $f_0 = 707.5$ MHz				
Temperature (°C)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	1.96	0.002770	±2.5
0		1.22	0.001719	±2.5
10		4.41	0.006228	±2.5
20		0.53	0.000748	±2.5
30		0.27	0.000384	±2.5
40		-0.74	-0.001051	±2.5
50		2.29	0.003235	±2.5
25	4.35	0.19	0.000263	±2.5
	3.4	0.96	0.001355	±2.5

Note: The EUT doesn't work below -10°C

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## 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.

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**LTE Band 2**
**Channel Bandwidth: 1.4 MHz**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0775	PASS
	MCH	6	0	1.0749	PASS
	HCH	6	0	1.0779	PASS
16QAM	LCH	6	0	1.0809	PASS
	MCH	6	0	1.0790	PASS
	HCH	6	0	1.0775	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6849	PASS
	MCH	15	0	2.6819	PASS
	HCH	15	0	2.6841	PASS
16QAM	LCH	15	0	2.6843	PASS
	MCH	15	0	2.6847	PASS
	HCH	15	0	2.6910	PASS

**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4870	PASS
	MCH	25	0	4.4818	PASS
	HCH	25	0	4.4723	PASS
16QAM	LCH	25	0	4.4822	PASS
	MCH	25	0	4.4797	PASS
	HCH	25	0	4.4816	PASS

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**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9466	PASS
	MCH	50	0	8.9475	PASS
	HCH	50	0	8.9229	PASS
16QAM	LCH	50	0	8.9376	PASS
	MCH	50	0	8.9330	PASS
	HCH	50	0	8.9253	PASS

**Channel Bandwidth: 15 MHz**

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	13.431	PASS
	MCH	75	0	13.403	PASS
	HCH	75	0	13.385	PASS
16QAM	LCH	75	0	13.407	PASS
	MCH	75	0	13.389	PASS
	HCH	75	0	13.387	PASS

**Channel Bandwidth: 20 MHz**

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	17.902	PASS
	MCH	100	0	17.850	PASS
	HCH	100	0	17.847	PASS
16QAM	LCH	100	0	17.888	PASS
	MCH	100	0	17.849	PASS
	HCH	100	0	17.825	PASS

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**LTE Band 4**
**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	1.0794	PASS
	HCH	6	0	1.0804	PASS
16QAM	LCH	6	0	1.0817	PASS
	MCH	6	0	1.0838	PASS
	HCH	6	0	1.0789	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6842	PASS
	MCH	15	0	2.6928	PASS
	HCH	15	0	2.6823	PASS
16QAM	LCH	15	0	2.6842	PASS
	MCH	15	0	2.6899	PASS
	HCH	15	0	2.6852	PASS

**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4806	PASS
	MCH	25	0	4.4936	PASS
	HCH	25	0	4.4781	PASS
16QAM	LCH	25	0	4.4842	PASS
	MCH	25	0	4.4828	PASS
	HCH	25	0	4.4883	PASS

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**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9485	PASS
	MCH	50	0	8.9387	PASS
	HCH	50	0	8.9343	PASS
16QAM	LCH	50	0	8.9467	PASS
	MCH	50	0	8.9375	PASS
	HCH	50	0	8.9347	PASS

**Channel Bandwidth: 15 MHz**

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	13.403	PASS
	MCH	75	0	13.405	PASS
	HCH	75	0	13.458	PASS
16QAM	LCH	75	0	13.400	PASS
	MCH	75	0	13.388	PASS
	HCH	75	0	13.420	PASS

**Channel Bandwidth: 20 MHz**

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	17.770	PASS
	MCH	100	0	17.804	PASS
	HCH	100	0	17.941	PASS
16QAM	LCH	100	0	17.796	PASS
	MCH	100	0	17.801	PASS
	HCH	100	0	17.921	PASS

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**LTE Band 5**
**Channel Bandwidth: 1.4 MHz**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0777	PASS
	MCH	6	0	1.0769	PASS
	HCH	6	0	1.0807	PASS
16QAM	LCH	6	0	1.0807	PASS
	MCH	6	0	1.0796	PASS
	HCH	6	0	1.0792	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6819	PASS
	MCH	15	0	2.6861	PASS
	HCH	15	0	2.6873	PASS
16QAM	LCH	15	0	2.6836	PASS
	MCH	15	0	2.6864	PASS
	HCH	15	0	2.6857	PASS

**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4880	PASS
	MCH	25	0	4.4874	PASS
	HCH	25	0	4.4835	PASS
16QAM	LCH	25	0	4.4827	PASS
	MCH	25	0	4.4835	PASS
	HCH	25	0	4.4853	PASS

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**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9415	PASS
	MCH	50	0	8.9538	PASS
	HCH	50	0	8.9278	PASS
16QAM	LCH	50	0	8.9443	PASS
	MCH	50	0	8.9482	PASS
	HCH	50	0	8.9438	PASS

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**LTE Band 12**
**Channel Bandwidth: 1.4 MHz**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0803	PASS
	MCH	6	0	1.0788	PASS
	HCH	6	0	1.1092	PASS
16QAM	LCH	6	0	1.0805	PASS
	MCH	6	0	1.0814	PASS
	HCH	6	0	1.0911	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6827	PASS
	MCH	15	0	2.6847	PASS
	HCH	15	0	2.7040	PASS
16QAM	LCH	15	0	2.6870	PASS
	MCH	15	0	2.6897	PASS
	HCH	15	0	2.6956	PASS

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**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4795	PASS
	MCH	25	0	4.4878	PASS
	HCH	25	0	4.4894	PASS
16QAM	LCH	25	0	4.4696	PASS
	MCH	25	0	4.4774	PASS
	HCH	25	0	4.4939	PASS

**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.8823	PASS
	MCH	50	0	8.9181	PASS
	HCH	50	0	8.9595	PASS
16QAM	LCH	50	0	8.8667	PASS
	MCH	50	0	8.9153	PASS
	HCH	50	0	8.9584	PASS

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

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## 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.

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**LTE Band 2**
**Channel Bandwidth: 1.4 MHz**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.230	PASS
	MCH	6	0	1.213	PASS
	HCH	6	0	1.226	PASS
16QAM	LCH	6	0	1.237	PASS
	MCH	6	0	1.231	PASS
	HCH	6	0	1.209	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.883	PASS
	MCH	15	0	2.855	PASS
	HCH	15	0	2.901	PASS
16QAM	LCH	15	0	2.878	PASS
	MCH	15	0	2.865	PASS
	HCH	15	0	2.886	PASS

**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.848	PASS
	MCH	25	0	4.832	PASS
	HCH	25	0	4.831	PASS
16QAM	LCH	25	0	4.812	PASS
	MCH	25	0	4.841	PASS
	HCH	25	0	4.789	PASS

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**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.547	PASS
	MCH	50	0	9.435	PASS
	HCH	50	0	9.455	PASS
16QAM	LCH	50	0	9.516	PASS
	MCH	50	0	9.413	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	14.18	PASS
	MCH	75	0	14.18	PASS
	HCH	75	0	14.04	PASS
16QAM	LCH	75	0	14.06	PASS
	MCH	75	0	14.07	PASS
	HCH	75	0	14.10	PASS

**Channel Bandwidth: 20 MHz**

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	18.70	PASS
	MCH	100	0	18.58	PASS
	HCH	100	0	18.59	PASS
16QAM	LCH	100	0	18.68	PASS
	MCH	100	0	18.60	PASS
	HCH	100	0	18.60	PASS

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**LTE Band 4**
**Channel Bandwidth: 1.4 MHz**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.244	PASS
	MCH	6	0	1.272	PASS
	HCH	6	0	1.223	PASS
16QAM	LCH	6	0	1.231	PASS
	MCH	6	0	1.280	PASS
	HCH	6	0	1.227	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.892	PASS
	MCH	15	0	3.000	PASS
	HCH	15	0	2.905	PASS
16QAM	LCH	15	0	2.862	PASS
	MCH	15	0	2.917	PASS
	HCH	15	0	2.890	PASS

**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.855	PASS
	MCH	25	0	4.887	PASS
	HCH	25	0	4.897	PASS
16QAM	LCH	25	0	4.829	PASS
	MCH	25	0	4.886	PASS
	HCH	25	0	4.942	PASS

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**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.515	PASS
	MCH	50	0	9.707	PASS
	HCH	50	0	9.516	PASS
16QAM	LCH	50	0	9.429	PASS
	MCH	50	0	9.618	PASS
	HCH	50	0	9.497	PASS

**Channel Bandwidth: 15 MHz**

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	15.06	PASS
	MCH	75	0	15.80	PASS
	HCH	75	0	14.20	PASS
16QAM	LCH	75	0	14.05	PASS
	MCH	75	0	15.09	PASS
	HCH	75	0	14.22	PASS

**Channel Bandwidth: 20 MHz**

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	18.79	PASS
	MCH	100	0	18.81	PASS
	HCH	100	0	18.85	PASS
16QAM	LCH	100	0	18.58	PASS
	MCH	100	0	18.62	PASS
	HCH	100	0	18.70	PASS

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**LTE Band 5**
**Channel Bandwidth: 1.4 MHz**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.234	PASS
	MCH	6	0	1.230	PASS
	HCH	6	0	1.258	PASS
16QAM	LCH	6	0	1.225	PASS
	MCH	6	0	1.222	PASS
	HCH	6	0	1.217	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.863	PASS
	MCH	15	0	2.876	PASS
	HCH	15	0	2.890	PASS
16QAM	LCH	15	0	2.861	PASS
	MCH	15	0	2.876	PASS
	HCH	15	0	2.870	PASS

**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.837	PASS
	MCH	25	0	4.839	PASS
	HCH	25	0	4.846	PASS
16QAM	LCH	25	0	4.830	PASS
	MCH	25	0	4.823	PASS
	HCH	25	0	4.866	PASS

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**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.440	PASS
	MCH	50	0	9.465	PASS
	HCH	50	0	9.461	PASS
16QAM	LCH	50	0	9.454	PASS
	MCH	50	0	9.487	PASS
	HCH	50	0	9.550	PASS

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**LTE Band 12**
**Channel Bandwidth: 1.4 MHz**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.245	PASS
	MCH	6	0	1.217	PASS
	HCH	6	0	2.193	PASS
16QAM	LCH	6	0	1.253	PASS
	MCH	6	0	1.215	PASS
	HCH	6	0	2.047	PASS

**Channel Bandwidth: 3 MHz**

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.886	PASS
	MCH	15	0	2.875	PASS
	HCH	15	0	4.552	PASS
16QAM	LCH	15	0	2.873	PASS
	MCH	15	0	2.890	PASS
	HCH	15	0	4.369	PASS

**Channel Bandwidth: 5 MHz**

Channel Bandwidth: 5MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	5.345	PASS
	MCH	25	0	4.898	PASS
	HCH	25	0	5.570	PASS
16QAM	LCH	25	0	4.835	PASS
	MCH	25	0	4.827	PASS
	HCH	25	0	4.870	PASS

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**Channel Bandwidth: 10 MHz**

Channel Bandwidth: 10MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.352	PASS
	MCH	50	0	9.598	PASS
	HCH	50	0	9.508	PASS
16QAM	LCH	50	0	9.352	PASS
	MCH	50	0	9.447	PASS
	HCH	50	0	9.460	PASS

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

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## 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(g) §27.53(h) §27.53(m)  
KDB 971168 D01v03 – 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  $43 + \log_{10}(P[\text{Watts}])$ , where P is the transmitter power in Watts.

Please refers to Appendix III for compliance test plots for band edge

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