



Report No.: SZ12110030W02



FCC TEST REPORT

Issued to

TCT Mobile Limited

For

LTE USB Modem

Model Name: One Touch L100G
 Trade Name: Alcatel
 Brand Name: Alcatel
 FCC ID : RAD341
 Standard: 47 CFR Part 2
 47 CFR Part 27, Subpart C, L
 Test date: 2012-11-20 to 2012-12-26
 Issue date: 2012-12-27

Shenzhen Morlab Communications Technology Co., Ltd.

Tested by Tu Lang
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Date 2012.12.27

Approved by Wu Xue

Date 2012.12.27

Reviewed by Huang Pulong

Date 2012.12.27



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Change History		
Issue	Date	Reason for change
1.0	Dec 27, 2012	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	One Touch L100G
Serial No.....	(n.a, marked #1 by test site)
Hardware Version	V3.0
Software Version	S1_B15001S_1110000_B10001S
Applicant	TCT Mobile Limited 5F, C building, No. 232, Liang Jing Road Zhang Jiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
Manufacturer	TCL COMMUNICATION TECHNOLOGY HOLDINGS LIMITED 70 Huifeng 4rd, Zhong Kai Hi-tech Development District, Huizhou, Guangdong 516006 P.R. China (TCL Mobile Communication Co., Ltd. Huizhou)
Modulation Type.....	LTE Band 17: QPSK, 16QAM LTE Band 4: QPSK, 16QAM
Tx Frequency Range.....	LTE Band 17: 704MHz~716MHz LTE Band 4: 1710MHz~1755MHz
Rx Frequency Range	LTE Band 17: 734MHz~746MHz LTE Band 4: 2110MHz~2155MHz
Emission Designator.....	4M52G7D (LTE Band 17, QPSK, BW 5MHz) 4M52W7D (LTE Band 17, 16QAM, BW 5MHz) 9M07G7D (LTE Band 17, QPSK, BW 10MHz) 9M08W7D (LTE Band 17, 16QAM, BW 10MHz) 1M11G7D (LTE Band 4, QPSK, BW 1.4MHz) 1M10W7D (LTE Band 4, 16QAM, BW 1.4MHz) 2M76G7D (LTE Band 4, QPSK, BW 3MHz) 2M76 W7D (LTE Band 4, 16QAM, BW 3MHz) 4M51G7D (LTE Band 4, QPSK, BW 5MHz) 4M53 W7D (LTE Band 4, 16QAM, BW 5MHz) 9M06G7D (LTE Band 4, QPSK, BW 10MHz) 9M08 W7D (LTE Band 4, 16QAM, BW 10MHz) 13M5G7D (LTE Band 4, QPSK, BW 15MHz) 13M5 W7D (LTE Band 4, 16QAM, BW 15MHz) 18M5G7D (LTE Band 4, QPSK, BW 20MHz) 18M4W7D (LTE Band 4, QPSK, BW 20MHz)
Antenna Type.....	PIFA Antenna
Antenna Gain.....	LTE Band 17: -2.1dBi LTE Band 4: -2.2dBi
Power Supply	5V DC Power

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2 and Part 27 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 27	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	2.1046(a)	Transmitter Conducted Output Power	PASS
2	2.1049 27.53(g)	Occupied Bandwidth	PASS
3	2.1055 27.54	Frequency Stability	PASS
4	27.50(d) (5)	Peak to Average Ratio	PASS
5	2.1051 27.53(g)(h)	Conducted Spurious Emissions	PASS
6	27.53(g)(h)	Band Edge	PASS
7	2.1046 27.50 (d)(4) 27.50(c) (10)(11)	Equivalent Isotropic Radiated Power	PASS
8	2.1053 27.53(g)(h)	Radiated Spurious Emissions	PASS

1.3 Facilities and Accreditations

1.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at 3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055 P. R. China. The test site is constructed in conformance with the requirements of TIA/EIA 603.D: 2010, ANSI C63.4: 2009 and CISPR Publication 22: 2010. The FCC registration number is 741109.

1.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

2. 47 CFR PART 2, PART 27 REQUIREMENTS

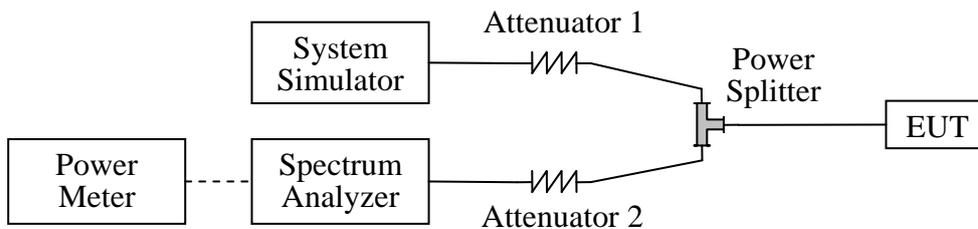
2.1 Transmitter Conducted Output Power

2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2 Test Description

1. Test Setup:



The EUT, which is powered 5V DC power (USB port), is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde& Schwarz	CMW500	1201.0002k5 0/124534/wk	2012.05	2013.05
Spectrum Analyzer	Rohde& Schwarz	FSL	10246	2012.05	2013.05
Spectrum Analyzer	Agilent	E4445A	MY44200685	2012.05	2013.05
Power Meter	Agilent	E4418B	GB43318055	2012.05	2013.05
Power Meter	Agilent	E4418B	GB43318055	2012.05	2013.05
Power Sensor	Agilent	8482A	MY41091706	2012.05	2013.05
Power Splitter	Weinschel	1506A	NW521	2012.05	2013.05
Attenuator 1	Resnet	20dB	(n.a.)	2012.05	2013.05
Attenuator 2	Resnet	3dB	(n.a.)	2012.05	2013.05

2.1.3 Test Results

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 4	20MHz	L 20050	1720	QPSK	1	0	22.89
					1	99	23.19
					50	25	22.06
					100	0	22.13
				16-QAM	1	0	23.07
					1	99	23.16
					50	25	22.04
					100	0	21.01
		M 20175	1732.5	QPSK	1	0	23.24
					1	99	22.89
					50	25	22.24
					100	0	22.12
				16-QAM	1	0	22.41
					1	99	22.16
					50	25	21.19
					100	0	21.15
		H 20300	1745	QPSK	1	0	23.18
					1	99	22.91
					50	25	22.02
					100	0	21.89
				16-QAM	1	0	22.14
					1	99	22.41
					50	25	20.89
					100	0	21.13
LTE Band 4	15MHz	L 20025	1717.5	QPSK	1	0	22.89
					1	74	23.1
					36	18	22.06
					75	0	22.01
				16-QAM	1	0	22.86
					1	74	23.03
					36	18	22.01
					75	0	21.06
		M 20175	1732.5	QPSK	1	0	23.01
					1	74	23.04
					36	18	22.1
					75	0	22.05
				16-QAM	1	0	21.73



Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)		
					RB Size	RB Offset			
		H 20325	1747.5	QPSK	1	74	21.69		
					36	18	21.07		
					75	0	21.13		
				16-QAM	1	0	22.9		
					1	74	22.73		
					36	18	21.92		
				L 20000	1715	QPSK	75	0	21.84
							1	0	22.16
							1	74	22.68
						16-QAM	36	18	21.03
							75	0	20.98
							1	0	23
LTE Band 4	10MHz	M 20175	1732.5	QPSK	1	49	22.97		
					25	13	22.11		
					50	0	22.14		
					1	0	21.8		
				16-QAM	1	49	21.71		
					25	13	20.99		
					50	0	21.16		
					1	0	23.09		
		H 20350	1750	QPSK	1750	1	49	23.21	
						25	13	22.15	
						50	0	22.11	
						1	0	21.86	
				16-QAM	1	49	21.9		
					25	13	21.07		
					50	0	21.16		
					1	0	22.79		
				QPSK	1750	1	49	22.78	
						25	13	21.84	
						50	0	21.78	
						1	0	22.05	
				16-QAM	1	49	22.02		
					25	13	20.88		
					50	0	20.91		
					1	0	23.01		
LTE Band 4	5MHz	L 19975	1712.5	QPSK	1	24	22.94		
					12	6	21.99		
					25	0	22.01		

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
		M 20175	1732.5	16-QAM	1	0	21.65
					1	24	21.66
					12	6	20.94
					25	0	20.92
				QPSK	1	0	23.1
					1	24	22.96
					12	6	22.07
					25	0	22.06
		H 20375	1752.5	16-QAM	1	0	22.33
					1	24	22.37
					12	6	21.11
					25	0	21.18
				QPSK	1	0	22.72
					1	24	22.77
					12	6	21.75
					25	0	21.76
		L 19965	1711.5	16-QAM	1	0	22.03
					1	24	22.14
					12	6	20.91
					25	0	20.85
QPSK	1			0	22.98		
	1			14	23.05		
	8			4	21.93		
	15			0	21.95		
LTE Band 4	3MHz	M 20175	16-QAM	1	0	21.81	
				1	14	21.95	
				8	4	21.03	
				15	0	21	
			QPSK	1	0	23.01	
				1	14	22.9	
				8	4	22.07	
				15	0	22.03	
		H 20385	1753.5	QPSK	1	0	22.26
					1	14	22.18
					8	4	21.13
					15	0	21.3
					1	0	22.83
					1	14	22.77
					8	4	21.69



Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 4	1.4MHz	L 19957	1710.7	16-QAM	15	0	21.66
					1	0	21.6
					1	14	21.58
					8	4	20.44
					15	0	20.54
		L 19957	1710.7	16-QAM	1	0	22.86
					1	5	22.91
					3	2	22.07
					6	0	21.95
		M 20175	1732.5	16-QAM	1	0	22.19
					1	5	22.21
					3	2	21.23
					6	0	21.19
		M 20175	1732.5	QPSK	1	0	23.05
					1	5	22.91
					3	2	23.01
					6	0	22.18
		M 20175	1732.5	16-QAM	1	0	22.36
					1	5	22.23
					3	2	22.13
6	0				21.37		
H 20393	1754.5	QPSK	1	0	22.76		
			1	5	22.77		
			3	2	22.85		
			6	0	21.79		
		H 20393	1754.5	16-QAM	1	0	22.37
					1	5	22.49
					3	2	22.21
					6	0	20.85

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 17	10MHz	L 23780	709	QPSK	1	0	22.38
					1	49	22.11
					25	13	20.87
					50	0	21.09
		16-QAM	1	0	20.73		
			1	49	20.59		
			25	13	20.11		
			50	0	20.04		
		M 23790	710	QPSK	1	0	21.71
					1	49	21.99
					25	13	20.97
					50	0	20.98
	16-QAM		1	0	21.01		
			1	49	21.12		
			25	13	20.07		
			50	0	20.04		
	H 23800	711	QPSK	1	0	22.1	
				1	49	21.54	
				25	13	21.01	
				50	0	20.93	
		16-QAM	1	0	20.53		
			1	49	19.91		
			25	13	19.96		
			50	0	19.88		
LTE Band 17	5MHz 5MHz	L 23755	706.5	QPSK	1	0	22.04
					1	24	22.08
					12	6	20.79
					25	0	20.85
				16-QAM	1	0	20.52
					1	24	20.45
					12	6	19.73
					25	0	19.65
		M 23790	710	QPSK	1	0	21.88
					1	24	22.06
					12	6	21.08
					25	0	21.03
				16-QAM	1	0	21.13
					1	24	21.28
					12	6	20.33



Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
					25	0	20.27
		H 23825	713.5	QPSK	1	0	22.21
					1	24	21.39
					12	6	21.16
					25	0	20.89
				16-QAM QPSK	1	0	21.63
					1	24	20.94
					12	6	19.86
					25	0	19.77
					1	0	22.04
					1	24	22.08

2.2 Occupied Bandwidth

2.2.1 Definition

According to FCC section 2.1049 and 27.53(g), the occupied bandwidth 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.

Occupied bandwidth is also known as the 99% emission bandwidth.

2.2.2 Test Description

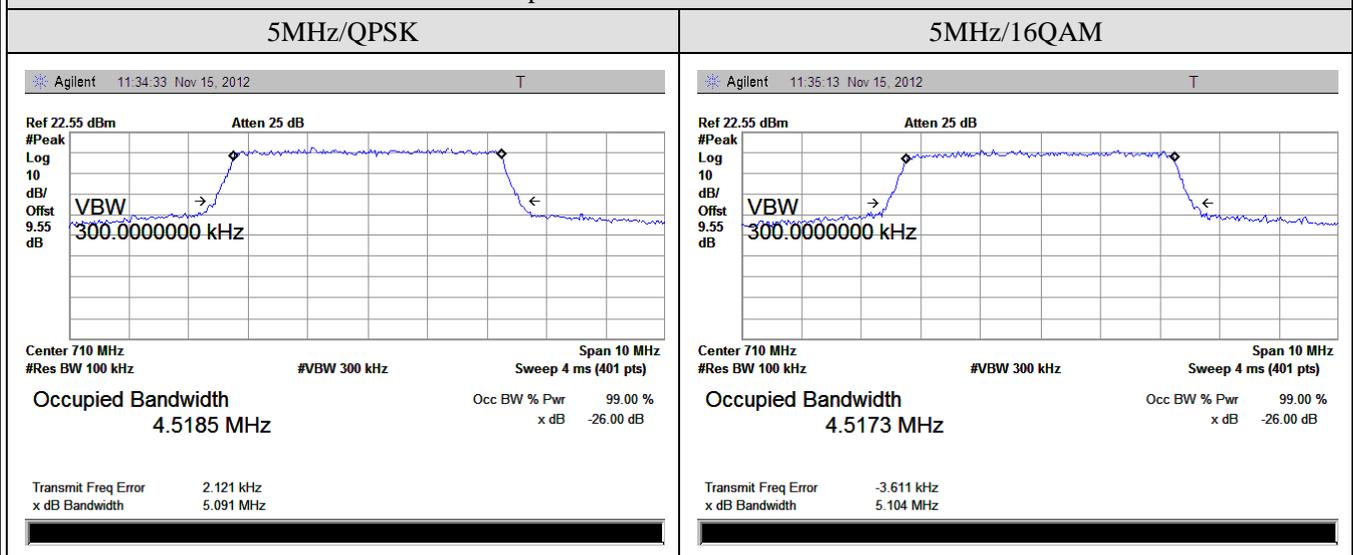
See section 2.1.2 of this report.

2.2.3 Test Results

LTE Band 17

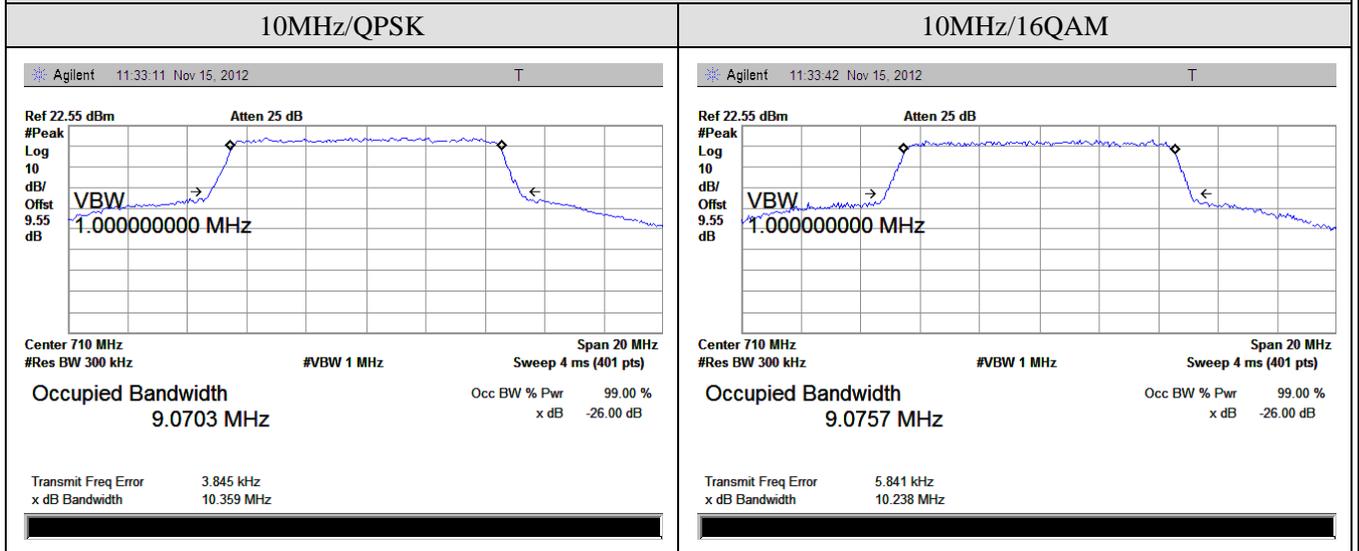
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23790	710.0	4.5185	4.5173	23790	710.0	9.0703	9.0757
Channel Bandwidth: 5MHz				Channel Bandwidth: 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23790	710.0	5.091	5.104	23790	710.0	10.359	10.238

Spectrum Plot of Worst Value





Spectrum Plot of Worst Value



LTE Band 4

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	1.1094	1.906	20175	1732.5	2.7637	2.7624

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	1.397	1.326	20175	1732.5	3.218	3.217

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	4.5168	4.5346	20175	1732.5	9.0647	9.0864

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	5.165	5.075	20175	1732.5	10.345	10.617

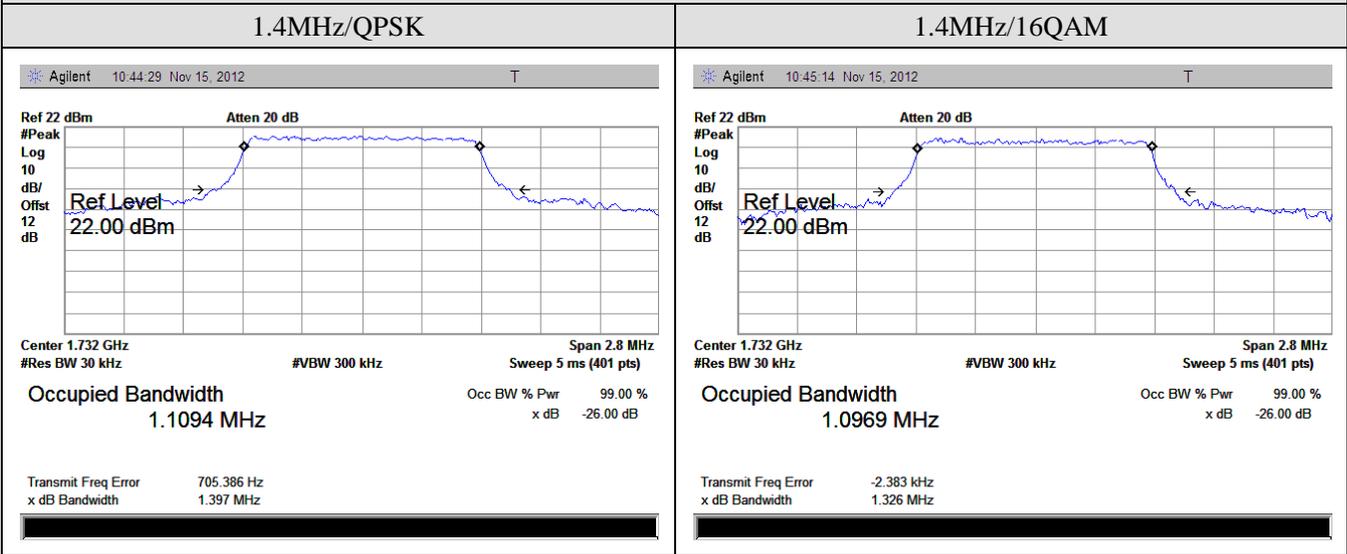
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	13.4839	13.4988	20175	1732.5	18.5415	18.4253

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
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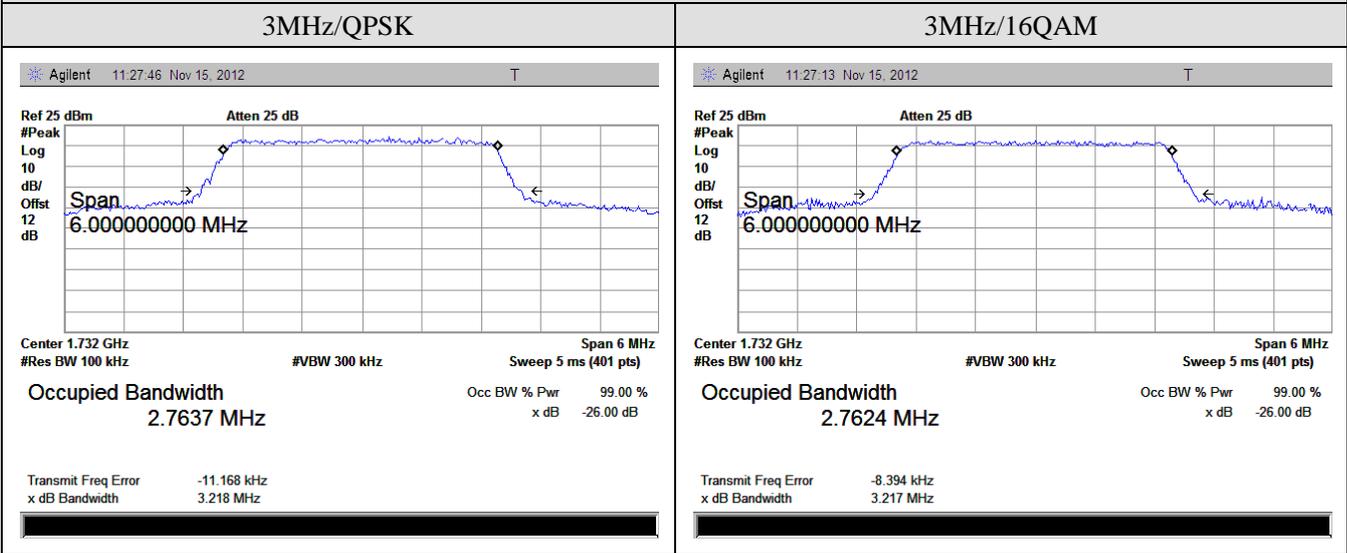


Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	15.122	15.151	20175	1732.5	21.603	21.320

Spectrum Plot of Worst Value



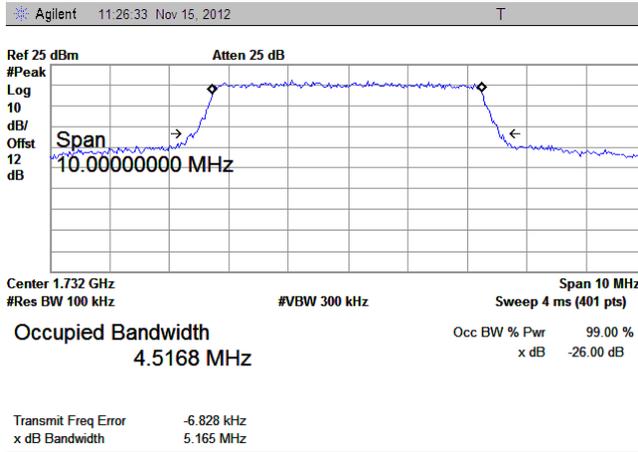
Spectrum Plot of Worst Value



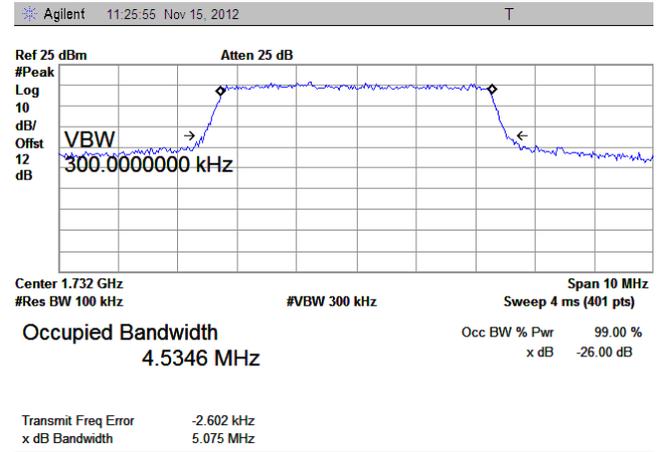


Spectrum Plot of Worst Value

5MHz/QPSK

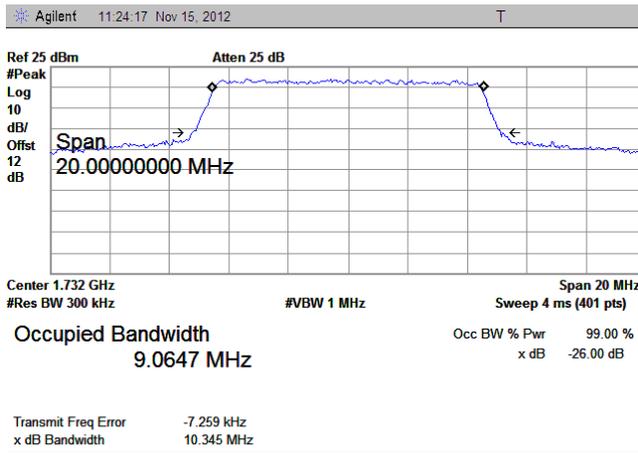


5MHz/16QAM

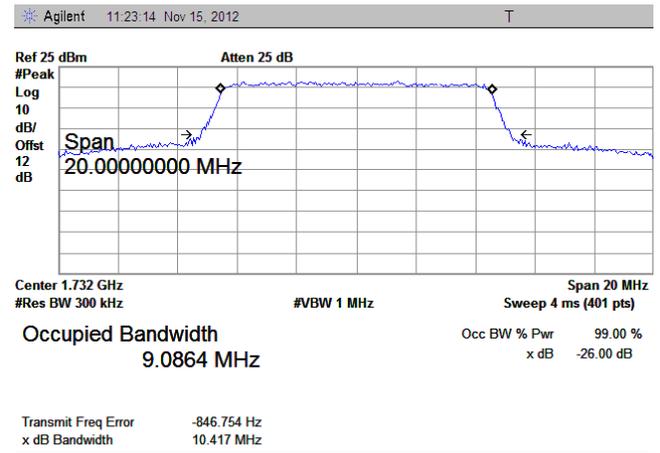


Spectrum Plot of Worst Value

10MHz/QPSK



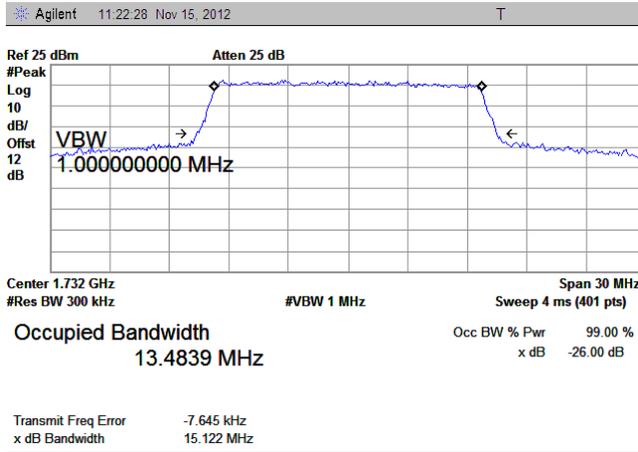
10MHz/16QAM



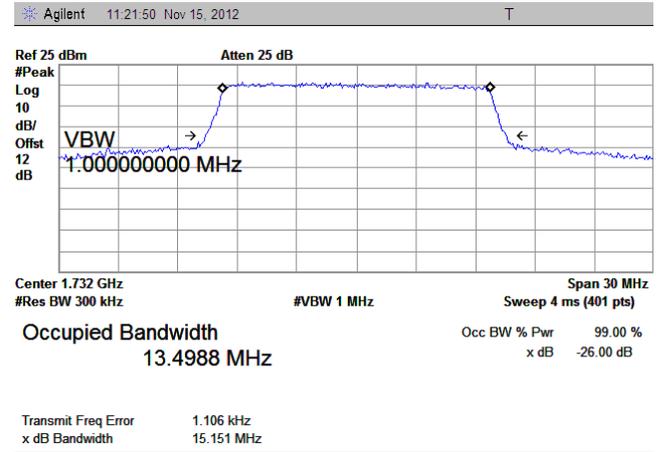


Spectrum Plot of Worst Value

15MHz/QPSK

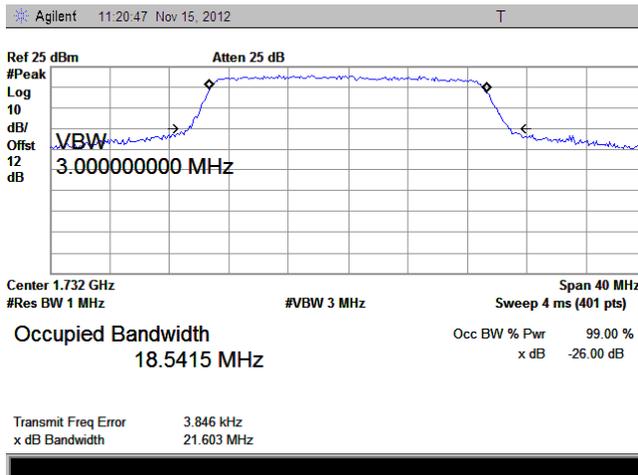


15MHz/16QAM

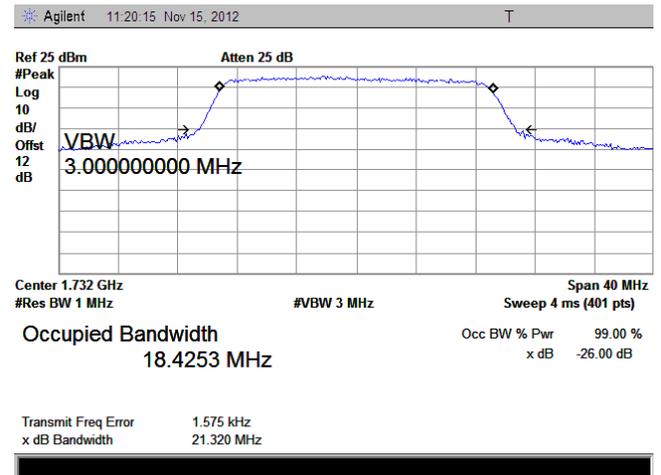


Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM



2.3 Frequency Stability

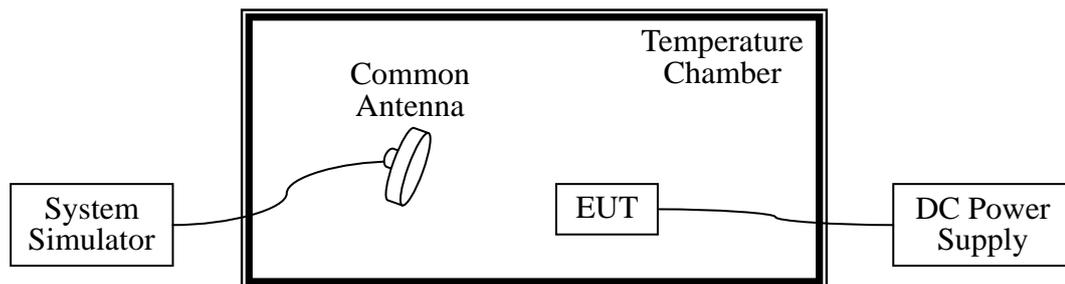
2.3.1 Requirement

According to FCC section 2.1055 and FCC section 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -30°C to $+50^{\circ}\text{C}$ at intervals of not more than 10°C .
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.3.2 Test Description

1. Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power. A call is established between the EUT and the SS via a Common Antenna.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde& Schwarz	CMW500	1201.0002k5 0/124534/wk	2012.05	2013.05
DC Power Supply	Good Will	GPS-3030DD	EF920938	2012.05	2013.05
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2012.05	2013.05

2.3.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 4.2VDC, 4.8VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 20°C . The frequency deviation limit is $\pm 2.5\text{ppm}$.

The testing was performed using one RB and Bandwidth setting for each band.

LTE Band 17 – QPSK - Channel 23790 – Frequency 710MHz – RB 25/0				
Limit: 710MHz*2.5ppm=1775Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	5.0	-30	N/A	PASS
100		-20	N/A	
100		-10	-5.79	
100		0	-4.58	
100		+10	-4.21	
100		+20	5.35	
100		+30	-5.31	
100		+40	5.60	
100		+45	-6.08	
115		5.75	+20	
85	4.25	+20	-5.49	

LTE Band 4 – QPSK - Channel 20175 – Frequency 1732.5MHz – RB 6/0				
Limit: 1732.5MHz*2.5ppm=4331.25Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	5	-30	N/A	PASS
100		-20	N/A	
100		-10	10.70	
100		0	11.64	
100		+10	11.46	
100		+20	9.38	
100		+30	-10.99	
100		+40	10.80	
100		+45	12.72	
115		5.75	+20	
85	4.25	+20	12.62	

Note: The manufacturer's recommended operating temperature range is -10°C to +45°C.

2.4 Peak to Average Ratio

2.4.1 Requirement

According to FCC section 27.50(d) (5), the peak to average ratio (PAR) of the transmission may not exceed 13dB.

2.4.2 Test Description

See section 2.1.2 of this report.

2.4.3 Test Result

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

LTE Band 4:

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	5.97	6.50	20175	1732.5	6.44	6.47
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	6.46	6.53	20175	1732.5	6.39	6.54
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	6.46	6.48	20175	1732.5	6.50	6.49

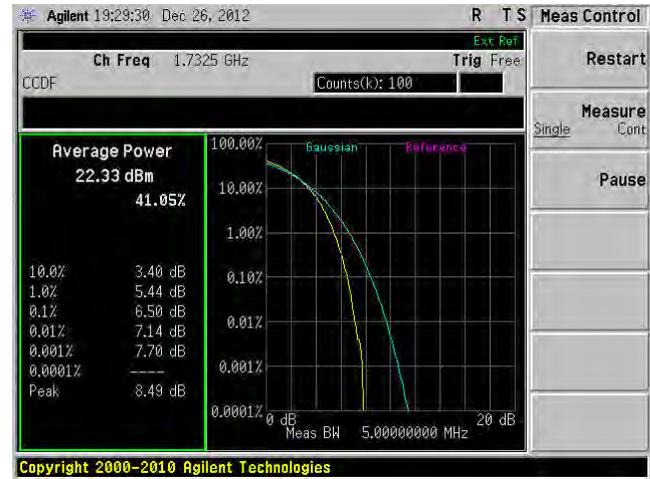


Spectrum Plot of Worst Value

1.4MHz/QPSK



1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK



3MHz/16QAM



Spectrum Plot of Worst Value

5MHz/QPSK



5MHz/16QAM



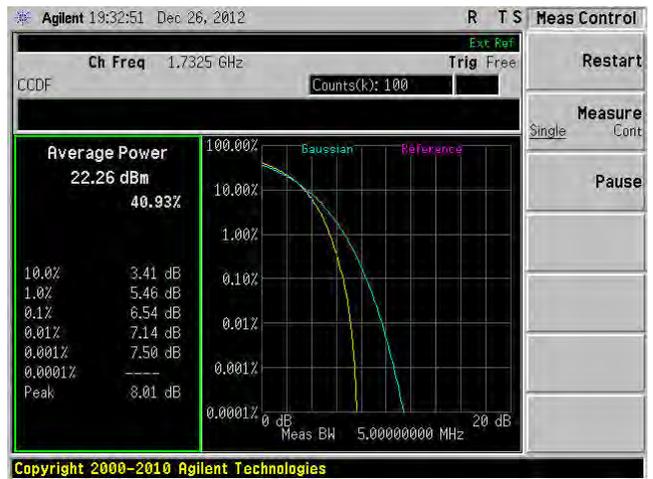
Spectrum Plot of Worst Value



10MHz/QPSK



10MHz/16QAM



Spectrum Plot of Worst Value

15MHz/QPSK

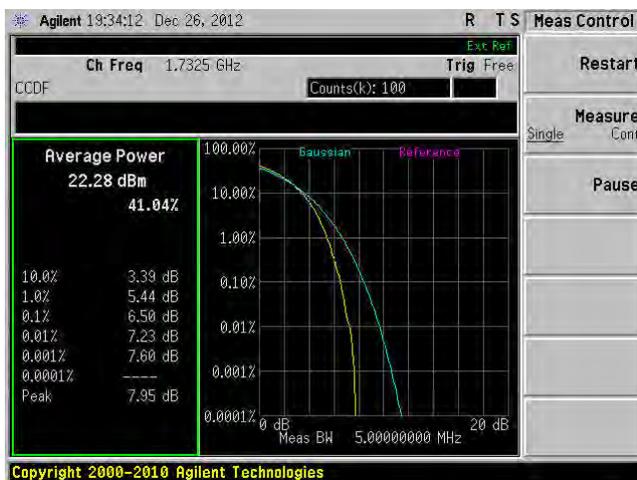


15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM





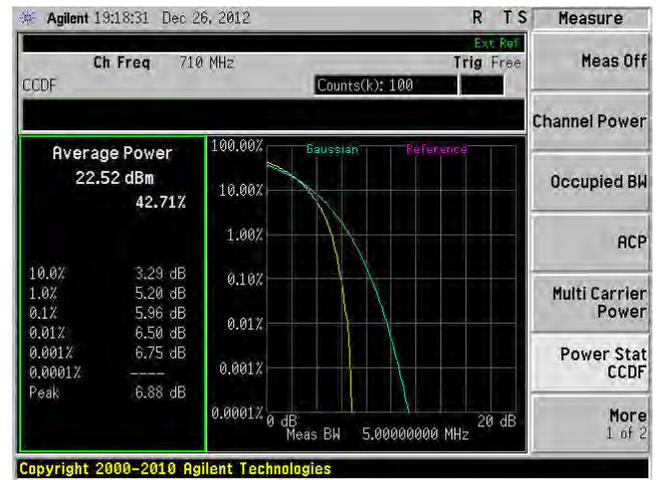
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23790	710.0	5.94	5.96	23790	710.0	5.98	6.01

Spectrum Plot of Worst Value

5MHz/QPSK



5MHz/16QAM

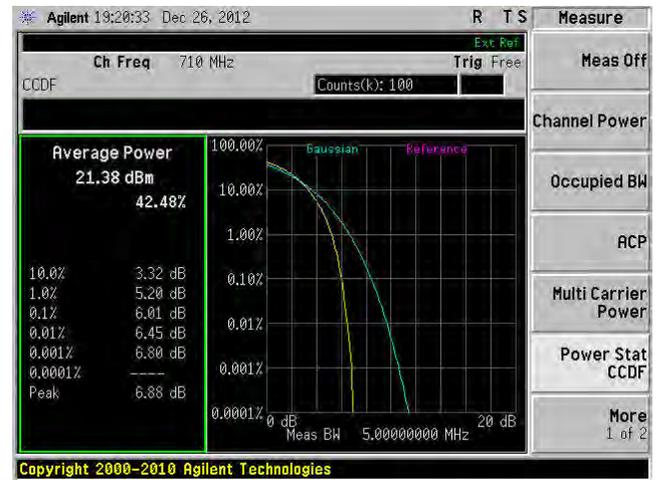


Spectrum Plot of Worst Value

10MHz/QPSK



10MHz/16QAM



2.5 Conducted Spurious Emissions

2.5.1 Test Requirement

According to FCC section 2.1051 and 27.53(g)(h), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43+10*\log(P)$ dB. This calculated to be -13dBm.

2.5.2 Test Procedure

See section 2.1.2 of this report.

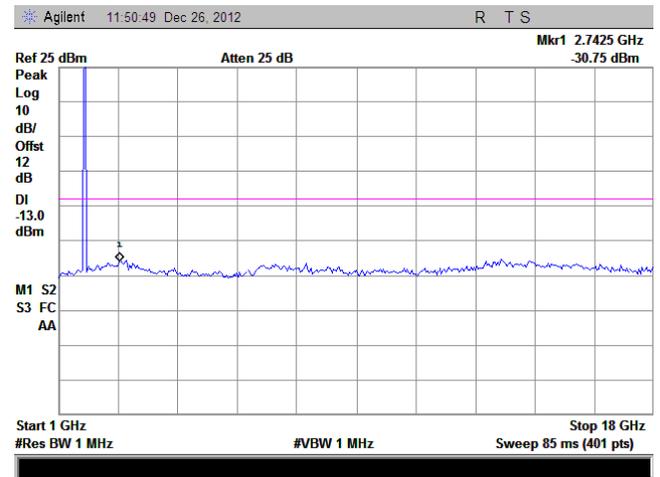
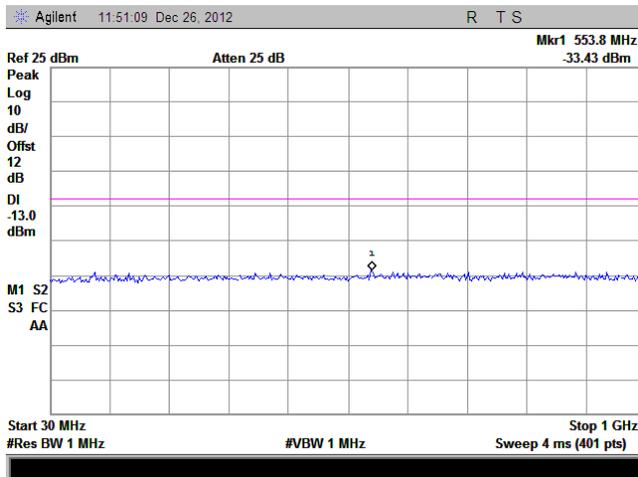
Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

2.5.3 Test Result

Compliant. See attached pots.

LTE Band 4 1.4MHz BW, Mid Channel

QPSK

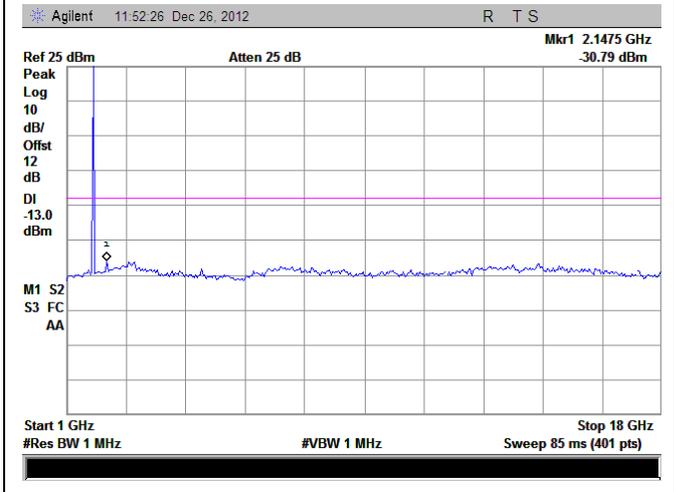
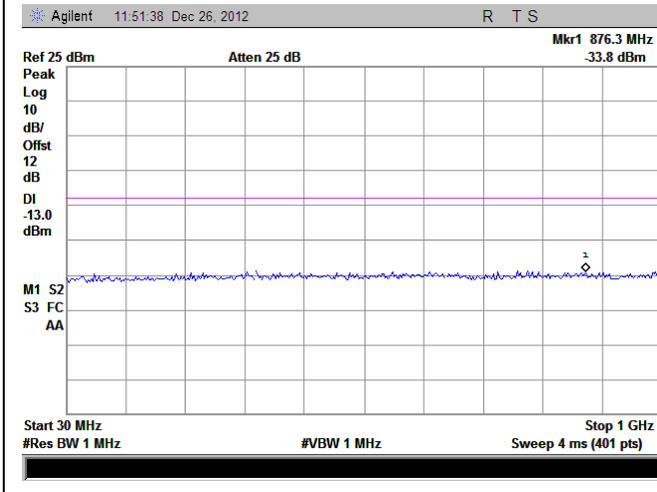


16QAM



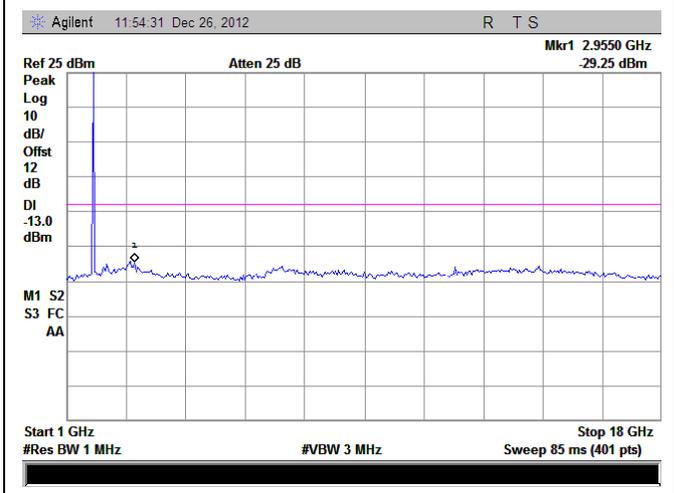
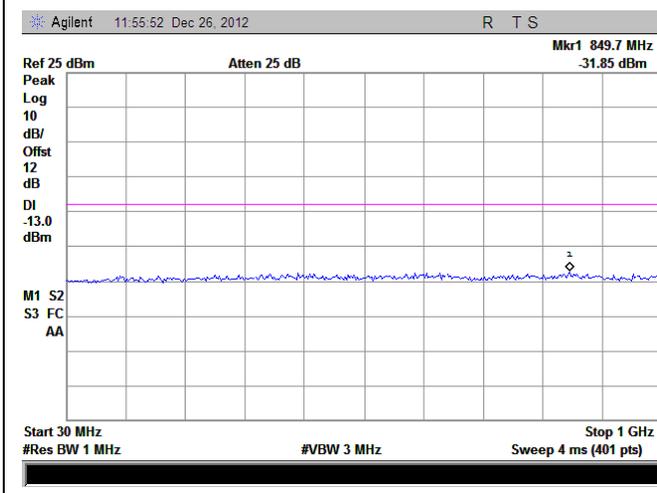
LTE Band 4 1.4MHz BW, Mid Channel

QPSK

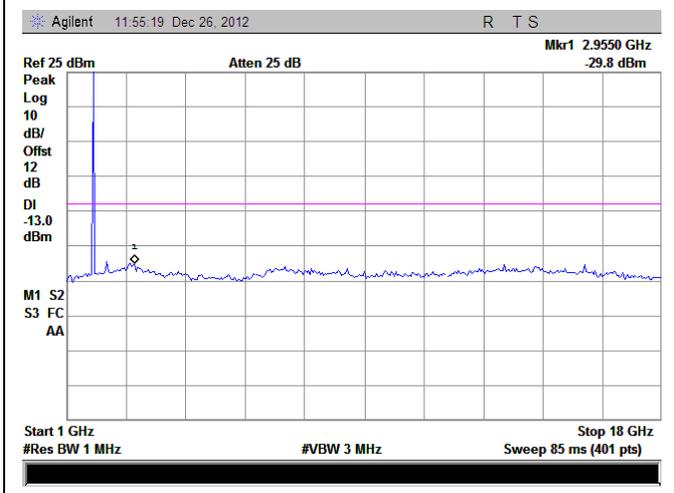
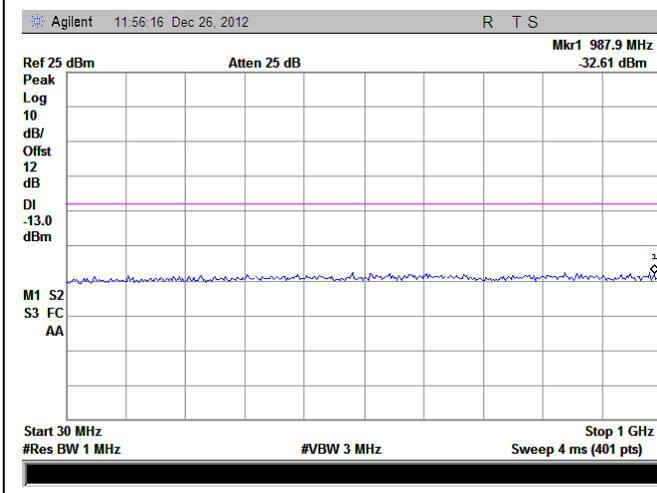


LTE Band 4 3MHz BW, Mid Channel

QPSK



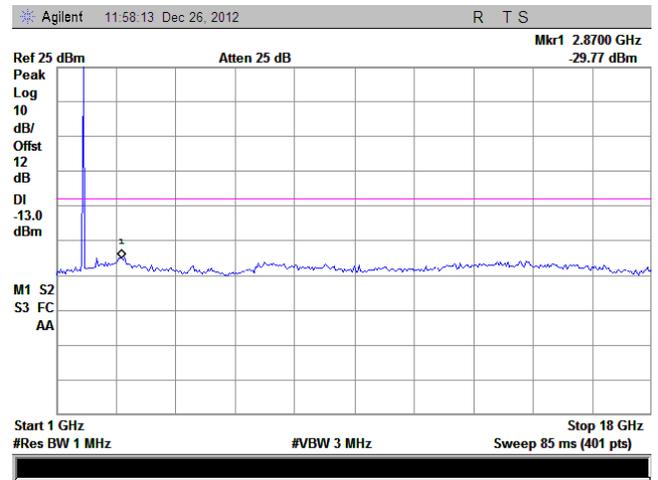
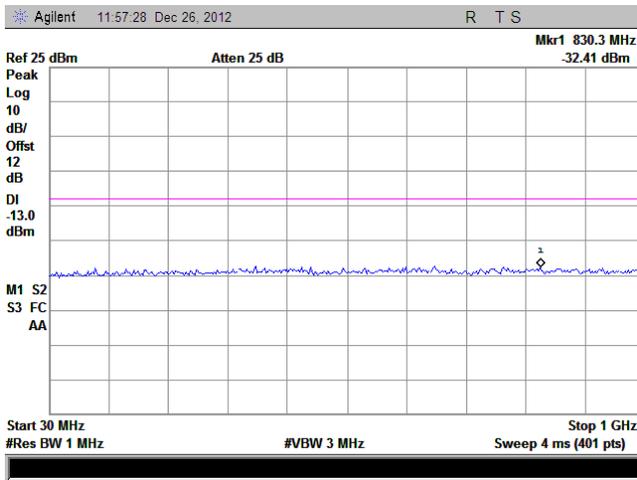
16QAM



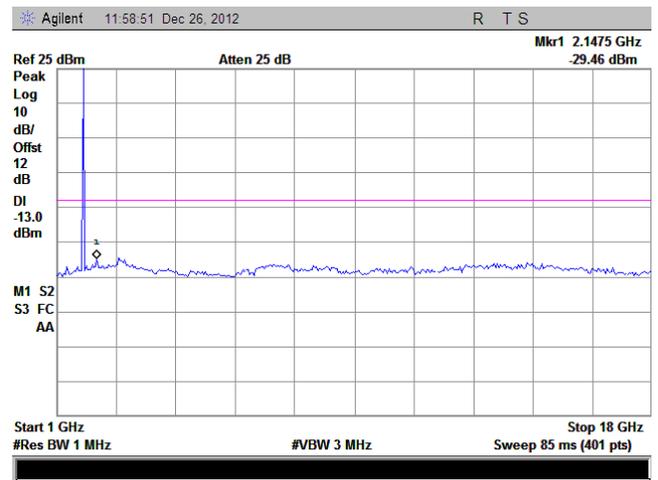
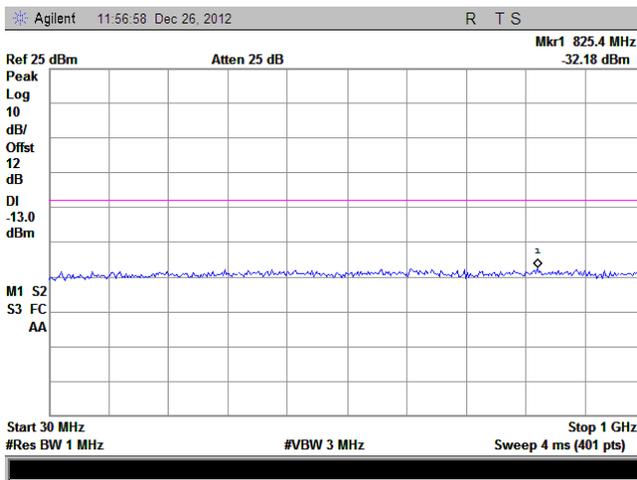


LTE Band 4 5MHz BW, Mid Channel

QPSK



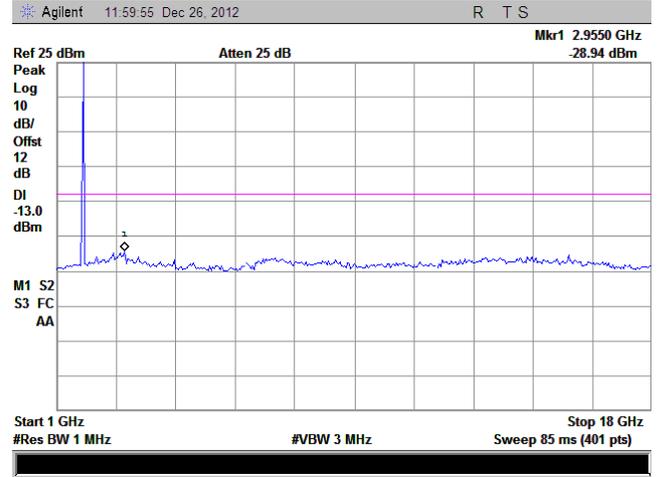
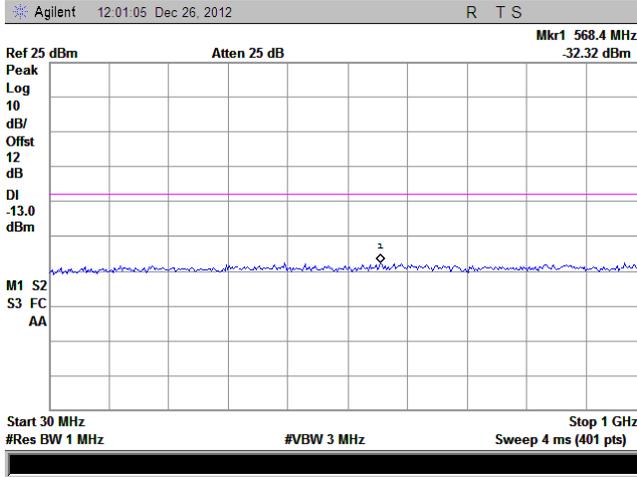
16QAM



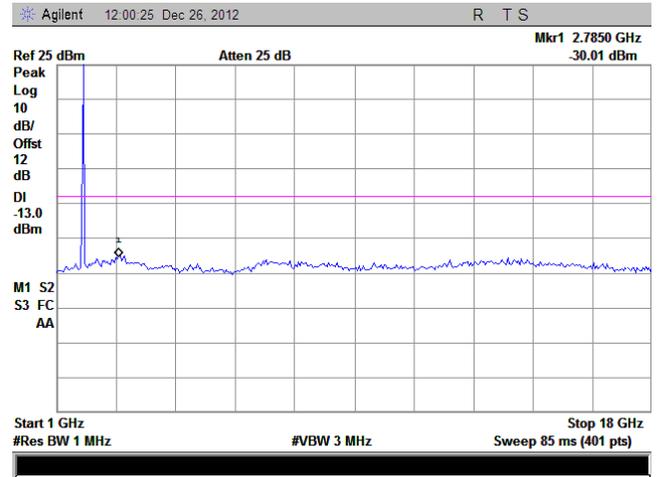
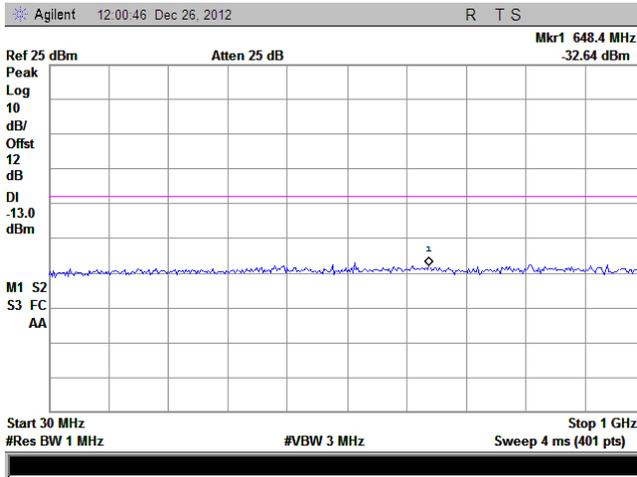


LTE Band 4 10MHz BW, Mid Channel

QPSK



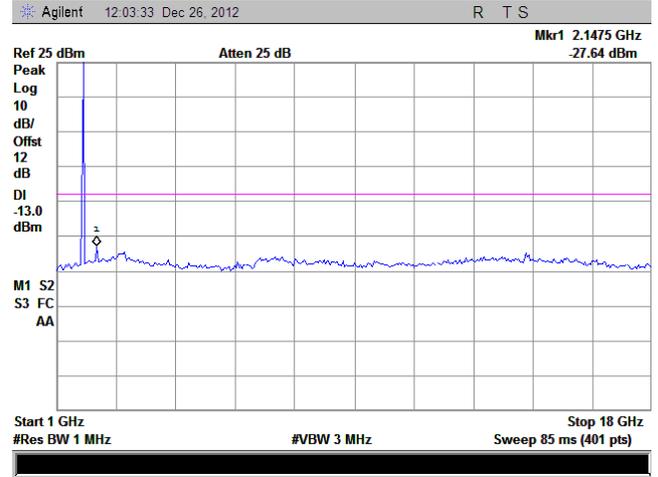
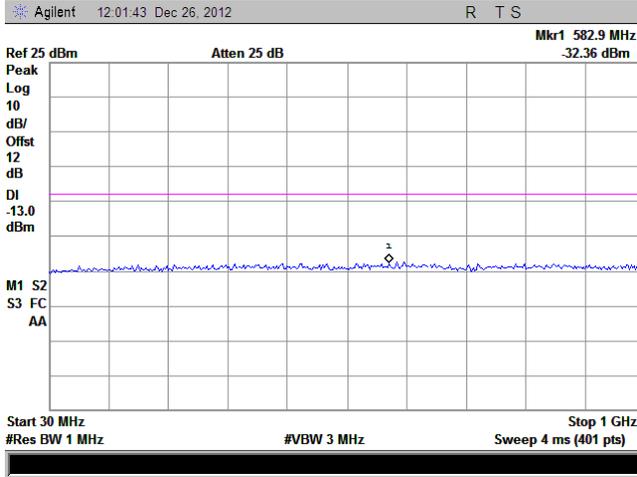
16QAM



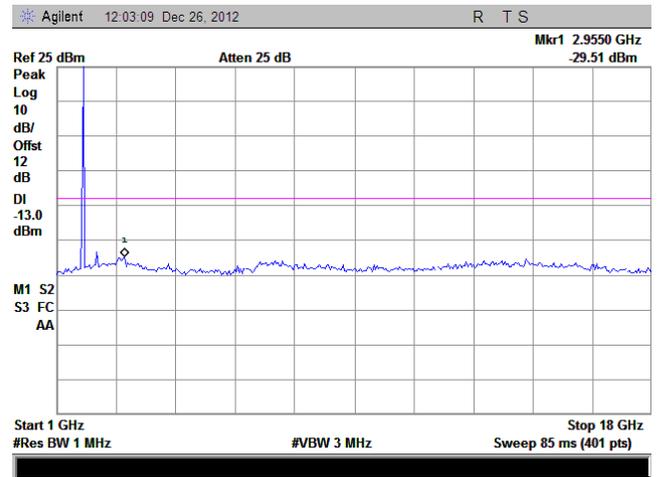
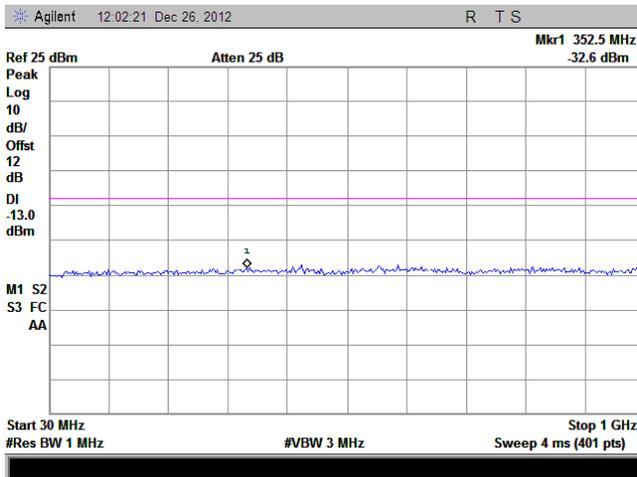


LTE Band 4 15MHz BW, Mid Channel

QPSK



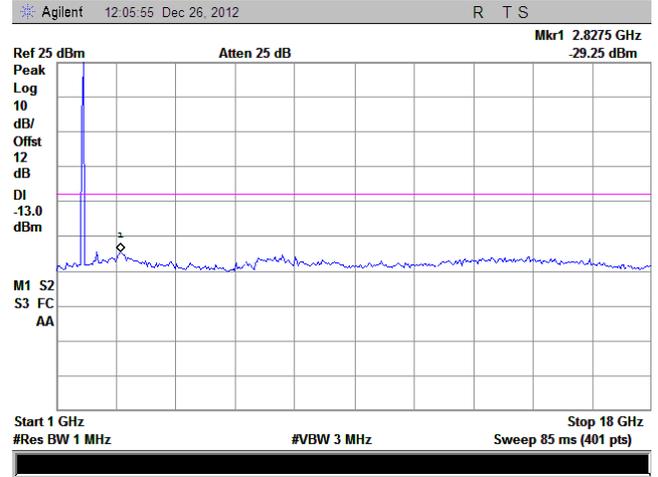
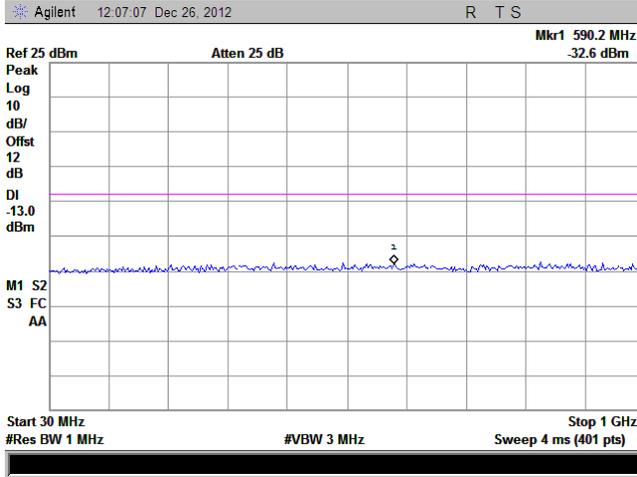
16QAM



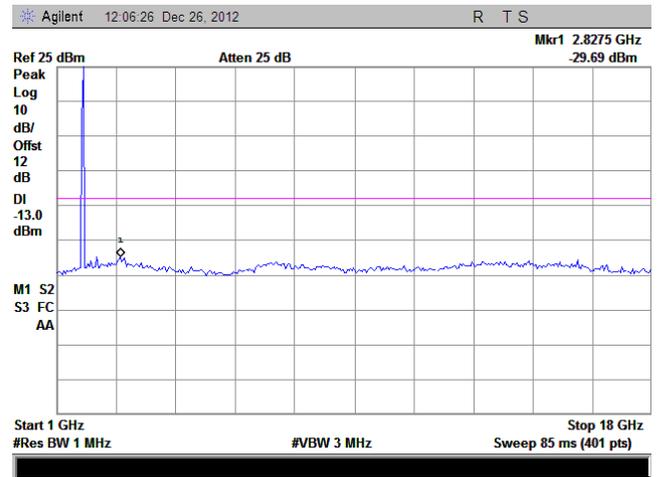
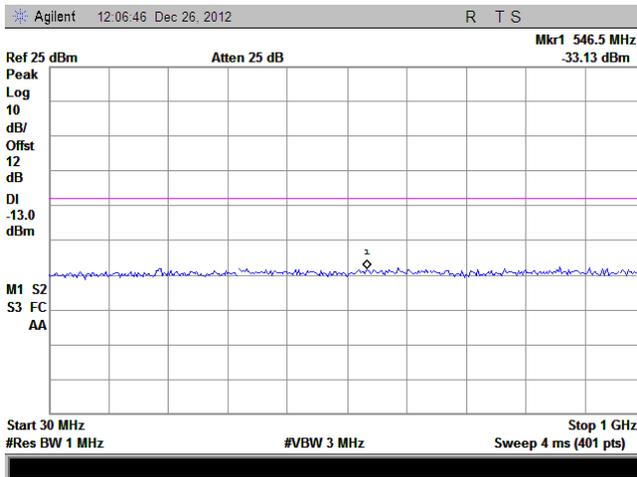


LTE Band 4 20MHz BW, Mid Channel

QPSK



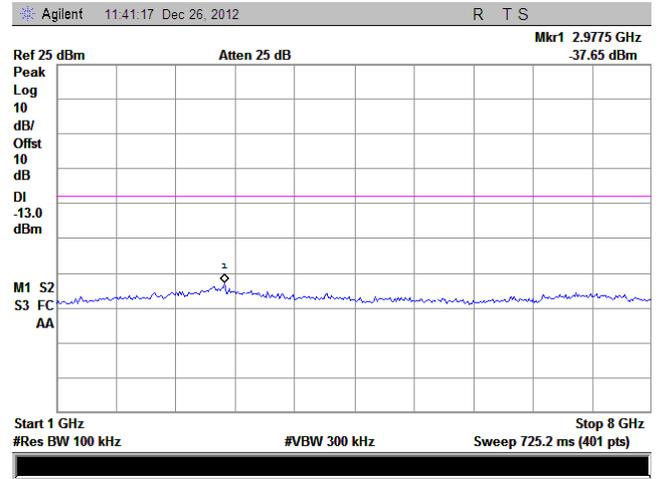
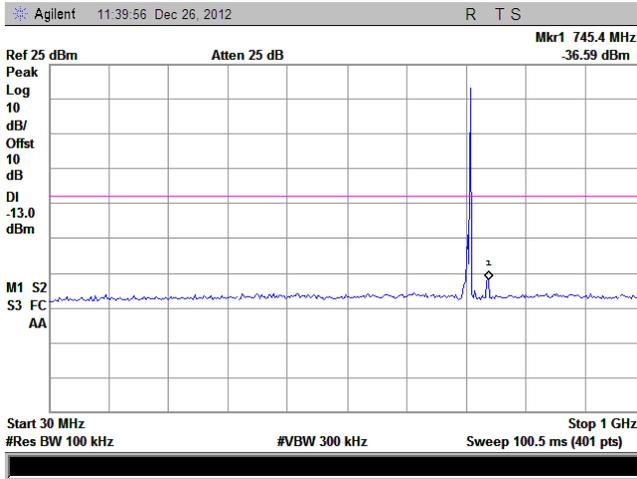
16QAM



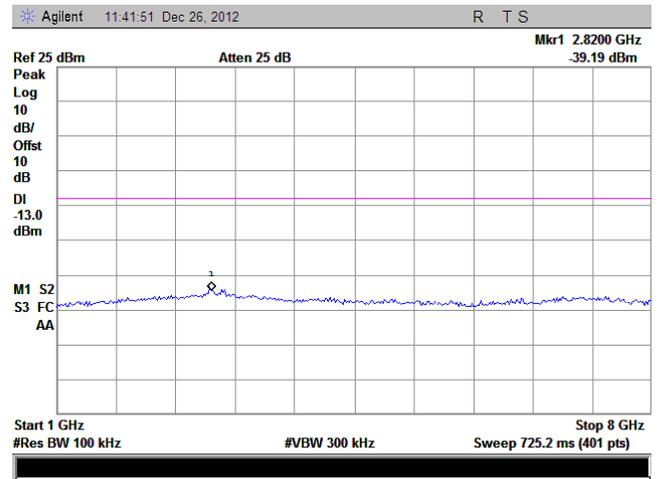
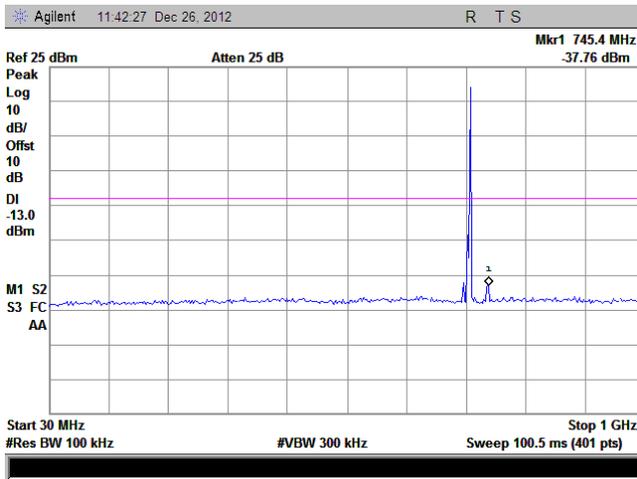


LTE Band 17 5MHz BW, Mid Channel

QPSK



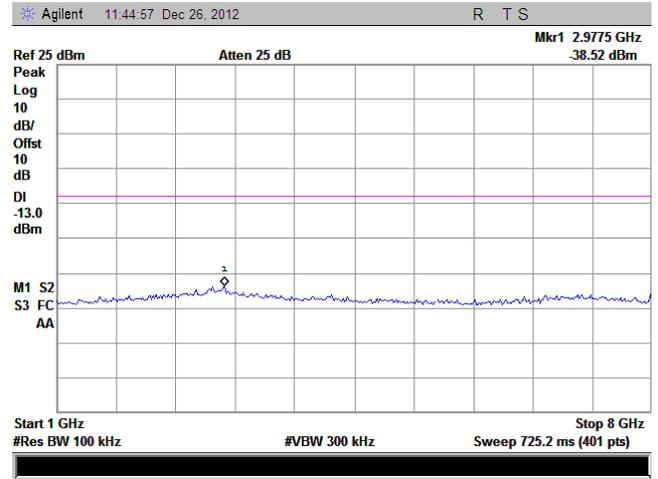
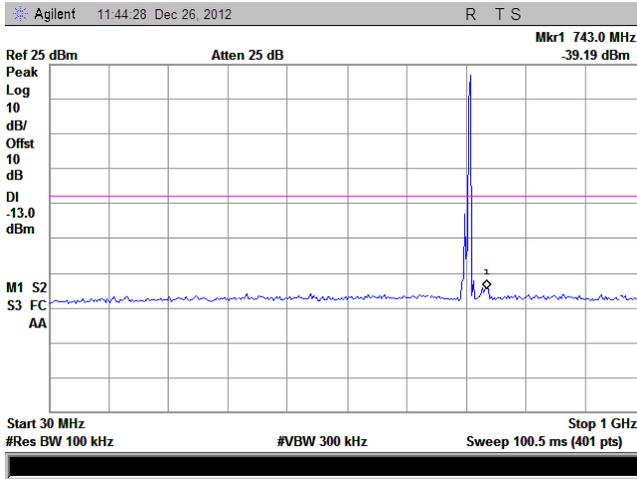
16QAM



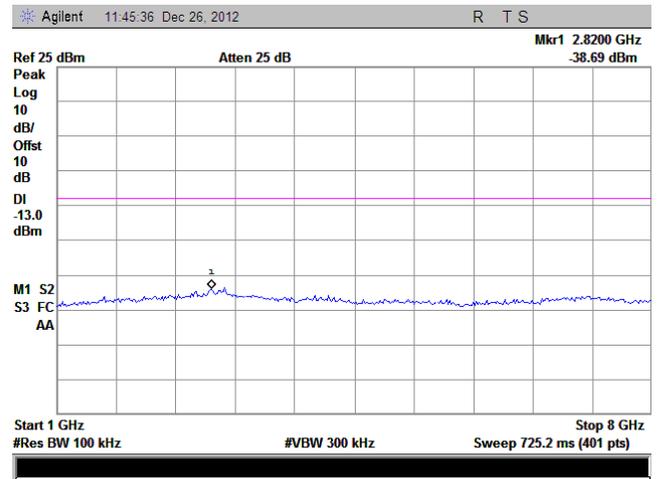
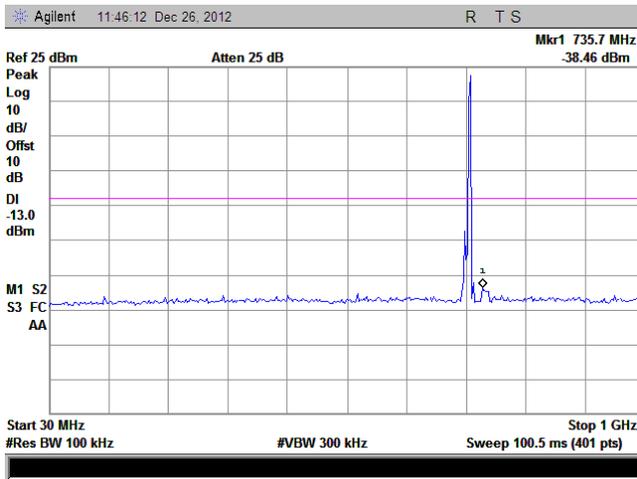


LTE Band 17 10MHz BW, Mid Channel

QPSK



16QAM



2.6 Band Edge

2.6.1 Requirement

According to FCC section 27.53(g) (h)

(g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

(h) For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

2.6.2 Test Description

See section 2.1.2 of this report.

2.6.3 Test Result

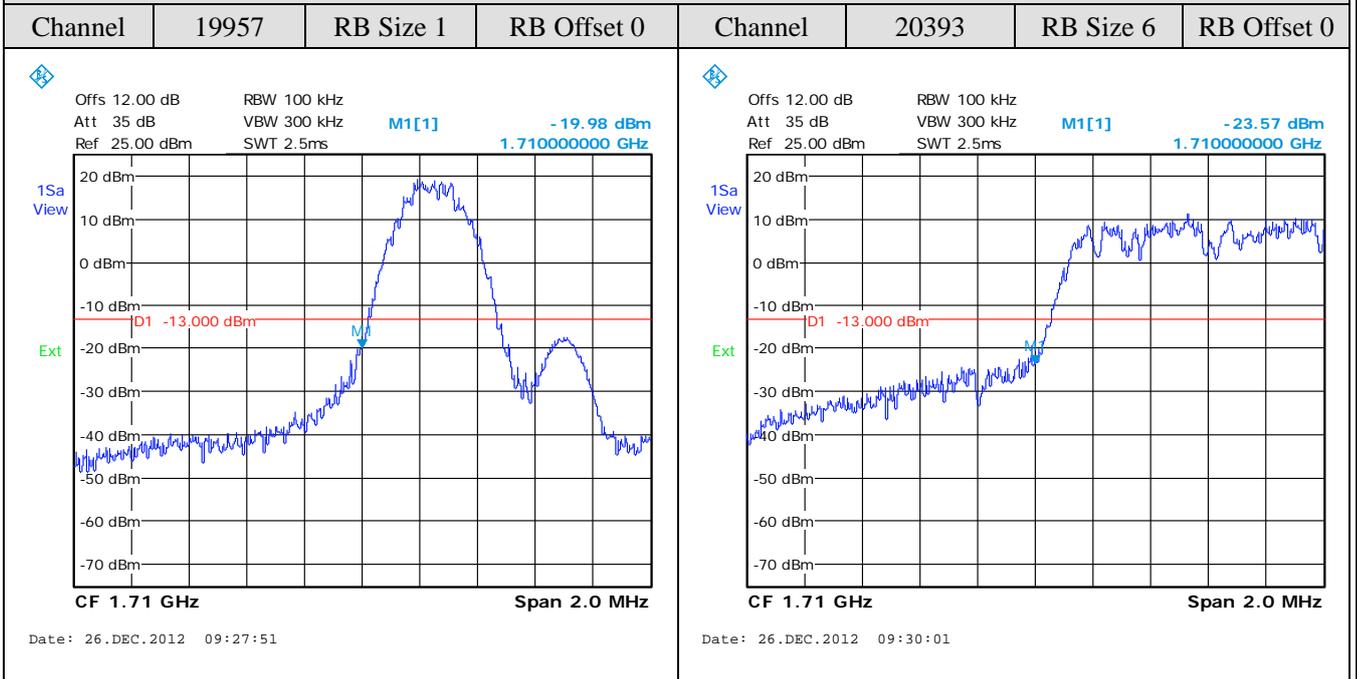
The center frequency of spectrum is the band edge frequency and span is 2MHz, Record the max trace into the test report.

PASS. See the attached plots.

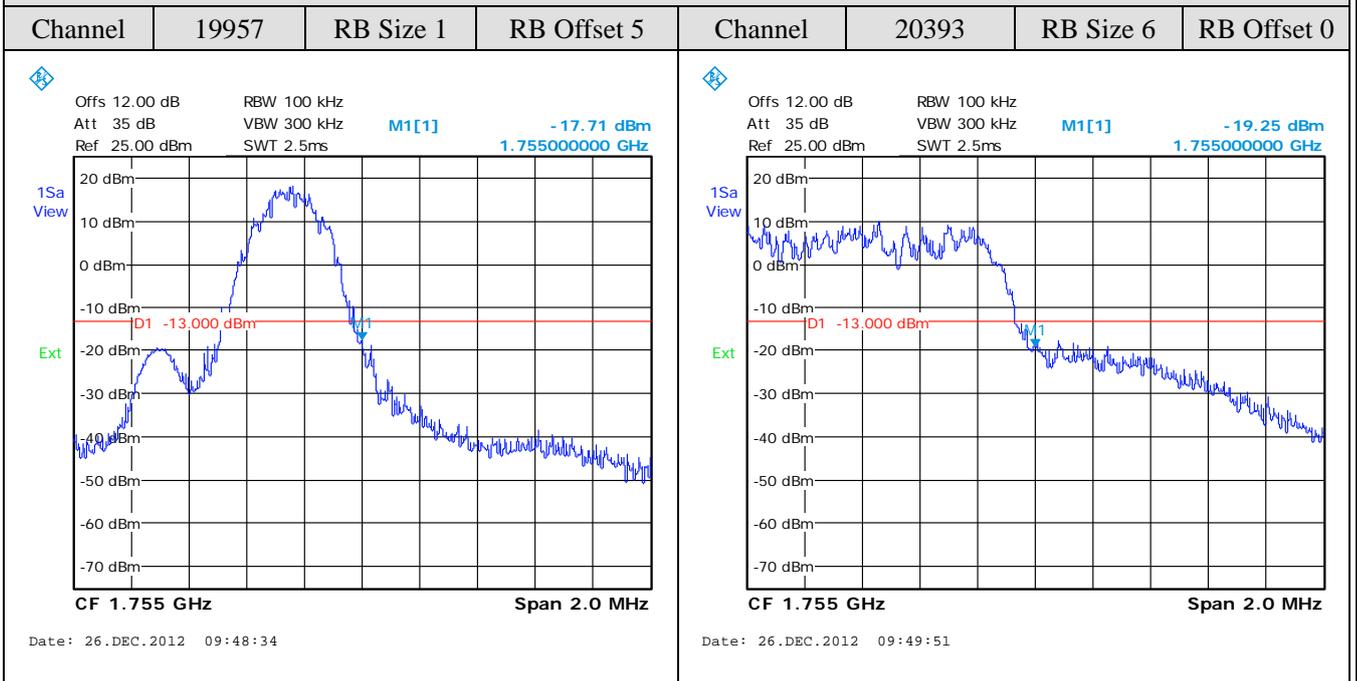
LTE Band 17:

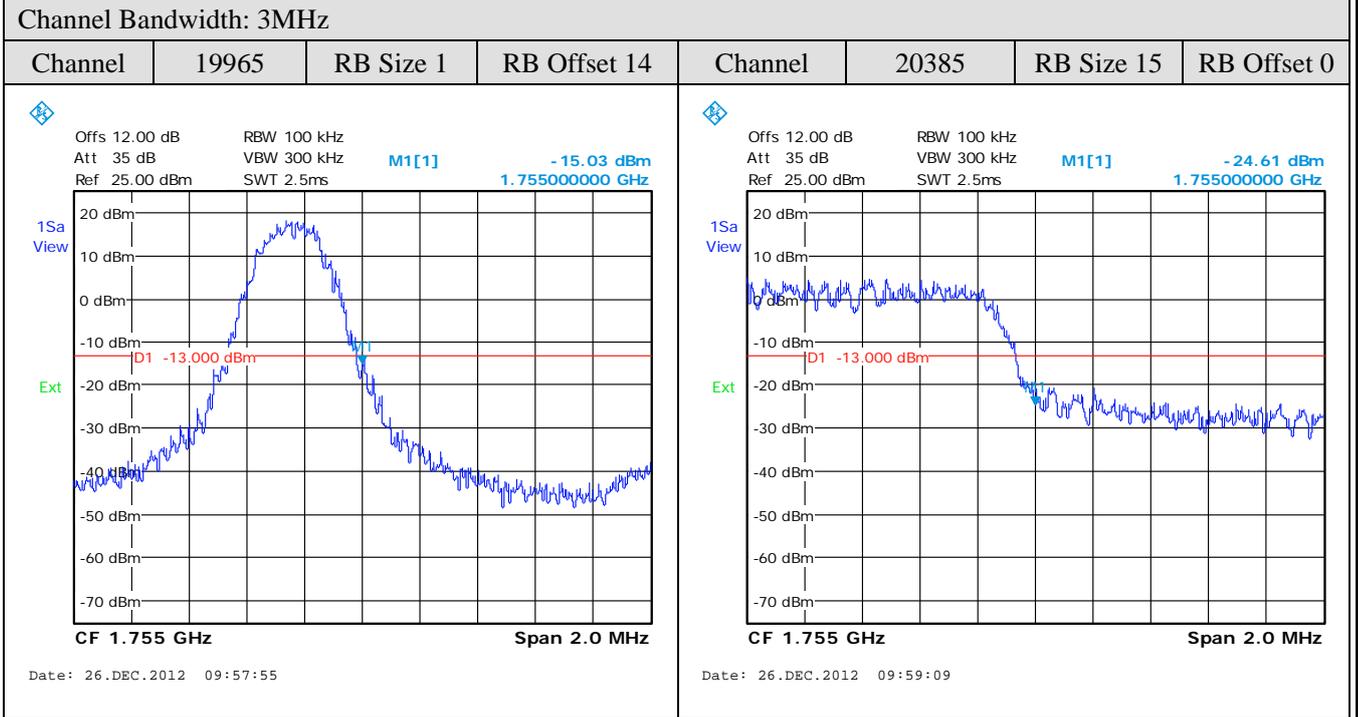
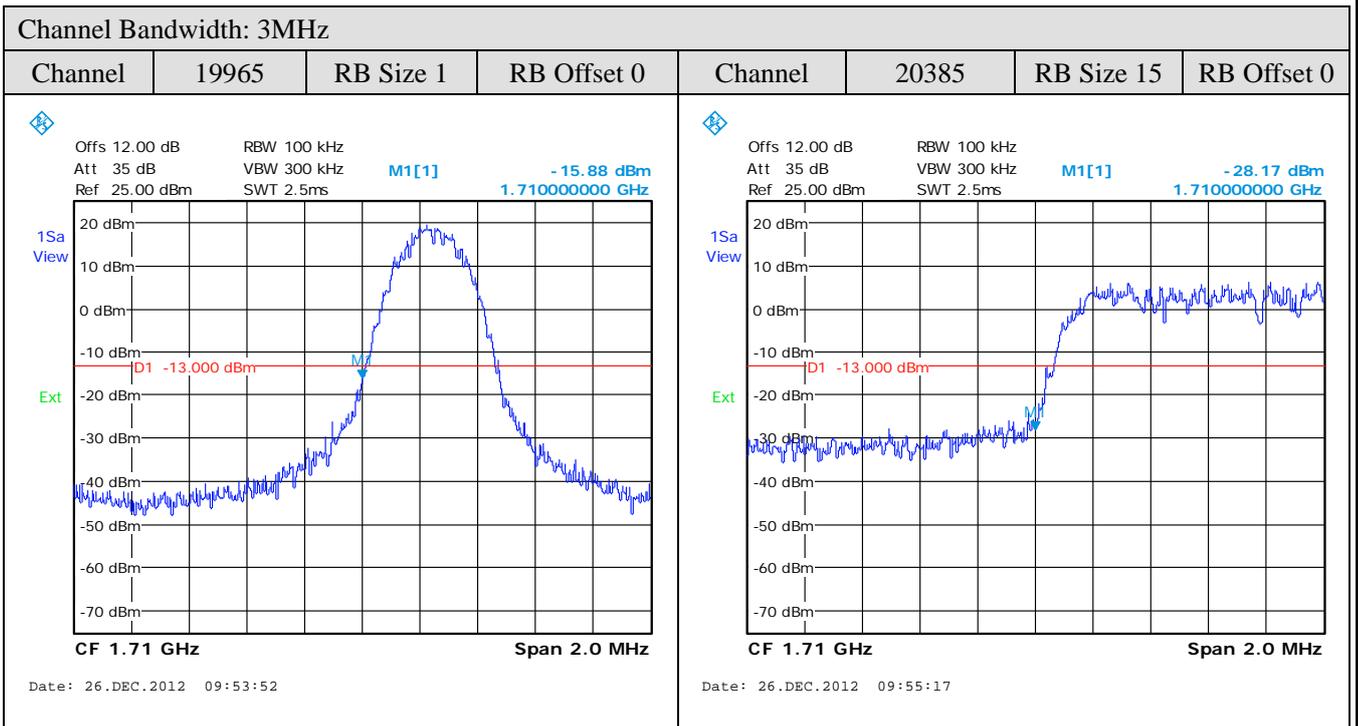
LTE Band 4:

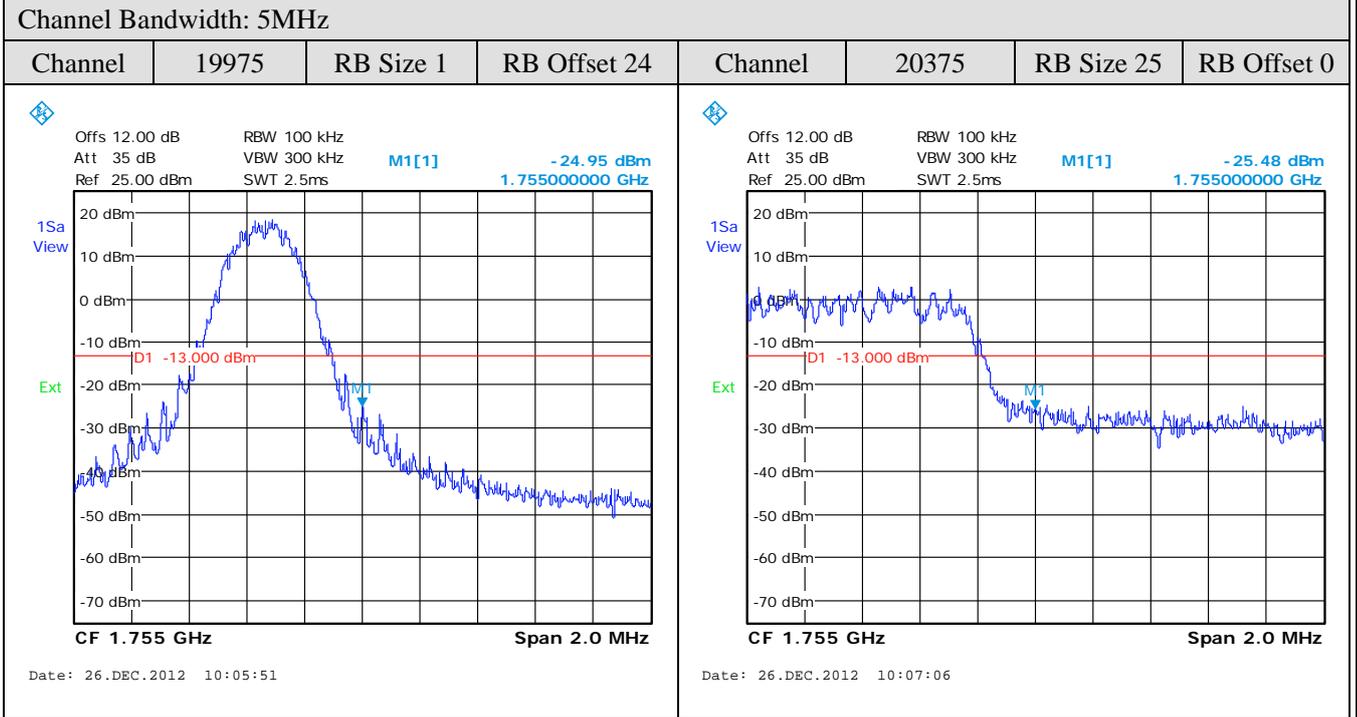
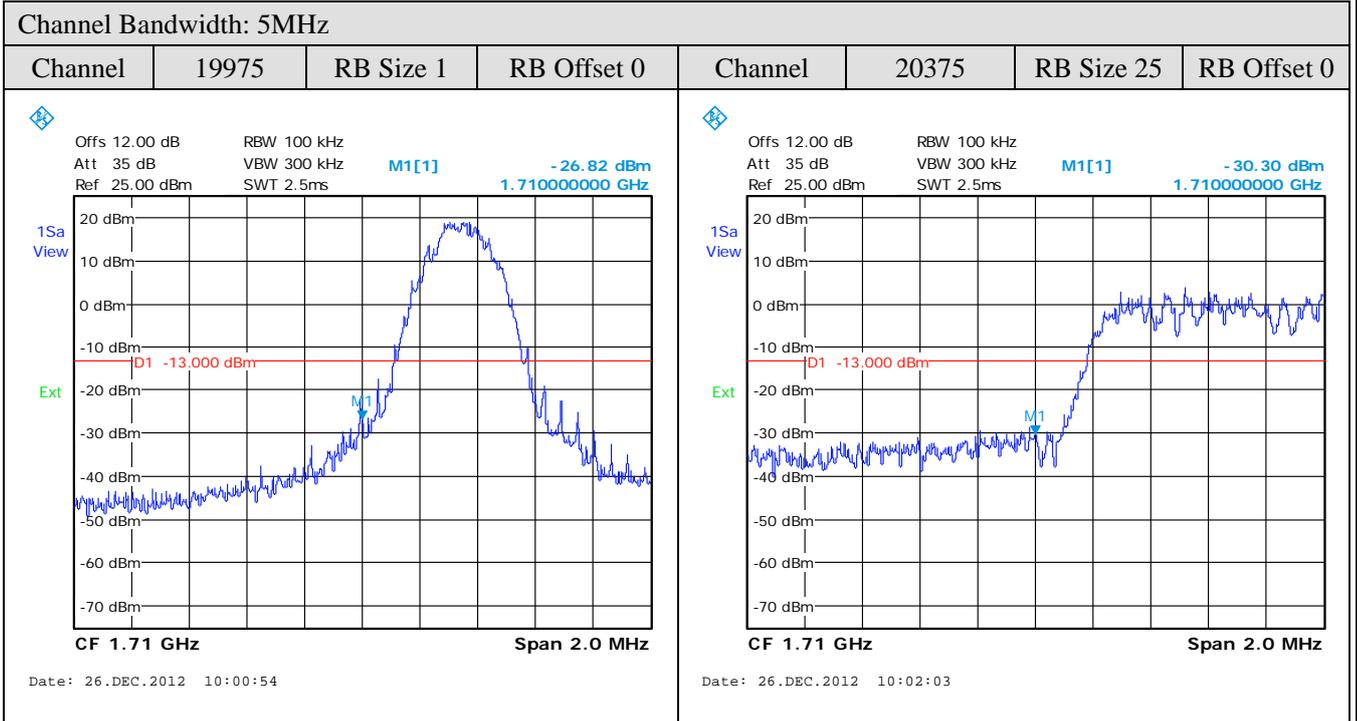
Channel Bandwidth: 1.4MHz

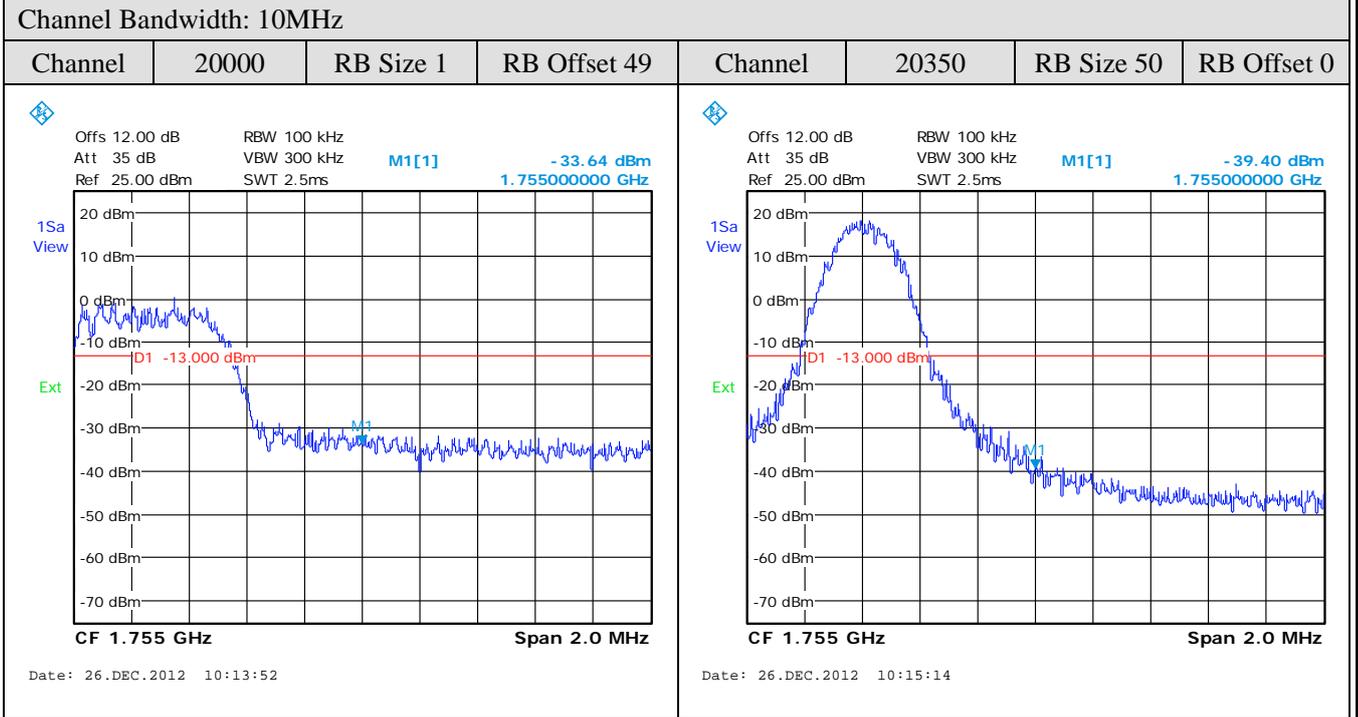
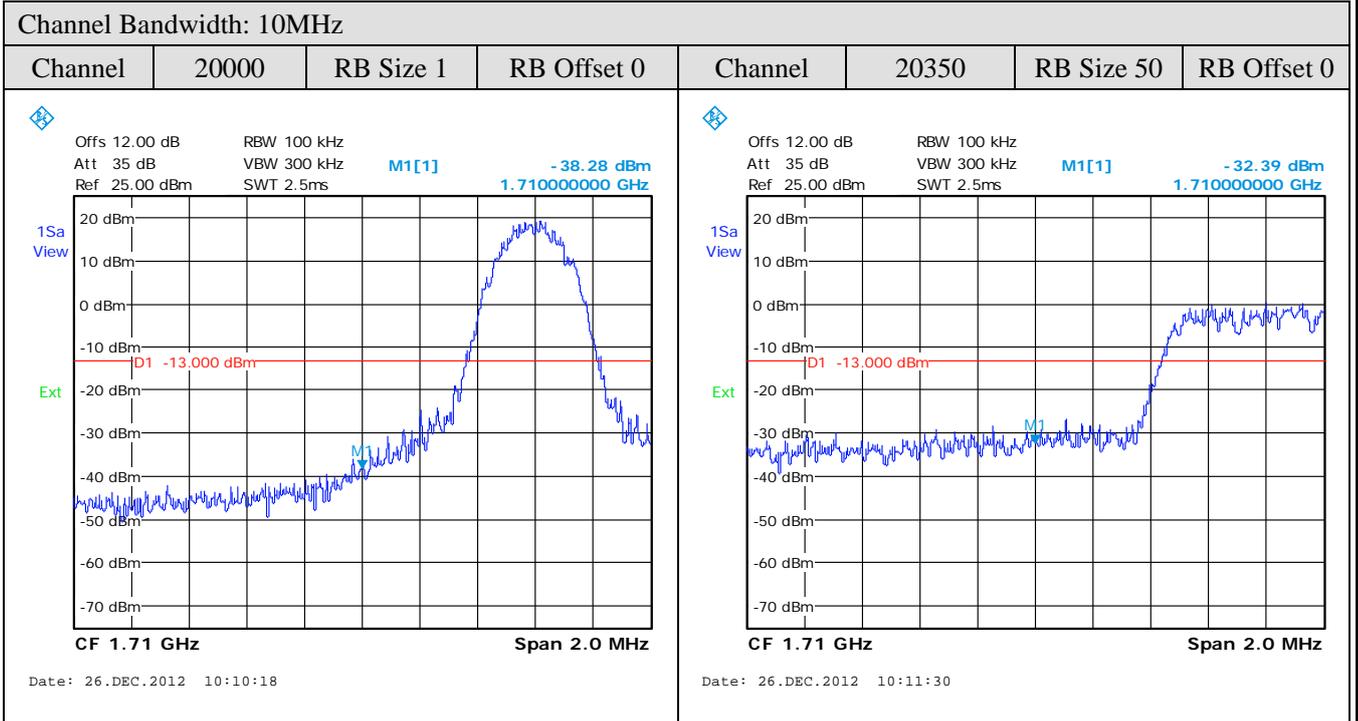


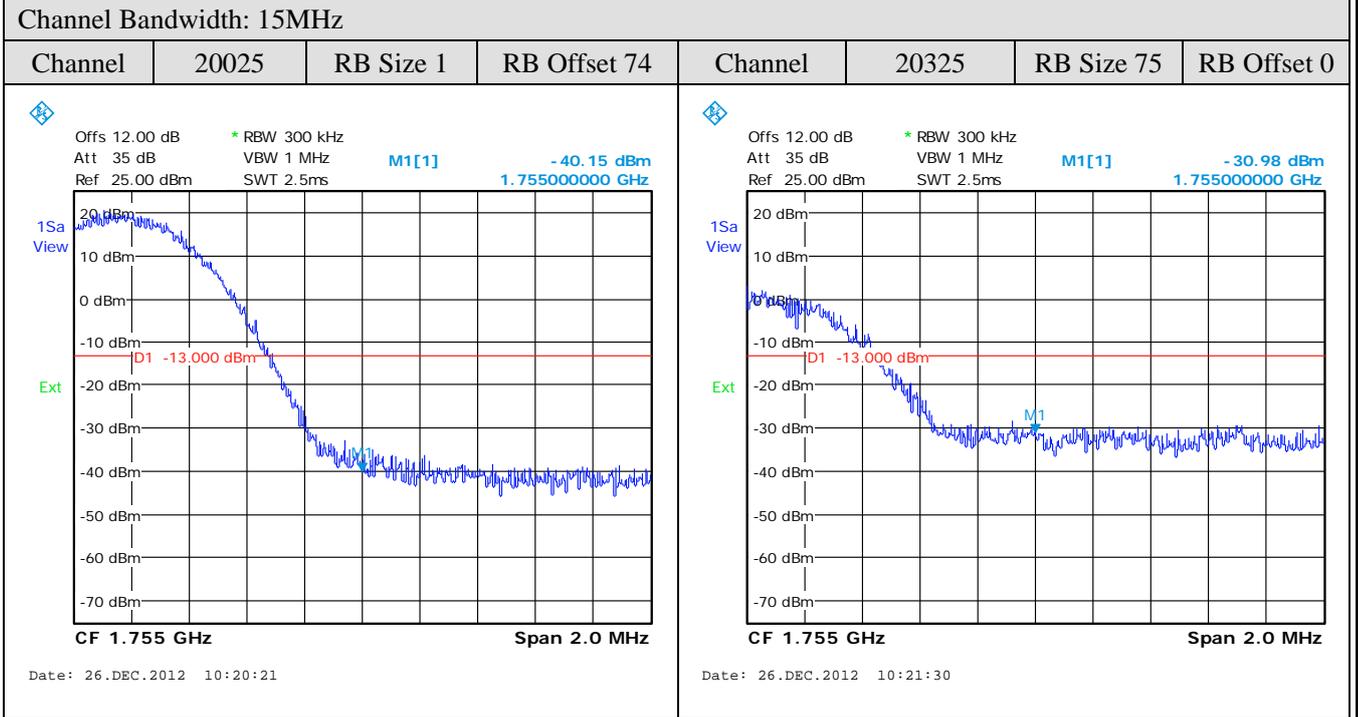
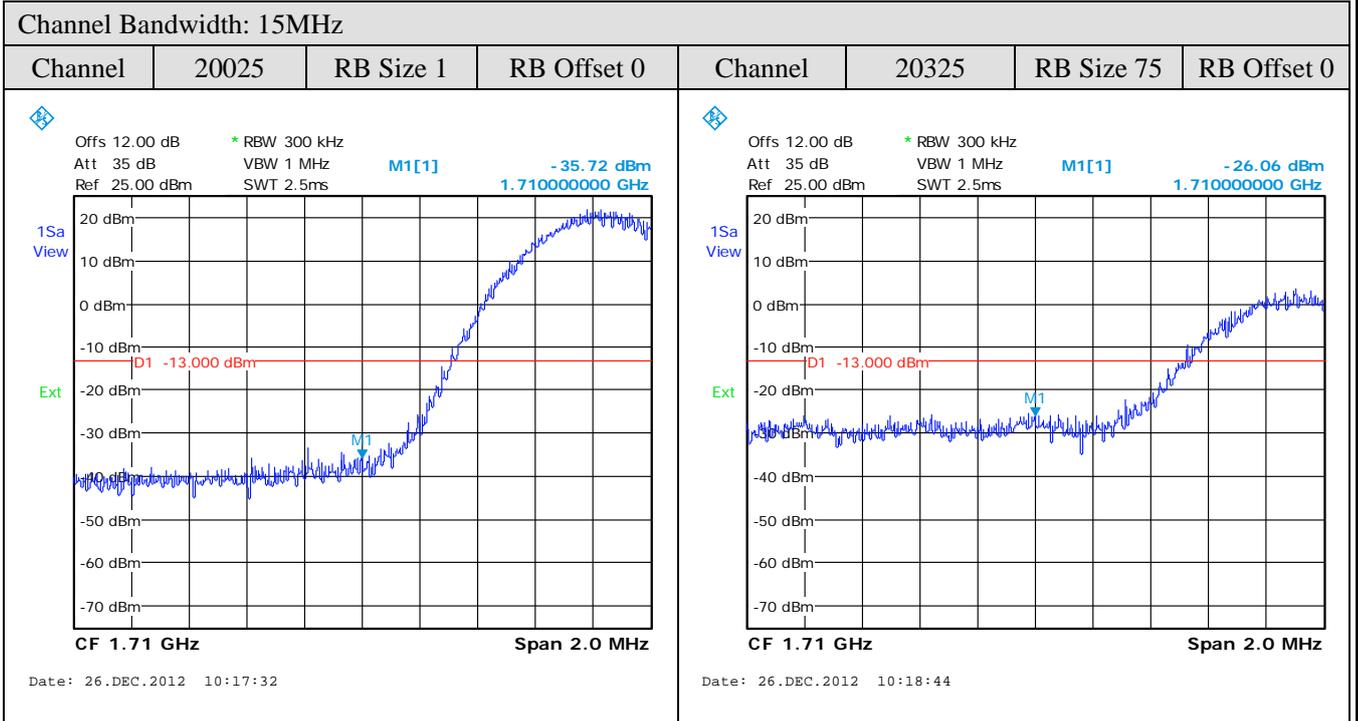
Channel Bandwidth: 1.4MHz











2.7 Transmitter Radiated Power (EIRP/ERP)

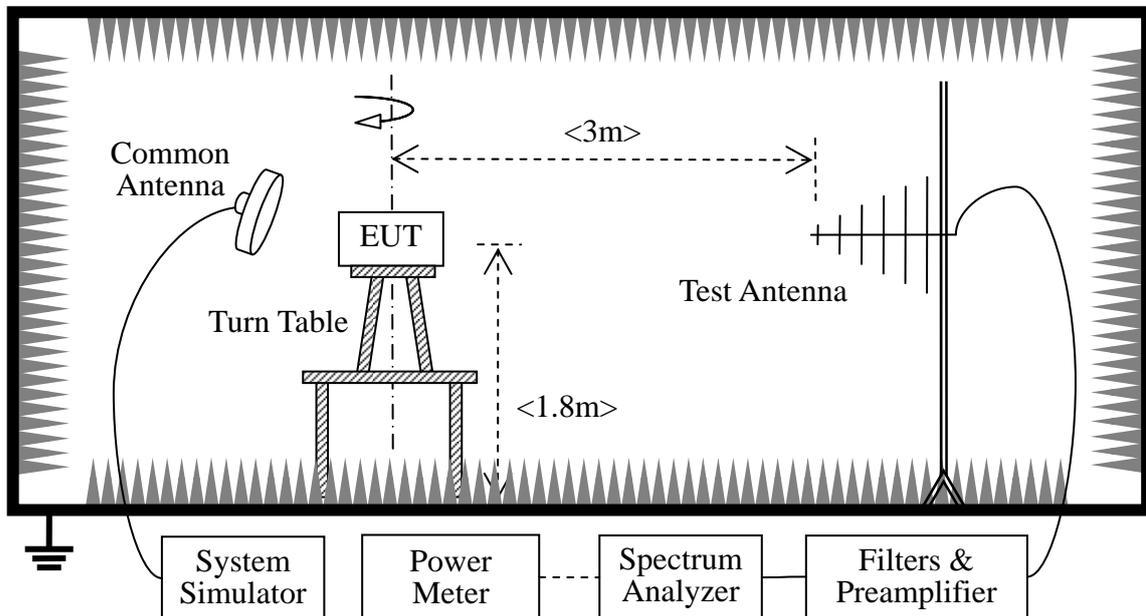
2.7.1 Requirement

According to FCC section 2.1046, 27.50 (d)(4), 27.50(c)(10)(11), fixed, mobile and portable (hand-held) stations in the 1710-1755MHz band are limited to 1wat EIRP.

Portable stations (hand-held devices) operating in the 704-716MHz band are limited to 3watts ERP.

2.7.2 Test Description

1. Test Setup:



The EUT, which is powered by the PC, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) or a Horn one (used for above 3GHz), and it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde&	CMW500	1201.0002k50	2012.05	2013.05

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
	Schwarz		/124534/wk		
Spectrum Analyzer	Rohde& Schwarz	FSL	10246	2012.05	2013.05
Spectrum Analyzer	Agilent	E4445A	MY44200685	2012.05	2013.05
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05	2013.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2012.05	2013.05
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2012.05	2013.05

2.7.3 Test Result

The EUT was verified under all configurations (RB size and offset) and the worst case radiated power reported for each modulation/channel bandwidth.

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST_TX}} - P_{\text{SUBST_RX}} - L_{\text{SUBST_CABLES}} + G_{\text{SUBST_TX_ANT}}$$

$$A_{\text{TOT}} = L_{\text{CABLES}} + A_{\text{SUBST}}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain.

$P_{\text{SUBST_TX}}$ is signal generator level,

$P_{\text{SUBST_RX}}$ is receiver level,

$L_{\text{SUBST_CABLES}}$ is cable losses including TX cable,

$G_{\text{SUBST_TX_ANT}}$ is substitution antenna gain.

A_{TOT} is total correction factor including cable loss and substitution correction

During the test, the data of A_{TOT} was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of A_{TOT} .

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		ERP (dBm)
					RB Size	RB Offset	
LTE Band 4	20MHz	L 20050	1720	QPSK	1	99	18.43
				16-QAM	1	99	19.24
		M 20175	1732.5	QPSK	1	0	18.46
				16-QAM	1	0	20.13
		H 20300	1745	QPSK	1	0	20.04
				16-QAM	1	99	19.79
	15MHz	L 20025	1717.5	QPSK	1	74	21.43
				16-QAM	1	74	21.04
		M 20175	1732.5	QPSK	1	74	18.46
				16-QAM	1	0	19.76
		H 20325	1747.5	QPSK	1	0	18.99
				16-QAM	1	74	19.99
	10MHz	L 20000	1715	QPSK	1	0	18.94
				16-QAM	1	49	19.21
		M 20175	1732.5	QPSK	1	49	18.12
				16-QAM	1	49	18.19
		H 20350	1750	QPSK	1	0	17.96
				16-QAM	1	0	18.56
	5MHz	L 19975	1712.5	QPSK	1	0	19.23
				16-QAM	1	24	19.67
		M 20175	1732.5	QPSK	1	0	18.17
				16-QAM	1	24	18.36
		H 20375	1752.5	QPSK	1	24	19.86
				16-QAM	1	24	19.68
	3MHz	L 19965	1711.5	QPSK	1	14	18.97
				16-QAM	1	14	19.72
		M 20175	1732.5	QPSK	1	0	18.73
				16-QAM	1	0	19.76
		H 20385	1753.5	QPSK	1	0	18.94
				16-QAM	1	0	18.37
1.4MHz	L 19957	1710.7	QPSK	1	5	18.79	
			16-QAM	1	5	19.27	
	M 20175	1732.5	QPSK	1	0	19.52	
			16-QAM	1	0	19.19	
	H 20393	1754.5	QPSK	3	2	19.71	
			16-QAM	1	5	18.76	



Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		ERP (dBm)
					RB Size	RB Offset	
LTE Band 17	10MHz	L 23780	709	QPSK	1	0	18.46
				16-QAM	1	0	18.97
		M 23790	710	QPSK	1	49	19.23
				16-QAM	1	49	19.76
		H 23800	711	QPSK	1	0	20.18
				16-QAM	1	0	18.67
	5MHz	L 23755	706.5	QPSK	1	24	18.43
				16-QAM	1	0	19.26
		M 23790	710	QPSK	1	24	19.77
				16-QAM	1	24	19.43
		H 23825	713.5	QPSK	1	0	19.47
				16-QAM	1	0	19.76

2.8 Radiated Spurious Emissions

2.8.1 Requirement

According to FCC section 2.1053 and section 27.53(g)(h), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43+10*\log(P)$ dB. This calculated to be -13dBm.

2.8.2 Test Description

See section 2.7.2 of this report.

Note: when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

2.8.3 Test Result

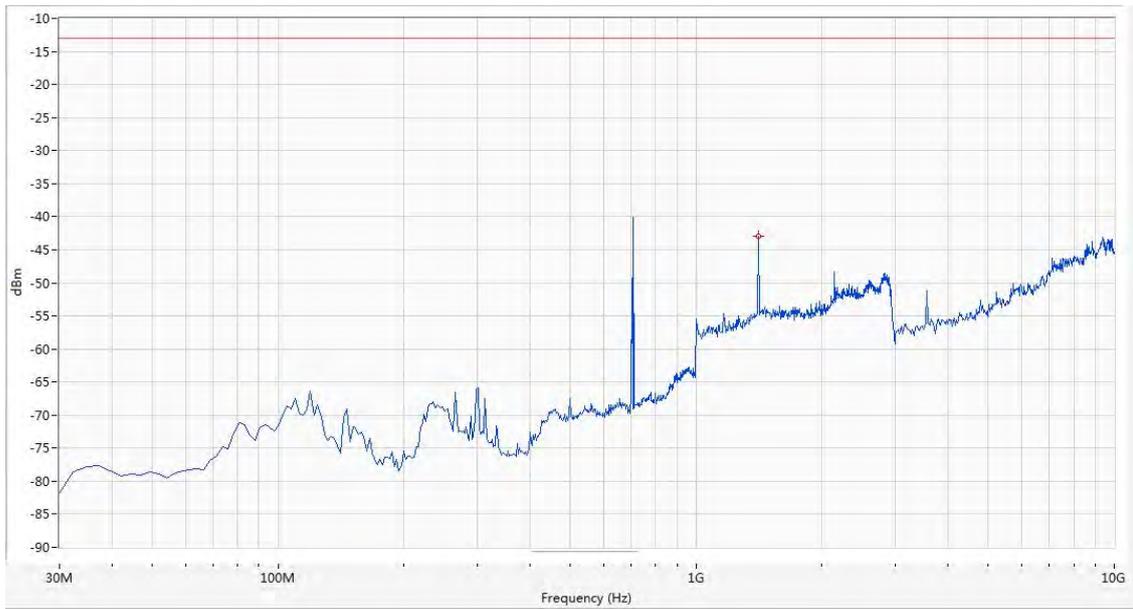
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

Test Plots for the Whole Measurement Frequency Range:

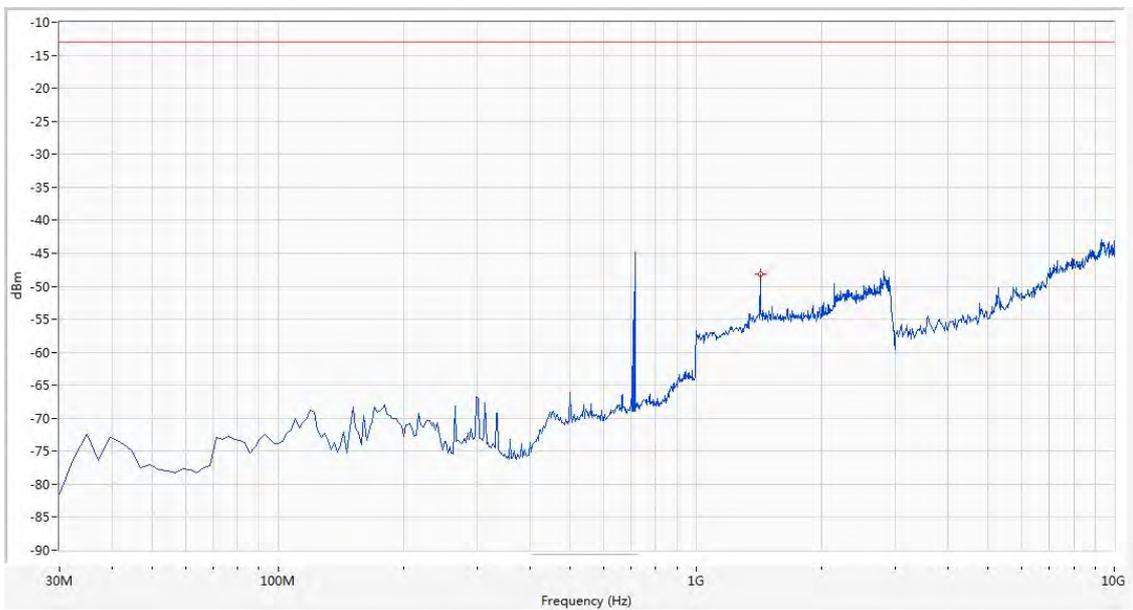
Note1: the power of the EUT transmitting frequency should be ignored.

Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

LTE Band 17 5MHz BW, Mid Channel, QPSK

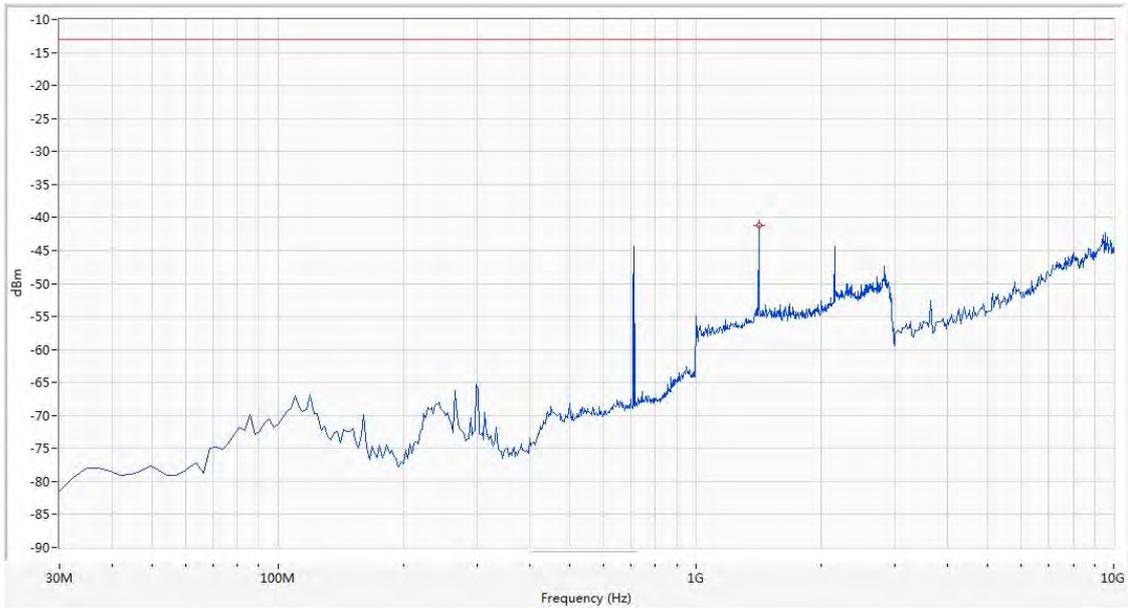


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-43.25	-13.0	30.25	Vertical	PASS
2130	-47.35	-13.0	34.35	Vertical	PASS

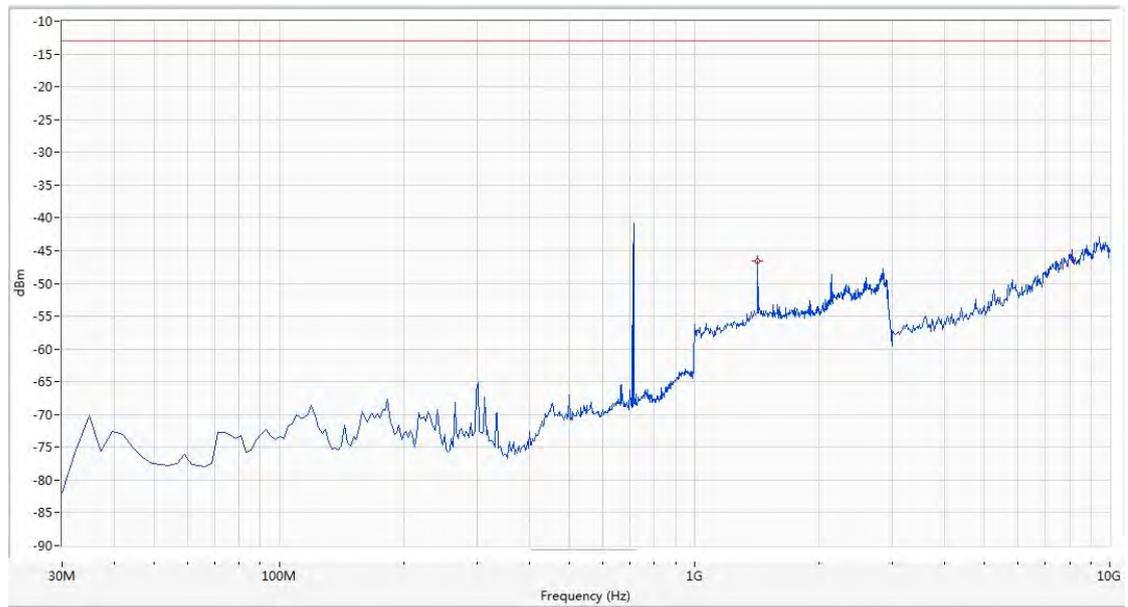


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-46.35	-13.0	33.35	Horizontal	PASS
2130	-49.78	-13.0	36.78	Horizontal	PASS

LTE Band 17 5MHz BW, Mid Channel, 16QAM

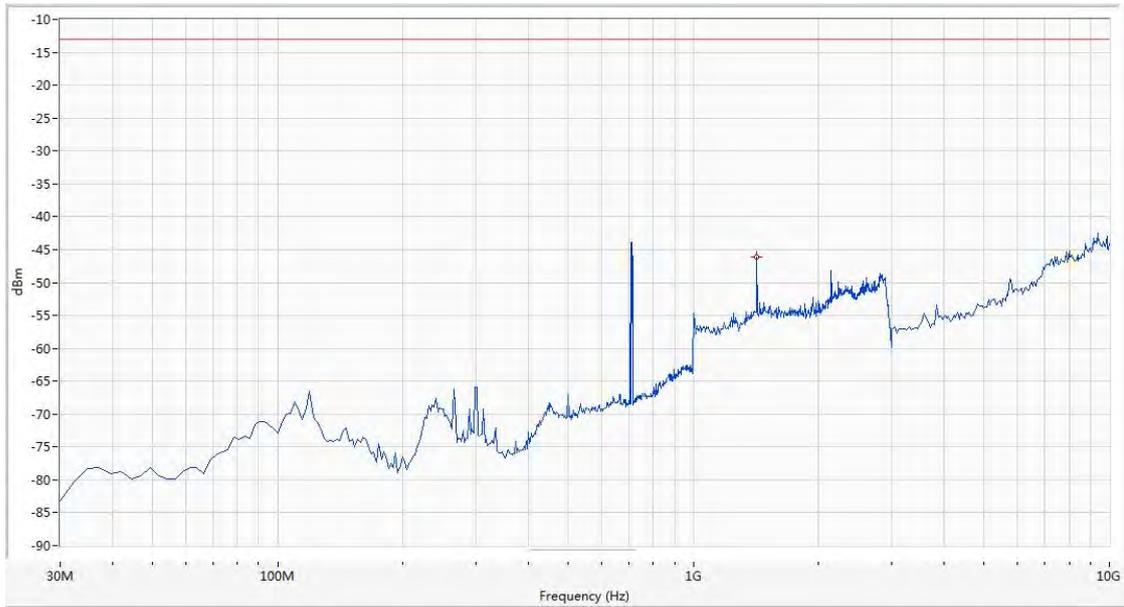


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-41.0	-13.0	29.0	Vertical	PASS
2130	-44.93	-13.0	31.93	Vertical	PASS

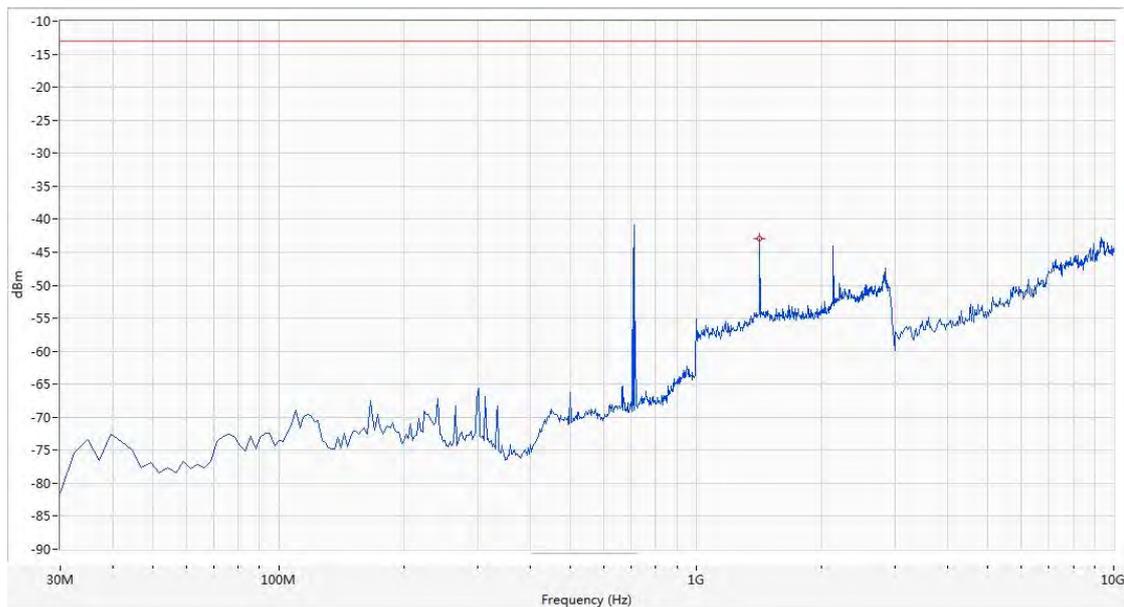


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-46.65	-13.0	33.65	Horizontal	PASS
2130	-47.70	-13.0	34.70	Horizontal	PASS

LTE Band 17 10MHz BW, Mid Channel, QPSK

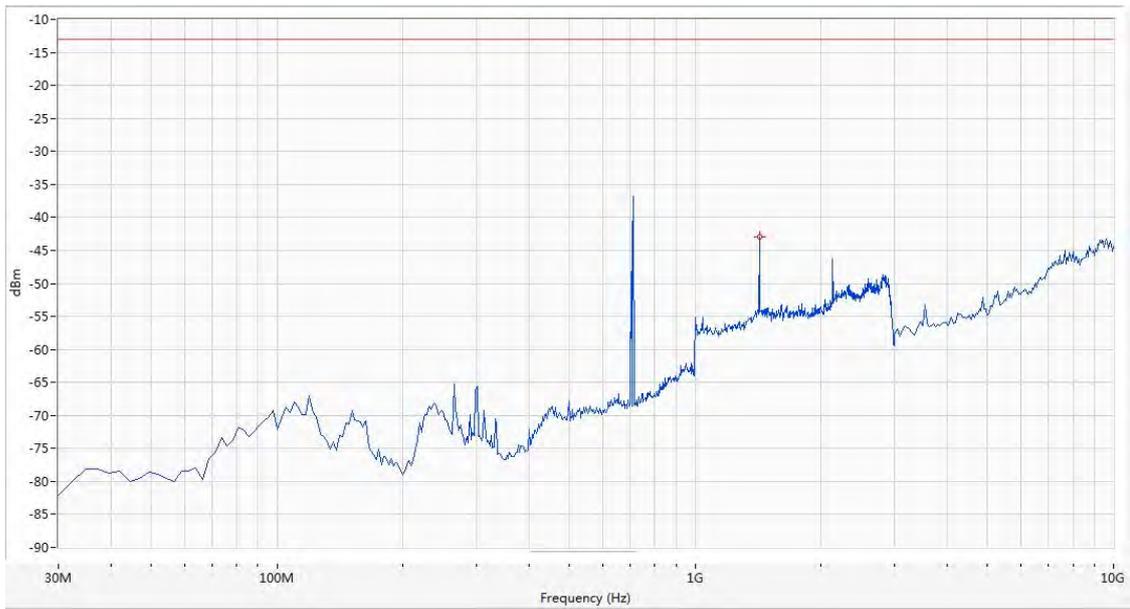


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-46.25	-13.0	36.25	Vertical	PASS
2130	-47.35	-13.0	34.35	Vertical	PASS

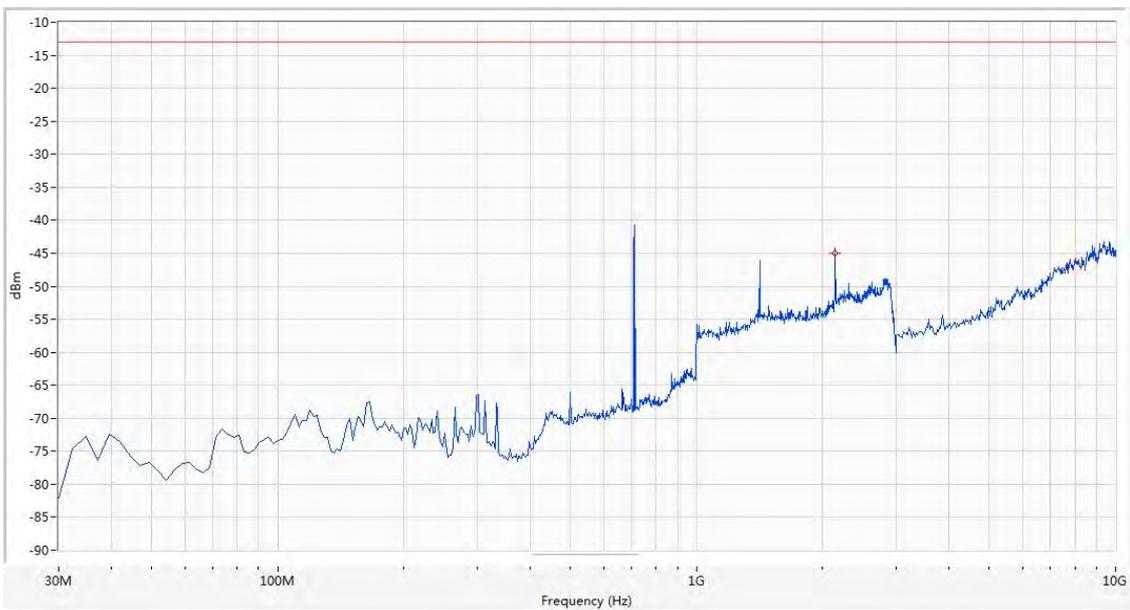


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-43.35	-13.0	30.35	Horizontal	PASS
2130	-44.78	-13.0	31.78	Horizontal	PASS

LTE Band 17 10MHz BW, Mid Channel, 16QAM

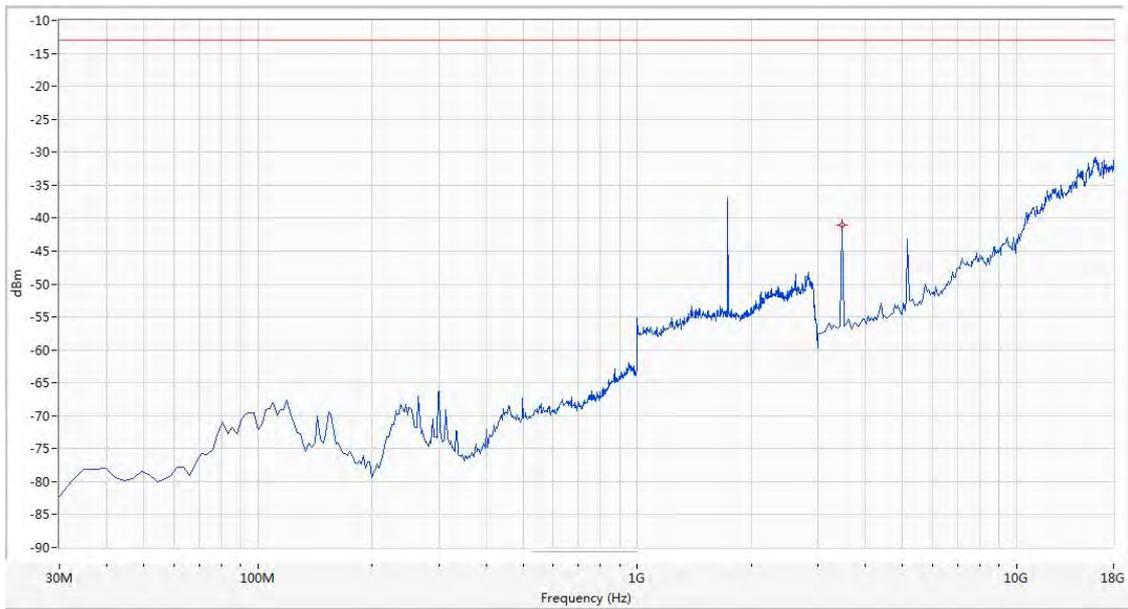


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-43.18	-13.0	30.18	Vertical	PASS
2130	-45.93	-13.0	32.93	Vertical	PASS

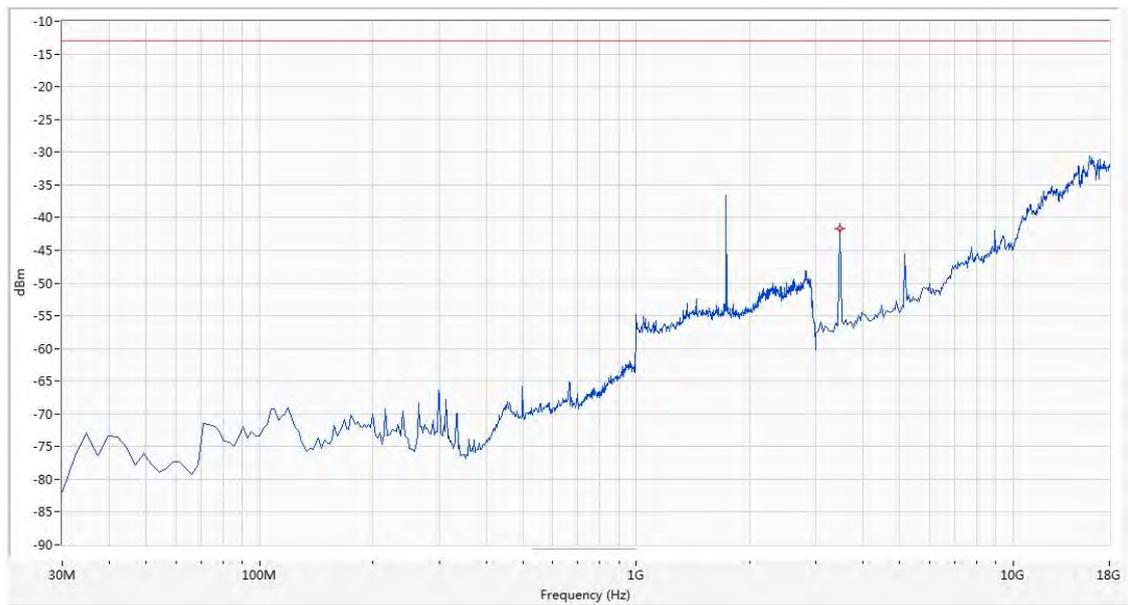


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
1420	-45.65	-13.0	32.65	Horizontal	PASS
2130	-45.00	-13.0	32.00	Horizontal	PASS

LTE Band 4 1.4MHz BW, Mid Channel, QPSK

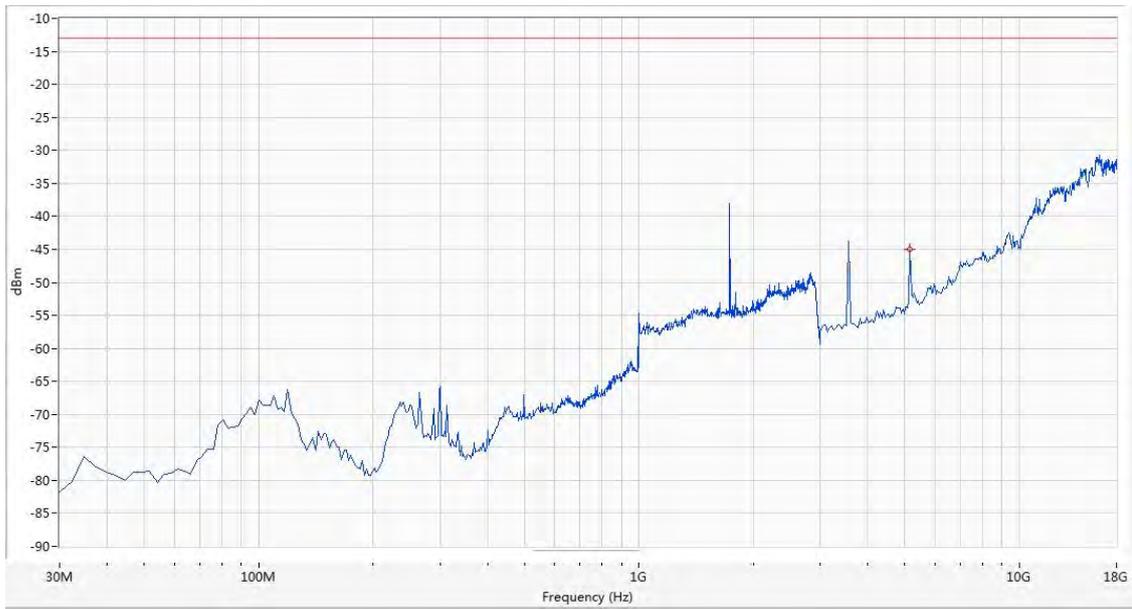


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-41.08	-13.0	28.08	Vertical	PASS
5179.5	-43.32	-13.0	30.32	Vertical	PASS

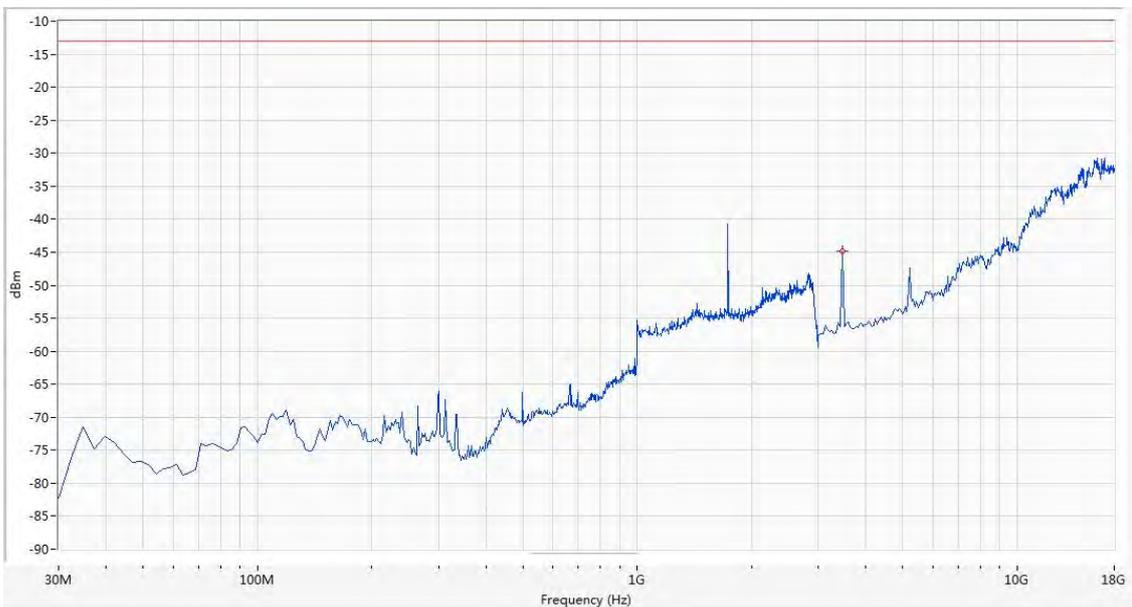


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-41.68	-13.0	28.68	Horizontal	PASS
5179.5	-45.48	-13.0	32.48	Horizontal	PASS

LTE Band 4 1.4MHz BW, Mid Channel, 16QAM

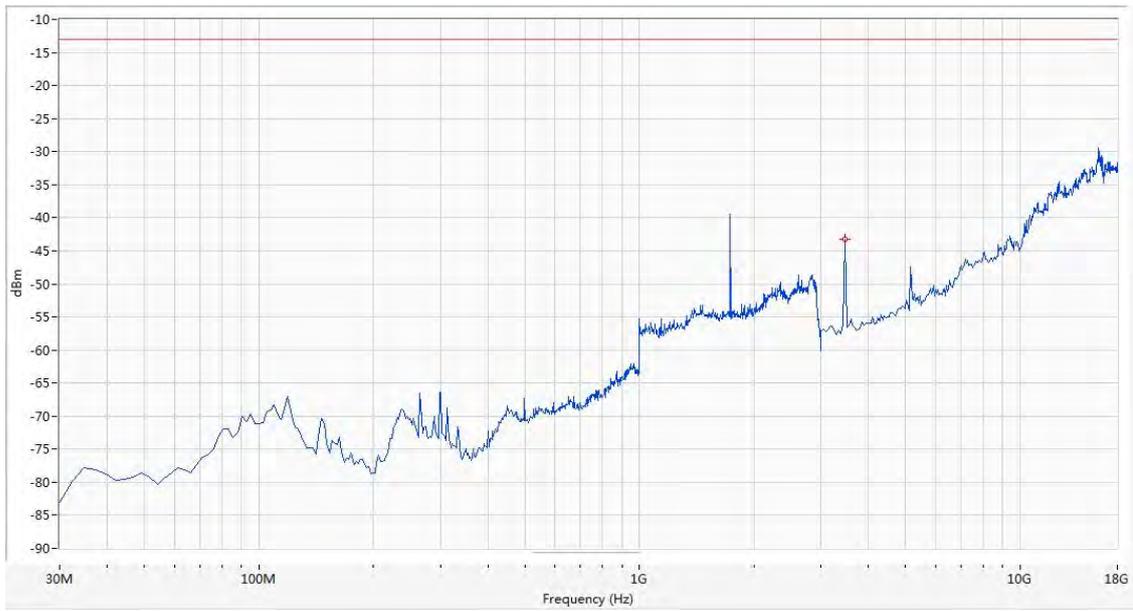


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-43.75	-13.0	30.75	Vertical	PASS
5179.5	-45.05	-13.0	32.05	Vertical	PASS

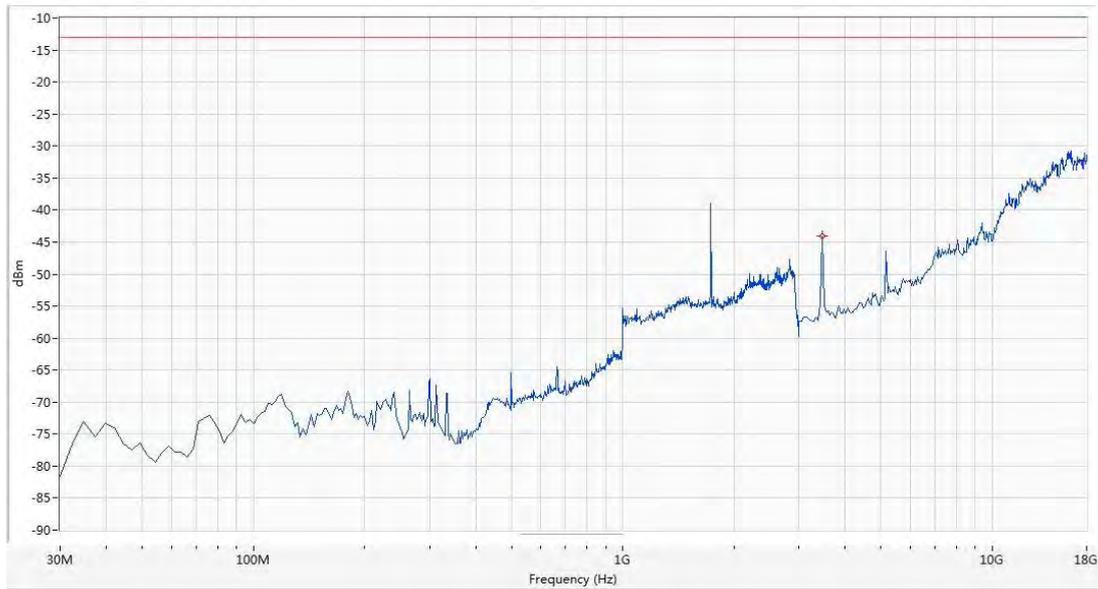


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.8	-13.0	31.8	Horizontal	PASS
5179.5	-47.34	-13.0	34.34	Horizontal	PASS

LTE Band 4 3MHz BW, Mid Channel, QPSK

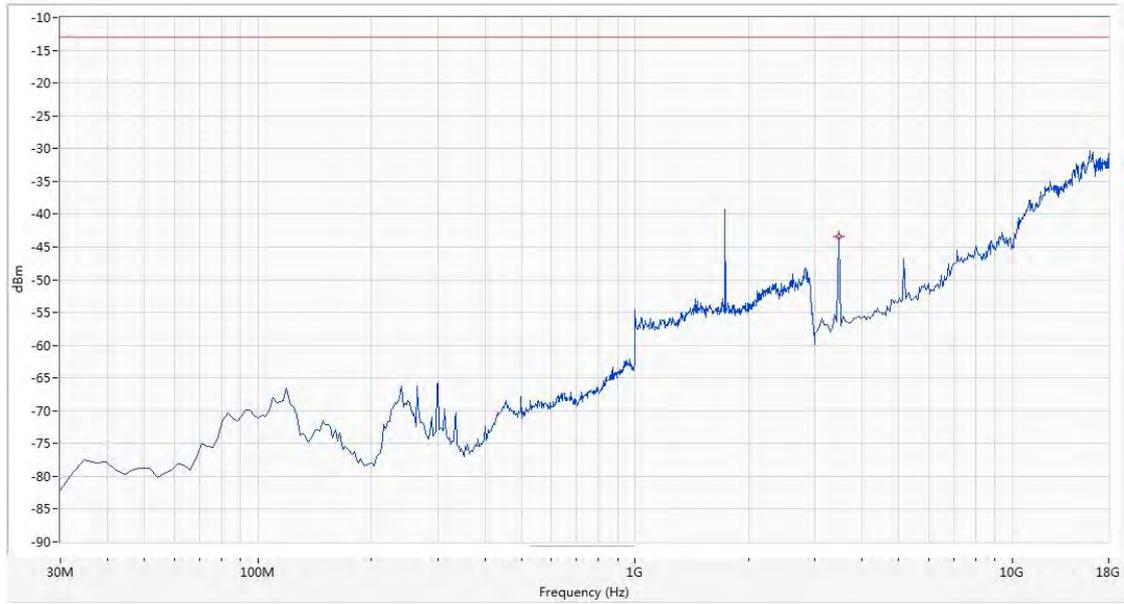


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-43.31	-13.0	30.31	Vertical	PASS
5179.5	-47.35	-13.0	34.35	Vertical	PASS

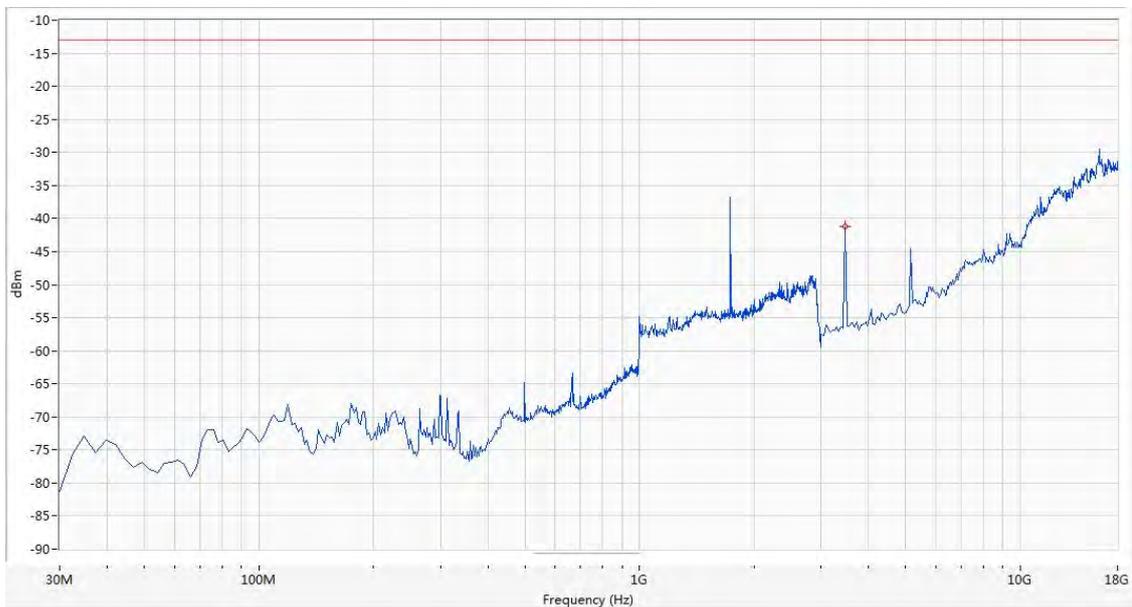


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.0	-13.0	31.0	Horizontal	PASS
5179.5	-46.38	-13.0	33.38	Horizontal	PASS

LTE Band 4 3MHz BW, Mid Channel, 16QAM

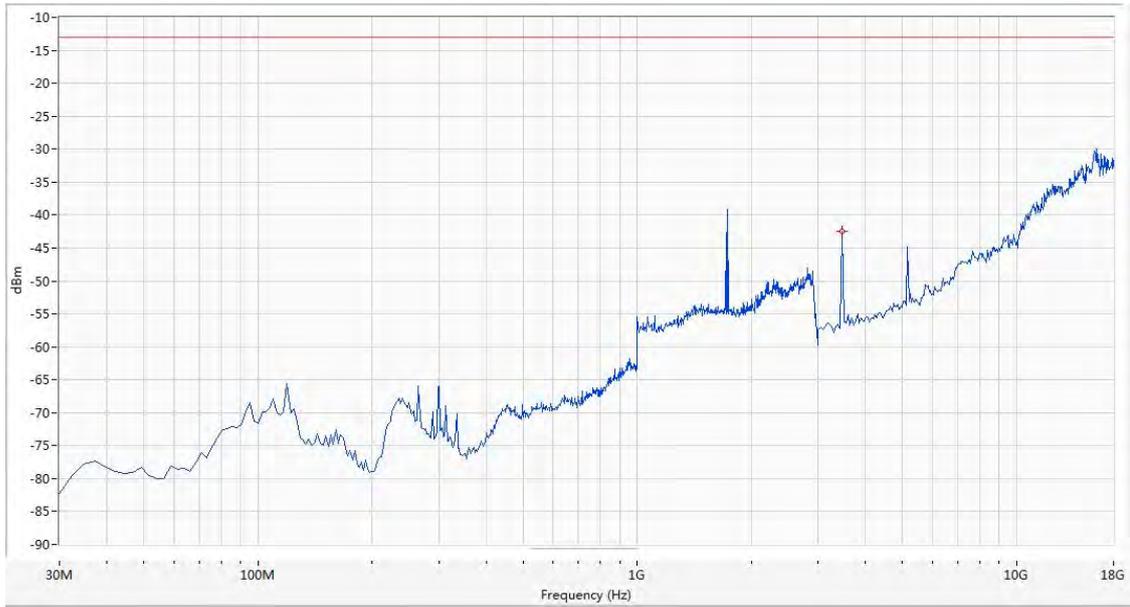


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-43.36	-13.0	30.36	Vertical	PASS
5179.5	-46.75	-13.0	33.75	Vertical	PASS

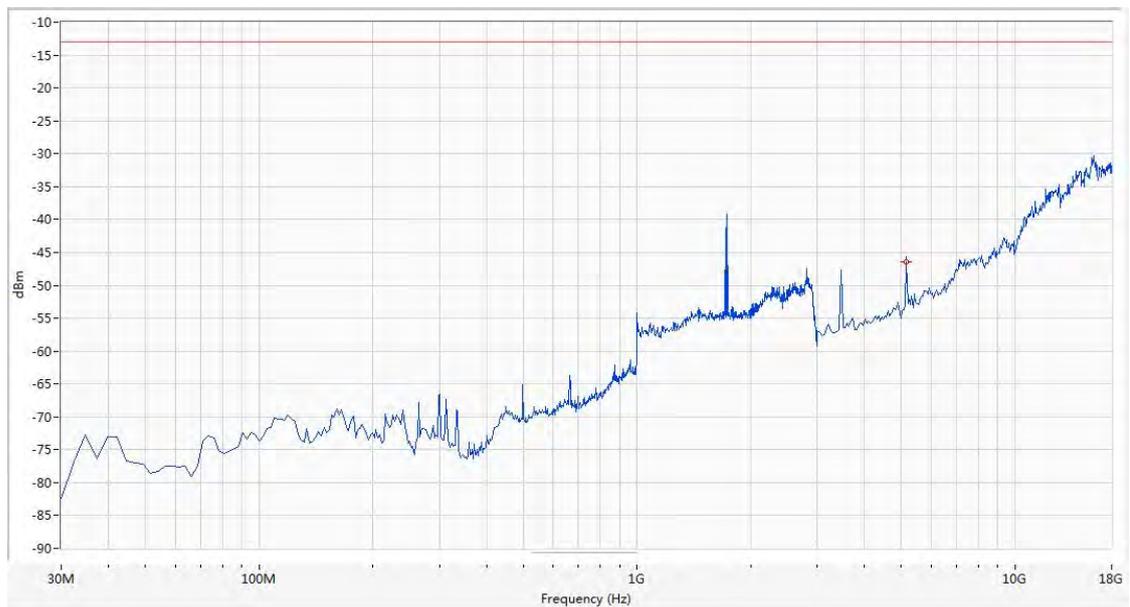


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-41.16	-13.0	28.16	Horizontal	PASS
5179.5	-44.52	-13.0	31.52	Horizontal	PASS

LTE Band 4 5MHz BW, Mid Channel, QPSK



Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-42.48	-13.0	29.48	Vertical	PASS
5179.5	-44.82	-13.0	31.82	Vertical	PASS

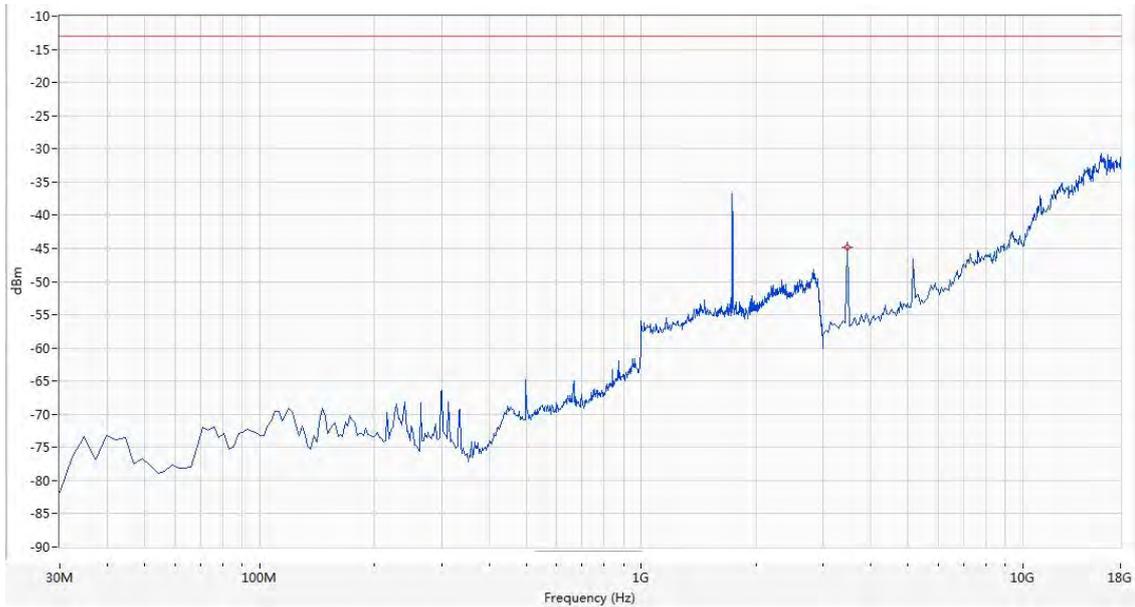


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-47.65	-13.0	34.65	Horizontal	PASS
5179.5	-46.46	-13.0	33.46	Horizontal	PASS

LTE Band 4 5MHz BW, Mid Channel, 16QAM

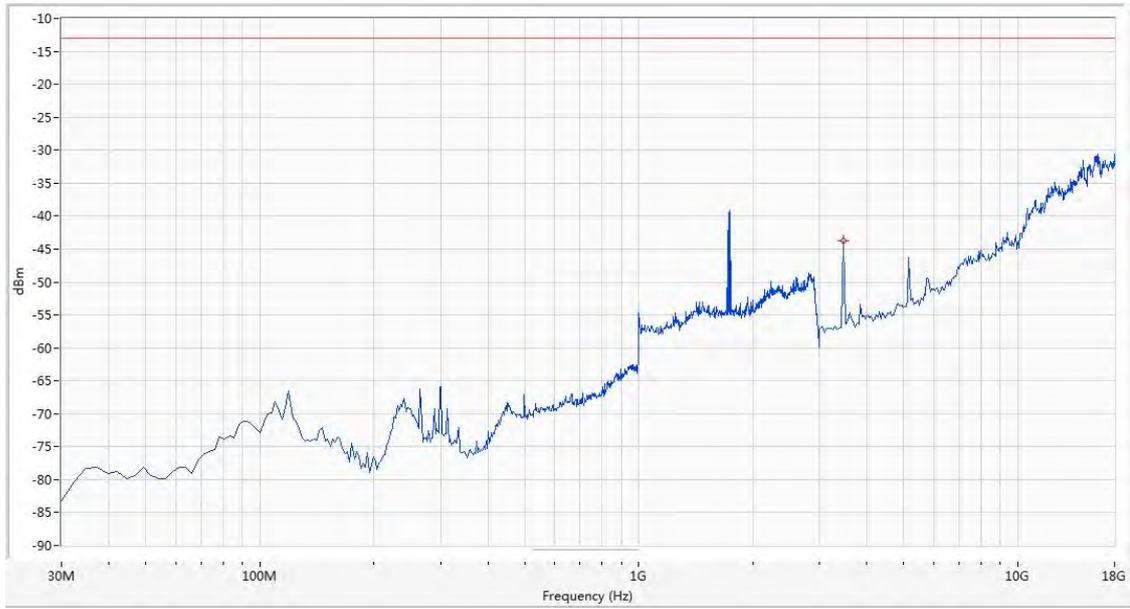


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-42.19	-13.0	29.19	Vertical	PASS
5179.5	-45.5	-13.0	32.5	Vertical	PASS

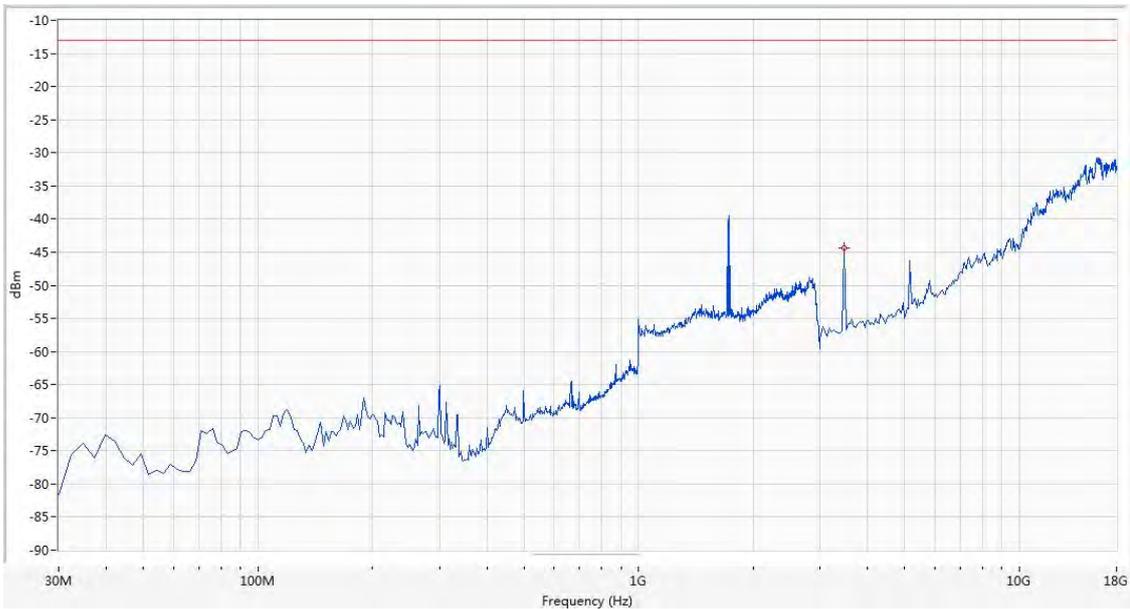


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.90	-13.0	31.9	Horizontal	PASS
5179.5	-46.55	-13.0	33.55	Horizontal	PASS

LTE Band 4 10MHz BW, Mid Channel, QPSK

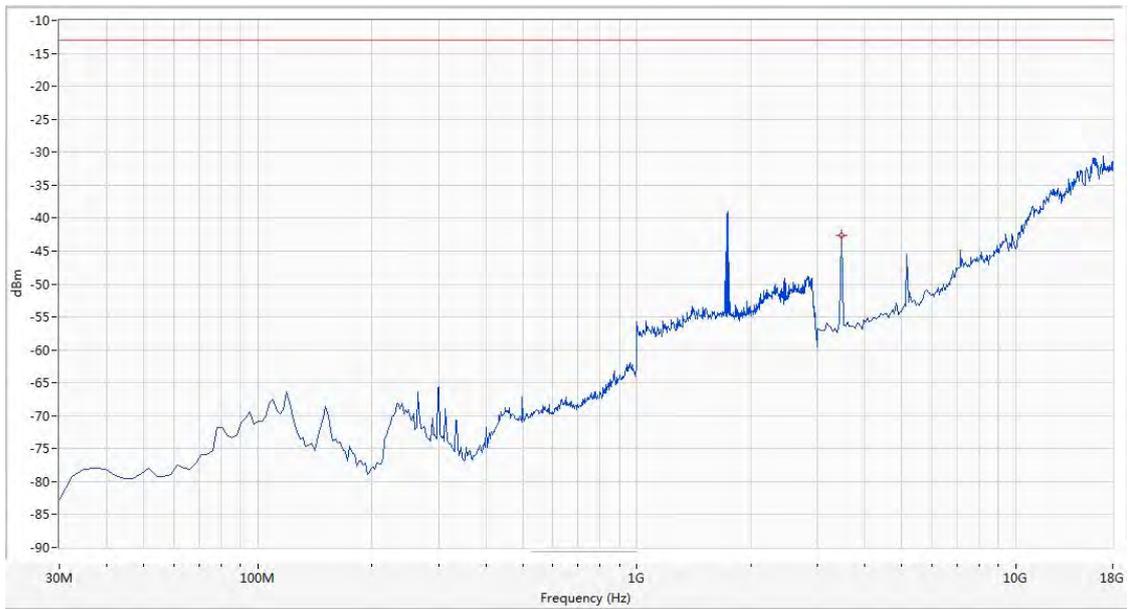


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-43.82	-13.0	30.82	Vertical	PASS
5179.5	-44.82	-13.0	31.82	Vertical	PASS

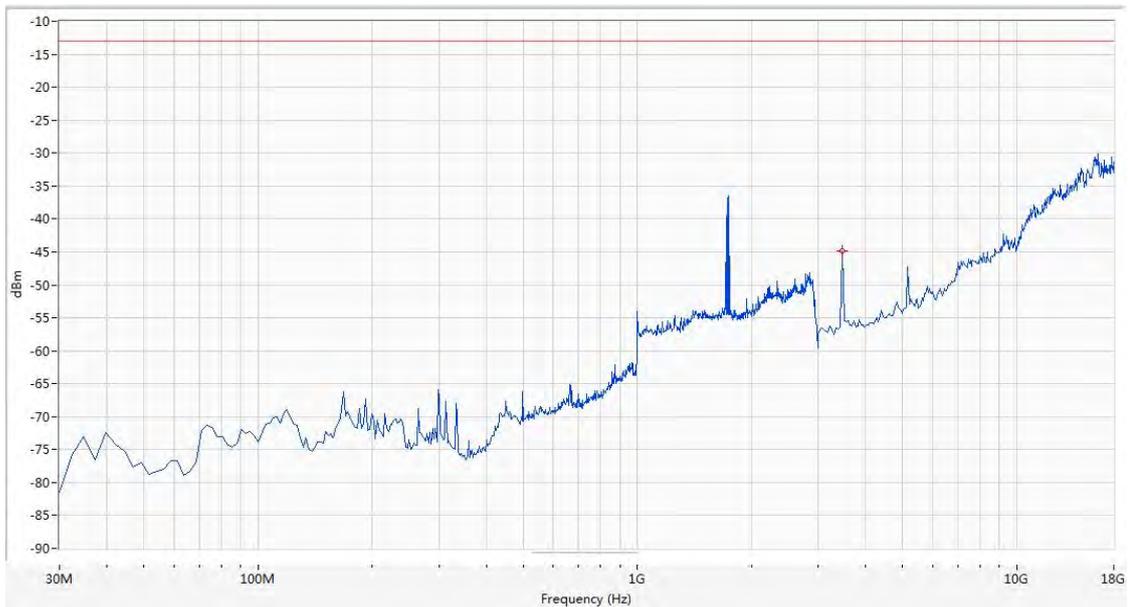


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.43	-13.0	31.43	Horizontal	PASS
5179.5	-46.29	-13.0	32.29	Horizontal	PASS

LTE Band 4 10MHz BW, Mid Channel, 16QAM

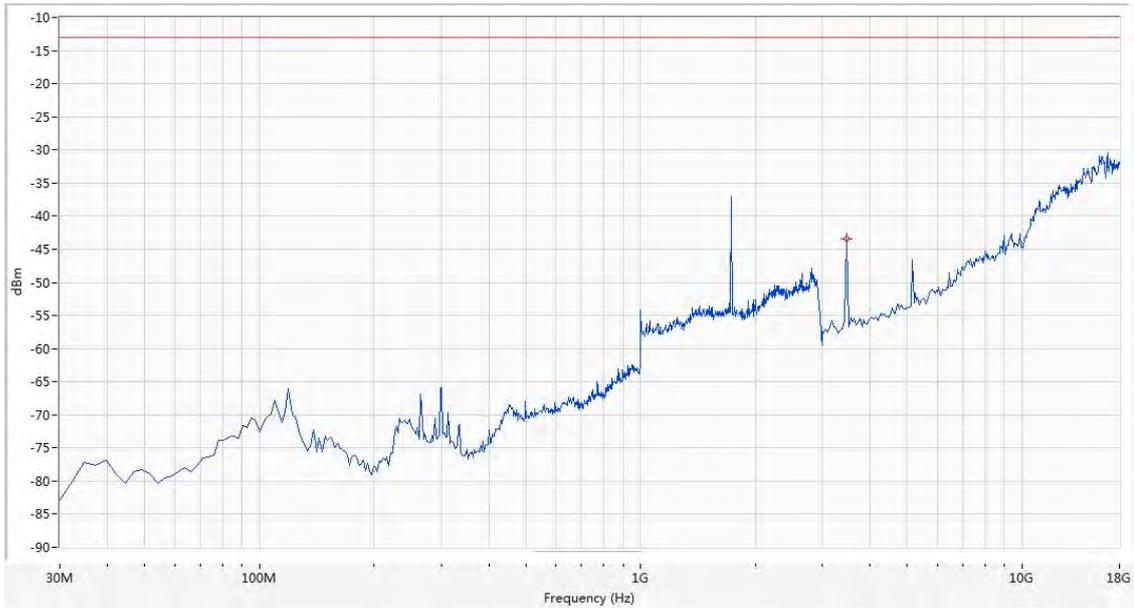


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-42.65	-13.0	29.65	Vertical	PASS
5179.5	-45.5	-13.0	32.5	Vertical	PASS

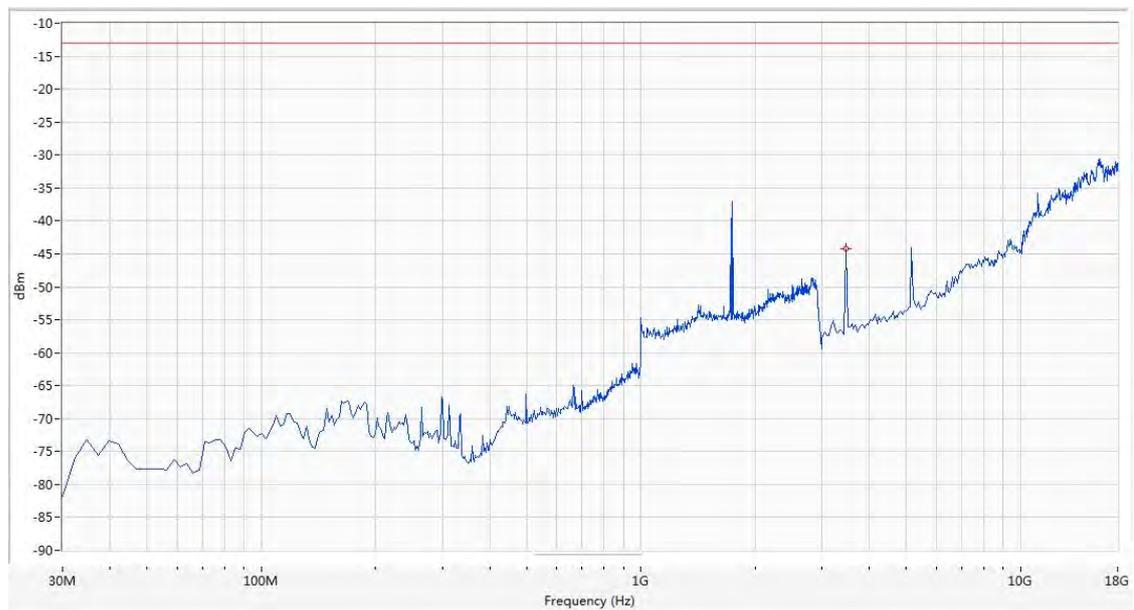


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.88	-13.0	31.88	Horizontal	PASS
5179.5	-47.15	-13.0	34.15	Horizontal	PASS

LTE Band 4 15MHz BW, Mid Channel, QPSK

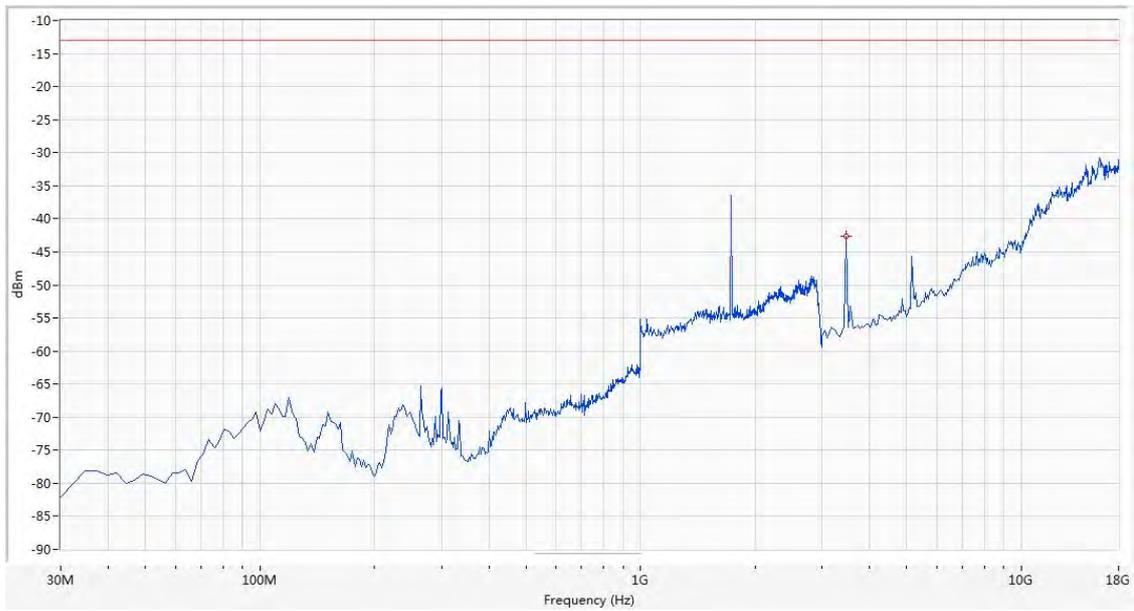


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-43.47	-13.0	30.47	Vertical	PASS
5179.5	-46.57	-13.0	33.57	Vertical	PASS

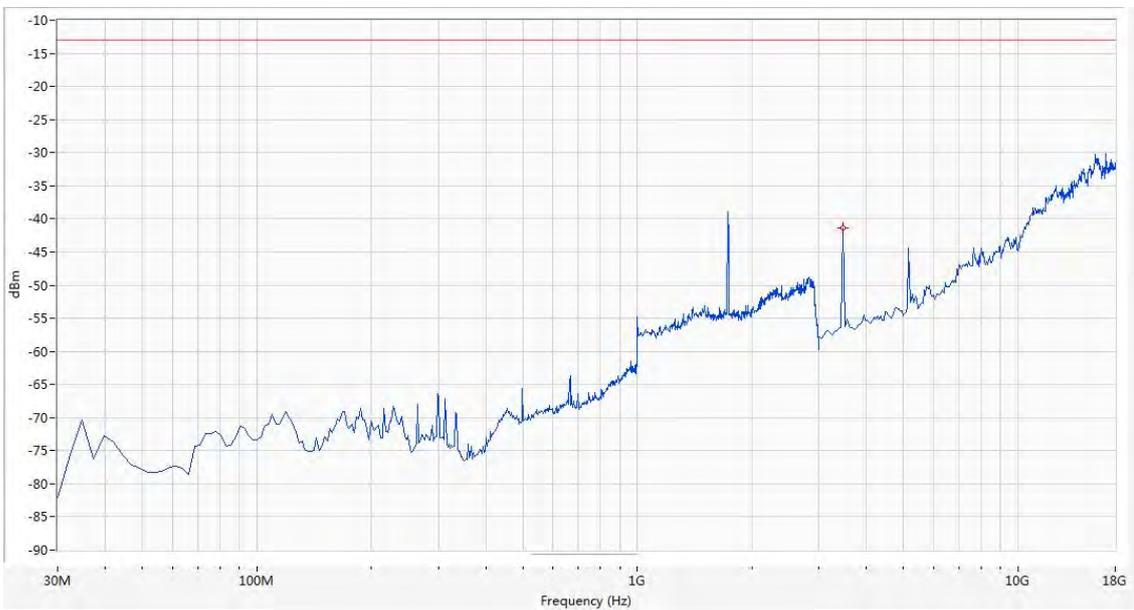


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.16	-13.0	31.16	Horizontal	PASS
5179.5	-44.06	-13.0	31.06	Horizontal	PASS

LTE Band 4 15MHz BW, Mid Channel, 16QAM

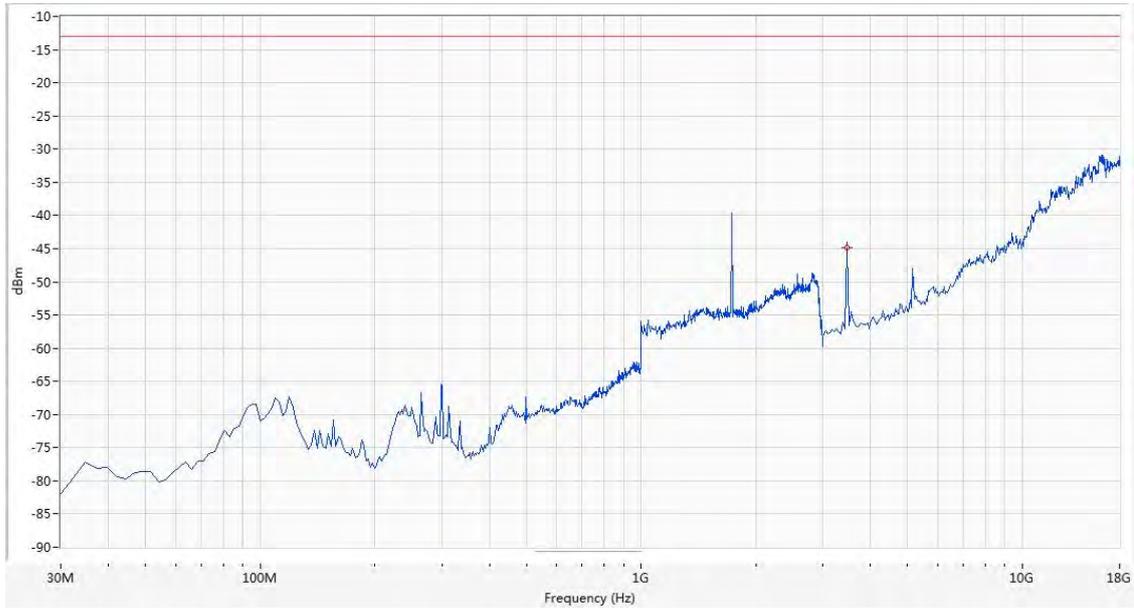


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-42.6	-13.0	29.6	Vertical	PASS
5179.5	-45.72	-13.0	32.72	Vertical	PASS

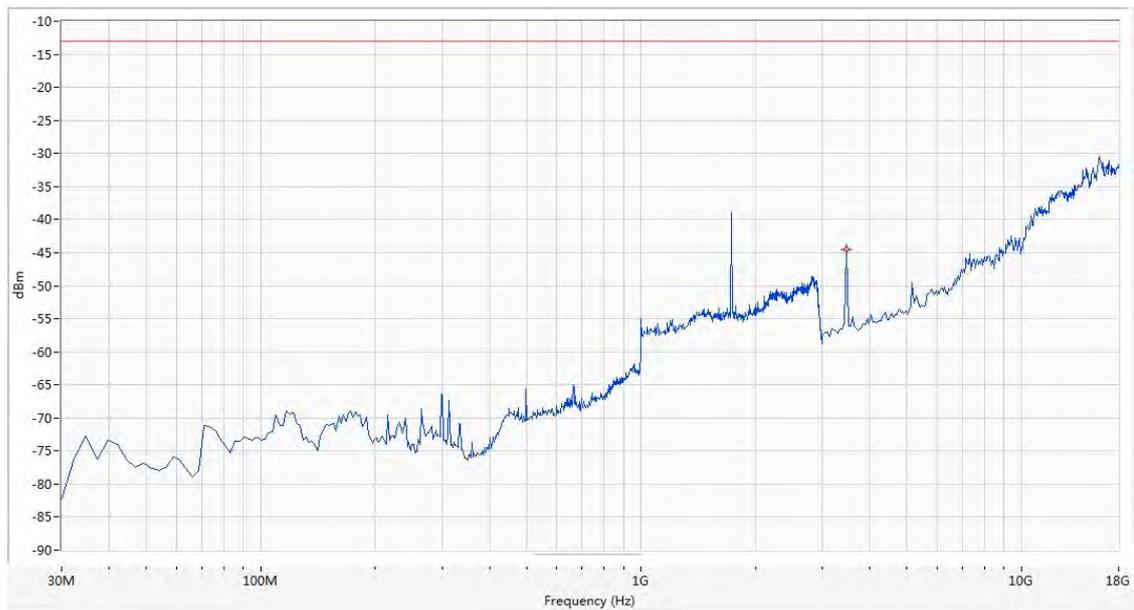


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-41.35	-13.0	28.35	Horizontal	PASS
5179.5	-44.31	-13.0	31.31	Horizontal	PASS

LTE Band 4 20MHz BW, Mid Channel, QPSK

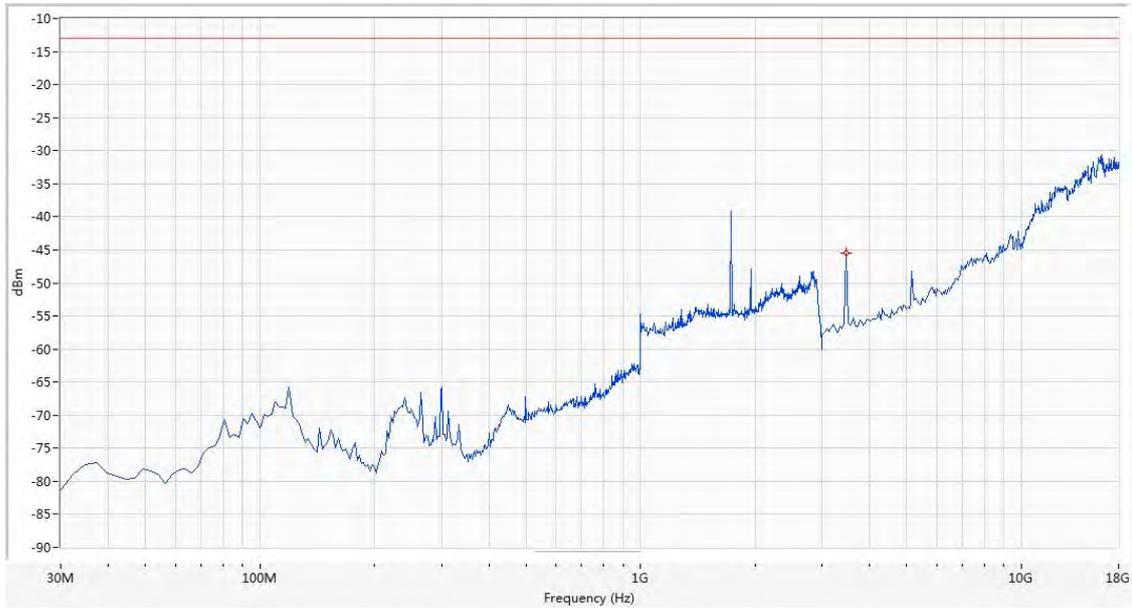


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.79	-13.0	31.79	Vertical	PASS
5179.5	-48.03	-13.0	35.03	Vertical	PASS

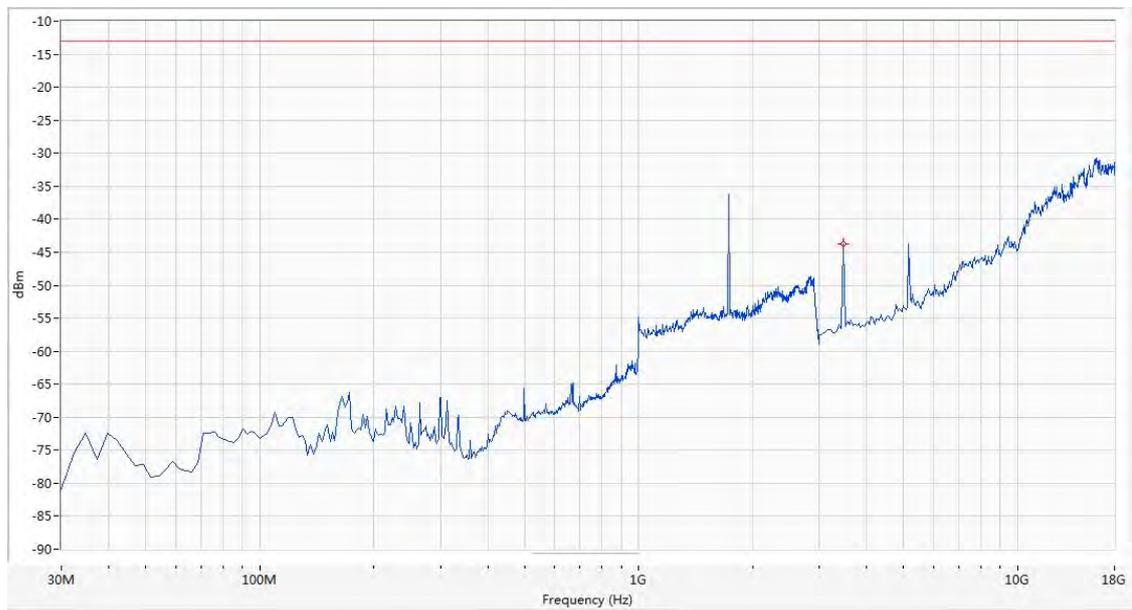


Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-44.61	-13.0	31.61	Horizontal	PASS
5179.5	-49.65	-13.0	36.65	Horizontal	PASS

LTE Band 4 20MHz BW, Mid Channel, 16QAM



Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-45.56	-13.0	32.56	Vertical	PASS
5179.5	-48.26	-13.0	35.26	Vertical	PASS



Fre. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Antenna	Verdict
3465.0	-43.69	-13.0	30.69	Horizontal	PASS
5179.5	-43.71	-13.0	30.71	Horizontal	PASS

** END OF REPORT **