



## FCC TEST REPORT and IC TEST REPORT

For

**LTE Module**

**Model: LTE7750**

**Trade Name: Getac**

*Issued to*

**Getac Technology Corp.**  
**4F, No.1, R&D 2nd Road, Hsin-Chu Science-Based Industrial Park,**  
**Hsin-Chu Hsien, Taiwan, R.O.C.**

*Issued by*

**Compliance Certification Services Inc.**  
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**Issued Date: October 11, 2012**



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**Revision History**

Rev.		Issue Date		Revisions	Effect Page	Revised By
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**TABLE OF CONTENTS**

<b>1.</b>	<b>TEST RESULT CERTIFICATION .....</b>	<b>4</b>
<b>2.</b>	<b>EUT DESCRIPTION.....</b>	<b>5</b>
<b>3.</b>	<b>TEST METHODOLOGY.....</b>	<b>6</b>
3.1	DESCRIPTION OF TEST TYPE .....	6
<b>4.</b>	<b>INSTRUMENT CALIBRATION .....</b>	<b>7</b>
4.1	MEASURING INSTRUMENT CALIBRATION .....	7
4.2	MEASUREMENT EQUIPMENT USED .....	7
4.3	MEASUREMENT UNCERTAINTY .....	8
<b>5.</b>	<b>FACILITIES AND ACCREDITATIONS.....</b>	<b>9</b>
5.1	FACILITIES.....	9
5.2	EQUIPMENT .....	9
5.3	TABLE OF ACCREDITATIONS AND LISTINGS .....	10
<b>6.</b>	<b>SETUP OF EQUIPMENT UNDER TEST .....</b>	<b>11</b>
6.1	SETUP CONFIGURATION OF EUT .....	11
6.2	SUPPORT EQUIPMENT .....	11
<b>7.</b>	<b>TEST PROCEDURE AND RESULT.....</b>	<b>12</b>
7.1	OUTPUT POWER MEASUREMENT .....	12
7.2	FREQUENCY STABILITY MEASUREMENT .....	19
7.3	OCCUPIED BANDWIDTH MEASUREMENT .....	22
7.4	PEAK TO AVERAGE RATIO.....	26
7.5	BAND EDGE MEASUREMENT.....	30
7.6	CONDUCTED SPURIOUS EMISSIONS .....	46
7.7	RADIATED EMISSION MEASUREMENT .....	49
	<b>APPENDIX I PHOTOGRAPHS OF TEST SETUP .....</b>	<b>66</b>



## 1. TEST RESULT CERTIFICATION

**Applicant:** Getac Technology Corp.  
4F, No.1, R&D 2nd Road, Hsin-Chu Science-Based Industrial Park, Hsin-Chu Hsien, Taiwan, R.O.C.

**Equipment Under Test:** LTE Module

**Trade Name:** Getac

**Model:** LTE7750

**Date of Test:** September 26 ~ October 1, 2012

<b>FCC PART 27, SUBPART C, L, FCC PART 2</b>	
<b>OPERATING BAND: 782.00 MHz</b>	
<b>Standard</b>	<b>TEST TYPE AND LIMIT</b>
2.1046 27.50(C)(10)	Maximum Peak Output Power Limit: max. 3 watts e.r.p peak power
2.1055 27.54	Frequency Stability
2.1049 27.53(g)	Occupied Bandwidth
27.50(d)(5)	Peak to average ratio
27.53(g)	Band Edge Measurements
2.1051 27.53(g)	Conducted Spurious Emissions
2.1053 27.53(g)	Radiated Spurious Emissions

**Note:** 1. The test result judgment is decided by the limit of test standard  
2. The information of measurement uncertainty is available upon the customer's request.

<b>Deviation from Applicable Standard</b>
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

*Approved by*

*Reviewed by*

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Miller Lee  
Section Manager  
Compliance Certification Services Inc.

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Gina Lo  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	LTE Module	
<b>Model Number</b>	LTE7750	
<b>Model Discrepancy</b>	N/A	
<b>Trade</b>	Getac	
<b>Received Date</b>	September 26, 2012	
<b>Power Source</b>	Powered by host device.	
<b>Modulation Technology</b>	LTE Band 13	QPSK, 16QAM
<b>Frequency Range</b>	LTE Band 13 Channel Bandwidth: 5MHz	782.00MHz
	LTE Band 13 Channel Bandwidth: 10MHz	782.00MHz
<b>Maximum ERP Power</b>	LTE Band 13 Channel Bandwidth: 5MHz	23.36dBm
	LTE Band 13 Channel Bandwidth: 10MHz	22.30dBm
<b>Antenna Specification</b>	1. Model: V100 PIFA Antenna / Gain: 2.25 dBi 2. Model: V200 PIFA Antenna / Gain: 2.34 dBi	
<b>Note</b>	Product name: Notebook Computer / Brand name: Getac Model: V100, V200	

**Note:** 1. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



### **3. TEST METHODOLOGY**

#### **3.1 DESCRIPTION OF TEST TYPE**

The EUT (model: LTE7750) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

#### **LTE Band 13: 782MHz**

Three channels had been tested for each channel bandwidth.

<b>5MHz</b>		<b>10MHz</b>	
<b>Channel</b>	<b>Frequency(MHz)</b>	<b>Channel</b>	<b>Frequency(MHz)</b>
23230	782.00	23230	782.00



## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

*Remark: Each piece of equipment is scheduled for calibration once a year.*

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/21/2013

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510268	11/15/2012
EMI Test Receiver	R&S	ESCI	100064	02/16/2013
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/13/2013
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/20/2012
Bilog Antenna	Sunol Sciences	JB3	A030105	10/03/2012
Bilog Antenna	Sunol Sciences	JB3	A030205	10/03/2012
Horn Antenna	EMCO	3117	00055165	02/14/2013
Horn Antenna	EMCO	3117	00055167	02/14/2013
Horn Antenna	EMCO	3116	00026370	10/12/2012
Loop Antenna	EMCO	6502	8905/2356	06/10/2013
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/23/2012
Test S/W	EZ-EMC (CCS-3A1RE)			



### **4.3 MEASUREMENT UNCERTAINTY**

<b>PARAMETER</b>	<b>UNCERTAINTY</b>
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

***Remark:*** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .



## **5. FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



### **5.3 TABLE OF ACCREDITATIONS AND LISTINGS**

<b>Country</b>	<b>Agency</b>	<b>Scope of Accreditation</b>	<b>Logo</b>
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

*\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*



## **6. SETUP OF EQUIPMENT UNDER TEST**

### **6.1 SETUP CONFIGURATION OF EUT**

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

### **6.2 SUPPORT EQUIPMENT**

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

***Remark:***

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



## 7. TEST PROCEDURE AND RESULT

### 7.1 OUTPUT POWER MEASUREMENT

#### LIMITS

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 698–746 MHz band are limited to 3 watts ERP

#### TEST PROCEDURES

##### **EIRP / ERP MEASUREMENT:**

1. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 10MHz for LTE.
2. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
3. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn
4. E.R.P = E.I.R.P- 2.15 dB

##### **CONDUCTED POWER MEASUREMENT:**

1. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
2. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



## TEST RESULTS

### LTE Band 13

#### Channel Bandwidth: 5MHz

Conducted Output Power (QPSK 1 RB ALLOCATED AT THE LOWER EDGE)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	22.98	0.19861

Conducted Output Power (QPSK 1 RB ALLOCATED AT THE UPPER EDGE)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	22.93	0.19634

Conducted Output Power (QPSK 50% RB ALLOCATION CENTERED)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	21.93	0.15596

Conducted Output Power (QPSK 100% RB ALLOCATION)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	21.86	0.15346

#### Remarks:

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Attenuator.
3. The value in bold is the worst.

**Channel Bandwidth: 5MHz**

<b>Conducted Output Power (16QAM 1 RB ALLOCATED AT THE LOWER EDGE)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	21.99	0.15812

<b>Conducted Output Power (16QAM 1 RB ALLOCATED AT THE UPPER EDGE)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	22.17	0.16482

<b>Conducted Output Power (16QAM 50% RB ALLOCATION CENTERED)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	20.91	0.12331

<b>Conducted Output Power (16QAM 100% RB ALLOCATION)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	20.90	0.12303

**Remarks:**

1. *Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).*
2. *Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Attenuator.*
3. *The value in bold is the worst.*

**LTE Band 13****Channel Bandwidth: 10MHz**

Conducted Output Power (QPSK 1 RB ALLOCATED AT THE LOWER EDGE)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	23.37	0.21727

Conducted Output Power (QPSK 1 RB ALLOCATED AT THE UPPER EDGE)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	23.12	0.20512

Conducted Output Power (QPSK 50% RB ALLOCATION CENTERED)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	22.08	0.16144

Conducted Output Power (QPSK 100% RB ALLOCATION)			
Frequency (MHz)	Channel	Output Power	
		(dBm)	(W)
782.00	23230	21.96	0.15704

**Remarks:**

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Attenuator.
3. The value in bold is the worst.



<b>Conducted Output Power (16QAM 1 RB ALLOCATED AT THE LOWER EDGE)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	22.20	0.16596

<b>Conducted Output Power (16QAM 1 RB ALLOCATED AT THE UPPER EDGE)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	22.16	0.16444

<b>Conducted Output Power (16QAM 50% RB ALLOCATION CENTERED)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	20.87	0.12218

<b>Conducted Output Power (16QAM 100% RB ALLOCATION)</b>			
<b>Frequency (MHz)</b>	<b>Channel</b>	<b>Output Power</b>	
		<b>(dBm)</b>	<b>(W)</b>
782.00	23230	21.15	0.13032

**Remarks:**

1. *Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).*
2. *Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Attenuator.*
3. *The value in bold is the worst.*

**ERP POWER****LTE Band 13****For V100****Channel Bandwidth: 5MHz / QPSK**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	20.54	3.3	6.12	23.36	34.77	-11.41
	782.00	H	19.14	3.3	6.12	21.96	34.77	-12.81

**Channel Bandwidth: 5MHz / 16QAM**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	19.17	3.31	6.13	21.99	34.77	-12.78
	782.00	H	17.82	3.31	6.13	20.64	34.77	-14.13

**Channel Bandwidth: 10MHz /16QAM**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	11.76	3.31	6.15	14.60	34.77	-20.17
	782.00	H	10.37	3.31	6.15	13.21	34.77	-21.56

**Channel Bandwidth: 10MHz / QPSK**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	19.48	3.31	6.13	22.30	34.77	-12.47
	782.00	H	17.93	3.31	6.13	20.75	34.77	-14.02

**Remark:**

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = S.G Level + Gain of Substitution horn + TX cable loss.
3. The value in bold is the worst.

**For V200****Channel Bandwidth: 5MHz / QPSK**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	20.54	3.31	6.13	23.36	34.77	-11.41
	782.00	H	19.25	3.31	6.13	22.07	34.77	-12.7

**Channel Bandwidth: 5MHz / 16QAM**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	19.17	3.31	6.13	21.99	34.77	-12.78
	782.00	H	17.82	3.31	6.15	20.66	34.77	-14.11

**Channel Bandwidth: 10MHz / 16QAM**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	11.66	3.31	6.15	14.50	34.77	-20.27
	782.00	H	10.1	3.31	6.15	12.94	34.77	-21.83

**Channel Bandwidth: 10MHz / QPSK**

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
23230	782.00	V	19.38	3.3	6.12	22.20	34.77	-12.57
	782.00	H	17.95	3.31	6.13	20.77	34.77	-14

**Remark:**

1. Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = S.G Level + Gain of Substitution horn + TX cable loss.
3. The value in bold is the worst.



## 7.2 FREQUENCY STABILITY MEASUREMENT

### **LIMIT**

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 1055(a)(1)  $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$ .

### **TEST PROCEDURE**

1. Because of the measure the carrier frequency under the condition of the AFC lock, it shall be used the mobile station in the LTE link mode. This is accomplished with the use of the communication simulator station. The oven room could control the temperatures and humidity.
2. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
3. Laptop pc is connected the external power supply to control the AC input power. The various Volts from the minimum 138 Volts to 102 Volts. Each step shall be record the frequency error rate.
4. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing.
5. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

*NOTE: The frequency error was recorded frequency error from the communication simulator.*



## TEST RESULTS

### **FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT:**

#### **LTE Band 13**

<b>Reference Frequency: LTE Band 13 782 MHz @ 20°C</b>						
Limit: $\pm 2.5$ ppm = 1955Hz						
Power Supply Vdc	Environment Temperature (°C)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	Limit (Hz)
120	50	781999997	-5	781999999	-3	1955
120	40	781999988	-14	781999997	-5	
120	30	781999997	-5	781999996	-6	
120	20	782000002	0	782000002	0	
120	10	782000000	-2	782000008	6	
120	0	782000004	2	781999998	-4	
120	-10	781999995	-7	781999987	-15	
120	-20	781999998	-4	781999997	-5	
120	-30	781999997	-5	781999994	-8	



**FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:**

**LTE Band 13**

<b>Reference Frequency: LTE Band 13 782 MHz @ 20°C</b>						
Limit: $\pm 2.5$ ppm = 1955Hz						
Power Supply Vdc	Environment Temperature (°C)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	Limit (Hz)
138	20	782000011	9	782000005	3	1955
120		782000002	0	782000002	0	
102		782000015	13	782000018	16	



## **7.3 OCCUPIED BANDWIDTH MEASUREMENT**

### **LIMITS**

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

### **TEST PROCEDURES**

1. The EUT makes a phone call to the communication simulator. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels. (low, middle and high operational frequency range.)
2. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
3. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.



## **TEST RESULTS**

### **LTE Band 13**

#### **CHANNEL BANDWIDTH: 5MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
23230	782.00	4.5056

#### **CHANNEL BANDWIDTH: 5MHz / 16QAM**

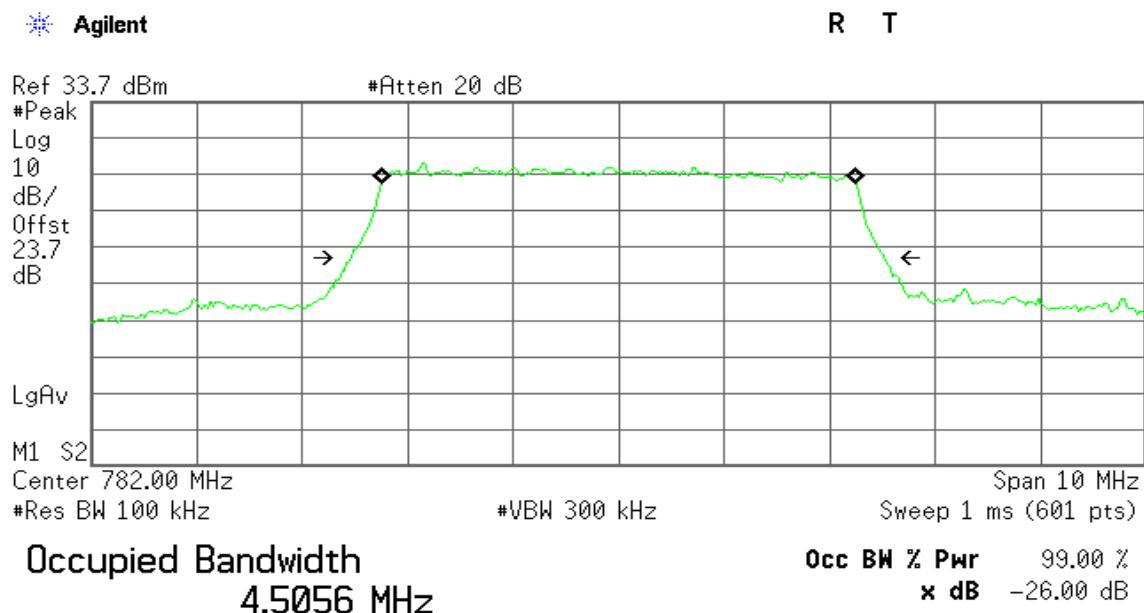
Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
23230	782.00	4.4987

#### **CHANNEL BANDWIDTH: 10MHz / QPSK**

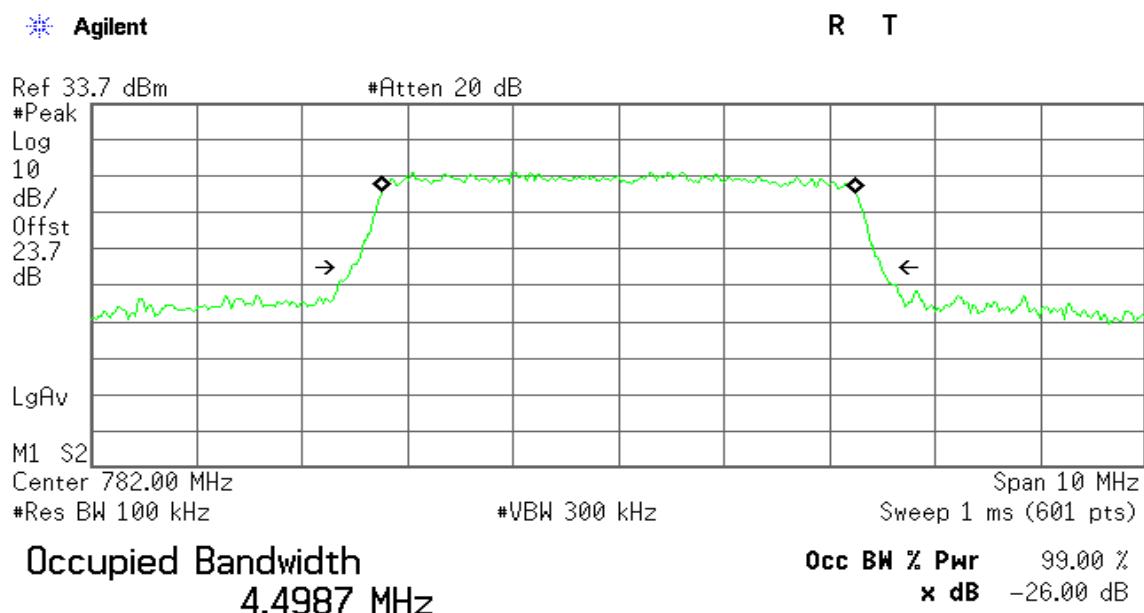
Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
23230	782.00	8.8782

#### **CHANNEL BANDWIDTH: 10MHz / 16QAM**

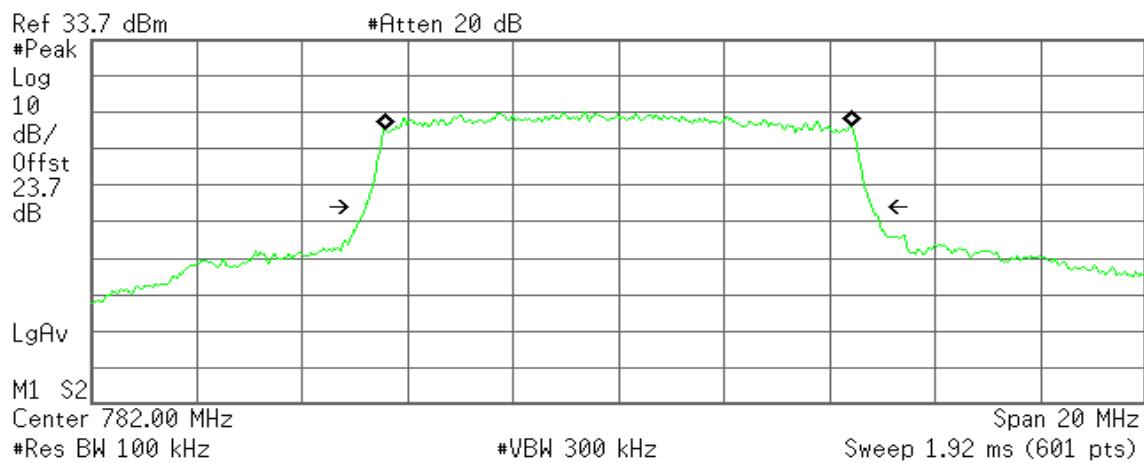
Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
23230	782.00	8.8783

**LTE Band 13****CHANNEL BANDWIDTH: 5MHz / QPSK**

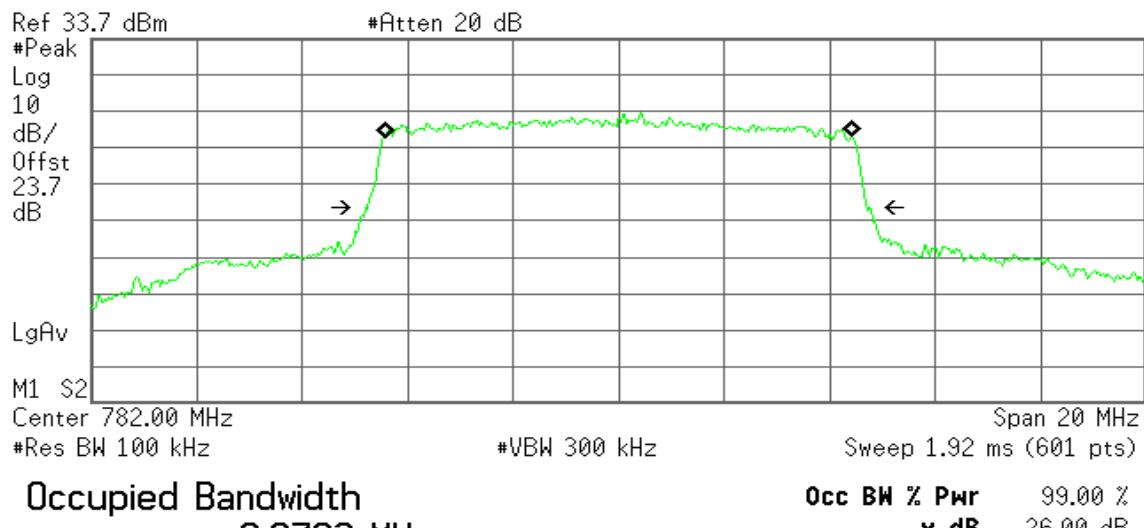
Transmit Freq Error 1.257 kHz  
x dB Bandwidth 5.066 MHz

**CHANNEL BANDWIDTH: 5MHz / 16QAM**

Transmit Freq Error 499.689 Hz  
x dB Bandwidth 5.031 MHz

**CHANNEL BANDWIDTH: 10MHz / QPSK****Agilent****R T**

**Transmit Freq Error**      625.912 Hz  
**x dB Bandwidth**      9.621 MHz

**CHANNEL BANDWIDTH: 10MHz / 16QAM****Agilent****R T**

**Transmit Freq Error**      -1.904 kHz  
**x dB Bandwidth**      9.481 MHz



## **7.4PEAK TO AVERAGE RATIO**

### **LIMIT**

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.

### **TEST PROCEDURES**

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1%.



## TEST RESULTS

### LTE Band 13

#### CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23230	782.00	6.15

#### CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23230	782.00	7.32

#### CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23230	782.00	5.21

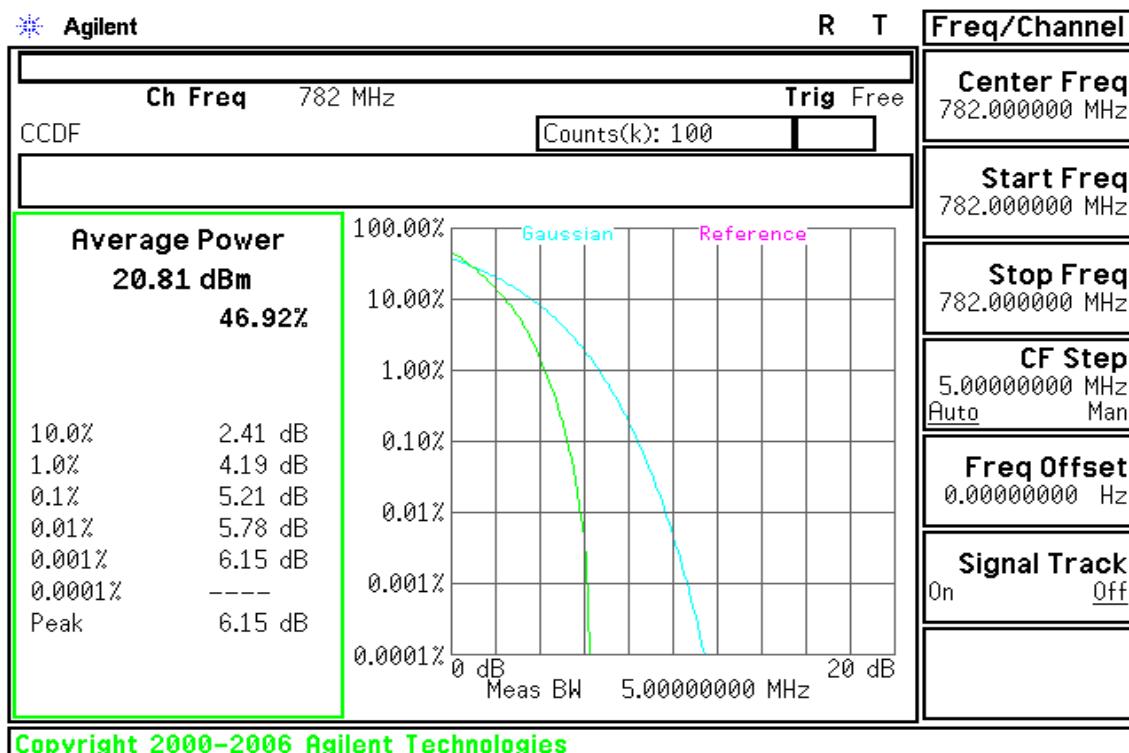
#### CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23230	782.00	7.07

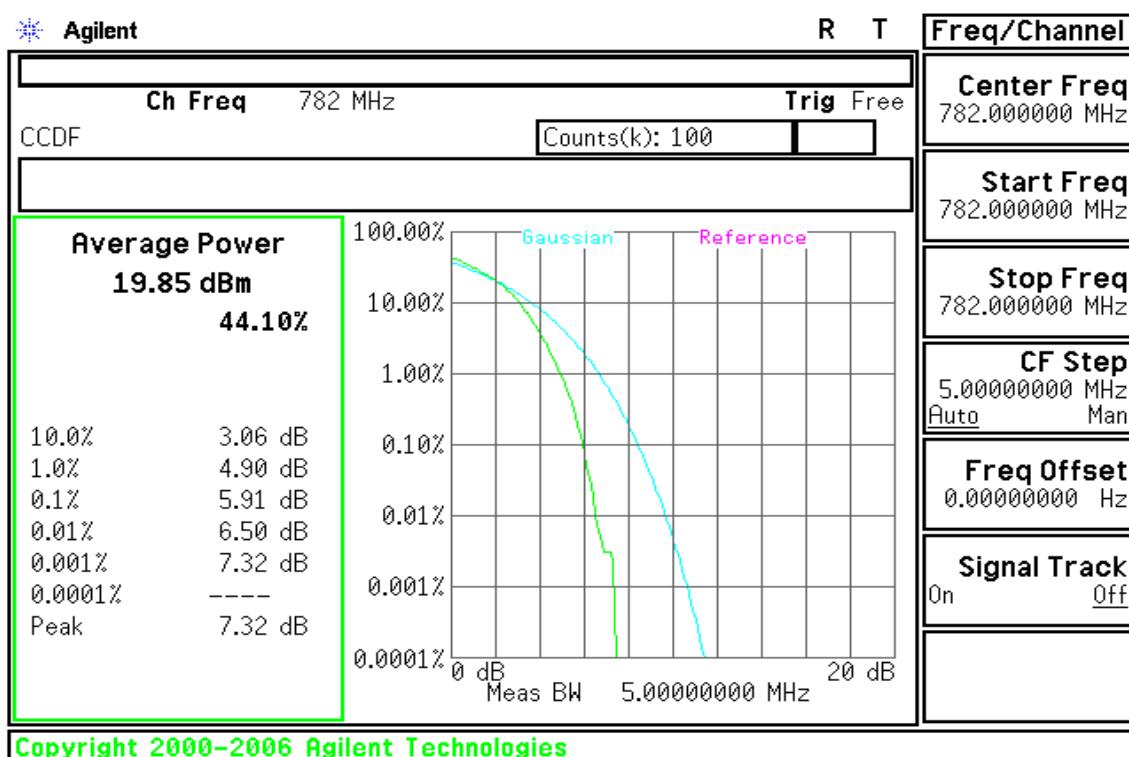


## LTE Band 13

### CHANNEL BANDWIDTH: 5MHz / QPSK

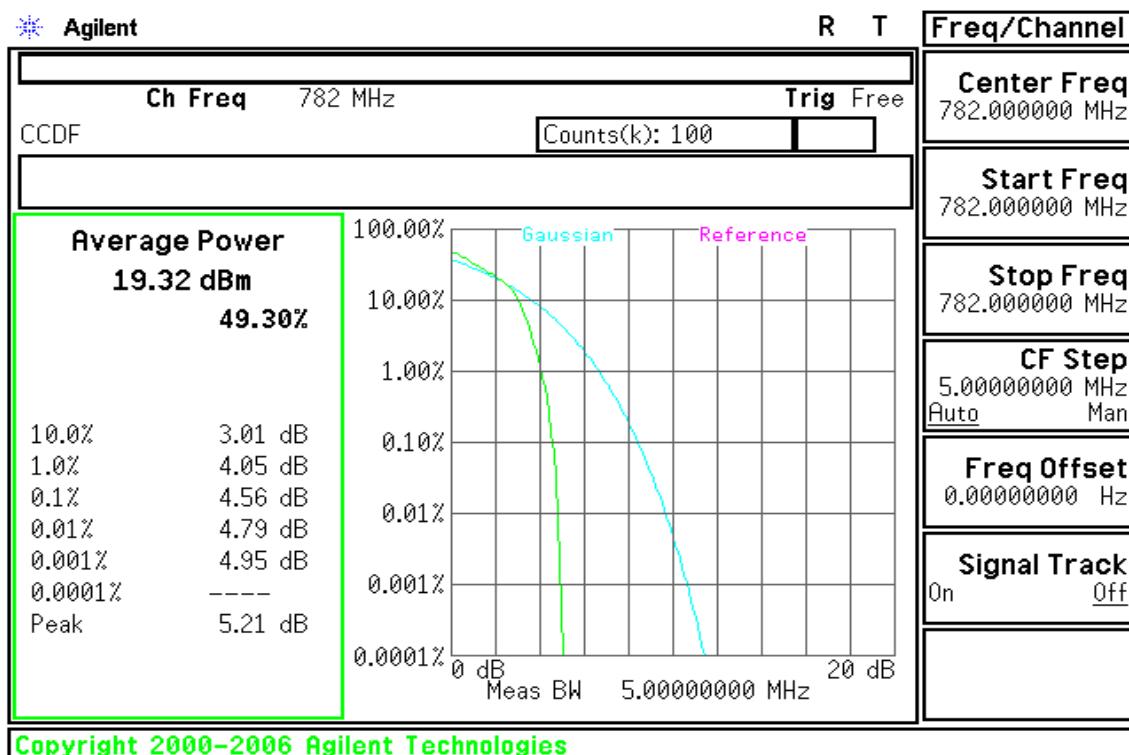


### CHANNEL BANDWIDTH: 5MHz / 16QAM

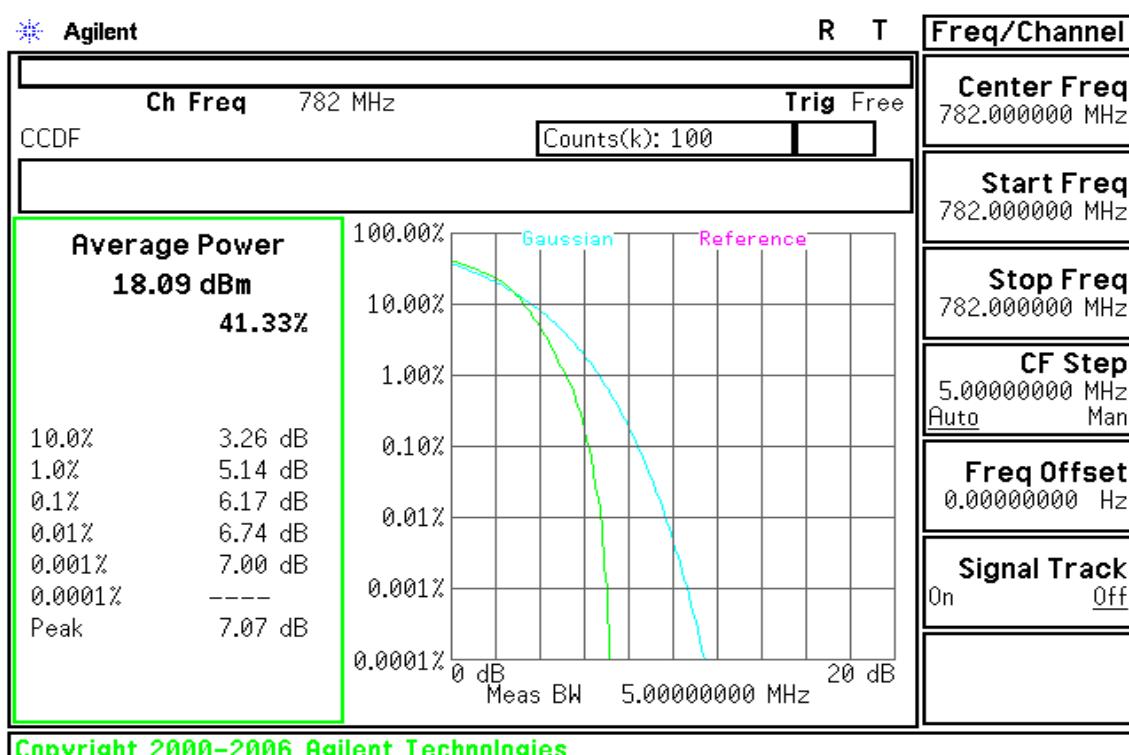




## CHANNEL BANDWIDTH: 10MHz / QPSK



## CHANNEL BANDWIDTH: 10MHz / 16QAM





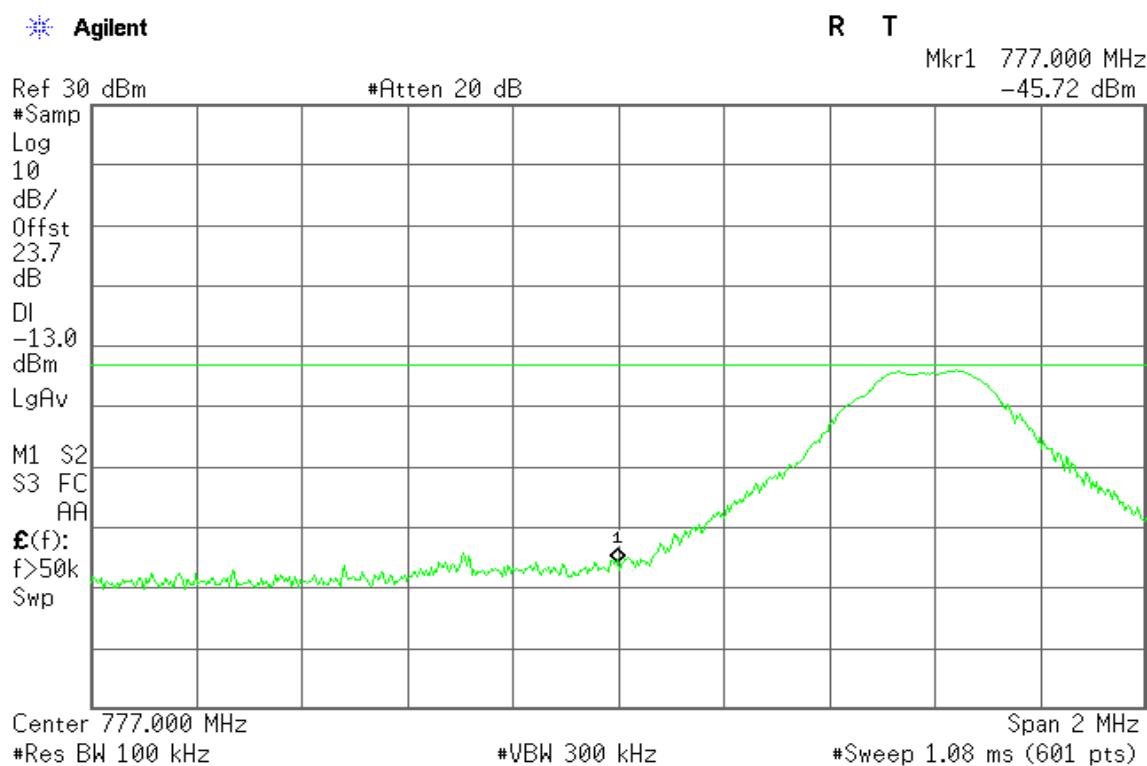
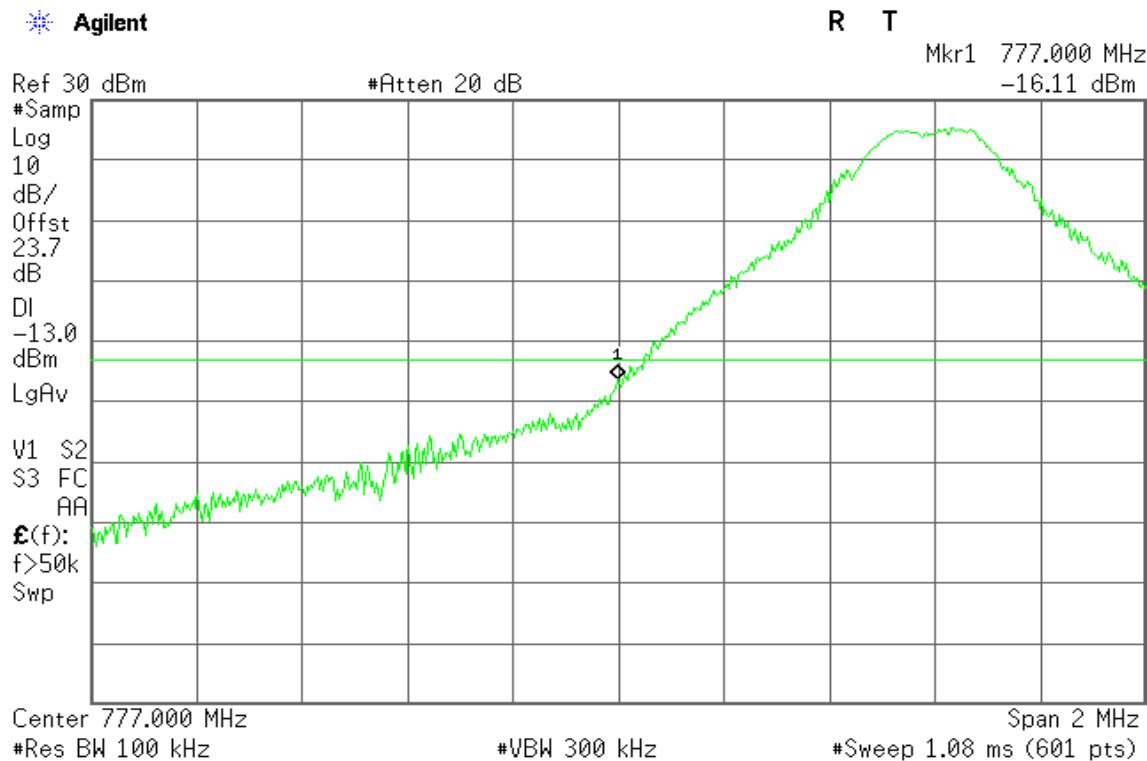
## 7.5BAND EDGE MEASUREMENT

### LIMIT

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. For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. The limit of emission equal to  $-13\text{dBm}$ . 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.

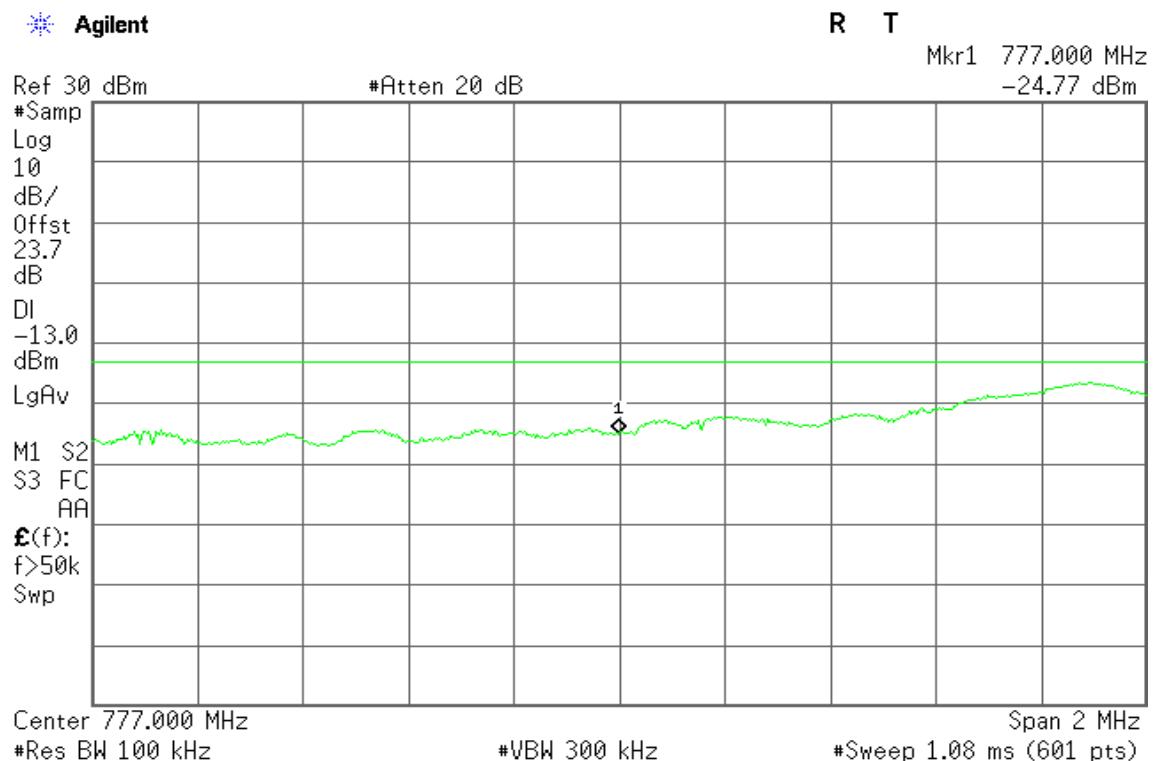
### TEST PROCEDURES

1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
2. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 7.2 dB in the transmitted path track.
3. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 50kHz and VB of the spectrum is 200kHz.
4. Record the max trace plot into the test report.

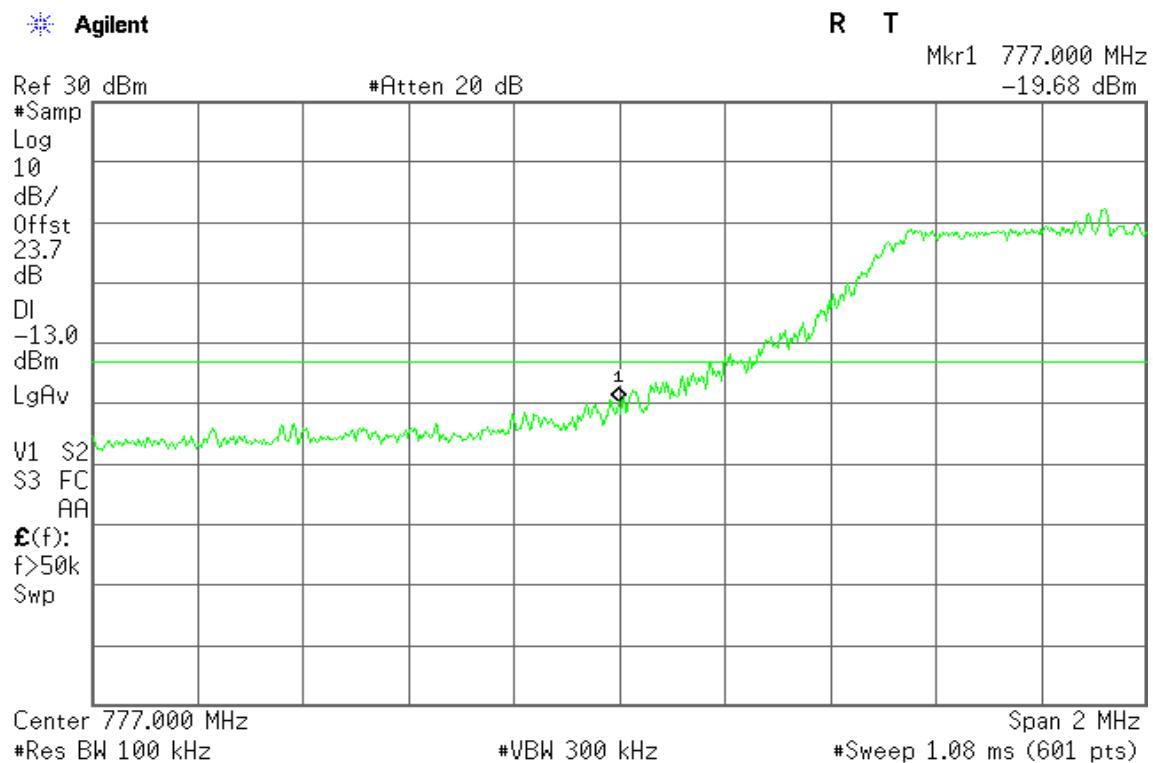
**TEST RESULTS:****LTE Band 13****CHANNEL BANDWIDTH: 10MHz / QPSK / FULL RB ALLOCATED****-13dB****Low BAND EDGE**

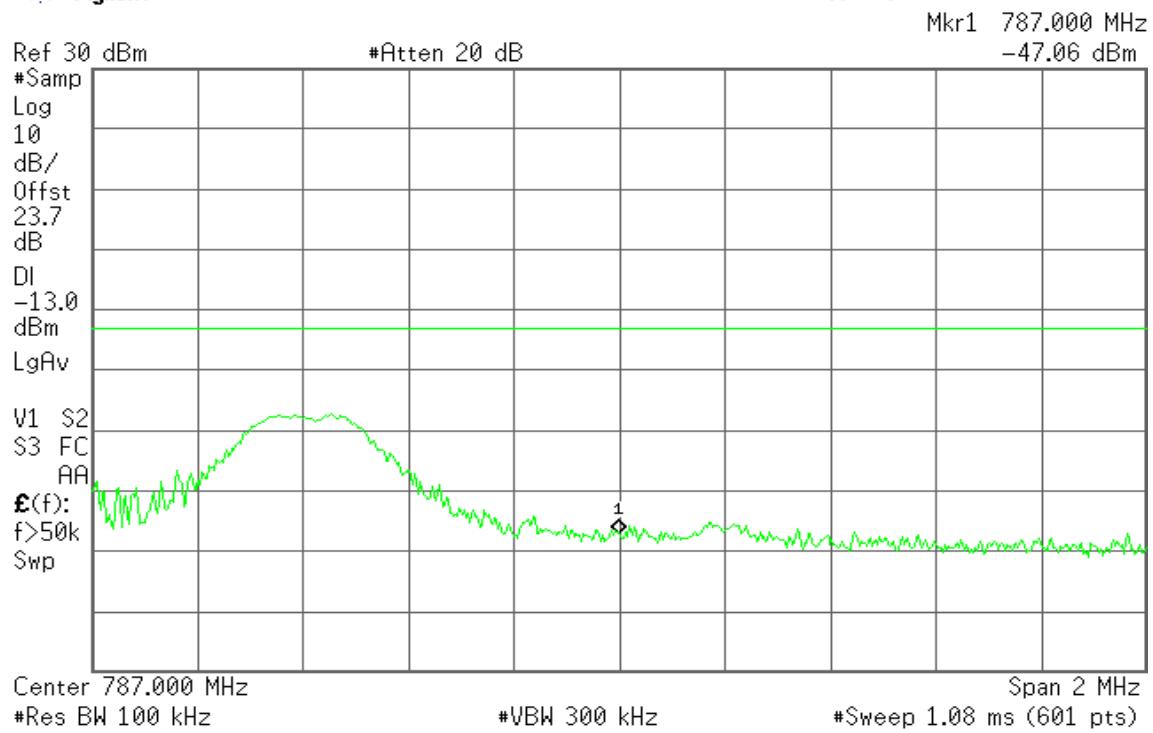
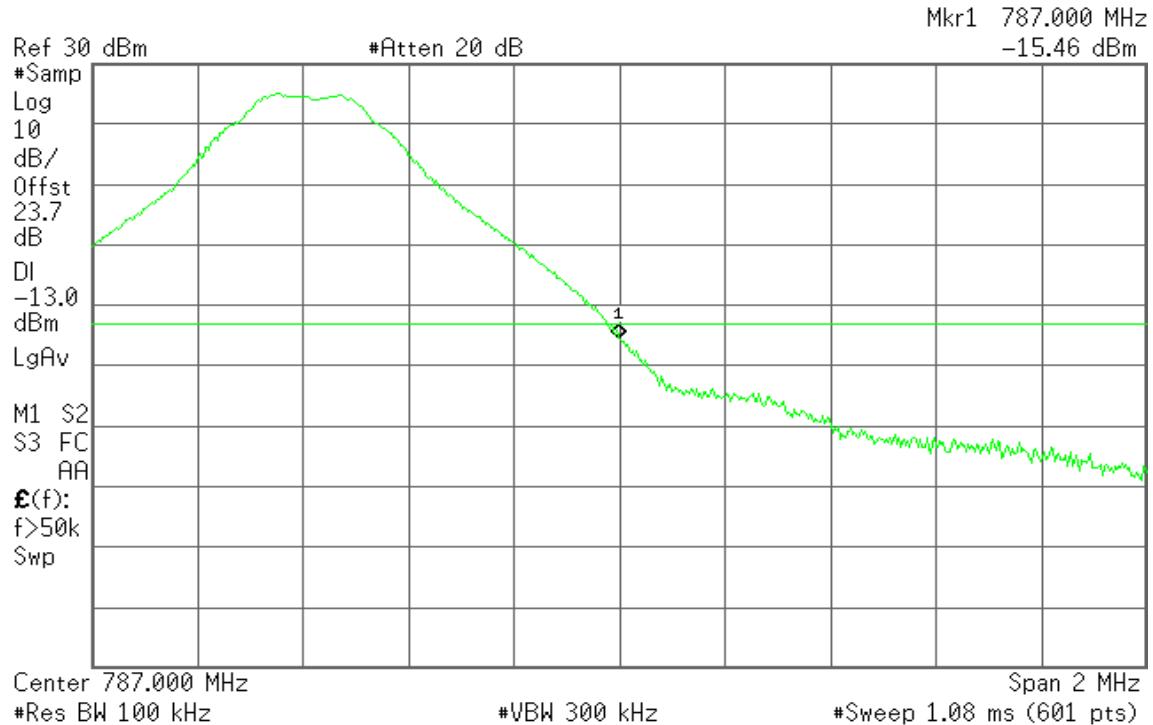


Agilent



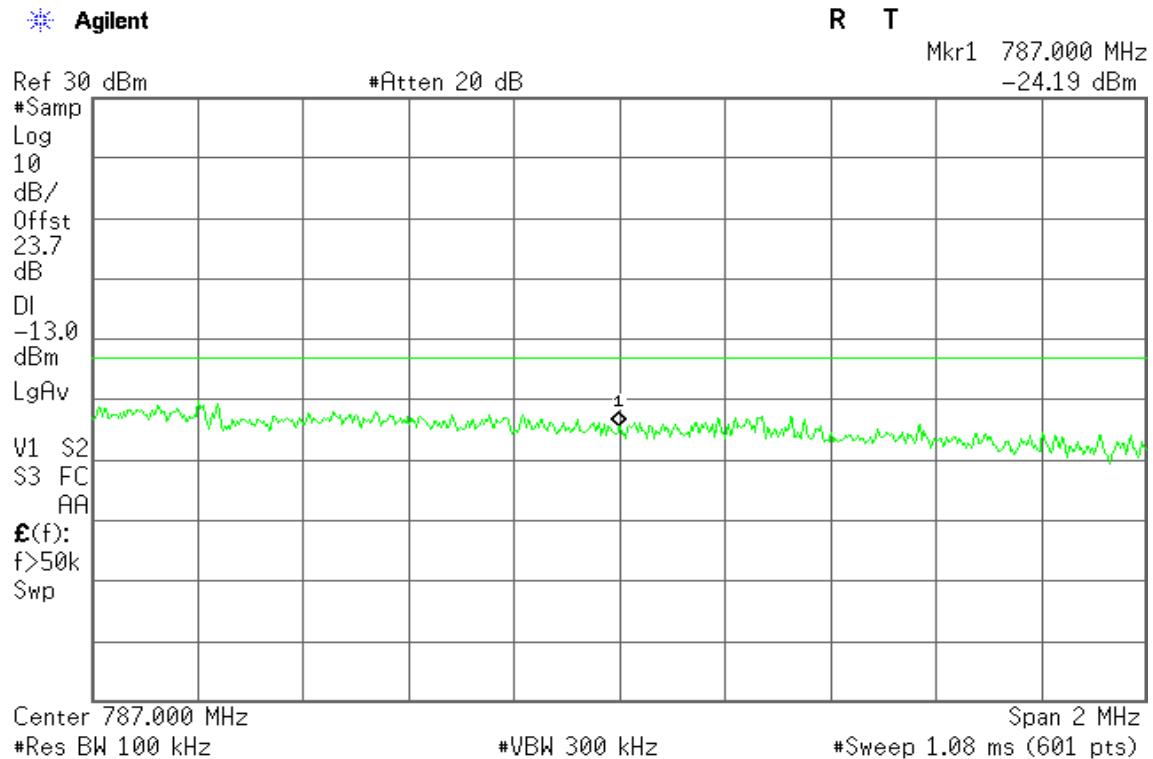
Agilent



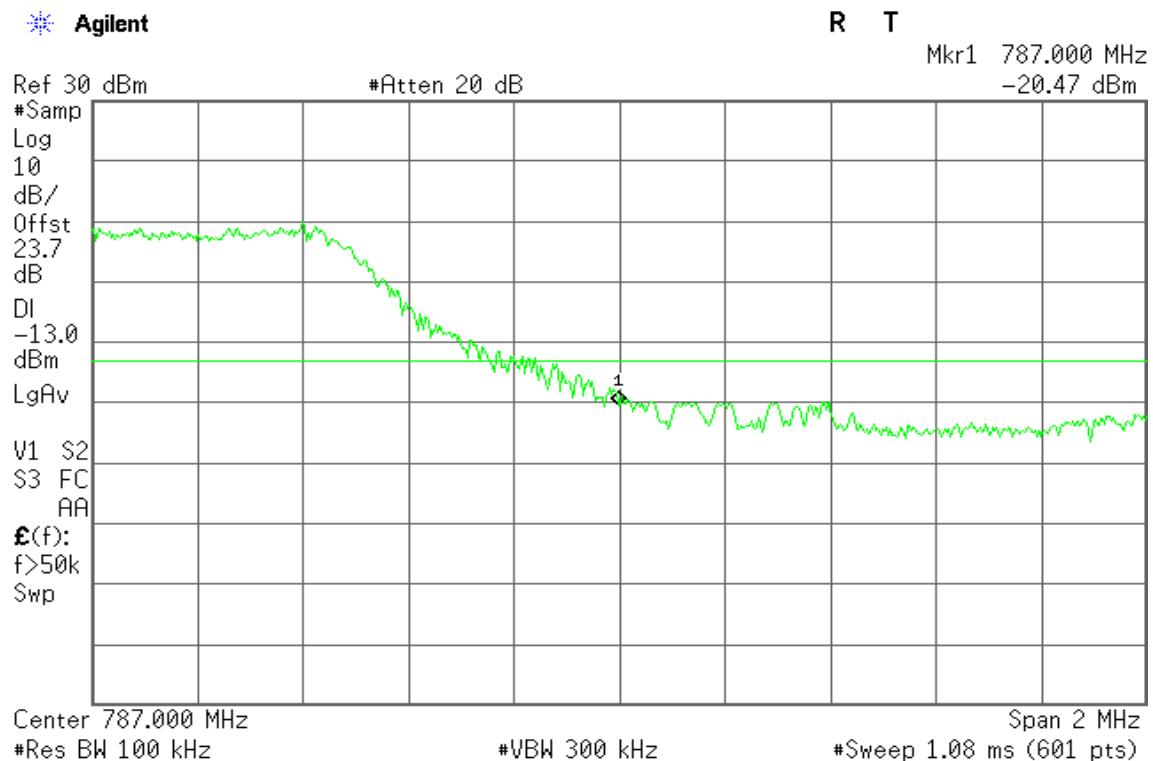
**High BAND EDGE****\* Agilent****\* Agilent**

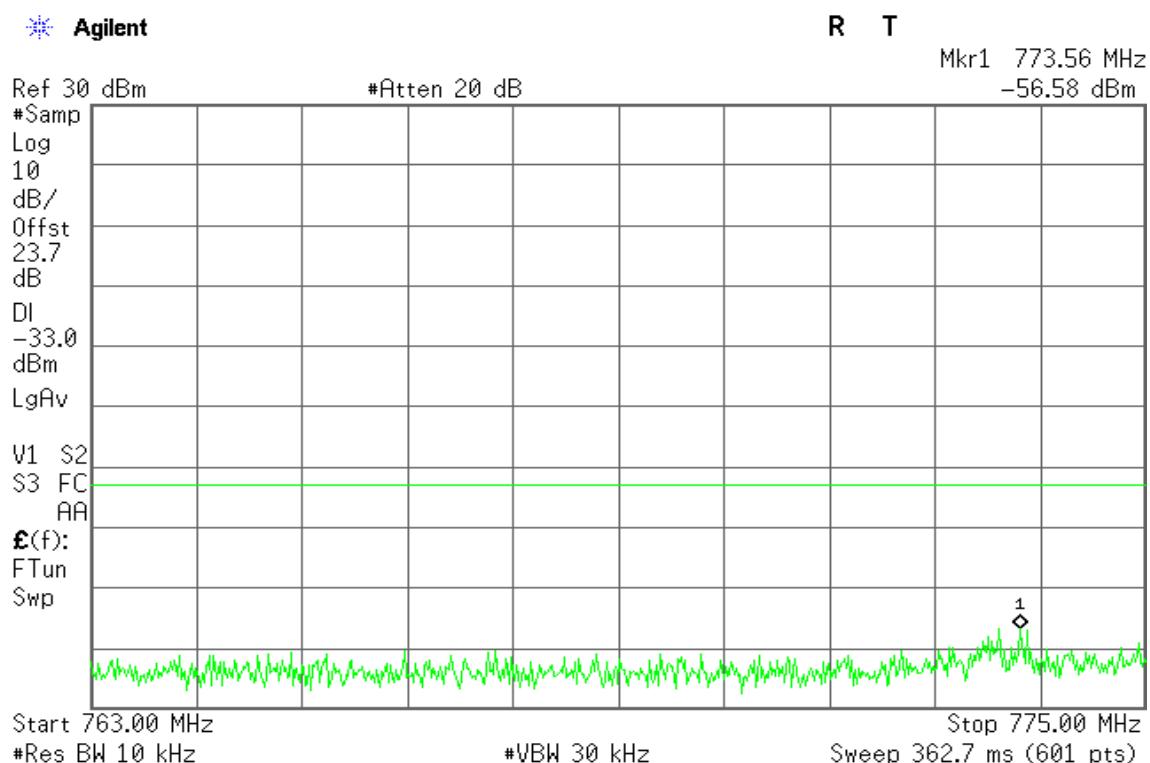
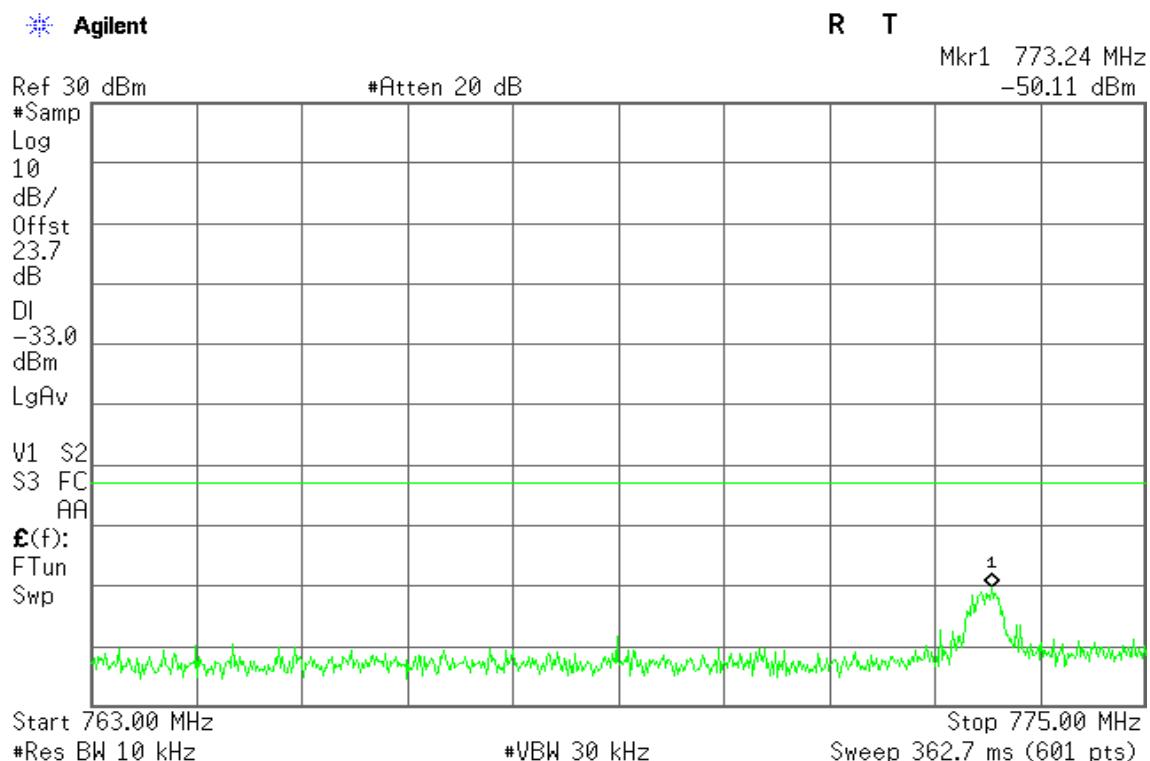


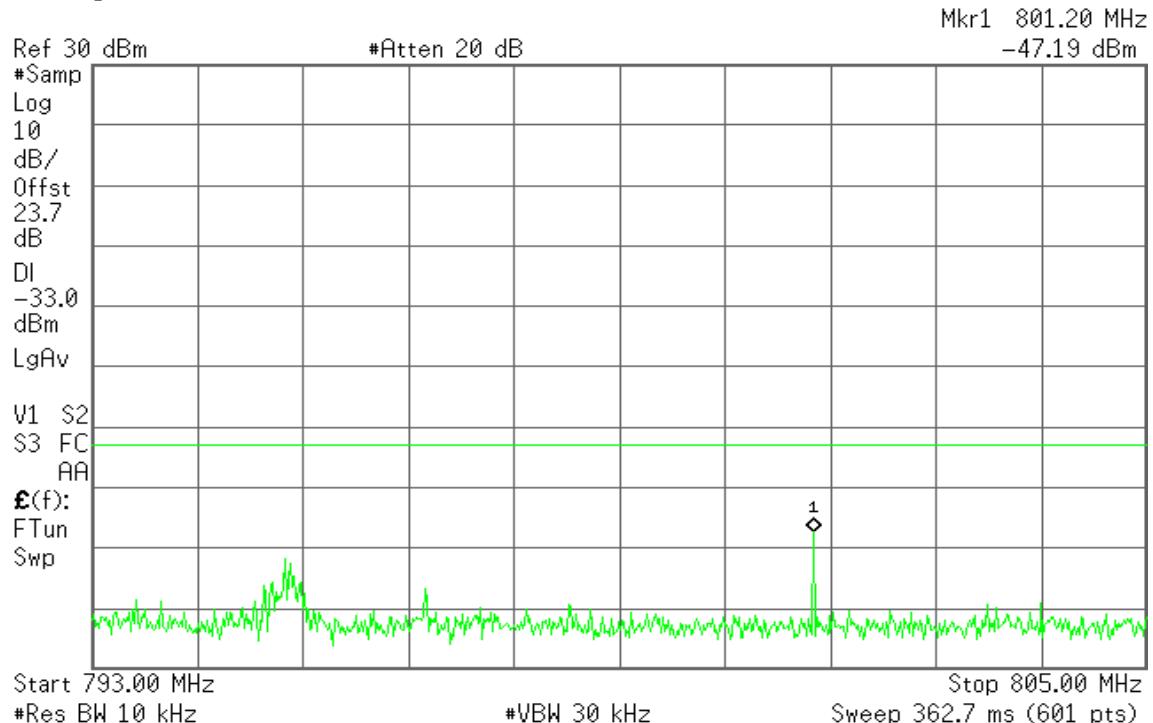
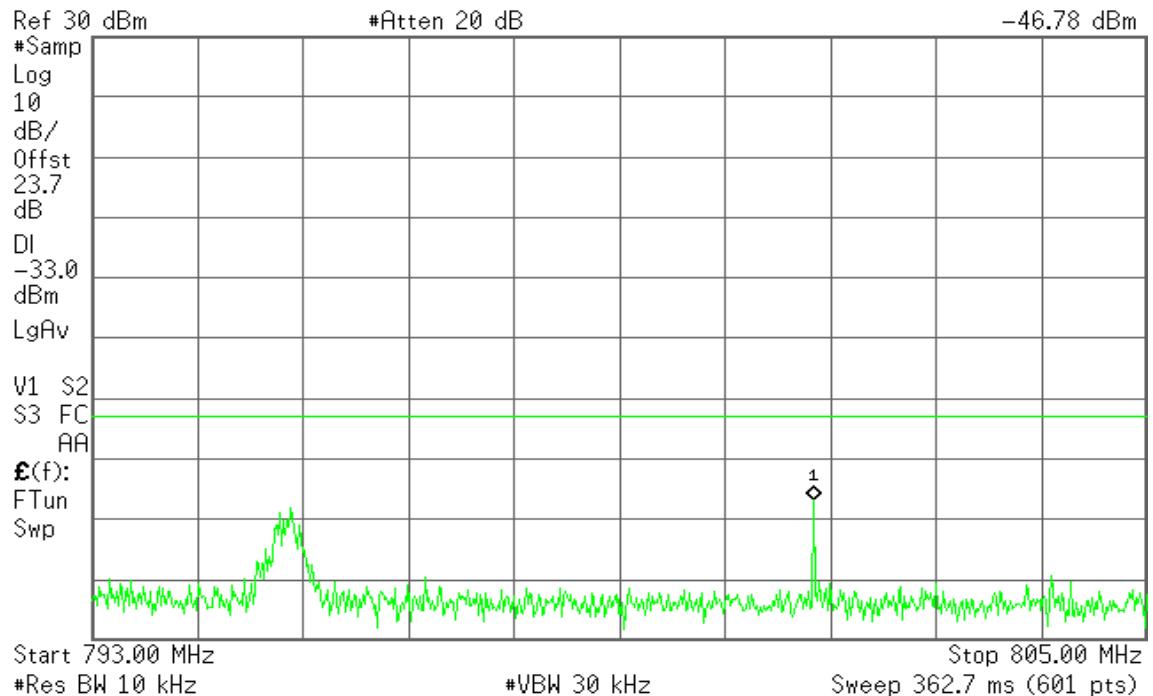
\* Agilent



\* Agilent

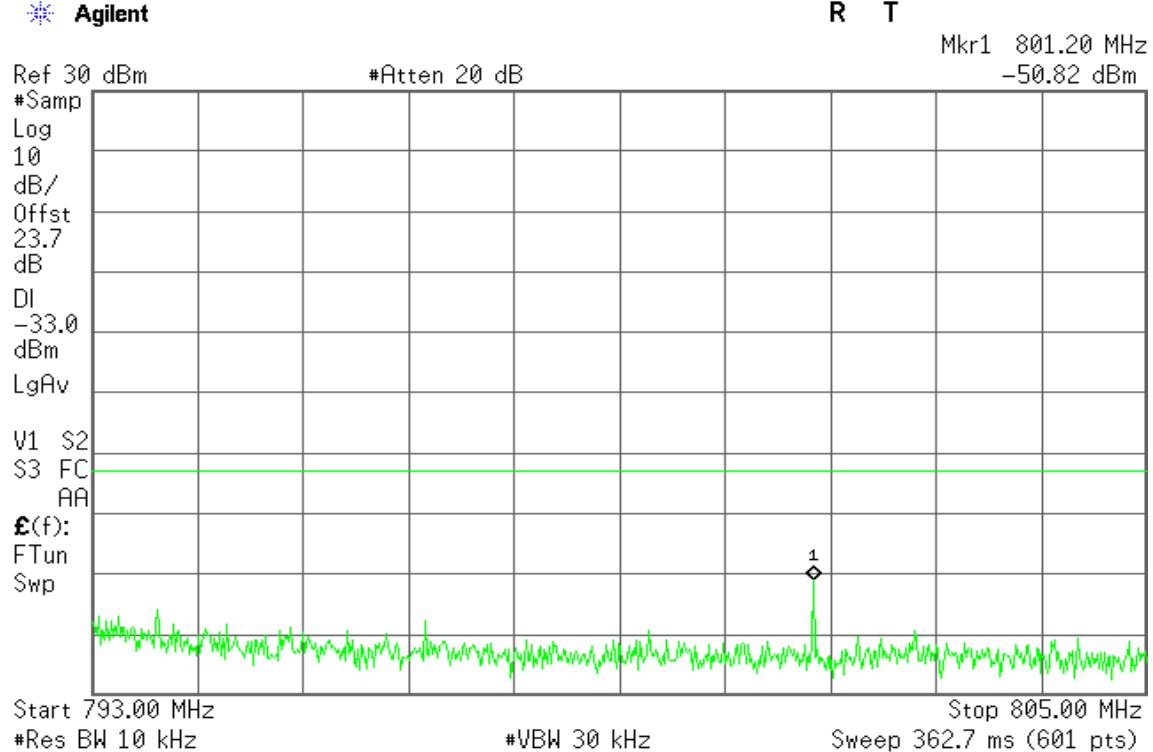


**-33dB****Low BAND EDGE**

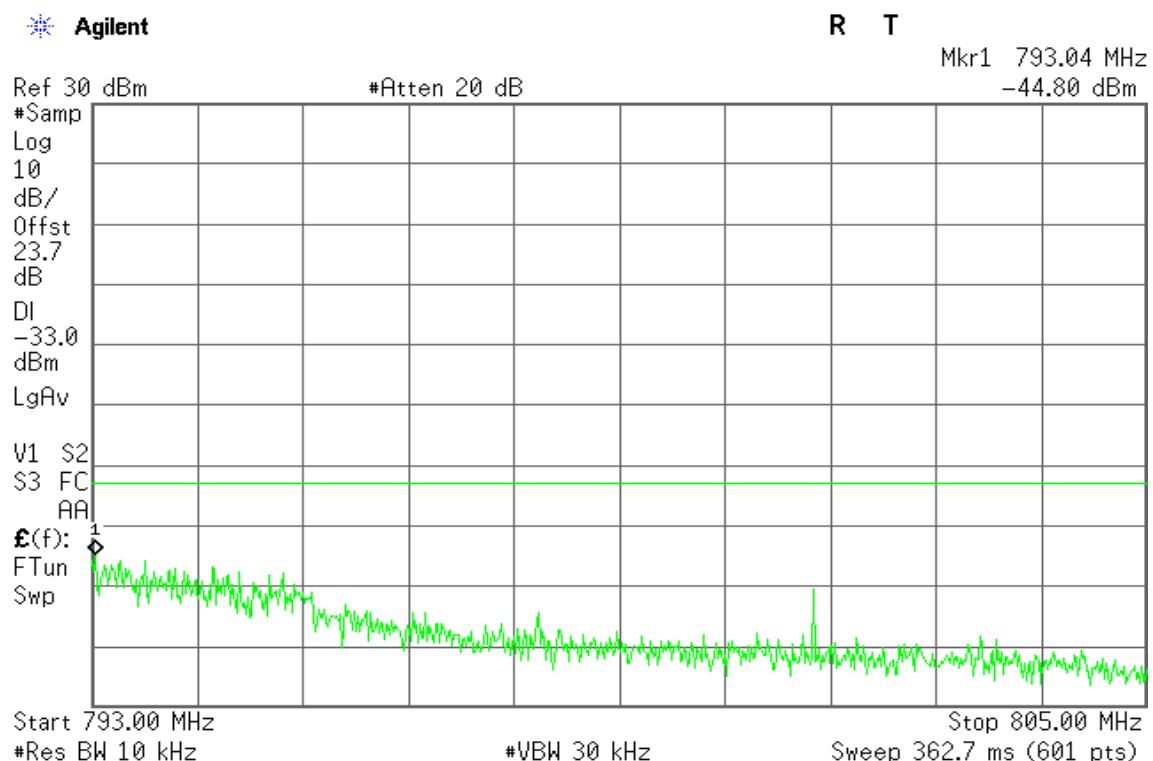
**High BAND EDGE****Agilent****Agilent****R T**Mkr1 801.20 MHz  
-46.78 dBm

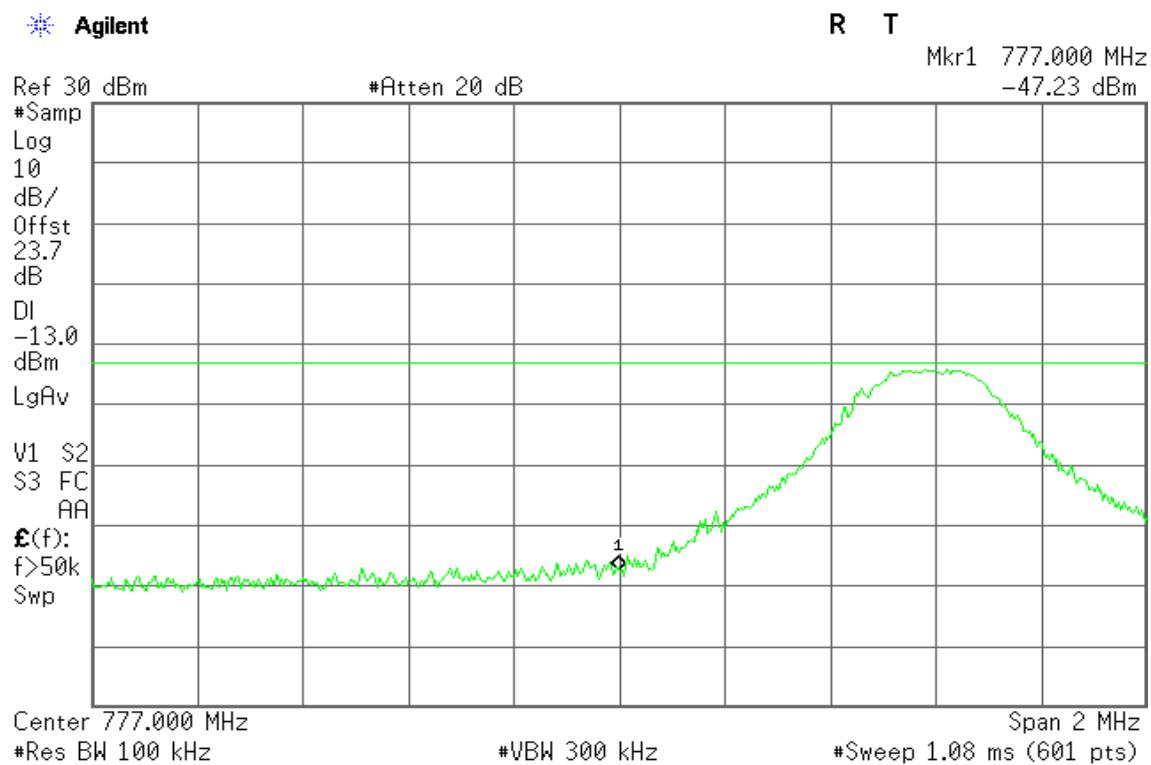
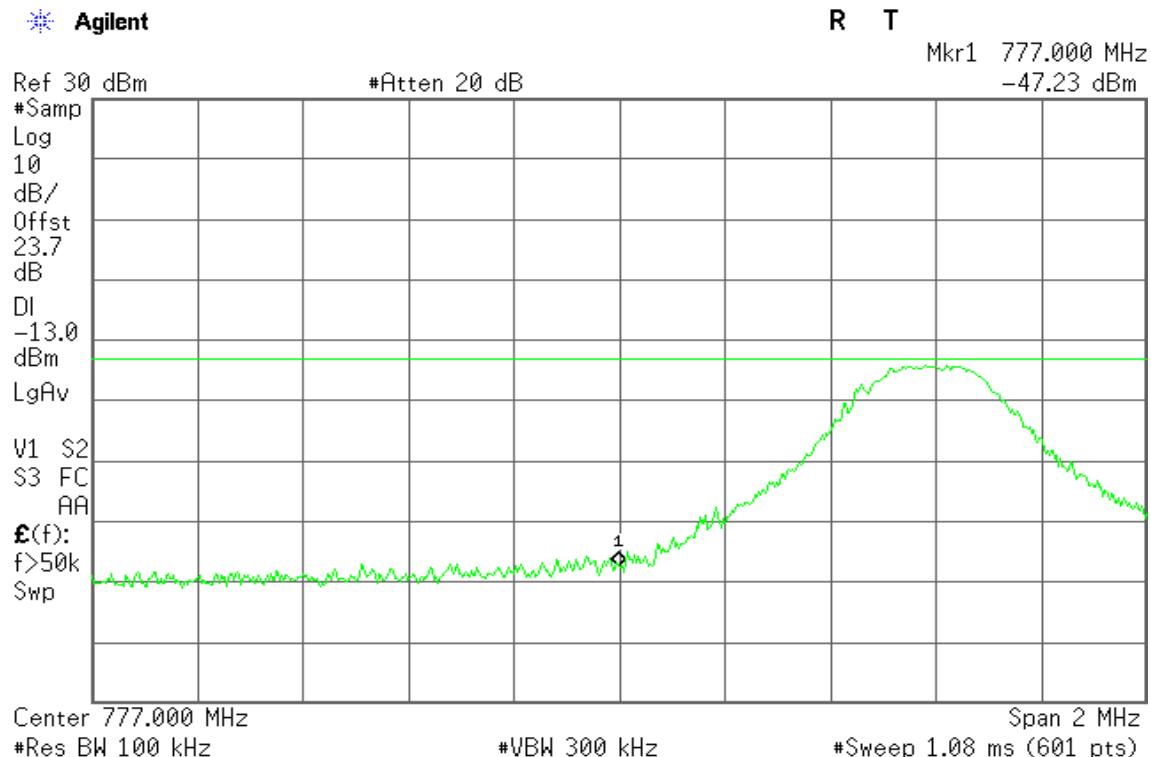


\* Agilent



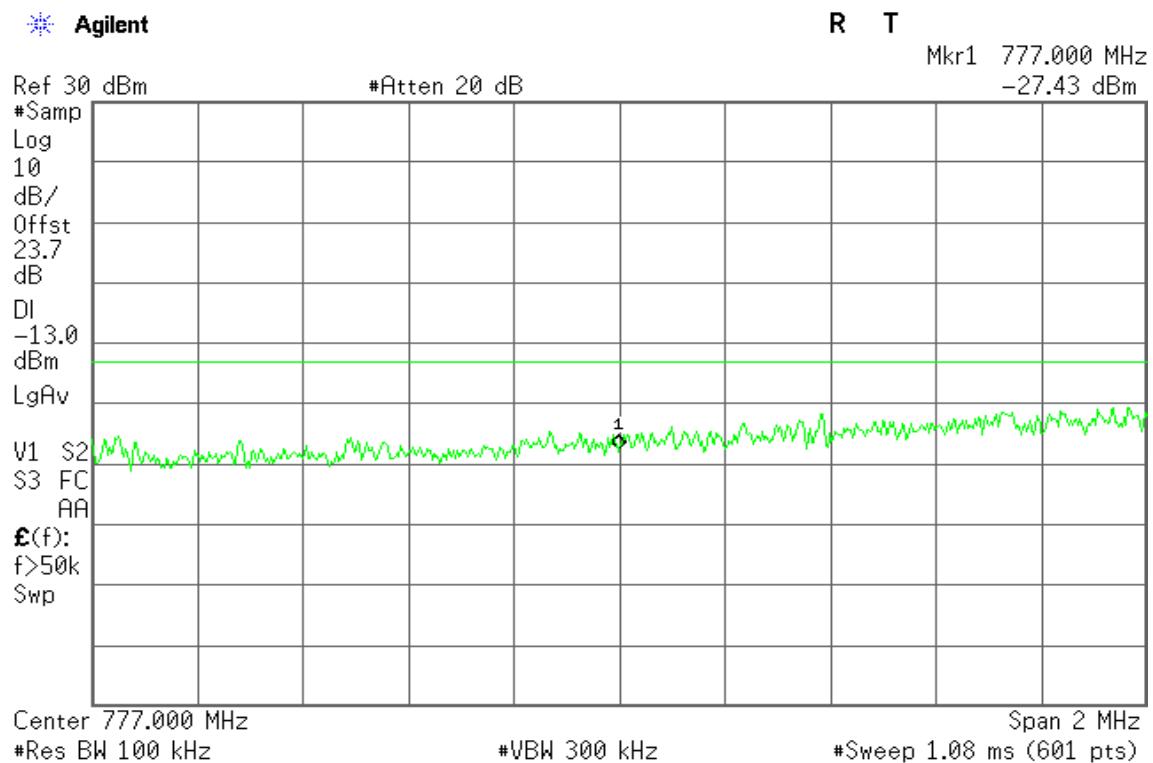
\* Agilent



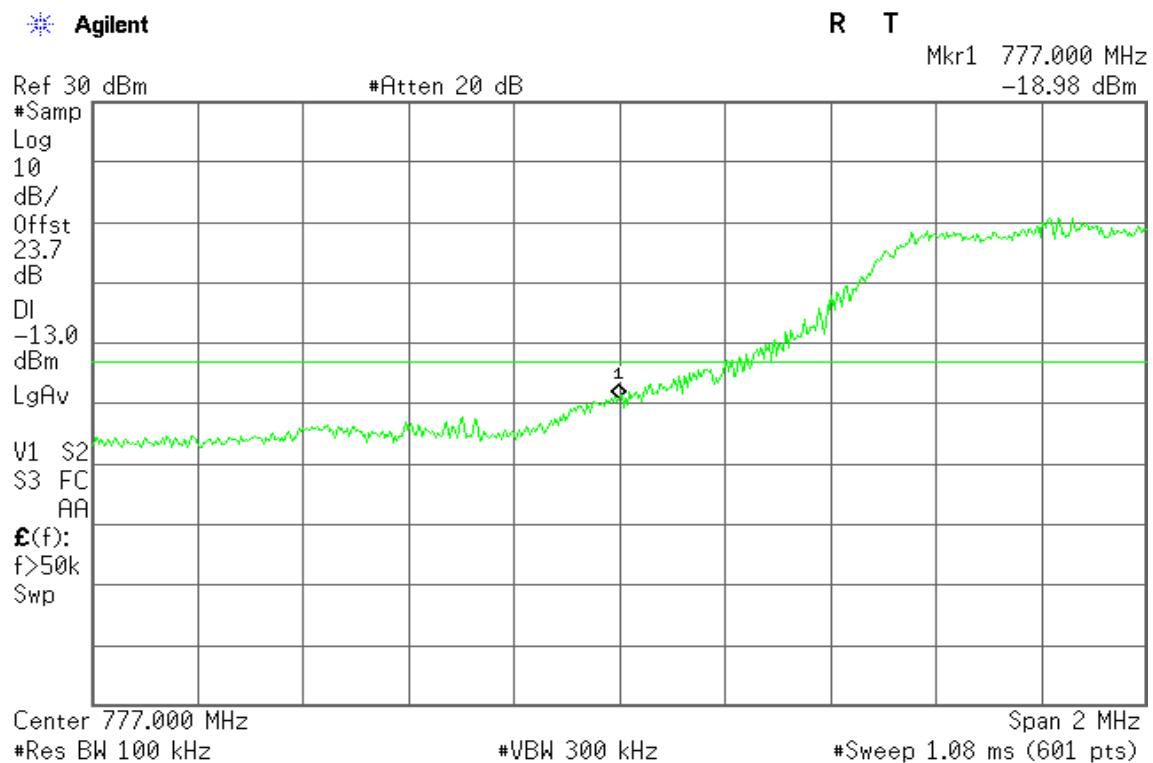
**LTE Band 13****CHANNEL BANDWIDTH: 10MHz / 16QAM / FULL RB ALLOCATED****-13dB****Low BAND EDGE**

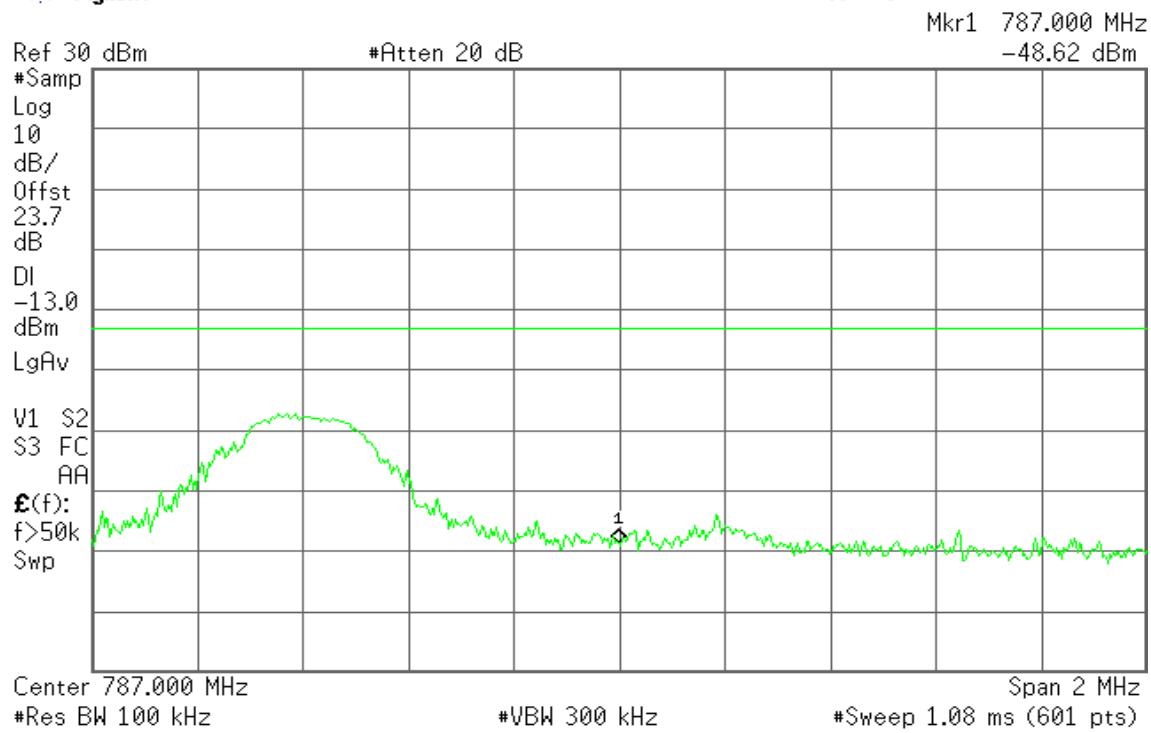
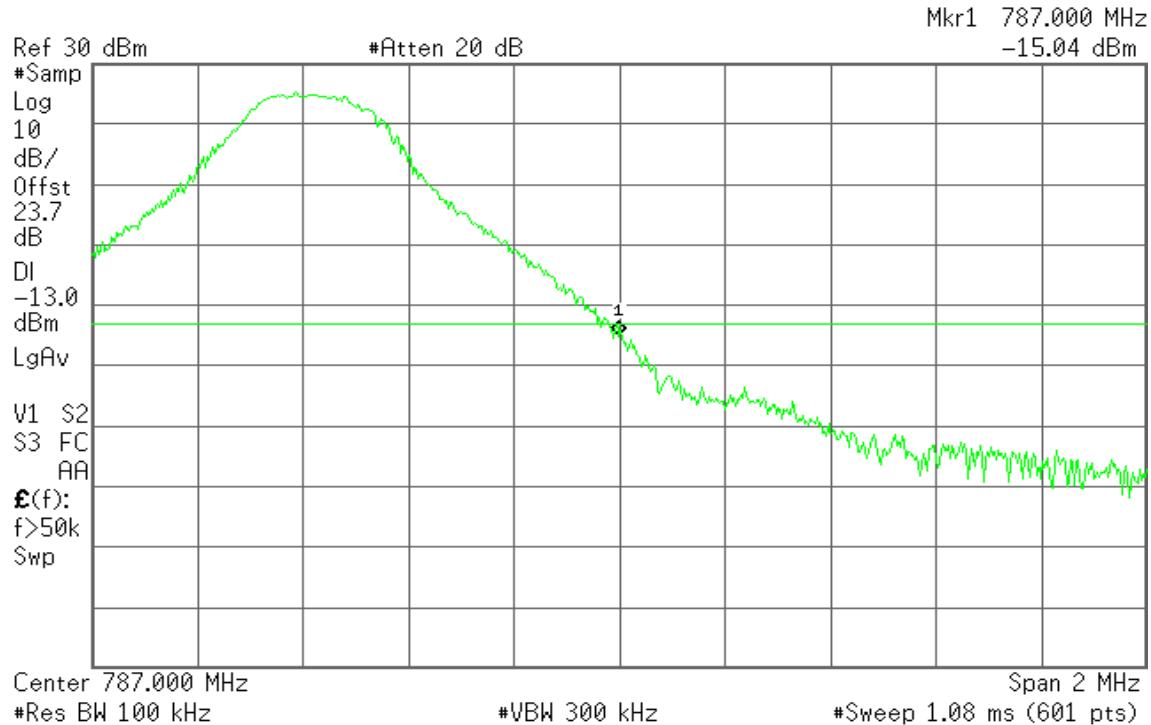


Agilent



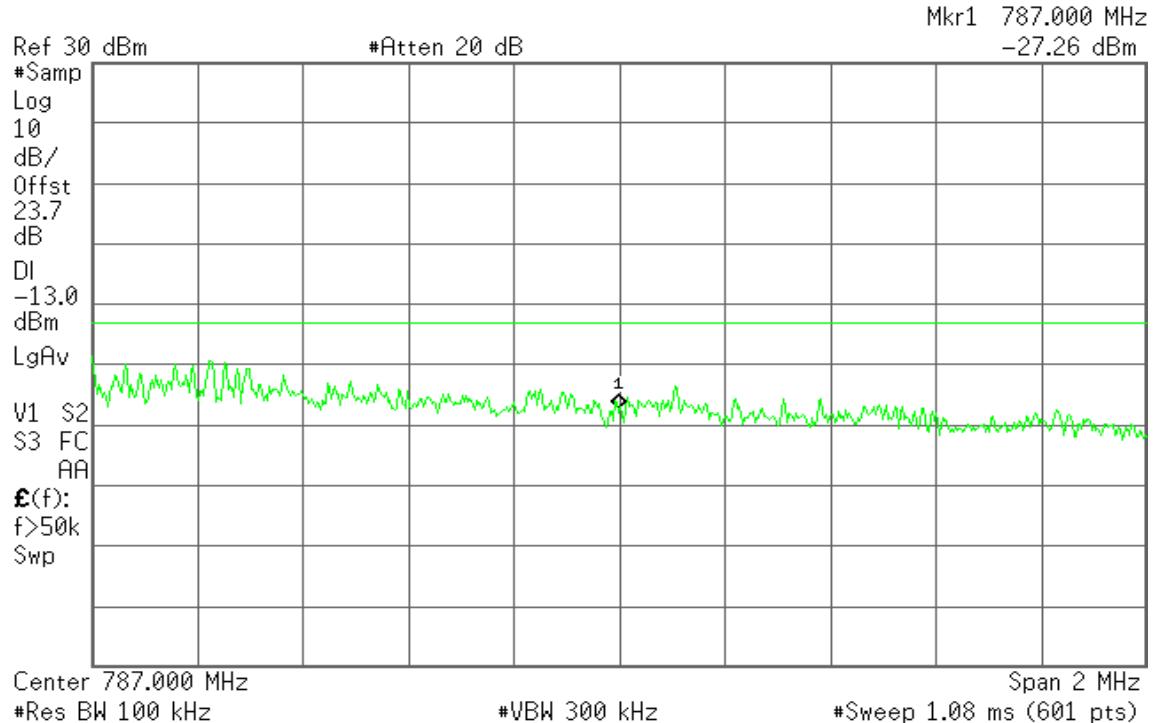
Agilent



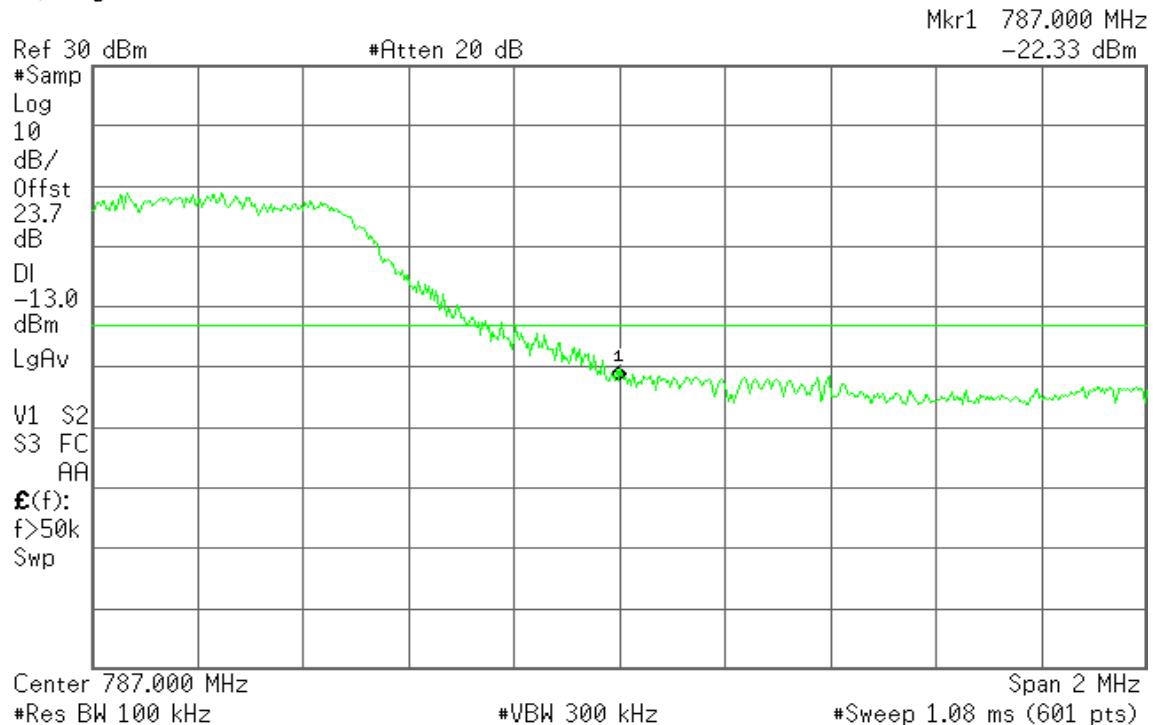
**High BAND EDGE****\* Agilent****\* Agilent**

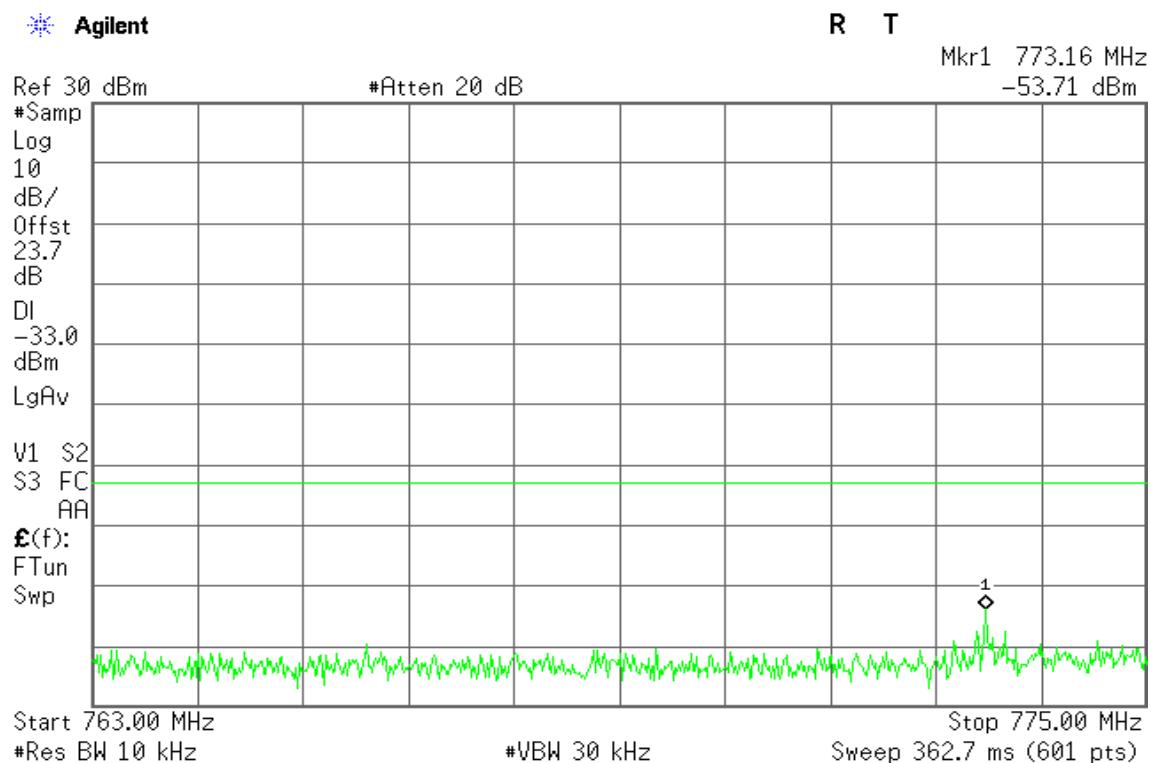
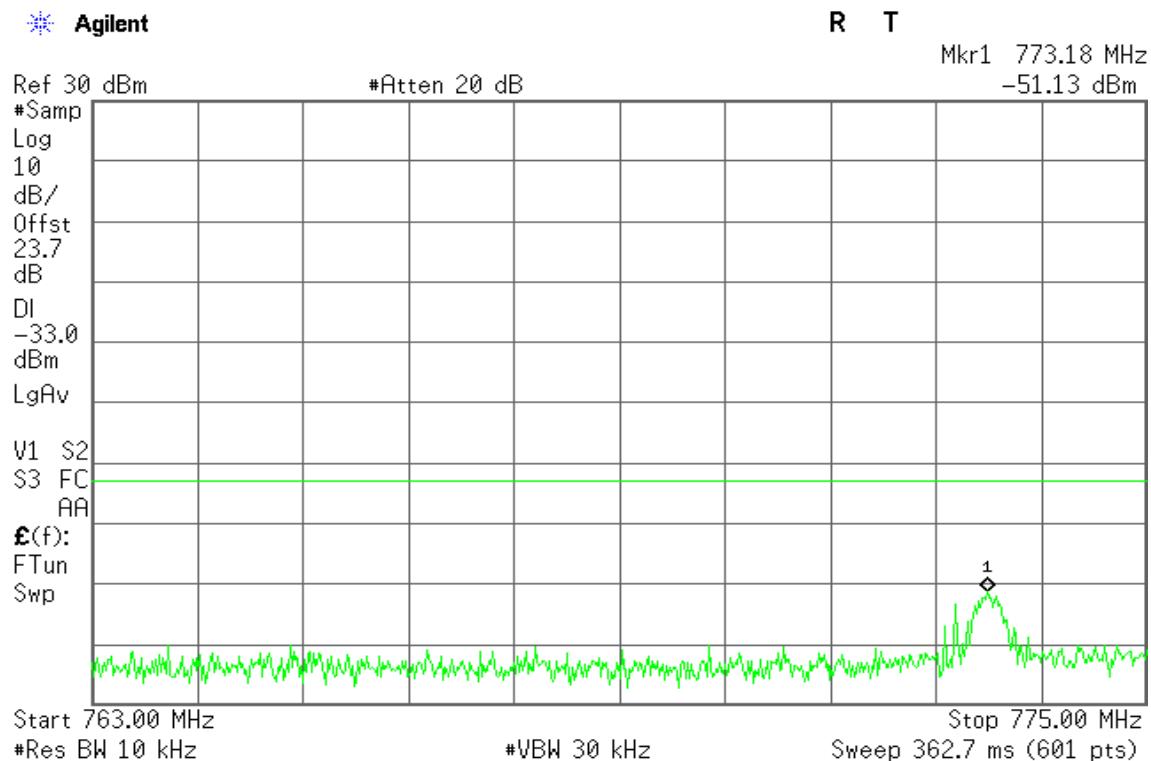


\* Agilent



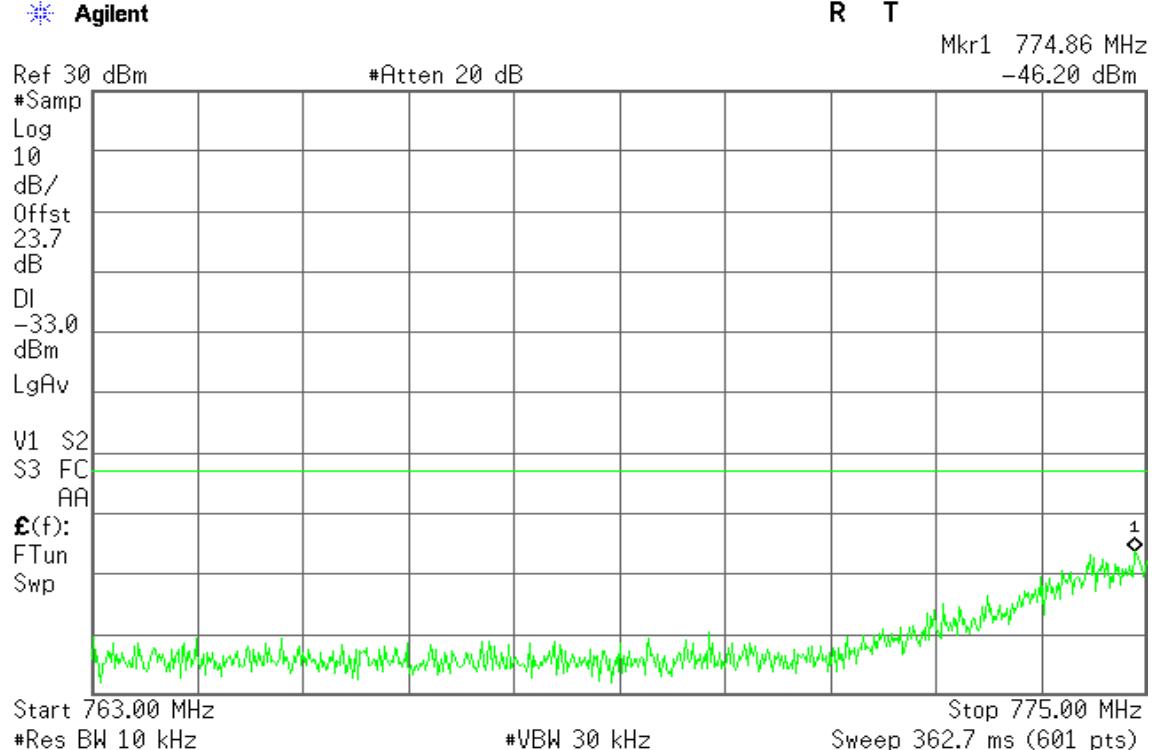
\* Agilent



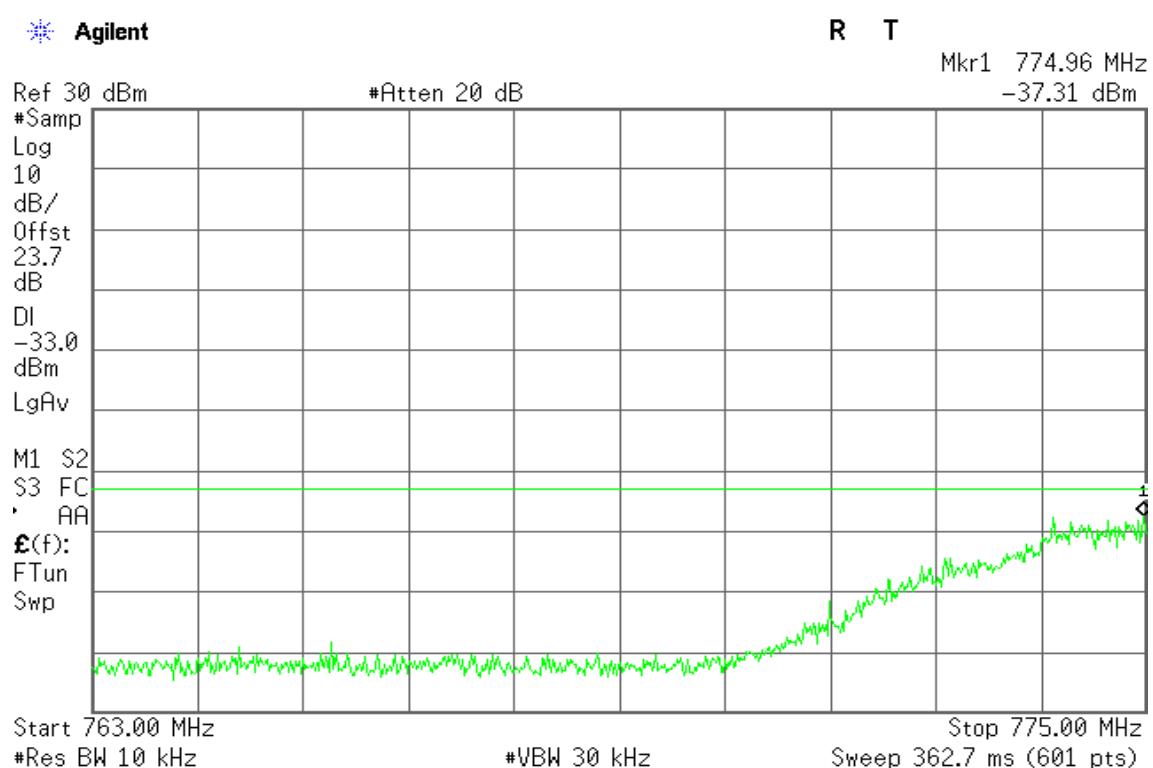
**-33dB****Low BAND EDGE**

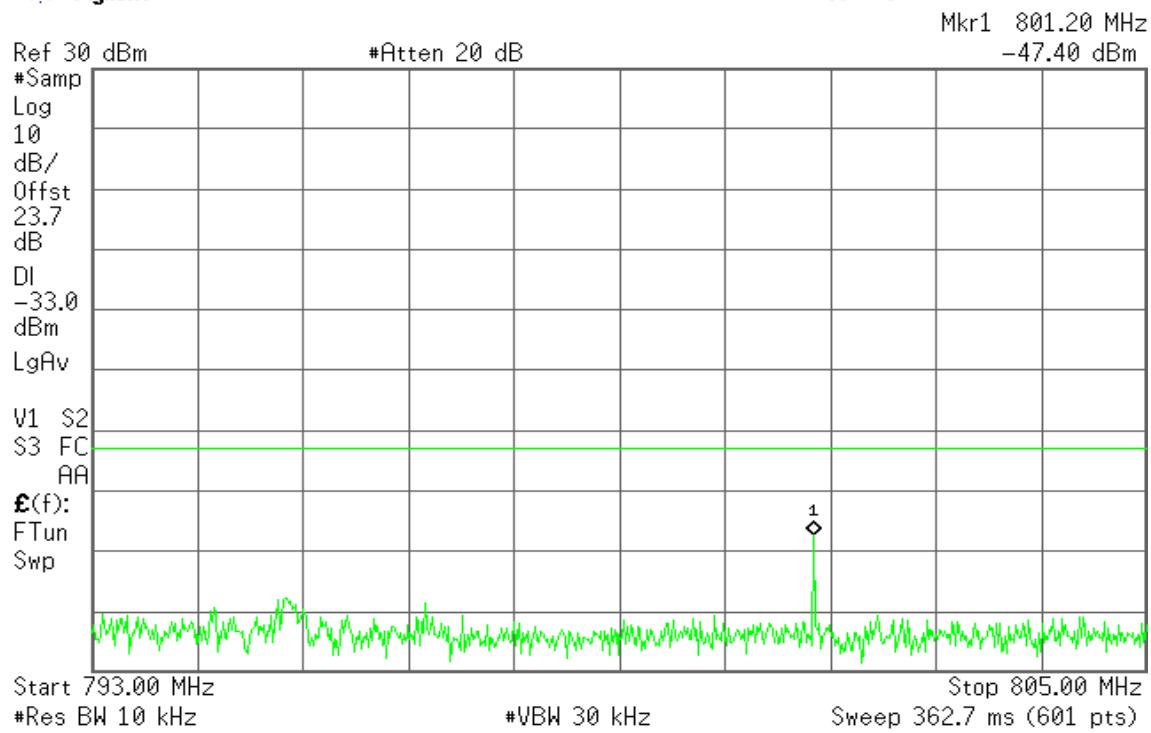
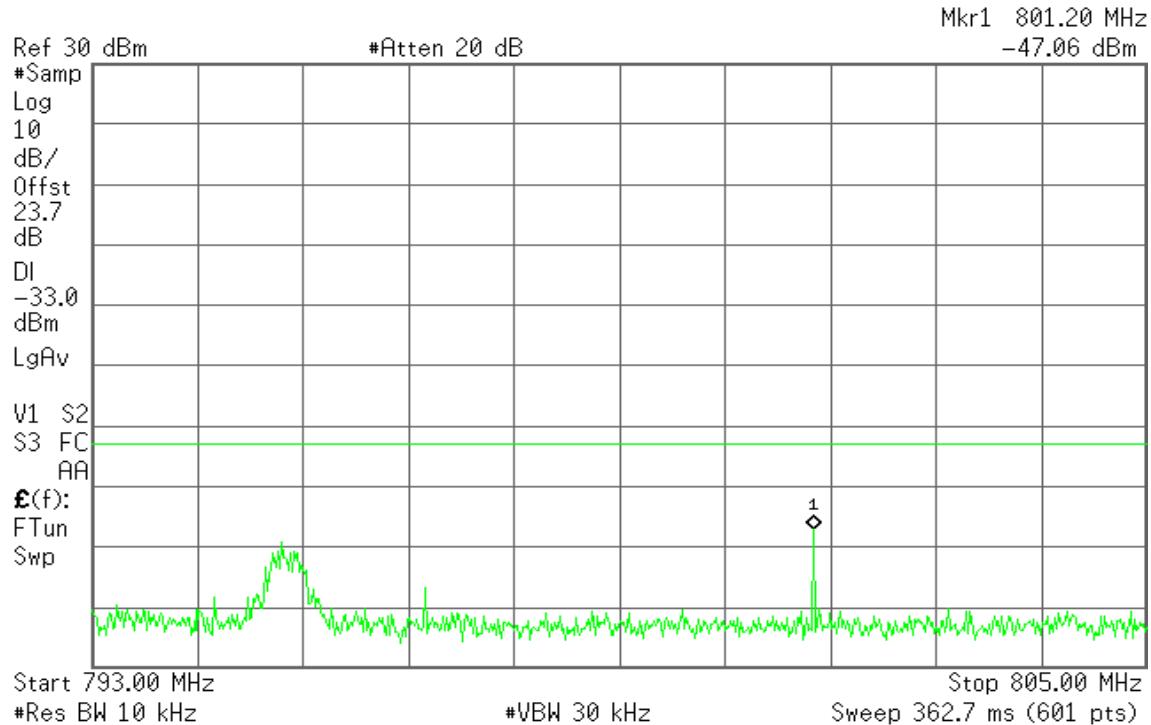


\* Agilent



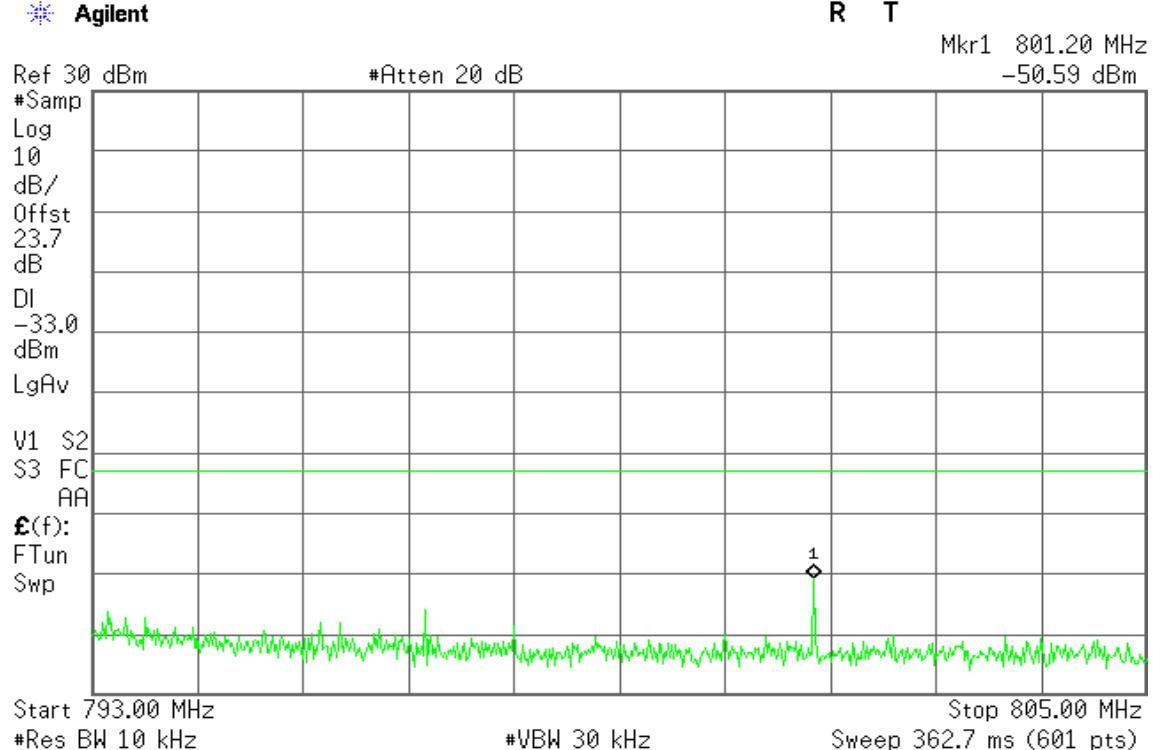
\* Agilent



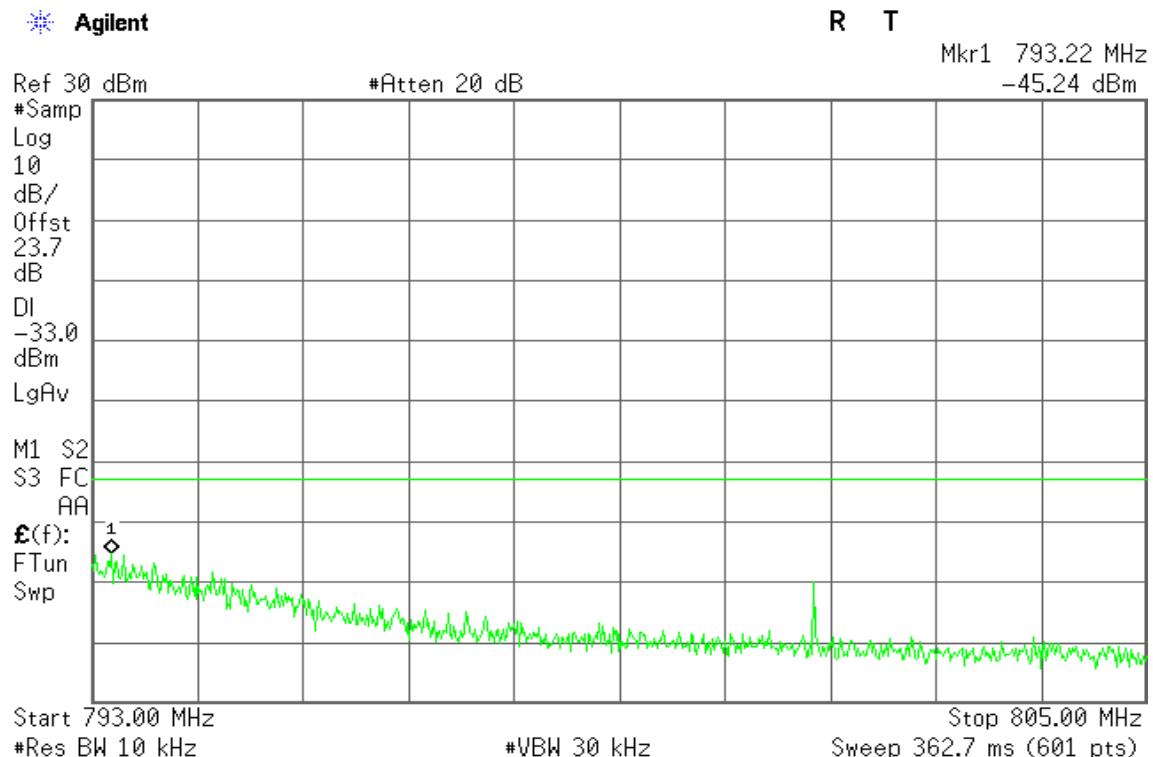
**High BAND EDGE****\* Agilent****\* Agilent**



\* Agilent



\* Agilent





## 7.6 CONDUCTED SPURIOUS EMISSIONS

### **LIMITS**

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. The limit of emission equal to  $-13\text{dBm}$

### **TEST PROCEDURES**

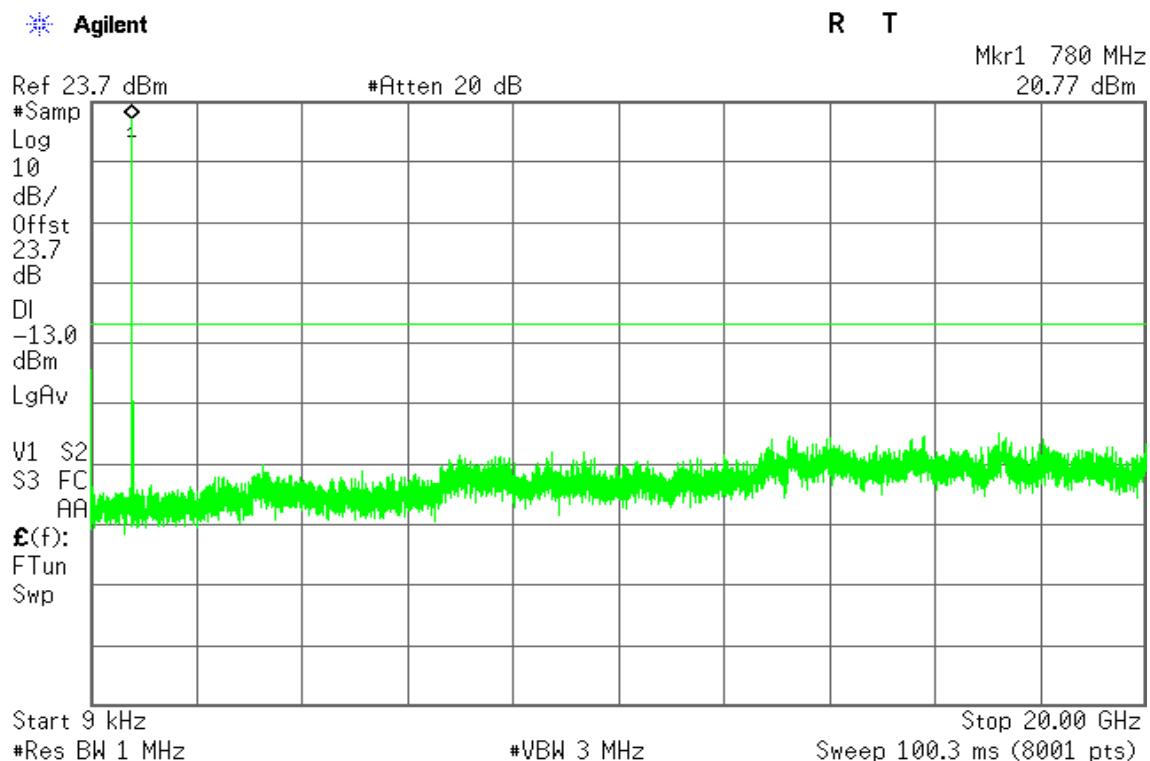
1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range.).
2. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
3. When the spectrum scanned from 30MHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.
4. When the spectrum scanned from 3GHz to 20GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.



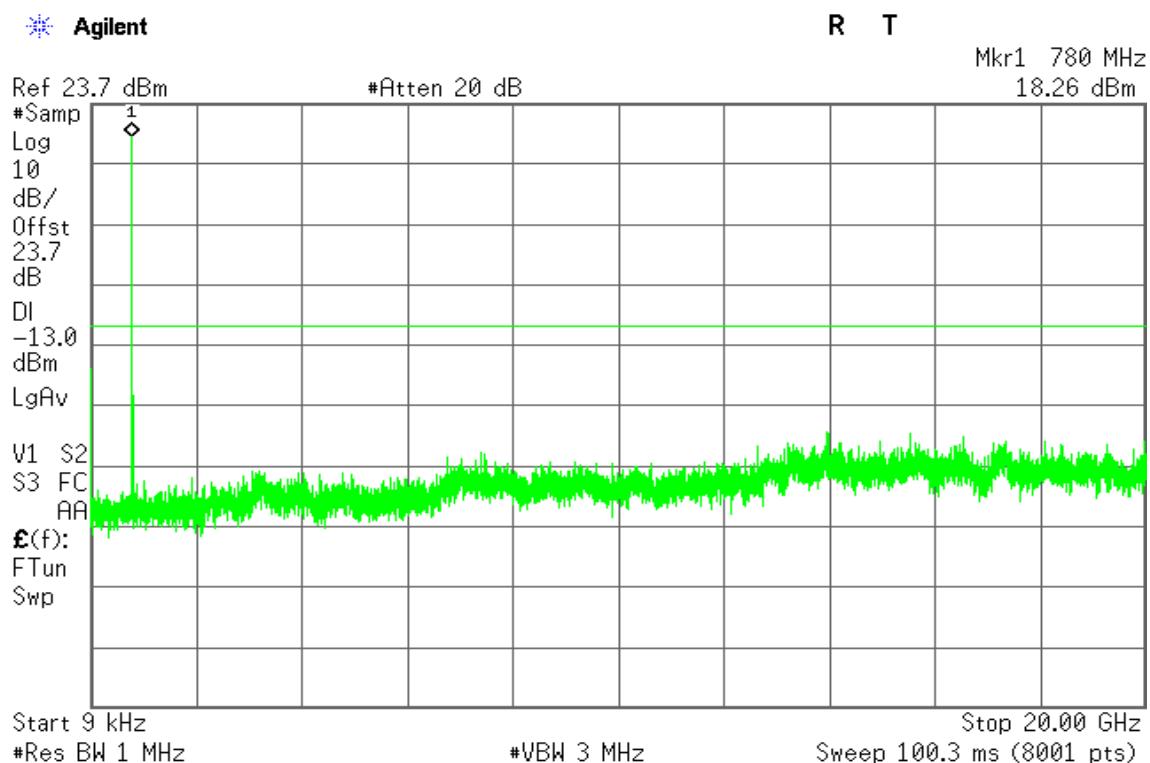
## TEST RESULTS

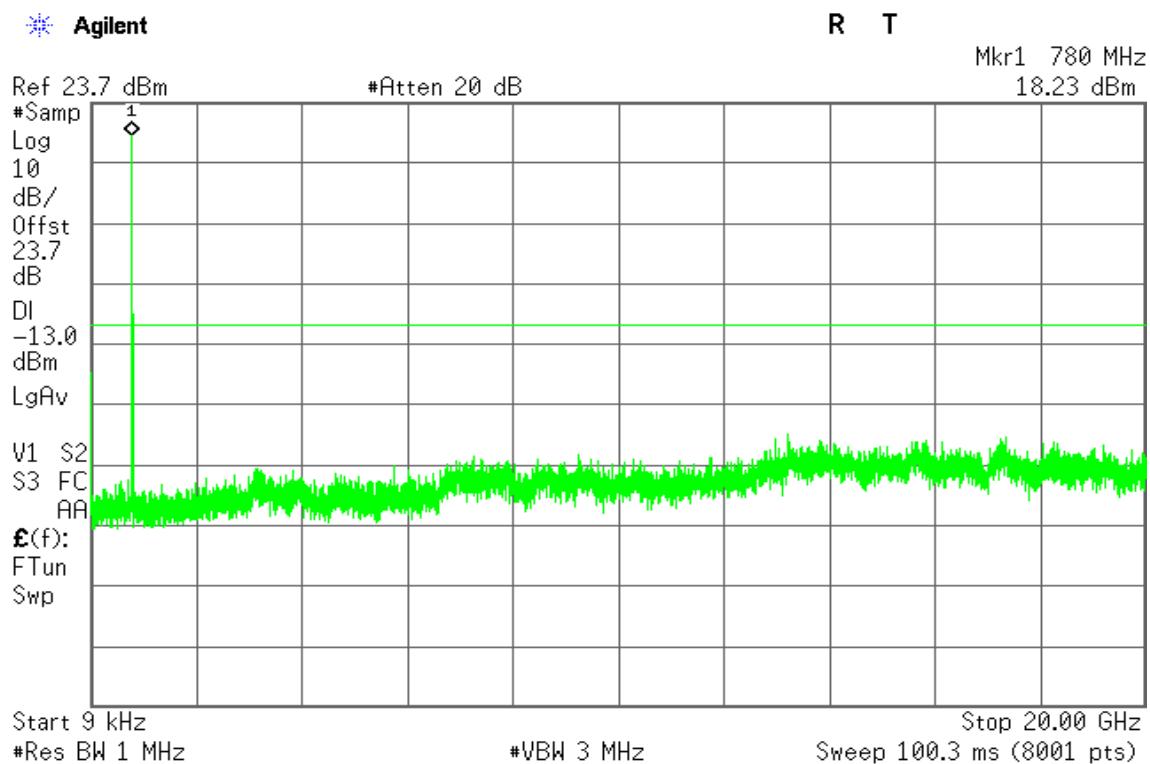
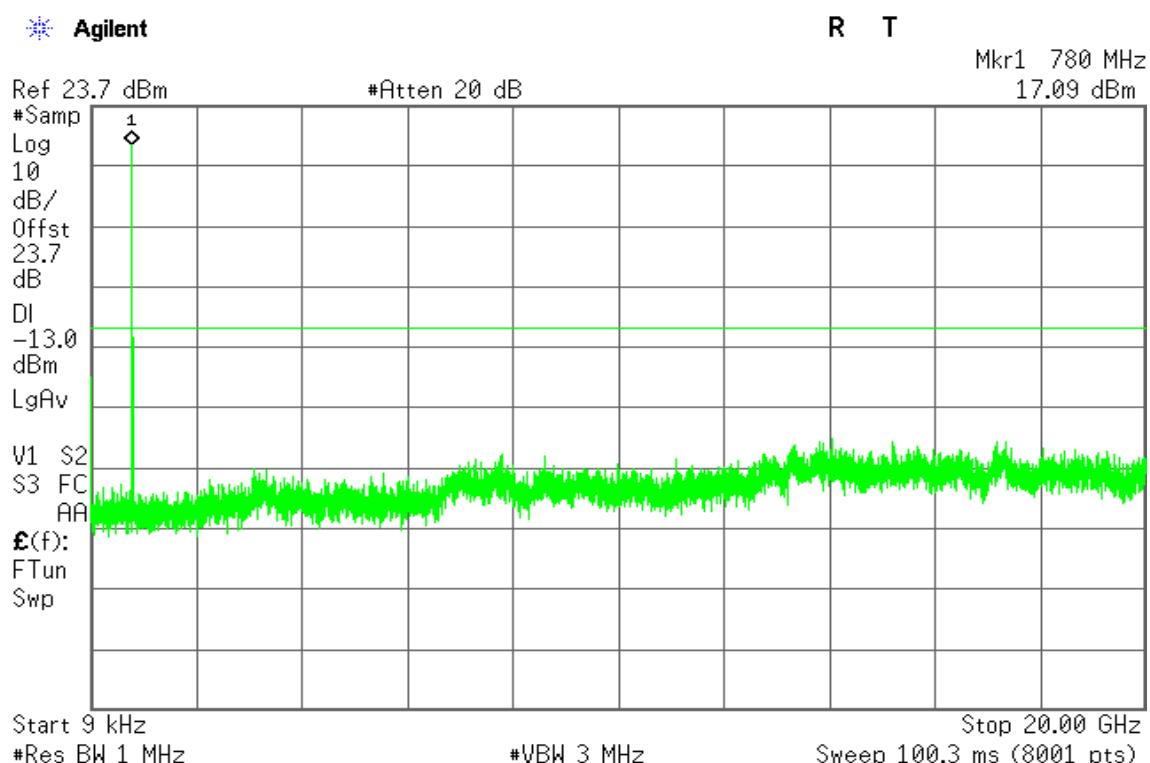
### LTE Band 13

#### CHANNEL BANDWIDTH: 5MHz / QPSK



#### CHANNEL BANDWIDTH: 5MHz / 16QAM



**CHANNEL BANDWIDTH: 10MHz / QPSK****CHANNEL BANDWIDTH: 10MHz / 16QAM**



## 7.7 RADIATED EMISSION MEASUREMENT

### LIMITS

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. The limit of emission equal to  $-13\text{dBm}$

So the limit of emission is the same absolute specified line.

Limits	EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE)
-13	82.22

**NOTE:** The following formula is used to convert the equipment radiated power to field strength.

$$E = [1000000\sqrt{(30P)}] / 3 \text{ uV/m, where P is Watts}$$

### TEST PROCEDURES

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.
3. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.
4. Repeat step 1 ~ 3 for horizontal polarization.

**NOTE:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.



## **TEST RESULTS**

### **Below 1GHz**

#### **For V100**

#### **LTE Band 13 / CHANNEL BANDWIDTH: 5MHz**

<b>Operation Mode:</b>	Tx / QPSK	<b>Test Date:</b>	September 26, 2012
<b>Temperature:</b>	25°C	<b>Tested by:</b>	David Lee
<b>Humidity:</b>	45% RH	<b>Polarity:</b>	Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
105.1750	-62.28	1.18	-1.07	-64.53	-13.00	-51.53	V
228.8500	-66.36	1.79	5.38	-62.77	-13.00	-49.77	V
325.8500	-73.46	2.17	5.71	-69.92	-13.00	-56.92	V
388.9000	-73.73	2.32	6	-70.05	-13.00	-57.05	V
519.8500	-74.22	2.7	6.1	-70.82	-13.00	-57.82	V
665.3500	-71.44	3.06	6.3	-68.20	-13.00	-55.20	V
<hr/>							
90.6250	-62.9	1.11	1.13	-62.88	-13.00	-49.88	H
233.7000	-66.34	1.8	5.39	-62.75	-13.00	-49.75	H
391.3250	-69.54	2.32	6	-65.86	-13.00	-52.86	H
454.3750	-74.76	2.59	5.79	-71.56	-13.00	-58.56	H
519.8500	-73.55	2.7	6.1	-70.15	-13.00	-57.15	H
650.8000	-72.35	3.03	6.3	-69.08	-13.00	-56.08	H

#### ***Remark:***

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** September 26, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
105.1750	-62.24	1.18	-1.07	-64.49	-13.00	-51.49	V
231.2750	-67.23	1.8	5.4	-63.63	-13.00	-50.63	V
388.9000	-73.56	2.32	6	-69.88	-13.00	-56.88	V
519.8500	-75.45	2.7	6.1	-72.05	-13.00	-59.05	V
585.3250	-76.84	2.89	6.11	-73.62	-13.00	-60.62	V
667.7750	-69.3	3.07	6.3	-66.07	-13.00	-53.07	V
93.0500	-61.43	1.12	0.74	-61.81	-13.00	-48.81	H
233.7000	-67.02	1.8	5.39	-63.43	-13.00	-50.43	H
391.3250	-70.81	2.32	6	-67.13	-13.00	-54.13	H
456.8000	-72.26	2.6	5.84	-69.02	-13.00	-56.02	H
519.8500	-71.26	2.7	6.1	-67.86	-13.00	-54.86	H
650.8000	-71.28	3.03	6.3	-68.01	-13.00	-55.01	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**LTE Band 13 / CHANNEL BANDWIDTH: 10MHz**

**Operation Mode:** Tx / QPSK      **Test Date:** September 26, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
102.7500	-62.85	1.16	-0.76	-64.77	-13.00	-51.77	V
216.7250	-66.13	1.74	5.35	-62.52	-13.00	-49.52	V
291.9000	-74.49	2.04	5.44	-71.09	-13.00	-58.09	V
388.9000	-74.25	2.32	6	-70.57	-13.00	-57.57	V
519.8500	-73.45	2.7	6.1	-70.05	-13.00	-57.05	V
650.8000	-73.37	3.03	6.3	-70.10	-13.00	-57.10	V
93.0500	-62.63	1.12	0.74	-63.01	-13.00	-50.01	H
233.7000	-66.62	1.8	5.39	-63.03	-13.00	-50.03	H
391.3250	-68.75	2.32	6	-65.07	-13.00	-52.07	H
519.8500	-71.84	2.7	6.1	-68.44	-13.00	-55.44	H
585.3250	-75.15	2.89	6.11	-71.93	-13.00	-58.93	H
650.8000	-74.06	3.03	6.3	-70.79	-13.00	-57.79	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** September 26, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
102.7500	-62.63	1.16	-0.76	-64.55	-13.00	-51.55	V
221.5750	-66.61	1.77	5.34	-63.04	-13.00	-50.04	V
388.9000	-73.95	2.32	6	-70.27	-13.00	-57.27	V
519.8500	-74.5	2.7	6.1	-71.10	-13.00	-58.10	V
650.8000	-72.99	3.03	6.3	-69.72	-13.00	-56.72	V
866.6250	-76.12	3.44	6.48	-73.08	-13.00	-60.08	V
93.0500	-62.66	1.12	0.74	-63.04	-13.00	-50.04	H
228.8500	-65.02	1.79	5.38	-61.43	-13.00	-48.43	H
274.9250	-73.18	1.99	5.2	-69.97	-13.00	-56.97	H
391.3250	-67.96	2.32	6	-64.28	-13.00	-51.28	H
519.8500	-72.29	2.7	6.1	-68.89	-13.00	-55.89	H
650.8000	-70.31	3.03	6.3	-67.04	-13.00	-54.04	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Above 1GHz****LTE Band 13 / CHANNEL BANDWIDTH: 5MHz**

**Operation Mode:** Tx / QPSK      **Test Date:** September 26, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1577.500	-43.3	4.95	6.16	-42.09	-13.00	-29.09	V
2347.500	-39.8	6.12	5.89	-40.03	-13.00	-27.03	V
3135.000	-49.25	7.2	7.8	-48.65	-13.00	-35.65	V
N/A							
1577.500	-45.71	4.95	6.16	-44.50	-13.00	-31.50	H
2347.500	-39.63	6.12	5.89	-39.86	-13.00	-26.86	H
3135.000	-43.14	7.2	7.8	-42.54	-13.00	-29.54	H
N/A							

***Remark:***

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** September 26, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1560.000	-41.04	4.93	6.19	-39.78	-13.00	-26.78	V
2347.500	-35.41	6.12	5.89	-35.64	-13.00	-22.64	V
3135.000	-43.75	7.2	7.8	-43.15	-13.00	-30.15	V
N/A							
1560.000	-42.82	4.93	6.19	-41.56	-13.00	-28.56	H
2347.500	-34.16	6.12	5.89	-34.39	-13.00	-21.39	H
3135.000	-38.83	7.2	7.8	-38.23	-13.00	-25.23	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**LTE Band 13 / CHANNEL BANDWIDTH: 10MHz / QPSK**

**Operation Mode:** Tx / QPSK      **Test Date:** September 26, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1560.000	-42.56	4.93	6.19	-41.30	-13.00	-28.30	V
2347.500	-36.34	6.12	5.89	-36.57	-13.00	-23.57	V
3117.500	-45	7.19	7.75	-44.44	-13.00	-31.44	V
N/A							
1560.000	-42.45	4.93	6.19	-41.19	-13.00	-28.19	H
2347.500	-35.62	6.12	5.89	-35.85	-13.00	-22.85	H
3117.500	-39.12	7.19	7.75	-38.56	-13.00	-25.56	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** September 26, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1560.000	-41.61	4.93	6.19	-40.35	-13.00	-27.35	V
2347.500	-36.61	6.12	5.89	-36.84	-13.00	-23.84	V
3117.500	-44.17	7.19	7.75	-43.61	-13.00	-30.61	V
N/A							
1560.000	-42.54	4.93	6.19	-41.28	-13.00	-28.28	H
2347.500	-35.51	6.12	5.89	-35.74	-13.00	-22.74	H
3117.500	-39.88	7.19	7.75	-39.32	-13.00	-26.32	H
N/A							

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**For V200****LTE Band 13 / CHANNEL BANDWIDTH: 5MHz**

**Operation Mode:** Tx / QPSK      **Test Date:** October 1, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
49.4000	-58.58	0.8	-5.08	-64.46	-13.00	-51.46	V
233.7000	-57.64	1.8	5.39	-54.05	-13.00	-41.05	V
388.9000	-72.68	2.32	6	-69.00	-13.00	-56.00	V
519.8500	-69.53	2.7	6.1	-66.13	-13.00	-53.13	V
699.3000	-68.5	3.11	6.4	-65.21	-13.00	-52.21	V
915.1250	-72.11	3.58	6.6	-69.09	-13.00	-56.09	V
46.9750	-58.12	0.78	-6.96	-65.86	-13.00	-52.86	H
233.7000	-58.59	1.8	5.39	-55.00	-13.00	-42.00	H
391.3250	-66.6	2.32	6	-62.92	-13.00	-49.92	H
519.8500	-69.78	2.7	6.1	-66.38	-13.00	-53.38	H
585.3250	-74.3	2.89	6.11	-71.08	-13.00	-58.08	H
650.8000	-70.38	3.03	6.3	-67.11	-13.00	-54.11	H

***Remark:***

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** October 1, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1332.500	-50.41	4.56	5.09	-49.88	-13.00	-36.88	V
1560.000	-43.79	4.93	6.19	-42.53	-13.00	-29.53	V
2347.500	-41.86	6.12	5.89	-42.09	-13.00	-29.09	V
3135.000	-45.24	7.2	7.8	-44.64	-13.00	-31.64	V
N/A							
1332.500	-45.8	4.56	5.09	-45.27	-13.00	-32.27	H
1560.000	-43.34	4.93	6.19	-42.08	-13.00	-29.08	H
2347.500	-41.41	6.12	5.89	-41.64	-13.00	-28.64	H
3135.000	-49.65	7.2	7.8	-49.05	-13.00	-36.05	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**LTE Band 13 / CHANNEL BANDWIDTH: 10MHz****Operation Mode:** Tx / QPSK      **Test Date:** October 1, 2012**Temperature:** 25°C      **Tested by:** David Lee**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
49.4000	-62.45	0.8	-5.08	-68.33	-13.00	-55.33	V
236.1250	-59.07	1.81	5.37	-55.51	-13.00	-42.51	V
391.3250	-77.01	2.32	6	-73.33	-13.00	-60.33	V
456.8000	-78.36	2.6	5.84	-75.12	-13.00	-62.12	V
519.8500	-73.53	2.7	6.1	-70.13	-13.00	-57.13	V
650.8000	-73.76	3.03	6.3	-70.49	-13.00	-57.49	V
49.4000	-60.6	0.8	-5.08	-66.48	-13.00	-53.48	H
233.7000	-58.9	1.8	5.39	-55.31	-13.00	-42.31	H
391.3250	-67.62	2.32	6	-63.94	-13.00	-50.94	H
519.8500	-73.37	2.7	6.1	-69.97	-13.00	-56.97	H
548.9500	-75.89	2.8	6.19	-72.50	-13.00	-59.50	H
650.8000	-71.88	3.03	6.3	-68.61	-13.00	-55.61	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** October 1, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
49.4000	-62.05	0.8	-5.08	-67.93	-13.00	-54.93	V
233.7000	-59.2	1.8	5.39	-55.61	-13.00	-42.61	V
415.5750	-75	2.45	5.85	-71.60	-13.00	-58.60	V
519.8500	-75	2.7	6.1	-71.60	-13.00	-58.60	V
650.8000	-73.25	3.03	6.3	-69.98	-13.00	-56.98	V
701.7250	-69.85	3.12	6.38	-66.59	-13.00	-53.59	V
49.4000	-62.01	0.8	-5.08	-67.89	-13.00	-54.89	H
233.7000	-59.03	1.8	5.39	-55.44	-13.00	-42.44	H
391.3250	-69	2.32	6	-65.32	-13.00	-52.32	H
519.8500	-72.53	2.7	6.1	-69.13	-13.00	-56.13	H
650.8000	-72.05	3.03	6.3	-68.78	-13.00	-55.78	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Above 1GHz****LTE Band 13 / CHANNEL BANDWIDTH: 5MHz**

**Operation Mode:** Tx / QPSK      **Test Date:** October 1, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1332.500	-47.04	4.56	5.09	-46.51	-13.00	-33.51	V
1560.000	-42.08	4.93	6.19	-40.82	-13.00	-27.82	V
2347.500	-39.11	6.12	5.89	-39.34	-13.00	-26.34	V
3135.000	-48.85	7.2	7.8	-48.25	-13.00	-35.25	V
N/A							
1332.500	-47.35	4.56	5.09	-46.82	-13.00	-33.82	H
1560.000	-42.41	4.93	6.19	-41.15	-13.00	-28.15	H
2347.500	-39.04	6.12	5.89	-39.27	-13.00	-26.27	H
3135.000	-43.41	7.2	7.8	-42.81	-13.00	-29.81	H
N/A							

***Remark:***

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** October 1, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1332.500	-50.41	4.56	5.09	-49.88	-13.00	-36.88	V
1560.000	-43.79	4.93	6.19	-42.53	-13.00	-29.53	V
2347.500	-41.86	6.12	5.89	-42.09	-13.00	-29.09	V
3135.000	-45.24	7.2	7.8	-44.64	-13.00	-31.64	V
N/A							
1332.500	-45.8	4.56	5.09	-45.27	-13.00	-32.27	H
1560.000	-43.34	4.93	6.19	-42.08	-13.00	-29.08	H
2347.500	-41.41	6.12	5.89	-41.64	-13.00	-28.64	H
3135.000	-49.65	7.2	7.8	-49.05	-13.00	-36.05	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**LTE Band 13 / CHANNEL BANDWIDTH: 10MHz****Operation Mode:** Tx / Low channel      **Test Date:** October 1, 2012**Temperature:** 25°C      **Tested by:** David Lee**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1332.500	-47.63	4.56	5.09	-47.10	-13.00	-34.10	V
1560.000	-43.32	4.93	6.19	-42.06	-13.00	-29.06	V
2347.500	-40.61	6.12	5.89	-40.84	-13.00	-27.84	V
N/A							
1560.000	-43.11	4.93	6.19	-41.85	-13.00	-28.85	H
2347.500	-40.55	6.12	5.89	-40.78	-13.00	-27.78	H
3117.500	-45.21	7.19	7.75	-44.65	-13.00	-31.65	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / 16QAM      **Test Date:** October 1, 2012  
**Temperature:** 25°C      **Tested by:** David Lee  
**Humidity:** 45% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1332.500	-49.24	4.56	5.09	-48.71	-13.00	-35.71	V
1577.500	-46.25	4.95	6.16	-45.04	-13.00	-32.04	V
2347.500	-45.79	6.12	5.89	-46.02	-13.00	-33.02	V
N/A							
1332.500	-49.12	4.56	5.09	-48.59	-13.00	-35.59	H
1560.000	-47.64	4.93	6.19	-46.38	-13.00	-33.38	H
2347.500	-46.4	6.12	5.89	-46.63	-13.00	-33.63	H
3135.000	-48.12	7.2	7.8	-47.52	-13.00	-34.52	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.