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Report On

Application for Grant of Equipment Authorization of the
AnyDATA
ACT233L 4G Vehicle Tracker with Hotspot

FCC CFR 47 Part 2 and 27
IC RSS-Gen and RSS-139 Issue 2 February 2009

Report No. SC1304495D

May 2013

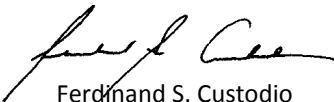



REPORT ON Radio Testing of the
AnyDATA
4G Vehicle Tracker with Hotspot

TEST REPORT NUMBER SC1304495D

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DATED May 17, 2013



Revision History

SC1304495D AnyDATA ACT233L 4G Vehicle Tracker with Hotspot					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
05/17/13	Initial Release				Ferdinand Custodio



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SECTION 1

REPORT SUMMARY

Radio Testing of the
AnyDATA
4G Vehicle Tracker with Hotspot



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the AnyDATA ACT233L 4G Vehicle Tracker with Hotspot to the requirements of the following:

- FCC CFR 47 Part 2 and 27
- IC RSS-Gen and RSS-139 Issue 2 February 2009.

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	AnyDATA
Model Number(s)	ACT233L
FCC ID Number	P4M-ACT233
IC Number	4594B-ACT233
Serial Number(s)	20130418001833
Number of Samples Tested	1
Test Specification/Issue/Date	<ul style="list-style-type: none">• FCC CFR 47 Part 2 and 27 (October 1, 2012).• RSS-139 - Advanced Wireless Services Equipment Operating in the Bands 1710-1755 MHz and 2110-2155 MHz (Issue 2, February 2009).• RSS-Gen - General Requirements and Information for the Certification of Radio Apparatus (Issue 3, December 2010).
Start of Test	April 29, 2013
Finish of Test	May 17, 2013
Name of Engineer(s)	Ferdinand Custodio
Related Document(s)	<ul style="list-style-type: none">• ANSI/TIA-603-C-2004 – Land Mobile FM or PM – Communications Equipment – Measurement and Performance Standards.• KDB971168 (D01 Power Meas License Digital Systems v01) Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems• 412172 D01 Determining ERP and EIRP v01 (Guidelines for Determining the Effective Radiated Power (ERP) and Equivalent Isotropically Radiated Power (EIRP) of a RF Transmitting System.• Supporting documents for EUT certification are separate exhibits.



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 2 and 27 with cross-reference to the corresponding IC RSS standard is shown below.

Section	FCC Part Sections(s)	RSS Section(s)	Test Description	Result
2.1	2.1046		Transmitter Conducted Output Power	Compliant
2.2	2.1046 and 27.50 (d)(4)	RSS-139(6.4)	Equivalent Isotropic Radiated Power	Compliant
2.3	2.1046, 27.50 (b) (10) and (12)		Effective Radiated Power	Compliant
2.4	2.1049 and 27.53(h)(1)	RSS-Gen (4.6.1)	Occupied Bandwidth	Compliant
2.5	27.50(d)(5)	RSS-139(6.4)	Peak-Average Ratio	Compliant
2.6	27.53(c)(2)(5) and (h)	RSS-139(6.5)	Band Edge	Compliant
2.7	27.53(c)(2)(5),(f) and (h)	RSS-139(6.5)	Conducted Spurious Emissions	Compliant
2.8	2.1053, 27.53(c) and (h)	RSS-139(6.5)	Field Strength Of Spurious Radiation	Compliant
2.9	2.1055(a)(1) 2.1055(d)(1) and 27.54	RSS-139(6.3)	Frequency Stability	Compliant
2.10		RSS-139(6.6)	Receiver Spurious Emissions	Compliant
2.11		RSS-Gen 7.2.4	Powerline Conducted Emissions	N/A

N/A -EUT is for vehicular use only

1.3 PRODUCT INFORMATION

1.3.1 EUT General Description

The Equipment Under Test (EUT) was an AnyDATA ACT233L 4G Vehicle Tracker with Hotspot as shown in the photograph below. The EUT connects to a vehicle's OBD2 port; it enables remote functions and vehicle tracking through a Smartphone app.





1.3.2 EUT General Description

EUT Description	ACT233L 4G Vehicle Tracker with Hotspot
Model Number(s)	ACT233L
Rated Voltage	13.5 VDC Nominal voltage.
Mode Verified	4G-LTE
Capability	800/1900 CDMA2000 1xRTT and 1xEV-DO Release 0 Revision A, Band 4 and 13 LTE, 802.11 b/g/n WLAN, BT and Part 15.231 Transmitter
Primary Unit (EUT)	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering
Antenna Type	Integral custom ILA (Inverted L Antenna) type
Antenna Gain	LTE Band 4 (1710-1755 MHz) = -5.0 to -3.5 LTE Band 13 (779-785 MHz) = -6.0

1.3.3 Transmit Frequency Table

LTE Band 4				
Bandwidth (MHz)	Tx Frequency (MHz)	Emission Designator	Max. Conducted Power (W)	Max. EIRP Power (W)
1.4	1710-1755	1M21G7D	0.264	0.114
1.4	1710-1755	1M20W7D	0.218	0.088
3.0	1710-1755	2M76G7D	0.272	0.114
3.0	1710-1755	2M77W7D	0.204	0.086
5.0	1710-1755	4M51G7D	0.275	0.123
5.0	1710-1755	4M52W7D	0.231	0.092
10.0	1710-1755	9M00G7D	0.270	0.116
10.0	1710-1755	8M01W7D	0.214	0.087
15.0	1710-1755	13M4G7D	0.279	0.124
15.0	1710-1755	13M5W7D	0.213	0.094
20.0	1710-1755	18M0G7D	0.282	0.126



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20.0	1710-1755	17M9W7D	0.214	0.096
LTE Band 13				
Bandwidth (MHz)	Tx Frequency (MHz)	Emission Designator	Max. Conducted Power (W)	Max.ERP Power (W)
5.0	777-787	4M53G7D	0.282	0.043
5.0	777-787	4M53W7D	0.217	0.033
10.0	777-787	8M99G7D	0.285	0.044
10.0	777-787	9M00W7D	0.208	0.032

1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
A	Conducted antenna port measurement
B	Radiated test setup. EUT transmitting through integral antenna.

Note: Antenna port is for service function only.

1.4.2 EUT Exercise Software

EUT is controlled by a CMW 500 Wideband Radio Communication Tester. Client provided CMW 500 test profiles for each Band.

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Sony	Support Laptop	Model PCG-3131L SN27545537 3001106
Rongchun	USB cable	0.9m, high speed USB, Type A to Micro-B connector, style 2725, USB Revision 2.0

1.4.4 Worst Case Configuration

Worst-case configuration used in this test report as per output power measurements:

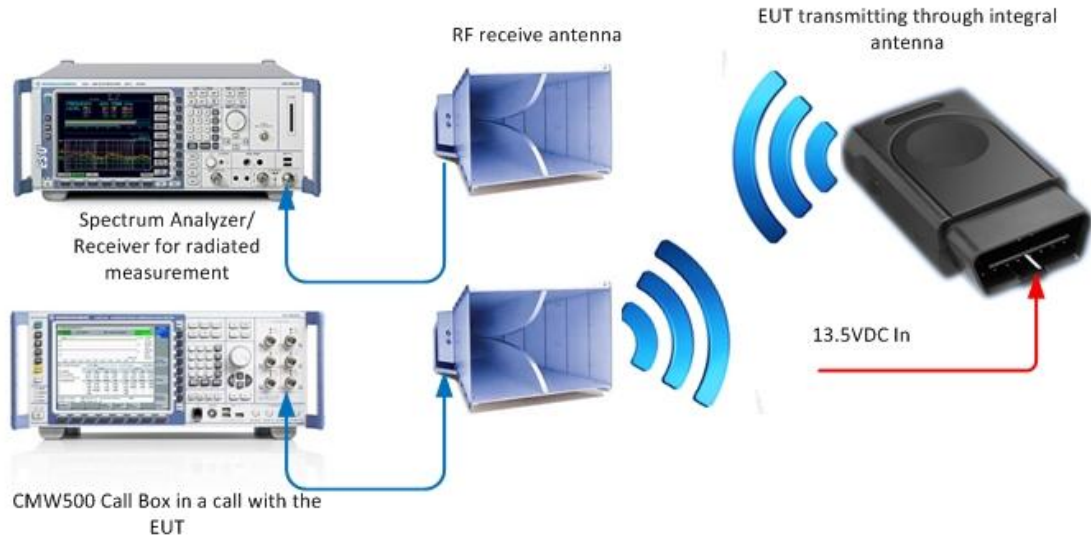
Band	Channel BW	Modulation	RB Size/Offset
LTE Band 4	20.0MHz	QPSK	1/0
LTE Band 13	10.0MHz	QPSK	1/0

EUT is a mobile device. For radiated measurements X, Y and Z orientations were verified. Worst case position is "X".



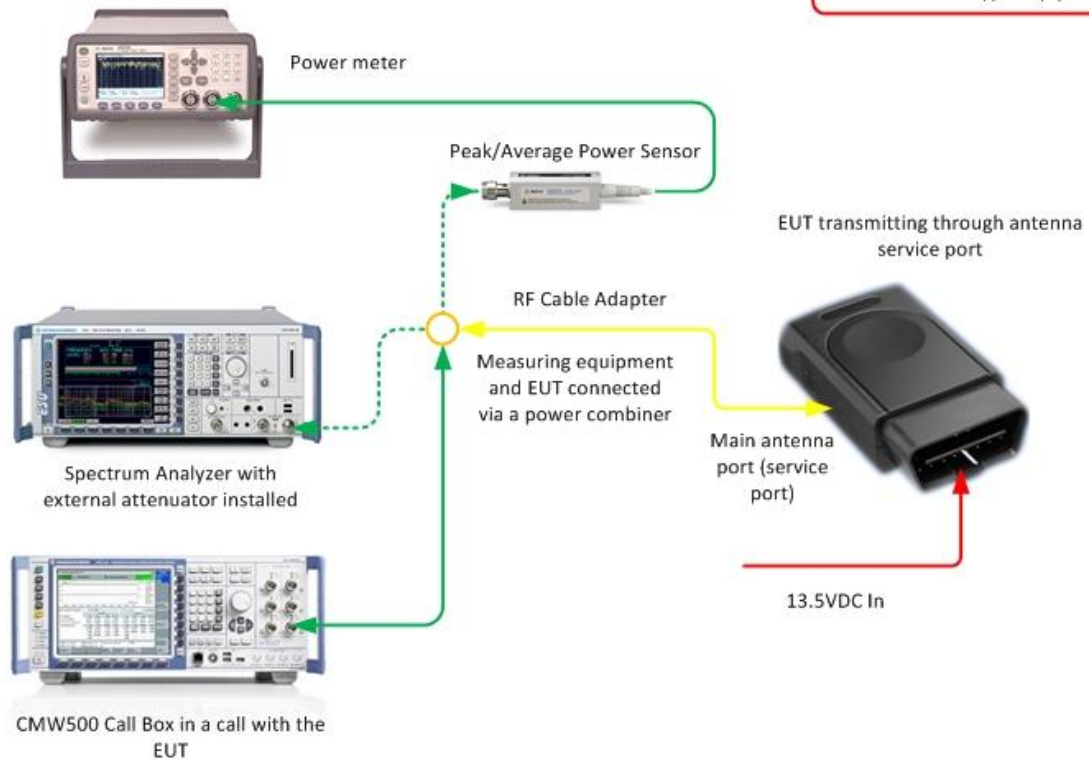
1.4.5 Simplified Test Configuration Diagram

Radiated Test Configuration/Conducted Emissions Test Configuration



Conducted (Antenna Port) Test Configuration

For Illustration Purpose Only
 Image presented may not represent the actual EUT or support equipment





1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number 20130418001833		
N/A		

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

1.7 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

For conducted (if applicable) and radiated emissions the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.4-2009. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

1.8 TEST FACILITY

1.8.1 FCC – Registration No.: US5296

TUV SUD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.498 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Registration is US5296.

1.8.2 Industry Canada (IC) Registration No.: 3067A

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego) has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No. 3067A.



1.9 SAMPLE CALCULATIONS

1.9.1 LTE Emission Designator (QPSK)

Emission Designator = 4M51G7D
 G = Phase Modulation
 7= Quantized/Digital Info
 D = Combination (Audio/Data)

1.9.2 LTE Emission Designator (16QAM)

Emission Designator = 4M50W7D
 W = Frequency Modulation
 7= Quantized/Digital Info
 D = Combination (Audio/Data)

1.9.3 Spurious Radiated Emission (below 1GHz)

Measuring equipment raw measurement (dbµV) @ 30 MHz		24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3
	Asset# 1172 (cable)	0.3
	Asset# 1016 (preamplifier)	-30.7
	Asset# 1175(cable)	0.3
	Asset# 1002 (antenna)	17.2
Reported QuasiPeak Final Measurement (dbµV/m) @ 30MHz		11.8

1.9.4 Spurious Radiated Emission – Substitution Method

Example = 84dBµV/m @ 1413 MHz (numerical sample only)

The field strength reading of 84dBµV/m @ 1413 MHz (2nd Harmonic of 706.5 MHz) is the maximized measurement when the EUT is on the turntable measured at 3 meters. The gain of the substituted antenna is 7.8dBi while the transmit cable loss is 1.0 dB (cable between signal generator and the substituted antenna). The signal generator level is adjusted until the 84dBµV/m level at the receiving end is replicated (identical test setup, i.e. same antenna, cable/s and preamp). If the adjusted signal generator level is -18dBm, then we have the following for both EIRP and ERP as required:

$$\begin{aligned}
 P_{EIRP} &= -18 \text{ dBm} + 7.8 \text{ dBi} - 1\text{dB} \\
 &= 11.2 \text{ dBm} \\
 P_{ERP} &= P_{EIRP} - 2.15 \text{ dB} \\
 &= 11.2 \text{ dBm} - 2.15 \text{ dB} \\
 &= 9.05 \text{ dBm}
 \end{aligned}$$



SECTION 2

TEST DETAILS

Radio Testing of the
AnyDATA
4G Vehicle Tracker with Hotspot



2.1 TRANSMITTER CONDUCTED POWER MEASUREMENTS

2.1.1 Specification Reference

Part 2.1046 (a) and (c)

2.1.2 Standard Applicable

(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 § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

(c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

2.1.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration A

2.1.4 Date of Test/Initial of test personnel who performed the test

May 10, 2013/FSC

2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.6 Environmental Conditions

Ambient Temperature	25.3°C
Relative Humidity	42.9%
ATM Pressure	99.3 kPa

2.1.7 Additional Observations

- This is a conducted test using an average power meter.
- A 27.6dB power meter offset was used for the power splitter, external attenuator and cable used.

2.1.8 Test Results

See attached table.



Band	Modulation	Bandwidth	RB Size	RB Offset	Channel	Frequency	Power
4	QPSK	1.4 MHz	6	0	19957	1710.7	23.14
					20175	1732.5	23.19
					20393	1754.3	22.98
			3	1	19957	1710.7	24.10
					20175	1732.5	24.12
					20393	1754.3	24.06
			1	Low	19957	1710.7	24.21
					20175	1732.5	24.17
					20393	1754.3	24.04
			1	High	19957	1710.7	24.18
					20175	1732.5	24.21
					20393	1754.3	23.97
		3.0 MHz	15	0	19965	1711.5	23.01
					20175	1732.5	23.12
					20385	1753.5	22.92
			8	3	19965	1711.5	23.14
					20175	1732.5	23.36
					20385	1753.5	22.98
			1	0	19965	1711.5	23.99
					20175	1732.5	24.30
					20385	1753.5	24.08
			1	14	19965	1711.5	24.04
					20175	1732.5	24.34
					20385	1753.5	23.98
		5.0 MHz	25	0	19975	1712.5	22.84
					20175	1732.5	23.26
					20375	1752.5	22.87
			12	6	19975	1712.5	23.05
					20175	1732.5	23.38
					20375	1752.5	23.04
			1	0	19975	1712.5	24.15
					20175	1732.5	24.04
					20375	1752.5	24.29
			1	24	19975	1712.5	24.08
					20175	1732.5	23.97
					20375	1752.5	24.40
		10.0 MHz	50	0	20000	1715	22.70
					20175	1732.5	22.93
					20350	1750	22.70
			25	12	20000	1715	22.83
					20175	1732.5	23.13
					20350	1750	22.94
1	0		20000	1715	23.97		
			20175	1732.5	24.17		
			20350	1750	24.14		
1	49		20000	1715	24.04		
			20175	1732.5	24.32		
			20350	1750	23.97		



Band	Modulation	Bandwidth	RB Size	RB Offset	Channel	Frequency	Power
4	QPSK	15.0 MHz	75	0	20025	1717.5	22.91
					20175	1732.5	23.16
					20325	1747.5	22.97
			36	19	20025	1717.5	22.93
					20175	1732.5	23.19
					20325	1747.5	23.00
			1	0	20025	1717.5	24.09
					20175	1732.5	24.45
					20325	1747.5	24.42
		1	74	20025	1717.5	24.29	
				20175	1732.5	24.43	
				20325	1747.5	24.07	
		20.0 MHz	100	0	20050	1720	23.01
					20175	1732.5	23.12
					20300	1745	23.01
			50	25	20050	1720	22.89
					20175	1732.5	23.20
					20300	1745	22.96
	1		0	20050	1720	24.29	
				20175	1732.5	24.27	
				20300	1745	24.51	
	1	99	20050	1720	24.50		
			20175	1732.5	24.41		
			20300	1745	24.06		
	16QAM	1.4 MHz	6	0	19957	1710.7	22.17
					20175	1732.5	22.46
					20393	1754.3	22.02
			3	1	19957	1710.7	23.09
					20175	1732.5	23.38
					20393	1754.3	22.92
			1	0	19957	1710.7	23.11
					20175	1732.5	23.32
					20393	1754.3	22.93
		1	5	19957	1710.7	23.12	
				20175	1732.5	23.31	
				20393	1754.3	22.95	
3.0 MHz		15	0	19965	1711.5	22.02	
				20175	1732.5	22.45	
				20385	1753.5	22.15	
		8	3	19965	1711.5	21.99	
				20175	1732.5	22.36	
				20385	1753.5	22.04	
	1	0	19965	1711.5	22.97		
			20175	1732.5	23.10		
			20385	1753.5	22.85		
1	14	19965	1711.5	23.01			
		20175	1732.5	23.04			
		20385	1753.5	22.73			



Band	Modulation	Bandwidth	RB Size	RB Offset	Channel	Frequency	Power
4	16QAM	5.0 MHz	25	0	19975	1712.5	21.89
					20175	1732.5	22.32
					20375	1752.5	21.91
			12	6	19975	1712.5	21.91
					20175	1732.5	22.35
					20375	1752.5	22.06
			1	0	19975	1712.5	23.22
					20175	1732.5	23.54
					20375	1752.5	22.88
			1	24	19975	1712.5	23.20
					20175	1732.5	23.64
					20375	1752.5	22.87
		10.0 MHz	50	0	20000	1715	21.77
					20175	1732.5	22.13
					20350	1750	21.95
			25	12	20000	1715	21.85
					20175	1732.5	22.17
					20350	1750	22.11
			1	0	20000	1715	23.01
					20175	1732.5	23.25
					20350	1750	22.88
			1	49	20000	1715	23.05
					20175	1732.5	23.30
					20350	1750	22.68
		15.0 MHz	75	0	20025	1717.5	21.98
					20175	1732.5	22.10
					20325	1747.5	21.89
			36	19	20025	1717.5	21.99
					20175	1732.5	22.15
					20325	1747.5	22.07
			1	0	20025	1717.5	23.14
					20175	1732.5	22.98
					20325	1747.5	23.24
			1	74	20025	1717.5	23.29
					20175	1732.5	23.01
					20325	1747.5	22.98
		20.0 MHz	100	0	20050	1720	22.01
					20175	1732.5	21.99
					20300	1745	22.04
			50	25	20050	1720	21.82
					20175	1732.5	22.12
					20300	1745	22.03
			1	0	20050	1720	22.98
					20175	1732.5	22.81
					20300	1745	23.31
			1	99	20050	1720	23.02
					20175	1732.5	23.07
					20300	1745	22.94



Band	Modulation	Bandwidth	RB Size	RB Offset	Channel	Frequency	Power	
13	QPSK	5.0 MHz	25	0	23205	779.5	23.19	
					23255	784.5	23.19	
			12	6	23205	779.5	23.30	
					23255	784.5	23.53	
			1	0	23205	779.5	24.51	
					23255	784.5	24.48	
				1	24	23205	779.5	24.42
						23255	784.5	24.48
		10.0 MHz	50	0	23230	782.0	23.05	
			25	13	23230	782.0	23.15	
	1		0	23230	782.0	24.55		
	1		49	23230	782.0	24.54		
	16QAM	5.0 MHz	25	0	23205	779.5	22.11	
					23255	784.5	22.19	
			12	6	23205	779.5	22.25	
					23255	784.5	22.56	
			1	0	23205	779.5	23.37	
					23255	784.5	23.30	
			1	24	23205	779.5	23.22	
					23255	784.5	23.28	
		10.0 MHz	50	0	23230	782.0	21.89	
			25	13	23230	782.0	22.19	
			1	0	23230	782.0	23.19	
			1	49	23230	782.0	23.15	



2.2 EQUIVALENT ISOTROPIC RADIATED POWER

2.2.1 Specification Reference

Part 27 Subpart C §27.50 (d)(4), Part 2.1046, RSS-139 Issue 2 (6.4)

2.2.2 Standard Applicable

(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in this band must employ a means for limiting power to the minimum necessary for successful communications

2.2.3 Equipment Under Test

Serial No: 20130418001833

2.2.4 Date of Verification/Initial of test personnel who performed the calculation

May 17, 2013/FSC

2.2.5 Additional Observations

- EIRP was calculated as per Section 1.3.2 of KDB412172 D01 (Determining ERP and EIRP v01).
- Calculation formula in logarithmic terms:

$$\text{EIRP} = P_T + G_T - L_C$$

Where:

P_T = transmitter conducted output power dBm (Section 2.1 of this test report)

G_T = gain of the transmitting antenna, in dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB (EUT uses integral antenna, this value is negligible).

2.2.6 Test Results

See attached table.



Band 4 QPSK								
Bandwidth	RB Size	RB Offset	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
1.4 MHz	6	0	19957	1710.7	23.14	-5	18.14	30
			20175	1732.5	23.19	-4	19.19	30
			20393	1754.3	22.98	-3.5	19.48	30
	3	1	19957	1710.7	24.1	-5	19.1	30
			20175	1732.5	24.12	-4	20.12	30
			20393	1754.3	24.06	-3.5	20.56	30
	1	Low	19957	1710.7	24.21	-5	19.21	30
			20175	1732.5	24.17	-4	20.17	30
			20393	1754.3	24.04	-3.5	20.54	30
	1	High	19957	1710.7	24.18	-5	19.18	30
			20175	1732.5	24.21	-4	20.21	30
			20393	1754.3	23.97	-3.5	20.47	30
3.0 MHz	15	0	19965	1711.5	23.01	-5	18.01	30
			20175	1732.5	23.12	-4	19.12	30
			20385	1753.5	22.92	-3.5	19.42	30
	8	3	19965	1711.5	23.14	-5	18.14	30
			20175	1732.5	23.36	-4	19.36	30
			20385	1753.5	22.98	-3.5	19.48	30
	1	0	19965	1711.5	23.99	-5	18.99	30
			20175	1732.5	24.3	-4	20.3	30
			20385	1753.5	24.08	-3.5	20.58	30
	1	14	19965	1711.5	24.04	-5	19.04	30
			20175	1732.5	24.34	-4	20.34	30
			20385	1753.5	23.98	-3.5	20.48	30
5.0 MHz	25	0	19975	1712.5	22.84	-5	17.84	30
			20175	1732.5	23.26	-4	19.26	30
			20375	1752.5	22.87	-3.5	19.37	30
	12	6	19975	1712.5	23.05	-5	18.05	30
			20175	1732.5	23.38	-4	19.38	30
			20375	1752.5	23.04	-3.5	19.54	30
	1	0	19975	1712.5	24.15	-5	19.15	30
			20175	1732.5	24.04	-4	20.04	30
			20375	1752.5	24.29	-3.5	20.79	30
	1	24	19975	1712.5	24.08	-5	19.08	30
			20175	1732.5	23.97	-4	19.97	30
			20375	1752.5	24.4	-3.5	20.9	30



10.0 MHz	50	0	20000	1715	22.7	-5	17.7	30
			20175	1732.5	22.93	-4	18.93	30
			20350	1750	22.7	-3.5	19.2	30
	25	12	20000	1715	22.83	-5	17.83	30
			20175	1732.5	23.13	-4	19.13	30
			20350	1750	22.94	-3.5	19.44	30
	1	0	20000	1715	23.97	-5	18.97	30
			20175	1732.5	24.17	-4	20.17	30
			20350	1750	24.14	-3.5	20.64	30
	1	49	20000	1715	24.04	-5	19.04	30
			20175	1732.5	24.32	-4	20.32	30
			20350	1750	23.97	-3.5	20.47	30
15.0 MHz	75	0	20025	1717.5	22.91	-5	17.91	30
			20175	1732.5	23.16	-4	19.16	30
			20325	1747.5	22.97	-3.5	19.47	30
	36	19	20025	1717.5	22.93	-5	17.93	30
			20175	1732.5	23.19	-4	19.19	30
			20325	1747.5	23	-3.5	19.5	30
	1	0	20025	1717.5	24.09	-5	19.09	30
			20175	1732.5	24.45	-4	20.45	30
			20325	1747.5	24.42	-3.5	20.92	30
	1	74	20025	1717.5	24.29	-5	19.29	30
			20175	1732.5	24.43	-4	20.43	30
			20325	1747.5	24.07	-3.5	20.57	30
20.0 MHz	100	0	20050	1720	23.01	-5	18.01	30
			20175	1732.5	23.12	-4	19.12	30
			20300	1745	23.01	-3.5	19.51	30
	50	25	20050	1720	22.89	-5	17.89	30
			20175	1732.5	23.2	-4	19.2	30
			20300	1745	22.96	-3.5	19.46	30
	1	0	20050	1720	24.29	-5	19.29	30
			20175	1732.5	24.27	-4	20.27	30
			20300	1745	24.51	-3.5	21.01	30
	1	99	20050	1720	24.5	-5	19.5	30
			20175	1732.5	24.41	-4	20.41	30
			20300	1745	24.06	-3.5	20.56	30



Band 4 16QAM								
Bandwidth	RB Size	RB Offset	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
1.4 MHz	6	0	19957	1710.7	22.17	-5	17.17	30
			20175	1732.5	22.46	-4	18.46	30
			20393	1754.3	22.02	-3.5	18.52	30
	3	1	19957	1710.7	23.09	-5	18.09	30
			20175	1732.5	23.38	-4	19.38	30
			20393	1754.3	22.92	-3.5	19.42	30
	1	0	19957	1710.7	23.11	-5	18.11	30
			20175	1732.5	23.32	-4	19.32	30
			20393	1754.3	22.93	-3.5	19.43	30
	1	5	19957	1710.7	23.12	-5	18.12	30
			20175	1732.5	23.31	-4	19.31	30
			20393	1754.3	22.95	-3.5	19.45	30
3.0 MHz	15	0	19965	1711.5	22.02	-5	17.02	30
			20175	1732.5	22.45	-4	18.45	30
			20385	1753.5	22.15	-3.5	18.65	30
	8	3	19965	1711.5	21.99	-5	16.99	30
			20175	1732.5	22.36	-4	18.36	30
			20385	1753.5	22.04	-3.5	18.54	30
	1	0	19965	1711.5	22.97	-5	17.97	30
			20175	1732.5	23.1	-4	19.1	30
			20385	1753.5	22.85	-3.5	19.35	30
	1	14	19965	1711.5	23.01	-5	18.01	30
			20175	1732.5	23.04	-4	19.04	30
			20385	1753.5	22.73	-3.5	19.23	30
5.0 MHz	25	0	19975	1712.5	21.89	-5	16.89	30
			20175	1732.5	22.32	-4	18.32	30
			20375	1752.5	21.91	-3.5	18.41	30
	12	6	19975	1712.5	21.91	-5	16.91	30
			20175	1732.5	22.35	-4	18.35	30
			20375	1752.5	22.06	-3.5	18.56	30
	1	0	19975	1712.5	23.22	-5	18.22	30
			20175	1732.5	23.54	-4	19.54	30
			20375	1752.5	22.88	-3.5	19.38	30
	1	24	19975	1712.5	23.2	-5	18.2	30
			20175	1732.5	23.64	-4	19.64	30
			20375	1752.5	22.87	-3.5	19.37	30
10.0 MHz	50	0	20000	1715	21.77	-5	16.77	30



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	25	12	20175	1732.5	22.13	-4	18.13	30
			20350	1750	21.95	-3.5	18.45	30
			20000	1715	21.85	-5	16.85	30
			20175	1732.5	22.17	-4	18.17	30
			20350	1750	22.11	-3.5	18.61	30
	1	0	20000	1715	23.01	-5	18.01	30
			20175	1732.5	23.25	-4	19.25	30
			20350	1750	22.88	-3.5	19.38	30
	1	49	20000	1715	23.05	-5	18.05	30
			20175	1732.5	23.3	-4	19.3	30
20350			1750	22.68	-3.5	19.18	30	
15.0 MHz	75	0	20025	1717.5	21.98	-5	16.98	30
			20175	1732.5	22.1	-4	18.1	30
			20325	1747.5	21.89	-3.5	18.39	30
	36	19	20025	1717.5	21.99	-5	16.99	30
			20175	1732.5	22.15	-4	18.15	30
			20325	1747.5	22.07	-3.5	18.57	30
	1	0	20025	1717.5	23.14	-5	18.14	30
			20175	1732.5	22.98	-4	18.98	30
			20325	1747.5	23.24	-3.5	19.74	30
	1	74	20025	1717.5	23.29	-5	18.29	30
			20175	1732.5	23.01	-4	19.01	30
			20325	1747.5	22.98	-3.5	19.48	30
20.0 MHz	100	0	20050	1720	22.01	-5	17.01	30
			20175	1732.5	21.99	-4	17.99	30
			20300	1745	22.04	-3.5	18.54	30
	50	25	20050	1720	21.82	-5	16.82	30
			20175	1732.5	22.12	-4	18.12	30
			20300	1745	22.03	-3.5	18.53	30
	1	0	20050	1720	22.98	-5	17.98	30
			20175	1732.5	22.81	-4	18.81	30
			20300	1745	23.31	-3.5	19.81	30
	1	99	20050	1720	23.02	-5	18.02	30
			20175	1732.5	23.07	-4	19.07	30
			20300	1745	22.94	-3.5	19.44	30



2.3 EFFECTIVE RADIATED POWER OUTPUT DATA

2.3.1 Specification Reference

Part 27 Subpart C §27.50 (b) (10)(12) and Part 2.1046

2.3.2 Standard Applicable

(b) The following power and antenna height limits apply to transmitters operating in the 746–763 MHz, 775–793 MHz and 805–806 MHz bands:

(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

(12) For transmissions in the 746–757, 758–763, 776–787, and 788–793 MHz bands, licensees may employ equipment operating in compliance with either the measurement techniques described in paragraph (b)(11) of this section or a Commission-approved average power technique. In both instances, equipment employed must be authorized in accordance with the provisions of §27.51.

2.3.3 Equipment Under Test

Serial No: 20130418001833

2.3.4 Date of Verification/Initial of test personnel who performed the calculation

May 17, 2013/FSC

2.3.5 Additional Observations

- ERP was calculated as per Section 1.3.2 of KDB412172 D01 (Determining ERP and EIRP v01).
- Calculation formula in logarithmic terms:

$$\text{ERP} = P_T + G_T - L_C - 2.15\text{dB}$$

Where:

P_T = transmitter conducted output power dBm (Section 2.1 of this test report)

G_T = gain of the transmitting antenna, in dBi (EIRP - the -2.15 in the formula is to convert EIRP to ERP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB (EUT uses integral antenna, this value is negligible).

2.3.6 Test Results

See attached table.



Band 13 QPSK								
Bandwidth	RB Size	RB Offset	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
5.0 MHz	25	0	23205	779.5	23.19	-6	15.04	34.77
			23255	784.5	23.19	-6	15.04	34.77
	12	6	23205	779.5	23.3	-6	15.15	34.77
			23255	784.5	23.53	-6	15.38	34.77
	1	0	23205	779.5	24.51	-6	16.36	34.77
			23255	784.5	24.48	-6	16.33	34.77
	1	24	23205	779.5	24.42	-6	16.27	34.77
			23255	784.5	24.48	-6	16.33	34.77
10.0 MHz	50	0	23230	782	23.05	-6	14.9	34.77
	25	13	23230	782	23.15	-6	15	34.77
	1	0	23230	782	24.55	-6	16.4	34.77
	1	49	23230	782	24.54	-6	16.39	34.77
Band 13 16QAM								
Bandwidth	RB Size	RB Offset	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
5.0 MHz	25	0	23205	779.5	22.11	-6	13.96	34.77
			23255	784.5	22.19	-6	14.04	34.77
	12	6	23205	779.5	22.25	-6	14.1	34.77
			23255	784.5	22.56	-6	14.41	34.77
	1	0	23205	779.5	23.37	-6	15.22	34.77
			23255	784.5	23.3	-6	15.15	34.77
	1	24	23205	779.5	23.22	-6	15.07	34.77
			23255	784.5	23.28	-6	15.13	34.77
10.0 MHz	50	0	23230	782	21.89	-6	13.74	34.77
	25	13	23230	782	22.19	-6	14.04	34.77
	1	0	23230	782	23.19	-6	15.04	34.77
	1	49	23230	782	23.15	-6	15	34.77



2.4 OCCUPIED BANDWIDTH

2.4.1 Specification Reference

Part 27 Subpart C §27.53(h)(1), 2.1049, RSS-GEN Issue 3 (4.6.1)

2.4.2 Standard Applicable

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

2.4.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration A

2.4.4 Date of Test/Initial of test personnel who performed the test

May 13, 2013/FSC

2.4.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.6 Environmental Conditions

Ambient Temperature	25.6°C
Relative Humidity	39.8%
ATM Pressure	99.0 kPa

2.4.7 Additional Observations

- This is a conducted test. Test procedure is per Section 3.0 of KDB971168 (D01 Power Meas License Digital Systems v01).
- Although the rule part specify an emission bandwidth, defined as the bandwidth between points on the emission skirts that are 26 dB down from the fundamental power level, the occupied bandwidth (@ 99% power) is a more accurate and straightforward measurement and is acceptable to the FCC in lieu of the signal's emission bandwidth (from KDB971168).
- All channels per each channel bandwidth/band were verified. Only the worst channel - presented.

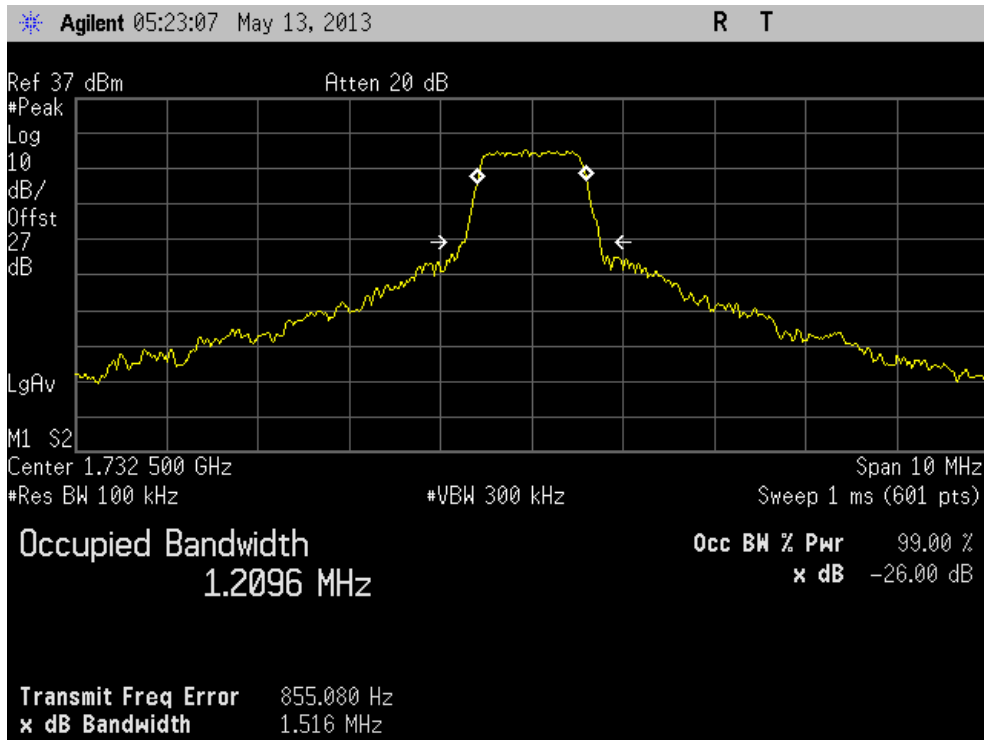
2.4.8 Test Results

See attached table and plots.

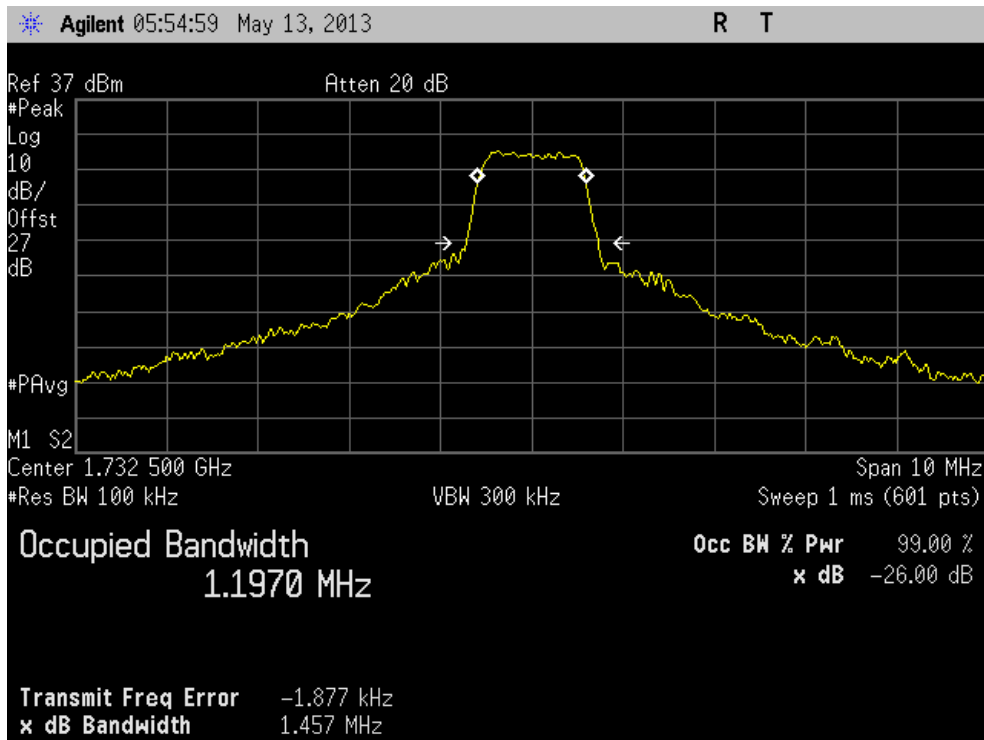


LTE Band	Channel	Frequency (MHz)	BW (MHz)	Modulation	OBW (MHz)	-26dB BW (MHz)
4	20175	1732.5	1.4	QPSK	1.2096	1.516
4	20175	1732.5	1.4	16QAM	1.1970	1.457
4	20175	1732.5	3.0	QPSK	2.7577	3.141
4	20175	1732.5	3.0	16QAM	2.7676	3.162
4	20175	1732.5	5.0	QPSK	4.5113	5.130
4	20175	1732.5	5.0	16QAM	4.5233	5.111
4	20175	1732.5	10.0	QPSK	8.9972	9.935
4	20175	1732.5	10.0	16QAM	8.0054	9.950
4	20175	1732.5	15.0	QPSK	13.4373	14.897
4	20175	1732.5	15.0	16QAM	13.4503	14.912
4	20175	1732.5	20.0	QPSK	17.9685	19.796
4	20175	1732.5	20.0	16QAM	17.8970	19.684
13	23255	784.5	5.0	QPSK	4.5264	5.144
13	23255	784.5	5.0	16QAM	4.5318	5.176
13	23230	782.0	10.0	QPSK	8.9894	9.937
13	23230	782.0	10.0	16QAM	9.0049	9.904

LTE Band 4 1732.5MHz (1.4 MHz BW) QPSK

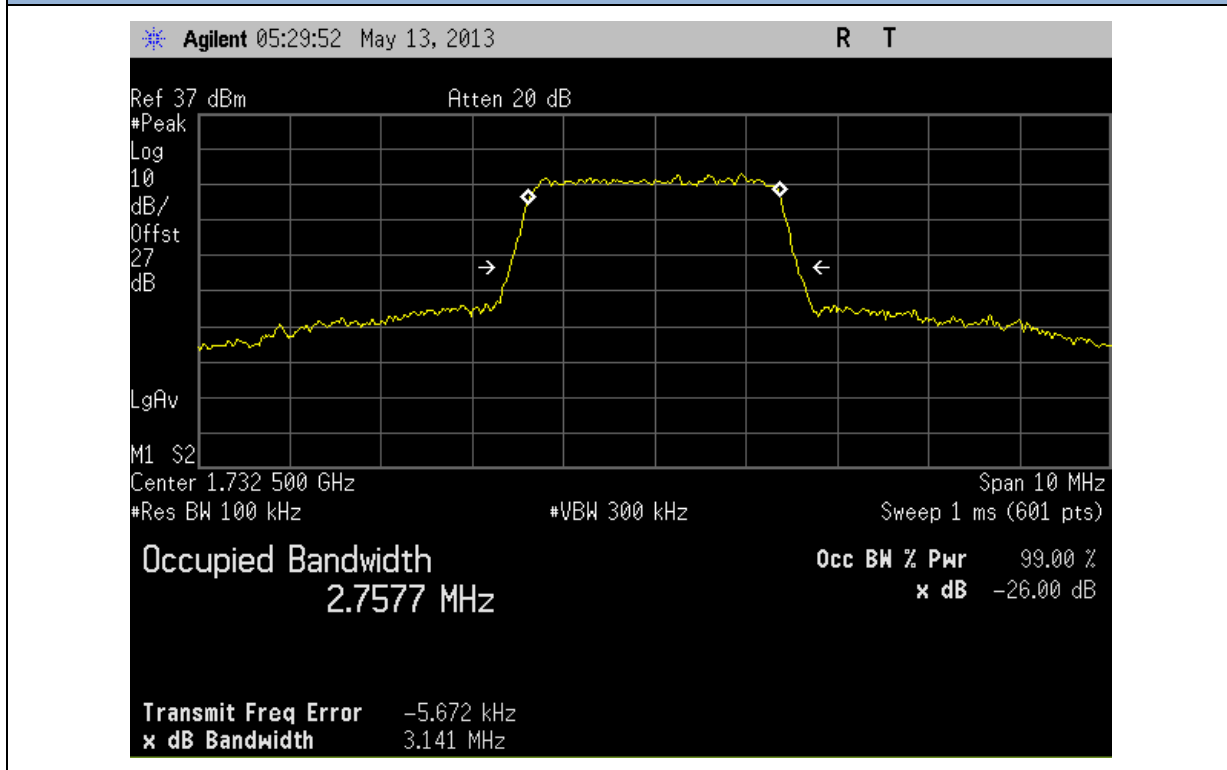


LTE Band 4 1732.5MHz (1.4 MHz BW) 16QAM

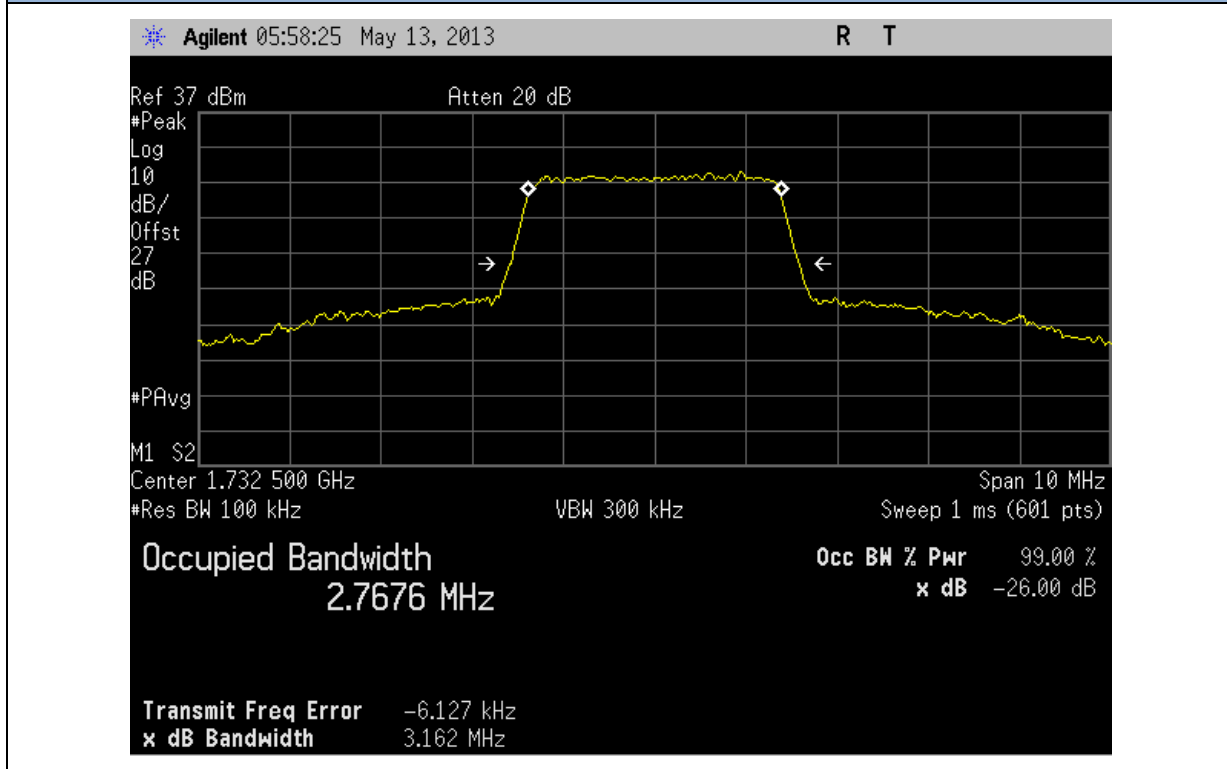




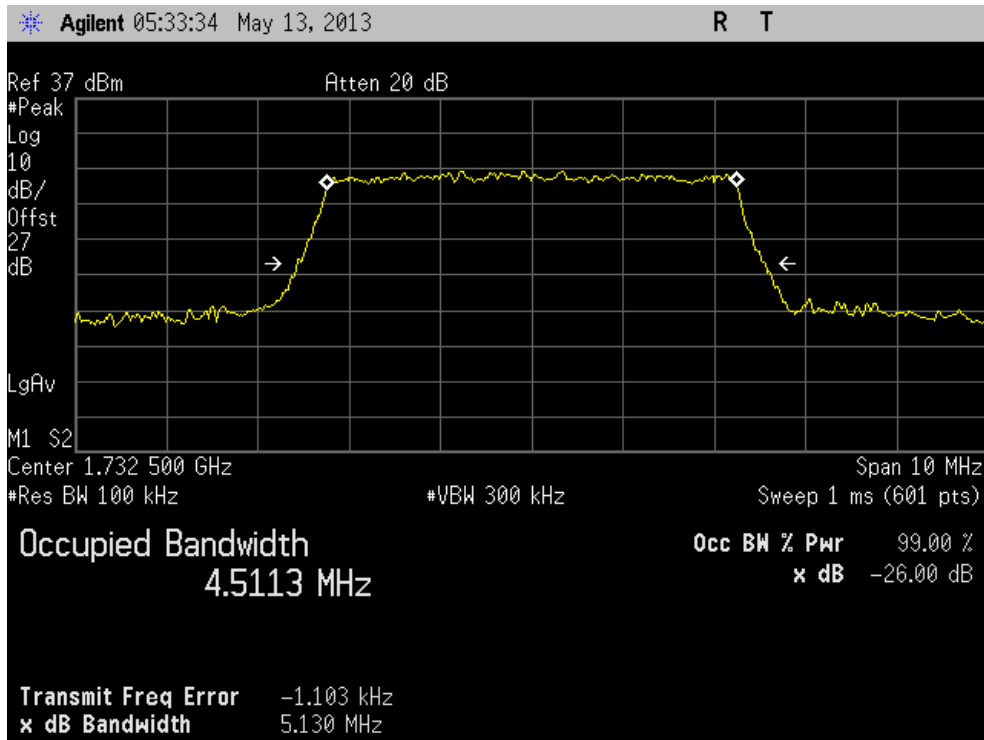
LTE Band 4 1732.5MHz (3.0 MHz BW) QPSK



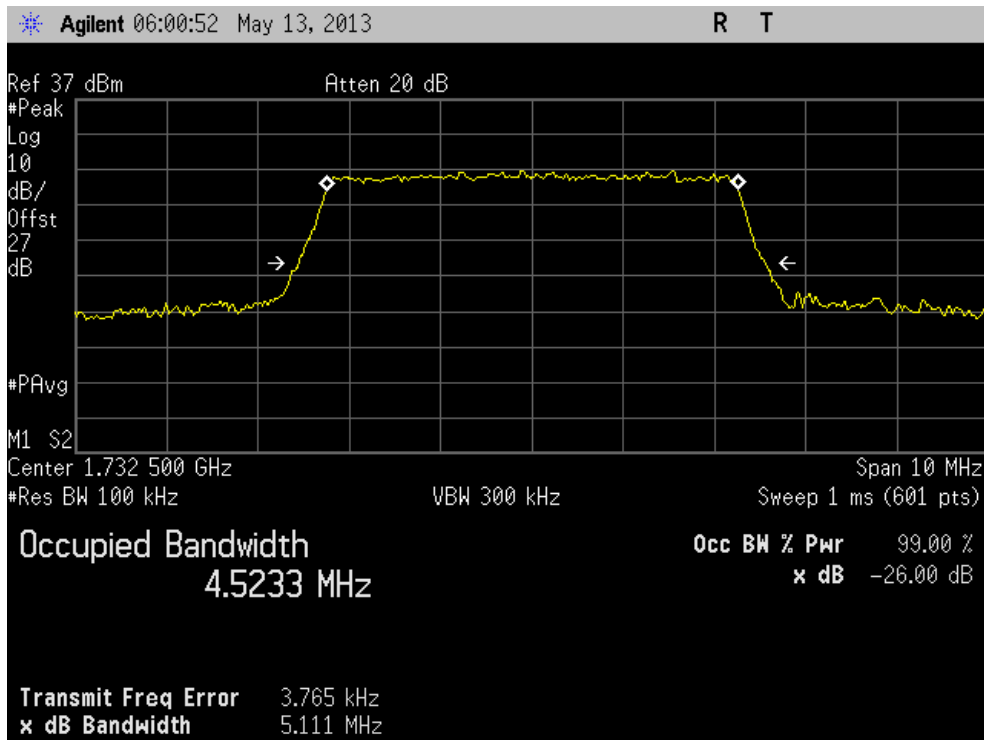
LTE Band 4 1732.5MHz (3.0 MHz BW) 16QAM



LTE Band 4 1732.5MHz (5.0 MHz BW) QPSK

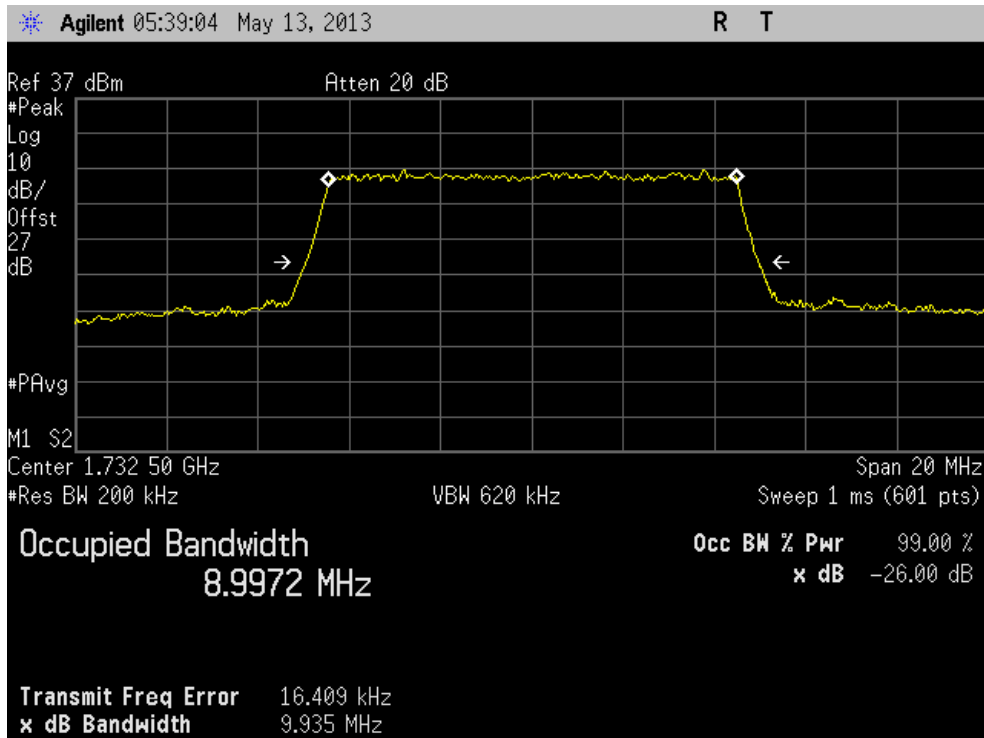


LTE Band 4 1732.5MHz (5.0 MHz BW) 16QAM

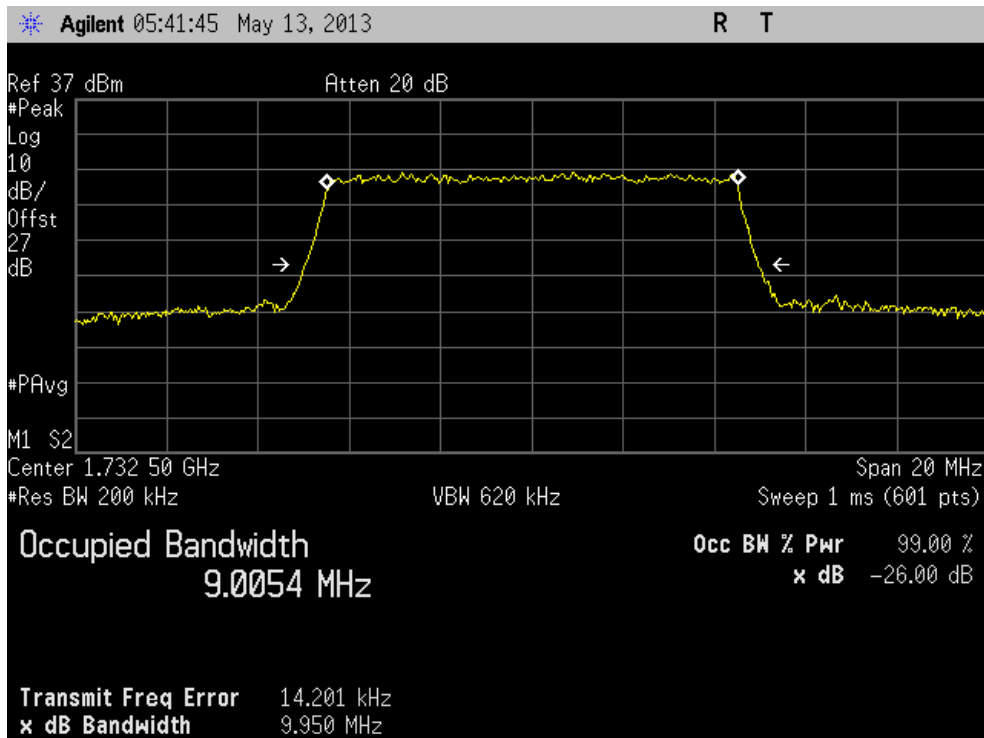




LTE Band 4 1732.5MHz (10.0 MHz BW) QPSK

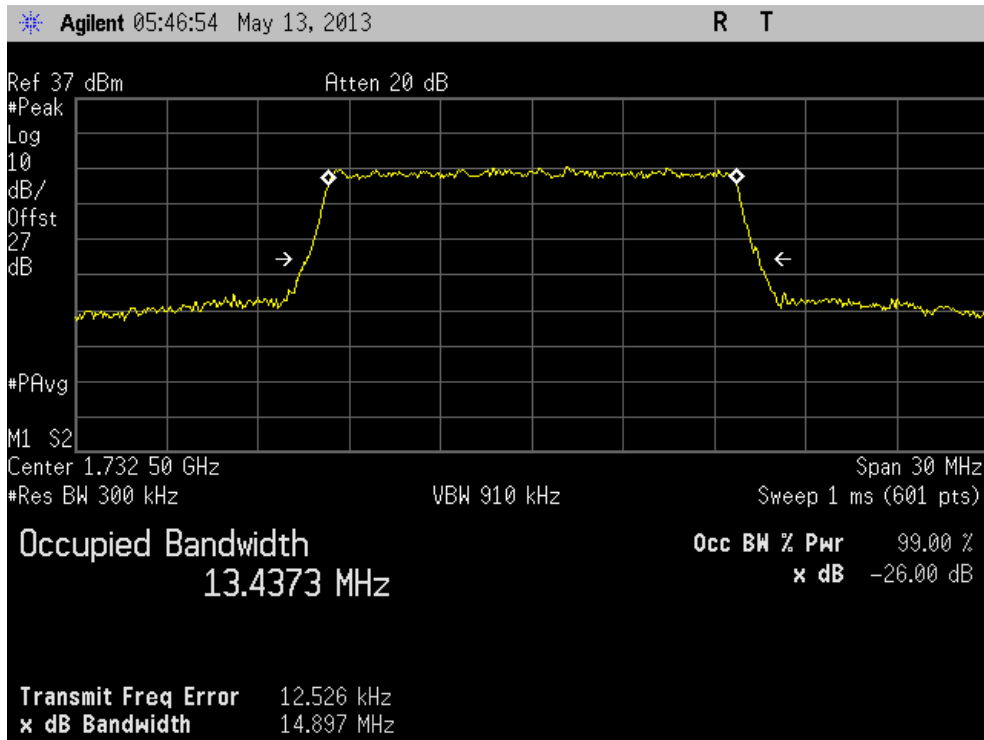


LTE Band 4 1732.5MHz (10.0 MHz BW) 16QAM

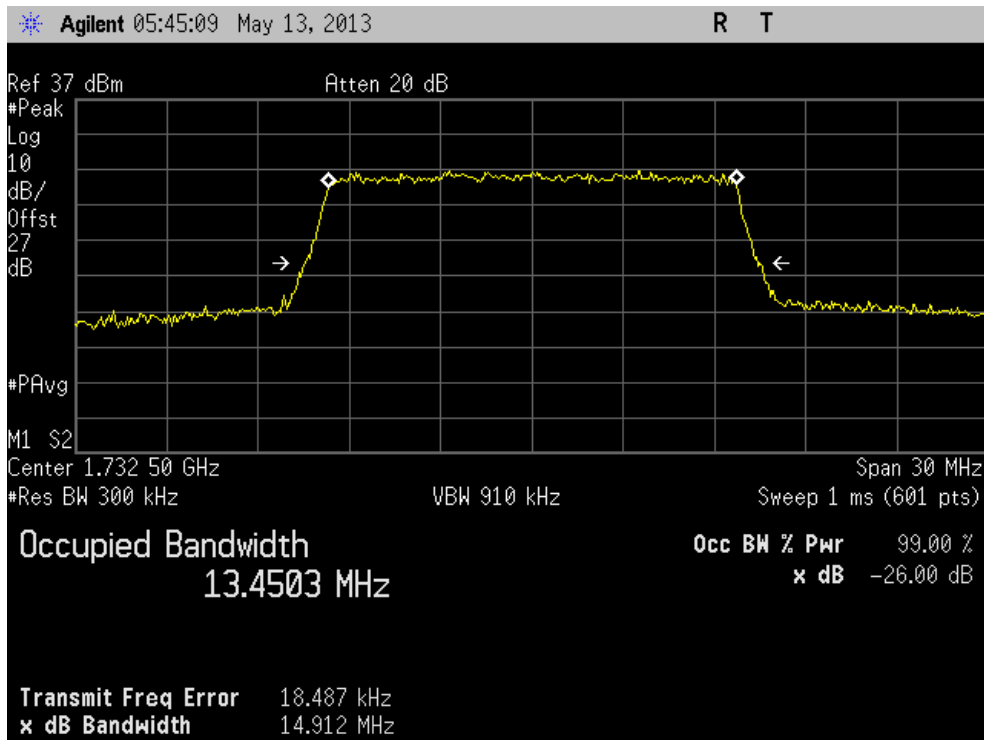




LTE Band 4 1732.5MHz (15.0 MHz BW) QPSK

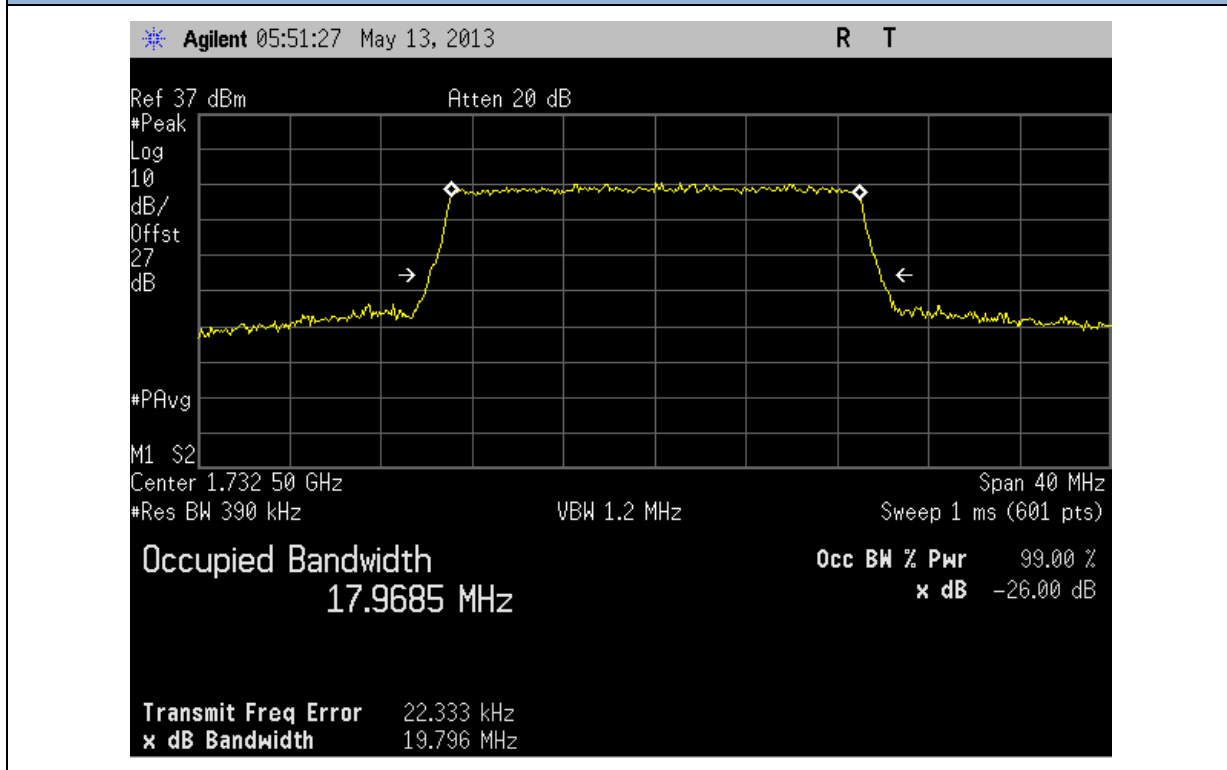


LTE Band 4 1732.5MHz (15.0 MHz BW) 16QAM

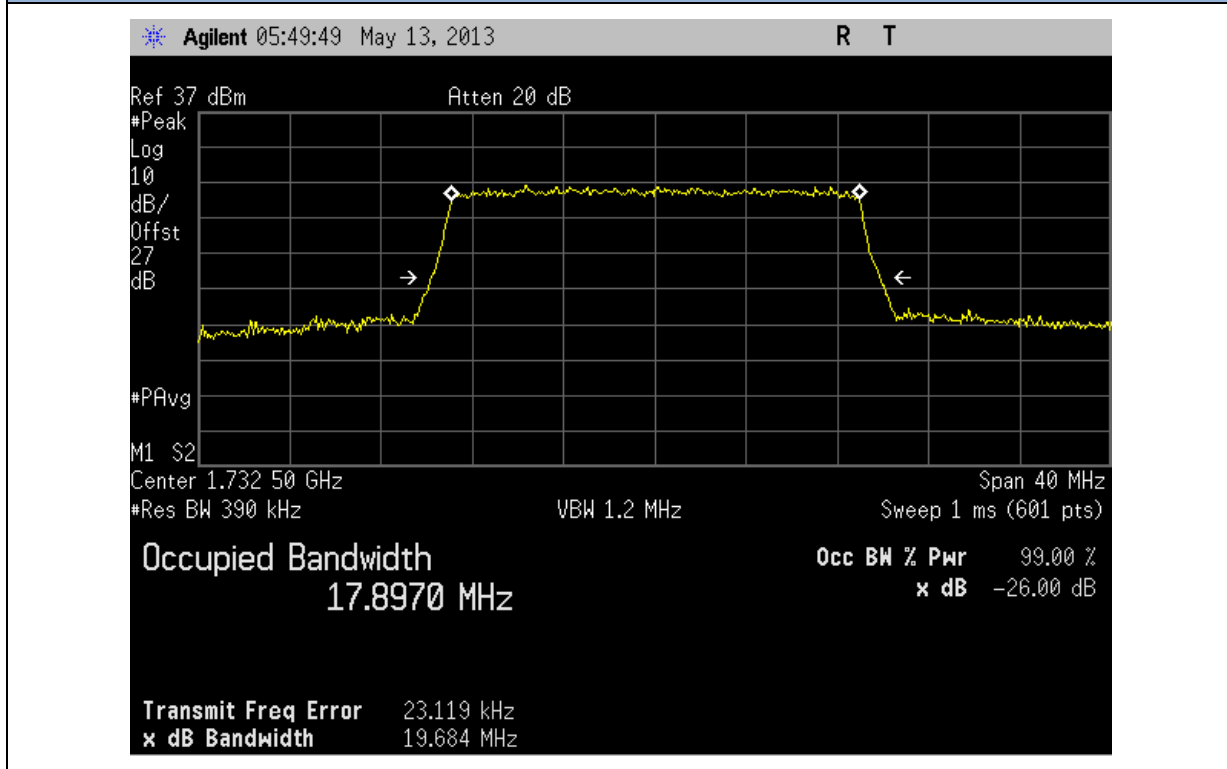




LTE Band 4 1732.5MHz (20.0 MHz BW) QPSK

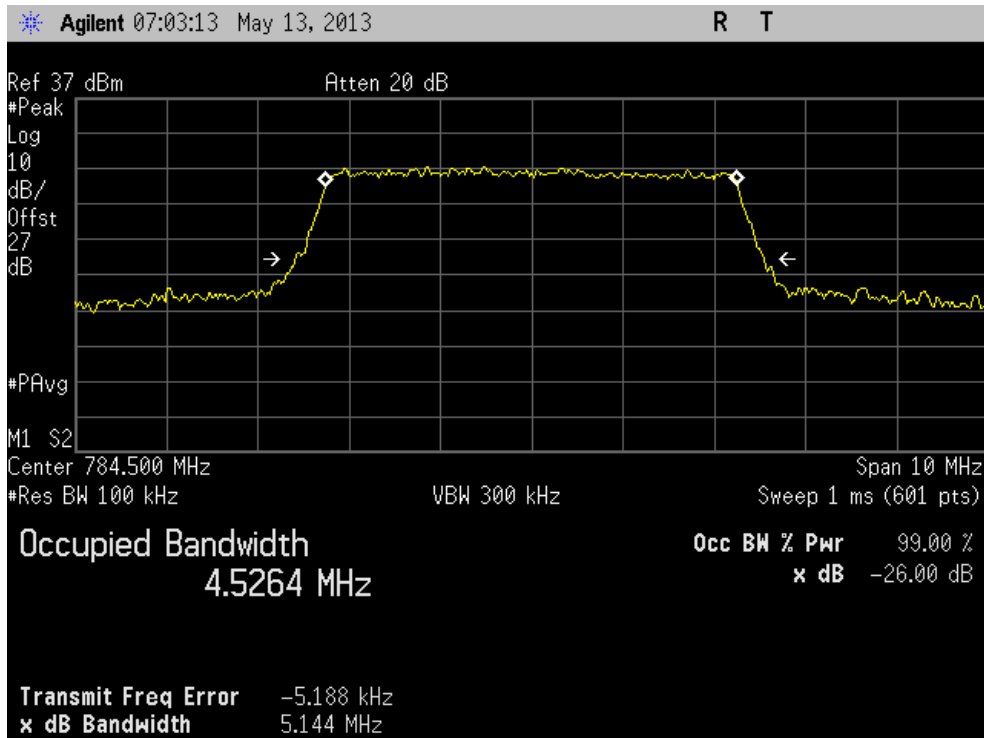


LTE Band 4 1732.5MHz (20.0 MHz BW) 16QAM

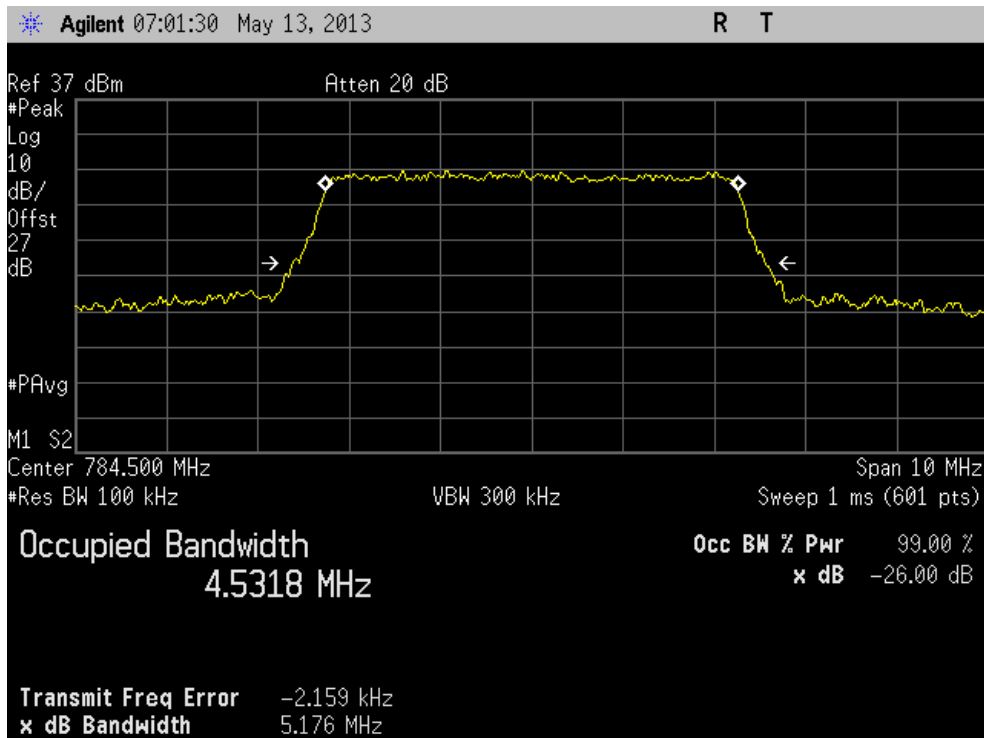




LTE Band 13 784.5MHz (5.0 MHz BW) QPSK

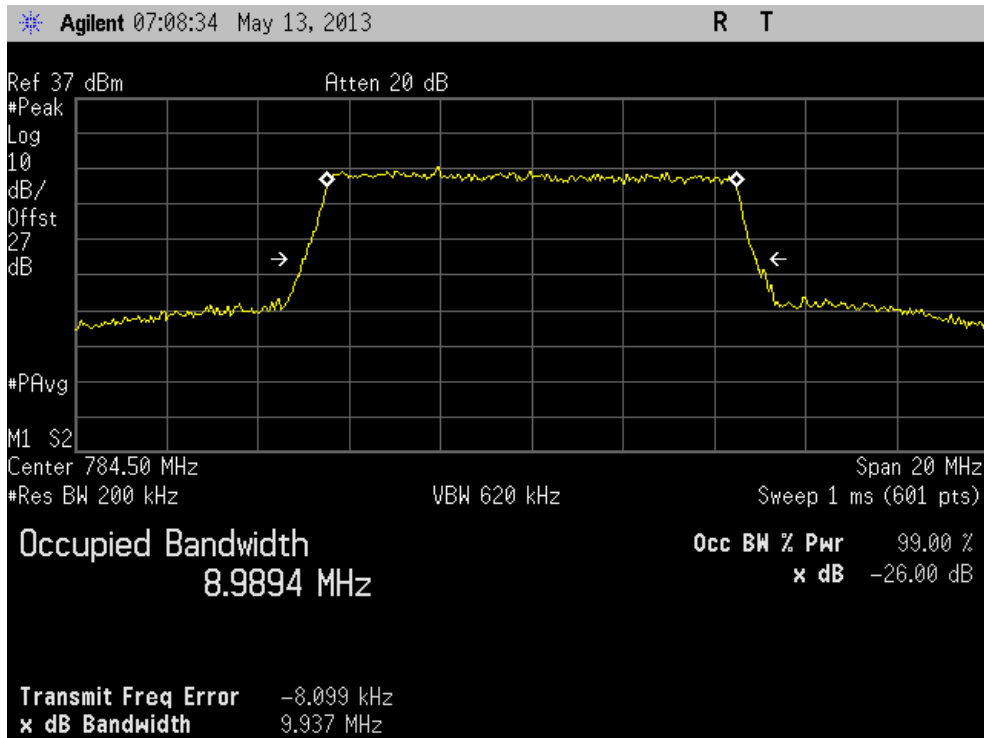


LTE Band 13 784.5MHz (5.0 MHz BW) 16QAM

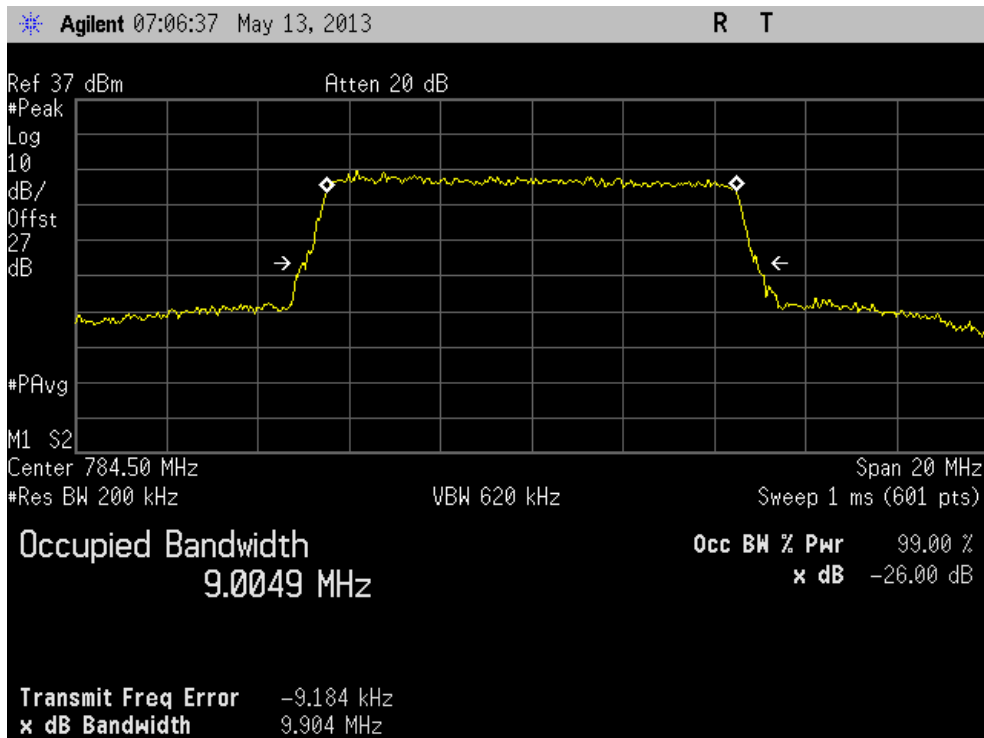




LTE Band 13 782.0MHz (10.0 MHz BW) QPSK



LTE Band 13 782.0MHz (10.0 MHz BW) 16QAM





2.5 PEAK-AVERAGE POWER RATIO

2.5.1 Specification Reference

Part 27 Subpart C §27.50(d)(5), RSS-139 Issue 2 (6.4)

2.5.2 Standard Applicable

(d) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands:

(5) Equipment employed must be authorized in accordance with the provisions of §24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. 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.

2.5.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration A

2.5.4 Date of Test/Initial of test personnel who performed the test

May 13, 2013/FSC

2.5.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.6 Environmental Conditions

Ambient Temperature	25.6°C
Relative Humidity	39.8%
ATM Pressure	99.0 kPa

2.5.7 Additional Observations

- This is a conducted test. Test procedure is per Section 3.0 of KDB971168 (D01 Power Meas License Digital Systems v01).
- Measurement was done using the Spectrum Analyzer's Complementary Cumulative Distribution Function (CCDF) measurement profile. The built-in function is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth (crest factor or peak-to-average ratio) A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth.



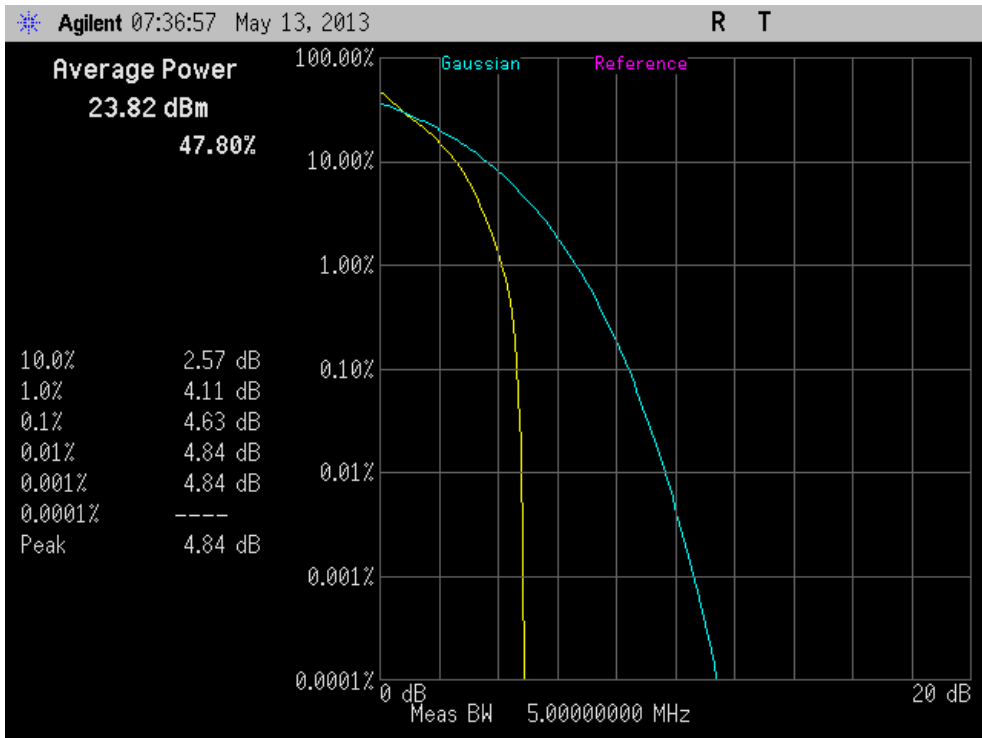
- All channels based from worst case configuration channel bandwidth were verified. Only the worst channel presented.
- There are no measured PAR levels greater than 13dB. EUT complies.

2.5.8 Test Results

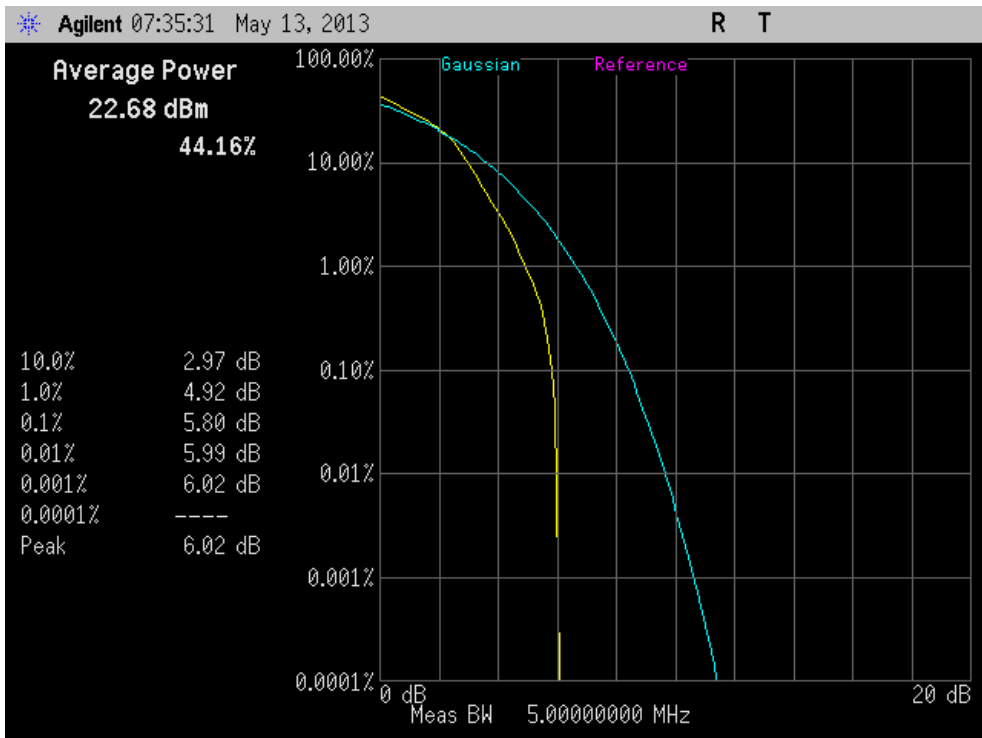
The worst case measured PAR level was 7.19dB (0.1%) at 1745.0 MHz using 16QAM with a 20MHz BW.

See attached plots.

LTE Band 4 1745.0MHz (1.4 MHz BW) QPSK

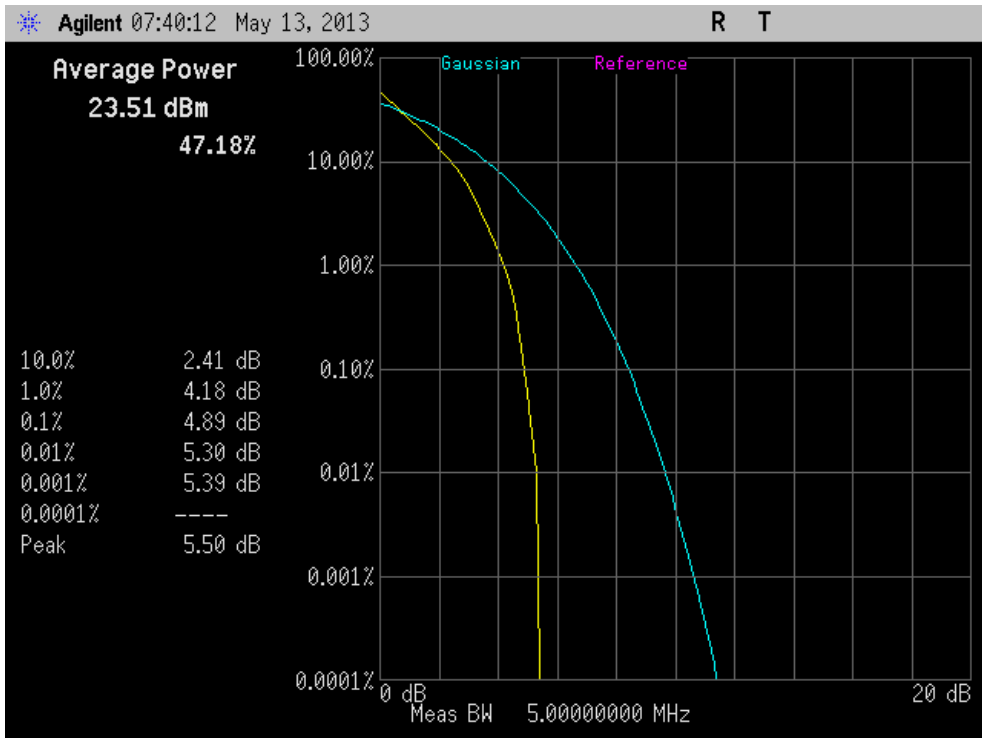


LTE Band 4 1745.0MHz (1.4 MHz BW) 16QAM





LTE Band 4 1745.0MHz (3.0 MHz BW) QPSK

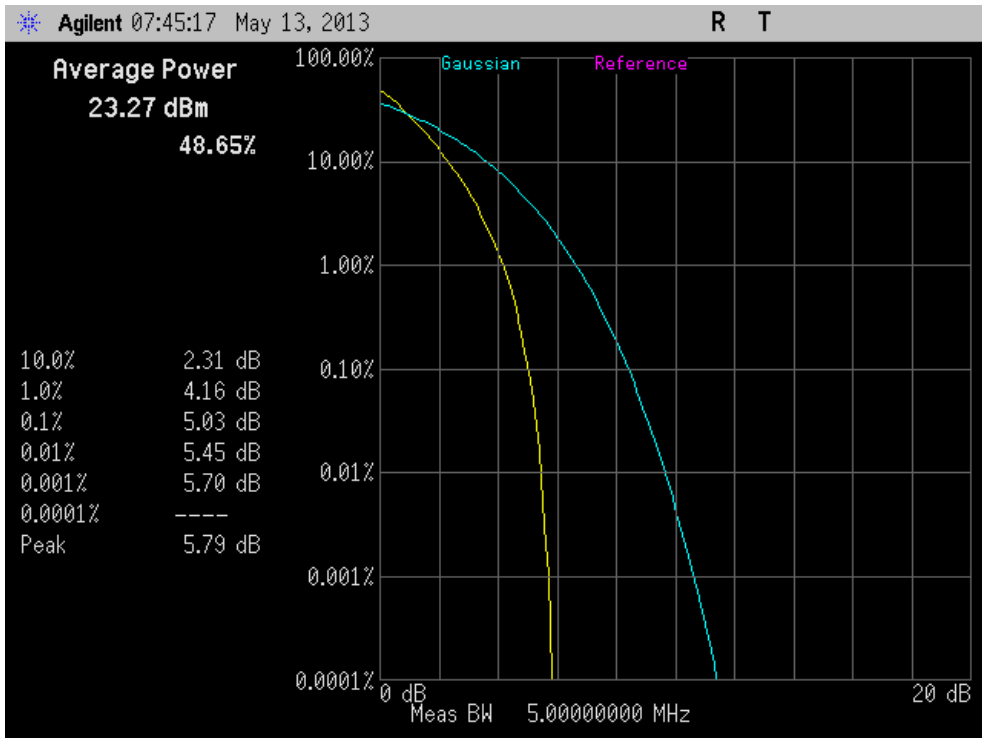


LTE Band 4 1745.0MHz (3.0 MHz BW) 16QAM





LTE Band 4 1745.0MHz (5.0 MHz BW) QPSK



LTE Band 4 1745.0MHz (5.0 MHz BW) 16QAM

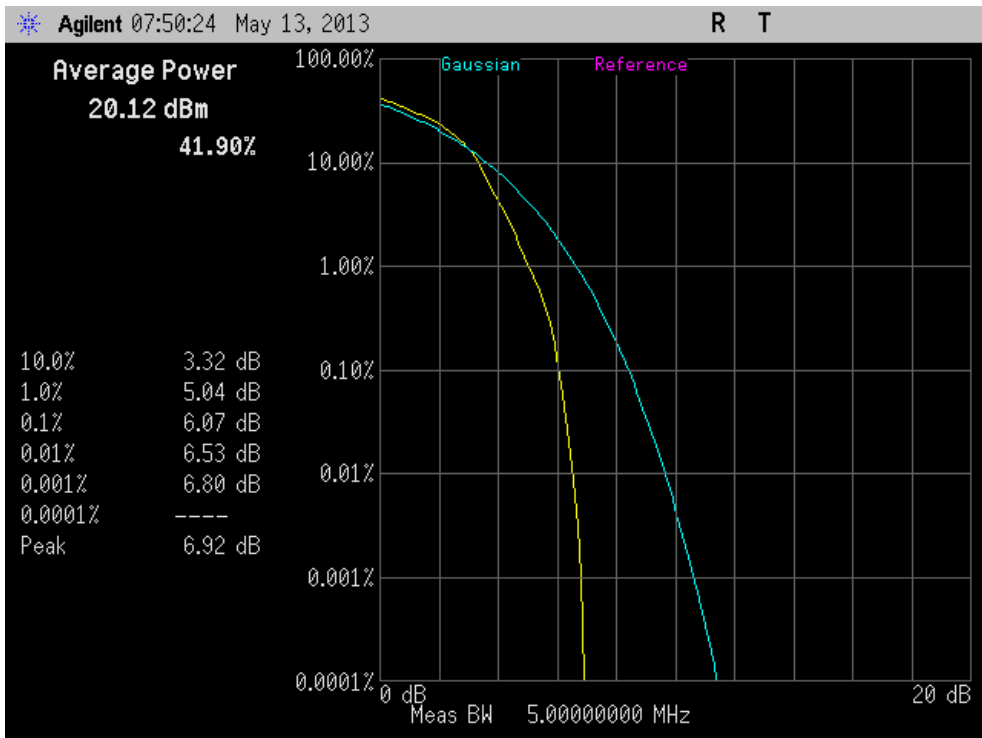




LTE Band 4 1745.0MHz (10.0 MHz BW) QPSK



LTE Band 4 1745.0MHz (10.0 MHz BW) 16QAM

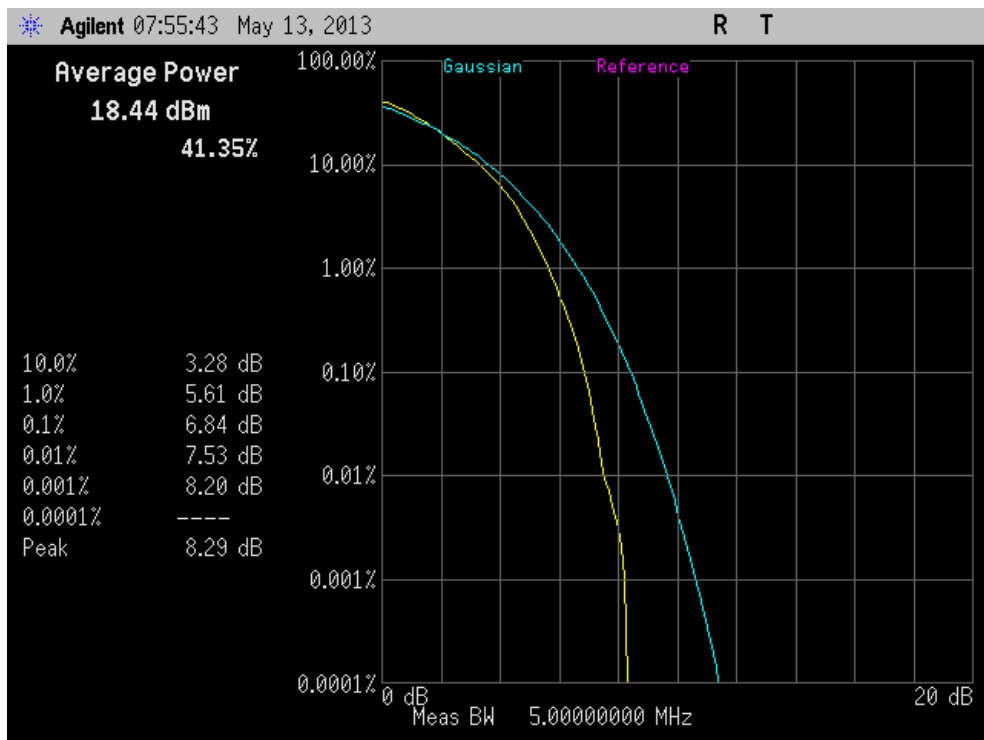




LTE Band 4 1745.0MHz (15.0 MHz BW) QPSK

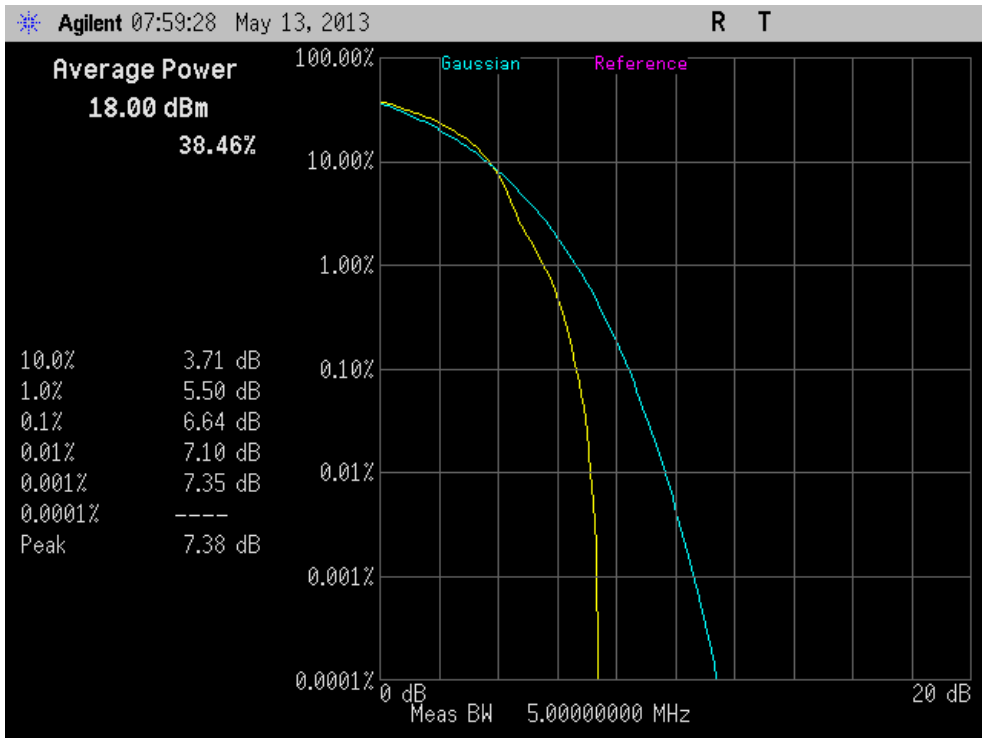


LTE Band 4 1745.0MHz (15.0 MHz BW) 16QAM

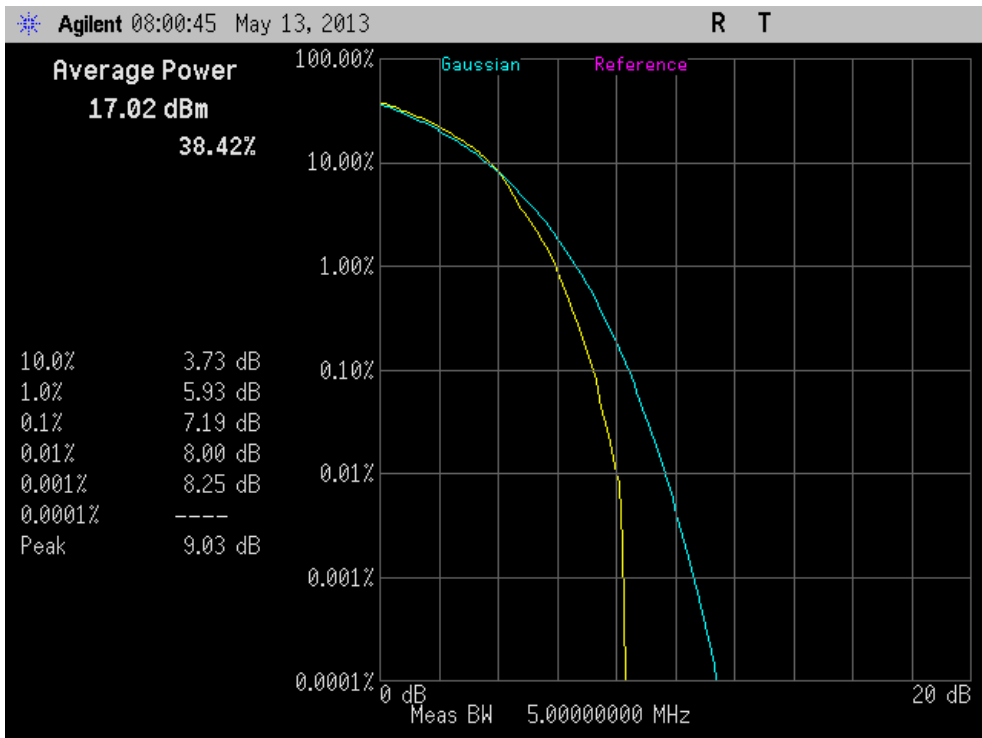




LTE Band 4 1745.0MHz (20.0 MHz BW) QPSK



LTE Band 4 1745.0MHz (20.0 MHz BW) 16QAM





2.6 BAND EDGE

2.6.1 Specification Reference

Part 27 Subpart C §27.53(c)(2)(5) and (h), RSS-139 Issue 2 (6.5)

2.6.2 Standard Applicable

(c)(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

(c)(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(h) 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 $43 + 10 \log_{10}(P)$ dB.

(3) Measurement procedure. (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power

2.6.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration A

2.6.4 Date of Test/Initial of test personnel who performed the test

May 13, 2013/FSC

2.6.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.6 Environmental Conditions

Ambient Temperature	25.6°C
Relative Humidity	39.8%
ATM Pressure	99.0 kPa

2.6.7 Additional Observations

- This is a conducted test.
- The 27.6dB offset is from the power splitter, external attenuator and cable used.



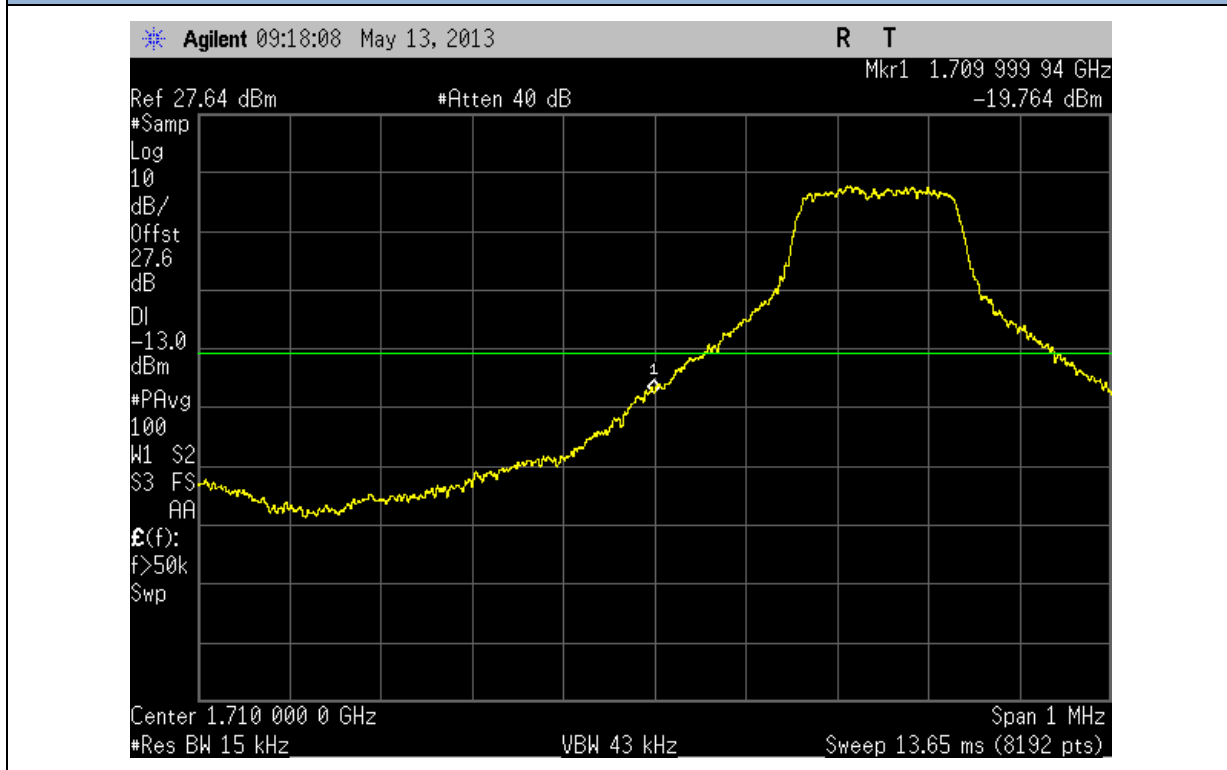
- The center frequency of the spectrum is the band edge frequency. Using a span of 1MHz for Band 13, RBW is set to 100 kHz and VBW is set to 3X RBW.
- In the band 1710-1755MHz (Band 4), RBW setting used is 1% of the -26dB bandwidth (EBW).
- For lower band edge, 0 offset is utilized while the maximum allowable offset per channel bandwidth for upper band edge is used.
- All RB size available verified and the worst case size for band edge verification presented in this test report.

2.6.8 Test Results

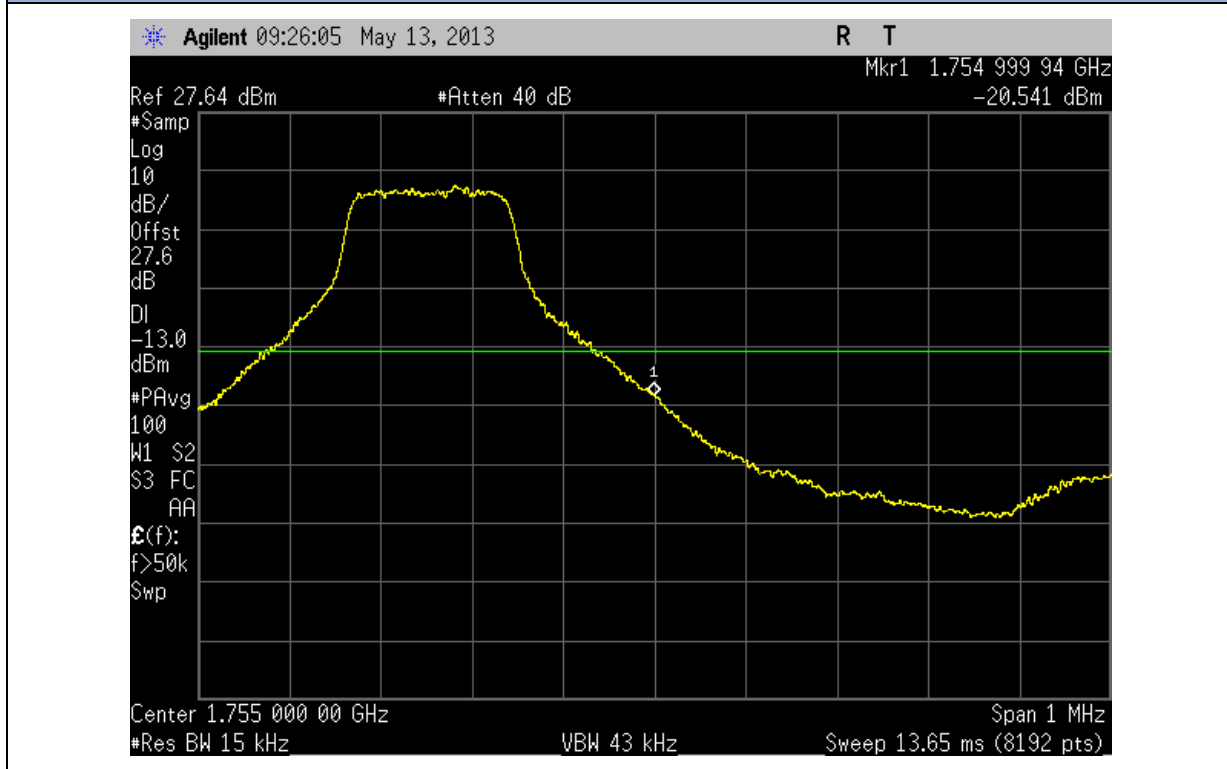
See attached plots.



LTE Band 4 1.4MHz BW Low Channel (19957) Band Edge @ 1710MHz (1RB)

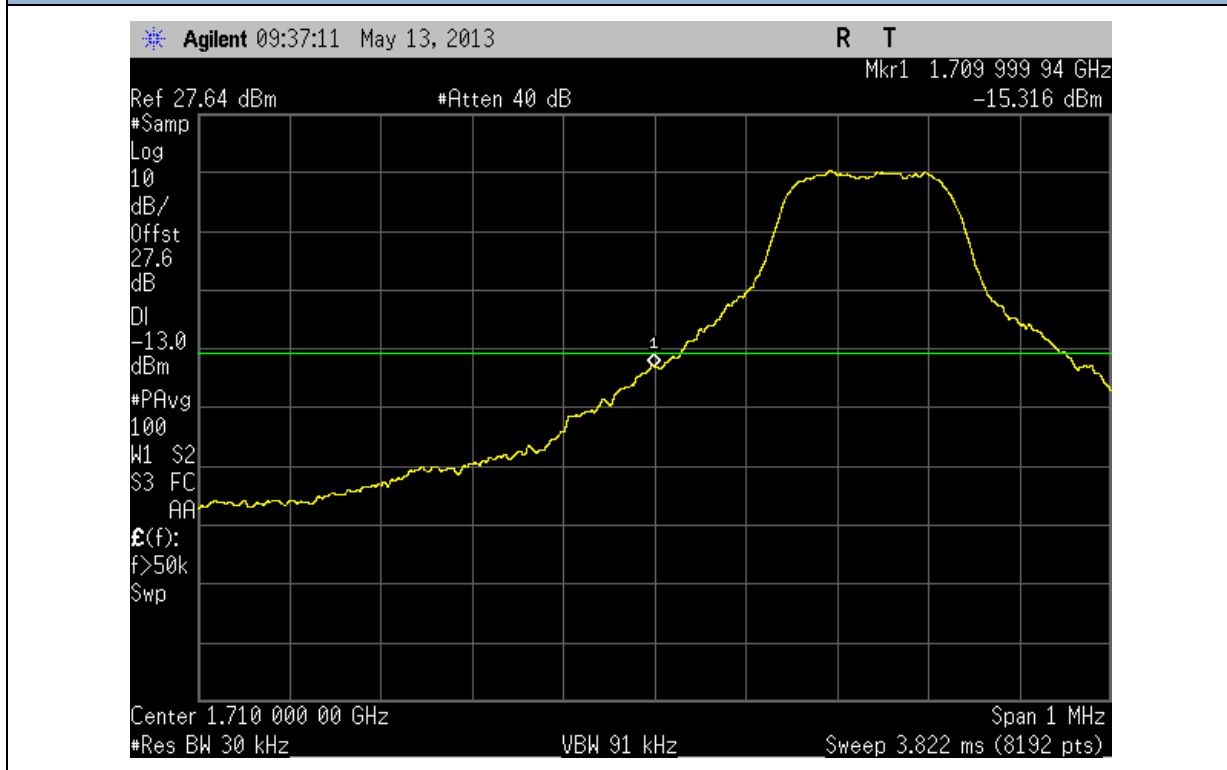


LTE Band 4 1.4MHz BW High Channel (20393) Band Edge @ 1755MHz (1RB)

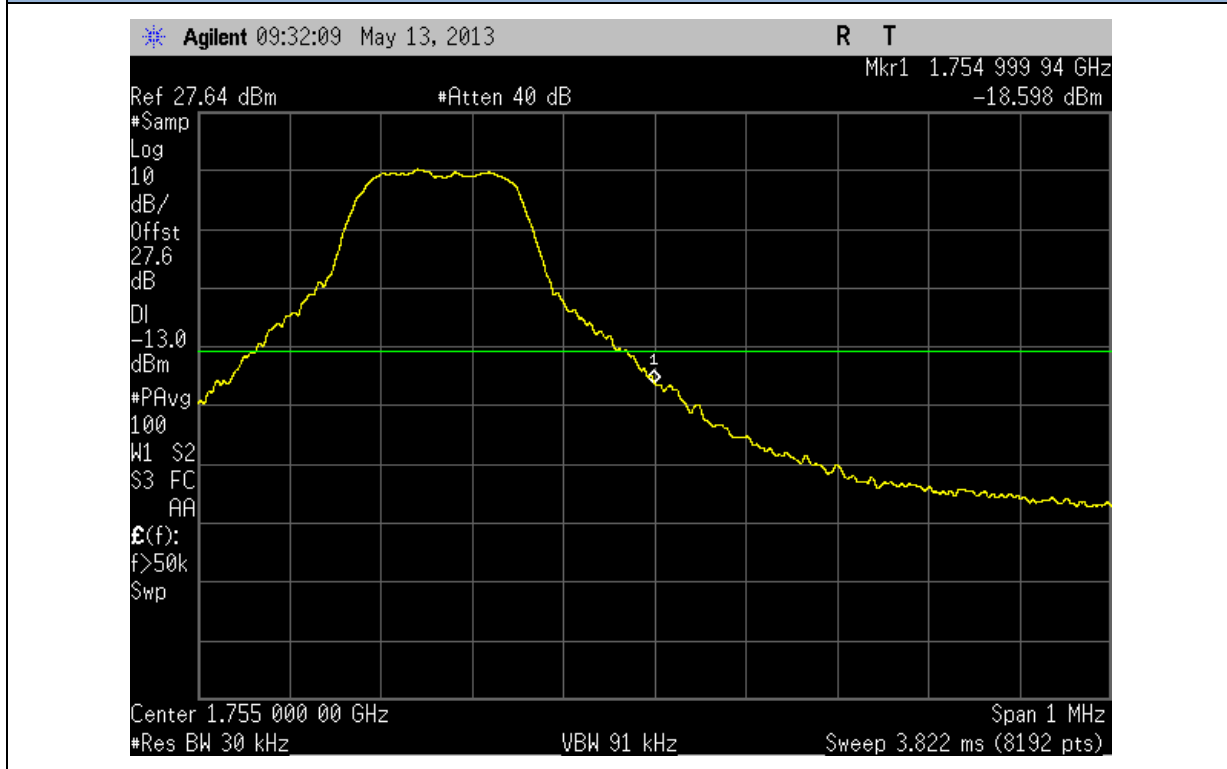




LTE Band 4 3.0MHz BW Low Channel (19965) Band Edge @ 1710MHz (1RB)

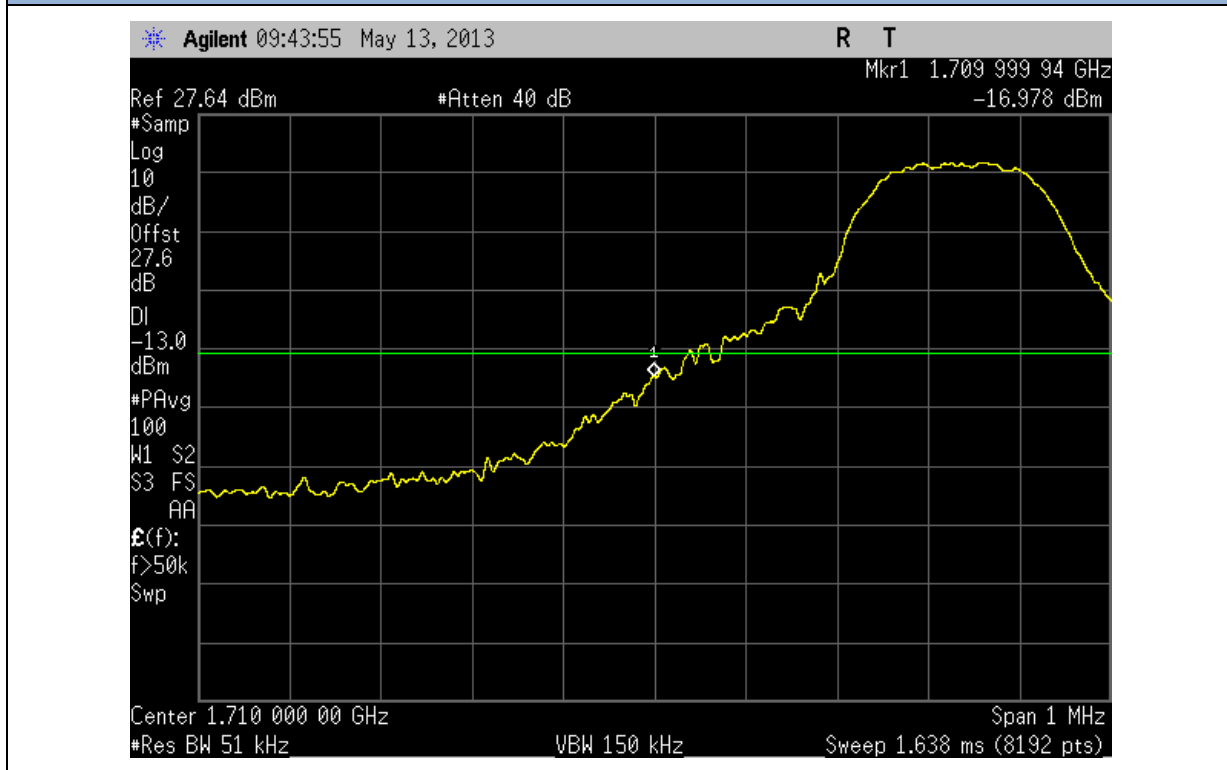


LTE Band 4 3.0MHz BW High Channel (20385) Band Edge @ 1755MHz (1RB)

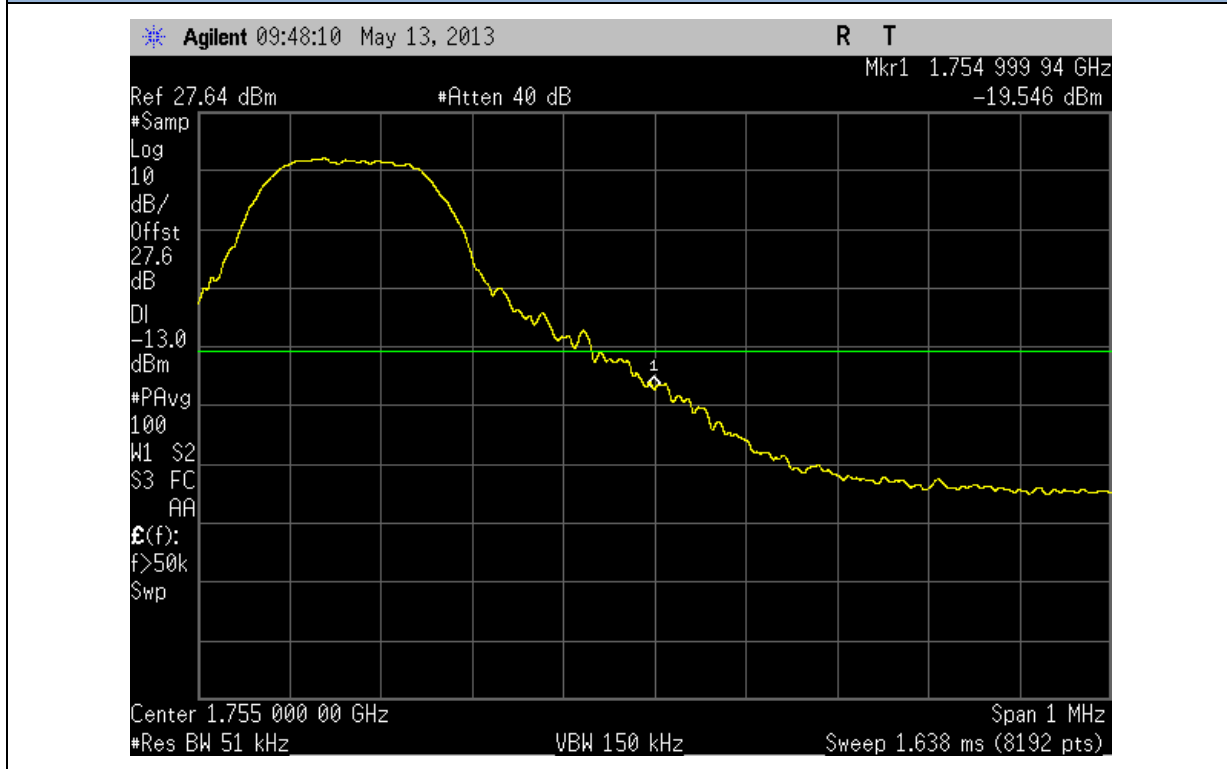




LTE Band 4 5.0MHz BW Low Channel (19975) Band Edge @ 1710MHz (1RB)

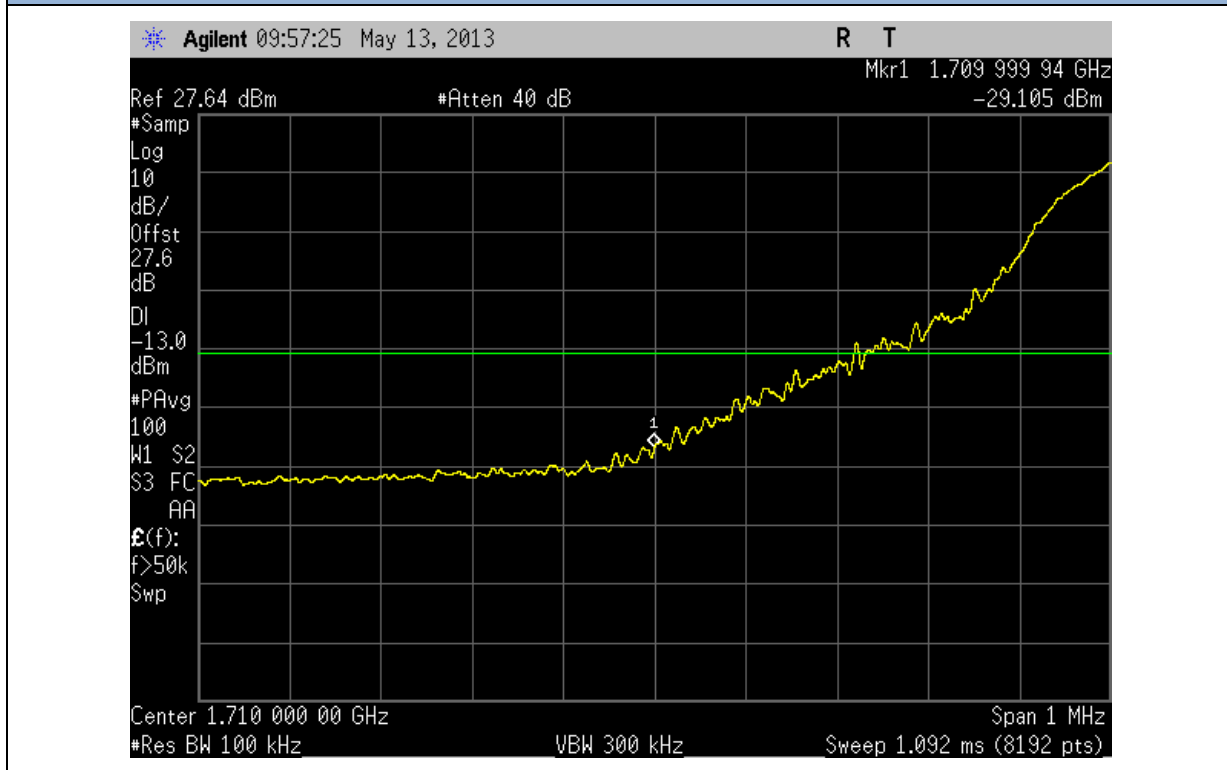


LTE Band 4 5.0MHz BW High Channel (20375) Band Edge @ 1755MHz (1RB)

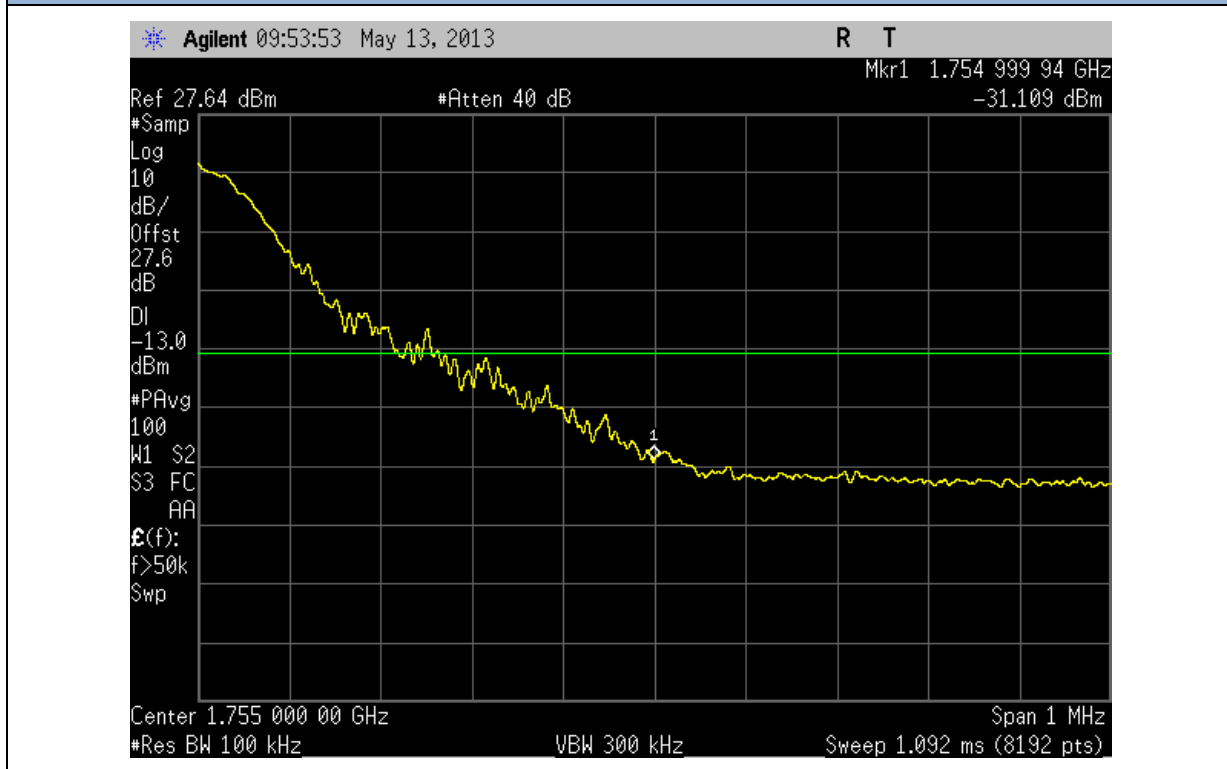




LTE Band 4 10.0MHz BW Low Channel (20000) Band Edge @ 1710MHz (1RB)

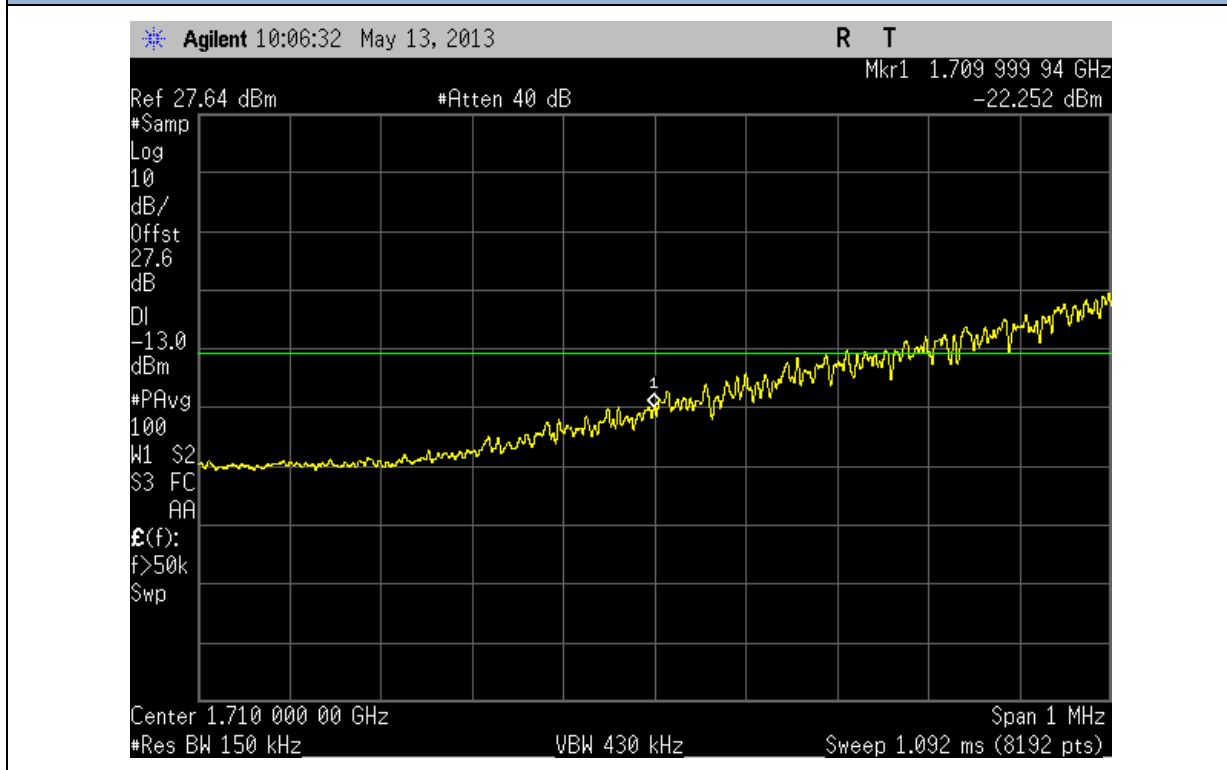


LTE Band 4 10.0MHz BW High Channel (20350) Band Edge @ 1755MHz (1RB)

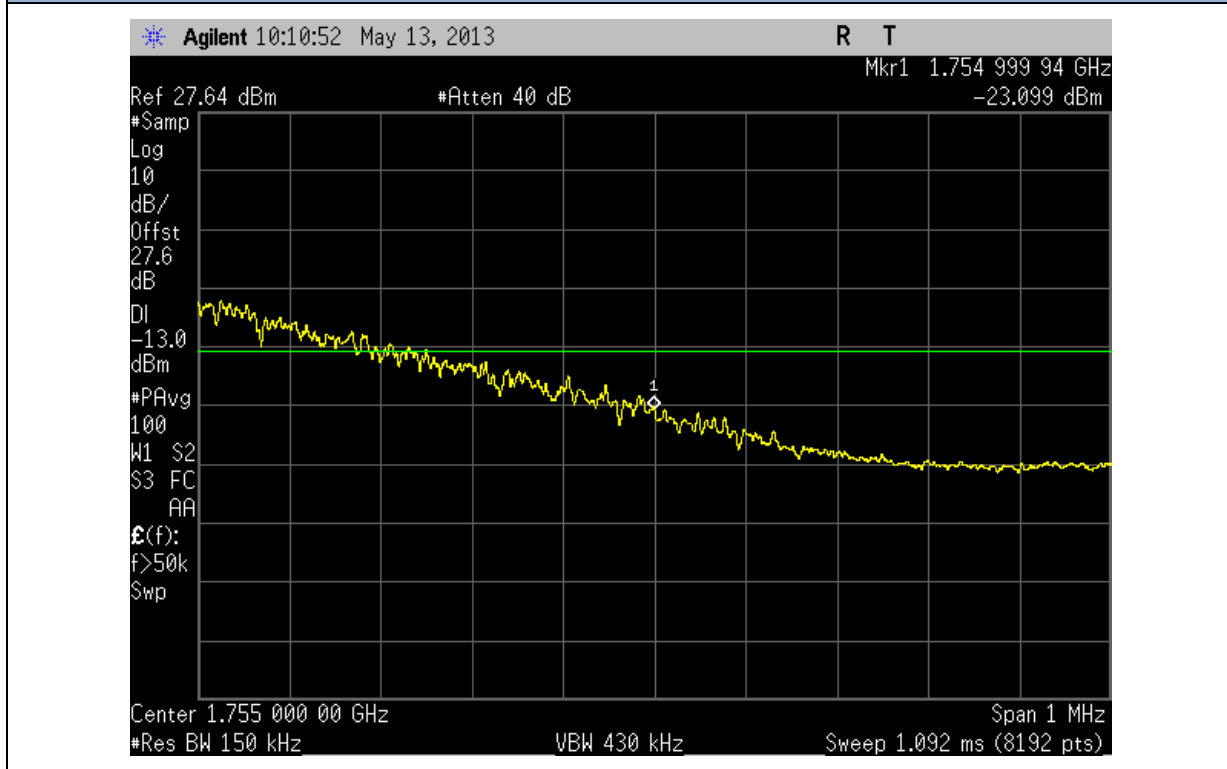




LTE Band 4 15.0MHz BW Low Channel (20025) Band Edge @ 1710MHz (1RB)

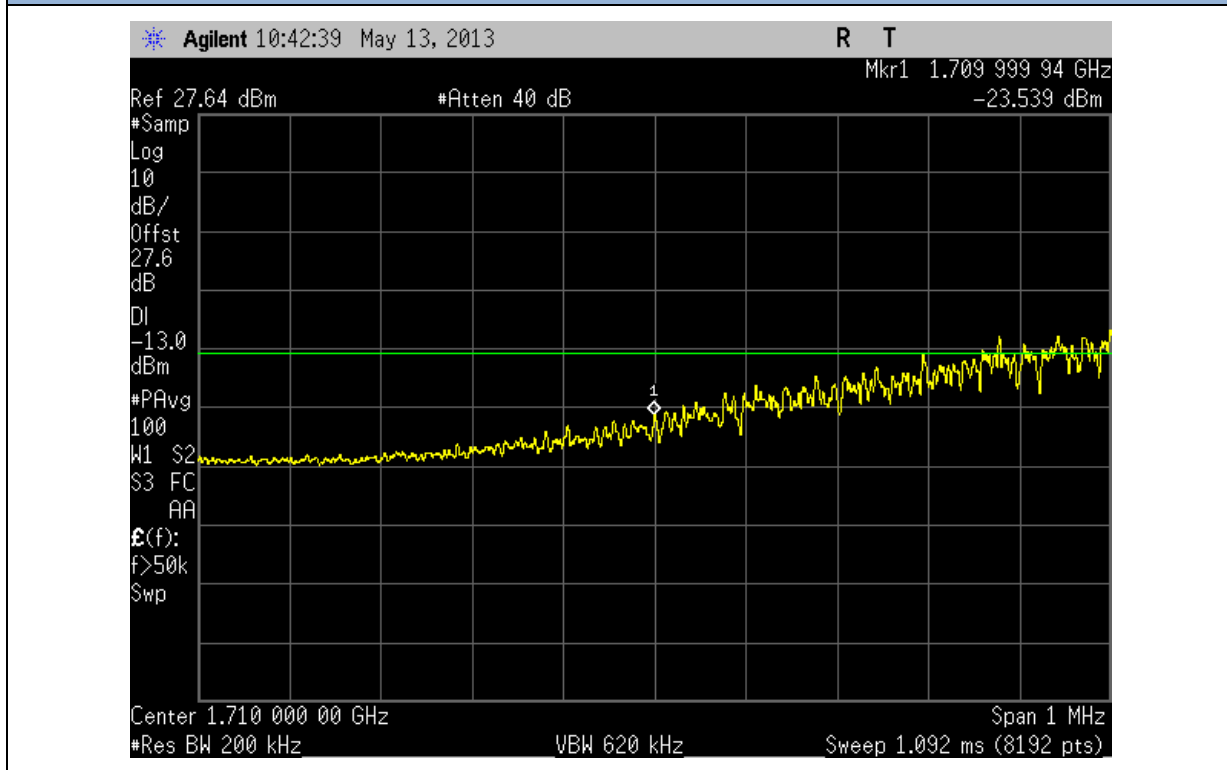


LTE Band 4 15.0MHz BW High Channel (20325) Band Edge @ 1755MHz (1RB)

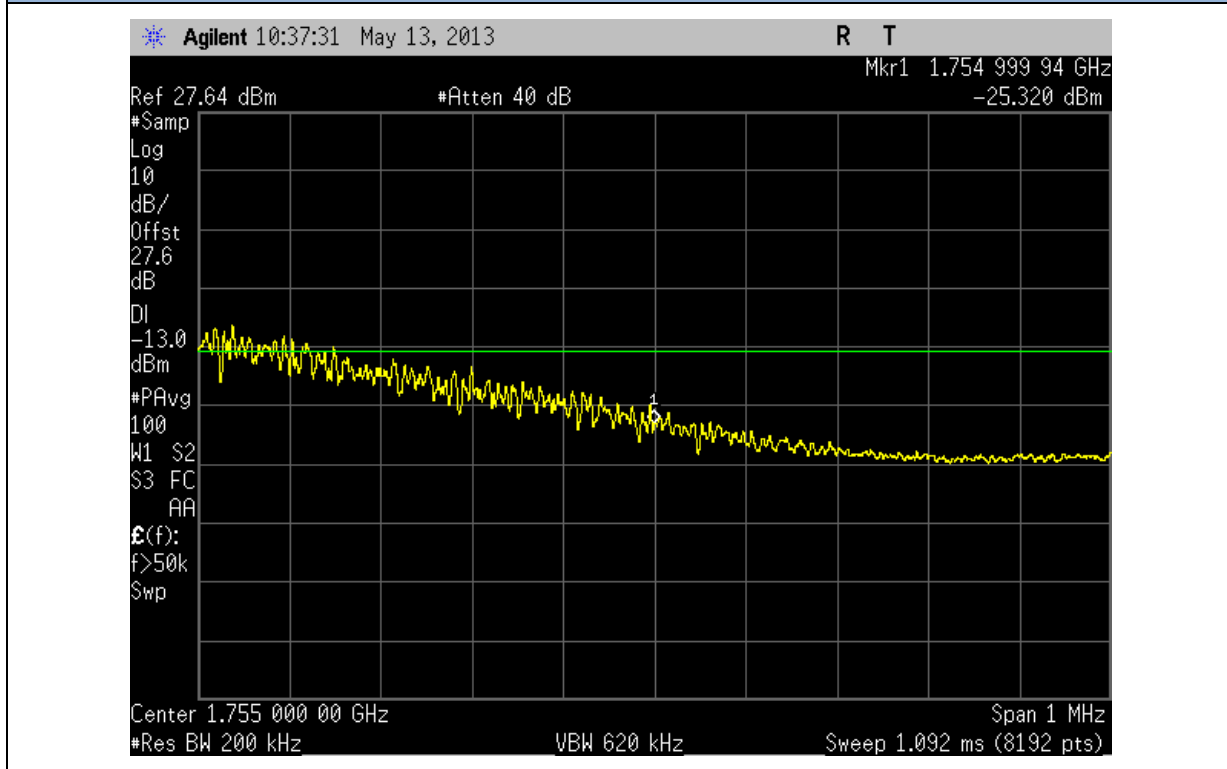




LTE Band 4 20.0MHz BW Low Channel (20050) Band Edge @ 1710MHz (1RB)

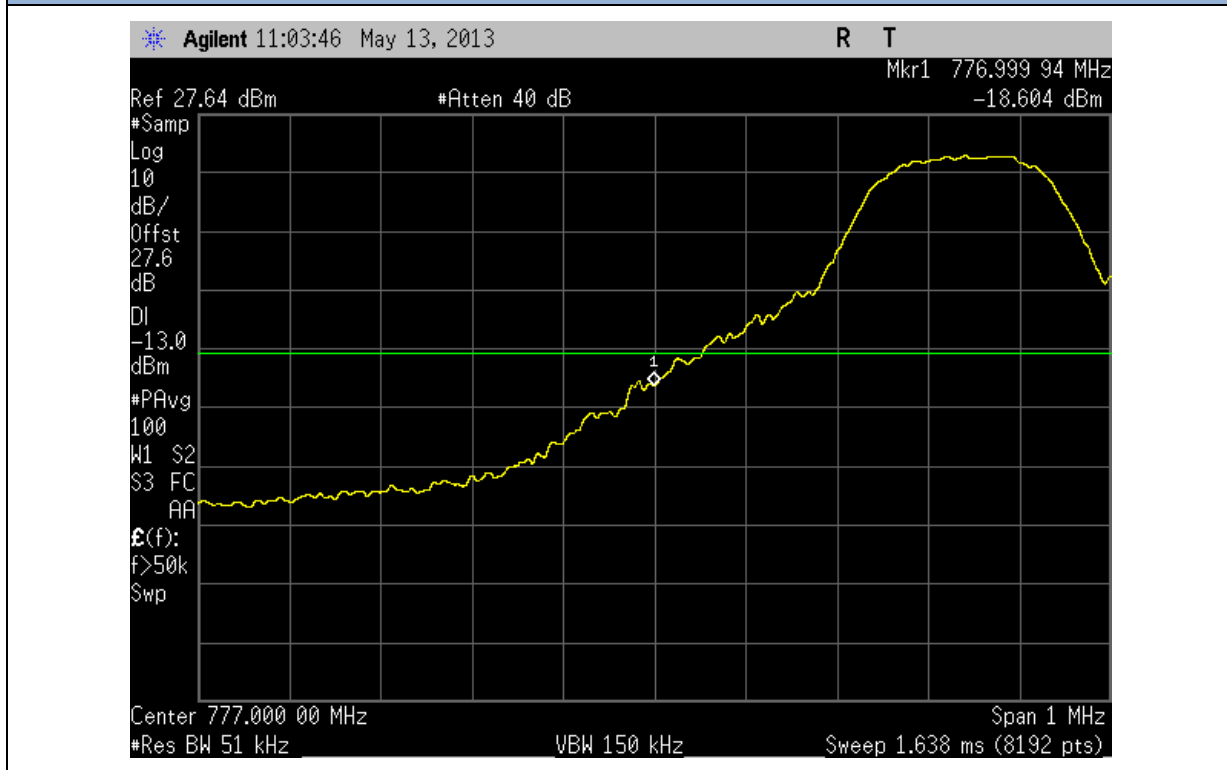


LTE Band 4 20.0MHz BW High Channel (20300) Band Edge @ 1755MHz (1RB)

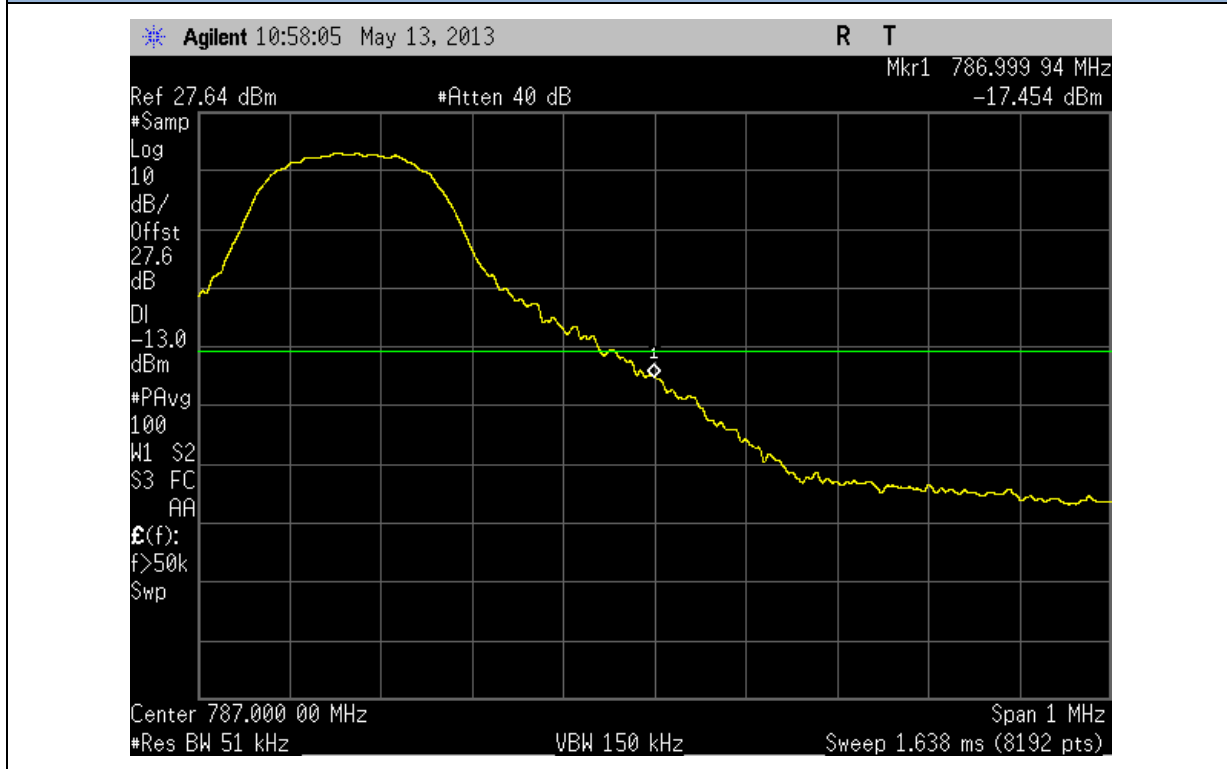




LTE Band 13 5.0MHz BW Low Channel (23205) Band Edge @ 777MHz (1RB)

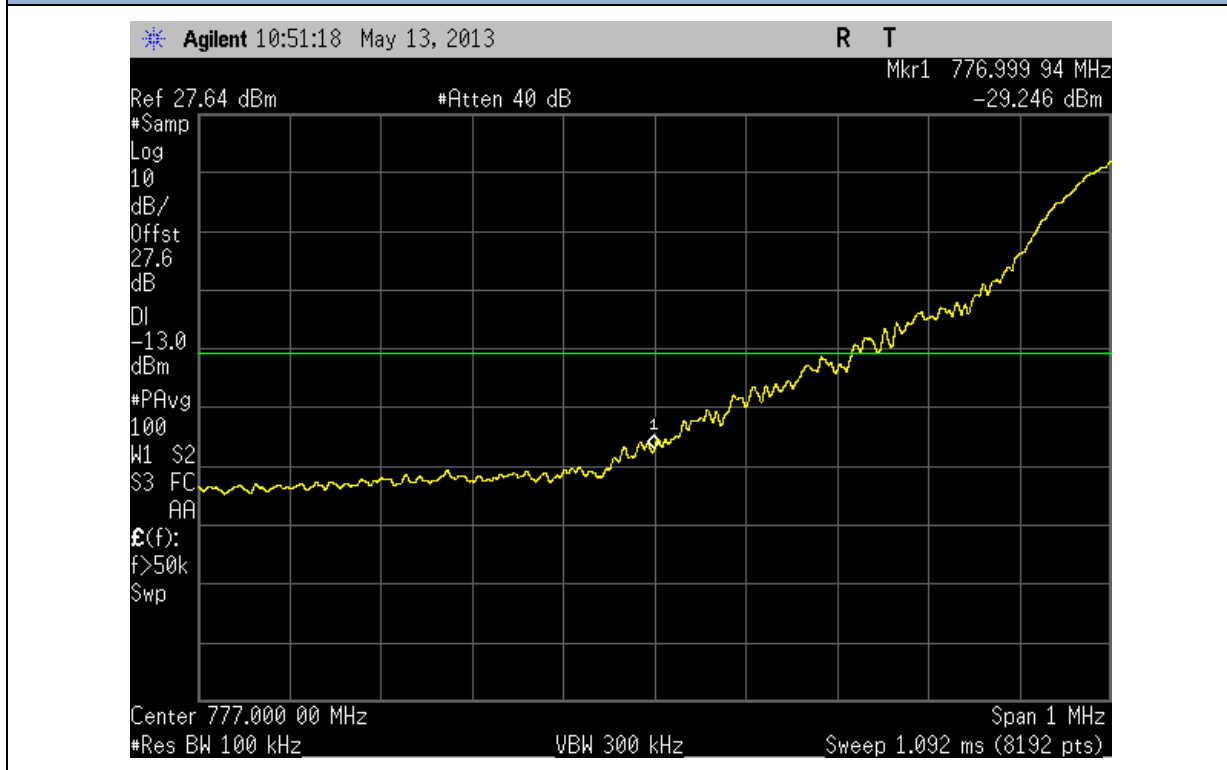


LTE Band 13 5.0MHz BW High Channel (23255) Band Edge @ 787MHz (1RB)

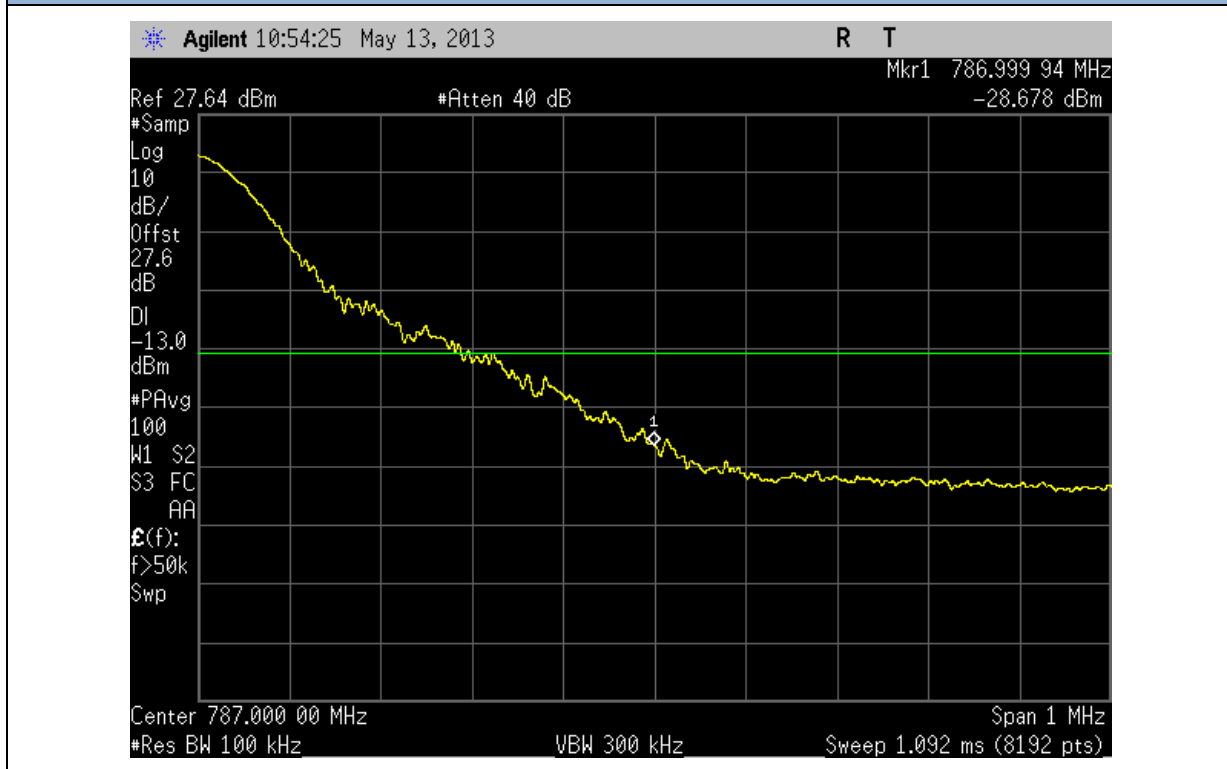




LTE Band 13 10.0MHz BW Channel 23230 Band Edge @ 777MHz (1RB)



LTE Band 13 10.0MHz BW Channel 23230 Band Edge @ 787MHz (1RB)





2.7 CONDUCTED SPURIOUS EMISSIONS

2.7.1 Specification Reference

Part 27 Subpart C §27.53 (c)(2)(5),(f),(h) and Part 2.1051, RSS-139 Issue 2(6.5)

2.7.2 Standard Applicable

(c)(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

(c)(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(f) For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(h) 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 $43 + 10 \log_{10}(P)$ dB.

2.7.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration A

2.7.4 Date of Test/Initial of test personnel who performed the test

May 13, 2013/FSC

2.7.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.6 Environmental Conditions

Ambient Temperature	25.6°C
Relative Humidity	39.8%
ATM Pressure	99.0 kPa

2.7.7 Additional Observations

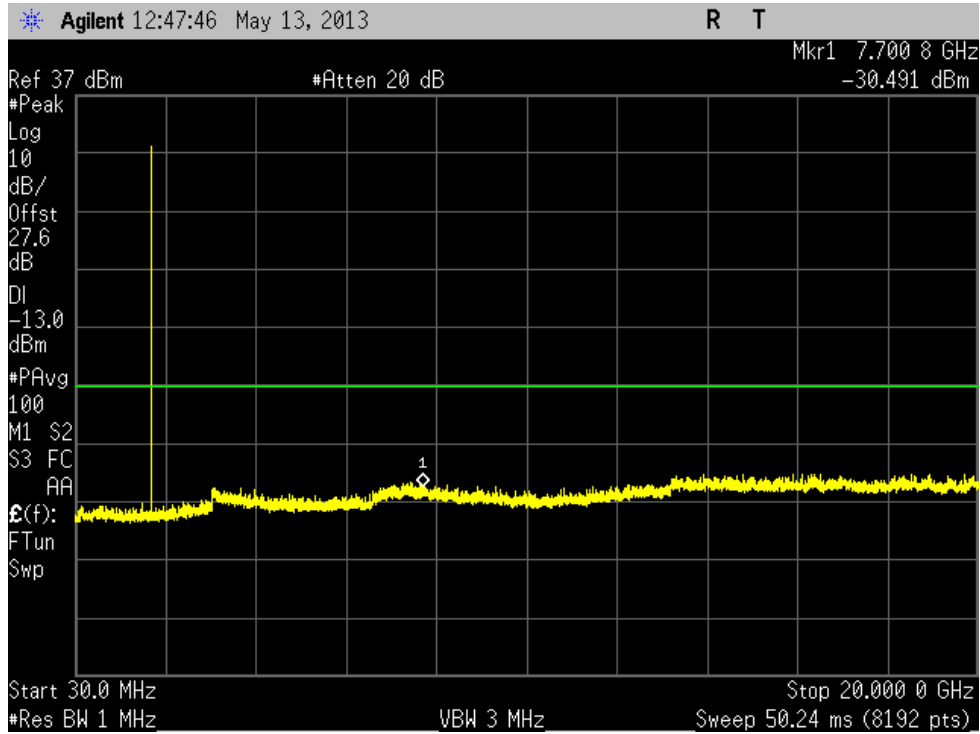
- This is a conducted test. The 27.6dB offset is from the power splitter, external attenuator and cable used.
- The spectrum was searched from 30MHz to the 10th harmonic (20GHz) for Band 4. Band 17 was verified up to 10GHz.
- Low, Mid and High channels on all channel bandwidth verified. Only the worst RB size/offset presented (See Section 1.4.4).

2.7.8 Test Results

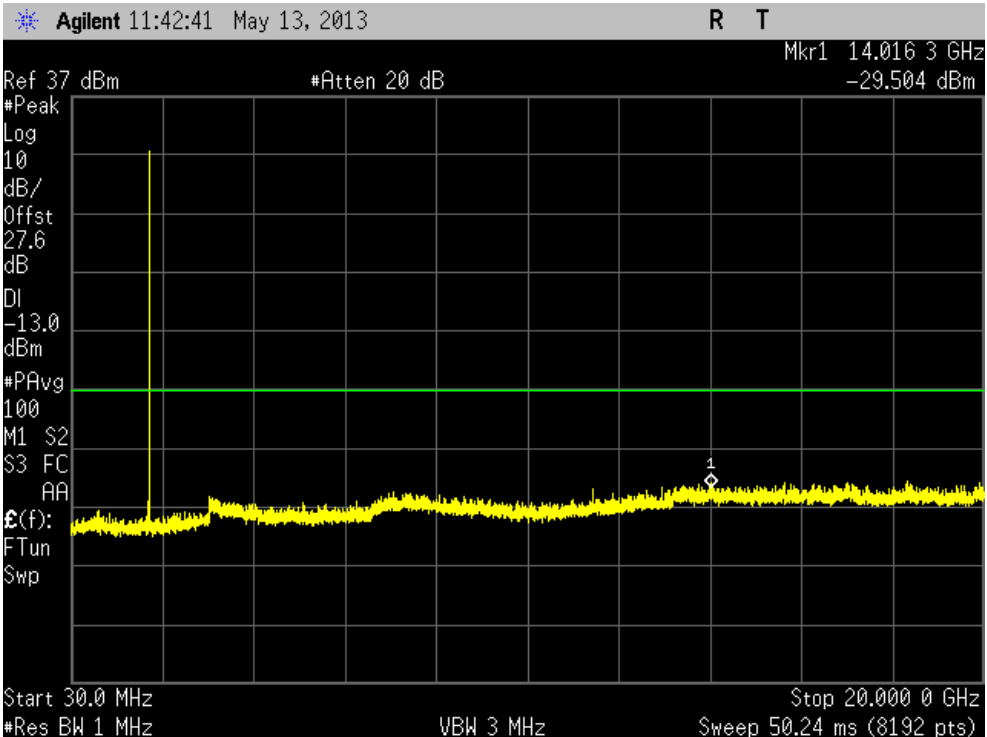
Compliant. See attached plots.



LTE Band 4 1.4MHz BW Low Channel

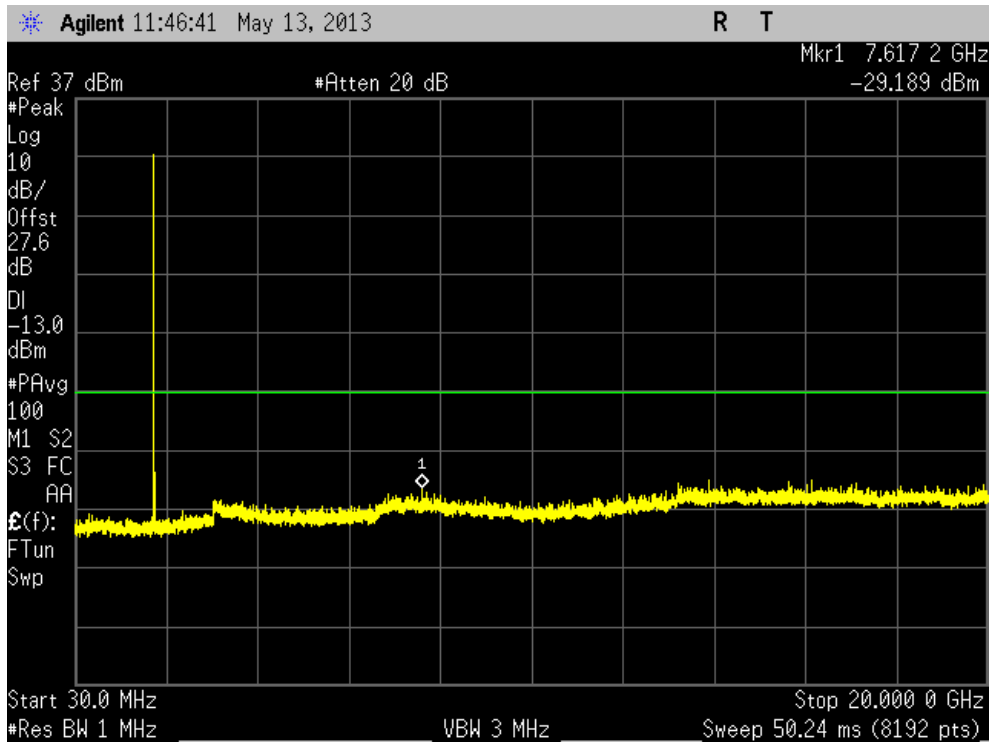


LTE Band 4 1.4MHz BW Mid Channel

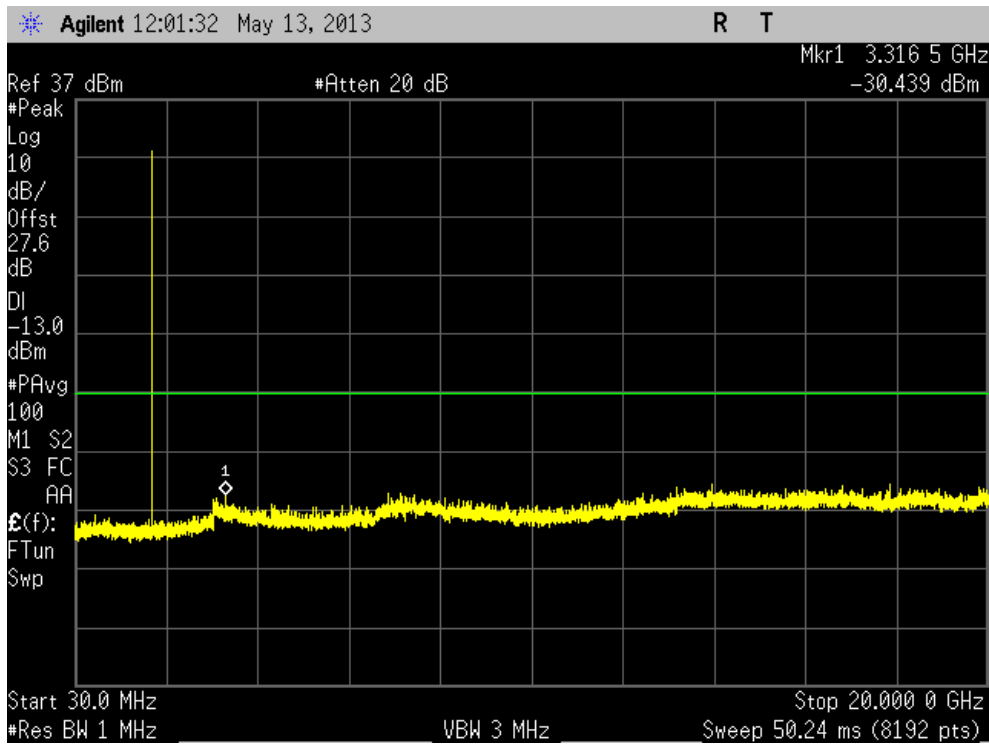




LTE Band 4 1.4MHz BW High Channel

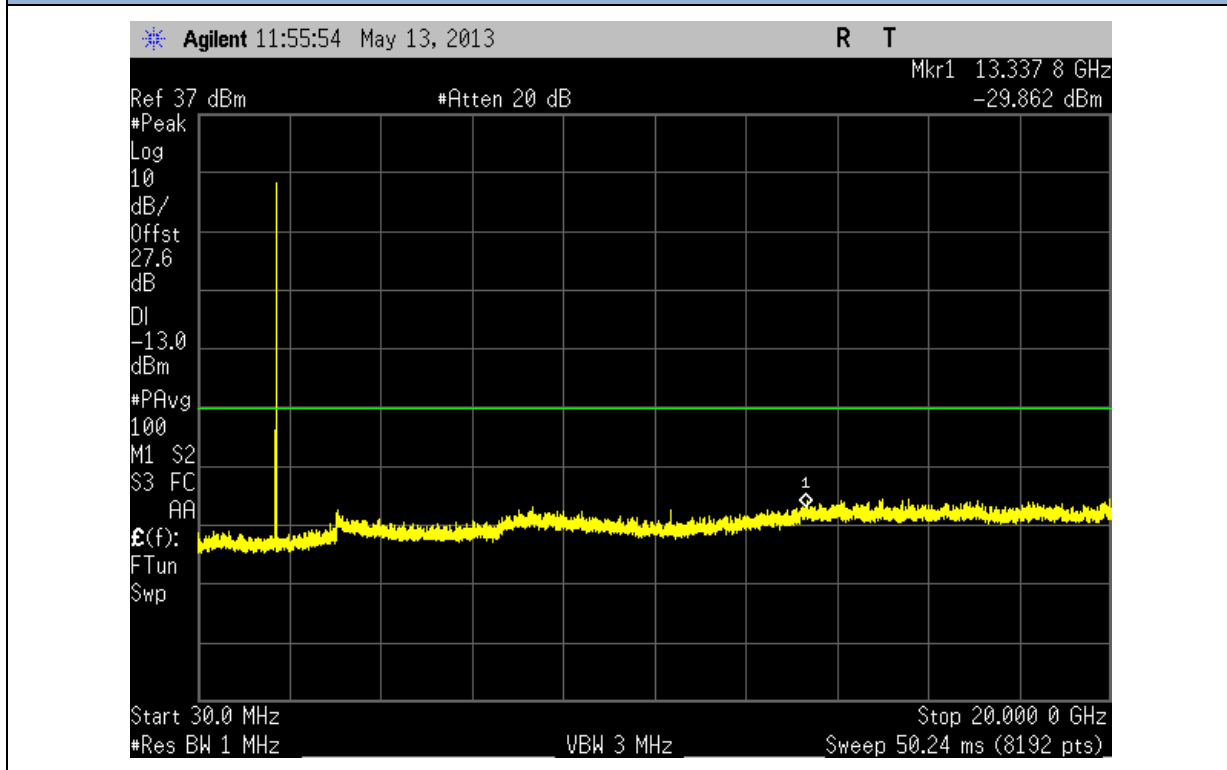


LTE Band 4 3MHz BW Low Channel

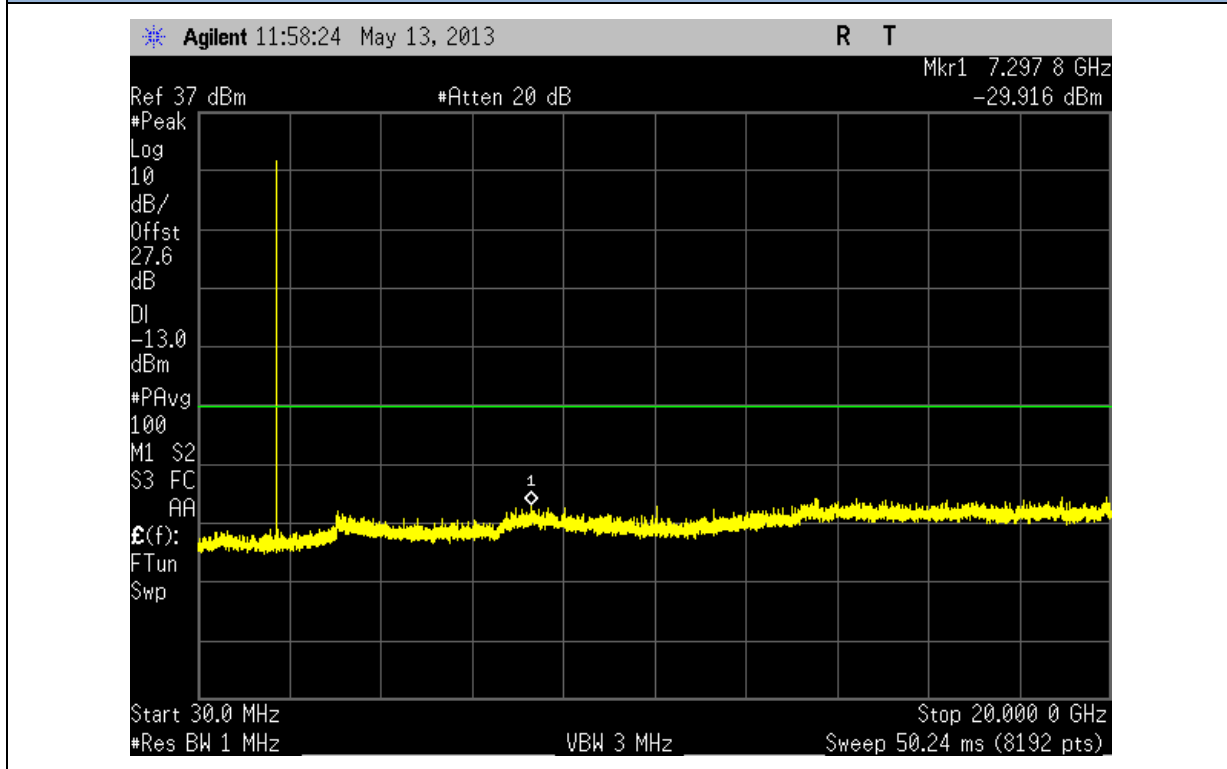




LTE Band 4 3MHz BW Mid Channel

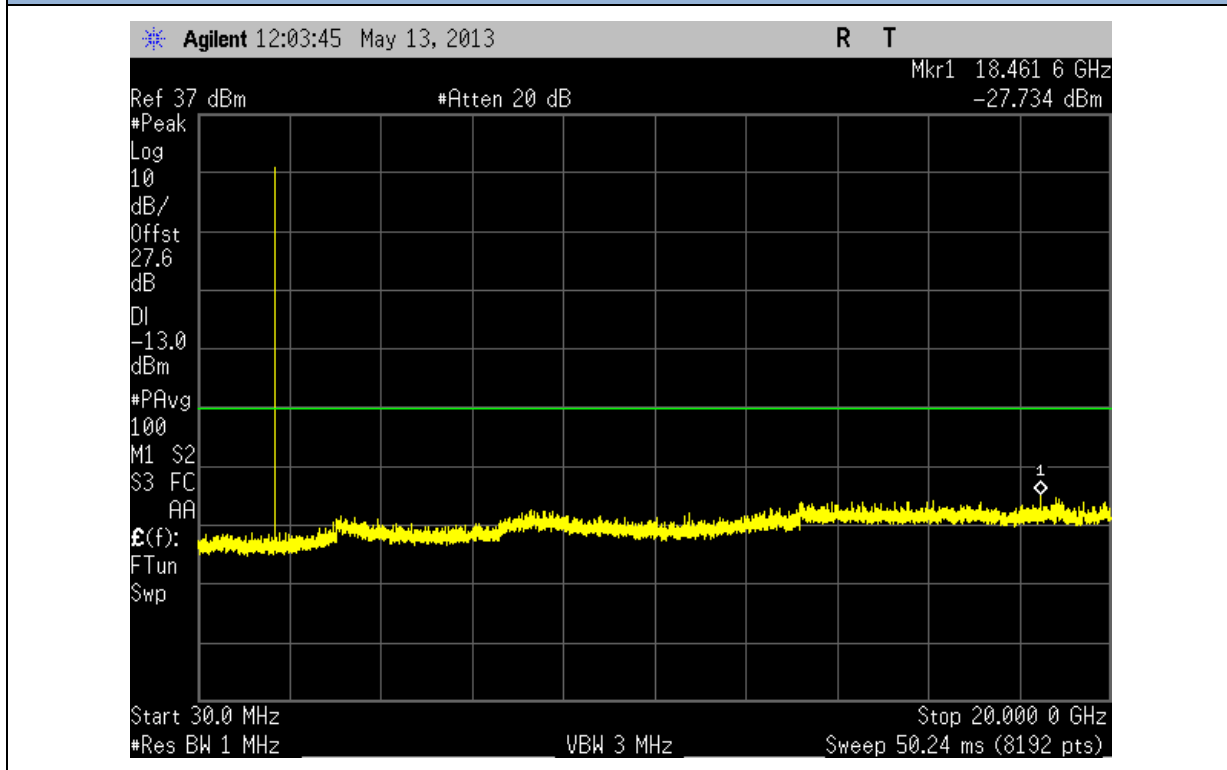


LTE Band 4 3MHz BW High Channel

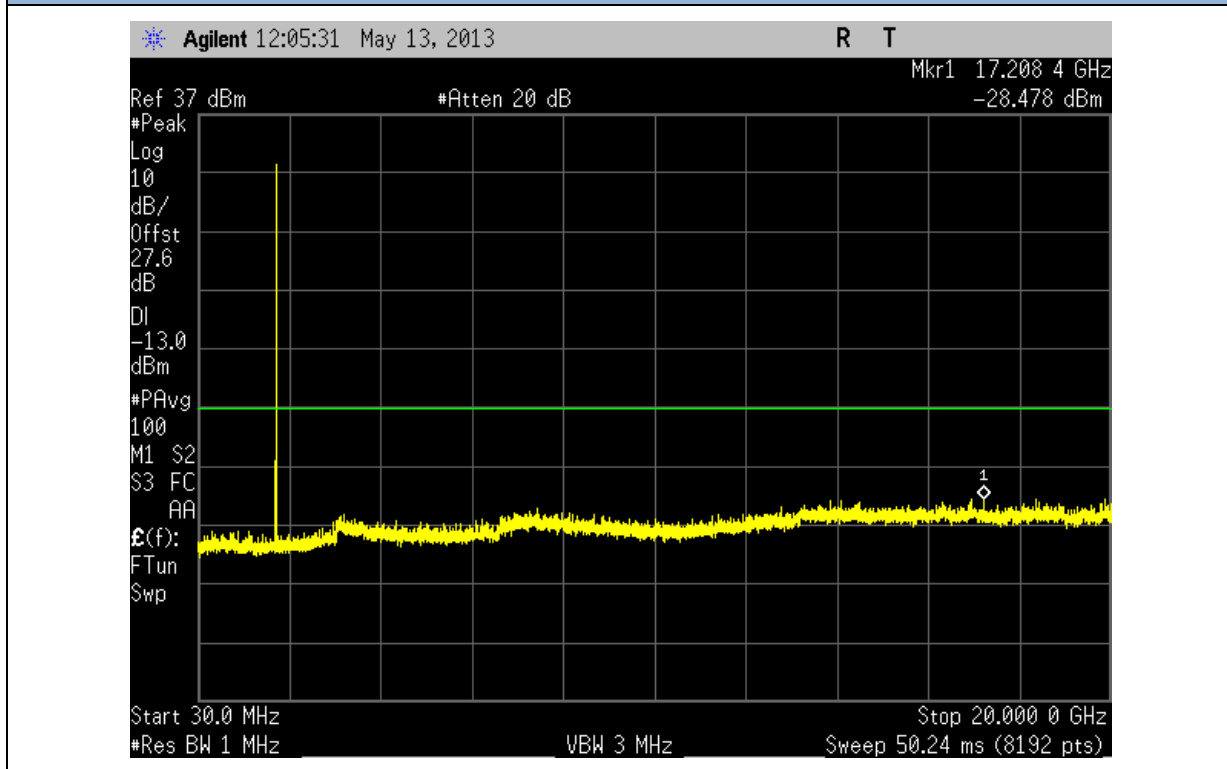




LTE Band 4 5MHz BW Low Channel

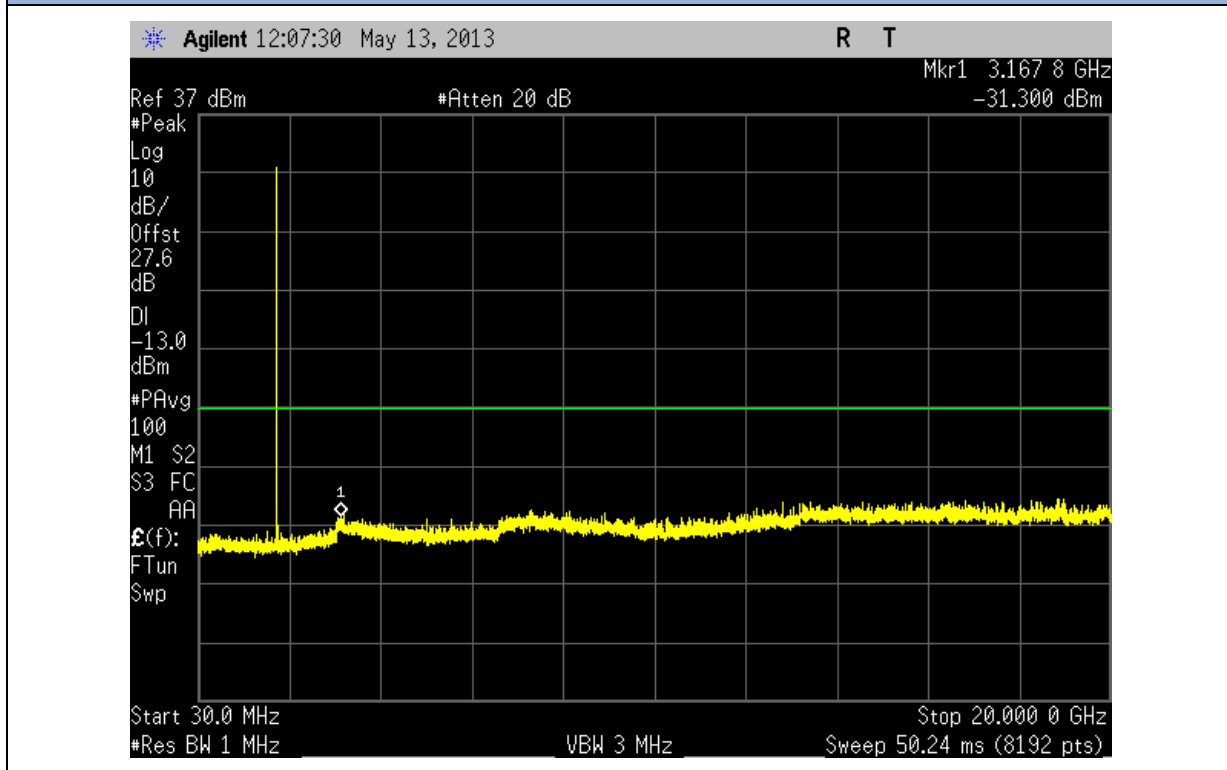


LTE Band 4 5MHz BW Mid Channel

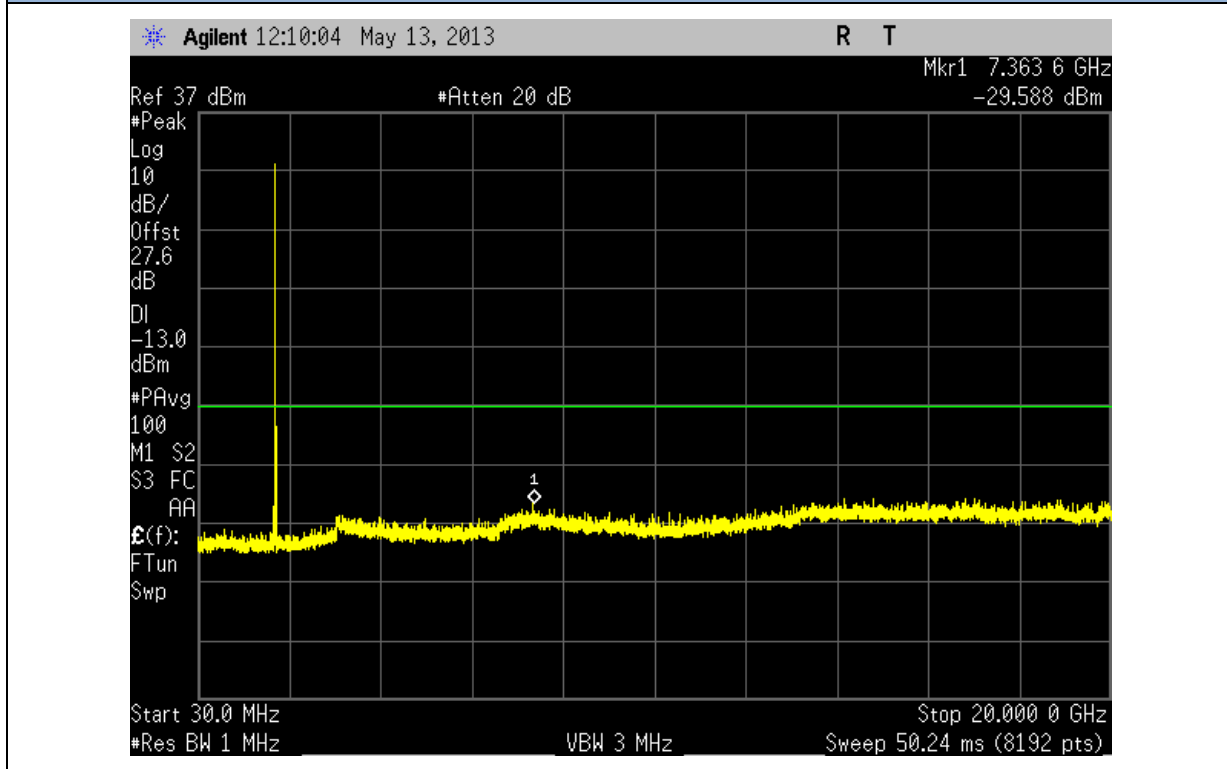




LTE Band 4 5MHz BW High Channel

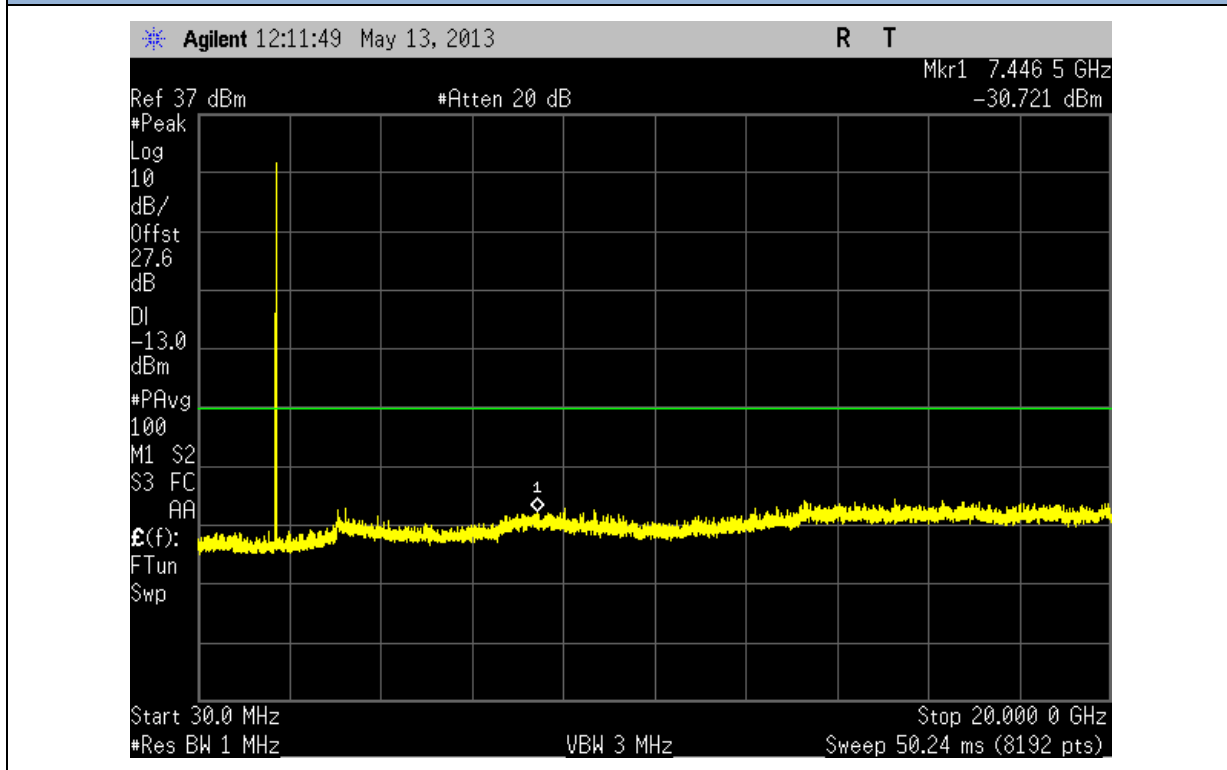


LTE Band 4 10MHz BW Low Channel

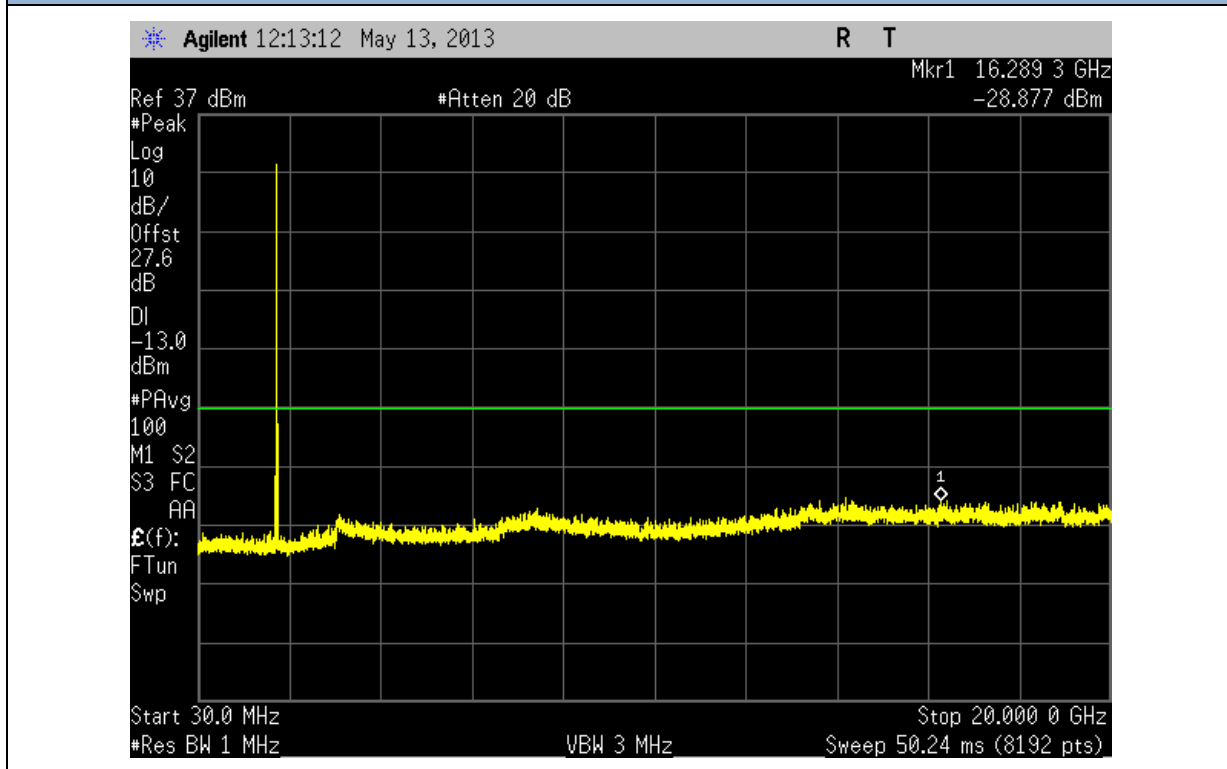




LTE Band 4 10MHz BW Mid Channel

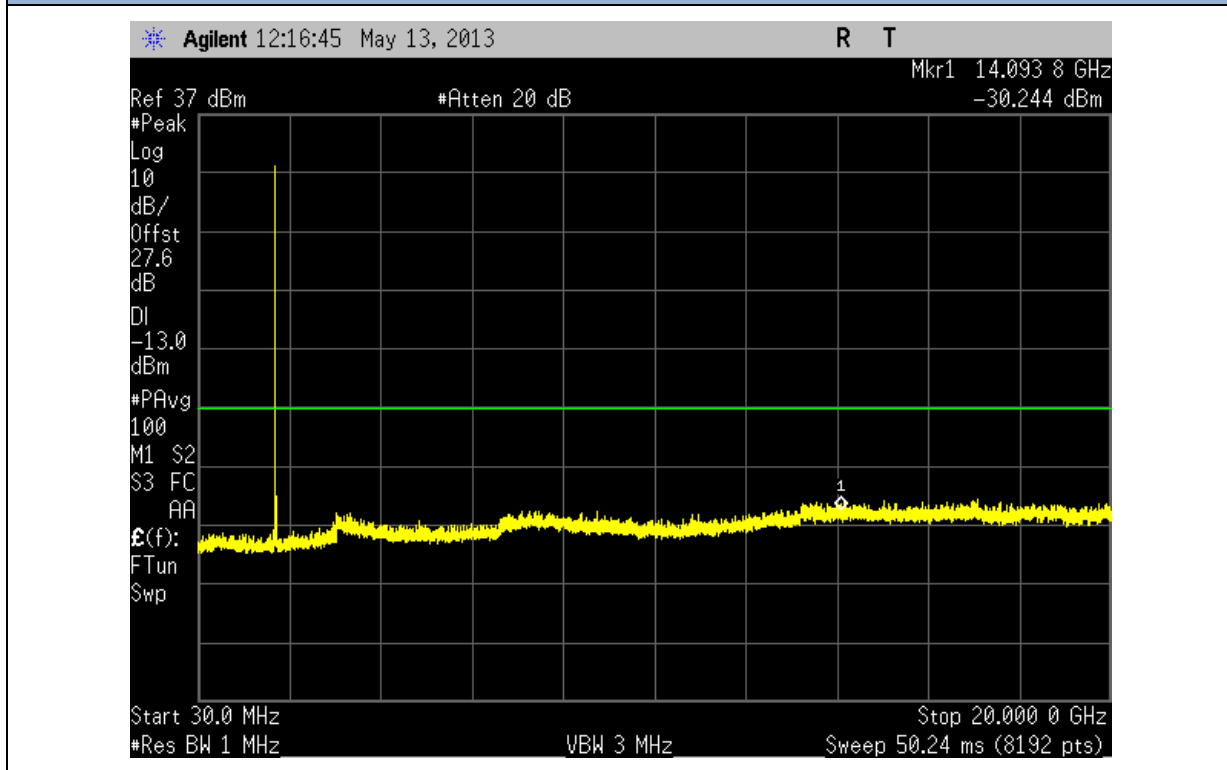


LTE Band 4 10MHz BW High Channel

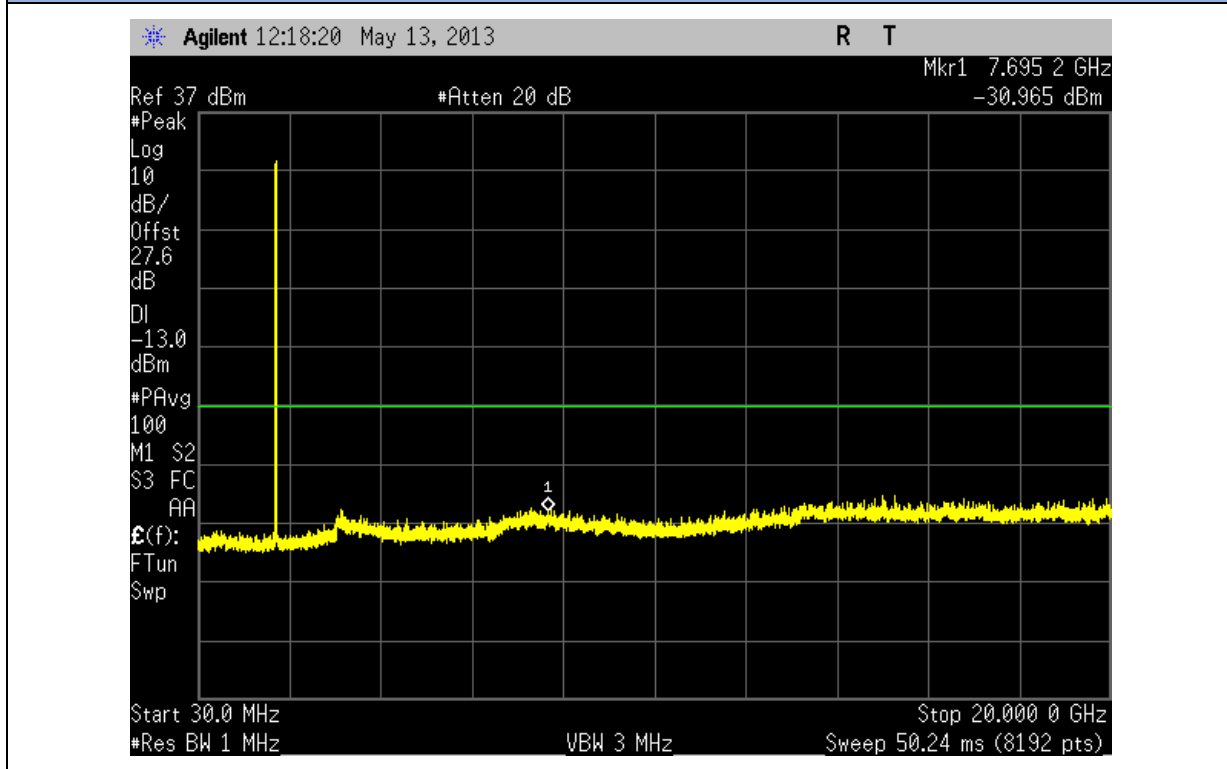




LTE Band 4 15MHz BW Low Channel

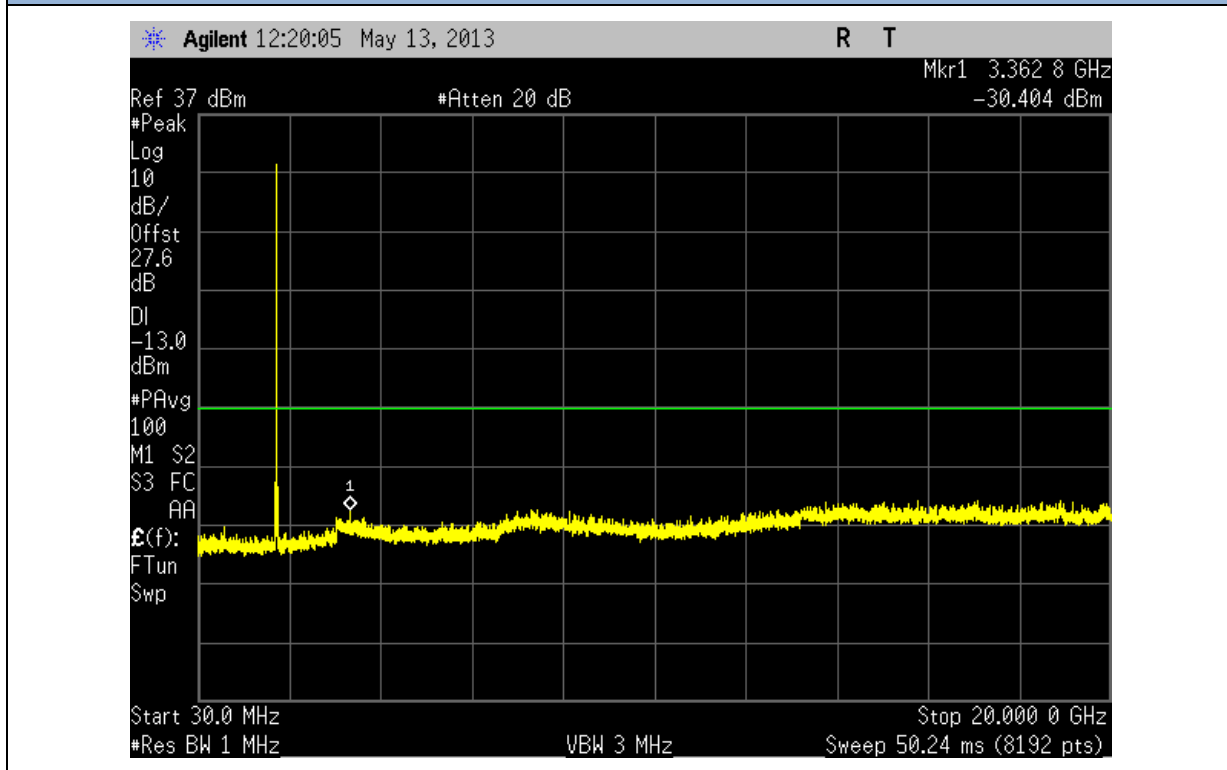


LTE Band 4 15MHz BW Mid Channel

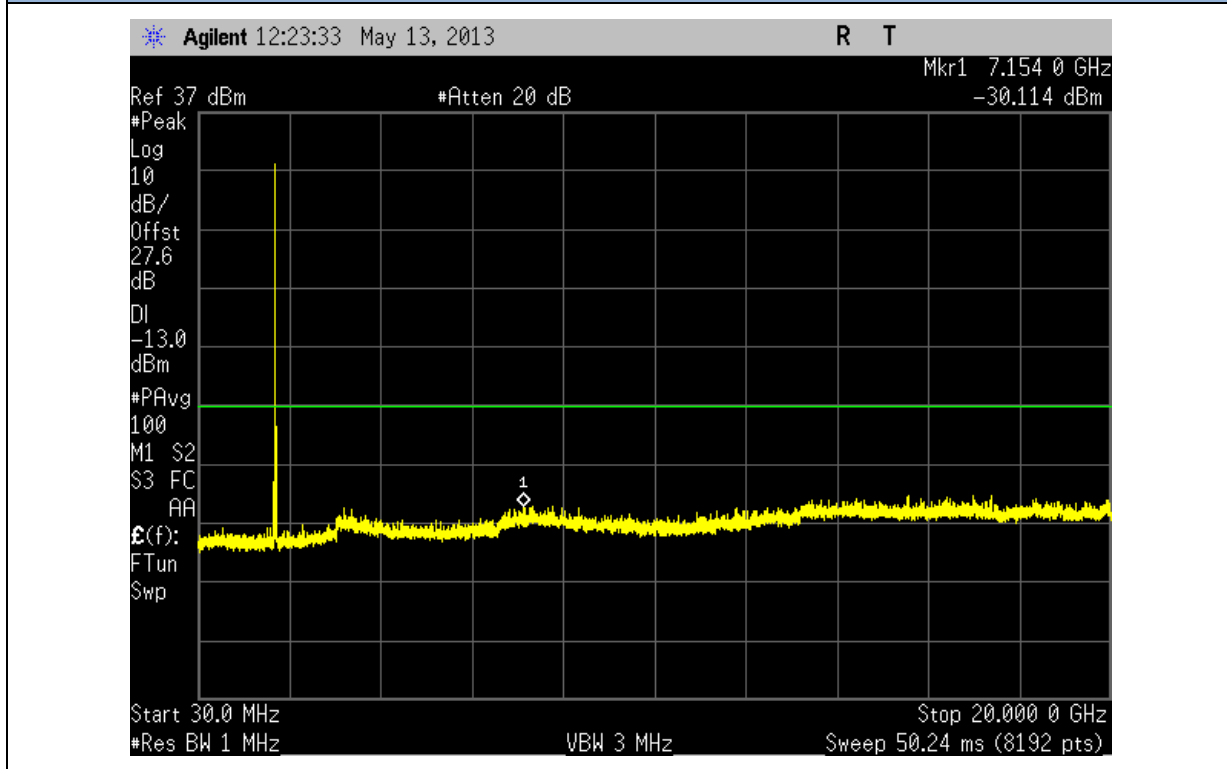




LTE Band 4 15MHz BW High Channel

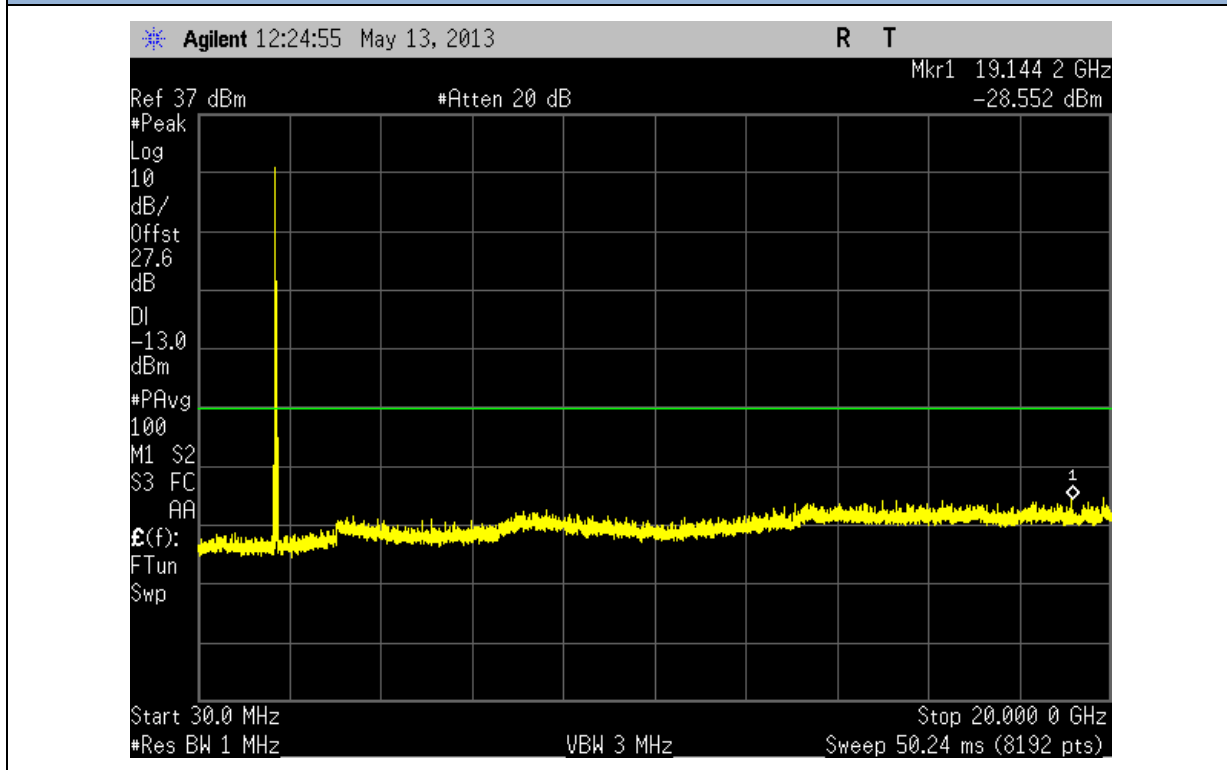


LTE Band 4 20MHz BW Low Channel

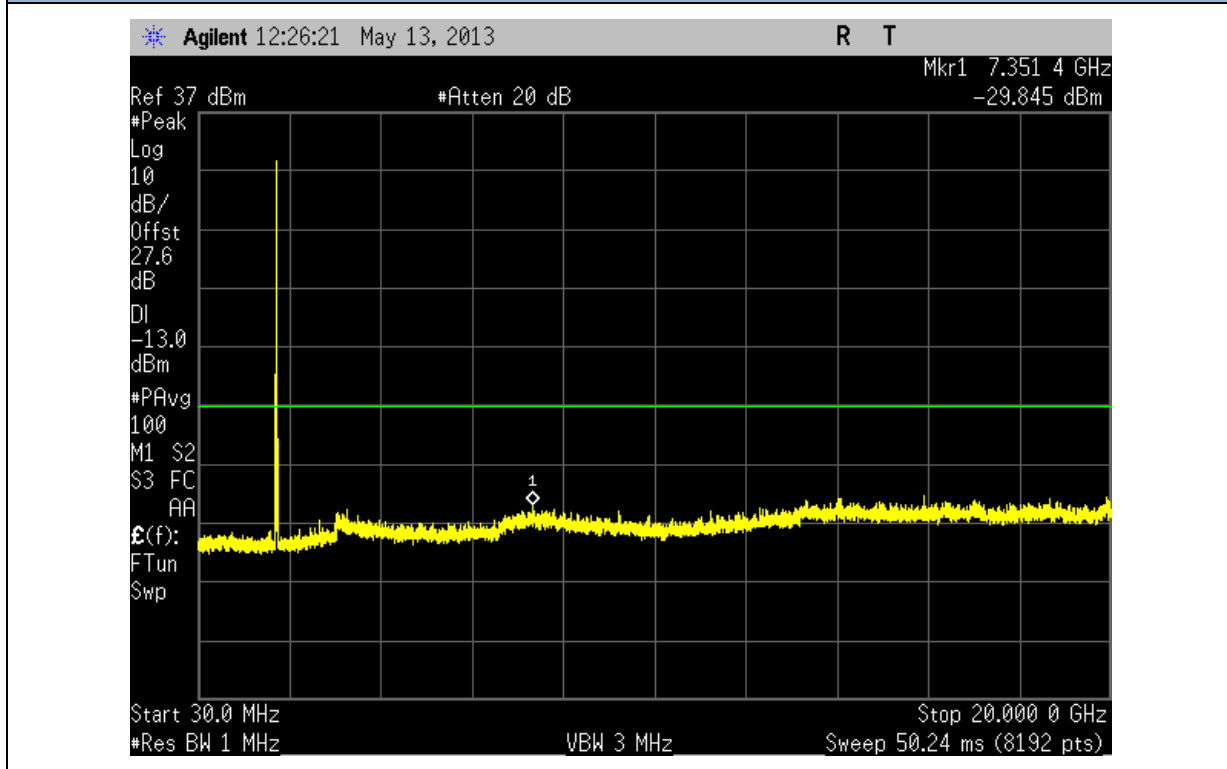




LTE Band 4 20MHz BW Mid Channel

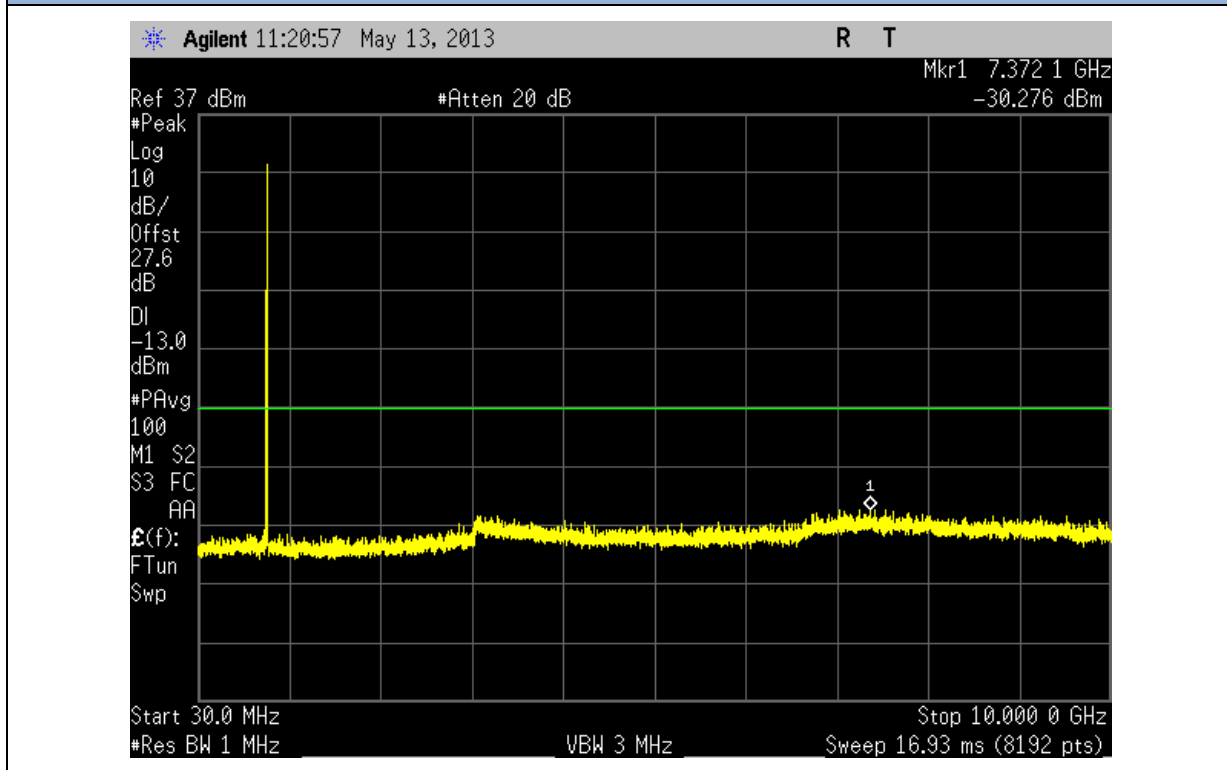


LTE Band 4 20MHz BW High Channel

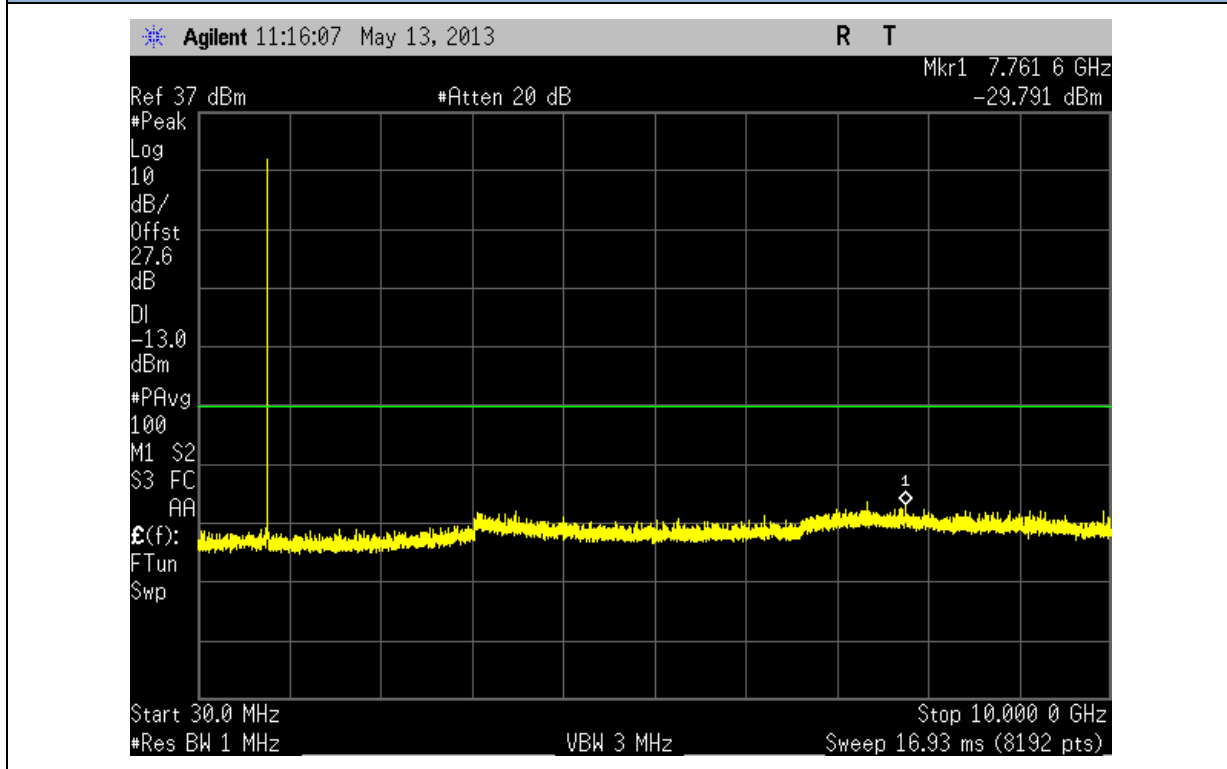


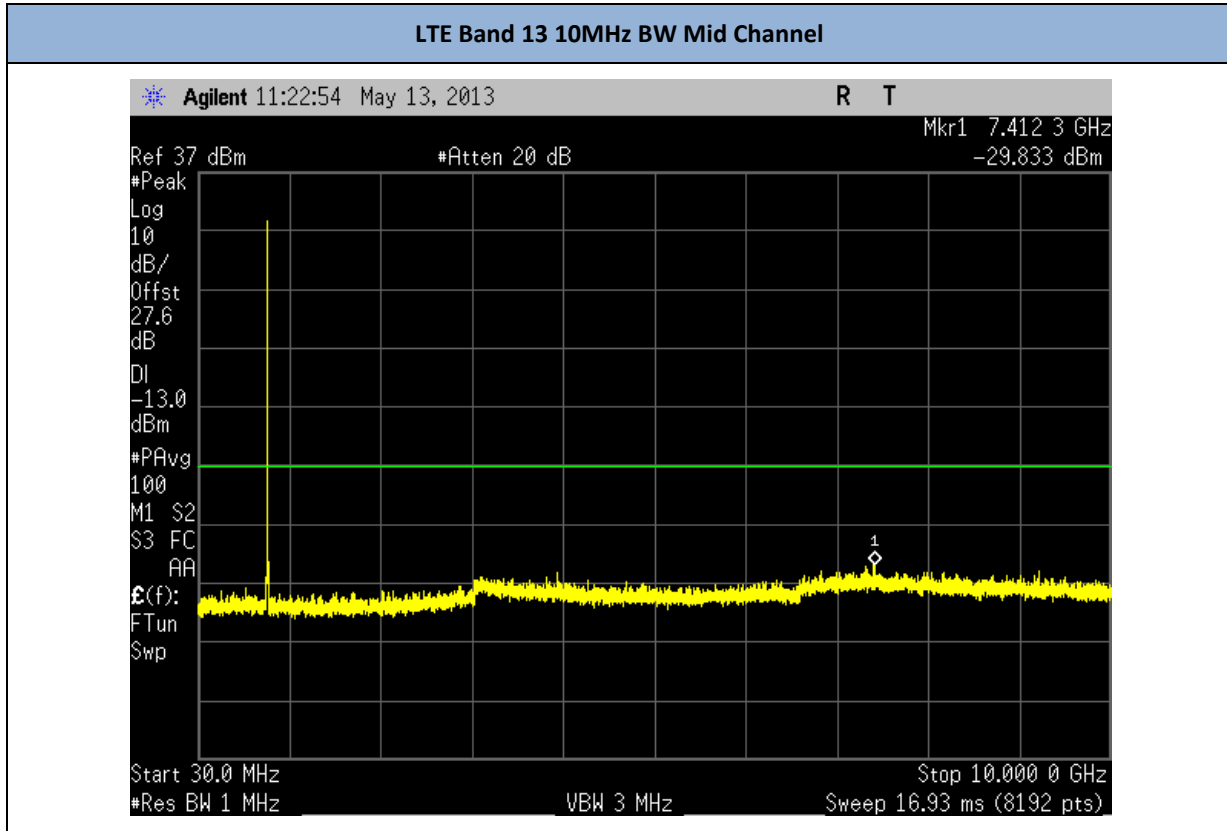


LTE Band 13 5MHz BW Low Channel



LTE Band 13 5MHz BW High Channel







2.8 FIELD STRENGTH OF SPURIOUS RADIATION

2.8.1 Specification Reference

Part 27 Subpart C §27.53(c) and (h) and Part 2.1053, RSS-139 Issue 2(6.5)

2.8.2 Standard Applicable

c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following: (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB; (5) Compliance with the provisions of paragraphs (c)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(h) 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 $43 + 10 \log_{10}(P)$ dB.

2.8.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration B

2.8.4 Date of Test/Initial of test personnel who performed the test

May 15 and 17, 2013/FSC

2.8.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.6 Environmental Conditions

Ambient Temperature	24.7-25.6 °C
Relative Humidity	42.7-44.2 %
ATM Pressure	98.9-99.2 kPa

2.8.7 Additional Observations

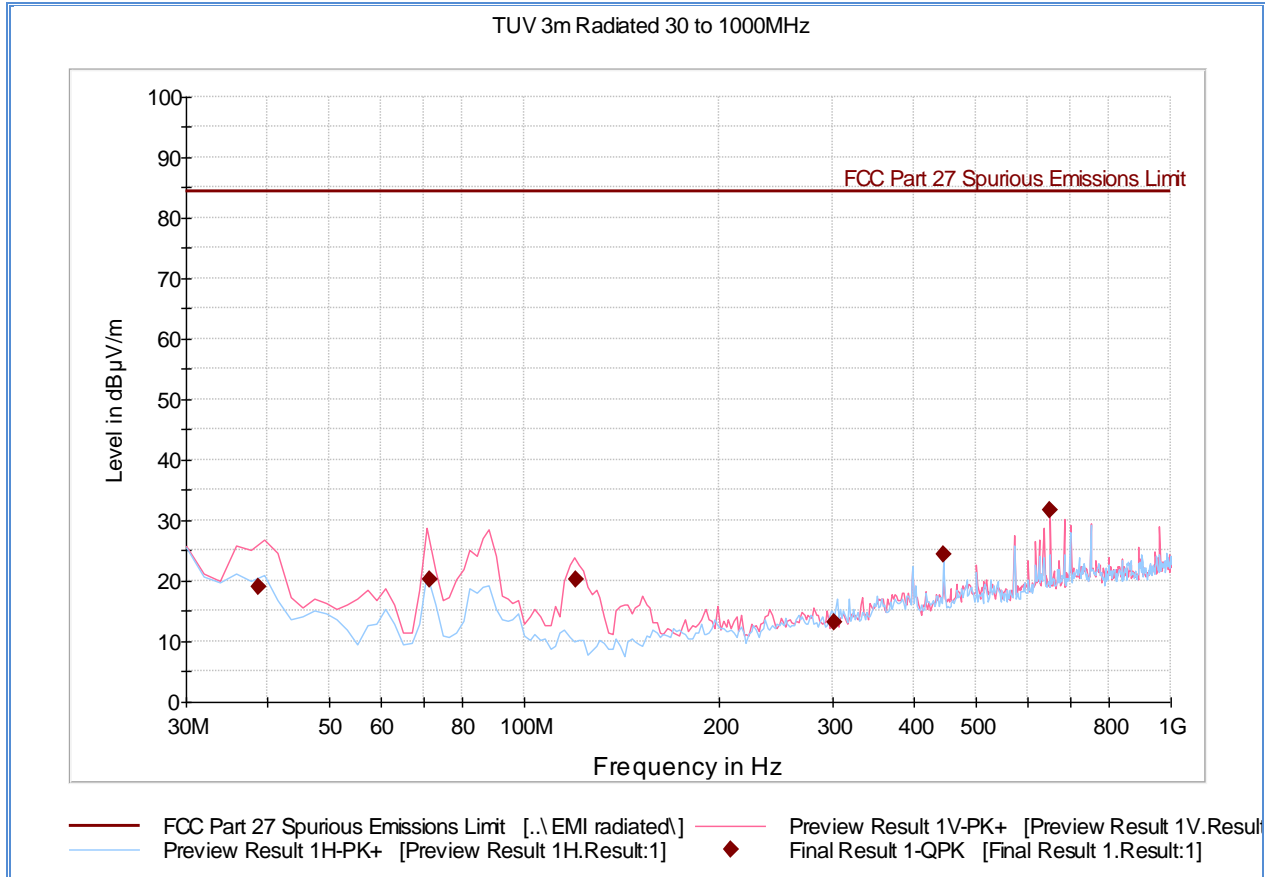
- This is a radiated test using substitution method as per Unwanted Emissions: Radiated Spurious method of measurement of ANSI/TIA/EIA-603-C 2004, August 17, 2004.
- Only the worst case configuration presented in this test report.
- Measurement was done using EMC32 V8.53 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only.

2.8.8 Test Results

See attached plots.



2.8.9 Test Results Below 1GHz-



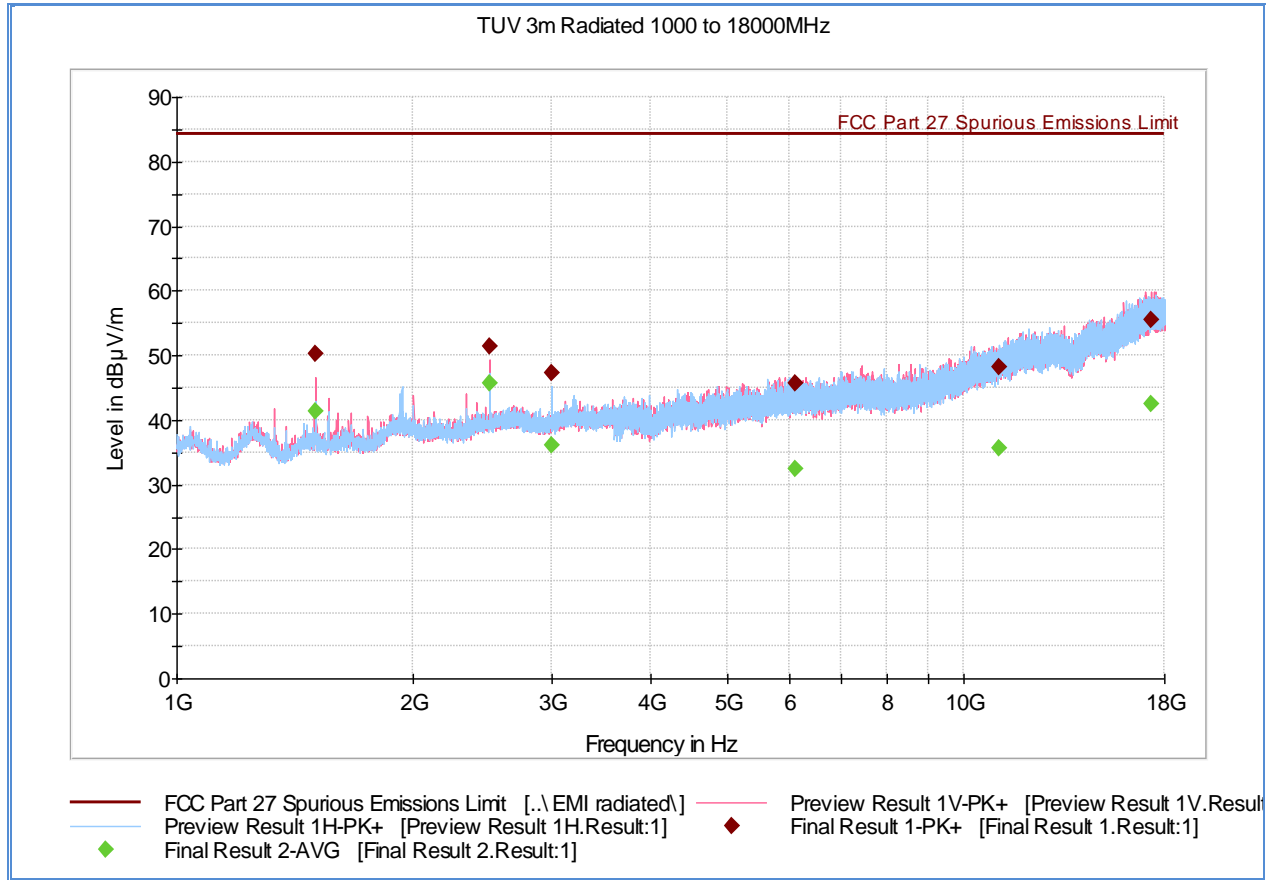
Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
38.839439	19.1	1000.0	120.000	100.0	V	24.0	-16.2	65.3	84.4
71.381643	20.2	1000.0	120.000	100.0	V	70.0	-21.7	64.2	84.4
119.978838	20.2	1000.0	120.000	100.0	V	200.0	-20.2	64.2	84.4
302.208176	13.2	1000.0	120.000	100.0	H	24.0	-12.2	71.2	84.4
443.968096	24.4	1000.0	120.000	100.0	H	154.0	-8.3	60.0	84.4
650.020200	31.7	1000.0	120.000	100.0	V	68.0	-4.3	52.7	84.4

Test Notes: Only worst case channel presented for spurious emissions below 1GHz. Emissions profile between Band 4 and 13 are identical below 1GHz. Plot presented is Band 4, high channel, 20MHz channel bandwidth with RB size/offset of 1/0. Emissions within 20dB of the limit are proven by substitution method. However no such emission observed.



2.8.10 Test Results Above 1GHz (Low Channel - Worst Case Configuration Band 13)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1500.140000	50.2	1000.0	1000.000	101.8	V	45.0	-5.1	34.2	84.4
2499.986667	51.4	1000.0	1000.000	101.8	V	354.0	-0.1	33.0	84.4
2999.986667	47.3	1000.0	1000.000	100.9	H	132.0	1.5	37.1	84.4
6108.146667	45.8	1000.0	1000.000	264.3	H	162.0	8.1	38.6	84.4
11089.393333	48.2	1000.0	1000.000	350.6	H	264.0	14.6	36.2	84.4
17301.766667	55.6	1000.0	1000.000	339.2	V	281.0	21.9	28.8	84.4

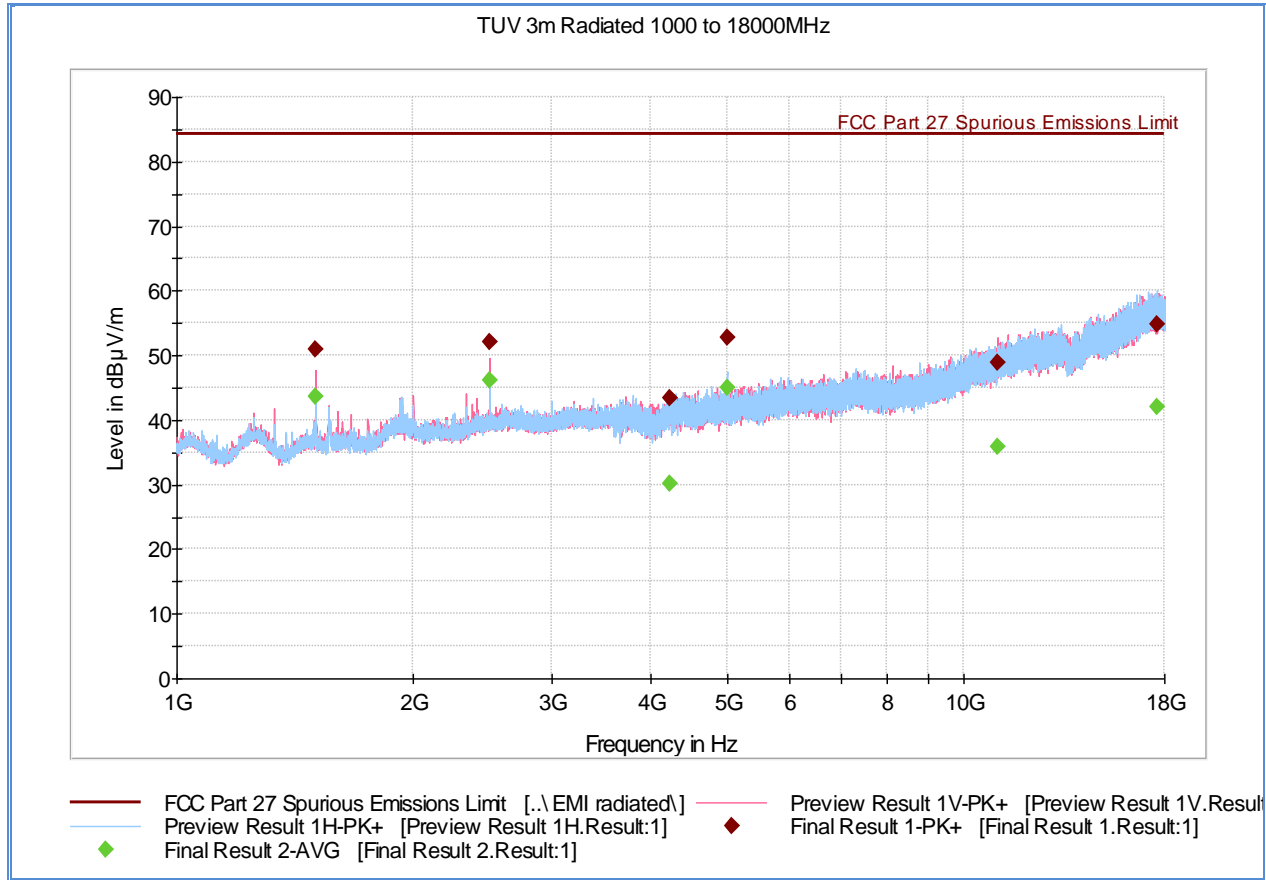
Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance

Test Notes: Only worst case channel presented for spurious emissions above 1GHz. Substitution data not required since margin is >20dB compared to the -13dBm limit (converted to field strength @ 3 meters). A 900 MHz high pass filter was used for this test.



2.8.11 Test Results Above 1GHz (Mid Channel - Worst Case Configuration Band 13)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1500.146667	51.0	1000.0	1000.000	99.8	V	42.0	-5.1	33.4	84.4
2500.026667	52.1	1000.0	1000.000	99.8	V	354.0	-0.1	32.3	84.4
4237.353333	43.4	1000.0	1000.000	197.6	H	114.0	4.0	41.0	84.4
5000.000000	52.9	1000.0	1000.000	157.7	H	118.0	5.4	31.5	84.4
11051.346667	49.0	1000.0	1000.000	157.7	V	264.0	14.6	35.4	84.4
17581.573333	54.9	1000.0	1000.000	111.8	H	243.0	22.1	29.5	84.4

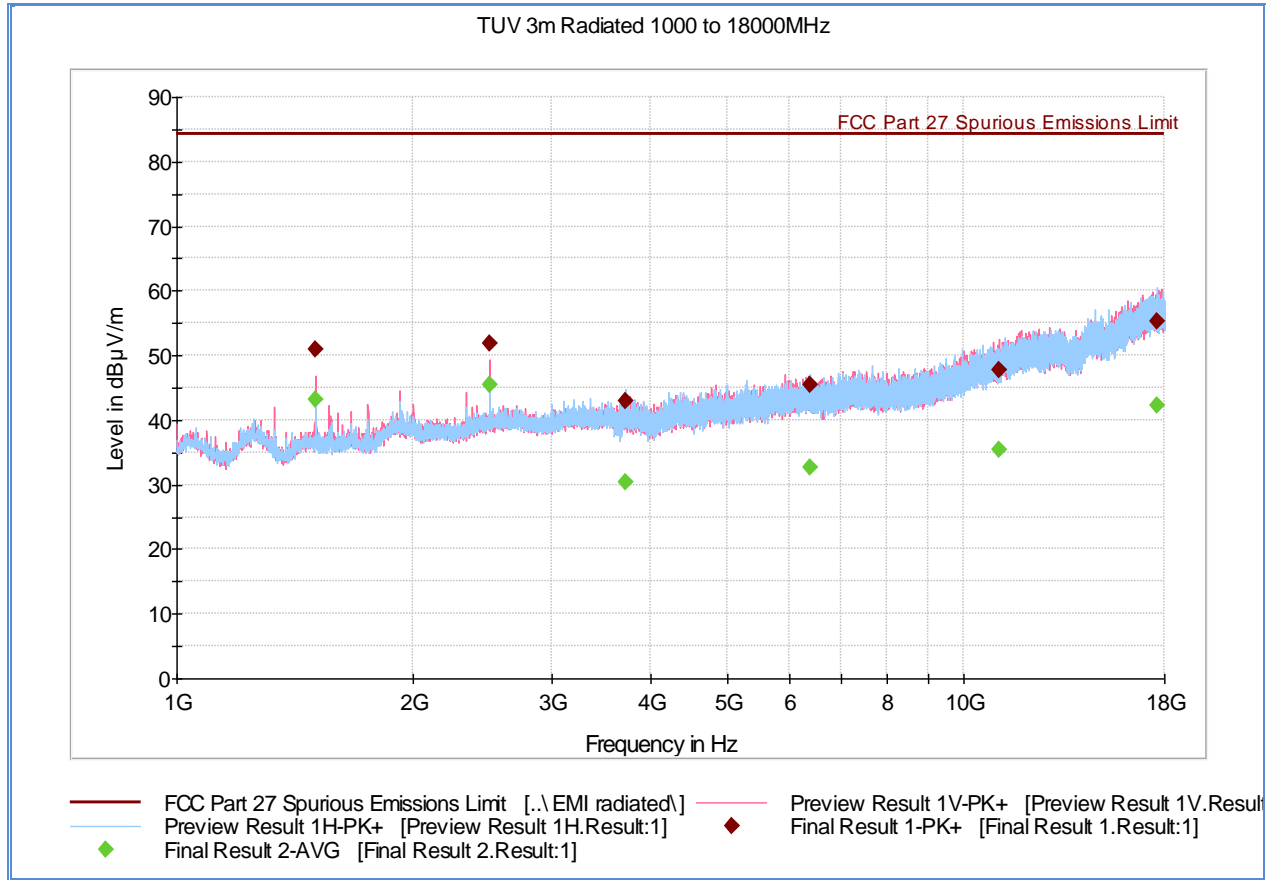
Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance

Test Notes: Only worst case channel presented for spurious emissions above 1GHz. Substitution data not required since margin is >20dB compared to the -13dBm limit (converted to field strength @ 3 meters). A 900 MHz high pass filter was used for this test.



2.8.12 Test Results Above 1GHz (High Channel - Worst Case Configuration Band 13)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1500.140000	50.8	1000.0	1000.000	99.8	V	41.0	-5.1	33.6	84.4
2499.986667	51.9	1000.0	1000.000	100.8	V	354.0	-0.1	32.5	84.4
3718.000000	43.0	1000.0	1000.000	282.3	H	44.0	3.0	41.4	84.4
6381.046667	45.4	1000.0	1000.000	337.2	H	22.0	8.3	39.0	84.4
11108.860000	47.8	1000.0	1000.000	121.8	V	334.0	14.6	36.6	84.4
17633.746667	55.2	1000.0	1000.000	315.2	H	176.0	22.1	29.2	84.4

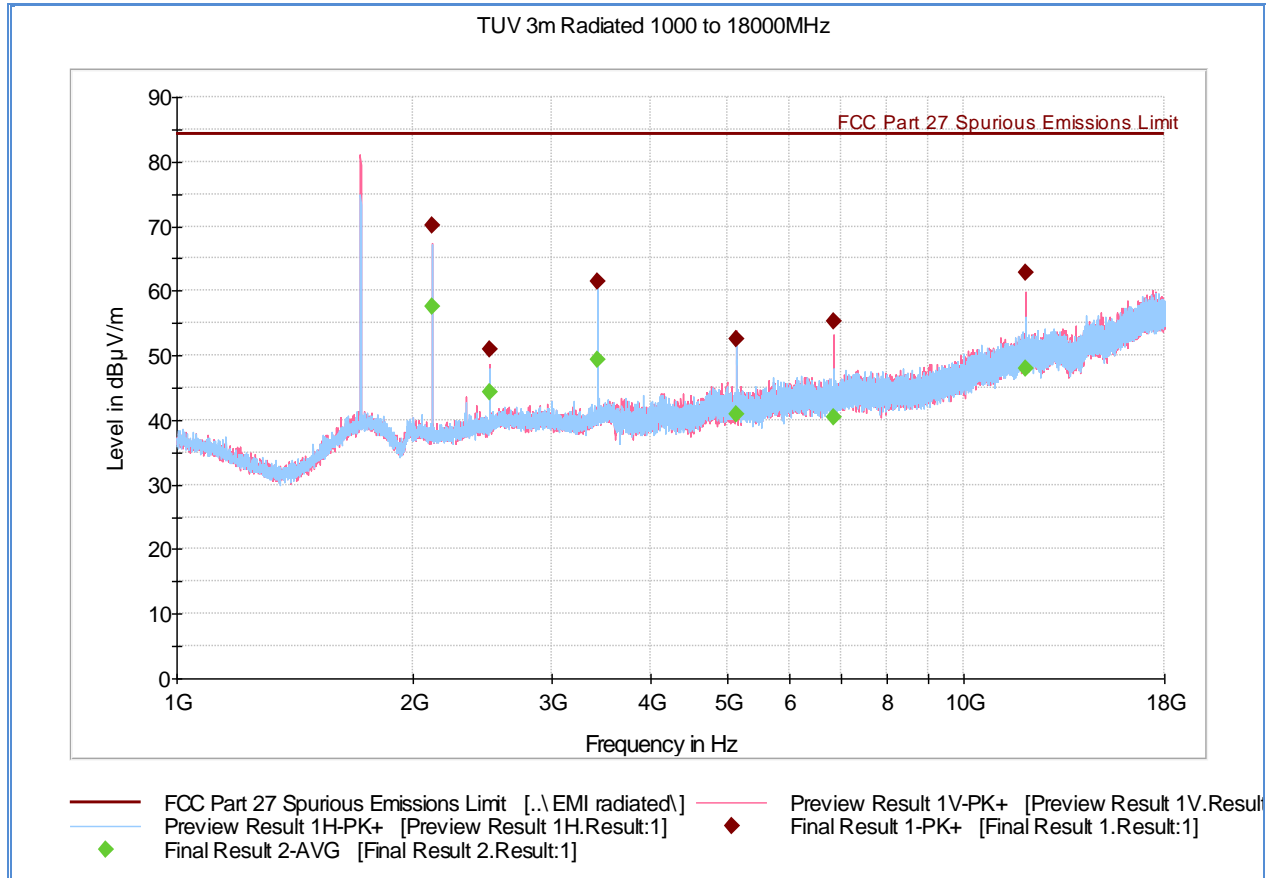
Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance

Test Notes: Only worst case channel presented for spurious emissions above 1GHz. Substitution data not required since margin is >20dB compared to the -13dBm limit (converted to field strength @ 3 meters). A 900 MHz high pass filter was used for this test.



2.8.13 Test Results Above 1GHz (Low Channel - Worst Case Configuration Band 4)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2112.340000	70.1	1000.0	1000.000	354.1	V	2.0	-1.4	Fwd/DL	
2500.026667	50.9	1000.0	1000.000	101.8	V	353.0	-0.1	33.5	84.4
3425.033333	61.5	1000.0	1000.000	100.8	H	134.0	1.9	22.9	84.4
5136.733333	52.6	1000.0	1000.000	344.2	V	5.0	6.2	31.8	84.4
6850.813333	55.3	1000.0	1000.000	114.8	V	330.0	8.8	29.1	84.4
11987.320000	62.8	1000.0	1000.000	160.7	V	184.0	16.1	21.6	84.4

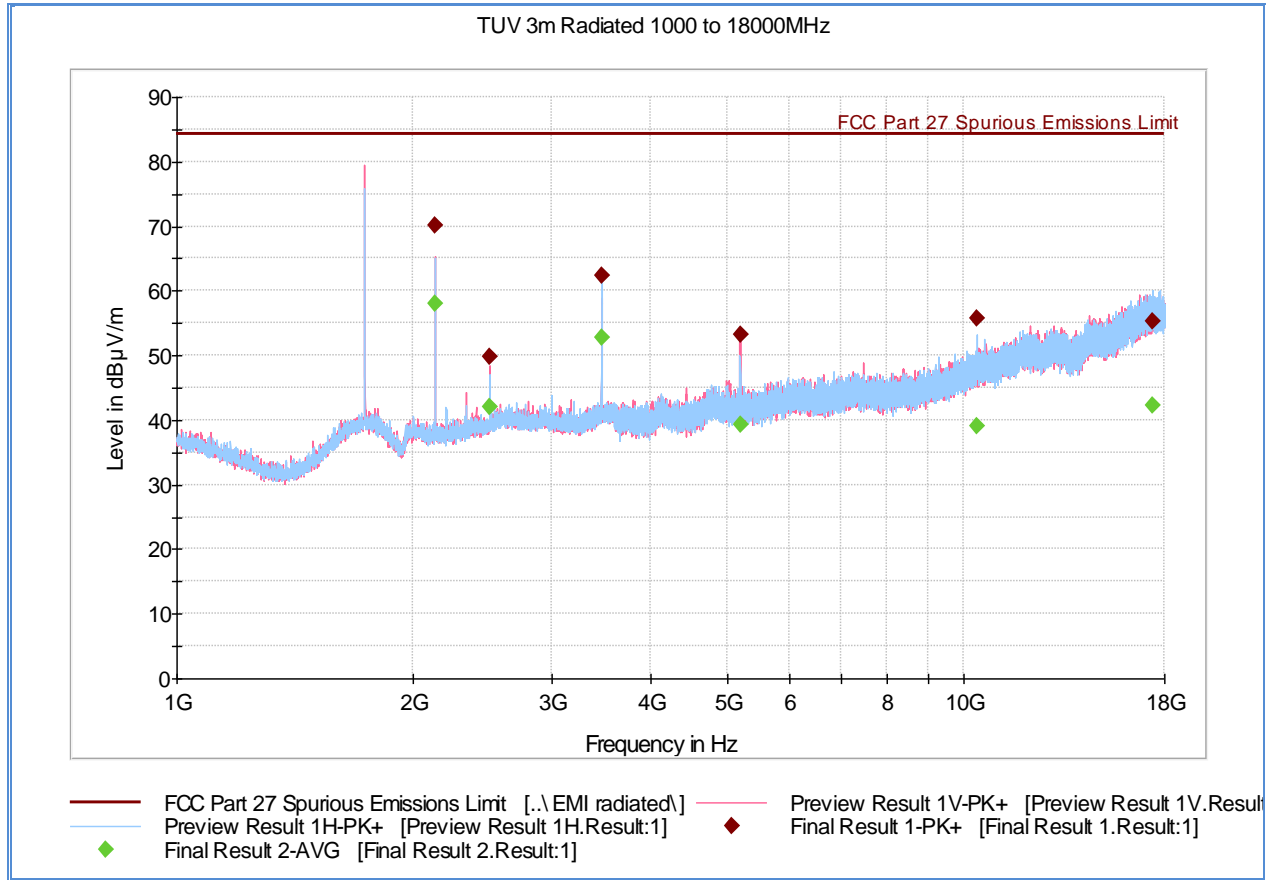
Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance

Test Notes: Only worst case channel presented for spurious emissions above 1GHz. Substitution data not required since margin is >20dB compared to the -13dBm limit (converted to field strength @ 3 meters). 2112.50 MHz is the downlink frequency. A 2.0GHz high pass filter was used. Spectrum from 1GHz up to 1710 MHz was verified manually without the filter, however there are no significant emissions observed.



2.8.14 Test Results Above 1GHz (Mid Channel - Worst Case Configuration Band 4)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2132.380000	70.2	1000.0	1000.000	399.3	V	41.0	-1.4	Fwd/DL	
2499.986667	49.9	1000.0	1000.000	99.8	V	322.0	-0.1	34.5	84.4
3464.580000	62.4	1000.0	1000.000	102.8	H	275.0	2.0	22.0	84.4
5198.446667	53.3	1000.0	1000.000	142.7	V	190.0	6.6	31.1	84.4
10395.233333	55.8	1000.0	1000.000	173.6	H	352.0	13.4	28.6	84.4
17404.006667	55.2	1000.0	1000.000	151.7	H	0.0	22.2	29.2	84.4

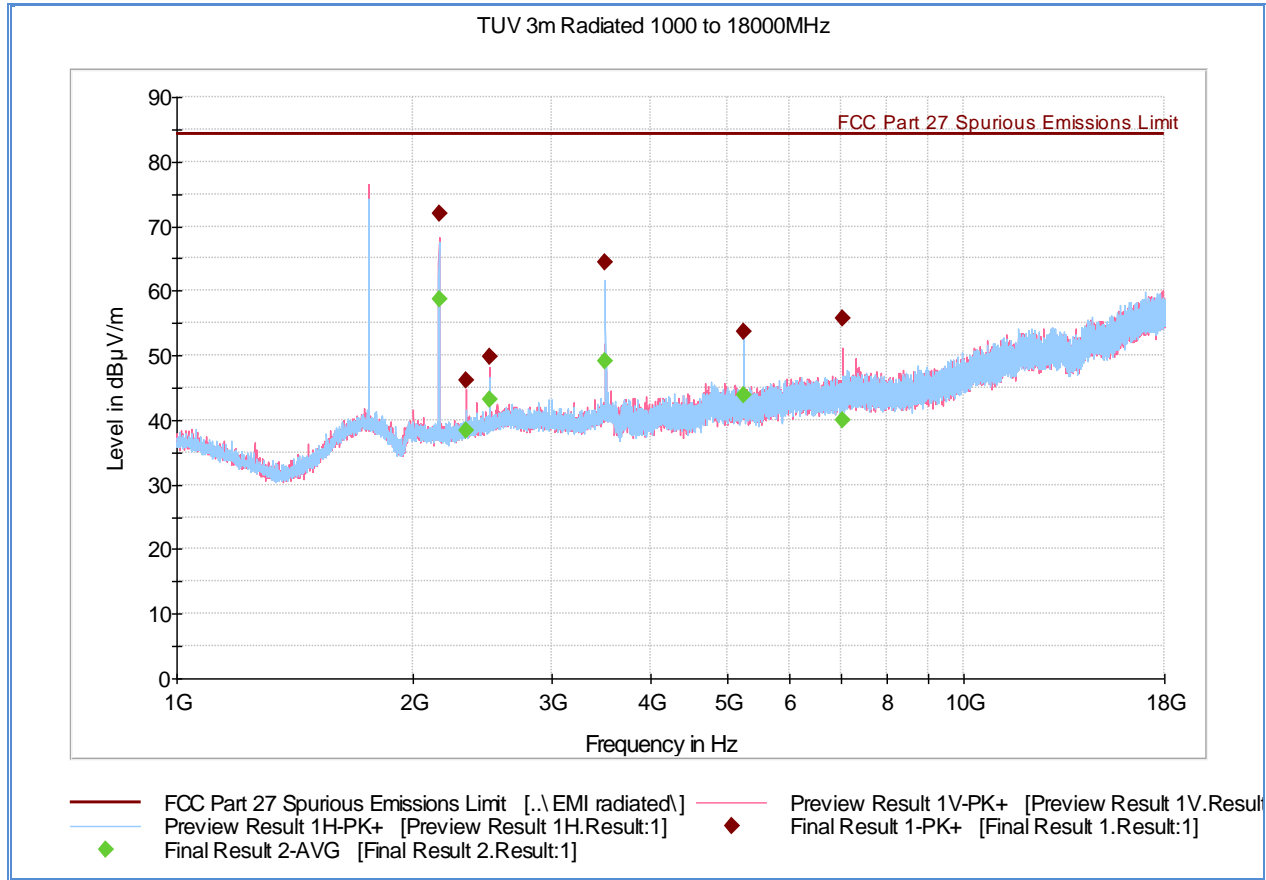
Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance

Test Notes: Only worst case channel presented for spurious emissions above. Substitution data not required since margin is >20dB compared to the -13dBm limit (converted to field strength @ 3 meters). 1GHz. 2132.50 MHz is the downlink frequency. A 2.0GHz high pass filter was used. Spectrum from 1GHz up to 1710 MHz was verified manually without the filter, however there are no significant emissions observed.



2.8.15 Test Results Above 1GHz (High Channel - Worst Case Configuration Band 4)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2153.266667	71.9	1000.0	1000.000	355.2	V	1.0	-1.3	Fwd/DL	
2331.160000	46.1	1000.0	1000.000	174.6	V	354.0	-0.7	38.3	84.4
2499.980000	49.9	1000.0	1000.000	119.8	V	105.0	-0.1	34.5	84.4
3506.993333	64.4	1000.0	1000.000	99.8	H	331.0	2.2	20.0	84.4
5260.820000	53.7	1000.0	1000.000	128.8	H	349.0	6.8	30.7	84.4
7014.053333	55.8	1000.0	1000.000	102.8	V	11.0	9.0	28.6	84.4

Substitution Data

Frequency (MHz)	Field Strength @ 3 meters (dBµV/m)	Cable Loss (dB)	Substitution Antenna Gain (dBi)	Signal Generator Level (dBm)	Substitution Data SGL+AG-CL (dBm)	Limit (dBm)	Compliance

Test Notes: Only worst case channel presented for spurious emissions above. Substitution data not required since margin is >20dB compared to the -13dBm limit (converted to field strength @ 3 meters). 1GHz. 2152.50 MHz is the downlink frequency. A 2.0GHz high pass filter was used. Spectrum from 1GHz up to 1710 MHz was verified manually without the filter, however there are no significant emissions observed.



2.9 FREQUENCY STABILITY

2.9.1 Specification Reference

Part 27 Subpart C §27.54 and Part 2.1055(a)(1) and (d)(1), RSS-139(6.3)

2.9.2 Standard Applicable

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

2.9.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration A

2.9.4 Date of Test/Initial of test personnel who performed the test

May 16, 2013/FSC

2.9.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.9.6 Environmental Conditions

Ambient Temperature	23.1°C
Relative Humidity	49.0%
ATM Pressure	99.0 kPa

2.9.7 Additional Observations

- This is a conducted test. The EUT was operated at 13.5VDC nominal voltage and was placed in the temperature chamber for this evaluation. The EUT was controlled by a CMW500 and the maximum frequency error was monitored through a Spectrum Analyzer using marker frequency count function. The results are compared to the CMW500 carrier frequency error TX Measurement application.
- The Temperature was reduced to -30°C and allowed to sit for 1 hour to allow the equipment and chamber temperature to stabilize. The measurements on both Band 4 and Band 13 were then performed. The temperature was then increased by 10°C steps and allowed to settle before taking the next set of measurements.
- Voltage variation was also performed at 85% and 115% of the nominal voltage.
- Only worst case configuration presented. See Section 1.4.4 of this test report for details.
- The maximum frequency deviation was verified against the frequency band edges using the EBW data. Sample calculation:

<i>LTE Band 4 worst case frequency error:</i>	<i>16.74 Hz</i>
<i>Worst case EBW (-26dB) of LTE Band 4 20MHz BW:</i>	<i>19.796 MHz</i>



Edge of fundamental emission (1745.0+(19.796/2)) : 1754.898 MHz
 Max. fundamental frequency error (1754.898 + 0.00001674): 1754.898017 MHz
 EUT complies. 1754.898017 MHz < 1755 MHz (edge of authorized band)

2.9.8 Test Results Summary

LTE Band 13 – QPSK - Channel 23230– Frequency 782.0MHz – RB 1/0				
Voltage (%)	Power (VDC)	Temp (°C)	Frequency Deviation (Hz)	Complies (Y or N)
100	13.5	-30	-5.94	EUT complies. See Section 2.9.7 for sample calculation
100		-20	-4.56	
100		-10	-4.12	
100		0	3.59	
100		+10	4.73	
100		+20	-5.52	
100		+30	-4.72	
100		+40	-5.41	
100		+50	-5.54	
115		15.525	+20	
85	11.475	+20	-6.12	

LTE Band 4 – QPSK - Channel 20300 – Frequency 1745.0MHz RB 1/0				
Voltage (%)	Power (VDC)	Temp (°C)	Frequency Deviation (Hz)	Complies (Y or N)
100	13.5	-30	16.74	EUT complies. See Section 2.9.7 for sample calculation
100		-20	9.91	
100		-10	12.03	
100		0	11.12	
100		+10	11.63	
100		+20	10.89	
100		+30	11.63	
100		+40	10.61	
100		+50	10.76	
115		15.525	+20	
85	11.475	+20	11.12	



2.10 RECEIVER SPURIOUS EMISSIONS

2.10.1 Specification Reference

RSS-139(6.6) and RSS-GEN Issue 3

2.10.2 Standard Applicable

Receiver spurious emissions shall comply with the limits specified in RSS-Gen.

2.10.3 Equipment Under Test and Modification State

Serial No: 20130418001833 / Test Configuration B

2.10.4 Date of Test/Initial of test personnel who performed the test

April 29 and 30, 2013/FSC

2.10.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.10.6 Environmental Conditions

Ambient Temperature	25.4-25.8°C
Relative Humidity	43.5-44.5%
ATM Pressure	98.7-99.0 kPa

2.10.7 Additional Observations

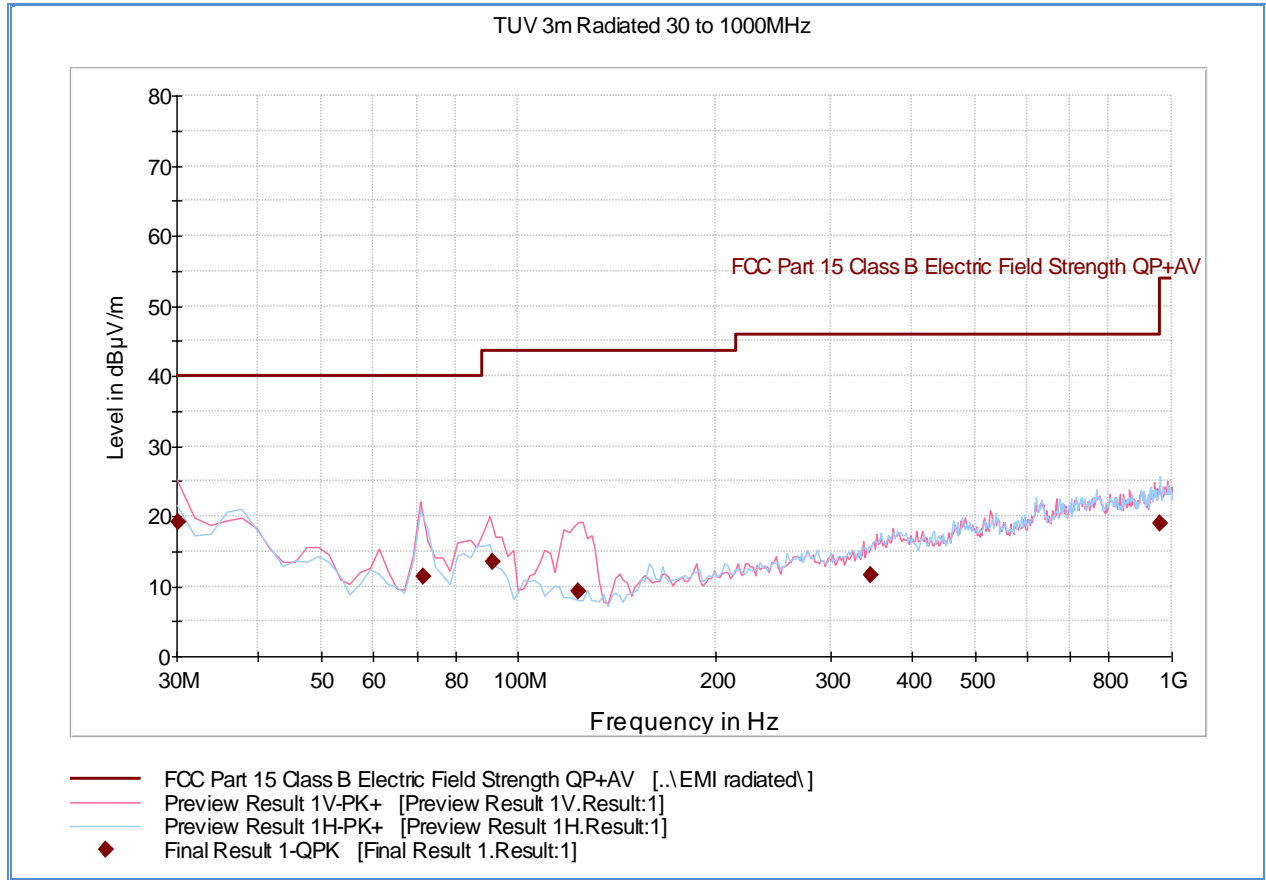
- This is a radiated test. The spectrum was searched from 30MHz to the 18GHz (6GHz as per requirement).
- Limit used is from FCC §15.209 which is identical to RSS-Gen limits.
- All emissions observed above 1GHz are noise floor measurements.
- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only.

2.10.8 Test Results

See attached plots.



2.10.9 Test Results Below 1GHz (Receive Mode)

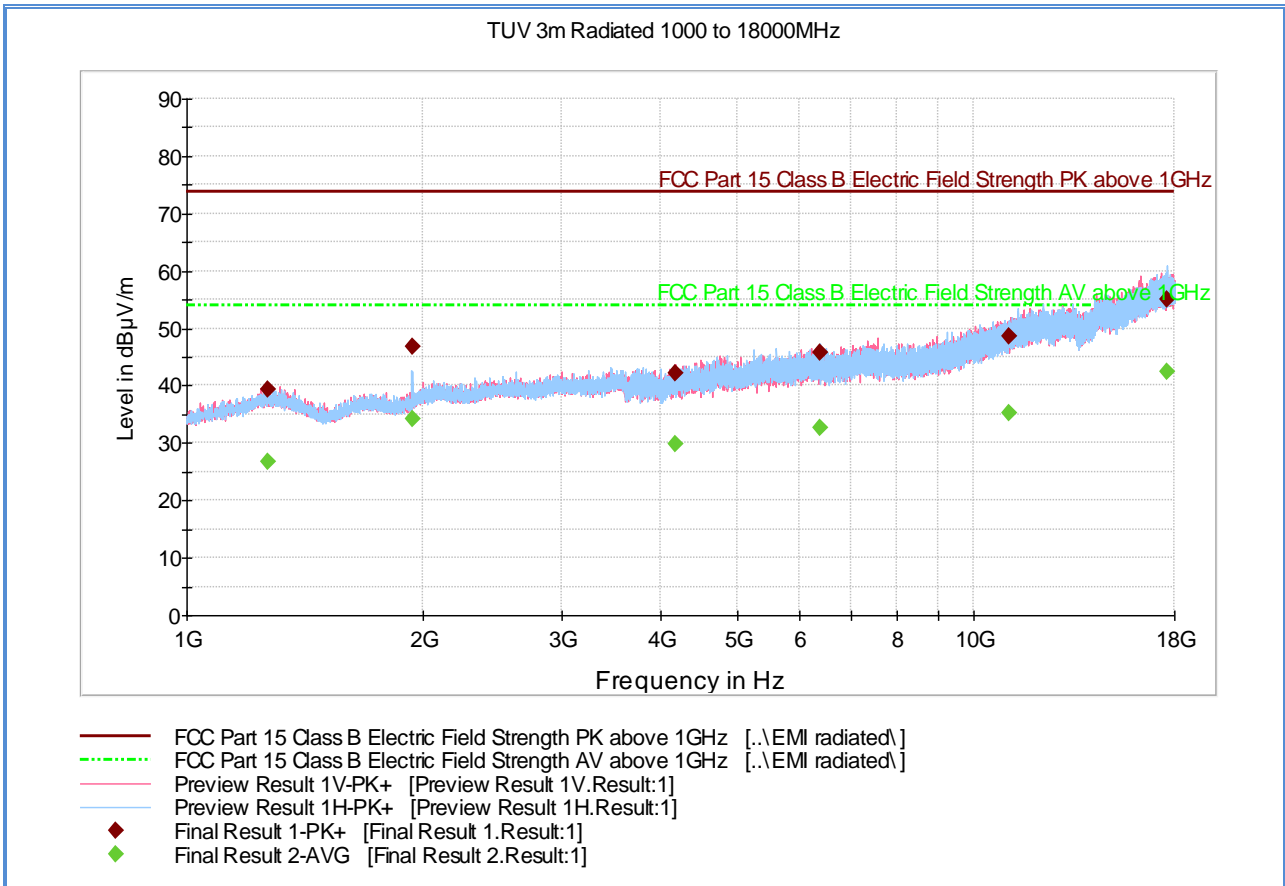


Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.200000	19.2	1000.0	120.000	350.0	V	221.0	-11.8	20.8	40.0
71.381643	11.4	1000.0	120.000	100.0	V	332.0	-21.7	28.6	40.0
91.540521	13.6	1000.0	120.000	110.0	V	244.0	-20.3	29.9	43.5
123.586613	9.3	1000.0	120.000	105.0	V	156.0	-20.3	34.2	43.5
346.077595	11.6	1000.0	120.000	309.0	V	173.0	-10.2	34.4	46.0
960.258357	18.9	1000.0	120.000	200.0	H	129.0	0.8	35.0	53.9



2.10.10 Test Results Above 1GHz (Receive Mode)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1270.886667	39.3	1000.0	1000.000	400.4	V	15.0	-4.8	34.6	73.9
1932.746667	46.7	1000.0	1000.000	99.8	H	43.0	-2.0	27.2	73.9
4177.726667	42.3	1000.0	1000.000	307.2	V	15.0	3.7	31.6	73.9
6369.073333	45.8	1000.0	1000.000	209.5	H	302.0	8.4	28.1	73.9
11114.333333	48.5	1000.0	1000.000	400.4	H	331.0	14.6	25.4	73.9
17648.44000	55.0	1000.0	1000.000	296.3	H	10.0	22.1	18.9	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1270.886667	26.9	1000.0	1000.000	400.4	V	15.0	-4.8	27.0	53.9
1932.746667	34.3	1000.0	1000.000	99.8	H	43.0	-2.0	19.6	53.9
4177.726667	29.8	1000.0	1000.000	307.2	V	15.0	3.7	24.1	53.9
6369.073333	32.5	1000.0	1000.000	209.5	H	302.0	8.4	21.4	53.9
11114.333333	35.2	1000.0	1000.000	400.4	H	331.0	14.6	18.7	53.9
17648.44000	42.3	1000.0	1000.000	296.3	H	10.0	22.1	11.6	53.9

Test Notes: No significant emissions observed.



2.11 POWER LINE CONDUCTED EMISSIONS

2.11.1 Specification Reference

RSS-Gen 7.2.4

2.11.2 Standard Applicable

Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The more stringent limit applies at the frequency range boundaries.

The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network (LISN).

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

**Decreases with the logarithm of the frequency.*

2.11.3 Equipment Under Test and Modification State

Not applicable. EUT is for vehicle use only.



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
Conducted Port Setup						
7569	Series Power Meter	N1911A P-	MY45100625	Agilent	04/15/13	04/15/14
5217 (loaner from Techmaster)	50MHz-18GHz Wideband Power Sensor	N1921A	MY45240180	Agilent	10/18/12	02/18/14
7571	Wideband Radio Communication Tester	CMW 500	1201.0002k50/103829	Rhode & Schwarz	Signalling purpose only	
6814	PSA Series Spectrum Analyzer	E4440A	MY42510441	Agilent	11/07/12	11/07/13
ATEK Rental	Temperature Chamber	SH-241	92009707	Espec	01/28/13	01/28/13
	20dB Attenuator	34-20-34	BP4180	MCE/Weinschel	Verified by 6814 and 1003	
8686	20dB Attenuator	0846	BW-N20W5+	MCL	Verified by 6814 and 1003	
Radiated Test Setup						
1033	Bilog Antenna	3142C	00044556	EMCO	05/23/12	05/23/13
7575	Double-ridged waveguide horn antenna	3117	00155511	EMCO	03/25/13	03/25/14
7575	Double-ridged waveguide horn antenna	3117	00155511	EMCO	03/25/13	03/25/14
1051	Double-ridged waveguide horn antenna	3115	9408-4329	EMCO	05/24/12	05/24/13
8628	Pre-amplifier	QLJ 01182835-JO	8986002	QuinStar Technologies Inc.	09/21/12	09/21/13
1153	High-frequency cable	SucoFlex 100 SX	N/A	Suhner	09/21/12	09/21/13
8543	High-frequency cable	Micropore 19057793	N/A	United Microwave Products	09/21/12	09/21/13
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	08/10/12	08/10/13
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	06/13/12	06/13/13
TUV777	900MHz High Pass Filter	FF6549-1	004	Sage	Verified by 1049 and 1003	
TUV783	2.0GHz High Pass Filter	FF6549-2	008	Sage	Verified by 1049 and 1003	
1016	Pre-amplifier	PAM-0202	187	PAM	09/24/12	09/24/13
Miscellaneous						
	Test Software	EMC32	V8.53	Rhode & Schwarz	N/A	
1003	Signal Generator	SMR-40	1104.0002.40	Rhode & Schwarz	11/12/12	11/12/13
6452	Multimeter	3478A	2911A52177	Hewlett Packard	07/16/12	07/16/13
7560	Barometer/Temperature /Humidity Transmitter	iBTHX-W	1240476	Omega	11/19/12	11/19/13
7539	DC Power Supply	6434B	1140A01866	Hewlett Packard	Verified by 6452	



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

3.2.1 Radiated Emission Measurements (Below 1GHz)

Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.45	0.26	0.07
2	Cables	Rectangular	0.50	0.29	0.08
3	Preamp	Rectangular	0.50	0.29	0.08
4	Antenna	Rectangular	0.75	0.43	0.19
5	Site	Rectangular	3.89	2.25	5.04
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.41
Coverage Factor (k):					2
Expanded Uncertainty:					4.82

3.2.2 Radiated Emission Measurements (Above 1GHz)

Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.57	0.33	0.11
2	Cables	Rectangular	0.70	0.40	0.16
3	Preamp	Rectangular	0.50	0.29	0.08
4	Antenna	Rectangular	0.37	0.21	0.05
5	Site	Rectangular	3.89	2.25	5.04
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.40
Coverage Factor (k):					2
Expanded Uncertainty:					4.81

3.2.3 Conducted Antenna Port Measurement

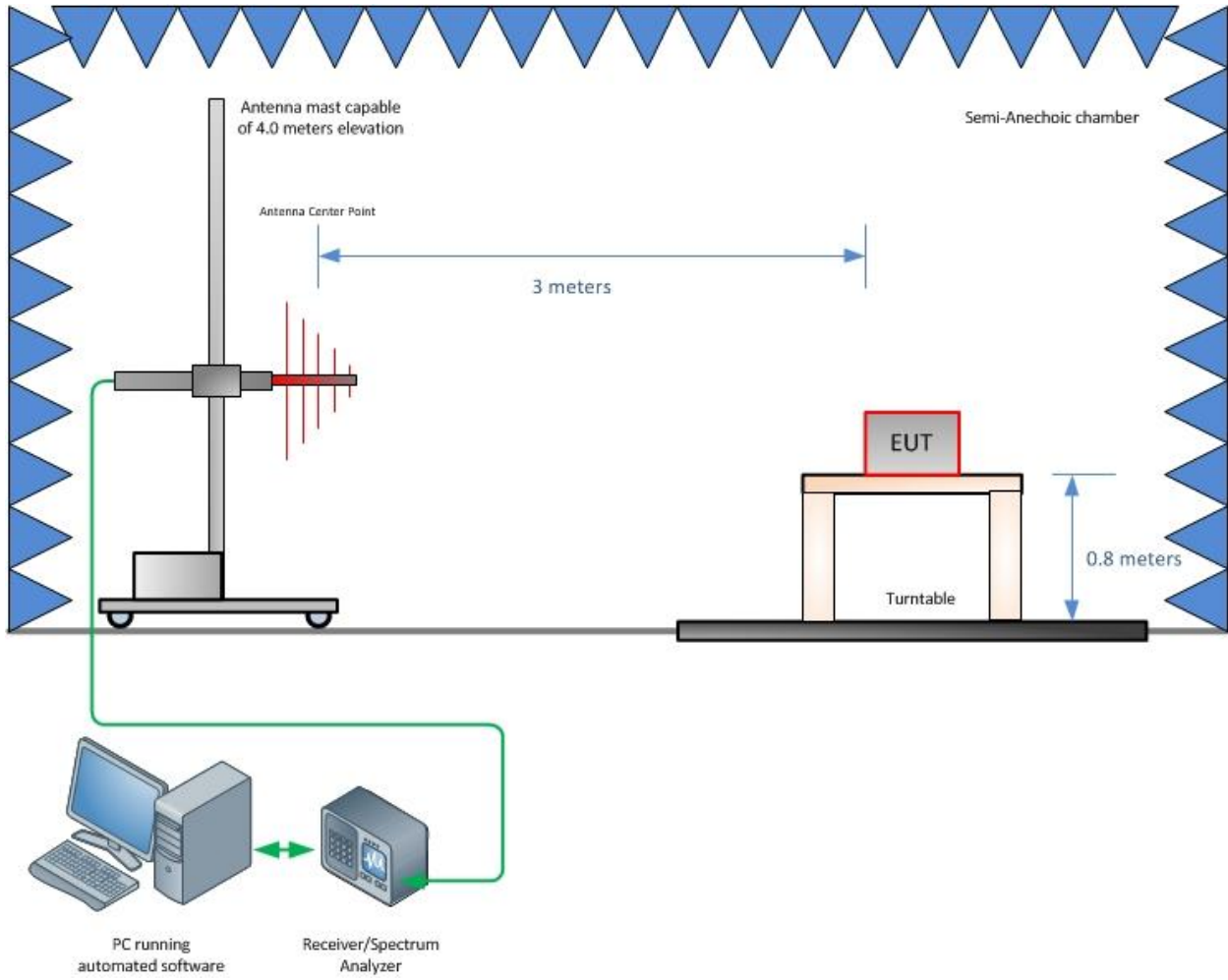
Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.57	0.33	0.11
2	Cables	Rectangular	0.50	0.29	0.08
3	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					0.72
Coverage Factor (k):					2
Expanded Uncertainty:					1.45



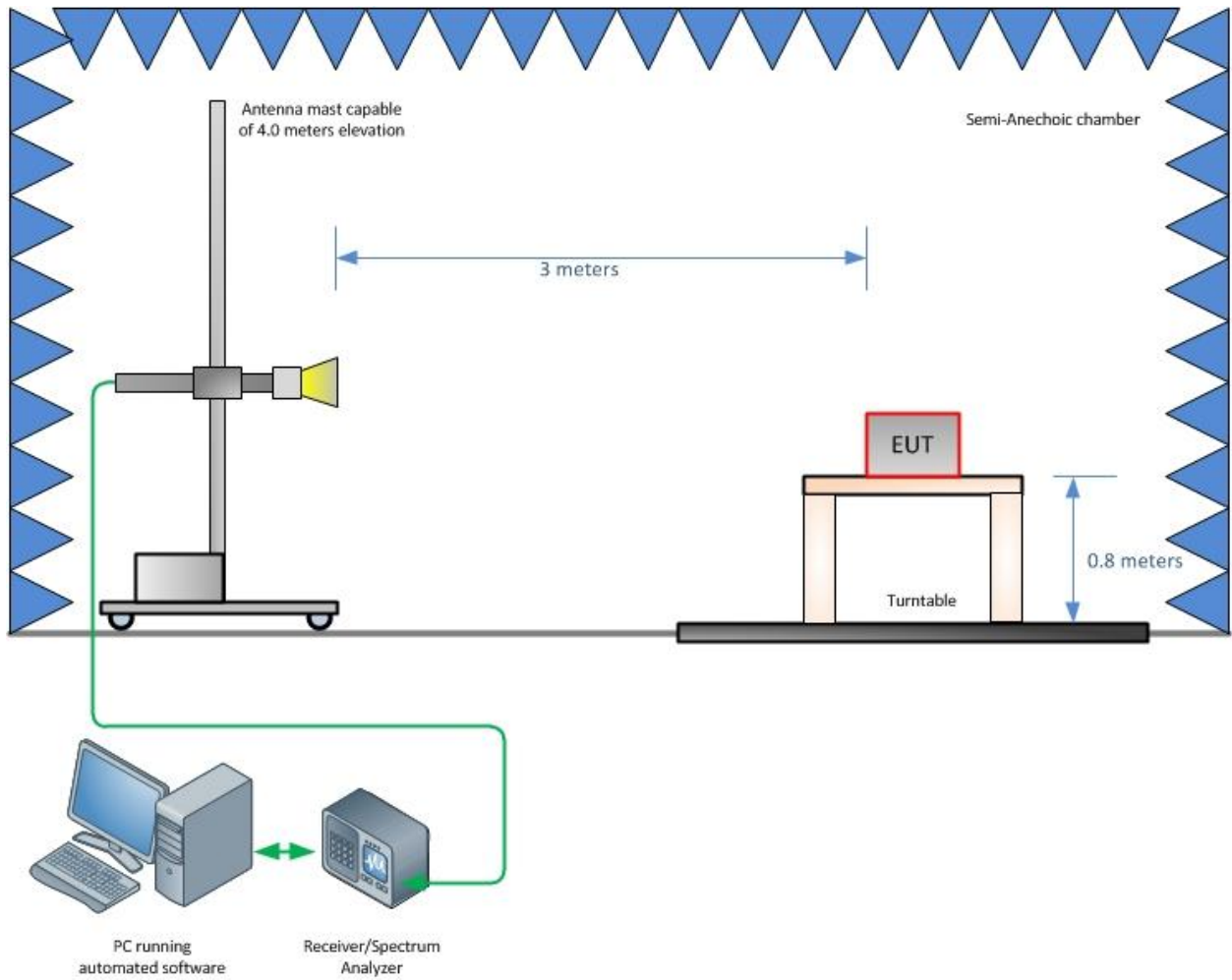
SECTION 4

DIAGRAM OF TEST SETUP

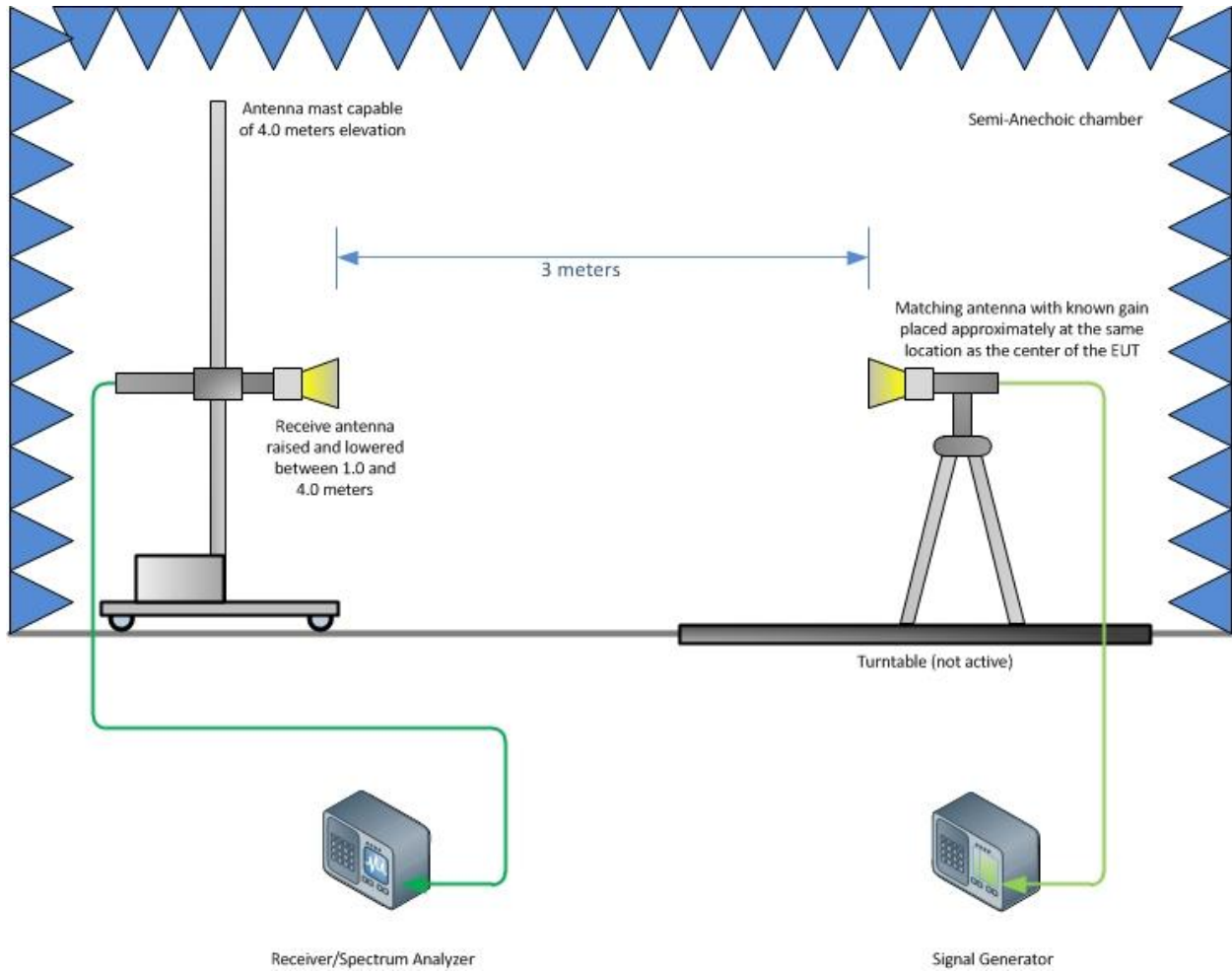
4.1 TEST SETUP DIAGRAM



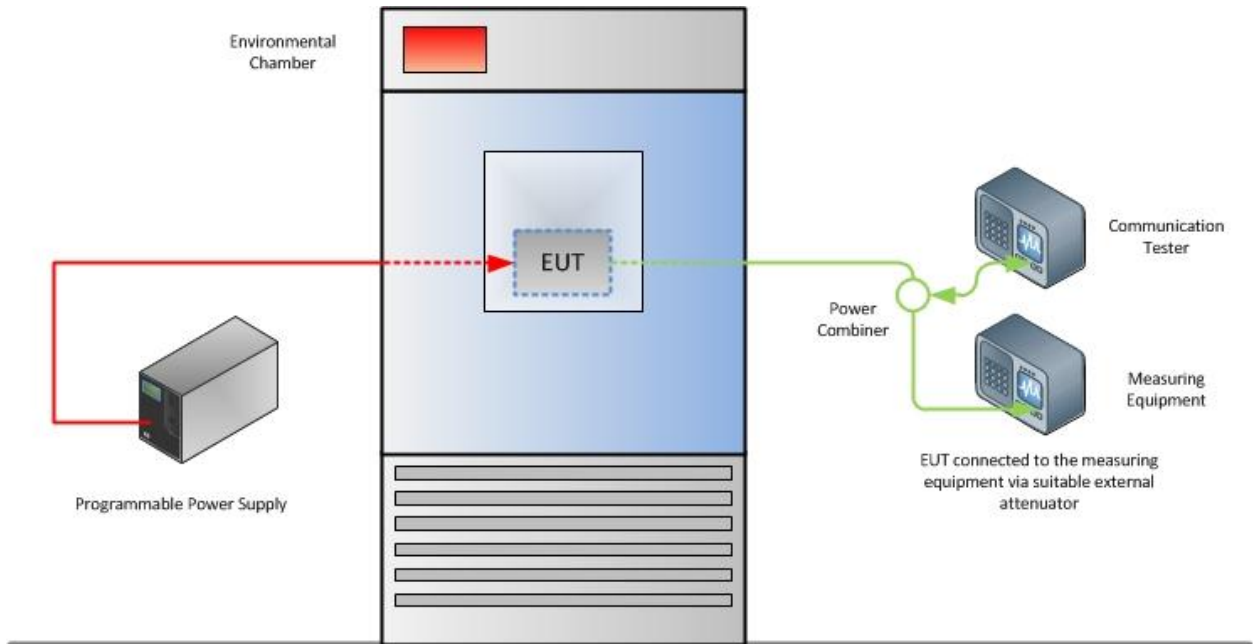
Radiated Emission Test Setup (Below 1GHz)



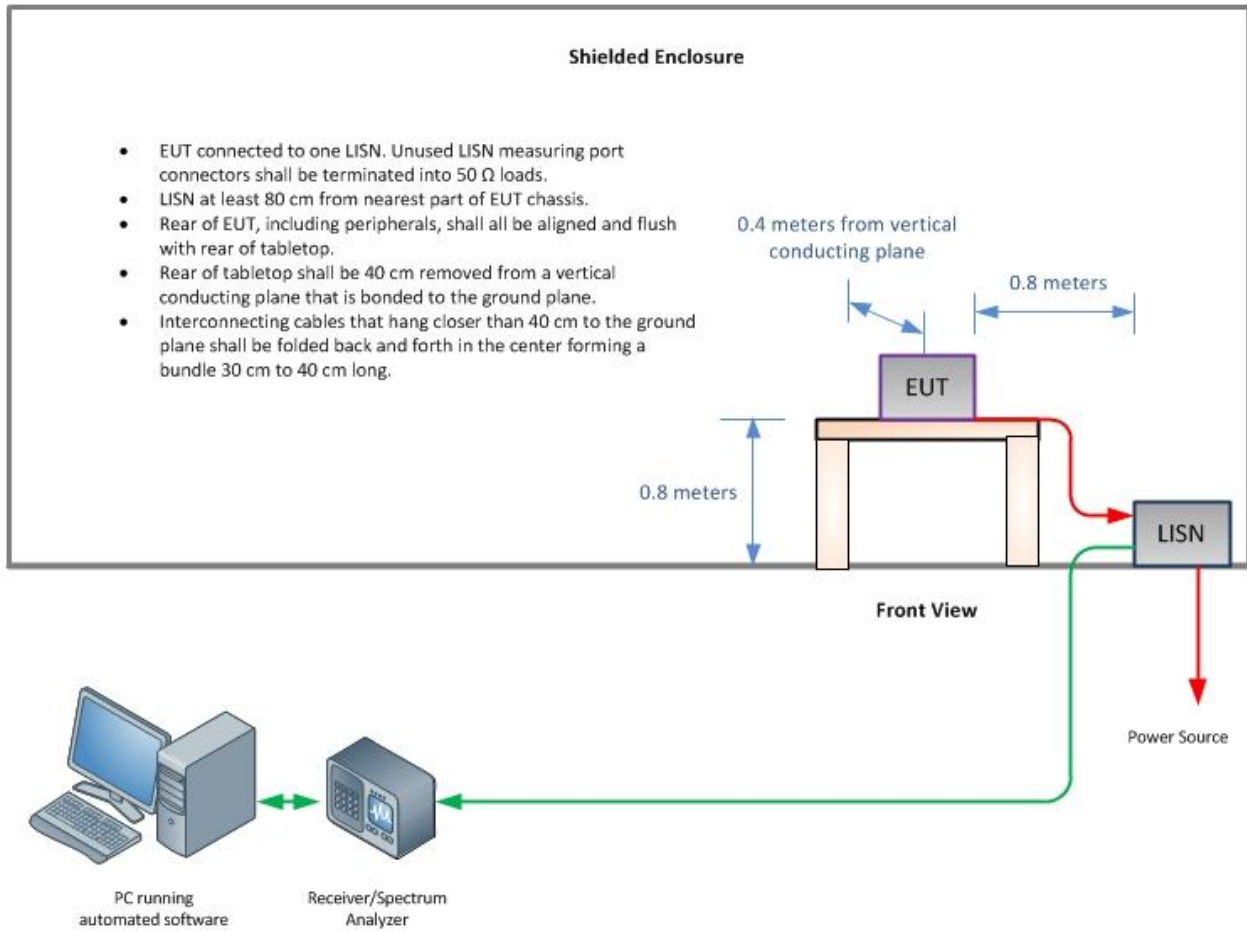
Radiated Emission Test Setup (Above 1GHz)



Substitution Test Method (Above 1GHz)



Frequency Stability Test Configuration





SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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