



**FCC CFR47 PART 22H, 24E, AND 27L  
CERTIFICATION TEST REPORT**

**FOR  
TRI-BAND CELLPHONE WITH LTE**

**MODEL NUMBER: LG-MS659  
FCC ID: ZNFMS659**

**REPORT NUMBER: 13U14916-4  
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*Prepared for*

**LG ELECTRONICS MOBILECOMM U.S.A., INC.  
1000 SYLVAN AVENUE  
ENGLEWOOD CLIFFS, NEW JERSEY 07632**

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**NVLAP LAB CODE 200065-0**

Revision History

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## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS .....</b>	<b>5</b>
<b>2. TEST METHODOLOGY .....</b>	<b>6</b>
<b>3. FACILITIES AND ACCREDITATION .....</b>	<b>6</b>
<b>4. CALIBRATION AND UNCERTAINTY .....</b>	<b>6</b>
4.1. MEASURING INSTRUMENT CALIBRATION .....	6
4.2. SAMPLE CALCULATION .....	6
4.3. MEASUREMENT UNCERTAINTY.....	6
<b>5. EQUIPMENT UNDER TEST .....</b>	<b>7</b>
5.1. DESCRIPTION OF EUT .....	7
5.2. MAXIMUM OUTPUT POWER.....	7
5.3. SOFTWARE AND FIRMWARE.....	9
5.4. DESCRIPTION OF AVAILABLE ANTENNAS .....	9
5.5. WORST-CASE CONFIGURATION AND MODE.....	9
5.6. DESCRIPTION OF TEST SETUP.....	10
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>12</b>
<b>7. RF POWER OUTPUT VERIFICATION .....</b>	<b>13</b>
7.1. GPRS MODES .....	13
7.2. UMTS REL 99 MODE.....	16
7.3. UMTS HSDPA MODE.....	18
7.4. UMTS DUAL CARRIER HSDPA .....	20
7.5. UMTS HSUPA MODE.....	21
7.6. LTE BAND 4 .....	23
7.7. LTE BAND 17 .....	27
<b>8. CONDUCTED TEST RESULTS .....</b>	<b>29</b>
8.1. OCCUPIED BANDWIDTH .....	29
8.1.1. GPRS MODE.....	33
8.1.2. EGPRS MODE .....	37
8.1.3. UMTS REL 99 MODE .....	41
8.1.4. UMTS HSDPA MODE.....	45
8.1.5. UMTS 1700 Rel 99 MODE.....	49
8.1.6. UMTS 1700 HSDPA MODE .....	51
8.1.7. LTE BAND 4 .....	53

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8.1.8.	LTE BAND 17 .....	77
8.2.	<i>BAND EDGE</i> .....	89
8.2.1.	GPRS MODE.....	90
8.2.2.	EGPRS MODE .....	92
8.2.3.	UMTS REL 99 MODE .....	94
8.2.4.	UMTS HSDPA MODE.....	96
8.2.5.	UMTS 1700 Rel 99 MODE.....	98
8.2.6.	UMTS 1700 HSDPA MODE.....	99
8.2.7.	LTE BAND 4 .....	100
8.2.8.	LTE BAND 17 .....	132
8.3.	<i>OUT OF BAND EMISSIONS</i> .....	148
8.3.1.	GPRS MODE.....	149
8.3.2.	EGPRS MODE .....	153
8.3.3.	UMTS REL 99 MODE .....	158
8.3.4.	UMTS HSDPA MODE.....	162
8.3.5.	UMTS 1700 Rel 99 MODE.....	166
8.3.6.	UMTS 1700 HSDPA MODE.....	168
8.3.7.	LTE BAND 4 .....	170
8.3.8.	LTE BAND 17 .....	186
8.4.	<i>FREQUENCY STABILITY</i> .....	194
<b>9.</b>	<b>RADIATED TEST RESULTS</b> .....	<b>199</b>
9.1.	<i>RADIATED POWER (ERP &amp; EIRP)</i> .....	199
9.2.	<i>FIELD STRENGTH OF SPURIOUS RADIATION</i> .....	225
<b>10.</b>	<b>SETUP PHOTOS</b> .....	<b>248</b>

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** LG ELECTRONICS MOBILECOMM U.S.A., INC.  
1000 SYLVAN AVENUE  
ENGLEWOOD CLIFFS, NEW JERSEY 07632

**EUT DESCRIPTION:** TRI-BAND CELLPHONE WITH LTE

**MODEL:** LG-MS659

**SERIAL NUMBER:** 302KPHG334905

**DATE TESTED:** MARCH 14 – APRIL 16, 2013

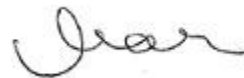
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H, 24E and 27L	PASS

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



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WISE LAB TECHNICIAN  
UL CCS

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, and FCC Part 27.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a Tri-Band Cellphone with Bluetooth, WLAN and LTE.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak of both conducted and ERP / EIRP output powers as follows:

Part 22 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.2 - 848.8	GPRS	32.90	1949.8	27.60	575.4
824.2 - 848.8	EGPRS	30.70	1174.9	26.60	457.1

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 - 1909.8	GPRS	30.20	1047.1	29.19	829.9
1850.2 - 1909.8	EGPRS	29.20	831.8	27.29	535.8

Part 22/24 Band					
Frequency range (MHz)	Modulation	Conducted		ERP/EIRP	
		dBm	mW	dBm	mW
826.4 - 846	REL 99	25.80	380.2	22.52	178.6
1852.4 - 1907.6		26.40	436.5	25.61	363.9

Part 22/24 Band					
Frequency range (MHz)	Modulation	Conducted		ERP/EIRP	
		dBm	mW	dBm	mW
826.4 - 846	HSDPA	26.50	446.7	22.80	190.5
1852.4 - 1907.6		26.45	441.6	22.82	191.4

Part 27 Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1712.4-1752.6	AWS Rel 99	25.60	363.1	24.89	308.3
	AWS HSDPA	26.60	457.1	25.69	370.7

Part 27 LTE Band 4 MODE (5 MHz BANDWIDTH)						
Frequency range (MHz)	Modulation	Start RB and RB offset	Conducted		EIRP	
			dBm	mW	dBm	mW
1712.5-1752.5	QPSK	25/0	27.82	605.3	25.78	378.4
	16QAM		27.37	545.8	24.88	307.6

Part 27 LTE Band 4 MODE (10.0- MHz BANDWIDTH)						
Frequency range (MHz)	Modulation	Start RB and RB offset	Conducted		EIRP	
			dBm	mW	dBm	mW
1715-1750	QPSK	50/0	27.58	572.8	25.54	358.1
	16QAM		27.37	545.8	24.64	291.1

Part 27 LTE Band 4 MODE (15.0 MHz BANDWIDTH)						
Frequency range (MHz)	Modulation	Start RB and RB offset	Conducted		EIRP	
			dBm	mW	dBm	mW
1717.5-1747.5	QPSK	75/0	27.79	601.2	25.81	381.1
	16QAM		27.15	518.8	24.91	309.7

Part 27 LTE Band 4 MODE (20.0 MHz BANDWIDTH)						
Frequency range (MHz)	Modulation	Start RB and RB offset	Conducted		EIRP	
			dBm	mW	dBm	mW
1720.0-1745	QPSK	100/0	27.80	602.6	26.11	408.3
	16QAM		27.40	549.5	25.21	331.9

Part 27 LTE Band 17 MODE (5 MHz BANDWIDTH)						
Frequency range (MHz)	Modulation	Start RB and RB offset	Conducted		EIRP	
			dBm	mW	dBm	mW
706.5-713.5	QPSK	25/0	28.36	685.5	21.65	146.2
	16QAM		28.35	683.9	20.65	116.1

Part 27 LTE Band 17 MODE (10.0- MHz BANDWIDTH)						
Frequency range (MHz)	Modulation	Start RB and RB offset	Conducted		EIRP	
			dBm	mW	dBm	mW
709 - 711	QPSK	50/0	28.20	660.7	21.55	142.9
	16QAM		27.50	562.3	20.45	110.9



### 5.3. SOFTWARE AND FIRMWARE

The EUT software installed during testing was LAP8960IR120417.

The EUT is linked with Agilent 8960 and CMW500 Communication Test Sets.

### 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna with a maximum peak gain as follow:

BAND	Gain (dBi)
GSM850/WCDMA B2( 824-894MHz)	-5.0
PCS WCDMA B2 (1850-1990MHz)	-5.0
WCDMA B4/LTE B4(1710-2155MHz)	-6.4
LTE band 17 (704-746MHz)	-7.4

### 5.5. WORST-CASE CONFIGURATION AND MODE

Based on the investigation results, the highest peak power and enhanced data rate is the worst-case scenario for all measurements.

Worst-case modes:

GPRS, UMTS WCDMA and UMTS HSDPA Sub-test 2

Worst-case modes:

- GPRS
- UMTS, WCDMA, HSDPA
- LTE Band 4 and 25

Since the EUT is a portable device, to determine the worst/highest emissions, the X, Y, and Z orientations of the EUT with respect to the turntable and the worst among them with headset and an AC adapter were investigated. After the investigations, Y-Orientation without headset and AC adapter was turned out to be the worst case for cell and Z-Orientation without headset and AC adapter was turned out to be the worst case for PCS bands.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

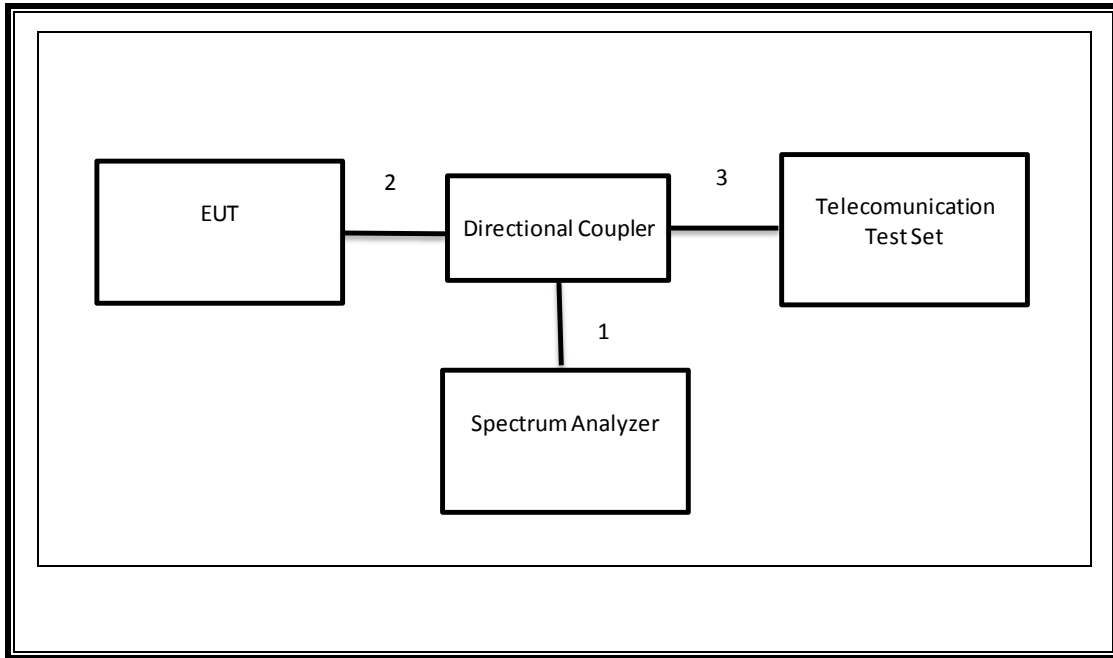
Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG	MCS-01WR	EAY62768916	NA
Headset	LG	NA	EAB62209301	NA

### I/O CABLES

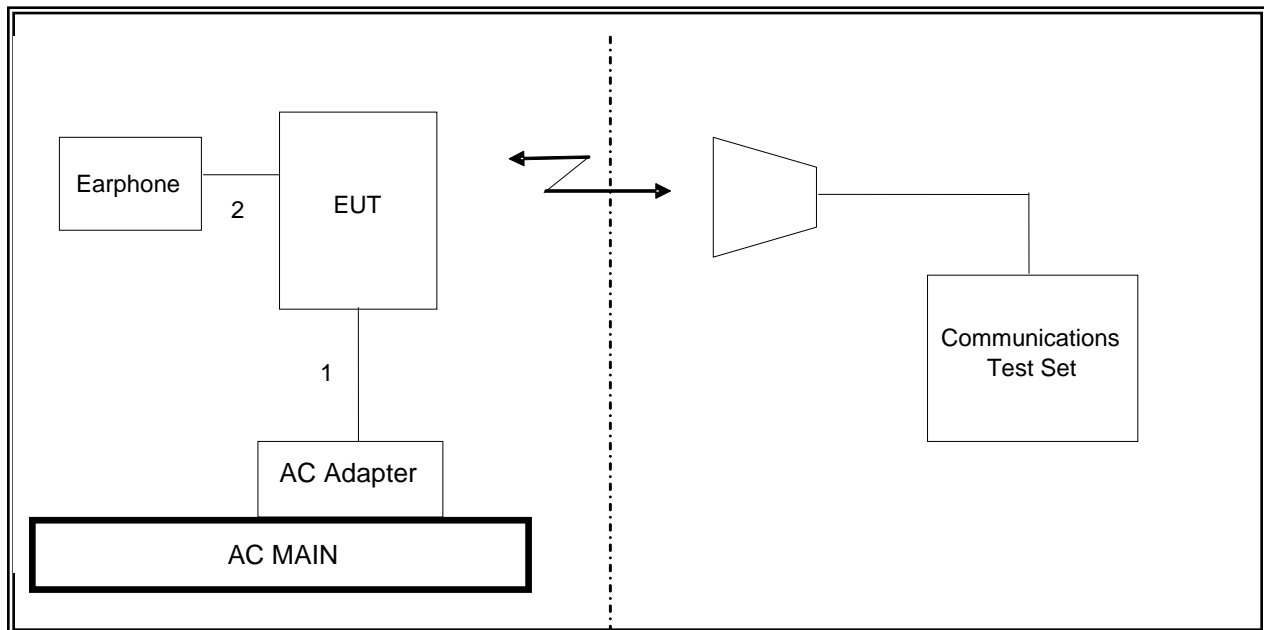
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Un-shielded	1m	NA
2	Jack	1	Earphone	Un-shielded	1.2m	NA

### TEST SETUP

**SETUP DIAGRAM FOR RF CONDUCTED TESTS**



**SETUP DIAGRAM FOR RF RADIATED TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Horn, 18 GHz	EMCO	3115	C00872	10/25/13
Antenna, Horn, 18 GHz	EMCO	3115	C00945	12/11/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00996	05/11/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/13
Communication Test Set	Agilent / HP	E5515C	C01086	06/20/13
Communication Test Set	Anritsu	MT8820C	1100481	07/13/13
Communication Test Set	R & S	CMW500	None	06/28/13
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	01/09/14
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	03/06/14
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	07/06/13
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	02/14/14

## 7. RF POWER OUTPUT VERIFICATION

### 7.1. GPRS MODES

#### TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with  $VBW \geq RBW \geq 26\text{dB BW}$ , typically 3MHz.
- Set a marker to point the corresponding peak value.

#### TEST PROCEDURE

##### GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900  
Press Connection control to choose the different menus  
Press RESET > choose all to reset all settings  
Connection Press Signal Off to turn off the signal and change settings  
Network Support > GSM+GPRS or GSM+EGPRS  
Main Service > Packet Data  
Service selection > Test Mode A – Auto Slot Config. off  
MS Signal Press Slot Config bottom on the right twice to select and change the number of time slots and power setting  
    > Slot configuration > Uplink/Gamma  
    > 33 dBm for GPRS 850/900  
    > 27 dBm for EGPRS 850/900  
    > 30 dBm for GPRS1800/1900  
    > 26 dBm for EGPRS1800/1900  
BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel  
Frequency Offset > + 0 Hz  
Mode > BCCH and TCH  
BCCH Level > -85 dBm (May need to adjust if link is not stable)  
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]  
Channel Type > Off  
P0> 4 dB  
Slot Config > Unchanged (if already set under MS Signal)

---

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3 (Default)

Network Coding Scheme > CS1 (GPRS) and MCS5 (EGPRS)

Bit Stream > 2E9-1PSR Bit Pattern

AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input

Connection Press Signal On to turn on the signal and change settings

**RESULTS**

**CELL BAND**

Mode	Ch.	f (MHz)	1 time slots
			Peak
GSM	128	824.2	32.9
	190	836.6	32.9
	251	848.8	32.9

Mode	Ch.	f (MHz)	1 time slot	2 time slots	3 time slots	4 time slots
			Peak	Peak	Peak	Peak
GPRS	128	824.2	32.9	30.2	28.3	27.5
	190	836.6	32.9	30.5	28.3	27.1
	251	848.8	32.9	30.4	28.3	26.9

Mode	Ch.	f (MHz)	1 time slot	2 time slots	3 time slots	4 time slots
			Peak	Peak	Peak	Peak
EGPRS	128	824.2	30.6	29.9	28.9	28.0
	190	836.6	30.7	30.0	28.9	28.1
	251	848.8	30.6	29.9	28.7	28.0

**PCS BAND**

Mode	Ch.	f (MHz)	1 time slot
			Peak
GSM	512	1850.2	30.0
	661	1880.0	30.1
	810	1909.8	30.0

Mode	Ch.	f (MHz)	1 time slot	2 time slots	3 time slots	4 time slots
			Peak	Peak	Peak	Peak
GPRS	512	1850.2	30.2	27.4	25.3	24.1
	661	1880.0	30.2	27.5	25.4	24.3
	810	1909.8	30.0	27.4	25.4	24.2

Mode	Ch.	f (MHz)	1 time slot	2 time slots	3 time slots	4 time slots
			Peak	Peak	Peak	Peak
EGPRS	512	1850.2	29.2	28.5	27.8	27.4
	661	1880.0	29.2	28.6	27.9	27.5
	810	1909.8	29.1	28.5	27.8	27.4

## 7.2. UMTS REL 99 MODE

### TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW  $\geq$  RBW  $\geq$  26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

### TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel99
	Subtest	-
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	$\beta_c$	Not Applicable
	$\beta_d$	Not Applicable
	$\beta_{ec}$	Not Applicable
	$\beta_c/\beta_d$	8/15
	$\beta_{hs}$	Not Applicable
	$\beta_{ed}$	Not Applicable

### RESULTS



Band	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS 850	4132	4357	826.4	25.59
	4180	4405	836.0	25.40
	4230	4455	846.0	25.80

Band	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS 190	9262	9662	1852.4	26.01
	9400	9800	1880.0	26.40
	9538	9938	1907.6	26.22

Band	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS 1700	1312	1537	1712.4	25.60
	1413	1638	1732.6	25.60
	1513	1738	1752.6	25.40

### 7.3. UMTS HSDPA MODE

#### TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	Not Applicable			
	Power Control Algorithm	Algorithm 2			
	$\beta_c$	2/15	12/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	$\beta_{ec}$	-	-	-	-
	$\beta_c/\beta_d$	2/15	12/15	15/8	15/4
	$\beta_{hs}$	4/15	24/15	30/15	30/15
	$\beta_{ed}$	Not Applicable			
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

**RESULTS**

Band	Subtest	UL Ch	DL Ch	Frequency	Peak power (dBm)
UMTS850 (Band V)	1	4132	4357	826.4	26.00
		4180	4405	836.0	25.70
		4230	4455	846.0	26.00
	2	4132	4357	826.4	26.00
		4180	4405	836.0	26.50
		4230	4455	846.0	26.40
	3	4132	4357	826.4	26.30
		4180	4405	836.0	26.00
		4230	4455	846.0	26.10
	4	4132	4357	826.4	25.70
		4180	4405	836.0	25.90
		4230	4455	846.0	25.70
UMTS1900 (Band II)	1	9262	9662	1852.4	26.10
		9400	9800	1880.0	26.10
		9538	9938	1907.6	26.30
	2	9262	9662	1852.4	26.20
		9400	9800	1880.0	26.40
		9538	9938	1907.6	26.45
	3	9262	9662	1852.4	26.00
		9400	9800	1880.0	25.90
		9538	9938	1907.6	26.10
	4	9262	9662	1852.4	25.90
		9400	9800	1880.0	25.80
		9538	9938	1907.6	26.10

Note 1: Maximum output power levels that are possible for all subtests reported.

Band	Subtest	UL Ch	DL Ch	Frequency	Peak power (dBm)
UMTS 1700 (Band IV)	1	1312	1537	1712.4	26.60
		1413	1638	1732.6	26.50
		1513	1738	1752.6	26.60
	2	1312	1537	1712.4	26.60
		1413	1638	1732.6	26.50
		1513	1738	1752.6	26.50
	3	1312	1537	1712.4	26.60
		1413	1638	1732.6	26.30
		1513	1738	1752.6	26.50
	4	1312	1537	1712.4	26.40
		1413	1638	1732.6	26.40
		1513	1738	1752.6	26.20

## 7.4. UMTS DUAL CARRIER HSDPA

### RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS850 (Band V)	1*	4132	4357	826.4	24.43
		4180	4405	836.0	24.44
		4230	4455	846.0	24.83
	2	4132	4357	826.4	24.42
		4180	4405	836.0	24.40
		4230	4455	846.0	24.80
	3	4132	4357	826.4	24.40
		4180	4405	836.0	24.38
		4230	4455	846.0	24.81
	4	4132	4357	826.4	24.40
		4180	4405	836.0	24.36
		4230	4455	846.0	24.83
UMTS1900 (Band II)	1*	9262	9662	1852.4	24.08
		9400	9800	1880.0	24.00
		9538	9938	1907.6	24.53
	2	9262	9662	1852.4	24.05
		9400	9800	1880.0	24.00
		9538	9938	1907.6	24.52
	3	9262	9662	1852.4	24.05
		9400	9800	1880.0	24.00
		9538	9938	1907.6	24.47
	4	9262	9662	1852.4	24.05
		9400	9800	1880.0	24.00
		9538	9938	1907.6	24.52

### UMTS BAND IV

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS1700 (Band IV)	1*	1312	1537	1712.40	25.36
		1413	1638	1732.60	25.18
		1513	1738	1752.60	25.43
	2	1312	1537	1712.40	25.11
		1413	1638	1732.60	25.22
		1513	1738	1752.60	25.34
	3	1312	1537	1712.40	24.96
		1413	1638	1732.60	25.03
		1513	1738	1752.60	25.43
	4	1312	1537	1712.40	24.94
		1413	1638	1732.60	25.07
		1513	1738	1752.60	25.36

## 7.5. UMTS HSUPA MODE

### TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	$\beta_c$	11/15	6/15	15/15	2/15	15/15
	$\beta_d$	15/15	15/15	9/15	15/15	0
	$\beta_{ec}$	209/225	12/15	30/15	2/15	5/15
	$\beta_c/\beta_d$	11/15	6/15	15/9	2/15	-
	$\beta_{hs}$	22/15	12/15	30/15	4/15	5/15
$\beta_{ed}$	1309/225	94/75	47/15 47/15	56/75	47/15	
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	$A_{hs} = \beta_{hs}/\beta_c$	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

**RESULTS**

Band	Subtest	UL Ch	DL Ch	Frequency	Peak power (dBm)
UMTS850 (Band V)	1	4132	4357	826.4	25.00
		4180	4405	836.0	25.20
		4230	4455	846.0	25.20
	2	4132	4357	826.4	25.50
		4180	4405	836.0	25.10
		4230	4455	846.0	25.30
	3	4132	4357	826.4	25.40
		4180	4405	836.0	25.00
		4230	4455	846.0	25.00
	4	4132	4357	826.4	25.30
		4180	4405	836.0	24.90
		4230	4455	846.0	25.30
	5	4132	4357	826.4	25.10
		4180	4405	836.0	25.00
		4230	4455	846.0	24.90
UMTS1900 (Band II)	1	9262	9662	1852.4	25.65
		9400	9800	1880.0	25.60
		9538	9938	1907.6	25.60
	2	9262	9662	1852.4	25.30
		9400	9800	1880.0	25.40
		9538	9938	1907.6	25.50
	3	9262	9662	1852.4	25.00
		9400	9800	1880.0	25.30
		9538	9938	1907.6	25.10
	4	9262	9662	1852.4	25.10
		9400	9800	1880.0	25.10
		9538	9938	1907.6	25.50
	5	9262	9662	1852.4	25.10
		9400	9800	1880.0	25.30
		9538	9938	1907.6	25.40

Note 1: Maximum output power levels that are possible for all subtests reported.

Band	Subtest	UL Ch	DL Ch	Frequency	Peak power (dBm)
UMTS 1700 (Band IV)	1	1312	1537	1712.4	25.20
		1413	1638	1732.6	25.50
		1513	1738	1752.6	25.70
	2	1312	1537	1712.4	26.00
		1413	1638	1732.6	25.70
		1513	1738	1752.6	25.80
	3	1312	1537	1712.4	26.10
		1413	1638	1732.6	26.20
		1513	1738	1752.6	26.10
	4	1312	1537	1712.4	26.00
		1413	1638	1732.6	25.70
		1513	1738	1752.6	25.70
	5	1312	1537	1712.4	25.20
		1413	1638	1732.6	25.30
		1513	1738	1752.6	25.40

**7.6. LTE BAND 4**

**Output power for LTE Band 4 (5 MHz)**

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)
1712.5	19975	QPSK	5.0	1	0	26.88
				1	12	26.83
				1	24	26.95
				12	0	26.62
				12	6	26.53
				12	11	26.56
				25	0	27.33
		16-QAM		1	0	26.55
				1	12	26.51
				1	24	26.63
				12	0	26.39
				12	6	26.27
				12	11	26.36
				25	0	26.94
1732.5	20175	QPSK	1	0	27.55	
			1	12	27.42	
			1	24	27.41	
			12	0	27.08	
			12	6	26.91	
			12	11	27.02	
			25	0	27.82	
		16-QAM	1	0	27.01	
			1	12	27.12	
			1	24	27.11	
			12	0	26.80	
			12	6	26.66	
			12	11	26.68	
			25	0	27.37	
1752.5	20375	QPSK	1	0	27.08	
			1	12	27.19	
			1	24	27.26	
			12	0	26.70	
			12	6	26.71	
			12	11	26.72	
			25	0	27.44	
		16-QAM	1	0	26.66	
			1	12	26.70	
			1	24	26.65	
			12	0	26.35	
			12	6	26.27	
			12	11	26.30	
			25	0	26.99	

**Output power for LTE Band 4 (10 MHz)**

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)
1715	20000	QPSK	10.0	1	0	27.03
				1	24	27.06
				1	49	27.22
				25	0	26.92
				25	12	26.89
				25	24	26.85
		50		0	27.34	
		16-QAM		1	0	26.34
				1	24	26.39
				1	49	26.70
				25	0	26.61
				25	12	26.4
				25	24	26.38
				50	0	26.84
1732.5	20175		QPSK	10.0	1	0
		1			24	27.55
		1			49	27.48
		25			0	27.50
		25			12	27.34
		25			24	27.29
		50	0		27.58	
		16-QAM	1		0	26.84
			1		24	27.00
			1		49	26.90
			25		0	26.92
			25		12	26.87
			25		24	26.83
			50		0	27.37
1750	20350		QPSK	10.0	1	0
		1			24	27.22
		1			49	27.05
		25			0	26.97
		25			12	26.50
		25			24	26.55
		50	0		27.21	
		16-QAM	1		0	26.20
			1		24	26.10
			1		49	26.30
			25		0	26.45
			25		12	26.20
			25		24	26.22
			50		0	26.90



**Output power for LTE Band 4 (15 MHz)**

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)
1717.5	20025	QPSK	15.0	1	0	26.99
				1	37	27.10
				1	74	27.20
				36	0	27.01
				36	16	26.88
				36	35	27.06
				75	0	27.59
		16-QAM		1	0	26.44
				1	37	26.60
				1	74	26.68
				36	0	26.75
				36	16	26.74
				36	35	26.89
				75	0	27.02
1732.5	20175	QPSK	15.0	1	0	27.34
				1	37	27.59
				1	74	27.46
				36	0	27.20
				36	16	27.35
				36	35	27.33
				75	0	27.79
		16-QAM		1	0	26.81
				1	37	26.99
				1	74	26.85
				36	0	26.99
				36	16	27.02
				36	35	26.99
				75	0	27.15
1747.5	20325	QPSK	15.0	1	0	27.45
				1	37	26.58
				1	74	26.81
				36	0	26.95
				36	16	26.43
				36	35	26.49
				75	0	27.29
		16-QAM		1	0	26.79
				1	37	26.13
				1	74	26.33
				36	0	26.55
				36	16	26.16
				36	35	26.22
				75	0	26.74

**Output power for LTE Band 4 (20 MHz)**

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)
1720	20050	QPSK	20.0	1	0	27.05
				1	49	27.16
				1	99	27.80
				50	0	26.96
				50	24	27.04
				50	49	27.15
				100	0	27.44
		16-QAM		1	0	26.50
				1	49	26.67
				1	99	27.24
				50	0	26.75
				50	24	26.75
				50	49	26.89
				100	0	27.25
1732.5	20175	QPSK	20.0	1	0	27.25
				1	49	27.65
				1	99	27.40
				50	0	27.16
				50	24	27.41
				50	49	27.36
				100	0	27.80
		16-QAM		1	0	26.76
				1	49	27.06
				1	99	26.81
				50	0	26.91
				50	24	26.99
				50	49	26.94
				100	0	27.40
1745	20300	QPSK	20.0	1	0	27.60
				1	49	27.29
				1	99	26.89
				50	0	27.14
				50	24	26.54
				50	49	26.58
				100	0	27.28
		16-QAM		1	0	26.71
				1	49	26.25
				1	99	26.31
				50	0	26.68
				50	24	26.17
				50	49	26.21
				100	0	26.95

### 7.7. LTE BAND 17

#### 5 MHz BANDWIDTH

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)
706.5	23755	QPSK	5.0	1	0	26.54
				1	12	26.72
				1	24	26.96
				12	0	25.98
				12	6	26.12
				12	11	26.23
				25	0	26.76
		16-QAM		1	0	26.2
				1	12	26.22
				1	24	26.42
				12	0	25.85
				12	6	25.61
				12	11	25.70
				25	0	26.60
710	23790	QPSK	5.0	1	0	26.81
				1	12	27.05
				1	24	27.55
				12	0	26.88
				12	6	26.55
				12	11	26.73
				25	0	27.50
		16-QAM		1	0	26.55
				1	12	26.85
				1	24	27.18
				12	0	26.49
				12	6	26.56
				12	11	26.29
				25	0	27.31
713.5	23825	QPSK	5.0	1	0	28.28
				1	12	28.18
				1	24	27.89
				12	0	27.80
				12	6	27.74
				12	11	27.61
				25	0	28.36
		16-QAM		1	0	28.35
				1	12	28.34
				1	24	27.95
				12	0	27.60
				12	6	27.50
				12	11	27.34
				25	0	27.89

**10 MHz BANDWIDTH**

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)
709	23780	QPSK	10.0	1	0	26.99
				1	24	27.10
				1	49	27.42
				25	0	26.58
				25	12	26.59
				25	24	26.99
				50	0	27.15
		16-QAM		1	0	26.35
				1	24	26.39
				1	49	26.98
				25	0	26.00
				25	12	25.88
				25	24	26.45
				50	0	26.63
710	23790	QPSK	1	0	27.00	
			1	24	27.24	
			1	49	27.65	
			25	0	26.60	
			25	12	26.77	
			25	24	27.17	
			50	0	27.20	
		16-QAM	1	0	26.17	
			1	24	26.45	
			1	49	26.94	
			25	0	26.54	
			25	12	26.66	
			25	24	26.61	
			50	0	26.80	
711	23800	QPSK	1	0	27.70	
			1	24	28.20	
			1	49	28.02	
			25	0	27.49	
			25	12	27.62	
			25	24	27.79	
			50	0	27.81	
		16-QAM	1	0	26.93	
			1	24	27.50	
			1	49	27.35	
			25	0	26.65	
			25	12	26.85	
			25	24	27.20	
			50	0	27.27	

## 8. CONDUCTED TEST RESULTS

### 8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99, and HSDPA
- LTE Band 4 and 17

RESULTS

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.20	253.3927	293.652
		190	836.60	254.5293	282.151
		251	848.80	254.7523	304.402
PCS		512	1850.2	244.0717	264.203
		661	1880.0	237.0840	305.677
		810	1909.8	236.8022	292.676

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	EGPRS	128	824.20	240.1723	287.265
		190	836.60	233.6744	271.476
		251	848.80	242.8177	265.608
PCS		512	1850.2	241.6262	304.381
		661	1880.0	253.6147	309.023
		810	1909.8	242.6328	333.342

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
REL 99	Cell	4357	826.4	4.0622	4.637
		4408	836.6	4.2149	4.656
		4458	846.6	4.2073	4.659
	PCS	9662	1852.4	4.1979	4.606
		9880	1880.0	4.2230	4.604
		9938	1907.6	4.2452	4.559

HSDPA	CELL	4357	826.4	4.1189	4.593
		4408	836.6	4.1819	5.323
		4458	846.6	4.0404	4.556
	PCS	9662	1852.4	4.1640	4.612
		9880	1880.0	4.1873	4.601
		9938	1907.6	4.1687	4.587

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
UMTS 1700 (Band IV)	Rel 99	4357	826.4	4.2068	4.615
		4408	836.6	4.2225	4.599
		4458	846.6	4.1944	4.542
	HSDPA	9662	1852.4	4.1671	4.560
		9880	1880.0	4.1385	4.585
		9938	1907.6	4.2045	4.574

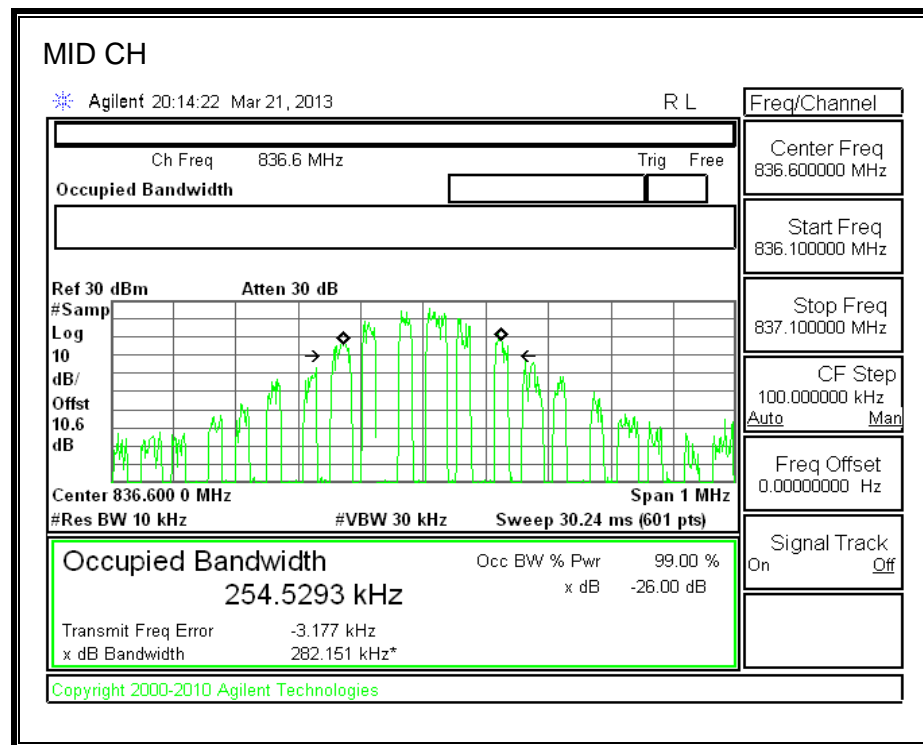
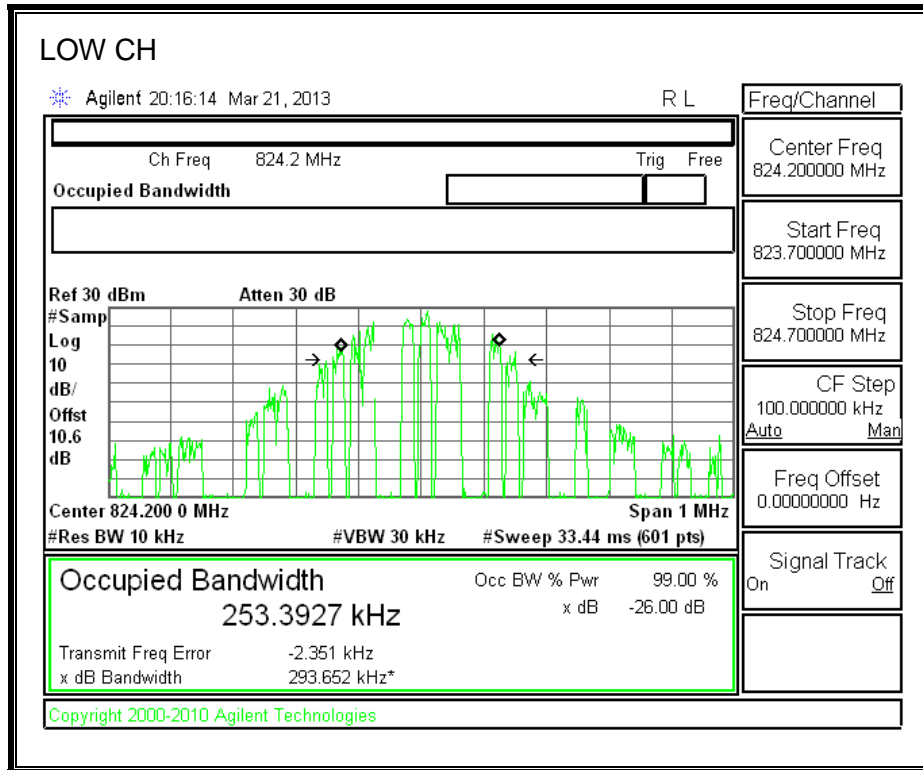
Band	Mode	RB/RB SIZE	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
LTE BAND 4	5.0 MHz BAND QPSK	12/6	1712.5	2.1528	2.257
		25/0		4.4528	4.675
	5.0 MHz BAND 16QAM	12/6		2.1505	2.292
		25/0		4.4259	4.663
	5.0 MHz BAND QPSK	12/6	1732.5	2.2046	2.528
		25/0		4.4569	4.956
	5.0 MHz BAND 16QAM	12/6		2.1470	2.555
		25/0		4.4396	5.007
	5.0 MHz BAND QPSK	12/6	1752.5	2.1915	2.752
		25/0		4.4773	4.685
	5.0 MHz BAND 16QAM	12/6		2.1429	2.454
		25/0		4.4951	4.965
	10 MHz BAND QPSK	25/12	1715	4.4571	4.708
		50/0		8.9246	9.342
	10 MHz BAND 16QAM	25/12		4.4967	4.640
		50/0		8.9626	9.334
	10 MHz BAND QPSK	25/12	1732.5	4.4859	6.013
		50/0		8.8612	9.328
	10 MHz BAND 16QAM	25/12		4.4953	4.666
		50/0		8.9034	9.323
	10 MHz BAND QPSK	25/12	1750.0	4.4749	5.565
		50/0		8.9638	9.806
	10 MHz BAND 16QAM	25/12		4.4988	5.408
		50/0		8.8929	9.408
	15 MHz BAND QPSK	36/18	1717.5	6.4533	6.707
		75/0		13.2409	13.877
	15 MHz BAND 16QAM	36/18		6.4409	6.742
		75/0		13.4441	13.940
	15 MHz BAND QPSK	36/18	1732.5	6.4654	6.742
		75/0		13.4478	13.964
	15 MHz BAND 16QAM	36/18		6.3808	6.840
		75/0		13.2417	13.887
15 MHz BAND QPSK	36/18	1747.5	6.4361	6.738	
	75/0		13.3654	13.967	
15 MHz BAND 16QAM	36/18		6.4210	6.658	
	75/0		13.2656	13.997	
20 MHz BAND QPSK	50/19	1720	8.9696	9.361	
	100/0		17.8513	18.566	
20 MHz BAND 16QAM	50/19		8.8887	9.368	
	100/0		17.6914	18.417	
20 MHz BAND QPSK	50/19	1732.5	9.0043	9.834	
	100/0		17.8507	18.548	
20 MHz BAND 16QAM	50/19		8.9964	9.315	
	100/0		17.8318	18.559	
20 MHz BAND QPSK	50/19	1745	8.9657	9.388	
	100/0		17.9279	19.112	
20 MHz BAND 16QAM	50/19		8.9364	9.317	
	100/0		17.8183	18.443	

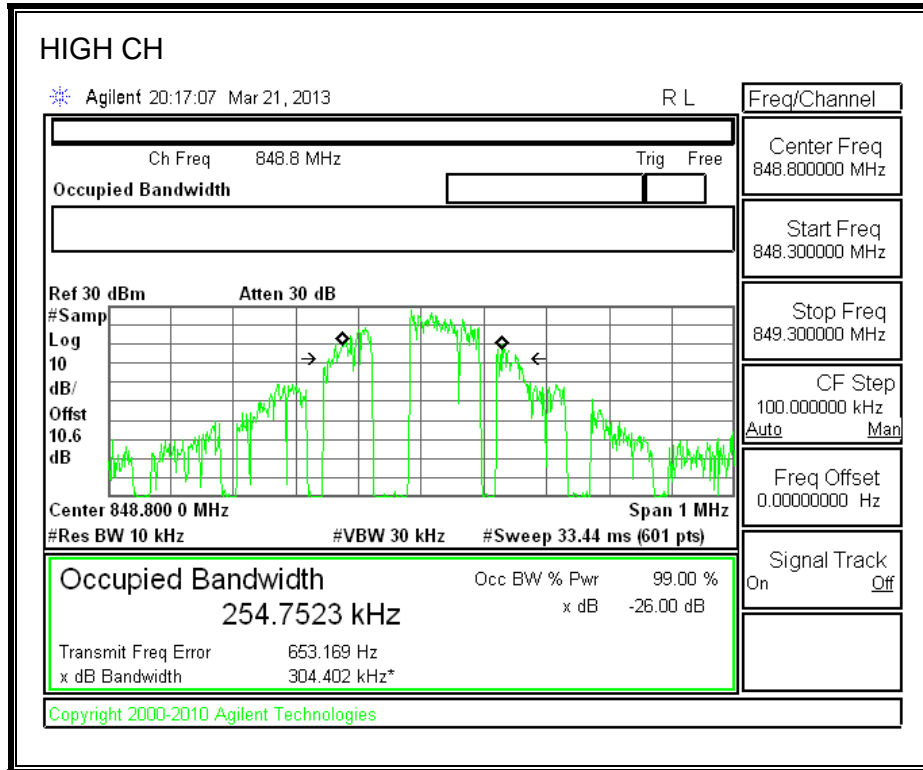
Band	Mode	RB/RB SIZE	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
LTE BAND 17	5 MHz BAND QPSK	12/6	706.5	2.1487	2.506
		25/0		4.4484	4.799
	12/6	2.1693		2.581	
	25/0	4.4820		4.652	
	5 MHz BAND 16QAM	12/6	710	2.1729	2.877
		25/0		4.4531	4.672
	12/6	2.1790		2.706	
	25/0	4.5008		4.763	
	5 MHz BAND QPSK	12/6	713.5	2.1387	2.262
		25/0		4.4951	4.866
	12/6	2.1828		2.879	
	25/0	4.4774		4.691	
	10 MHz BAND QPSK	25/12	709	4.4841	4.656
		50/0		8.9787	9.383
	25/12	4.4457		4.661	
	50/0	8.8963		9.327	
	10 MHz BAND 16QAM	25/12	710	4.4640	4.680
		50/0		8.9612	9.686
	25/12	4.4627		4.668	
	50/0	8.9167		9.348	
10 MHz BAND QPSK	25/12	711	4.4354	4.638	
	50/0		8.8466	9.404	
25/12	4.4747		4.686		
50/0	8.9616		9.347		



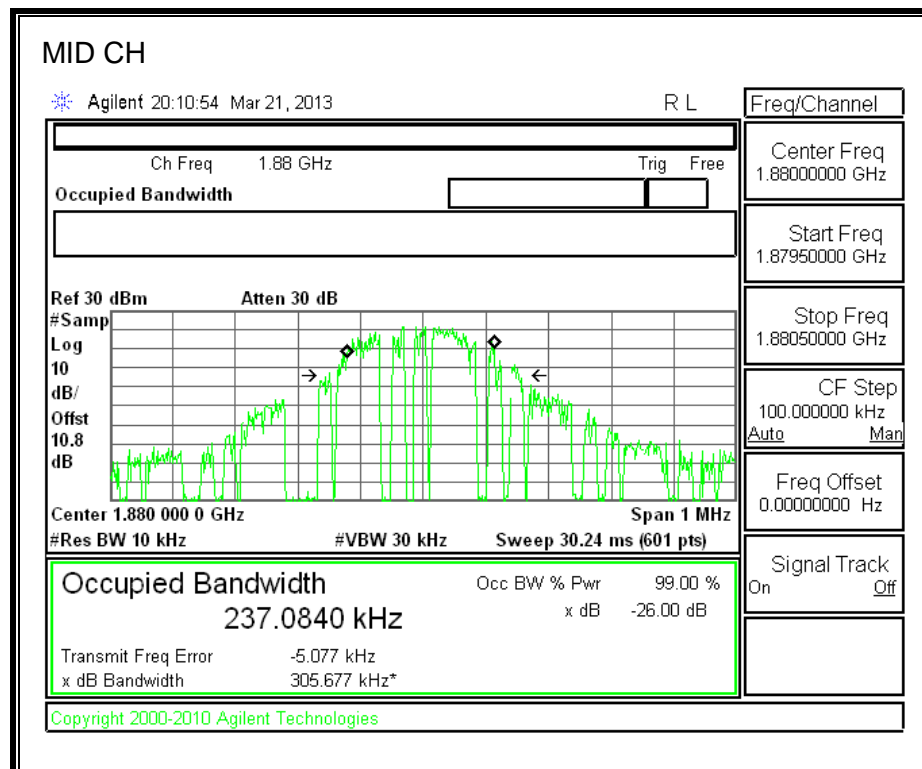
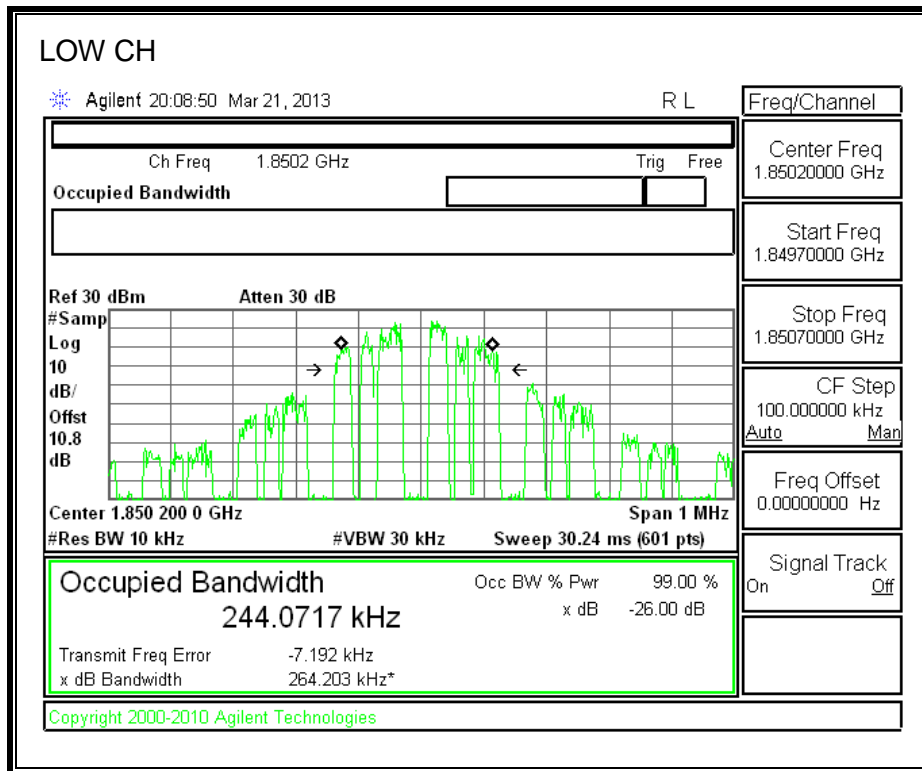
8.1.1. GPRS MODE

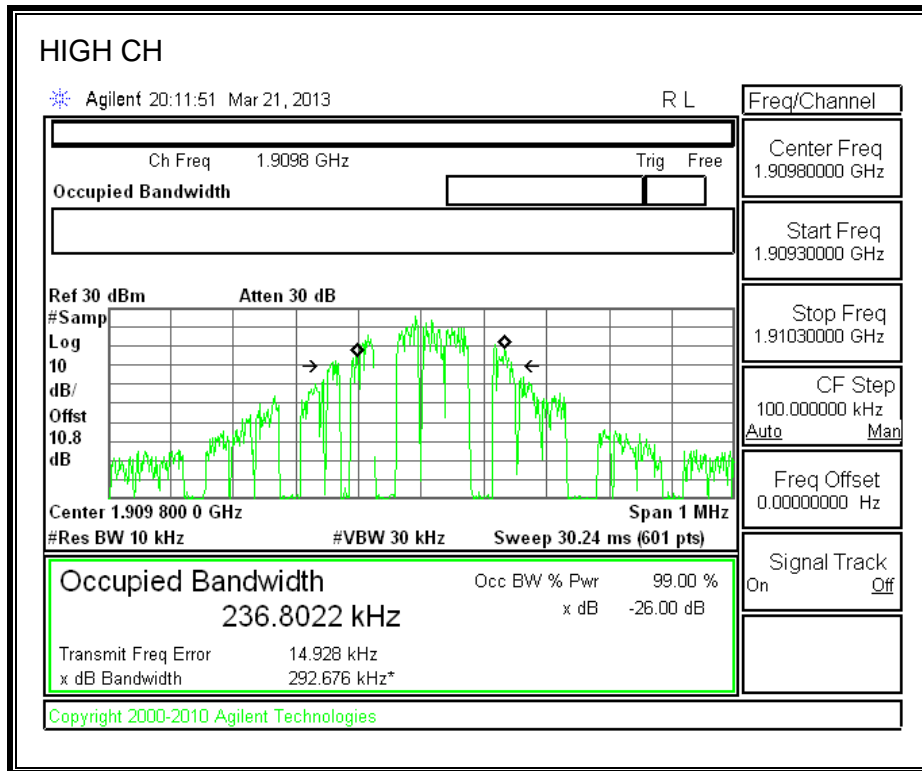
**CELL BAND**





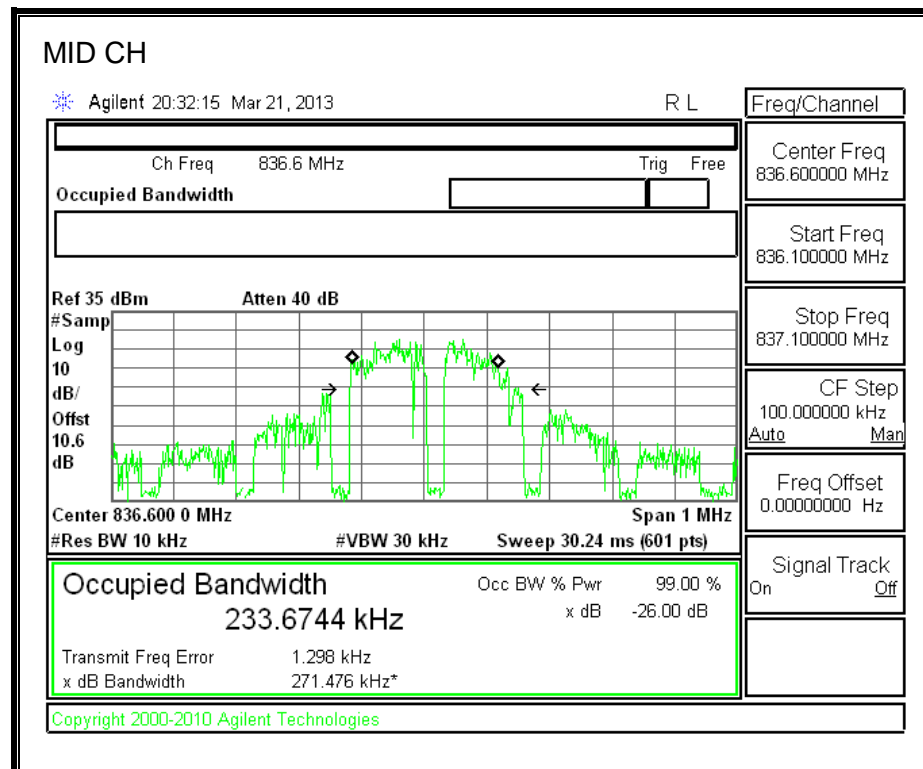
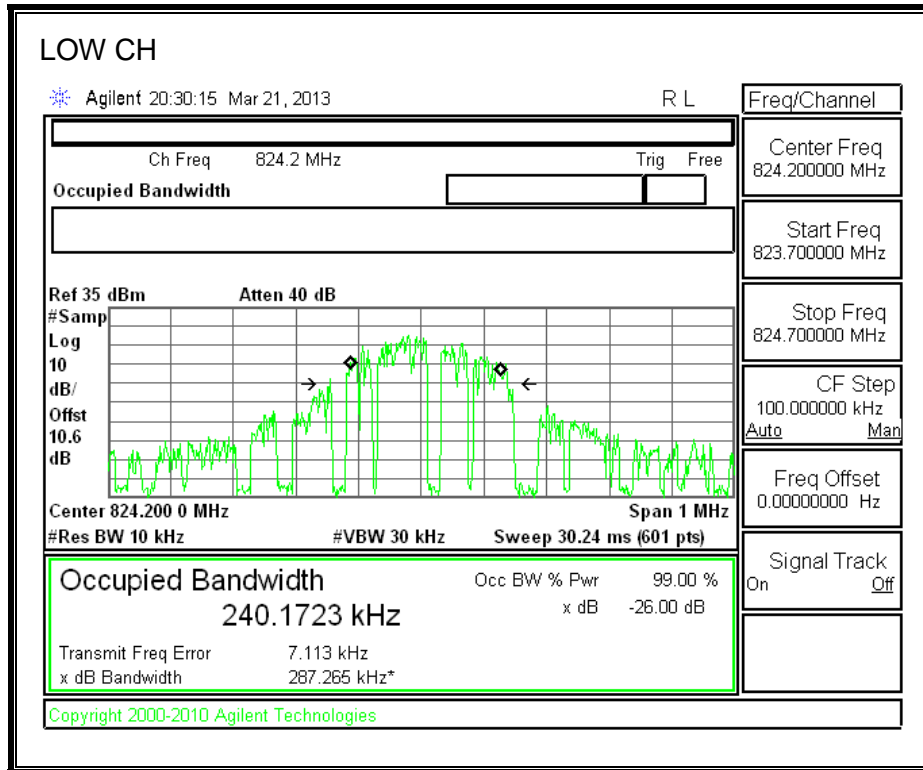
**PCS Band**

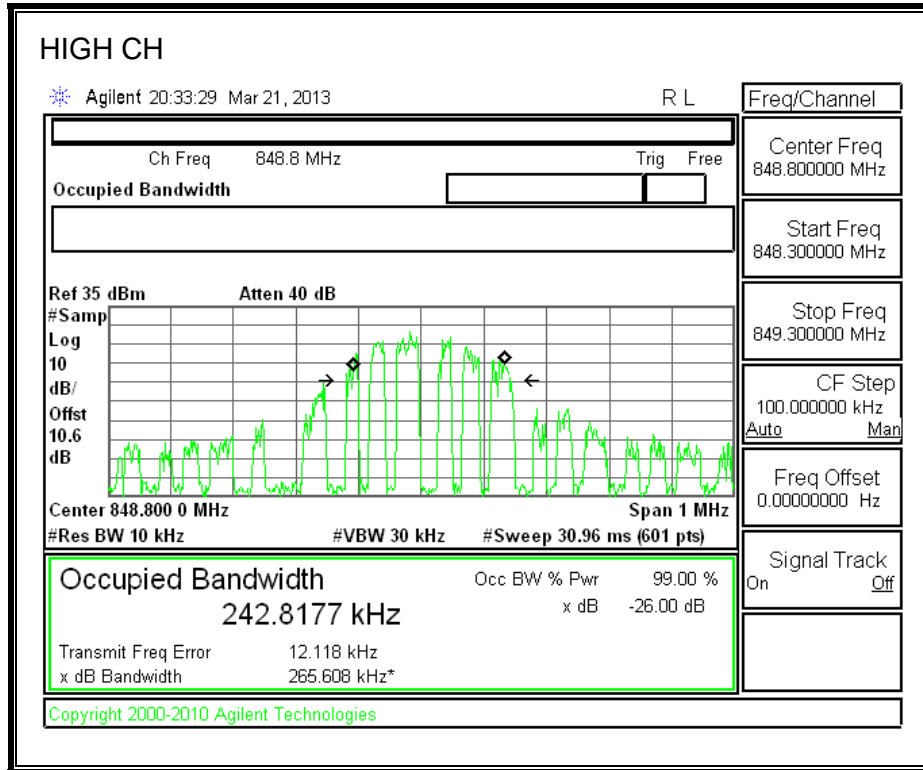




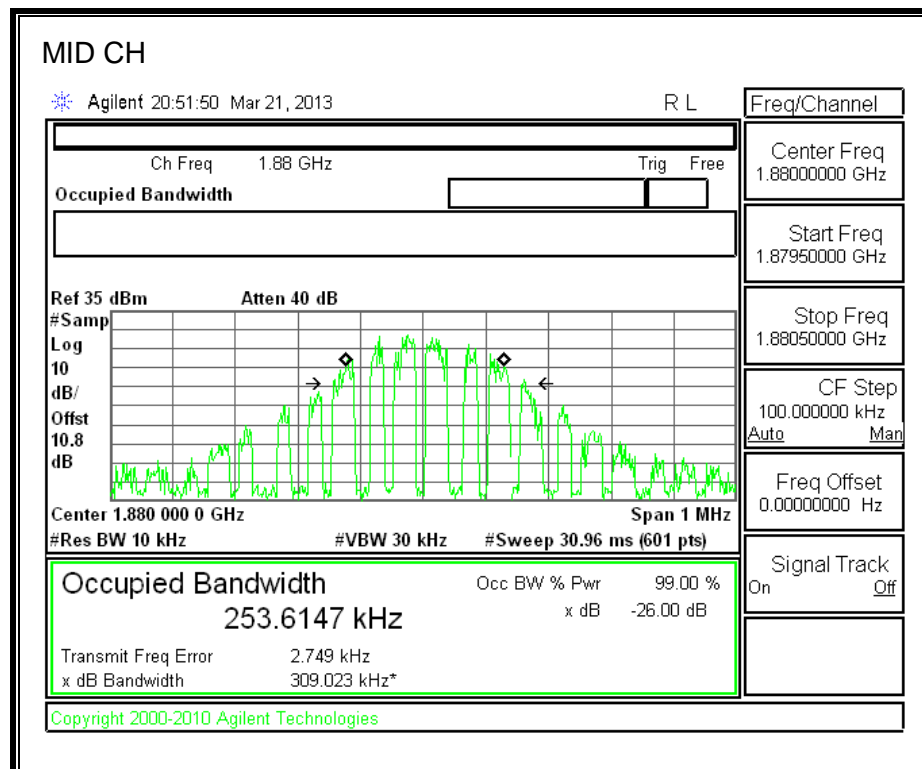
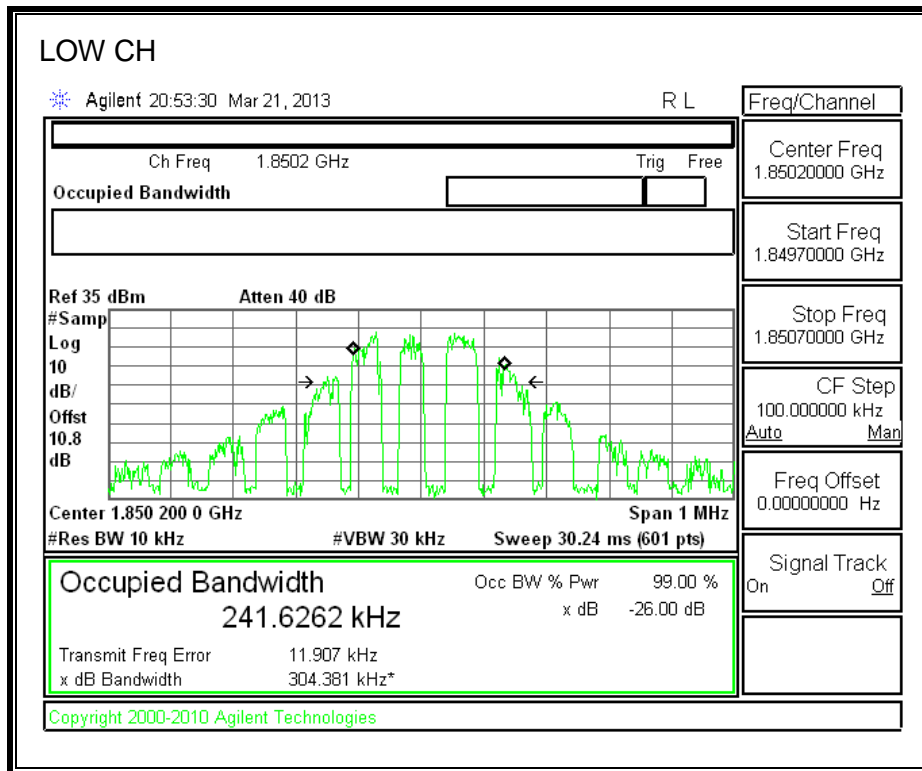
8.1.2. EGPRS MODE

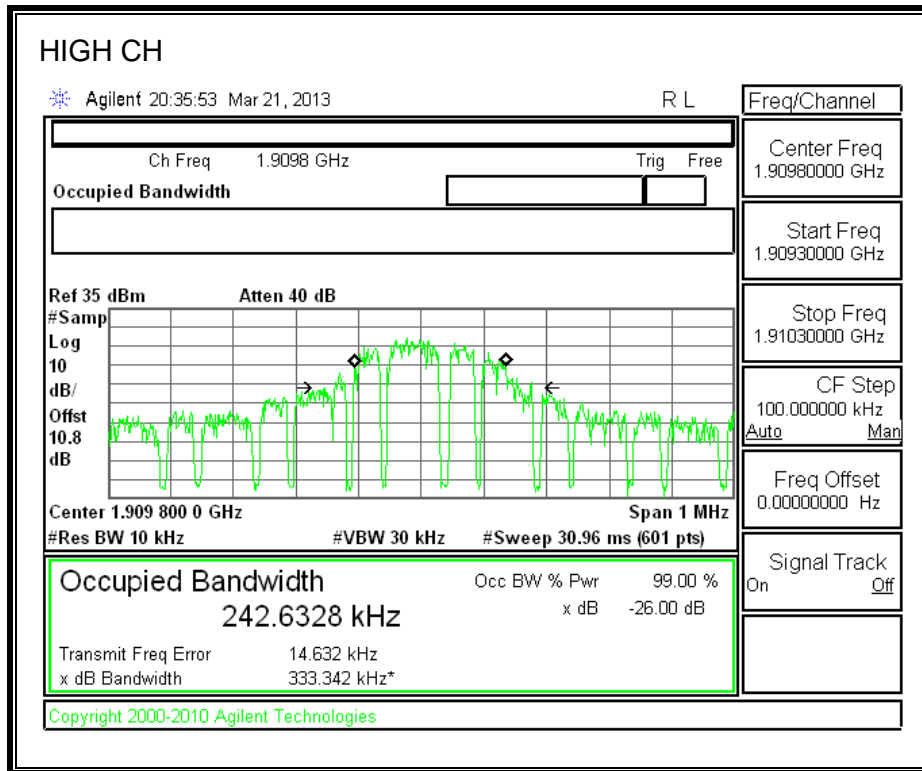
**CELL BAND**





**PCS Band**

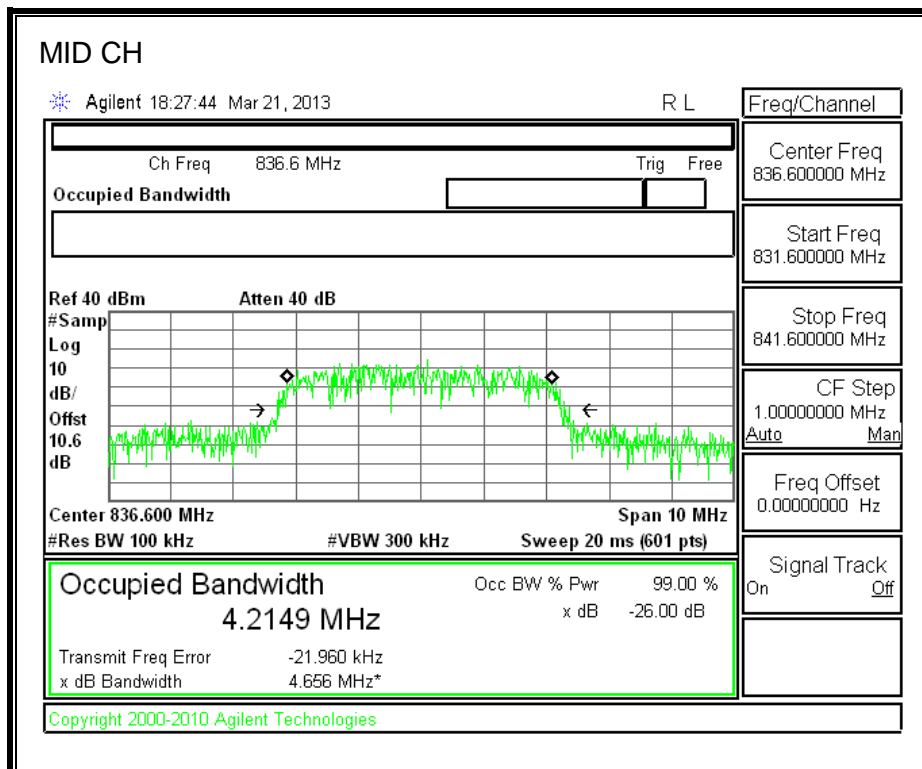
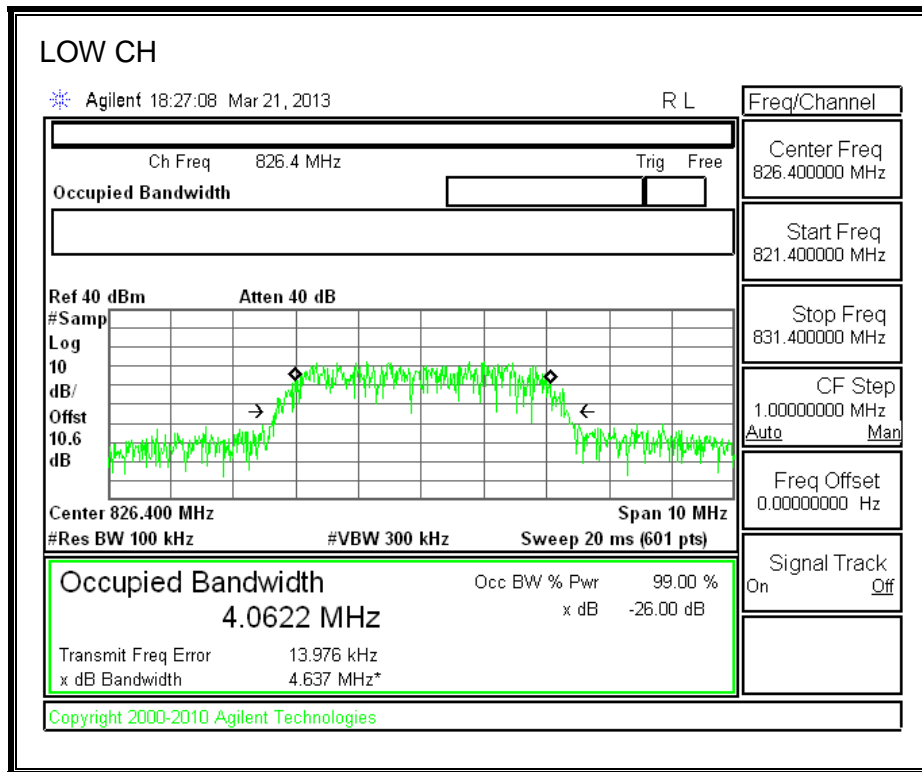


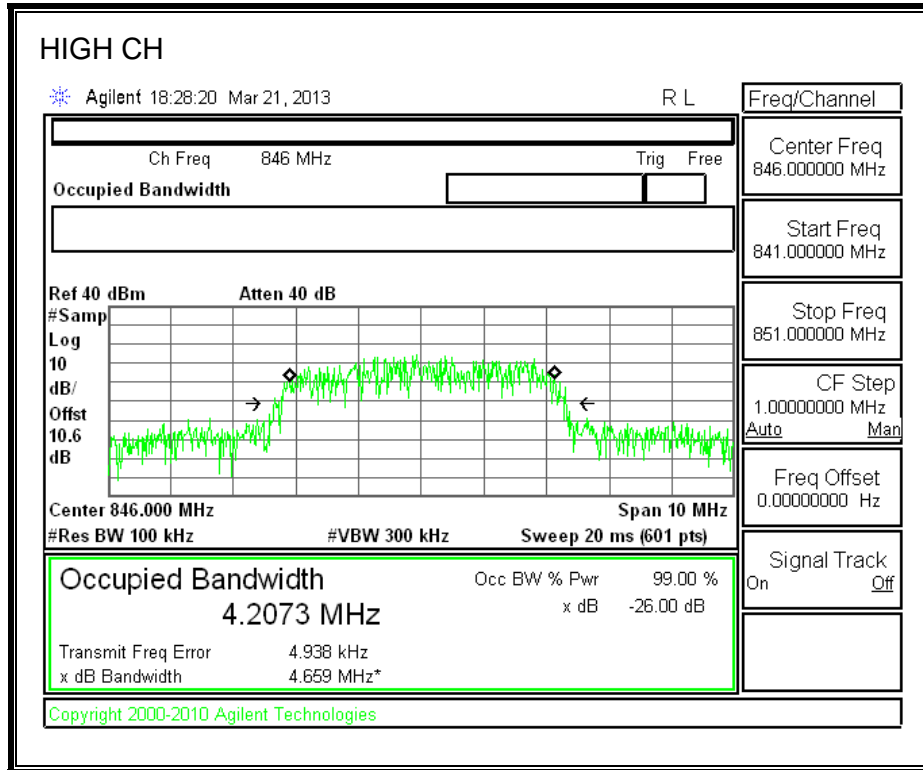




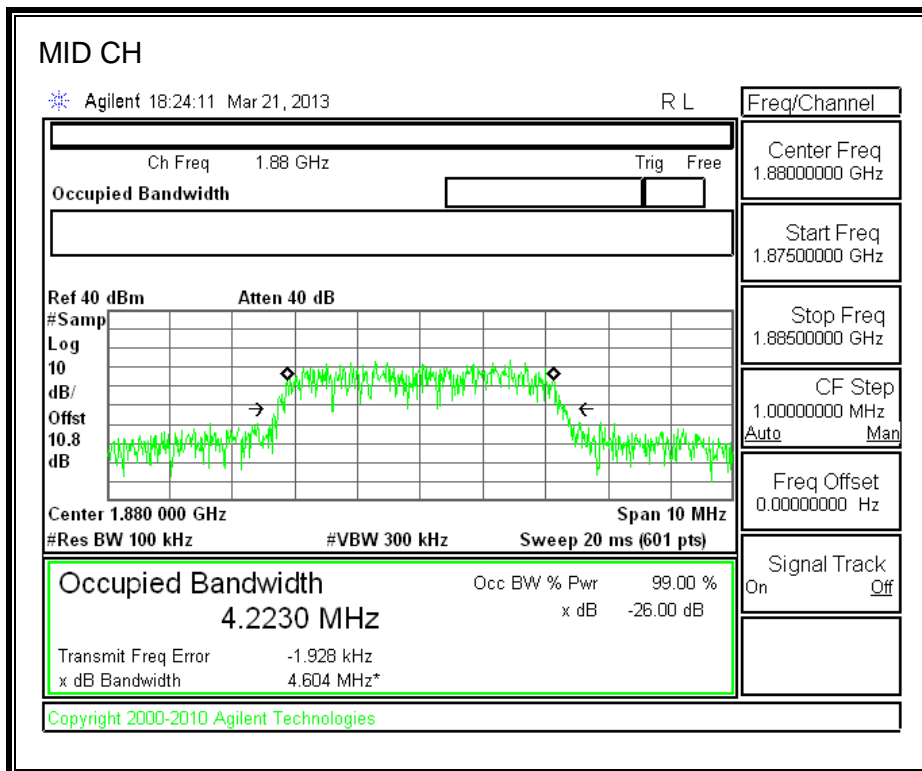
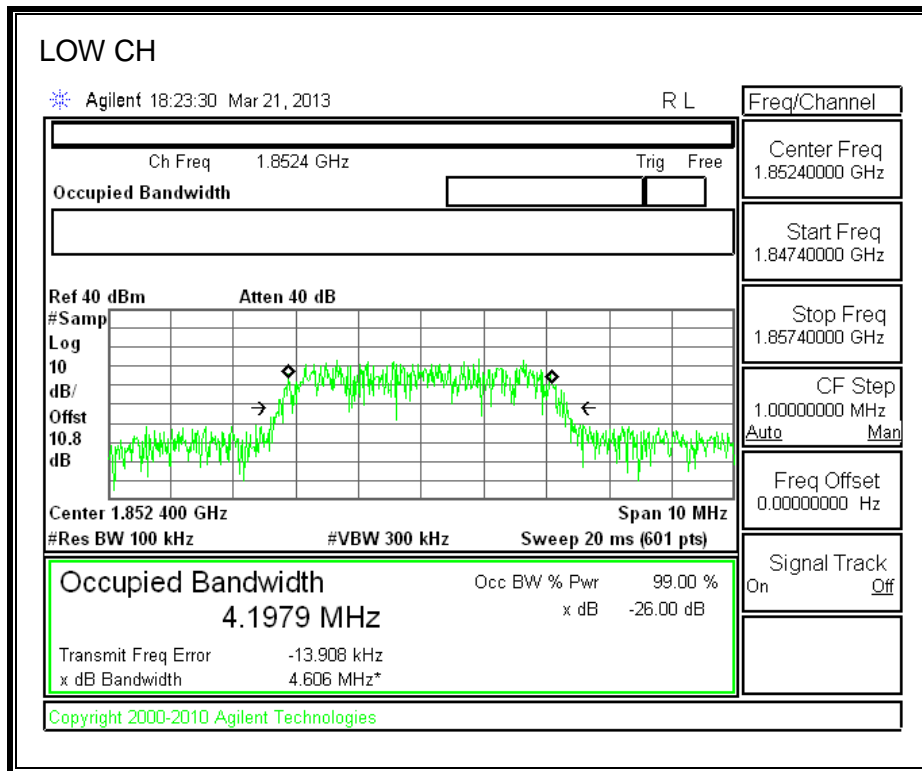
### 8.1.3. UMTS REL 99 MODE

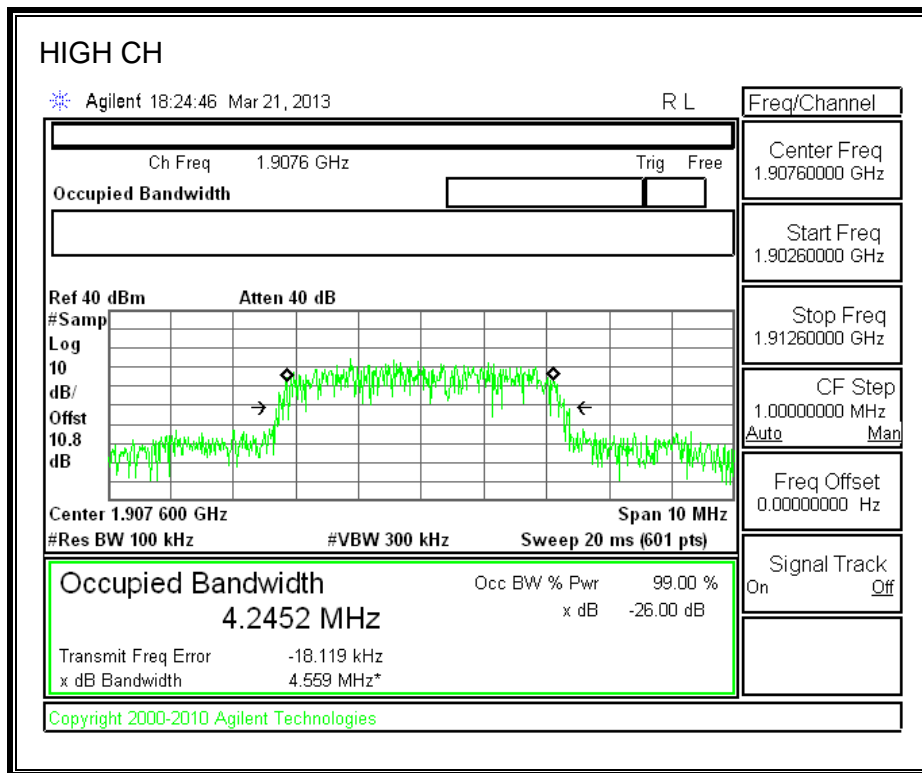
#### CELL BAND





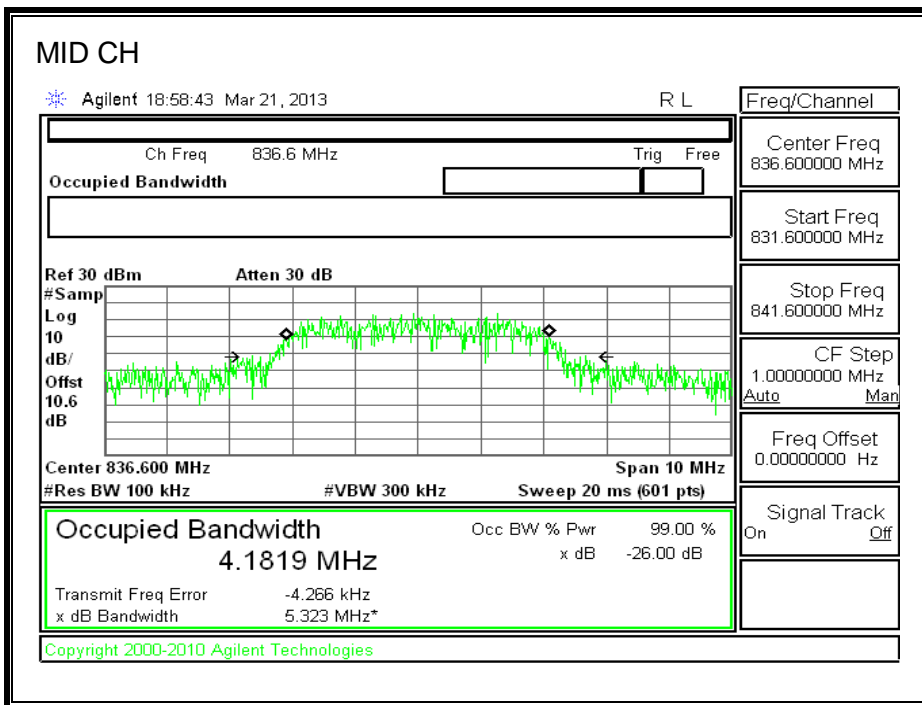
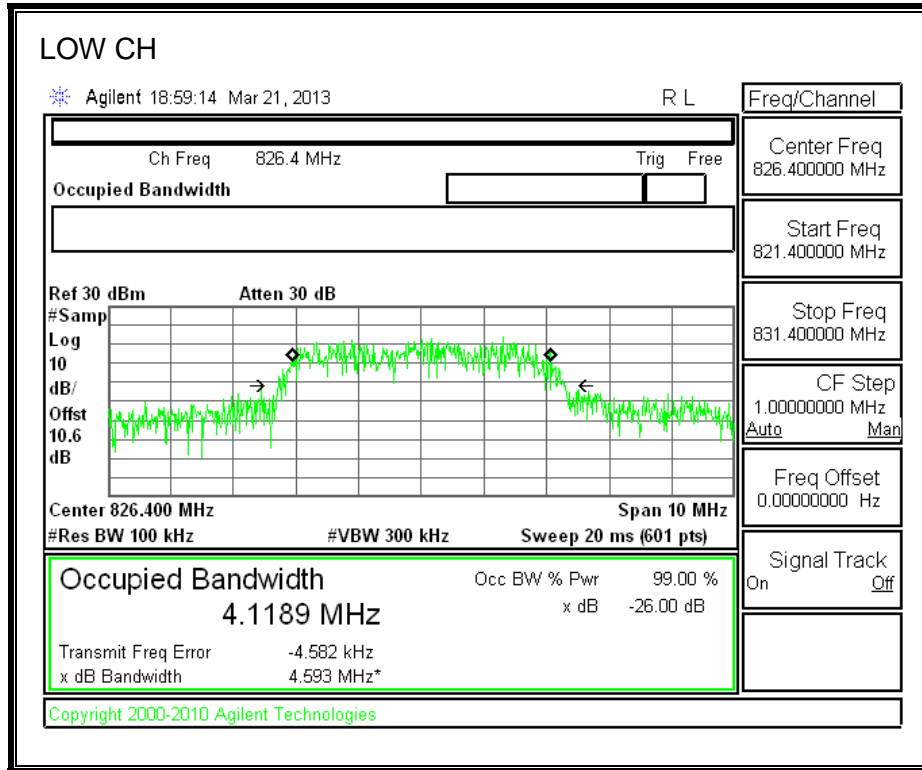
**PCS Band**

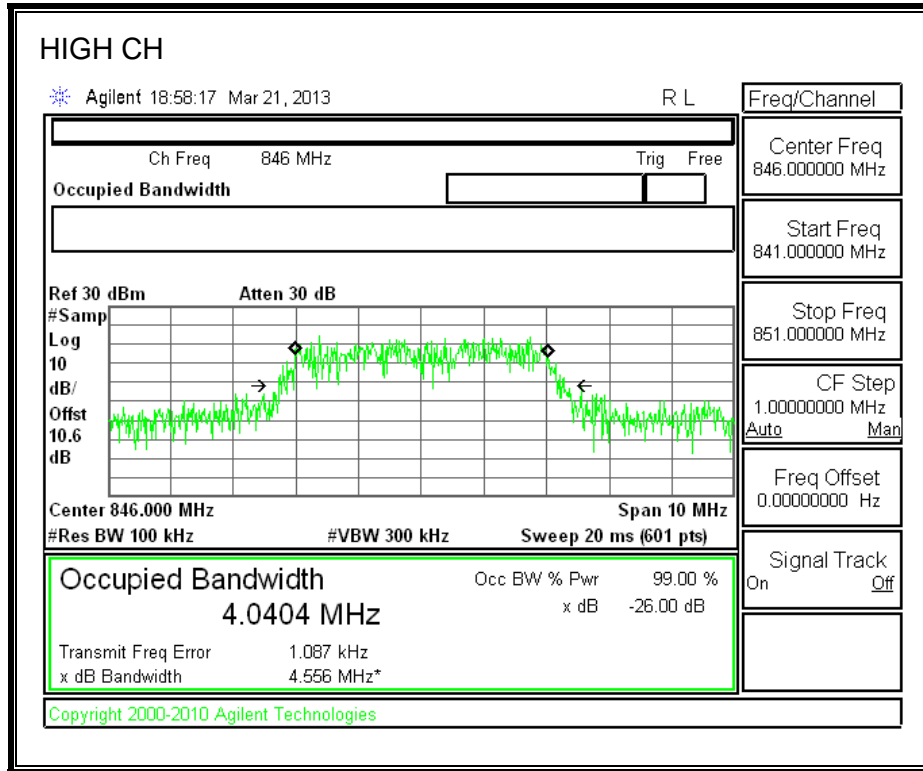




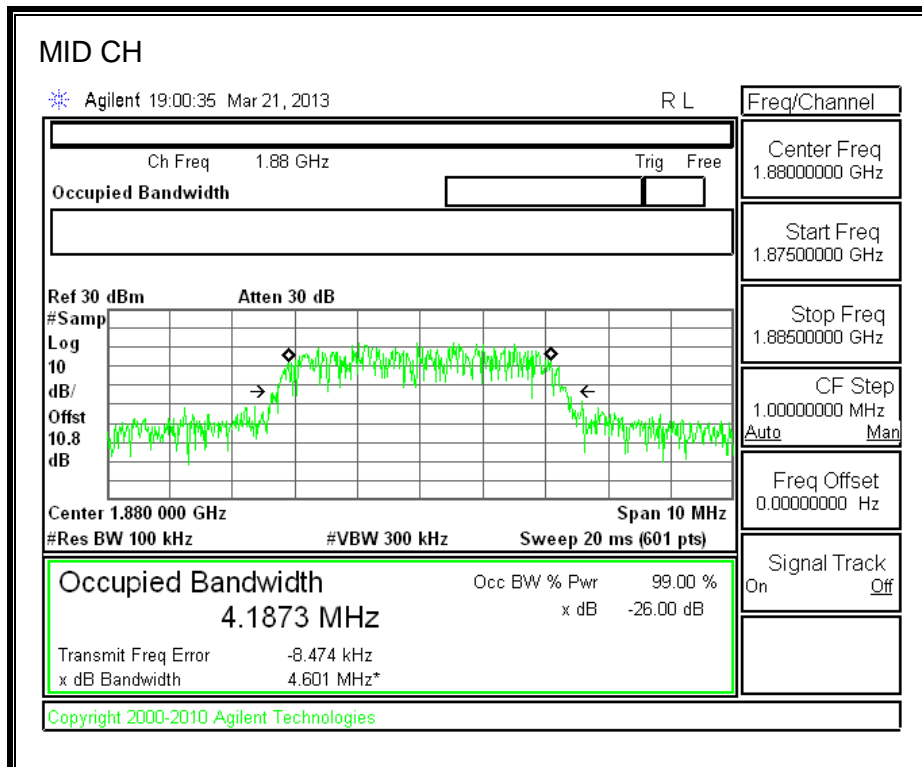
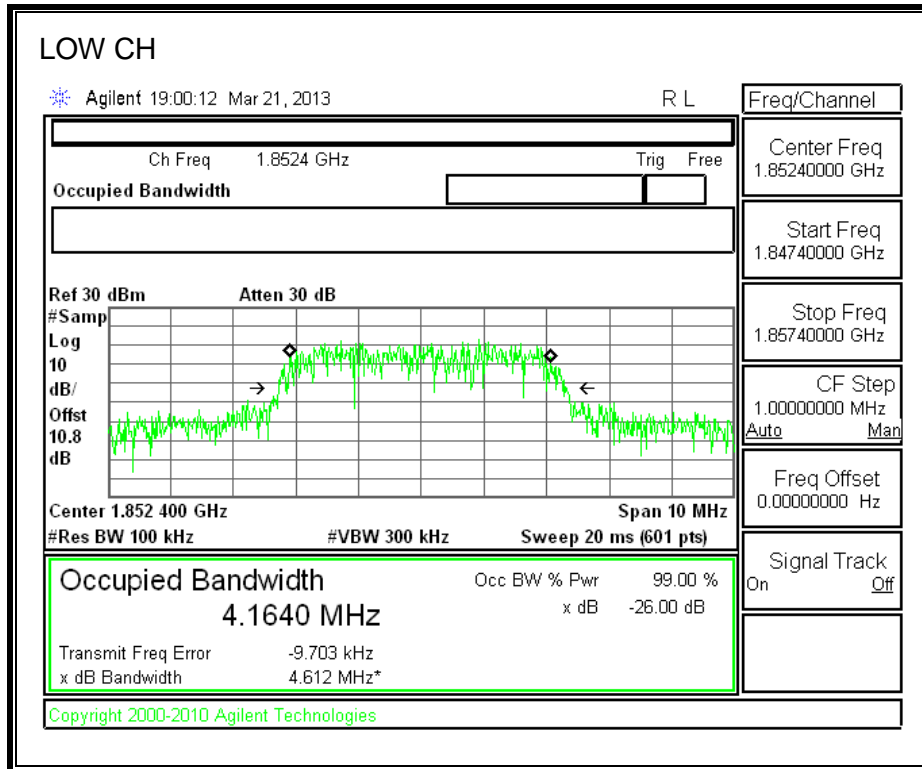
### 8.1.4. UMTS HSDPA MODE

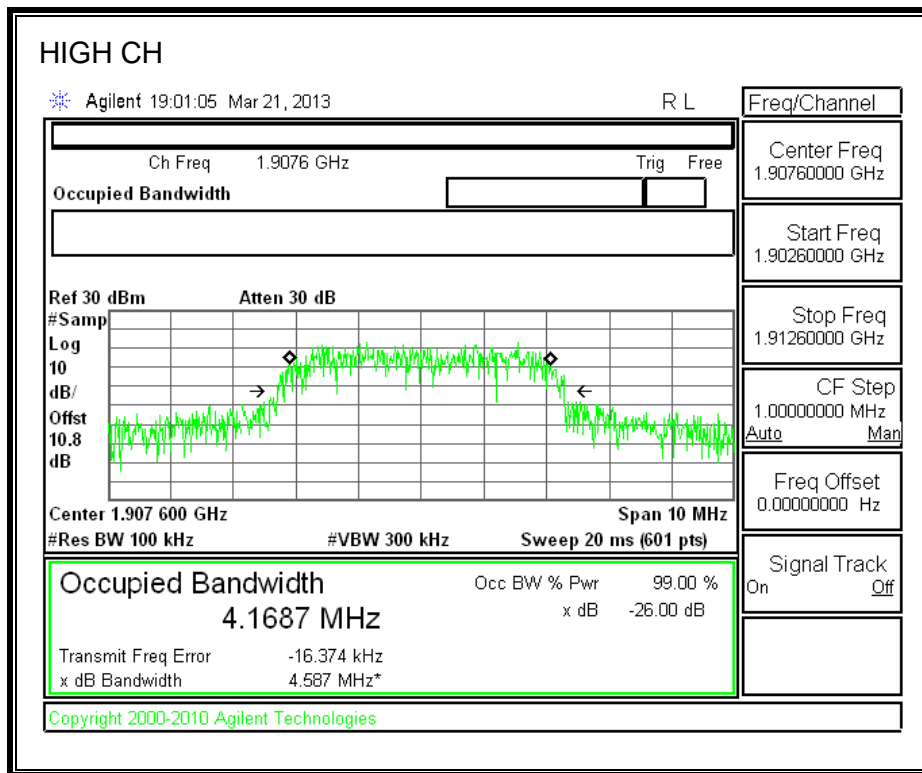
#### CELL Band





**PCS BAND**

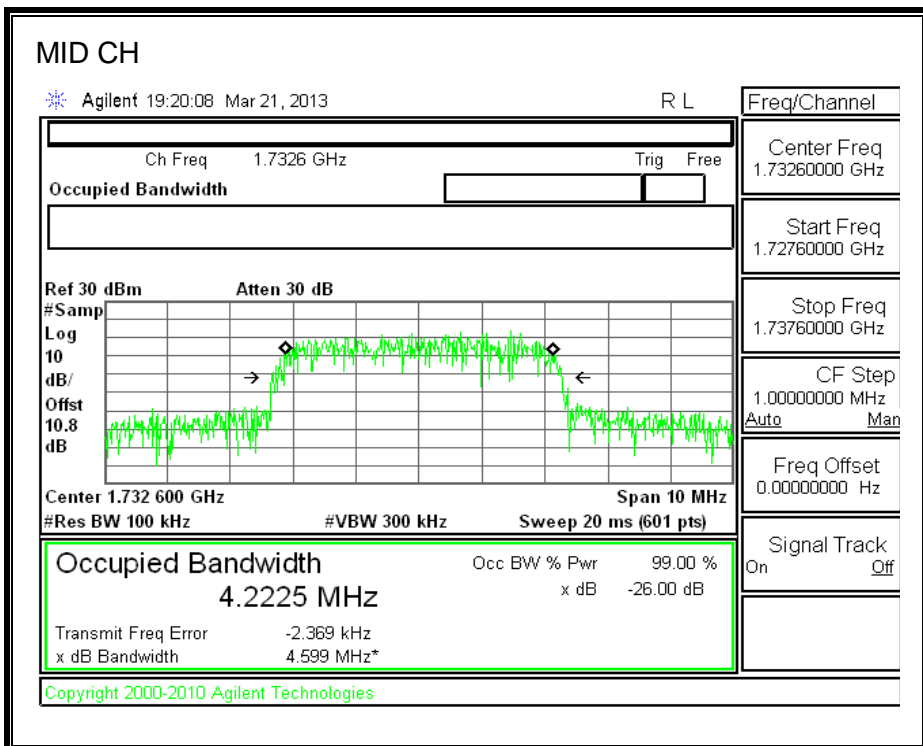
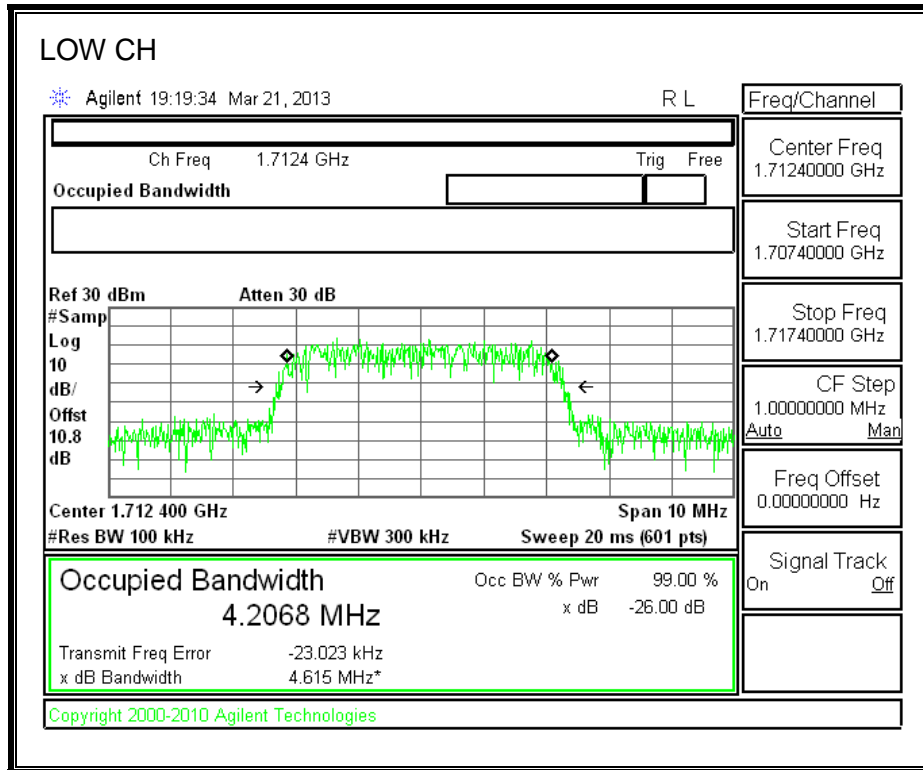


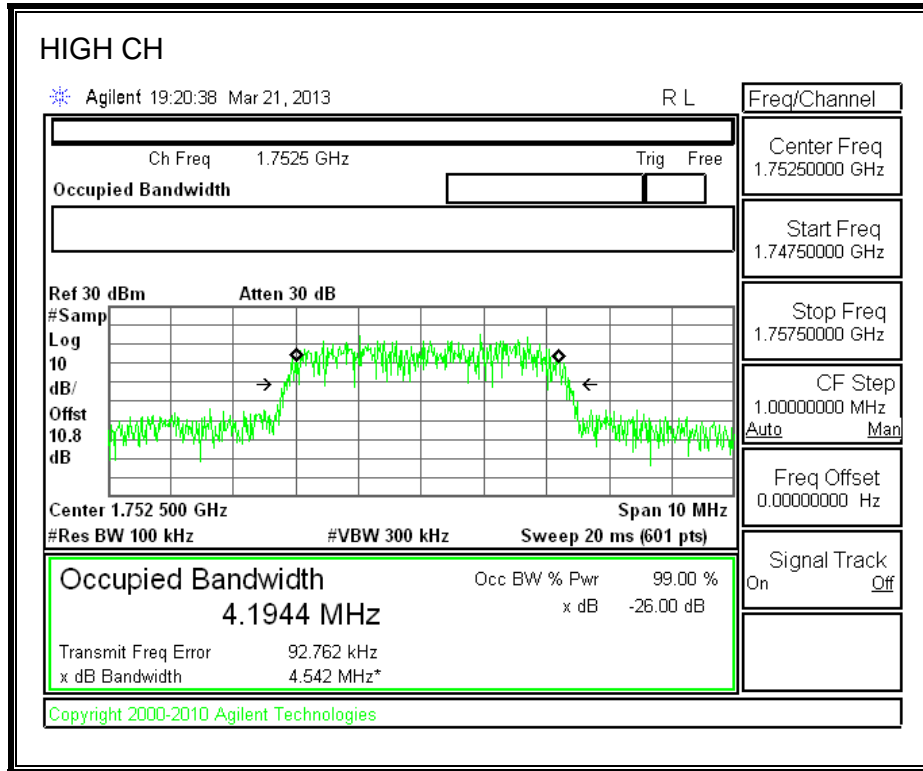




8.1.5. UMTS 1700 Rel 99 MODE

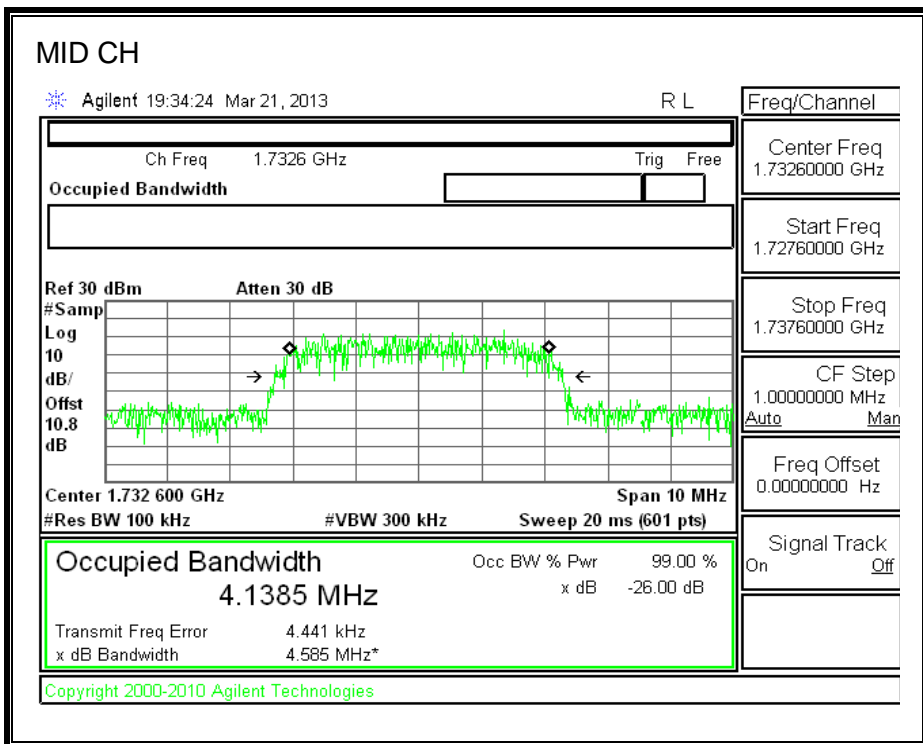
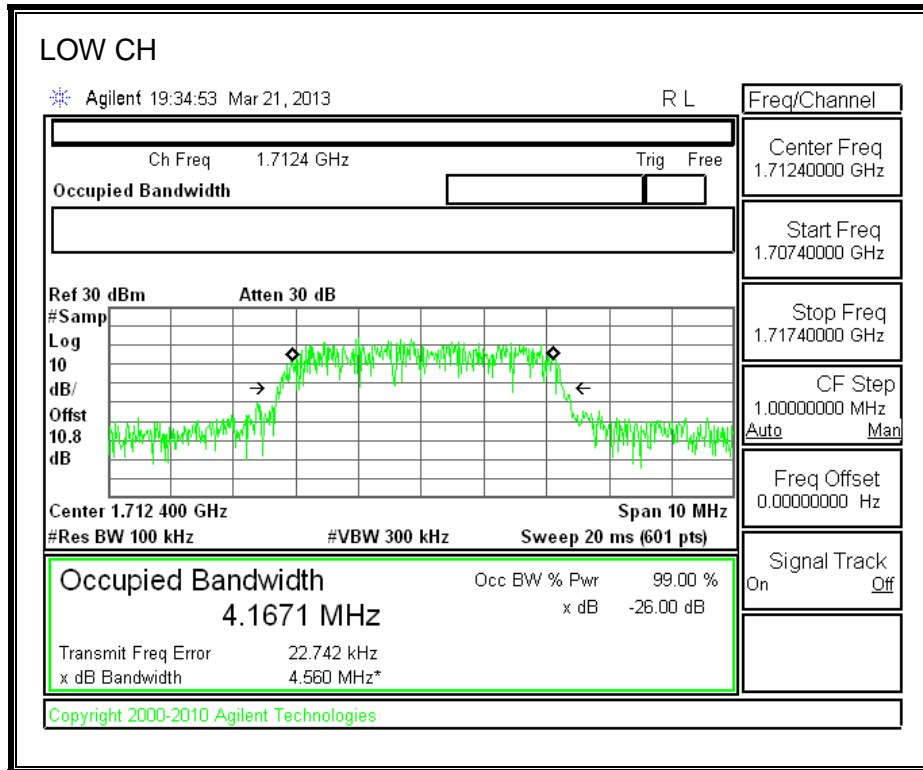
AWS Band

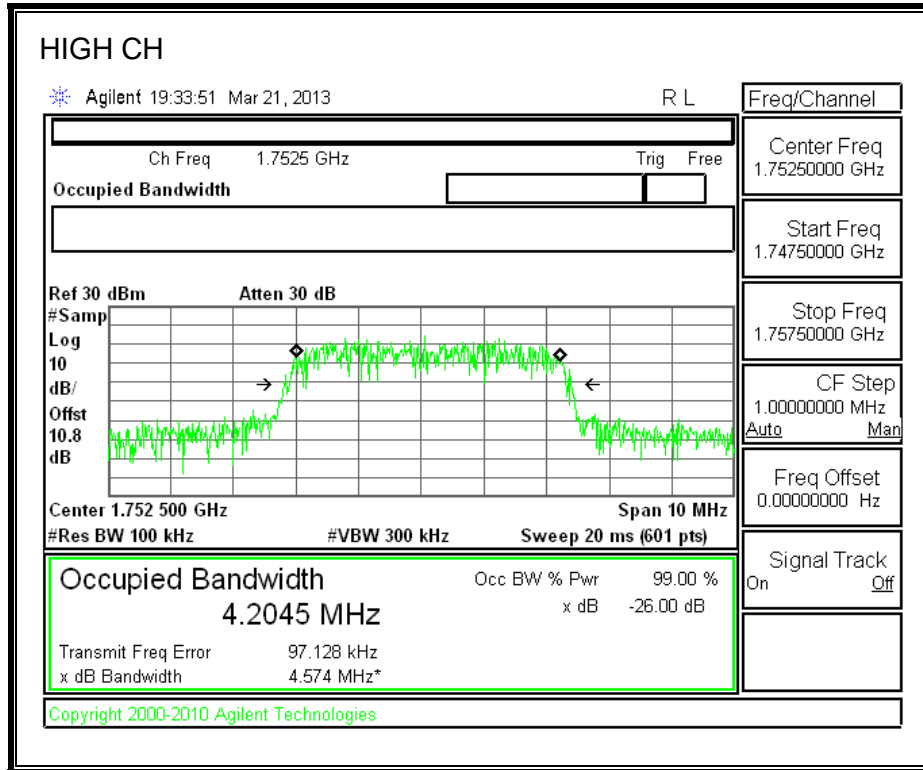




8.1.6. UMTS 1700 HSDPA MODE

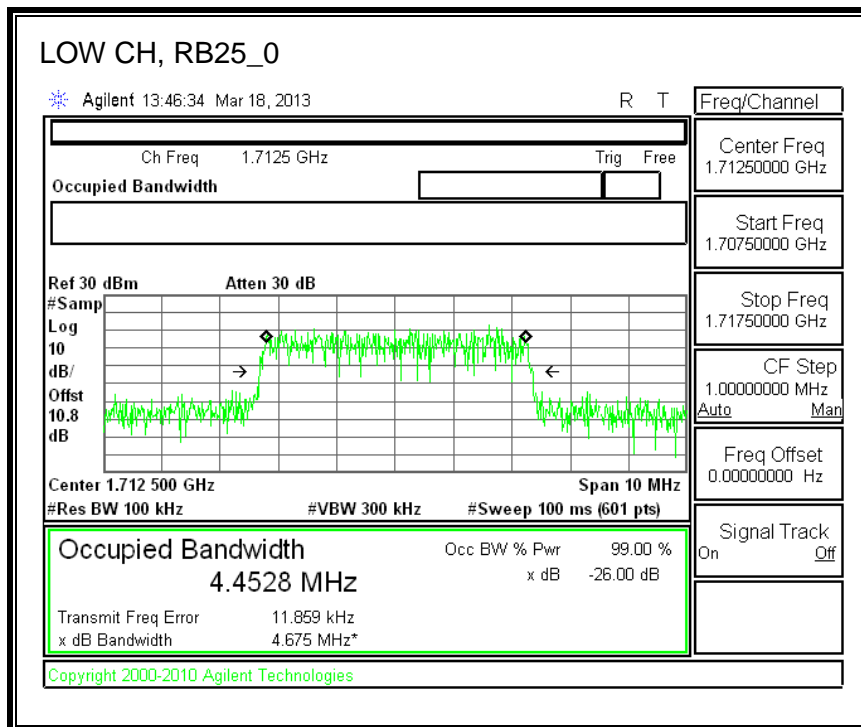
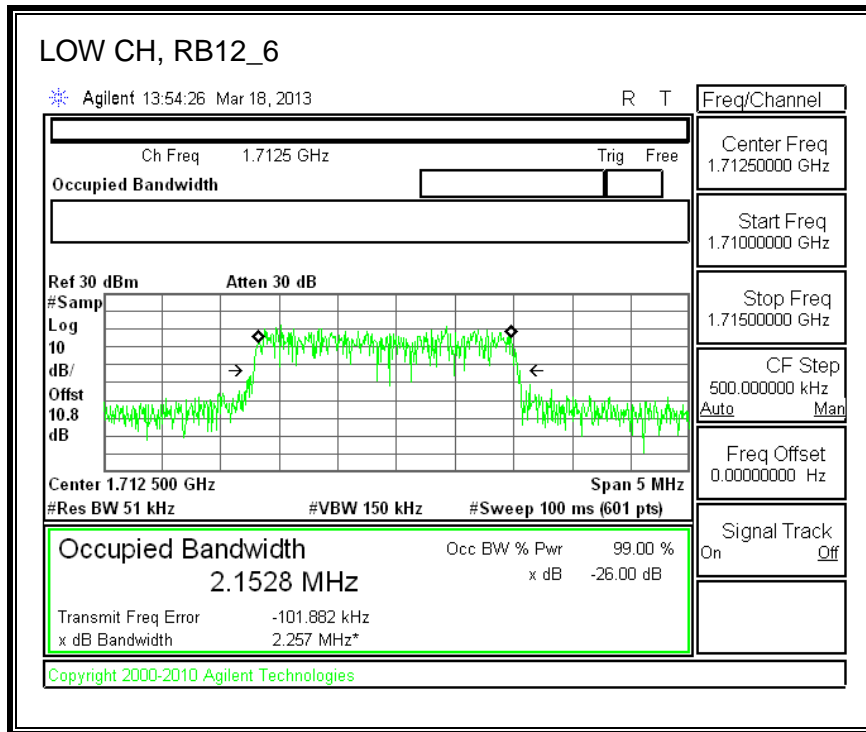
AWS Band

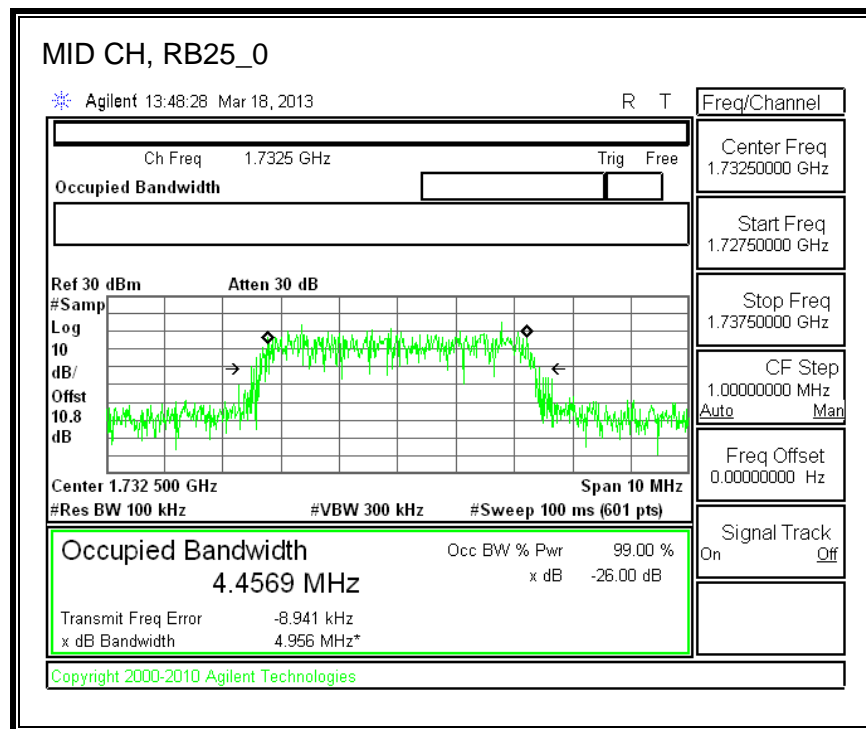
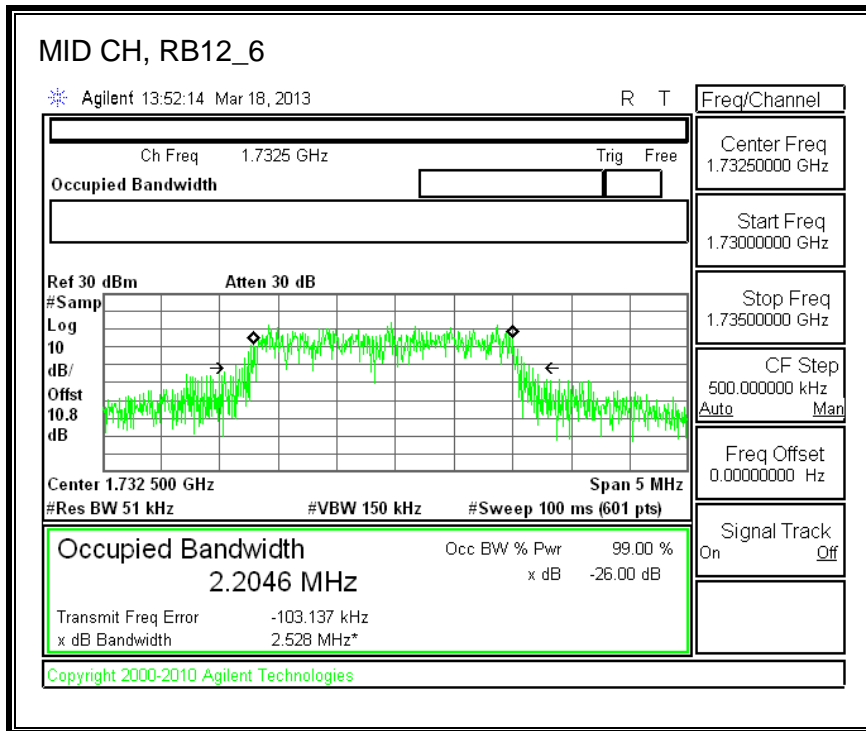


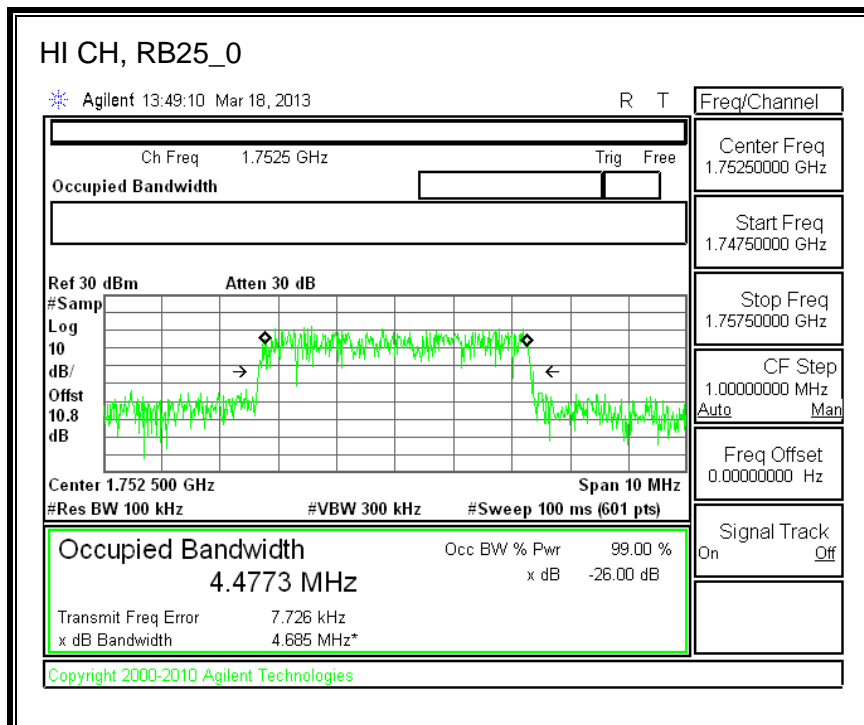
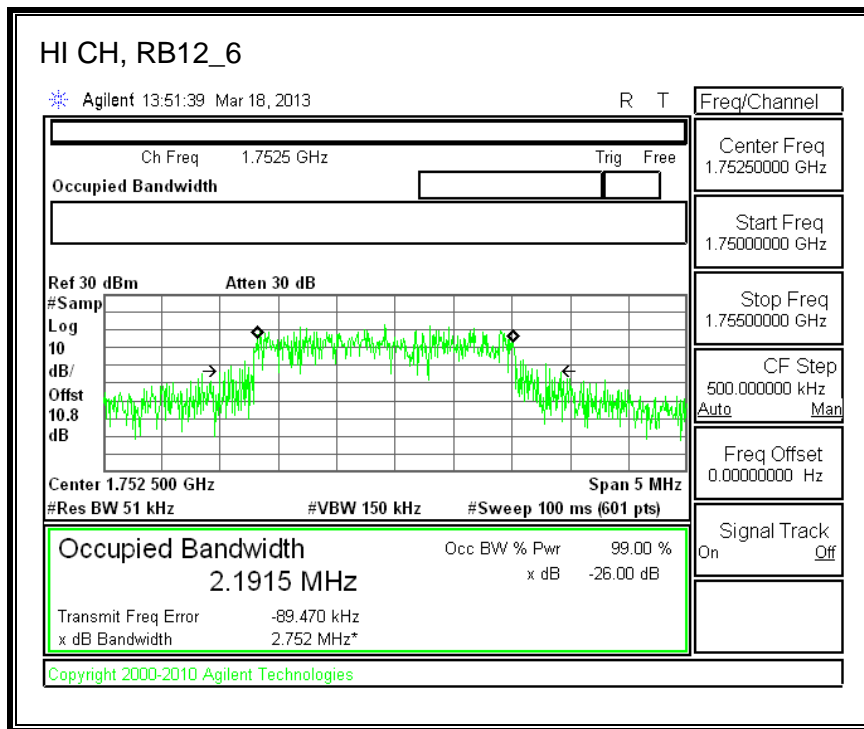


### 8.1.7. LTE BAND 4

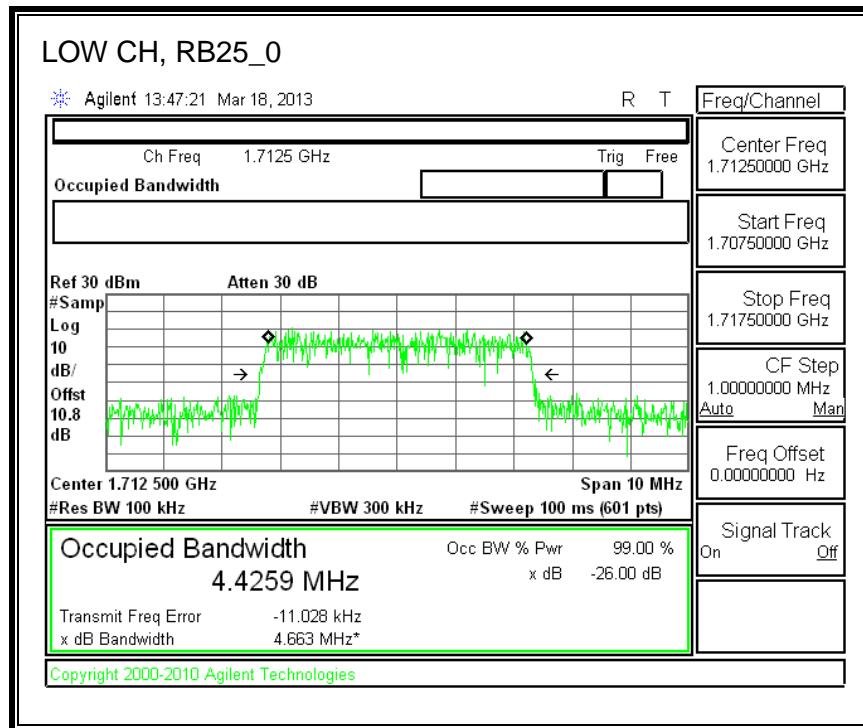
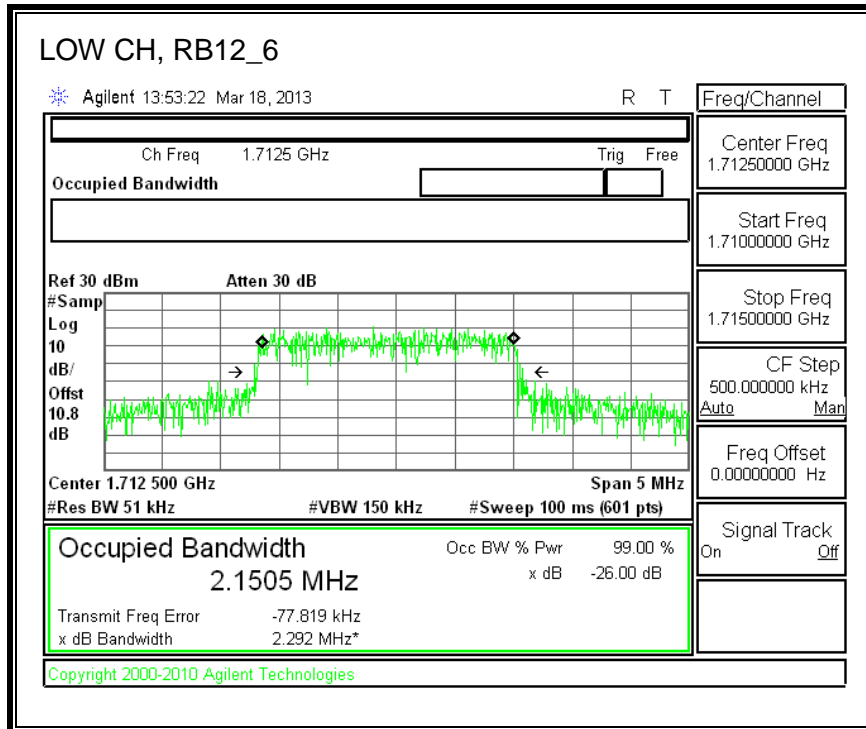
#### QPSK(5MHz BANDWIDTH)



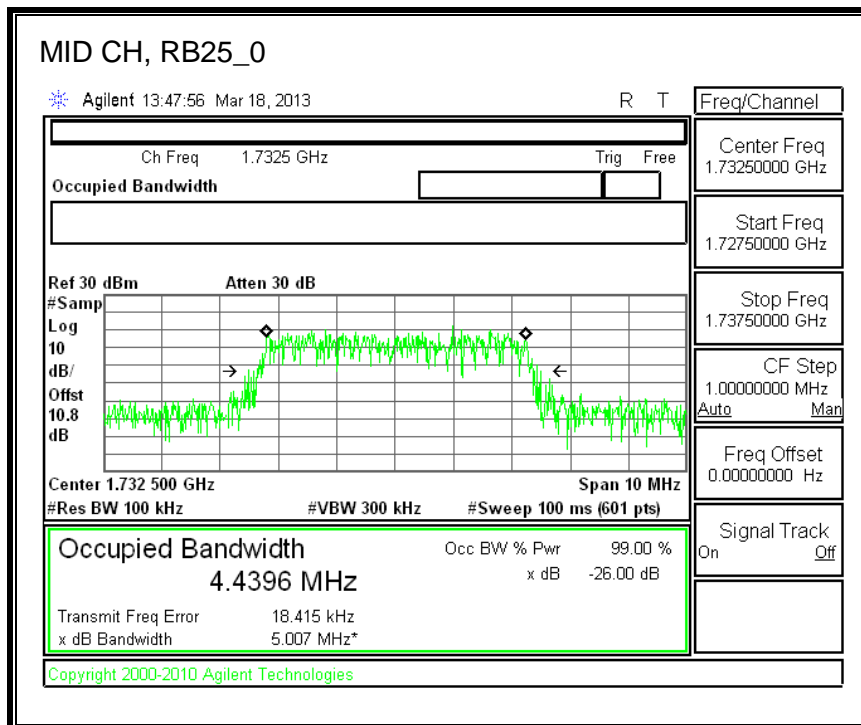
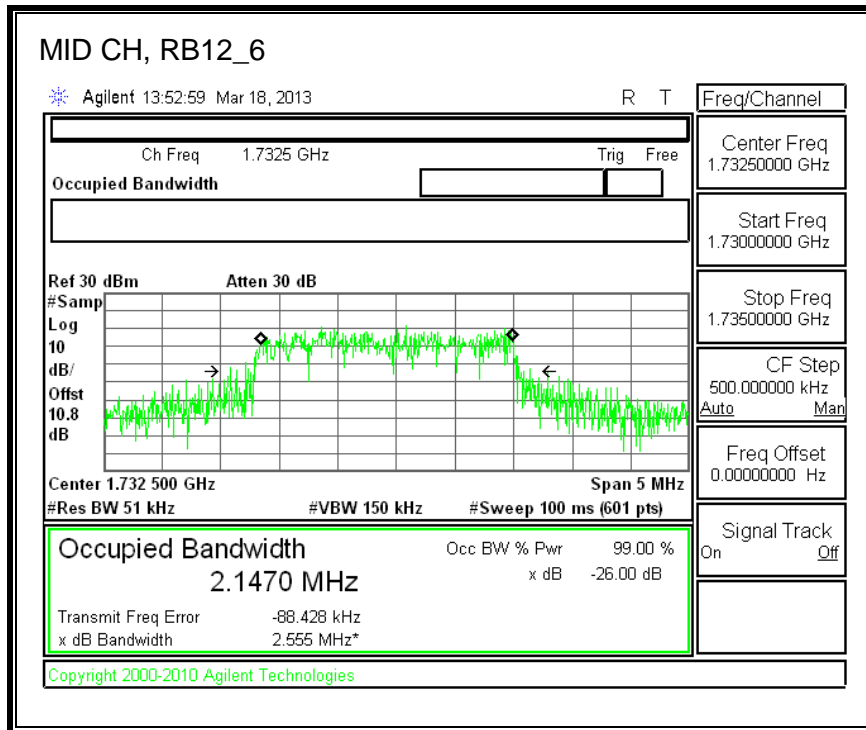


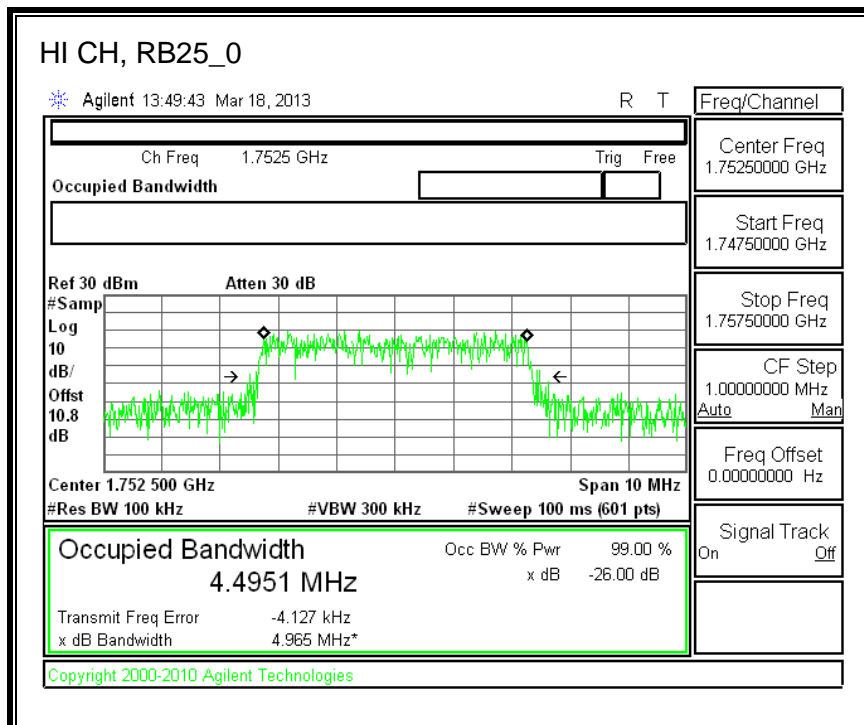
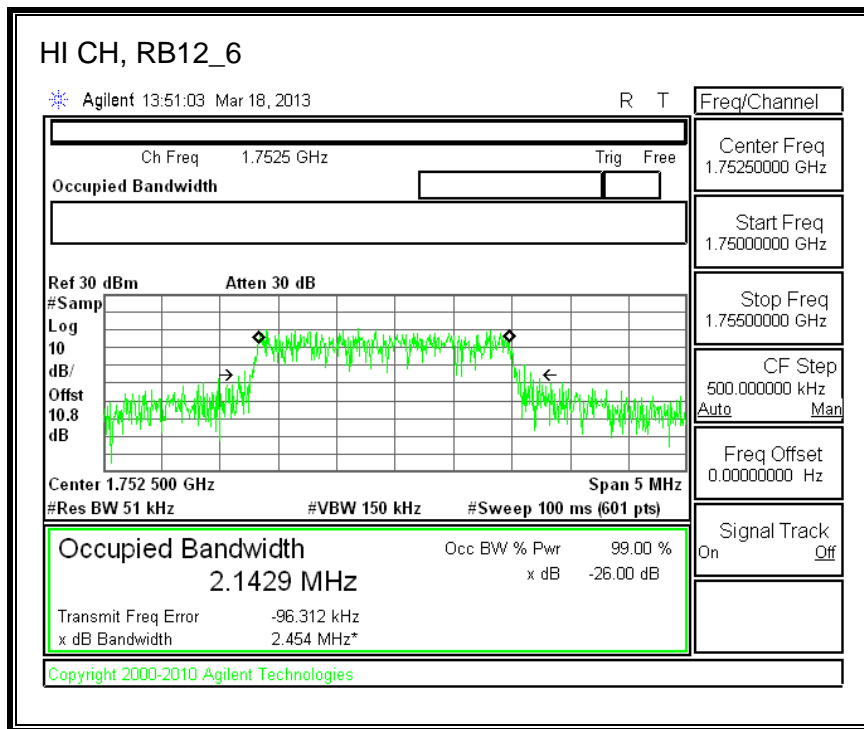


**16QAM(5 MHz BAND WIDTH)**

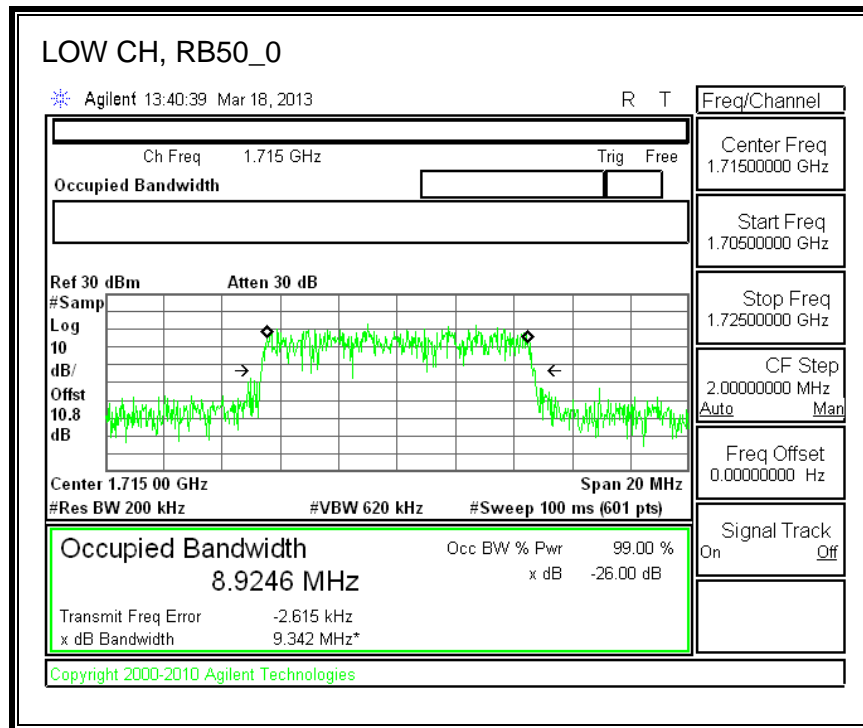
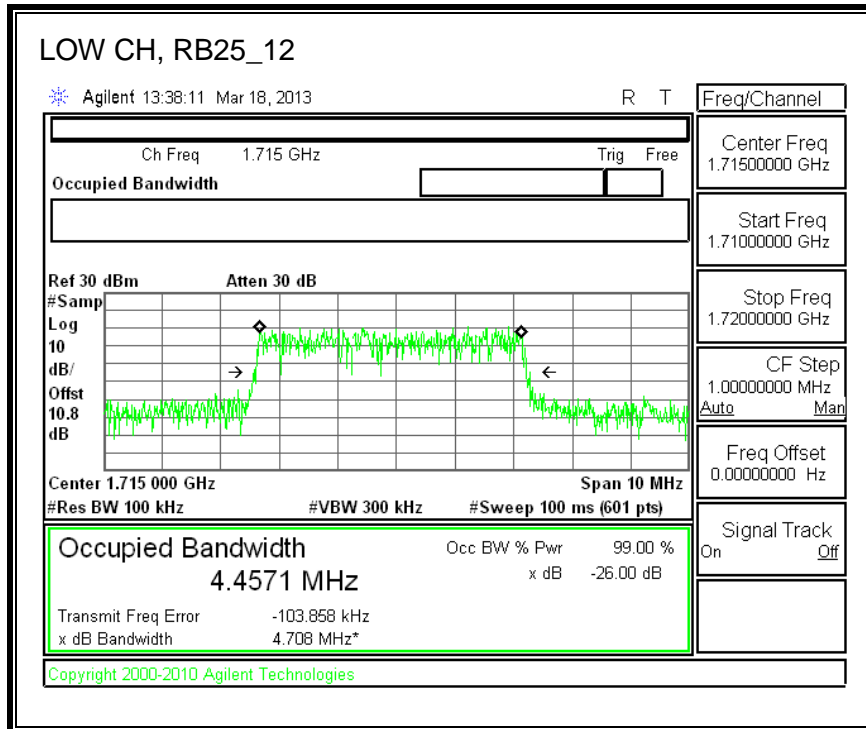


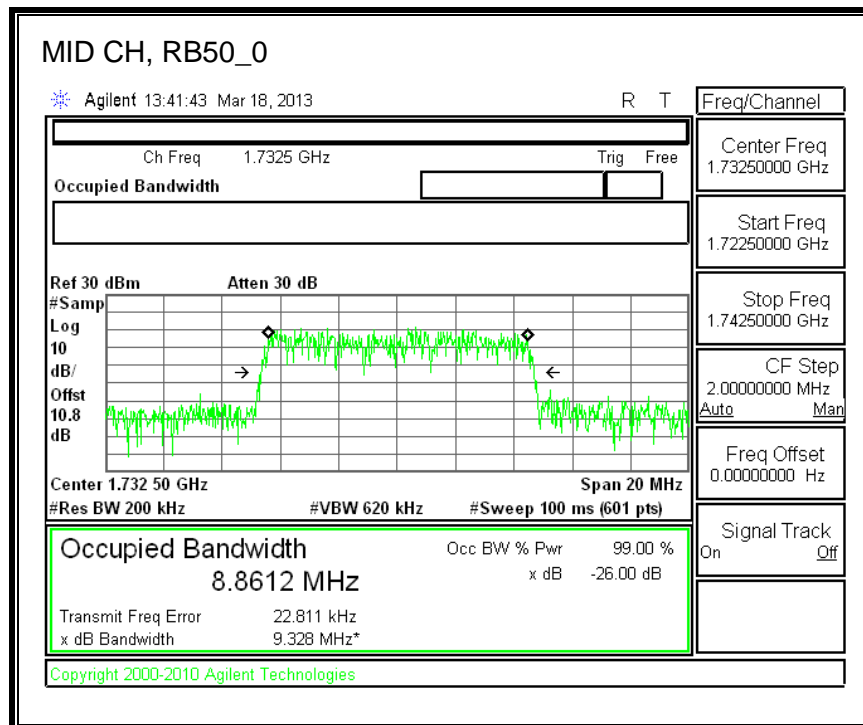
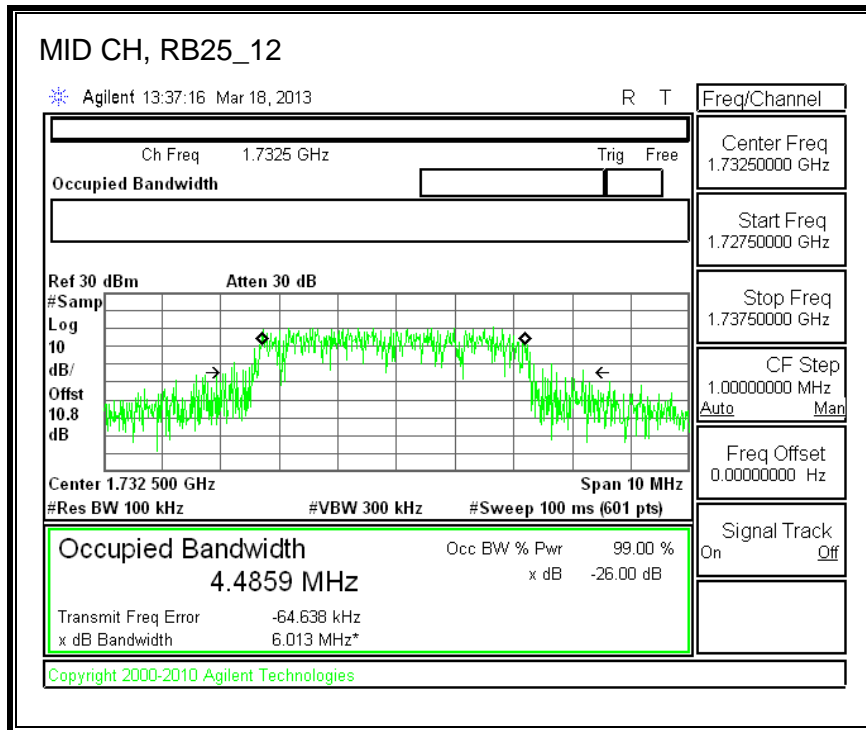


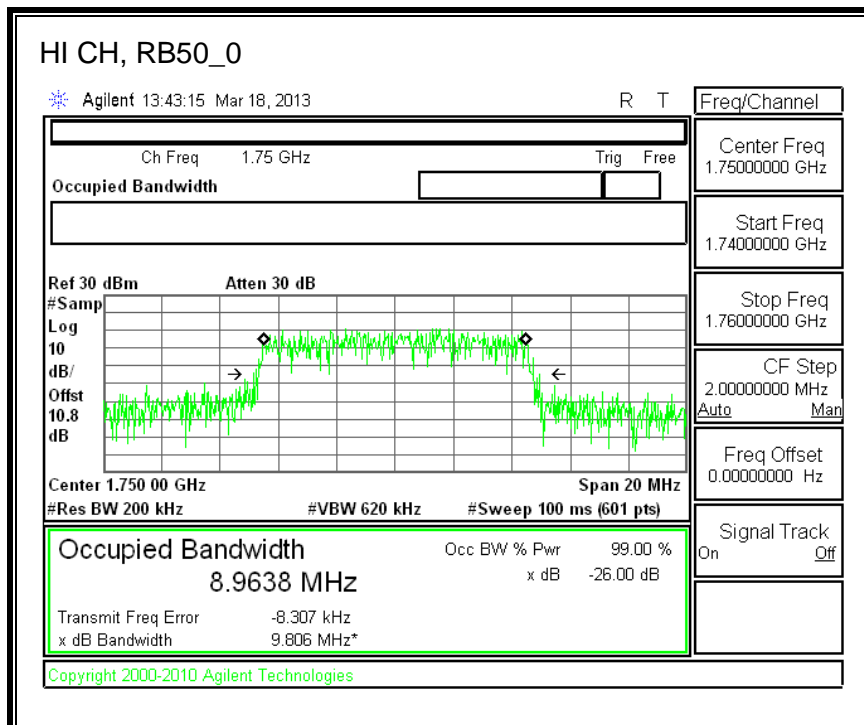
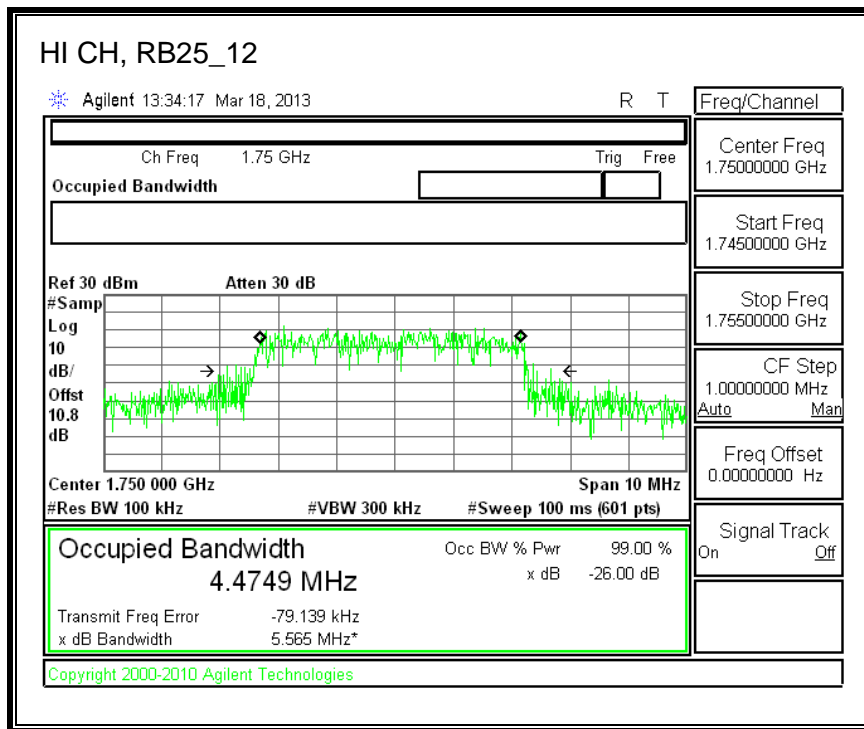




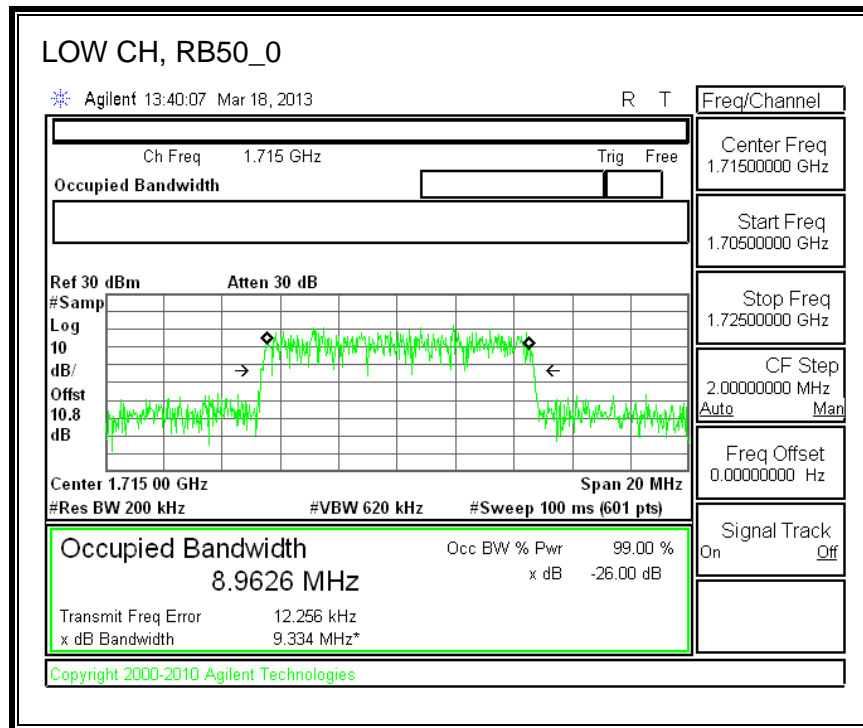
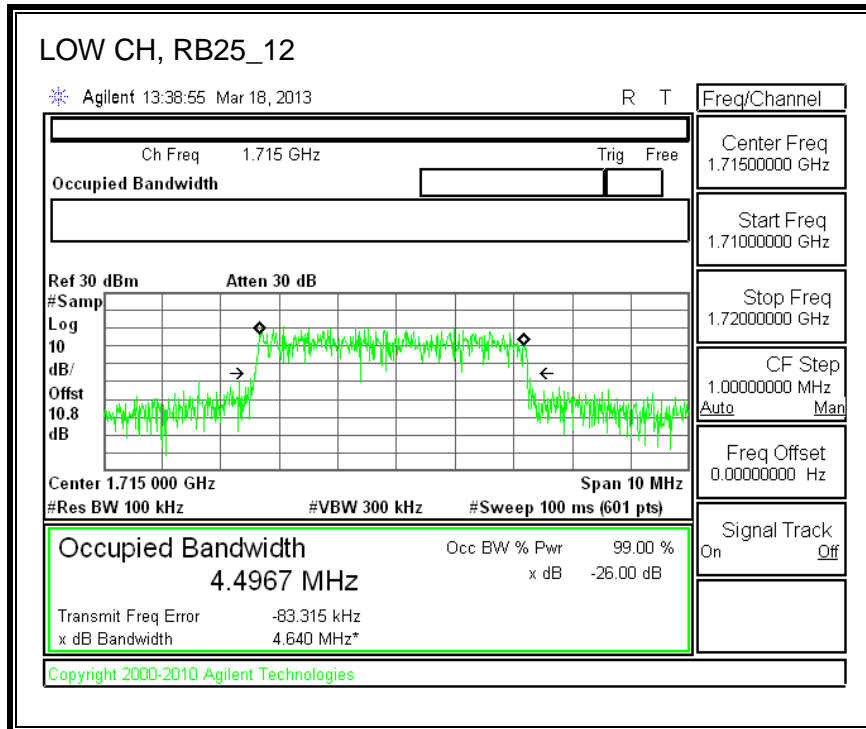
**QPSK (10.0 MHz BAND WIDTH)**

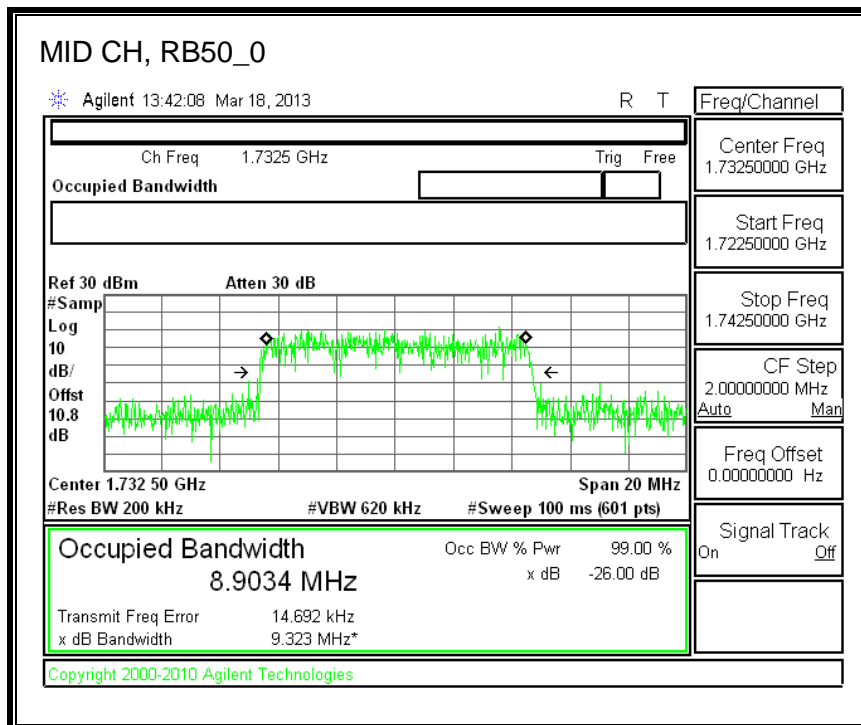
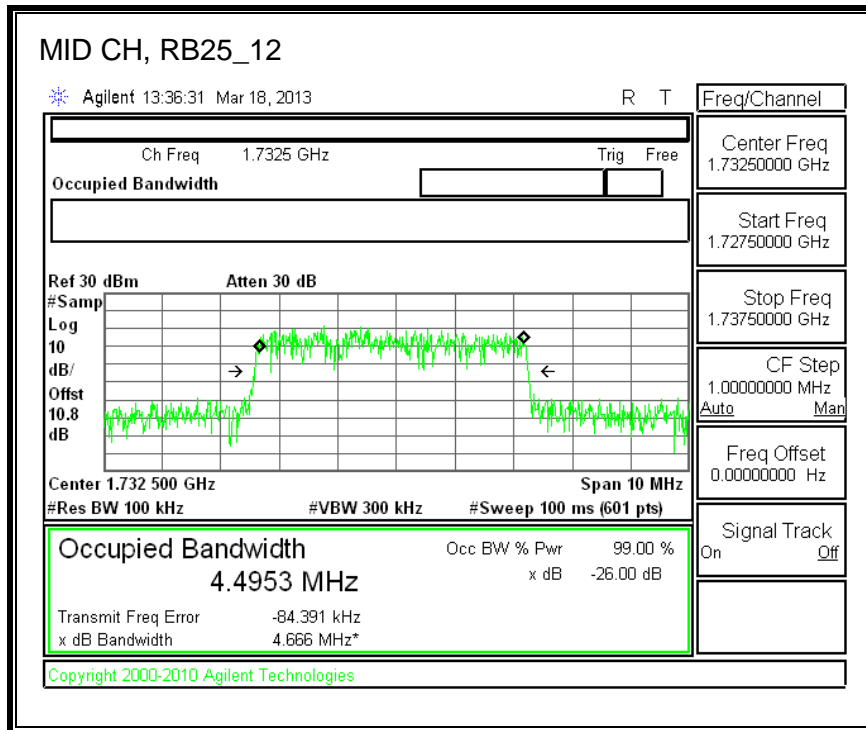


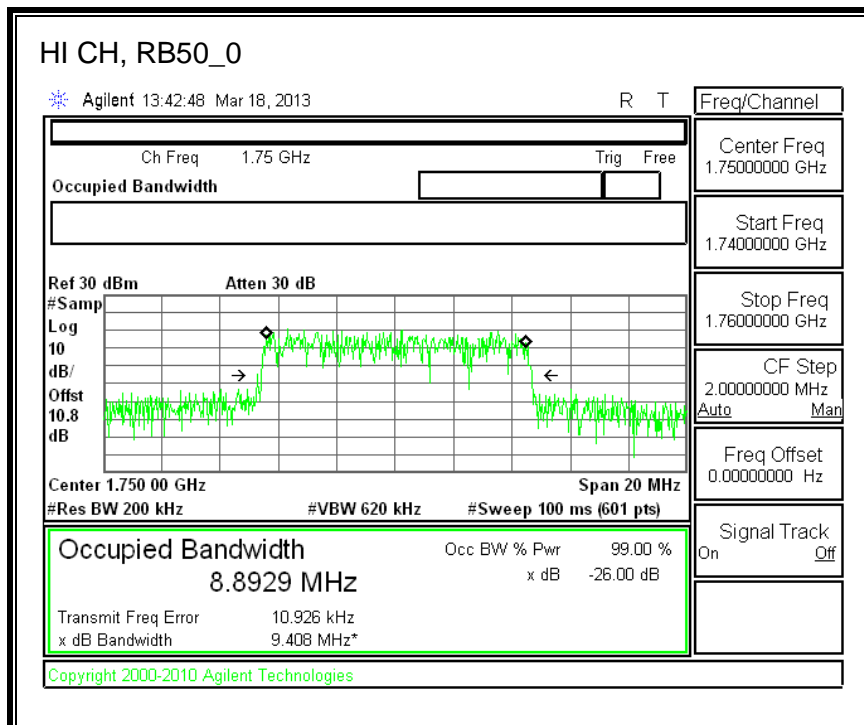
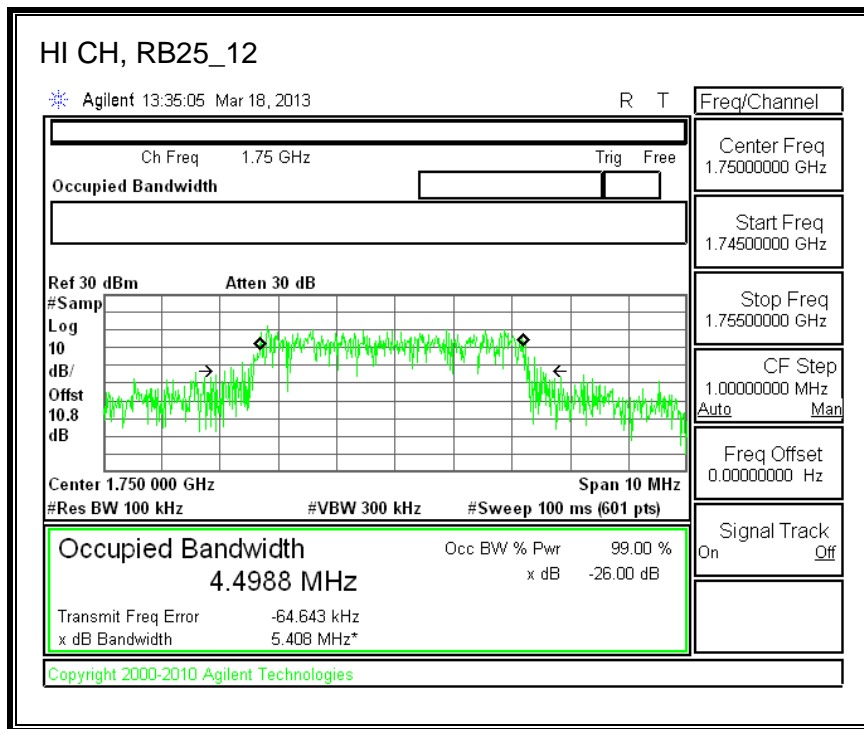




**16QAM (10 MHz BAND WIDTH)**

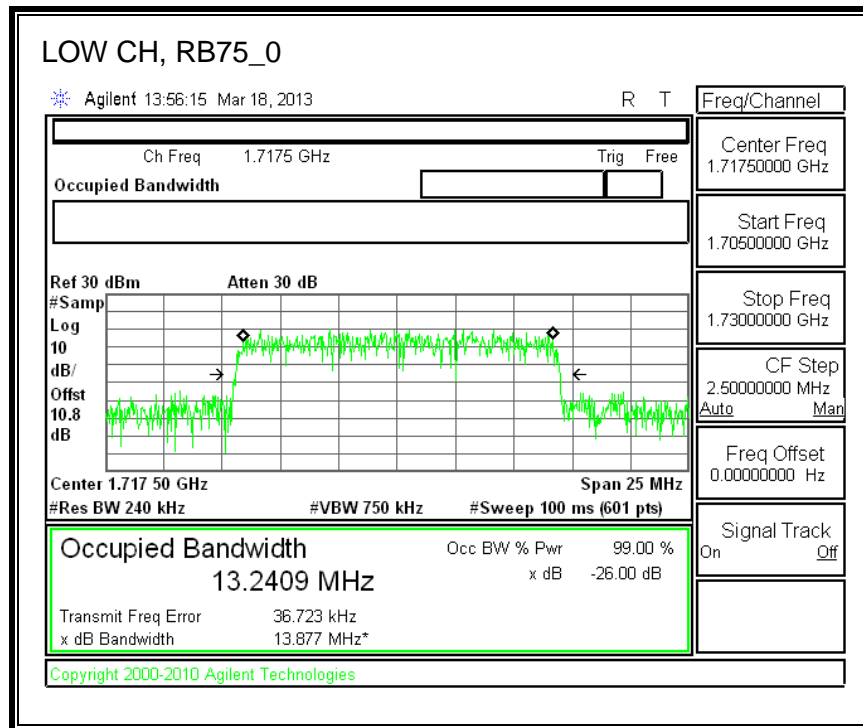
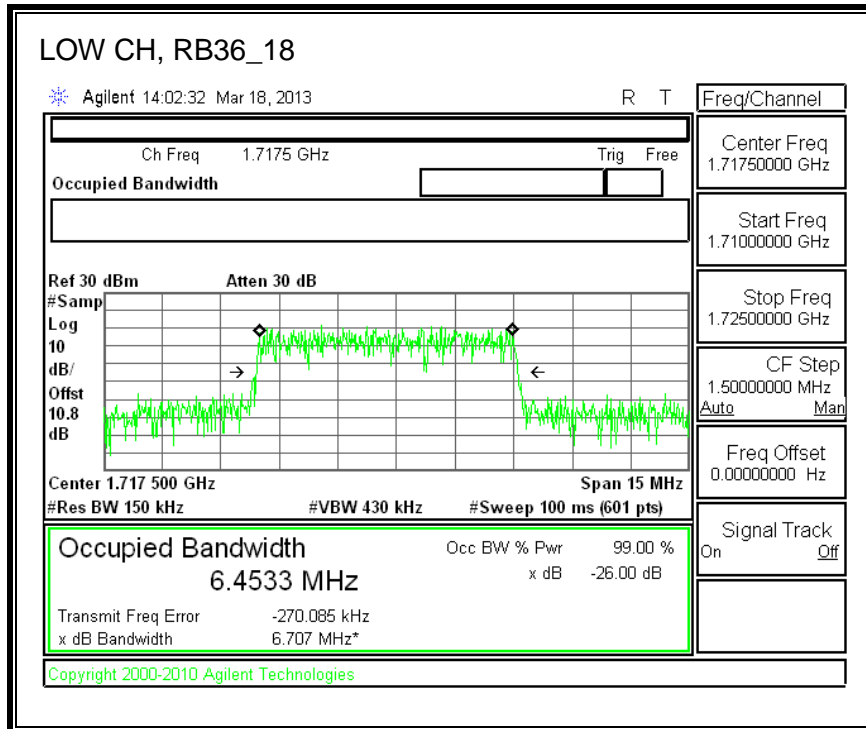


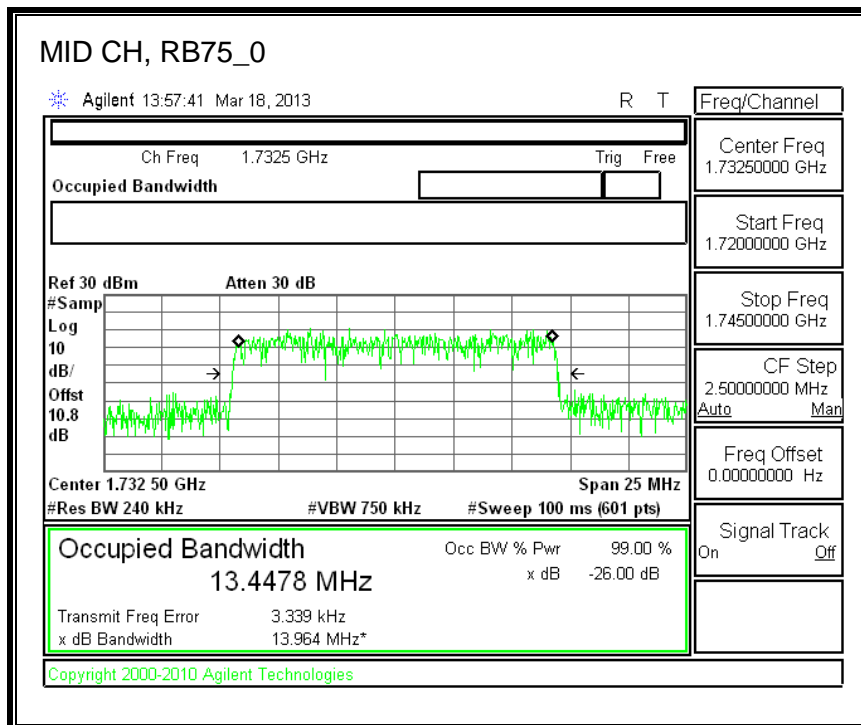
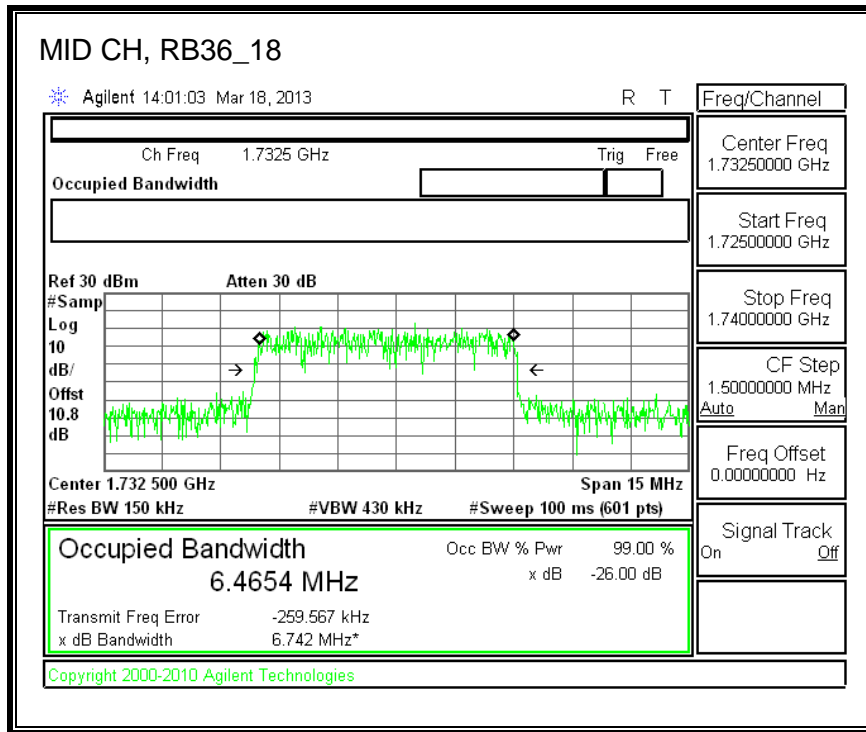


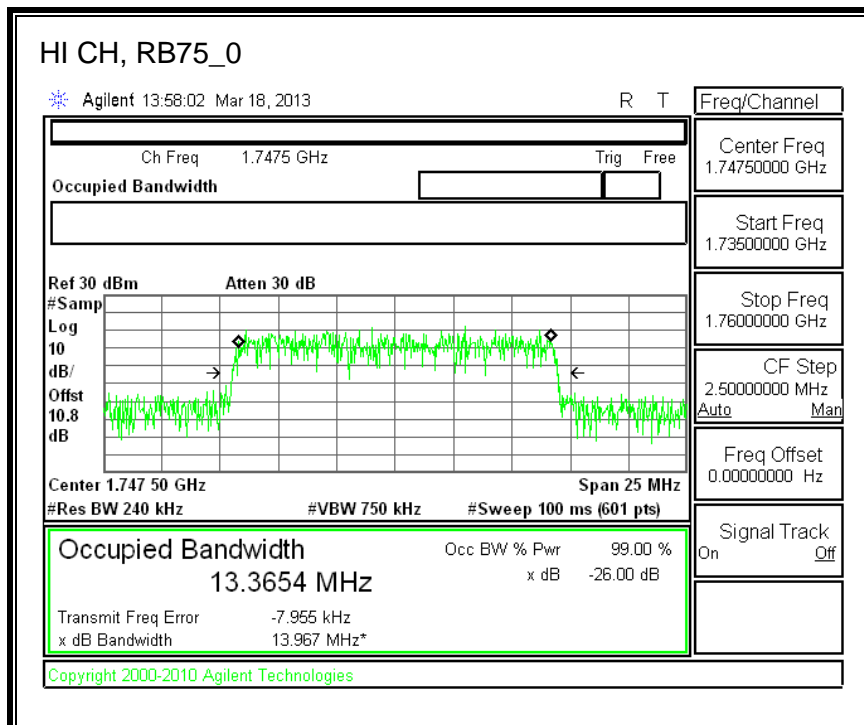
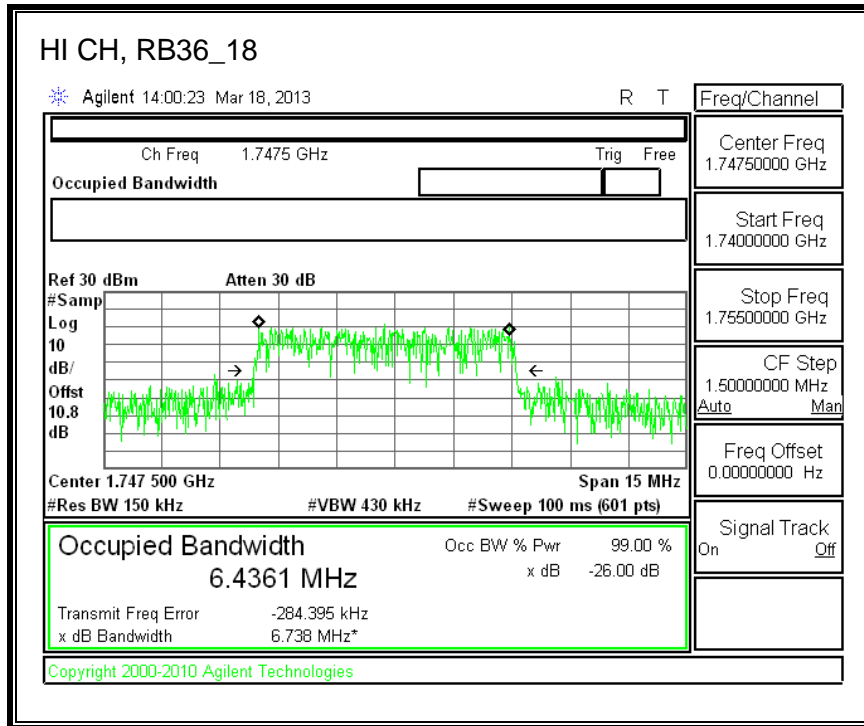




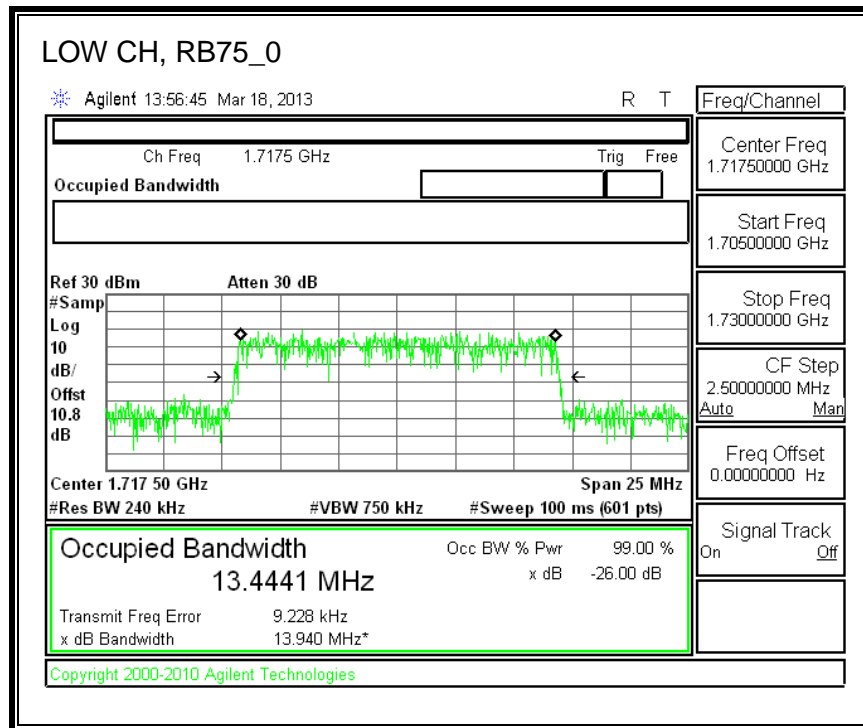
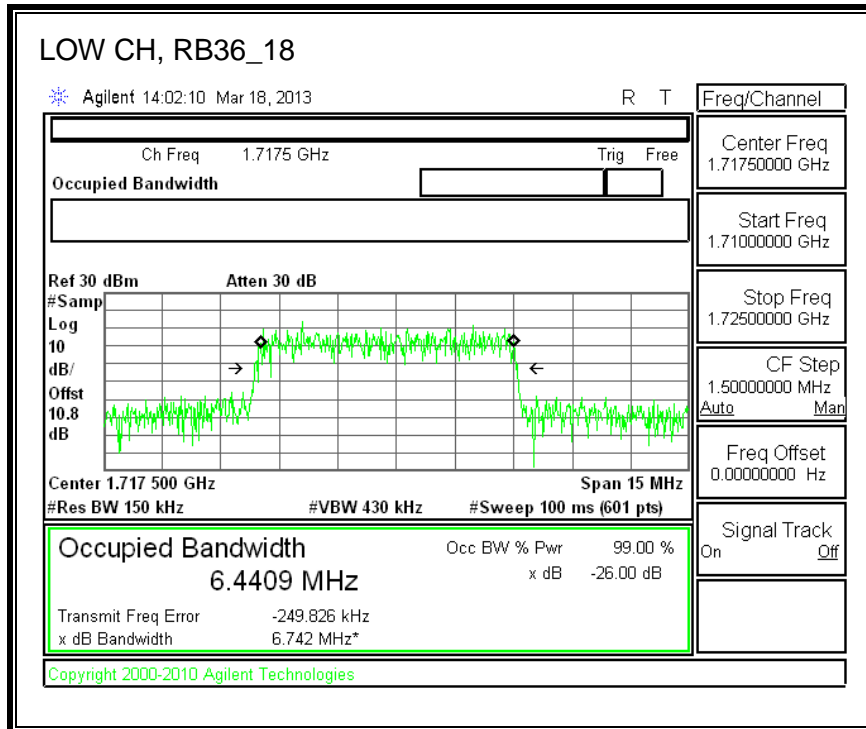
**QPSK (15.0 MHz BAND WIDTH)**

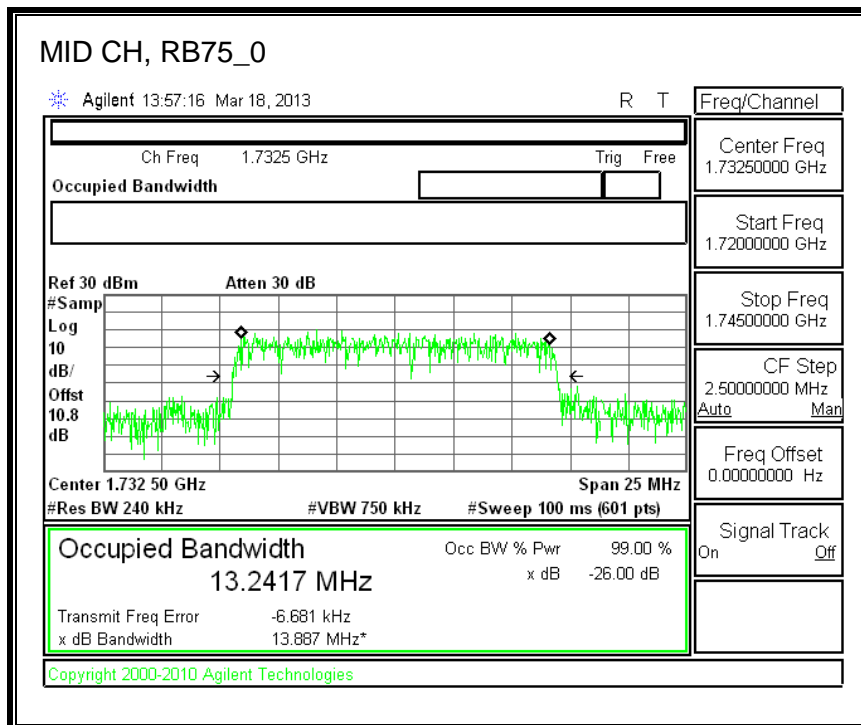
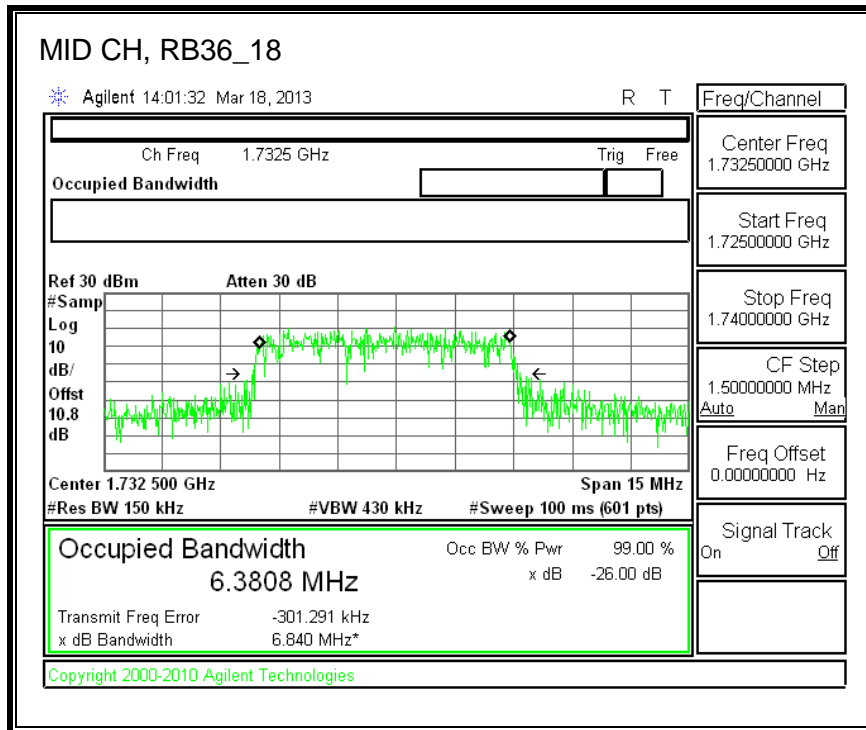


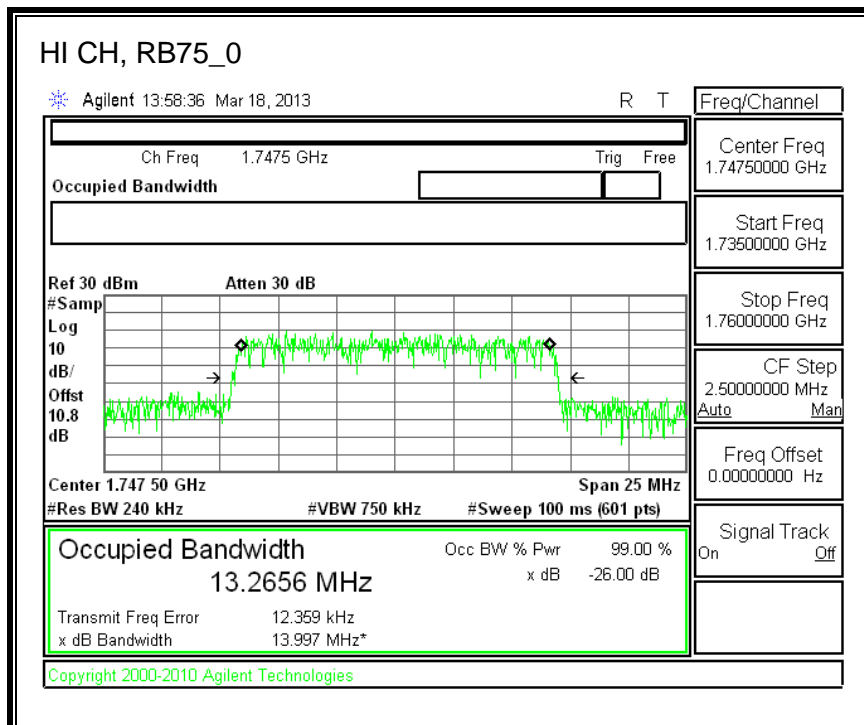
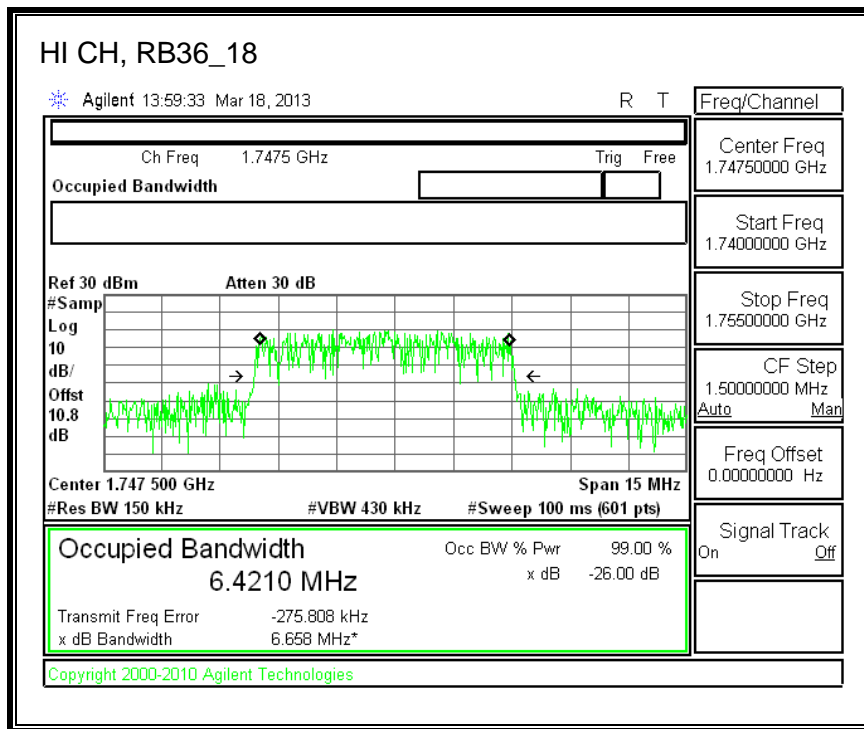




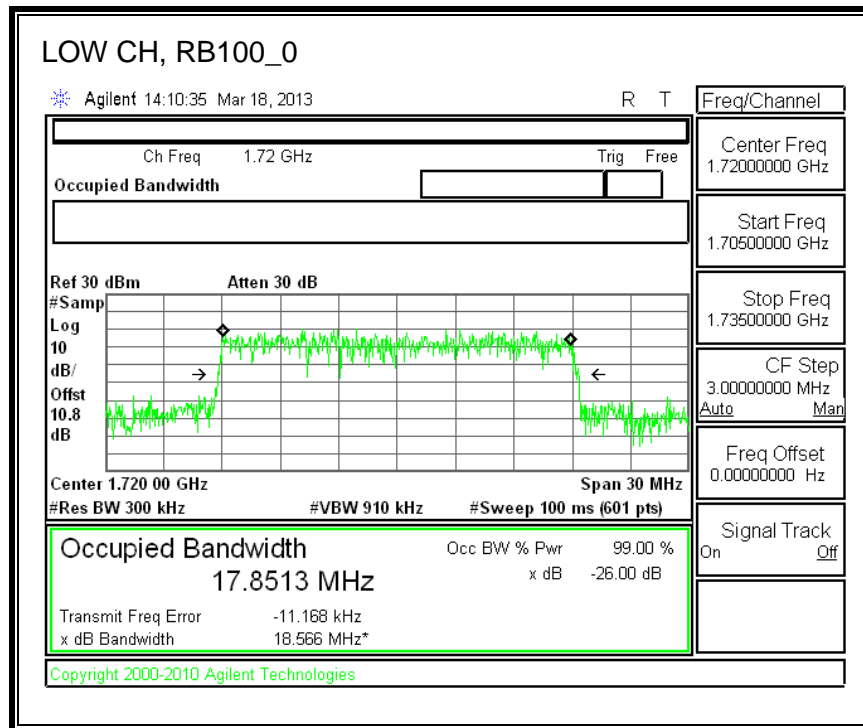
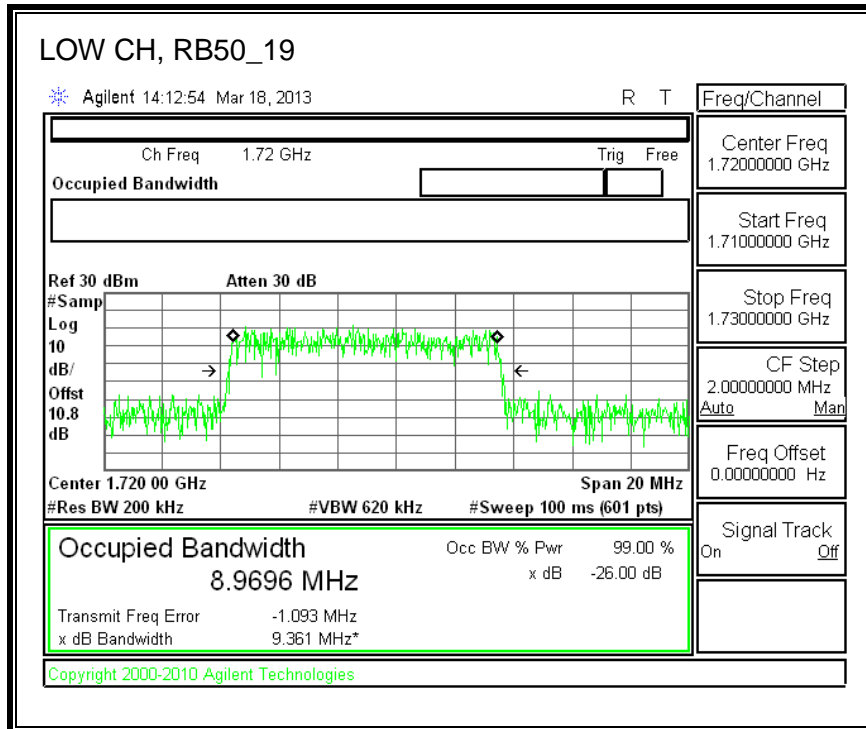
**16QAM (15 MHz BAND WIDTH)**

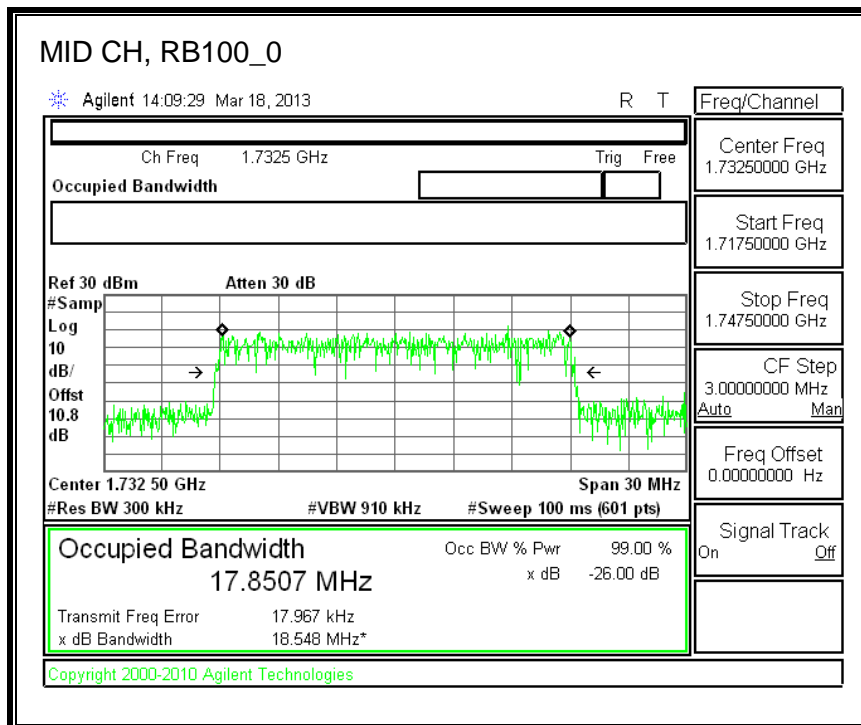
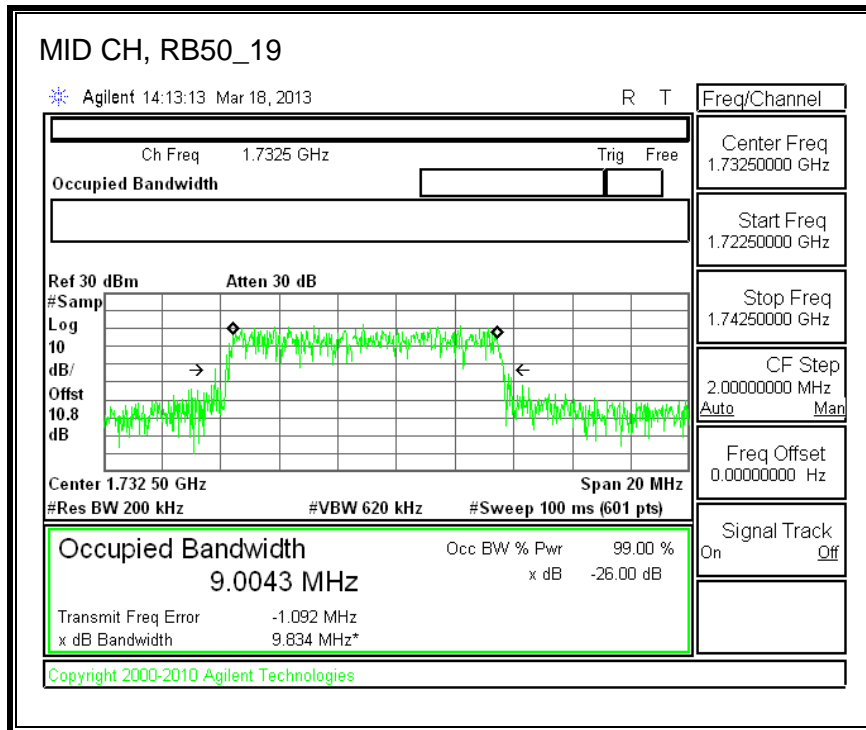




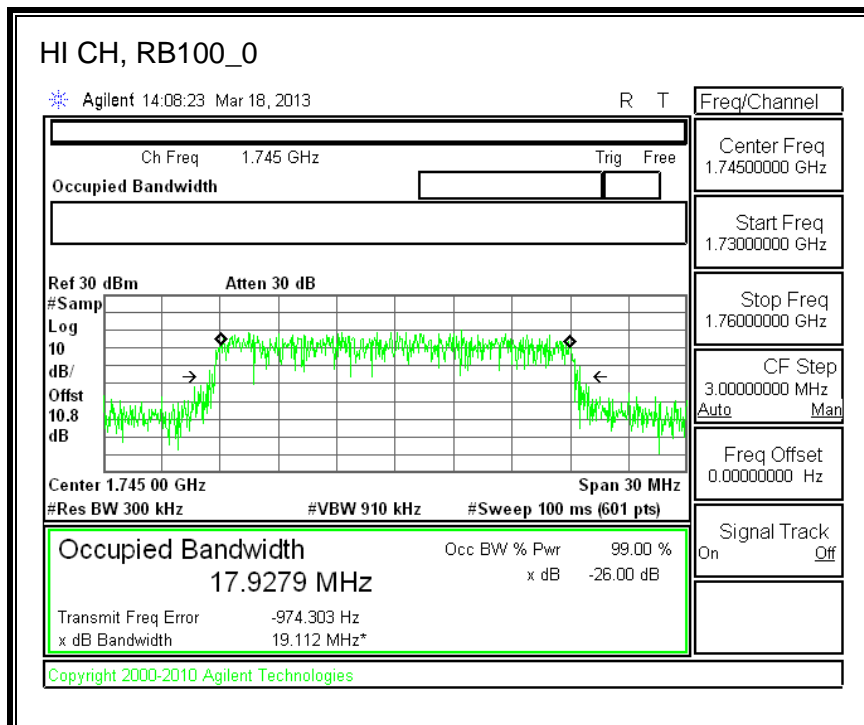
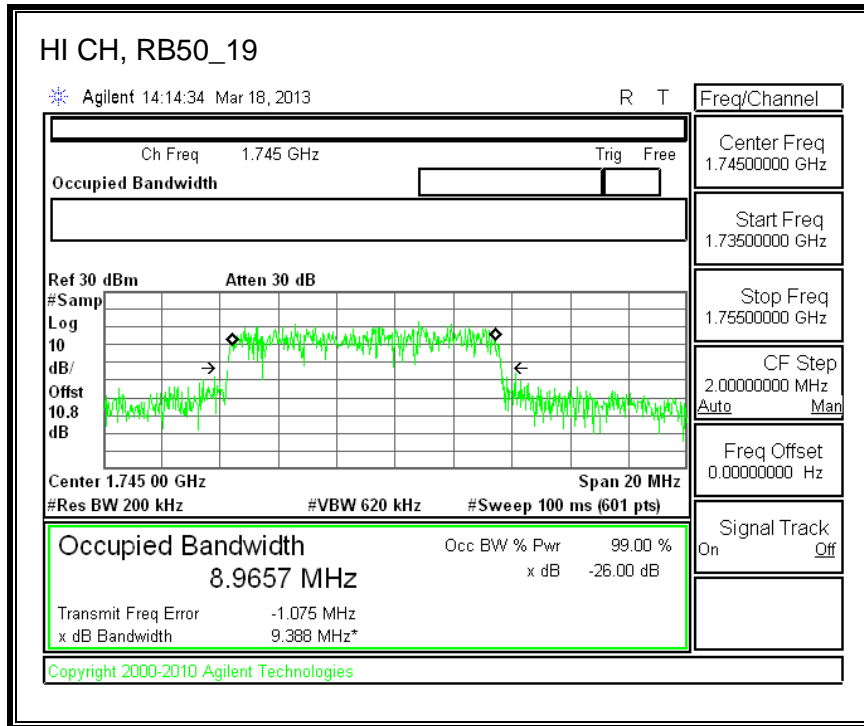


**QPSK (20.0 MHz BAND WIDTH)**

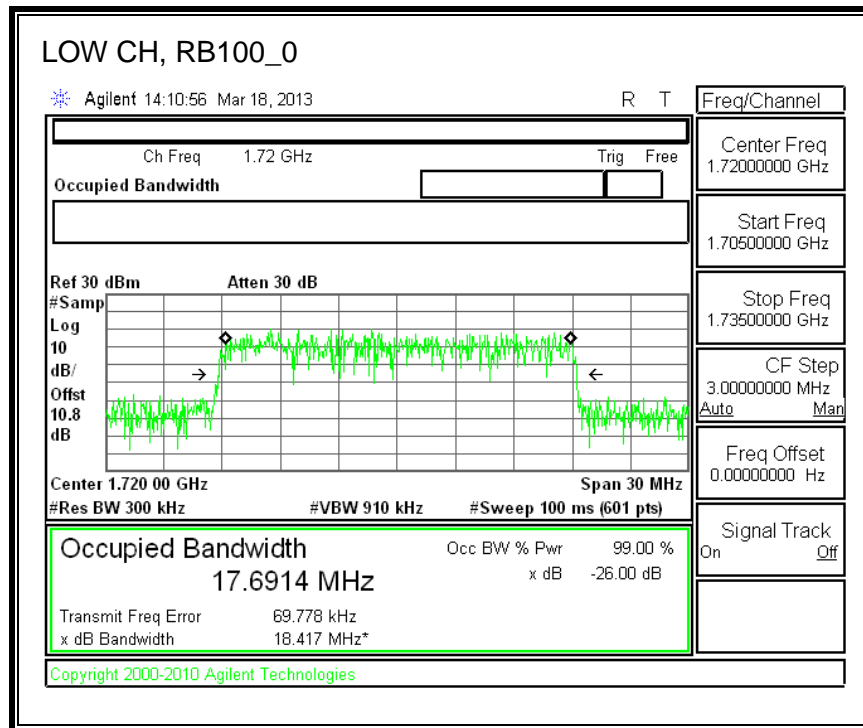
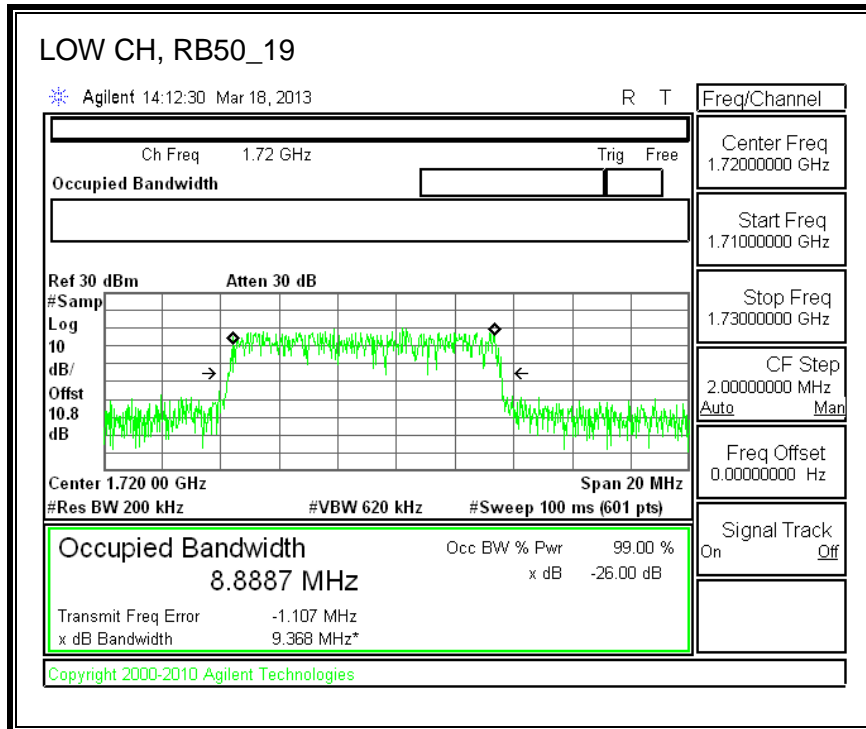


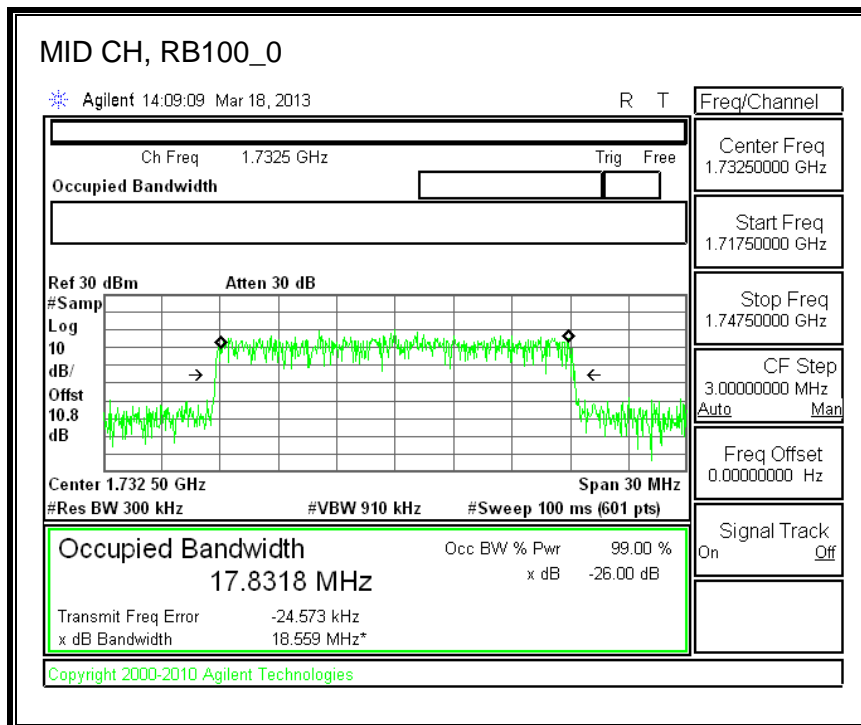
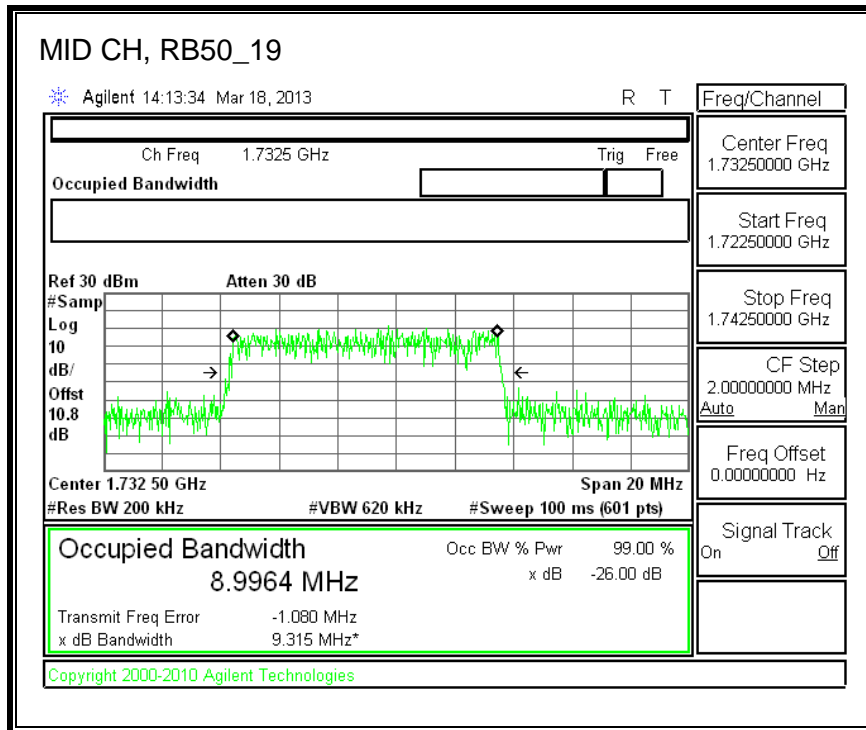


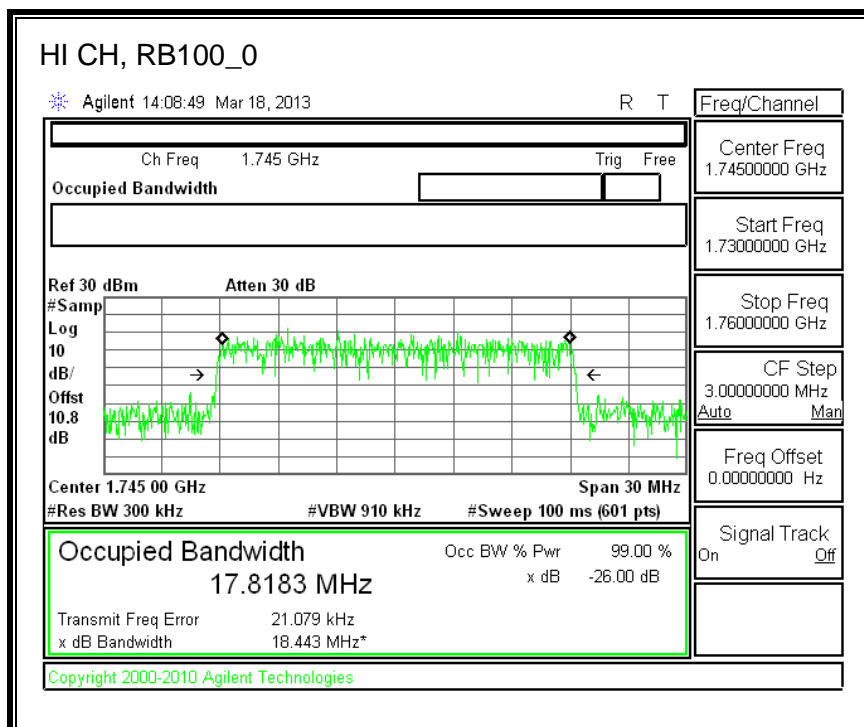
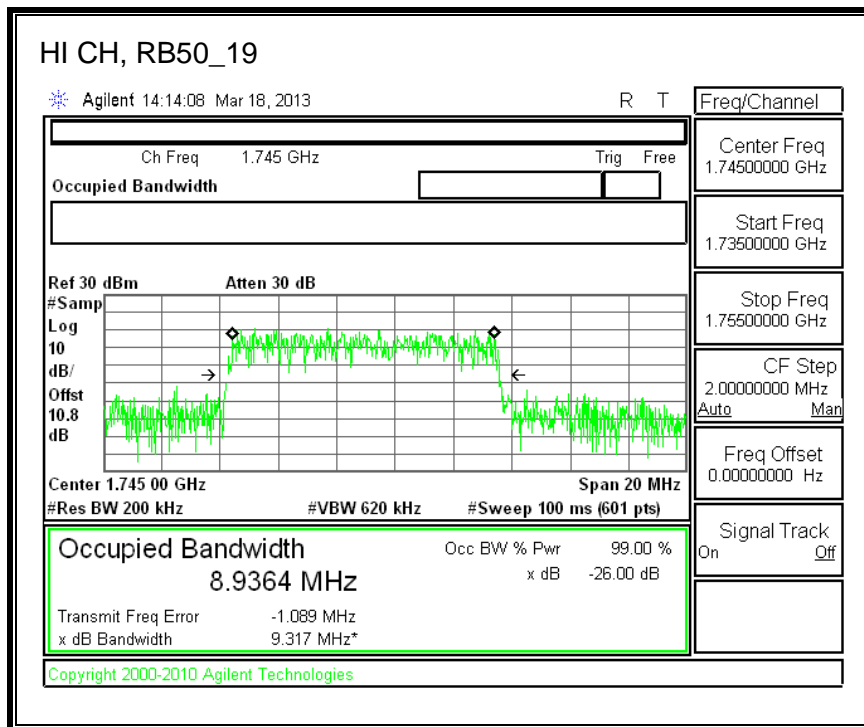




**16QAM (20 MHz BAND WIDTH)**

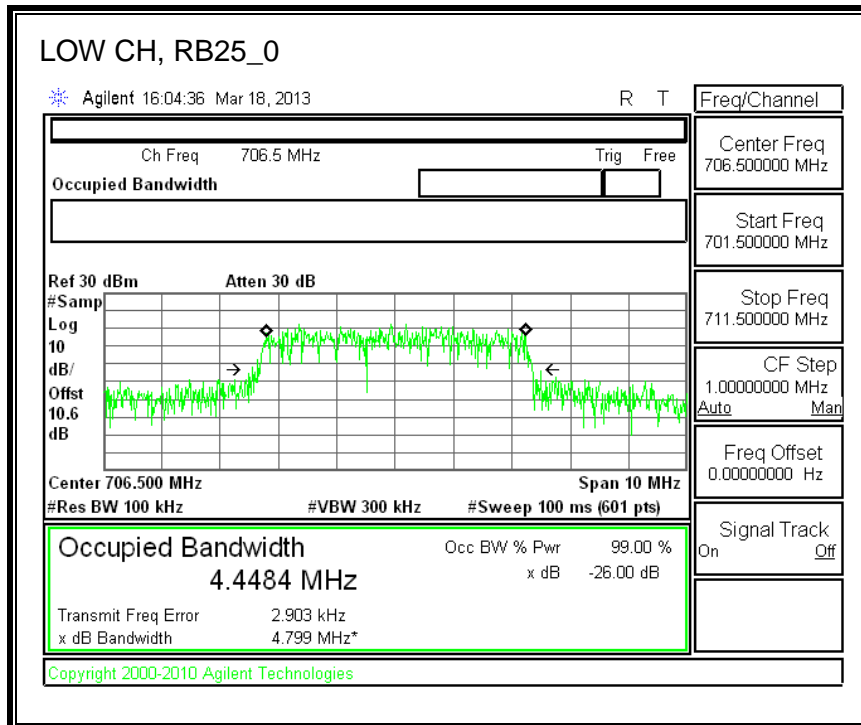
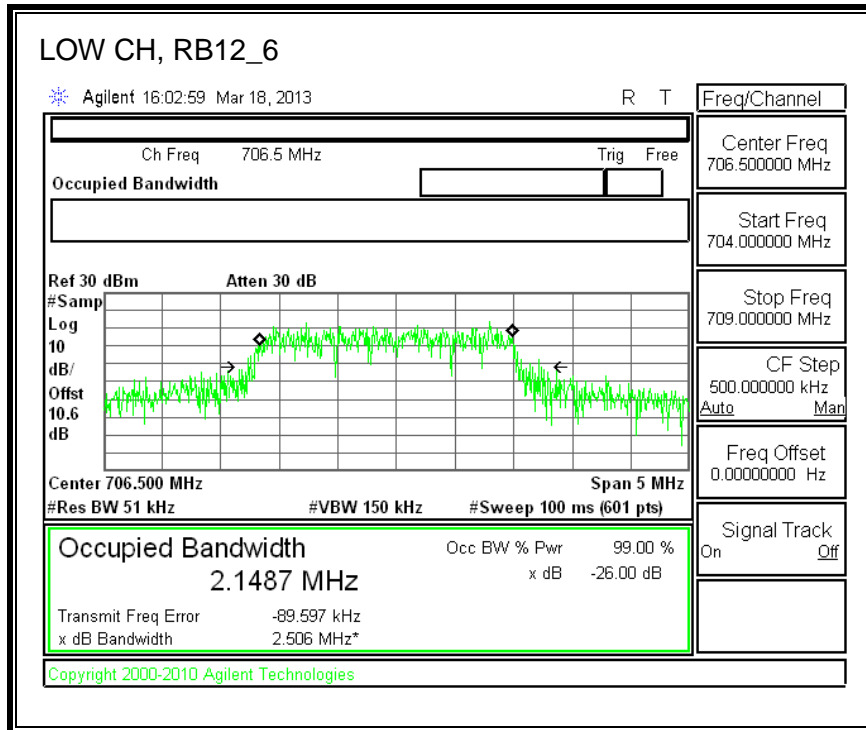


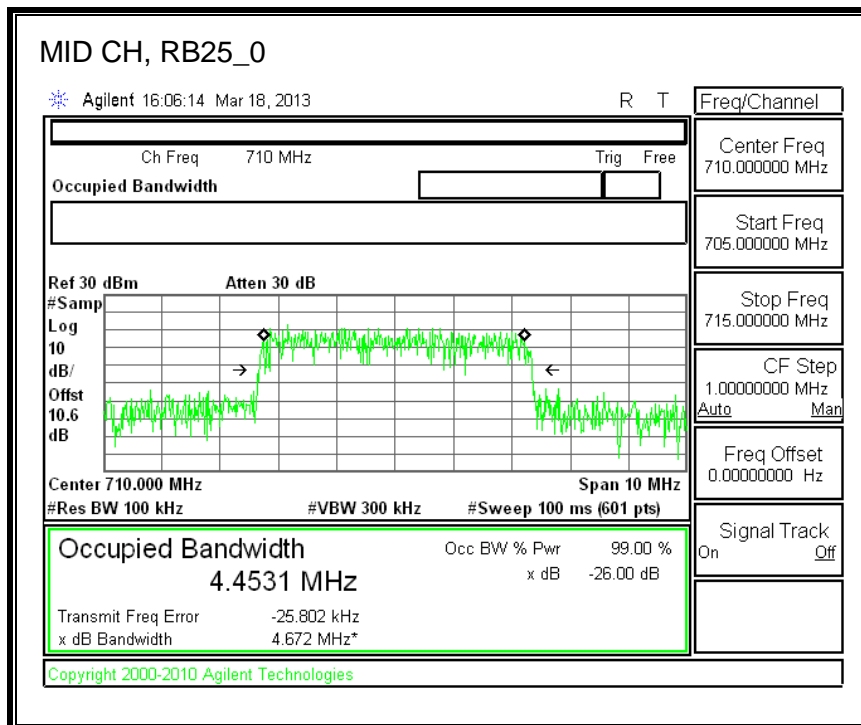
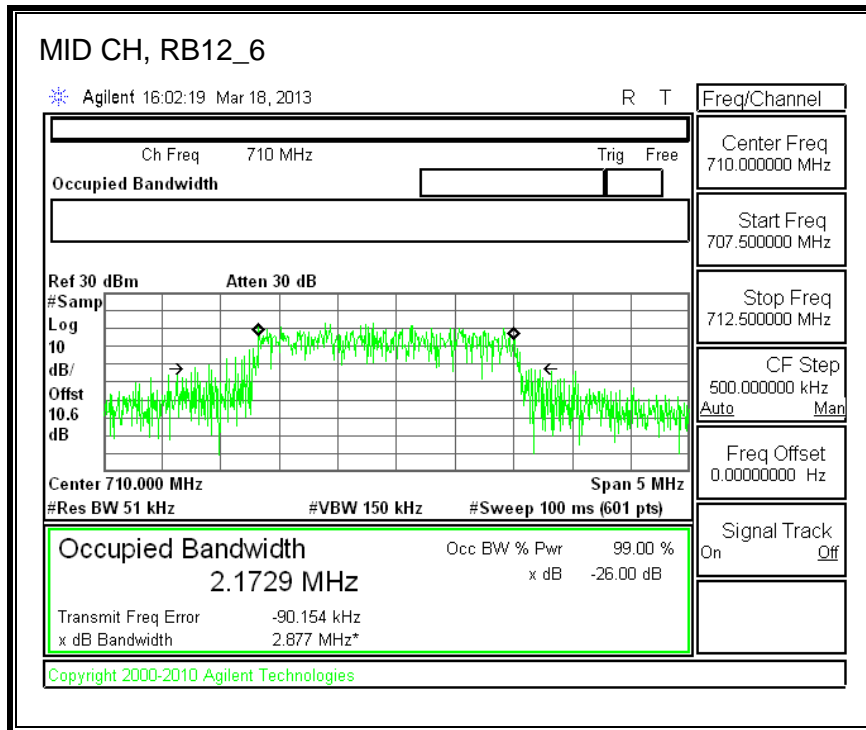


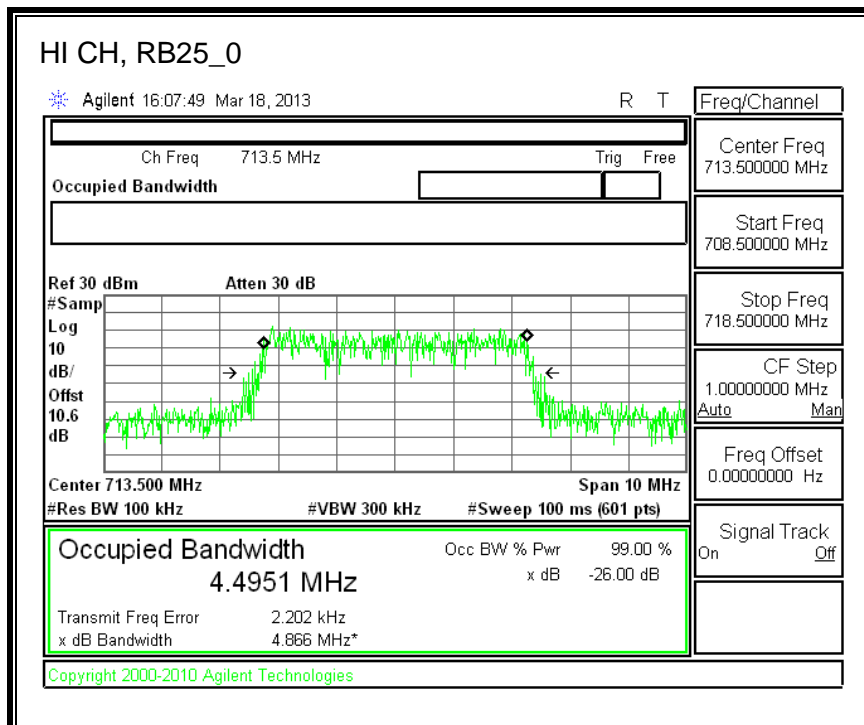
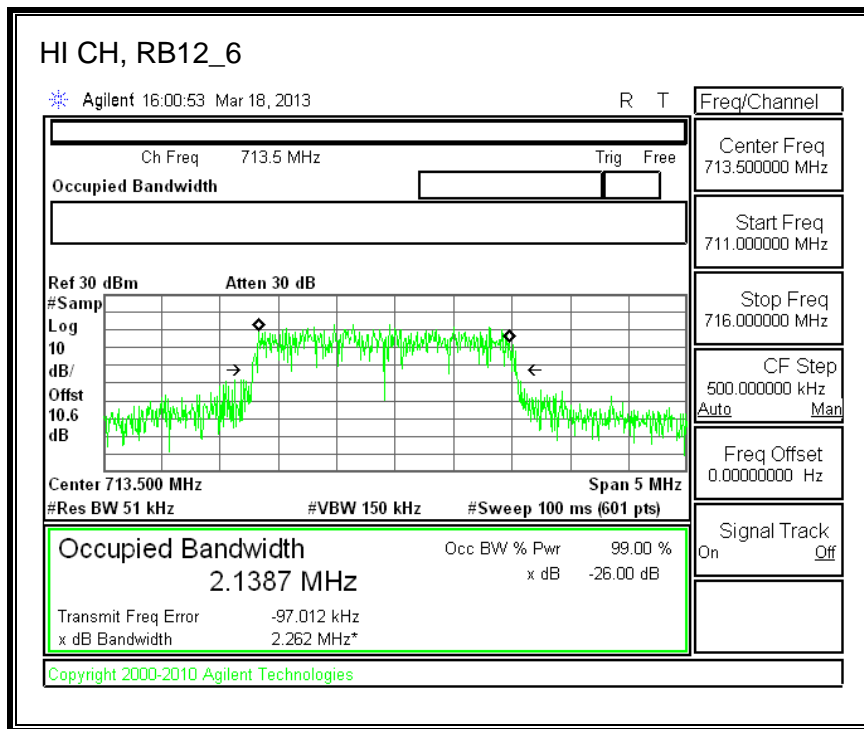


8.1.8. LTE BAND 17

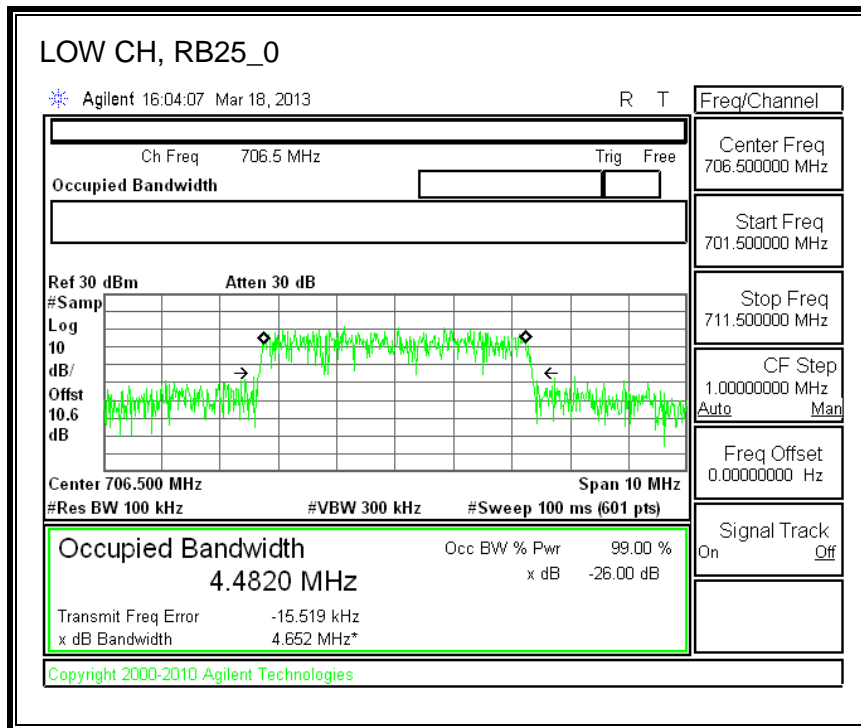
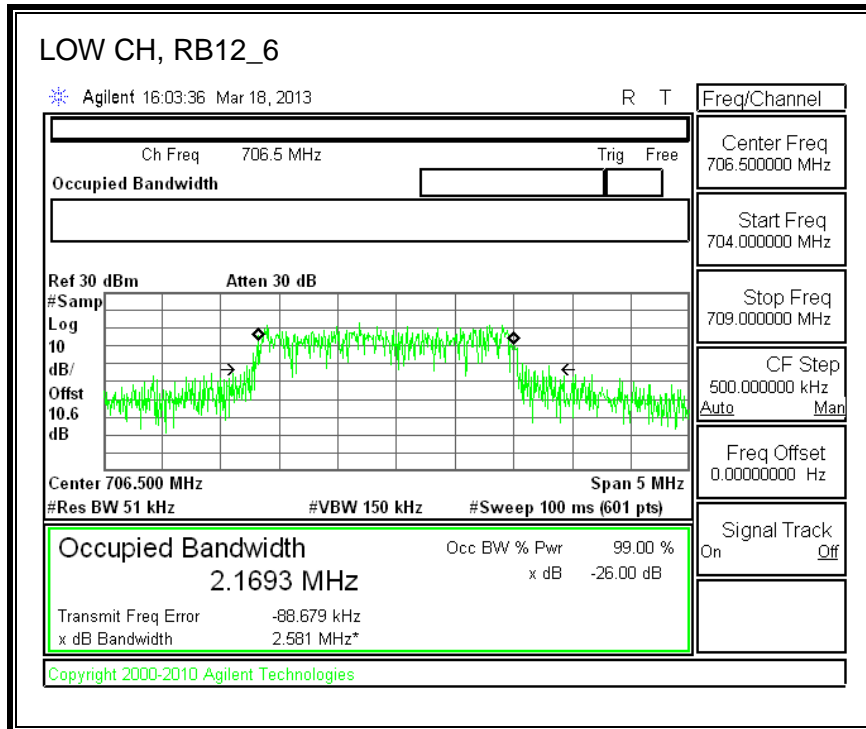
**LTE QPSK (5MHz BANDWIDTH)**



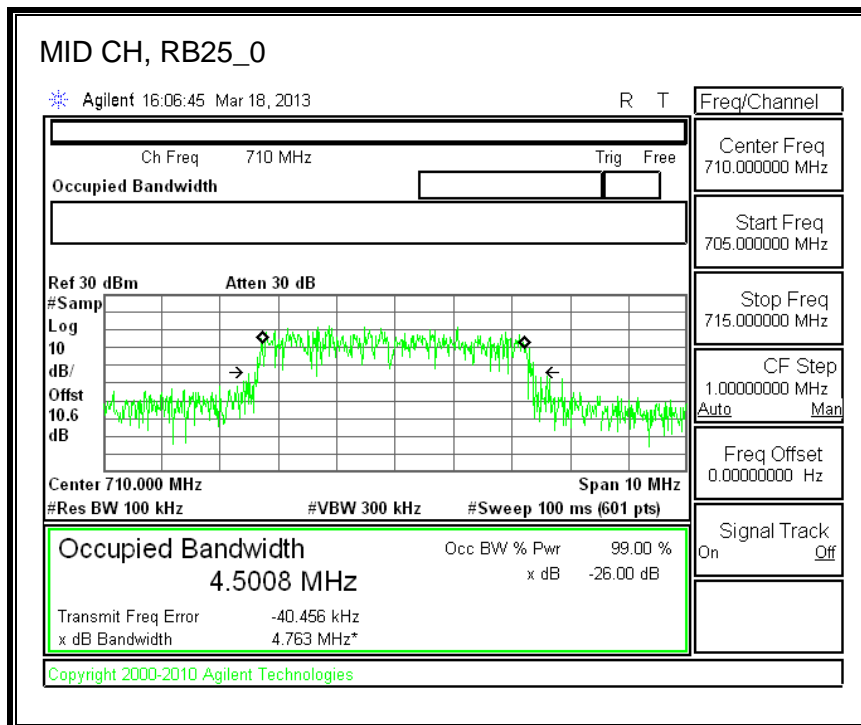
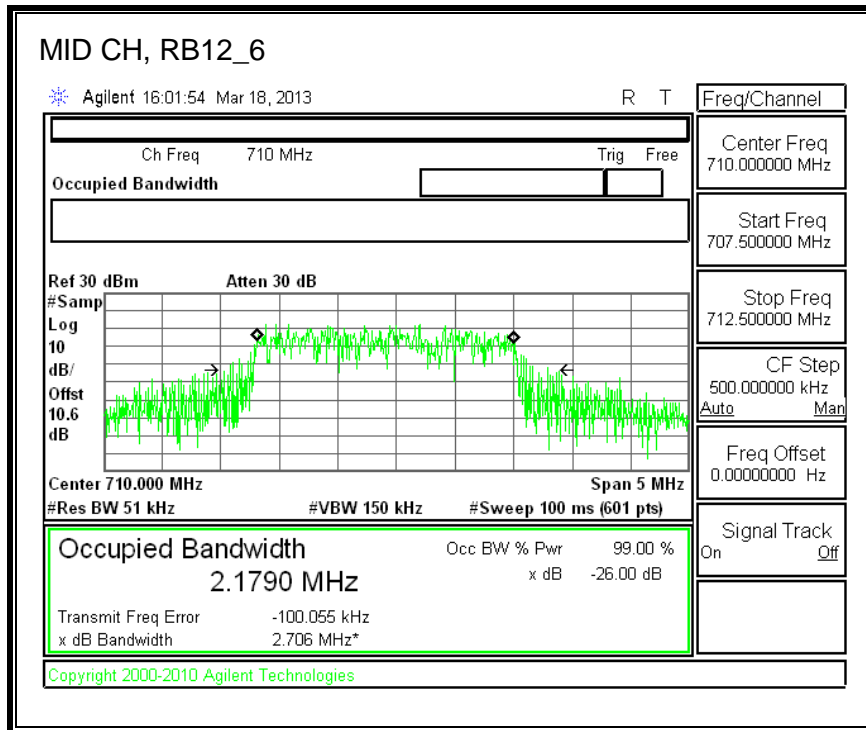


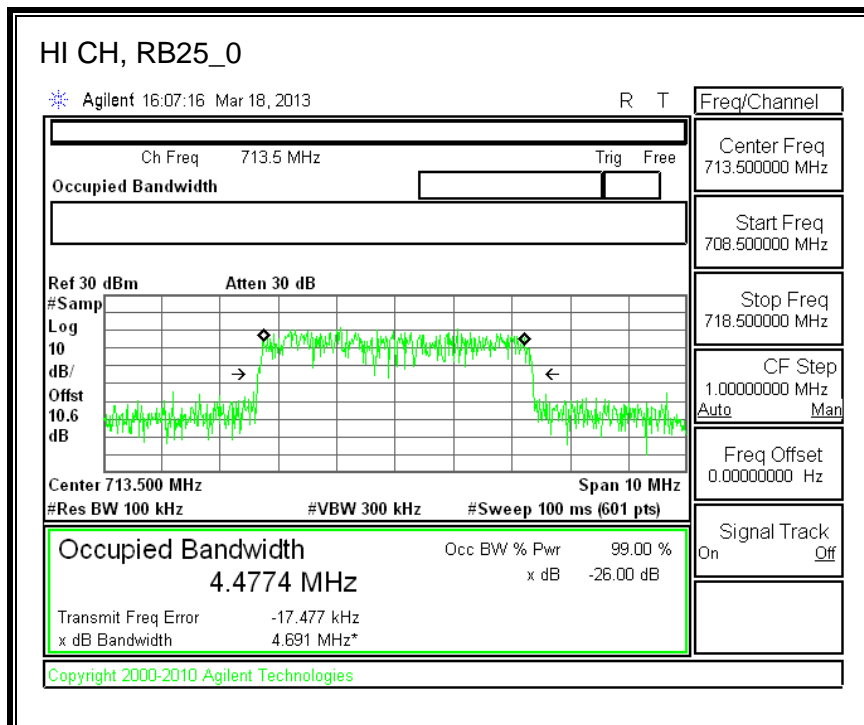
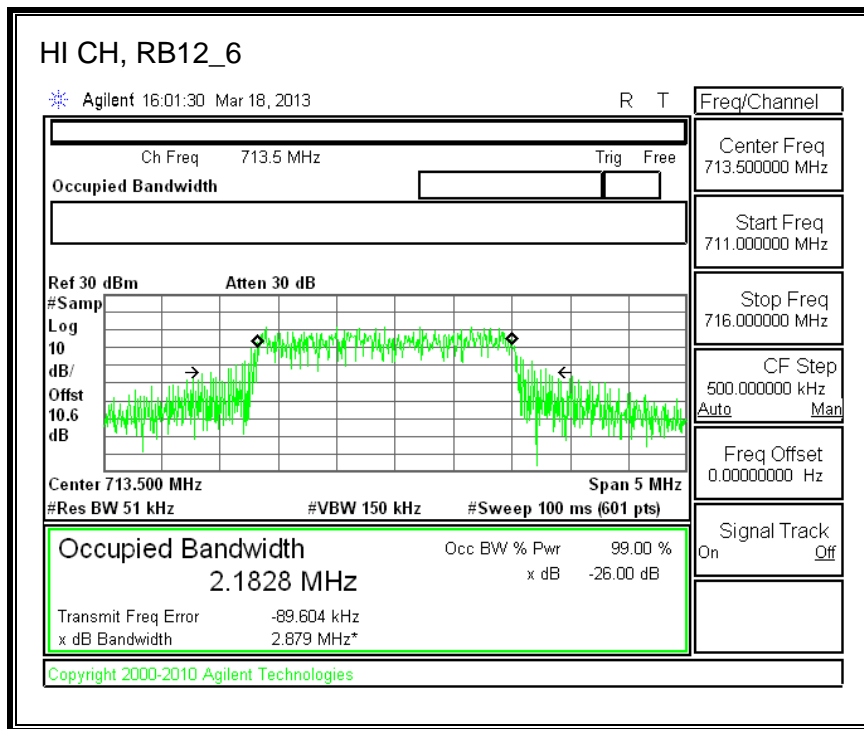


**16QAM (5 MHz BAND WIDTH)**

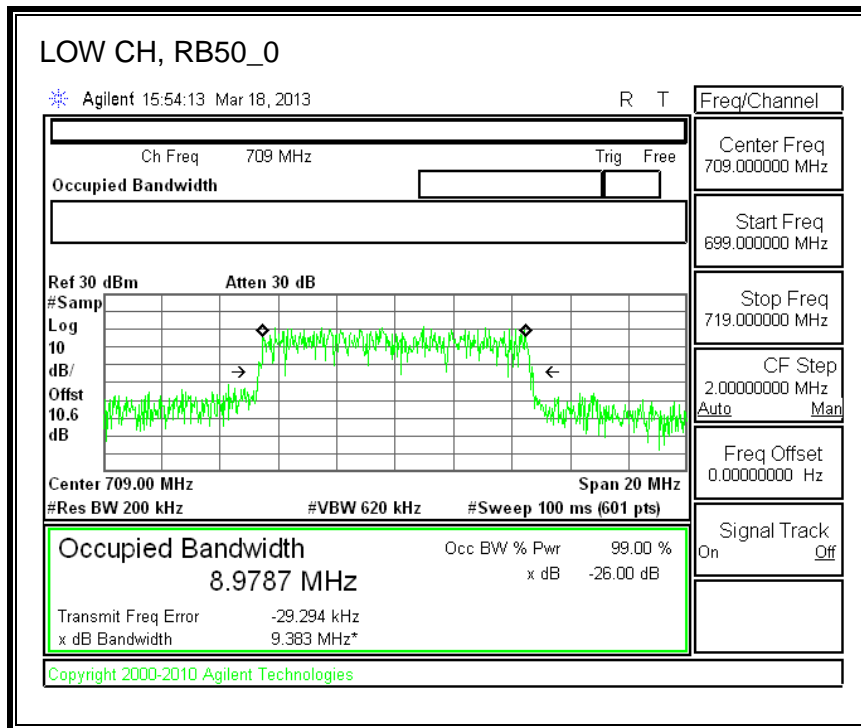
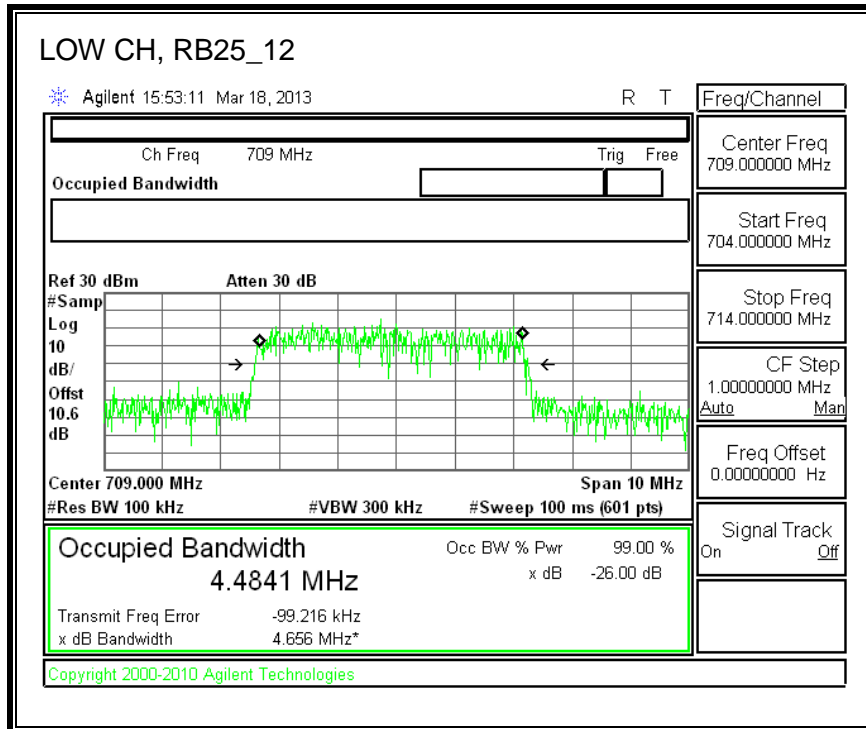


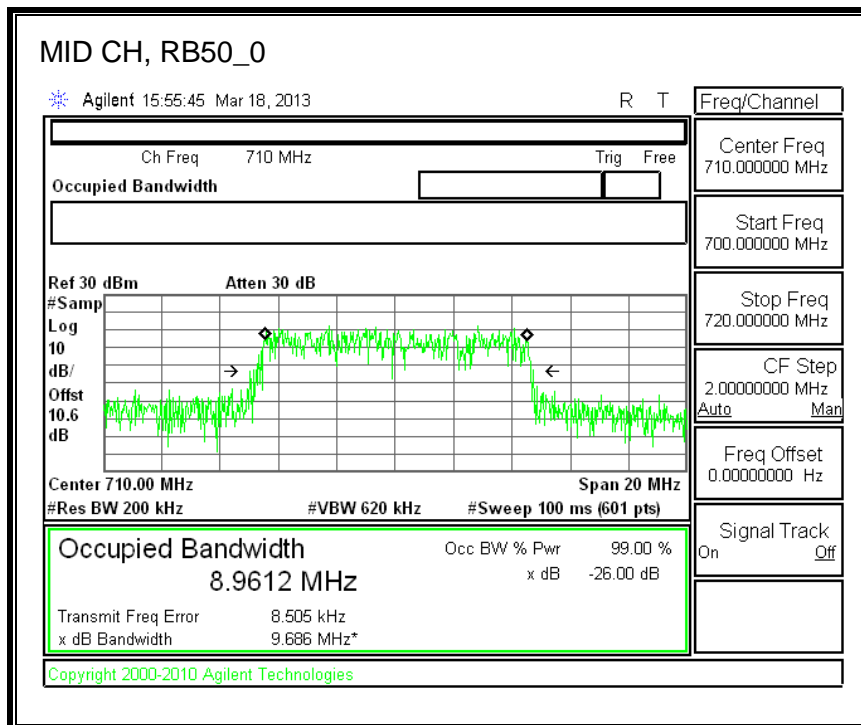
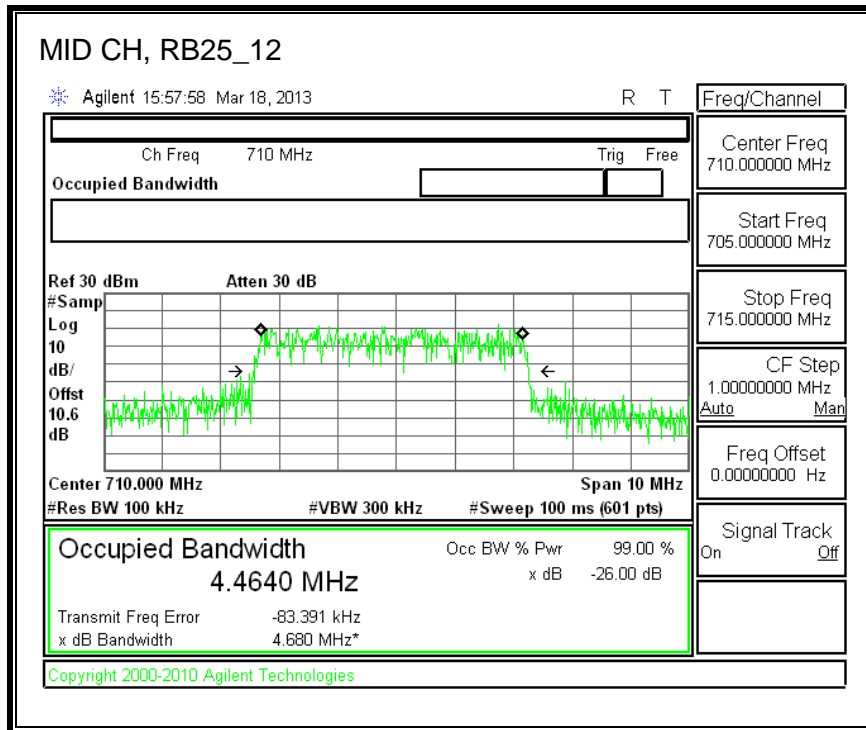


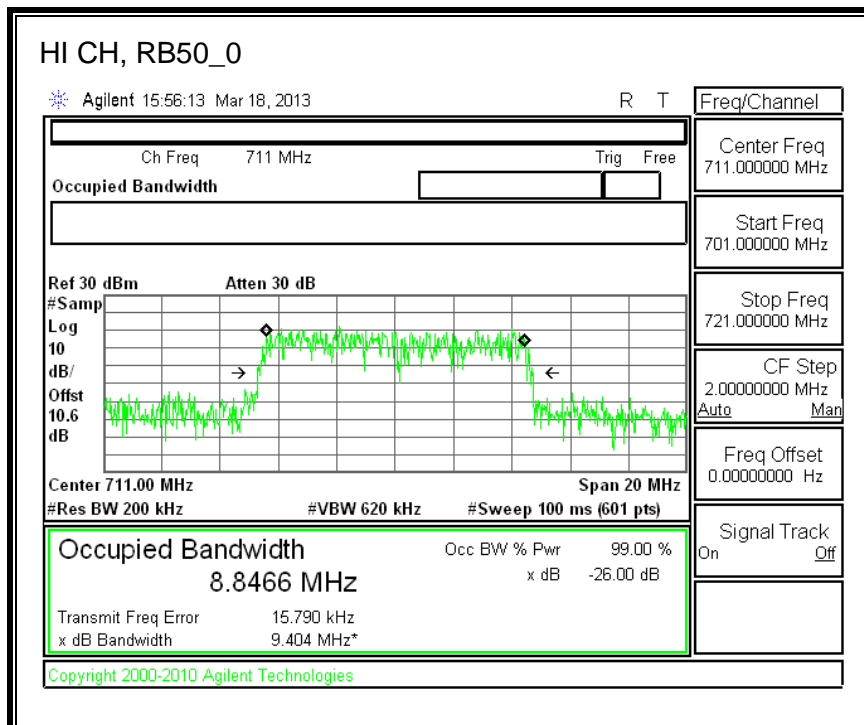
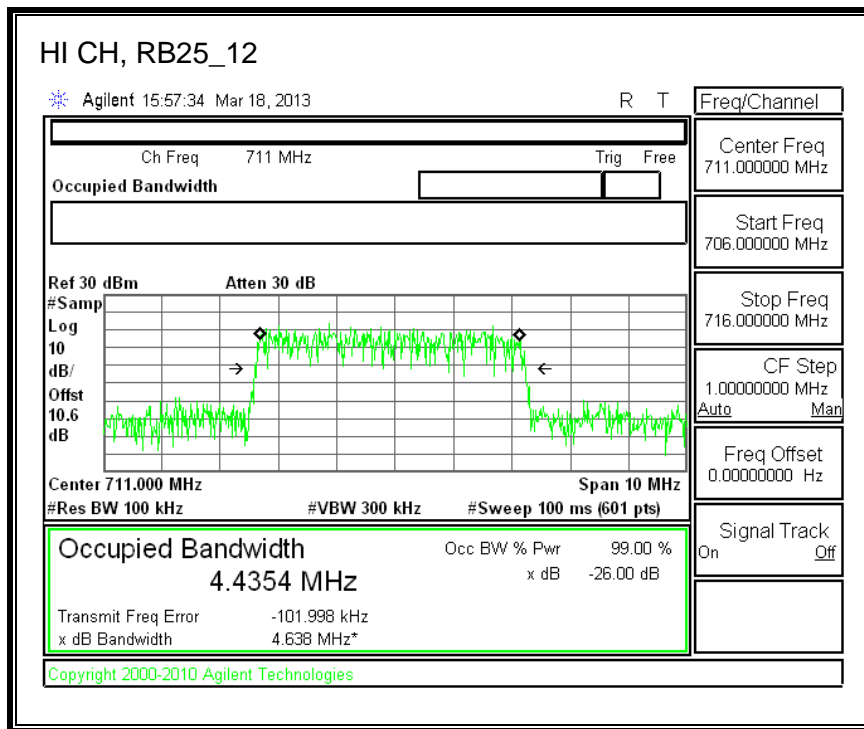




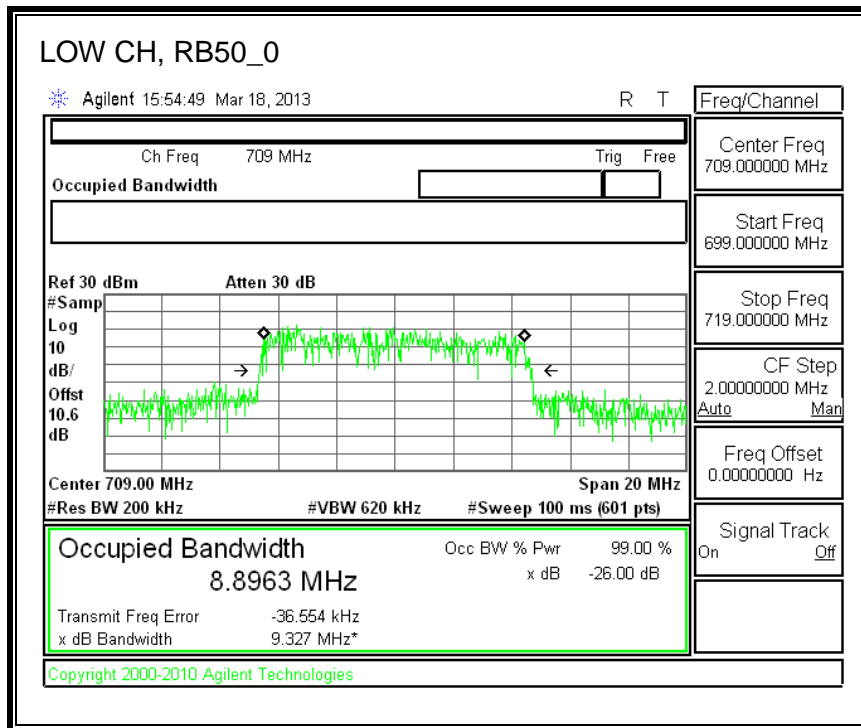
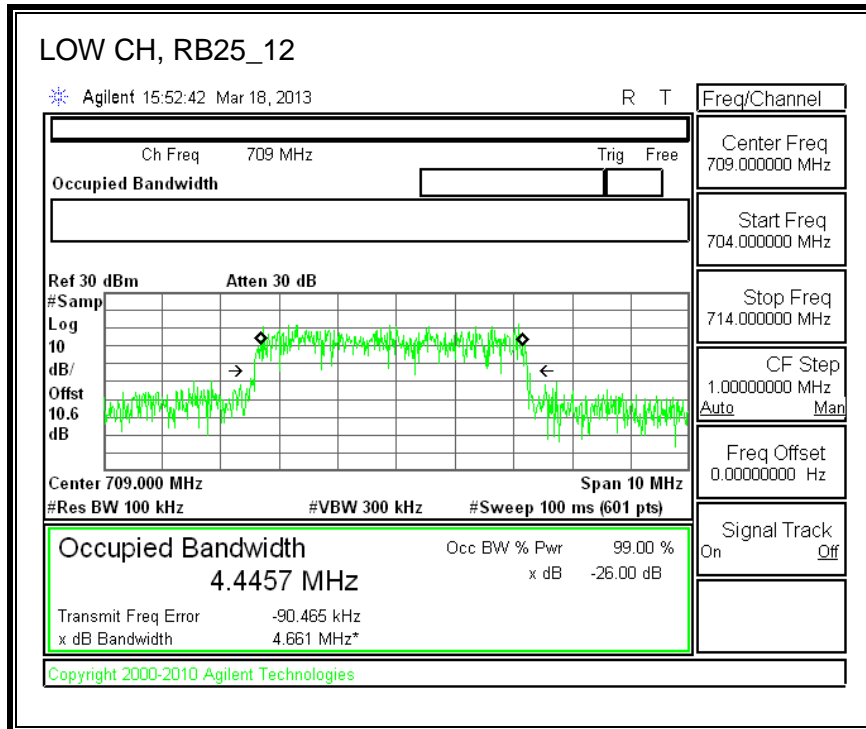
**QPSK (10.0 MHz BAND WIDTH)**

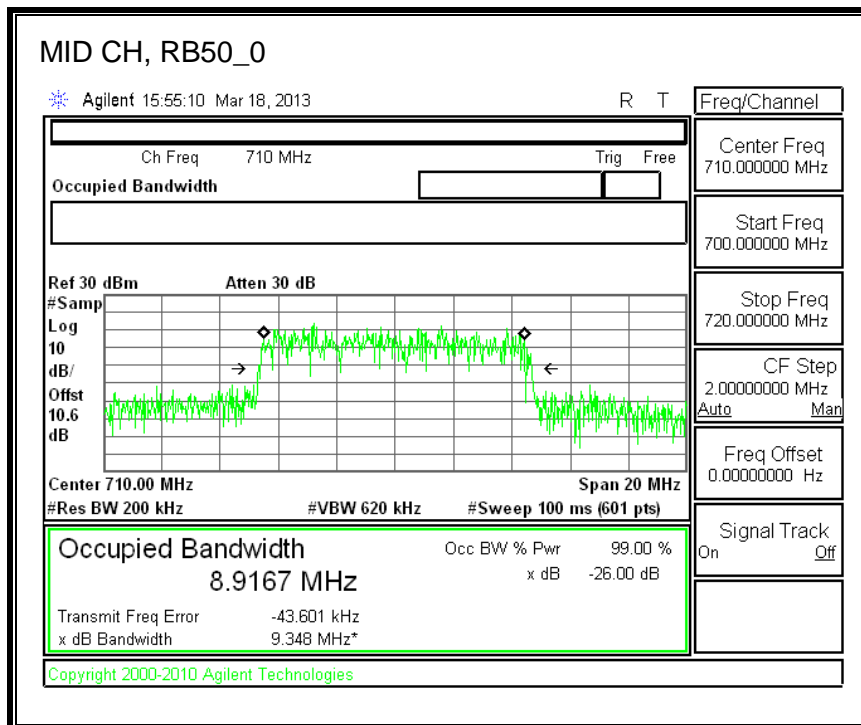
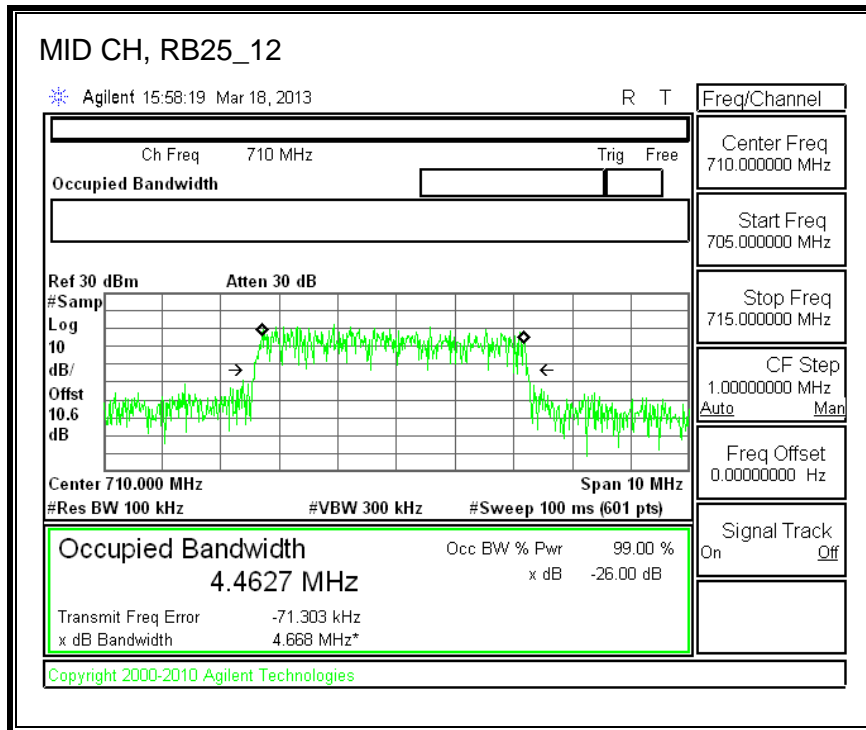


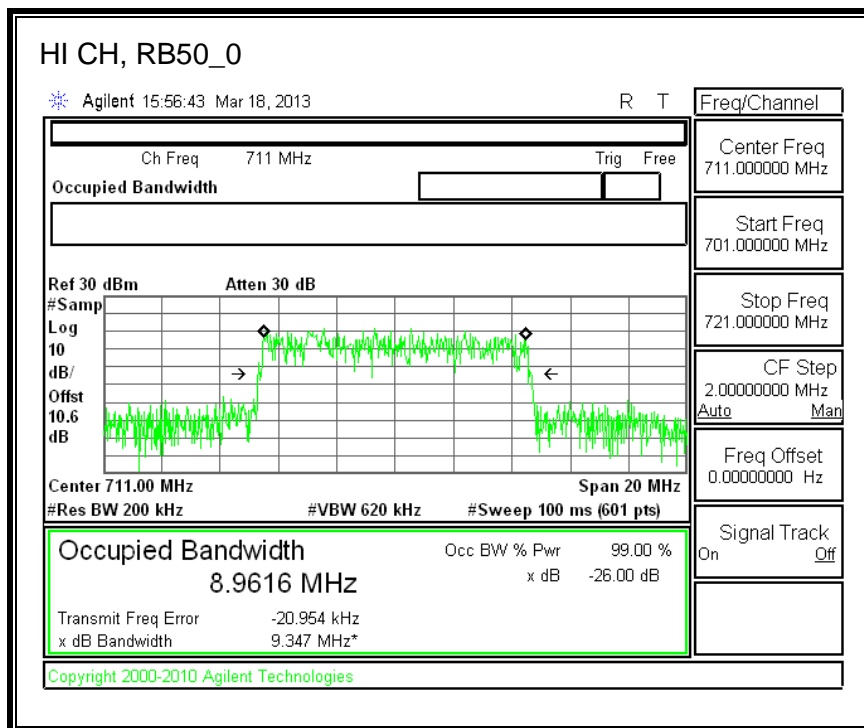
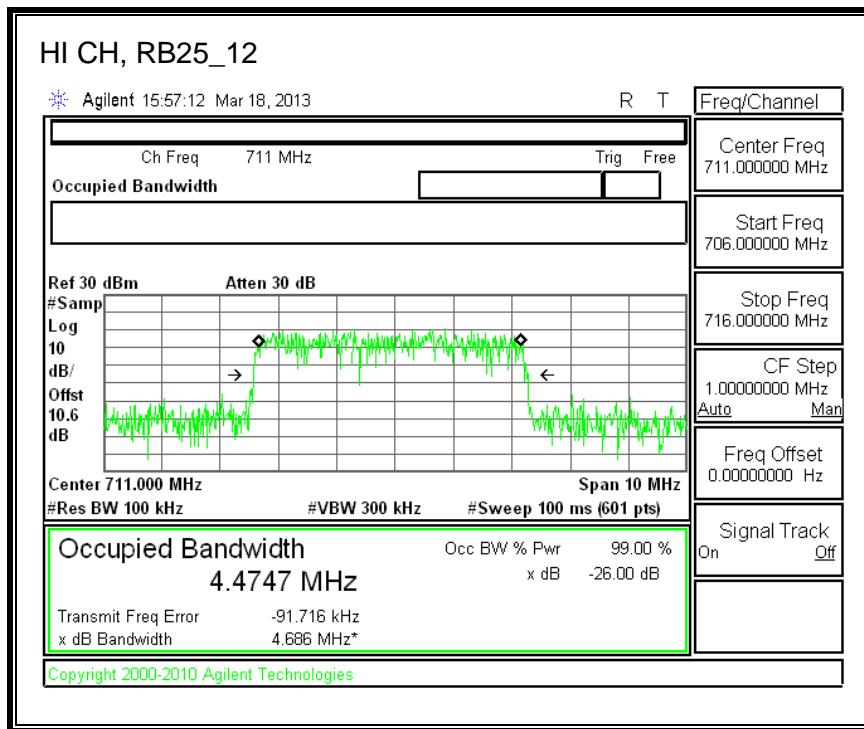




**16QAM (10 MHz BAND WIDTH)**









## **8.2. BAND EDGE**

### **RULE PART(S)**

FCC: §22.359, 24.238, and 27.53

### **LIMITS**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

### **TEST PROCEDURE**

The transmitter output was connected to a Agilent 8960 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency (704, 716, 824, 849, 1710, 1755, 1850 and 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

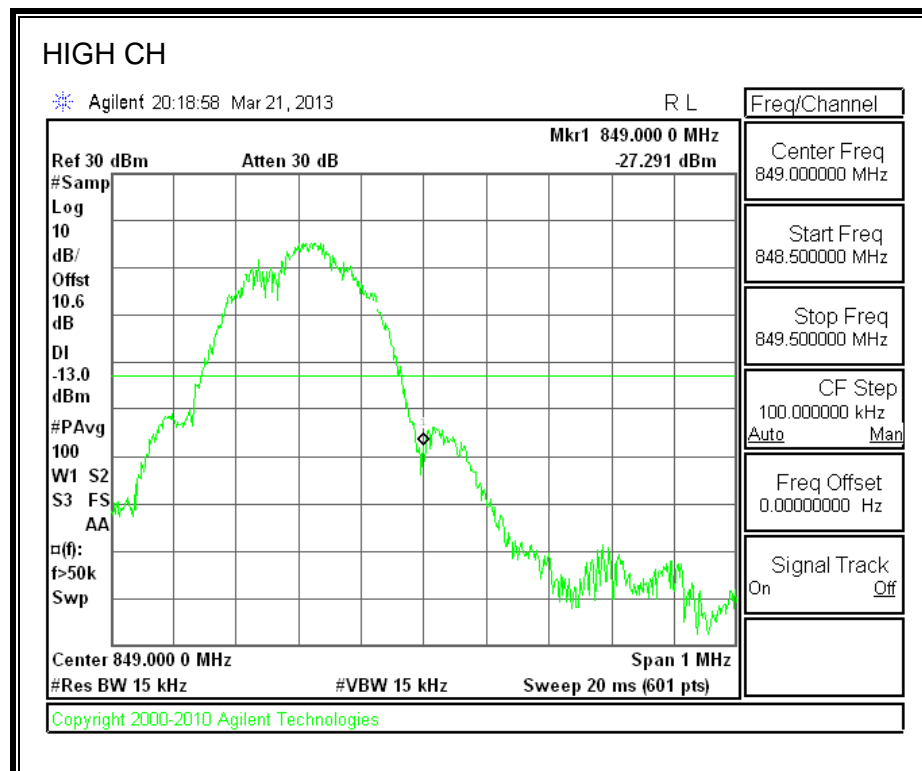
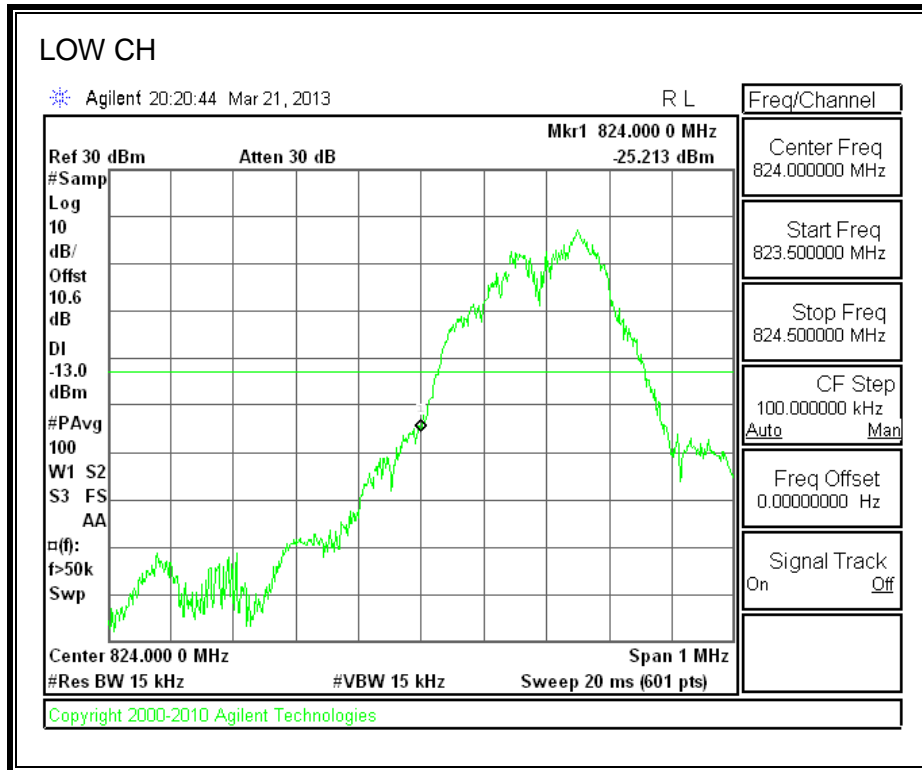
### **MODES TESTED**

- GPRS and EGPRS
- UMTS, REL 99, and HSDPA
- LTE BAND 4 and 17

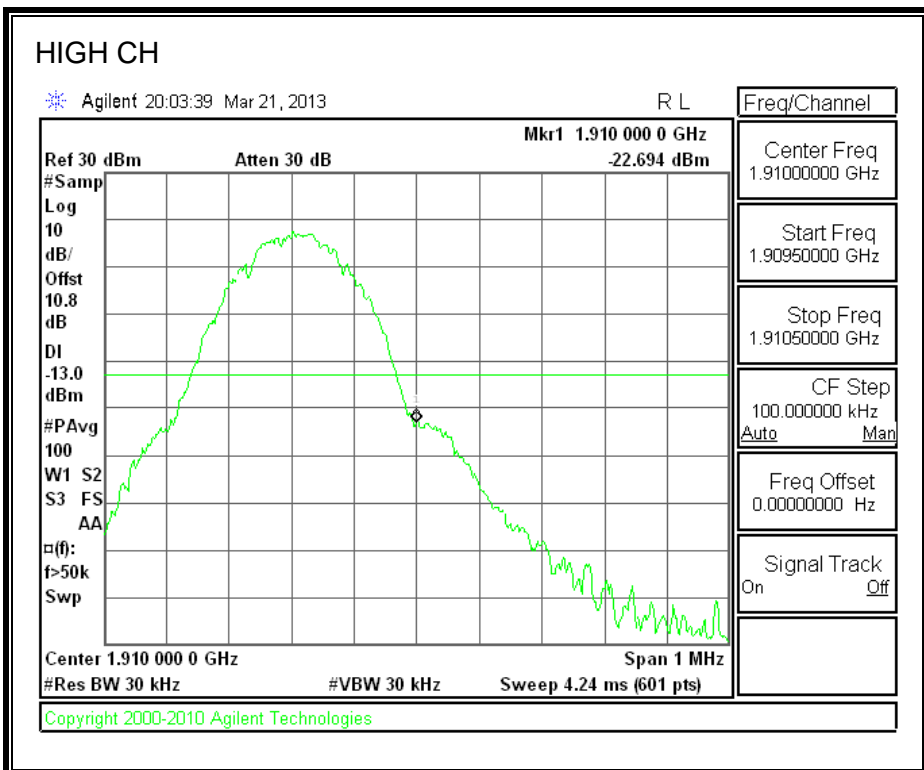
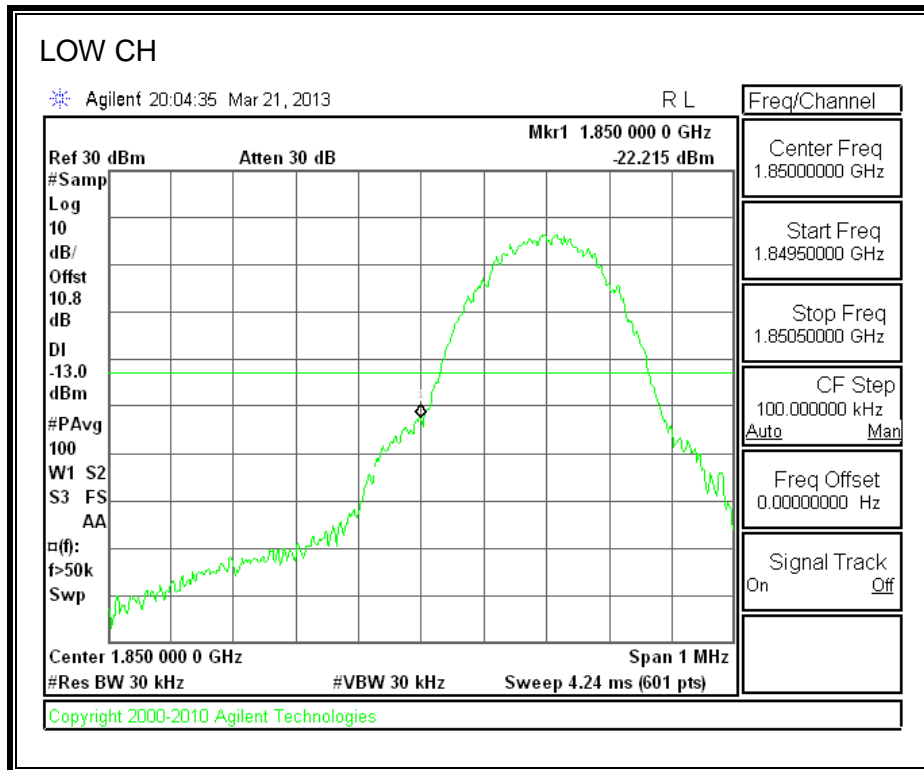
### **RESULTS**

### 8.2.1. GPRS MODE

#### CELL BAND

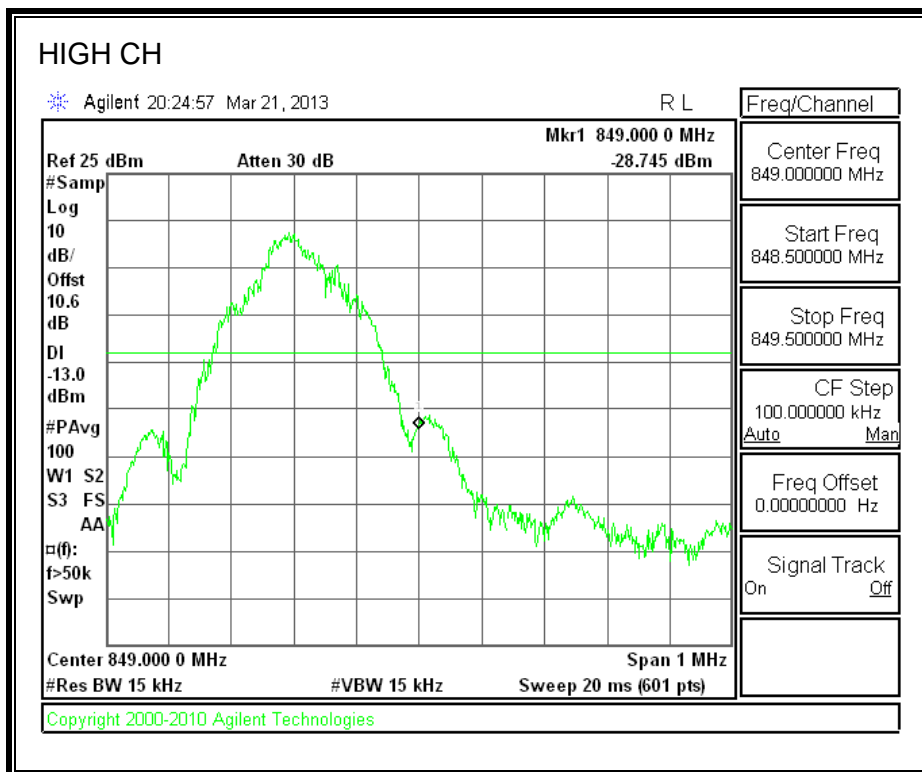
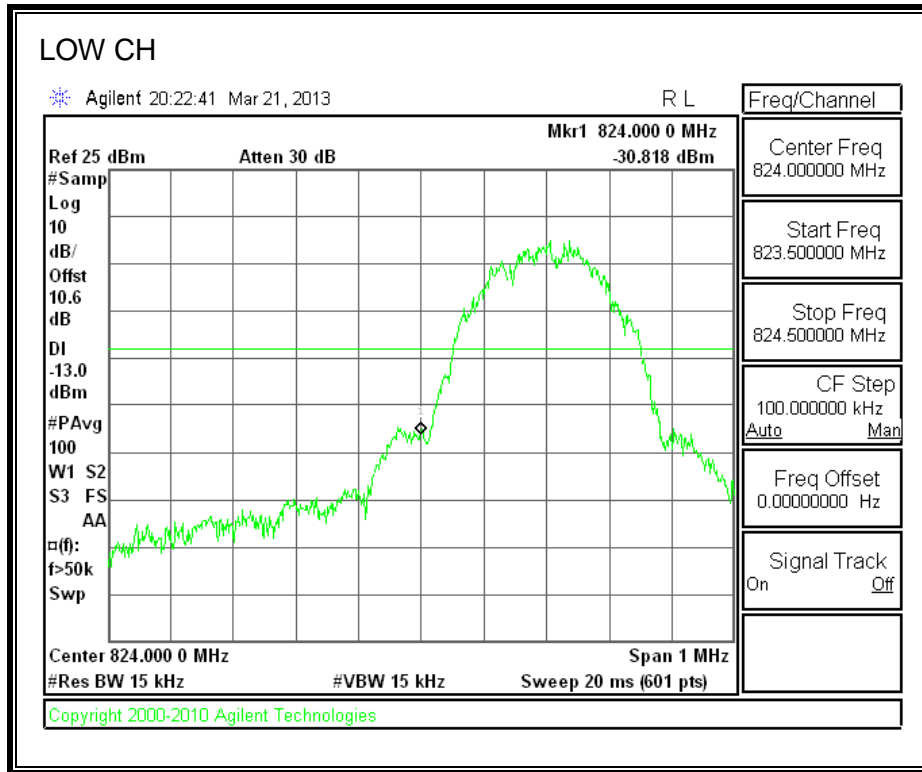


**PCS BAND**

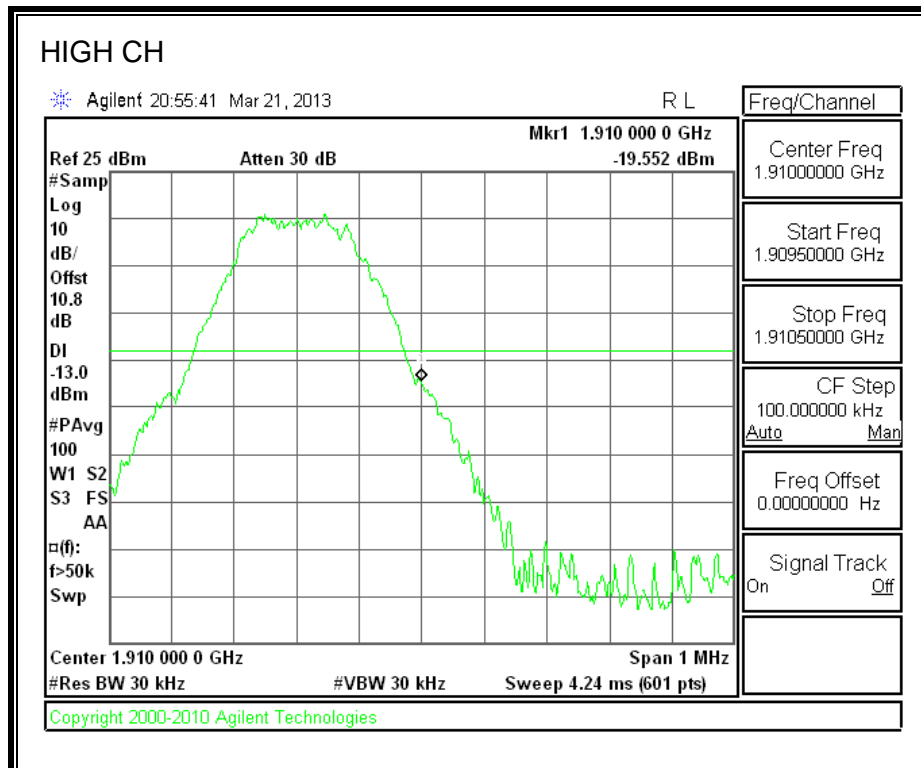
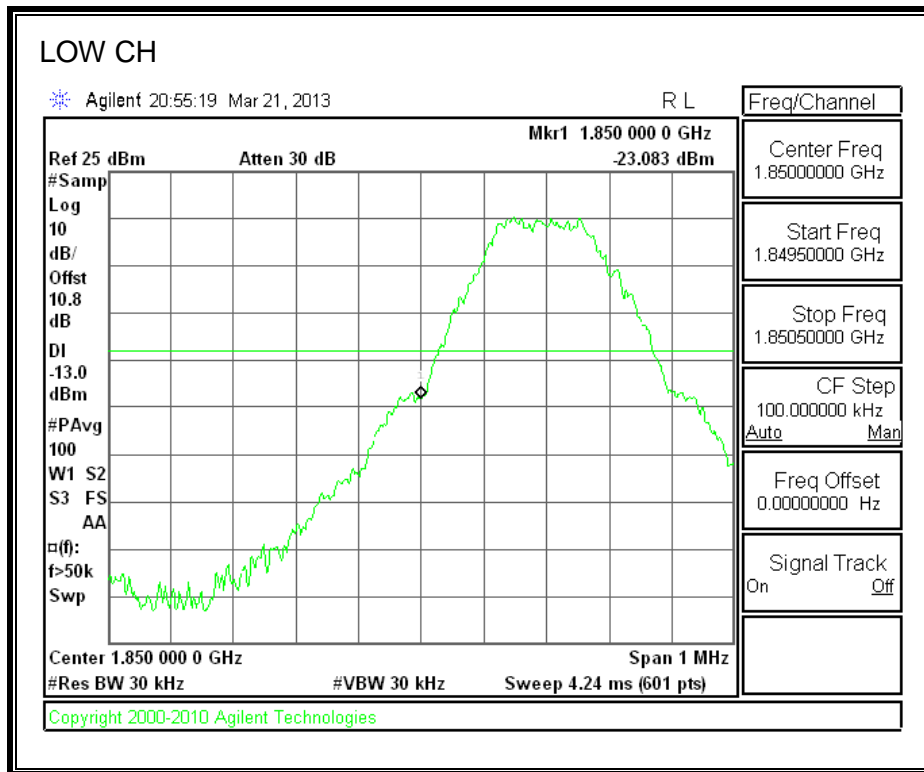


### 8.2.2. EGPRS MODE

#### CELL BAND

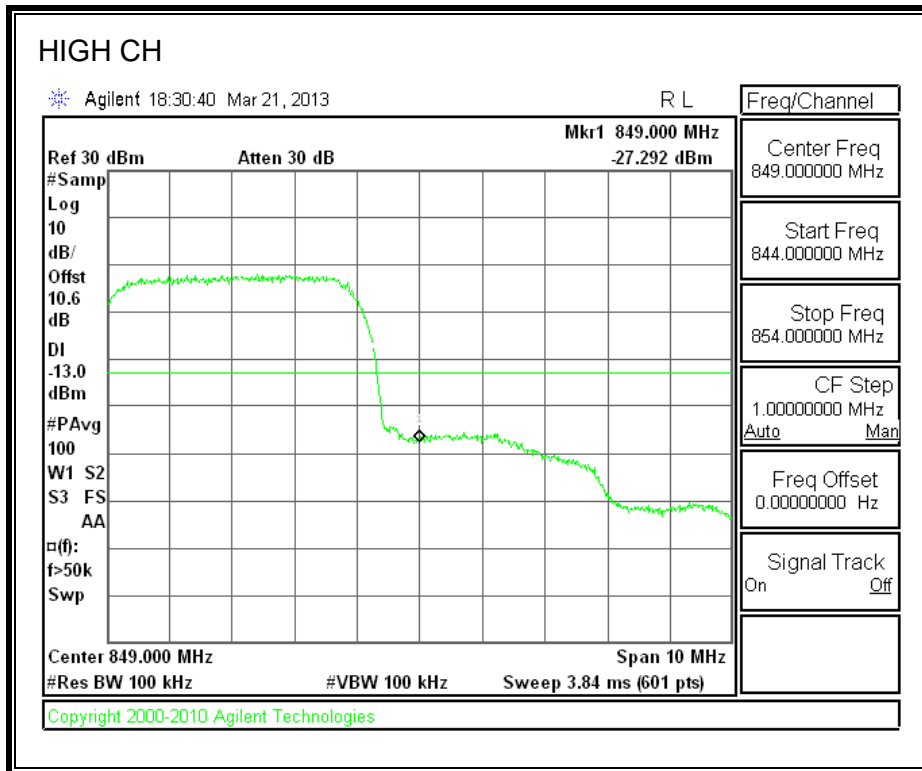
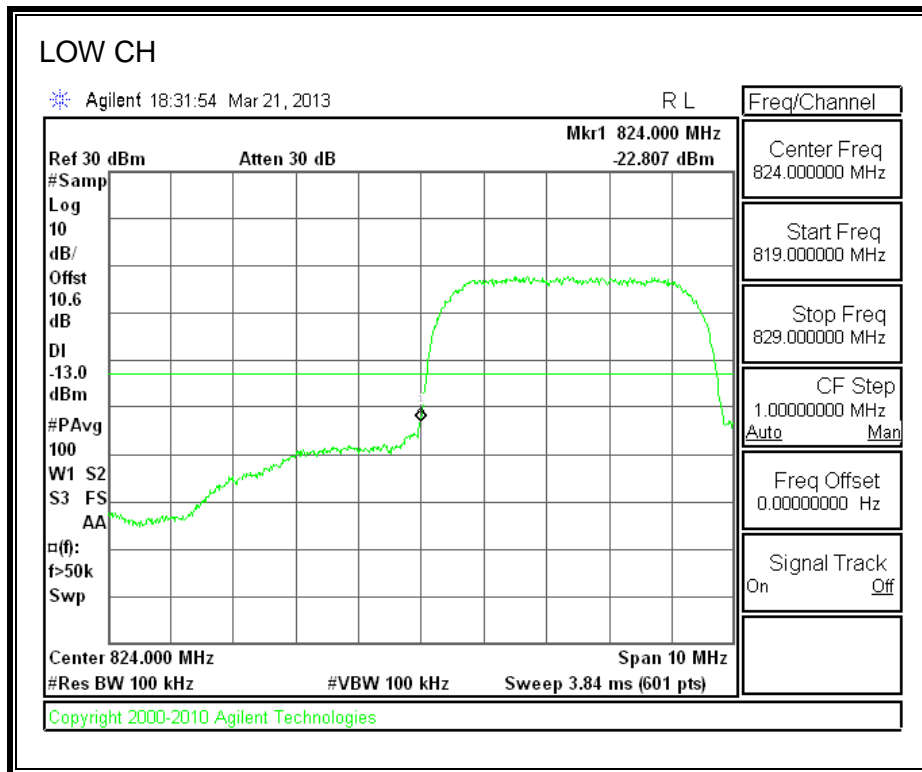


**PCS BAND**

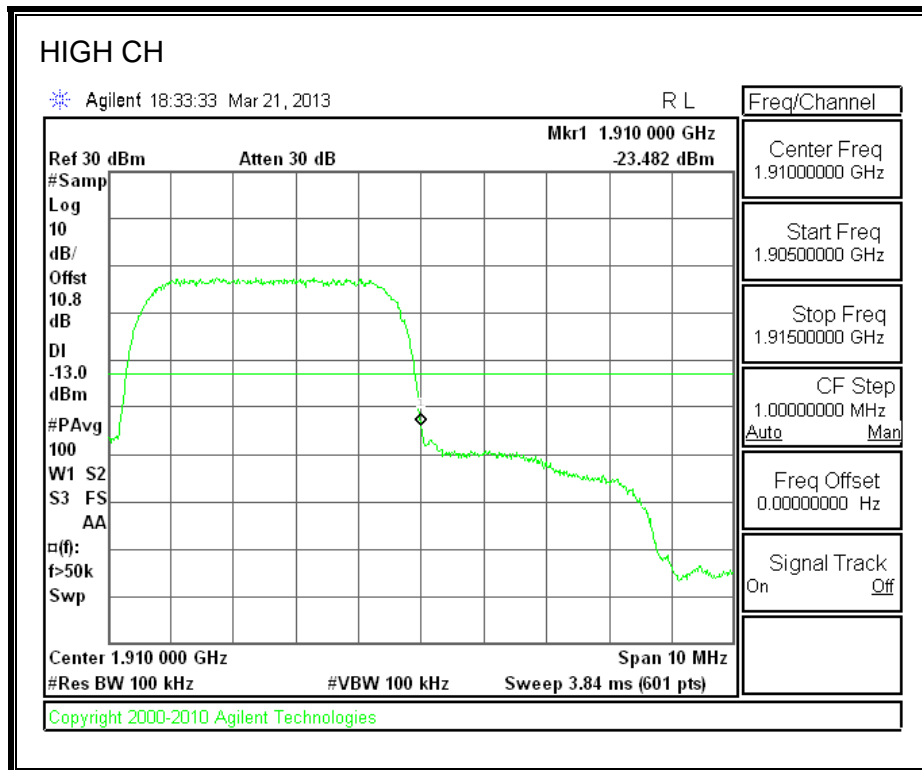
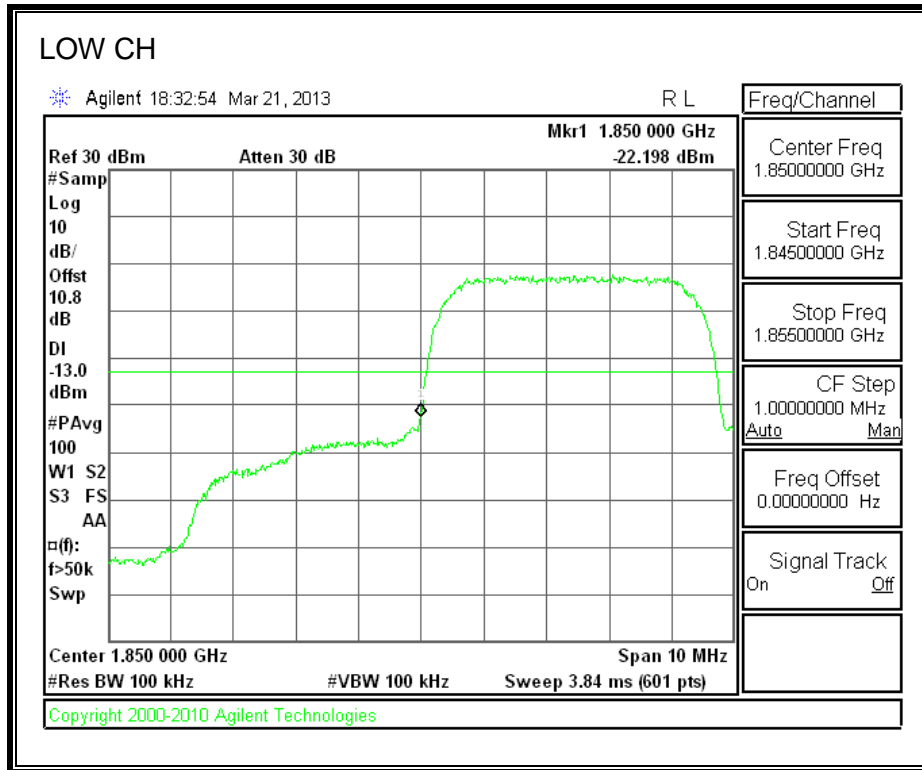


8.2.3. UMTS REL 99 MODE

**CELL BAND**

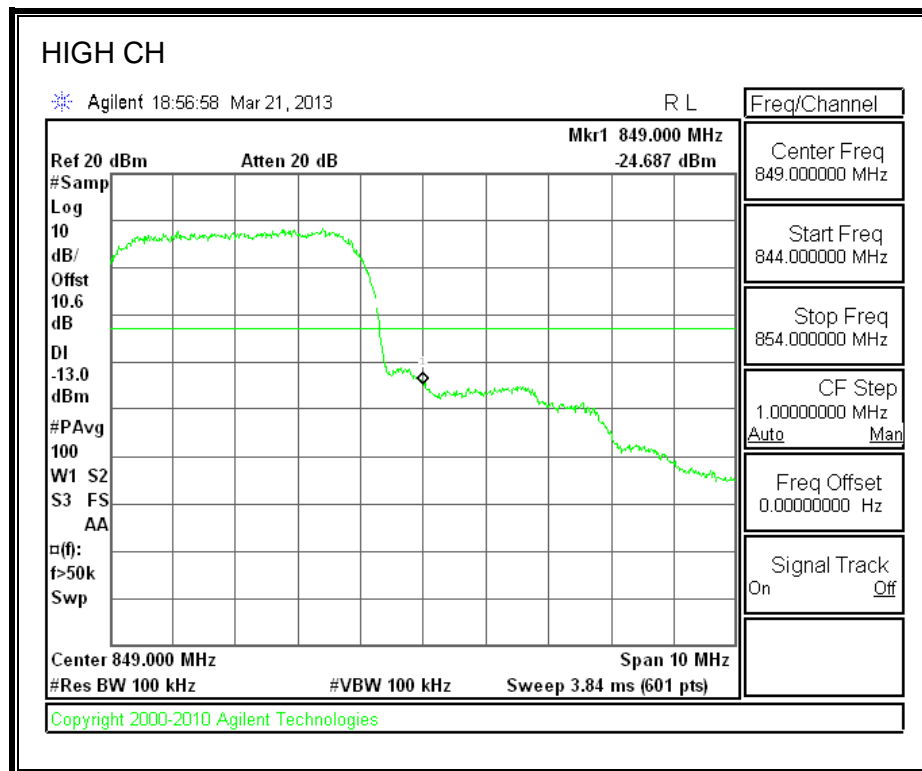
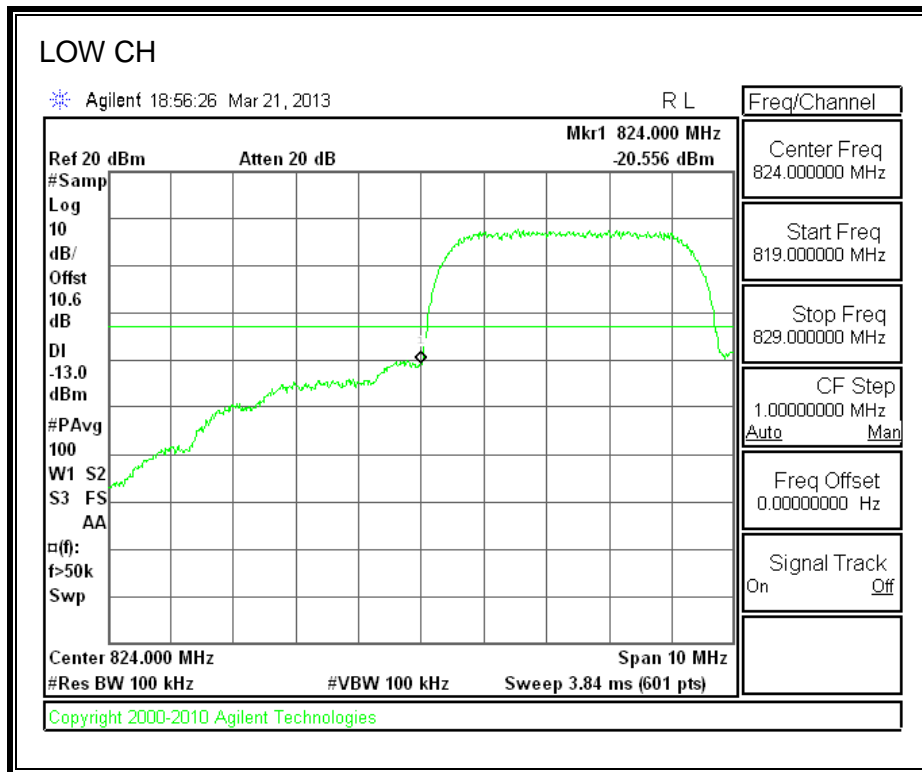


**PCS BAND**



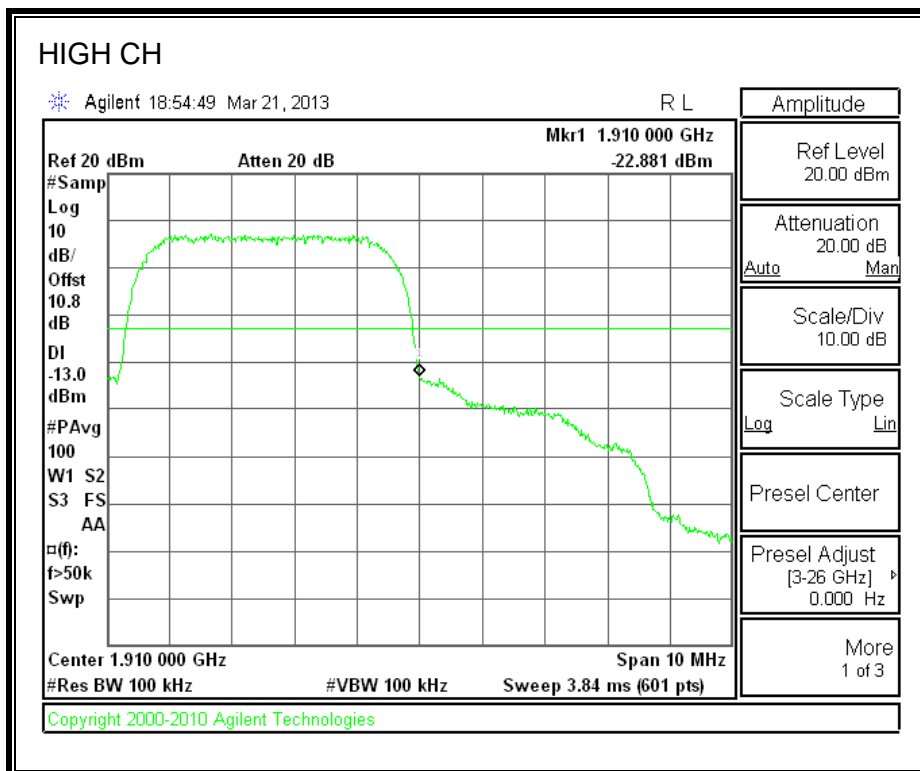
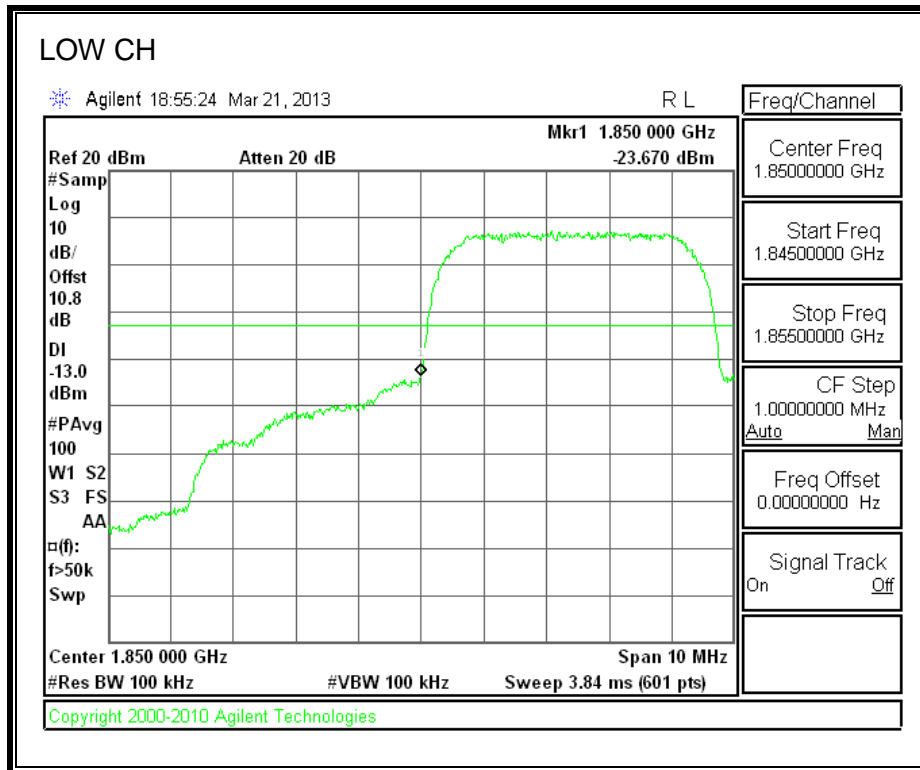
8.2.4. UMTS HSDPA MODE

CELL BAND



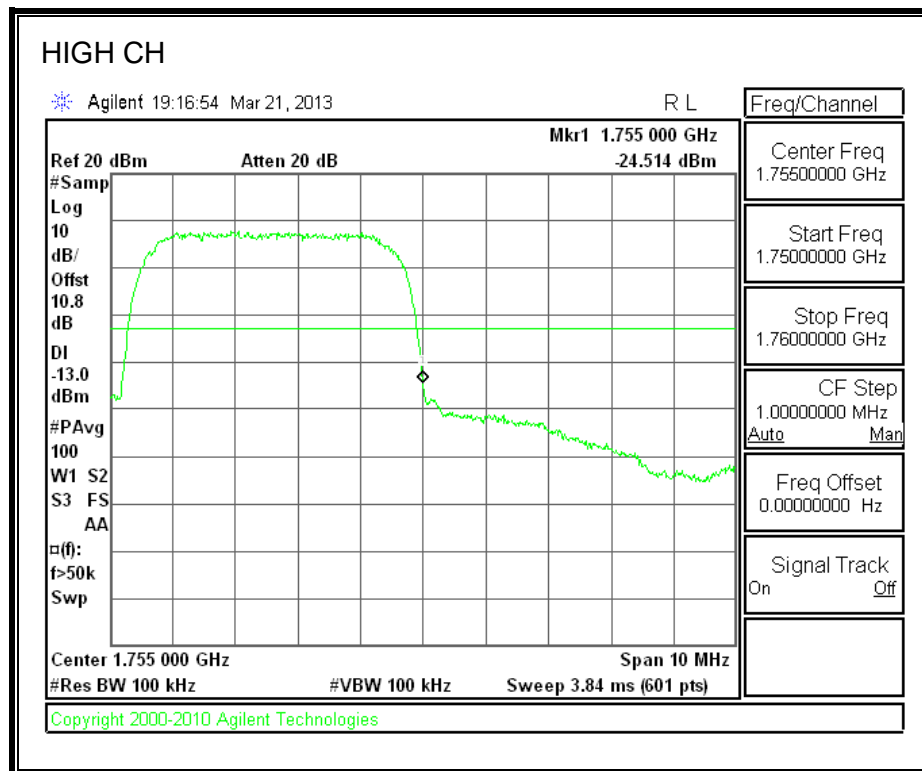
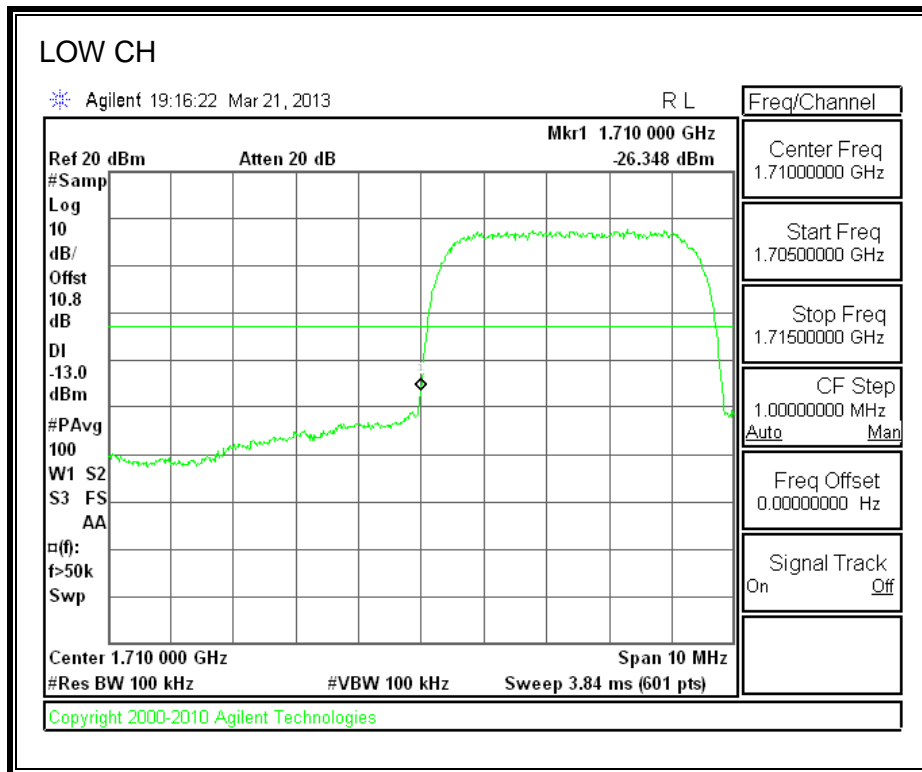


**PCS BAND**



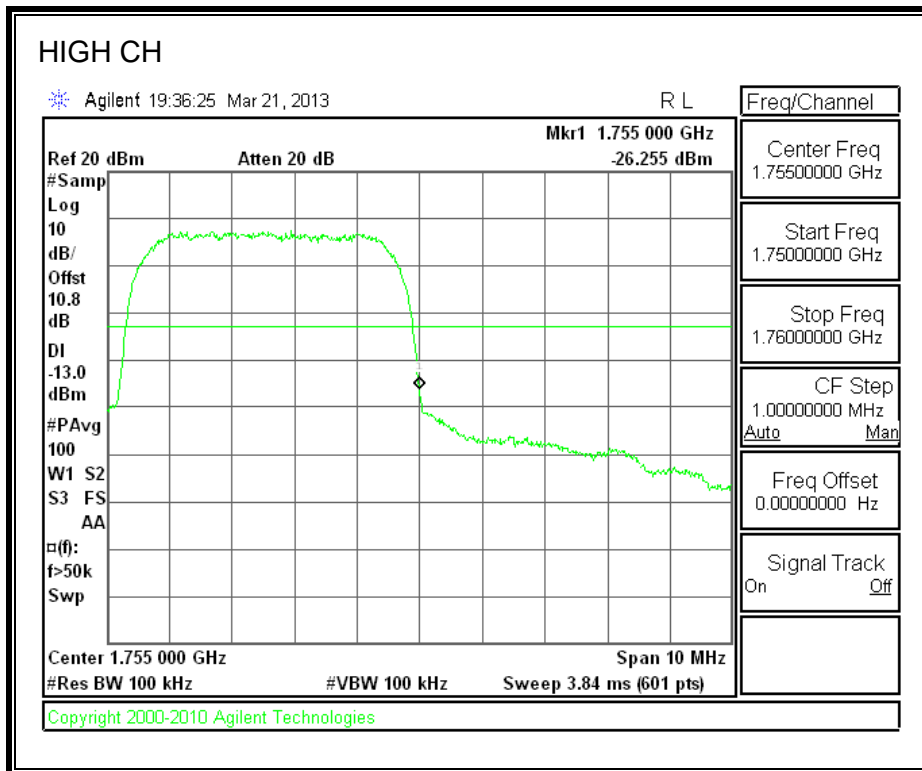
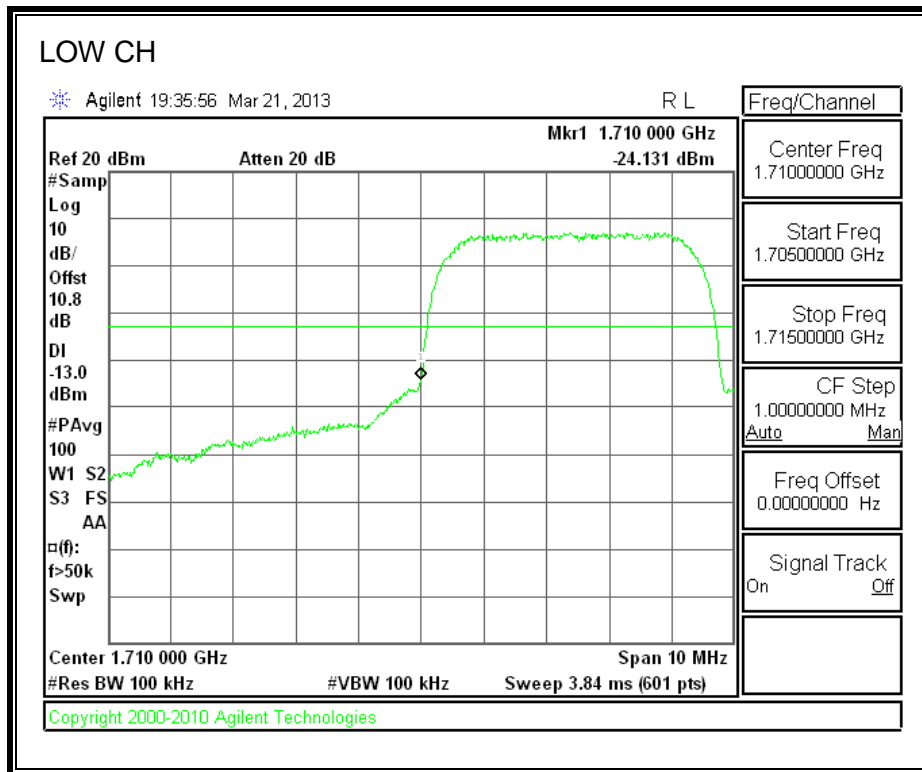
8.2.5. UMTS 1700 Rel 99 MODE

**AWS BAND**



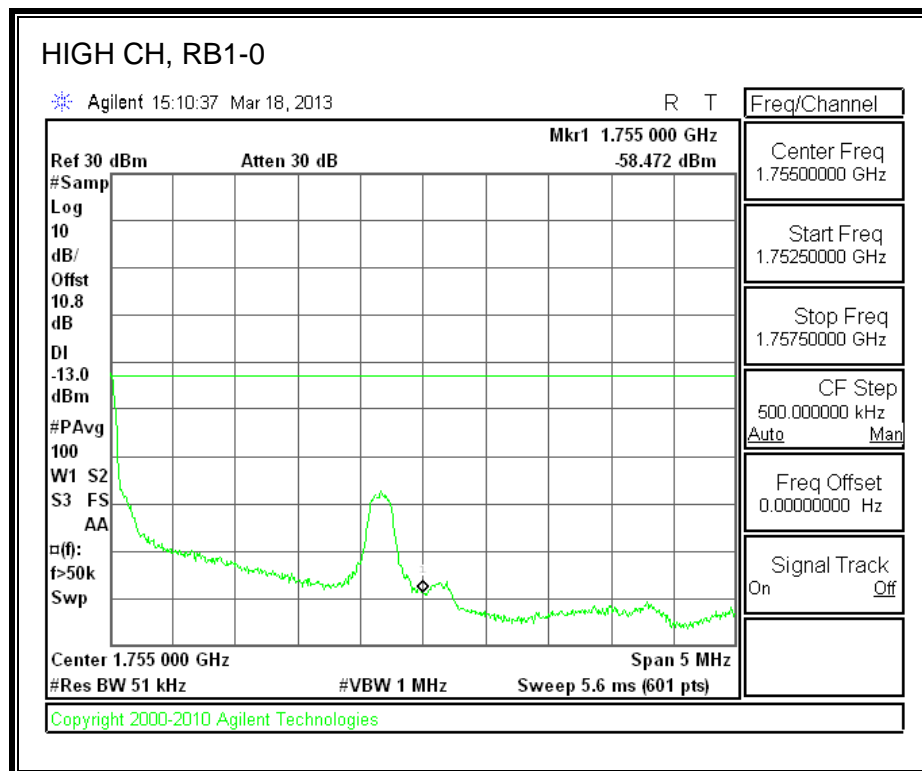
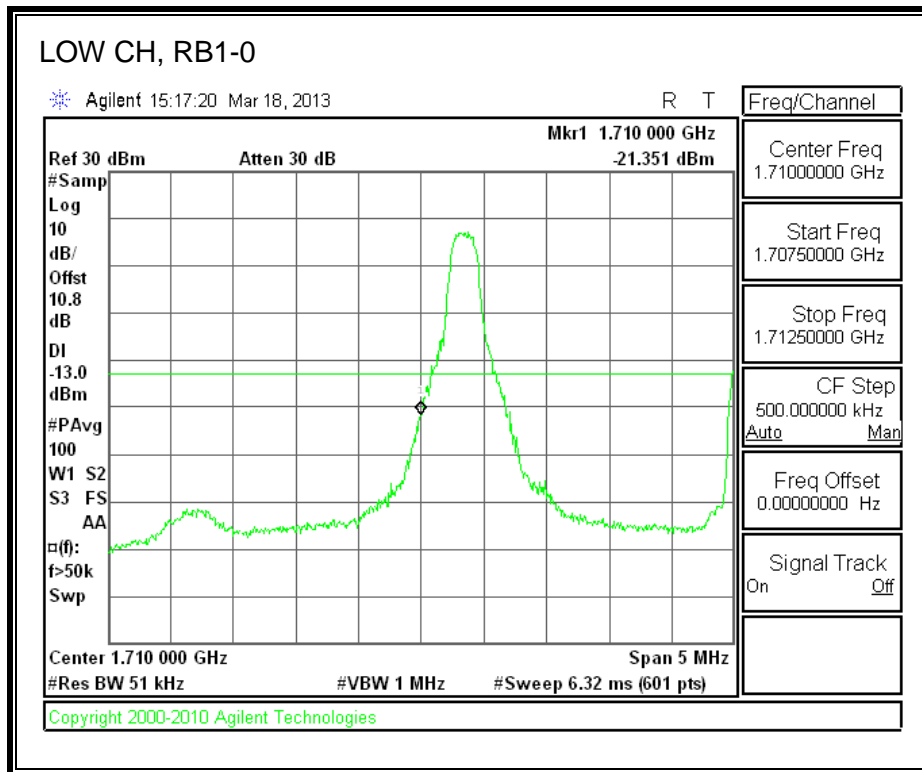
8.2.6. UMTS 1700 HSDPA MODE

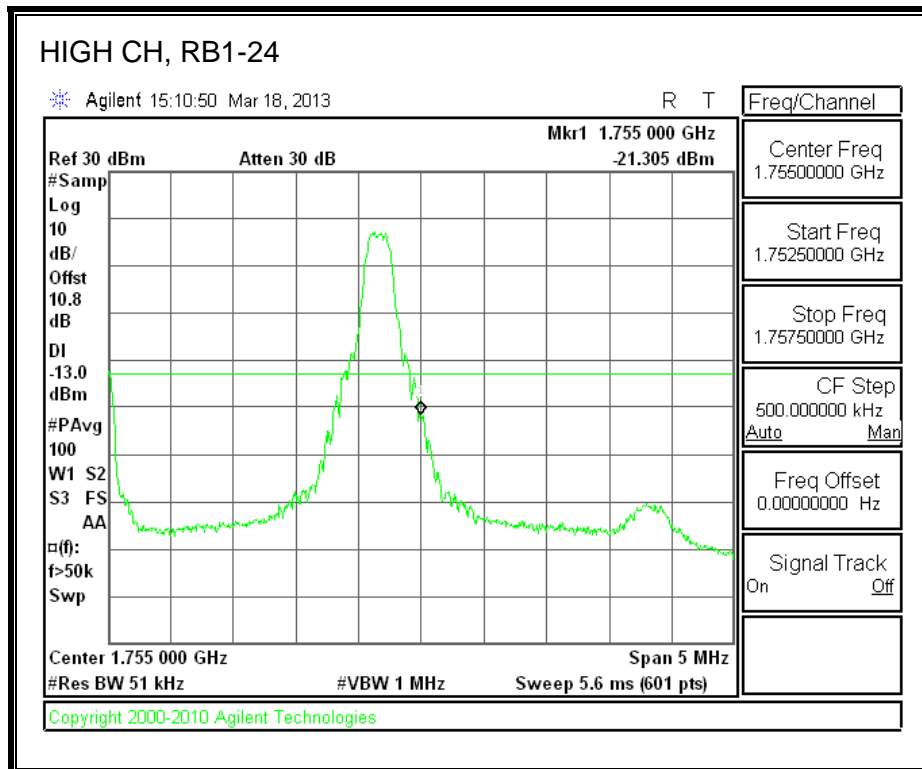
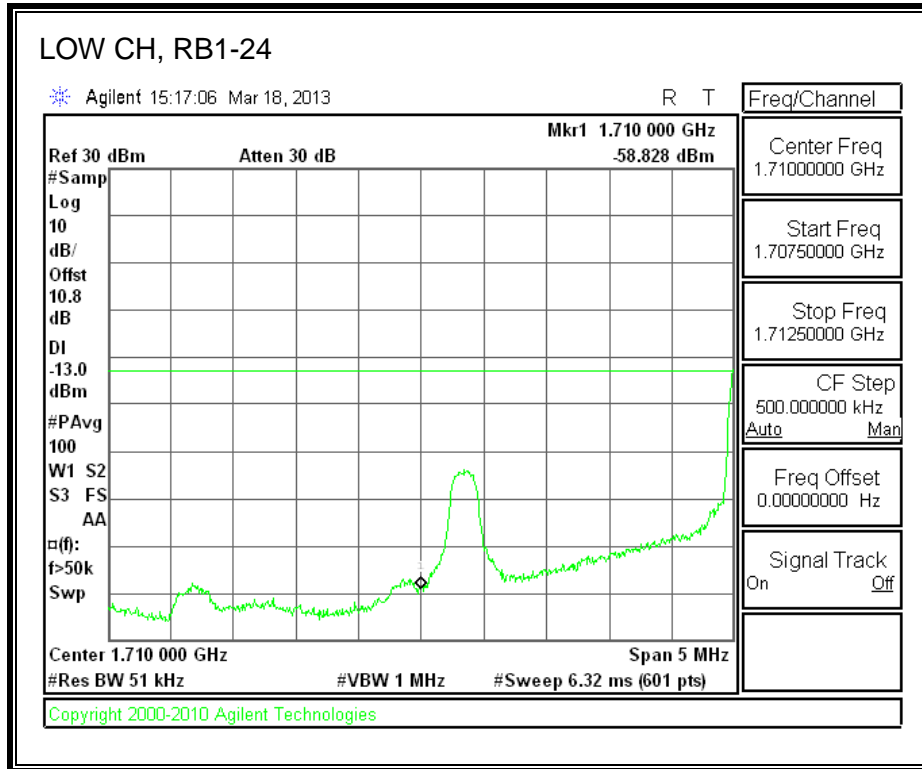
AWS BAND

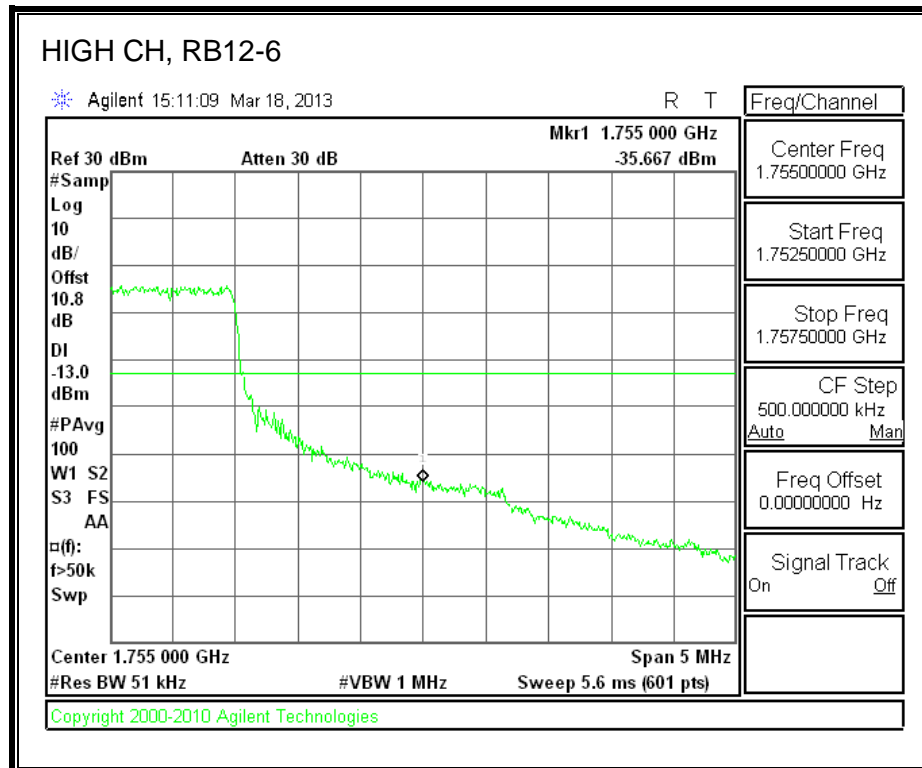
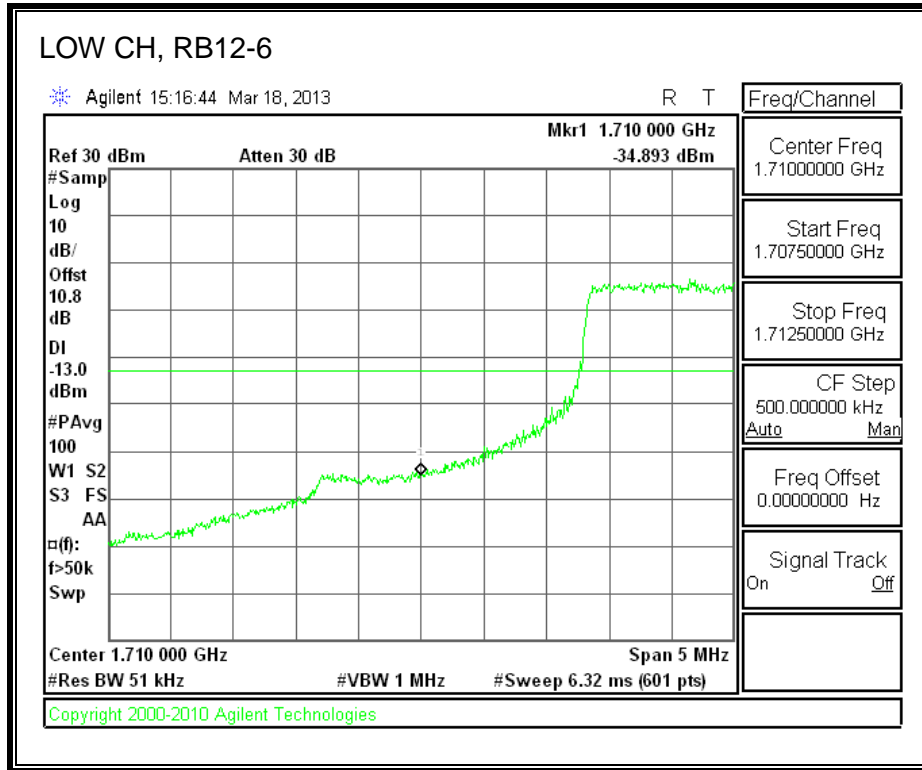


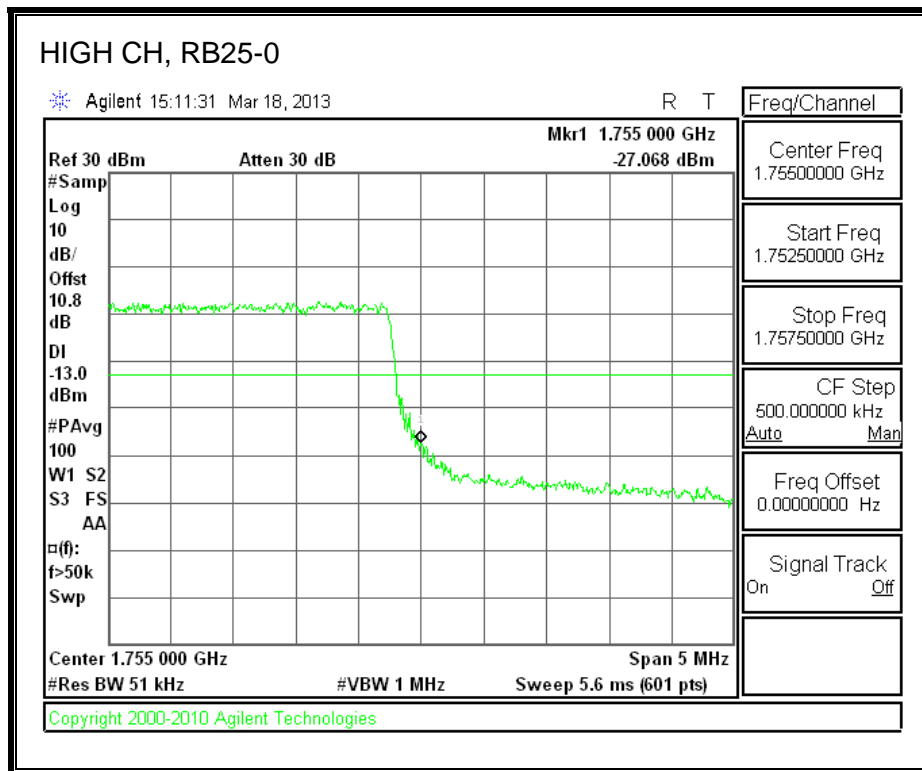
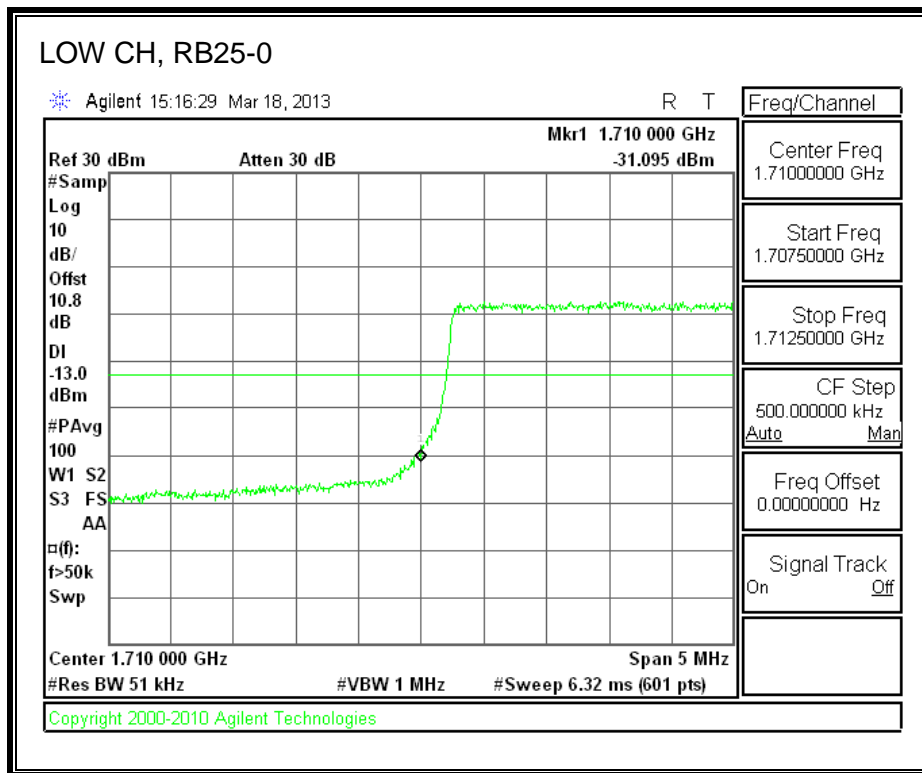
**8.2.7. LTE BAND 4**

**LTE QPSK Band 4 (5.0 MHz BAND WIDTH)**

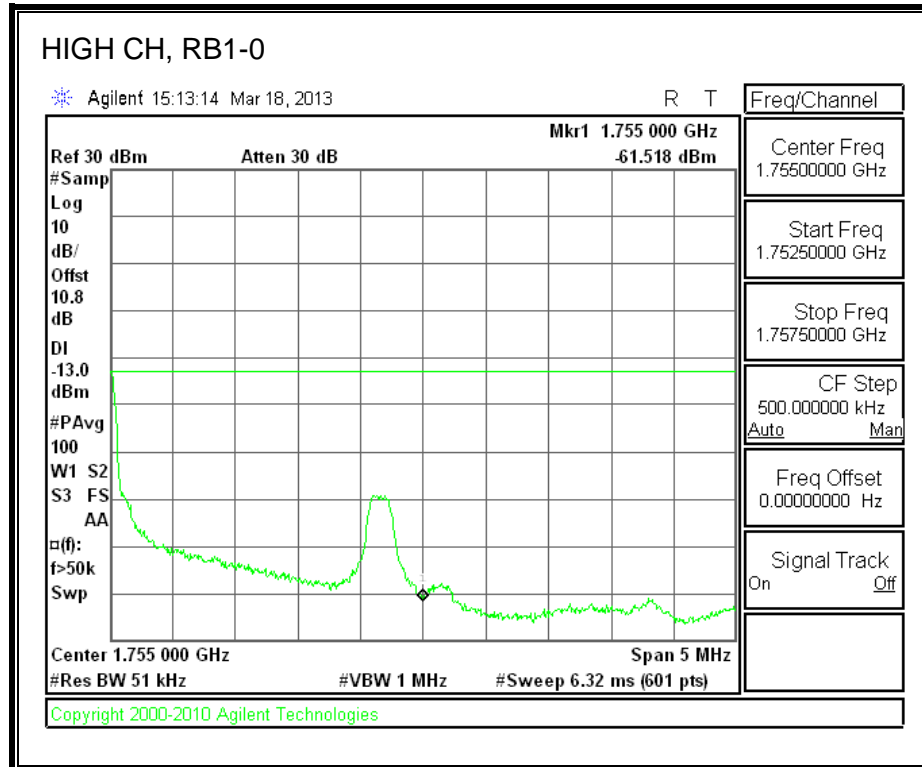
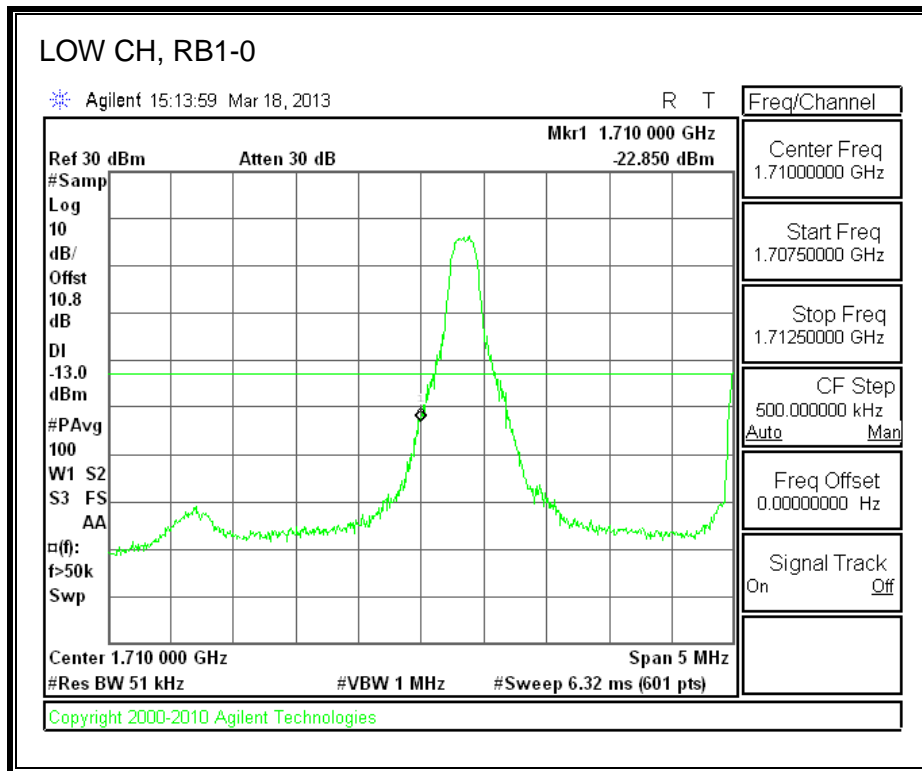




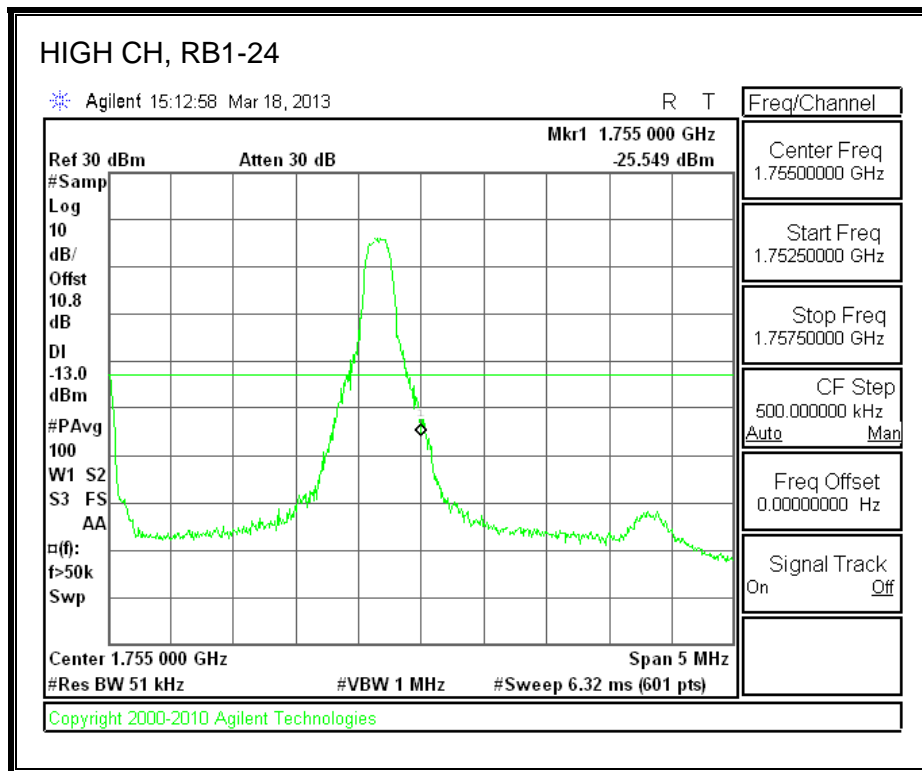
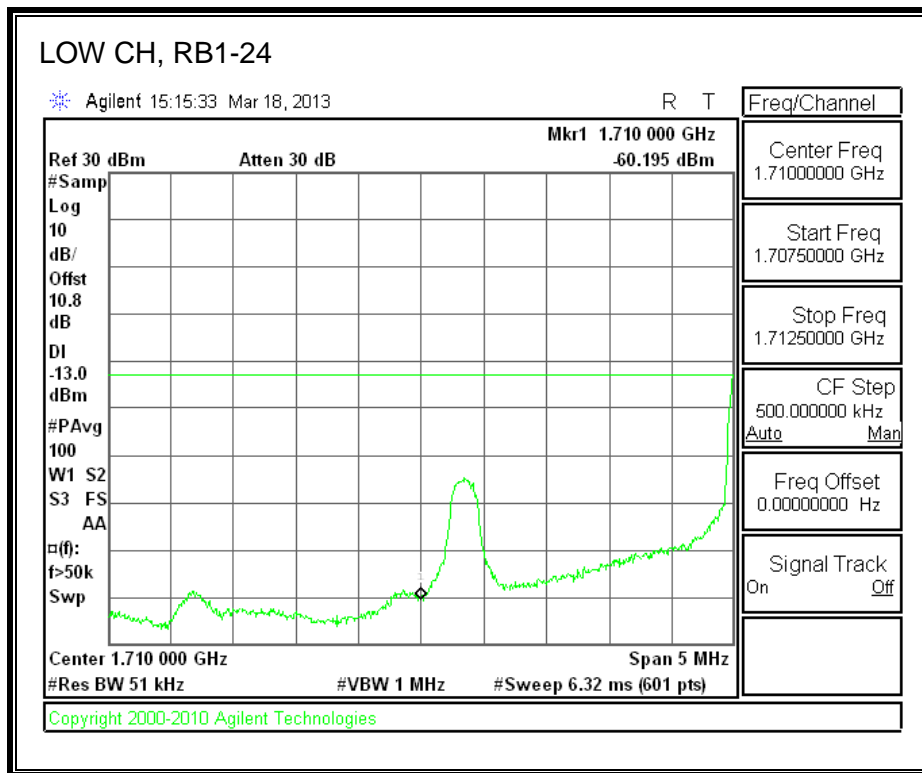


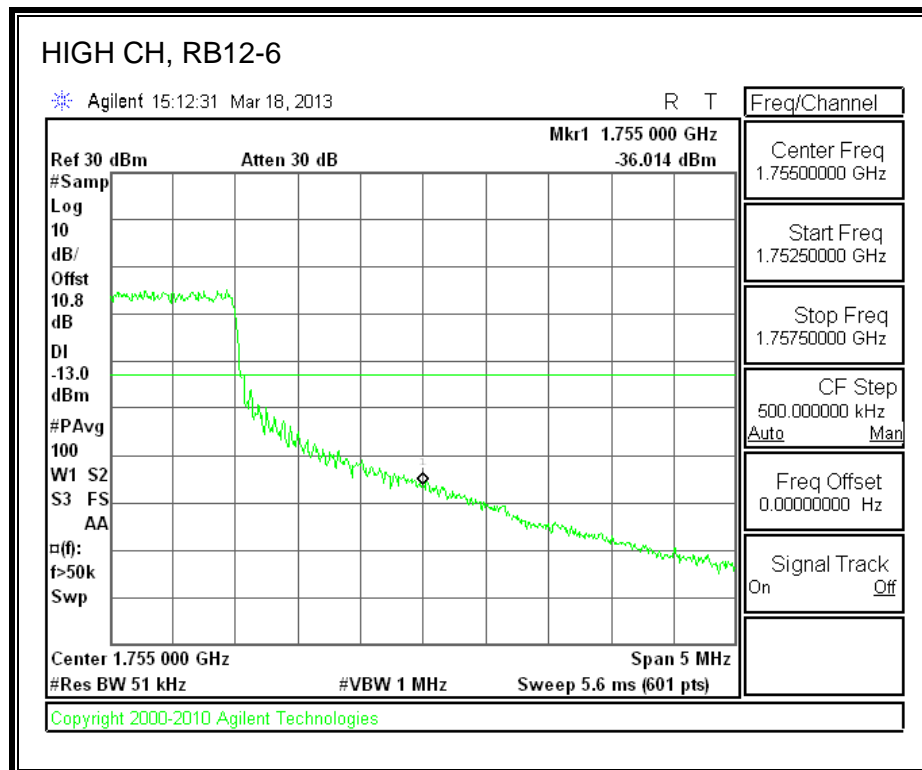
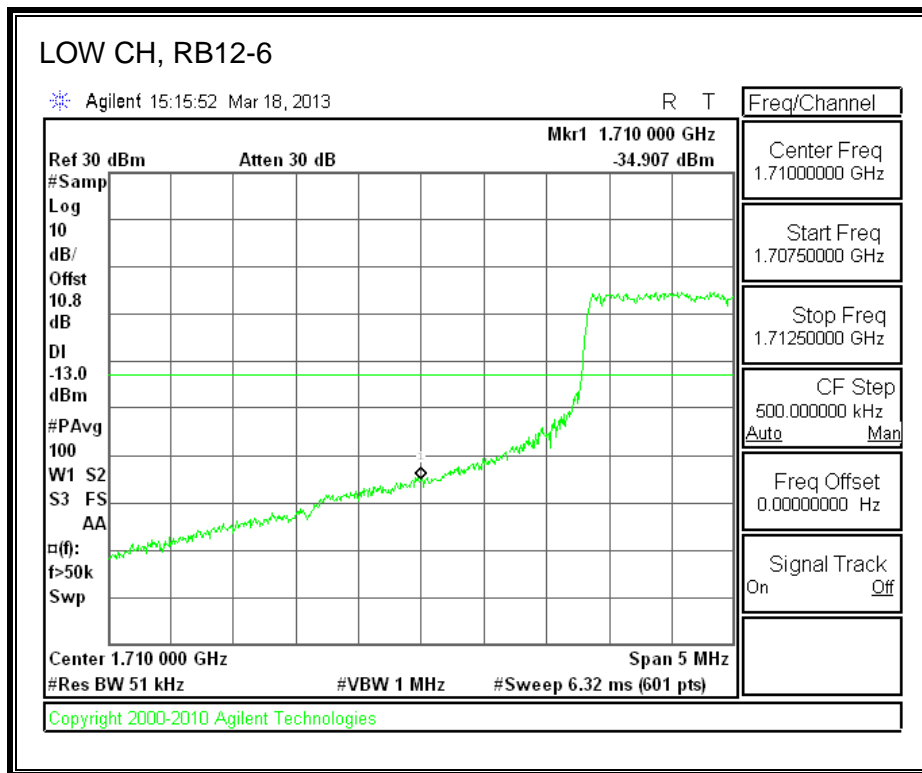


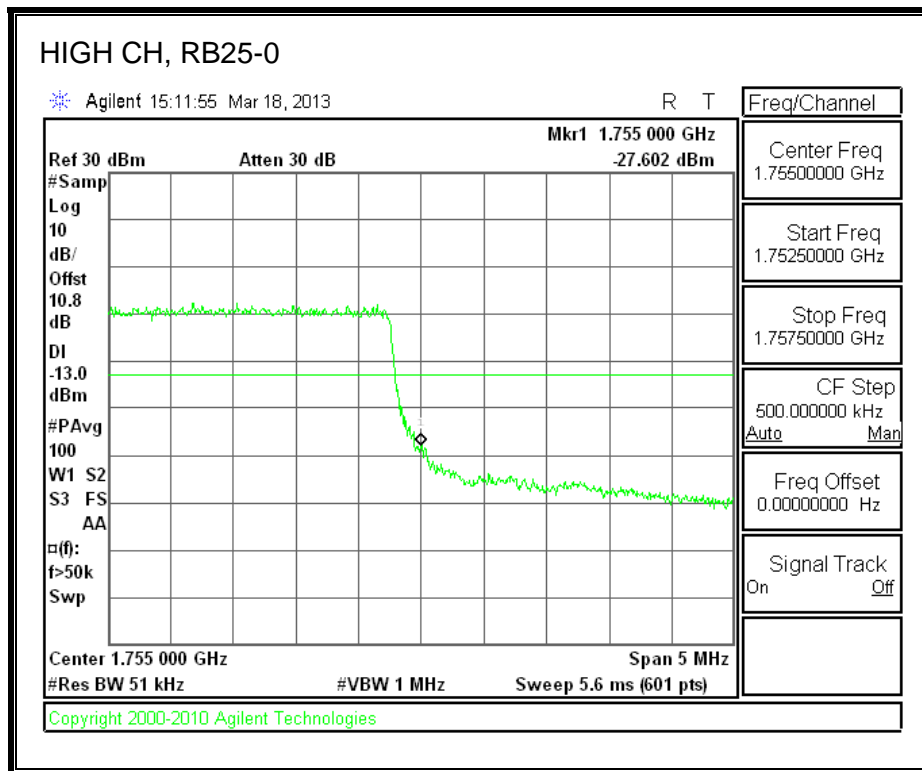
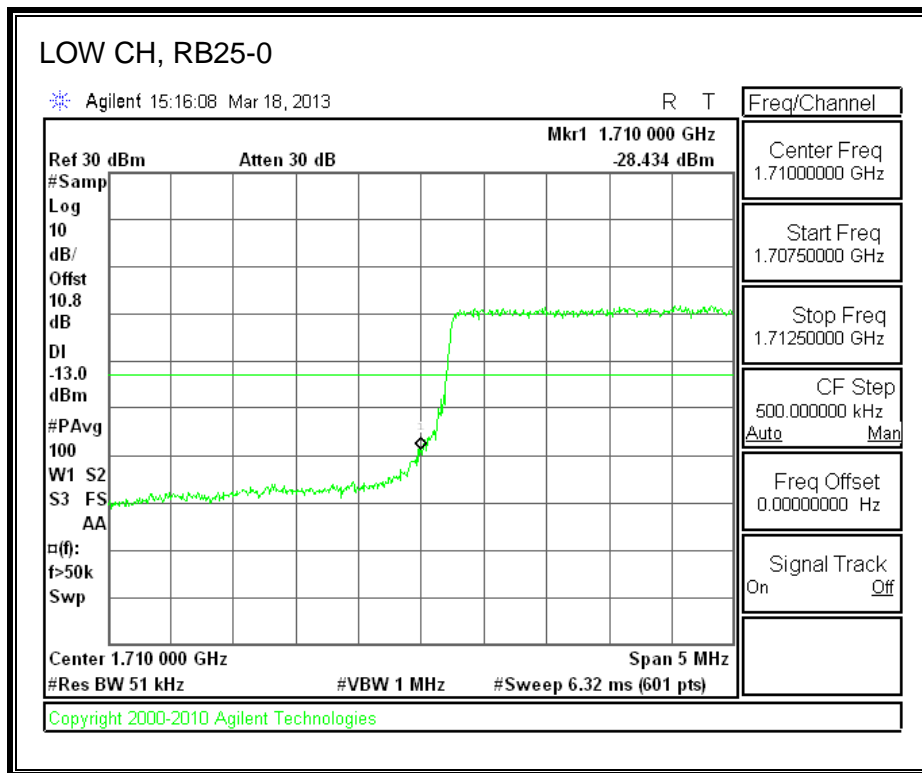
**LTE 16QAM Band 4 (5.0 MHz BAND WIDTH )**



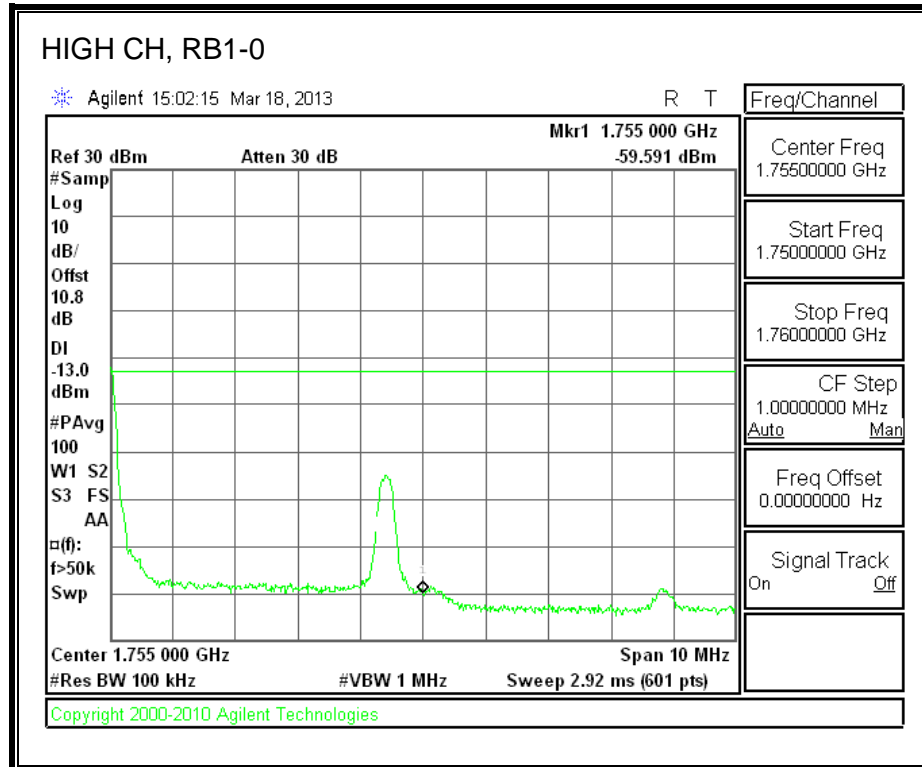
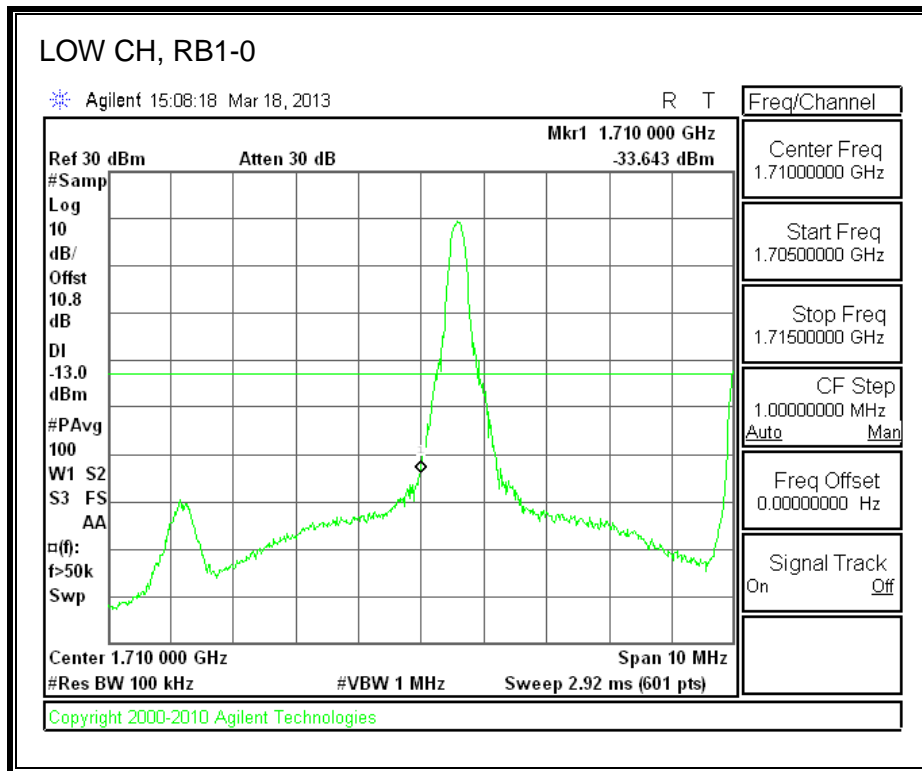


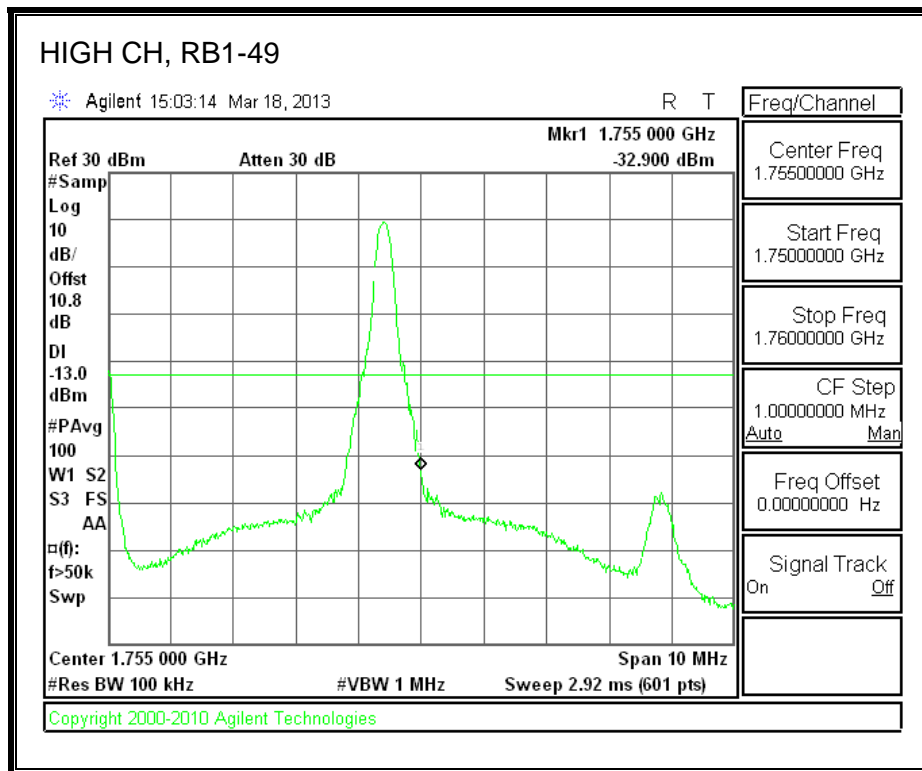
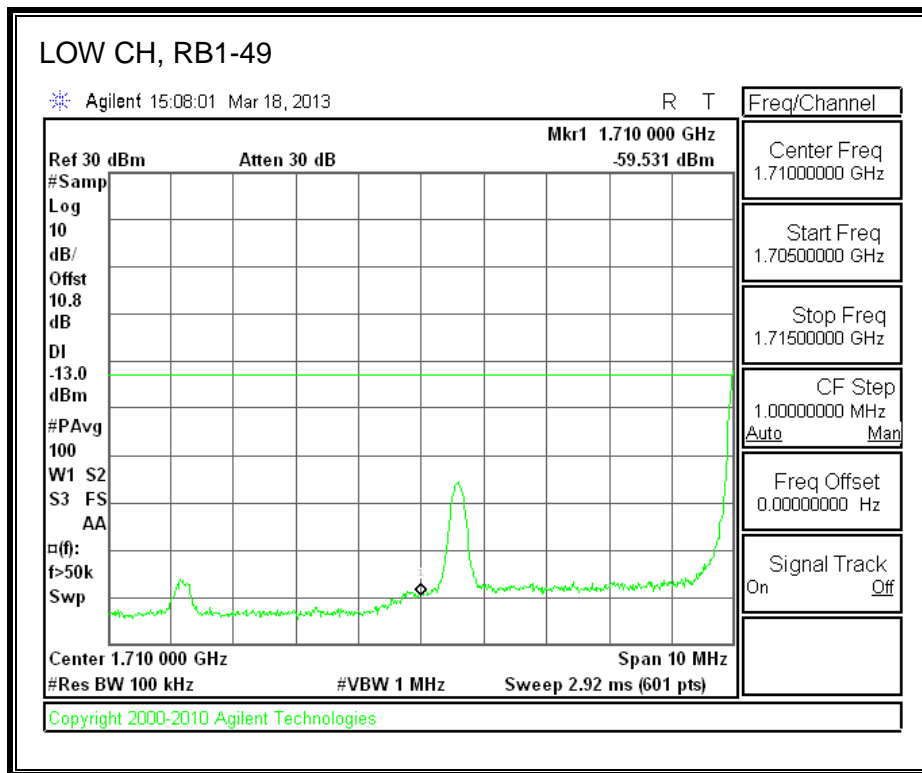


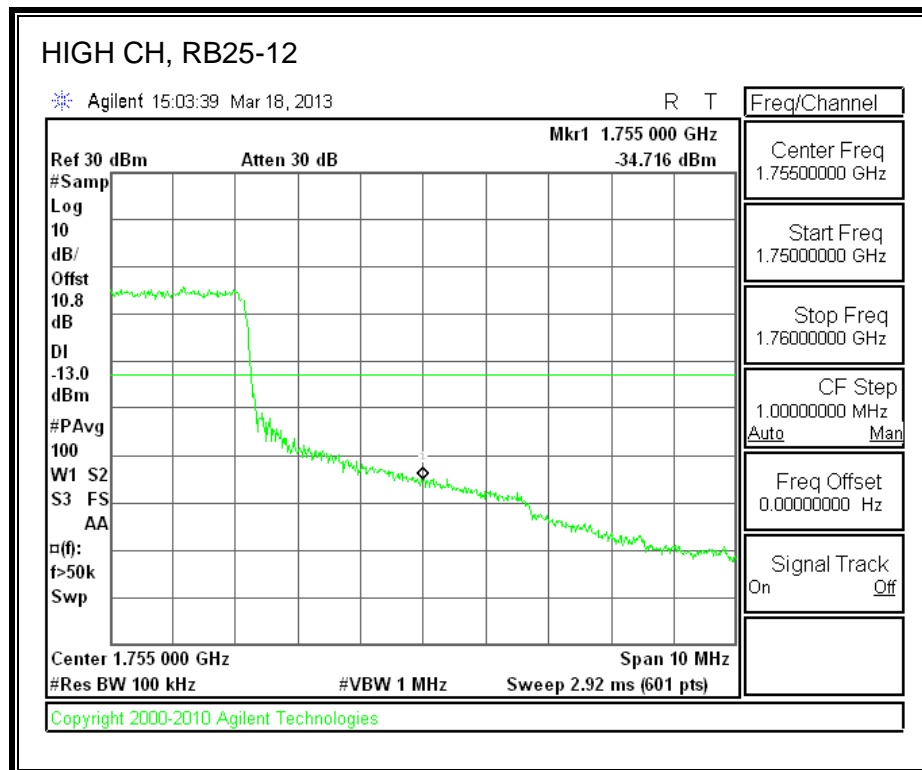
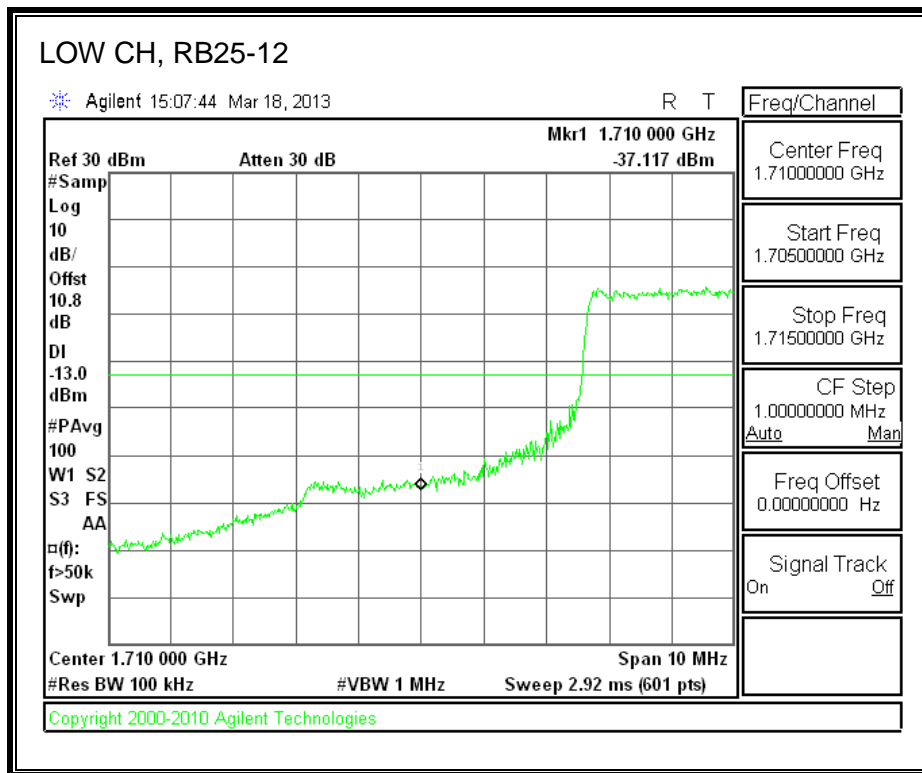


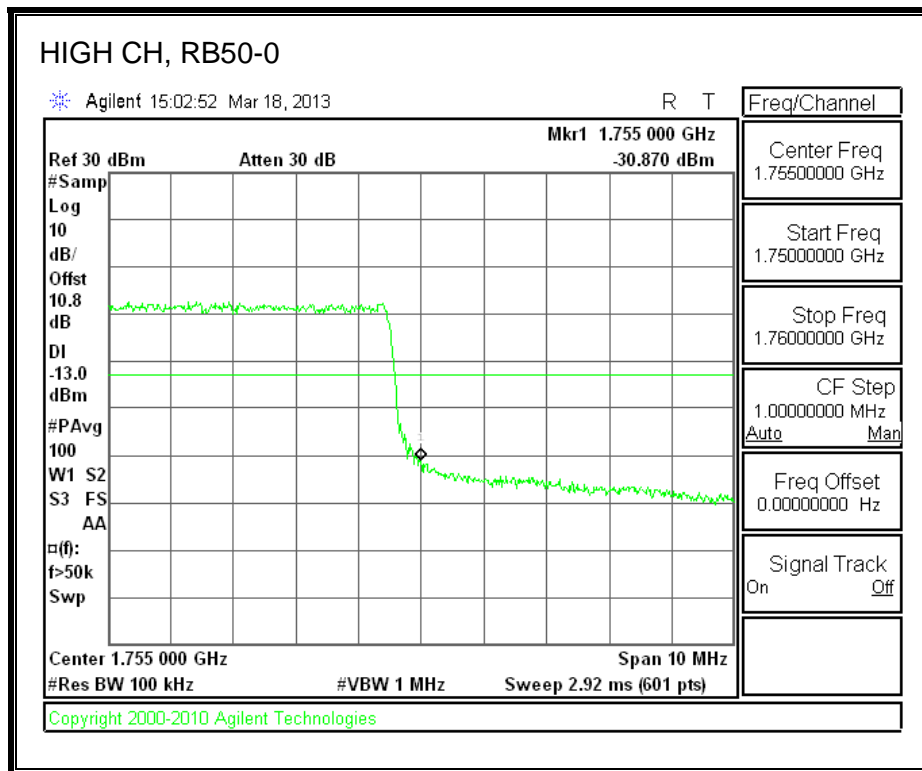
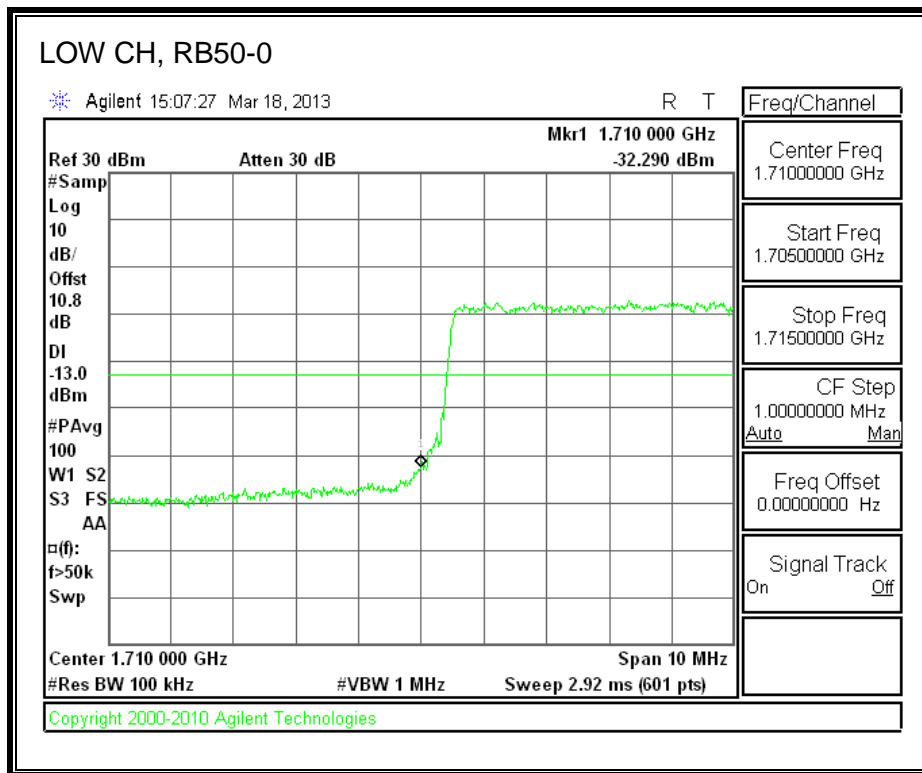


**LTE QPSK Band 4 (10.0 MHz BAND WIDTH)**

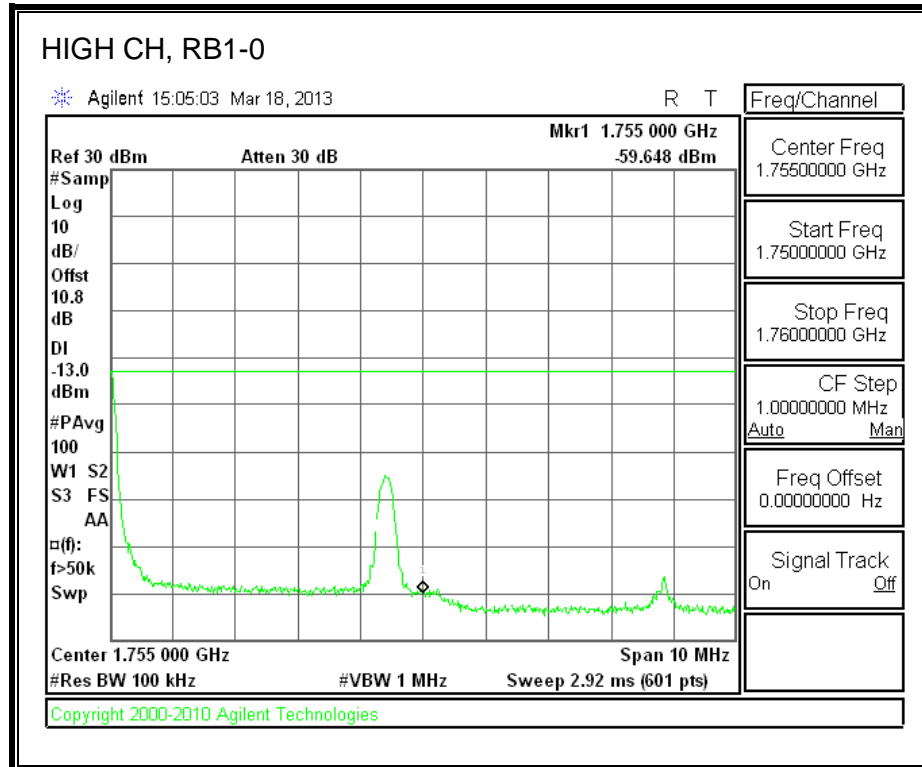
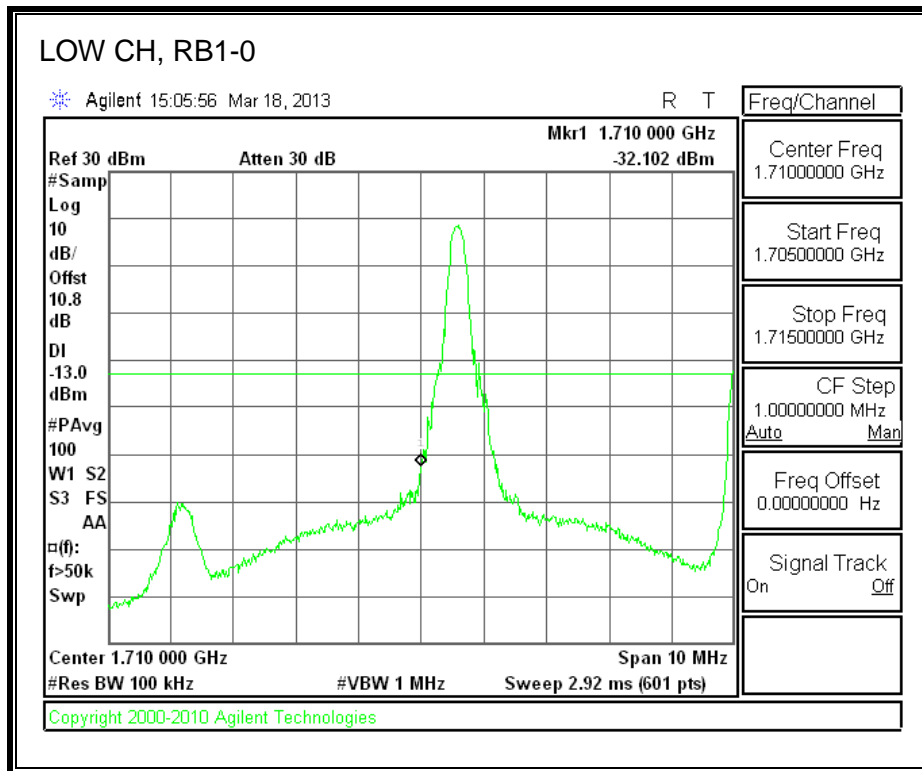




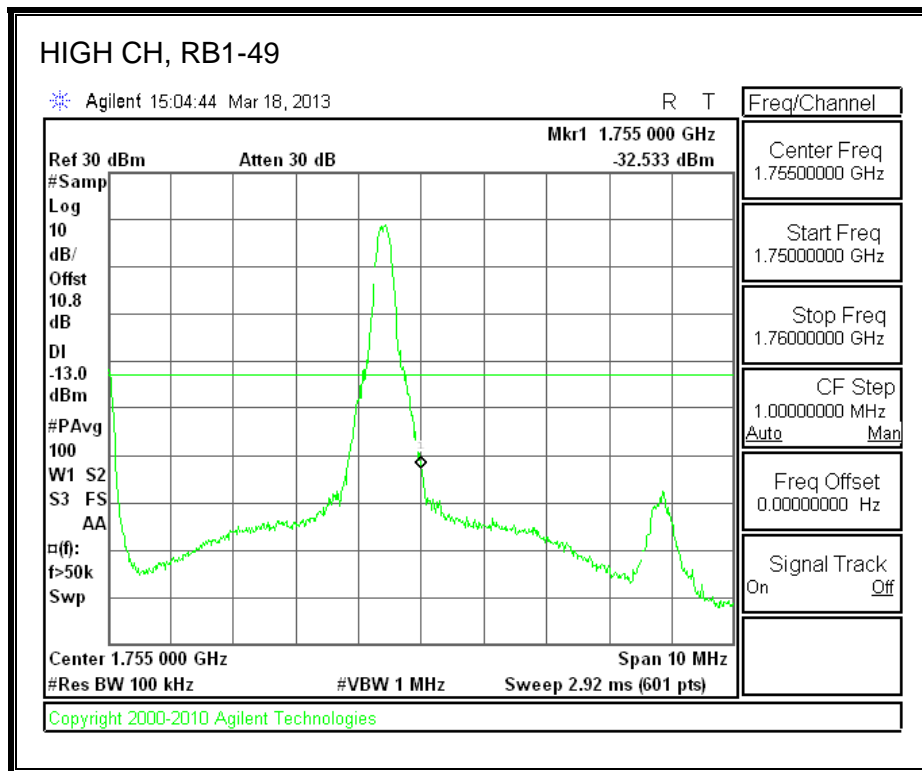
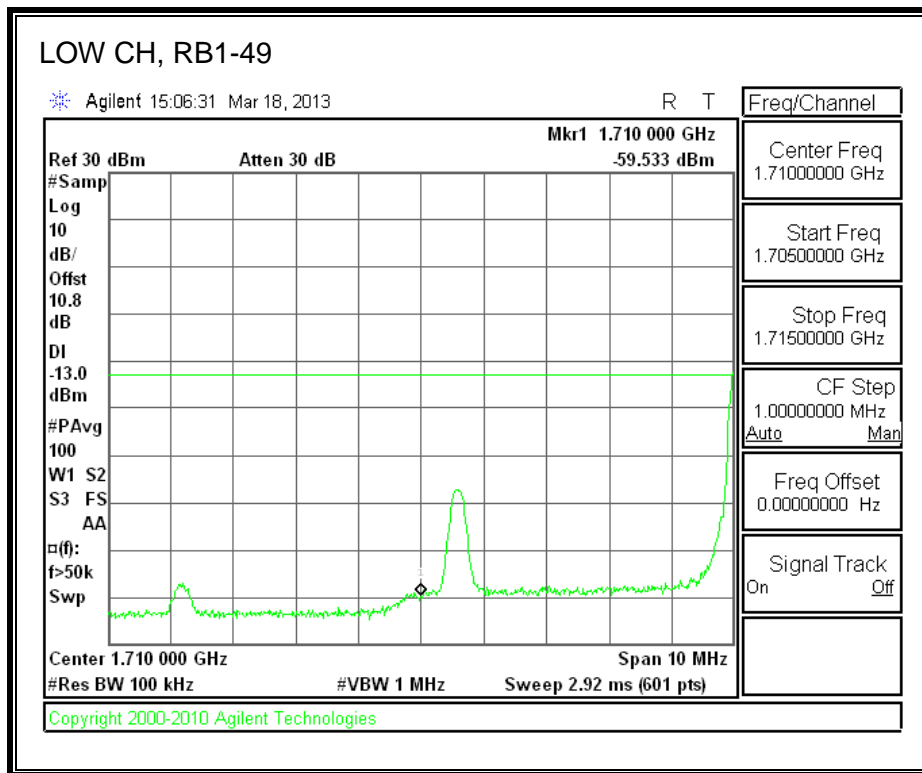


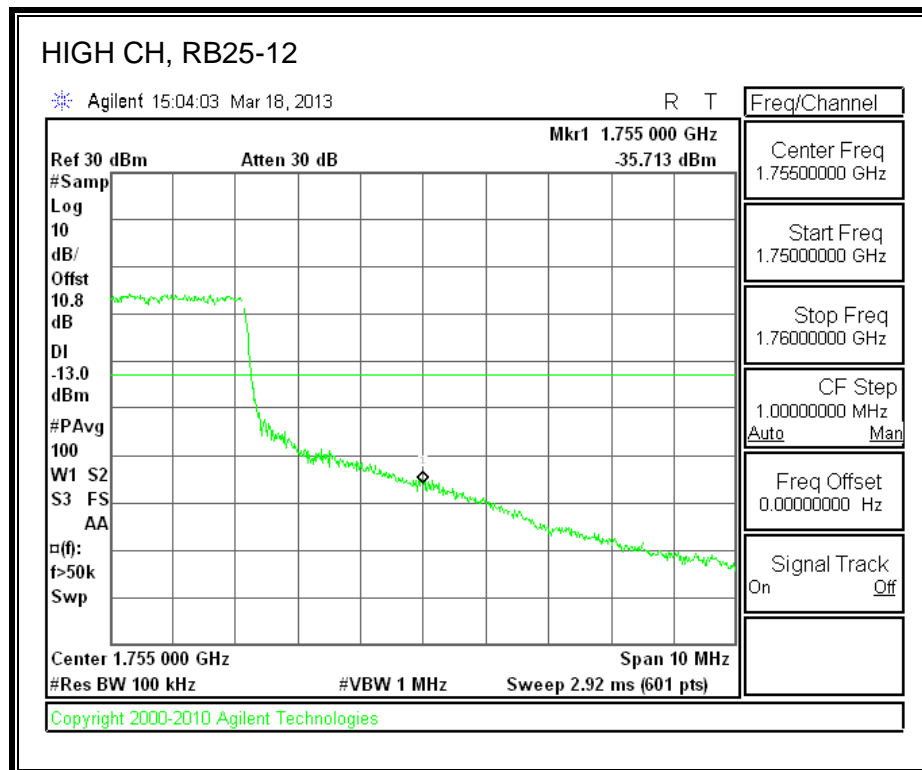
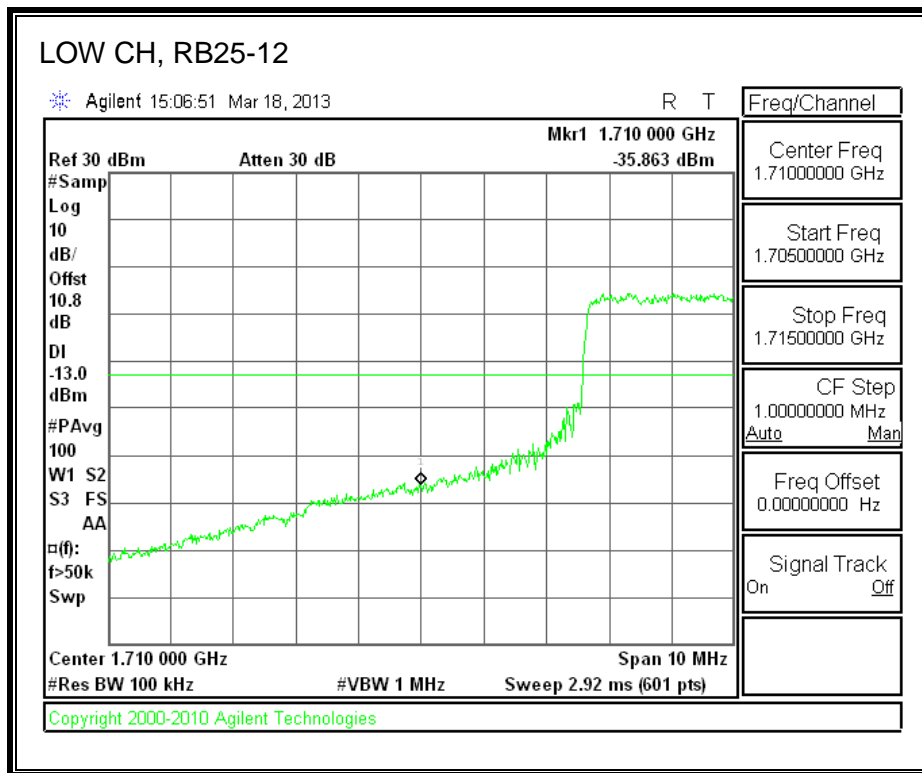


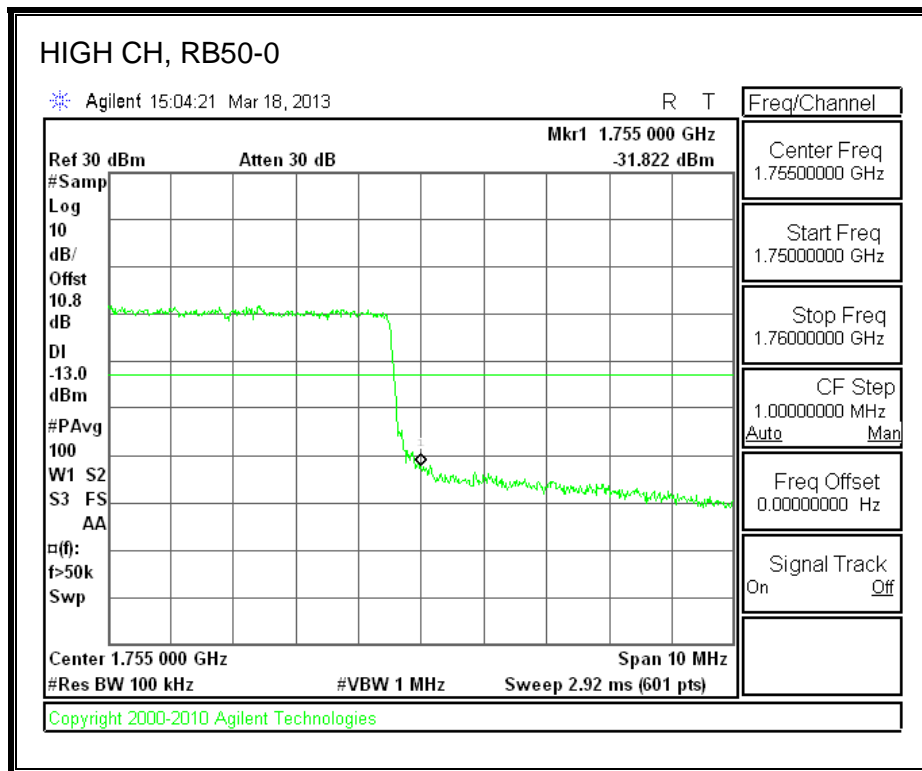
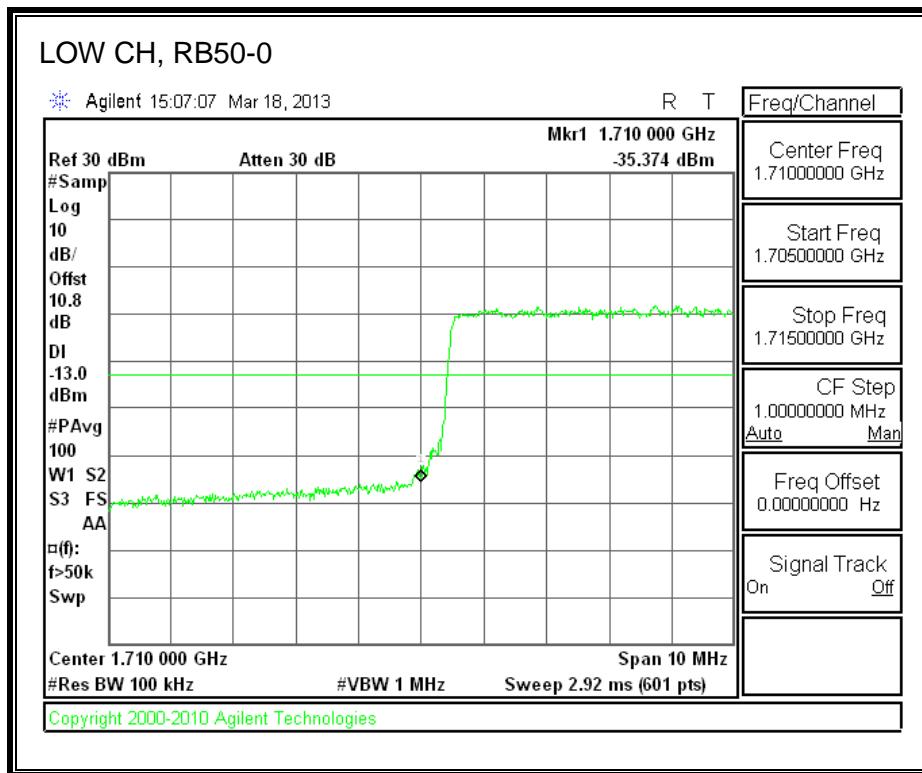
**LTE 16QAM Band 4 (10.0 MHz BAND WIDTH)**



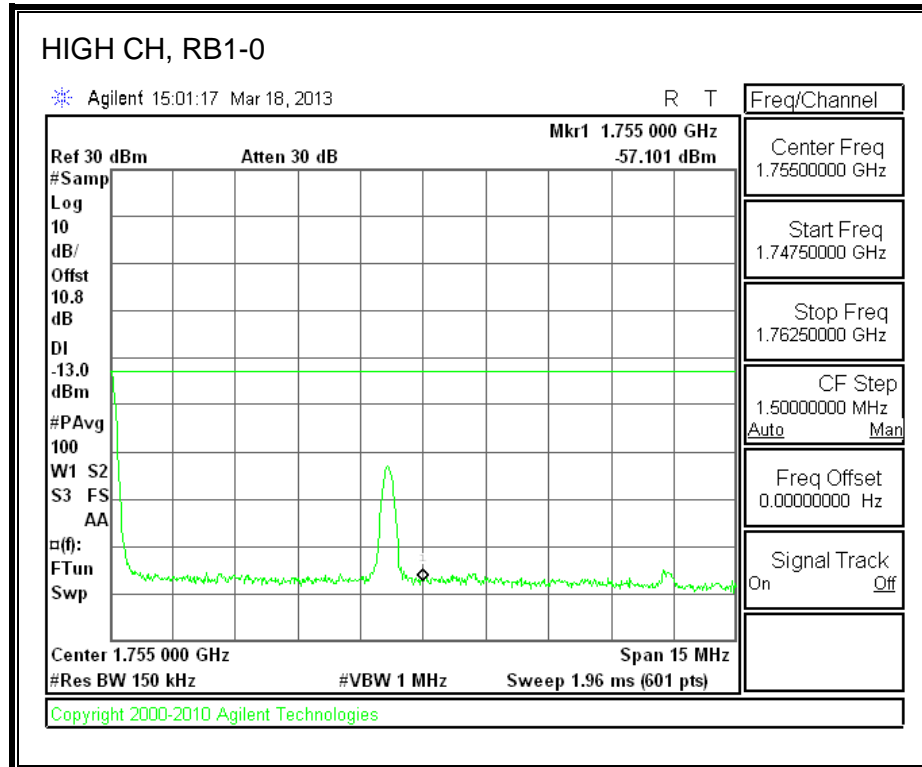
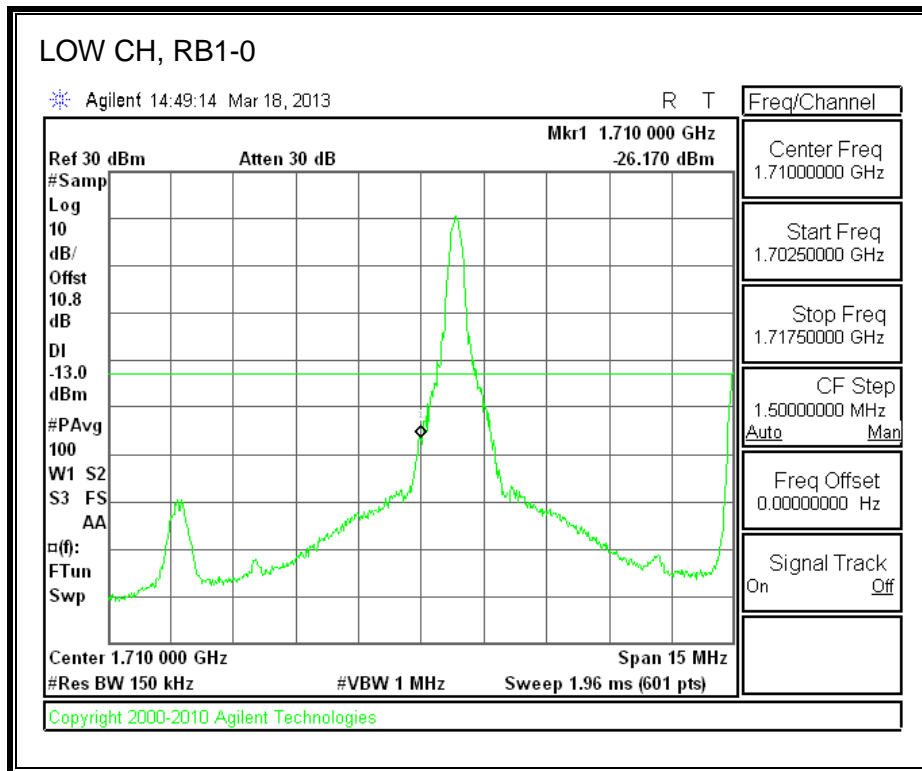


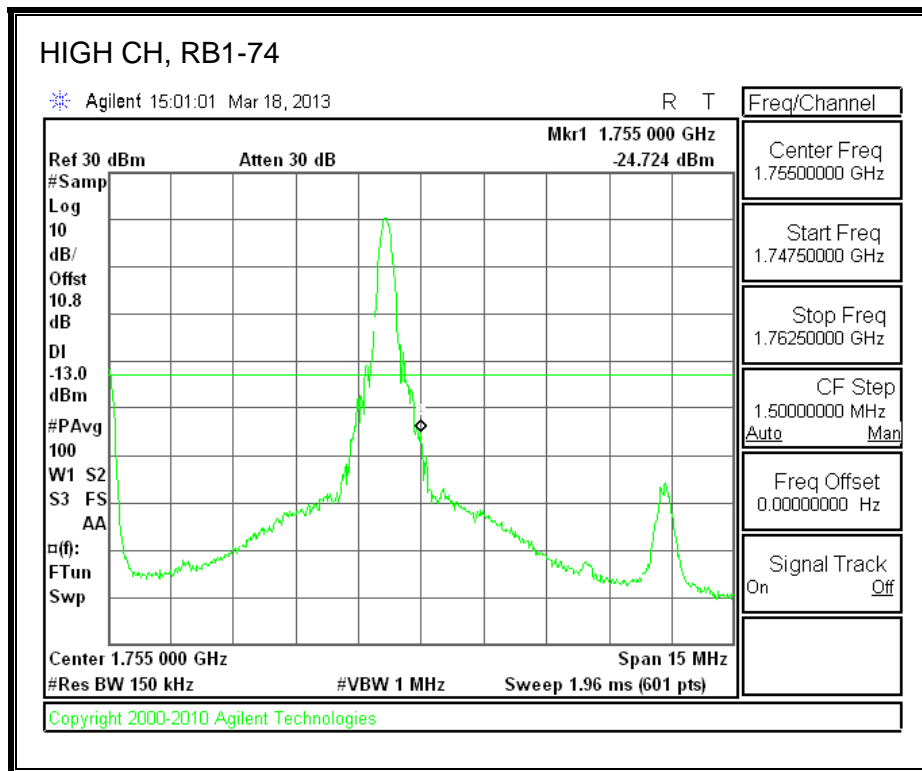
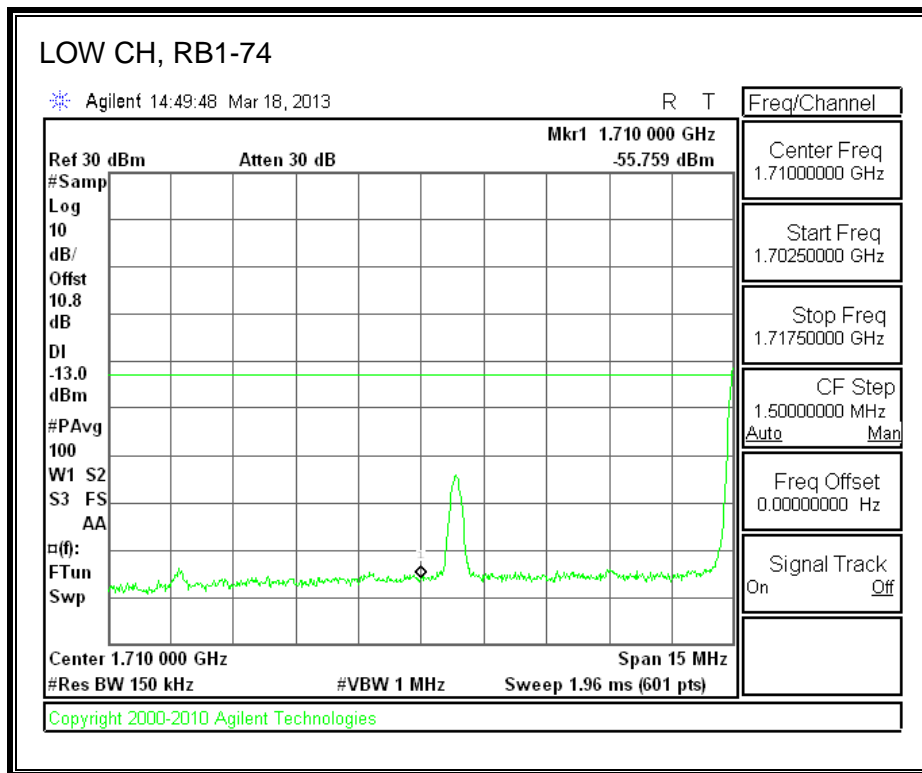


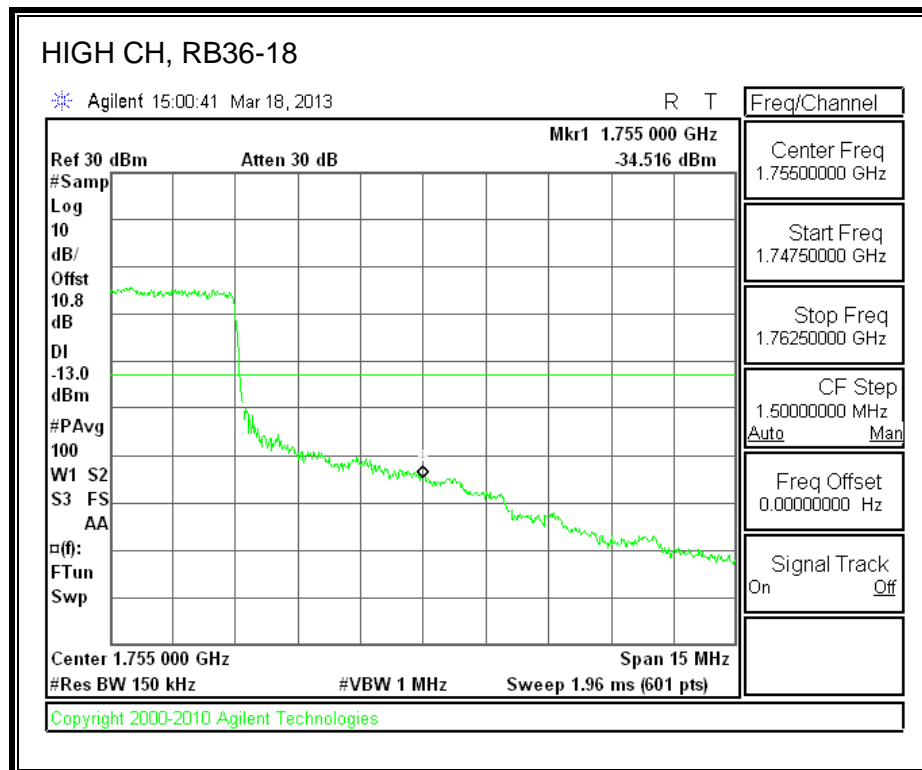
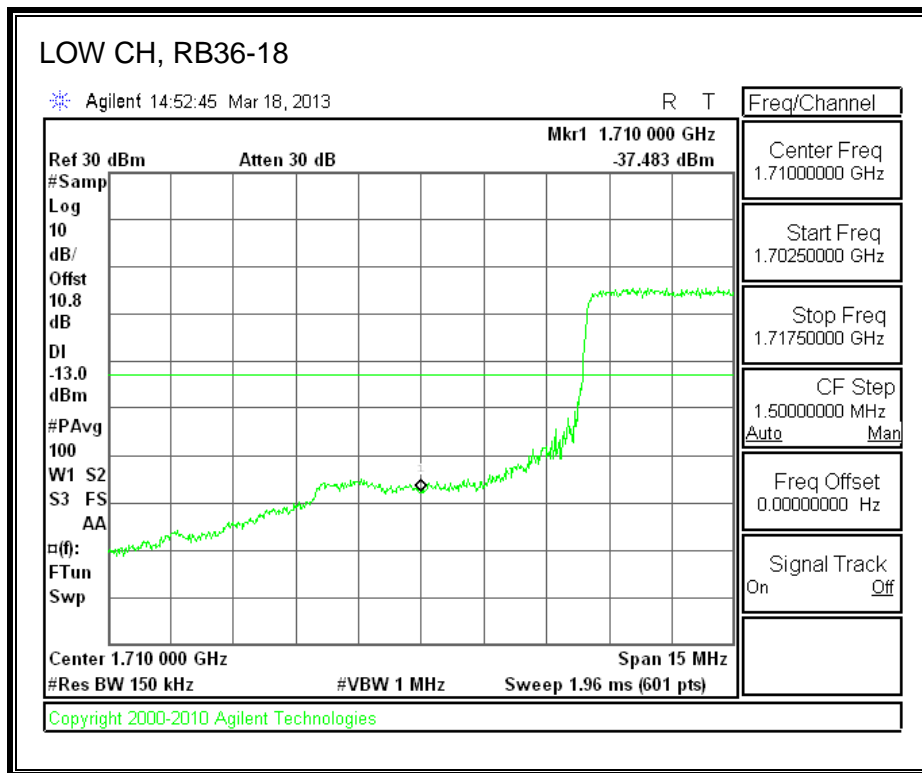


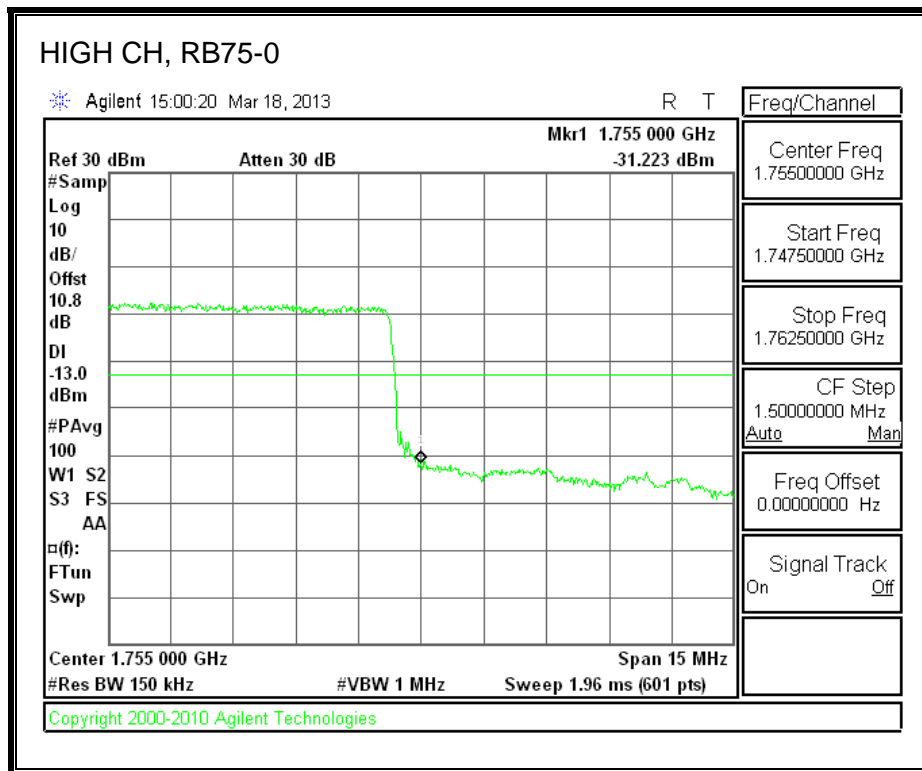
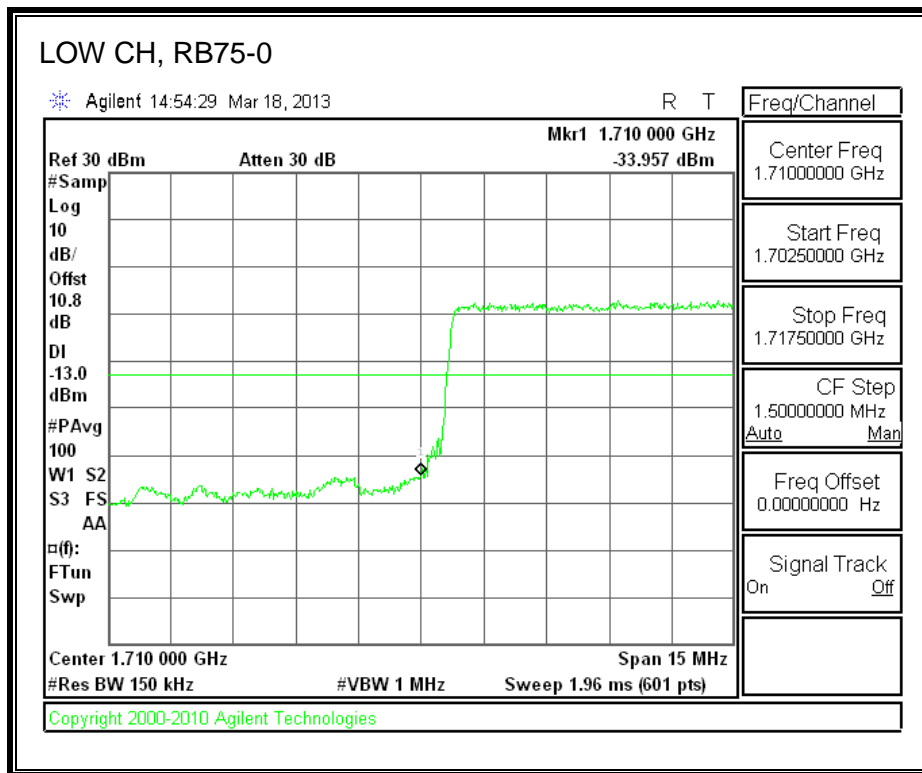


**LTE QPSK Band 4 (15.0 MHz BAND WIDTH)**

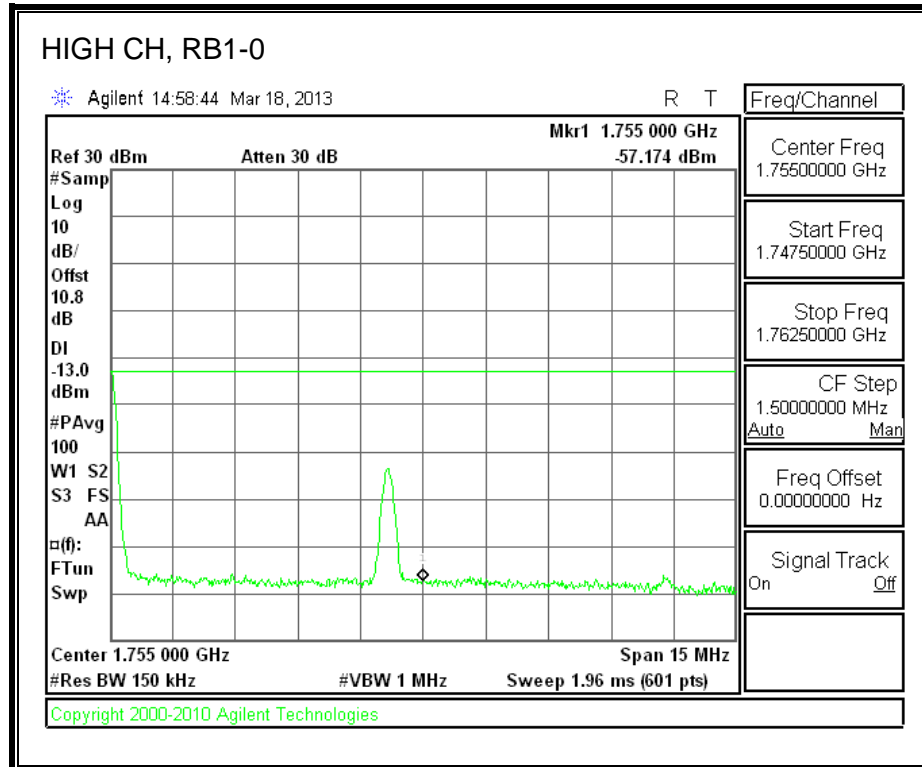
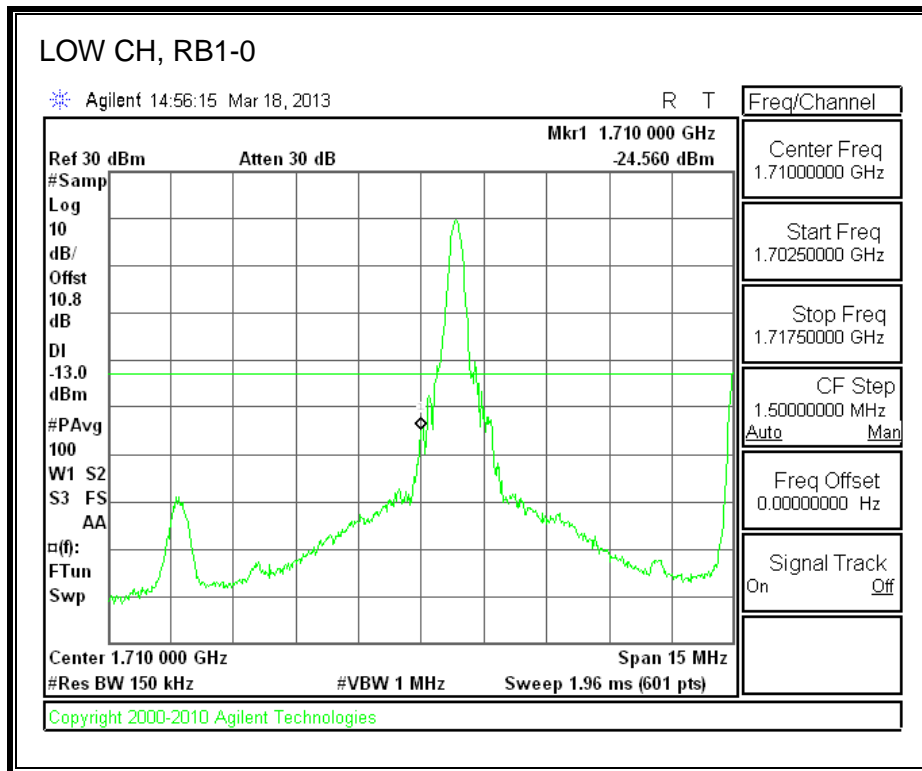




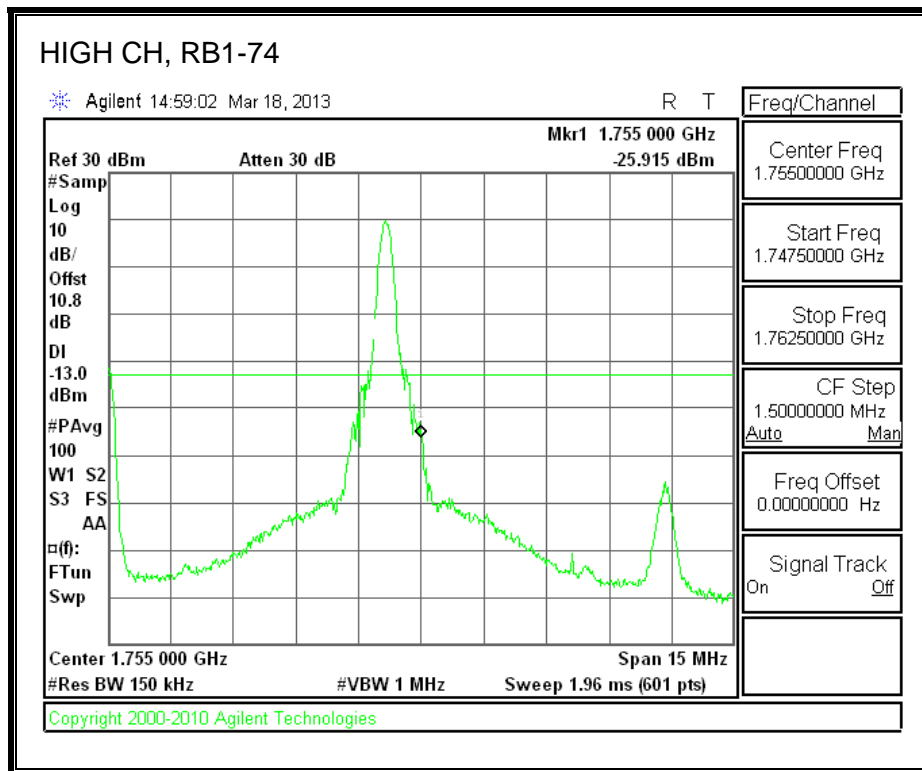
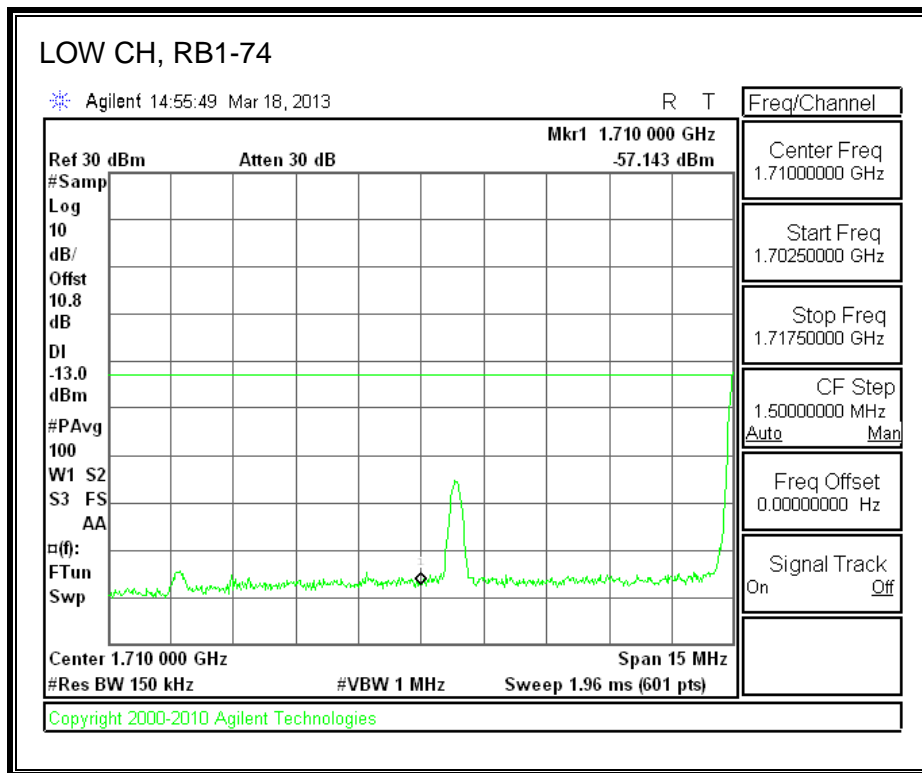


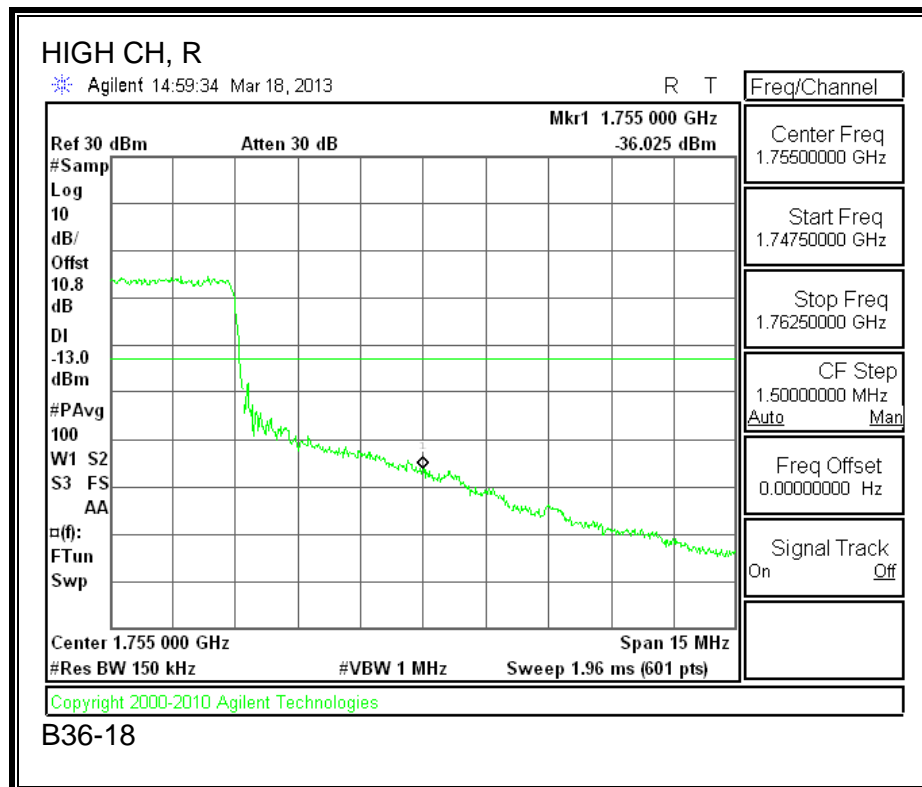
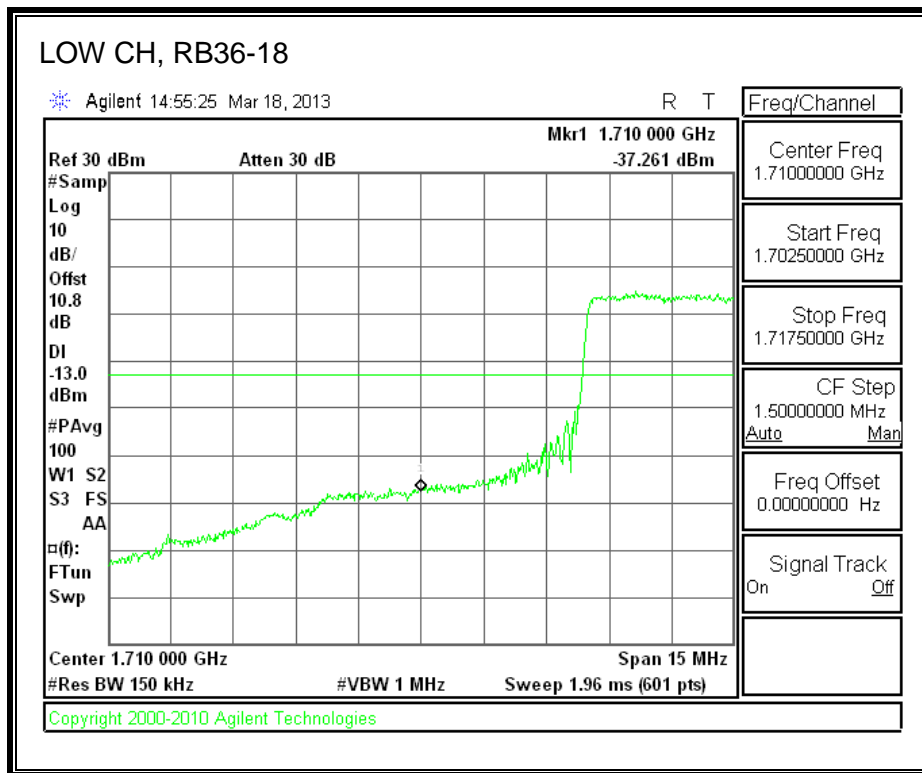


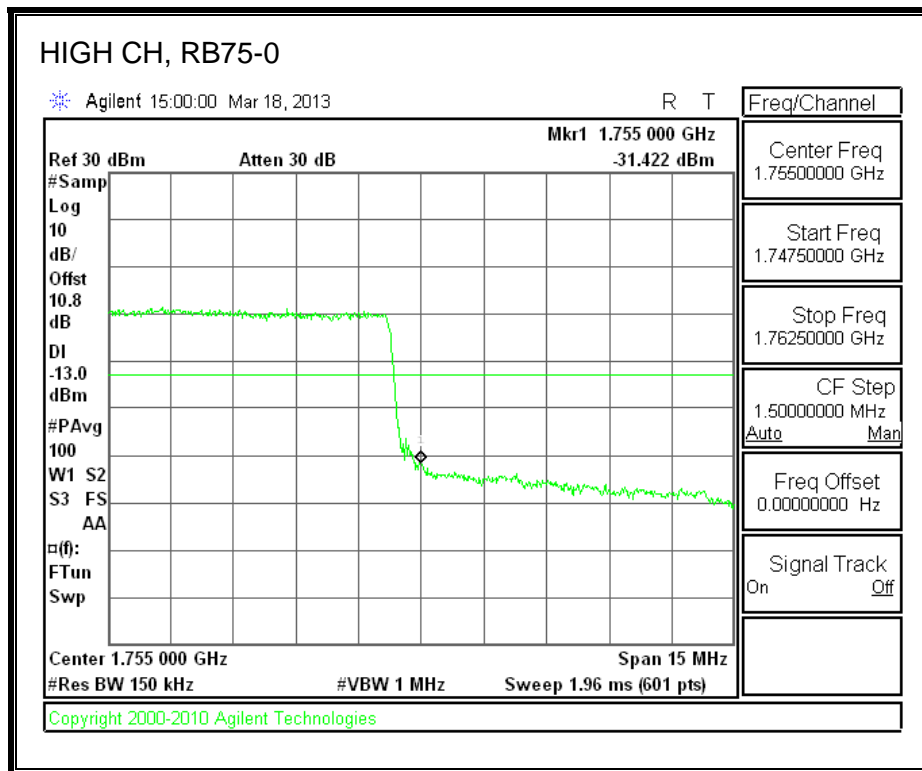
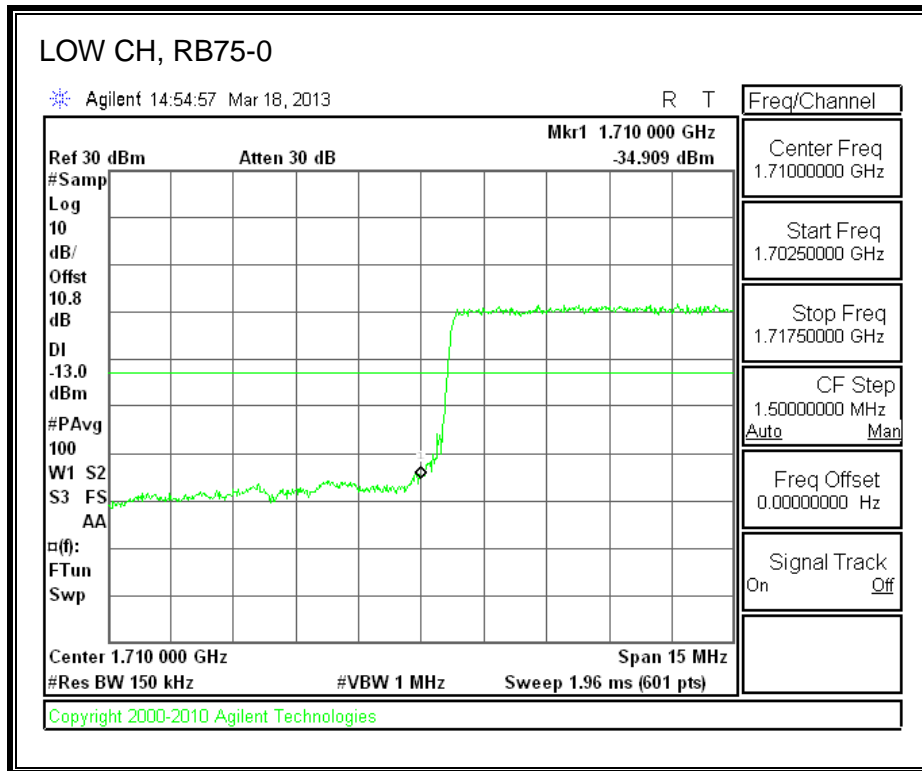
**LTE 16QAM Band 4 (15.0 MHz BAND WIDTH)**



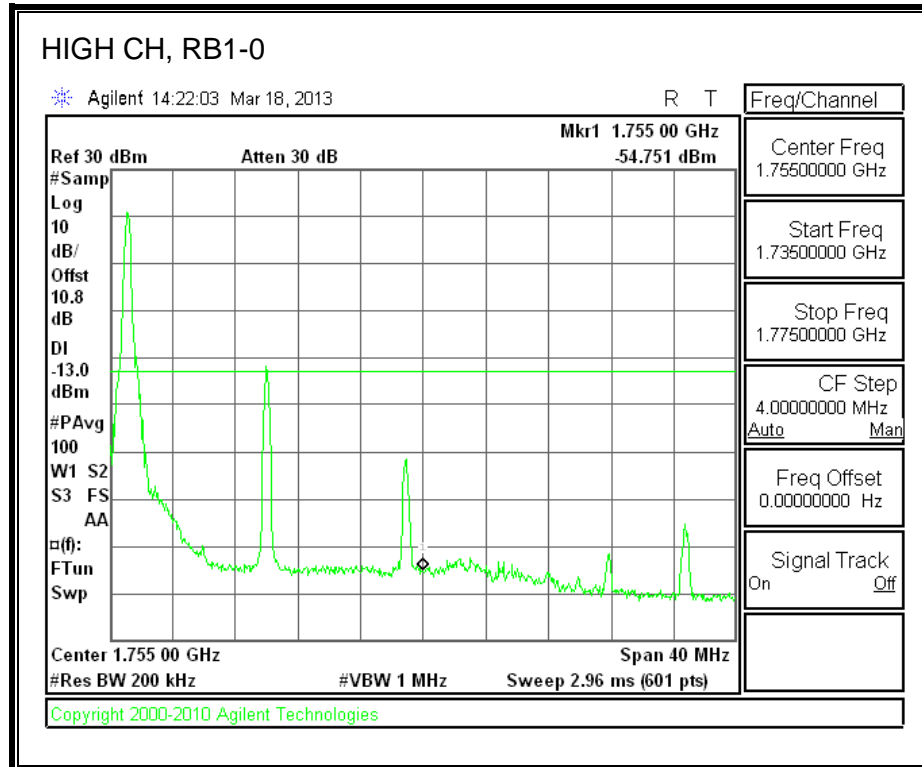
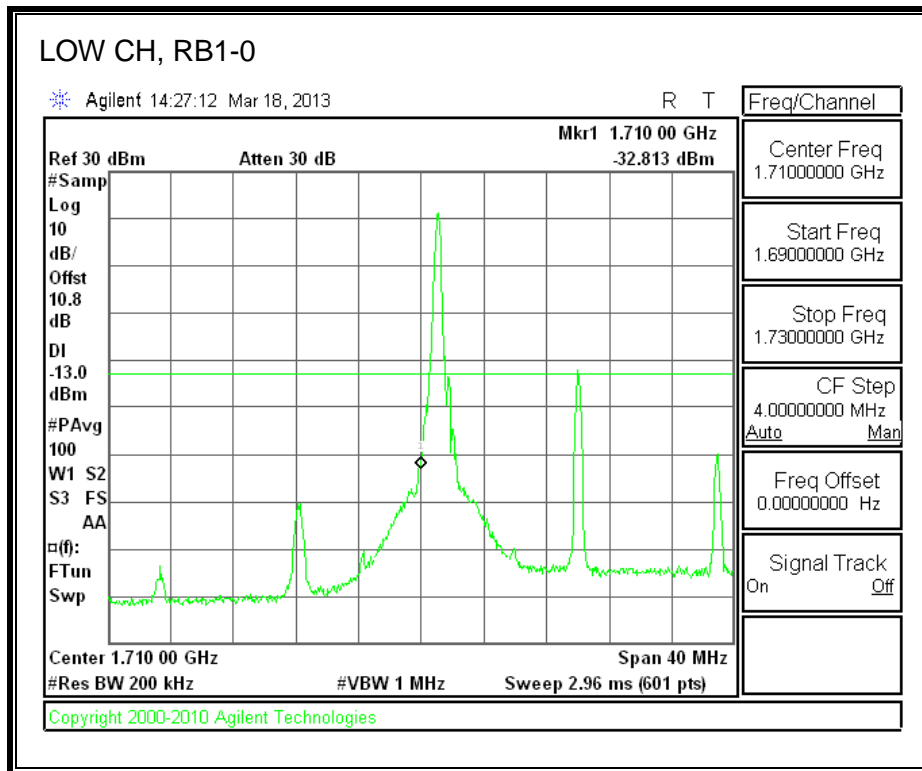


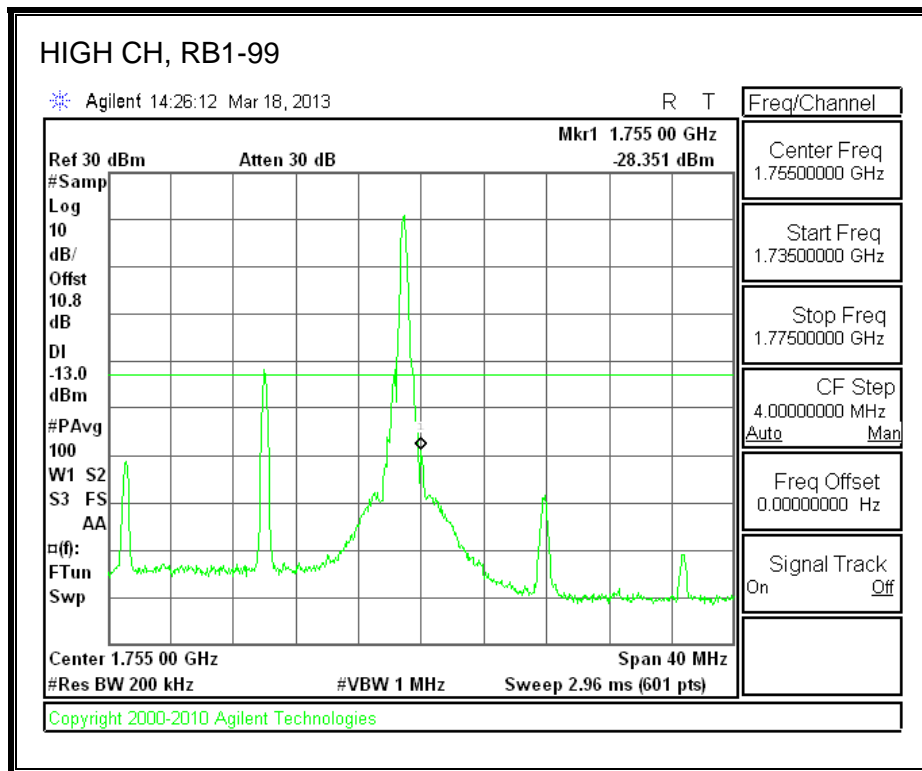
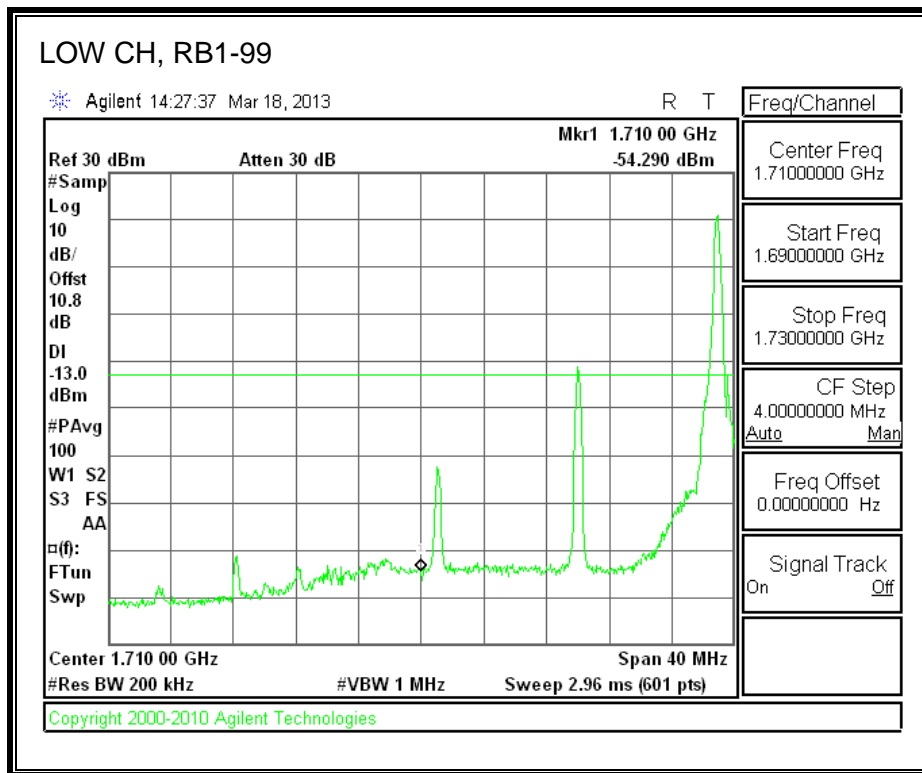


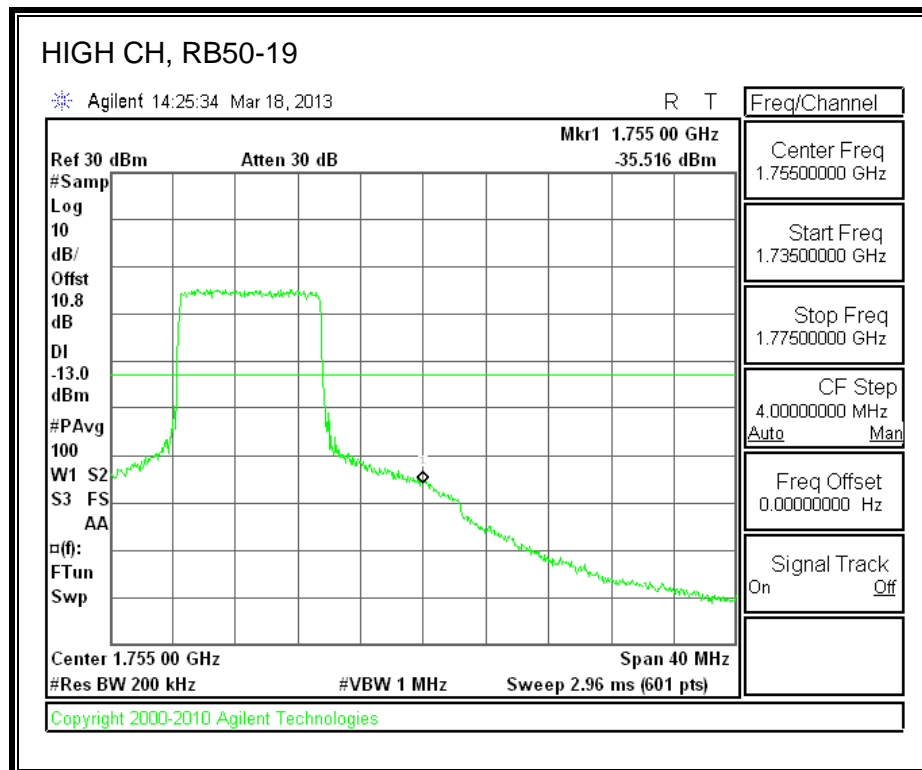
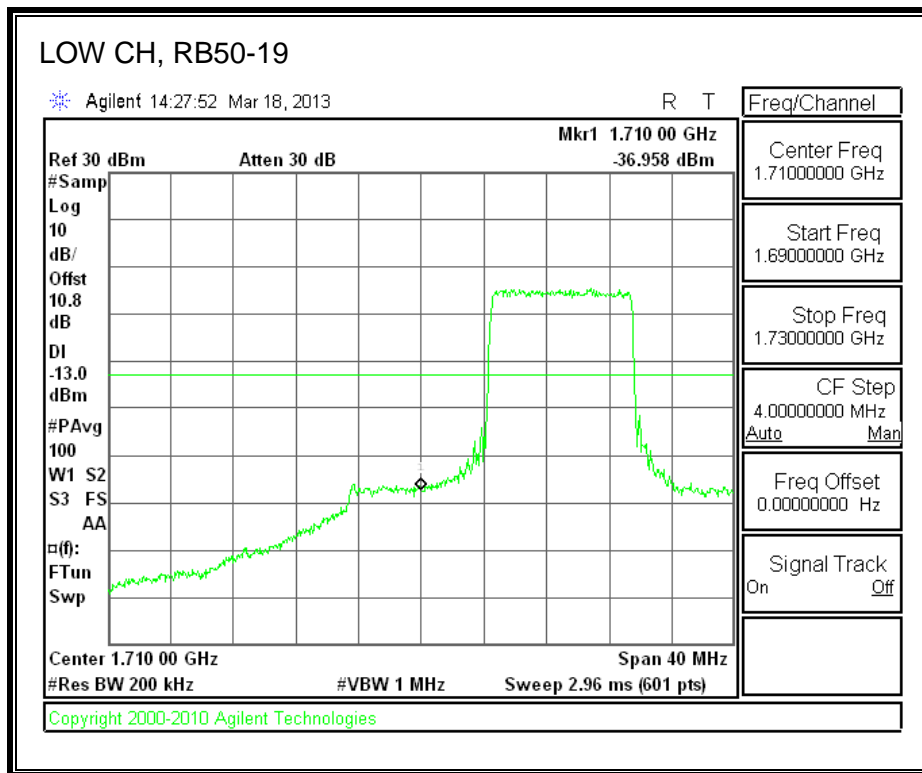


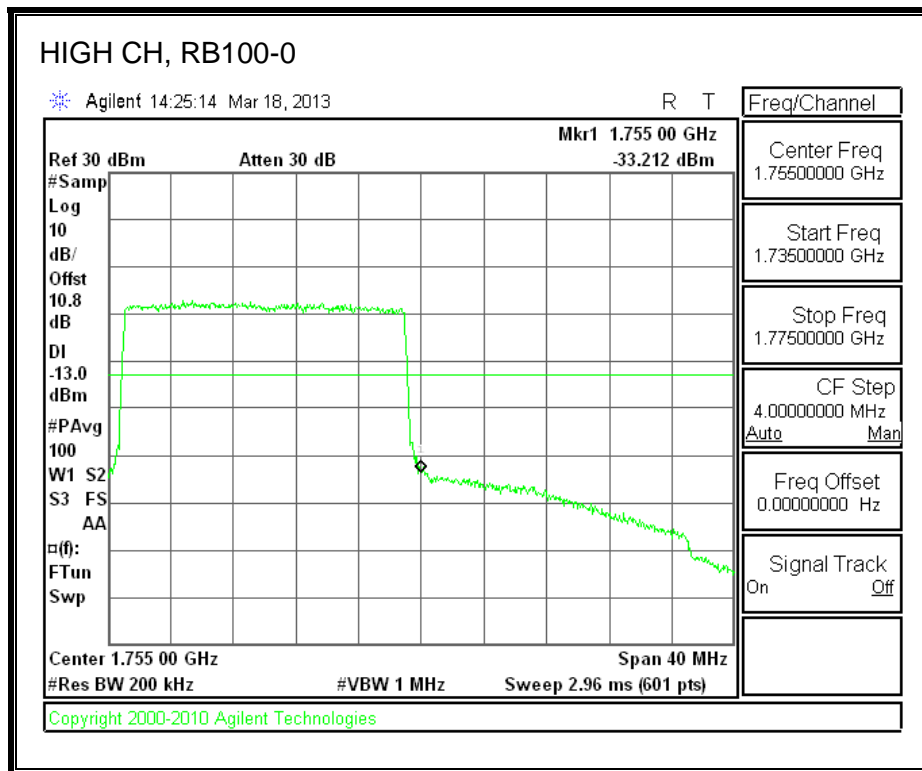
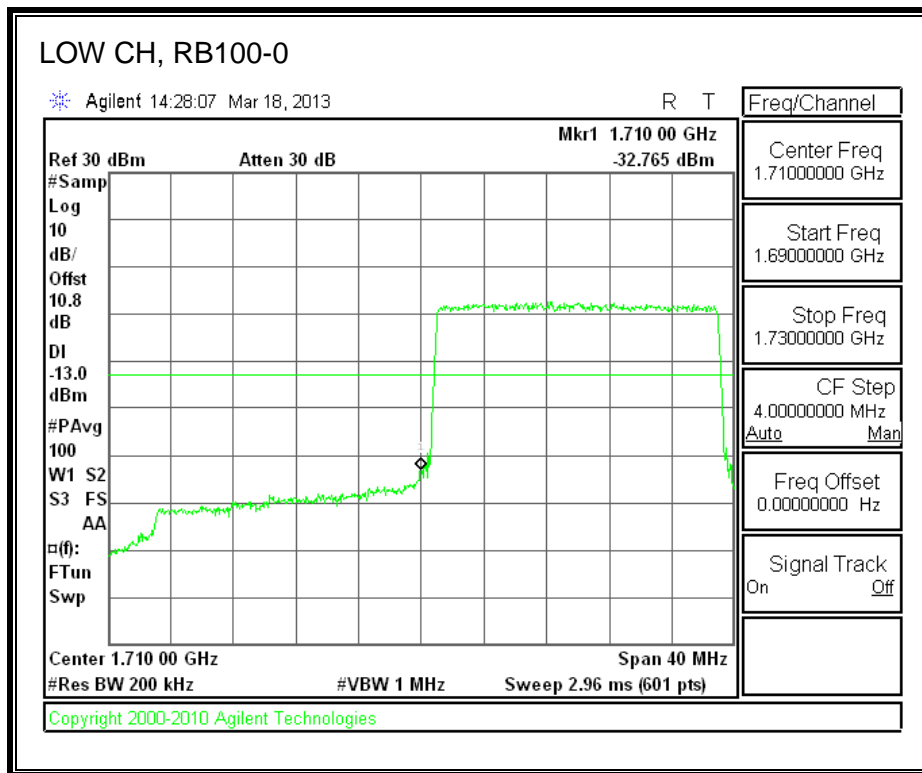


**LTE QPSK Band 4 (20.0 MHz BAND WIDTH)**

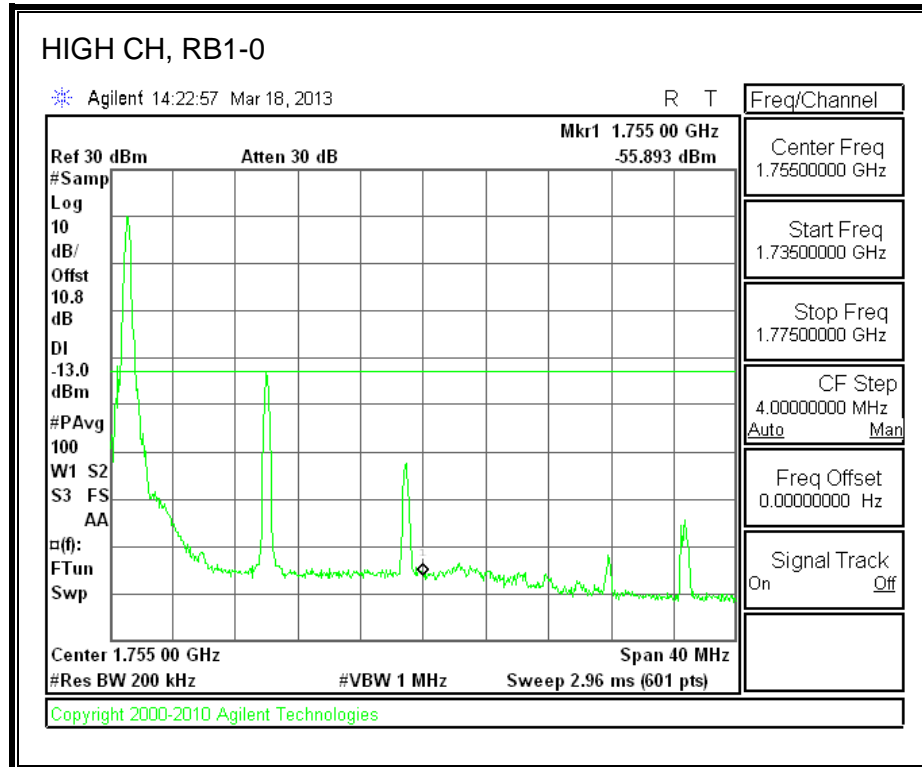
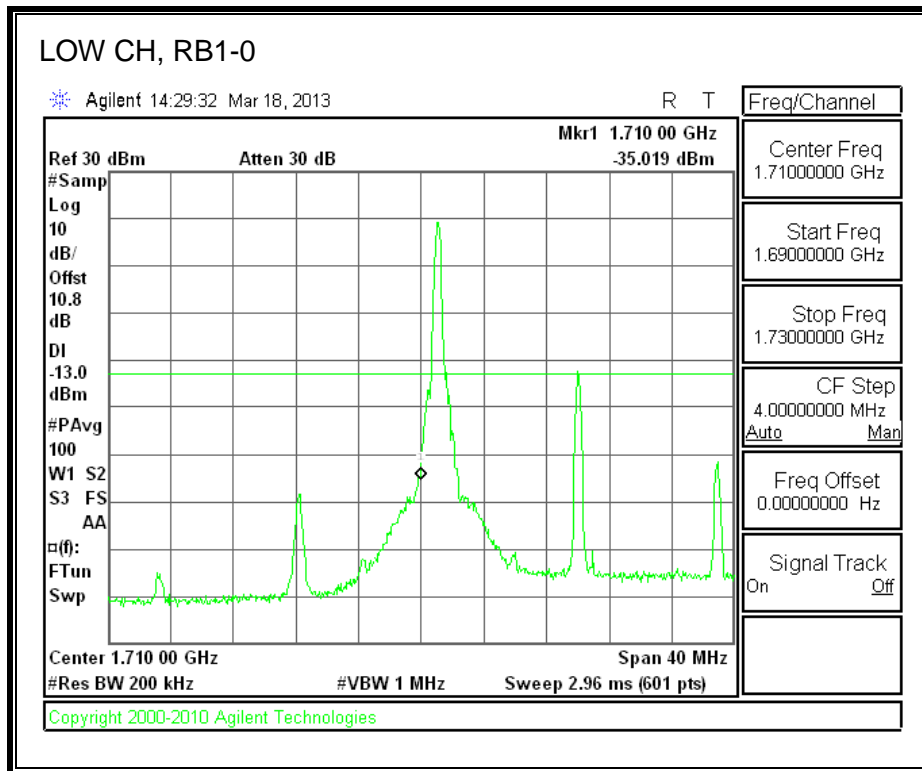




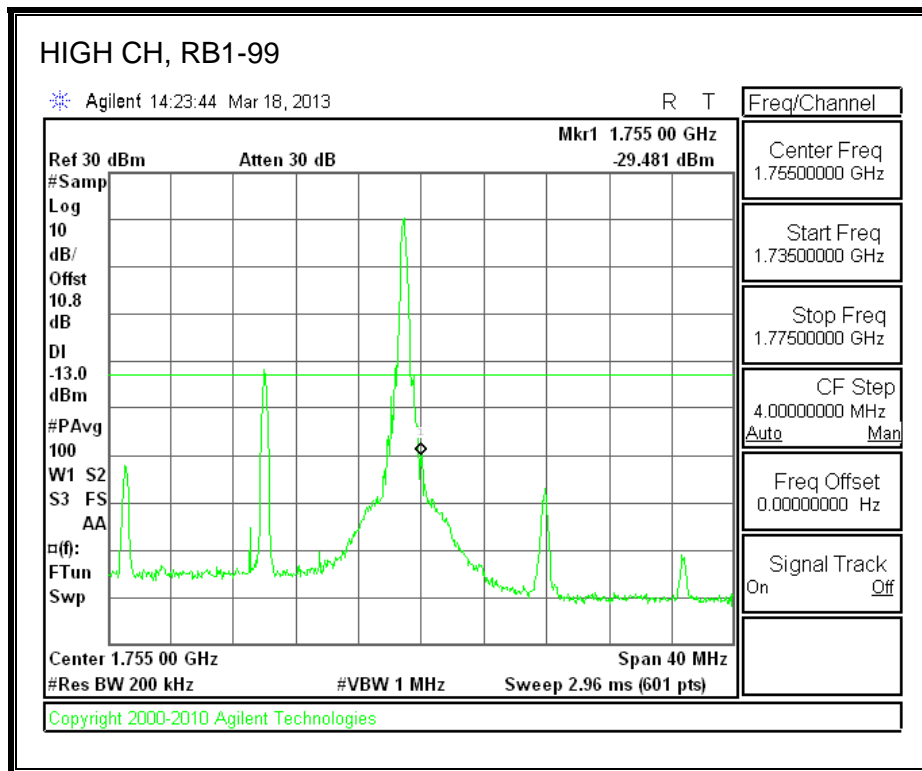
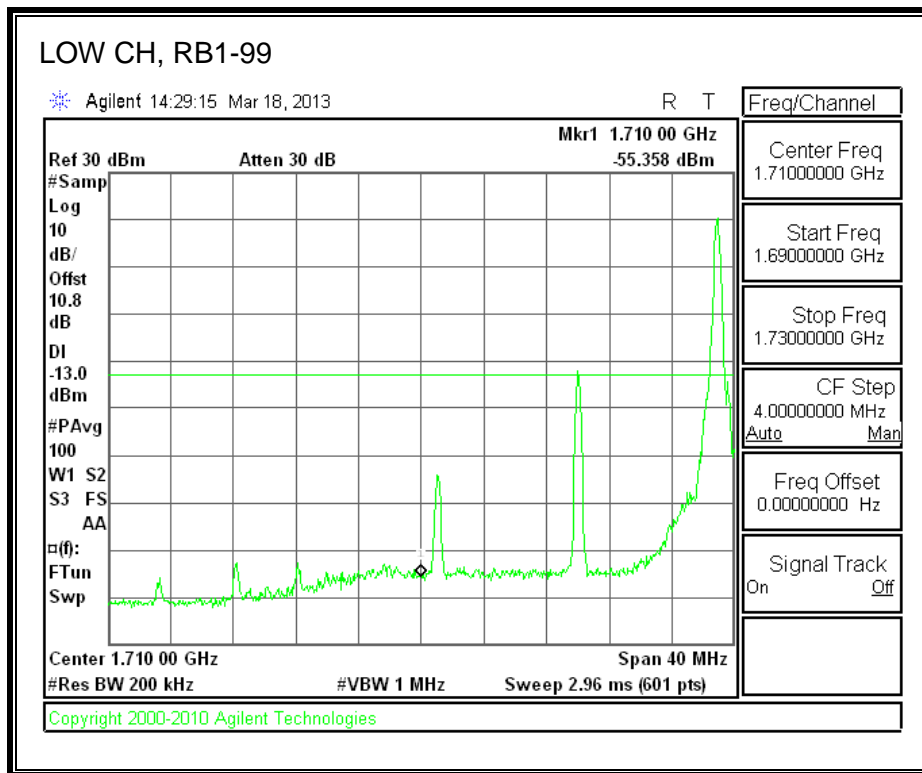


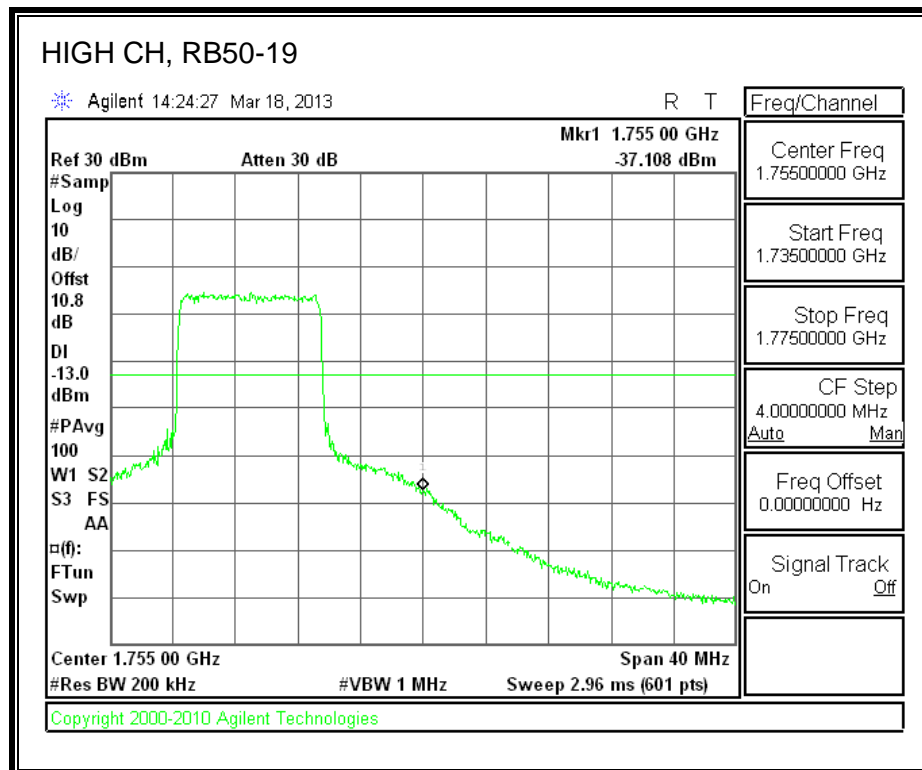
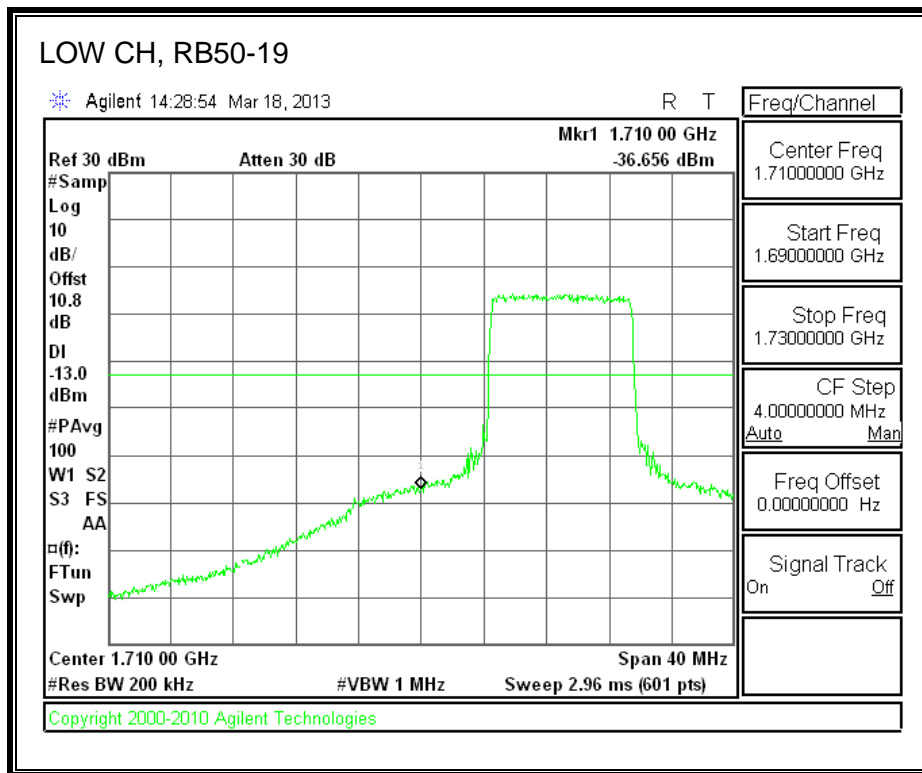


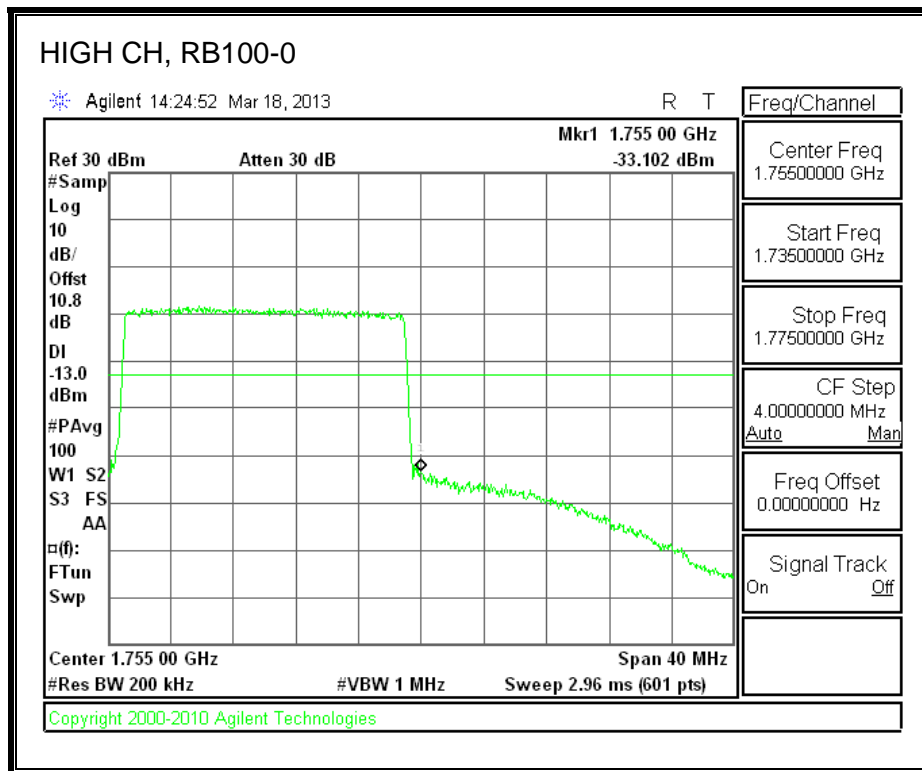
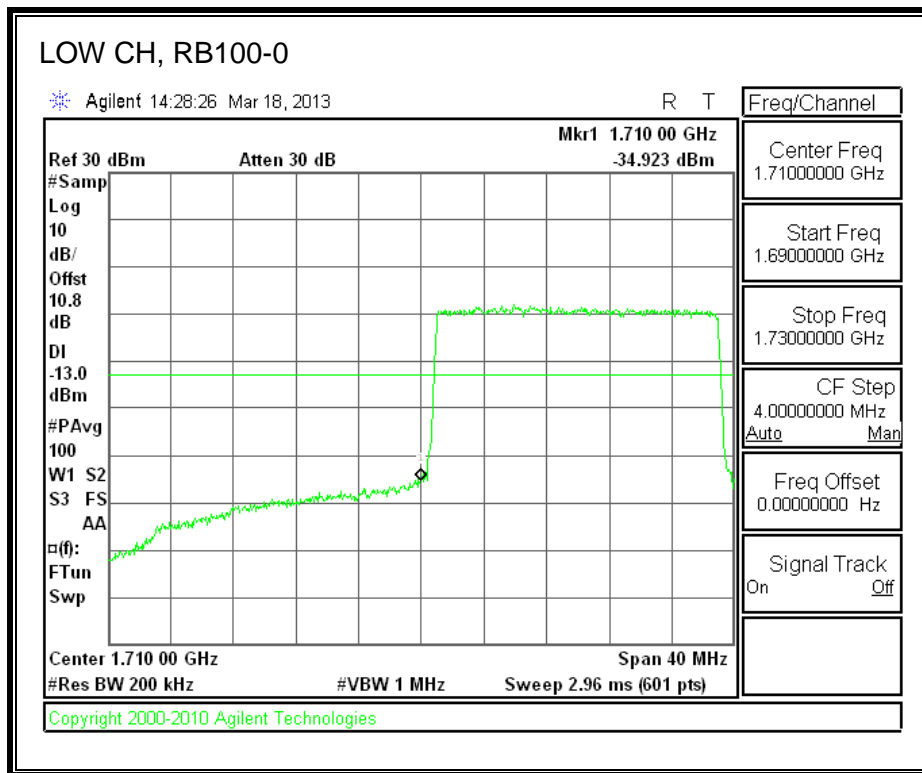
**LTE 16QAM Band 4 (20.0 MHz BAND WIDTH)**





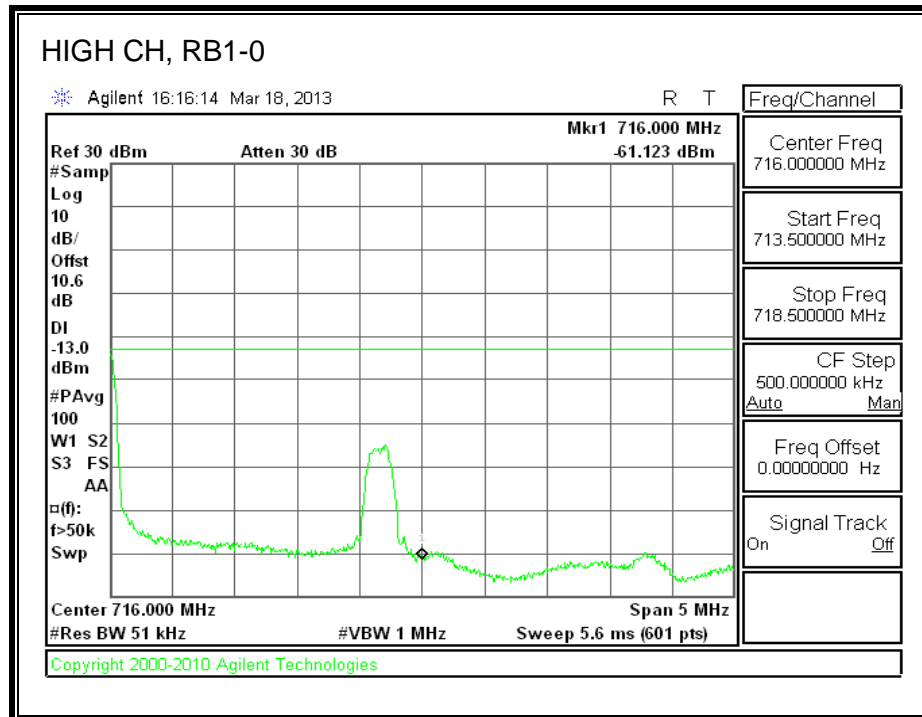
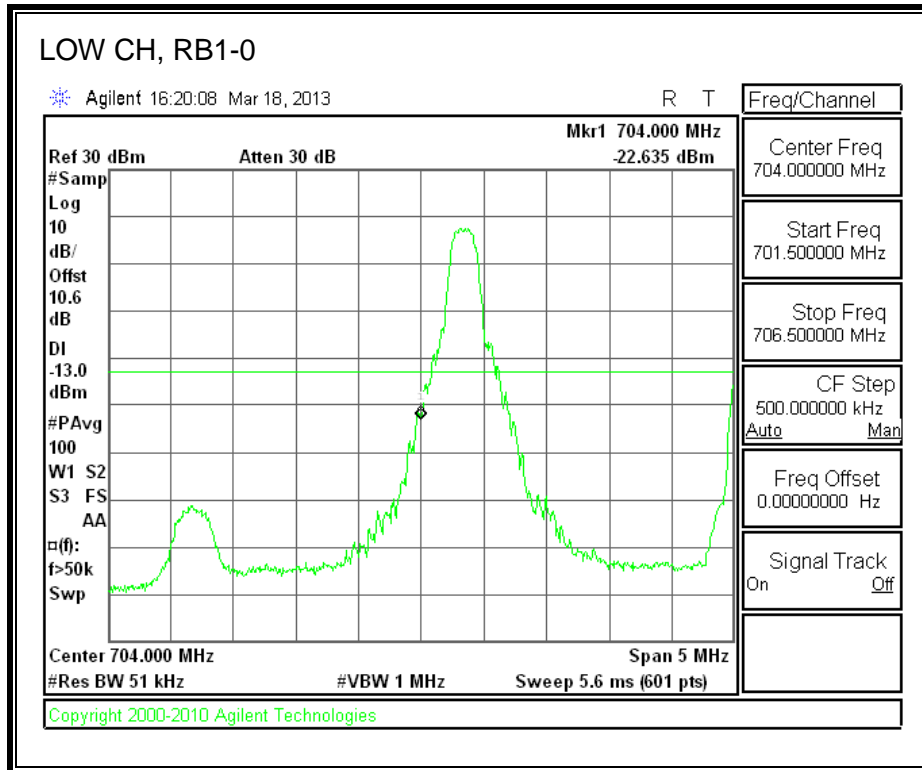


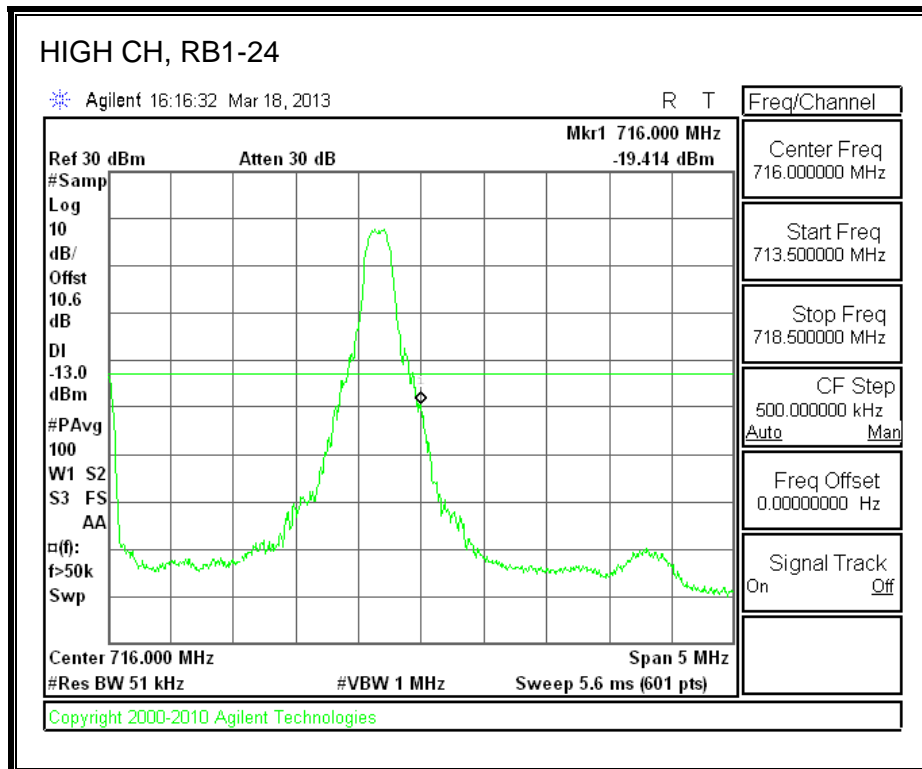
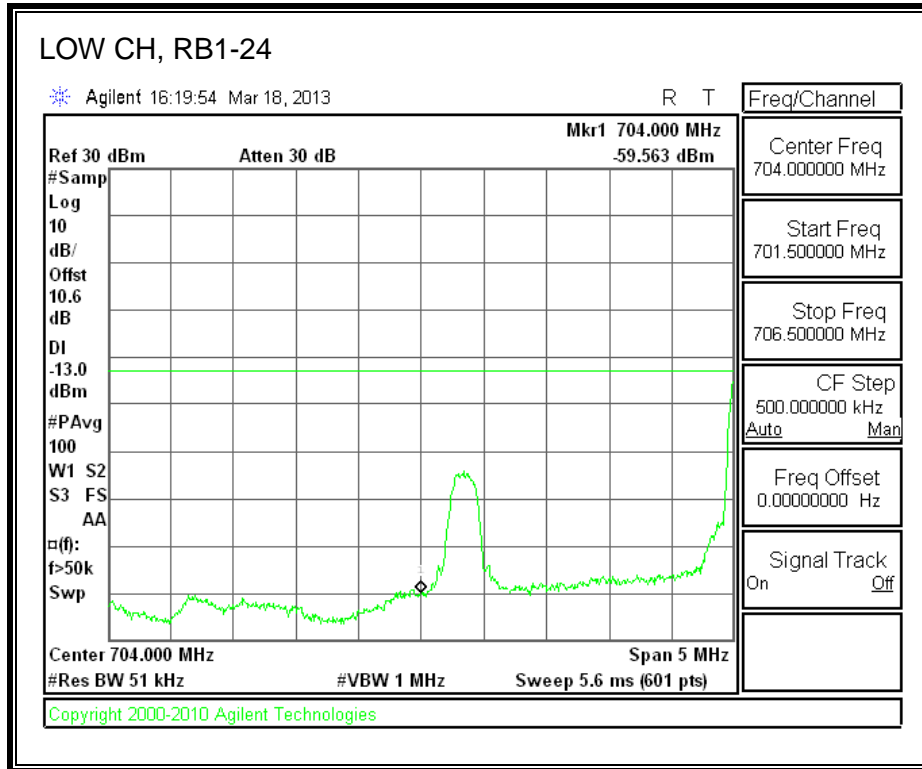


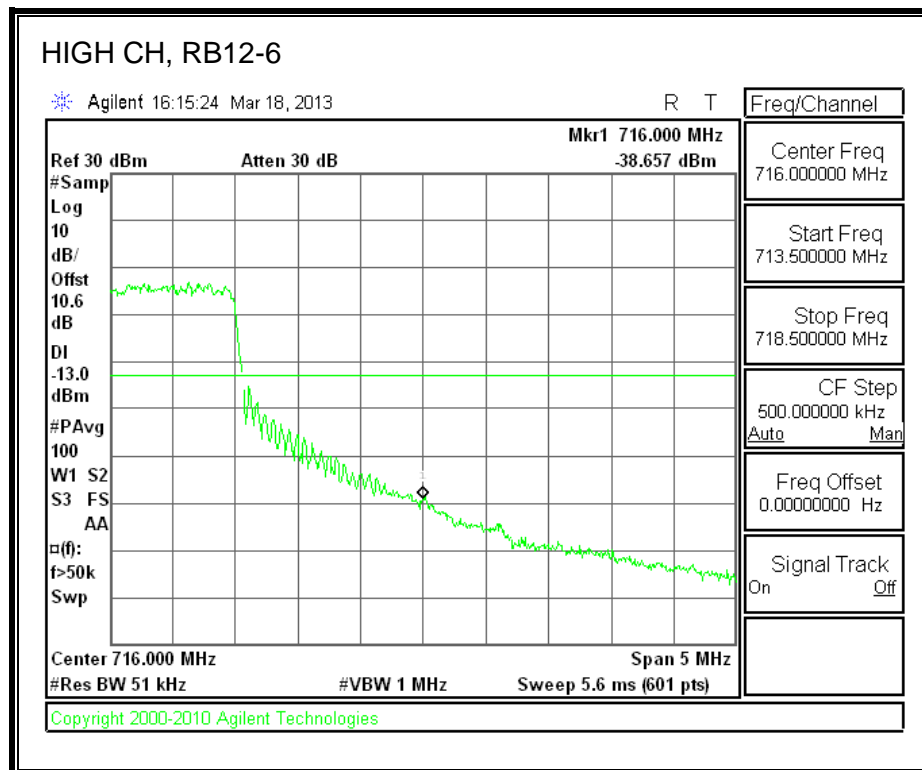
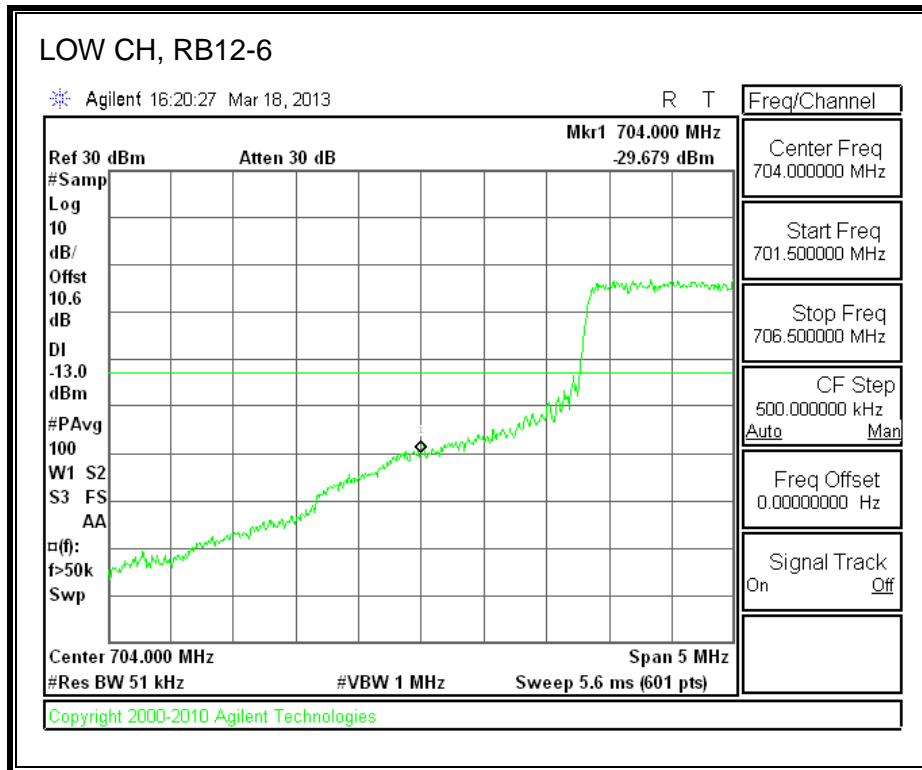


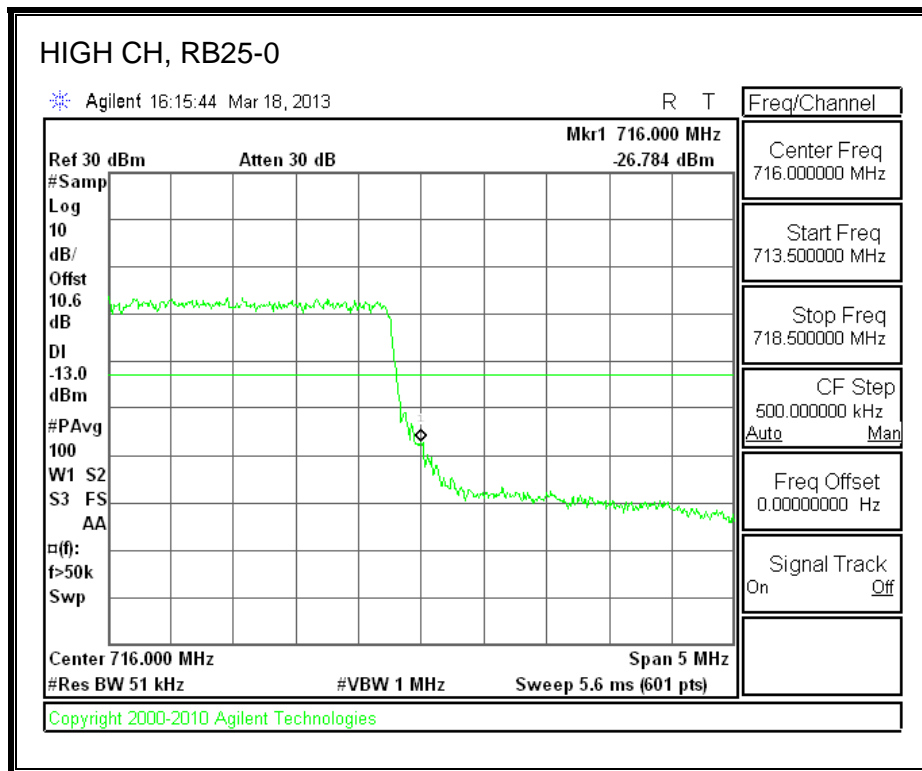
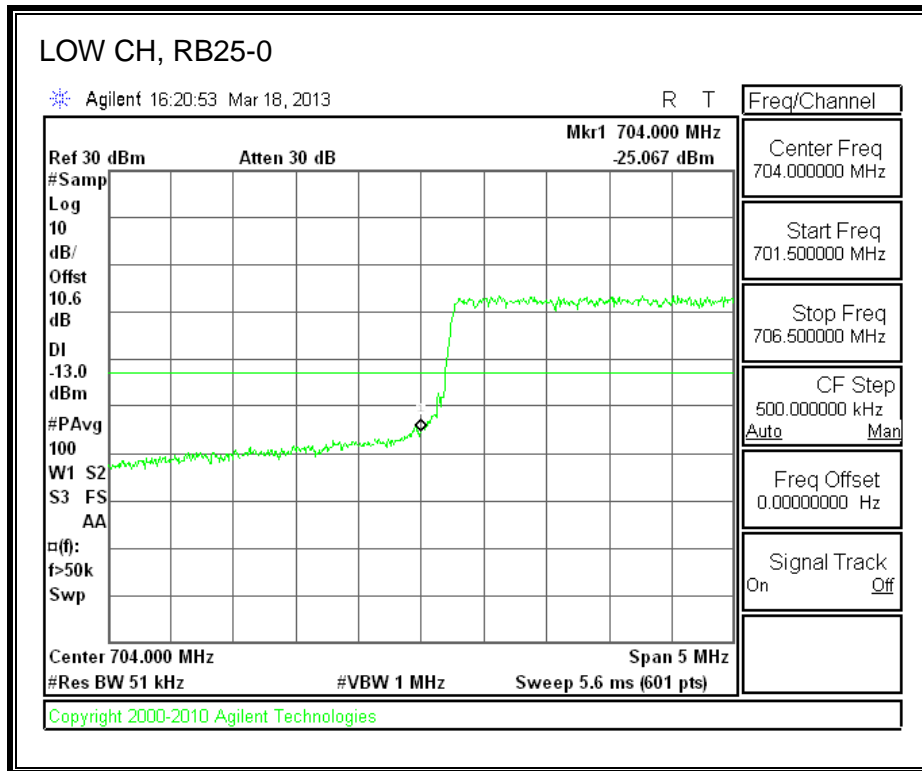
### 8.2.8. LTE BAND 17

#### LTE QPSK Band 17 (5.0 MHz BAND WIDTH)

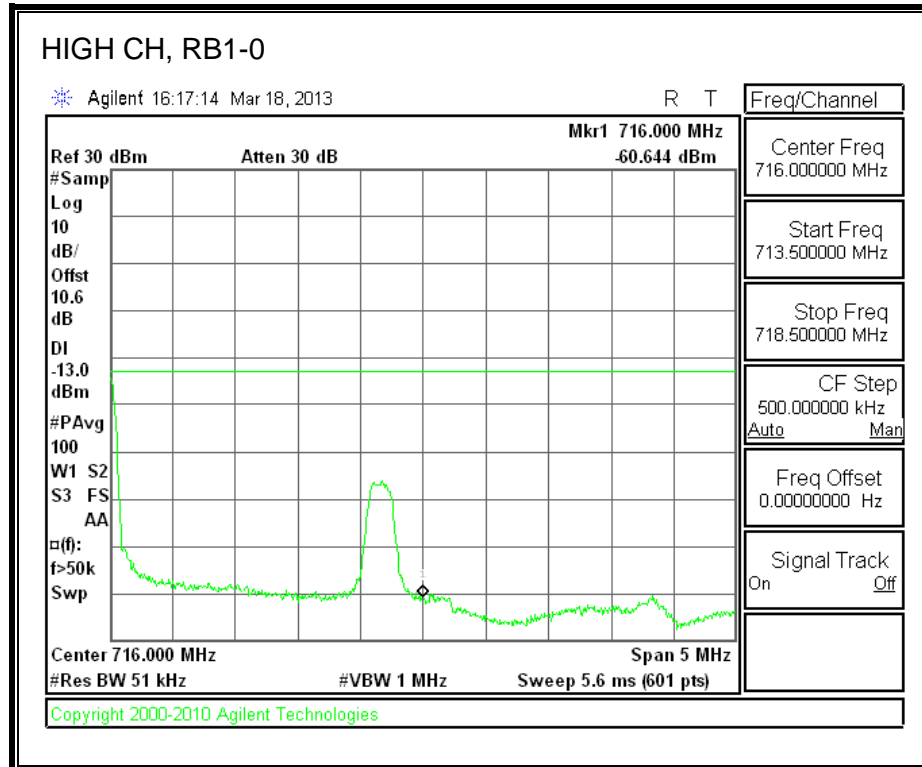
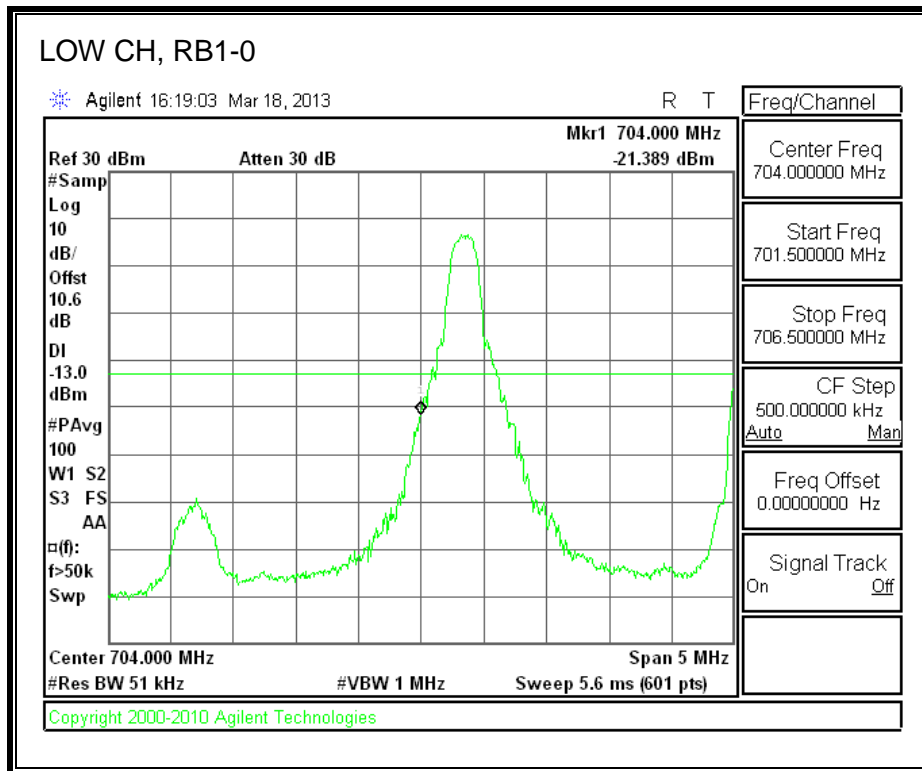




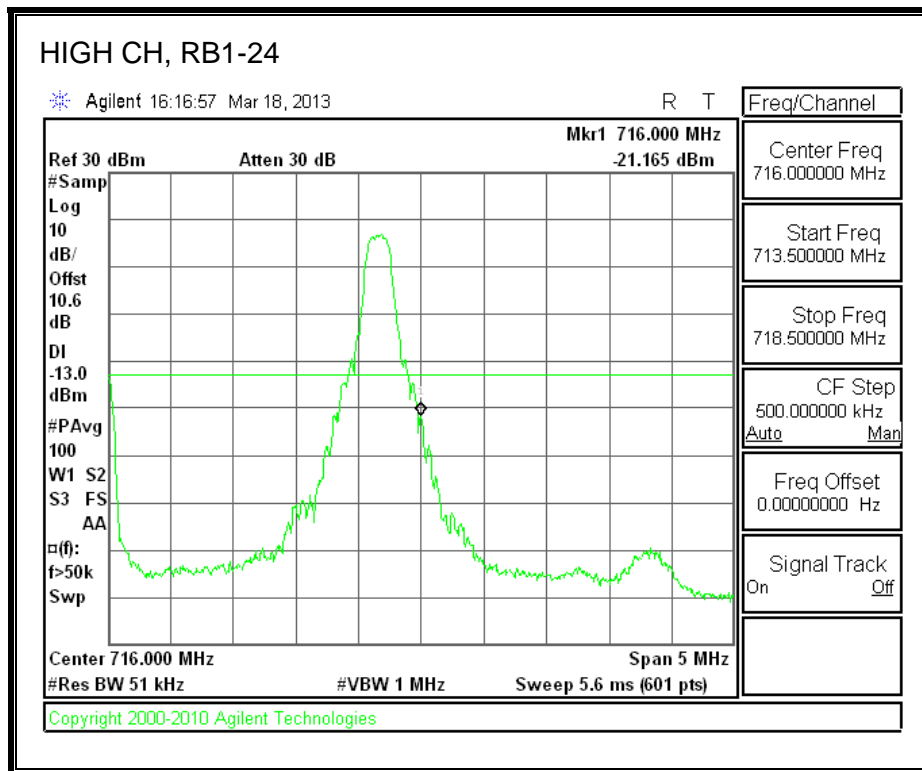
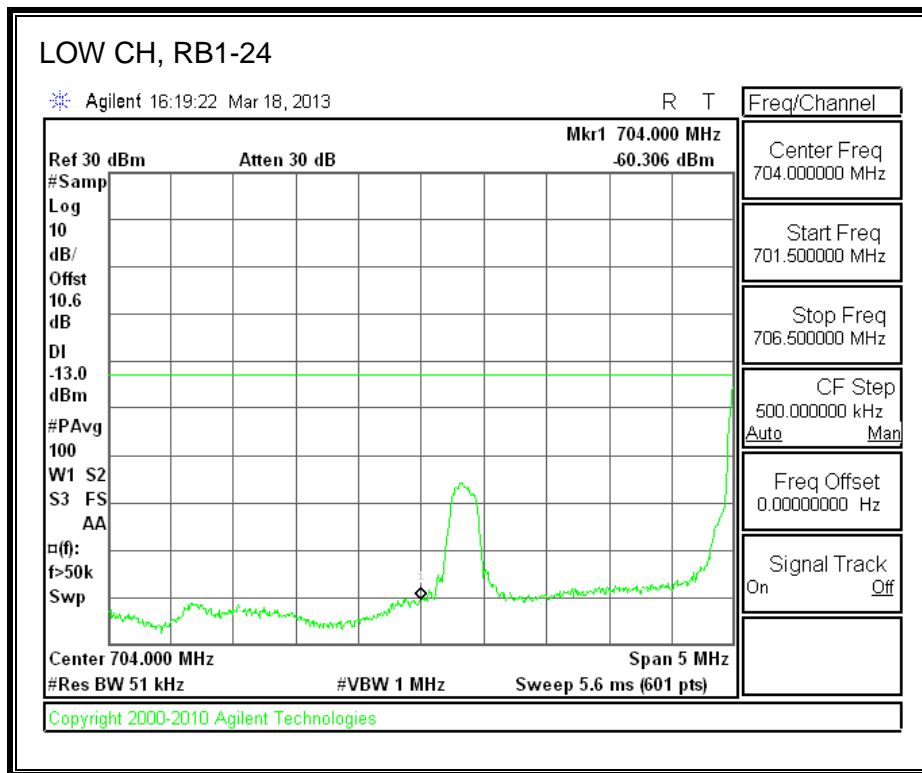


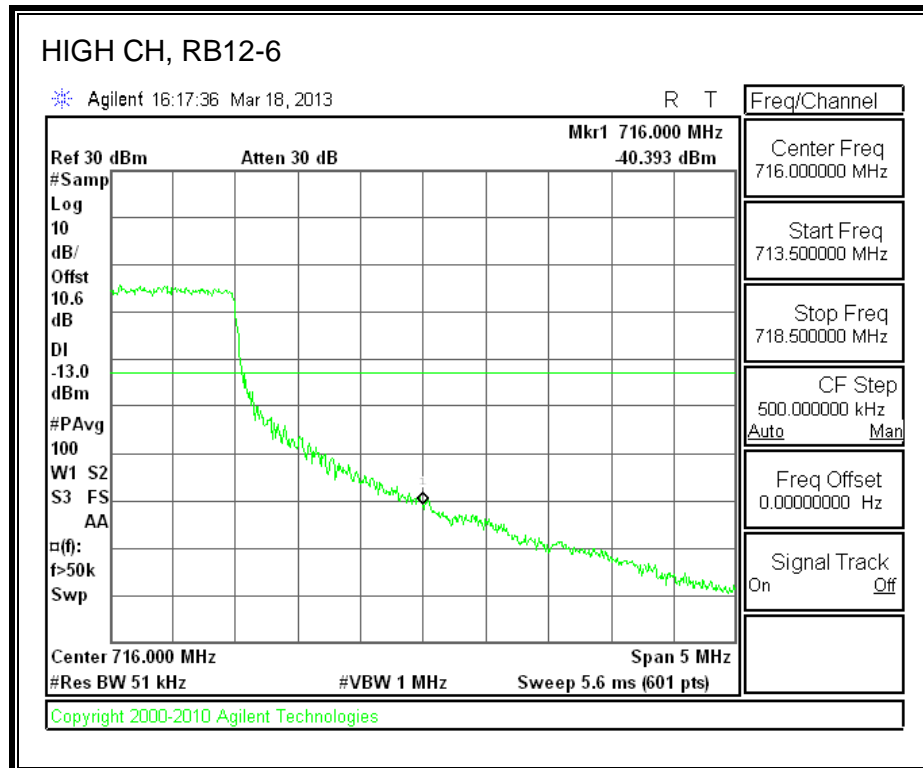
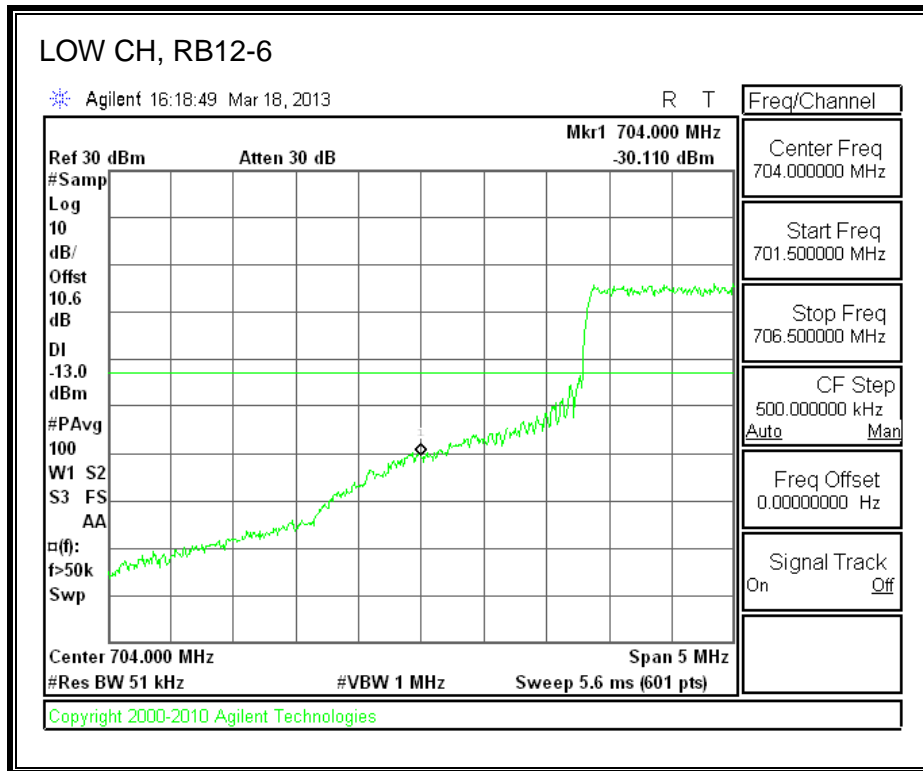


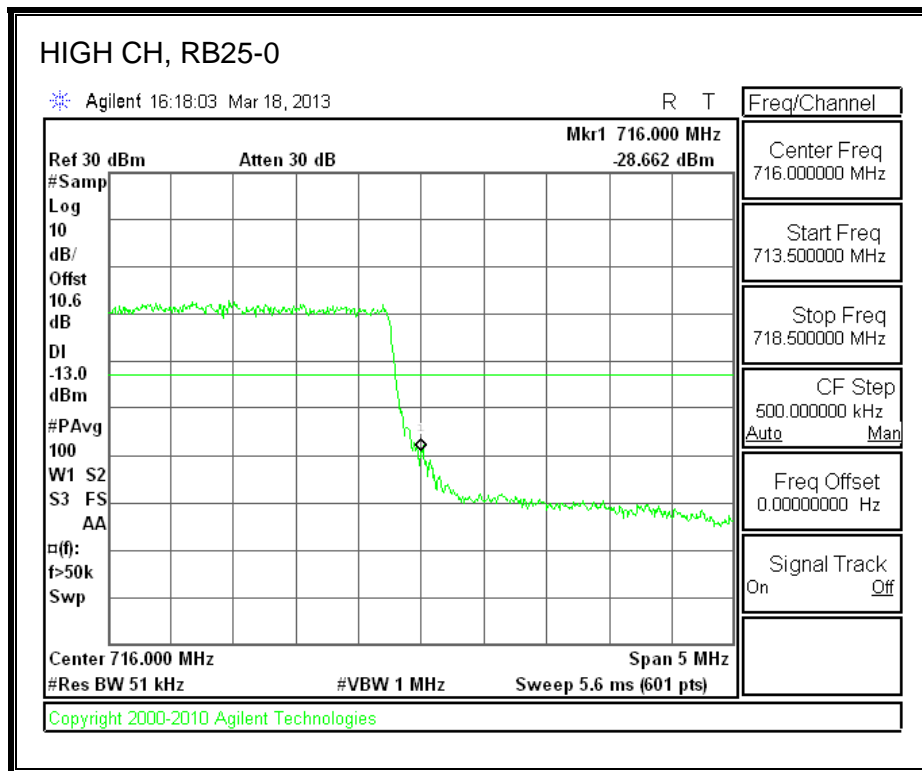
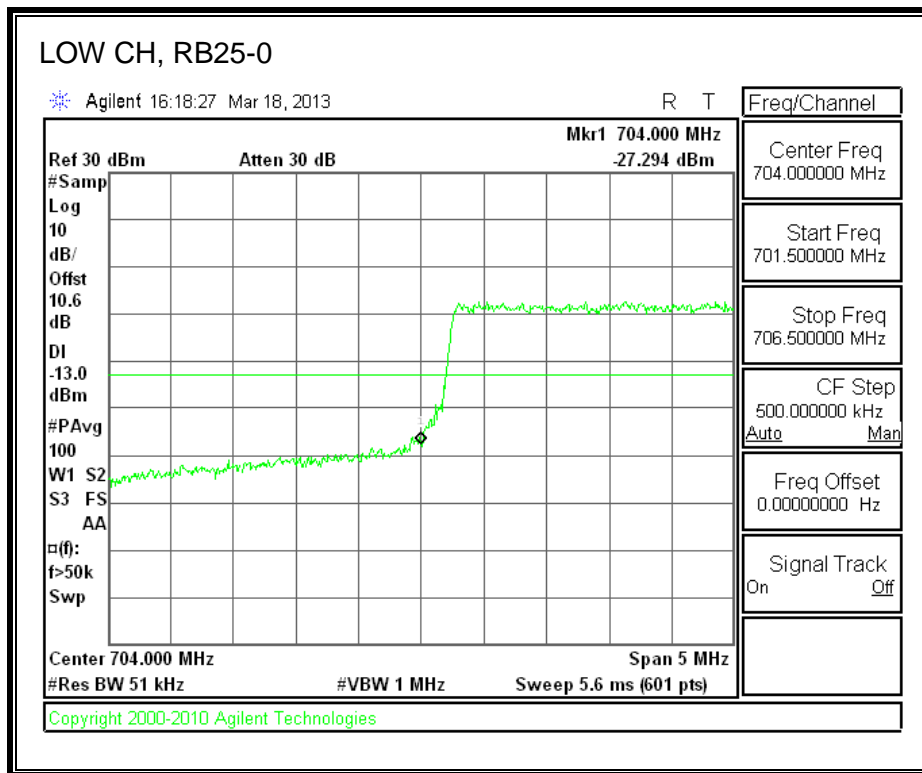
**LTE 16QAM Band 17 (5.0 MHz BAND WIDTH)**



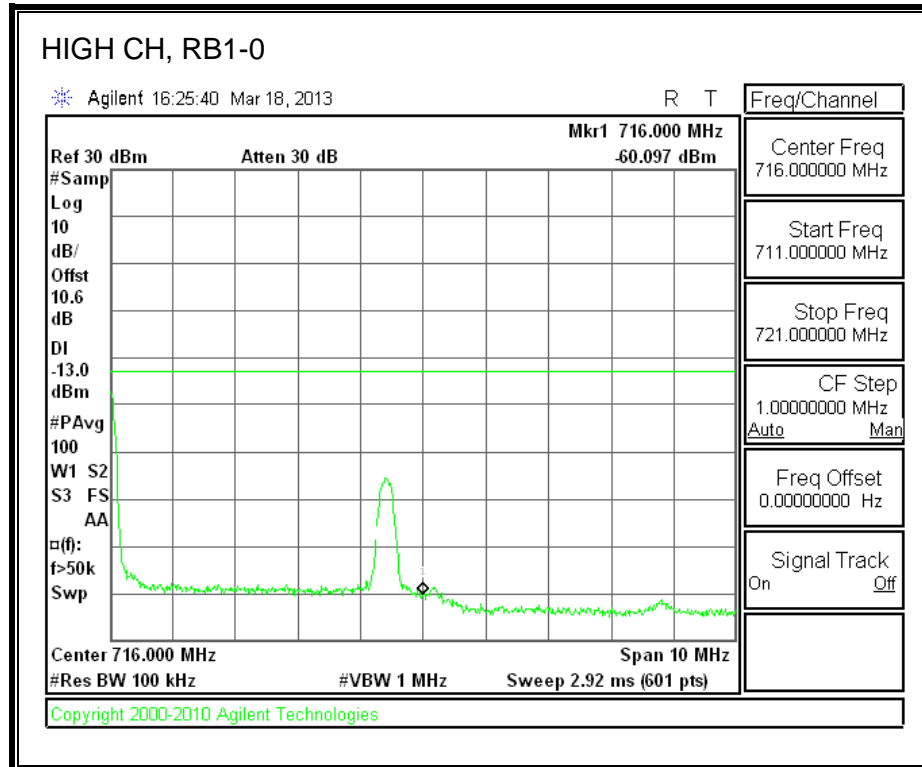
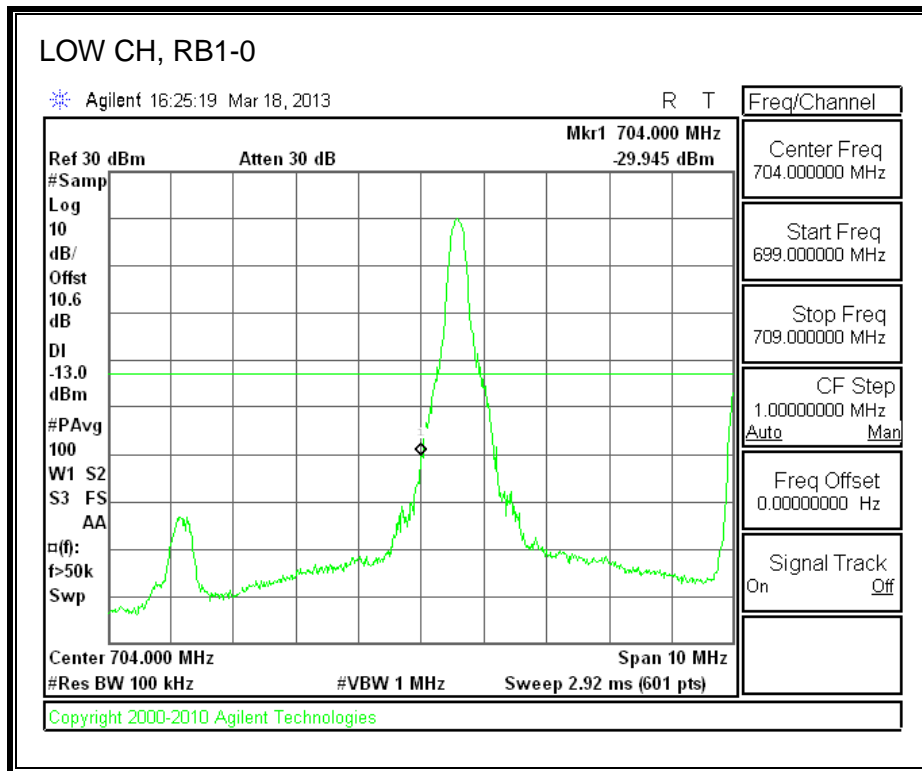


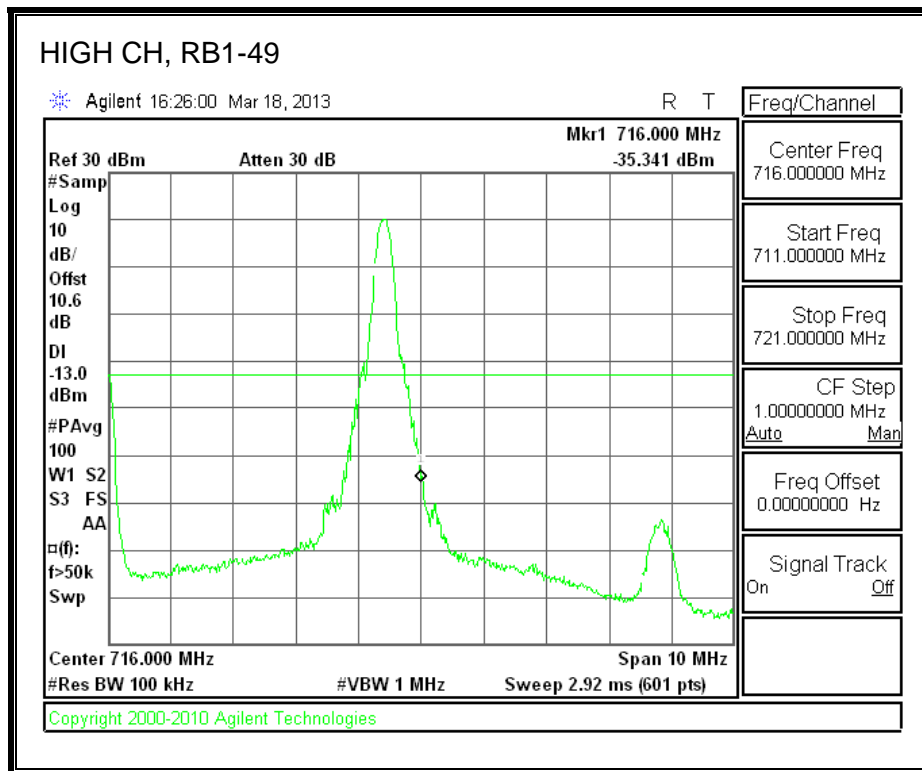
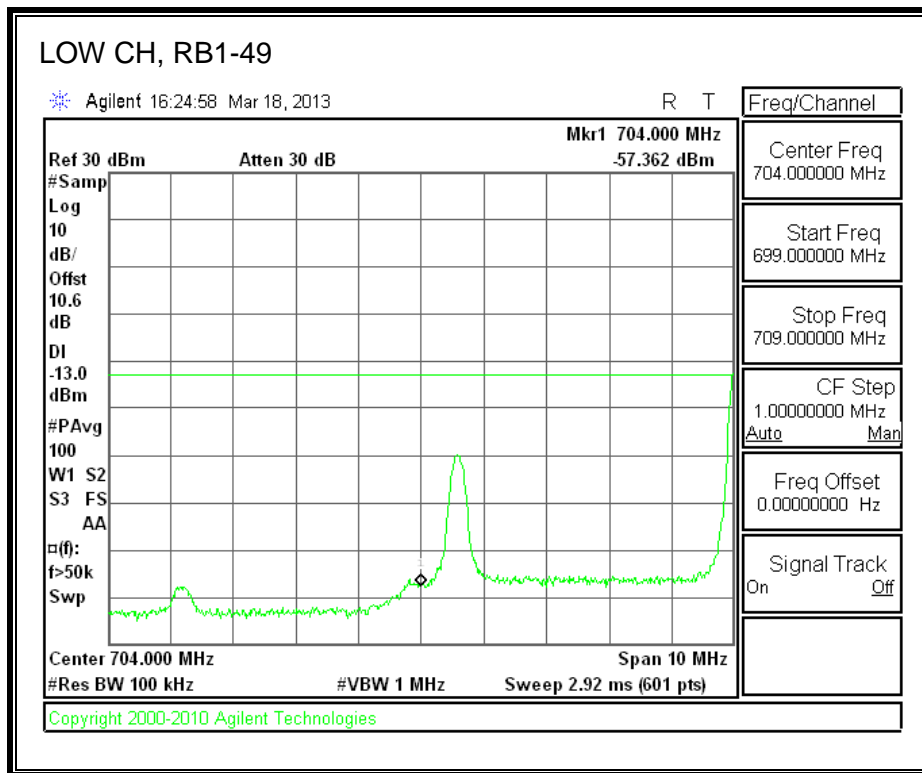


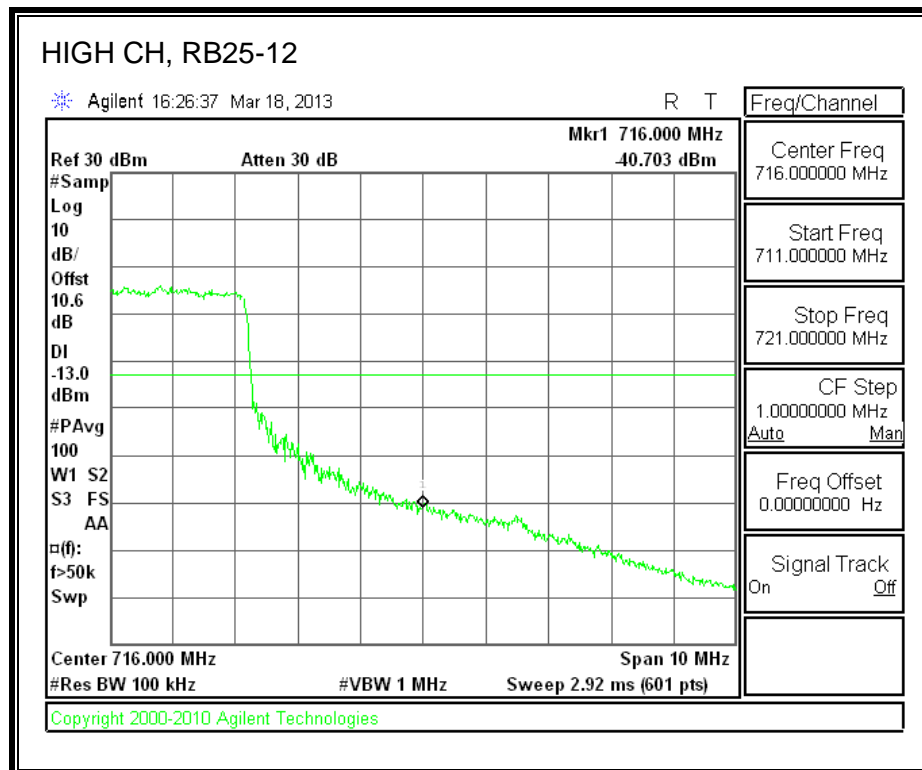
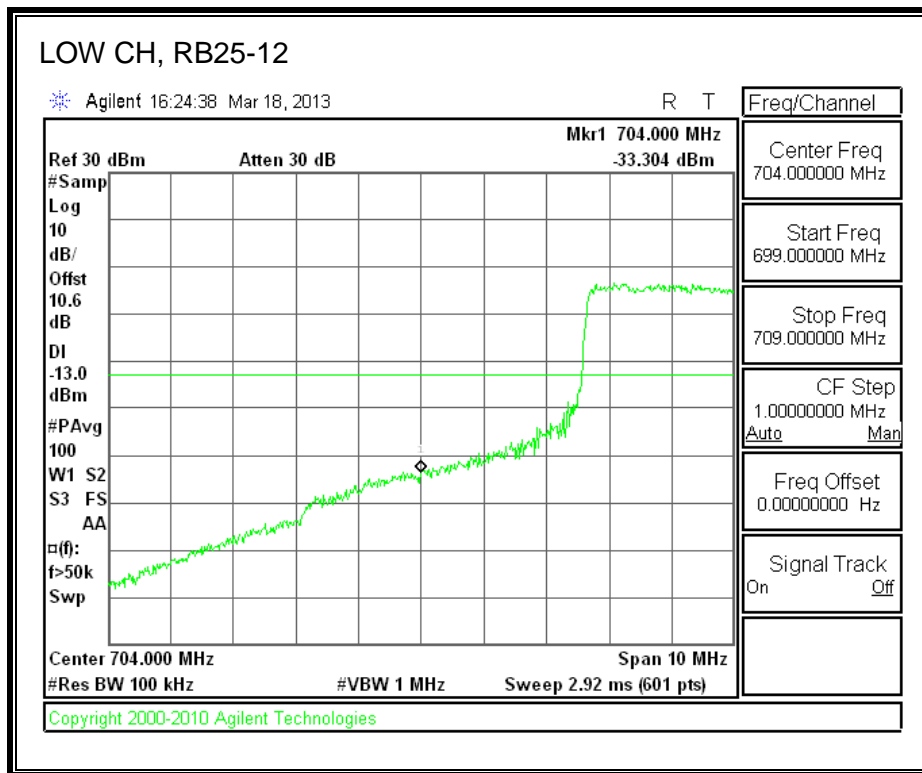


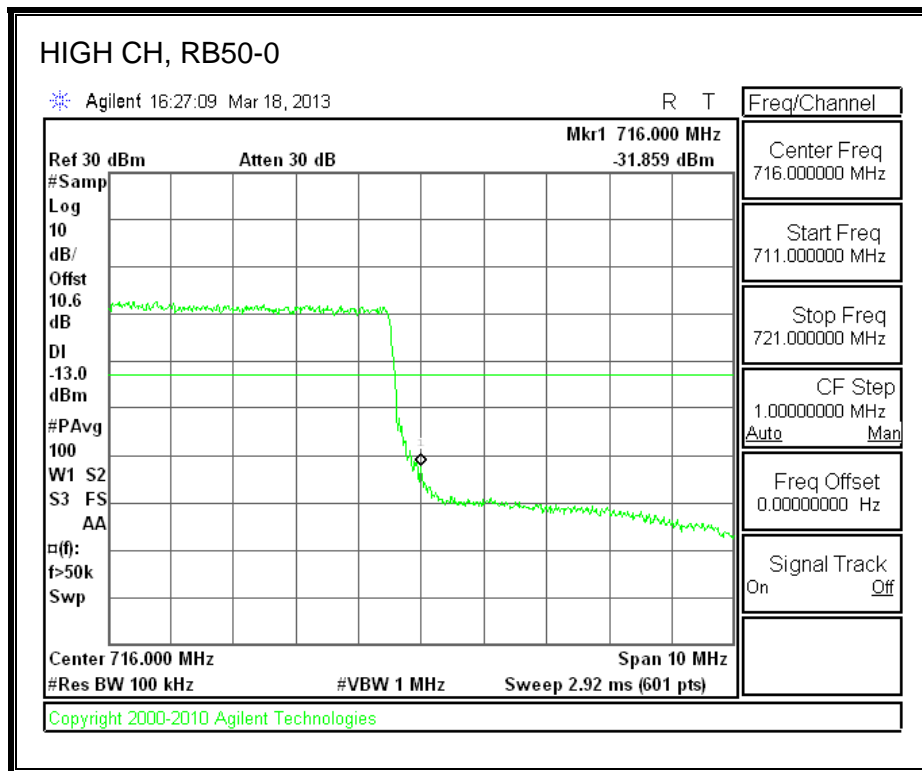
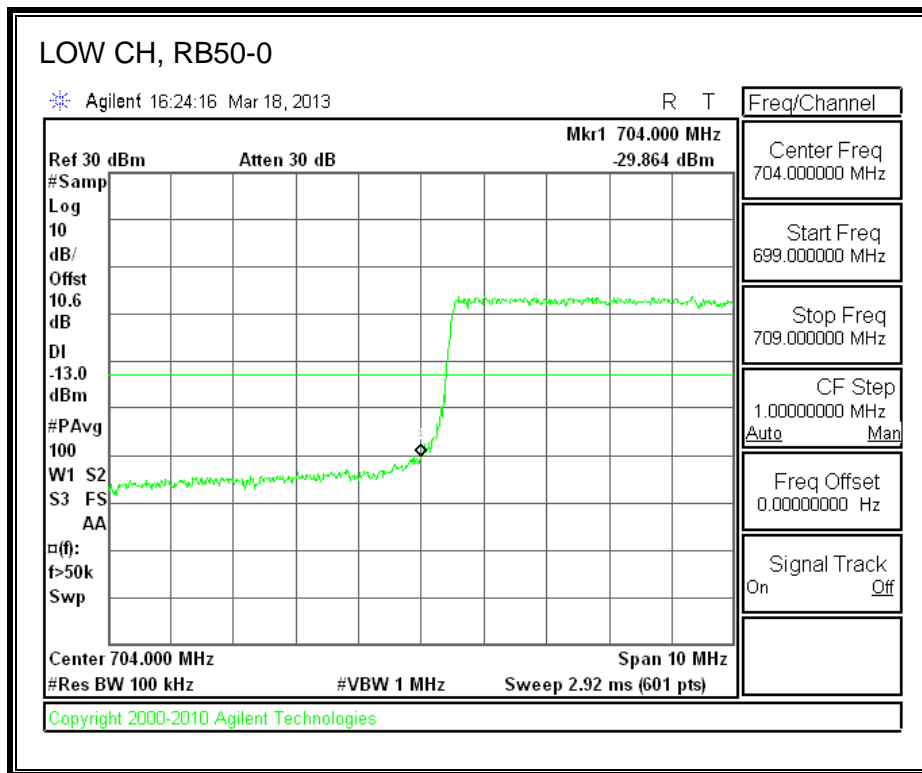


**LTE QPSK Band 17 (10.0 MHz BAND WIDTH)**

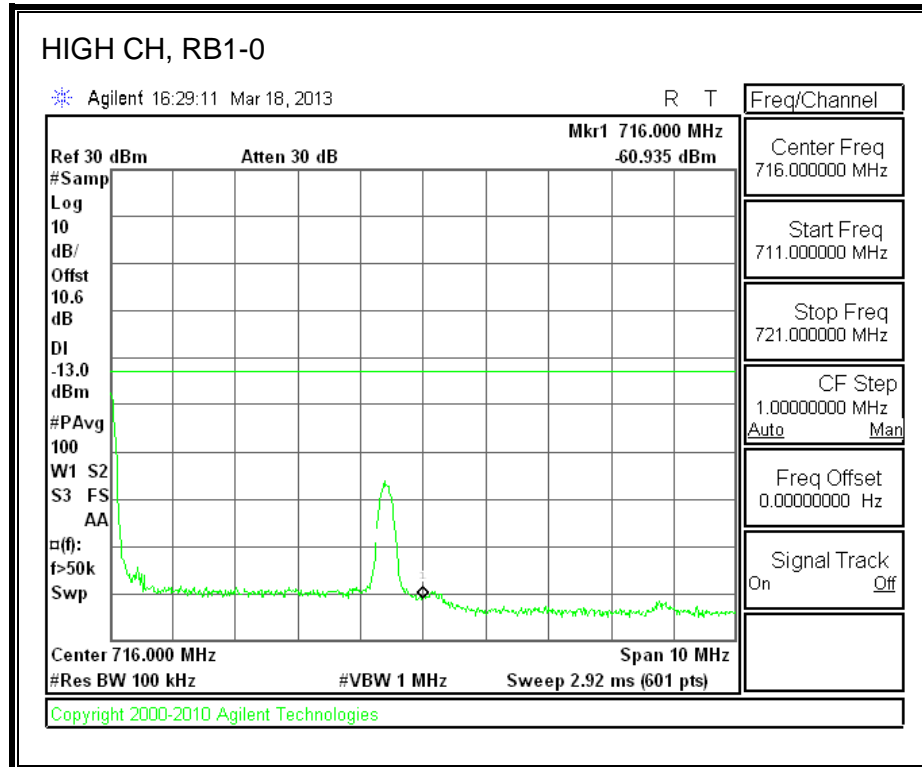
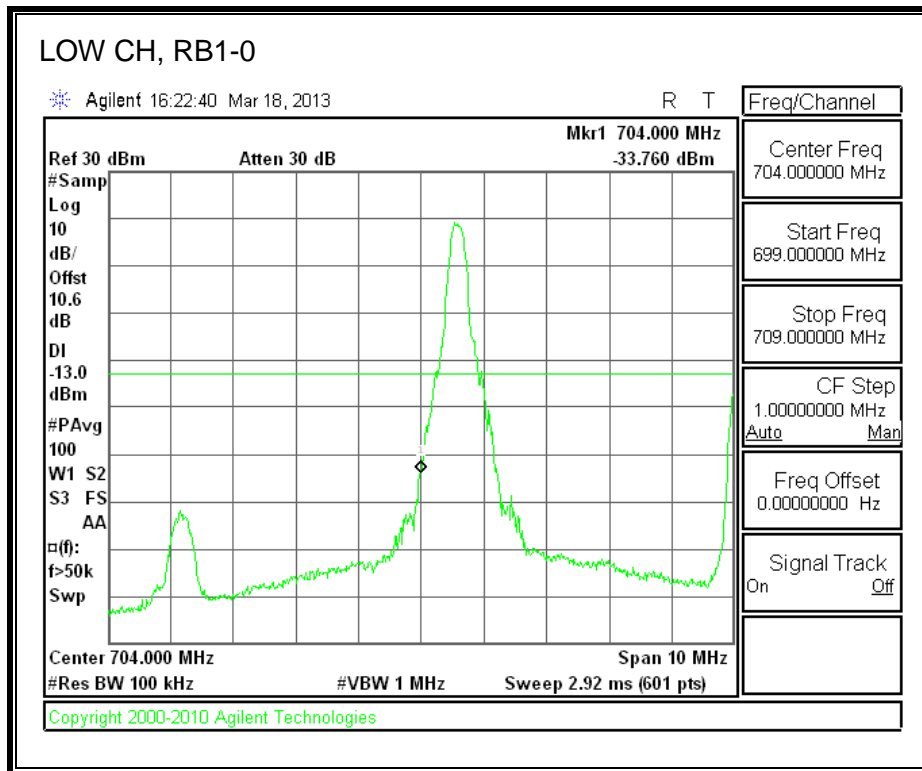




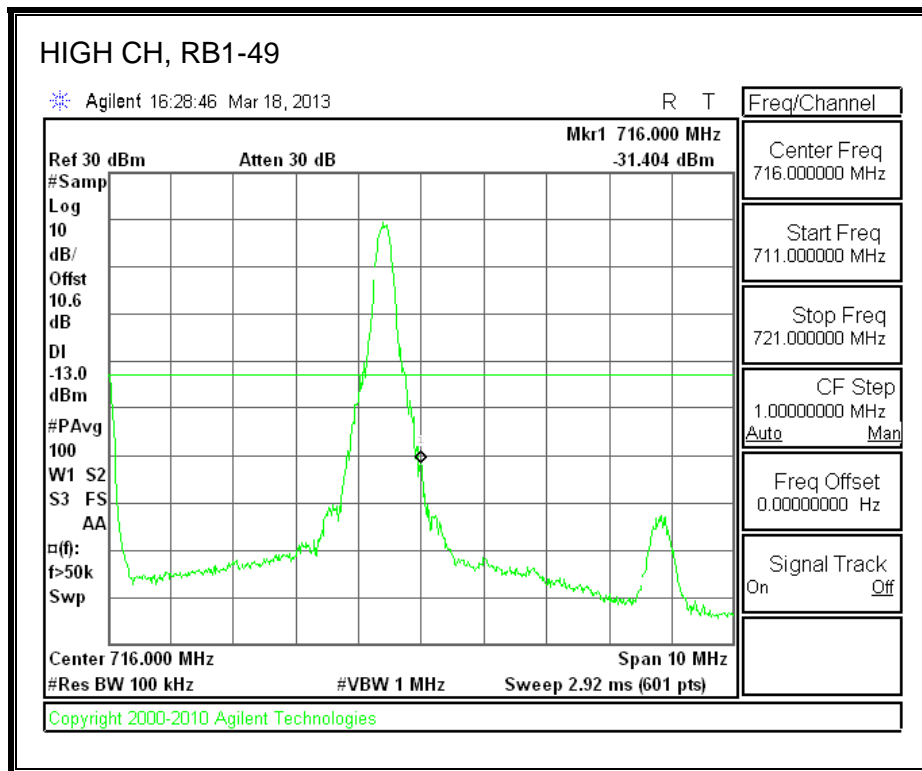
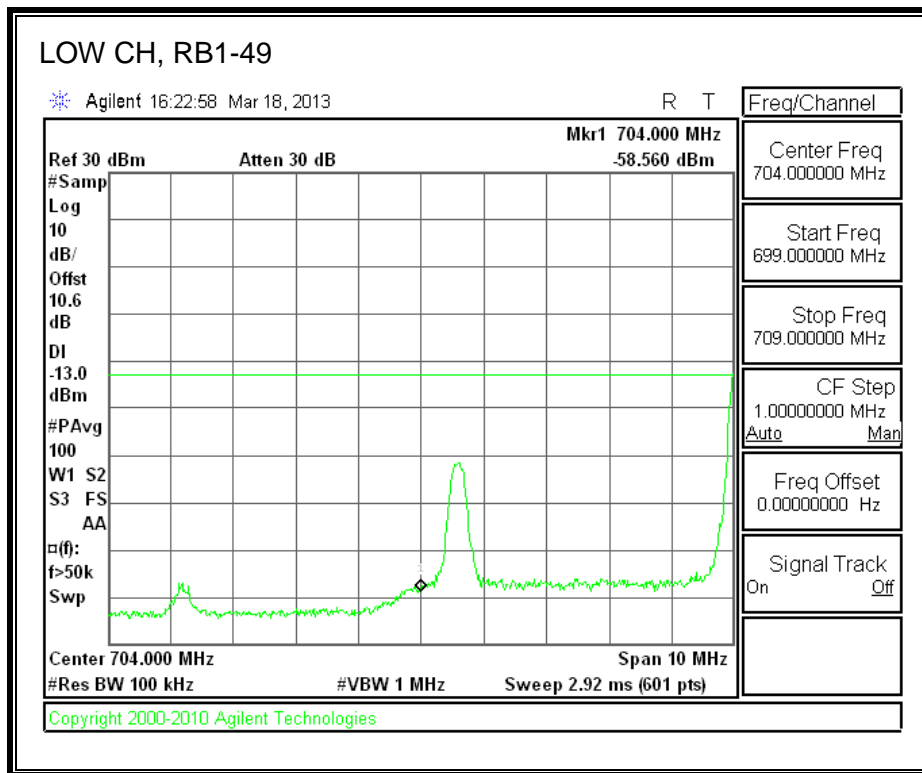


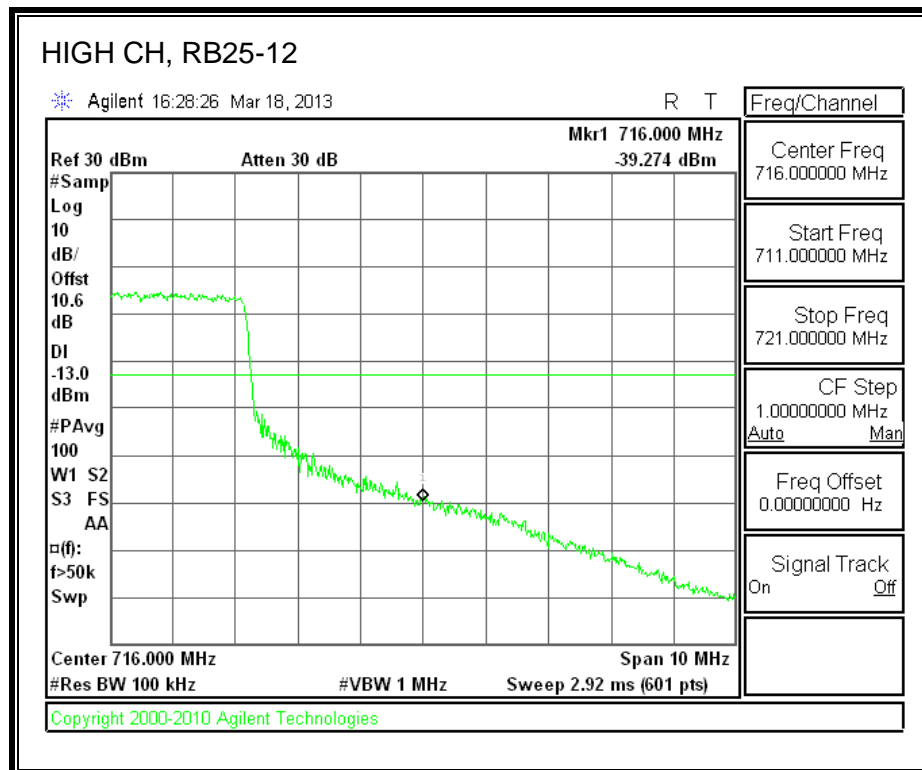
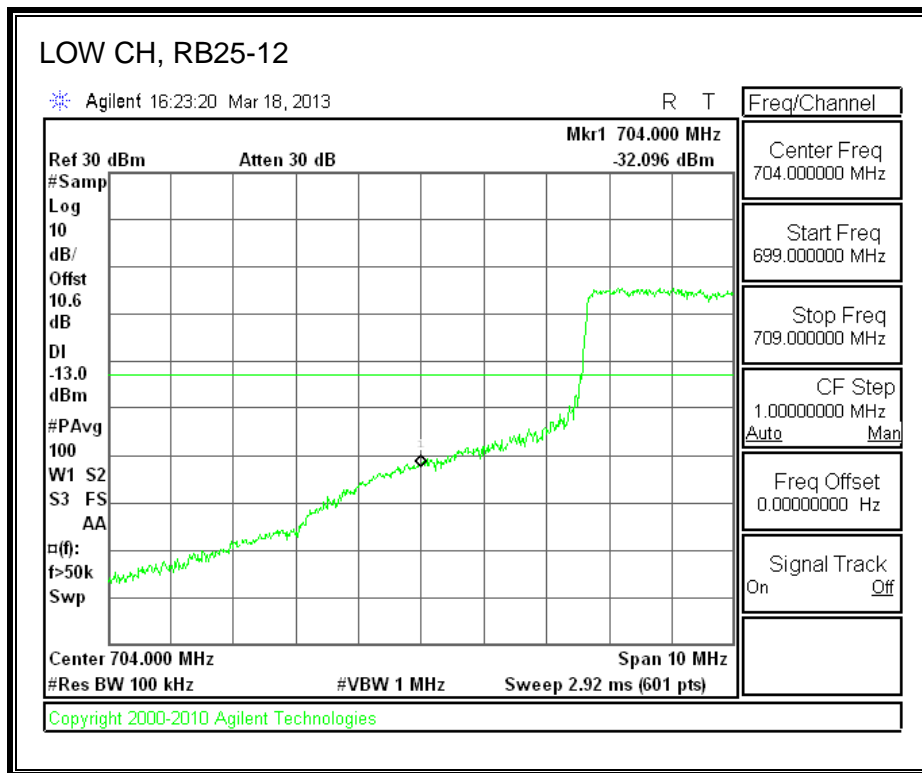


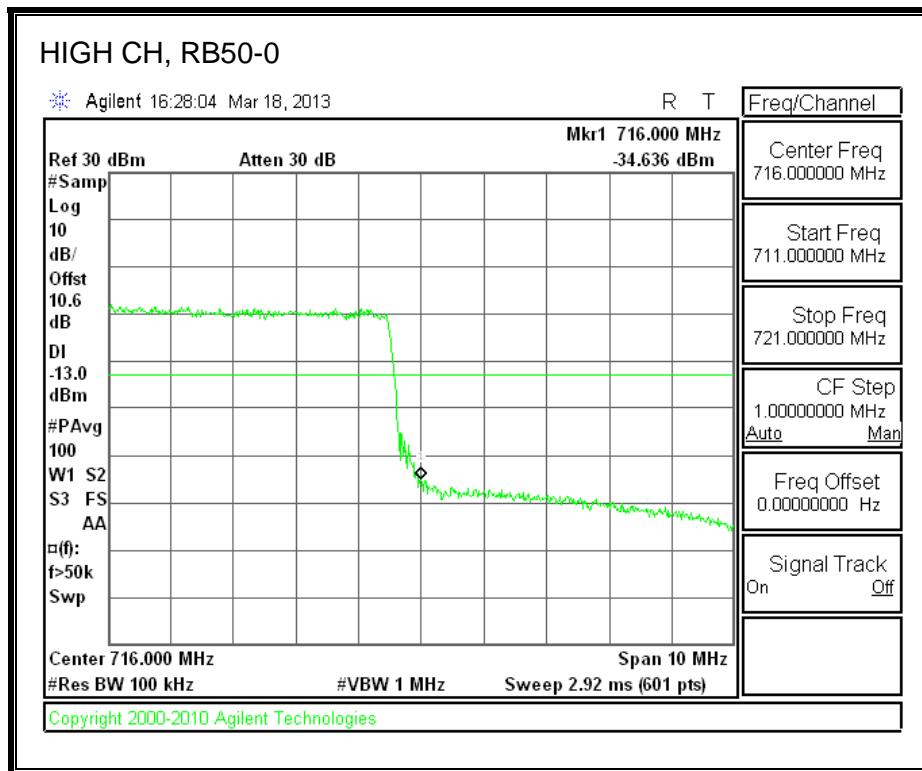
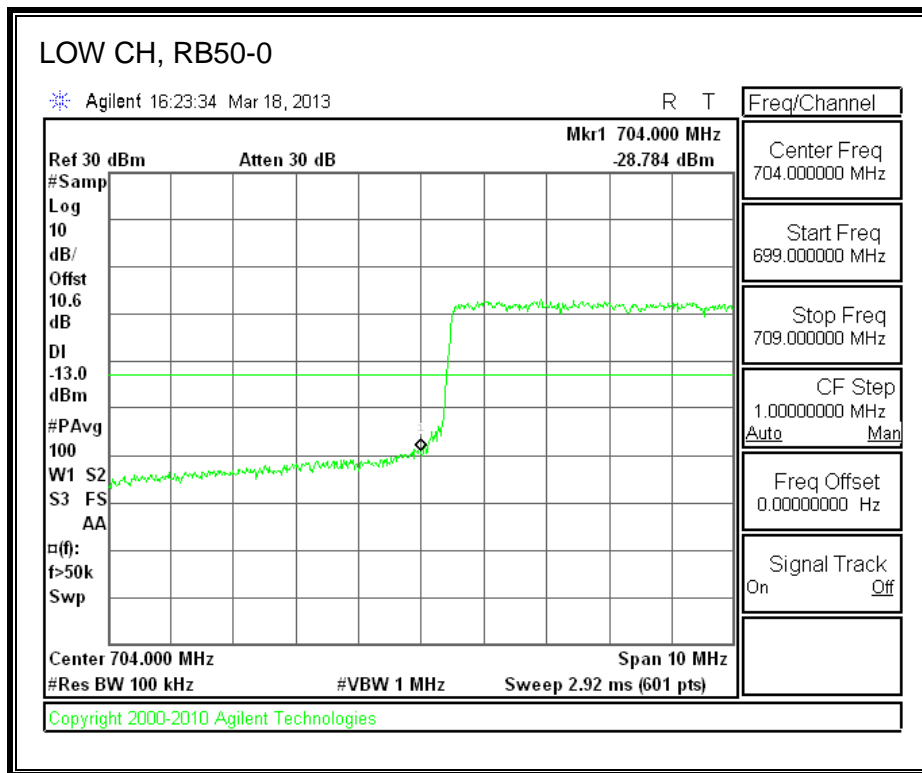
**LTE 16QAM Band 17 (10.0 MHz BAND WIDTH)**











### **8.3. OUT OF BAND EMISSIONS**

#### **RULE PART(S)**

FCC: §2.1051, §22.901, §22.917, §24.238 and §27.53

#### **LIMITS**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

#### **TEST PROCEDURE**

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

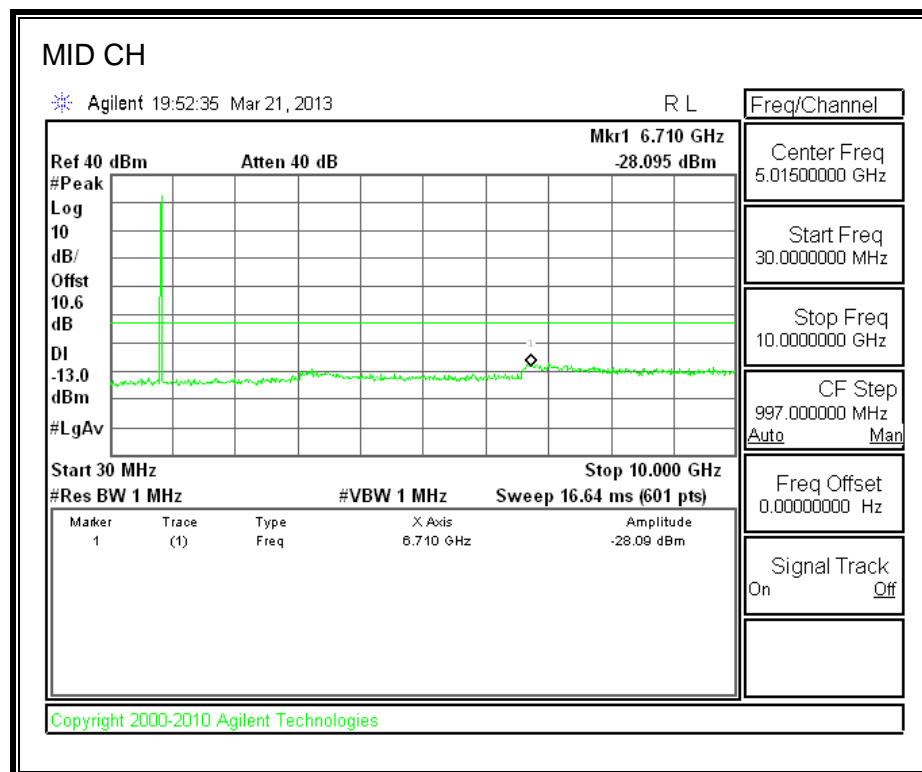
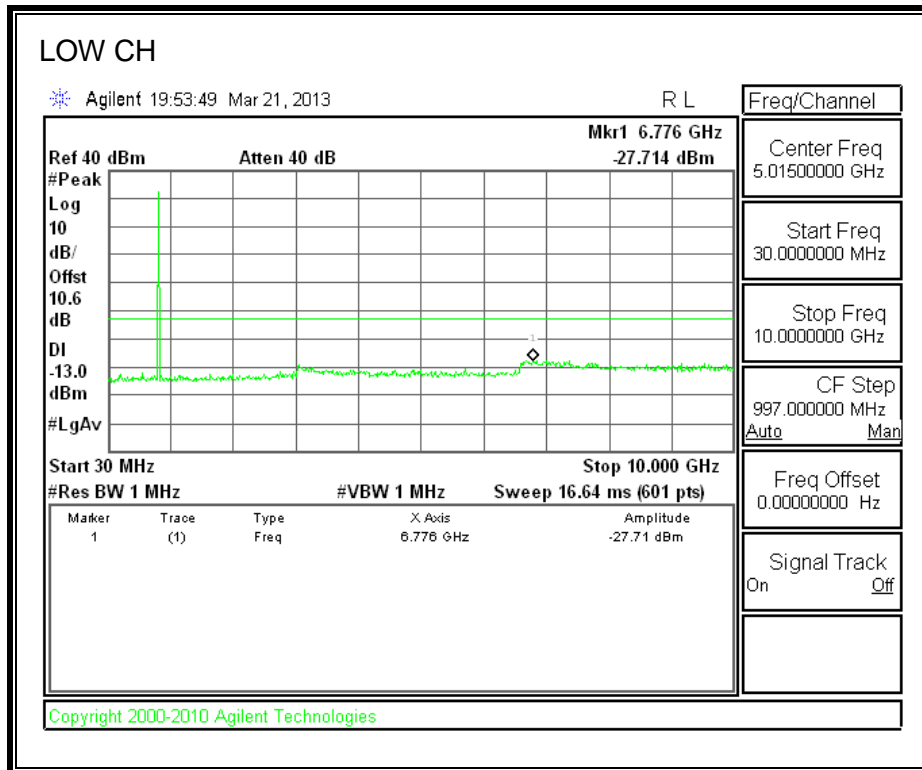
#### **MODES TESTED**

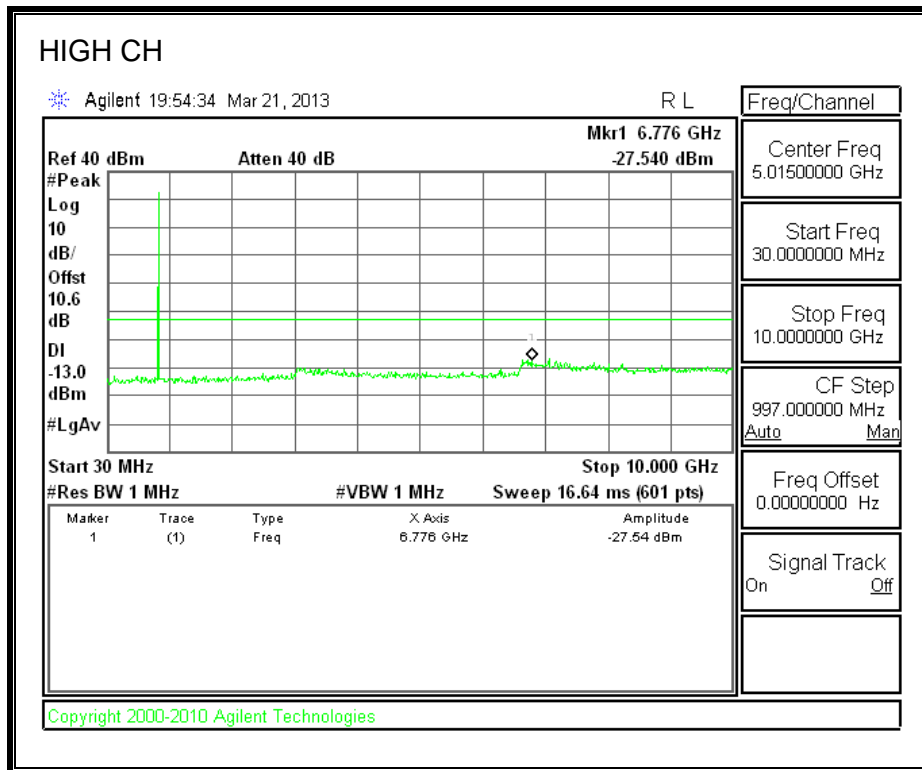
- GPRS and EGPRS
- UMTS, REL 99, and HSDPA
- LTE Band 4 and 17

#### **RESULTS**

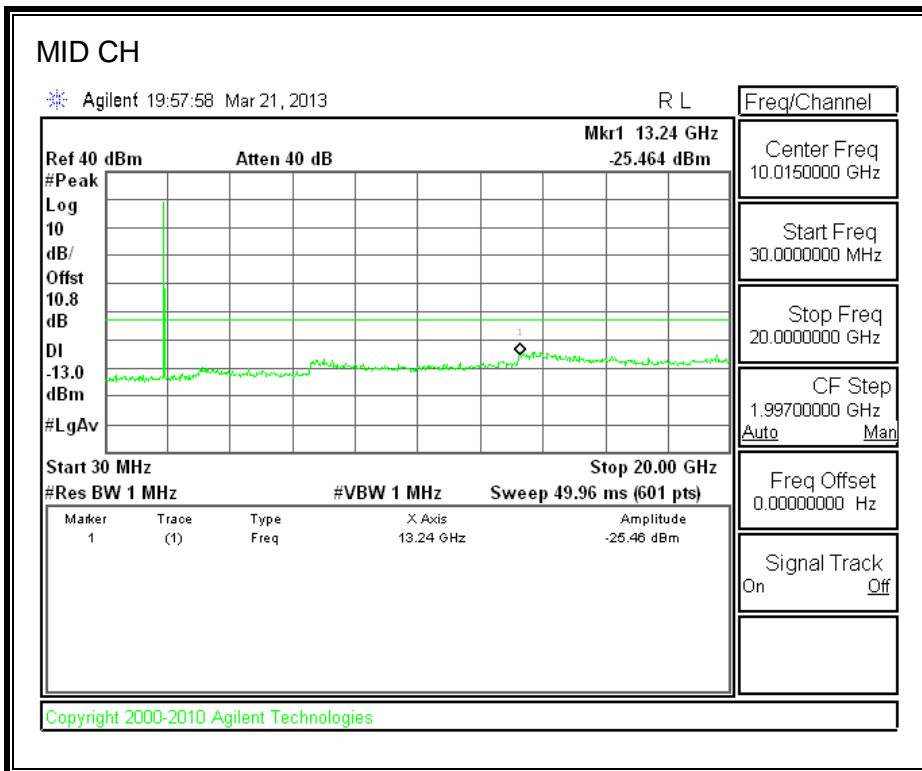
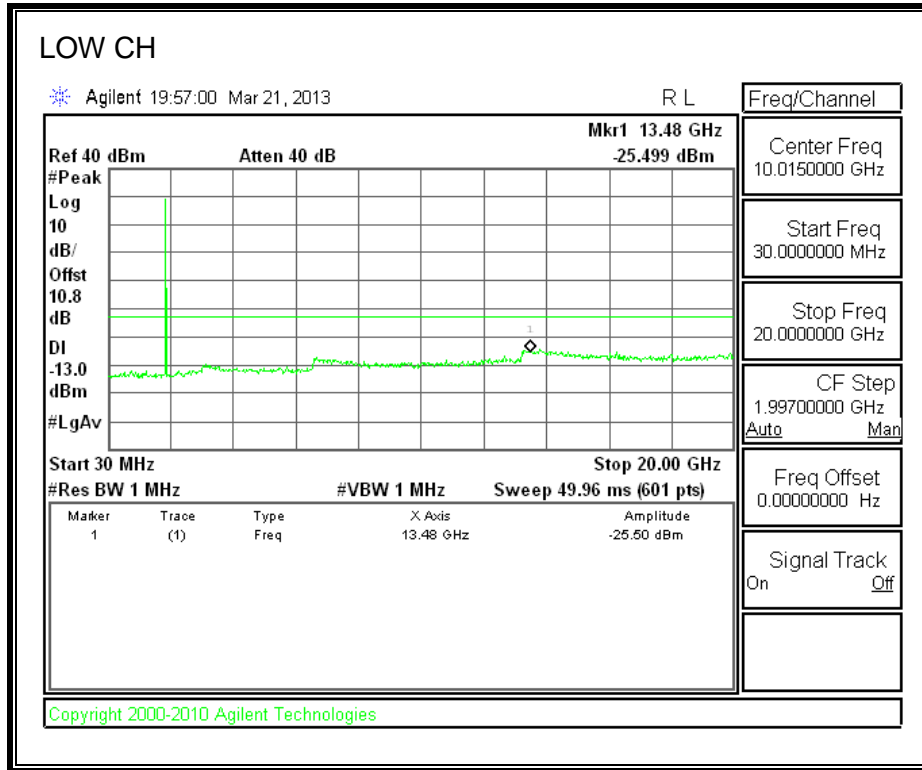
### 8.3.1. GPRS MODE

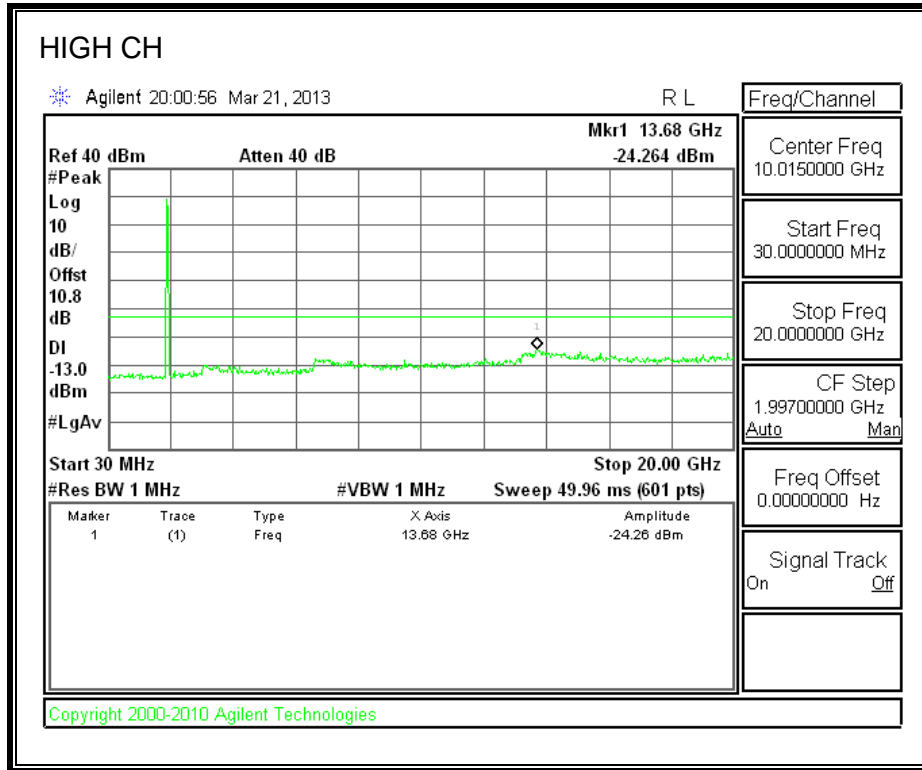
#### CELL BAND





**PCS BAND**

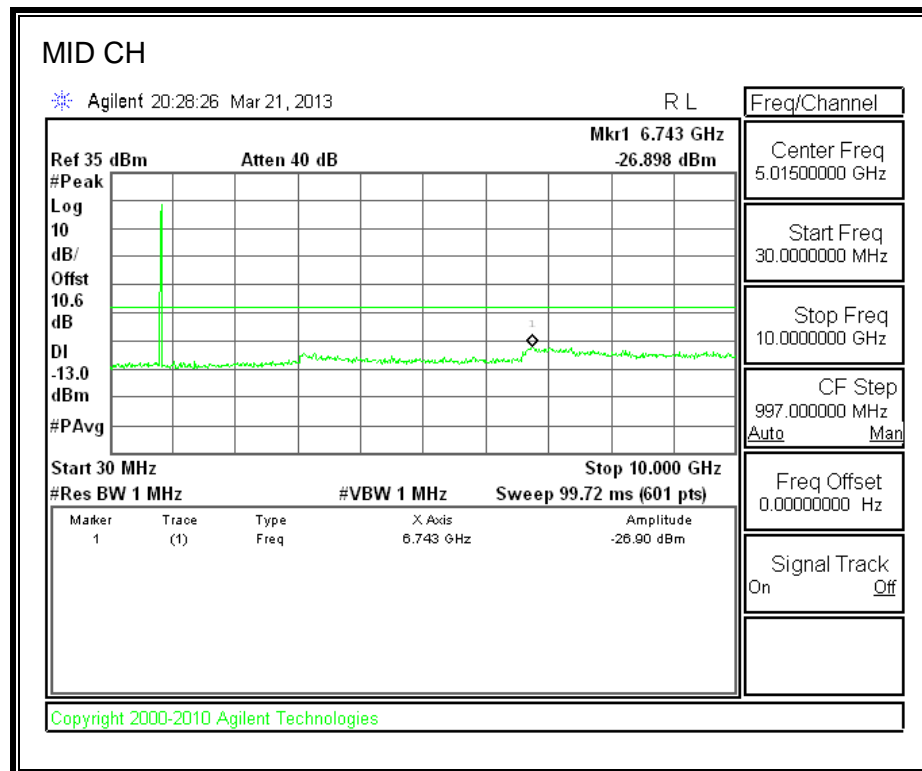
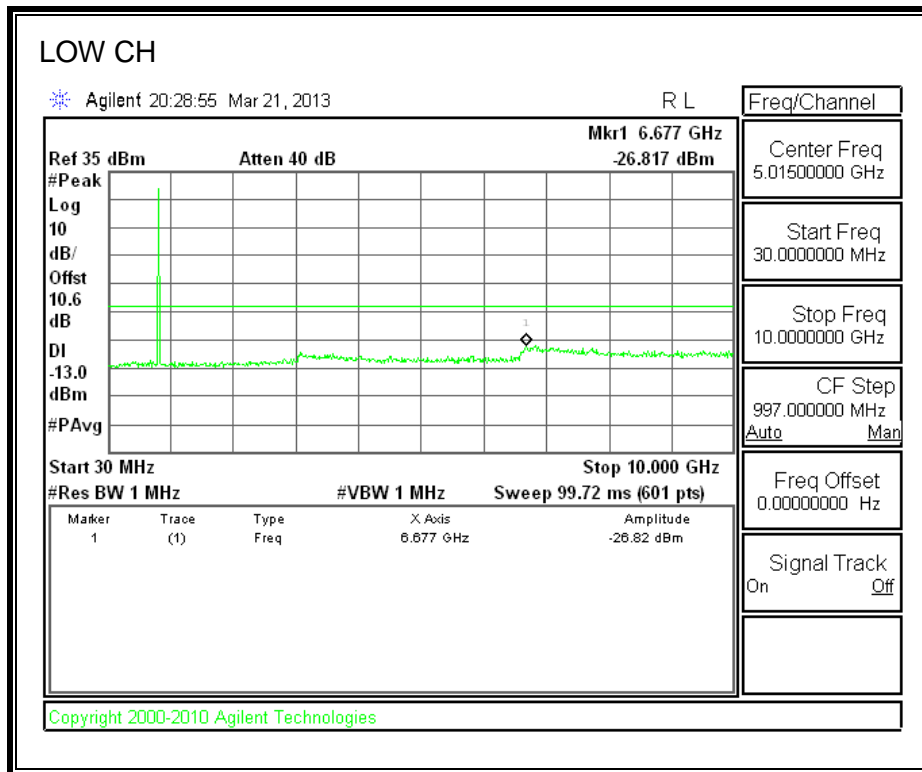


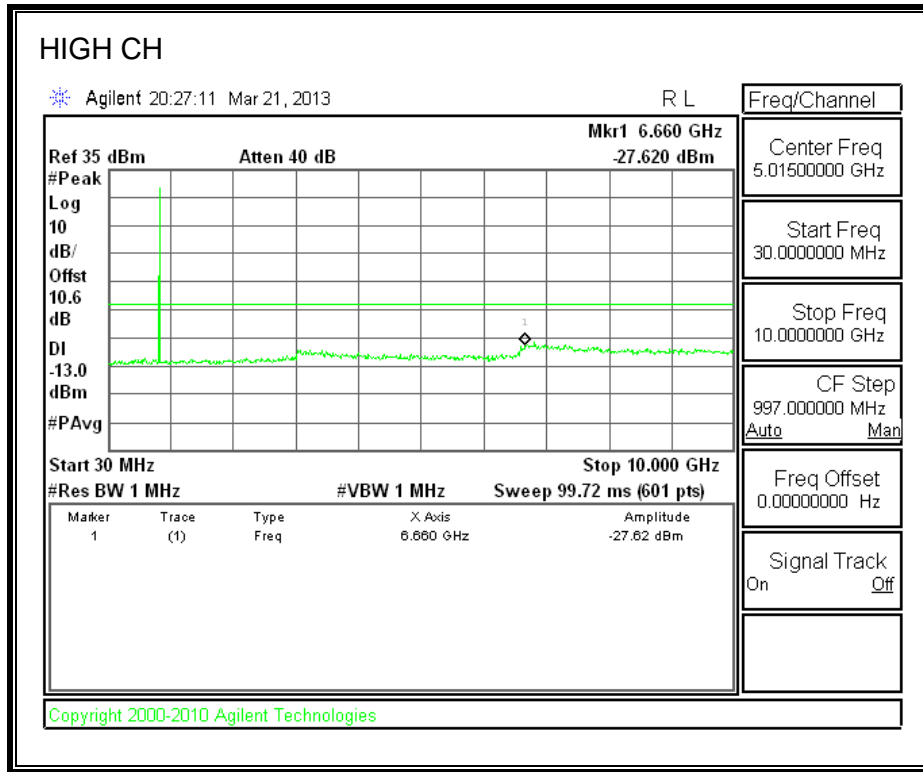




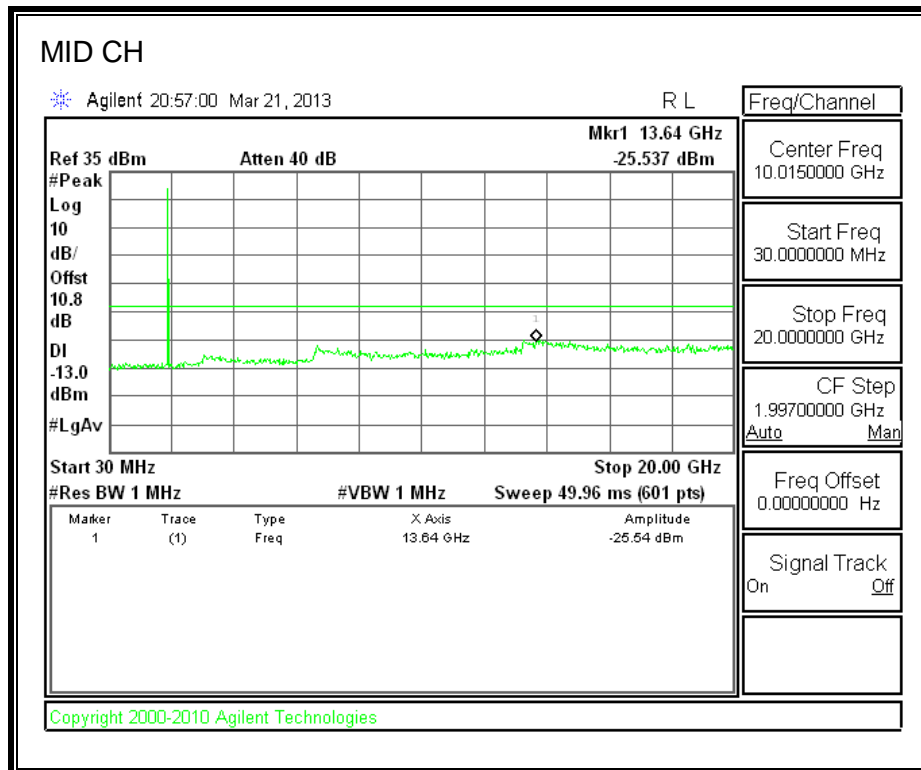
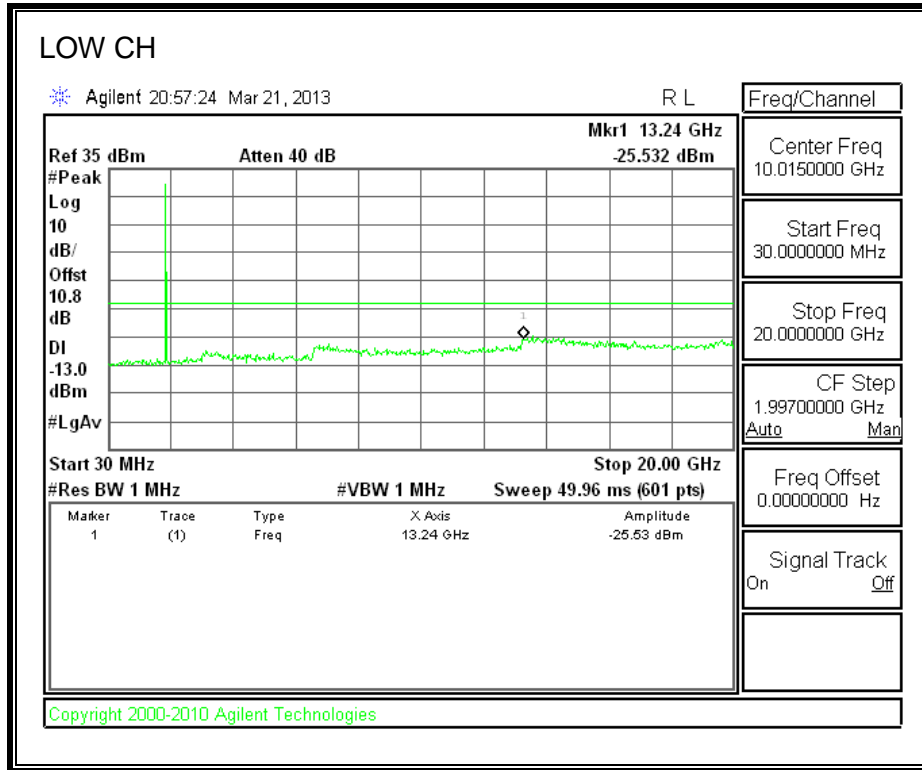
### 8.3.2. EGPRS MODE

#### CELL BAND

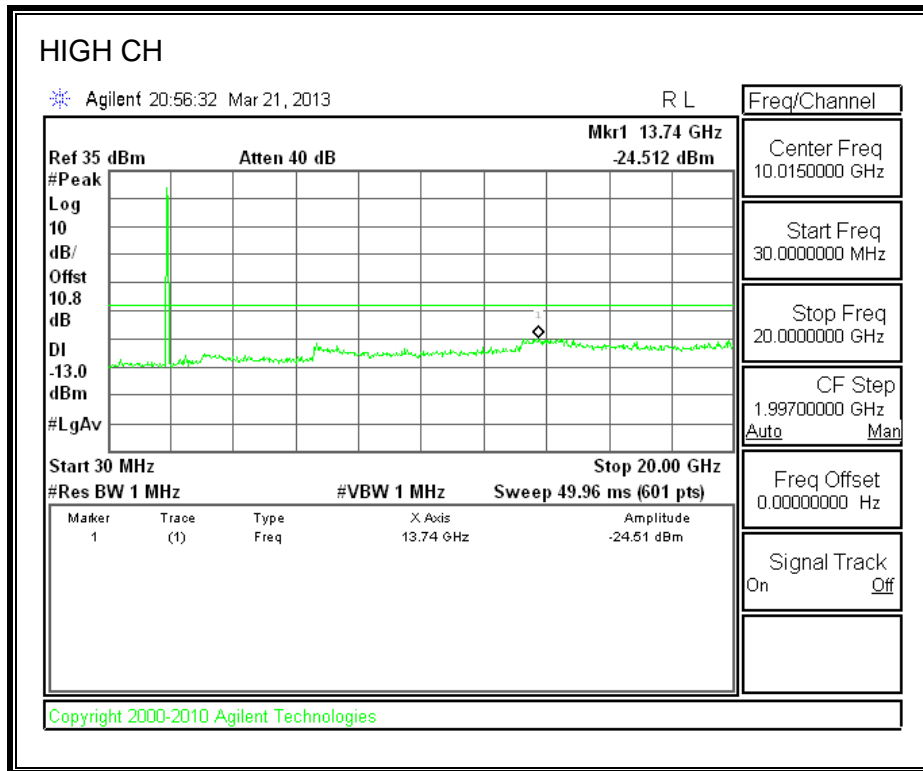




**PCS BAND**

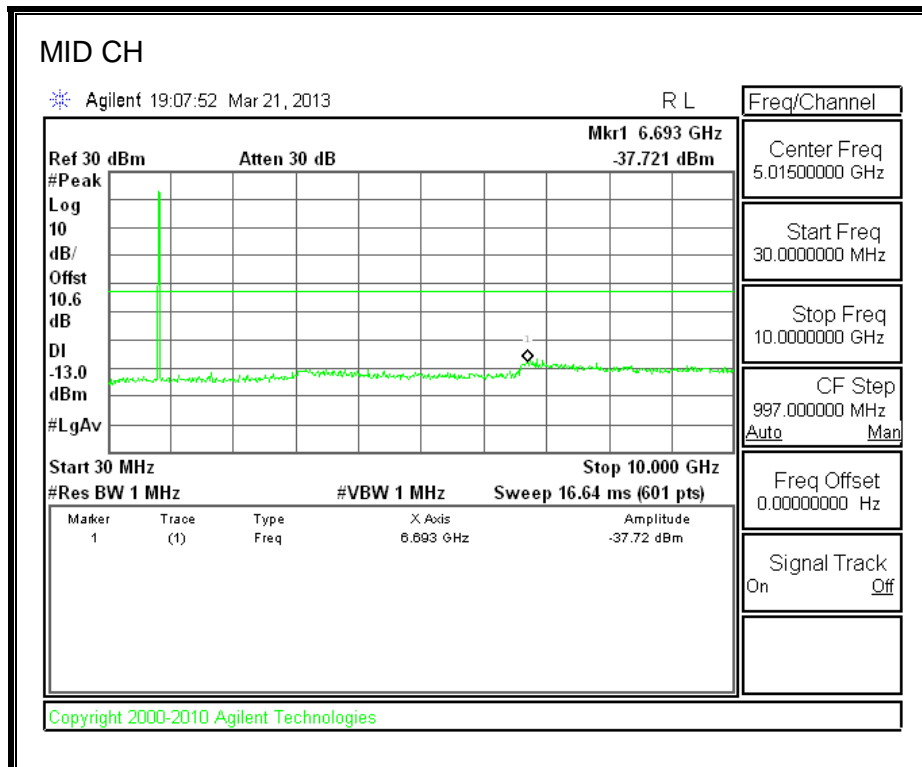
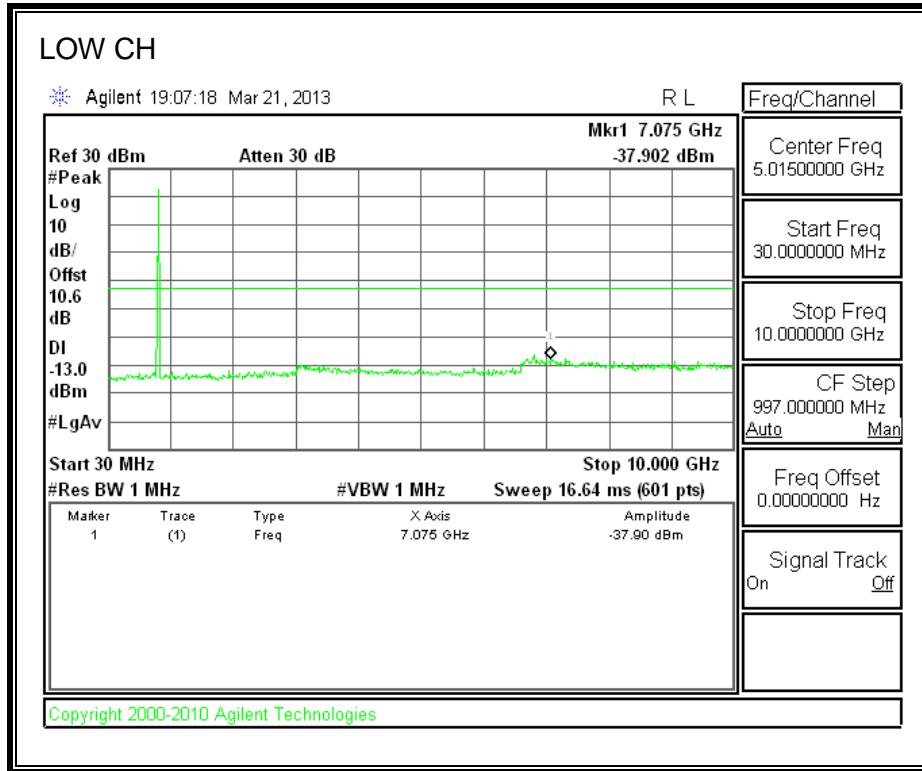


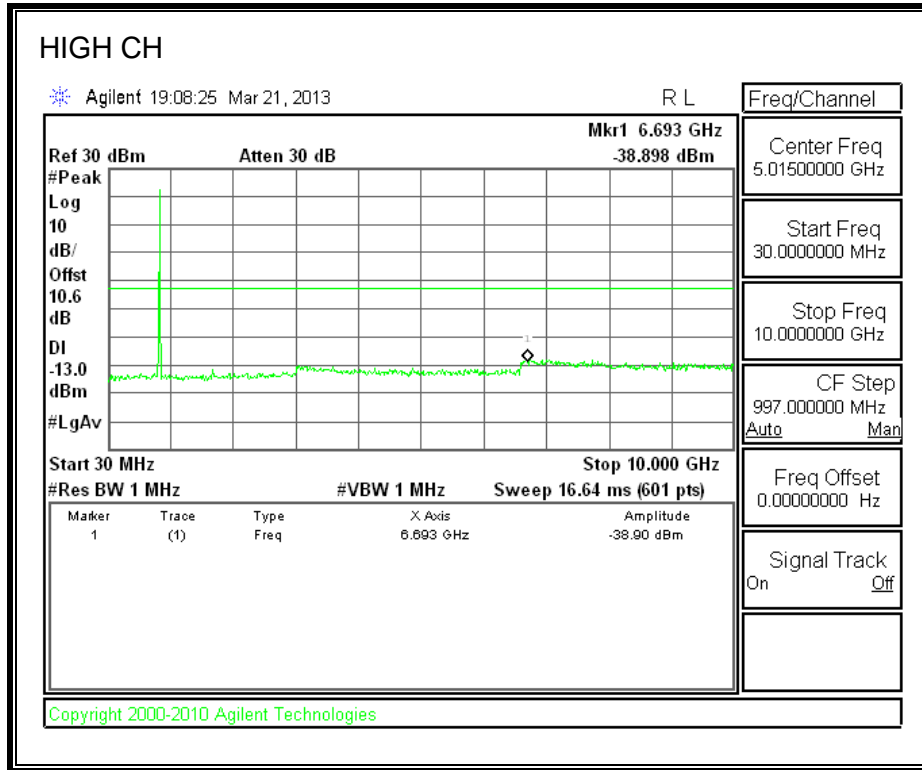




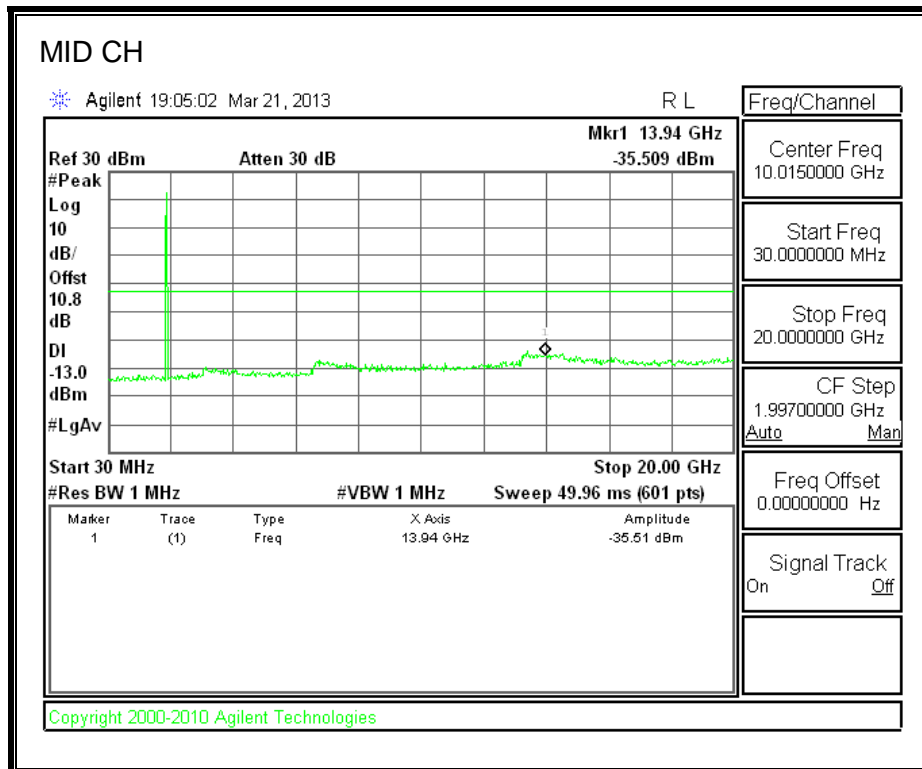
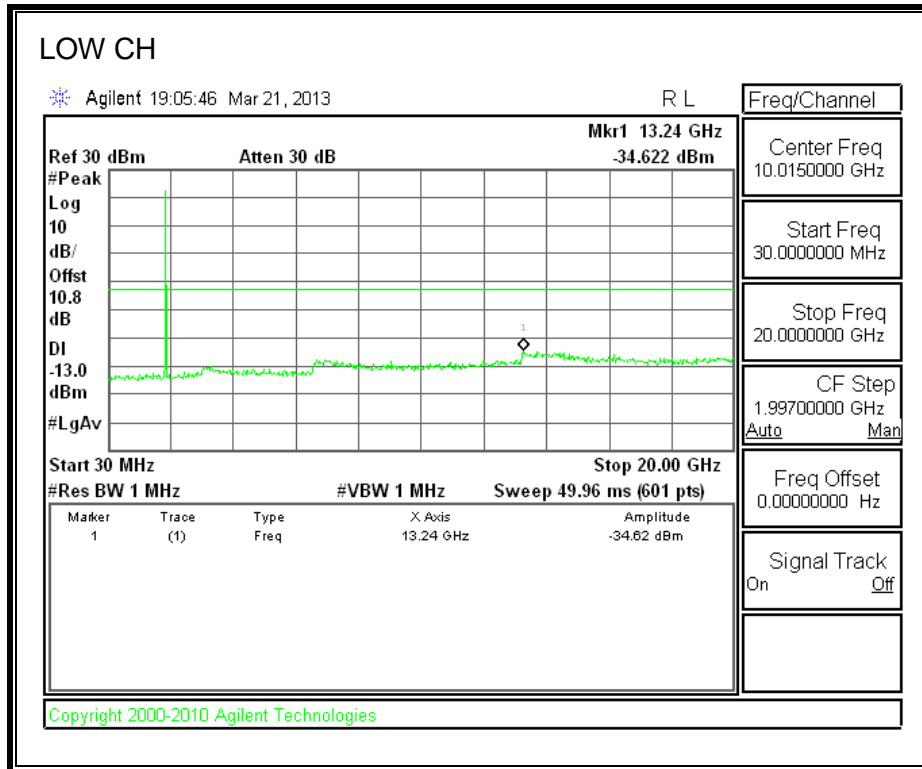
### 8.3.3. UMTS REL 99 MODE

#### CELL BAND

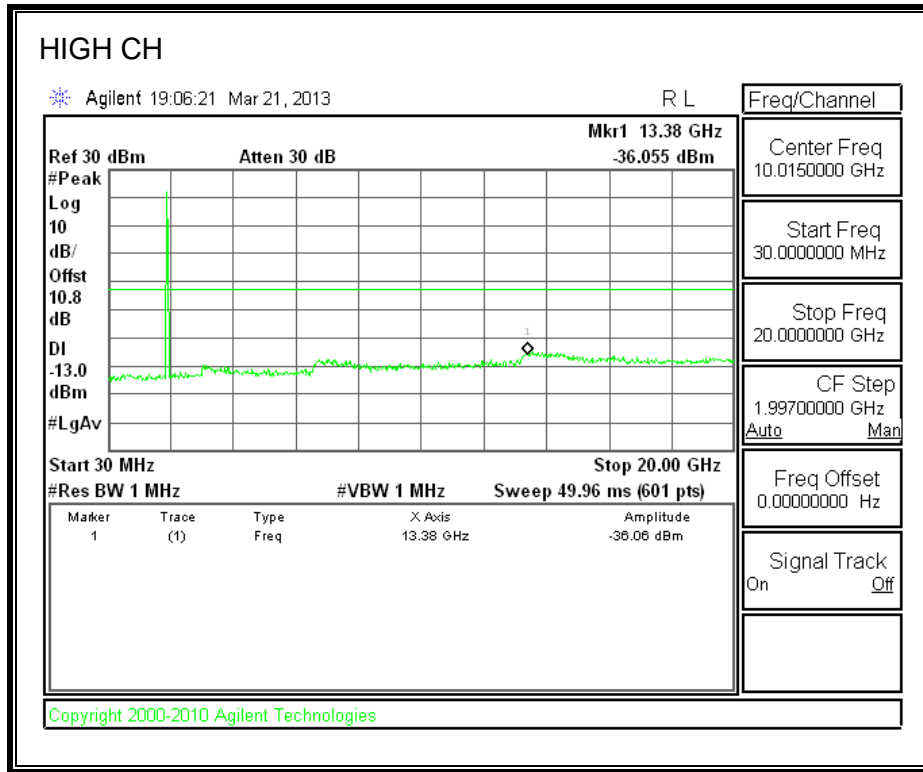




**PCS BAND**

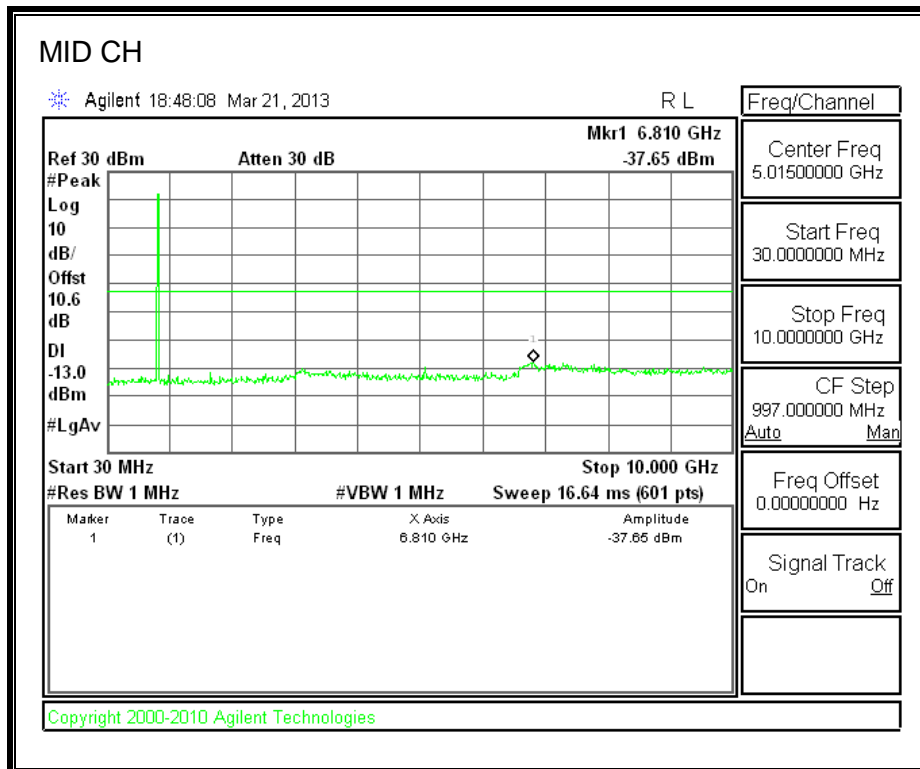
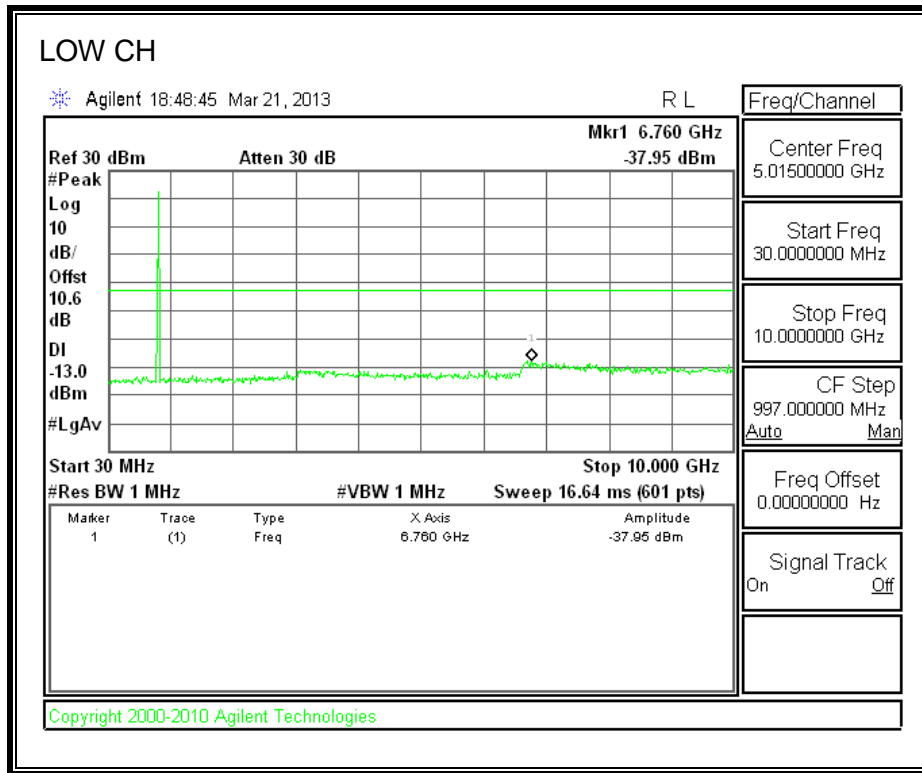


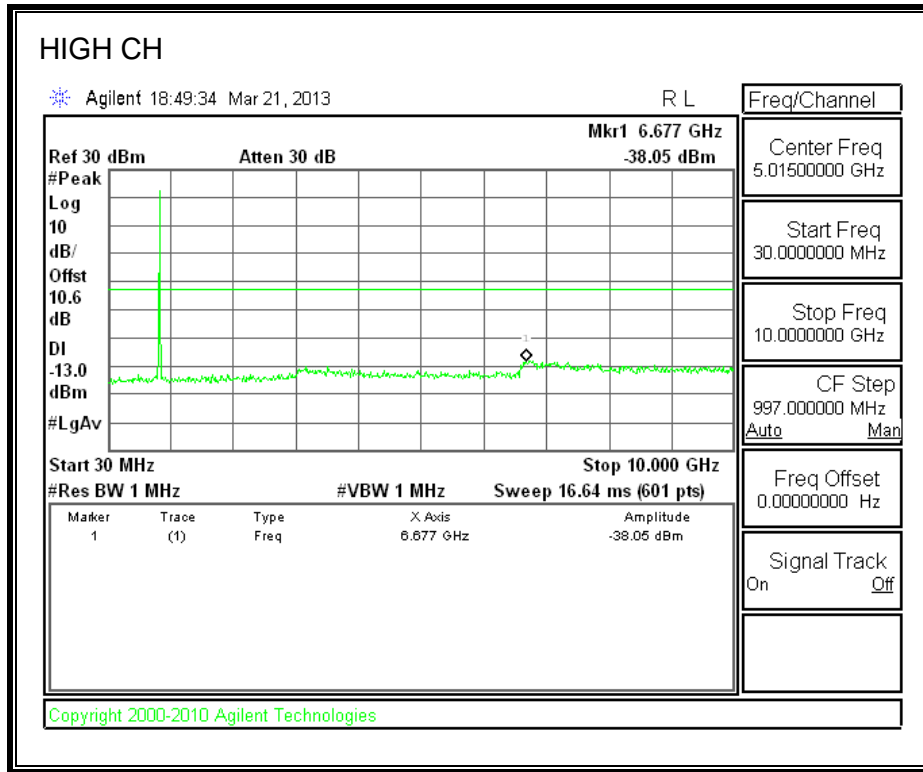




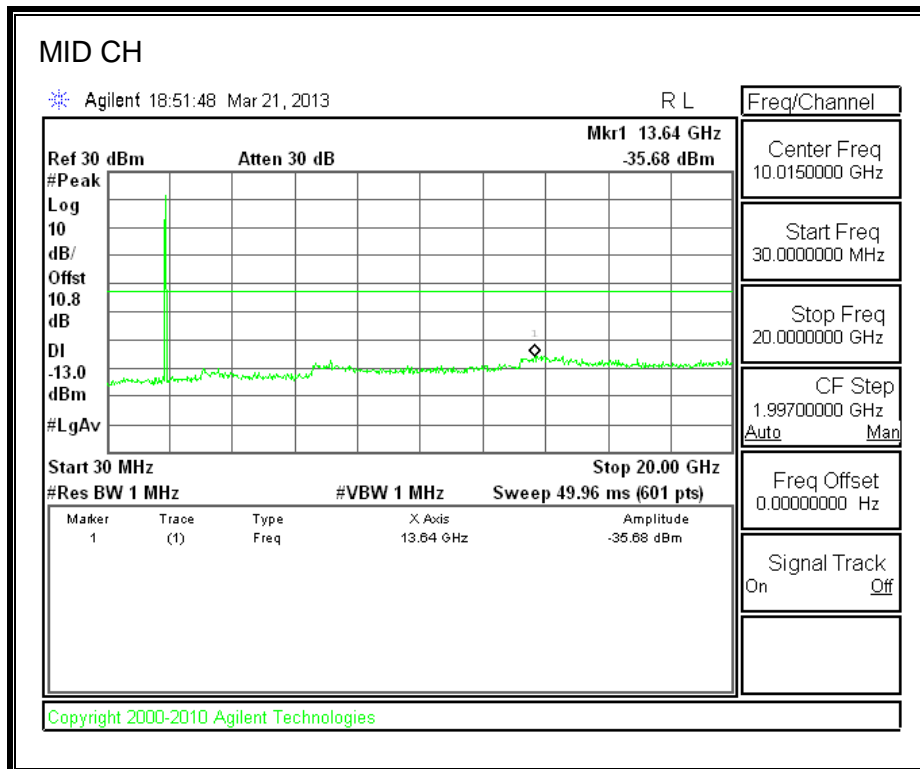
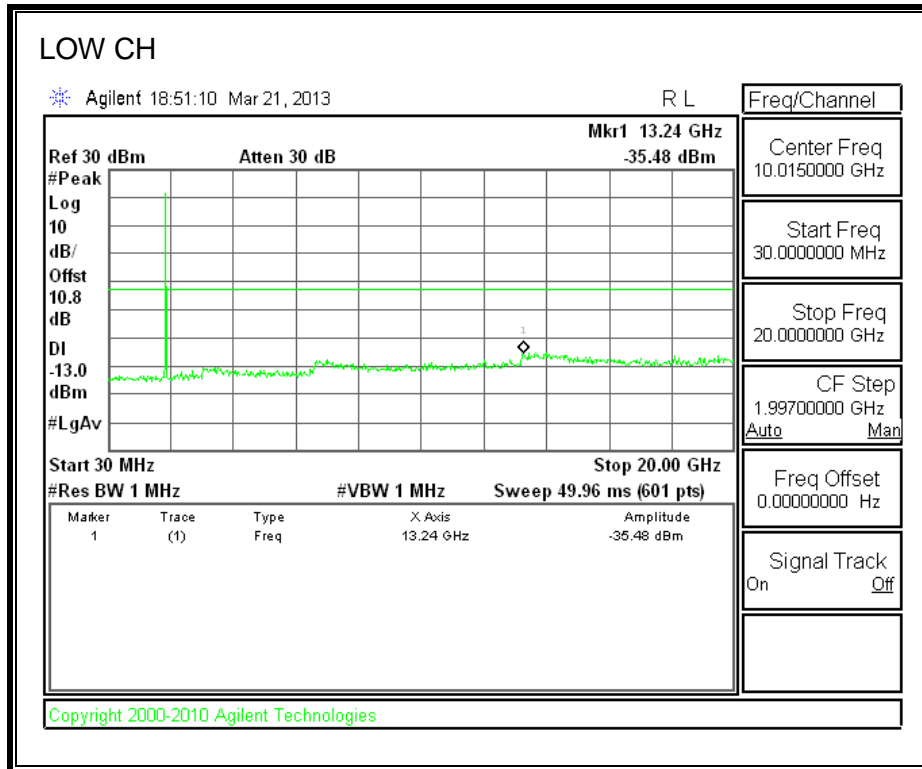
### 8.3.4. UMTS HSDPA MODE

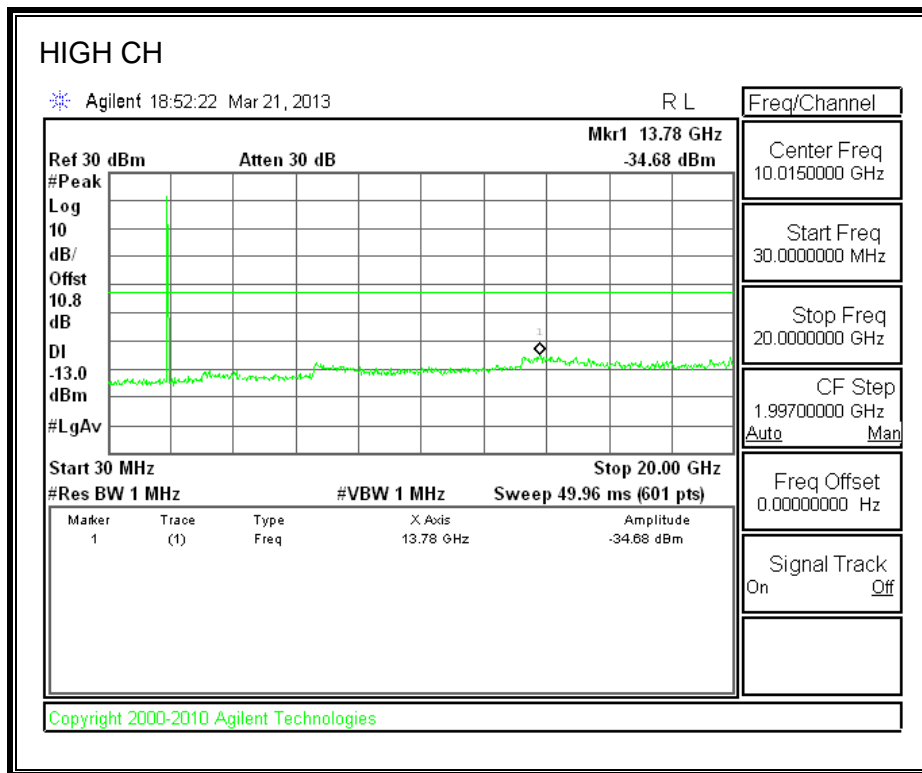
#### CELL BAND





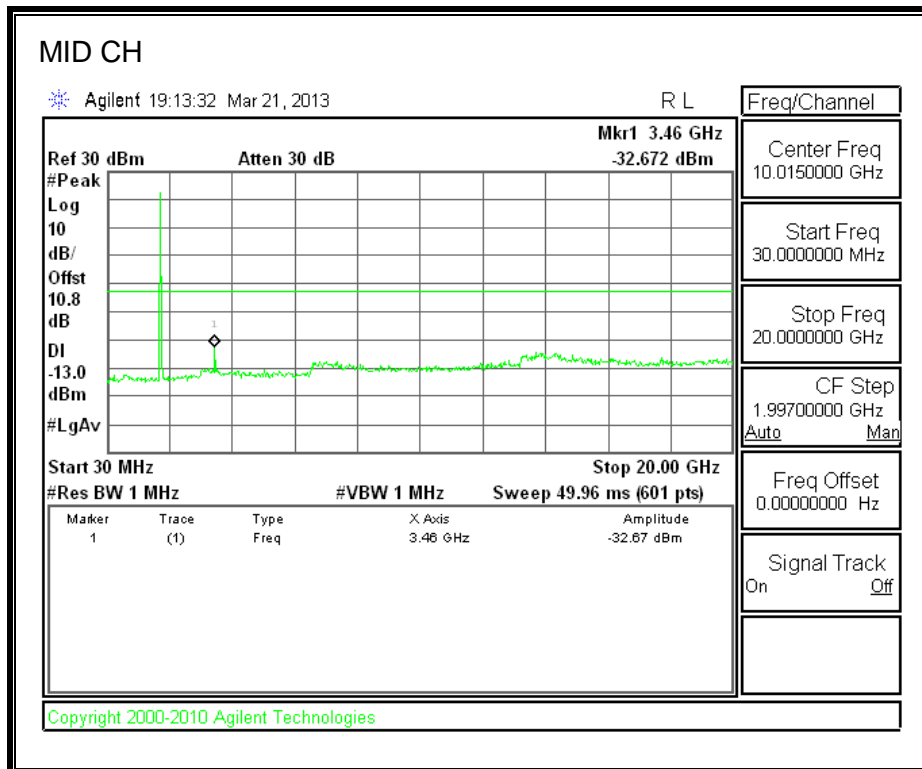
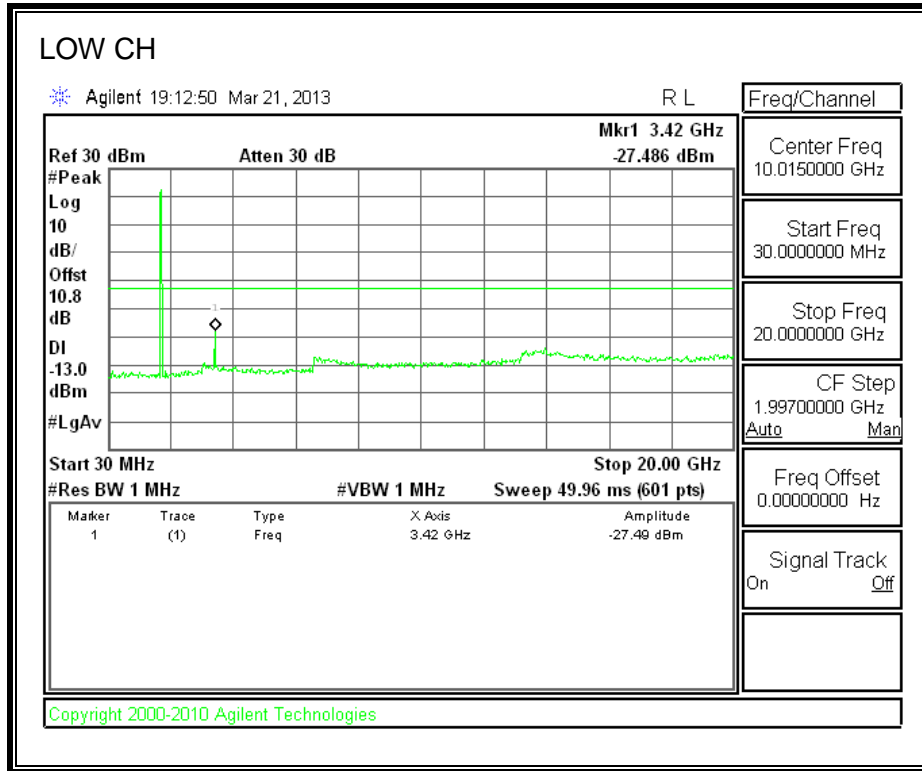
**PCS Band**

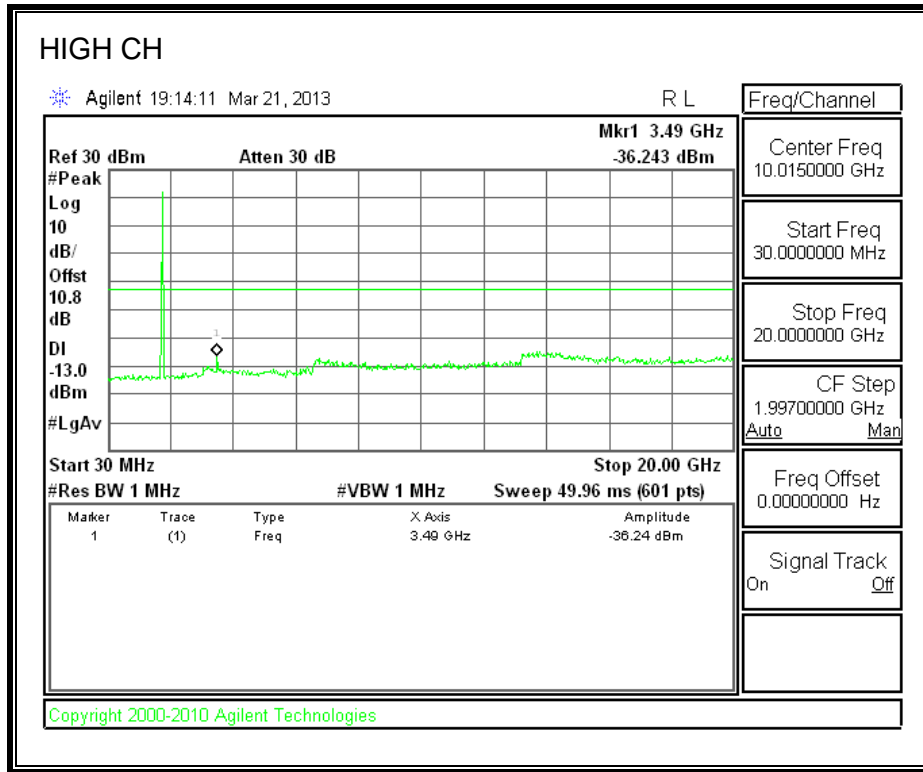




### 8.3.5. UMTS 1700 Rel 99 MODE

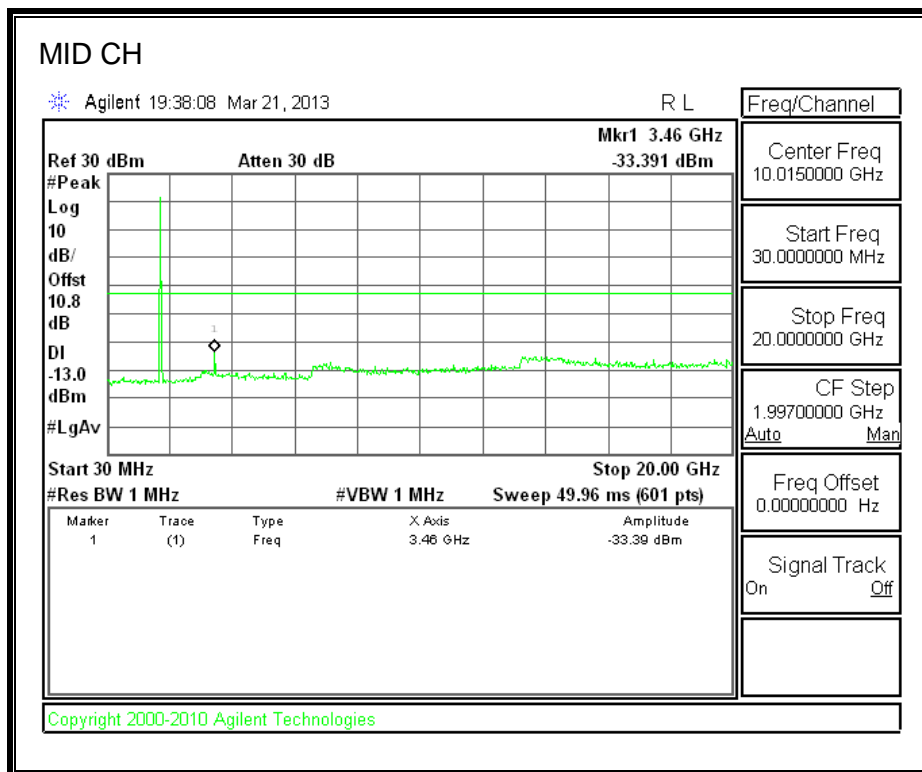
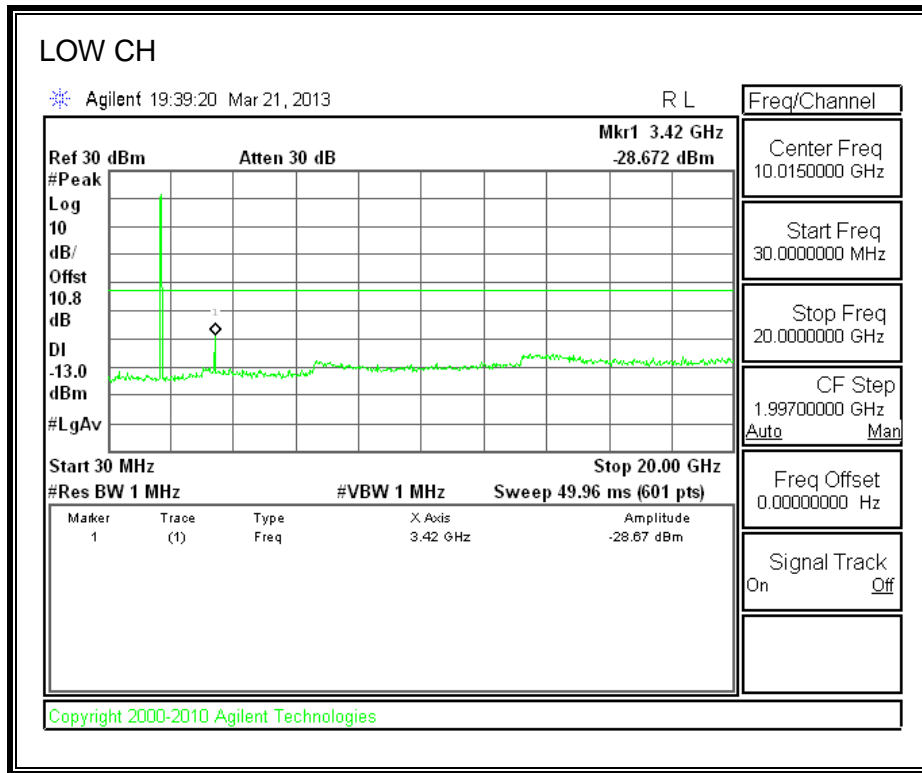
#### AWS BAND



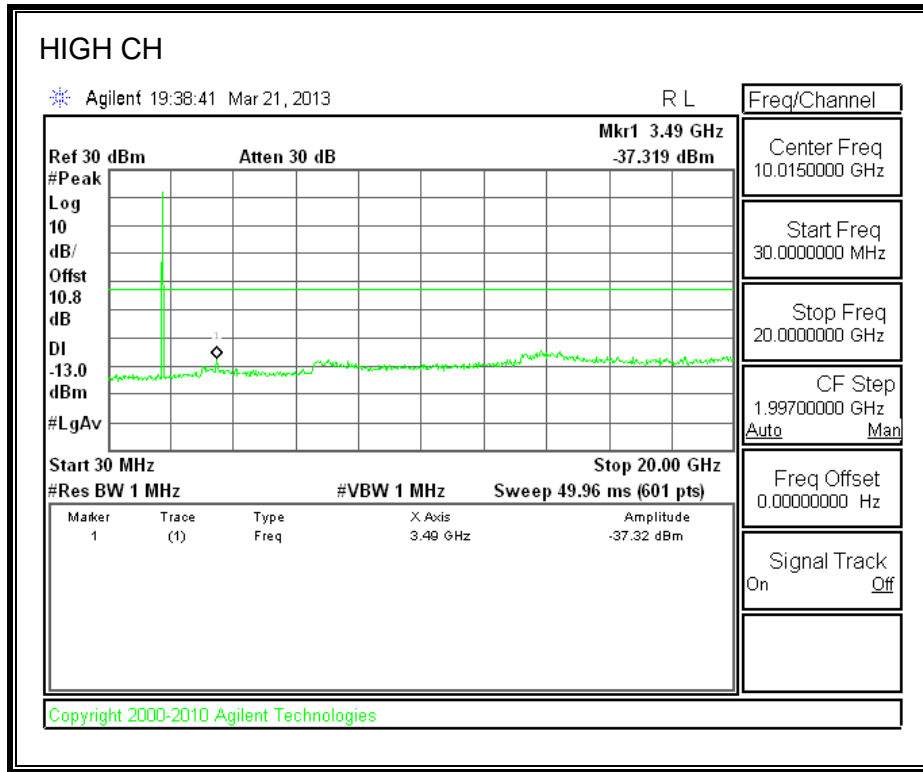


### 8.3.6. UMTS 1700 HSDPA MODE

#### AWS BAND



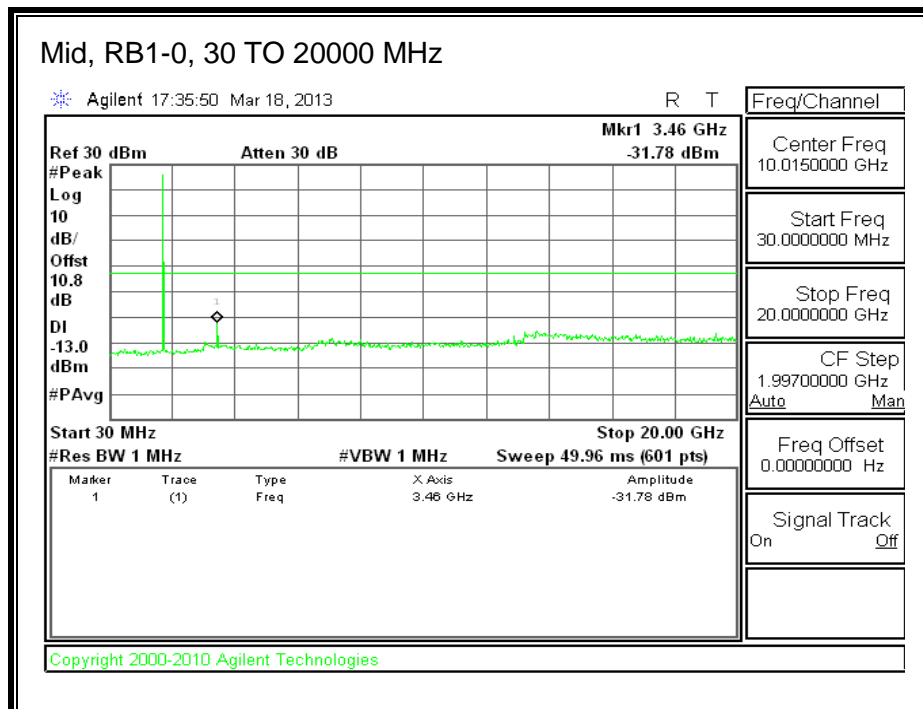
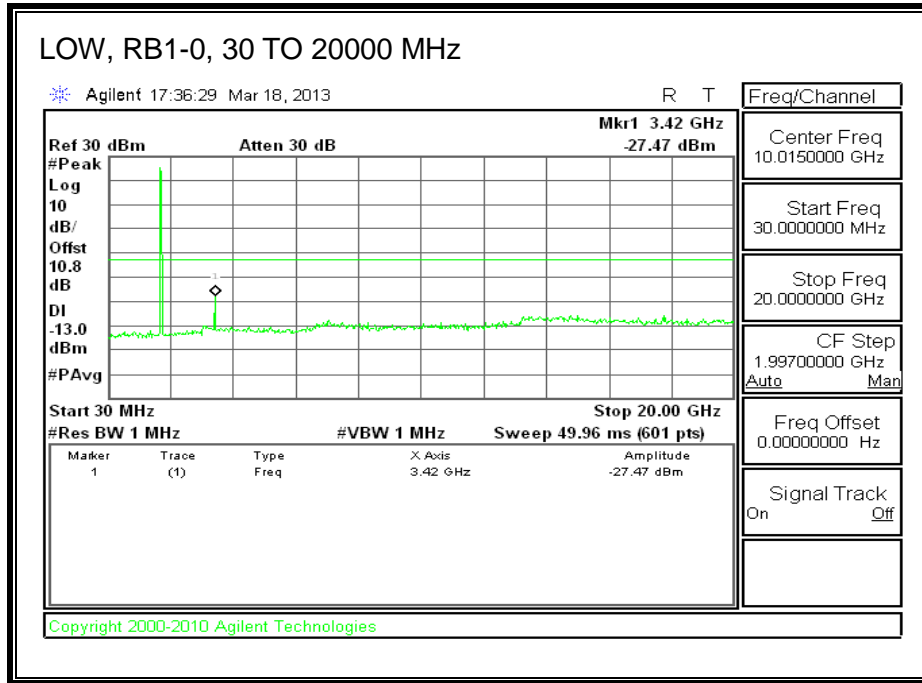


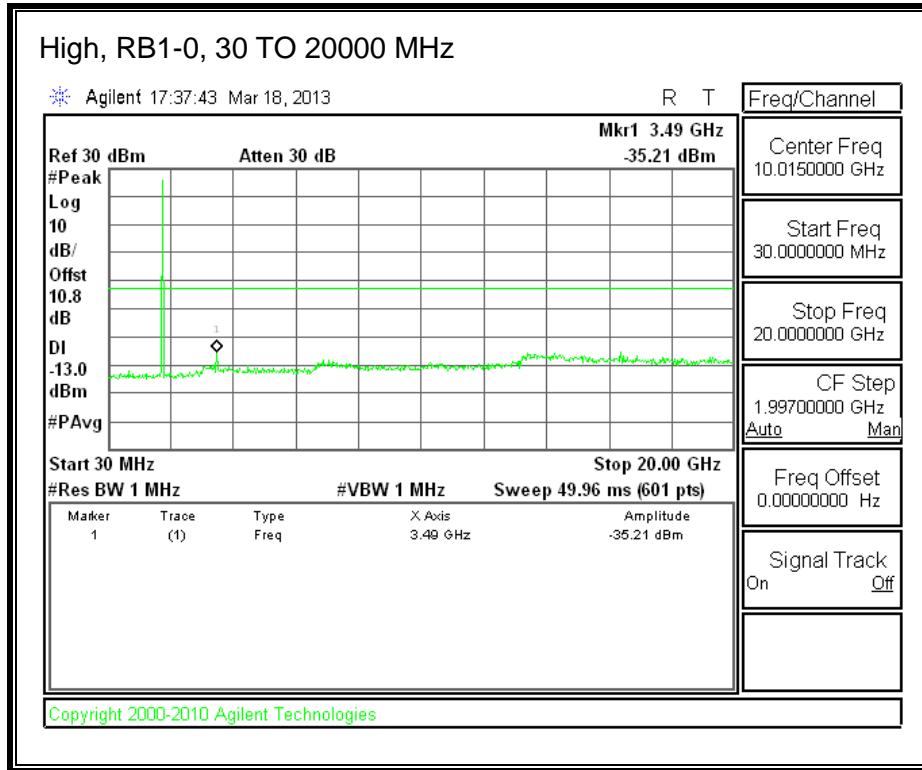


### 8.3.7. LTE BAND 4

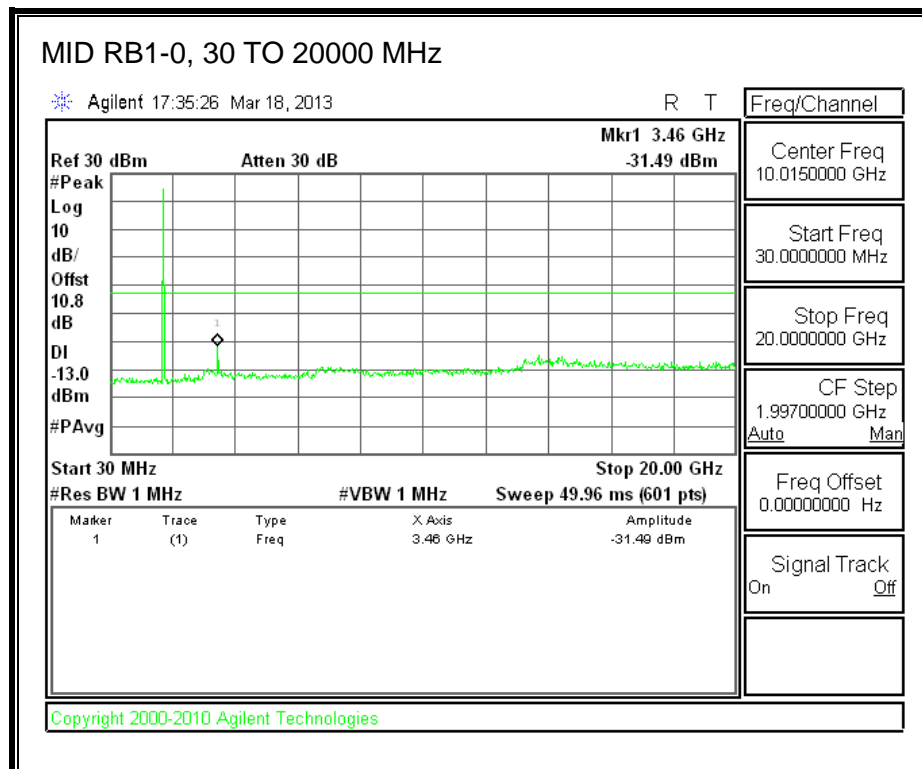
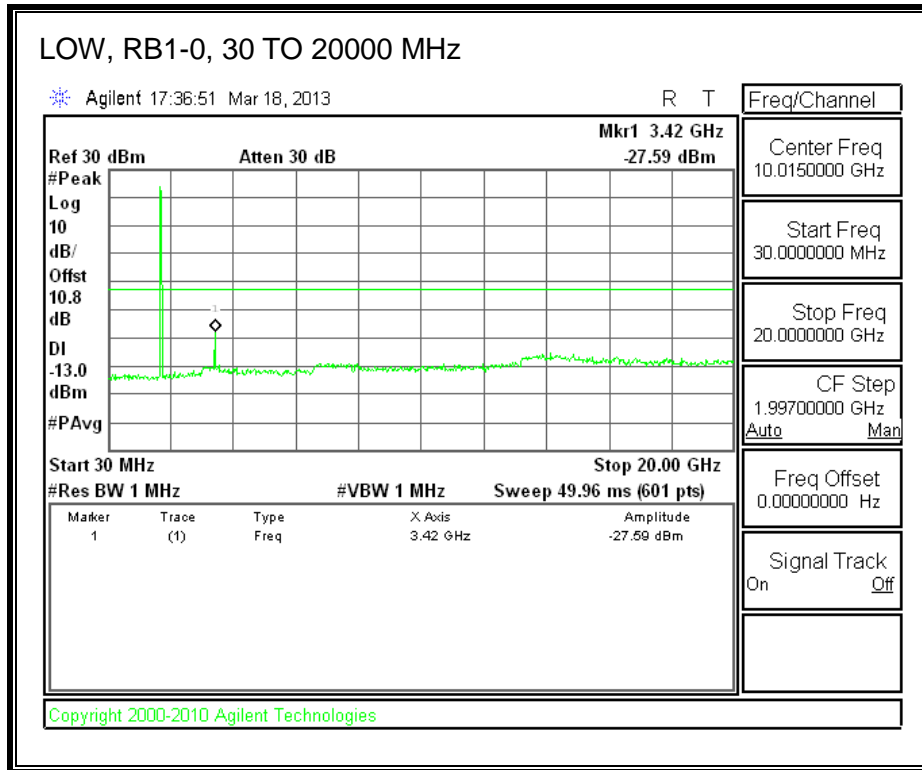
#### Band 4 (5.0 MHz BAND WIDTH)

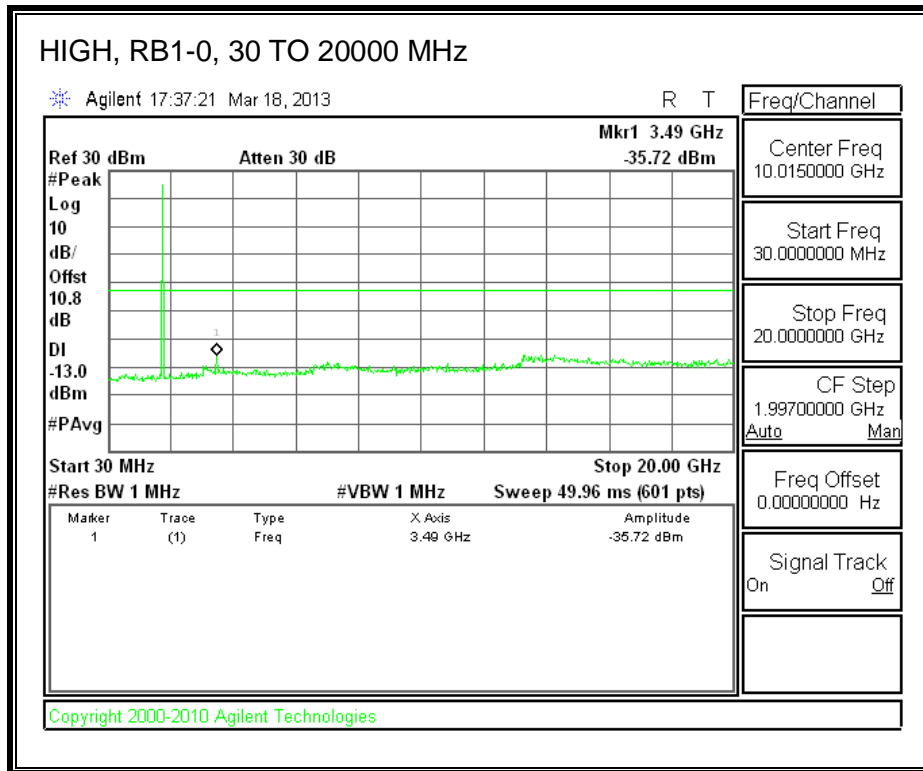
#### LTE QPSK





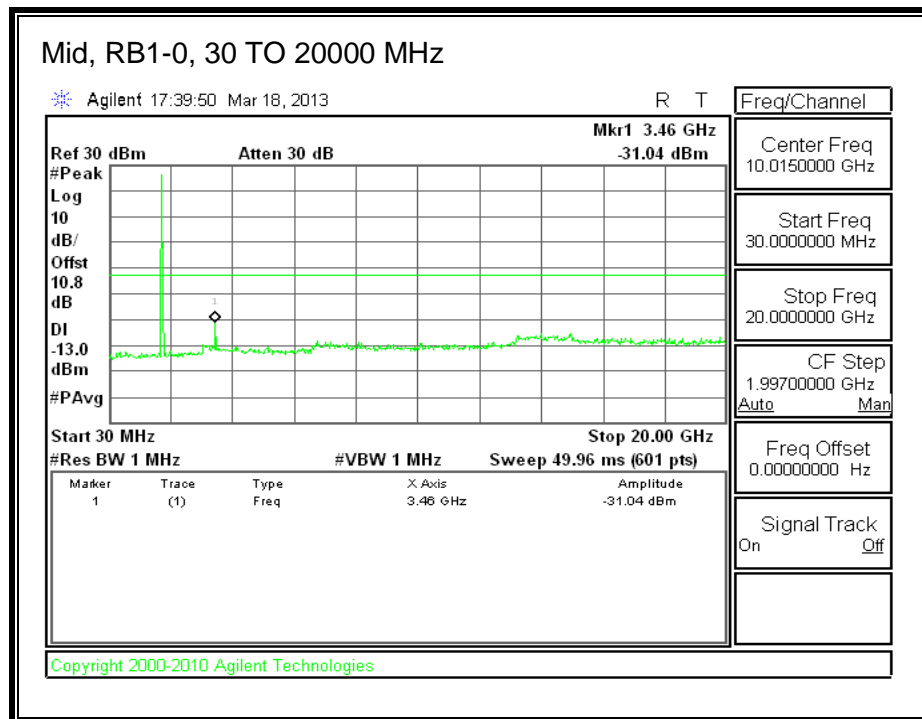
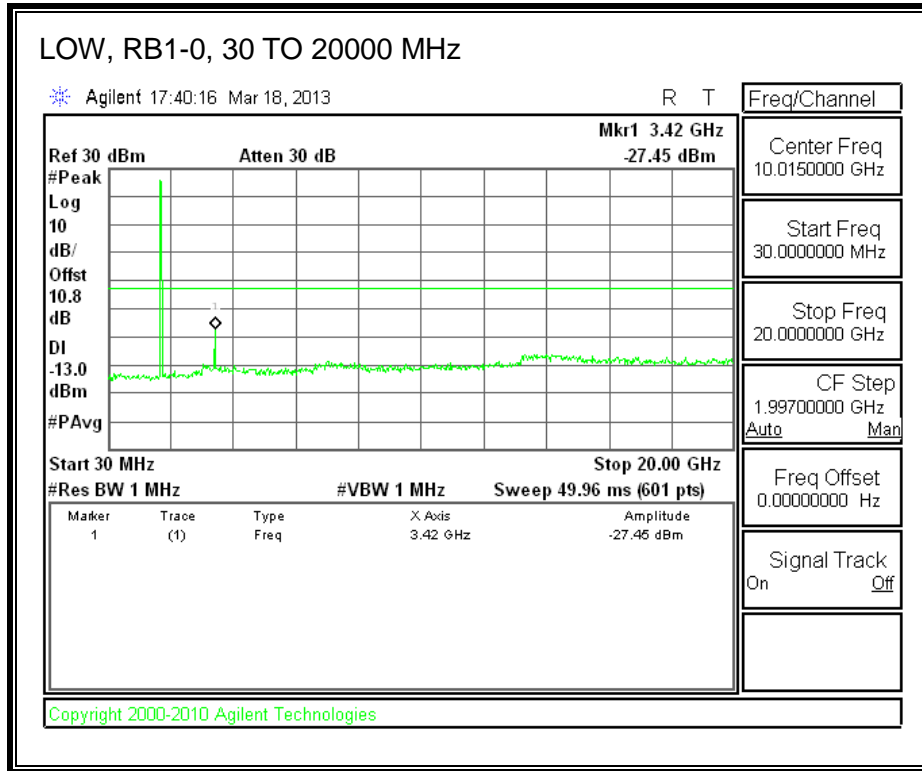
**LTE 16QAM**

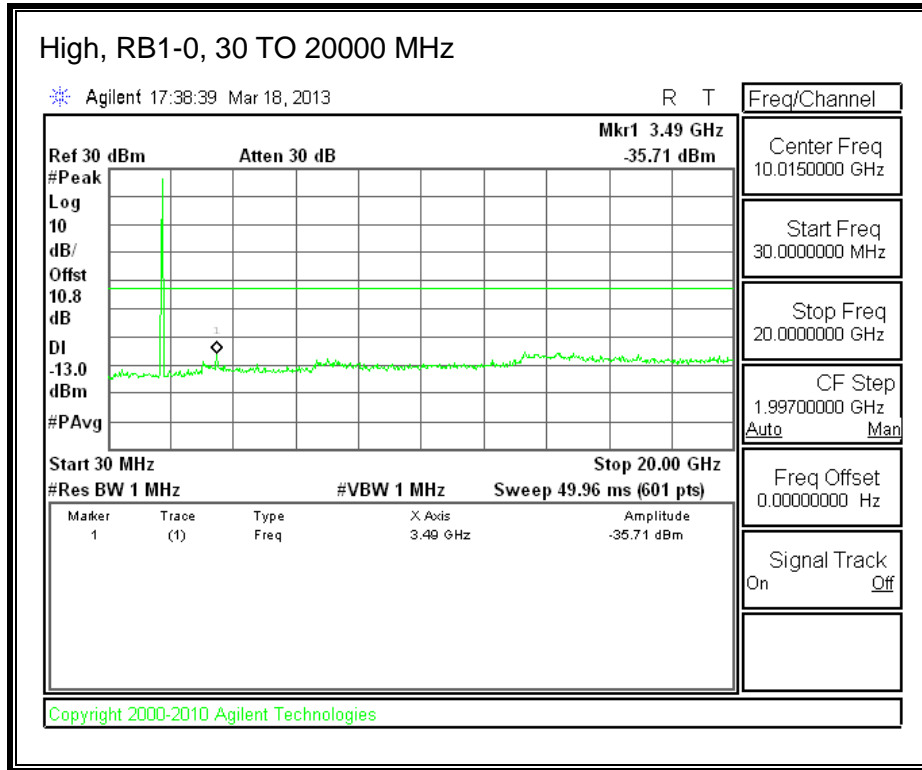




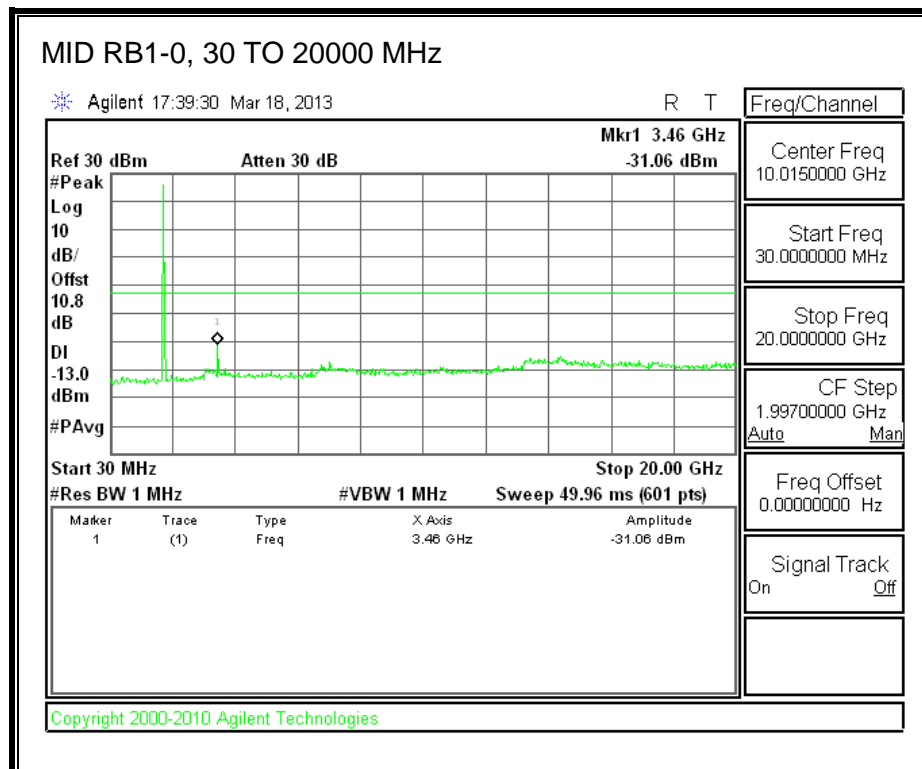
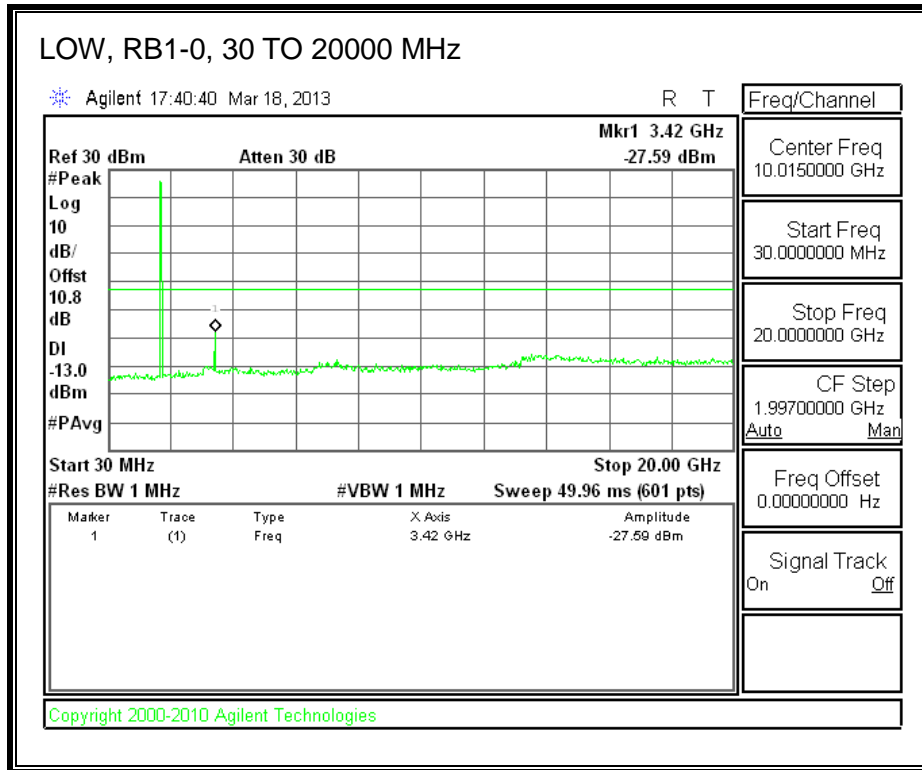
**Band 4 (10.0 MHz BAND WIDTH)**

**LTE QPSK**

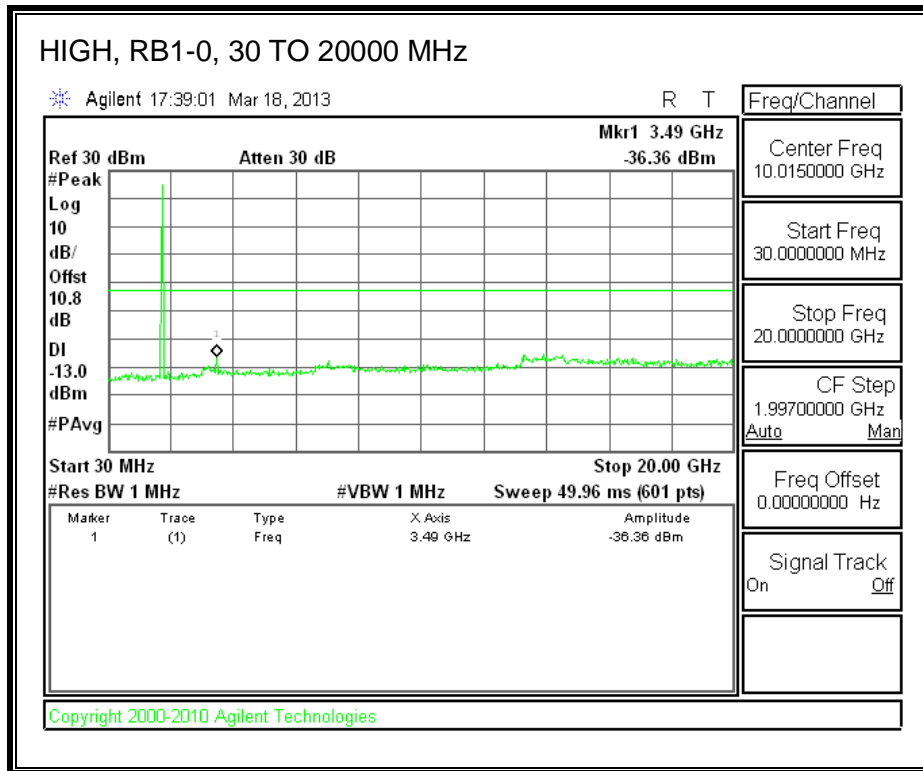




**LTE 16QAM**

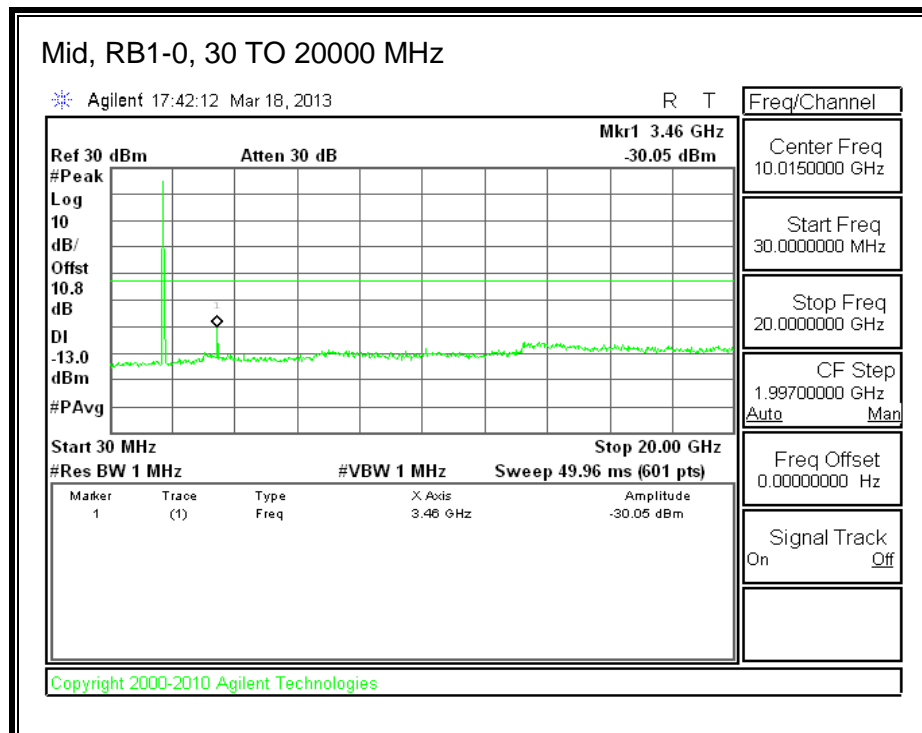
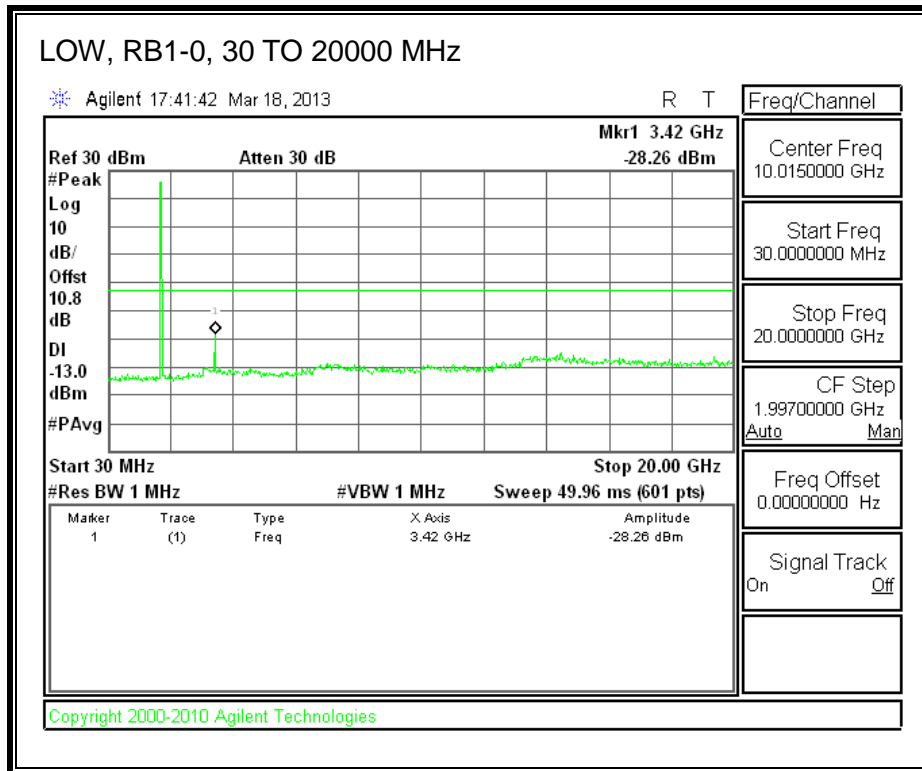


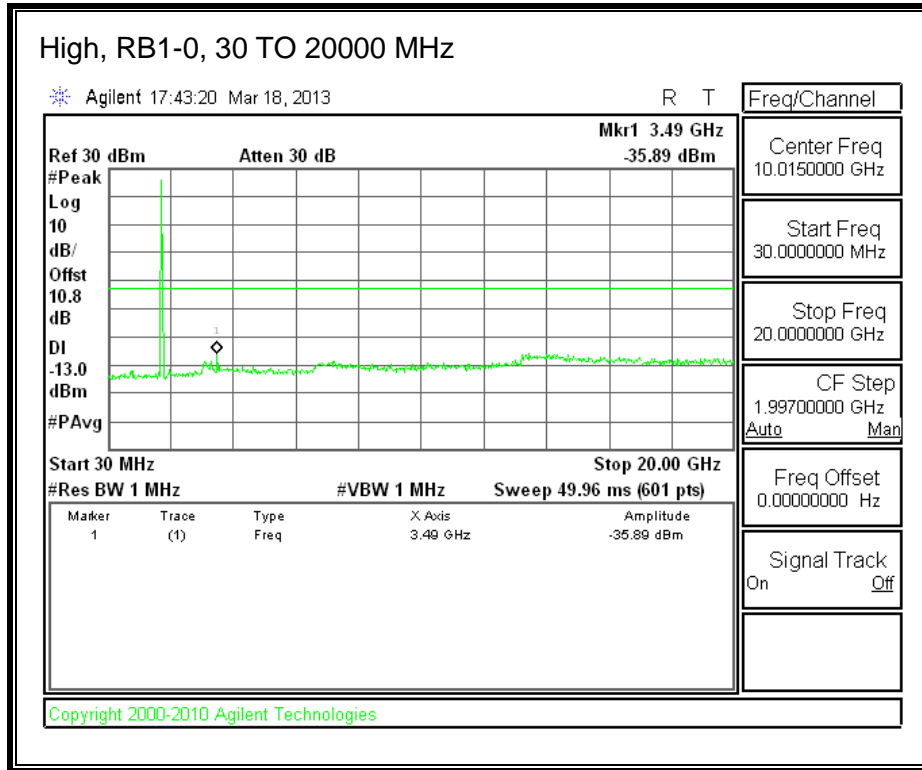




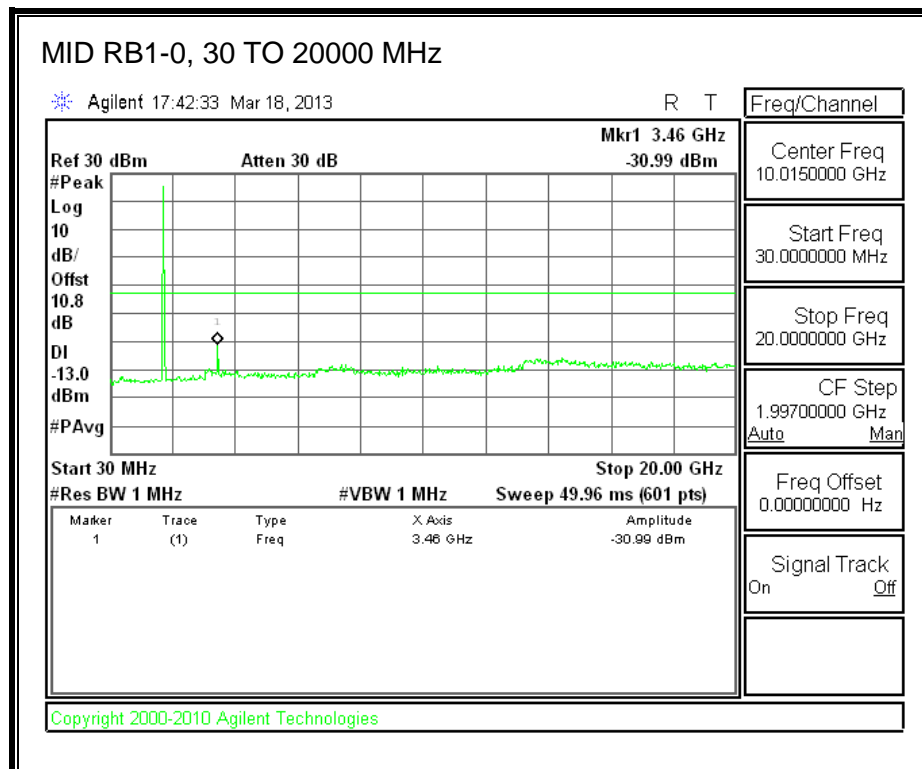
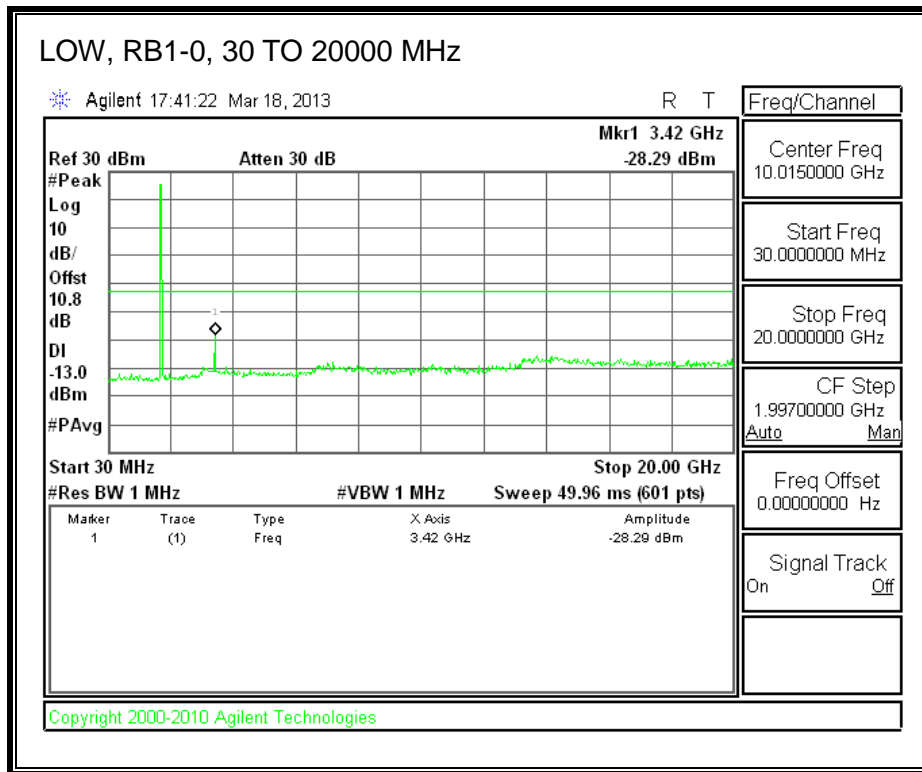
**Band 4 (15.0 MHz BAND WIDTH)**

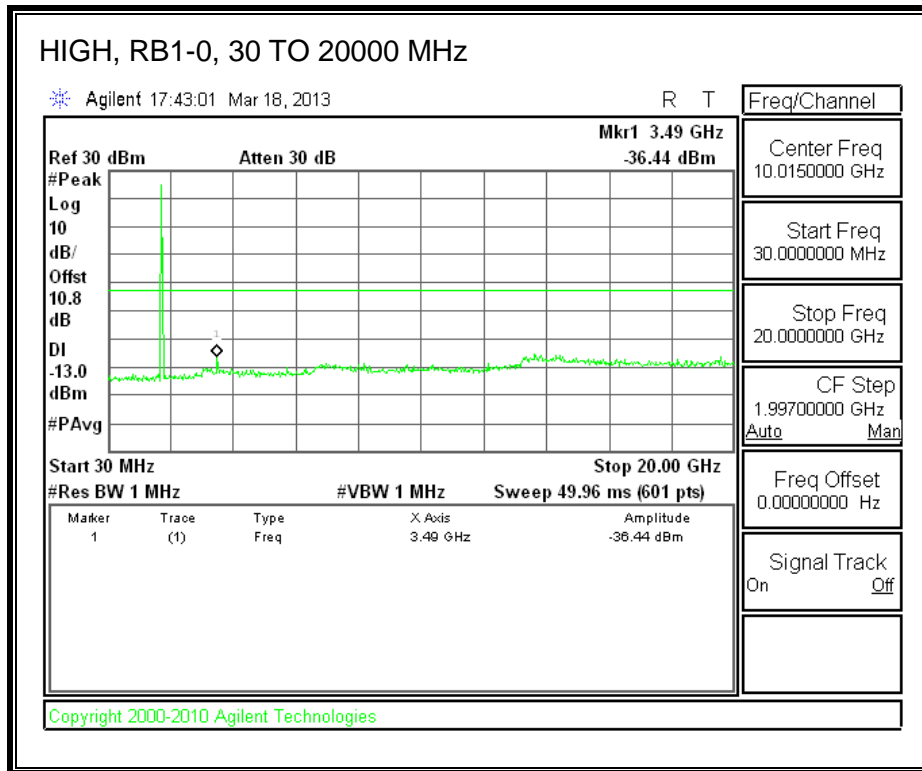
**LTE QPSK**





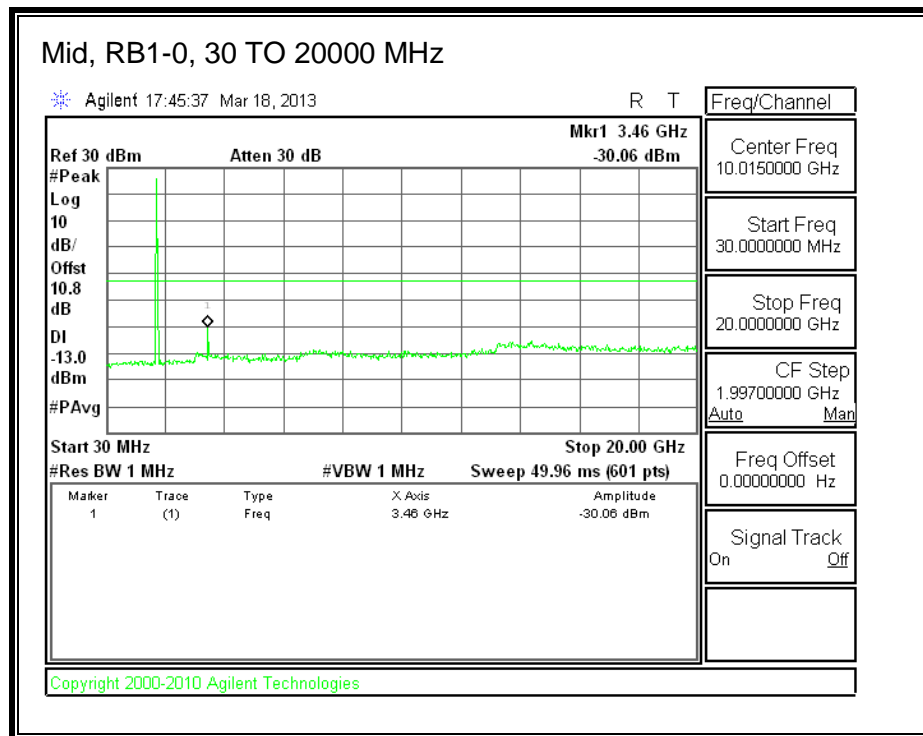
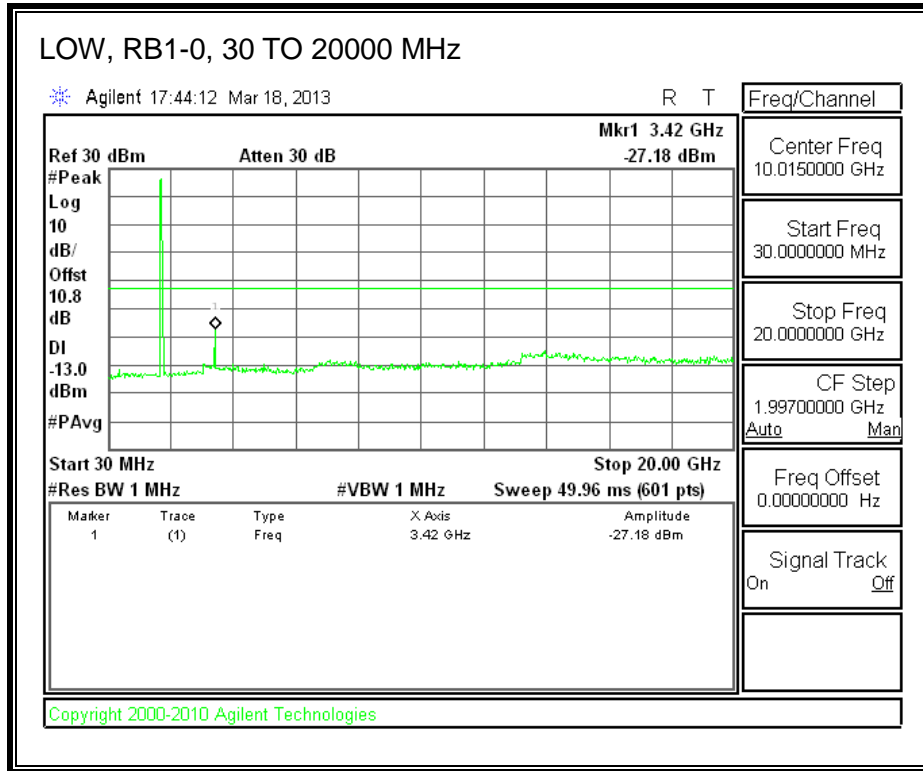
**LTE 16QAM**

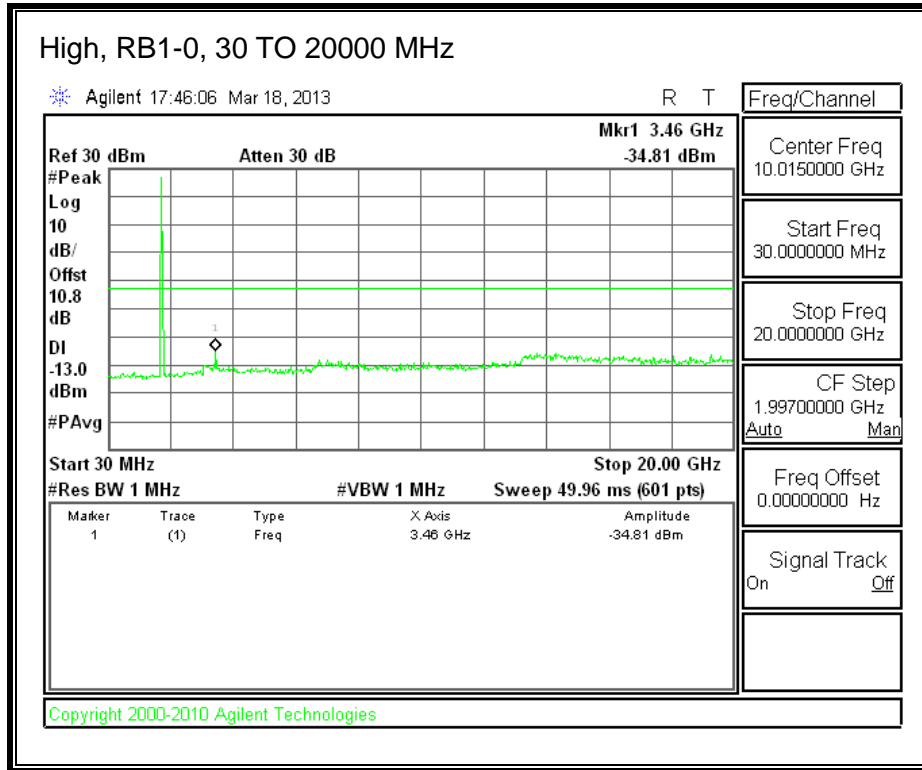




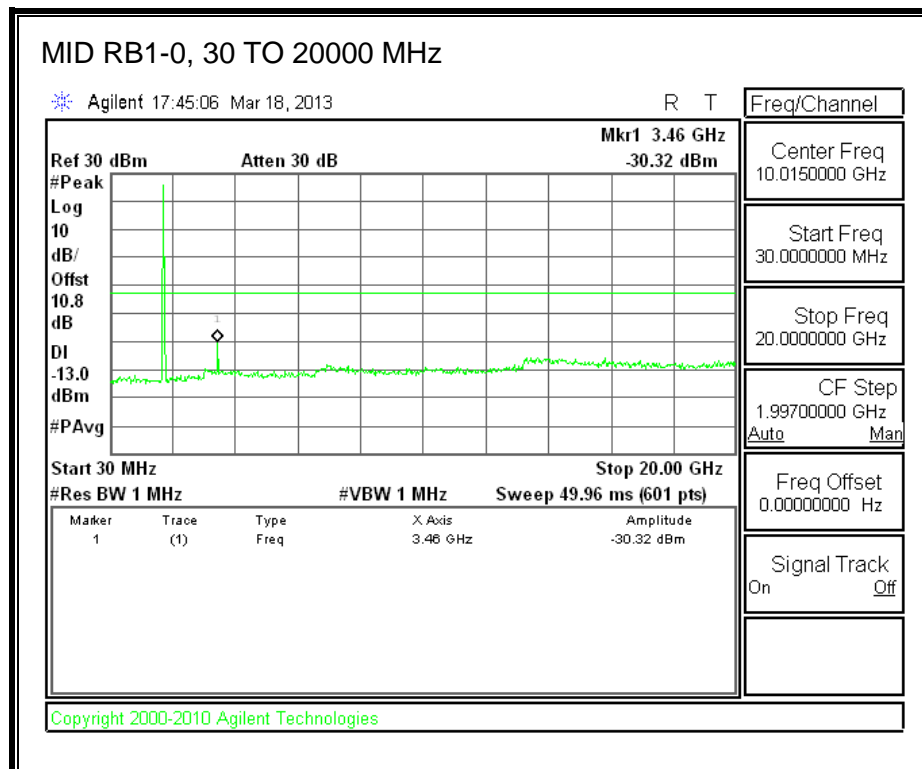
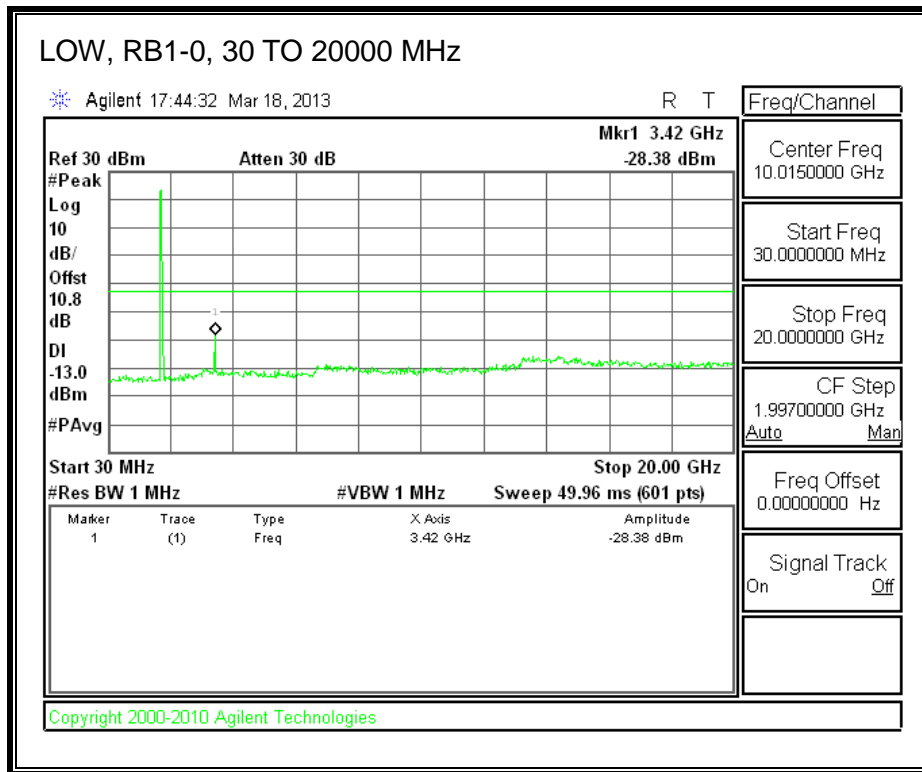
**Band 4 (20.0 MHz BAND WIDTH)**

**LTE QPSK**

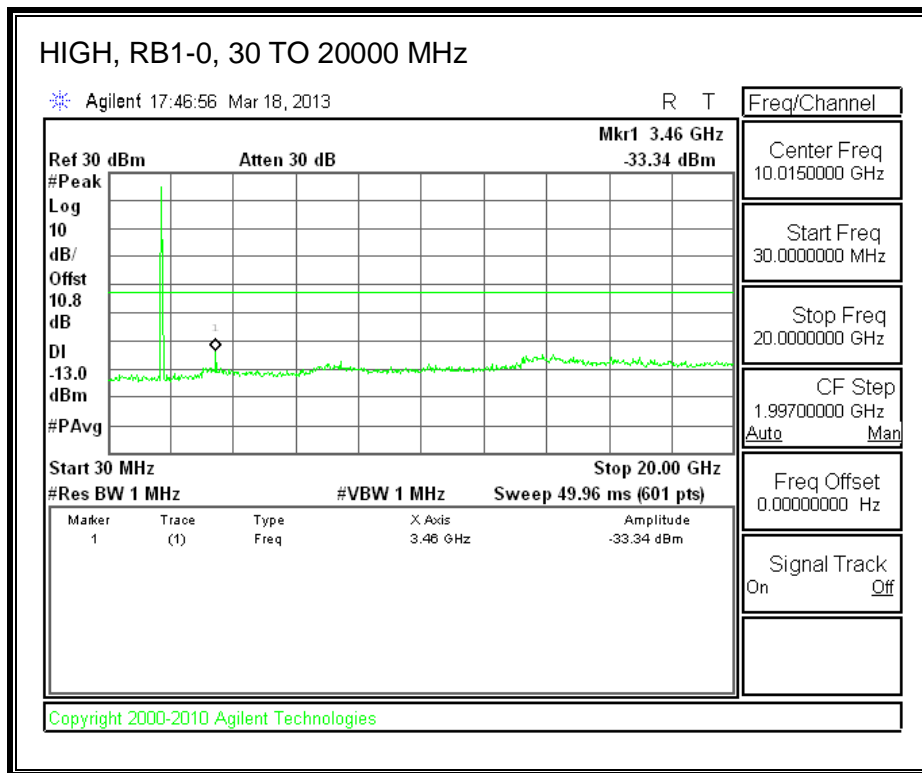




**LTE 16QAM**

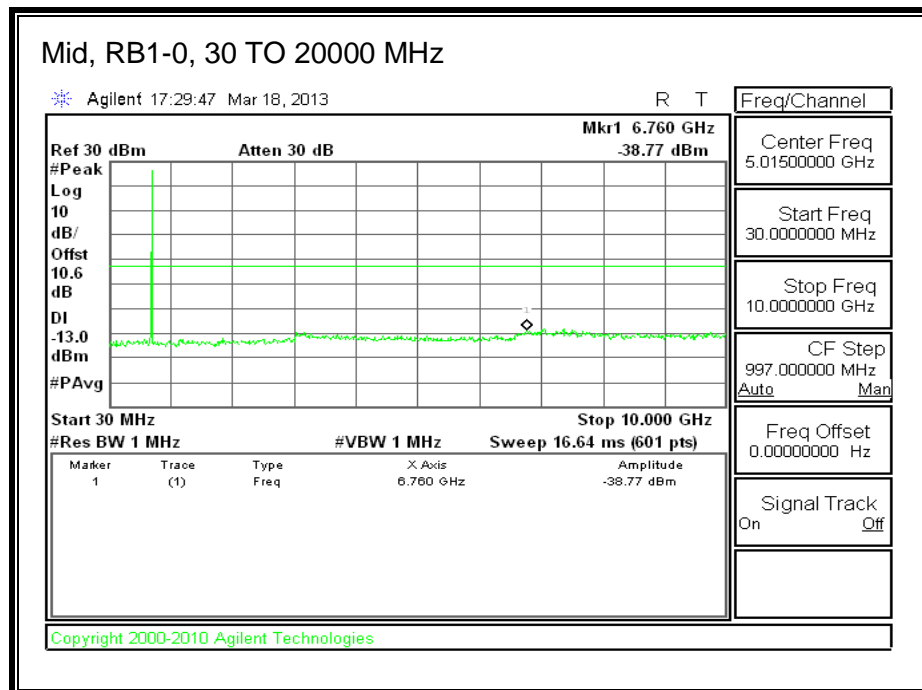
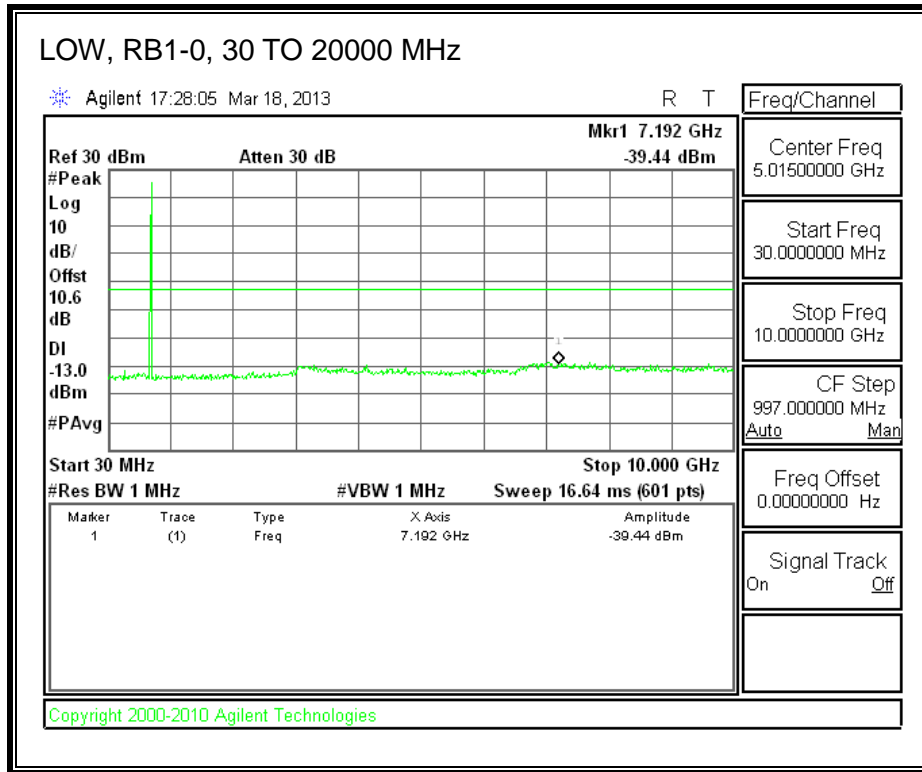


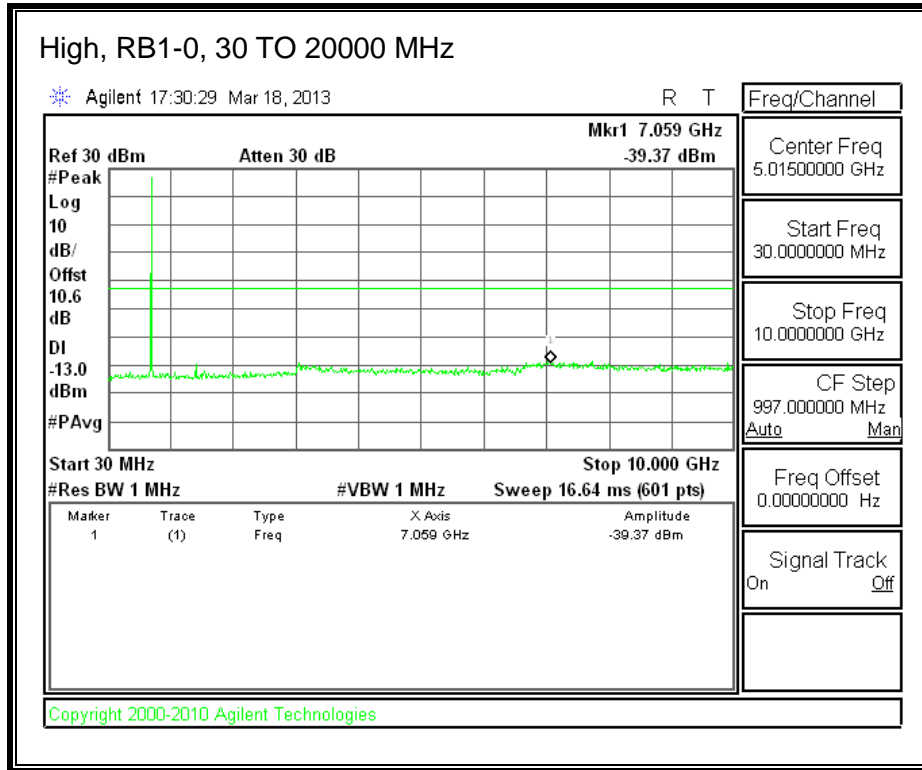




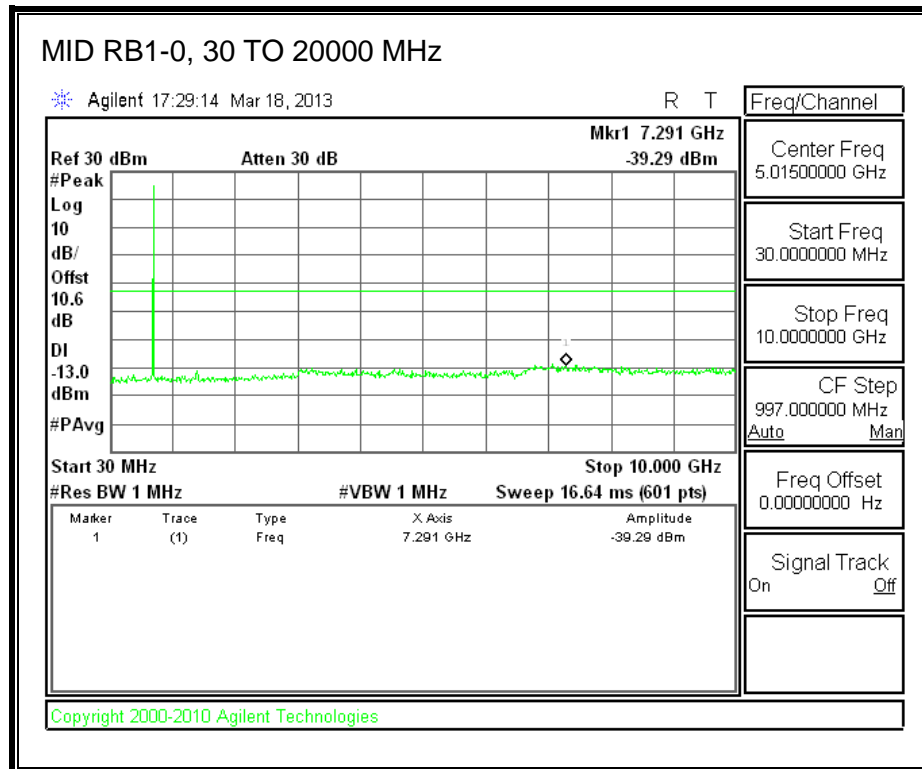
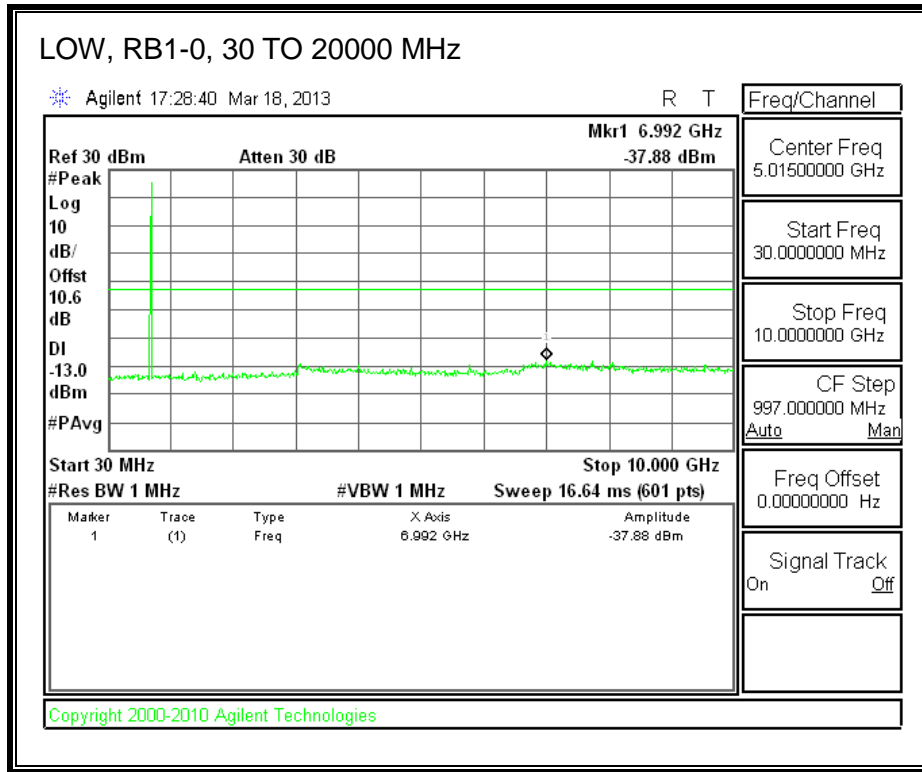
### 8.3.8. LTE BAND 17

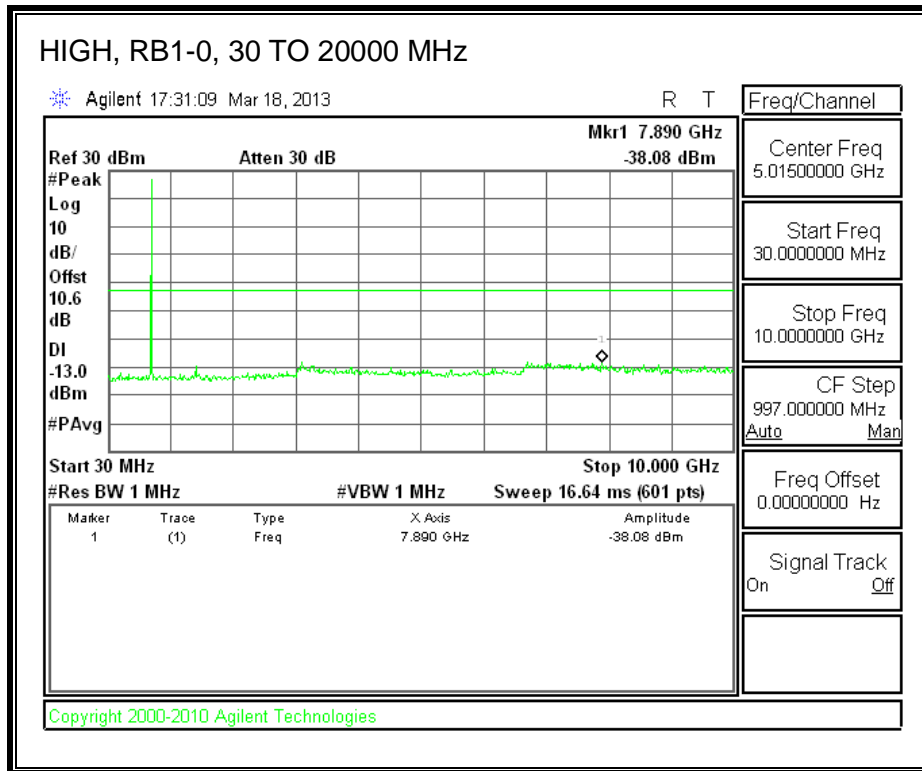
#### LTE QPSK (5.0 MHz BAND WIDTH)





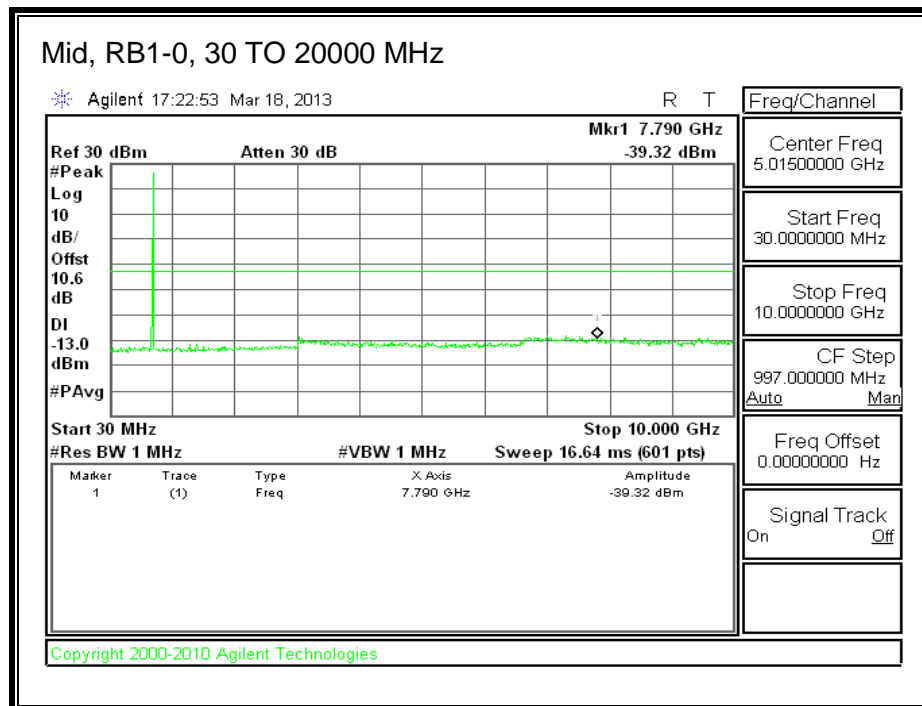
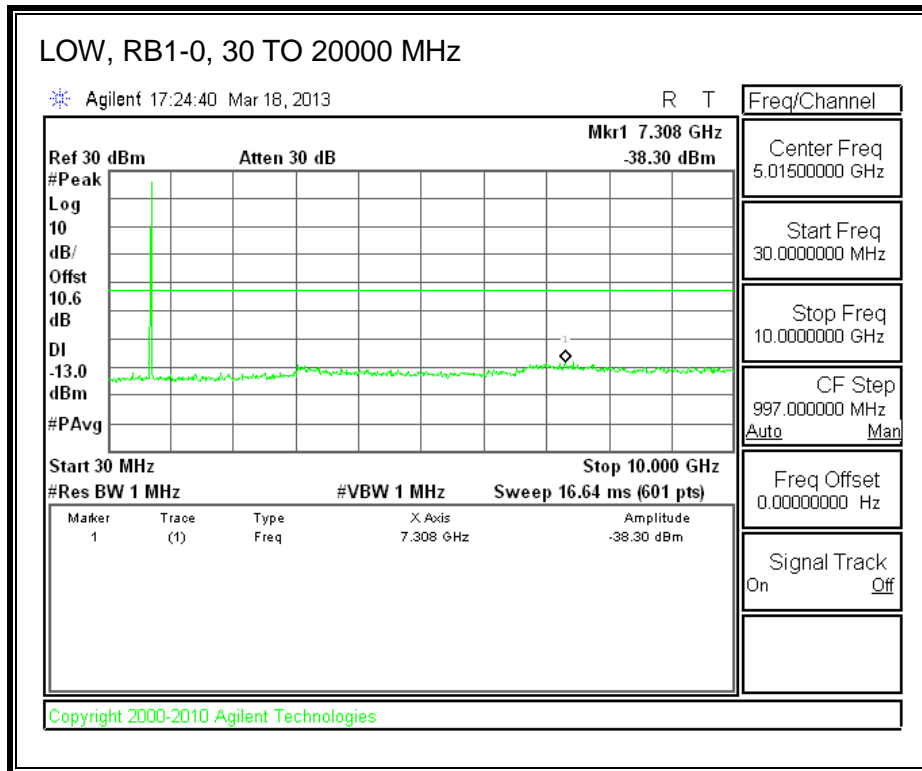
**LTE 16QAM**

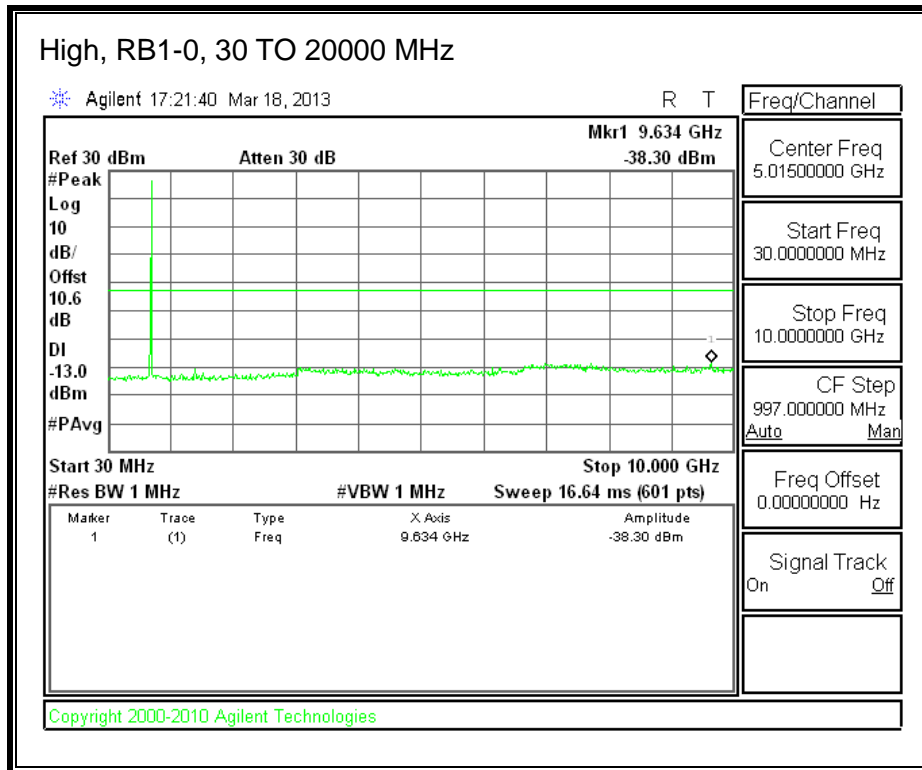




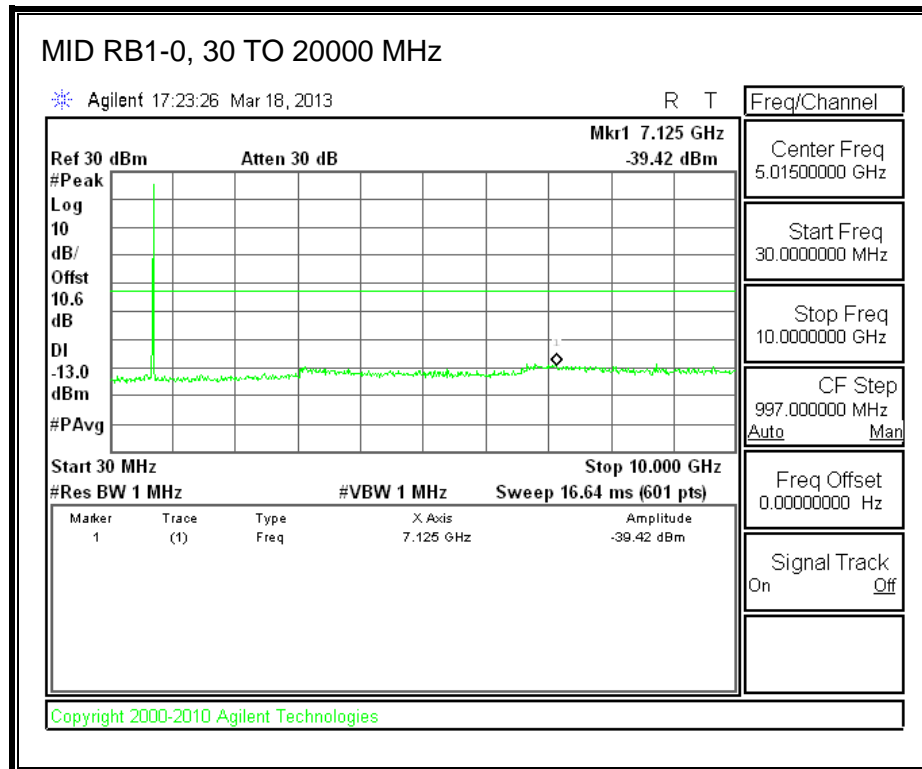
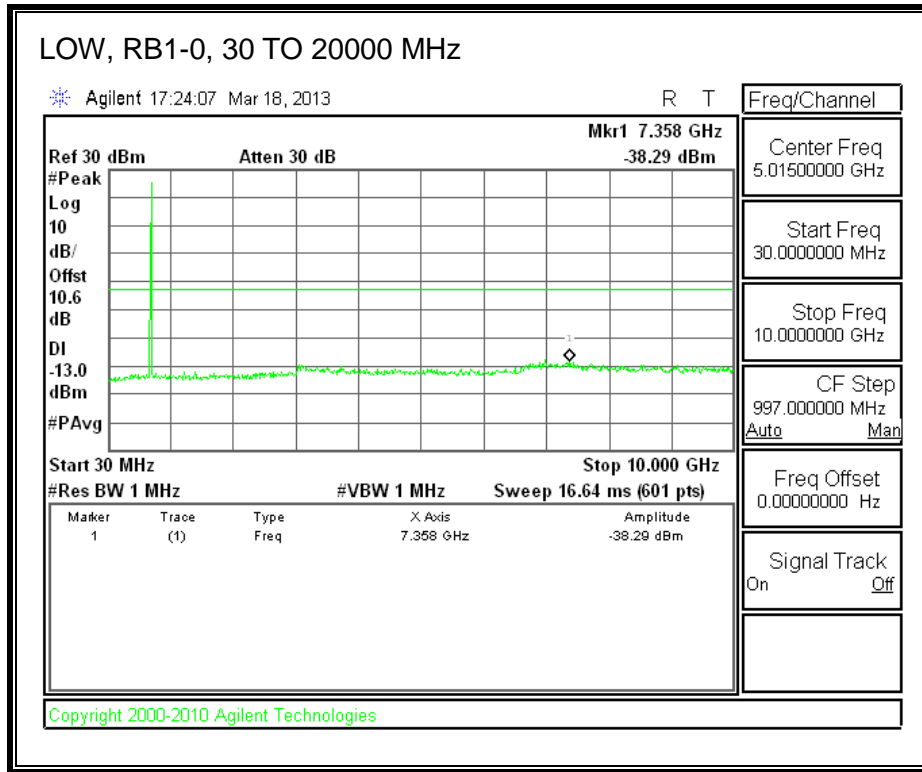
**Band 17 (10.0 MHz BAND WIDTH)**

**LTE QPSK**

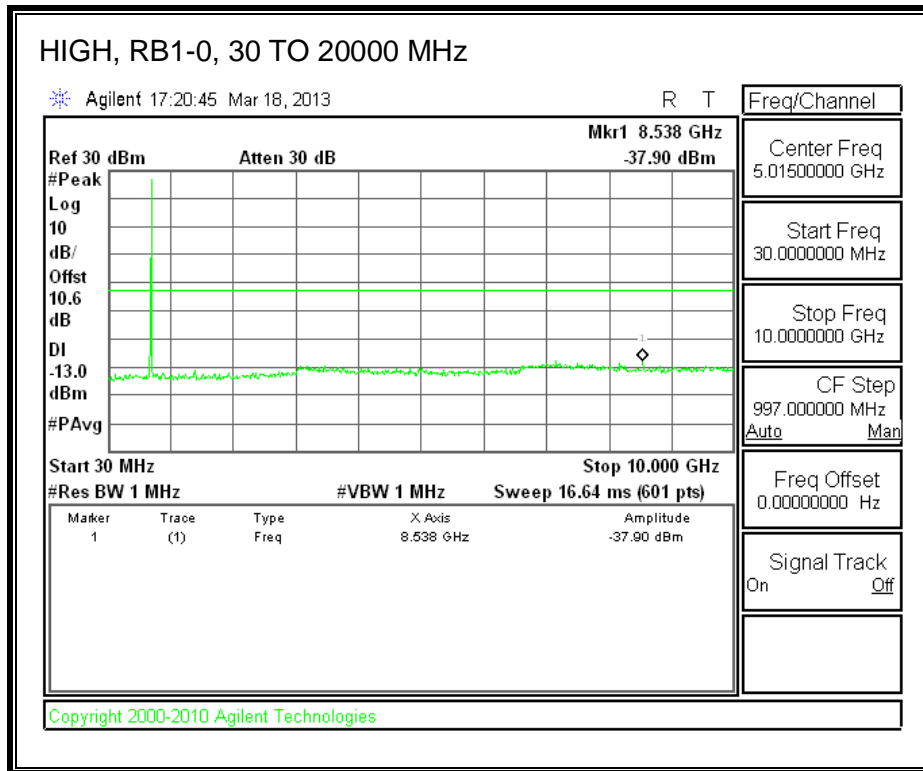




**LTE 16QAM**







## 8.4. FREQUENCY STABILITY

### RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54

### LIMITS

- §22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.
- §24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
- §27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation

### TEST PROCEDURE

Use Agilent 8960 with Frequency Error measurement capability.

- Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$
- Voltage (85% - 115%)

#### **Frequency Stability vs Temperature:**

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

#### **Frequency Stability vs Voltage:**

The peak frequency error is recorded (worst-case).

### MODES TESTED

- GPRS
- UMTS, HSDPA
- LTE BAND 4 and 17

### RESULTS

See the following pages

**CELL, GPRS MODULATION – MID CHANNEL**

Reference Frequency: Cellular Mid Channel 836.600014MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	836.600022	-0.010	2.5
3.70	40	836.600015	-0.001	2.5
3.70	30	836.600010	0.005	2.5
<b>3.70</b>	<b>20</b>	<b>836.600014</b>	<b>0</b>	2.5
3.70	10	836.600016	-0.002	2.5
3.70	0	836.600012	0.002	2.5
3.70	-10	836.600014	0.000	2.5
3.70	-20	836.600014	0.000	2.5
3.70	-30	836.600016	-0.002	2.5
Reference Frequency: Cellular Mid Channel 836.600014MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.70</b>	20	<b>836.600014</b>	<b>0.000</b>	2.5
4.20	20	836.599985	0.035	2.5
3.30	20	836.599975	0.047	2.5
End Volt (3.1)	20	836.599972	0.050	2.5

**PCS, GPRS MODULATION – MID CHANNEL**

Reference Frequency: PCS Mid Channel 1879.999987MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1879.999878	0.058	2.5
3.70	40	1879.999969	0.010	2.5
3.70	30	1879.999968	0.010	2.5
3.70	<b>20</b>	1879.999987	<b>0</b>	<b>2.5</b>
3.70	10	1879.978000	11.695	2.5
3.70	0	1879.999972	0.008	2.5
3.70	-10	1879.999970	0.009	2.5
3.70	-20	1879.999971	0.009	2.5
3.70	-30	1879.999973	0.007	2.5
Reference Frequency: PCS Mid Channel 1879.999987MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	<b>20</b>	1879.999987	<b>0</b>	<b>2.5</b>
4.20	20	1879.999982	0.003	2.5
3.30	20	1879.999988	-0.001	2.5
End Volt(3.1)	20	1879.999986	0.001	2.5

**CELL WCDMA – MID CHANNEL**

Reference Frequency: Cellular Mid Channel 836.000027MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2090.000 Hz				
DC Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	836.000030	-0.004	2.5
3.70	40	836.000029	-0.002	2.5
3.70	30	836.000029	-0.002	2.5
<b>3.70</b>	<b>20</b>	<b>836.000027</b>	<b>0</b>	2.5
3.70	10	836.000046	-0.023	2.5
3.70	0	836.000048	-0.025	2.5
3.70	-10	835.999860	0.200	2.5
3.70	-20	835.999860	0.200	2.5
3.70	-30	835.999890	0.164	2.5

Reference Frequency: Cellular Mid Channel 836.000027MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2090.000 Hz				
DC Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.80</b>	20	836.000027	<b>0.000</b>	2.5
4.20	20	836.000023	0.005	2.5
3.30	20	836.000017	0.012	2.5
End Volt (3.1)	20	836.000014	0.016	2.5

**PCS WCDMA – MID CHANNEL**

Reference Frequency: PCS Mid Channel 1879.999983MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1879.999980	0.002	2.5
3.70	40	1879.999982	0.001	2.5
3.70	30	1879.999989	-0.003	2.5
3.70	<b>20</b>	1879.999983	<b>0</b>	<b>2.5</b>
3.70	10	1879.999990	-0.004	2.5
3.70	0	1879.999989	-0.003	2.5
3.70	-10	1879.999990	-0.004	2.5
3.70	-20	1880.000005	-0.012	2.5
3.70	-30	1879.999978	0.003	2.5

Reference Frequency: PCS Mid Channel 1879.999983MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	<b>20</b>	1879.999983	<b>0</b>	<b>2.5</b>
4.20	20	1879.999989	-0.003	2.5
3.30	20	1879.999978	0.003	2.5
End Volt(3.1)	20	1879.999975	0.004	2.5

**AWS WCDMA – MID CHANNEL**

Reference Frequency: PCS Mid Channel 1732.599985MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1732.599978	0.004	2.5
3.70	40	1732.599980	0.003	2.5
3.70	30	1732.599983	0.001	2.5
<b>3.70</b>	<b>20</b>	<b>1732.599985</b>	<b>0</b>	<b>2.5</b>
3.70	10	1732.599992	-0.004	2.5
3.70	0	1732.599998	-0.008	2.5
3.70	-10	1732.600007	-0.013	2.5
3.70	-20	1732.600008	-0.013	2.5
3.70	-30	1732.600012	-0.016	2.5

Reference Frequency: PCS Mid Channel 1732.599985MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.70</b>	<b>20</b>	<b>1732.599985</b>	<b>0</b>	<b>2.5</b>
4.20	20	1732.599982	0.002	2.5
3.30	20	1732.599978	0.004	2.5
End Volt ( 3.1)	20	1732.599975	0.006	2.5

**LTE BAND 4 – 1732.5 MHz QPSK**

Reference Frequency: LTE Band 4_Mid Channel 1732.500008 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	1732.500005	0.0017	2.5
3.30	40	1732.500007	0.0006	2.5
3.30	30	1732.500011	-0.0017	2.5
<b>3.30</b>	<b>20</b>	<b>1732.500008</b>	<b>0</b>	<b>2.5</b>
3.30	10	1732.499995	0.0075	2.5
3.30	0	1732.499992	0.0092	2.5
3.30	-10	1732.499993	0.0087	2.5
3.30	-20	1732.499995	0.0075	2.5
3.30	-30	1732.499994	0.0081	2.5

Reference Frequency: LTE Band 4_Mid Channel 1732.500008 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.70</b>	<b>20</b>	<b>1732.500008</b>	<b>0</b>	<b>2.5</b>
4.20	20	1732.500010	-0.0012	2.5
3.30	20	1732.500005	0.0017	2.5
End Volt(3.1)	20	1732.499993	0.0087	2.5

**LTE BAND 17 – 710.000MHz, QPSK**

Reference Frequency: LTE Band 17_Mid Channe 709.999995MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 1800.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	709.999994	13888.890	2.5
3.70	40	709.999992	13888.893	2.5
3.70	30	709.999993	13888.892	2.5
<b>3.70</b>	<b>20</b>	<b>719.999995</b>	<b>0</b>	2.5
3.70	10	709.999994	13888.890	2.5
3.70	0	710.000003	13888.878	2.5
3.70	-10	710.000005	13888.875	2.5
3.70	-20	710.000006	13888.874	2.5
3.70	-30	710.000006	13888.874	2.5

Reference Frequency: LTE Band 17_Mid channel 709.999995 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.70</b>	<b>20</b>	<b>709.999995</b>	<b>0</b>	<b>2.5</b>
4.20	20	709.999993	0.003	2.5
3.30	20	709.999996	-0.001	2.5
End Volt(3.1)	20	709.999994	0.001	2.5

## 9. RADIATED TEST RESULTS

### 9.1. RADIATED POWER (ERP & EIRP)

#### RULE PART(S)

FCC: §2.1046, §22.913, §24.232 and §27.50

#### LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

#### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

The ERP/EIRP power was measured with the spectrum analyzer which attached with receiver antenna via calibrated cable. The measurements have been taken at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW  $\geq$  RBW  $\geq$  26dB BW, typically 3MHz for GSM and 5MHz for WCDMA modes respectively.
- Set a marker to point the corresponding peak value.

#### MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99, and HSDPA
- LTE Band 4 and 17

#### RESULTS

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	27.47	558.47
	190	836.60	27.40	549.54
	251	848.80	27.60	575.44
EGPRS	128	824.20	25.97	395.37
	190	836.60	26.60	457.09
	251	848.80	26.50	446.68

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	29.14	820.35
	661	1880.00	28.80	758.58
	810	1909.80	29.19	829.85
EGPRS	512	1850.20	27.14	517.61
	661	1880.00	26.90	489.78
	810	1909.80	27.29	535.80

Mode	Channel	f (MHz)	ERP	
			dBm	mW
REL 99	4357	826.40	21.60	144.54
	4408	836.60	22.24	167.49
	4458	846.60	22.52	178.65
	9662	1852.40	23.87	243.78
	9800	1880.00	25.61	363.92
	9938	1907.60	25.25	334.97

Mode	Channel	f (MHz)	ERP / EIRP	
			dBm	mW
HSDPA	4357	826.40	22.30	169.82
	4405	836.00	22.32	170.61
	4455	846.00	22.80	190.55
	9662	1852.40	22.77	189.23
	9800	1880.00	22.51	178.24
	9938	1907.60	22.82	191.43

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS 1700, REL 99	1537	1712.40	24.32	270.40
	1638	1732.60	24.89	308.32
	1738	1752.50	24.87	306.90

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS 1700, HSDPA	1537	1712.40	25.22	332.66
	1638	1732.60	25.69	370.68
	1738	1752.50	25.67	368.98



**EIRP LTE Band 4 (5.0 MHz BAND WIDTH)**

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
5.0 MHZ BAND QPSK	25/0	1712.5	25.78	378.44
		1732.5	25.44	349.95
		1752.5	24.81	302.69
5.0 MHZ BAND 16QAM	25/0	1712.5	24.88	307.61
		1732.5	24.04	253.51
		1752.5	24.01	251.77

**EIRP LTE Band 4 (10.0 MHz BAND WIDTH)**

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
10.0 MHZ BAND QPSK	50/0	1715.0	25.28	337.29
		1732.5	25.54	358.10
		1750.0	25.11	324.34
10.0 MHZ BAND 16QAM	50/0	1715.0	24.38	274.16
		1732.5	24.64	291.07
		1750.0	24.11	257.63

**EIRP LTE Band 4 (15.0 MHz BAND WIDTH)**

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
15.0 MHZ BAND QPSK	75/0	1715.0	25.58	361.41
		1732.5	25.44	349.95
		1750.0	25.81	381.07
15.0 MHZ BAND 16QAM	75/0	1715.0	24.48	280.54
		1732.5	24.54	284.45
		1750.0	24.91	309.74

**EIRP LTE Band 4 (20.0 MHz BAND WIDTH)**

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
20.0 MHZ BAND QPSK	100/0	1715.0	25.88	387.26
		1732.5	26.04	401.79
		1750.0	26.11	408.32
20.0 MHZ BAND 16QAM	100/0	1715.0	24.88	307.61
		1732.5	25.14	326.59
		1750.0	25.21	331.89

**ERP LTE Band 17 (5.0 MHz BAND WIDTH)**

Mode	RB/RB SIZE	f (MHz)	ERP	
			dBm	mW
5MHz Band QASK	1/0	706.5	21.57	143.55
		710.0	21.65	146.22
		713.5	21.25	133.35
5MHz Band 16QAM	1/0	706.5	20.65	116.14
		710.0	20.65	116.14
		713.5	20.35	108.39

**ERP LTE Band 17 (10.0 MHz BAND WIDTH)**

Mode	RB/RB SIZE	f (MHz)	ERP	
			dBm	mW
10.0 MHZ BAND QPSK	1/0	709.0	21.55	142.89
		710.0	21.45	139.64
		711.0	21.36	136.77
10.0 MHZ BAND 16QAM	1/0	709.0	20.45	110.92
		710.0	20.35	108.39
		711.0	20.35	108.39

**GPRS (Cellular Band)**

**High Frequency Substitution Measurement  
 Compliance Certification Services Chamber B**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/20/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT only  
**Mode:** TX, GPRS850  
 Peak

**Test Equipment:**

Receiving: Sunol T243 and Chamber B N-type Cable (Setup this one for testing EUT)  
 Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>								
824.20	27.97	V	0.5	0.0	27.47	38.5	-11.0	
824.20	14.60	H	0.5	0.0	14.10	38.5	-24.3	
<b>Mid Ch</b>								
836.60	27.90	V	0.5	0.0	27.40	38.5	-11.0	
836.60	15.40	H	0.5	0.0	14.90	38.5	-23.6	
<b>High Ch</b>								
848.80	28.10	V	0.5	0.0	27.60	38.5	-10.8	
848.80	16.00	H	0.5	0.0	15.50	38.5	-22.9	

**EGPRS (Cellular Band)**

**High Frequency Substitution Measurement  
 Compliance Certification Services Chamber A**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/23/13  
**Test Engineer:** Chin Pang  
**Configuration:** EUT only  
**Mode:** TX, EGPRS850  
 Peak

**Test Equipment:**

Receiving: Sunoi T243 and Chamber A N-type Cable (Setup this one for testing EUT)  
 Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>								
824.20	26.47	V	0.5	0.0	25.97	38.5	-12.5	
824.20	15.60	H	0.5	0.0	15.10	38.5	-23.3	
<b>Mid Ch</b>								
836.60	27.10	V	0.5	0.0	26.60	38.5	-11.8	
836.60	15.90	H	0.5	0.0	15.40	38.5	-23.1	
<b>High Ch</b>								
848.80	27.00	V	0.5	0.0	26.50	38.5	-11.9	
848.80	15.80	H	0.5	0.0	15.30	38.5	-23.1	

**GPRS (PCS Band)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company: LG								
Project #: 13U14916								
Date: 05/11/13								
Test Engineer: Chin Pang								
Configuration: EUT only								
Mode: GPRS1900								
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.850	10.9	V	0.85	8.30	18.35	33.0	-14.7	
1.850	21.4	H	0.85	8.59	29.14	33.0	-3.9	
Mid Ch								
1.880	11.0	V	0.85	8.19	18.34	33.0	-14.7	
1.880	21.1	H	0.85	8.55	28.80	33.0	-4.2	
High Ch								
1.910	10.7	V	0.85	8.15	18.00	33.0	-15.0	
1.910	21.5	H	0.85	8.54	29.19	33.0	-3.8	

**EGPRS (PCS Band)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company: LG								
Project #: 13U14916								
Date: 05/11/13								
Test Engineer: Chin Pang								
Configuration: EUT Only								
Mode: EGPRS 1900								
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.850	8.8	V	0.85	8.30	16.20	33.0	-16.8	
1.850	19.4	H	0.85	8.59	27.14	33.0	-5.9	
Mid Ch								
1.880	8.7	V	0.85	8.19	16.04	33.0	-17.0	
1.880	19.2	H	0.85	8.55	26.90	33.0	-6.1	
High Ch								
1.910	8.5	V	0.85	8.15	15.80	33.0	-17.2	
1.910	19.6	H	0.85	8.54	27.29	33.0	-5.7	

**UMTS 850 REL 99 (Cellular Band)**

**High Frequency Substitution Measurement  
 Compliance Certification Services Chamber B**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/20/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT only  
**Mode:** TX, 850MHz BAND WCDMA Rel 99

**Test Equipment:**

Receiving: Sunoi T243 and Chamber B N-type Cable (Setup this one for testing EUT)  
 Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>								
826.40	22.10	V	0.5	0.0	21.60	38.5	-16.8	
826.40	9.64	H	0.5	0.0	9.14	38.5	-29.3	
<b>Mid Ch</b>								
836.00	22.74	V	0.5	0.0	22.24	38.5	-16.2	
836.00	10.30	H	0.5	0.0	9.80	38.5	-28.6	
<b>High Ch</b>								
846.00	23.02	V	0.5	0.0	22.52	38.5	-15.9	
846.00	10.60	H	0.5	0.0	10.10	38.5	-28.3	

**UMTS 1900 REL 99 (PCS Band)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14990						
<b>Date:</b>		05/10/13						
<b>Test Engineer:</b>		Lieu Nguyen						
<b>Configuration:</b>		EUT Model MS659 with AC Adapter						
<b>Mode:</b>		TX, WCDMA, PCS band						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Camber A SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.852	16.1	V	0.85	8.62	23.87	33.0	-9.1	
1.852	15.9	H	0.85	8.47	23.52	33.0	-9.5	
1.880	18.0	V	0.85	8.46	25.61	33.0	-7.4	
1.880	18.5	H	0.85	8.36	25.96	33.0	-7.0	
1.908	17.8	V	0.85	8.30	25.25	33.0	-7.8	
1.908	16.6	H	0.85	8.25	24.00	33.0	-9.0	



**UMTS 850 HSDPA (Cellular Band)**

**High Frequency Substitution Measurement  
 Compliance Certification Services Chamber B**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/23/13  
**Test Engineer:** Chin Pang  
**Configuration:** EUT Only  
**Mode:** WCDMA, HSDPA

**Test Equipment:**

Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)  
 Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>								
826.40	22.90	V	0.6	0.0	22.30	38.5	-16.1	
826.40	10.60	H	0.6	0.0	10.00	38.5	-28.4	
<b>Mid Ch</b>								
836.00	22.92	V	0.6	0.0	22.32	38.5	-16.1	
836.00	11.00	H	0.6	0.0	10.40	38.5	-28.0	
<b>High Ch</b>								
846.00	23.40	V	0.6	0.0	22.80	38.5	-15.6	
846.00	10.63	H	0.6	0.0	10.03	38.5	-28.4	

**UMTS 1900 HSDPA (PCS Band)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14990						
<b>Date:</b>		05/13/13						
<b>Test Engineer:</b>		Lieu Nguyen						
<b>Configuration:</b>		EUT Model MS659 with AC Adapter						
<b>Mode:</b>		TX, WCDMA-HSDPA, PCS band						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Camber A SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.852	15.0	V	0.85	8.62	22.77	33.0	-10.2	
1.852	13.4	H	0.85	8.47	21.00	33.0	-12.0	
1.880	14.9	V	0.85	8.46	22.51	33.0	-10.5	
1.880	13.2	H	0.85	8.36	20.68	33.0	-12.3	
1.908	15.4	V	0.85	8.30	22.82	33.0	-10.2	
1.908	14.9	H	0.85	8.25	22.33	33.0	-10.7	

**UMTS 1700 REL 99 (AWS Band)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		05/11/13						
<b>Test Engineer:</b>		Chin Pang						
<b>Configuration:</b>		EUT only						
<b>Mode:</b>		TX, WCDMA, REL 99, AWS 1700 band						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.712	7.9	V	0.85	8.73	15.78	33.0	-17.2	
1.712	16.4	H	0.85	8.77	24.32	33.0	-8.7	
Mid Ch								
1.732	8.5	V	0.85	8.69	16.34	33.0	-16.7	
1.732	17.0	H	0.85	8.74	24.89	33.0	-8.1	
High Ch								
1.752	8.3	V	0.85	8.66	16.11	33.0	-16.9	
1.752	17.0	H	0.85	8.72	24.87	33.0	-8.1	

**UMTS 1700 HSDPA (AWS Band)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		05/11/13						
<b>Test Engineer:</b>		Chin Pang						
<b>Configuration:</b>		EUT only						
<b>Mode:</b>		WCDMA 1700 HSDPA						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch</b>								
1.713	9.1	V	0.85	8.73	16.98	30.0	-13.0	
1.713	17.3	H	0.85	8.77	25.22	30.0	-4.8	
<b>Mid Ch</b>								
1.733	8.7	V	0.85	8.69	16.54	30.0	-13.5	
1.733	17.8	H	0.85	8.74	25.69	30.0	-4.3	
<b>High Ch</b>								
1.753	8.6	V	0.85	8.66	16.41	30.0	-13.6	
1.753	17.8	H	0.85	8.72	25.67	30.0	-4.3	

**LTE BAND 4**

**EIRP LTE QPSK Band 4 (5.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 5MHz BW QPSK, Peak, RB25-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.713	17.9	V	0.85	8.73	25.78	30.0	-4.2	
1.713	14.6	H	0.85	8.77	22.52	30.0	-7.5	
Mid Ch								
1.733	17.6	V	0.85	8.69	25.44	30.0	-4.6	
1.733	15.4	H	0.85	8.74	23.29	30.0	-6.7	
High Ch								
1.753	17.0	V	0.85	8.66	24.81	30.0	-5.2	
1.753	15.6	H	0.85	8.72	23.47	30.0	-6.5	
Rev. 3.17.11								

**EIRP LTE 16QAM Band 4 (5.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 5MHz BW 16QAM, Peak, RB25-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.713	17.0	V	0.85	8.73	24.88	30.0	-5.1	
1.713	13.4	H	0.85	8.77	21.32	30.0	-8.7	
Mid Ch								
1.733	16.2	V	0.85	8.69	24.04	30.0	-6.0	
1.733	14.5	H	0.85	8.74	22.39	30.0	-7.6	
High Ch								
1.753	16.2	V	0.85	8.66	24.01	30.0	-6.0	
1.753	14.9	H	0.85	8.72	22.77	30.0	-7.2	
Rev. 3.17.11								

**EIRP LTE QPSK Band 4 (10.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 10MHz BW						
		QPSK, Peak, RB50-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.715	17.4	V	0.85	8.73	25.28	30.0	-4.7	
1.715	14.0	H	0.85	8.77	21.92	30.0	-8.1	
Mid Ch								
1.733	17.7	V	0.85	8.69	25.54	30.0	-4.5	
1.733	13.4	H	0.85	8.74	21.29	30.0	-8.7	
High Ch								
1.750	17.3	V	0.85	8.66	25.11	30.0	-4.9	
1.750	13.6	H	0.85	8.72	21.47	30.0	-8.5	
Rev. 3.17.11								

**EIRP LTE 16QAM Band 4 (10.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 10MHz BW 16QAM, Peak, RB50-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.715	16.5	V	0.85	8.73	24.38	30.0	-5.6	
1.715	13.0	H	0.85	8.77	20.92	30.0	-9.1	
Mid Ch								
1.733	16.8	V	0.85	8.69	24.64	30.0	-5.4	
1.733	12.4	H	0.85	8.74	20.29	30.0	-9.7	
High Ch								
1.750	16.3	V	0.85	8.66	24.11	30.0	-5.9	
1.750	12.5	H	0.85	8.72	20.37	30.0	-9.6	
Rev. 3.17.11								



**EIRP LTE QPSK Band 4 (15.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 15MHz BW						
		QPSK, Peak, RB75-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.718	17.7	V	0.85	8.73	25.58	30.0	-4.4	
1.718	14.6	H	0.85	8.77	22.52	30.0	-7.5	
Mid Ch								
1.733	17.6	V	0.85	8.69	25.44	30.0	-4.6	
1.733	15.3	H	0.85	8.74	23.19	30.0	-6.8	
High Ch								
1.748	18.0	V	0.85	8.66	25.81	30.0	-4.2	
1.748	15.1	H	0.85	8.72	22.97	30.0	-7.0	
Rev. 3.17.11								

**EIRP LTE 16QAM Band 4 (15.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 15MHz BW 16QAM, Peak, RB75-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.718	16.6	V	0.85	8.73	24.48	30.0	-5.5	
1.718	13.7	H	0.85	8.77	21.62	30.0	-8.4	
Mid Ch								
1.733	16.7	V	0.85	8.69	24.54	30.0	-5.5	
1.733	14.3	H	0.85	8.74	22.19	30.0	-7.8	
High Ch								
1.748	17.1	V	0.85	8.66	24.91	30.0	-5.1	
1.748	14.2	H	0.85	8.72	22.07	30.0	-7.9	
Rev. 3.17.11								

**EIRP LTE QPSK Band 4 (20.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 20MHz BW						
		QPSK, Peak, RB100-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.720	18.0	V	0.85	8.73	25.88	30.0	-4.1	
1.720	14.9	H	0.85	8.77	22.82	30.0	-7.2	
Mid Ch								
1.733	18.2	V	0.85	8.69	26.04	30.0	-4.0	
1.733	15.0	H	0.85	8.74	22.89	30.0	-7.1	
High Ch								
1.745	18.3	V	0.85	8.66	26.11	30.0	-3.9	
1.745	14.4	H	0.85	8.72	22.27	30.0	-7.7	
Rev. 3.17.11								

**EIRP LTE 16QAM Band4 (20.0 MHz BAND WIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14916						
<b>Date:</b>		03/20/13						
<b>Test Engineer:</b>		Mona Hua						
<b>Configuration:</b>		EUT with AC adapter only						
<b>Mode:</b>		LTE band 4, 20MHz BW						
		16QAM, Peak, RB100-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.720	17.0	V	0.85	8.73	24.88	30.0	-5.1	
1.720	13.8	H	0.85	8.77	21.72	30.0	-8.3	
Mid Ch								
1.733	17.3	V	0.85	8.69	25.14	30.0	-4.9	
1.733	14.0	H	0.85	8.74	21.89	30.0	-8.1	
High Ch								
1.745	17.4	V	0.85	8.66	25.21	30.0	-4.8	
1.745	13.3	H	0.85	8.72	21.17	30.0	-8.8	
Rev. 3.17.11								

**LTE BAND 17**

**ERP LTE QPSK, Band 17 (5.0 MHz BAND WIDTH)**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14990						
<b>Date:</b>		05/10/13						
<b>Test Engineer:</b>		Lieu Nguyen						
<b>Configuration:</b>		EUT Only						
<b>Mode:</b>		LTE Band 17, 5MHz BW QPSK, RB25-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	17.32	V	0.5	0.0	16.82	34.8	-18.0	
706.50	22.07	H	0.5	0.0	21.57	34.8	-13.2	
Mid Ch								
710.00	19.12	V	0.5	0.0	18.62	34.8	-16.2	
710.00	22.15	H	0.5	0.0	21.65	34.8	-13.2	
High Ch								
713.50	18.42	V	0.5	0.0	17.92	34.8	-16.9	
713.50	21.75	H	0.5	0.0	21.25	34.8	-13.6	

**ERP LTE 16QAM Band 17 (5.0 MHz BAND WIDTH)**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14990						
<b>Date:</b>		05/10/13						
<b>Test Engineer:</b>		Lieu Nguyen						
<b>Configuration:</b>		EUT Only						
<b>Mode:</b>		LTE Band 17, 5MHz BW 16QAM, RB25-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	16.42	V	0.5	0.0	15.92	34.8	-18.9	
706.50	21.15	H	0.5	0.0	20.65	34.8	-14.2	
Mid Ch								
710.00	18.32	V	0.5	0.0	17.82	34.8	-17.0	
710.00	21.15	H	0.5	0.0	20.65	34.8	-14.2	
High Ch								
713.50	17.42	V	0.5	0.0	16.92	34.8	-17.9	
713.50	20.85	H	0.5	0.0	20.35	34.8	-14.5	

**ERP LTE QPSK Band 17 (10.0 MHz BAND WIDTH )**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14990						
<b>Date:</b>		05/10/13						
<b>Test Engineer:</b>		Lieu Nguyen						
<b>Configuration:</b>		EUT Only						
<b>Mode:</b>		LTE Band 17, 10MHz BW QPSK, RB50-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
709.00	18.12	V	0.5	0.0	17.62	34.8	-17.2	
709.00	22.05	H	0.5	0.0	21.55	34.8	-13.3	
Mid Ch								
710.00	17.82	V	0.5	0.0	17.32	34.8	-17.5	
710.00	21.95	H	0.5	0.0	21.45	34.8	-13.4	
High Ch								
711.00	18.22	V	0.5	0.0	17.72	34.8	-17.1	
711.00	21.86	H	0.5	0.0	21.36	34.8	-13.4	

**ERP LTE 16QAM Band 17 (10.0 MHz BAND WIDTH)**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG						
<b>Project #:</b>		13U14990						
<b>Date:</b>		05/10/13						
<b>Test Engineer:</b>		Lieu Nguyen						
<b>Configuration:</b>		EUT Only						
<b>Mode:</b>		LTE Band 17, 10MHz BW 16QAM, RB50-0						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Chamber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
709.00	17.02	V	0.5	0.0	16.52	34.8	-18.3	
709.00	20.95	H	0.5	0.0	20.45	34.8	-14.4	
Mid Ch								
710.00	16.82	V	0.5	0.0	16.32	34.8	-18.5	
710.00	20.85	H	0.5	0.0	20.35	34.8	-14.5	
High Ch								
711.00	17.22	V	0.5	0.0	16.72	34.8	-18.1	
711.00	20.85	H	0.5	0.0	20.35	34.8	-14.5	



## 9.2. FIELD STRENGTH OF SPURIOUS RADIATION

### RULE PART(S)

FCC: §2.1053, §22.917, §24.238 and §27.53

### LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.

§27.53 (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.

### TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 100 kHz or 1 percent of emission bandwidth, as specified). 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.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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.

### MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99, and HSDPA
- LTE Band 4 and 17

**RESULTS**

**GPRS (Cellular Band)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG							
<b>Project #:</b>		13U14916							
<b>Date:</b>		03/27/13							
<b>Test Engineer:</b>		Mona Hua							
<b>Configuration:</b>		EUT with AC adapter and headset							
<b>Mode:</b>		Tx, GPRS 850							
Chamber		Pre-amplifier			Filter		Limit		
5m Chamber B		T145 8449B			Filter 1		Part 22		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (824.2MHz)</b>									
1.648	-11.8	V	3.0	35.5	1.0	-46.4	-13.0	-33.4	
2.473	-12.4	V	3.0	35.4	1.0	-46.8	-13.0	-33.8	
1.648	-11.2	H	3.0	35.5	1.0	-45.7	-13.0	-32.7	
2.473	-15.3	H	3.0	35.4	1.0	-49.7	-13.0	-36.7	
<b>Mid Ch, (836.6MHz)</b>									
1.673	-11.8	V	3.0	35.5	1.0	-46.3	-13.0	-33.3	
2.510	-11.2	V	3.0	35.4	1.0	-45.6	-13.0	-32.6	
1.673	-10.9	H	3.0	35.5	1.0	-45.5	-13.0	-32.5	
2.510	-10.6	H	3.0	35.4	1.0	-45.0	-13.0	-32.0	
<b>High Ch, (848.8MHz)</b>									
1.698	-7.8	V	3.0	35.5	1.0	-42.3	-13.0	-29.3	
2.546	-11.5	V	3.0	35.4	1.0	-46.0	-13.0	-33.0	
1.698	-8.5	H	3.0	35.5	1.0	-43.0	-13.0	-30.0	
2.546	-8.9	H	3.0	35.4	1.0	-43.3	-13.0	-30.3	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

**EGPRS (Cellular Band)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/27/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter and headset  
**Mode:** Tx, EGPRS 850

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

T145 8449B

Filter 1

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (824.2MHz)</b>									
1.648	-15.9	V	3.0	35.5	1.0	-50.5	-13.0	-37.5	
2.473	-12.7	V	3.0	35.4	1.0	-47.1	-13.0	-34.1	
1.648	-16.6	H	3.0	35.5	1.0	-51.1	-13.0	-38.1	
2.473	-14.8	H	3.0	35.4	1.0	-49.2	-13.0	-36.2	
<b>Mid Ch, (836.6MHz)</b>									
1.673	-14.2	V	3.0	35.5	1.0	-48.7	-13.0	-35.7	
2.510	-12.2	V	3.0	35.4	1.0	-46.6	-13.0	-33.6	
1.673	-15.2	H	3.0	35.5	1.0	-49.8	-13.0	-36.8	
2.510	-13.8	H	3.0	35.4	1.0	-48.2	-13.0	-35.2	
<b>High Ch, (848.8MHz)</b>									
1.698	-14.0	V	3.0	35.5	1.0	-48.5	-13.0	-35.5	
2.546	-13.2	V	3.0	35.4	1.0	-47.7	-13.0	-34.7	
1.698	-12.1	H	3.0	35.5	1.0	-46.6	-13.0	-33.6	
2.546	-13.6	H	3.0	35.4	1.0	-48.0	-13.0	-35.0	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**GPRS (PCS Band)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG							
<b>Project #:</b>		13U14990							
<b>Date:01/29/2013</b>		05/13/13							
<b>Test Engineer:</b>		Kiya Kedida							
<b>Configuration:</b>		EUT with AC adapter and headset							
<b>Mode:</b>		WCDMA, PCS 1900							
<b>Chamber</b>		<b>Pre-amplifer</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1		Part 27		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1850.2MHz)</b>									
3.705	-16.0	V	3.0	35.4	1.0	-50.4	-13.0	-37.4	
5.557	-15.1	V	3.0	35.4	1.0	-49.5	-13.0	-36.5	
7.410	-8.7	V	3.0	35.7	1.0	-43.4	-13.0	-30.4	
3.705	-16.5	H	3.0	35.4	1.0	-50.8	-13.0	-37.8	
5.557	-14.9	H	3.0	35.4	1.0	-49.3	-13.0	-36.3	
7.410	-13.1	H	3.0	35.7	1.0	-47.8	-13.0	-34.8	
<b>Mid Ch, (1880MHz)</b>									
3.760	-12.9	V	3.0	35.3	1.0	-47.2	-13.0	-34.2	
5.640	-10.2	V	3.0	35.4	1.0	-44.7	-13.0	-31.7	
7.520	-9.5	V	3.0	35.7	1.0	-44.2	-13.0	-31.2	
3.760	-17.8	H	3.0	35.3	1.0	-52.1	-13.0	-39.1	
5.640	-11.8	H	3.0	35.4	1.0	-46.2	-13.0	-33.2	
7.520	-11.1	H	3.0	35.7	1.0	-45.8	-13.0	-32.8	
<b>High Ch, (1909.8MHz)</b>									
3.815	-20.9	V	3.0	35.3	1.0	-55.2	-13.0	-42.2	
5.723	-12.0	V	3.0	35.4	1.0	-46.4	-13.0	-33.4	
7.630	-12.6	V	3.0	35.7	1.0	-47.3	-13.0	-34.3	
3.815	-20.7	H	3.0	35.3	1.0	-55.0	-13.0	-42.0	
5.723	-11.3	H	3.0	35.4	1.0	-45.8	-13.0	-32.8	
7.630	-9.6	H	3.0	35.7	1.0	-44.3	-13.0	-31.3	

**EGPRS (PCS Band)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG							
<b>Project #:</b>		13U14990							
<b>Date:</b> 01/29/2013		05/13/13							
<b>Test Engineer:</b>		Kiya Kedida							
<b>Configuration:</b>		EUT with AC adapter and headset							
<b>Mode:</b>		WCDMA, PCS 1900							
<b>Chamber</b>		<b>Pre-amplifer</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1		Part 27		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1850.2MHz)</b>									
3.705	-22.1	V	3.0	35.4	1.0	-56.5	-13.0	-43.5	
5.557	-19.3	V	3.0	35.4	1.0	-53.7	-13.0	-40.7	
7.410	-14.5	V	3.0	35.7	1.0	-49.2	-13.0	-36.2	
3.705	-22.1	H	3.0	35.4	1.0	-56.4	-13.0	-43.4	
5.557	-20.2	H	3.0	35.4	1.0	-54.6	-13.0	-41.6	
7.410	-16.6	H	3.0	35.7	1.0	-51.3	-13.0	-38.3	
<b>Mid Ch, (1880MHz)</b>									
3.760	-22.4	V	3.0	35.3	1.0	-56.8	-13.0	-43.8	
5.640	-20.2	V	3.0	35.4	1.0	-54.6	-13.0	-41.6	
7.520	-10.7	V	3.0	35.7	1.0	-45.4	-13.0	-32.4	
3.760	-22.7	H	3.0	35.3	1.0	-57.0	-13.0	-44.0	
5.640	-20.0	H	3.0	35.4	1.0	-54.4	-13.0	-41.4	
7.520	-16.9	H	3.0	35.7	1.0	-51.6	-13.0	-38.6	
<b>High Ch, (1909.8MHz)</b>									
3.815	-21.8	V	3.0	35.3	1.0	-56.2	-13.0	-43.2	
5.723	-19.7	V	3.0	35.4	1.0	-54.2	-13.0	-41.2	
7.630	-15.1	V	3.0	35.7	1.0	-49.8	-13.0	-36.8	
3.815	-23.1	H	3.0	35.3	1.0	-57.4	-13.0	-44.4	
5.723	-17.3	H	3.0	35.4	1.0	-51.8	-13.0	-38.8	
7.630	-17.0	H	3.0	35.7	1.0	-51.7	-13.0	-38.7	

**WCDMA REL 99 (Cellular Band)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/27/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter and headset  
**Mode:** Tx, WCDMA, Rel 99

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

T145 8449B

Filter 1

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (826.4MHz)</b>									
1.653	-14.5	V	3.0	35.5	1.0	-49.0	-13.0	-36.0	
2.479	-11.5	V	3.0	35.4	1.0	-45.9	-13.0	-32.9	
1.653	-12.8	H	3.0	35.5	1.0	-47.4	-13.0	-34.4	
2.479	-14.4	H	3.0	35.4	1.0	-48.8	-13.0	-35.8	
<b>Mid Ch, (836MHz)</b>									
1.672	-13.9	V	3.0	35.5	1.0	-48.4	-13.0	-35.4	
2.508	-8.3	V	3.0	35.4	1.0	-42.7	-13.0	-29.7	
1.672	-12.4	H	3.0	35.5	1.0	-47.0	-13.0	-34.0	
2.508	-8.8	H	3.0	35.4	1.0	-43.2	-13.0	-30.2	
<b>High Ch, (846.6MHz)</b>									
1.693	-14.5	V	3.0	35.5	1.0	-49.0	-13.0	-36.0	
2.540	-8.2	V	3.0	35.4	1.0	-42.6	-13.0	-29.6	
1.693	-13.2	H	3.0	35.5	1.0	-47.8	-13.0	-34.8	
2.540	-10.5	H	3.0	35.4	1.0	-44.9	-13.0	-31.9	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**WCDMA HSDPA (Cellular Band)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/27/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter and headset  
**Mode:** Tx, WCDMA, HSDPA

Chamber

5m Chamber B

Pre-amplifer

T145 8449B

Filter

Filter 1

Limit

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (826.4MHz)</b>									
1.653	-14.9	V	3.0	35.5	1.0	-49.4	-13.0	-36.4	
2.479	-12.5	V	3.0	35.4	1.0	-46.9	-13.0	-33.9	
1.653	-13.2	H	3.0	35.5	1.0	-47.8	-13.0	-34.8	
2.479	-14.9	H	3.0	35.4	1.0	-49.3	-13.0	-36.3	
<b>Mid Ch, (836MHz)</b>									
1.672	-13.8	V	3.0	35.5	1.0	-48.3	-13.0	-35.3	
2.508	-10.2	V	3.0	35.4	1.0	-44.7	-13.0	-31.7	
1.672	-12.4	H	3.0	35.5	1.0	-47.0	-13.0	-34.0	
2.508	-9.8	H	3.0	35.4	1.0	-44.2	-13.0	-31.2	
<b>High Ch, (846.6MHz)</b>									
1.693	-15.0	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
2.540	-11.9	V	3.0	35.4	1.0	-46.3	-13.0	-33.3	
1.693	-11.7	H	3.0	35.5	1.0	-46.3	-13.0	-33.3	
2.540	-14.1	H	3.0	35.4	1.0	-48.5	-13.0	-35.5	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**WCDMA REL 99 (PCS Band)**

Compliance Certification Services									
Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG							
<b>Project #:</b>		13U14990							
<b>Date:</b> 01/29/2013		05/13/13							
<b>Test Engineer:</b>		Lieu Nguyen							
<b>Configuration:</b>		EUT with AC adapter and headset							
<b>Mode:</b>		WCDMA, Rel 99 PCS 1900							
<b>Chamber</b>		<b>Pre-amplifer</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1		Part 27		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1852.4MHz)</b>									
3.705	-4.5	V	3.0	35.4	1.0	-38.8	-13.0	-25.8	
5.557	4.0	V	3.0	35.4	1.0	-30.4	-13.0	-17.4	
7.410	-8.6	V	3.0	35.7	1.0	-43.3	-13.0	-30.3	
3.705	-12.5	H	3.0	35.4	1.0	-46.8	-13.0	-33.8	
5.557	-1.9	H	3.0	35.4	1.0	-36.3	-13.0	-23.3	
7.410	-6.3	H	3.0	35.7	1.0	-41.0	-13.0	-28.0	
<b>Mid Ch, (1880MHz)</b>									
3.760	-7.1	V	3.0	35.3	1.0	-41.5	-13.0	-28.5	
5.640	5.3	V	3.0	35.4	1.0	-29.1	-13.0	-16.1	
7.520	-7.3	V	3.0	35.7	1.0	-42.0	-13.0	-29.0	
3.760	-13.3	H	3.0	35.3	1.0	-47.6	-13.0	-34.6	
5.640	0.7	H	3.0	35.4	1.0	-33.7	-13.0	-20.7	
7.520	-6.8	H	3.0	35.7	1.0	-41.5	-13.0	-28.5	
<b>High Ch, (1907.6MHz)</b>									
3.815	-2.7	V	3.0	35.3	1.0	-37.0	-13.0	-24.0	
5.723	-0.7	V	3.0	35.4	1.0	-35.2	-13.0	-22.2	
7.630	-7.6	V	3.0	35.7	1.0	-42.3	-13.0	-29.3	
3.815	-7.0	H	3.0	35.3	1.0	-41.3	-13.0	-28.3	
5.723	-1.3	H	3.0	35.4	1.0	-35.7	-13.0	-22.7	
7.630	-4.1	H	3.0	35.7	1.0	-38.8	-13.0	-25.8	



**WCDMA HSDPA (PCS Band)**

**Compliance Certification Services  
 Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14990  
**Date:** 01/29/2013 05/13/13  
**Test Engineer:** Lieu Nguyen  
**Configuration:** EUT with AC adapter and headset  
**Mode:** WCDMA, HSDPA PCS 1900

<b>Chamber</b>	<b>Pre-amplifier</b>	<b>Filter</b>	<b>Limit</b>
5m Chamber B	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1852.4MHz)</b>									
3.705	-13.7	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
5.557	2.5	V	3.0	35.4	1.0	-31.9	-13.0	-18.9	
7.410	-5.8	V	3.0	35.7	1.0	-40.5	-13.0	-27.5	
3.705	-11.9	H	3.0	35.4	1.0	-46.2	-13.0	-33.2	
5.557	4.2	H	3.0	35.4	1.0	-30.2	-13.0	-17.2	
7.410	-3.7	H	3.0	35.7	1.0	-38.4	-13.0	-25.4	
<b>Mid Ch, (1880MHz)</b>									
3.760	-14.0	V	3.0	35.3	1.0	-48.4	-13.0	-35.4	
5.640	-1.0	V	3.0	35.4	1.0	-35.4	-13.0	-22.4	
7.520	-7.3	V	3.0	35.7	1.0	-42.0	-13.0	-29.0	
3.760	-12.1	H	3.0	35.3	1.0	-46.4	-13.0	-33.4	
5.640	0.7	H	3.0	35.4	1.0	-33.8	-13.0	-20.8	
7.520	-6.0	H	3.0	35.7	1.0	-40.7	-13.0	-27.7	
<b>High Ch, (1907.6MHz)</b>									
3.815	-8.9	V	3.0	35.3	1.0	-43.2	-13.0	-30.2	
5.723	3.2	V	3.0	35.4	1.0	-31.3	-13.0	-18.3	
11.446	5.9	V	3.0	34.6	1.0	-27.7	-13.0	-14.7	
3.815	-7.7	H	3.0	35.3	1.0	-42.0	-13.0	-29.0	
5.723	0.5	H	3.0	35.4	1.0	-33.9	-13.0	-20.9	
7.630	3.5	H	3.0	35.7	1.0	-31.2	-13.0	-18.2	

**WCDMA 1700 Rel 99 (AWS Band)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG							
<b>Project #:</b>		13U14990							
<b>Date:</b>		05/13/13							
<b>Test Engineer:</b>		Lieu Nguyen							
<b>Configuration:</b>		EUT with AC adapter and headset							
<b>Mode:</b>		WCDMA, AWS 1700, Rel 99							
<b>Chamber</b>		<b>Pre-amplifer</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1		Part 27		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1712.4MHz)</b>									
3.425	2.1	V	3.0	35.5	1.0	-32.4	-13.0	-19.4	
5.137	-4.0	V	3.0	35.3	1.0	-38.3	-13.0	-25.3	
6.850	-7.6	V	3.0	35.7	1.0	-42.3	-13.0	-29.3	
3.425	-5.9	H	3.0	35.5	1.0	-40.4	-13.0	-27.4	
5.137	-8.2	H	3.0	35.3	1.0	-42.5	-13.0	-29.5	
6.850	-6.2	H	3.0	35.7	1.0	-40.9	-13.0	-27.9	
<b>Mid Ch, (1732.6MHz)</b>									
3.465	0.1	V	3.0	35.5	1.0	-34.4	-13.0	-21.4	
5.198	-7.9	V	3.0	35.3	1.0	-42.2	-13.0	-29.2	
6.930	-0.8	V	3.0	35.7	1.0	-35.5	-13.0	-22.5	
3.465	-4.0	H	3.0	35.5	1.0	-38.4	-13.0	-25.4	
5.198	-9.1	H	3.0	35.3	1.0	-43.4	-13.0	-30.4	
6.930	-1.5	H	3.0	35.7	1.0	-36.2	-13.0	-23.2	
<b>High Ch, (1752.5MHz)</b>									
3.505	3.8	V	3.0	35.4	1.0	-30.7	-13.0	-17.7	
5.258	-5.7	V	3.0	35.3	1.0	-40.1	-13.0	-27.1	
7.010	-2.6	V	3.0	35.7	1.0	-37.3	-13.0	-24.3	
3.505	-8.3	H	3.0	35.4	1.0	-42.8	-13.0	-29.8	
5.258	1.5	H	3.0	35.3	1.0	-32.9	-13.0	-19.9	
7.010	-3.2	H	3.0	35.7	1.0	-37.9	-13.0	-24.9	

**WCDMA 1700 HSDPA (AWS Band)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG							
<b>Project #:</b>		13U14990							
<b>Date:</b>		05/13/13							
<b>Test Engineer:</b>		Lieu Nguyen							
<b>Configuration:</b>		EUT with AC adapter and headset							
<b>Mode:</b>		WCDMA, AWS 1700, HSDPA							
<b>Chamber</b>		<b>Pre-amplifer</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1		Part 27		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1712.4MHz)</b>									
3.425	-0.6	V	3.0	35.5	1.0	-35.1	-13.0	-22.1	
5.137	-3.3	V	3.0	35.3	1.0	-37.6	-13.0	-24.6	
6.850	-7.8	V	3.0	35.7	1.0	-42.5	-13.0	-29.5	
3.425	0.2	H	3.0	35.5	1.0	-34.3	-13.0	-21.3	
5.137	-7.1	H	3.0	35.3	1.0	-41.4	-13.0	-28.4	
6.850	-5.7	H	3.0	35.7	1.0	-40.4	-13.0	-27.4	
<b>Mid Ch, (1732.6MHz)</b>									
3.465	-2.6	V	3.0	35.5	1.0	-37.1	-13.0	-24.1	
5.198	-7.9	V	3.0	35.3	1.0	-42.2	-13.0	-29.2	
6.930	-1.7	V	3.0	35.7	1.0	-36.4	-13.0	-23.4	
3.465	-4.8	H	3.0	35.5	1.0	-39.2	-13.0	-26.2	
5.198	-9.1	H	3.0	35.3	1.0	-43.4	-13.0	-30.4	
6.930	-1.3	H	3.0	35.7	1.0	-36.0	-13.0	-23.0	
<b>High Ch, (1752.5MHz)</b>									
3.505	1.9	V	3.0	35.4	1.0	-32.5	-13.0	-19.5	
5.258	-5.0	V	3.0	35.3	1.0	-39.4	-13.0	-26.4	
7.010	-3.7	V	3.0	35.7	1.0	-38.4	-13.0	-25.4	
3.505	-6.7	H	3.0	35.4	1.0	-41.2	-13.0	-28.2	
5.258	-0.6	H	3.0	35.3	1.0	-34.9	-13.0	-21.9	
7.010	-2.9	H	3.0	35.7	1.0	-37.6	-13.0	-24.6	

**LTE Band 4, QPSK (5 MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/14/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter  
**Mode:** LTE Band 4, 5MHz QPSK

**Chamber**

5m Chamber B

**Pre-amplifier**

T145 8449B

**Filter**

Filter 1

**Limit**

Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1712.5MHz)</b>									
3.421	-8.1	V	3.0	35.5	1.0	-42.5	-13.0	-29.5	
5.131	2.7	V	3.0	35.3	1.0	-31.6	-13.0	-18.6	
6.841	-5.3	V	3.0	35.7	1.0	-40.0	-13.0	-27.0	
3.421	-8.5	H	3.0	35.5	1.0	-43.0	-13.0	-30.0	
5.131	7.7	H	3.0	35.3	1.0	-26.7	-13.0	-13.7	
6.841	9.3	H	3.0	35.7	1.0	-25.4	-13.0	-12.4	
<b>Mid Ch, (1732.5MHz)</b>									
3.461	-8.6	V	3.0	35.5	1.0	-43.1	-13.0	-30.1	
5.191	-0.6	V	3.0	35.3	1.0	-34.9	-13.0	-21.9	
6.921	-4.4	V	3.0	35.7	1.0	-39.1	-13.0	-26.1	
3.461	-2.6	H	3.0	35.5	1.0	-37.1	-13.0	-24.1	
5.191	6.8	H	3.0	35.3	1.0	-27.5	-13.0	-14.5	
6.921	5.7	H	3.0	35.7	1.0	-29.0	-13.0	-16.0	
<b>High Ch, (1752.5MHz)</b>									
3.501	-13.2	V	3.0	35.4	1.0	-47.6	-13.0	-34.6	
5.251	4.8	V	3.0	35.3	1.0	-29.5	-13.0	-16.5	
7.001	-3.3	V	3.0	35.7	1.0	-38.0	-13.0	-25.0	
3.501	-10.1	H	3.0	35.4	1.0	-44.5	-13.0	-31.5	
5.251	12.2	H	3.0	35.3	1.0	-22.2	-13.0	-9.2	
7.002	8.9	H	3.0	35.7	1.0	-25.9	-13.0	-12.9	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**LTE Band 4, 16QAM (5 MHz BANDWIDTH)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		LG							
Project #:		13U14916							
Date:		03/14/13							
Test Engineer:		Mona Hua							
Configuration:		EUT with AC adapter							
Mode:		LTE Band 4, 5MHz 16QAM							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber B		T145 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5MHz)									
3.421	-8.2	V	3.0	35.5	1.0	-42.7	-13.0	-29.7	
5.131	1.9	V	3.0	35.3	1.0	-32.4	-13.0	-19.4	
6.841	-6.1	V	3.0	35.7	1.0	-40.8	-13.0	-27.8	
3.421	-9.0	H	3.0	35.5	1.0	-43.5	-13.0	-30.5	
5.131	9.7	H	3.0	35.3	1.0	-24.6	-13.0	-11.6	
6.841	11.2	H	3.0	35.7	1.0	-23.5	-13.0	-10.5	
Mid Ch, (1732.5MHz)									
3.460	-8.6	V	3.0	35.5	1.0	-43.1	-13.0	-30.1	
5.191	3.0	V	3.0	35.3	1.0	-31.3	-13.0	-18.3	
6.921	-5.2	V	3.0	35.7	1.0	-39.9	-13.0	-26.9	
3.461	-3.1	H	3.0	35.5	1.0	-37.5	-13.0	-24.5	
5.191	9.8	H	3.0	35.3	1.0	-24.5	-13.0	-11.5	
6.921	6.4	H	3.0	35.7	1.0	-28.3	-13.0	-15.3	
High Ch, (1752.5MHz)									
3.501	-13.5	V	3.0	35.4	1.0	-47.9	-13.0	-34.9	
5.251	4.7	V	3.0	35.3	1.0	-29.6	-13.0	-16.6	
8.752	-1.6	V	3.0	35.6	1.0	-36.3	-13.0	-23.3	
5.251	13.4	H	3.0	35.3	1.0	-20.9	-13.0	-7.9	
7.002	9.1	H	3.0	35.7	1.0	-25.6	-13.0	-12.6	
8.752	0.1	H	3.0	35.6	1.0	-34.5	-13.0	-21.5	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

**LTE Band 4, QPSK (10 MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/14/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter  
**Mode:** LTE Band 4, 10MHz QPSK

<b>Chamber</b>	<b>Pre-amplifier</b>	<b>Filter</b>	<b>Limit</b>
5m Chamber B	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1715MHz)</b>									
3.421	-7.5	V	3.0	35.5	1.0	-42.0	-13.0	-29.0	
5.132	-4.7	V	3.0	35.3	1.0	-39.0	-13.0	-26.0	
3.421	-7.8	H	3.0	35.5	1.0	-42.3	-13.0	-29.3	
5.132	-10.7	H	3.0	35.3	1.0	-23.7	-13.0	-10.7	
6.843	-12.2	H	3.0	35.7	1.0	-22.5	-13.0	-9.5	
<b>Mid Ch, (1732.5MHz)</b>									
3.456	-6.1	V	3.0	35.5	1.0	-40.5	-13.0	-27.5	
5.184	-0.8	V	3.0	35.3	1.0	-35.2	-13.0	-22.2	
3.456	-10.0	H	3.0	35.5	1.0	-44.5	-13.0	-31.5	
5.184	-5.8	H	3.0	35.3	1.0	-40.1	-13.0	-27.1	
<b>High Ch, (1750MHz)</b>									
3.491	-11.5	V	3.0	35.5	1.0	-46.0	-13.0	-33.0	
5.237	3.3	V	3.0	35.3	1.0	-31.1	-13.0	-18.1	
3.491	-10.4	H	3.0	35.5	1.0	-44.8	-13.0	-31.8	
5.237	5.6	H	3.0	35.3	1.0	-28.7	-13.0	-15.7	
6.982	5.0	H	3.0	35.7	1.0	-29.7	-13.0	-16.7	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**LTE Band 4, 16QAM (10 MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/14/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter  
**Mode:** LTE Band 4, 10MHz 16QAM

**Chamber**

5m Chamber B

**Pre-amplifier**

T145 8449B

**Filter**

Filter 1

**Limit**

Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1715MHz)</b>									
3.421	-8.1	V	3.0	35.5	1.0	-42.5	-13.0	-29.5	
5.132	-2.9	V	3.0	35.3	1.0	-37.3	-13.0	-24.3	
3.421	-8.8	H	3.0	35.5	1.0	-43.2	-13.0	-30.2	
5.132	10.8	H	3.0	35.3	1.0	-23.5	-13.0	-10.5	
6.843	12.5	H	3.0	35.7	1.0	-22.2	-13.0	-9.2	
<b>Mid Ch, (1732.5MHz)</b>									
3.456	-7.0	V	3.0	35.5	1.0	-41.4	-13.0	-28.4	
5.184	2.8	V	3.0	35.3	1.0	-31.5	-13.0	-18.5	
3.456	-9.8	H	3.0	35.5	1.0	-44.3	-13.0	-31.3	
5.184	-0.1	H	3.0	35.3	1.0	-34.5	-13.0	-21.5	
<b>High Ch, (1750MHz)</b>									
3.491	-12.2	V	3.0	35.5	1.0	-46.6	-13.0	-33.6	
5.237	6.1	V	3.0	35.3	1.0	-28.2	-13.0	-15.2	
3.491	-11.7	H	3.0	35.5	1.0	-46.1	-13.0	-33.1	
5.237	6.1	H	3.0	35.3	1.0	-28.2	-13.0	-15.2	
6.982	7.3	H	3.0	35.7	1.0	-27.5	-13.0	-14.5	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**LTE Band 4, QPSK (15MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/14/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter  
**Mode:** LTE Band 4, 15MHz QPSK

**Chamber**

5m Chamber B

**Pre-amplifier**

T145 8449B

**Filter**

Filter 1

**Limit**

Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1717.5MHz)</b>									
3.422	9.7	V	3.0	35.5	1.0	44.2	-13.0	-31.2	
5.133	2.1	V	3.0	35.3	1.0	-32.2	-13.0	-19.2	
6.843	4.4	V	3.0	35.7	1.0	-30.2	-13.0	-17.2	
3.422	-8.1	H	3.0	35.5	1.0	-42.6	-13.0	-29.6	
5.132	9.4	H	3.0	35.3	1.0	-24.9	-13.0	-11.9	
6.843	11.0	H	3.0	35.7	1.0	-23.7	-13.0	-10.7	
<b>Mid Ch, (1732.5MHz)</b>									
3.452	-4.1	V	3.0	35.5	1.0	-38.6	-13.0	-25.6	
5.177	4.1	V	3.0	35.3	1.0	-30.2	-13.0	-17.2	
6.903	2.9	V	3.0	35.7	1.0	-31.8	-13.0	-18.8	
3.452	-5.6	H	3.0	35.5	1.0	-40.1	-13.0	-27.1	
5.178	8.0	H	3.0	35.3	1.0	-26.3	-13.0	-13.3	
6.904	8.0	H	3.0	35.7	1.0	-26.7	-13.0	-13.7	
<b>High Ch, (1747.5MHz)</b>									
3.482	-11.1	V	3.0	35.5	1.0	-45.5	-13.0	-32.5	
5.223	3.2	V	3.0	35.3	1.0	-31.1	-13.0	-18.1	
3.482	-5.4	H	3.0	35.5	1.0	-39.8	-13.0	-26.8	
5.223	7.7	H	3.0	35.3	1.0	-26.6	-13.0	-13.6	
6.964	1.0	H	3.0	35.7	1.0	-33.7	-13.0	-20.7	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.



**LTE Band 4, 16QAM (15MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/14/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter  
**Mode:** LTE Band 4, 15MHz 16QAM

**Chamber**

5m Chamber B

**Pre-amplifier**

T145 8449B

**Filter**

Filter 1

**Limit**

Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1717.5MHz)</b>									
3.422	9.8	V	3.0	35.5	1.0	-44.3	-13.0	-31.3	
5.133	5.1	V	3.0	35.3	1.0	-29.2	-13.0	-16.2	
6.843	4.1	V	3.0	35.7	1.0	-30.6	-13.0	-17.6	
3.422	-10.2	H	3.0	35.5	1.0	-44.6	-13.0	-31.6	
5.132	11.9	H	3.0	35.3	1.0	-22.4	-13.0	-9.4	
6.843	11.0	H	3.0	35.7	1.0	-23.7	-13.0	-10.7	
<b>Mid Ch, (1732.5MHz)</b>									
3.452	-5.3	V	3.0	35.5	1.0	-39.8	-13.0	-26.8	
5.177	5.4	V	3.0	35.3	1.0	-29.0	-13.0	-16.0	
6.903	0.7	V	3.0	35.7	1.0	-34.0	-13.0	-21.0	
3.452	-6.5	H	3.0	35.5	1.0	-40.9	-13.0	-27.9	
5.178	10.2	H	3.0	35.3	1.0	-24.1	-13.0	-11.1	
6.904	6.6	H	3.0	35.7	1.0	-28.1	-13.0	-15.1	
<b>High Ch, (1747.5MHz)</b>									
3.482	-11.7	V	3.0	35.5	1.0	-46.2	-13.0	-33.2	
5.223	3.4	V	3.0	35.3	1.0	-30.9	-13.0	-17.9	
3.482	-6.3	H	3.0	35.5	1.0	-40.8	-13.0	-27.8	
5.223	10.7	H	3.0	35.3	1.0	-23.7	-13.0	-10.7	
6.964	2.4	H	3.0	35.7	1.0	-32.3	-13.0	-19.3	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**LTE Band 4, QPSK (20 MHz BANDWIDTH)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		LG							
Project #:		13U14916							
Date:		03/15/13							
Test Engineer:		Mona Hua							
Configuration:		EUT with AC adapter							
Mode:		LTE Band 4, 20MHz QPSK							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber B		T145 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1720MHz)</b>									
3.422	-11.1	V	3.0	35.5	1.0	-45.6	-13.0	-32.6	
5.134	2.4	V	3.0	35.3	1.0	-31.9	-13.0	-18.9	
6.845	-2.4	V	3.0	35.7	1.0	-37.1	-13.0	-24.1	
3.422	-8.8	H	3.0	35.5	1.0	-43.3	-13.0	-30.3	
5.134	12.8	H	3.0	35.3	1.0	-21.5	-13.0	-8.5	
6.845	13.0	H	3.0	35.7	1.0	-21.7	-13.0	-8.7	
8.556	-2.1	H	3.0	35.6	1.0	-36.7	-13.0	-23.7	
<b>Mid Ch, (1732.5MHz)</b>									
3.447	-5.6	V	3.0	35.5	1.0	-40.0	-13.0	-27.0	
5.170	0.5	V	3.0	35.3	1.0	-33.8	-13.0	-20.8	
6.894	4.6	V	3.0	35.7	1.0	-30.2	-13.0	-17.2	
3.447	-6.0	H	3.0	35.5	1.0	-40.5	-13.0	-27.5	
5.170	9.7	H	3.0	35.3	1.0	-24.6	-13.0	-11.6	
6.894	10.8	H	3.0	35.7	1.0	-23.9	-13.0	-10.9	
8.618	-3.8	H	3.0	35.6	1.0	-38.4	-13.0	-25.4	
<b>High Ch, (1745MHz)</b>									
3.472	-11.7	V	3.0	35.5	1.0	-46.2	-13.0	-33.2	
5.208	-6.4	V	3.0	35.3	1.0	-40.7	-13.0	-27.7	
6.944	-6.0	V	3.0	35.7	1.0	-40.7	-13.0	-27.7	
3.472	-4.9	H	3.0	35.5	1.0	-39.3	-13.0	-26.3	
5.208	5.4	H	3.0	35.3	1.0	-28.9	-13.0	-15.9	
6.944	2.4	H	3.0	35.7	1.0	-32.3	-13.0	-19.3	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

**LTE Band 4, 16QAM (20MHz BANDWIDTH)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		LG							
Project #:		13U14916							
Date:		03/15/13							
Test Engineer:		Mona Hua							
Configuration:		EUT with AC adapter							
Mode:		LTE Band 4, 20MHz 16QAM							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber B		T145 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1720MHz)</b>									
3.422	-12.3	V	3.0	35.5	1.0	-46.8	-13.0	-33.8	
5.134	5.0	V	3.0	35.3	1.0	-29.3	-13.0	-16.3	
6.845	-1.9	V	3.0	35.7	1.0	-36.6	-13.0	-23.6	
3.422	-8.7	H	3.0	35.5	1.0	-43.2	-13.0	-30.2	
5.134	13.6	H	3.0	35.3	1.0	-20.7	-13.0	-7.7	
6.845	12.5	H	3.0	35.7	1.0	-22.2	-13.0	-9.2	
8.556	-2.4	H	3.0	35.6	1.0	-37.0	-13.0	-24.0	
<b>Mid Ch, (1732.5MHz)</b>									
3.447	-6.8	V	3.0	35.5	1.0	-41.2	-13.0	-28.2	
5.170	0.8	V	3.0	35.3	1.0	-33.5	-13.0	-20.5	
6.894	4.3	V	3.0	35.7	1.0	-30.4	-13.0	-17.4	
3.447	-7.1	H	3.0	35.5	1.0	-41.6	-13.0	-28.6	
5.170	11.0	H	3.0	35.3	1.0	-23.3	-13.0	-10.3	
6.894	12.2	H	3.0	35.7	1.0	-22.5	-13.0	-9.5	
8.618	-3.0	H	3.0	35.6	1.0	-37.6	-13.0	-24.6	
<b>High Ch, (1745MHz)</b>									
3.472	-13.5	V	3.0	35.5	1.0	-48.0	-13.0	-35.0	
5.208	-1.1	V	3.0	35.3	1.0	-35.4	-13.0	-22.4	
6.944	-6.3	V	3.0	35.7	1.0	-41.1	-13.0	-28.1	
3.472	-5.6	H	3.0	35.5	1.0	-40.1	-13.0	-27.1	
5.208	8.2	H	3.0	35.3	1.0	-26.1	-13.0	-13.1	
6.944	-0.3	H	3.0	35.7	1.0	-35.0	-13.0	-22.0	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

**LTE Band 17, QPSK (5.0 MHz BANDWIDTH)**

Compliance Certification Services									
Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG							
<b>Project #:</b>		13U14916							
<b>Date:</b>		03/14/13							
<b>Test Engineer:</b>		Mona Hua							
<b>Configuration:</b>		EUT with AC adapter							
<b>Mode:</b>		LTE Band 17, 5MHz QPSK							
<b>Chamber</b>		<b>Pre-amplifier</b>		<b>Filter</b>		<b>Limit</b>			
5m Chamber B		T145 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (706.5MHz)</b>									
1.413	-15.5	V	3.0	35.8	1.0	-50.2	-13.0	-37.2	
1.413	-18.6	H	3.0	35.8	1.0	-53.4	-13.0	-40.4	
<b>Mid Ch, (710MHz)</b>									
1.420	-15.5	V	3.0	35.7	1.0	-50.3	-13.0	-37.3	
1.420	-15.3	H	3.0	35.7	1.0	-50.1	-13.0	-37.1	
<b>High Ch, (713.5MHz)</b>									
1.427		V	3.0	35.7	1.0	-34.7	-13.0	-21.7	
1.427	-13.6	H	3.0	35.7	1.0	-48.4	-13.0	-35.4	

**LTE Band 17, 16QAM (5.0 MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: LG  
 Project #: 13U14916  
 Date: 03/14/13  
 Test Engineer: Mona Hua  
 Configuration: EUT with AC adapter  
 Mode: LTE Band 17, 5MHz 16QAM

Chamber

5m Chamber B

Pre-amplifier

T145 8449B

Filter

Limit

Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (706.5MHz)</b>									
1.413	-16.4	V	3.0	35.8		-52.1	-13.0	-39.1	
1.413	-20.3	H	3.0	35.8		-56.1	-13.0	-43.1	
<b>Mid Ch, (710MHz)</b>									
1.420	-18.7	V	3.0	35.7		-54.5	-13.0	-41.5	
1.420	-18.1	H	3.0	35.7		-53.9	-13.0	-40.9	
<b>High Ch, (713.5MHz)</b>									
1.427	-15.7	V	3.0	35.7		-51.4	-13.0	-38.4	
1.427	-15.1	H	3.0	35.7		-50.8	-13.0	-37.8	

**LTE Band 17, QPSK (10.0 MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/14/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter  
**Mode:** LTE Band 17, 10MHz QPSK

**Chamber**  
 5m Chamber B

**Pre-amplifier**  
 T145 8449B

**Filter**  
 [Empty]

**Limit**  
 Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (709MHz)</b>									
1.418	-15.6	V	3.0	35.7		-51.4	-13.0	-38.4	
1.418	-22.1	H	3.0	35.7		-57.9	-13.0	-44.9	
<b>Mid Ch, (710MHz)</b>									
1.420	-15.5	V	3.0	35.7		-51.3	-13.0	-38.3	
1.420	-17.4	H	3.0	35.7		-53.2	-13.0	-40.2	
<b>High Ch, (711MHz)</b>									
1.422	-18.5	V	3.0	35.7		-54.2	-13.0	-41.2	
1.422	-17.4	H	3.0	35.7		-53.1	-13.0	-40.1	

**LTE Band 17, 16QAM (10.0 MHz BANDWIDTH)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG  
**Project #:** 13U14916  
**Date:** 03/14/13  
**Test Engineer:** Mona Hua  
**Configuration:** EUT with AC adapter  
**Mode:** LTE Band 17, 10MHz 16QAM

Chamber

5m Chamber B

Pre-amplifier

T145 8449B

Filter

Limit

Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (709MHz)</b>									
1.418	-17.0	V	3.0	35.7		-52.7	-13.0	-39.7	
1.418	-22.2	H	3.0	35.7		-58.0	-13.0	-45.0	
<b>Mid Ch, (710MHz)</b>									
1.420	-17.7	V	3.0	35.7		-53.5	-13.0	-40.5	
1.420	-19.7	H	3.0	35.7		-55.4	-13.0	-42.4	
<b>High Ch, (711MHz)</b>									
1.422	-19.5	V	3.0	35.7		-55.2	-13.0	-42.2	
1.422	-18.5	H	3.0	35.7		-54.2	-13.0	-41.2	