FCC CFR47 PART 22H, 24E, AND 27L

CERTIFICATION TEST REPORT

FOR

PCI EXPRESS MINI CARD

MODEL NUMBER: E371

FCC ID: PKRNVWE371
IC: 3229A-E371

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Revision History

Rev.	Issue Date	Revisions	Revised By
---	09/25/11	Initial Issue	T. Chan
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: NOVATEL WIRELESS INC.
9645 SCRANTON ROAD SUITE #205
SAN DIEGO, CA 92121

EUT DESCRIPTION: PCI EXPRESS MINI CARD

MODEL: E371

SERIAL NUMBER: 2132000035-01L1

DATE TESTED: JULY 9 – NOVEMBER 07, 2011

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

Compliance Certification Services (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:

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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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 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 PCI Express Mini Card that operates in GSM/GPRS/EDGE modes for Cellular/PCS bands and WCDMA/HSPA/LTE modes for Cellular, AWS, and PCS bands.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak 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	32.70	1862.1	32.01	1588.5
824.2 – 848.8	EGPRS	29.16	824.1	28.78	755.1
826.4 – 846	UMTS, Rel 99	27.60	575.4	29.22	835.6
826.4 – 846	UMTS, HSDPA	28.00	631.0	27.94	622.3

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2-1909.8	GPRS	29.20	831.8	28.73	746.4
1850.2-1909.8	EGPRS	28.08	642.7	28.28	673.0
1852.4-1907.6	UMTS, Rel 99	27.05	507.0	27.11	514.0
1852.4-1907.6	UMTS, HSDPA	27.91	618.0	27.62	578.1

Part 27 AWS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1712.4 -1752.6	UMTS, Rel 99	27.46	557.2	27.39	548.3
1712.4 -1752.6	UMTS, HSDPA	28.97	788.9	28.40	691.8

Part 27 LTE Band 17 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
706.50	QPSK	28.83	763.8	30.86	1219.0
710.00		28.57	719.4		1.0
713.50		28.70	741.3		1.0
706.50	16QAM	29.45	881.0	30.80	1202.3
710.00		29.05	803.5		1.0
713.50		29.42	875.0		1.0

Part 27 LTE Band 17 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
709.00	QPSK	28.71	743.0	26.54	450.8
710.00		28.94	783.4		1.0
711.00		28.77	753.4		1.0
709.00	16QAM	28.57	719.4	25.49	354.0
710.00		28.90	776.2		1.0
711.00		29.00	794.3		1.0

Part 27 LTE Band 4 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
1710.7	QPSK	28.87	770.9		1.0
1732.5		28.15	653.1		1.0
1754.3		28.72	744.7	29.49	889.2
1710.7	16QAM	29.22	835.6		1.0
1732.5		28.02	633.9		1.0
1754.3		29.03	799.8	29.53	897.4

Part 27 LTE Band 4 MODE (3.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
1711.5	QPSK	28.99	792.5		1.0
1732.5		28.08	642.7		1.0
1753.5		28.64	731.1	28.87	770.9
1711.5	16QAM	29.01	796.2		1.0
1732.5		27.58	572.8		1.0
1753.5		28.31	677.6	28.88	772.7

Part 27 LTE Band 4 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
1712.5	QPSK	28.33	680.8		1.0
1732.5		27.72	591.6		1.0
1752.5		28.30	676.1	29.57	905.7
1712.5	16QAM	28.89	774.5		1.0
1732.5		28.08	642.7		1.0
1752.5		28.56	717.8	29.47	885.1

Part 27 LTE Band 4 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1715.0	QPSK	28.80	758.6		1.0
1732.5		27.29	535.8		1.0
1750.0		28.73	746.4	29.73	939.7
1715.0	16QAM	28.57	719.4	29.88	972.7
1732.5		27.88	613.8		1.0
1750.0		28.62	727.8		1.0

Part 27 LTE Band 4 MODE (15.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1717.5	QPSK	28.55	716.1	29.41	873.0
1732.5		27.97	626.6		1.0
1747.5		28.37	687.1		1.0
1717.5	16QAM	28.30	676.1		1.0
1732.5		27.59	574.1		1.0
1747.5		28.48	704.7	29.53	897.4

Part 27 LTE Band 4 MODE (20.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1720.0	QPSK	28.51	709.6	29.64	920.4
1732.5		28.07	641.2		1.0
1745.0		28.23	665.3		1.0
1720.0	16QAM	28.19	659.2	29.36	863.0
1732.5		27.85	609.5		1.0
1745.0		28.21	662.2		1.0

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was RF_NV_Manager ver. 1.0.0.1.

5.4. MAXIMUM ANTENNA GAIN

Please see table below:

FREQUENCY RANGE	ANTENNA Gain
(MHz)	(dBi)
706.5 - 713.5	-4.76
824.2 - 848.8	-0.24
1710.7 - 1754.3	2.13
1850.2 - 1909.8	2.92

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel for RF radiated emissions below 1GHz tests is channel with highest RF output power.

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 (GMSK)
- EGPRS (8PSK)
- UMTS Rel 99 and HSDPA Sub 2
- LTE Band 4 and band 17

For the fundamental investigation, the EUT is investigated for vertical and horizontal antenna orientations. After the investigations the worst case was found to be a Z-position for cell band and Y-Orientation for PCS and AWS bands respectively.

5.6. DESCRIPTION OF TEST SETUP

RADIATED TESTS SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	**Manufacturer**	**Model**	**Serial Number**
Lab Test Board	Novatel Wireless	N/A	17017568
DC Power Supply	Agilent	66309D	US39073145

I/O CABLES (RF Conducted Test)

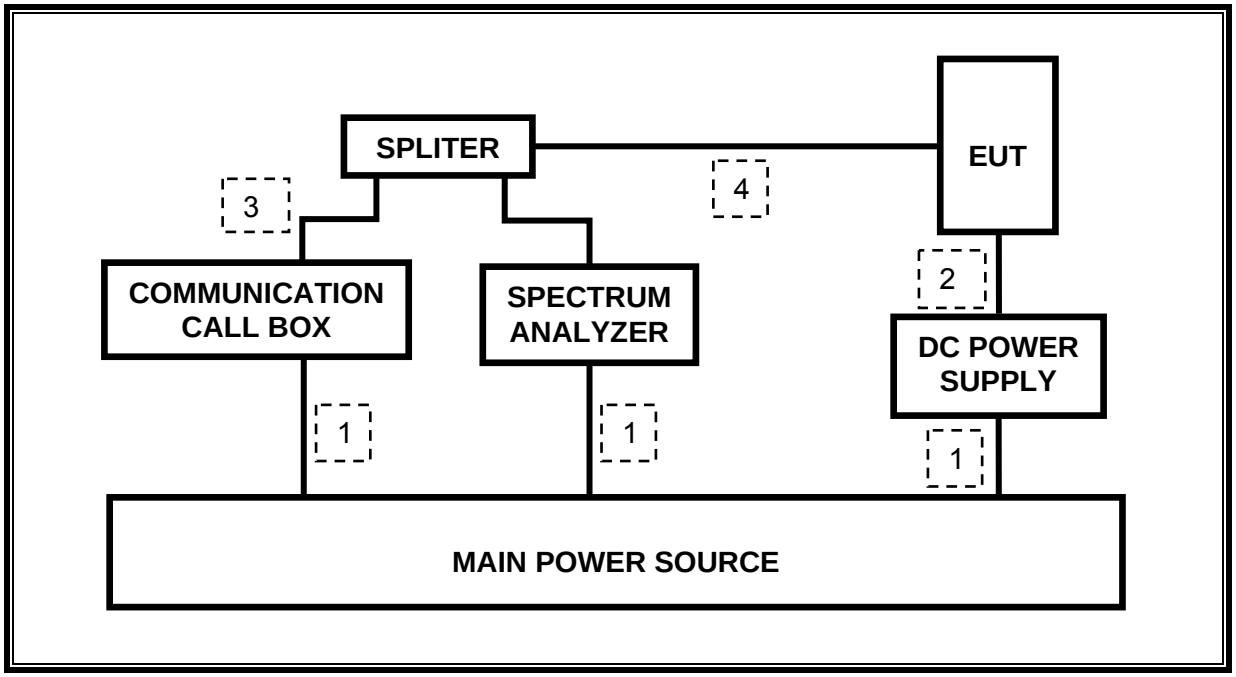
I/O CABLE LIST						
Cable No.	**Port**	**# of Identic Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	3	AC	UN-SHELDED	2.0 m	N/A
2	DC	1	4 Pins	UN-SHELDED	0.9 m	N/A
3	RF	1	SMA	SHELDED	0.6 m	N/A
4	RF	1	RF	SHELDED	0.1m	N/A

I/O CABLES (RF Radiated Test)

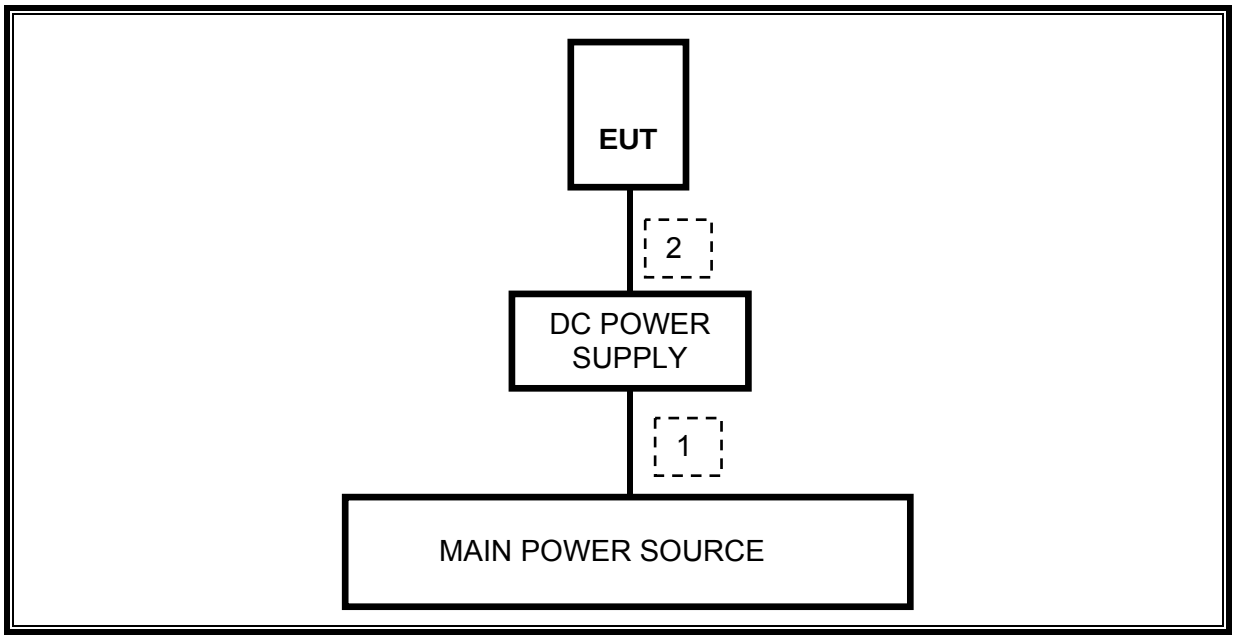
I/O CABLE LIST						
Cable No.	**Port**	**# of Identic Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	3	AC	UN-SHELDED	2.0 m	N/A
2	DC	1	4 Pins Connector	UN-SHELDED	0.9 m	N/A

TEST SETUP

CONDUCTED SETUP DIAGRAM FOR TESTS



RADIATED SETUP DIAGRAM FOR 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**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	01/19/12
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	04/07/12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/12
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/12
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/17/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/12/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/12/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/27/12
Communications Test Set	Agilent / HP	E5515C	C01086	09/17/12
Communication Test Set	R & S	CMW500	N/A	01/25/12
Radio Communication Analizer	Anritsu	MT8820C		06/17/12
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	04/20/12
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689`	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Directional Coupler, 4.2 GHz, 40 dB	A-R	DC7144A	C00983	CNR
Sleeve Dipole 1730~2030 MHz	ETS	3126-1880	C01157	10/27/12
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/14/12
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	07/10/12

7. RF POWER OUTPUT VERIFICATION

7.1. RF POWER OUTPUT FOR GSM MODE

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 > CS4 (GPRS) and MCS9 (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

GPRS FOR CELL AND PCS BAND

Mode	Ch.	f (MHz)	1 time slots		2 time slots	
			Peak	Average	peak	Average
GPRS	128	824.2	32.7	32.5	32.6	32.3
	190	836.6	**32.7**	**32.5**	32.4	32.3
	251	848.8	32.5	32.2	32.4	32.1
GPRS	512	1850.2	**29.2**	**29.0**	29.1	28.9
	661	1880	29.0	28.9	28.9	28.8
	810	1909.8	28.9	28.8	28.9	28.7

EGPRS FOR CELL AND PCS BAND

Mode	Ch.	f (MHz)	1 time slots		2 time slots		3 time slots		4 time slots	
			Peak	Average	Peak	Average	Peak	Average	Peak	Average
EGPRS	128	824.2	29.16	26.04	28.97	25.96	29.00	25.88	28.74	25.50
	190	836.6	29.11	26.03	29.00	25.93	28.92	25.74	28.84	25.60
	251	848.8	29.10	26.03	28.99	25.93	28.92	25.77	28.72	25.63
EGPRS	512	1850.2	27.92	25.00	27.98	24.81	27.84	24.72	27.72	24.57
	661	1880.0	27.99	24.91	28.08	25.00	27.91	24.95	27.91	27.78
	810	1909.8	27.96	24.92	28.08	25.02	27.97	24.79	27.95	24.78

7.2. RF POWER OUTPUT FOR UMTS REL99

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
	βc	Not Applicable
	βd	Not Applicable
	βec	Not Applicable
	βc/βd	8/15
	βhs	Not Applicable
	βed	Not Applicable

Cell Band 850MHz REL 99

Band	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS 850	4132	4357	826.4	27.25
	4180	4405	836.4	27.52
	4230	4455	846.0	**27.60**

AWS Band 1700MHz REL 99

Band	SUB Test	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm
AWS1700	2	1312	1537	1712.4	**27.46**
		1413	1638	1732.6	26.63
		1513	1738	1752.6	27.19

PCS Band 1900MHz REL 99

Band	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS 1900	9262	9662	1852.4	26.24
	9400	9800	1880.0	**27.05**
	9538	9938	1907.6	26.61

7.3. RF POWER OUTPUT FOR UMTS Rel 6 HSDPA

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			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βec	-	-	-	-
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	βed	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			
	Ahs = βhs/βc	30/15			

RESULT

RF OUTPUT POWER RESULT FOR UMTS 850 HSDPA

Band	SUB Test	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS850	1	4132	4357	826.4	27.59
		4180	4405	836.0	27.60
		4230	4455	846.0	27.81
	2	4132	4357	826.4	27.71
		4180	4405	836.0	27.93
		4230	4455	846.0	**28.00**
	3	4132	4357	826.4	27.35
		4180	4405	836.0	27.19
		4230	4455	846.0	27.58
	4	4132	4357	826.4	27.56
		4180	4405	836.0	27.39
		4230	4455	846.0	27.56

RF OUTPUT POWER RESULT FOR UMTS1900 HSDPA

Band	SUB Test	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS1900	1	9262	9662	1852.4	26.27
		9400	9800	1880.0	27.68
		9538	9938	1907.6	26.95
	2	9262	9662	1852.4	26.44
		9400	9800	1880.0	**27.91**
		9538	9938	1907.6	27.16
	3	9262	9662	1852.4	26.34
		9400	9800	1880.0	27.31
		9538	9938	1907.6	26.41
	4	9262	9662	1852.4	26.55
		9400	9800	1880.0	27.51
		9538	9938	1907.6	21.77

RF OUTPUT POWER RESULT FOR UMTS1700 HSDPA

Band	SUB Test	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS1700	1	1312	1537	1712.4	28.31
		1412	1637	1732.4	27.43
		1513	1738	1752.6	28.20
	2	1312	1537	1712.4	**28.97**
		1412	1637	1732.4	28.02
		1513	1738	1752.6	28.83
	3	1312	1537	1712.4	28.67
		1412	1637	1732.4	27.95
		1513	1738	1752.6	28.74
	4	1312	1537	1712.4	28.83
		1412	1637	1732.4	27.85
		1513	1738	1752.6	28.67

7.4. RF POWER OUTPUT UMTS Rel 6 HSPA (HSDPA & HSUPA)

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				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	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				
	Ahs = βhs/βc	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

RF OUTPUT POWER RESULT FOR Cell Band 850MHz HSUPA

Band	SUB Test	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS850	1	4132	4357	826.4	27.41
		4180	4405	836.4	27.64
		4230	4455	846.6	27.63
	2	4132	4357	826.4	27.57
		4180	4405	836.4	27.80
		4230	4455	846.6	27.74
	3	4132	4357	826.4	27.93
		4180	4405	836.4	27.81
		4230	4455	846.6	**27.90**
	4	4132	4357	826.4	27.49
		4180	4405	836.4	27.79
		4230	4455	846.6	27.71
	5	4132	4357	826.4	27.44
		4180	4405	836.4	27.62
		4230	4455	846.6	27.75

RF OUTPUT POWER RESULT FOR Cell Band 1900MHz HSUPA

Band	SUB Test	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS1900	1	9262	9662	1852.4	26.33
		9400	9800	1880.0	27.48
		9538	9938	1907.6	27.14
	2	9262	9662	1852.4	27.56
		9400	9800	1880.0	26.92
		9538	9938	1907.6	26.83
	3	9262	9662	1852.4	27.27
		9400	9800	1880.0	**27.61**
		9538	9938	1907.6	27.48
	4	9262	9662	1852.4	26.47
		9400	9800	1880.0	27.45
		9538	9938	1907.6	26.61
	5	9262	9662	1852.4	26.23
		9400	9800	1880.0	27.51
		9538	9938	1907.6	26.30

RF OUTPUT POWER RESULT FOR AWS Band 1700MHz HSUPA

Band	SUB Test	UL Ch	DL Ch	Frequency	Peak Conducted Output Power (dBm)
UMTS1900	1	1312	1537	1712.4	28.12
		1412	1637	1732.4	27.43
		1513	1738	1752.6	28.28
	2	1312	1537	1712.4	28.44
		1412	1637	1732.4	27.42
		1513	1738	1752.6	28.62
	3	1312	1537	1712.4	28.31
		1412	1637	1732.4	27.45
		1513	1738	1752.6	**28.70**
	4	1312	1537	1712.4	28.11
		1412	1637	1732.4	27.58
		1513	1738	1752.6	27.91
	5	1312	1537	1712.4	27.54
		1412	1637	1732.4	27.20
		1513	1738	1752.6	28.67

7.5. RF POWER OUTPUT FOR LTE BAND 17

5 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
5	23755	706.5	QPSK	1	0	28.33
				1	24	28.20
				12	6	28.77
				25	0	**28.83**
			16QAM	1	0	28.02
				1	24	28.03
				12	6	29.05
				25	0	**29.45**
	23790	710.0	QPSK	1	0	28.35
				1	24	28.17
				12	6	28.51
				25	0	**28.57**
			16QAM	1	0	27.40
				1	24	27.84
				12	6	28.47
				25	0	**29.05**
	23825	713.5	QPSK	1	0	28.35
				1	24	28.05
				12	6	28.60
				25	0	**28.70**
			16QAM	1	0	27.88
				1	24	27.70
				12	6	28.37
				25	0	**29.42**

10 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
10	23780	709.0	QPSK	1	0	**28.71**
				1	49	28.27
				25	12	28.51
				50	0	28.53
			16QAM	1	0	28.48
				1	49	28.02
				25	12	28.23
				50	0	**28.57**
	23790	710.0	QPSK	1	0	28.52
				1	49	27.90
				25	12	28.27
				50	0	**28.94**
			16QAM	1	0	28.38
				1	49	27.82
				25	12	28.40
				50	0	**28.90**
	23800	711.0	QPSK	1	0	28.66
				1	49	28.05
				25	12	28.22
				50	0	**28.77**
			16QAM	1	0	28.65
				1	49	27.87
				25	12	28.37
				50	0	**29.00**

7.6. RF POWER OUTPUT FOR LTE BAND 4

1.4 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
1.4	19957	1710.7	QPSK	1	0	28.71
				1	5	28.80
				3	1	**28.87**
				6	0	28.21
			16QAM	1	0	28.44
				1	5	28.53
				3	1	28.72
				6	0	**29.22**
	20175	1732.5	QPSK	1	0	27.53
				1	5	27.48
				3	1	27.51
				6	0	**28.15**
			16QAM	1	0	27.17
				1	5	27.13
				3	1	27.60
				6	0	**28.02**
	20393	1754.3	QPSK	1	0	28.71
				1	5	28.63
				3	1	**28.72**
				6	0	27.90
			16QAM	1	0	28.30
				1	5	28.28
				3	1	28.53
				6	0	**29.03**

3 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
3	19965	1711.5	QPSK	1	0	28.84
				1	14	**28.99**
				8	4	28.30
				15	0	28.55
			16QAM	1	0	27.71
				1	14	27.83
				8	4	28.14
				15	0	**29.01**
	20175	1732.5	QPSK	1	0	27.46
				1	14	27.42
				8	4	27.46
				15	0	**28.08**
			16QAM	1	0	26.61
				1	14	26.65
				8	4	27.20
				15	0	**27.58**
	20385	1753.5	QPSK	1	0	28.50
				1	14	**28.64**
				8	4	28.41
				15	0	28.30
			16QAM	1	0	27.65
				1	14	27.70
				8	4	**28.31**
				15	0	28.28

5 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
5	19975	1712.5	QPSK	1	0	28.18
				1	24	28.29
				12	6	28.32
				25	0	**28.33**
			16QAM	1	0	27.90
				1	24	28.09
				12	6	28.57
				25	0	**28.89**
	20175	1732.5	QPSK	1	0	27.02
				1	24	27.04
				12	6	27.14
				25	0	**27.72**
			16QAM	1	0	26.90
				1	24	26.92
				12	6	26.92
				25	0	**28.08**
	20375	1752.5	QPSK	1	0	**28.30**
				1	24	28.15
				12	6	28.13
				25	0	28.20
			16QAM	1	0	28.10
				1	24	28.08
				12	6	28.24
				25	0	**28.56**

10 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
10	20000	1715.0	QPSK	1	0	28.38
				1	49	28.38
				25	12	28.16
				50	0	**28.80**
			16QAM	1	0	28.02
				1	49	27.81
				25	12	28.25
				50	0	**28.75**
	20175	1732.5	QPSK	1	0	27.20
				1	49	27.23
				25	12	27.05
				50	0	**27.29**
			16QAM	1	0	27.01
				1	49	26.91
				25	12	26.95
				50	0	**27.88**
	20350	1750.0	QPSK	1	0	28.12
				1	49	28.15
				25	12	28.10
				50	0	**28.73**
			16QAM	1	0	28.57
				1	49	27.70
				25	12	27.85
				50	0	**28.62**

15 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
15	20025	1717.5	QPSK	1	0	27.87
				1	74	25.25
				36	18	28.18
				75	0	**28.55**
			16QAM	1	0	**28.30**
				1	74	27.72
				36	18	28.06
				75	0	28.23
	20175	1732.5	QPSK	1	0	27.70
				1	74	27.49
				36	18	27.10
				75	0	**27.97**
			16QAM	1	0	27.26
				1	74	27.17
				36	18	26.75
				75	0	**27.59**
	20325	1747.5	QPSK	1	0	27.50
				1	74	28.08
				36	18	28.03
				75	0	**28.37**
			16QAM	1	0	27.70
				1	74	**28.48**
				36	18	28.09
				75	0	28.41

20 MHz BANDWIDTH

Ch. BW (MHz)	UL Ch #.	Freq. (MHz)	Mode	RB SIze	RB Offset	Actual Peak Pwr (dBm)
20	20050	1720.0	QPSK	1	0	27.93
				1	99	27.12
				50	19	28.42
				100	0	**28.51**
			16QAM	1	0	28.10
				1	99	27.10
				50	19	27.75
				100	0	**28.19**
	20175	1732.5	QPSK	1	0	27.82
				1	99	27.47
				50	19	27.58
				100	0	**28.07**
			16QAM	1	0	27.70
				1	99	27.55
				50	19	26.91
				100	0	**27.85**
	20300	1745.0	QPSK	1	0	27.06
				1	99	27.88
				50	19	28.05
				100	0	**28.23**
			16QAM	1	0	27.36
				1	99	28.44
				50	19	28.01
				100	0	**28.21**

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
- WCDMA REL. 99 and HSDPA
- LTE BAND 4 and 17

RESULTS

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.2	241.3389	305.159
		190	836.6	244.1688	300.273
		251	848.8	241.8042	298.499
	EGPRS	128	824.2	245.9343	293.989
		190	836.6	241.3833	302.229
		251	848.8	240.5181	319.909
PCS	GPRS	512	1850.2	243.4758	303.902
		661	1880.0	239.7176	314.940
		810	1909.8	240.2124	295.308
	EGPRS	512	1850.2	242.1294	293.815
		661	1880.0	238.1985	301.186
		810	1909.8	240.5181	319.909

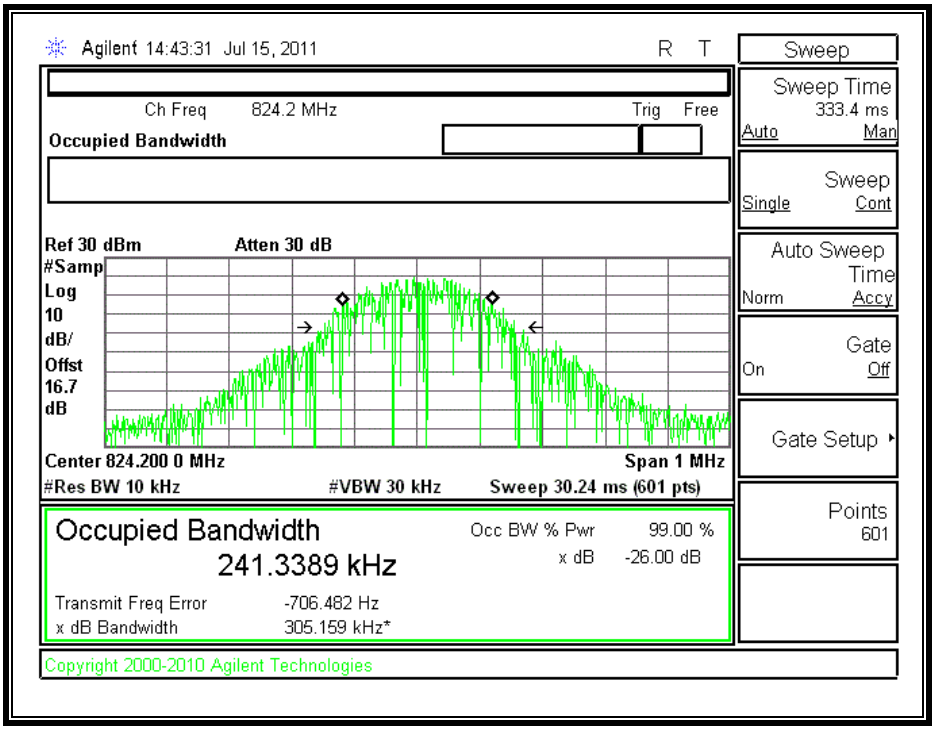
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cell	WCDMA, REL 99	4357	826.4	4.1222	4.565
		4405	836.0	4.1300	4.586
		4455	846.0	4.1576	4.631
	HSDPA REL 6	4357	826.4	4.1461	4.550
		4405	836.0	4.1447	4.601
		4455	846.0	4.1712	4.572
PCS	WCDMA, REL 99	9662	1852.4	4.1401	4.538
		9800	1880.0	4.1754	4.501
		9938	1907.6	4.1465	4.581
	HSDPA REL 6	9662	1852.4	4.1873	4.478
		9800	1880.0	4.1224	4.594
		9938	1907.6	4.1402	4.576
AWS	WCDMA, REL 99	1537	1712.4	4.1514	4.617
		1637	1732.4	4.0671	4.603
		1738	1752.6	4.1909	4.583
	HSDPA REL 6	1537	1712.4	4.0990	4.541
		1637	1732.4	4.1195	4.621
		1738	1752.6	4.1417	4.584

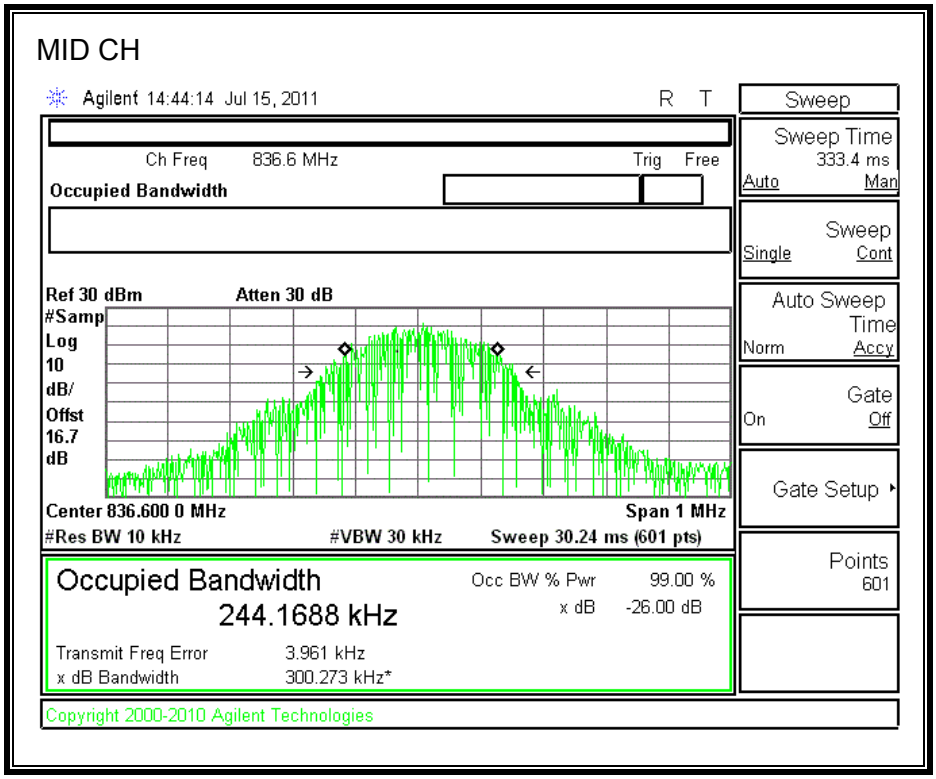
Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 4	1.4 MHz BAND QPSK	6/0	1710.7	1.0681	1.199
			1732.5	1.0641	1.167
			1754.3	1.0790	1.158
	1.4 MHz BAND 16QAM		1710.7	1.0776	1.139
			1732.5	1.0740	1.171
			1754.3	1.0656	1.170
	3.0 MHz BAND QPSK	15/0	1711.5	2.6717	2.838
			1732.5	2.6917	2.957
			1753.5	2.7331	2.963
	3.0 MHz BAND 16QAM		1711.5	2.6564	2.772
			1732.5	2.6605	2.875
			1753.5	2.6630	2.847
	5.0 MHz BAND QPSK	25/0	1712.5	4.4736	4.680
			1732.5	4.4654	4.647
			1752.5	4.4388	4.591
	5.0 MHz BAND 16QAM		1712.5	4.4407	4.634
			1732.5	4.4566	4.592
			1752.5	4.4489	4.632
	10.0 MHz BAND QPSK	50/0	1715.0	8.8418	9.223
			1732.5	8.8599	9.104
			1750.0	8.8762	9.126
	10.0 MHz BAND 16QAM		1715.0	8.8725	9.131
			1732.5	8.8209	9.118
			1750.0	8.8780	9.047
	15.0 MHz BAND QPSK	75/0	1717.7	13.2109	13.821
			1732.5	13.3165	13.831
			1747.5	13.3827	13.878
	15.0 MHz BAND 16QAM		1717.7	13.3298	13.889
			1732.5	13.332	14.250
			1747.5	13.3648	13.979
	20.0 MHz BAND QPSK	100/0	1720.0	17.7813	18.405
			1732.5	17.4877	18.353
			1745.0	17.5782	18.314
	20.0 MHz BAND 16QAM		1720.0	17.7705	18.358
			1732.5	17.7197	18.271
			1745.0	17.6660	18.321

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 17	5.0 MHz BAND QPSK	25/0	706.5	4.4519	4.584
			710.0	4.4605	4.601
			713.5	4.4379	4.661
	5.0 MHz BAND 16QAM		706.5	4.4666	4.590
			710.0	4.4756	4.569
			713.5	4.4455	4.581
	10.0 MHz BAND QPSK	50/0	709.0	8.8820	9.100
			710.5	8.8344	9.038
			711.0	8.8485	9.167
	10.0 MHz BAND 16QAM		709.0	8.8765	9.059
			710.5	8.8537	9.047
			711.0	8.8528	9.061

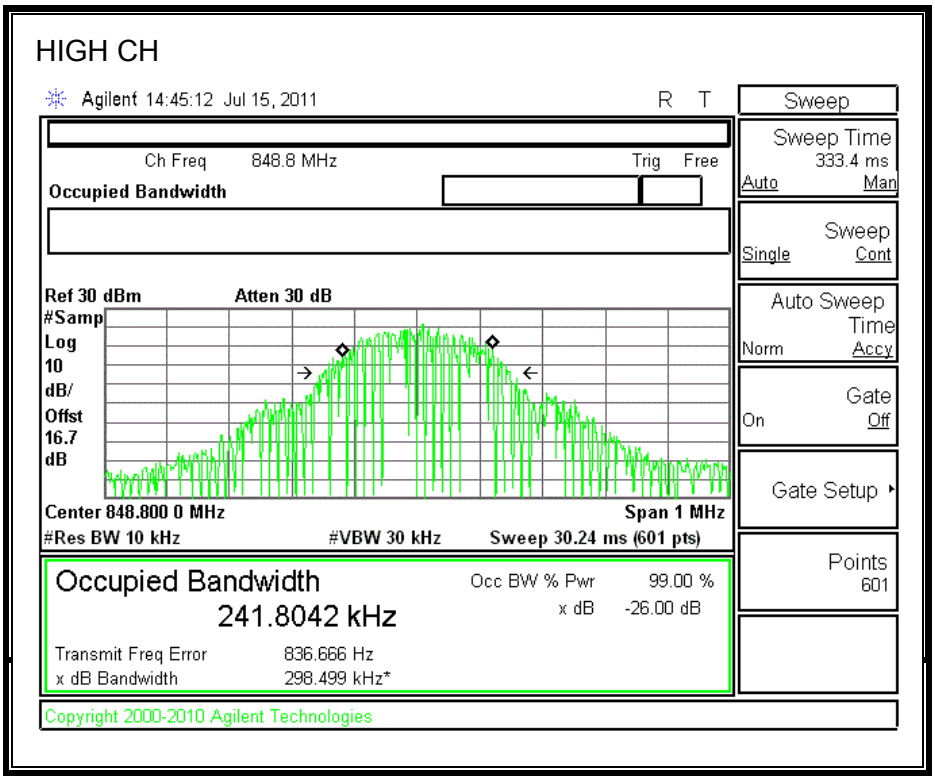
99% BANDWIDTH and 26dB

GPRS850 BAND



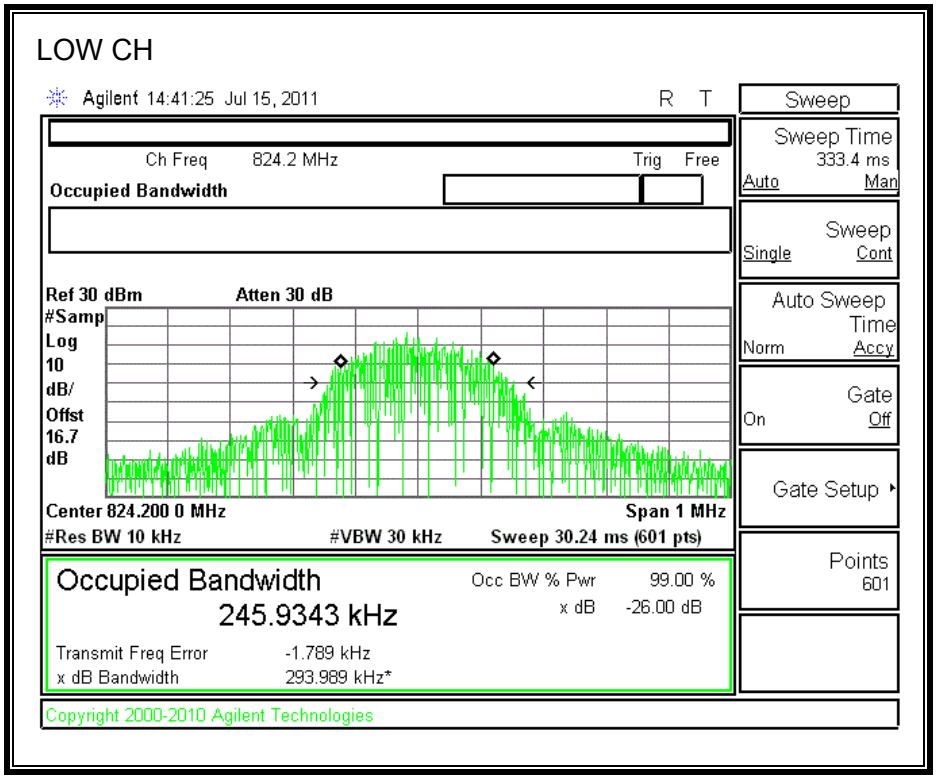


HIGH CH

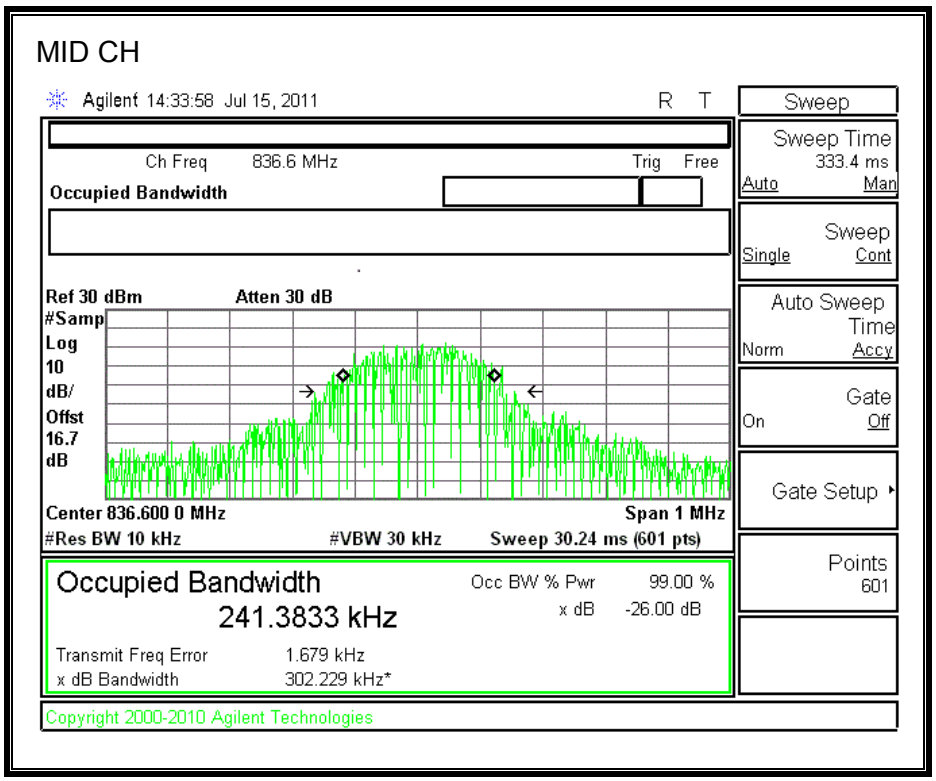


EGPRS850 BAND

LOW CH



MID CH



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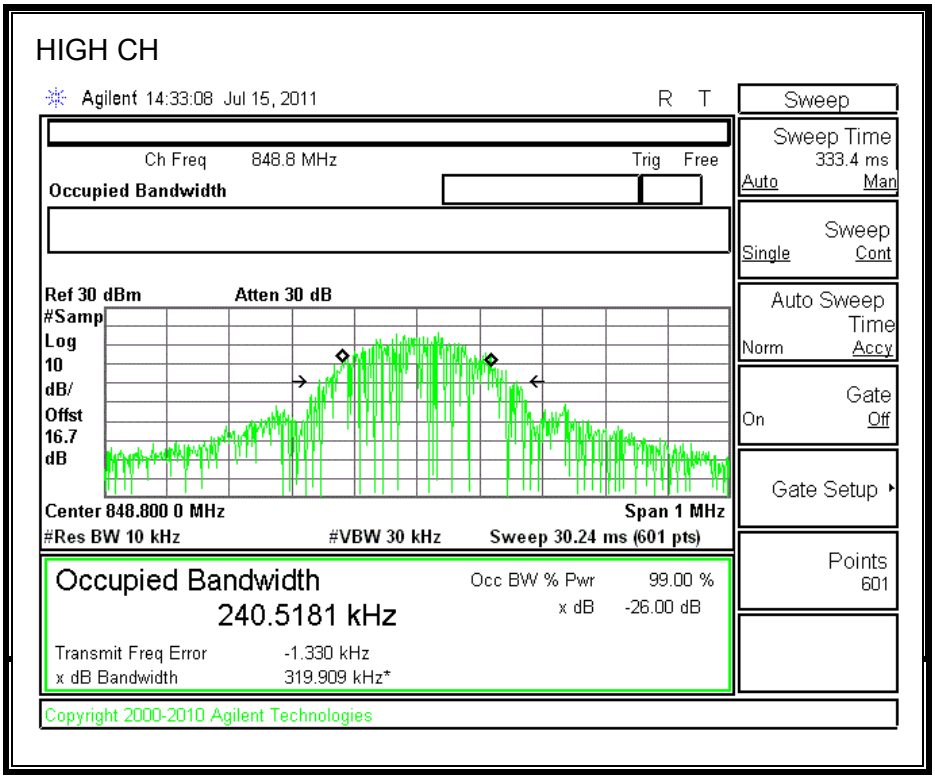
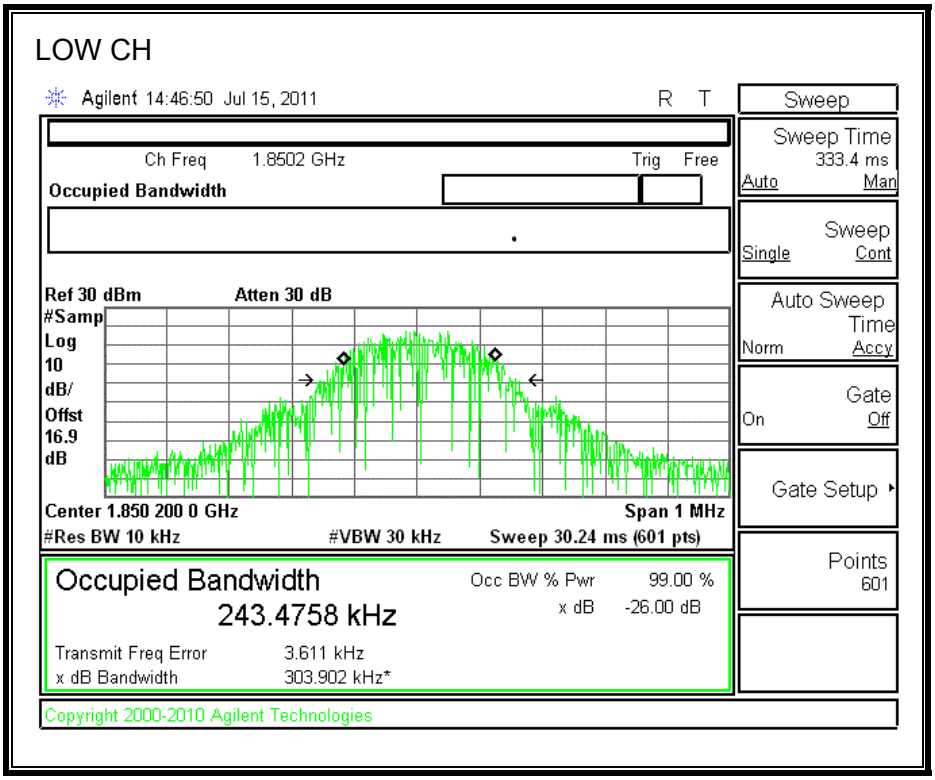


GPRS1900 BAND

LOW CH



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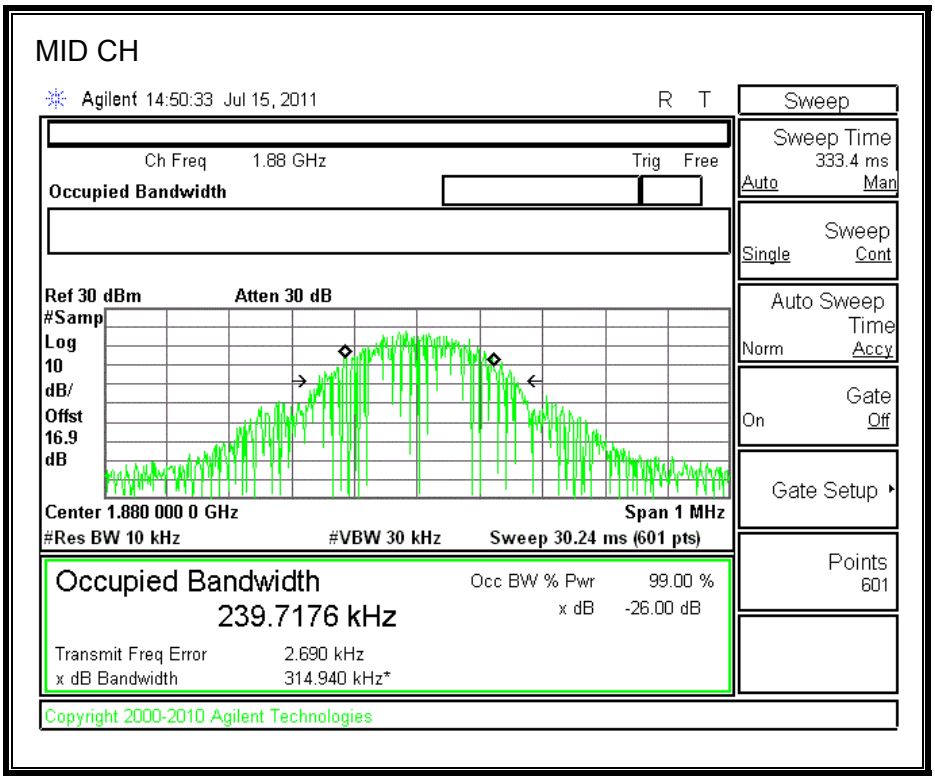

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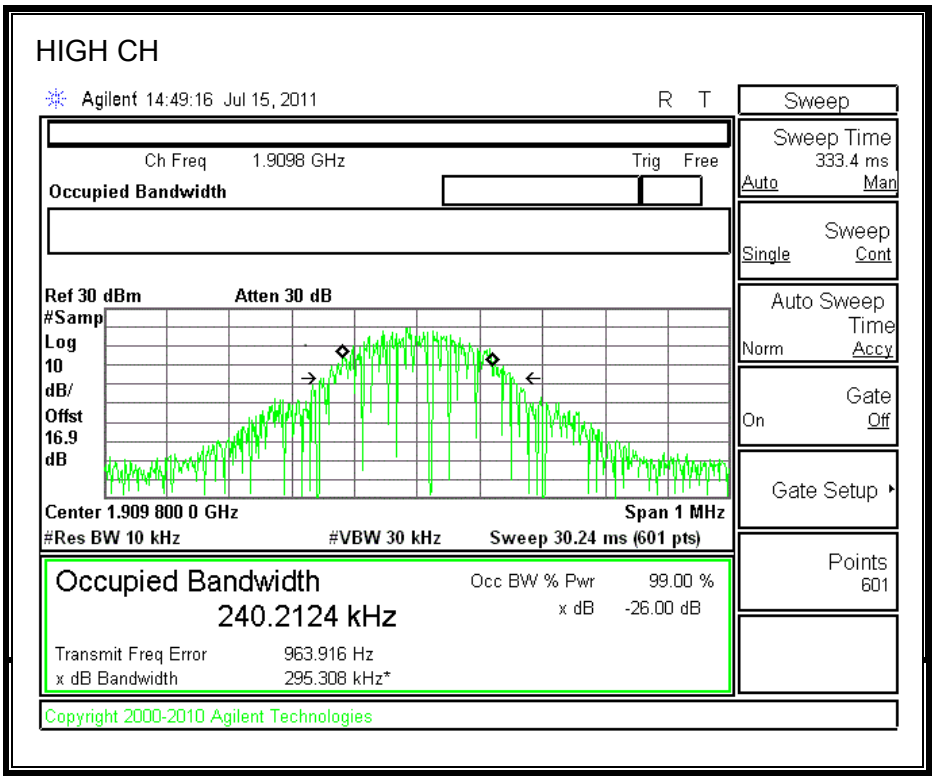
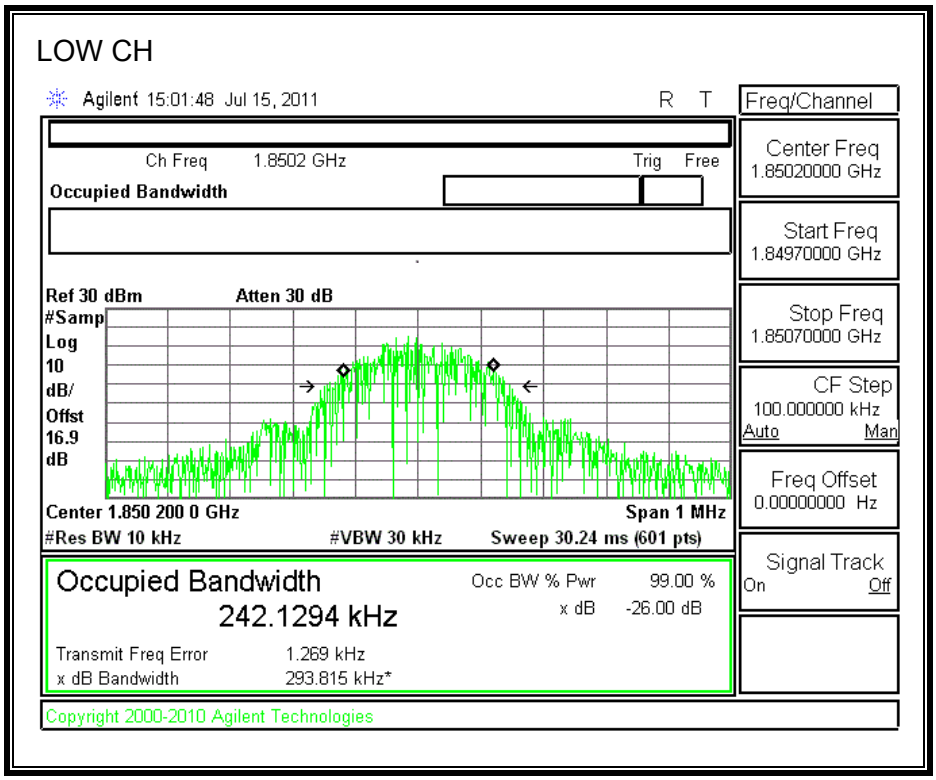


EGPRS1900 BAND

LOW CH



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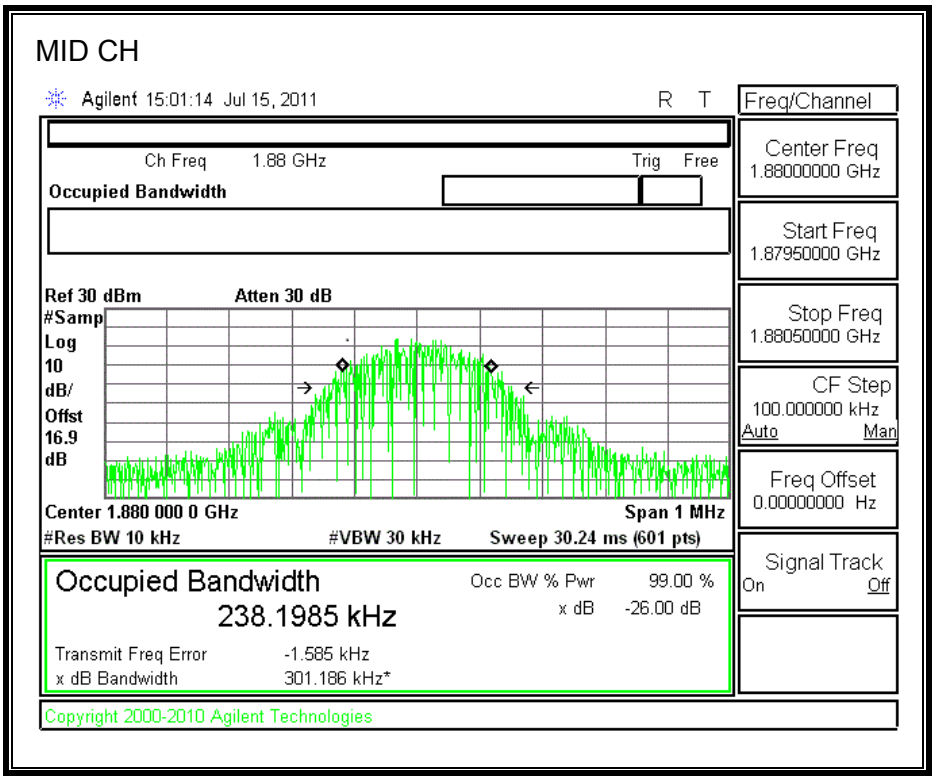

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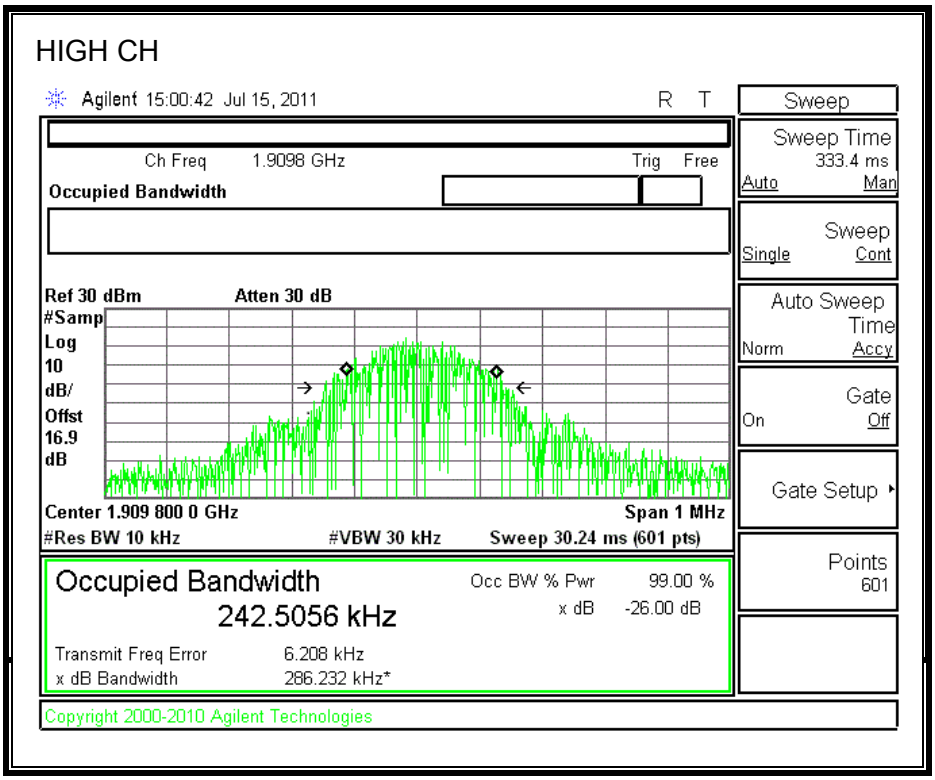
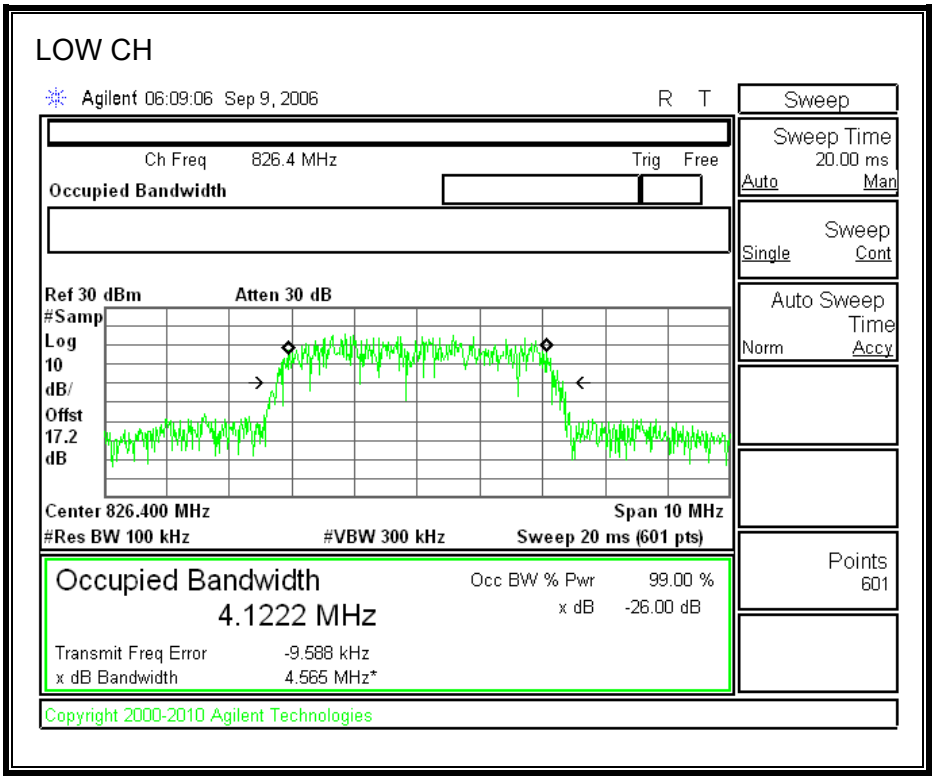
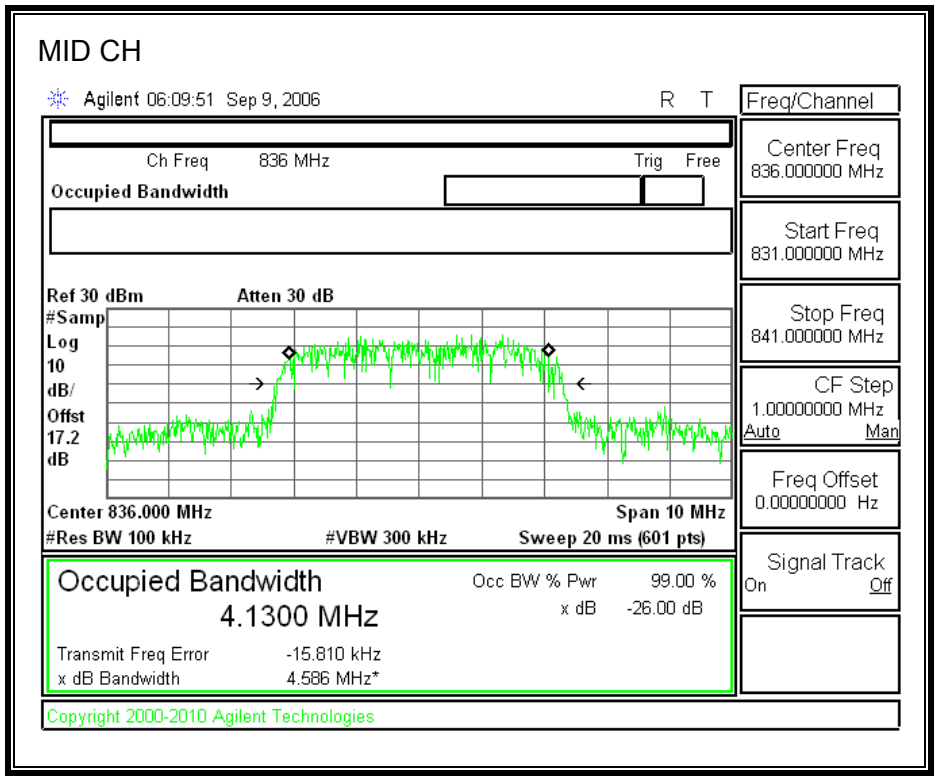


UMTS WCDMA Rel 99, Cell BAND

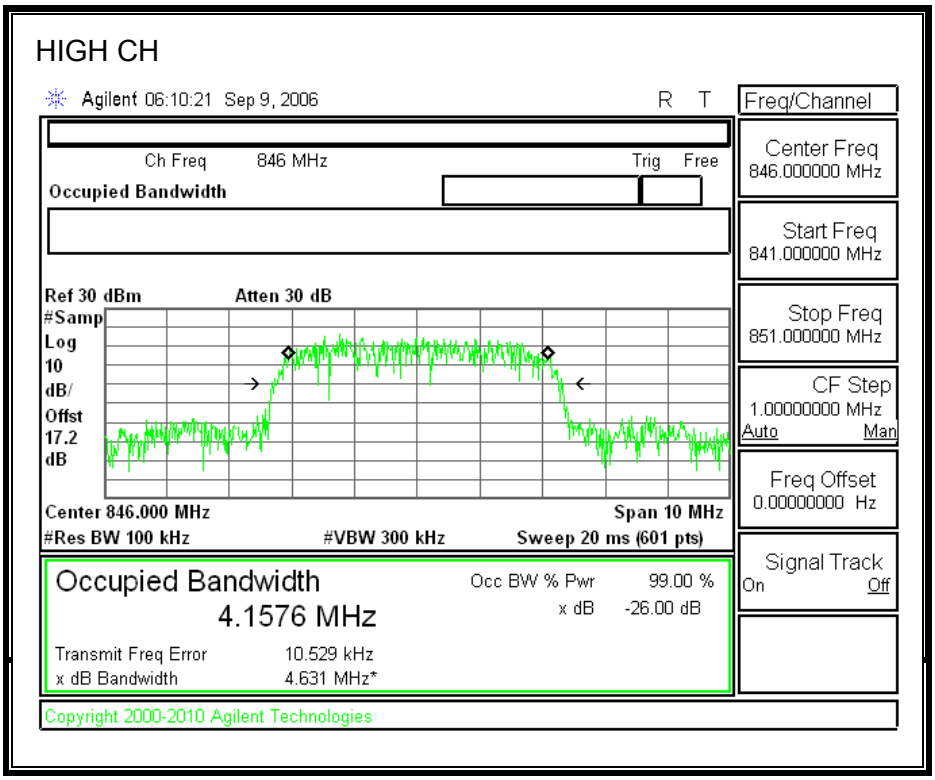
LOW CH



MID CH

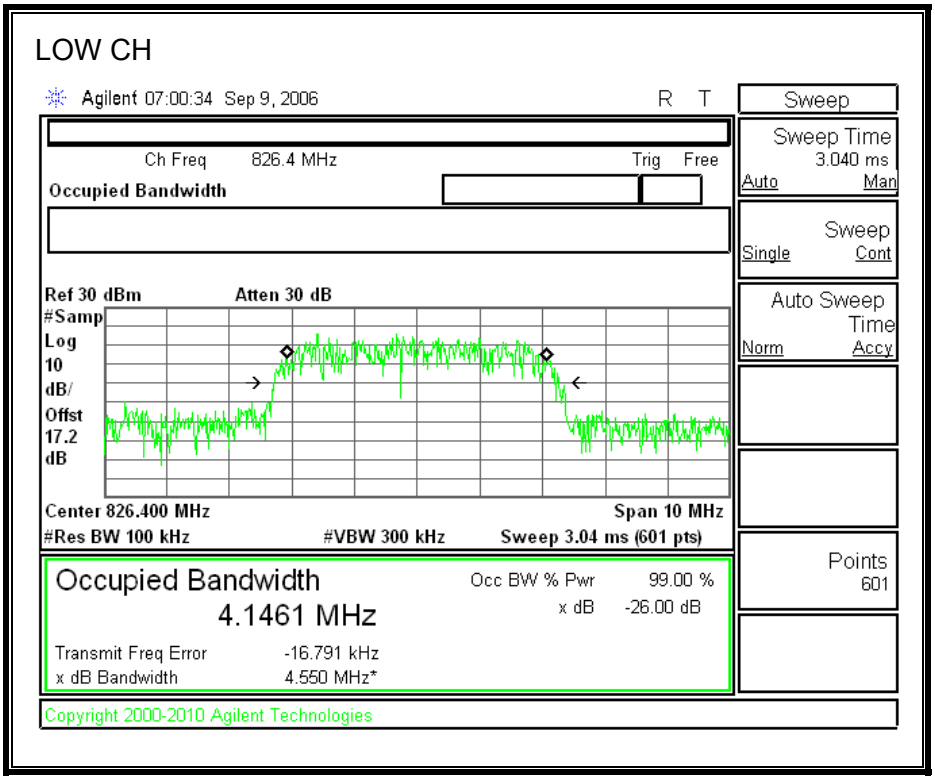


HIGH CH

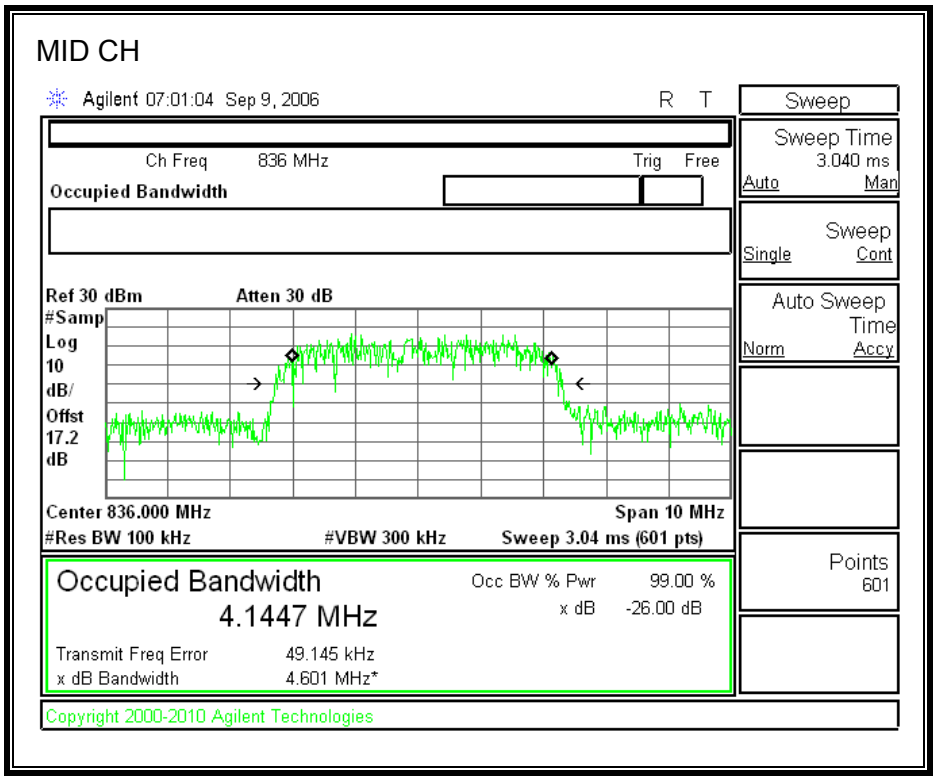


UMTS HSDPA Rel 6, Cell BAND

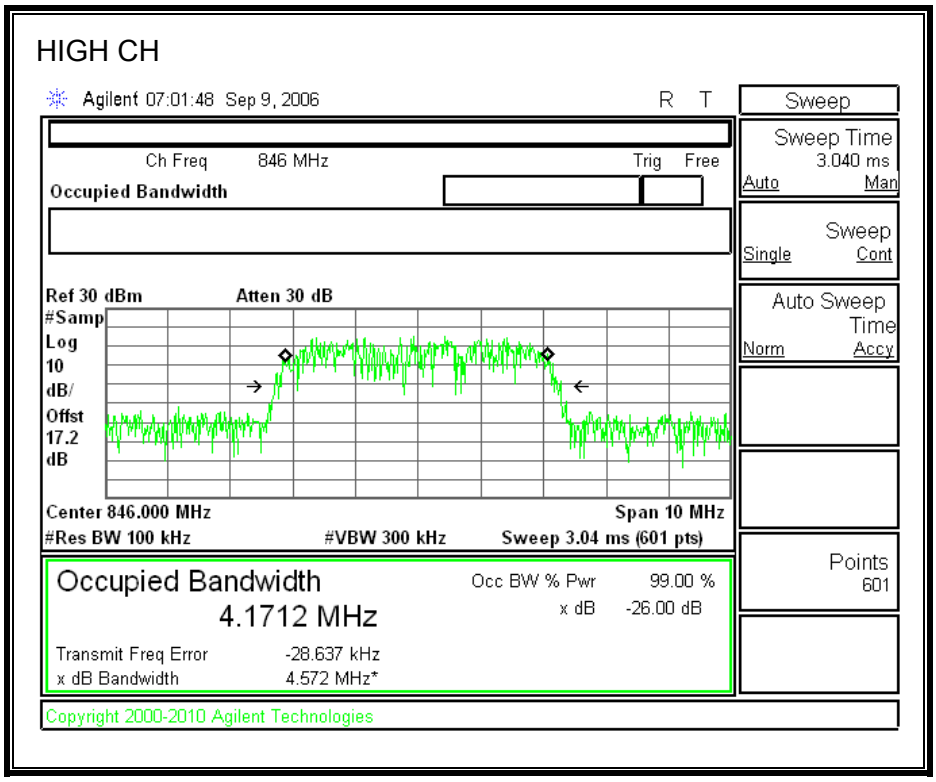
LOW CH



MID CH

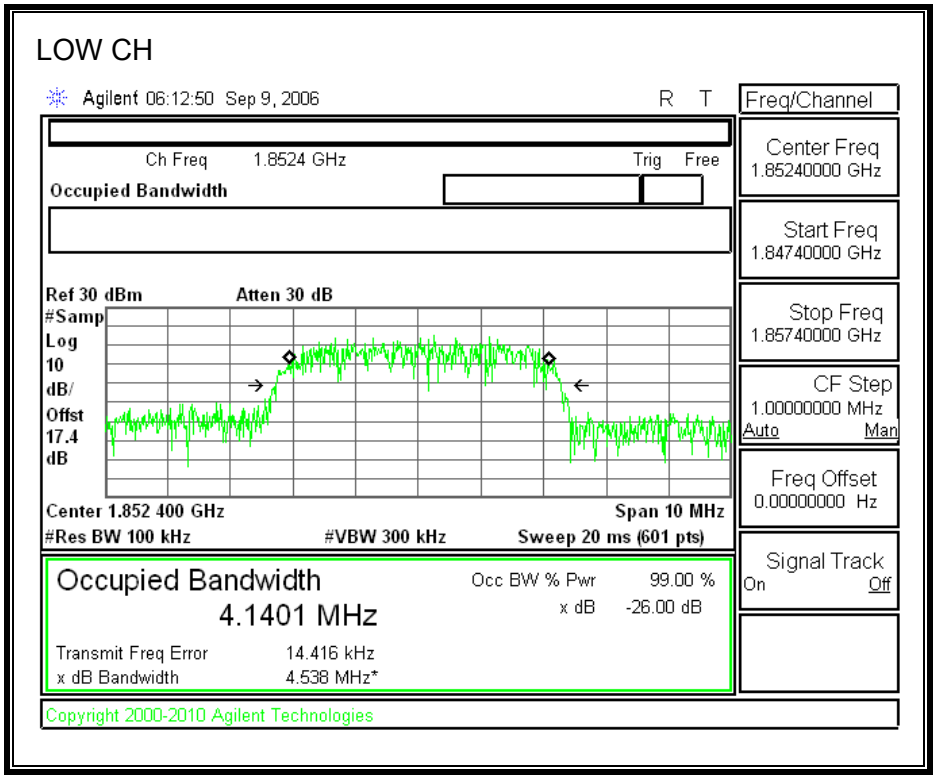


HIGH CH



UMTS WCDMA REL 99. PCS Band

LOW CH



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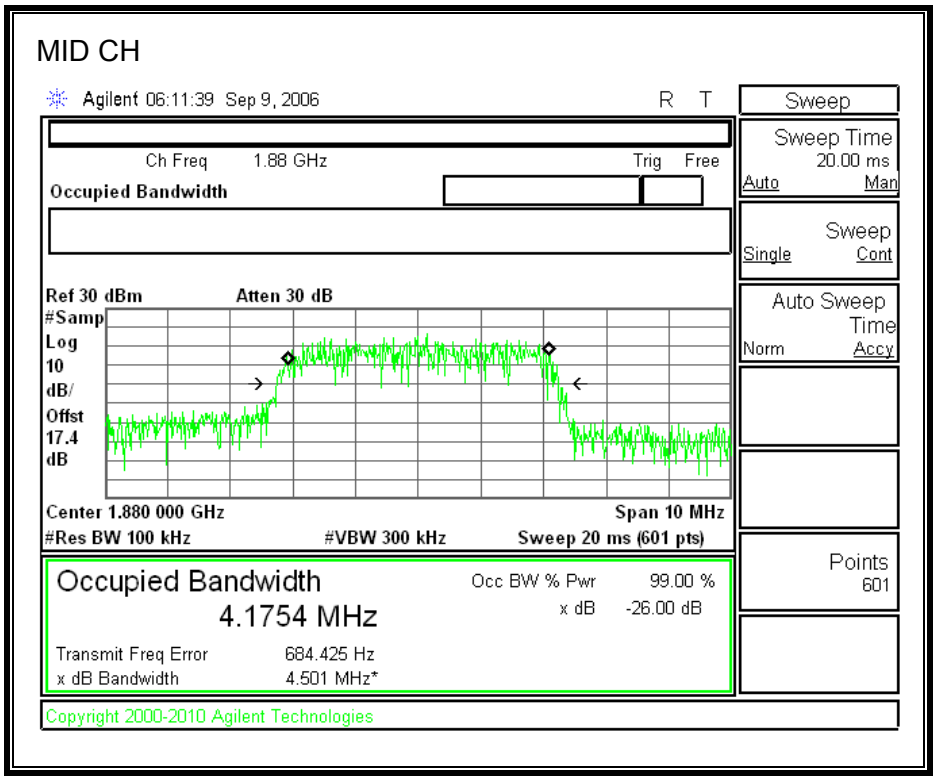

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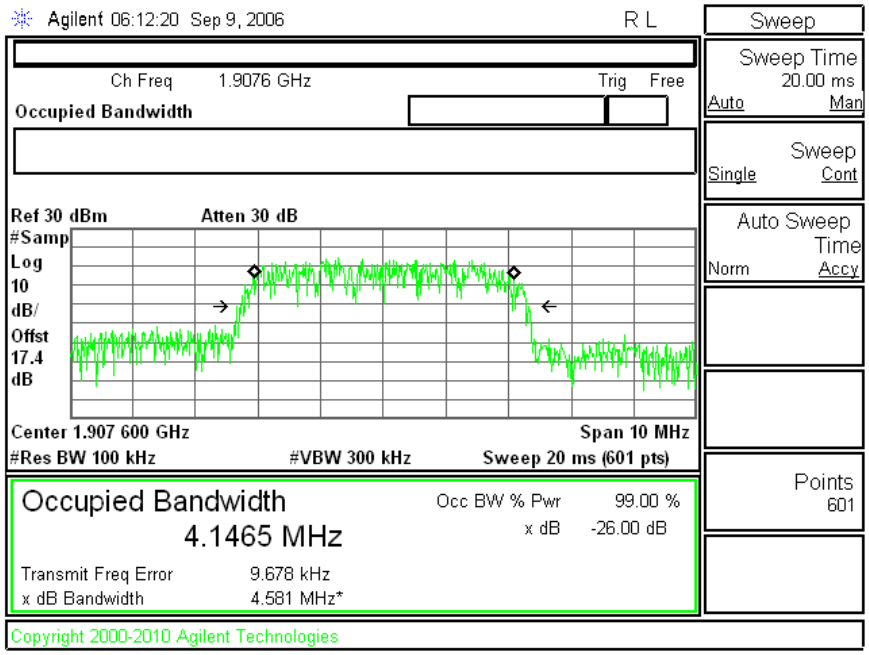
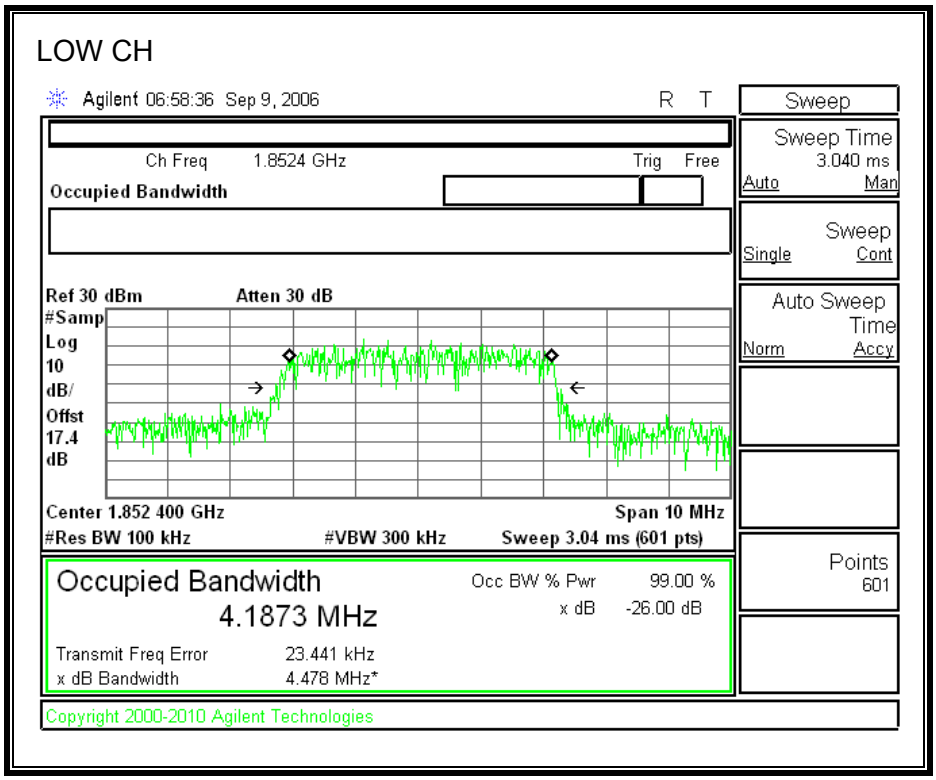


UMTS HSDPA Rel 6,. PCS Band

LOW CH



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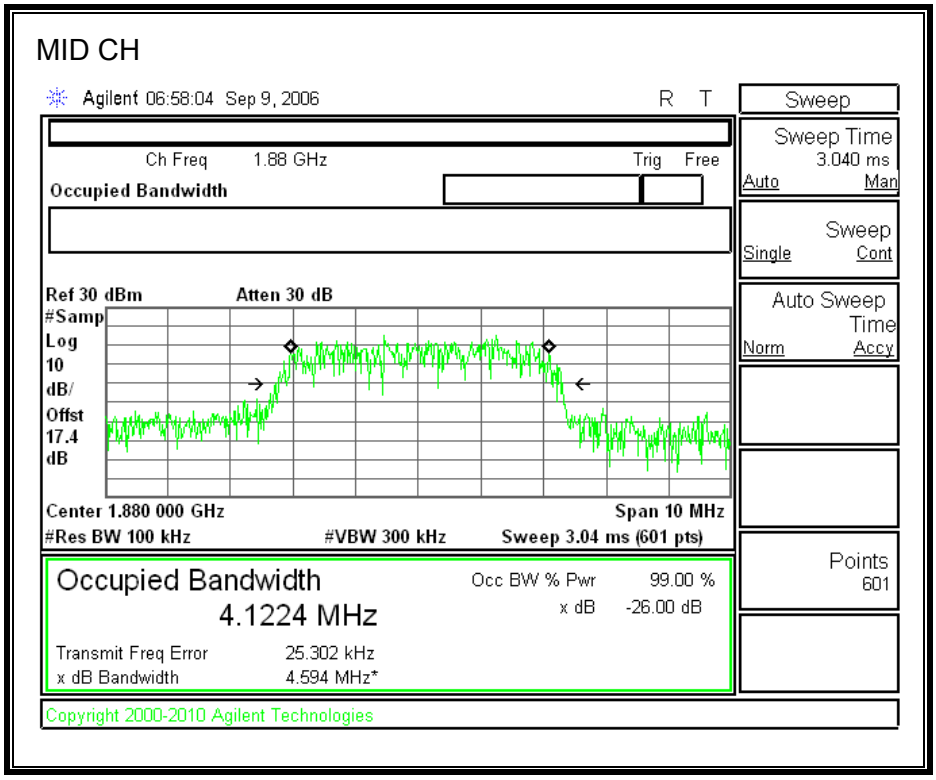

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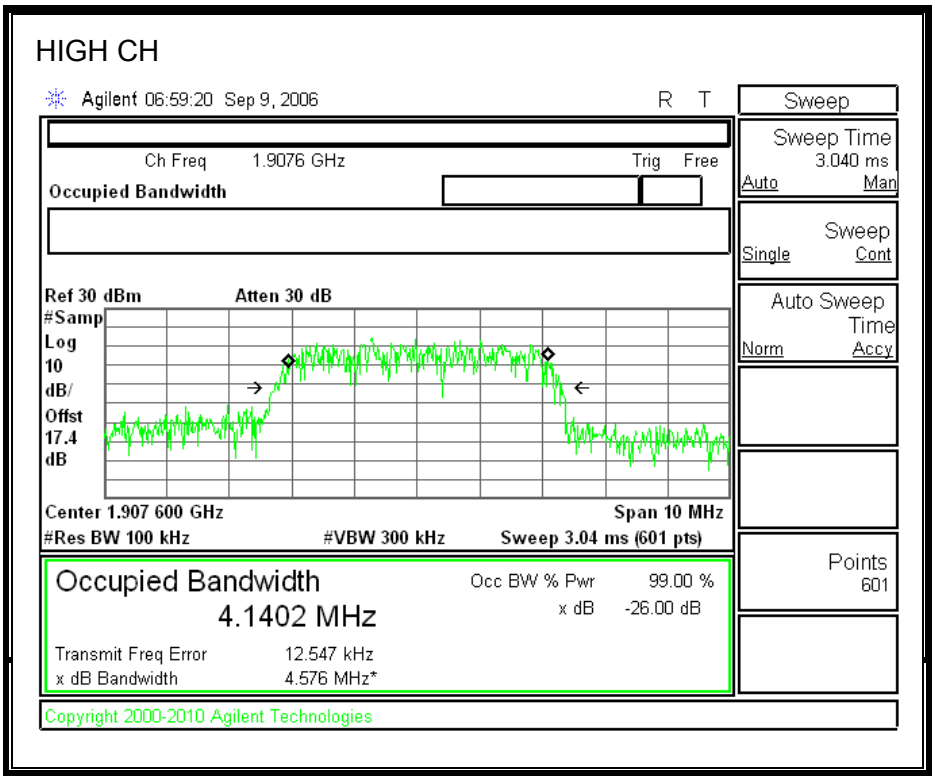
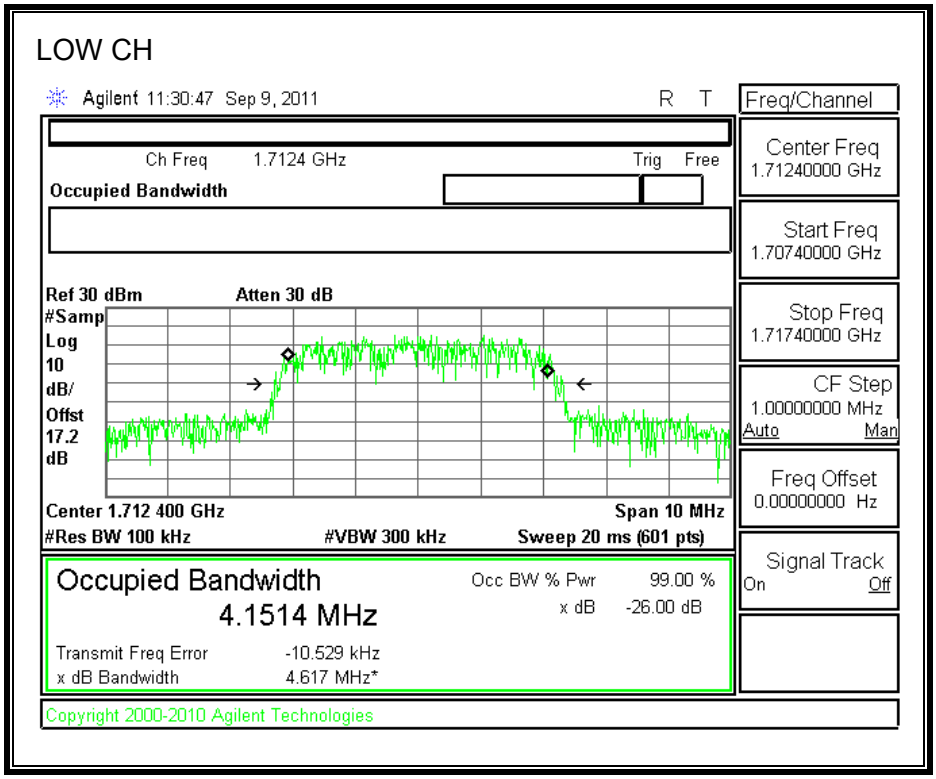
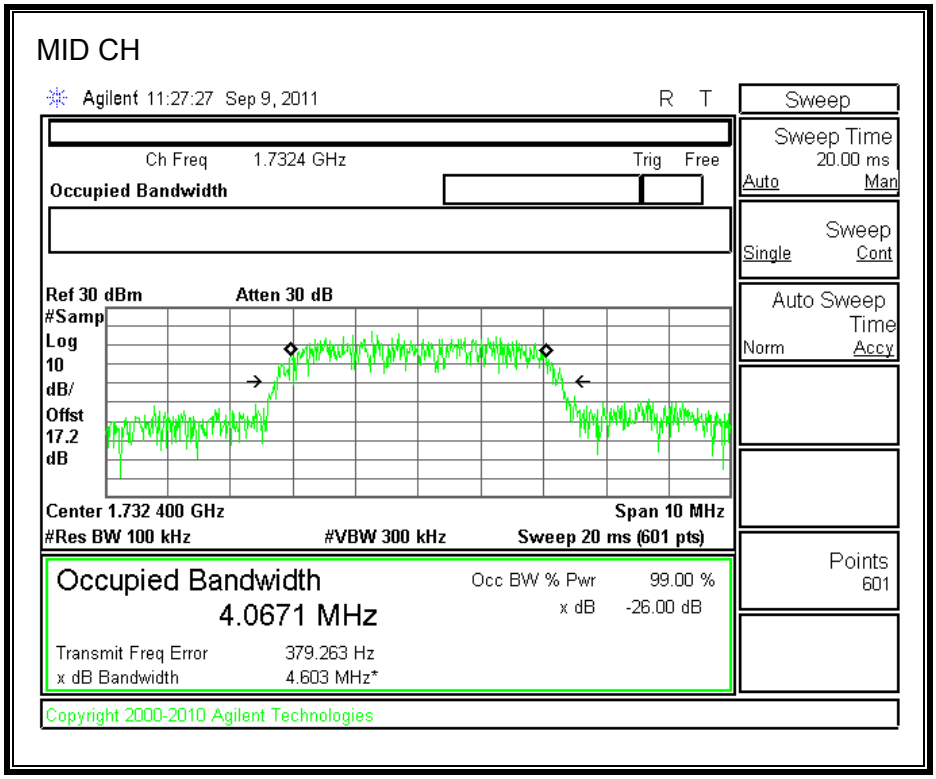


UMTS WCDMA REL 99. AWS Band

LOW CH



MID CH



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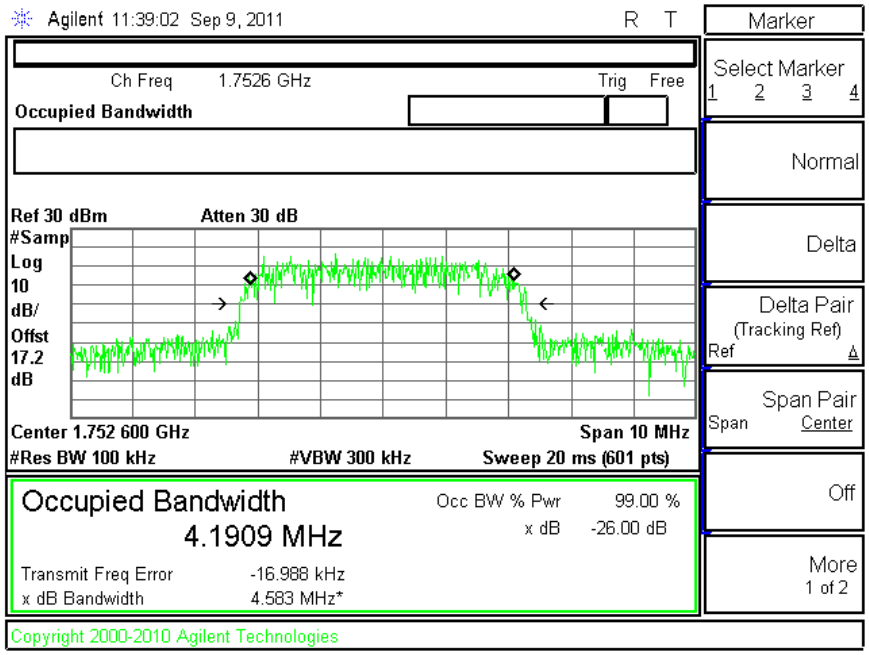
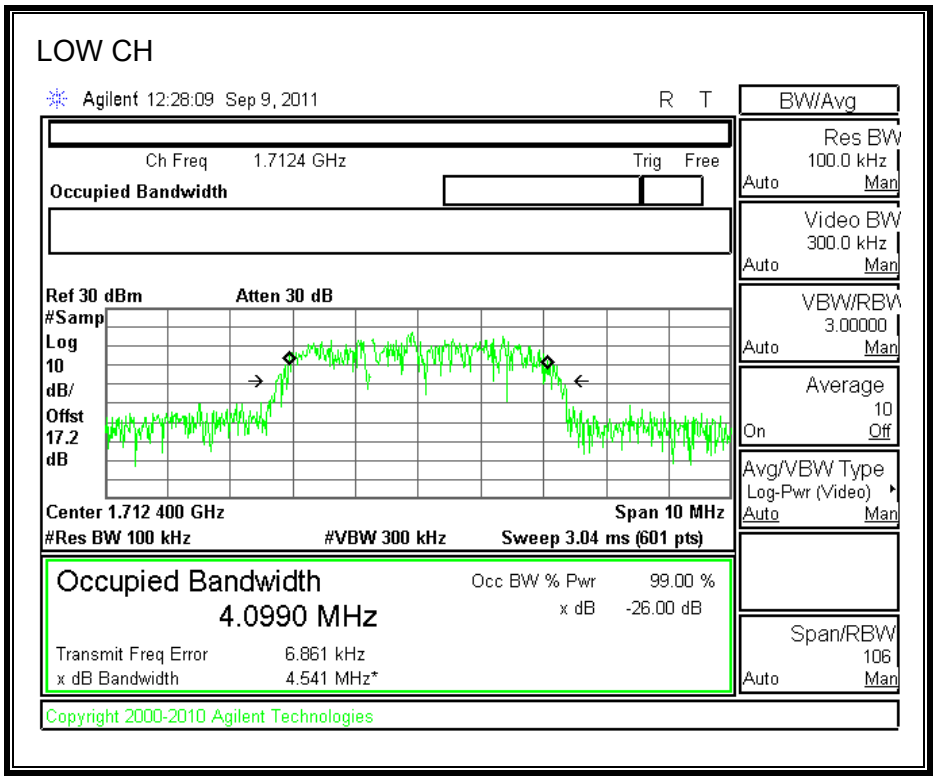


UMTS HSDPA Rel 6,. AWS Band

LOW CH



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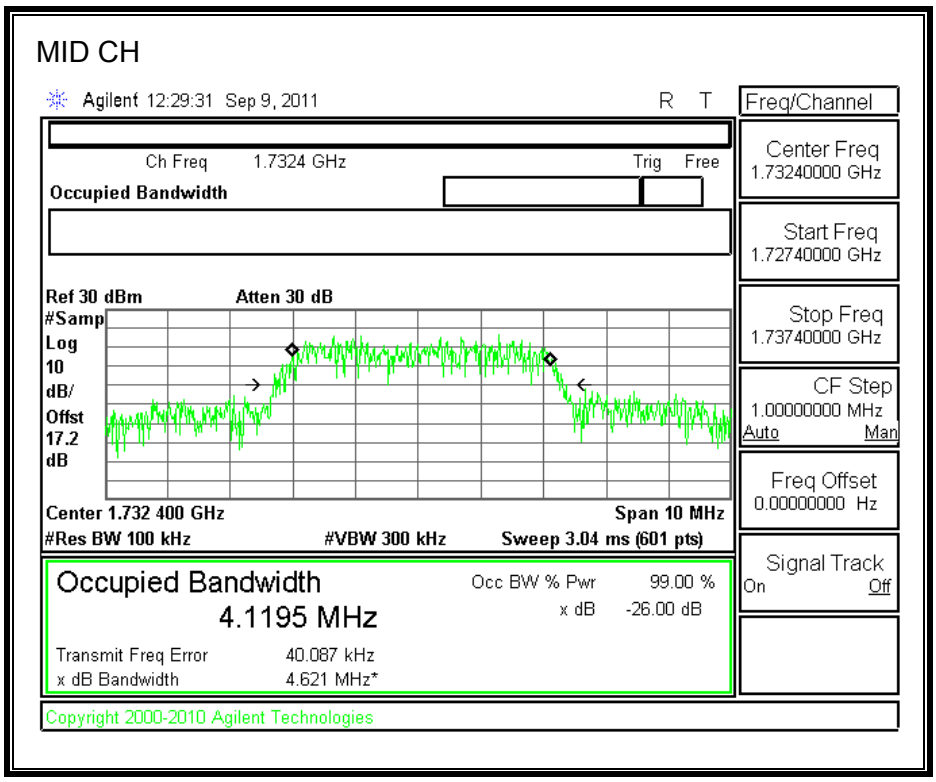
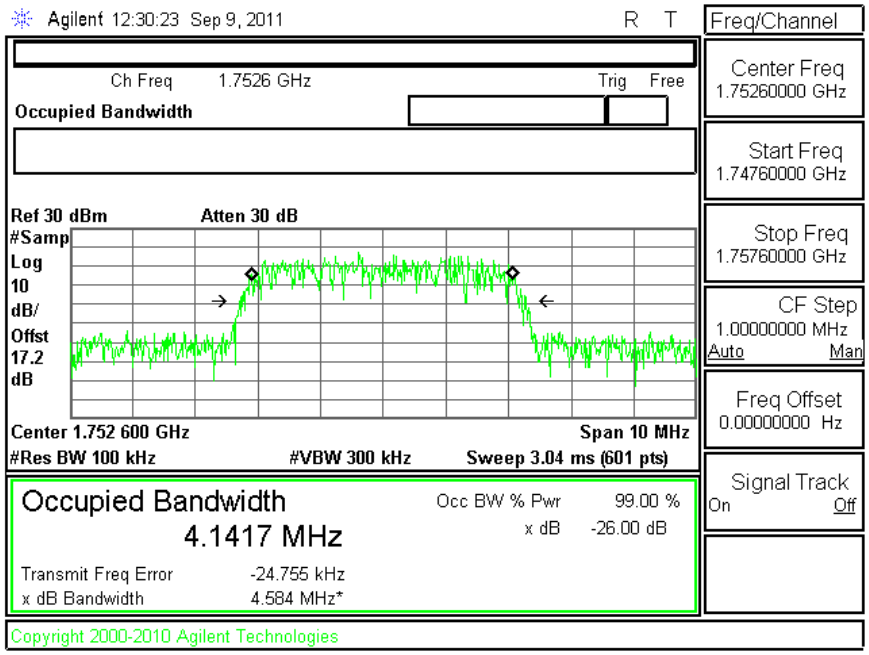


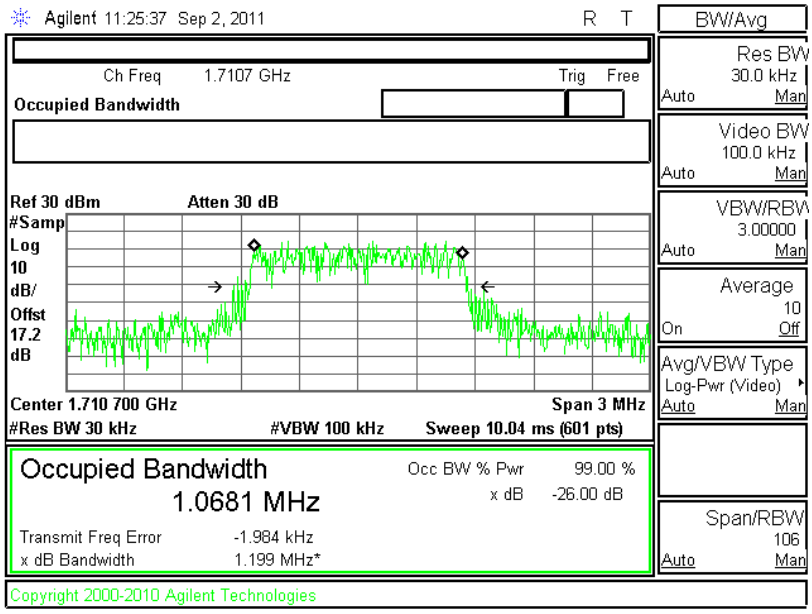
HIGH CH



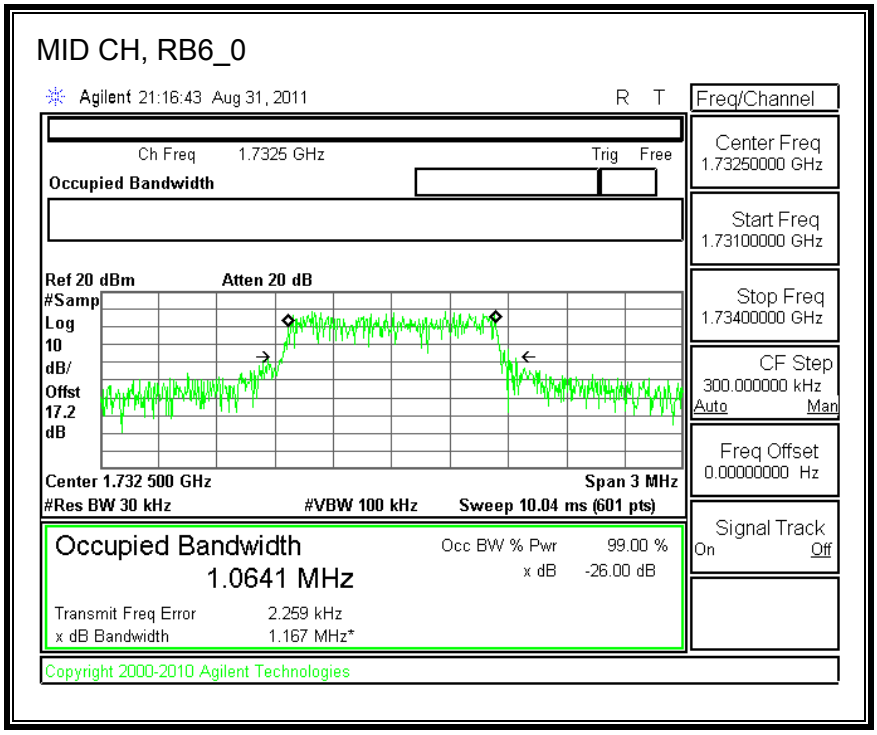
Band 4 (1.4 MHz BAND WIDTH)

LTE QPSK

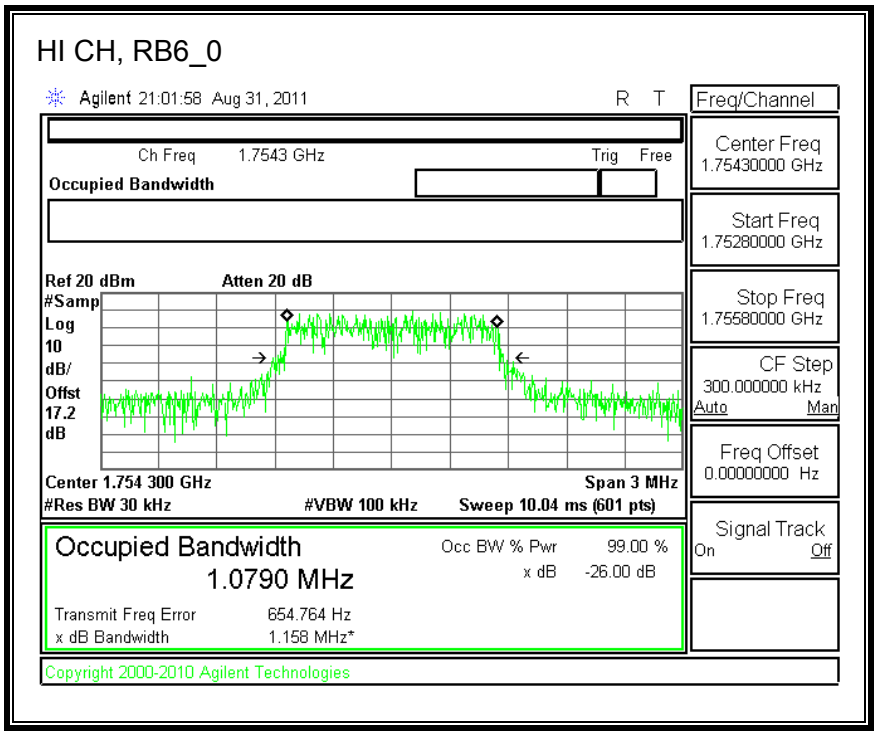
LOW CH, RB6_0



MID CH, RB6_0

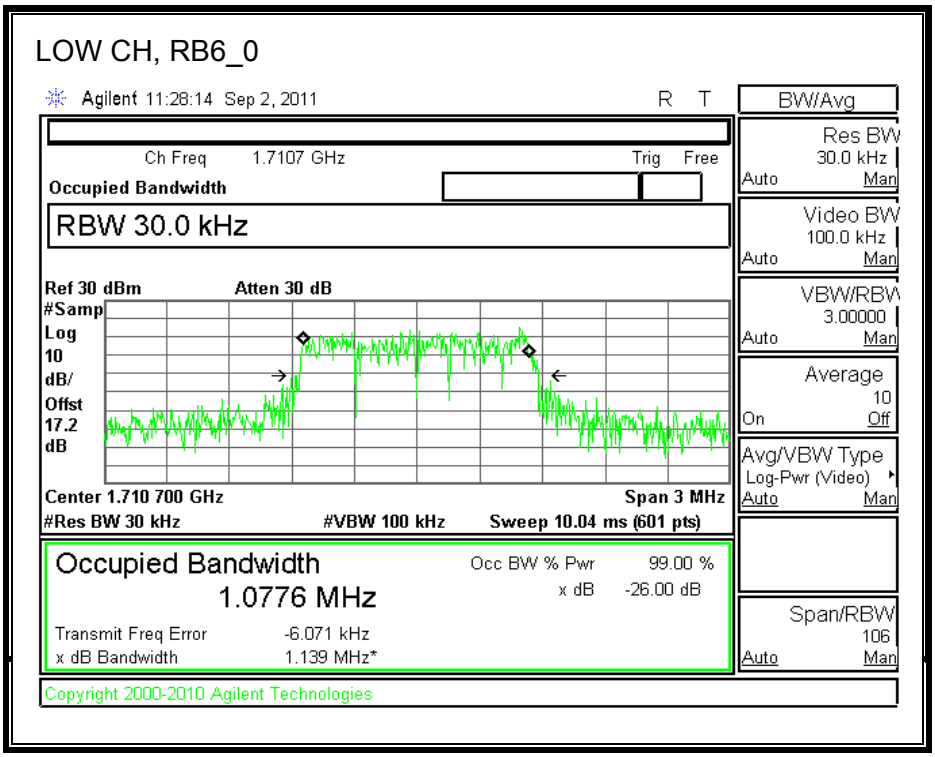


HI CH, RB6_0

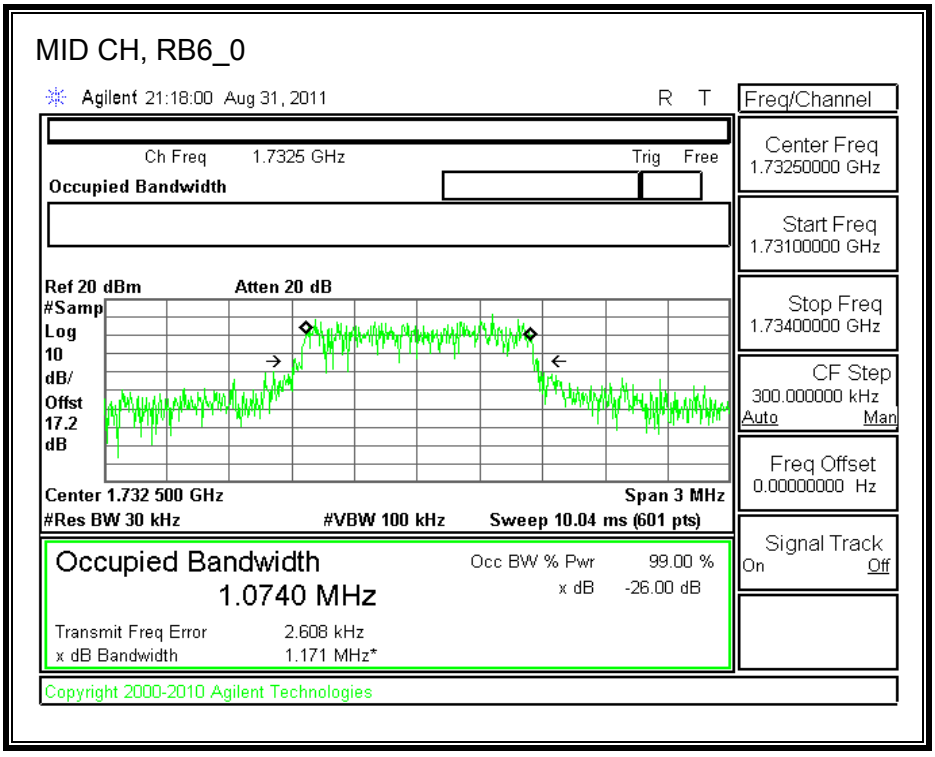


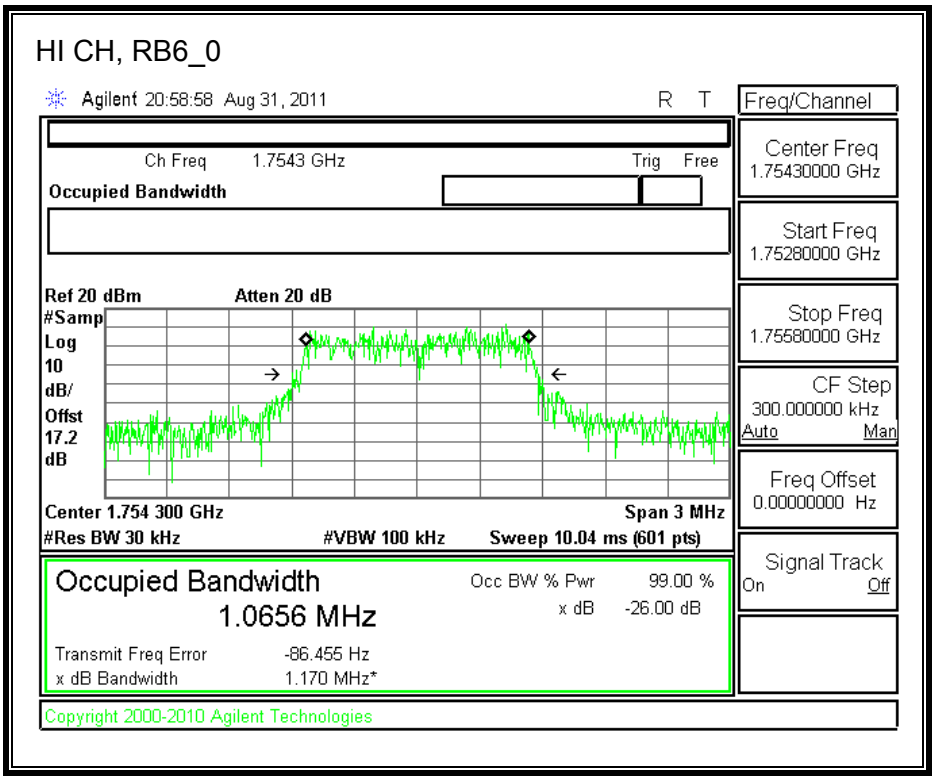
LTE 16QAM

LOW CH, RB6_0



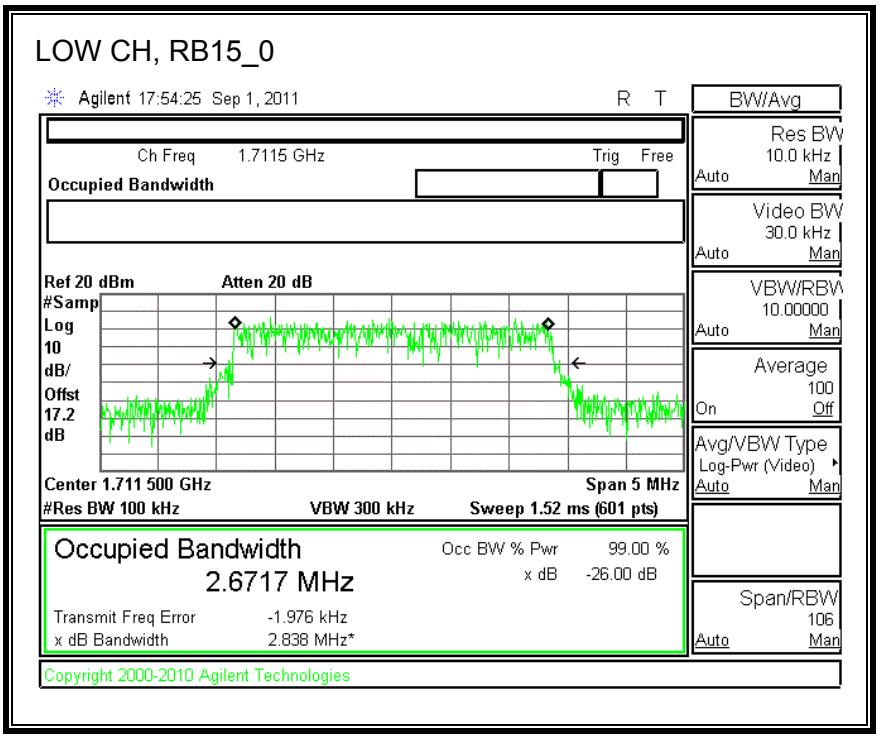
MID CH, RB6_0

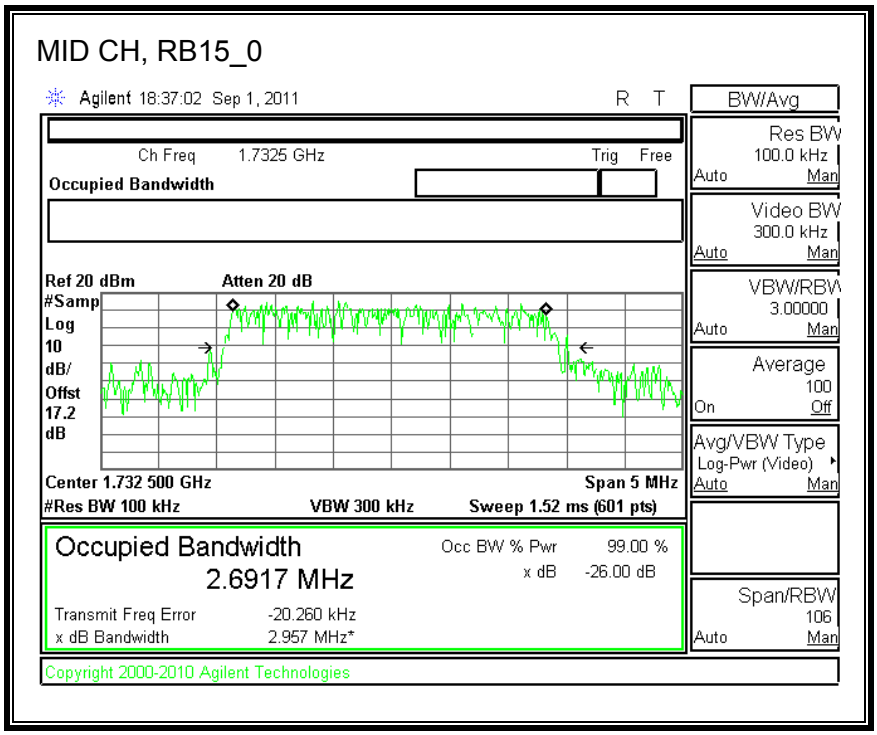




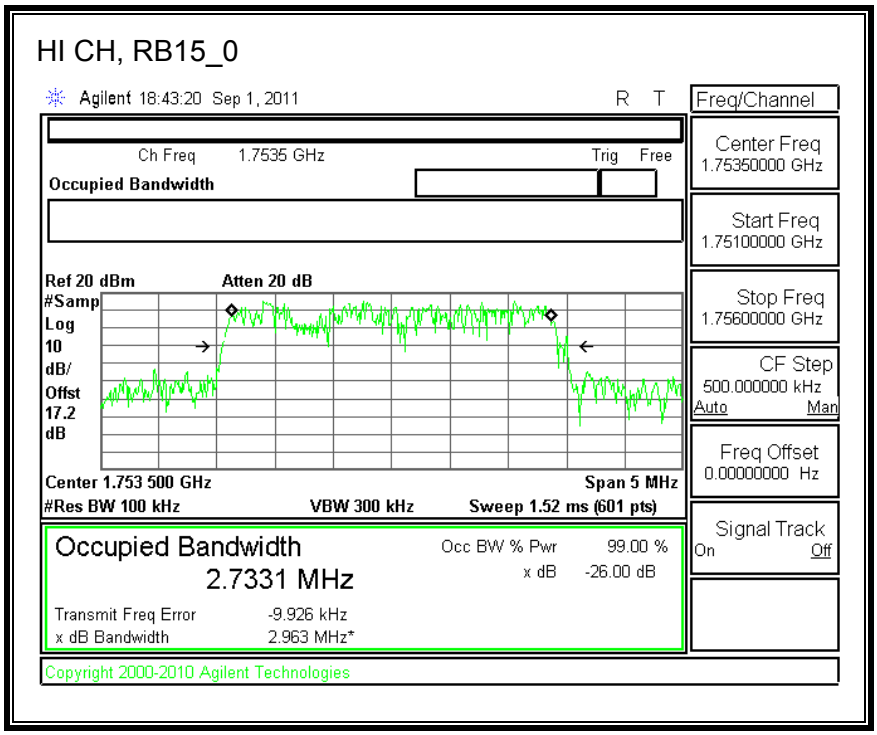
Band 4 (3.0 MHz BAND WIDTH)

LTE QPSK

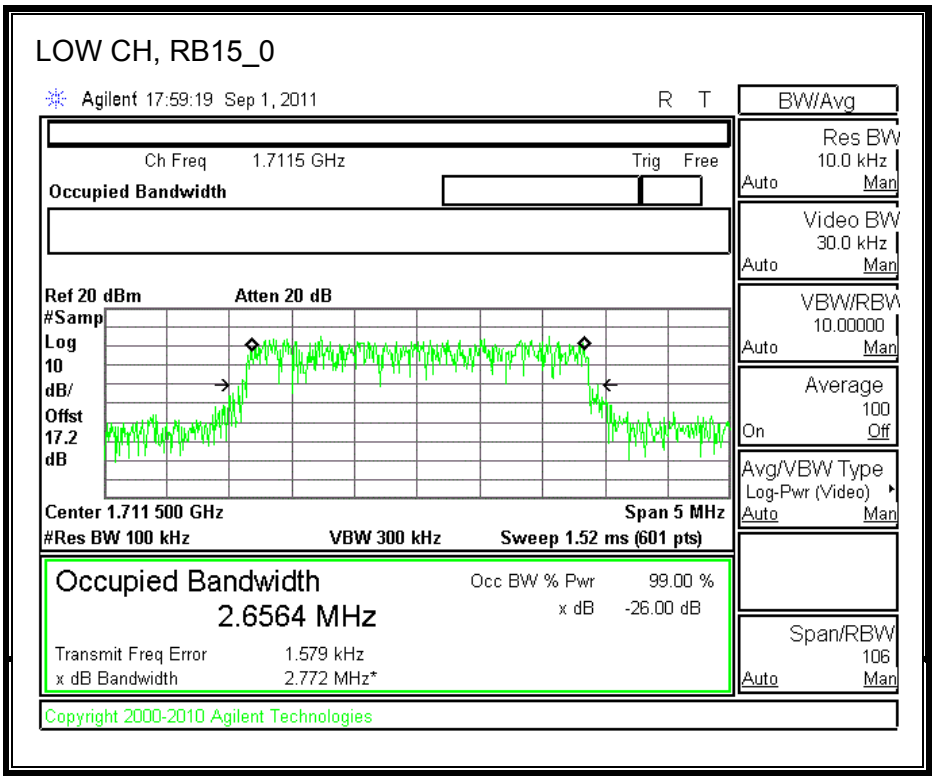


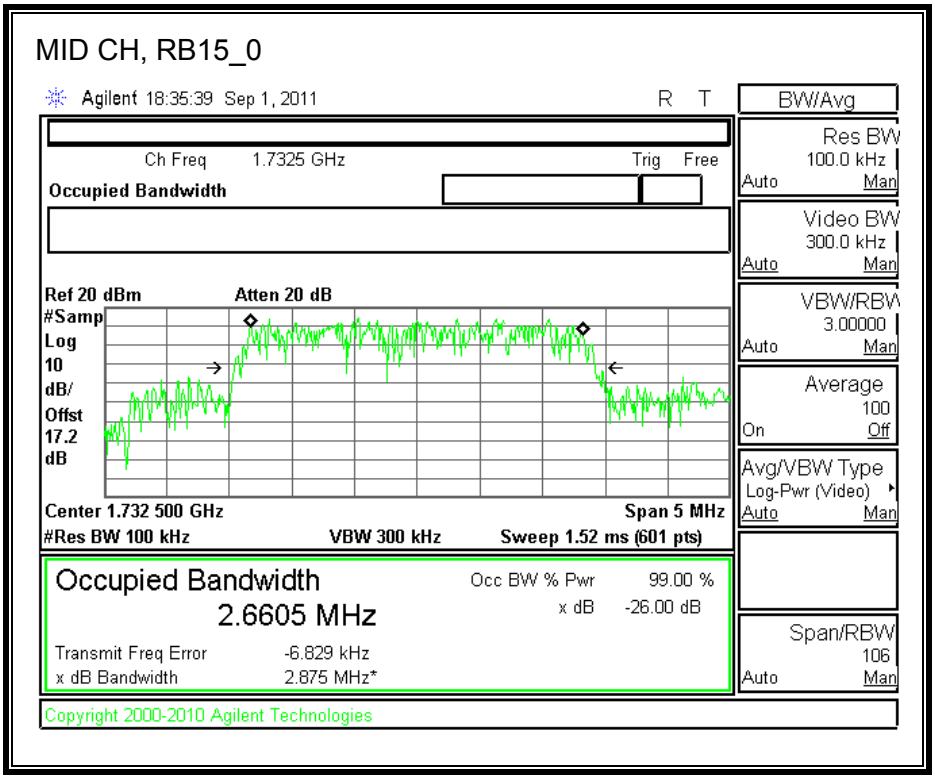


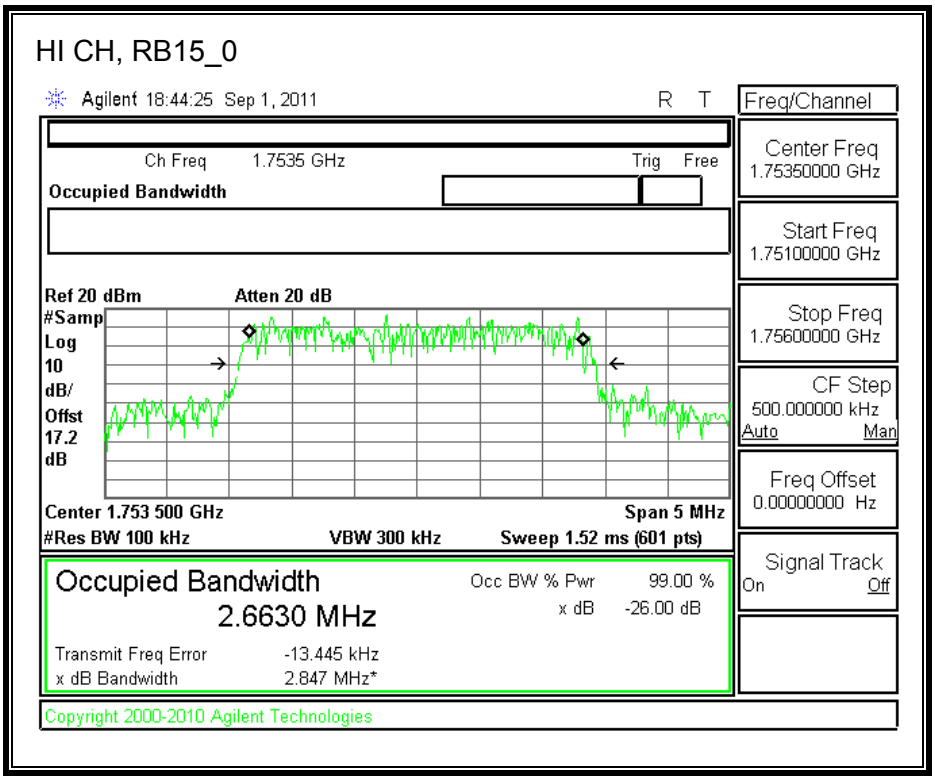
HI CH, RB15_0



LTE 16QAM

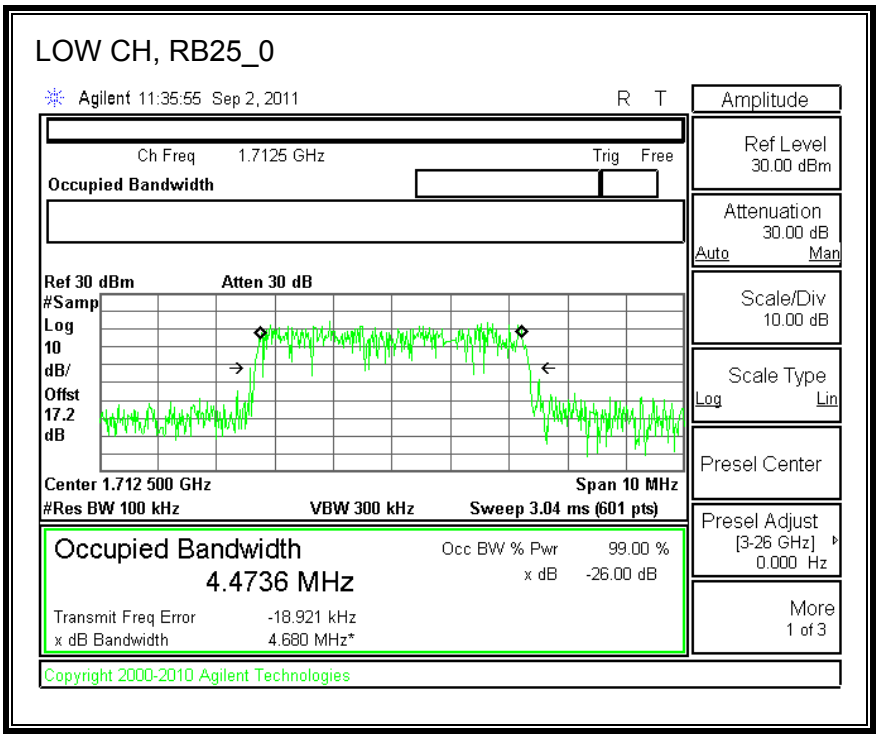


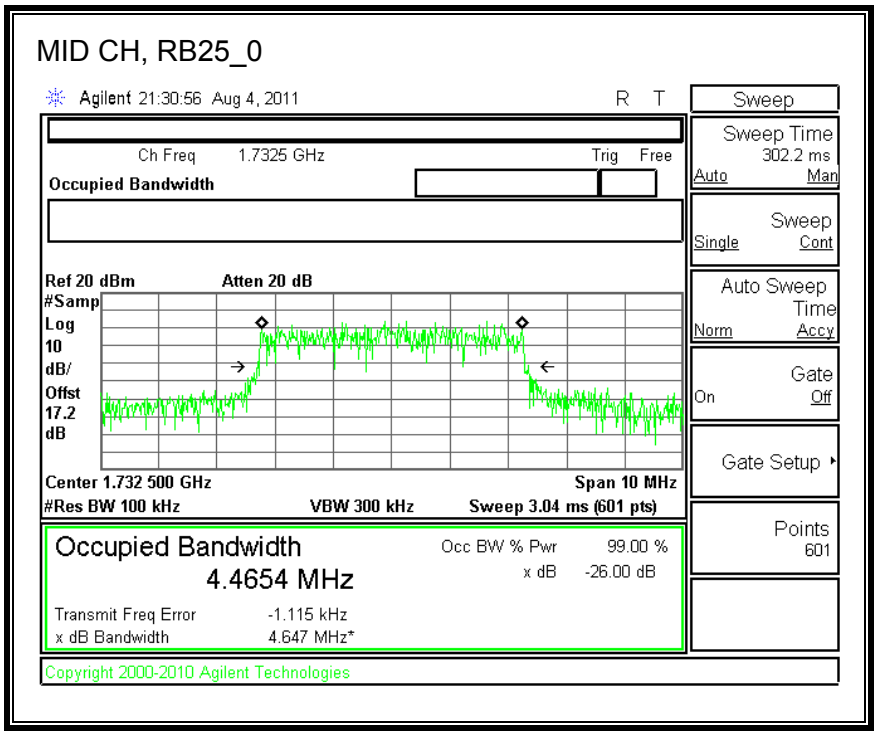




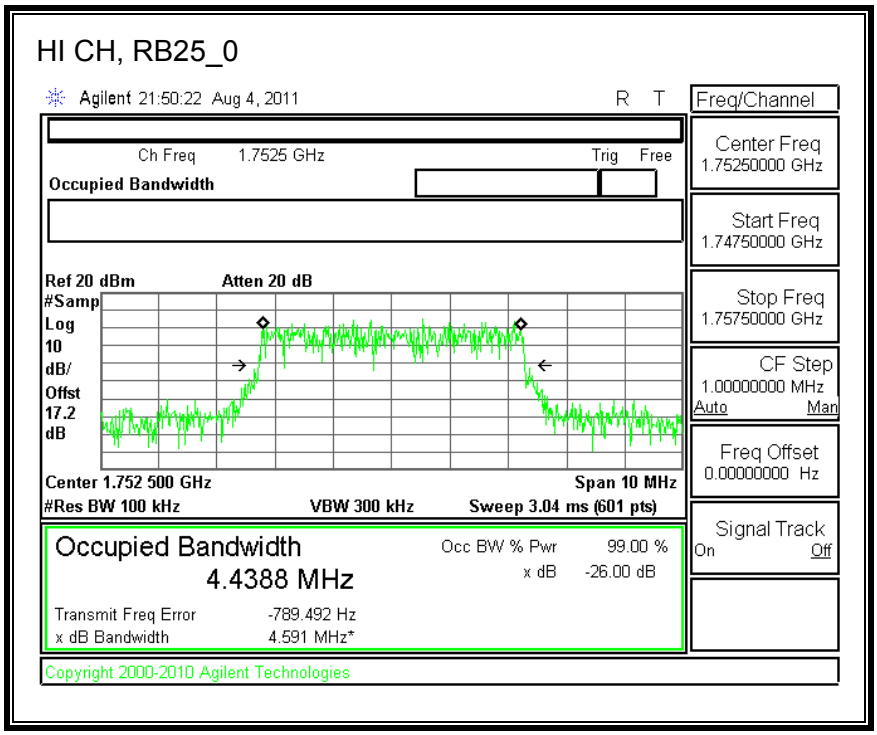
Band 4 (5.0 MHz BAND WIDTH)

LTE QPSK

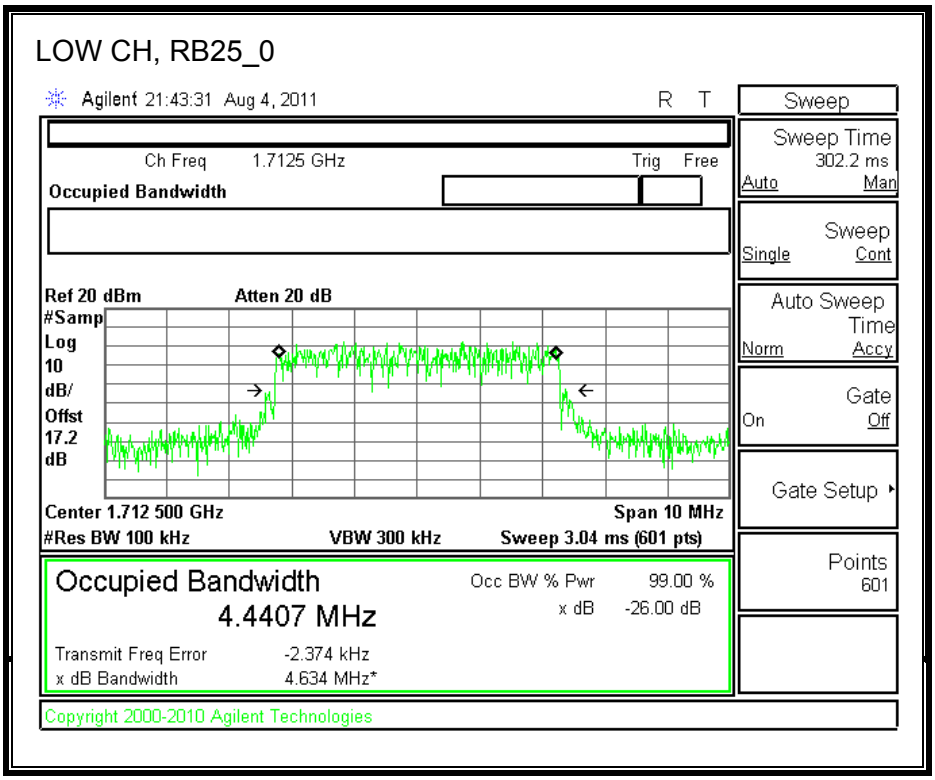


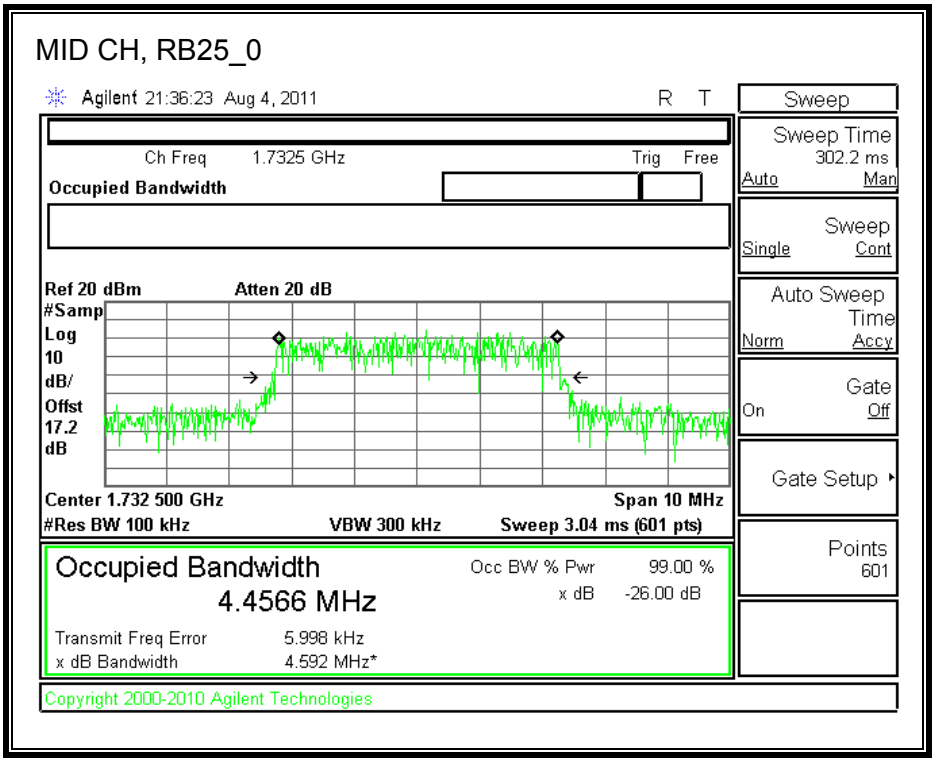


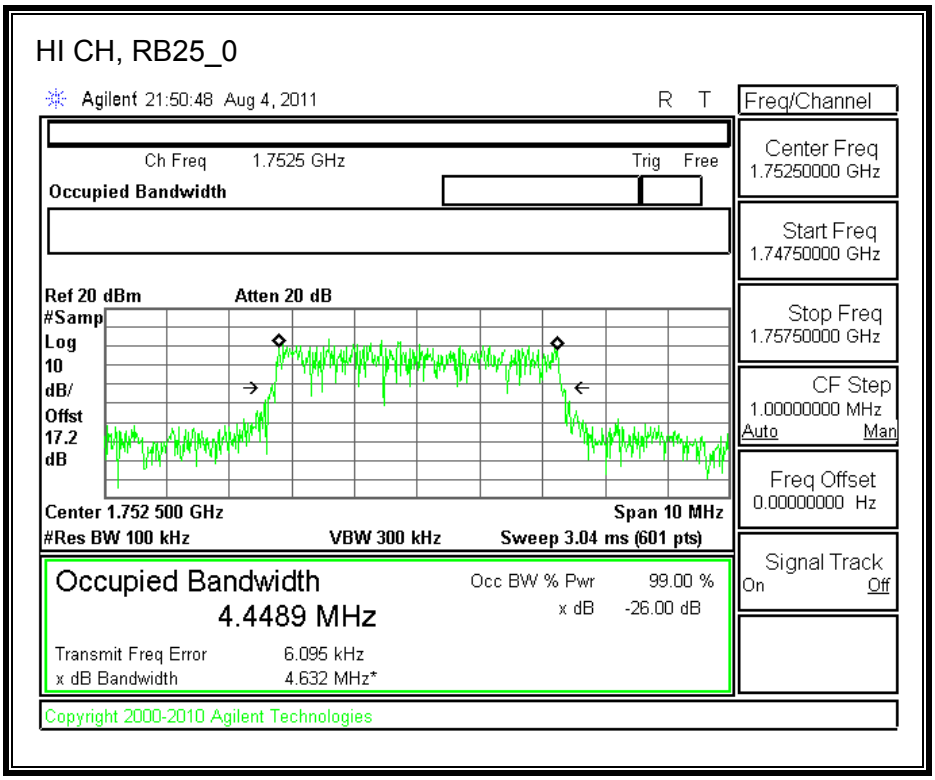
HI CH, RB25_0



LTE 16QAM

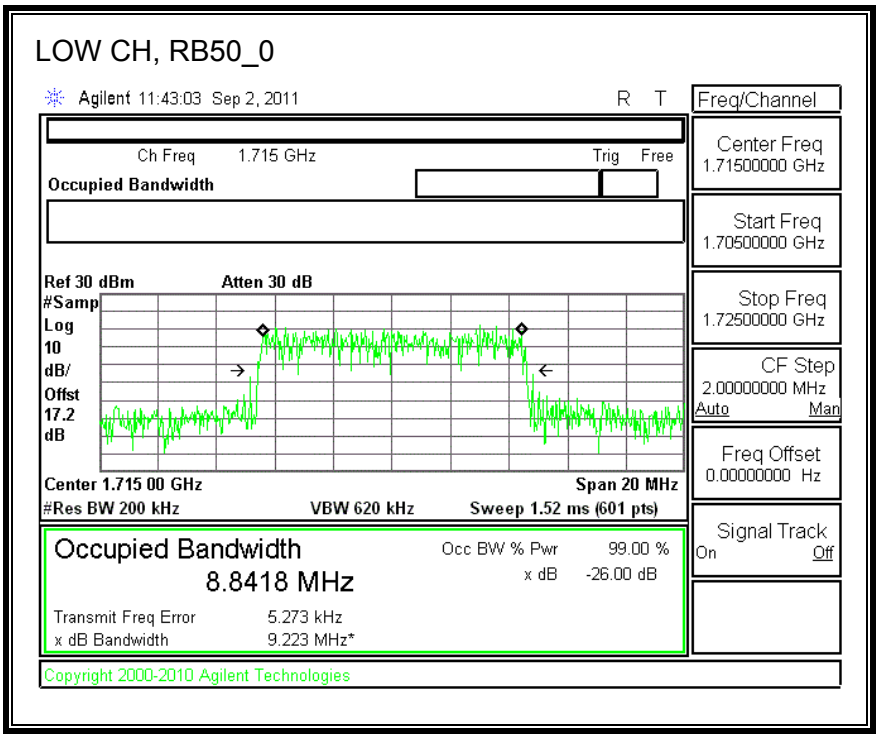


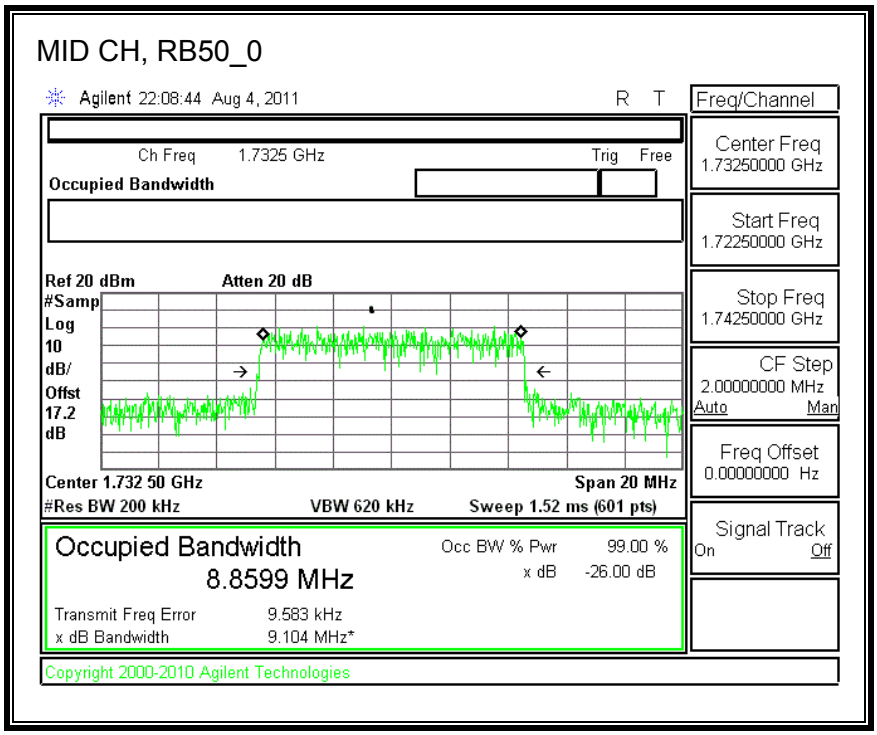


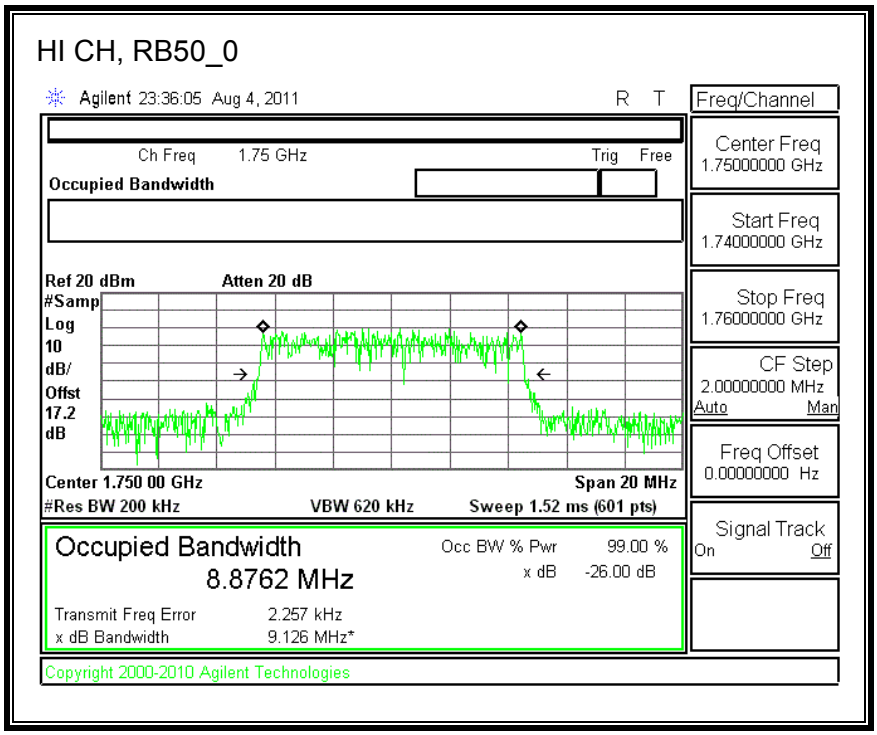


Band 4 (10.0 MHz BAND WIDTH)

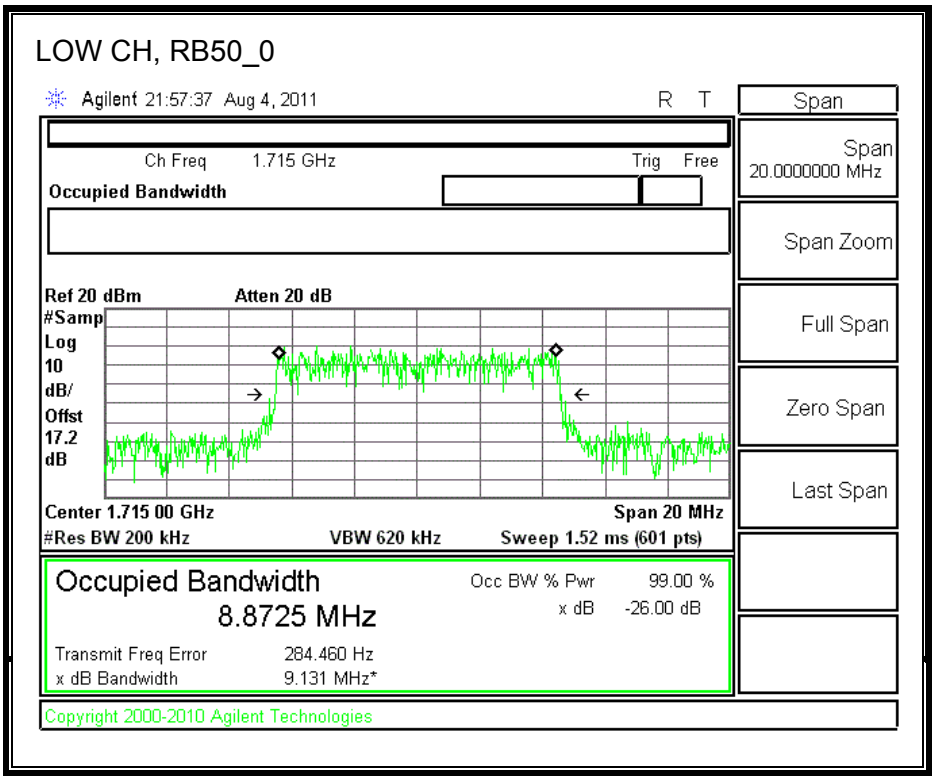
LTE QPSK

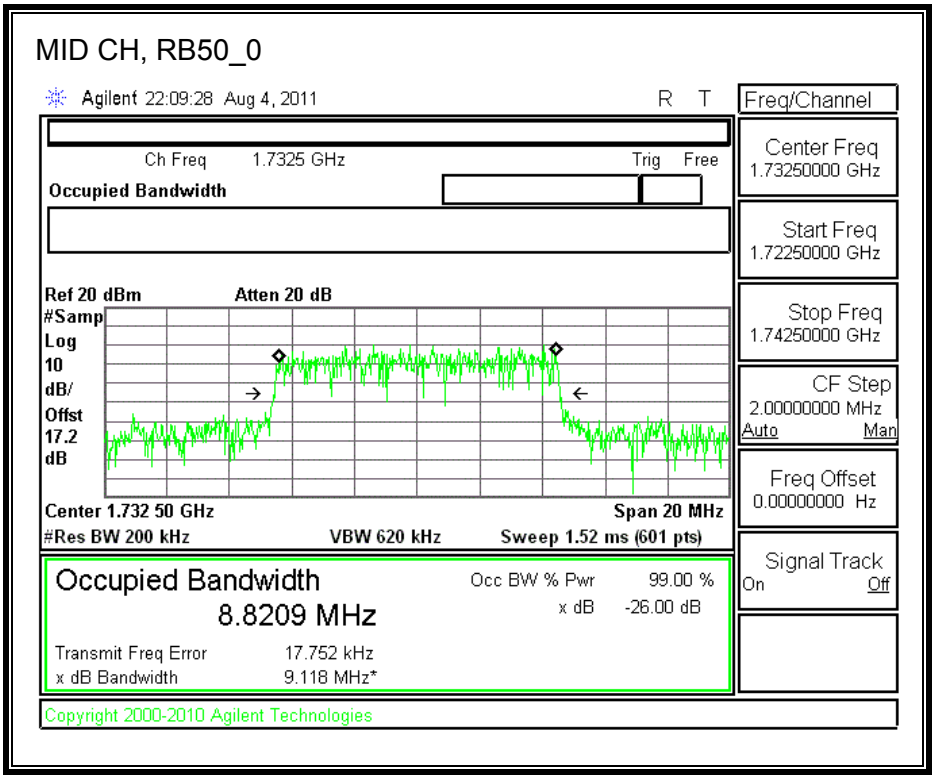


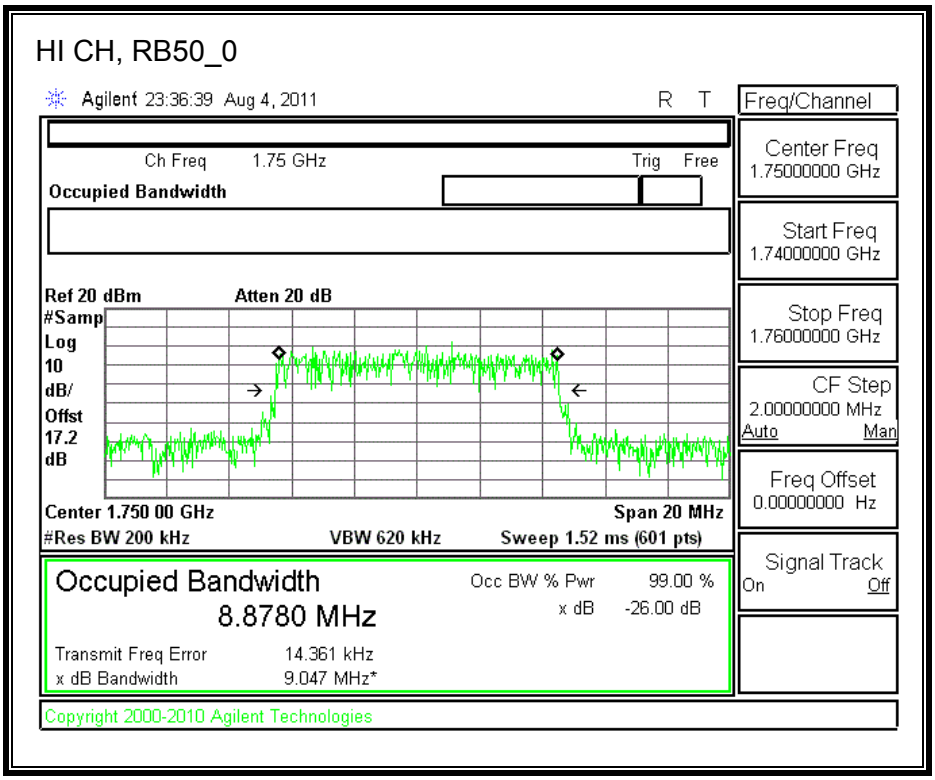




LTE 16QAM

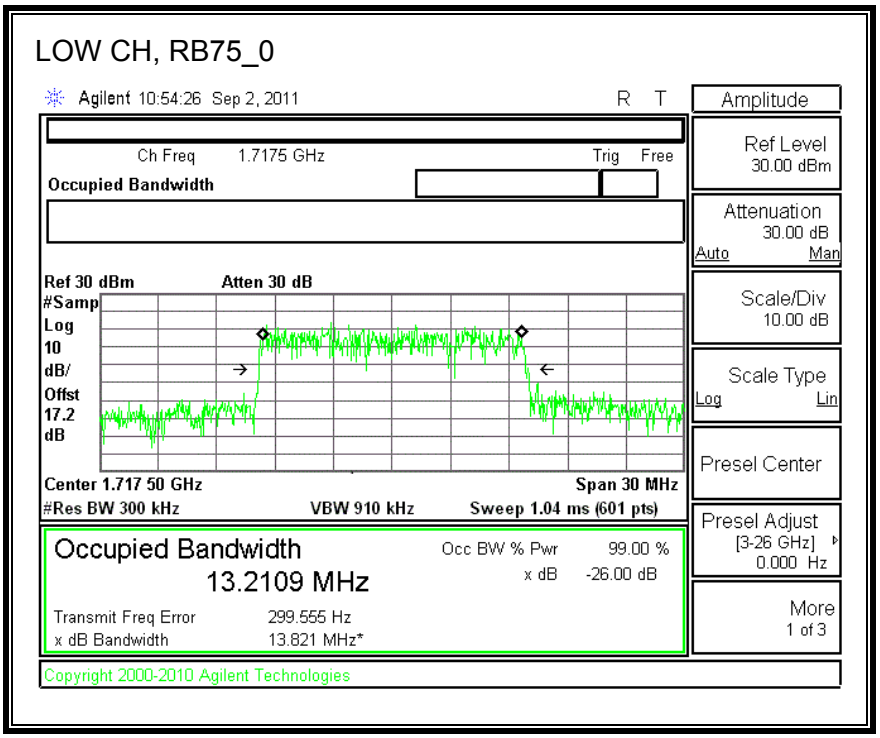


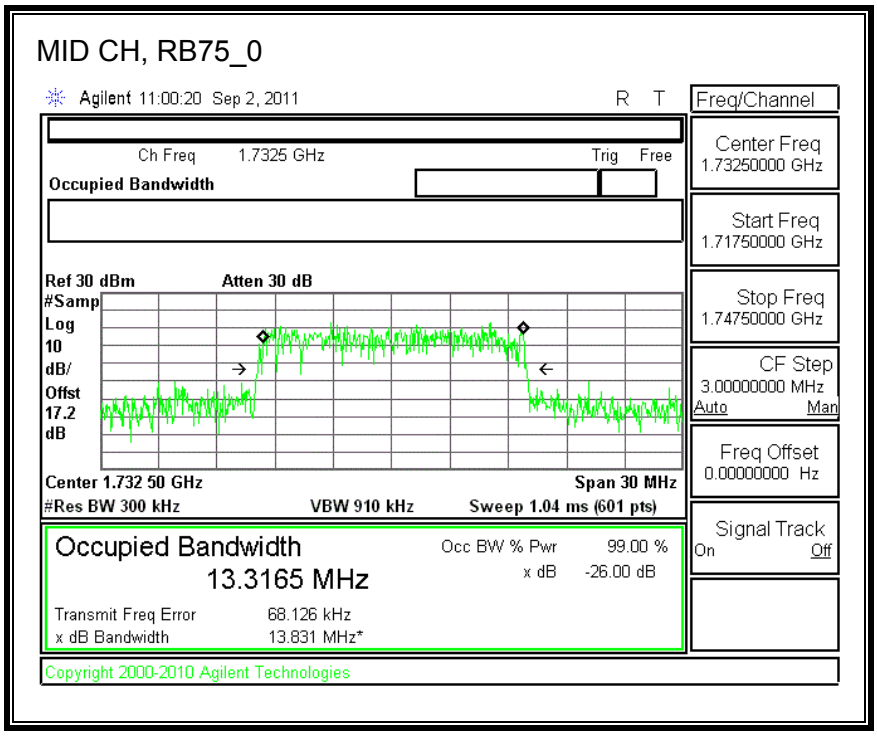


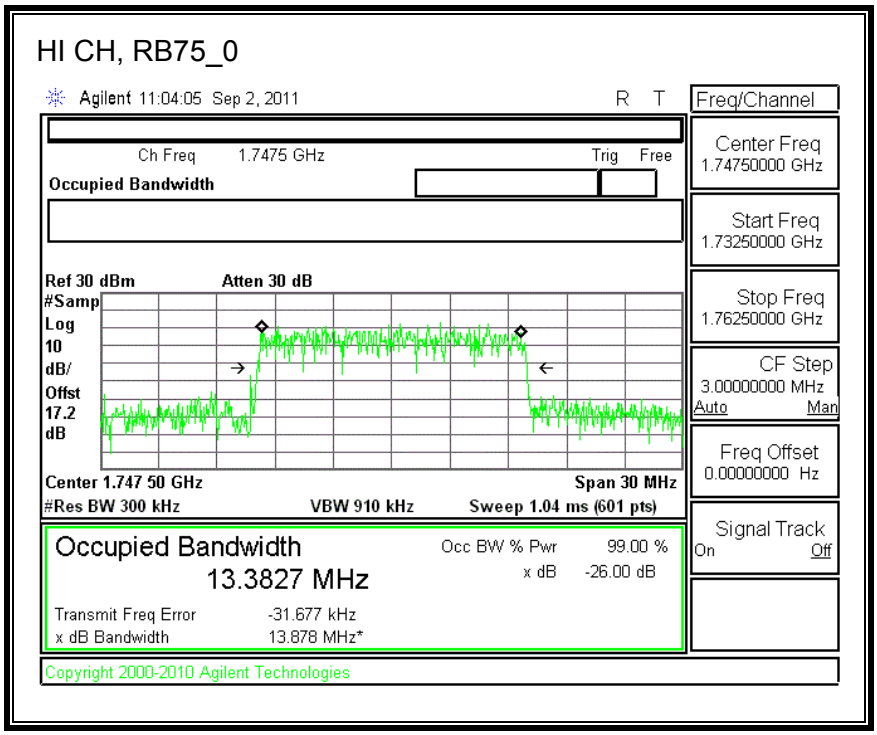


Band 4 (15.0 MHz BAND WIDTH)

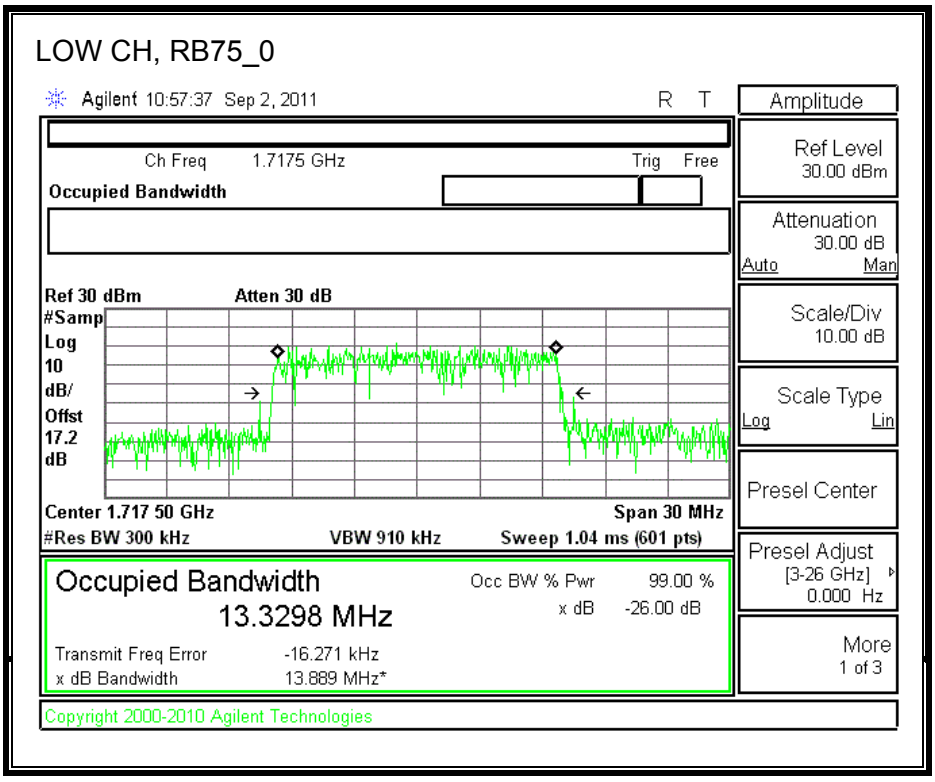
LTE QPSK

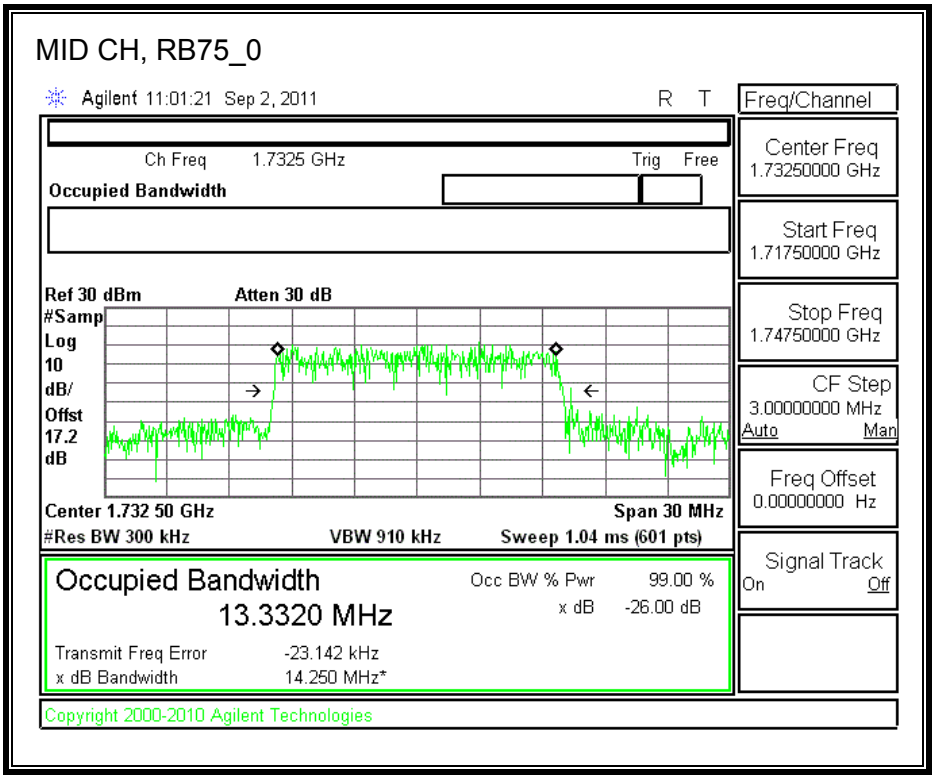


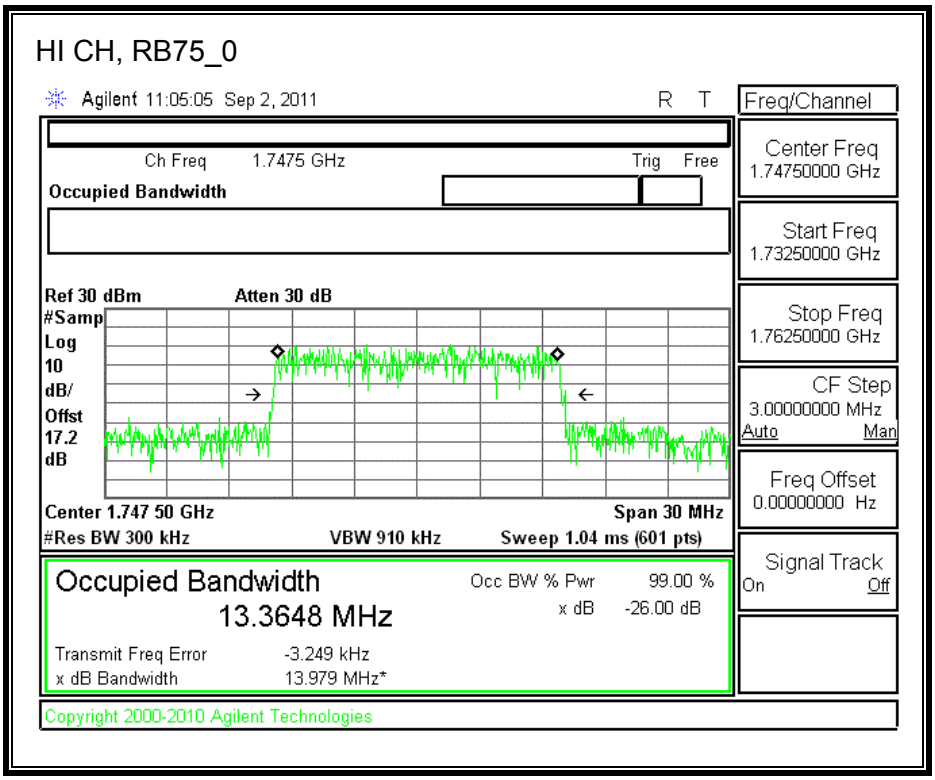




LTE 16QAM

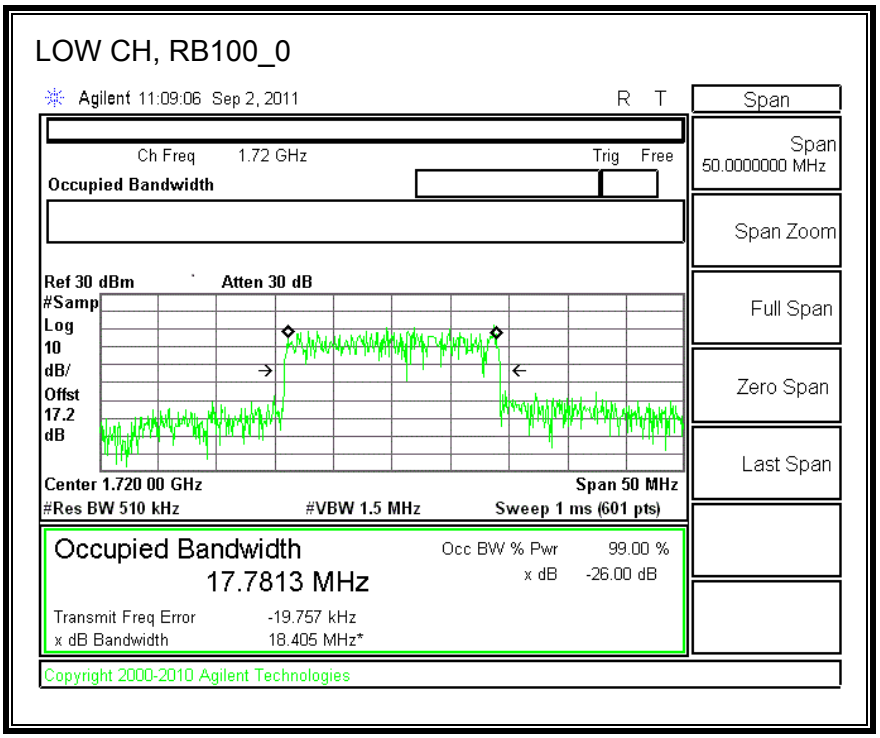


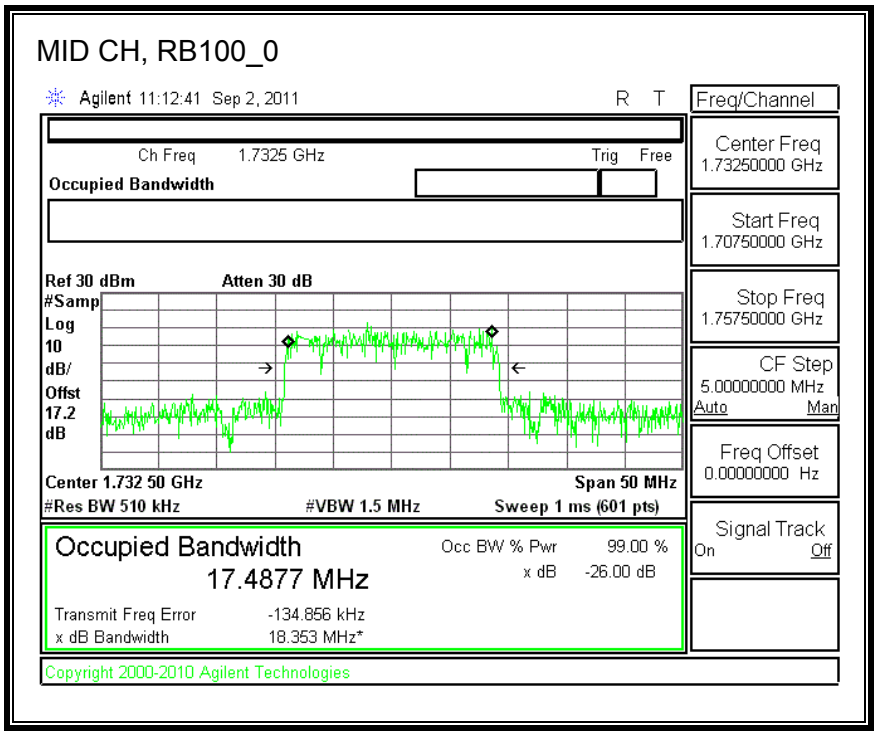


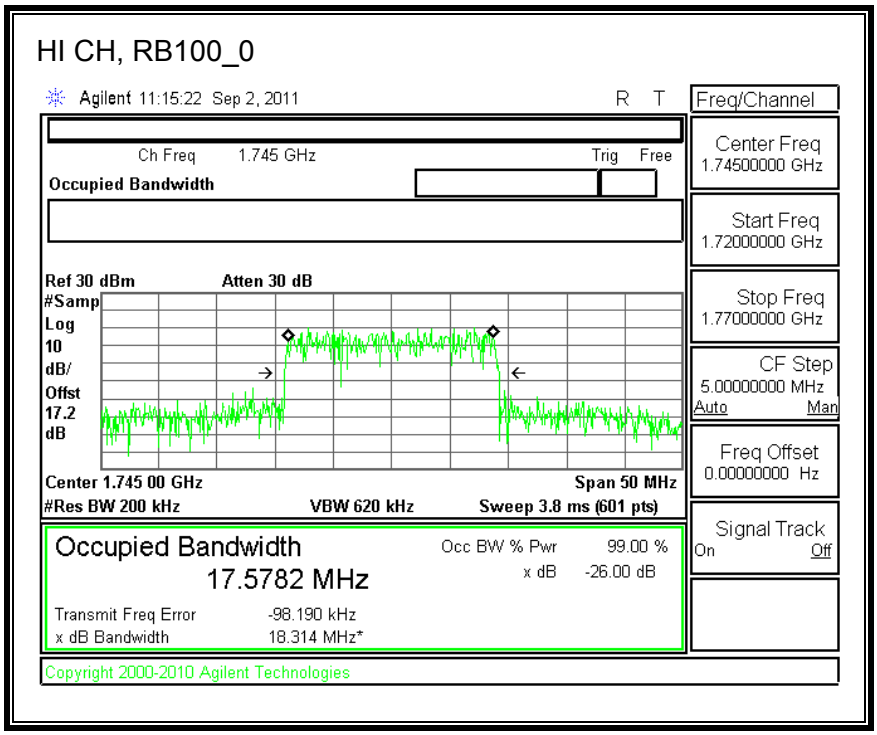


Band 4 (20.0 MHz BAND WIDTH)

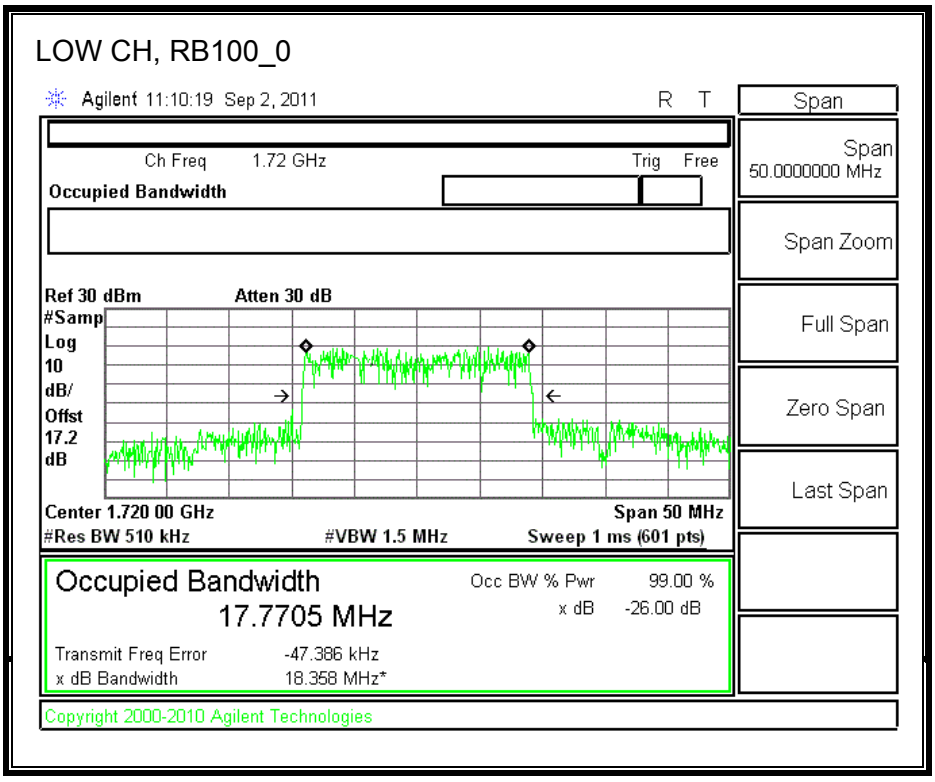
LTE QPSK

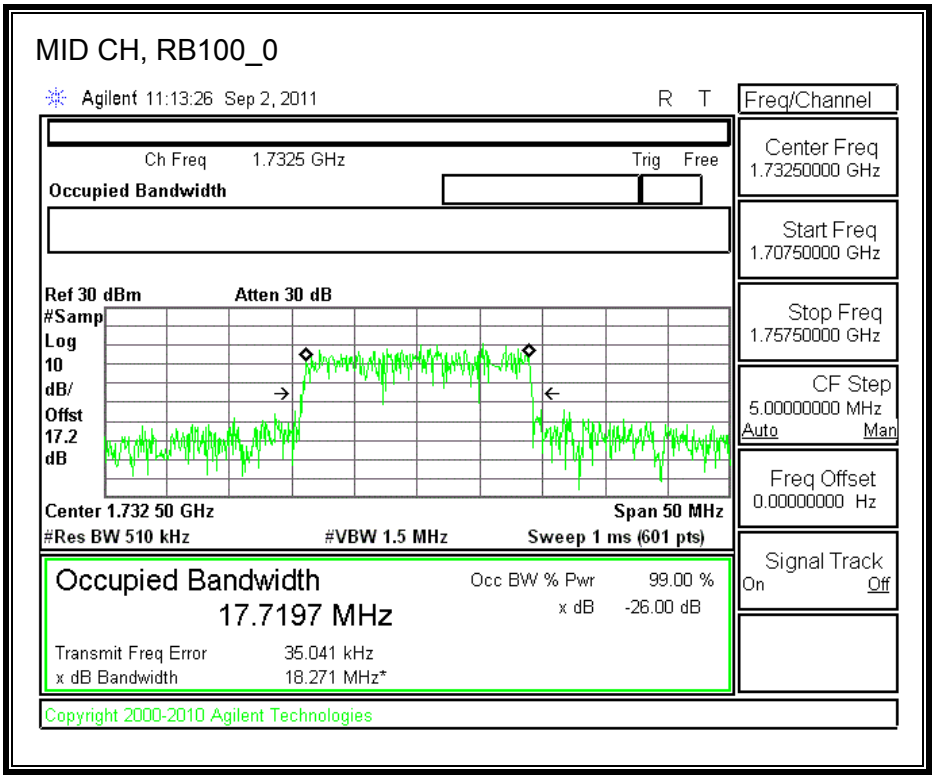


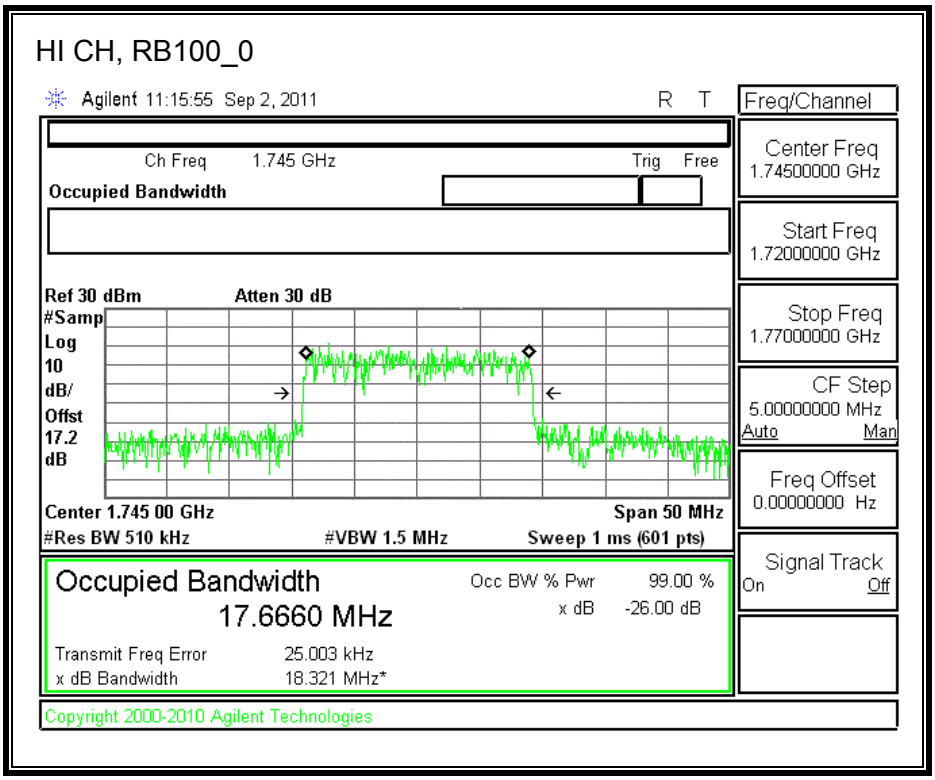




LTE 16QAM

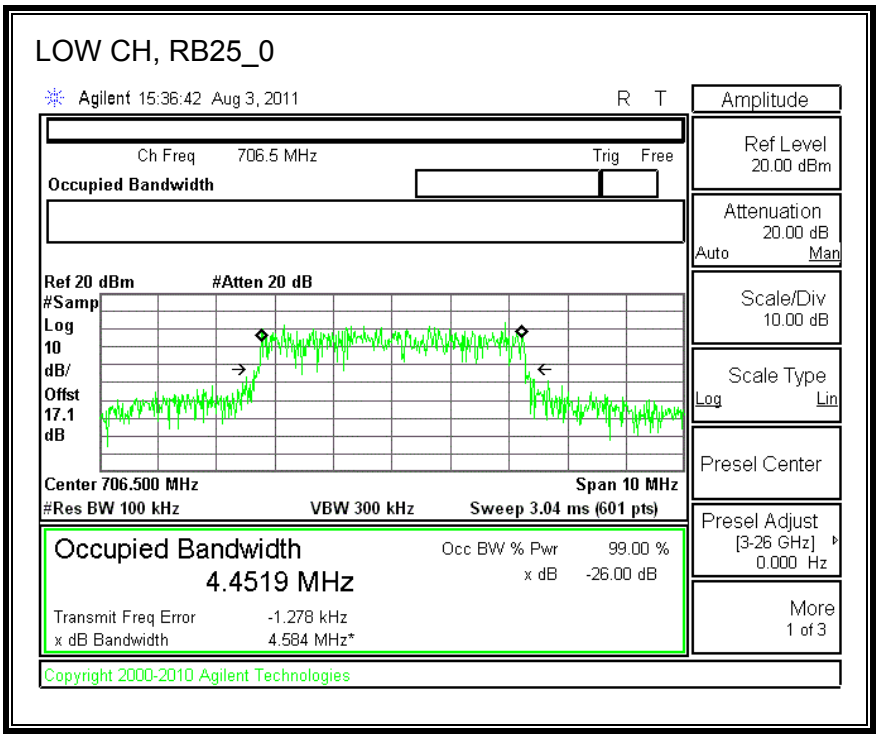


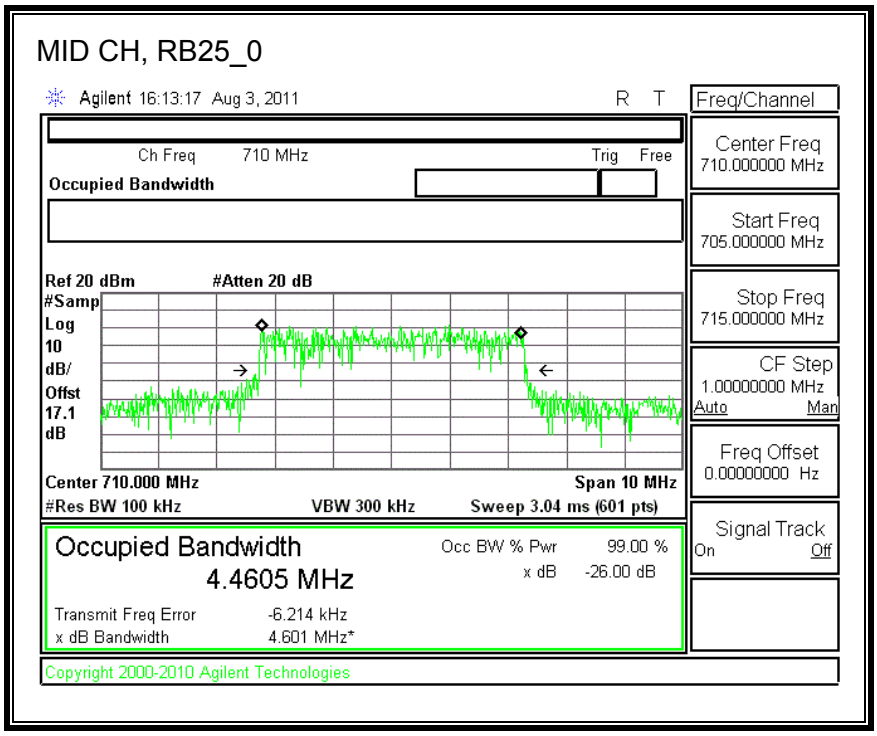




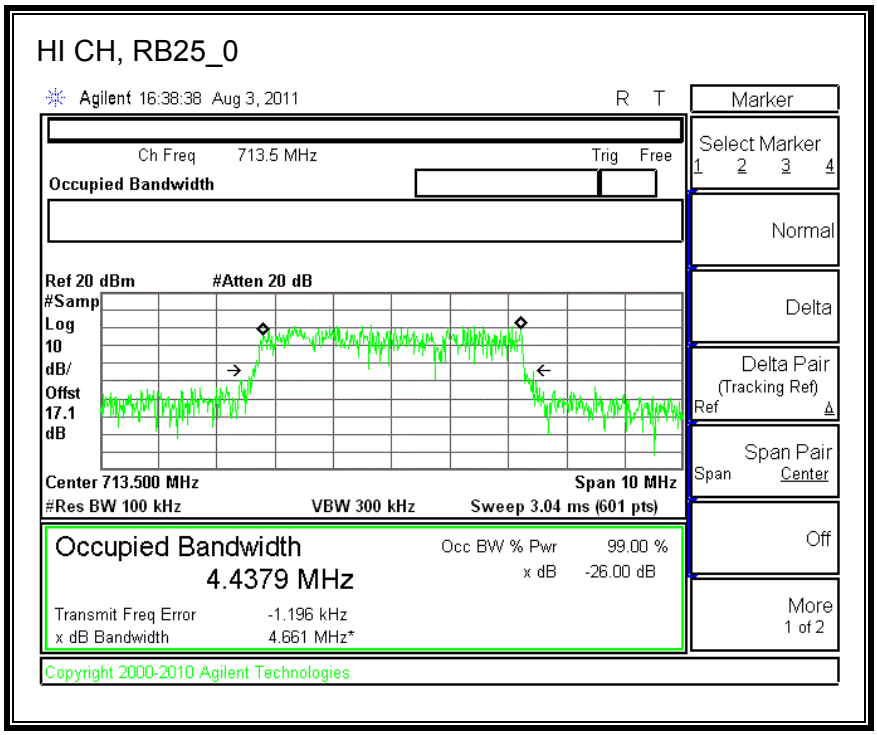
Band 17 (5.0 MHz BAND WIDTH)

LTE QPSK

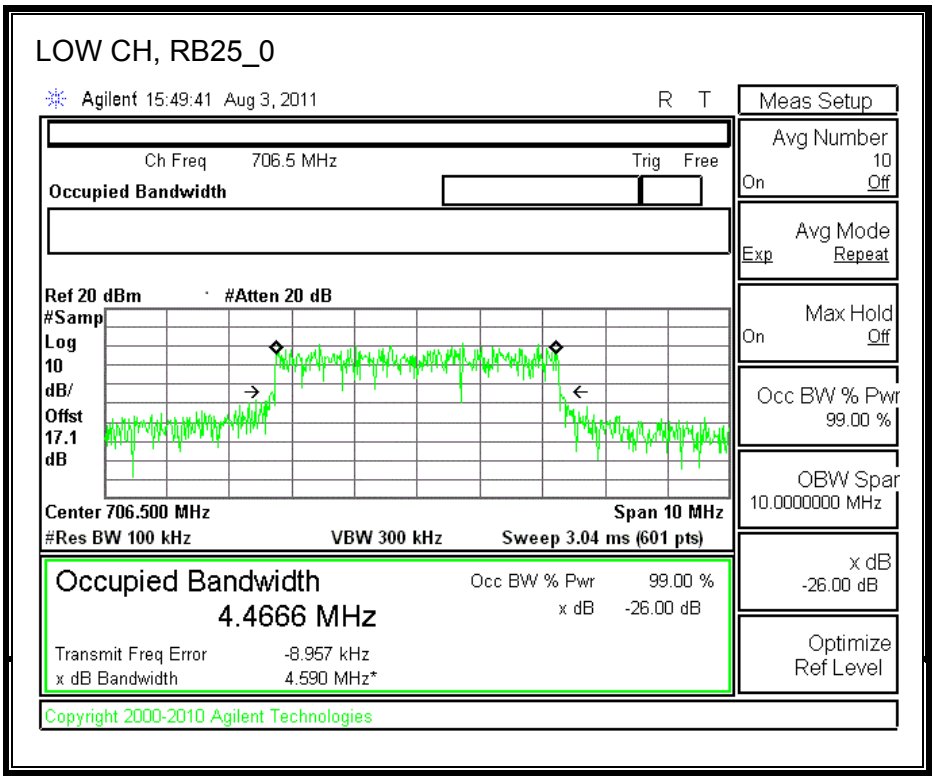


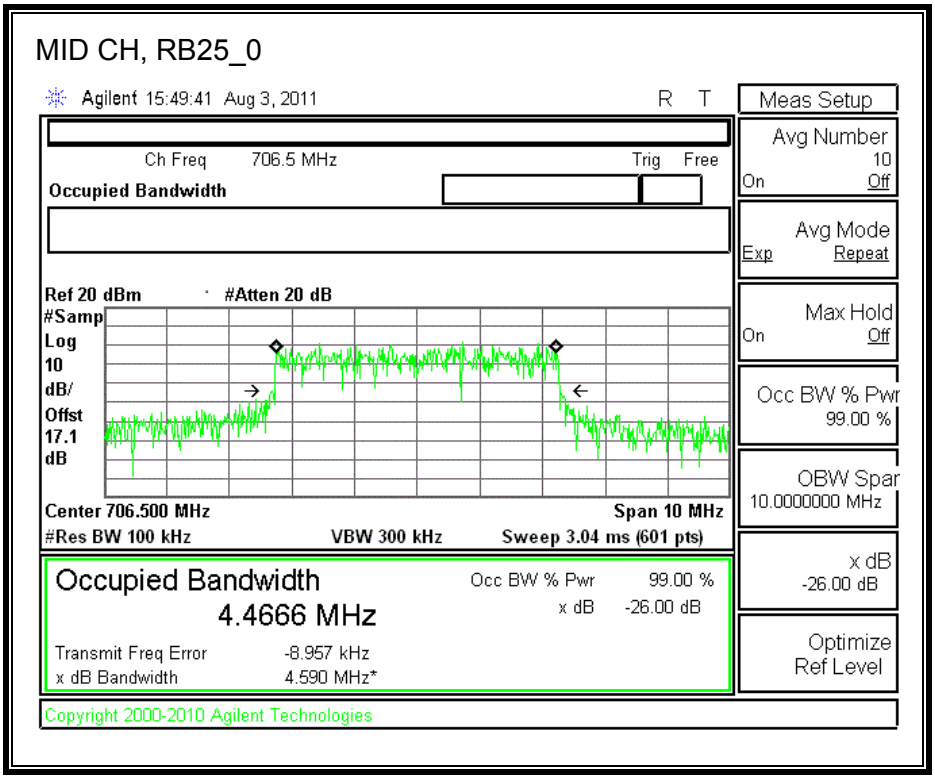


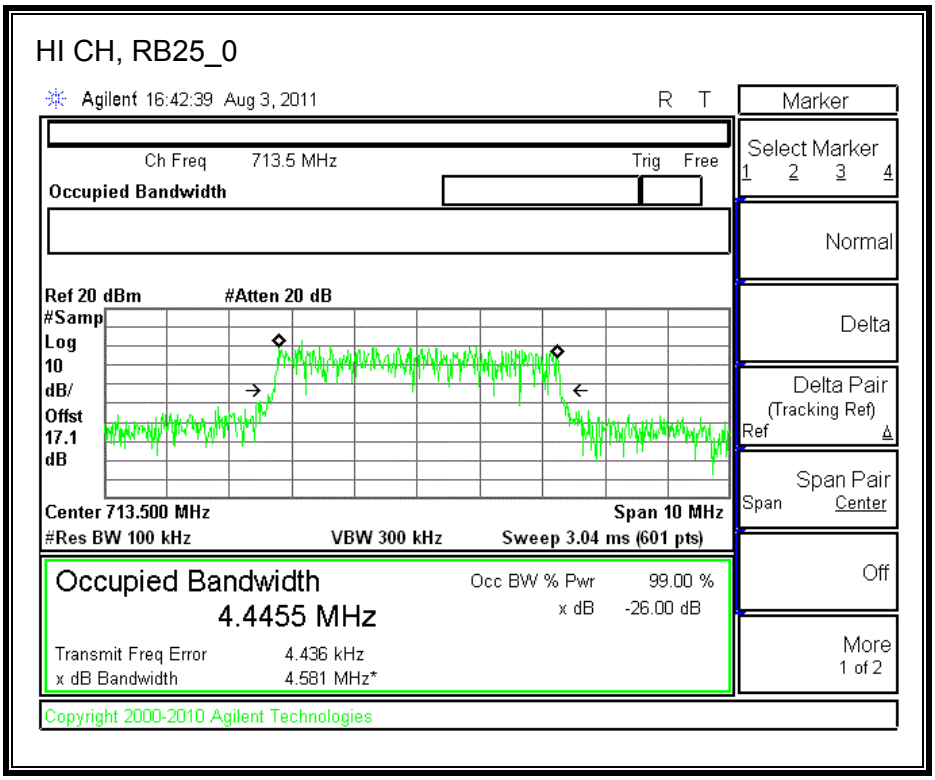
HI CH, RB25_0



LTE 16QAM

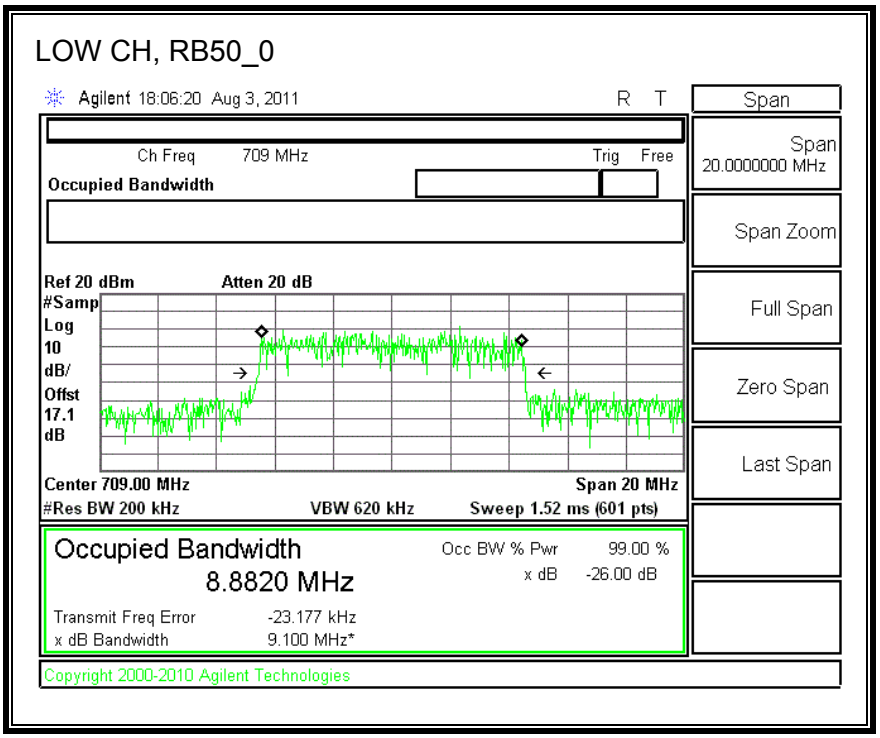


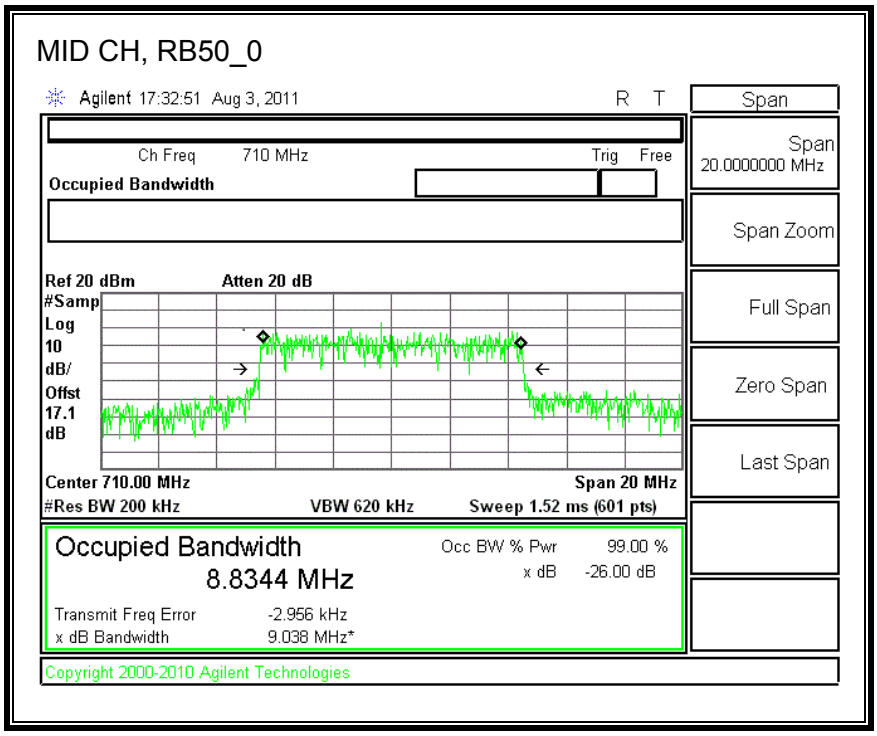


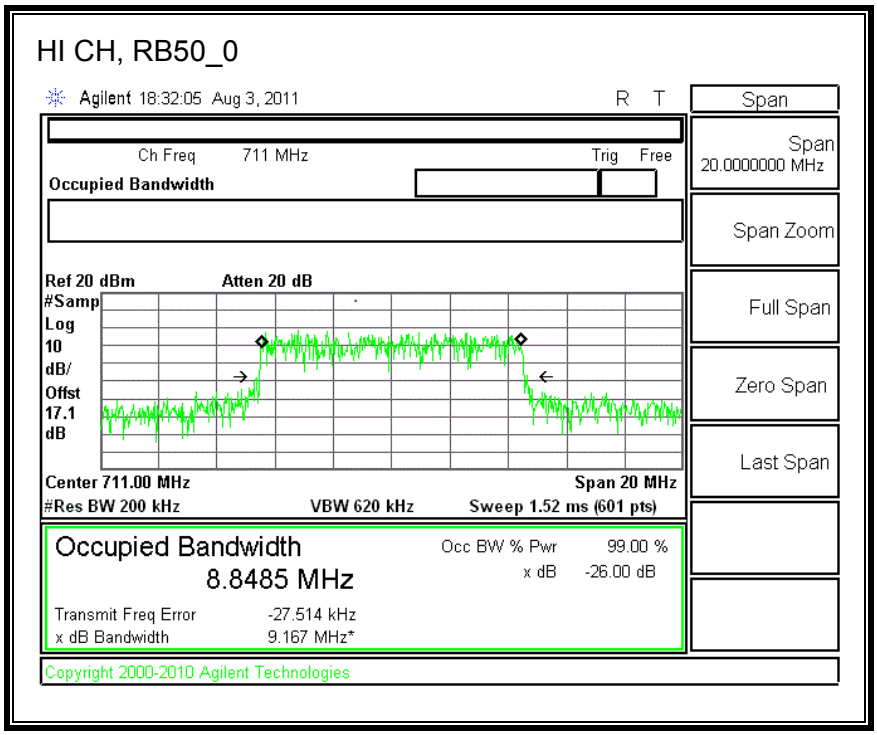


Band 17 (10.0 MHz BAND WIDTH)

LTE QPSK

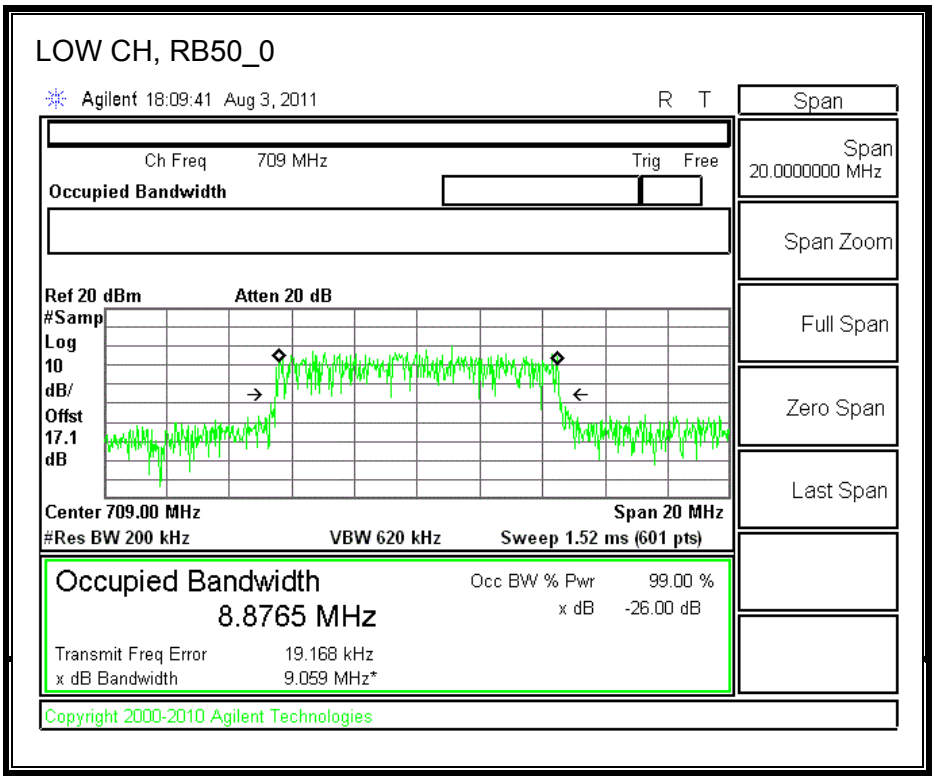




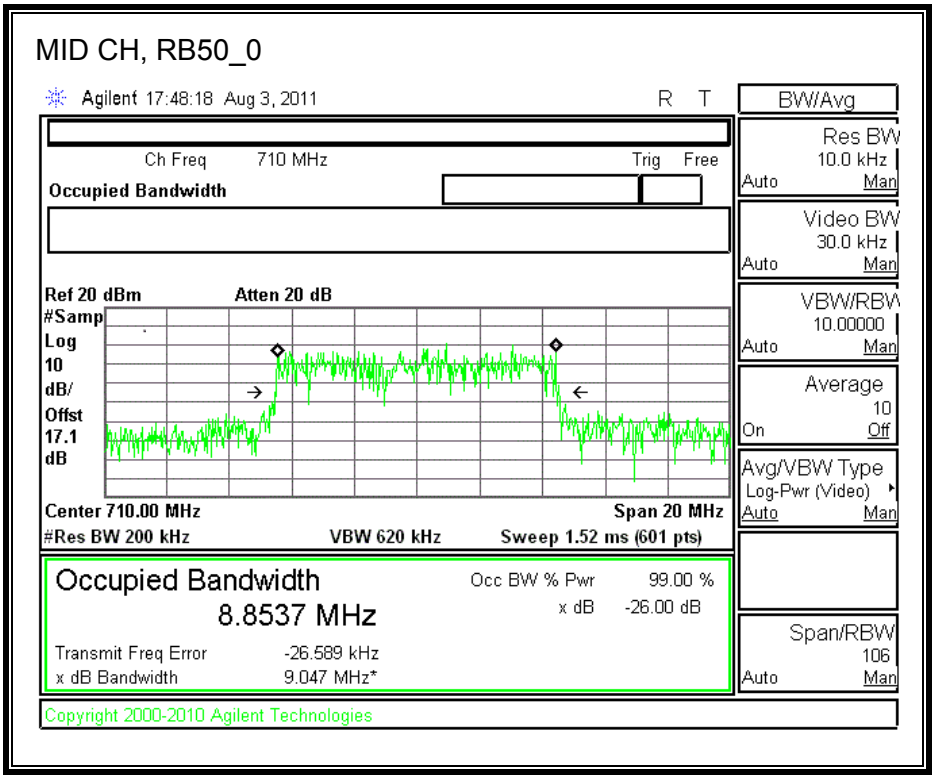


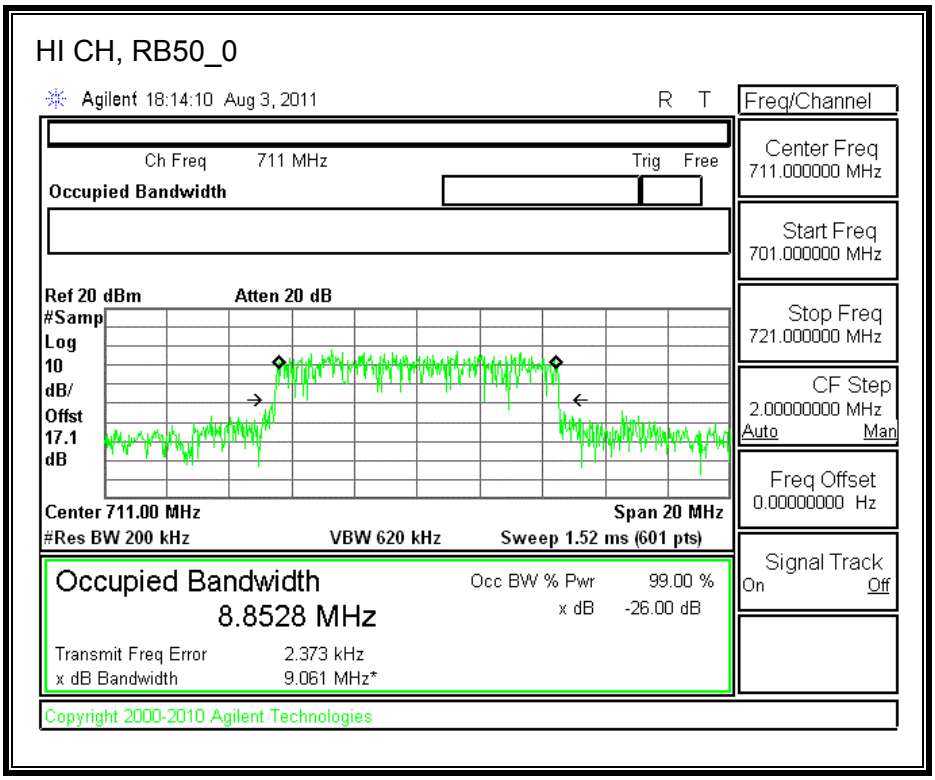
LTE 16QAM

LOW CH, RB50_0



MID CH, RB50_0





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 (824, 849, 1710, 1755, 1850, 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.

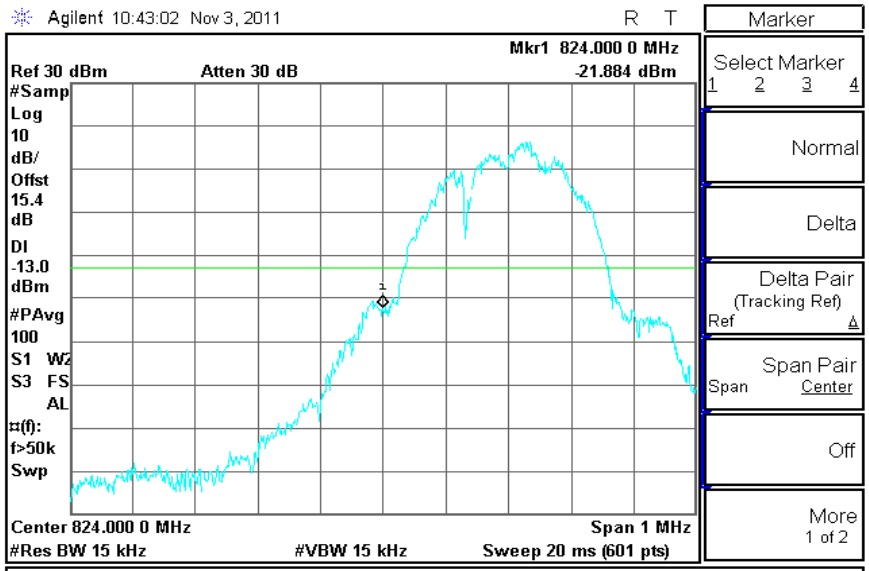
MODES TESTED

- GPRS and EGPRS
- WCDMA REL. 99 and HSDPA
- LTE BAND 4 and BAND 17

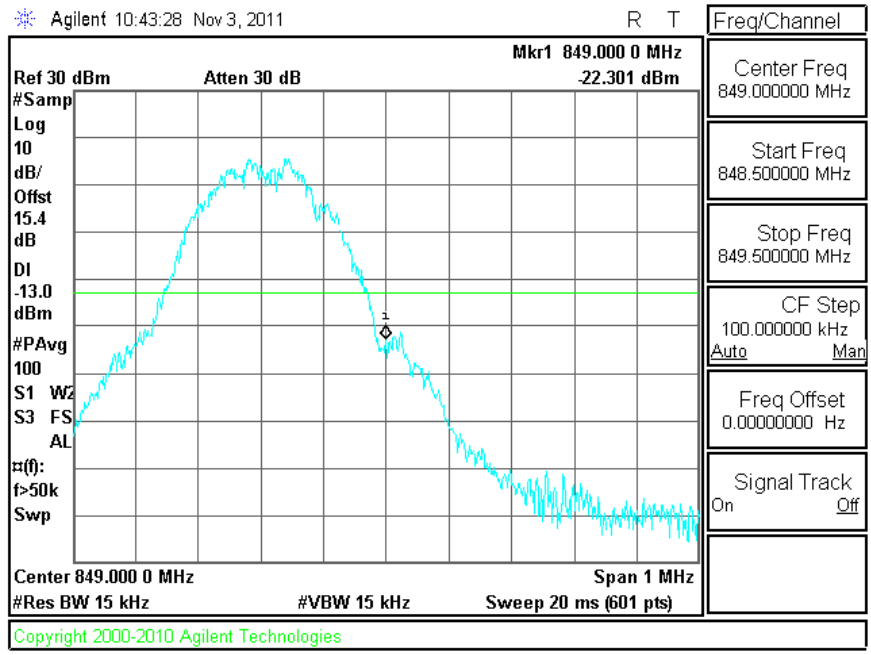
RESULTS

GPRS850 BAND

LOW CH

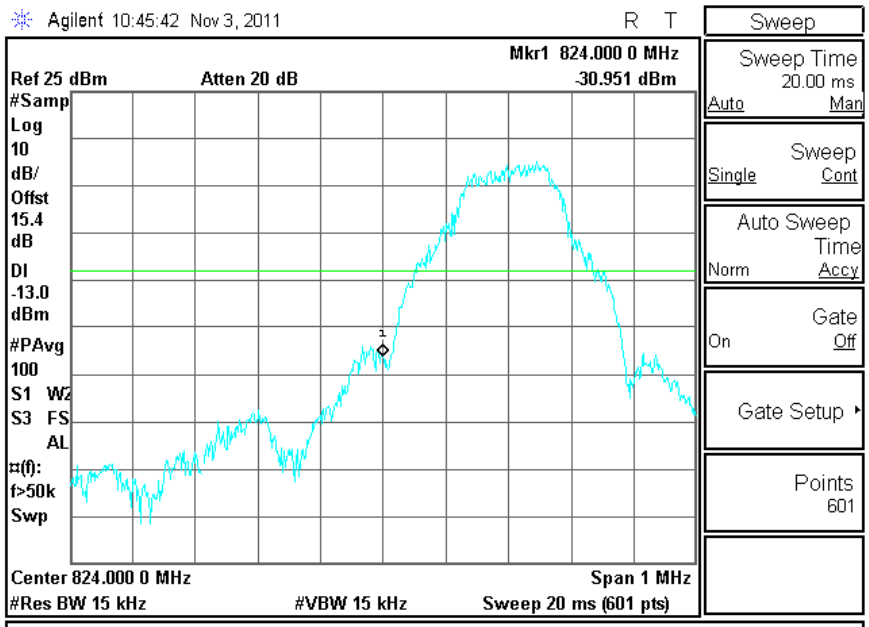


HIGH CH

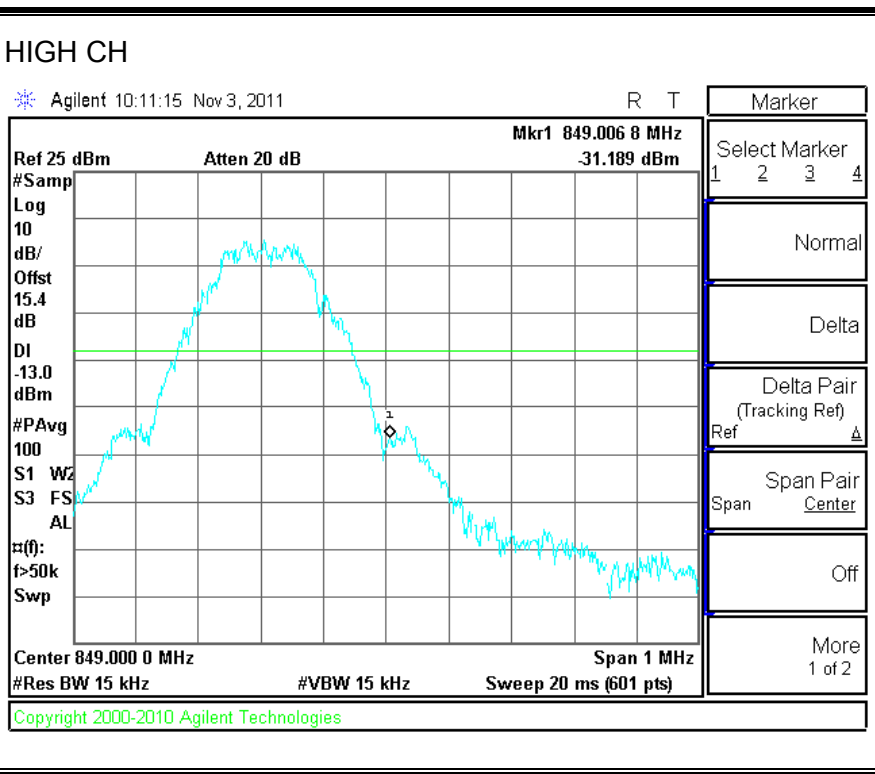


EGPRS850 BAND

LOW CH

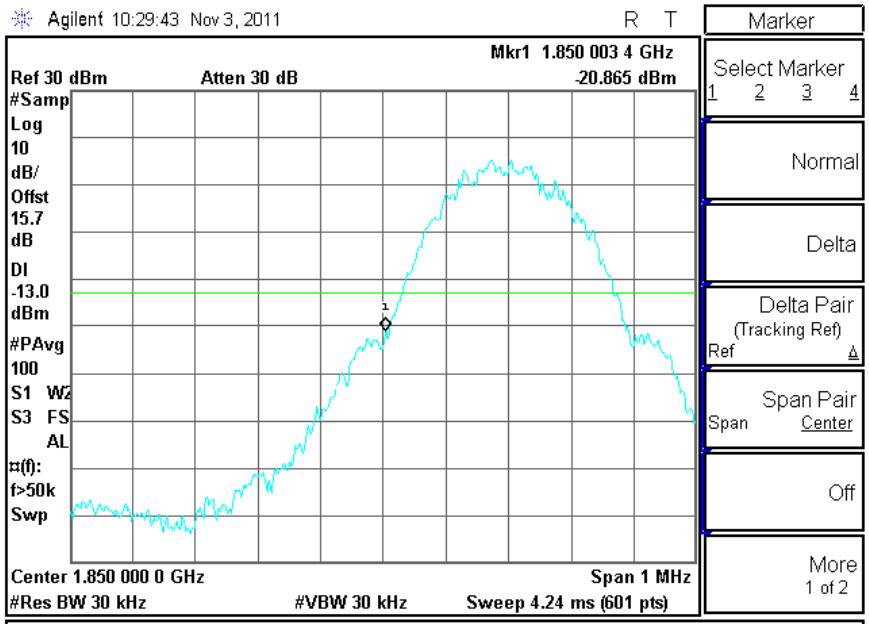


HIGH CH

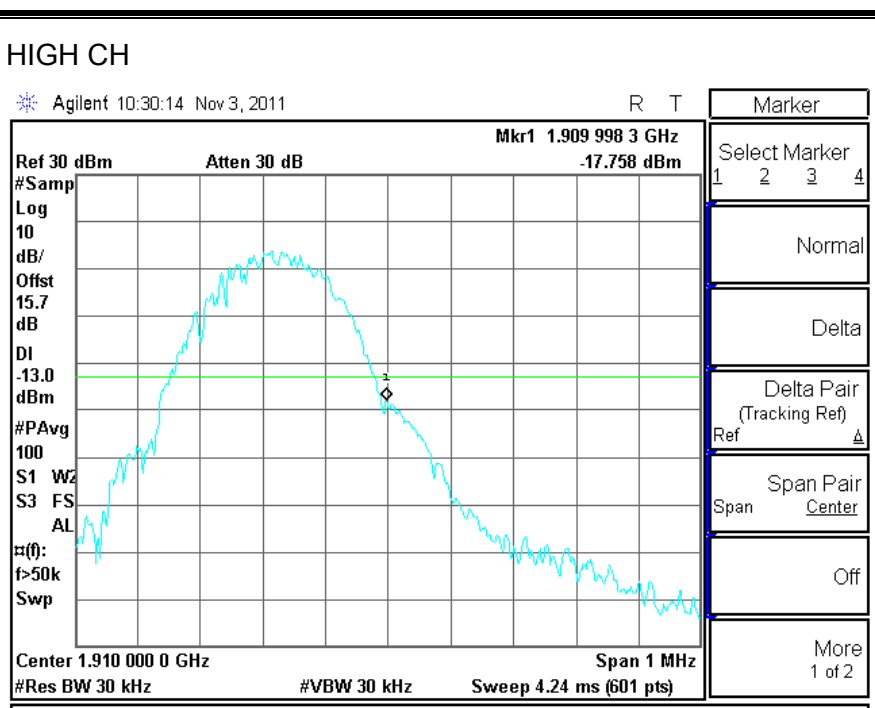


GPRS1900 BAND

LOW CH

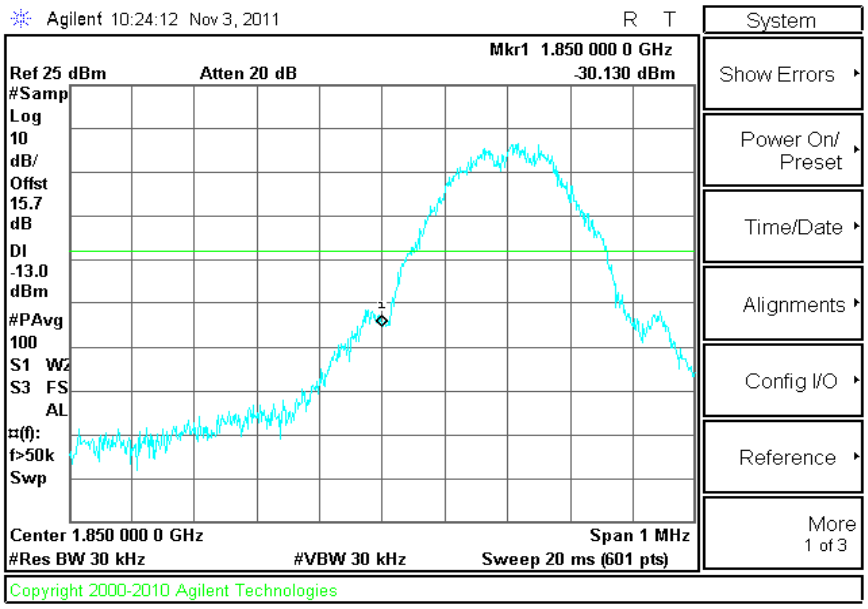


HIGH CH

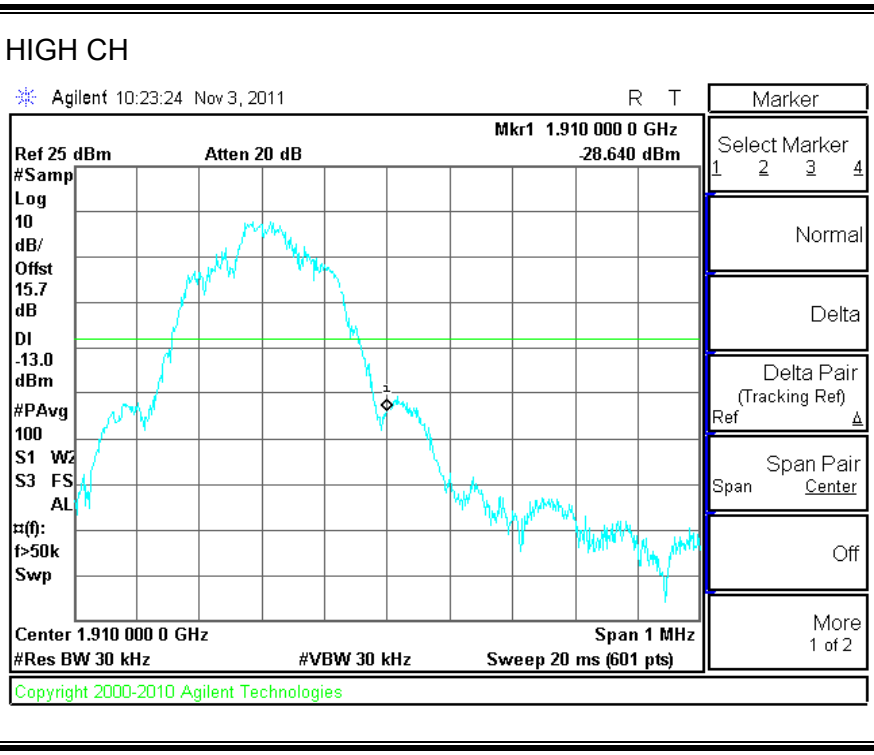


EGPRS1900 BAND

LOW CH

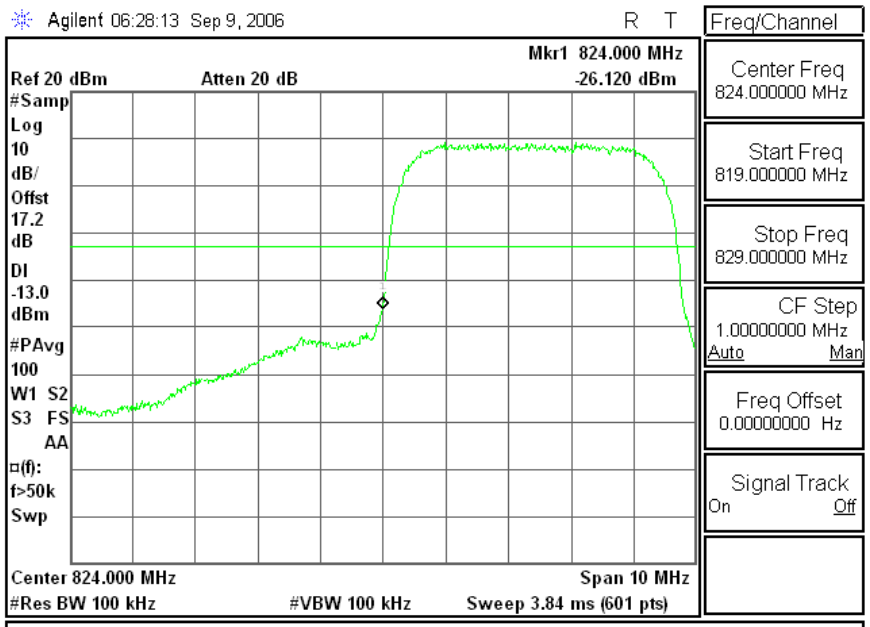


HIGH CH

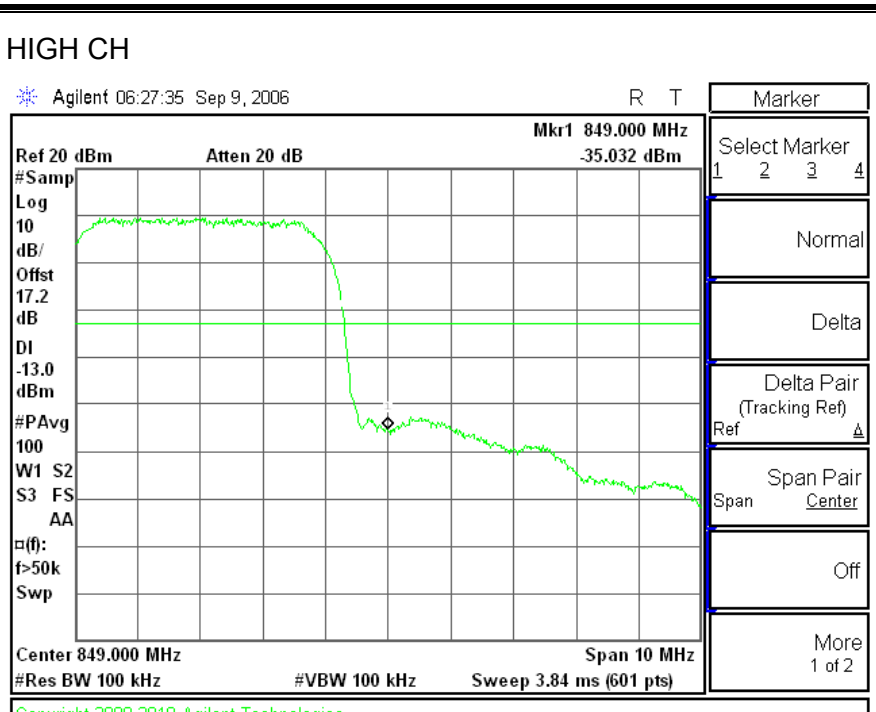


UMTS WCDMA REL 99 CELL BAND

LOW CH

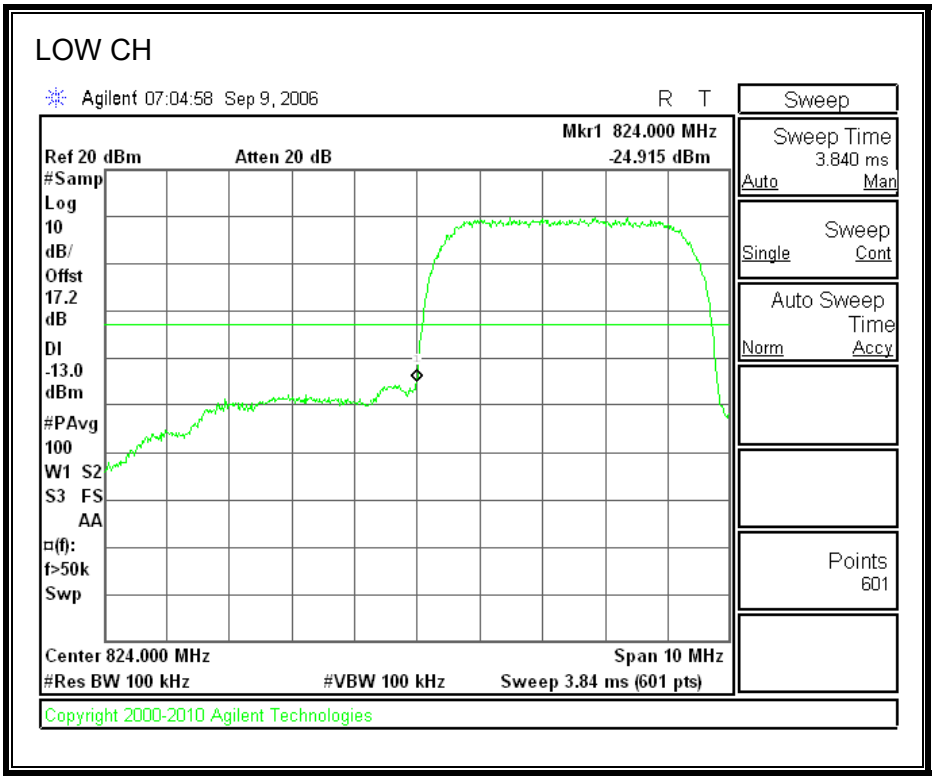


HIGH CH

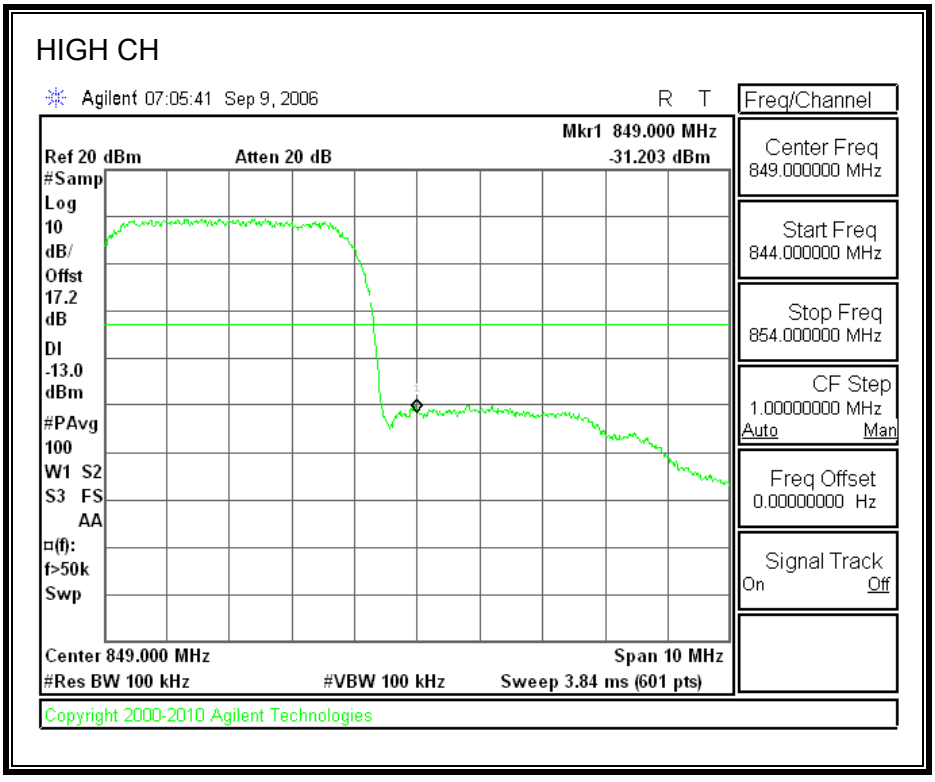


UMTS HSDPA REL 6 CELL BAND

LOW CH

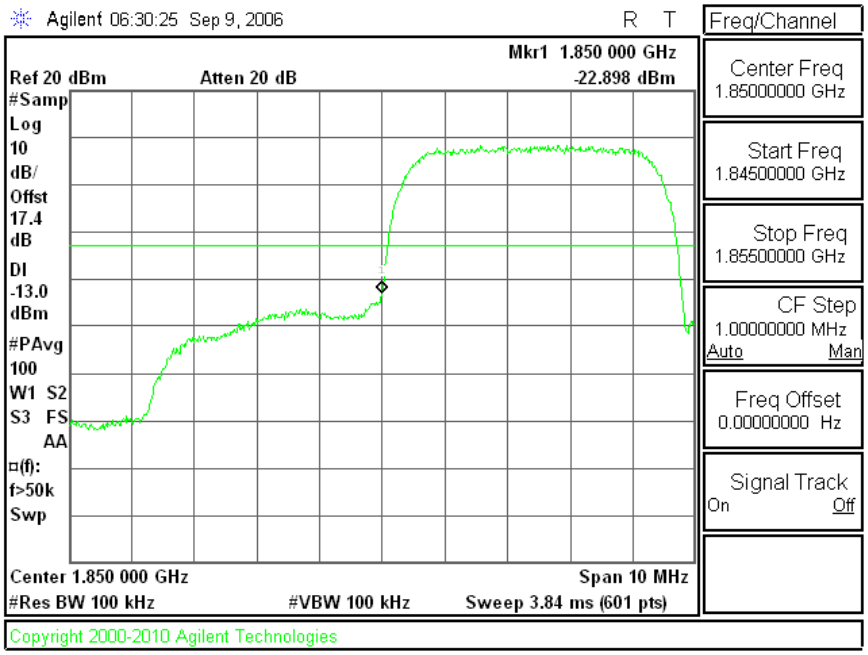


HIGH CH

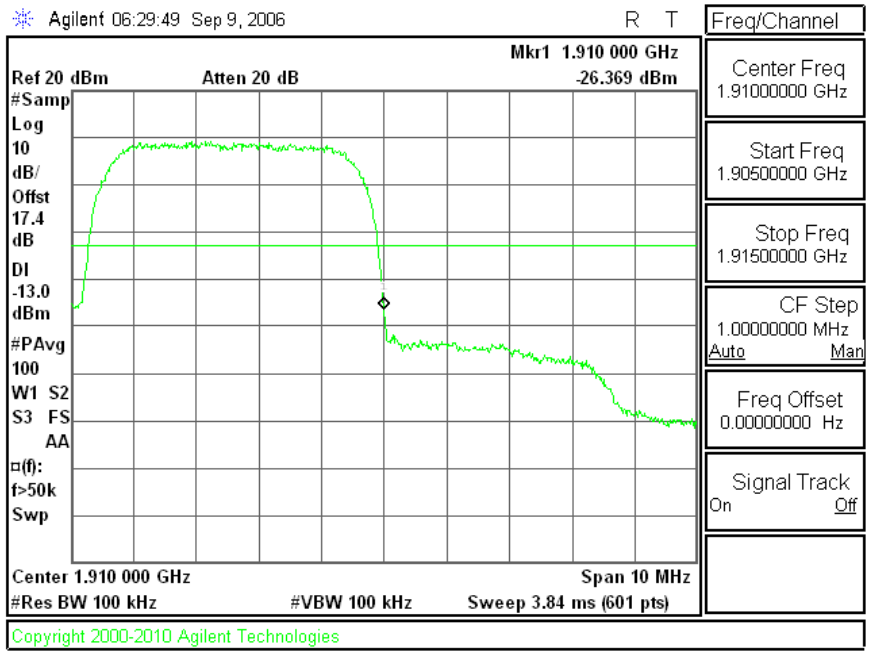


UMTS WCDMA REL 99 PCS Band

LOW CH

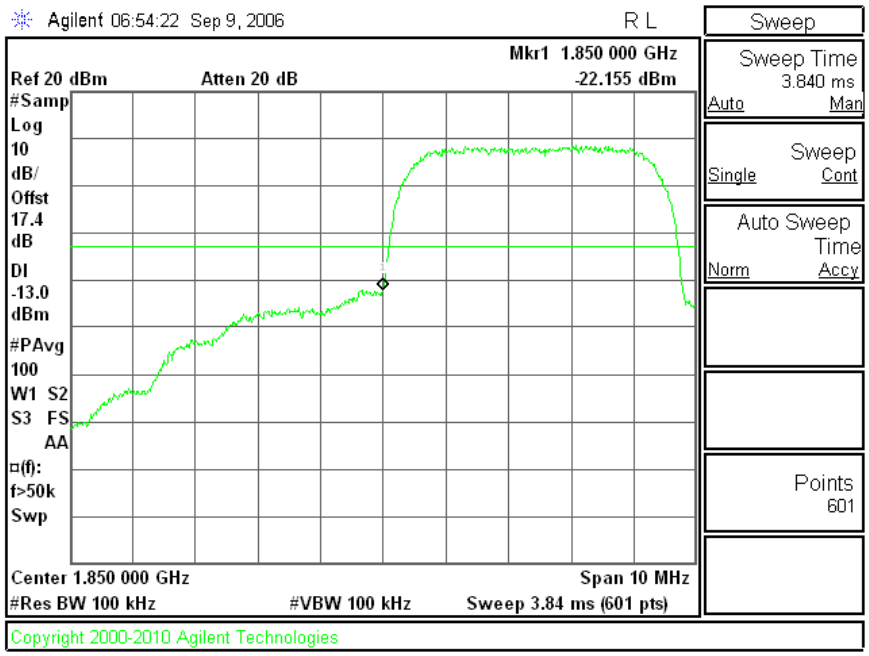


HIGH CH

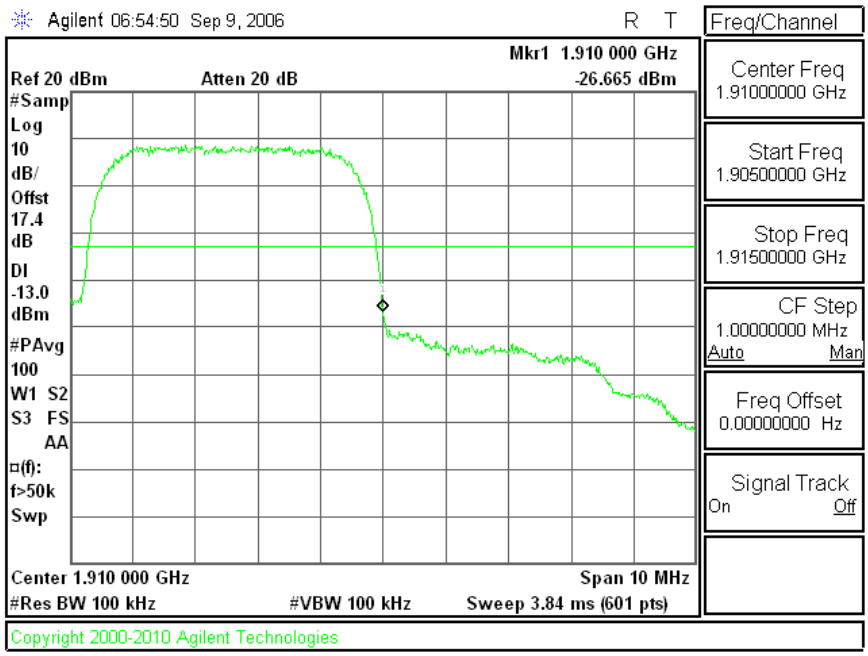


UMTS HSDPA REL 6 PCS Band

LOW CH

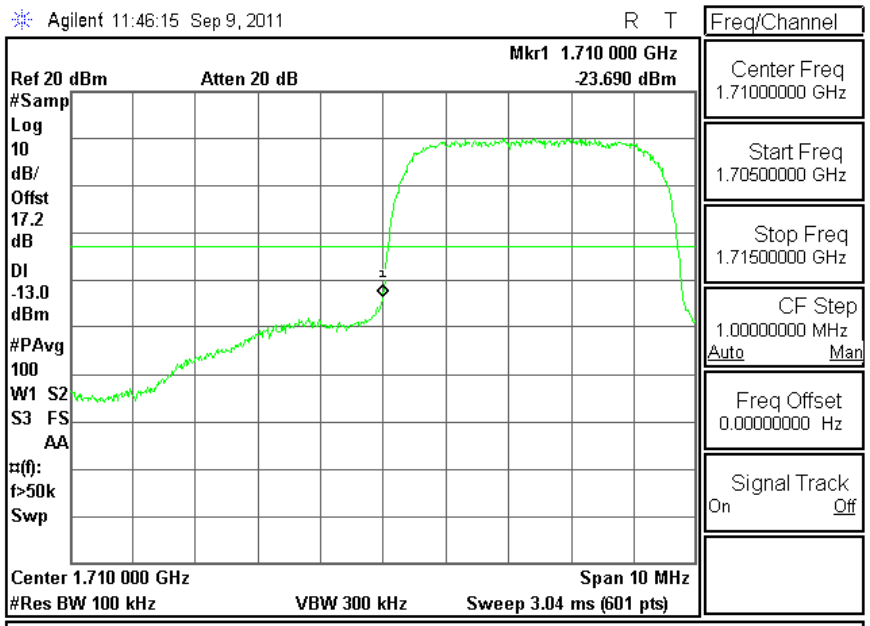


HIGH CH

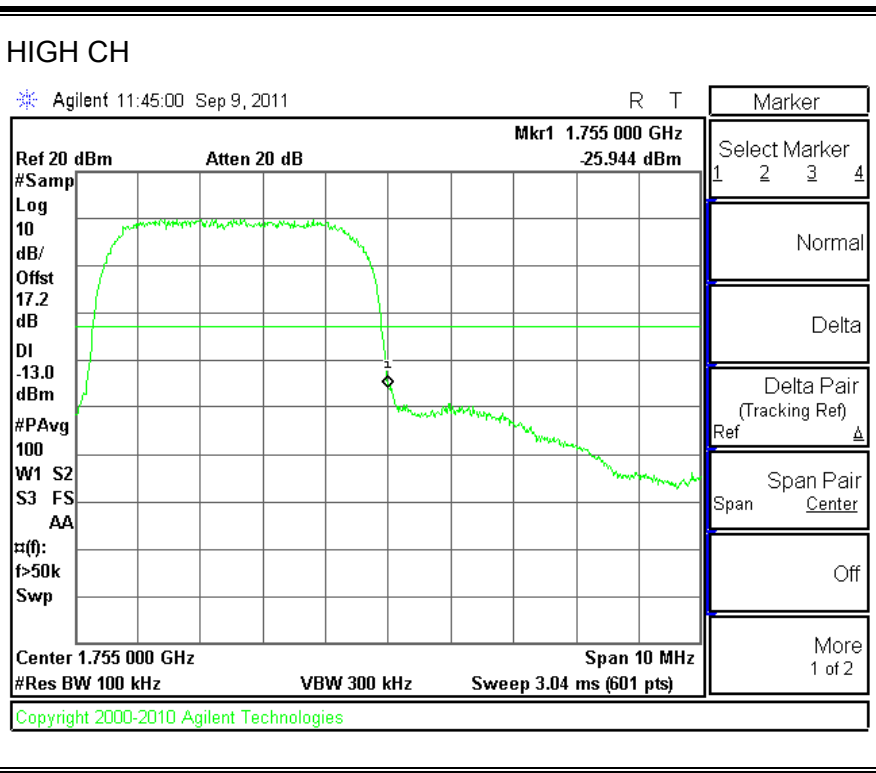


UMTS WCDMA REL 99 AWS Band

LOW CH

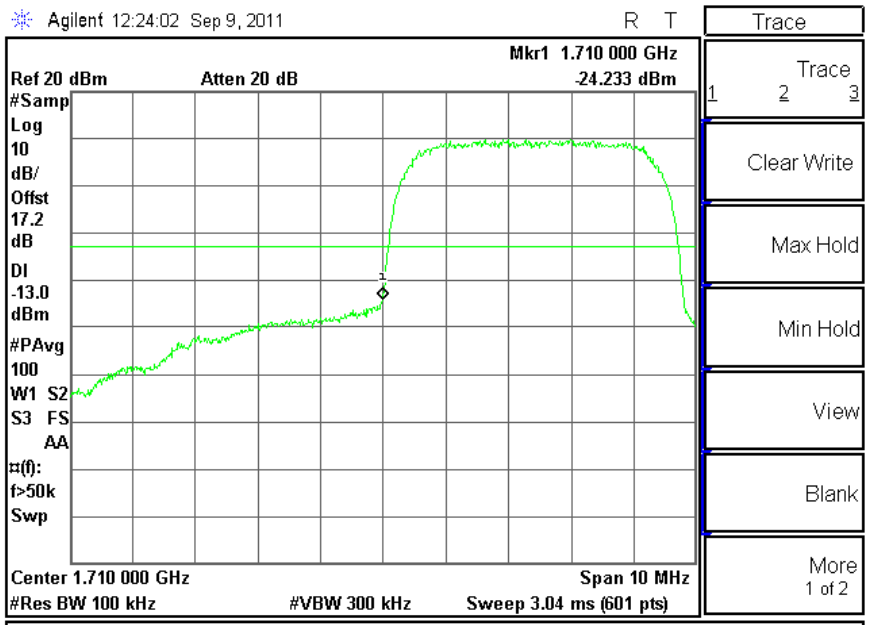


HIGH CH

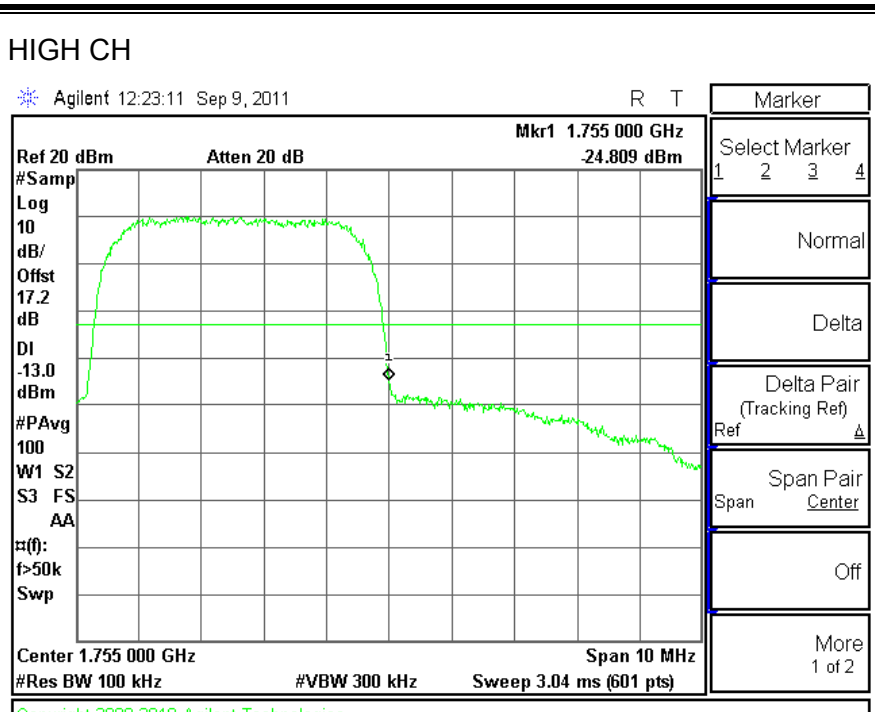


UMTS HSDPA REL 6 AWS Band

LOW CH

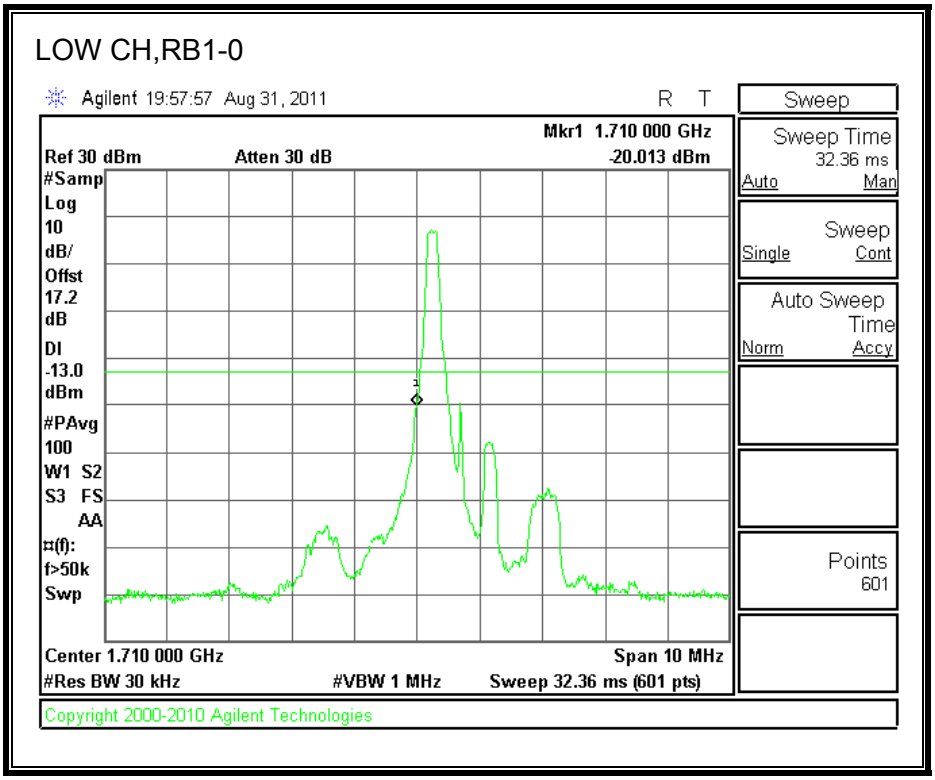


HIGH CH

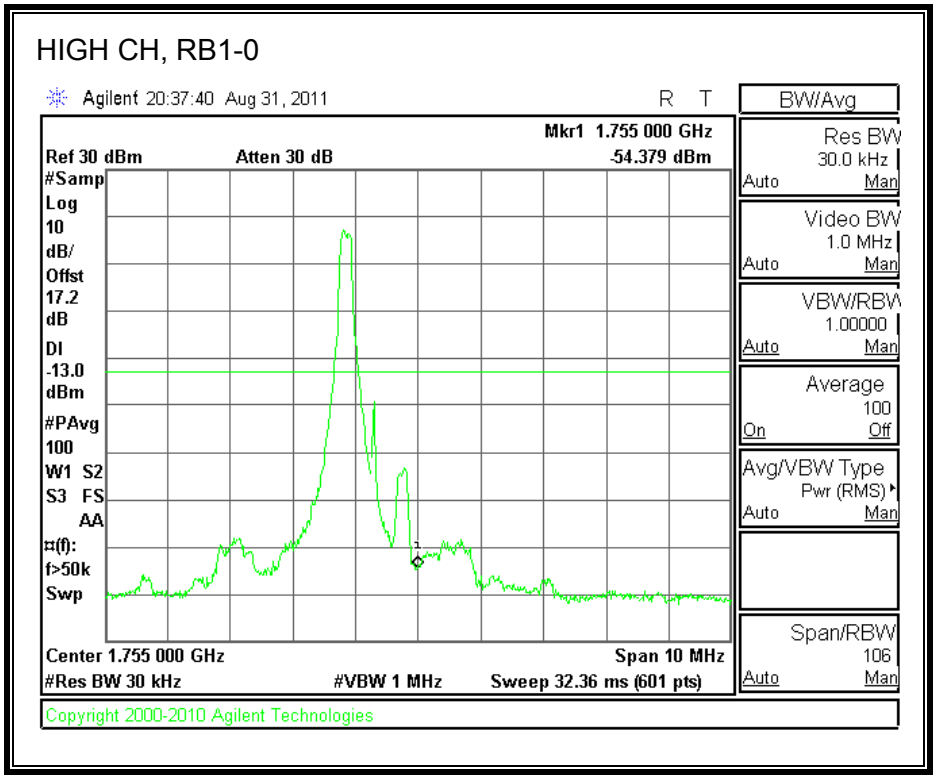


LTE QPSK Band 4 (1.4 MHz BAND WIDTH)

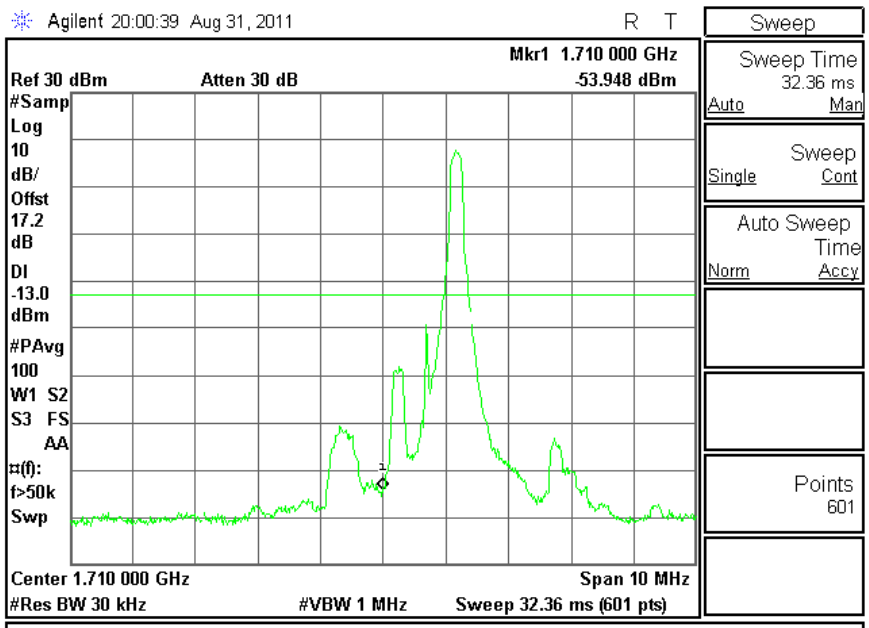
LOW CH,RB1-0



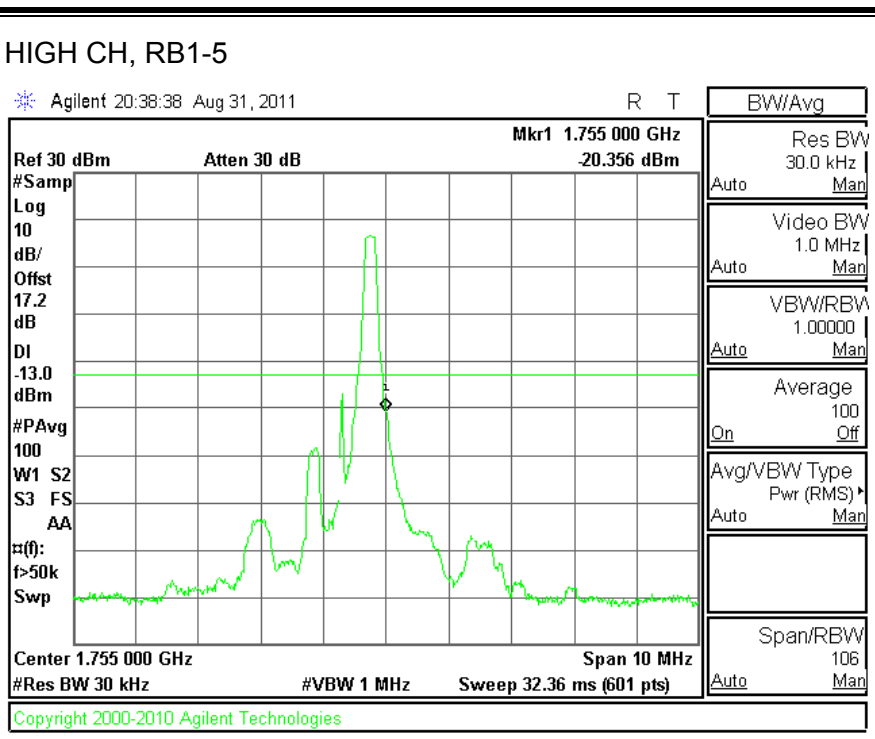
HIGH CH, RB1-0



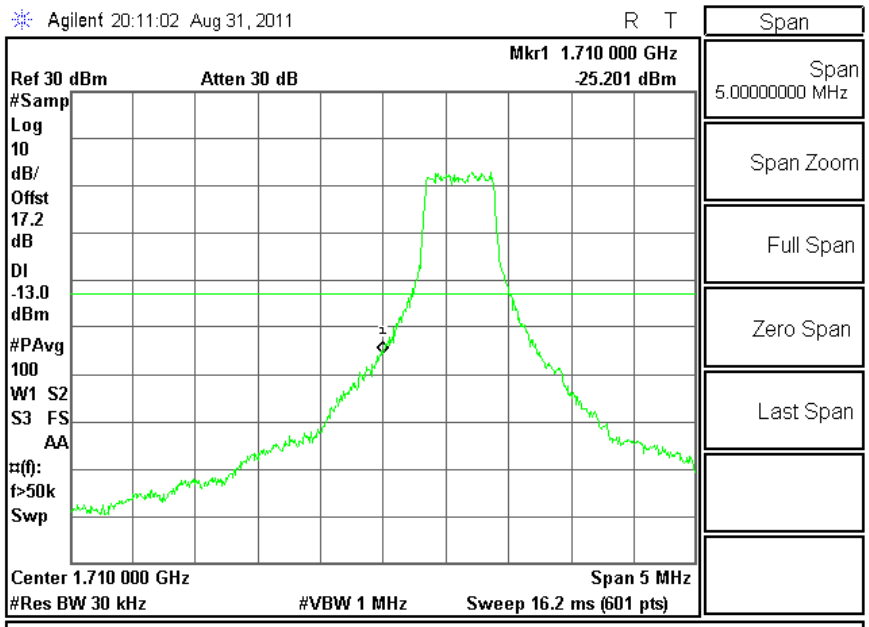
LOW CH, RB1-5



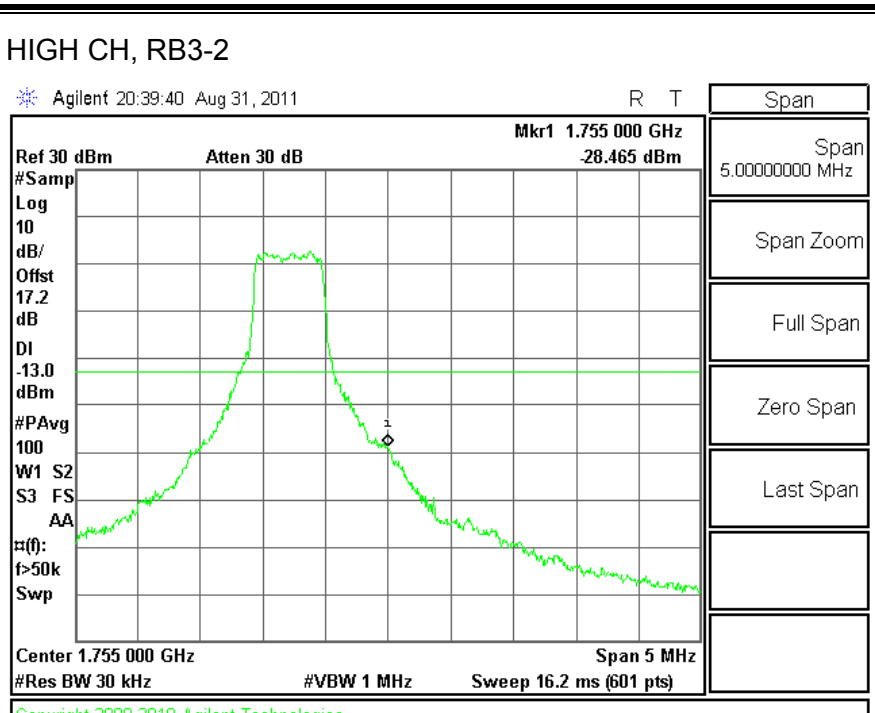
HIGH CH, RB1-5



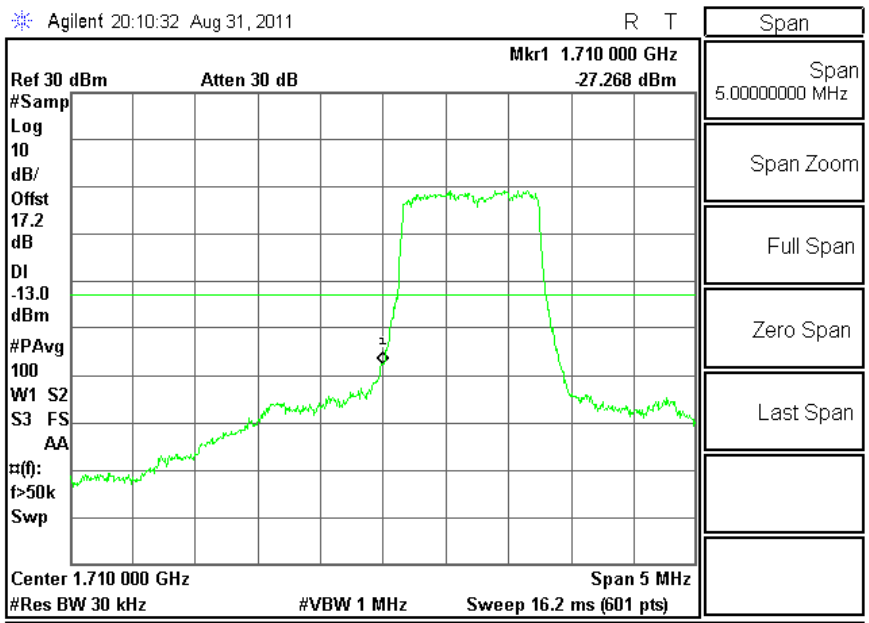
LOW CH, RB3-2



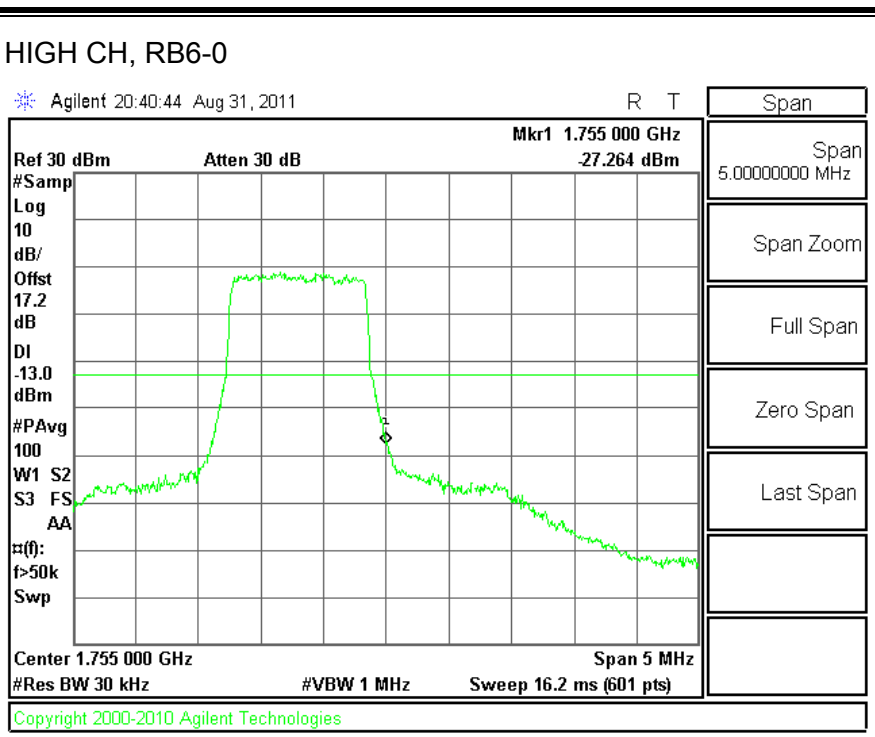
HIGH CH, RB3-2



LOW CH, RB6-0

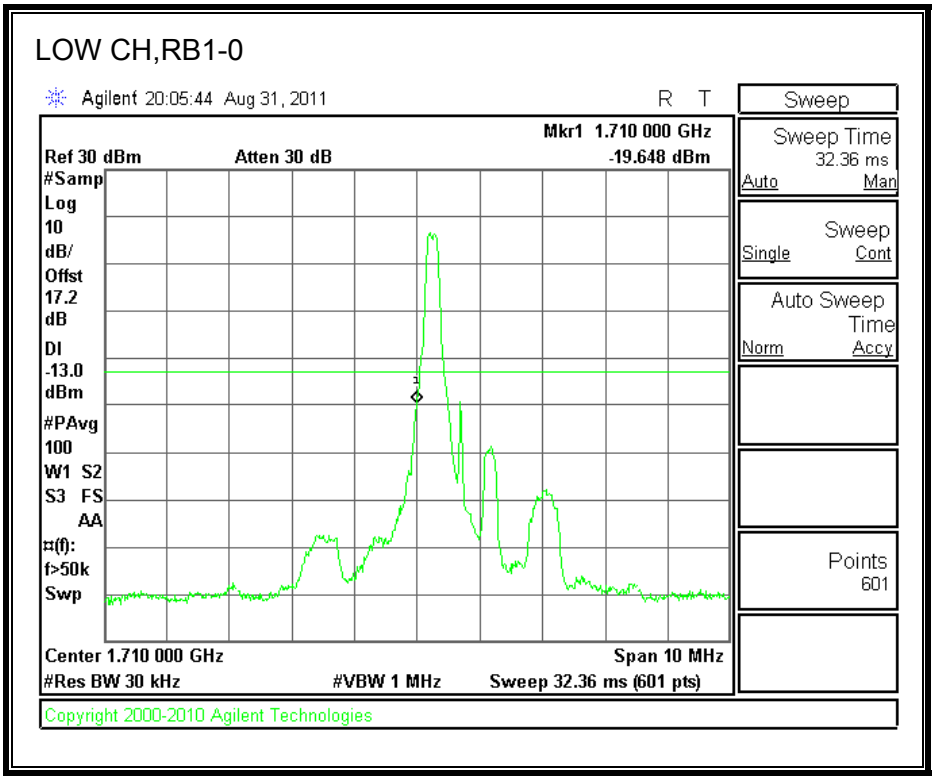


HIGH CH, RB6-0

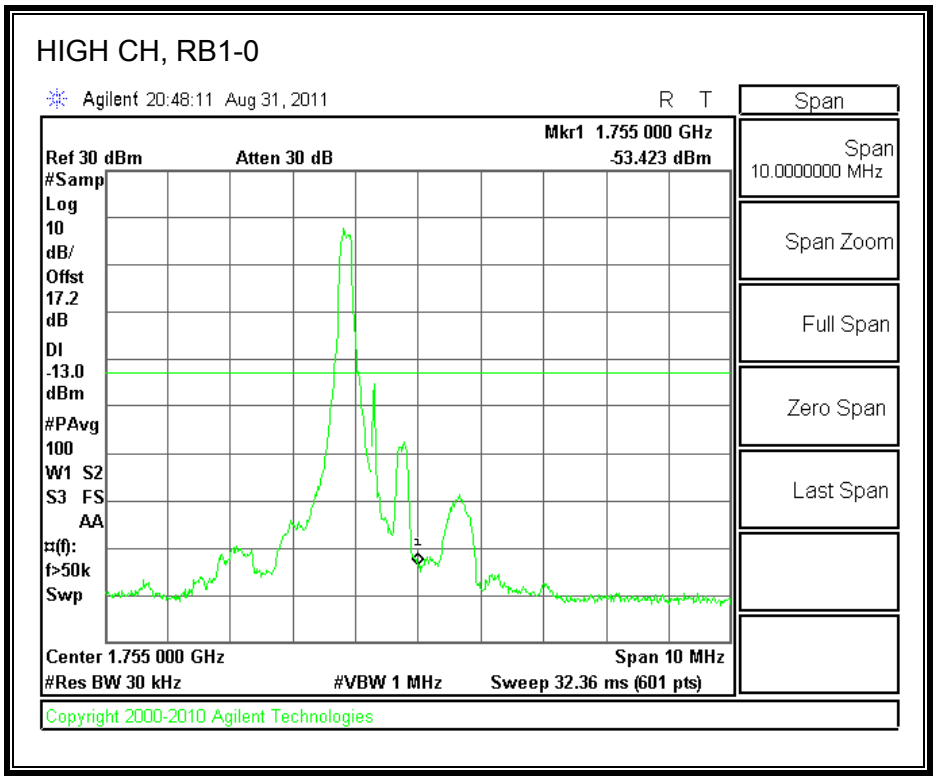


LTE 16QAM Band 4 (1.4 MHz BAND WIDTH)

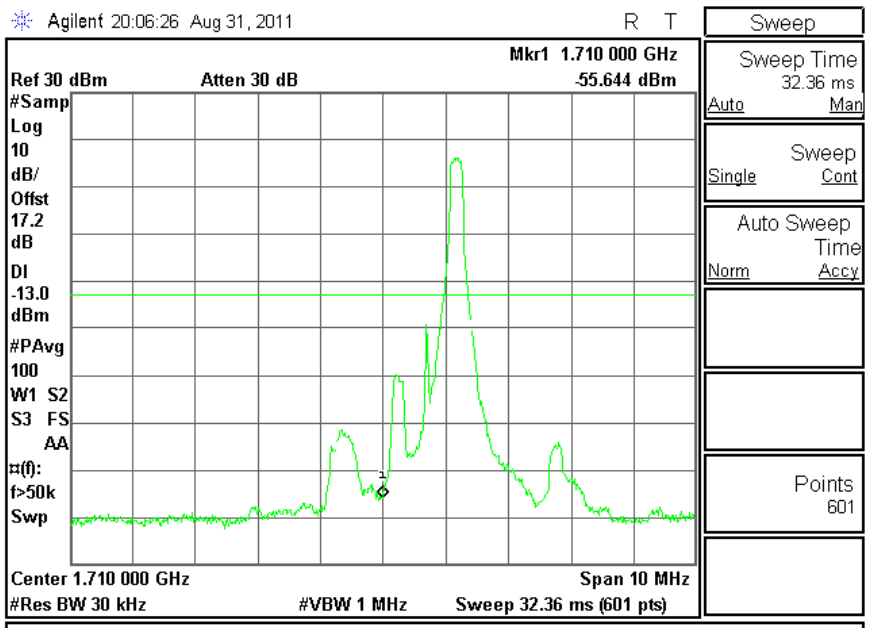
LOW CH,RB1-0



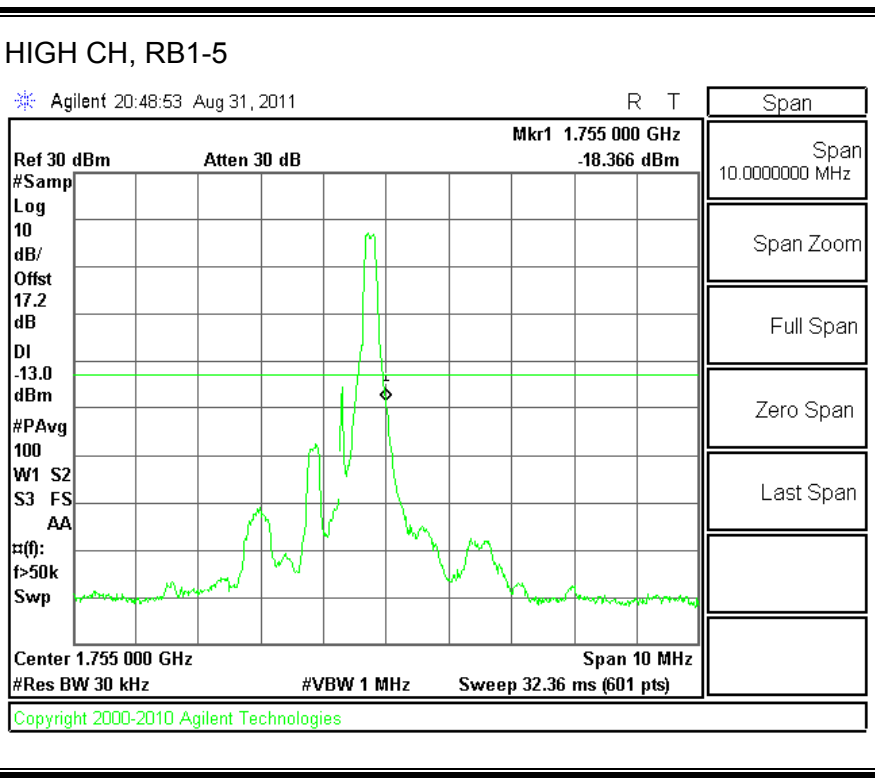
HIGH CH, RB1-0



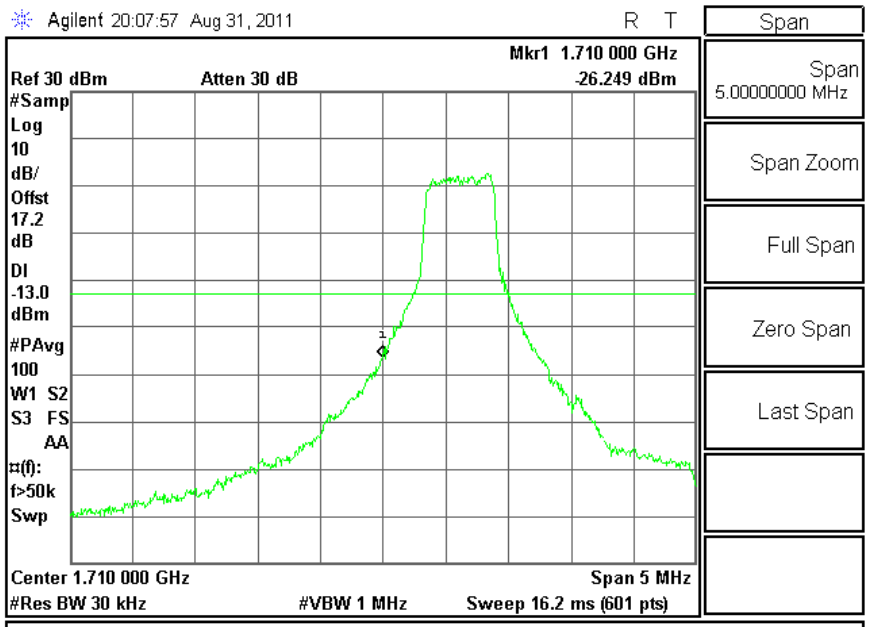
LOW CH, RB1-5



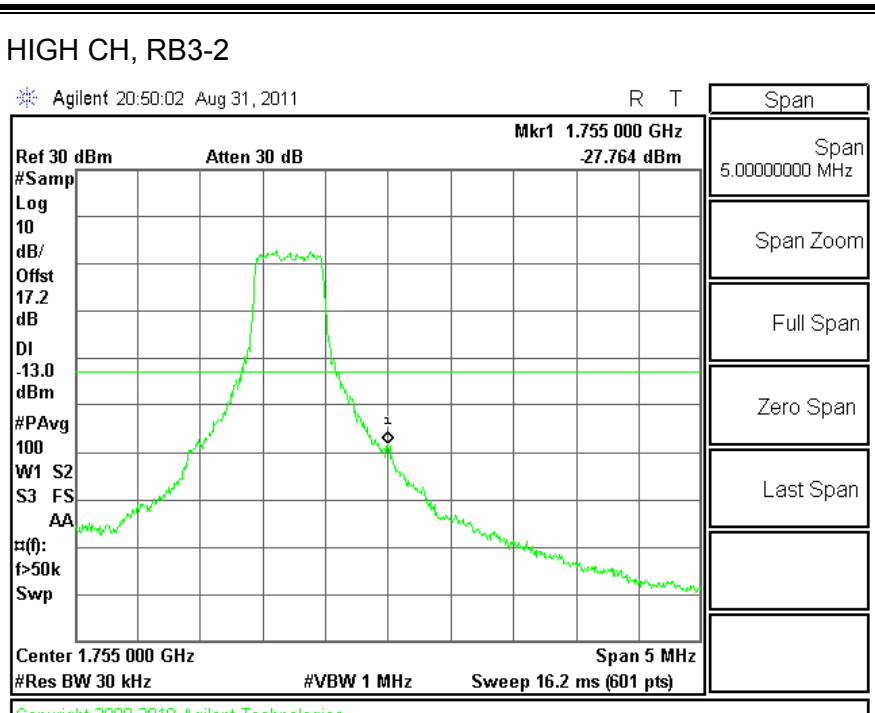
HIGH CH, RB1-5



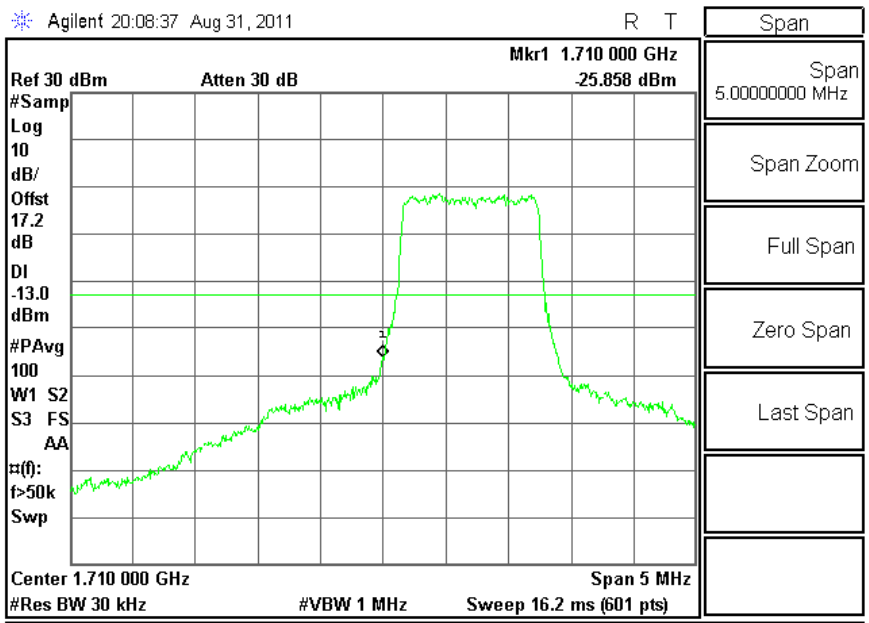
LOW CH, RB3-2



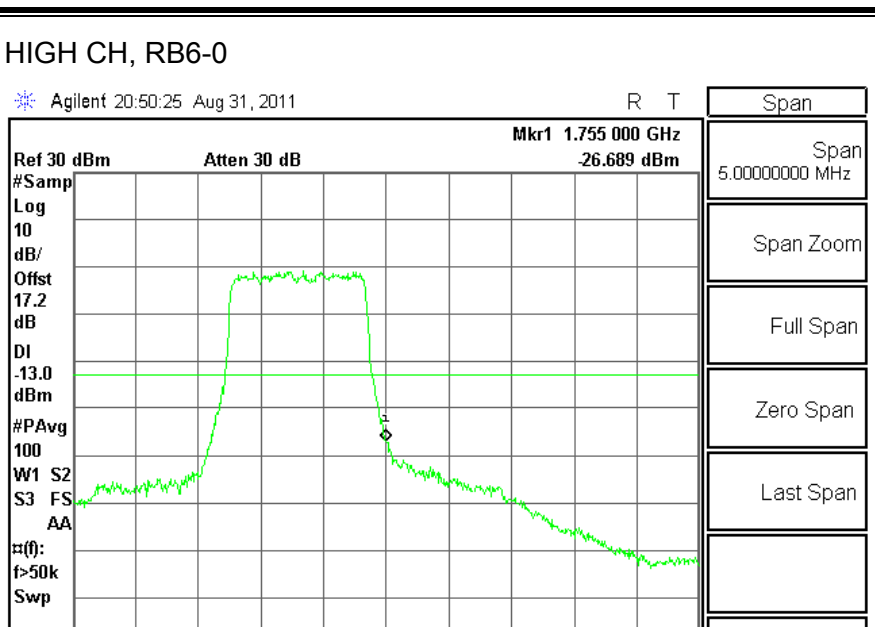
HIGH CH, RB3-2



LOW CH, RB6-0

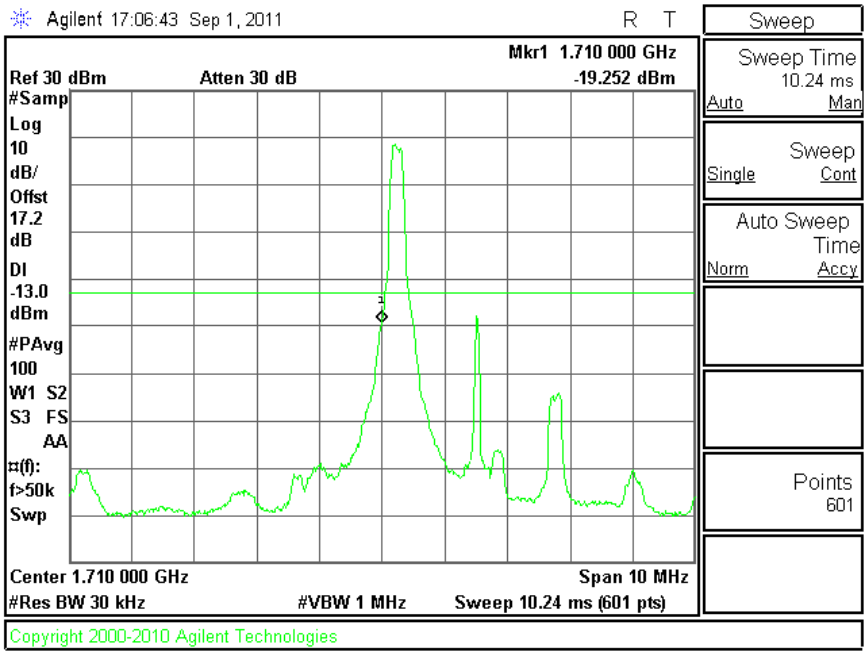


HIGH CH, RB6-0

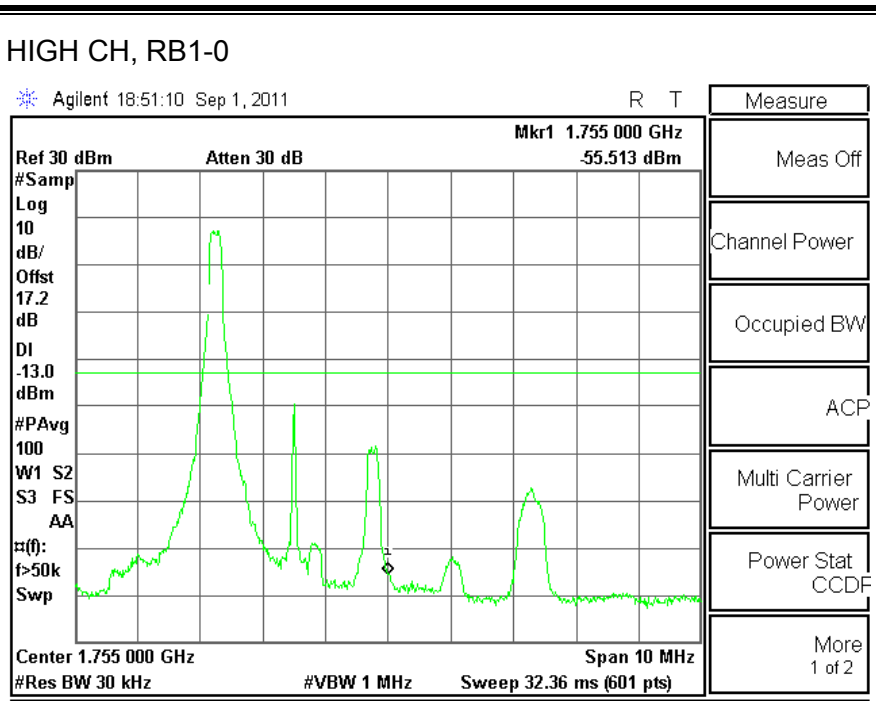


LTE QPSK Band 4 (3.0 MHz BAND WIDTH)

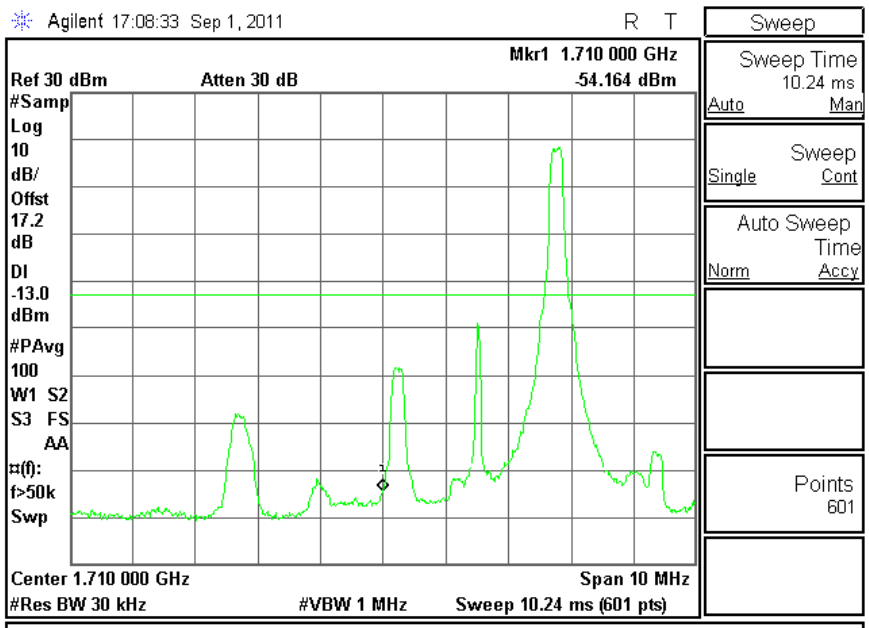
LOW CH,RB1-0



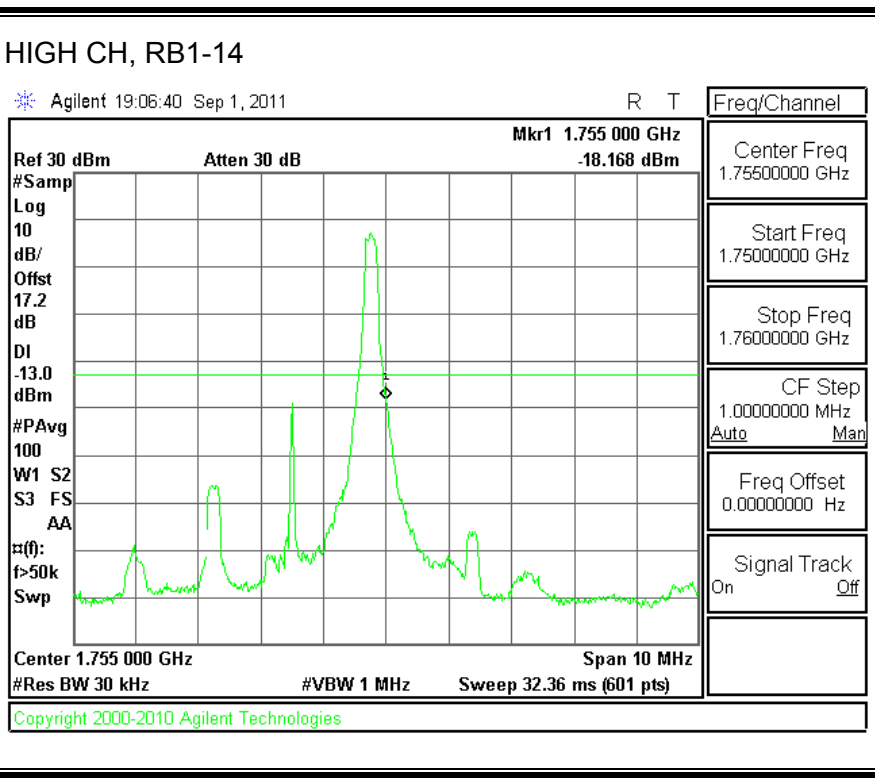
HIGH CH, RB1-0



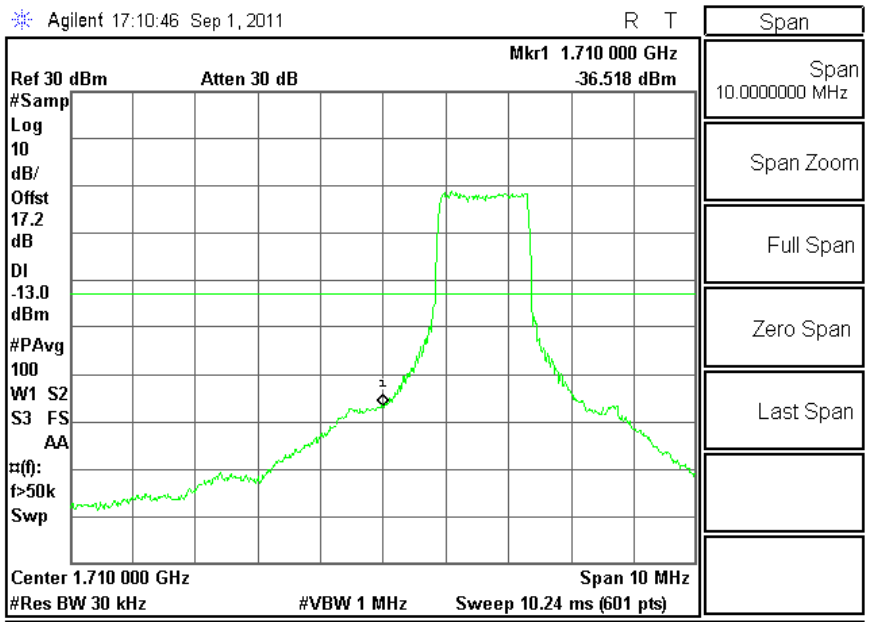
LOW CH, RB1-14



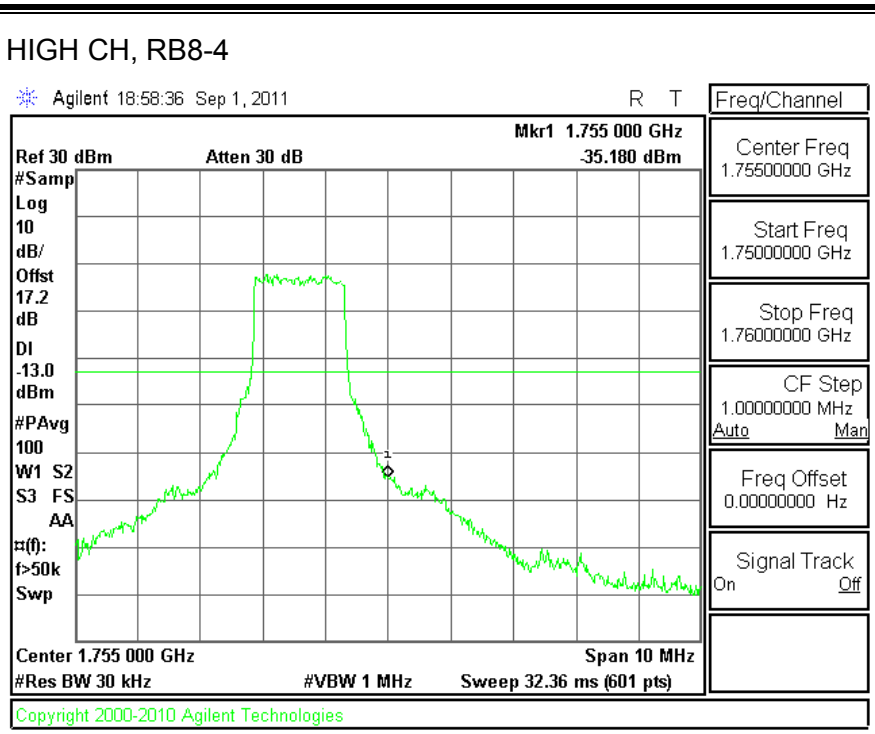
HIGH CH, RB1-14



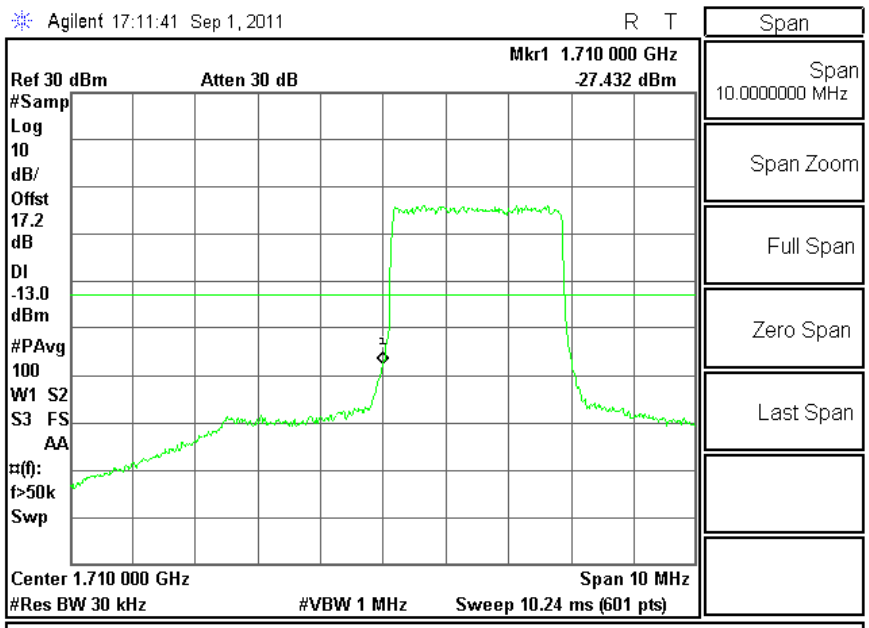
LOW CH, RB8-4



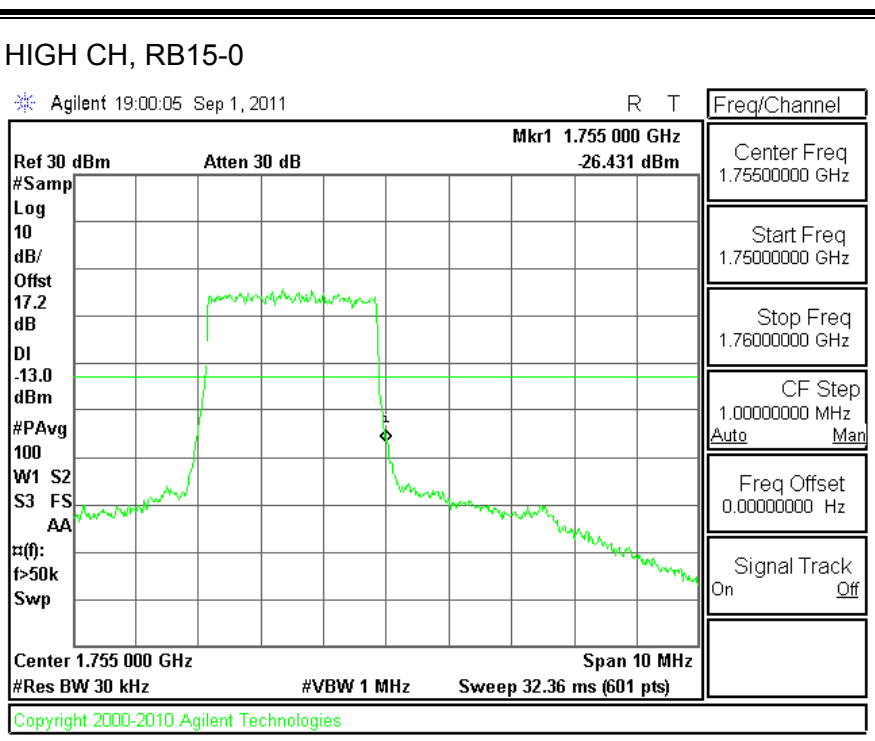
HIGH CH, RB8-4



LOW CH, RB15-0

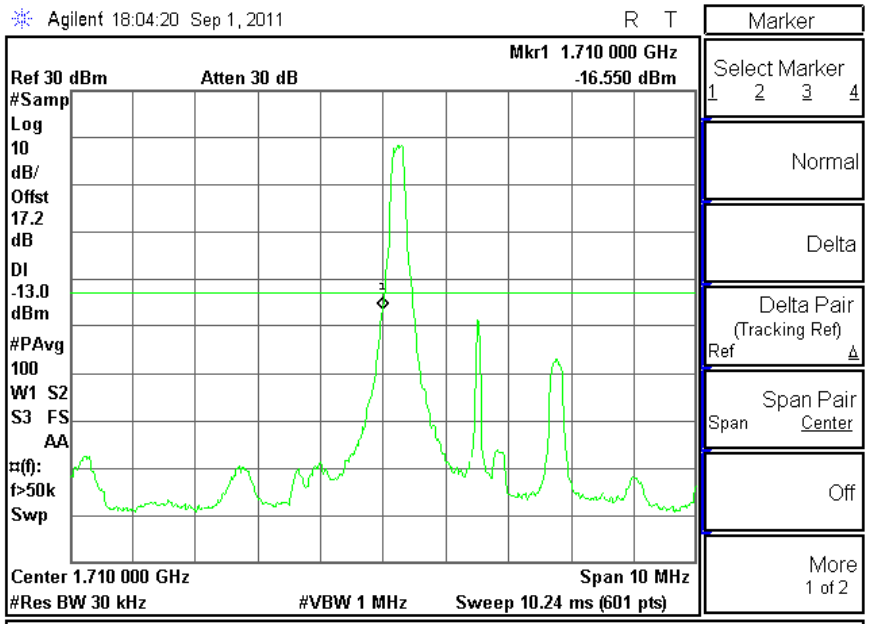


HIGH CH, RB15-0

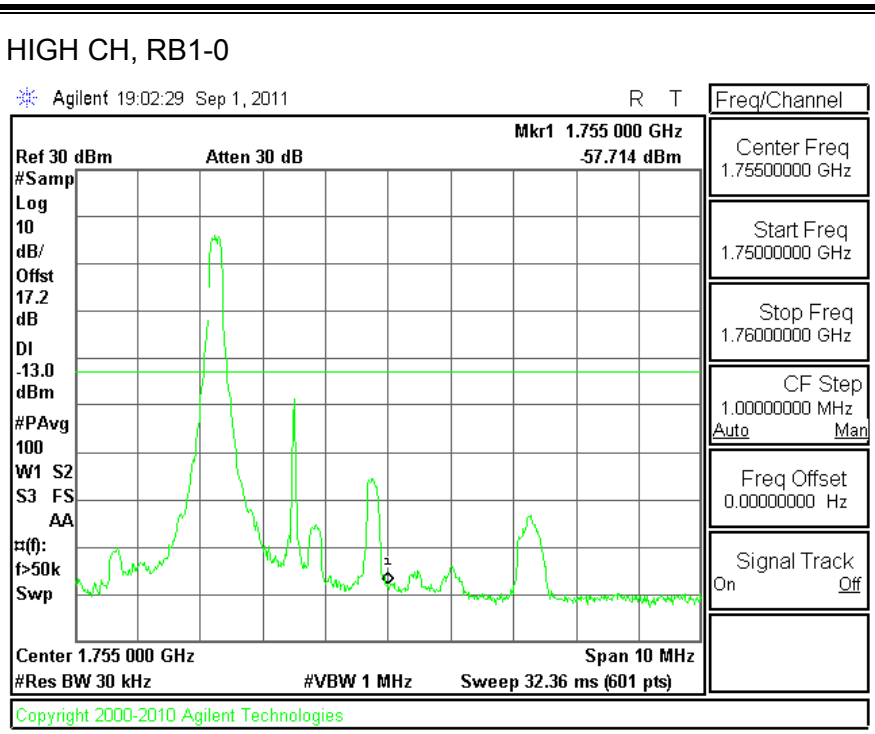


LTE 16QAM Band 4 (3.0 MHz BAND WIDTH)

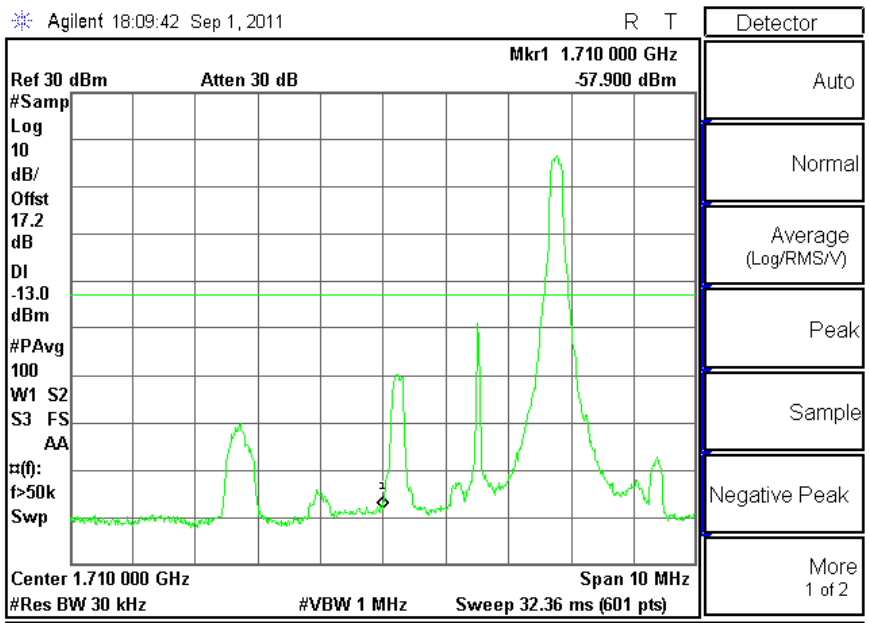
LOW CH, RB1-0



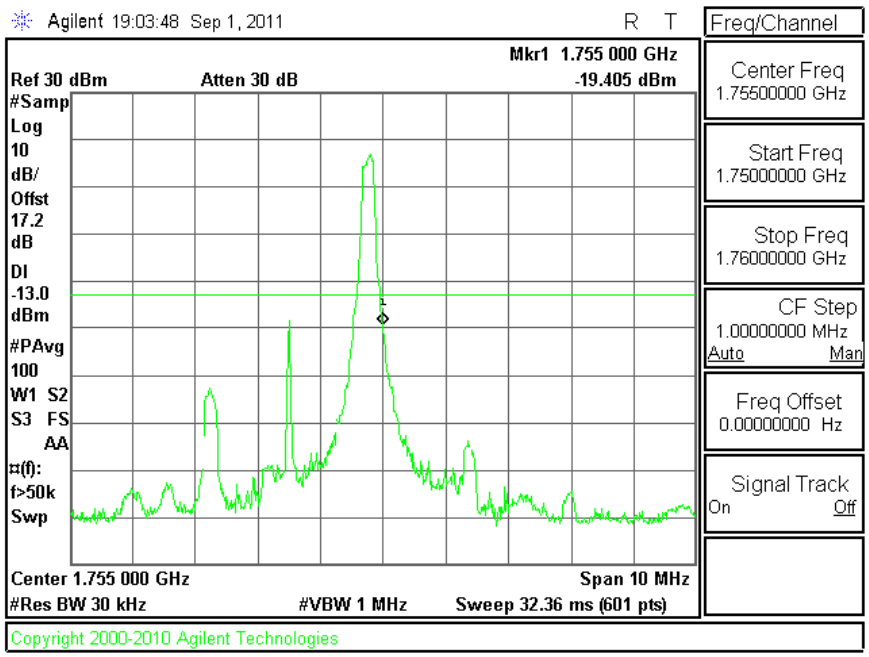
HIGH CH, RB1-0



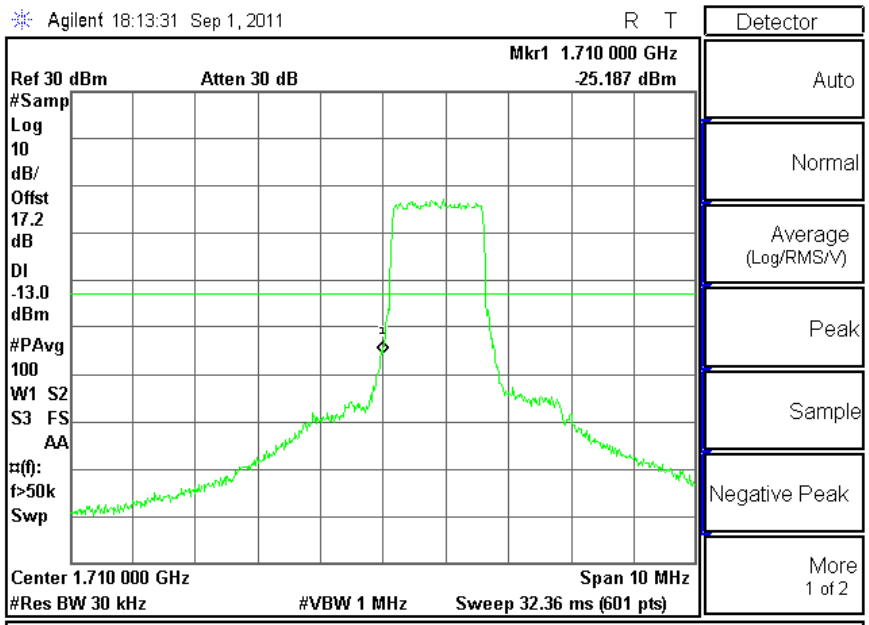
LOW CH, RB1-14



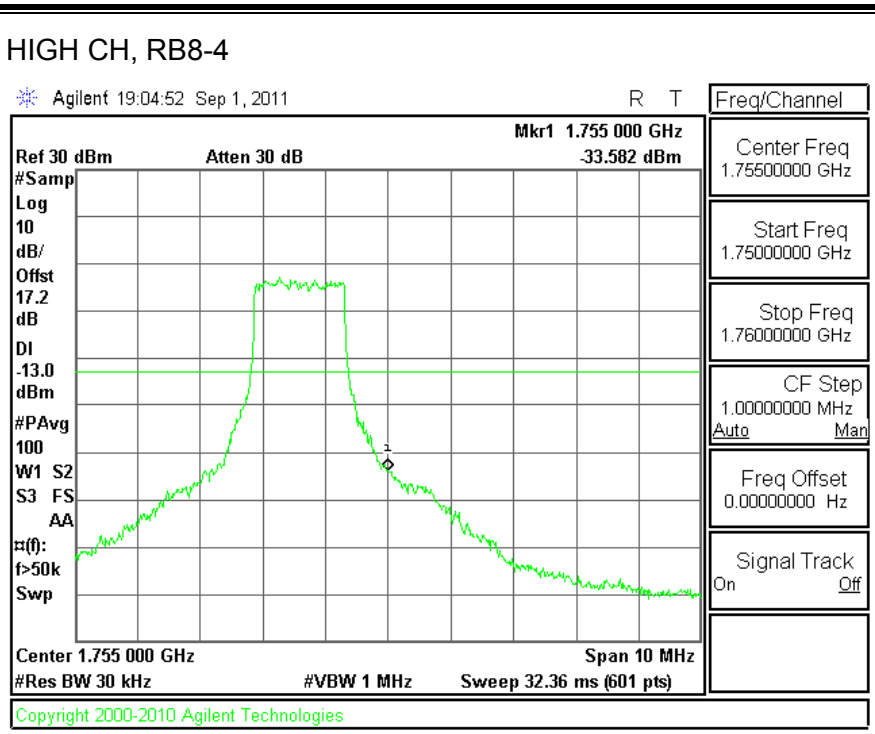
HIGH CH, RB1-14



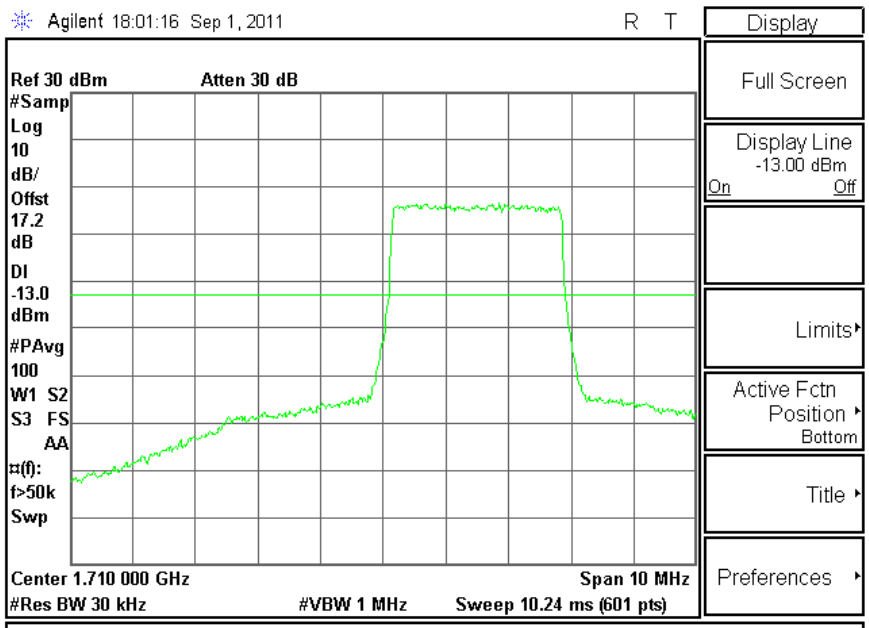
LOW CH, RB8-4



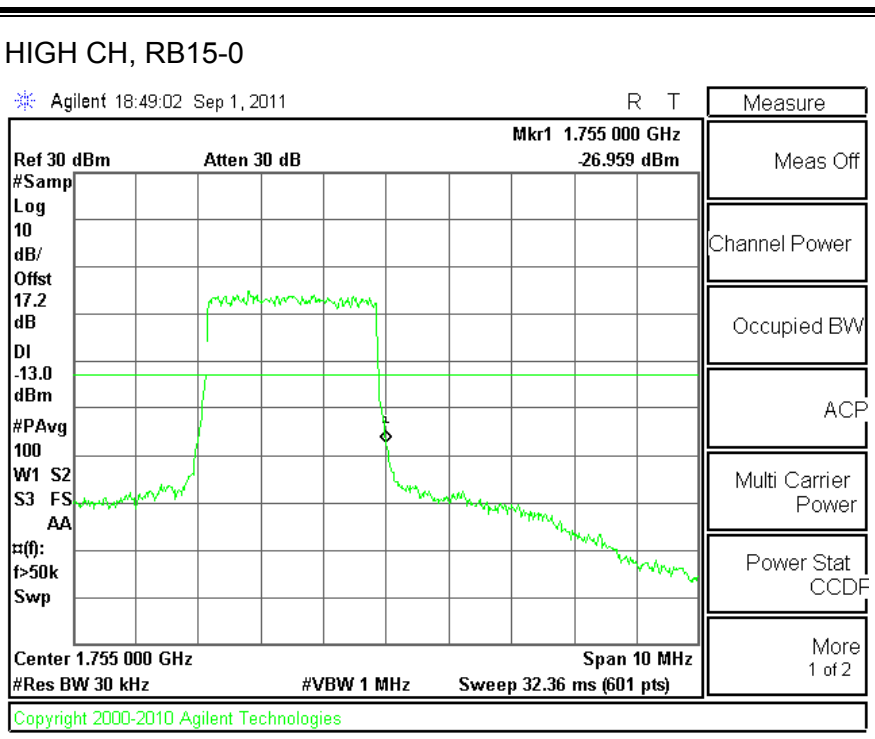
HIGH CH, RB8-4



LOW CH, RB15-0

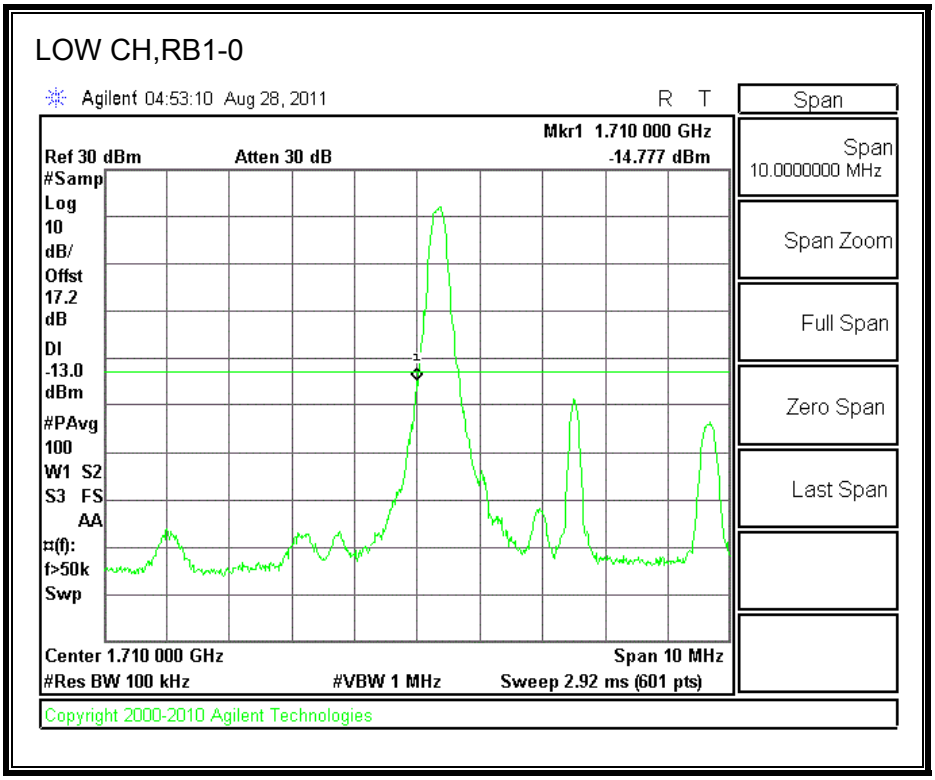


HIGH CH, RB15-0

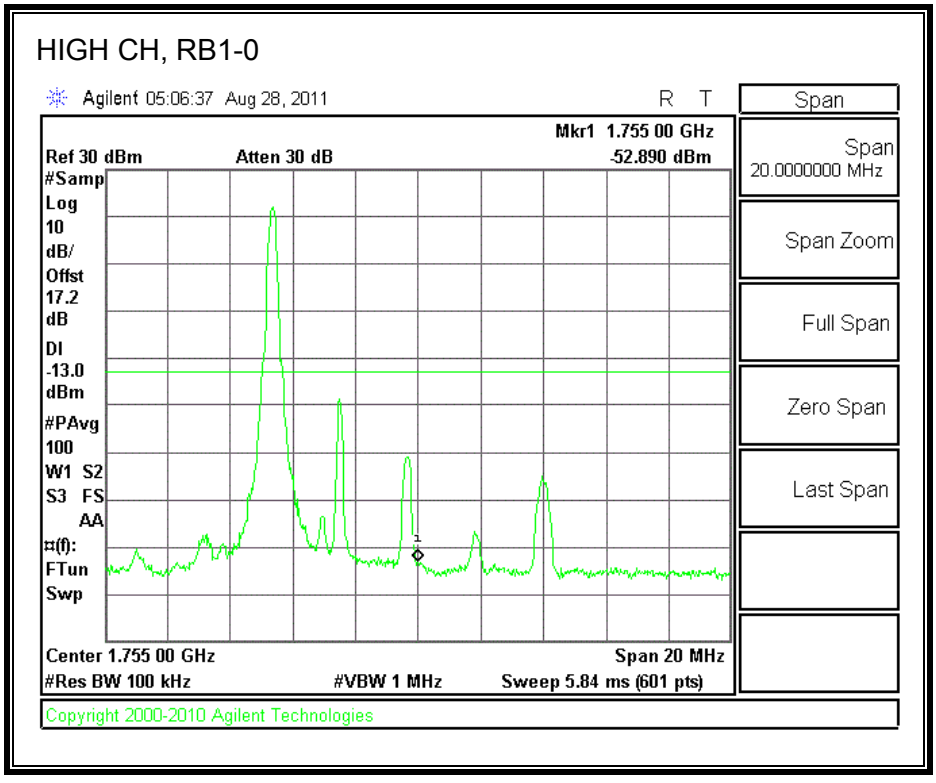


LTE QPSK Band 4 (5.0 MHz BAND WIDTH)

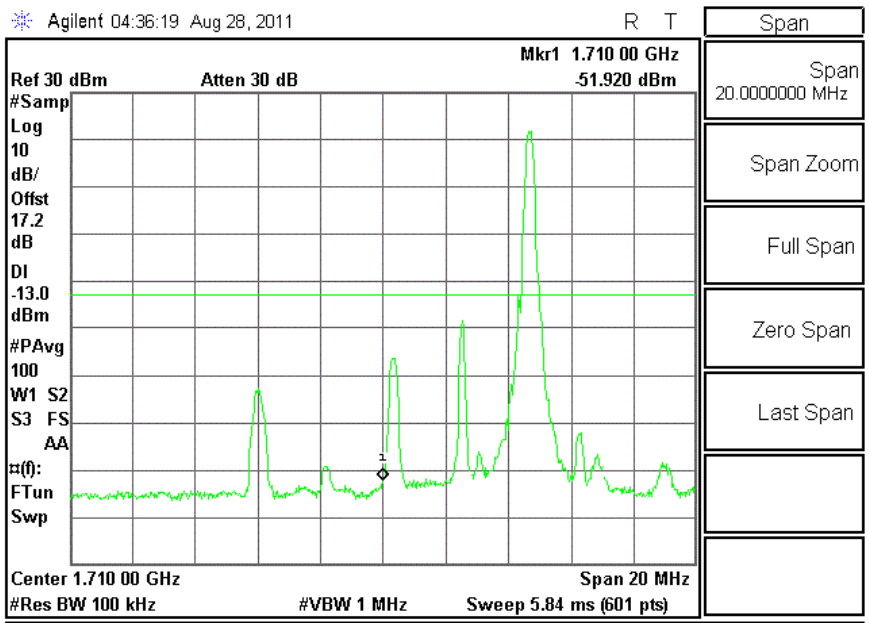
LOW CH,RB1-0



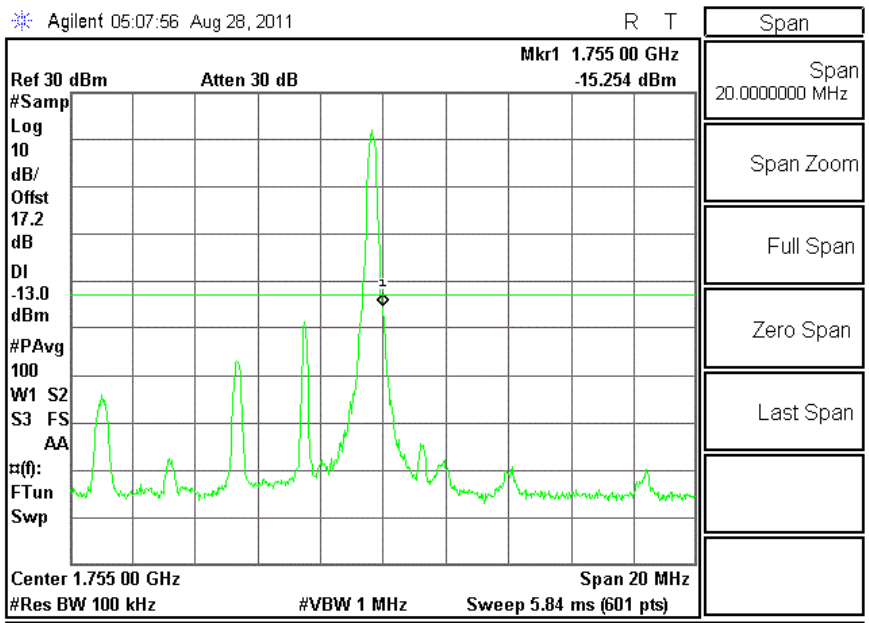
HIGH CH, RB1-0



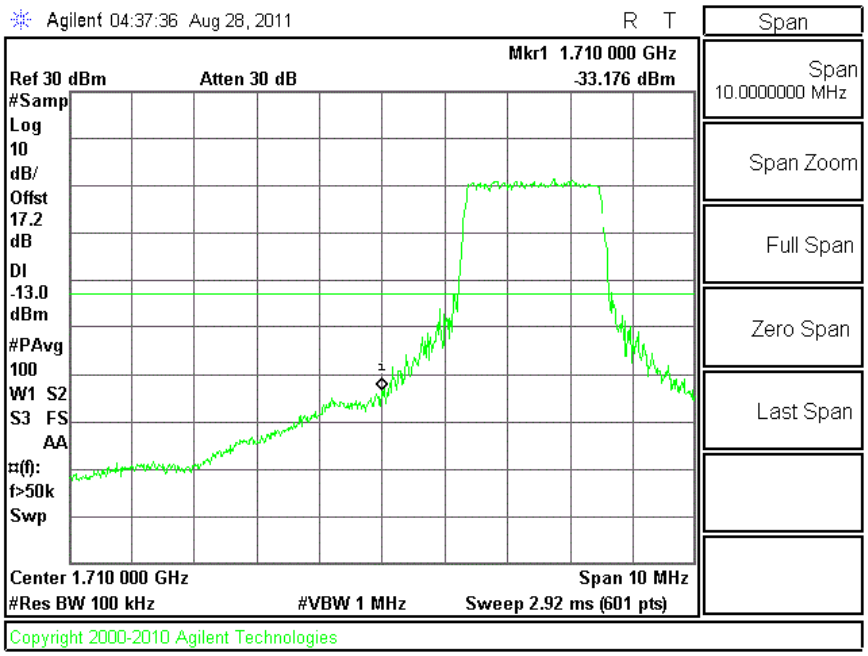
LOW CH, RB1-24



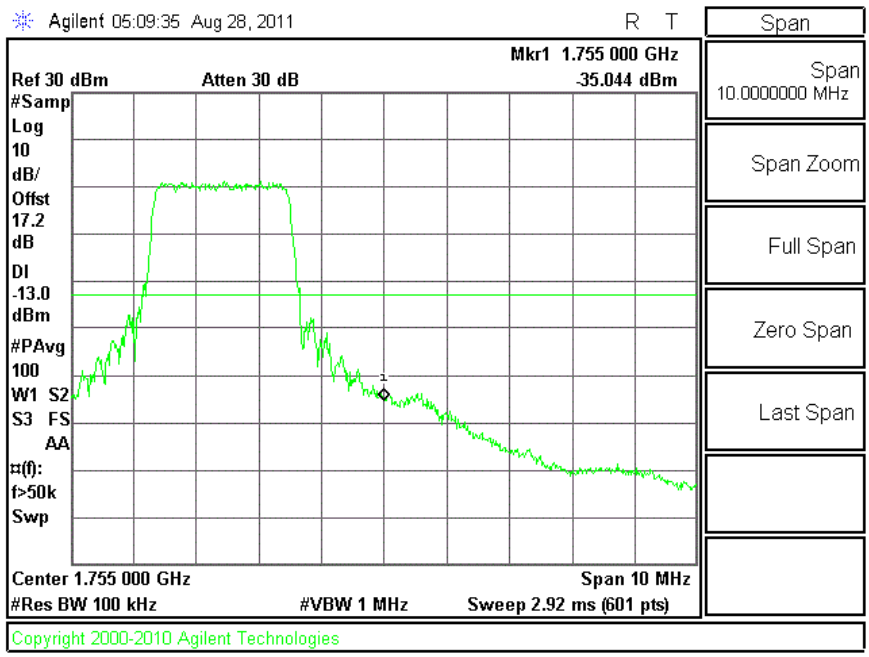
HIGH CH, RB1-24



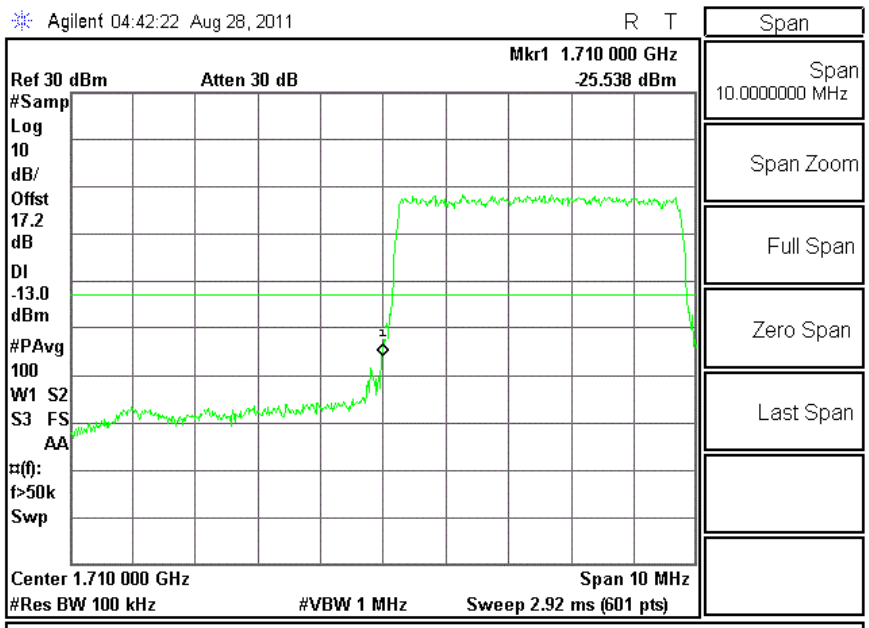
LOW CH, RB12-6



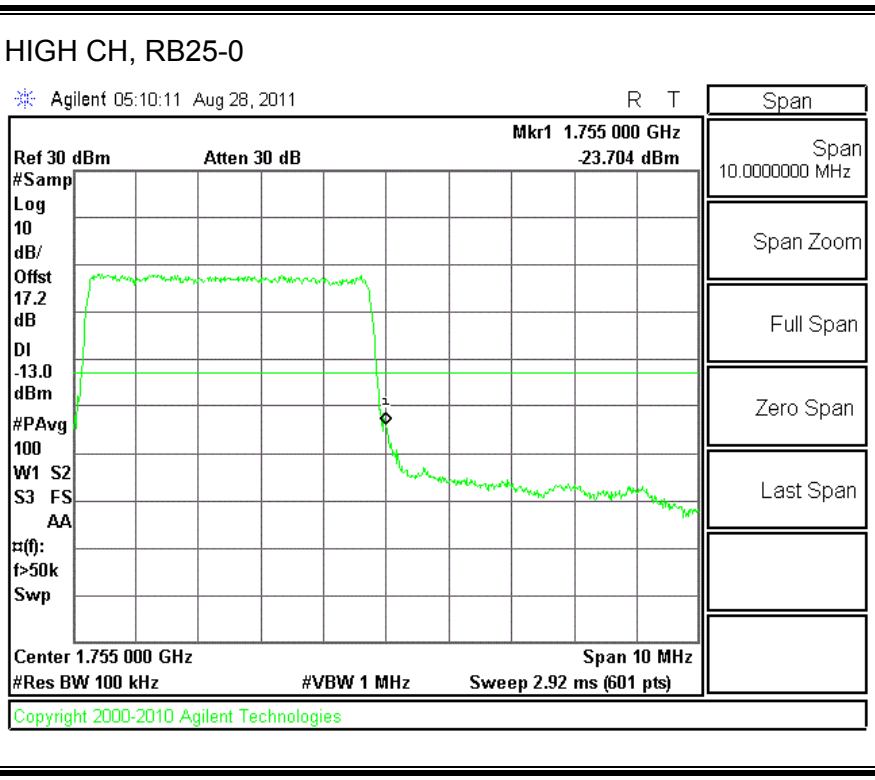
HIGH CH, RB12-6



LOW CH, RB25-0

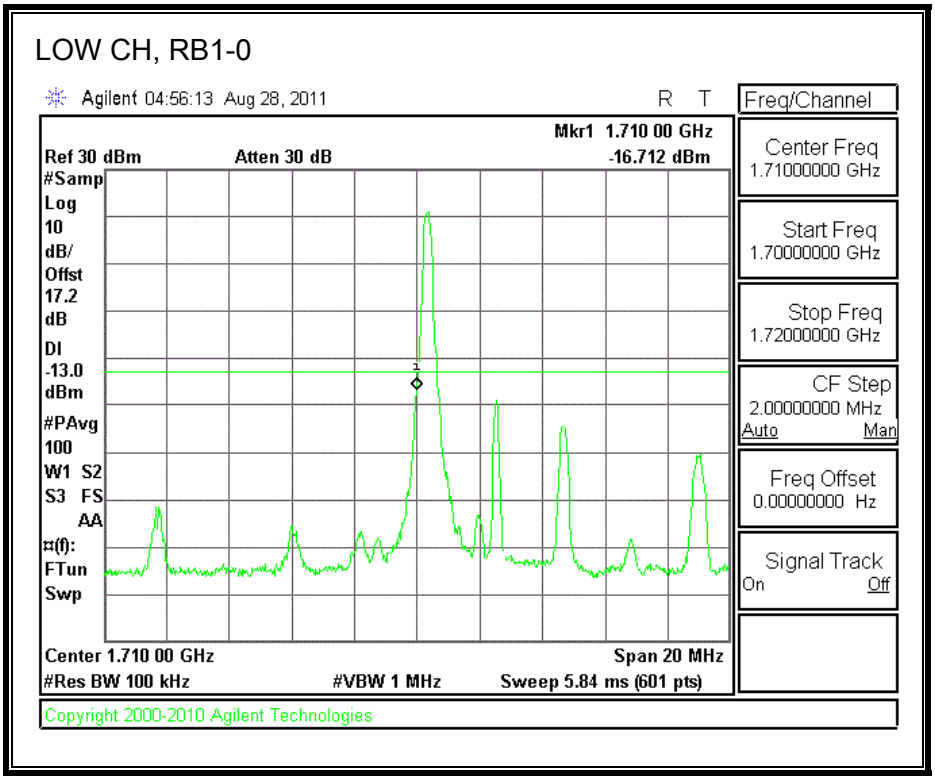


HIGH CH, RB25-0

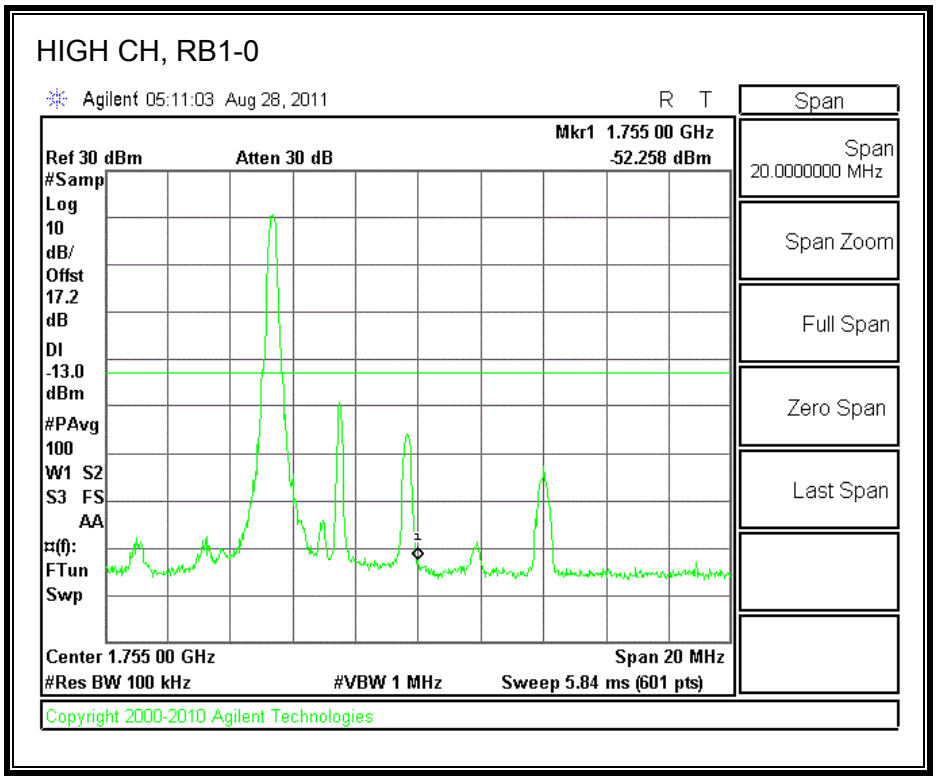


LTE 16QAM Band 4 (5.0 MHz BAND WIDTH)

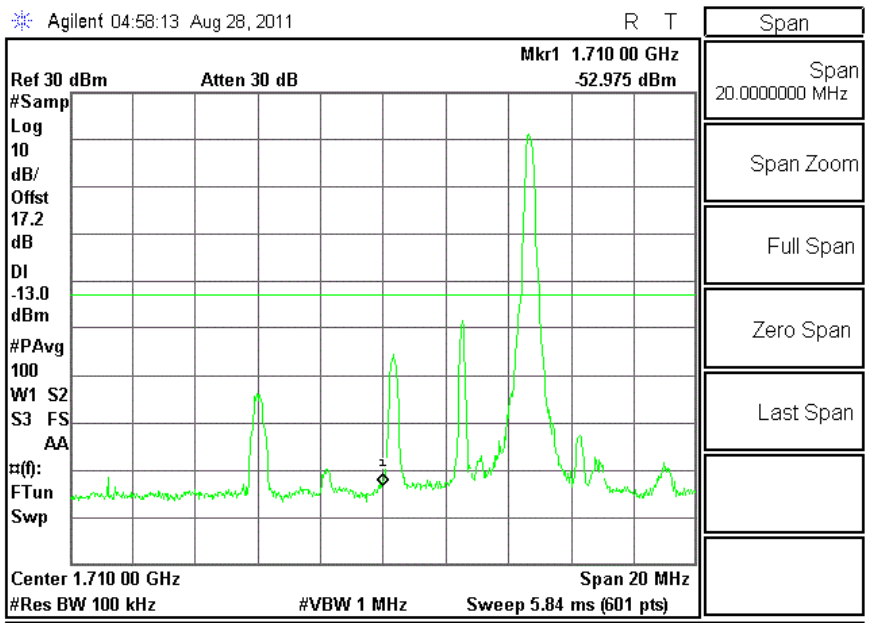
LOW CH, RB1-0



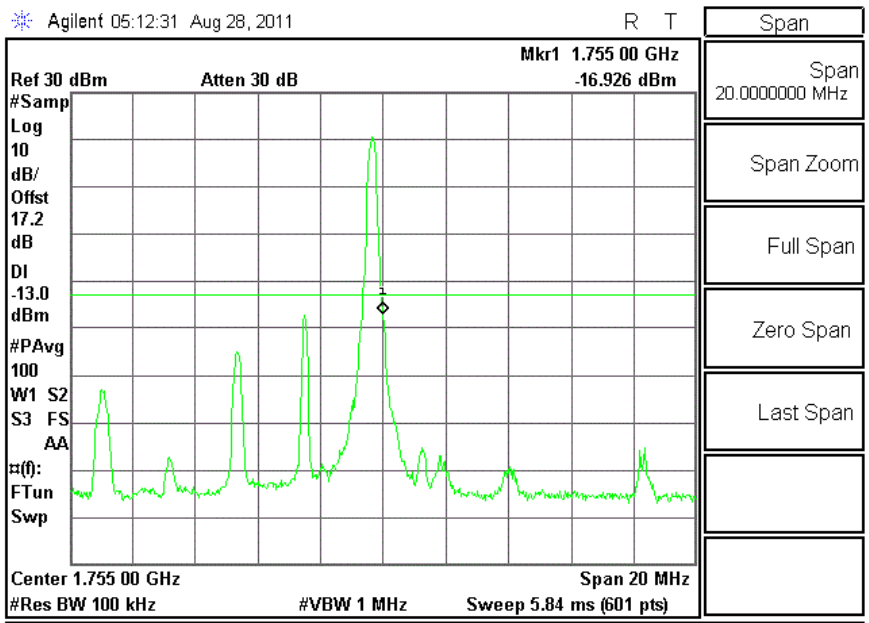
HIGH CH, RB1-0



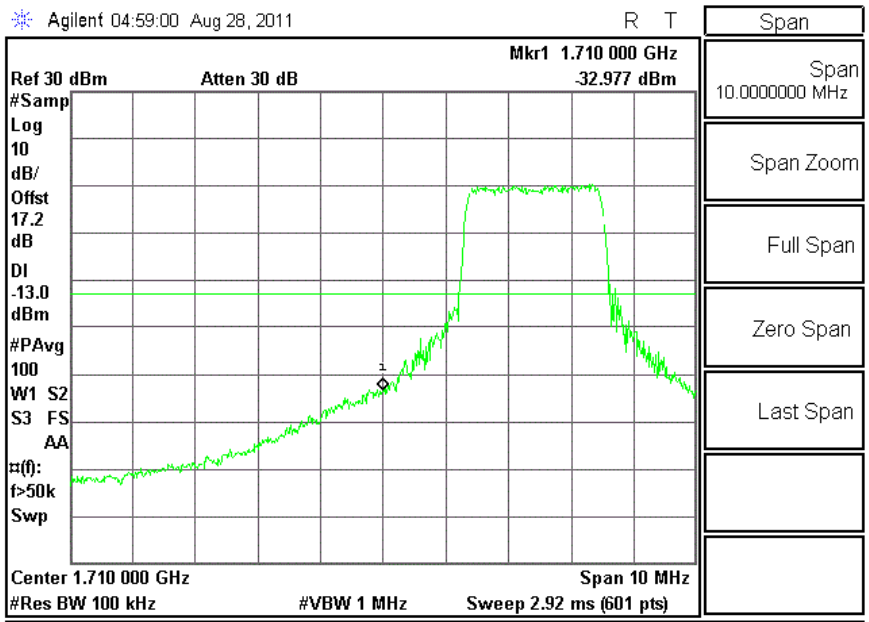
LOW CH, RB1-24



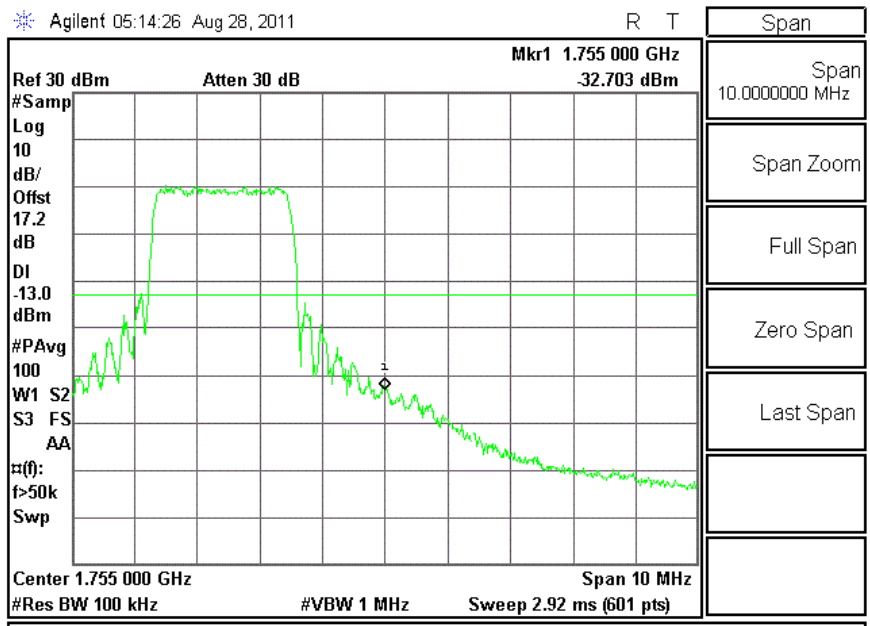
HIGH CH, RB1-24



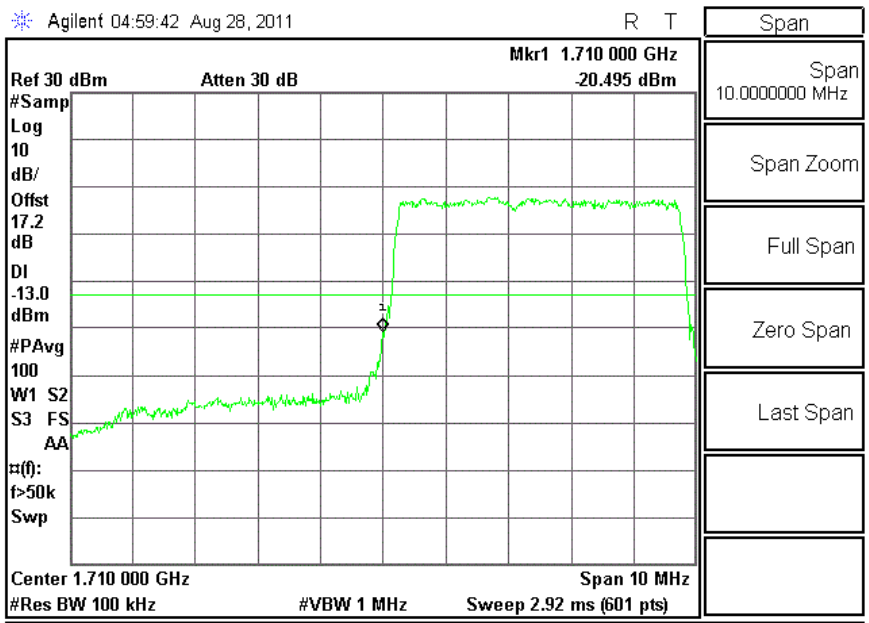
LOW CH, RB12-6



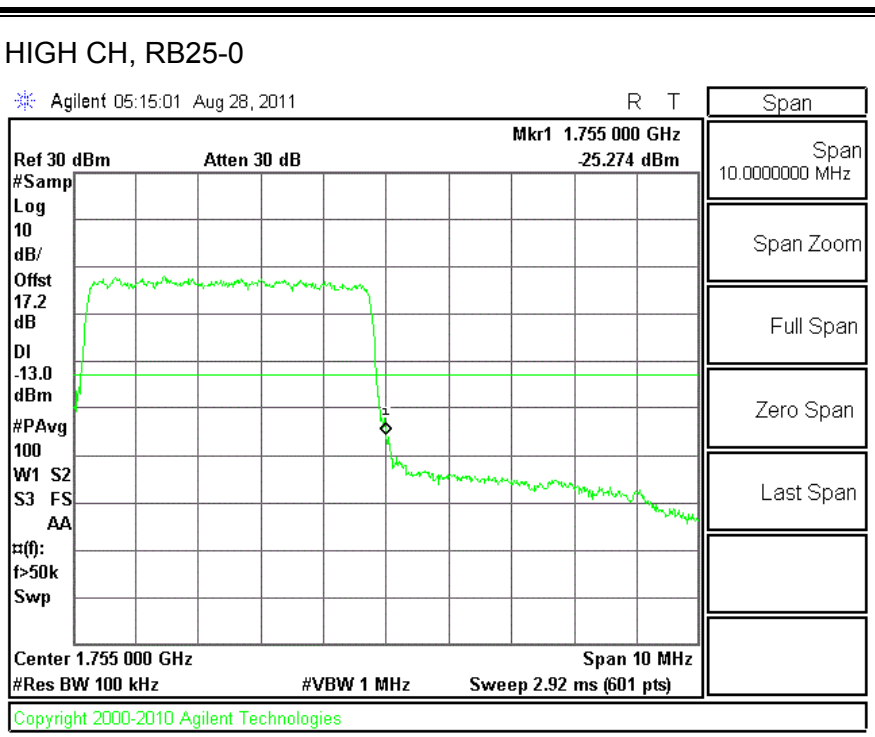
HIGH CH, RB12-6



LOW CH, RB25-0

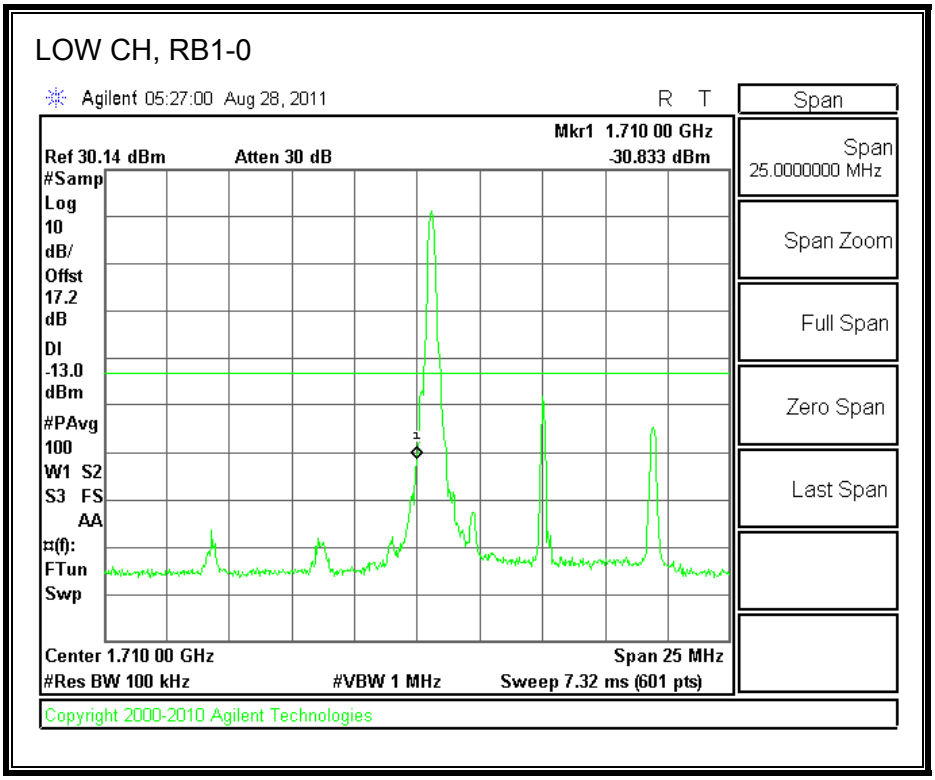


HIGH CH, RB25-0

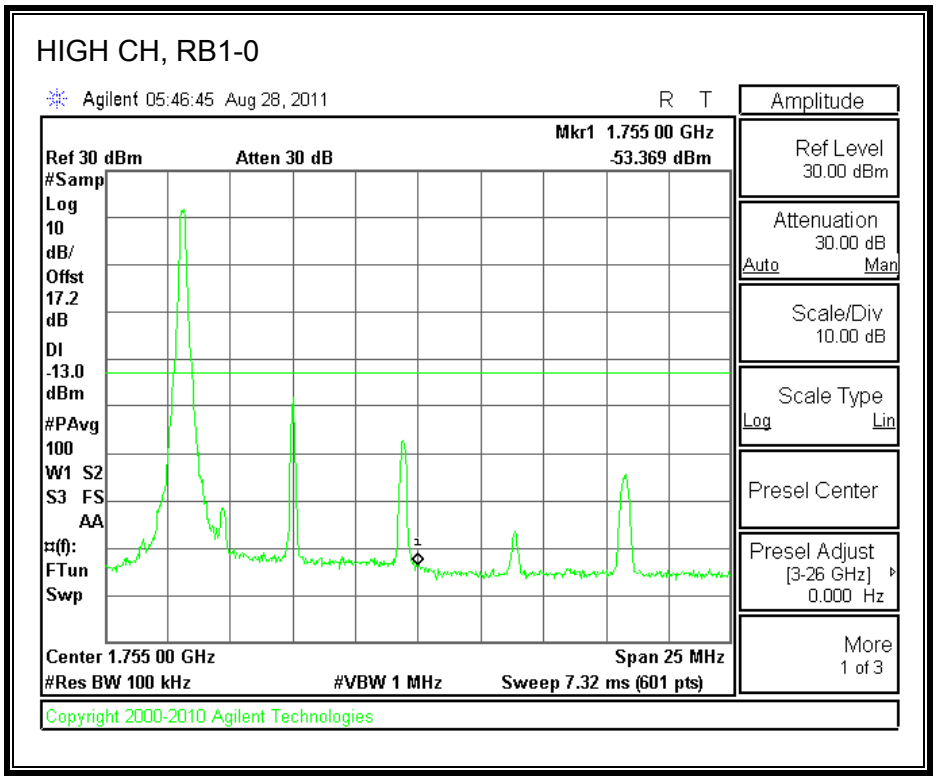


LTE QPSK Band 4 (10.0 MHz BAND WIDTH)

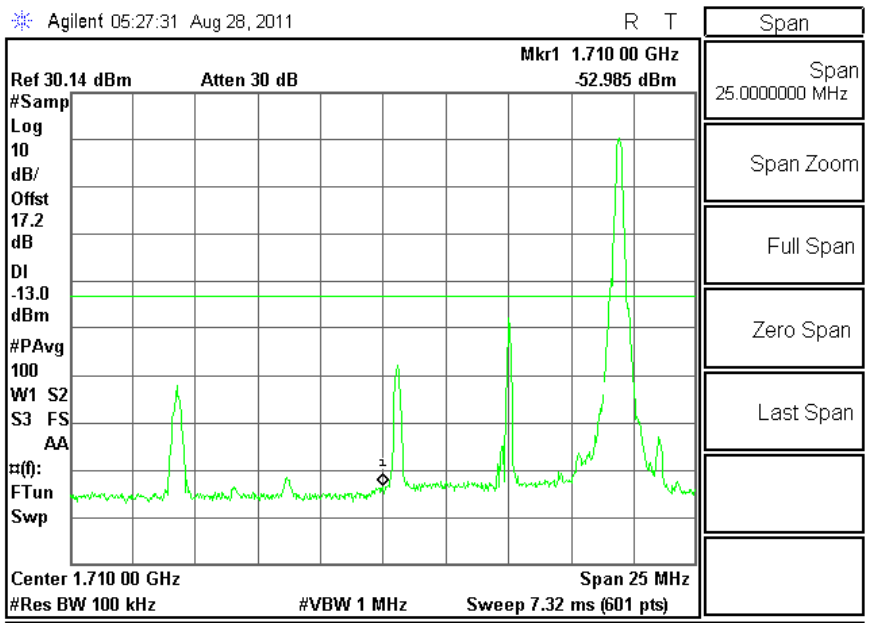
LOW CH, RB1-0



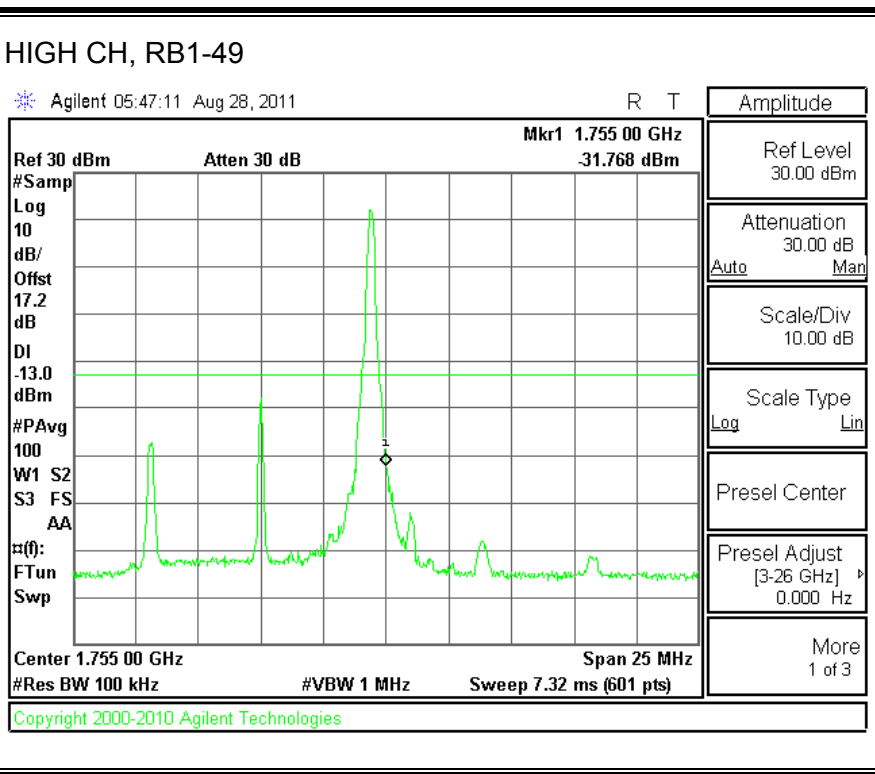
HIGH CH, RB1-0



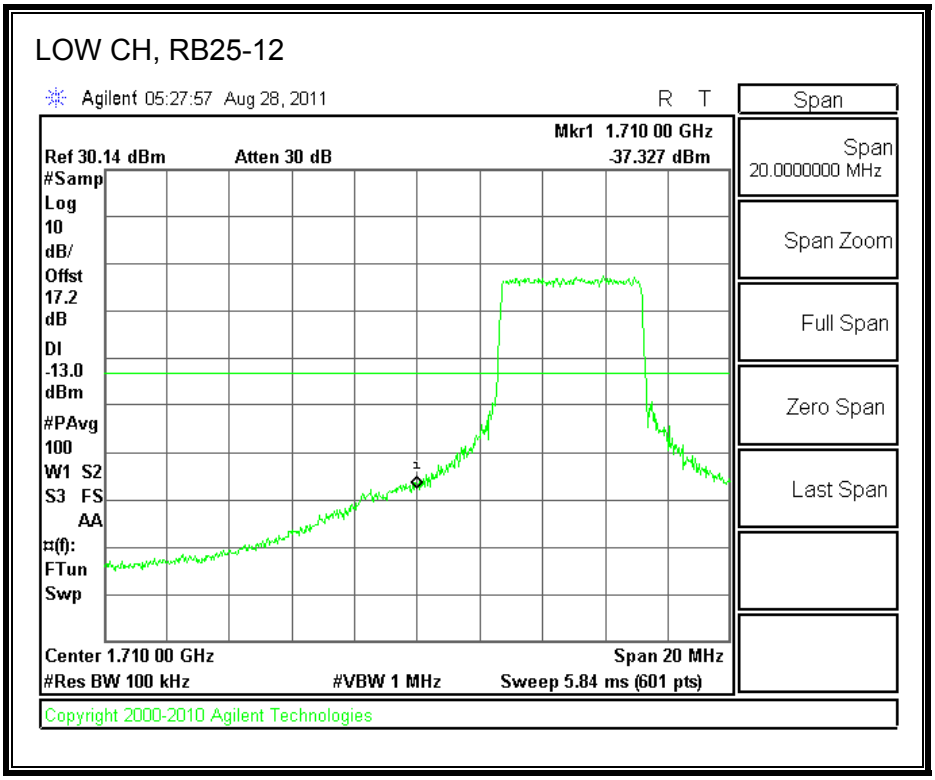
LOW CH, RB1-49



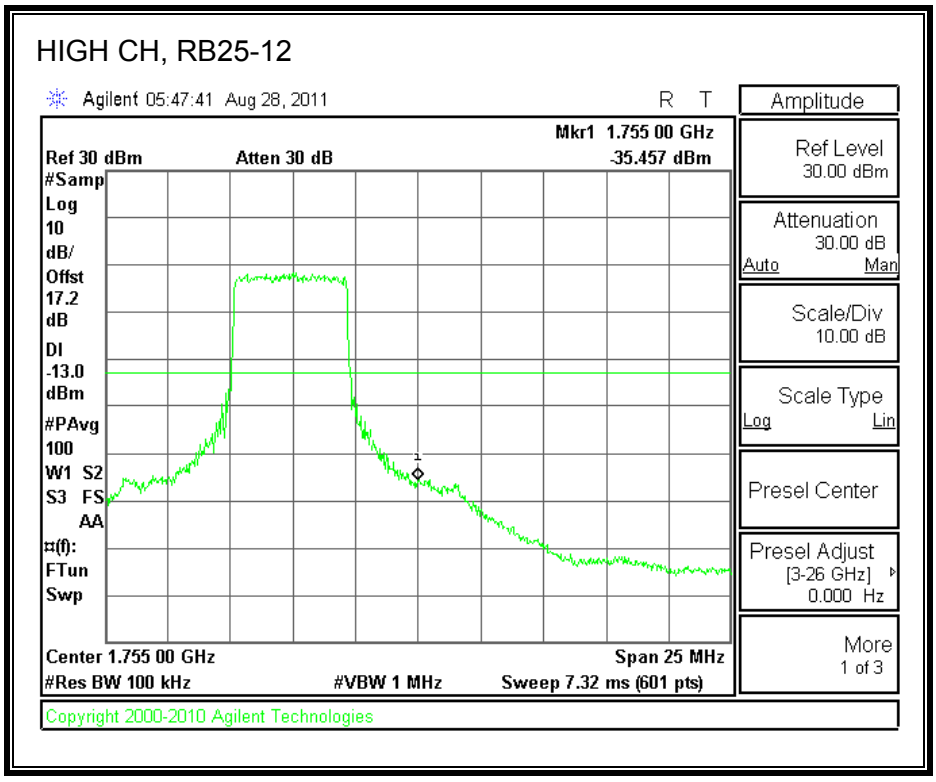
HIGH CH, RB1-49



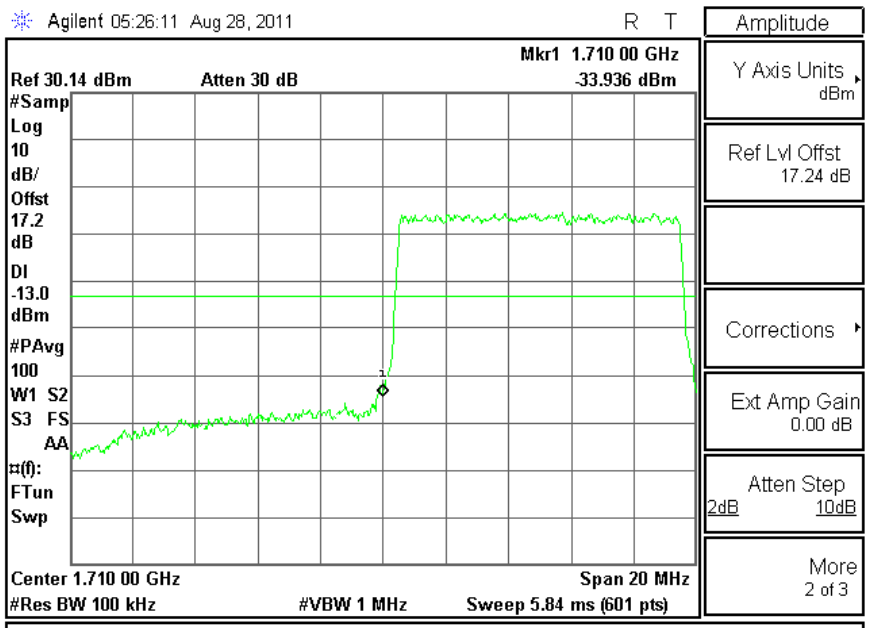
LOW CH, RB25-12



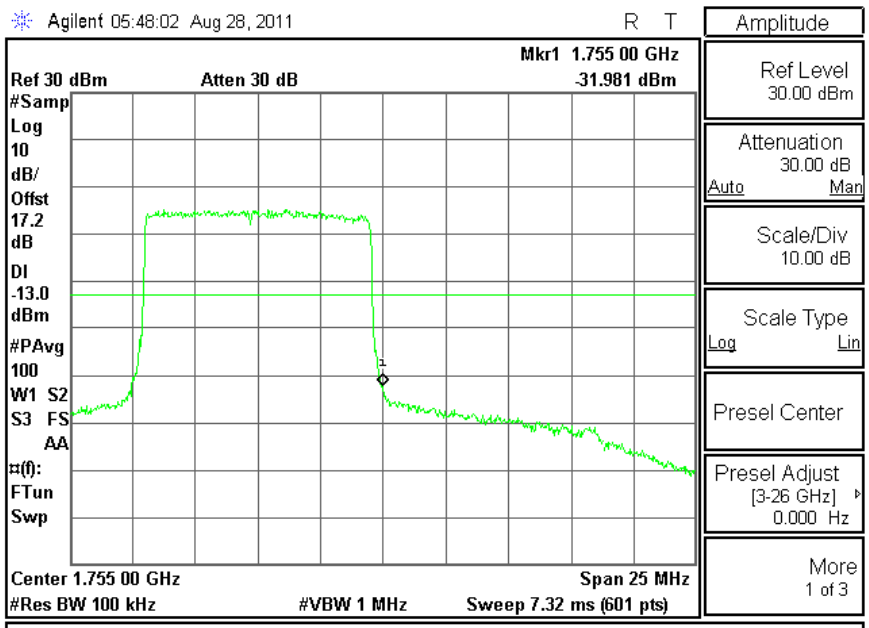
HIGH CH, RB25-12



LOW CH, RB50-0

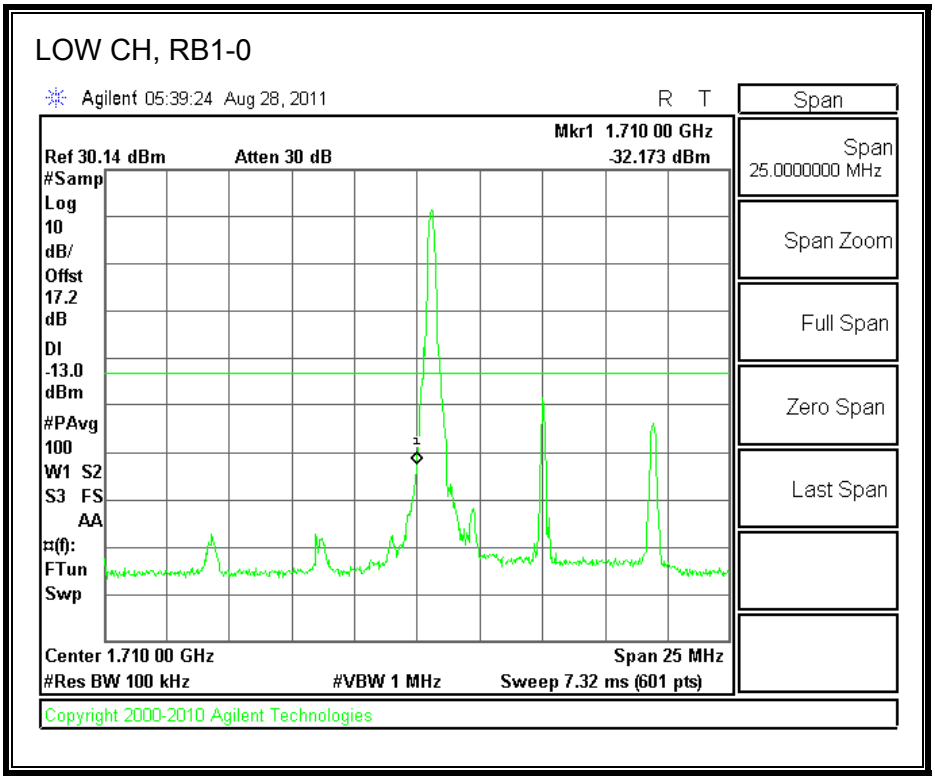


HIGH CH, RB50-0

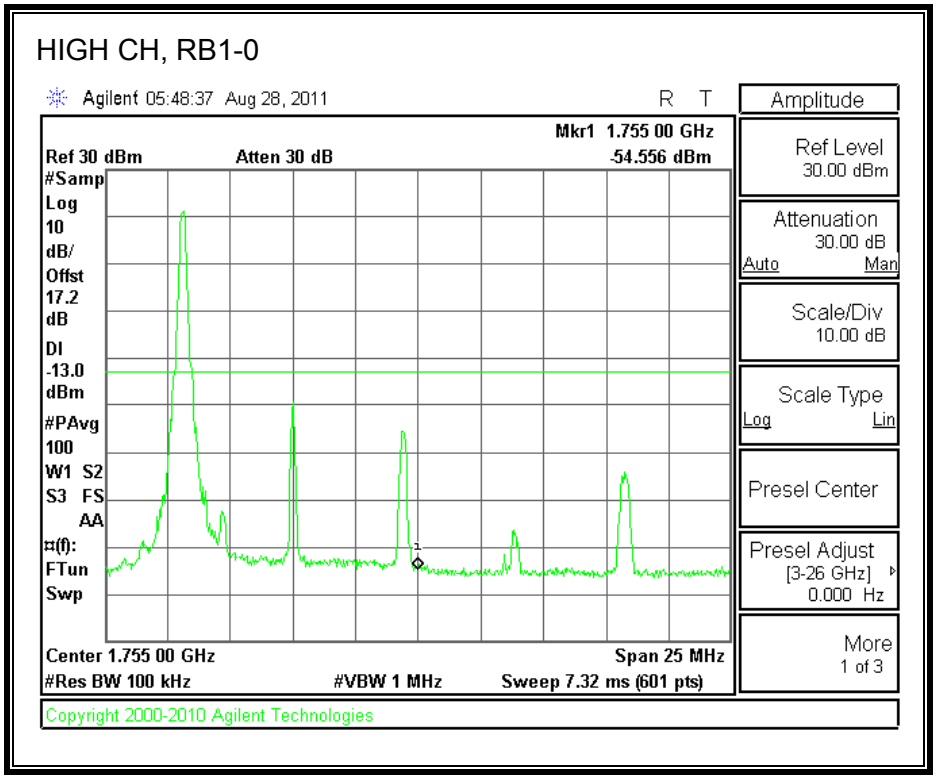


LTE 16QAM Band 4 (10.0 MHz BAND WIDTH)

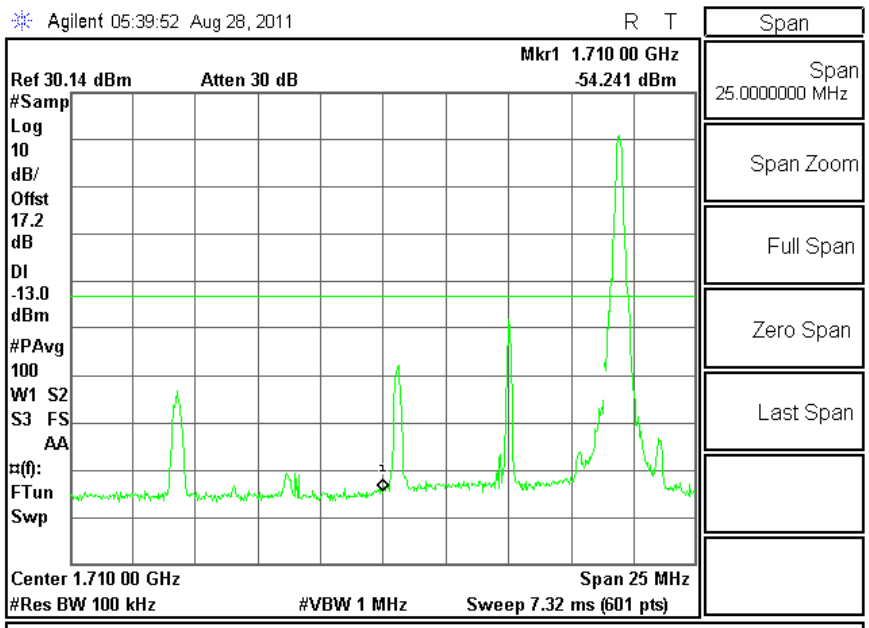
LOW CH, RB1-0



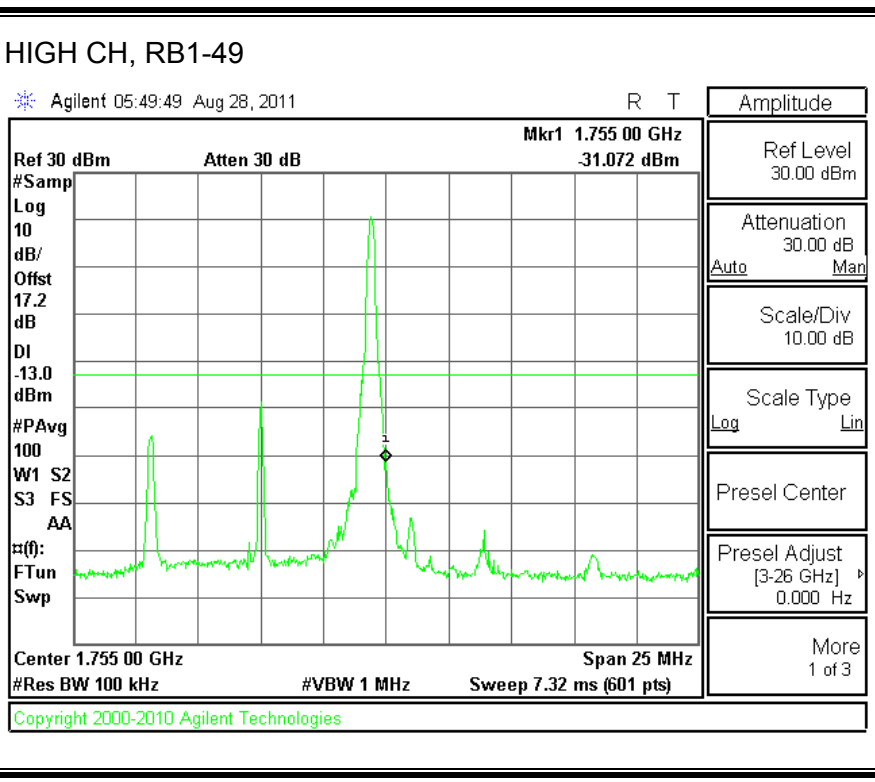
HIGH CH, RB1-0



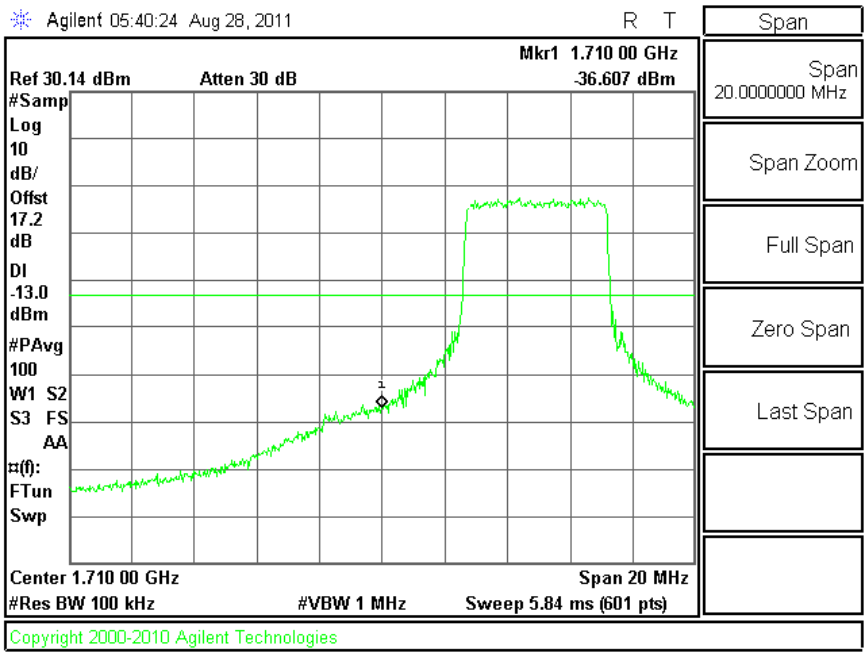
LOW CH, RB1-49



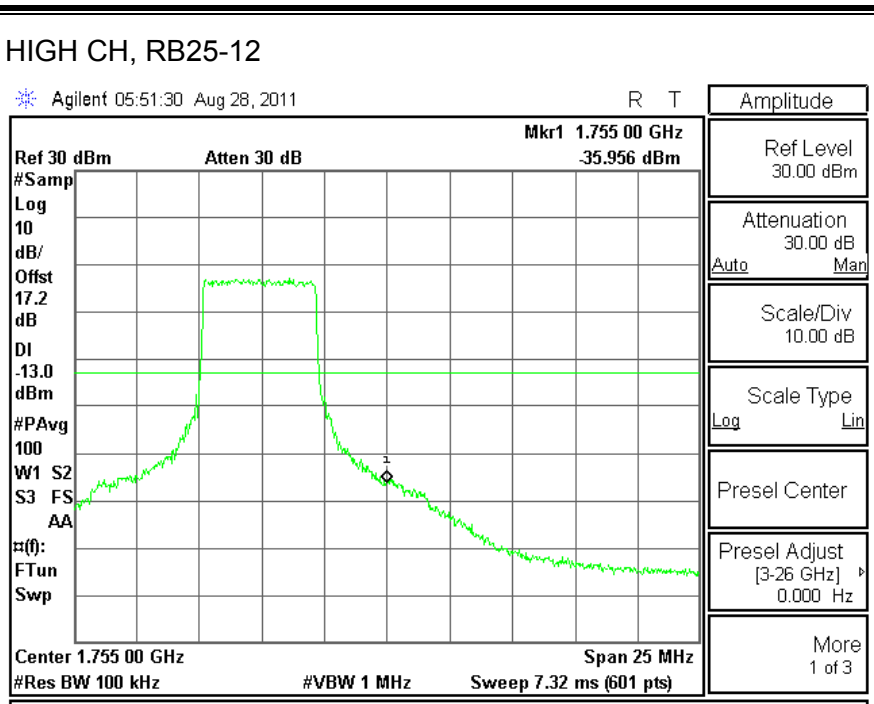
HIGH CH, RB1-49



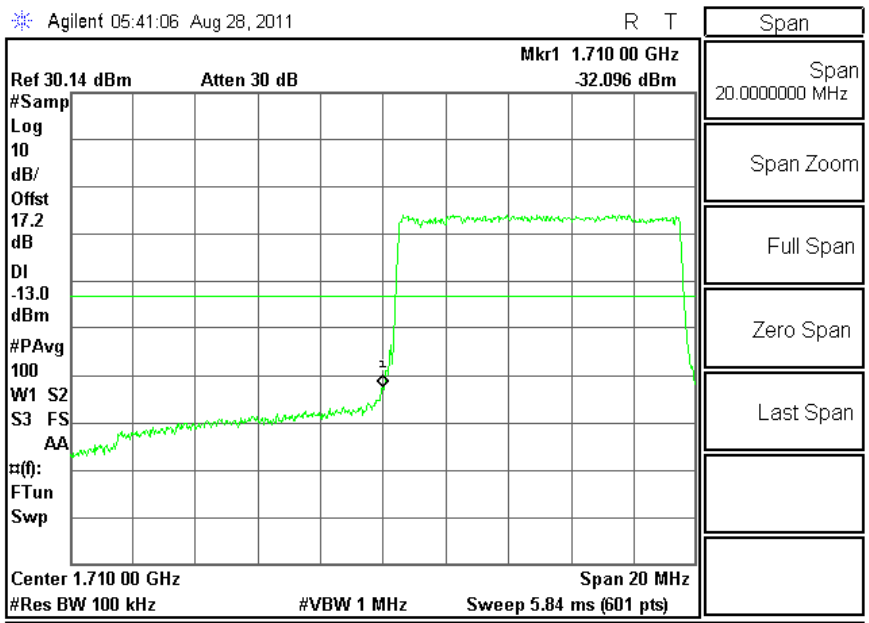
LOW CH, RB25-12



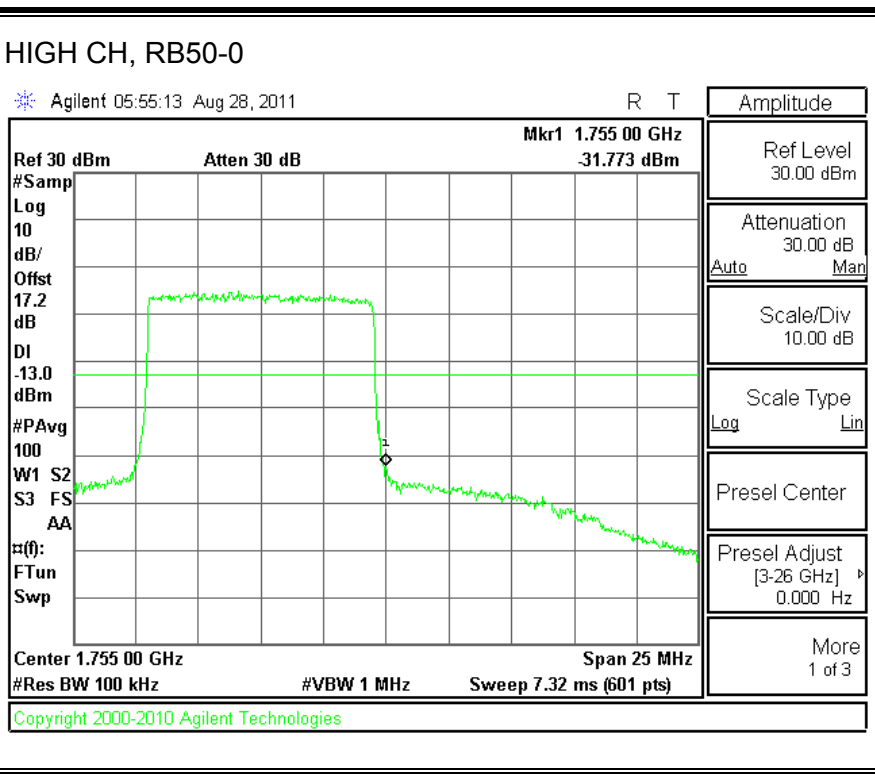
HIGH CH, RB25-12



LOW CH, RB50-0

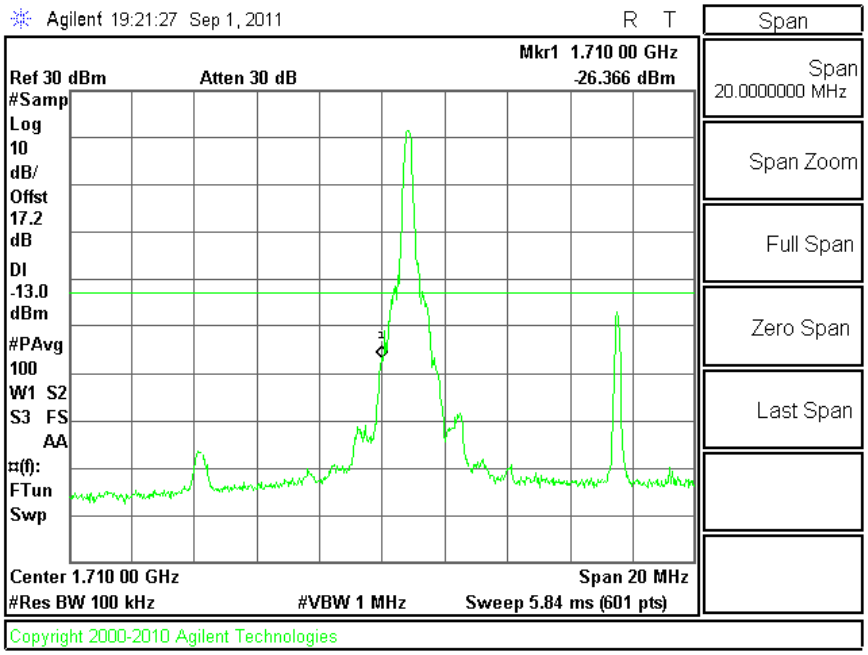


HIGH CH, RB50-0

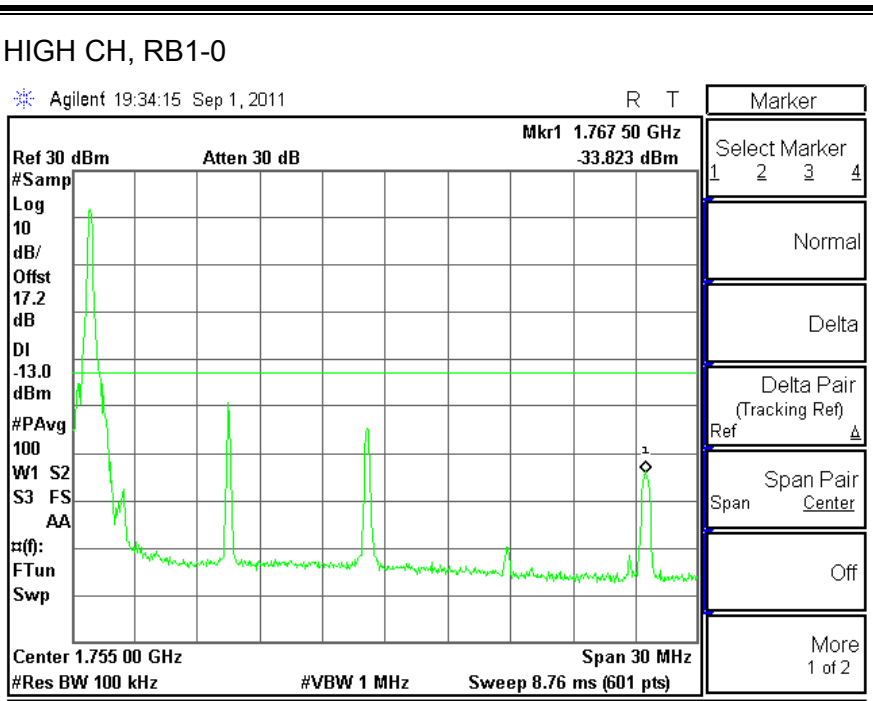


LTE QPSK Band 4 (15.0 MHz BAND WIDTH)

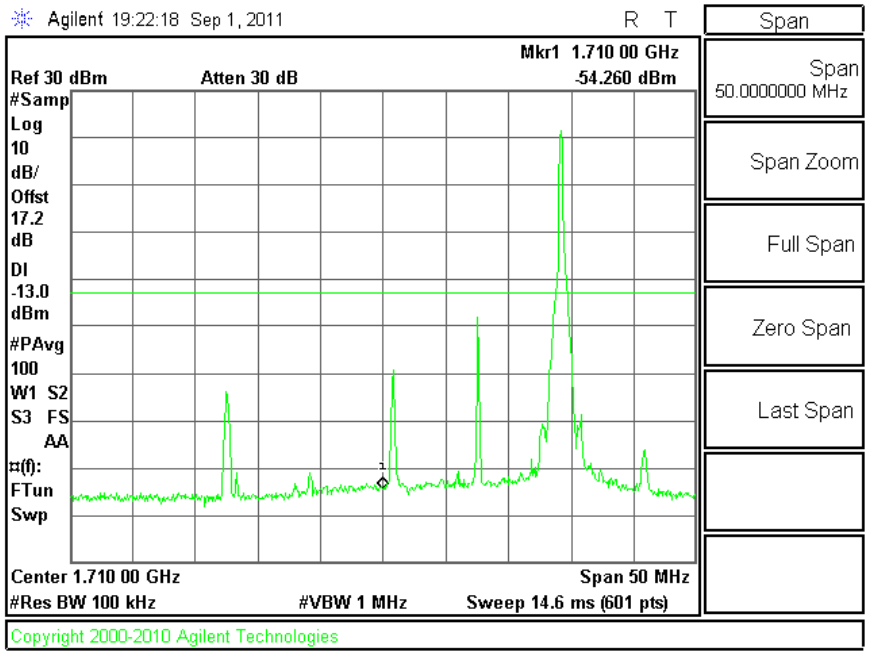
LOW CH, RB1-0



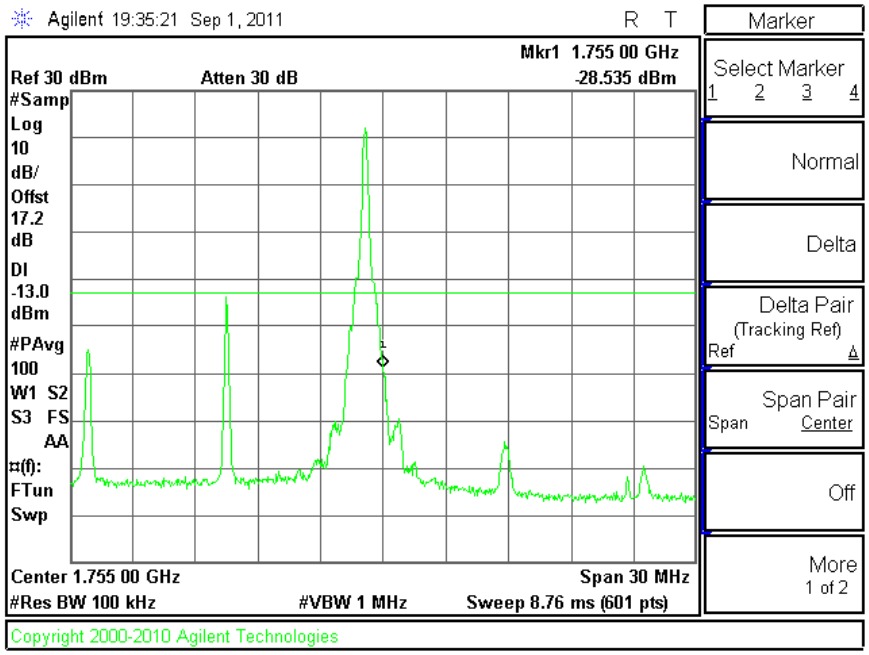
HIGH CH, RB1-0



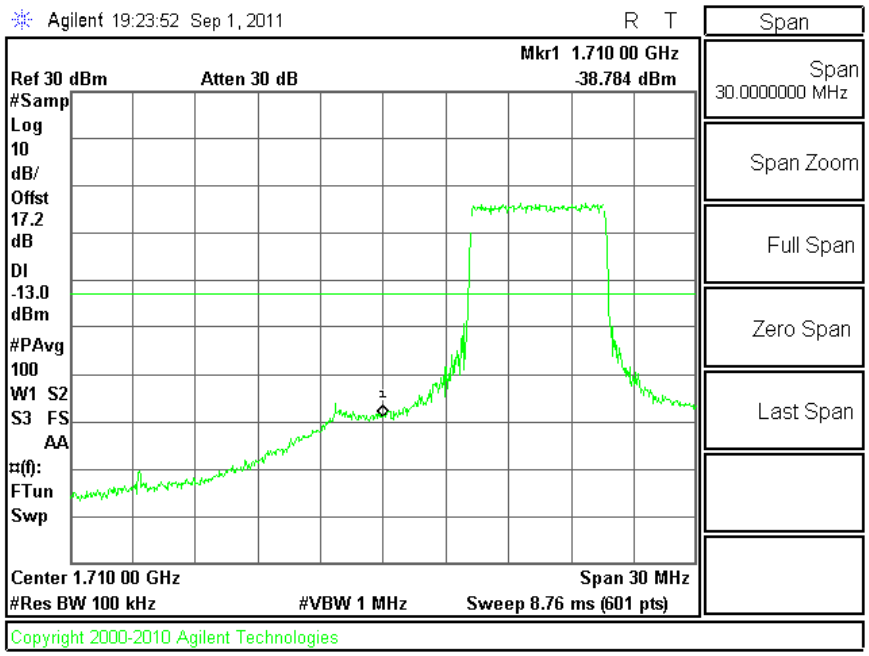
LOW CH, RB1-74



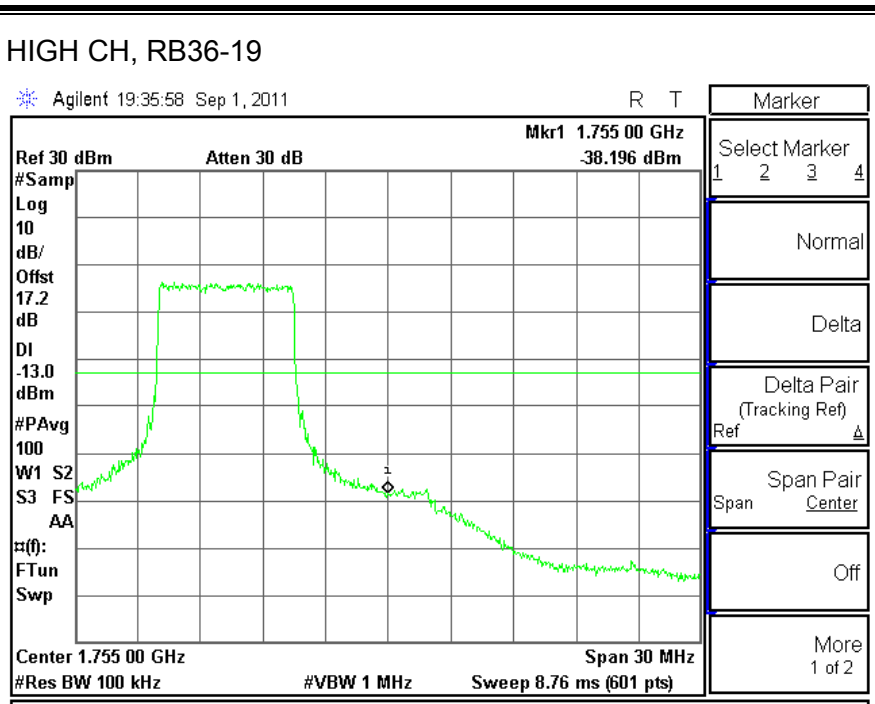
HIGH CH, RB1-74



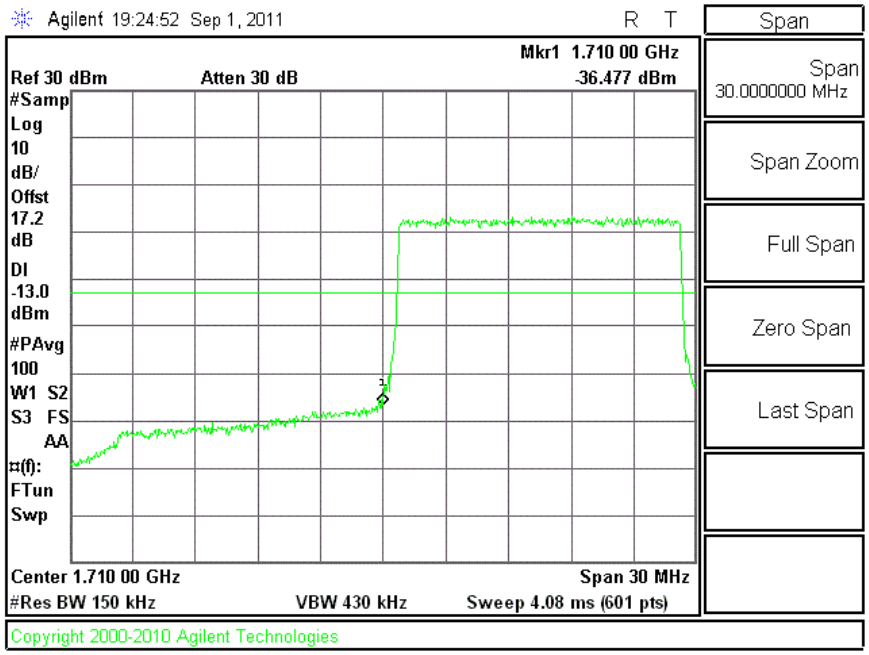
LOW CH, RB36-19



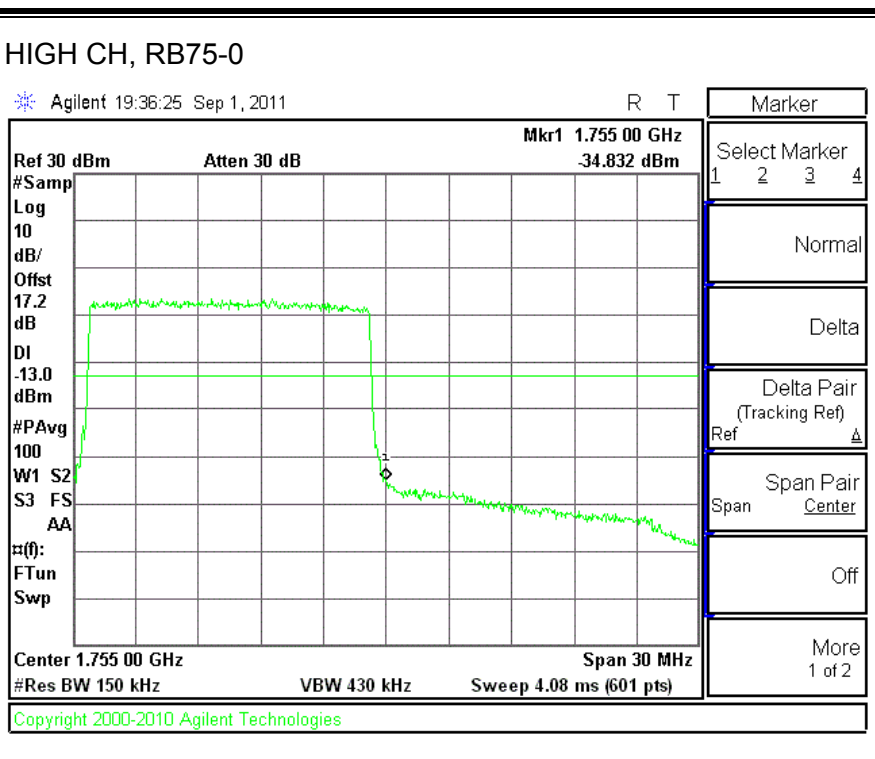
HIGH CH, RB36-19



LOW CH, RB75-0

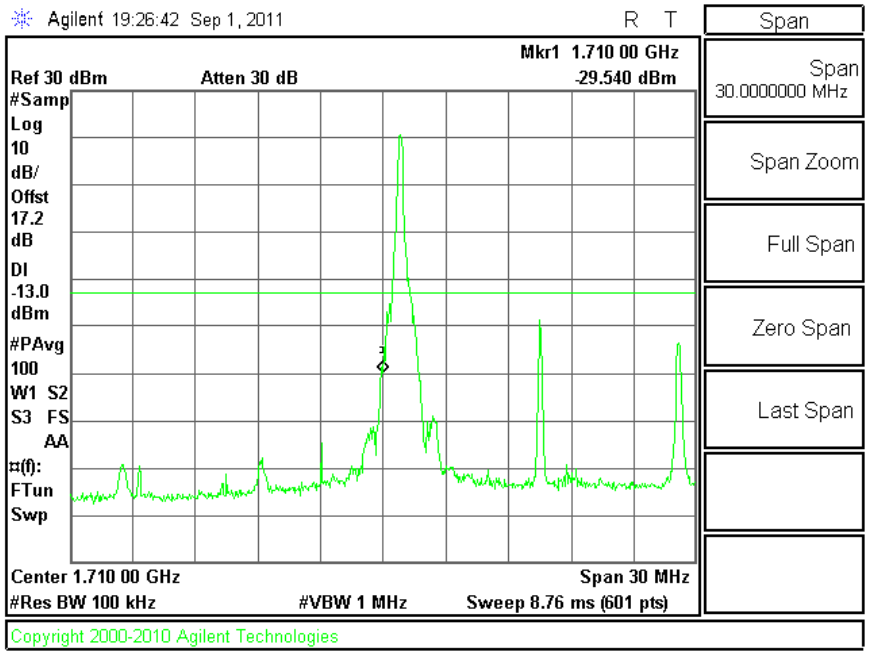


HIGH CH, RB75-0

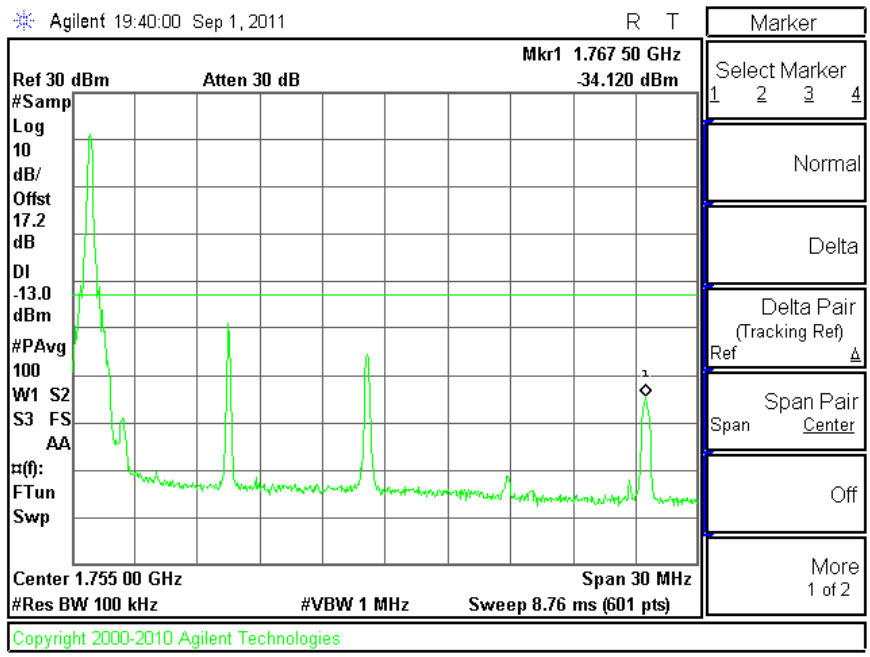


LTE 16QAM Band 4 (15.0 MHz BAND WIDTH)

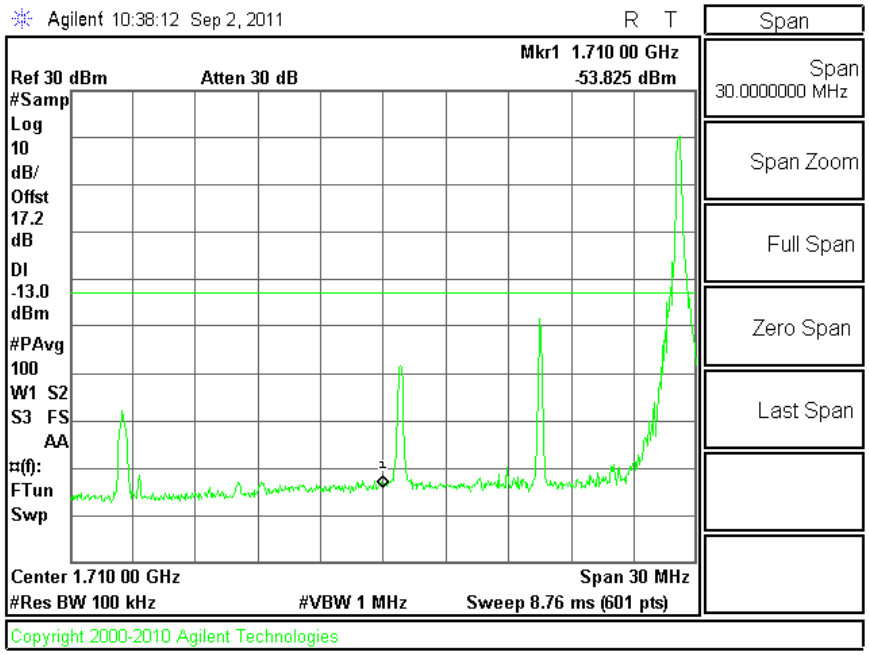
LOW CH, RB1-0



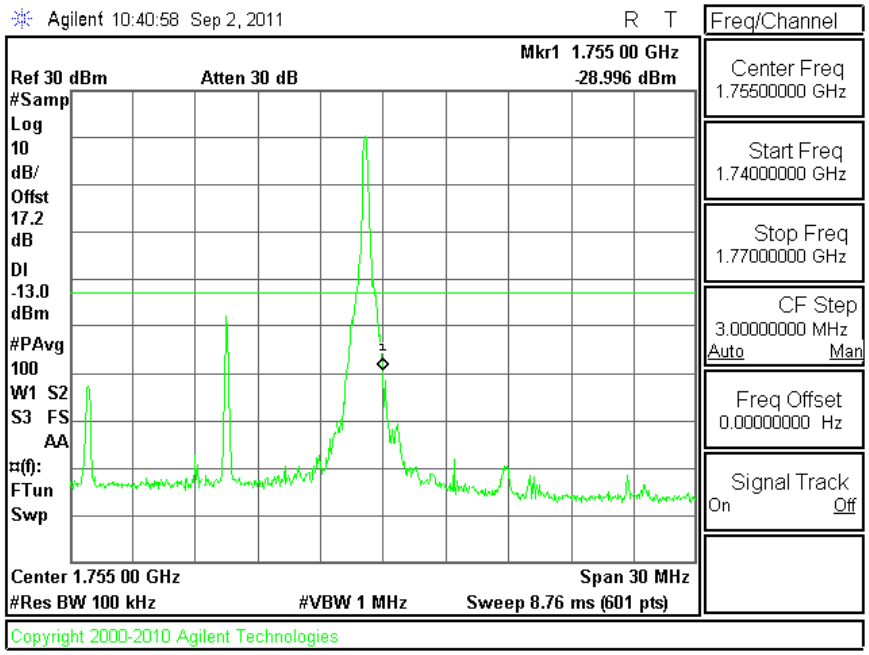
HIGH CH, RB1-0



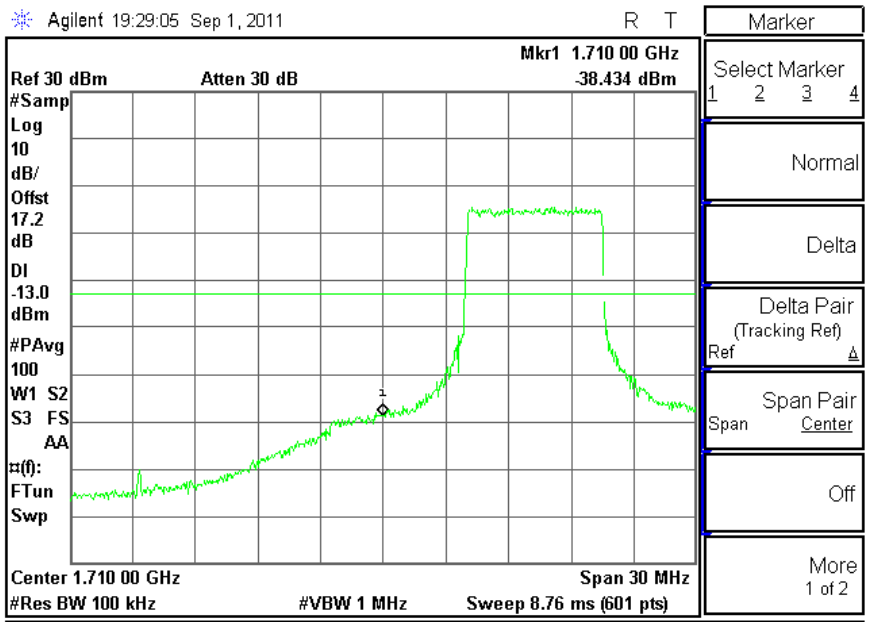
LOW CH, RB1-74



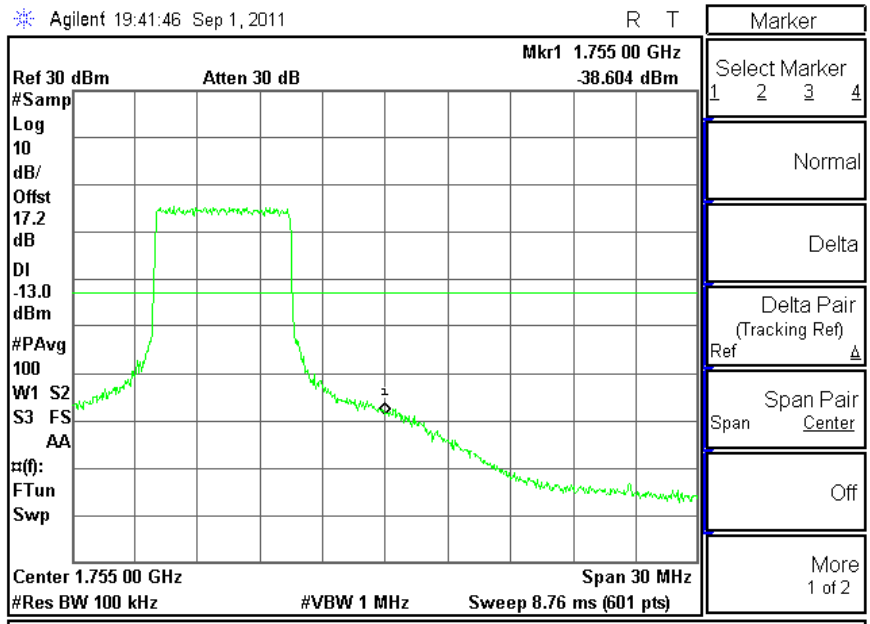
HIGH CH, RB1-74



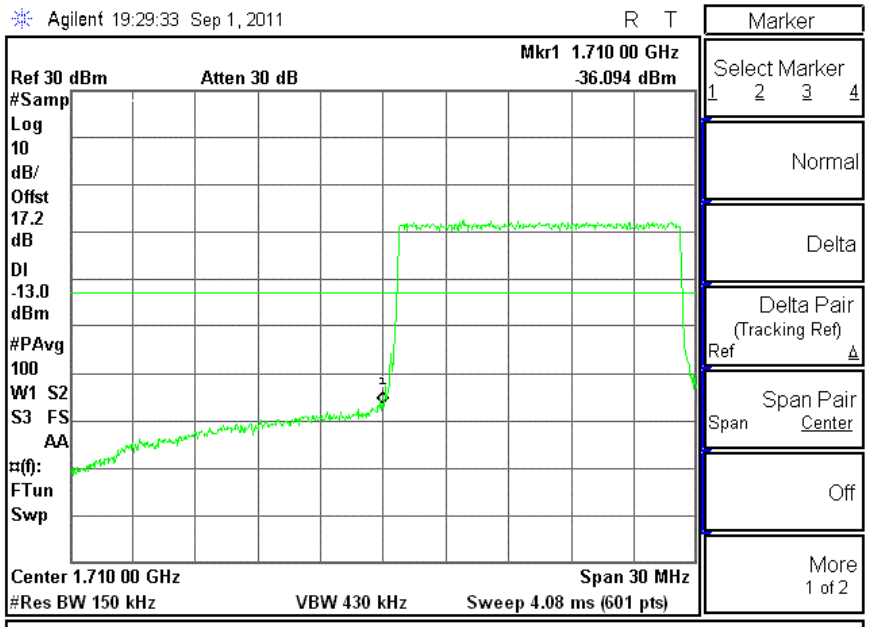
LOW CH, RB36-19



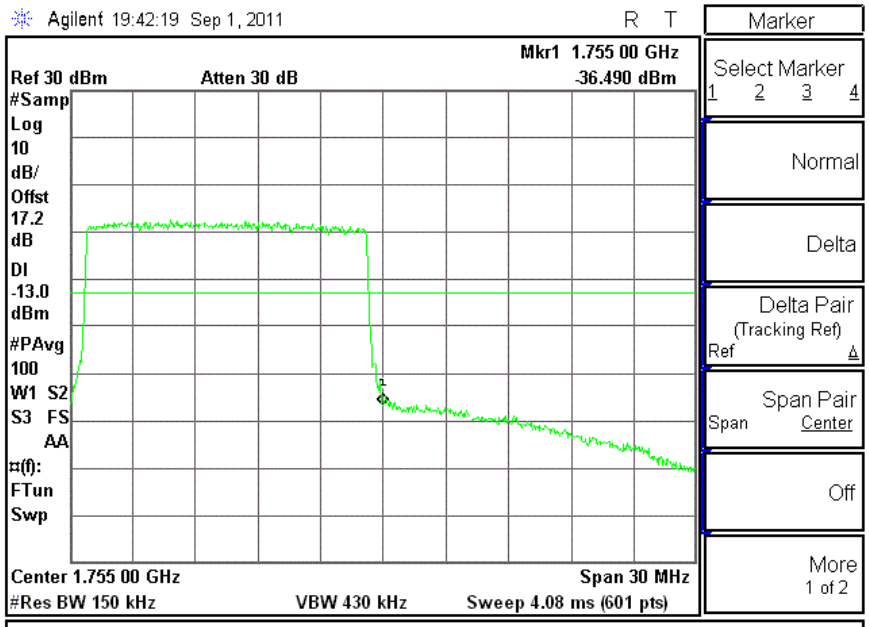
HIGH CH, RB36-19



LOW CH, RB75-0

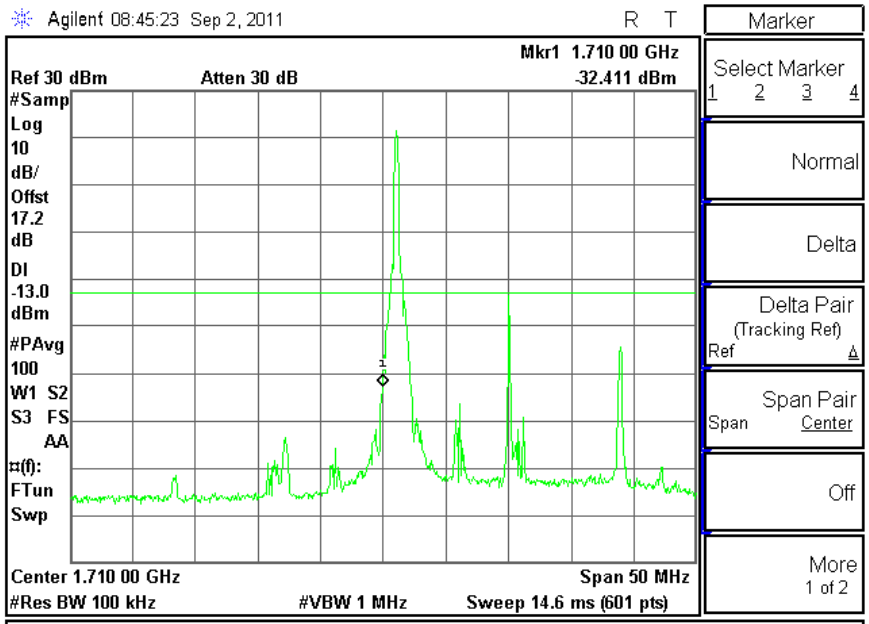


HIGH CH, RB75-0

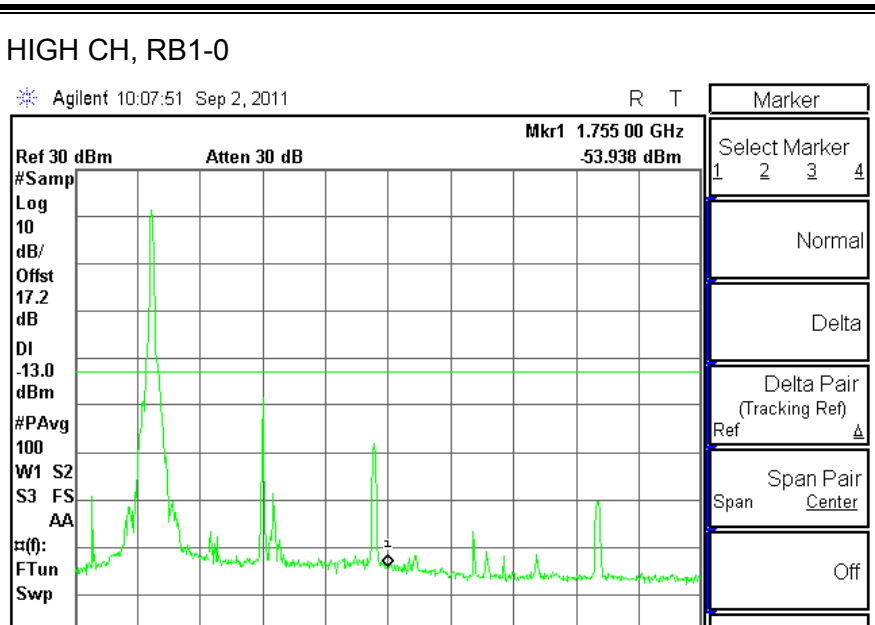


LTE QPSK Band 4 (20.0 MHz BAND WIDTH)

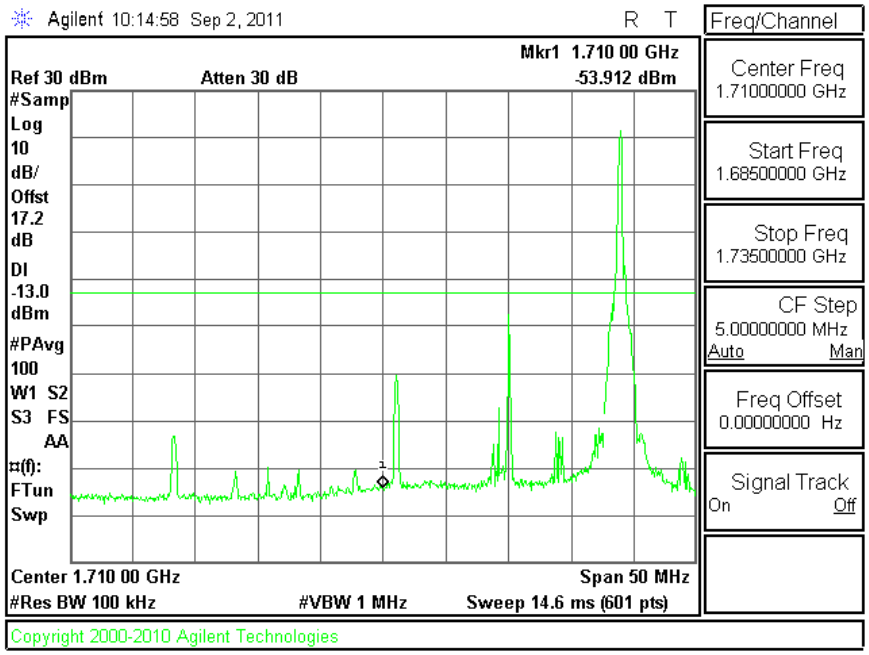
LOW CH, RB1-0



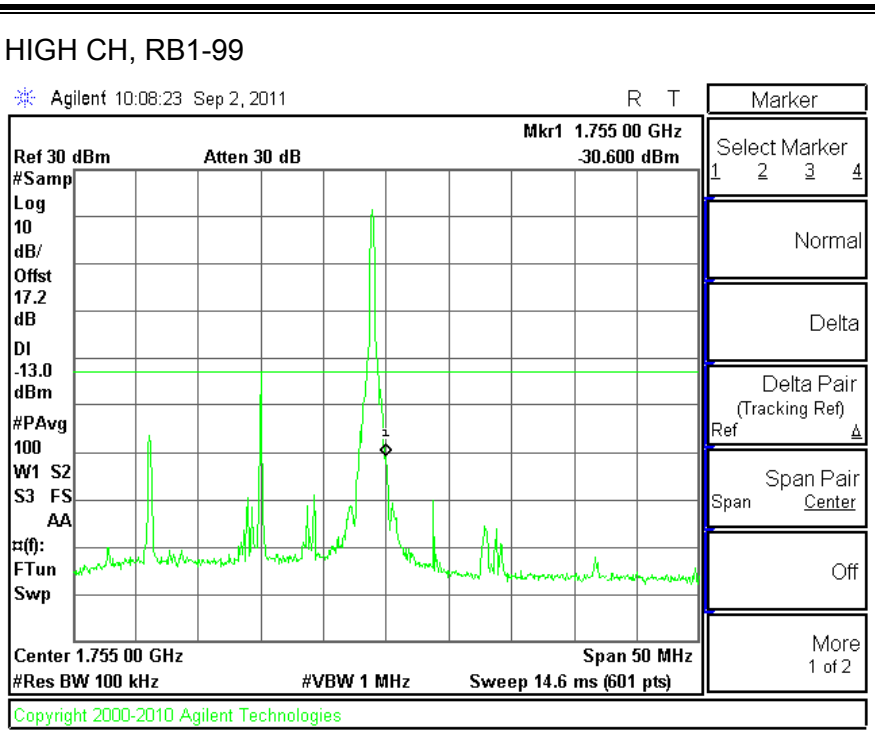
HIGH CH, RB1-0



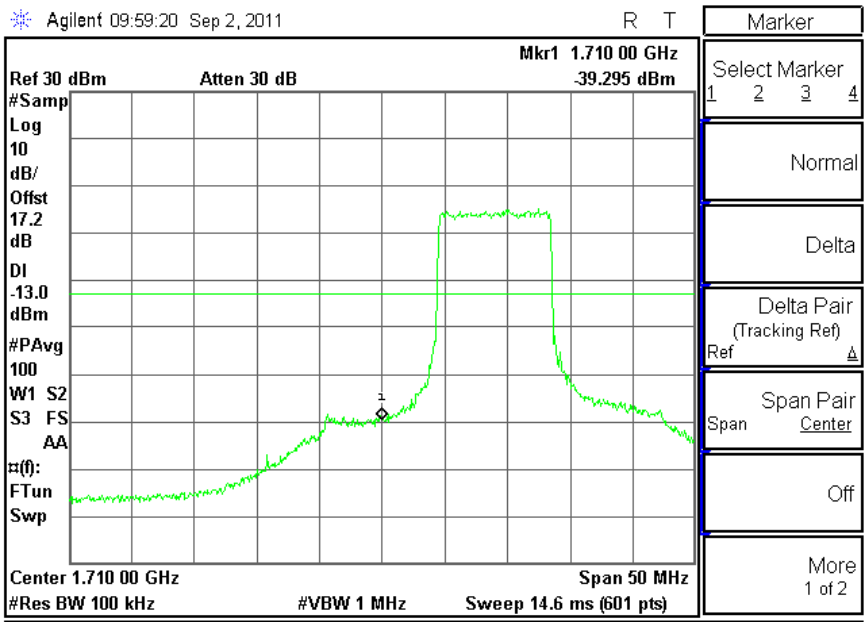
LOW CH, RB1-99



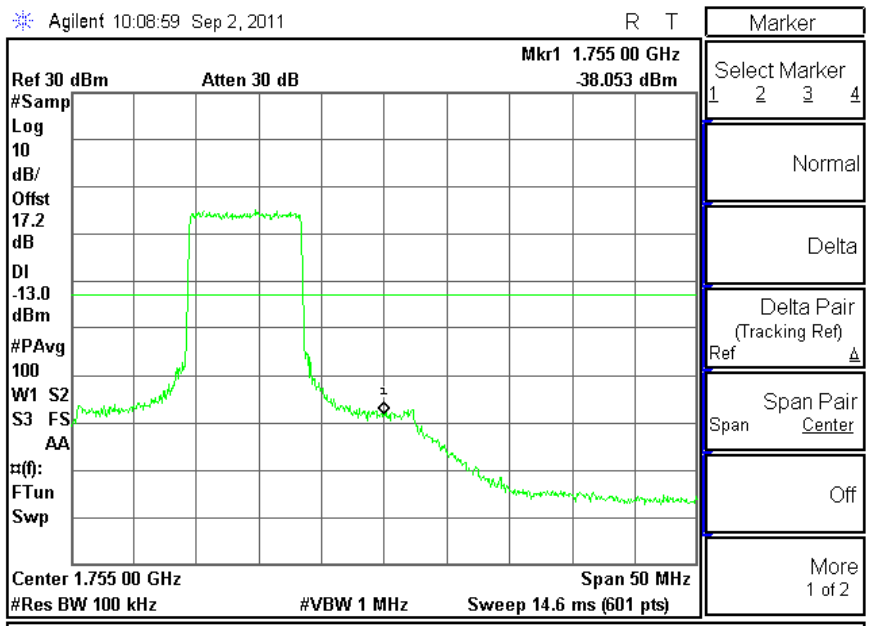
HIGH CH, RB1-99



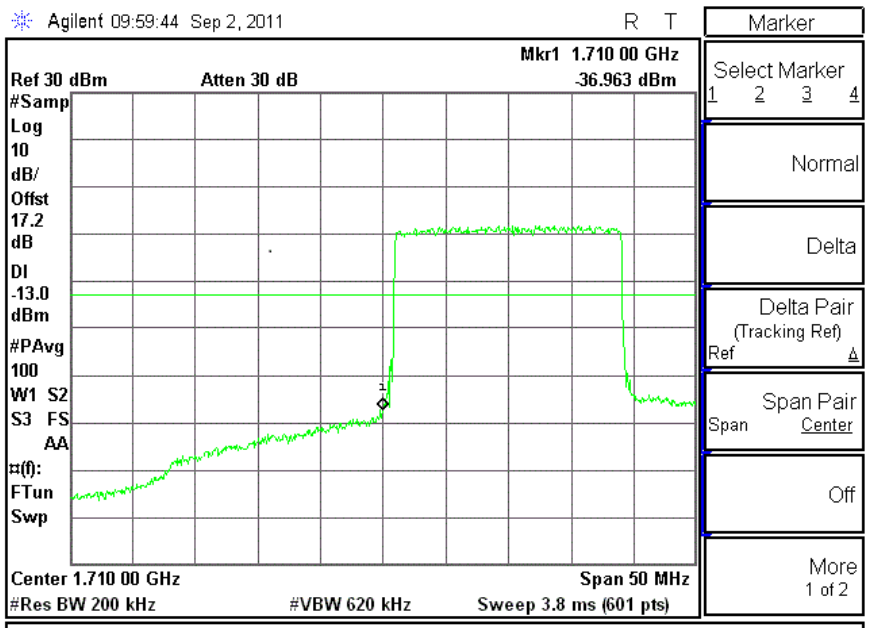
LOW CH, RB50-19



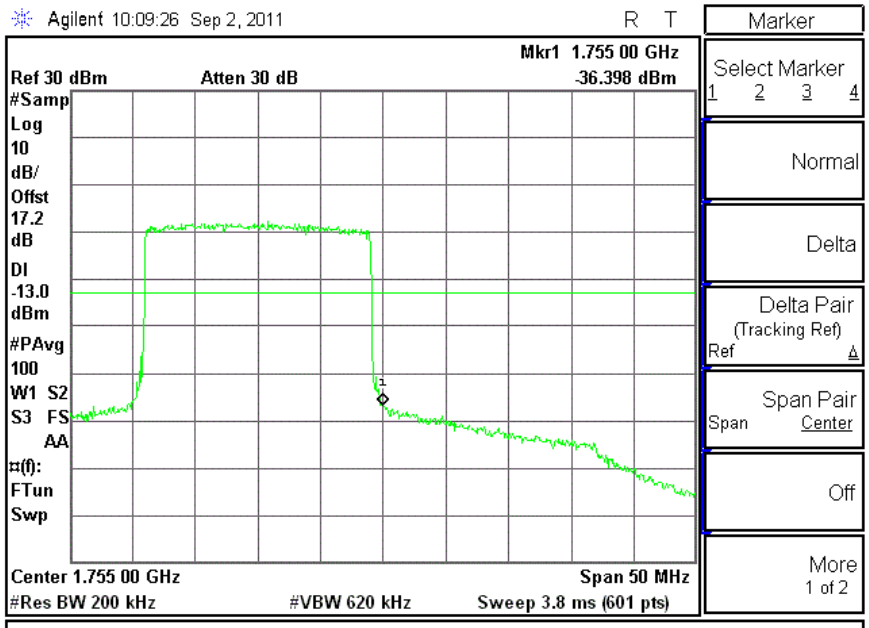
HIGH CH, RB50-19



LOW CH, RB100-0

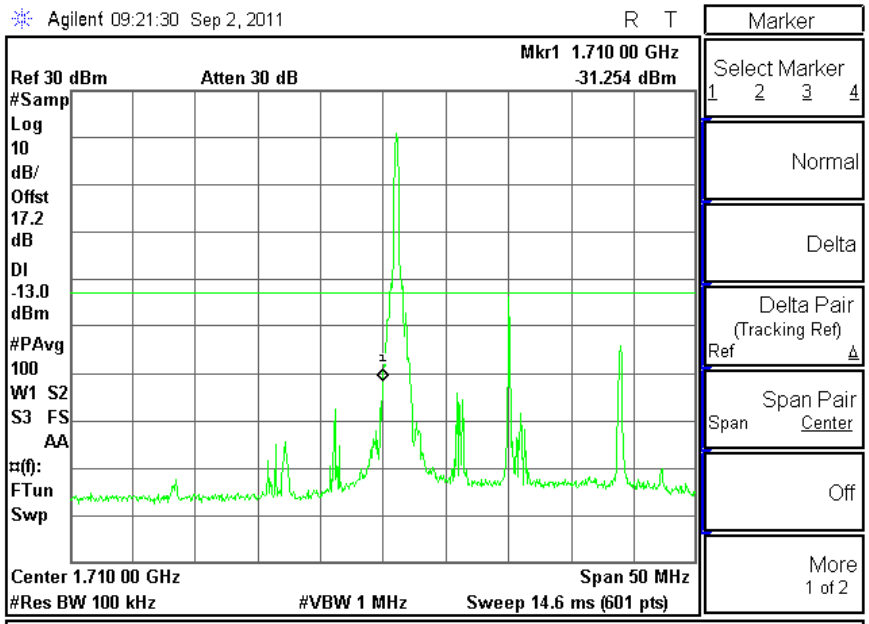


HIGH CH, RB100-0

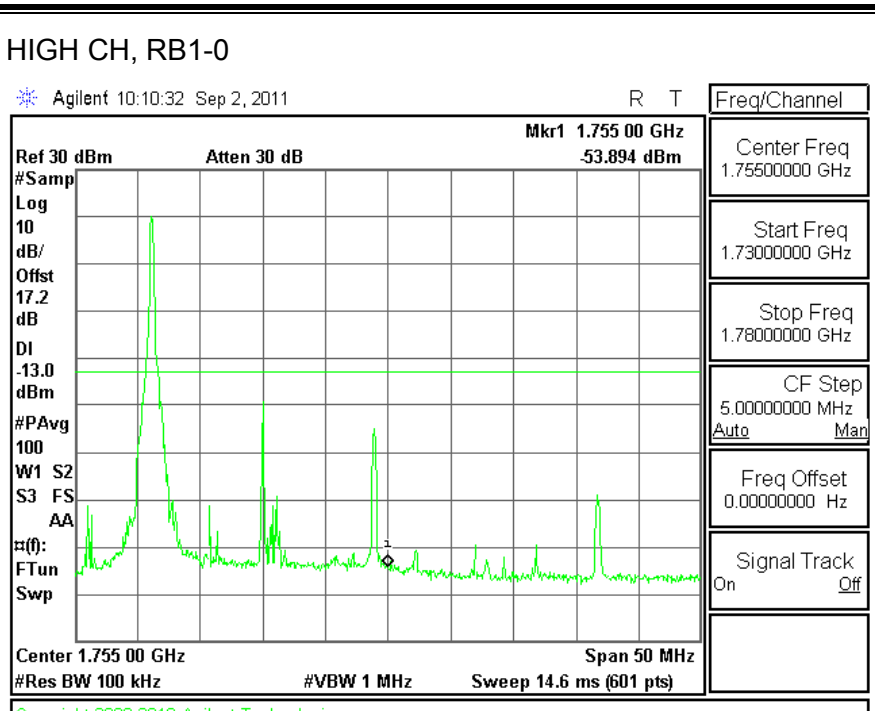


LTE 16QAM Band 4 (20.0 MHz BAND WIDTH)

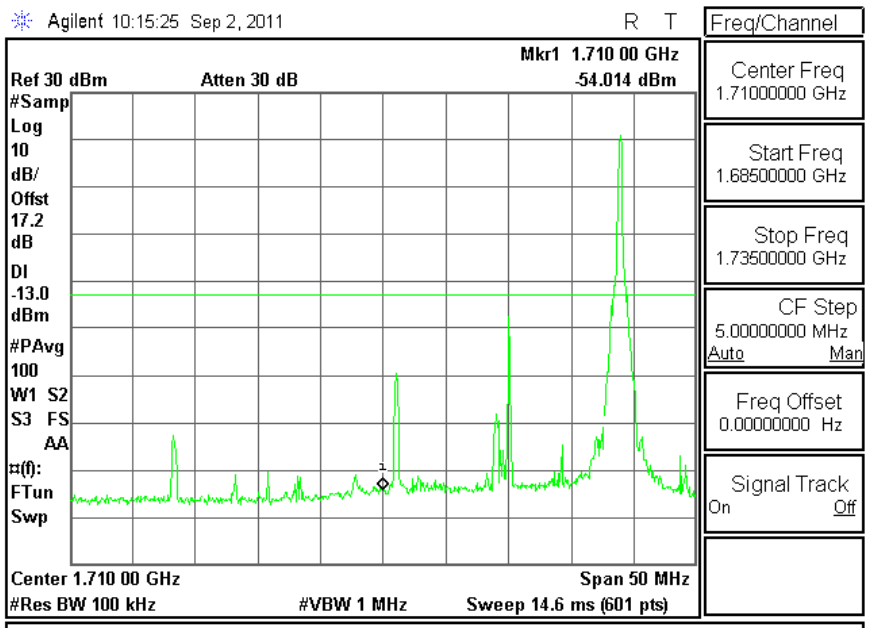
LOW CH, RB1-0



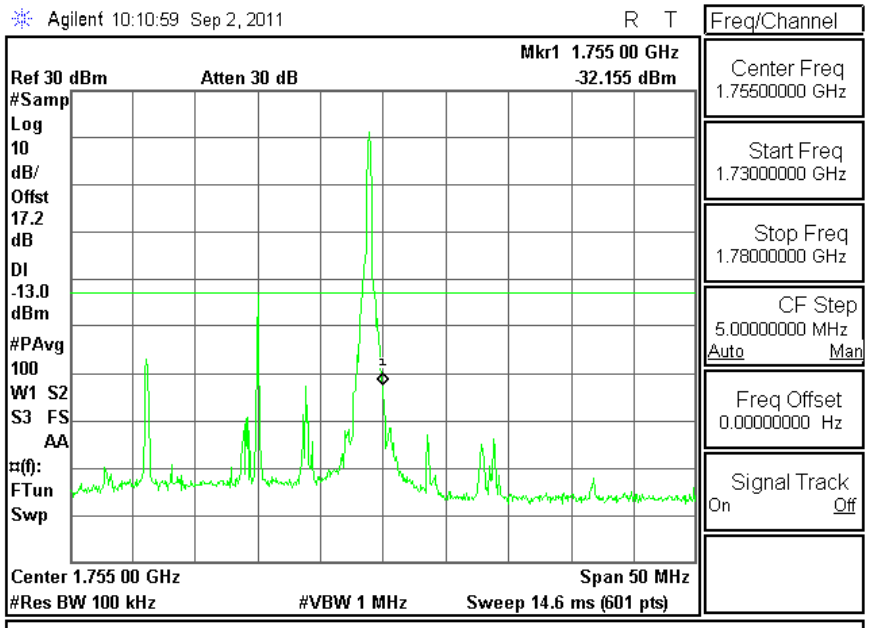
HIGH CH, RB1-0



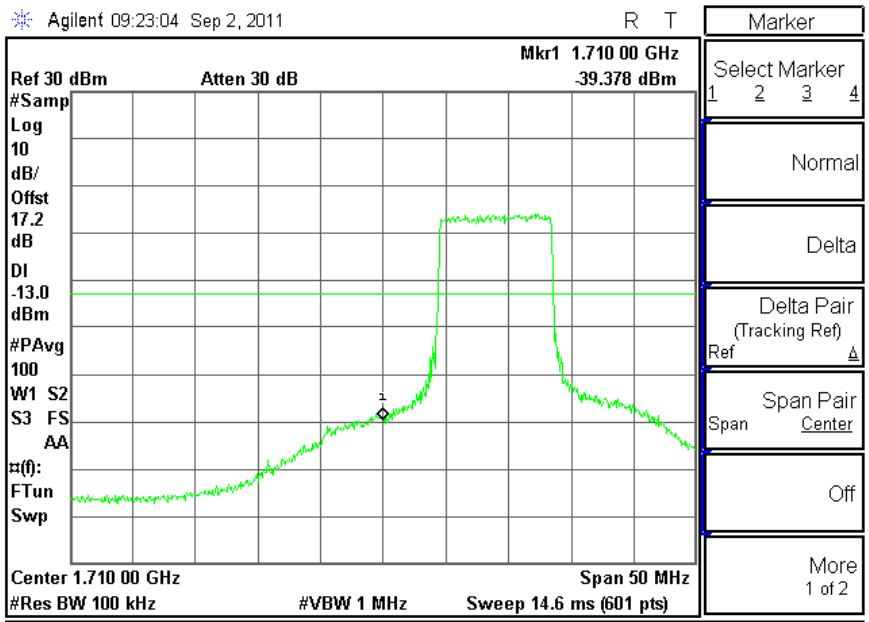
LOW CH, RB1-99



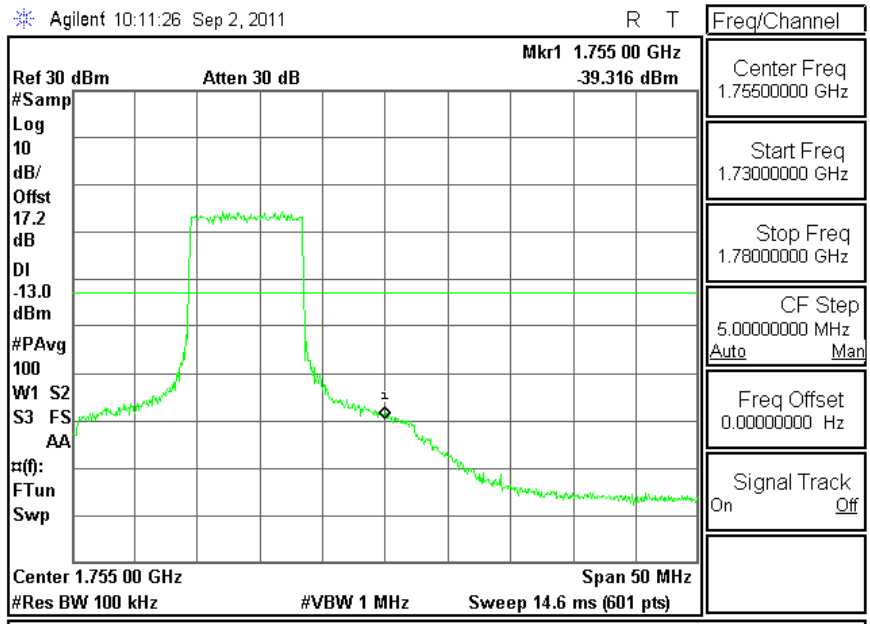
HIGH CH, RB1-99



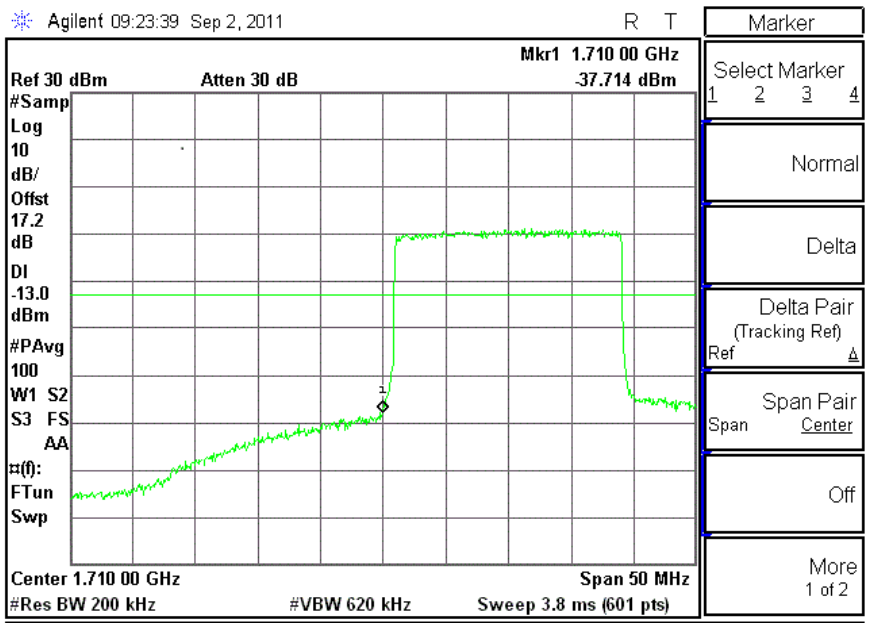
LOW CH, RB50-19



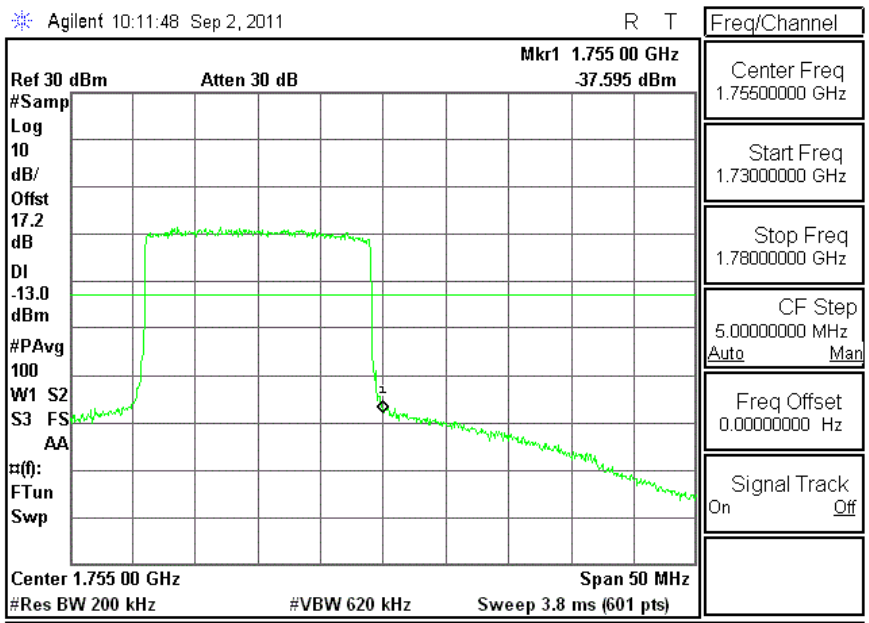
HIGH CH, RB50-19



LOW CH, RB100-0

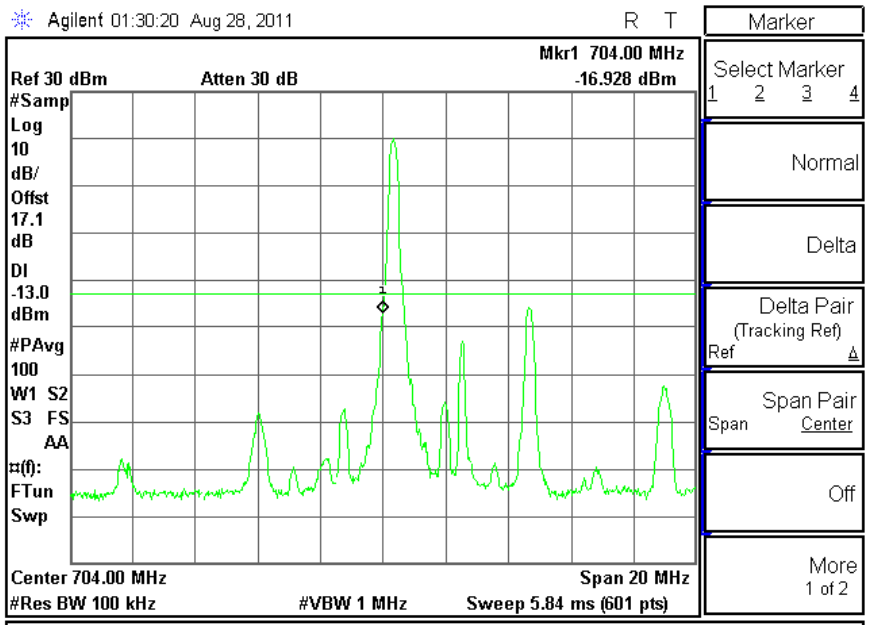


HIGH CH, RB100-0

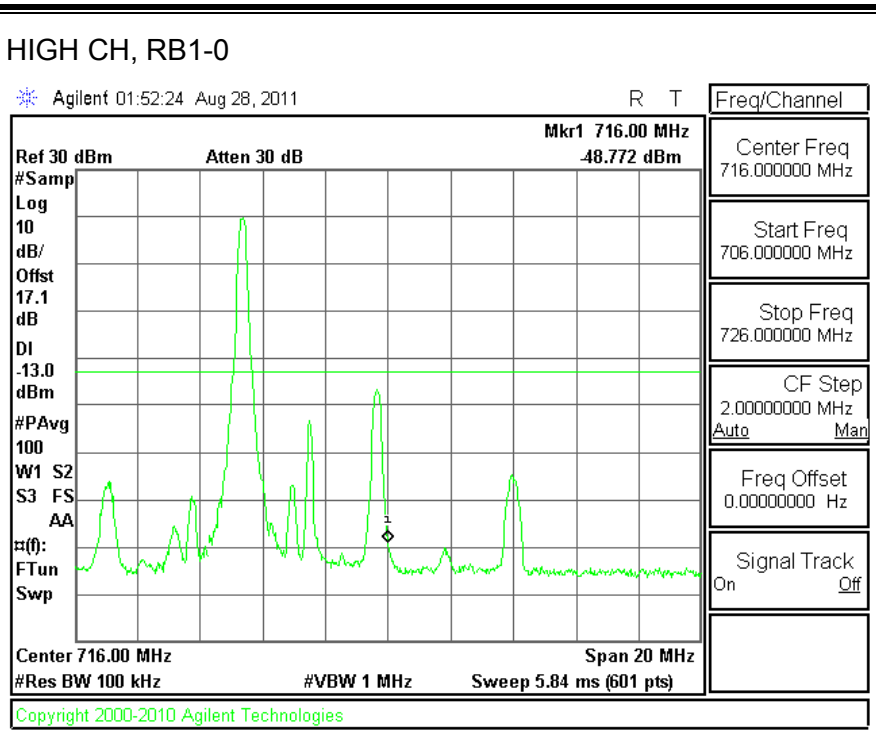


LTE QPSK Band 17 (5.0 MHz BAND WIDTH)

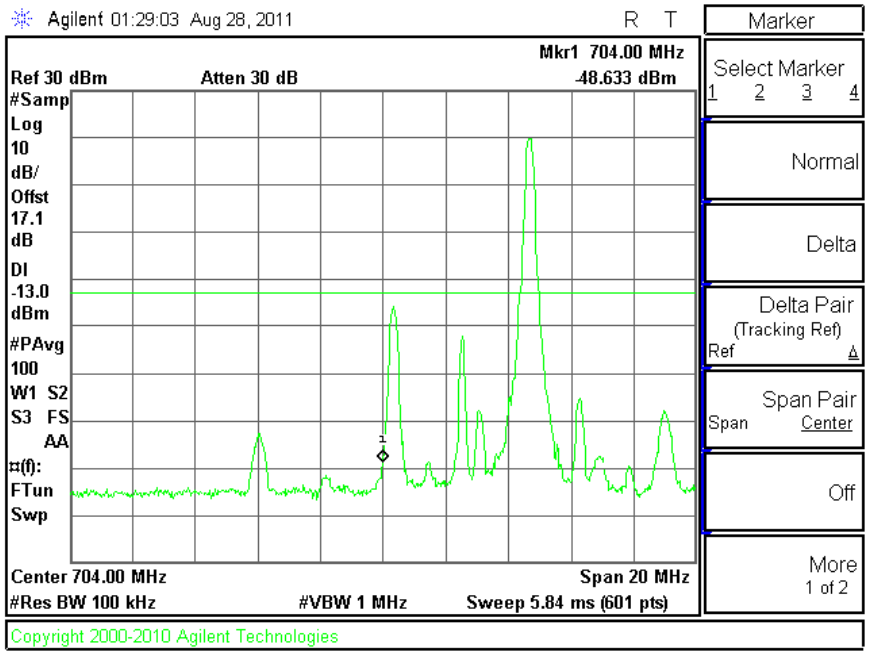
LOW CH, RB1-0



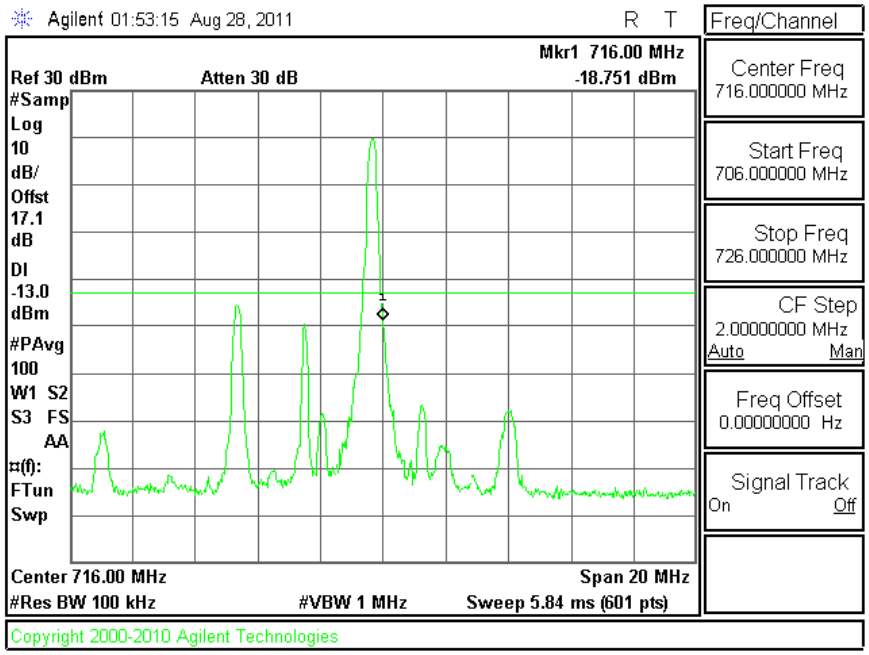
HIGH CH, RB1-0



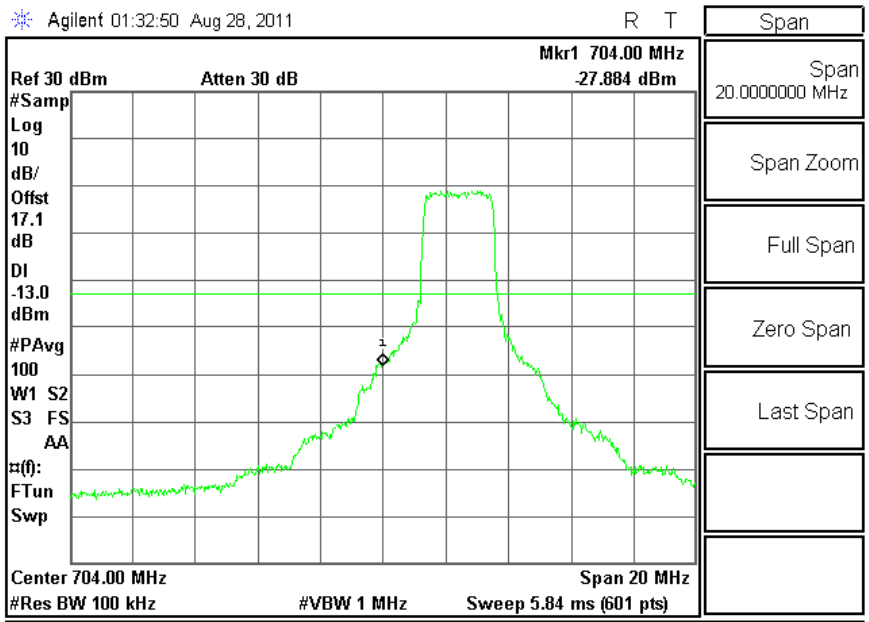
LOW CH, RB1-24



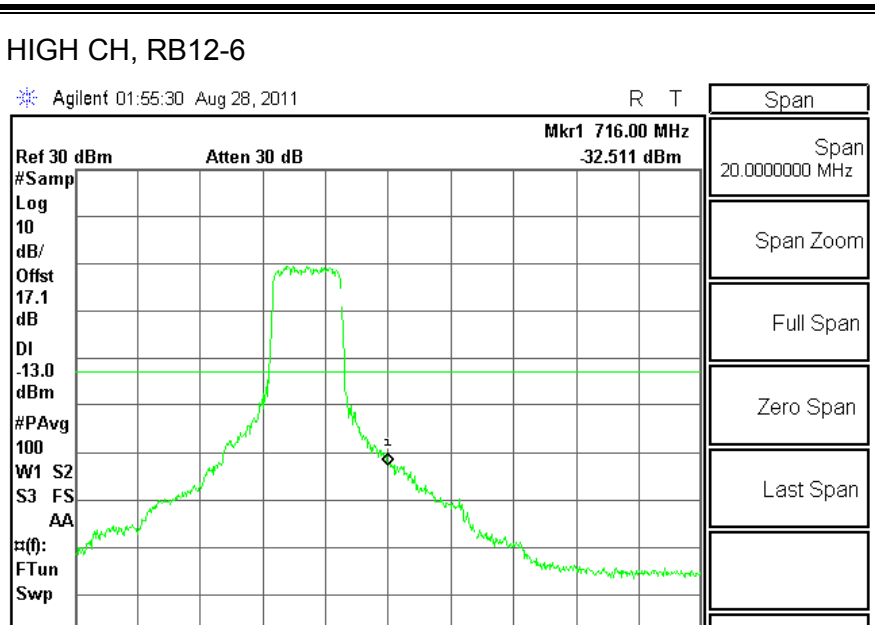
HIGH CH, RB1-24



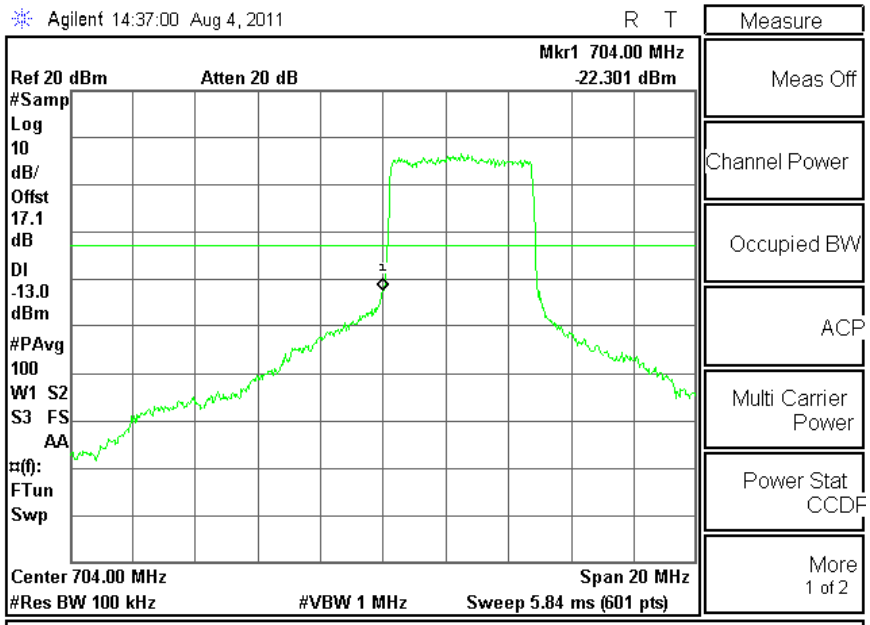
LOW CH, RB12-6



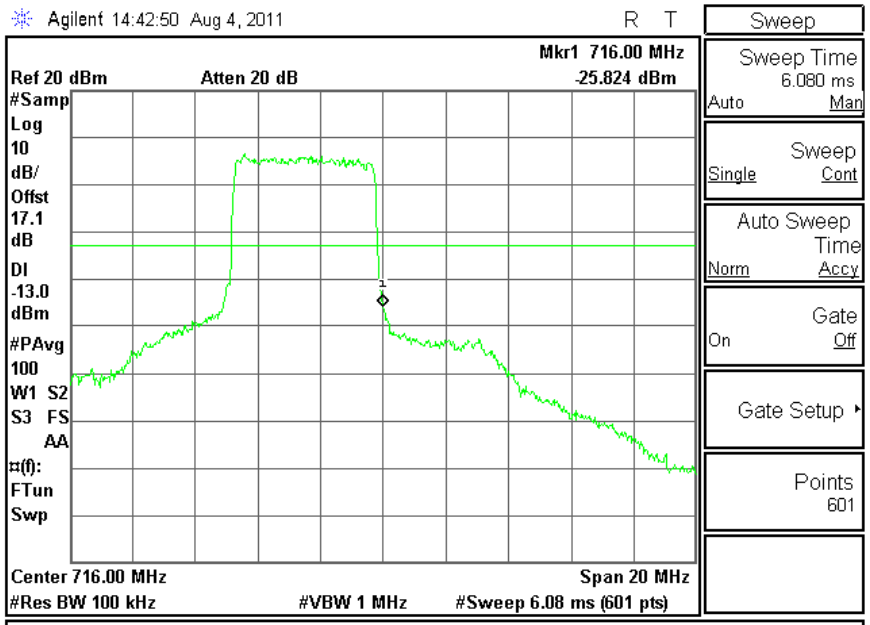
HIGH CH, RB12-6



LOW CH, RB25-0

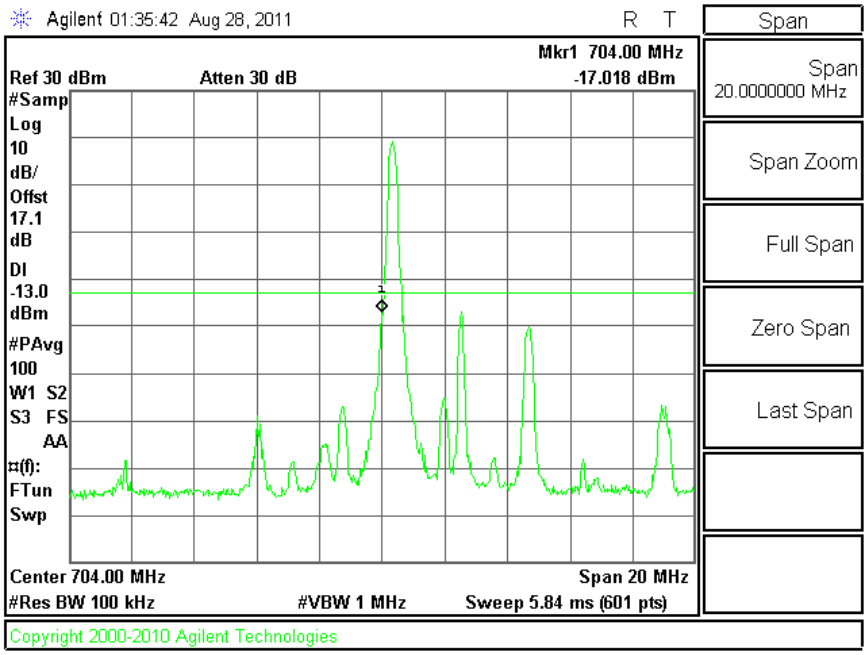


HIGH CH, RB25-0

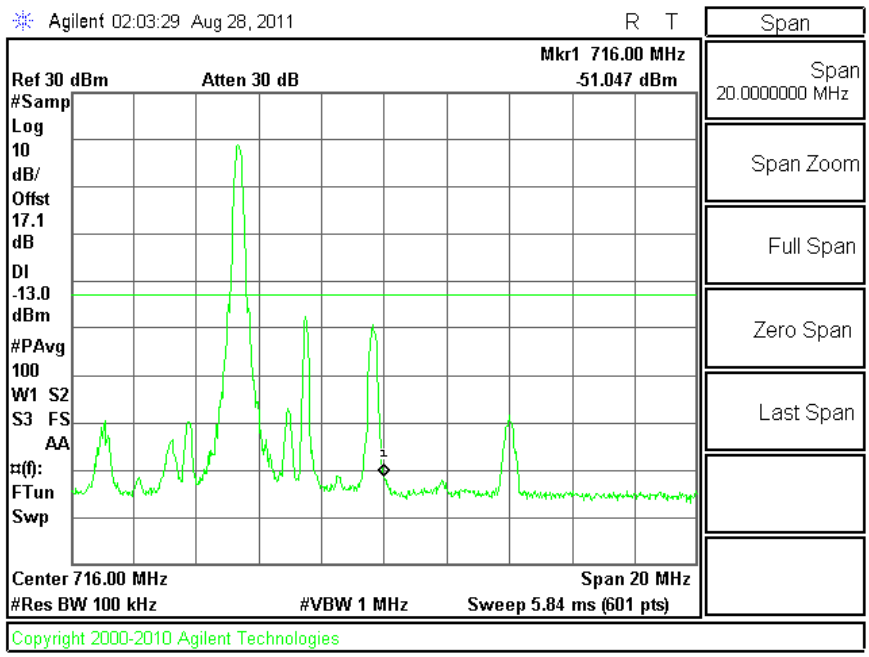


LTE 16QAM Band 17 (5.0 MHz BAND WIDTH)

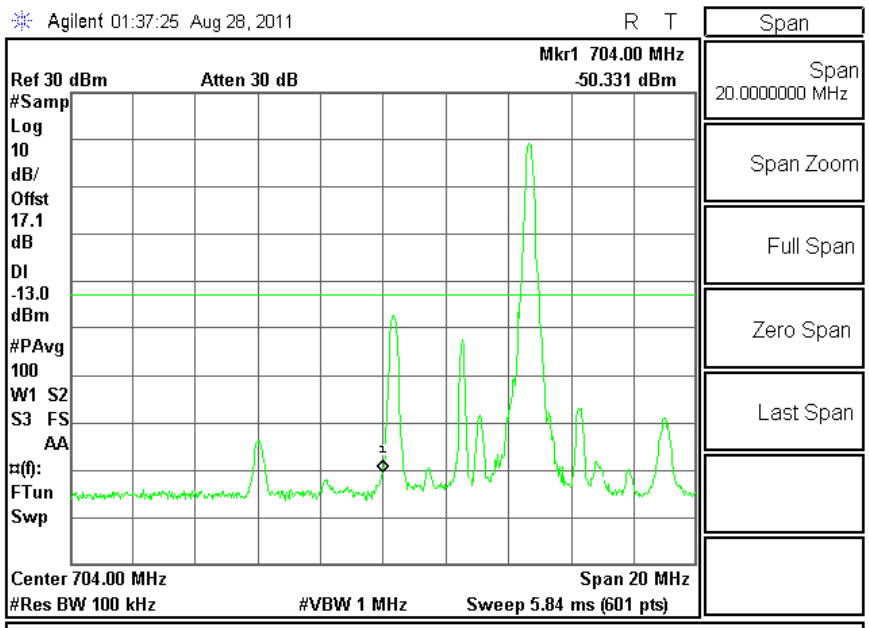
LOW CH, RB1-0



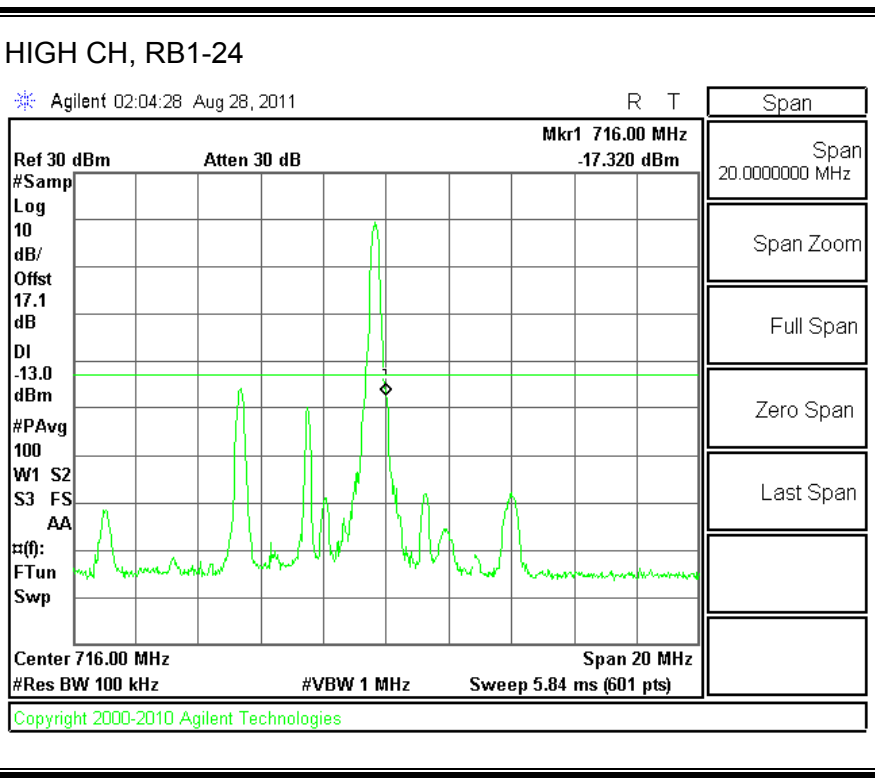
HIGH CH, RB1-0



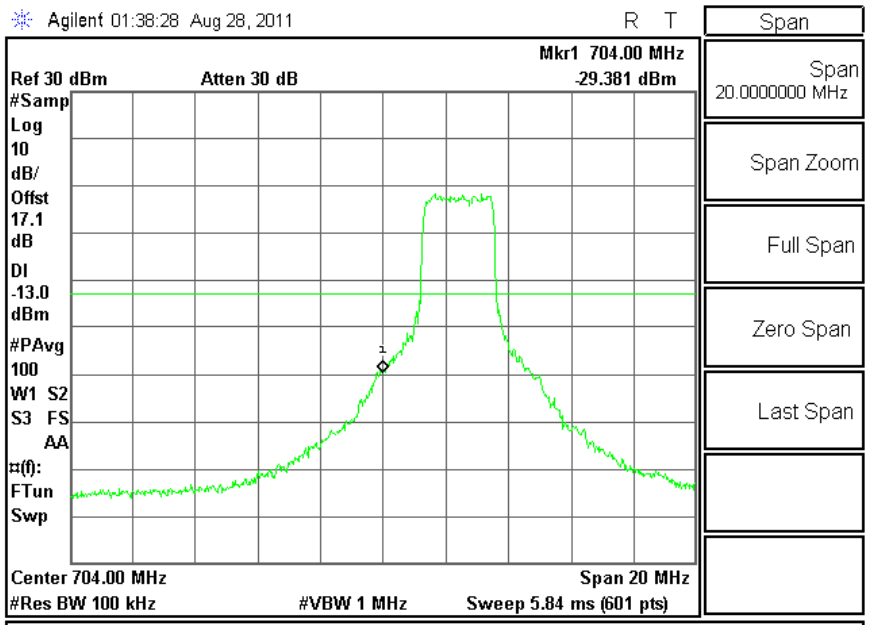
LOW CH, RB1-24



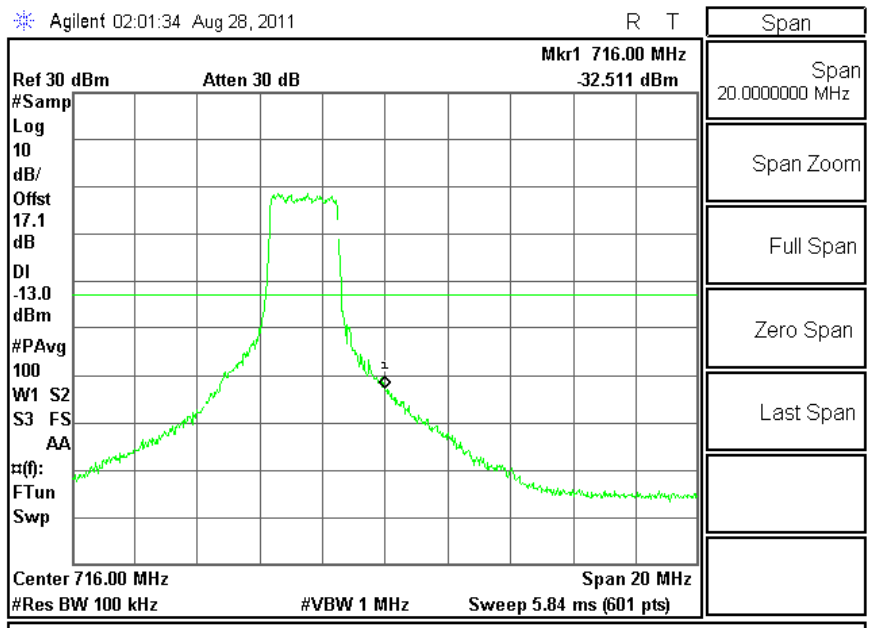
HIGH CH, RB1-24



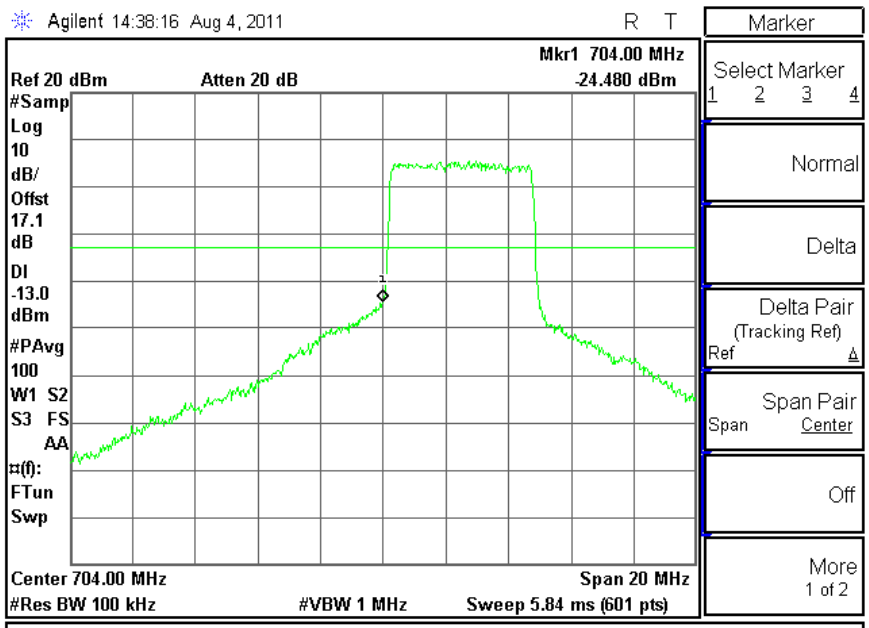
LOW CH, RB12-6



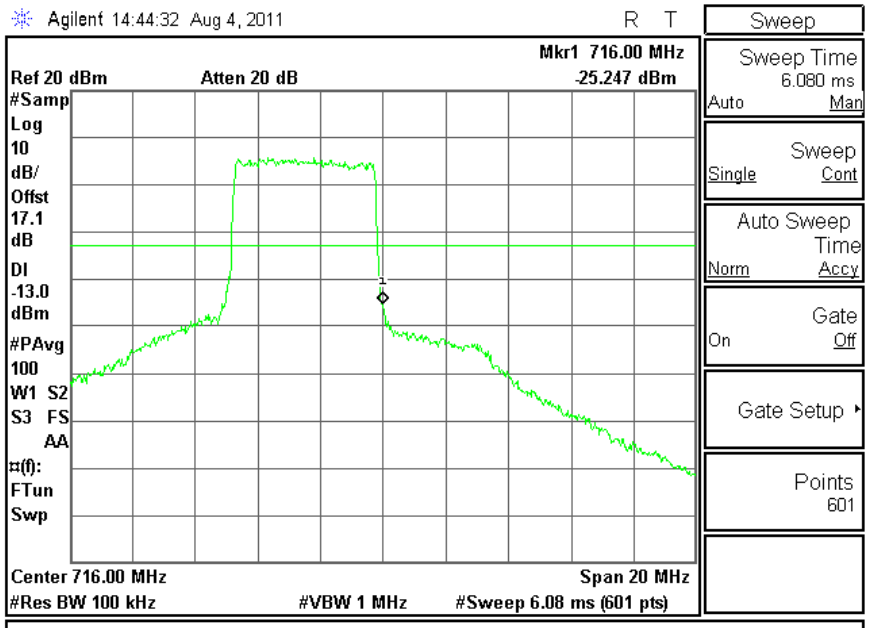
HIGH CH, RB12-6



LOW CH, RB25-0

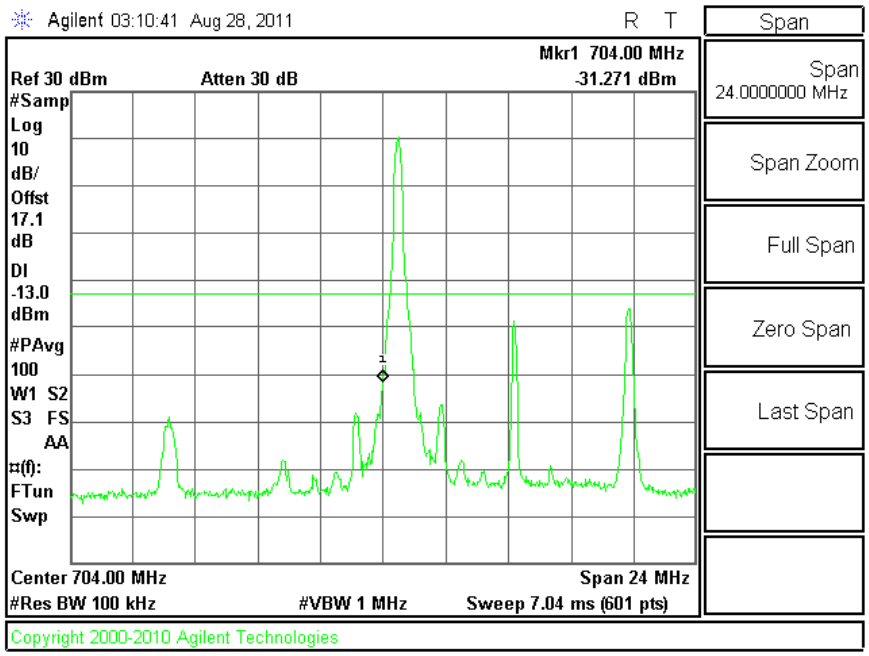


HIGH CH, RB25-0

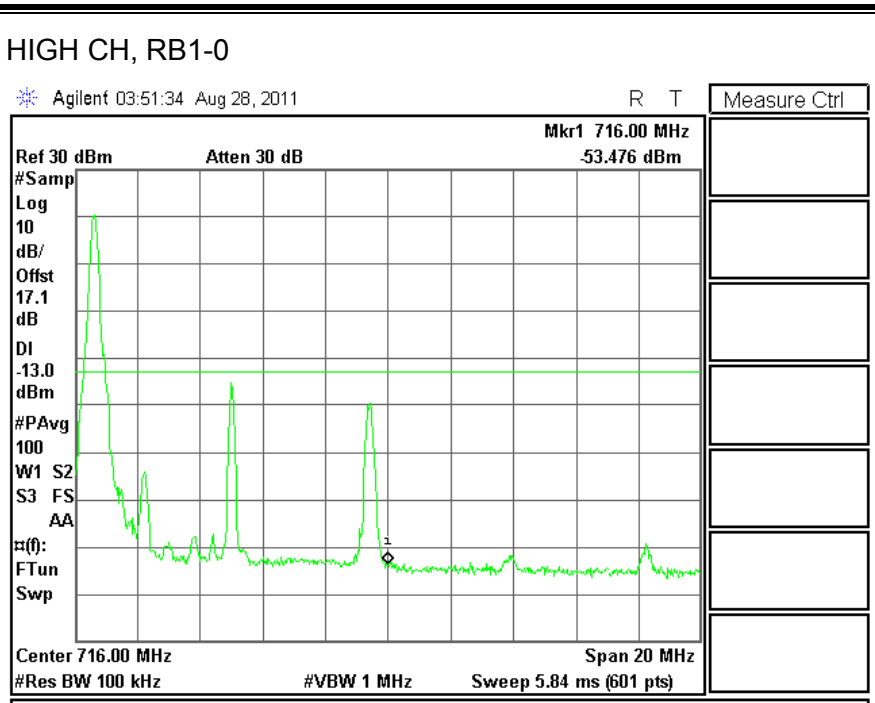


LTE QPSK Band 17 (10.0 MHz BAND WIDTH)

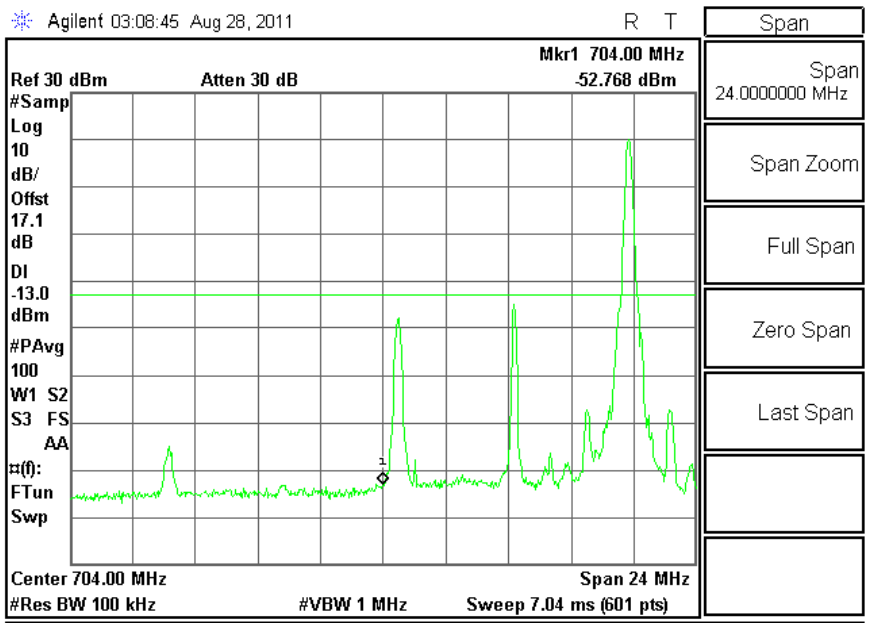
LOW CH, RB1-0



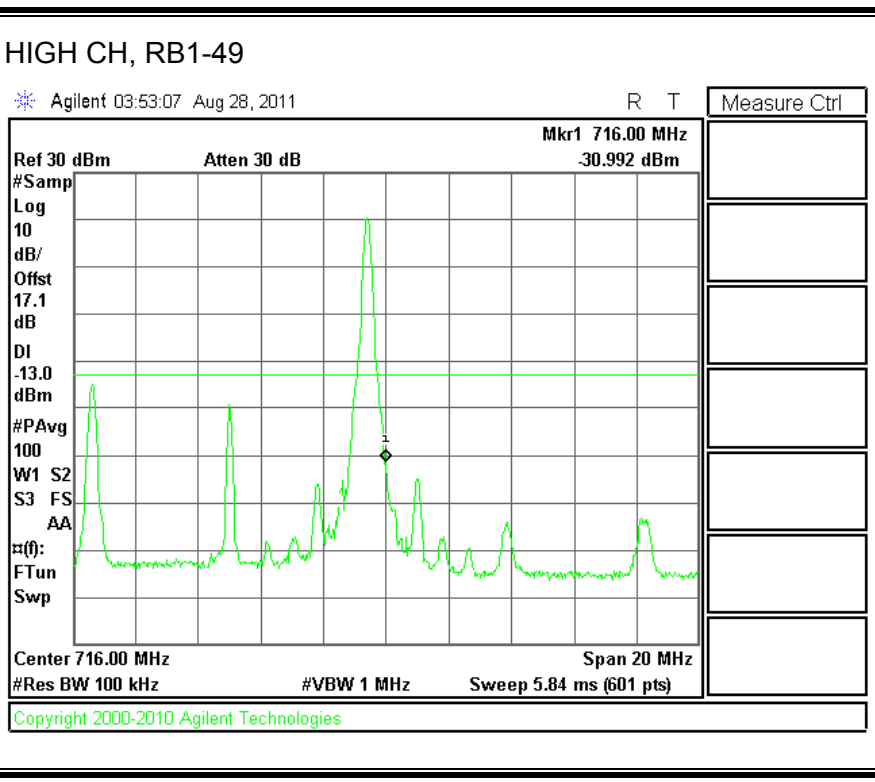
HIGH CH, RB1-0



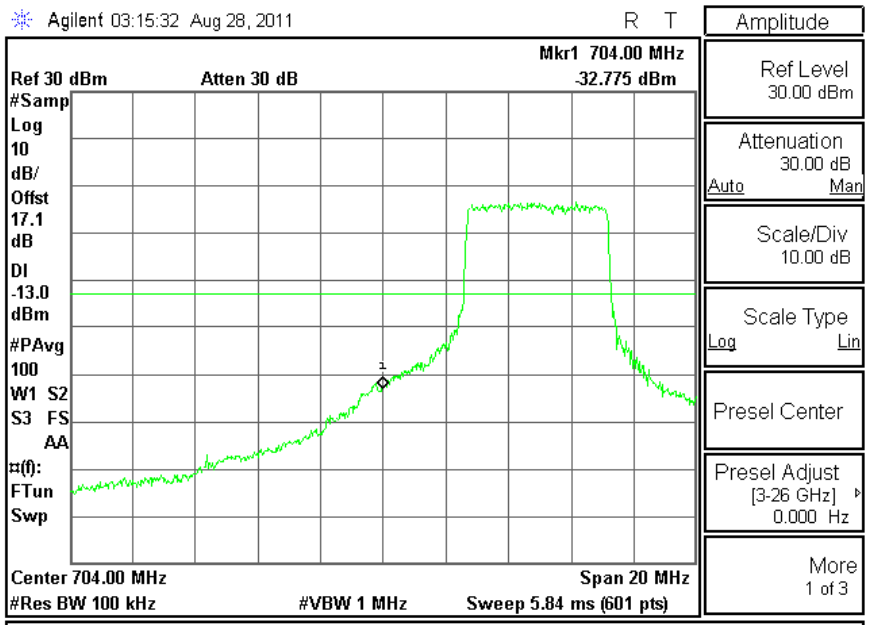
LOW CH, RB1-49



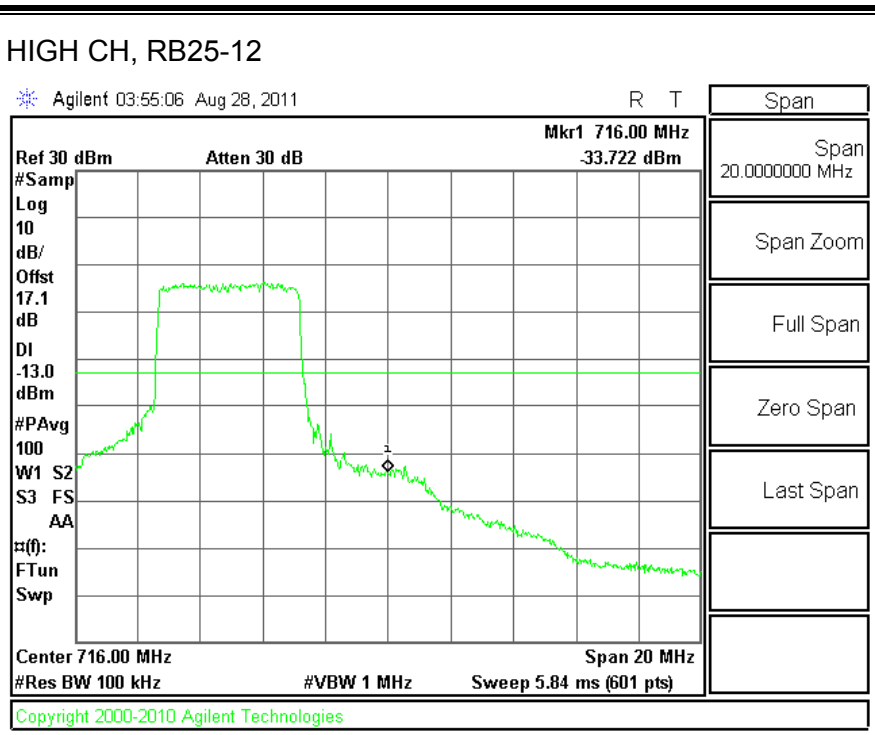
HIGH CH, RB1-49



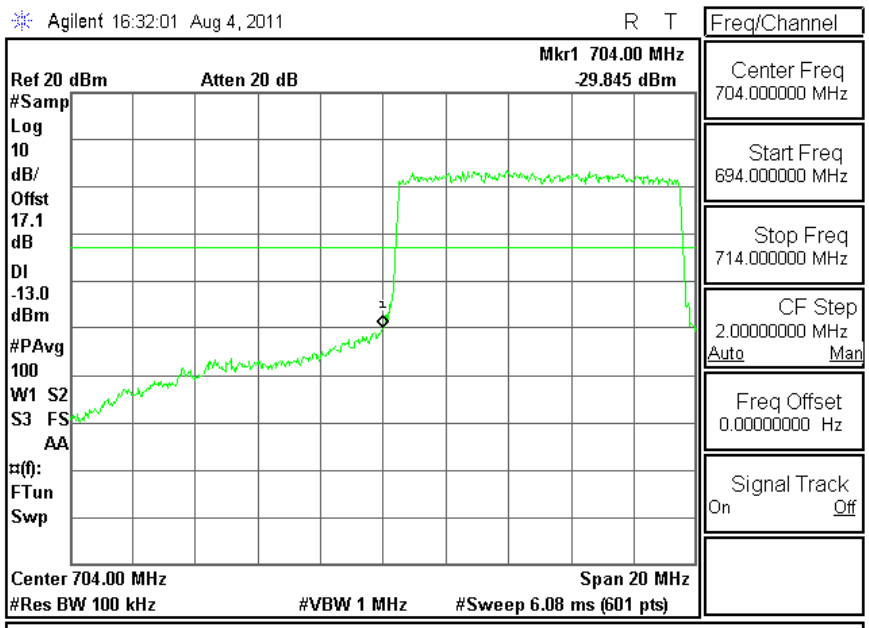
LOW CH, RB25-12



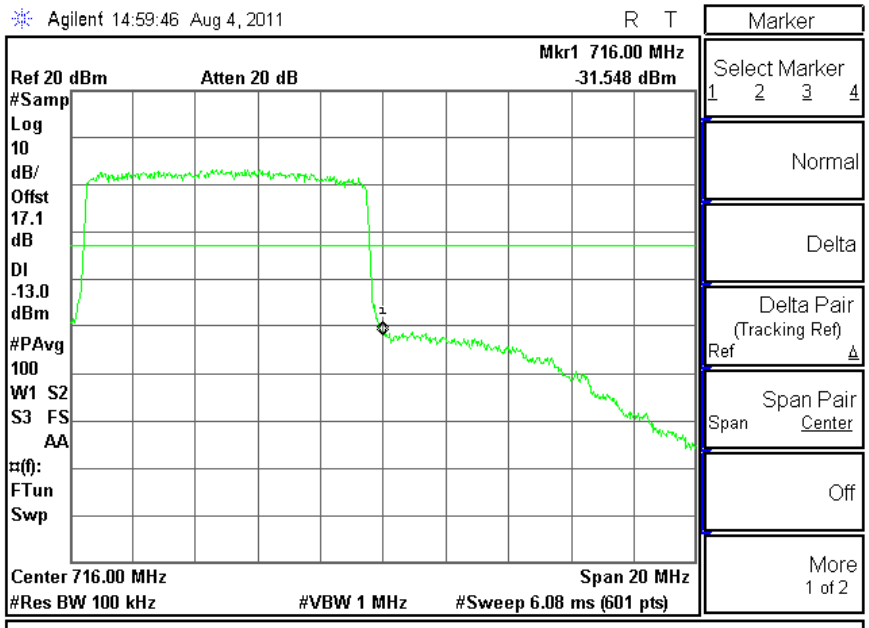
HIGH CH, RB25-12



LOW CH, RB50-0

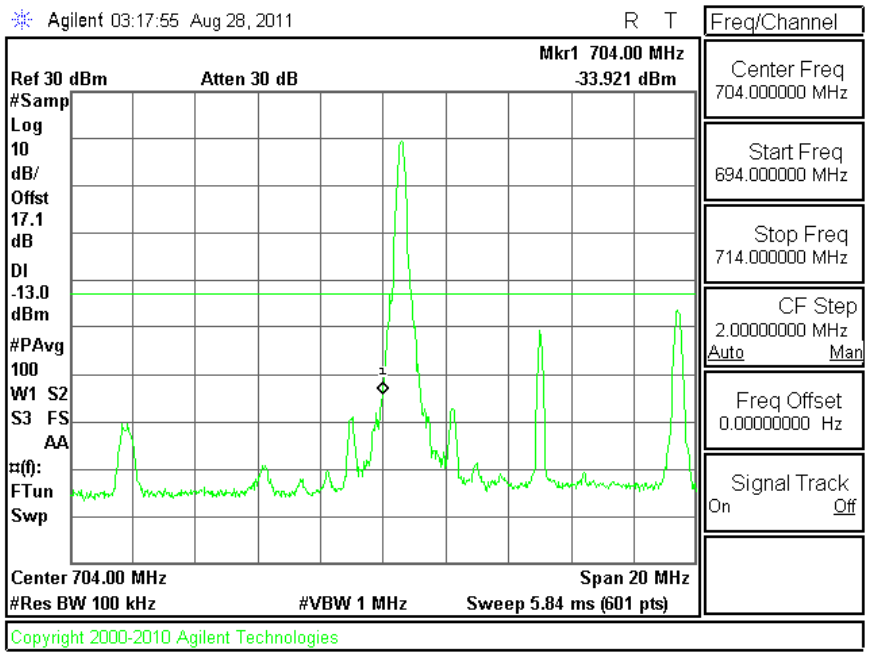


HIGH CH, RB50-0

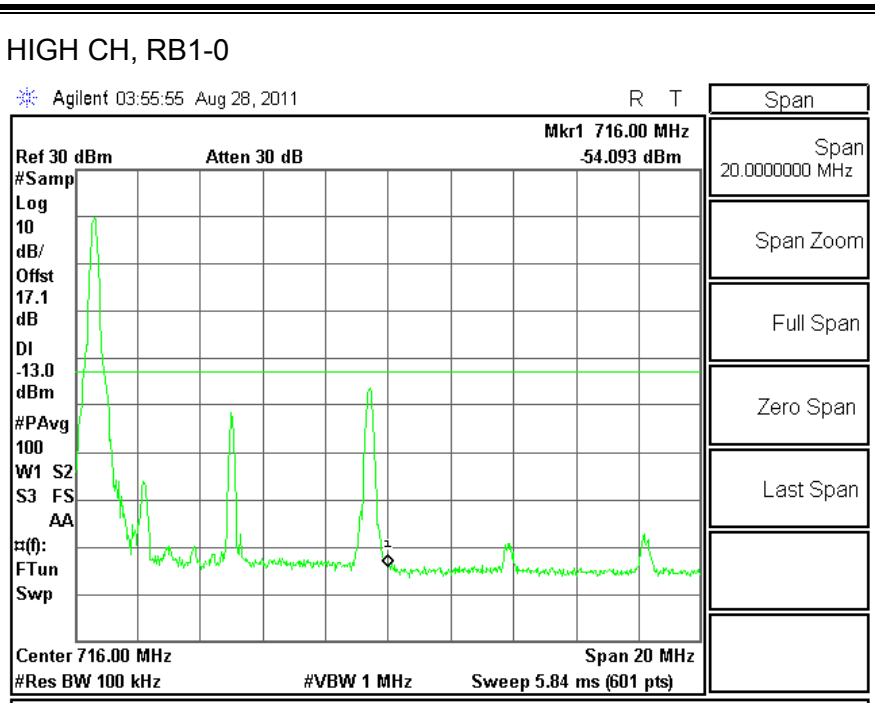


LTE 16QAM Band 17 (10.0 MHz BAND WIDTH)

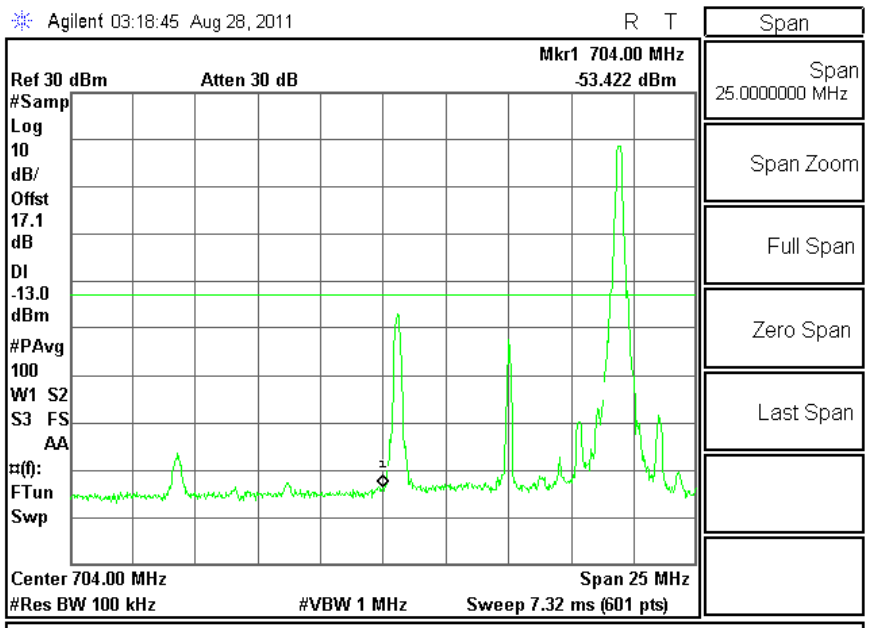
LOW CH, RB1-0



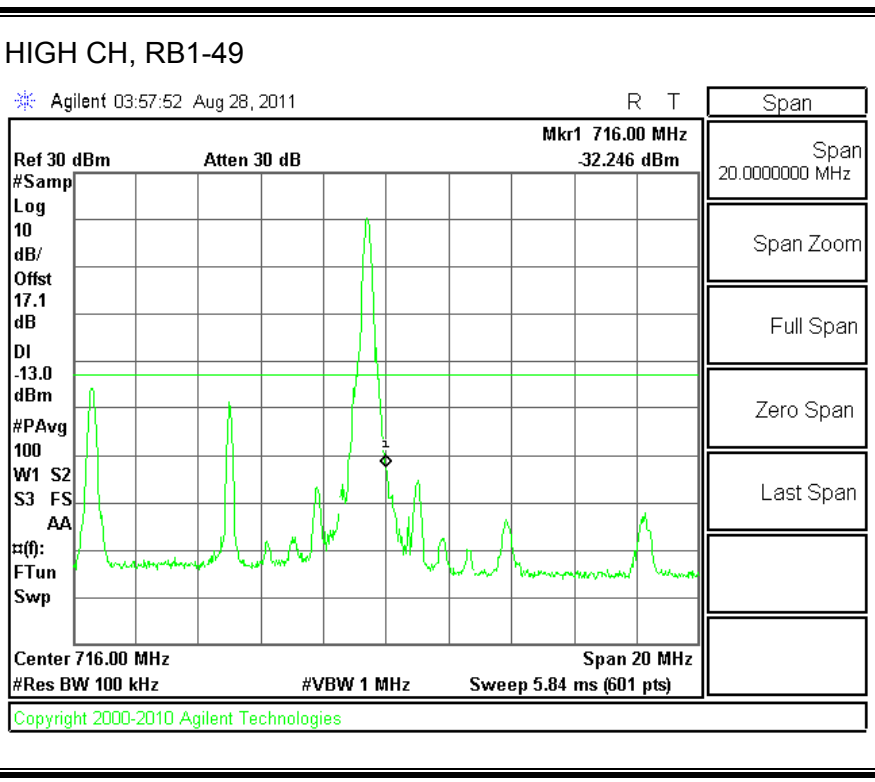
HIGH CH, RB1-0



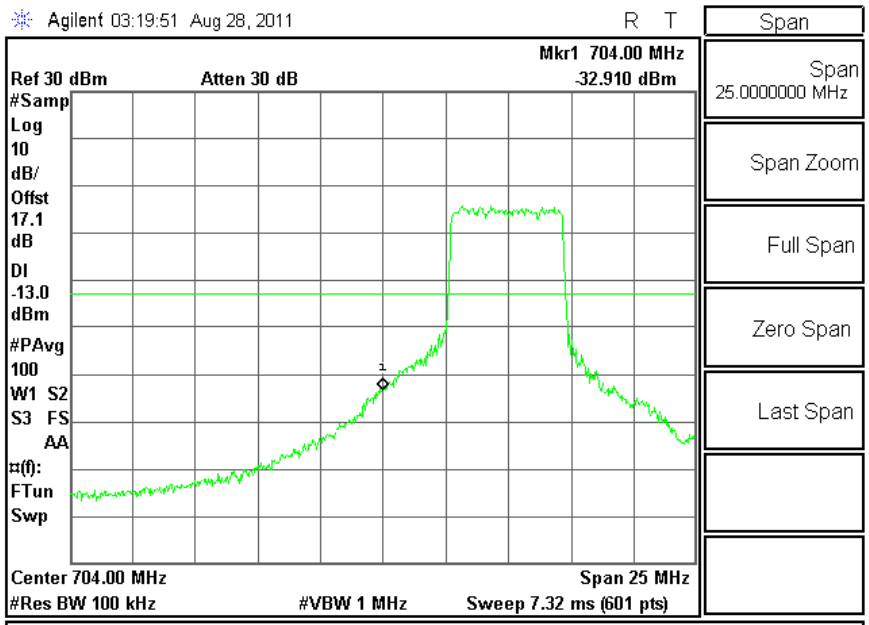
LOW CH, RB1-49



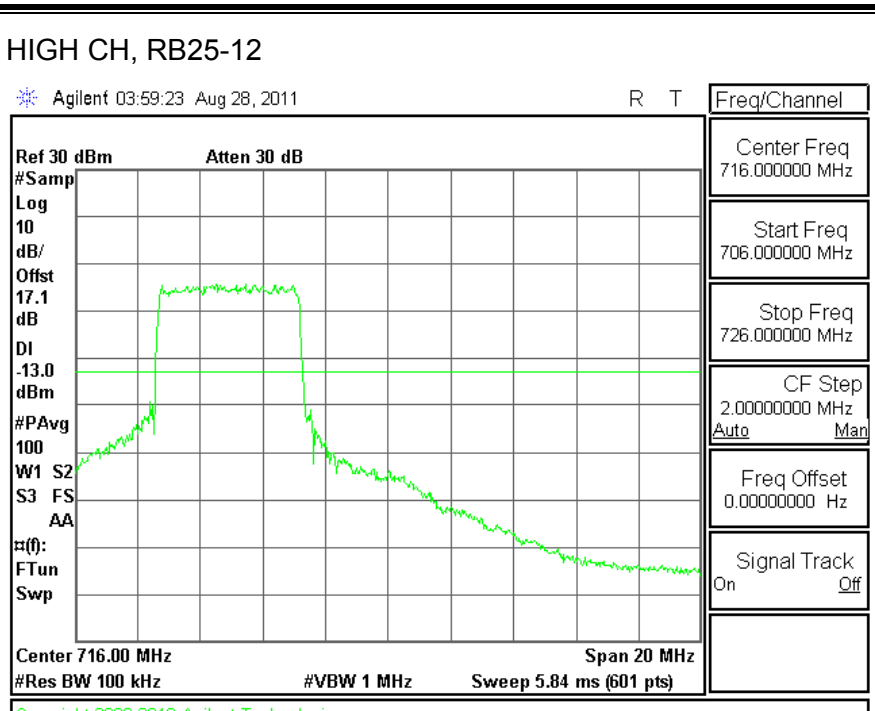
HIGH CH, RB1-49



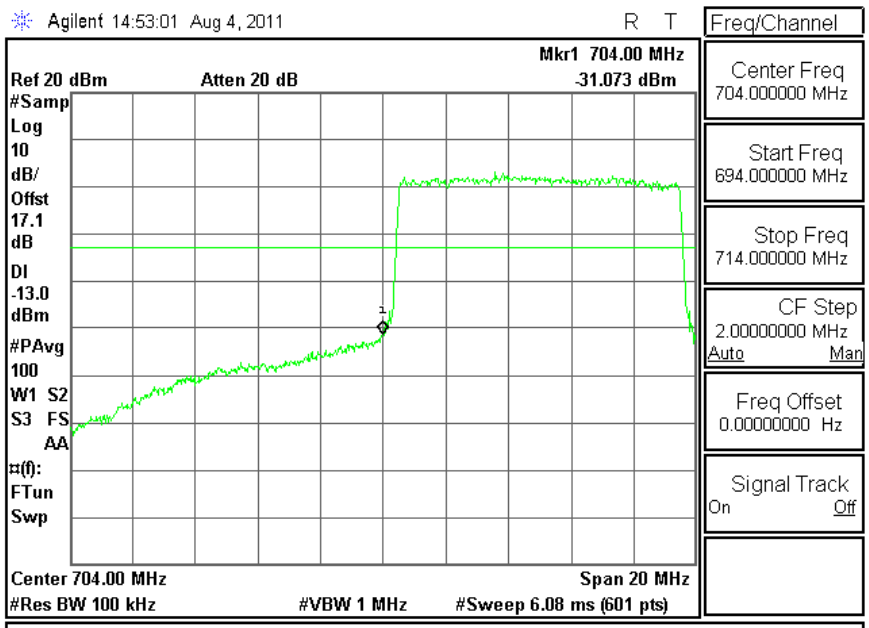
LOW CH, RB25-12



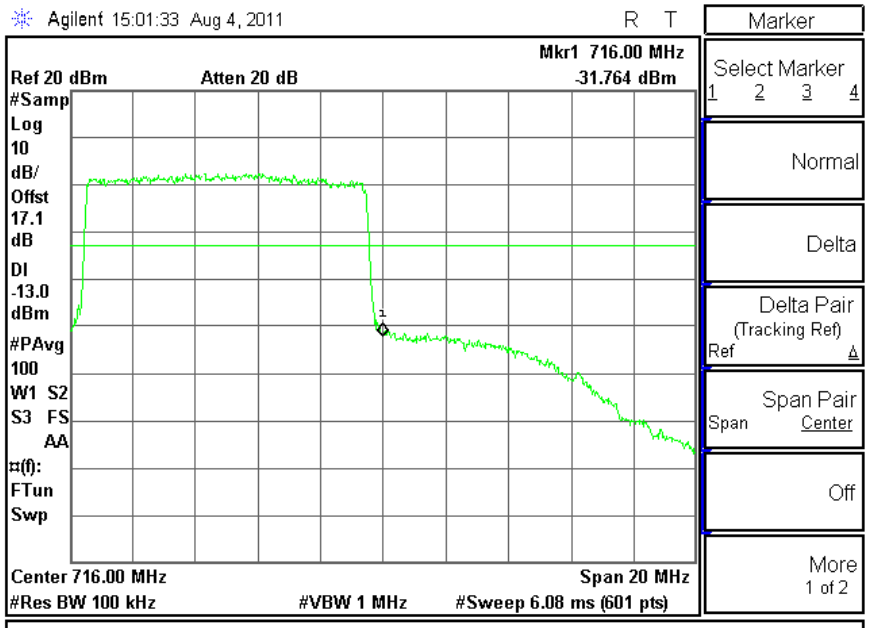
HIGH CH, RB25-12



LOW CH, RB50-0



HIGH CH, RB50-0



8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §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.

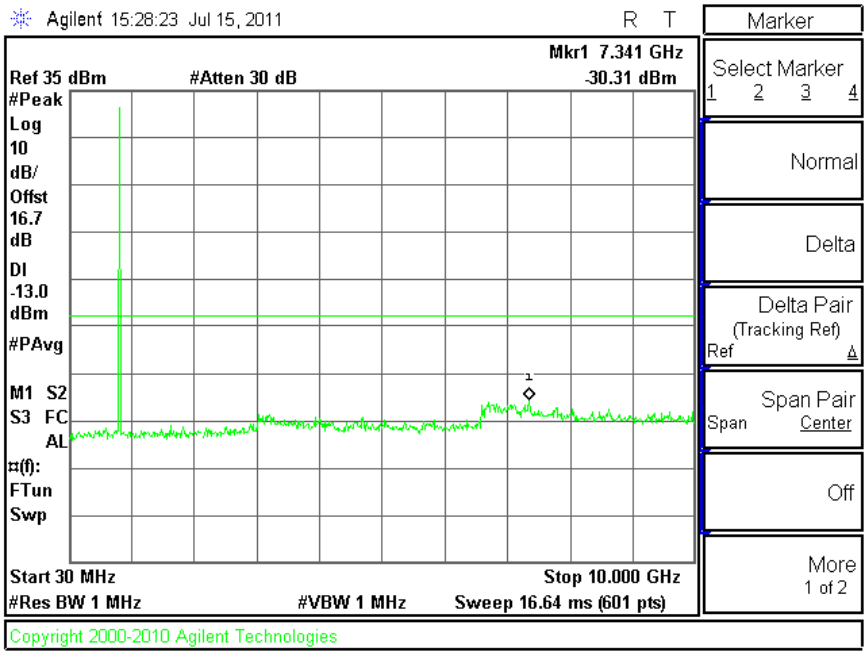
MODES TESTED

- GPRS and EGPRS
- WCDMA REL. 99 and HSDPA
- LTE BAND 4 and BAND 17

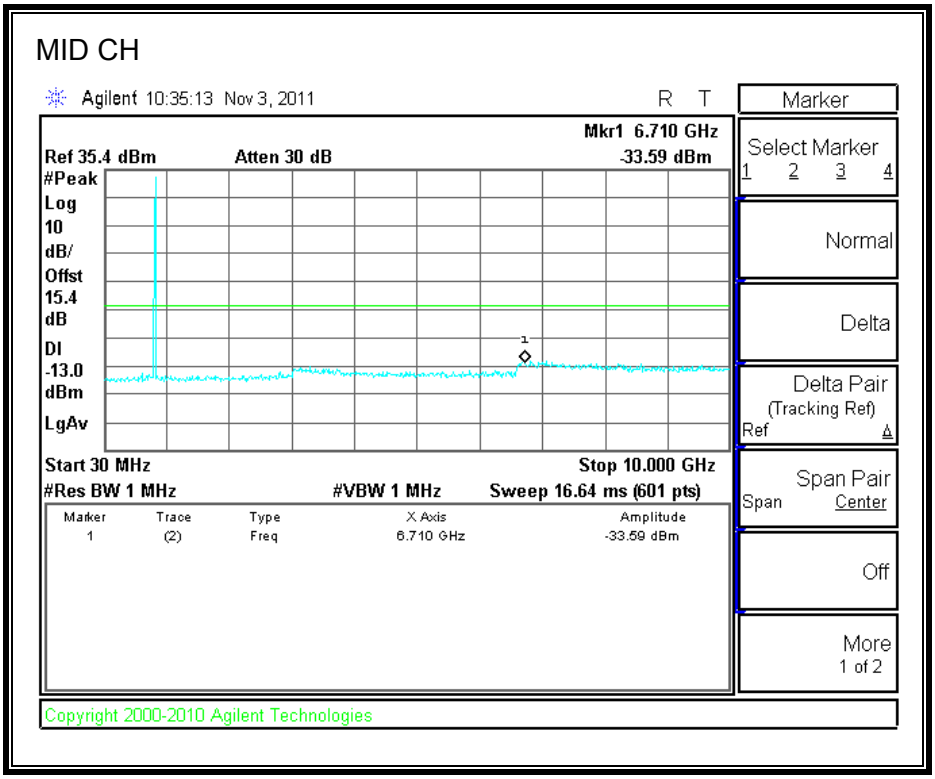
RESULTS

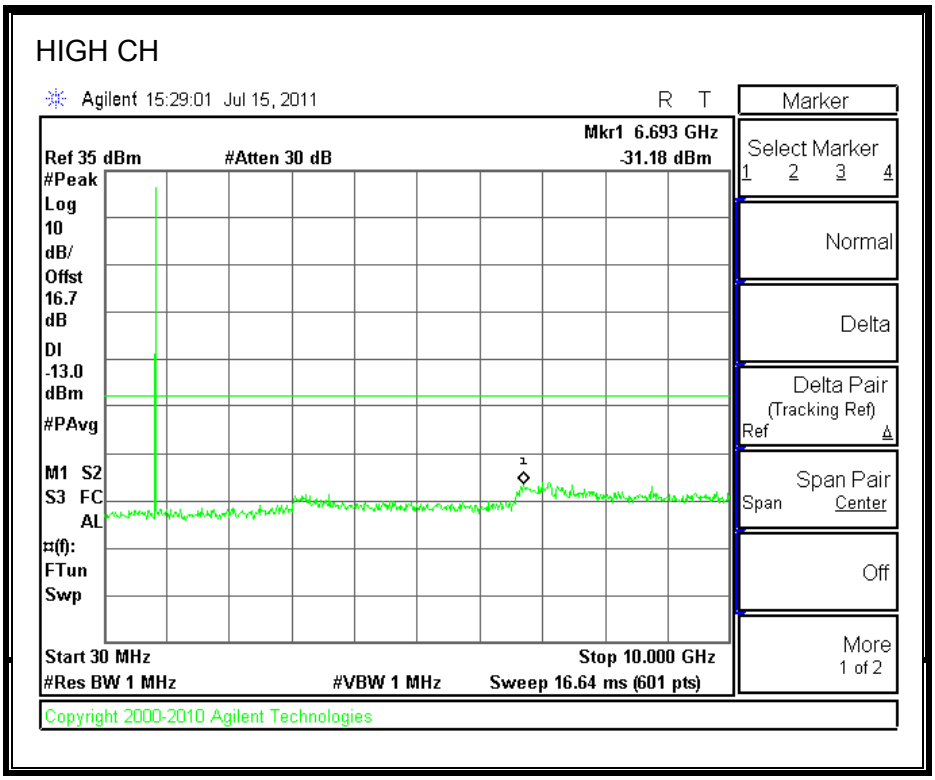
GPRS850 BAND

LOW CH

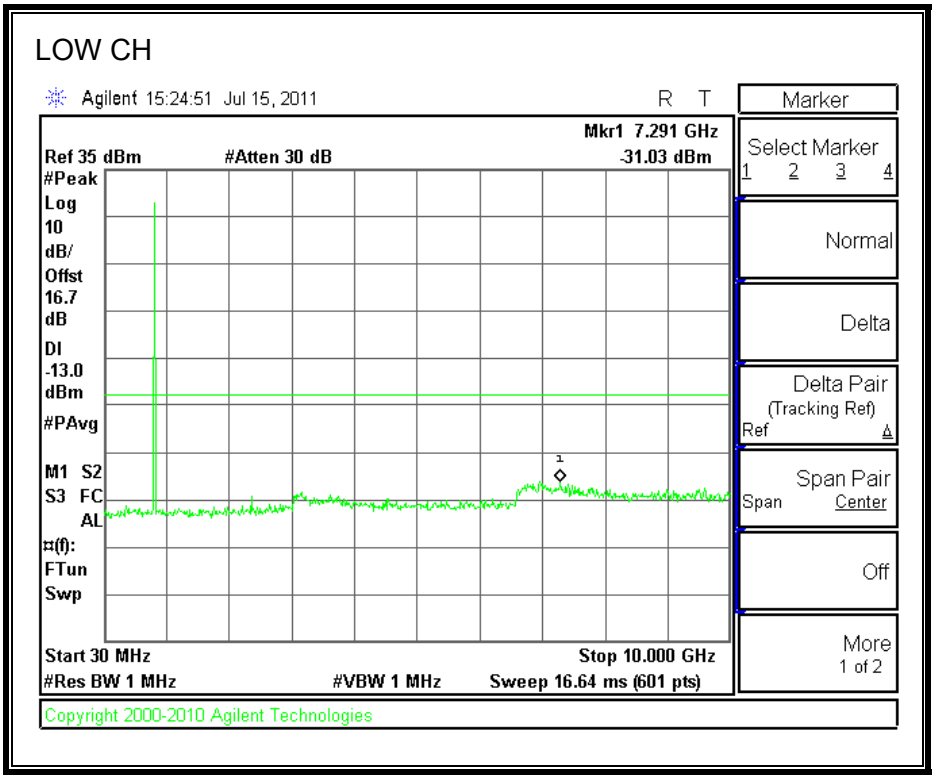


MID CH

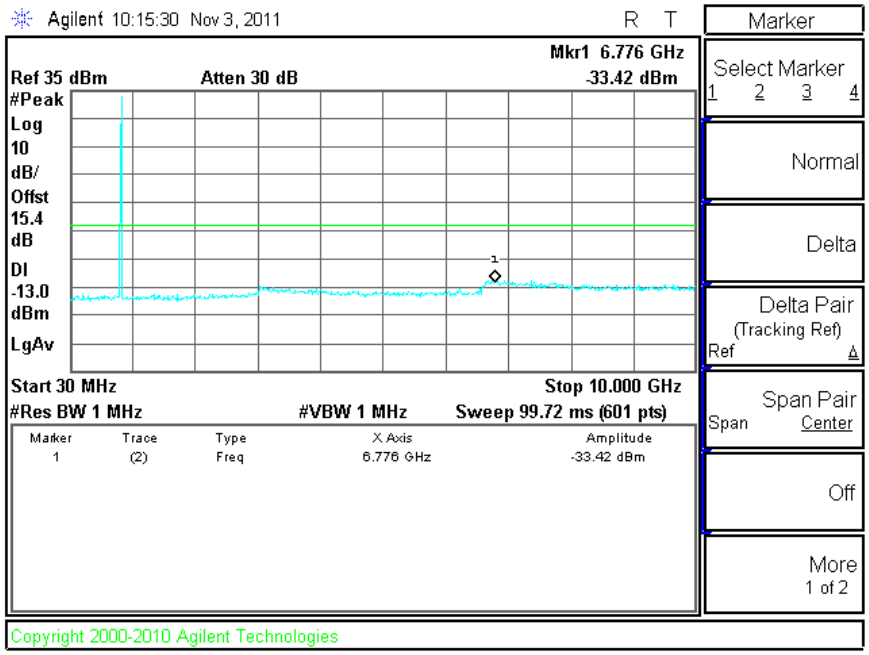




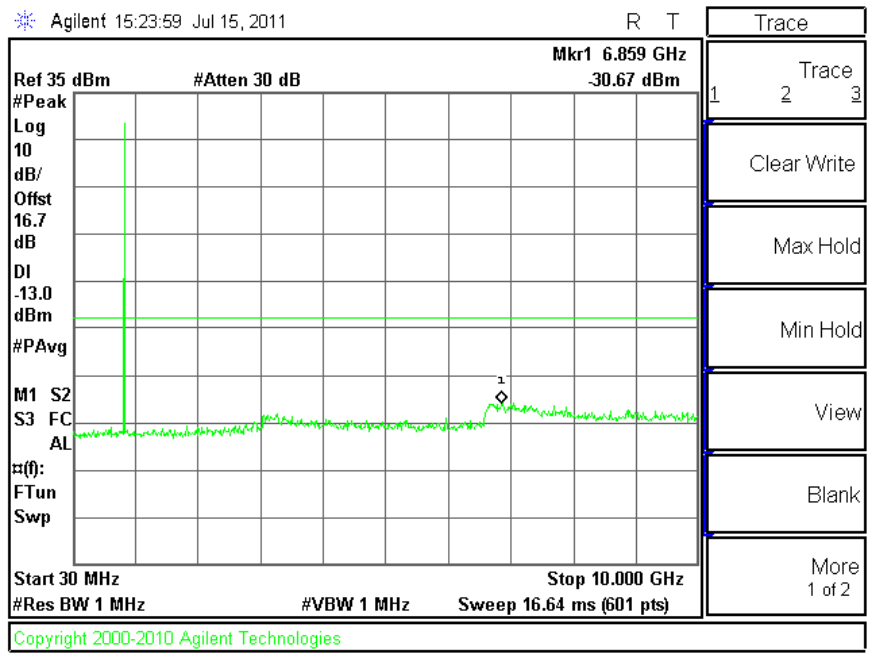
EGPRS850 BAND



MID CH

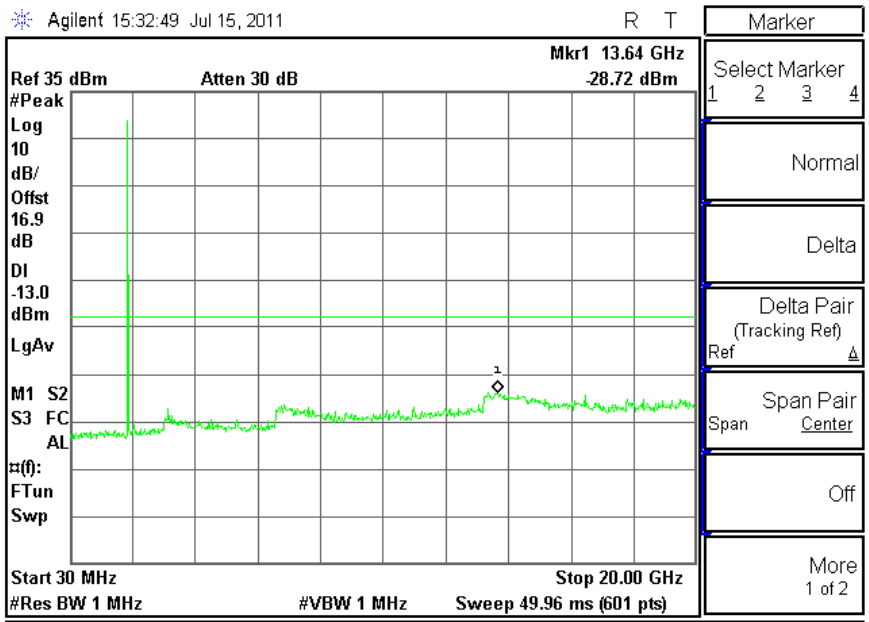


HIGH CH

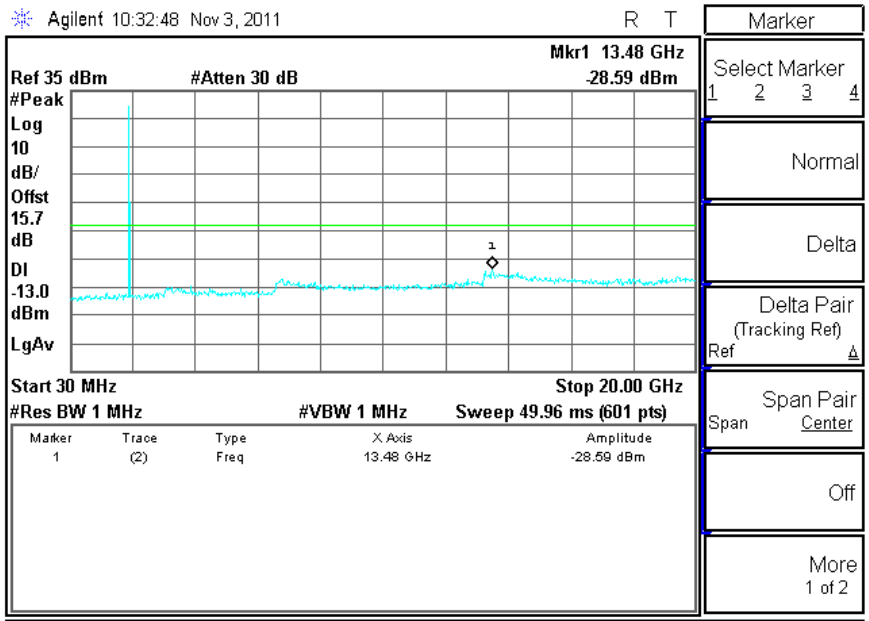


GPRS1900 BAND

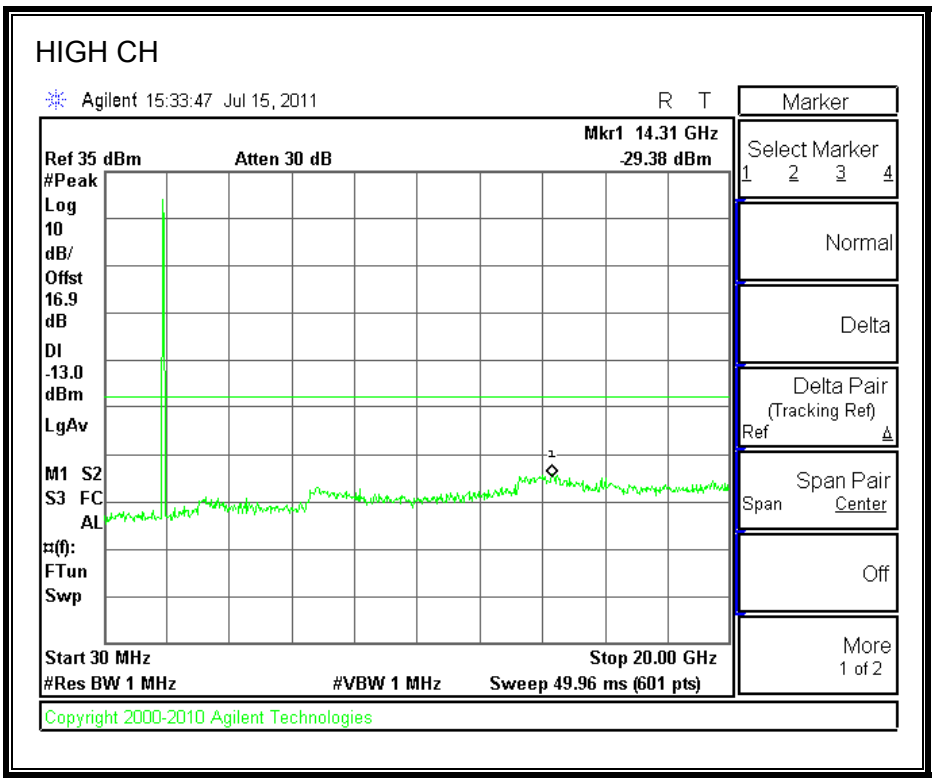
LOW CH



MID CH

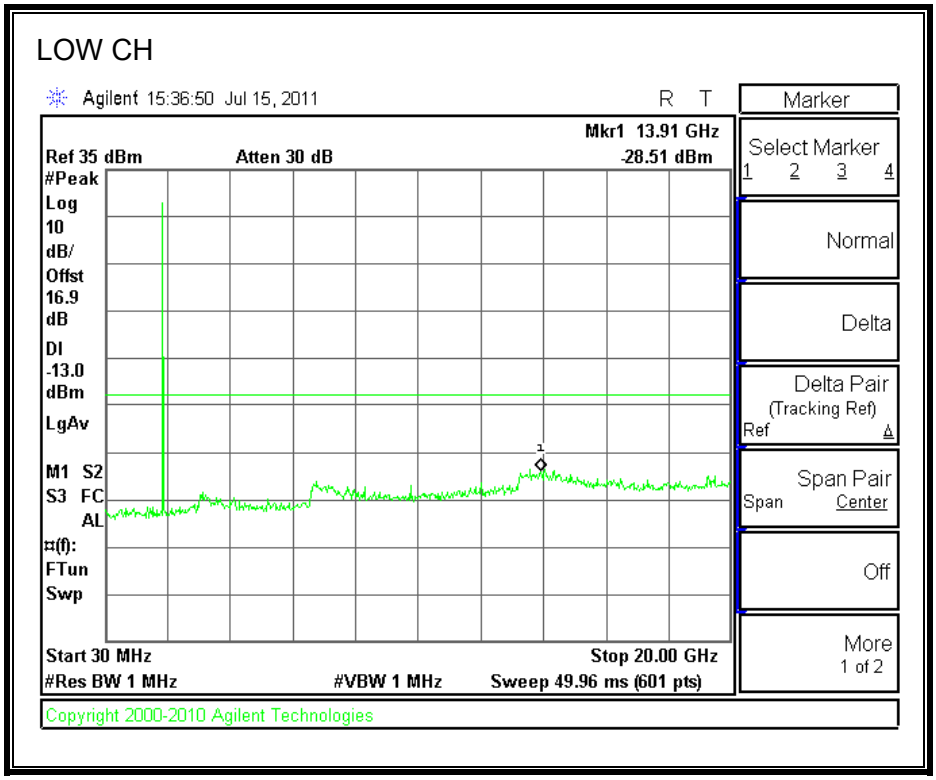


HIGH CH

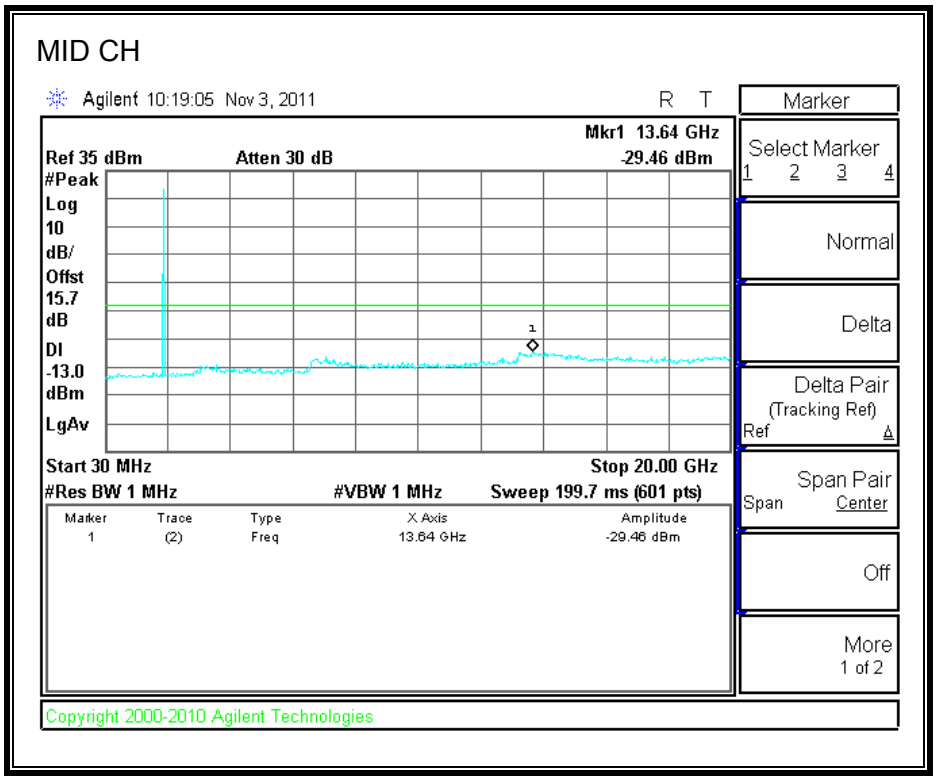


EGPRS1900 BAND

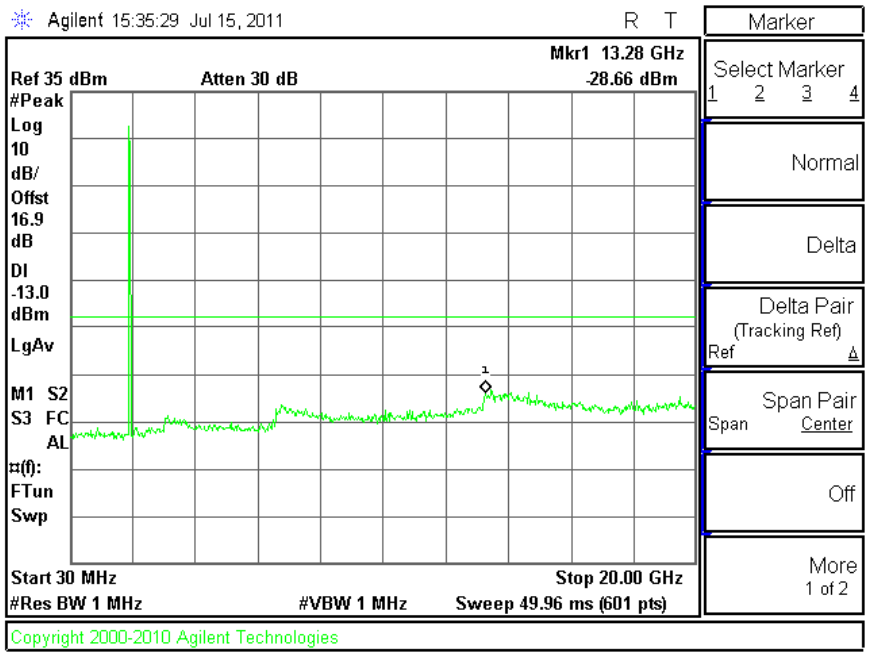
LOW CH



MID CH

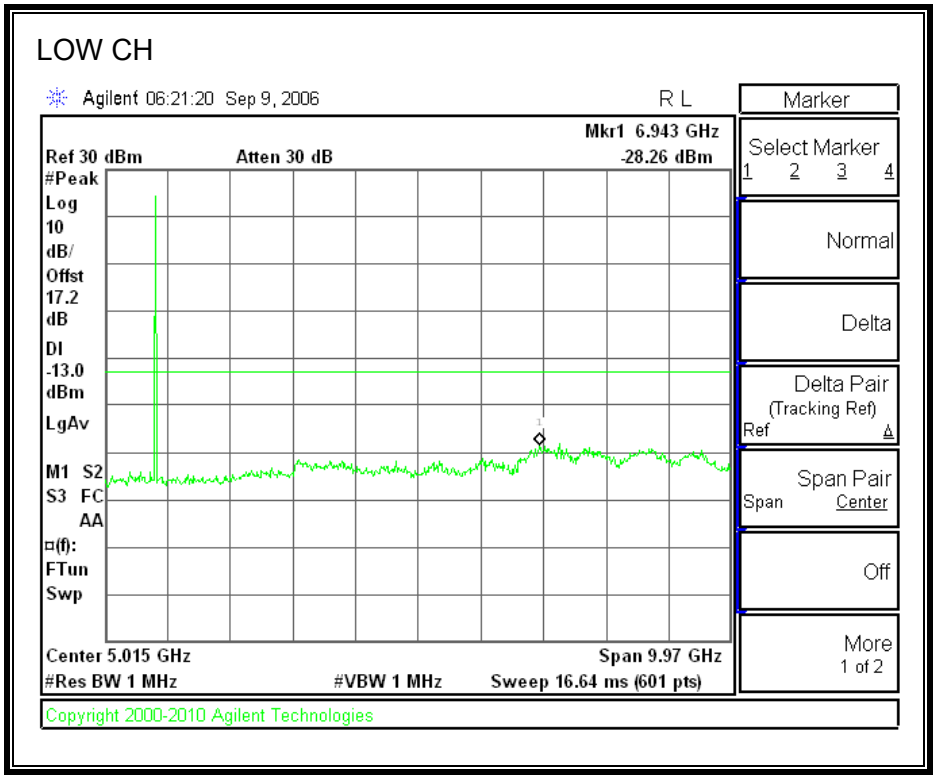


HIGH CH

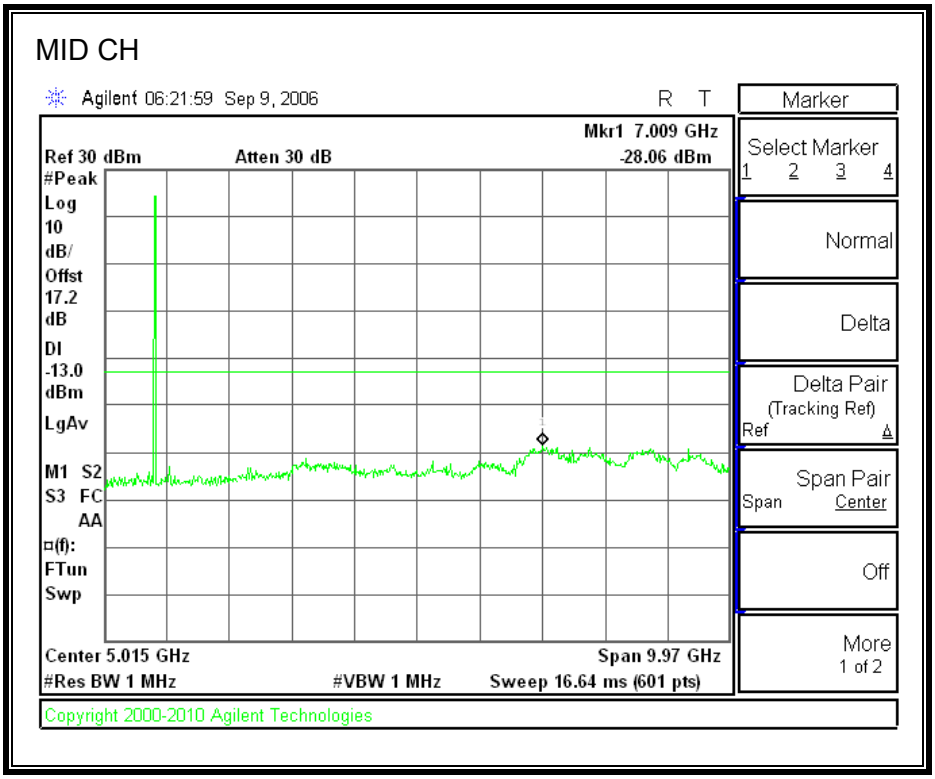


UMTS WCDMA REL 99, Cell Band

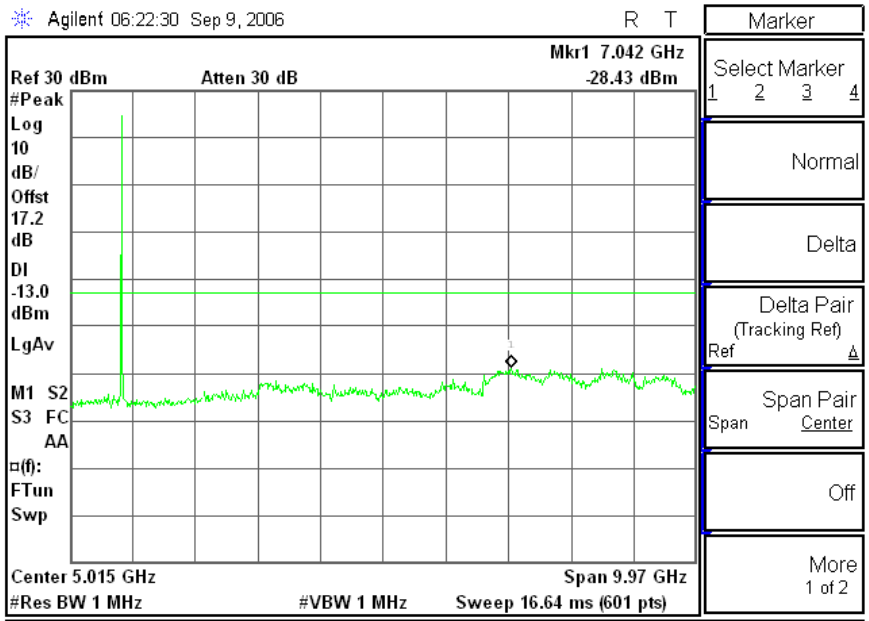
LOW CH



MID CH

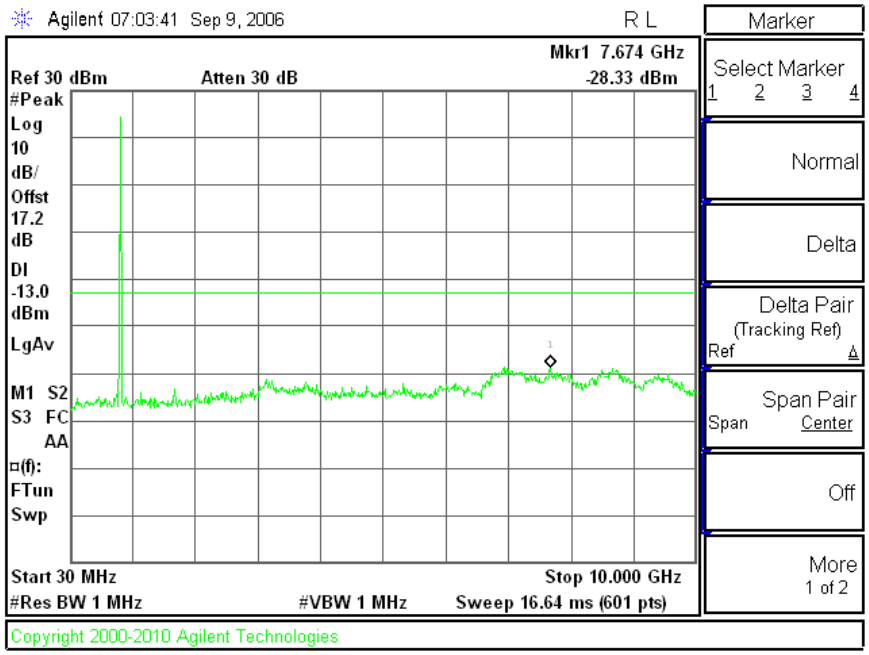


HIGH CH

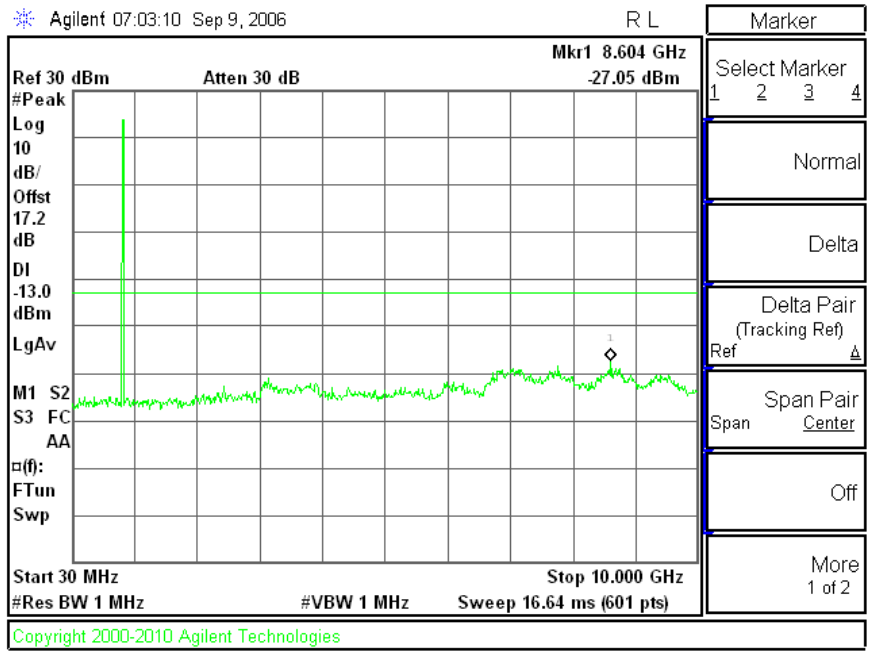


UMTS HSDPA Rel 6, Cell Band

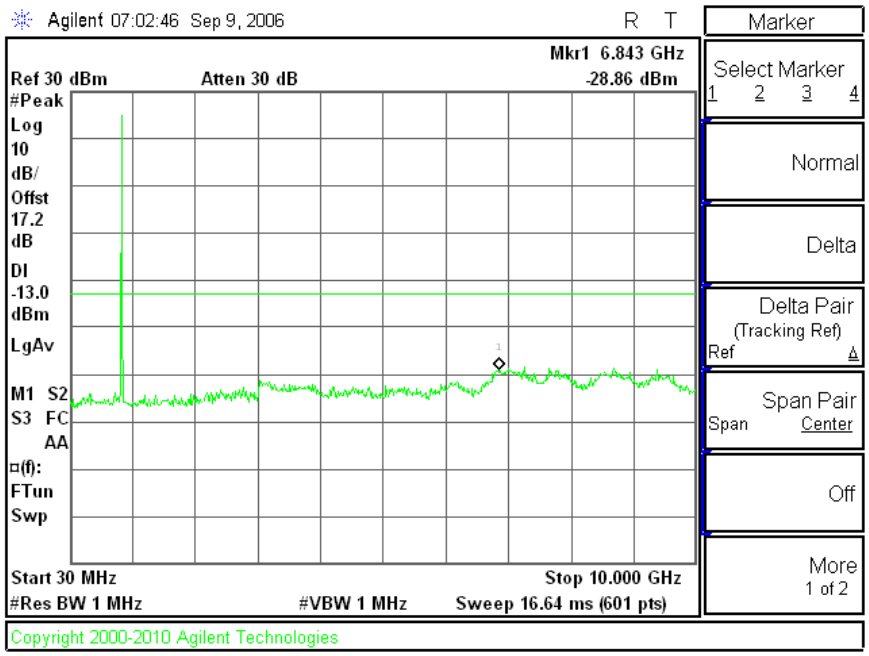
LOW CH



MID CH

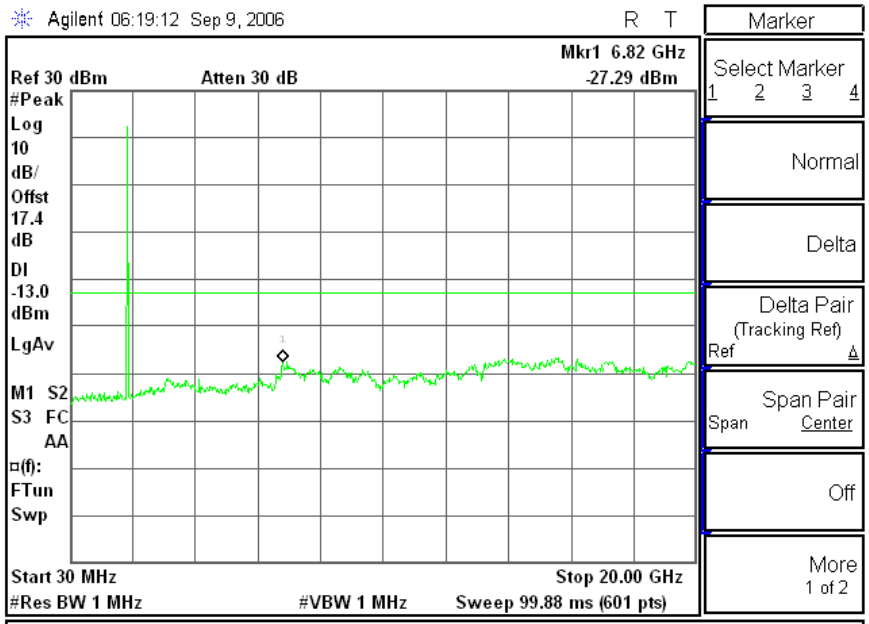


HIGH CH

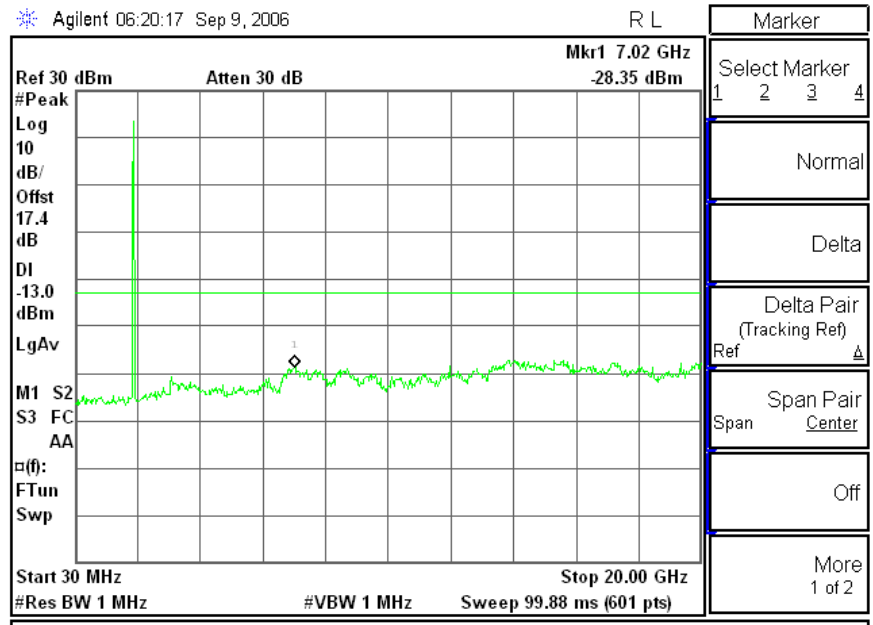


UMTS WCDMA REL 99, PCS Band

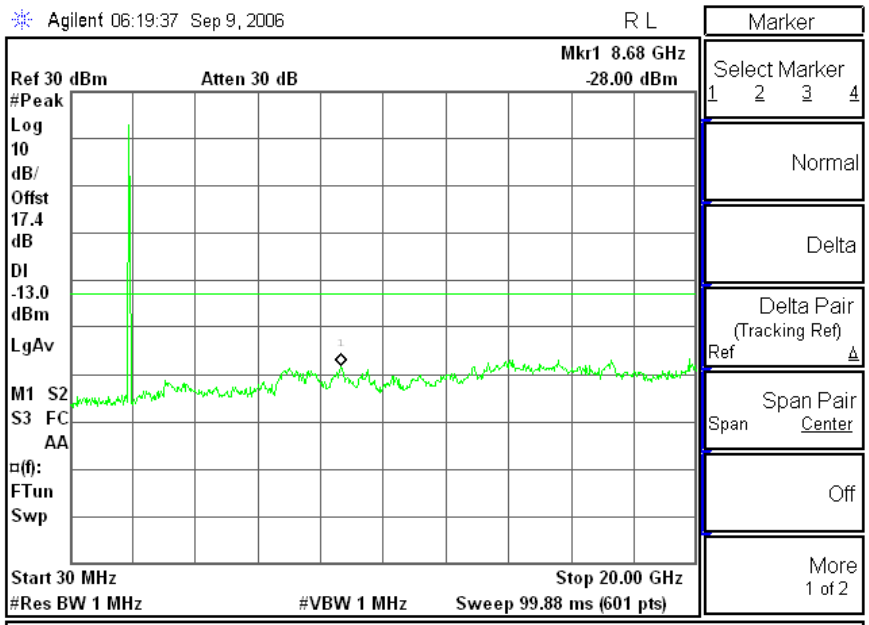
LOW CH



MID CH

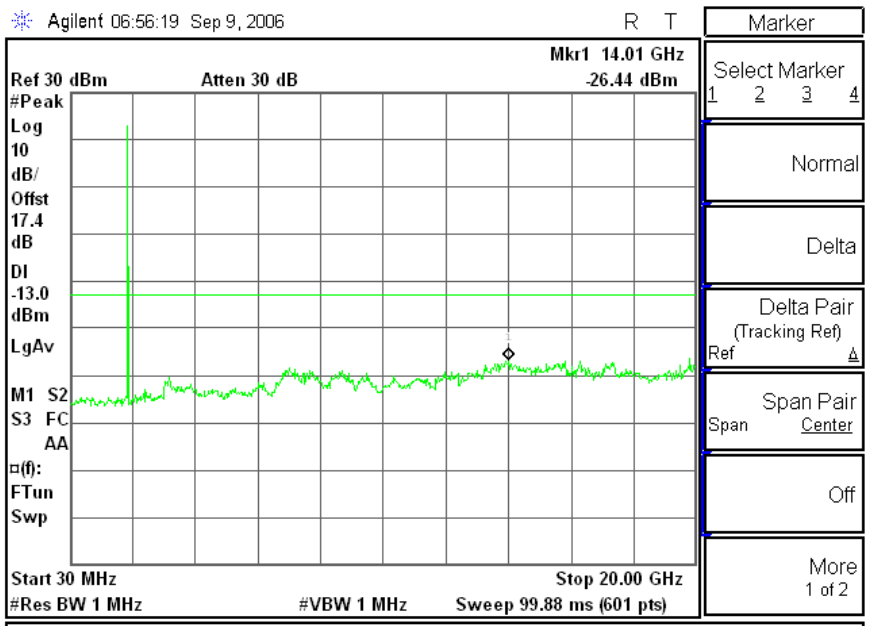


HIGH CH

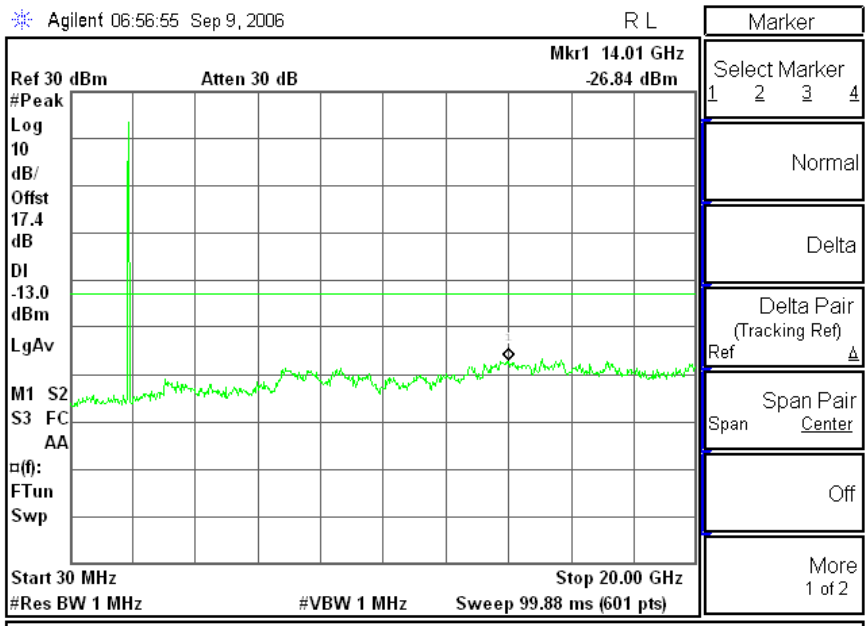


UMTS HSDPA Rel 6, PCS Band

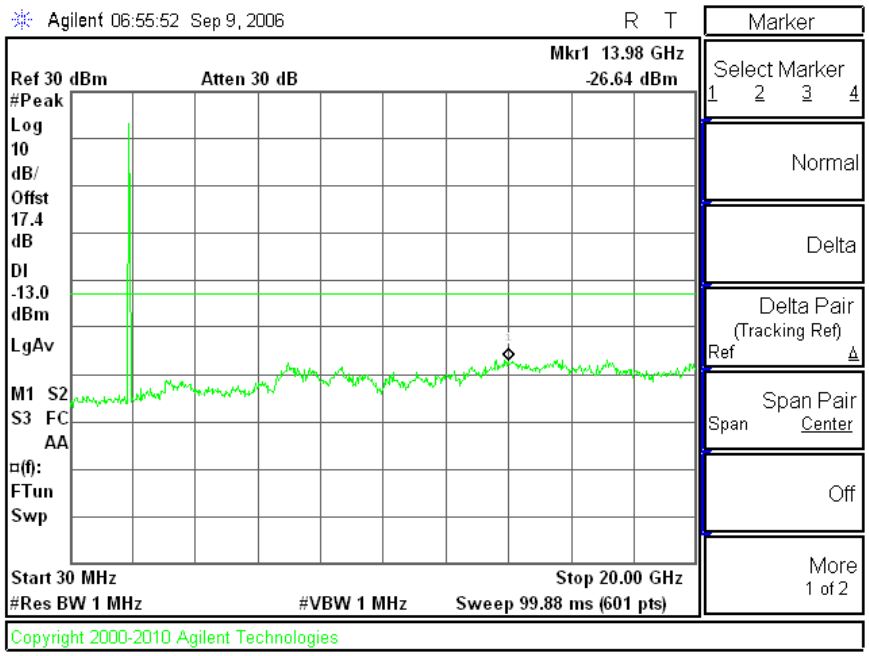
LOW CH



MID CH

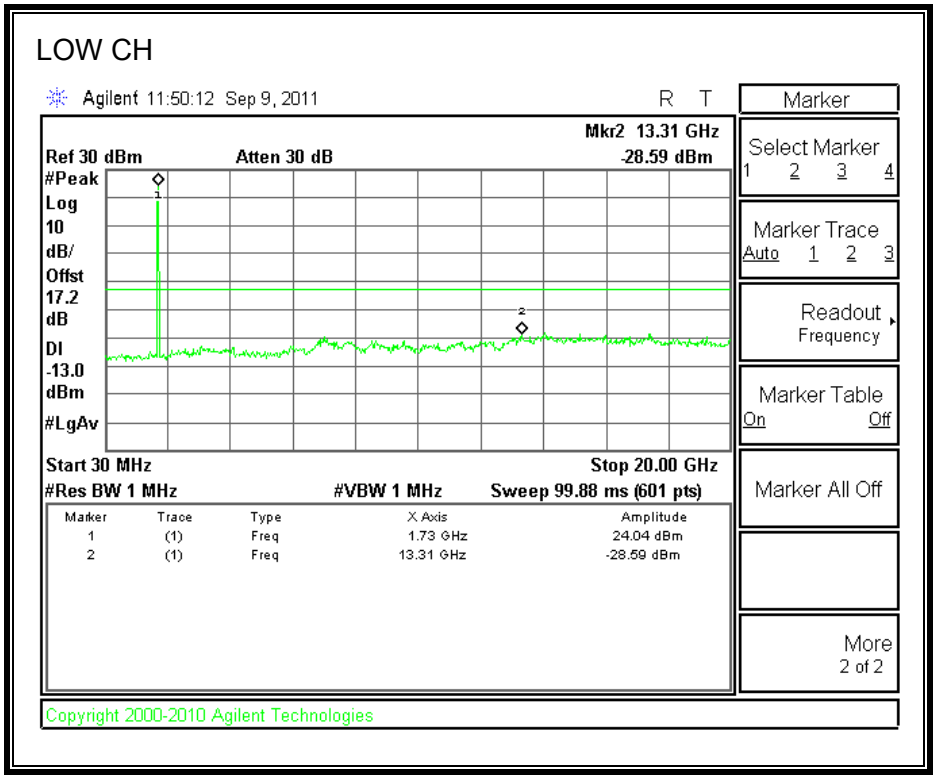


HIGH CH

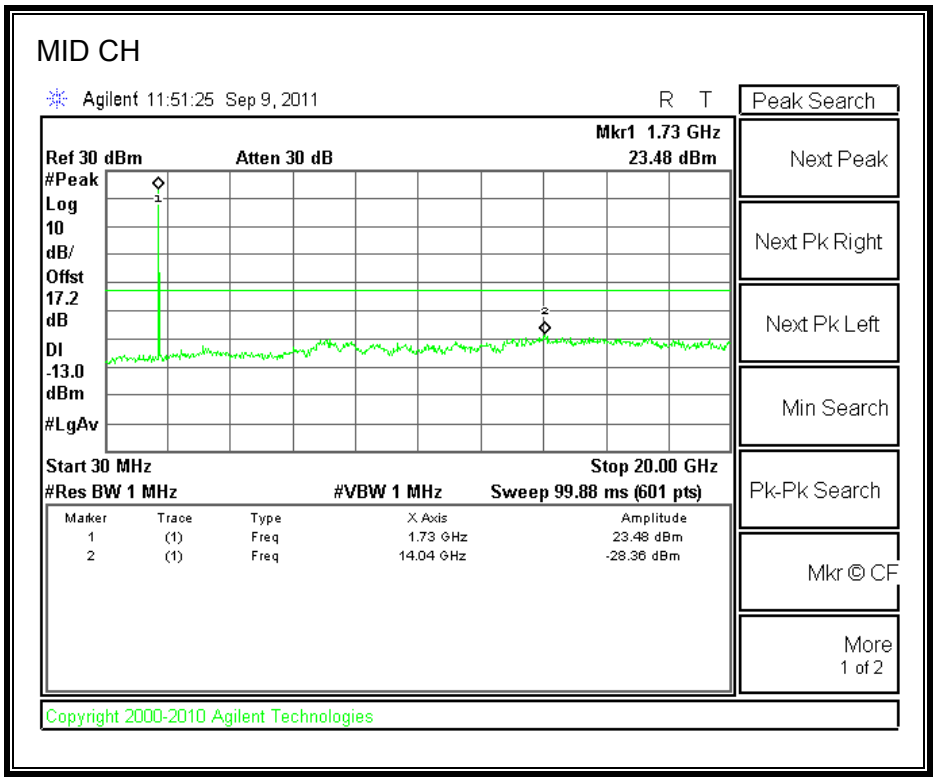


UMTS WCDMA REL 99, AWS Band

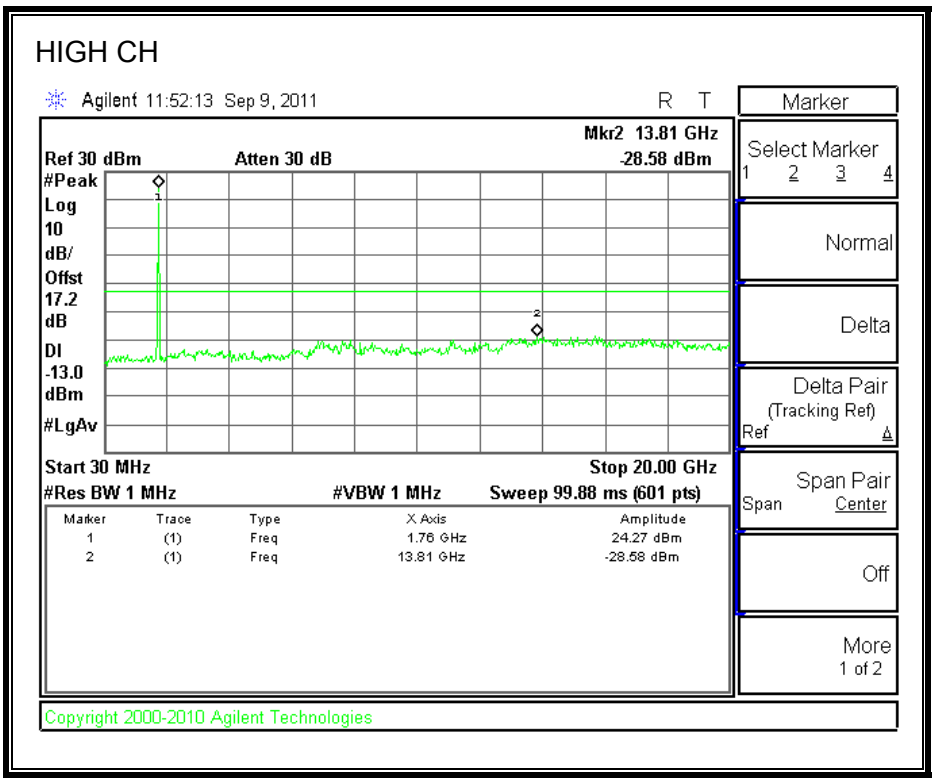
LOW CH



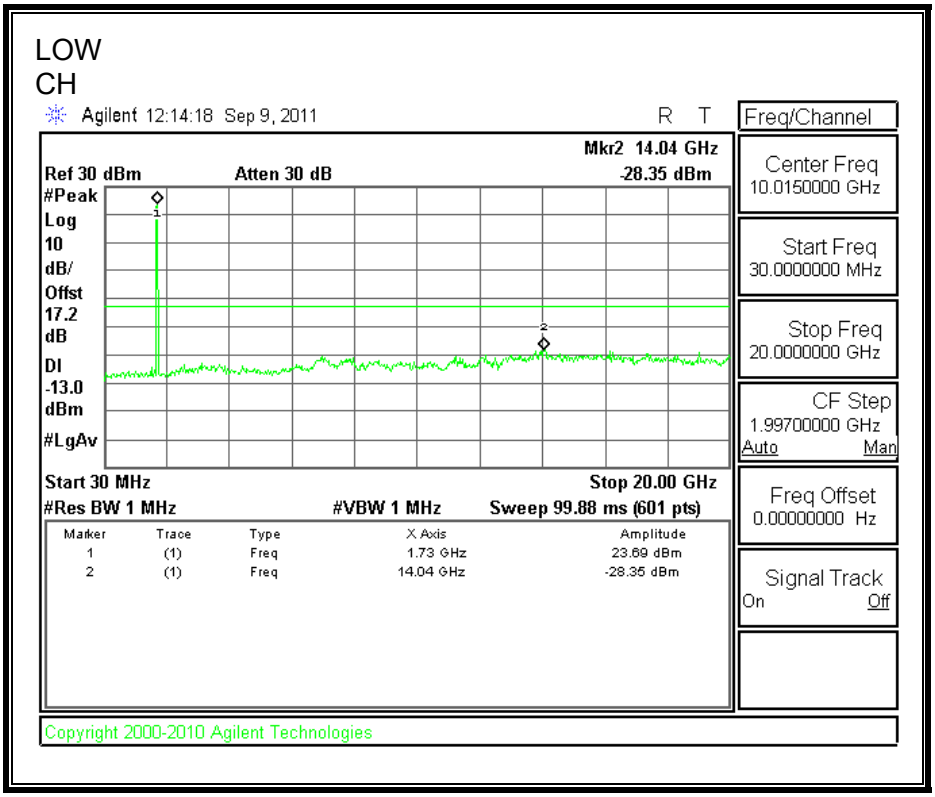
MID CH

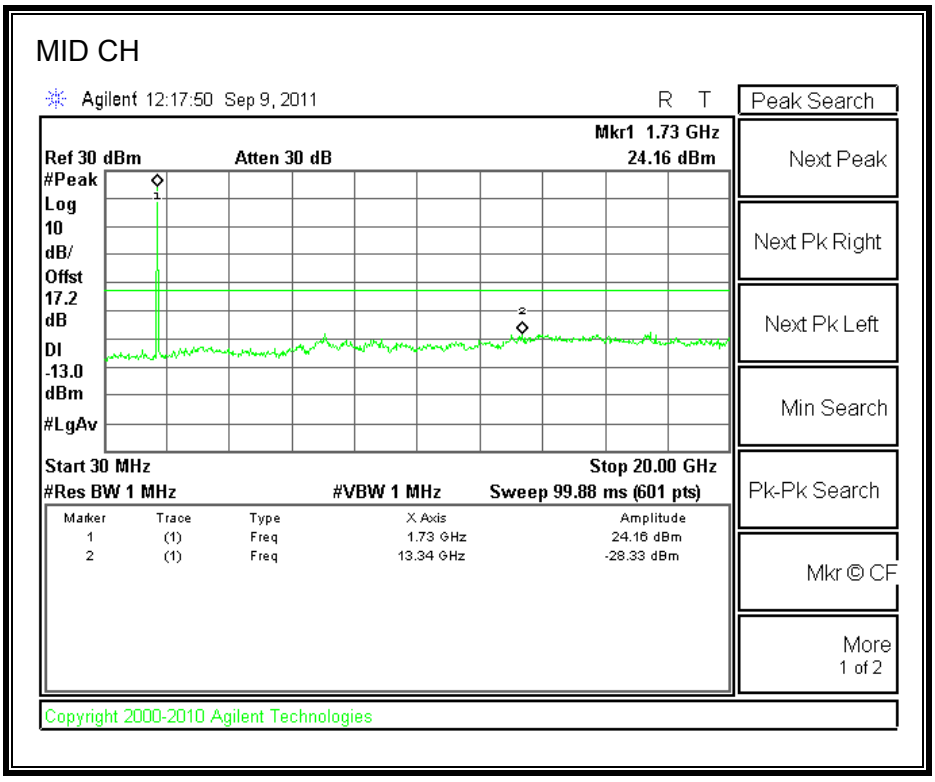


HIGH CH

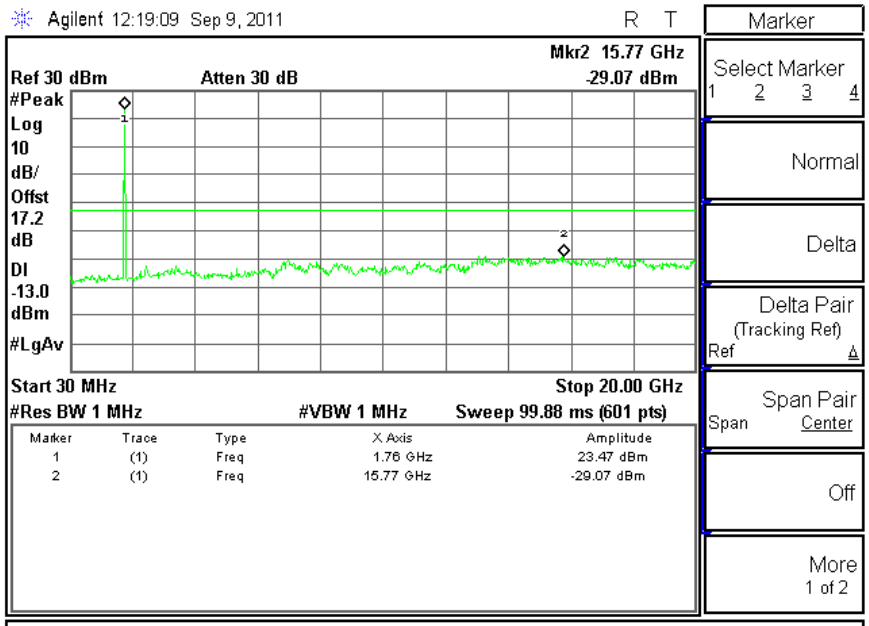


UMTS HSDPA Rel 6, AWS Band





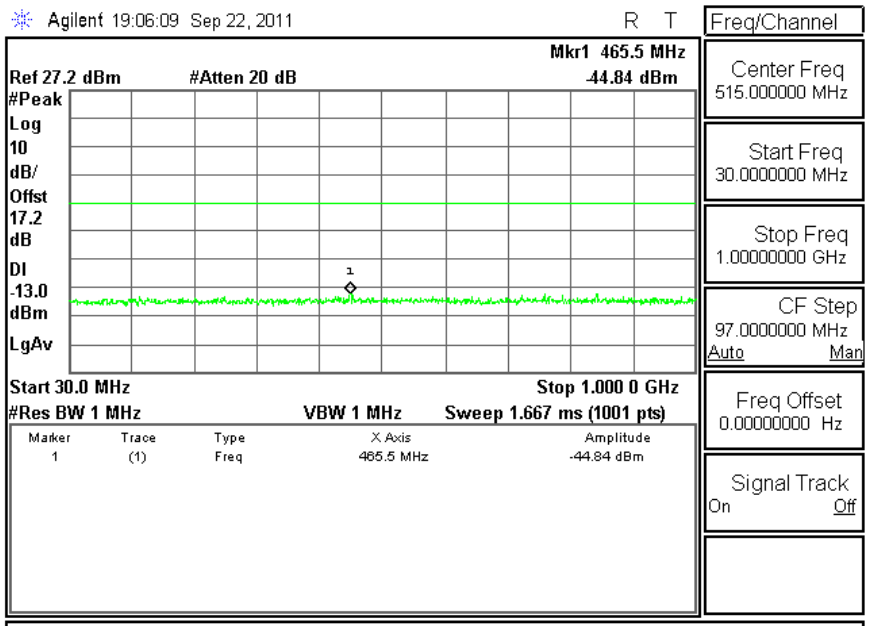
HIGH CH



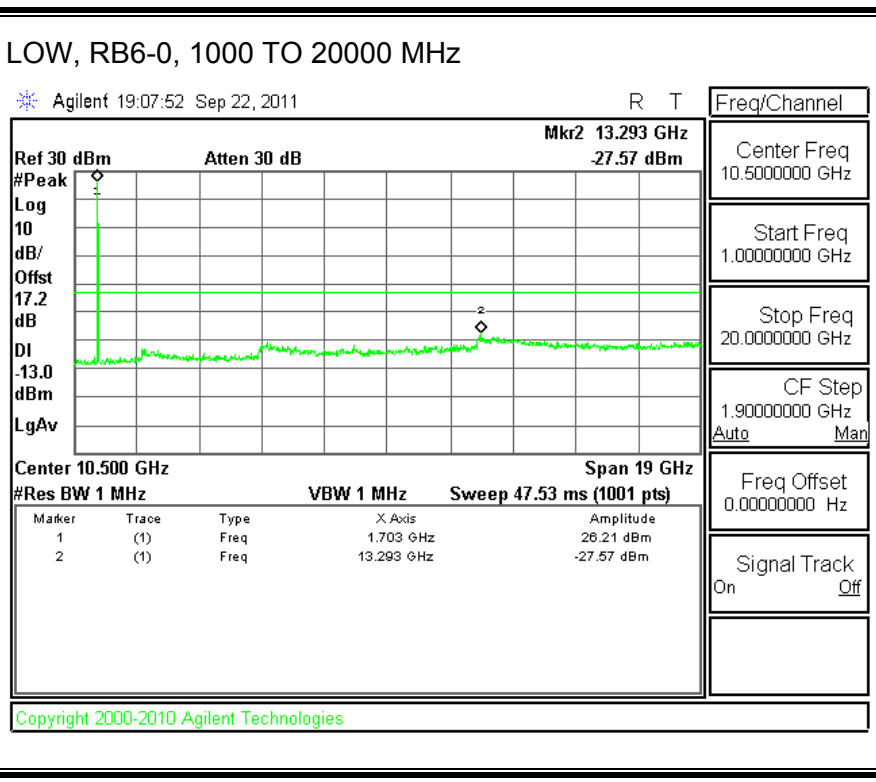
Band 4 (1.4MHz BAND WIDTH)

LTE QPSK

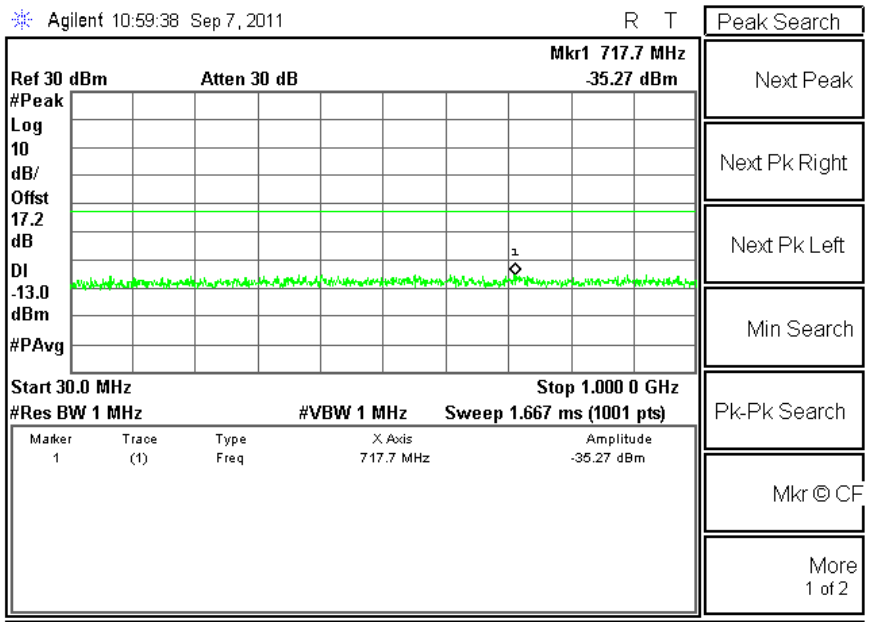
LOW, RB6-0, 30 TO 1000 MHz



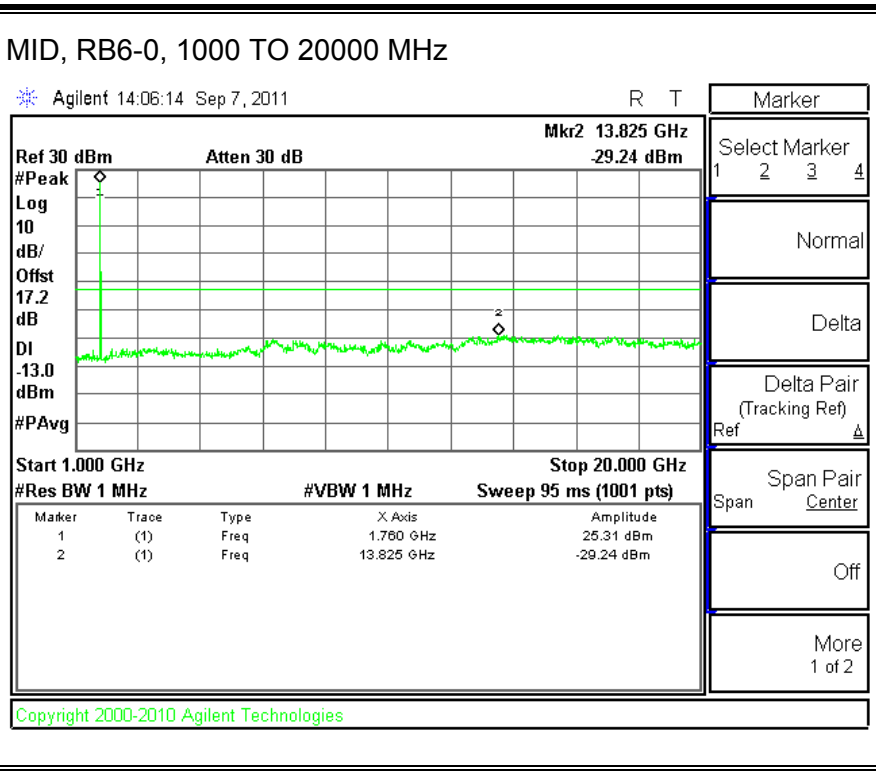
LOW, RB6-0, 1000 TO 20000 MHz



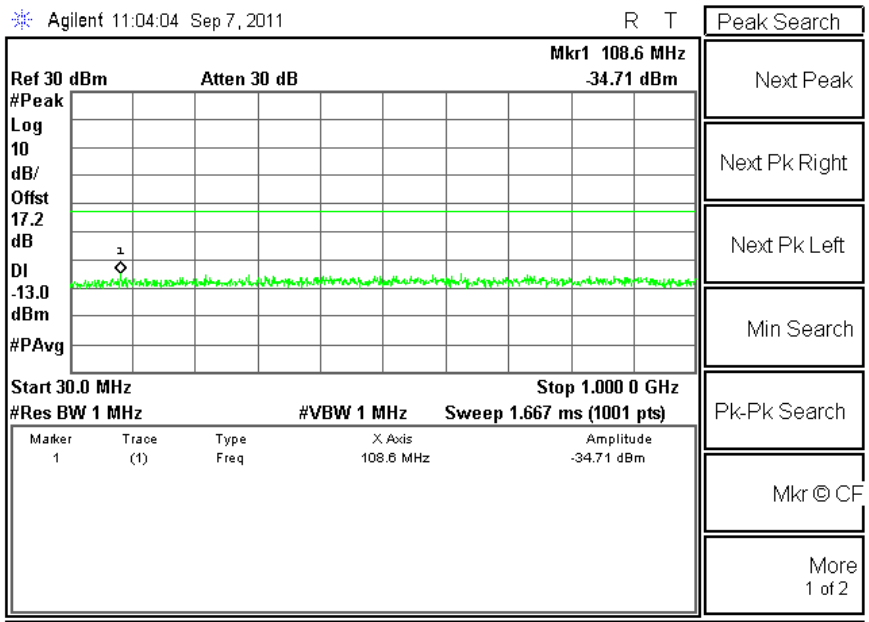
MID, RB6-0, 30 TO 1000 MHz



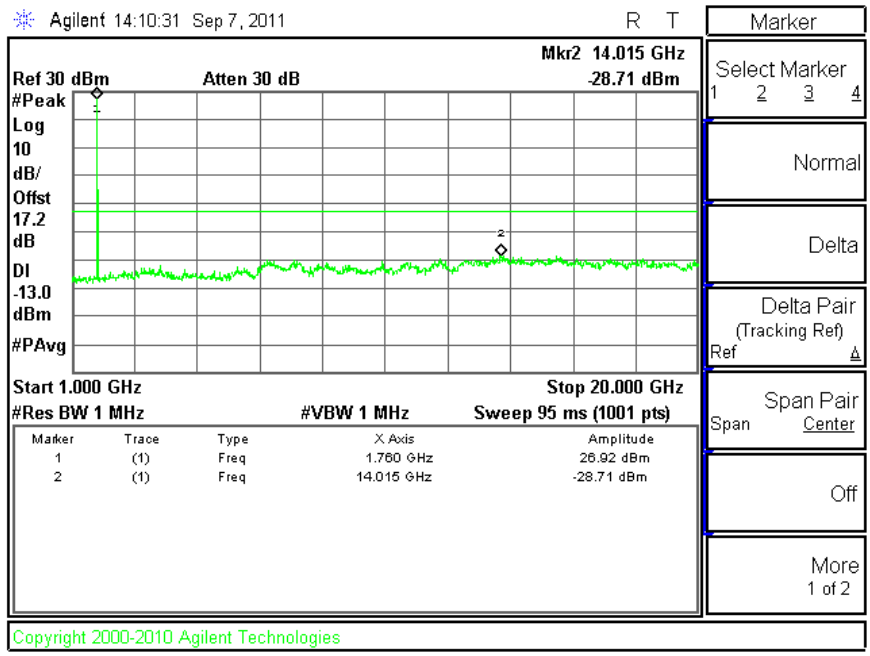
MID, RB6-0, 1000 TO 20000 MHz



HIGH, RB6-0, 30 TO 1000 MHz

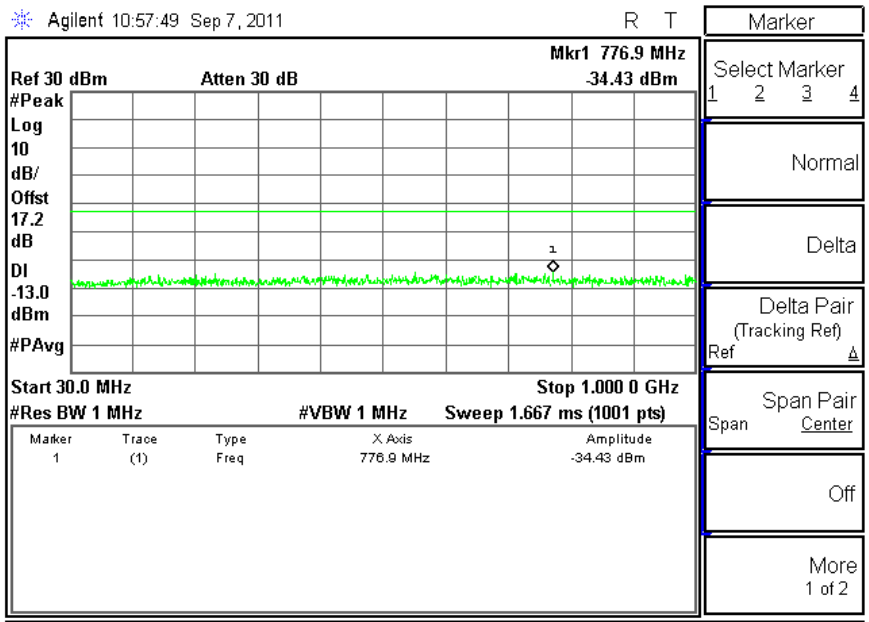


HIGH, RB6-0, 1000 TO 20000 MHz

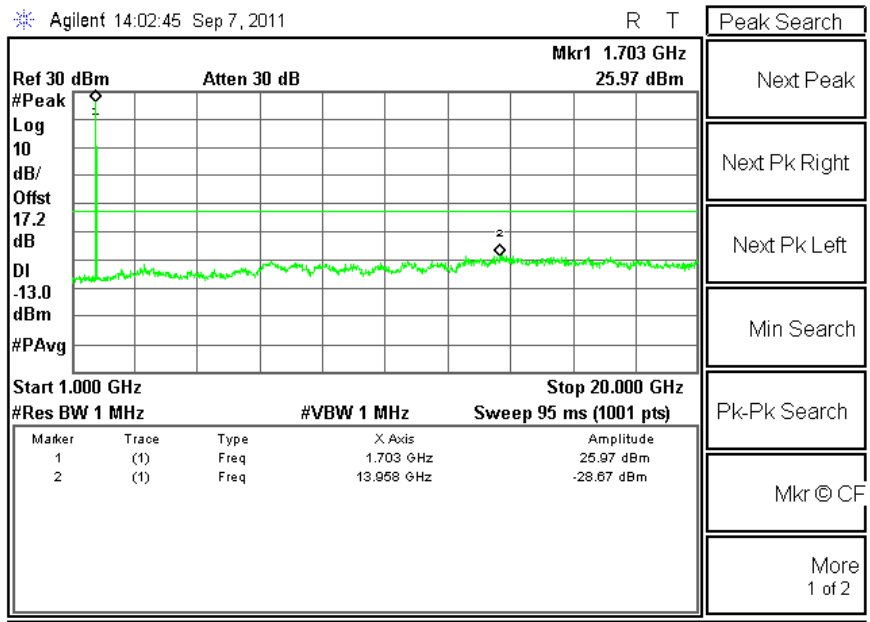


LTE 16QAM

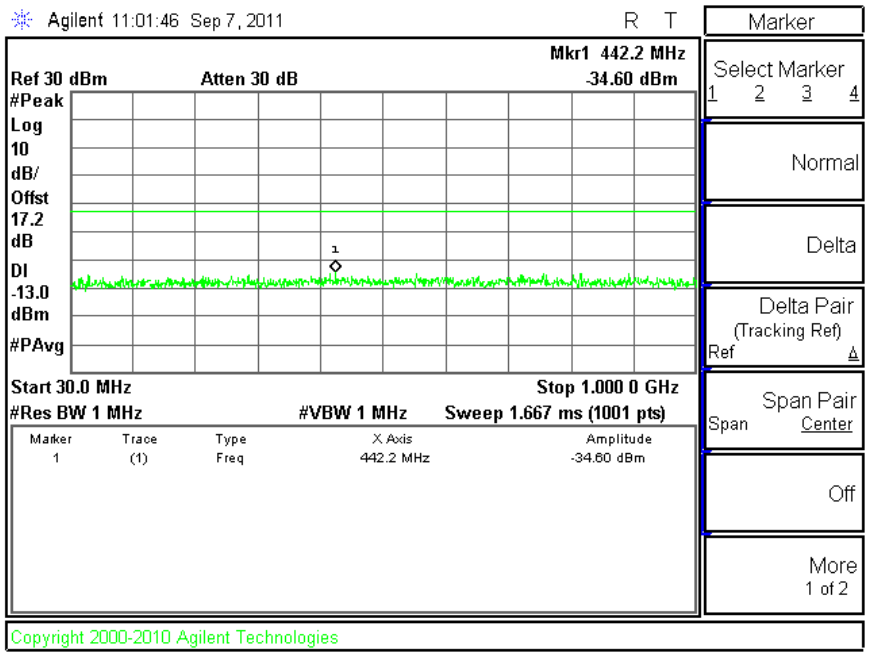
LOW, RB6-0, 30 TO 1000 MHz



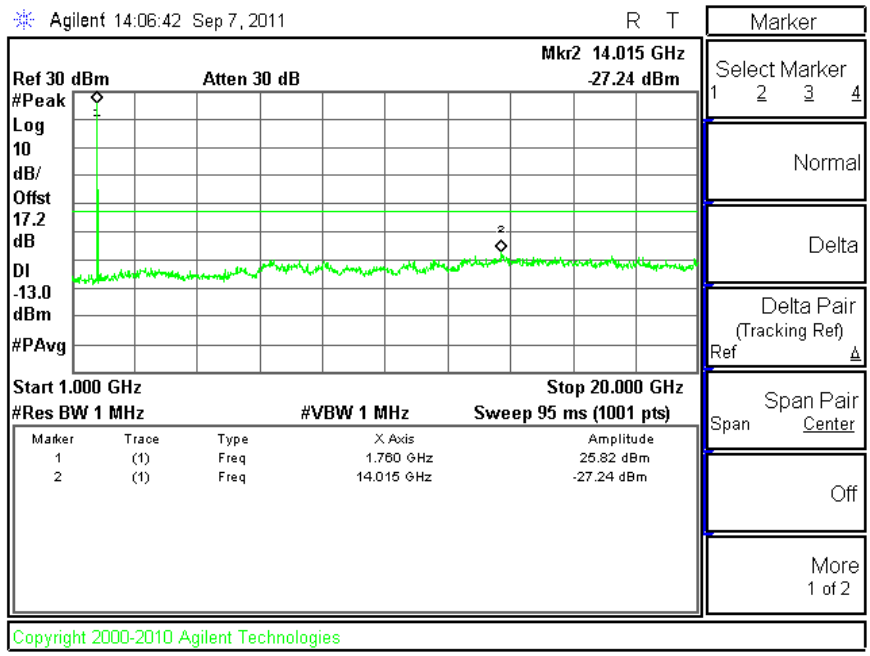
LOW, RB6-0, 1000 TO 20000 MHz



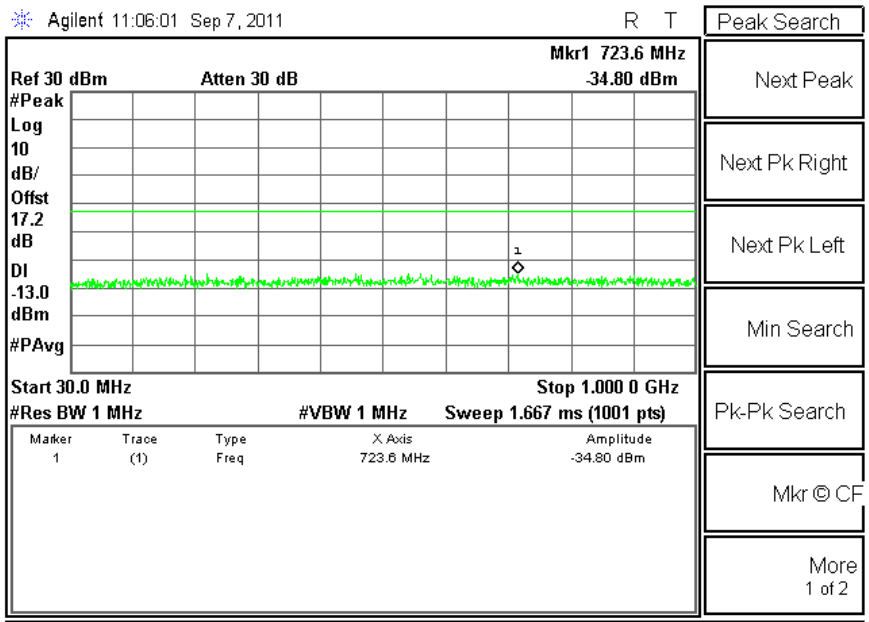
MID, RB6-0, 30 TO 1000 MHz



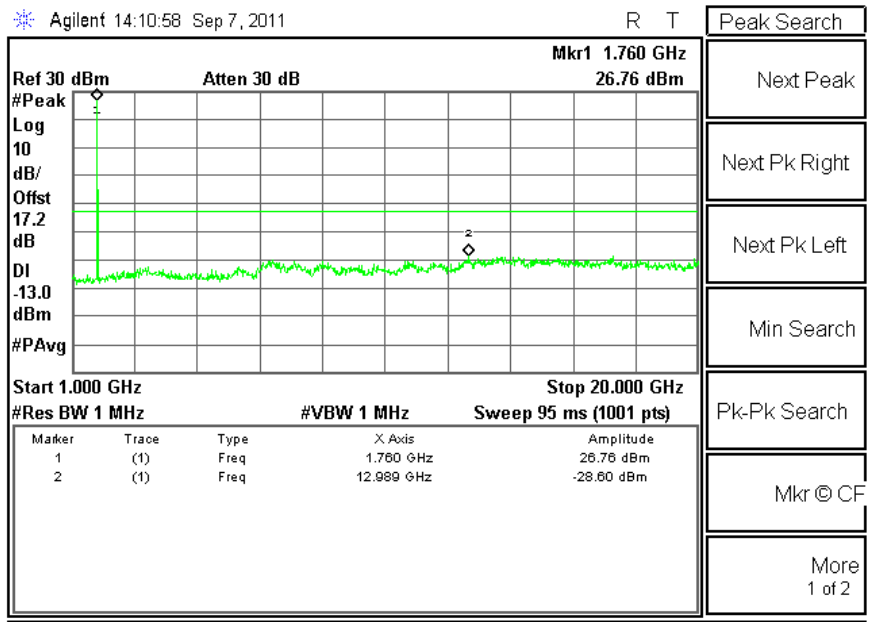
MID, RB6-0, 1000 TO 20000 MHz



HIGH, RB6-0, 30 TO 1000 MHz

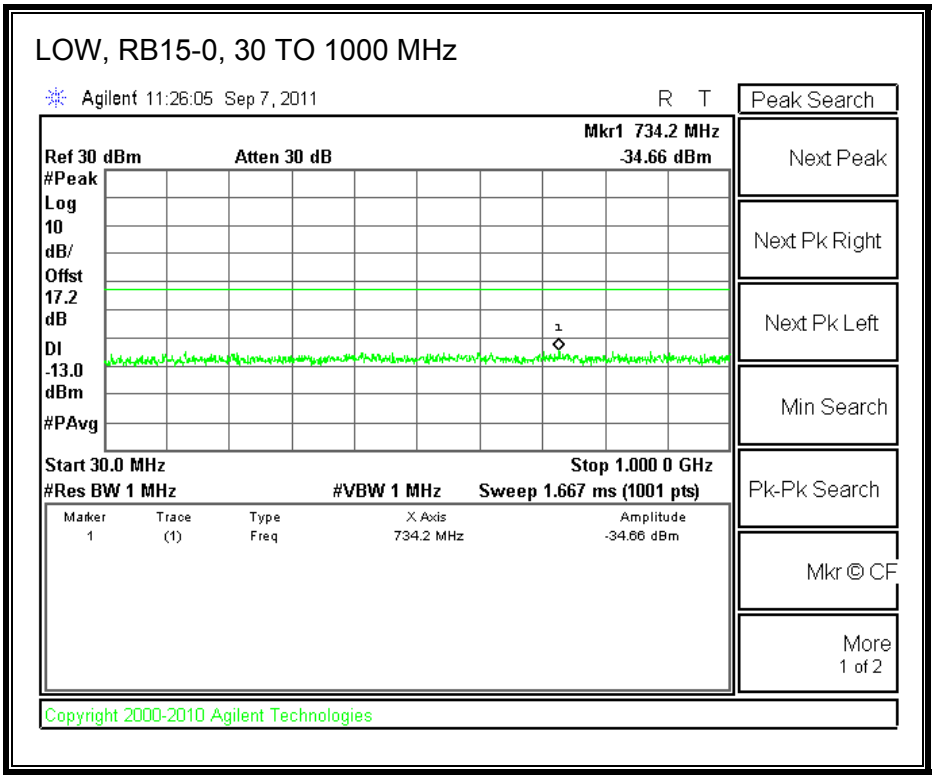


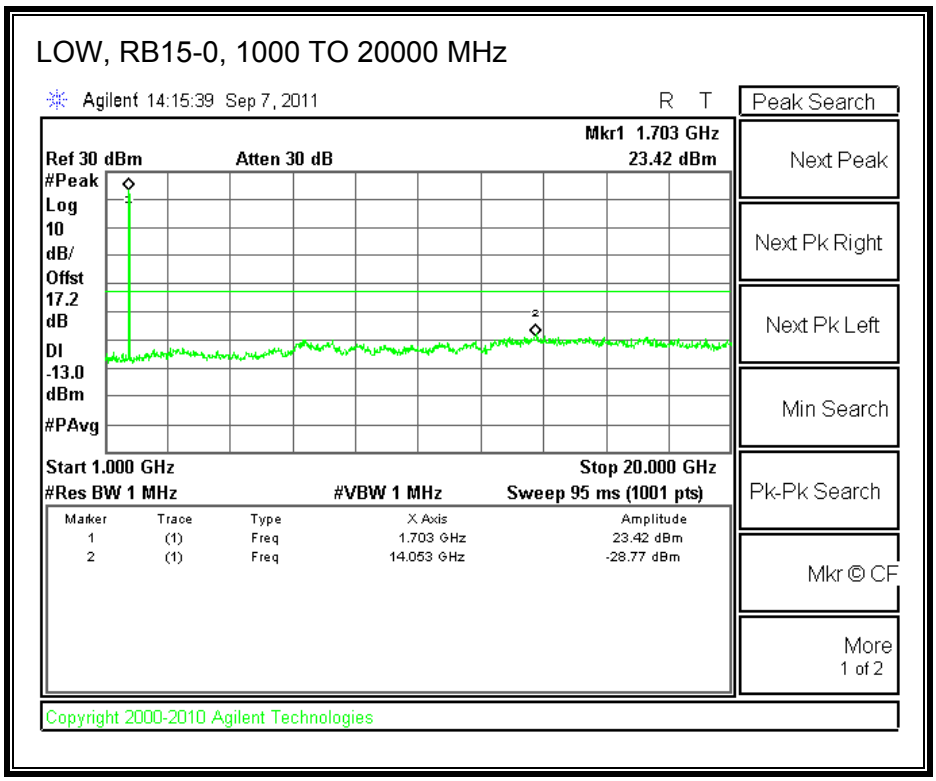
HIGH, RB6-0, 1000 TO 20000 MHz



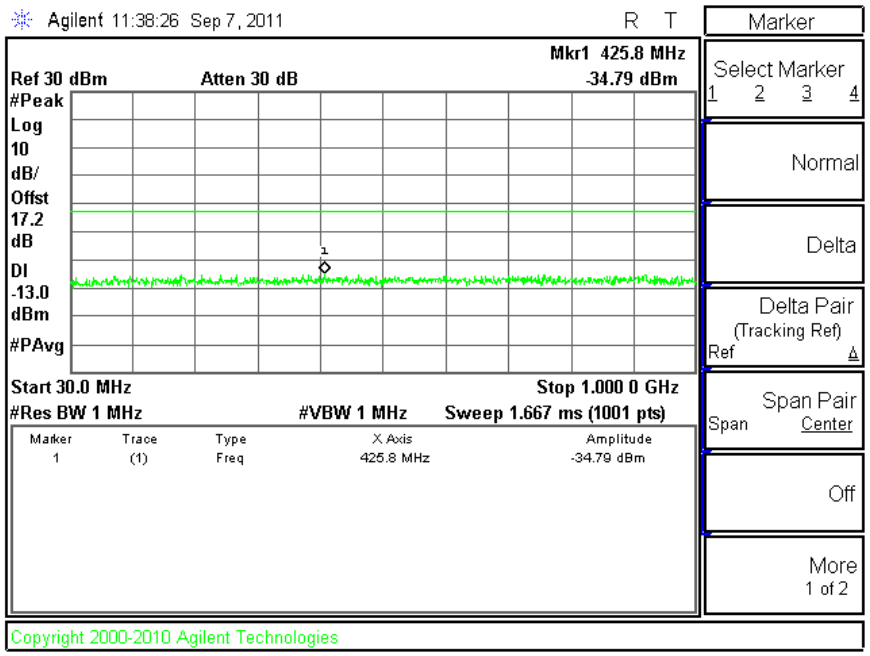
Band 4 (3.0 MHz BAND WIDTH)

LTE QPSK

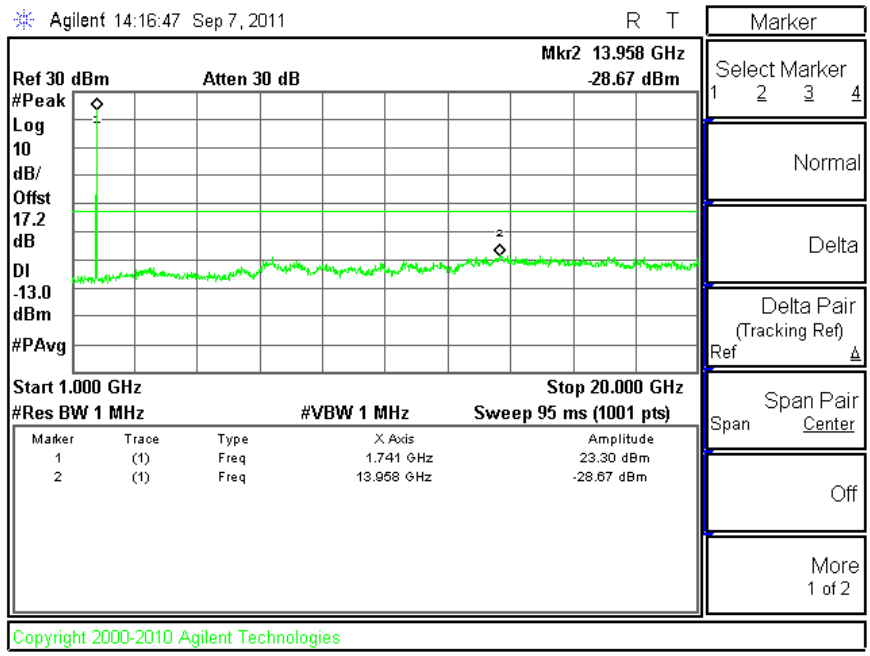




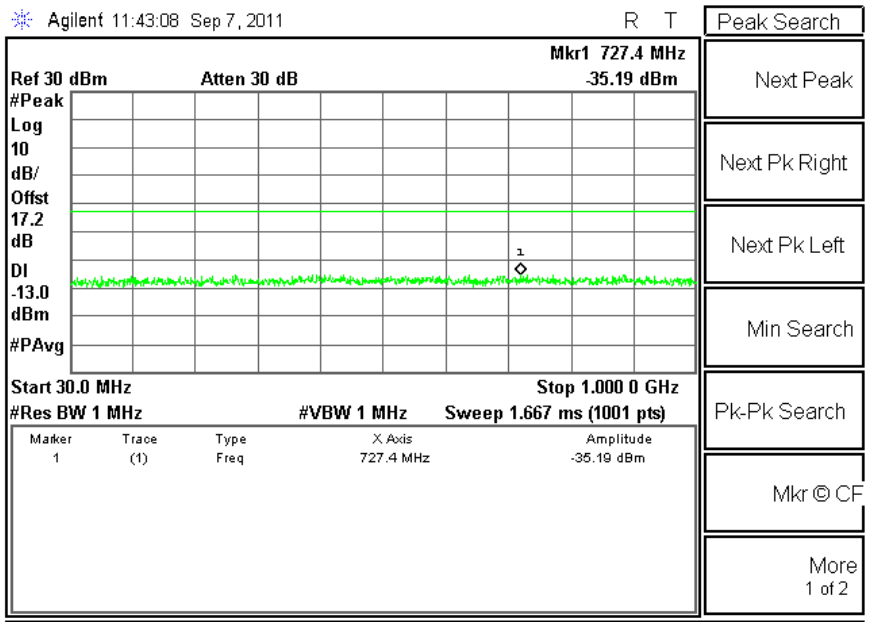
MID, RB15-0, 30 TO 1000 MHz



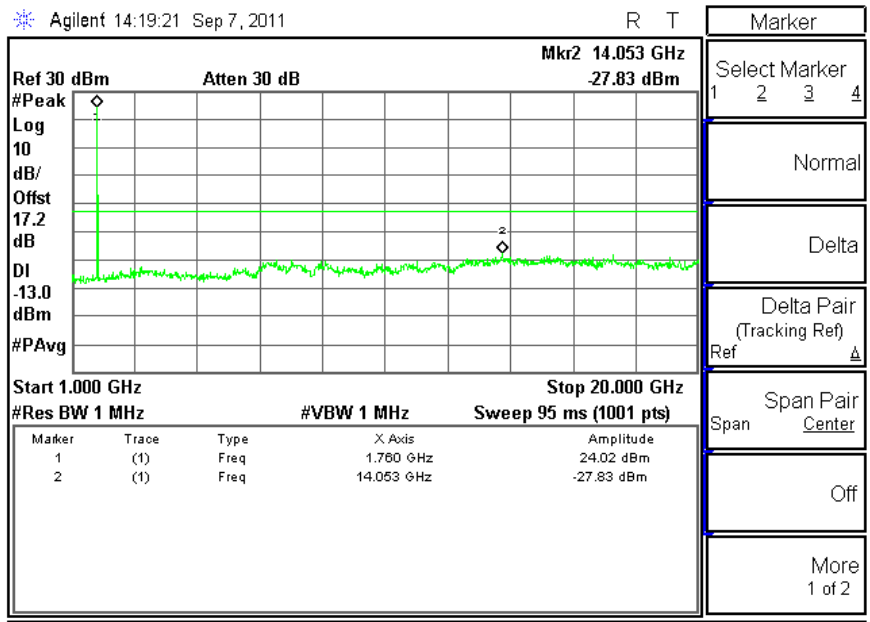
MID, RB15-0, 1000 TO 20000 MHz



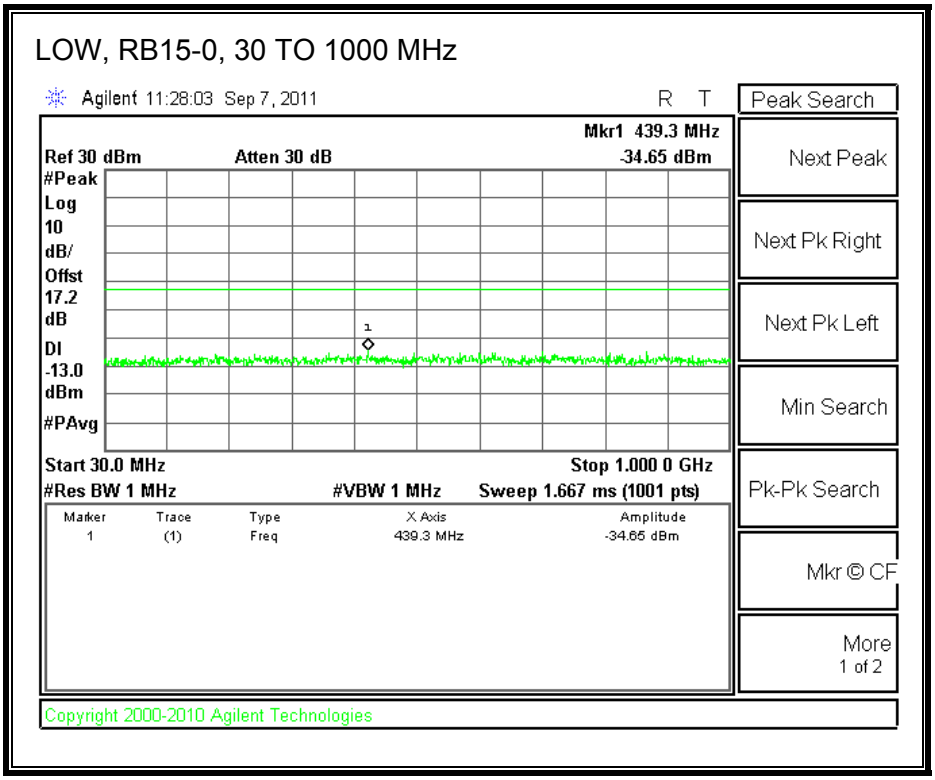
HIGH, RB15-0, 30 TO 1000 MHz

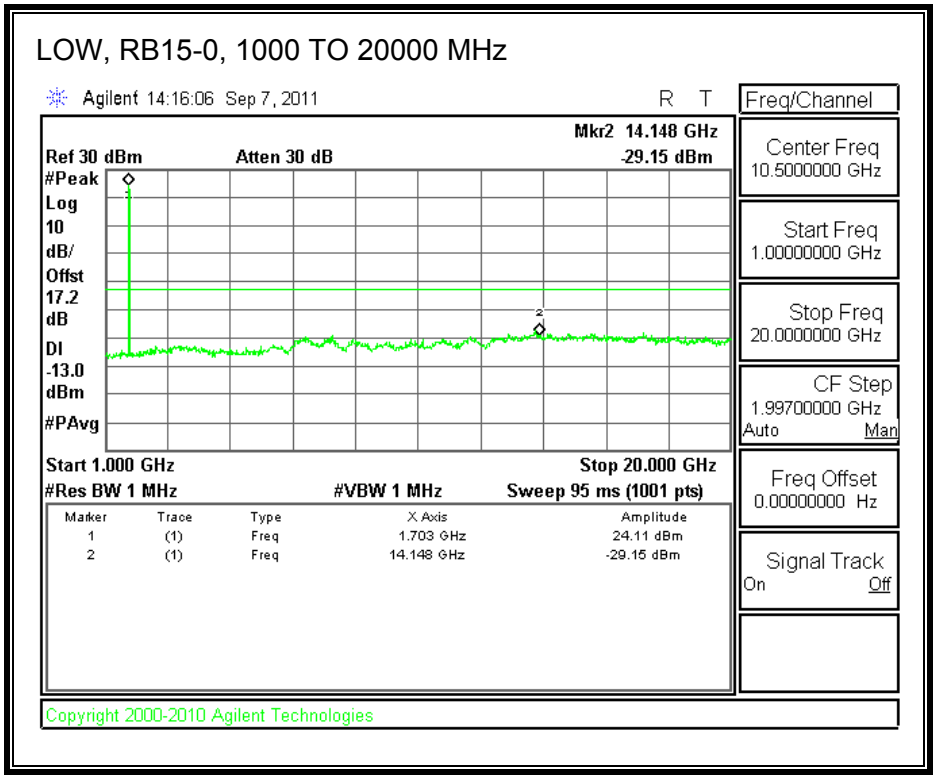


HIGH, RB15-0, 1000 TO 20000 MHz

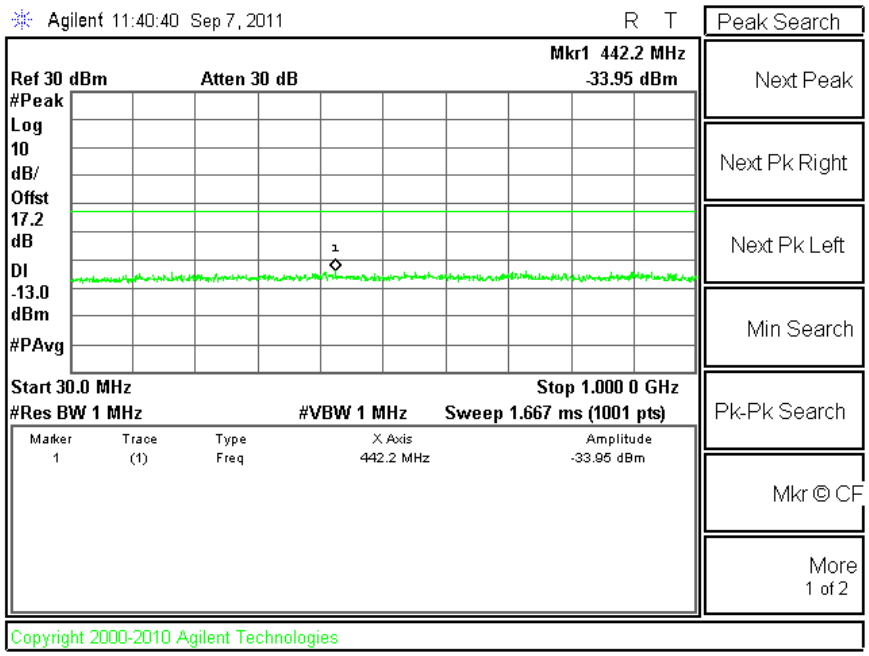


LTE 16QAM

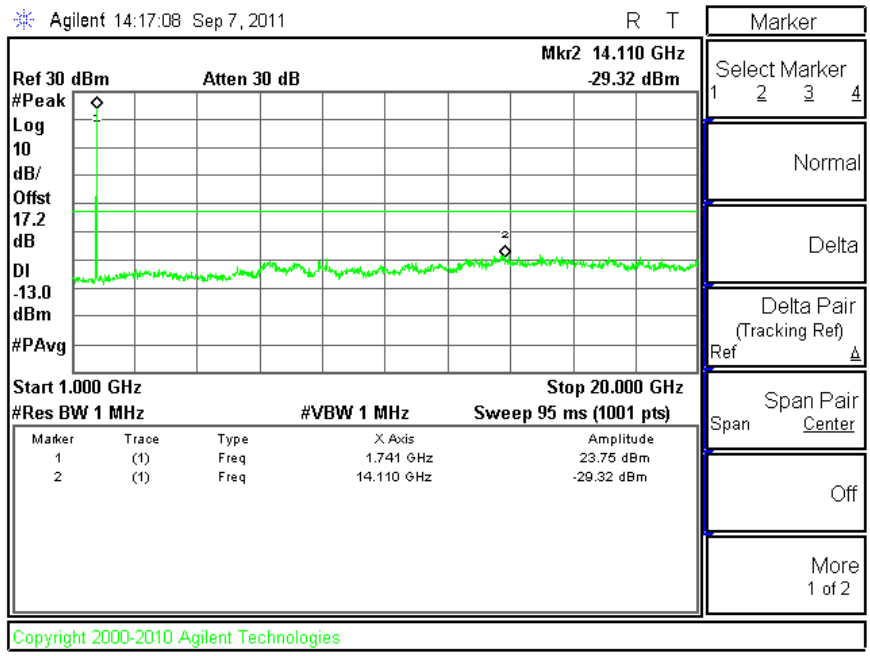




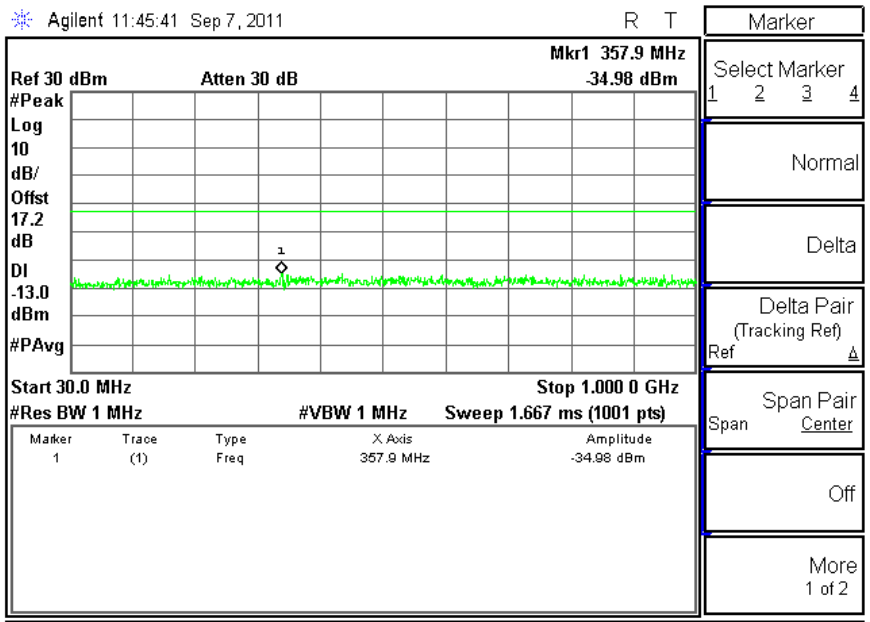
MID, RB15-0, 30 TO 1000 MHz



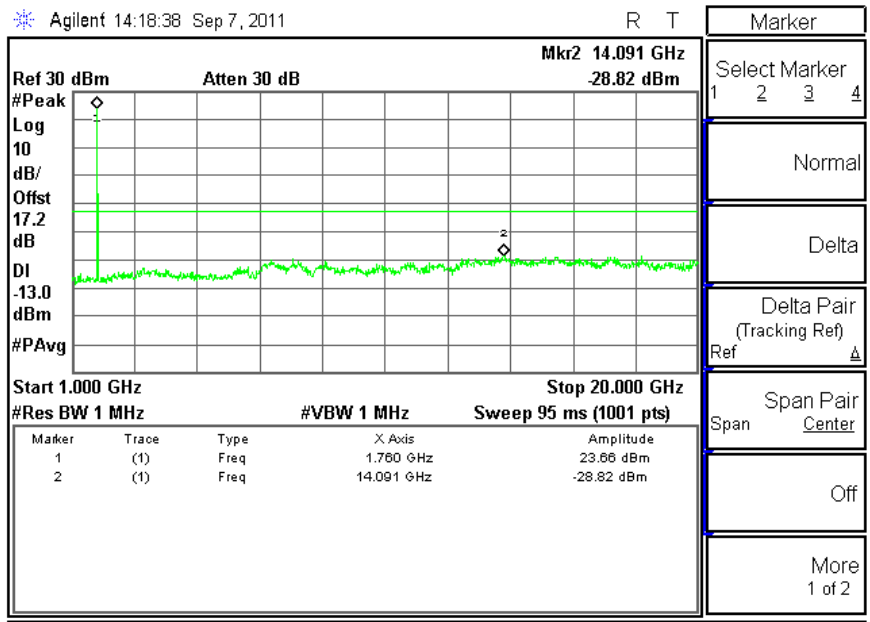
MID, RB15-0, 1000 TO 20000 MHz



HIGH, RB15-0, 30 TO 1000 MHz

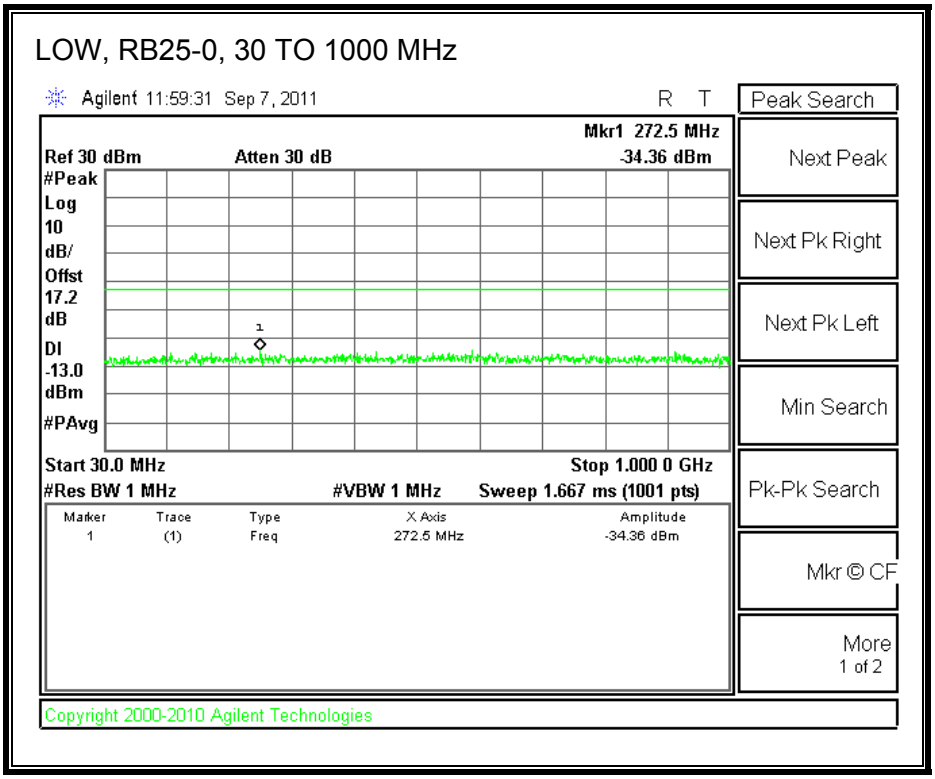


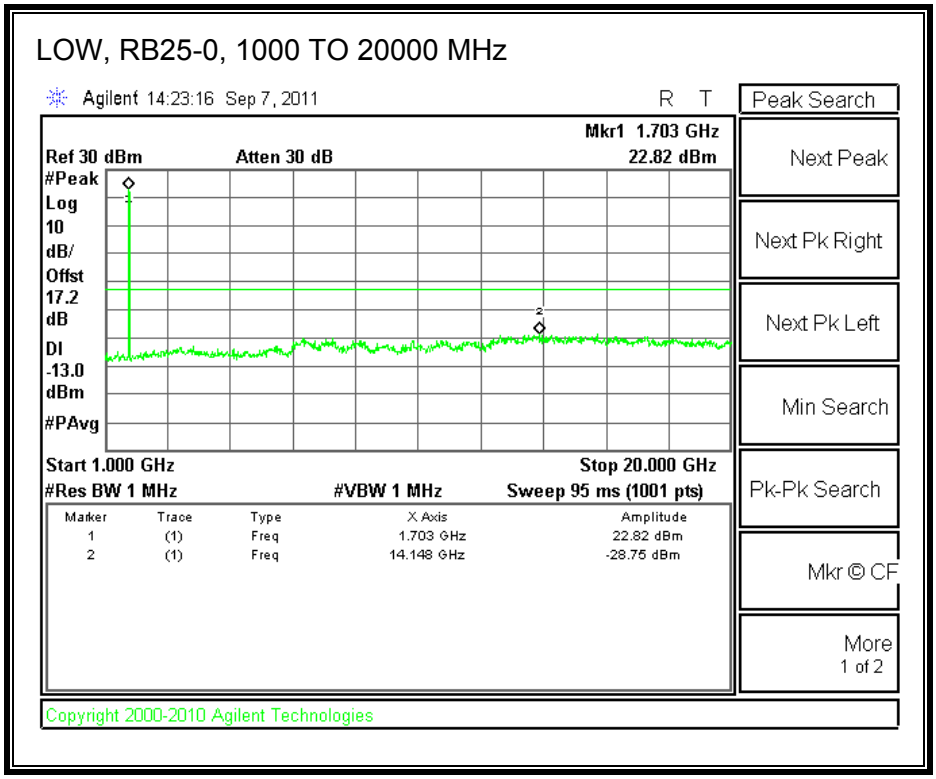
HIGH, RB15-0, 1000 TO 200000 MHz



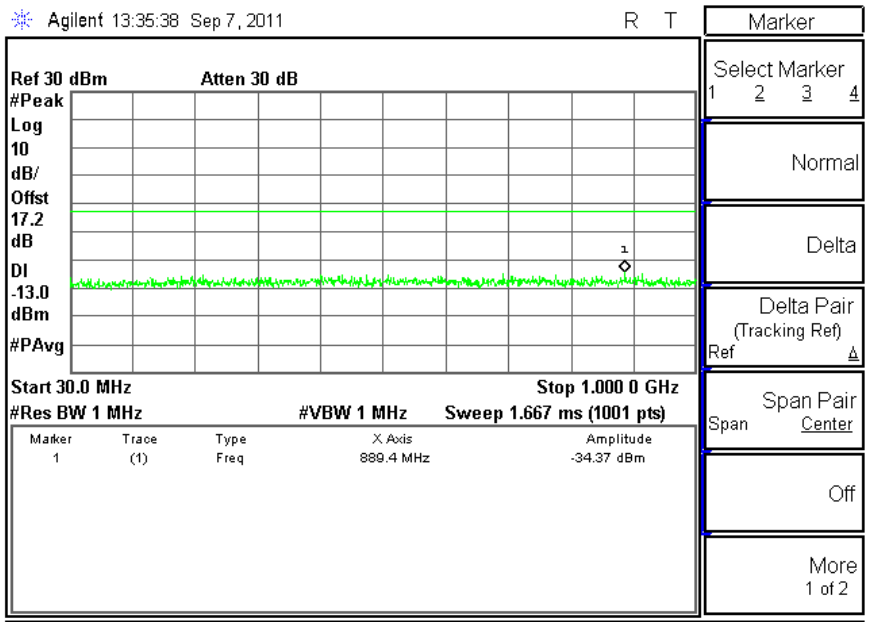
Band 4 (5.0 MHz BAND WIDTH)

LTE QPSK

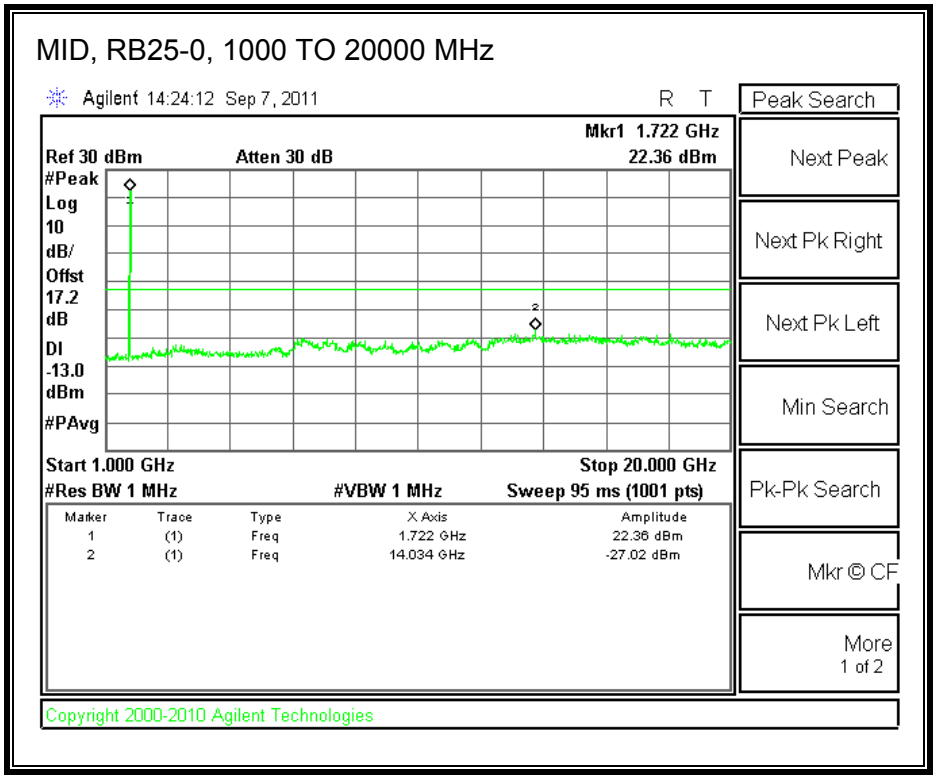




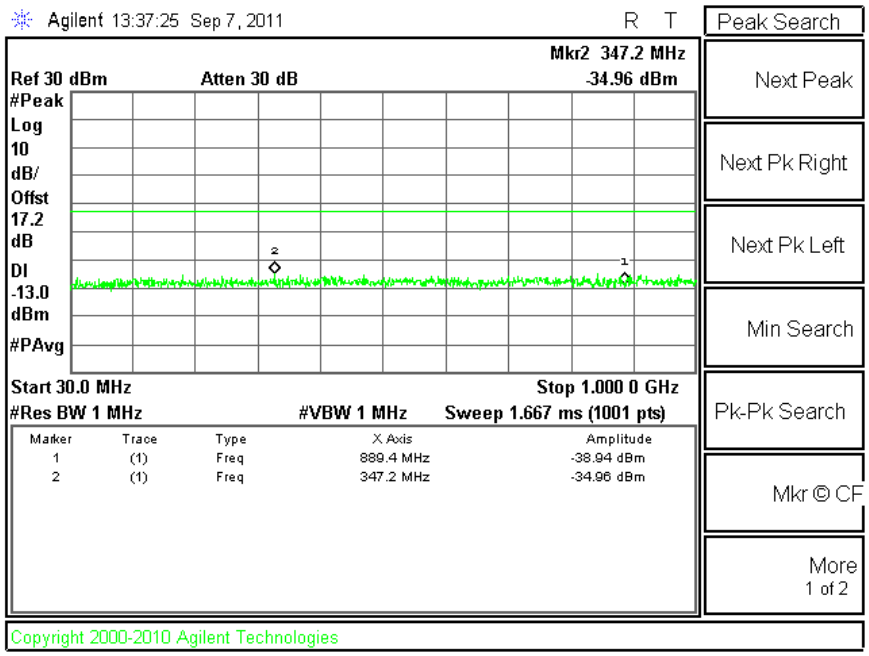
MID, RB25-0, 30 TO 1000 MHz



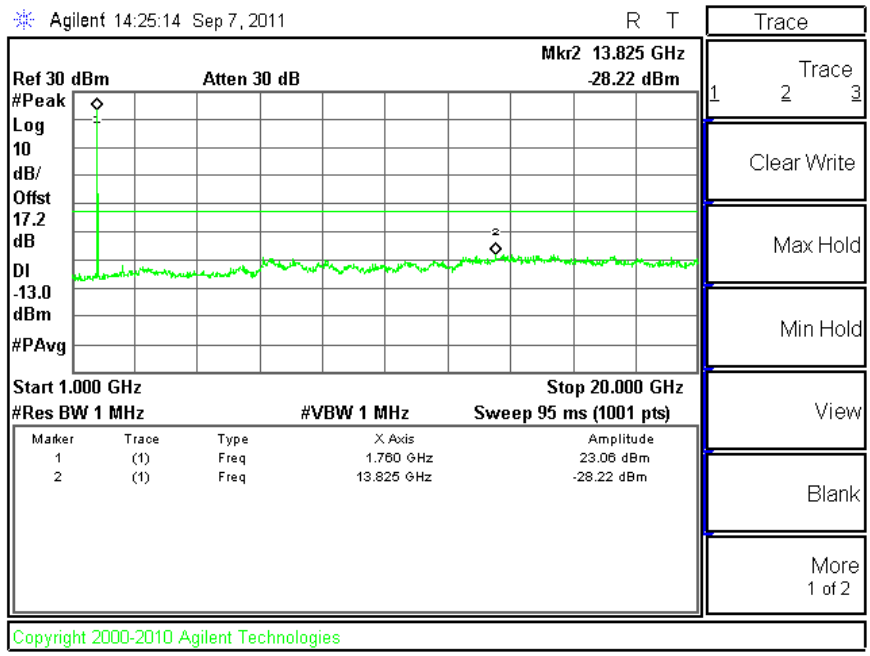
MID, RB25-0, 1000 TO 20000 MHz



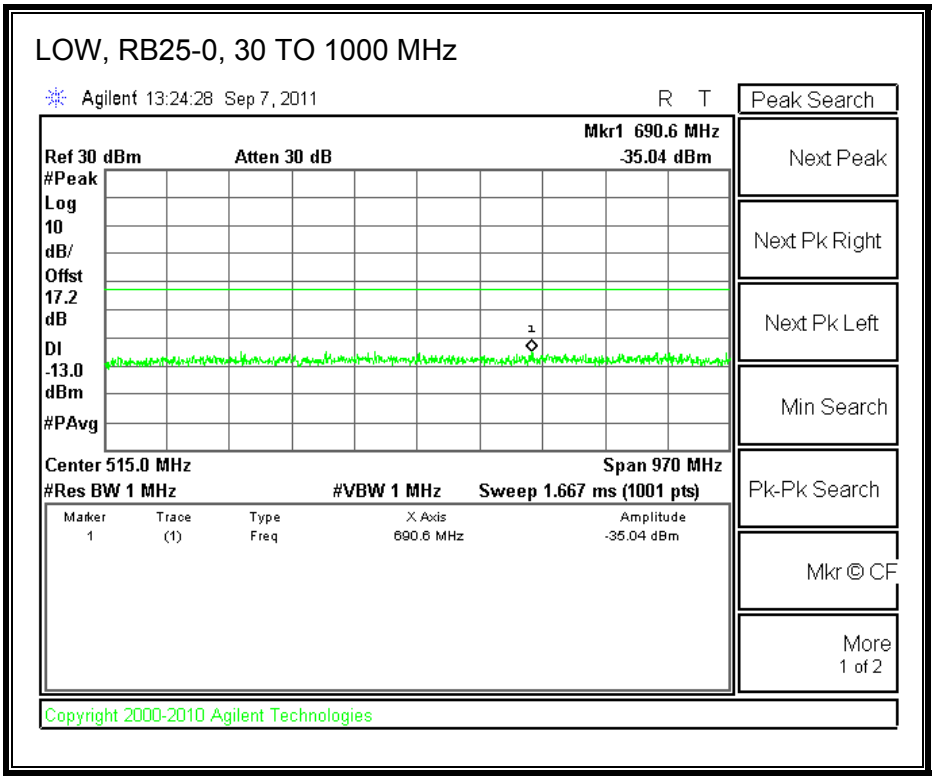
HIGH, RB25-0, 30 TO 1000 MHz

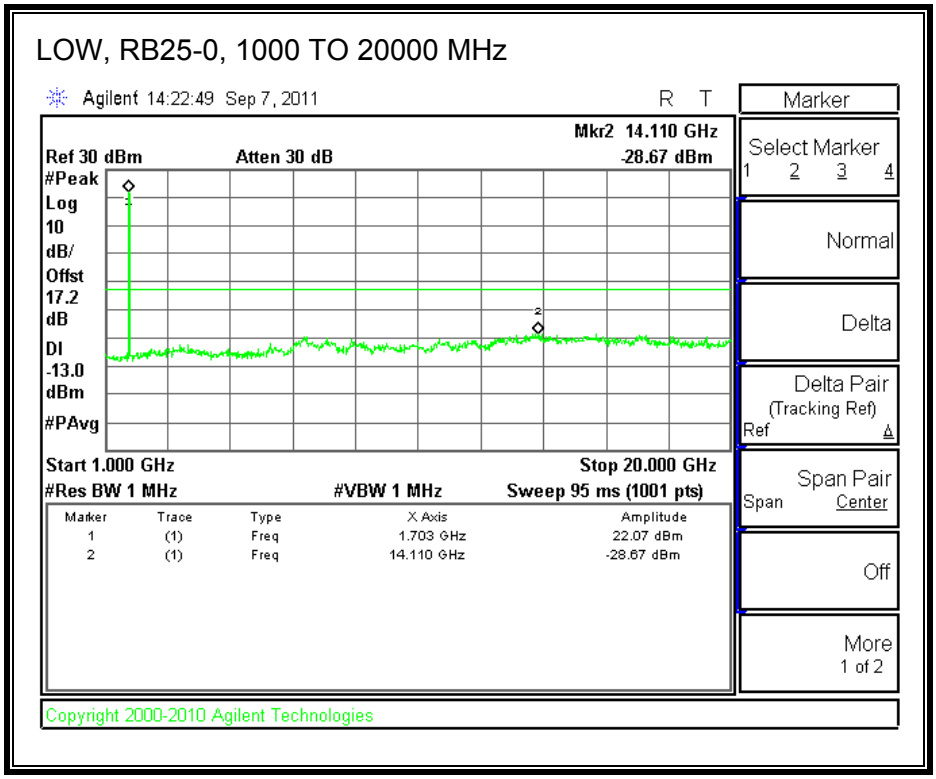


HIGH, RB25-0, 1000 TO 20000 MHz

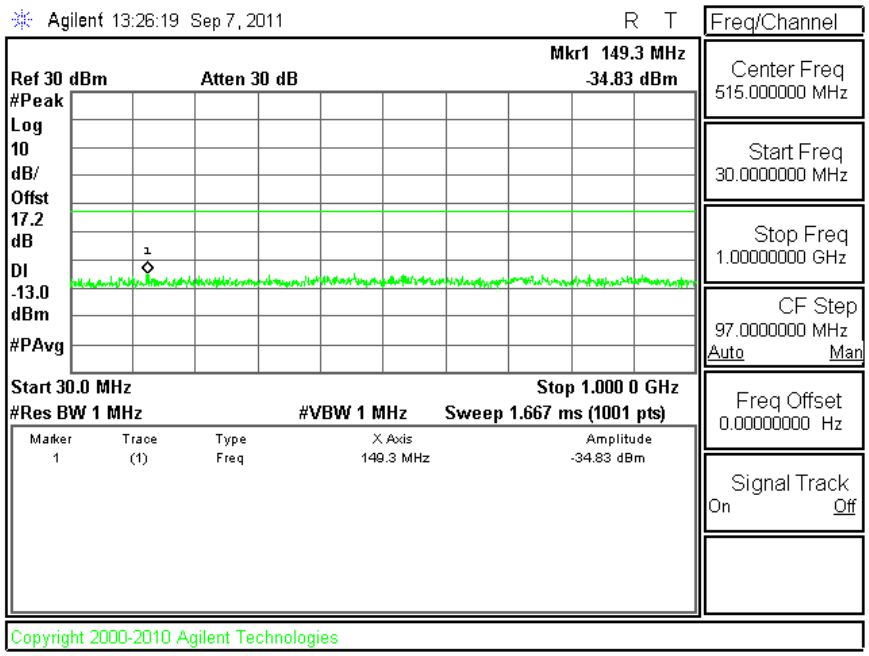


LTE 16QAM

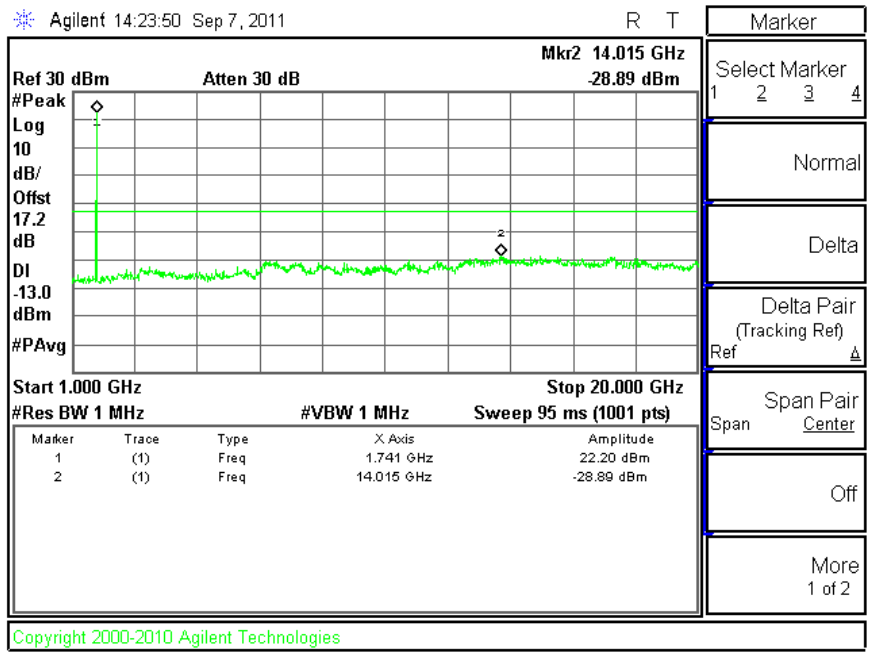




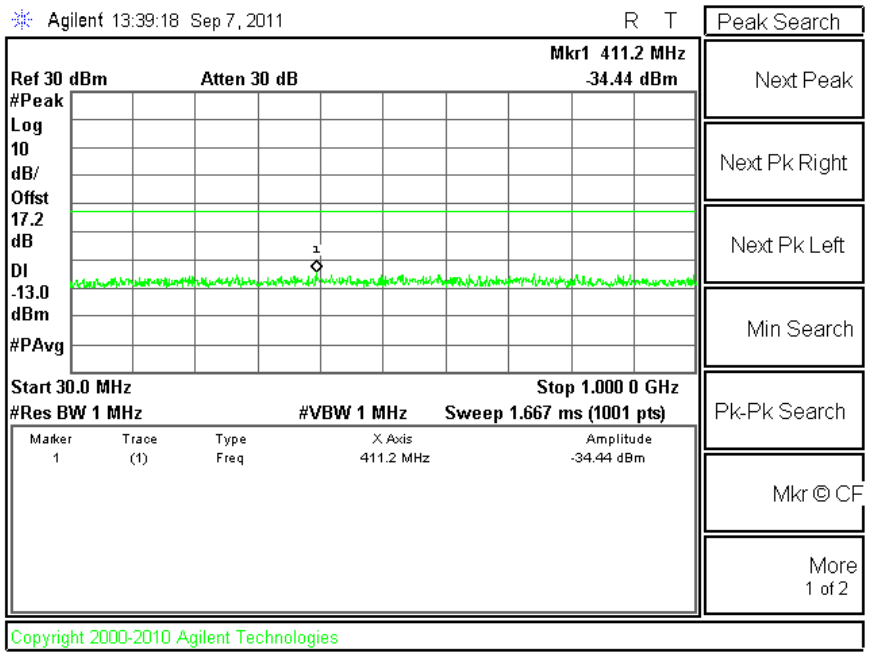
MID, RB25-0, 30 TO 1000 MHz



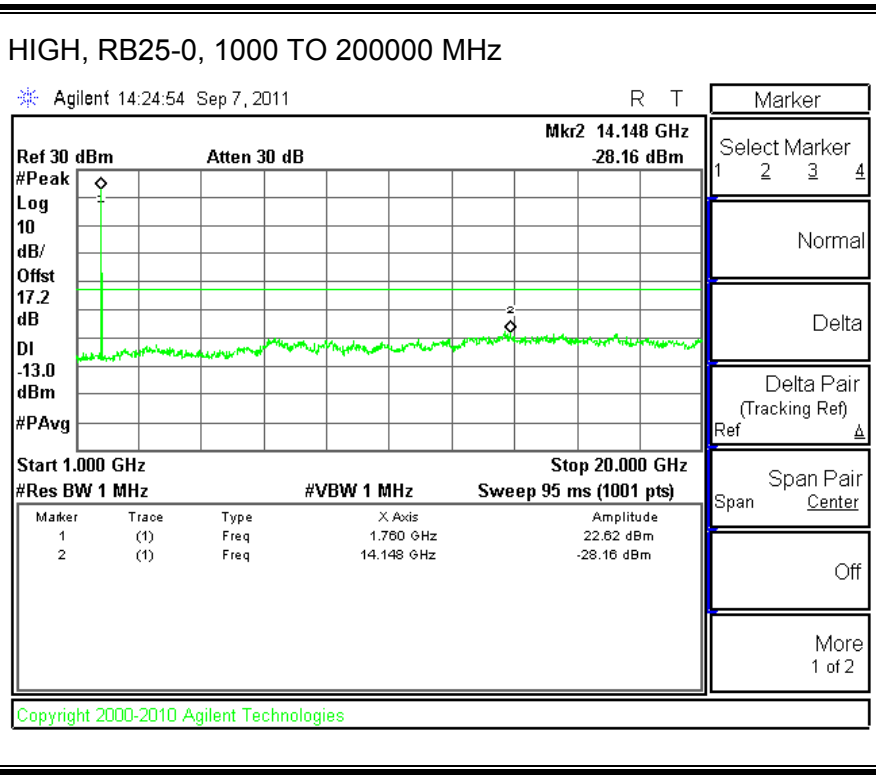
MID, RB25-0, 1000 TO 20000 MHz



HIGH, RB25-0, 30 TO 1000 MHz

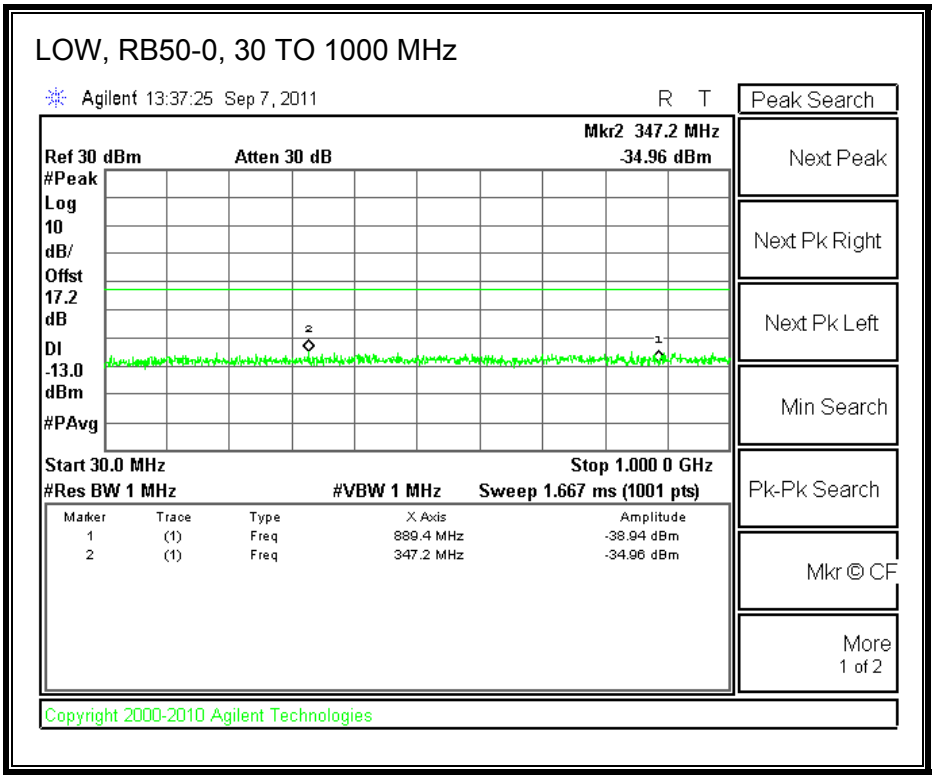


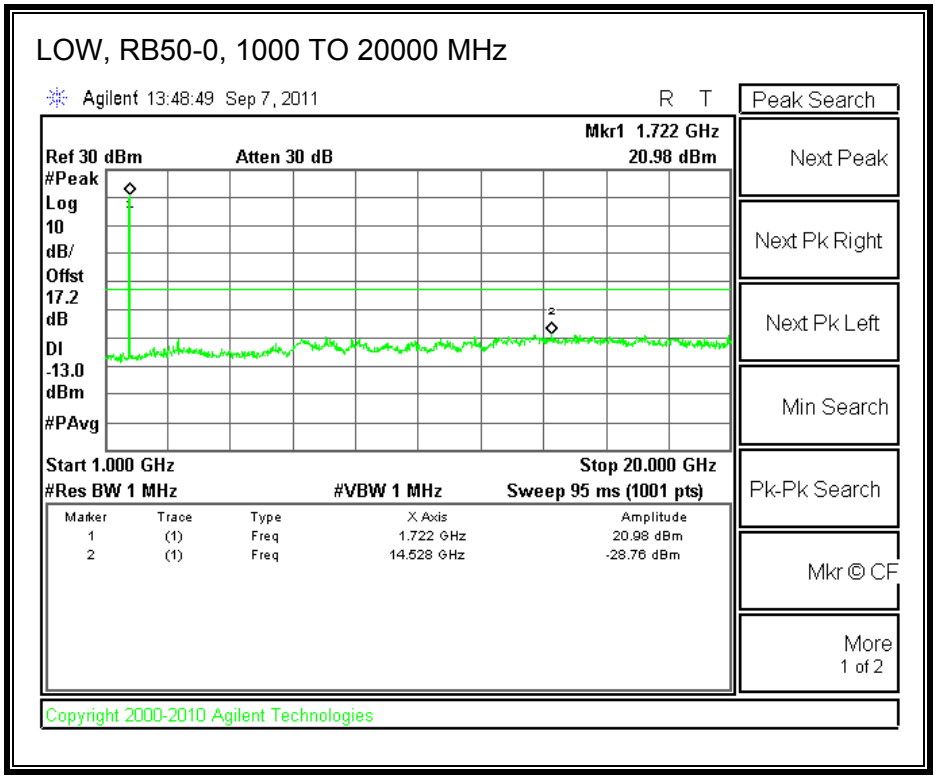
HIGH, RB25-0, 1000 TO 200000 MHz



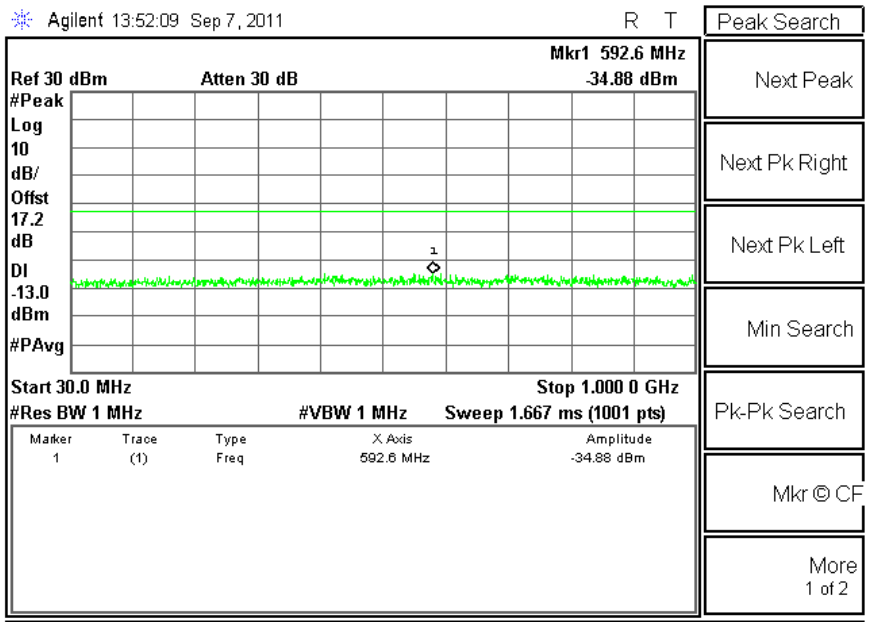
Band 4 (10.0 MHz BAND WIDTH)

LTE QPSK

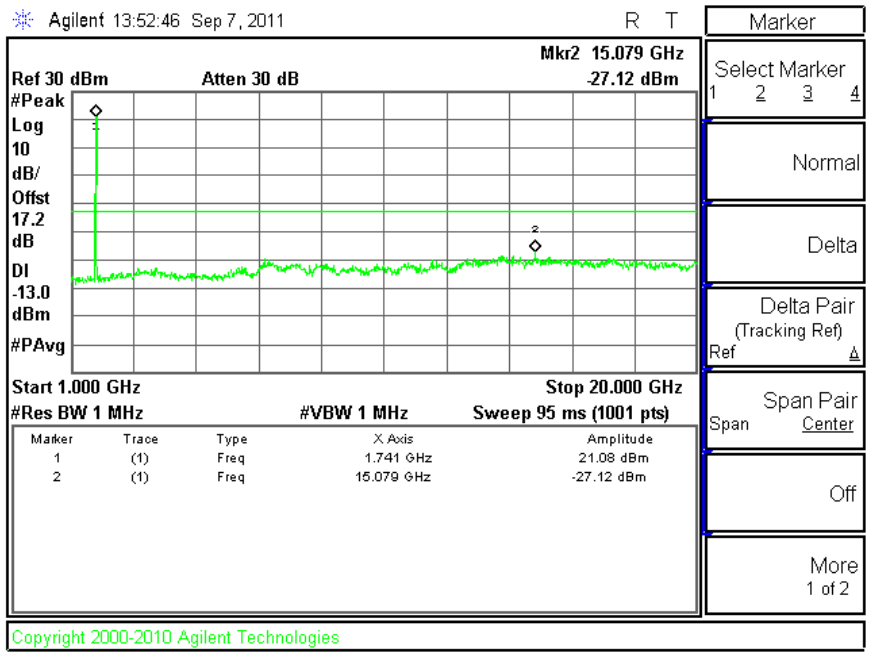




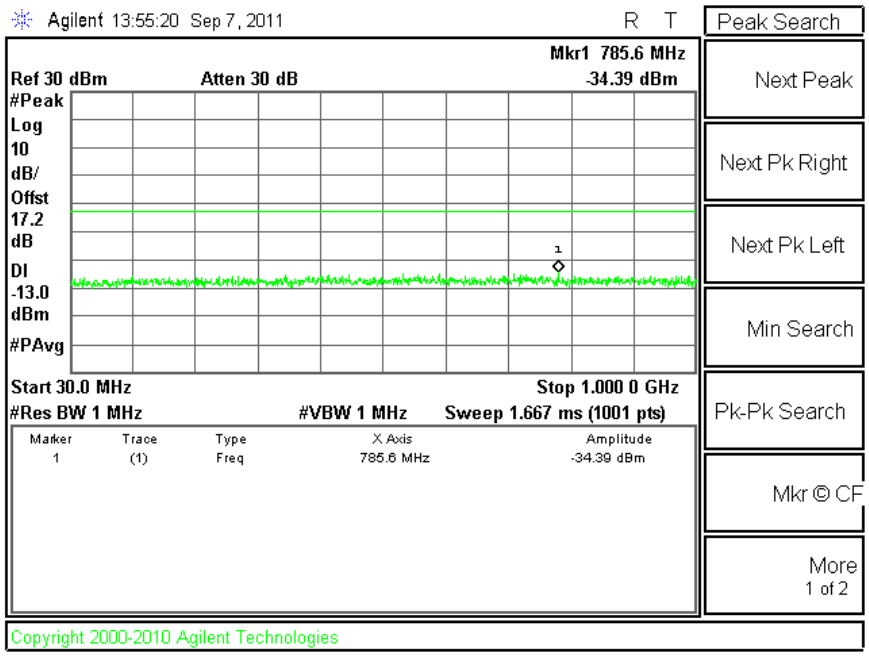
MID, RB50-0, 30 TO 1000 MHz



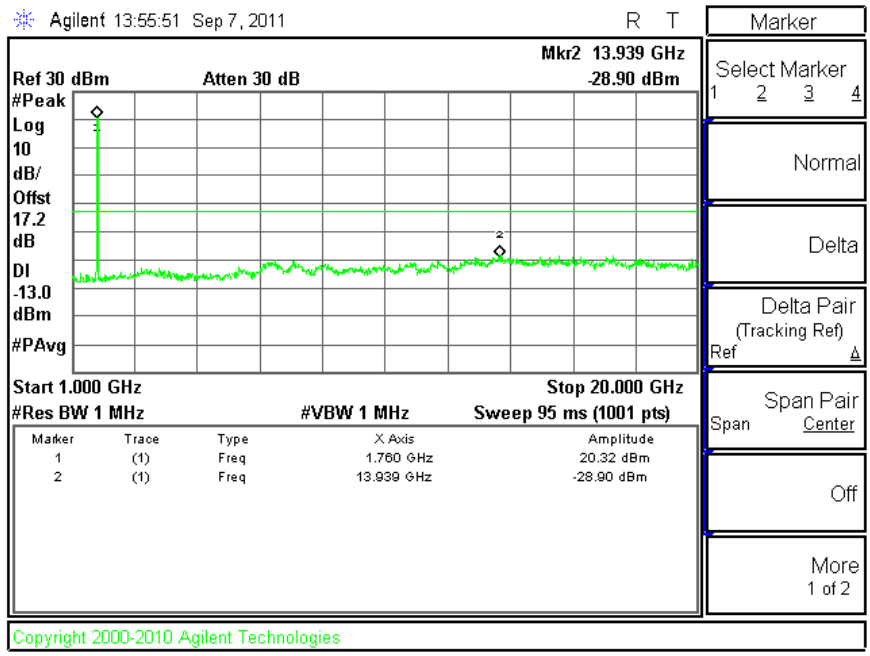
MID, RB50-0, 1000 TO 20000 MHz



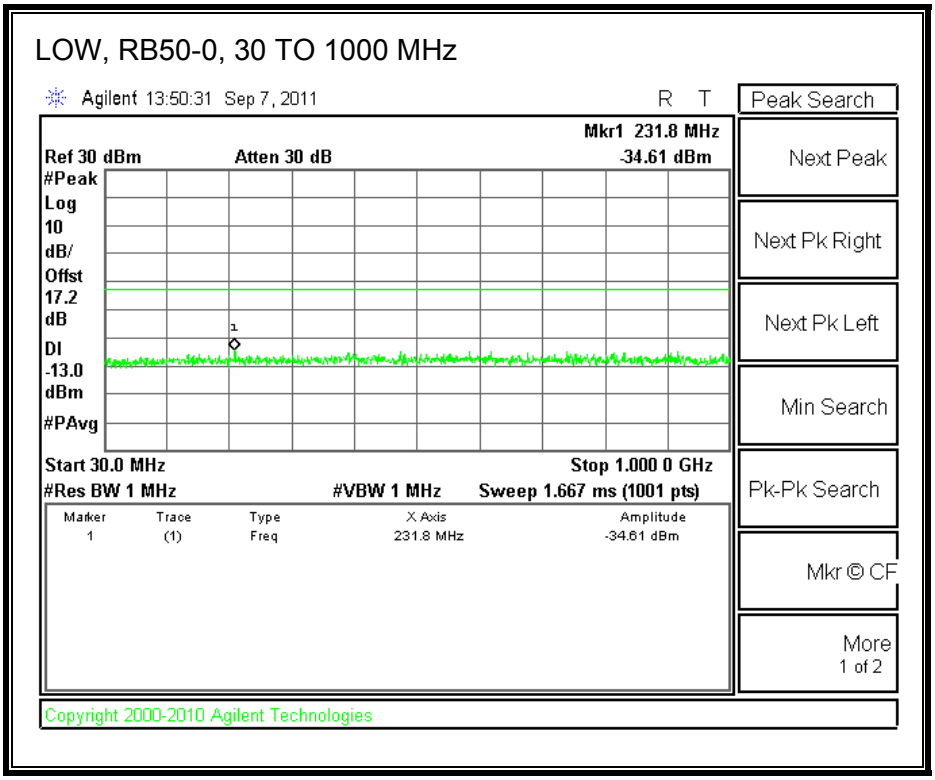
HIGH, RB50-0, 30 TO 1000 MHz

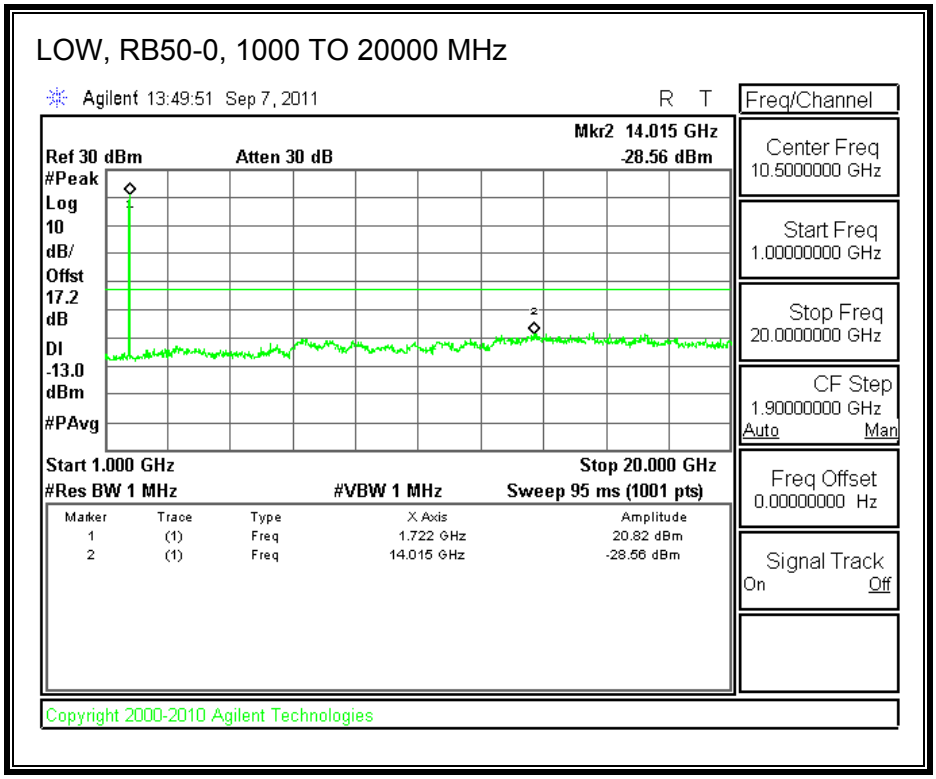


HIGH, RB50-0, 1000 TO 20000 MHz

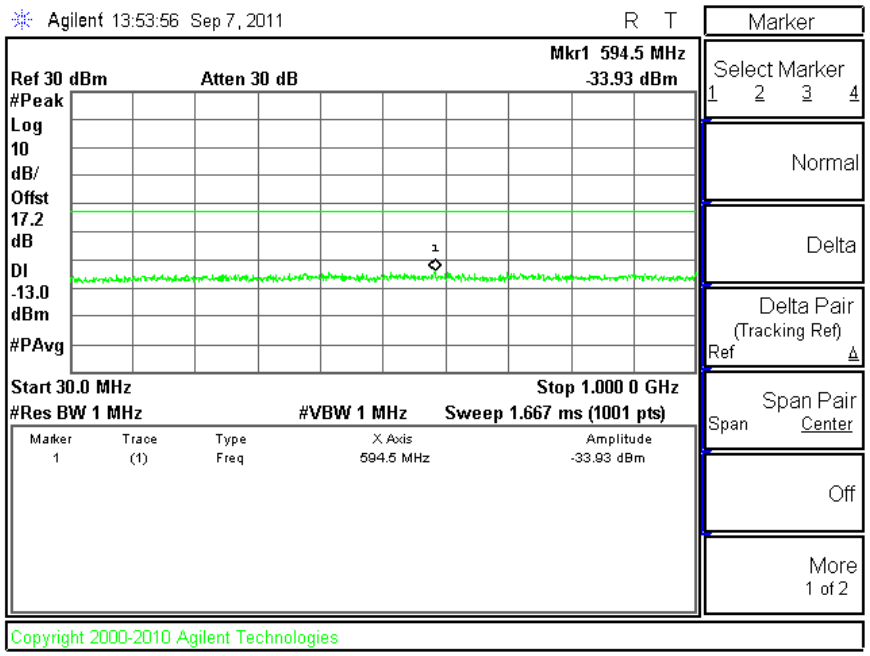


LTE 16QAM

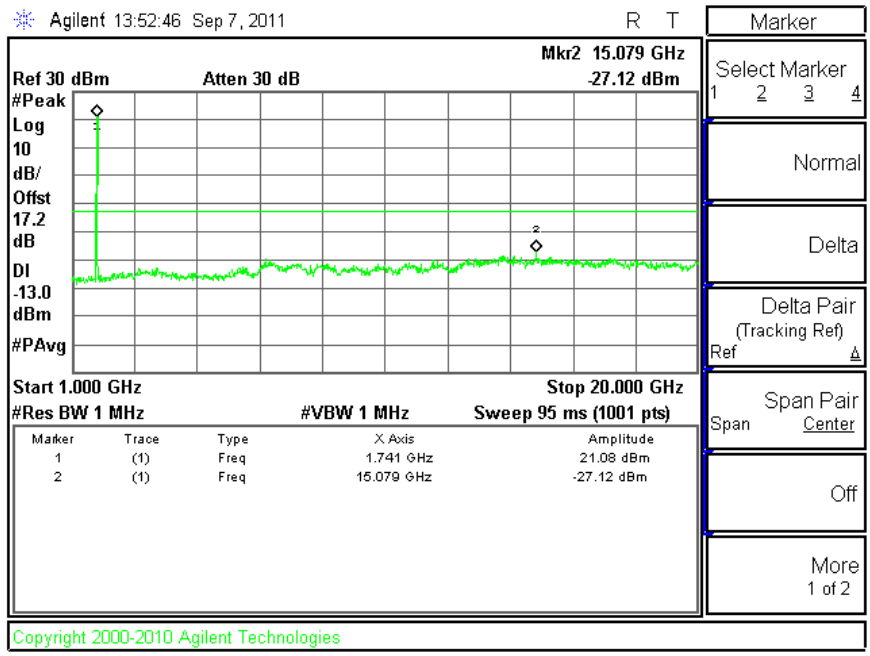




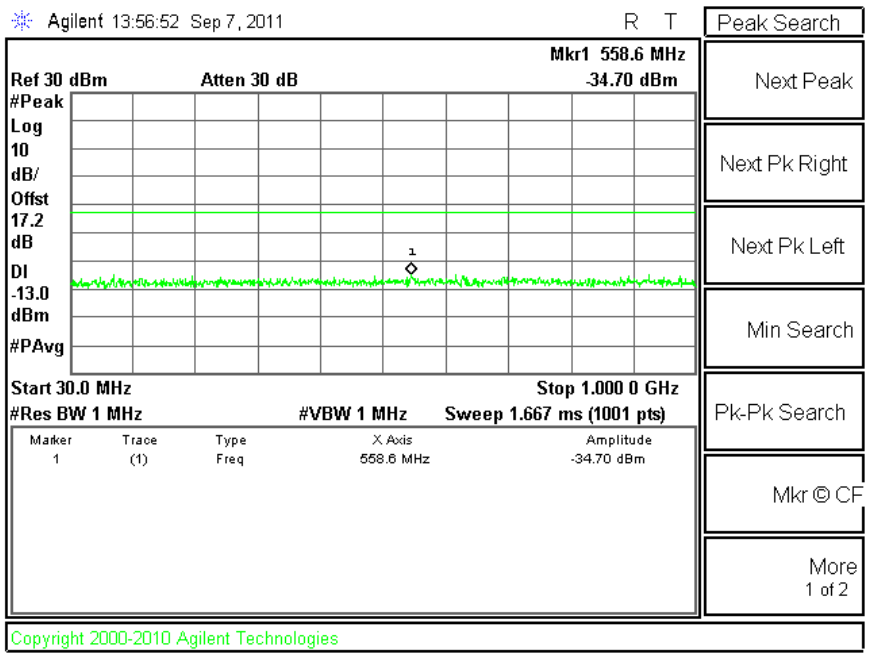
MID, RB50-0, 30 TO 1000 MHz



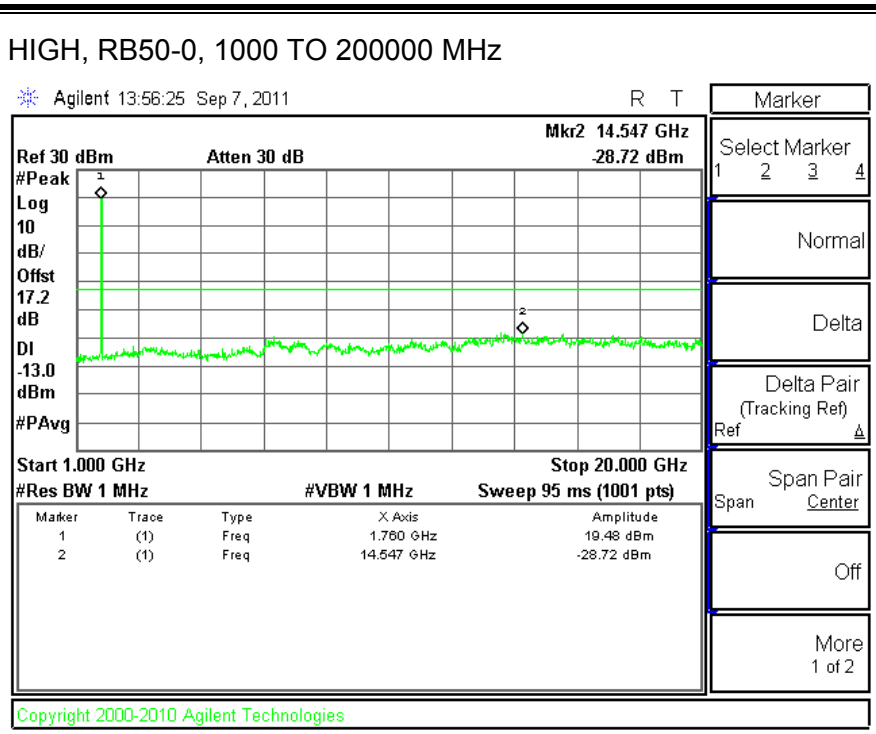
MID, RB50-0, 1000 TO 20000 MHz



HIGH, RB50-0, 30 TO 1000 MHz

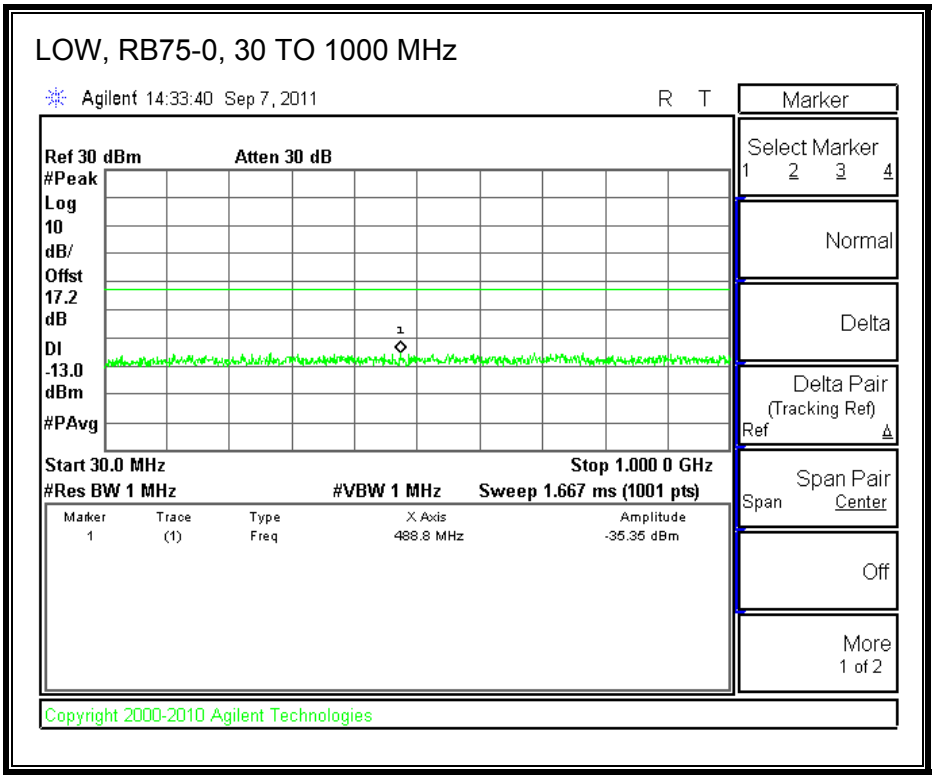


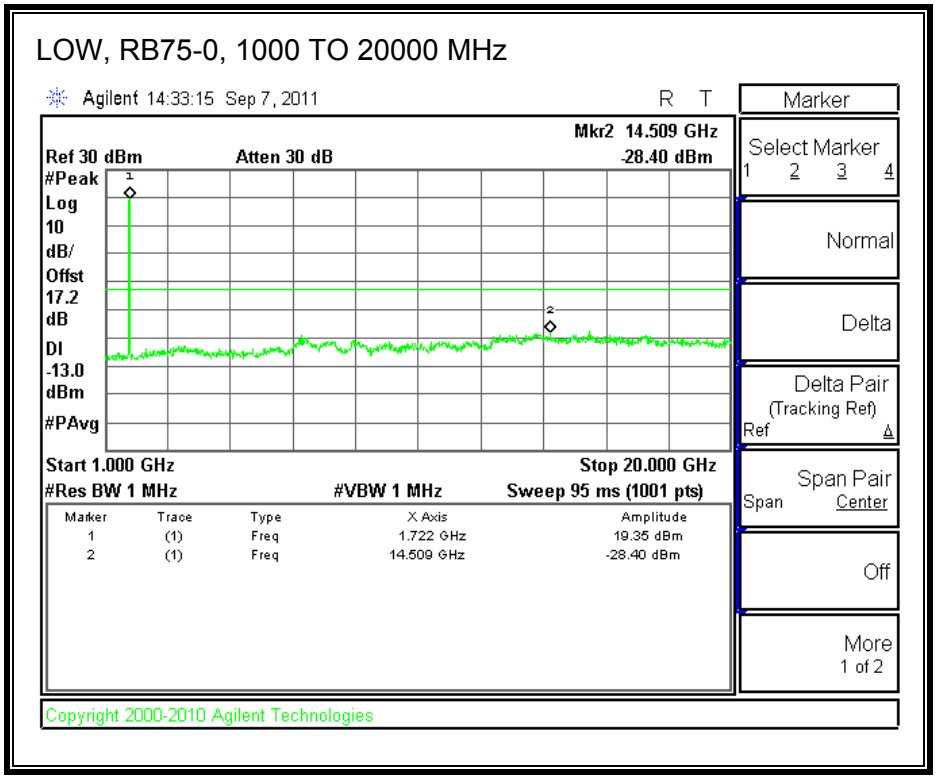
HIGH, RB50-0, 1000 TO 200000 MHz



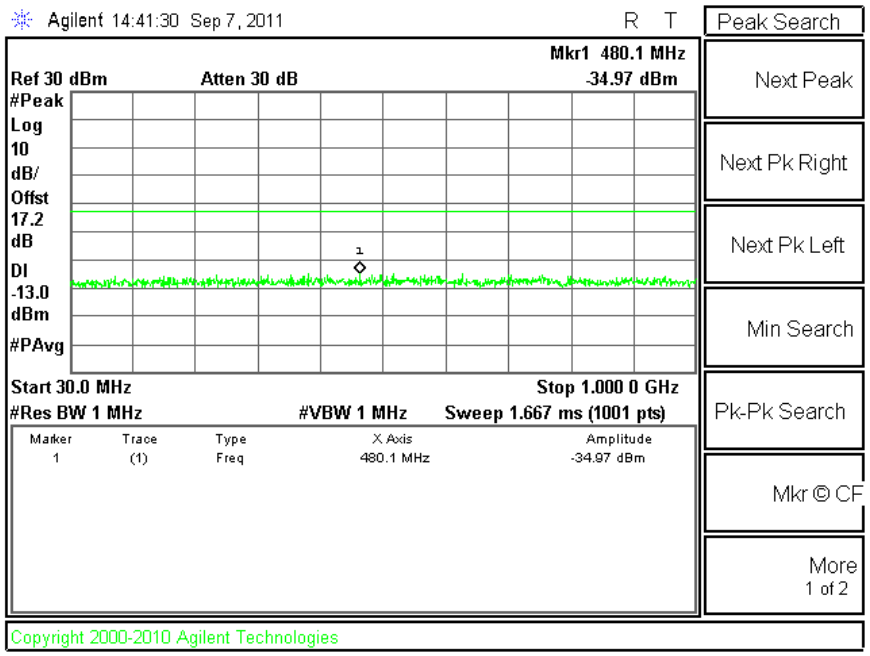
Band 4 (15.0 MHz BAND WIDTH)

LTE QPSK

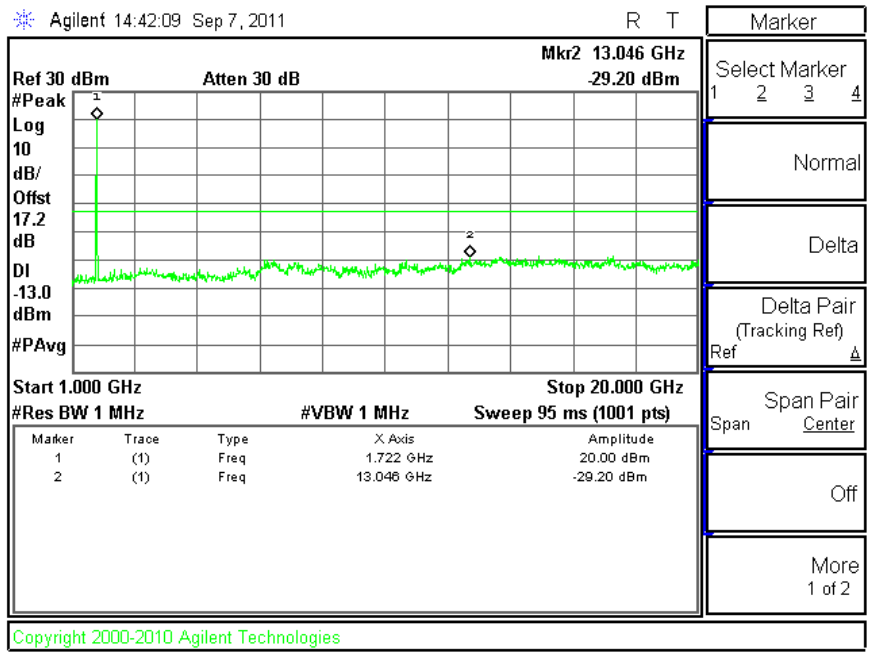




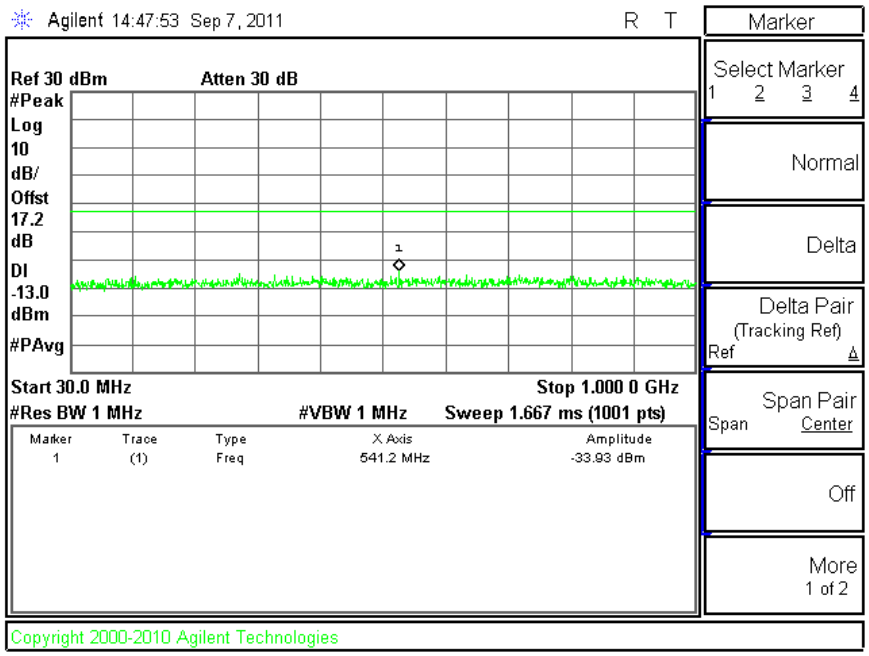
MID, RB75-0, 30 TO 1000 MHz



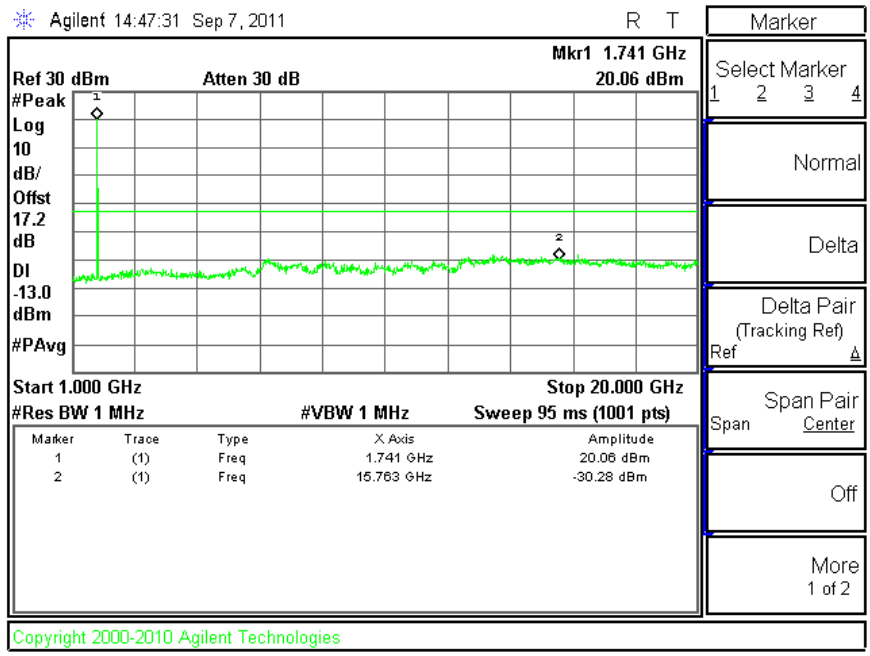
MID, RB75-0, 1000 TO 20000 MHz



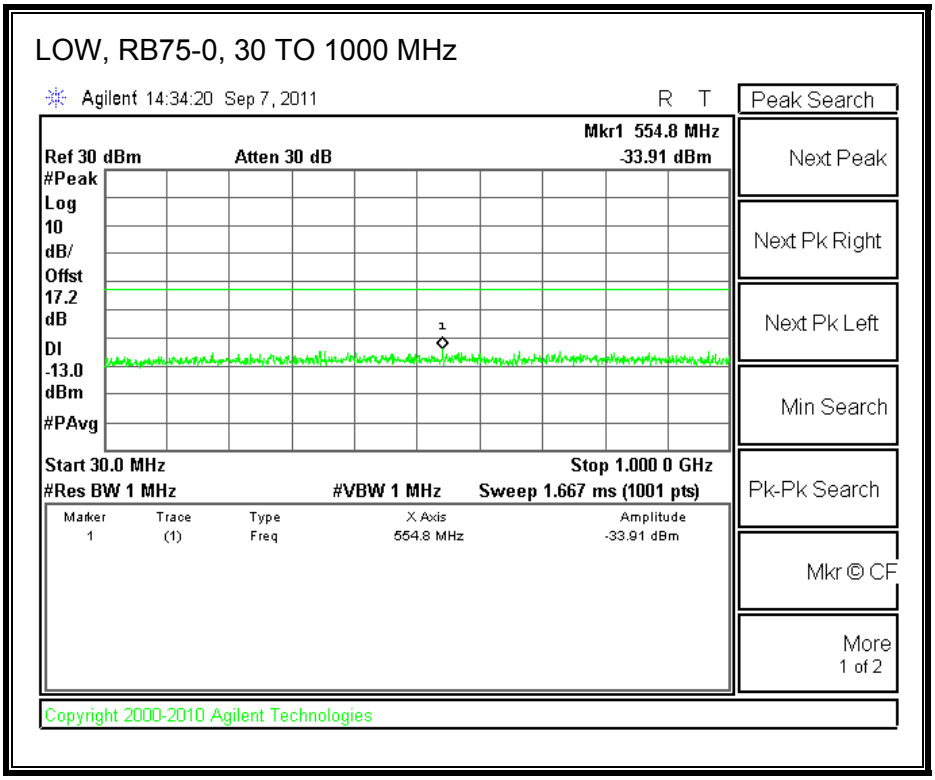
HIGH, RB75-0, 30 TO 1000 MHz

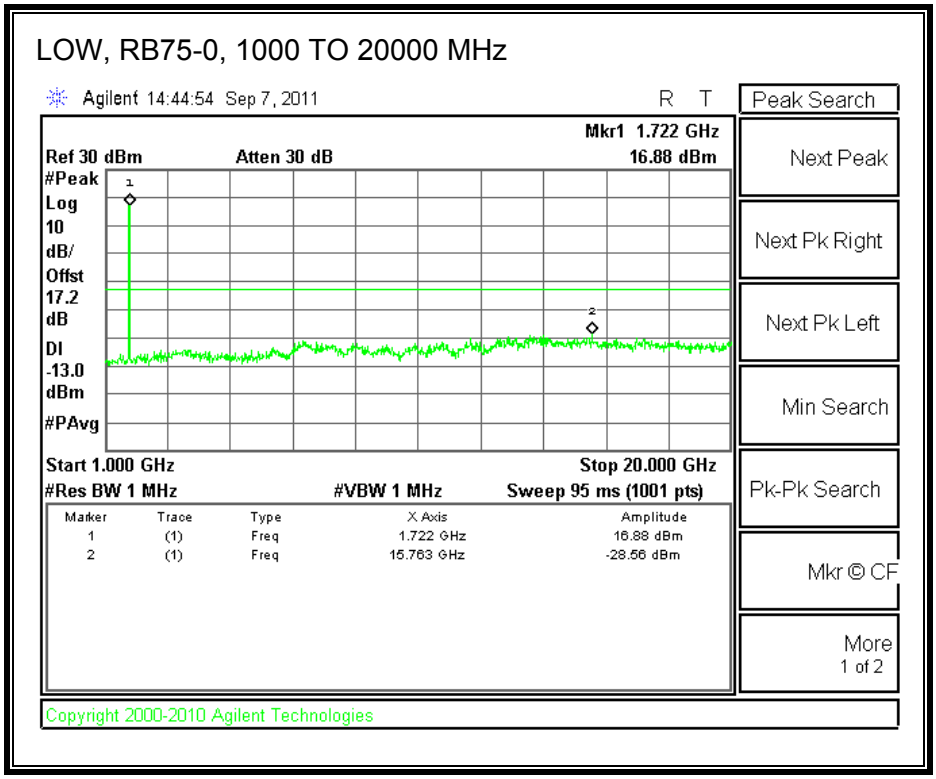


HIGH, RB75-0, 1000 TO 20000 MHz

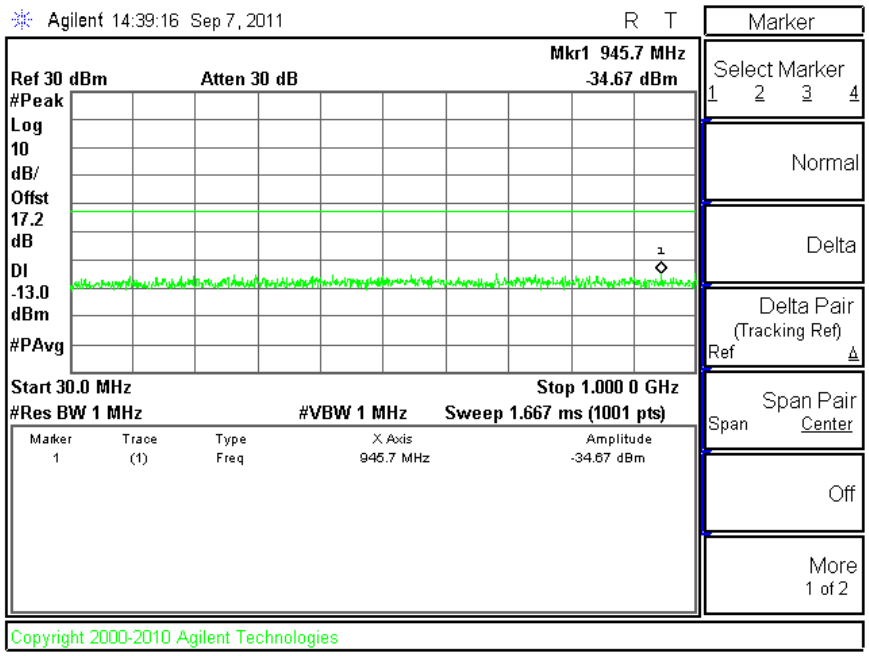


LTE 16QAM

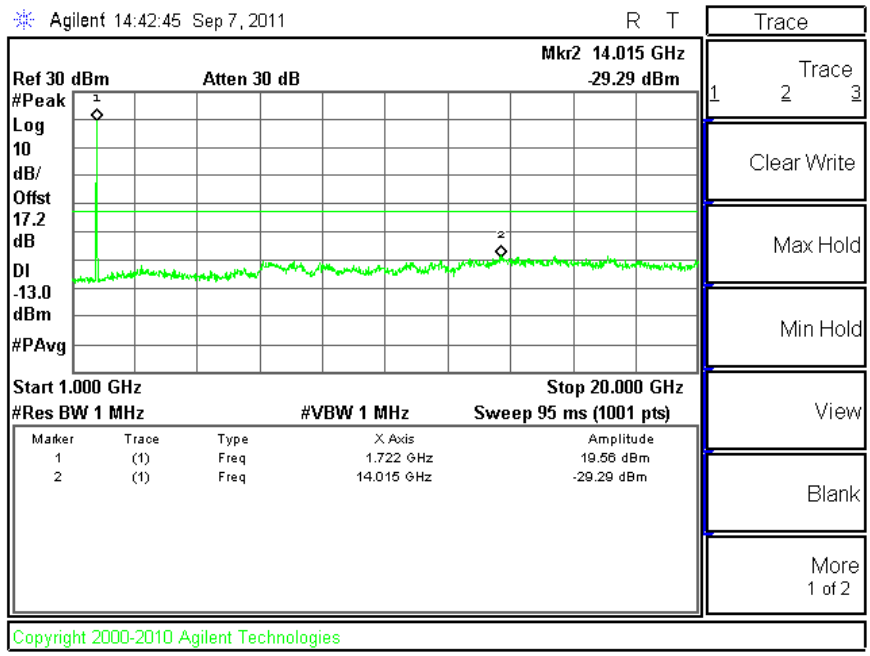




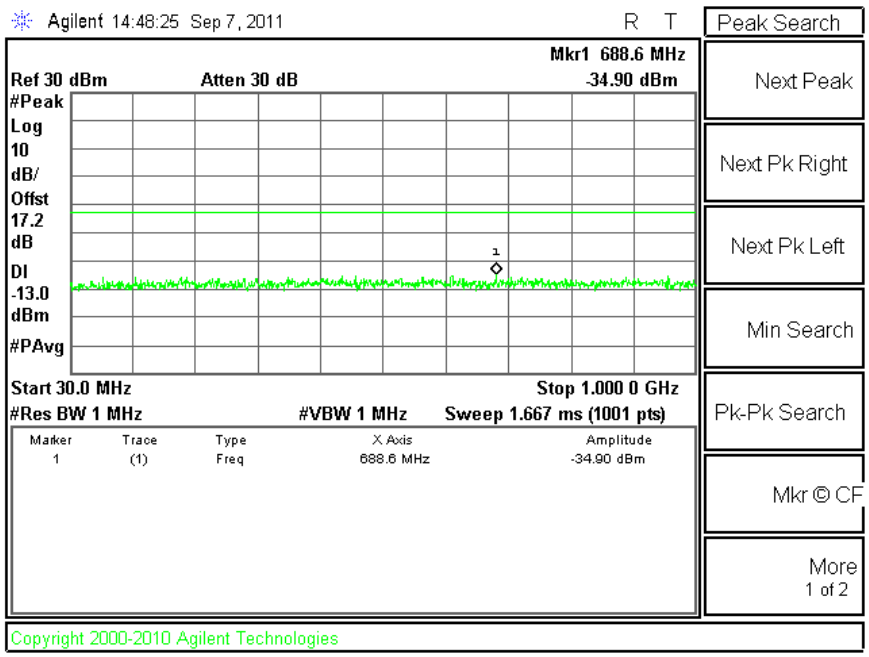
MID, RB75-0, 30 TO 1000 MHz



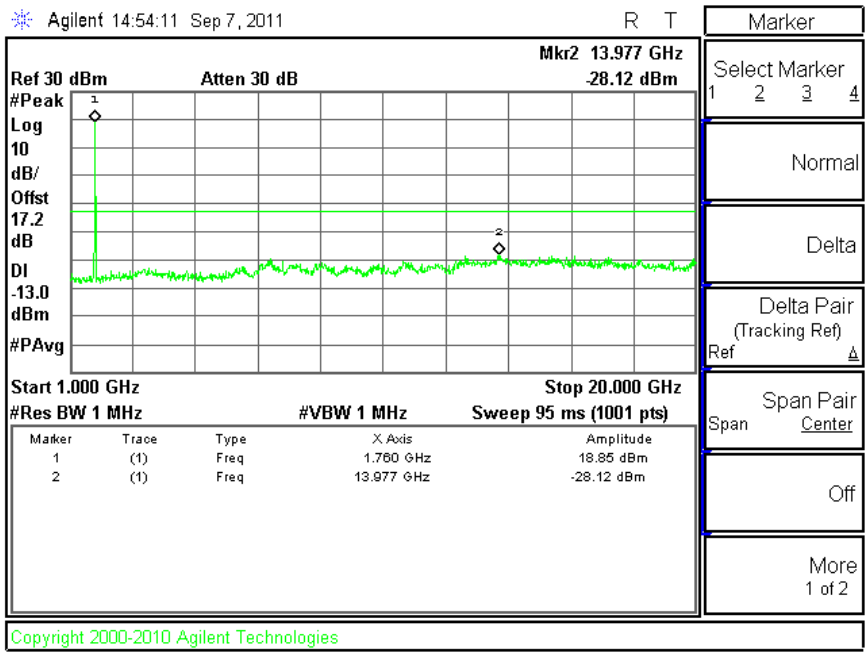
MID, RB75-0, 1000 TO 20000 MHz



HIGH, RB75-0, 30 TO 1000 MHz

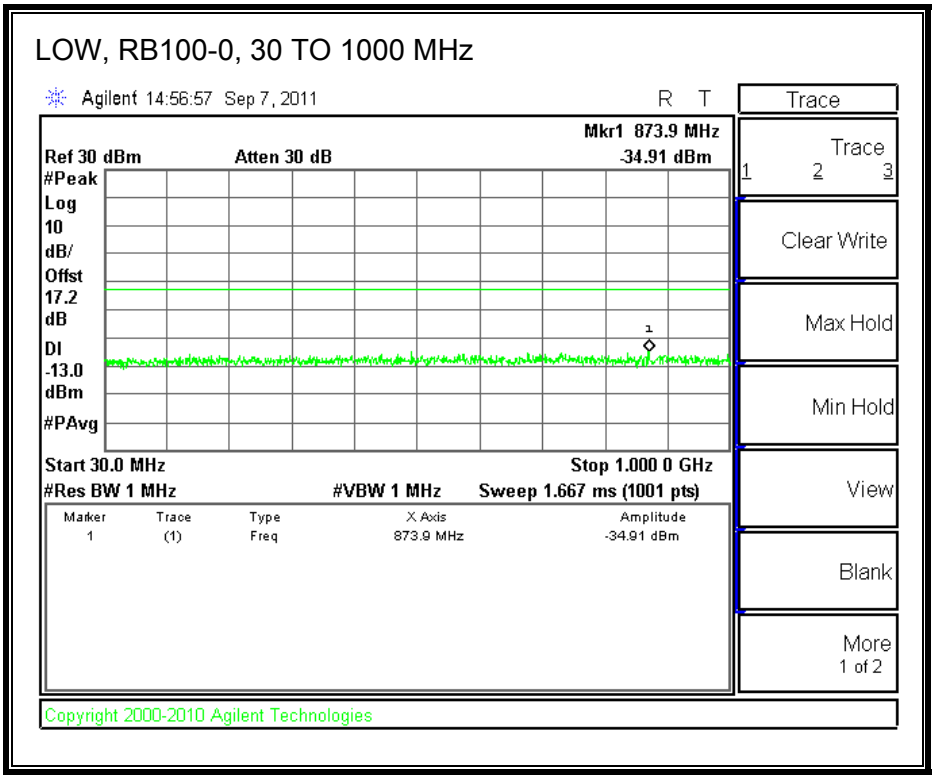


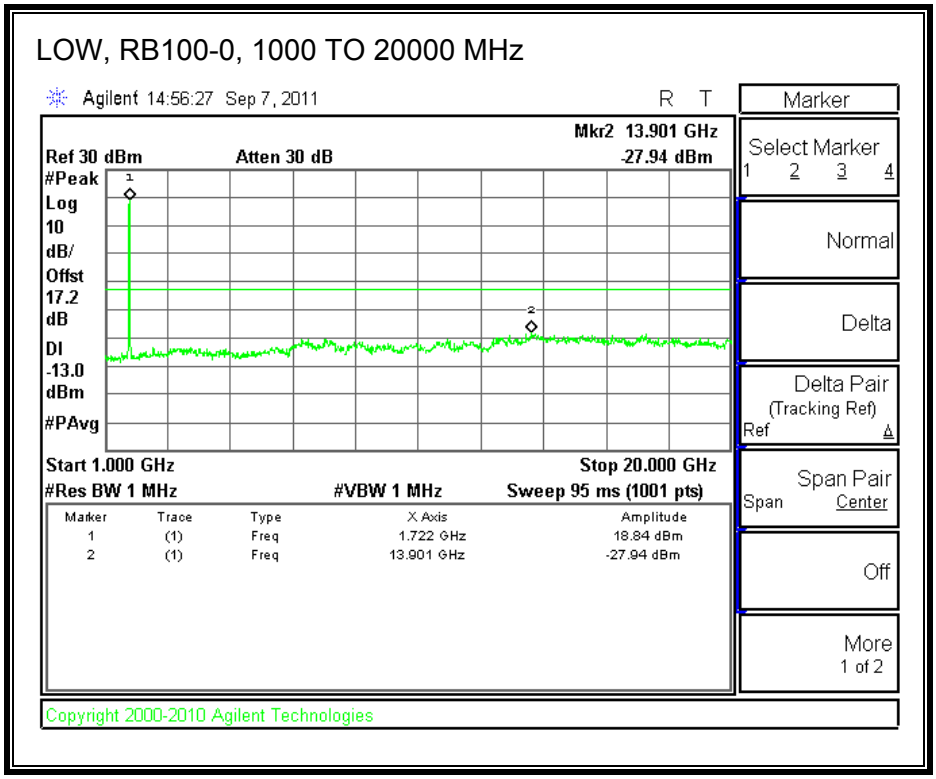
HIGH, RB75-0, 1000 TO 200000 MHz



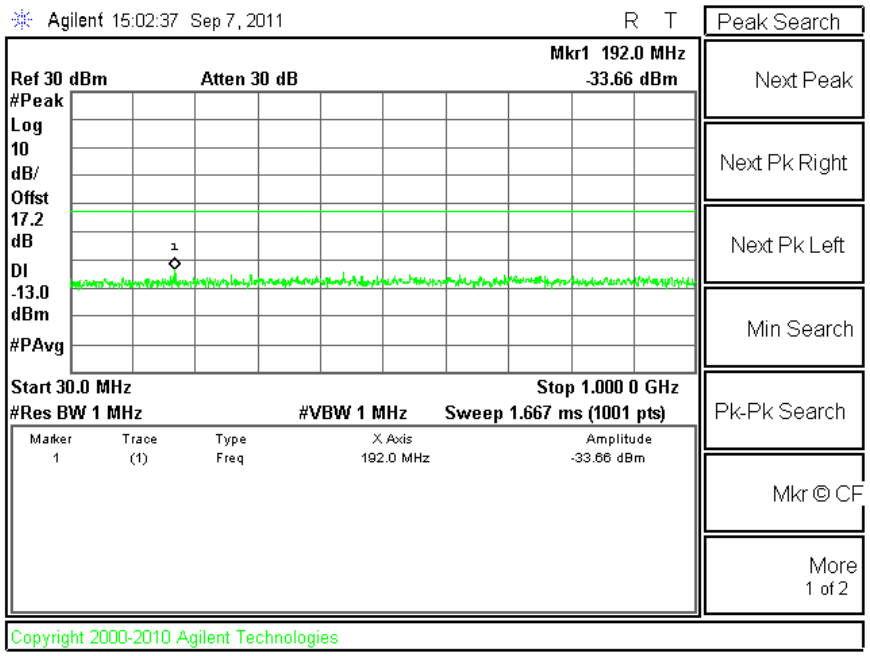
Band 4 (20.0 MHz BAND WIDTH)

LTE QPSK

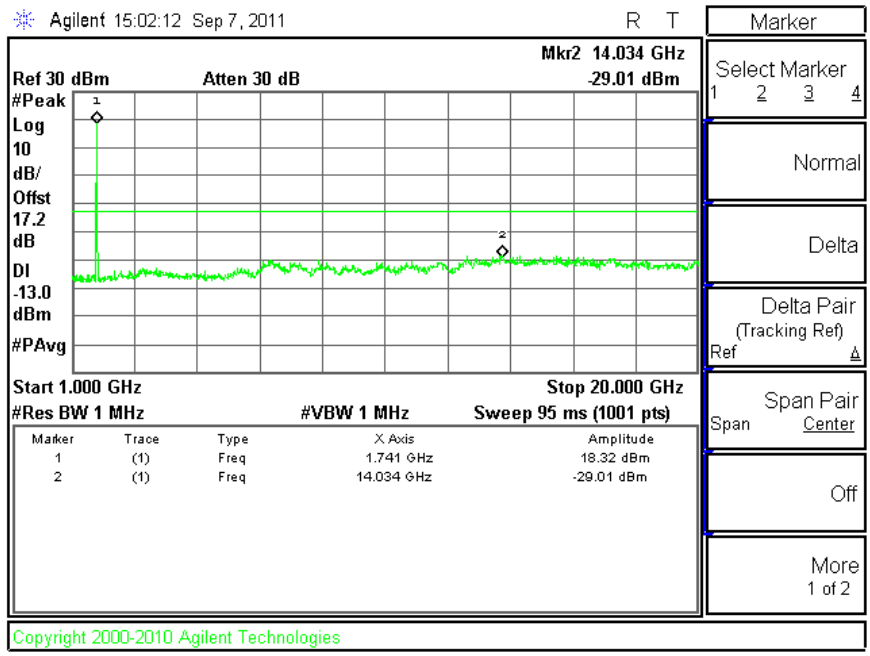




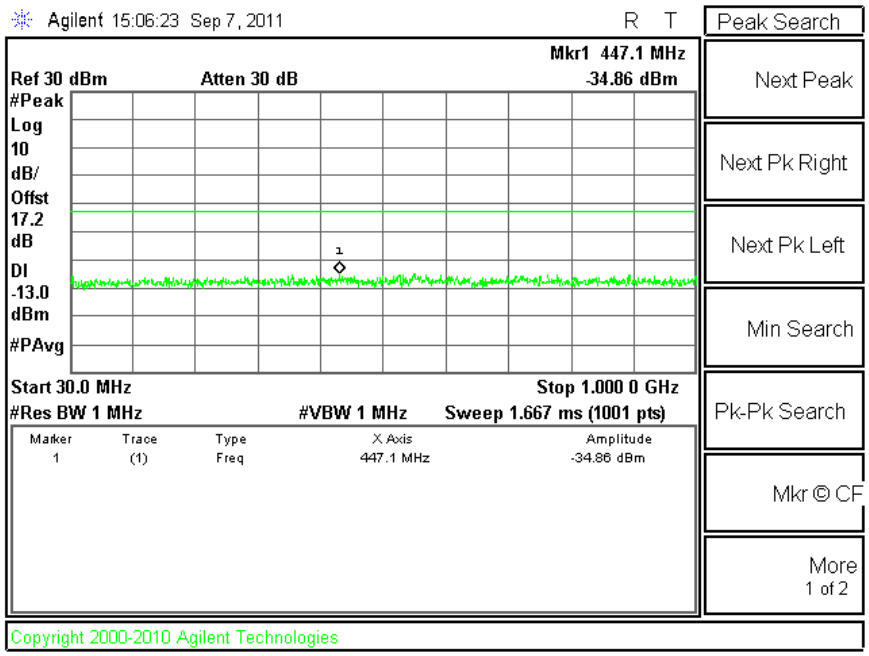
MID, RB100-0, 30 TO 1000 MHz



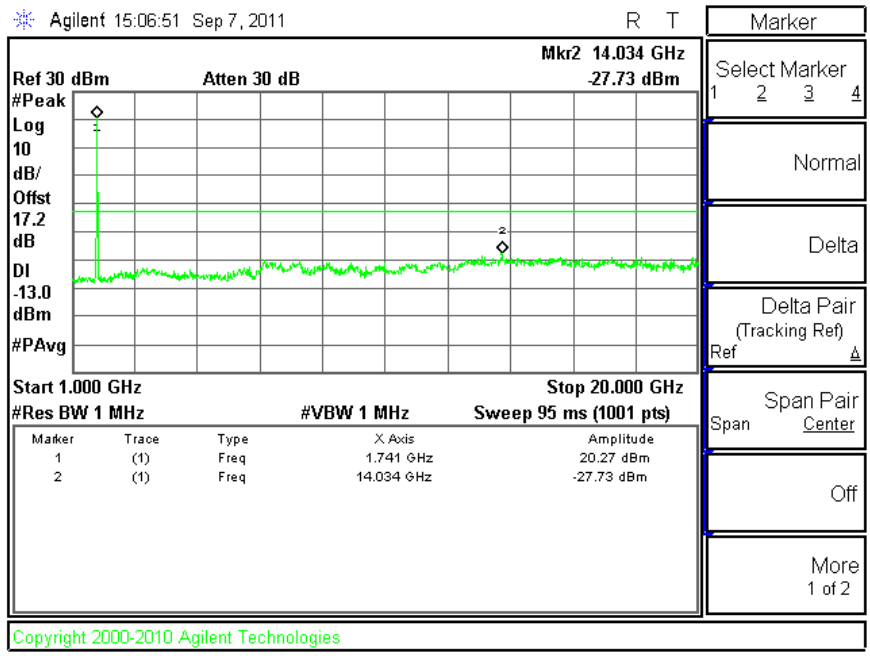
MID, RB100-0, 1000 TO 20000 MHz



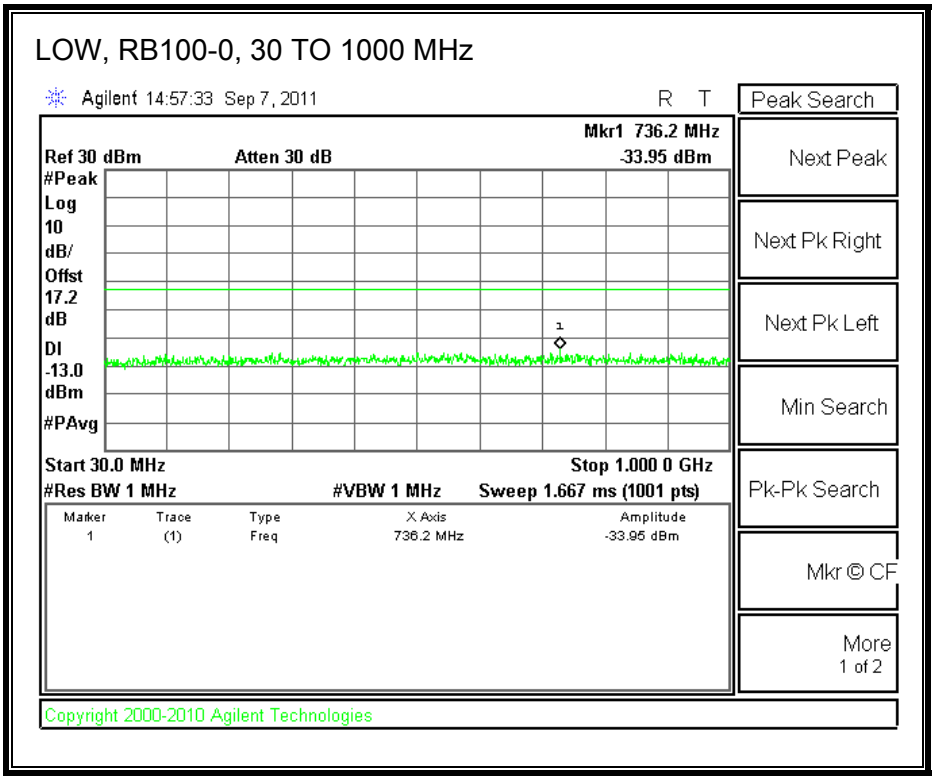
HIGH, RB100-0, 30 TO 1000 MHz

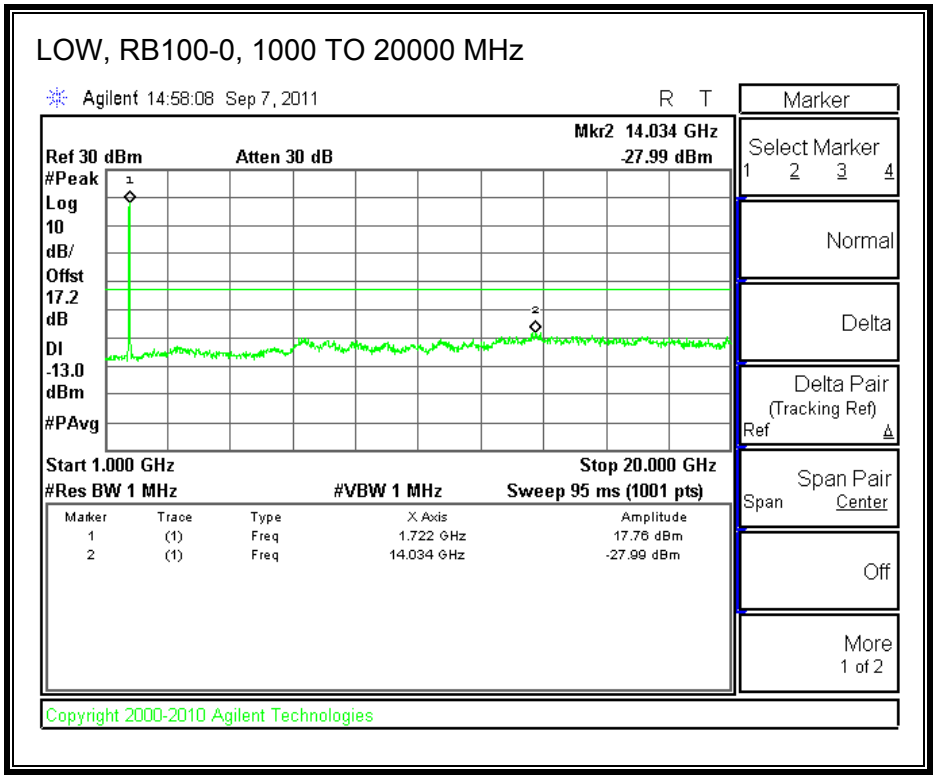


HIGH, RB100-0, 1000 TO 20000 MHz

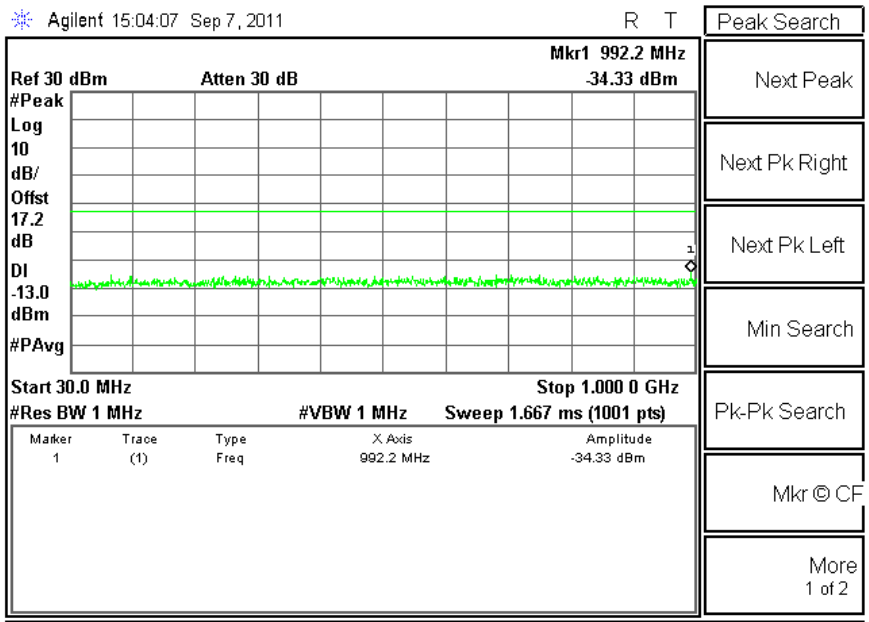


LTE 16QAM

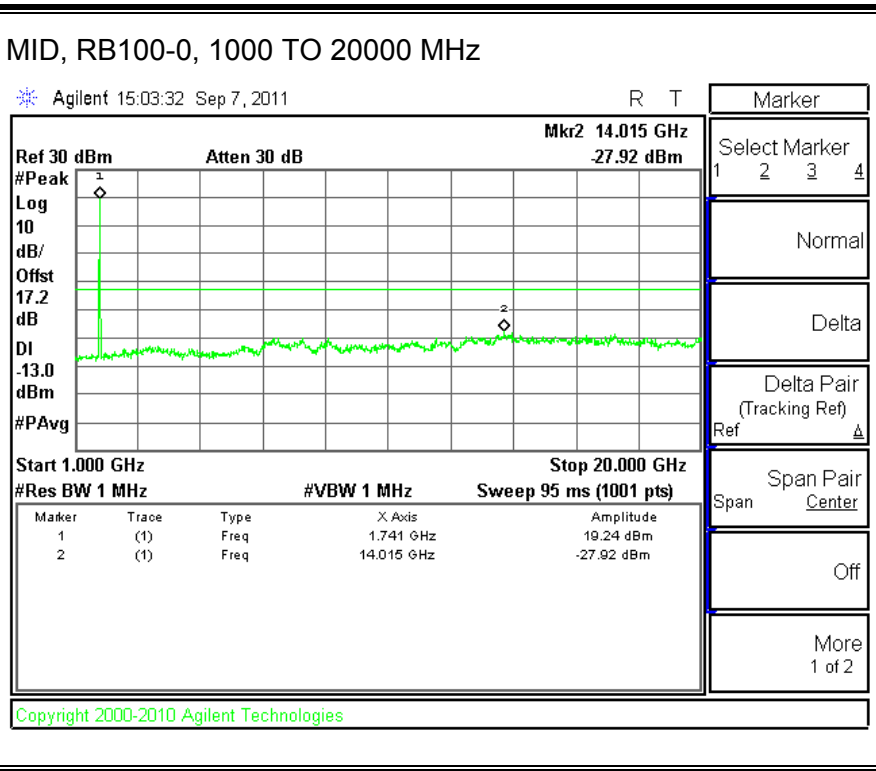




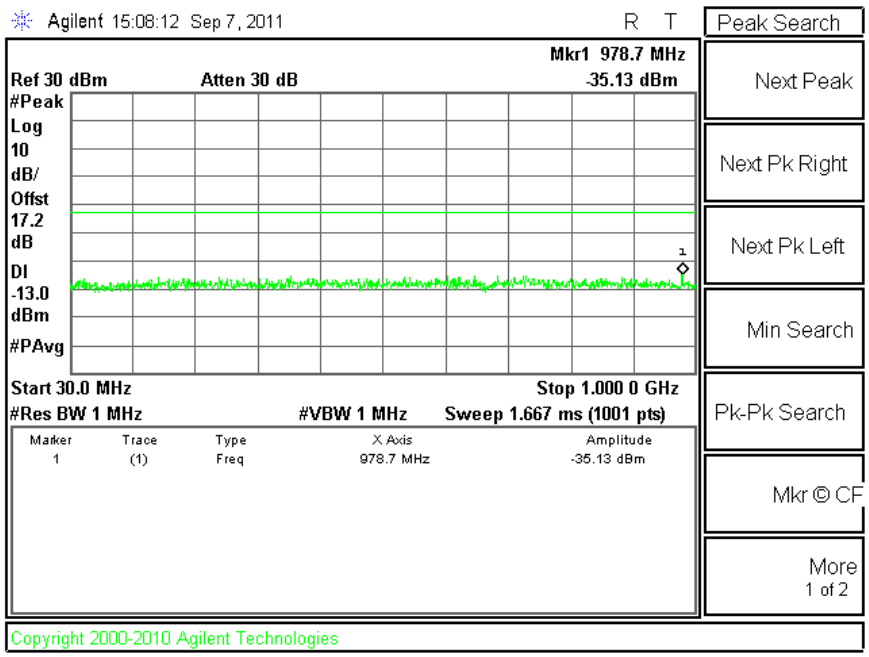
MID, RB100-0, 30 TO 1000 MHz



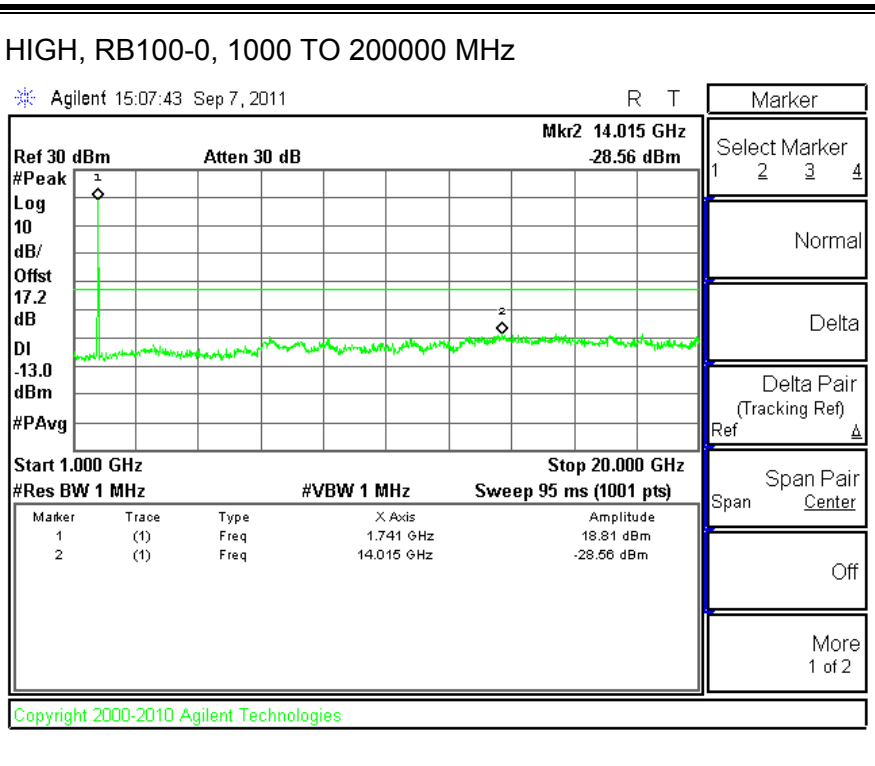
MID, RB100-0, 1000 TO 20000 MHz



HIGH, RB100-0, 30 TO 1000 MHz

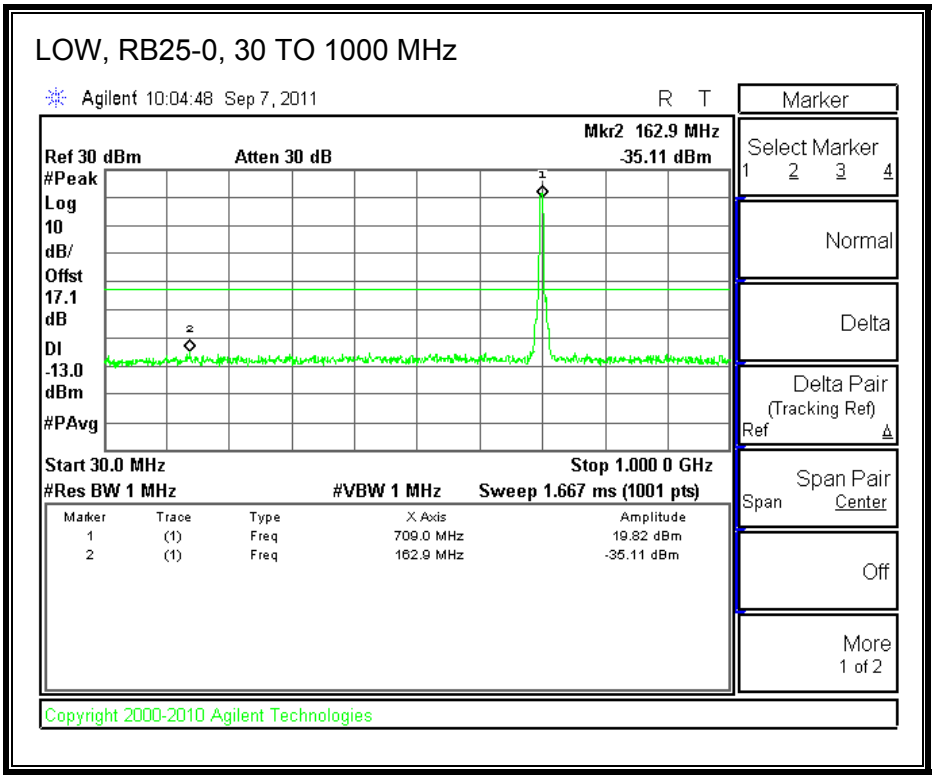


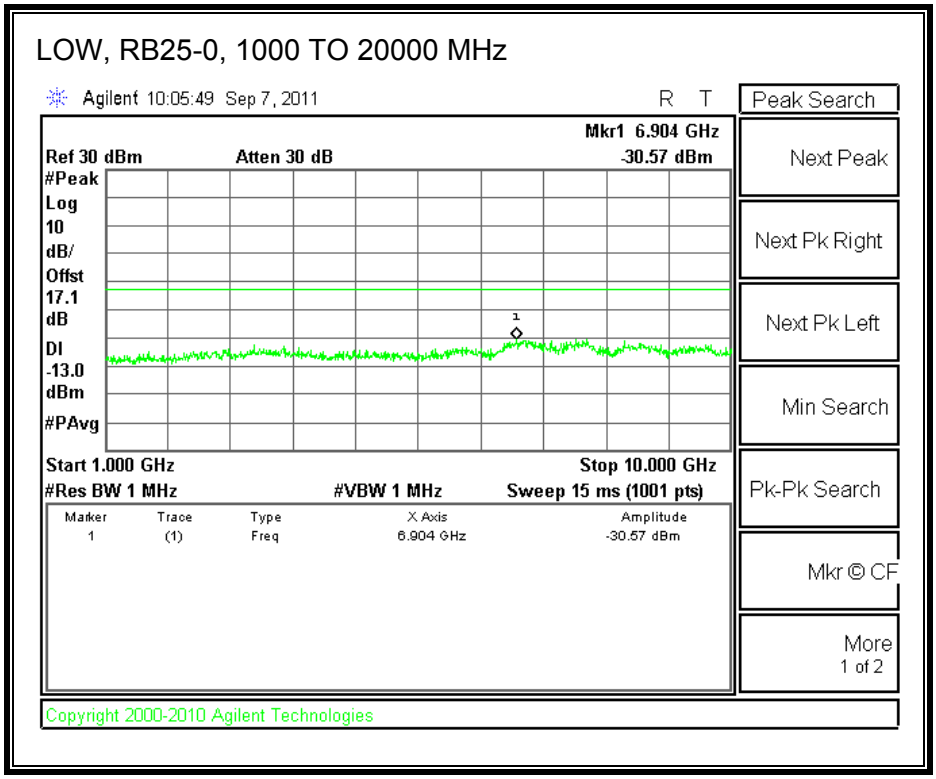
HIGH, RB100-0, 1000 TO 200000 MHz



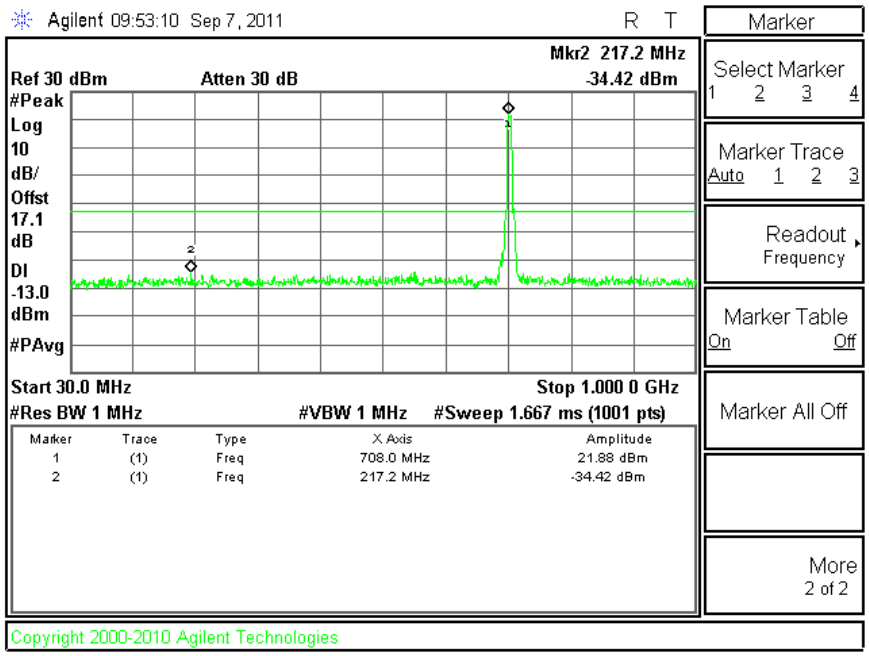
Band 17 (5.0 MHz BAND WIDTH)

LTE QPSK

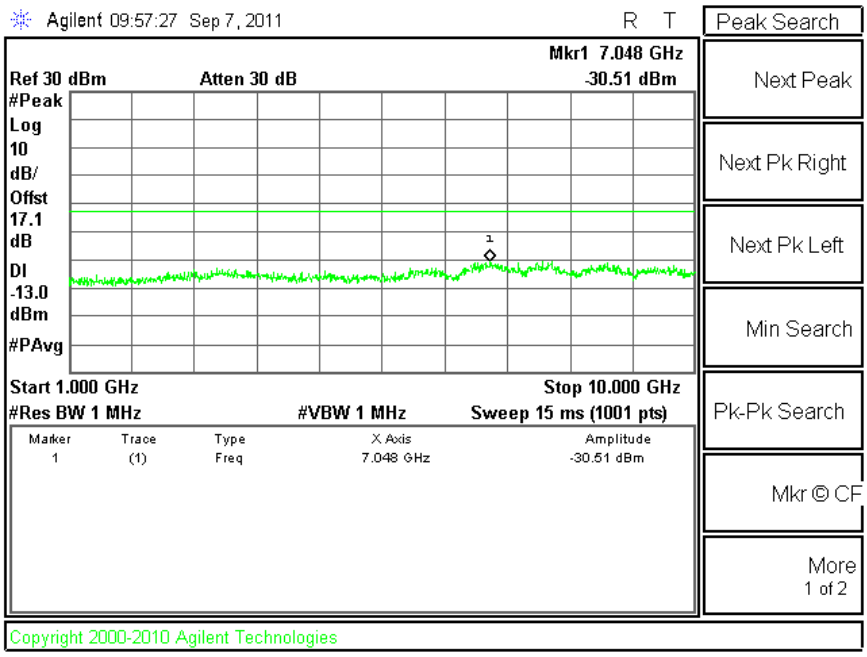




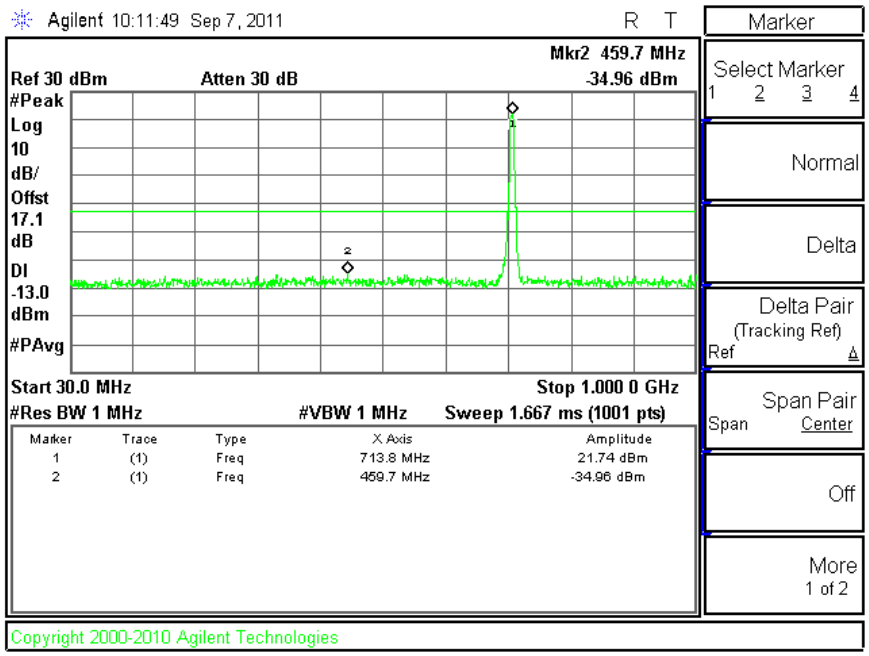
MID, RB25-0, 30 TO 1000 MHz



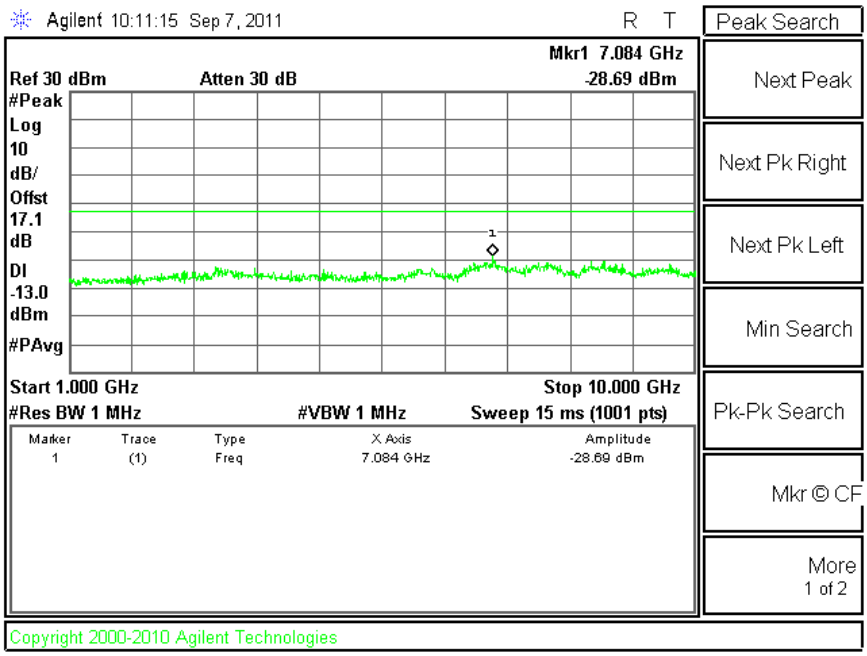
MID, RB25-0, 1000 TO 20000 MHz



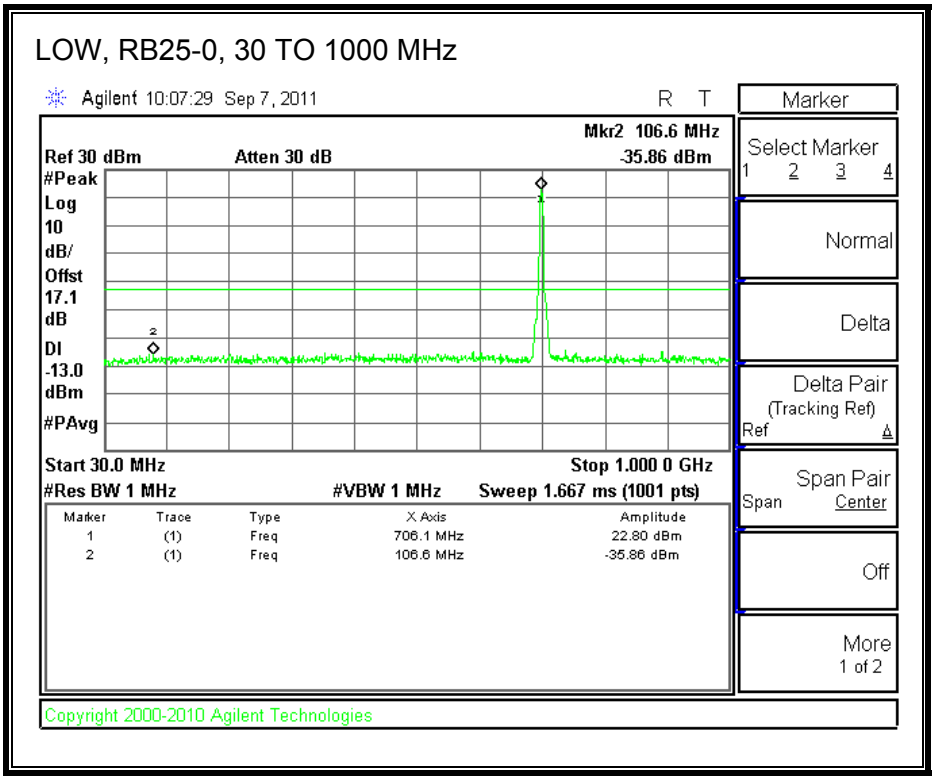
HIGH, RB25-0, 30 TO 1000 MHz

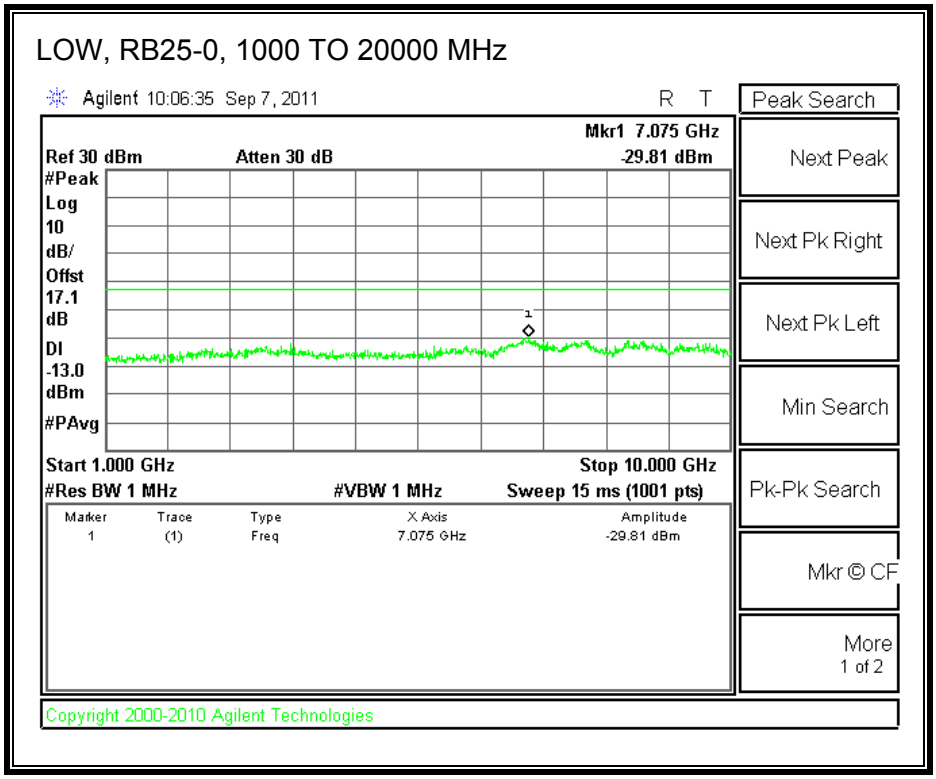


HIGH, RB25-0, 1000 TO 20000 MHz

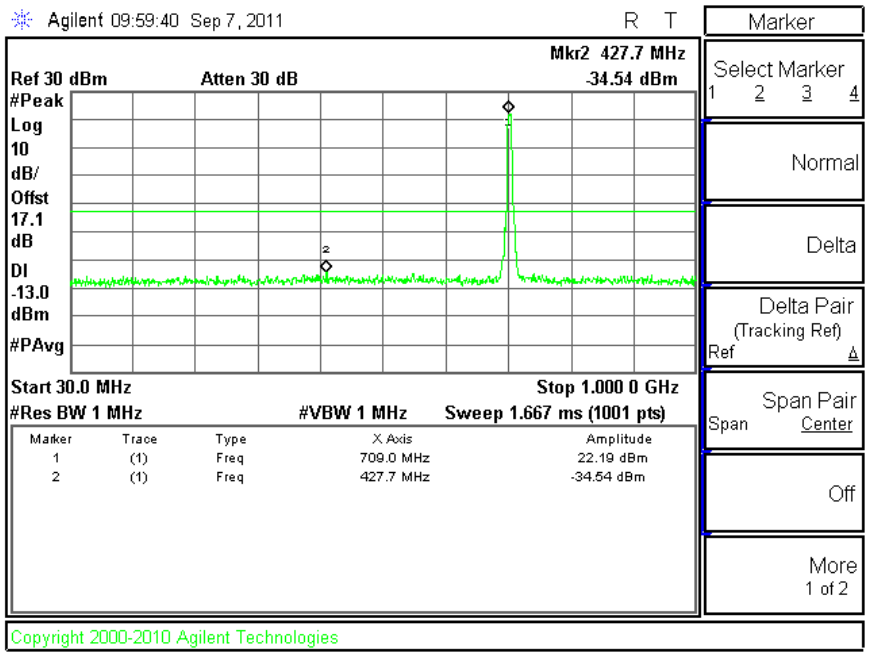


LTE 16QAM

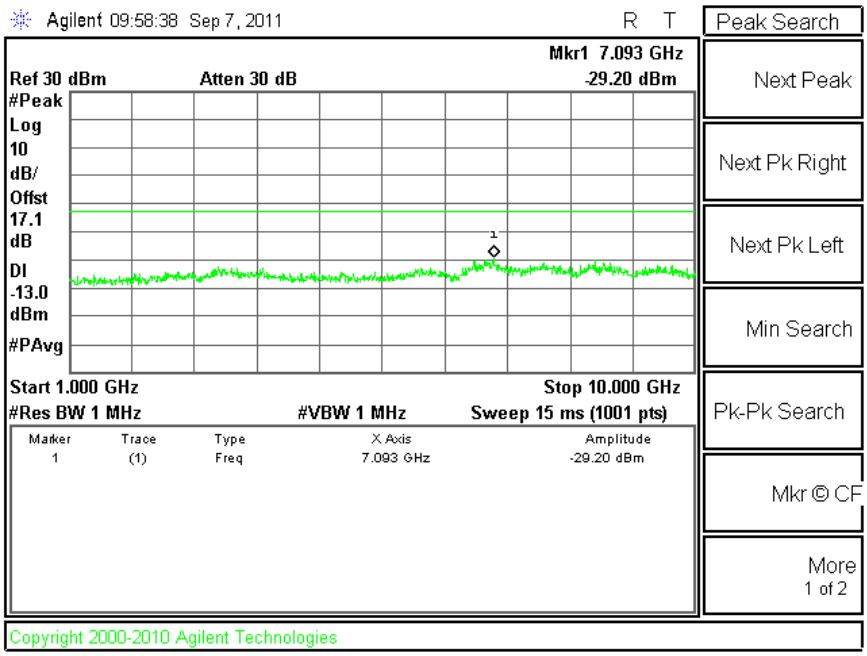




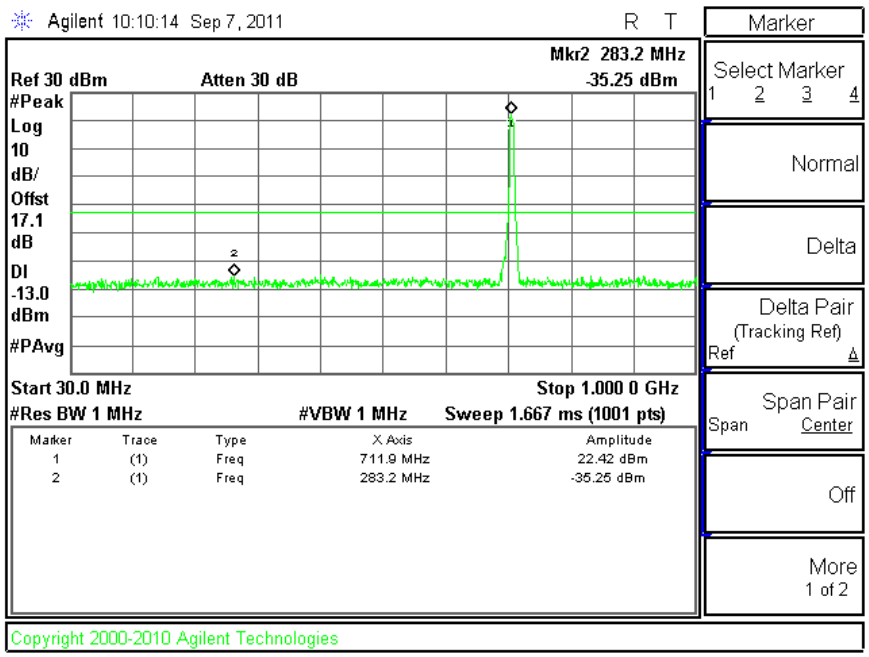
MID, RB25-0, 30 TO 1000 MHz



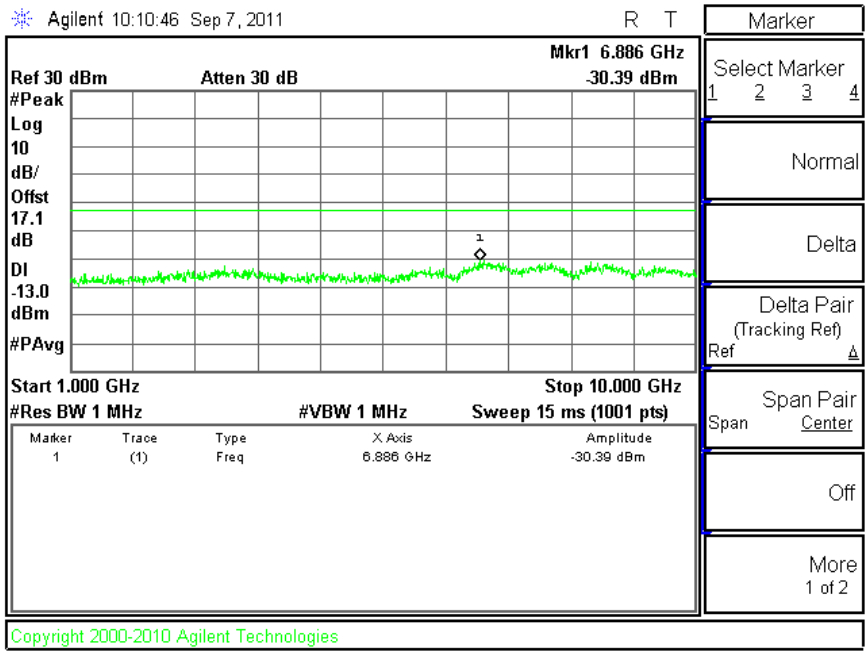
MID, RB25-0, 1000 TO 20000 MHz



HIGH, RB25-0, 30 TO 1000 MHz

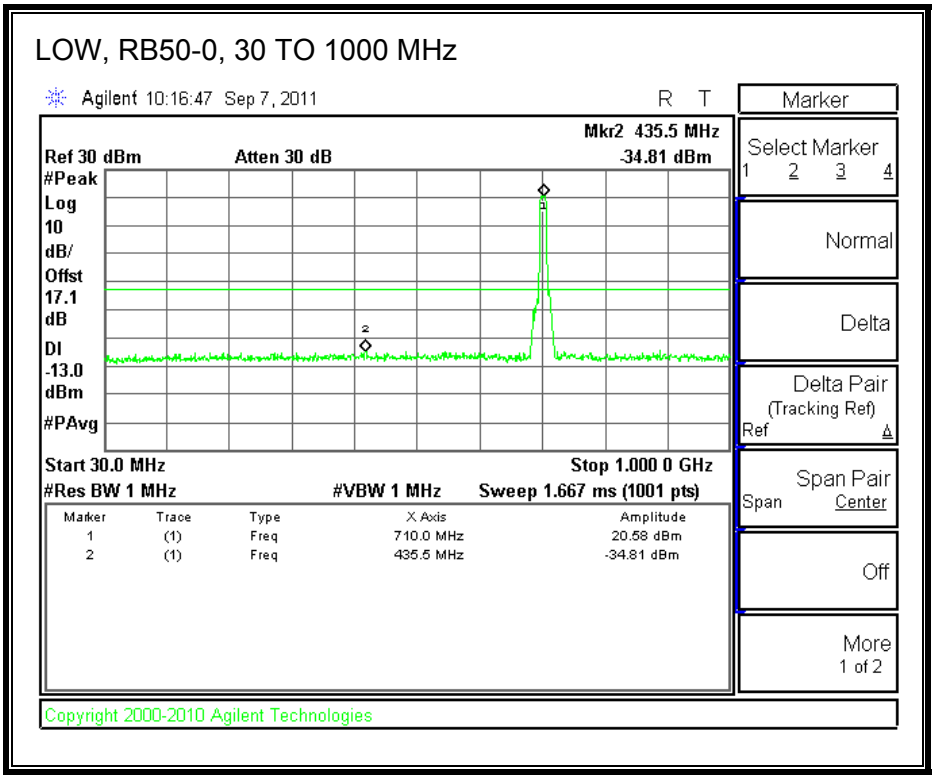


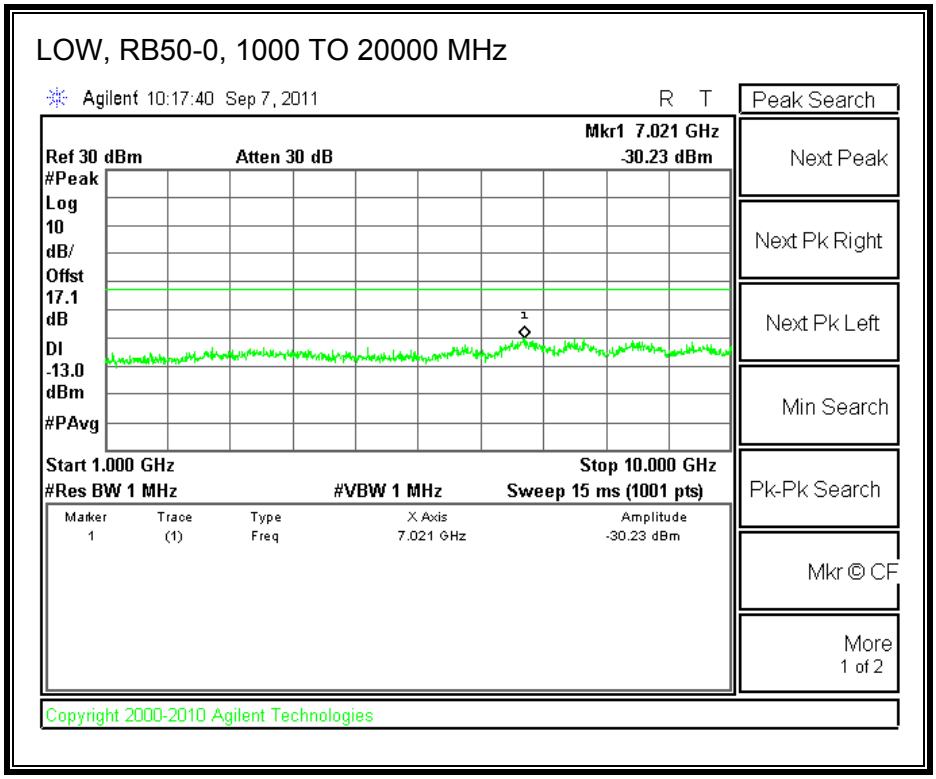
HIGH, RB25-0, 1000 TO 200000 MHz



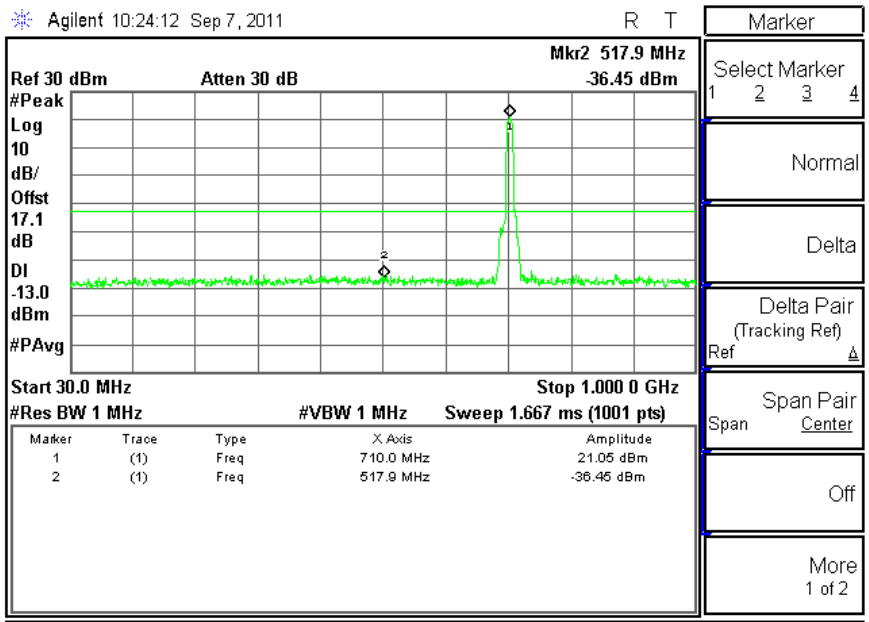
Band 17 (10.0 MHz BAND WIDTH)

LTE QPSK

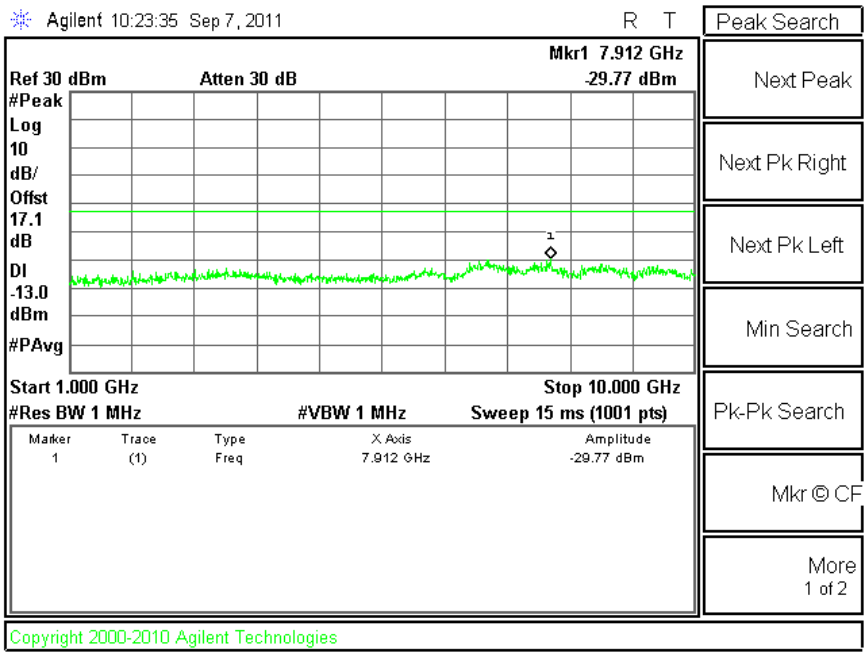




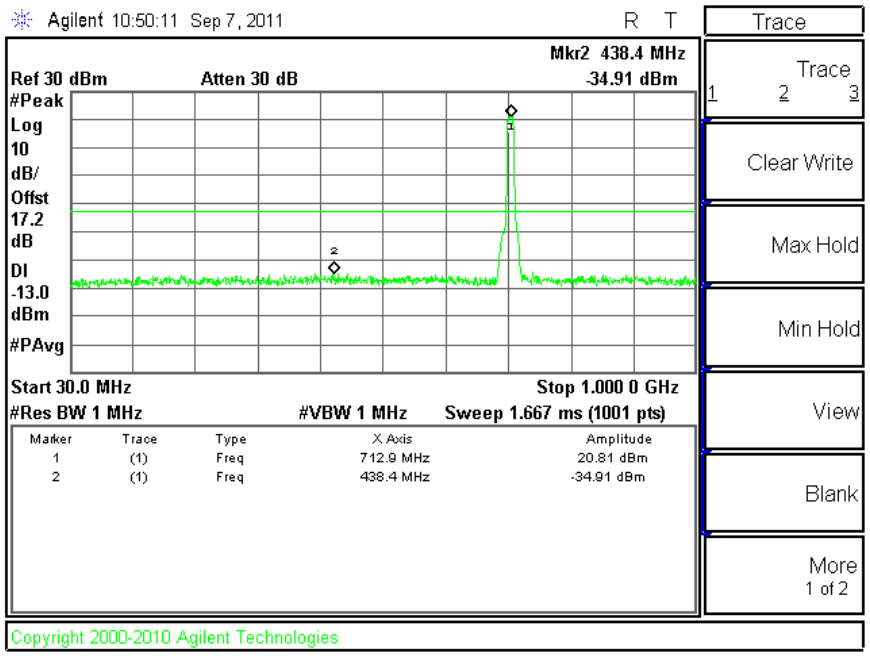
MID, RB50-0, 30 TO 1000 MHz



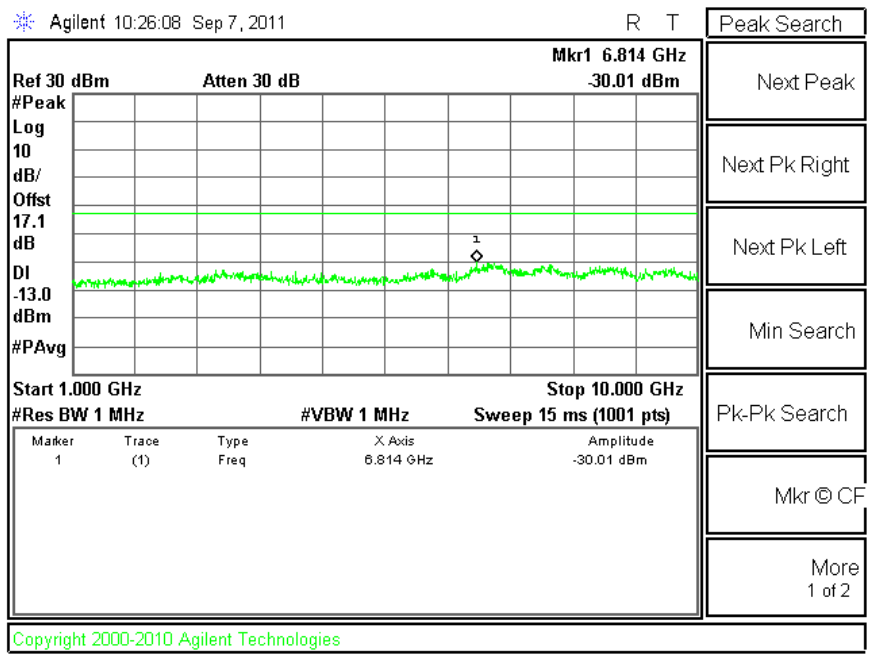
MID, RB50-0, 1000 TO 20000 MHz



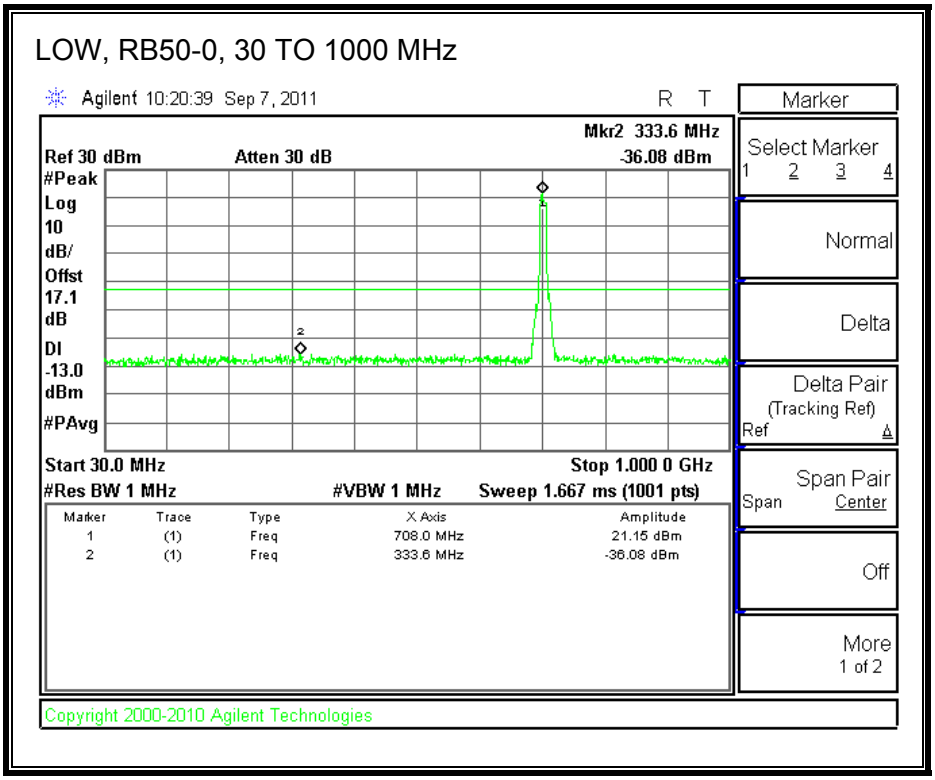
HIGH, RB50-0, 30 TO 1000 MHz

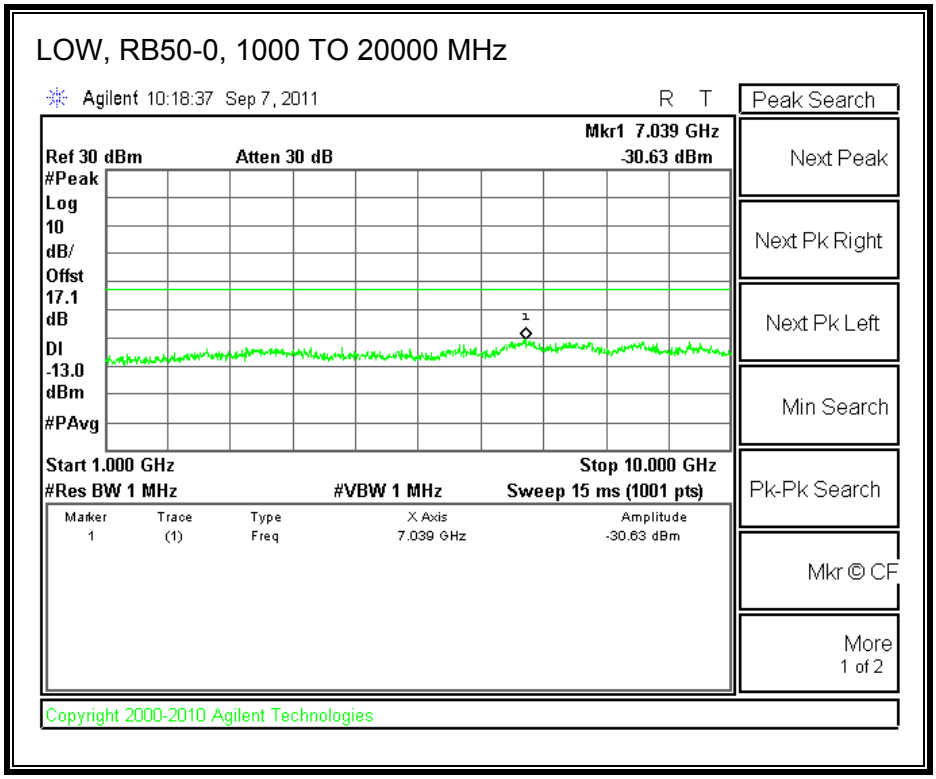


HIGH, RB50-0, 1000 TO 20000 MHz

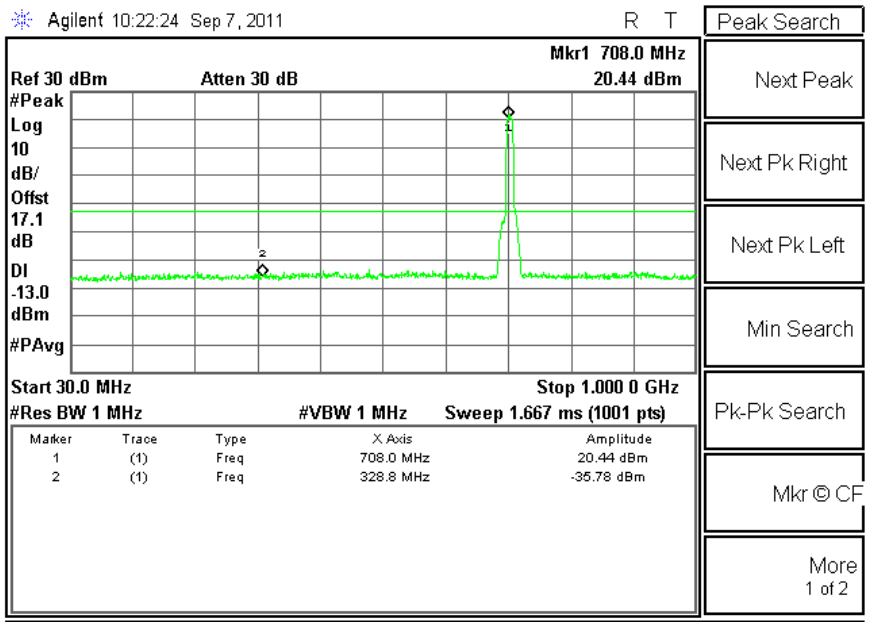


LTE 16QAM

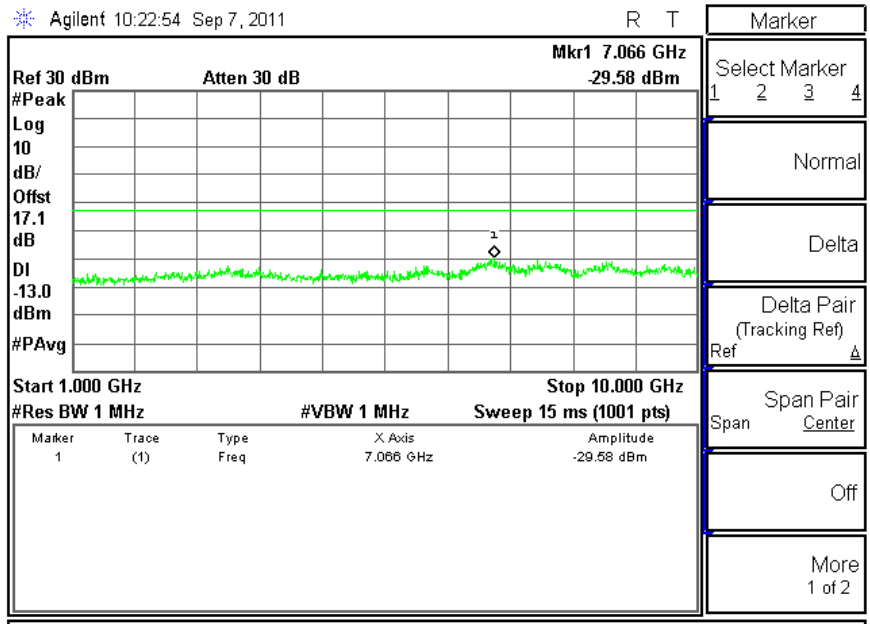




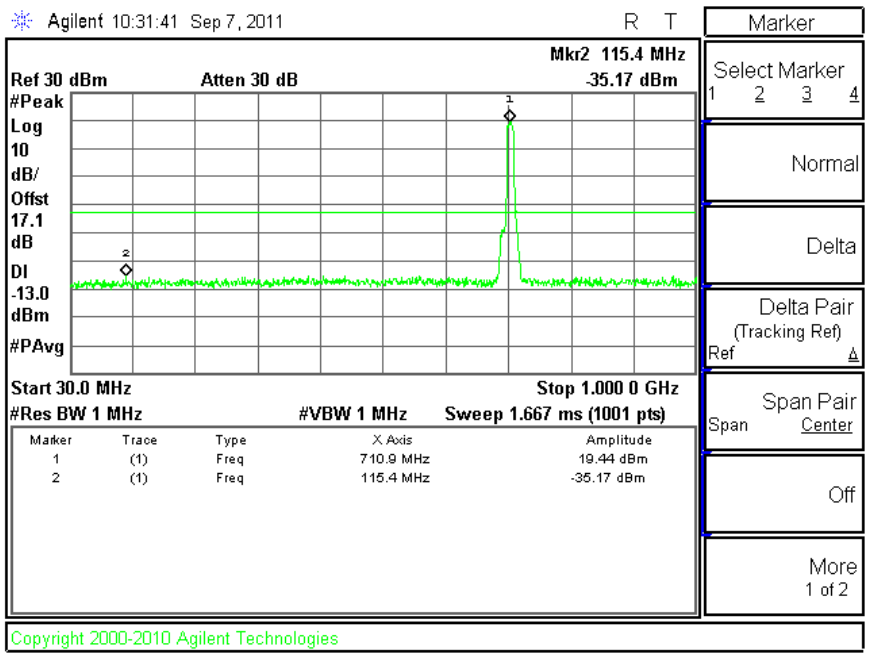
MID, RB50-0, 30 TO 1000 MHz



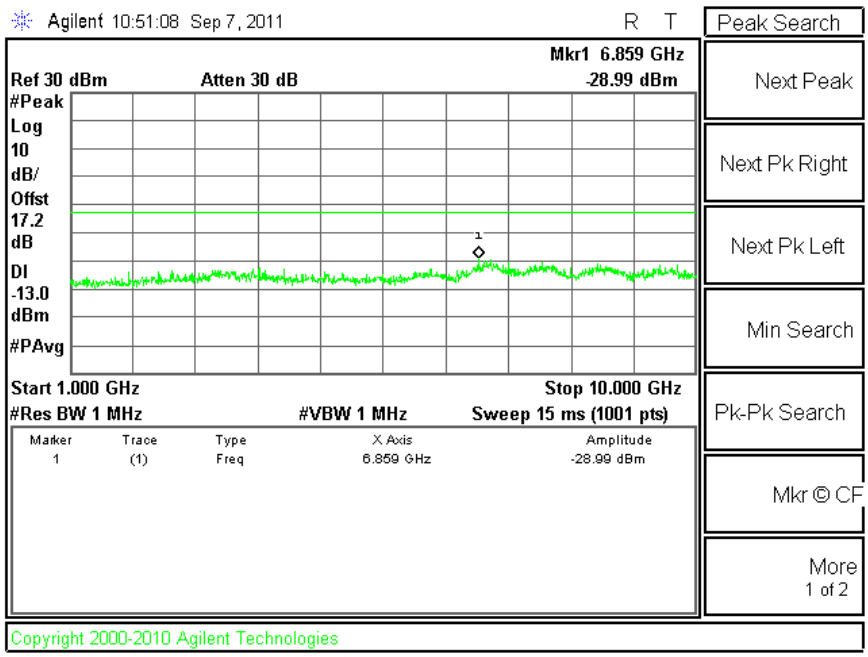
MID, RB50-0, 1000 TO 20000 MHz



HIGH, RB50-0, 30 TO 1000 MHz



HIGH, RB50-0, 1000 TO 200000 MHz



9. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

§22.355 & RSS-132 4.3 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

RSS-133 6.3 - The carrier frequency shall not depart from the reference frequency in excess of ±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.

TEST PROCEDURE

Use Agilent 8960 and CMW 500 with Frequency Error measurement capability.

- Temp. = −30° to +50°C
- Voltage = 3.3 Vdc (85% - 115%)

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC 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 +50ºC is reached.
Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

MODES TESTED

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

RESULTS

See the following pages.

CELL, GSM MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.599982MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	836.599996	-0.017	2.5
3.30	40	836.599990	-0.010	2.5
3.30	30	836.599986	-0.005	2.5
3.30	***20***	***836.599982***	***0***	2.5
3.30	10	836.599996	-0.017	2.5
3.30	0	836.600003	-0.025	2.5
3.30	-10	836.600008	-0.031	2.5
3.30	-20	836.600012	-0.036	2.5
3.30	-30	836.600015	-0.039	2.5

Reference Frequency: Cellular Mid Channel 836.599982MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.599982***	***0***	***2.5***
85%	20	836.599987	*-0.006*	2.5
115%	20	836.599992	*-0.012*	2.5

PCS, GSM MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999995Hz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	1879.999985	0.005	2.5
3.30	40	1879.999983	0.006	2.5
3.30	30	1879.999980	0.008	2.5
3.30	***20***	***1879.999995***	***0***	***2.5***
3.30	10	1880.000017	-0.012	2.5
3.30	0	1880.000025	-0.016	2.5
3.30	-10	1880.000037	-0.022	2.5
3.30	-20	1880.000045	-0.027	2.5
3.30	-30	1880.000055	-0.032	2.5

Reference Frequency: PCS Mid Channel 1879.999995MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1879.999995***	***0.00000***	***2.5***
85%	20	1879.999986	*0.00479*	2.5
115%	20	1879.999973	*0.01170*	2.5

CELL WCDMA – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.000004MHz @ 20°C Limit: to stay +- 2.5 ppm = 2090.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	836.000008	-0.005	2.5
3.30	40	836.000007	-0.003	2.5
3.30	30	836.000007	-0.004	2.5
3.30	***20***	***836.000004***	***0***	2.5
3.30	10	836.000008	-0.005	2.5
3.30	0	836.000006	-0.003	2.5
3.30	-10	836.000008	-0.005	2.5
3.30	-20	836.000008	-0.005	2.5
3.30	-30	836.000009	-0.006	2.5

Reference Frequency: Cellular Mid Channel 836.000004MHz @ 20°C Limit: to stay +- 2.5 ppm = 2090.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.000004***	***0***	***2.5***
85%	20	836.000008	*-0.005*	2.5
115%	20	836.000010	*-0.007*	2.5

PCS, WCDMA – MID CHANNEL

Reference Frequency: PCS Mid Channel 1880.0000047MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	1880.0000057	-0.0005	2.5
3.30	40	1880.0000051	-0.0002	2.5
3.30	30	1880.0000061	-0.0007	2.5
3.30	***20***	***1880.0000047***	***0***	***2.5***
3.30	10	1880.0000052	-0.0003	2.5
3.30	0	1880.0000055	-0.0004	2.5
3.30	-10	1880.0000065	-0.0009	2.5
3.30	-20	1880.0000067	-0.0011	2.5
3.30	-30	1880.0000065	-0.0009	2.5

Reference Frequency: PCS Mid Channel 1880.0000047MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1880.0000047***	***0***	***2.5***
85%	20	1880.0000090	-0.0023	2.5
115%	20	1880.0000043	0.0002	2.5

AWS, WCDMA – MID CHANNEL

Reference Frequency: AWS Mid Channel 1732.3999950MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4331.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	1732.3999953	-0.00014	2.5
3.30	40	1732.3999952	-0.00010	2.5
3.30	30	1732.3999958	-0.00044	2.5
3.30	***20***	***1732.3999950***	***0***	***2.5***
3.30	10	1732.3999946	0.00025	2.5
3.30	0	1732.3999941	0.00051	2.5
3.30	-10	1732.3999943	0.00039	2.5
3.30	-20	1732.3999948	0.00013	2.5
3.30	-30	1732.3999958	-0.00044	2.5

Reference Frequency: AWS Mid Channel 1732.3999950MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4331.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1732.3999950***	***0***	***2.5***
85%	20	1732.3999945	0.00027	2.5
115%	20	1732.3999955	-0.00027	2.5

LTE BAND 4 – 1732.5 MHz, 1.4MHz

Reference Frequency: LTE Band 4_Mid Channel 1732.500005MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.30	50	1732.499996	0.0050	2.5
3.30	40	1732.499999	0.0038	2.5
3.30	30	1732.500000	0.0028	2.5
3.30	***20***	***1732.500005***	***0***	2.5
3.30	10	1732.500003	0.0010	2.5
3.30	0	1732.500003	0.0013	2.5
3.30	-10	1732.500002	0.0019	2.5
3.30	-20	1732.500000	0.0032	2.5
3.30	-30	1732.499998	0.0039	2.5

Reference Frequency: LTE Band 4_Mid Channel 1732.500005MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1732.500005***	***0***	***2.5***
85%	20	1732.500016	*-0.0065*	2.5
115%	20	1732.499999	*0.0038*	2.5

LTE BAND 4 – 1732.5 MHZ, 20MHZ

Reference Frequency: LTE Band 4_Mid Channle 1732.499994MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.30	50	1732.499983	0.0066	2.5
3.30	40	1732.499984	0.0056	2.5
3.30	30	1732.499988	0.0032	2.5
3.30	***20***	***1732.499994***	***0***	2.5
3.30	10	1732.499992	0.0013	2.5
3.30	10	1732.499991	0.0017	2.5
3.30	10	1732.499991	0.0019	2.5
3.30	0	1732.499988	0.0032	2.5
3.30	-10	1732.499987	0.0039	2.5

Reference Frequency: LTE Band 4_Mid Channle 1732.499994MHzMHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1732.499994***	***0***	***2.5***
85%	20	1732.500021	*-0.0156*	2.5
115%	20	1732.499985	*0.0053*	2.5

LTE BAND 17 – 710 MHz, 5MHz

Reference Frequency: LTE Band 17_Mid Channe 710.000002MHz @ 20°C Limit: to stay +- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	710.000009	-0.009	2.5
3.30	40	710.000000	0.002	2.5
3.30	30	710.000004	-0.003	2.5
3.30	***20***	***710.000002***	***0***	2.5
3.30	10	710.000004	-0.002	2.5
3.30	0	709.999999	0.005	2.5
3.30	-10	710.000004	-0.003	2.5
3.30	-20	710.000000	0.003	2.5
3.30	-30	709.999998	0.006	2.5

Reference Frequency: LTE Band 17_Mid channel 710.000002MHz @ 20°C Limit: to stay +- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***710.000002***	***0***	***2.5***
85%	20	710.000019	-0.024	2.5
115%	20	709.999995	0.010	2.5

LTE BAND 17 – 710 MHz, 10MHz

Reference Frequency: LTE Band 17_Mid Channel 710.999998MHz @ 20°C Limit: to stay +- 2.5 ppm = 1777.500 Hz				
Power Supply (Vac)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	711.000002	-0.006	2.5
3.30	40	711.000002	-0.005	2.5
3.30	30	711.000000	-0.002	2.5
3.30	***20***	***710.999998***	***0***	2.5
3.30	10	711.000001	-0.005	2.5
3.30	0	710.999996	0.003	2.5
3.30	-10	710.999996	0.003	2.5
3.30	-20	710.999995	0.004	2.5
3.30	-30	710.999995	0.005	2.5

Reference Frequency: LTE Band 17_Mid Channel 710.999998MHz @ 20°C Limit: to stay +- 2.5 ppm = 1777.500 Hz				
Power Supply (Vac)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***710.999998***	***0***	***2.5***
85%	20	711.000010	*-0.017*	2.5
115%	20	710.999991	*0.009*	2.5

10. RADIATED TEST RESULTS

10.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50(d) (2)

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

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 603C Clause 2.2.17

MODES TESTED

- GPRS and EGPRS
- WCDMA REL. 99 and HSDPA
- LTE BAND 4 & BAND 17

RESULTS

CELLULAR BAND (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	**32.01**	1588.55
	192	836.60	31.36	1367.73
	251	848.80	31.60	1445.44
EGPRS	128	824.20	**28.78**	755.09
	192	836.60	28.06	639.73
	251	848.80	27.80	602.56
WCDMA, Rel 99	4357	826.40	28.43	696.63
	4405	836.00	**29.22**	835.60
	4455	846.00	27.36	544.50
WCDMA, HSDPA	4357	826.40	27.66	583.45
	4405	836.00	**27.94**	622.30
	4455	846.00	26.80	478.63

PCS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	28.23	665.27
	661	1880.00	**28.73**	746.45
	810	1909.80	28.46	701.46
EGPRS	512	1850.20	27.53	566.24
	661	1880.00	28.03	635.33
	810	1909.80	**28.28**	672.98
WCDMA,REL 99	9626	1852.40	**27.11**	514.04
	9800	1880.00	26.65	462.38
	9938	1907.60	26.95	495.45
WCDMA, HSDPA	9662	1852.40	**27.62**	578.10
	9800	1880.00	25.59	362.24
	9938	1907.60	25.59	362.24

AWS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
WCDMA,REL 99	1537	1712.40	27.39	548.28
	1637	1732.40	26.32	428.55
	1738	1752.60	27.16	520.00
WCDMA, HSDPA	1537	1712.40	28.40	691.83
	1637	1732.40	27.58	572.80
	1738	1752.60	28.11	647.14

EIRP LTE Band 17 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP	
			dBm	mW
5.0 MHZ BAND QPSK	12/6	706.5	**30.86**	1218.99
		710.0	24.92	310.46
		713.5	28.10	645.65
	25/0	706.5	30.45	1109.17
		710.0	26.30	426.58
		713.5	28.43	696.63
5.0 MHZ BAND 16QAM	12/6	706.5	**30.80**	1201.71
		710.0	25.01	316.96
		713.5	28.01	632.41
	25/0	706.5	30.13	1030.39
		710.0	25.05	319.89
		713.5	28.54	714.50

EIRP LTE Band 17 (10.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP	
			dBm	mW
10.0 MHZ BAND QPSK	25/12	709.0	**26.54**	450.82
		710.0	25.14	326.59
		711.0	25.86	385.48
	50/0	709.0	24.89	308.32
		710.0	25.52	356.45
		711.0	24.81	302.69
10.0 MHZ BAND 16QAM	25/12	709.0	25.32	340.41
		710.0	24.92	310.46
		711.0	24.82	303.39
	50/0	709.0	**25.49**	354.00
		710.0	25.17	328.85
		711.0	24.62	289.73

EIRP LTE Band 4 (1.4 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP	
			dBm	mW
1.4 MHZ BAND QPSK	3/1	1710.7	28.61	726.11
		1732.5	27.48	559.76
		1754.3	**29.49**	889.20
	6/0	1710.7	28.48	704.69
		1732.5	27.29	535.80
		1754.3	29.26	843.33
1.4 MHZ BAND 16QAM	3/1	1710.7	28.65	732.82
		1732.5	27.38	547.02
		1754.3	**29.53**	897.43
	6/0	1710.7	28.51	709.58
		1732.5	27.20	524.81
		1754.3	29.44	879.02

EIRP LTE Band 4 (3.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP	
			dBm	mW
3.0 MHZ BAND QPSK	8/4	1711.5	28.25	668.34
		1732.5	27.01	502.34
		1753.5	**28.87**	770.90
	15/0	1711.5	27.75	595.66
		1732.5	26.53	449.78
		1753.5	28.14	651.63
3.0 MHZ BAND 16QAM	8/4	1711.5	28.36	685.49
		1732.5	26.66	463.45
		1753.5	**28.88**	772.68
	15/0	1711.5	27.76	597.04
		1732.5	26.22	418.79
		1753.5	28.48	704.69

EIRP LTE Band 4 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP	
			dBm	mW
5.0 MHZ BAND QPSK	12/6	1712.5	29.02	797.99
		1732.5	27.32	539.51
		1752.5	29.27	845.28
	25/0	1712.5	29.28	847.23
		1732.5	27.75	595.66
		1752.5	**29.57**	905.73
5.0 MHZ BAND 16QAM	12/6	1712.5	29.10	812.83
		1732.5	27.43	553.35
		1752.5	**29.47**	885.12
	25/0	1712.5	28.93	781.63
		1732.5	27.45	555.90
		1752.5	29.34	859.01

EIRP LTE Band 4 (10.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP	
			dBm	mW
10.0 MHZ BAND QPSK	25/12	1715.0	27.96	625.17
		1732.5	26.51	447.71
		1750.0	27.22	527.23
	50/0	1715.0	29.04	801.68
		1732.5	28.67	736.21
		1750.0	**29.73**	939.72
10.0 MHZ BAND 16QAM	25/12	1715.0	28.18	657.66
		1732.5	26.63	460.26
		1750.0	27.25	530.88
	50/0	1715.0	**29.88**	972.75
		1732.5	29.35	860.99
		1750.0	29.35	860.99

EIRP LTE Band 4 (15.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP	
			dBm	mW
15.0 MHZ BAND QPSK	36/18	1717.5	27.27	533.33
		1732.5	25.67	368.98
		1747.5	26.00	398.11
	75/0	1717.5	**29.41**	872.97
		1732.5	28.41	693.43
		1747.5	29.06	805.38
15.0 MHZ BAND 16QAM	36/18	1717.5	27.73	592.93
		1732.5	25.76	376.70
		1747.5	26.32	428.55
	75/0	1717.5	29.47	885.12
		1732.5	28.50	707.95
		1747.5	**29.53**	897.43

EIRP LTE Band 4 (20.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP	
			dBm	mW
20.0 MHZ BAND QPSK	50/19	1720.0	**29.64**	920.45
		1732.5	29.16	824.14
		1745.0	28.76	751.62
	100/0	1720.0	28.17	656.15
		1732.5	28.15	653.13
		1745.0	27.68	586.14
20.0 MHZ BAND 16QAM	50/19	1720.0	**29.36**	862.98
		1732.5	28.73	746.45
		1745.0	27.90	616.60
	100/0	1720.0	29.05	803.53
		1732.5	28.11	647.14
		1745.0	28.62	727.78

ERP GPRS850 BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Novatel
Project #: 11U13889
Date: 11/03/11
Test Engineer: Chin Pang
Configuration: EUT and Antenna
Mode: TX, CELL BAND GPRS

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
Low Ch								
824.20	32.51	V	0.5	0.0	32.01	38.5	-6.4	
824.20	25.50	H	0.5	0.0	25.00	38.5	-13.4	
Mid Ch								
836.60	31.86	V	0.5	0.0	31.36	38.5	-7.1	
836.60	26.21	H	0.5	0.0	25.71	38.5	-12.7	
High Ch								
848.80	32.10	V	0.5	0.0	31.60	38.5	-6.8	
848.80	26.05	H	0.5	0.0	25.55	38.5	-12.9	

Rev. 3.17.11

ERP EGPRS850 BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Novatel
Project #: 11U13889
Date: 11/03/11
Test Engineer: Chin Pang
Configuration: EUT and Antenna
Mode: TX, CELL BAND EGPRS

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
Low Ch								
824.20	29.28	V	0.5	0.0	28.78	38.5	-9.7	
824.20	23.40	H	0.5	0.0	22.90	38.5	-15.5	
Mid Ch								
836.60	28.56	V	0.5	0.0	28.06	38.5	-10.4	
836.60	24.05	H	0.5	0.0	23.55	38.5	-14.9	
High Ch								
848.80	28.30	V	0.5	0.0	27.80	38.5	-10.6	
848.80	23.78	H	0.5	0.0	23.28	38.5	-15.2	

Rev. 3.17.11

ERP WCDMA REL 99, 850MHz BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Novatel
Project #: 11U13889
Date: 07/28/11
Test Engineer: Vien Tran
Configuration: EUTwith dipole antenna
Mode: WCDMA_Rel 99_Cell Band

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
826.60	28.93	V	0.5	0.0	28.43	38.5	-10.0	
826.60	21.19	H	0.5	0.0	20.69	38.5	-17.8	
836.60	29.72	V	0.5	0.0	29.22	38.5	-9.2	
836.60	22.09	H	0.5	0.0	21.59	38.5	-16.9	
846.60	27.86	V	0.5	0.0	27.36	38.5	-11.1	
846.60	20.22	H	0.5	0.0	19.72	38.5	-18.7	

Rev. 3.17.11

ERP WCDMA, HSDPA 850MHz BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company:	NOVATEL
Project #:	11U13889
Date:	09/18/11
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUTwith dipole antenna
Mode:	HSDPA_Rel 6_Cell Band

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
826.40	28.16	V	0.5	0.0	27.66	38.5	-10.8	
826.40	20.29	H	0.5	0.0	19.79	38.5	-18.7	
836.60	28.44	V	0.5	0.0	27.94	38.5	-10.5	
836.60	21.14	H	0.5	0.0	20.64	38.5	-17.8	
846.60	27.30	V	0.5	0.0	26.80	38.5	-11.7	
846.60	21.12	H	0.5	0.0	20.62	38.5	-17.8	

Rev. 3.17.11

EIRP GPRS1900 BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Novatel
Project #: 11U13889
Date: 11/03/11
Test Engineer: Chin Pang
Configuration: EUT and Antenna
Mode: TX, PCS BAND GPRS1900

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) 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	21.1	V	0.85	8.01	28.23	33.0	-4.8	
1.850	14.8	H	0.85	8.01	21.92	33.0	-11.1	
Mid Ch								
1.880	21.5	V	0.85	8.13	28.73	33.0	-4.3	
1.880	15.3	H	0.85	8.13	22.62	33.0	-10.4	
High Ch								
1.909	21.2	V	0.85	8.13	28.46	33.0	-4.5	
1.909	14.7	H	0.85	8.13	21.98	33.0	-11.0	

Rev. 3.17.11

EIRP EGPRS1900 BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Novatel
Project #: 11U13399
Date: 11/03/11
Test Engineer: Chin Pang
Configuration: EUT and Antenna
Mode: TX, PCS BAND EGPRS1900

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) 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	20.4	V	0.85	8.01	27.53	33.0	-5.5	
1.850	13.5	H	0.85	8.01	20.62	33.0	-12.4	
Mid Ch								
1.880	20.8	V	0.85	8.13	28.03	33.0	-5.0	
1.880	13.8	H	0.85	8.13	21.12	33.0	-11.9	
High Ch								
1.909	21.0	V	0.85	8.13	28.28	33.0	-4.7	
1.909	14.9	H	0.85	8.13	22.18	33.0	-10.8	

Rev. 3.17.11

EIRP WCDMA REL. 99 PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Novatel
Project #: 11U13889
Date: 07/28/11
Test Engineer: Vien Tran
Configuration: EUTwith dipole antenna
Mode: WCDMA_Rel 99_PCS Band

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) 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	20.0	V	0.85	8.01	27.11	33.0	-5.9	
1.852	14.2	H	0.85	8.01	21.32	33.0	-11.7	
1.880	19.4	V	0.85	8.07	26.65	33.0	-6.4	
1.880	14.4	H	0.85	8.07	21.62	33.0	-11.4	
1.908	19.7	V	0.85	8.12	26.95	33.0	-6.1	
1.908	12.6	H	0.85	8.12	19.87	33.0	-13.1	

Rev. 3.17.11

EIRP WCDMA HSDPA, PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/18/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: HSDPA_Rel 6_PCS Band

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) 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	20.5	V	0.85	8.01	27.62	33.0	-5.4	
1.852	16.6	H	0.85	8.01	23.72	33.0	-9.3	
1.880	18.4	V	0.85	8.07	25.59	33.0	-7.4	
1.880	15.8	H	0.85	8.07	23.01	33.0	-10.0	
1.908	18.3	V	0.85	8.12	25.59	33.0	-7.4	
1.908	15.7	H	0.85	8.12	22.99	33.0	-10.0	

Rev. 3.17.11

EIRP WCDMA REL. 99 AWS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: WCDMA_Rel 99_AWS Band

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	20.1	V	0.67	8.01	27.39	30.0	-2.6	
1.712	16.2	H	0.67	8.01	23.50	30.0	-6.5	
1.732	18.9	V	0.67	8.07	26.32	30.0	-3.7	
1.732	15.2	H	0.67	8.07	22.63	30.0	-7.4	
1.753	19.7	V	0.67	8.13	27.16	30.0	-2.8	
1.753	16.7	H	0.67	8.13	24.18	30.0	-5.8	

Rev. 1.24.7

EIRP WCDMA HSDPA, AWS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/18/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: HSDPA_Rel 6_AWS Band

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	21.1	V	0.67	8.01	28.40	30.0	-1.6	
1.712	17.3	H	0.67	8.01	24.68	30.0	-5.3	
1.732	20.2	V	0.67	8.07	27.58	30.0	-2.4	
1.732	15.9	H	0.67	8.07	23.27	30.0	-6.7	
1.753	20.7	V	0.67	8.13	28.11	30.0	-1.9	
1.753	17.9	H	0.67	8.13	25.33	30.0	-4.7	

Rev. 1.24.7

EIRP LTE QPSK Band 4 (1.4 MHz BAND WIDTH)

RB3-1

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_1.4 MHz BW_QPSK_RB#3_1 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.711	21.3	V	0.67	8.01	28.61	30.0	-1.4	
1.711	19.9	H	0.67	8.01	27.26	30.0	-2.7	
1.733	20.1	V	0.67	8.07	27.48	30.0	-2.5	
1.733	18.9	H	0.67	8.07	26.30	30.0	-3.7	
1.754	22.0	V	0.67	8.13	29.47	30.0	-0.5	
1.754	20.9	H	0.67	8.13	28.35	30.0	-1.7	

Rev. 1.24.7

RB6-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 08/30/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_1.4 MHz BW_QPSK_RB#6_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.711	21.1	V	0.67	8.01	28.48	30.0	-1.5	
1.711	19.7	H	0.67	8.01	26.99	30.0	-3.0	
1.733	19.9	V	0.67	8.07	27.29	30.0	-2.7	
1.733	18.6	H	0.67	8.07	26.02	30.0	-4.0	
1.754	21.8	V	0.67	8.13	29.26	30.0	-0.7	
1.754	20.7	H	0.67	8.13	28.20	30.0	-1.8	

Rev. 1.24.7

EIRP LTE 16QAM Band 4 (1.4 MHz BAND WIDTH)

RB3-1

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_1.4 MHz BW_16QAM_RB#3_1 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.711	21.3	V	0.67	8.01	28.65	30.0	-1.4	
1.711	19.9	H	0.67	8.01	27.26	30.0	-2.7	
1.733	20.0	V	0.67	8.07	27.38	30.0	-2.6	
1.733	18.8	H	0.67	8.07	26.24	30.0	-3.8	
1.754	22.1	V	0.67	8.13	29.53	30.0	-0.5	
1.754	21.0	H	0.67	8.13	28.41	30.0	-1.6	

Rev. 1.24.7

RB6-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_1.4 MHz BW_16QAM_RB#6_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.711	21.2	V	0.67	8.01	28.51	30.0	-1.5	
1.711	19.7	H	0.67	8.01	27.07	30.0	-2.9	
1.733	19.8	V	0.67	8.07	27.20	30.0	-2.8	
1.733	18.7	H	0.67	8.07	26.14	30.0	-3.9	
1.754	22.0	V	0.67	8.13	29.44	30.0	-0.6	
1.754	20.7	H	0.67	8.13	28.14	30.0	-1.9	

Rev. 1.24.7

EIRP LTE QPSK Band 4 (3.0 MHz BAND WIDTH)

RB8-4

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_3.0 MHz BW_QPSK_RB#8_4 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	20.9	V	0.67	8.01	28.25	30.0	-1.8	
1.712	19.7	H	0.67	8.01	27.03	30.0	-3.0	
1.733	19.6	V	0.67	8.07	27.01	30.0	-3.0	
1.733	19.0	H	0.67	8.07	26.44	30.0	-3.6	
1.754	21.4	V	0.67	8.13	28.87	30.0	-1.1	
1.754	20.4	H	0.67	8.13	27.83	30.0	-2.2	

Rev. 1.24.7

RB15-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_3.0 MHz BW_QPSK_RB#15_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	20.4	V	0.67	8.01	27.75	30.0	-2.3	
1.712	19.2	H	0.67	8.01	26.53	30.0	-3.5	
1.733	19.1	V	0.67	8.07	26.53	30.0	-3.5	
1.733	17.8	H	0.67	8.07	25.24	30.0	-4.8	
1.754	20.7	V	0.67	8.13	28.14	30.0	-1.9	
1.754	19.9	H	0.67	8.13	27.33	30.0	-2.7	

Rev. 1.24.7

EIRP LTE 16QAM Band 4 (3.0 MHz BAND WIDTRB1-0

RB8-4

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_3.0 MHz BW_18QAM_RB#8_4 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	21.0	V	0.67	8.01	28.36	30.0	-1.6	
1.712	19.7	H	0.67	8.01	27.03	30.0	-3.0	
1.733	19.3	V	0.67	8.07	26.66	30.0	-3.3	
1.733	18.0	H	0.67	8.07	25.44	30.0	-4.6	
1.754	21.4	V	0.67	8.13	28.88	30.0	-1.1	
1.754	20.3	H	0.67	8.13	27.73	30.0	-2.3	

Rev. 1.24.7

RB15-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_3.0 MHz BW_16QAM_RB#15_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	20.4	V	0.67	8.01	27.76	30.0	-2.2	
1.712	19.3	H	0.67	8.01	26.63	30.0	-3.4	
1.733	18.8	V	0.67	8.07	26.22	30.0	-3.8	
1.733	18.1	H	0.67	8.07	25.49	30.0	-4.5	
1.754	21.0	V	0.67	8.13	28.48	30.0	-1.5	
1.754	19.7	H	0.67	8.13	27.16	30.0	-2.8	

Rev. 1.24.7

EIRP LTE QPSK Band 4 (5.0 MHz BAND WIDTH)

RB12-6

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_5.0 MHz BW_QPSK_RB#12_6 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	21.7	V	0.67	8.01	29.02	30.0	-1.0	
1.713	20.6	H	0.67	8.01	27.93	30.0	-2.1	
1.733	19.9	V	0.67	8.07	27.32	30.0	-2.7	
1.733	18.8	H	0.67	8.07	26.24	30.0	-3.8	
1.753	21.8	V	0.67	8.13	29.27	30.0	-0.7	
1.753	20.8	H	0.67	8.13	28.23	30.0	-1.8	

Rev. 1.24.7

RB25-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_5.0 MHz BW_QPSK_RB#25_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	21.9	V	0.67	8.01	29.28	30.0	-0.7	
1.713	20.5	H	0.67	8.01	27.83	30.0	-2.2	
1.733	20.4	V	0.67	8.07	27.75	30.0	-2.3	
1.733	19.0	H	0.67	8.07	26.44	30.0	-3.6	
1.753	22.1	V	0.67	8.13	29.57	30.0	-0.4	
1.753	21.2	H	0.67	8.13	28.63	30.0	-1.4	

Rev. 1.24.7

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

RB12-6

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_5.0 MHz BW_16QAM_RB#12_6 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	21.8	V	0.67	8.01	29.10	30.0	-0.9	
1.713	20.3	H	0.67	8.01	27.63	30.0	-2.4	
1.733	20.0	V	0.67	8.07	27.43	30.0	-2.6	
1.733	18.8	H	0.67	8.07	26.24	30.0	-3.8	
1.753	22.0	V	0.67	8.13	29.47	30.0	-0.5	
1.753	21.0	H	0.67	8.13	28.43	30.0	-1.6	

Rev. 1.24.7

RB25-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/12/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_5.0 MHz BW_16QAM_RB#25_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	21.6	V	0.67	8.01	28.93	30.0	-1.1	
1.713	20.0	H	0.67	8.01	27.33	30.0	-2.7	
1.733	20.1	V	0.67	8.07	27.45	30.0	-2.6	
1.733	18.8	H	0.67	8.07	26.24	30.0	-3.8	
1.753	21.9	V	0.67	8.13	29.34	30.0	-0.7	
1.753	20.7	H	0.67	8.13	28.13	30.0	-1.9	

Rev. 1.24.7

EIRP LTE QPSK Band 4 (10MHz BANDWIDTH)

RB25-12

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_10.0 MHz BW_QPSK_RB#25_12 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	20.6	V	0.67	8.01	27.96	30.0	-2.0	
1.713	19.5	H	0.67	8.01	26.83	30.0	-3.2	
1.733	19.1	V	0.67	8.07	26.51	30.0	-3.5	
1.733	18.2	H	0.67	8.07	25.64	30.0	-4.4	
1.753	19.8	V	0.67	8.13	27.22	30.0	-2.8	
1.753	19.0	H	0.67	8.13	26.43	30.0	-3.6	

Rev. 1.24.7

RB50-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_10.0 MHz BW_QPSK_RB#50_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.715	21.7	V	0.67	8.01	29.04	30.0	-1.0	
1.715	20.2	H	0.67	8.01	27.53	30.0	-2.5	
1.733	21.3	V	0.67	8.07	28.67	30.0	-1.3	
1.733	19.9	H	0.67	8.07	27.34	30.0	-2.7	
1.750	22.3	V	0.67	8.13	29.73	30.0	-0.3	
1.750	21.4	H	0.67	8.13	28.83	30.0	-1.2	

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EIRP LTE 16QAM Band 4 (10MHz BAND WIDTH)

RB25-12

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_10.0 MHz BW_16QAM_RB#25_12 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	20.8	V	0.67	8.01	28.18	30.0	-1.8	
1.713	19.6	H	0.67	8.01	26.93	30.0	-3.1	
1.733	19.2	V	0.67	8.07	26.63	30.0	-3.4	
1.733	17.9	H	0.67	8.07	25.34	30.0	-4.7	
1.753	19.8	V	0.67	8.13	27.25	30.0	-2.8	
1.753	18.9	H	0.67	8.13	26.33	30.0	-3.7	

Rev. 1.24.7

RB50-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_10.0 MHz BW_16QAM_RB#50_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.715	22.5	V	0.67	8.01	29.88	30.0	-0.1	
1.715	21.0	H	0.67	8.01	28.33	30.0	-1.7	
1.733	22.0	V	0.67	8.07	29.35	30.0	-0.6	
1.733	20.8	H	0.67	8.07	28.24	30.0	-1.8	
1.750	21.9	V	0.67	8.13	29.35	30.0	-0.6	
1.750	20.6	H	0.67	8.13	28.03	30.0	-2.0	

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EIRP LTE QPSK Band 4 (15.0 MHz BAND WIDTH)

RB36-18

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_15.0 MHz BW_QPSK_RB#36_18 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.718	19.9	V	0.67	8.01	27.27	30.0	-2.7	
1.718	18.6	H	0.67	8.01	25.93	30.0	-4.1	
1.733	18.3	V	0.67	8.07	25.67	30.0	-4.3	
1.733	17.0	H	0.67	8.07	24.44	30.0	-5.6	
1.748	18.5	V	0.67	8.13	26.00	30.0	-4.0	
1.748	17.5	H	0.67	8.13	24.93	30.0	-5.1	

Rev. 1.24.7

RB75-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_15.0 MHz BW_QPSK_RB#75_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.715	22.1	V	0.67	8.01	29.41	30.0	-0.6	
1.715	20.7	H	0.67	8.01	28.03	30.0	-2.0	
1.733	21.0	V	0.67	8.07	28.41	30.0	-1.6	
1.733	19.7	H	0.67	8.07	27.14	30.0	-2.9	
1.750	21.6	V	0.67	8.13	29.06	30.0	-0.9	
1.750	20.6	H	0.67	8.13	28.03	30.0	-2.0	

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

RB36-18

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_15.0 MHz BW_16QAM_RB#36_19 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	20.4	V	0.67	8.01	27.73	30.0	-2.3	
1.713	19.0	H	0.67	8.01	26.33	30.0	-3.7	
1.733	18.4	V	0.67	8.07	25.76	30.0	-4.2	
1.733	17.3	H	0.67	8.07	24.74	30.0	-5.3	
1.753	18.9	V	0.67	8.13	26.32	30.0	-3.7	
1.753	18.1	H	0.67	8.13	25.53	30.0	-4.5	

Rev. 1.24.7

RB75-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_15.0 MHz BW_16QAM_RB#75_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.715	22.1	V	0.67	8.01	29.47	30.0	-0.5	
1.715	20.8	H	0.67	8.01	28.13	30.0	-1.9	
1.733	21.1	V	0.67	8.07	28.50	30.0	-1.5	
1.733	19.8	H	0.67	8.07	27.24	30.0	-2.8	
1.750	22.1	V	0.67	8.13	29.53	30.0	-0.5	
1.750	20.8	H	0.67	8.13	28.23	30.0	-1.8	

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EIRP LTE QPSK Band 4 (20.0 MHz BAND WIDTH)

RB50-19

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_20.0 MHz BW_QPSK_RB#50_19 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.720	22.3	V	0.67	8.01	29.64	30.0	-0.4	
1.720	19.1	H	0.67	8.01	26.48	30.0	-3.5	
1.733	21.8	V	0.67	8.07	29.16	30.0	-0.8	
1.733	19.6	H	0.67	8.07	26.96	30.0	-3.0	
1.745	21.3	V	0.67	8.13	28.76	30.0	-1.2	
1.745	20.5	H	0.67	8.13	27.98	30.0	-2.0	

Rev. 1.24.7

RB100-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_20 .0 MHz BW_QPSK_RB#100_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.720	20.8	V	0.67	8.01	28.17	30.0	-1.8	
1.720	18.6	H	0.67	8.01	25.94	30.0	-4.1	
1.733	20.8	V	0.67	8.07	28.15	30.0	-1.9	
1.733	17.7	H	0.67	8.07	25.12	30.0	-4.9	
1.745	20.2	V	0.67	8.13	27.68	30.0	-2.3	
1.745	19.2	H	0.67	8.13	26.64	30.0	-3.4	

Rev. 1.24.7

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

RB50-19

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_20.0 MHz BW_16QAM_RB#50_19 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.720	22.0	V	0.67	8.01	29.36	30.0	-0.6	
1.720	19.2	H	0.67	8.01	26.54	30.0	-3.5	
1.733	21.3	V	0.67	8.07	28.73	30.0	-1.3	
1.733	19.0	H	0.67	8.07	26.42	30.0	-3.6	
1.745	20.4	V	0.67	8.13	27.90	30.0	-2.1	
1.745	19.7	H	0.67	8.13	27.16	30.0	-2.8	

Rev. 1.24.7

RB100-0

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: NOVATEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 4_20.0 MHz BW_16QAM_RB#100_0 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.720	21.7	V	0.67	8.01	29.05	30.0	-1.0	
1.720	17.9	H	0.67	8.01	25.27	30.0	-4.7	
1.733	20.7	V	0.67	8.07	28.11	30.0	-1.9	
1.733	18.8	H	0.67	8.07	26.16	30.0	-3.8	
1.745	21.2	V	0.67	8.13	28.62	30.0	-1.4	
1.745	18.7	H	0.67	8.13	26.15	30.0	-3.9	

Rev. 1.24.7

EIRP LTE QPSK Band 17 (5.0 MHz BAND WIDTH)

RB12-6

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_5 MHz BW_ QPSK_RB12_6 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
706.50	31.36	V	0.5	0.0	30.86	34.8	-3.9	
706.50	27.42	H	0.5	0.0	26.92	34.8	-7.9	
710.00	25.42	V	0.5	0.0	24.92	34.8	-9.8	
710.00	24.44	H	0.5	0.0	23.94	34.8	-10.8	
713.50	28.60	V	0.5	0.0	28.10	34.8	-6.7	
713.50	26.30	H	0.5	0.0	25.80	34.8	-9.0	

Rev. 3.17.11

RB25-0

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_5 MHz BW_ QPSK_RB25_0 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
706.50	30.95	V	0.5	0.0	30.45	34.8	-4.3	
706.50	27.00	H	0.5	0.0	26.50	34.8	-8.3	
710.00	26.80	V	0.5	0.0	26.30	34.8	-8.5	
710.00	24.92	H	0.5	0.0	24.42	34.8	-10.3	
713.50	28.93	V	0.5	0.0	28.43	34.8	-6.3	
713.50	26.72	H	0.5	0.0	26.22	34.8	-8.6	

Rev. 3.17.11

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

RB12-6

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_5 MHz BW_ 16QAM_RB12_6 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
706.50	31.28	V	0.5	0.0	30.78	34.8	-4.0	
706.50	27.39	H	0.5	0.0	26.89	34.8	-7.9	
710.00	25.51	V	0.5	0.0	25.01	34.8	-9.8	
710.00	24.56	H	0.5	0.0	24.06	34.8	-10.7	
713.50	28.51	V	0.5	0.0	28.01	34.8	-6.8	
713.50	26.26	H	0.5	0.0	25.76	34.8	-9.0	

Rev. 3.17.11

RB25-0

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_5 MHz BW_ 16QAM_RB25_0 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
706.50	30.63	V	0.5	0.0	30.13	34.8	-4.6	
706.50	26.59	H	0.5	0.0	26.09	34.8	-8.7	
710.00	25.55	V	0.5	0.0	25.05	34.8	-9.7	
710.00	24.71	H	0.5	0.0	24.21	34.8	-10.6	
713.50	29.04	V	0.5	0.0	28.54	34.8	-6.2	
713.50	26.53	H	0.5	0.0	26.03	34.8	-8.7	

Rev. 3.17.11

EIRP LTE QPSK Band 17 (10.0 MHz BAND WIDTH)

RB25-12

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_10 MHz BW_ QPSK_RB25_12 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
709.00	27.04	V	0.5	0.0	26.54	34.8	-8.2	
709.00	24.82	H	0.5	0.0	24.32	34.8	-10.4	
710.00	25.64	V	0.5	0.0	25.14	34.8	-9.6	
710.00	25.62	H	0.5	0.0	25.12	34.8	-9.6	
711.00	26.36	V	0.5	0.0	25.86	34.8	-8.9	
711.00	24.71	H	0.5	0.0	24.21	34.8	-10.6	

Rev. 3.17.11

RB50-0

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_10 MHz BW_ QPSK_RB50_0 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
709.00	25.39	V	0.5	0.0	24.89	34.8	-9.9	
709.00	24.74	H	0.5	0.0	24.24	34.8	-10.5	
710.00	26.02	V	0.5	0.0	25.52	34.8	-9.2	
710.00	24.04	H	0.5	0.0	23.54	34.8	-11.2	
711.00	25.31	V	0.5	0.0	24.81	34.8	-10.0	
711.00	24.59	H	0.5	0.0	24.09	34.8	-10.7	

Rev. 3.17.11

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

RB25-12

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_10 MHz BW_ 16QAM_RB25_12 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
709.00	25.82	V	0.5	0.0	25.32	34.8	-9.4	
709.00	24.71	H	0.5	0.0	24.21	34.8	-10.6	
710.00	25.42	V	0.5	0.0	24.92	34.8	-9.8	
710.00	24.69	H	0.5	0.0	24.19	34.8	-10.6	
711.00	25.32	V	0.5	0.0	24.82	34.8	-9.9	
711.00	24.55	H	0.5	0.0	24.05	34.8	-10.7	

Rev. 3.17.11

RB50-0

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: NOVOTEL
Project #: 11U13889
Date: 09/13/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, LTE BAND 17_10 MHz BW_ 16QAM_RB50_0 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber 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
709.00	25.99	V	0.5	0.0	25.49	34.8	-9.3	
709.00	25.54	H	0.5	0.0	25.04	34.8	-9.7	
710.00	25.67	V	0.5	0.0	25.17	34.8	-9.6	
710.00	24.88	H	0.5	0.0	24.38	34.8	-10.4	
711.00	25.12	V	0.5	0.0	24.62	34.8	-10.1	
711.00	23.77	H	0.5	0.0	23.27	34.8	-11.5	

Rev. 3.17.11

10.1. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, & §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 log10(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
- WCDMA REL. 99 and HSDPA
- LTE BAND 4 & 17

RESULTS

ERP GPRS850 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Novatel
Project #:	11U13889
Date:	11/04/11
Test Engineer:	Chin Pang
Configuration:	EUT and Antenna
Mode:	TX, CELL BAND GPRS

Chamber	Pre-amplifer	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
Low Ch, (824.2MHz)									
1.648	-11.7	V	3.0	35.5	1.0	-46.3	-13.0	-33.3	
2.473	-7.5	V	3.0	35.4	1.0	-41.9	-13.0	-28.9	
1.648	-11.1	H	3.0	35.5	1.0	-45.6	-13.0	-32.6	
2.473	-14.8	H	3.0	35.4	1.0	-49.2	-13.0	-36.2	
Mid Ch, (836.6MHz)									
1.673	-9.9	V	3.0	35.5	1.0	-44.4	-13.0	-31.4	
2.510	-9.2	V	3.0	35.4	1.0	-43.6	-13.0	-30.6	
1.673	-7.0	H	3.0	35.5	1.0	-41.6	-13.0	-28.6	
2.510	-13.2	H	3.0	35.4	1.0	-47.6	-13.0	-34.6	
High Ch, (848.8MHz)									
1.698	-7.6	V	3.0	35.5	1.0	-42.1	-13.0	-29.1	
2.546	-7.0	V	3.0	35.4	1.0	-41.5	-13.0	-28.5	
1.698	-6.9	H	3.0	35.5	1.0	-41.4	-13.0	-28.4	
2.546	-11.9	H	3.0	35.4	1.0	-46.3	-13.0	-33.3	

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

ERP EGPRS850 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Novatel
Project #: 11U13889
Date: 11/04/11
Test Engineer: Chin Pang
Configuration: EUT and Antenna
Mode: TX, CELL BAND EGPRS

Chamber	Pre-amplifer	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
Low Ch, (824.2MHz)									
1.648	-17.0	V	3.0	35.5	1.0	-51.6	-13.0	-38.6	
2.473	-12.4	V	3.0	35.4	1.0	-46.8	-13.0	-33.8	
1.648	-13.8	H	3.0	35.5	1.0	-48.3	-13.0	-35.3	
2.473	-17.9	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
Mid Ch, (836.6MHz)									
1.673	-14.2	V	3.0	35.5	1.0	-48.7	-13.0	-35.7	
2.510	-13.2	V	3.0	35.4	1.0	-47.6	-13.0	-34.6	
1.673	-9.3	H	3.0	35.5	1.0	-43.9	-13.0	-30.9	
2.510	-18.1	H	3.0	35.4	1.0	-52.5	-13.0	-39.5	
High Ch, (848.8MHz)									
1.698	-9.9	V	3.0	35.5	1.0	-44.4	-13.0	-31.4	
2.546	-10.5	V	3.0	35.4	1.0	-45.0	-13.0	-32.0	
1.698	-11.8	H	3.0	35.5	1.0	-46.3	-13.0	-33.3	
2.546	-16.9	H	3.0	35.4	1.0	-51.3	-13.0	-38.3	

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

ERP WCDMA Rel 99, CELL BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Novatel
Project #: 11U13889
Date: 09/16/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT with Dipole Antenna
Mode: TX, CELL BAND WCDMA MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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
Low Ch, (826.4MHz)									
1.653	-7.9	V	3.0	38.1	1.0	-45.1	-13.0	-32.1	
2.479	-12.5	V	3.0	37.5	1.0	-49.0	-13.0	-36.0	
3.306	-16.0	V	3.0	37.1	1.0	-52.2	-13.0	-39.2	
4.132	-2.4	V	3.0	36.5	1.0	-37.9	-13.0	-24.9	
4.958	3.7	V	3.0	36.3	1.0	-31.7	-13.0	-18.7	
1.653	-9.8	H	3.0	38.1	1.0	-47.0	-13.0	-34.0	
4.132	-12.6	H	3.0	36.5	1.0	-48.2	-13.0	-35.2	
4.958	-8.6	H	3.0	36.3	1.0	-43.9	-13.0	-30.9	
Mid Ch, (836.6MHz)									
1.673	-10.1	V	3.0	38.1	1.0	-47.2	-13.0	-34.2	
2.510	-18.7	V	3.0	37.5	1.0	-55.2	-13.0	-42.2	
3.346	-15.6	V	3.0	37.1	1.0	-51.7	-13.0	-38.7	
4.183	-0.9	V	3.0	36.5	1.0	-36.4	-13.0	-23.4	
5.020	5.9	V	3.0	36.3	1.0	-29.4	-13.0	-16.4	
5.856	-13.4	V	3.0	36.3	1.0	-48.8	-13.0	-35.8	
6.693	-13.3	V	3.0	36.4	1.0	-48.7	-13.0	-35.7	
1.673	-13.9	H	3.0	38.1	1.0	-51.1	-13.0	-38.1	
4.183	-10.0	H	3.0	36.5	1.0	-45.6	-13.0	-32.6	
5.020	-7.6	H	3.0	36.3	1.0	-42.9	-13.0	-29.9	
High Ch, (846.6MHz)									
1.693	-9.5	V	3.0	38.1	1.0	-46.6	-13.0	-33.6	
2.540	-17.1	V	3.0	37.5	1.0	-53.5	-13.0	-40.5	
3.386	-12.3	V	3.0	37.1	1.0	-48.3	-13.0	-35.3	
4.233	3.3	V	3.0	36.5	1.0	-32.2	-13.0	-19.2	
5.080	2.0	V	3.0	36.3	1.0	-33.3	-13.0	-20.3	
1.693	-8.5	H	3.0	38.1	1.0	-45.6	-13.0	-32.6	
4.233	-7.5	H	3.0	36.5	1.0	-43.1	-13.0	-30.1	
5.080	-7.1	H	3.0	36.3	1.0	-42.4	-13.0	-29.4	

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

ERP HSDPA Rel 6, CELL BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Novatel
Project #: 11U13889
Date: 09/16/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT with Dipole Antenna
Mode: TX, CELL BAND HSDPA MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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
Low Ch, (826.4MHz)									
1.653	-6.5	V	3.0	38.1	1.0	-43.7	-13.0	-30.7	
2.479	-13.3	V	3.0	37.5	1.0	-49.7	-13.0	-36.7	
3.306	-13.9	V	3.0	37.1	1.0	-50.0	-13.0	-37.0	
4.132	-1.9	V	3.0	36.5	1.0	-37.4	-13.0	-24.4	
4.958	5.2	V	3.0	36.3	1.0	-30.1	-13.0	-17.1	
5.785	-16.2	V	3.0	36.3	1.0	-51.5	-13.0	-38.5	
1.653	-11.0	H	3.0	38.1	1.0	-48.1	-13.0	-35.1	
2.479	-19.6	H	3.0	37.5	1.0	-56.1	-13.0	-43.1	
3.306	-18.2	H	3.0	37.1	1.0	-54.4	-13.0	-41.4	
4.132	-11.3	H	3.0	36.5	1.0	-46.9	-13.0	-33.9	
4.958	-7.9	H	3.0	36.3	1.0	-43.2	-13.0	-30.2	
5.785	-14.9	H	3.0	36.3	1.0	-50.2	-13.0	-37.2	
Mid Ch, (836.6MHz)									
1.673	-10.5	V	3.0	38.1	1.0	-47.6	-13.0	-34.6	
2.510	-17.0	V	3.0	37.5	1.0	-53.5	-13.0	-40.5	
3.346	-14.5	V	3.0	37.1	1.0	-50.6	-13.0	-37.6	
4.183	1.8	V	3.0	36.5	1.0	-33.7	-13.0	-20.7	
5.020	7.8	V	3.0	36.3	1.0	-27.5	-13.0	-14.5	
5.856	-11.8	V	3.0	36.3	1.0	-47.1	-13.0	-34.1	
1.673	-14.9	H	3.0	38.1	1.0	-52.0	-13.0	-39.0	
2.510	-20.9	H	3.0	37.5	1.0	-57.4	-13.0	-44.4	
3.346	-5.6	H	3.0	37.1	1.0	-41.7	-13.0	-28.7	
4.183	-7.7	H	3.0	36.5	1.0	-43.2	-13.0	-30.2	
5.020	-5.8	H	3.0	36.3	1.0	-41.1	-13.0	-28.1	
High Ch, (846.6MHz)									
1.693	-6.7	V	3.0	38.1	1.0	-43.8	-13.0	-30.8	
2.540	-15.8	V	3.0	37.5	1.0	-52.3	-13.0	-39.3	
3.386	-11.2	V	3.0	37.1	1.0	-47.3	-13.0	-34.3	
4.233	3.7	V	3.0	36.5	1.0	-31.8	-13.0	-18.8	
5.080	4.7	V	3.0	36.3	1.0	-30.6	-13.0	-17.6	
5.926	-14.4	V	3.0	36.3	1.0	-49.8	-13.0	-36.8	
1.693	-14.1	H	3.0	38.1	1.0	-51.2	-13.0	-38.2	
2.540	-19.2	H	3.0	37.5	1.0	-55.7	-13.0	-42.7	
3.386	-16.3	H	3.0	37.1	1.0	-52.3	-13.0	-39.3	
4.233	-5.6	H	3.0	36.5	1.0	-41.1	-13.0	-28.1	
5.080	-5.0	H	3.0	36.3	1.0	-40.3	-13.0	-27.3	
5.926	-14.7	H	3.0	36.3	1.0	-50.0	-13.0	-37.0	

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

EIRP GPRS1900 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Novatel
Project #: 11U13889
Date: 11/04/11
Test Engineer: Chin Pang
Configuration: EUT and Antenna
Mode: TX, PCS BAND GPRS

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.2MHz)									
3.700	-11.7	V	3.0	35.4	1.0	-46.0	-13.0	-33.0	
5.551	-11.4	V	3.0	35.4	1.0	-45.8	-13.0	-32.8	
3.700	-16.7	H	3.0	35.4	1.0	-51.0	-13.0	-38.0	
5.551	-14.3	H	3.0	35.4	1.0	-48.7	-13.0	-35.7	
Mid Ch, (1880.0MHz)									
3.760	-9.7	V	3.0	35.3	1.0	-44.1	-13.0	-31.1	
5.640	-9.3	V	3.0	35.4	1.0	-43.7	-13.0	-30.7	
3.760	-15.7	H	3.0	35.3	1.0	-50.0	-13.0	-37.0	
5.640	-14.3	H	3.0	35.4	1.0	-48.8	-13.0	-35.8	
High Ch, (1909.8MHz)									
3.820	-11.0	V	3.0	35.3	1.0	-45.3	-13.0	-32.3	
5.729	-11.4	V	3.0	35.4	1.0	-45.9	-13.0	-32.9	
3.820	-15.3	H	3.0	35.3	1.0	-49.6	-13.0	-36.6	
5.729	-13.1	H	3.0	35.4	1.0	-47.5	-13.0	-34.5	

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

EIRP EGPRS1900 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Novatel
Project #: 11U13889
Date: 11/04/11
Test Engineer: Chin Pang
Configuration: EUT with Antenna
Mode: TX, PCS BAND EGPRS

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.2MHz)									
3.700	-13.9	V	3.0	35.4	1.0	-48.2	-13.0	-35.2	
5.551	-12.0	V	3.0	35.4	1.0	-46.4	-13.0	-33.4	
3.700	-16.7	H	3.0	35.4	1.0	-51.0	-13.0	-38.0	
5.551	-14.3	H	3.0	35.4	1.0	-48.7	-13.0	-35.7	
Mid Ch, (1880.0MHz)									
3.760	-12.0	V	3.0	35.3	1.0	-46.4	-13.0	-33.4	
5.640	-12.0	V	3.0	35.4	1.0	-46.4	-13.0	-33.4	
3.760	-17.6	H	3.0	35.3	1.0	-51.9	-13.0	-38.9	
5.640	-15.0	H	3.0	35.4	1.0	-49.5	-13.0	-36.5	
High Ch, (1909.8MHz)									
3.820	-13.2	V	3.0	35.3	1.0	-47.5	-13.0	-34.5	
5.729	-11.0	V	3.0	35.4	1.0	-45.5	-13.0	-32.5	
3.820	-16.7	H	3.0	35.3	1.0	-51.0	-13.0	-38.0	
5.729	-14.0	H	3.0	35.4	1.0	-48.4	-13.0	-35.4	

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

EIRP WCDMA Rel 99, PCS BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	NOVATEL
Project #:	11U13889
Date:	09/16/11
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH DIPOLE ANTENNA
Mode:	TX, PCS BAND WCDMA MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1854.2MHz)									
3.705	-11.1	V	3.0	35.4	1.0	-45.5	-13.0	-32.5	
5.557	-3.2	V	3.0	35.4	1.0	-37.6	-13.0	-24.6	
7.410	-12.0	V	3.0	35.7	1.0	-46.7	-13.0	-33.7	
3.705	-12.0	H	3.0	35.4	1.0	-46.3	-13.0	-33.3	
5.557	-12.8	H	3.0	35.4	1.0	-47.3	-13.0	-34.3	
7.410	-12.4	H	3.0	35.7	1.0	-47.1	-13.0	-34.1	
Mid Ch, (1880.0MHz)									
3.760	-7.9	V	3.0	35.3	1.0	-42.2	-13.0	-29.2	
5.640	-3.3	V	3.0	35.4	1.0	-37.7	-13.0	-24.7	
7.520	-9.3	V	3.0	35.7	1.0	-44.0	-13.0	-31.0	
3.760	-10.7	H	3.0	35.3	1.0	-45.0	-13.0	-32.0	
5.640	-10.4	H	3.0	35.4	1.0	-44.9	-13.0	-31.9	
7.520	-12.2	H	3.0	35.7	1.0	-46.9	-13.0	-33.9	
9.400	-10.2	H	3.0	35.6	1.0	-44.8	-13.0	-31.8	
High Ch, (1907.6MHz)									
3.815	-8.8	V	3.0	35.3	1.0	-43.1	-13.0	-30.1	
5.723	-8.7	V	3.0	35.4	1.0	-43.2	-13.0	-30.2	
7.630	-8.0	V	3.0	35.7	1.0	-42.7	-13.0	-29.7	
3.815	-10.6	H	3.0	35.3	1.0	-44.9	-13.0	-31.9	
5.723	-15.0	H	3.0	35.4	1.0	-49.5	-13.0	-36.5	
7.630	-11.1	H	3.0	35.7	1.0	-45.7	-13.0	-32.7	

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

EIRP HSDPA Rel 6; PCS BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVATEL
Project #: 11U13889
Date: 09/16/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH DIPOLE ANTENNA
Mode: TX, PCS BAND HSDPA MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1854.2MHz)									
3.705	-10.7	V	3.0	35.4	1.0	-45.0	-13.0	-32.0	
5.557	-2.9	V	3.0	35.4	1.0	-37.3	-13.0	-24.3	
7.410	-10.4	V	3.0	35.7	1.0	-45.1	-13.0	-32.1	
3.705	-11.6	H	3.0	35.4	1.0	-46.0	-13.0	-33.0	
5.557	-10.8	H	3.0	35.4	1.0	-45.2	-13.0	-32.2	
7.410	-11.5	H	3.0	35.7	1.0	-46.2	-13.0	-33.2	
Mid Ch, (1880.0MHz)									
3.760	-8.4	V	3.0	35.3	1.0	-42.7	-13.0	-29.7	
5.640	-3.0	V	3.0	35.4	1.0	-37.4	-13.0	-24.4	
7.520	-8.4	V	3.0	35.7	1.0	-43.1	-13.0	-30.1	
3.760	-9.9	H	3.0	35.3	1.0	-44.3	-13.0	-31.3	
5.640	-10.8	H	3.0	35.4	1.0	-45.2	-13.0	-32.2	
7.520	-10.9	H	3.0	35.7	1.0	-45.6	-13.0	-32.6	
High Ch, (1907.6MHz)									
3.815	-8.1	V	3.0	35.3	1.0	-42.4	-13.0	-29.4	
5.723	-6.0	V	3.0	35.4	1.0	-40.4	-13.0	-27.4	
7.630	-7.5	V	3.0	35.7	1.0	-42.2	-13.0	-29.2	
3.815	-9.6	H	3.0	35.3	1.0	-43.9	-13.0	-30.9	
5.723	-13.5	H	3.0	35.4	1.0	-48.0	-13.0	-35.0	
7.630	-11.8	H	3.0	35.7	1.0	-46.5	-13.0	-33.5	

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

EIRP WCDMA Rel 99, AWS BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVATEL
Project #: 11U13889
Date: 09/16/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH DIPOLE ANTENNA
Mode: TX, AWS BAND WCDMA MODE

Chamber	Pre-amplifer	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, (1712.4MHz)									
3.425	-11.2	V	3.0	35.5	1.0	-45.6	-13.0	-32.6	
5.137	-11.7	V	3.0	35.3	1.0	-46.0	-13.0	-33.0	
6.850	-3.6	V	3.0	35.7	1.0	-38.3	-13.0	-25.3	
8.562	-10.4	V	3.0	35.6	1.0	-45.1	-13.0	-32.1	
3.425	-15.5	H	3.0	35.5	1.0	-50.0	-13.0	-37.0	
5.137	-14.2	H	3.0	35.3	1.0	-48.5	-13.0	-35.5	
6.850	-10.5	H	3.0	35.7	1.0	-45.2	-13.0	-32.2	
8.562	-9.8	H	3.0	35.6	1.0	-44.5	-13.0	-31.5	
Mid Ch, (1732.4MHz)									
3.465	-13.4	V	3.0	35.5	1.0	-47.8	-13.0	-34.8	
5.197	-10.5	V	3.0	35.3	1.0	-44.8	-13.0	-31.8	
6.930	-3.1	V	3.0	35.7	1.0	-37.8	-13.0	-24.8	
8.662	-9.6	V	3.0	35.6	1.0	-44.2	-13.0	-31.2	
3.465	-16.6	H	3.0	35.5	1.0	-51.1	-13.0	-38.1	
5.197	-12.4	H	3.0	35.3	1.0	-46.8	-13.0	-33.8	
6.930	-10.9	H	3.0	35.7	1.0	-45.6	-13.0	-32.6	
8.662	-11.7	H	3.0	35.6	1.0	-46.3	-13.0	-33.3	
High Ch, (1752.6MHz)									
3.505	-10.0	V	3.0	35.4	1.0	-44.4	-13.0	-31.4	
5.258	-6.3	V	3.0	35.3	1.0	-40.6	-13.0	-27.6	
7.010	-4.6	V	3.0	35.7	1.0	-39.4	-13.0	-26.4	
8.763	-8.1	V	3.0	35.6	1.0	-42.8	-13.0	-29.8	
3.505	-14.0	H	3.0	35.4	1.0	-48.4	-13.0	-35.4	
5.258	-9.2	H	3.0	35.3	1.0	-43.5	-13.0	-30.5	
7.010	-9.3	H	3.0	35.7	1.0	-44.0	-13.0	-31.0	
8.763	-9.1	H	3.0	35.6	1.0	-43.7	-13.0	-30.7	

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

EIRP HSDPA Rel 6, AWS BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVATEL
Project #: 11U13889
Date: 09/16/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH DIPOLE ANTENNA
Mode: TX, AWS BAND HSDPA MODE

Chamber	Pre-amplifer	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, (1712.4MHz)									
3.425	-9.6	V	3.0	35.5	1.0	-44.1	-13.0	-31.1	
5.137	-5.9	V	3.0	35.3	1.0	-40.3	-13.0	-27.3	
6.850	-1.8	V	3.0	35.7	1.0	-36.5	-13.0	-23.5	
8.562	-10.7	V	3.0	35.6	1.0	-45.3	-13.0	-32.3	
3.425	-13.8	H	3.0	35.5	1.0	-48.2	-13.0	-35.2	
5.137	-10.9	H	3.0	35.3	1.0	-45.2	-13.0	-32.2	
6.850	-11.5	H	3.0	35.7	1.0	-46.2	-13.0	-33.2	
8.562	-11.0	H	3.0	35.6	1.0	-45.6	-13.0	-32.6	
Mid Ch, (1732.4MHz)									
3.465	-12.9	V	3.0	35.5	1.0	-47.3	-13.0	-34.3	
5.197	-5.2	V	3.0	35.3	1.0	-39.5	-13.0	-26.5	
6.930	-1.7	V	3.0	35.7	1.0	-36.4	-13.0	-23.4	
8.662	-8.5	V	3.0	35.6	1.0	-43.1	-13.0	-30.1	
3.465	-16.3	H	3.0	35.5	1.0	-50.8	-13.0	-37.8	
5.197	-6.7	H	3.0	35.3	1.0	-41.0	-13.0	-28.0	
6.930	-9.2	H	3.0	35.7	1.0	-44.0	-13.0	-31.0	
8.662	-10.7	H	3.0	35.6	1.0	-45.3	-13.0	-32.3	
High Ch, (1752.6MHz)									
3.505	-9.7	V	3.0	35.4	1.0	-44.1	-13.0	-31.1	
5.258	-4.5	V	3.0	35.3	1.0	-38.8	-13.0	-25.8	
7.010	-2.3	V	3.0	35.7	1.0	-37.0	-13.0	-24.0	
8.763	-9.1	V	3.0	35.6	1.0	-43.7	-13.0	-30.7	
3.505	-14.9	H	3.0	35.4	1.0	-49.3	-13.0	-36.3	
5.258	-10.0	H	3.0	35.3	1.0	-44.3	-13.0	-31.3	
7.010	-9.4	H	3.0	35.7	1.0	-44.2	-13.0	-31.2	
8.763	-11.2	H	3.0	35.6	1.0	-45.8	-13.0	-32.8	

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

EIRP LTE QPSK Band 4 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, QPSK_1.4 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1710.7MHz									
3.421	-4.3	V	3.0	37.0	1.0	-40.4	-13.0	-27.4	
5.132	-14.9	V	3.0	36.3	1.0	-50.2	-13.0	-37.2	
6.843	-6.2	V	3.0	36.5	1.0	-41.6	-13.0	-28.6	
8.554	-8.8	V	3.0	36.8	1.0	-44.7	-13.0	-31.7	
3.421	-8.1	H	3.0	37.0	1.0	-44.1	-13.0	-31.1	
5.132	-15.8	H	3.0	36.3	1.0	-51.0	-13.0	-38.0	
6.843	5.7	H	3.0	36.5	1.0	-29.8	-13.0	-16.8	
8.554	-12.5	H	3.0	36.8	1.0	-48.3	-13.0	-35.3	
Mid Ch, 1732.5MHz									
3.465	-4.9	V	3.0	37.0	1.0	-40.9	-13.0	-27.9	
5.198	-7.9	V	3.0	36.2	1.0	-43.2	-13.0	-30.2	
6.930	-4.5	V	3.0	36.5	1.0	-39.9	-13.0	-26.9	
8.663	-4.1	V	3.0	36.9	1.0	-39.9	-13.0	-26.9	
3.465	-10.9	H	3.0	37.0	1.0	-46.9	-13.0	-33.9	
5.198	-12.4	H	3.0	36.2	1.0	-47.6	-13.0	-34.6	
6.930	7.4	H	3.0	36.5	1.0	-28.1	-13.0	-15.1	
8.663	-10.9	H	3.0	36.9	1.0	-46.8	-13.0	-33.8	
High Ch, 1754.3MHz									
3.509	5.2	V	3.0	37.0	1.0	-30.8	-13.0	-17.8	
5.263	-5.2	V	3.0	36.3	1.0	-40.4	-13.0	-27.4	
7.017	0.2	V	3.0	36.5	1.0	-35.3	-13.0	-22.3	
8.772	-4.2	V	3.0	36.9	1.0	-40.1	-13.0	-27.1	
3.509	-4.0	V	3.0	37.0	1.0	-40.0	-13.0	-27.0	
5.263	-12.4	H	3.0	36.3	1.0	-47.7	-13.0	-34.7	
7.017	7.7	H	3.0	36.5	1.0	-27.8	-13.0	-14.8	
8.772	-6.2	H	3.0	36.9	1.0	-42.1	-13.0	-29.1	

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

EIRP LTE 16QAM Band 4 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 16QAM_1.4 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1710.7MHz									
3.421	0.6	V	3.0	37.0	1.0	-35.5	-13.0	-22.5	
5.132	-10.3	V	3.0	36.3	1.0	-45.5	-13.0	-32.5	
6.843	-5.2	V	3.0	36.5	1.0	-40.6	-13.0	-27.6	
8.554	-9.4	V	3.0	36.8	1.0	-45.2	-13.0	-32.2	
3.421	-8.2	H	3.0	37.0	1.0	-44.2	-13.0	-31.2	
5.132	-14.4	H	3.0	36.3	1.0	-49.7	-13.0	-36.7	
6.843	6.1	H	3.0	36.5	1.0	-29.3	-13.0	-16.3	
8.554	-9.7	H	3.0	36.8	1.0	-45.5	-13.0	-32.5	
Mid Ch, 1732.5MHz									
3.465	-5.1	V	3.0	37.0	1.0	-41.1	-13.0	-28.1	
5.198	-2.7	V	3.0	36.2	1.0	-38.0	-13.0	-25.0	
6.930	-2.3	V	3.0	36.5	1.0	-37.8	-13.0	-24.8	
8.663	-4.1	V	3.0	36.9	1.0	-39.9	-13.0	-26.9	
3.465	-12.1	H	3.0	37.0	1.0	-48.1	-13.0	-35.1	
5.198	-11.7	H	3.0	36.2	1.0	-46.9	-13.0	-33.9	
6.930	9.2	H	3.0	36.5	1.0	-26.2	-13.0	-13.2	
8.663	-7.5	H	3.0	36.9	1.0	-43.4	-13.0	-30.4	
High Ch, 1754.3MHz									
3.509	-3.2	V	3.0	37.0	1.0	-39.2	-13.0	-26.2	
5.263	-7.6	V	3.0	36.3	1.0	-42.8	-13.0	-29.8	
7.017	1.0	V	3.0	36.5	1.0	-34.5	-13.0	-21.5	
8.772	-0.7	V	3.0	36.9	1.0	-36.6	-13.0	-23.6	
3.509	-4.1	V	3.0	37.0	1.0	-40.1	-13.0	-27.1	
5.263	-9.9	H	3.0	36.3	1.0	-45.1	-13.0	-32.1	
7.017	8.5	H	3.0	36.5	1.0	-26.9	-13.0	-13.9	
8.772	-4.5	H	3.0	36.9	1.0	-40.4	-13.0	-27.4	

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

EIRP LTE QPSK Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, QPSK_3 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1711.5MHz									
3.423	-3.4	V	3.0	37.0	1.0	-39.5	-13.0	-26.5	
5.135	-10.4	V	3.0	36.3	1.0	-45.7	-13.0	-32.7	
6.846	-3.0	V	3.0	36.5	1.0	-38.4	-13.0	-25.4	
8.558	-6.3	V	3.0	36.8	1.0	-42.1	-13.0	-29.1	
3.423	-6.6	H	3.0	37.0	1.0	-42.6	-13.0	-29.6	
5.135	-14.1	H	3.0	36.3	1.0	-49.4	-13.0	-36.4	
6.846	6.3	H	3.0	36.5	1.0	-29.2	-13.0	-16.2	
8.558	-10.3	H	3.0	36.8	1.0	-46.1	-13.0	-33.1	
Mid Ch, 1732.5MHz									
3.465	-6.9	V	3.0	37.0	1.0	-42.9	-13.0	-29.9	
5.198	-9.2	V	3.0	36.2	1.0	-44.4	-13.0	-31.4	
6.930	-1.1	V	3.0	36.5	1.0	-36.6	-13.0	-23.6	
8.663	0.0	V	3.0	36.9	1.0	-35.8	-13.0	-22.8	
3.465	-9.8	H	3.0	37.0	1.0	-45.8	-13.0	-32.8	
5.198	-11.6	H	3.0	36.2	1.0	-46.9	-13.0	-33.9	
6.930	9.6	H	3.0	36.5	1.0	-25.9	-13.0	-12.9	
8.663	-8.2	H	3.0	36.9	1.0	-44.1	-13.0	-31.1	
High Ch, 1753.5MHz									
3.507	-1.1	V	3.0	37.0	1.0	-37.1	-13.0	-24.1	
5.261	-9.2	V	3.0	36.3	1.0	-44.5	-13.0	-31.5	
7.014	-0.2	V	3.0	36.5	1.0	-35.6	-13.0	-22.6	
8.768	-1.2	V	3.0	36.9	1.0	-37.1	-13.0	-24.1	
3.507	-4.5	H	3.0	37.0	1.0	-40.5	-13.0	-27.5	
5.261	-10.6	H	3.0	36.3	1.0	-45.9	-13.0	-32.9	
7.014	8.2	H	3.0	36.5	1.0	-27.3	-13.0	-14.3	
8.768	-5.4	H	3.0	36.9	1.0	-41.3	-13.0	-28.3	

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

EIRP LTE 16QAM Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 16QAM_3 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1711.5MHz									
3.423	-1.1	V	3.0	37.0	1.0	-37.1	-13.0	-24.1	
5.135	-11.9	V	3.0	36.3	1.0	-47.1	-13.0	-34.1	
6.846	-5.2	V	3.0	36.5	1.0	-40.6	-13.0	-27.6	
8.558	-8.9	V	3.0	36.8	1.0	-44.7	-13.0	-31.7	
3.423	-9.2	H	3.0	37.0	1.0	-45.2	-13.0	-32.2	
5.135	-14.2	H	3.0	36.3	1.0	-49.5	-13.0	-36.5	
6.846	5.2	H	3.0	36.5	1.0	-30.2	-13.0	-17.2	
8.558	-9.8	H	3.0	36.8	1.0	-45.6	-13.0	-32.6	
Mid Ch, 1732.5MHz									
3.465	-0.7	V	3.0	37.0	1.0	-36.7	-13.0	-23.7	
5.198	-4.6	V	3.0	36.2	1.0	-39.9	-13.0	-26.9	
6.930	-3.6	V	3.0	36.5	1.0	-39.0	-13.0	-26.0	
8.663	-3.7	V	3.0	36.9	1.0	-39.5	-13.0	-26.5	
3.465	-10.7	H	3.0	37.0	1.0	-46.7	-13.0	-33.7	
5.198	-11.7	H	3.0	36.2	1.0	-46.9	-13.0	-33.9	
6.930	10.3	H	3.0	36.5	1.0	-25.2	-13.0	-12.2	
8.663	-6.0	H	3.0	36.9	1.0	-41.9	-13.0	-28.9	
High Ch, 1753.5MHz									
3.507	-2.3	V	3.0	37.0	1.0	-38.2	-13.0	-25.2	
5.261	-10.4	V	3.0	36.3	1.0	-45.7	-13.0	-32.7	
7.014	-1.0	V	3.0	36.5	1.0	-36.5	-13.0	-23.5	
8.768	-0.6	V	3.0	36.9	1.0	-36.5	-13.0	-23.5	
3.507	-5.1	H	3.0	37.0	1.0	-41.1	-13.0	-28.1	
5.261	-10.8	H	3.0	36.3	1.0	-46.0	-13.0	-33.0	
7.014	7.7	H	3.0	36.5	1.0	-27.8	-13.0	-14.8	
8.768	-5.6	H	3.0	36.9	1.0	-41.5	-13.0	-28.5	

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

EIRP LTE QPSK Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, QPSK_5 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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									
3.425	-4.1	V	3.0	37.0	1.0	-40.2	-13.0	-27.2	
5.138	-14.3	V	3.0	36.3	1.0	-49.5	-13.0	-36.5	
6.850	-4.8	V	3.0	36.5	1.0	-40.3	-13.0	-27.3	
8.563	-6.7	V	3.0	36.8	1.0	-42.6	-13.0	-29.6	
3.425	-7.8	H	3.0	37.0	1.0	-43.8	-13.0	-30.8	
5.138	-14.6	H	3.0	36.3	1.0	-49.9	-13.0	-36.9	
6.850	4.5	H	3.0	36.5	1.0	-31.0	-13.0	-18.0	
8.563	-10.3	H	3.0	36.8	1.0	-46.1	-13.0	-33.1	
Mid Ch, 1732.5MHz									
3.465	-11.4	V	3.0	37.0	1.0	-47.4	-13.0	-34.4	
5.198	-7.2	V	3.0	36.2	1.0	-42.4	-13.0	-29.4	
6.930	-4.8	V	3.0	36.5	1.0	-40.3	-13.0	-27.3	
8.663	-2.0	V	3.0	36.9	1.0	-37.9	-13.0	-24.9	
3.465	-11.6	H	3.0	37.0	1.0	-47.6	-13.0	-34.6	
5.198	-10.4	H	3.0	36.2	1.0	-45.7	-13.0	-32.7	
6.930	9.1	H	3.0	36.5	1.0	-26.4	-13.0	-13.4	
8.663	-6.0	H	3.0	36.9	1.0	-41.9	-13.0	-28.9	
High Ch, 1752.5MHz									
3.505	-1.0	V	3.0	37.0	1.0	-37.0	-13.0	-24.0	
5.258	-9.3	V	3.0	36.3	1.0	-44.6	-13.0	-31.6	
7.010	-2.6	V	3.0	36.5	1.0	-38.1	-13.0	-25.1	
8.763	-1.8	V	3.0	36.9	1.0	-37.7	-13.0	-24.7	
3.505	-3.0	V	3.0	37.0	1.0	-39.0	-13.0	-26.0	
5.258	-13.1	V	3.0	36.3	1.0	-48.3	-13.0	-35.3	
7.010	7.3	V	3.0	36.5	1.0	-28.2	-13.0	-15.2	
8.763	-8.9	V	3.0	36.9	1.0	-44.8	-13.0	-31.8	

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

EIRP LTE 16QAM Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 16QAM_5 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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									
3.425	-5.7	V	3.0	37.0	1.0	-41.7	-13.0	-28.7	
5.138	-13.6	V	3.0	36.3	1.0	-48.9	-13.0	-35.9	
6.850	-6.0	V	3.0	36.5	1.0	-41.5	-13.0	-28.5	
8.563	-8.5	V	3.0	36.8	1.0	-44.4	-13.0	-31.4	
3.425	-6.9	H	3.0	37.0	1.0	-42.9	-13.0	-29.9	
5.138	-13.1	H	3.0	36.3	1.0	-48.4	-13.0	-35.4	
6.850	5.2	H	3.0	36.5	1.0	-30.3	-13.0	-17.3	
8.563	-12.1	H	3.0	36.8	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1732.5MHz									
3.465	-14.4	V	3.0	37.0	1.0	-50.4	-13.0	-37.4	
5.198	-10.4	V	3.0	36.2	1.0	-45.6	-13.0	-32.6	
6.930	-7.0	V	3.0	36.5	1.0	-42.5	-13.0	-29.5	
8.663	-1.4	V	3.0	36.9	1.0	-37.3	-13.0	-24.3	
3.465	-15.2	H	3.0	37.0	1.0	-51.2	-13.0	-38.2	
5.198	-12.5	H	3.0	36.2	1.0	-47.8	-13.0	-34.8	
6.930	7.3	H	3.0	36.5	1.0	-28.2	-13.0	-15.2	
8.663	-9.1	H	3.0	36.9	1.0	-44.9	-13.0	-31.9	
High Ch, 1752.5MHz									
3.505	2.5	V	3.0	37.0	1.0	-33.5	-13.0	-20.5	
5.258	-8.3	V	3.0	36.3	1.0	-43.5	-13.0	-30.5	
7.010	-1.9	V	3.0	36.5	1.0	-37.4	-13.0	-24.4	
8.763	-4.2	V	3.0	36.9	1.0	-40.1	-13.0	-27.1	
3.505	-6.5	H	3.0	37.0	1.0	-42.5	-13.0	-29.5	
5.258	-14.4	H	3.0	36.3	1.0	-49.6	-13.0	-36.6	
7.010	5.2	H	3.0	36.5	1.0	-30.3	-13.0	-17.3	
8.763	-7.9	H	3.0	36.9	1.0	-43.8	-13.0	-30.8	

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

EIRP LTE QPSK Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, QPSK_10 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1715.0MHz									
3.430	-3.1	V	3.0	37.0	1.0	-39.1	-13.0	-26.1	
5.145	-13.8	V	3.0	36.3	1.0	-49.1	-13.0	-36.1	
6.860	-5.2	V	3.0	36.5	1.0	-40.7	-13.0	-27.7	
8.575	-9.4	V	3.0	36.9	1.0	-45.2	-13.0	-32.2	
3.430	-7.9	H	3.0	37.0	1.0	-43.9	-13.0	-30.9	
5.145	-14.6	H	3.0	36.3	1.0	-49.8	-13.0	-36.8	
6.860	5.4	H	3.0	36.5	1.0	-30.0	-13.0	-17.0	
8.575	-11.9	H	3.0	36.9	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1732.5MHz									
3.465	-11.7	V	3.0	37.0	1.0	-47.7	-13.0	-34.7	
5.198	-6.6	V	3.0	36.2	1.0	-41.9	-13.0	-28.9	
6.930	-4.9	V	3.0	36.5	1.0	-40.4	-13.0	-27.4	
8.663	-1.4	V	3.0	36.9	1.0	-37.3	-13.0	-24.3	
3.465	-14.2	H	3.0	37.0	1.0	-50.2	-13.0	-37.2	
5.198	-11.3	H	3.0	36.2	1.0	-46.5	-13.0	-33.5	
6.930	9.6	H	3.0	36.5	1.0	-25.8	-13.0	-12.8	
8.663	-7.0	H	3.0	36.9	1.0	-42.9	-13.0	-29.9	
High Ch, 1750.0MHz									
3.500	-3.9	V	3.0	37.0	1.0	-39.9	-13.0	-26.9	
5.250	-13.8	V	3.0	36.3	1.0	-49.0	-13.0	-36.0	
7.000	-5.1	V	3.0	36.5	1.0	-40.6	-13.0	-27.6	
8.750	-7.8	V	3.0	36.9	1.0	-43.7	-13.0	-30.7	
3.500	-7.6	H	3.0	37.0	1.0	-43.6	-13.0	-30.6	
5.250	-15.9	H	3.0	36.3	1.0	-51.1	-13.0	-38.1	
7.000	2.3	H	3.0	36.5	1.0	-33.2	-13.0	-20.2	
8.750	-10.3	H	3.0	36.9	1.0	-46.2	-13.0	-33.2	

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

EIRP LTE 16QAM Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 16QAM_10 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1715.0MHz									
3.430	1.0	V	3.0	37.0	1.0	-35.0	-13.0	-22.0	
5.145	-11.3	V	3.0	36.3	1.0	-46.5	-13.0	-33.5	
6.860	-5.9	V	3.0	36.5	1.0	-41.4	-13.0	-28.4	
8.575	-8.8	V	3.0	36.9	1.0	-44.6	-13.0	-31.6	
3.430	-7.6	H	3.0	37.0	1.0	-43.6	-13.0	-30.6	
5.145	-17.3	H	3.0	36.3	1.0	-52.5	-13.0	-39.5	
6.860	5.5	H	3.0	36.5	1.0	-29.9	-13.0	-16.9	
8.575	-11.8	H	3.0	36.9	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1732.5MHz									
3.465	-12.1	V	3.0	37.0	1.0	-48.1	-13.0	-35.1	
5.198	-5.5	V	3.0	36.2	1.0	-40.7	-13.0	-27.7	
6.930	-4.6	V	3.0	36.5	1.0	-40.1	-13.0	-27.1	
8.663	-2.9	V	3.0	36.9	1.0	-38.8	-13.0	-25.8	
3.465	47.3	H	3.0	37.0	1.0	11.3	-13.0	24.3	
5.198	-7.9	H	3.0	36.2	1.0	-43.1	-13.0	-30.1	
6.930	6.1	H	3.0	36.5	1.0	-29.4	-13.0	-16.4	
8.663	-8.4	H	3.0	36.9	1.0	-44.2	-13.0	-31.2	
High Ch, 1750.0MHz									
3.500	-4.8	V	3.0	37.0	1.0	-40.7	-13.0	-27.7	
5.250	-14.2	V	3.0	36.3	1.0	-49.4	-13.0	-36.4	
7.000	-7.6	V	3.0	36.5	1.0	-43.1	-13.0	-30.1	
8.750	-8.5	V	3.0	36.9	1.0	-44.4	-13.0	-31.4	
3.500	-8.0	H	3.0	37.0	1.0	-44.0	-13.0	-31.0	
5.250	-15.6	H	3.0	36.3	1.0	-50.9	-13.0	-37.9	
7.000	3.0	H	3.0	36.5	1.0	-32.5	-13.0	-19.5	
8.750	-10.2	H	3.0	36.9	1.0	-46.1	-13.0	-33.1	

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

EIRP LTE QPSK Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, QPSK_15 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1717.5MHz									
3.435	-10.8	V	3.0	37.0	1.0	-46.8	-13.0	-33.8	
5.153	-10.9	V	3.0	36.3	1.0	-46.1	-13.0	-33.1	
6.870	-5.5	V	3.0	36.5	1.0	-40.9	-13.0	-27.9	
8.588	-7.1	V	3.0	36.9	1.0	-43.0	-13.0	-30.0	
3.435	-12.6	H	3.0	37.0	1.0	-48.7	-13.0	-35.7	
5.153	-14.0	H	3.0	36.3	1.0	-49.2	-13.0	-36.2	
6.870	5.4	H	3.0	36.5	1.0	-30.1	-13.0	-17.1	
8.588	-10.6	H	3.0	36.9	1.0	-46.4	-13.0	-33.4	
Mid Ch, 1732.5MHz									
3.465	-6.9	V	3.0	37.0	1.0	-42.9	-13.0	-29.9	
5.198	-12.3	V	3.0	36.2	1.0	-47.6	-13.0	-34.6	
6.930	-0.4	V	3.0	36.5	1.0	-35.8	-13.0	-22.8	
8.663	-3.8	V	3.0	36.9	1.0	-39.6	-13.0	-26.6	
3.465	-9.3	H	3.0	37.0	1.0	-45.3	-13.0	-32.3	
5.198	-13.5	H	3.0	36.2	1.0	-48.7	-13.0	-35.7	
6.930	7.4	H	3.0	36.5	1.0	-28.1	-13.0	-15.1	
8.663	-8.4	H	3.0	36.9	1.0	-44.3	-13.0	-31.3	
High Ch, 1747.5MHz									
3.495	-14.2	V	3.0	37.0	1.0	-50.2	-13.0	-37.2	
5.243	-6.7	V	3.0	36.3	1.0	-42.0	-13.0	-29.0	
6.990	-8.6	V	3.0	36.5	1.0	-44.1	-13.0	-31.1	
8.738	-5.7	V	3.0	36.9	1.0	-41.6	-13.0	-28.6	
3.495	-13.8	H	3.0	37.0	1.0	-49.8	-13.0	-36.8	
5.243	-9.8	H	3.0	36.3	1.0	-45.0	-13.0	-32.0	
6.990	5.7	H	3.0	36.5	1.0	-29.7	-13.0	-16.7	
8.738	-9.3	H	3.0	36.9	1.0	-45.2	-13.0	-32.2	

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

EIRP LTE 16QAM Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 16QAM_15 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1717.5MHz									
3.435	-12.3	V	3.0	37.0	1.0	-48.3	-13.0	-35.3	
5.153	-12.2	V	3.0	36.3	1.0	-47.4	-13.0	-34.4	
6.870	-6.4	V	3.0	36.5	1.0	-41.9	-13.0	-28.9	
8.588	-8.1	V	3.0	36.9	1.0	-43.9	-13.0	-30.9	
3.435	-13.6	H	3.0	37.0	1.0	-49.6	-13.0	-36.6	
5.153	-13.6	H	3.0	36.3	1.0	-48.8	-13.0	-35.8	
6.870	5.9	H	3.0	36.5	1.0	-29.6	-13.0	-16.6	
8.588	-11.5	H	3.0	36.9	1.0	-47.3	-13.0	-34.3	
Mid Ch, 1732.5MHz									
3.465	-2.6	V	3.0	37.0	1.0	-38.6	-13.0	-25.6	
5.198	-9.3	V	3.0	36.2	1.0	-44.5	-13.0	-31.5	
6.930	-3.6	V	3.0	36.5	1.0	-39.1	-13.0	-26.1	
8.663	-4.0	V	3.0	36.9	1.0	-39.8	-13.0	-26.8	
3.465	-8.8	H	3.0	37.0	1.0	-44.8	-13.0	-31.8	
5.198	-11.7	H	3.0	36.2	1.0	-47.0	-13.0	-34.0	
6.930	8.7	H	3.0	36.5	1.0	-26.7	-13.0	-13.7	
8.663	-10.2	H	3.0	36.9	1.0	-46.1	-13.0	-33.1	
High Ch, 1747.5MHz									
3.495	-13.5	V	3.0	37.0	1.0	-49.5	-13.0	-36.5	
5.243	-10.0	V	3.0	36.3	1.0	-45.2	-13.0	-32.2	
6.990	-9.5	V	3.0	36.5	1.0	-45.0	-13.0	-32.0	
8.738	-3.9	V	3.0	36.9	1.0	-39.8	-13.0	-26.8	
3.495	-17.0	H	3.0	37.0	1.0	-53.0	-13.0	-40.0	
5.243	-13.1	H	3.0	36.3	1.0	-48.3	-13.0	-35.3	
6.990	5.1	H	3.0	36.5	1.0	-30.3	-13.0	-17.3	
8.738	-9.8	H	3.0	36.9	1.0	-45.7	-13.0	-32.7	

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

EIRP LTE QPSK Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, QPSK_20 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1720.0MHz									
3.440	-2.4	V	3.0	37.0	1.0	-38.4	-13.0	-25.4	
5.160	-12.4	V	3.0	36.3	1.0	-47.6	-13.0	-34.6	
6.880	-4.5	V	3.0	36.5	1.0	-40.0	-13.0	-27.0	
8.600	-7.9	V	3.0	36.9	1.0	-43.7	-13.0	-30.7	
3.440	-8.8	H	3.0	37.0	1.0	-44.8	-13.0	-31.8	
5.160	-15.5	H	3.0	36.3	1.0	-50.8	-13.0	-37.8	
6.880	6.0	H	3.0	36.5	1.0	-29.5	-13.0	-16.5	
8.600	-10.8	H	3.0	36.9	1.0	-46.7	-13.0	-33.7	
Mid Ch, 1732.5MHz									
3.465	0.2	V	3.0	37.0	1.0	-35.8	-13.0	-22.8	
5.198	-8.6	V	3.0	36.2	1.0	-43.8	-13.0	-30.8	
6.930	-2.1	V	3.0	36.5	1.0	-37.6	-13.0	-24.6	
8.663	-2.0	V	3.0	36.9	1.0	-37.8	-13.0	-24.8	
3.465	-8.4	H	3.0	37.0	1.0	-44.4	-13.0	-31.4	
5.198	-13.9	H	3.0	36.2	1.0	-49.1	-13.0	-36.1	
6.930	10.2	H	3.0	36.5	1.0	-25.3	-13.0	-12.3	
8.663	-11.5	H	3.0	36.9	1.0	-47.4	-13.0	-34.4	
High Ch, 1745.0MHz									
3.490	-5.7	V	3.0	37.0	1.0	-41.7	-13.0	-28.7	
5.235	-7.3	V	3.0	36.3	1.0	-42.6	-13.0	-29.6	
6.980	-6.1	V	3.0	36.5	1.0	-41.6	-13.0	-28.6	
8.725	-5.4	V	3.0	36.9	1.0	-41.3	-13.0	-28.3	
3.490	-11.4	H	3.0	37.0	1.0	-47.4	-13.0	-34.4	
5.235	-11.3	H	3.0	36.3	1.0	-46.5	-13.0	-33.5	
6.980	8.3	H	3.0	36.5	1.0	-27.2	-13.0	-14.2	
8.725	-9.9	H	3.0	36.9	1.0	-45.8	-13.0	-32.8	

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

EIRP LTE 16QAM Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: NOVOTEL
Project #: 11U13889
Date: 09/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 16QAM_20 MHz_RB#1_0 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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, 1720.0MHz									
3.440	-4.3	V	3.0	37.0	1.0	-40.3	-13.0	-27.3	
5.160	-11.8	V	3.0	36.3	1.0	-47.0	-13.0	-34.0	
6.880	-1.5	V	3.0	36.5	1.0	-37.0	-13.0	-24.0	
8.600	-6.2	V	3.0	36.9	1.0	-42.1	-13.0	-29.1	
3.440	-9.0	H	3.0	37.0	1.0	-45.0	-13.0	-32.0	
5.160	-12.9	H	3.0	36.3	1.0	-48.1	-13.0	-35.1	
6.880	7.7	H	3.0	36.5	1.0	-27.8	-13.0	-14.8	
8.600	-10.0	H	3.0	36.9	1.0	-45.8	-13.0	-32.8	
Mid Ch, 1732.5MHz									
3.465	-4.4	V	3.0	37.0	1.0	-40.4	-13.0	-27.4	
5.198	-7.7	V	3.0	36.2	1.0	-42.9	-13.0	-29.9	
6.930	-3.7	V	3.0	36.5	1.0	-39.2	-13.0	-26.2	
8.663	-0.9	V	3.0	36.9	1.0	-36.8	-13.0	-23.8	
3.465	-8.0	H	3.0	37.0	1.0	-44.0	-13.0	-31.0	
5.198	-12.0	H	3.0	36.2	1.0	-47.2	-13.0	-34.2	
6.930	9.3	H	3.0	36.5	1.0	-26.1	-13.0	-13.1	
8.663	-6.4	H	3.0	36.9	1.0	-42.3	-13.0	-29.3	
High Ch, 1745.0MHz									
3.490	-6.4	V	3.0	37.0	1.0	-42.4	-13.0	-29.4	
5.235	-7.4	V	3.0	36.3	1.0	-42.6	-13.0	-29.6	
6.980	-4.9	V	3.0	36.5	1.0	-40.4	-13.0	-27.4	
8.725	-3.7	V	3.0	36.9	1.0	-39.6	-13.0	-26.6	
3.490	-17.0	H	3.0	37.0	1.0	-52.9	-13.0	-39.9	
5.235	4.8	H	3.0	36.3	1.0	-30.5	-13.0	-17.5	
6.980	-10.2	H	3.0	36.5	1.0	-45.7	-13.0	-32.7	
8.725		H	3.0	36.9	1.0	-35.9	-13.0	-22.9	

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

EIRP LTE QPSK Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG ELECTRONICS
Project #: 11U13917
Date: 08/03/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, QPSK_5 MHz_RB1_0 MODE

Chamber	Pre-amplifer	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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch (706.5 MHz)									
1.413	-45.9	V	3.0	0.0	0.0	-45.9	-13.0	-32.9	
2.120	-18.3	V	3.0	35.4	1.0	-52.6	-13.0	-39.6	
1.413	-45.8	H	3.0	0.0	0.0	-45.8	-13.0	-32.8	
2.120	-23.1	H	3.0	35.4	1.0	-57.5	-13.0	-44.5	
Mid Ch (710.0 MHz)									
1.420	-44.1	V	3.0	0.0	0.0	-44.1	-13.0	-31.1	
2.130	-20.5	V	3.0	35.4	1.0	-54.9	-13.0	-41.9	
1.420	-43.8	H	3.0	0.0	0.0	-43.8	-13.0	-30.8	
2.130	-24.7	H	3.0	35.4	1.0	-59.1	-13.0	-46.1	
Hi Ch (713.5 MHz)									
1.427	-45.0	V	3.0	0.0	0.0	-45.0	-13.0	-32.0	
2.141	-21.4	V	3.0	35.4	1.0	-55.8	-13.0	-42.8	
1.427	-46.6	H	3.0	0.0	0.0	-46.6	-13.0	-33.6	
2.141	-23.4	H	3.0	35.4	1.0	-57.7	-13.0	-44.7	

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

EIRP LTE 16QAM Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG ELECTRONICS
Project #: 11U13917
Date: 08/03/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 16QAM_5 MHz_RB1_0 MODE

Chamber	Pre-amplifer	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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch (706.5 MHz)									
1.413	-46.2	V	3.0	0.0	0.0	-46.2	-13.0	-33.2	
2.120	-20.0	V	3.0	35.4	1.0	-54.4	-13.0	-41.4	
1.413	-44.9	H	3.0	0.0	0.0	-44.9	-13.0	-31.9	
2.120	-23.9	H	3.0	35.4	1.0	-58.3	-13.0	-45.3	
Mid Ch (710.0 MHz)									
1.420	-44.9	V	3.0	0.0	0.0	-44.9	-13.0	-31.9	
2.130	-20.8	V	3.0	35.4	1.0	-55.1	-13.0	-42.1	
1.420	-42.8	H	3.0	0.0	0.0	-42.8	-13.0	-29.8	
2.130	-25.3	H	3.0	35.4	1.0	-59.7	-13.0	-46.7	
Hi Ch (713.5 MHz)									
1.427	-45.2	V	3.0	0.0	0.0	-45.2	-13.0	-32.2	
2.141	-18.7	V	3.0	35.4	1.0	-53.1	-13.0	-40.1	
1.427	-46.4	H	3.0	0.0	0.0	-46.4	-13.0	-33.4	
2.141	-24.9	H	3.0	35.4	1.0	-59.3	-13.0	-46.3	

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

EIRP LTE QPSK Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	LG ELECTRONICS
Project #:	11U13917
Date:	08/03/11
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT ALONE
Mode:	TX, QPSK_10 MHz_RB1_0 MODE

Chamber	Pre-amplifer	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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch (709.0 MHz)									
1.418	-45.5	V	3.0	0.0	0.0	-45.5	-13.0	-32.5	
2.127	-19.0	V	3.0	35.4	1.0	-53.4	-13.0	-40.4	
1.418	-45.8	H	3.0	0.0	0.0	-45.8	-13.0	-32.8	
2.127	-22.5	H	3.0	35.4	1.0	-56.9	-13.0	-43.9	
Mid Ch (710.0 MHz)									
1.420	-45.2	V	3.0	0.0	0.0	-45.2	-13.0	-32.2	
2.130	-19.7	V	3.0	35.4	1.0	-54.1	-13.0	-41.1	
1.420	-44.6	H	3.0	0.0	0.0	-44.6	-13.0	-31.6	
2.130	-23.9	H	3.0	35.4	1.0	-58.3	-13.0	-45.3	
Hi Ch (711.0 MHz)									
1.422	-44.7	V	3.0	0.0	0.0	-44.7	-13.0	-31.7	
2.133	-17.9	V	3.0	35.4	1.0	-52.3	-13.0	-39.3	
1.422	-44.2	H	3.0	0.0	0.0	-44.2	-13.0	-31.2	
2.133	-22.1	H	3.0	35.4	1.0	-56.4	-13.0	-43.4	

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

EIRP LTE 16QAM Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	LG ELECTRONICS
Project #:	11U13917
Date:	08/03/11
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT ALONE
Mode:	TX, 16QAM_10 MHz_RB1_0 MODE

Chamber	Pre-amplifer	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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch (709.0 MHz)									
1.418	-46.4	V	3.0	35.7	1.0	-81.1	-13.0	-68.1	
2.127	-18.0	V	3.0	35.4	1.0	-52.4	-13.0	-39.4	
1.418	-45.2	H	3.0	35.7	1.0	-80.0	-13.0	-67.0	
2.127	-20.9	H	3.0	35.4	1.0	-55.3	-13.0	-42.3	
Mid Ch (710.0 MHz)									
1.420	-45.6	V	3.0	35.7	1.0	-80.3	-13.0	-67.3	
2.130	-19.0	V	3.0	35.4	1.0	-53.3	-13.0	-40.3	
1.420	-45.1	H	3.0	35.7	1.0	-79.9	-13.0	-66.9	
2.130	-21.0	H	3.0	35.4	1.0	-55.4	-13.0	-42.4	
Hi Ch (711.0 MHz)									
1.422	-43.8	V	3.0	35.7	1.0	-78.5	-13.0	-65.5	
2.133	-18.0	V	3.0	35.4	1.0	-52.3	-13.0	-39.3	
1.422	-44.1	H	3.0	35.7	1.0	-78.9	-13.0	-65.9	
2.133	-20.9	H	3.0	35.4	1.0	-55.3	-13.0	-42.3	

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

10.2. RECEIVER SPURIOUS EMISSIONS

RULE PART(S)

FCC: N/A

LIMIT

Spurious Emission Limits for Receivers:

Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

TEST PROCEDURE

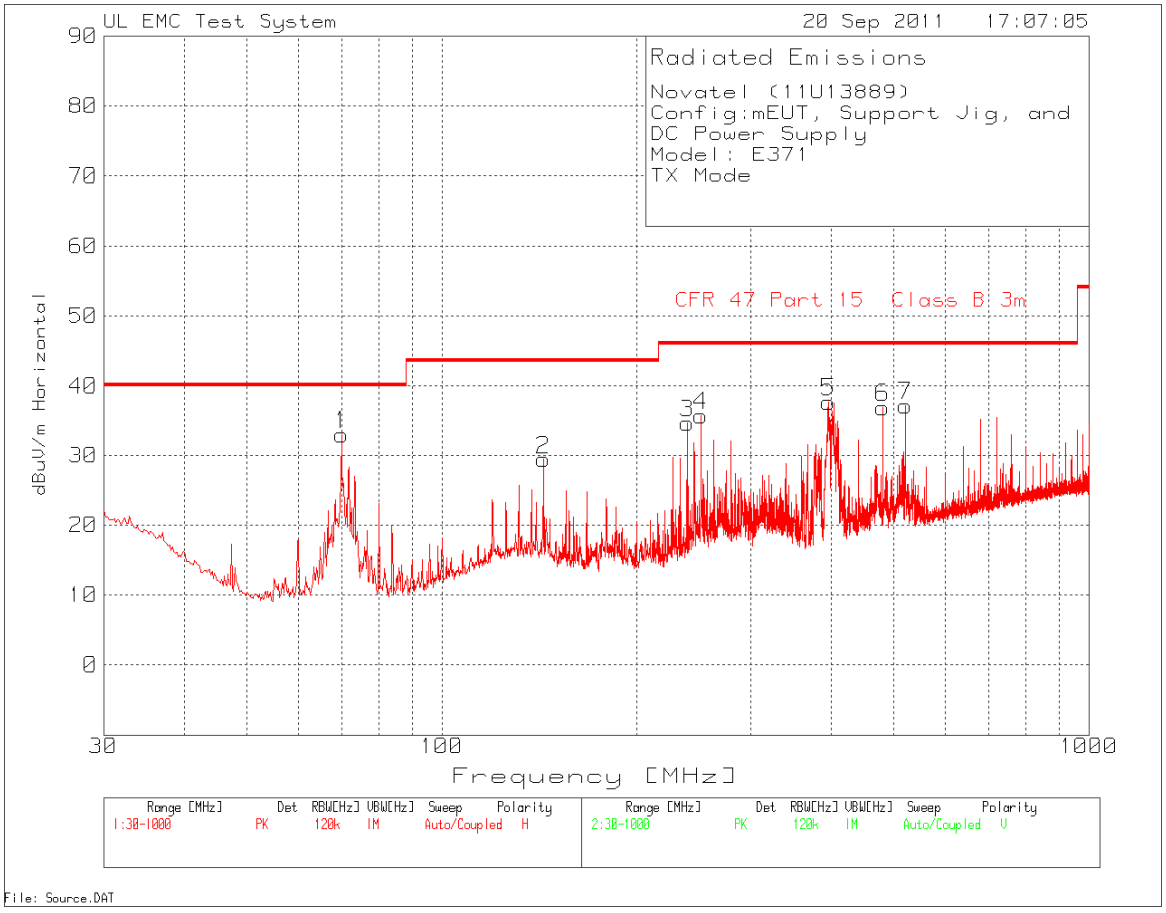
The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (local oscillator frequency, intermediate frequency or carrier frequency),

or 30 MHz, whichever is the higher, to at least 3 times the highest tunable and local oscillator frequencies.

RESULTS

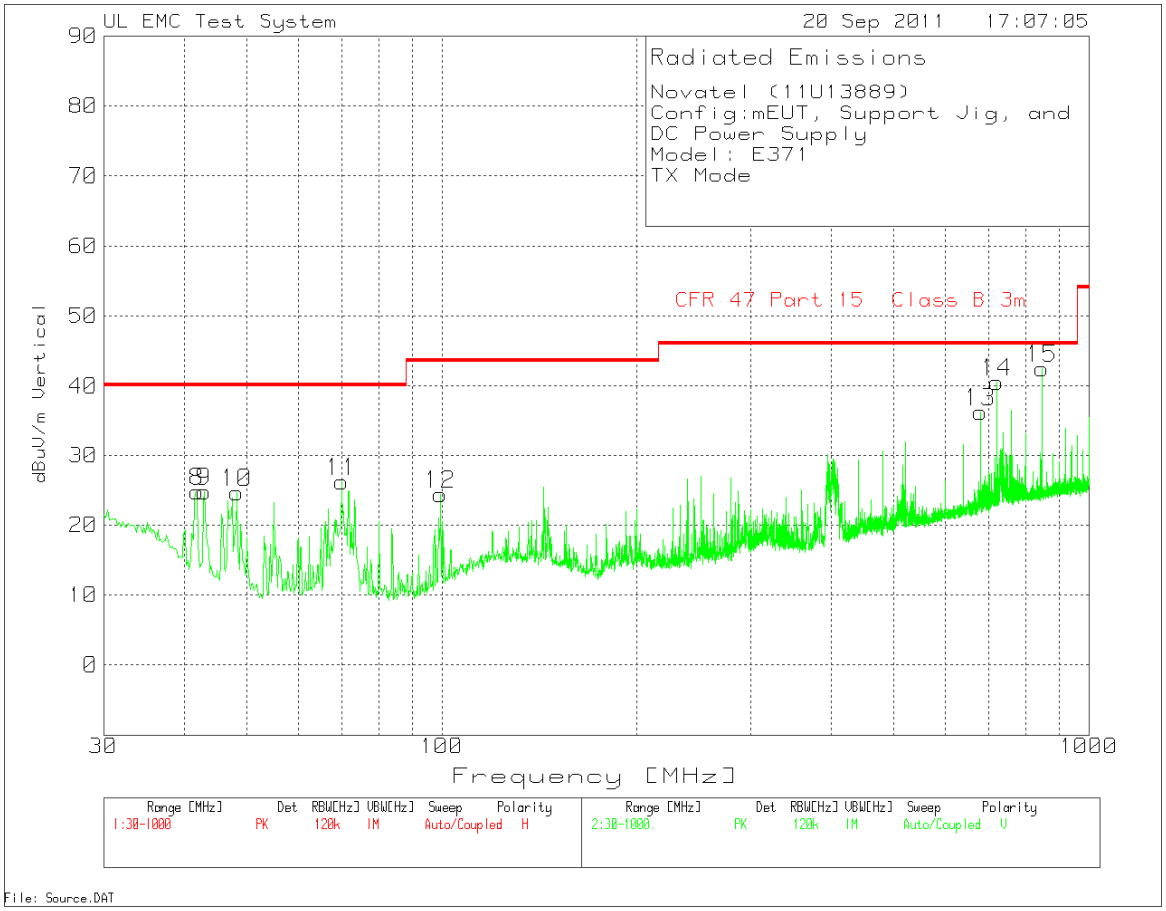
RECEIVER SPURIOUS EMISSIONS FOR 30 TO 1000 MHz, HORIZONTAL

HORIZONTAL PLOT



RECEIVER SPURIOUS EMISSIONS FOR 30 TO 1000 MHz, VERTICAL

VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Manufacturer: Novatel
Project: 11U13889
Model: E371
Description: EUT, Support Jig, and DC Power Supply

Range 1 30 - 1000MHz

Test Freq. (MHz)	Meter Reading (dBuV)	Detector	Cable Loss [dB]	Pre-Amp Gain [dB]	Antenna Factor [dB]	dBuV/m	CISPR22 Class B 10 m Limit	Margin	Height [cm]	Polarity
69.9321	52.27	PK	0.9	-28.2	8.1	33.07	40	-6.93	300	Horz
143.5931	43.3	PK	1.2	-28.1	13	29.4	43.5	-14.1	200	Horz
239.3525	49.27	PK	1.7	-28.1	11.8	34.67	46	-11.33	200	Horz
251.3709	50.31	PK	1.7	-28.1	11.8	35.71	46	-10.29	200	Horz
395.7854	48.44	PK	2.2	-27.8	14.9	37.74	46	-8.26	100	Horz
480.1079	45.82	PK	2.4	-27.7	16.4	36.92	46	-9.08	100	Horz
520.04	45.24	PK	2.5	-27.6	17.1	37.24	46	-8.76	100	Horz

Range 2 30 - 1000MHz

Test Freq. (MHz)	Meter Reading (dBuV)	Detector	Cable Loss [dB]	Pre-Amp Gain [dB]	Antenna Factor [dB]	dBuV/m	CISPR22 Class B 10 m Limit	Margin	Height [cm]	Polarity
41.8245	39.56	PK	0.7	-28.3	12.8	24.76	40	-15.24	100	Vert
42.9876	40.36	PK	0.7	-28.3	12	24.76	40	-15.24	100	Vert
48.2214	42.91	PK	0.8	-28.3	9.2	24.61	40	-15.39	100	Vert
69.9321	45.38	PK	0.9	-28.2	8.1	26.18	40	-13.82	300	Vert
99.5903	41.71	PK	1.1	-28.2	9.8	24.41	43.5	-19.09	100	Vert
680.1559	41.22	PK	2.9	-27.1	19.3	36.32	46	-9.68	200	Vert
720.0879	44.73	PK	3	-27.1	19.9	40.53	46	-5.47	100	Vert
845.5056	45.24	PK	3.2	-27.3	21.4	42.54	46	-3.46	400	Vert

RECEIVER SPURIOUS EMISSIONS ABOVE 1000 MHz

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: NOVATEL
Project #: 11u13889
Date: 20/9/2011
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH DIPOLE ANTENNA AND DC POWER SUPPLY
Mode: RX MODE

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931			RX RSS 210

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.040	3.0	52.8	47.6	24.1	2.8	-38.8	0.0	0.0	40.9	35.7	74	54	-33.1	-18.3	V
1.080	3.0	51.2	46.1	24.3	2.8	-38.7	0.0	0.0	39.5	34.5	74	54	-34.5	-19.5	V
1.160	3.0	50.8	44.3	24.6	2.9	-38.6	0.0	0.0	39.7	33.3	74	54	-34.3	-20.7	V
1.200	3.0	51.5	46.7	24.8	3.0	-38.5	0.0	0.0	40.6	35.8	74	54	-33.4	-18.2	V
1.240	3.0	53.3	48.6	24.9	3.0	-38.5	0.0	0.0	42.8	38.0	74	54	-31.2	-16.0	V
1.960	3.0	50.5	37.0	27.7	3.8	-37.5	0.0	0.0	44.5	31.1	74	54	-29.5	-22.9	V
1.080	3.0	50.7	45.2	24.3	2.8	-38.7	0.0	0.0	39.1	33.6	74	54	-34.9	-20.4	H
1.120	3.0	52.1	46.3	24.5	2.9	-38.7	0.0	0.0	40.8	35.0	74	54	-33.2	-19.0	H
1.160	3.0	55.3	49.9	24.6	2.9	-38.6	0.0	0.0	44.2	38.8	74	54	-29.8	-15.2	H
1.200	3.0	53.8	49.9	24.8	3.0	-38.5	0.0	0.0	43.0	39.1	74	54	-31.0	-14.9	H
1.240	3.0	52.1	46.3	24.9	3.0	-38.5	0.0	0.0	41.5	35.7	74	54	-32.5	-18.3	H

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f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		