



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

FOR

**GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/ LTE Radio, IEEE802.11a/b/g/n
and Bluetooth Radio**

MODEL NUMBER: A1454

FCC ID: BCGA1454

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/ LTE Radio,
IEEE 802.11a/b/g/n and Bluetooth Radio

MODEL: A1454

SERIAL NUMBER: C8TJ900FF1K8

DATE TESTED: SEPTEMBER 03 - OCTOBER 04, 2012

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

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

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

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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, Part 24 and Part 27.

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The Apple iPad Model A1454 is a tablet device with multimedia functions (music, application support, and video), cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/LTE radio, IEEE 802.11a/b/g/n and Bluetooth radio. The rechargeable battery is not user accessible.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted and ERP / EIRP output powers; average detector is used for UMTS/CDMA mode of Cellular band, while peak detector is used for GSM mode of Cellular and all GSM/CDMA/UMTS PCS bands as follows:

Part 22/24							
Frequency Range (MHz)	Modulation	Conducted			ERP/EIRP		
		Peak	Average	mW	Peak	Average	mW
824.2 - 848.8	GPRS	33.70		2344.2	32.14		1636.8
824.2 - 848.8	EGPRS	32.10		1621.8	30.24		1056.8
1850.2-1909.8	GPRS	30.50		1122.0	31.21		1321.3
1850.2-1909.8	EGPRS	30.50		1122.0	31.09		1285.3
826.4 - 846.0	Rel 99		24.50	281.8		21.14	130.0
1852.4-1907.6	Rel 99	26.10		407.4	28.64		731.1
826.4 - 846.0	HSUPA		23.60	229.1		20.21	105.0
1852.4-1907.6	HSUPA	27.75		595.7	28.81		760.3

LTE BAND 2

Part 24 LTE Band 2 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1850.7 - 1909.3	QPSK, RB6-0	27.85	609.5	30.76	1191.2
1850.7 - 1909.3	16QAM, RB6-0	28.10	645.7	29.71	935.4

Part 24 LTE Band 2 MODE (3.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1851.5 - 1908.5	QPSK, RB15-0	27.90	616.6	30.75	1188.5
1851.5 - 1908.5	16QAM, RB15-0	27.60	575.4	29.78	950.6

Part 24 LTE Band 2 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1852.5 - 1907.5	QPSK, RB25-0	27.70	588.8	30.84	1213.4
1852.5 - 1907.5	16QAM, RB25-0	27.80	602.6	29.87	970.5

Part 24 LTE Band 2 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1855 - 1905	QPSK, RB50-0	27.70	588.8	30.71	1177.6
1855 - 1905	16QAM, RB50-0	27.90	616.6	29.62	916.2

Part 24 LTE Band 2 MODE (15.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1857.5 - 1902.5	QPSK, RB75-0	28.00	631.0	30.72	1180.3
1857.5 - 1902.5	16QAM, RB75-0	28.10	645.7	29.63	918.3

Part 24 LTE Band 2 MODE (20.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1860 - 1900	QPSK, RB100-0	28.20	660.7	30.72	1180.3
1860 - 1900	16QAM, RB100-0	28.00	631.0	29.72	937.6

5.2.1. LTE BAND 4

Part 27 LTE Band 4 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1710.7 - 1754.3	QPSK, RB6-0	28.65	732.8	28.78	755.1
1710.7 - 1754.3	16QAM, RB6-0	29.23	837.5	27.28	534.6

Part 27 LTE Band 4 MODE (3.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1711.5 - 1753.5	QPSK, RB15-0	28.90	776.2	28.95	785.2
1711.5 - 1753.5	16QAM, RB15-0	28.50	707.9	27.95	623.7

Part 27 LTE Band 4 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1712.5 - 1752.5	QPSK, RB25-0	28.90	776.2	29.06	805.4
1712.5 - 1752.5	16QAM, RB25-0	28.90	776.2	28.06	639.7

Part 27 LTE Band 4 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1715 - 1750	QPSK, RB50-0	28.80	758.6	28.41	693.4
1715 - 1750	16QAM, RB50-0	29.20	831.8	27.71	590.2

Part 27 LTE Band 4 MODE (15.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1717.5 - 1747.50	QPSK, RB75-0	29.20	831.8	28.06	639.7
1717.5 - 1747.50	16QAM RB75-0	29.60	912.0	27.28	534.6

Part 27 LTE Band 4 MODE (20.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1720 - 1745	QPSK, RB100-0	29.36	863.0	28.68	737.9
1720 - 1745	16QAM, RB100-0	29.20	831.8	27.68	586.1

5.2.2. LTE BAND 5

Part 22 LTE Band 5 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
824.7 - 848.3	QPSK, RB1-0	23.90	245.5	20.83	121.1
824.7 - 848.3	16QAM, RB1-0	22.70	186.2	19.91	97.9

Part 22 LTE Band 5 MODE (3.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
825.5 - 847.5	QPSK, RB1-0	23.80	239.9	20.92	123.6
825.5 - 847.5	16QAM, RB1-0	22.80	190.5	19.94	98.6

Part 22 LTE Band 5 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
826.5 - 846.5	QPSK, RB1-0	24.00	251.2	20.87	122.2
826.5 - 846.5	16QAM, RB1-0	23.00	199.5	19.94	98.6

Part 22 LTE Band 5 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
829 - 844	QPSK, RB1-0	23.80	239.9	20.71	117.8
829 - 844	16QAM, RB1-0	22.60	182.0	19.74	94.2

5.2.3. LTE BAND 17

Part 27 LTE Band 17 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
706.5 - 713.5	QPSK, RB1-0	23.90	245.5	19.22	83.6
706.5 - 713.5	16QAM, RB1-0	23.20	208.9	18.22	66.4

Part 27 LTE Band 17 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
709 - 711	QPSK, RB1-0	24.00	251.2	19.22	83.6
709 - 711	16QAM, RB1-0	22.70	186.2	18.32	67.9

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a band gap type integral antenna with a maximum peak gain as follow:

Frequency (MHz)	Gain (dBi)
GSM/UMTS Cell, 824 – 849MHz	-1.52
GSM / UMTS PCS, 1850-1910MHz	1.41
LTE Band 5, 824.7-848MHz	-1.52
LTE Band 2, 1850-1910MHz	1.41
LTE Band 4, 1710-1755MHz	0.48
LTE Band 17, 704-716MHz	-4.66

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 2.00.01_Debug

The EUT software installed during testing was 10A8397.

The EUT is linked with Agilent 8960 Communication, CMU200 and CMW500 Test Set.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel for RF radiated emissions below 1GHz and AC conducted emissions are determined as the channel with the AC Power Adapter Source

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

Worst-case modes below:

- For Cellular and PCS band: GPRS and EGPRS
- For Cellular and PCS band: UMTS, REL 99 and HSUPA.
- For LTE Band 2, 4, 5 and 17.

Both conducted and radiated emissions measurement with all bands.

The EUT has been investigated on X, Y and Z position, the worst-case was determined on Z-position for CELL and PCS band by comparing the fundamental ERP / EIRP output power.

5.6. DESCRIPTION OF TEST SETUP

I/O CABLES (RF CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	RF Out	1	Spectrum Analyzer	Un-shielded	1m	N/A
2	RF In/Out	1	Directional Coupler	Un-shielded	1m	N/A
3	RF In/Out	1	Communication Test Set	Un-shielded	None	N/A

I/O CABLES (RF RADIATED TEST)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	2	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	1m	NA
3	Jack	1	Earphone	Un-shielded	0.5m	NA
4	RF In/Out	1	Horn	Un-shielded	2m	NA

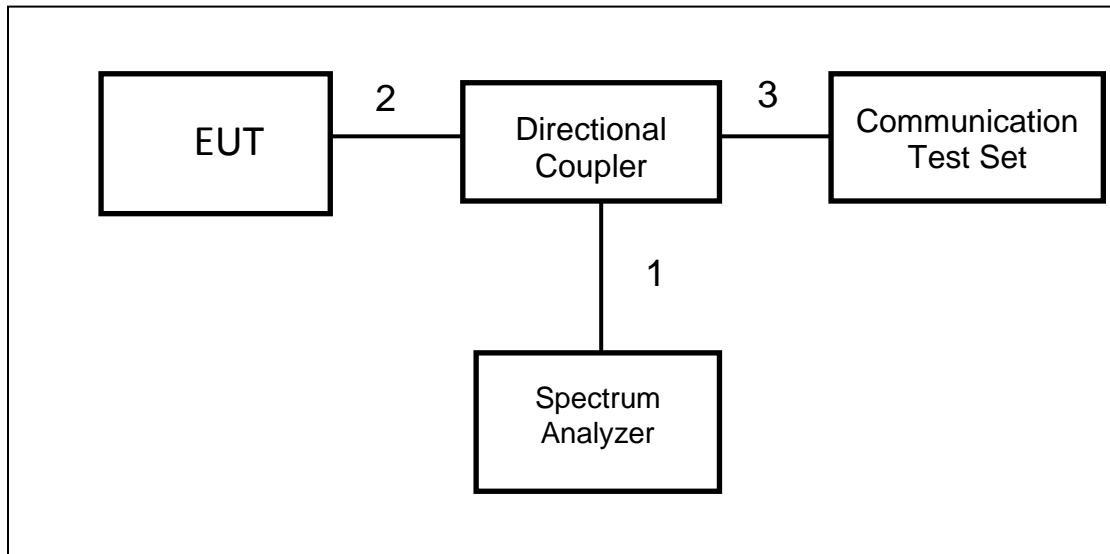
SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Apple	NA	NA	DoC
DC Power Supply	Xantrex	XHR-60-18	27519	NA

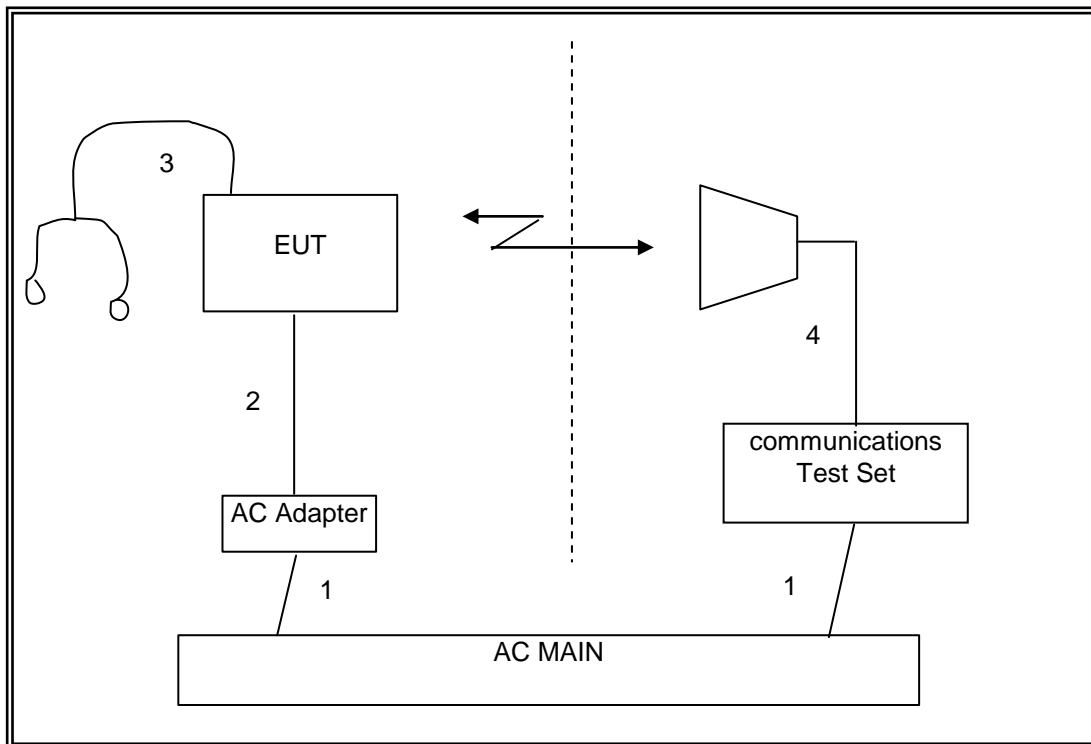
TEST SETUP

The EUT is a stand-alone device. The Communication test set exercised the EUT.

SETUP DIAGRAM FOR RF CONDUCTED TESTS



SETUP DIAGRAM FOR RF RADIATED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	04/09/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	11/11/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	11/11/12
Communication Test Set	R & S	CMU 200	None	06/06/13
Wideband Communication Test Set	R & S	CMW 500	None	12/16/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	09/20/13
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	02/07/13
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Temperature / Humidity Chamber	WATLOW Controls	SK-3102	None	CNR
Dual Channel Thermometer	Tektronix	DTM920	CCS-0048	05/21/13
Directional Coupler	Krytar	1817	N02656	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	07/06/13
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	07/16/13

7. RF POWER OUTPUT VERIFICATION

7.1. GSM

TEST PROCEDURE

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

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

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

PROCEDURE USED TO ESTABLISH TEST SIGNAL

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/EGPRS

	Ch.	f (MHz)	1 time slots		2 time slots	
			Peak	Average	Peak	Average
GPRS	128	824.2	33.70	33.50	33.20	33.00
	190	836.6	33.70	33.50	33.20	33.00
	251	848.8	33.60	33.40	33.15	32.90
EGPRS	128	824.2	32.10	29.00	32.00	28.90
	190	836.6	32.10	29.00	32.00	28.90
	251	848.8	32.00	28.90	31.95	28.85

	Ch.	f (MHz)	1 time slots		2 time slots	
			Peak	Average	Peak	Average
GPRS	512	1850.2	30.50	30.00	29.60	29.40
	661	1880.0	30.50	30.00	29.50	29.30
	810	1909.8	30.20	29.80	29.50	29.30
EGPRS	512	1850.2	30.50	27.90	30.50	27.80
	661	1880.0	30.50	27.90	30.50	27.90
	810	1909.8	30.45	27.85	30.50	27.80

7.2. UMTS MODE

TEST PROCEDURE

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

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

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

7.2.1. 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
	β_c	Not Applicable
	β_d	Not Applicable
	β_{ec}	Not Applicable
	β_c/β_d	8/15
	β_{hs}	Not Applicable
	β_{ed}	Not Applicable

RESULTS

UMTS REL99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 850	4132	4357	826.4	26.80	24.47
	4180	4405	836.0	27.10	24.45
	4230	4455	846.0	27.08	24.50

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 1900	9262	9662	1852.4	26.05	22.90
	9400	9800	1880.0	26.10	22.90
	9538	9938	1907.6	25.85	22.75

7.2.2. HSDPA REL 5

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Summary of settings are illustrated below:

	Mode	Rel5 HSDPA			
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

Result

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	Conducted output power (dBm)
					Peak	Average
UMTS850 (Band V)	1	4132	4357	826.4	26.66	23.50
		4180	4405	836.0	26.95	23.50
		4230	4455	846.0	27.00	23.50
	2*	4132	4357	826.4	26.95	23.51
		4180	4405	836.0	27.43	23.55
		4230	4455	846.0	27.30	23.50
	3	4132	4357	826.4	26.90	23.03
		4180	4405	836.0	27.30	23.06
		4230	4455	846.0	27.22	23.15
	4	4132	4357	826.4	26.95	23.04
		4180	4405	836.0	27.19	23.07
		4230	4455	846.0	27.15	23.10
UMTS1900 (Band II)	1	9262	9662	1852.4	26.10	22.80
		9400	9800	1880.0	26.36	22.90
		9538	9938	1907.6	26.08	22.78
	2*	9262	9662	1852.4	26.50	22.76
		9400	9800	1880.0	27.10	22.90
		9538	9938	1907.6	26.50	22.76
	3	9262	9662	1852.4	26.86	22.35
		9400	9800	1880.0	26.82	22.50
		9538	9938	1907.6	26.65	22.46
	4	9262	9662	1852.4	26.67	22.44
		9400	9800	1880.0	27.00	22.50
		9538	9938	1907.6	26.74	22.50

Note 1: Asterisk (*) represents the worst case

Note 2: Maximum output power levels that are possible for all subtests reported.

7.2.3. HSPA REL 6 (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				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
β_{ed}	1309/225	94/75	47/15 47/15	56/75	47/15	
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	$A_{hs} = \beta_{hs}/\beta_c$	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	E-TFCI 11 E-TFCI PO 4 E-TFCI 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	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27

RESULTS

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS850 (Band V)	1*	4132	4357	826.4	27.50	23.50
		4180	4405	836.0	28.17	23.60
		4230	4455	846.0	27.91	23.55
	2	4132	4357	826.4	27.30	21.80
		4180	4405	836.0	27.80	21.80
		4230	4455	846.0	27.88	21.75
	3	4132	4357	826.4	27.65	22.90
		4180	4405	836.0	28.00	22.84
		4230	4455	846.0	27.97	22.88
	4	4132	4357	826.4	27.23	21.80
		4180	4405	836.0	27.80	21.85
		4230	4455	846.0	27.56	22.00
	5	4132	4357	826.4	26.87	23.50
		4180	4405	836.0	27.30	23.50
		4230	4455	846.0	27.20	23.58
UMTS1900 (Band II)	1*	9262	9662	1852.4	27.36	22.70
		9400	9800	1880.0	27.75	22.90
		9538	9938	1907.6	27.20	22.70
	2	9262	9662	1852.4	26.28	20.22
		9400	9800	1880.0	26.48	20.46
		9538	9938	1907.6	26.26	20.23
	3	9262	9662	1852.4	27.10	21.80
		9400	9800	1880.0	27.20	21.90
		9538	9938	1907.6	27.30	21.90
	4	9262	9662	1852.4	26.03	20.15
		9400	9800	1880.0	26.40	20.45
		9538	9938	1907.6	26.00	20.26
	5	9262	9662	1852.4	26.26	22.70
		9400	9800	1880.0	26.50	22.80
		9538	9938	1907.6	26.30	22.70

Note 1: Asterisk (*) represents the worst case

Note 2: Maximum output power levels that are possible for all subtests reported.

7.2.4. DUAL CARRIER HSDPA

DC-HSDPA (Rel 8, CAT 24)

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

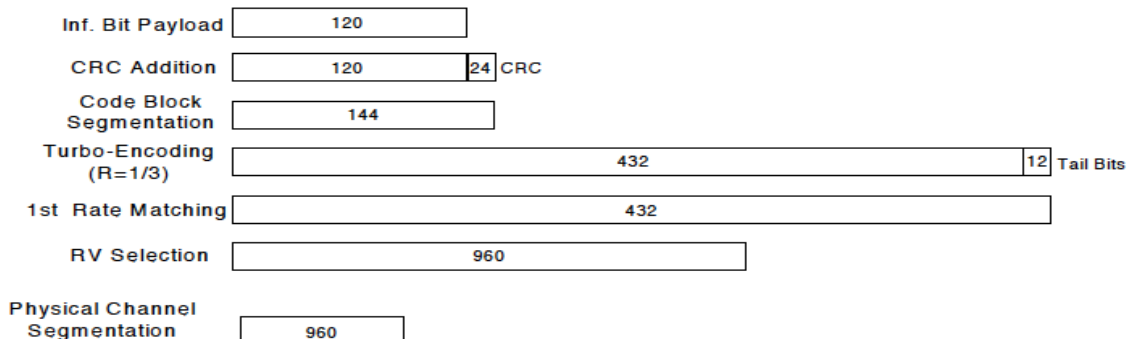


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest 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			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs} / \beta_c$	30/15			

RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS850 (Band V)	1	4132	4357	826.4	27.10	23.46
		4180	4405	836.0	27.25	23.50
		4230	4455	846.0	27.10	23.45
	2*	4132	4357	826.4	27.48	23.50
		4180	4405	836.0	27.15	23.50
		4230	4455	846.0	27.12	23.45
	3	4132	4357	826.4	27.06	23.00
		4180	4405	836.0	26.90	23.00
		4230	4455	846.0	27.12	23.00
	4	4132	4357	826.4	26.90	23.00
		4180	4405	836.0	26.85	23.00
		4230	4455	846.0	27.05	23.00
UMTS1900 (Band II)	1	9262	9662	1852.4	26.46	23.00
		9400	9800	1880.0	26.85	22.95
		9538	9938	1907.6	26.84	22.90
	2*	9262	9662	1852.4	26.65	22.90
		9400	9800	1880.0	27.05	22.90
		9538	9938	1907.6	26.77	22.85
	3	9262	9662	1852.4	26.70	22.65
		9400	9800	1880.0	26.72	22.65
		9538	9938	1907.6	26.85	22.60
	4	9262	9662	1852.4	26.68	22.55
		9400	9800	1880.0	26.75	22.60
		9538	9938	1907.6	26.75	22.60

Note 1: Asterisk (*) represents the worst case

Note 2: Maximum output power levels that are possible for all subtests reported.

7.3. LTE Band 2

Output power for LTE Band 2 (1.4MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
1850.7	18607	QPSK	1.4	1	0	27.40	22.70
				1	5	27.50	22.60
				3	2	27.50	22.50
				6	0	27.55	21.48
		16-QAM		1	0	27.40	21.60
				1	5	27.30	21.40
				3	2	27.50	21.80
				6	0	27.90	20.70
1880.0	18900	QPSK		1	0	27.80	22.75
				1	5	27.75	22.75
				3	2	27.75	22.70
				6	0	27.85	21.50
		16-QAM		1	0	27.70	21.70
				1	5	27.65	21.64
				3	2	27.90	22.00
				6	0	28.10	20.77
1909.3	19193	QPSK		1	0	27.20	22.75
				1	5	27.20	22.66
				3	2	27.30	22.55
				6	0	27.40	21.45
		16-QAM		1	0	27.20	21.50
				1	5	27.10	21.45
				3	2	27.30	21.90
				6	0	27.90	20.60

Output power for LTE Band 2 (3 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
1851.5	18615	QPSK	3.0	1	0	27.00	22.70
				1	14	27.00	22.64
				8	4	26.95	21.70
				15	0	27.05	21.65
		16-QAM		1	0	27.00	21.30
				1	14	27.20	21.24
				8	4	27.40	20.90
				15	0	27.25	20.80
1880.0	18900	QPSK	1	0	27.40	22.75	
			1	14	27.19	22.67	
			8	4	27.15	21.95	
			15	0	27.52	21.80	
		16-QAM	1	0	27.15	21.00	
			1	14	27.18	21.17	
			8	4	27.45	21.00	
			15	0	27.50	20.90	
1908.5	19185	QPSK	1	0	27.00	22.75	
			1	14	26.50	22.55	
			8	4	27.40	21.60	
			15	0	27.90	21.70	
		16-QAM	1	0	27.20	21.30	
			1	14	27.00	21.00	
			8	4	27.55	20.80	
			15	0	27.60	21.00	

Output power for LTE Band 2 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
1852.5	18625	QPSK	5.0	1	0	27.20	22.60
				1	24	27.10	22.60
				12	6	27.00	21.60
				25	0	27.30	21.60
		16-QAM		1	0	27.50	21.70
				1	24	27.30	21.80
				12	6	27.10	20.90
				25	0	27.70	20.70
1880.0	18900	QPSK	1	0	27.60	22.75	
			1	24	27.50	22.70	
			12	6	27.40	21.80	
			25	0	27.70	21.75	
		16-QAM	1	0	27.60	21.80	
			1	24	27.70	22.00	
			12	6	27.70	21.00	
			25	0	27.80	20.90	
1907.5	19175	QPSK	1	0	27.20	22.75	
			1	24	27.00	22.70	
			12	6	27.10	21.70	
			25	0	27.60	21.70	
		16-QAM	1	0	27.35	21.80	
			1	24	27.10	21.70	
			12	6	27.00	20.90	
			25	0	27.60	20.85	

Output power for LTE Band 2 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
1855	18650	QPSK	10.0	1	0	27.00	22.65
				1	49	27.00	22.50
				25	12	27.30	21.70
				50	0	27.60	21.65
		16-QAM		1	0	27.05	21.50
				1	49	26.90	21.30
				25	12	26.95	20.80
				50	0	27.30	20.70
1880.0	18900	QPSK	1	0	27.22	22.75	
			1	49	27.00	22.50	
			25	12	27.20	21.80	
			50	0	27.70	21.70	
		16-QAM	1	0	27.30	21.60	
			1	49	27.30	21.30	
			25	12	27.40	20.90	
			50	0	27.90	20.80	
1905	19150	QPSK	1	0	27.00	22.75	
			1	49	26.60	22.40	
			25	12	27.10	21.80	
			50	0	27.75	21.80	
		16-QAM	1	0	27.00	21.70	
			1	49	26.90	21.20	
			25	12	27.30	20.90	
			50	0	27.50	20.85	

Output power for LTE Band 2 (15 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
1857.5	18675	QPSK	15.0	1	0	27.30	22.75
				1	74	27.00	22.70
				36	18	27.20	21.70
				75	0	27.60	21.62
		16-QAM		1	0	27.50	21.70
				1	74	27.10	21.75
				36	18	26.90	20.90
				75	0	27.80	20.80
1880.0	18900	QPSK	1	0	27.50	22.75	
			1	74	27.40	22.65	
			36	18	27.80	21.80	
			75	0	28.00	21.70	
		16-QAM	1	0	27.60	21.80	
			1	74	27.40	21.60	
			36	18	27.50	20.95	
			75	0	28.10	20.80	
1902.5	19125	QPSK	1	0	27.00	22.70	
			1	74	26.95	22.60	
			36	18	27.20	21.88	
			75	0	27.80	21.80	
		16-QAM	1	0	26.80	21.75	
			1	74	27.20	21.77	
			36	18	26.90	20.90	
			75	0	28.00	20.80	

Output power for LTE Band 2 (20 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
1860	18700	QPSK	20	1	0	27.25	22.70
				1	99	27.23	22.66
				50	24	27.35	21.75
				100	0	27.87	21.80
		16-QAM		1	0	27.80	21.70
				1	99	27.80	21.80
				50	24	26.90	20.70
				100	0	27.90	20.70
1880.0	18900	QPSK	1	0	27.40	22.75	
			1	99	26.95	22.65	
			50	24	28.00	21.90	
			100	0	28.20	21.70	
		16-QAM	1	0	27.70	21.80	
			1	99	27.60	21.50	
			50	24	27.50	20.75	
			100	0	28.00	20.55	
1900	19100	QPSK	1	0	26.80	22.75	
			1	99	27.00	22.60	
			50	24	27.20	21.80	
			100	0	27.75	21.70	
		16-QAM	1	0	27.00	21.60	
			1	99	27.20	21.70	
			50	24	26.00	20.70	
			100	0	27.25	20.68	

7.4. LTE Band 4

Output power for LTE Band 4 (1.4MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)	Average (dBm)
1710.7	19957	QPSK	1.4	1	0	28.00	23.80
				1	5	27.67	23.77
				3	2	27.90	23.40
				6	0	27.73	22.60
		16-QAM		1	0	27.74	22.78
				1	5	27.64	22.99
				3	2	27.60	22.80
				6	0	28.10	21.65
1732.5	20175	QPSK	1	0	28.60	24.00	
			1	5	28.32	23.98	
			3	2	28.60	23.48	
			6	0	28.65	22.65	
		16-QAM	1	0	28.00	22.85	
			1	5	28.40	22.80	
			3	2	28.76	22.75	
			6	0	29.23	21.80	
1754.3	20393	QPSK	1	0	27.70	23.76	
			1	5	27.68	23.72	
			3	2	27.80	23.57	
			6	0	27.70	22.58	
		16-QAM	1	0	27.65	22.80	
			1	5	27.70	23.00	
			3	2	27.60	22.70	
			6	0	28.18	21.75	

Output power for LTE Band 4 (3 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)	Average (dBm)
1711.5	19965	QPSK	3.0	1	0	27.50	23.70
				1	14	27.32	23.65
				8	4	27.80	22.70
				15	0	28.31	22.70
		16-QAM		1	0	27.70	22.60
				1	14	27.27	22.75
				8	4	27.40	21.95
				15	0	27.50	21.75
1732.5	20175	QPSK	3.0	1	0	28.00	23.80
				1	14	27.90	23.90
				8	4	28.40	22.90
				15	0	28.90	22.80
		16-QAM		1	0	28.40	22.50
				1	14	28.36	22.80
				8	4	28.45	22.15
				15	0	28.50	22.10
1753.5	20385	QPSK	3.0	1	0	27.65	23.60
				1	14	27.60	23.60
				8	4	27.40	22.78
				15	0	28.25	22.80
		16-QAM		1	0	27.36	22.60
				1	14	27.63	22.89
				8	4	27.60	21.96
				15	0	28.04	22.00

Output power for LTE Band 4 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)	Average (dBm)
1712.5	19975	QPSK	5.0	1	0	27.70	23.75
				1	24	27.60	23.70
				12	6	27.43	22.75
				25	0	28.20	22.70
		16-QAM		1	0	27.60	22.90
				1	24	27.50	22.74
				12	6	27.35	21.70
				25	0	28.11	21.65
1732.5	20175	QPSK	1	0	28.52	23.97	
			1	24	28.25	23.95	
			12	6	28.40	23.00	
			25	0	28.90	22.91	
		16-QAM	1	0	28.80	22.96	
			1	24	28.40	22.80	
			12	6	28.80	21.90	
			25	0	28.90	21.80	
1752.5	20375	QPSK	1	0	27.30	23.68	
			1	24	27.30	23.65	
			12	6	27.20	22.75	
			25	0	27.80	22.60	
		16-QAM	1	0	27.20	22.80	
			1	24	27.50	22.80	
			12	6	27.17	21.70	
			25	0	28.00	21.65	

Output power for LTE Band 4 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1715	20000	QPSK	10.0	1	0	27.60	23.80
				1	49	27.60	23.79
				25	12	27.70	23.40
				50	0	28.20	22.08
		16-QAM		1	0	27.60	22.50
				1	49	27.60	22.40
				25	12	27.40	21.85
				50	0	28.40	21.60
1732.5	20175	QPSK	1	0	28.30	24.00	
			1	49	28.11	24.00	
			25	12	28.80	23.30	
			50	0	28.80	22.30	
		16-QAM	1	0	28.70	22.70	
			1	49	28.36	22.55	
			25	12	28.50	21.90	
			50	0	29.20	21.49	
1750	20350	QPSK	1	0	27.35	23.80	
			1	49	27.20	23.75	
			25	12	27.30	23.37	
			50	0	28.30	22.25	
		16-QAM	1	0	27.30	22.50	
			1	49	27.30	22.40	
			25	12	27.10	21.70	
			50	0	27.90	21.65	

Output power for LTE Band 4 (15 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1717.5	20025	QPSK	15.0	1	0	27.71	23.90
				1	74	28.51	23.80
				36	18	27.90	23.00
				75	0	28.72	22.90
		16-QAM		1	0	27.65	22.90
				1	74	28.40	22.78
				36	18	27.79	22.00
				75	0	28.90	21.90
1732.5	20175	QPSK	15.0	1	0	28.70	24.00
				1	74	27.83	23.95
				36	18	28.60	23.20
				75	0	29.20	23.05
		16-QAM		1	0	28.90	23.05
				1	74	28.80	23.00
				36	18	28.90	22.05
				75	0	29.60	21.97
1747.5	20325	QPSK	15.0	1	0	27.60	23.75
				1	74	27.43	23.70
				36	18	27.50	23.15
				75	0	27.90	22.78
		16-QAM		1	0	28.20	23.10
				1	74	27.90	22.92
				36	18	27.43	21.90
				75	0	28.00	21.80

Output power for LTE Band 4 (20 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1720	20050	QPSK	20.0	1	0	27.80	23.92
				1	99	28.61	23.90
				50	24	28.29	22.95
				100	0	28.48	22.85
		16-QAM		1	0	28.10	23.00
				1	99	28.60	23.27
				50	24	27.88	21.95
				100	0	28.35	22.05
1732.5	20175	QPSK	20.0	1	0	28.57	23.90
				1	99	27.67	23.75
				50	24	28.78	23.10
				100	0	29.36	22.90
		16-QAM		1	0	29.15	23.10
				1	99	28.04	23.00
				50	24	28.70	22.02
				100	0	29.20	21.96
1745	20300	QPSK	20.0	1	0	28.28	24.00
				1	99	27.60	23.80
				50	24	27.60	22.88
				100	0	28.64	22.91
		16-QAM		1	0	28.65	23.10
				1	99	27.85	23.01
				50	24	27.40	21.75
				100	0	28.35	22.00

7.5. LTE BAND 5

Output power for LTE Band 5 (1.4MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average
824.7	20407	QPSK	1.4	1	0	28.67	23.90
				1	5	28.10	23.85
				3	2	28.53	23.70
				6	0	28.42	22.60
		16-QAM		1	0	28.30	22.70
				1	5	28.20	22.62
				3	2	28.60	22.10
				6	0	28.76	21.80
836.5	20525	QPSK		1	0	28.76	23.70
				1	5	28.65	23.69
				3	2	28.90	23.50
				6	0	28.54	22.50
		16-QAM		1	0	28.54	22.50
				1	5	28.50	22.43
				3	2	28.96	22.20
				6	0	28.80	21.70
848.3	20643	QPSK		1	0	28.22	23.90
				1	5	28.15	23.78
				3	2	28.49	23.60
				6	0	28.42	22.70
		16-QAM		1	0	27.80	22.70
				1	5	28.17	22.47
				3	2	28.93	22.10
				6	0	29.04	21.90

Output power for LTE Band 5 (3 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
825.5	20415	QPSK	3.0	1	0	27.76	23.80
				1	14	27.75	23.77
				8	4	28.45	22.70
				15	0	28.20	22.65
		16-QAM		1	0	28.15	22.70
				1	14	27.00	22.33
				8	4	27.85	22.00
				15	0	27.72	21.80
836.5	20525	QPSK		1	0	28.30	23.75
				1	14	28.30	23.70
				8	4	28.90	22.60
				15	0	28.50	22.70
		16-QAM		1	0	28.40	22.70
				1	14	28.00	22.55
				8	4	28.11	22.00
				15	0	28.12	21.80
847.5	20635	QPSK		1	0	28.10	23.80
				1	14	27.71	23.60
				8	4	28.60	22.90
				15	0	28.45	22.90
		16-QAM		1	0	28.50	22.80
				1	14	28.05	22.70
				8	4	28.57	22.20
				15	0	28.31	22.00

Output power for LTE Band 5 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average
826.5	20425	QPSK	5.0	1	0	28.24	23.80
				1	24	27.92	23.80
				12	6	27.60	22.70
				25	0	28.25	22.60
		16-QAM		1	0	28.42	23.00
				1	24	27.56	22.90
				12	6	29.07	21.80
				25	0	28.03	21.70
836.5	20525	QPSK	1	0	28.60	23.80	
			1	24	28.50	23.77	
			12	6	28.50	22.70	
			25	0	28.78	22.65	
		16-QAM	1	0	28.80	22.90	
			1	24	28.80	23.00	
			12	6	28.21	21.80	
			25	0	28.40	21.70	
846.5	20625	QPSK	1	0	28.40	24.00	
			1	24	28.20	23.90	
			12	6	28.34	23.00	
			25	0	28.62	22.90	
		16-QAM	1	0	28.56	23.00	
			1	24	28.35	22.90	
			12	6	28.50	21.90	
			25	0	28.57	21.70	

Output power for LTE Band 5 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Max Peak Power (dBm)	Average
829	20405	QPSK	10.0	1	0	28.00	23.70
				1	49	28.03	23.66
				25	12	28.05	22.70
				50	0	28.29	22.60
		16-QAM		1	0	27.78	22.60
				1	49	27.78	22.26
				25	12	27.45	22.00
				50	0	28.53	21.90
836.5	20525	QPSK	1	0	28.22	23.80	
			1	49	28.15	23.80	
			25	12	29.00	22.70	
			50	0	29.05	22.60	
		16-QAM	1	0	27.70	22.60	
			1	49	27.90	22.40	
			25	12	28.45	22.00	
			50	0	28.51	21.80	
844	20600	QPSK	1	0	28.20	23.70	
			1	49	27.95	23.57	
			25	12	28.39	22.90	
			50	0	28.96	22.60	
		16-QAM	1	0	28.36	22.50	
			1	49	28.10	22.35	
			25	12	28.56	22.00	
			50	0	28.80	21.93	

7.6. LTE Band 17

Output power for LTE Band 17 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)	Average (dBm)
706.5	23755	QPSK	5.0	1	0	28.40	23.90
				1	24	27.80	23.90
				12	6	28.10	22.80
				25	0	28.50	22.70
		16-QAM		1	0	28.30	23.20
				1	24	28.10	23.00
				12	6	28.20	21.80
710	23790	QPSK		25	0	28.60	21.70
				1	0	27.90	23.70
				1	24	27.30	23.80
				12	6	27.40	22.65
		16-QAM		25	0	28.00	22.60
				1	0	28.00	23.00
				1	24	27.40	22.95
713.0	23825	QPSK	12	6	27.50	21.80	
			25	0	28.20	21.70	
			1	0	27.60	23.80	
			1	24	27.50	23.78	
		16-QAM	12	6	27.20	23.10	
			25	0	27.50	22.80	
			1	0	27.65	23.00	
				1	24	27.50	22.90
				12	6	27.00	21.90
				25	0	27.70	21.90

Output power for LTE Band 17 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)	Average (dBm)
709	23780	QPSK	10.0	1	0	27.90	23.70
				1	49	27.20	23.70
				25	12	27.50	22.80
				50	0	28.00	23.00
		16-QAM		1	0	28.19	22.60
				1	49	27.20	22.40
				25	12	27.80	22.00
				50	0	28.44	21.80
710	23790	QPSK	10.0	1	0	28.60	24.00
				1	49	27.80	23.90
				25	12	27.50	22.80
				50	0	28.30	22.70
		16-QAM		1	0	28.20	22.70
				1	49	27.40	22.50
				25	12	27.60	22.00
				50	0	28.15	21.90
711	23800	QPSK	10.0	1	0	27.80	23.80
				1	49	27.50	23.70
				25	12	27.40	22.90
				50	0	27.78	22.80
		16-QAM		1	0	27.90	22.50
				1	49	27.50	22.70
				25	12	27.50	22.00
				50	0	28.20	21.90

8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

IC: RSS-132, 4.5; RSS-133, 6.5

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSUPA
- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 17

RESULTS

MODE	BAND	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
GPRS	CELL	128	824.20	249.2607	307.926
		190	836.60	251.1096	303.550
		251	848.80	243.5836	275.774
	PCS	512	1850.2	250.8087	313.609
		661	1880.0	242.4720	307.872
		810	1909.8	248.1024	277.184

MODE	BAND	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
EGPRS	Cell	128	824.20	244.6912	267.819
		190	836.60	250.8333	301.707
		251	848.80	244.4098	276.431
	PCS	512	1850.2	251.2327	323.965
		661	1880.0	240.6925	333.577
		810	1909.8	247.1392	346.785

MODE	BAND	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
REL 99	Cell	4357	826.4	4.1747	4.655
		4405	836.0	4.1892	4.638
		4455	846.0	4.1971	4.568
	PCS	9662	1852.4	4.1800	4.572
		9800	1880.0	4.1878	4.629
		9938	1907.6	4.1795	4.573

MODE	BAND	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
HSUPA	Cell	4357	826.4	4.1856	4.609
		4405	836.0	4.1765	4.626
		4455	846.0	4.2111	4.655
	PCS	9662	1852.4	4.1649	4.641
		9800	1880.0	4.1699	4.621
		9938	1907.6	4.1710	4.583

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	1.4 MHz BAND QPSK	3/2	1850.7	0.5711480	0.755328
		6/0		1.0941	1.233
	1.4 MHz BAND QPSK	3/2	1880.0	0.5546168	0.772714
		6/0		1.0816	1.260
	1.4 MHz BAND QPSK	3/2	1909.3	0.5544839	0.763624
		6/0		1.0894	1.159
	1.4 MHz BAND 16QAM	3/2	1850.7	0.5495442	0.646316
		6/0		1.0780	1.195
	1.4 MHz BAND 16QAM	3/2	1880.0	0.5513269	0.759749
		6/0		1.0848	1.214
	1.4 MHz BAND 16QAM	3/2	1909.3	0.5668363	0.838151
		6/0		1.0809	1.269
	3 MHz BAND QPSK	8/4	1851.5	1.4364	1.811
		15/0		2.6759	2.867
	3 MHz BAND QPSK	8/4	1880.0	1.4248	1.707
		15/0		2.6633	2.917
	3 MHz BAND QPSK	8/4	1908.5	1.4363	1.886
		15/0		2.6871	2.866
	3 MHz BAND QPSK	8/4	1851.5	2.6765	2.798
		15/0		2.6765	2.798
3 MHz BAND QPSK	8/4	1880.0	1.4245	1.887	
	15/0		2.6636	2.797	
3 MHz BAND QPSK	8/4	1908.5	1.4300	1.730	
	15/0		2.6800	2.791	
5 MHz BAND QPSK	12/6	1852.5	2.1597	2.632	
	25/0		4.4945	4.802	
5 MHz BAND QPSK	12/6	1880.0	2.1482	2.541	
	25/0		4.4499	4.691	
5 MHz BAND QPSK	12/6	1907.5	2.1673	2.507	
	25/0		4.5187	4.688	
5 MHz BAND 16QAM	12/6	1852.5	2.1736	3.003	
	25/0		4.4646	4.803	
5 MHz BAND 16QAM	12/6	1880.0	2.1383	2.508	
	25/0		4.4841	4.744	
5 MHz BAND 16QAM	12/6	1907.5	2.1592	2.514	
	25/0		4.4605	4.682	

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	10 MHz BAND QPSK	25/12	1855.0	4.4747	5.260
		50/0		8.9205	9.253
	10 MHz BAND QPSK	25/12	1880.0	4.4407	4.800
		50/0		8.8478	9.347
	10 MHz BAND QPSK	25/12	1905.0	4.4258	5.054
		50/0		8.9566	9.354
	10 MHz BAND 16QAM	25/12	1855.0	4.4705	5.519
		50/0		8.9801	9.383
	10 MHz BAND 16QAM	25/12	1880.0	4.4811	4.709
		50/0		8.9495	9.332
	10 MHz BAND 16QAM	25/12	1905.0	4.4264	4.845
		50/0		8.9364	9.360
	15 MHz BAND QPSK	36/18	1857.5	6.4226	7.002
		75/0		13.4177	13.944
	15 MHz BAND QPSK	36/18	1880.0	6.4182	6.829
		75/0		13.4116	14.103
	15 MHz BAND QPSK	36/18	1902.5	6.4014	6.901
		75/0		13.4063	14.069
	15 MHz BAND 16QAM	36/18	1857.5	6.4428	7.169
		75/0		13.3784	13.991
15 MHz BAND 16QAM	36/18	1880.0	6.4267	6.870	
	75/0		13.4379	14.321	
15 MHz BAND 16QAM	36/18	1902.5	6.4194	7.145	
	75/0		13.3428	13.991	
20 MHz BAND QPSK	50/19	1860.0	8.9663	9.535	
	100/0		17.8015	18.803	
20 MHz BAND QPSK	50/19	1880.0	8.8598	9.366	
	100/0		17.8399	19.136	
20 MHz BAND QPSK	50/19	1900.0	8.9794	9.557	
	100/0		17.6302	18.608	
20 MHz BAND 16QAM	50/19	1860.0	8.9070	9.651	
	100/0		17.6923	18.816	
20 MHz BAND 16QAM	50/19	1880.0	8.8694	9.343	
	100/0		17.7733	18.802	
20 MHz BAND 16QAM	50/19	1900.0	8.8579	9.312	
	100/0		17.8472	18.708	

LTE BAND 4

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 4	1.4 MHz BAND QPSK	3/2	1710.7	0.5898198	0.830150
		6/0		1.0723	1.208
	1.4 MHz BAND QPSK	3/2	1732.5	0.5659796	0.806407
		6/0		1.0874	1.223
	1.4 MHz BAND QPSK	3/2	1754.3	0.5626775	0.809067
		6/0		1.0795	1.207
	1.4 MHz BAND 16QAM	3/2	1710.7	0.5476528	0.772983
		6/0		1.0706	1.216
	1.4 MHz BAND 16QAM	3/2	1732.5	0.5545931	0.746381
		6/0		1.0854	1.161
	1.4 MHz BAND 16QAM	3/2	1754.3	0.5488464	0.839039
		6/0		1.0966	1.267
	3 MHz BAND QPSK	6/0	1711.5	1.4173	1.621
		15/0		2.6792	2.786
	3 MHz BAND QPSK	8/4	1732.5	1.4415	2.903
		15/0		2.6836	1.962
	3 MHz BAND QPSK	8/4	1753.5	1.4409	1.804
		15/0		2.6623	2.844
	3 MHz BAND 16QAM	6/0	1711.5	1.4316	1.823
		15/0		2.6795	2.913
	3 MHz BAND 16QAM	8/4	1732.5	1.4281	1.794
		15/0		2.6753	2.885
	3 MHz BAND 16QAM	8/4	1753.5	1.4460	1.806
		15/0		2.6631	2.897
	5 MHz BAND QPSK	12/6	1712.5	2.1562	2.520
		25/0		4.4772	4.663
	5 MHz BAND QPSK	12/6	1732.5	2.1166	2.470
		25/0		4.4588	4.686
5 MHz BAND QPSK	12/6	1752.5	2.1690	2.616	
	25/0		4.4420	5.021	
5 MHz BAND 16QAM	12/6	1732.5	2.1587	2.878	
	25/0		4.5060	4.782	
5 MHz BAND 16QAM	12/6	1752.5	2.1211	2.511	
	25/0		4.4995	4.674	
5 MHz BAND 16QAM	12/6	1752.5	2.1620	2.524	
	25/0		4.4799	4.826	

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
LTE BAND 4	10 MHz BAND QPSK	25/12	1715.0	4.4392	5.057
		50/0		8.8769	9.422
	10 MHz BAND QPSK	25/12	1732.50	4.4048	5.227
		50/0		8.9005	9.646
	10 MHz BAND QPSK	25/12	1750.00	4.4193	4.769
		50/0		8.9408	9.442
	10 MHz BAND 16QAM	25/12	1715.0	4.4376	5.016
		50/0		8.9750	9.529
	10 MHz BAND 16QAM	25/12	1732.50	4.5062	5.514
		50/0		8.9124	9.295
	10 MHz BAND 16QAM	25/12	1750.00	4.4788	4.900
		50/0		8.8642	9.680
	15 MHz BAND QPSK	36/18	1717.50	6.3785	6.677
		75/0		13.1683	14.052
	15 MHz BAND QPSK	36/18	1732.50	6.5214	6.744
		75/0		13.4113	14.404
	15 MHz BAND QPSK	36/18	1747.50	6.3424	6.761
		75/0		13.3726	14.431
	15 MHz BAND 16QAM	36/18	1717.50	6.4600	7.134
		75/0		13.2950	14.043
	15 MHz BAND 16QAM	36/18	1732.50	6.4424	7.161
		75/0		13.5189	14.097
	15 MHz BAND 16QAM	36/18	1747.50	6.3908	6.887
		75/0		13.4514	13.970
	20 MHz BAND QPSK	50/19	1720.0	8.8683	9.318
		100/0		17.6774	18.879
	20 MHz BAND QPSK	50/19	1732.50	8.9349	9.316
		100/0		17.8006	18.692
20 MHz BAND QPSK	50/19	1745.0	9.0294	9.535	
	100/0		17.8184	18.794	
20 MHz BAND 16QAM	50/19	1720.0	8.8877	9.518	
	100/0		18.0257	18.779	
20 MHz BAND 16QAM	50/19	1732.50	8.9023	9.329	
	100/0		17.8292	18.679	
20 MHz BAND 16QAM	50/19	1745.0	8.9788	9.466	
	100/0		17.4935	18.781	

LTE Band 5

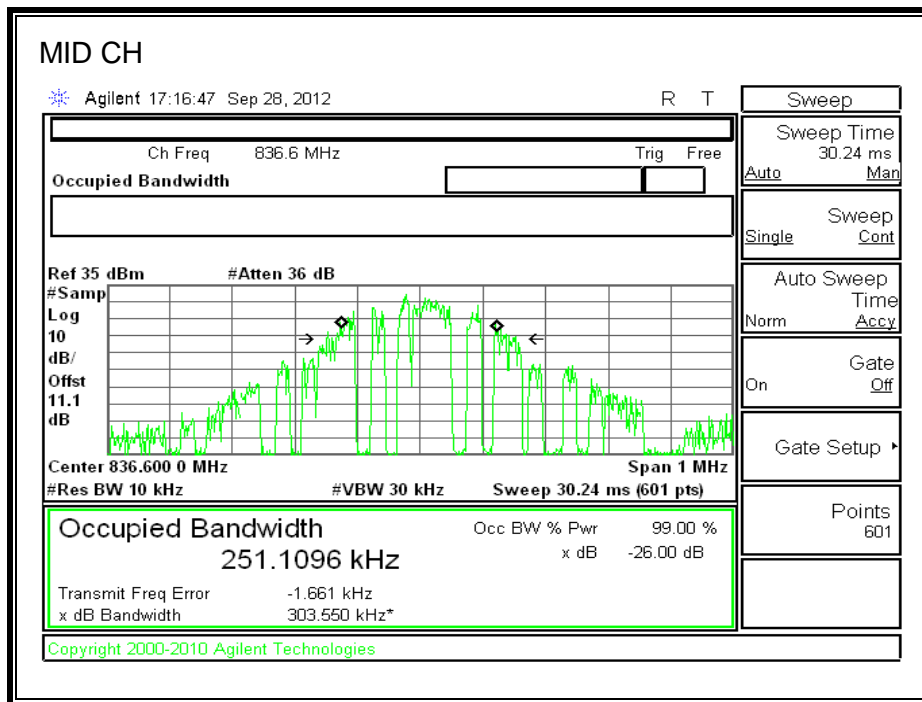
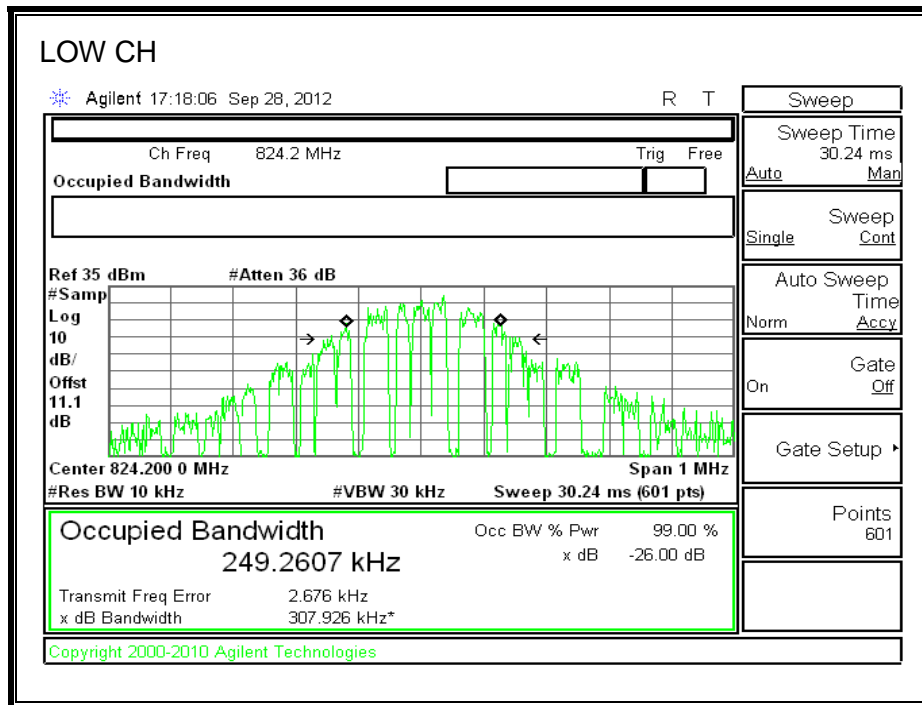
Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 5	1.4 MHz BAND QPSK	3/2	824.7	0.5670862	0.783881
		6/0		1.0719	1.269
	1.4 MHz BAND QPSK	3/2	836.5	0.5736739	0.838970
		6/0		1.0696	1.216
	1.4 MHz BAND QPSK	3/2	848.3	0.5613489	0.702970
		6/0		1.0572	1.224
	1.4 MHz BAND 16QAM	3/2	824.7	0.5518363	0.782920
		6/0		1.0879	1.215
	1.4 MHz BAND 16QAM	3/2	836.5	0.5549398	0.743268
		6/0		1.0791	1.269
	1.4 MHz BAND 16QAM	3/2	848.3	0.5604349	0.698490
		6/0		1.0871	1.217
	3 MHz BAND QPSK	8/4	825.5	1.4268	1.674
		15/0		2.6605	2.789
	3 MHz BAND QPSK	8/4	836.5	1.4363	1.721
		15/0		2.6700	2.868
	3 MHz BAND QPSK	8/4	847.5	1.4374	1.803
		15/0		2.6597	2.798
	3 MHz BAND 16QAM	8/4	825.5	1.4476	1.805
		15/0		2.6684	2.901
	3 MHz BAND 16QAM	8/4	836.5	1.4427	1.737
		15/0		2.6750	2.795
	3 MHz BAND 16QAM	8/4	847.5	1.4277	1.644
		15/0		2.7010	2.904
	5 MHz BAND QPSK	12/6	821.5	2.1345	2.382
		25/0		4.4524	4.764
	5 MHz BAND QPSK	12/6	836.5	2.1404	2.510
		25/0		4.4885	4.778
	5 MHz BAND QPSK	12/6	846.5	2.1587	2.507
		25/0		4.4420	4.751
5 MHz BAND 16QAM	12/6	821.5	2.1494	2.367	
	25/0		4.4840	4.669	
5 MHz BAND 16QAM	12/6	836.5	2.1472	2.399	
	25/0		4.3989	4.775	
5 MHz BAND 16QAM	12/6	846.5	2.1907	2.880	
	25/0		4.4655	4.774	
10 MHz BAND QPSK	25/12	829	4.4585	5.049	
	50/0		8.8657	9.553	
10 MHz BAND QPSK	25/12	836.5	4.5167	5.510	
	50/0		8.8740	9.521	
10 MHz BAND QPSK	25/12	844	4.4421	4.778	
	50/0		8.8844	9.405	
10 MHz BAND 16QAM	25/12	829	4.4654	5.020	
	50/0		8.8305	9.310	
10 MHz BAND 16QAM	25/12	836.5	4.4777	5.015	
	50/0		8.8782	9.396	
10 MHz BAND 16QAM	25/12	844	4.4400	5.016	
	50/0		8.9034	9.260	

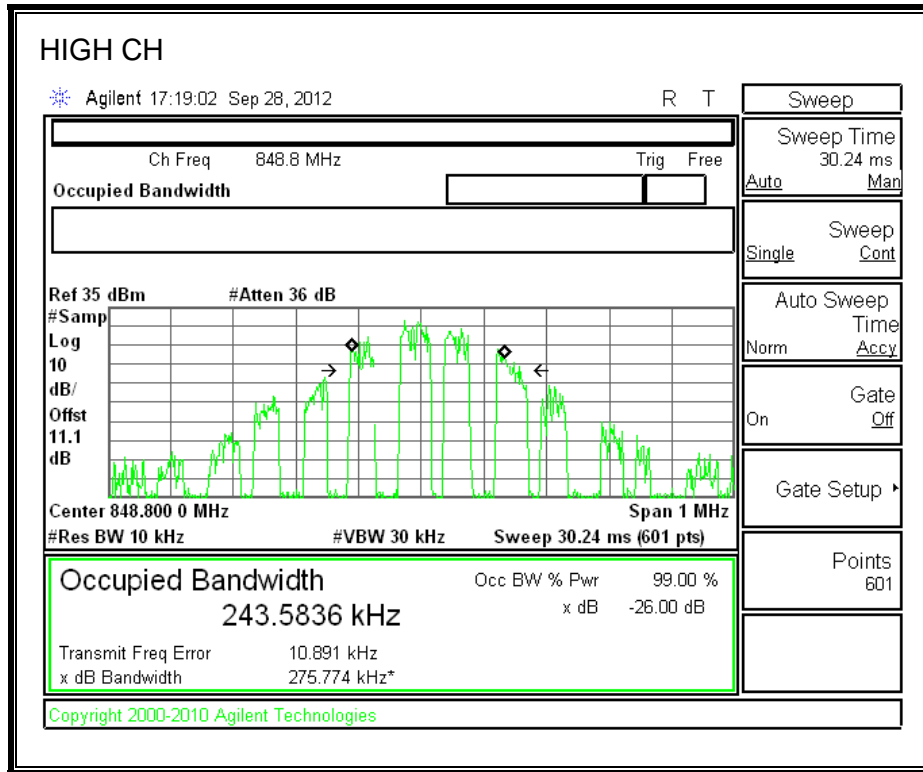
LTE Band 17

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 17	5 MHz BAND QPSK	12/6	706.5	2.1364	2.381
		25/0		4.4614	4.684
	5 MHz BAND QPSK	12/6	710	2.1553	2.646
		25/0		4.4773	4.721
	5 MHz BAND QPSK	12/6	713.5	2.1429	2.650
		25/0		4.5000	4.688
	5 MHz BAND 16QAM	12/6	706.5	2.1584	2.629
		25/0		4.4528	4.803
	5 MHz BAND 16QAM	12/6	710	2.1571	2.509
		25/0		4.4674	4.654
	5 MHz BAND 16QAM	12/6	713.5	2.1651	2.522
		25/0		4.4734	4.807
	10 MHz BAND QPSK	25/12	709	4.4559	6.005
		50/0		8.9282	9.398
	10 MHz BAND QPSK	25/12	710	4.4526	4.682
		50/0		8.7942	9.250
	10 MHz BAND QPSK	25/12	711	4.4549	5.422
		50/0		8.6894	9.336
10 MHz BAND 16QAM	25/12	709	4.4635	4.910	
	50/0		8.9881	9.389	
10 MHz BAND 16QAM	25/12	710	4.4661	5.020	
	50/0		8.8420	9.349	
10 MHz BAND 16QAM	25/12	711	4.4333	5.027	
	50/0		8.8159	9.307	

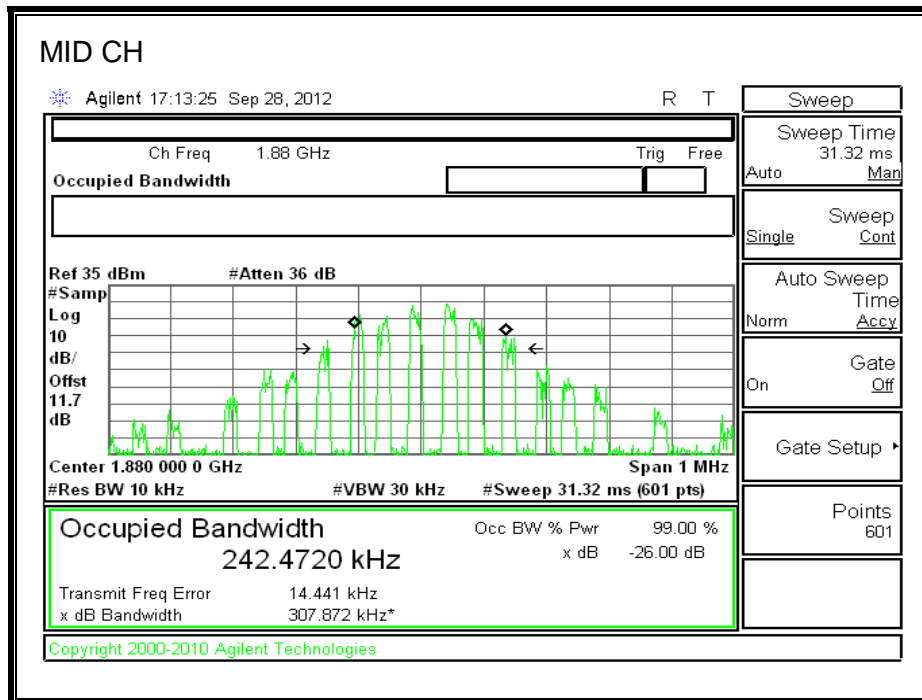
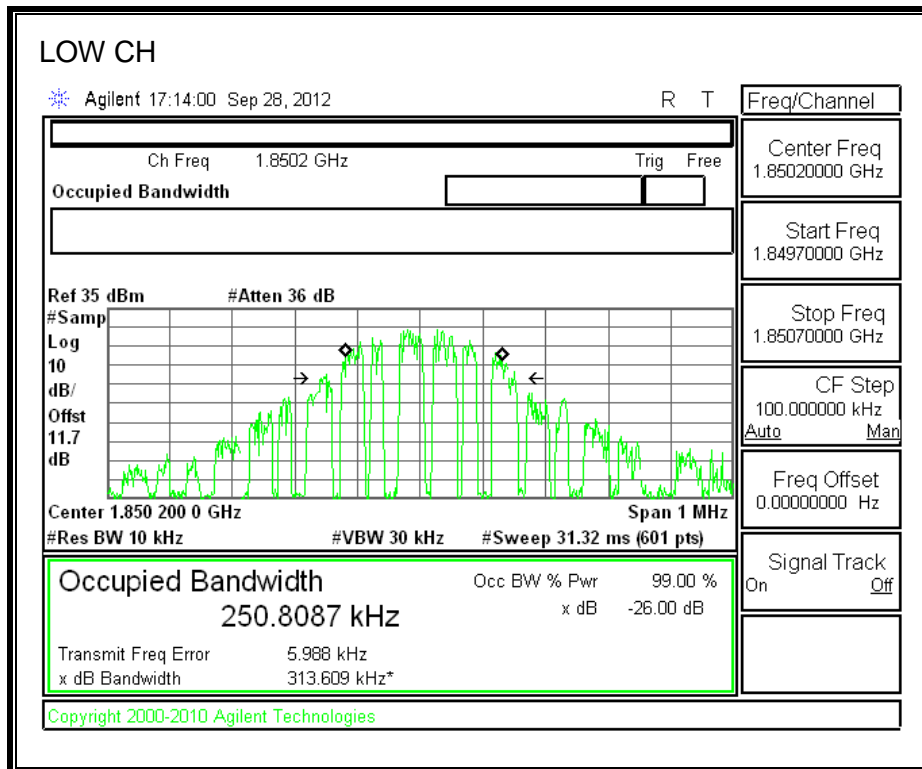
8.1.1. GSM

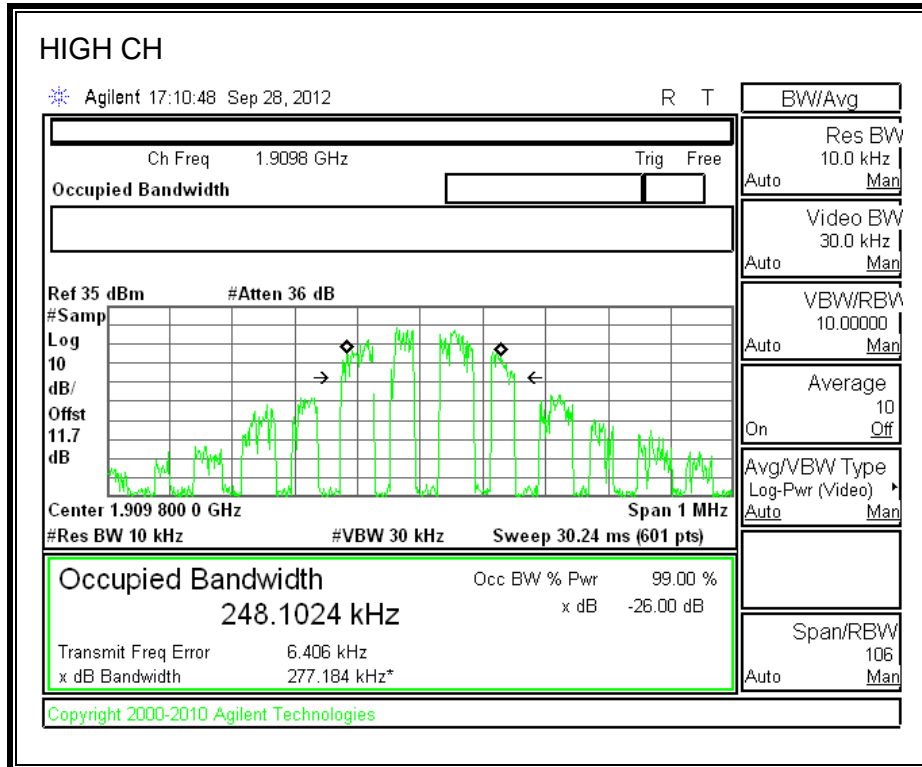
GPRS Mode (Cellular Band)



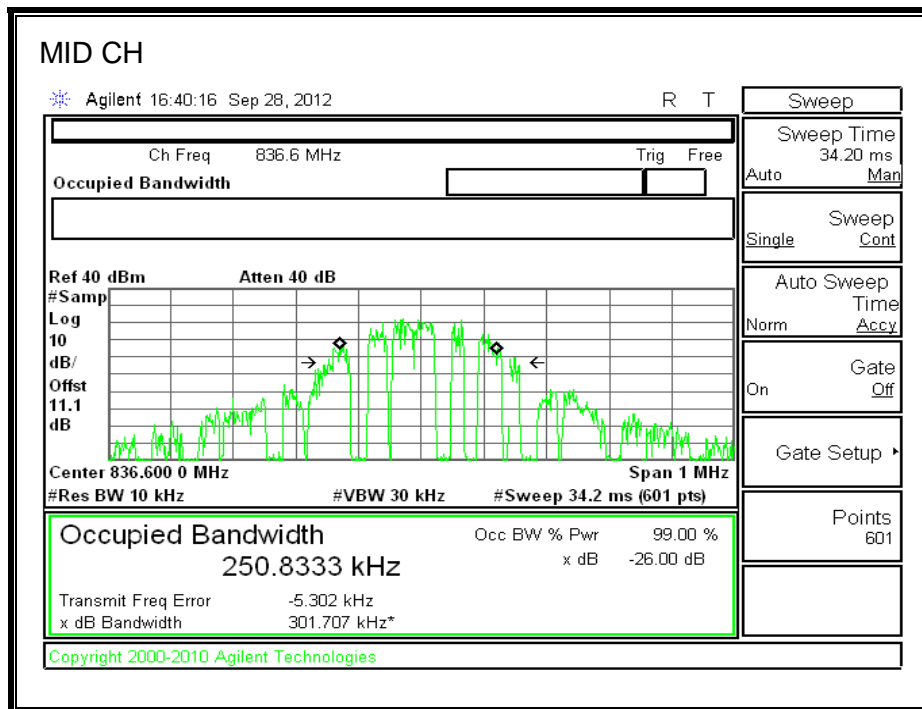
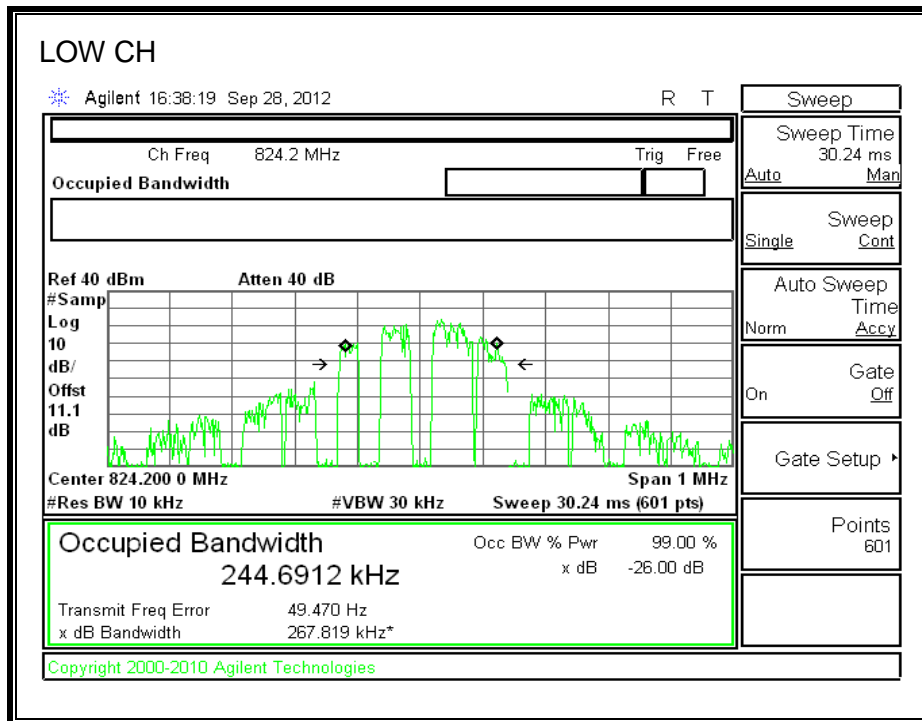


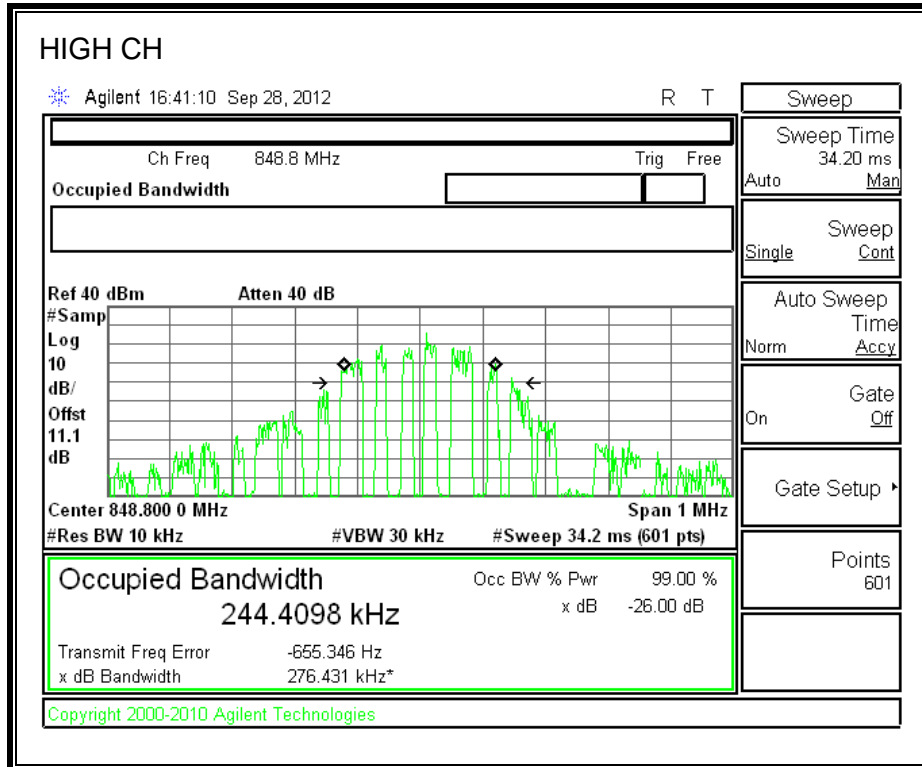
GPRS 1900 Mode (PCS Band)



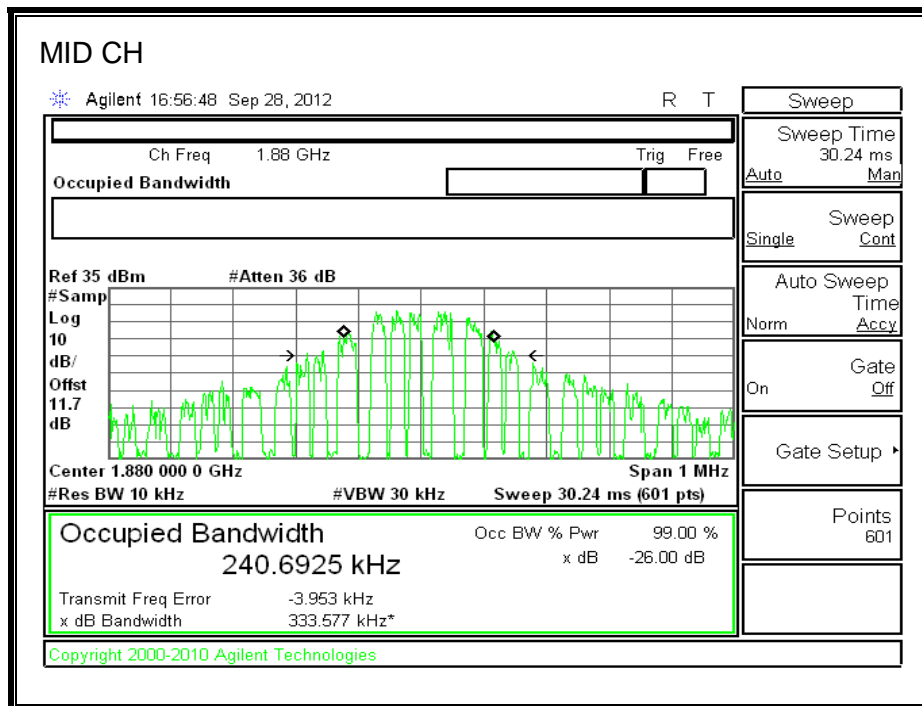
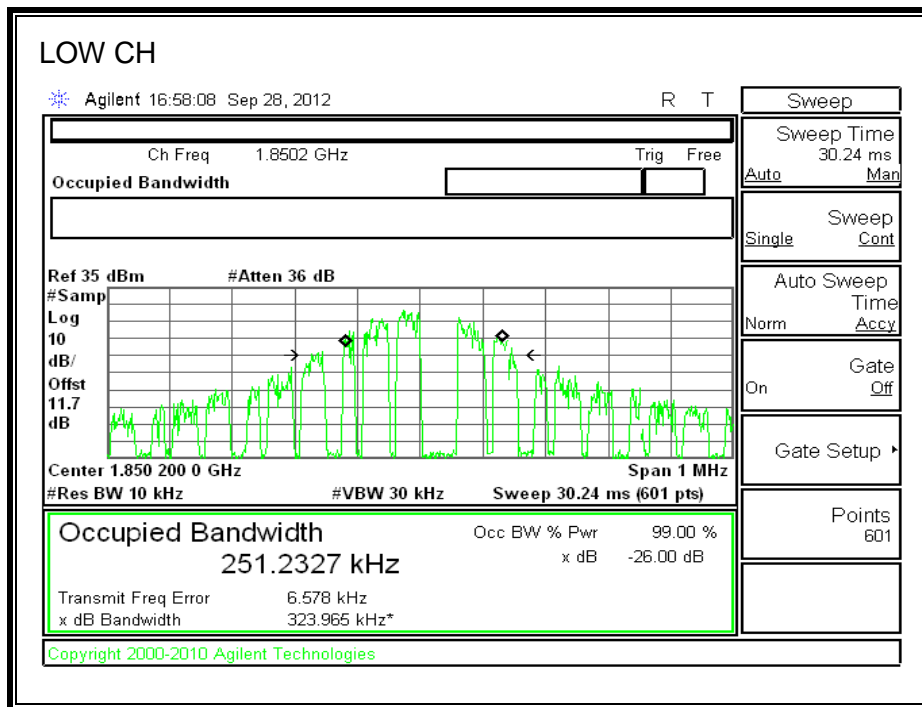


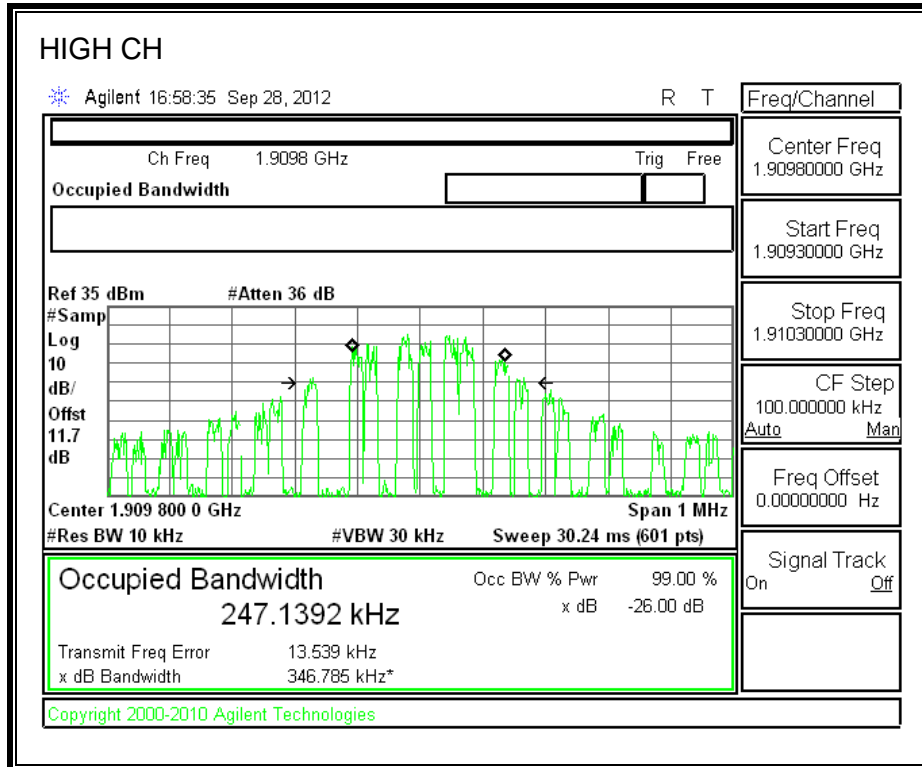
EGPRS Cellular Band





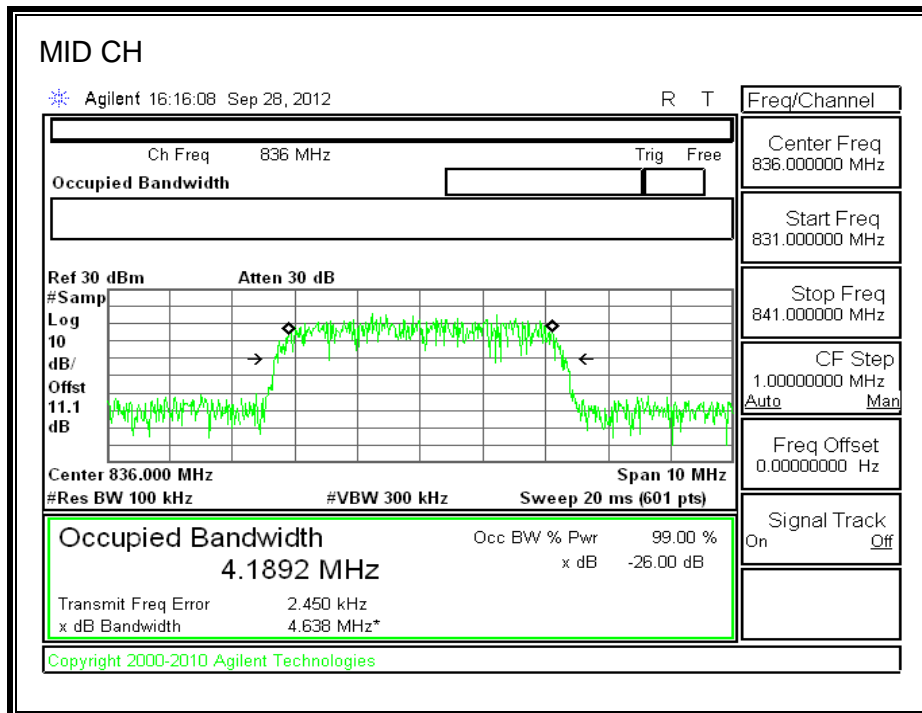
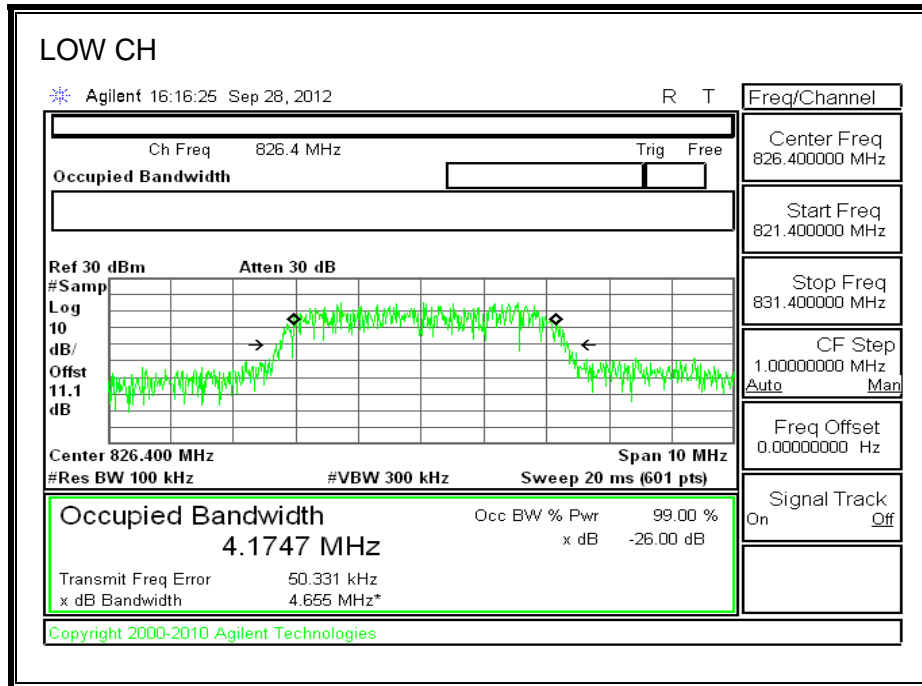
EGPRS 1900 Mode (PCS Band)

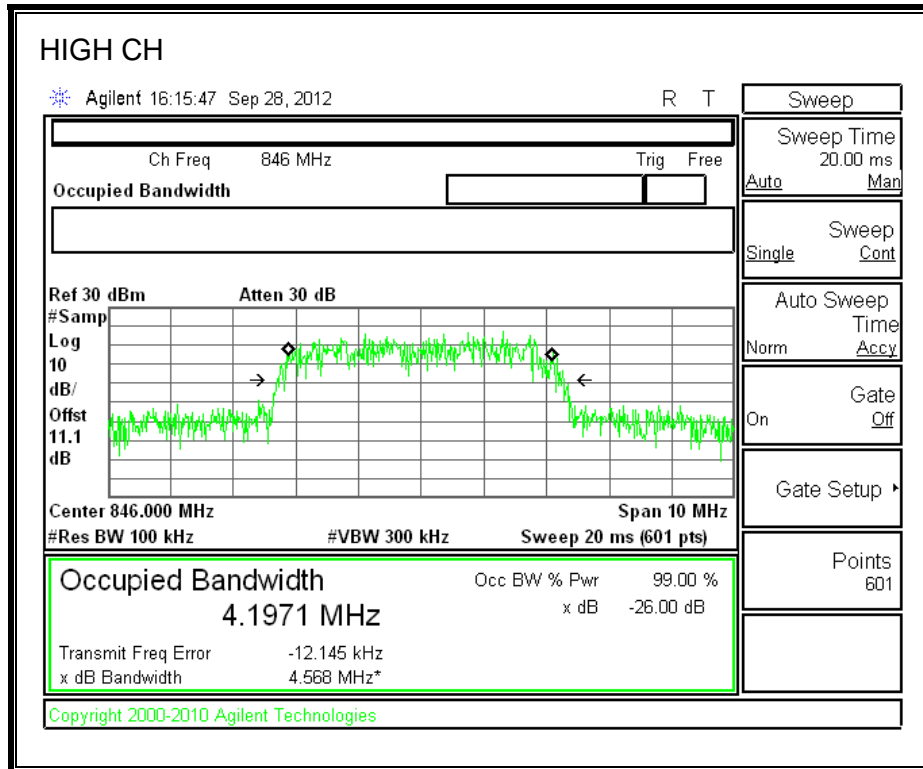




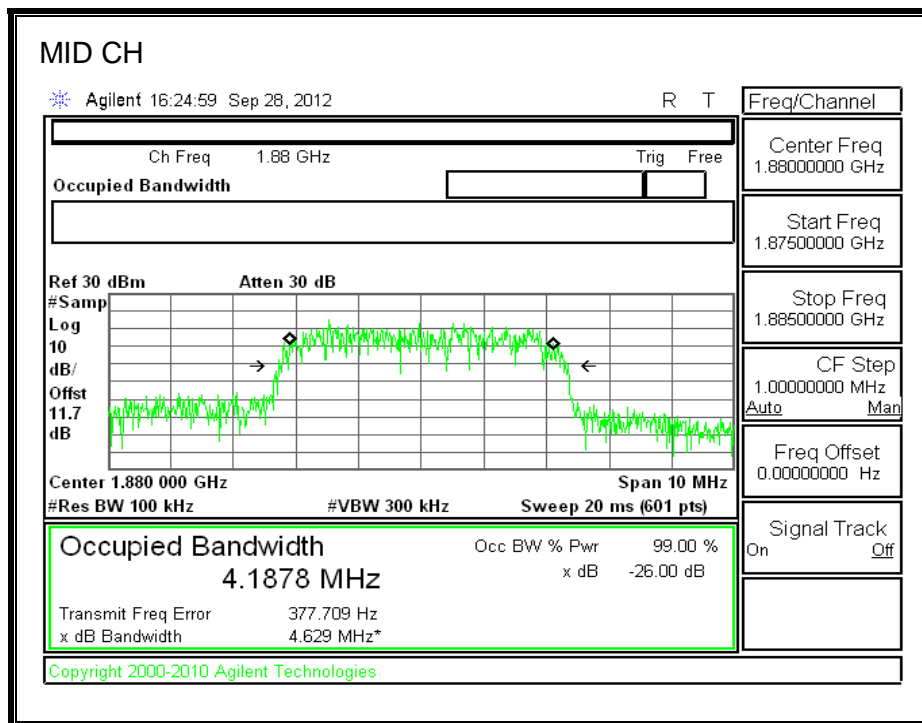
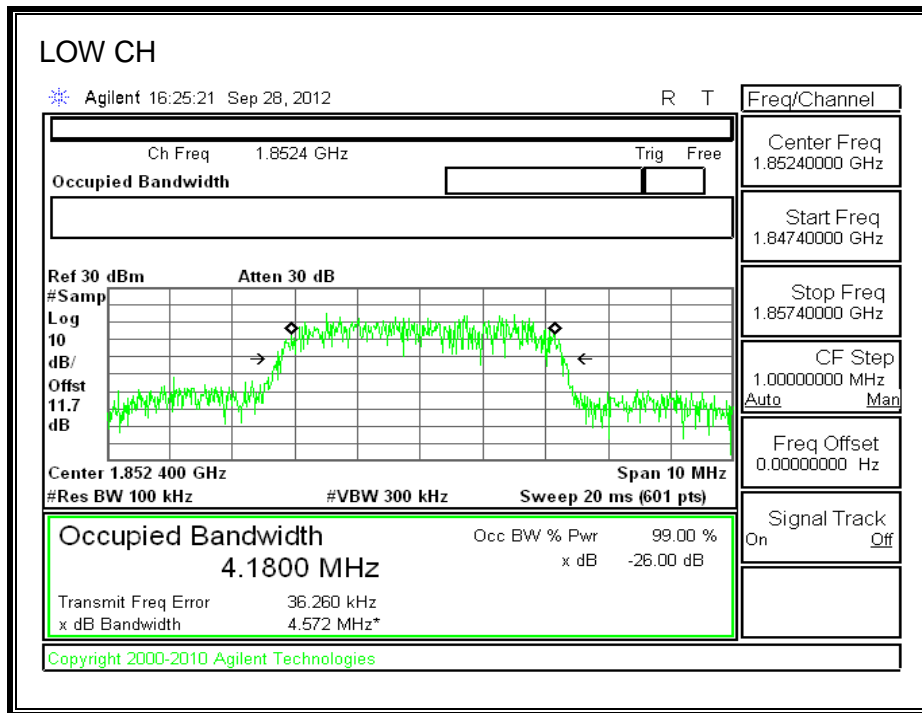
8.1.2. WCDMA

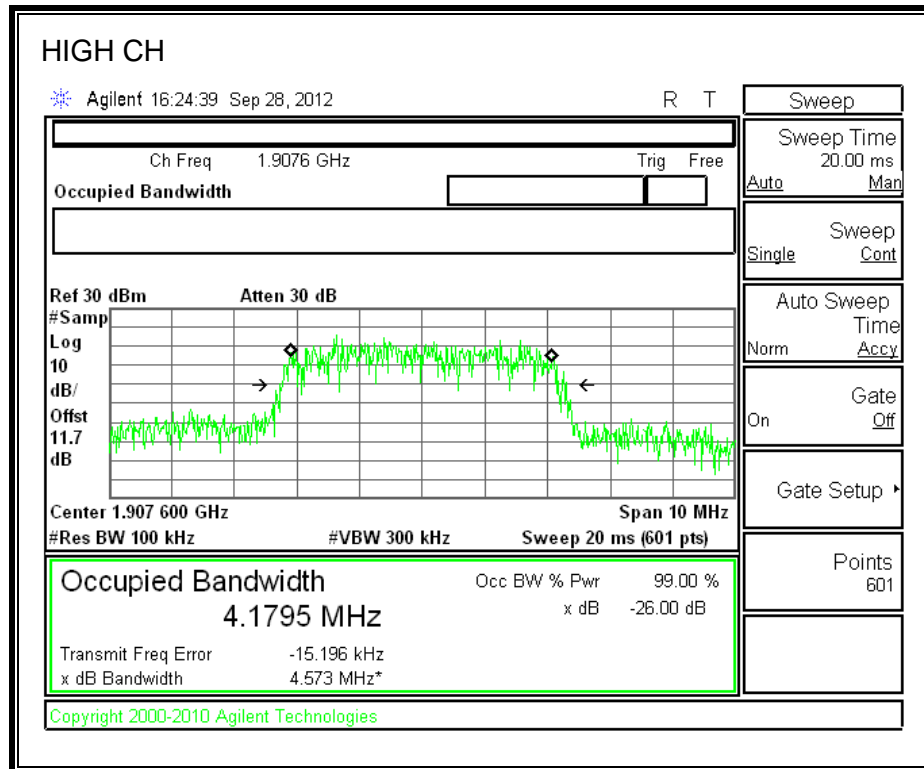
Rel 99 (Cellular Band)



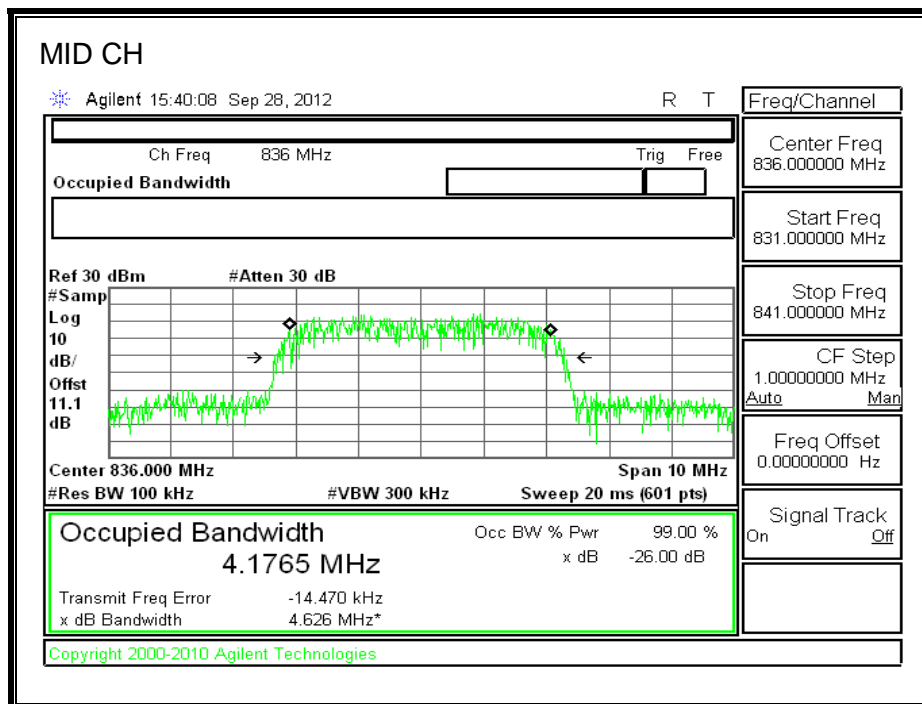
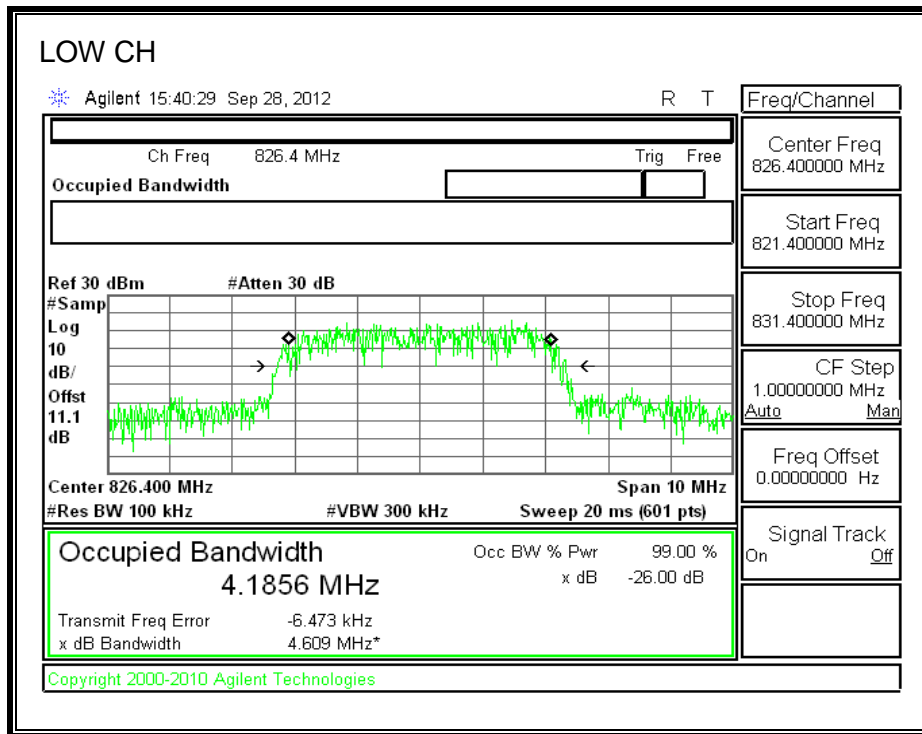


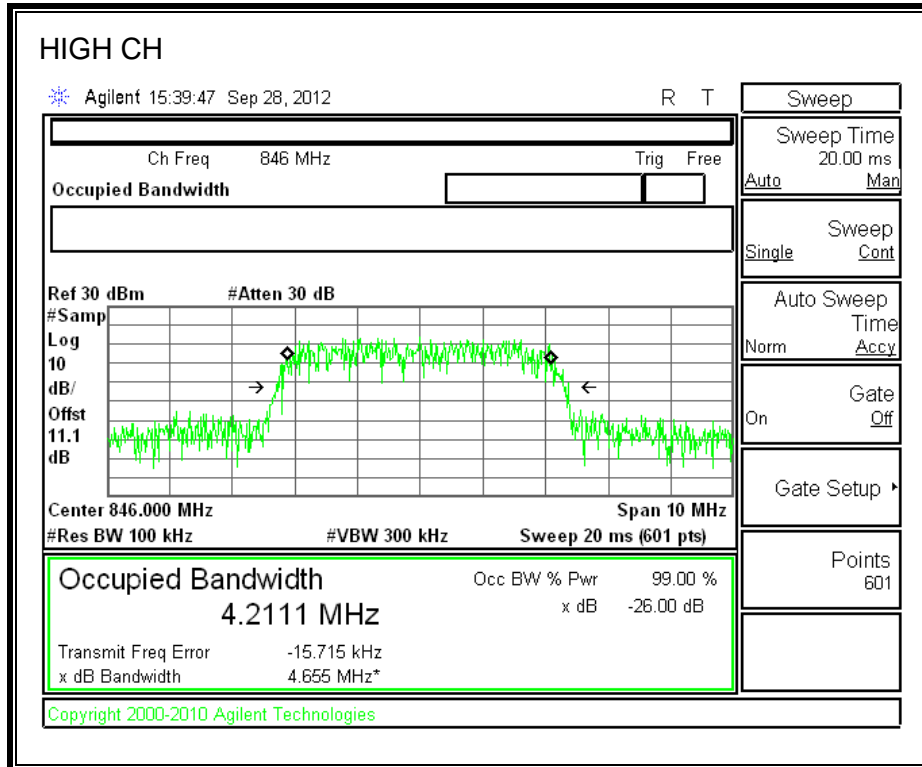
REL 99 Mode (PCS Band)



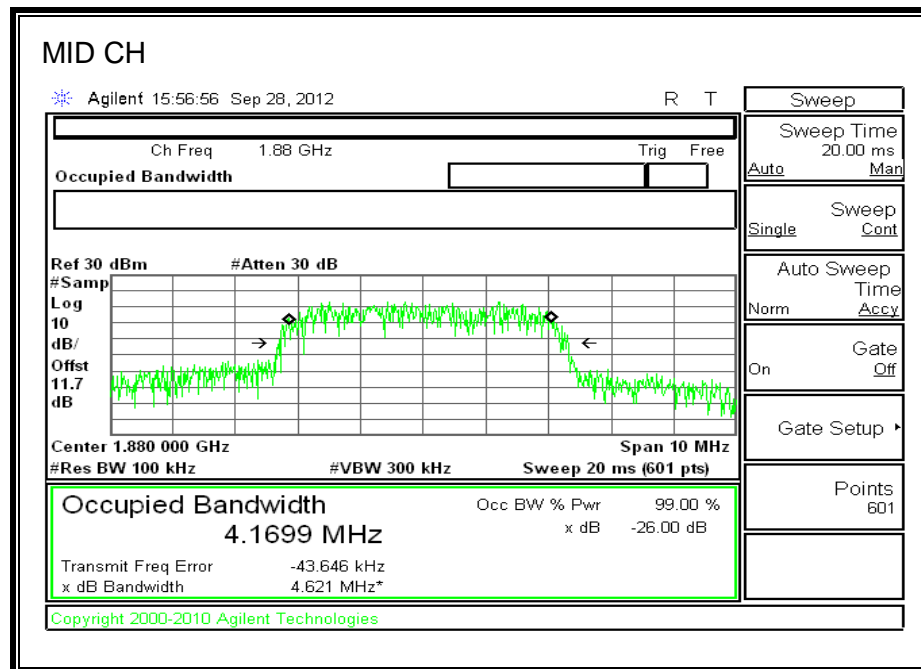
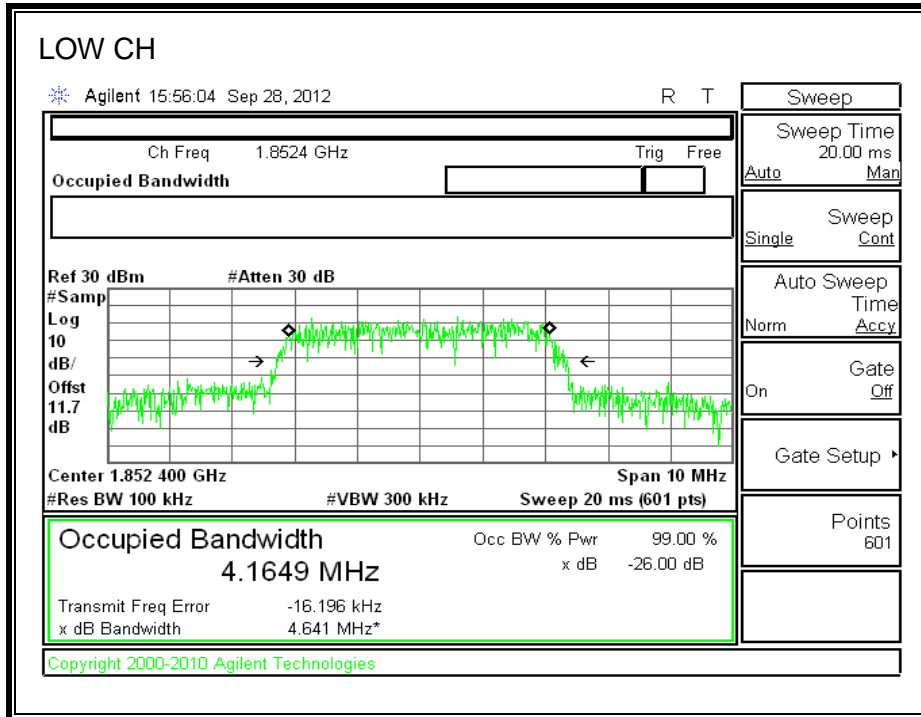


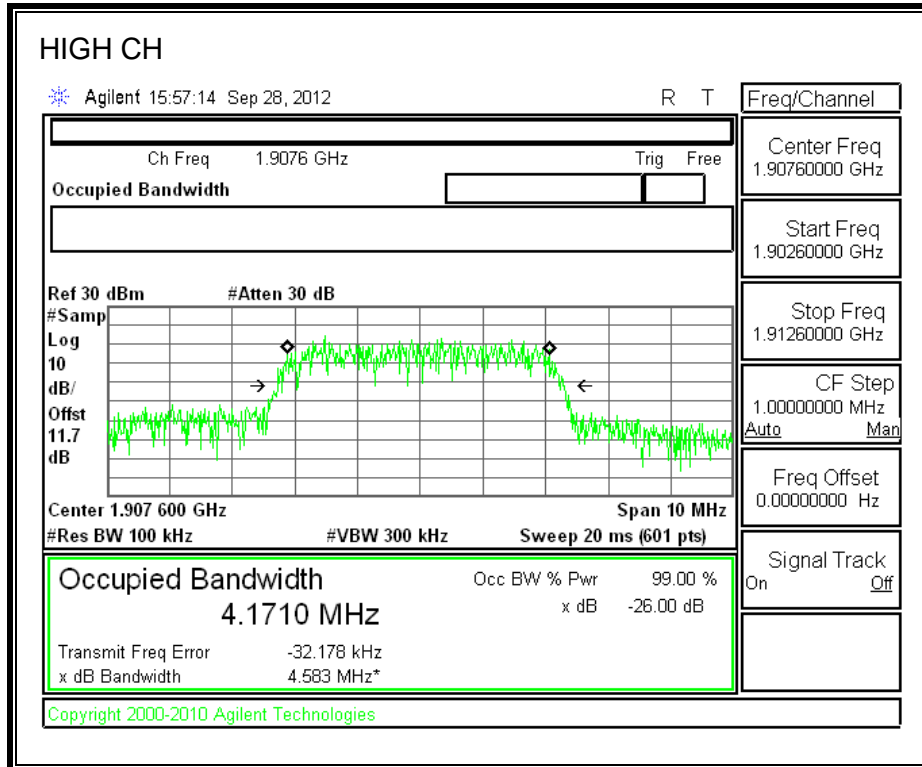
WCDMA HSUPA (Cellular Band)





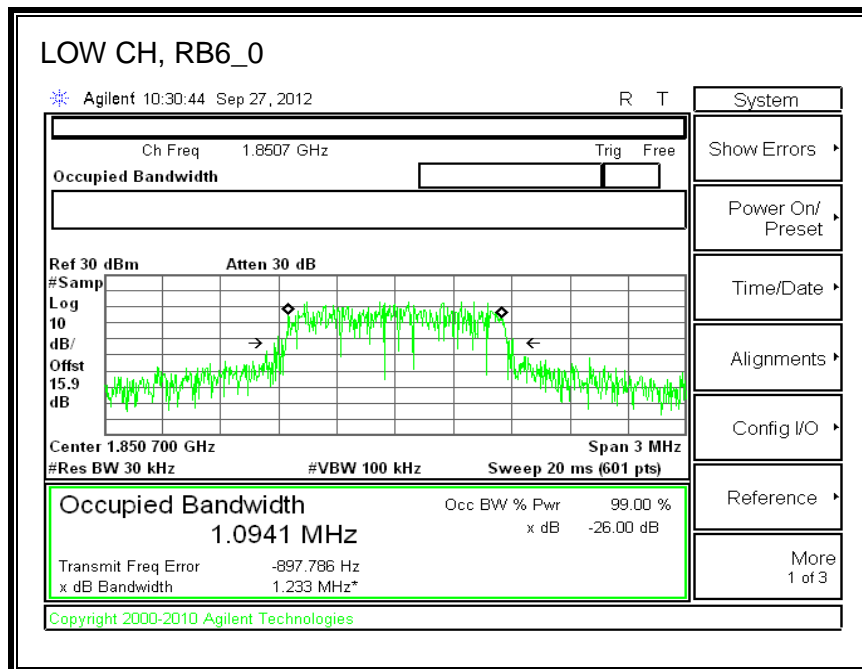
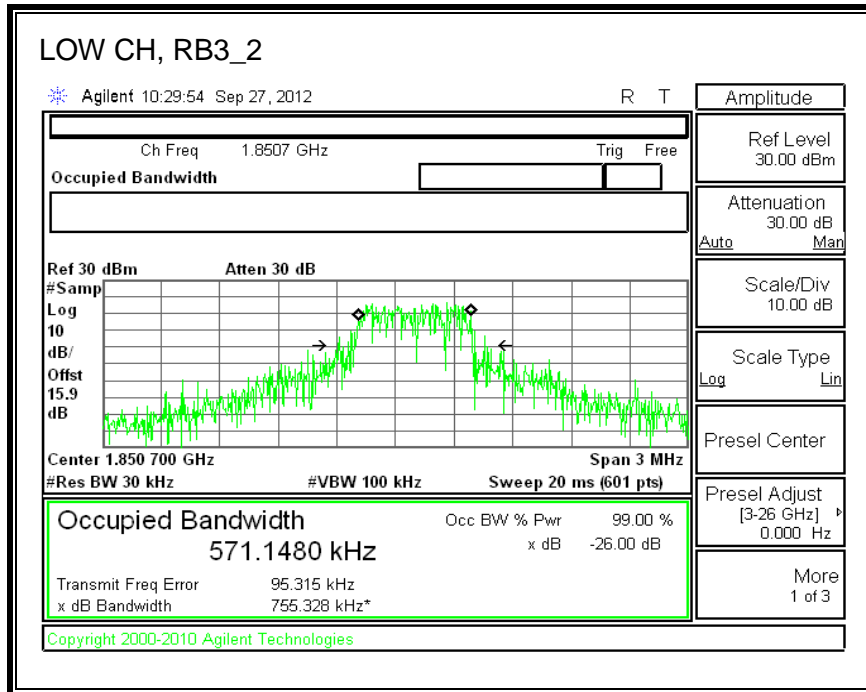
WCDMA HSUA Mode (PCS Band)

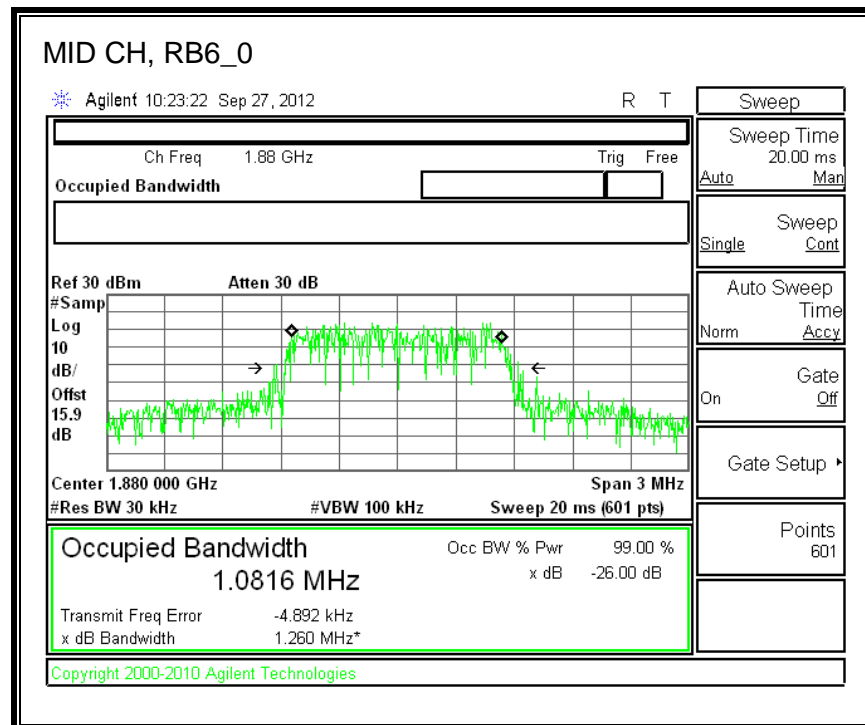
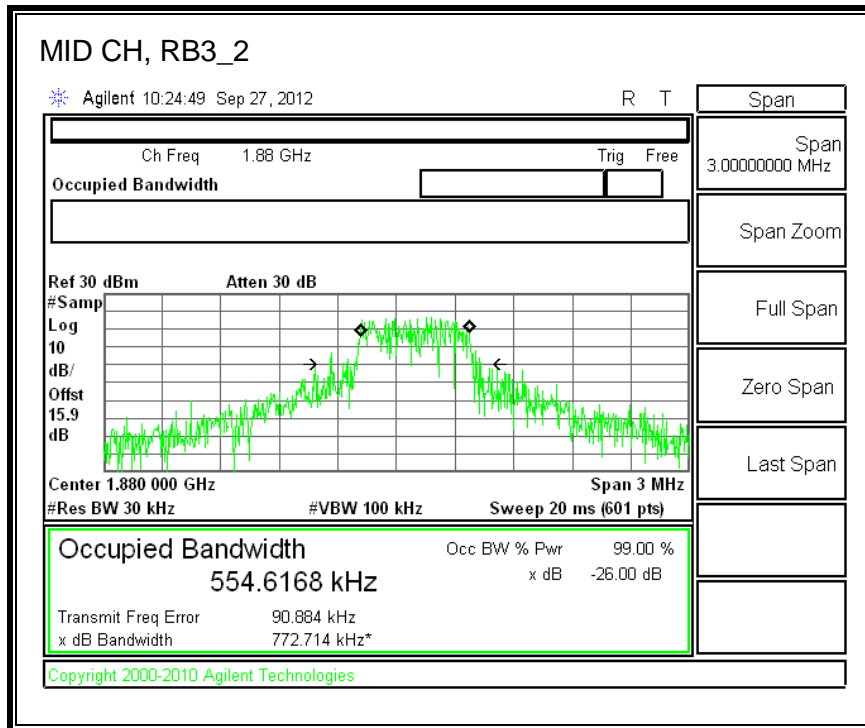


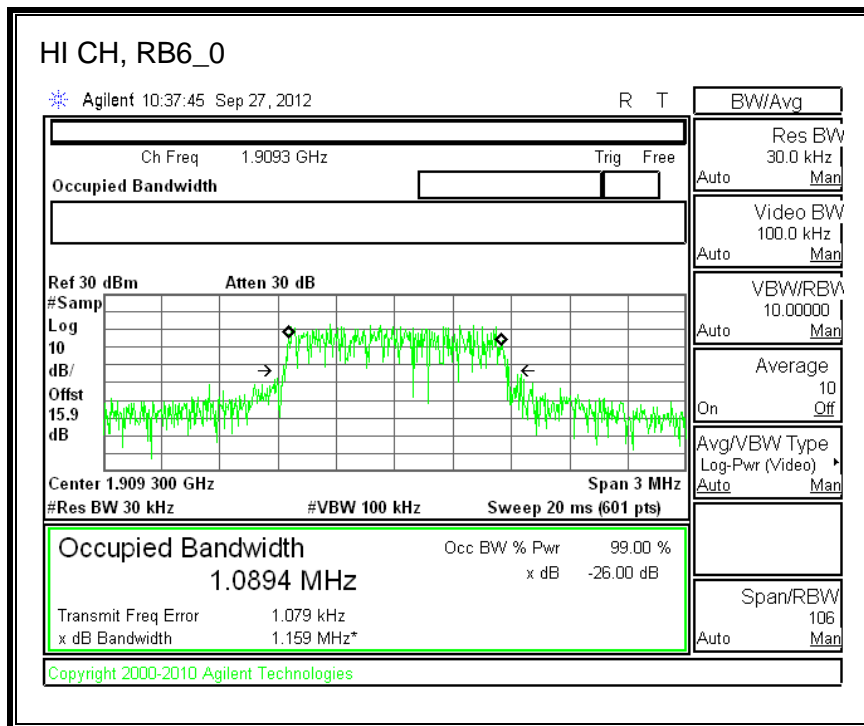
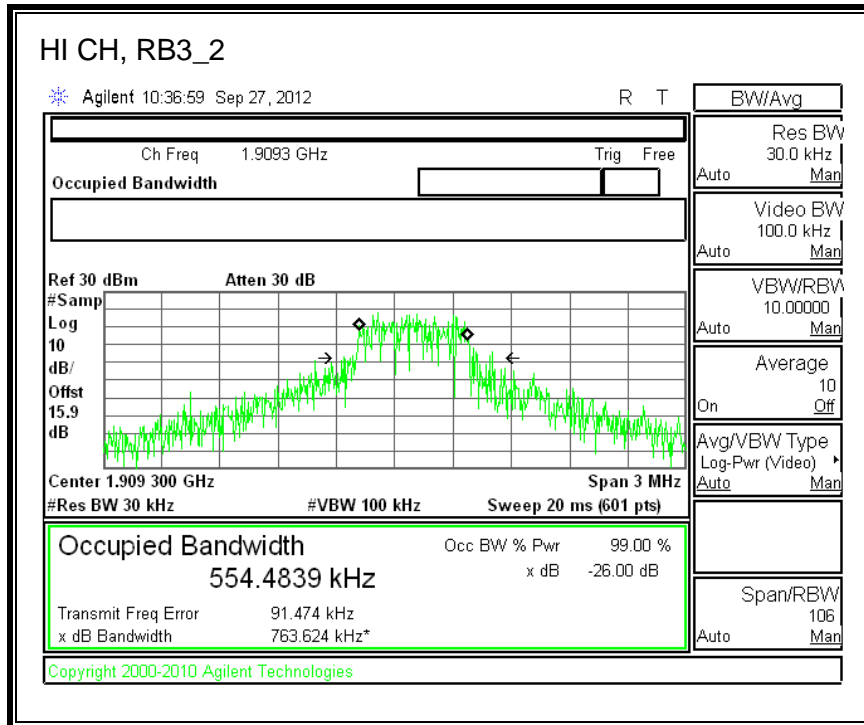


8.1.3. LTE Band 2

QPSK (1.4 MHz BANDWIDTH)

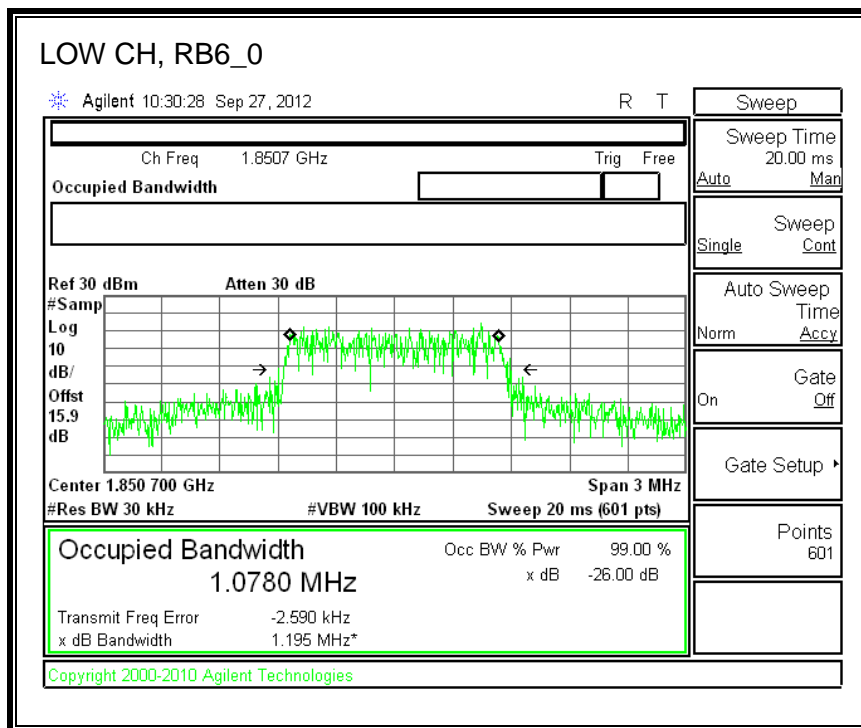
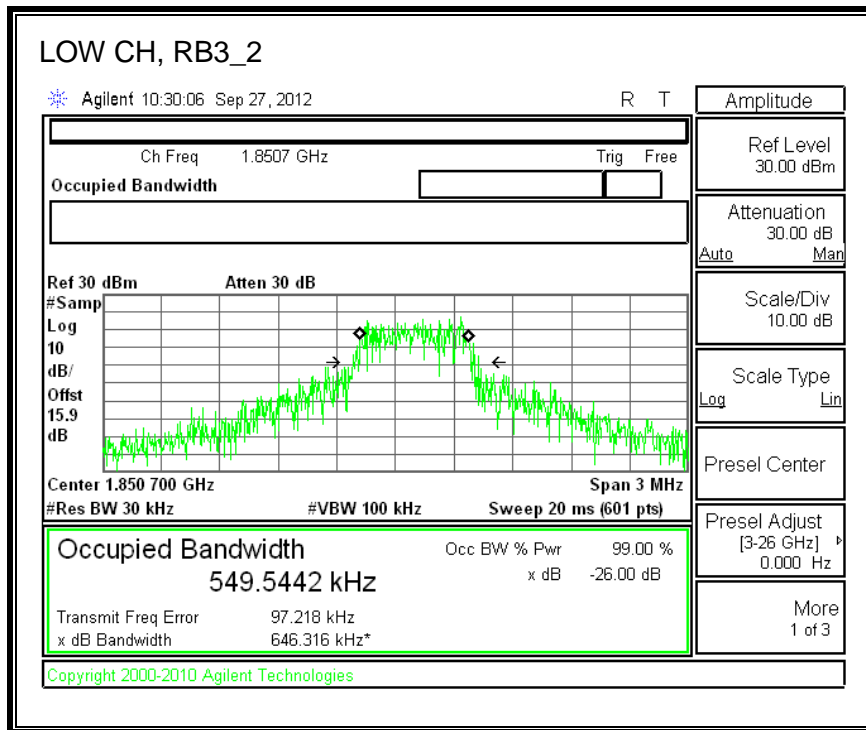


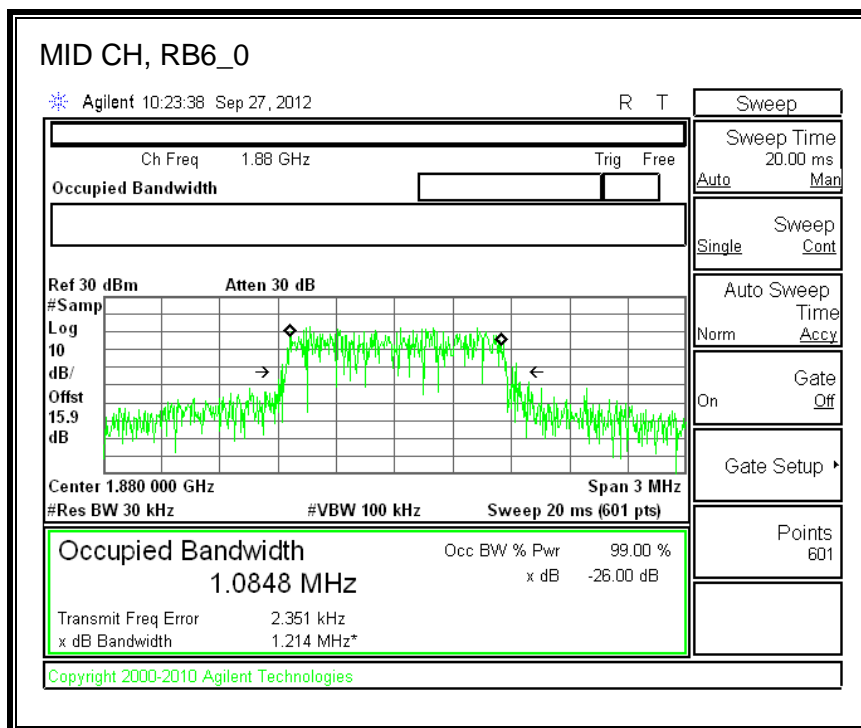
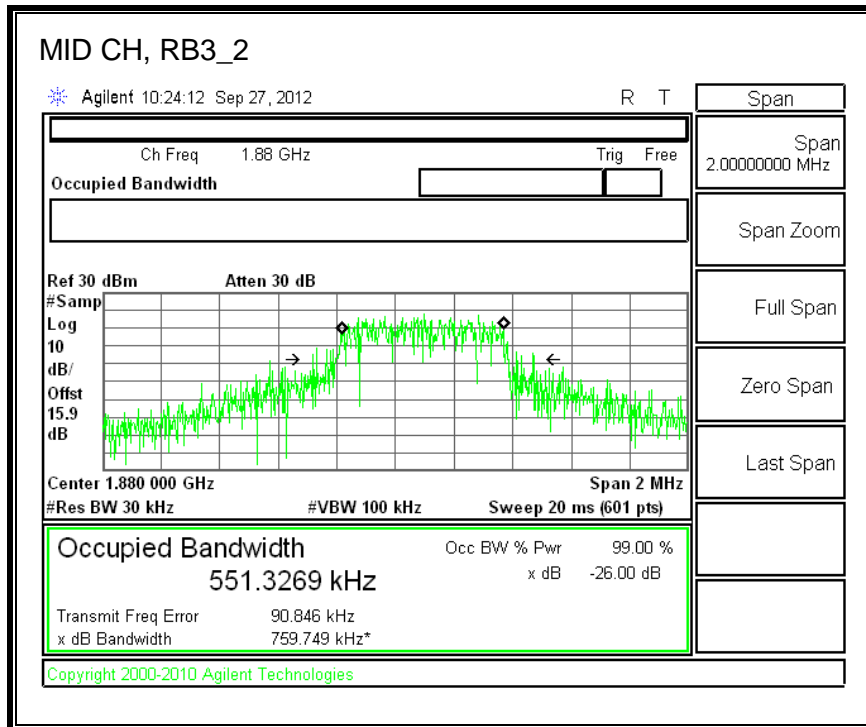


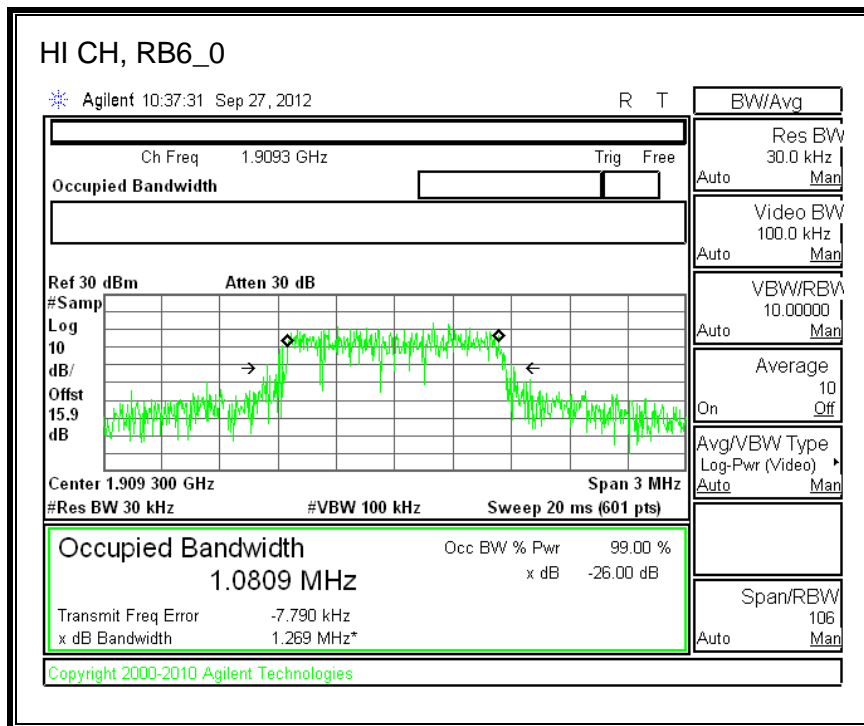
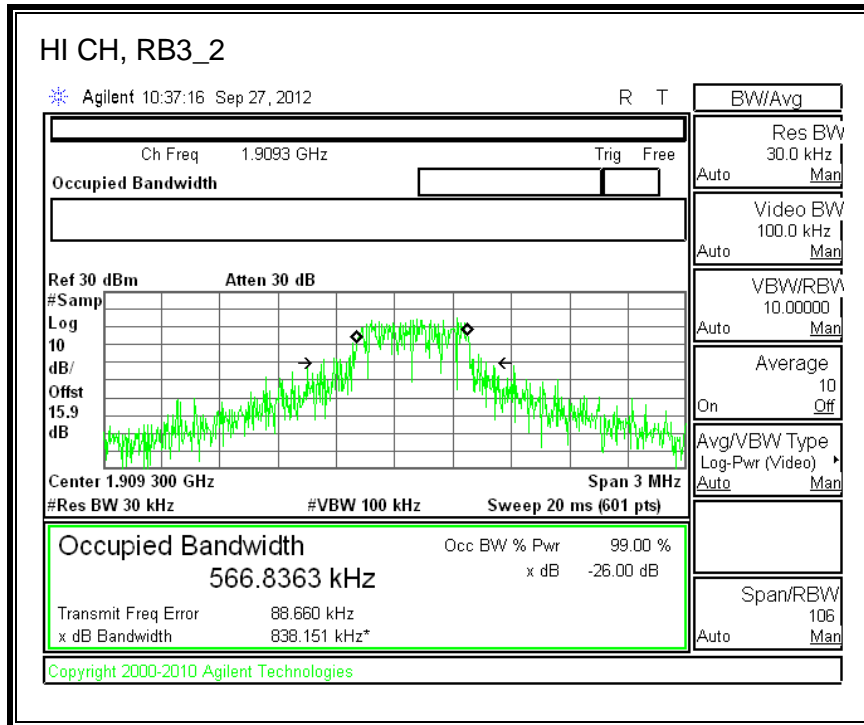


Band 2 (1.4 MHz BANDWIDTH)

16QAM

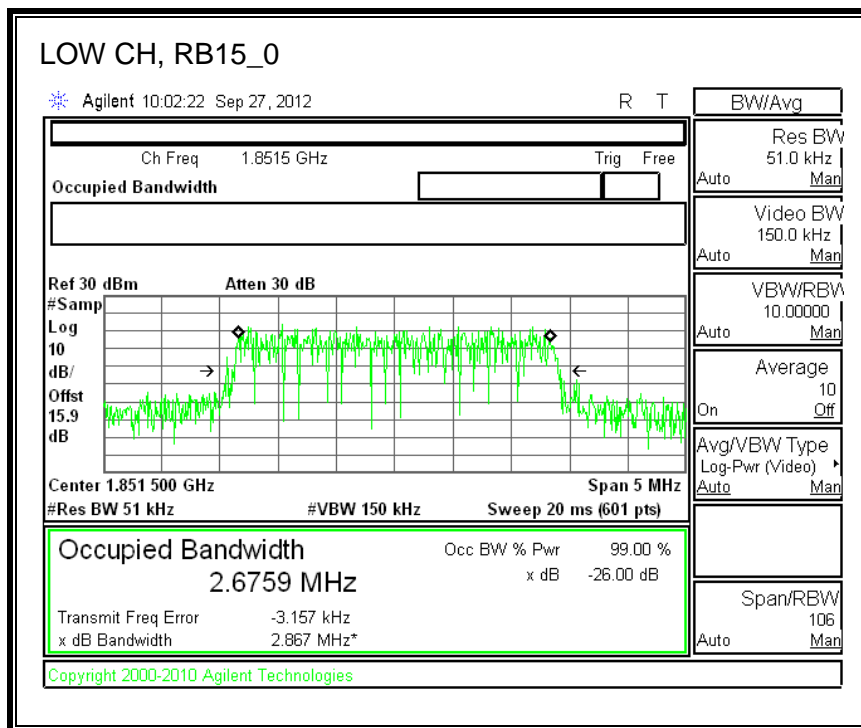
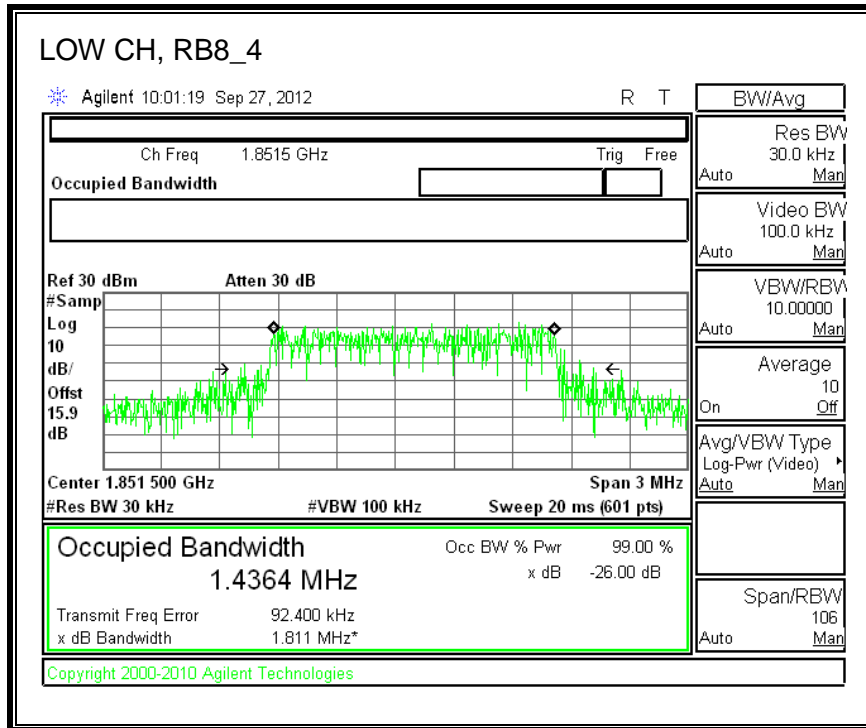


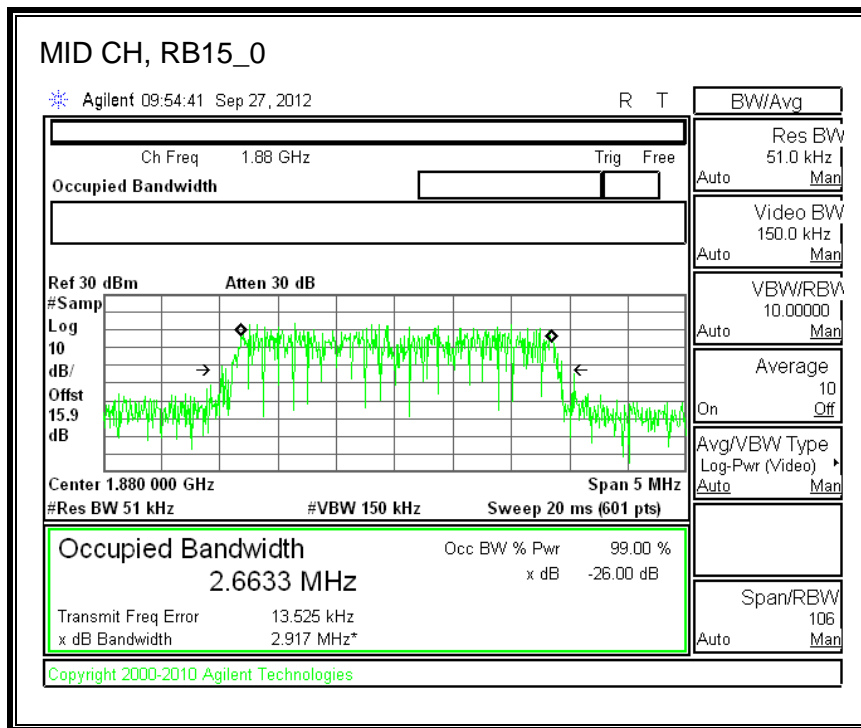
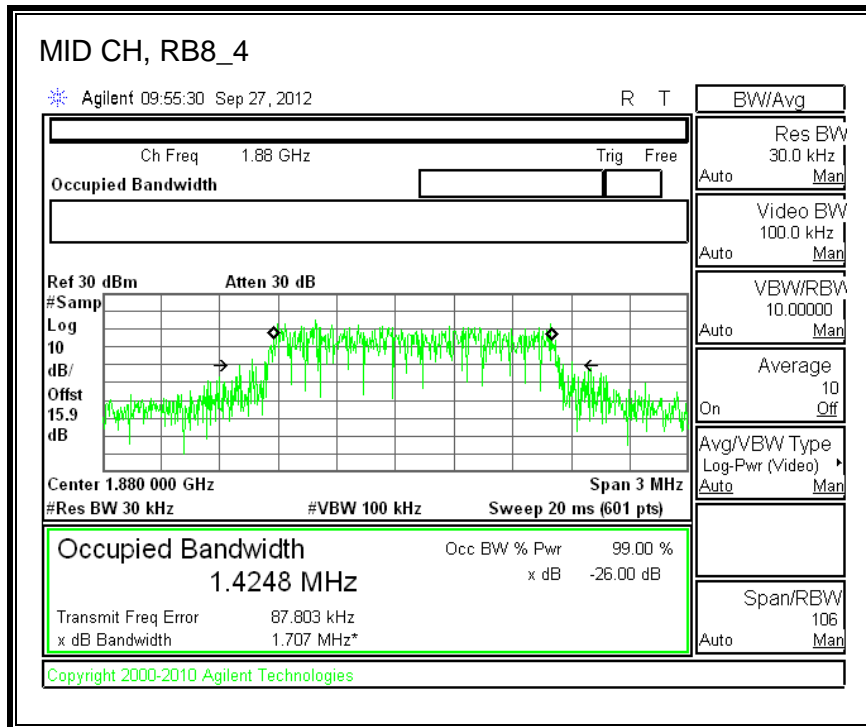


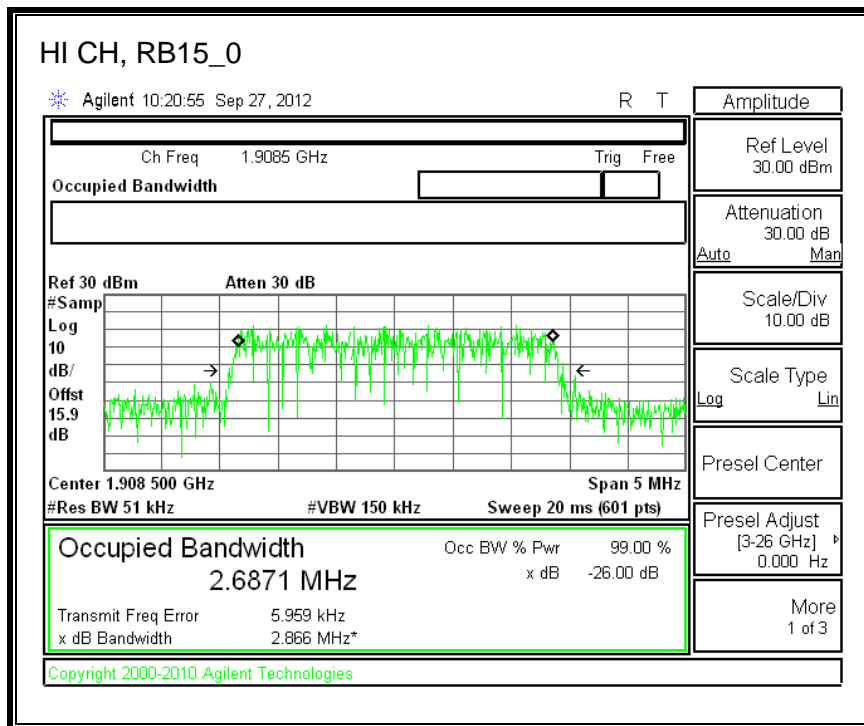
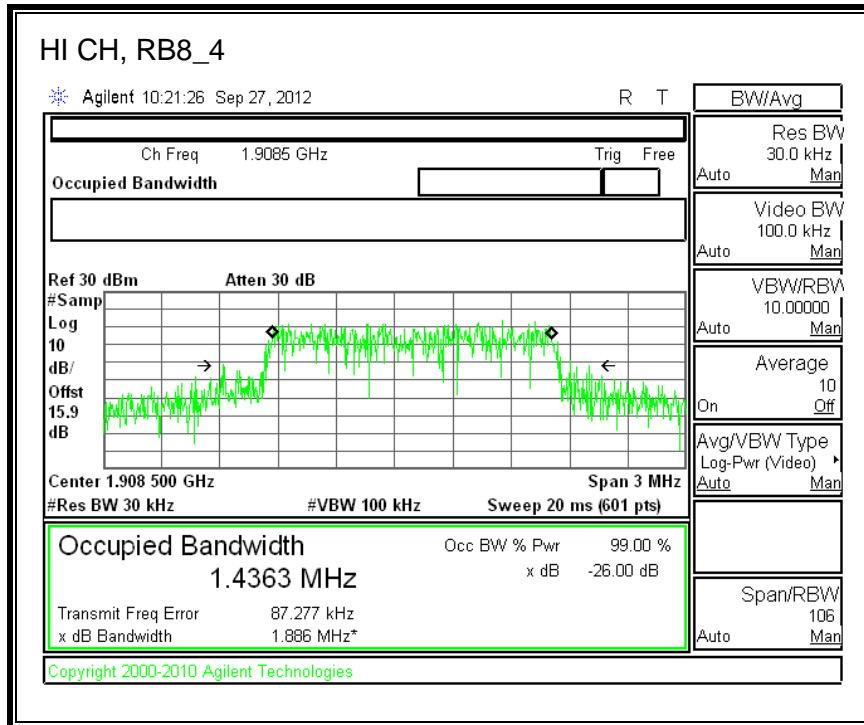


Band 2 (3 MHz BANDWIDTH)

QPSK

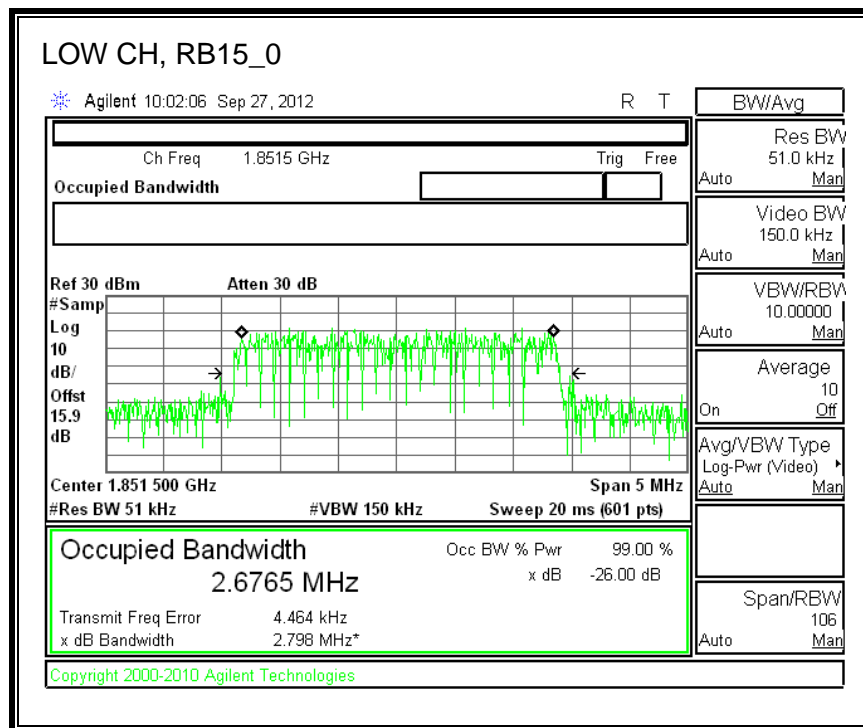
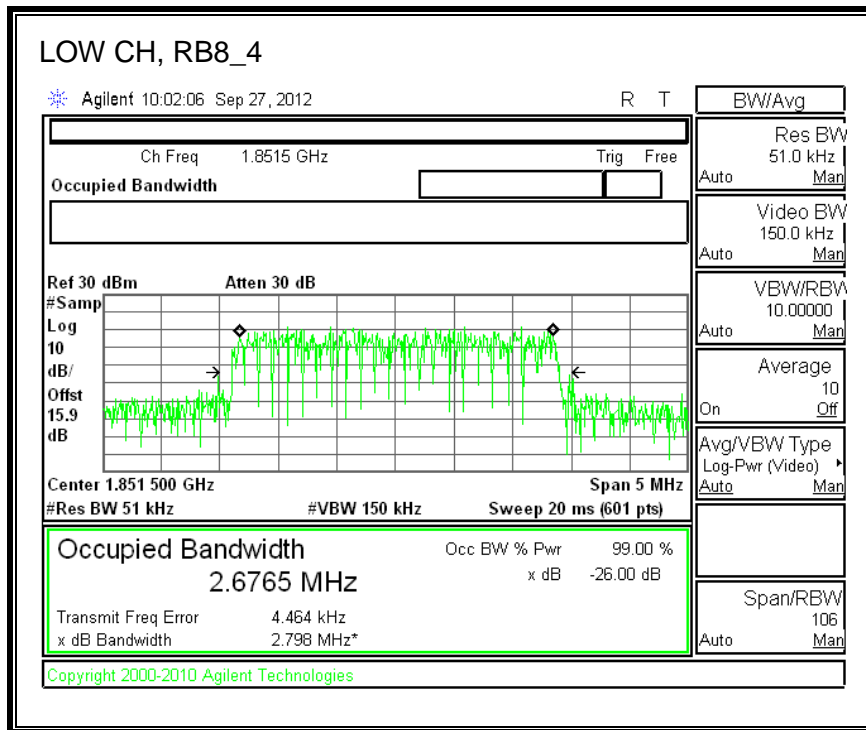


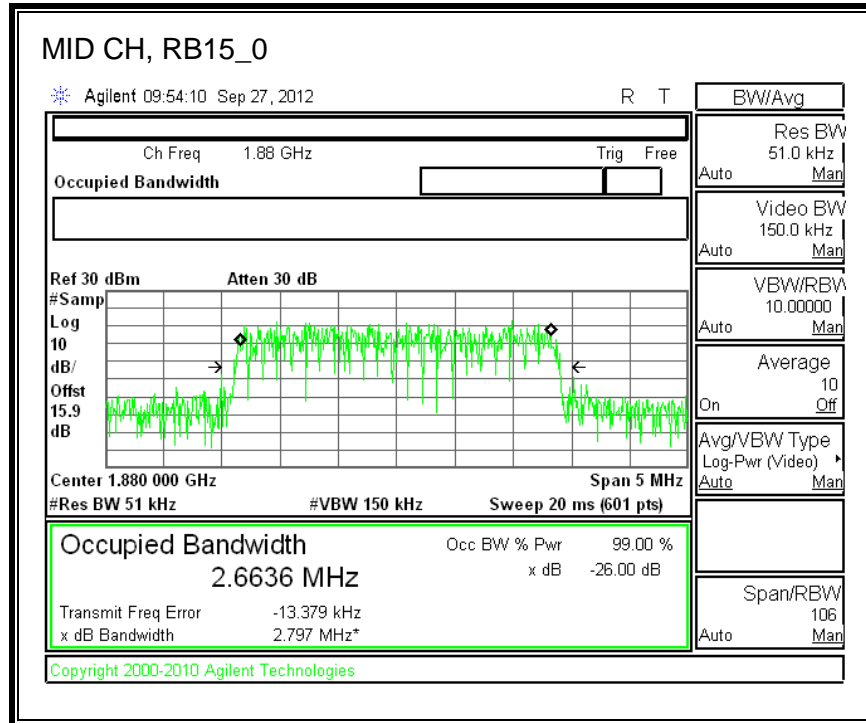
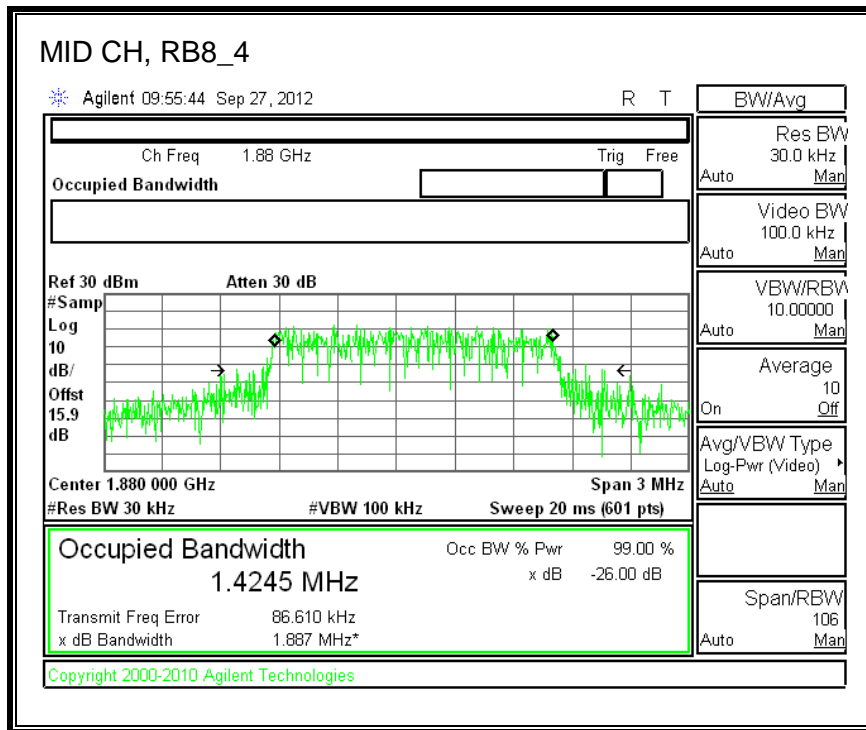


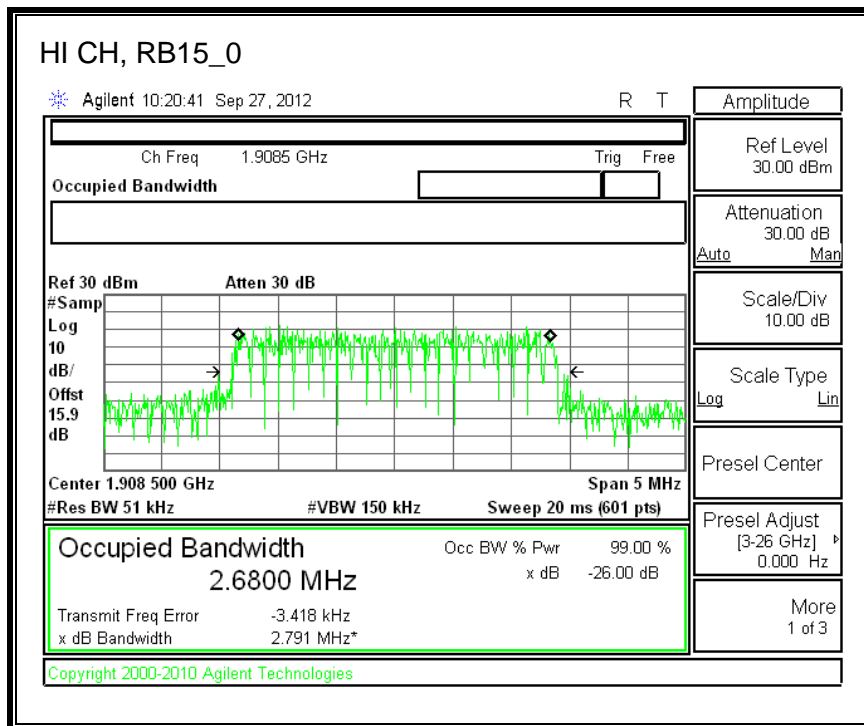
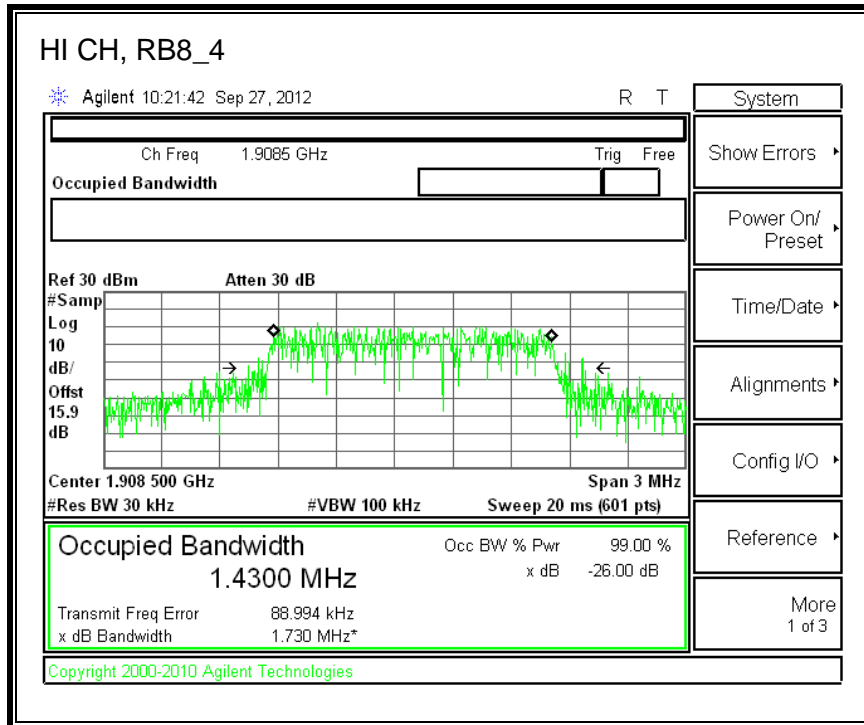


Band 2 (3 MHz BANDWIDTH)

16QAM

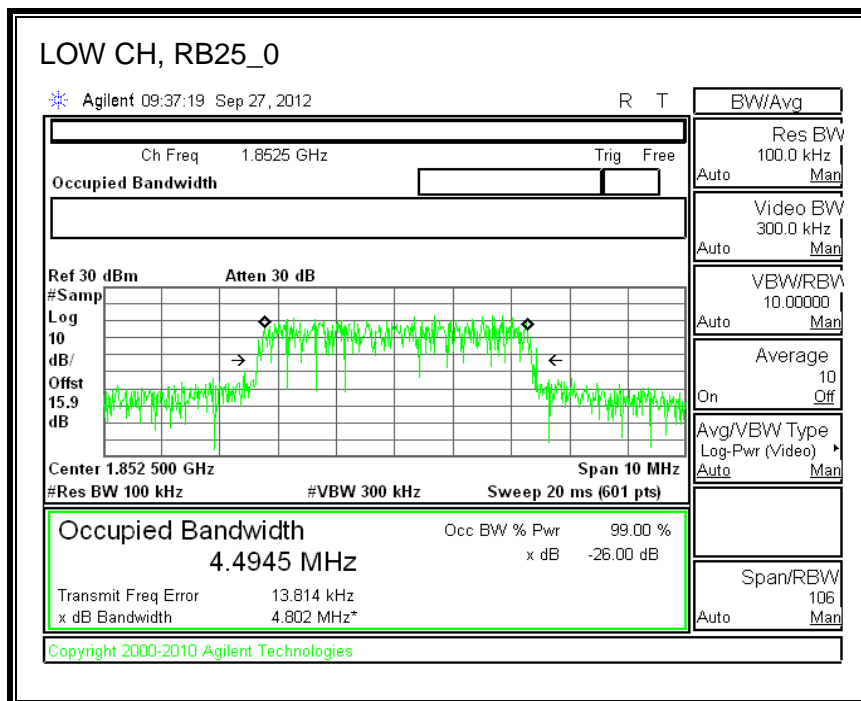
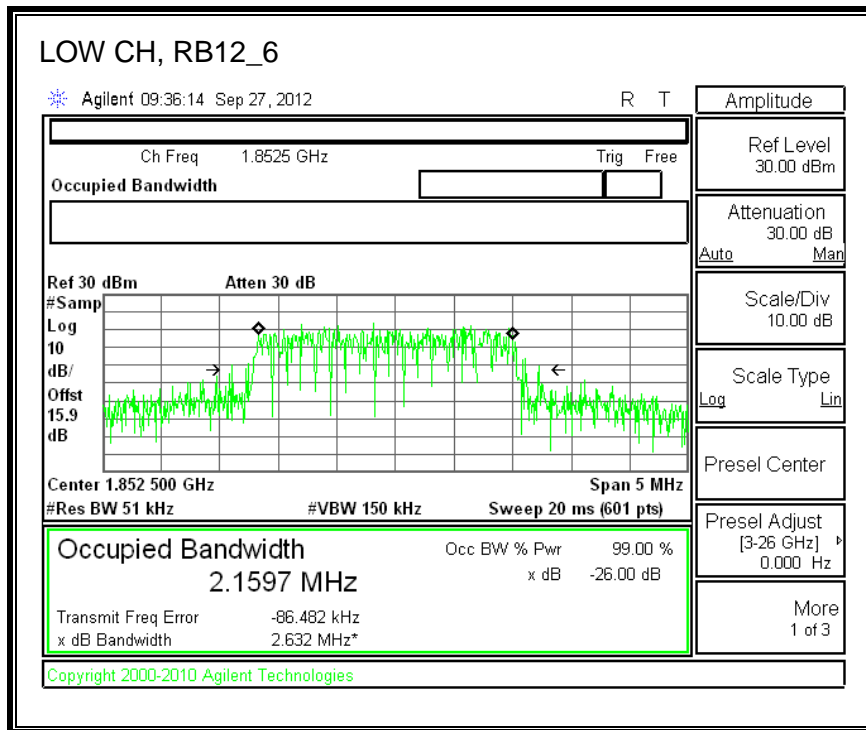


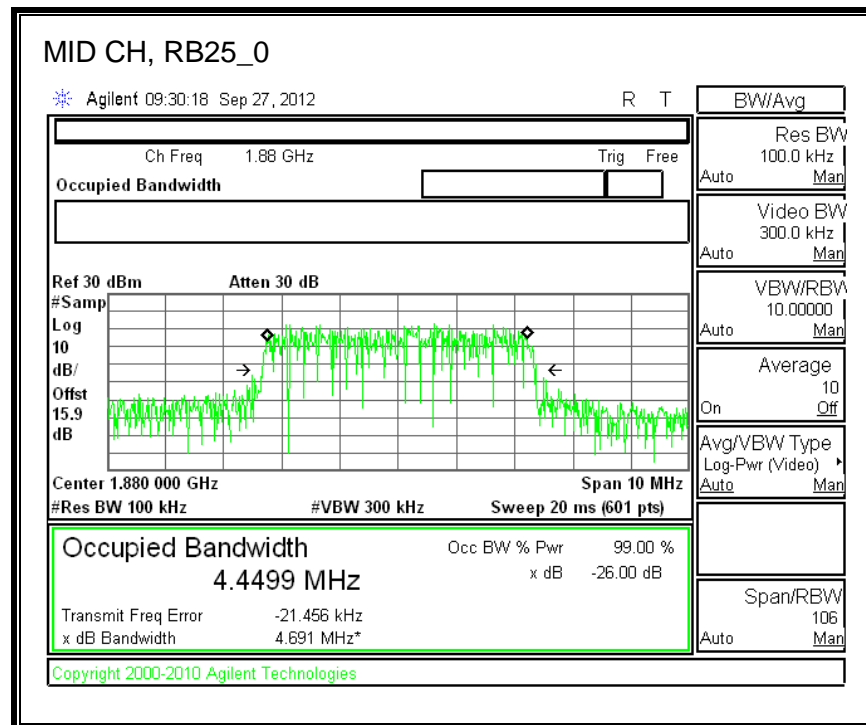
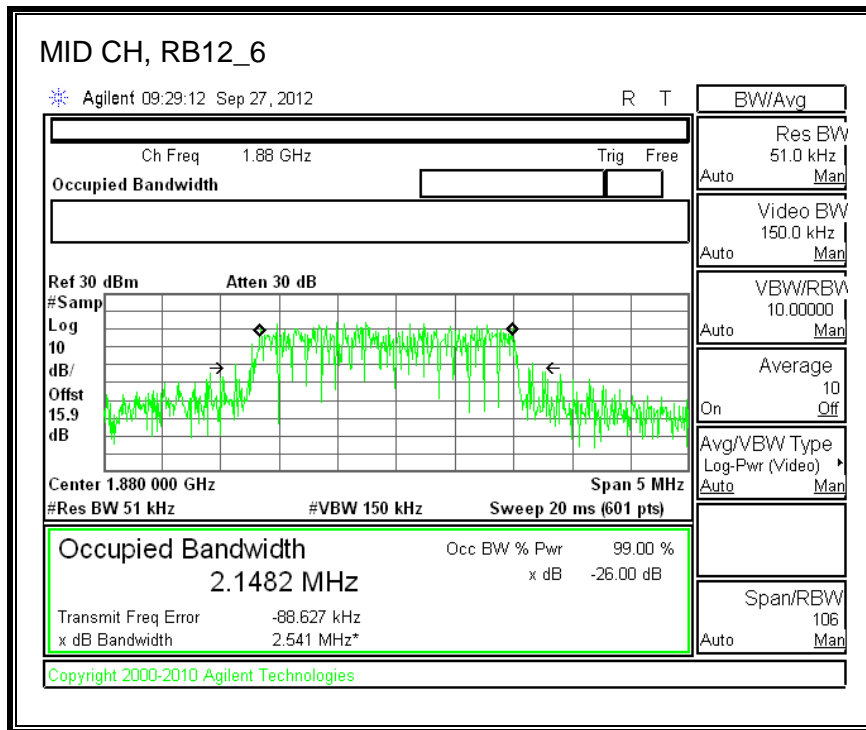


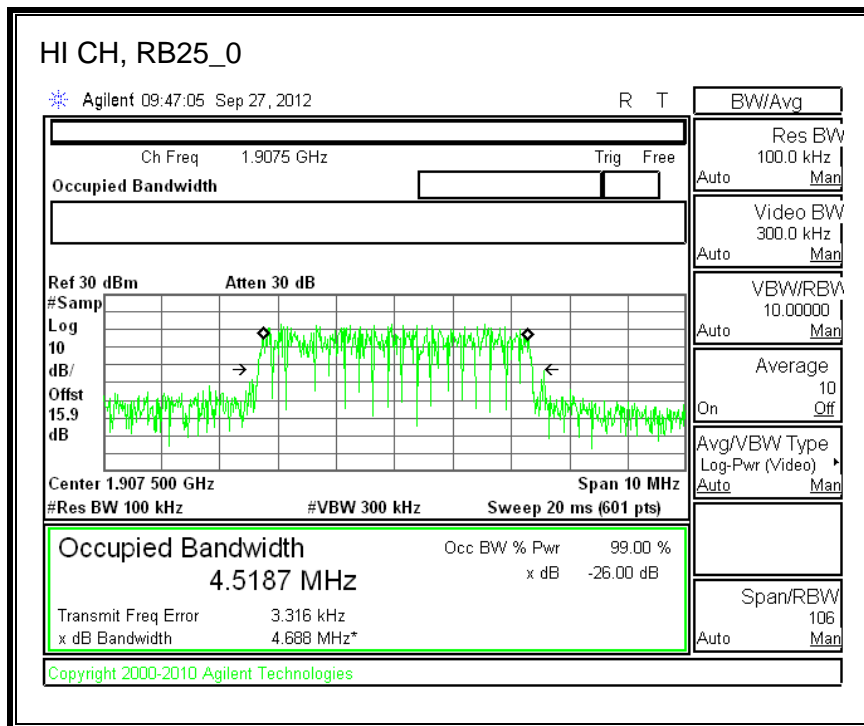
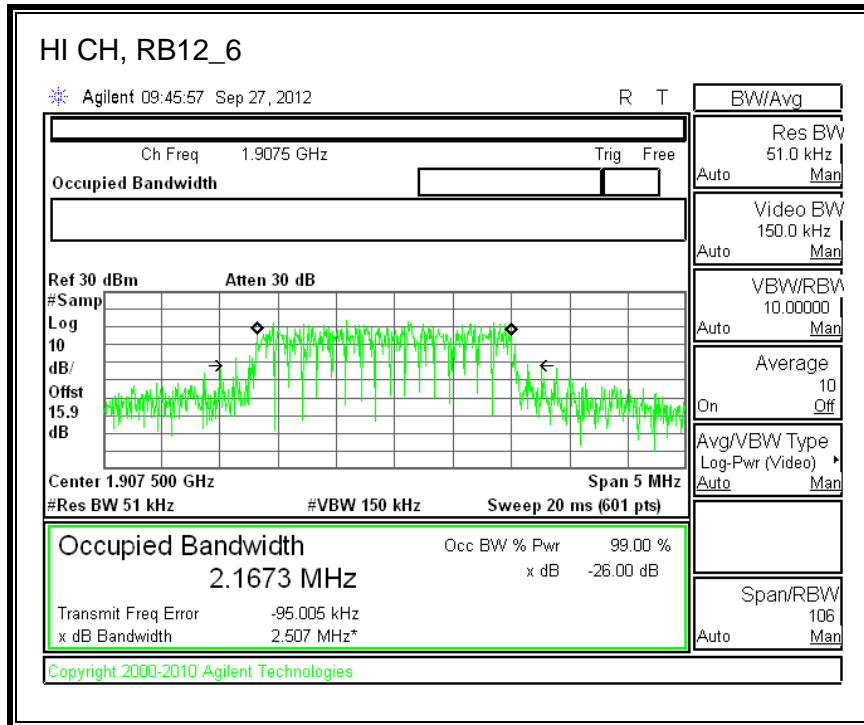


Band 2 (5 MHz BANDWIDTH)

QPSK

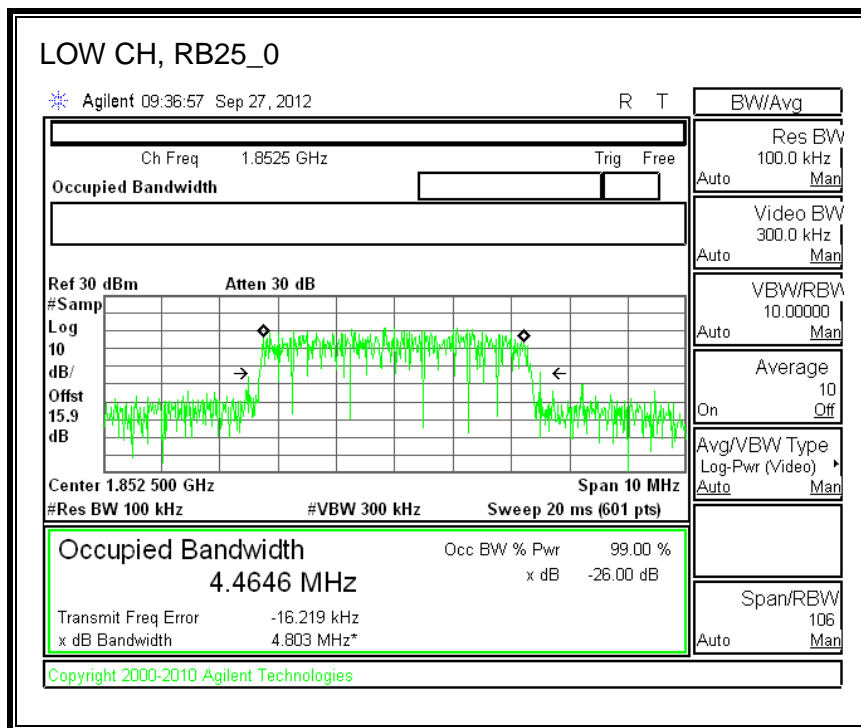
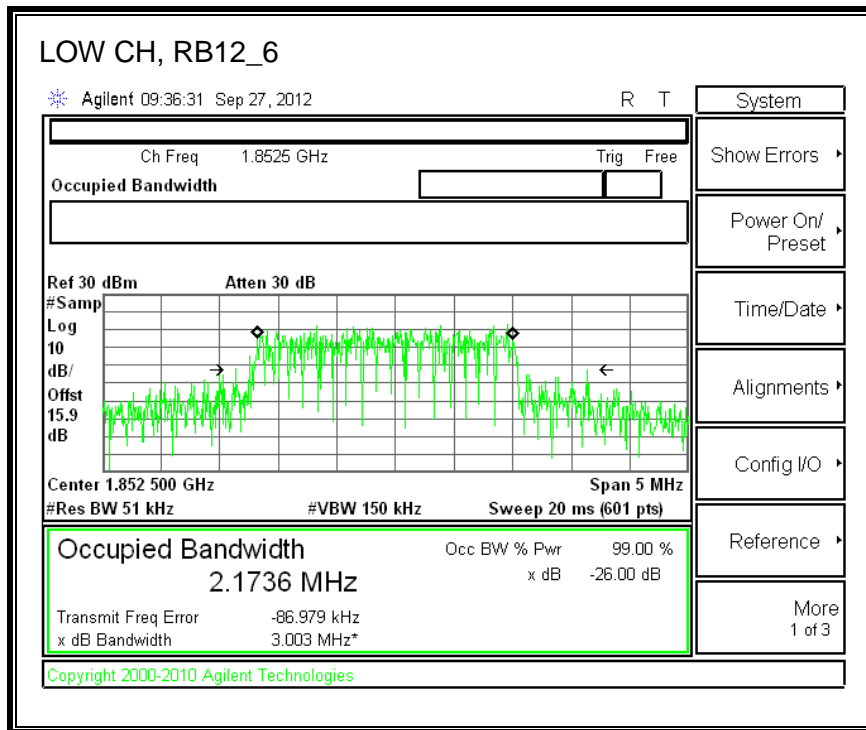


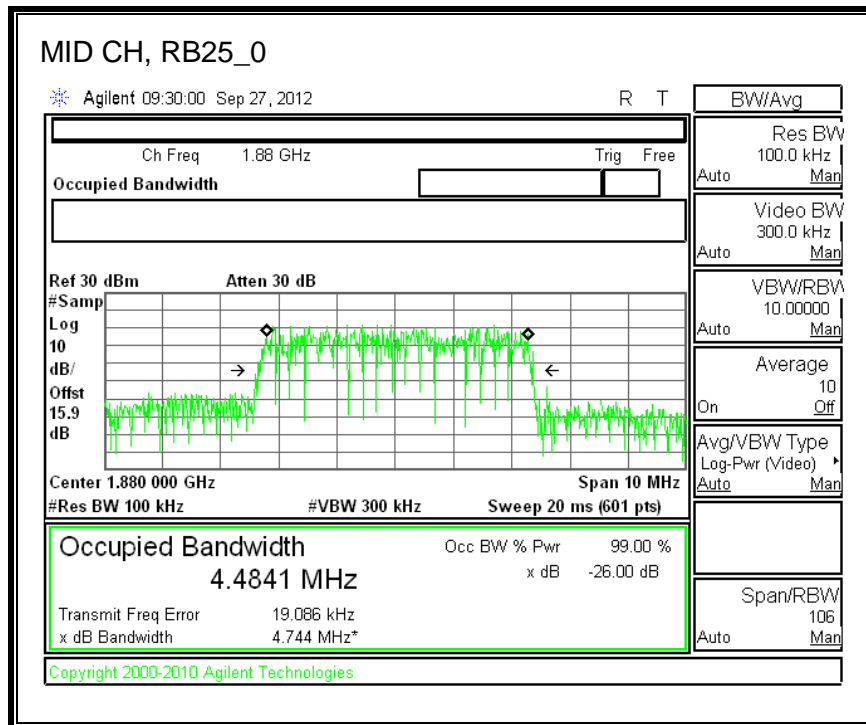
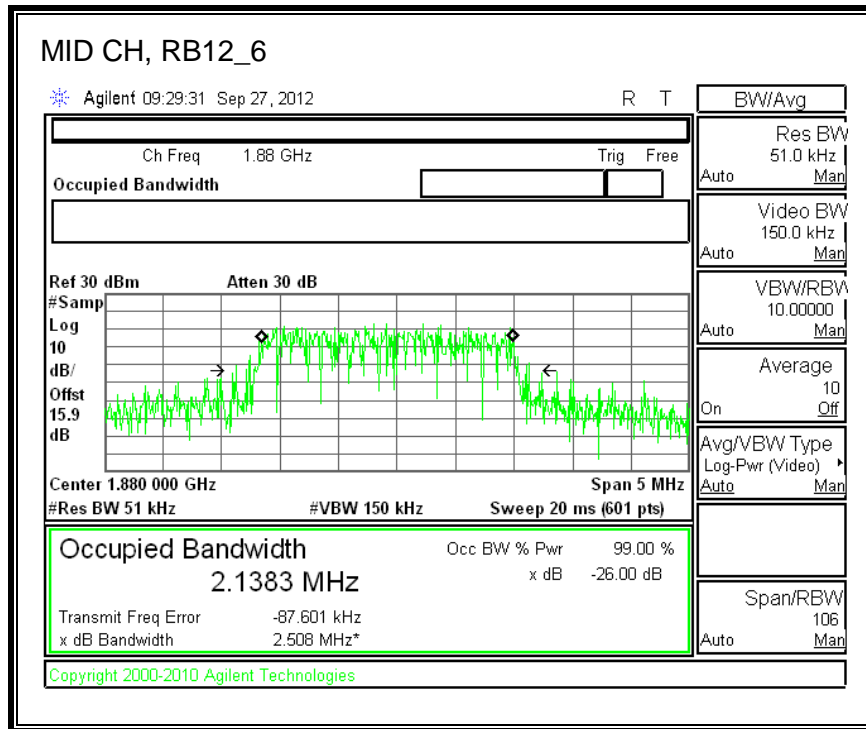


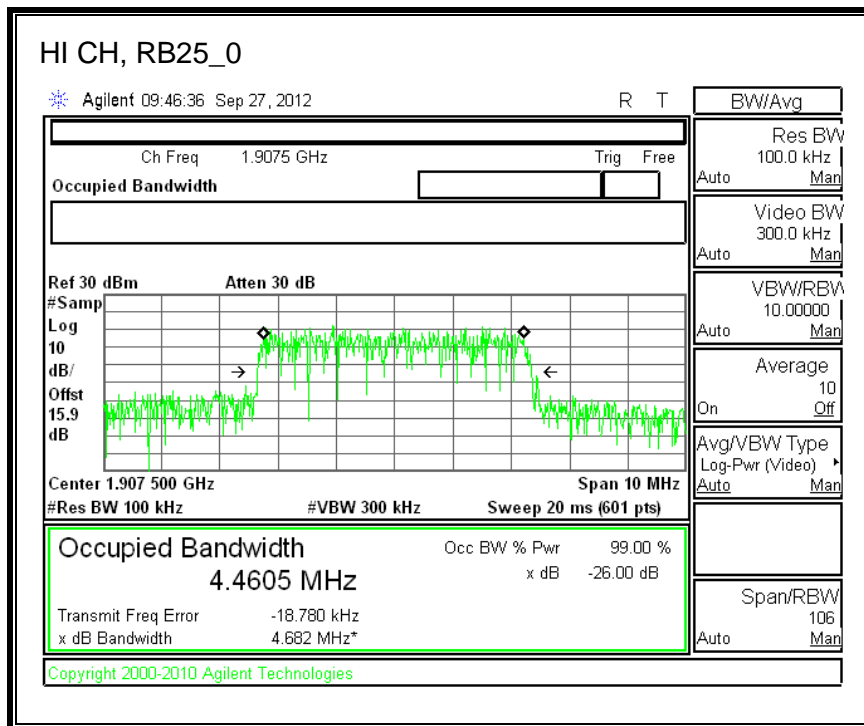
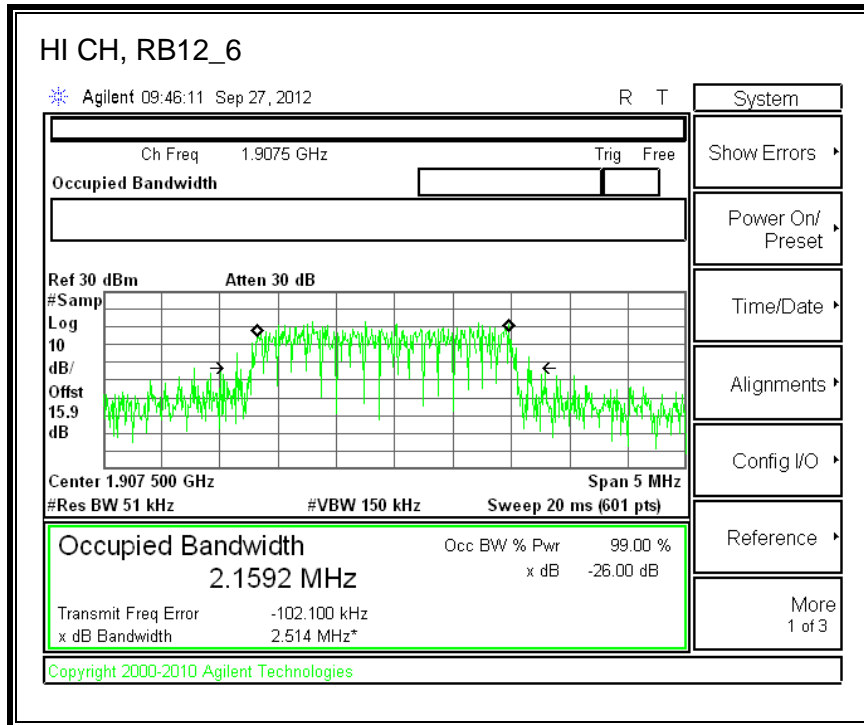


Band 2 (5 MHz BANDWIDTH)

16QAM

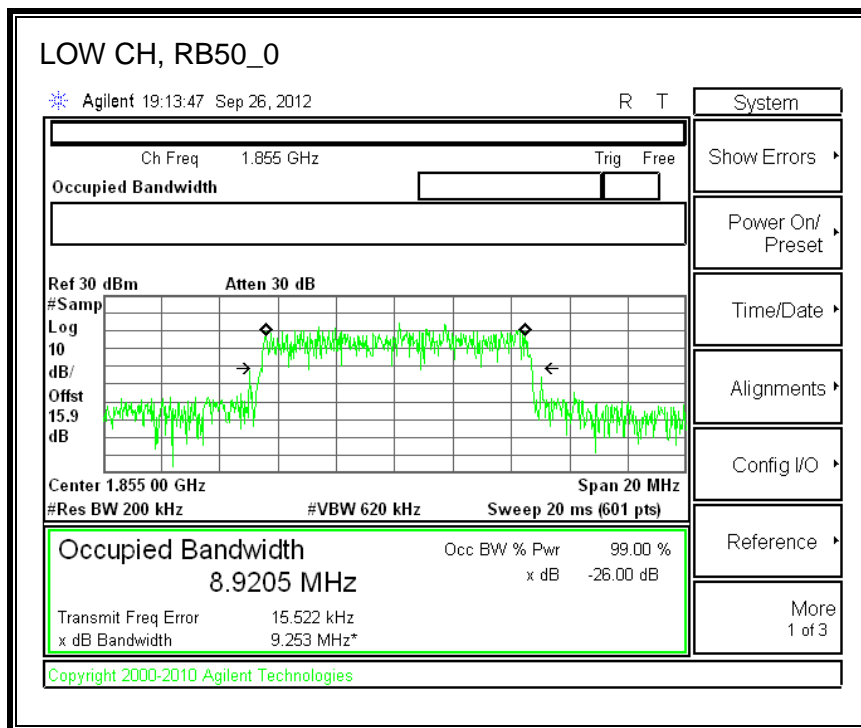
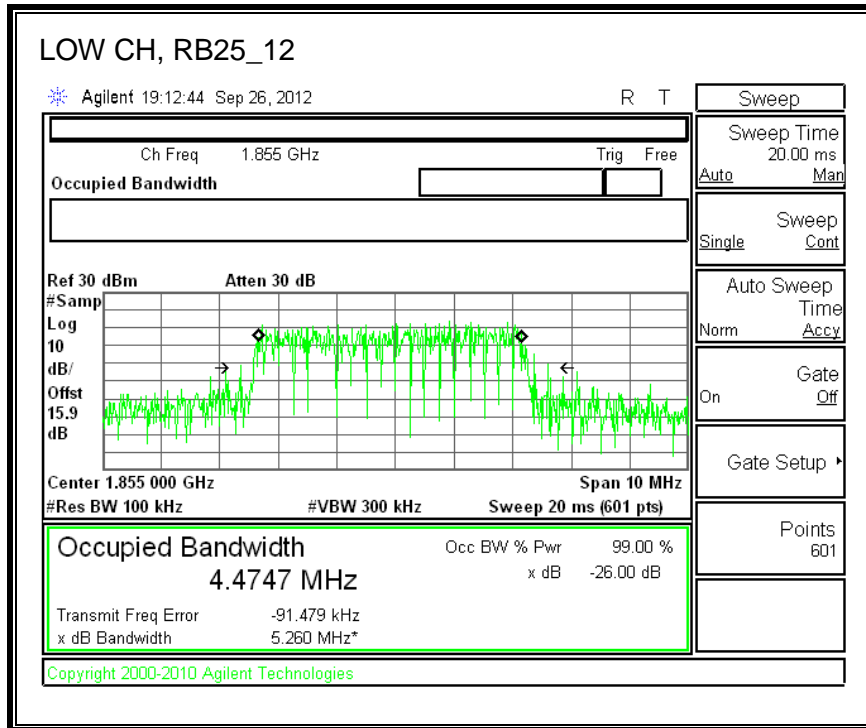


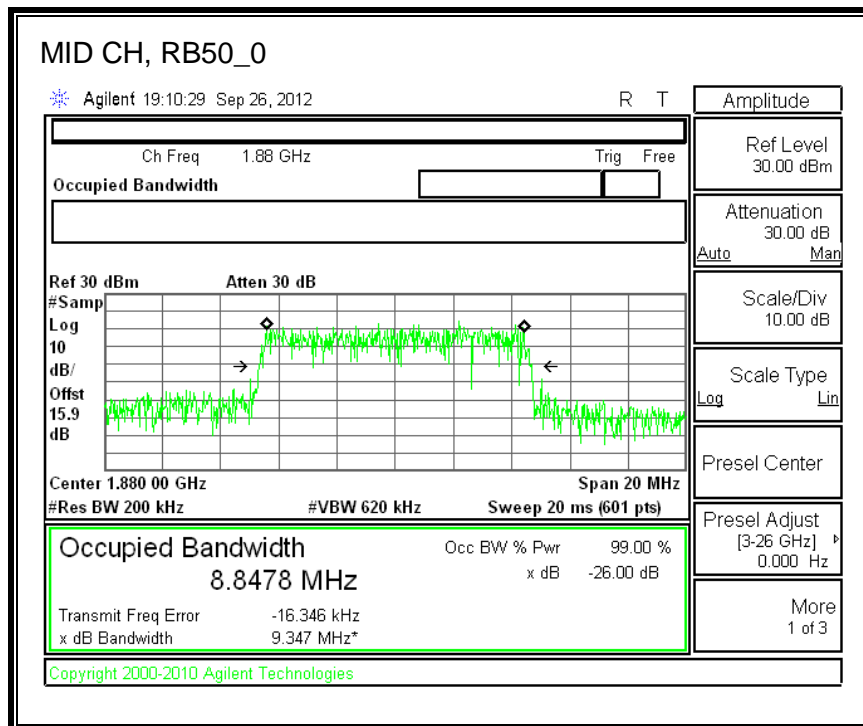
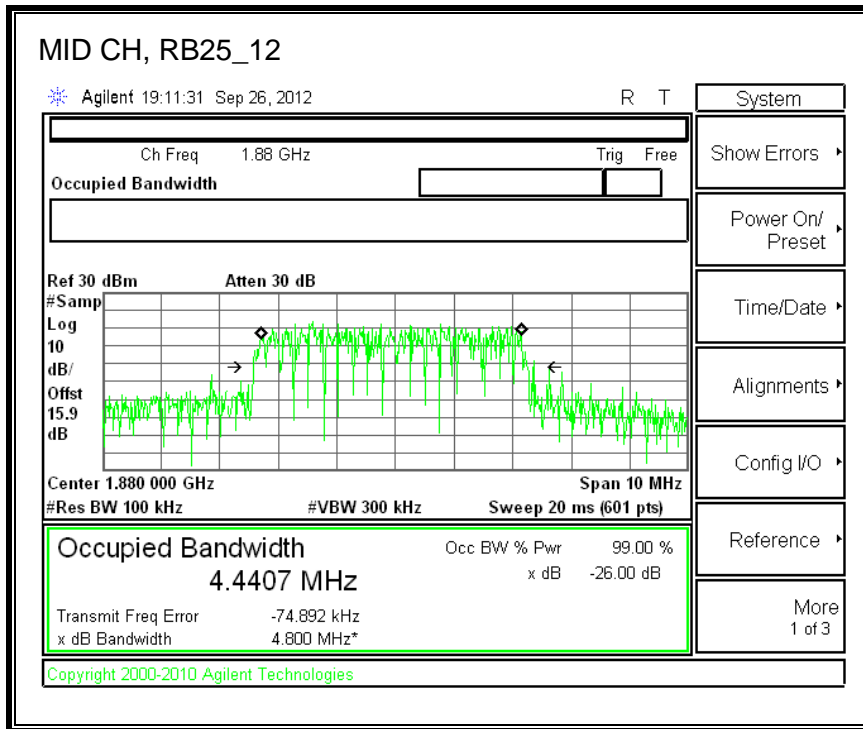


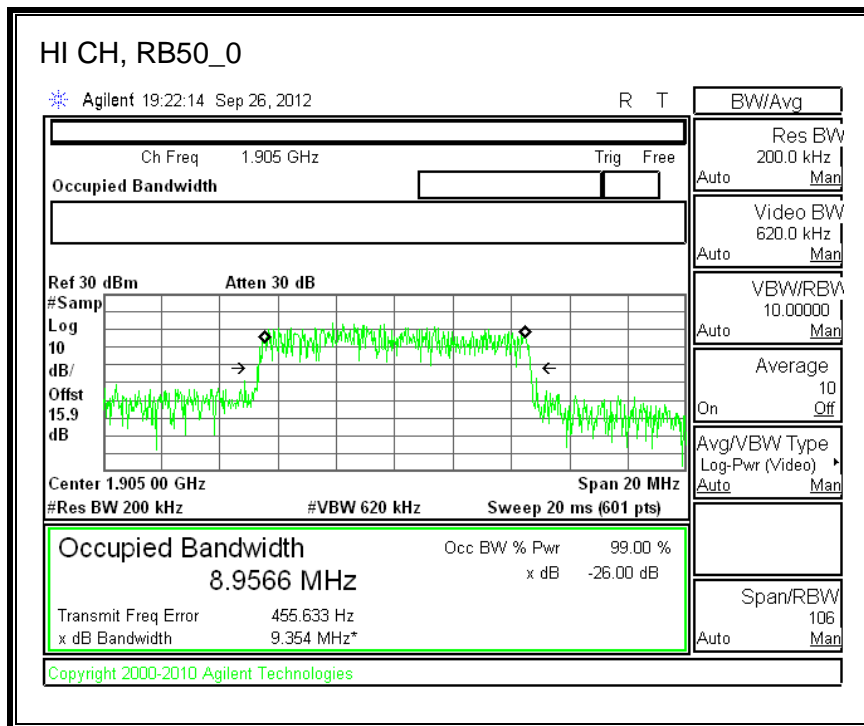
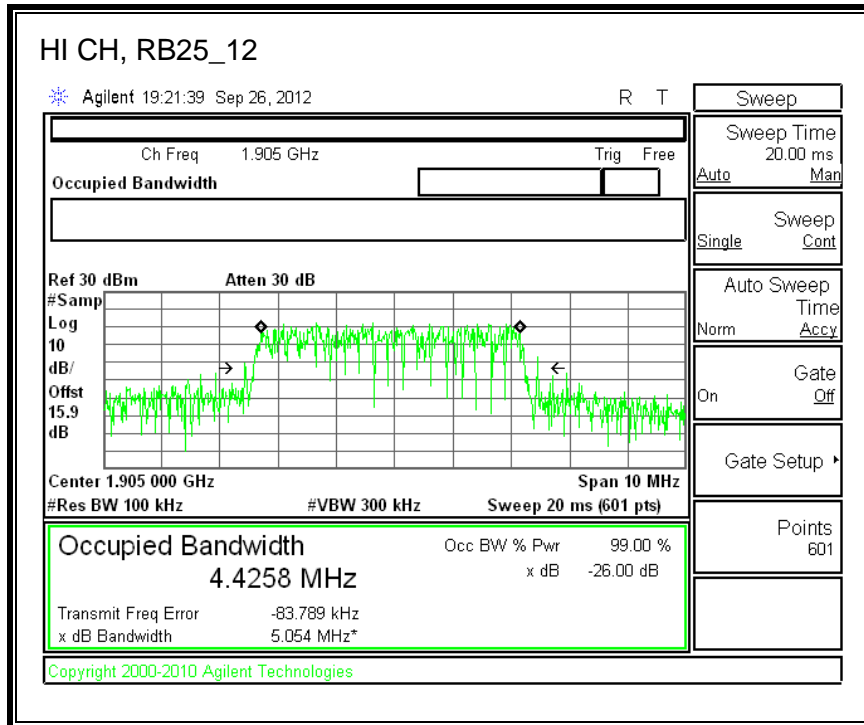


Band 2 (10 MHz BANDWIDTH)

QPSK

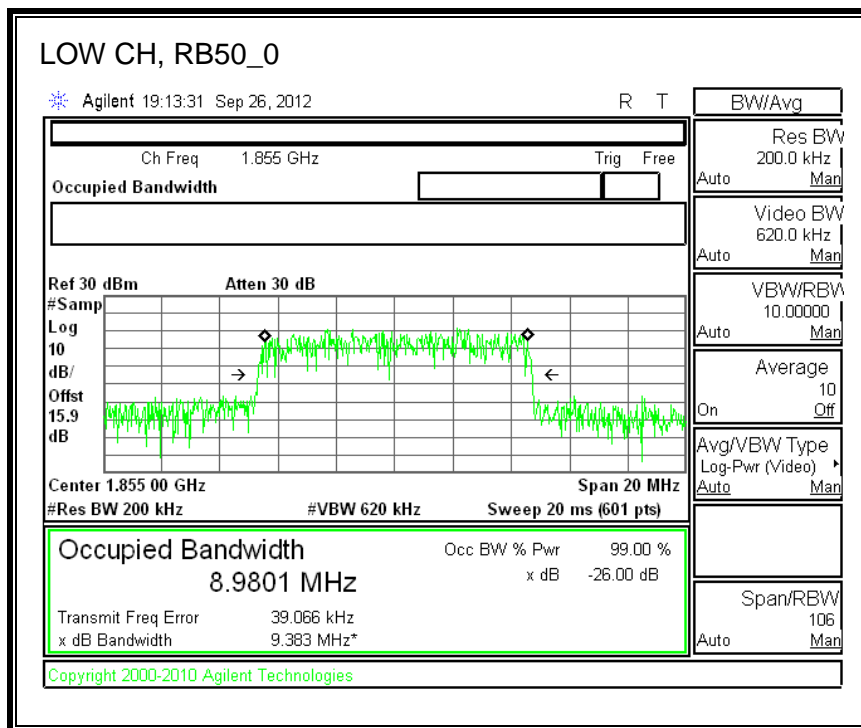
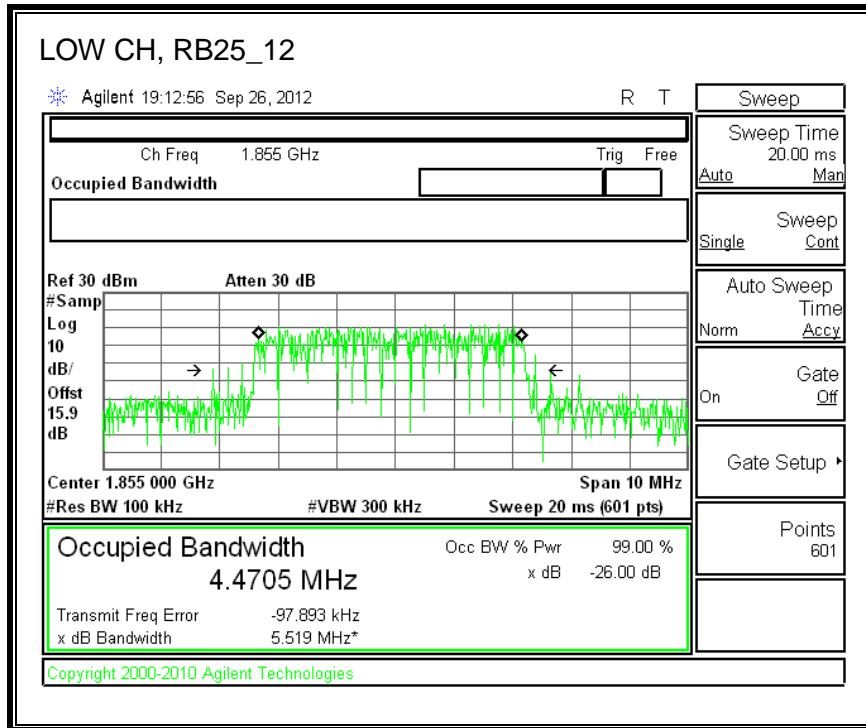


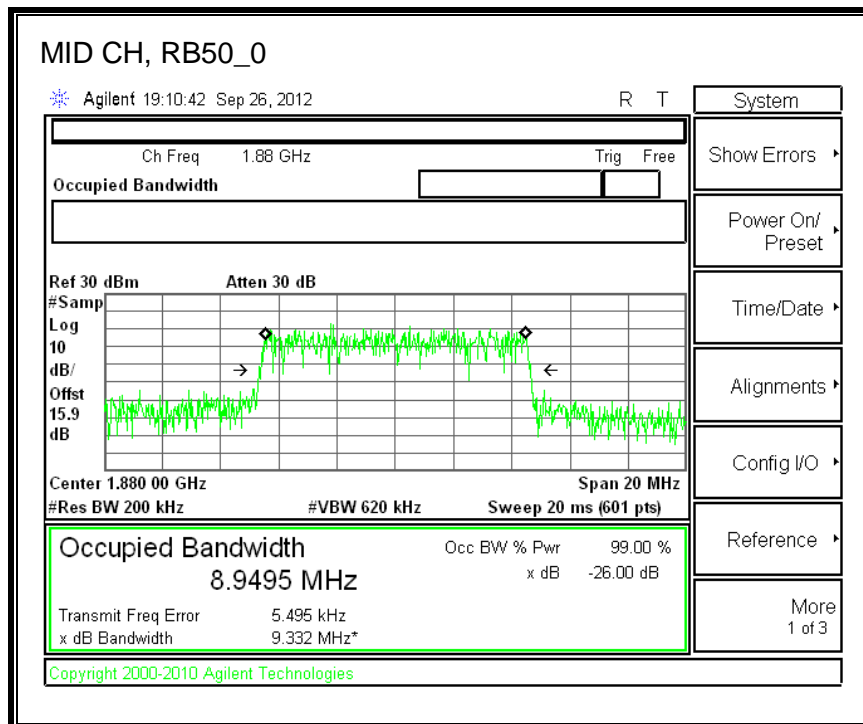
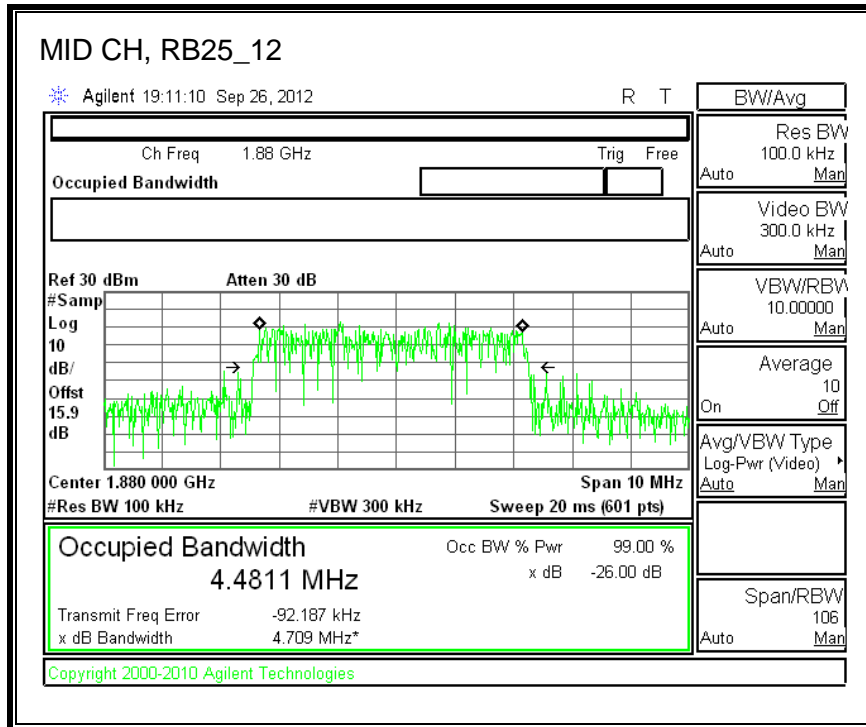


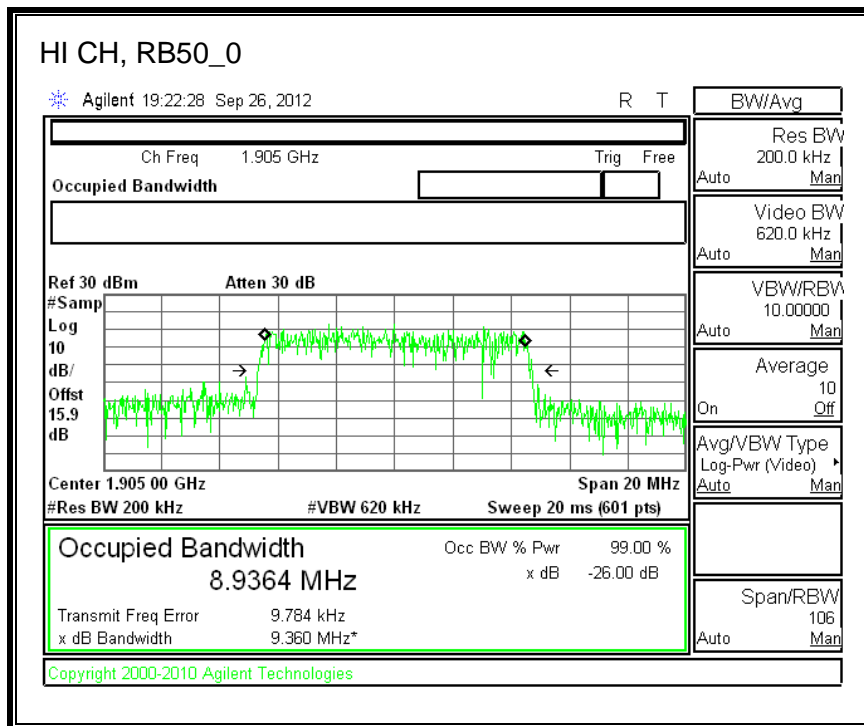
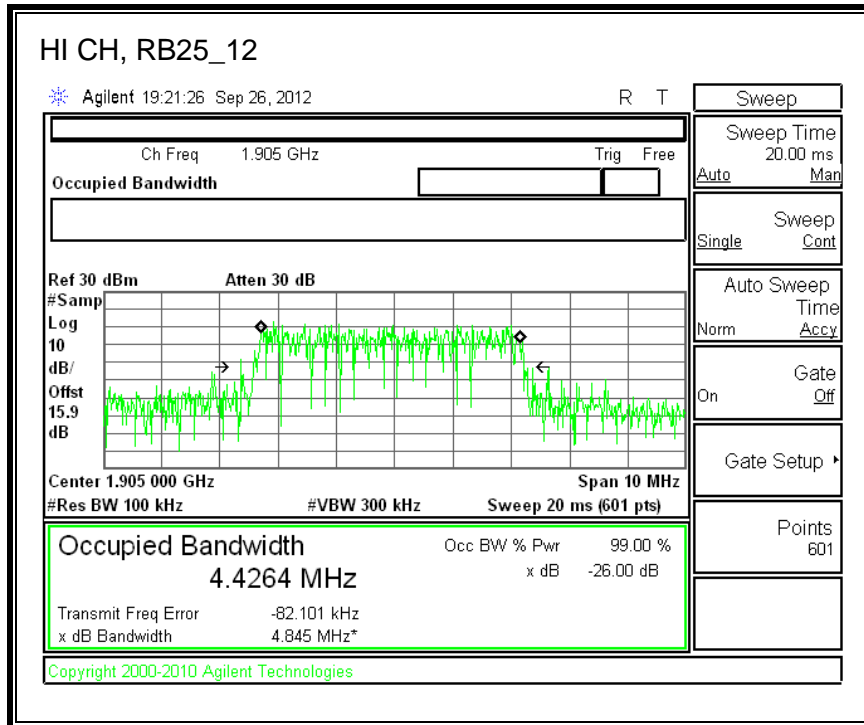


Band 2 (10 MHz BANDWIDTH)

16QAM

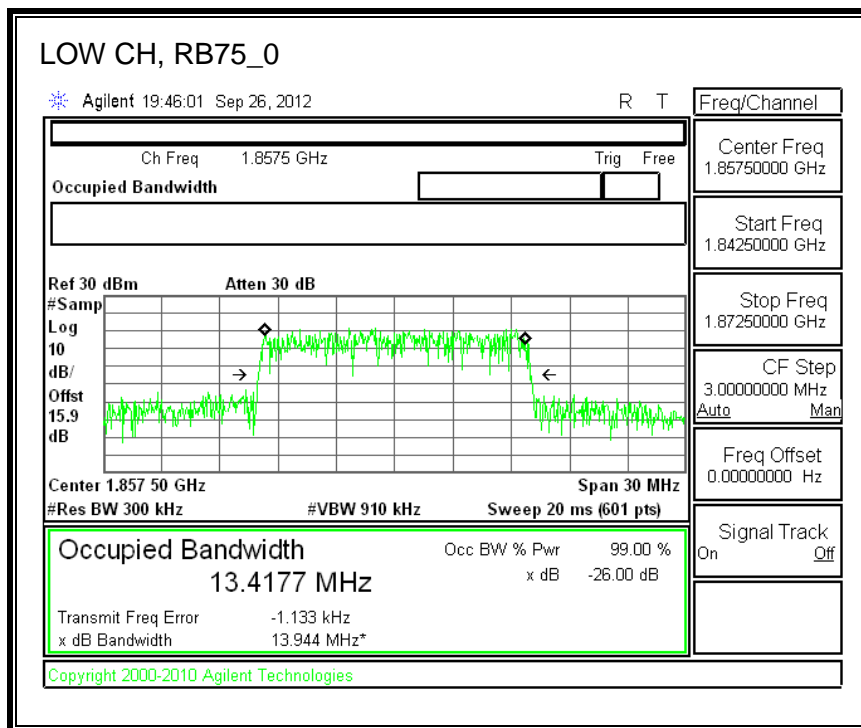
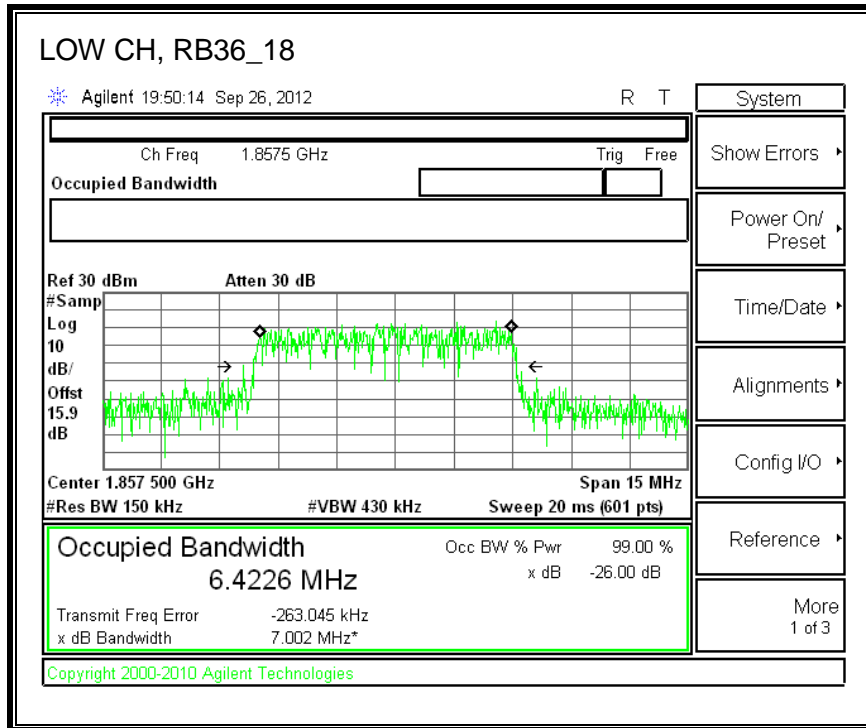


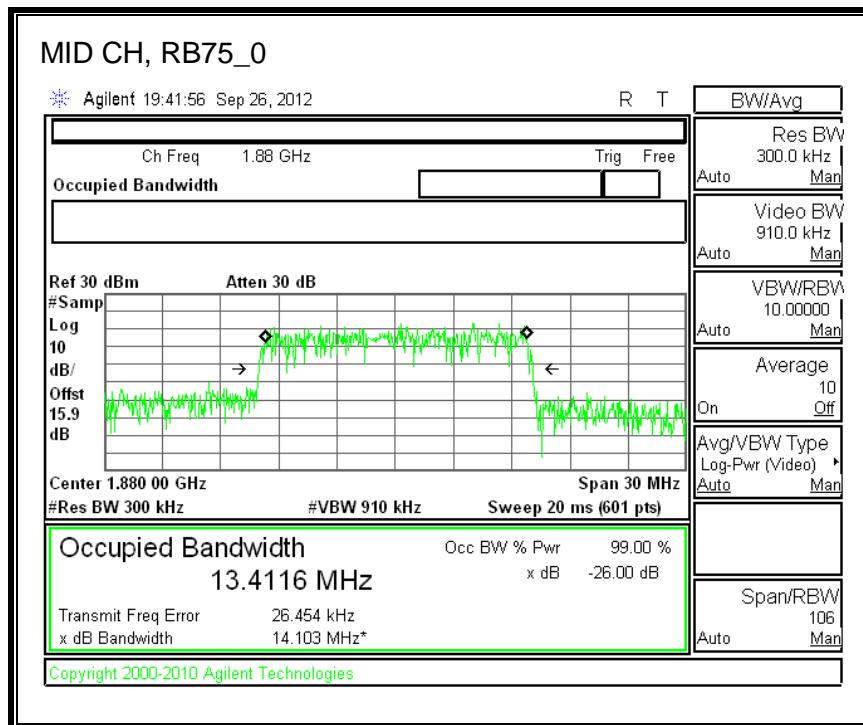
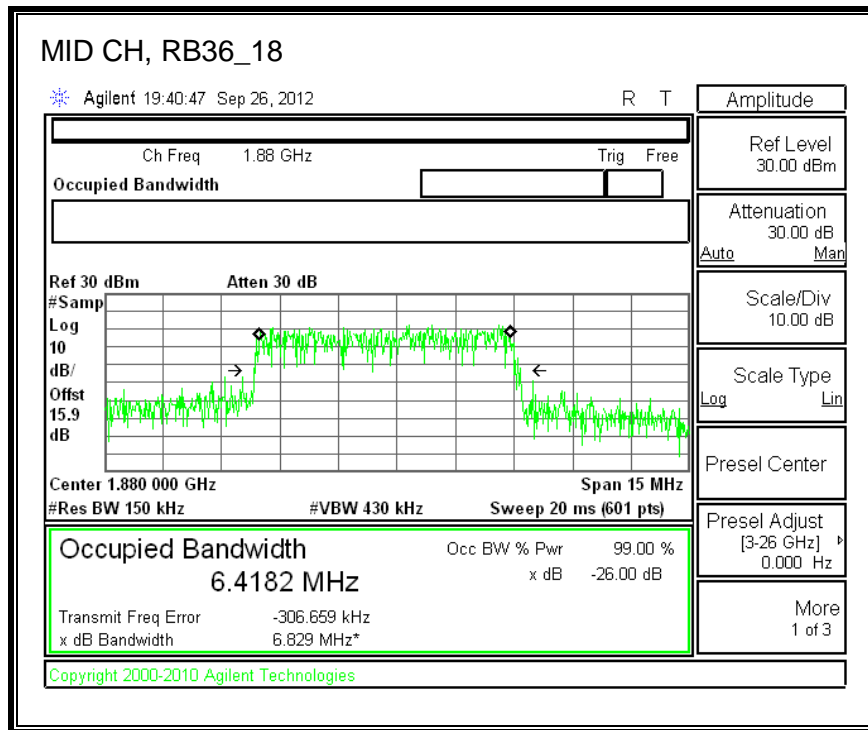


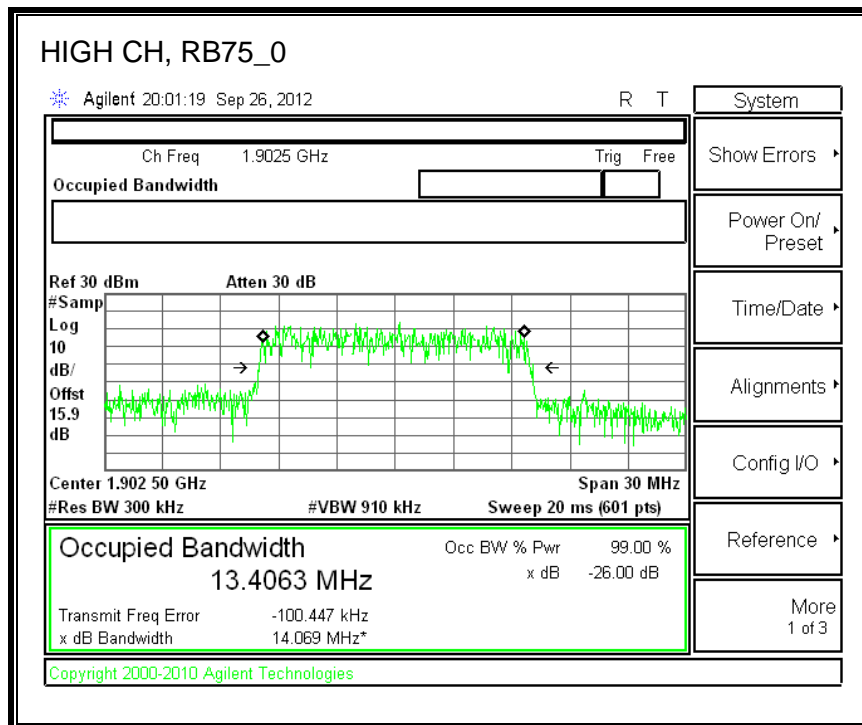
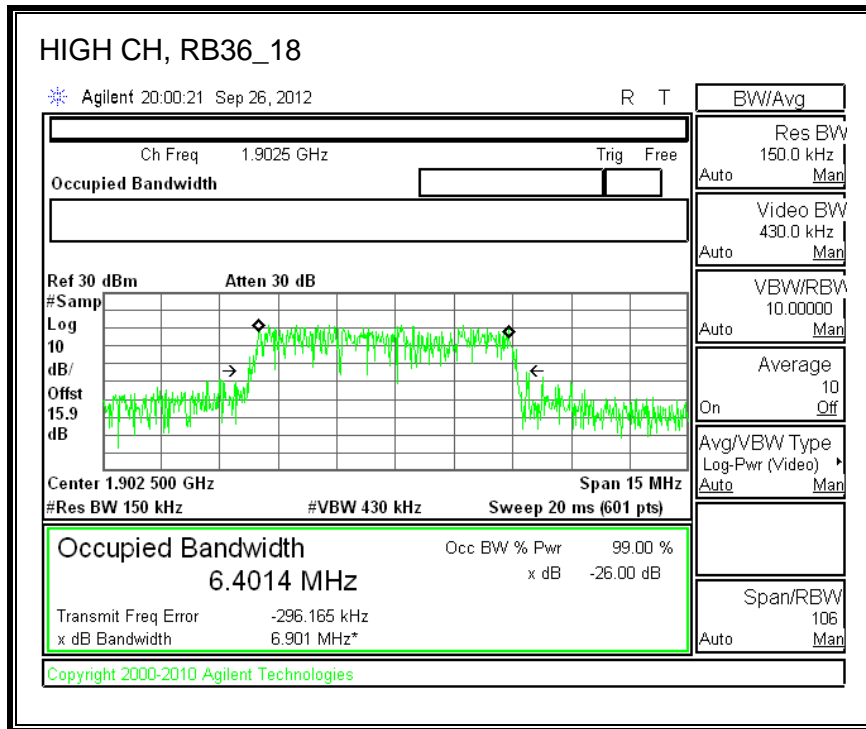


Band 2 (15 MHz BANDWIDTH)

QPSK

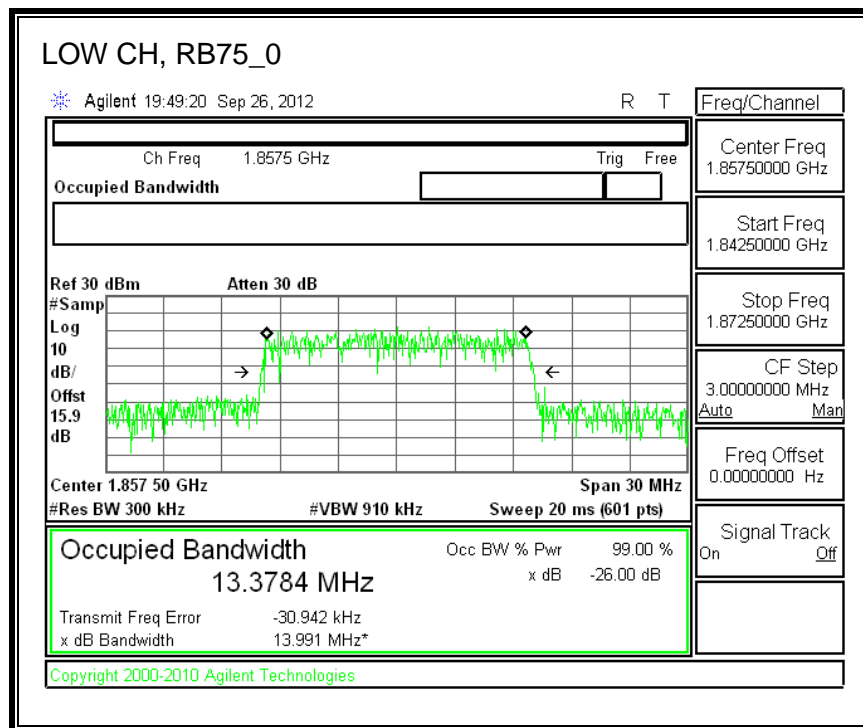
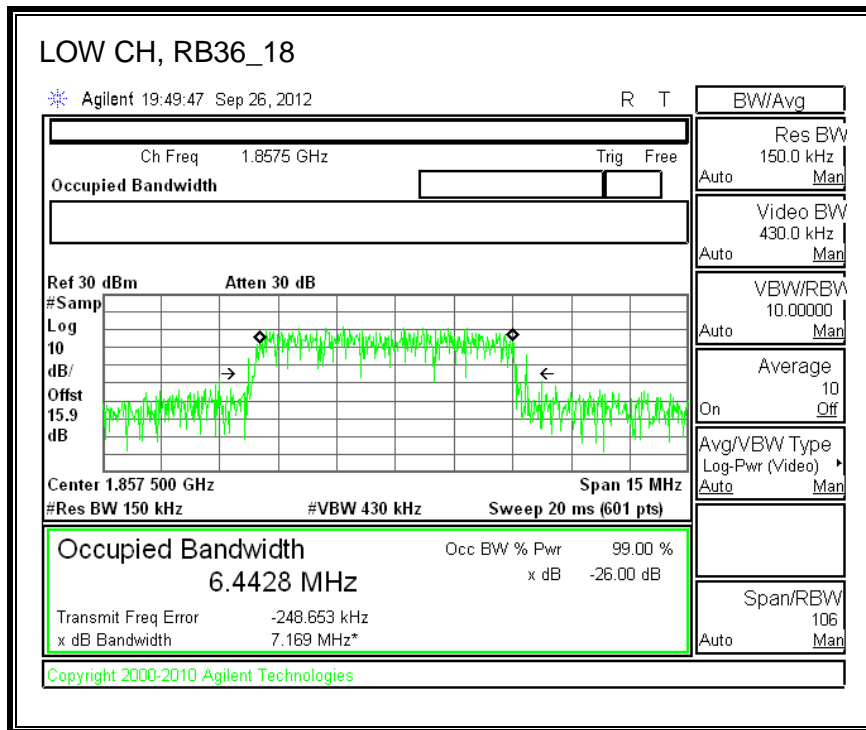


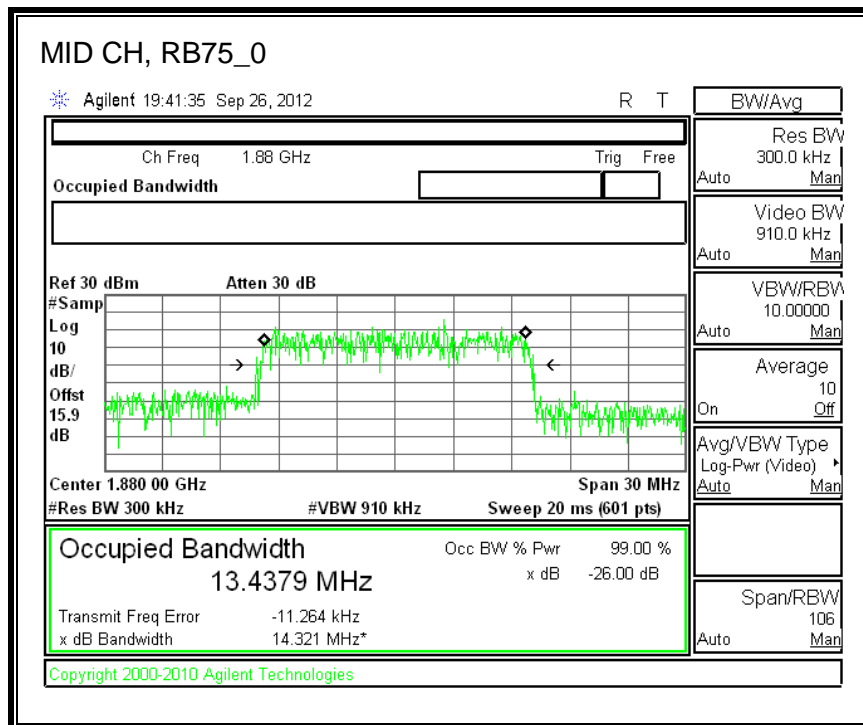
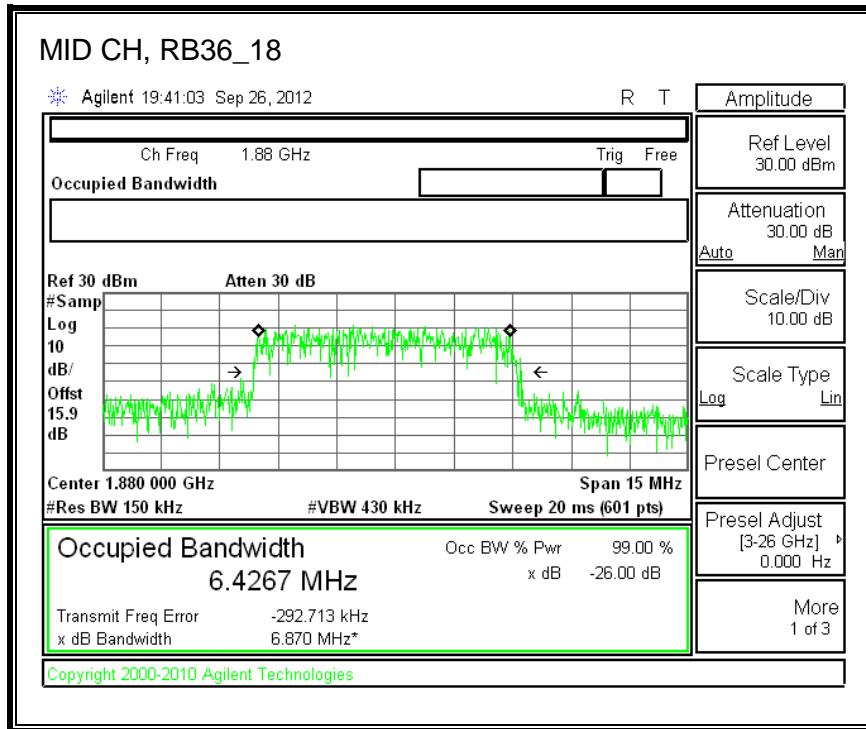


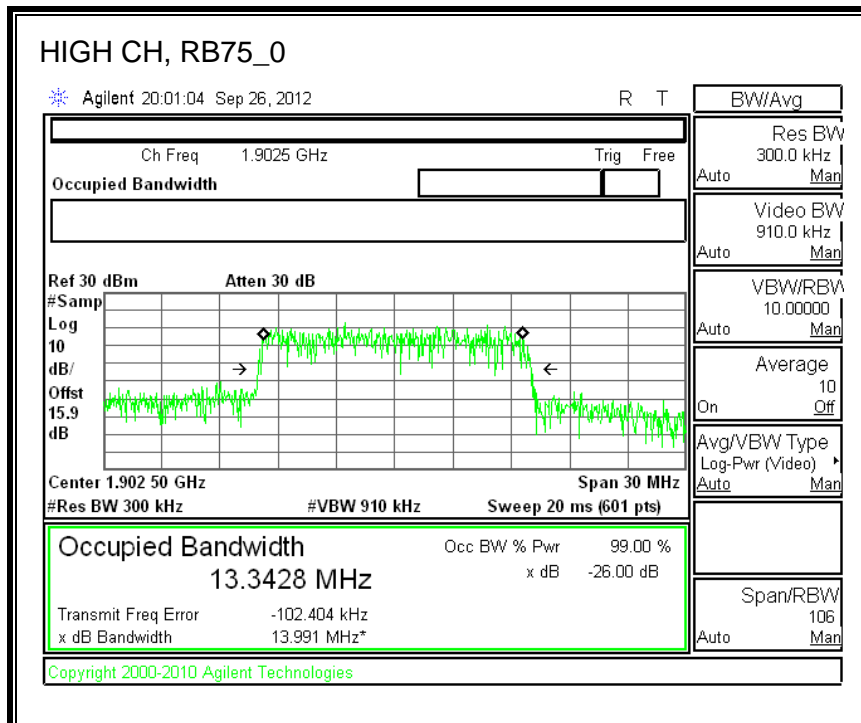
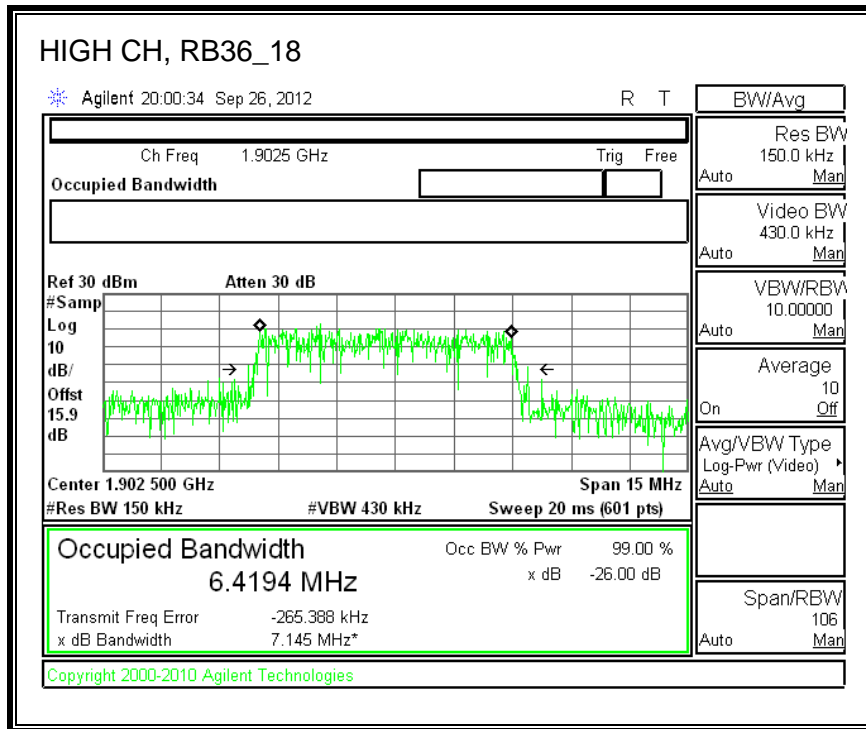


Band 2 (15 MHz BANDWIDTH)

16QAM

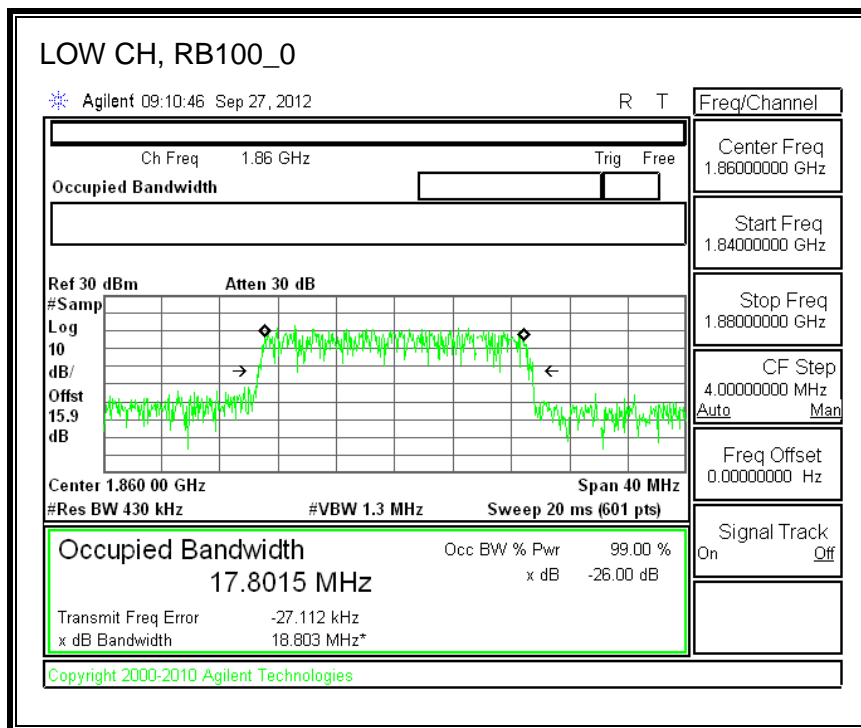
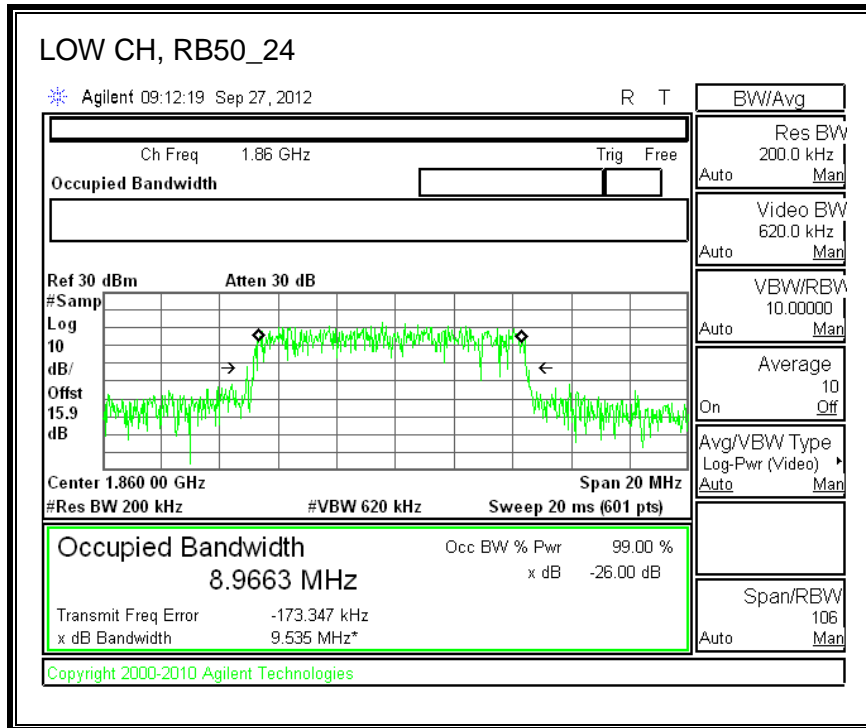


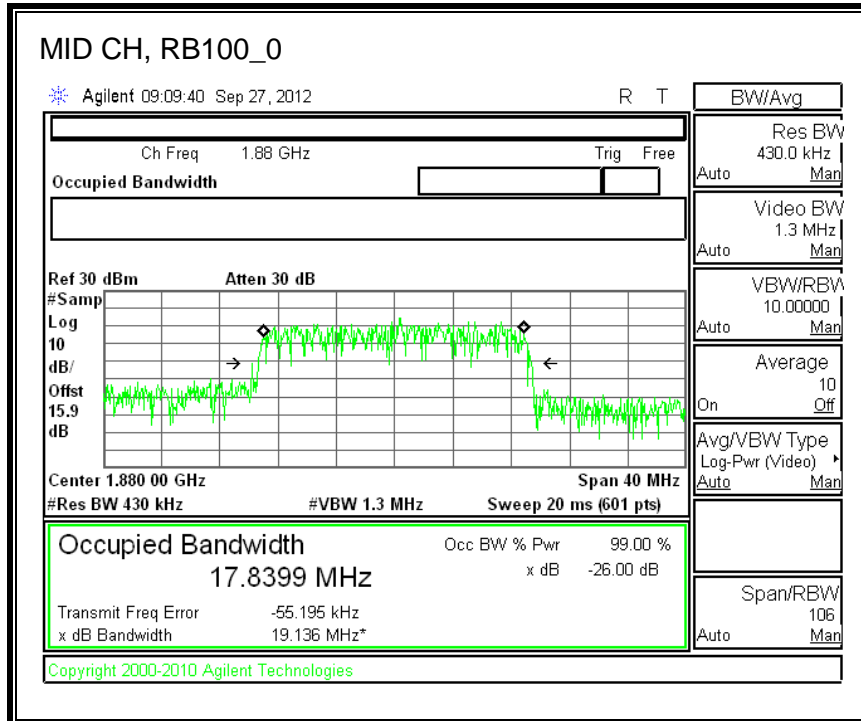
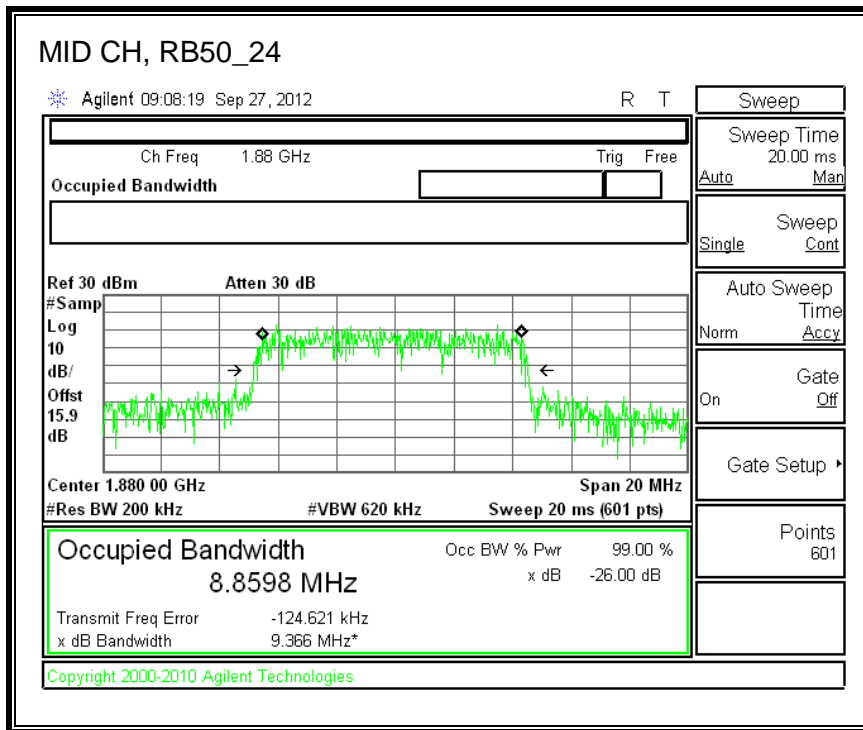


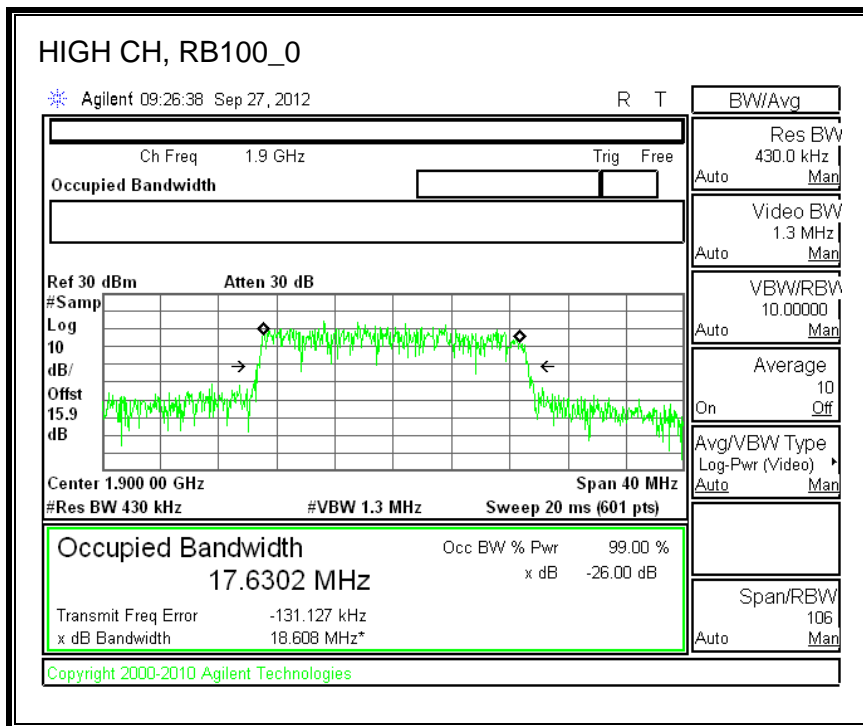
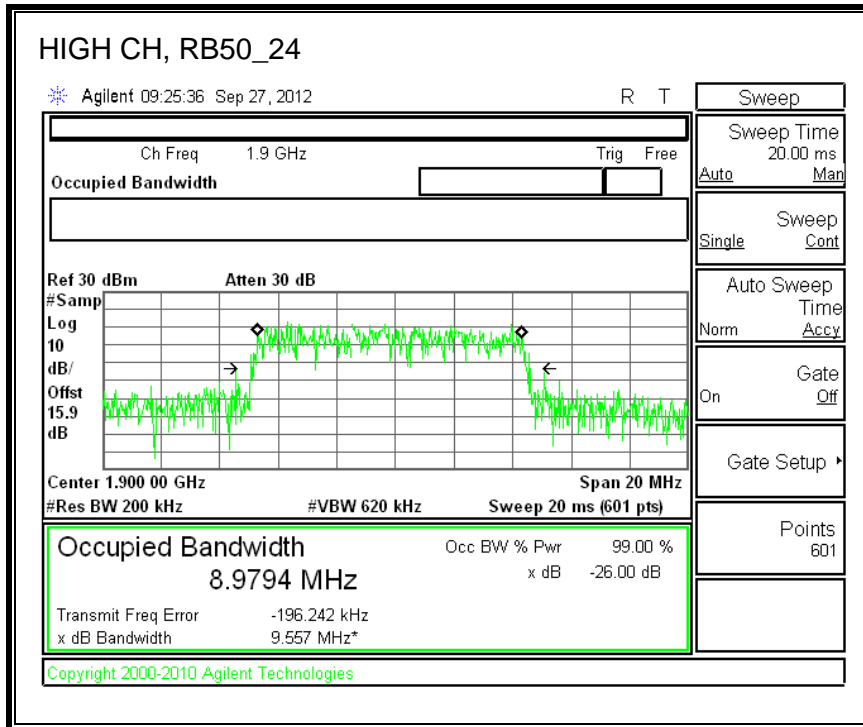


Band 2 (20 MHz BANDWIDTH)

QPSK

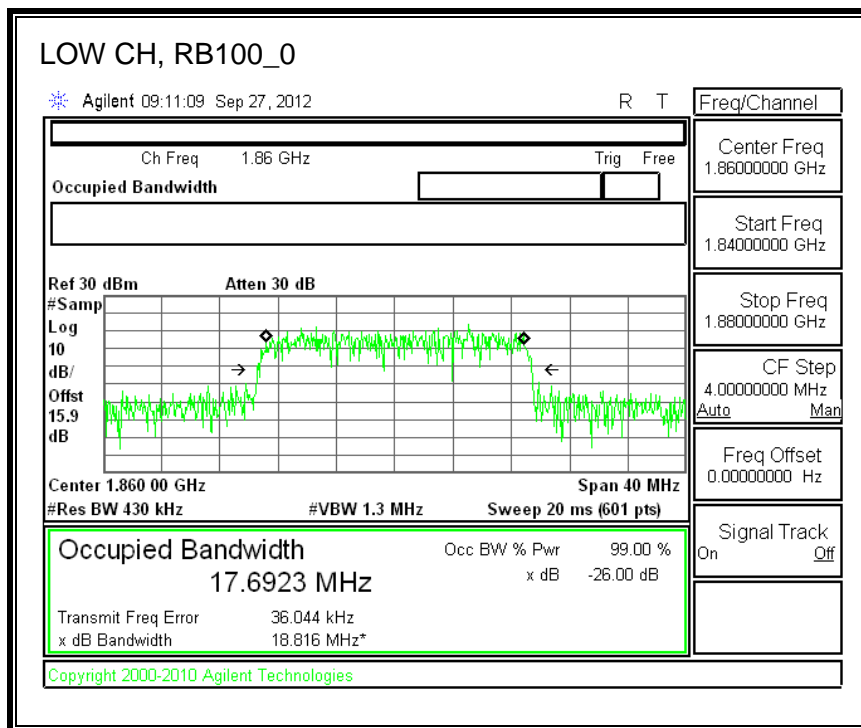
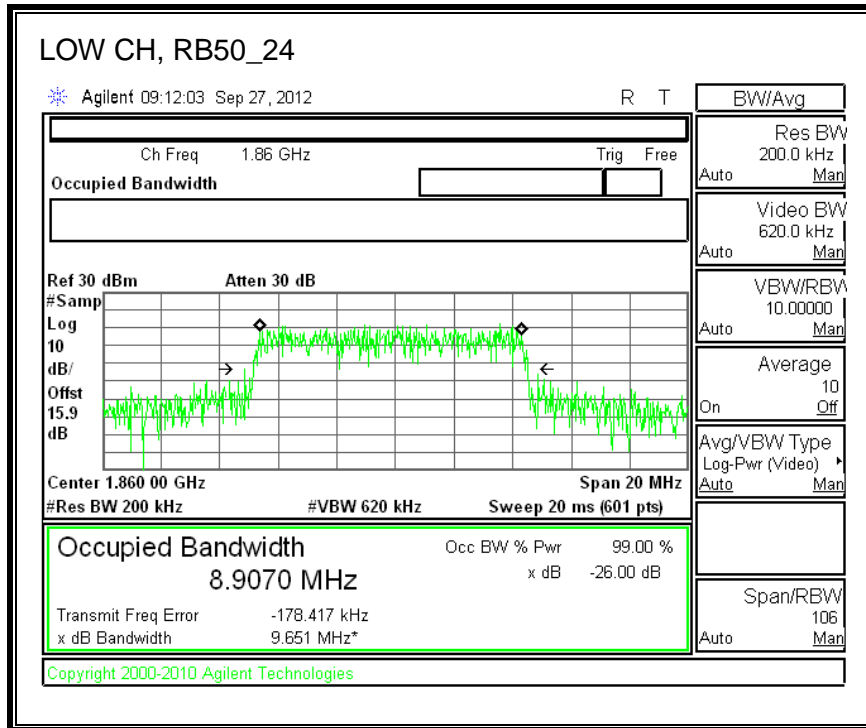


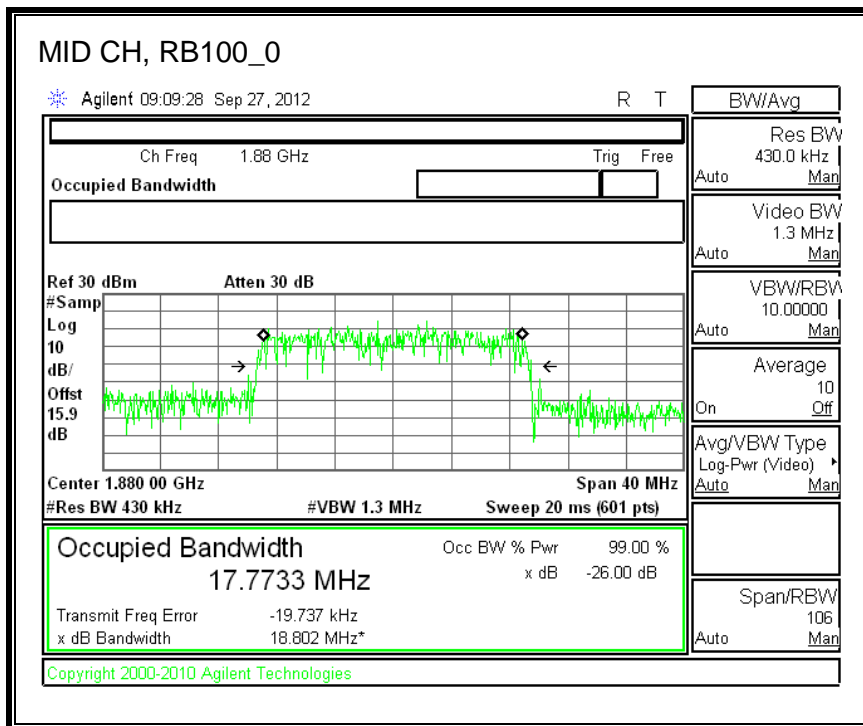
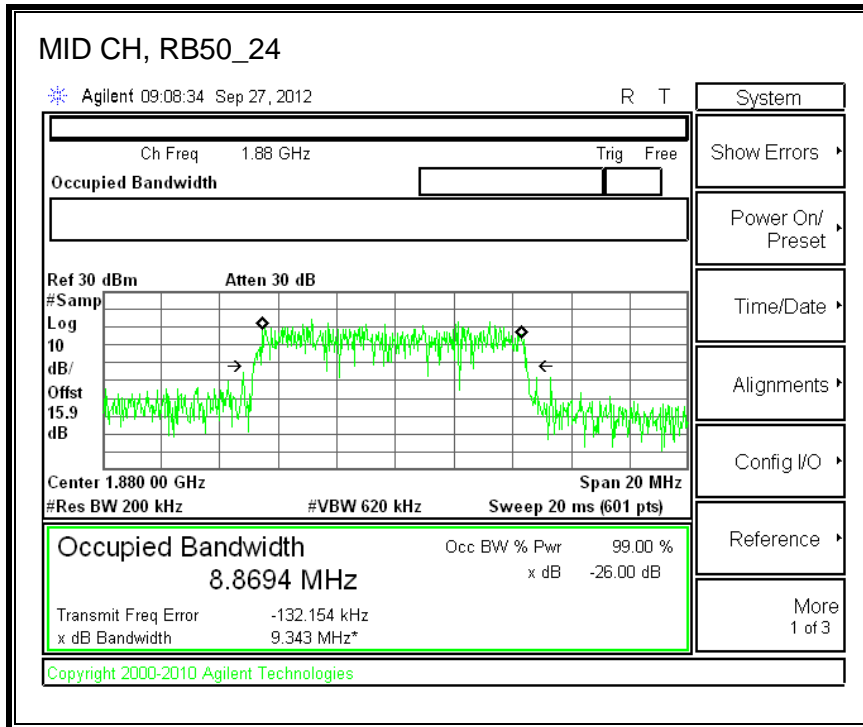


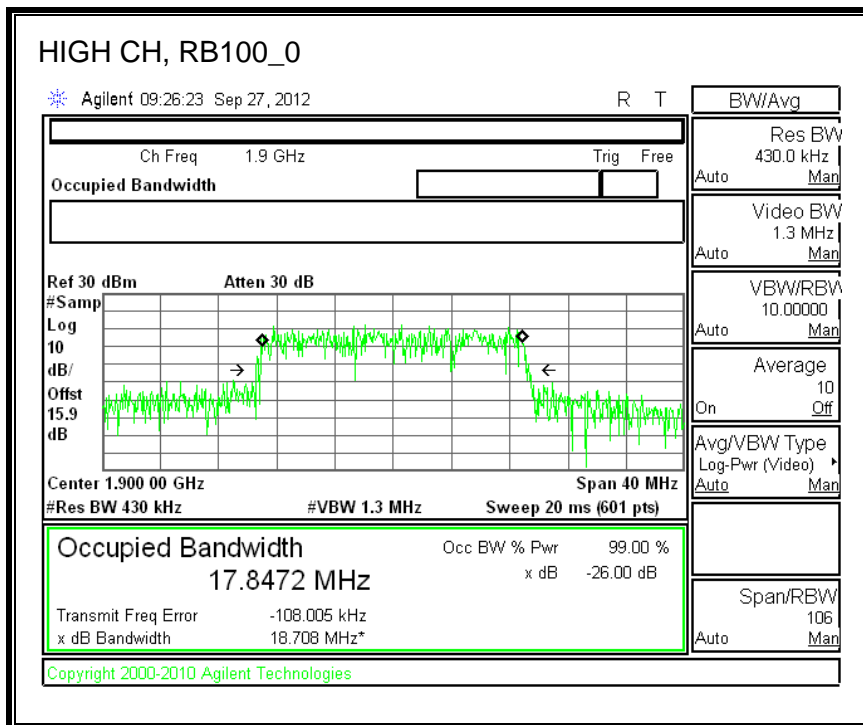
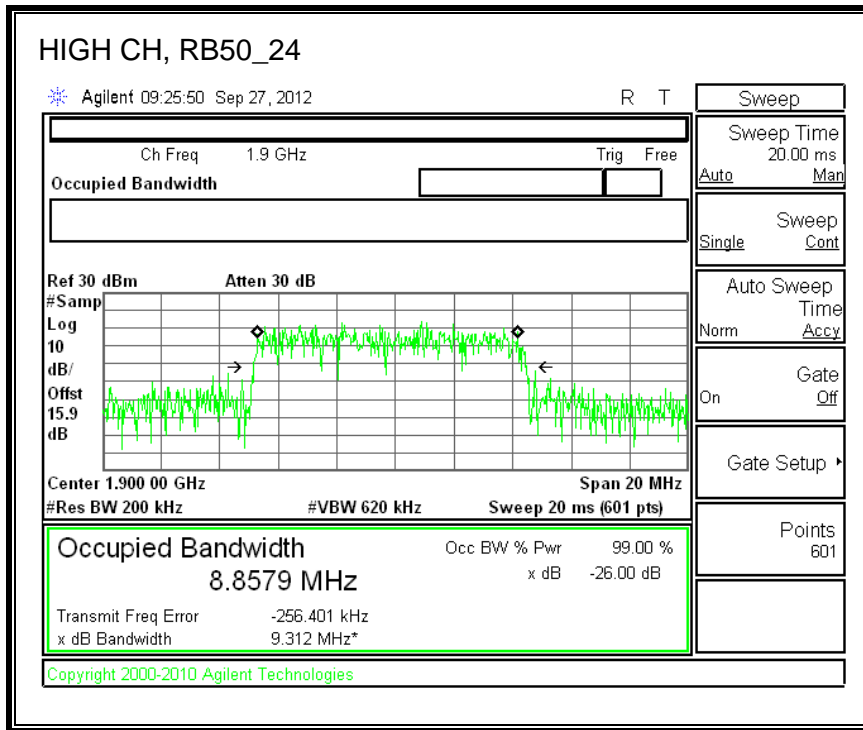


Band 2 (20 MHz BANDWIDTH)

16QAM

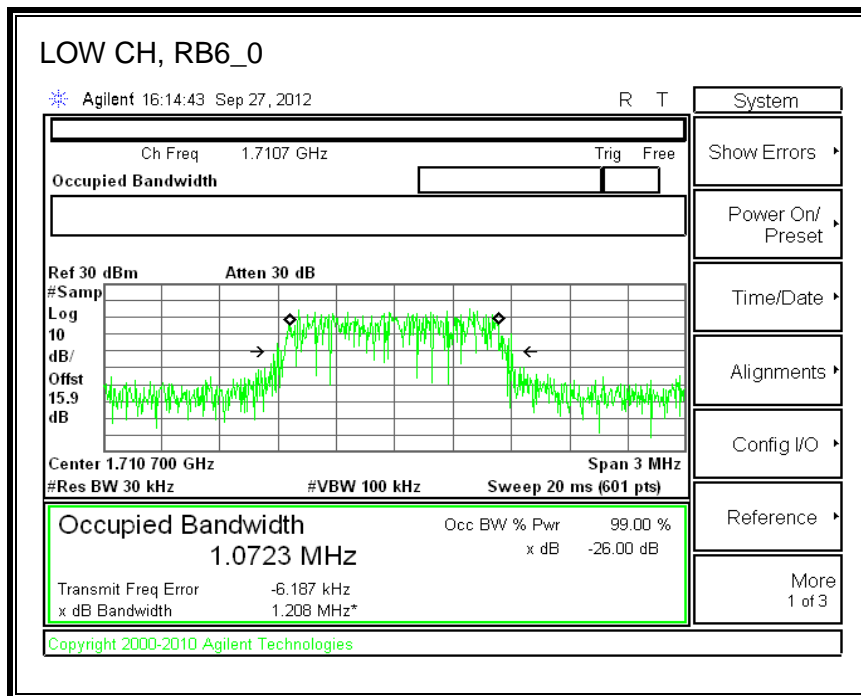
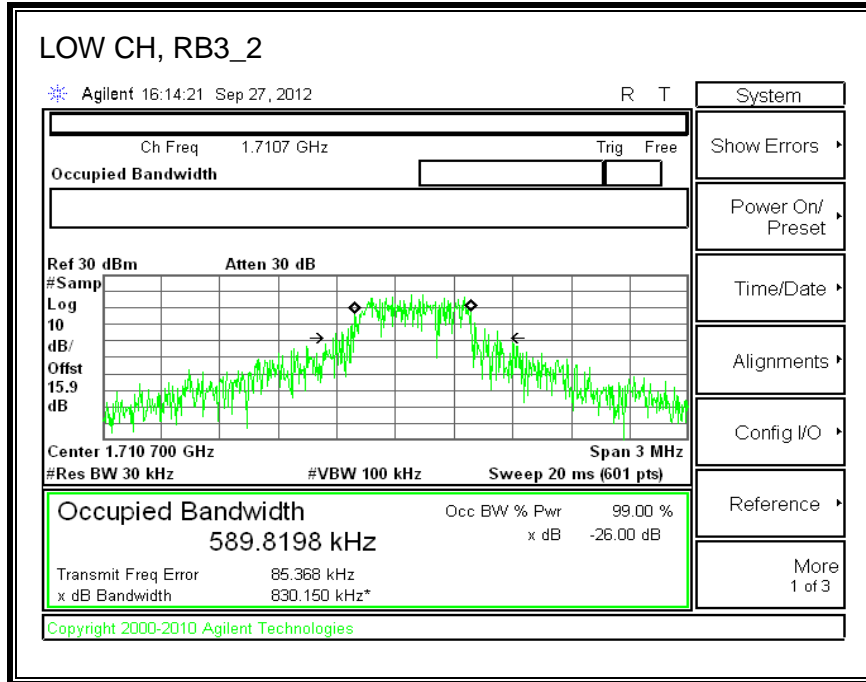


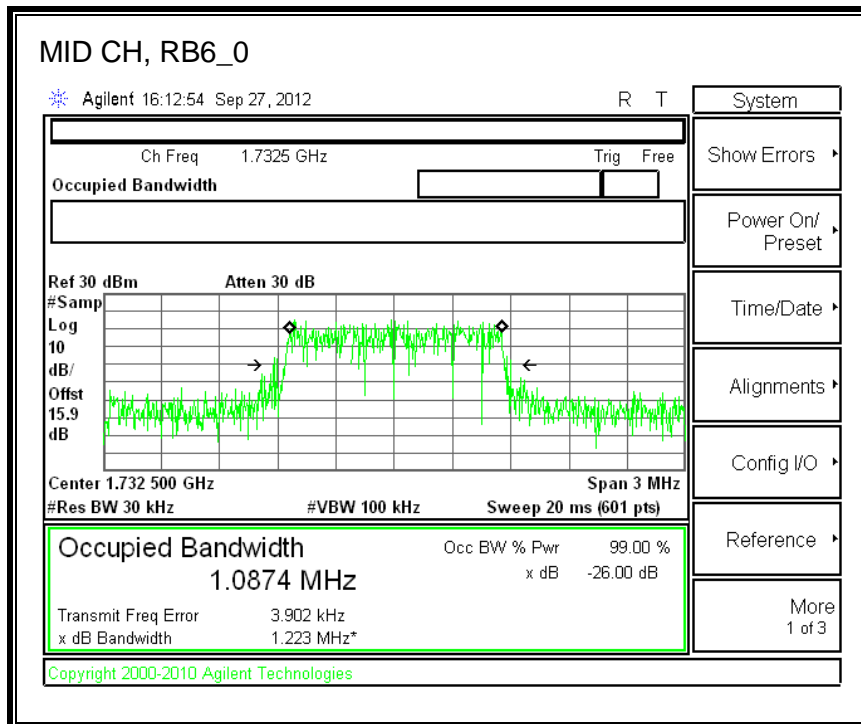
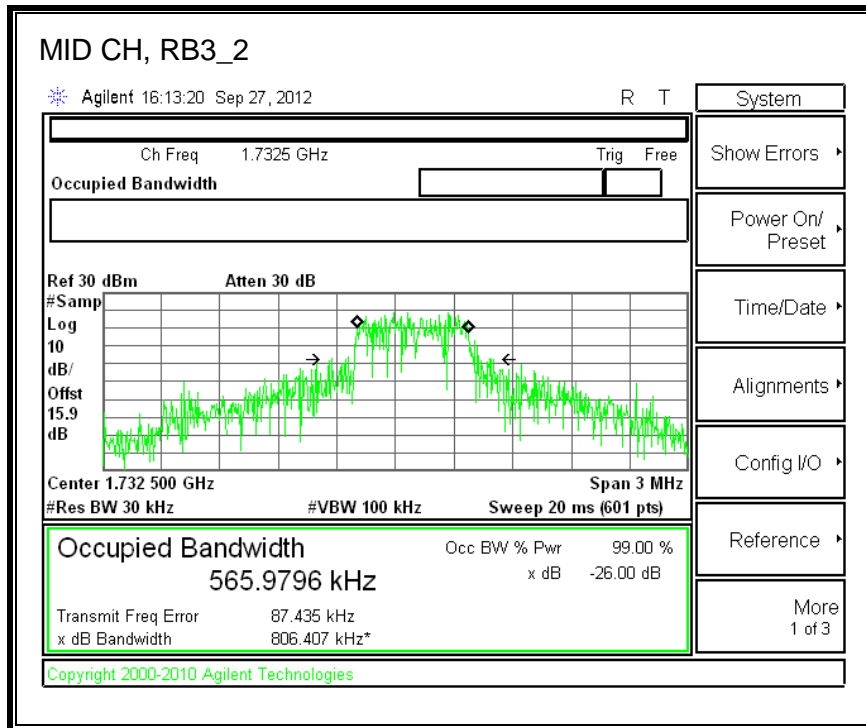


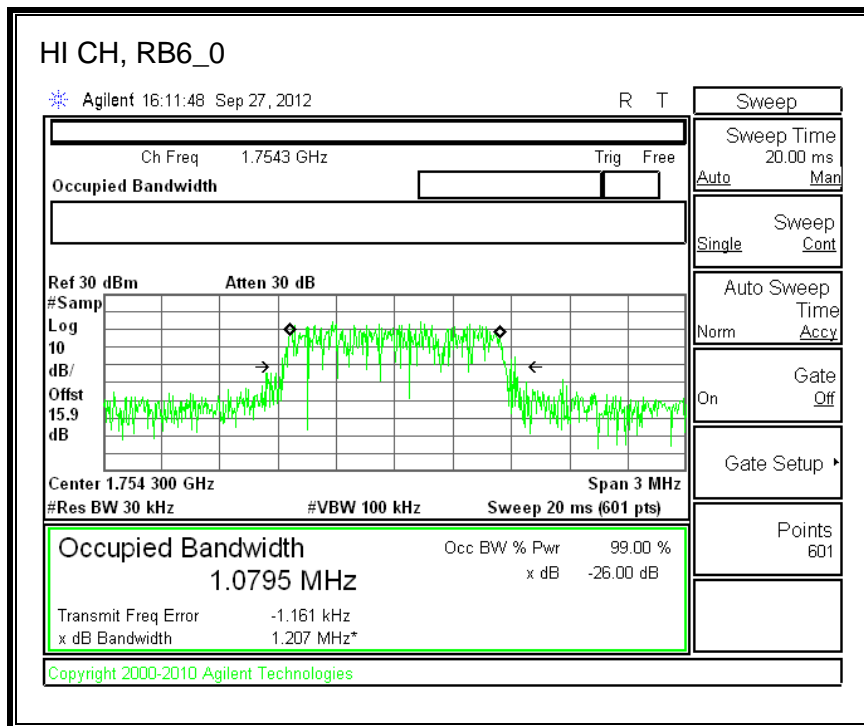
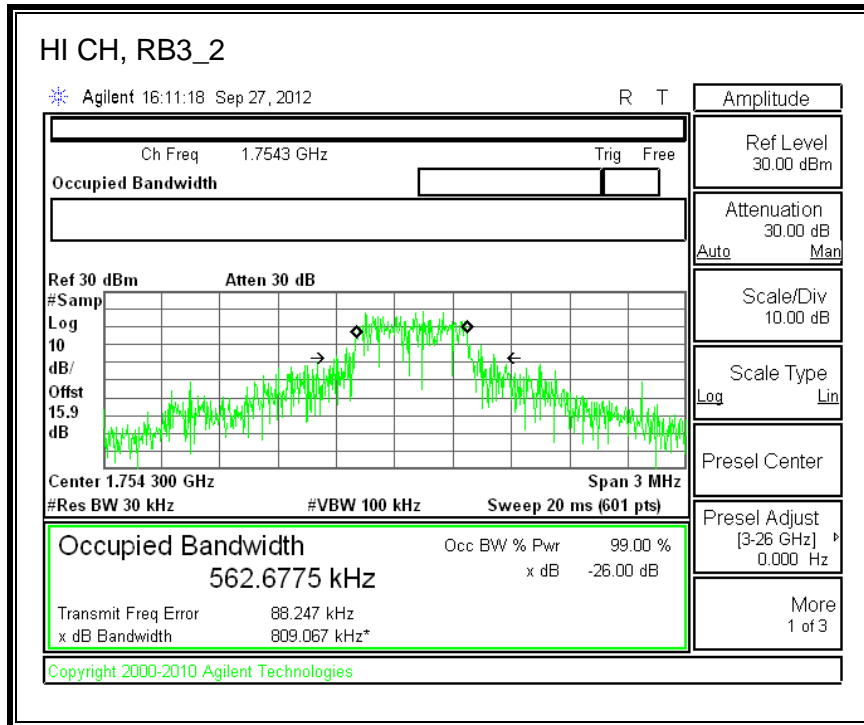


8.1.4. LTE Band 4

QPSK 1.4 MHz BANDWIDTH)

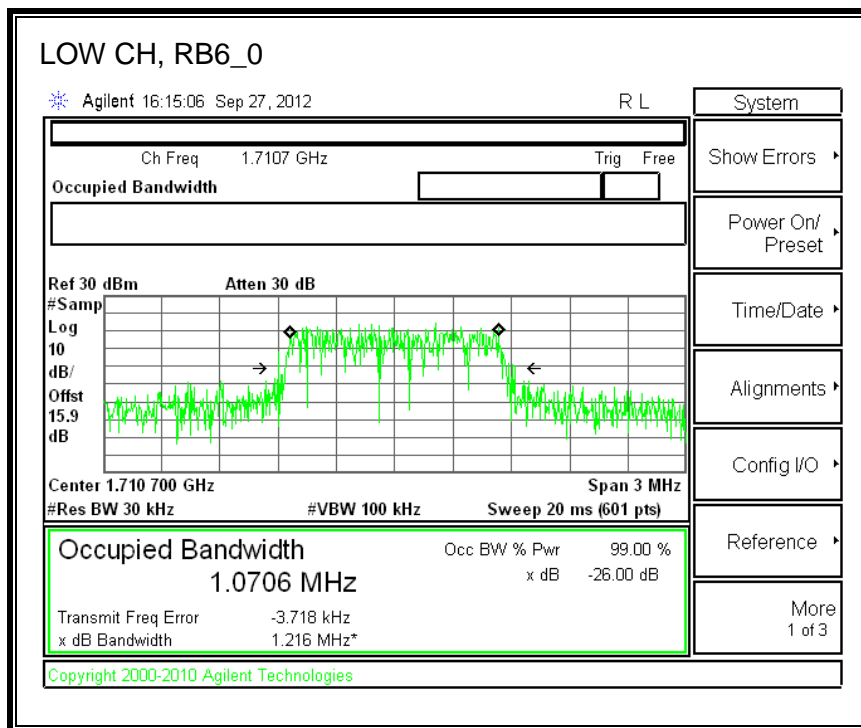
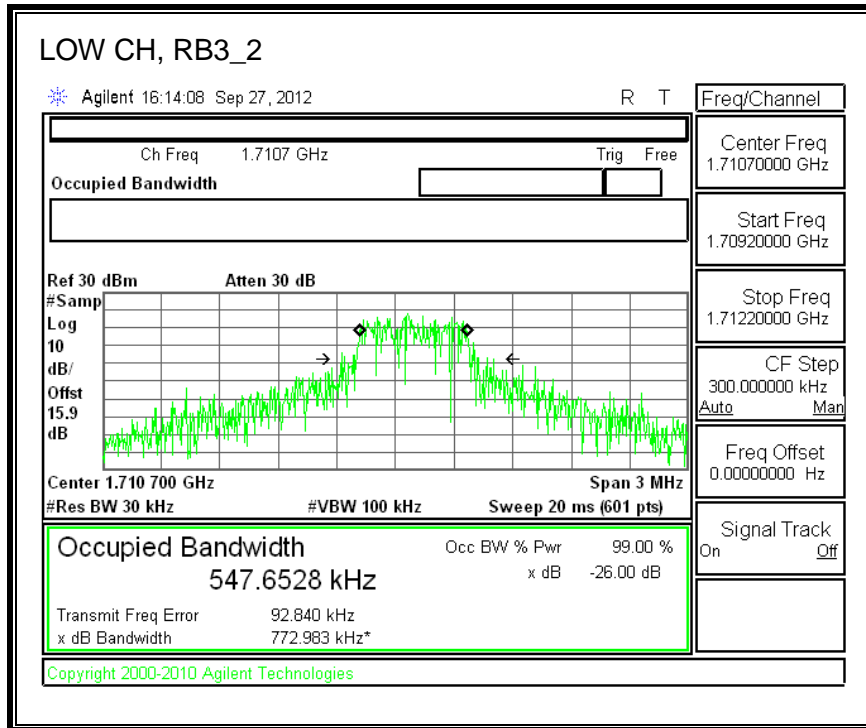


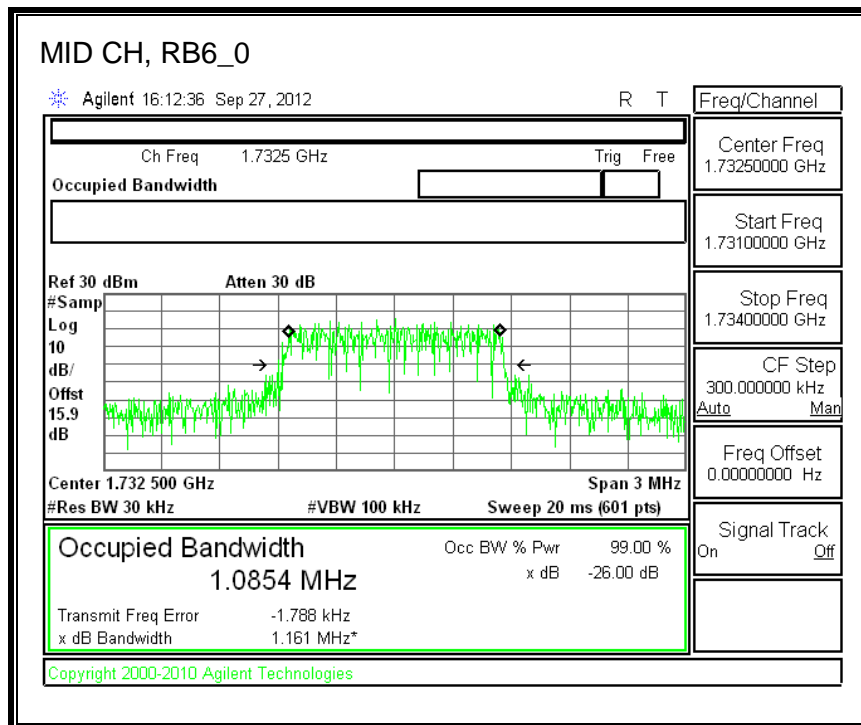
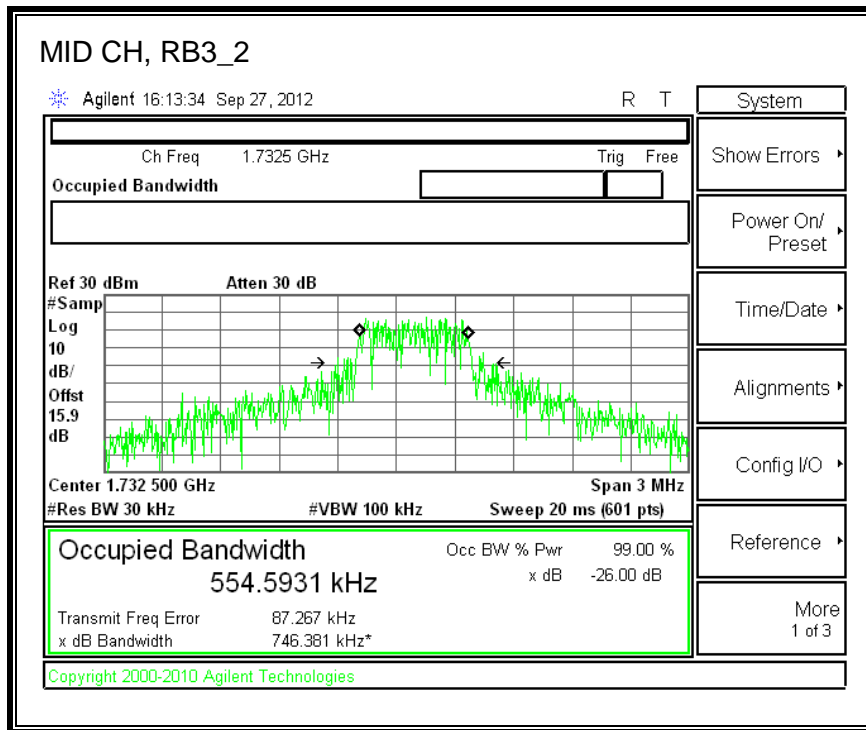


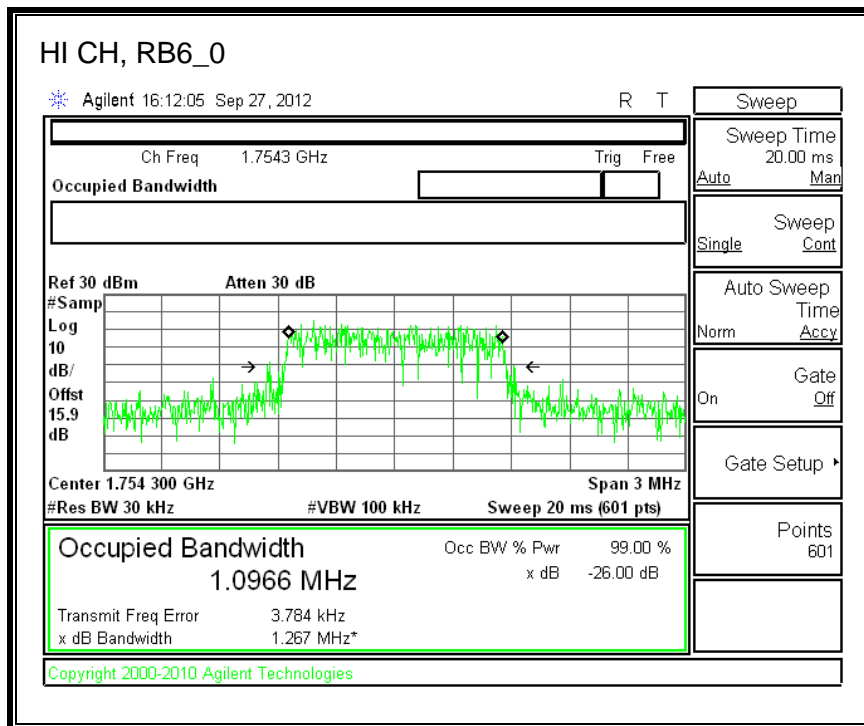
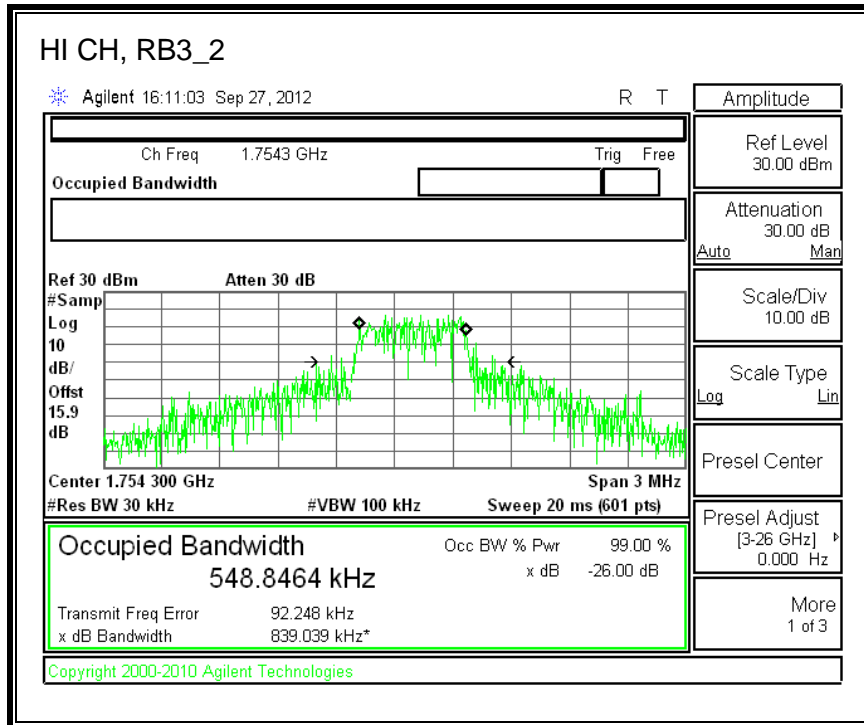


Band 4 (1.4 MHz BANDWIDTH)

16QAM

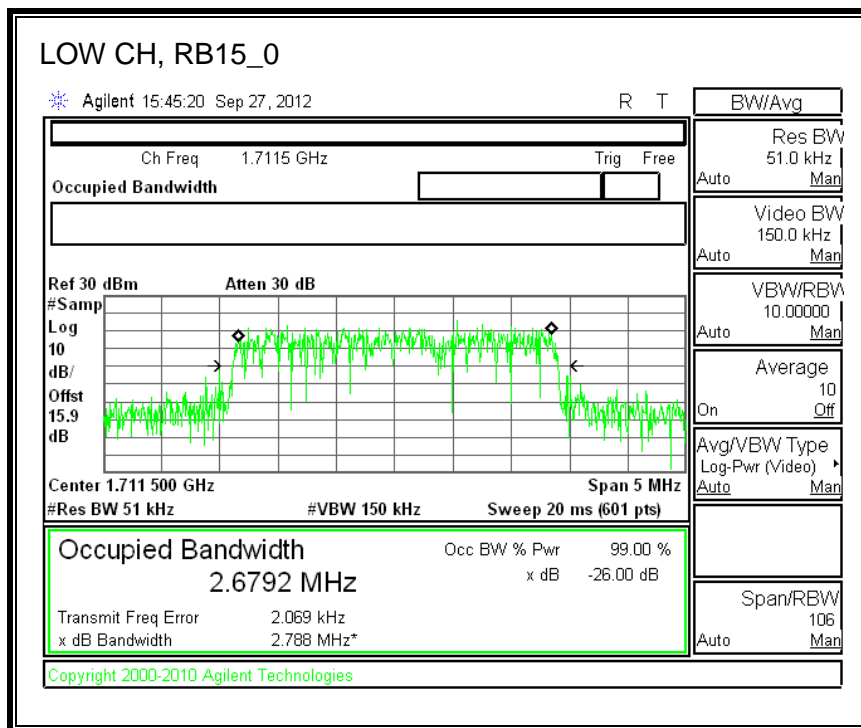
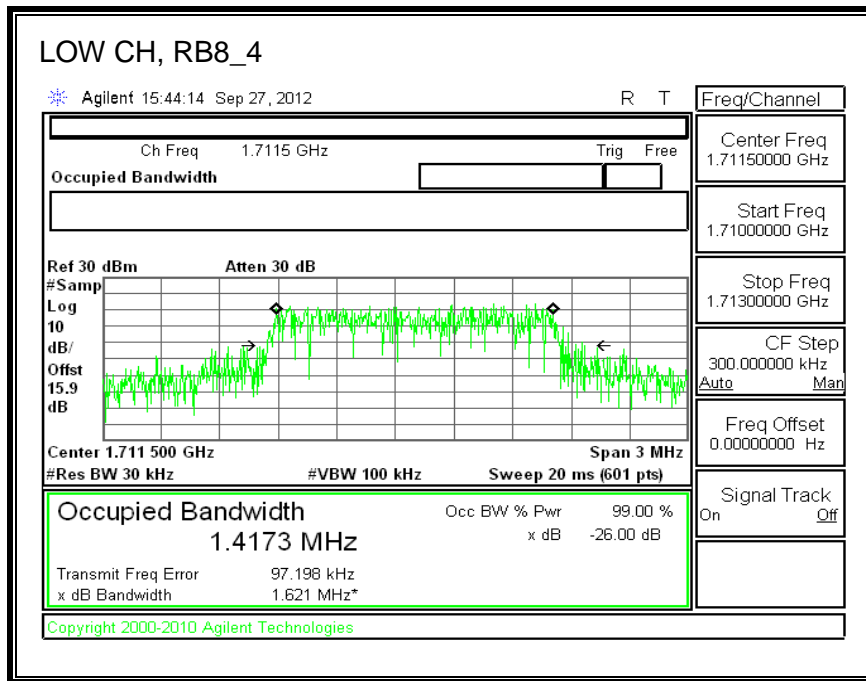


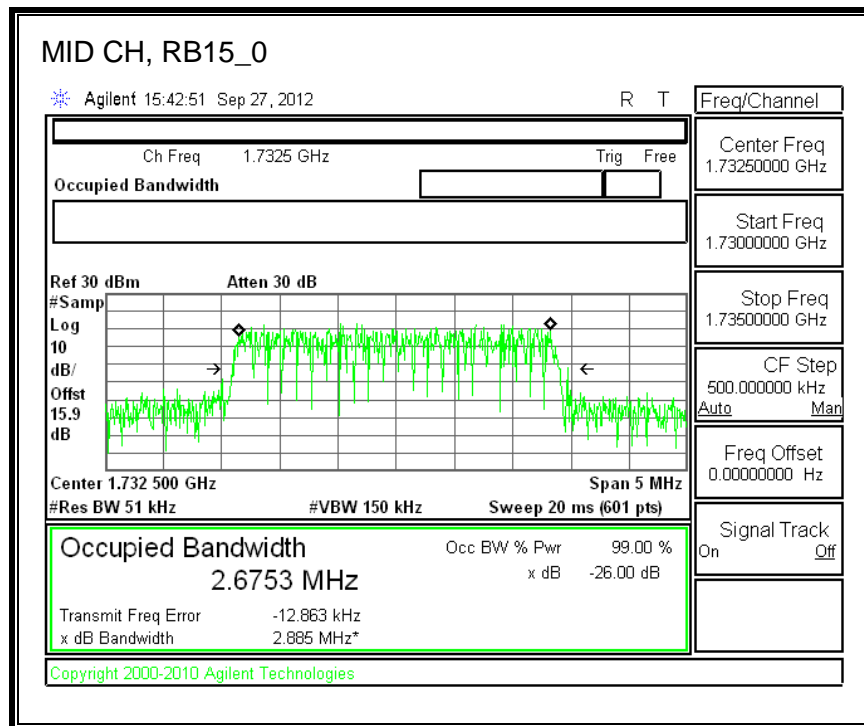
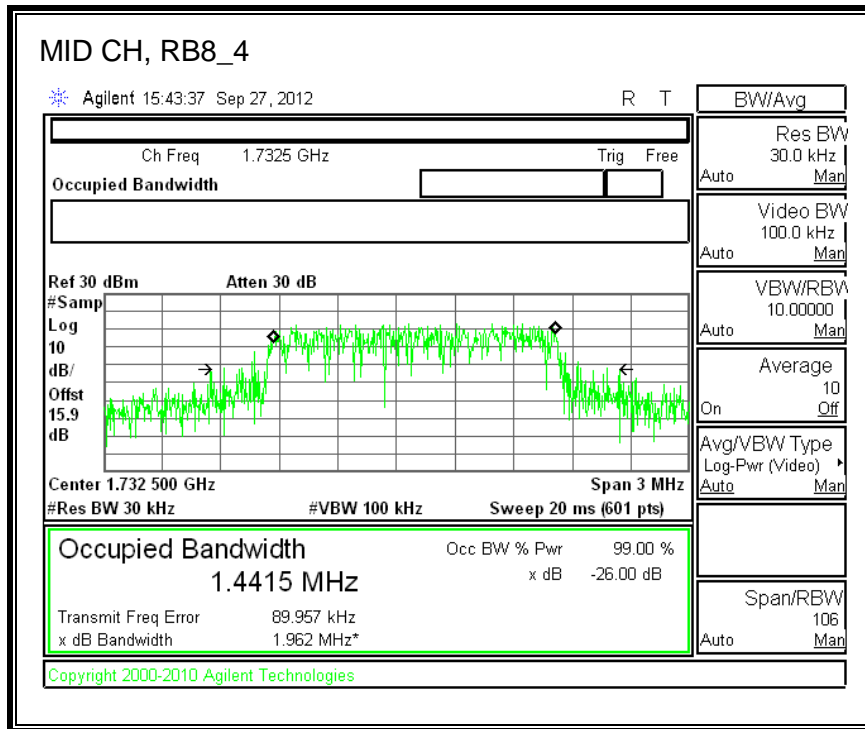


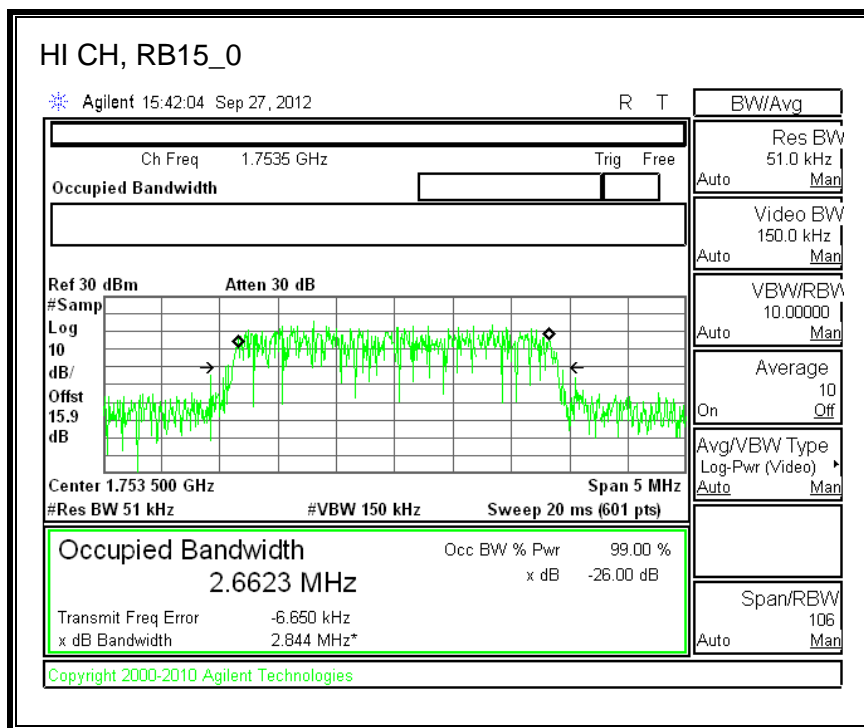
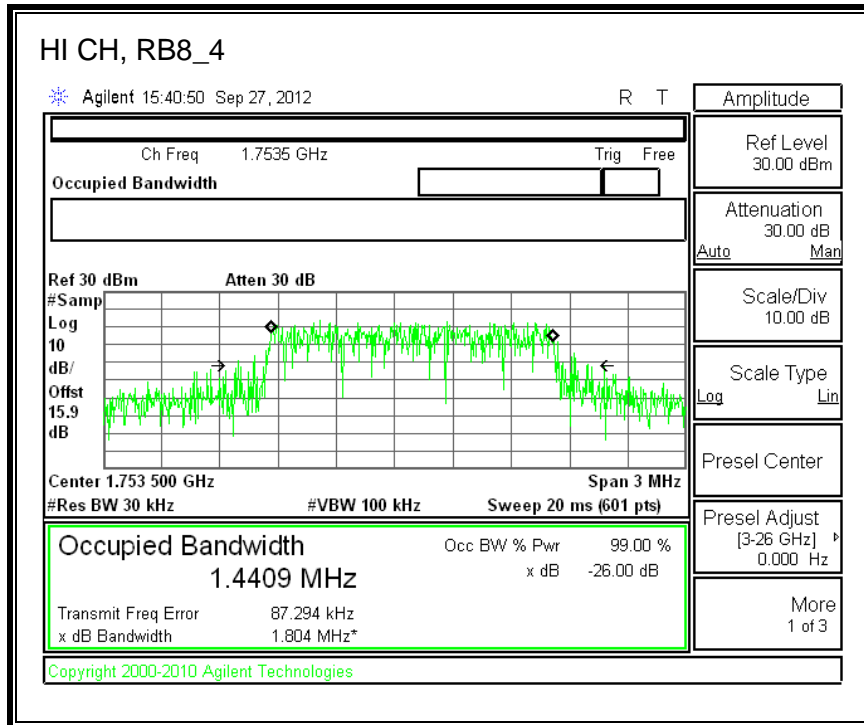


Band 4 (3 MHz BANDWIDTH)

QPSK

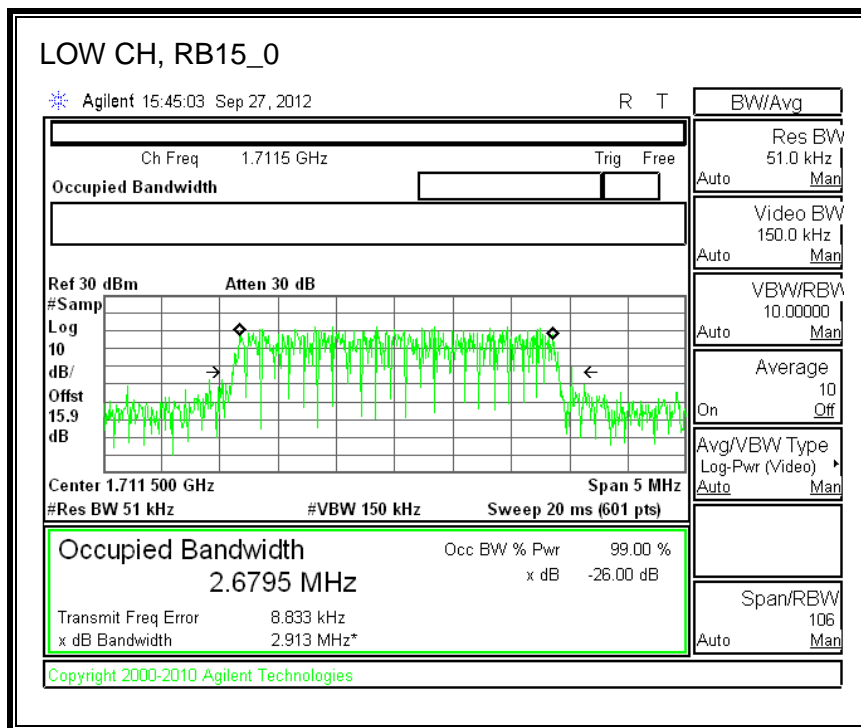
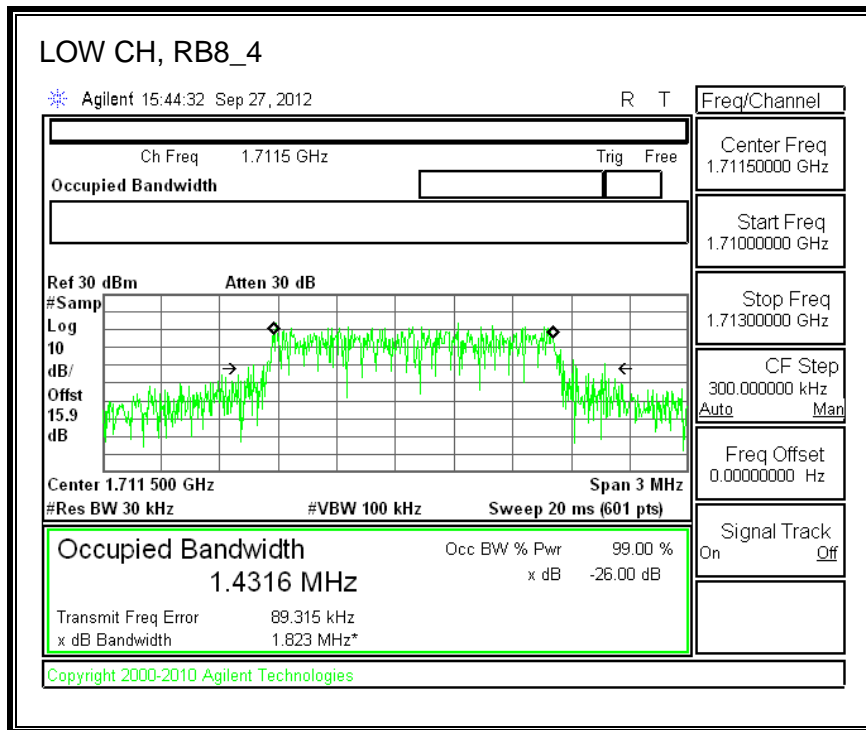


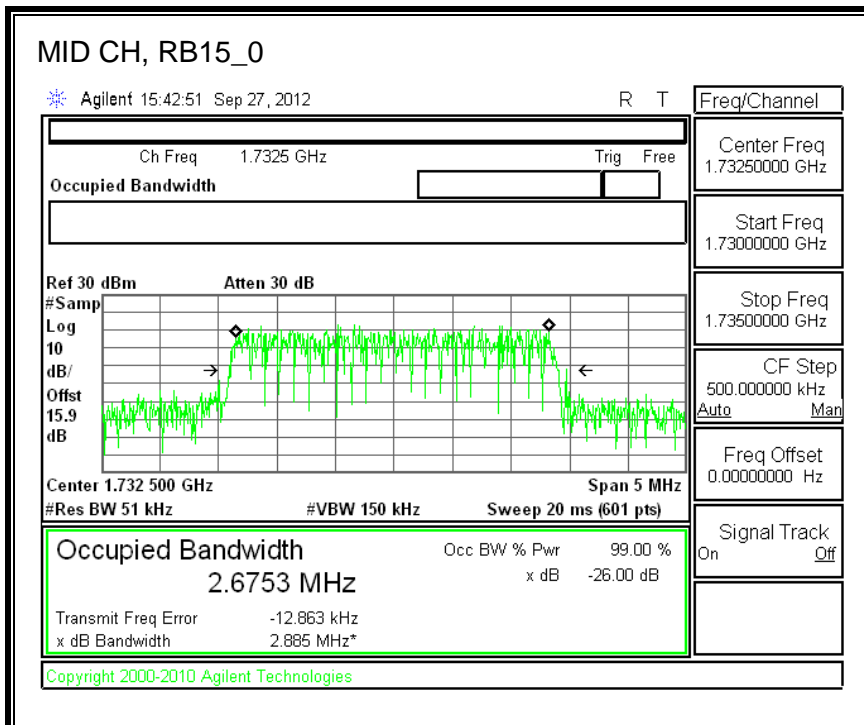
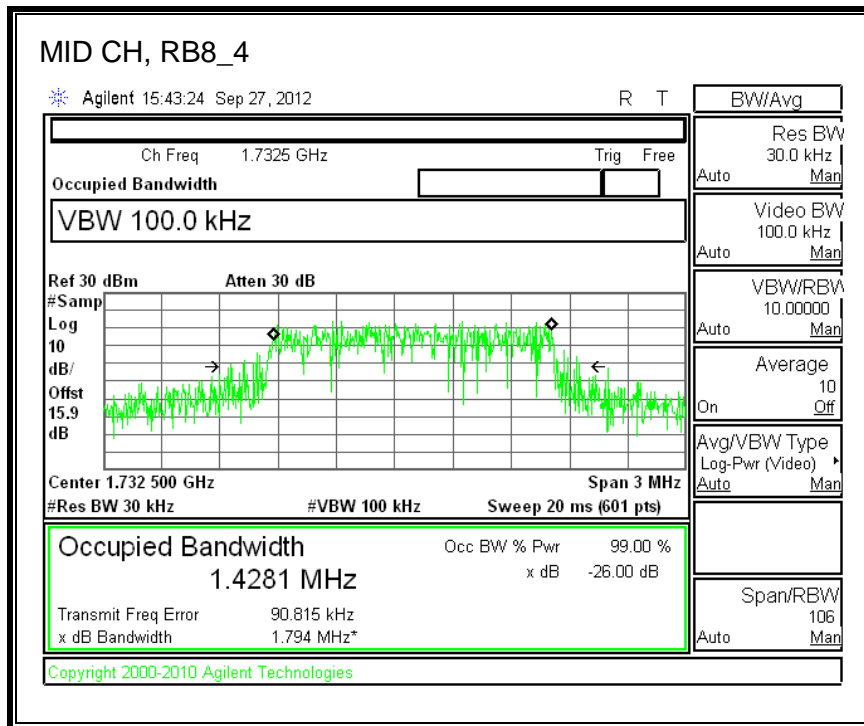


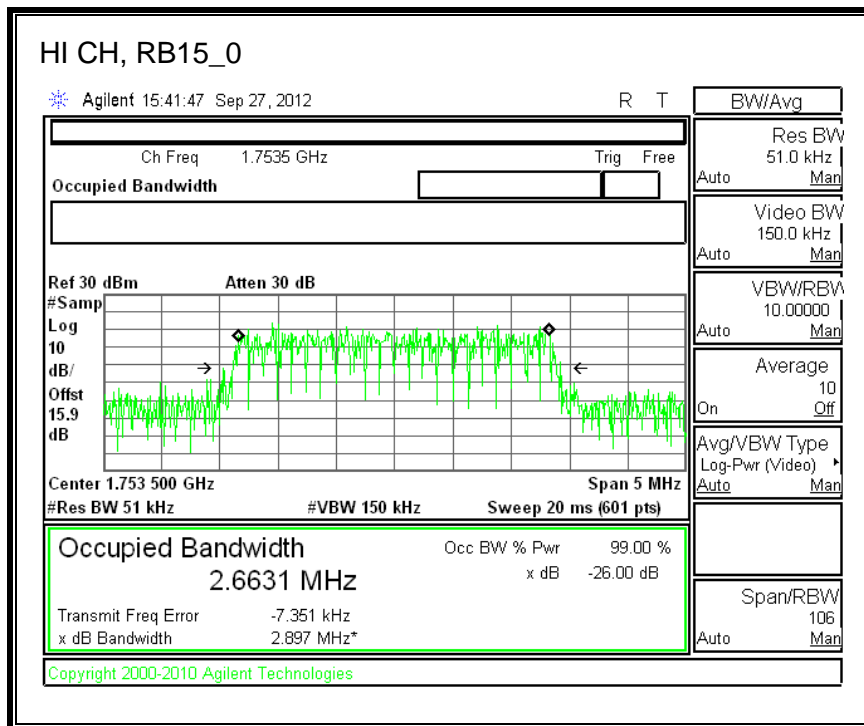
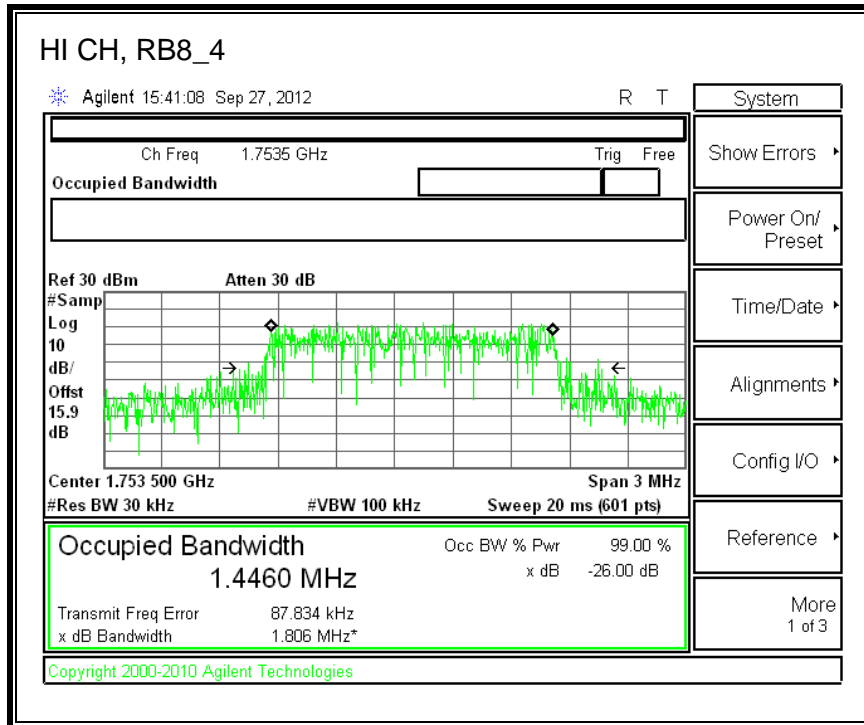


Band 4 (3 MHz BANDWIDTH)

16QAM

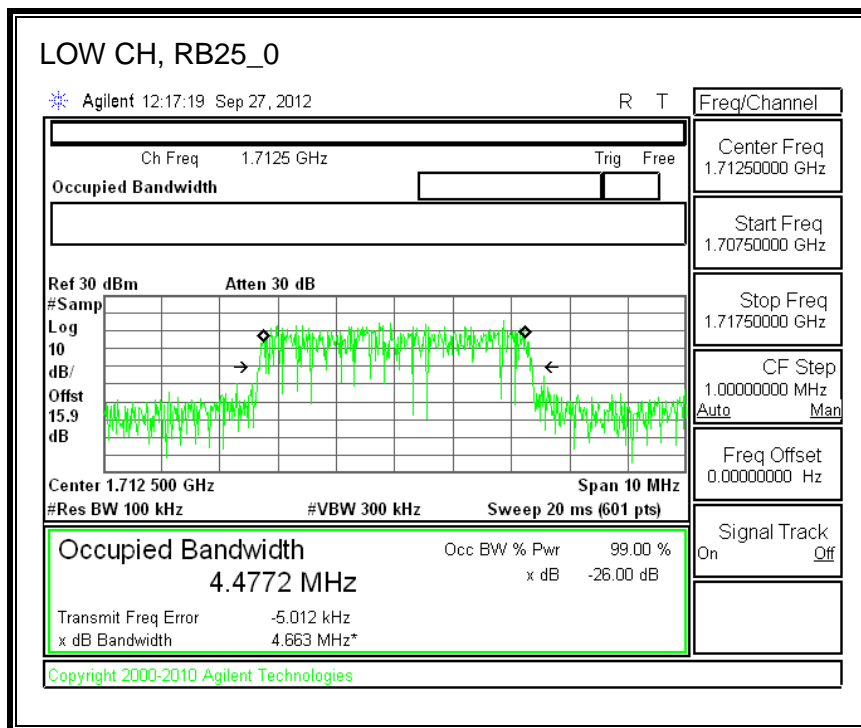
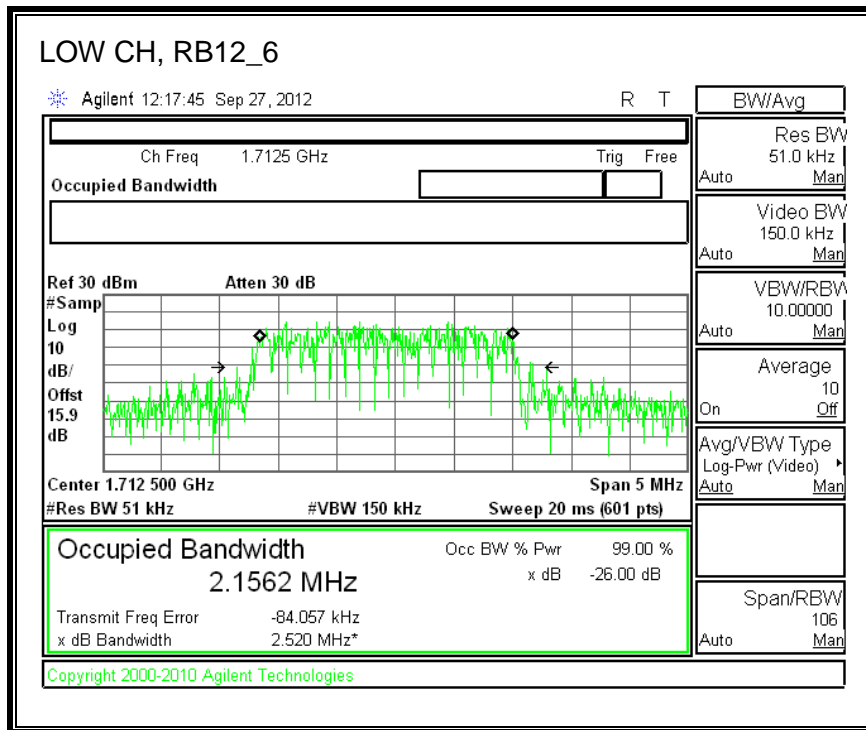


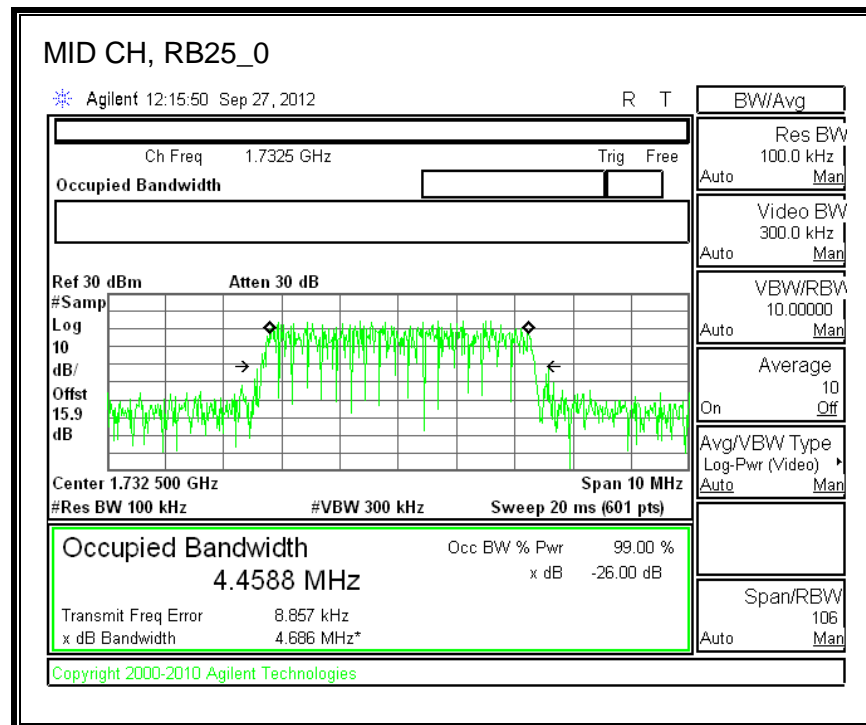
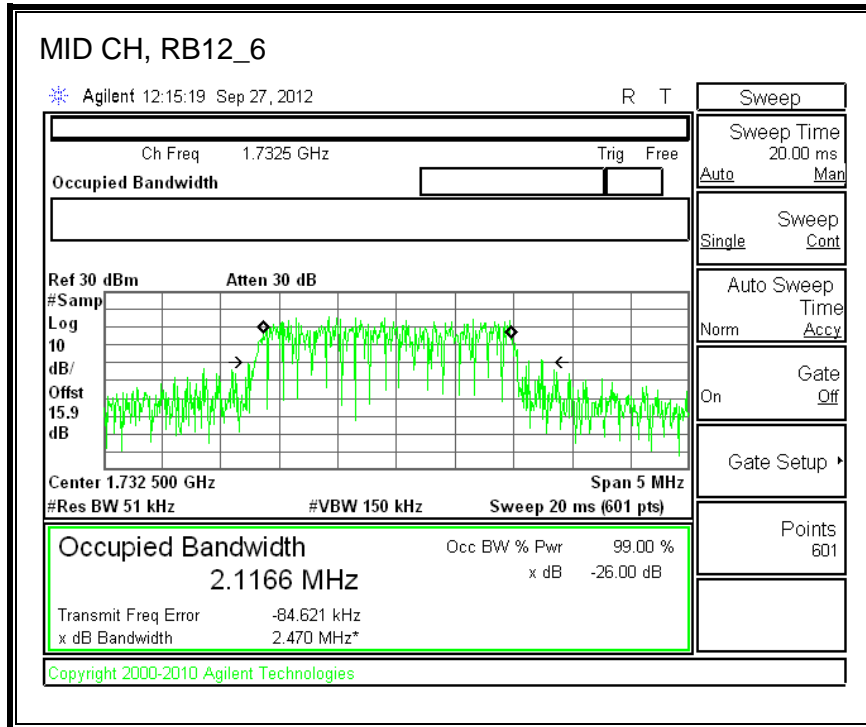


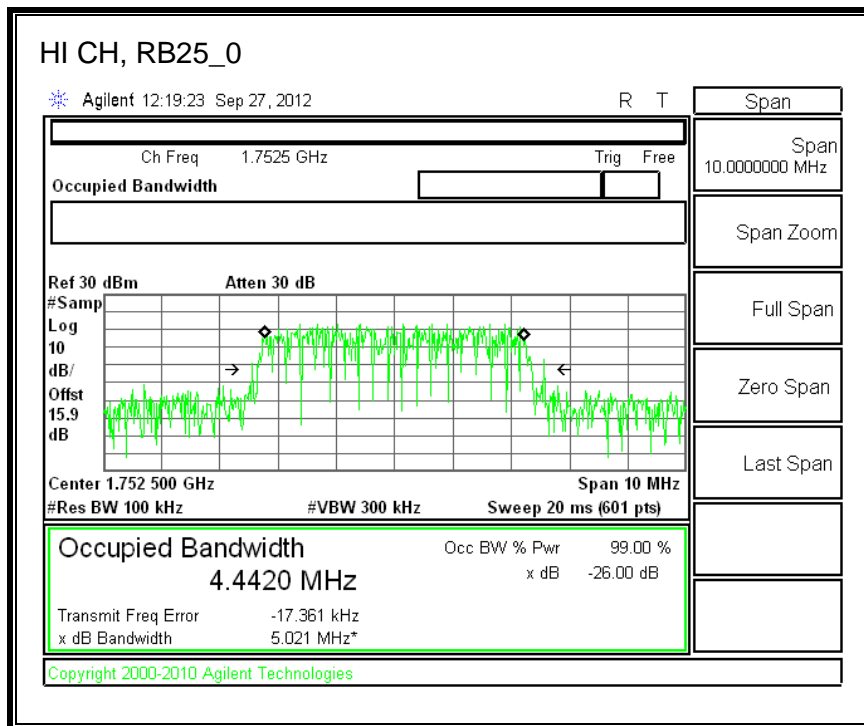
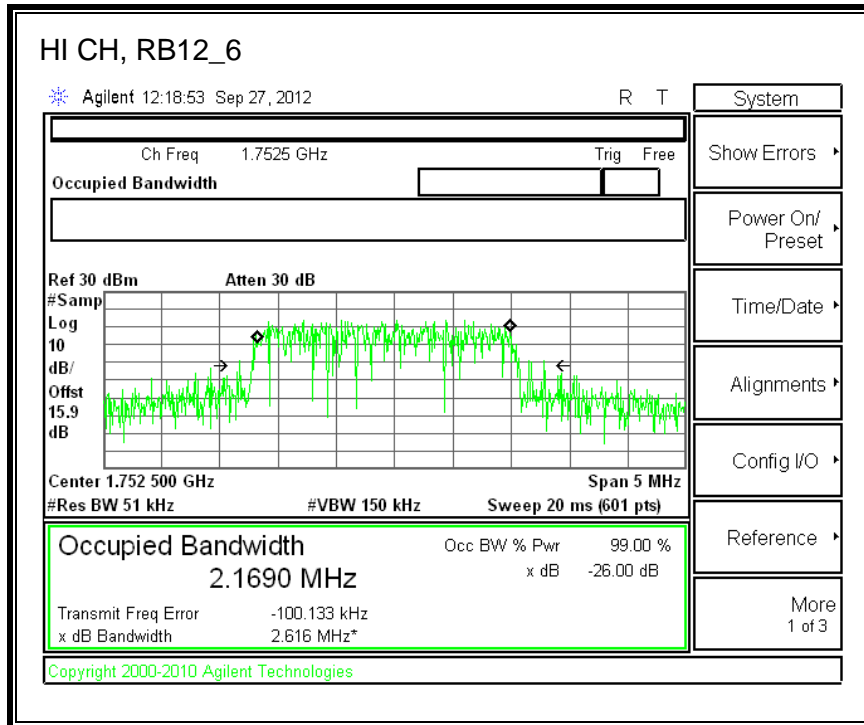


Band 4 (5 MHz BANDWIDTH)

QPSK

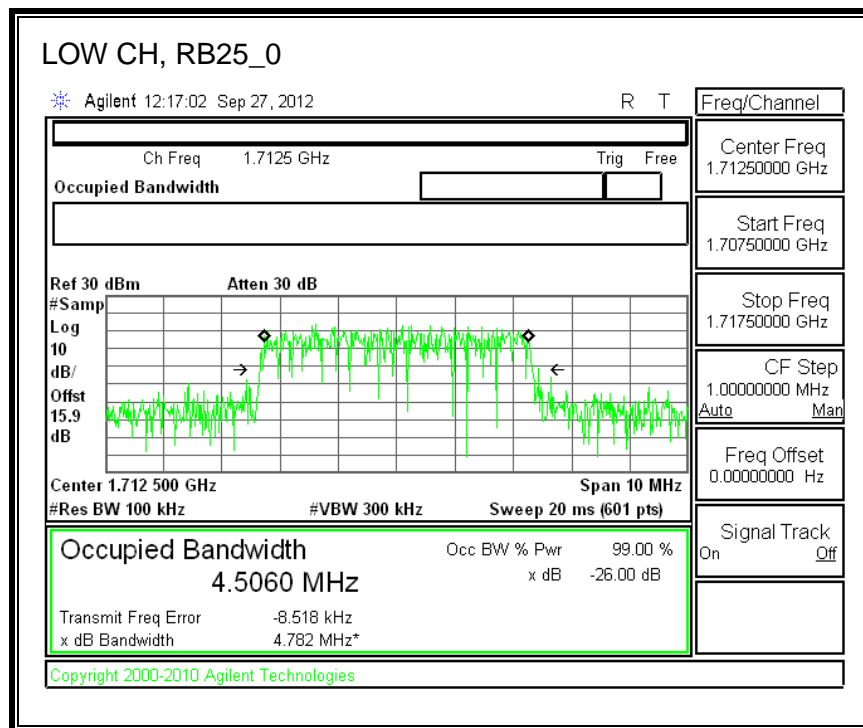
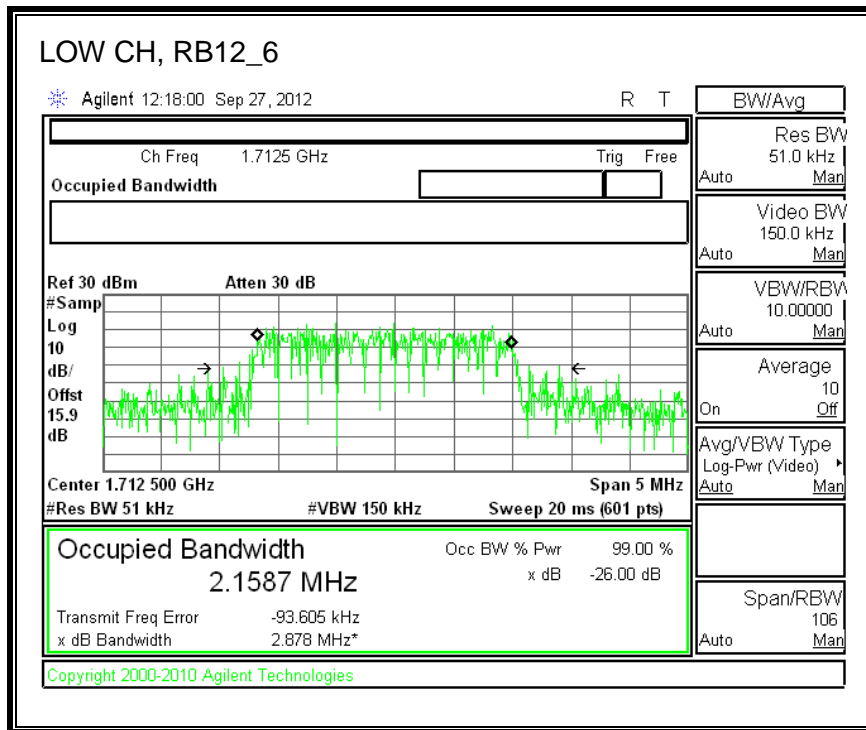


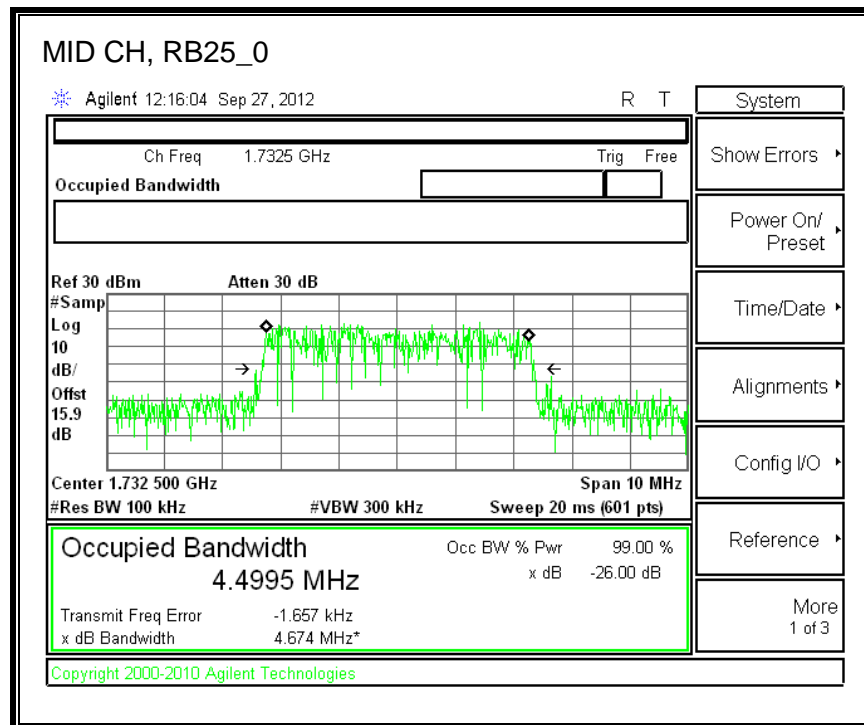
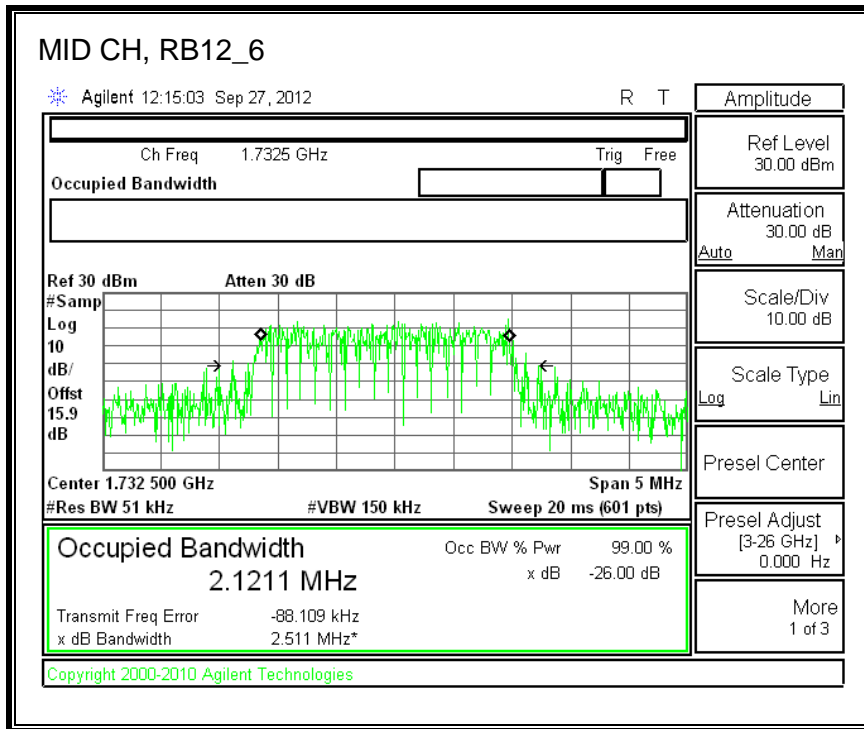


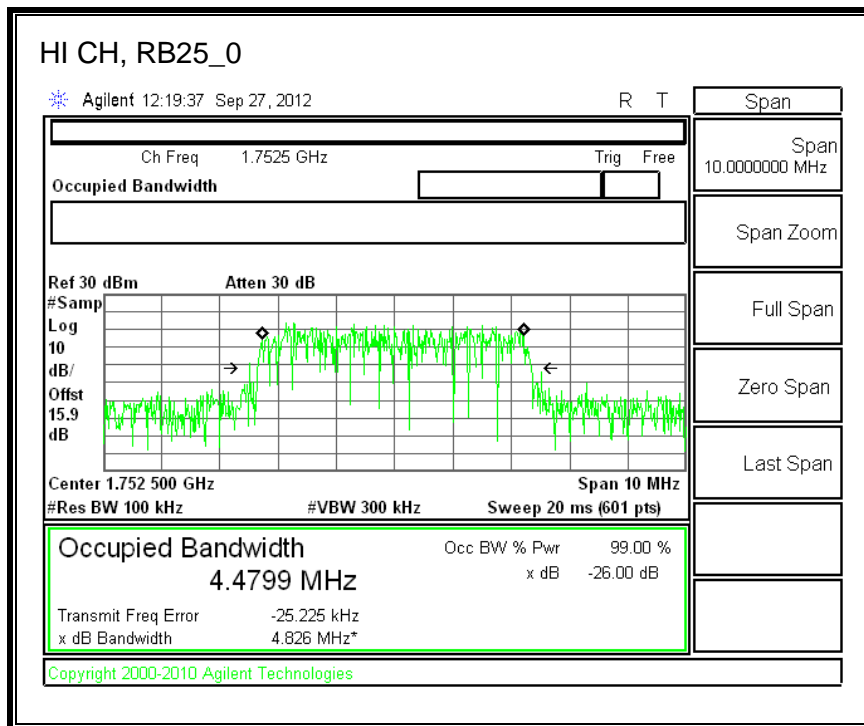
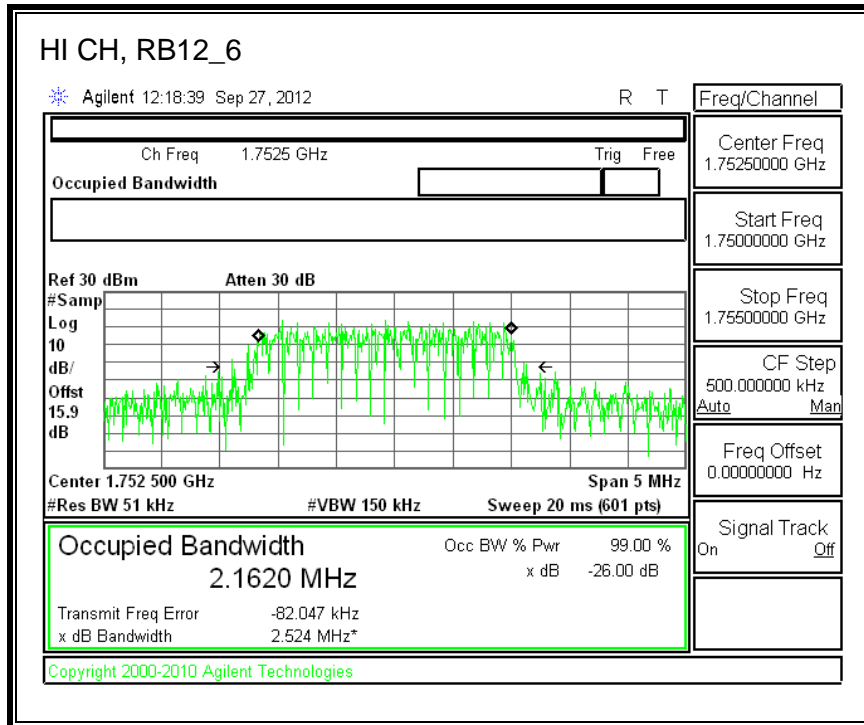


Band 4 (5 MHz BANDWIDTH)

16QAM

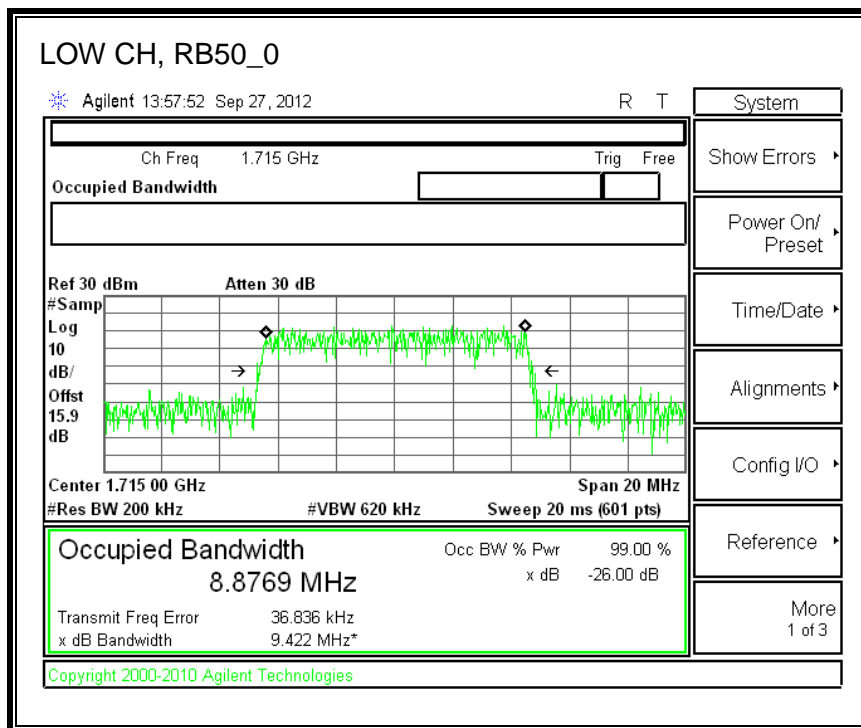
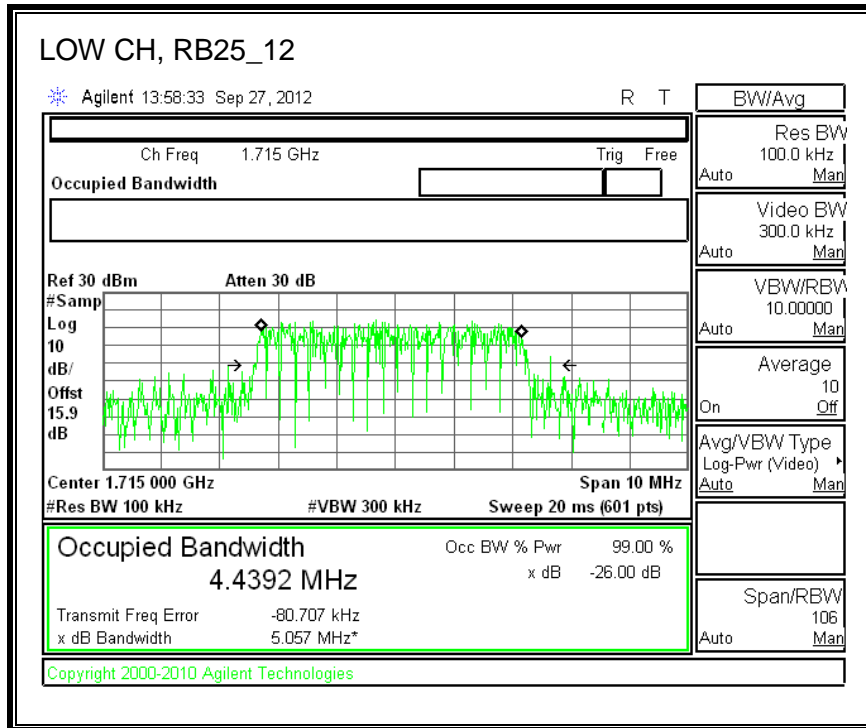


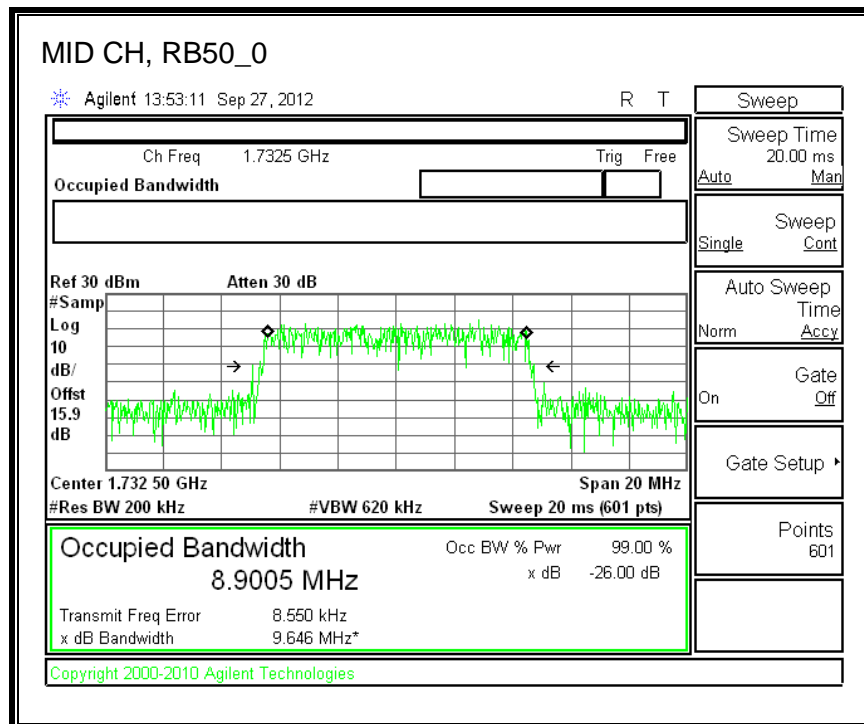
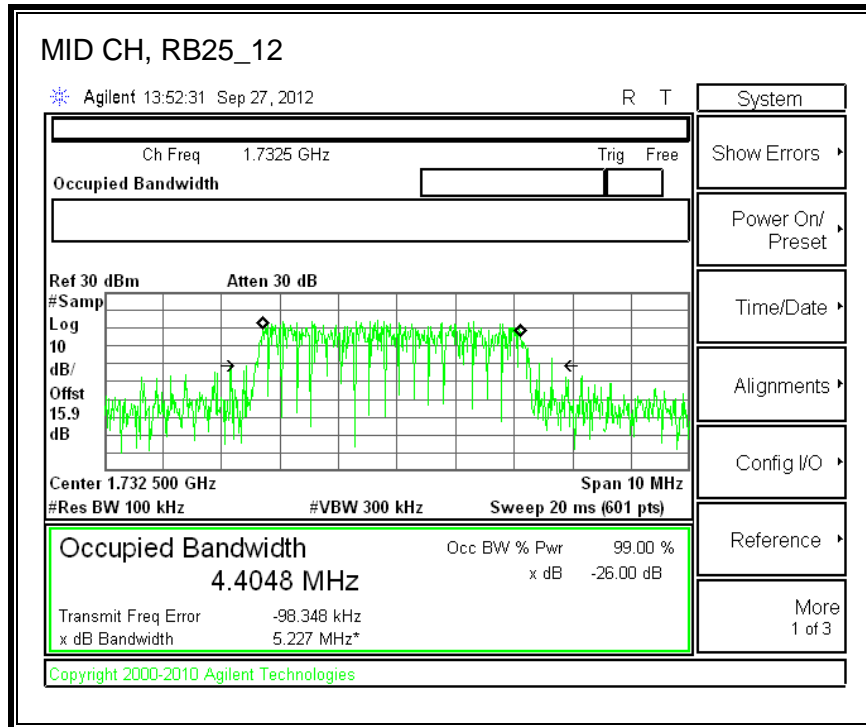


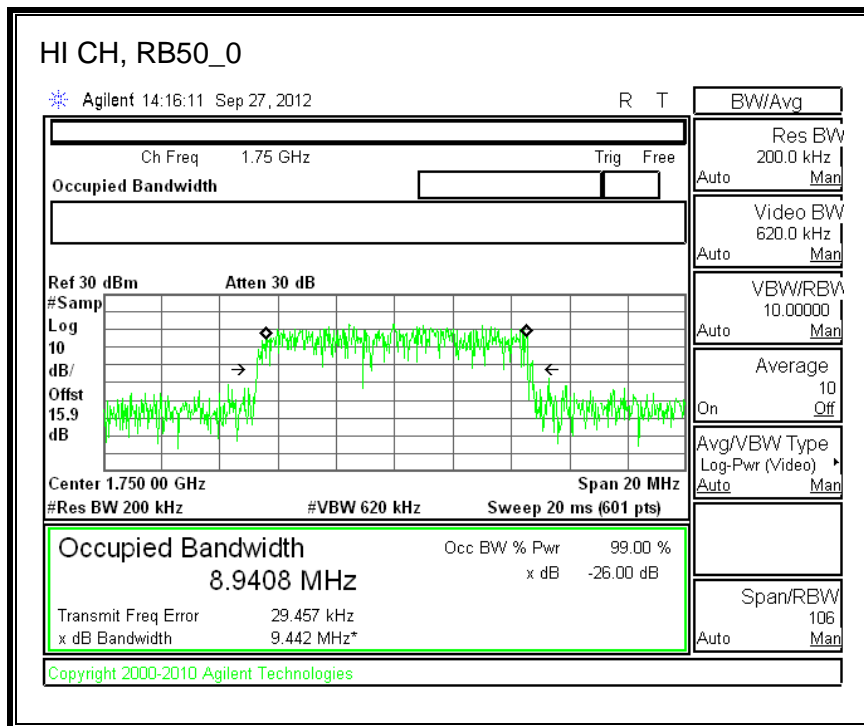
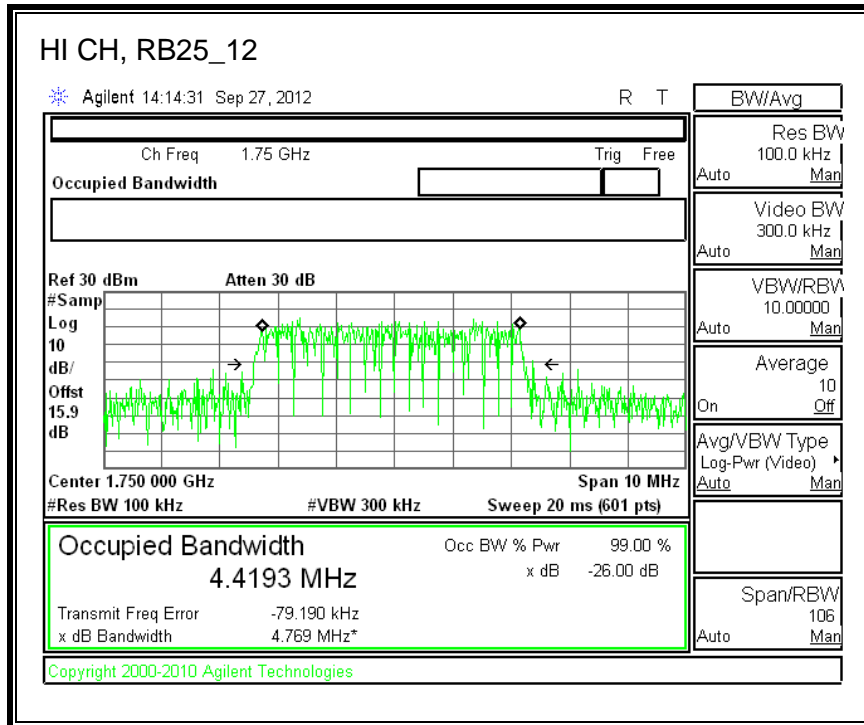


Band 4 (10 MHz BANDWIDTH)

QPSK

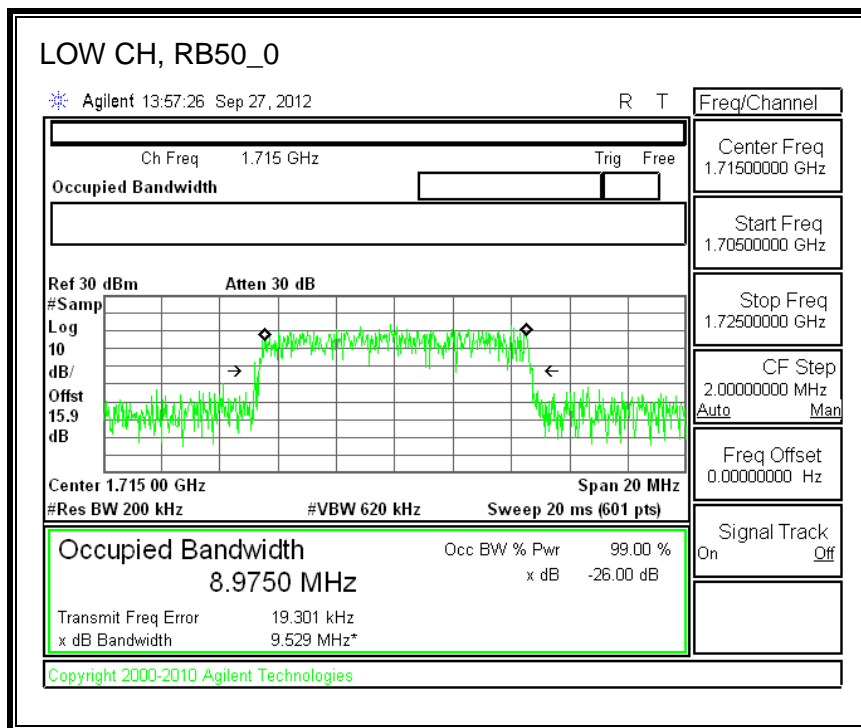
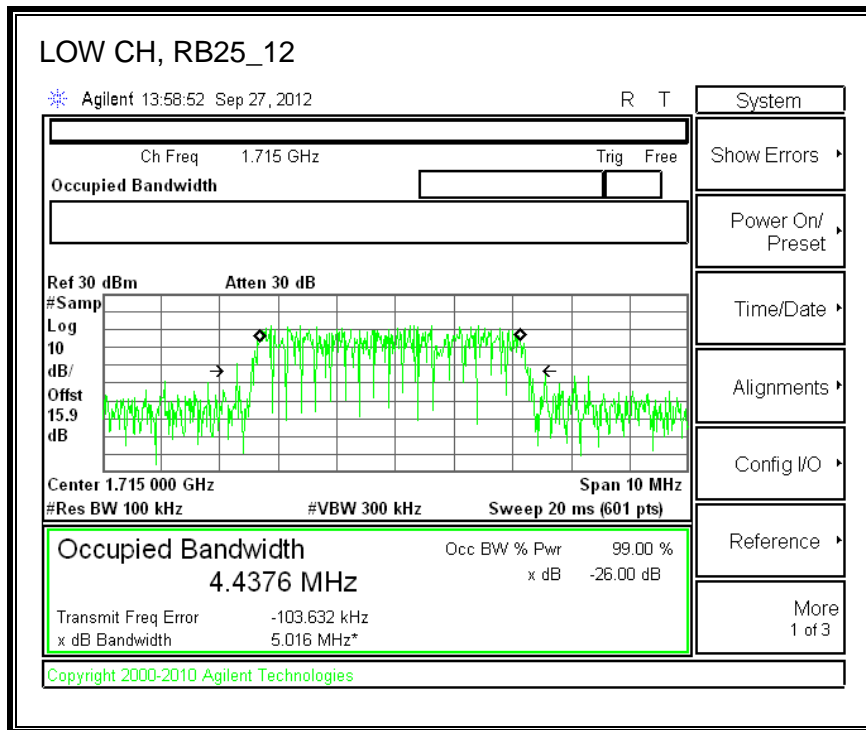


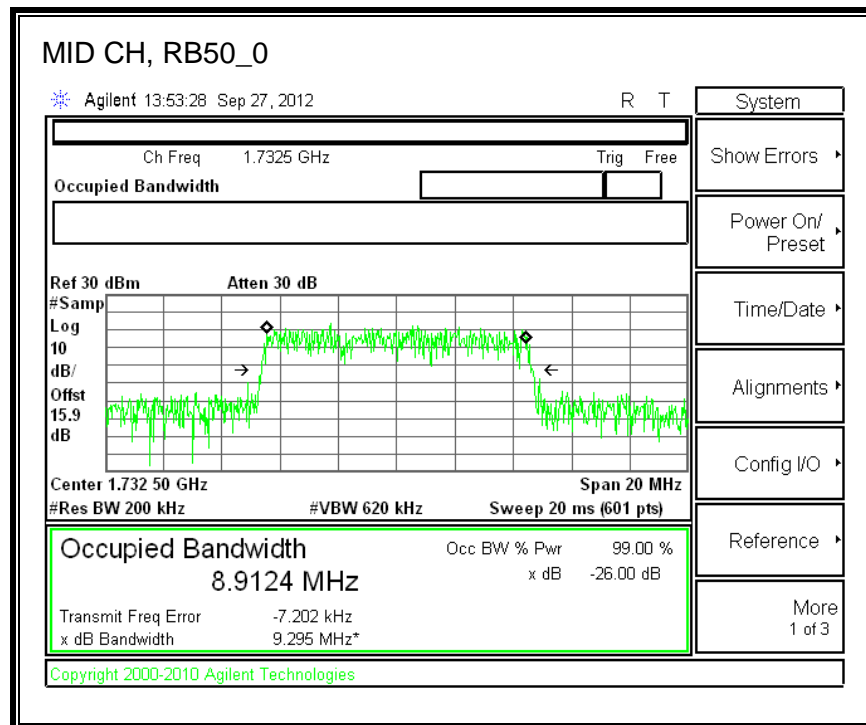
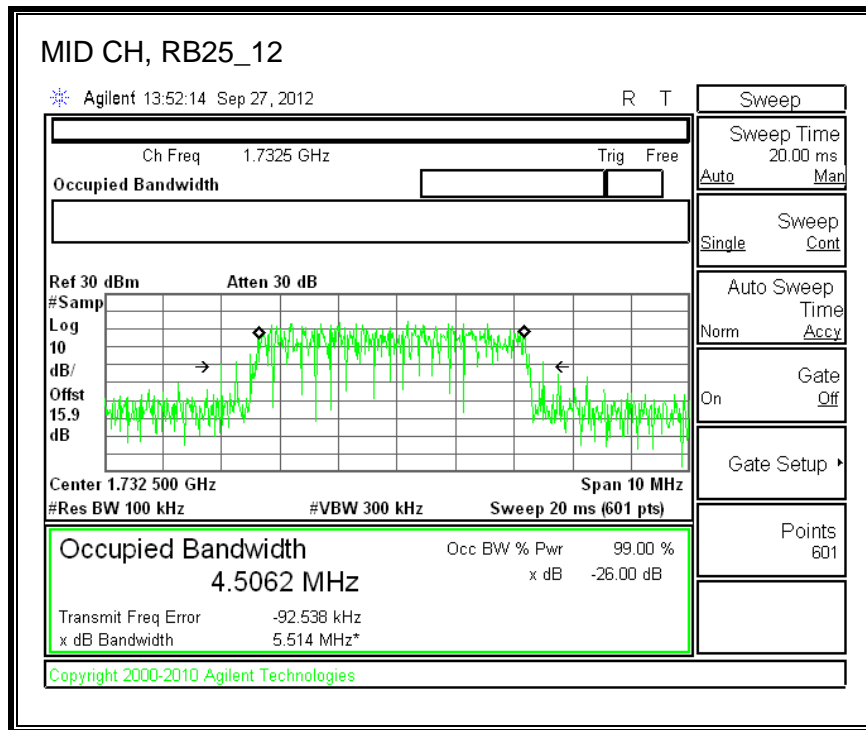


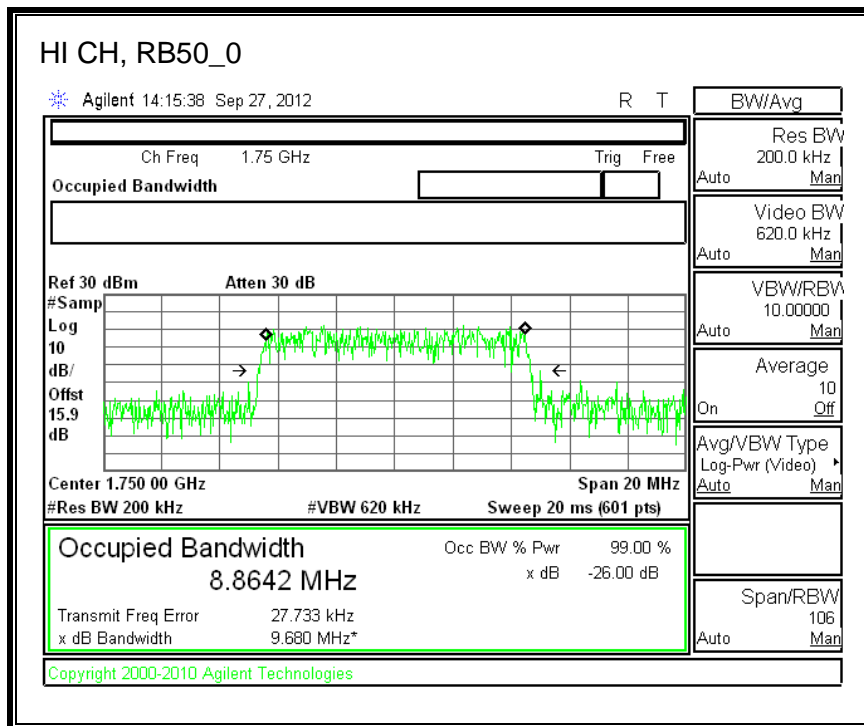
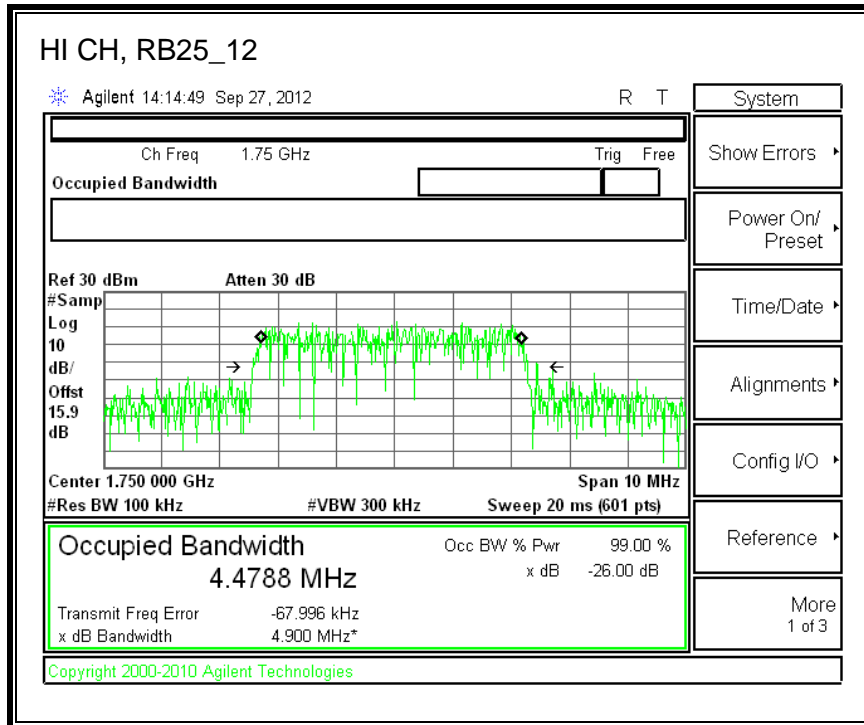


Band 4 (10 MHz BANDWIDTH)

16QAM

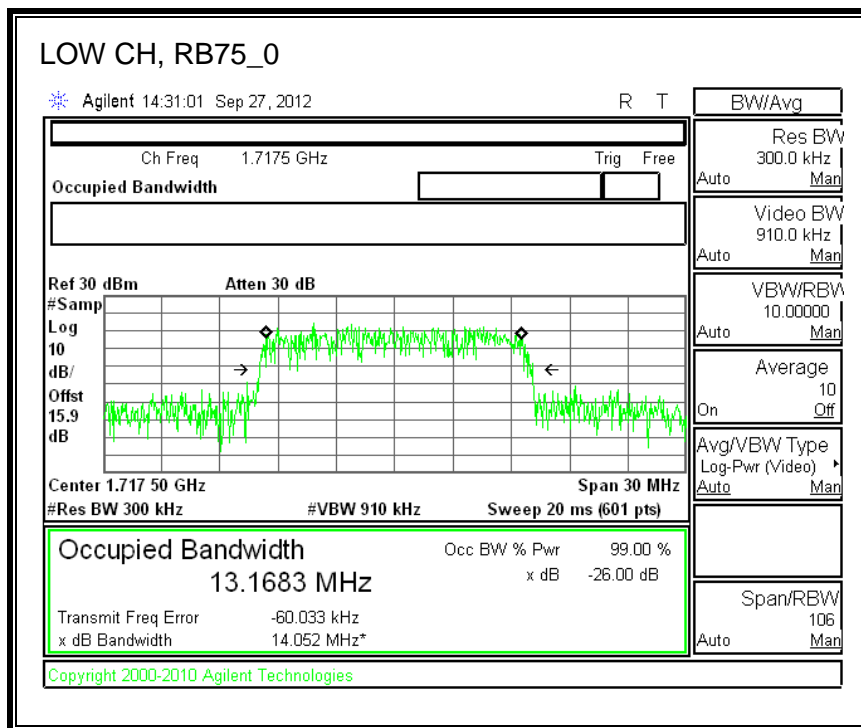
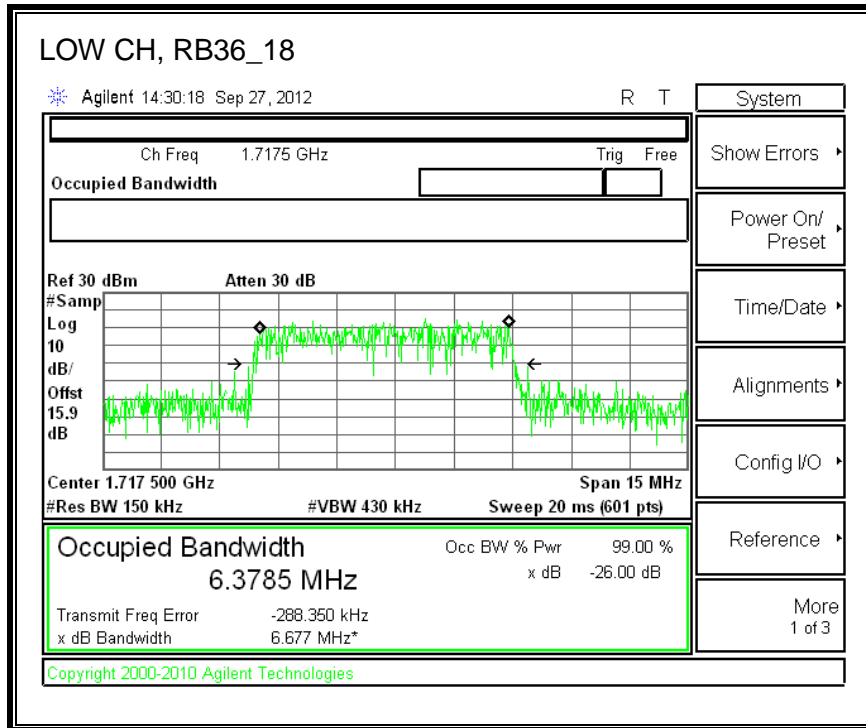


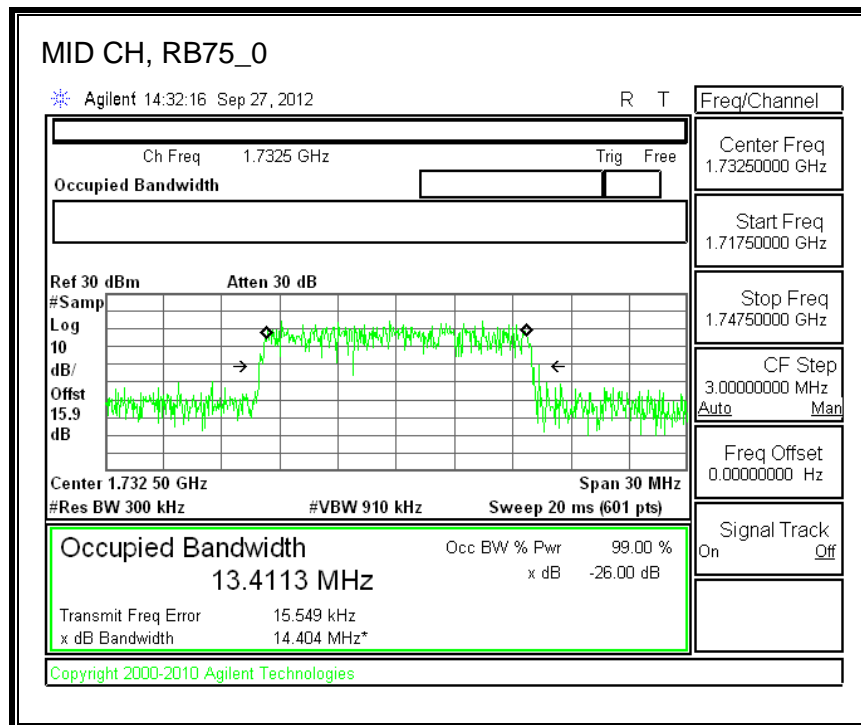
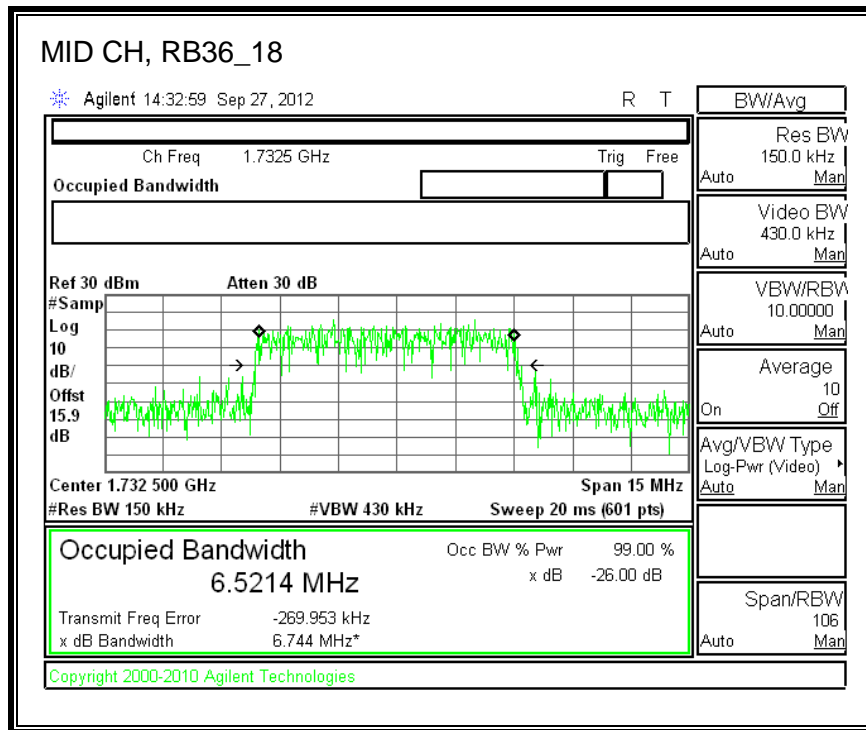


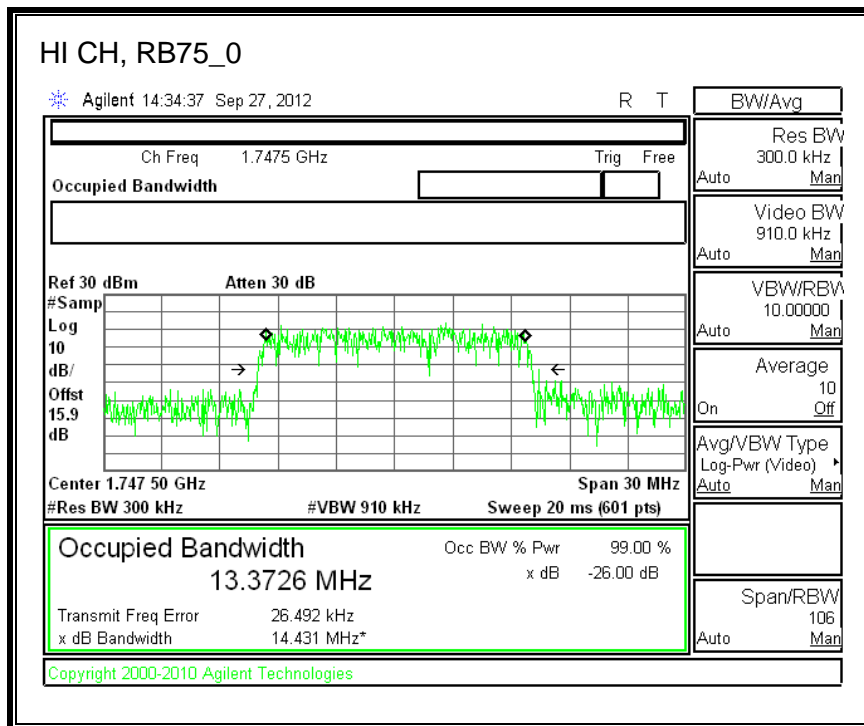
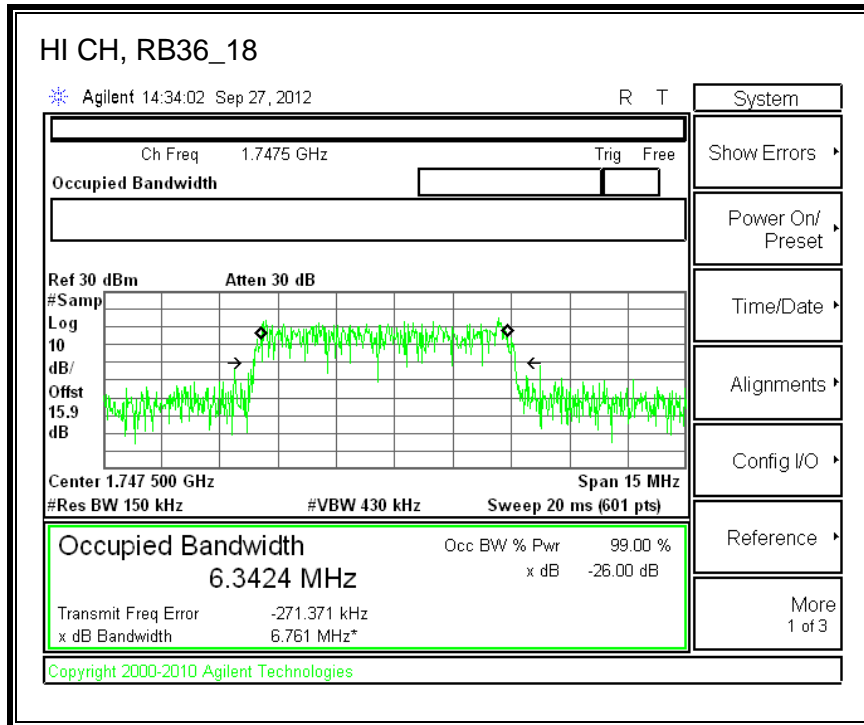


Band 4 (15 MHz BANDWIDTH)

QPSK

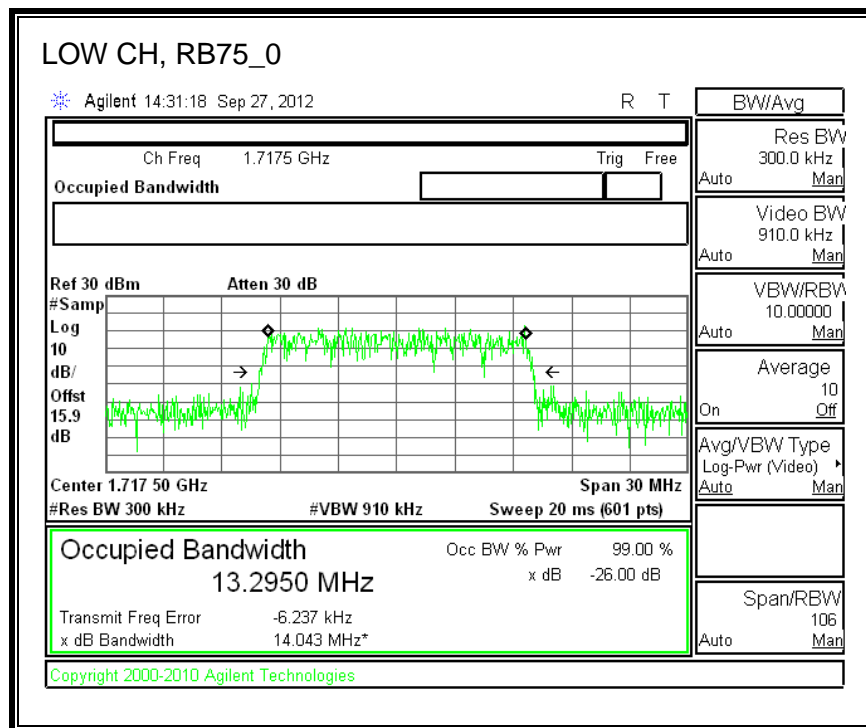
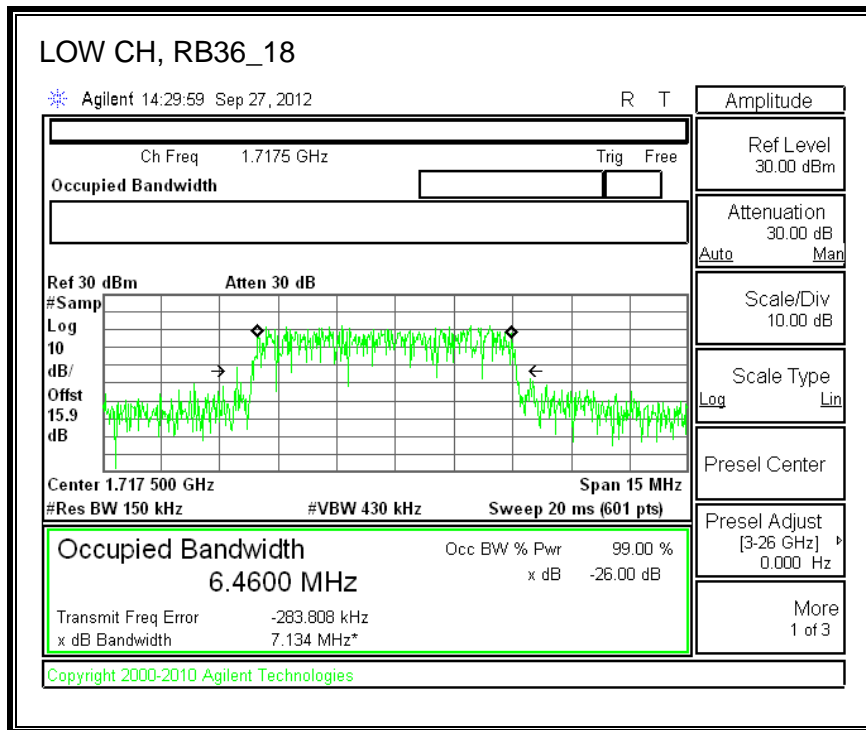


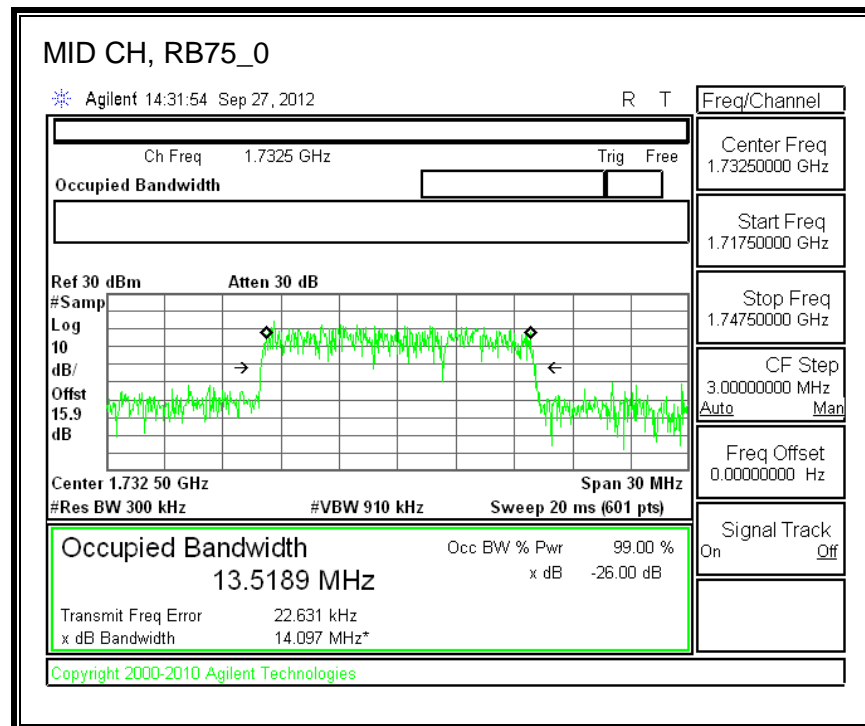
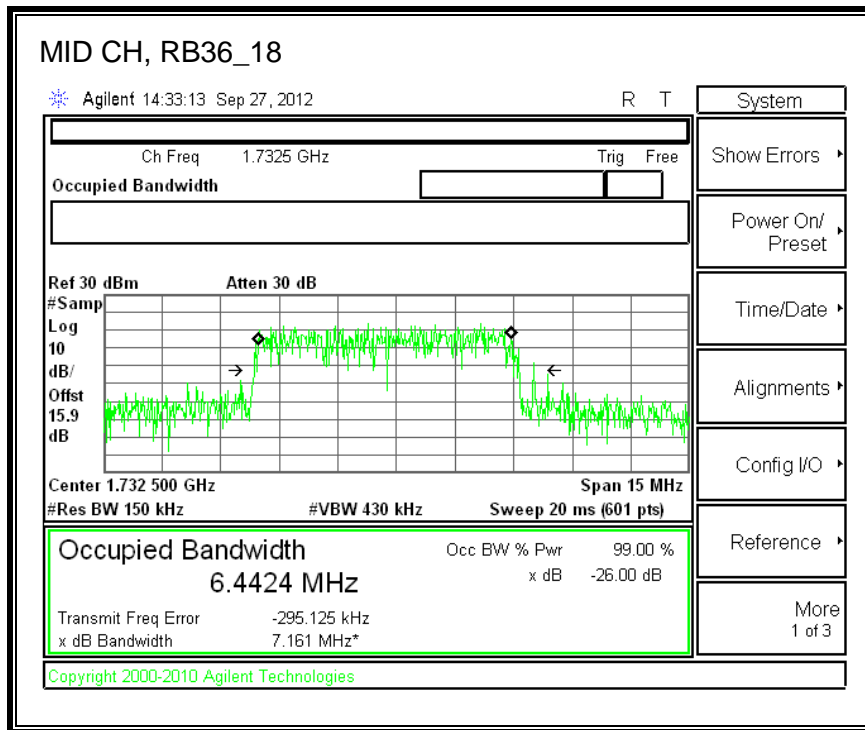


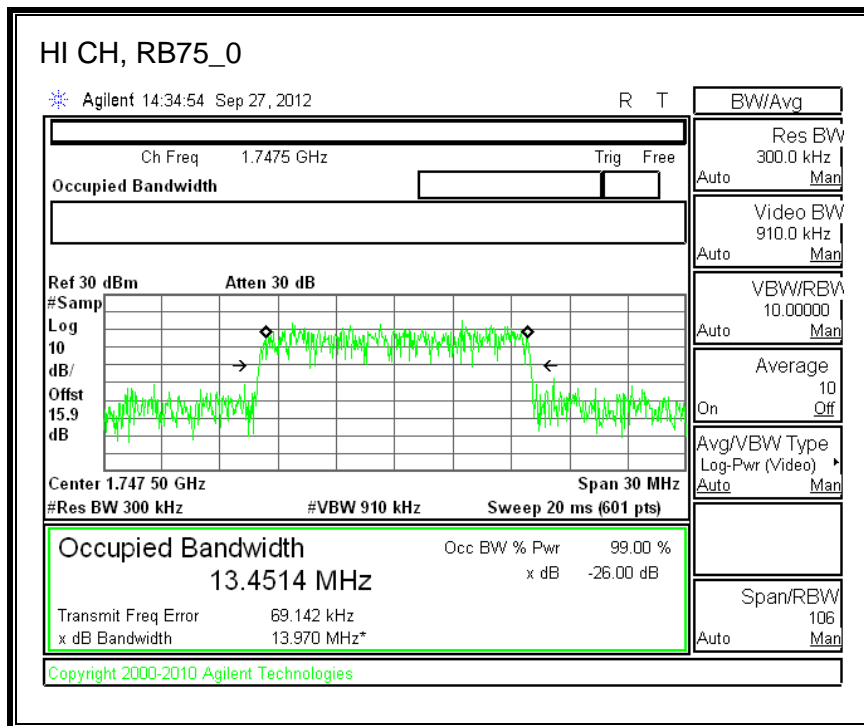
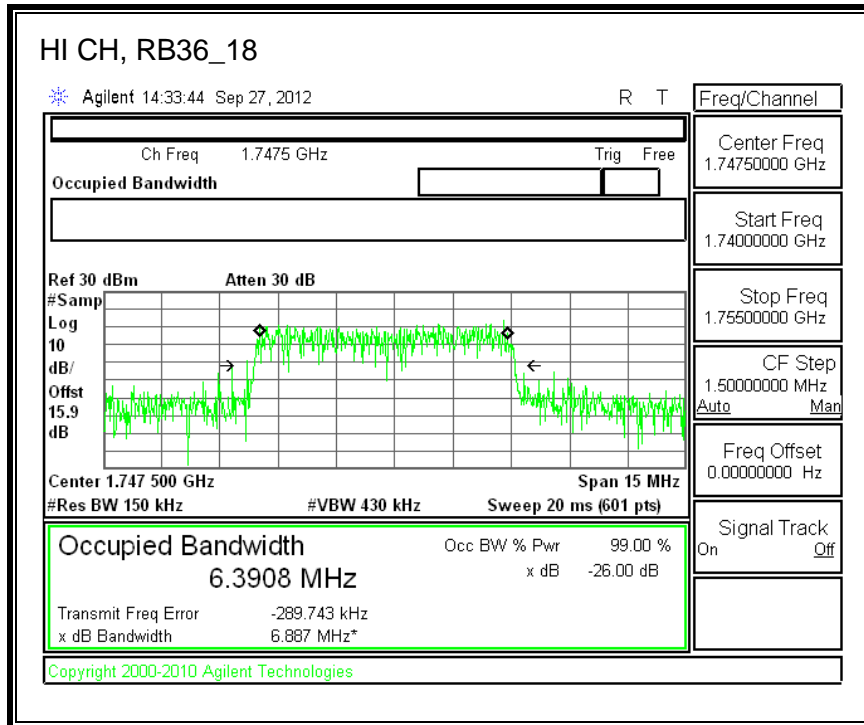


Band 4 (15 MHz BANDWIDTH)

16QAM

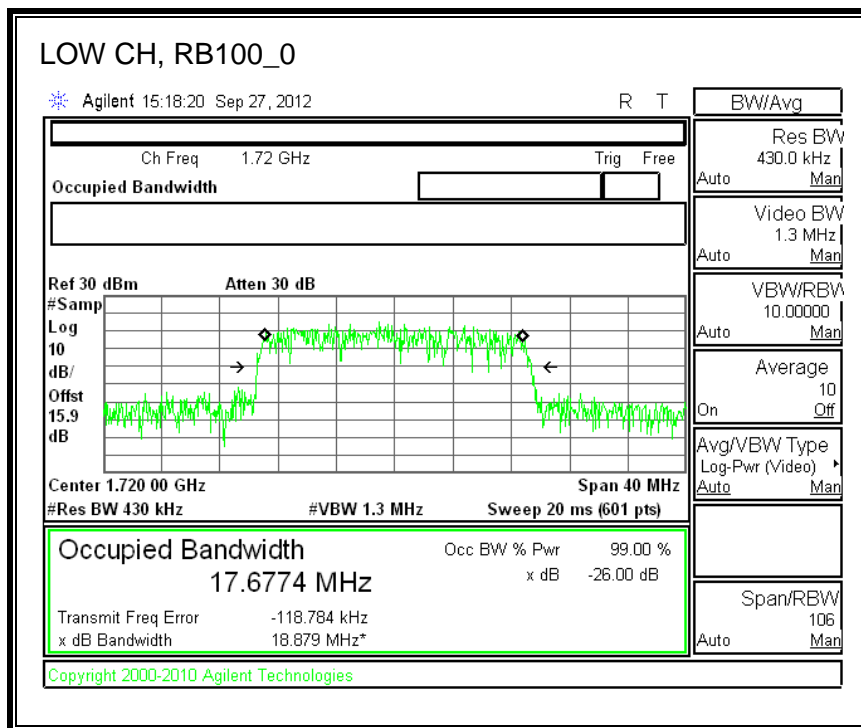
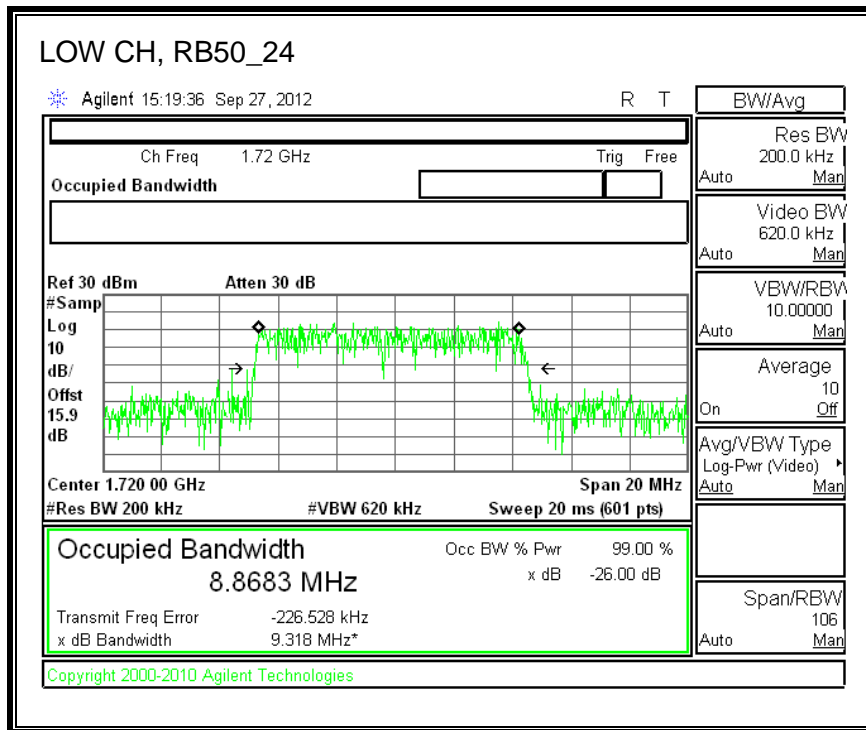


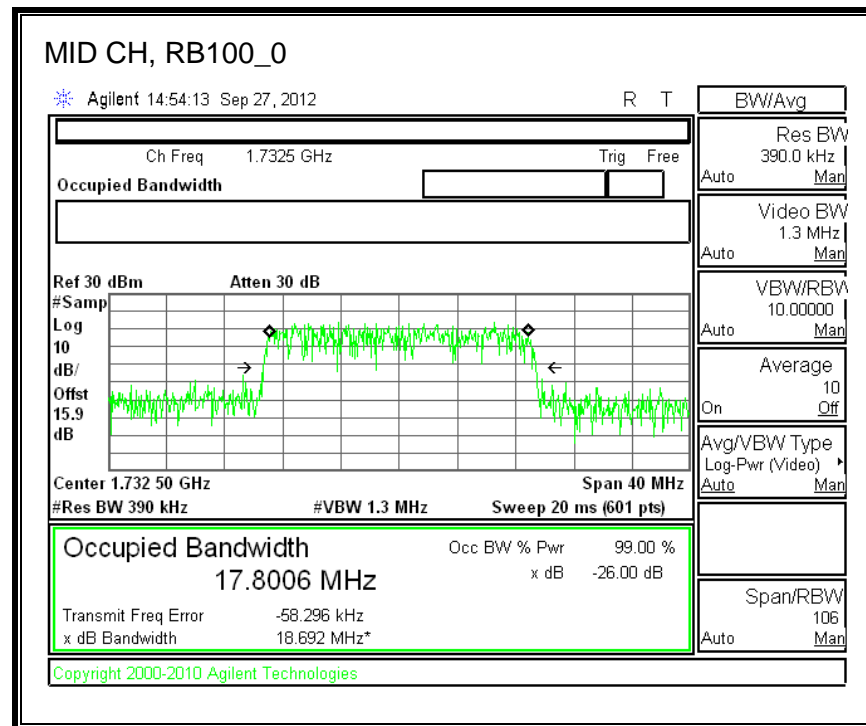
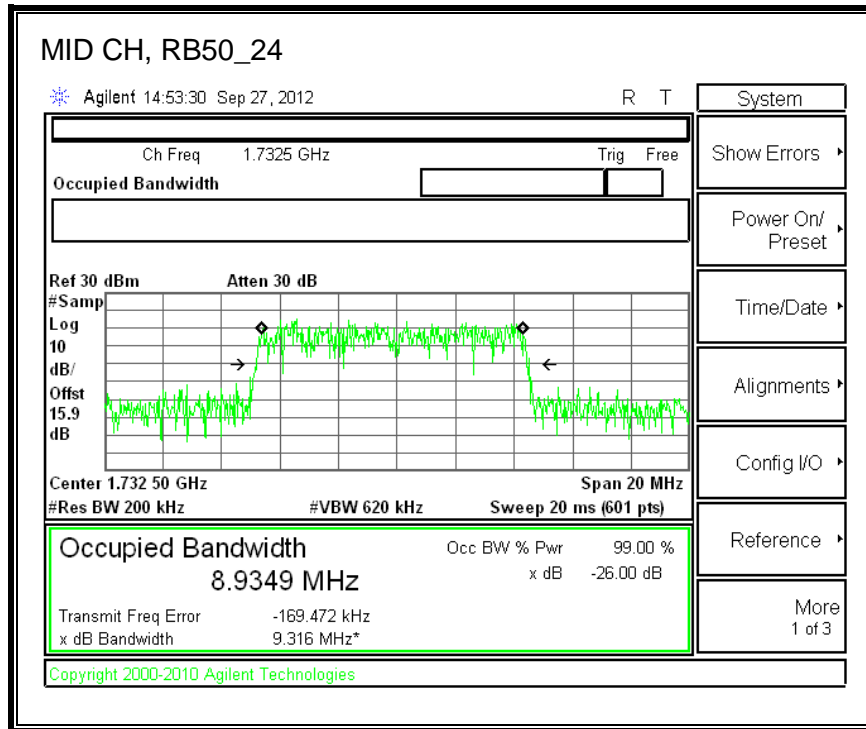


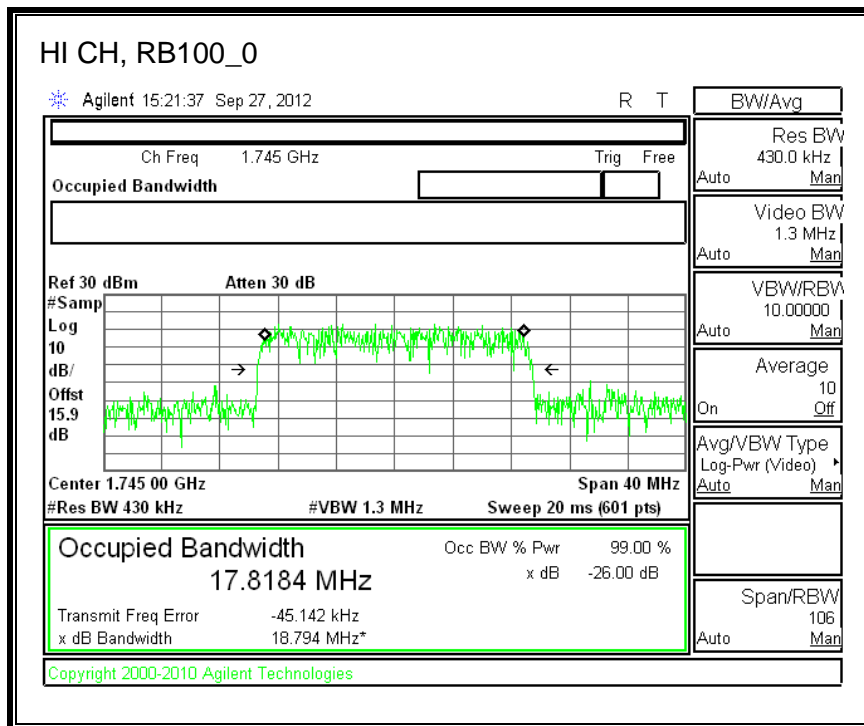
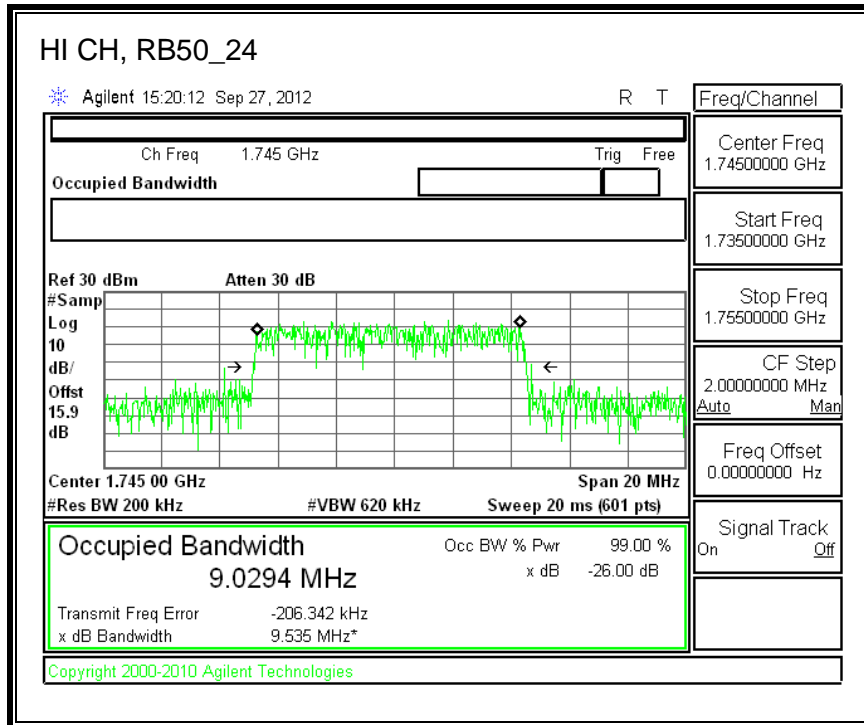


Band 4 (20 MHz BANDWIDTH)

QPSK

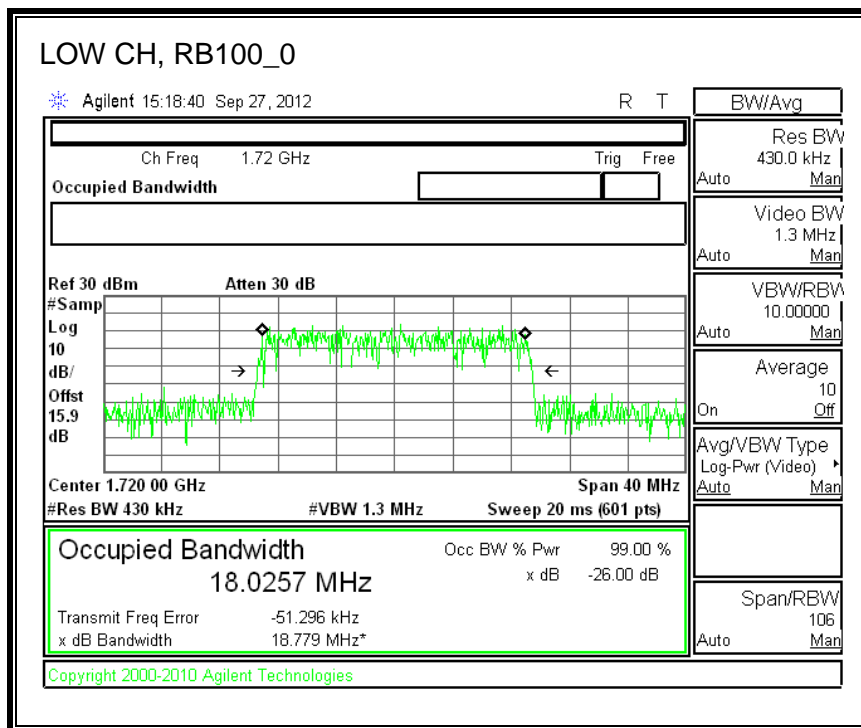
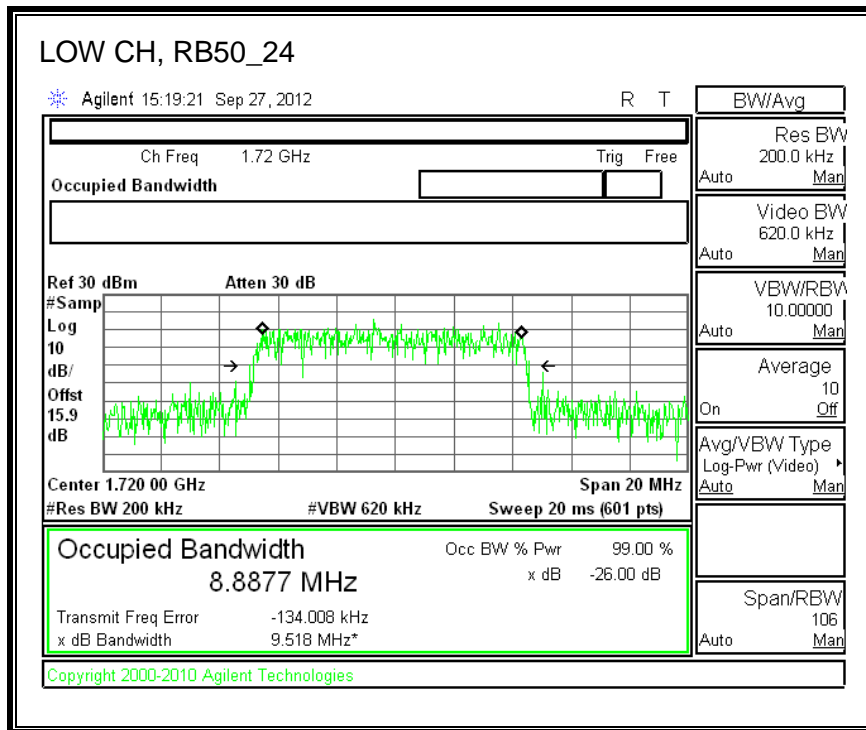


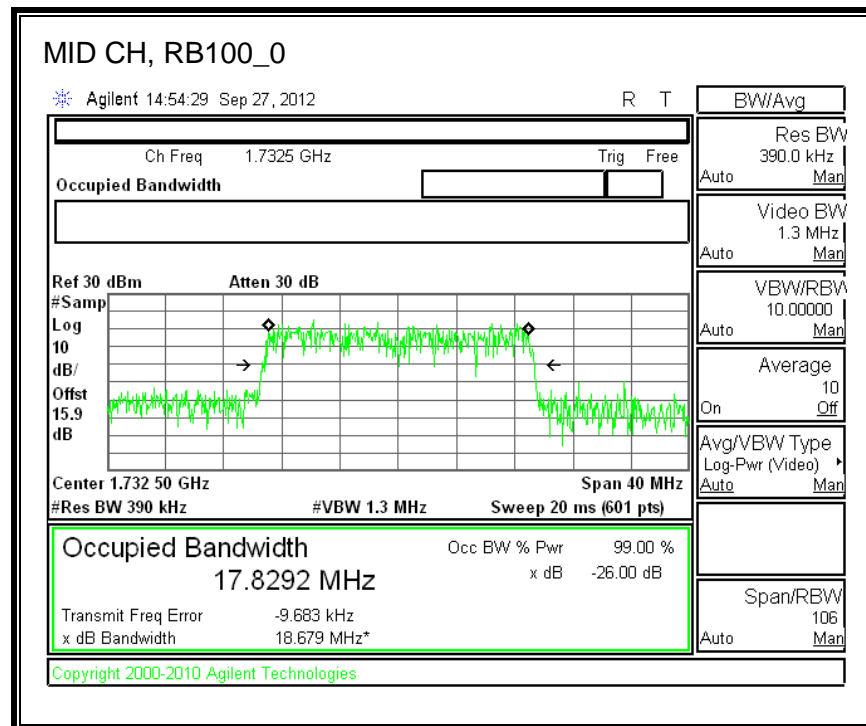
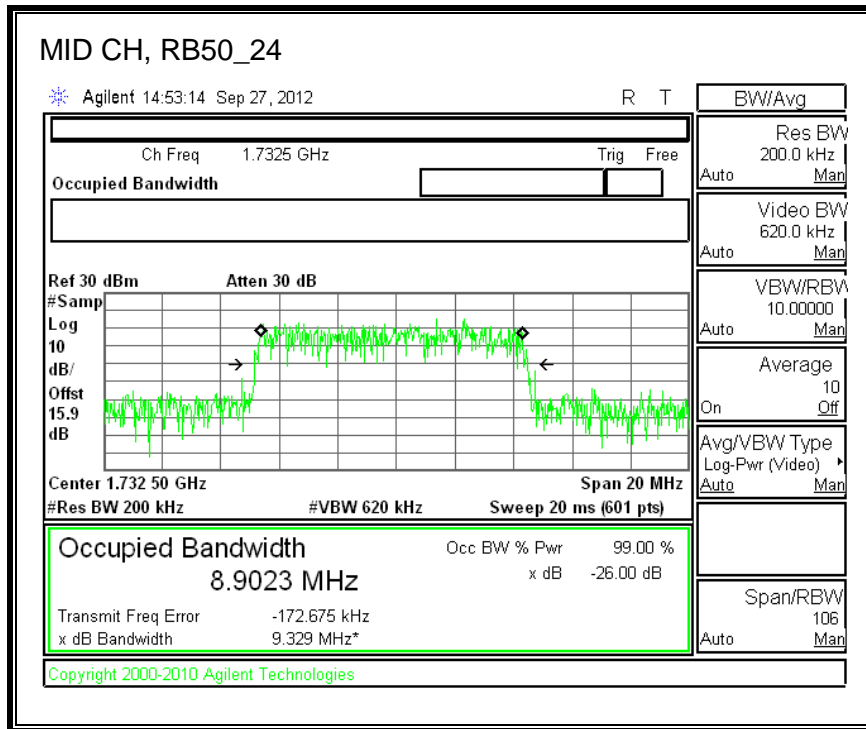


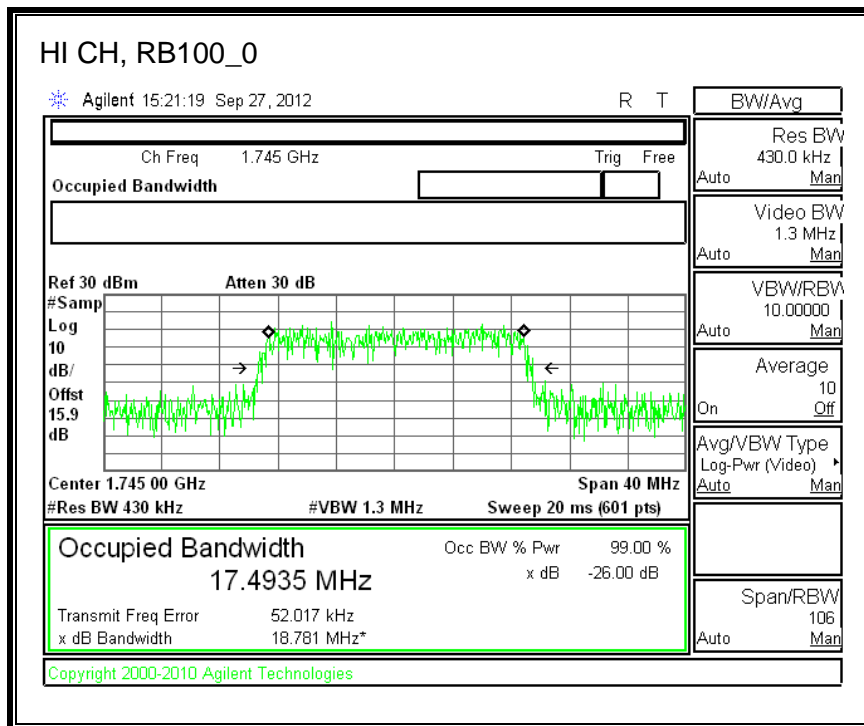
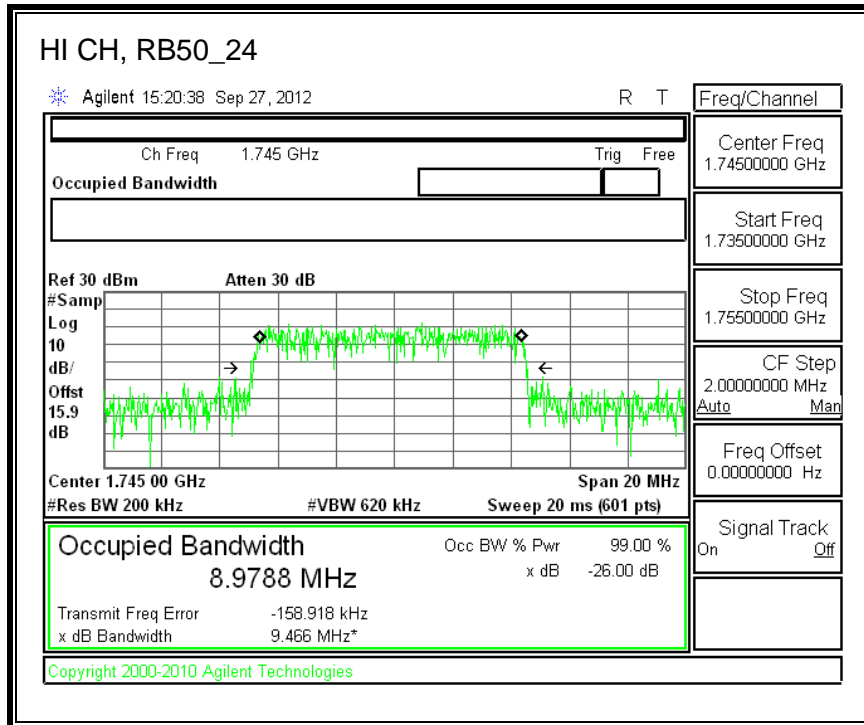


Band 4 (20 MHz BANDWIDTH)

16QAM

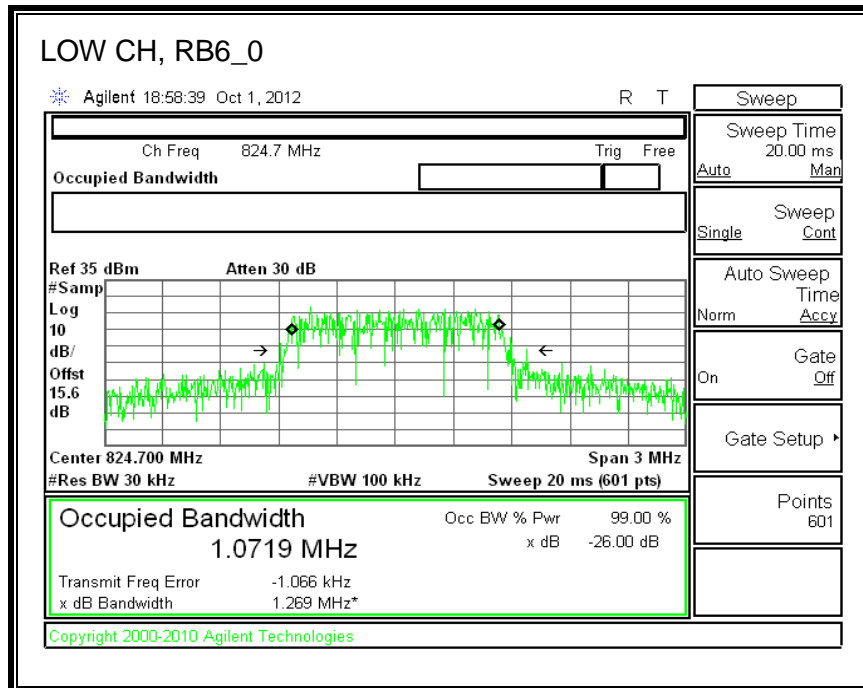
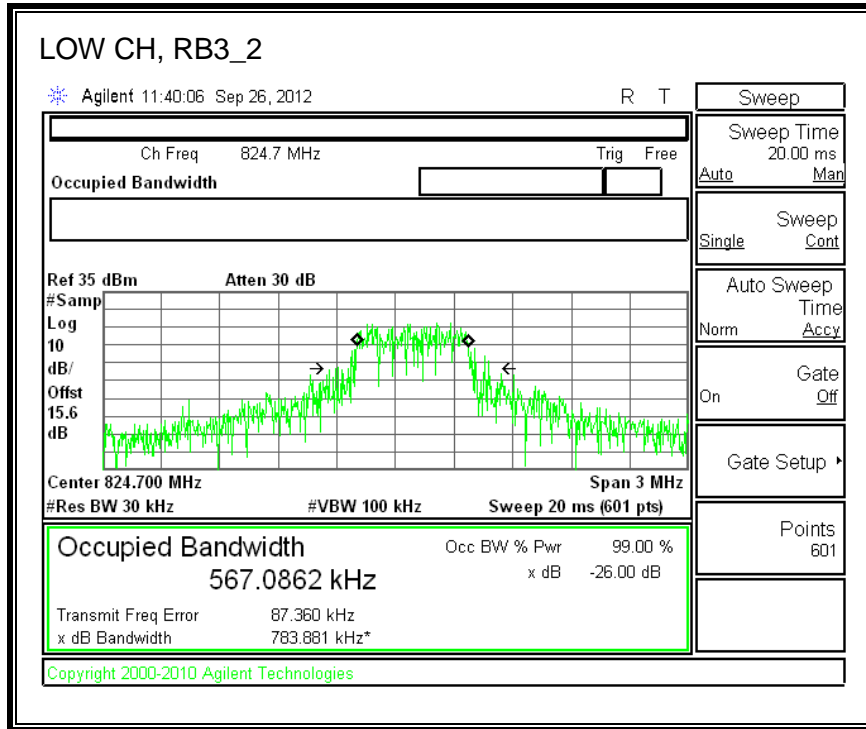


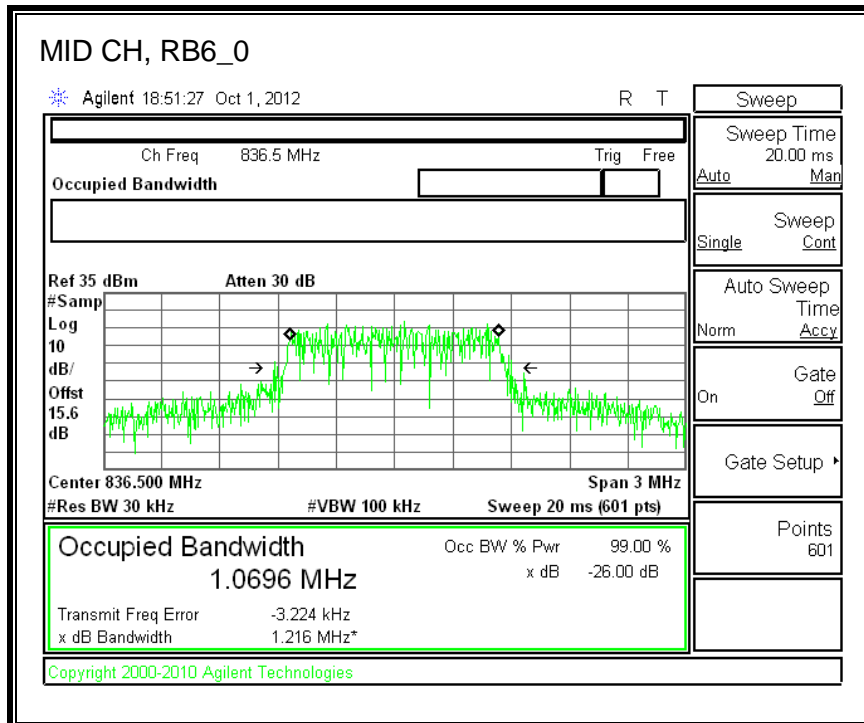
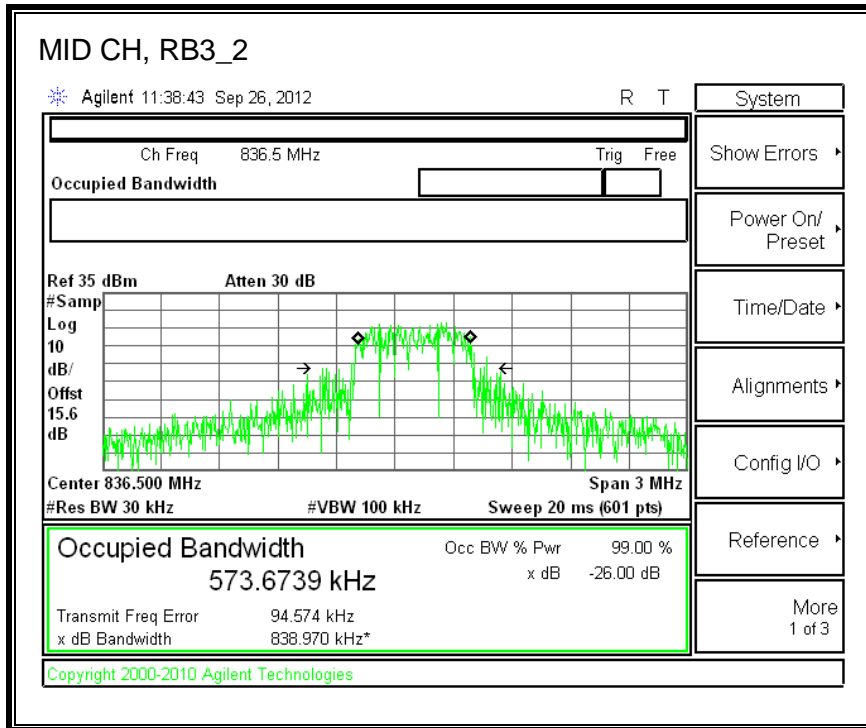


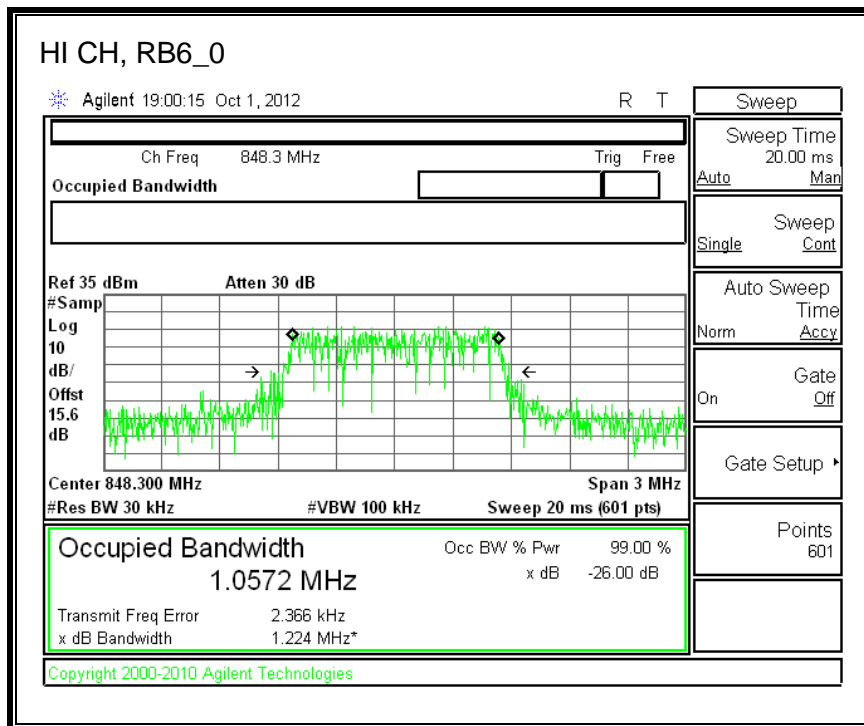
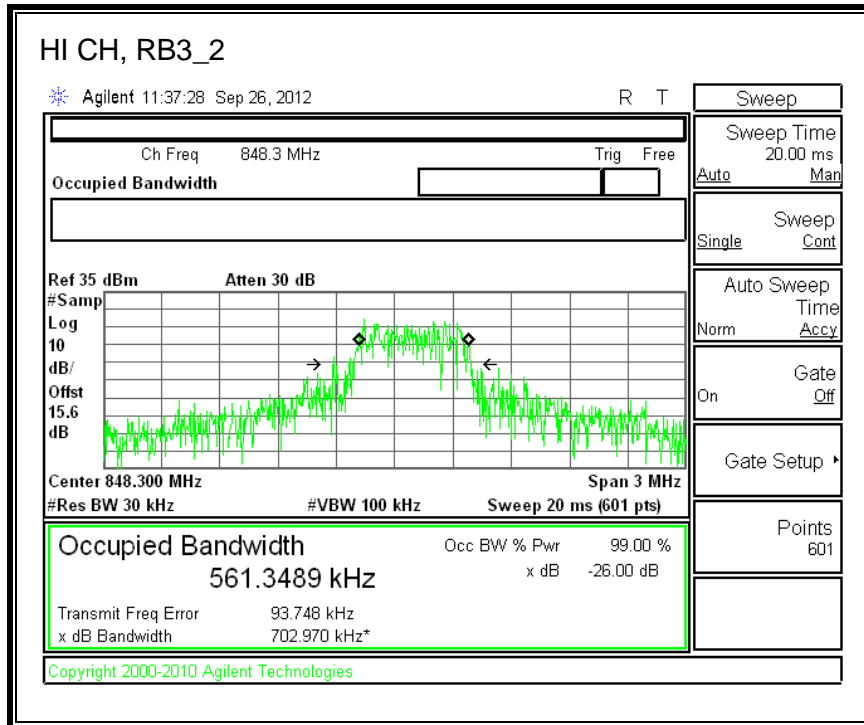


8.1.5. LTE Band 5

QPSK(1.4 MHz BANDWIDTH)

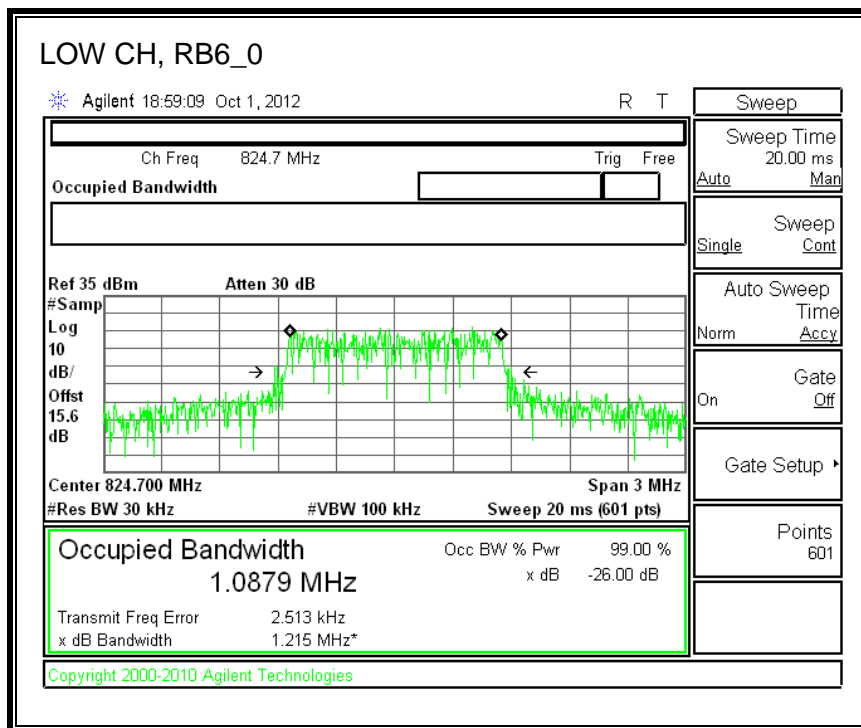
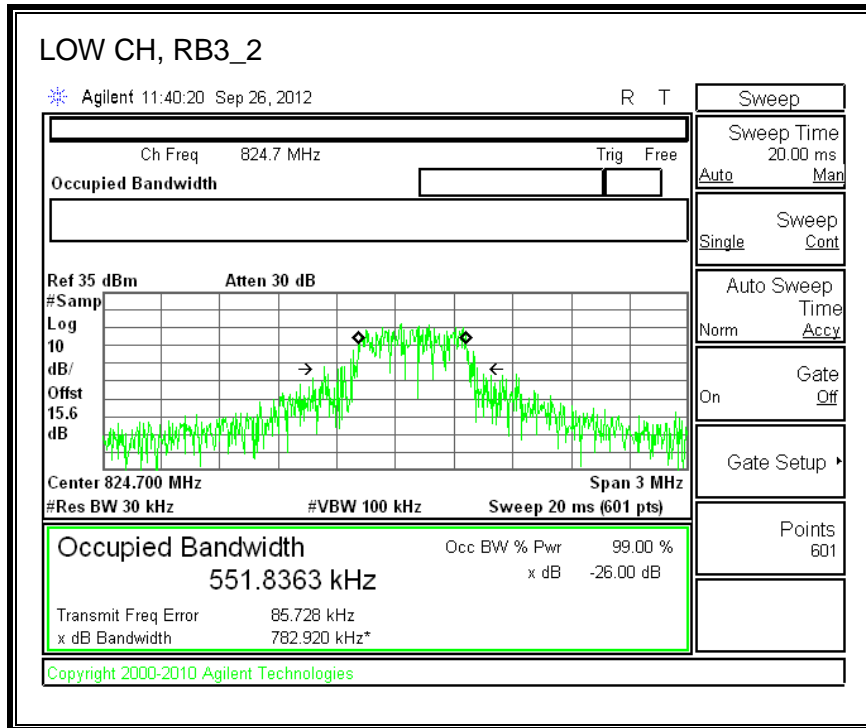


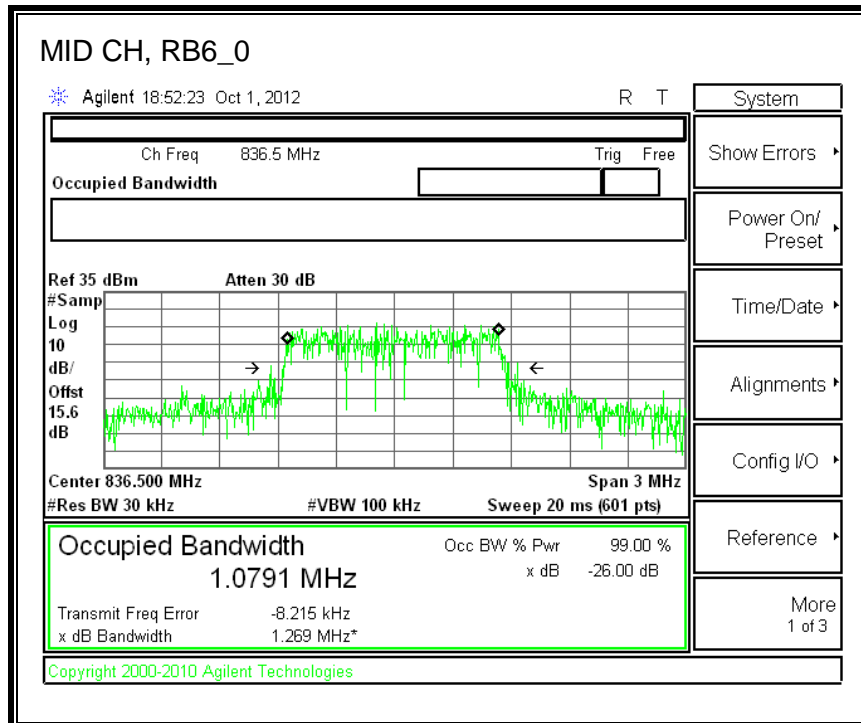
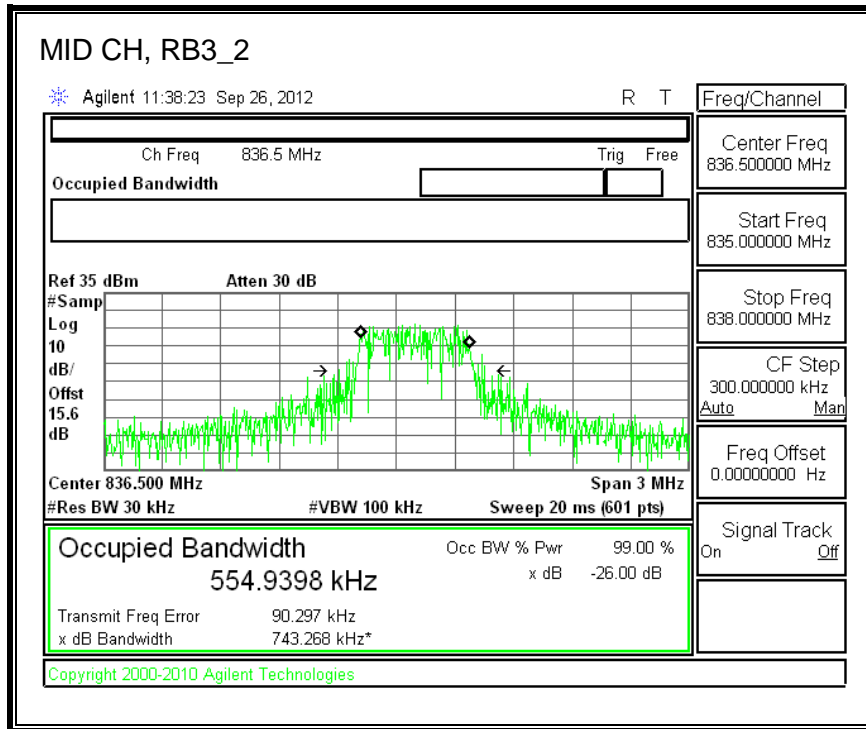


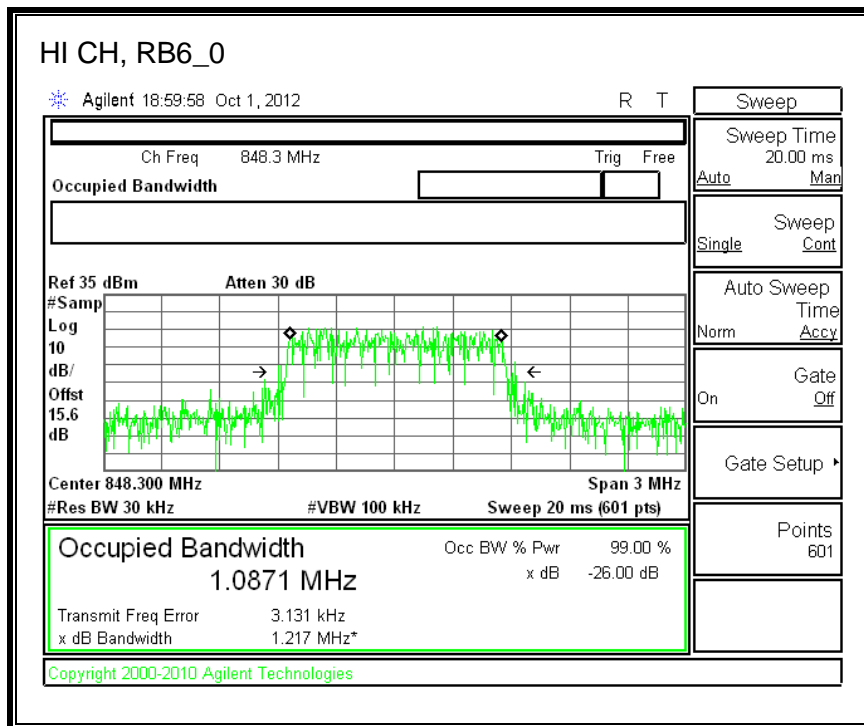
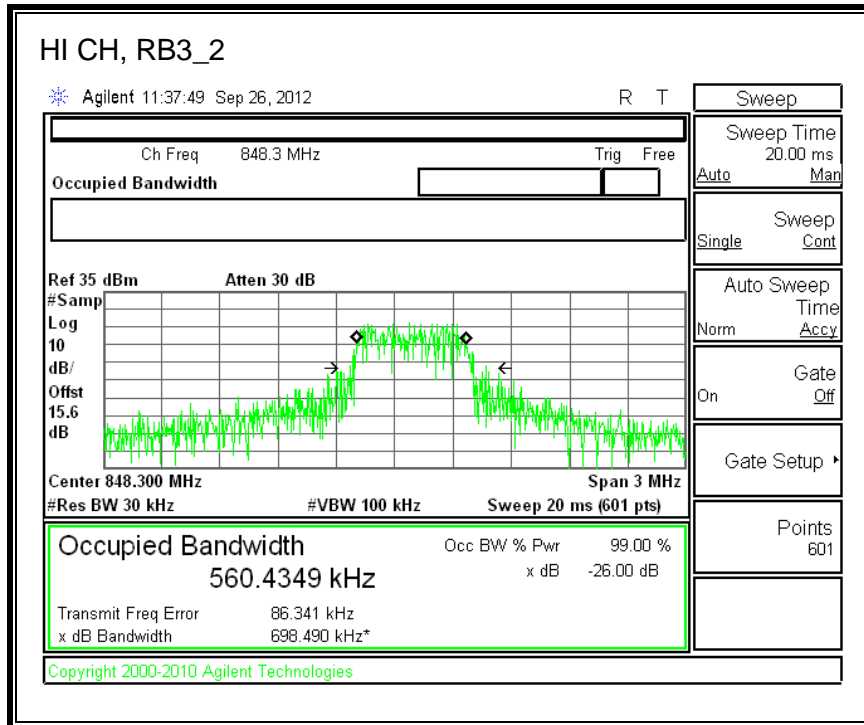


Band 5 (1.4 MHz BANDWIDTH)

16QAM

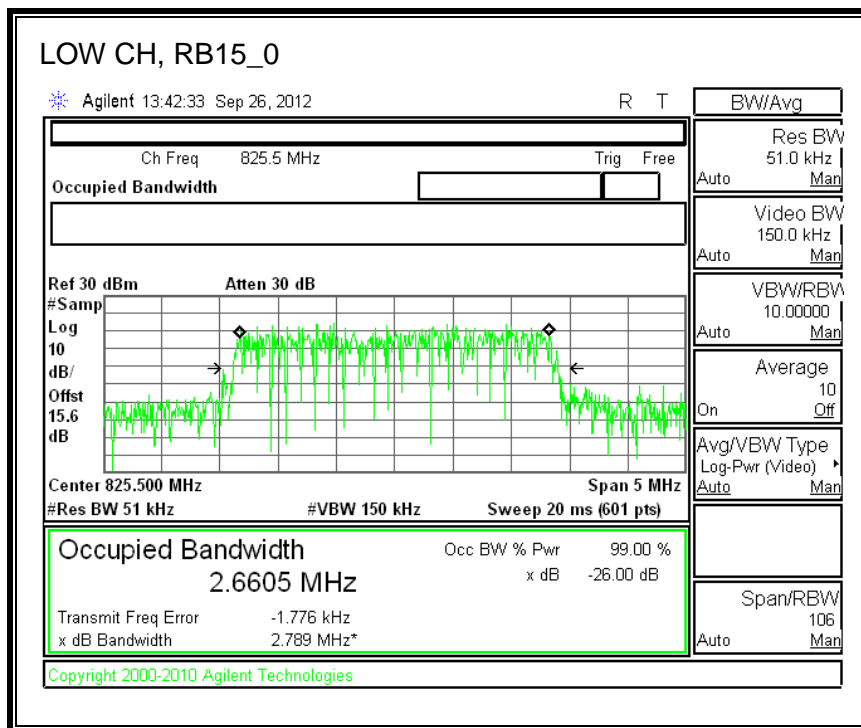
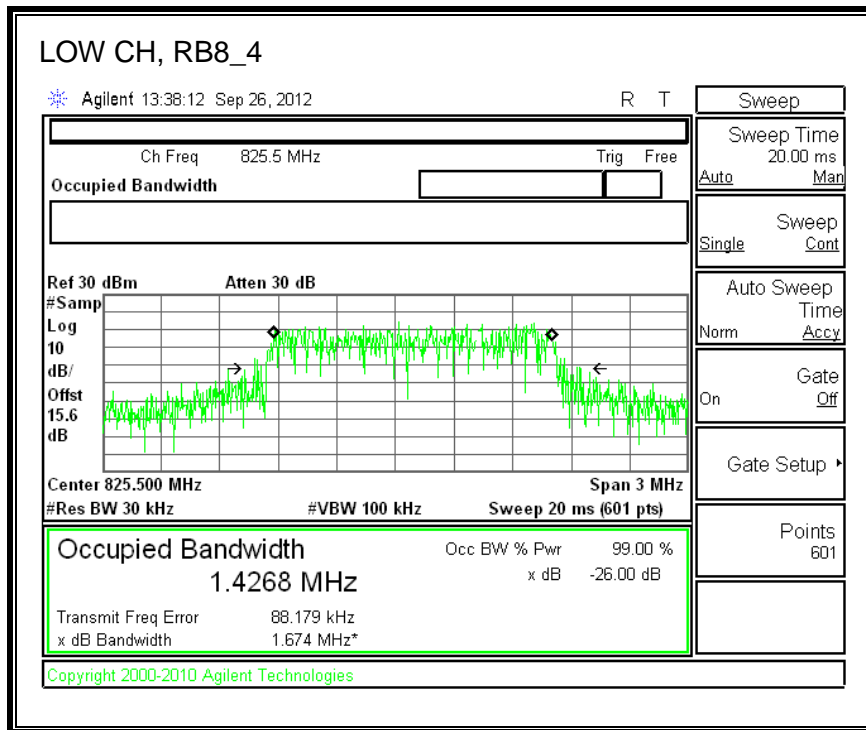


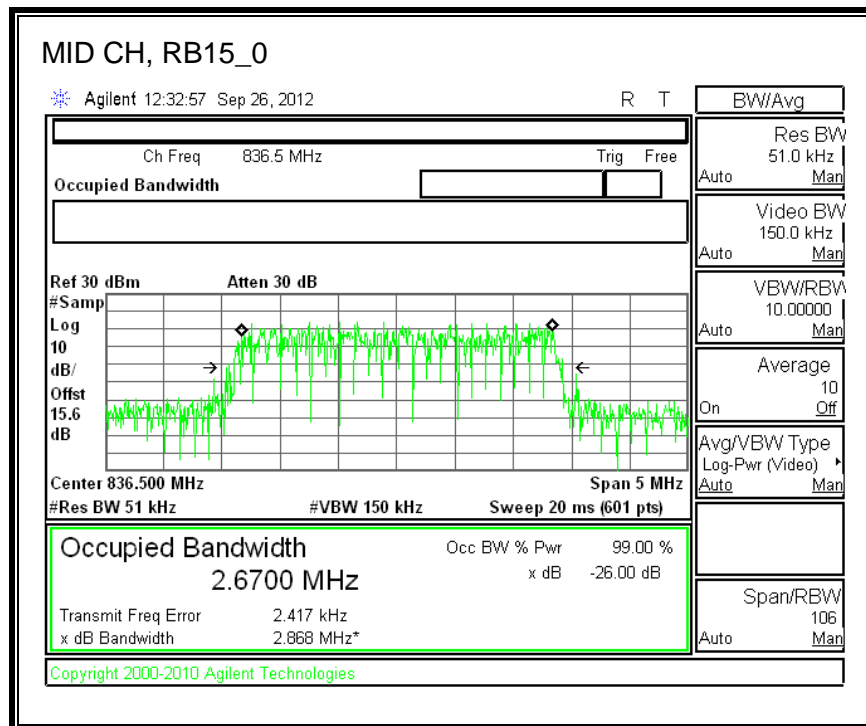
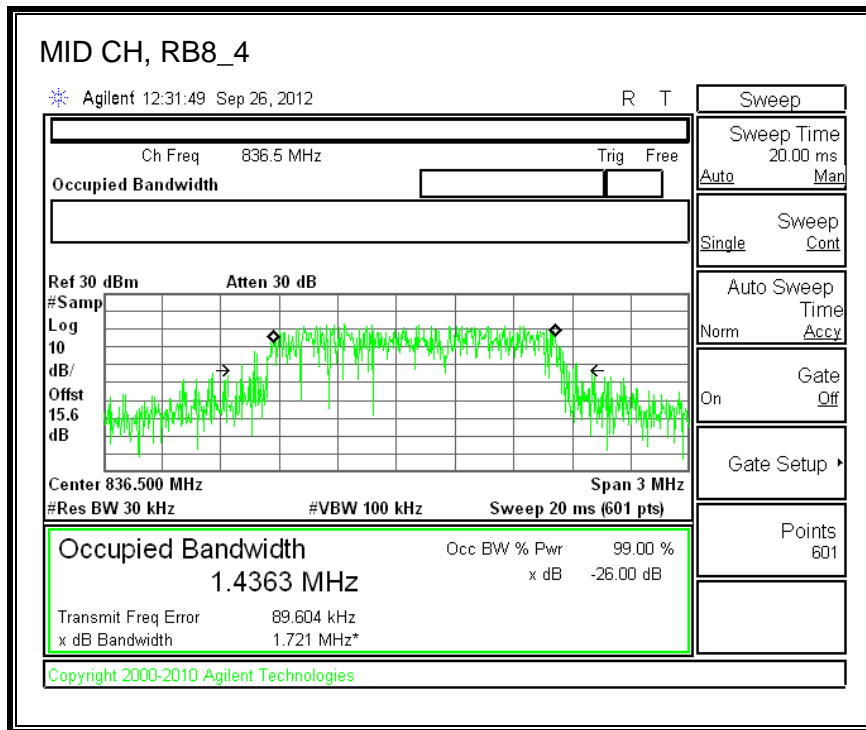


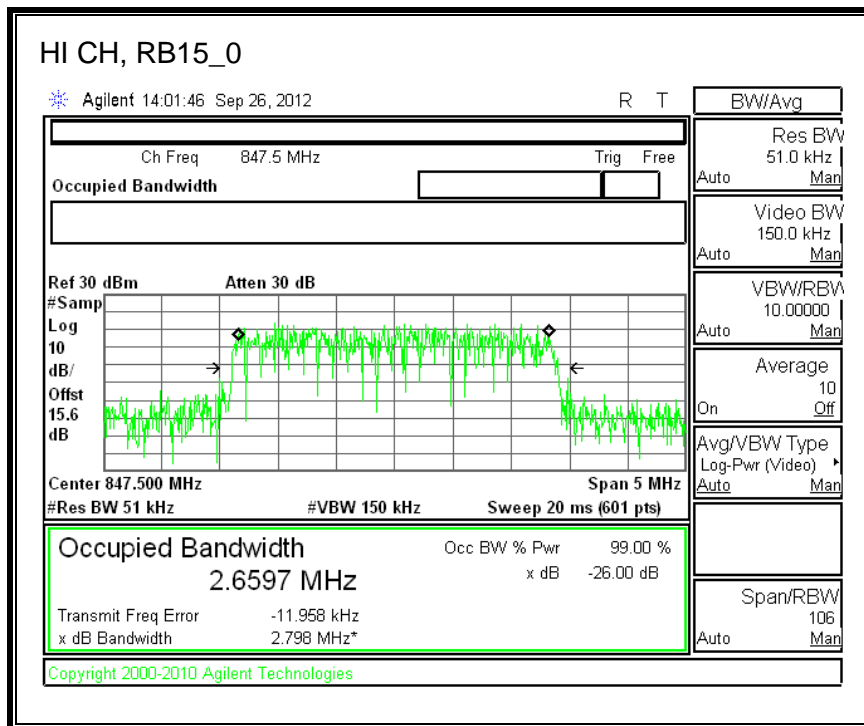
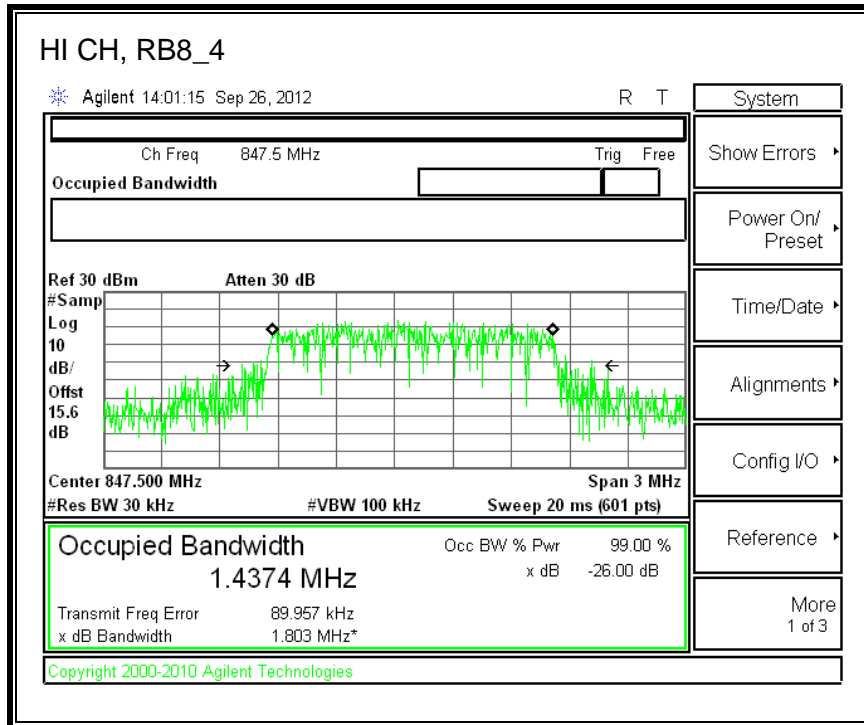


Band 5 (3 MHz BANDWIDTH)

QPSK

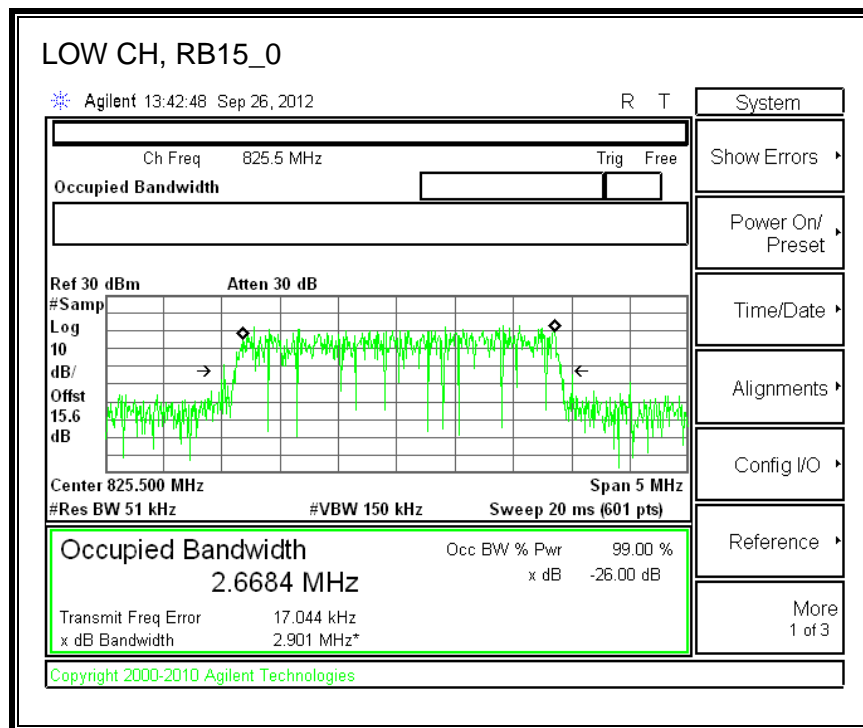
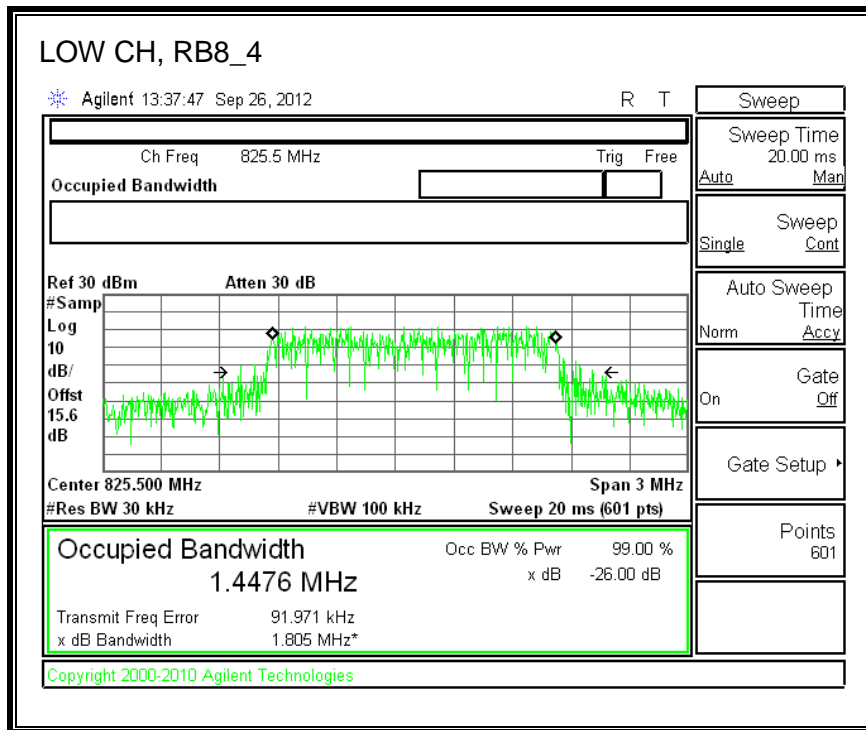


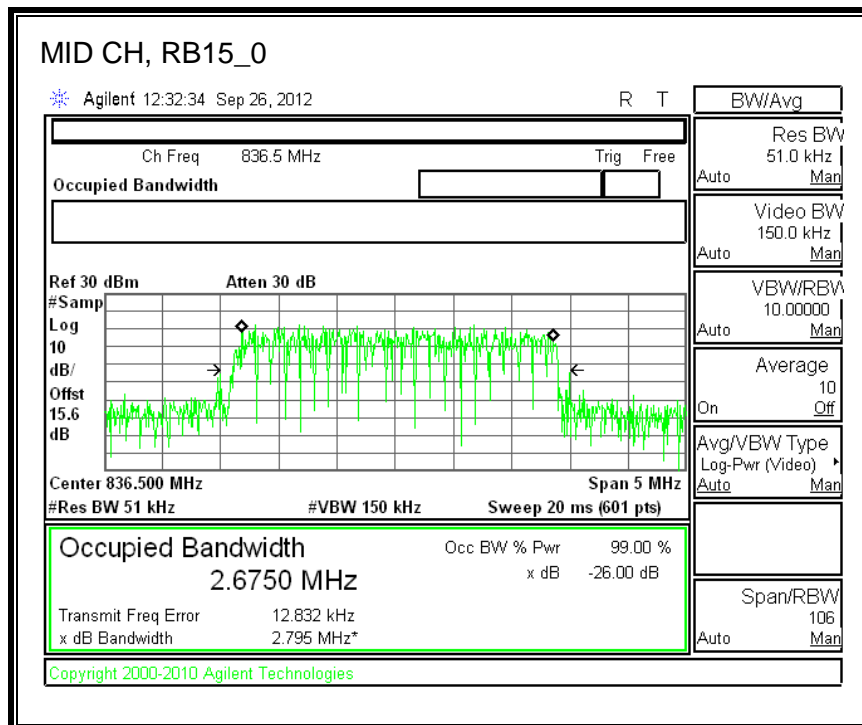
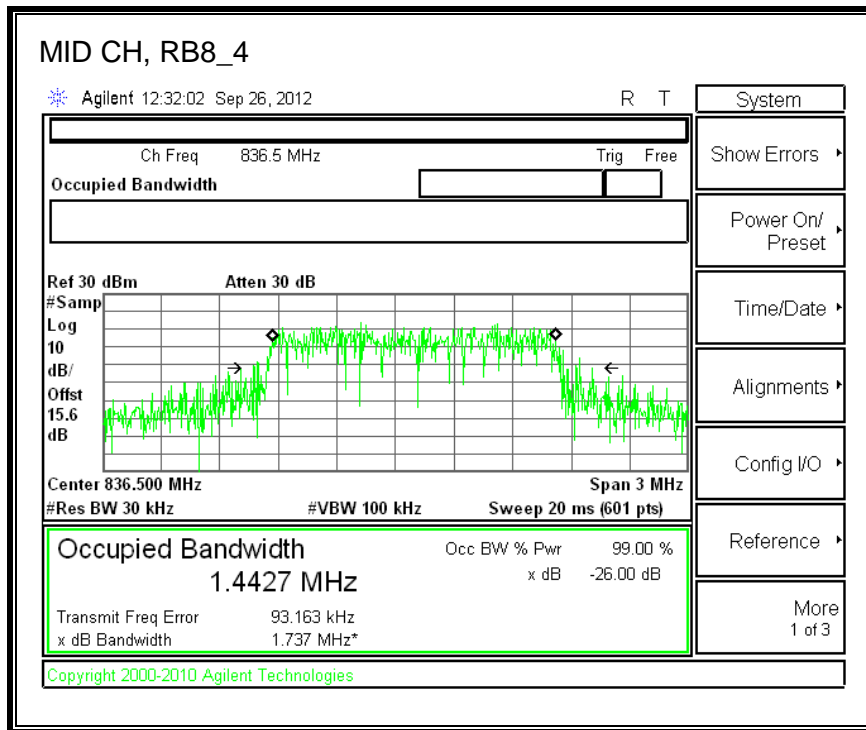


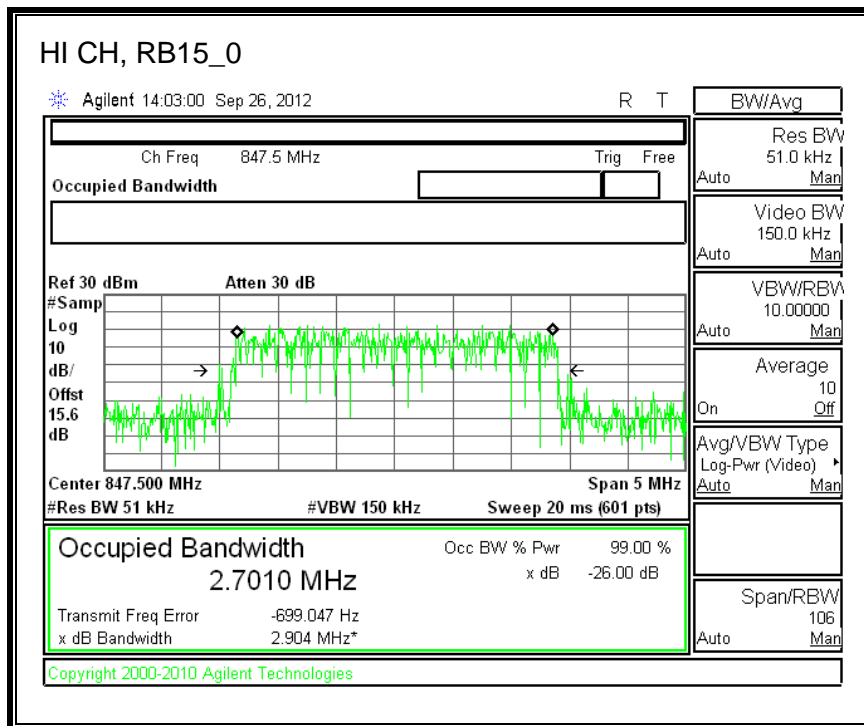
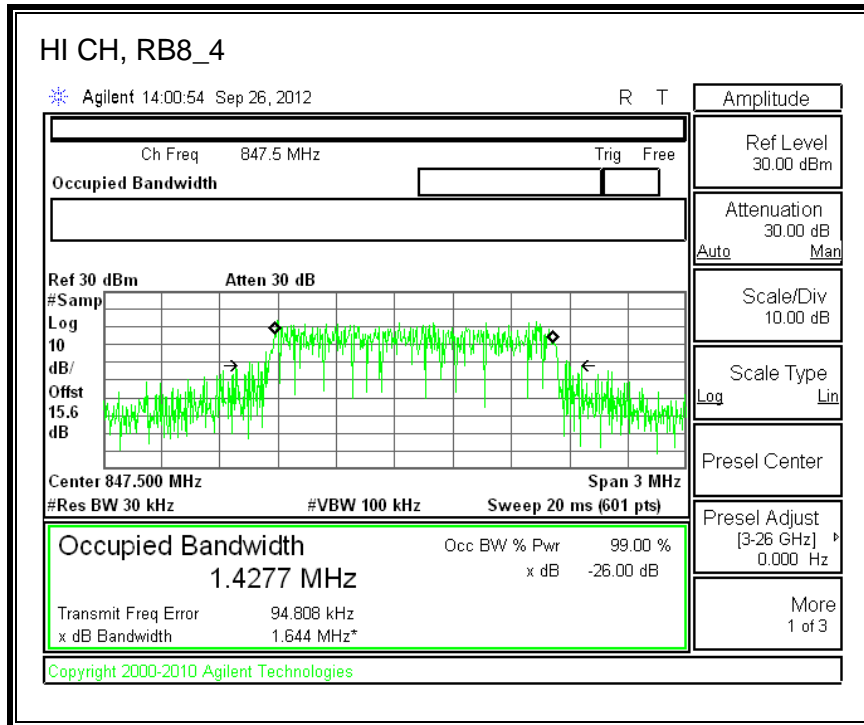


Band 5 (3 MHz BANDWIDTH)

16QAM

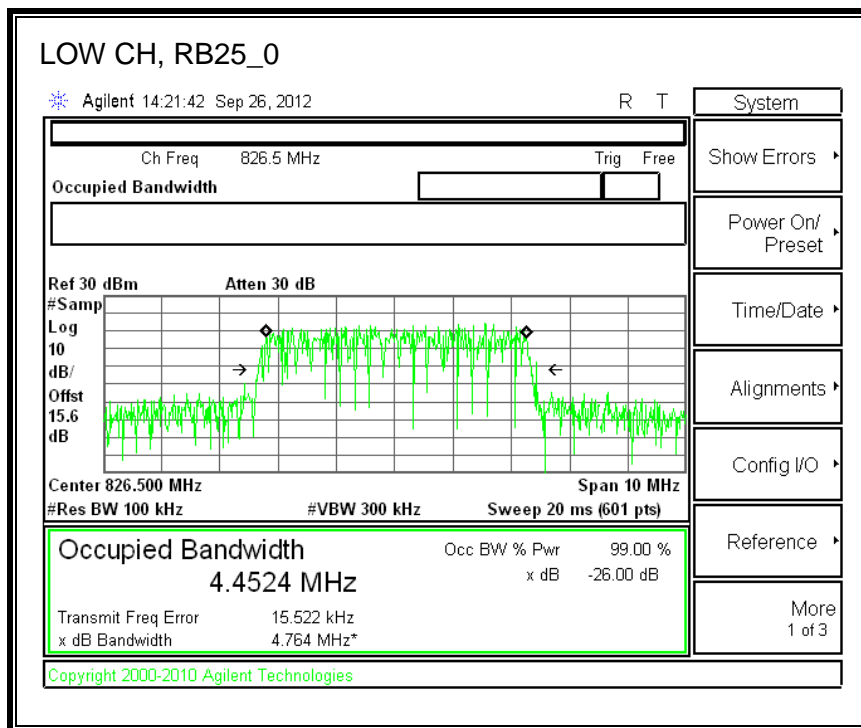
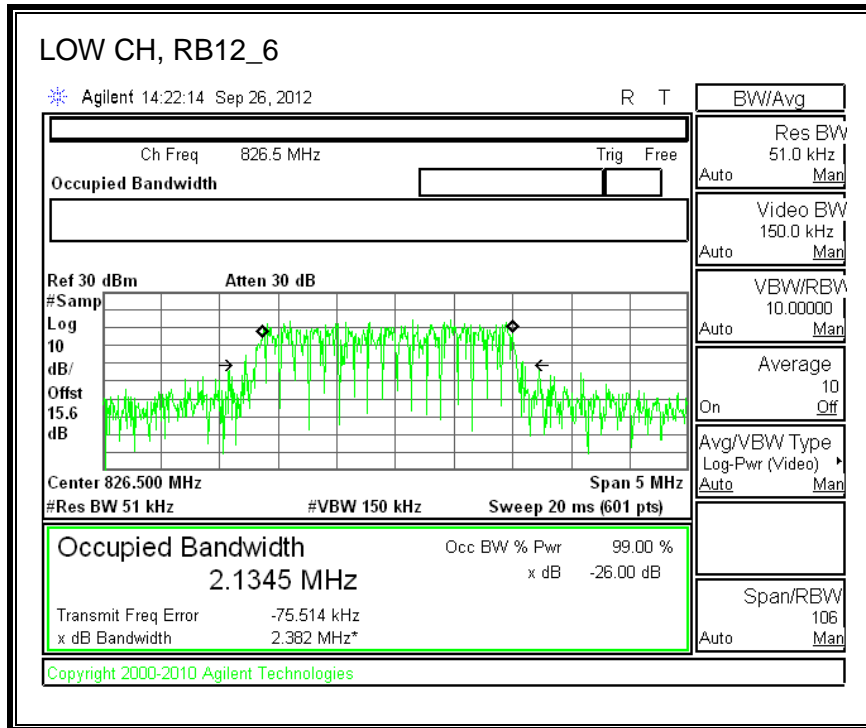


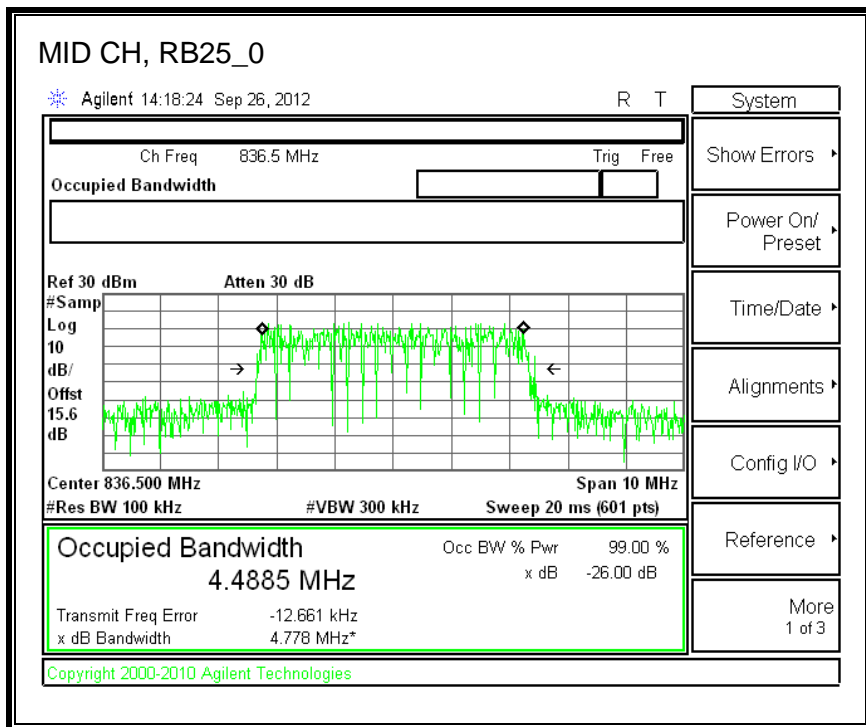
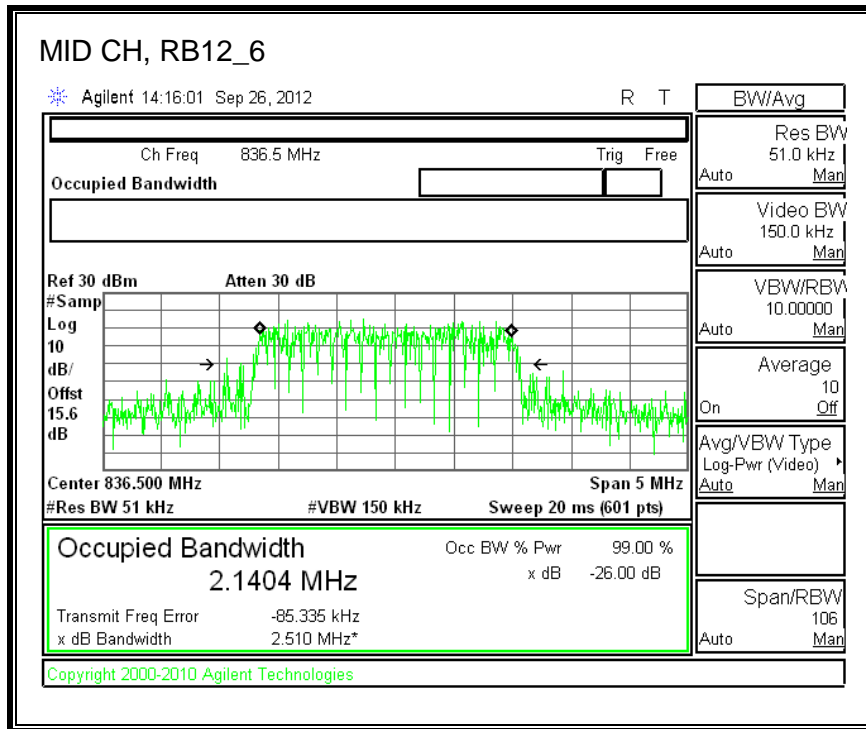


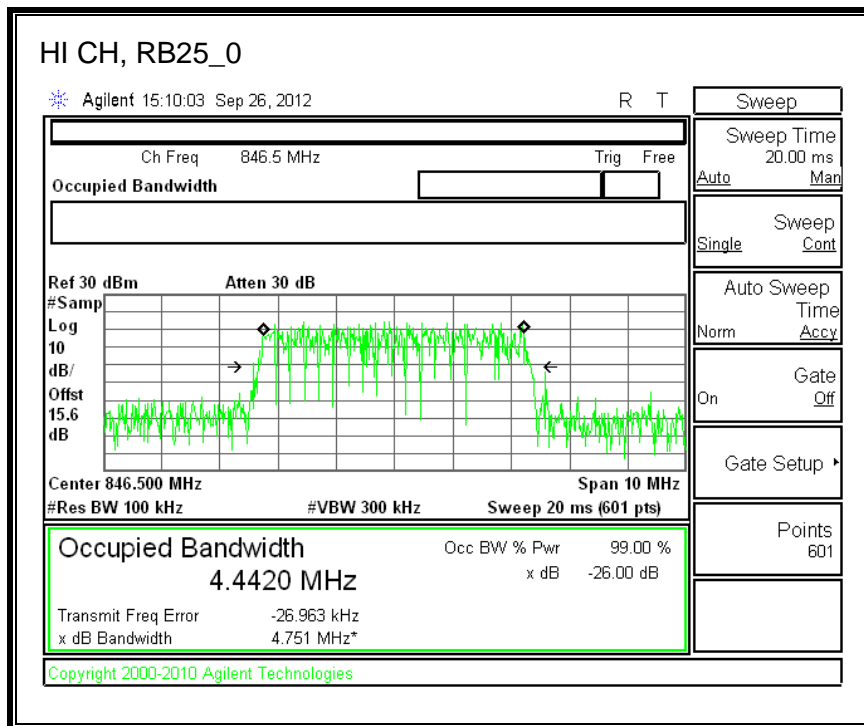
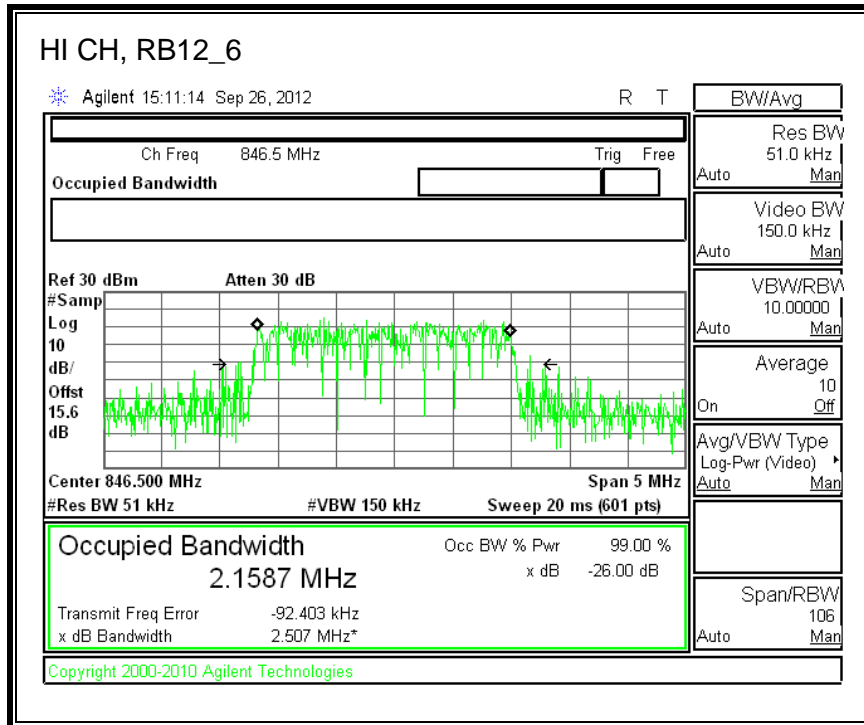


Band 5 (5 MHz BANDWIDTH)

QPSK

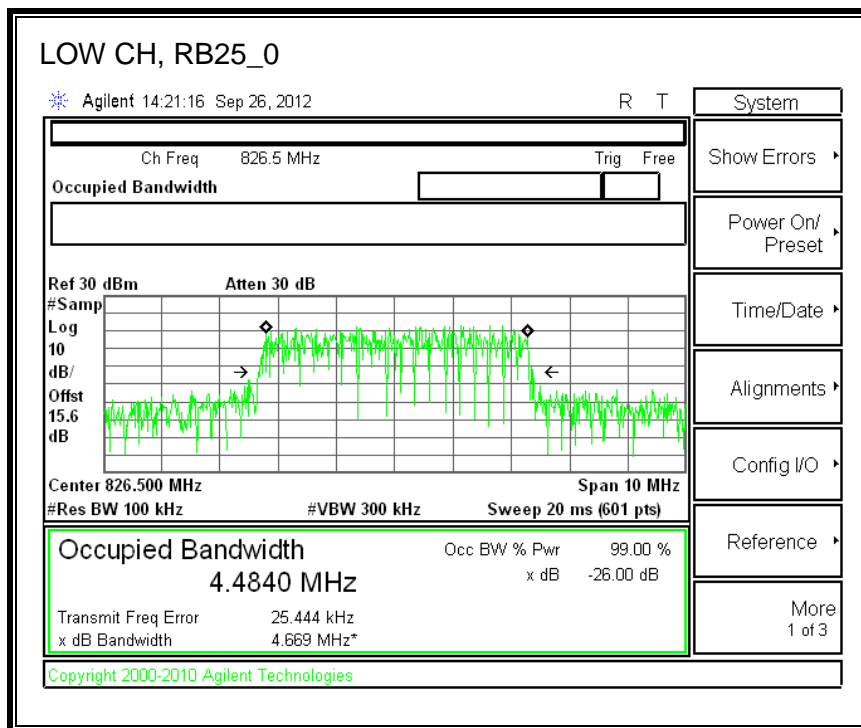
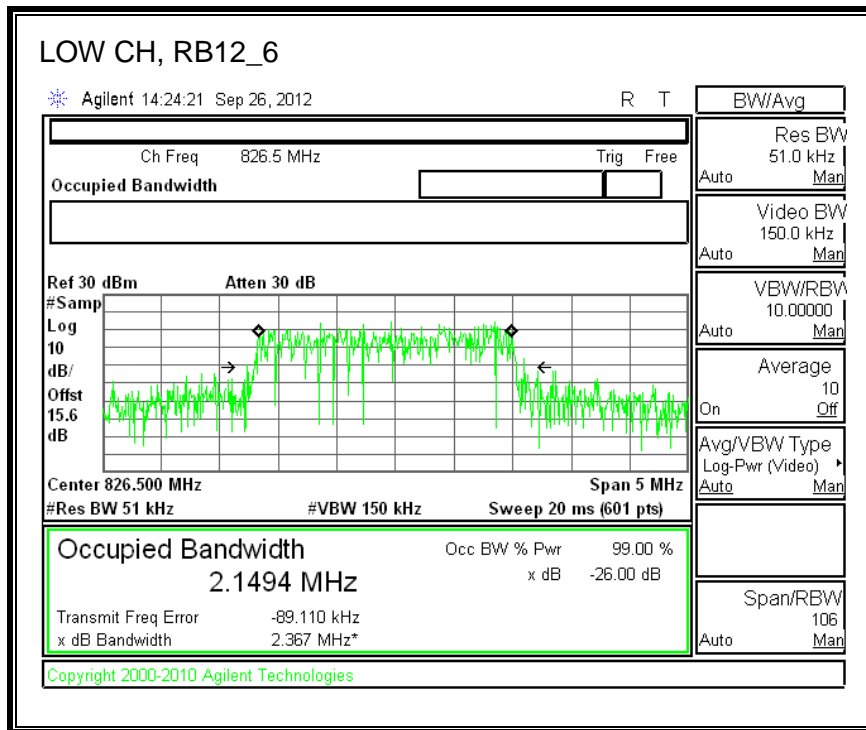


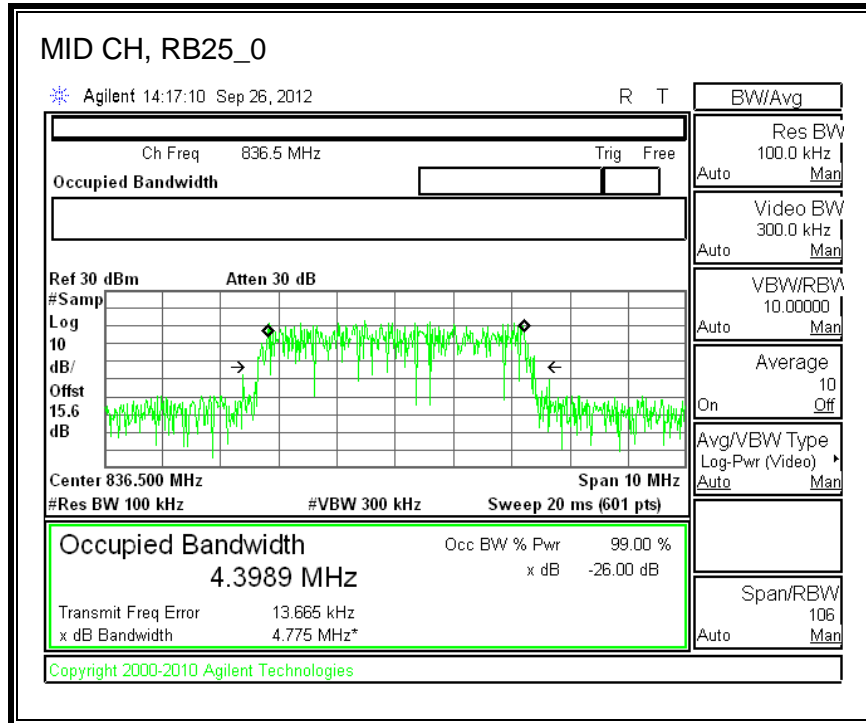
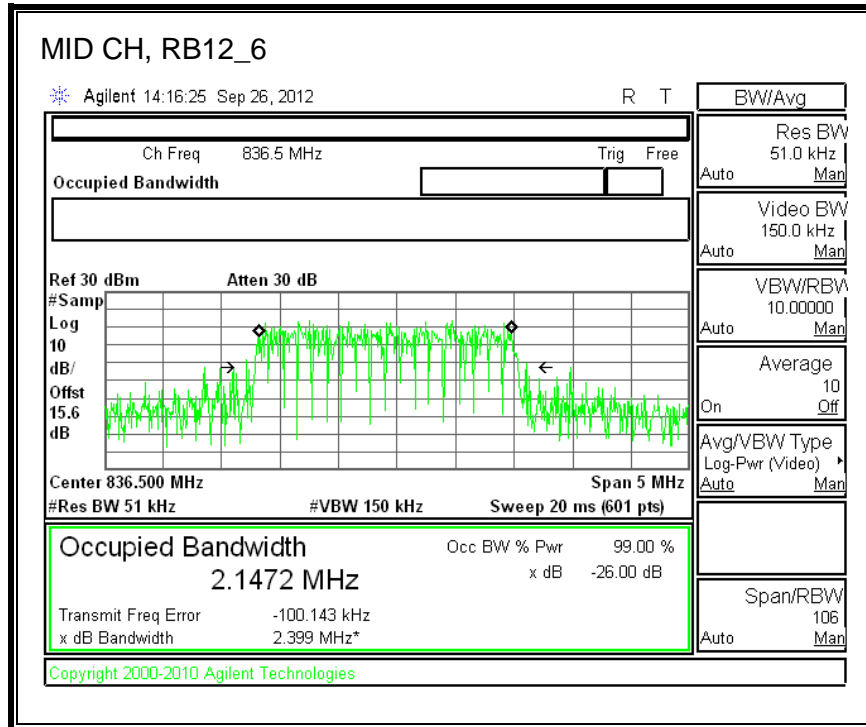


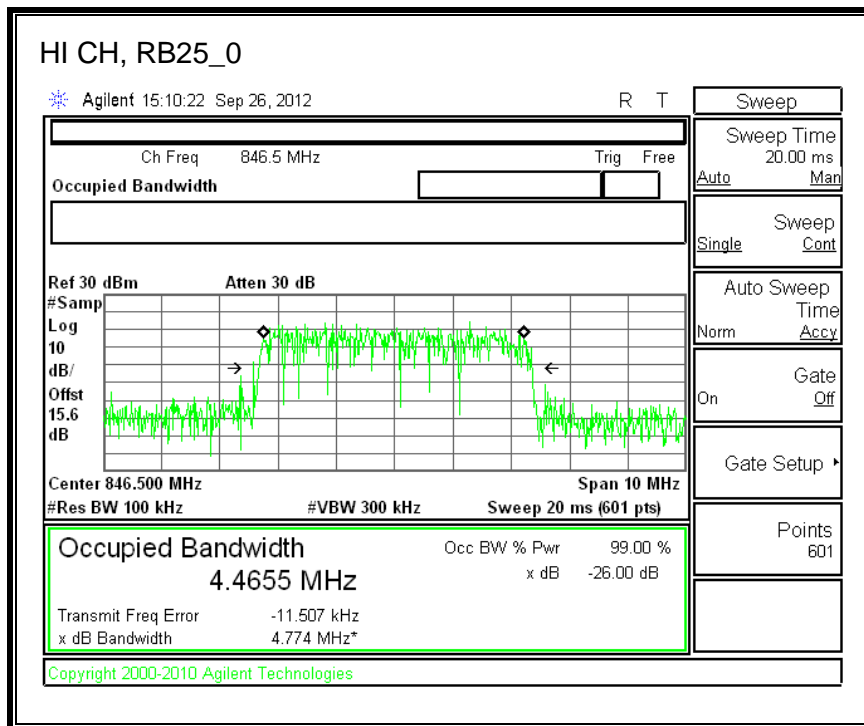
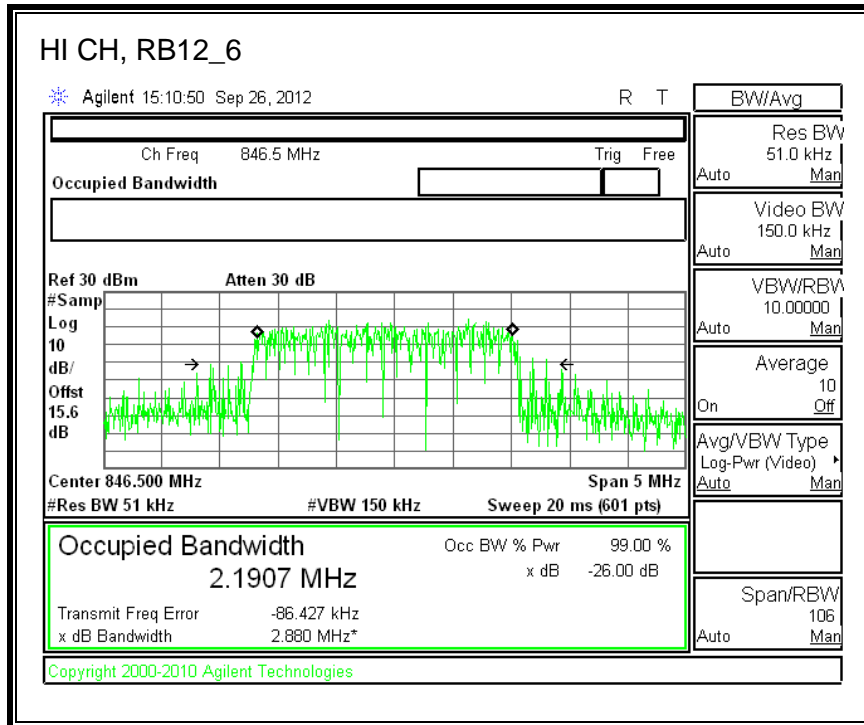


Band 5 (5 MHz BANDWIDTH)

16QAM

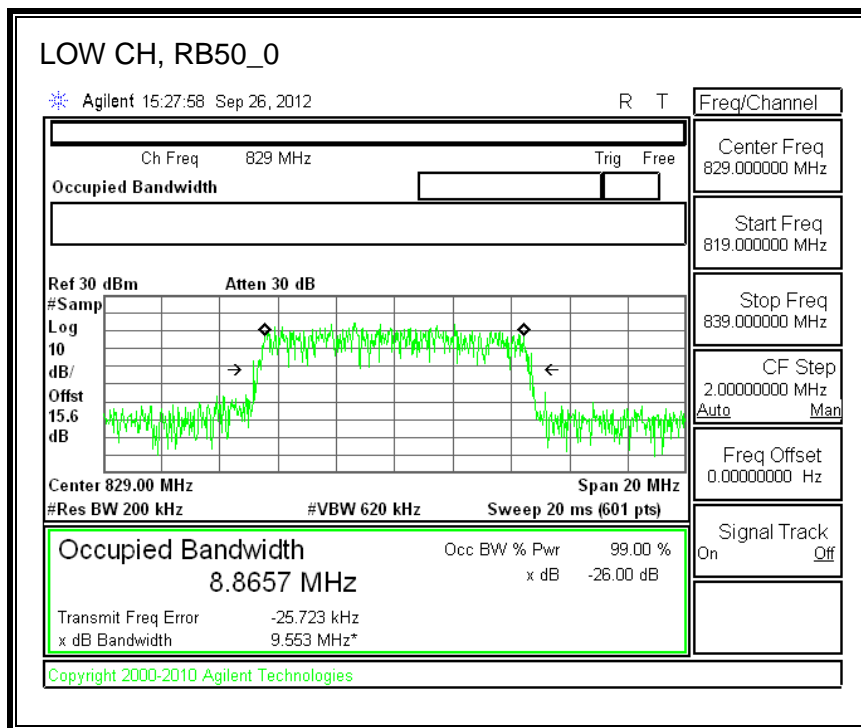
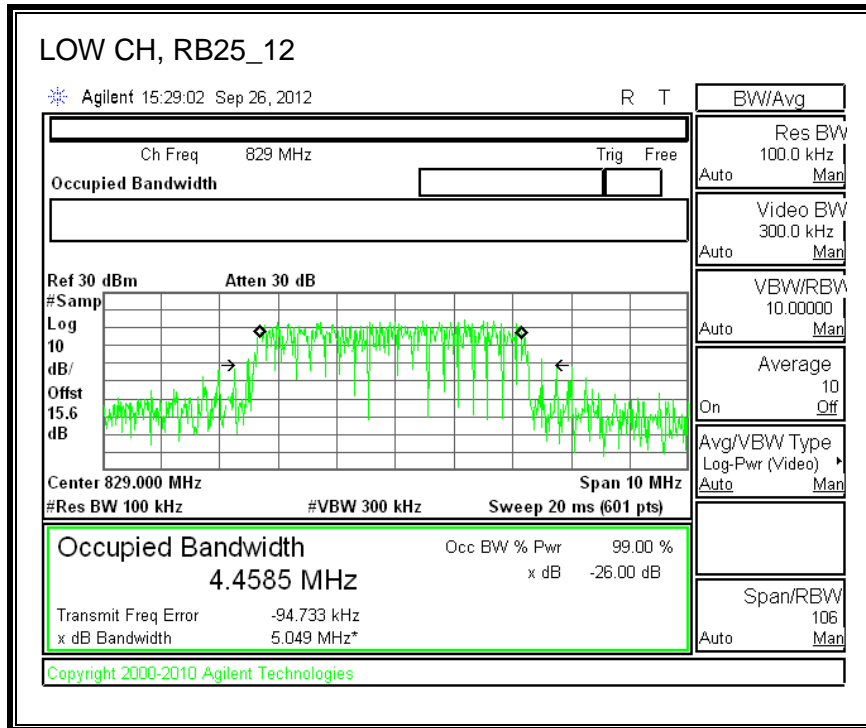


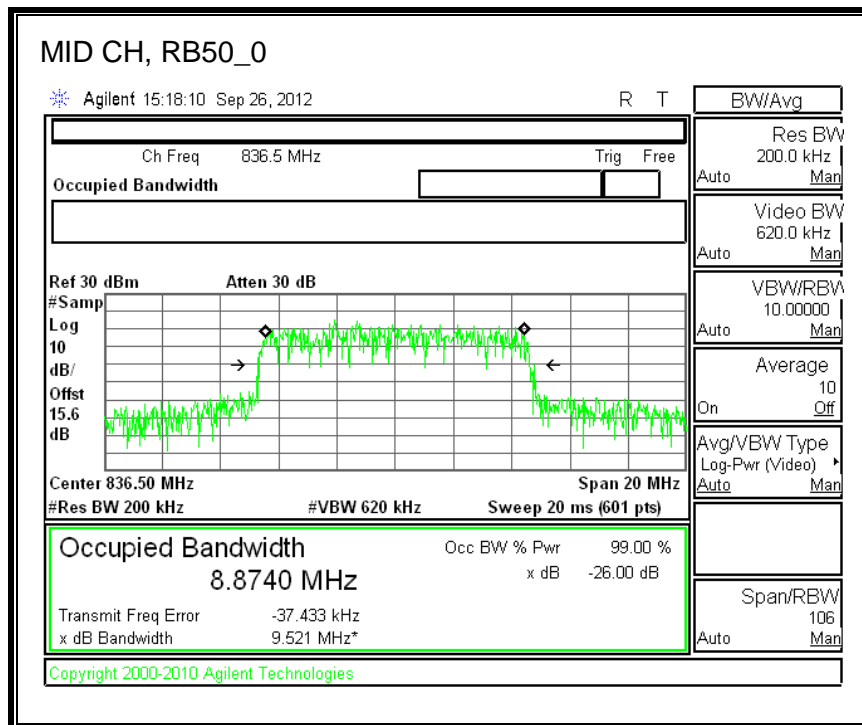
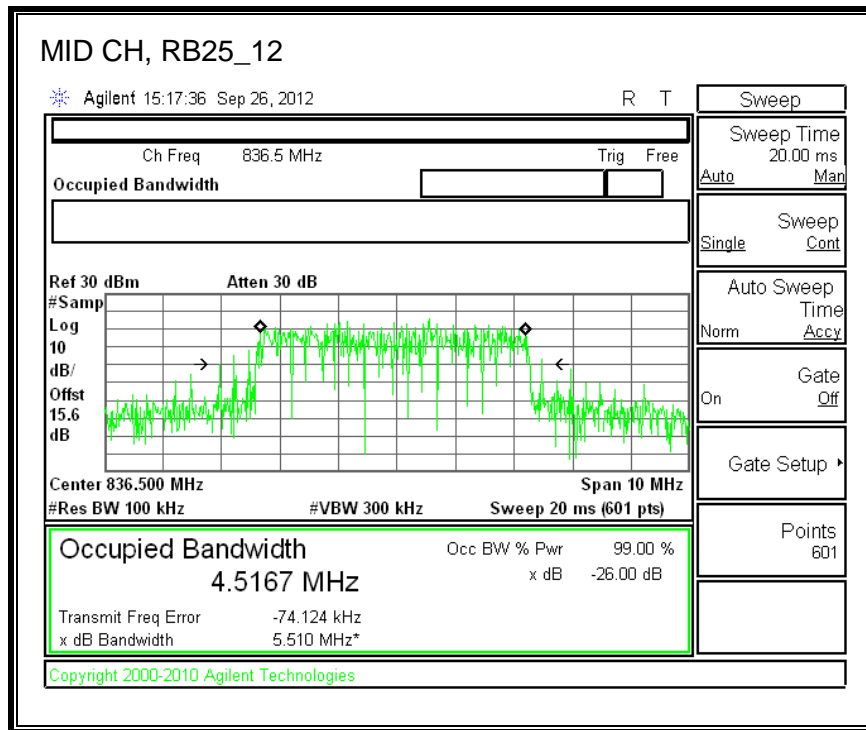


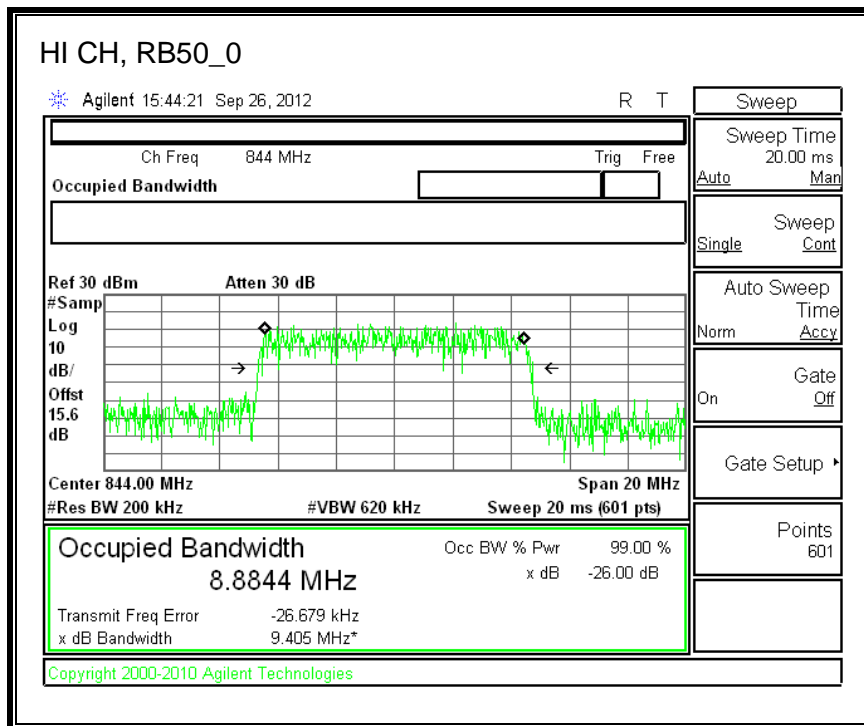
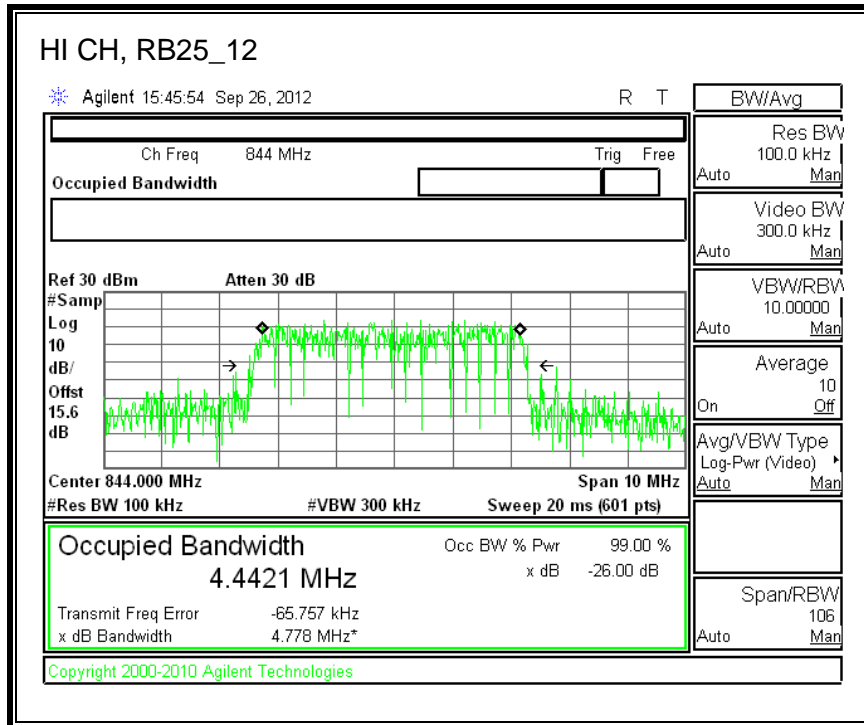


Band 5 (10 MHz BANDWIDTH)

QPSK

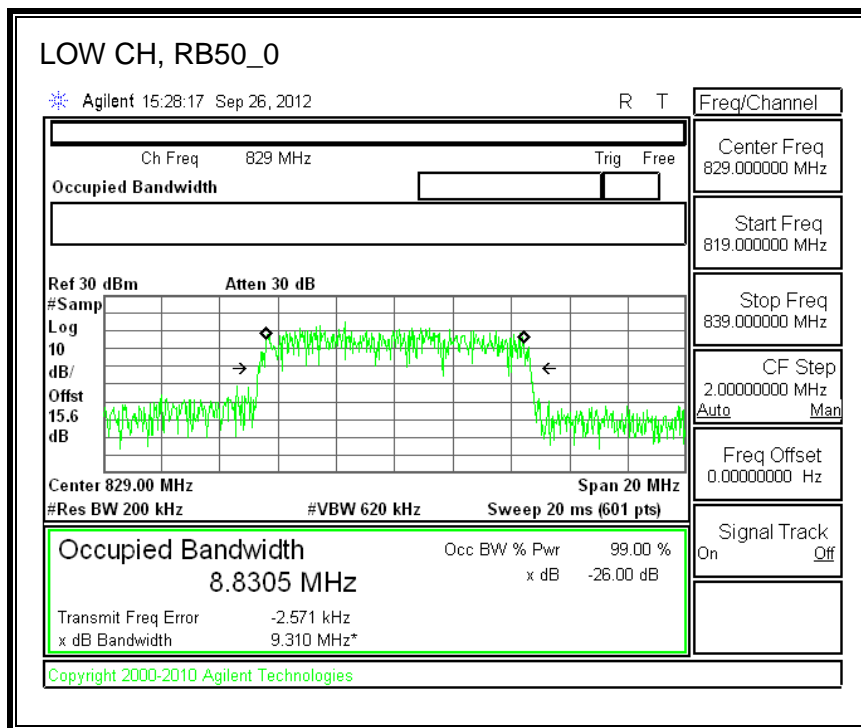
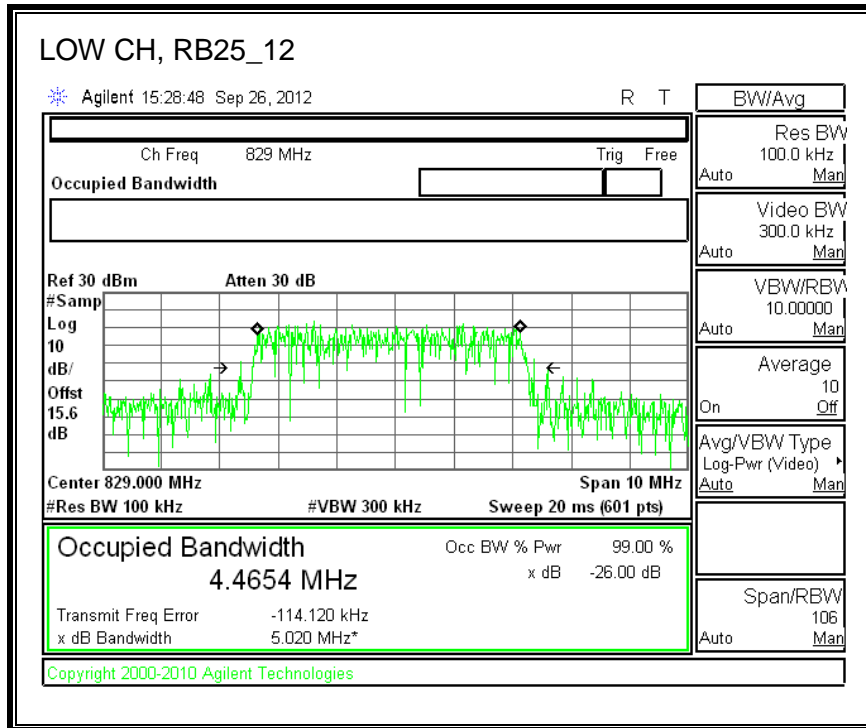


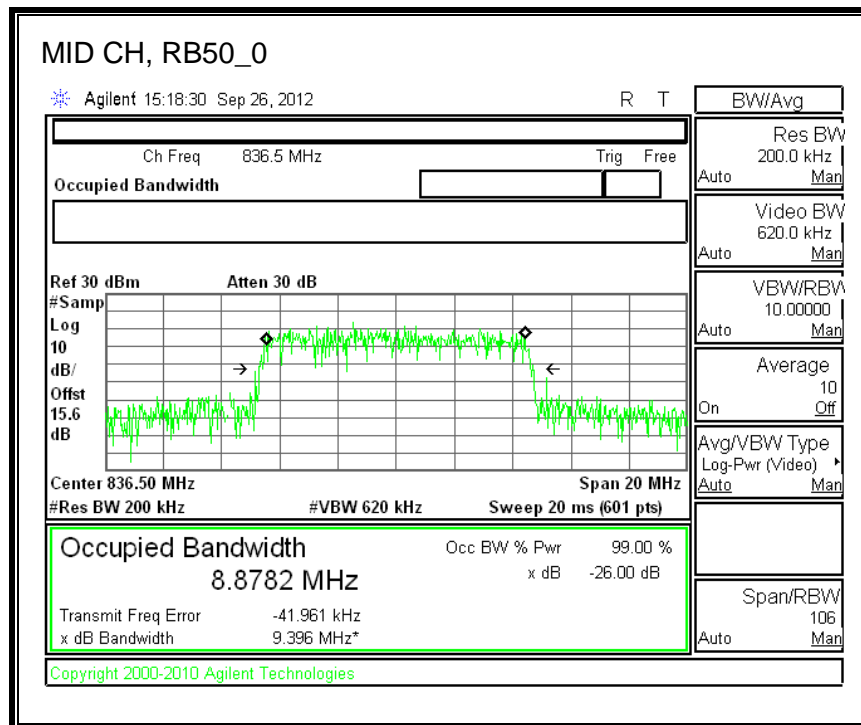
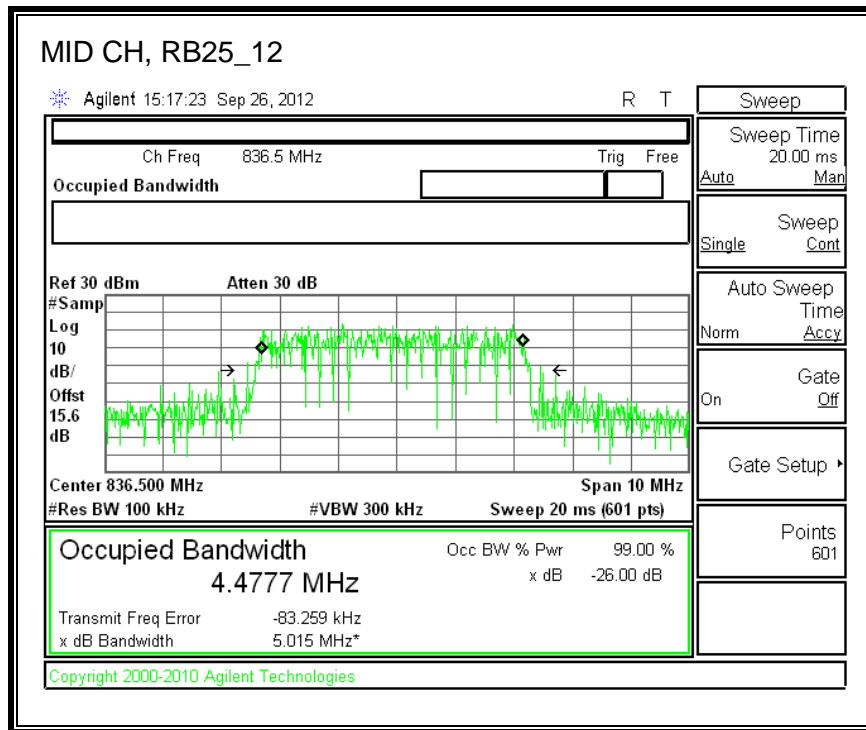


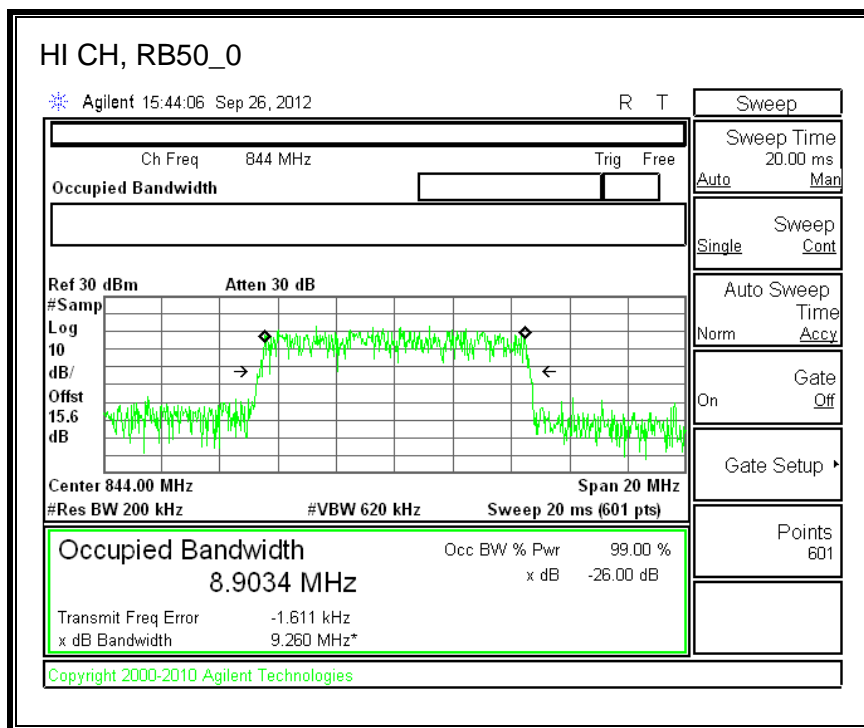
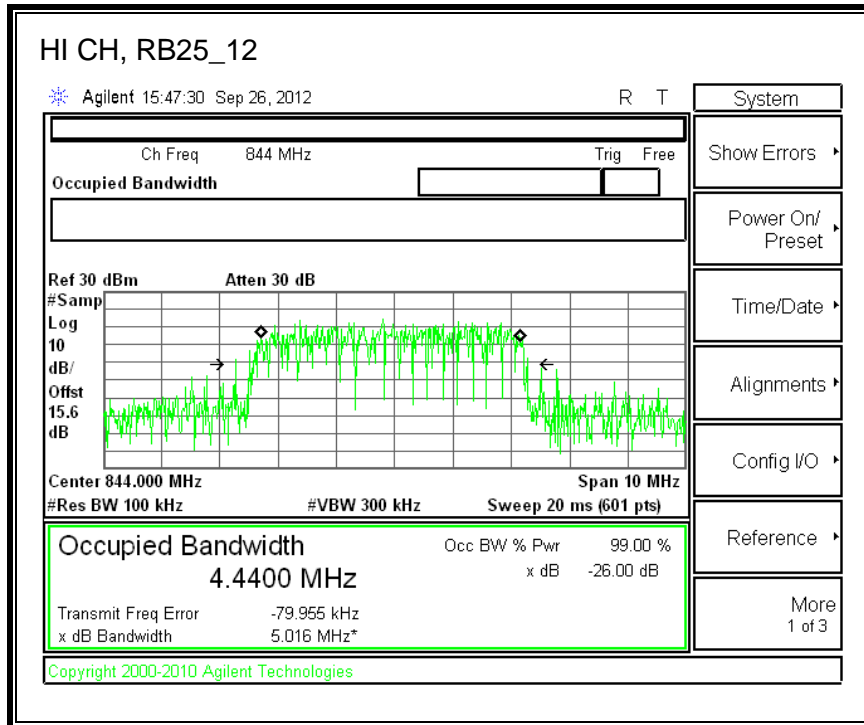


Band 5 (10 MHz BANDWIDTH)

16QAM

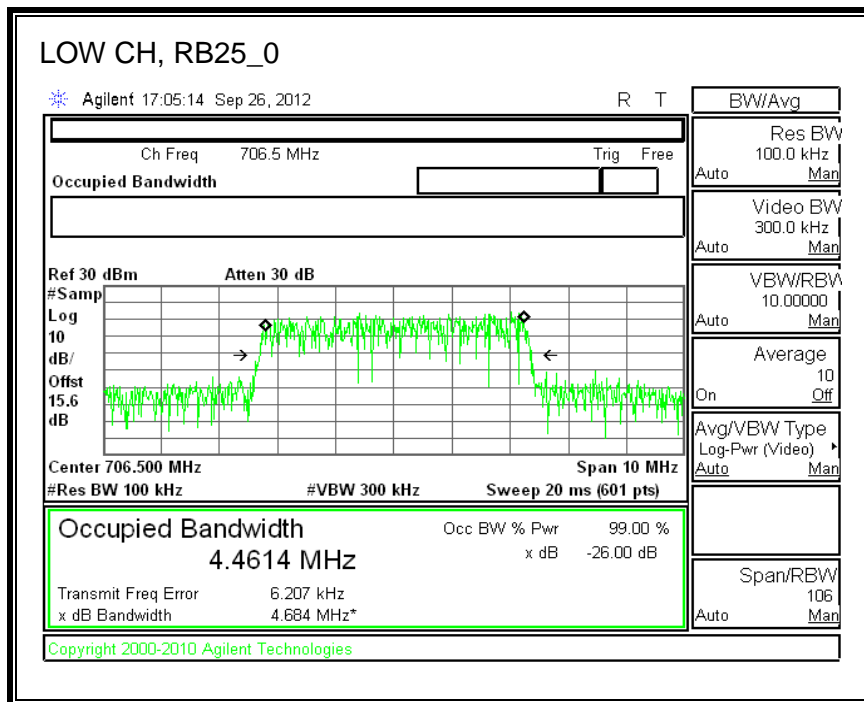
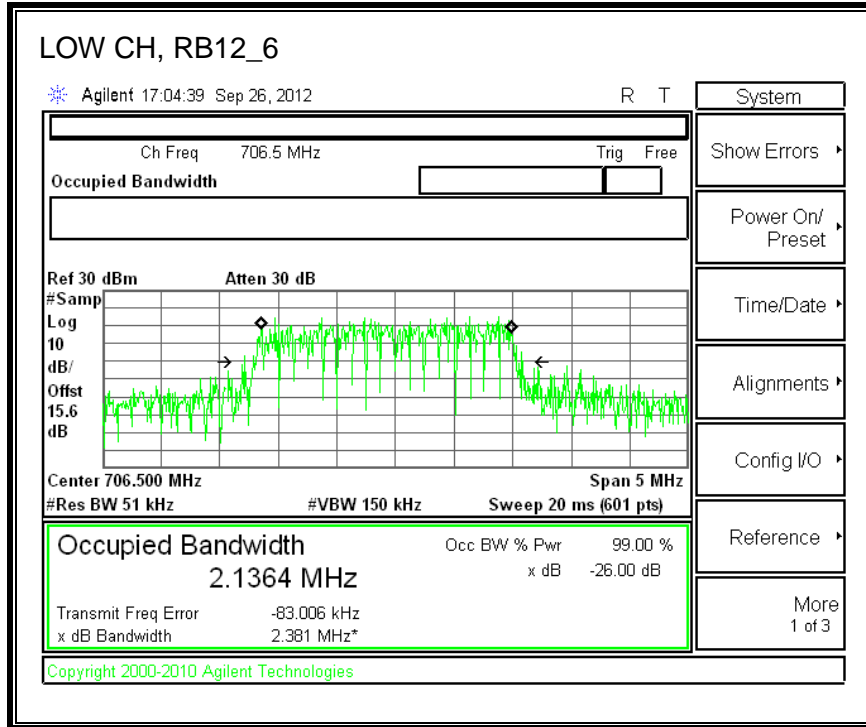


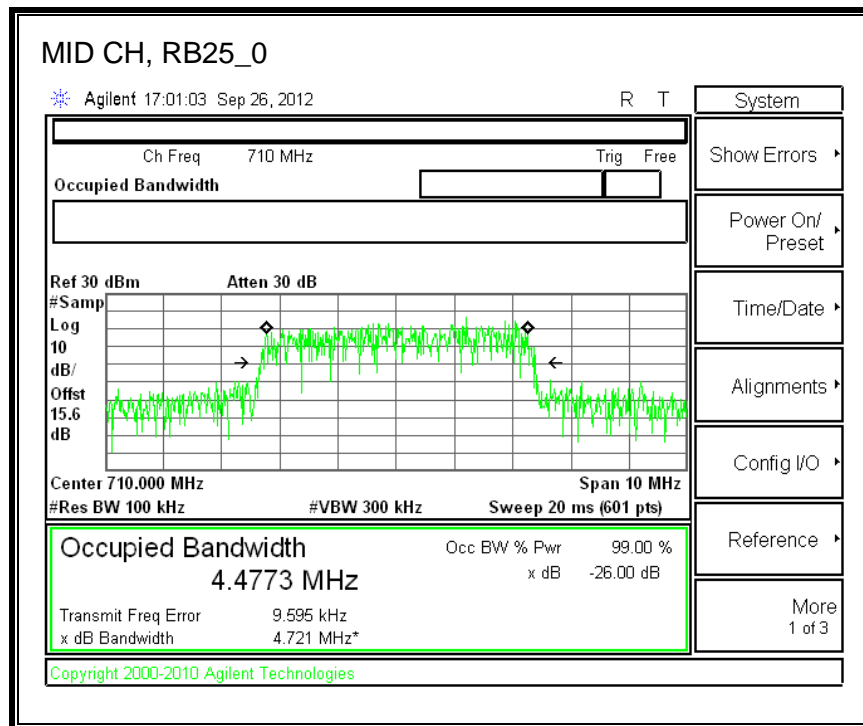
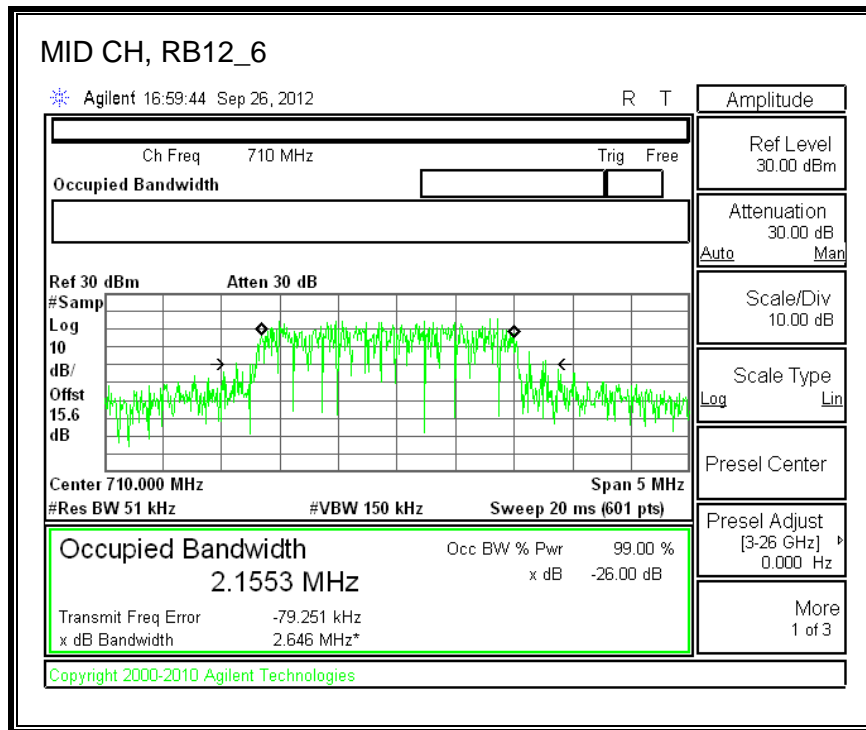


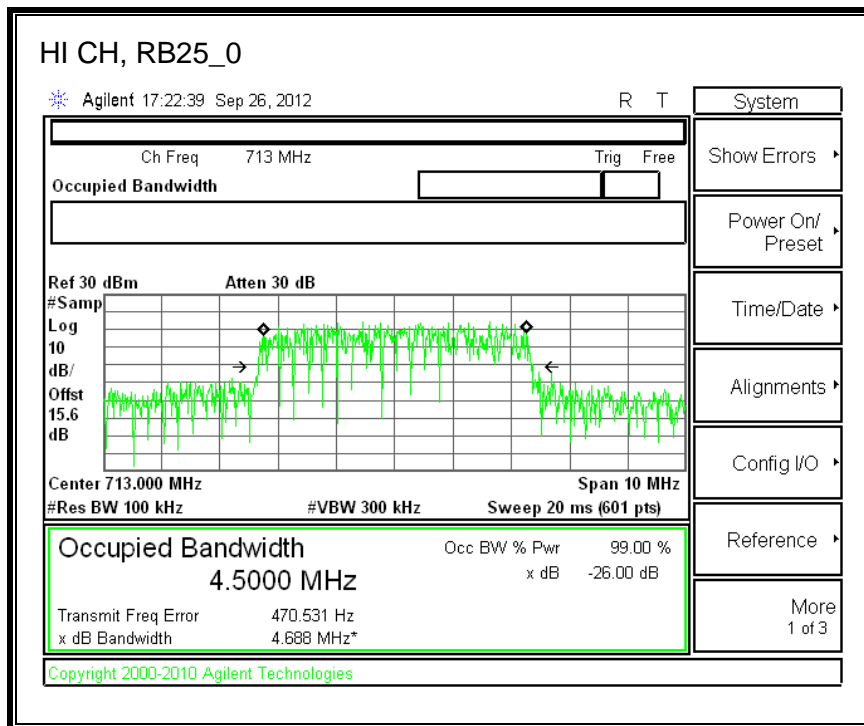
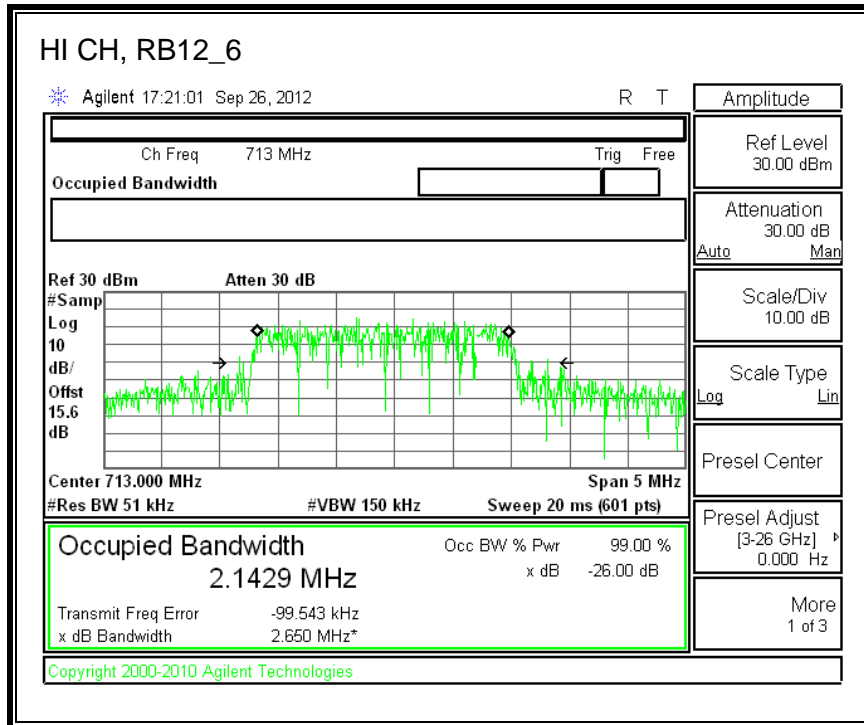


8.1.6. LTE Band 17

QPSK (5 MHz BANDWIDTH)

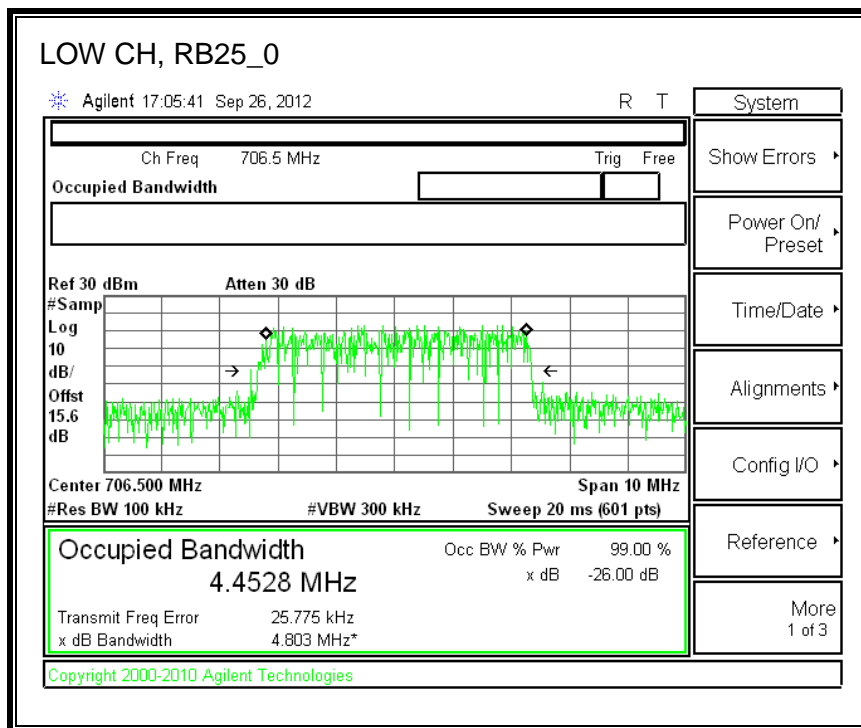
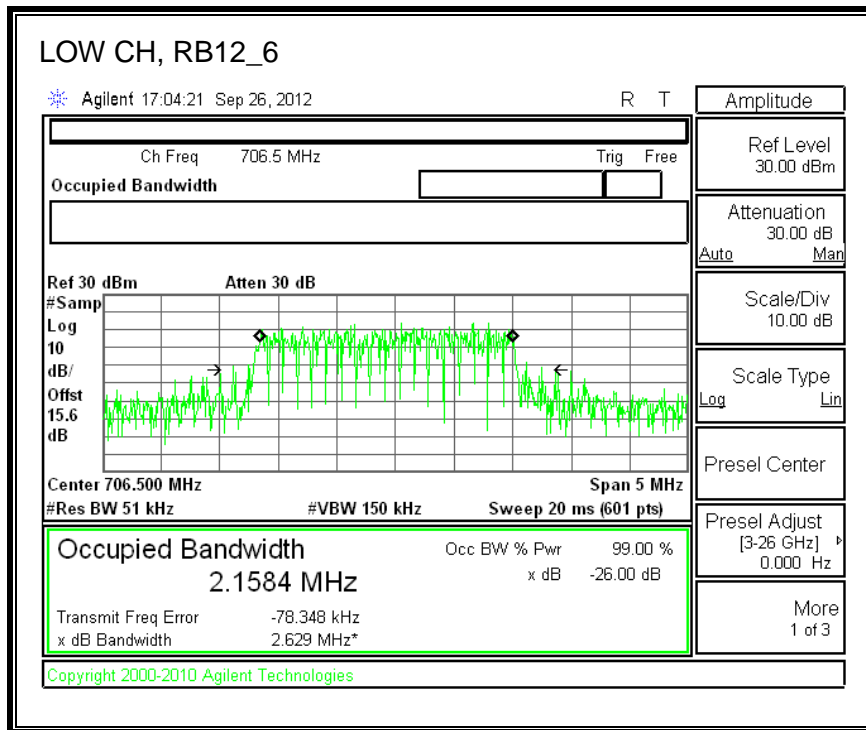


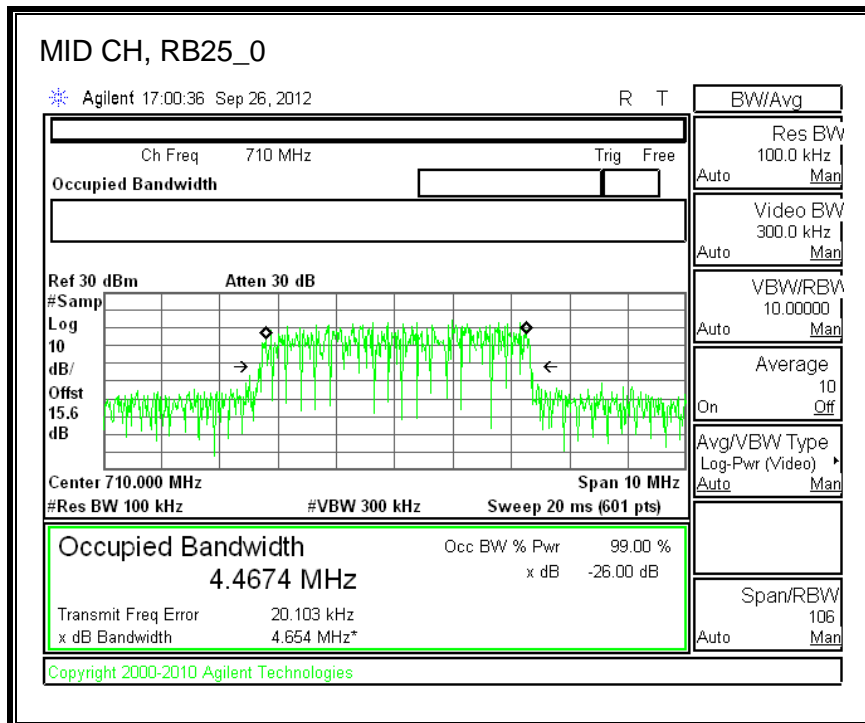
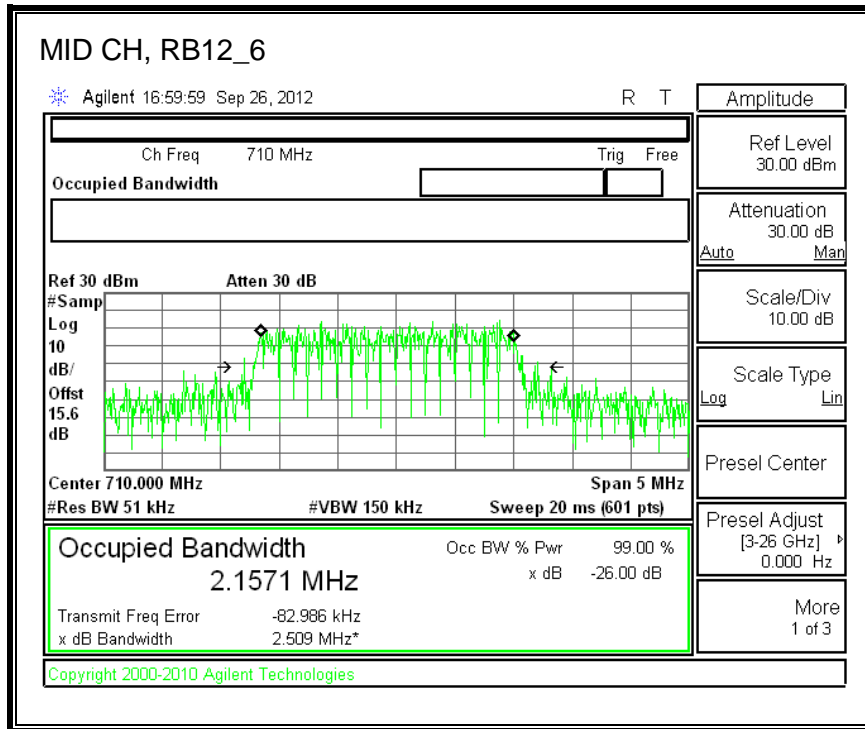


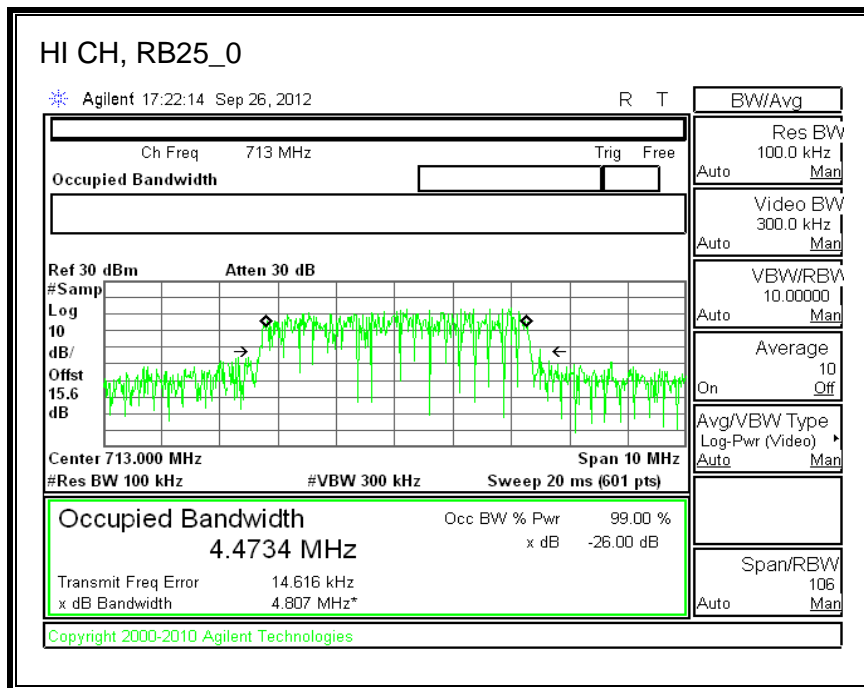
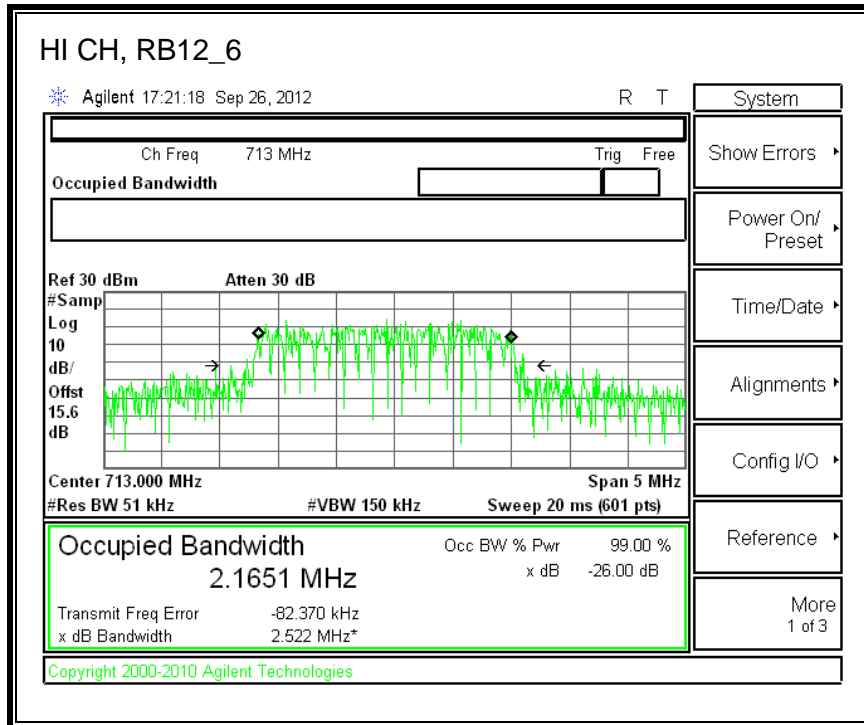


Band 17 (5 MHz BANDWIDTH)

16QAM

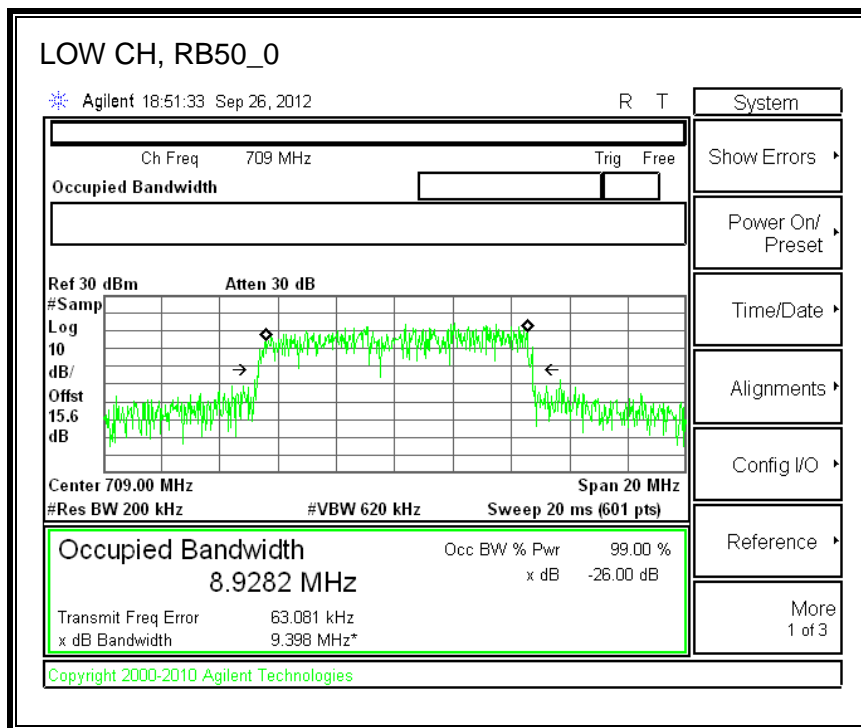
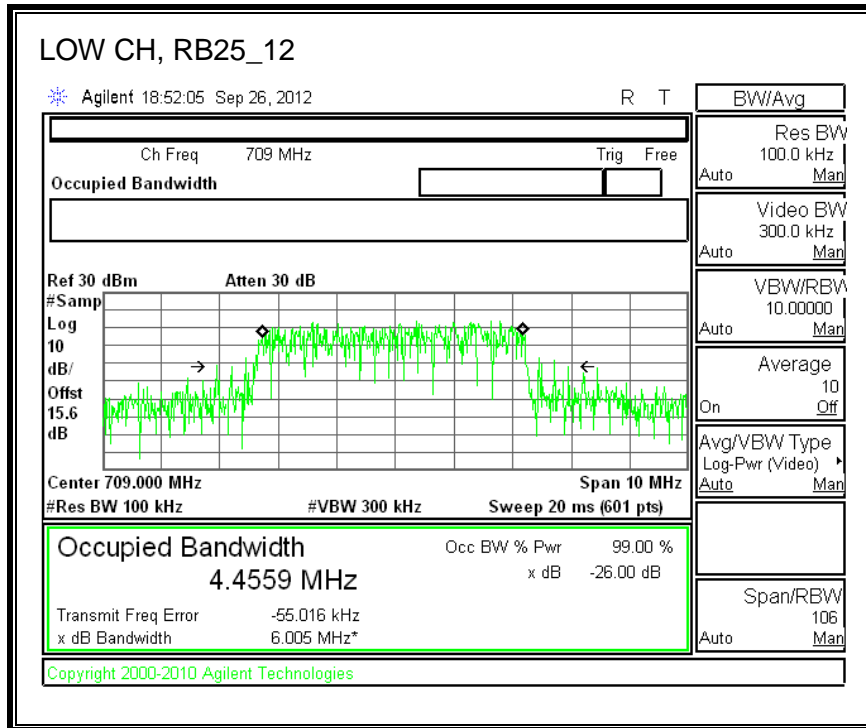


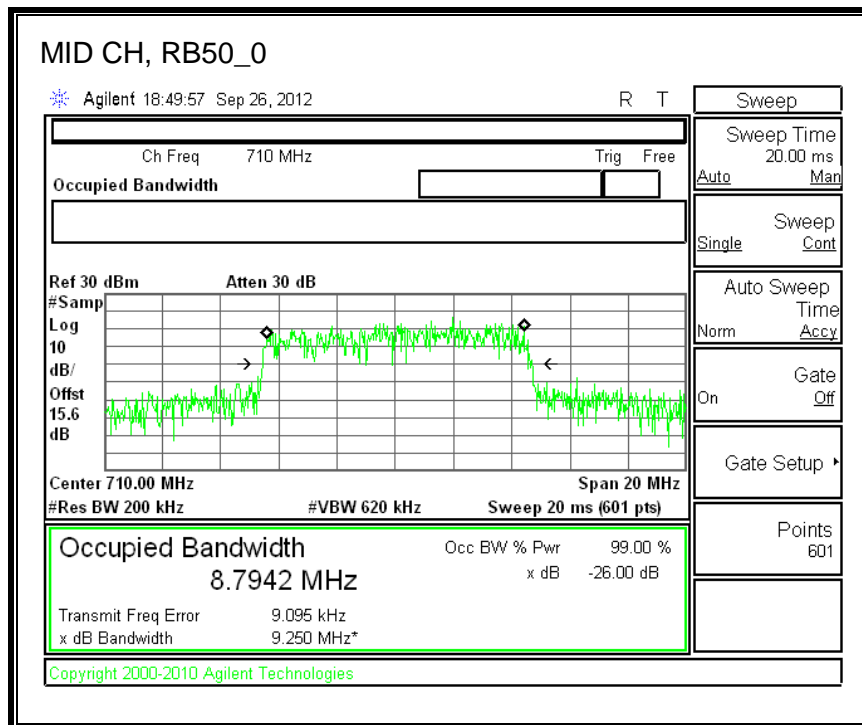
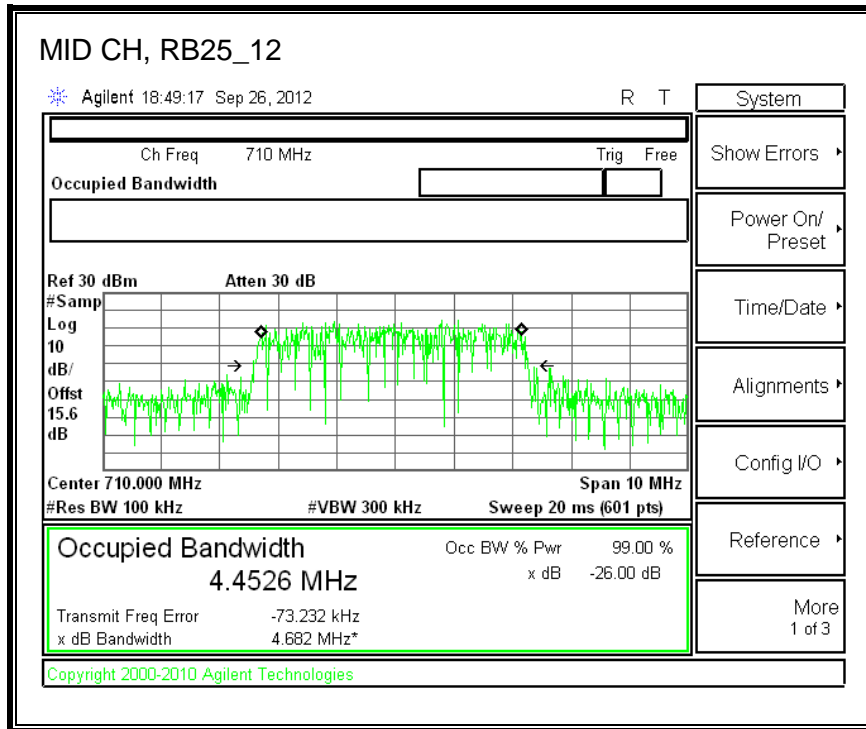


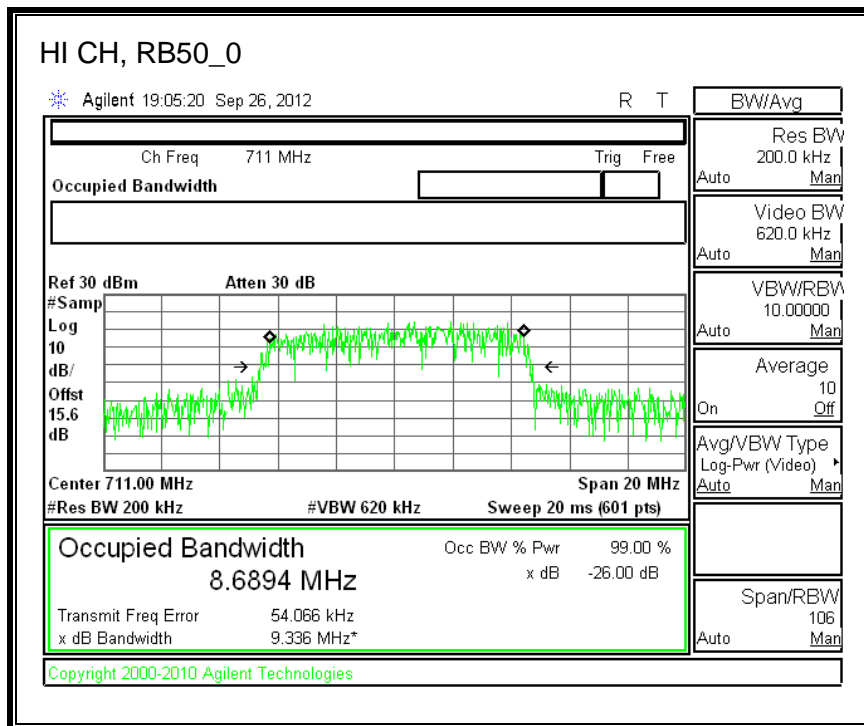
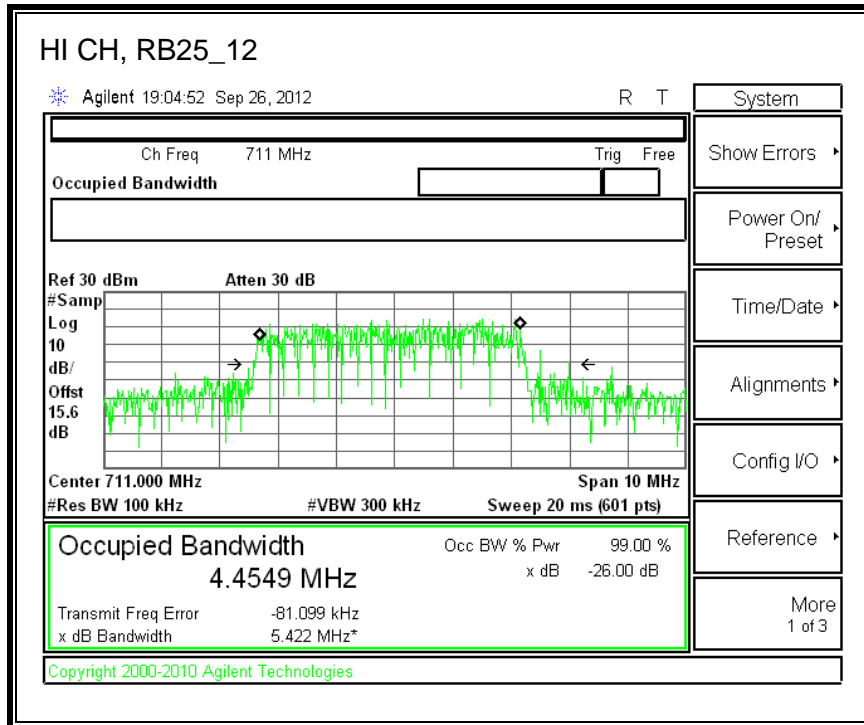


Band 17 (10 MHz BANDWIDTH)

QPSK

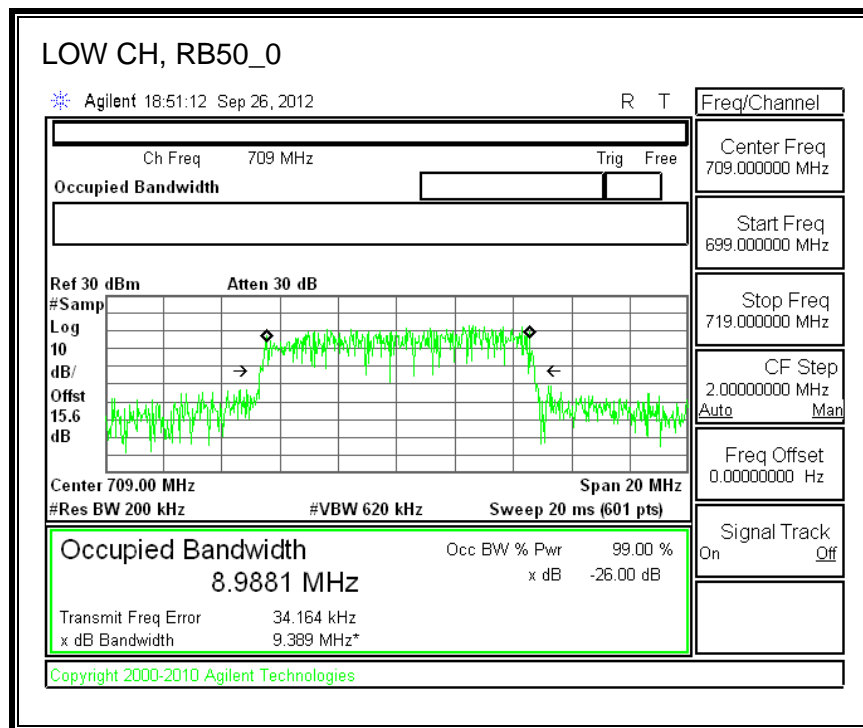
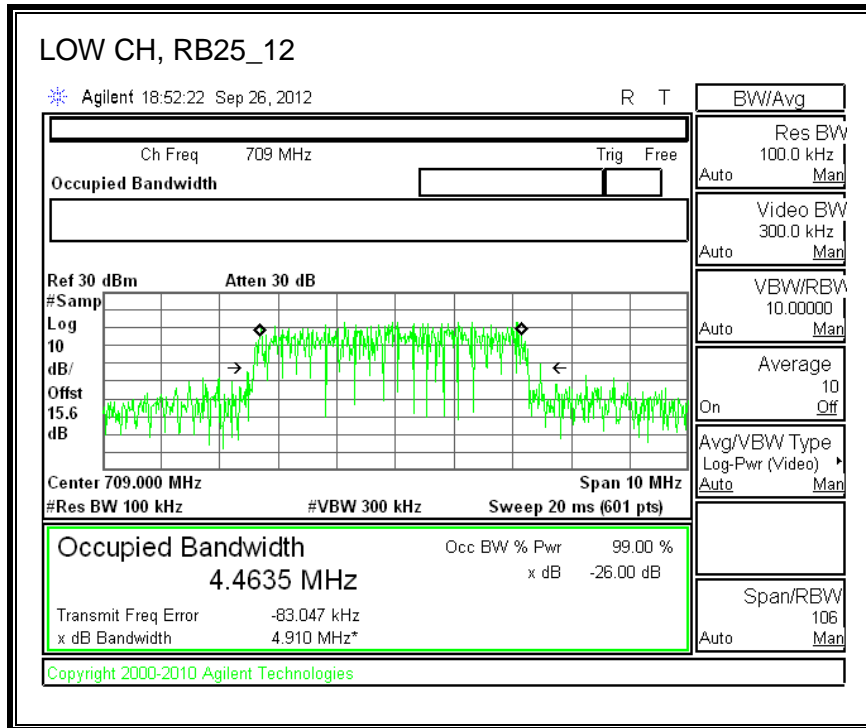


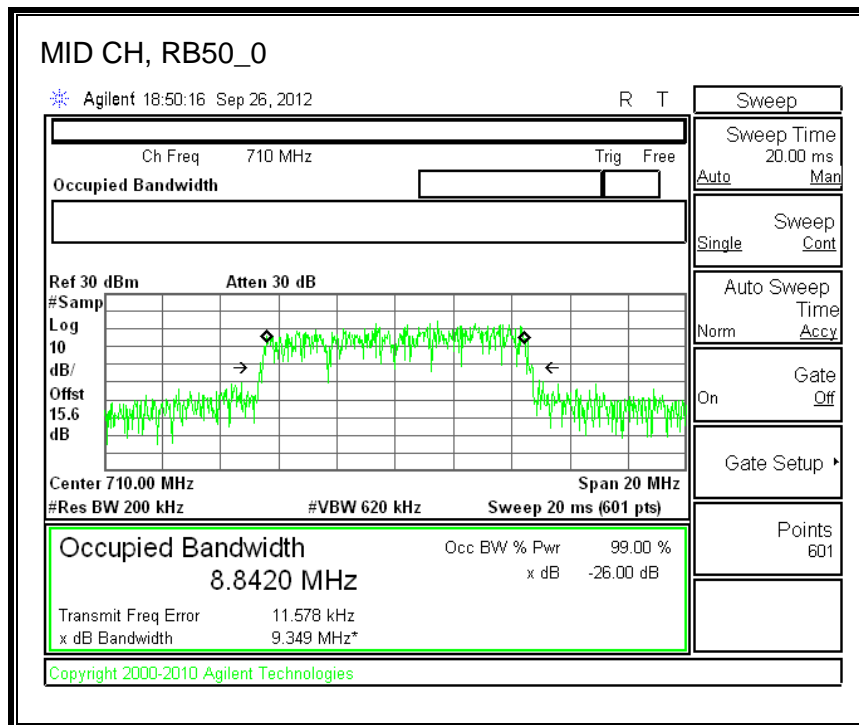
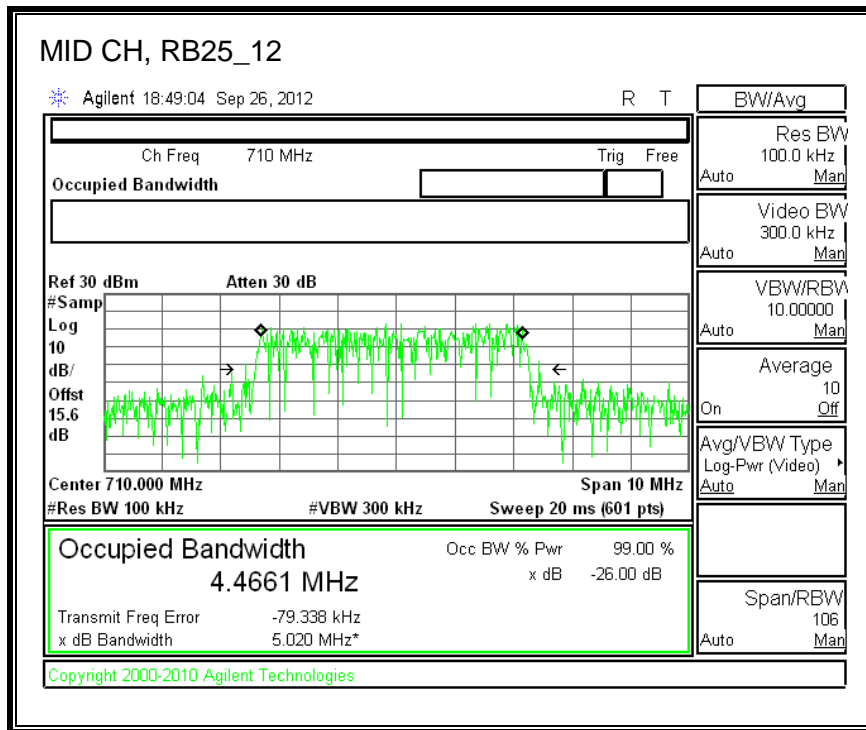


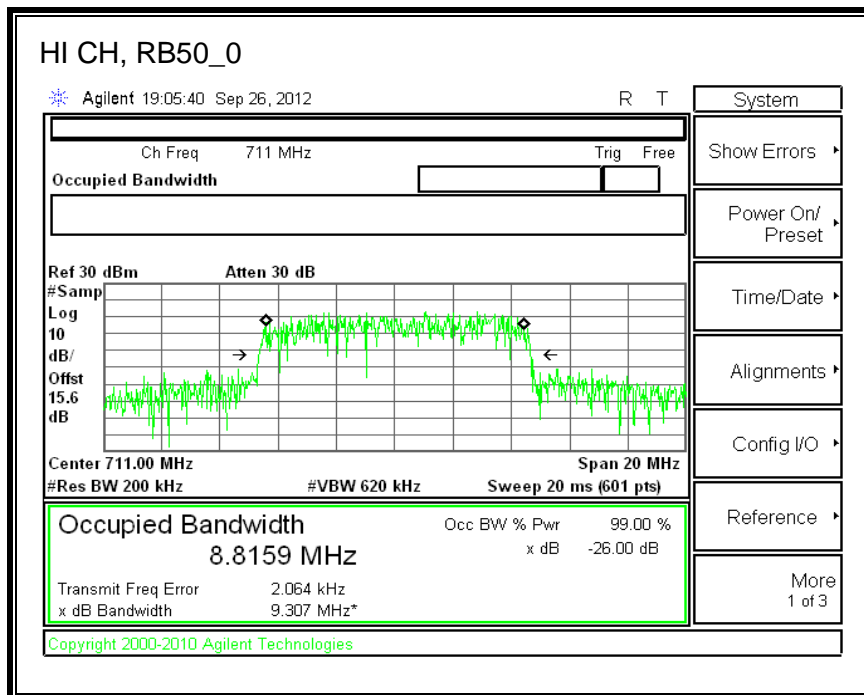
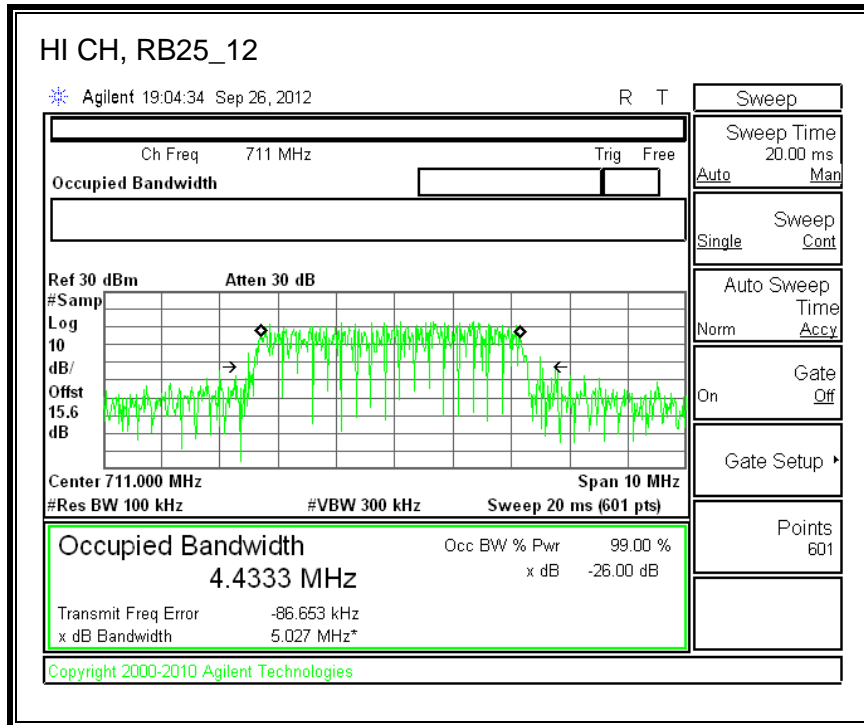


Band 17 (10 MHz BANDWIDTH)

16QAM







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, 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.

LIMITS

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

On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

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

TEST PROCEDURE

The transmitter output was connected to a CMW500 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:

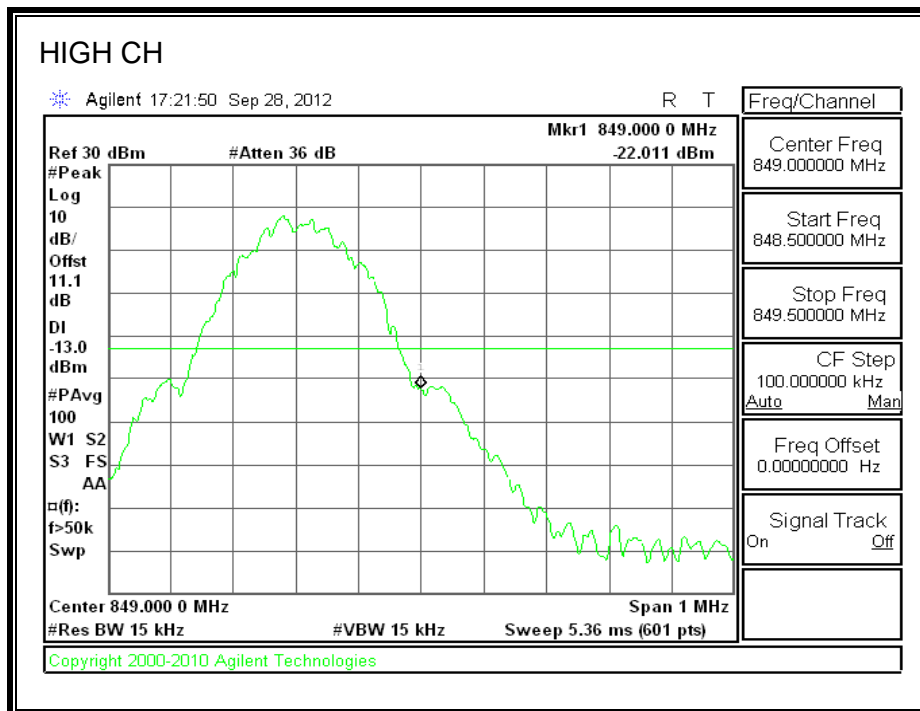
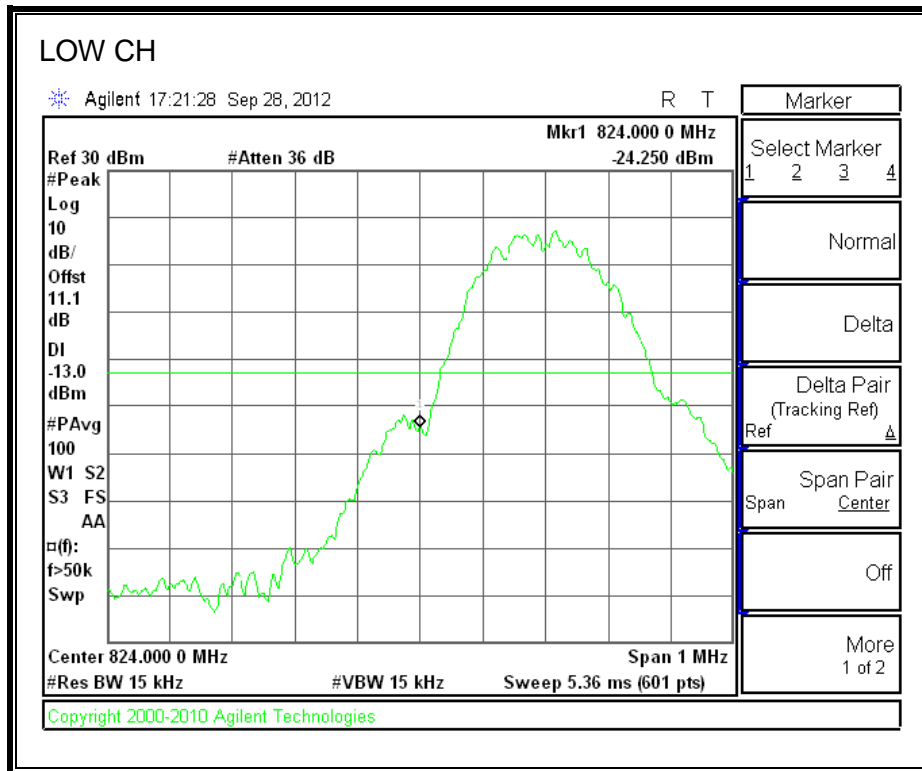
- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

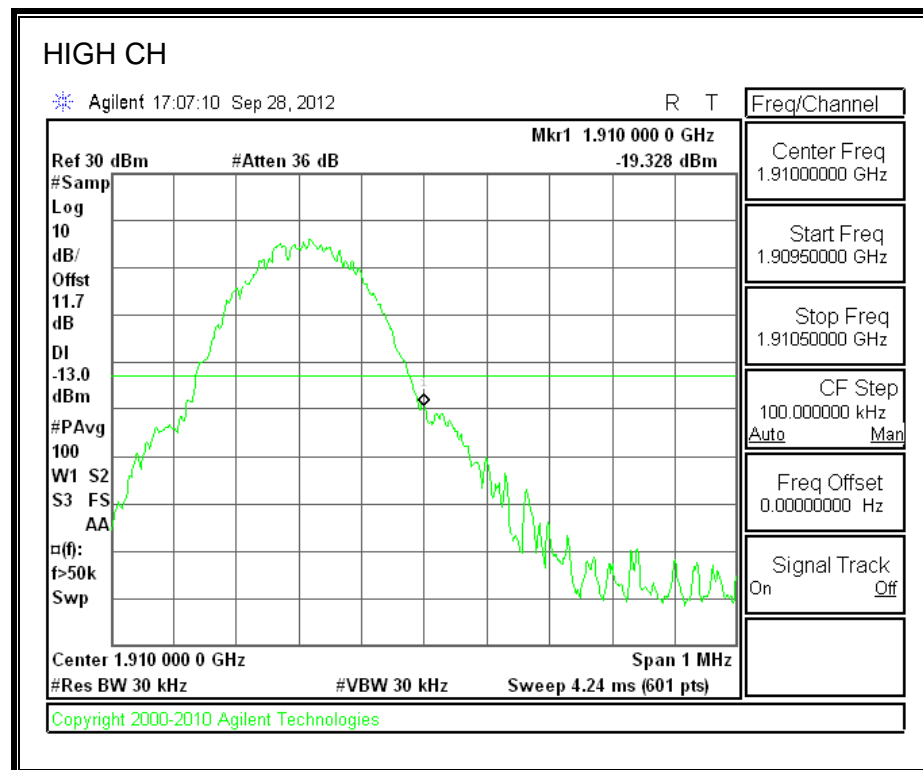
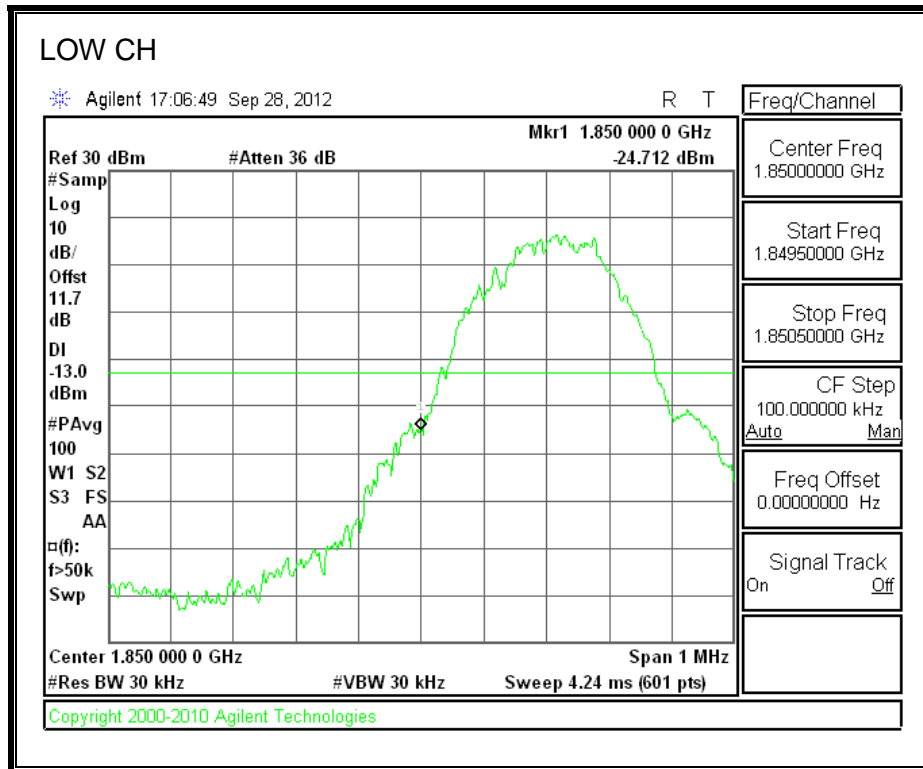
- GPRS and EGPRS
- UMTS, REL 99 and HSUPA
- LTE BAND 2
- LTE BAND 4
- LTE BAND 5
- LTE BAND 17

RESULTS

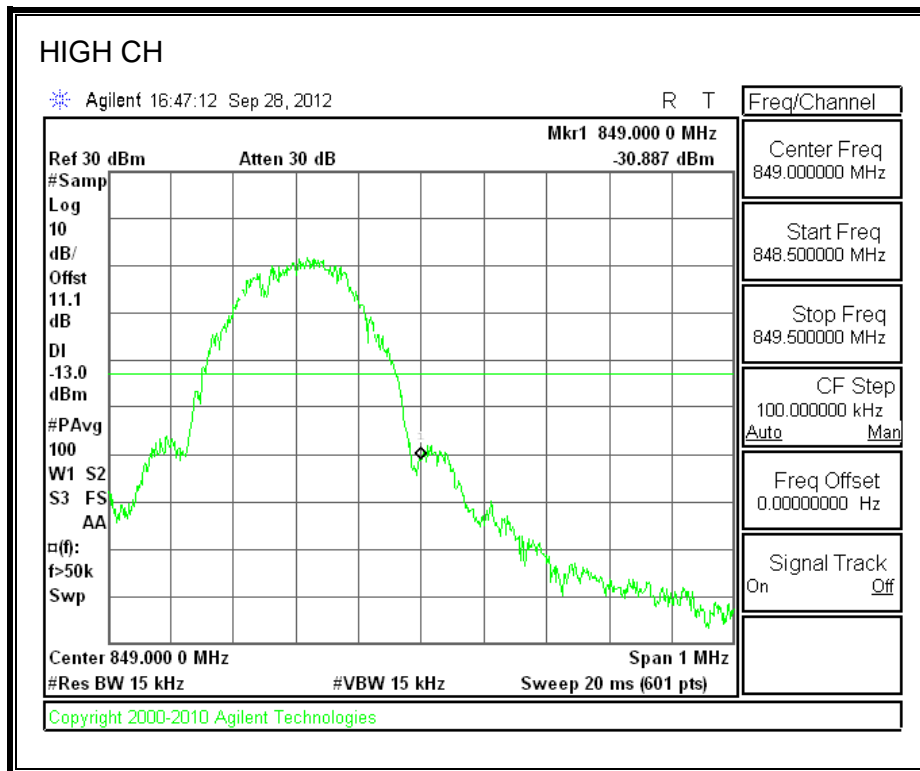
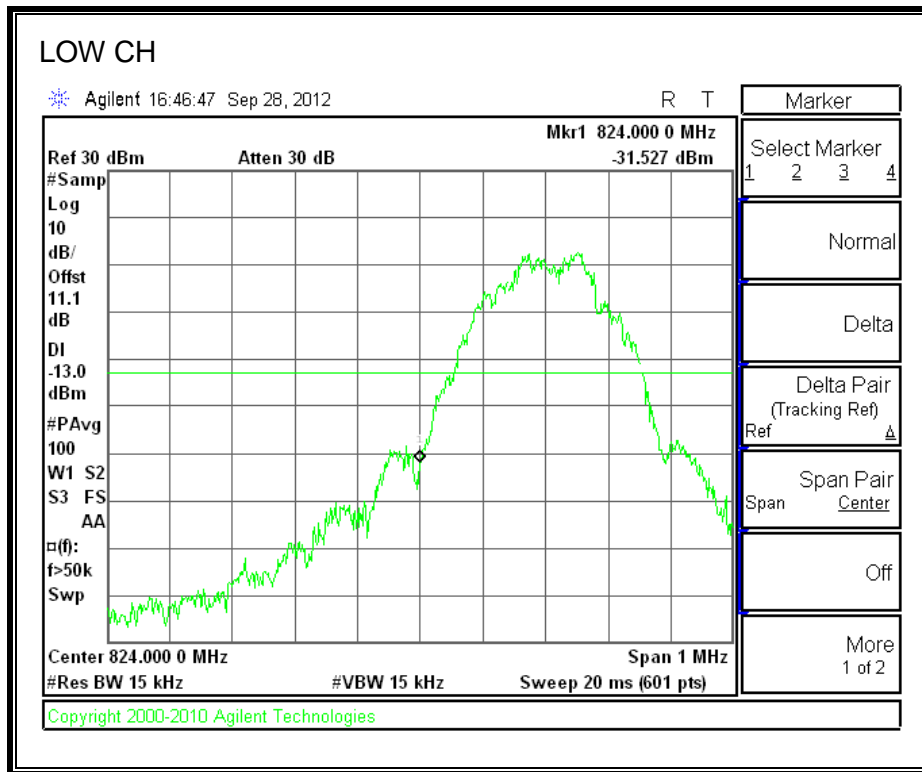
8.2.1. GSM
CELL, GPRS



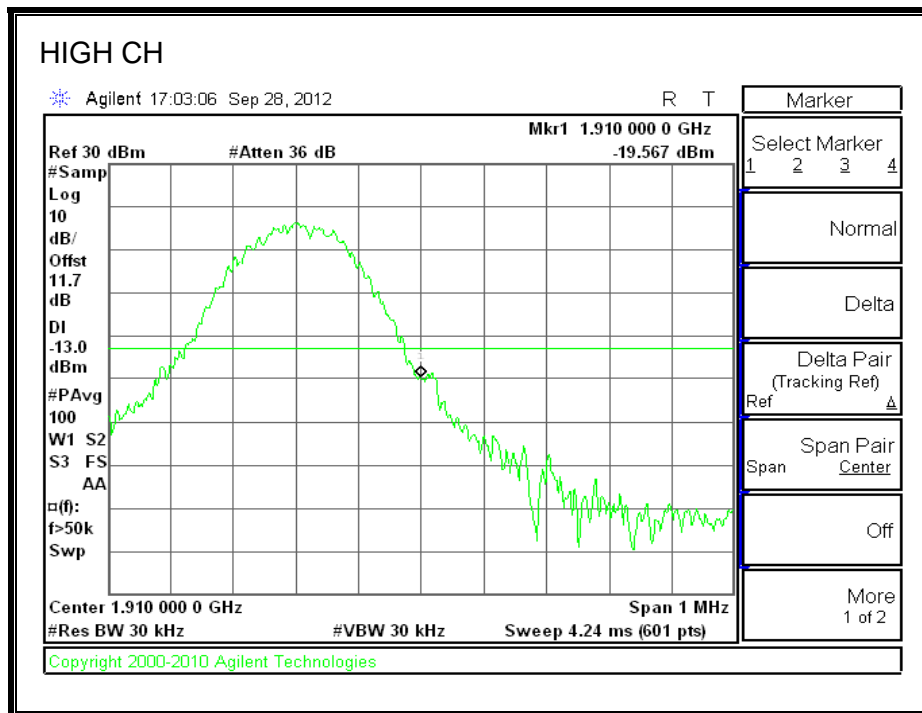
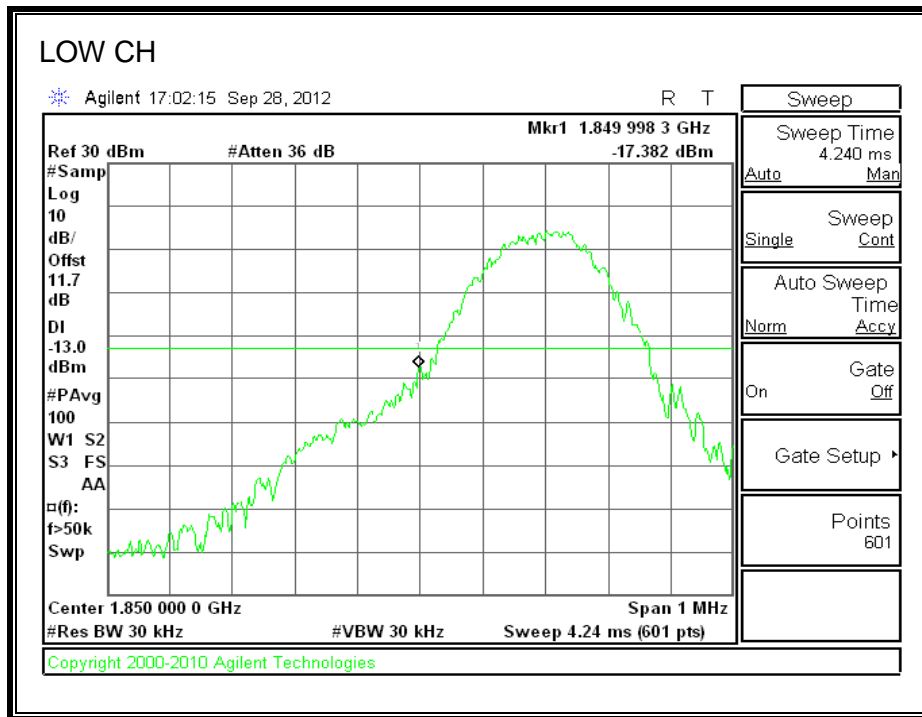
PCS, GPRS



CELL, EGPRS

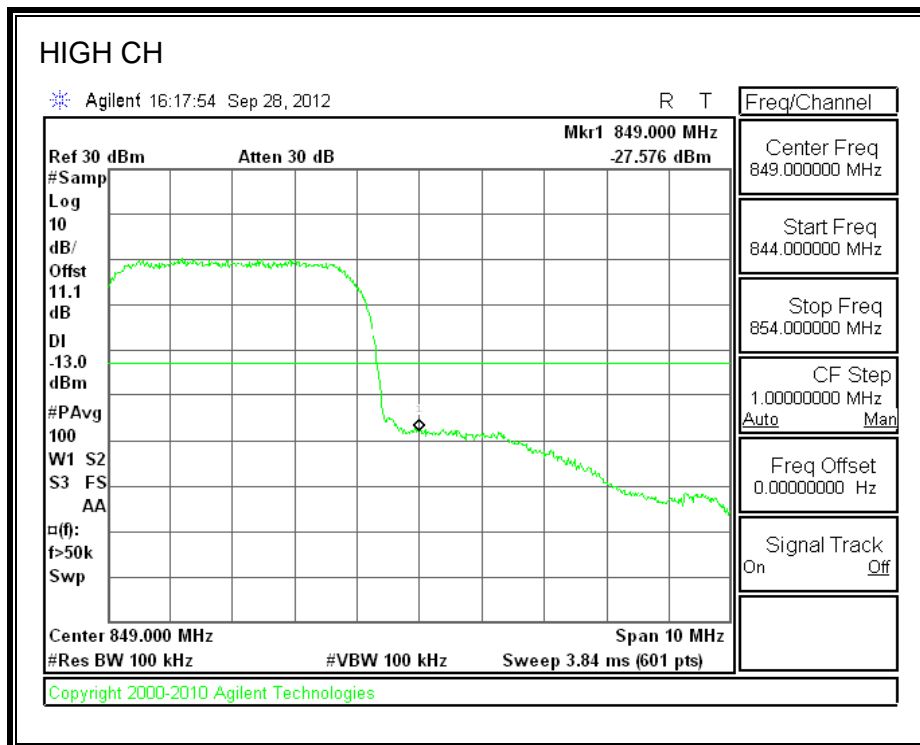
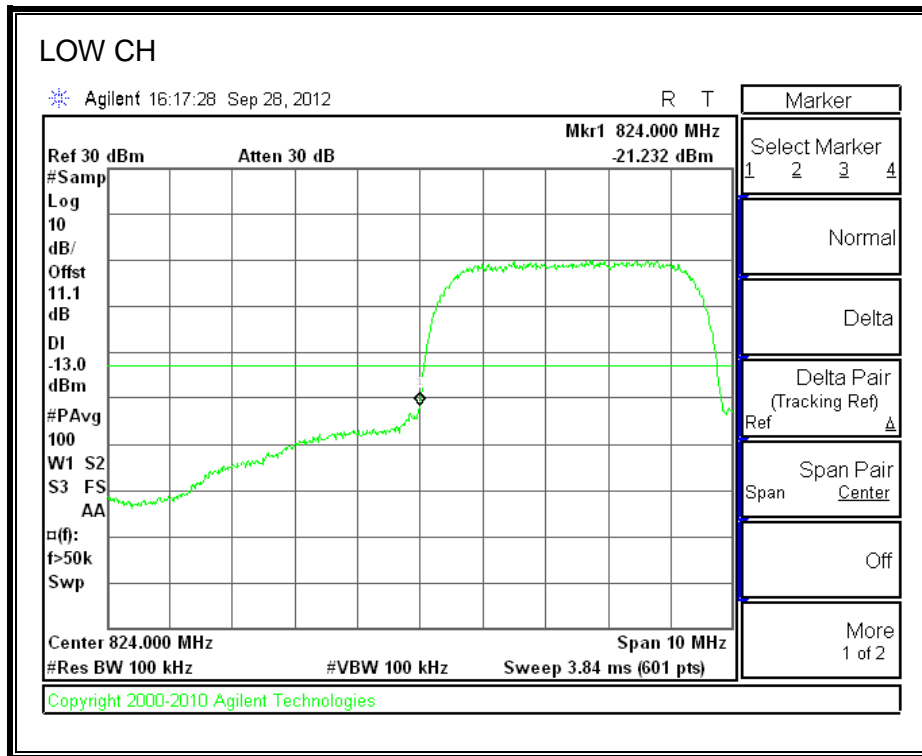


PCS, EGPRS

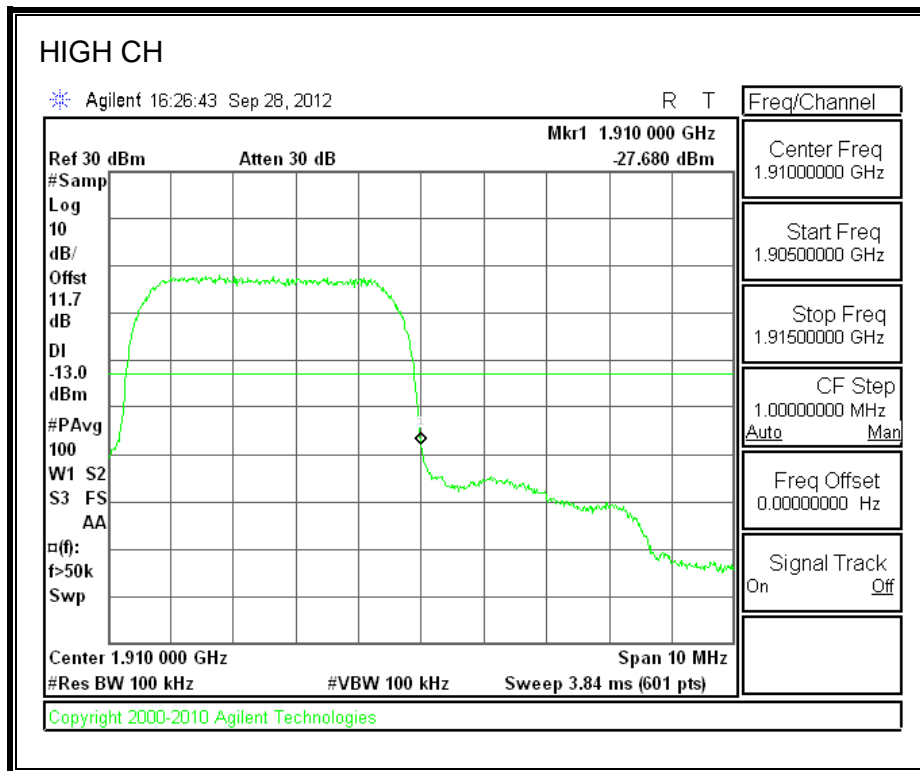
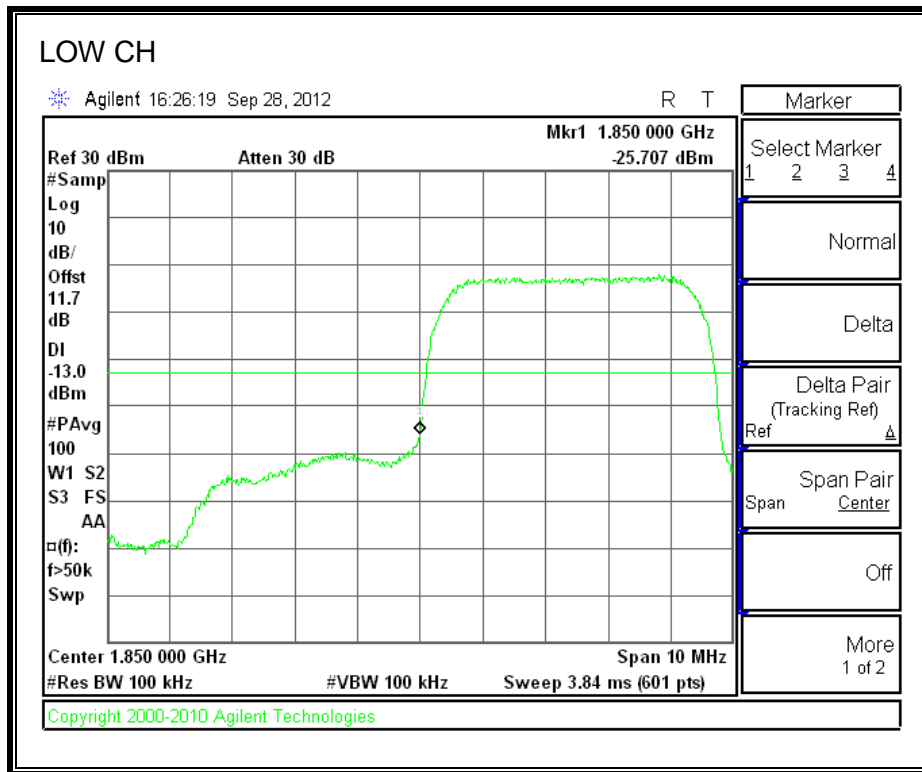


8.2.2. WCDMA850

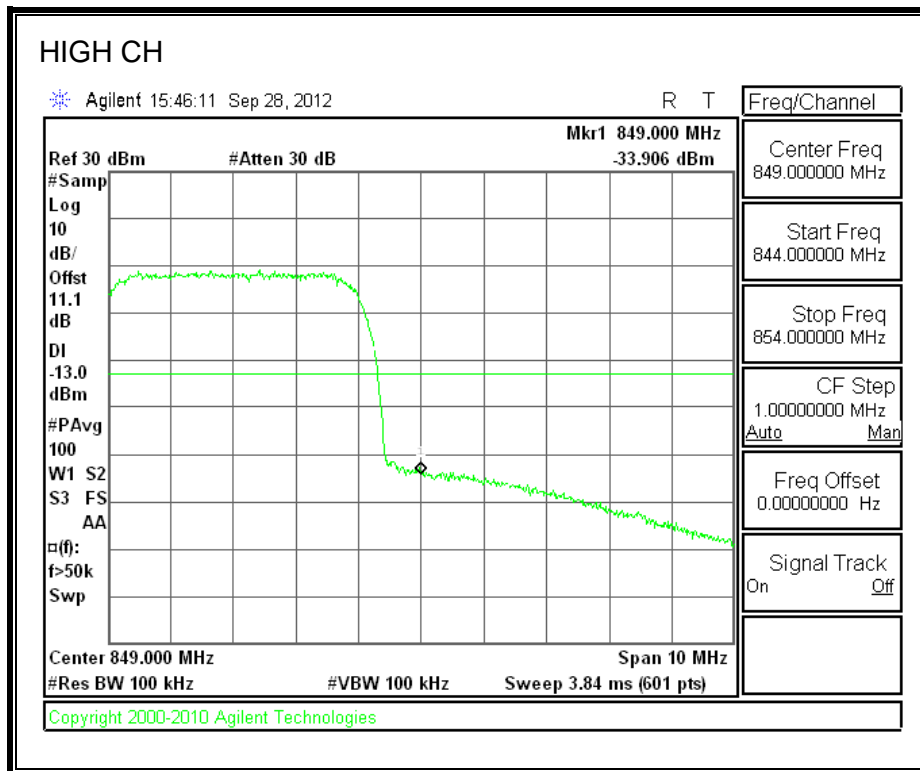
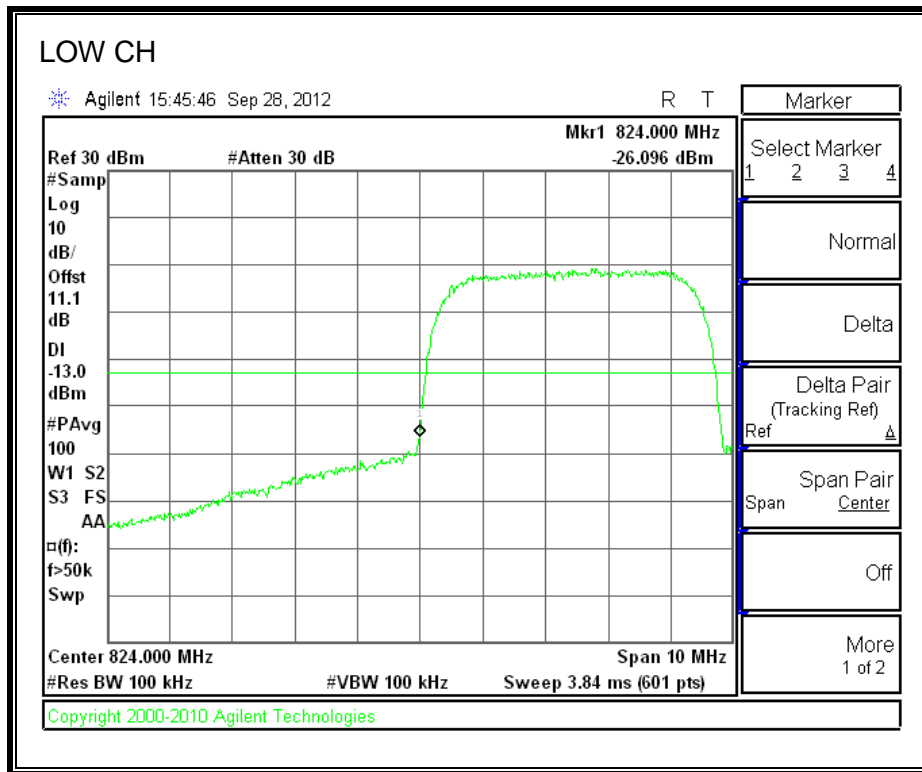
CELL, REL99



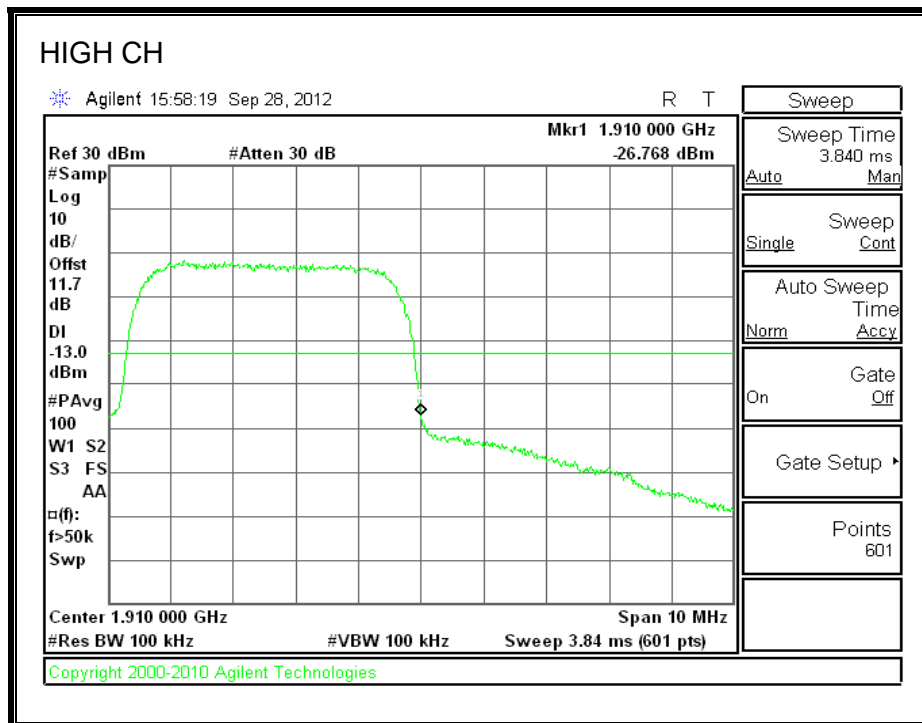
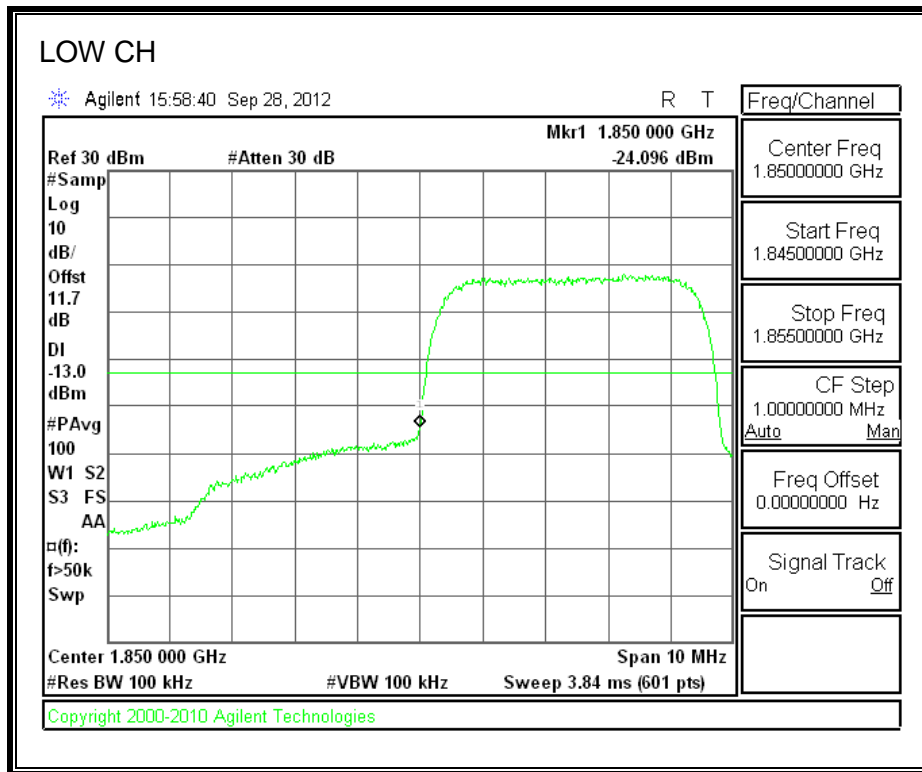
PCS, REL 99



CELL, HSUPA

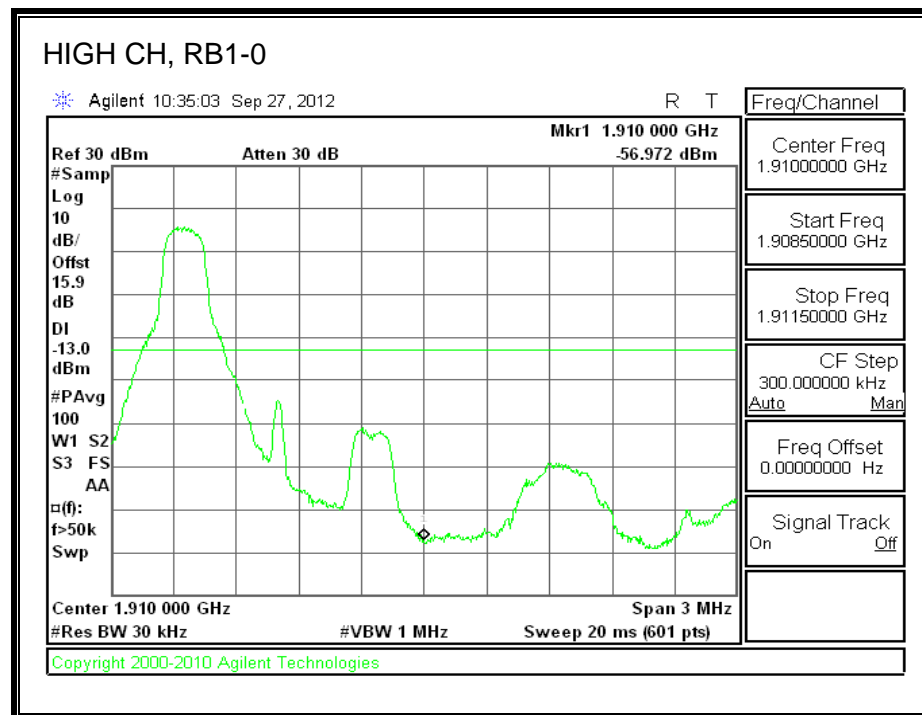
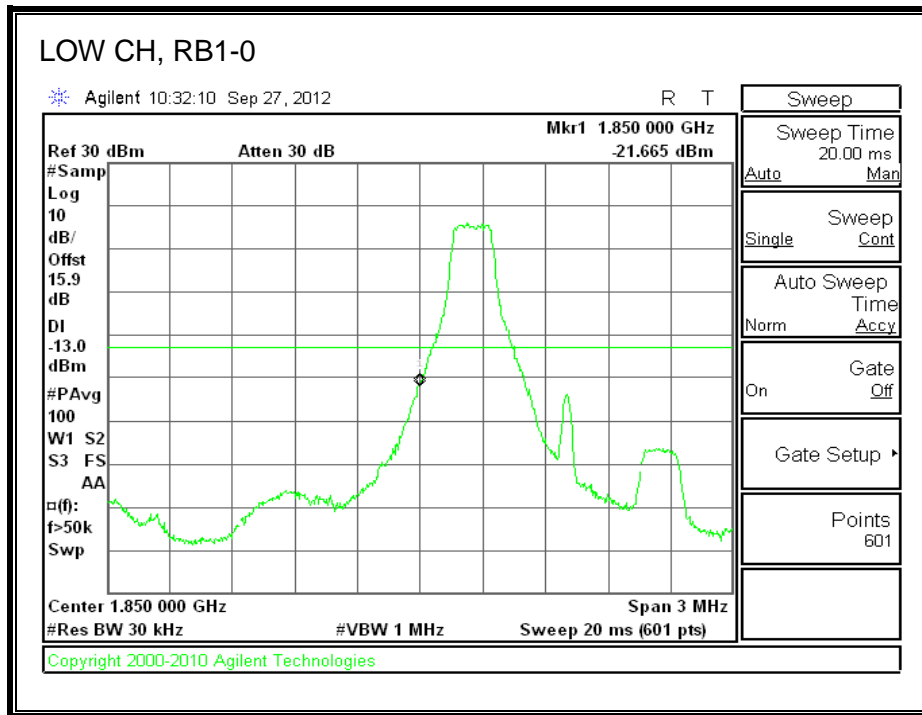


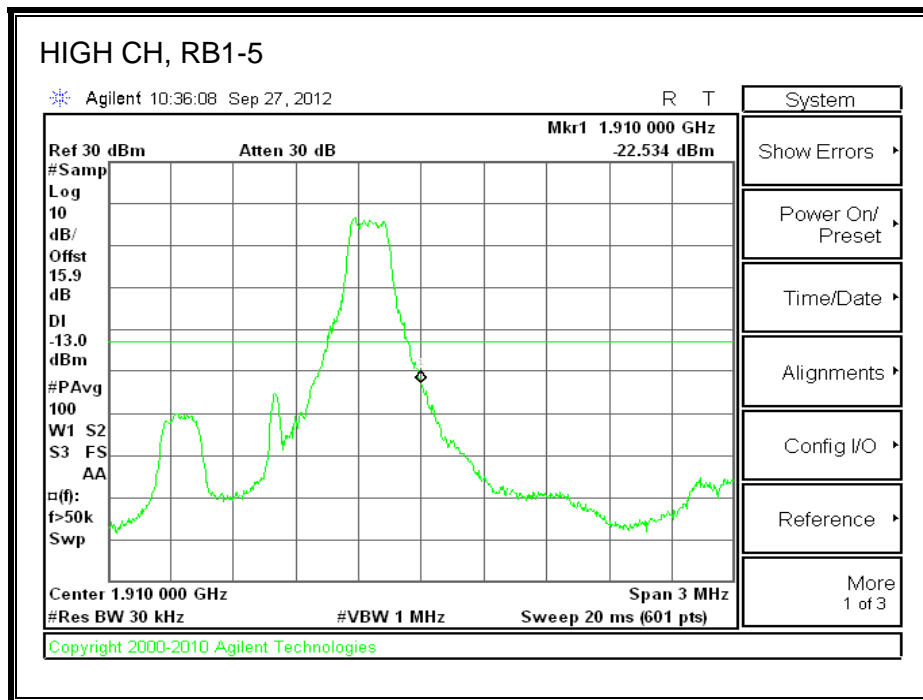
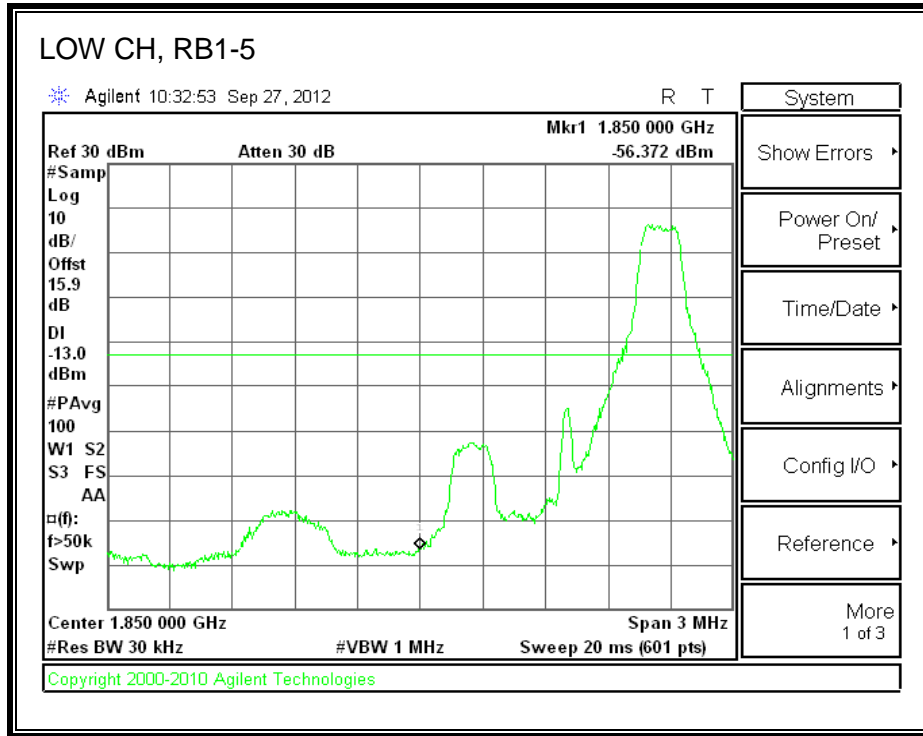
PCS, HSUPA

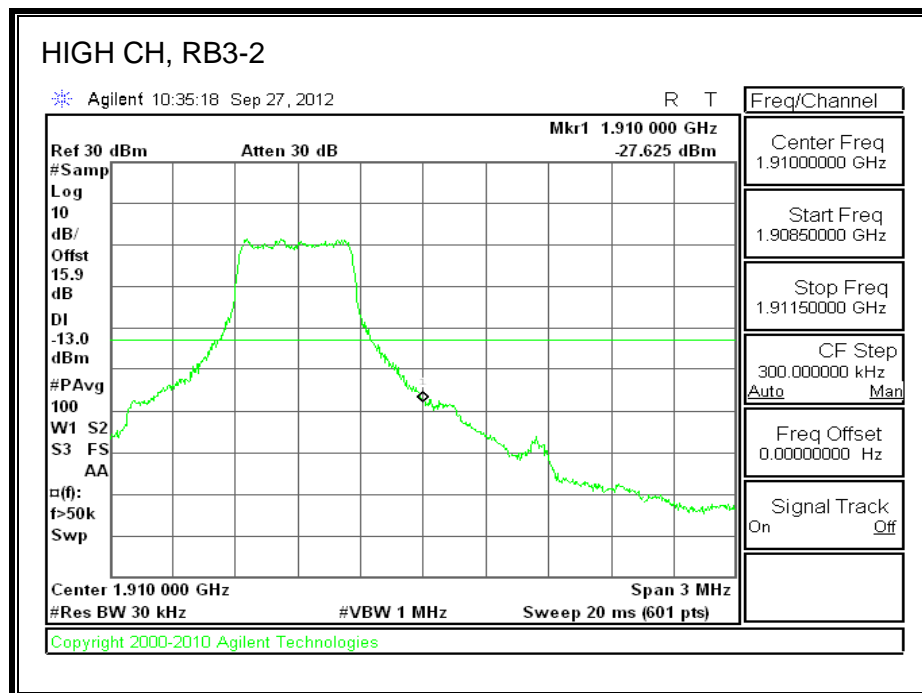
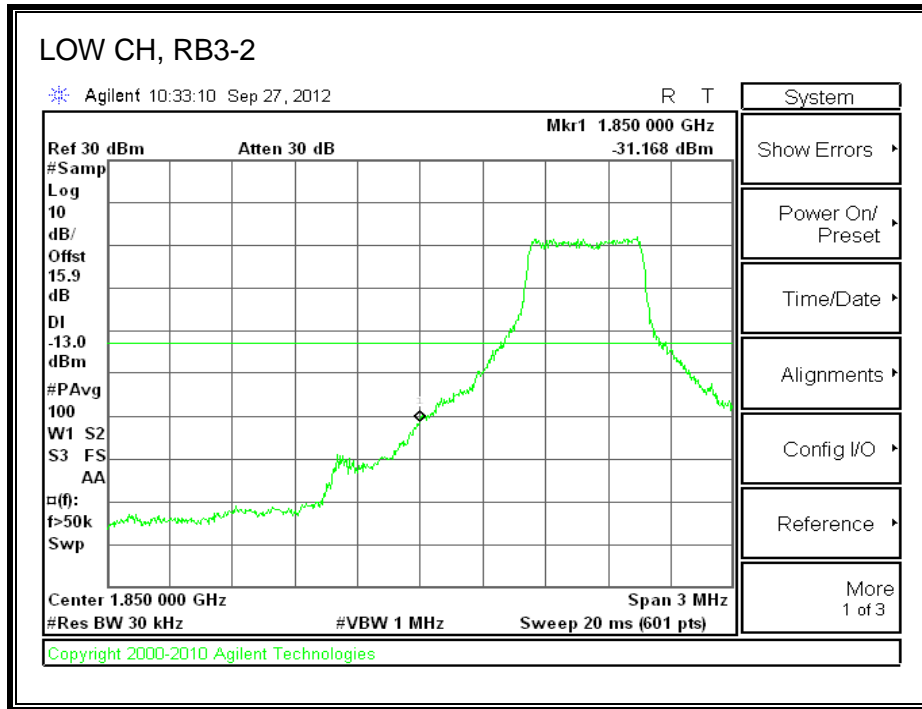


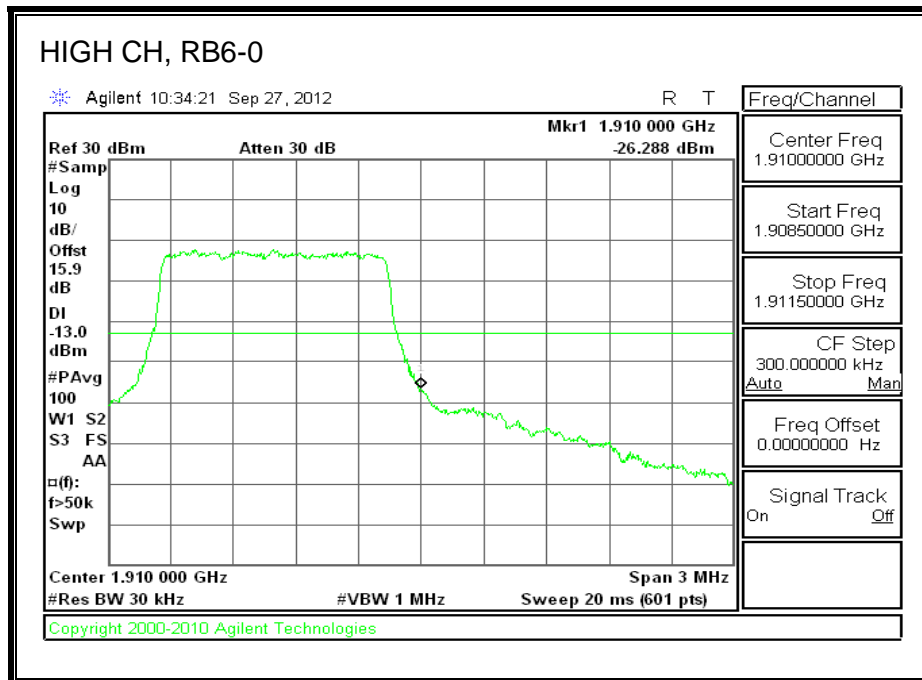
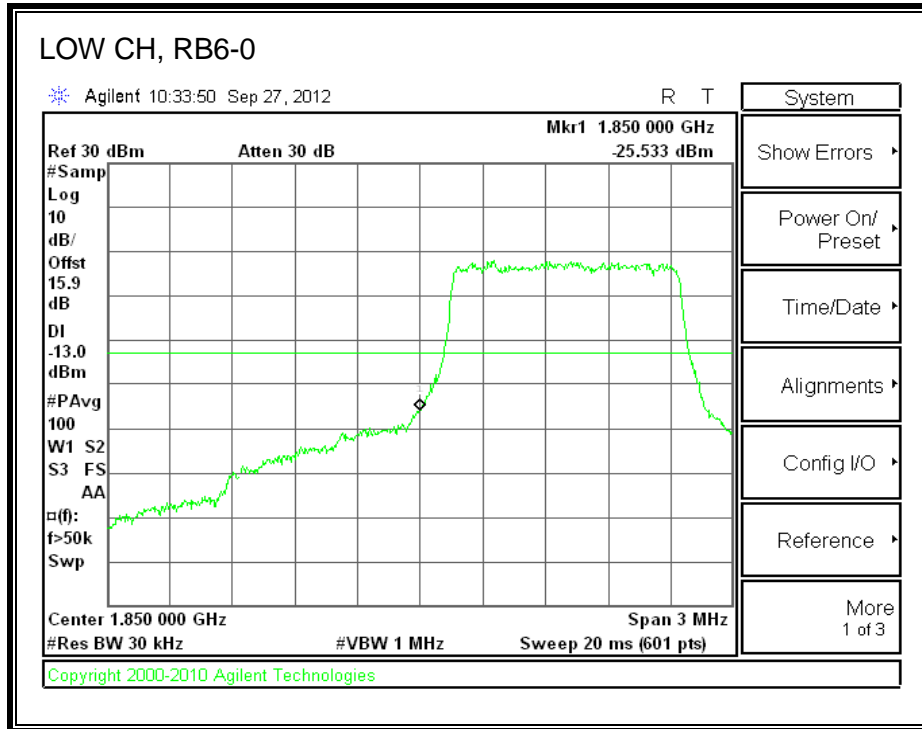
8.2.1. LTE BAND 2

QPSK Band 2 (1.4 MHz BANDWIDTH)

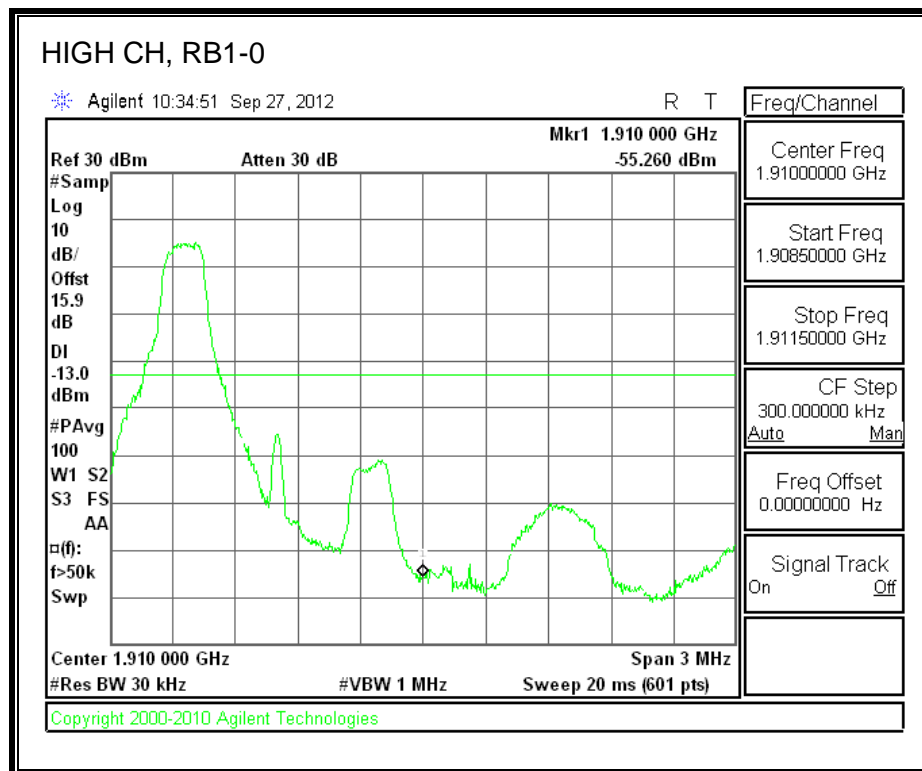
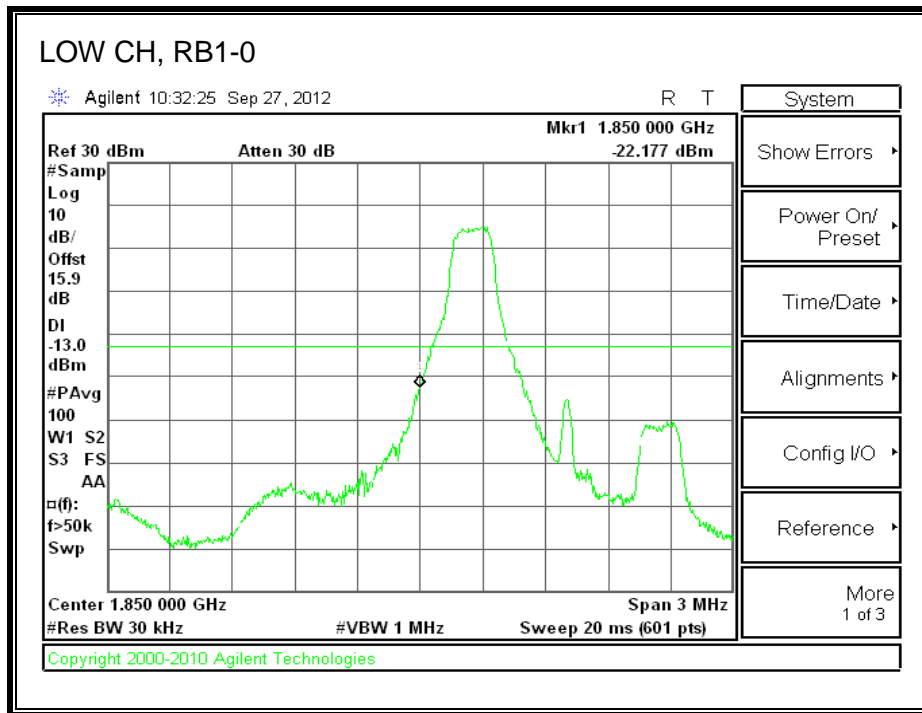


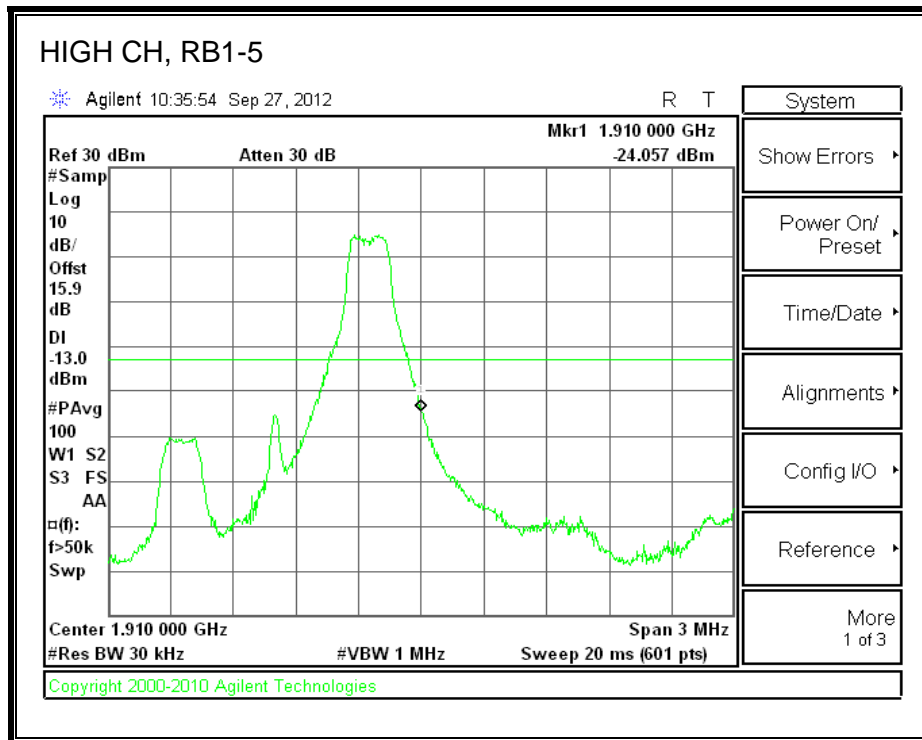
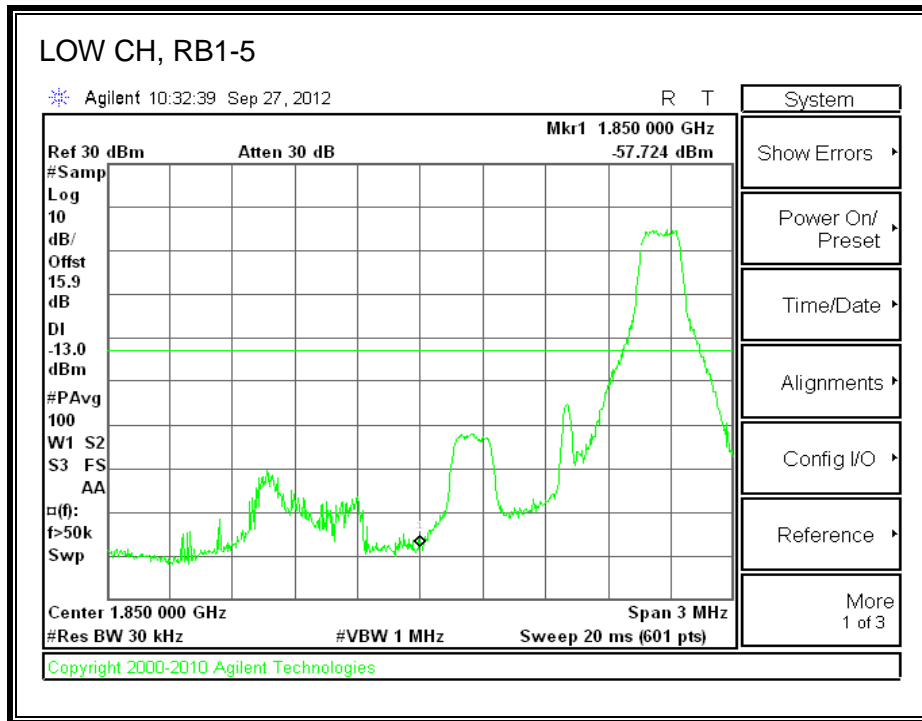


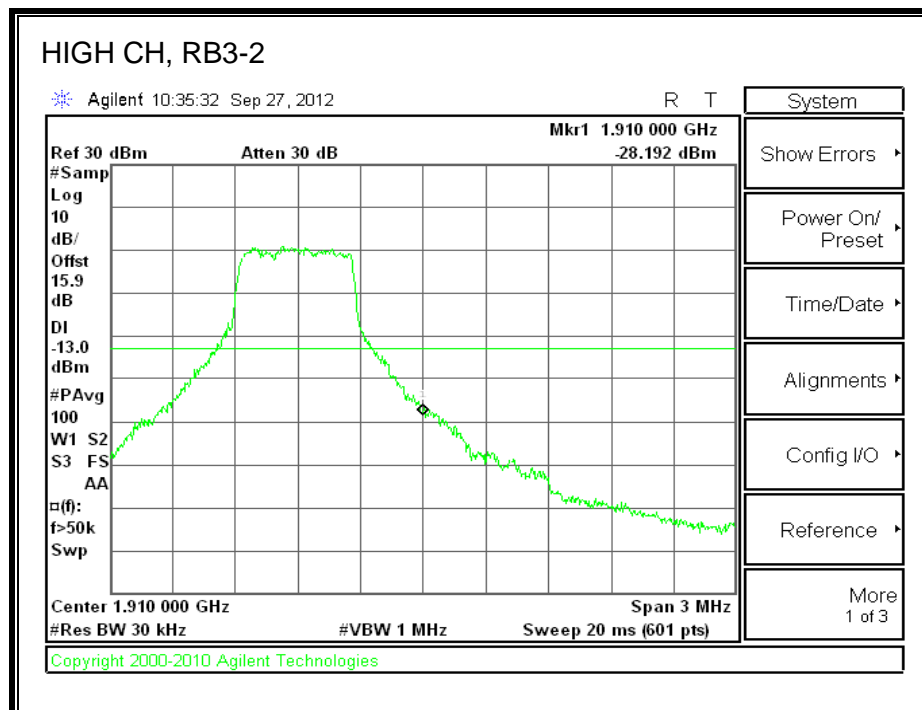
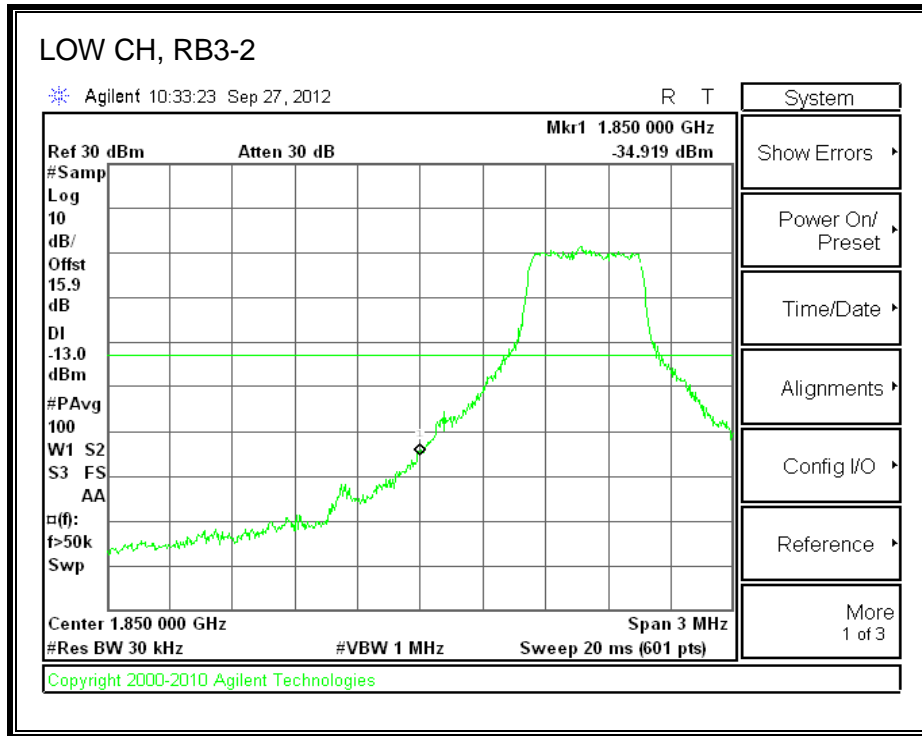


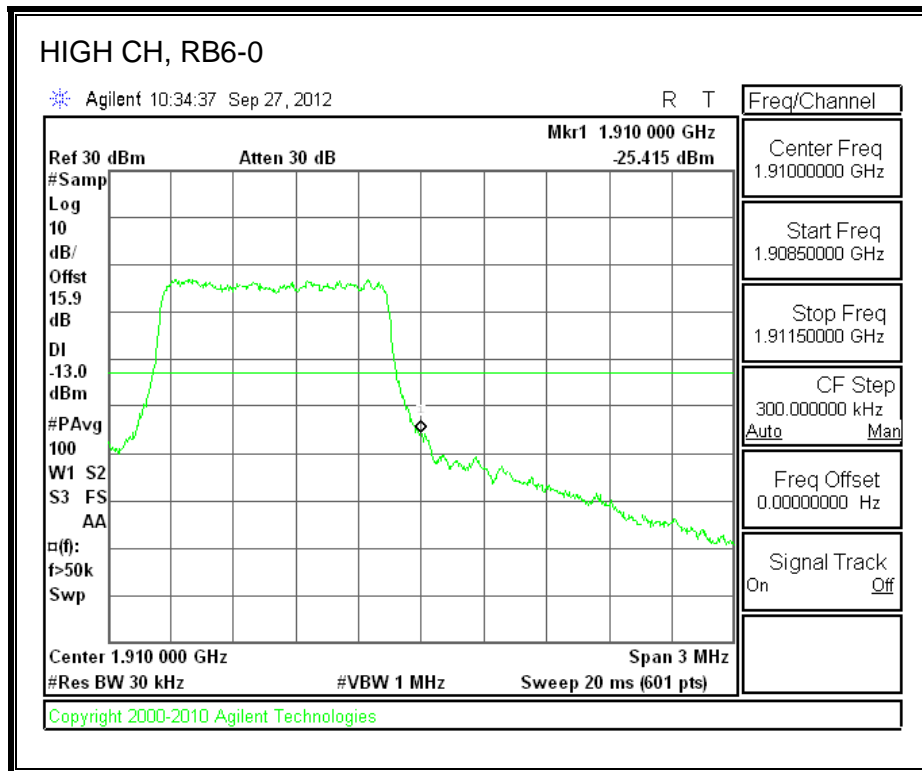
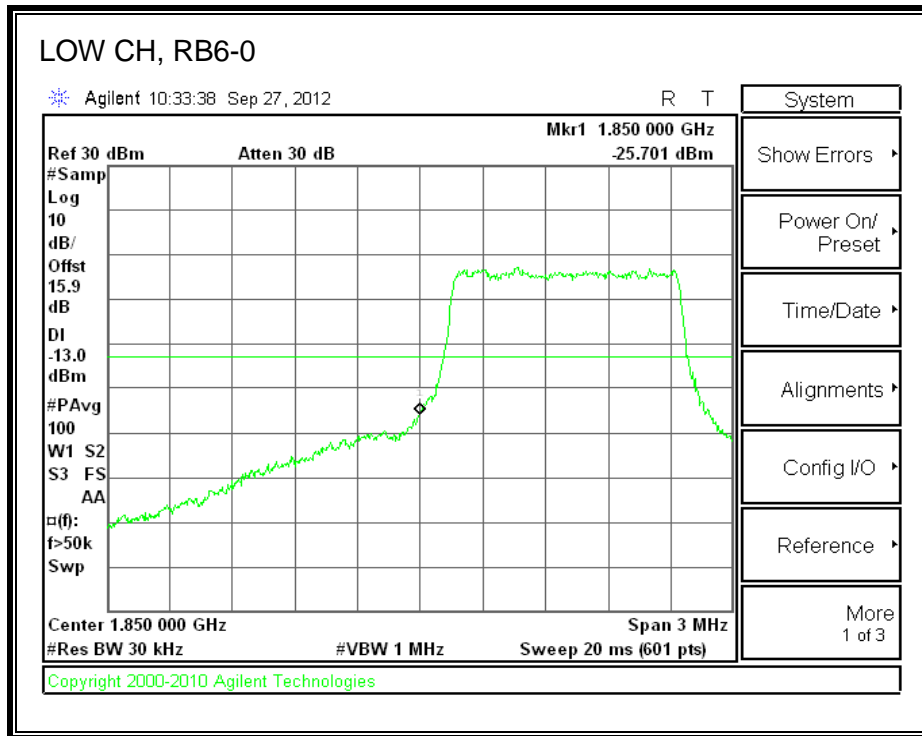


16QAM Band 2 (1.4 MHz BANDWIDTH)

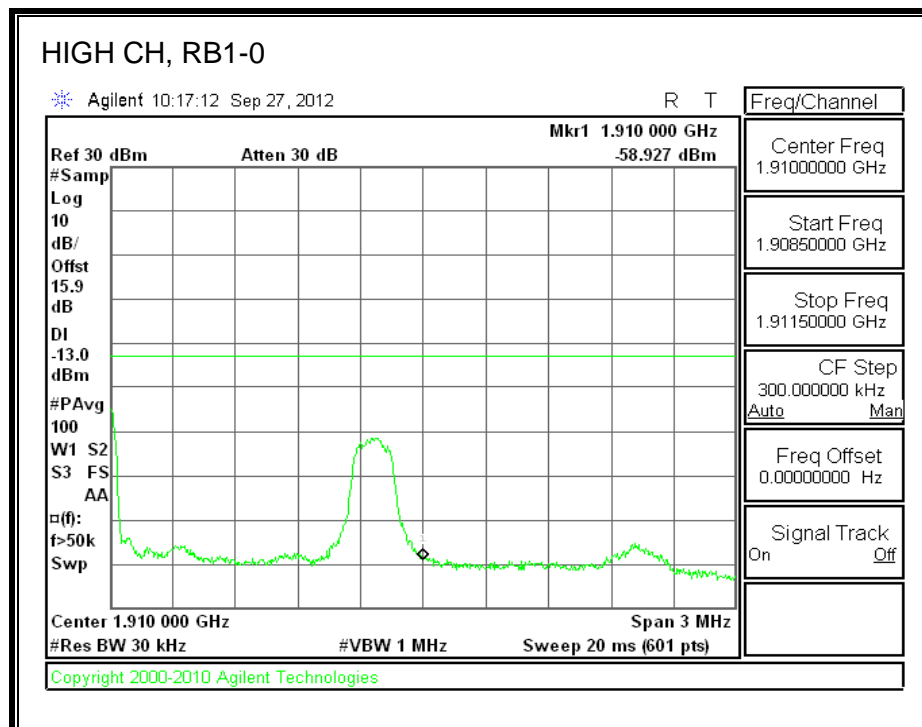
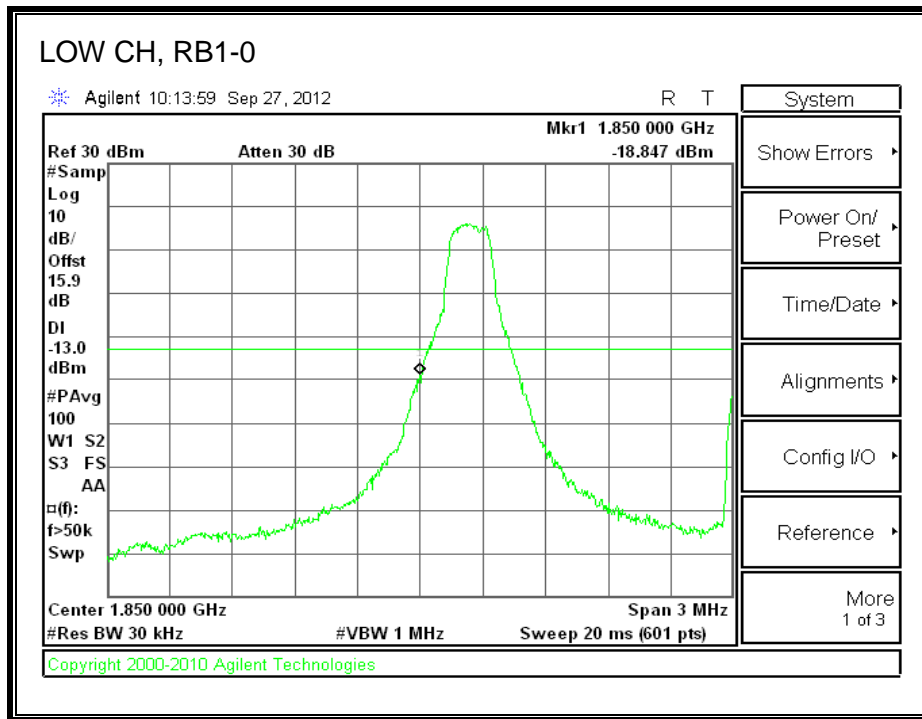


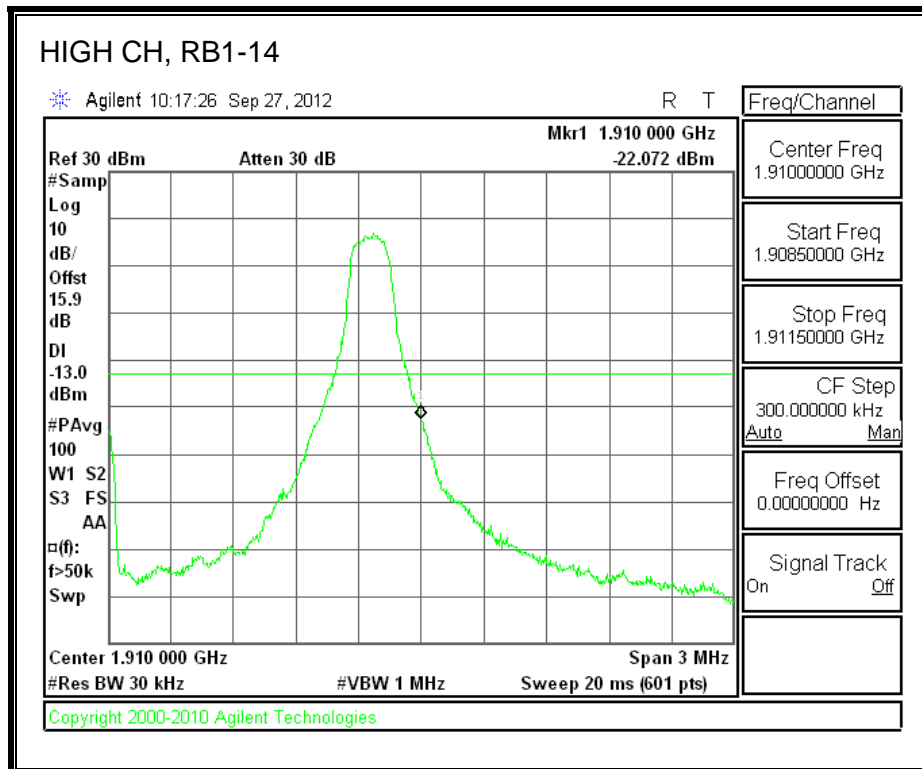
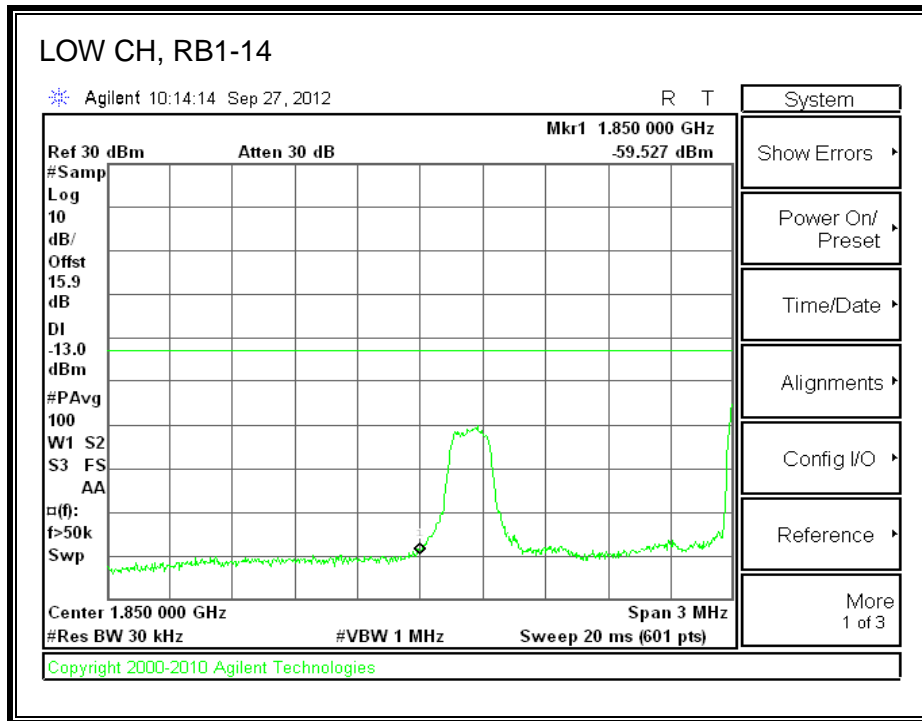


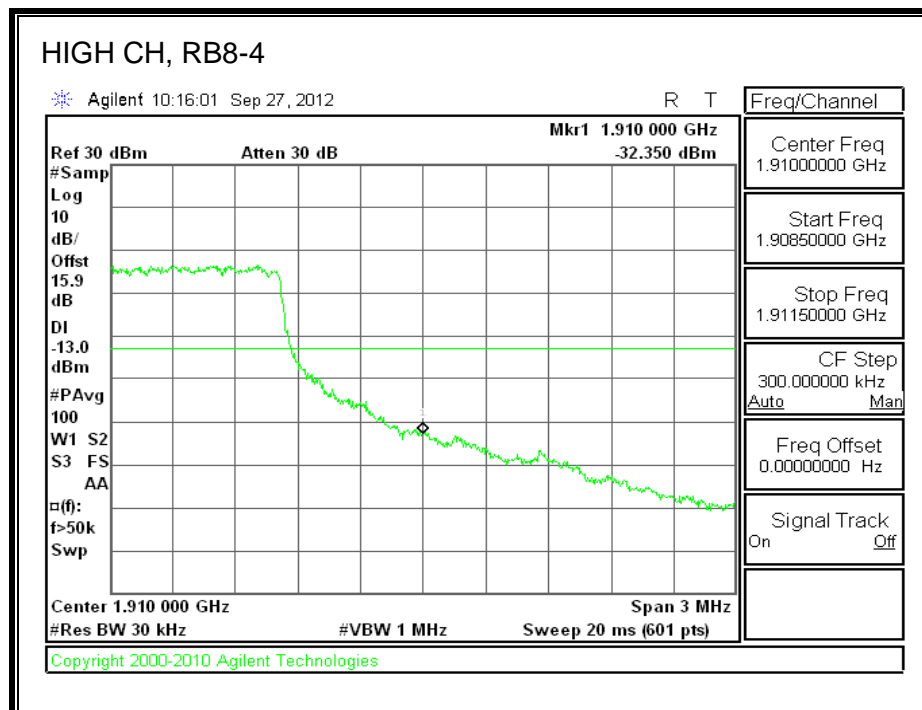
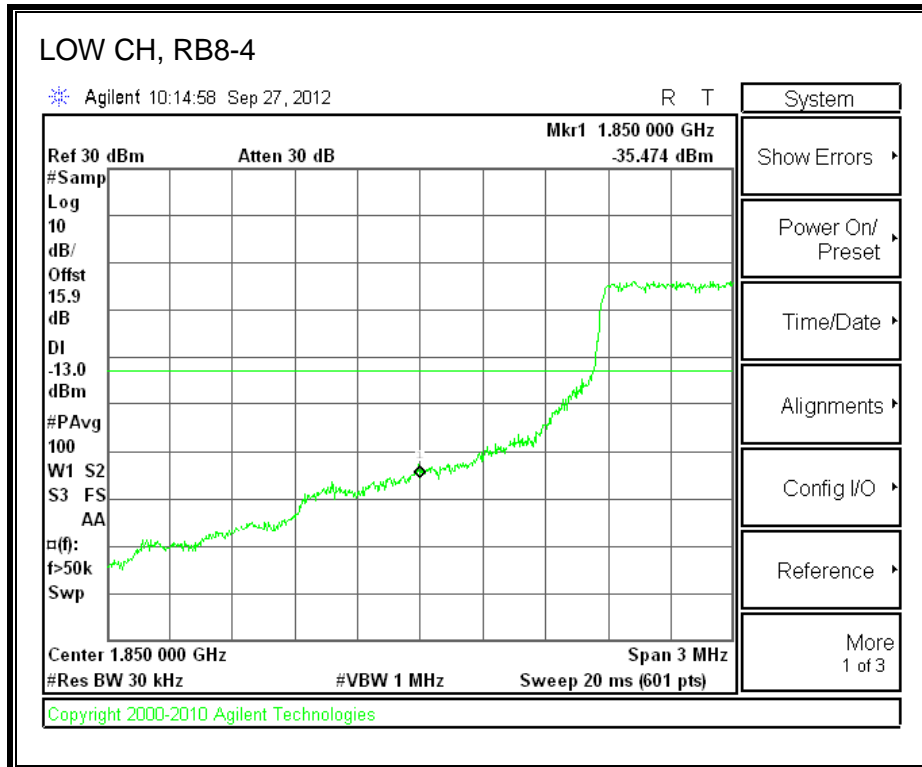


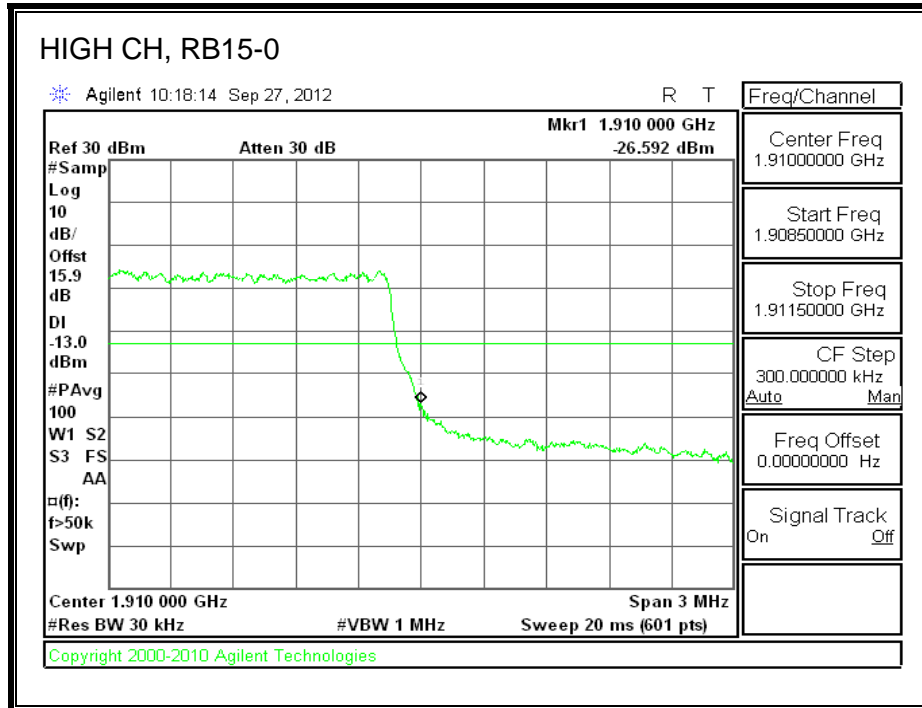
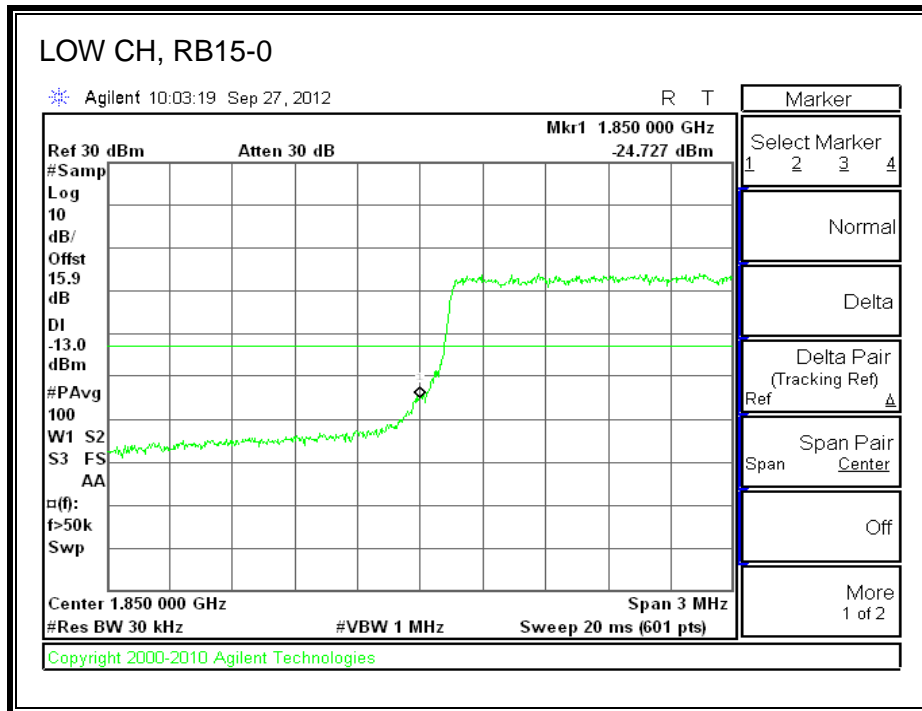


QPSK Band 2 (3 MHz BANDWIDTH)

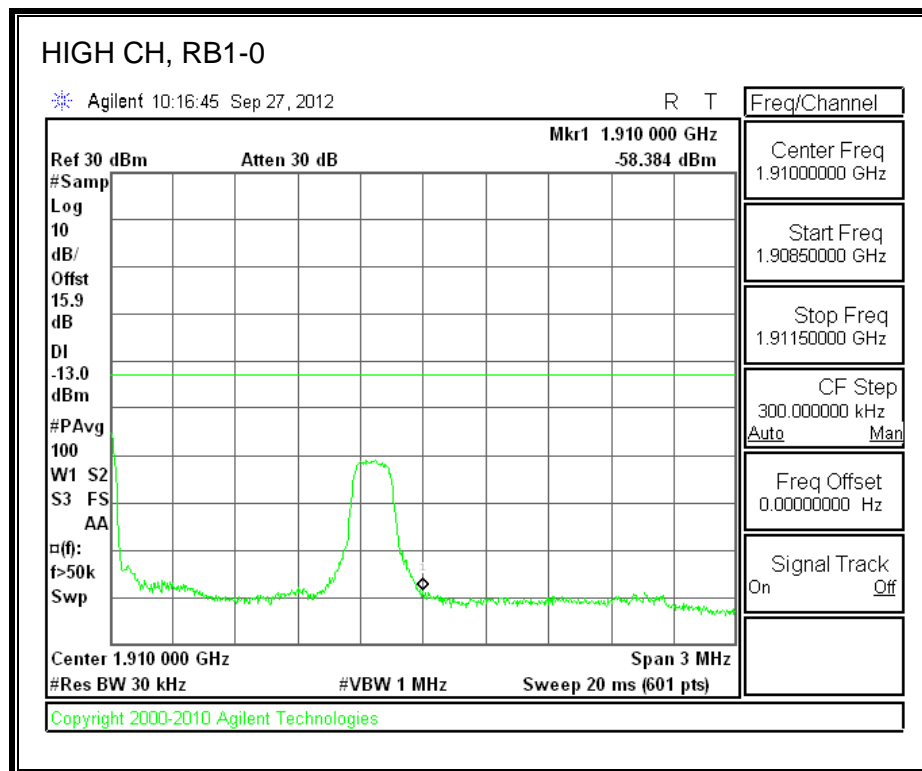
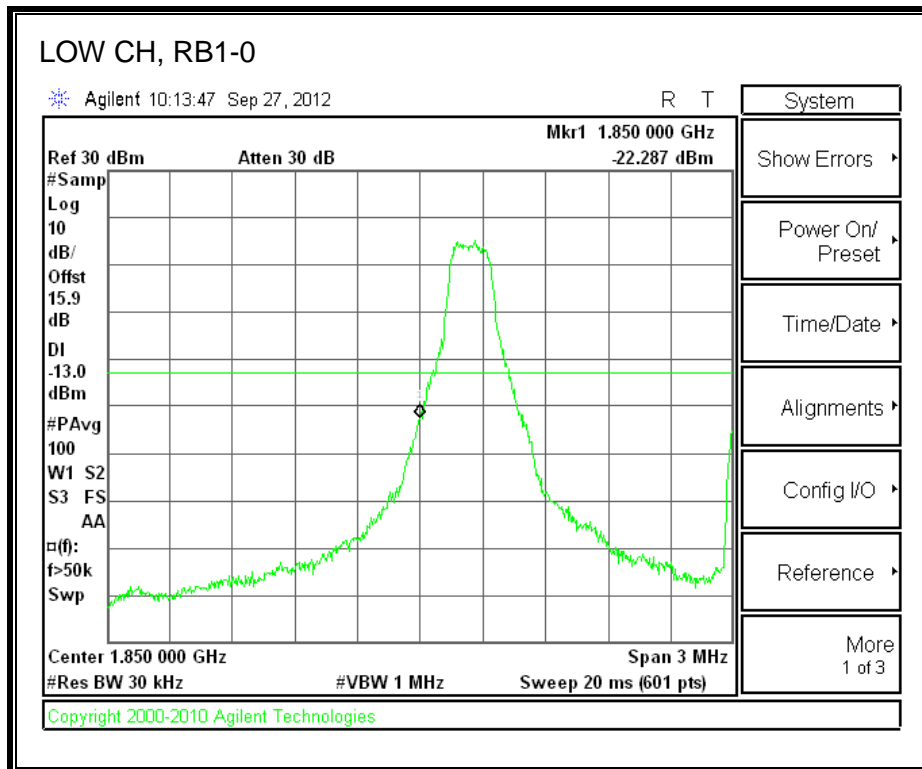


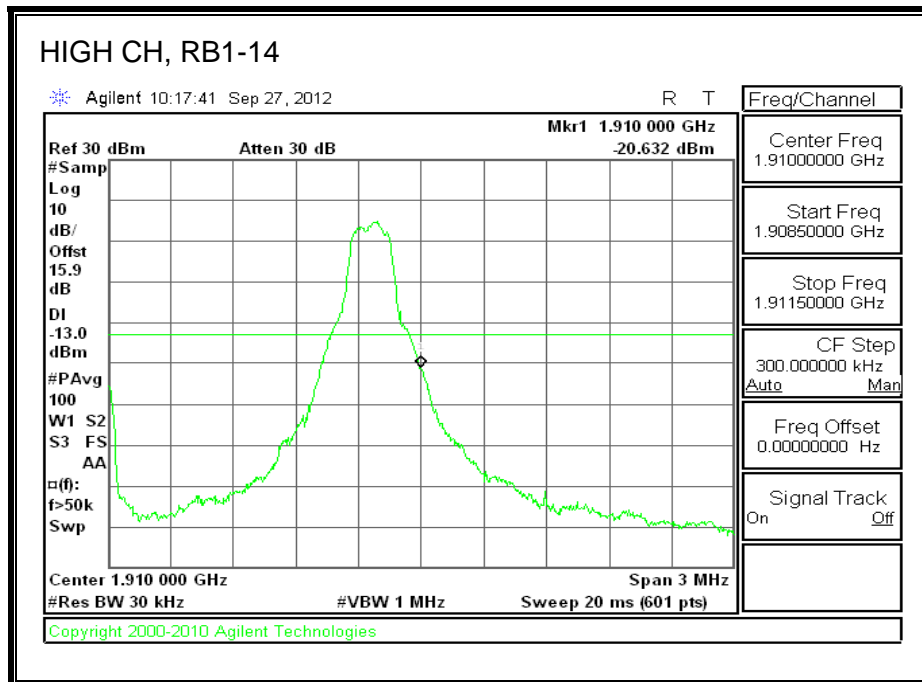
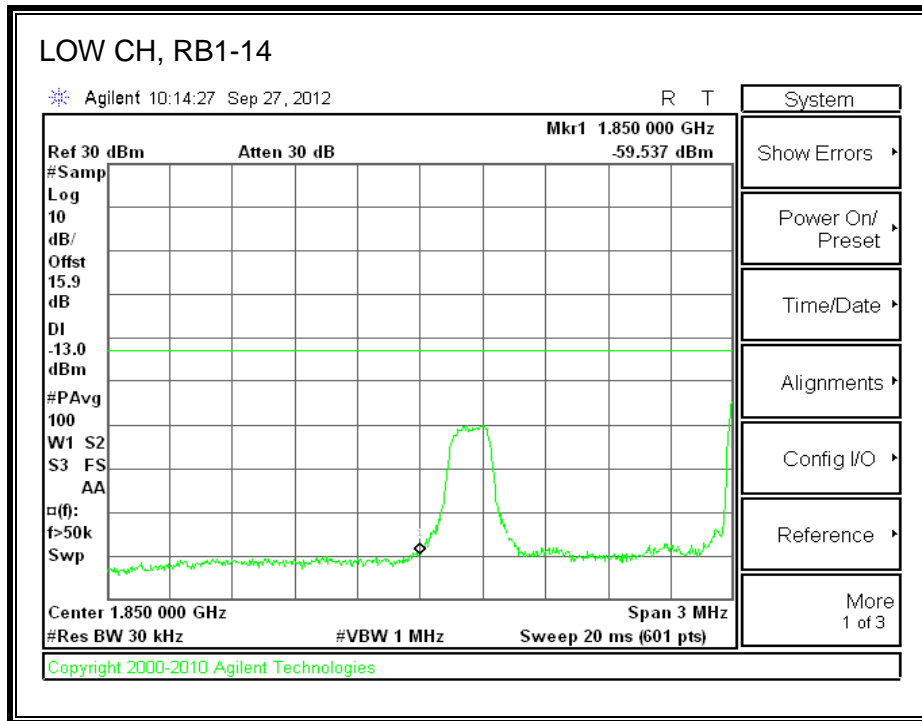


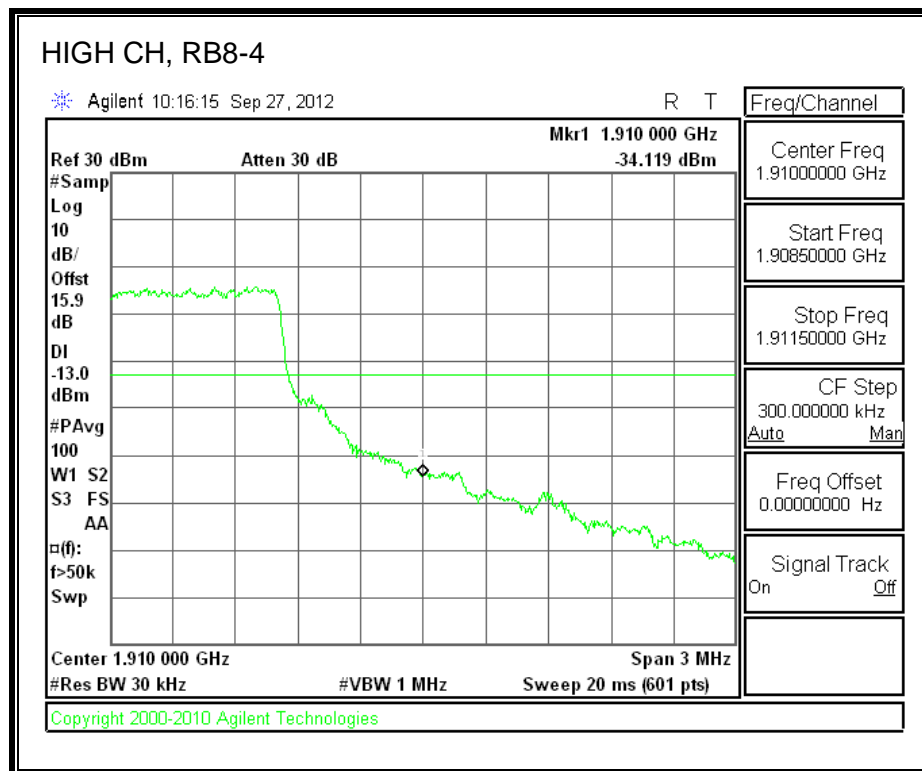
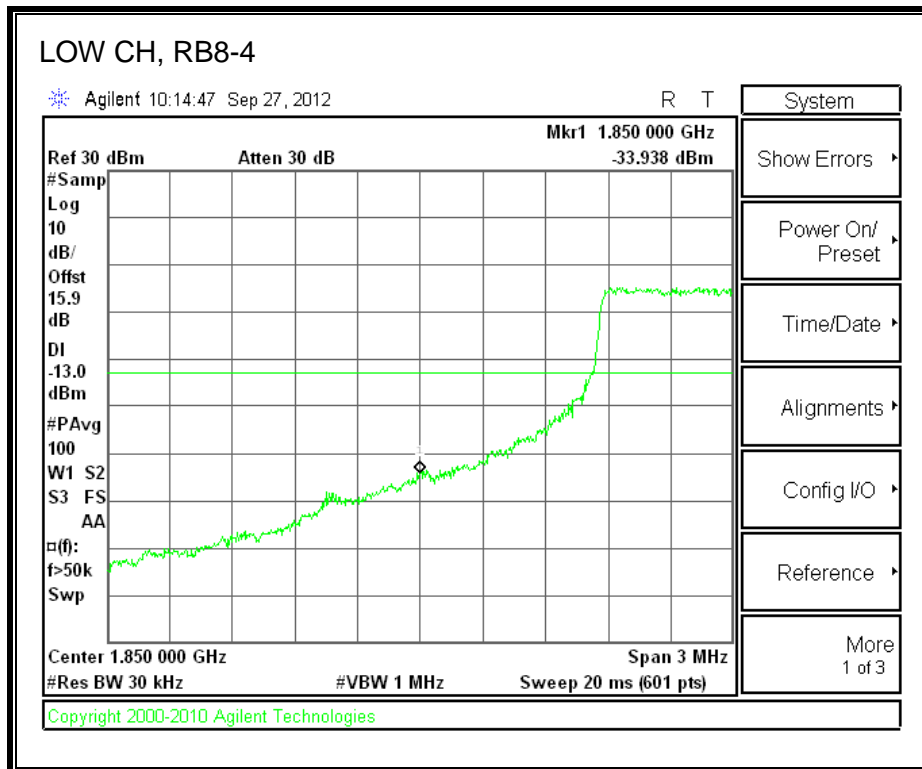


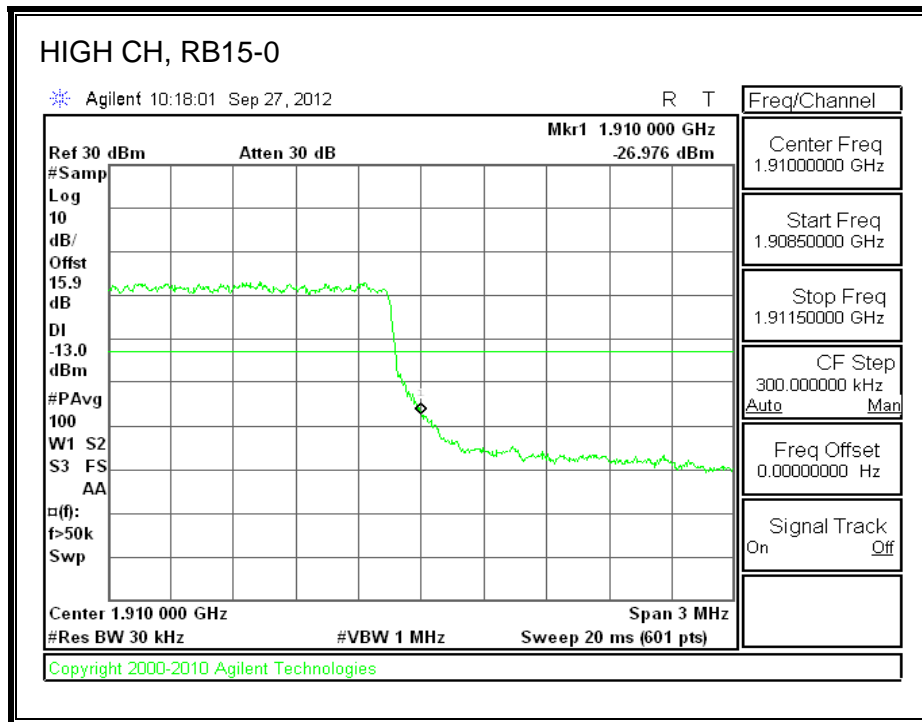
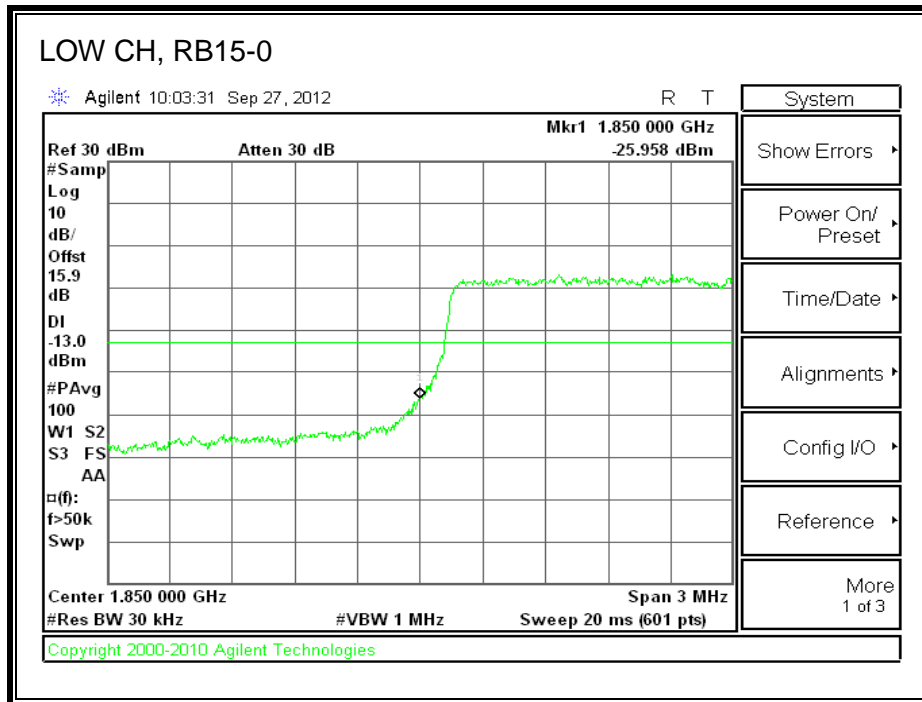


16QAM Band 2 (3 MHz BANDWIDTH)

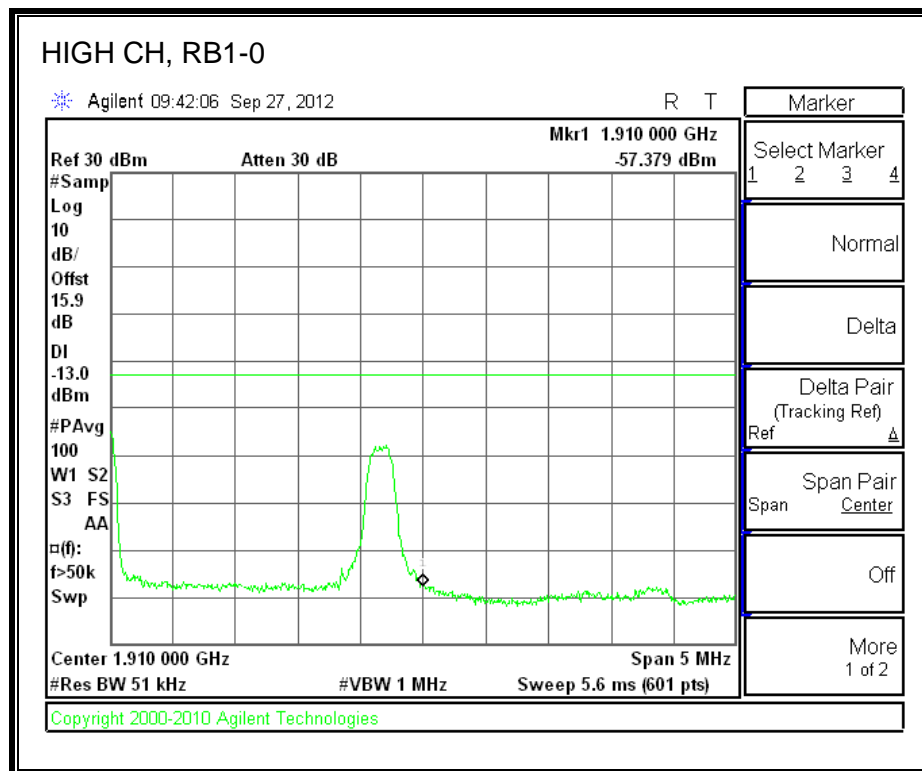
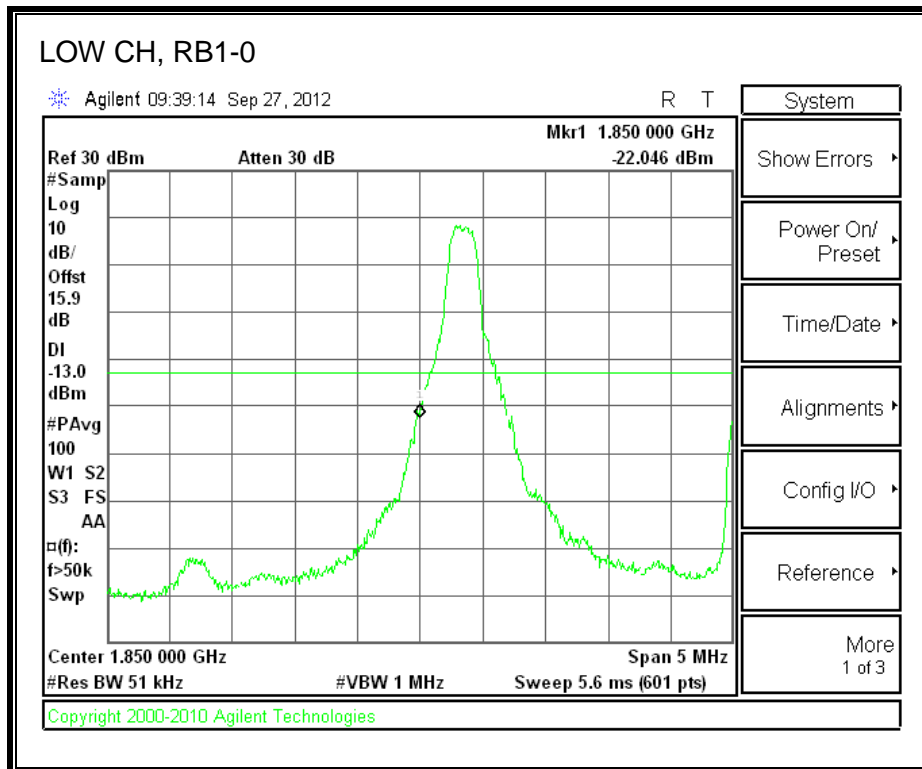


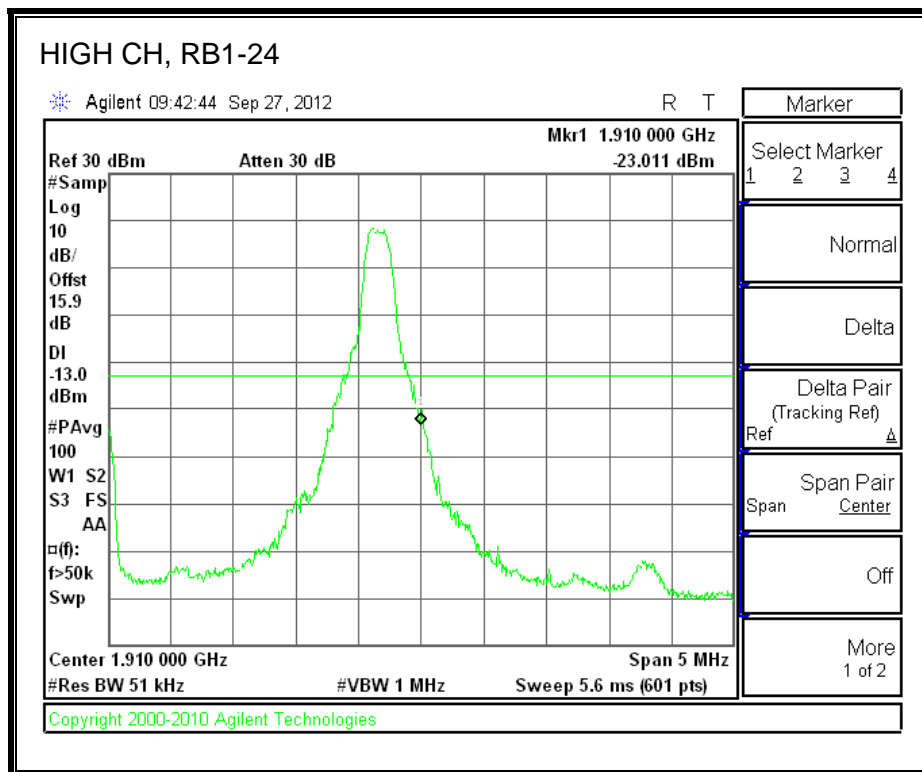
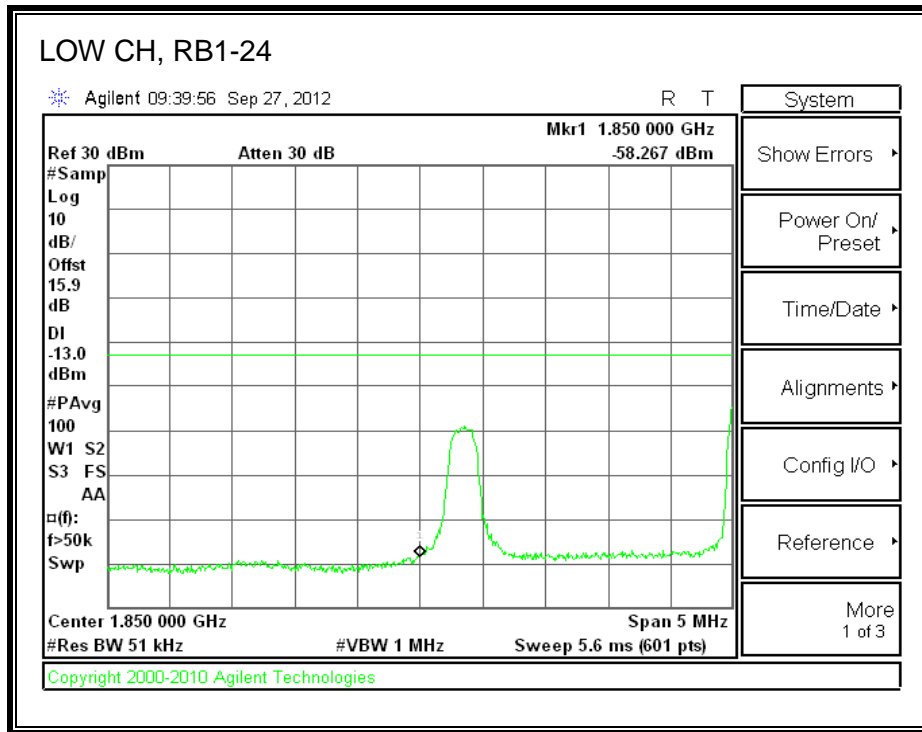


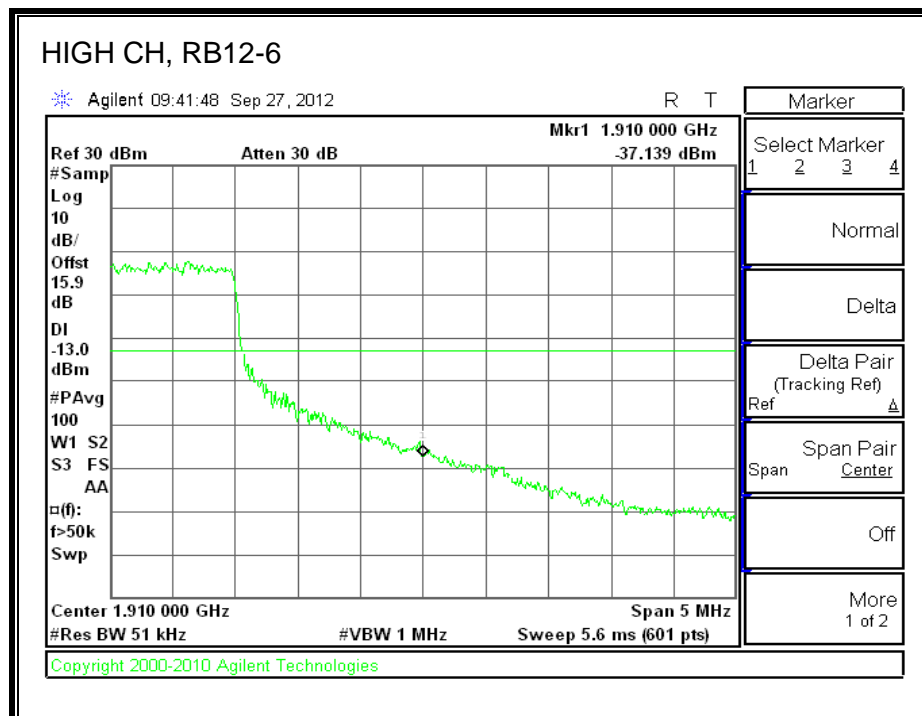
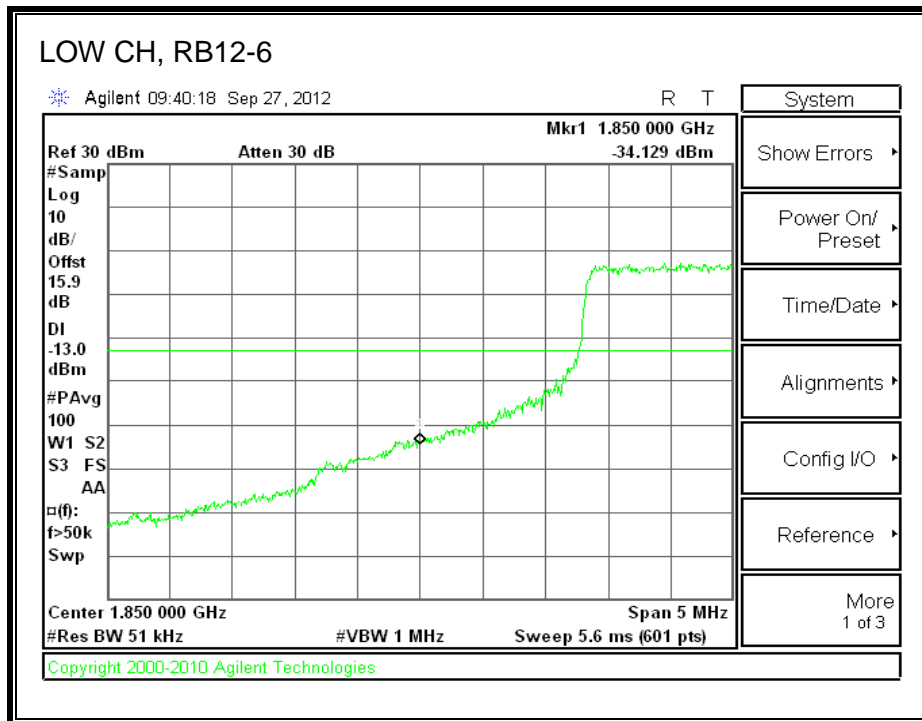


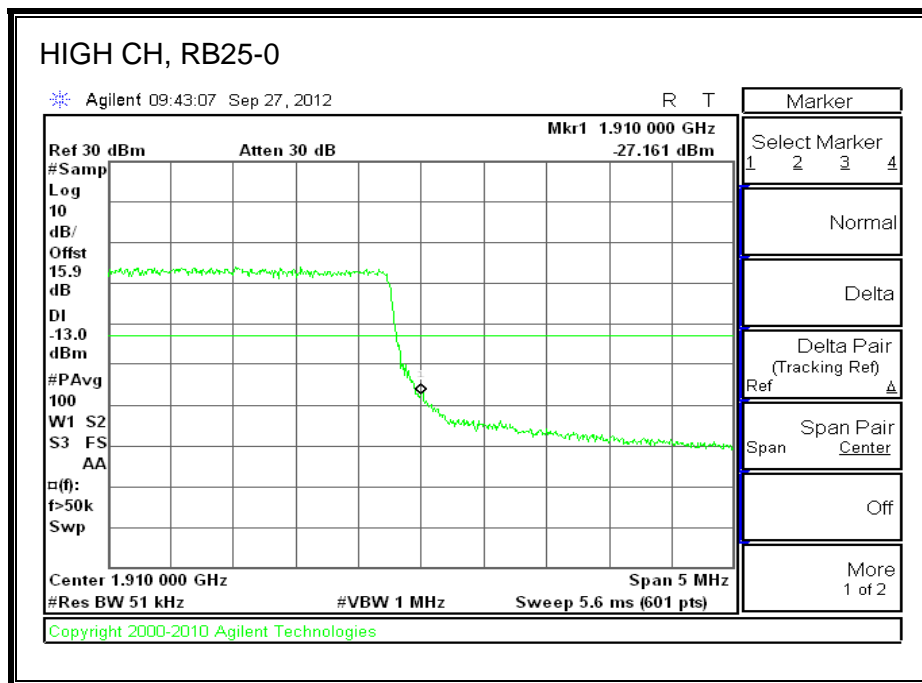
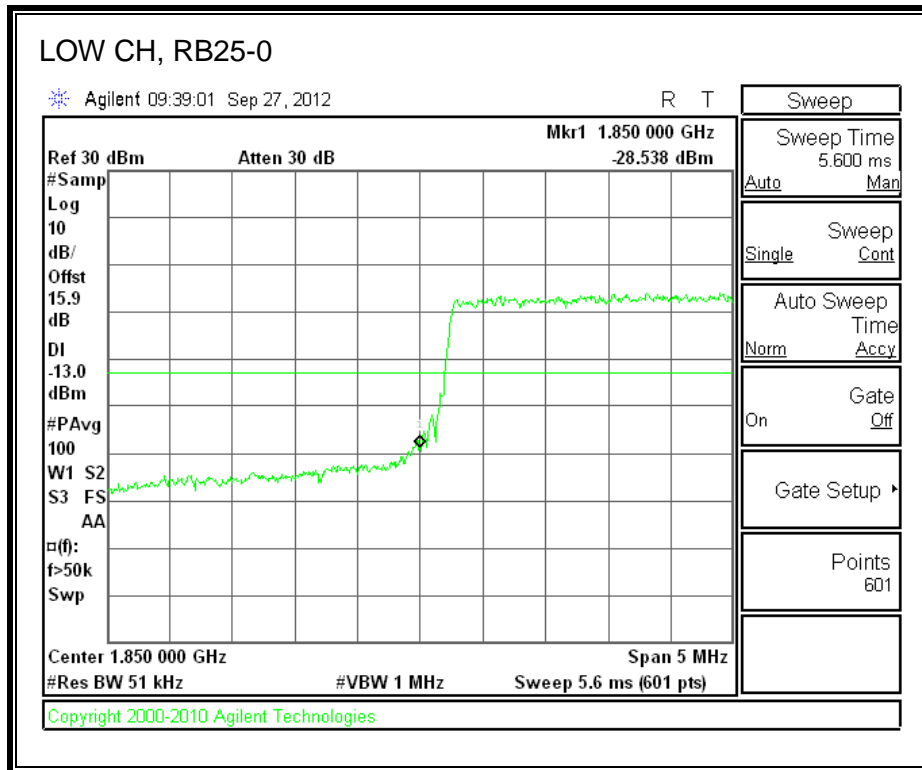


QPSK Band 2 (5 MHz BANDWIDTH)

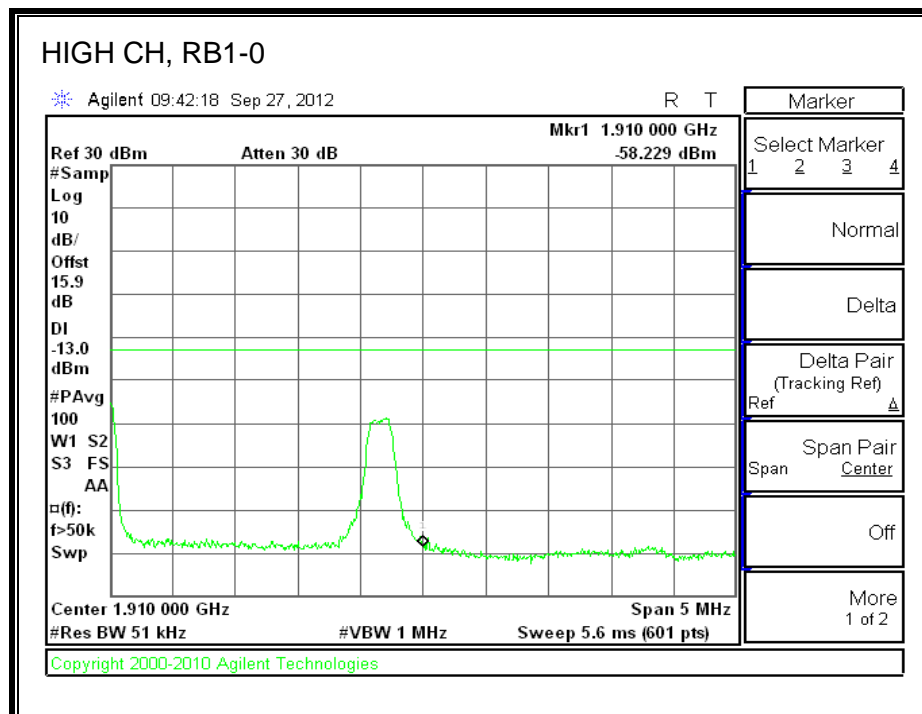
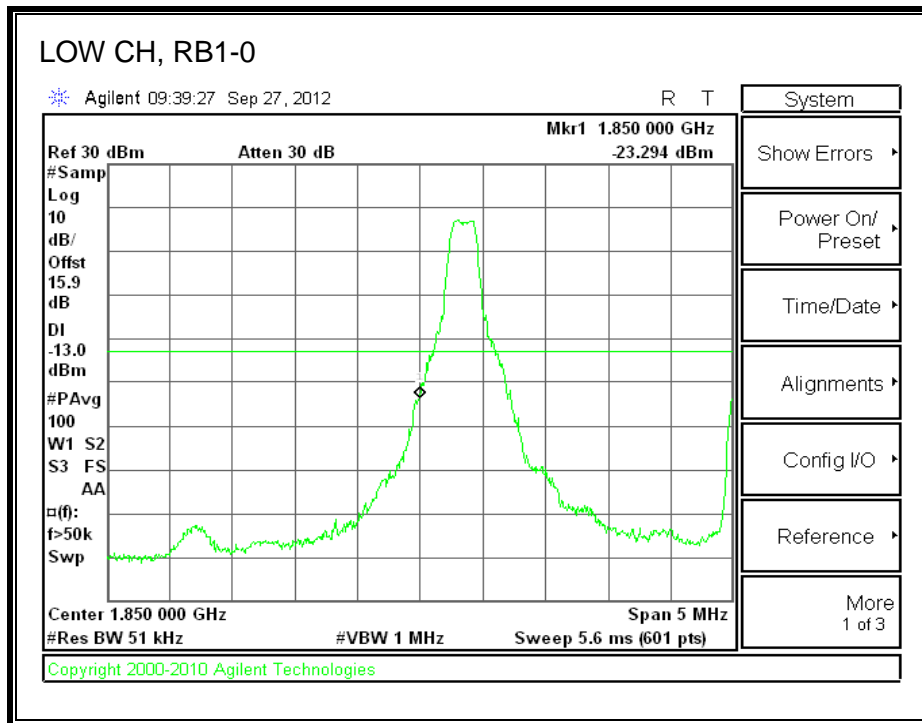


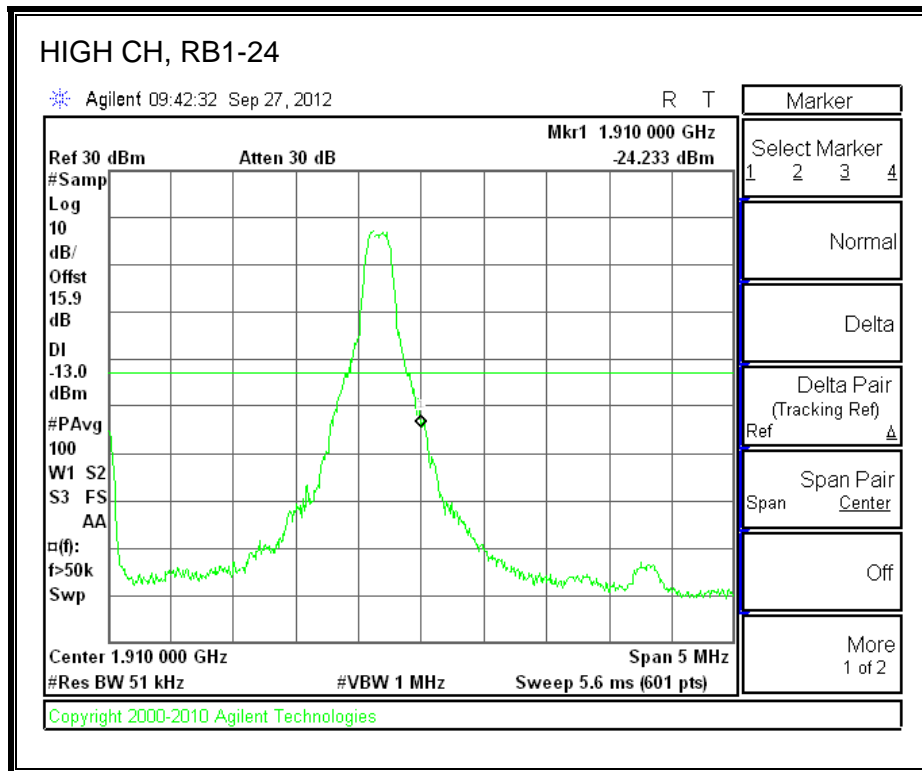
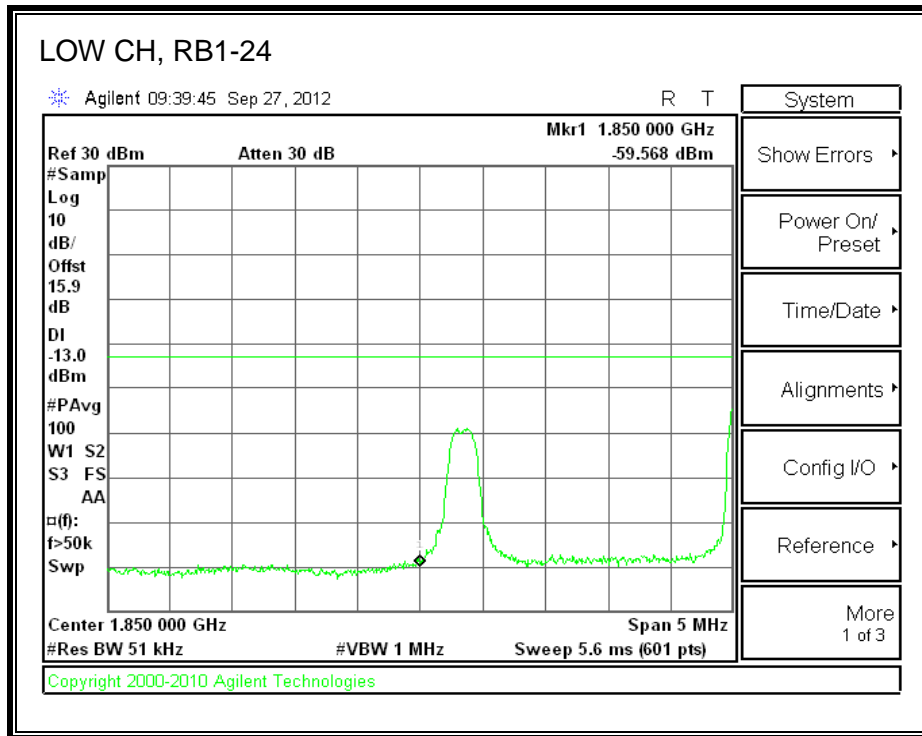


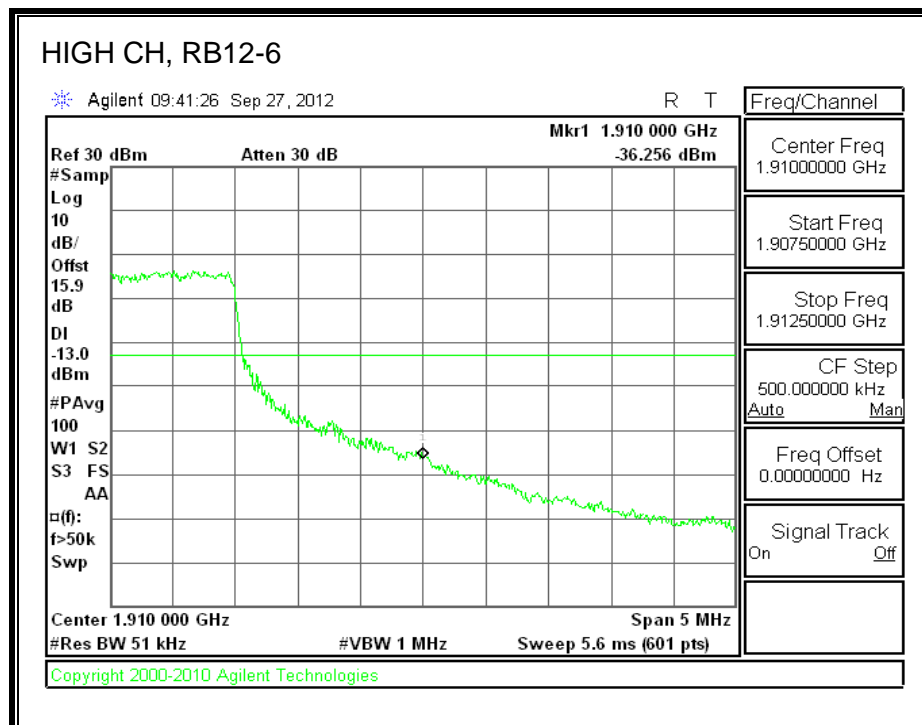
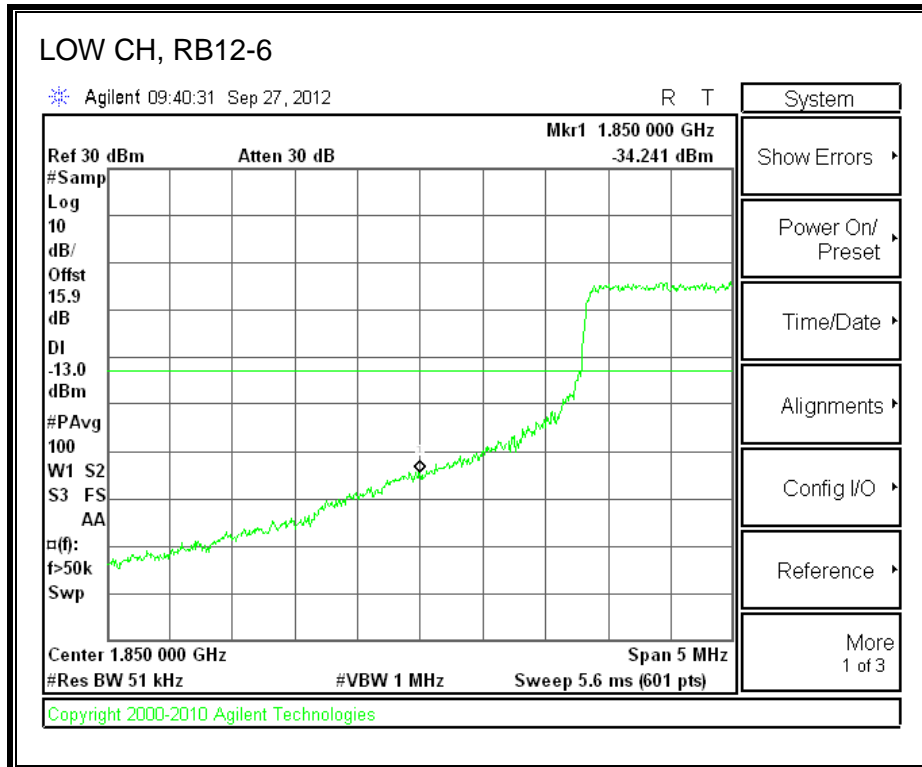


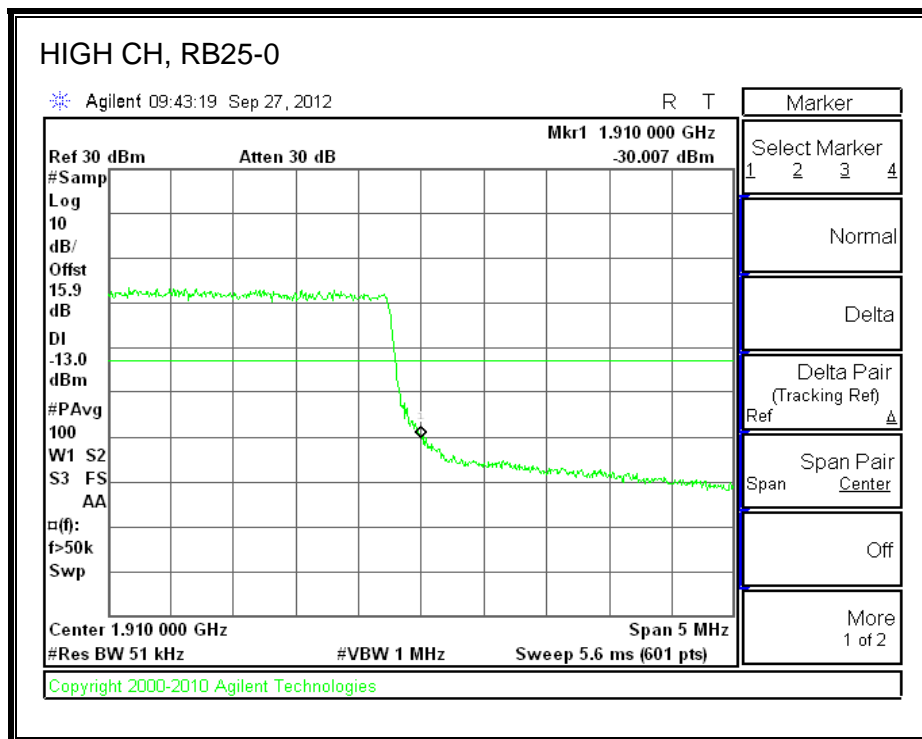
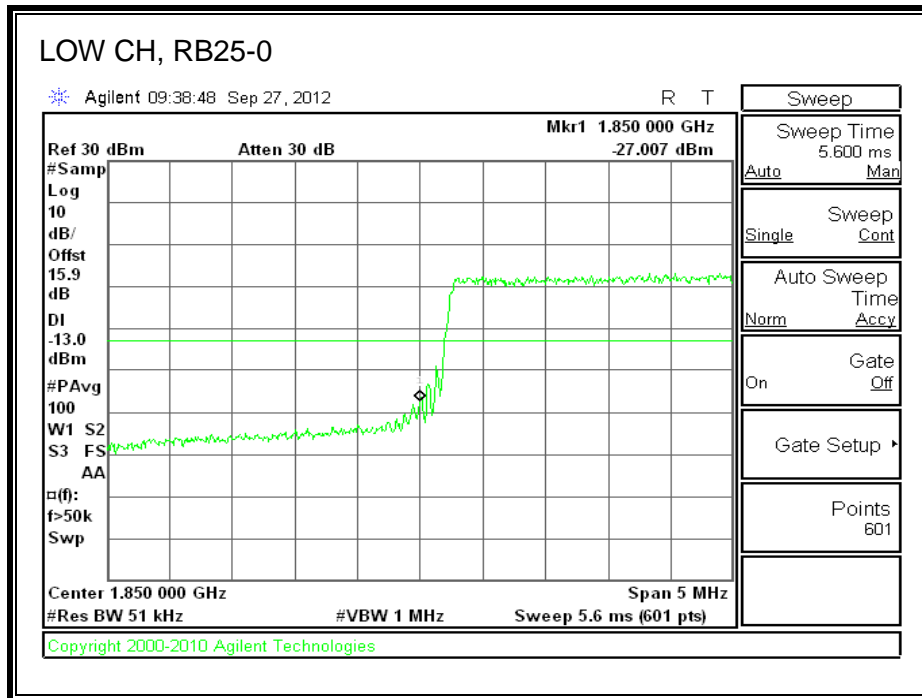


16QAM Band 2 (5 MHz BANDWIDTH)

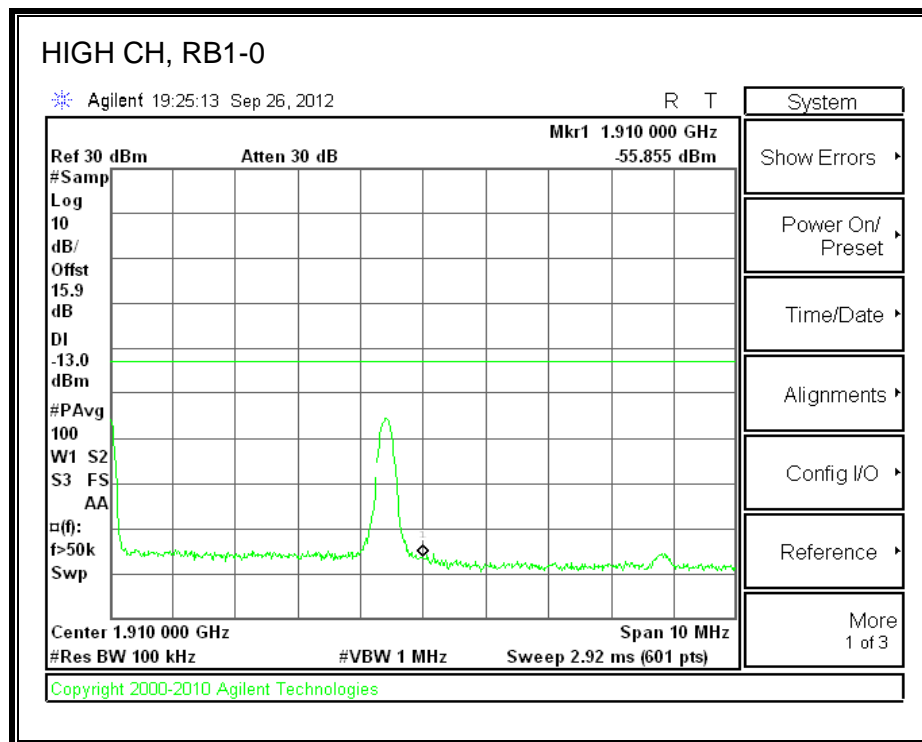
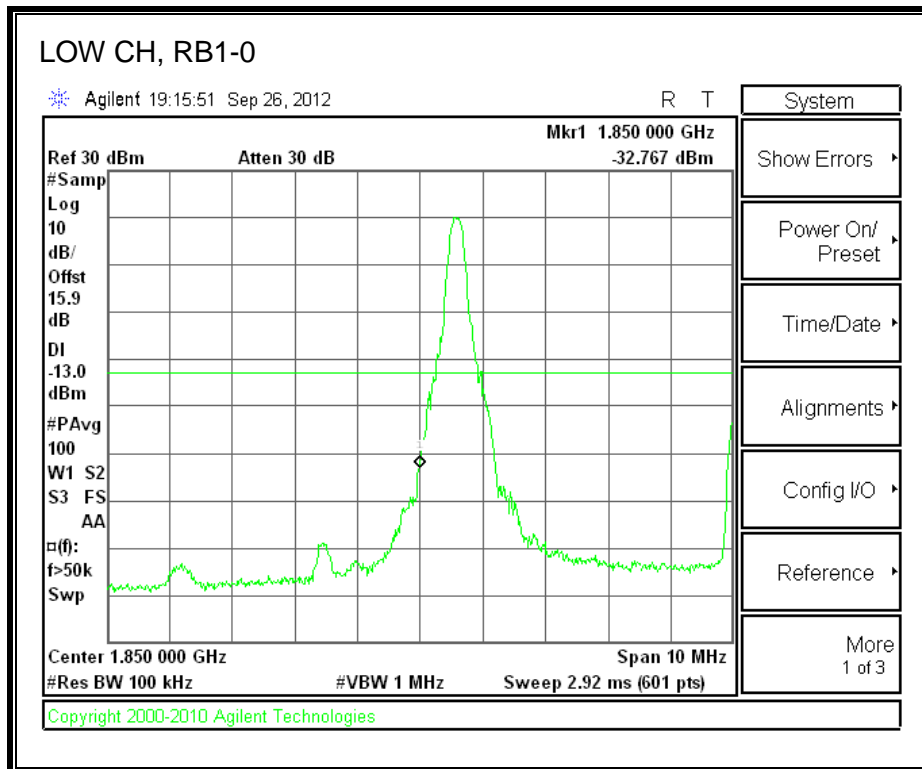


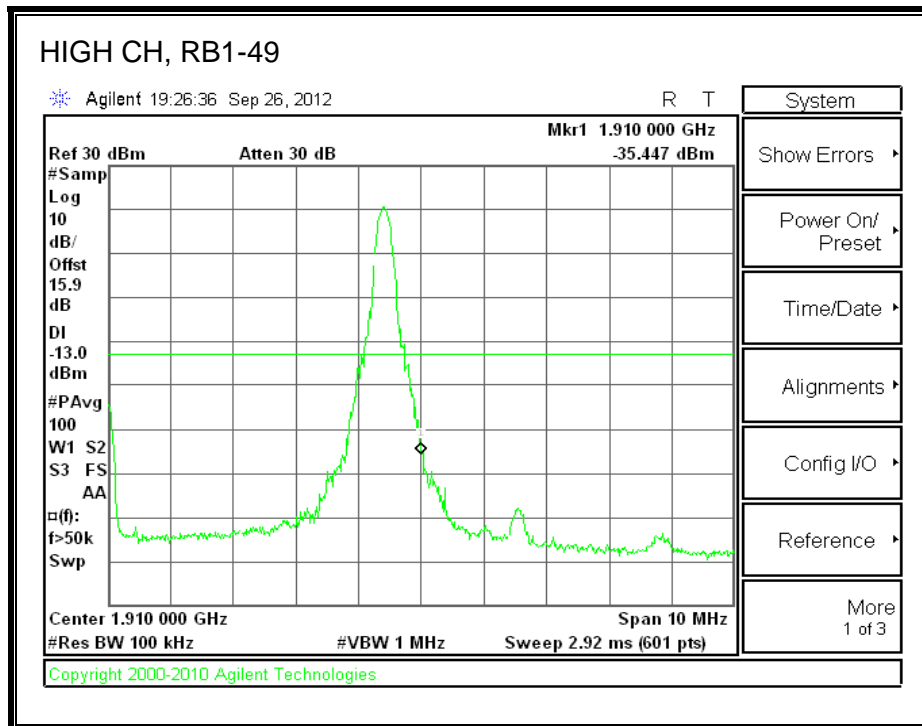
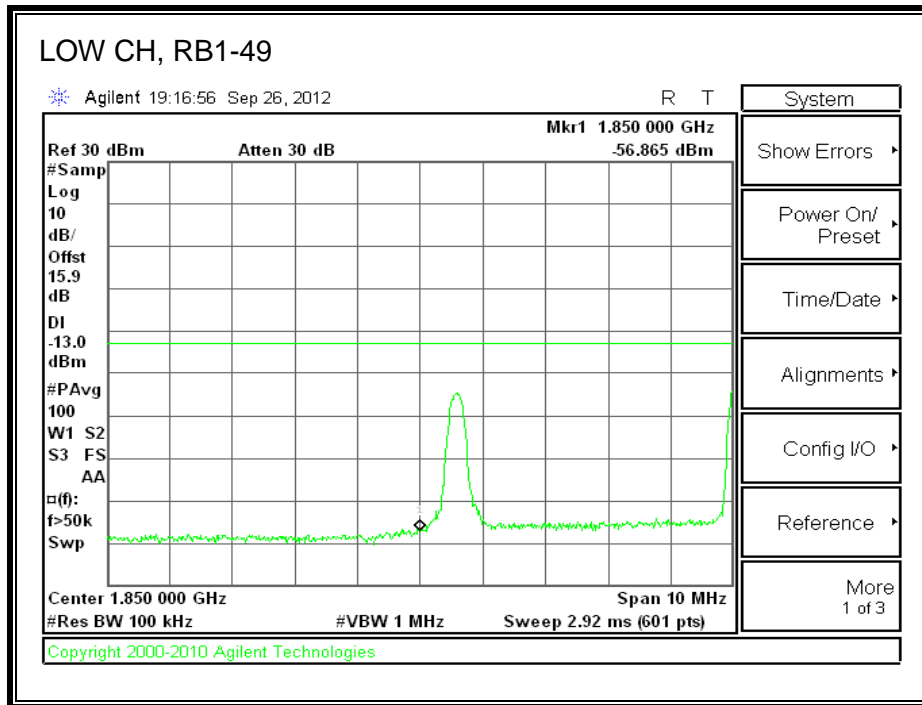


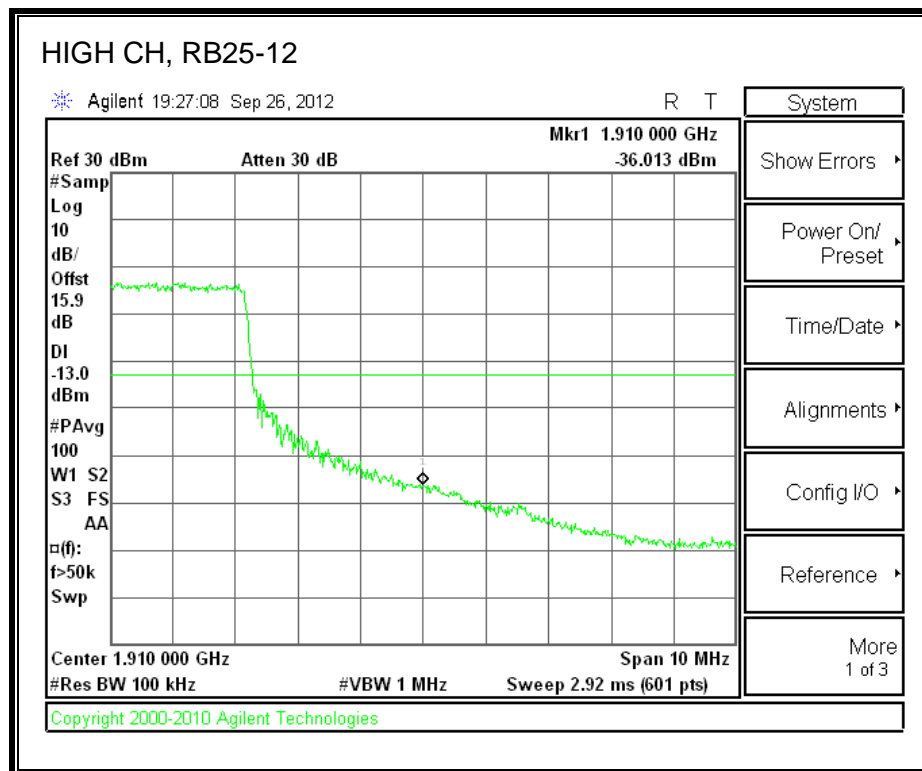
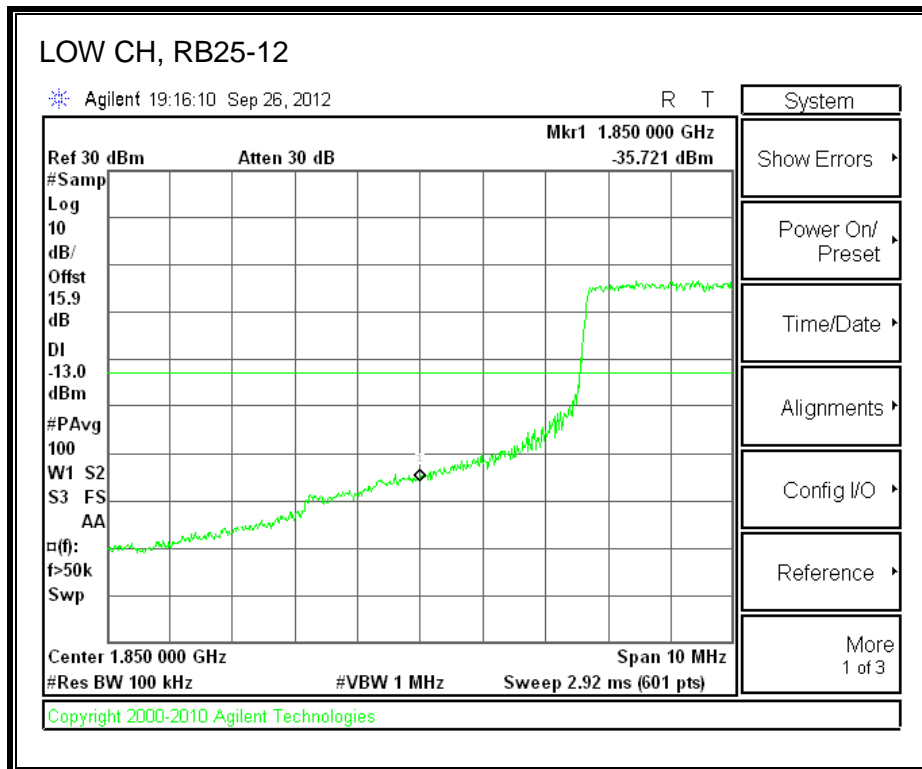


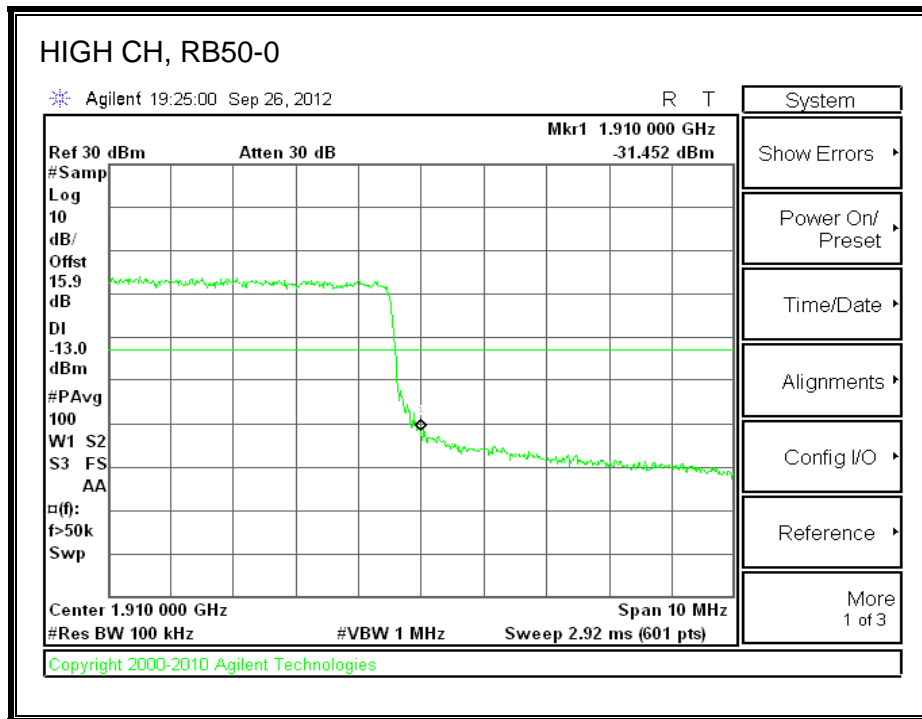
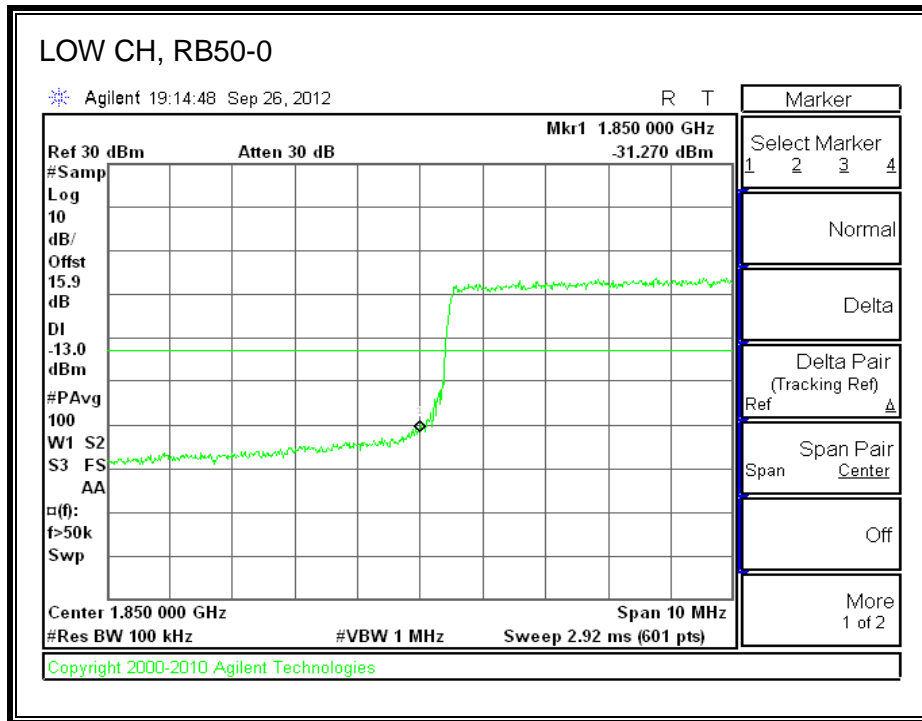


QPSK Band 2 (10 MHz BANDWIDTH)

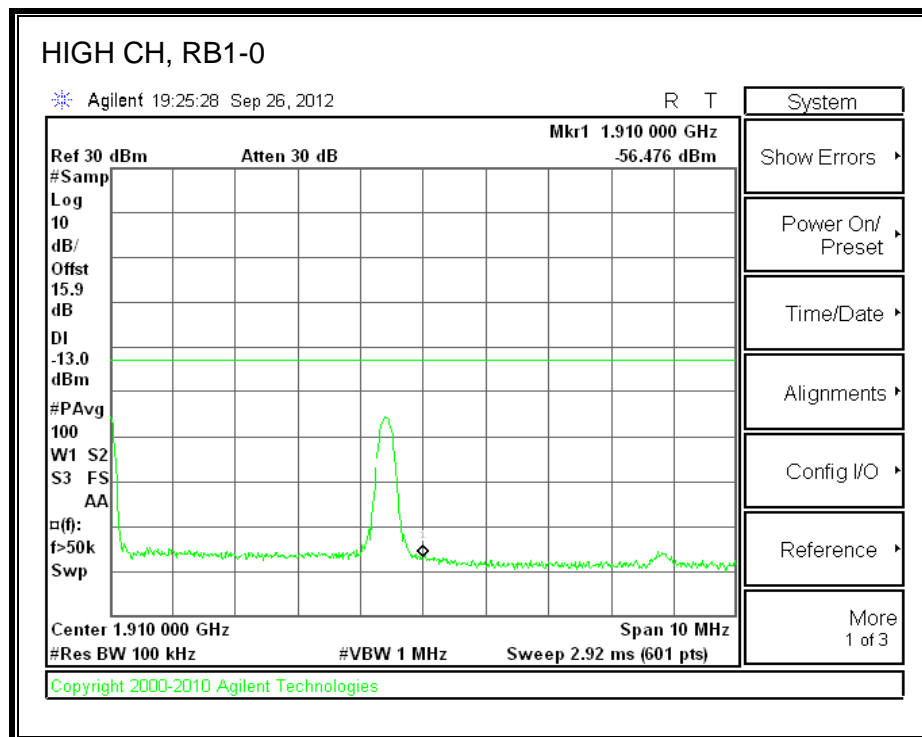
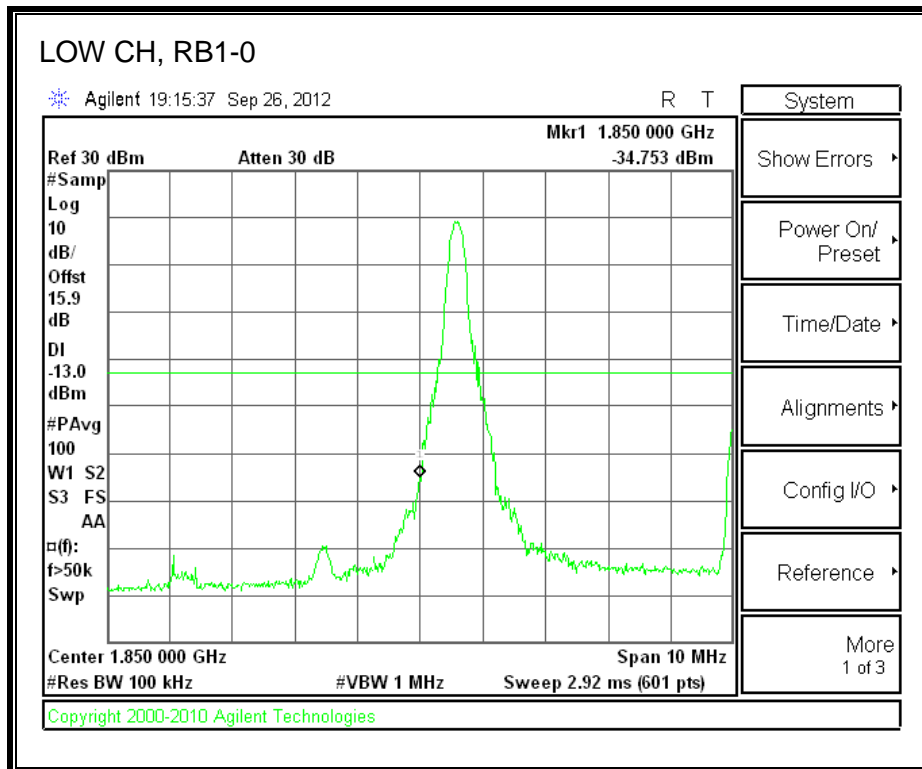


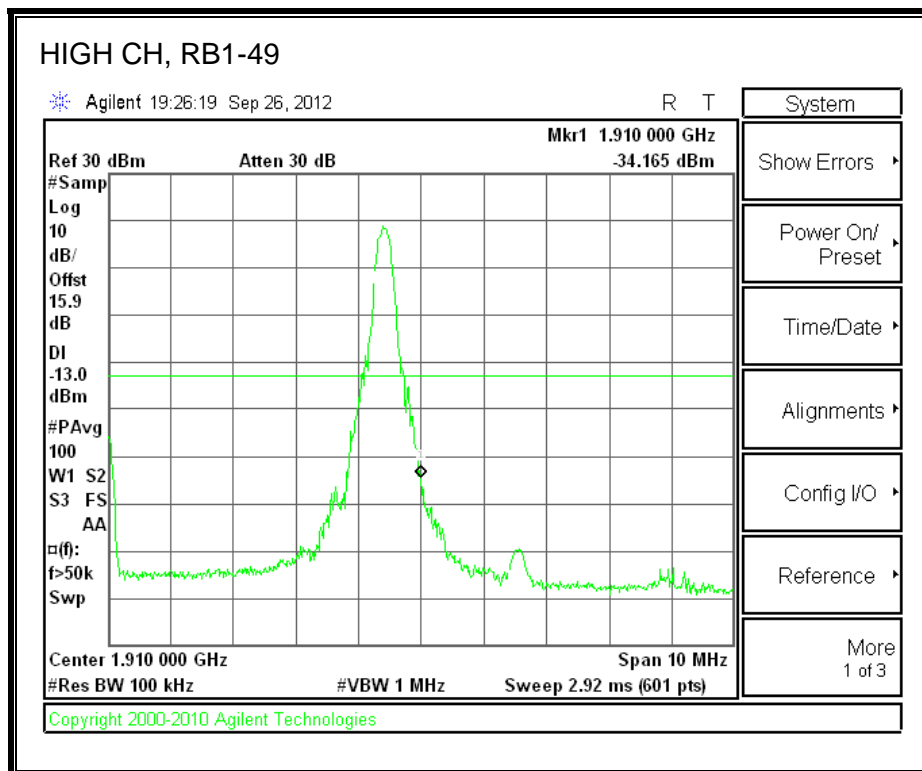
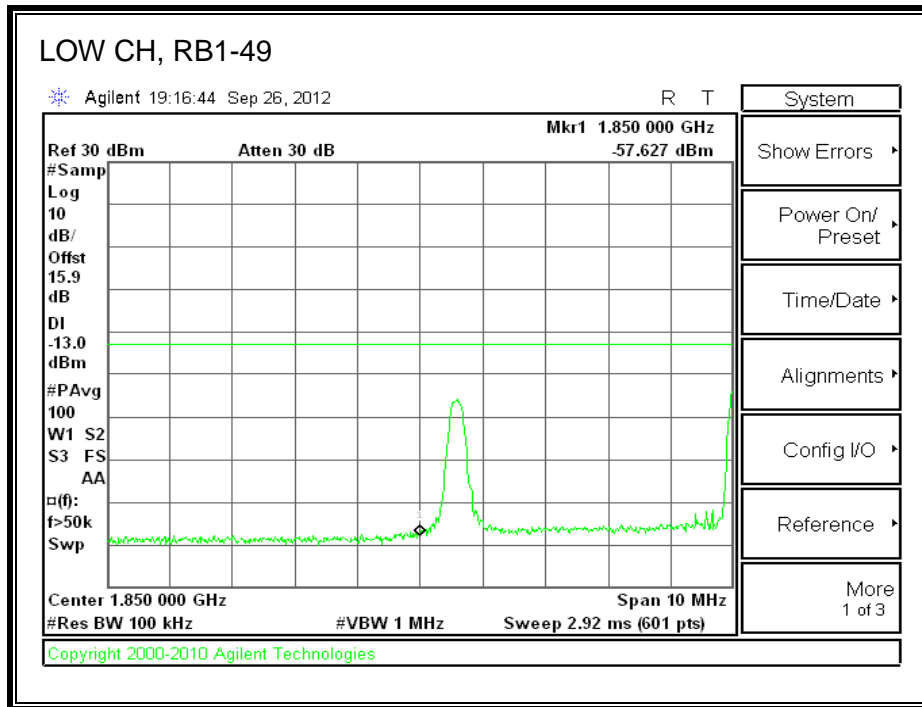


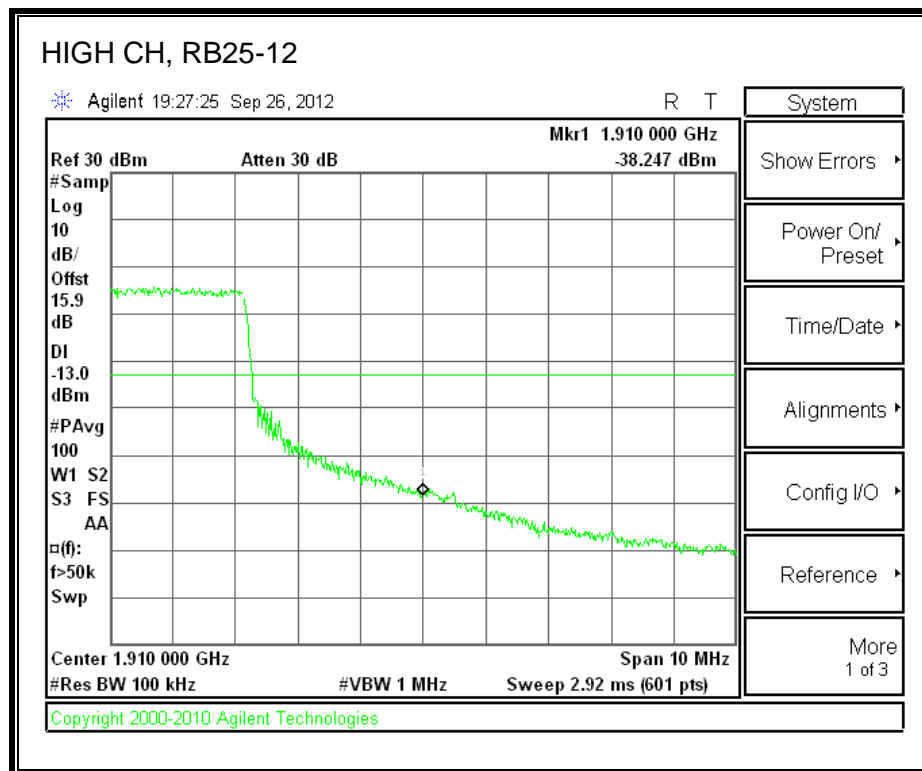
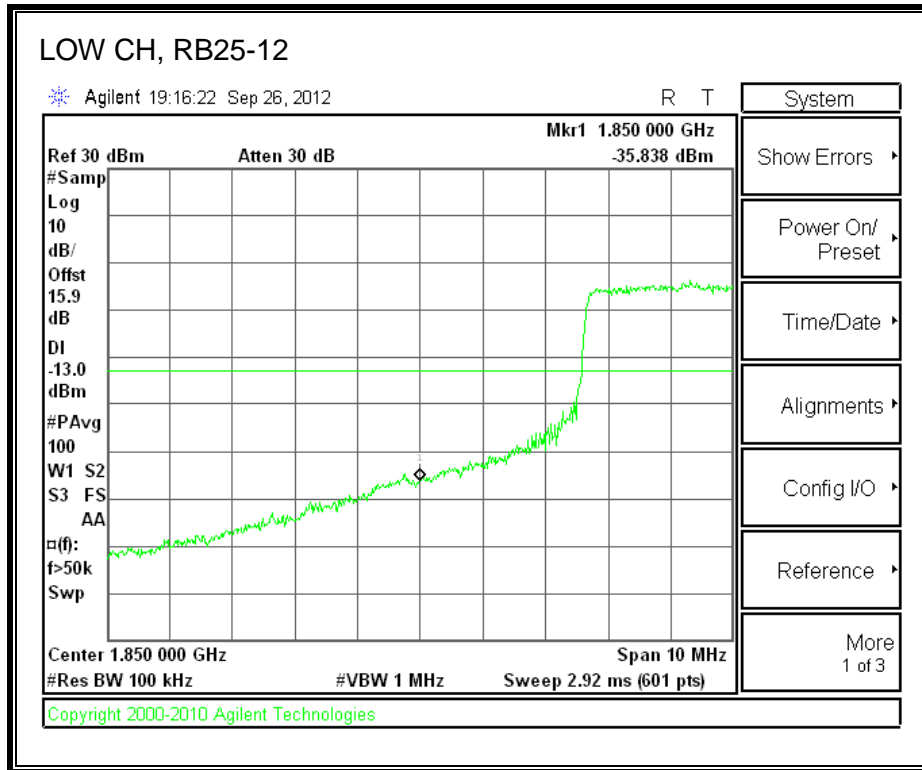


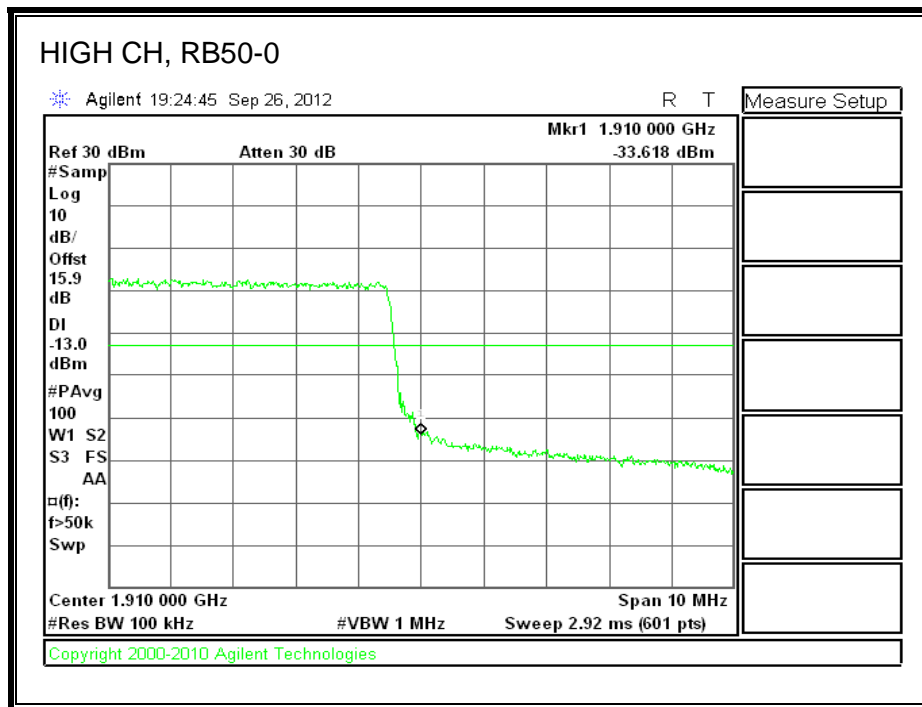
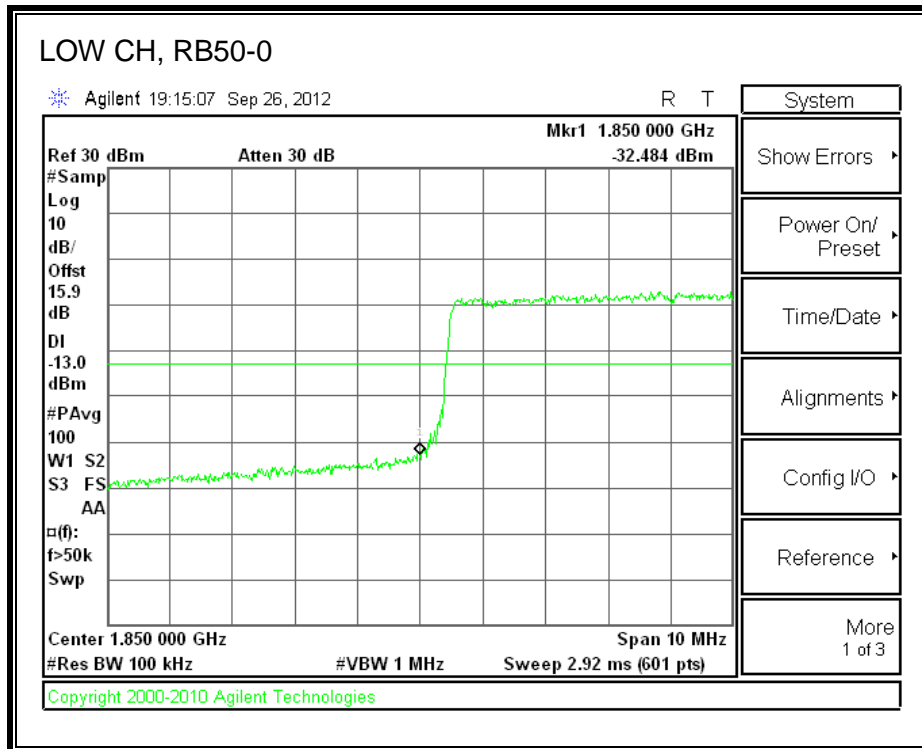


16QAM Band 2 (10 MHz BANDWIDTH)

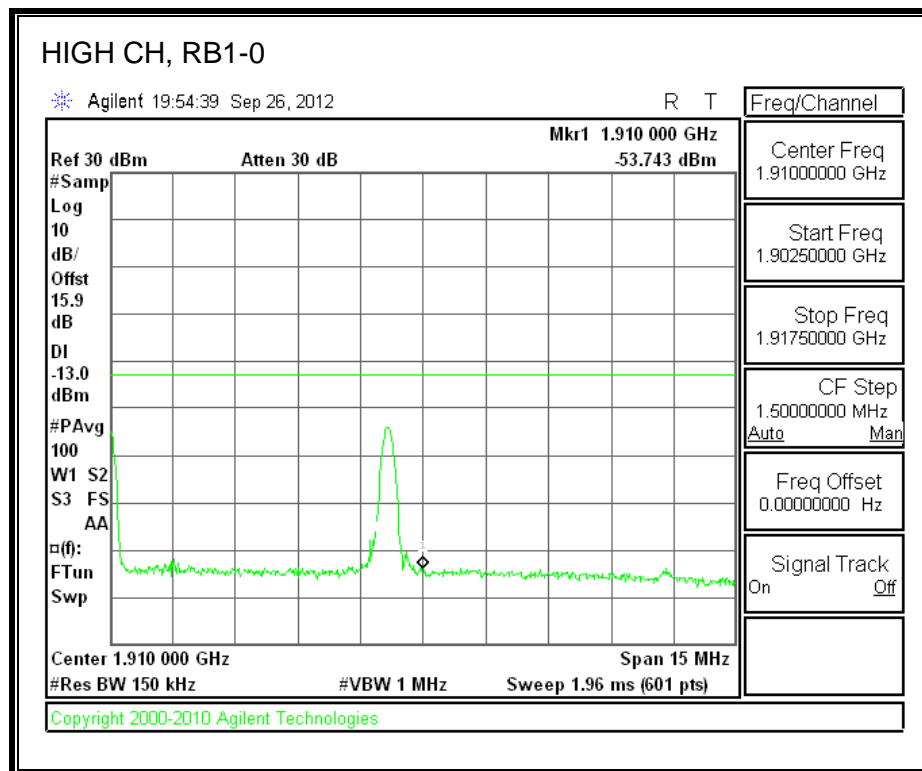
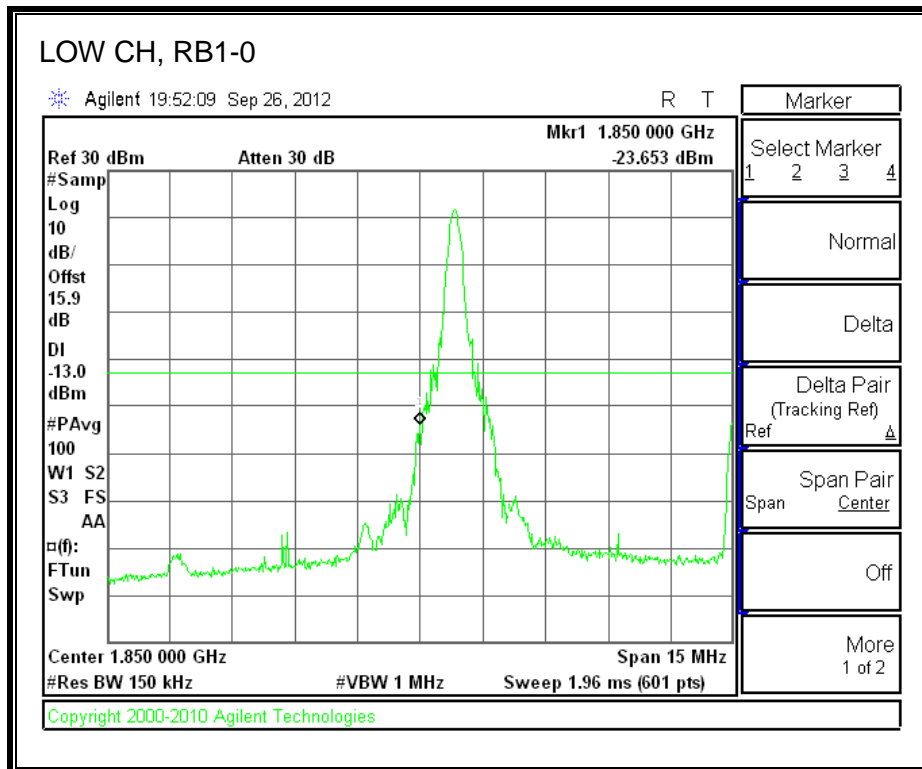


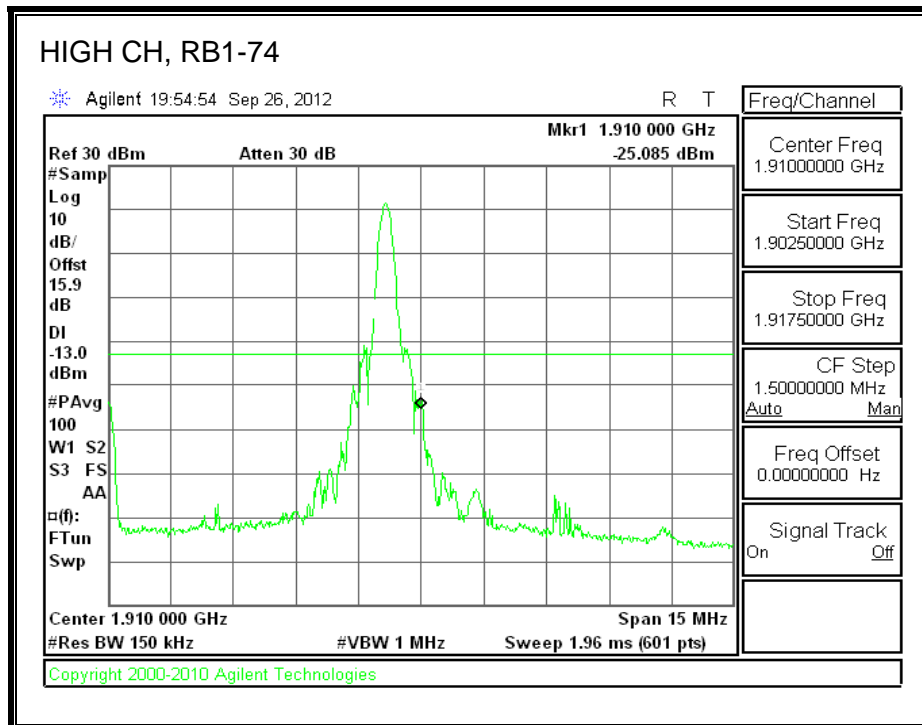
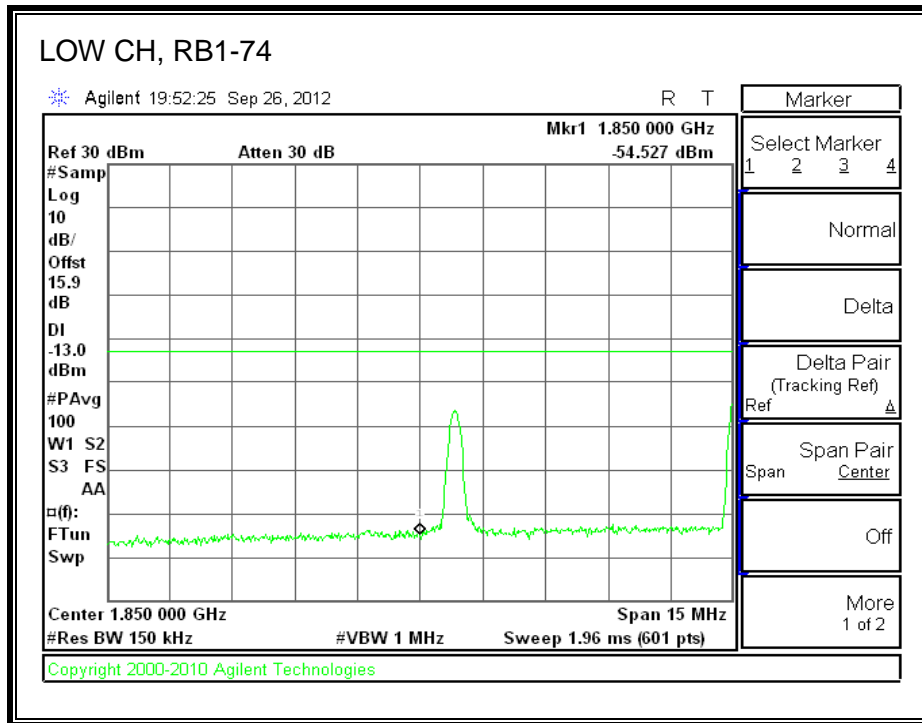


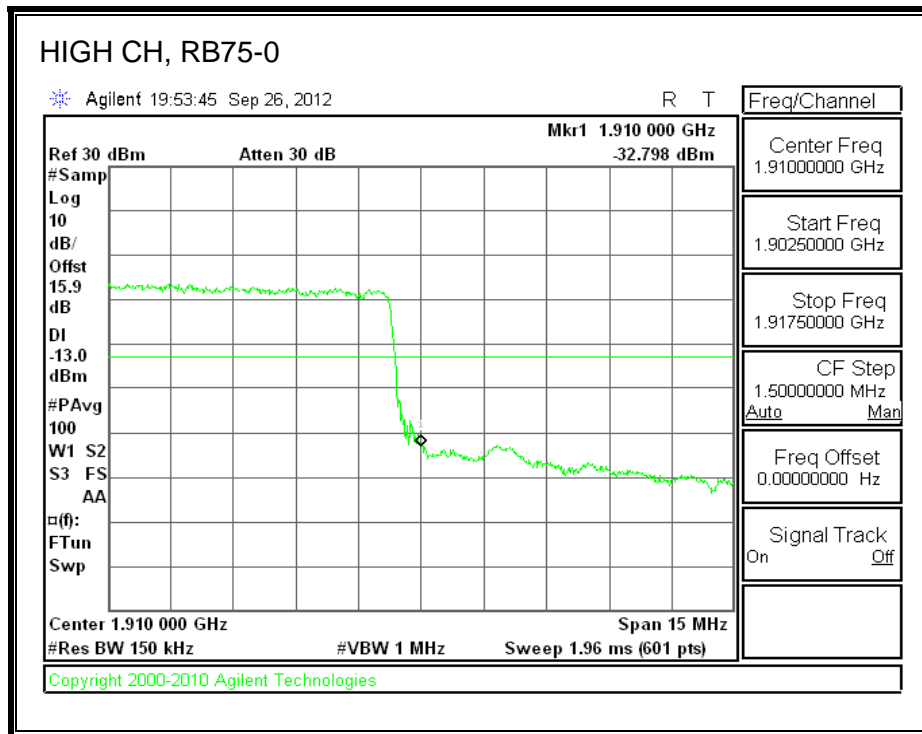
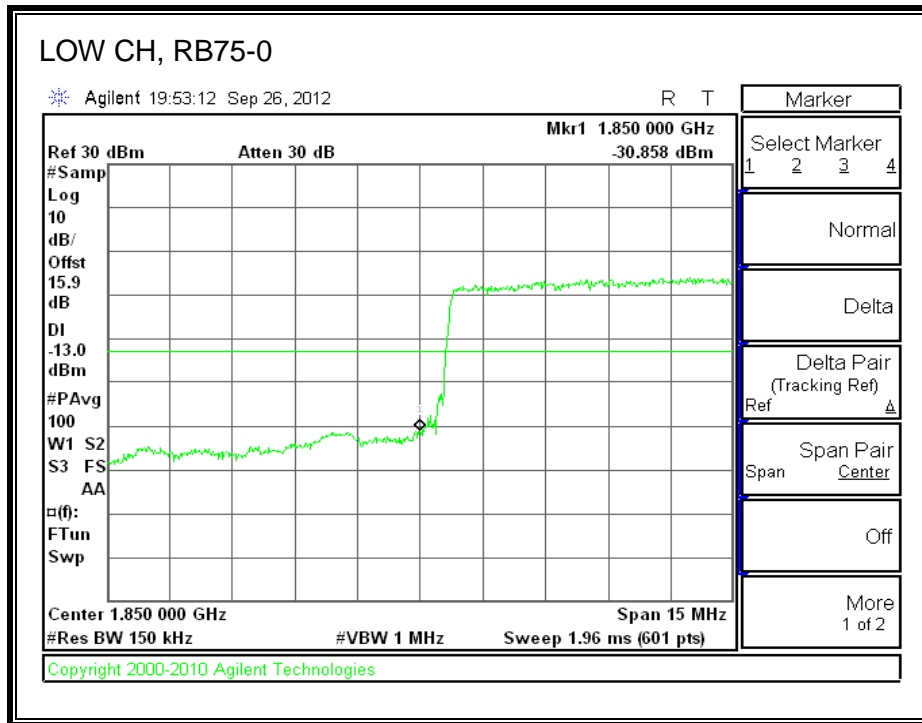




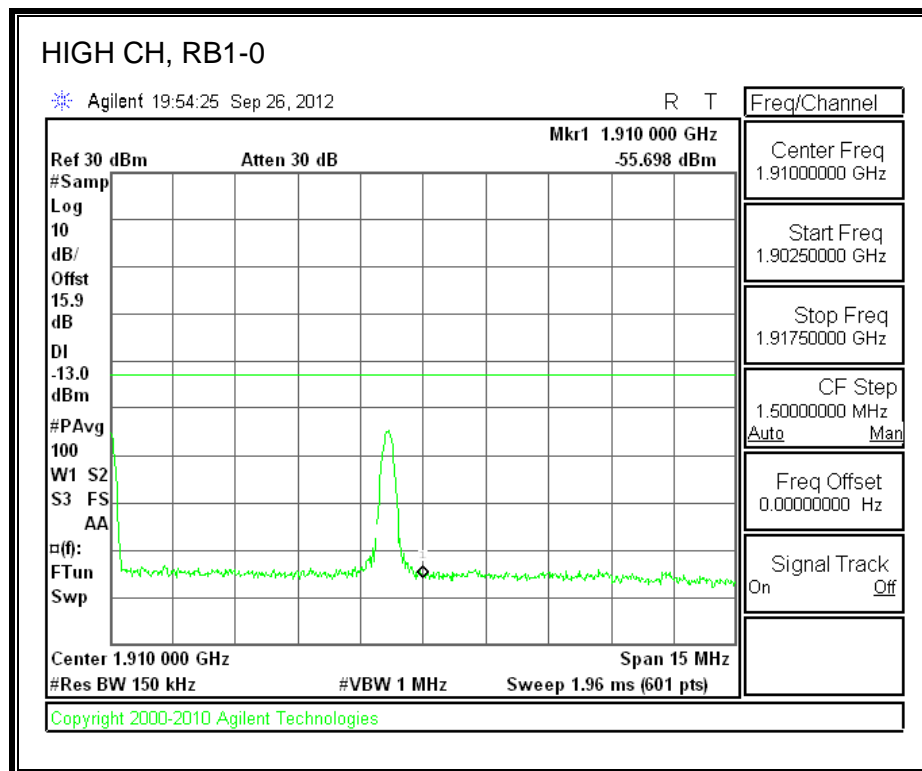
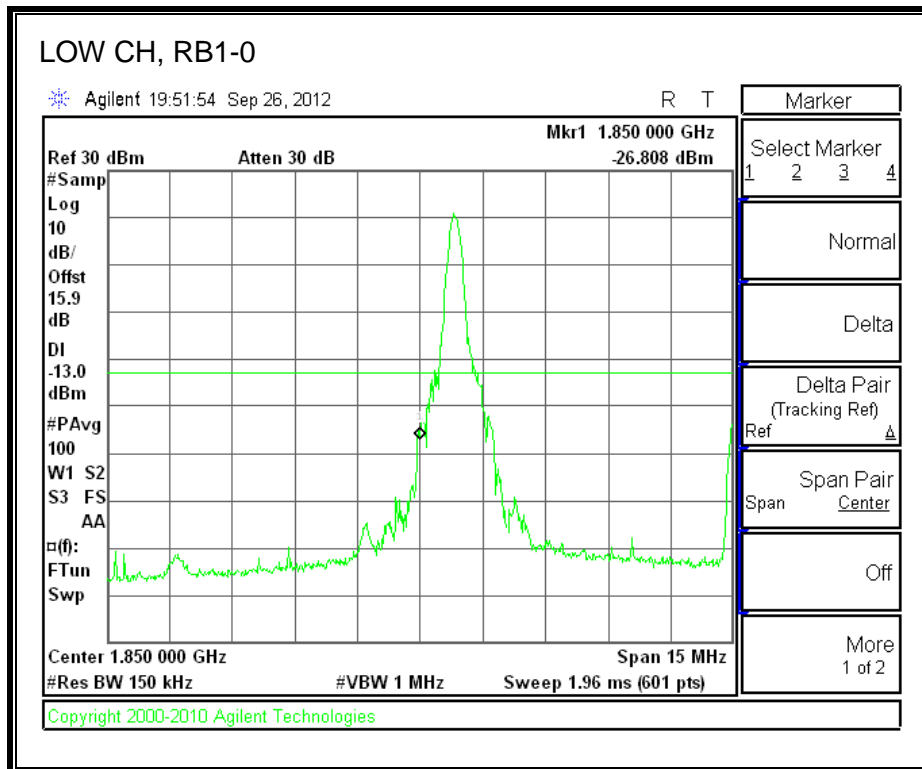
QPSK Band 2 (15 MHz BANDWIDTH)

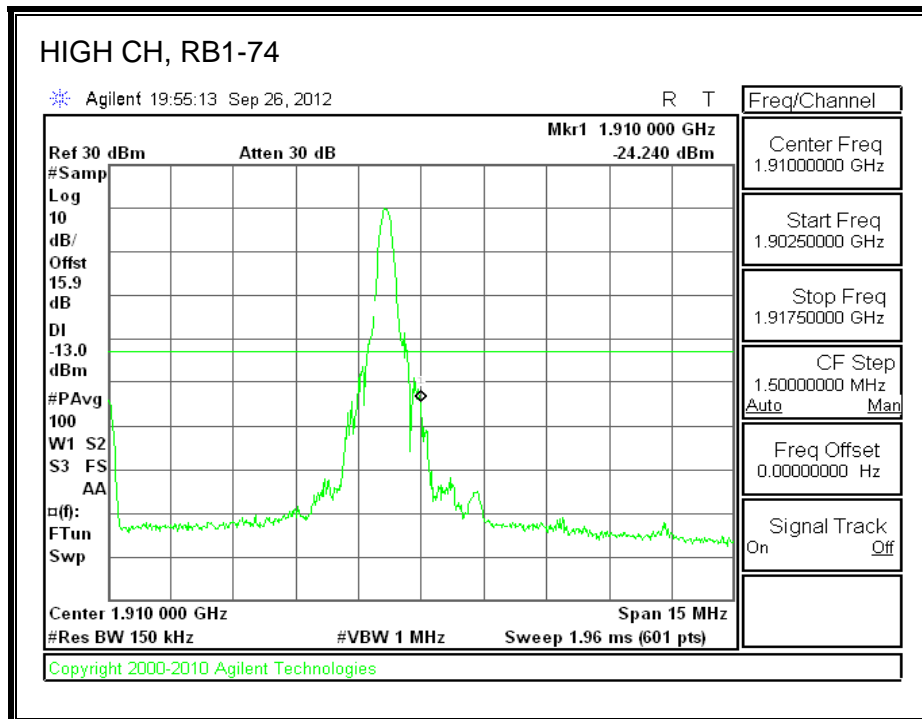
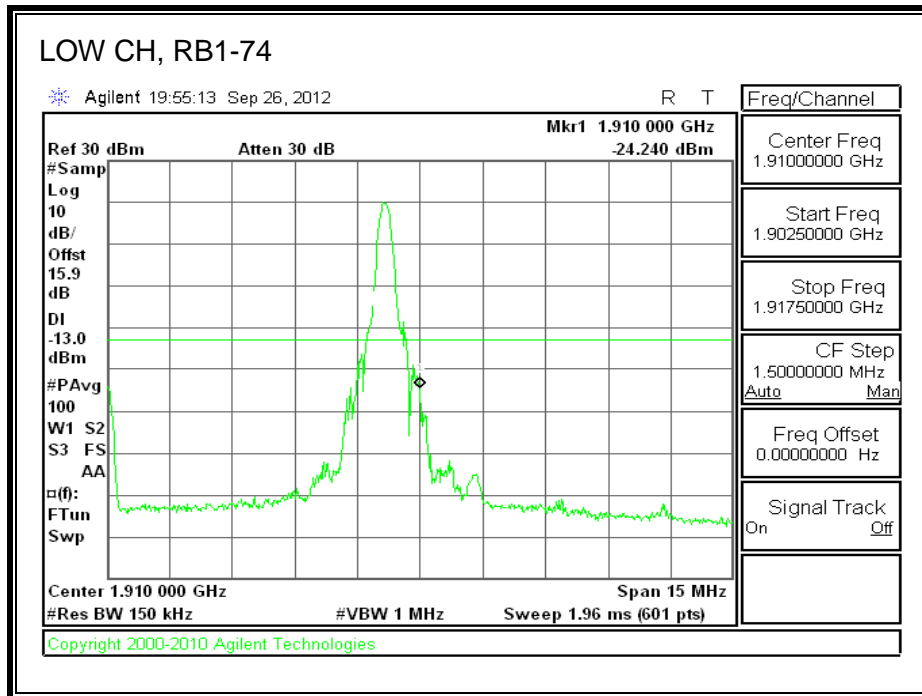


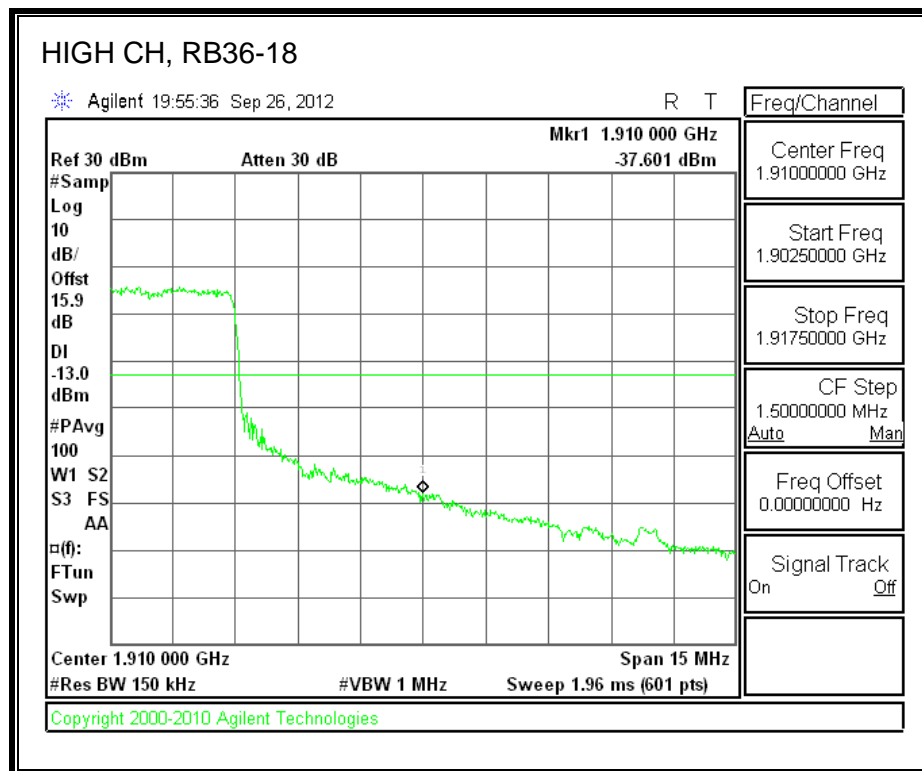
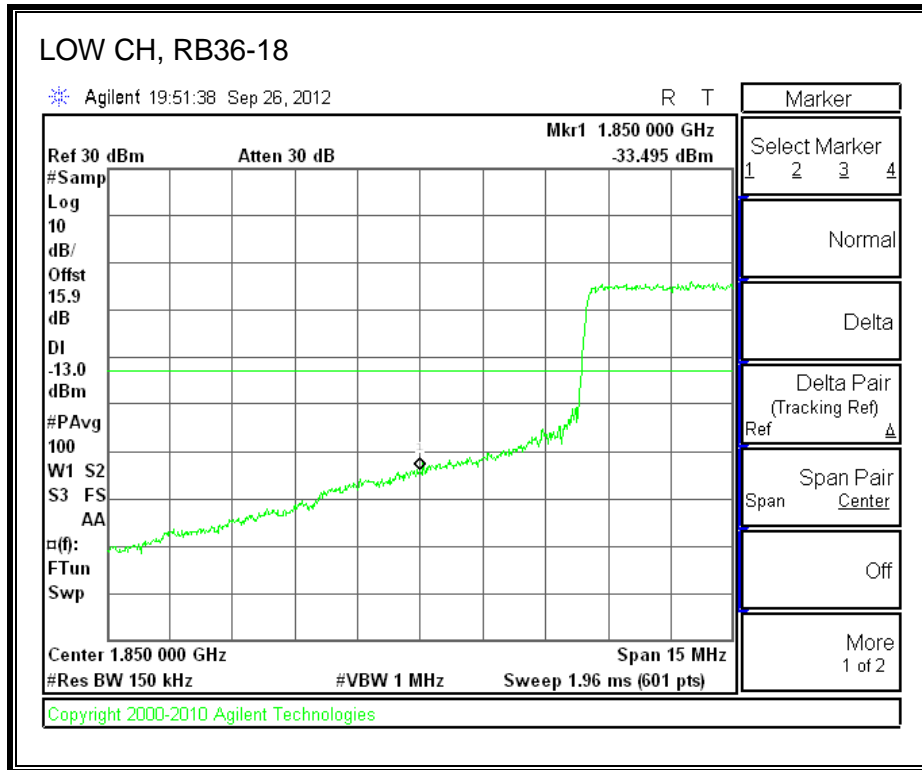


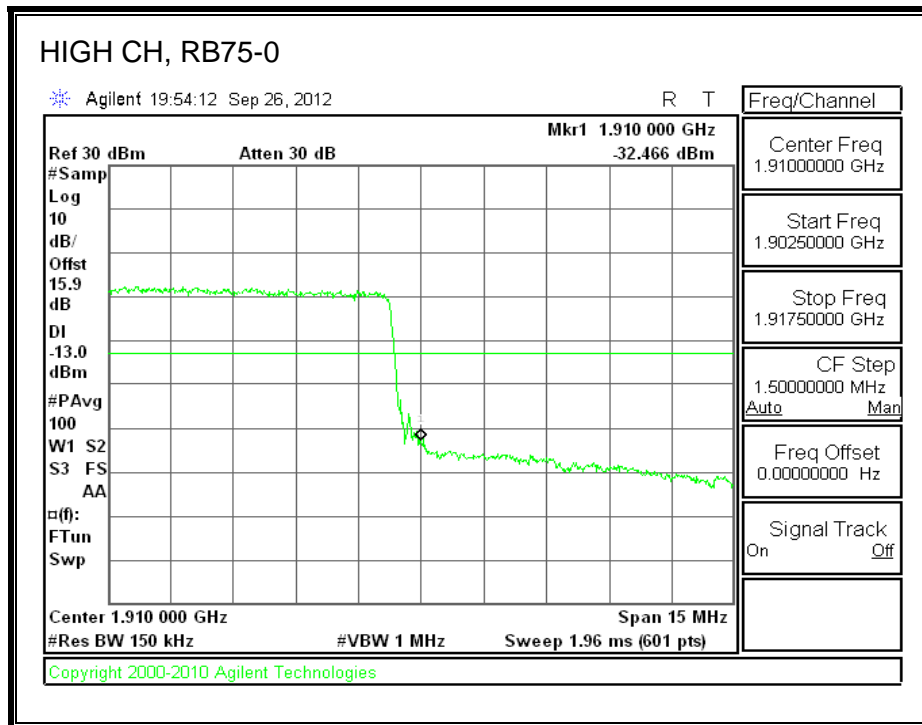
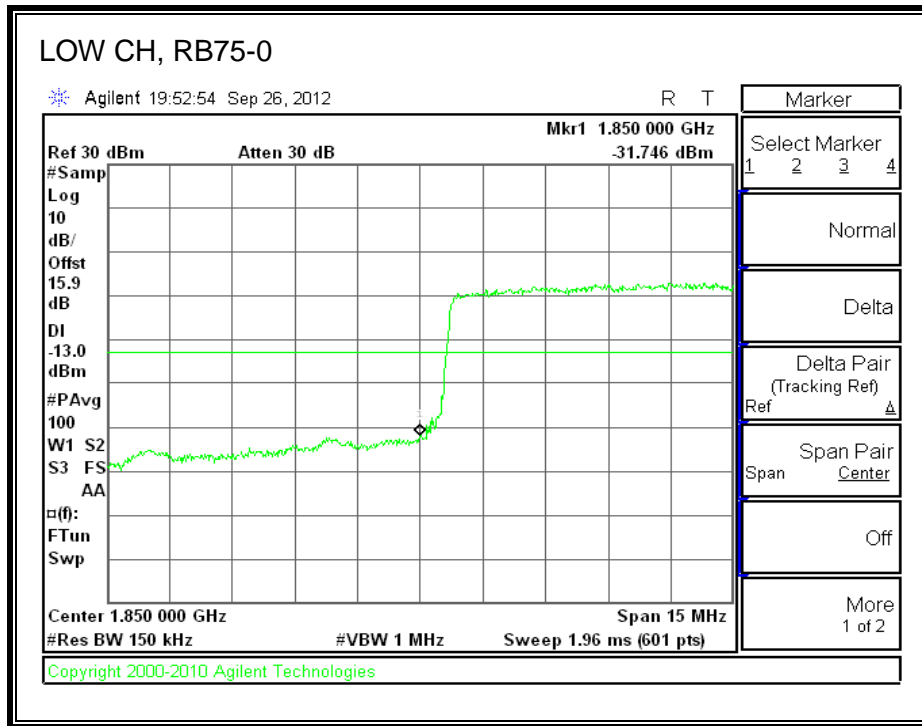


16QAM Band 2 (15 MHz BANDWIDTH)

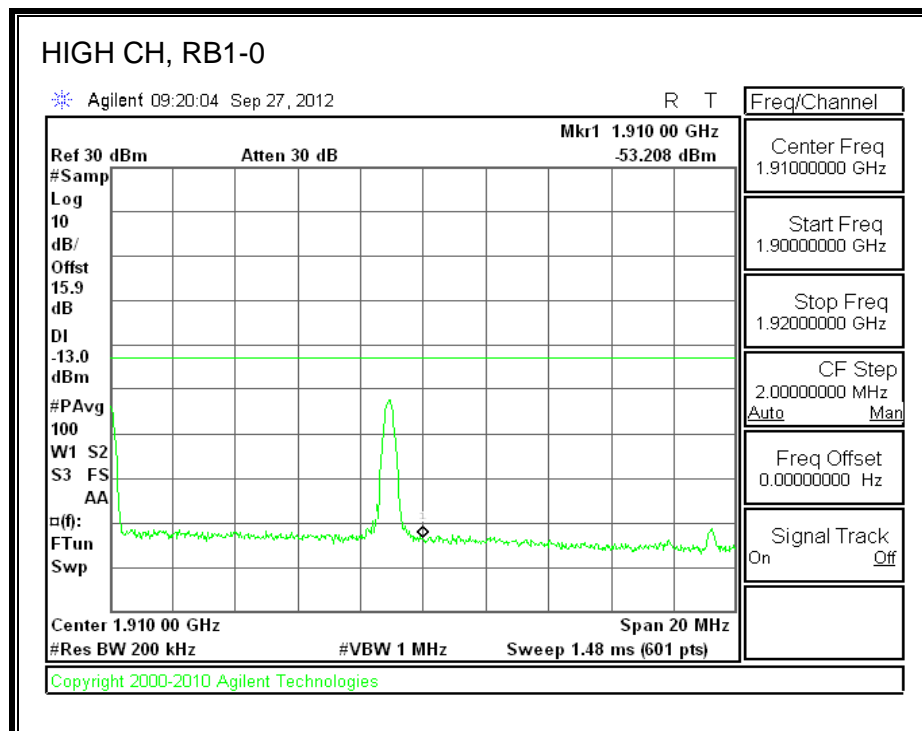
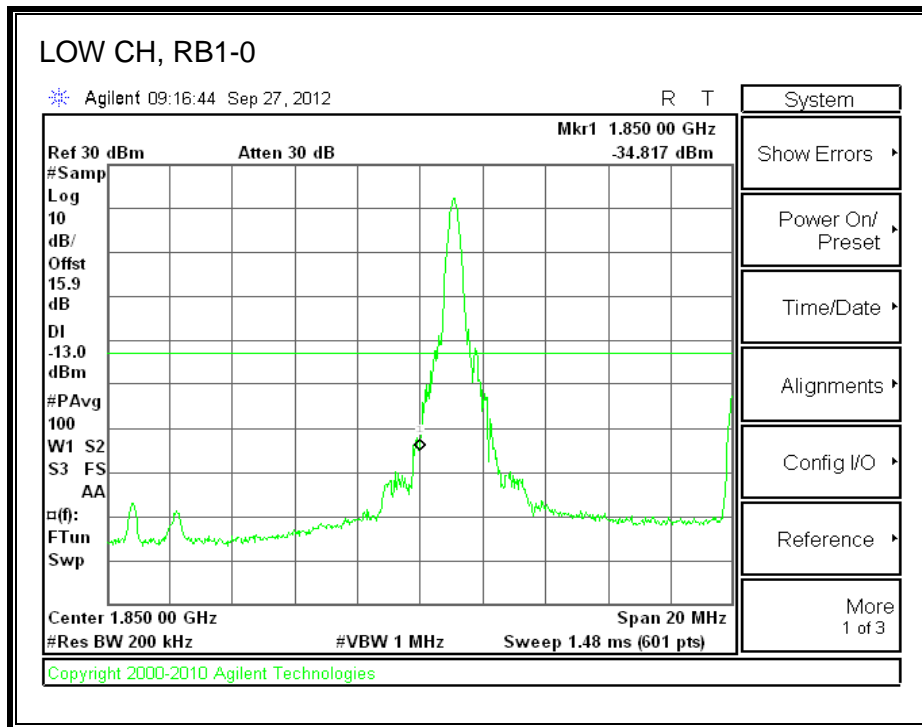


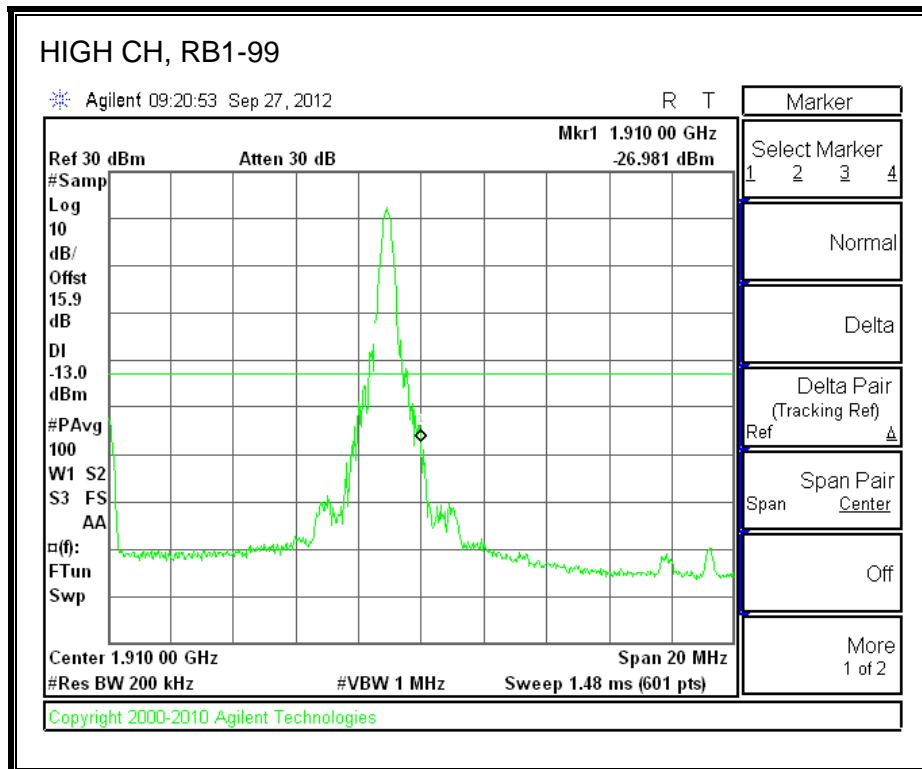
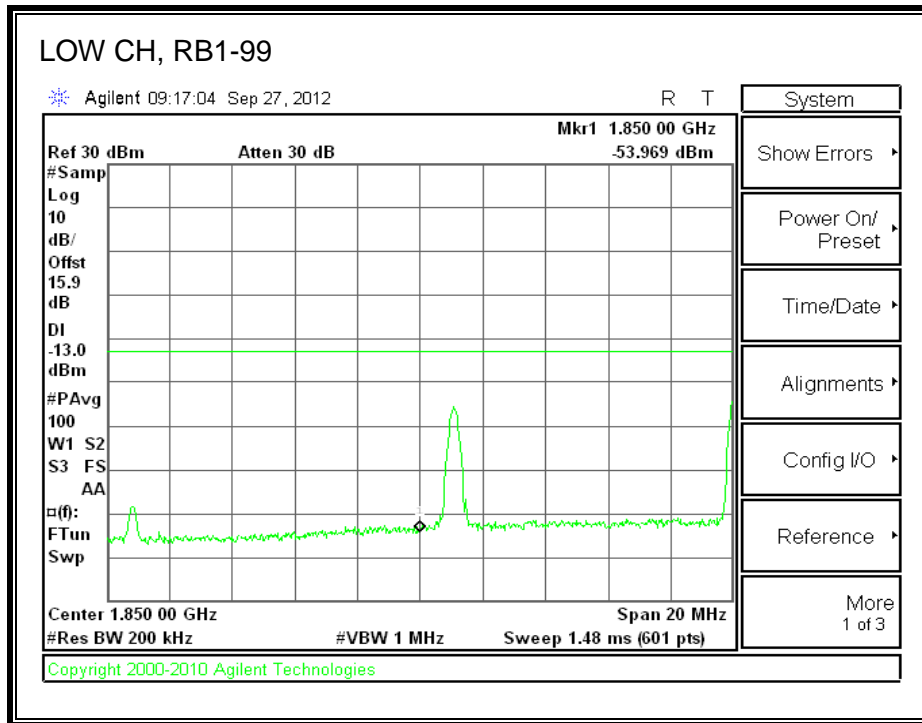


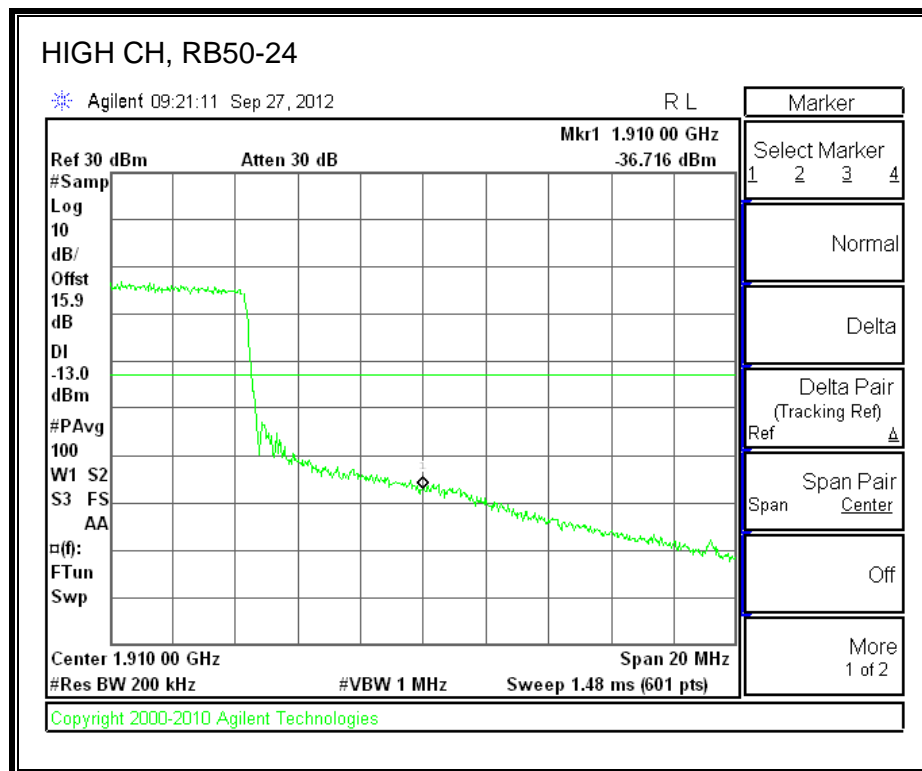
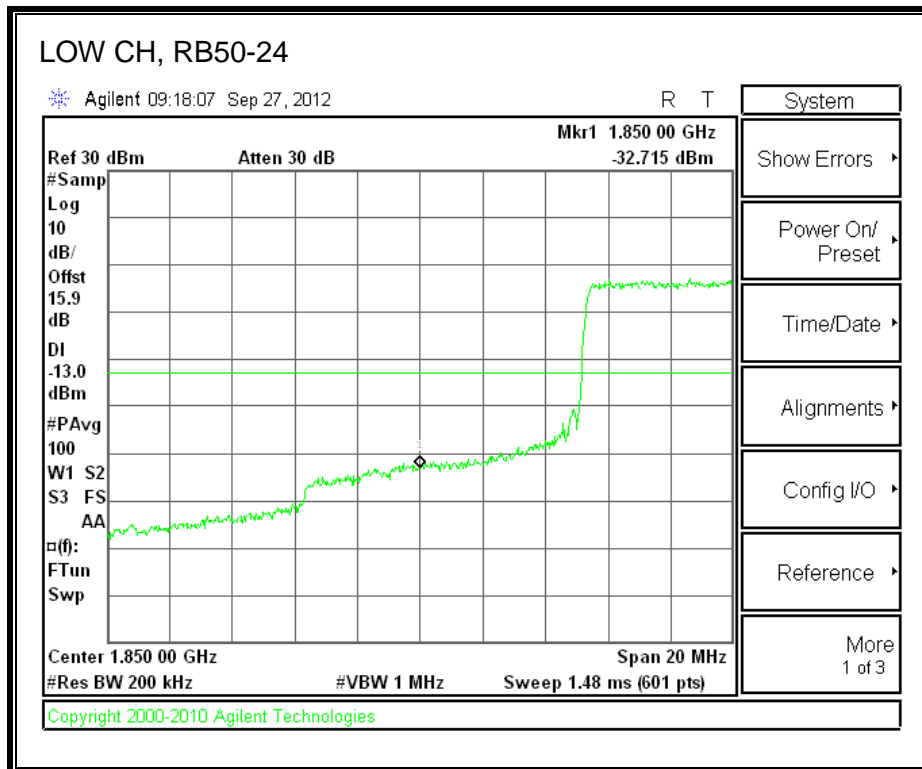


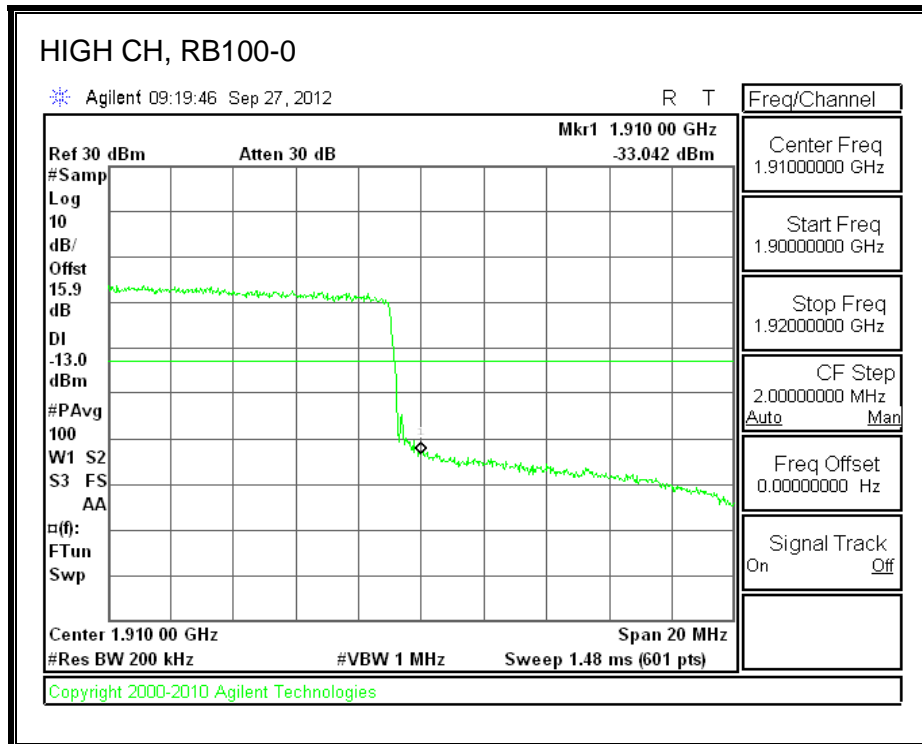
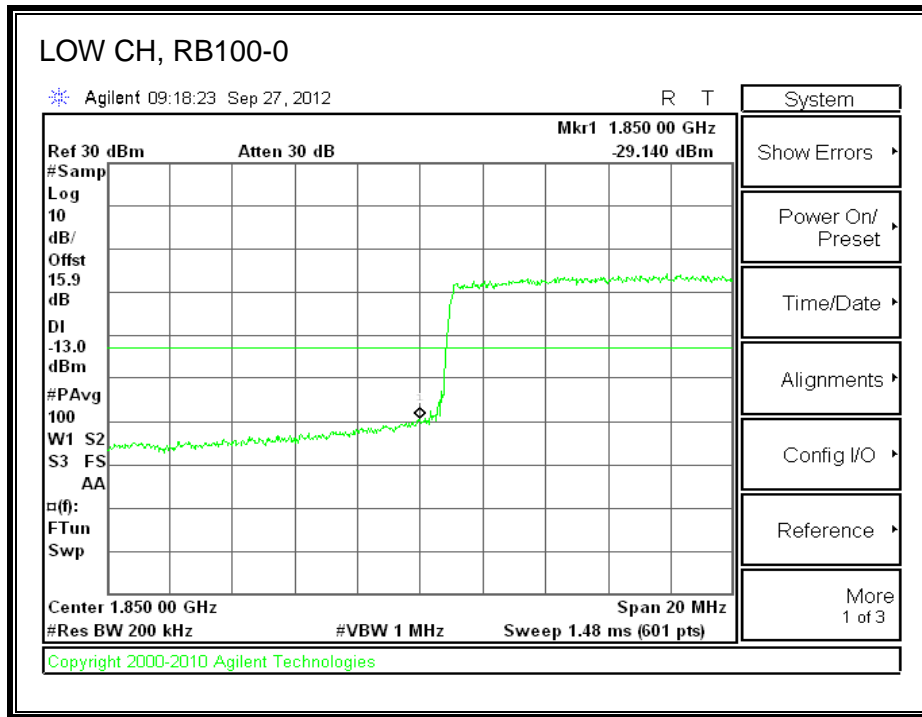


QPSK Band 2 (20 MHz BANDWIDTH)

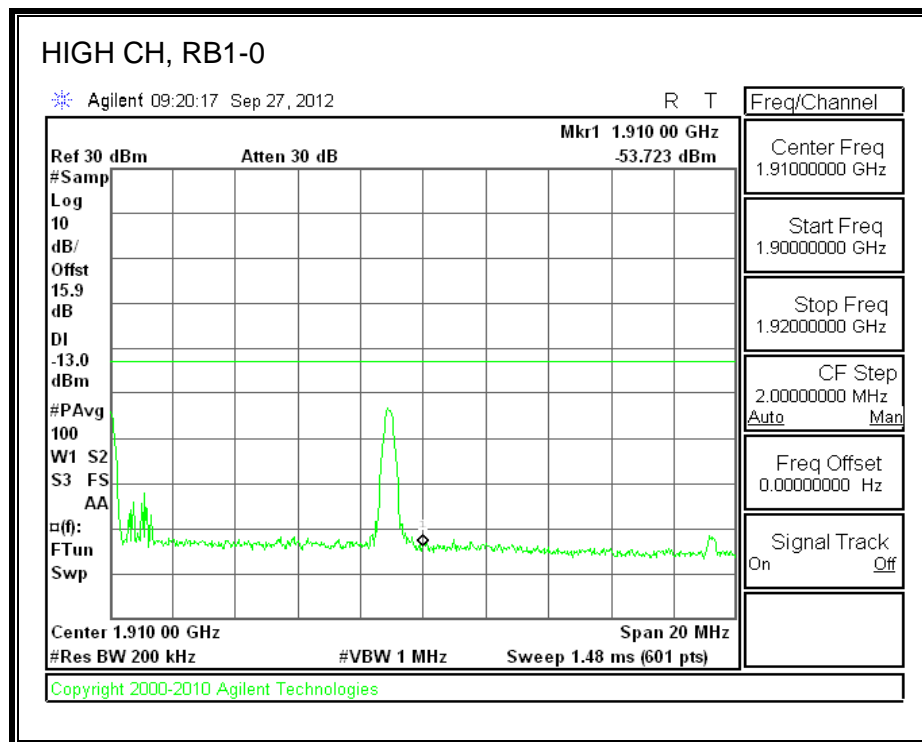
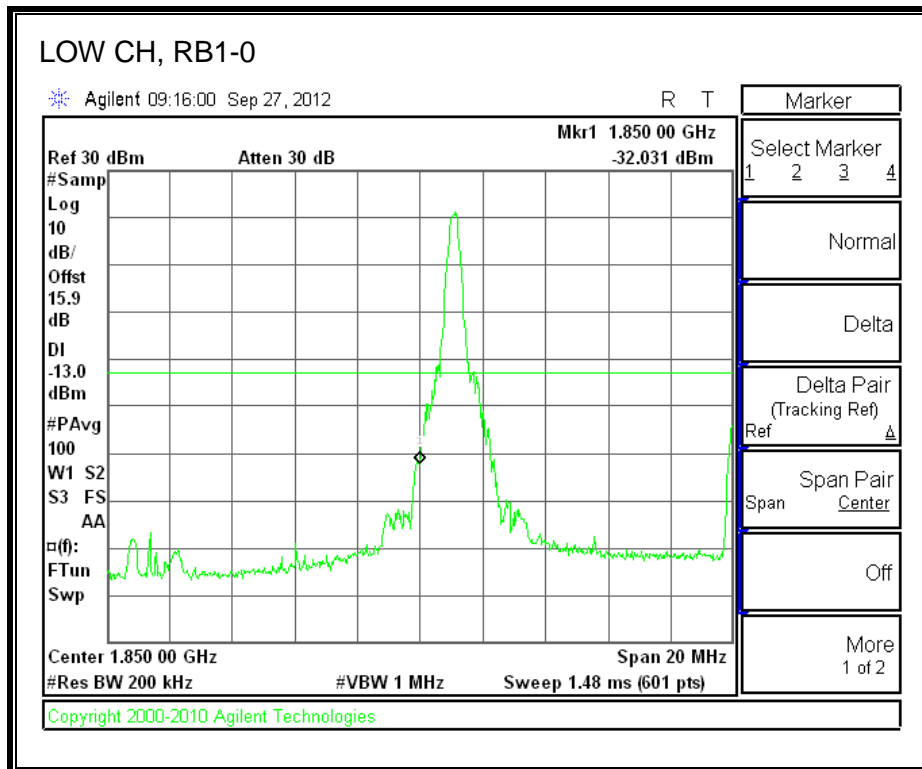


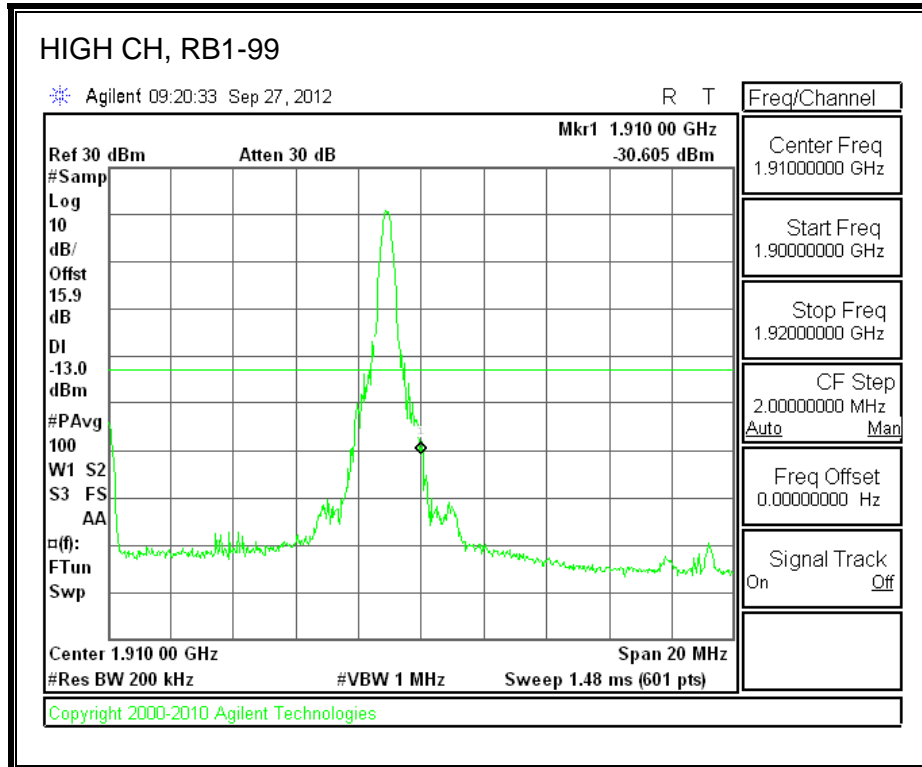
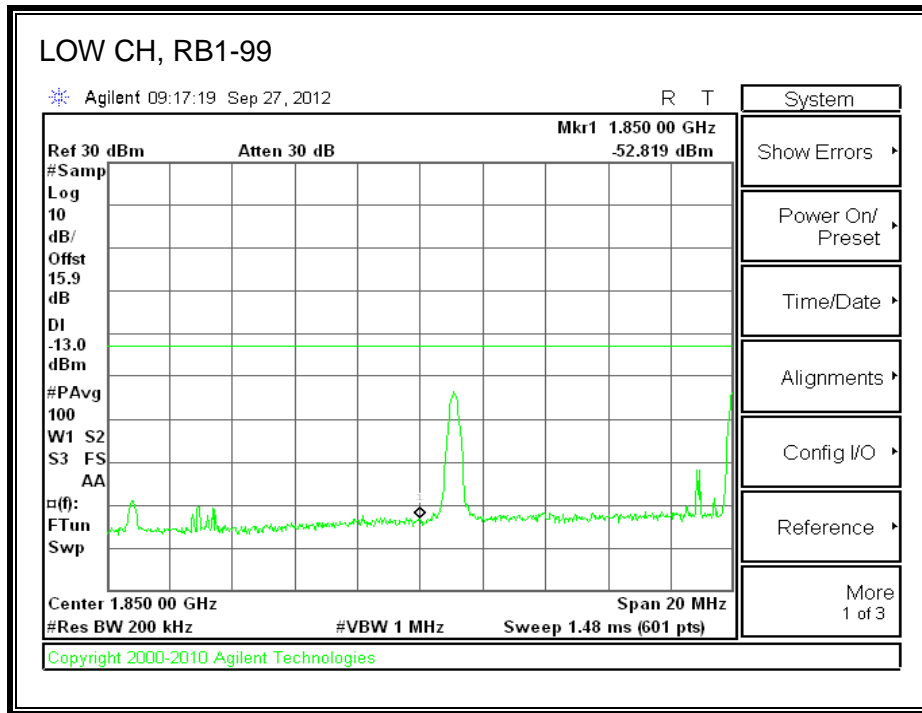


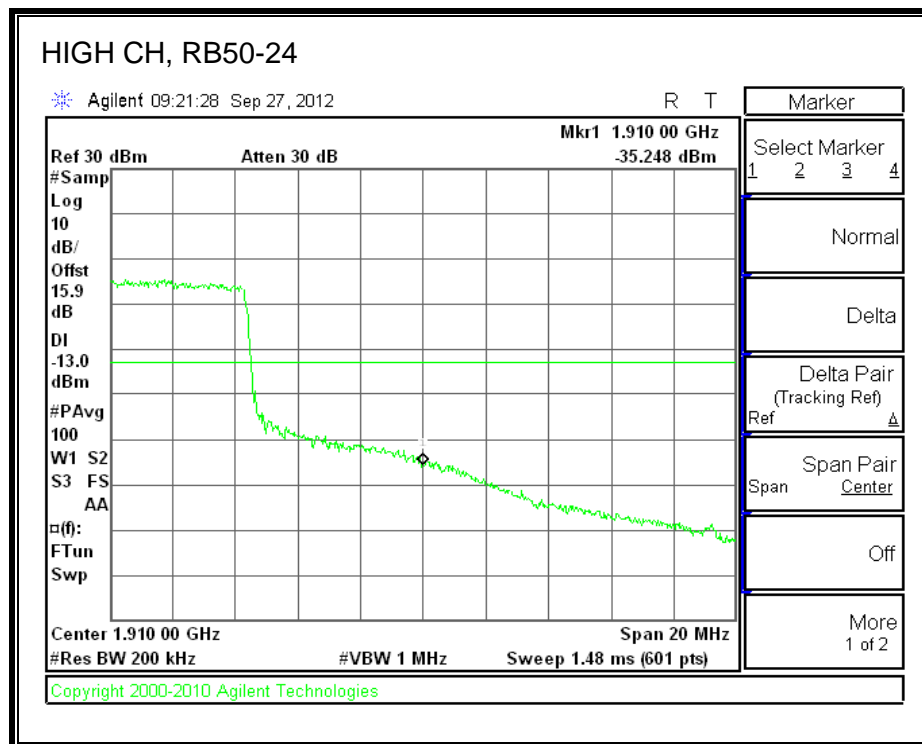
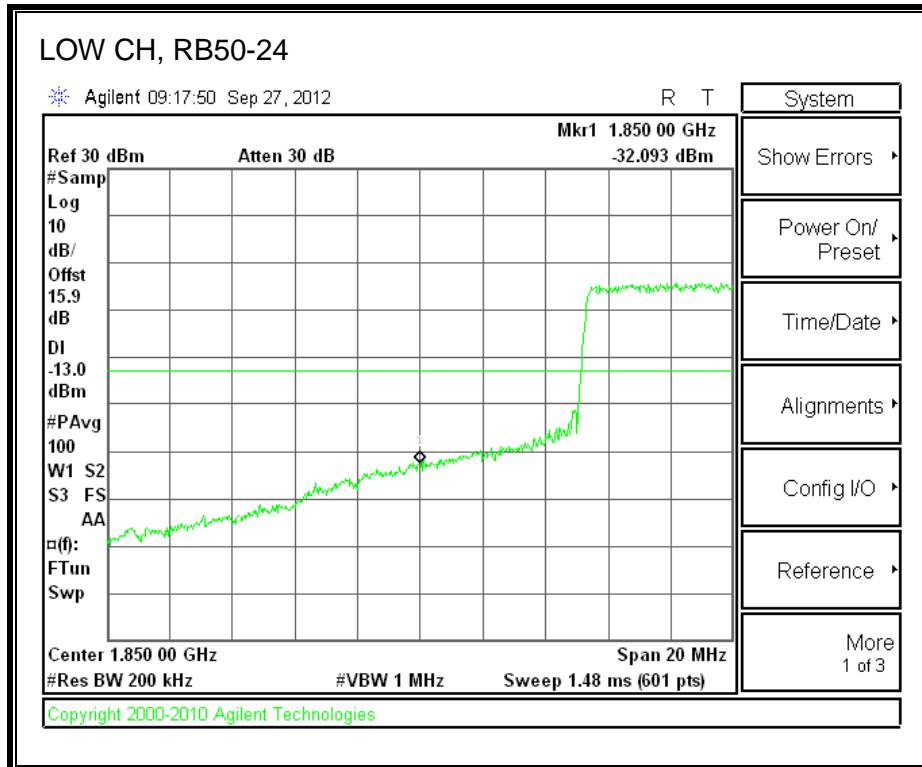


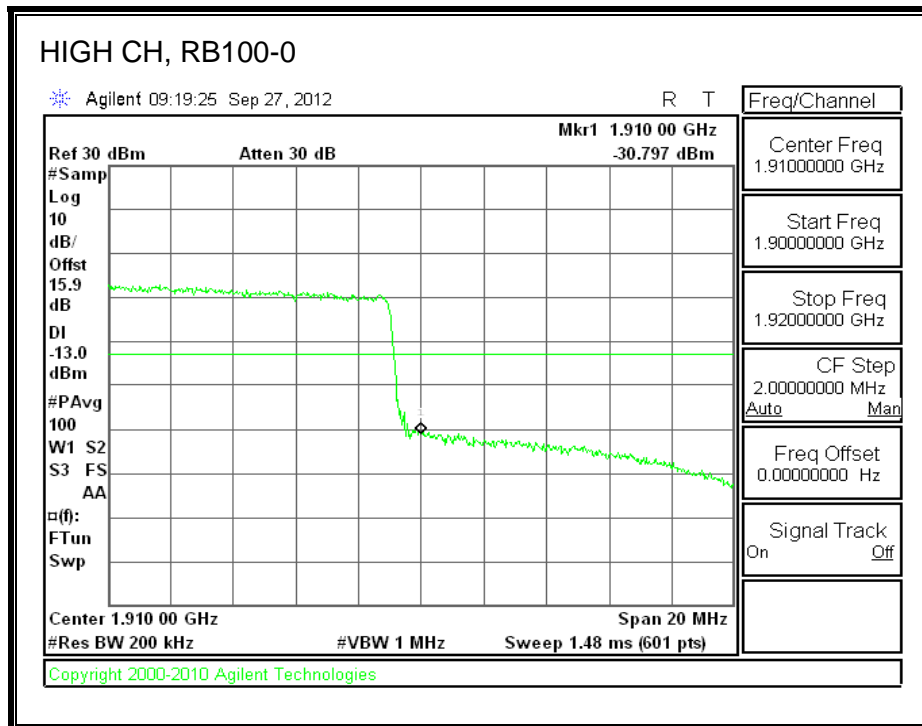
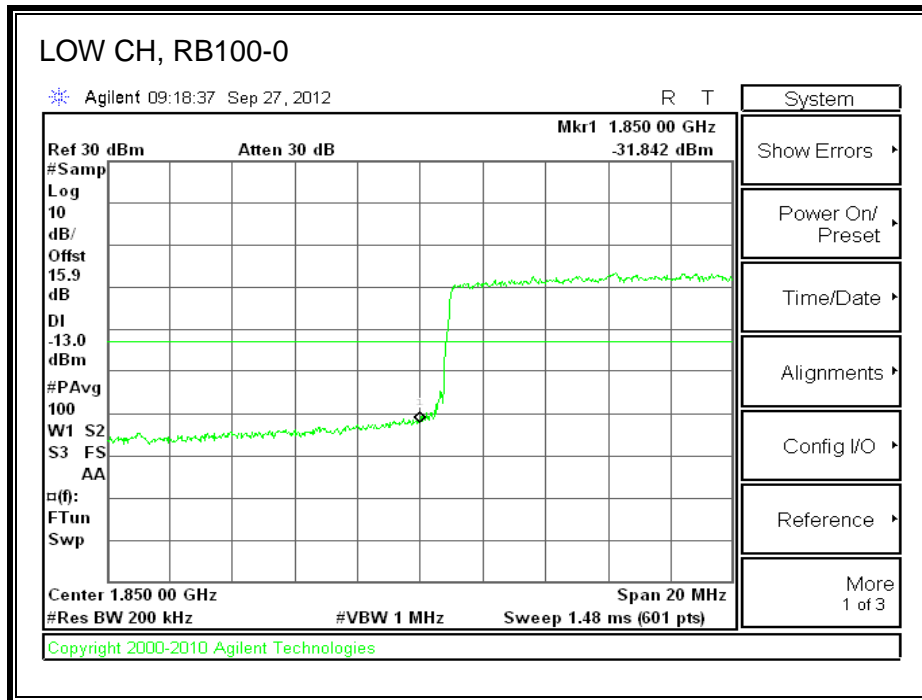


16QAM Band 2 (20 MHz BANDWIDTH)



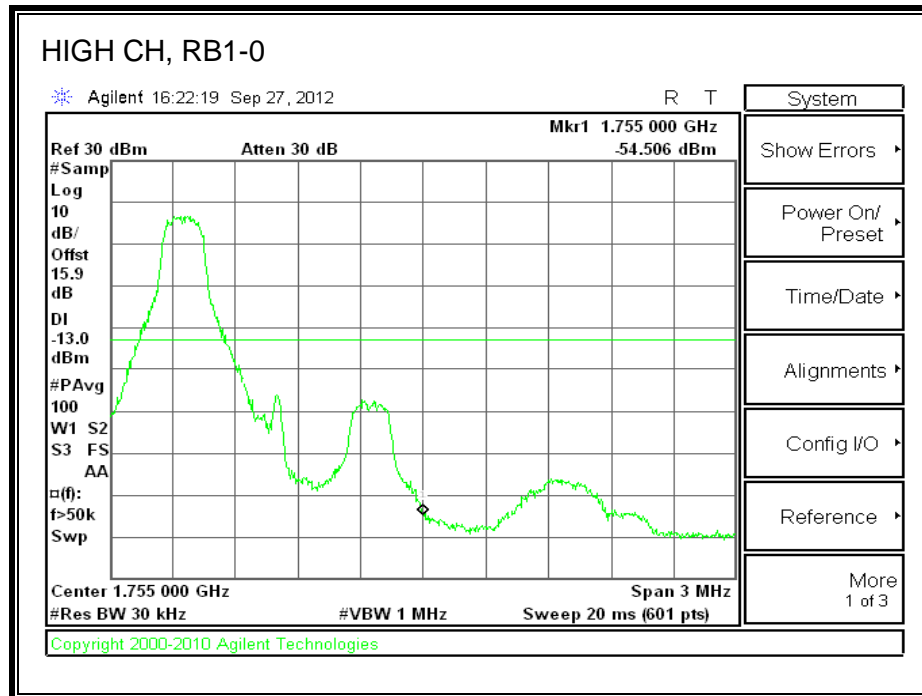
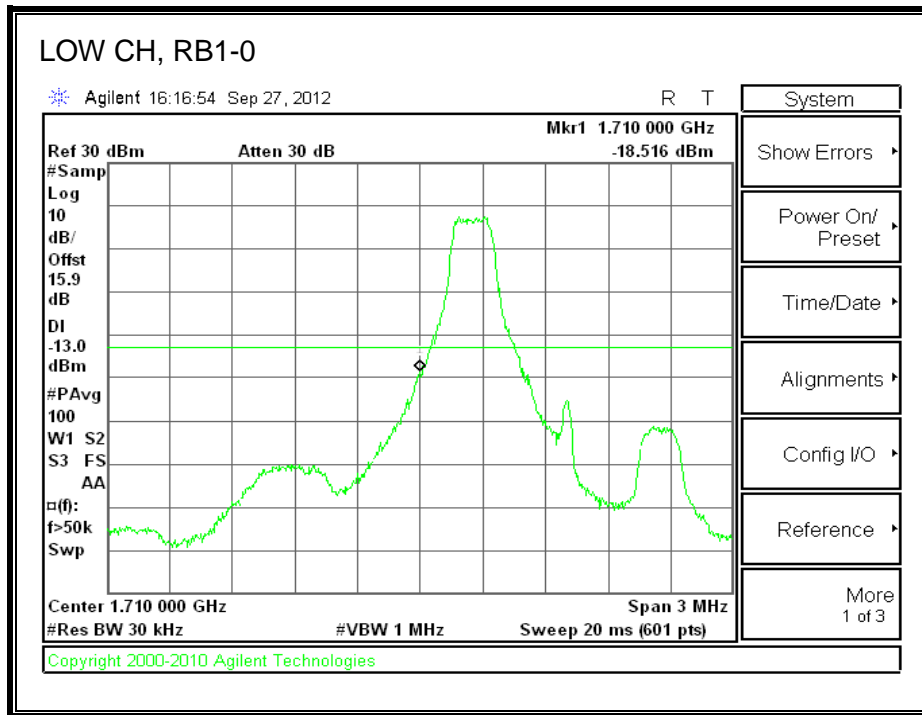


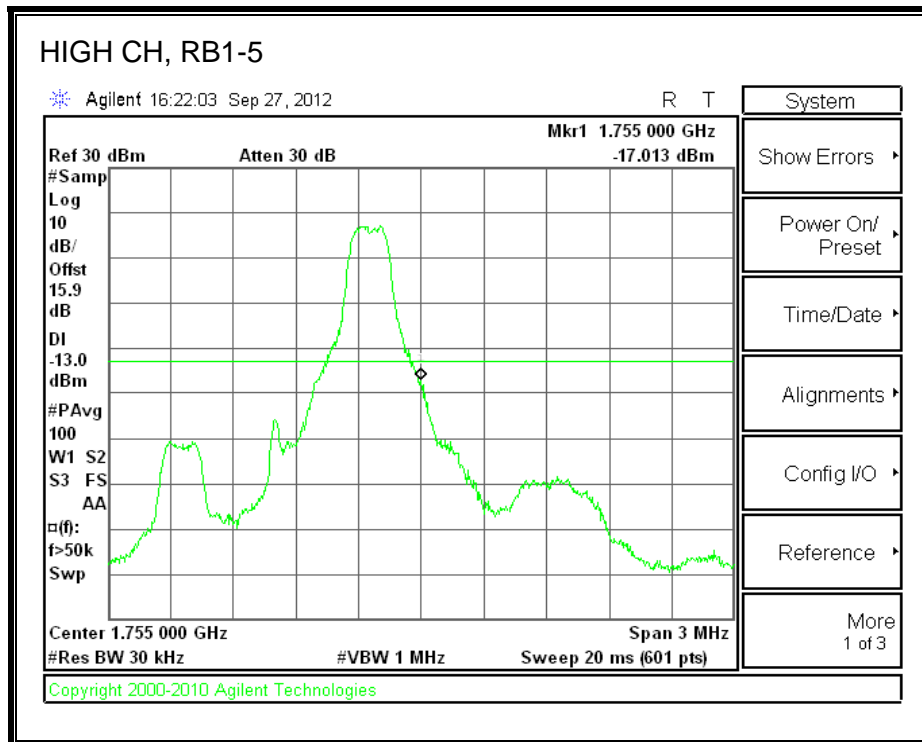
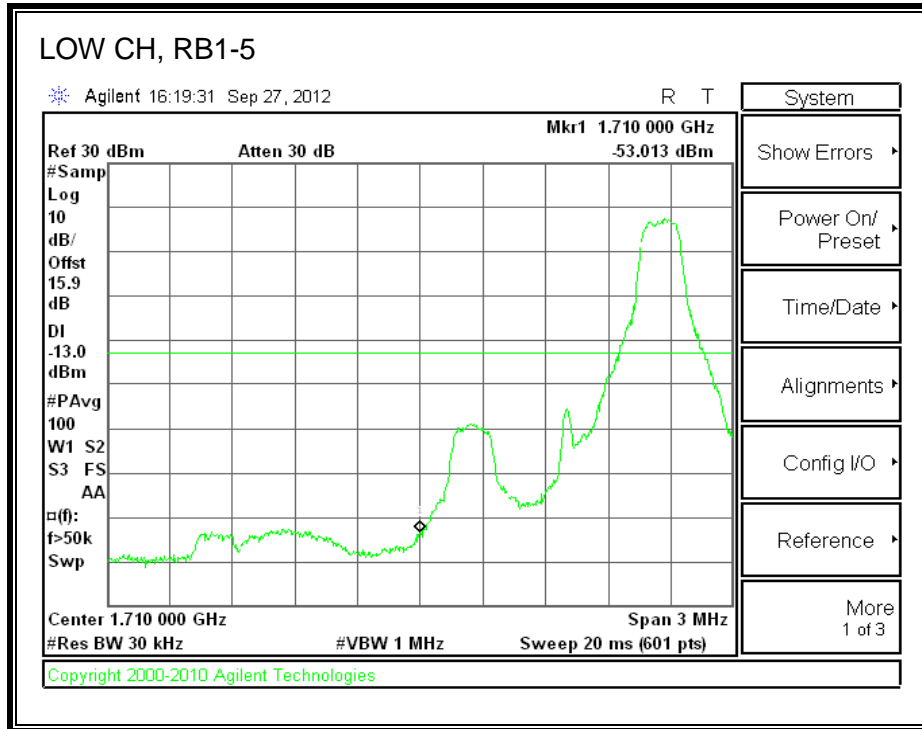


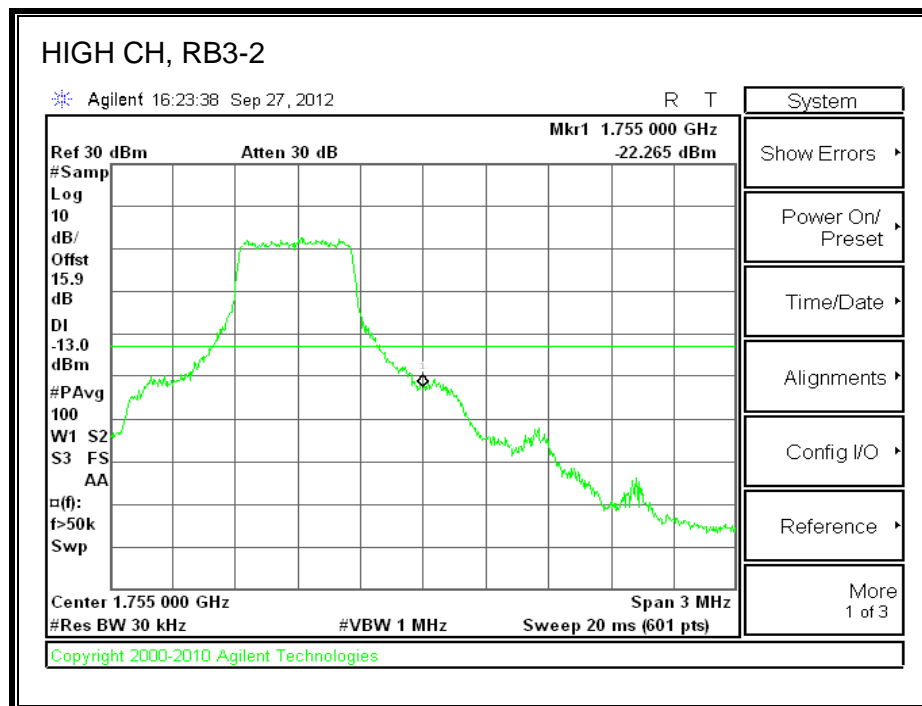
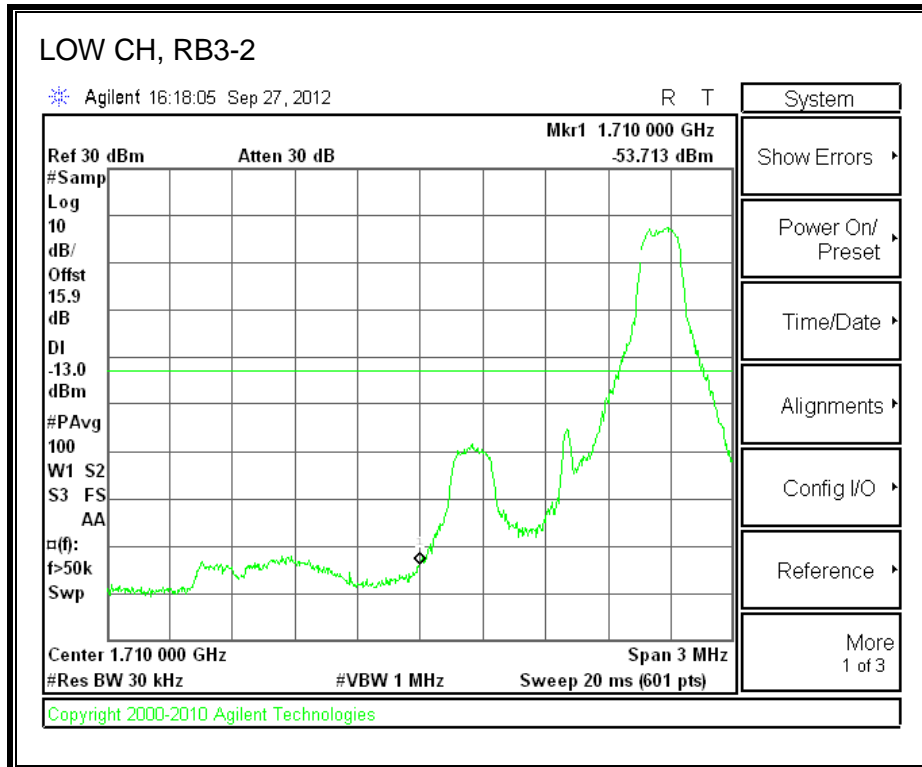


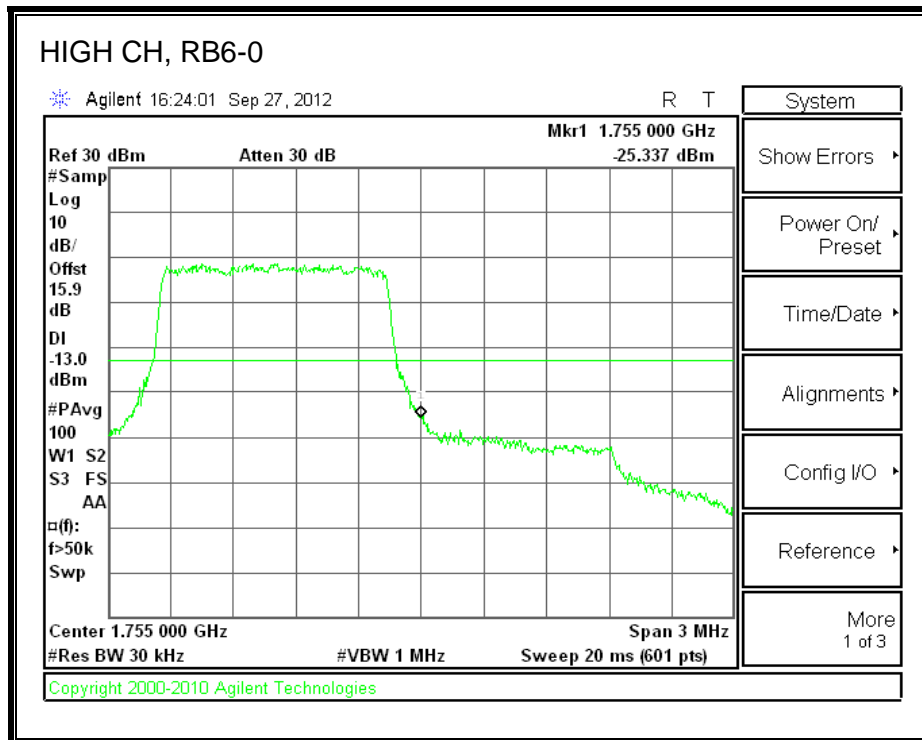
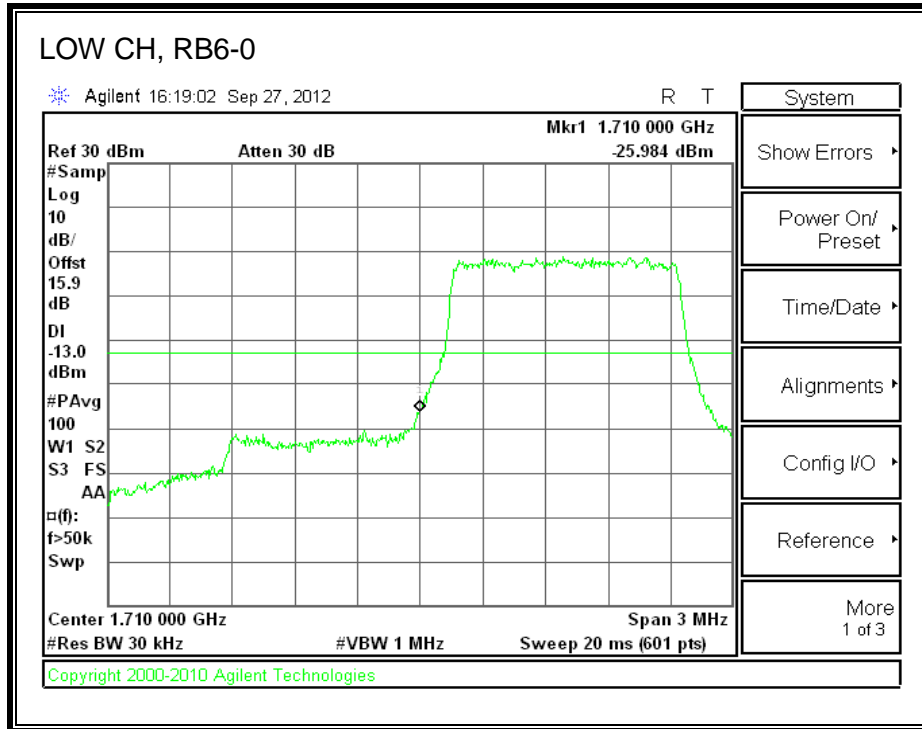
8.2.2. LTE BAND 4

QPSK Band 4 (1.4 MHz BANDWIDTH)

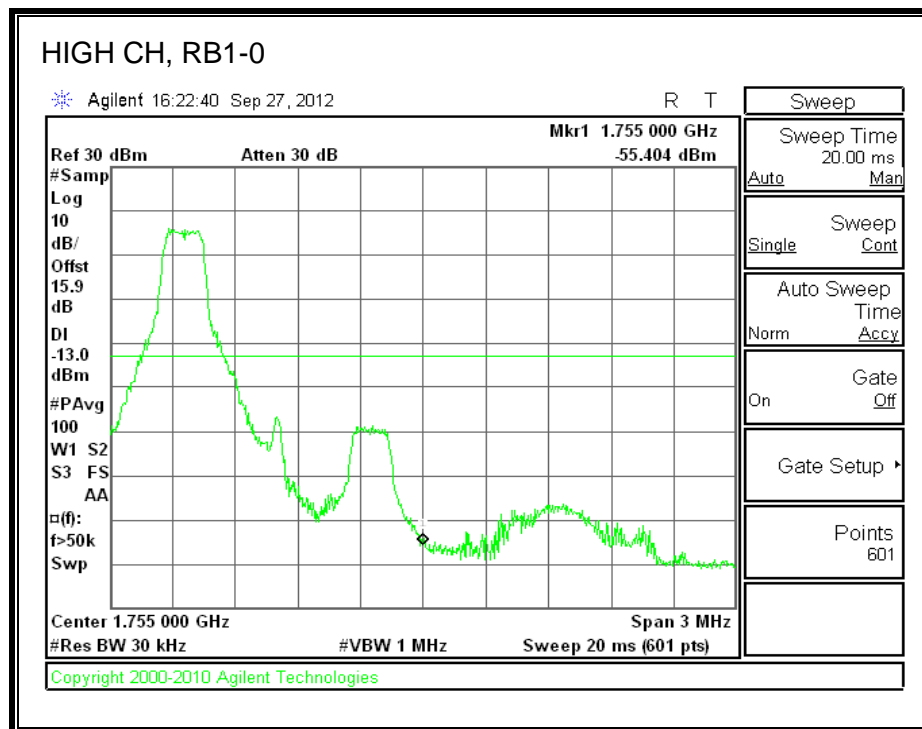
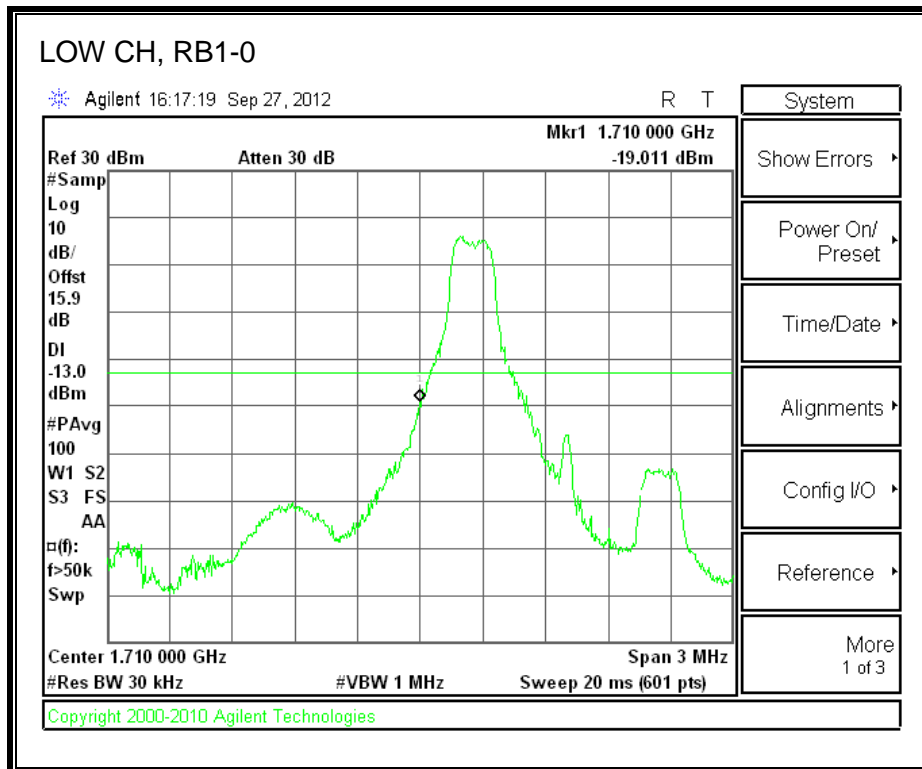


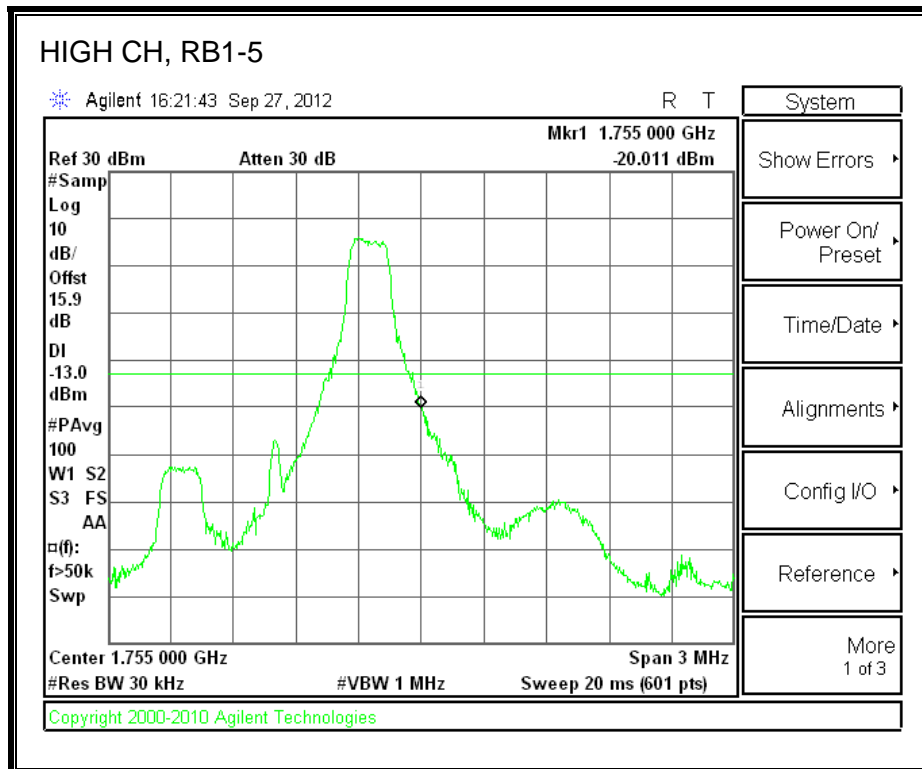
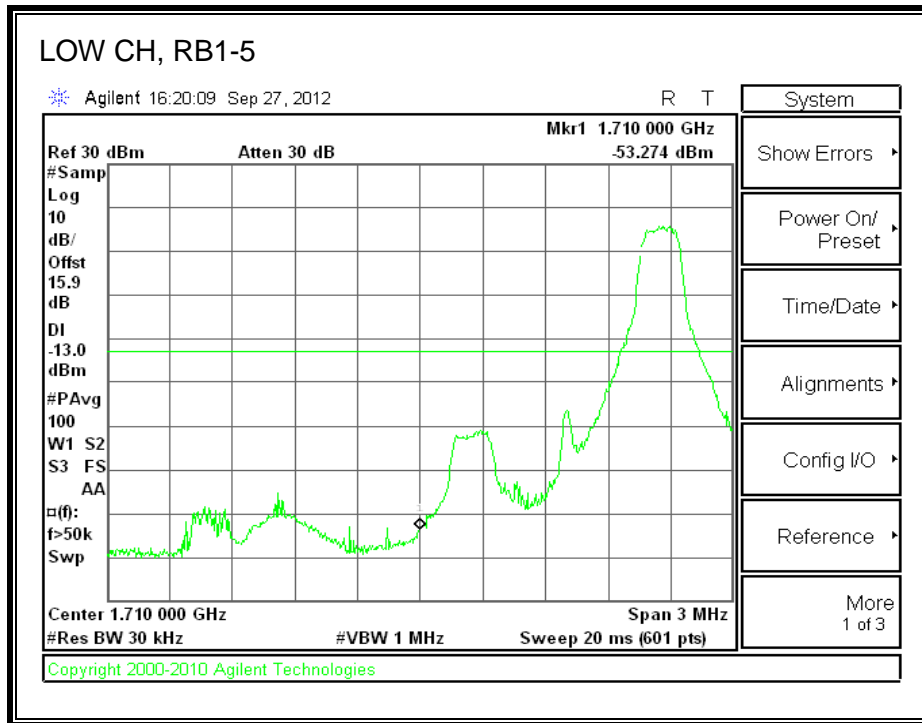


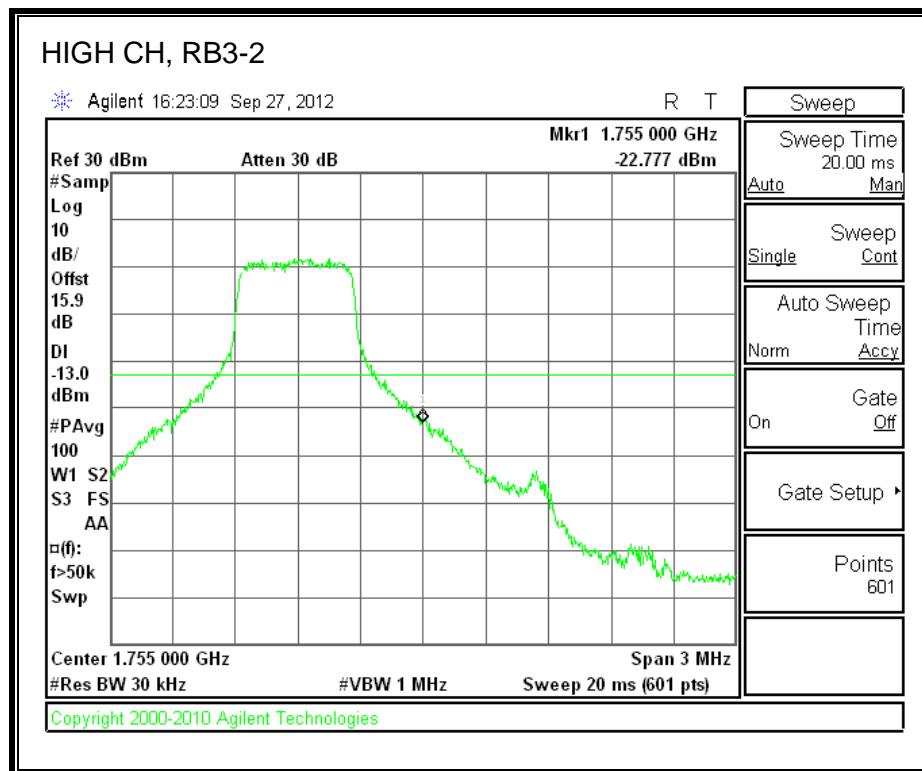
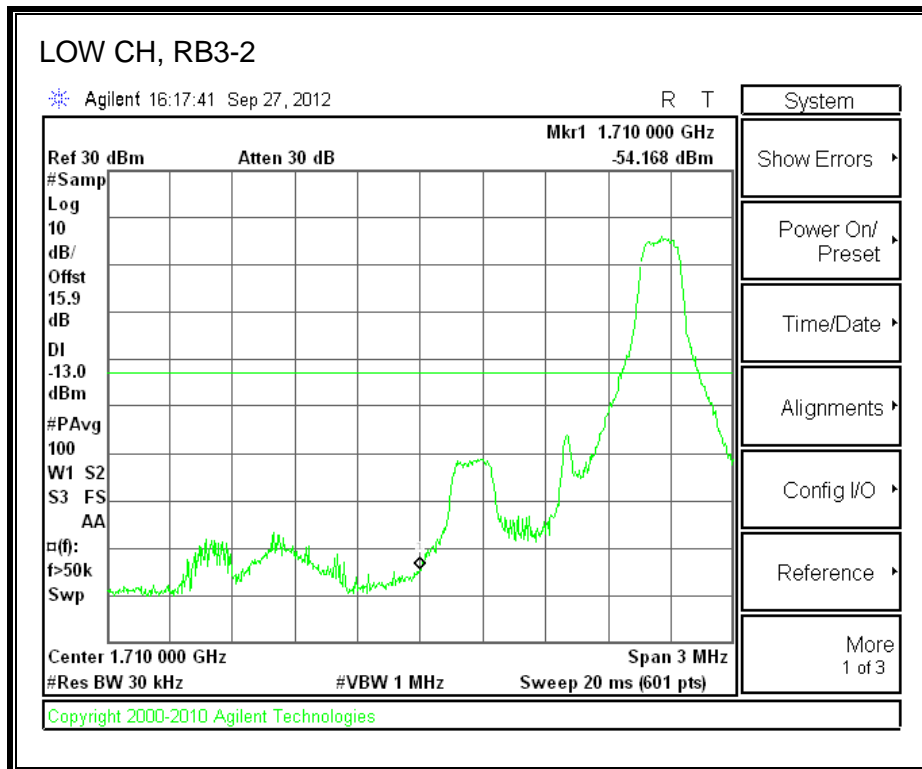


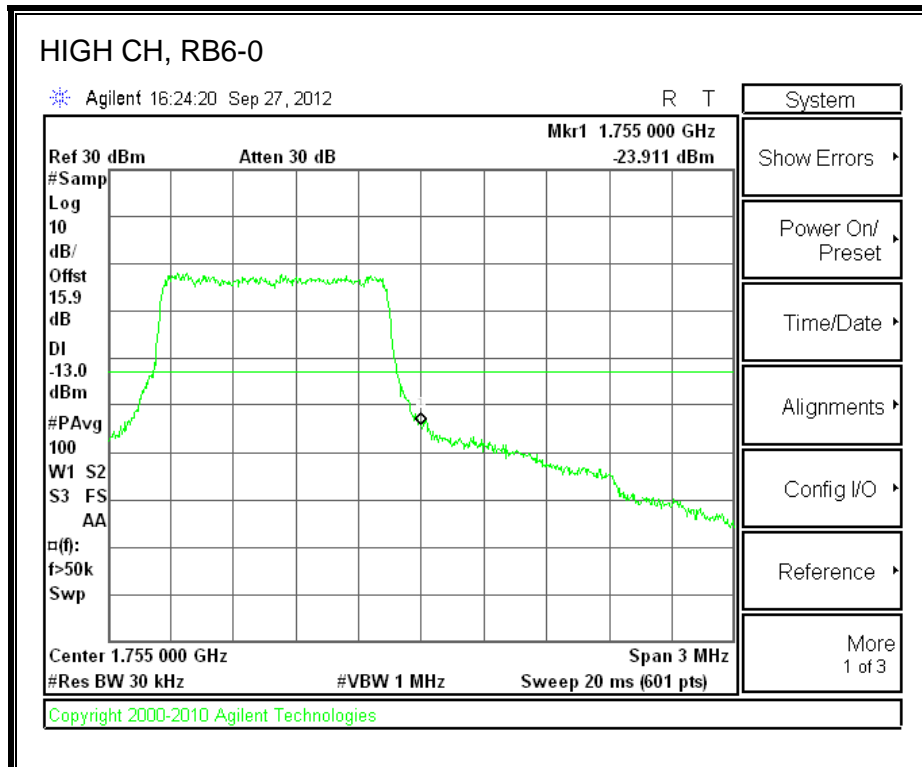
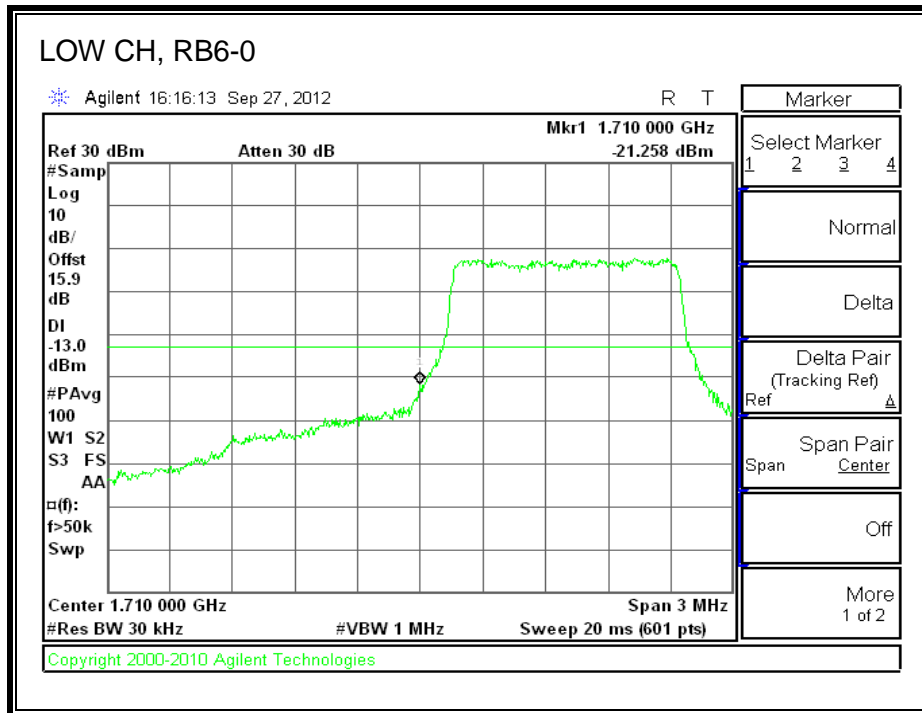


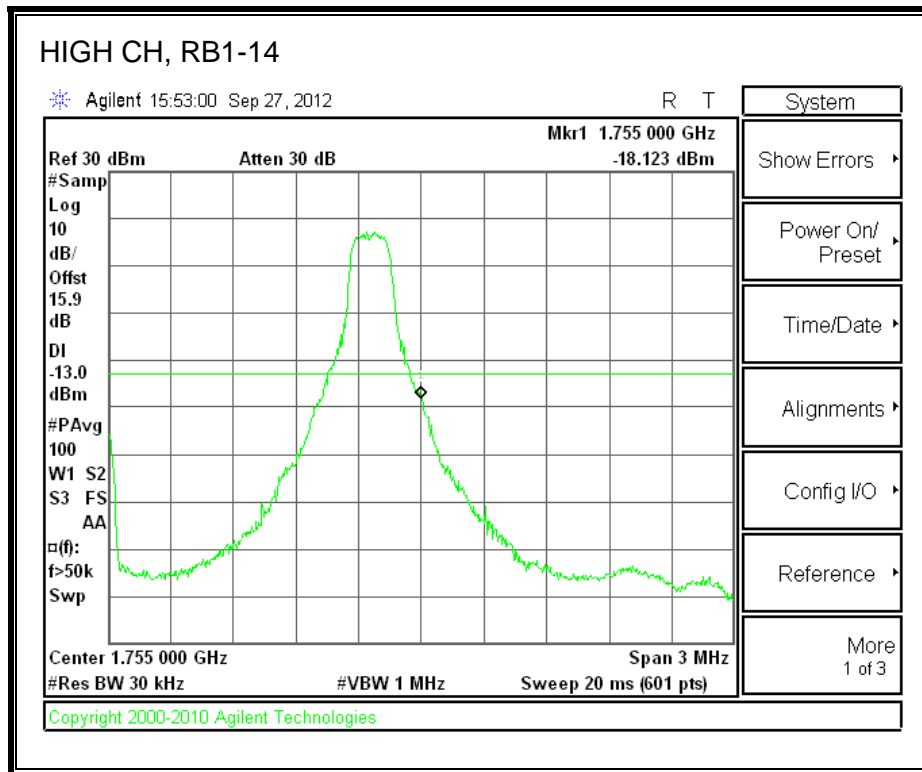
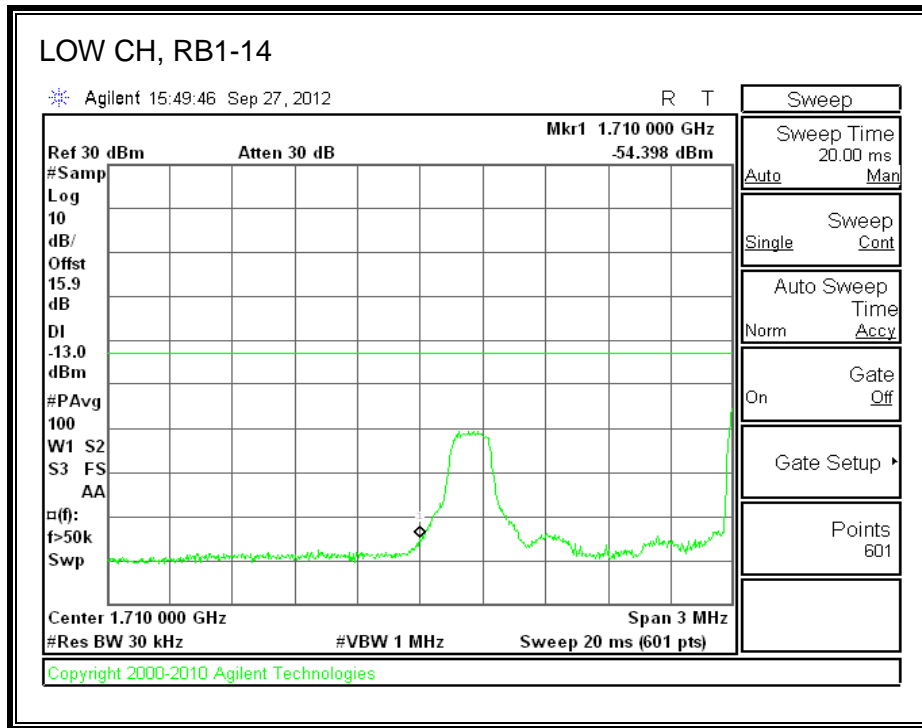
16QAM Band 4 (1.4 MHz BANDWIDTH)

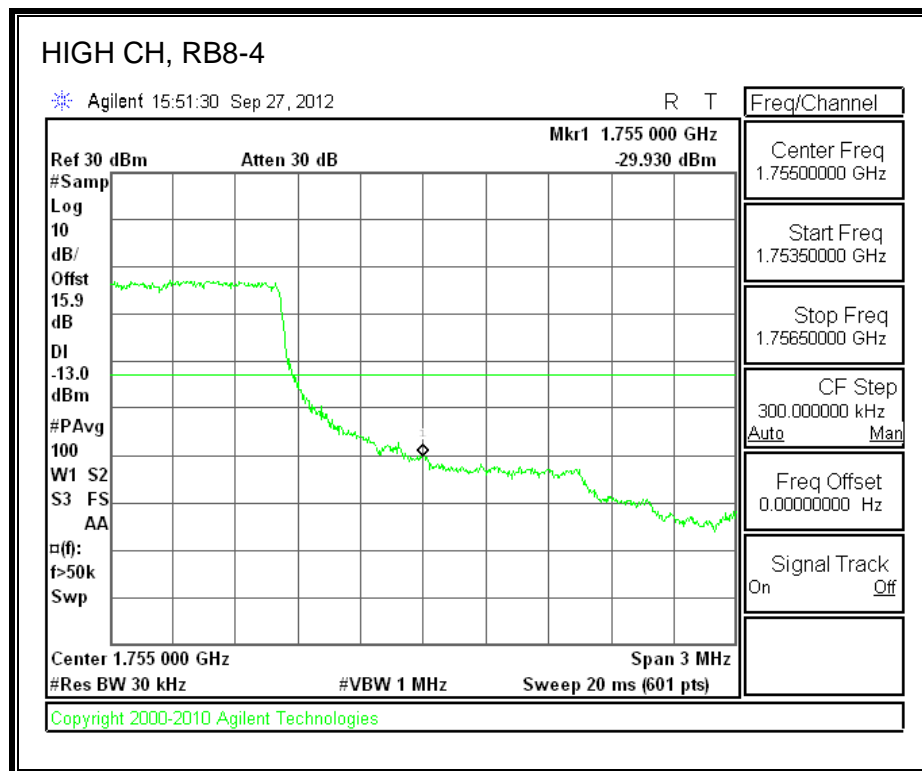
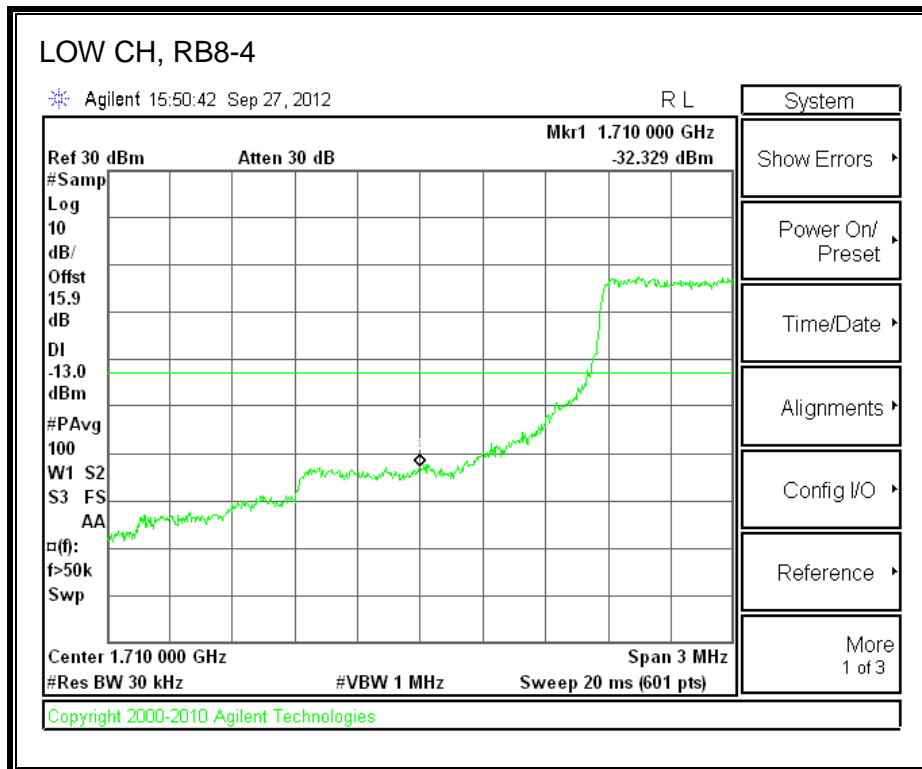


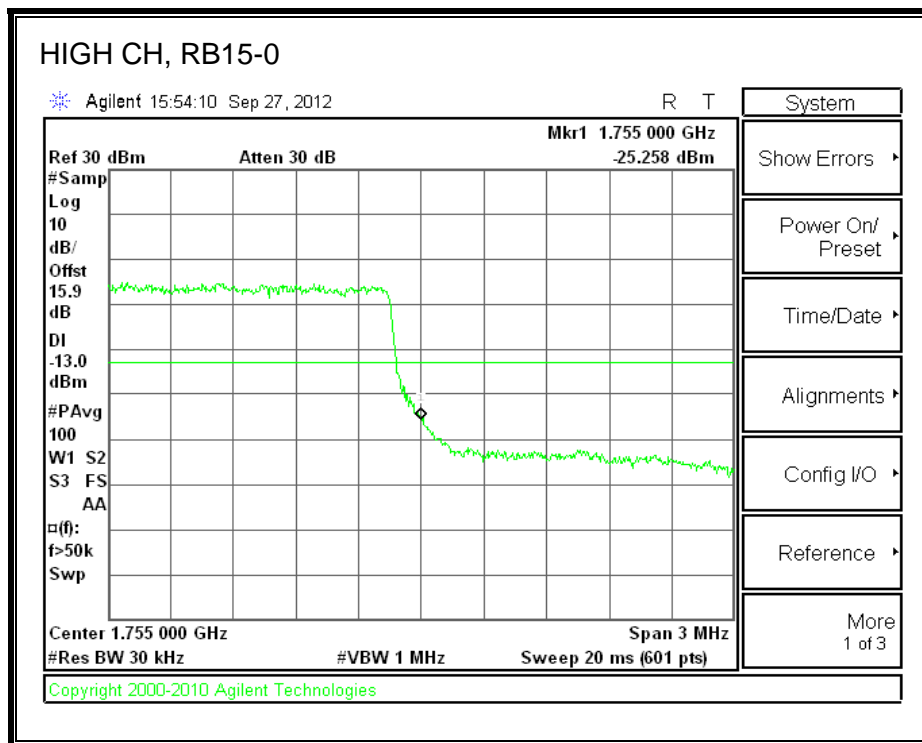
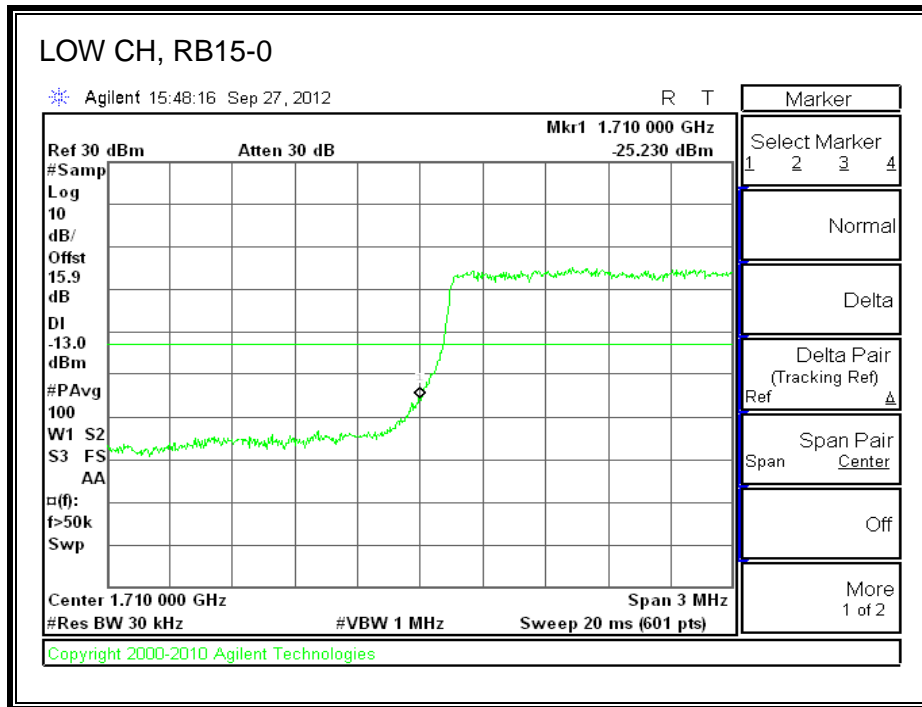












16QAM Band 4 (3 MHz BANDWIDTH)

