



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8**

CERTIFICATION TEST REPORT

FOR

Broadcom 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM94360CS

**FCC ID: QDS-BRCM1069
IC: 4324A-BRCM1069**

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Prepared for

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

EUT DESCRIPTION: Broadcom 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom
Combination Card

MODEL: BCM94360CS

SERIAL NUMBER: C8Y2382001EF563ES

DATE TESTED: DECEMBER 21, 2012 – JANUARY 09, 2013

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	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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EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Broadcom 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card.

The radio module is manufactured by Broadcom.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	7.05	5.07
2402 - 2480	Enhanced 8PSK	8.21	6.62

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The following antennas are utilized for this device:

No.	Antenna Manufacturer	Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz	Peak gain (5150-5250MHz) @5200MHz	Peak gain (5250-5350MHz) @5320MHz	Peak gain (5470-5725MHz) @5500, 5700MHz	Peak gain (5725-5850MHz) @5785, 5805MHz	
1	Amphenol/Molex	802.11abgn WLAN Antenna	613-1143 Wi-Fi1	0.12	7.04	7.09	5.03	2.66	Host2 antenna
1	Amphenol/Molex	802.11abgn WLAN/BT Antenna	613-1143 Wi-Fi2	5.3	6.7	7.06	6.66	5.93	Host2 antenna
1	Amphenol/Molex	802.11abgn WLAN Antenna	613-1143 Wi-Fi3 & Bluetooth	4.69	3.79	3.58	3.94	6.04	Host2 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi1	2.47	4.18	3.35	3.32	3.56	Host1 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi2	2.64	4.22	3.44	2.41	3.68	Host1 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi3 & Bluetooth	4.82	4.63	3.01	4.63	4.31	Host1 antenna

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 6.30.118.23.

The test utility software used during testing was Broadcom Bluetool, rev. 1.4.2.6.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The EUT was tested as an external module installed in a test jig board connected to a host Laptop PC. The EUT was oriented in a flat orientation, similar to the orientation it would have in real installations; see setup photos for details.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Apple	A1465	2012-2333	DoC
AC Adapter	Liteon Technology	MagSafe2	NSW25804	DoC
Mouse	HP	N8ROU	537749-001	DoC

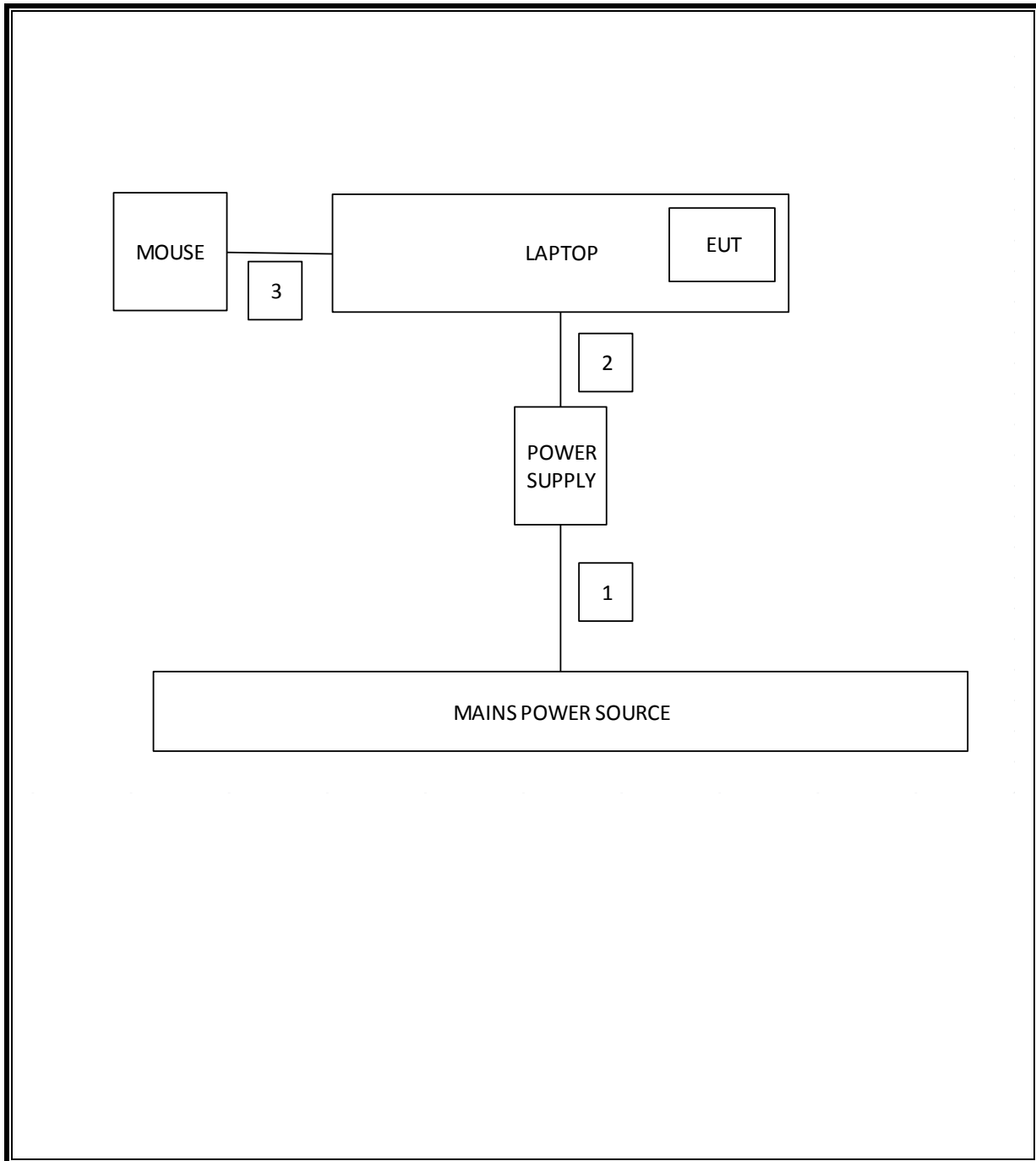
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Un-Shielded	1.8	N/A
2	DC	1	DC	Shielded	1.8	N/A
3	USB	1	USB	Shielded	1.8	N/A

TEST SETUP

The EUT is installed in a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/2011	12/13/2012
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	12/13/2012	12/13/2013
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01161	5/2/2012	5/2/2013
Antenna, Horn, 18 GHz	EMCO	3115	C00945	11/12/2012	11/12/2013
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/2012	10/22/2013
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/20/2011	12/30/2013
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	--	2/7/2012	2/7/2013
Antenna, Horn, 26.5 GHz	ARA	SWH-28	C01015	4/23/2012	4/23/2013
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	8/8/2012	8/8/2013
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/2011	1/13/2014

7. ANTENNA PORT TEST RESULTS

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

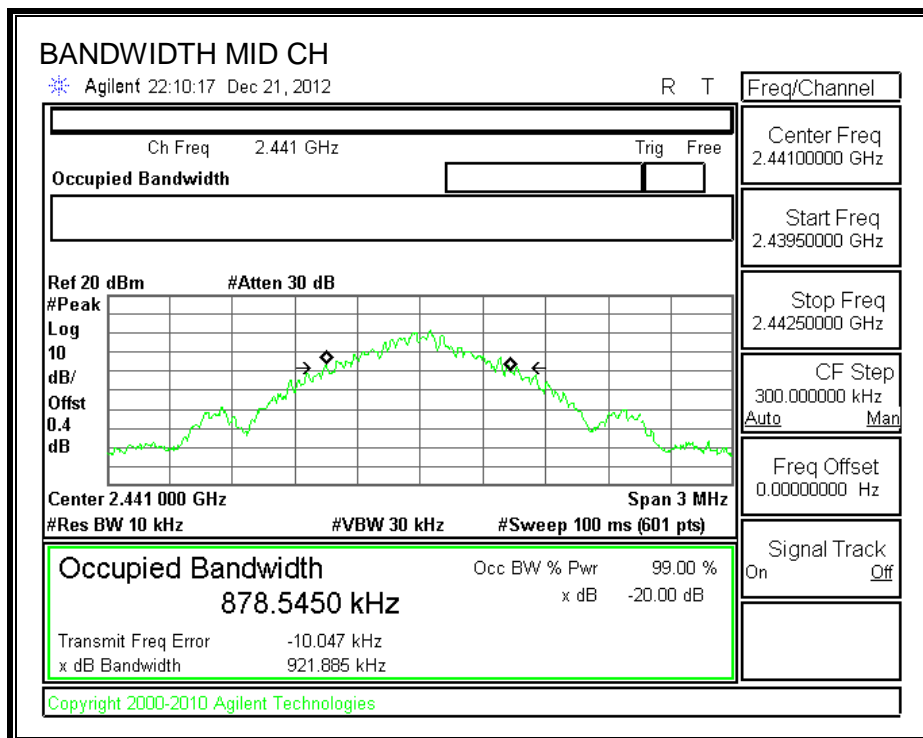
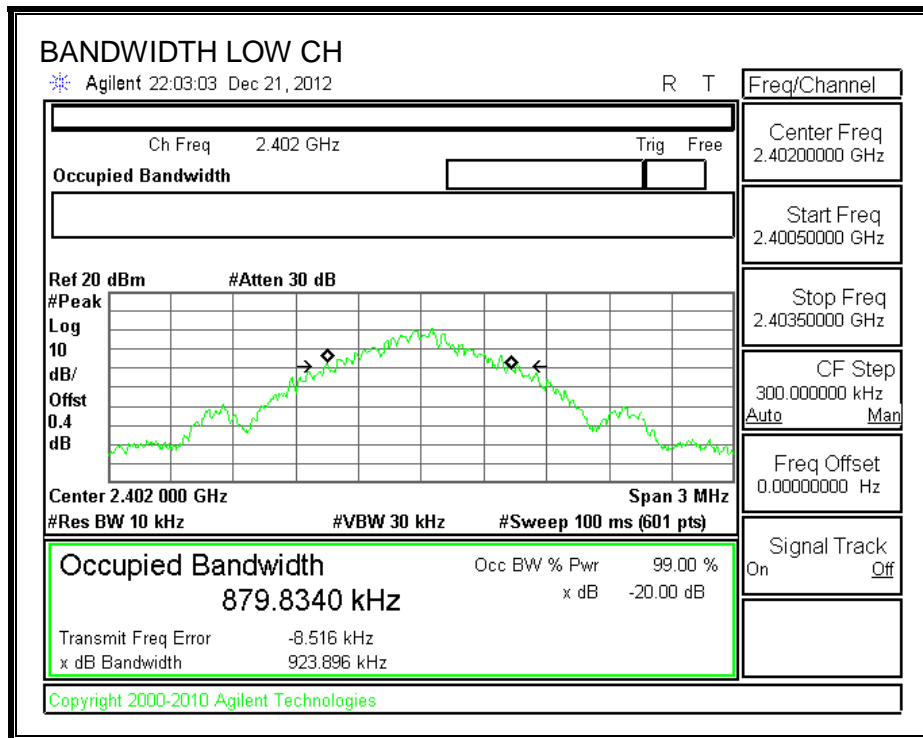
TEST PROCEDURE

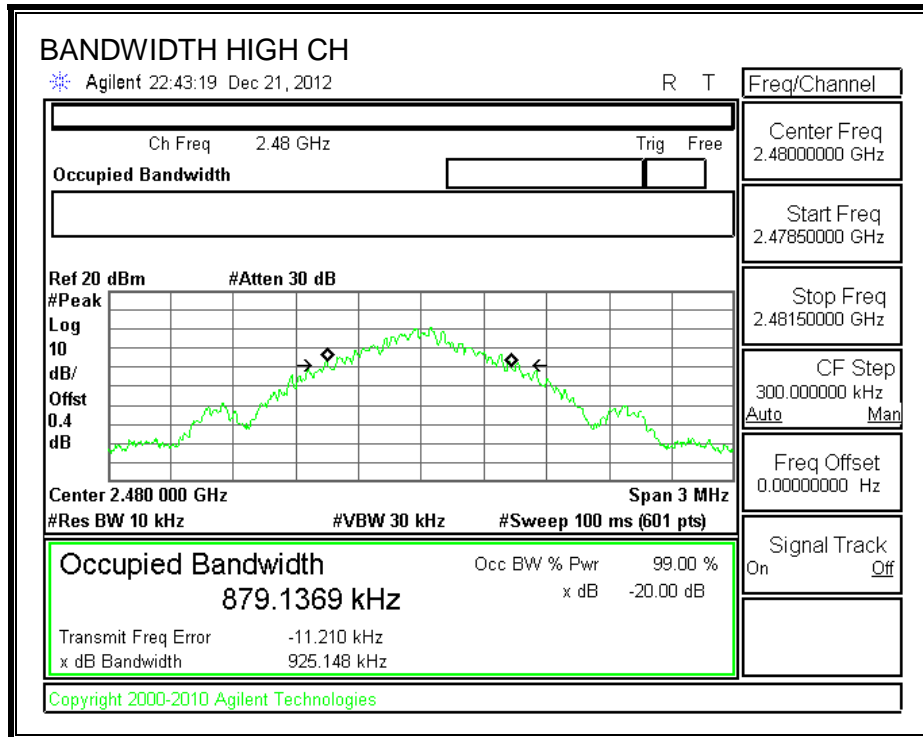
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

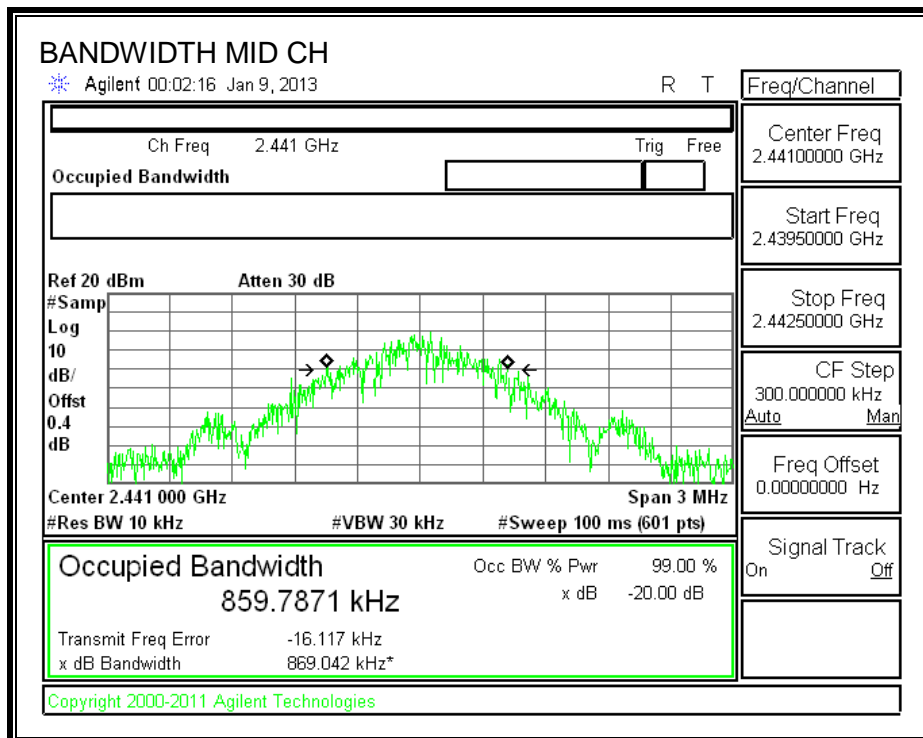
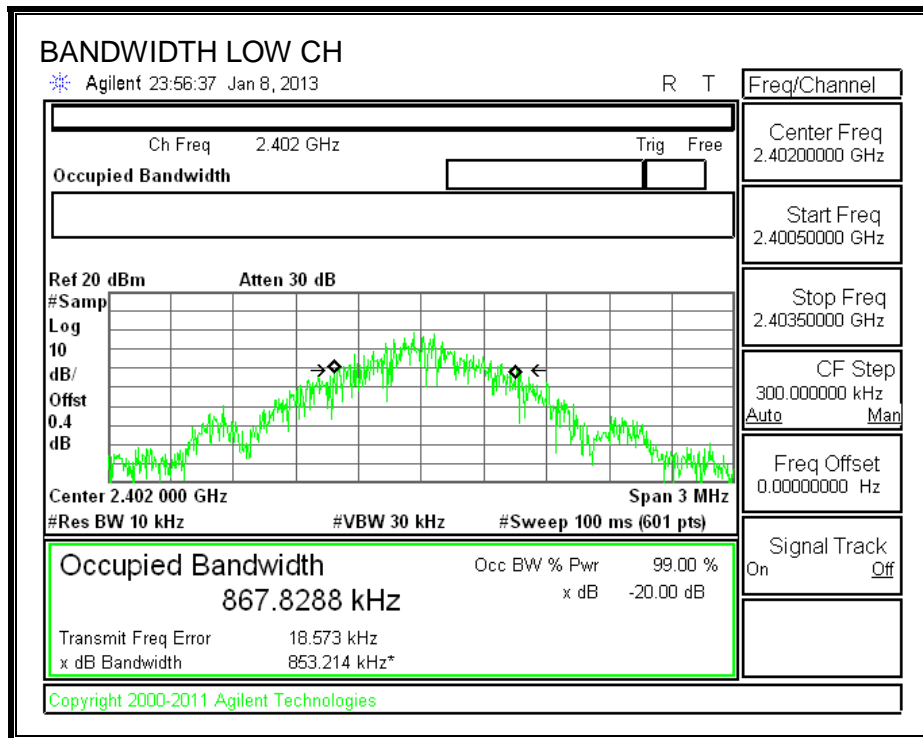
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	1347	1202.8
Middle	2441	1345	1202.3
High	2480	1346	1210.9

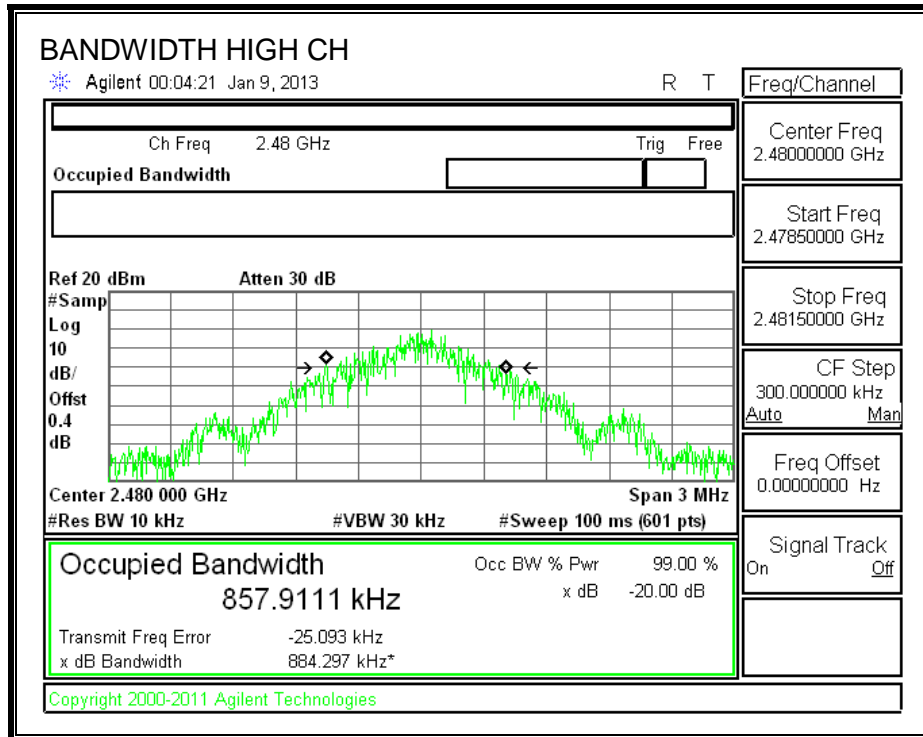
20 dB BANDWIDTH





99% BANDWIDTH





7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

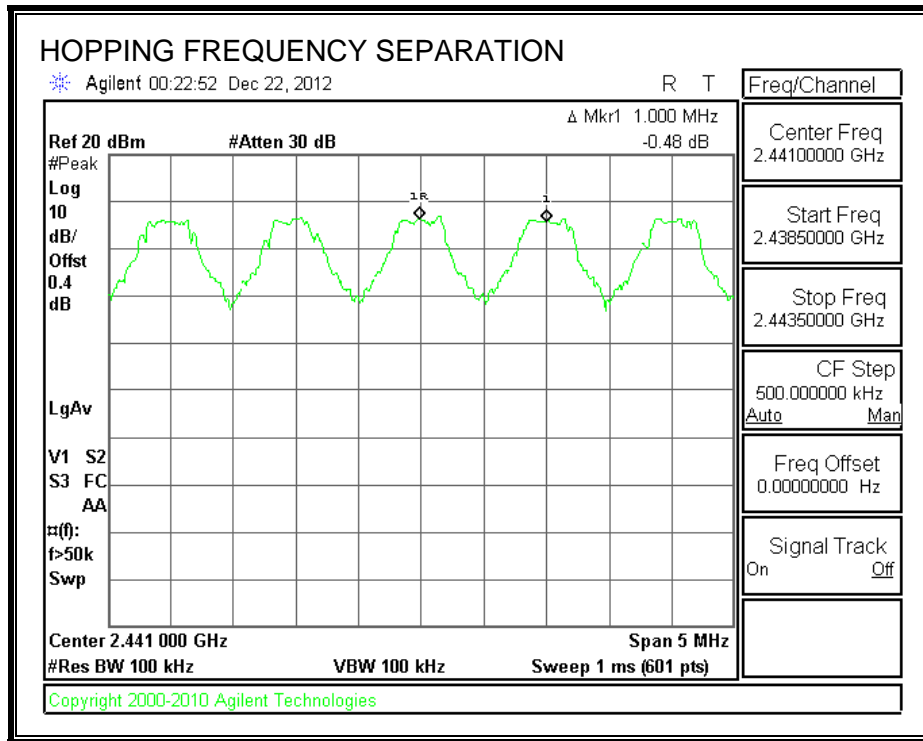
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

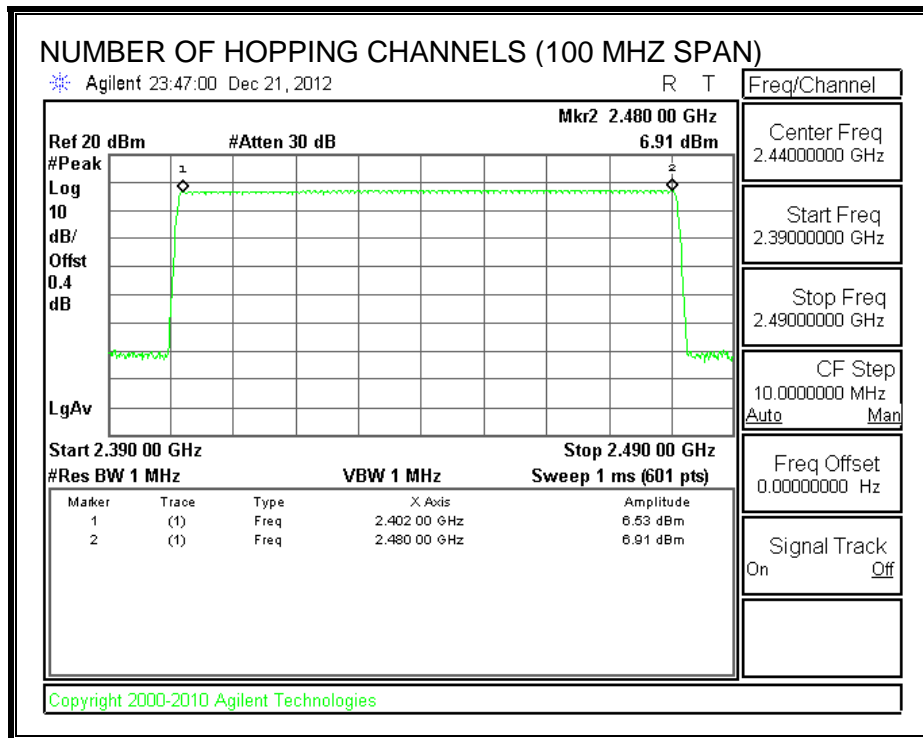
TEST PROCEDURE

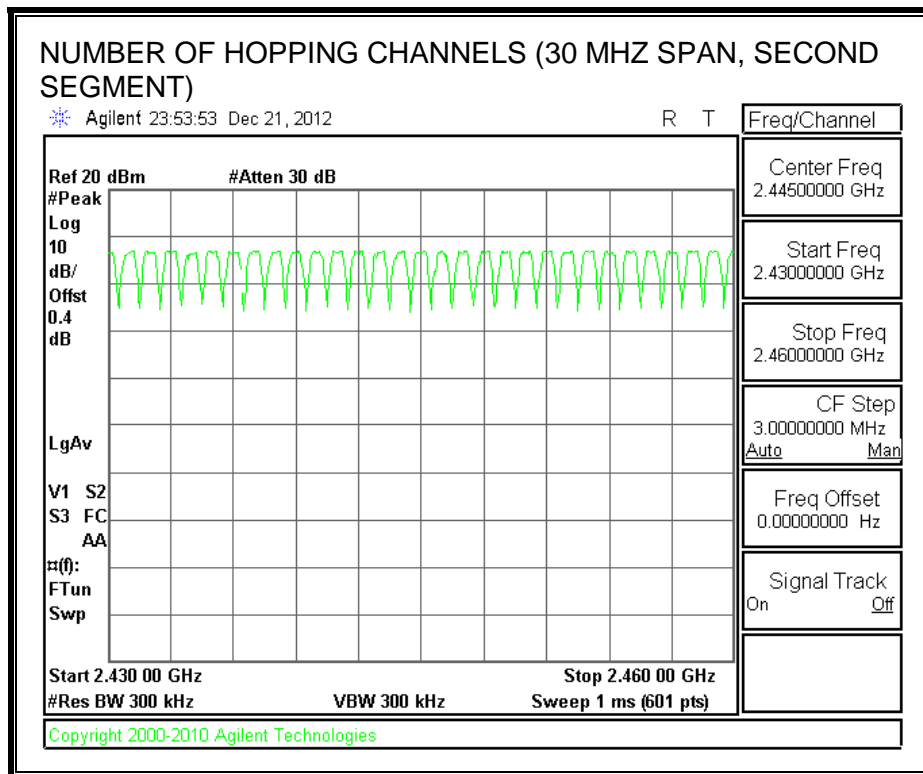
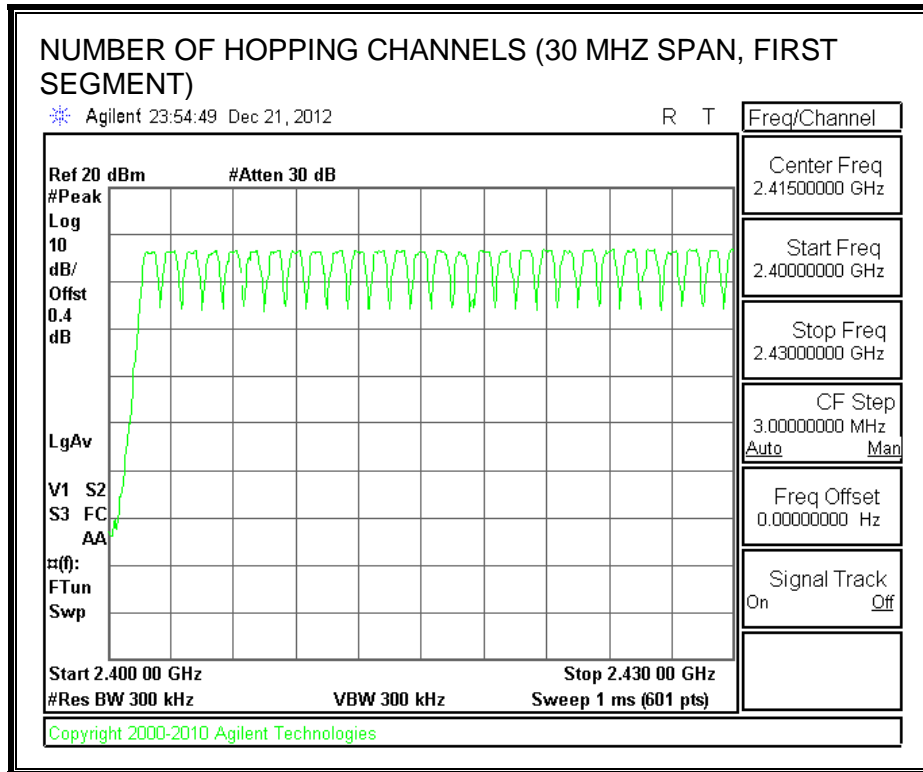
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

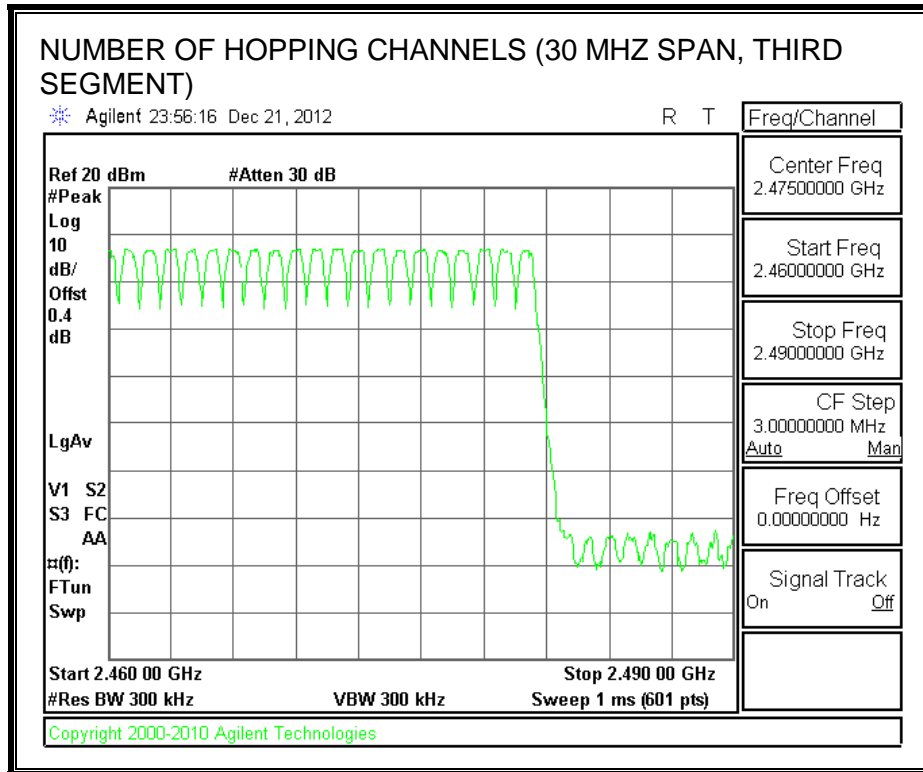
RESULTS

Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS







7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

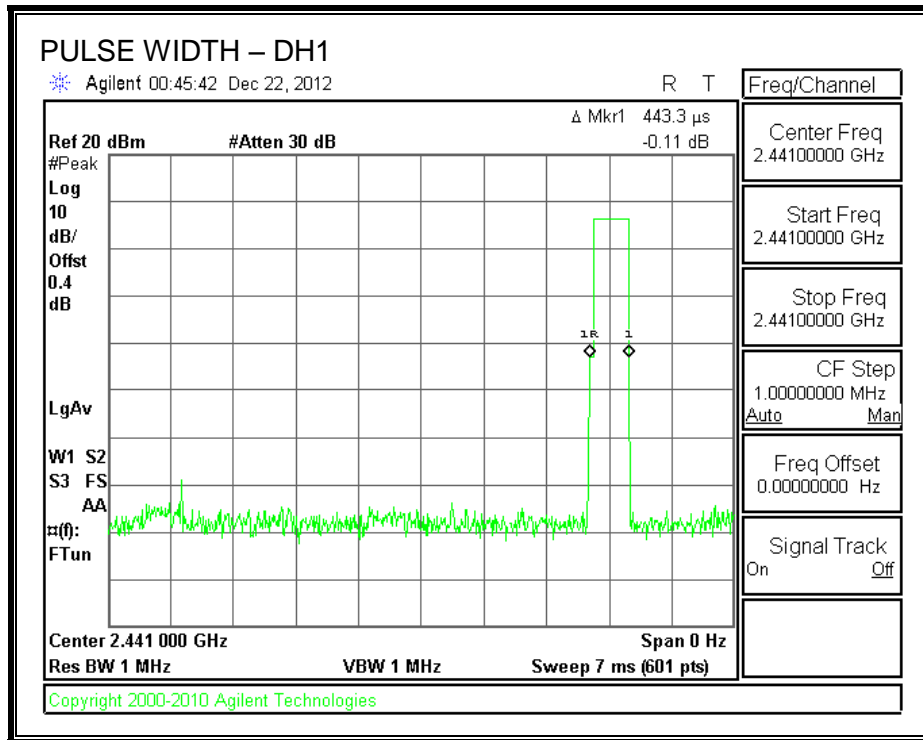
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{ pulse width}$.

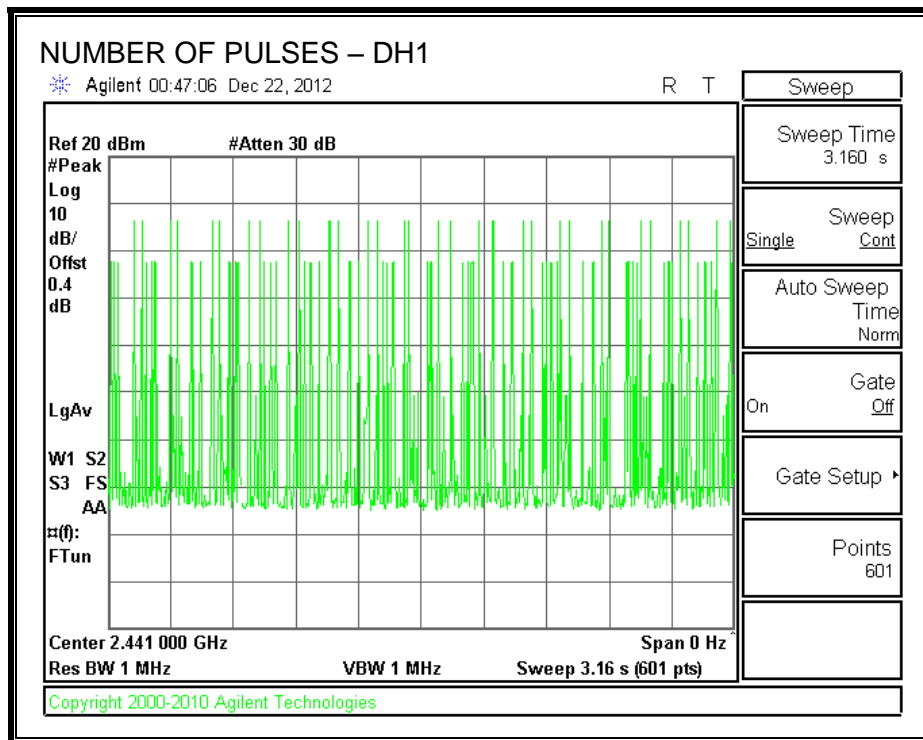
RESULTS

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.4433	32	0.142	0.4	-0.258
DH3	1.703	16	0.272	0.4	-0.128
DH5	2.94	12	0.353	0.4	-0.047
GFSK AFH Mode					
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.4433	64	0.284	0.4	-0.116
DH3	1.703	21	0.358	0.4	-0.042
DH5	2.94	13	0.382	0.4	-0.018

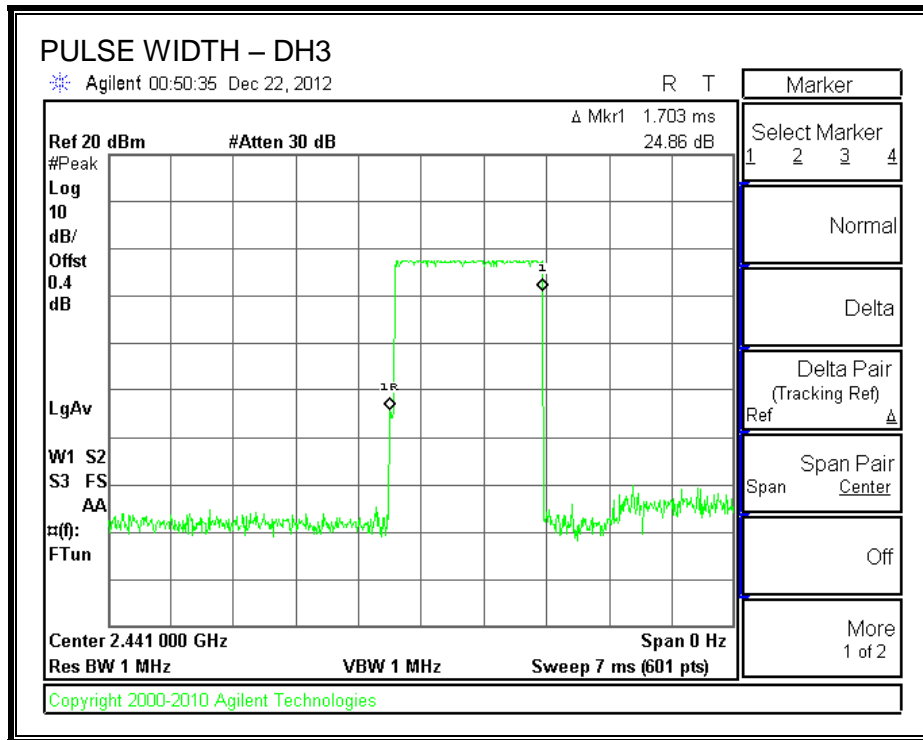
PULSE WIDTH - DH1



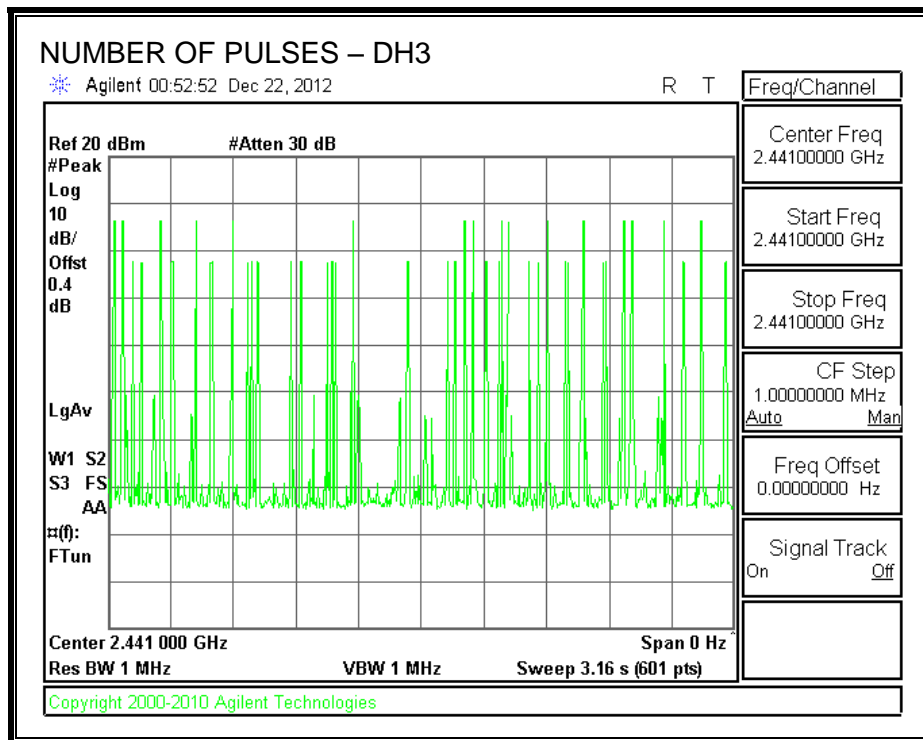
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH1



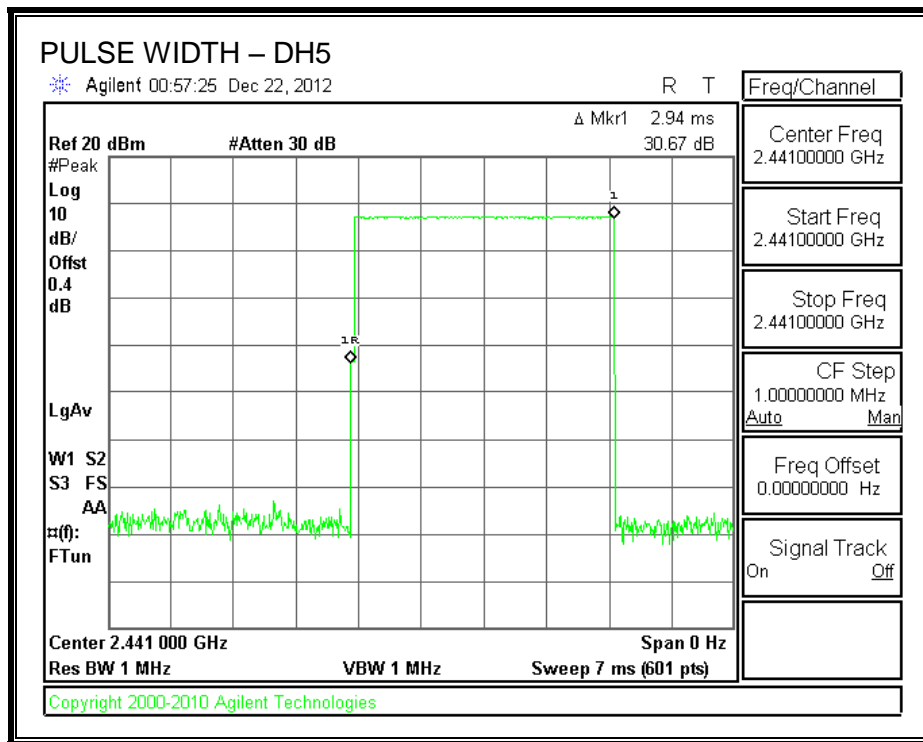
PULSE WIDTH – DH3



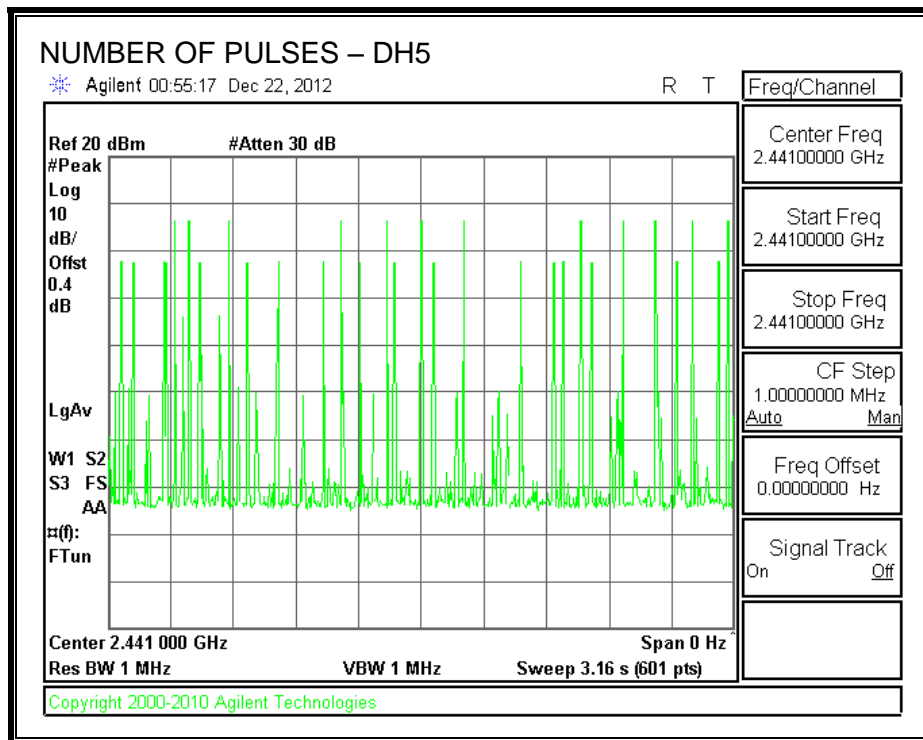
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



7.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

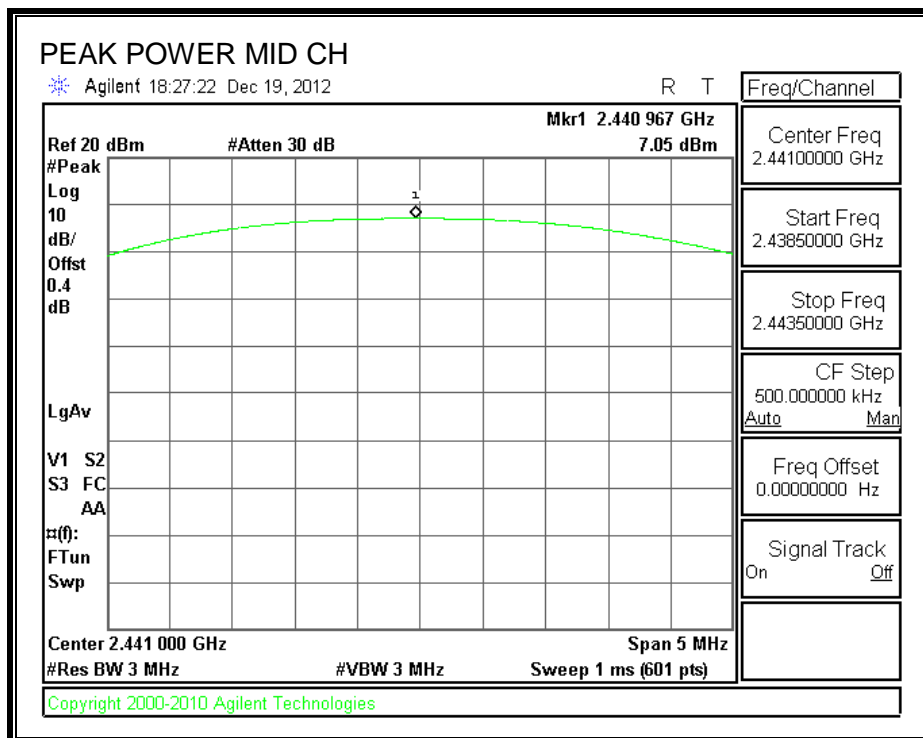
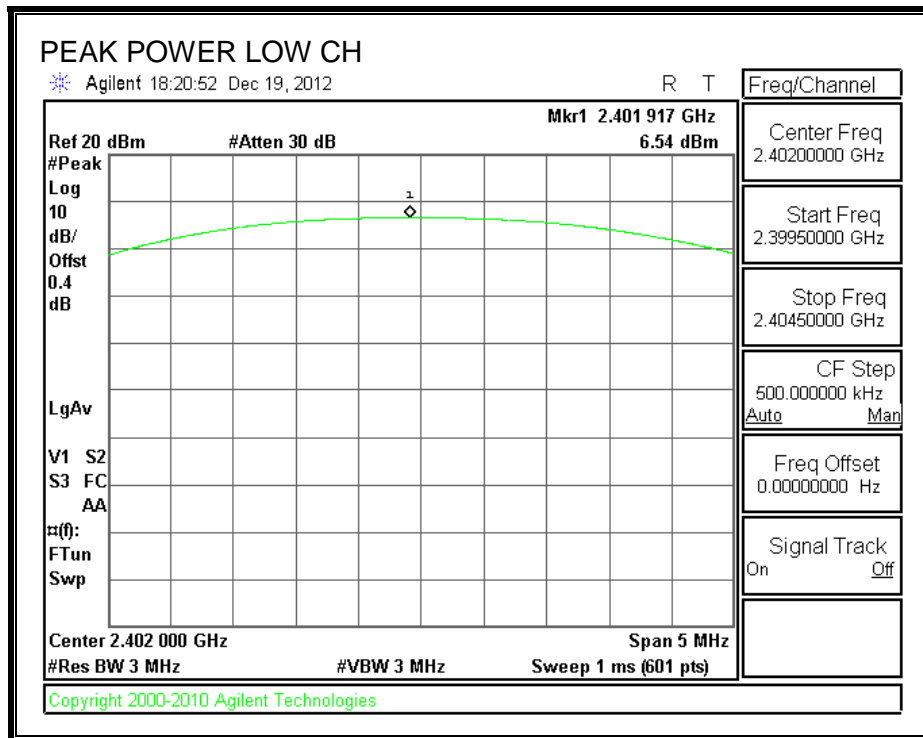
TEST PROCEDURE

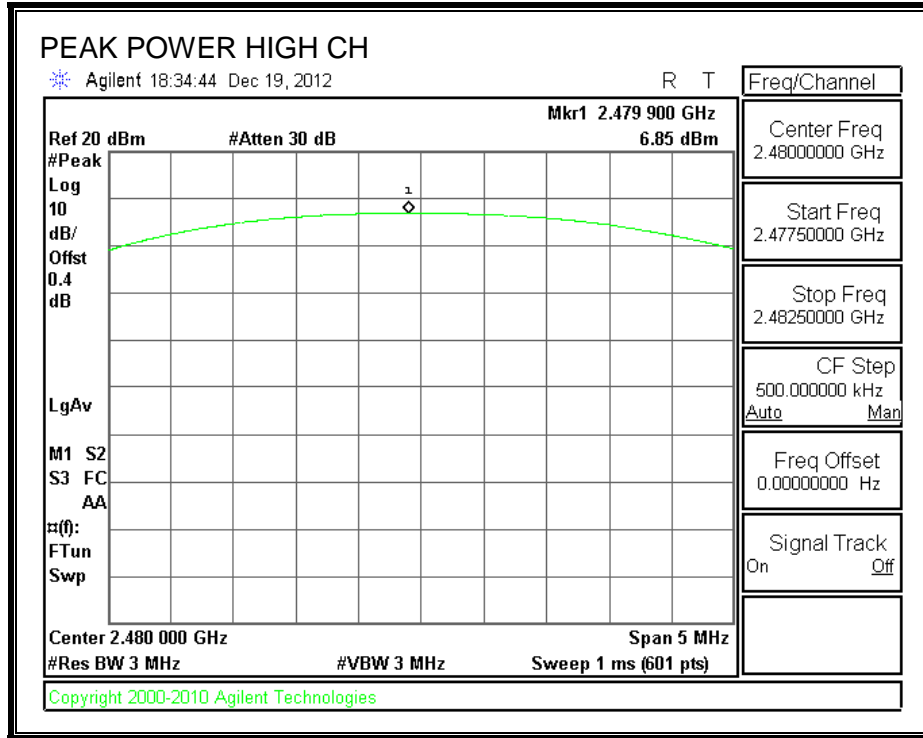
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	6.54	30	-23.46
Middle	2441	7.05	30	-22.95
High	2480	6.85	30	-23.15

OUTPUT POWER





7.1.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 0.4 dB (including 0 dB pad and 0.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.43
Middle	2441	6.86
High	2480	6.87

7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

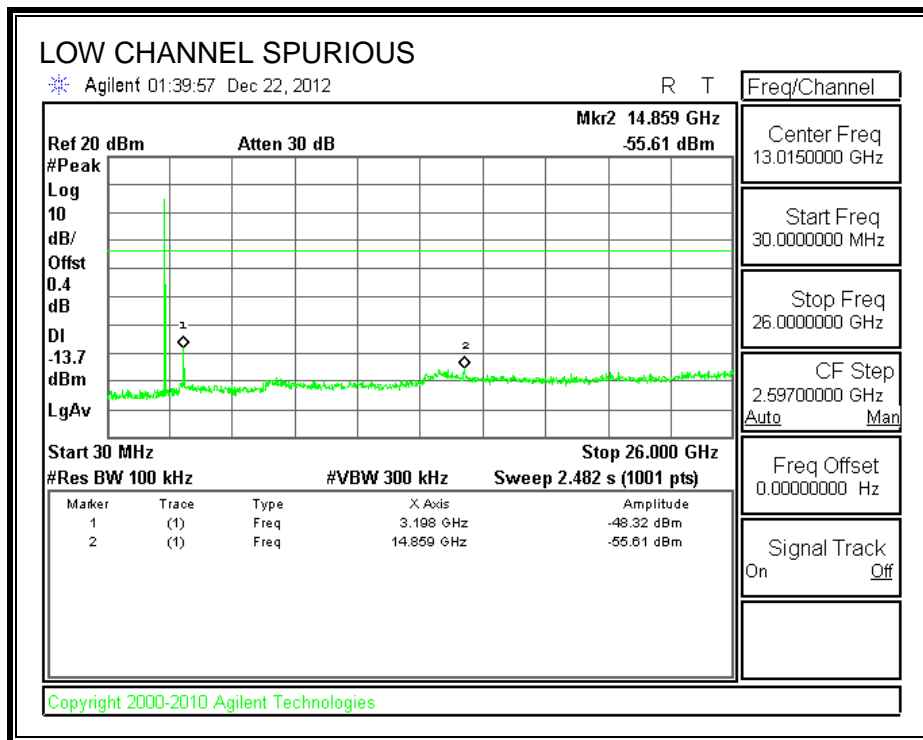
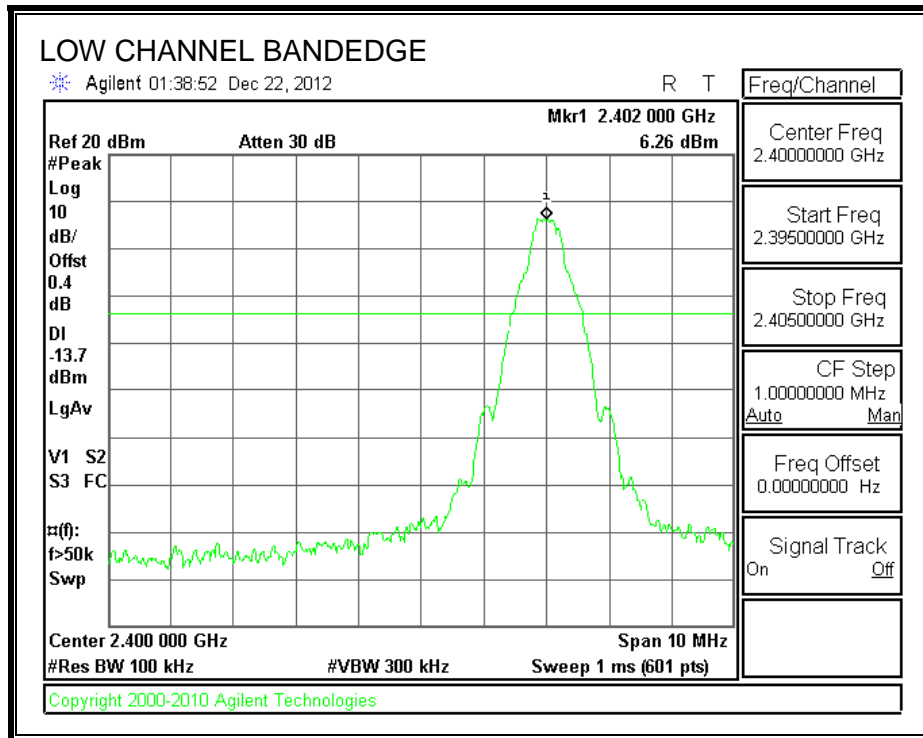
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

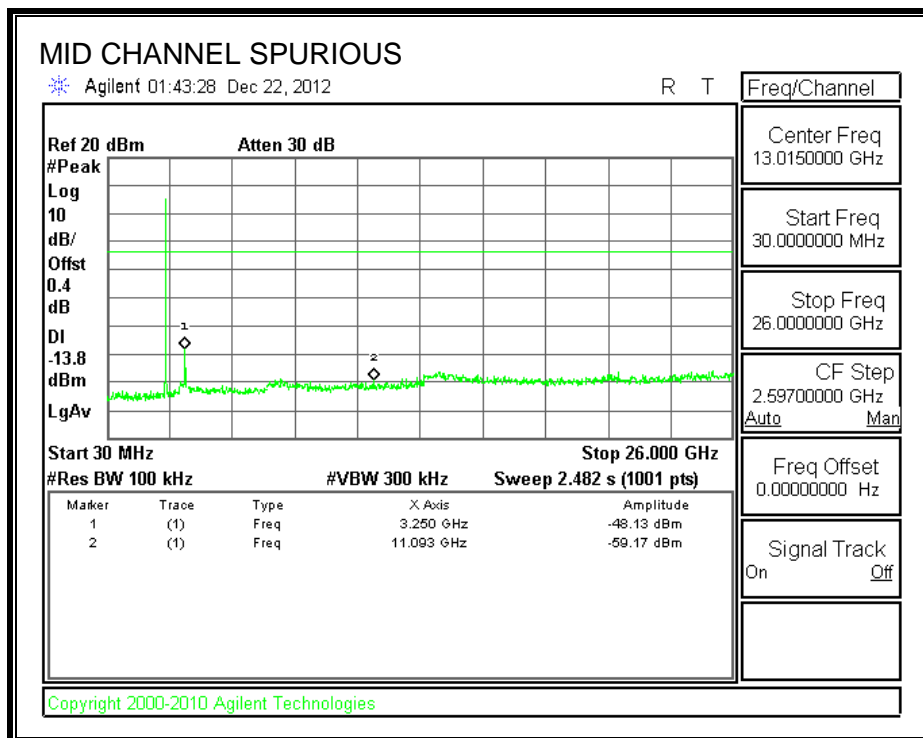
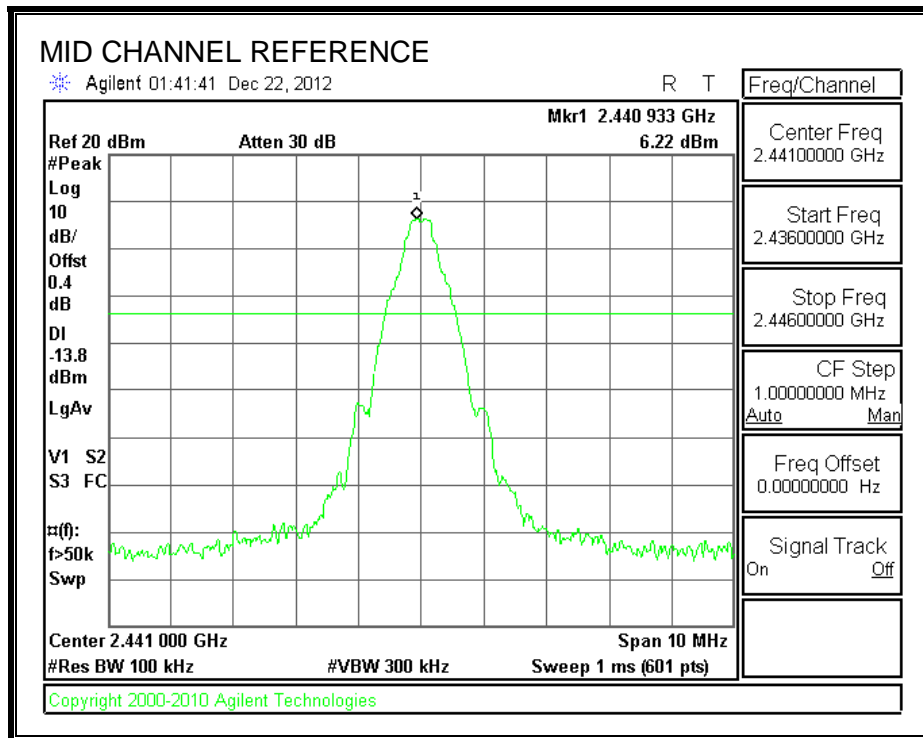
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

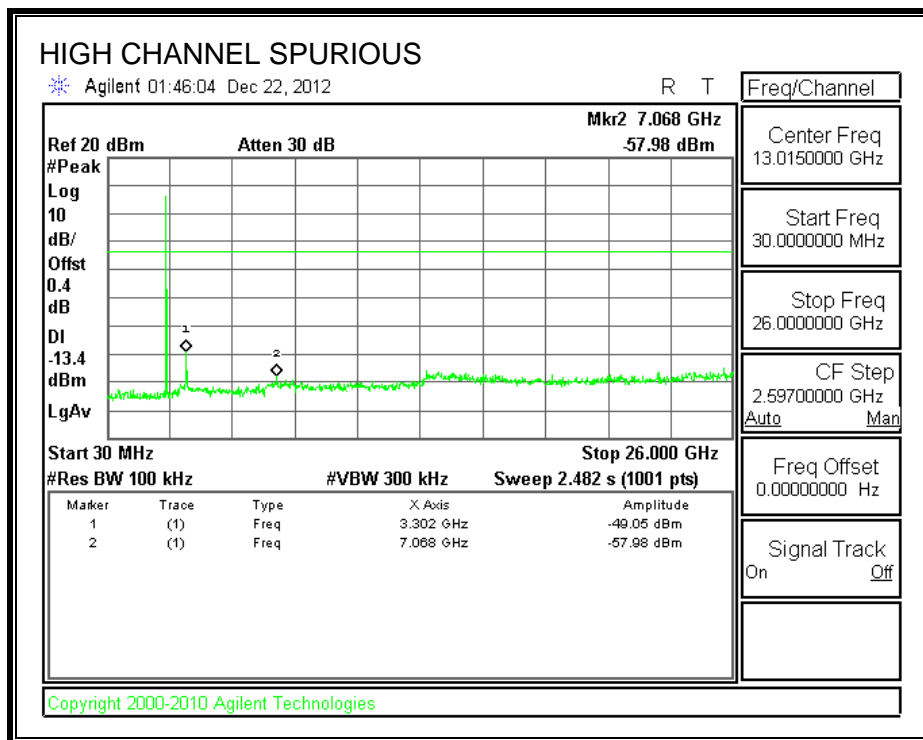
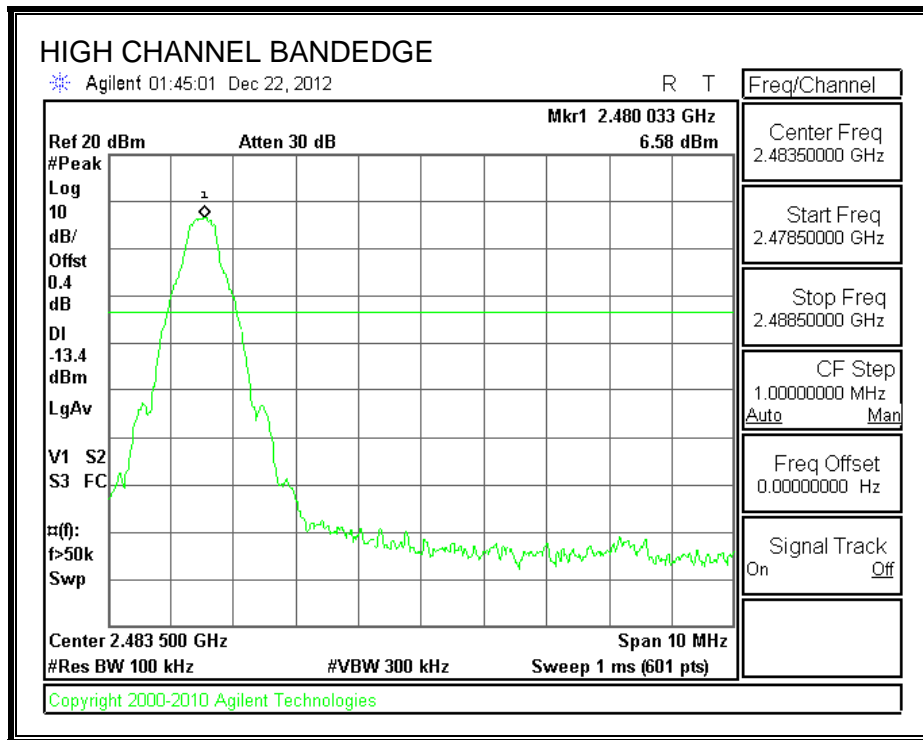
SPURIOUS EMISSIONS, LOW CHANNEL



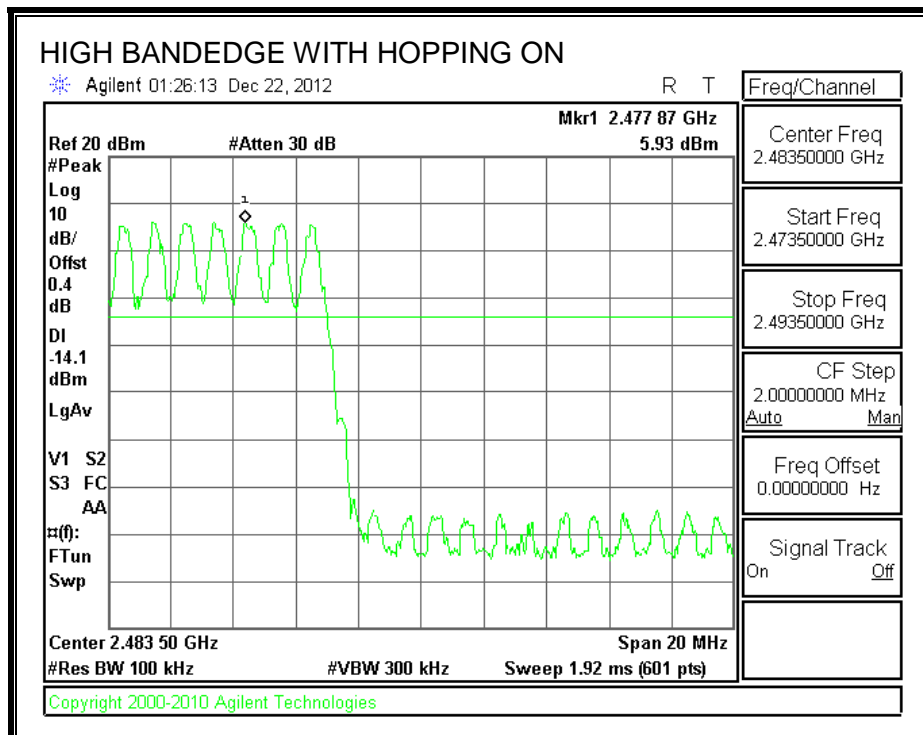
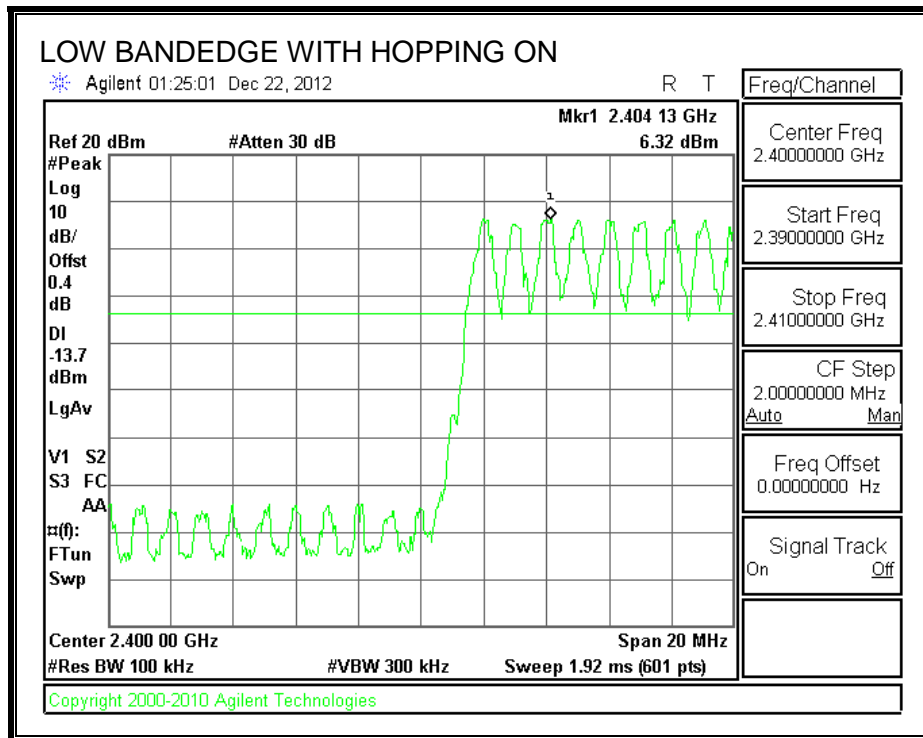
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



7.2. ENHANCED DATA RATE 8PSK MODULATION

7.2.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

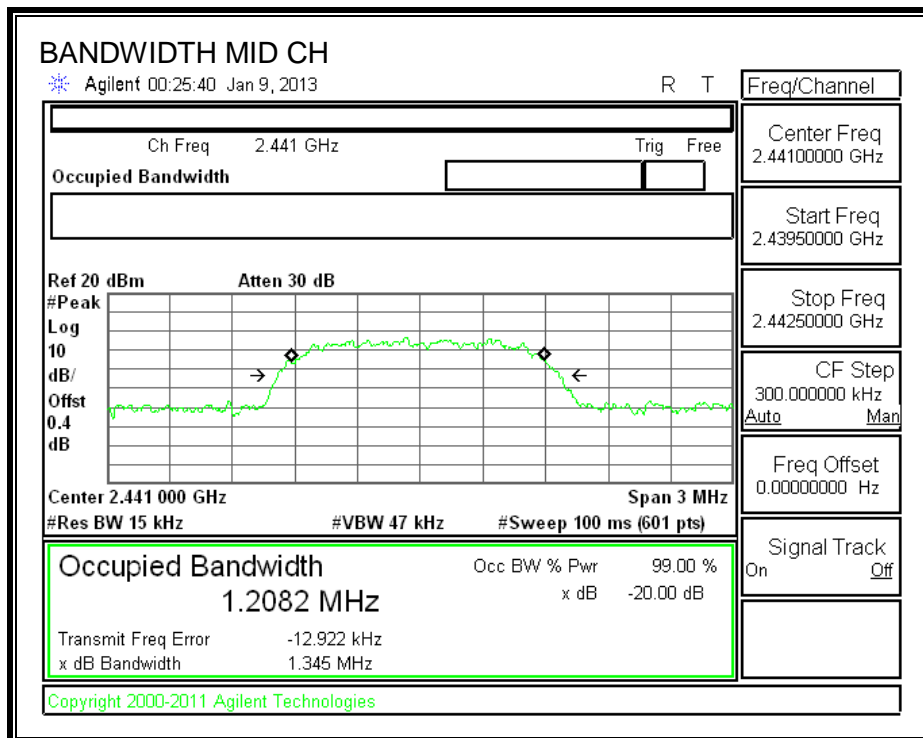
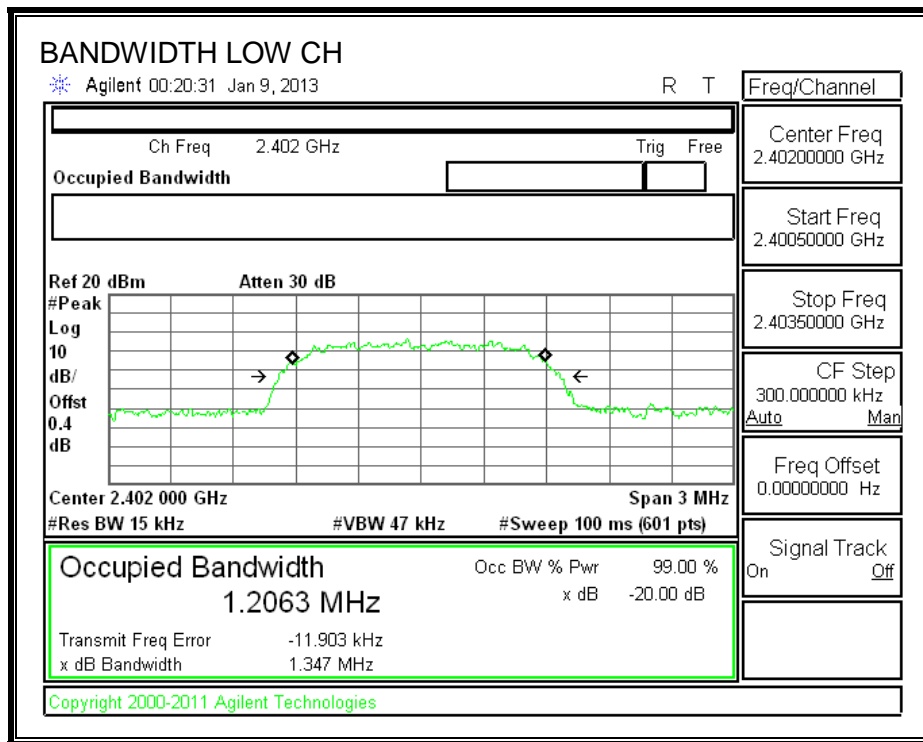
TEST PROCEDURE

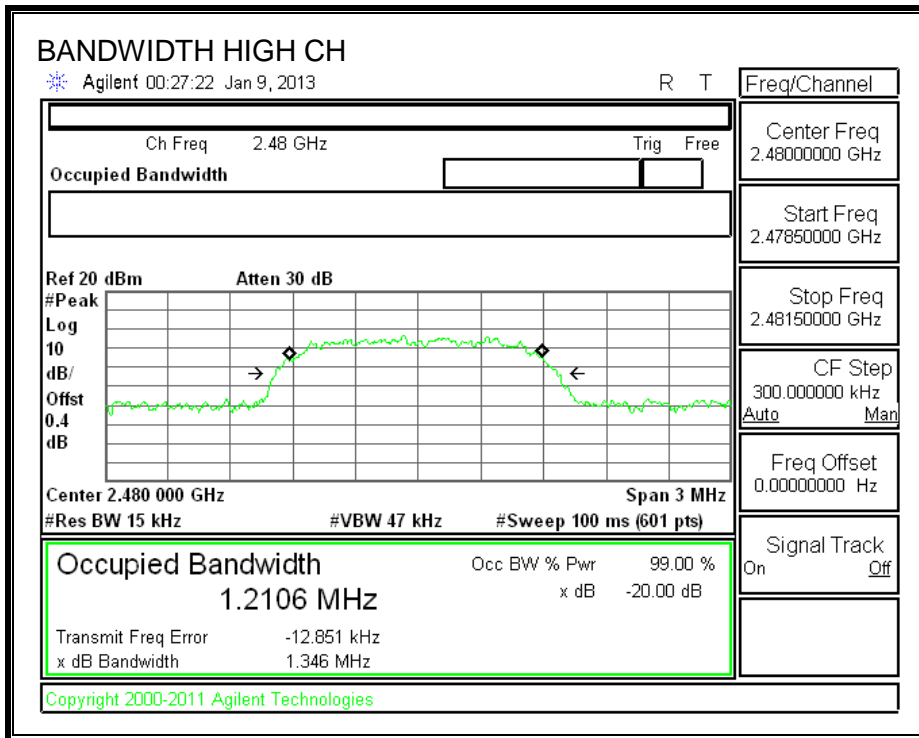
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

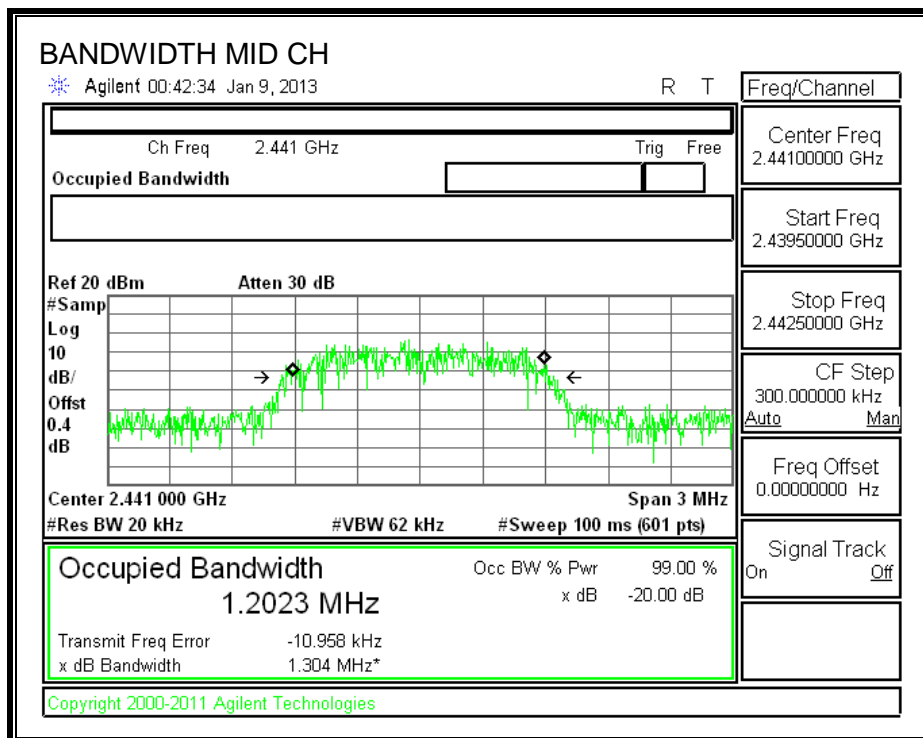
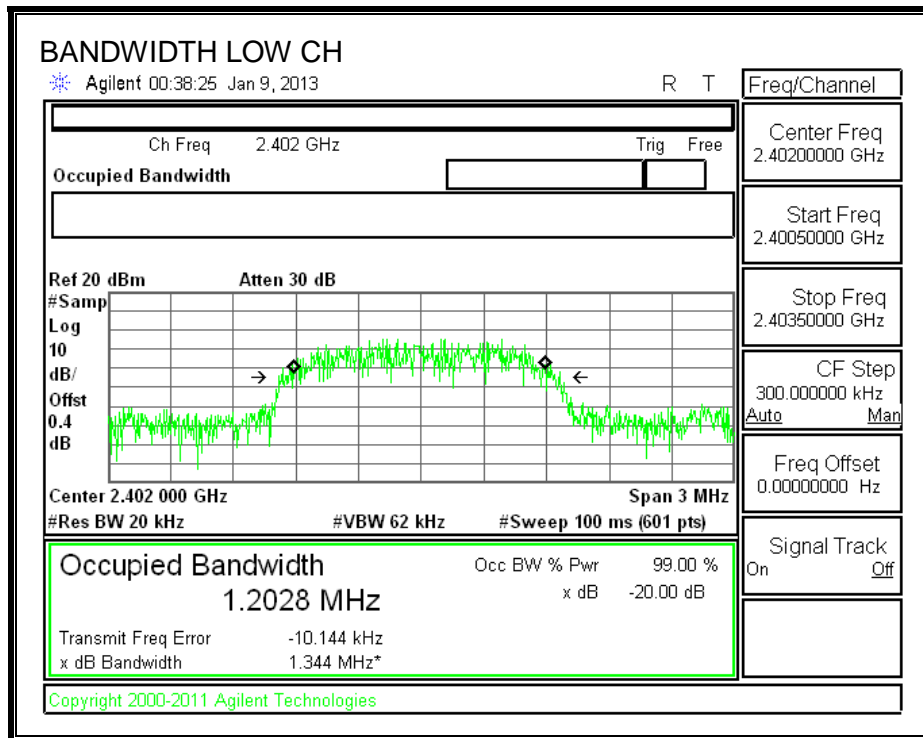
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	1347	1202.8
Middle	2441	1345	1202.3
High	2480	1346	1210.9

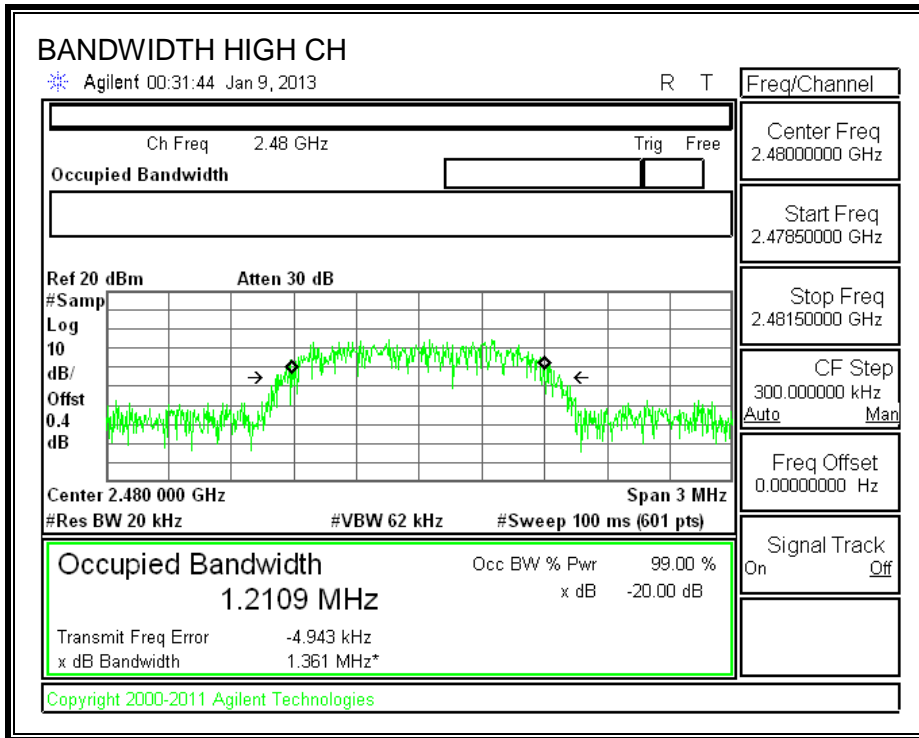
20 dB BANDWIDTH





99% BANDWIDTH





7.2.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

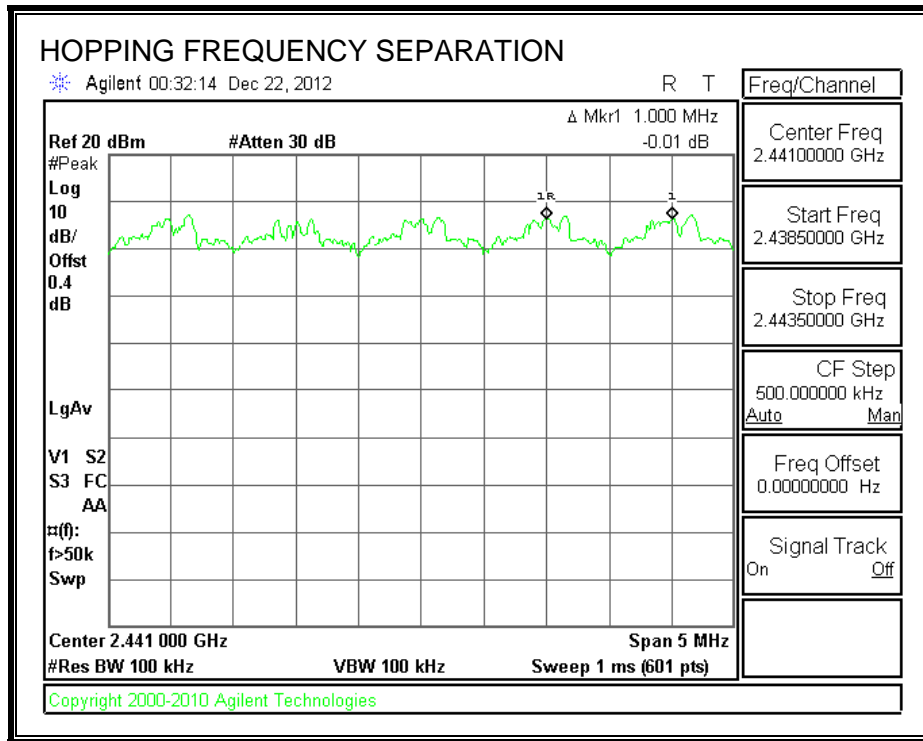
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

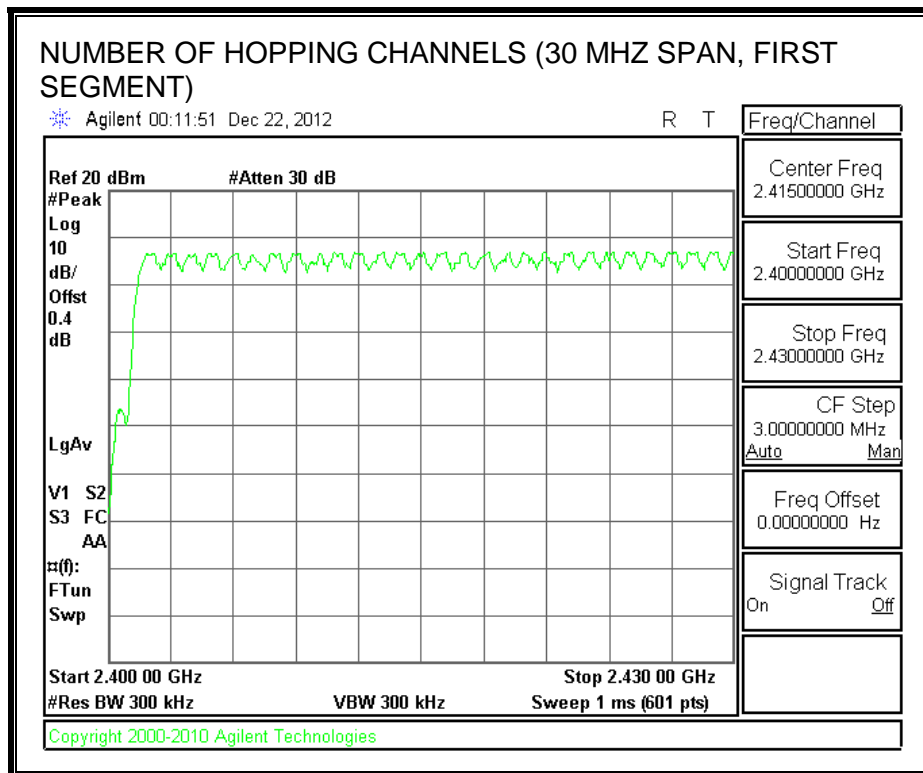
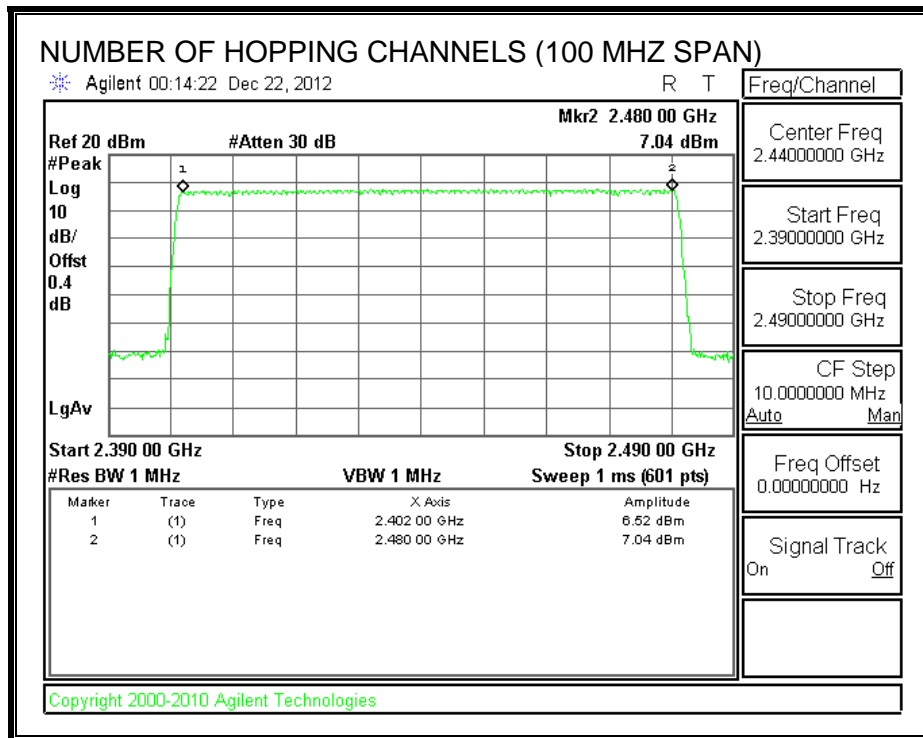
TEST PROCEDURE

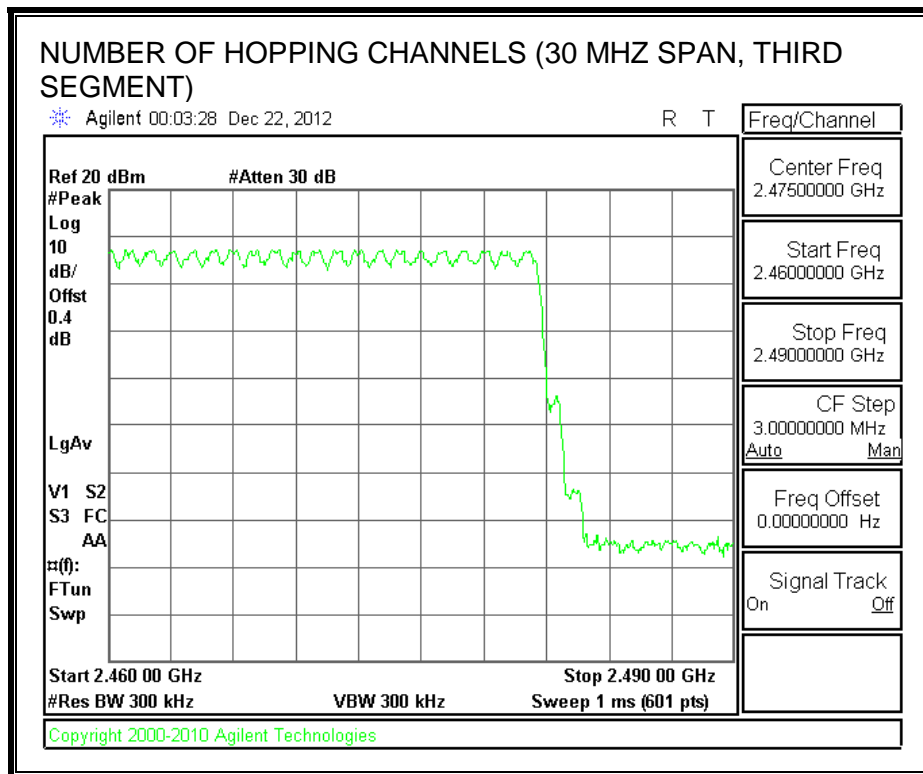
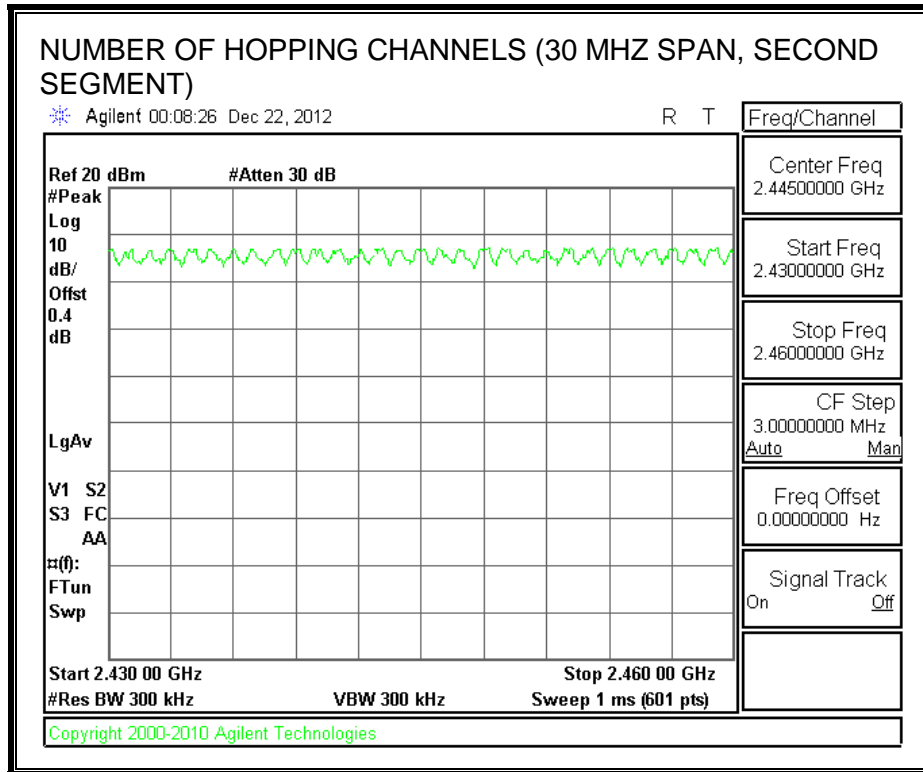
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS





7.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

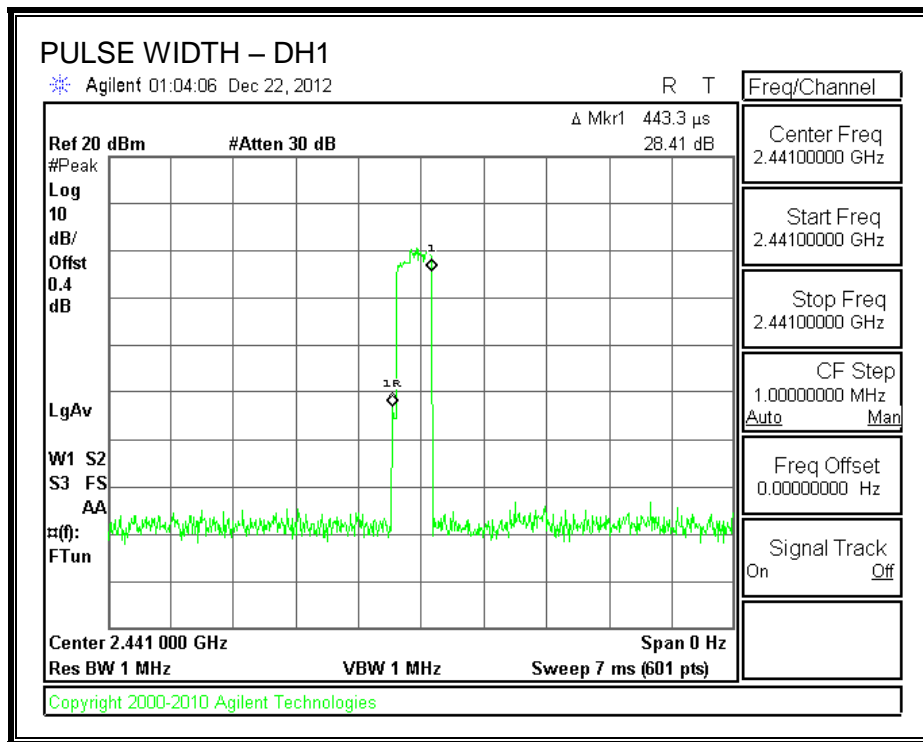
RESULTS

Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

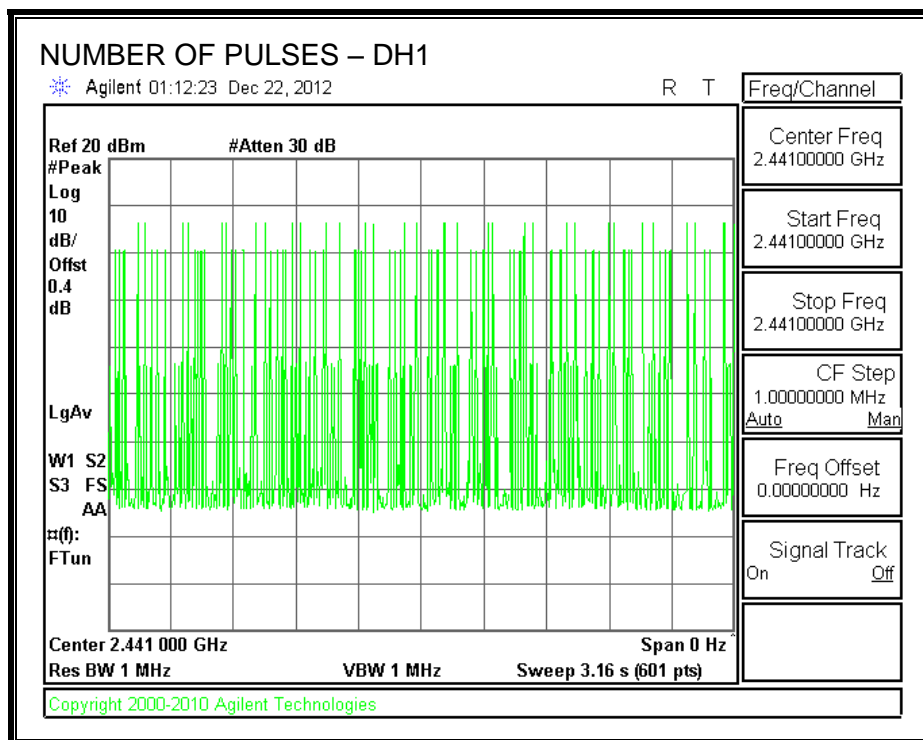
8PSK (EDR) Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.4433	32	0.142	0.4	-0.258
DH3	1.703	19	0.324	0.4	-0.076
DH5	2.952	13	0.384	0.4	-0.016

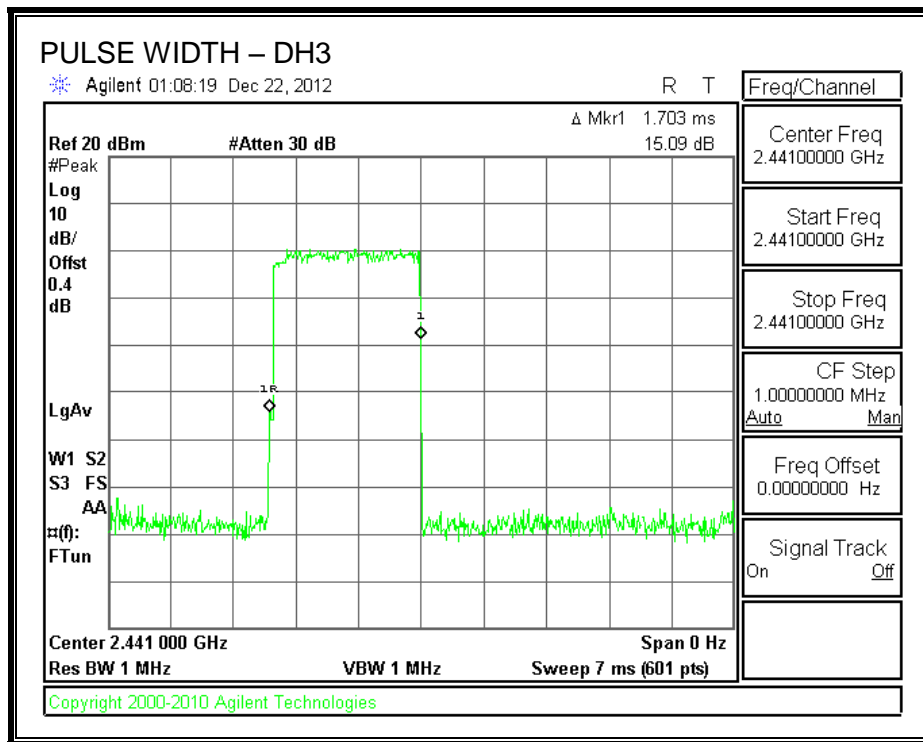
PULSE WIDTH - DH1



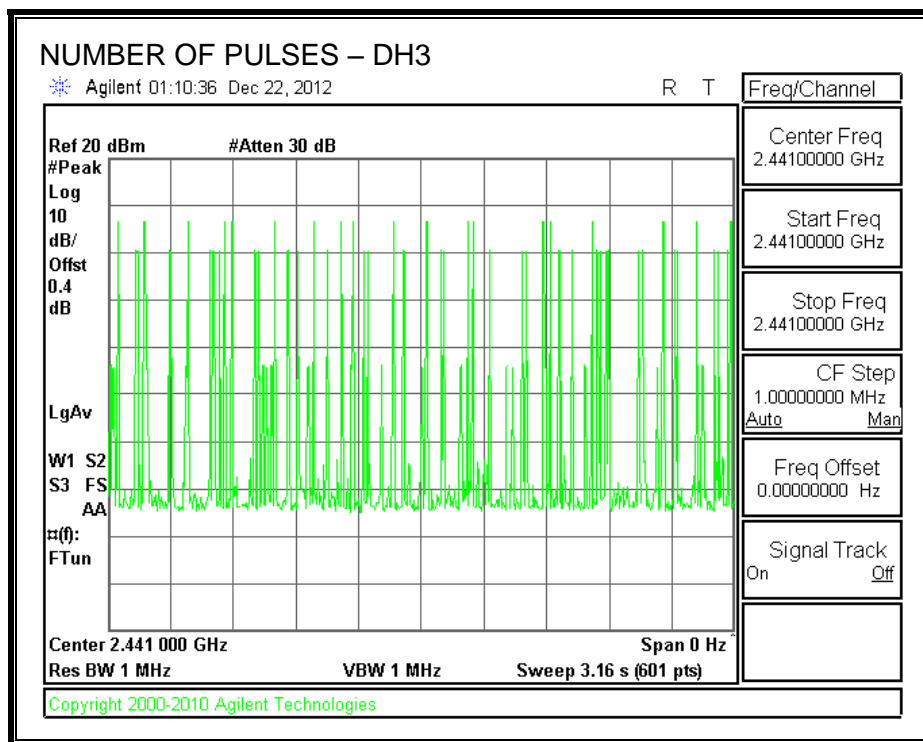
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH1



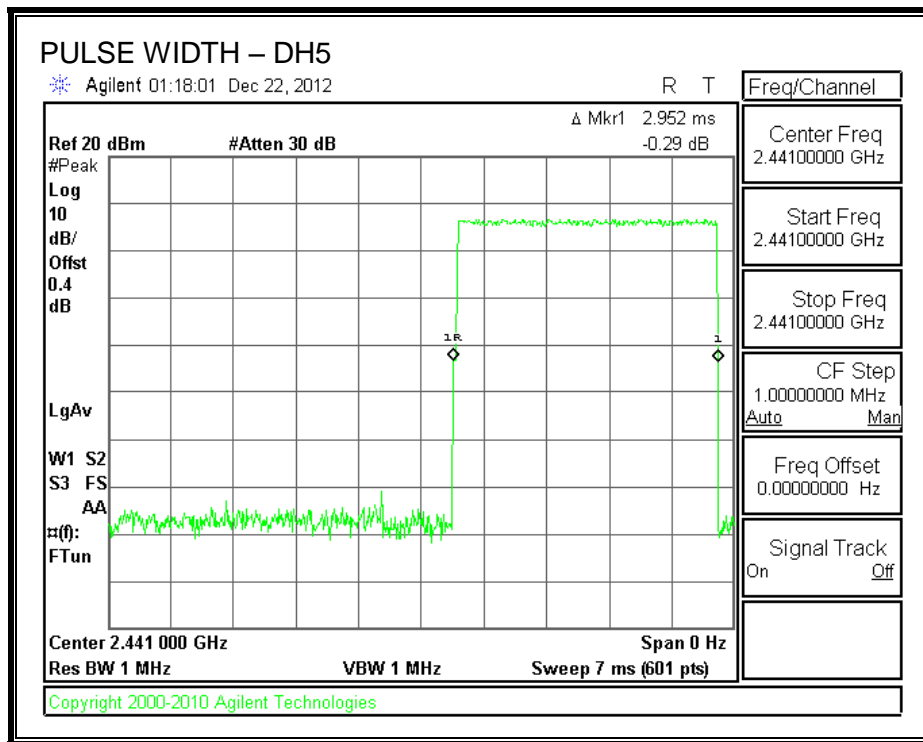
PULSE WIDTH – DH3



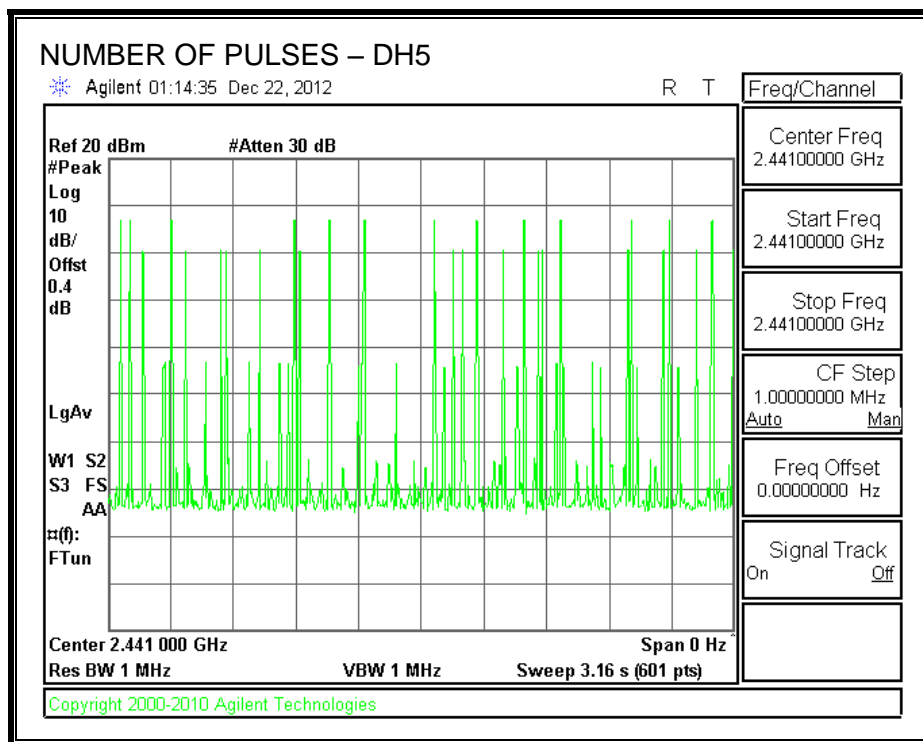
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



7.2.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 20.97 dBm.

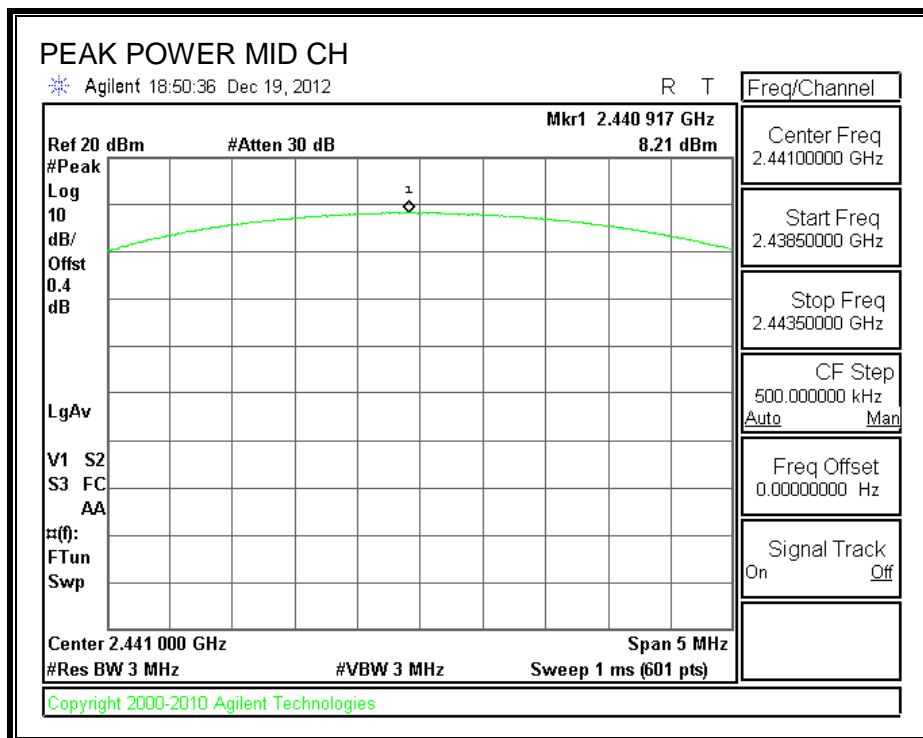
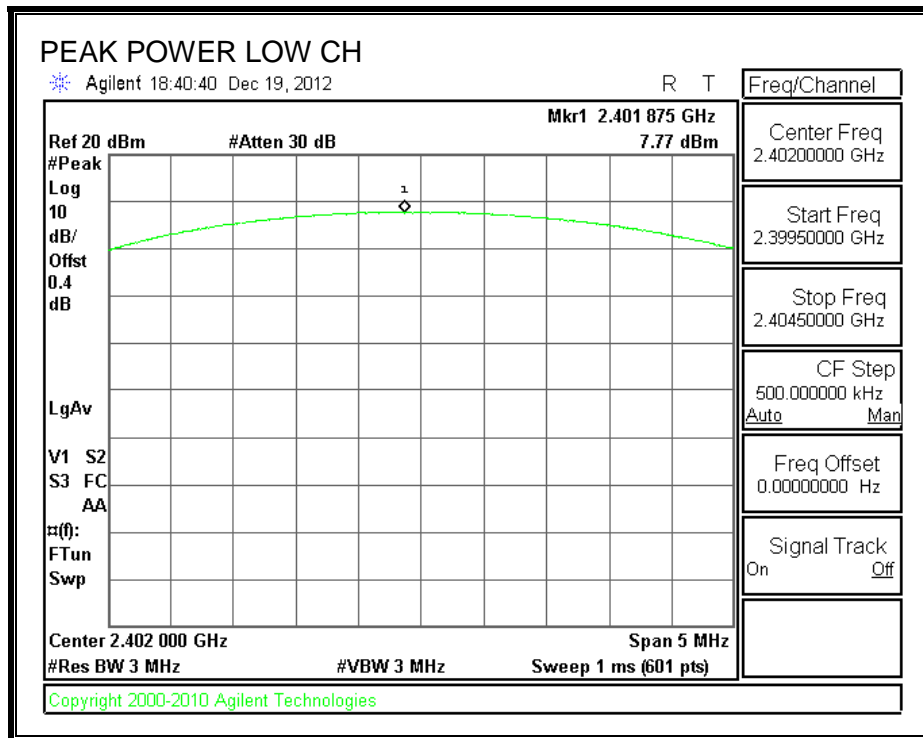
TEST PROCEDURE

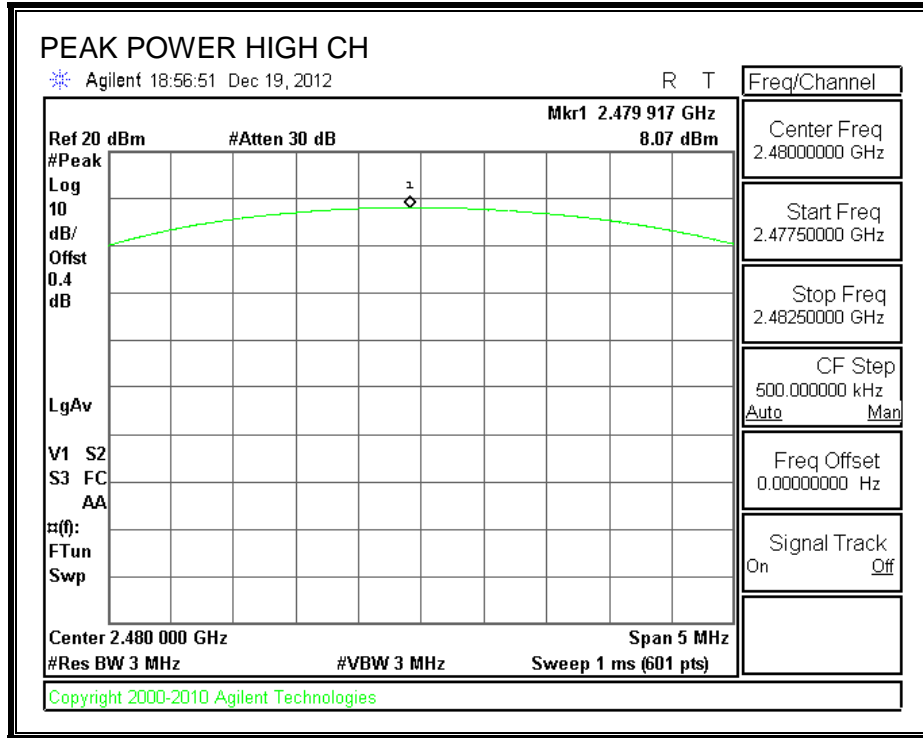
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.77	20.97	-13.20
Middle	2441	8.21	20.97	-12.76
High	2480	8.07	20.97	-12.90

OUTPUT POWER





7.2.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of .4 dB (including 0 dB pad and 0.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	5.01
Middle	2441	5.46
High	2480	5.45

7.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

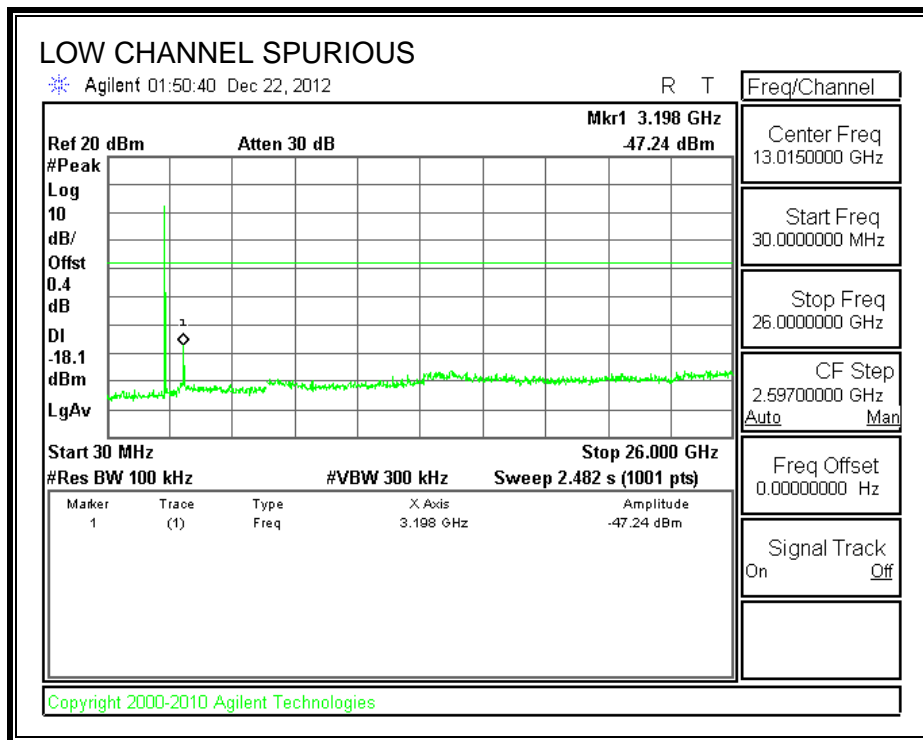
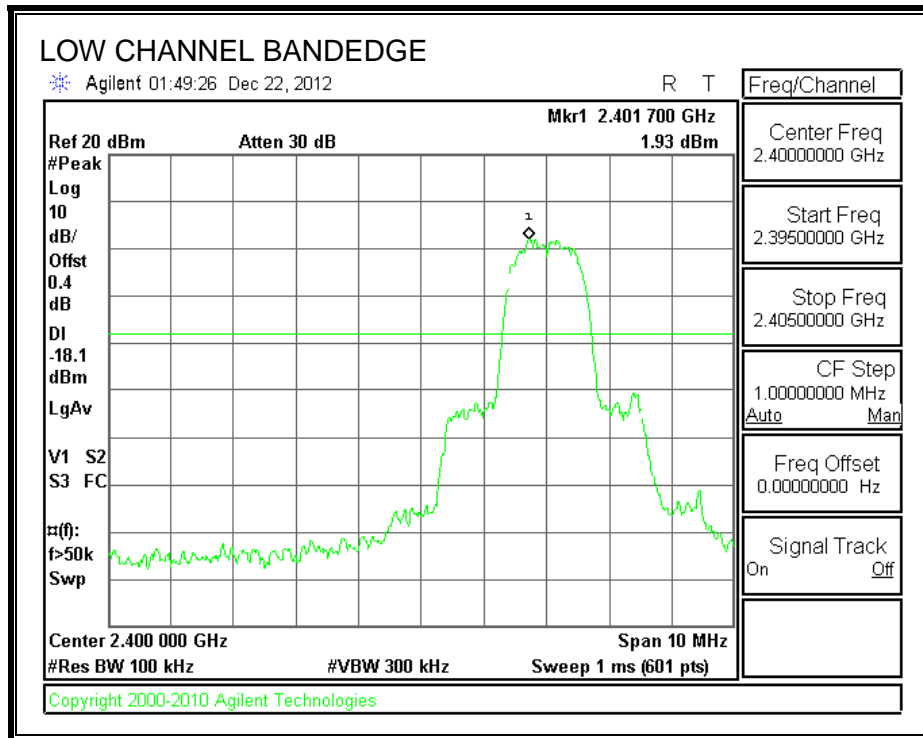
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

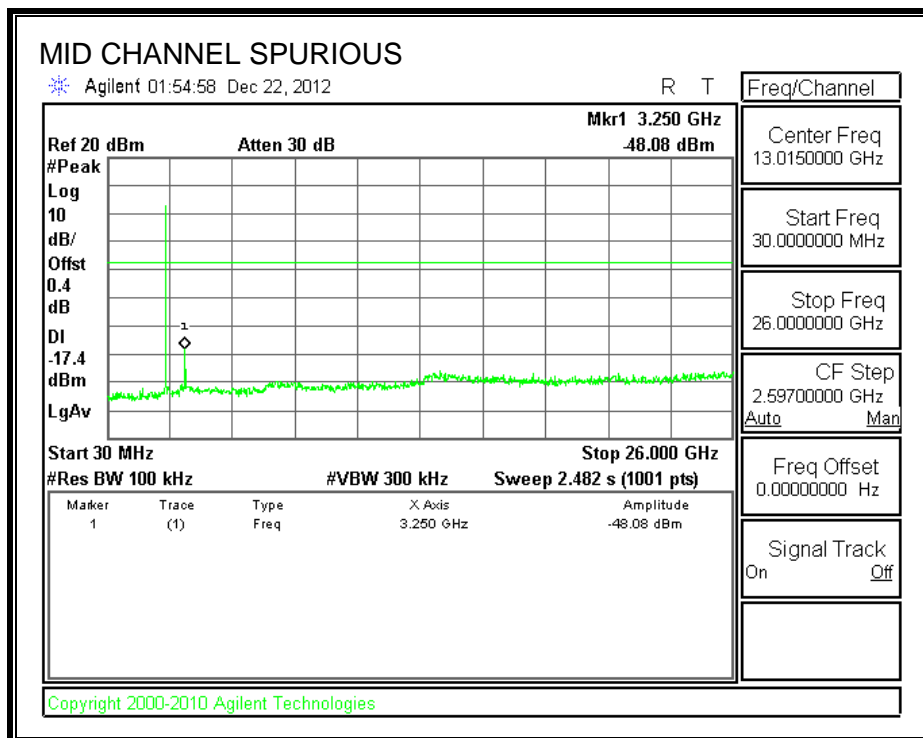
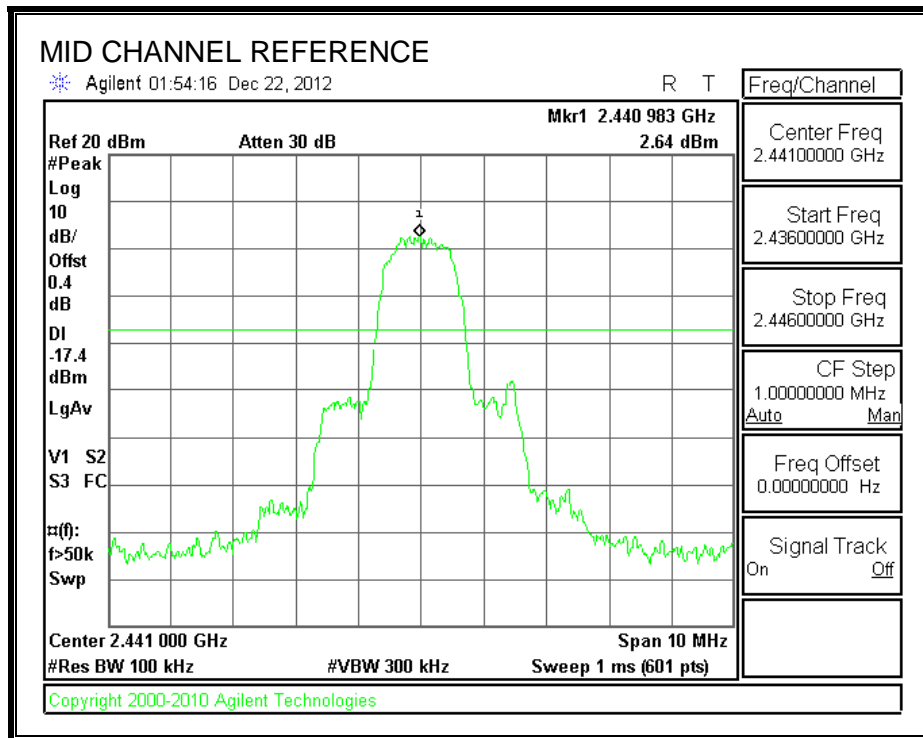
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

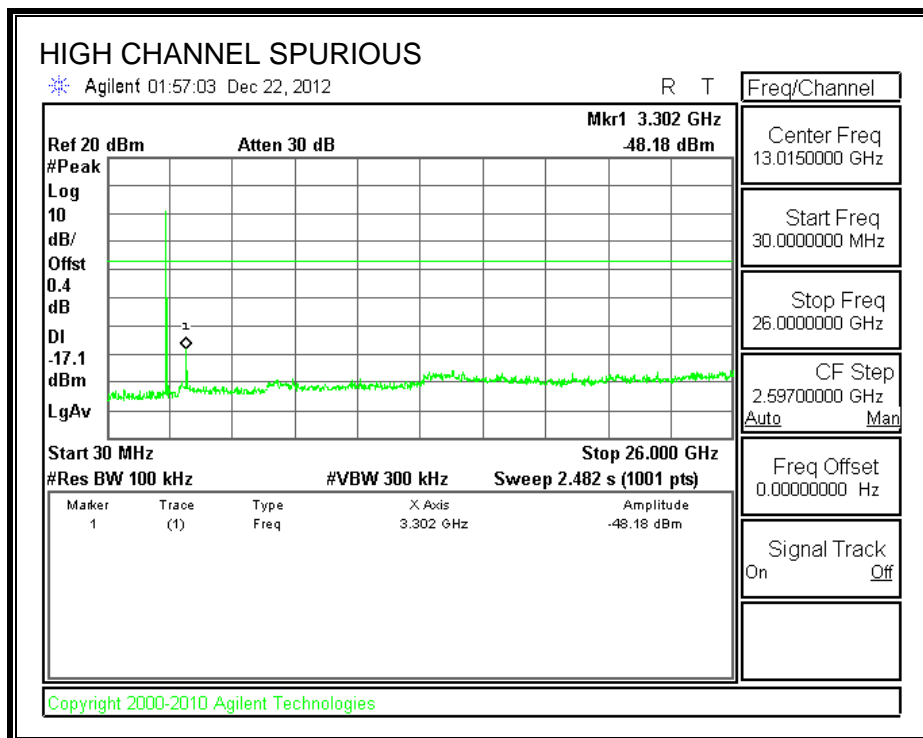
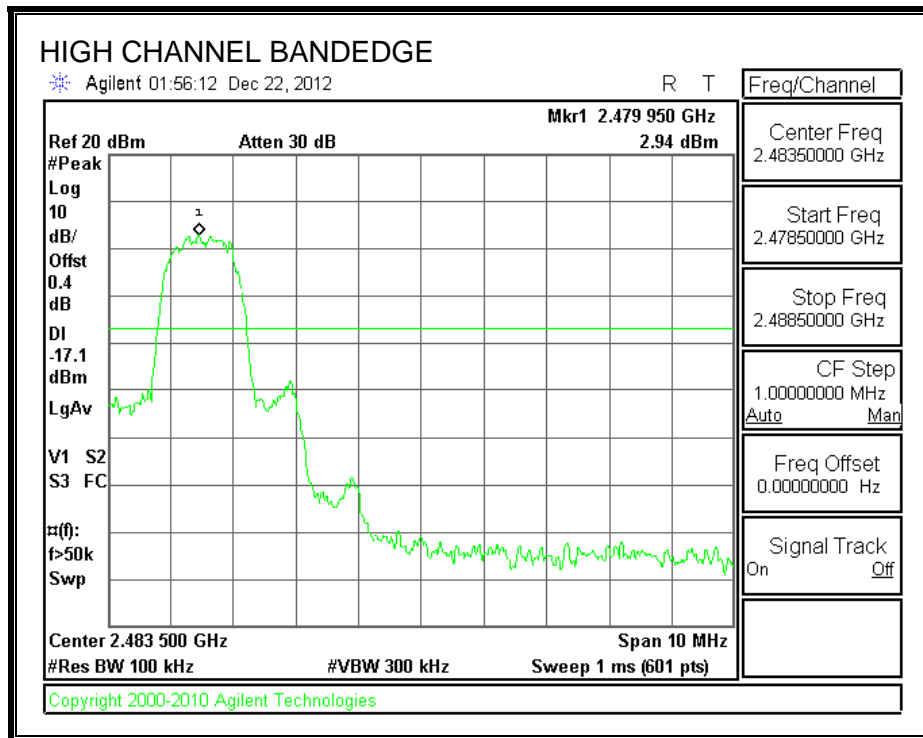
SPURIOUS EMISSIONS, LOW CHANNEL



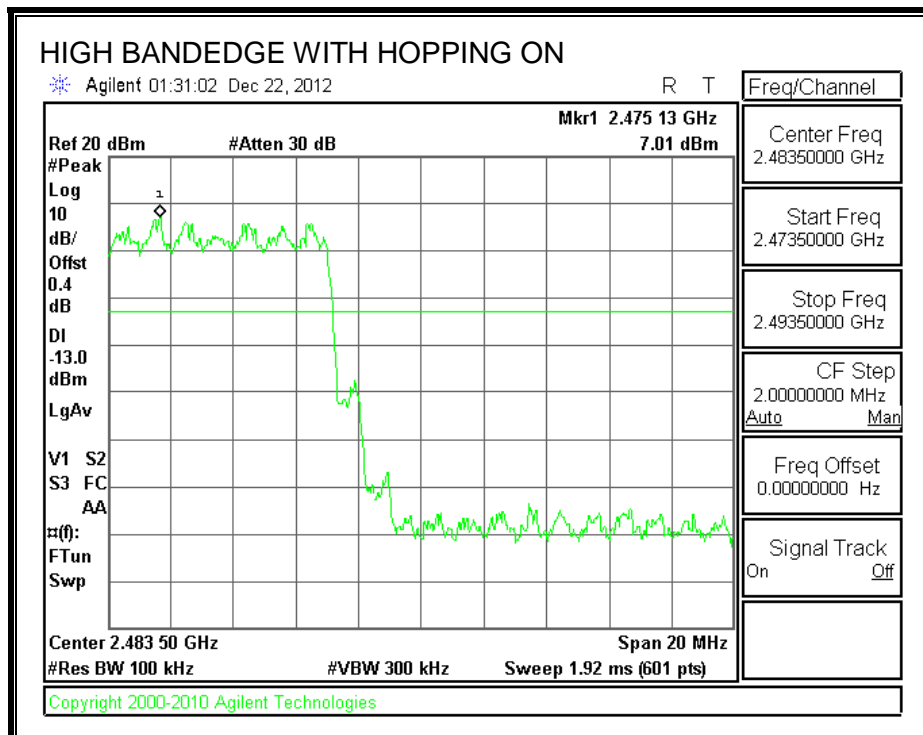
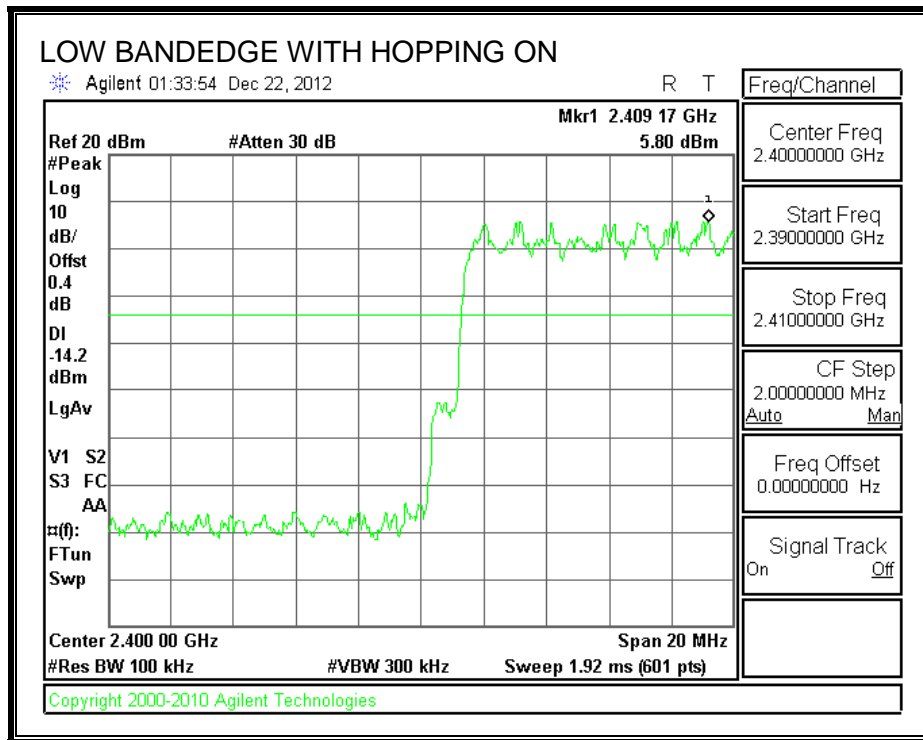
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



SPURIOUS BANDEGE EMISSIONS WITH HOPPING ON



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

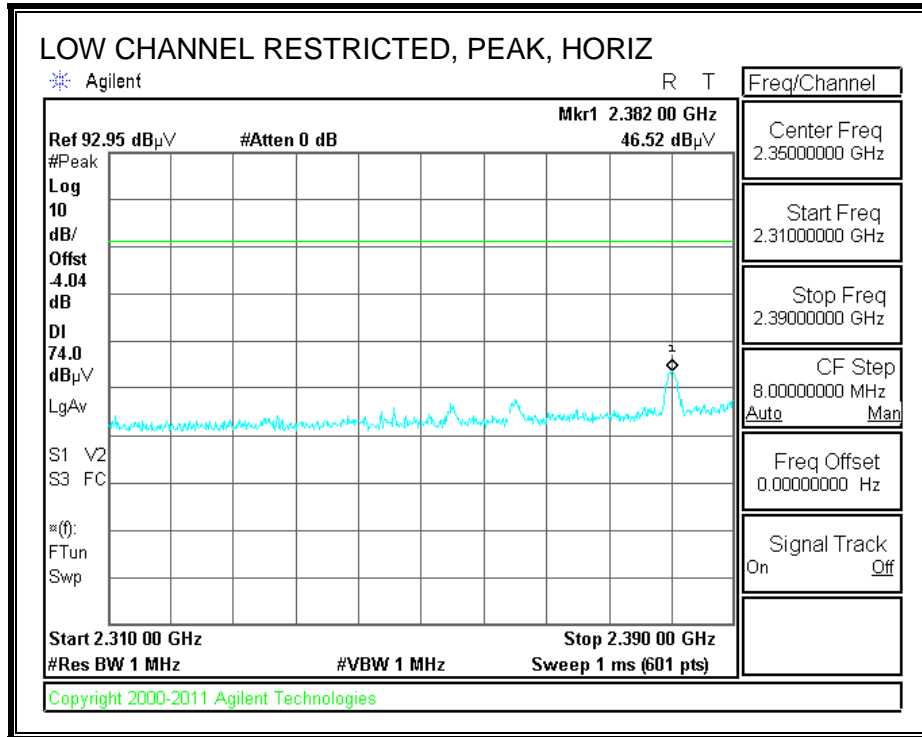
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

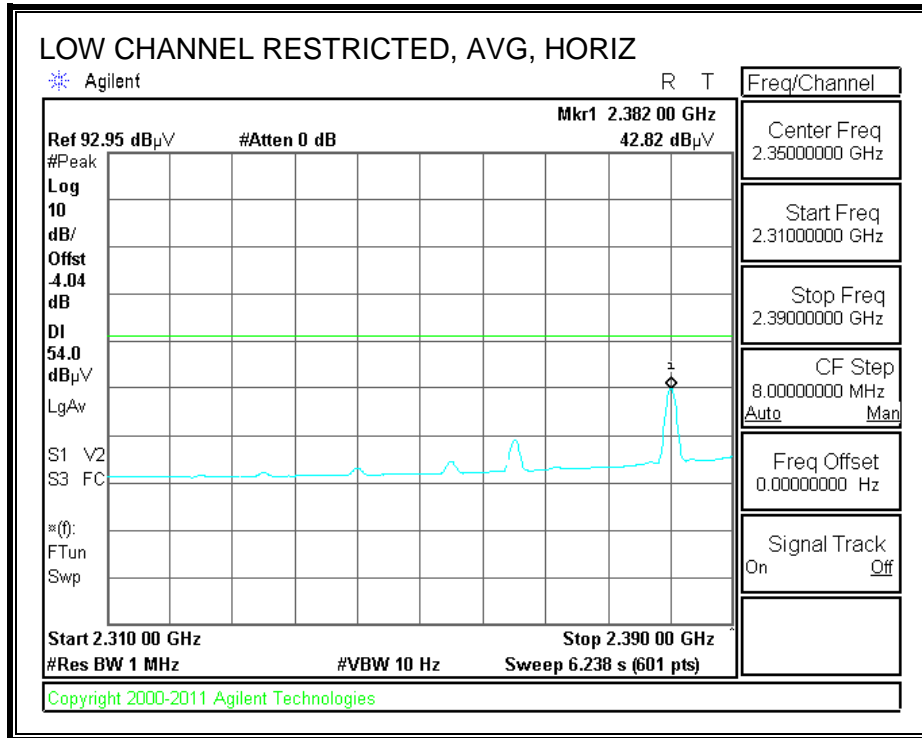
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. TRANSMITTER ABOVE 1 GHz

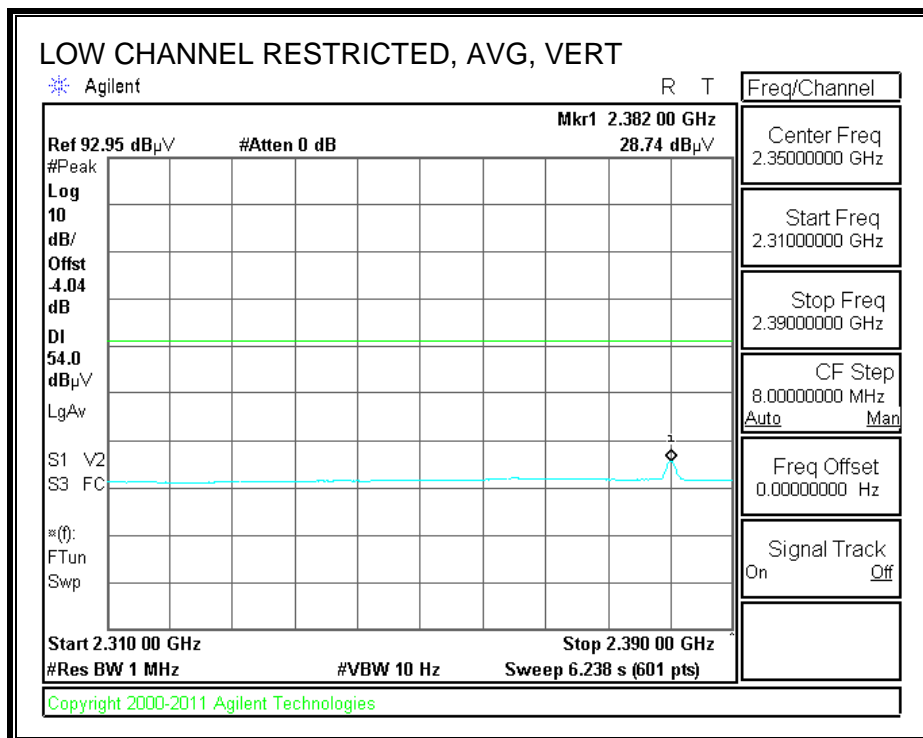
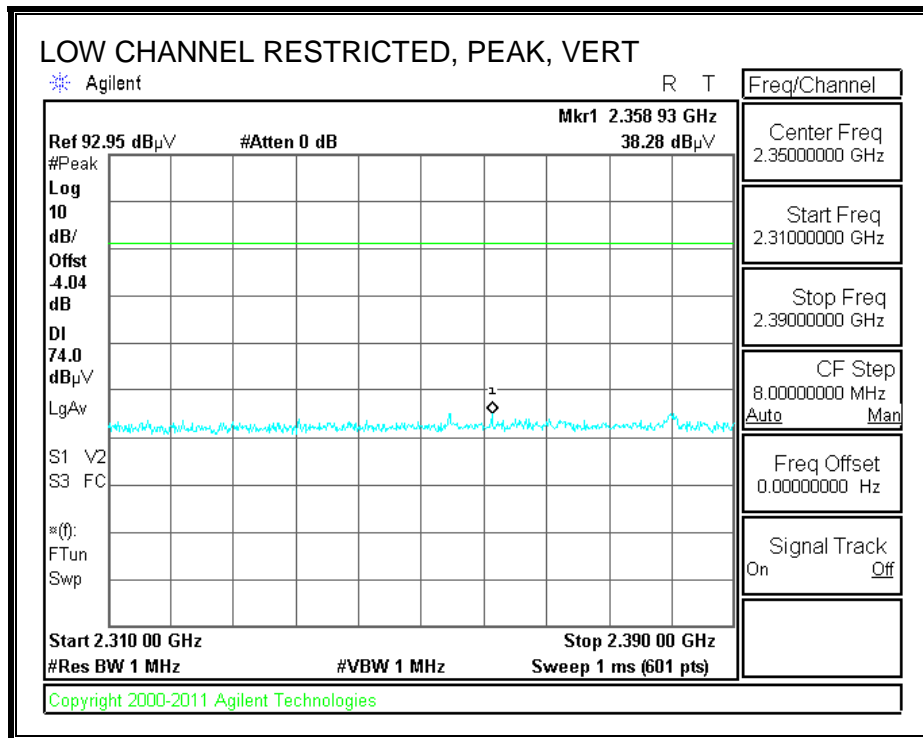
8.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

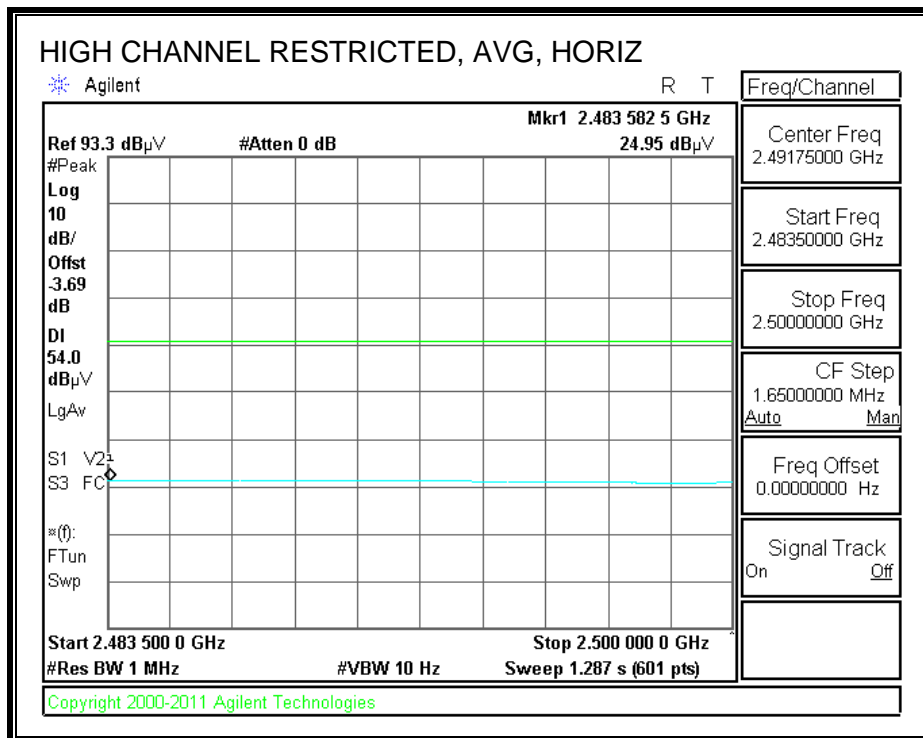
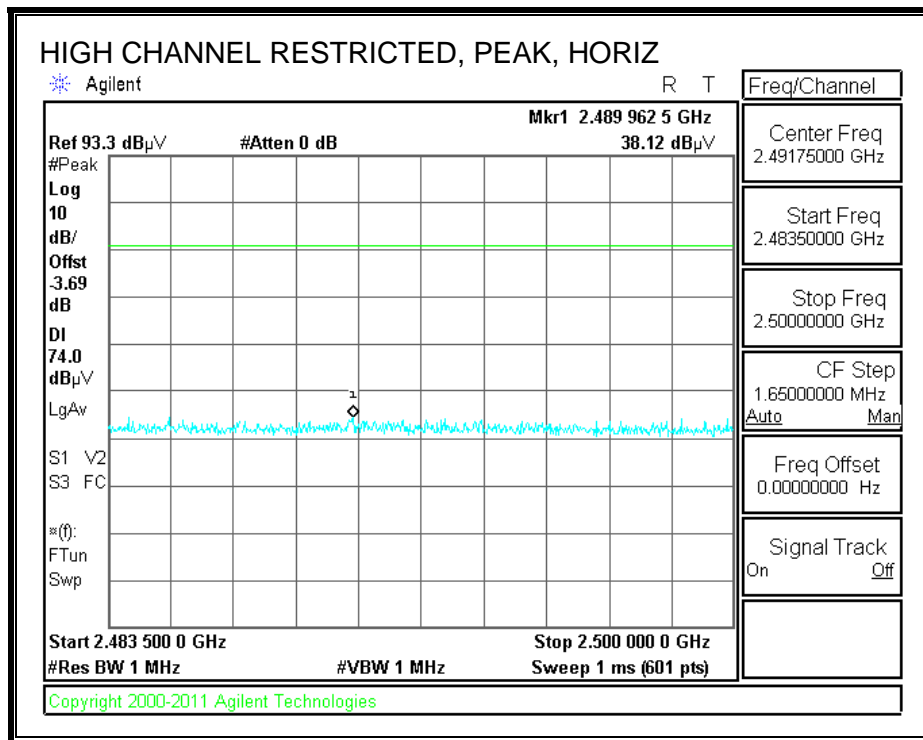




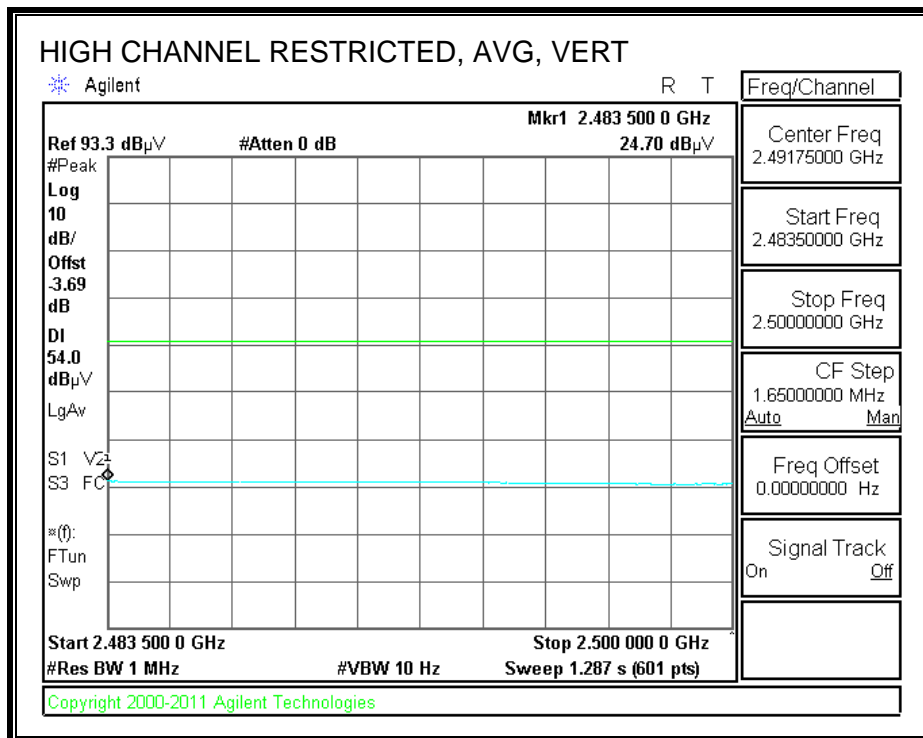
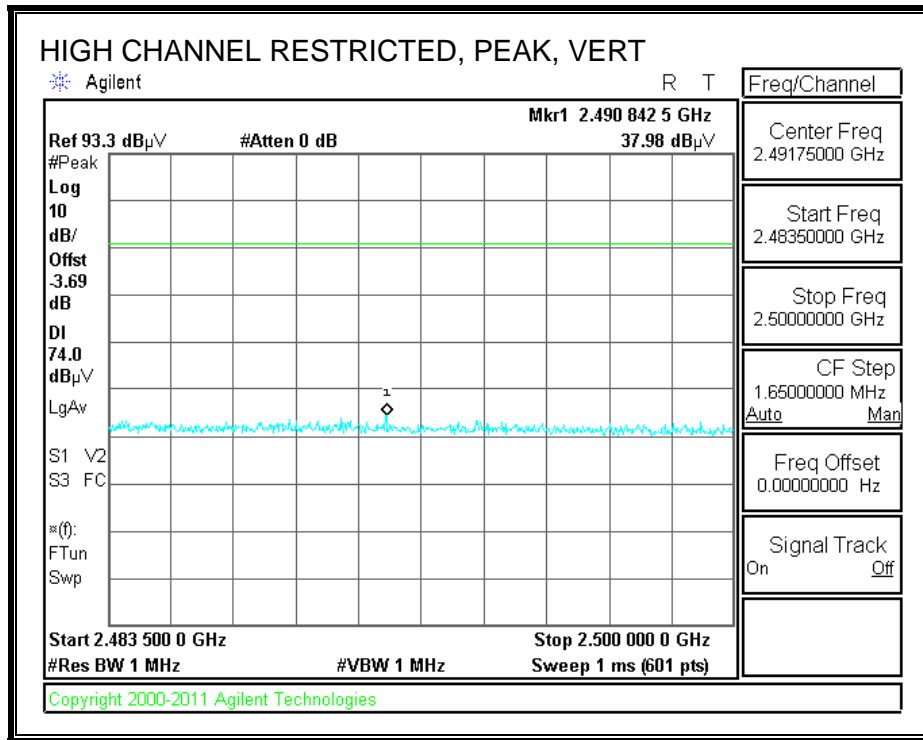
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

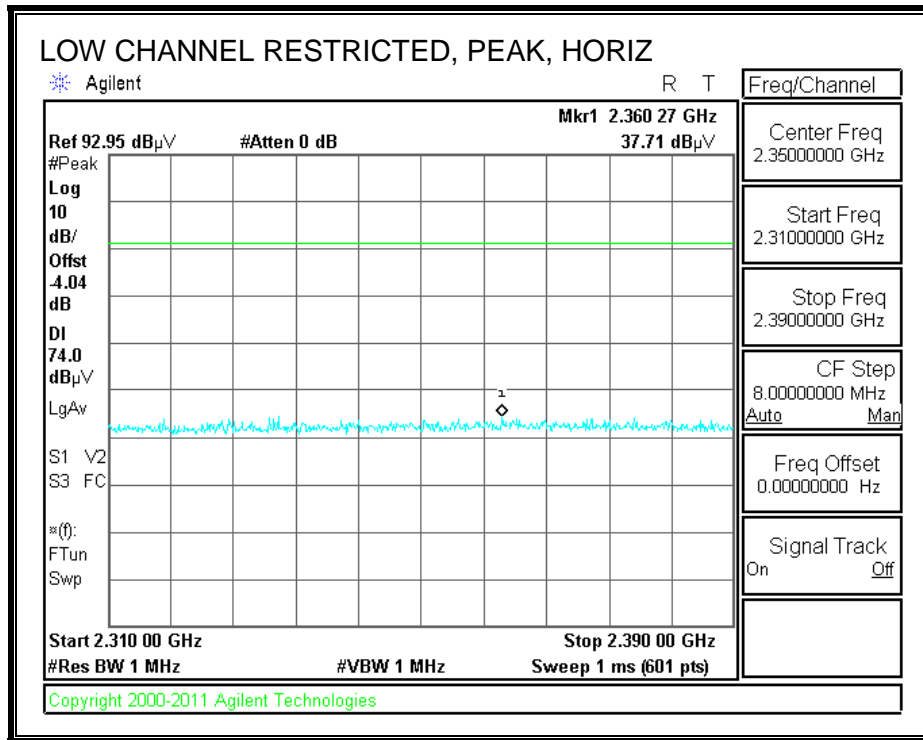


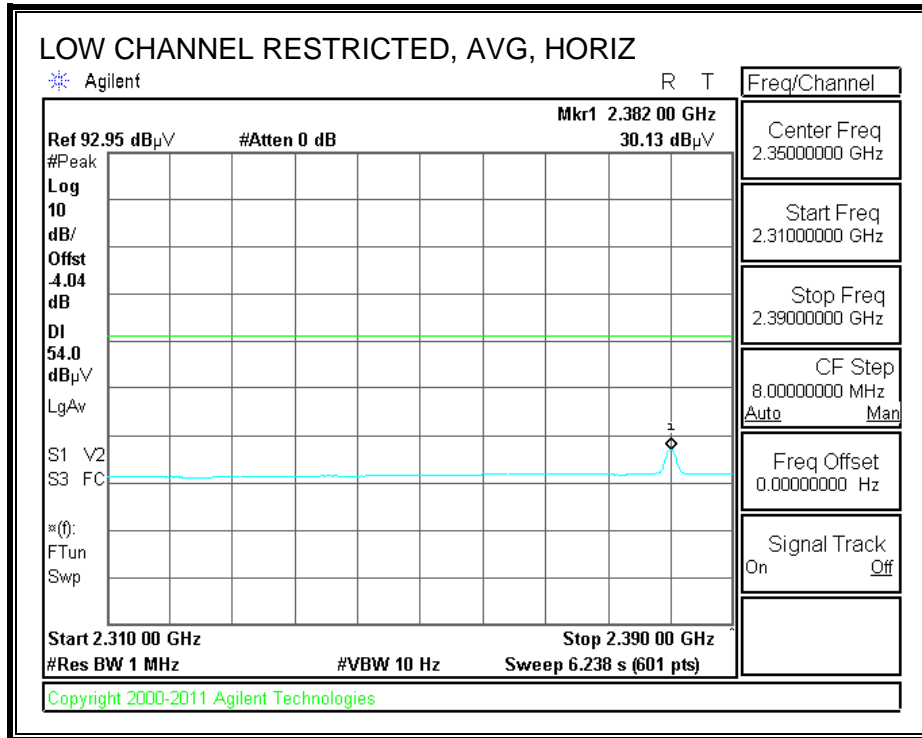
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



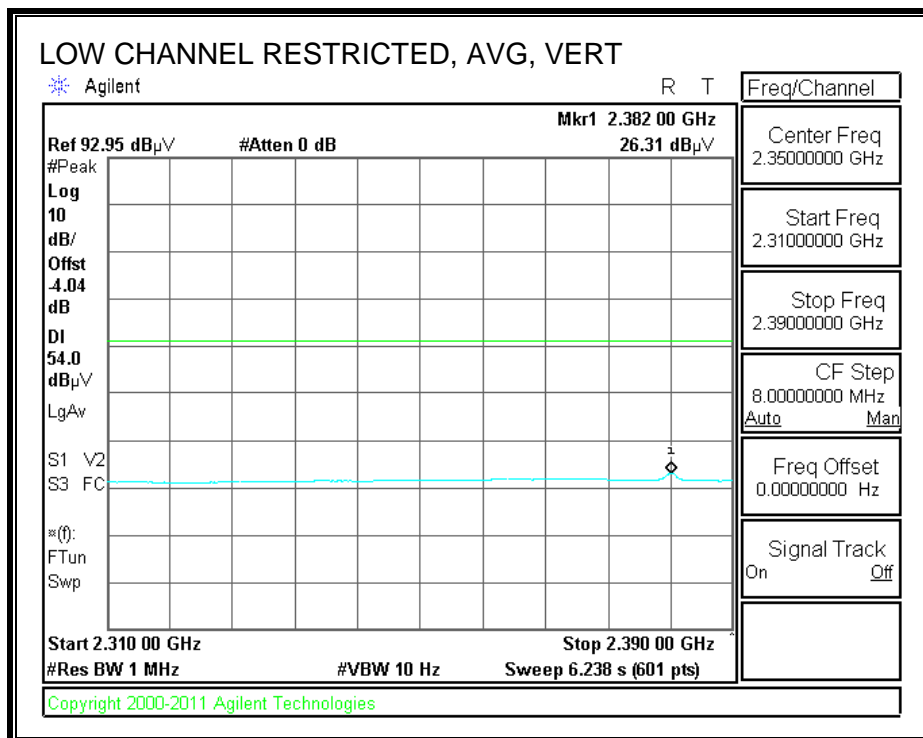
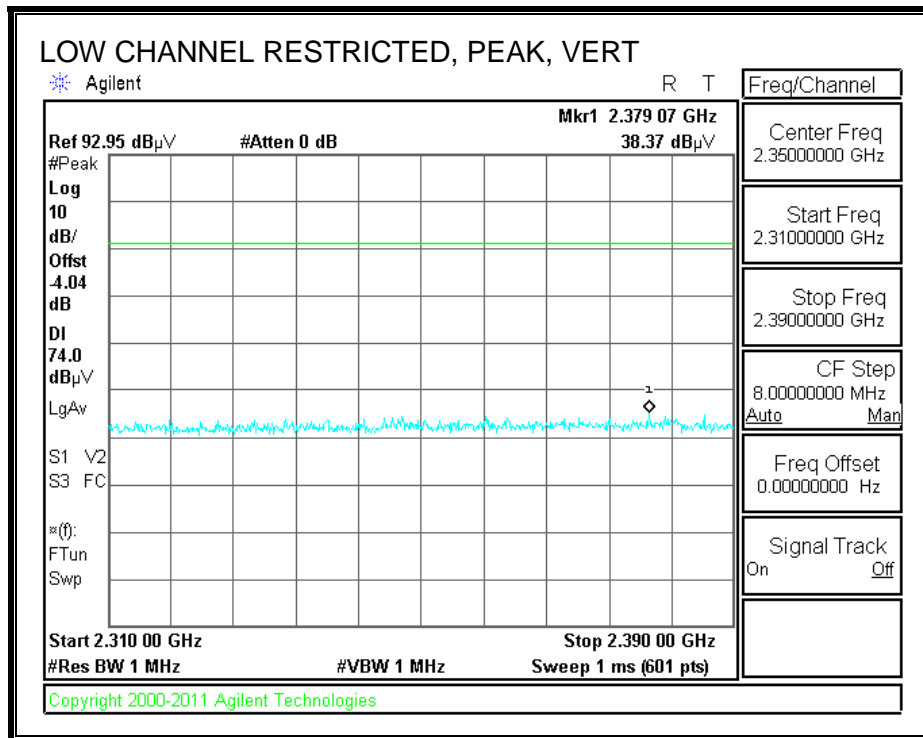
8.2.2. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

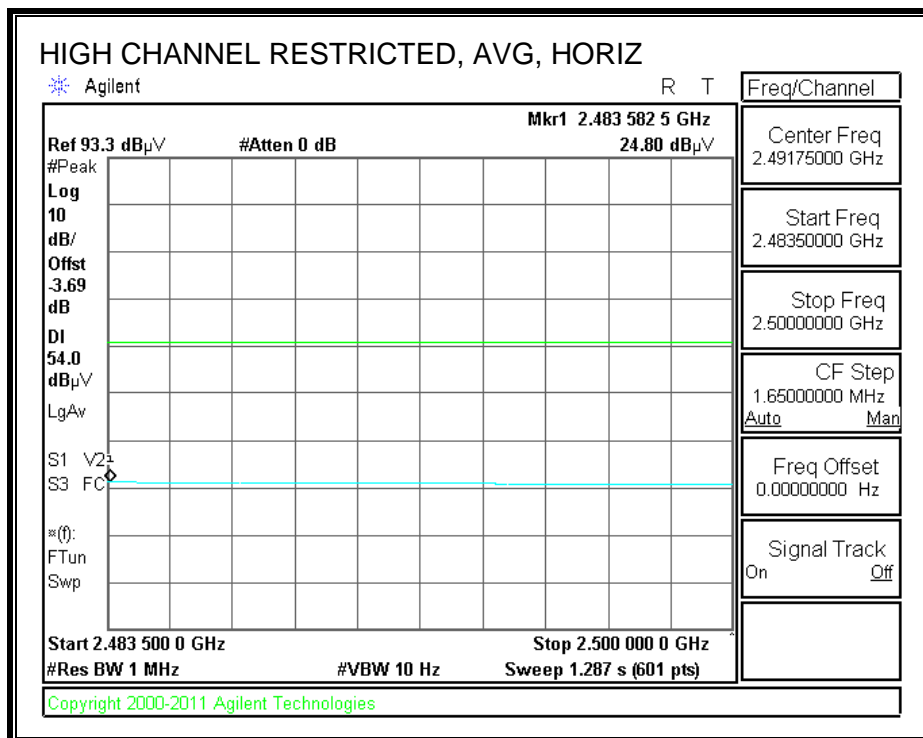
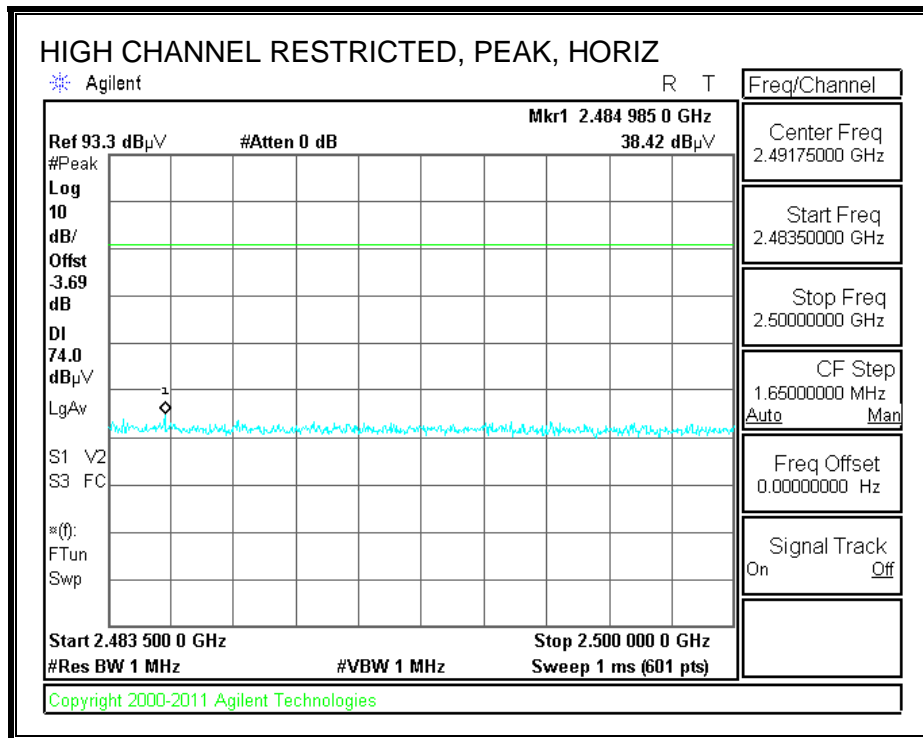




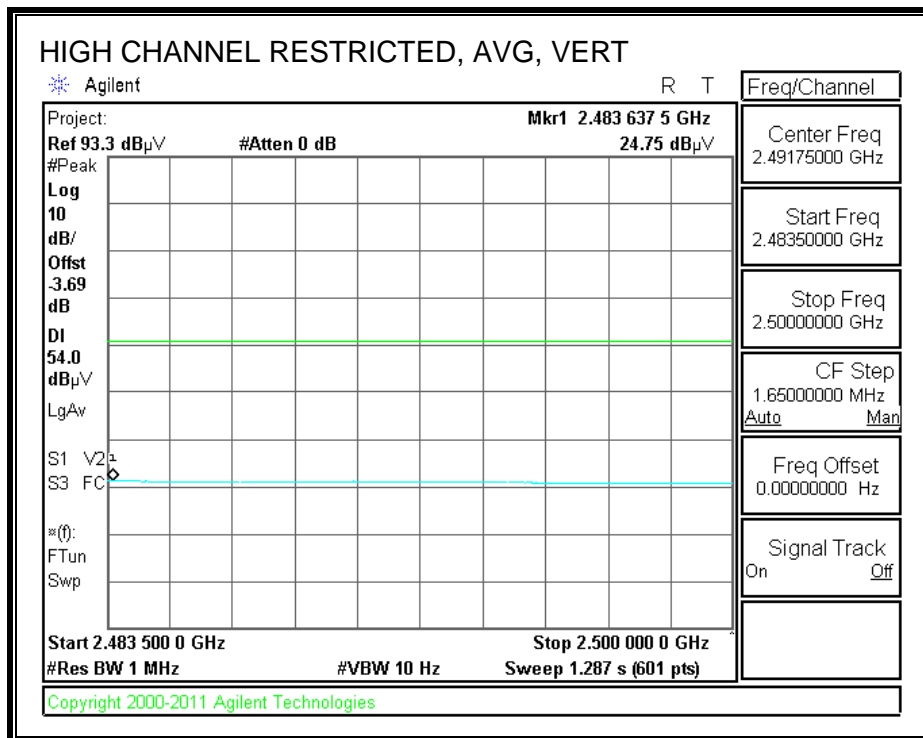
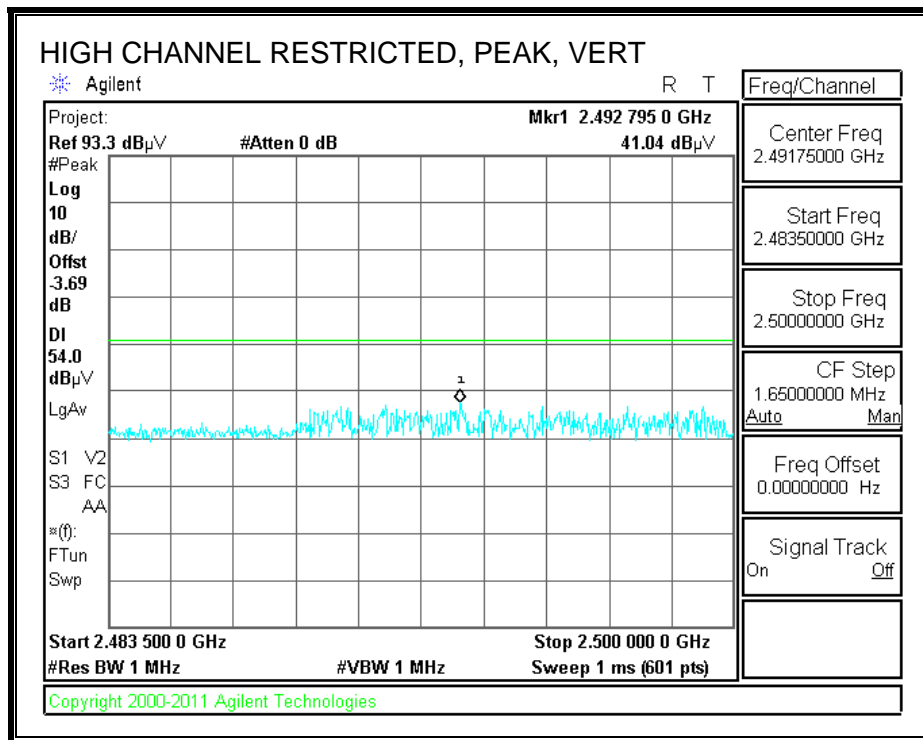
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

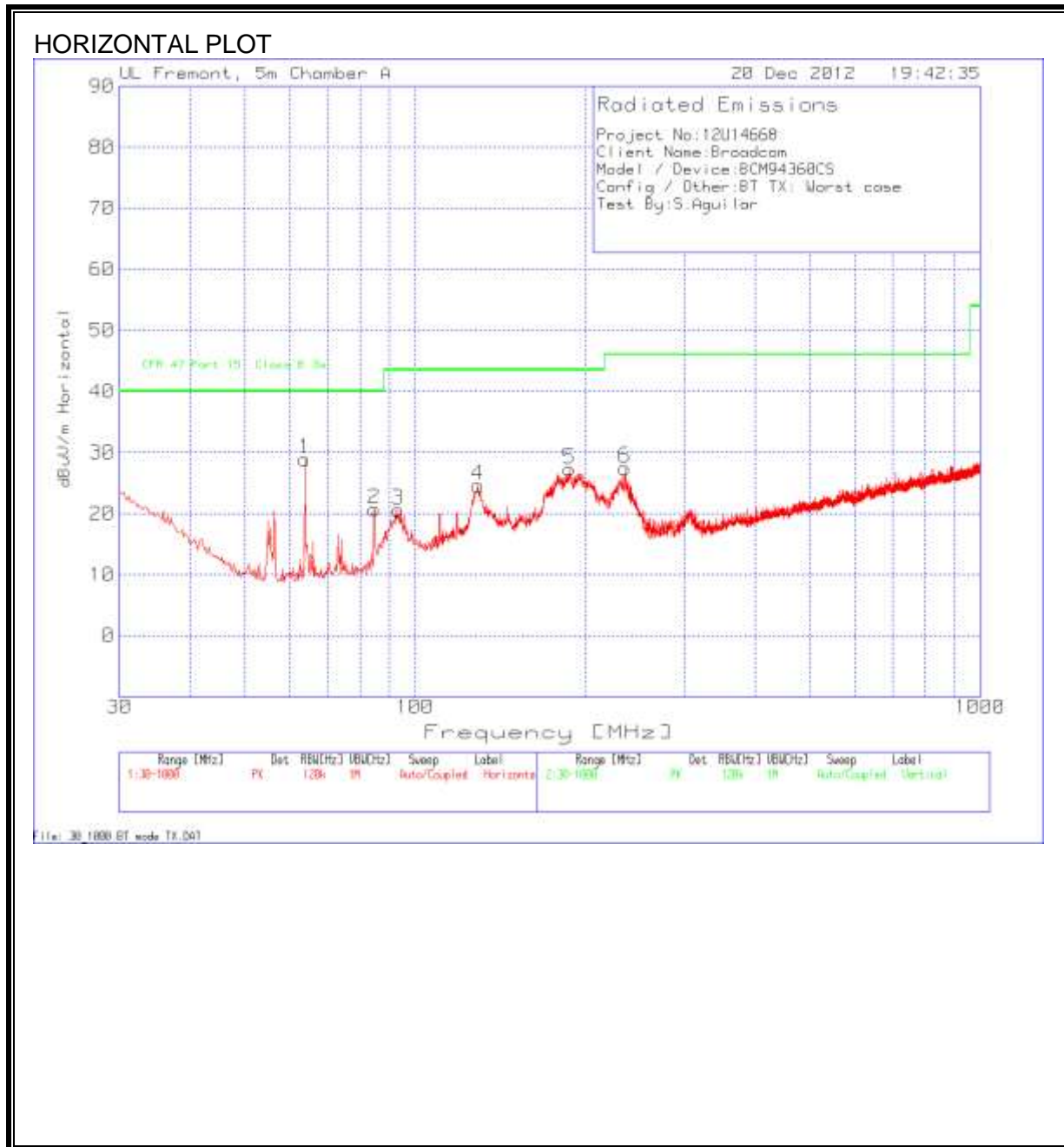


HARMONICS AND SPURIOUS EMISSIONS

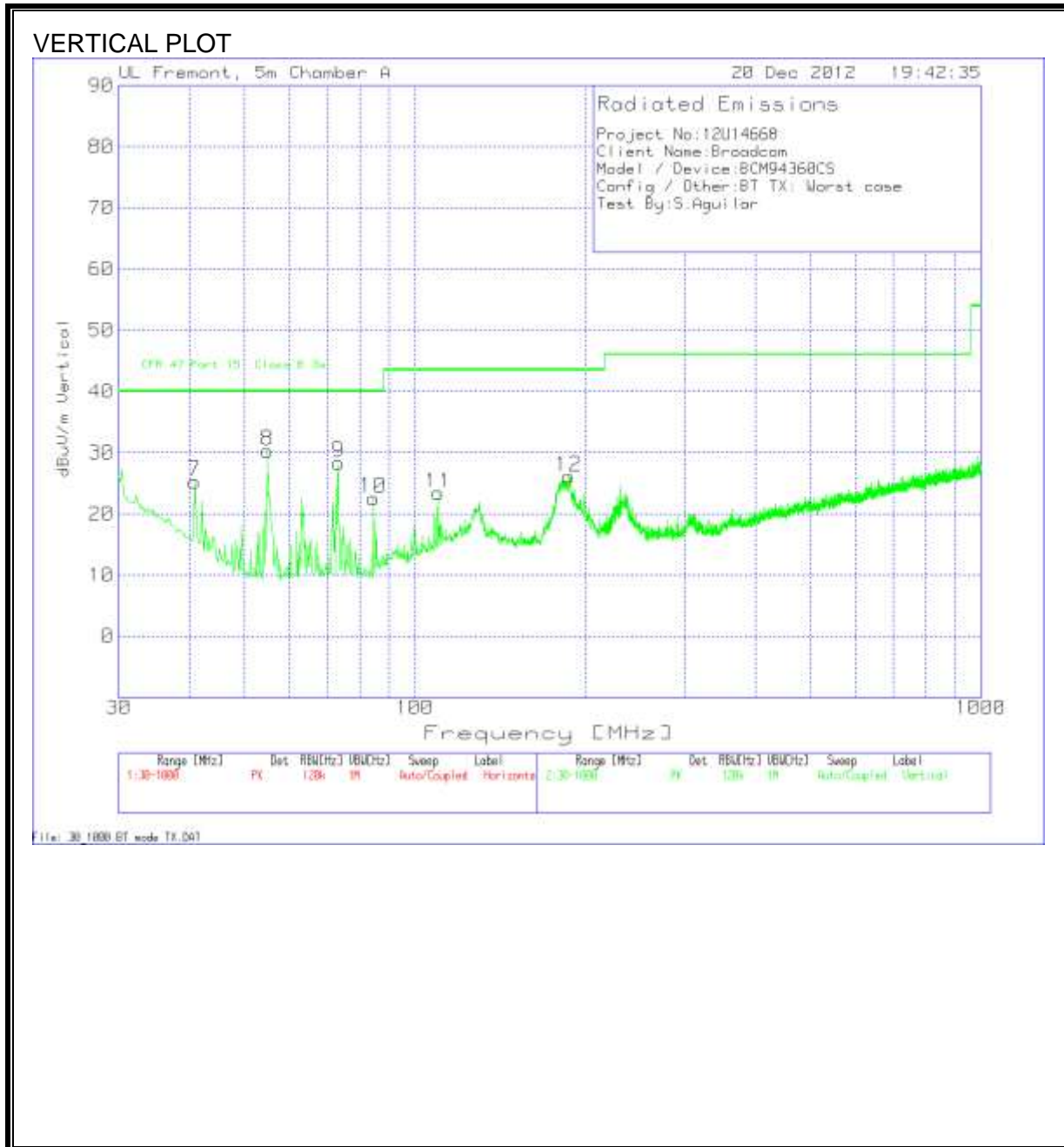
High Frequency Measurement																																																																																																																																																																																																																																															
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8.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



HORIZONTAL AND VERTICAL DATA

Company Name: Broadcom
Project: 12U14668
Model/Device: BCM94360CS
Date: 12/20/2012
Configuraiton: BT TX Worst case
Tested by: Steve Aguilar

Test Frequency [MHz]	Meter Reading [dB(μV)]	Detector	Pre Amp Factor [dB]	Antenna Factor [dB/m]	Corrected [dB(μV/m)]	Class B limit [dB(μV/m)]	Margin [dB]	Height [cm]	Polarity
Range 1 30 - 1000MHz									
63.729	48.44	PK	-27.2	7.6	28.84	40	-11.16	300	Horz
84.6643	40.49	PK	-27.1	7.3	20.69	40	-19.31	200	Horz
93.1934	39.3	PK	-27	8.3	20.6	43.5	-22.9	300	Horz
129.0548	37.66	PK	-26.7	13.7	24.66	43.5	-18.84	200	Horz
187.7898	42.26	PK	-26.3	11.3	27.26	43.5	-16.24	100	Horz
234.8941	42.27	PK	-26	11.2	27.47	46	-18.53	100	Horz
Range 2 30 - 1000MHz									
40.8553	39.26	PK	-27.4	13.4	25.26	40	-14.74	100	Vert
54.8122	50.48	PK	-27.3	7.1	30.28	40	-9.72	200	Vert
73.2274	47.36	PK	-27.1	8.1	28.36	40	-11.64	200	Vert
84.4704	42.21	PK	-27.1	7.4	22.51	40	-17.49	100	Vert
109.8641	37.4	PK	-26.7	12.7	23.4	43.5	-20.1	100	Vert
187.2082	41.1	PK	-26.3	11.3	26.1	43.5	-17.4	100	Vert

PK - Peak detector
 QP - Quasi-peak detector

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

Company Name: Broadcom
Project: 12U14668
Model/Device: BCM94360CS
Date: 12/27/2012
Configuraiton: TX BT Worst Case
Test Voltage/Frequency: 120VAC 60Hz
Tested by: Steve Aguilar

Line-L1 .15 - 30MHz

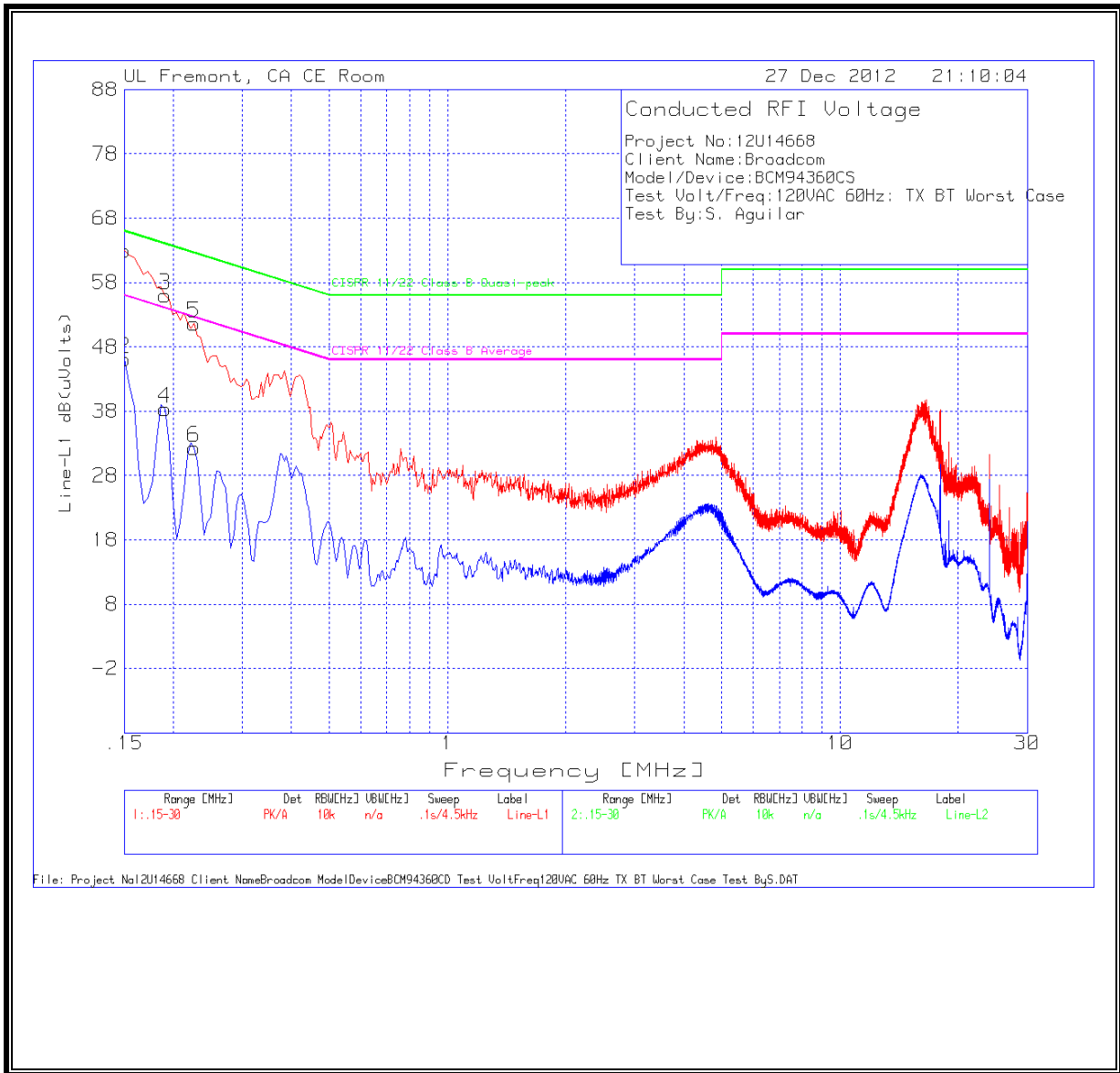
Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.15	62.85	PK	0.1	0	62.95	66	-3.05	-	-
0.15	45.94	Av	0.1	0	46.04	-	-	56	-9.96
0.1905	55.87	PK	0.1	0	55.97	64	-8.03	-	-
0.1905	38.27	Av	0.1	0	38.37	-	-	54	-15.63
0.2265	51.55	PK	0.1	0	51.65	62.6	-10.95	-	-
0.2265	32.23	Av	0.1	0	32.33	-	-	52.6	-20.27

Line-L2 .15 - 30MHz

Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.1545	58.81	PK	0.1	0	58.91	65.8	-6.89	-	-
0.1545	36	Av	0.1	0	36.1	-	-	55.8	-19.7
0.1815	53.07	PK	0.1	0	53.17	64.4	-11.23	-	-
0.1815	34.06	Av	0.1	0	34.16	-	-	54.4	-20.24
0.3885	45.33	PK	0.1	0	45.43	58.1	-12.67	-	-
0.3885	34.38	Av	0.1	0	34.48	-	-	48.1	-13.62

PK - Peak detector
 QP - Quasi-Peak detector
 Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS

