



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

CELLULAR/PCS/AWS CDMA AND AWS LTE WITH BLUETOOTH AND WLAN

MODEL NUMBERS: MS840, LG-MS840, LGMS840

FCC ID: ZNFMS840

REPORT NUMBER: 11U13993-3

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Prepared for
LG ELECTRONICS MOBILECOMM U.S.A., INC.
10101 OLD GROVE ROAD
SAN DIEGO, CA 92131, U.S.A.

Prepared by
COMPLIANCE CERTIFICATION SERVICES (UL CCS)
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

*The models covered by this report are identical



NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	09/29/11	Initial Issue	F. Ibrahim

8.3. *WORST-CASE BELOW 1 GHz* 95

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC.
10101 OLD GROVE ROAD
SAN DIEGO, CA 92131

EUT DESCRIPTION: Cellular/PCS/AWS CDMA and AWS LTE with Bluetooth and WLAN

MODEL: LG-MS840

SERIAL NUMBER: 99000073000106

DATE TESTED: SEPTEMBER 15-29, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

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

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

Approved & Released For UL CCS By:



FRANK IBRAHIM
EMC SUPERVISOR
UL CCS

Tested By:



DAVID GARCIA
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, and FCC CFR 47 Part 15.

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 smart-phone that features Cellular/PCS/AWS CDMA and AWS LTE with Bluetooth and WLAN.

The radio module is manufactured by Broadcom Co.

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	11.07	12.79
2402 - 2480	Enhanced 8PSK	11.55	14.29

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio uses a PIFA (Planar Inverted F Antenna) with a maximum peak gain of -4dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT software installed during testing was MS840C01.

The test utility software used during testing was BT Test.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

Radiated emissions below 1 GHz and power line conducted emissions were performed with the EUT set to the channel with highest output power.

The EUT is a portable device that may be used in any orientation. The EUT may or may not be connected to its AC power adapter and earphones during use. The EUT was initially assessed in each of three axes of operation (X, Y and Z) with and without the AC adaptor and earphones connected to determine the worst-case condition. Worst-case was found to be the EUT in the Z orientation with its AC power adapter and earphones connected. See the setup photographs for an indication of the EUT orientations.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG Electronics	STA-U13WV	VA 11020005999	N/A
Ear Phone	LG Electronics	N/A	N/A	N/A

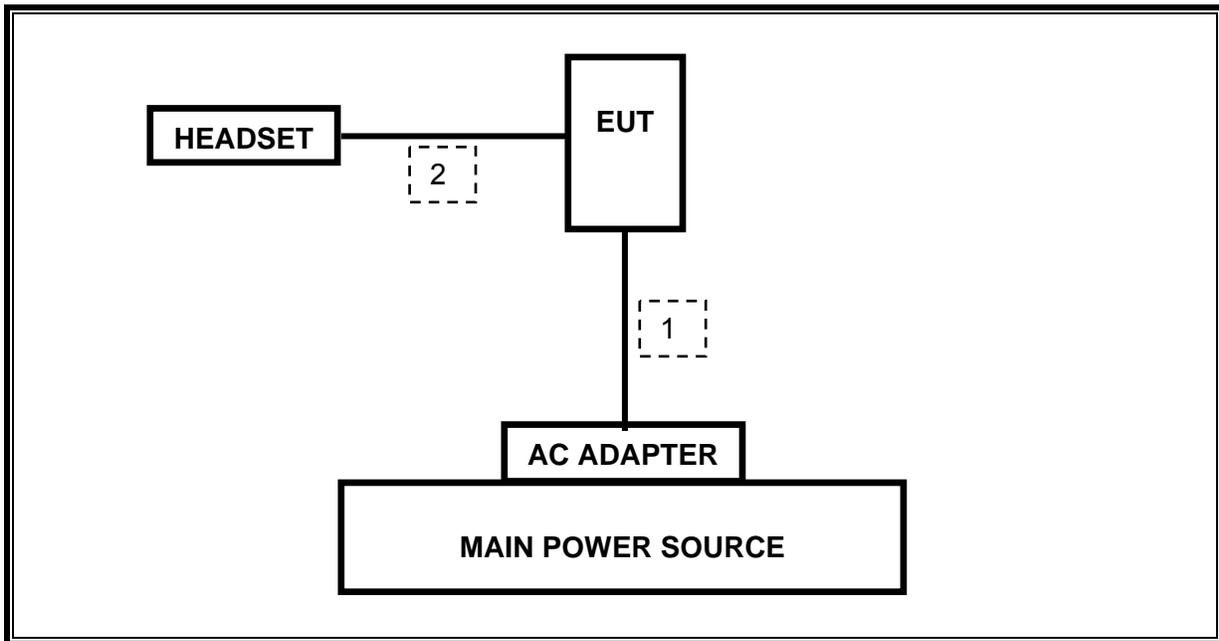
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	#of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	MINI USB	Un-Shielded	1.0m	
2	AUDIO	1	MINI JACK	Un-Shielded	1.0m	Volume control on cable

TEST SETUP

The EUT is a stand-alone device and was tested with AC/USB adapter and earphone. Bluetooth Tester was used to control the EUT.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/15/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/08/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	01/27/12
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/12
Antenna, Horn, 26.5 GHz	ARA	MMH-1826/B	C00980	07/28/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/16/12
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRM50702	N02685	CNR
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4407B	C01098	04/30/12
Power Meter	Agilent / HP	437B	N02778	08/11/12
Power Sensor, 18 GHz	Agilent / HP	8481A	N02784	08/01/13
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/10/11
Bluetooth Tester	R & S	1153.9000K35	N/A	04/22/12

7. ANTENNA PORT TEST RESULTS

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

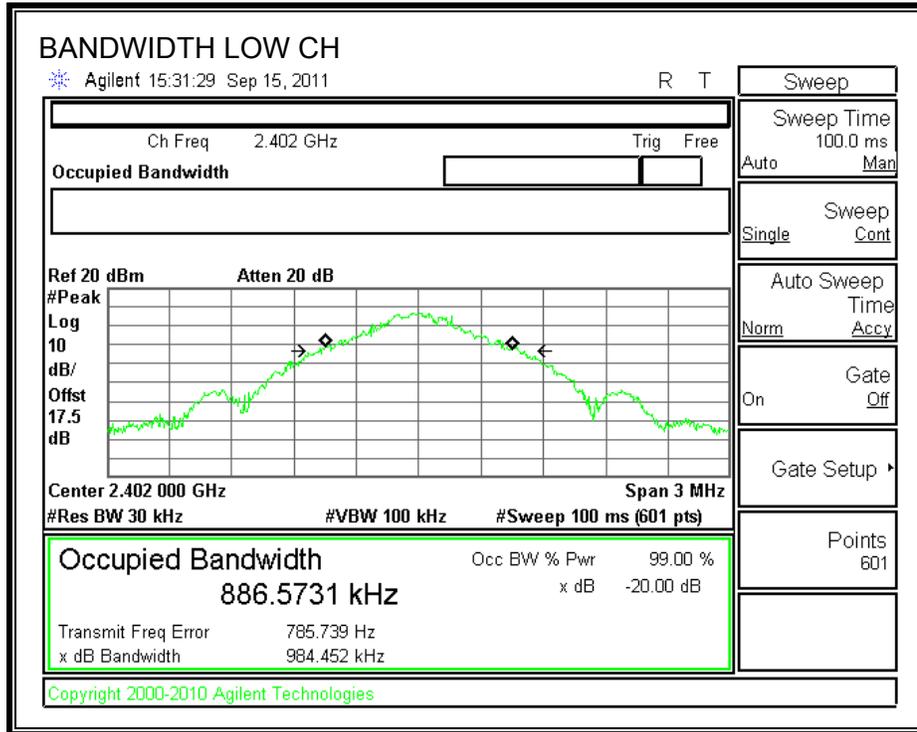
TEST PROCEDURE

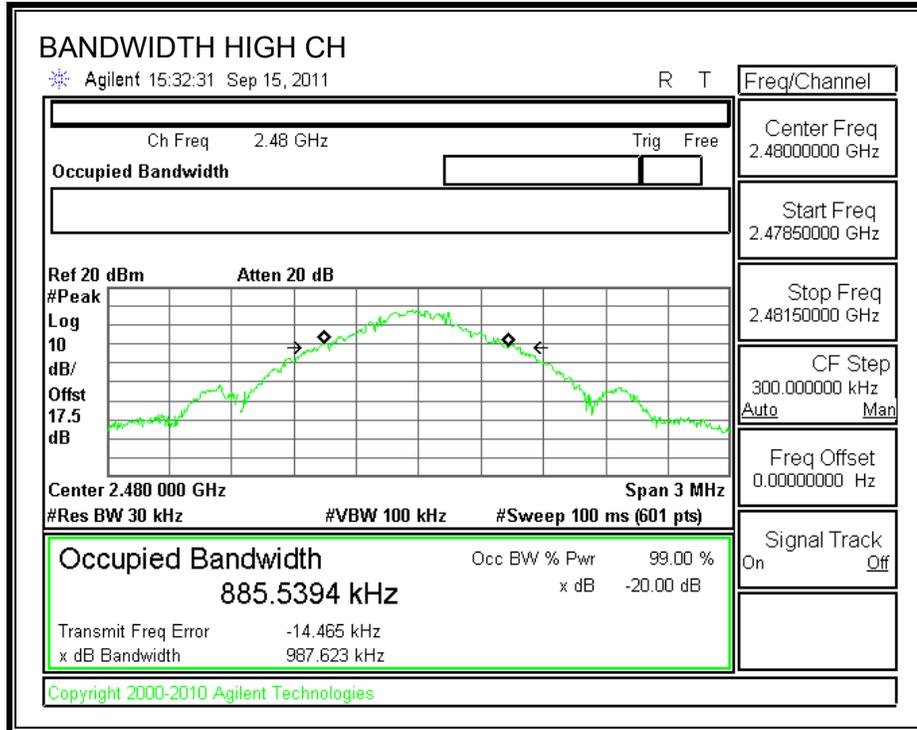
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	2402	984.452
Middle	2441	963.535
High	2480	987.623

20 dB BANDWIDTH





7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

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.

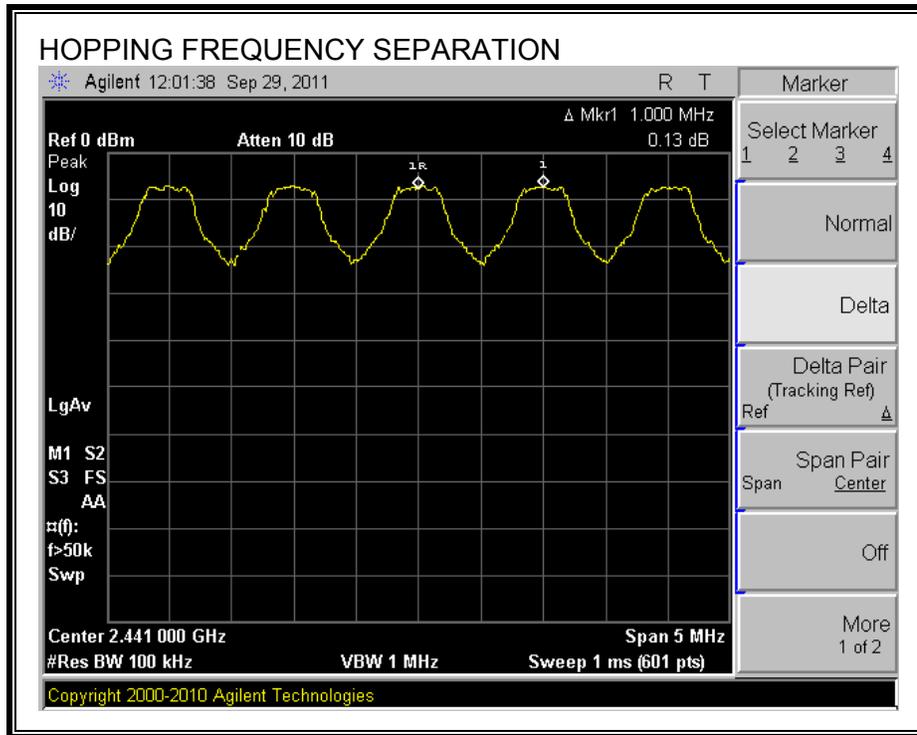
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 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 1 MHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

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

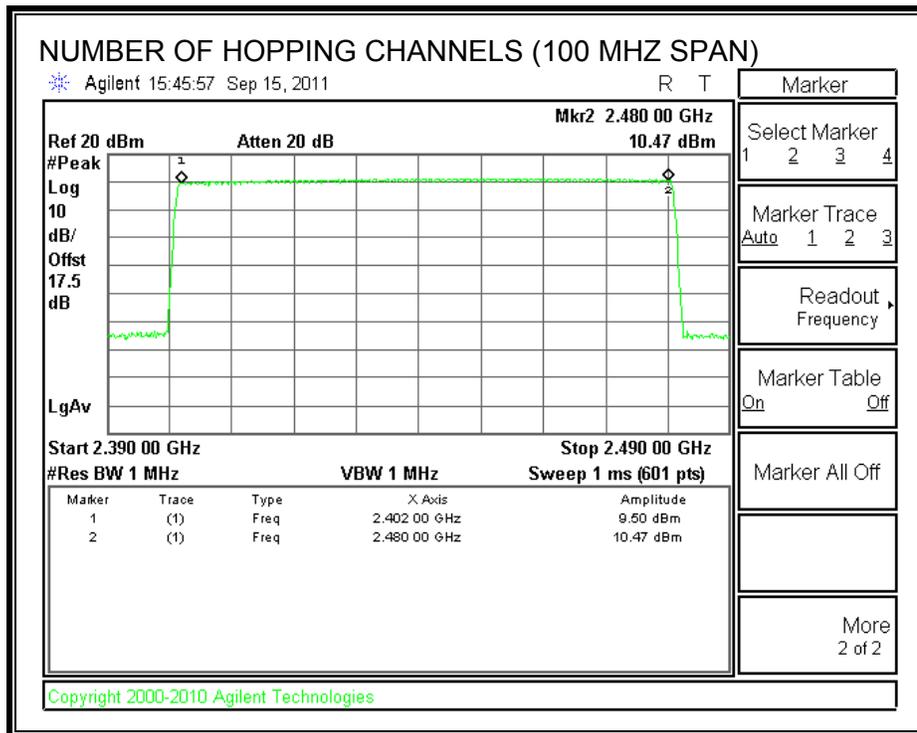
TEST PROCEDURE

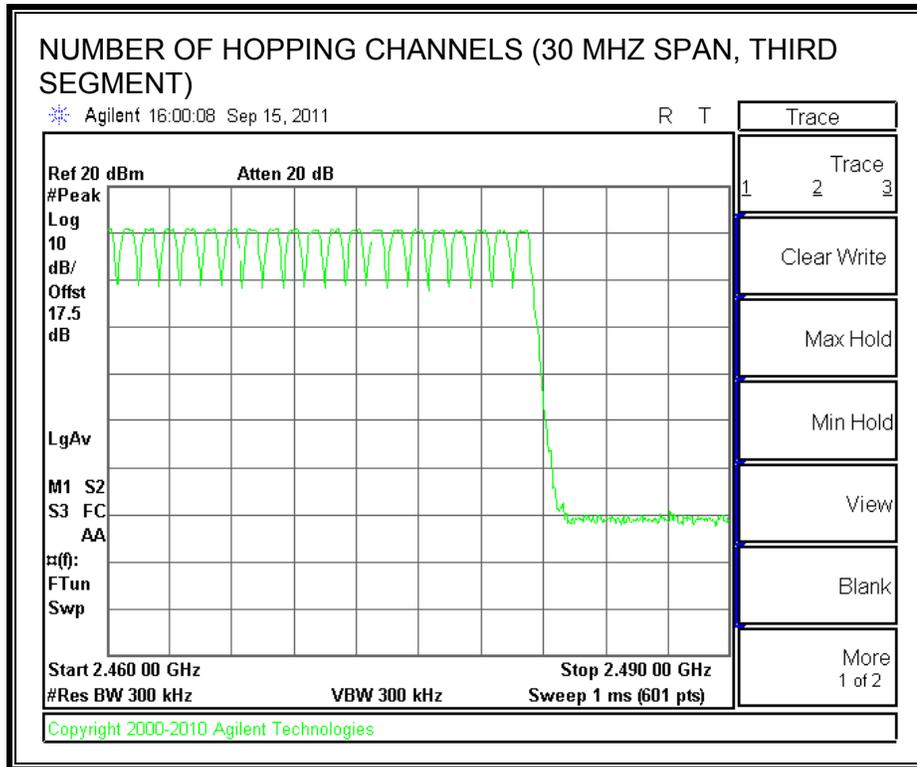
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

79 Channels observed.

NUMBER OF HOPPING CHANNELS





7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

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

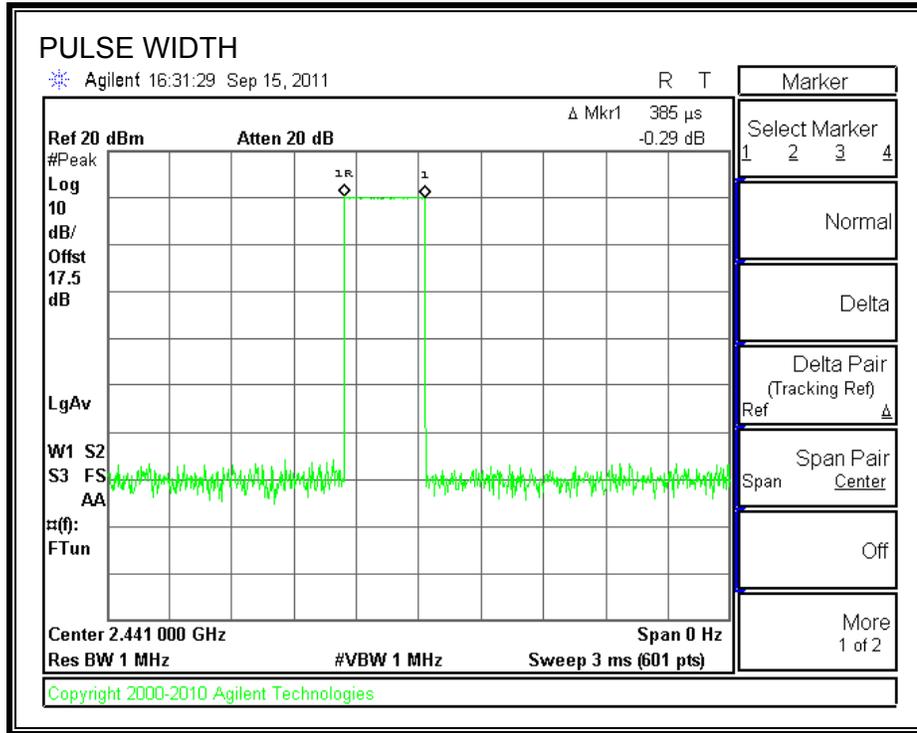
Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

GFSK Mode

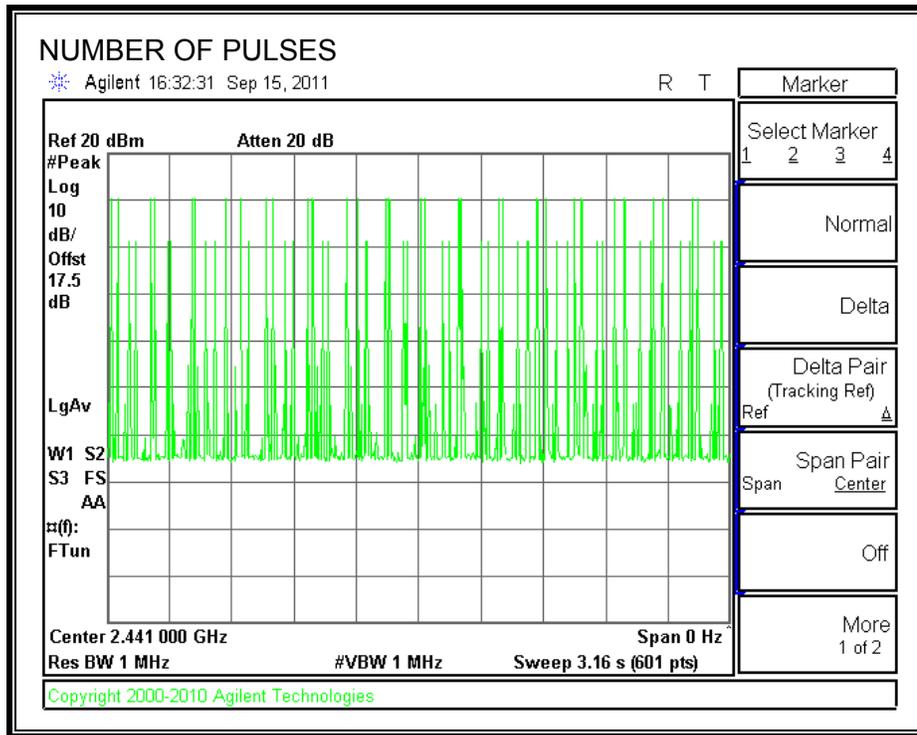
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.385	32	0.123	0.4	-0.277
DH3	1.650	18	0.297	0.4	-0.103
DH5	2.900	11	0.319	0.4	-0.081

DH1

PULSE WIDTH

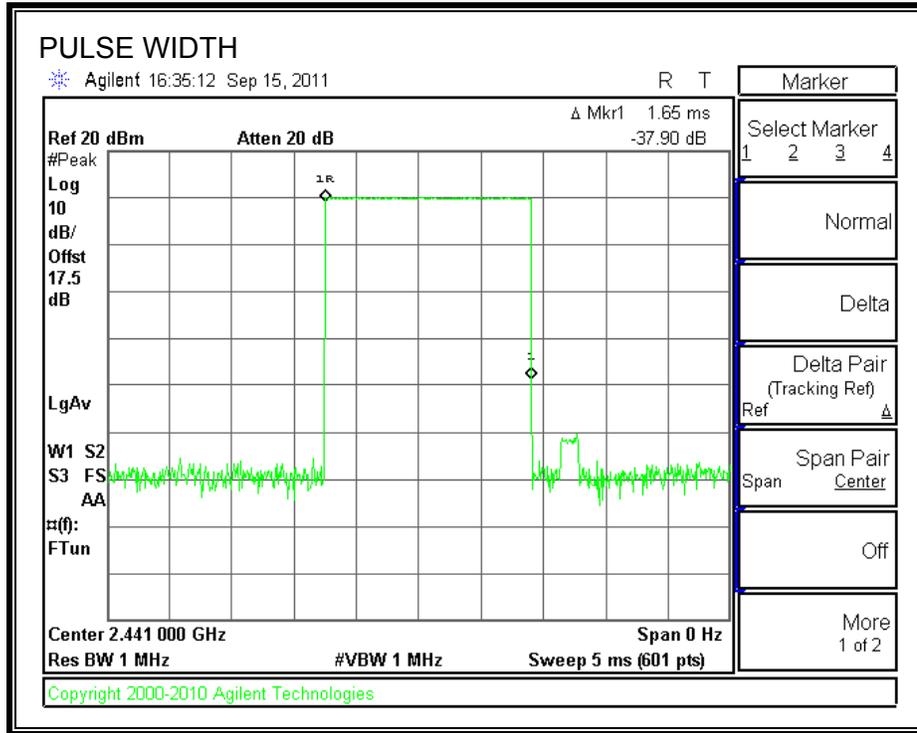


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

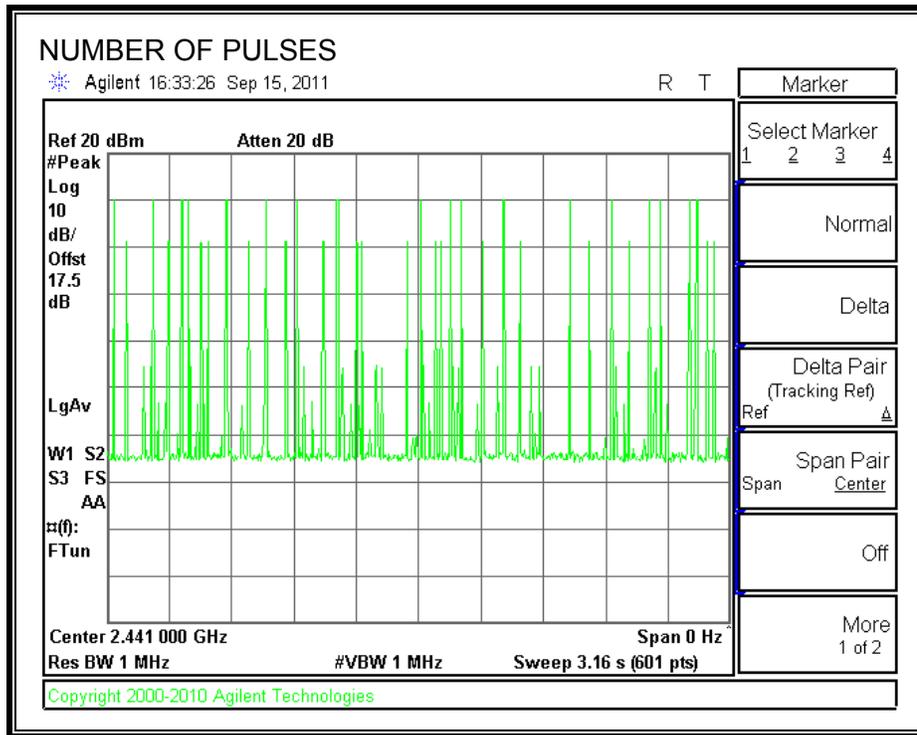


DH3

PULSE WIDTH

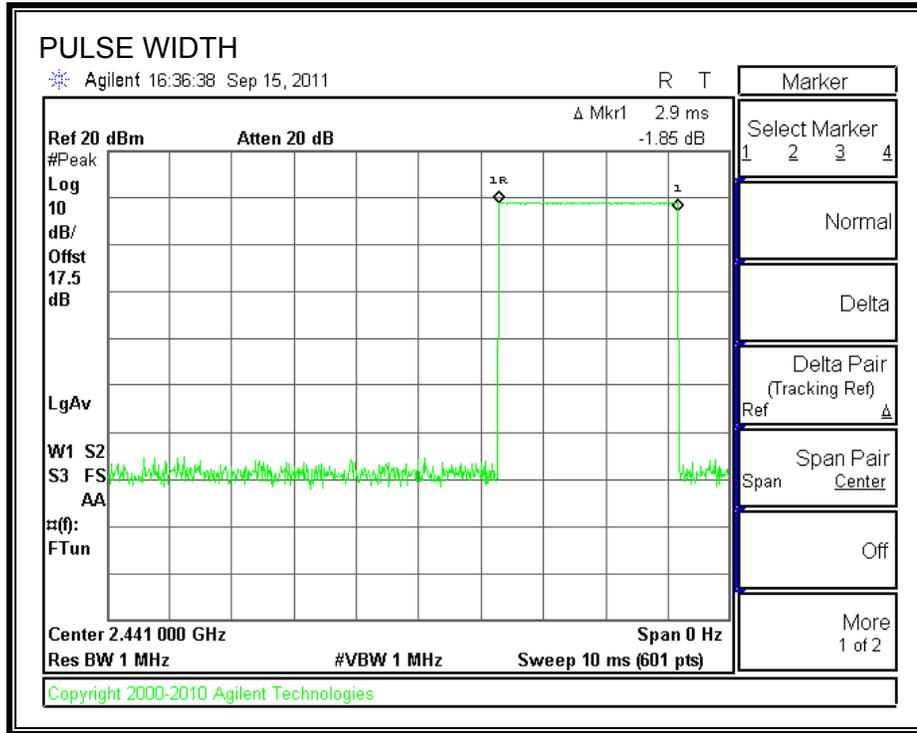


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

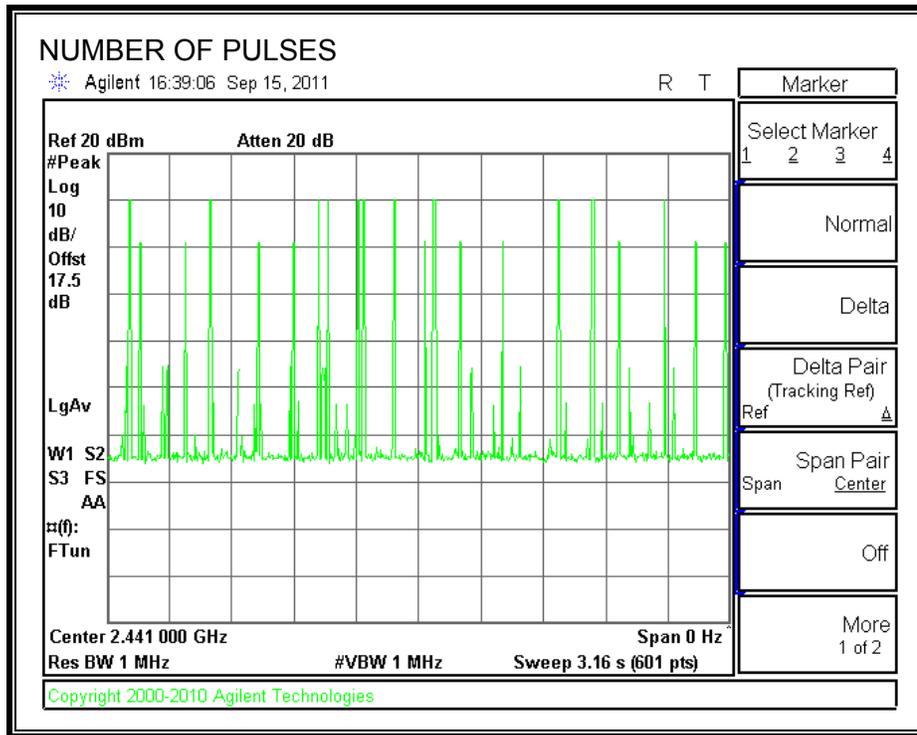


DH5

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

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

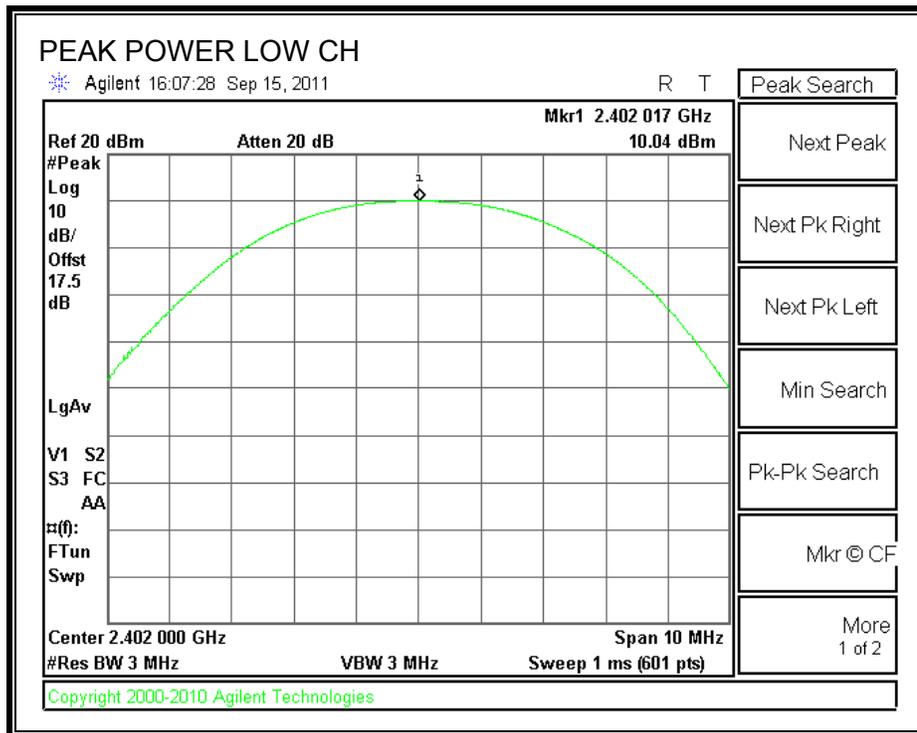
TEST PROCEDURE

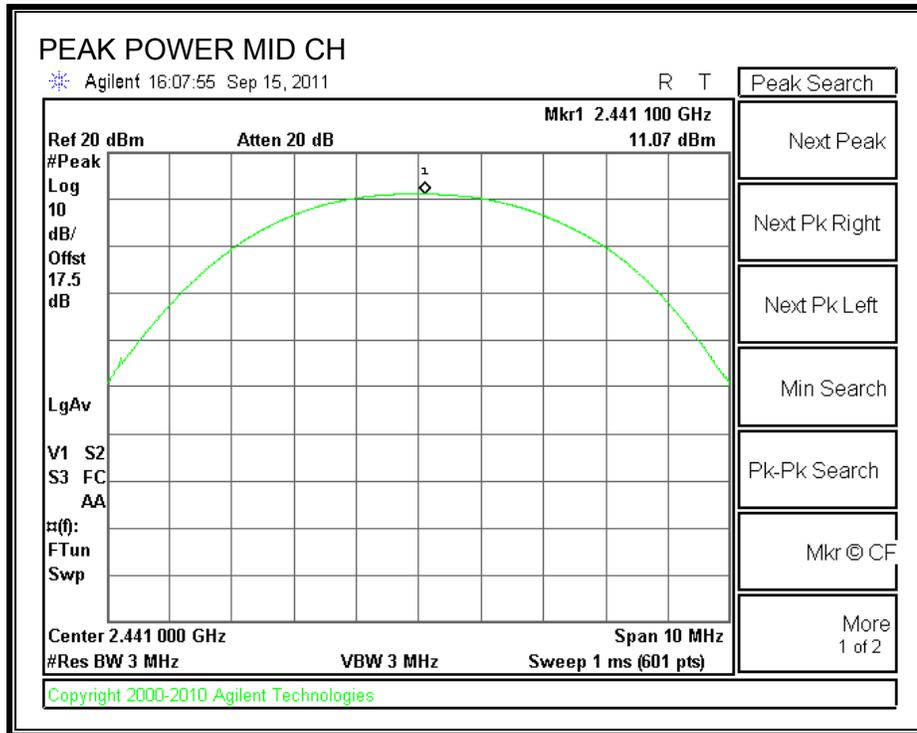
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

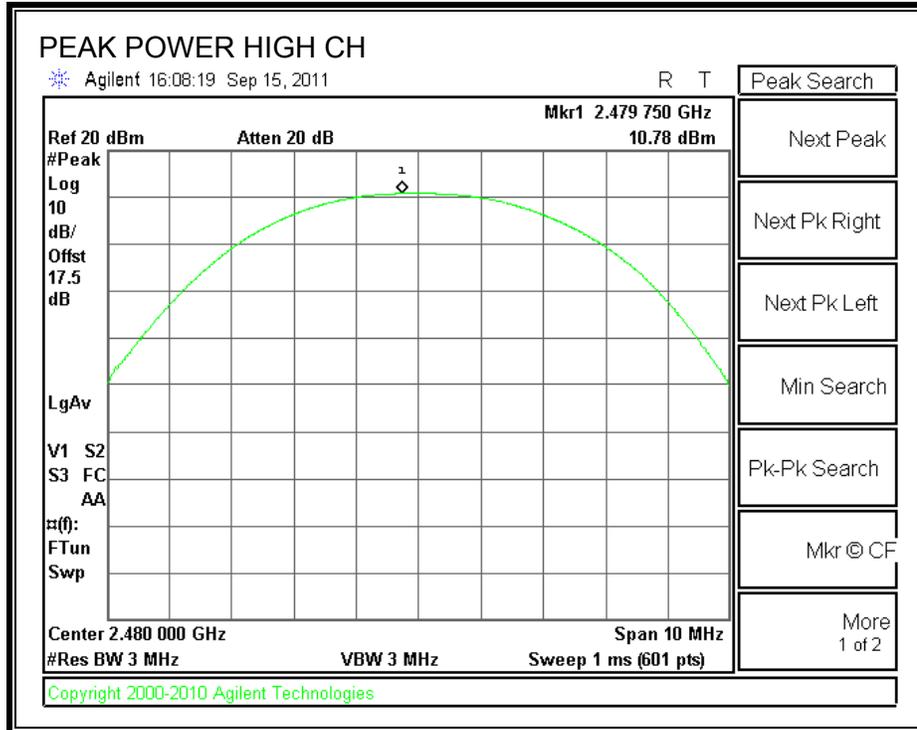
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.04	30	-19.96
Middle	2441	11.07	30	-18.93
High	2480	10.78	30	-19.22

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 11 dB (including 10 dB pad and 1 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	9.20
Middle	2441	9.50
High	2480	9.20

7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Limit = -20 dBc

TEST PROCEDURE

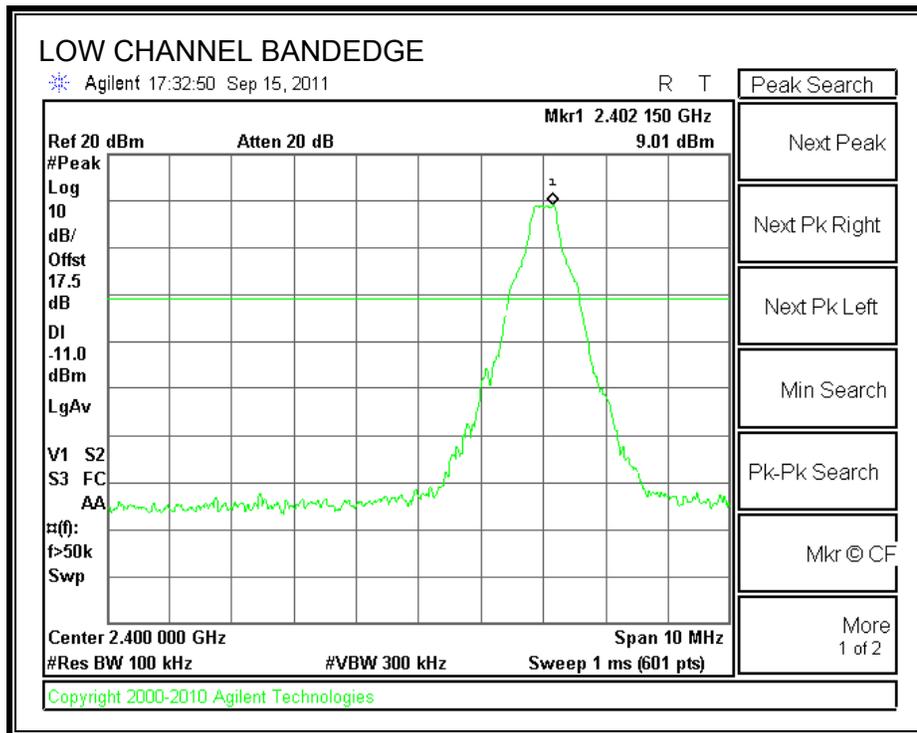
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

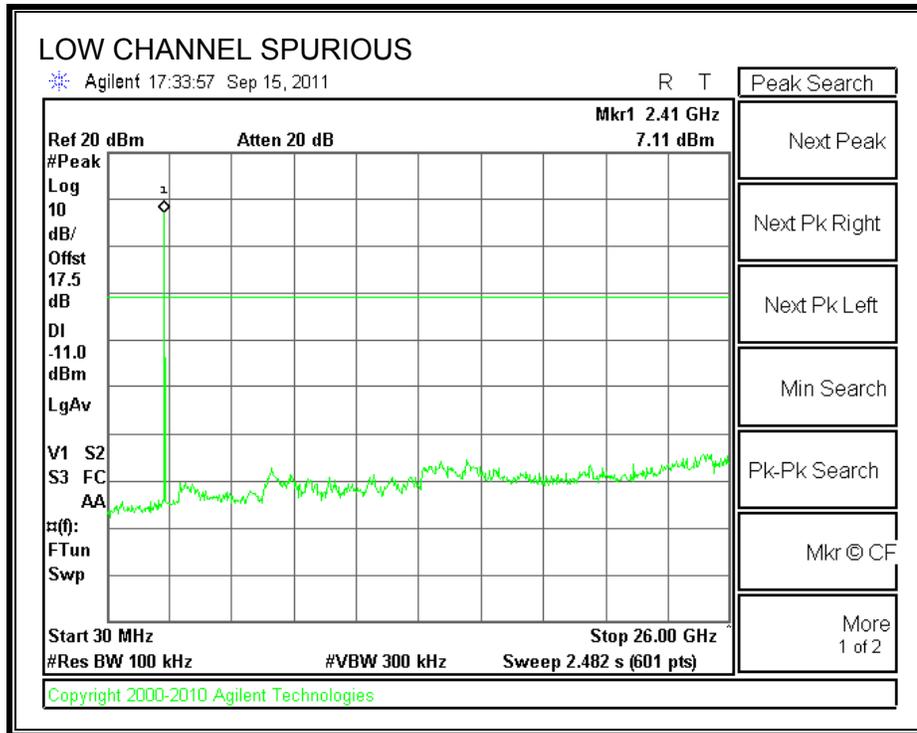
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

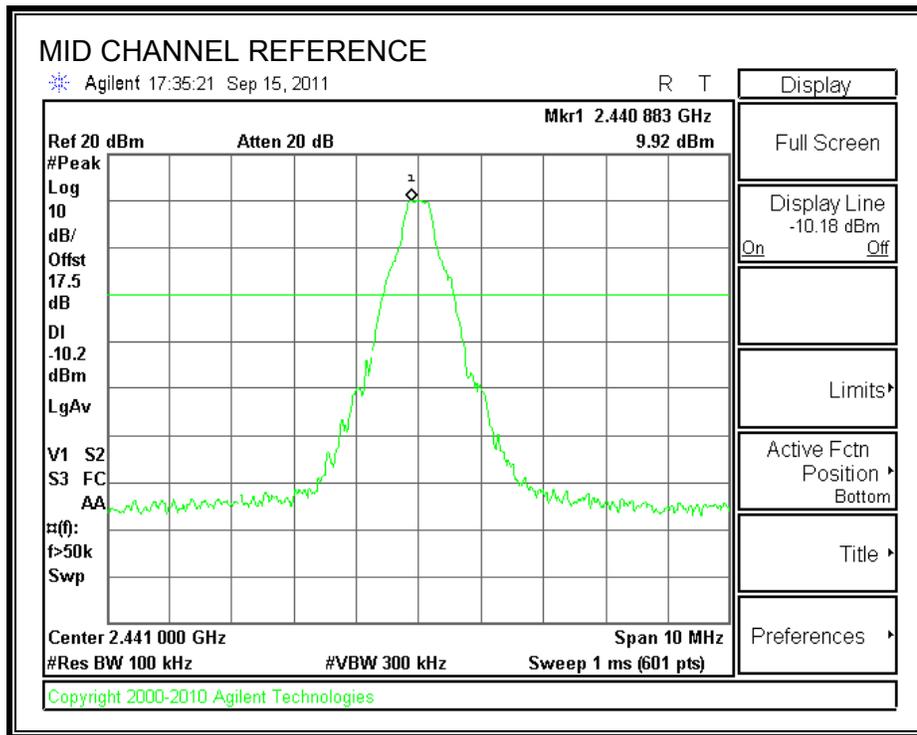
RESULTS

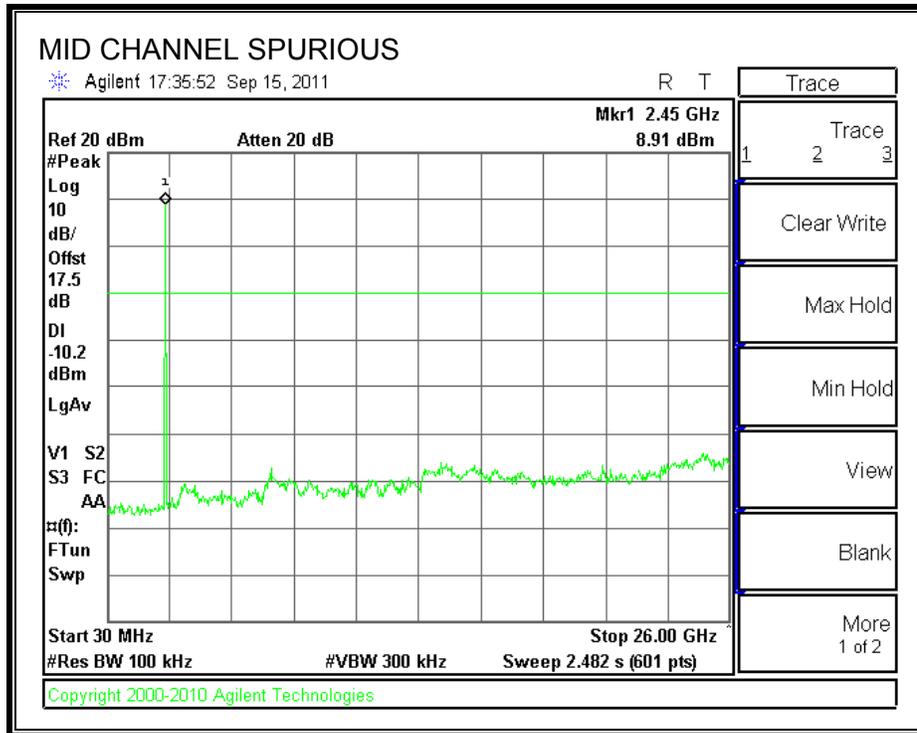
SPURIOUS EMISSIONS, LOW CHANNEL



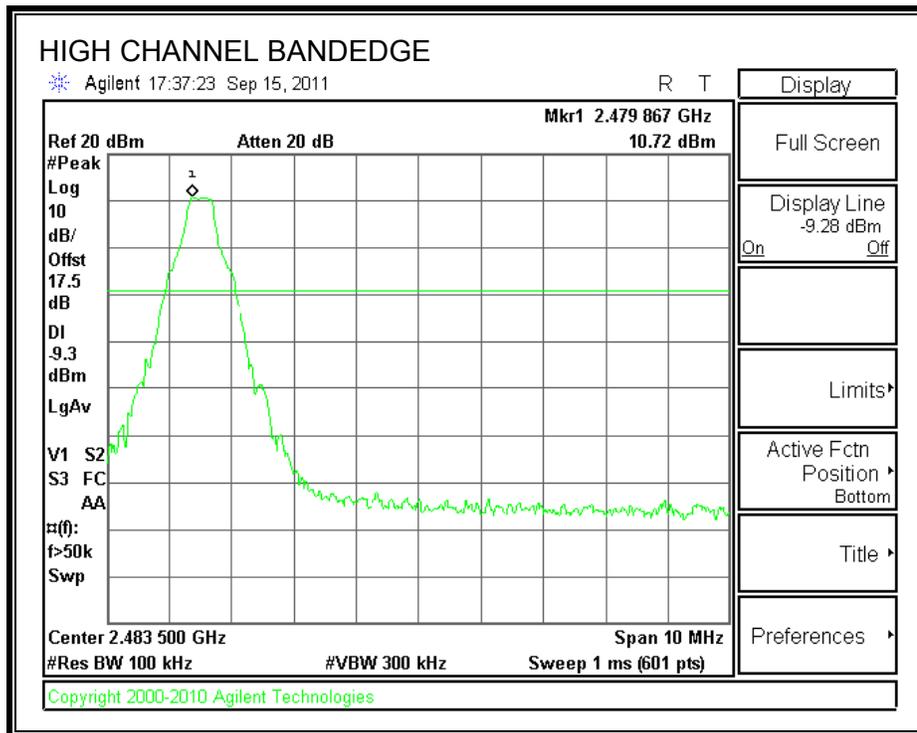


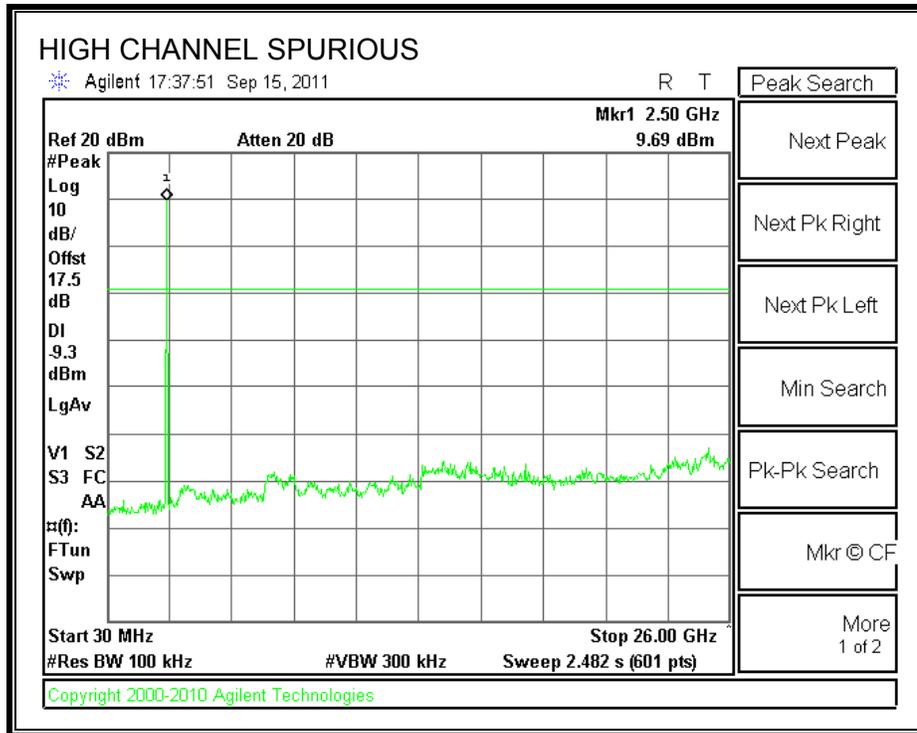
SPURIOUS EMISSIONS, MID CHANNEL



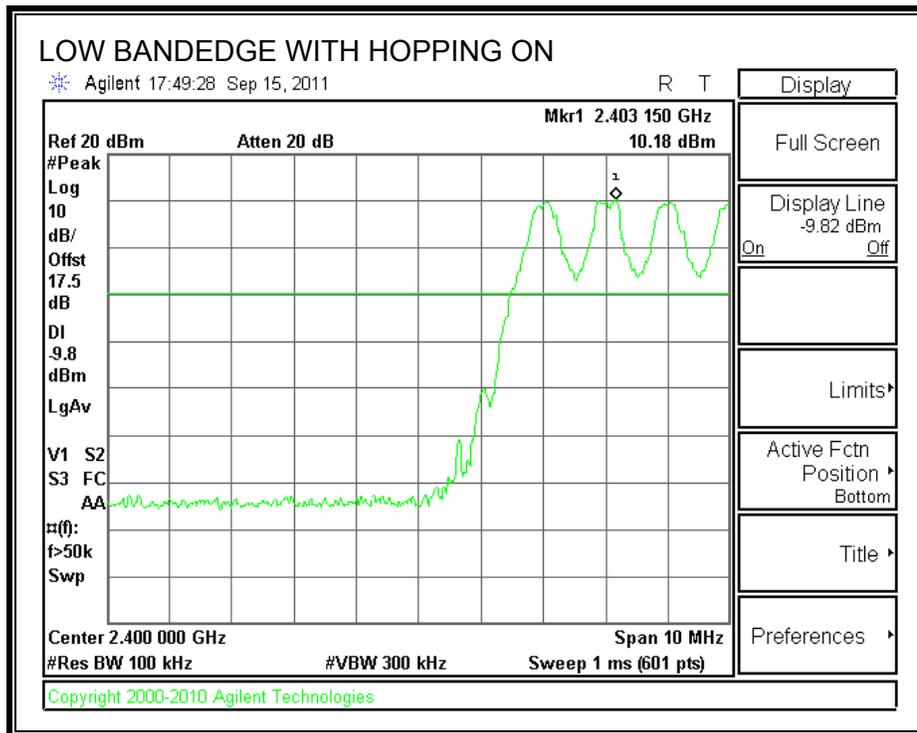


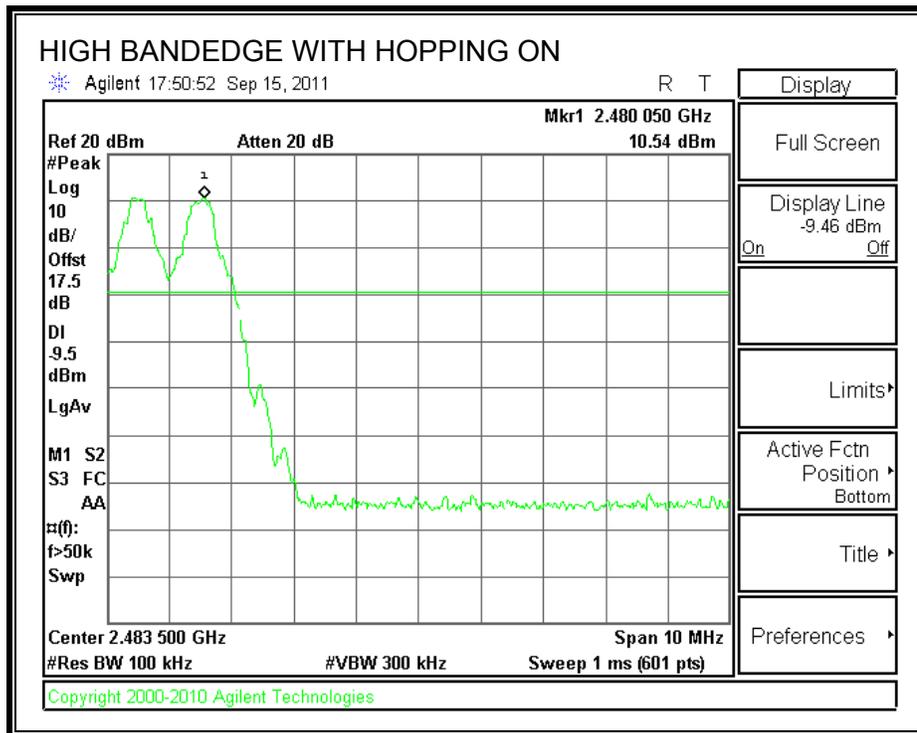
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





7.2. ENHANCED DATA RATE 8PSK MODULATION

7.2.1. 20 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

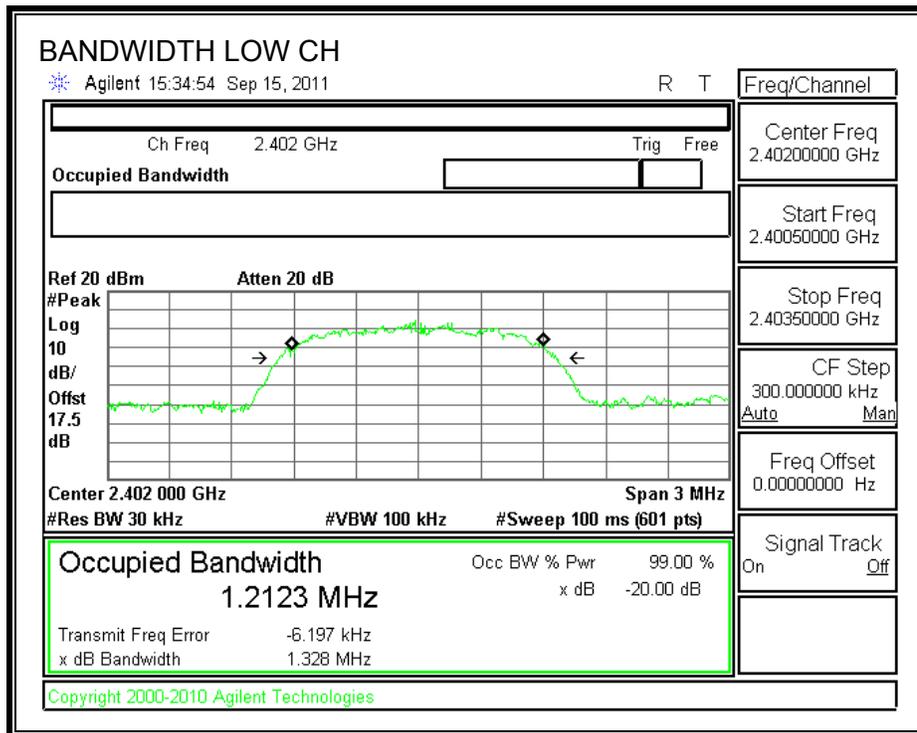
TEST PROCEDURE

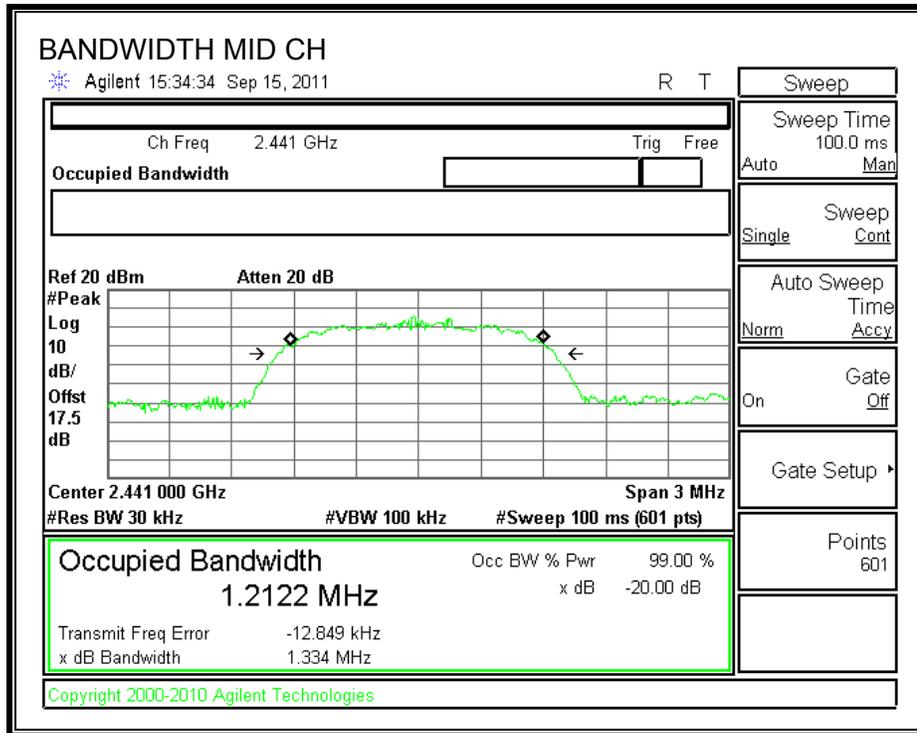
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	2402	1328
Middle	2441	1334
High	2480	1341

20 dB BANDWIDTH







7.2.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

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.

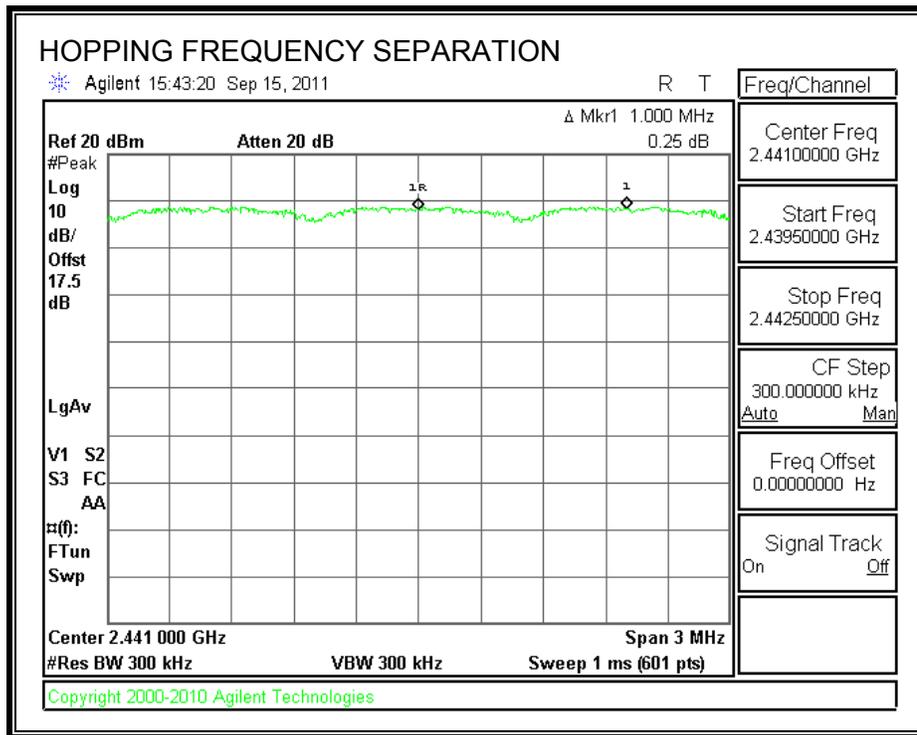
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

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

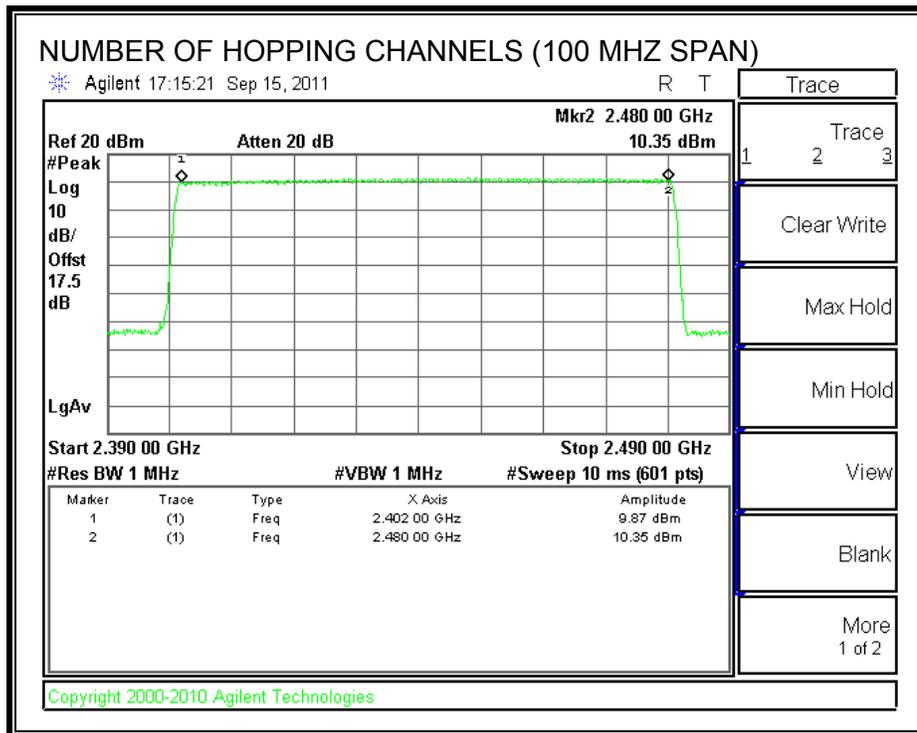
TEST PROCEDURE

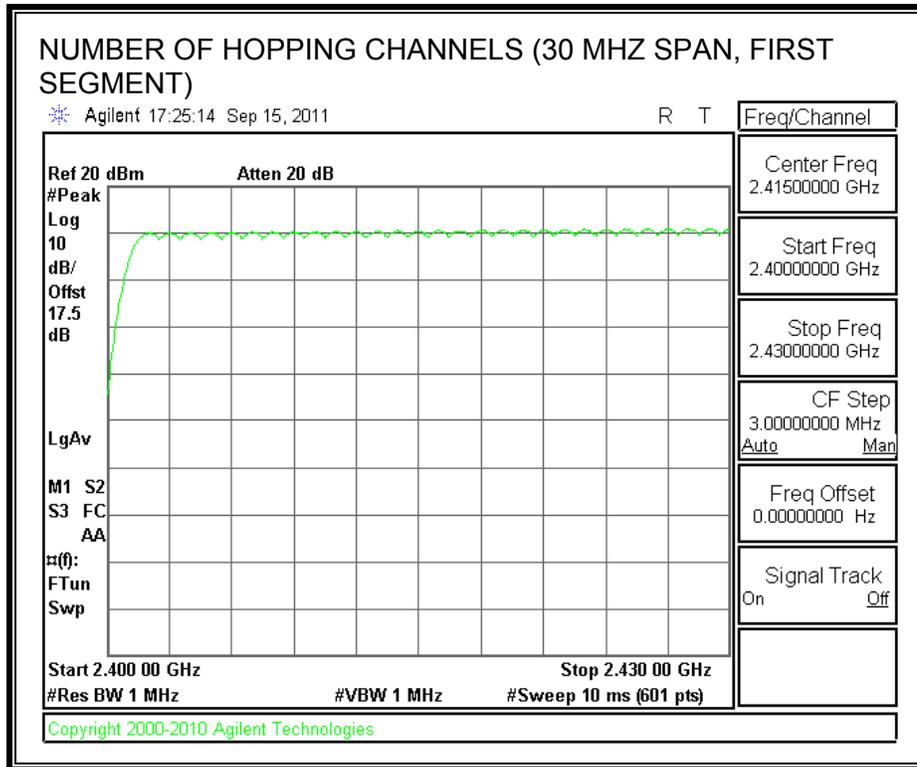
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

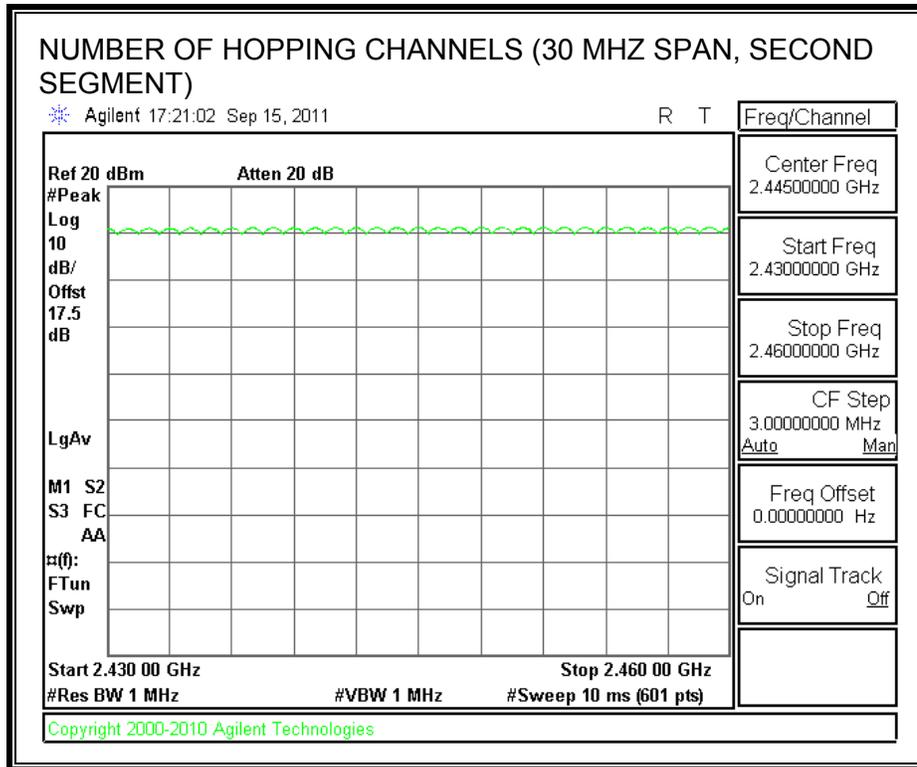
RESULTS

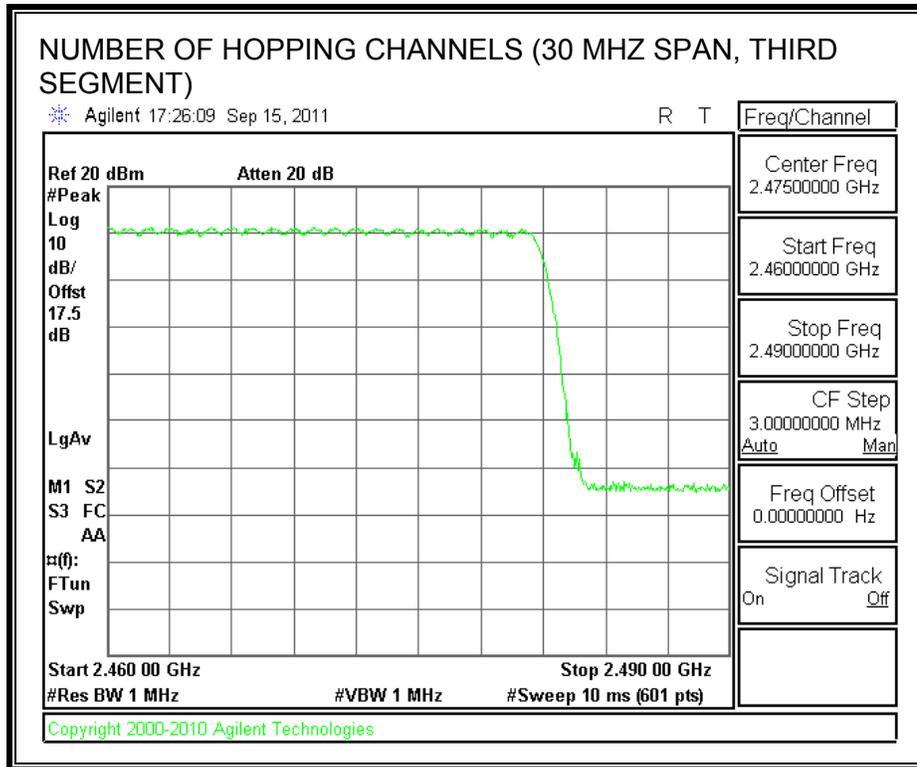
79 Channels observed.

NUMBER OF HOPPING CHANNELS









7.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

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

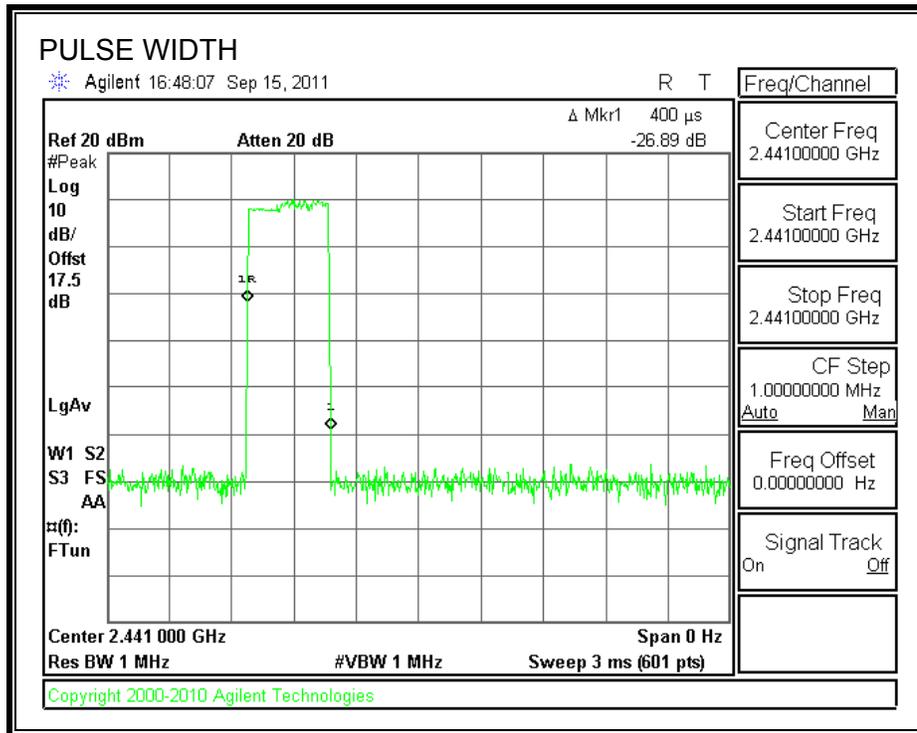
Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

8PSK Mode

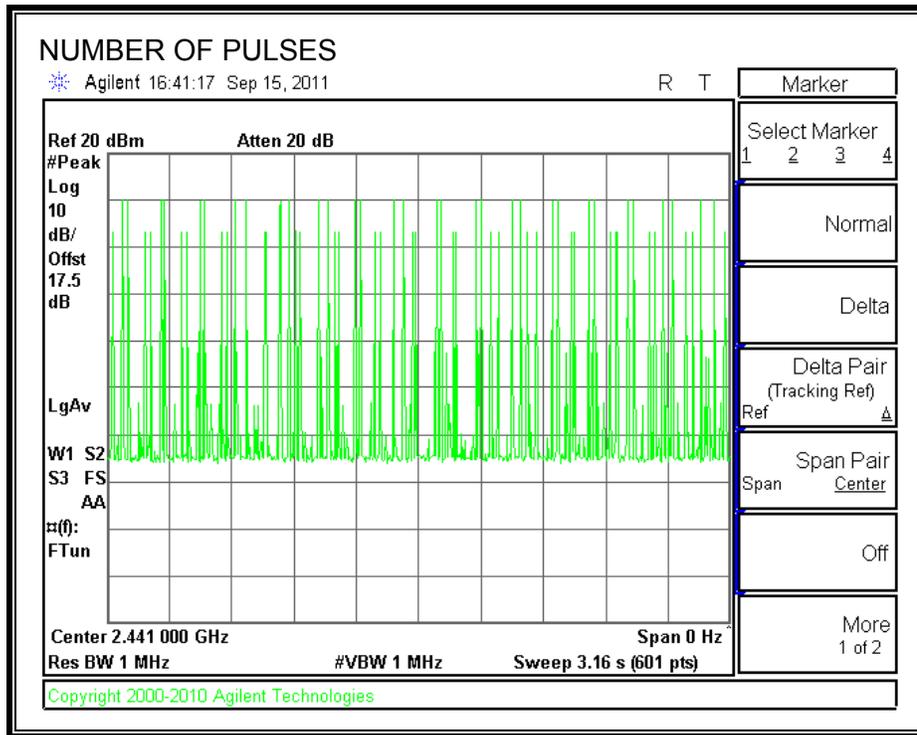
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.4	32	0.128	0.4	-0.272
DH3	1.65	17	0.281	0.4	-0.120
DH5	2.9	12	0.348	0.4	-0.052

DH1

PULSE WIDTH

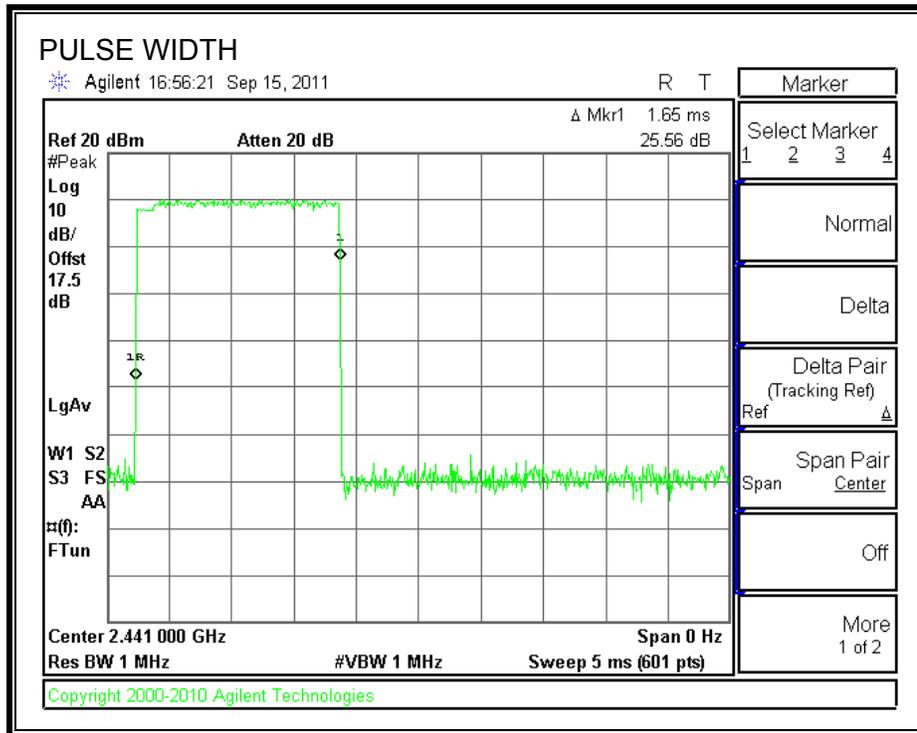


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

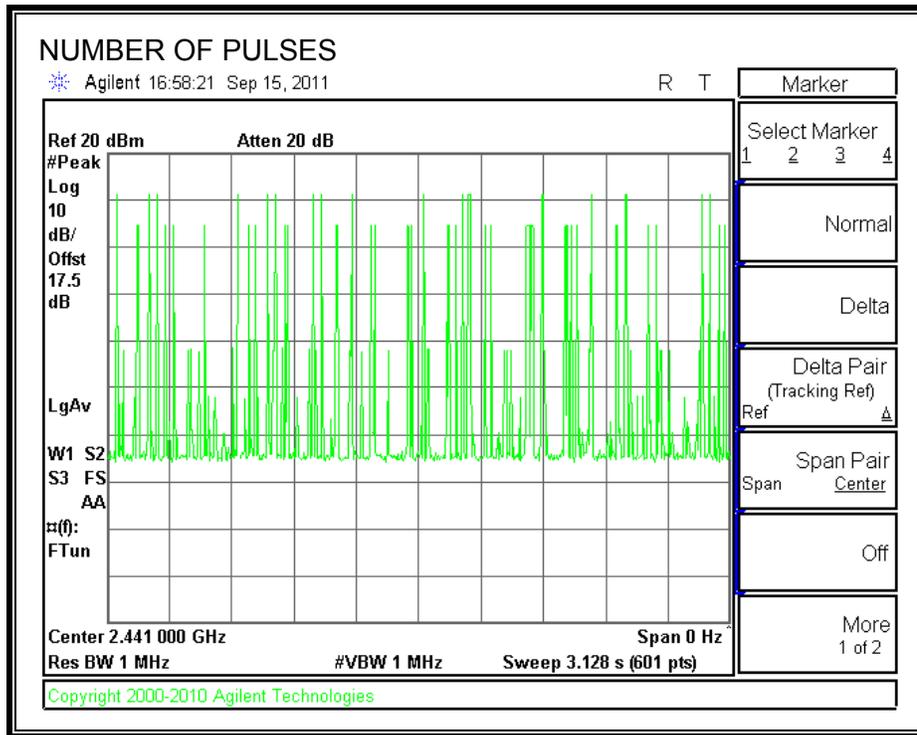


DH3

PULSE WIDTH

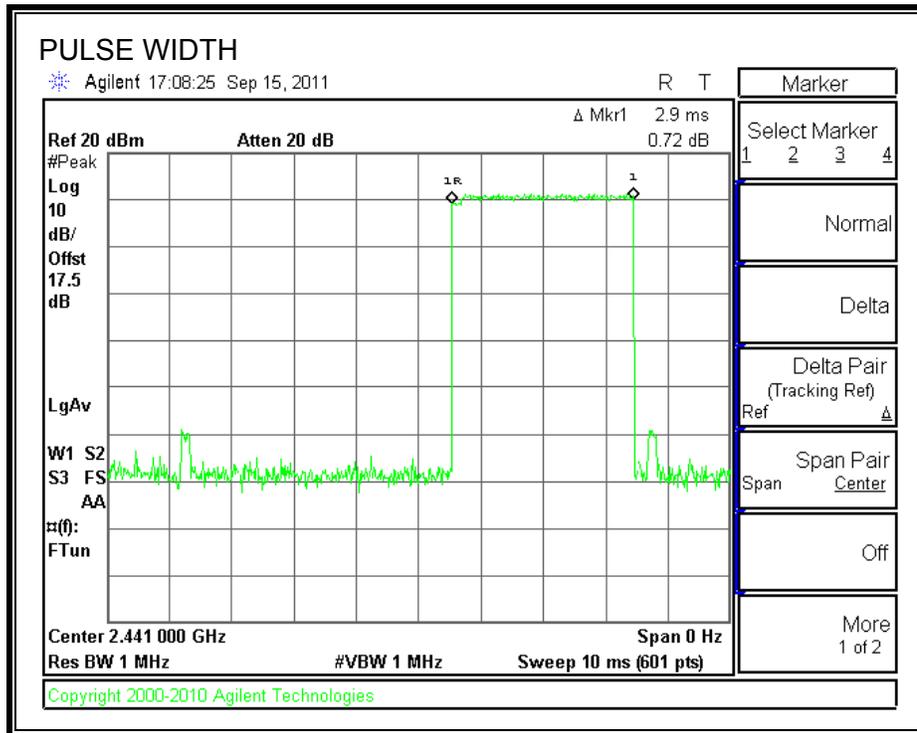


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

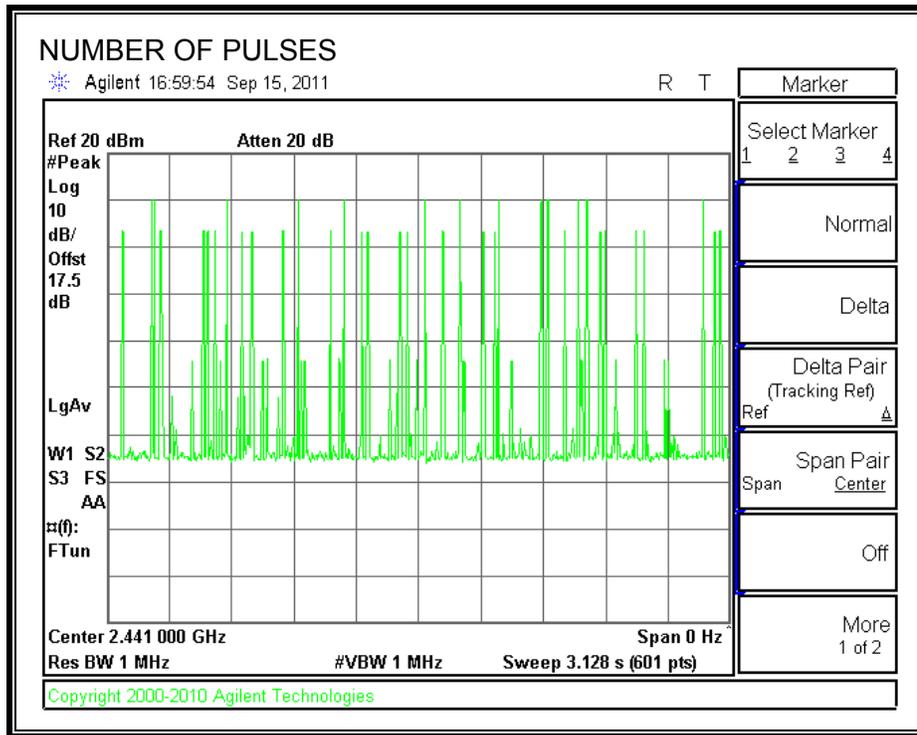


DH5

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.2.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

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

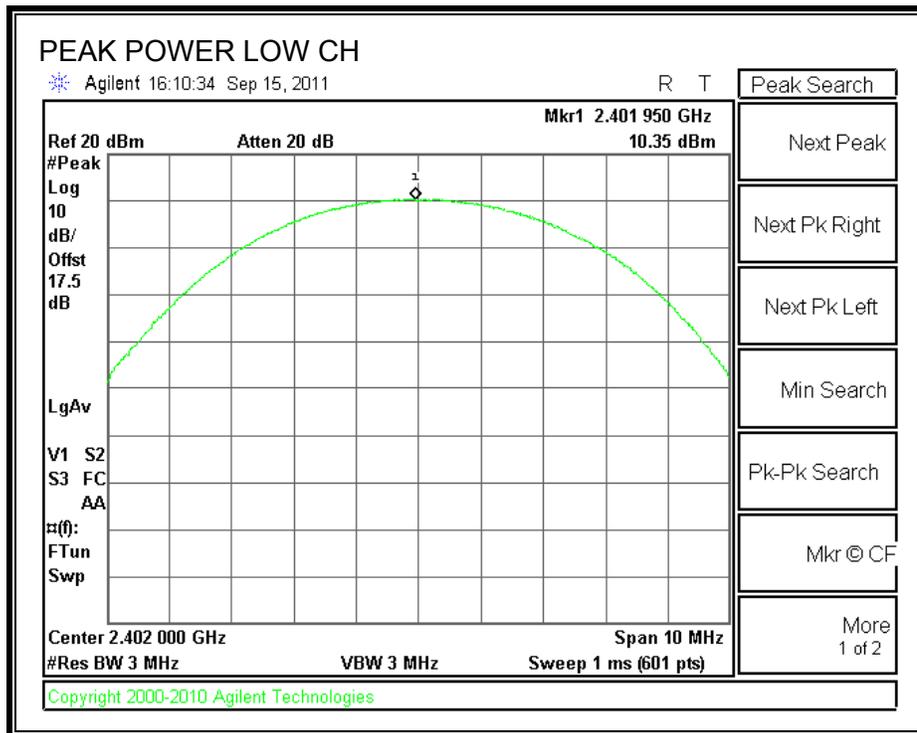
TEST PROCEDURE

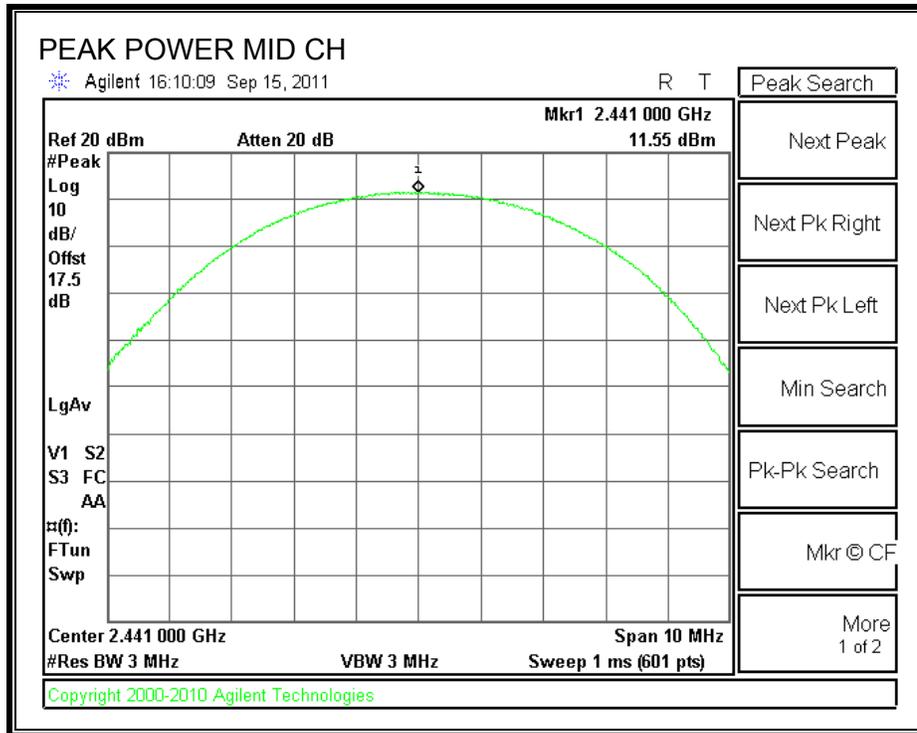
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

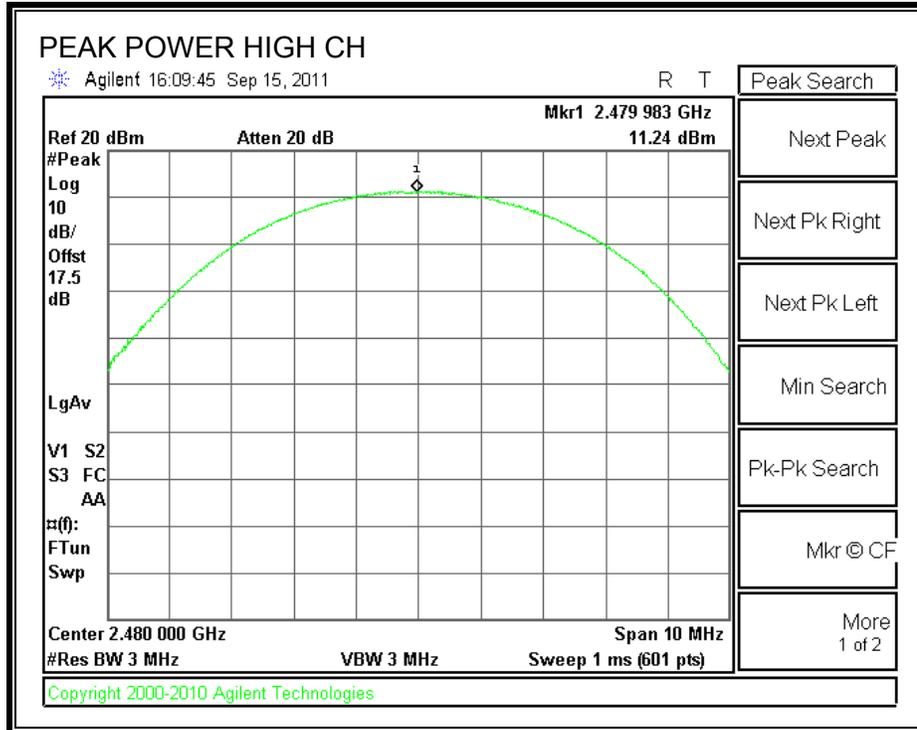
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.35	30	-19.65
Middle	2441	11.55	30	-18.45
High	2480	11.24	30	-18.76

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 11 dB (including 10 dB pad and 1 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	7.10
Middle	2441	7.40
High	2480	7.10

7.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Limit = -20 dBc

TEST PROCEDURE

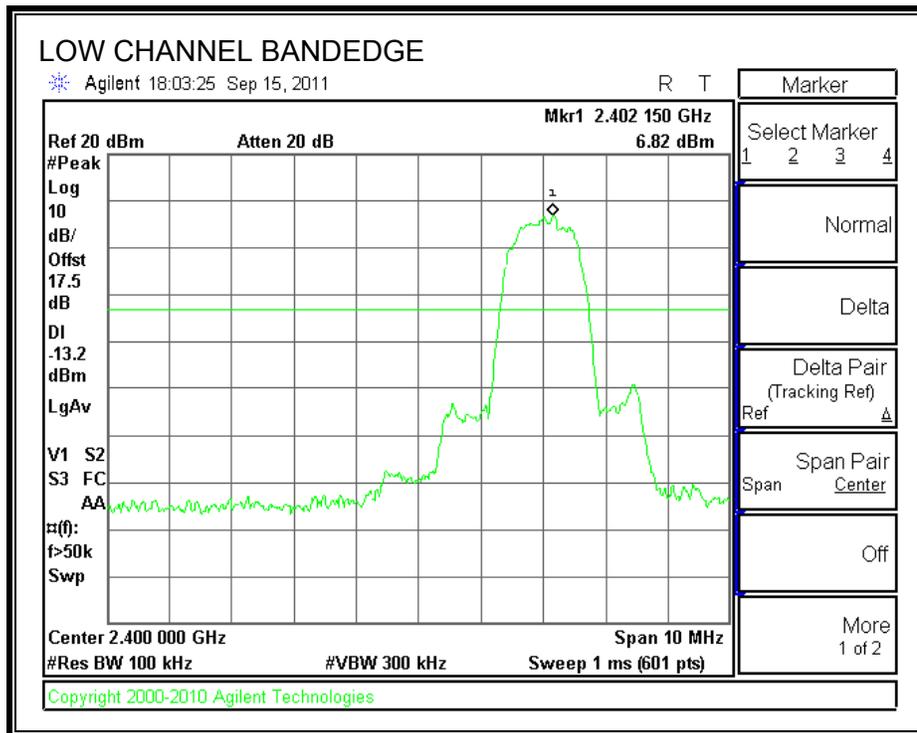
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

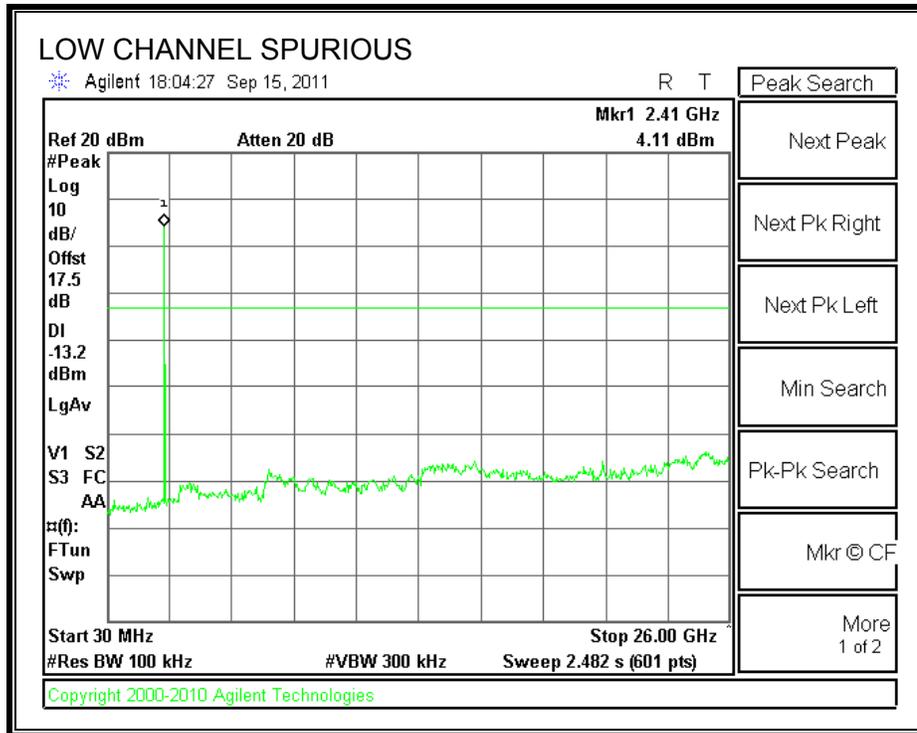
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

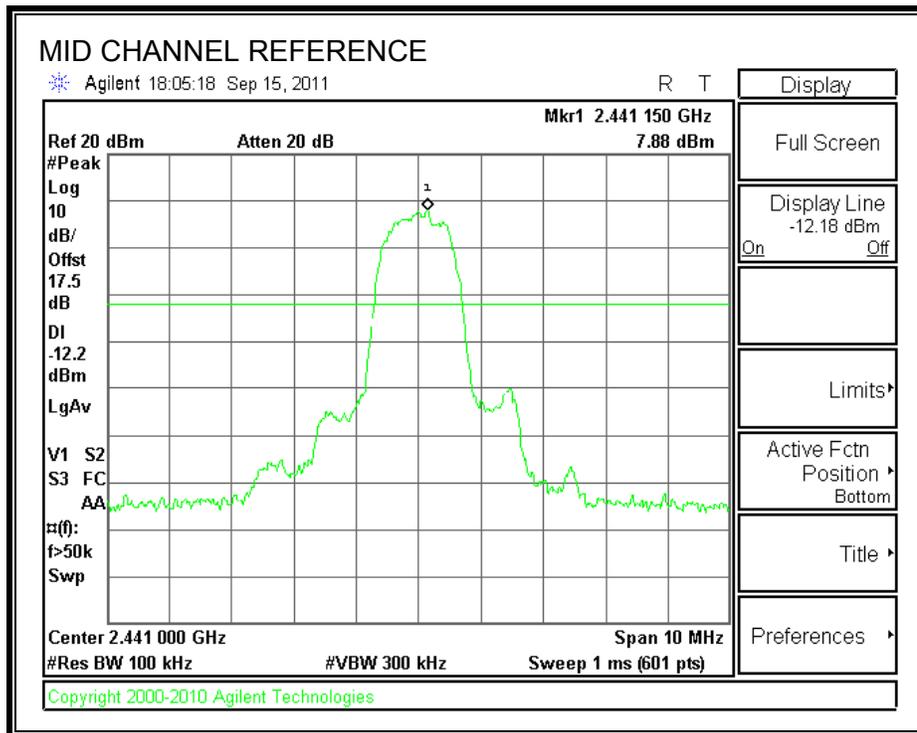
RESULTS

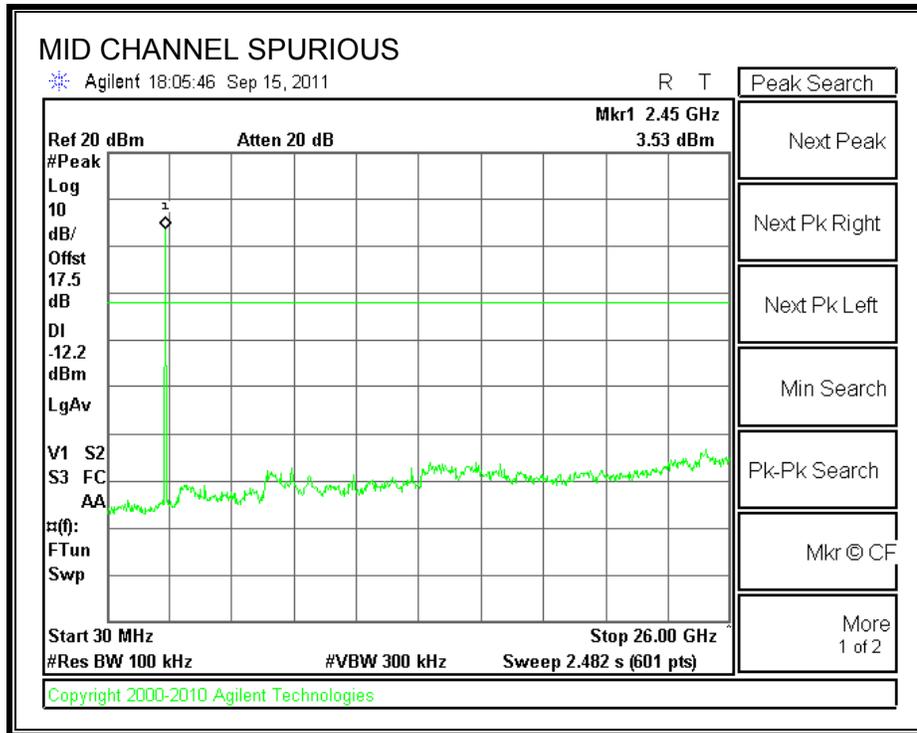
SPURIOUS EMISSIONS, LOW CHANNEL



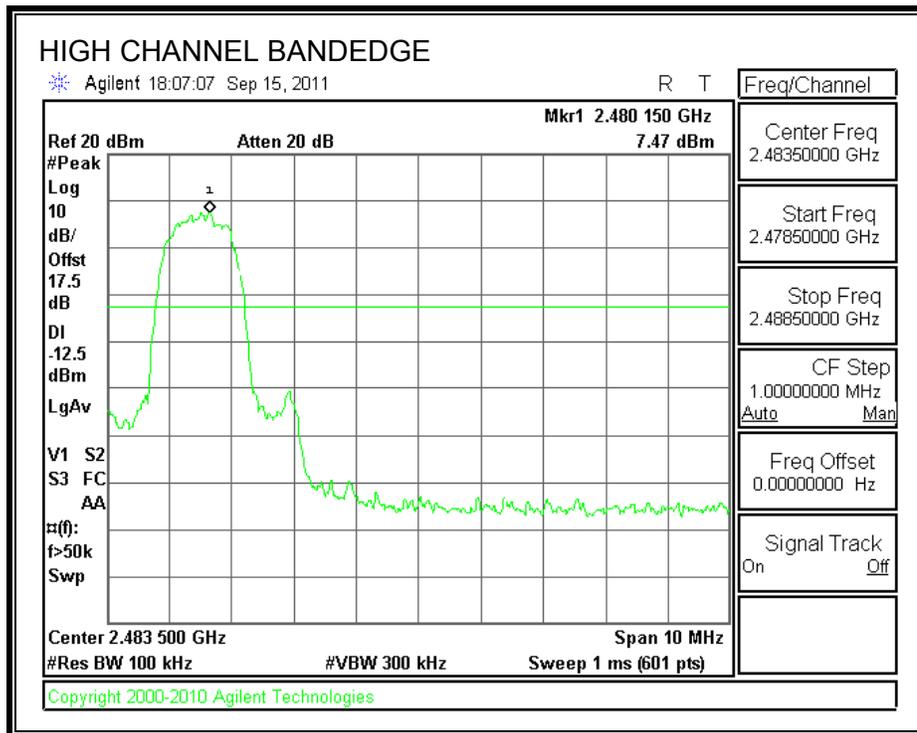


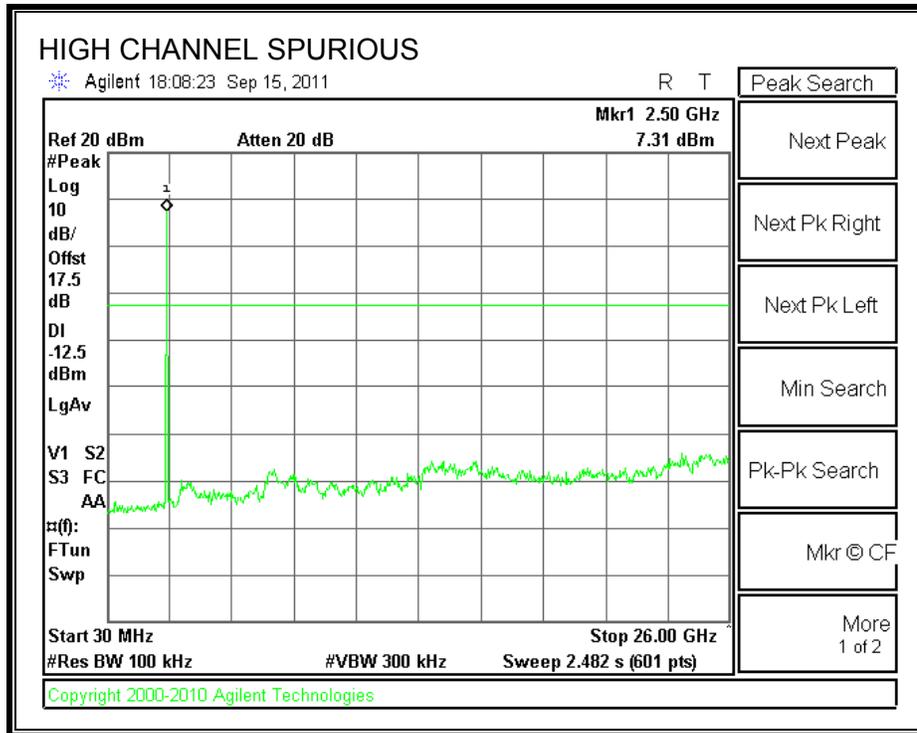
SPURIOUS EMISSIONS, MID CHANNEL



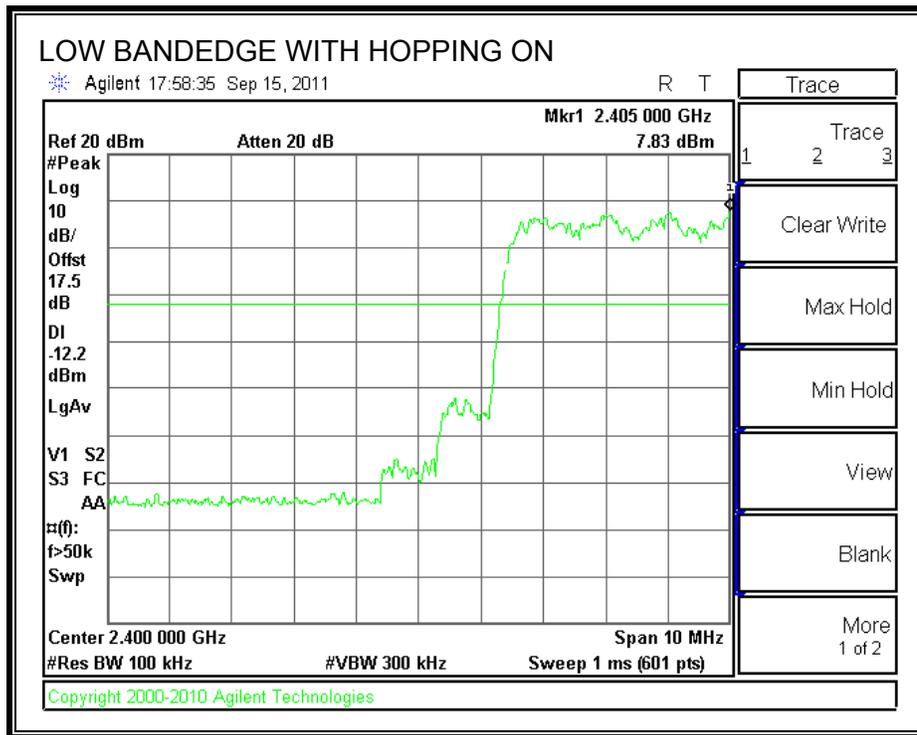


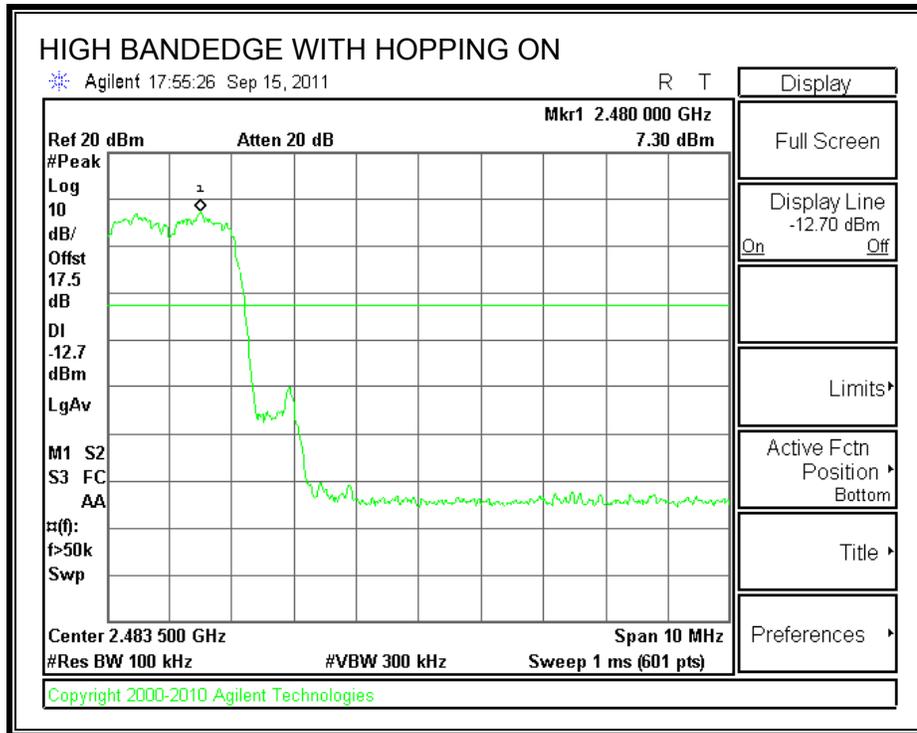
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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.

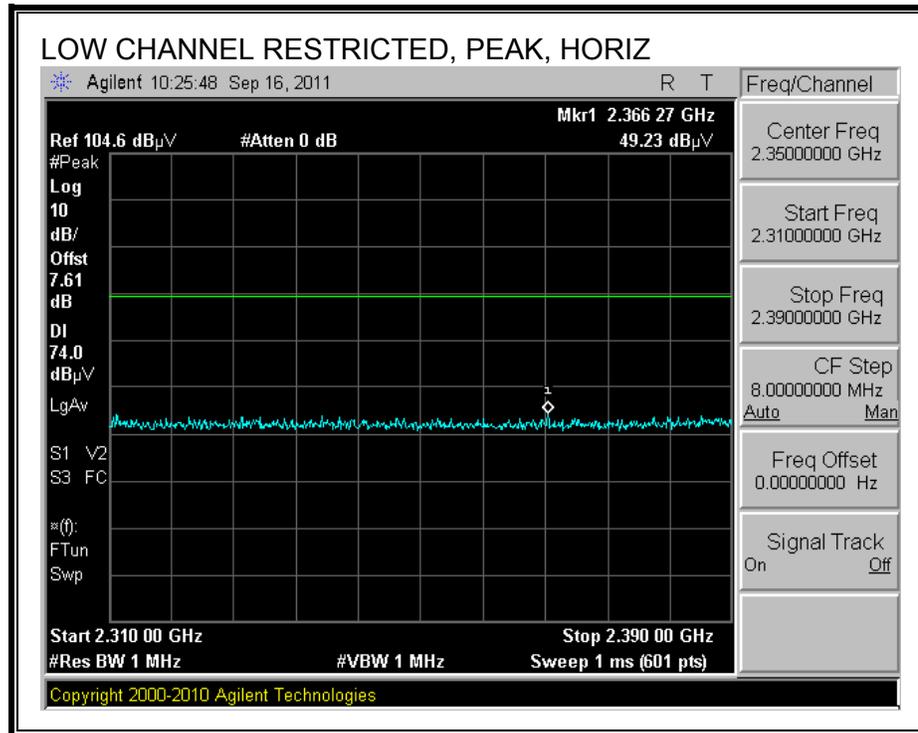
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

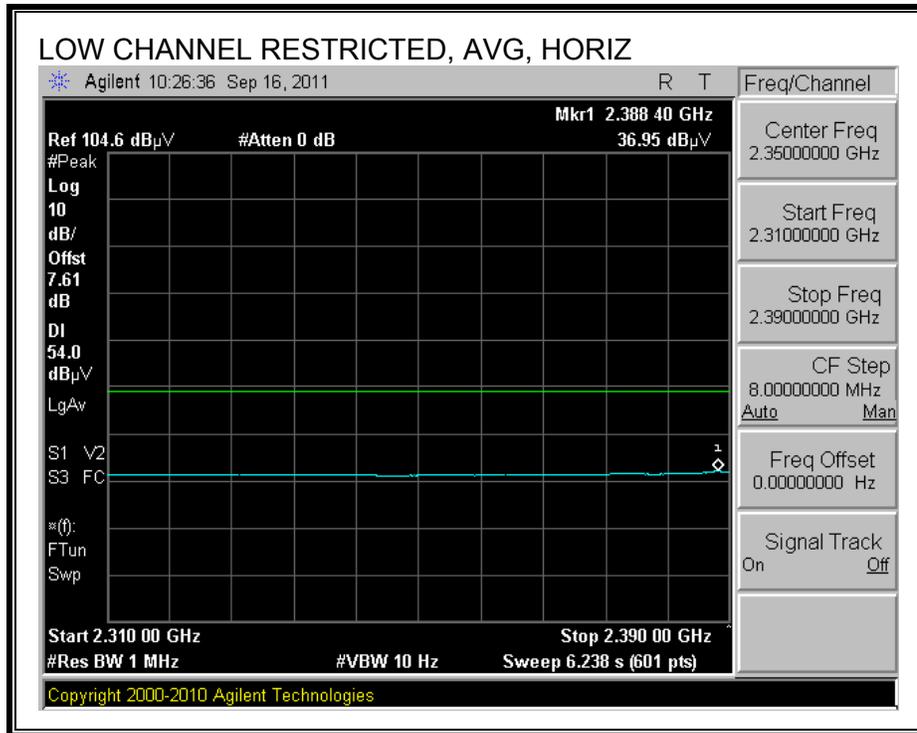
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

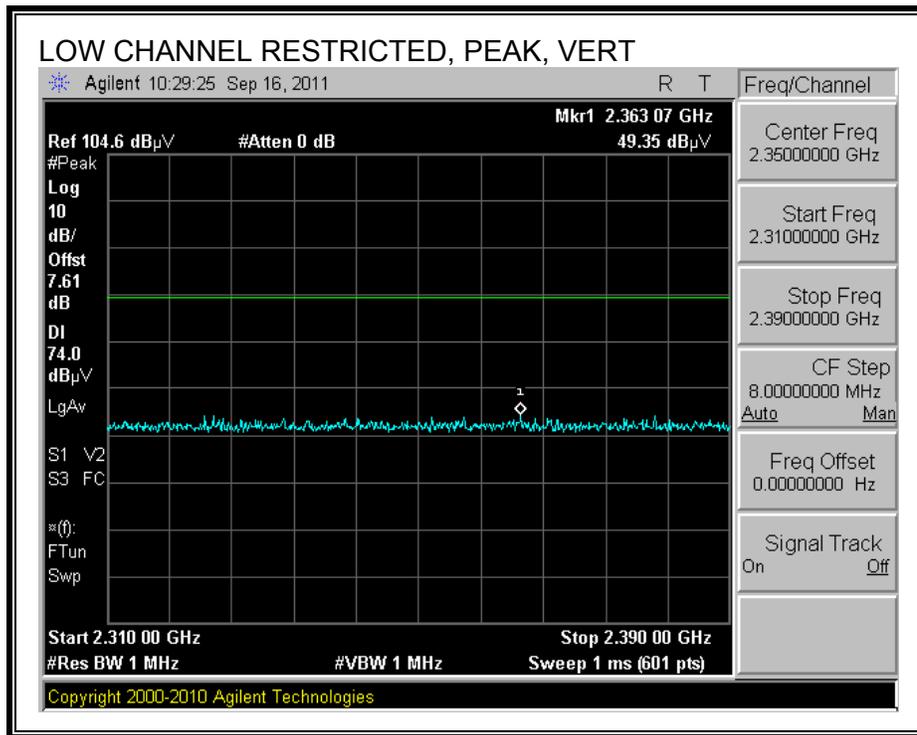
8.2.1. BASIC DATA RATE GFSK MODULATION

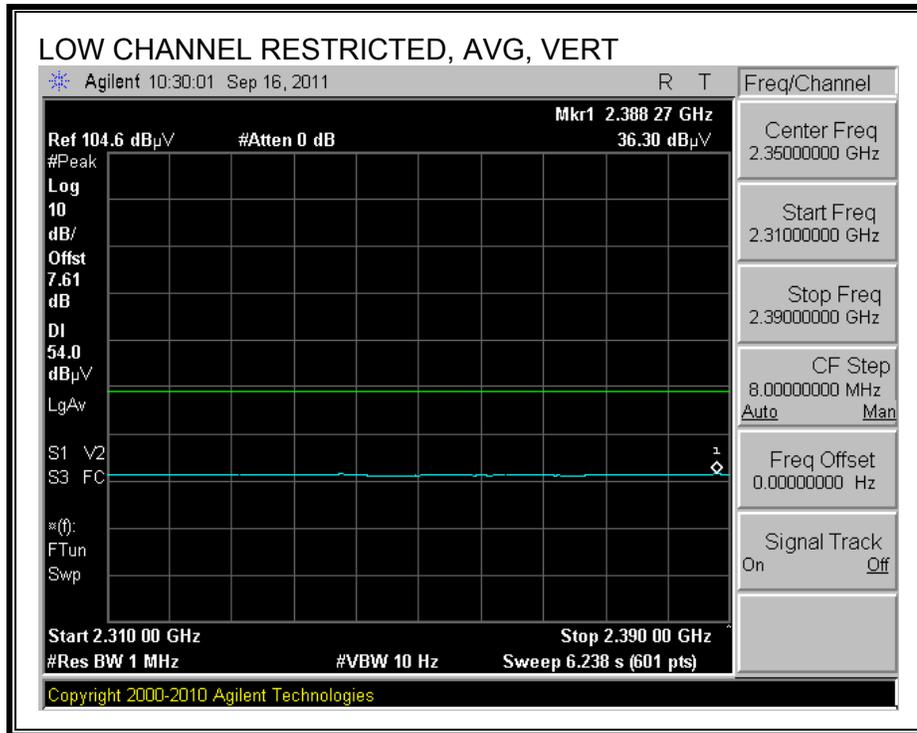
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



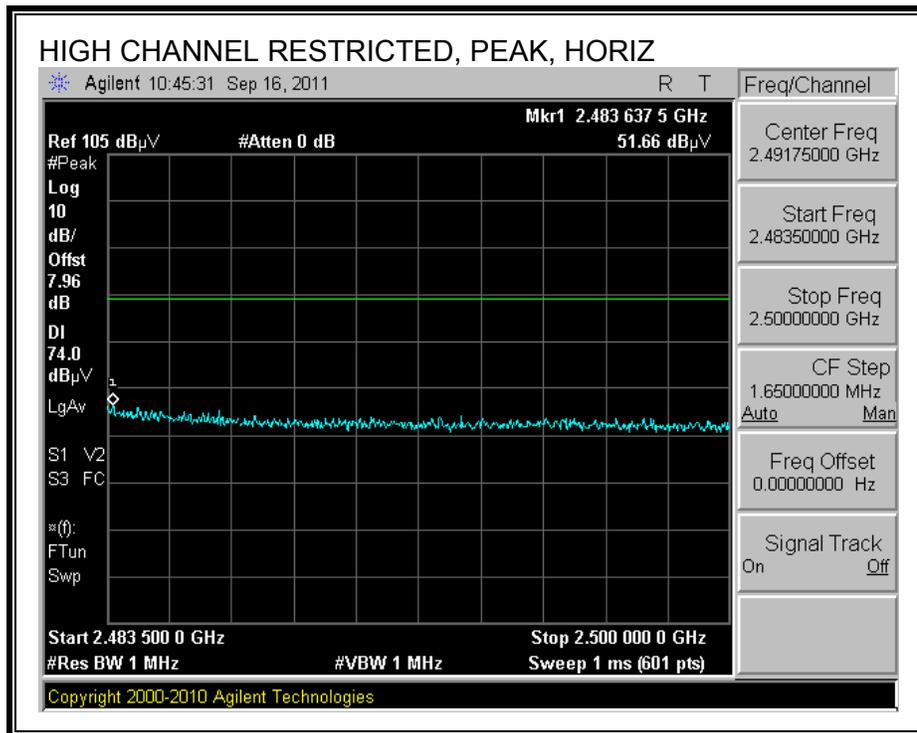


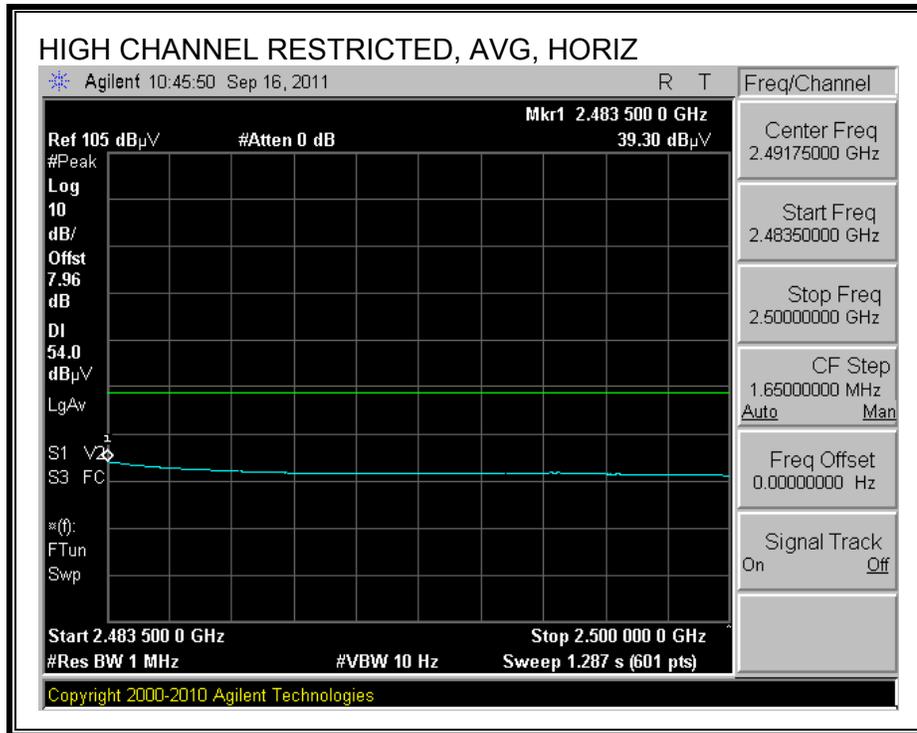
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



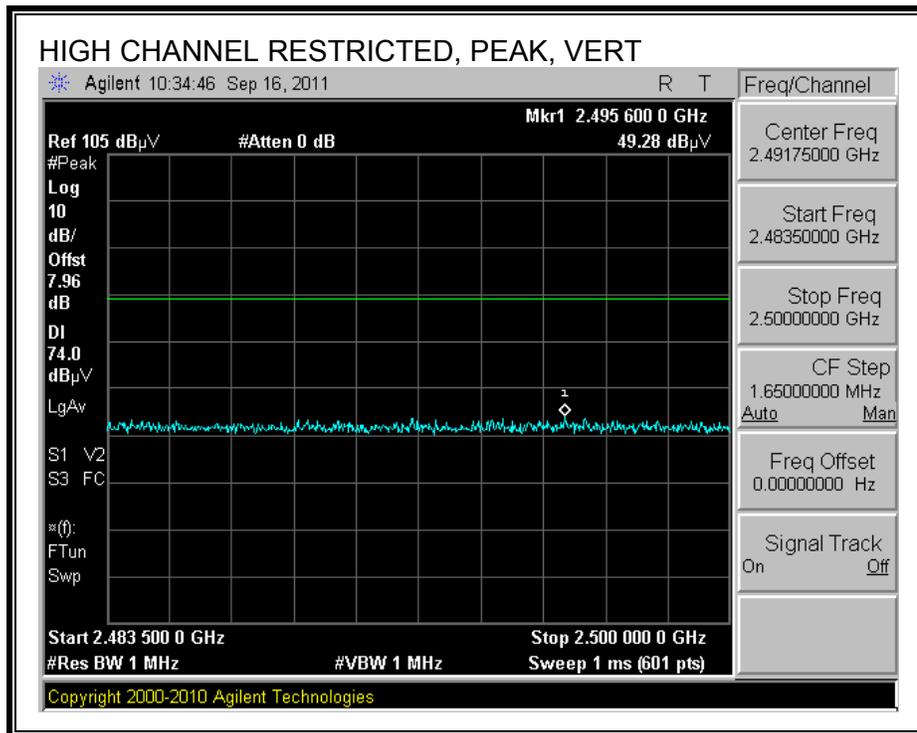


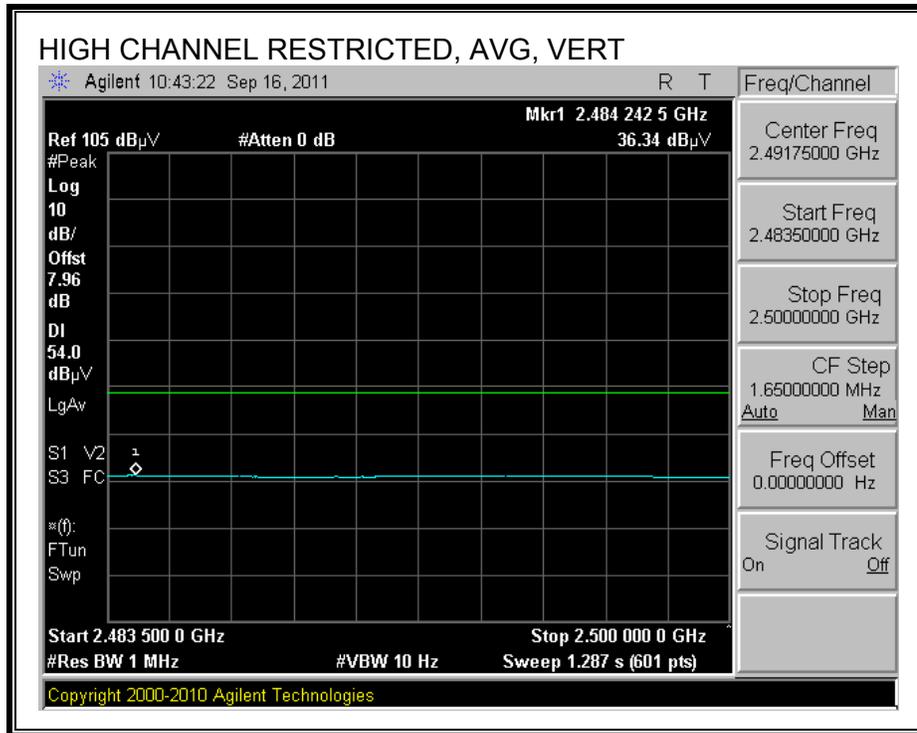
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



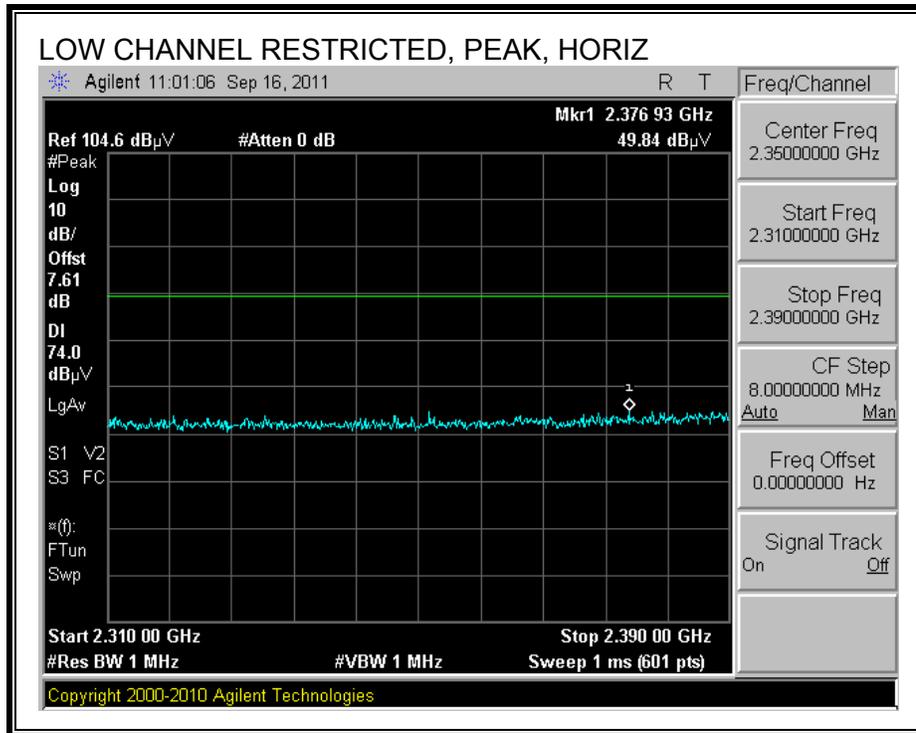


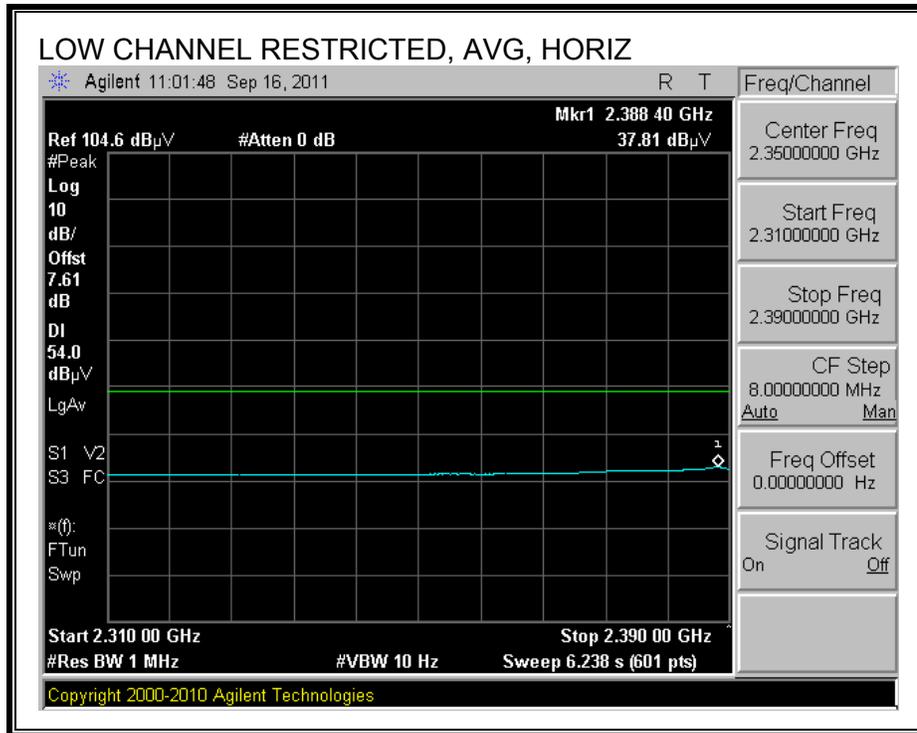
HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		David Garcia											
Date:		09/16/11											
Project #:		11U13993											
Company:		LG											
Test Target:		FCC 15.209											
Mode Oper:		Tx, GFSK											
f	Measurement Frequency			Amp	Preamp Gain			Average Field Strength Limit					
Dist	Distance to Antenna			D Corr	Distance Correct to 3 meters			Peak Field Strength Limit					
Read	Analyzer Reading			Avg	Average Field Strength @ 3 m			Margin vs. Average Limit					
AF	Antenna Factor			Peak	Calculated Peak Field Strength			Margin vs. Peak Limit					
CL	Cable Loss			HPF	High Pass Filter								
f	Dist	Read	AF	CL	Amp	D Corr	Fltr	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Low Channel: 2402 MHz													
4.804	3.0	36.9	33.9	6.8	-34.1	0.0	0.0	43.5	74.0	-30.5	H	P	
4.804	3.0	24.3	33.9	6.8	-34.1	0.0	0.0	30.9	54.0	-23.1	H	A	
4.804	3.0	36.7	33.9	6.8	-34.1	0.0	0.0	43.2	74.0	-30.8	V	P	
4.804	3.0	24.3	33.9	6.8	-34.1	0.0	0.0	30.9	54.0	-23.1	V	A	
Mid Channel: 2441 MHz													
4.882	3.0	36.1	33.9	6.8	-34.0	0.0	0.0	42.8	74.0	-31.2	H	P	
4.882	3.0	24.0	33.9	6.8	-34.0	0.0	0.0	30.8	54.0	-23.2	H	A	
7.323	3.0	35.3	36.6	9.1	-33.1	0.0	0.0	47.9	74.0	-26.1	H	P	
7.323	3.0	22.9	36.6	9.1	-33.1	0.0	0.0	35.5	54.0	-18.5	H	A	
4.882	3.0	36.8	33.9	6.8	-34.0	0.0	0.0	43.5	74.0	-30.5	V	P	
4.882	3.0	24.1	33.9	6.8	-34.0	0.0	0.0	30.8	54.0	-23.2	V	A	
7.323	3.0	34.9	36.6	9.1	-33.1	0.0	0.0	47.4	74.0	-26.6	V	P	
7.323	3.0	22.9	36.6	9.1	-33.1	0.0	0.0	35.5	54.0	-18.5	V	A	
High Channel: 2480 MHz													
4.960	3.0	36.0	34.0	6.9	-34.0	0.0	0.0	42.9	74.0	-31.1	V	P	
4.960	3.0	23.7	34.0	6.9	-34.0	0.0	0.0	30.6	54.0	-23.4	V	A	
7.440	3.0	35.2	36.7	9.1	-33.0	0.0	0.0	48.0	74.0	-26.0	V	P	
7.440	3.0	22.8	36.7	9.1	-33.0	0.0	0.0	35.6	54.0	-18.4	V	A	
4.960	3.0	35.9	34.0	6.9	-34.0	0.0	0.0	42.8	74.0	-31.2	H	P	
4.960	3.0	23.6	34.0	6.9	-34.0	0.0	0.0	30.4	54.0	-23.6	H	A	
7.440	3.0	35.1	36.7	9.1	-33.0	0.0	0.0	47.9	74.0	-26.1	H	P	
7.440	3.0	22.7	36.7	9.1	-33.0	0.0	0.0	35.5	54.0	-18.5	H	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

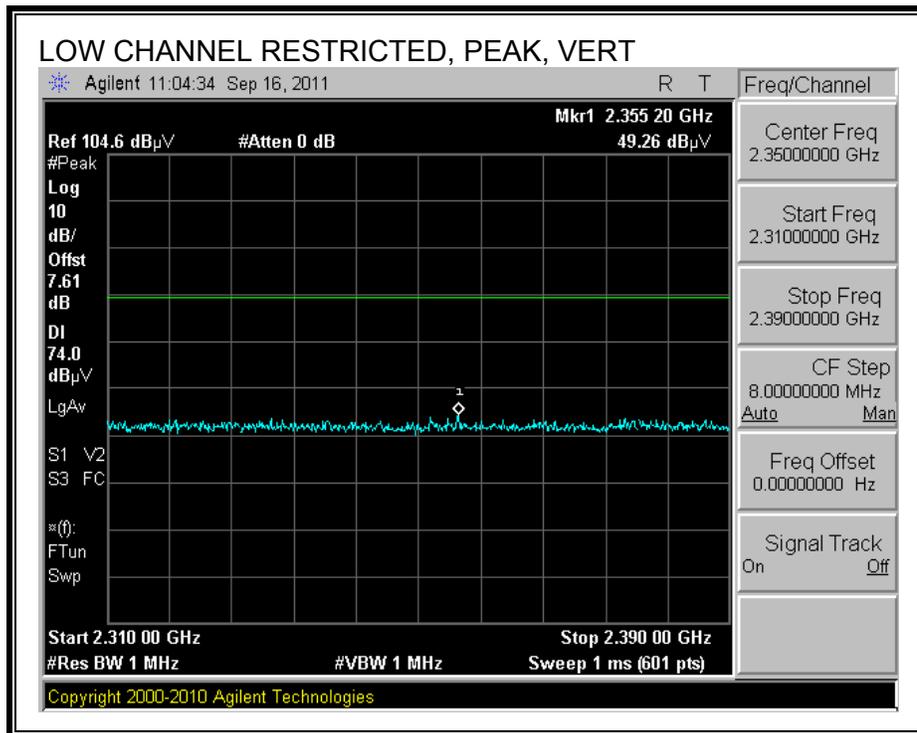
8.2.2. ENHANCED DATA RATE 8PSK MODULATION

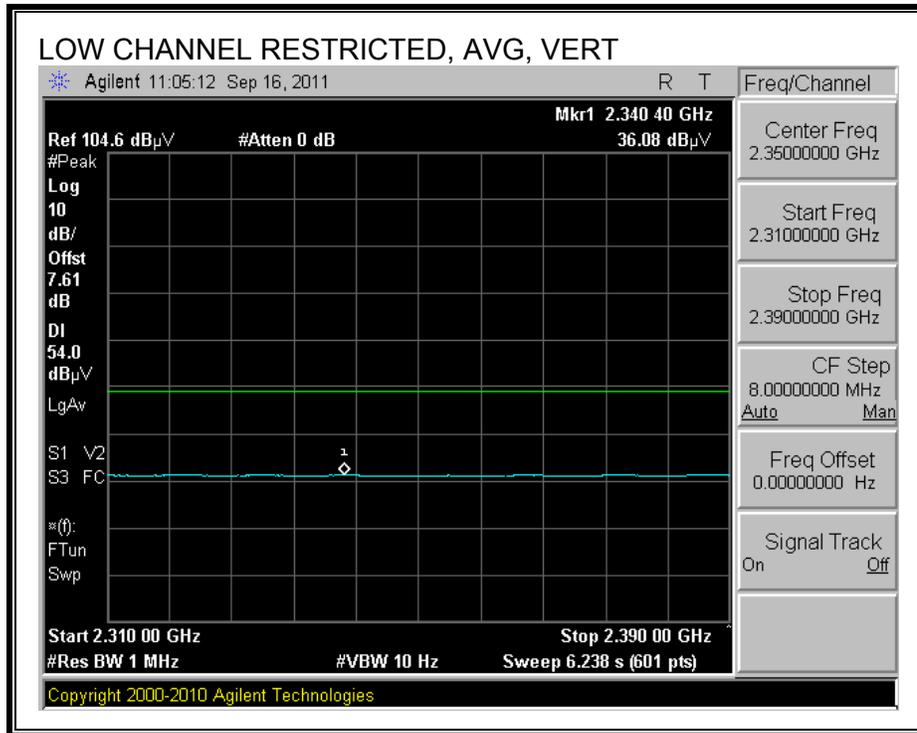
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



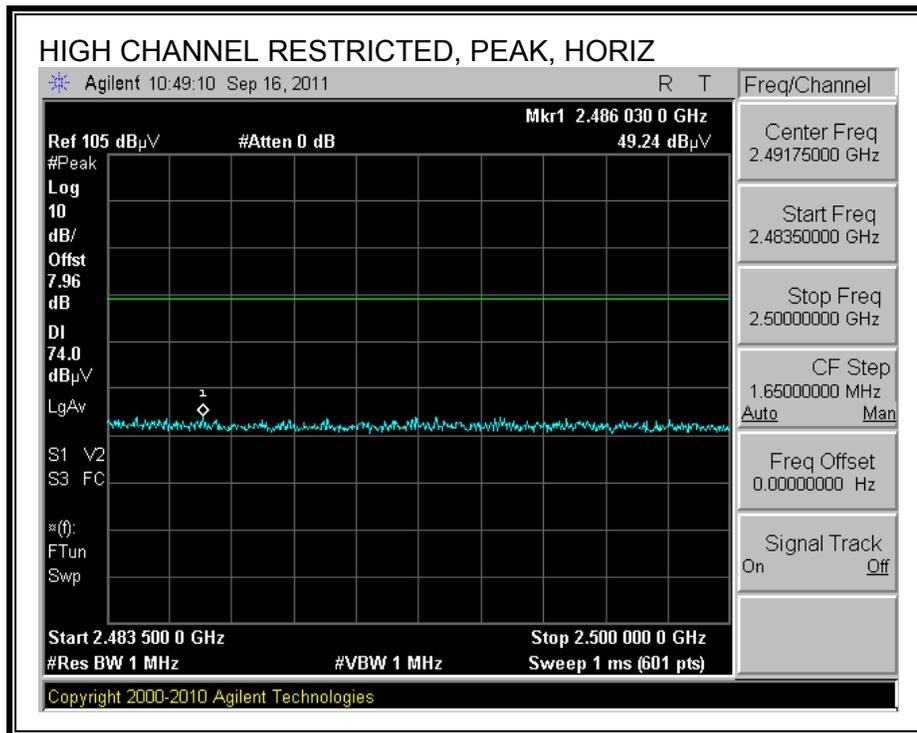


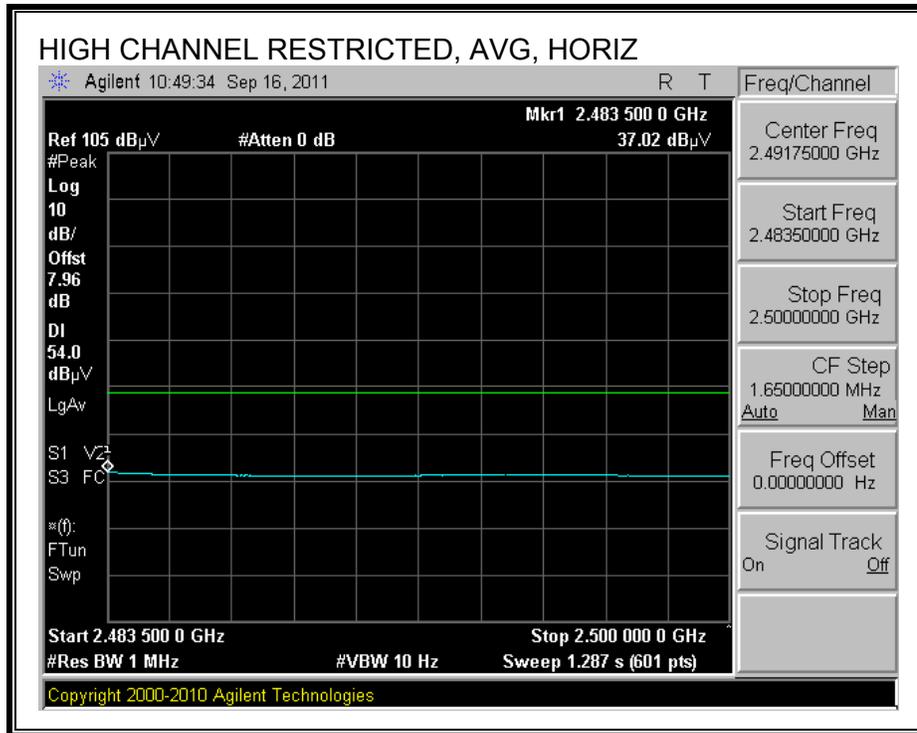
RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)



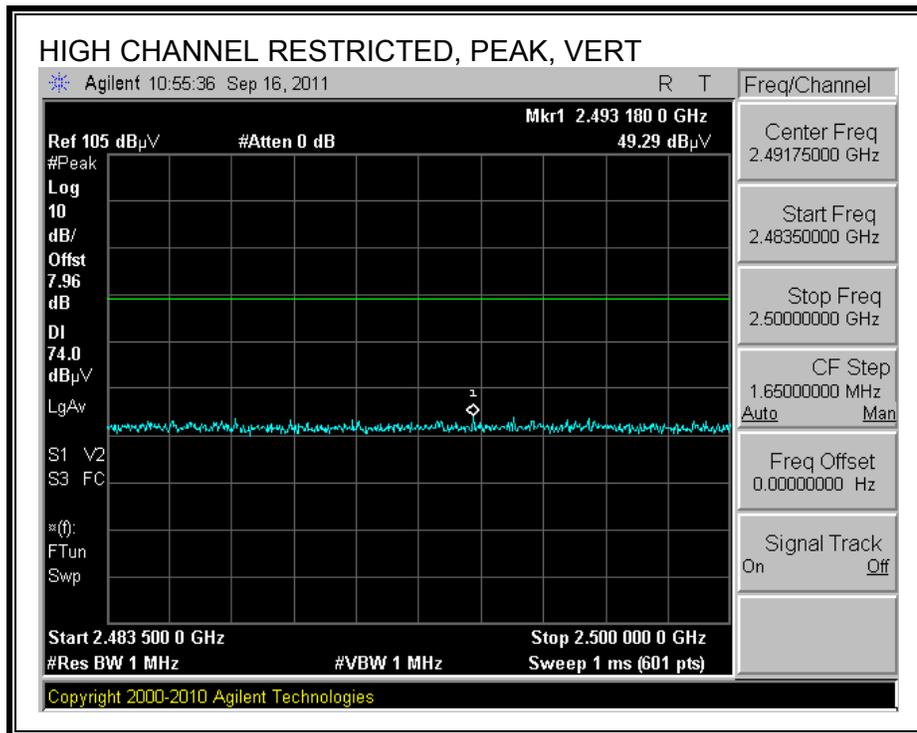


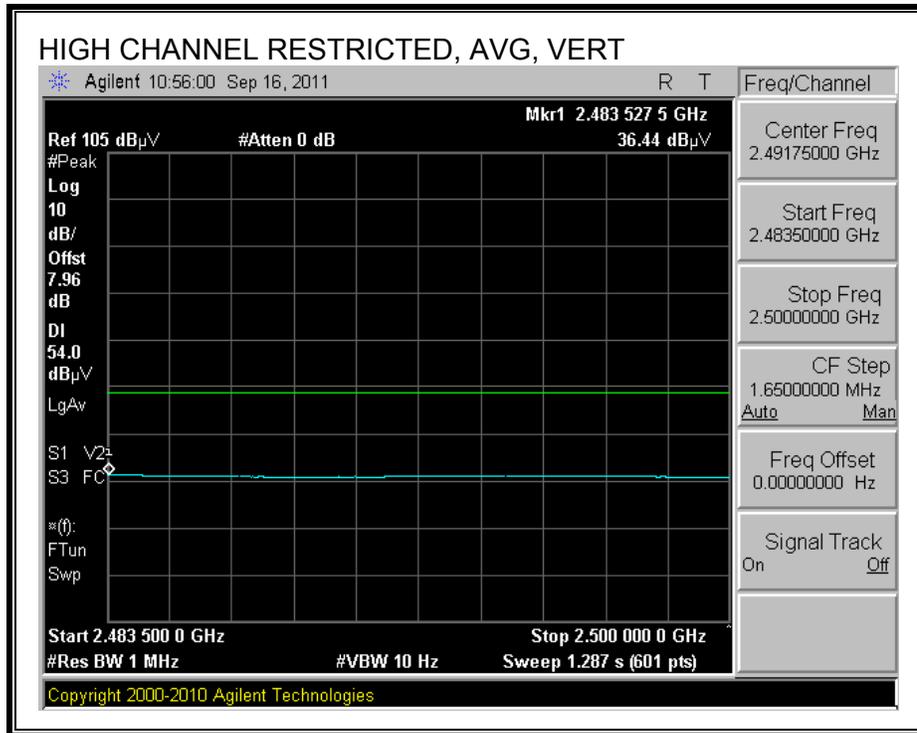
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)



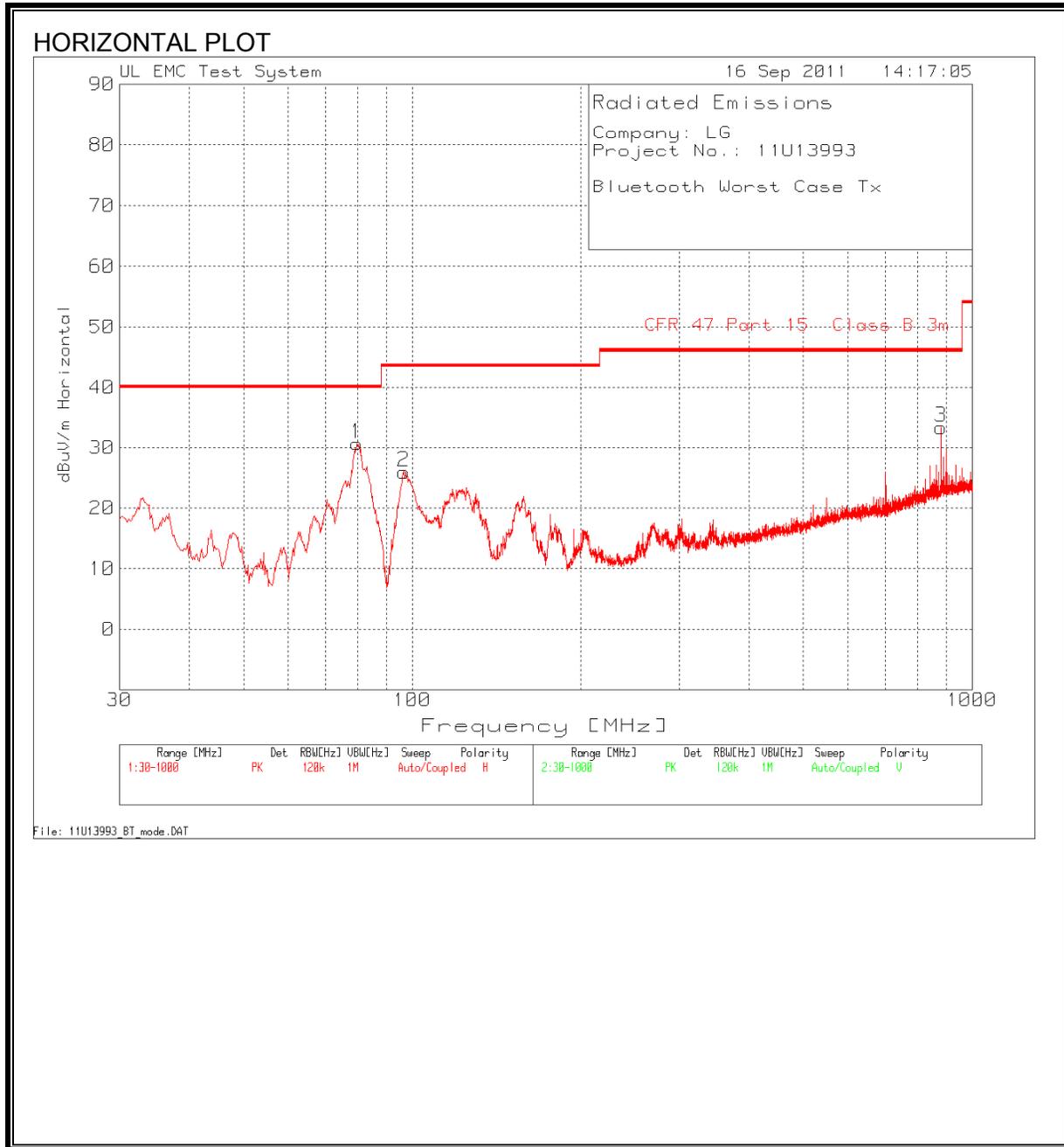


HARMONICS AND SPURIOUS EMISSIONS

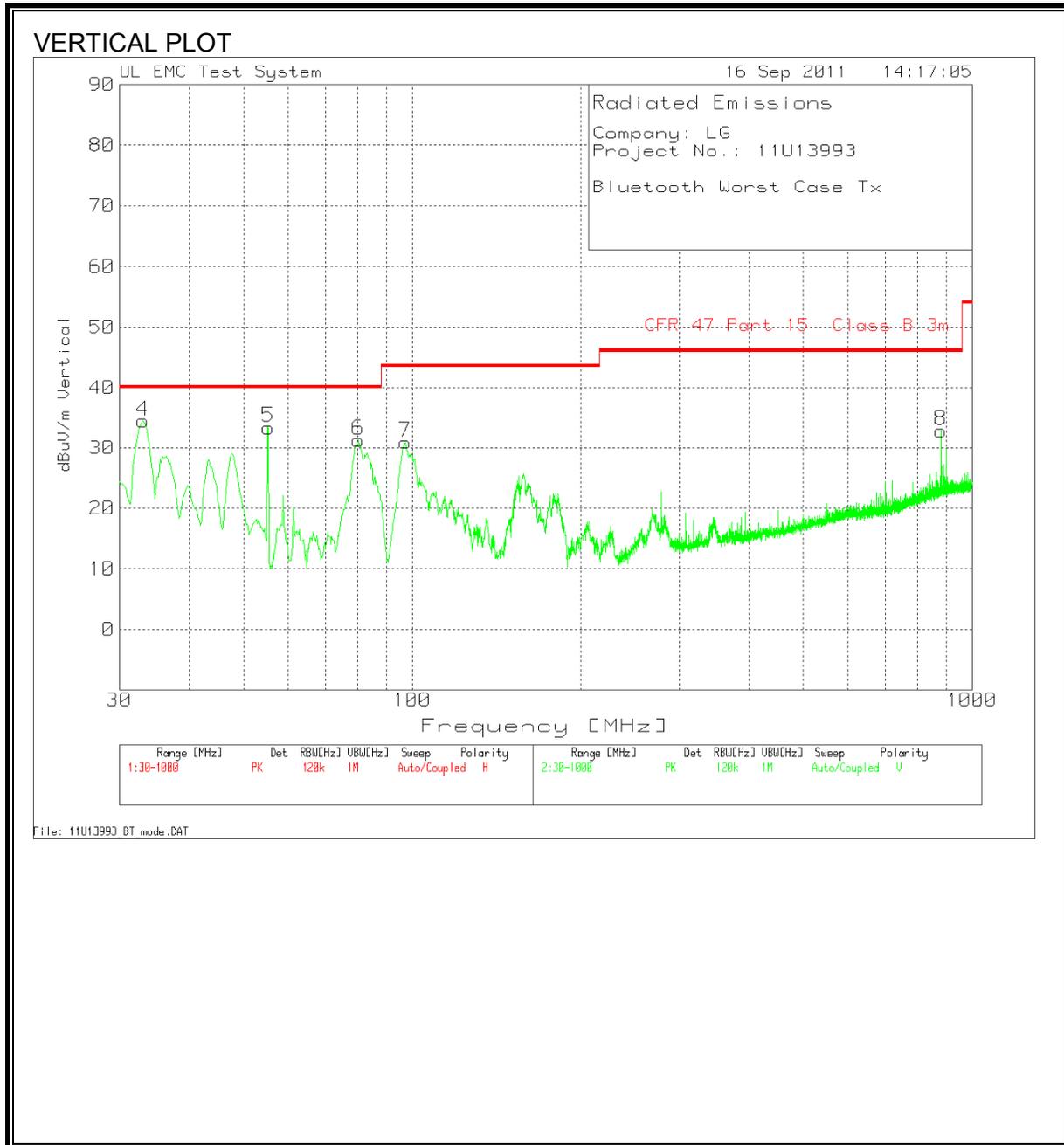
High Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		David Garcia											
Date:		09/16/11											
Project #:		11U13993											
Company:		LG											
Test Target:		FCC 15.209											
Mode Oper:		Tx, 8PSK											
f	Measurement Frequency			Amp	Preamp Gain			Average Field Strength Limit					
Dist	Distance to Antenna			D Corr	Distance Correct to 3 meters			Peak Field Strength Limit					
Read	Analyzer Reading			Avg	Average Field Strength @ 3 m			Margin vs. Average Limit					
AF	Antenna Factor			Peak	Calculated Peak Field Strength			Margin vs. Peak Limit					
CL	Cable Loss			HPF	High Pass Filter								
f	Dist	Read	AF	CL	Amp	D Corr	Fltr	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Low Channel: 2402 MHz													
4.804	3.0	36.7	33.9	6.8	-34.1	0.0	0.0	43.3	74.0	-30.7	H	P	
4.804	3.0	24.2	33.9	6.8	-34.1	0.0	0.0	30.7	54.0	-23.3	H	A	
4.804	3.0	36.4	33.9	6.8	-34.1	0.0	0.0	43.0	74.0	-31.0	V	P	
4.804	3.0	24.2	33.9	6.8	-34.1	0.0	0.0	30.7	54.0	-23.3	V	A	
Mid Channel: 2441 MHz													
4.882	3.0	37.7	33.9	6.8	-34.0	0.0	0.0	44.4	74.0	-29.6	H	P	
4.882	3.0	24.0	33.9	6.8	-34.0	0.0	0.0	30.7	54.0	-23.3	H	A	
7.323	3.0	34.9	36.6	9.1	-33.1	0.0	0.0	47.5	74.0	-26.5	H	P	
7.323	3.0	22.9	36.6	9.1	-33.1	0.0	0.0	35.4	54.0	-18.6	H	A	
4.882	3.0	36.9	33.9	6.8	-34.0	0.0	0.0	43.6	74.0	-30.4	V	P	
4.882	3.0	24.0	33.9	6.8	-34.0	0.0	0.0	30.7	54.0	-23.3	V	A	
7.323	3.0	35.1	36.6	9.1	-33.1	0.0	0.0	47.6	74.0	-26.4	V	P	
7.323	3.0	22.9	36.6	9.1	-33.1	0.0	0.0	35.4	54.0	-18.6	V	A	
High Channel: 2480 MHz													
4.960	3.0	36.0	34.0	6.9	-34.0	0.0	0.0	42.9	74.0	-31.1	H	P	
4.960	3.0	23.7	34.0	6.9	-34.0	0.0	0.0	30.6	54.0	-23.4	H	A	
7.440	3.0	35.0	36.7	9.1	-33.0	0.0	0.0	47.7	74.0	-26.3	H	P	
7.440	3.0	22.8	36.7	9.1	-33.0	0.0	0.0	35.5	54.0	-18.5	H	A	
4.960	3.0	36.5	34.0	6.9	-34.0	0.0	0.0	43.3	74.0	-30.7	V	P	
4.960	3.0	23.8	34.0	6.9	-34.0	0.0	0.0	30.6	54.0	-23.4	V	A	
7.440	3.0	36.2	36.7	9.1	-33.0	0.0	0.0	49.0	74.0	-25.0	V	P	
7.440	3.0	22.8	36.7	9.1	-33.0	0.0	0.0	35.6	54.0	-18.4	V	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

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: LG										
Project No.: 11U13993										
Bluetooth Worst Case Tx										
Test Frequency	Meter Reading	Detector	3m below 1GHz Cable.TXT [dB]	3m T15 PreAmp below 1GHz.TXT [dB]	3m Bilog T185 below 1GHz.TXT [dB]	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
79.6243	49.83	PK	1	-28.1	8	30.73	40	-9.27	251	Horz
96.4888	44.45	PK	1	-28.1	8.6	25.95	43.5	-17.55	176	Horz
880.01	36.23	PK	3.1	-27.7	21.8	33.43	46	-12.57	176	Horz
33.1015	43.73	PK	0.6	-28.3	18.5	34.53	40	-5.47	99	Vert
55.3937	52.29	PK	0.8	-28.2	8.6	33.49	40	-6.51	251	Vert
80.2058	50.6	PK	1	-28.1	7.9	31.4	40	-8.6	176	Vert
97.0703	49.27	PK	1	-28.1	8.8	30.97	43.5	-12.53	99	Vert
880.01	35.69	PK	3.1	-27.7	21.8	32.89	46	-13.11	99	Vert

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.

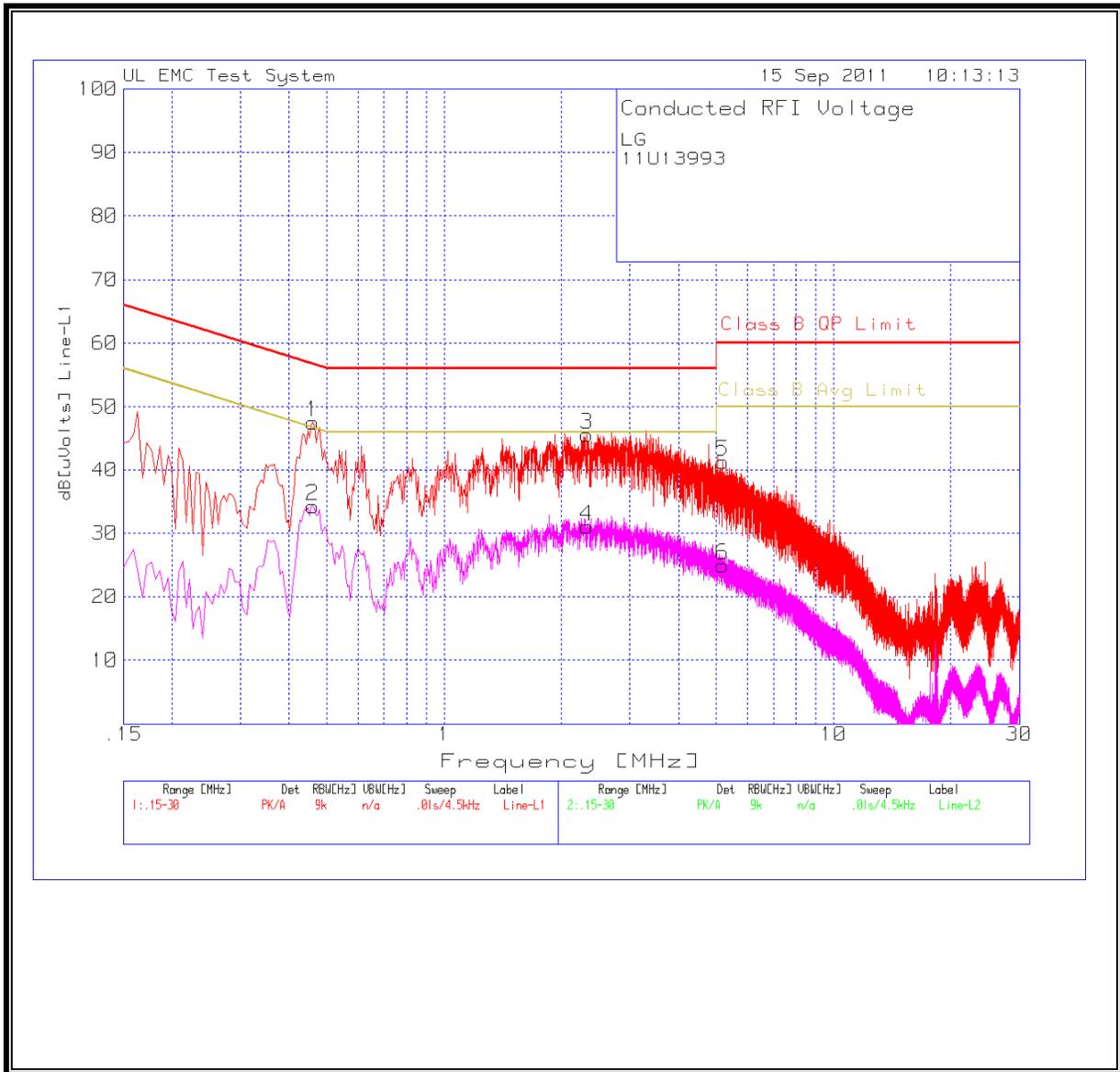
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

Company: LG Electronics Inc.						Test Engineer: Vien Tran			
Project: 11U13993						Date: 09/15/11			
Line-L1 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	LISN [dB]	Conducted Emission Cable [dB]	dB[uVolts]	Class B QP Limit	Margin	Class B Avg Limit	Margin
0.4605	47.60	PK	0	0	47.60	56.70	-9.10	46.70	0.90
0.4605	34.30	Av	0	0	34.30	56.70	-22.40	46.70	-12.40
2.328	45.68	PK	0	0	45.68	56.00	-10.32	46.00	-0.32
2.328	30.99	Av	0	0	30.99	56.00	-25.01	46.00	-15.01
5.199	41.38	PK	0	0	41.38	60.00	-18.62	50.00	-8.62
5.199	24.98	Av	0	0	24.98	60.00	-35.02	50.00	-25.02
Line-L2 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	LISN [dB]	Conducted Emission Cable [dB]	dB[uVolts]	Class B QP Limit	Margin	Class B Avg Limit	Margin
0.4515	44.45	PK	0	0	44.45	56.80	-12.35	46.80	-2.35
0.4515	29.28	Av	0	0	29.28	56.80	-27.52	46.80	-17.52
1.9635	45.39	PK	0	0	45.39	56.00	-10.61	46.00	-0.61
1.9635	29.11	Av	0	0	29.11	56.00	-26.89	46.00	-16.89
5.3835	38.66	PK	0	0	38.66	60.00	-21.34	50.00	-11.34
5.3835	22.56	Av	0	0	22.56	60.00	-37.44	50.00	-27.44
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									
Text File: LC3.TXT									

LINE 1 RESULTS



LINE 2 RESULTS

