



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

CERTIFICATION TEST REPORT

FOR

**CELLULAR/PCS GSM/GPRS/EDGE AND AWS WCDMA/HSPA PHONE WITH
BLUETOOTH AND WLAN**

MODEL NUMBER: LG-P930, P930, LGP930

**FCC ID: BEJP930
IC: 2703C-P930**

REPORT NUMBER: 11U13917-2, Revision A

ISSUE DATE: AUGUST 24, 2011

Prepared for
**LG ELECTRONICS INC.
1000 SYLVAN AVENUE
ENGLEWOOD CLIFFS, NEW JERSEY 07632**

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



NVLAP LAB CODE 200065-0

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS
1000 SYLVAN AVENUE
ENGLEWOOD CLIFFS, NEW JERSEY 07632

EUT DESCRIPTION: CELLULAR/PCS GSM/GPRS/EDGE AND AWS WCDMA/HSPA
PHONE WITH BT&WLAN

MODEL: LG-P930

SERIAL NUMBER: 106KPCA038187 for conducted sample &
106KPAE038176 for radiated sample

DATE TESTED: JULY 13 - August 23, 2011

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

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:



WILLIAM ZHUANG
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, 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 smart phone with the feature of 802.11b/g/n, Bluetooth, CDMA, GSM, WCDMA, and LTE.

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	10.92	12.36
2402 - 2480	Enhanced 8PSK	11.74	14.93

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA (Planar Inverted F Antenna) with a maximum peak gain of -2.20 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT software installed during testing was V07D_June 23, 2011

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.

For the fundamental investigation, since the EUT is a portable device that has three orientations; X, Y and Z orientations have been investigated, also with AC/DC adapter, and earphone, and the worst case was found to be at X orientation with AC/USB adapter and earphone.

Worst-case data rates used based on an input from the client were as follows:

GFSK mode: 1 Mbps

8PSK mode: 3 Mbps

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	VA11020019236	N/A
Ear Phone	LG Electronics	N/A	N/A	N/A

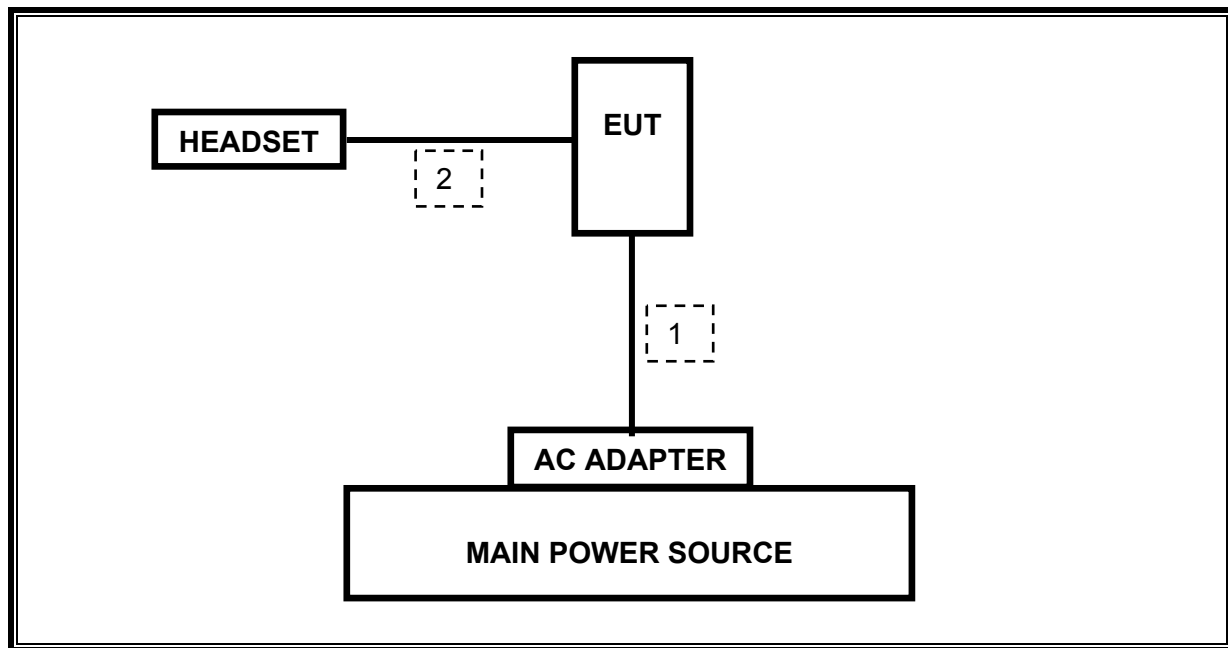
I/O CABLES

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.

RADIATED SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/11
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	MVH-1826/B	C00980	07/29/11
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	07/28/11
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.

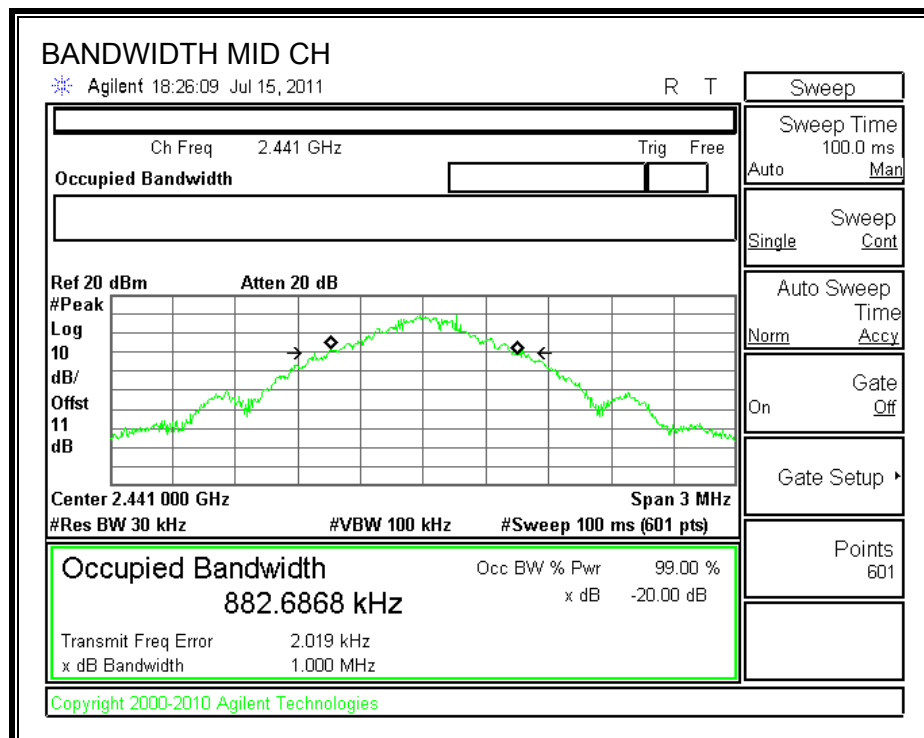
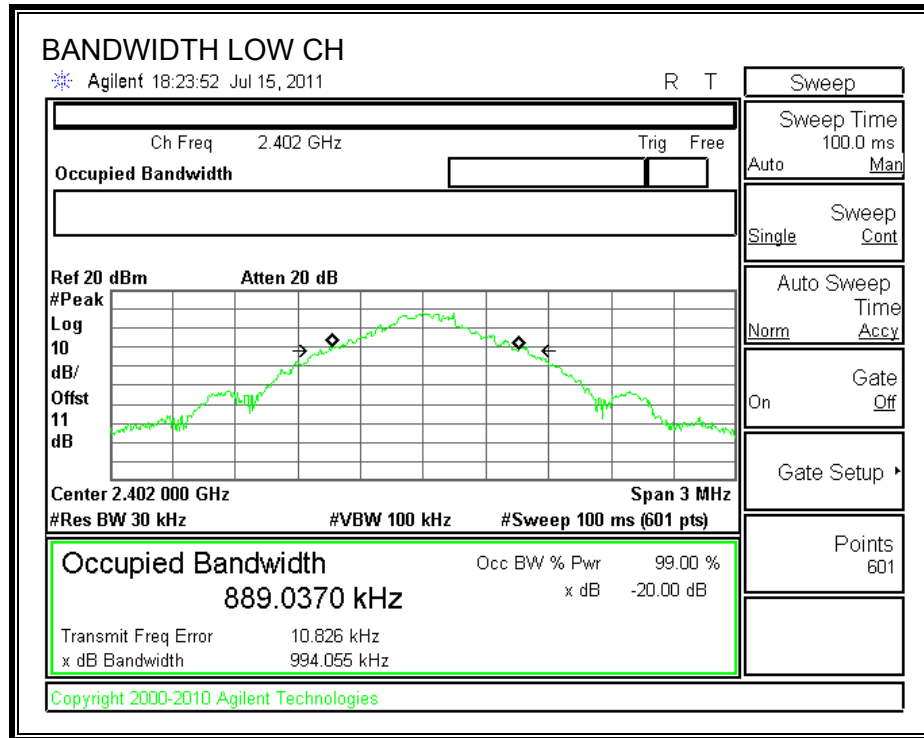
TEST PROCEDURE

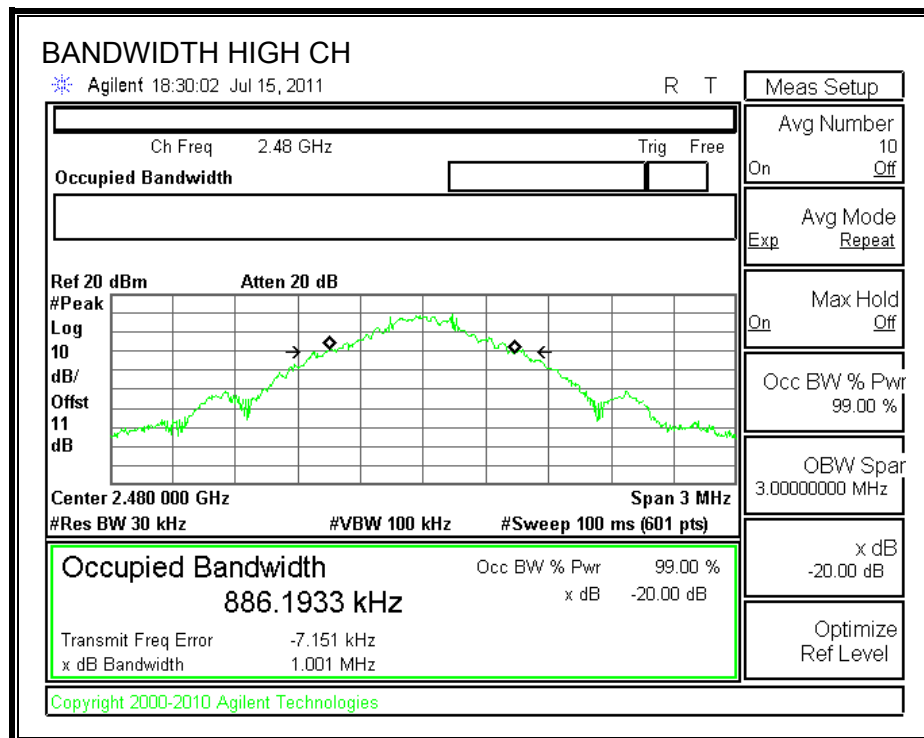
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	2402	994.055
Middle	2441	1000.000
High	2480	1001.000

20 dB BANDWIDTH





7.1.2. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

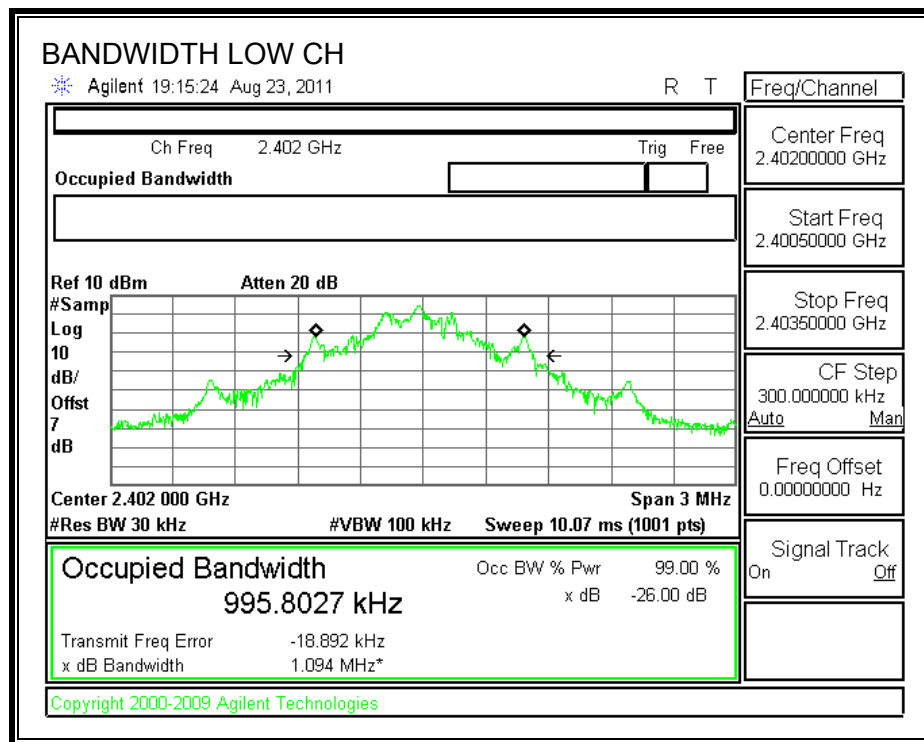
TEST PROCEDURE

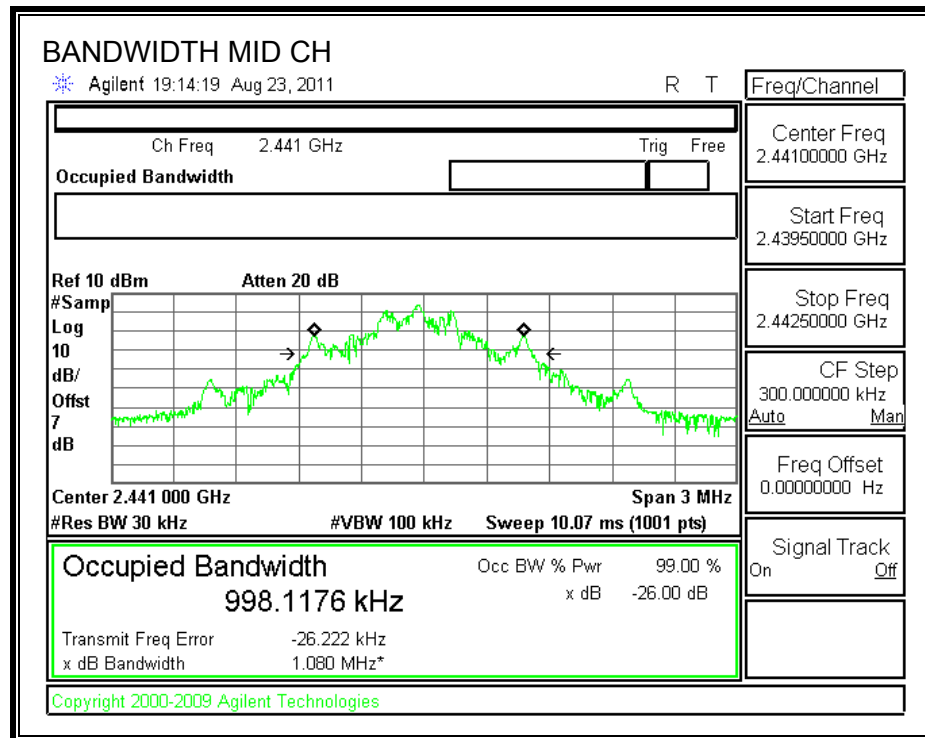
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

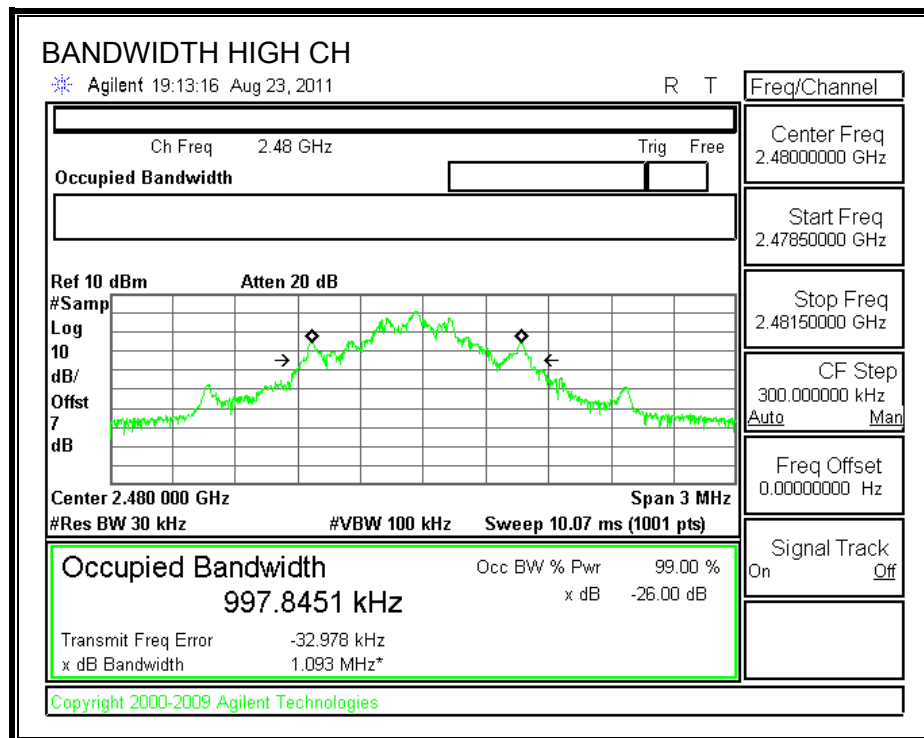
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (kHz)
Low	2402	995.8027
Middle	2441	998.1176
High	2480	997.8451

99% BANDWIDTH







7.1.3. 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.

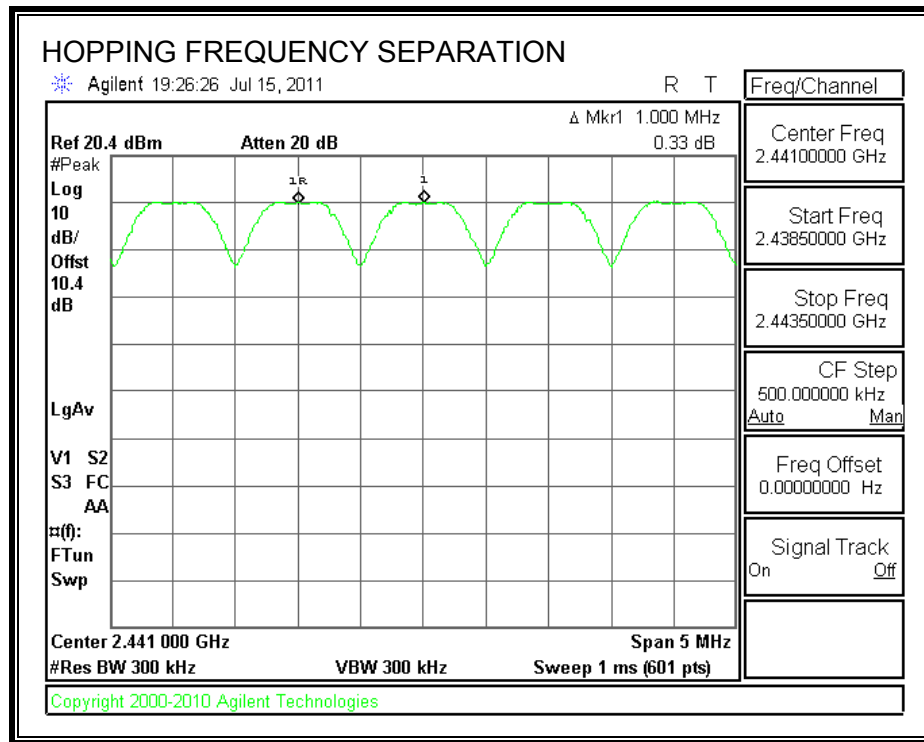
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



7.1.4. 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.

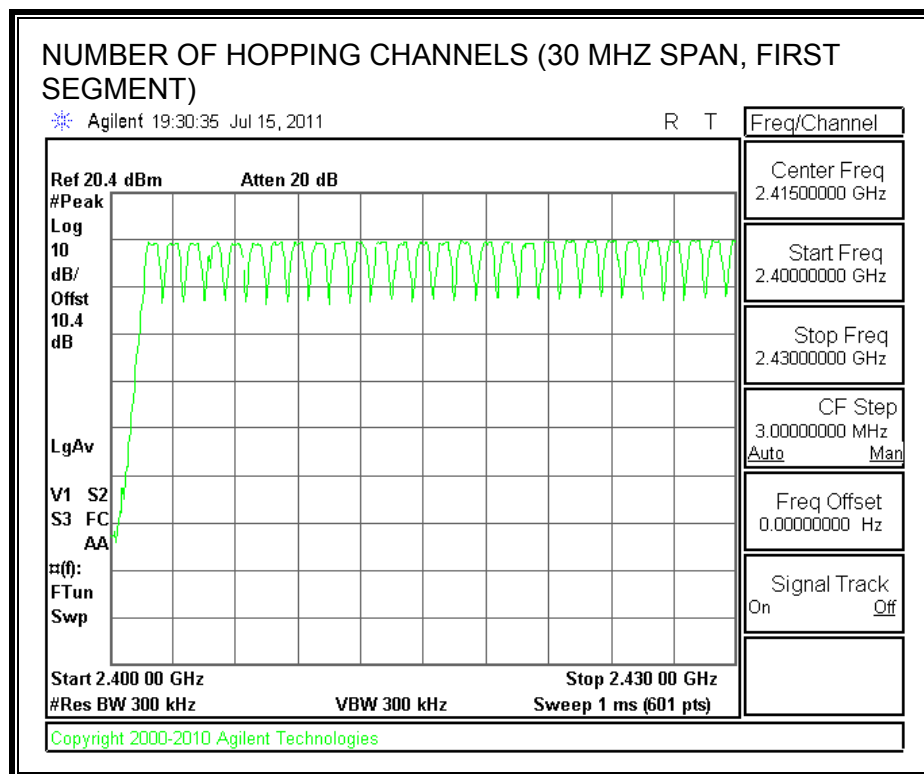
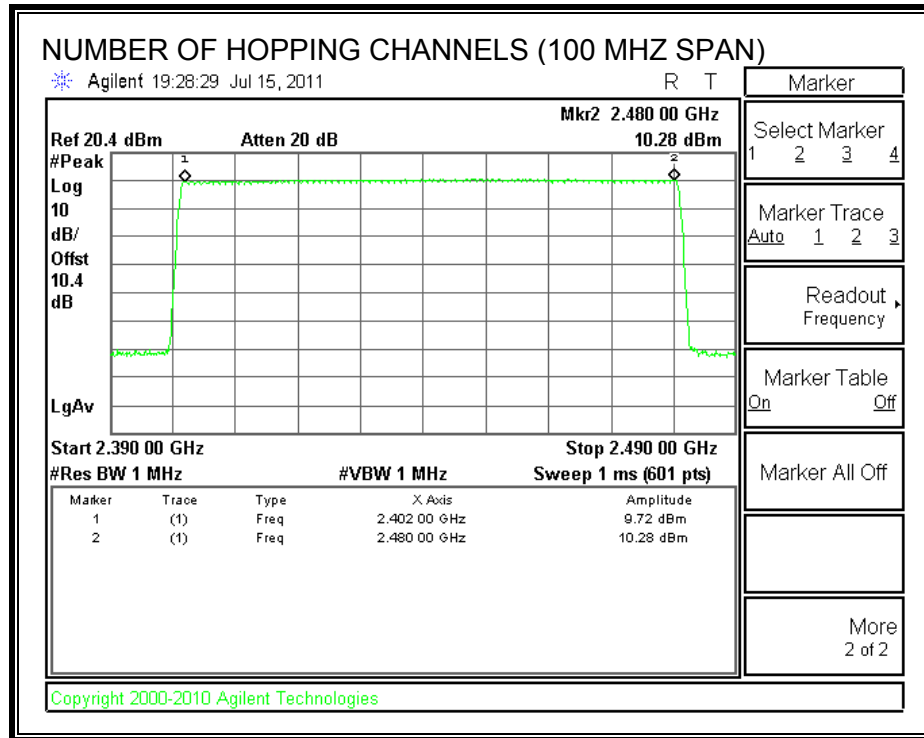
TEST PROCEDURE

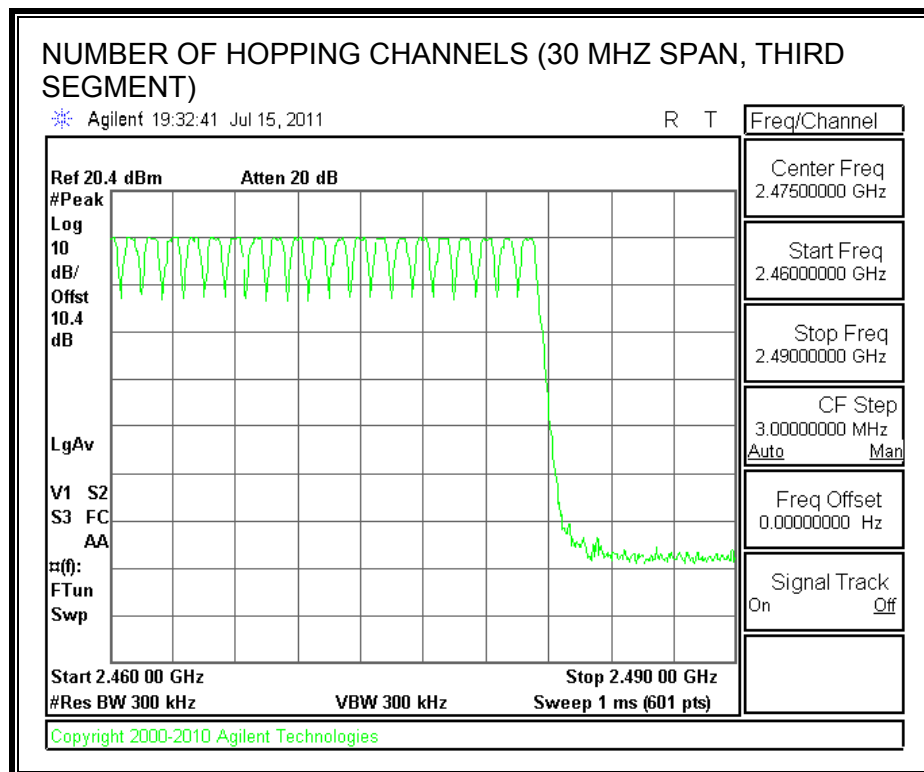
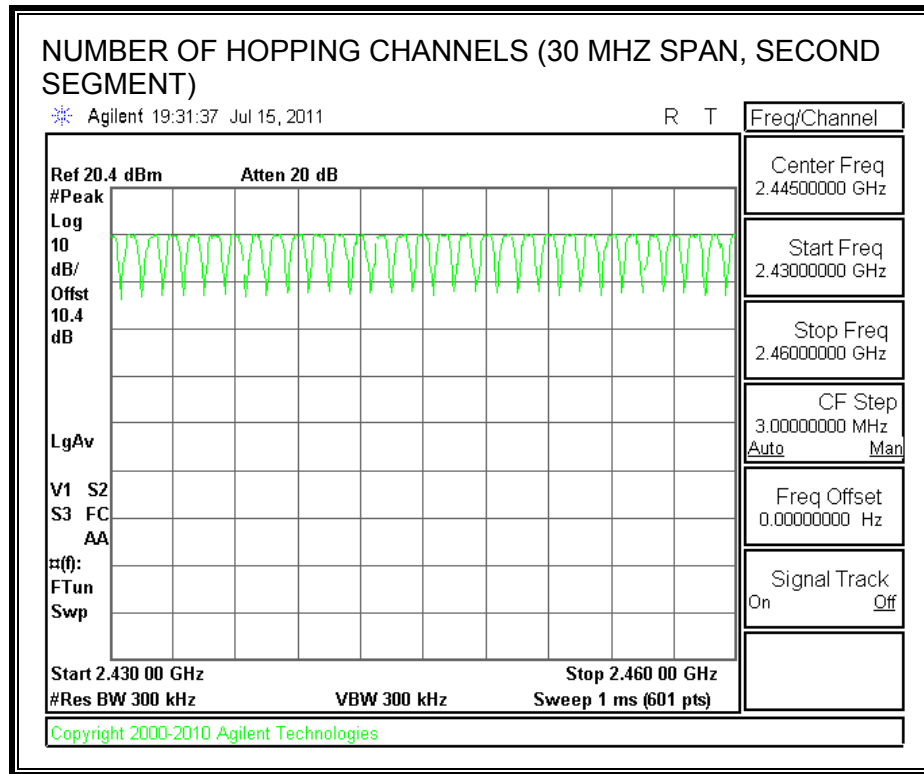
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

79 Channels observed.

NUMBER OF HOPPING CHANNELS





7.1.5. 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 $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

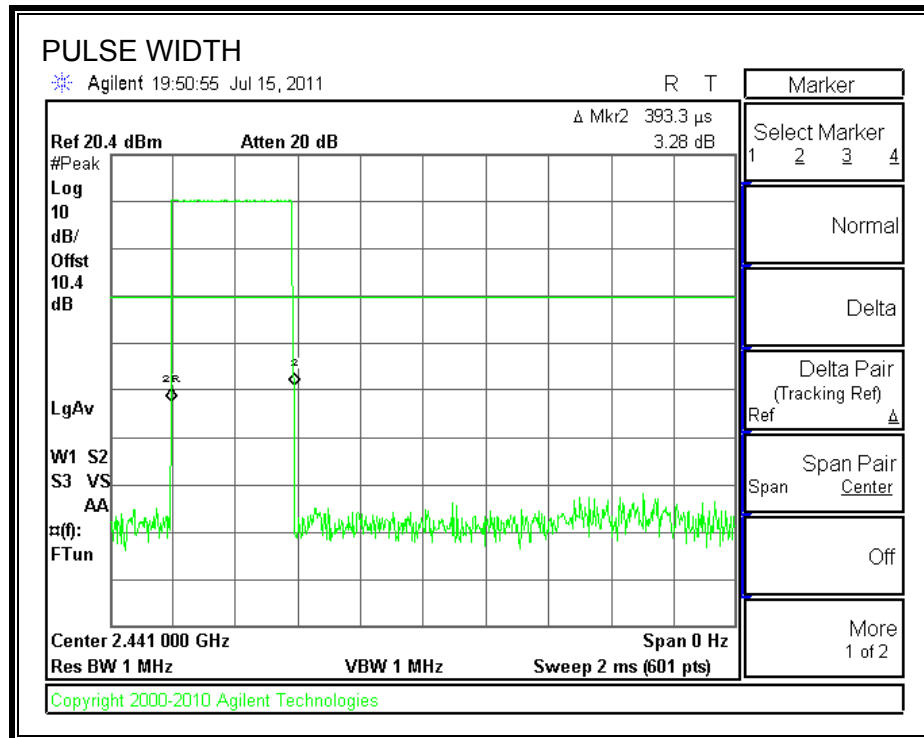
RESULTS

GFSK Mode

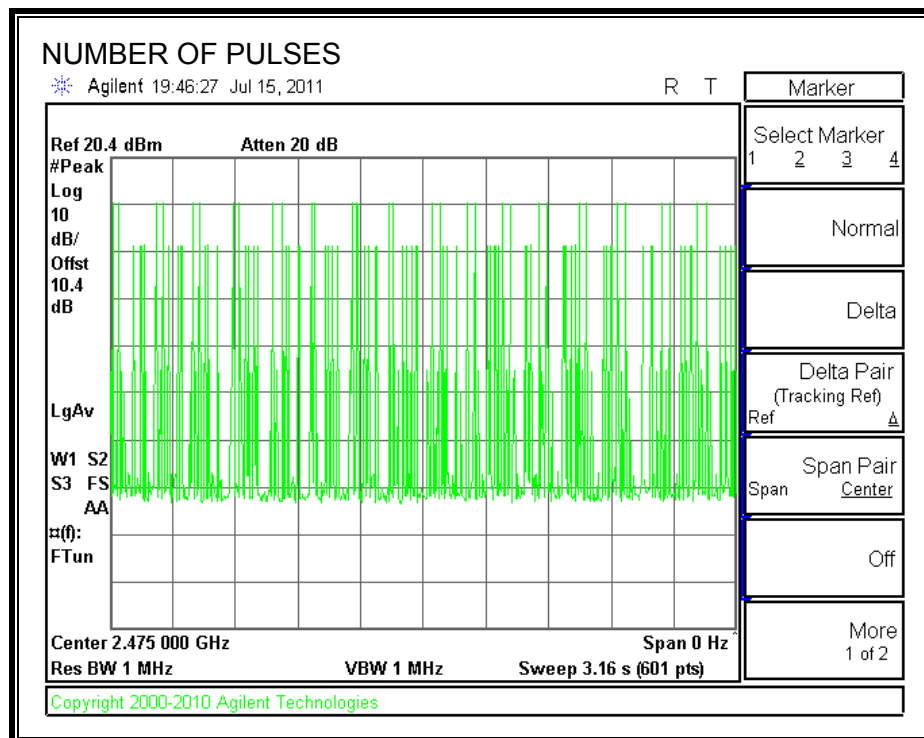
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.3933	32	0.1259	0.4	-0.2741
DH3	1.6420	16	0.2627	0.4	-0.1373
DH5	2.9000	11	0.3190	0.4	-0.0810

DH1

PULSE WIDTH

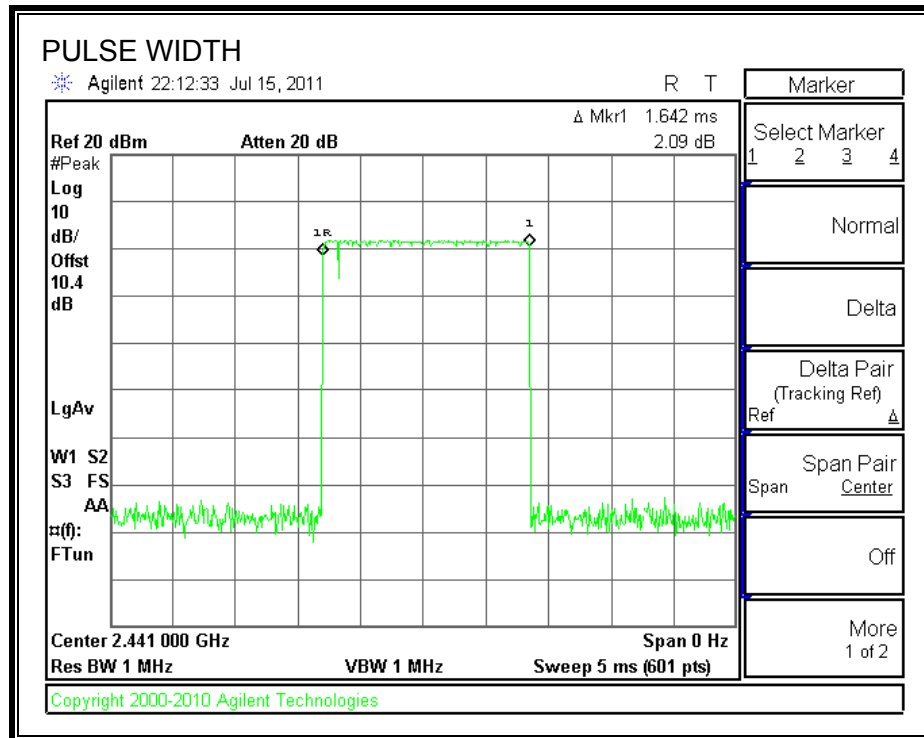


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

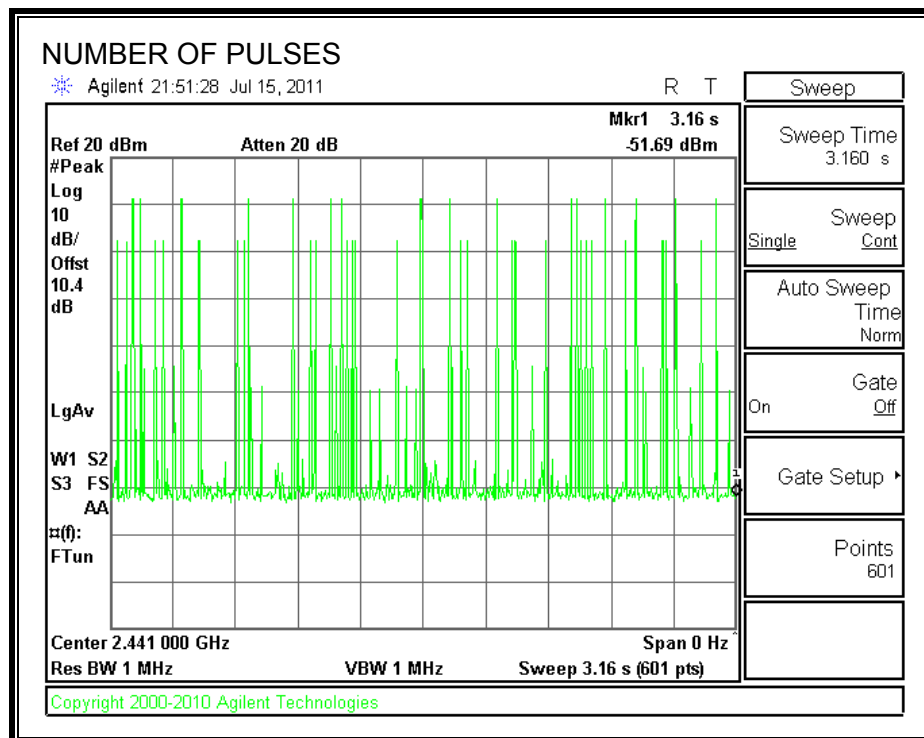


DH3

PULSE WIDTH

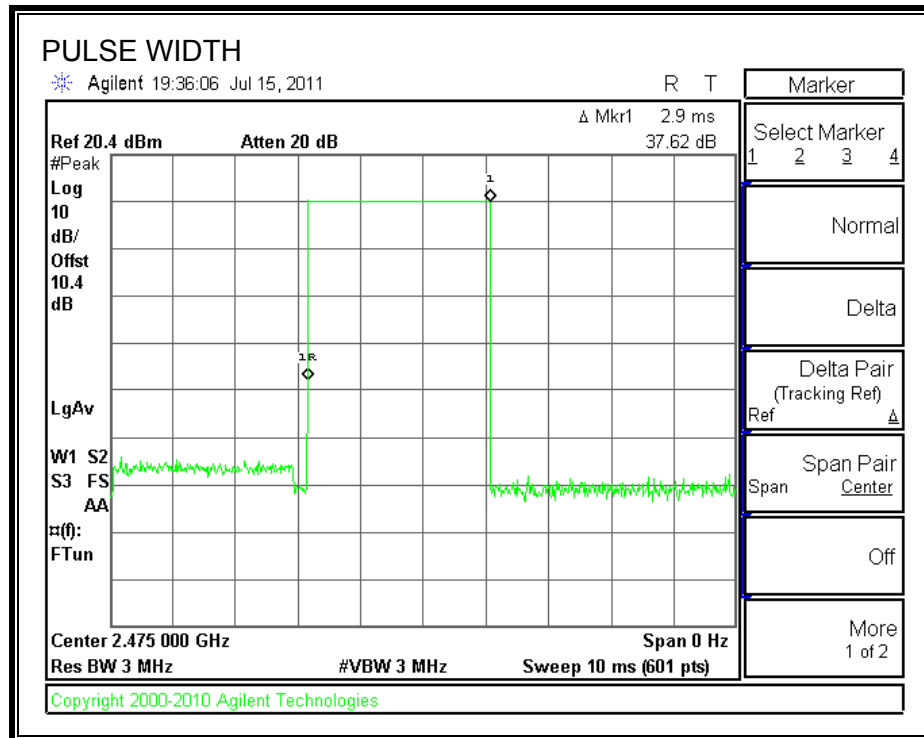


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

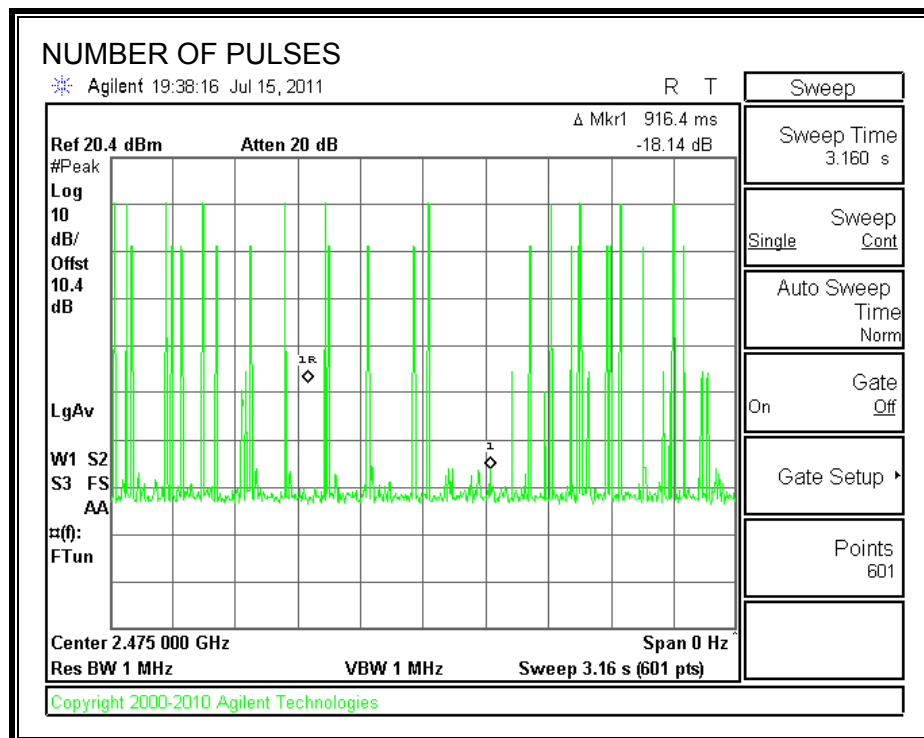


DH5

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.1.6. 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.

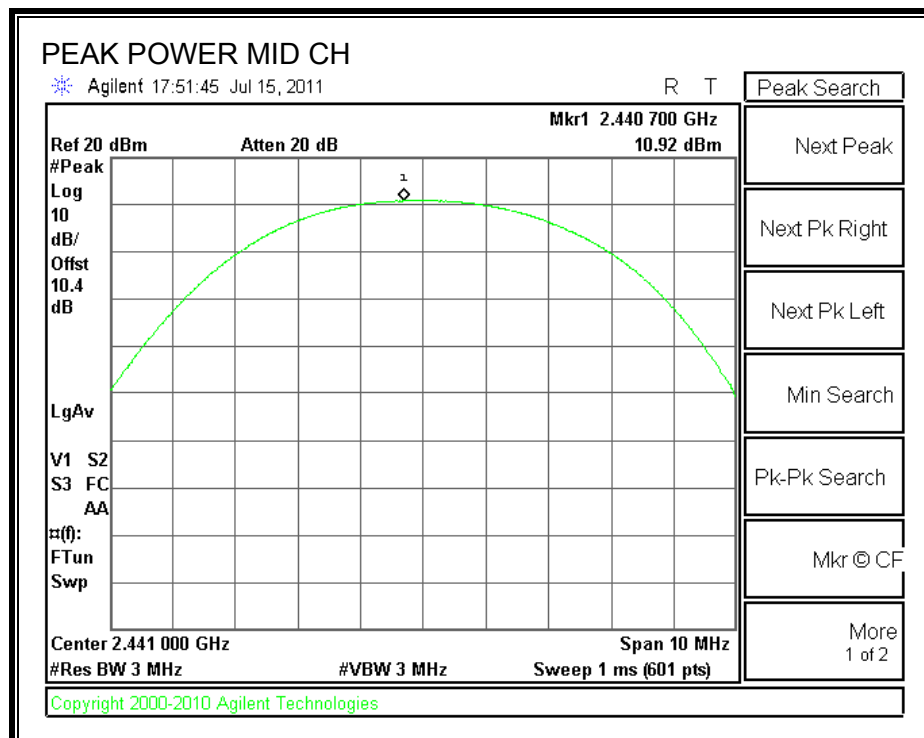
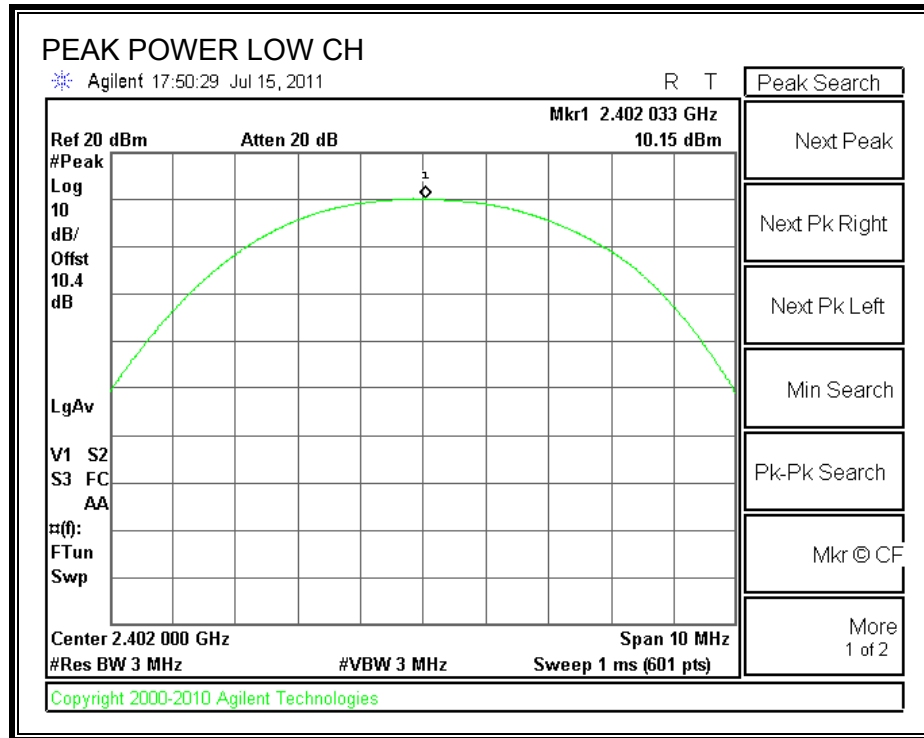
TEST PROCEDURE

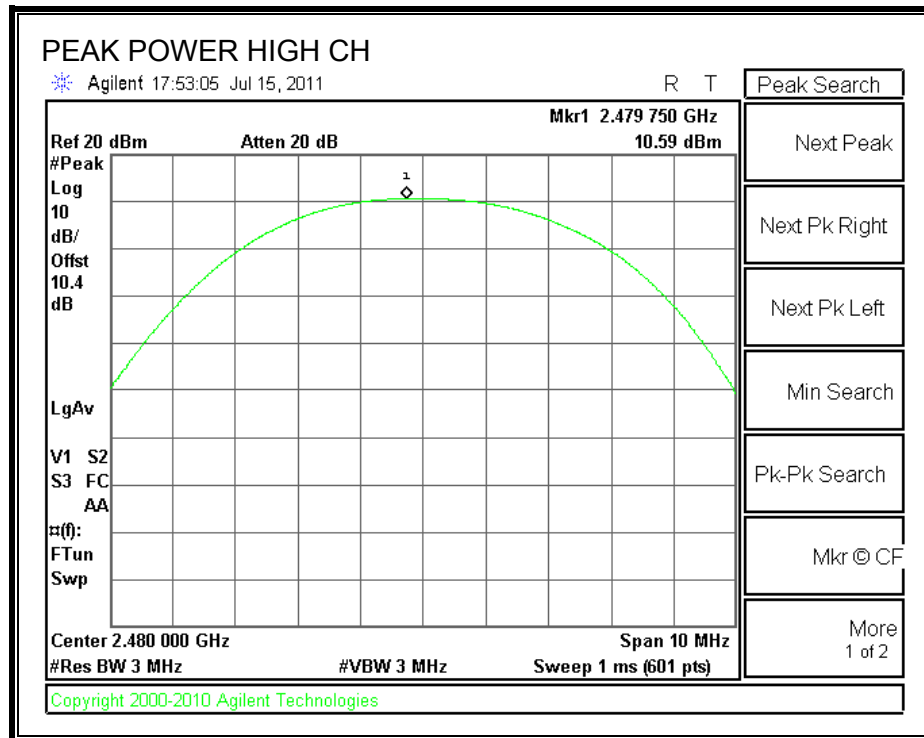
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.15	30	-19.85
Middle	2441	10.92	30	-19.08
High	2480	10.59	30	-19.41

OUTPUT POWER





7.1.7. 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 10.4 dB (including 9.40 dB pad and 1.0 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	9.74
Middle	2441	10.13
High	2480	10.14

7.1.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

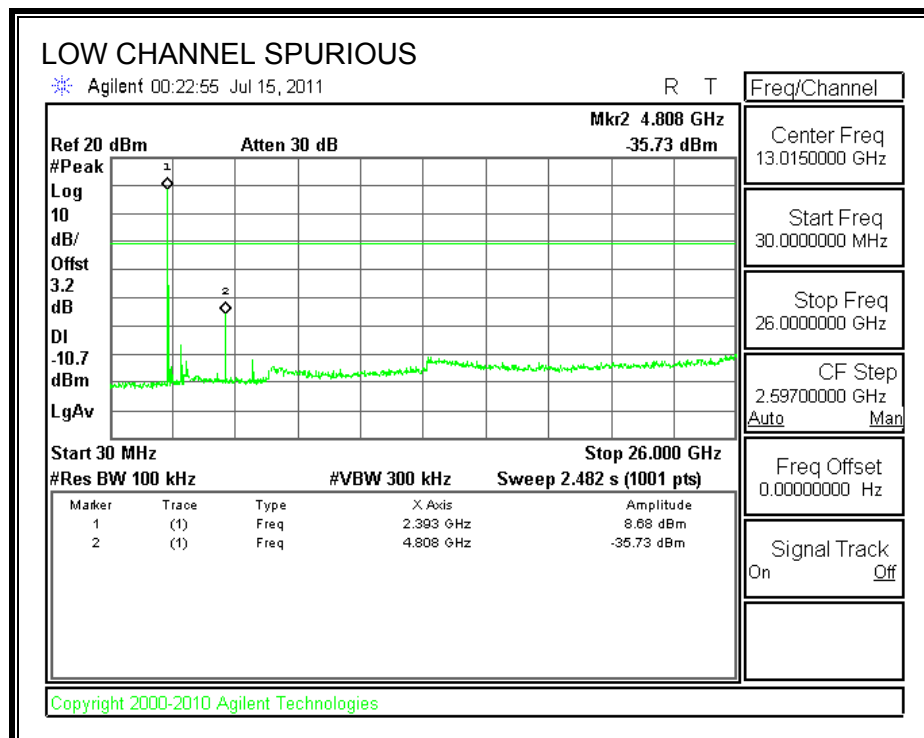
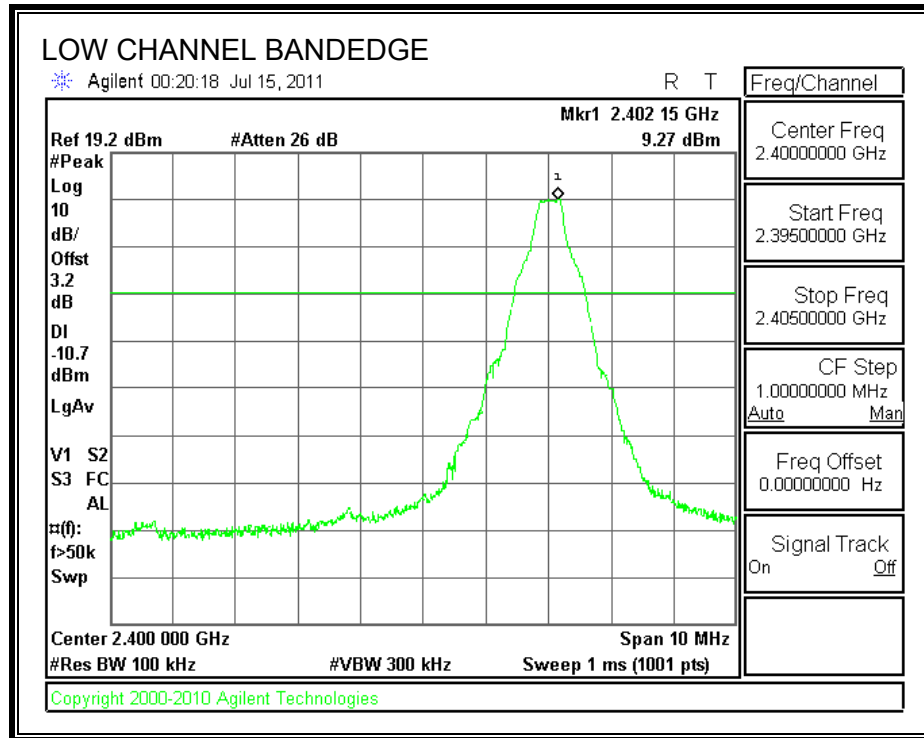
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

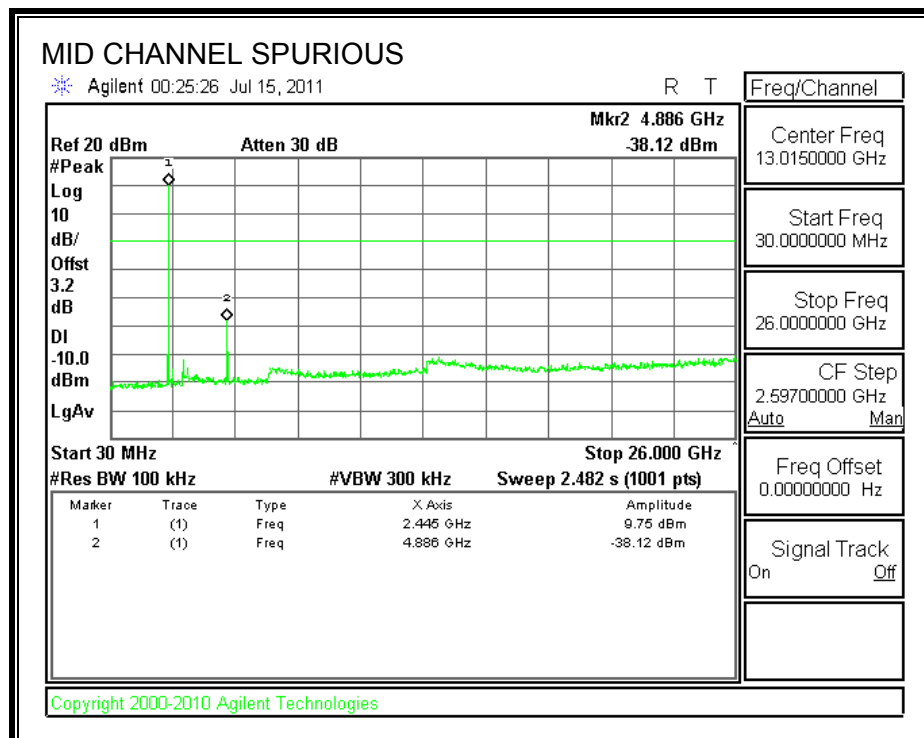
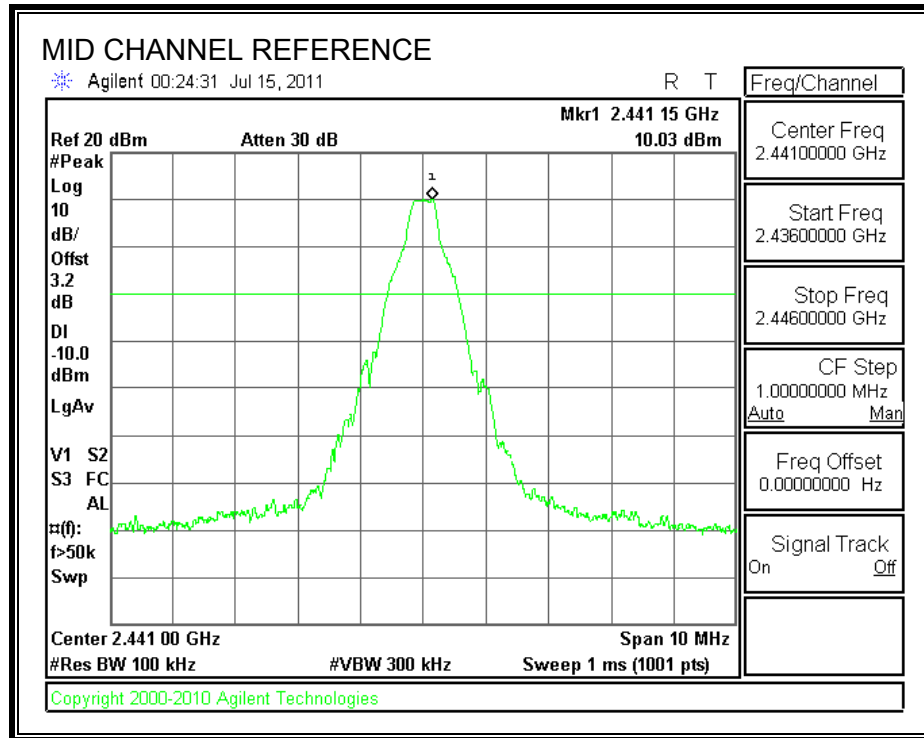
The band edges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

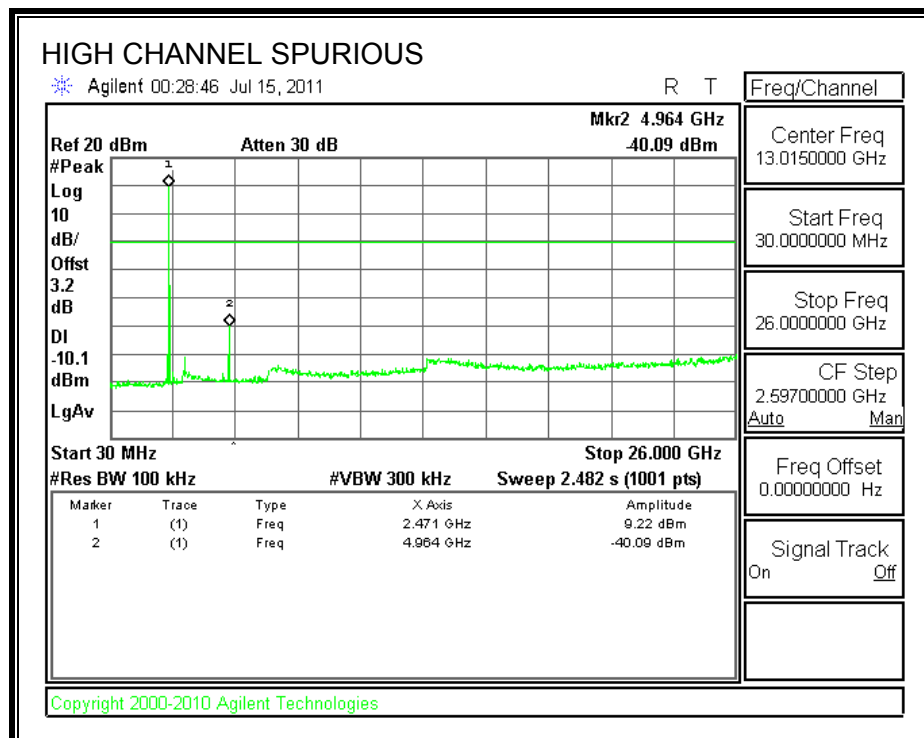
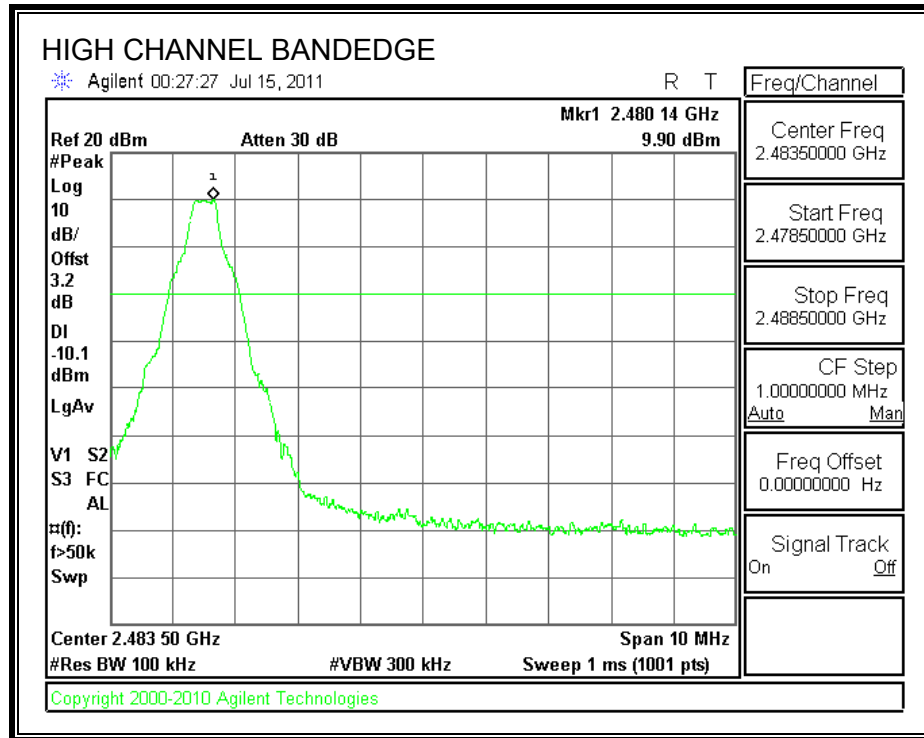
SPURIOUS EMISSIONS, LOW CHANNEL



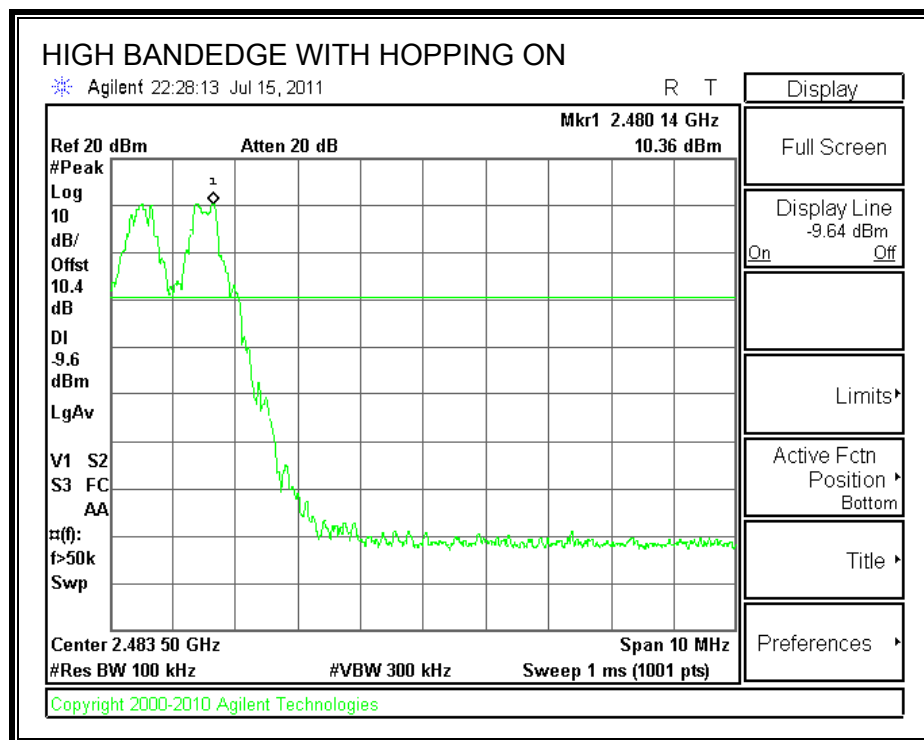
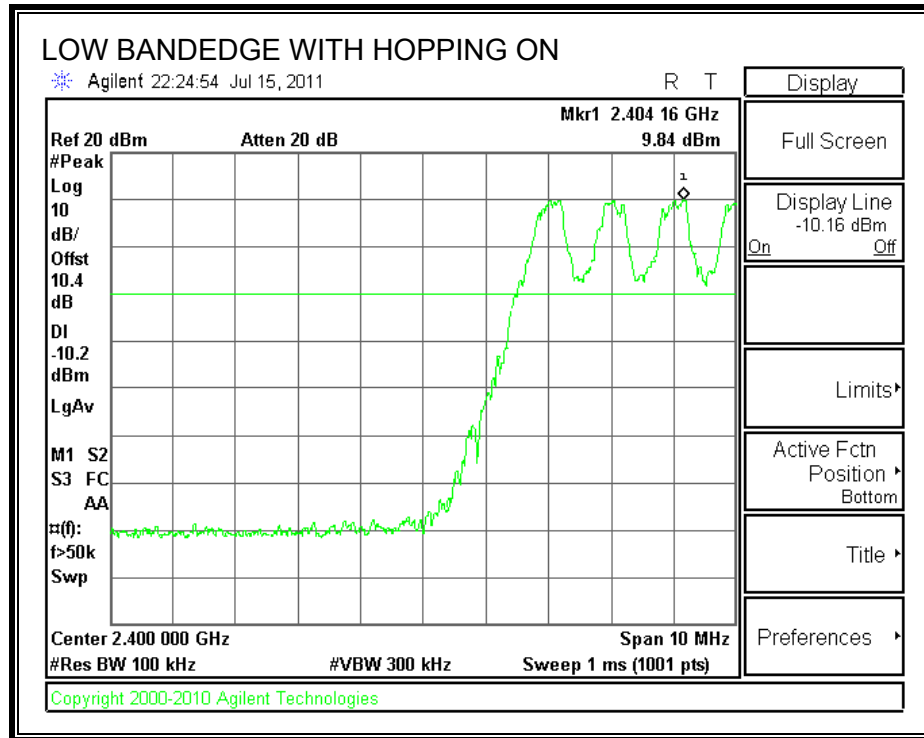
SPURIOUS EMISSIONS, MID CHANNEL



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.

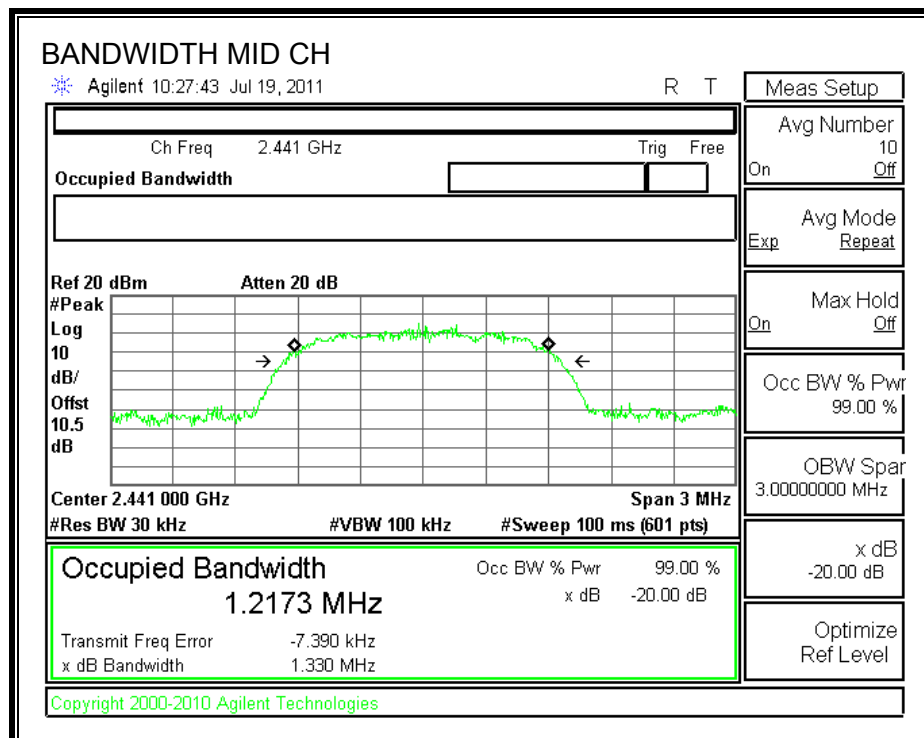
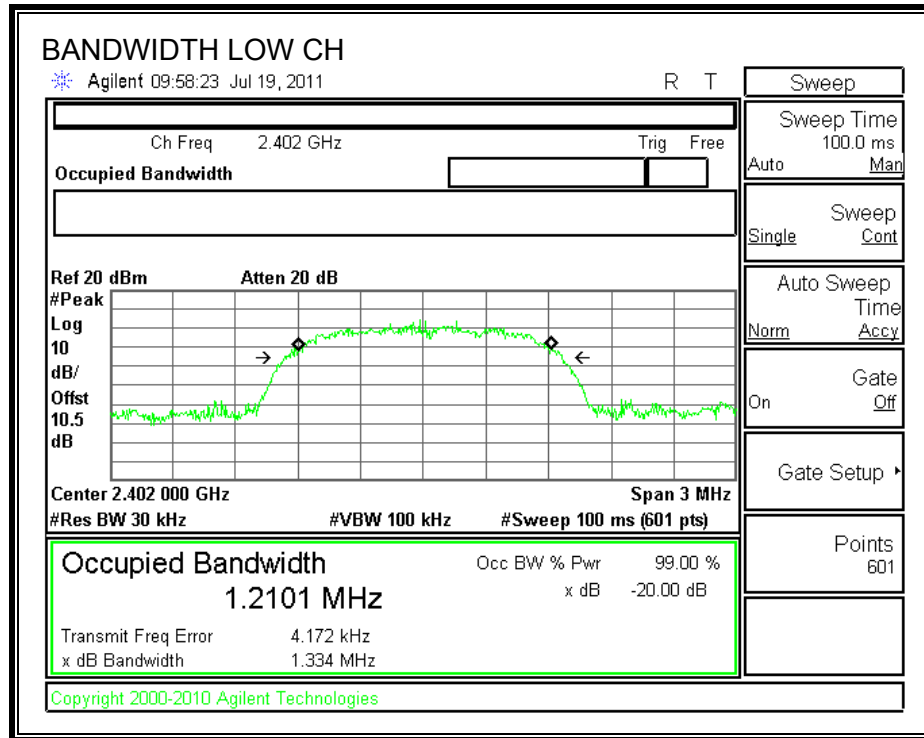
TEST PROCEDURE

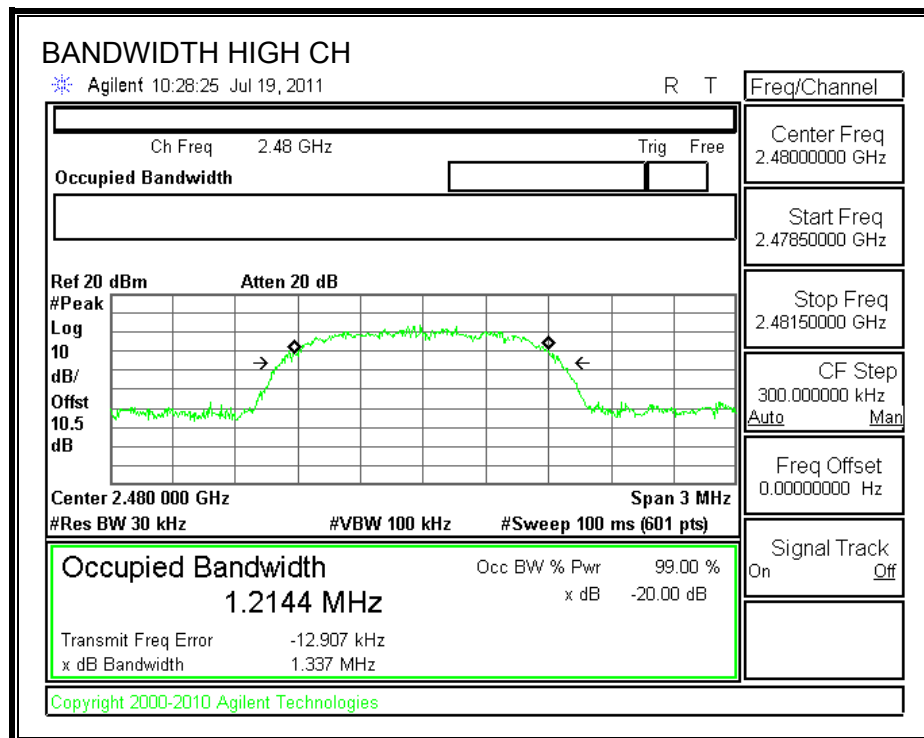
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	2402	1334.0
Middle	2441	1330.0
High	2480	1337.0

20 dB BANDWIDTH





7.2.2. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

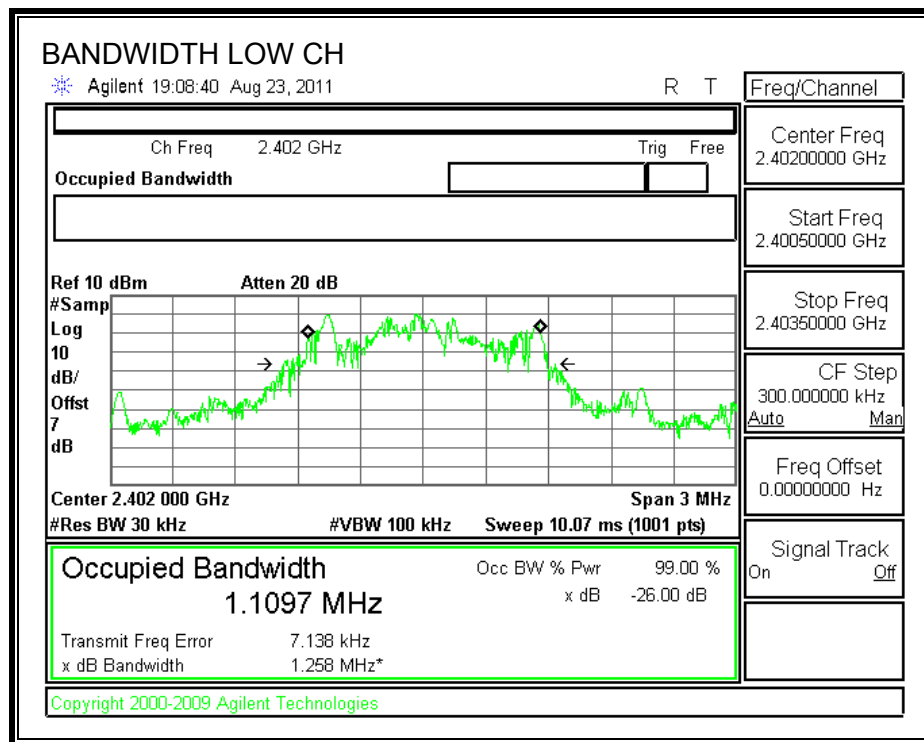
TEST PROCEDURE

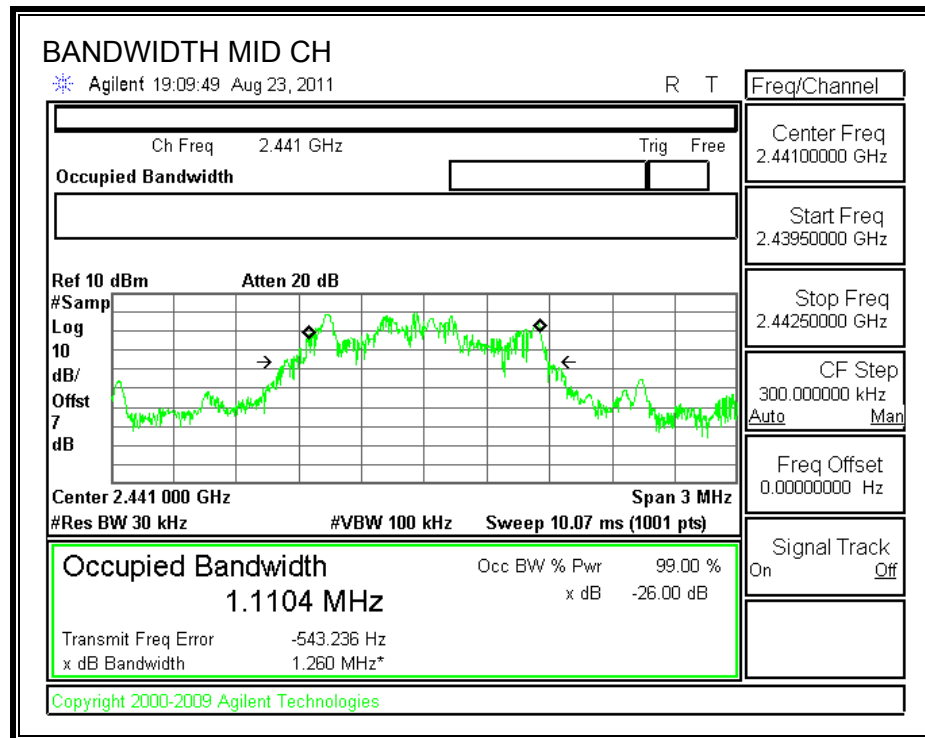
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

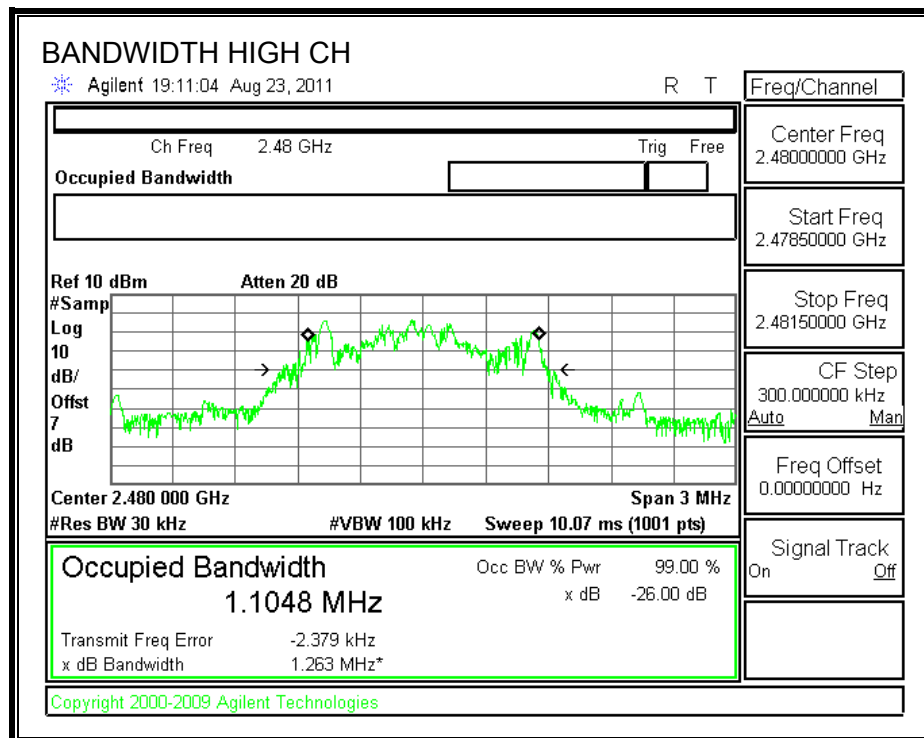
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (kHz)
Low	2402	1.1097
Middle	2441	1.1104
High	2480	1.1048

99% BANDWIDTH







7.2.3. 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.

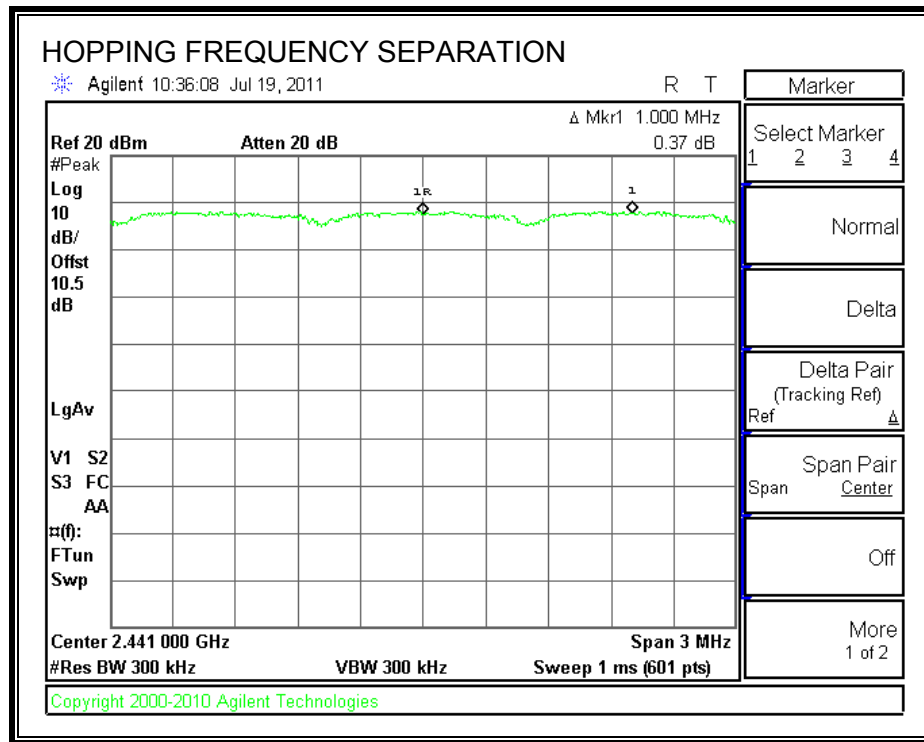
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

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

RESULTS

HOPPING FREQUENCY SEPARATION



7.2.4. 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.

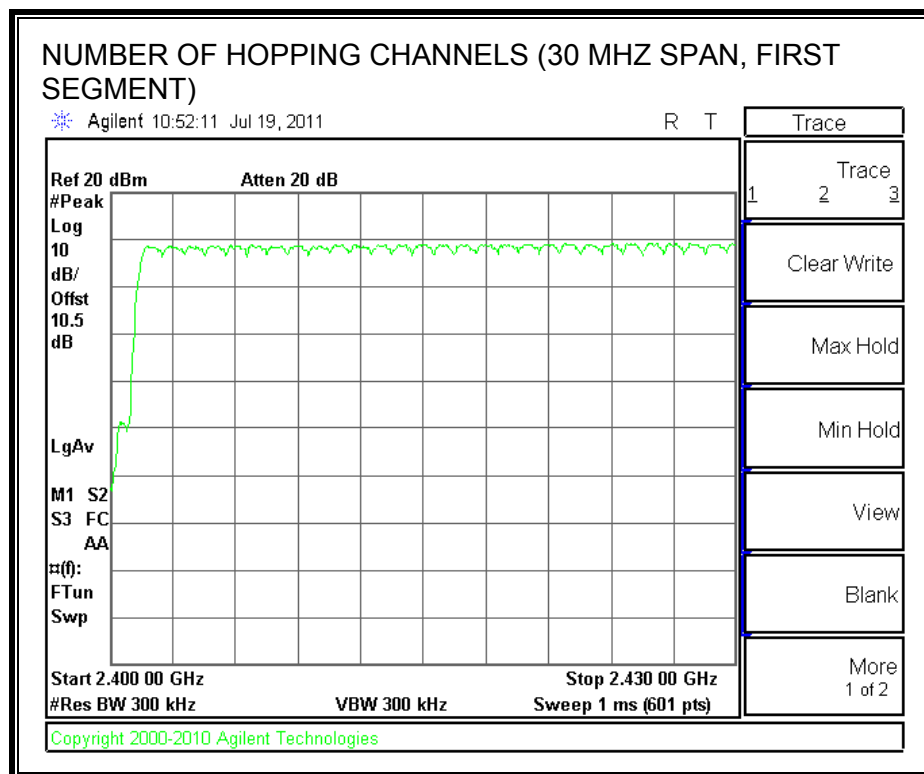
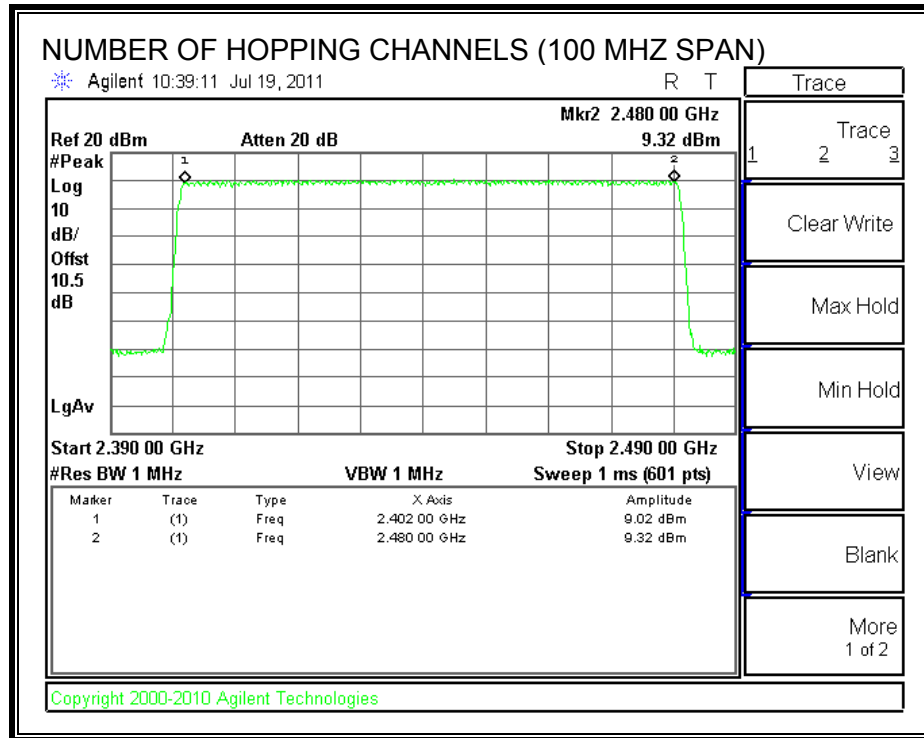
TEST PROCEDURE

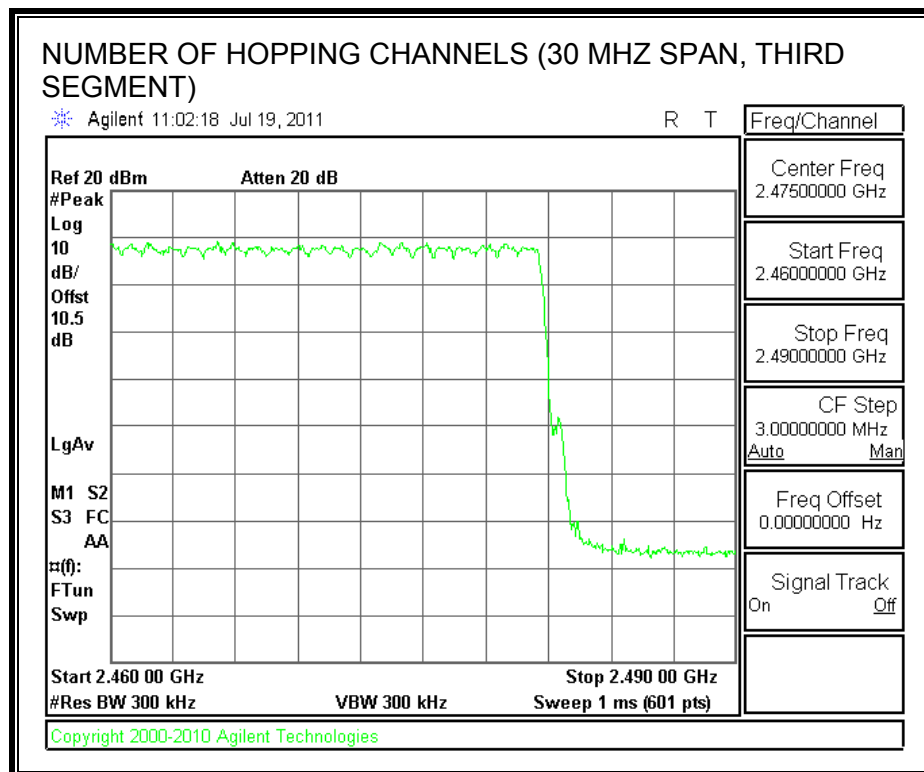
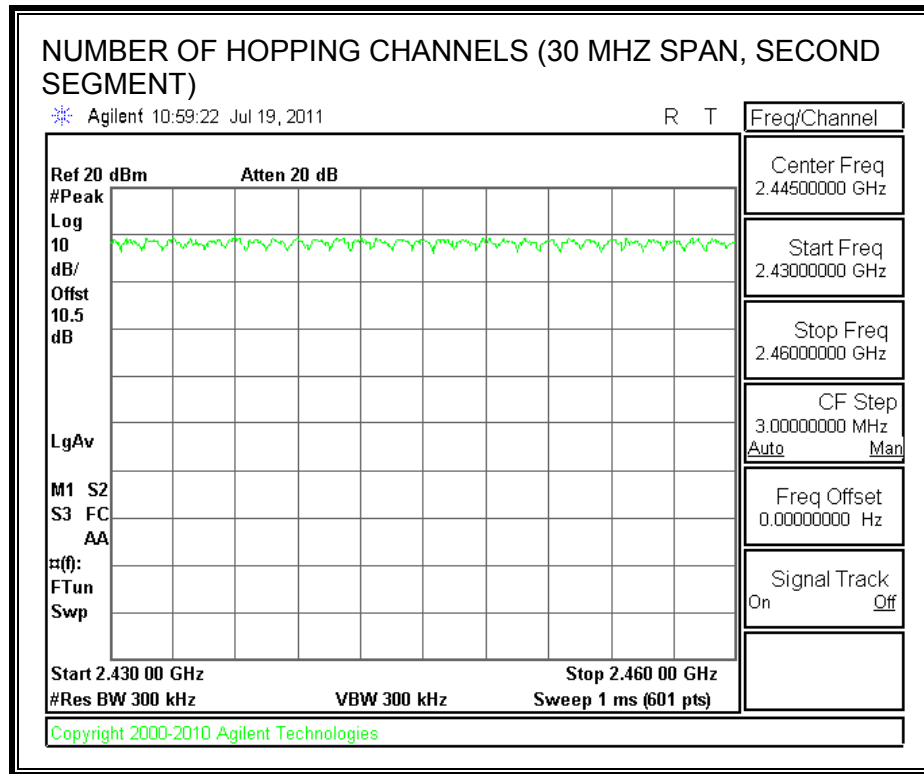
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

79 Channels observed.

NUMBER OF HOPPING CHANNELS





7.2.5. 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 $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

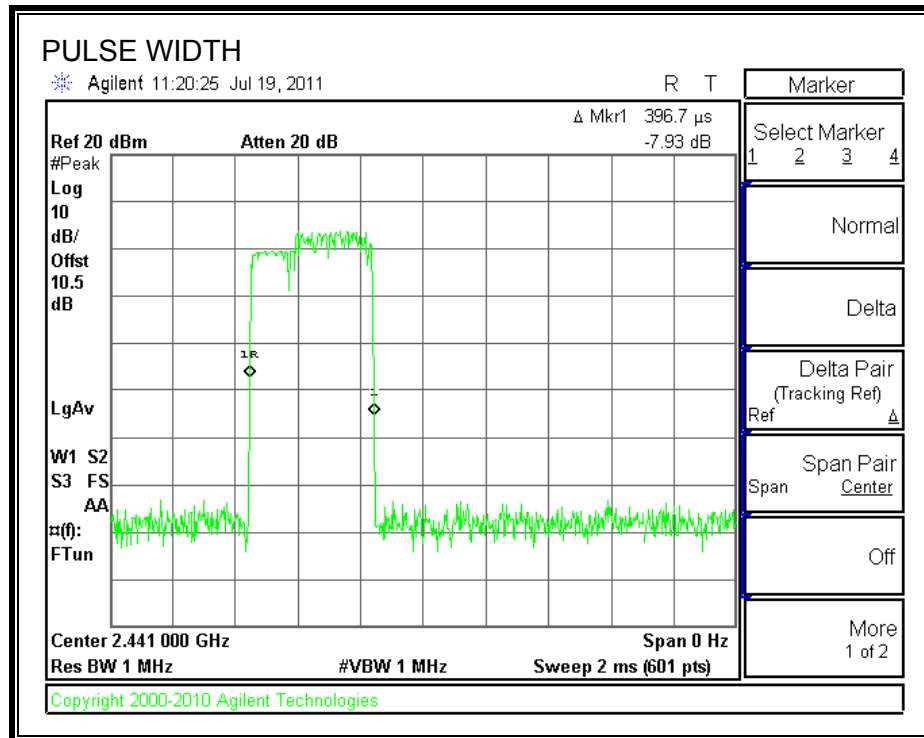
RESULTS

8PSK Mode

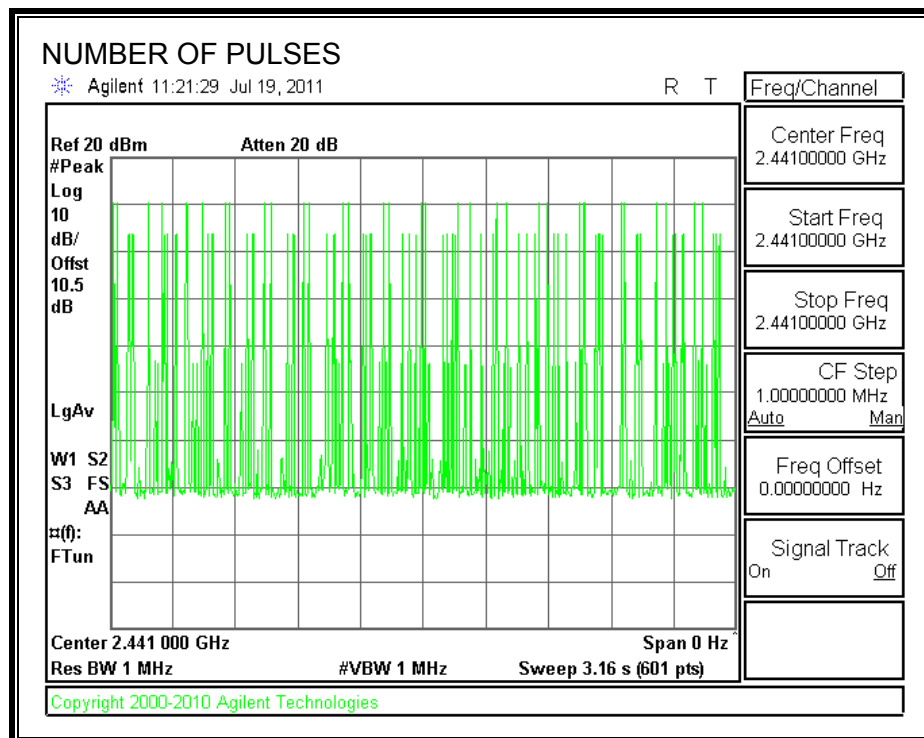
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.3967	32	0.1269	0.4	-0.2731
DH3	1.6500	17	0.2805	0.4	-0.1195
DH5	2.9000	13	0.3770	0.4	-0.0230

3-DH1

PULSE WIDTH

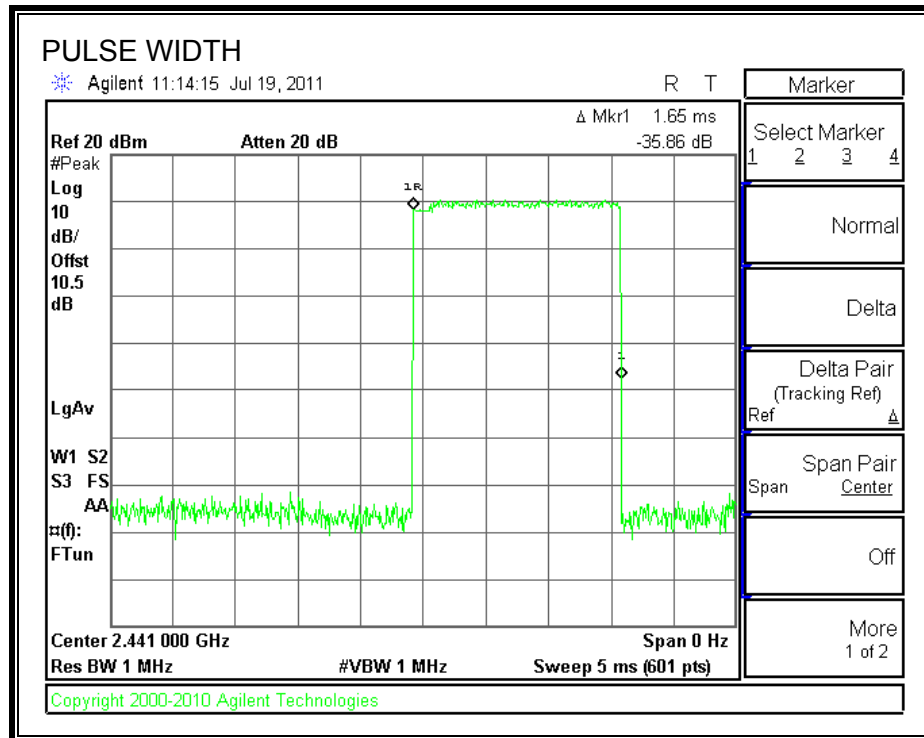


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

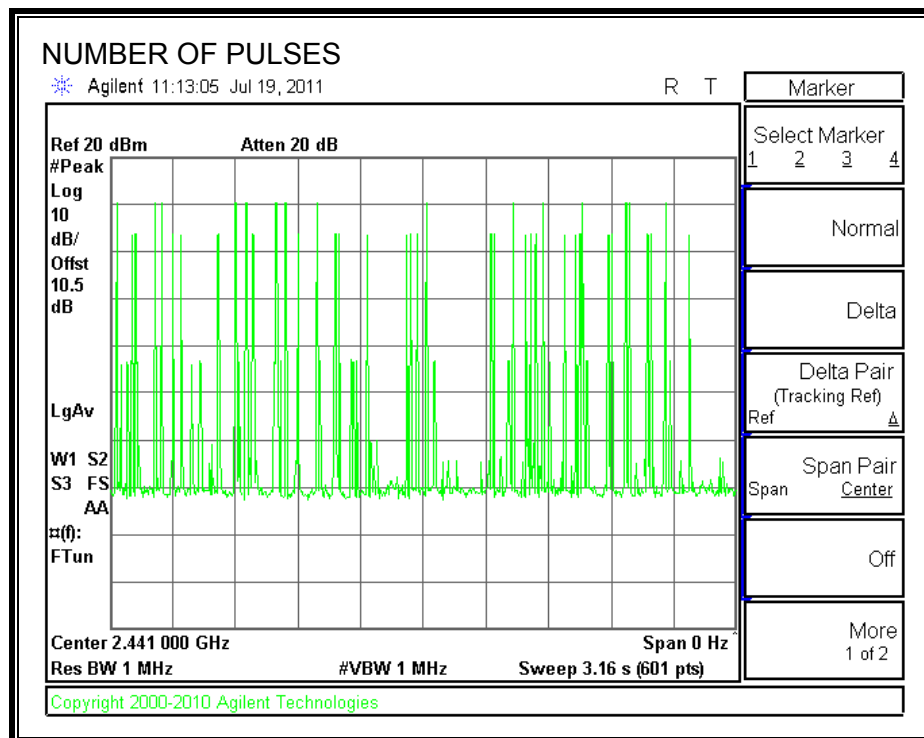


3-DH3

PULSE WIDTH

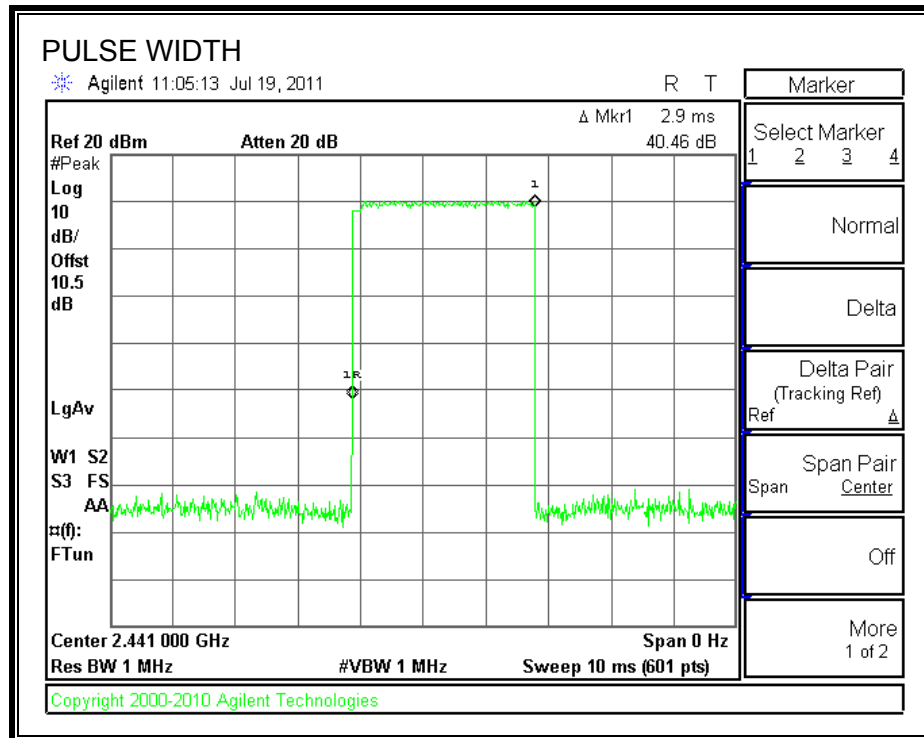


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

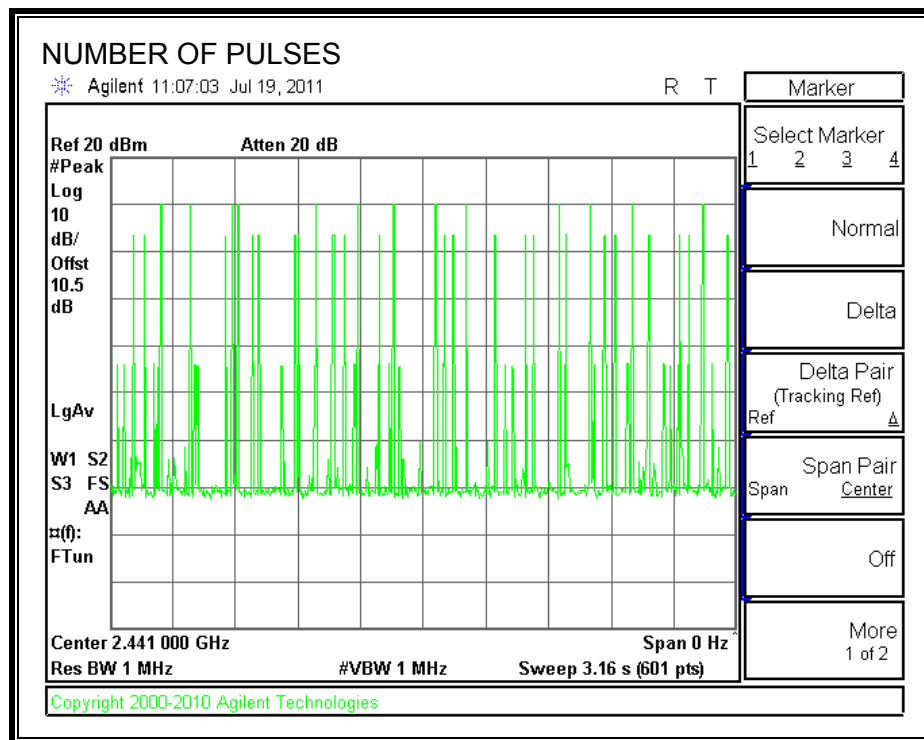


3-DH5

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.2.6. 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.

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.

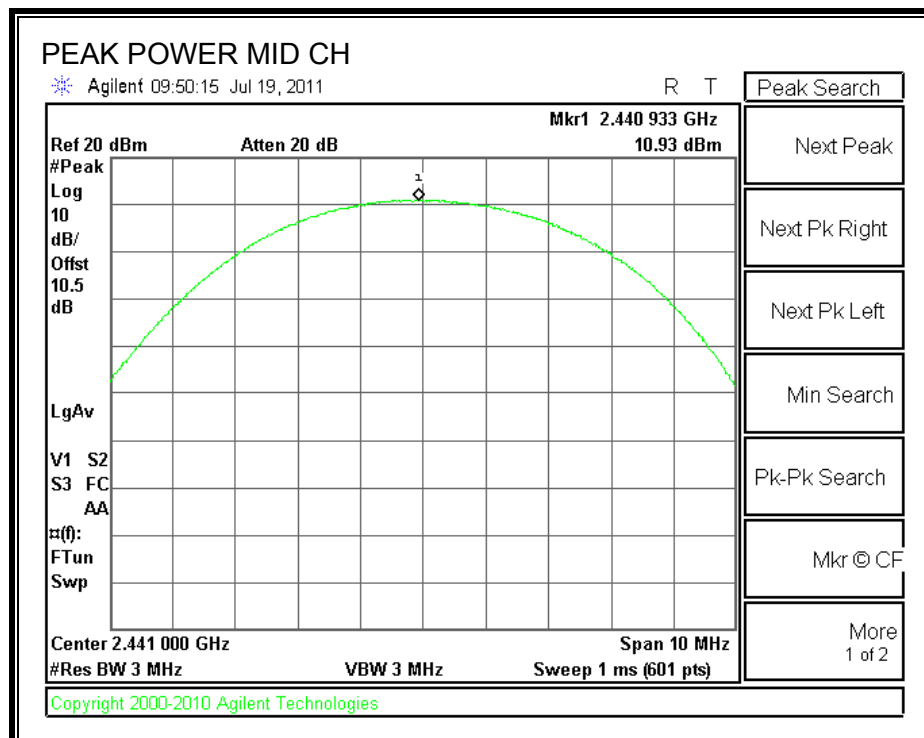
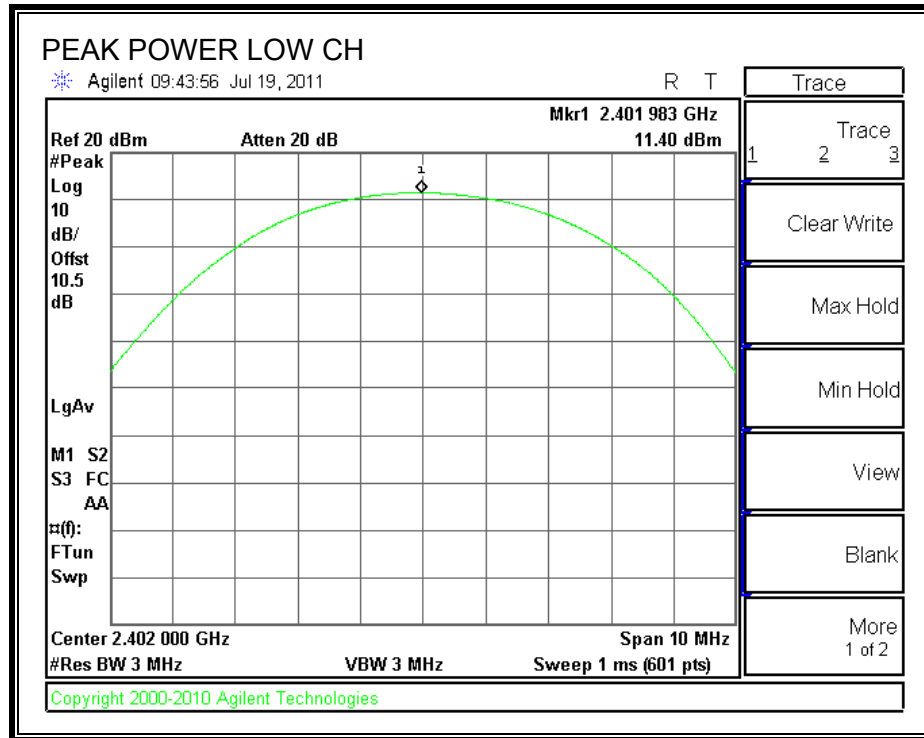
TEST PROCEDURE

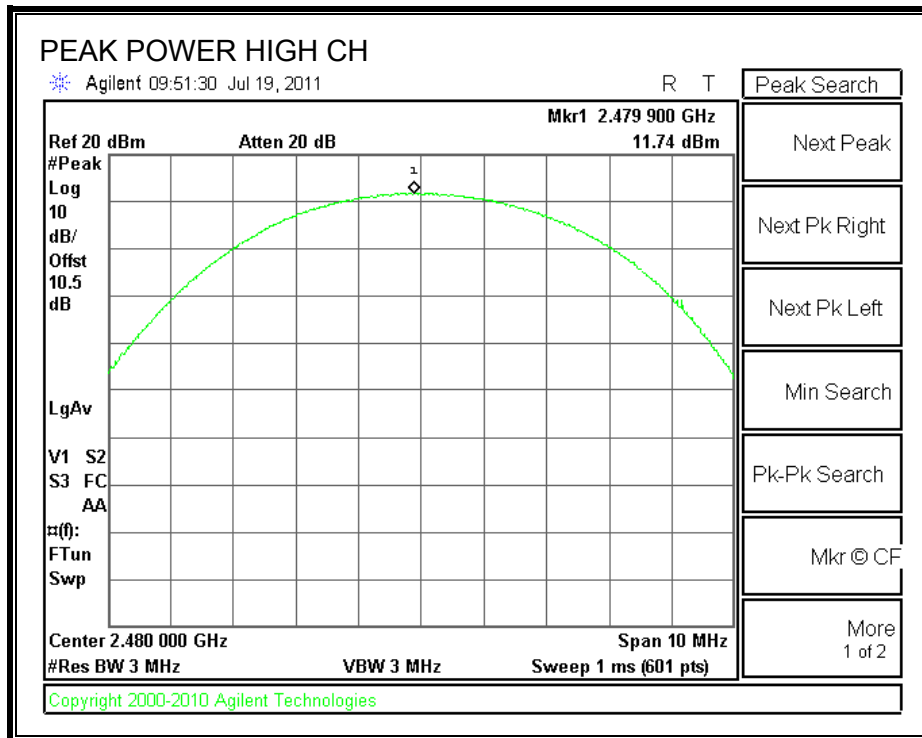
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.40	21	-9.60
Middle	2441	10.93	21	-10.07
High	2480	11.74	21	-9.26

OUTPUT POWER





7.2.7. 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 10.5 dB (including 9.40 dB pad and 1.1 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	7.40
Middle	2441	8.10
High	2480	8.00

7.2.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

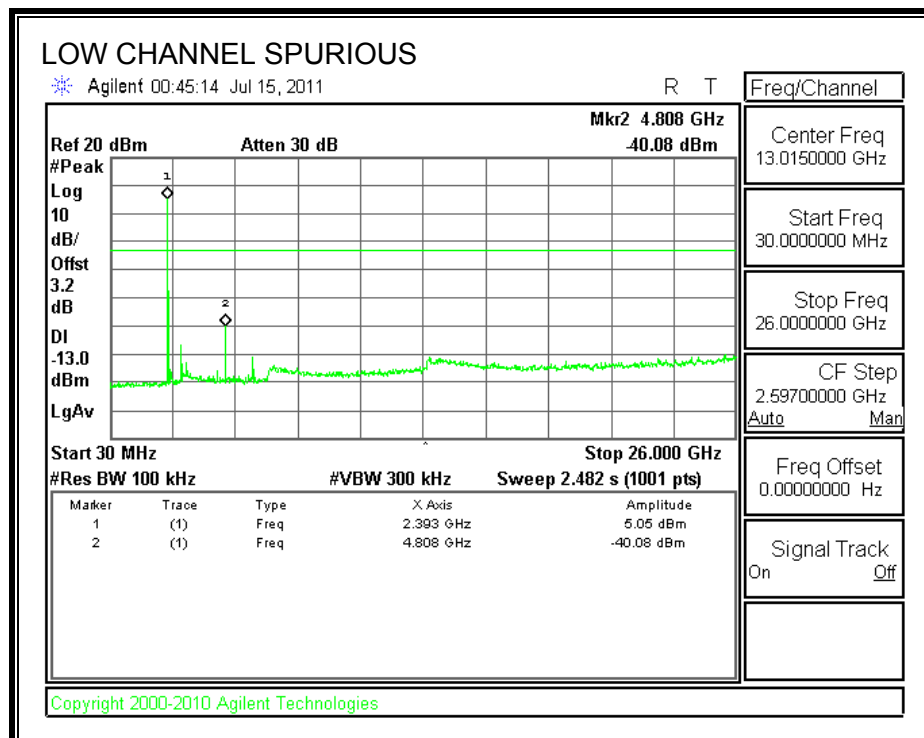
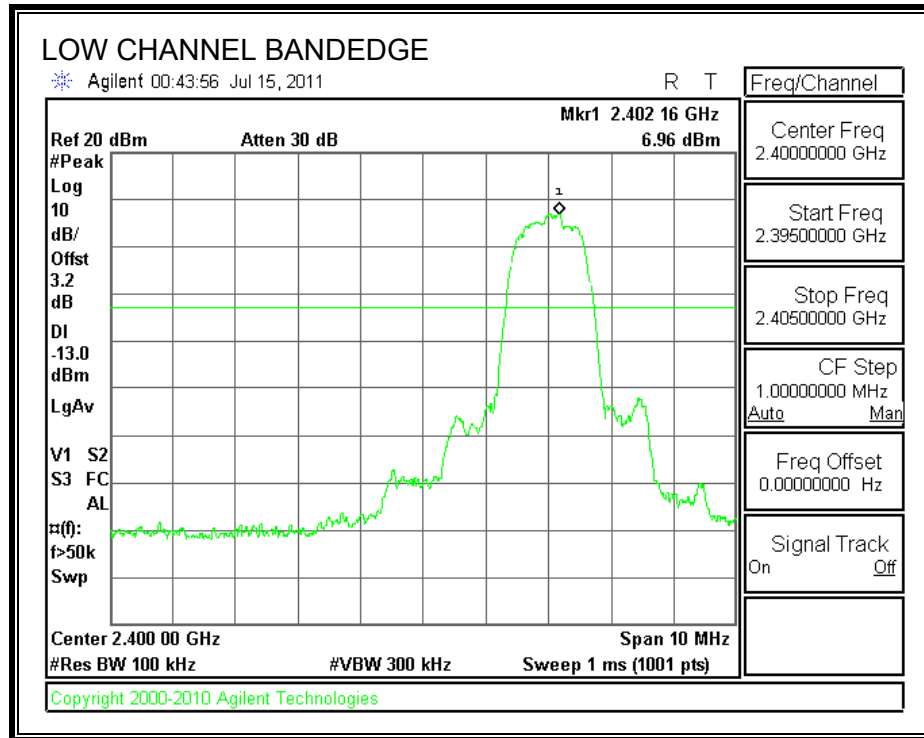
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

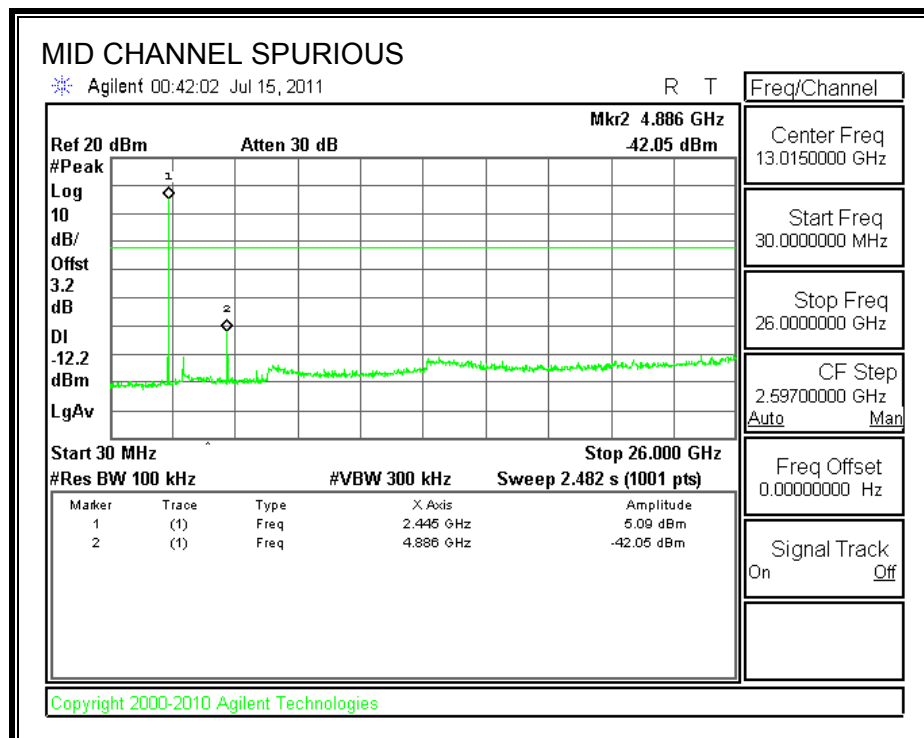
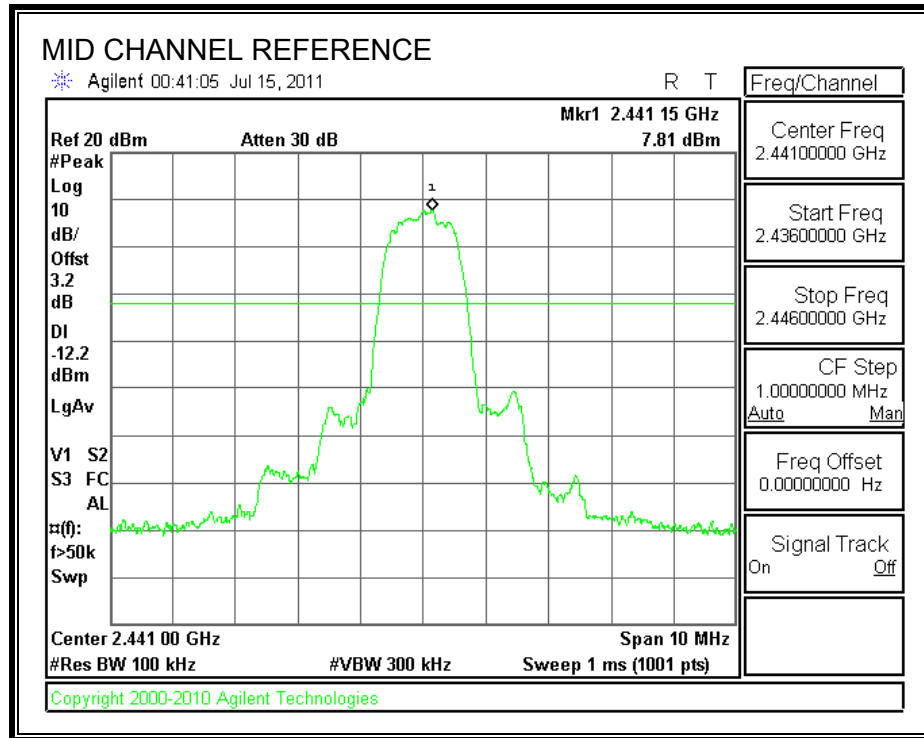
The band edges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

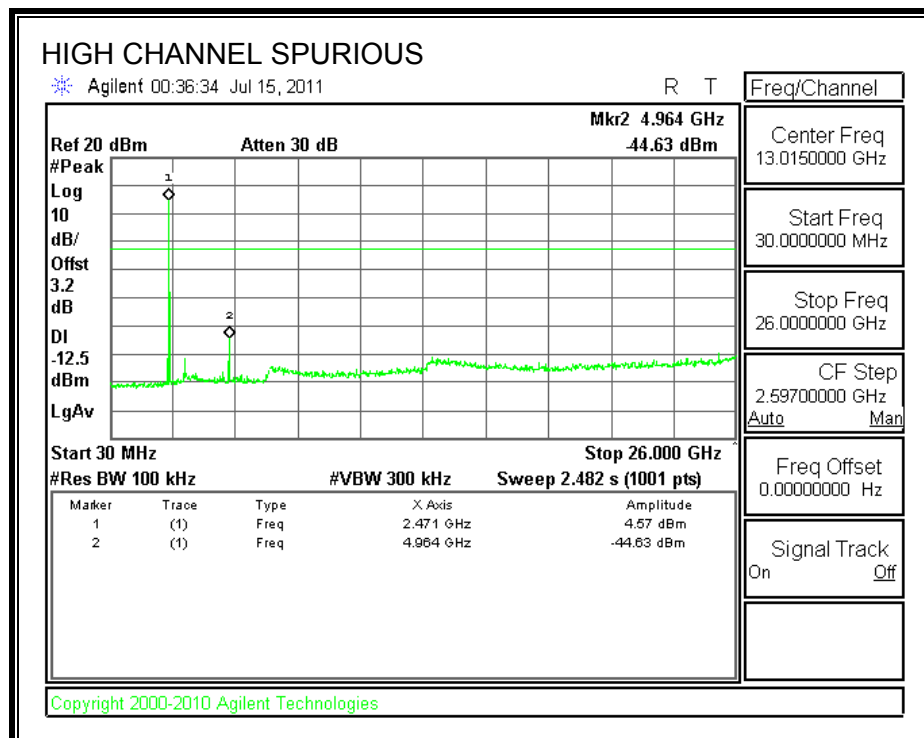
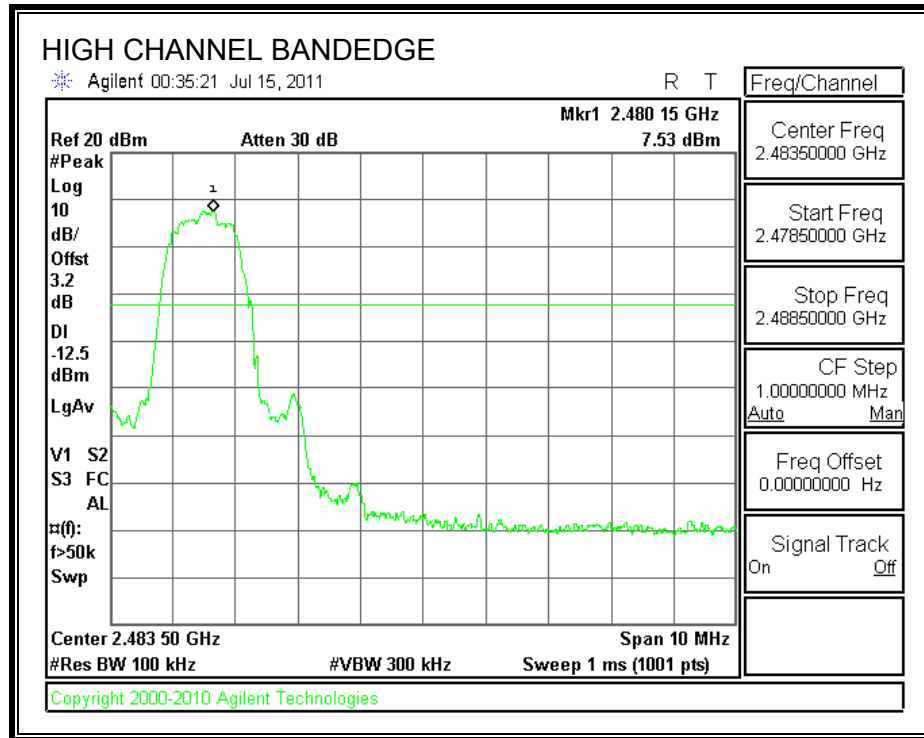
SPURIOUS EMISSIONS, LOW CHANNEL



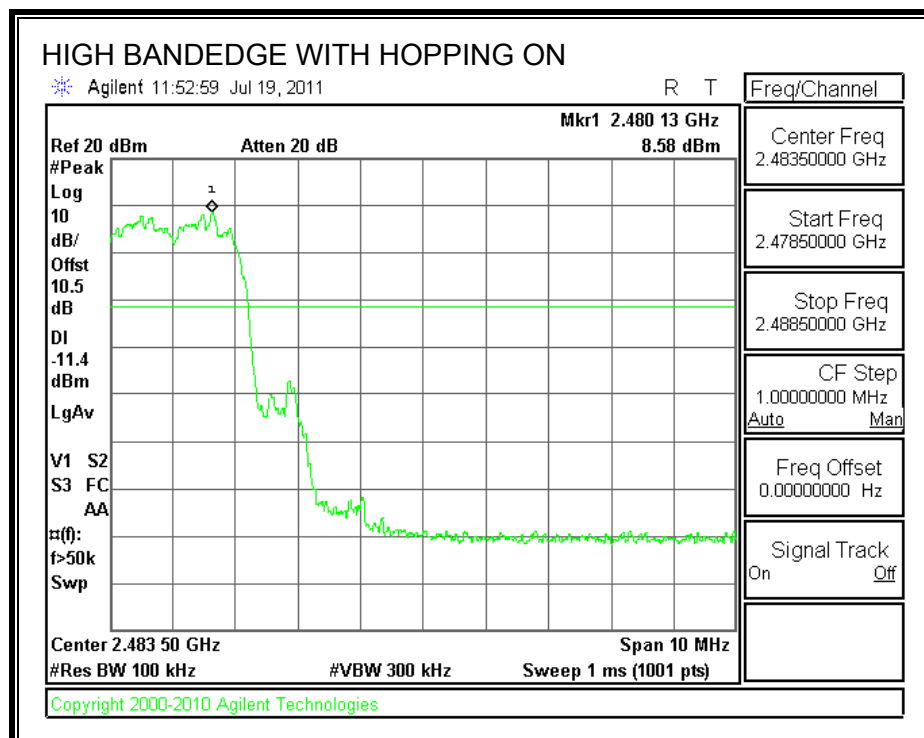
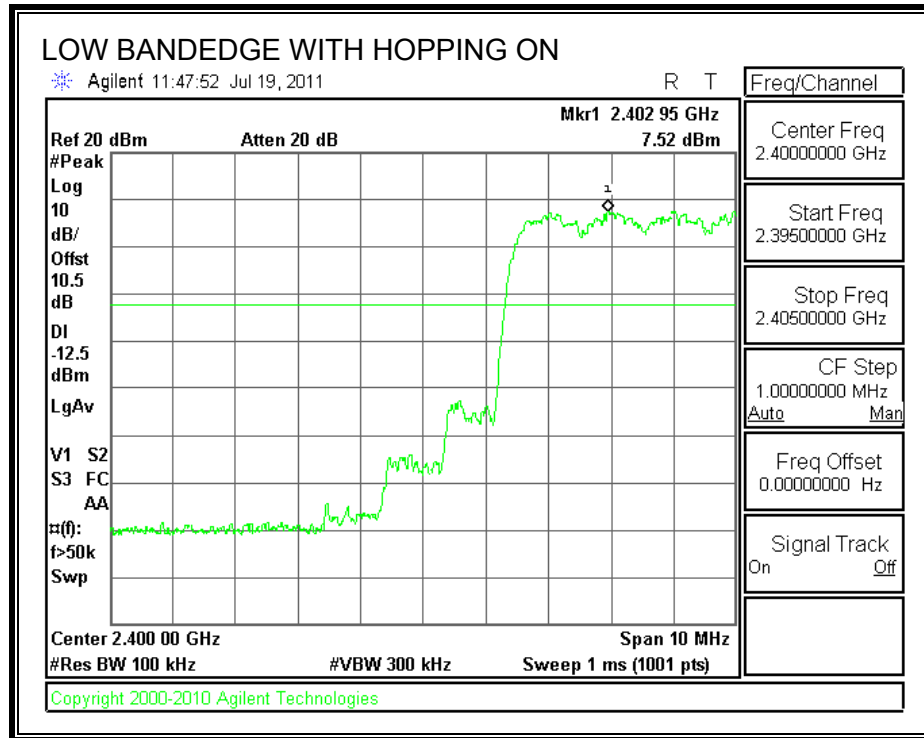
SPURIOUS EMISSIONS, MID CHANNEL



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

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.

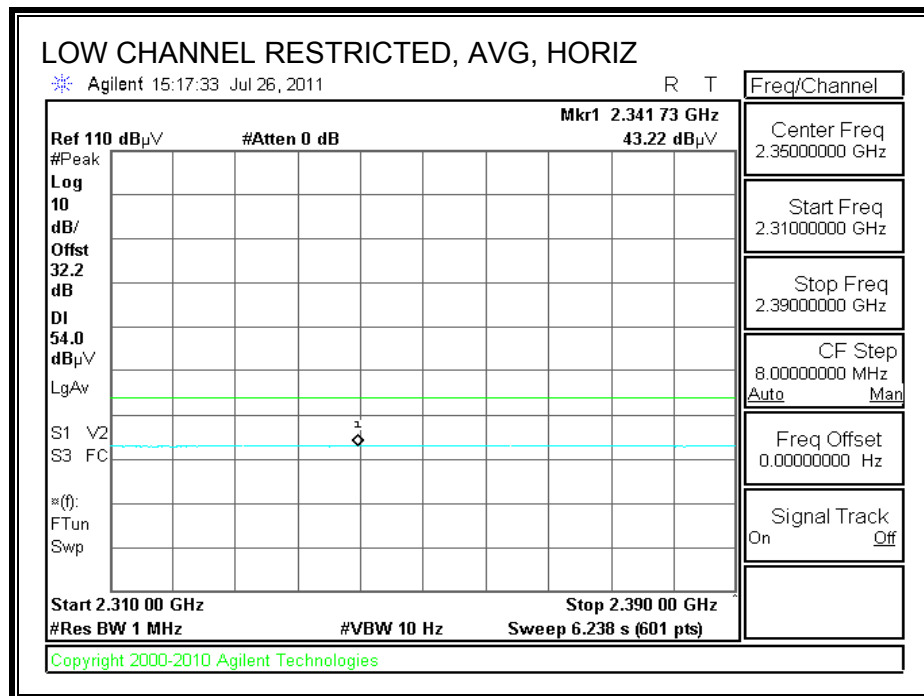
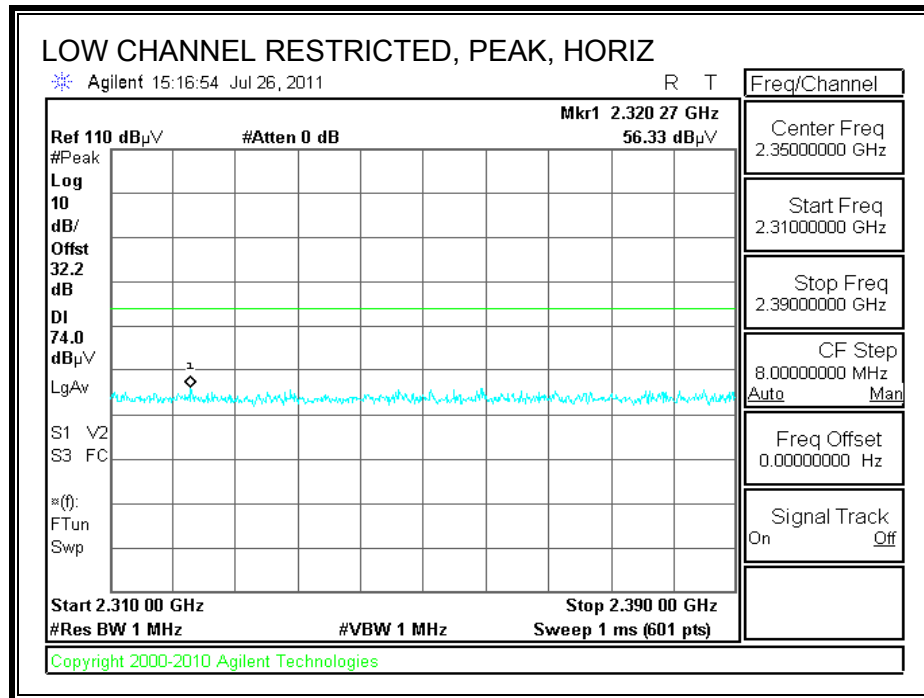
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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.

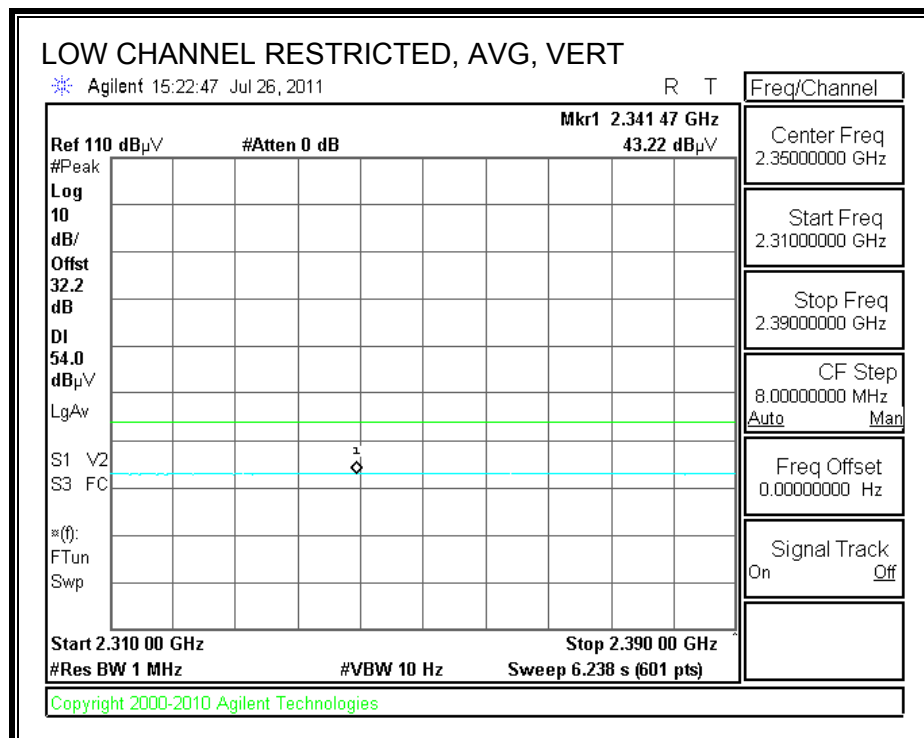
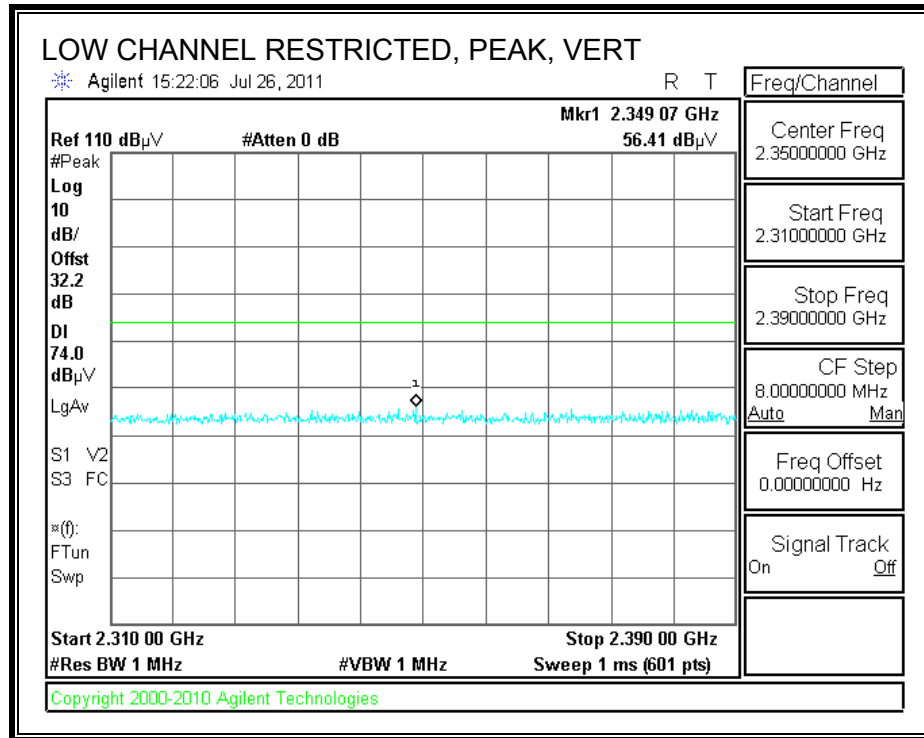
8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. BASIC DATA RATE GFSK MODULATION

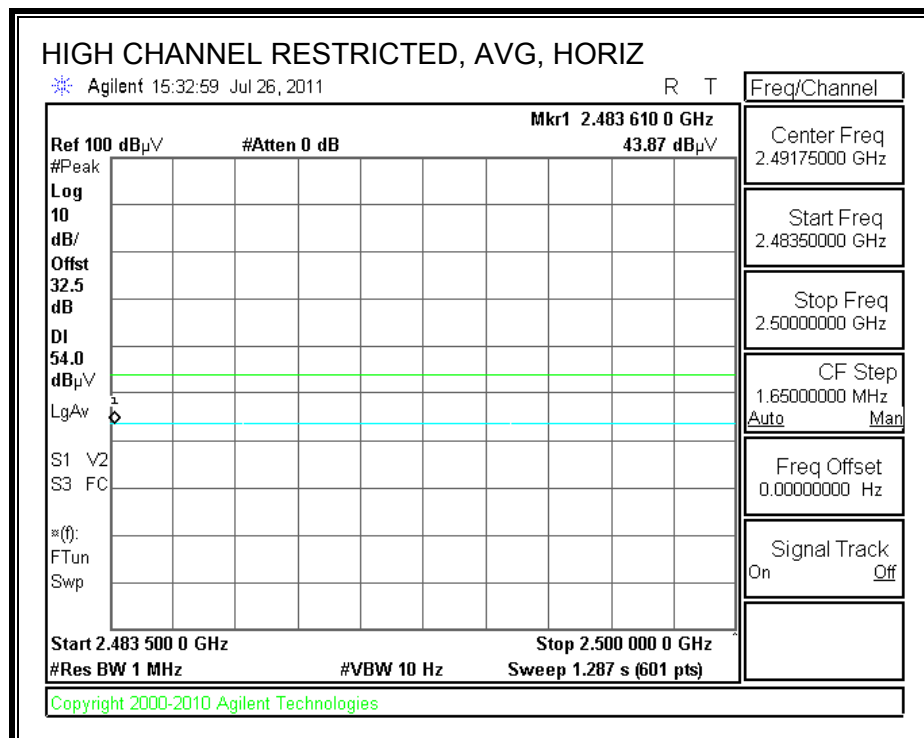
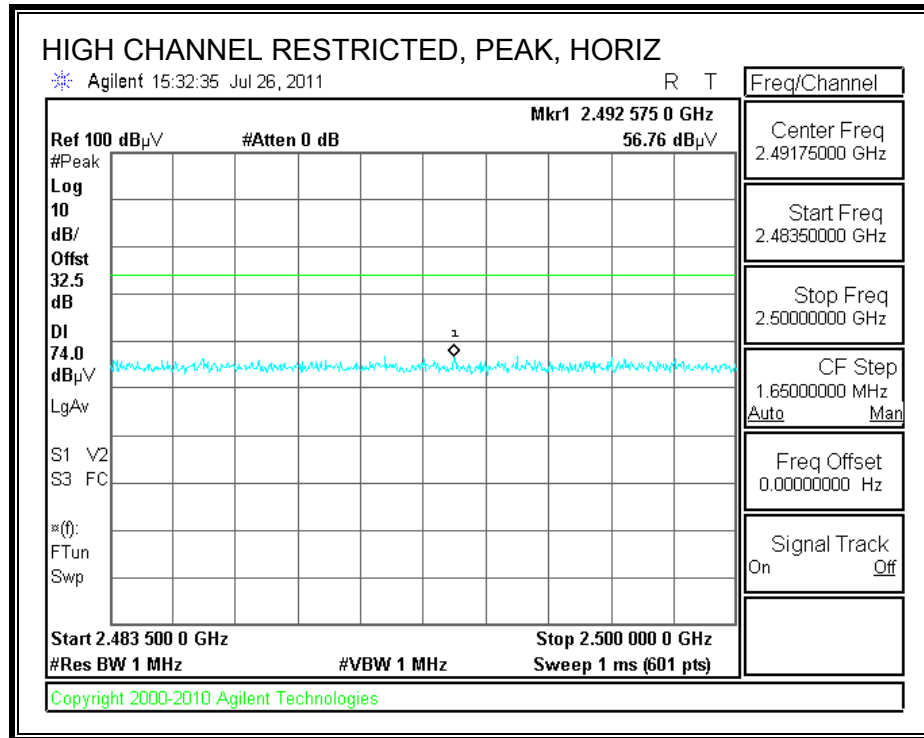
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



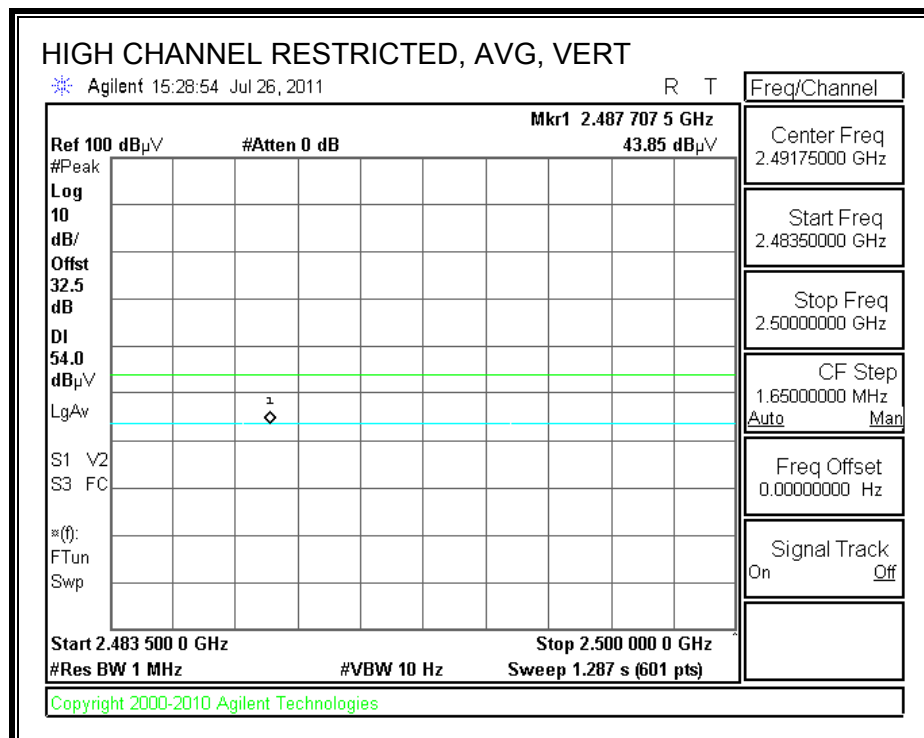
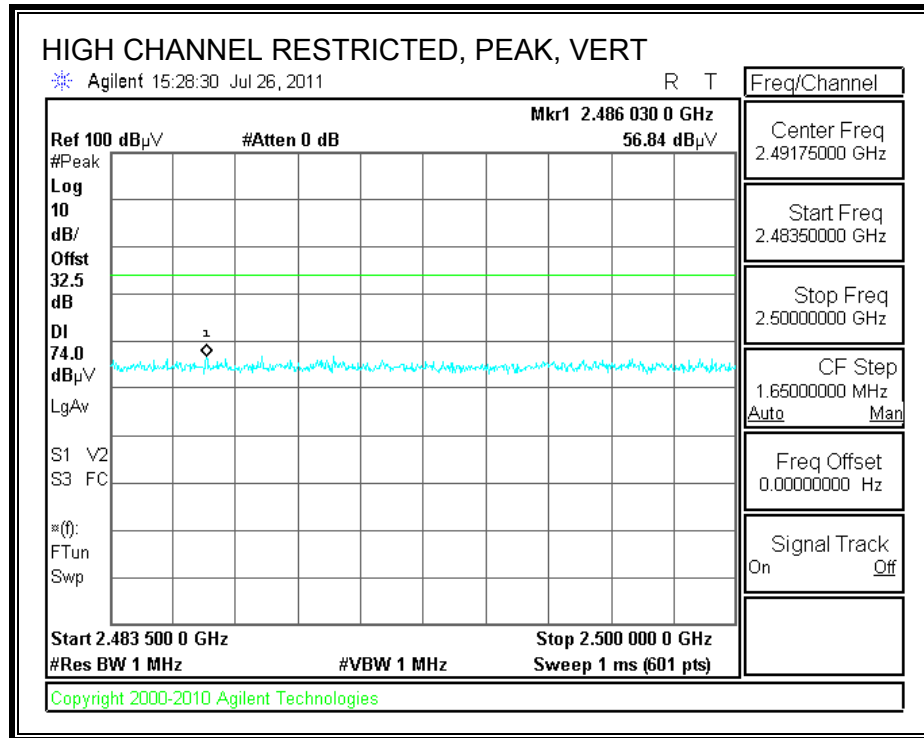
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

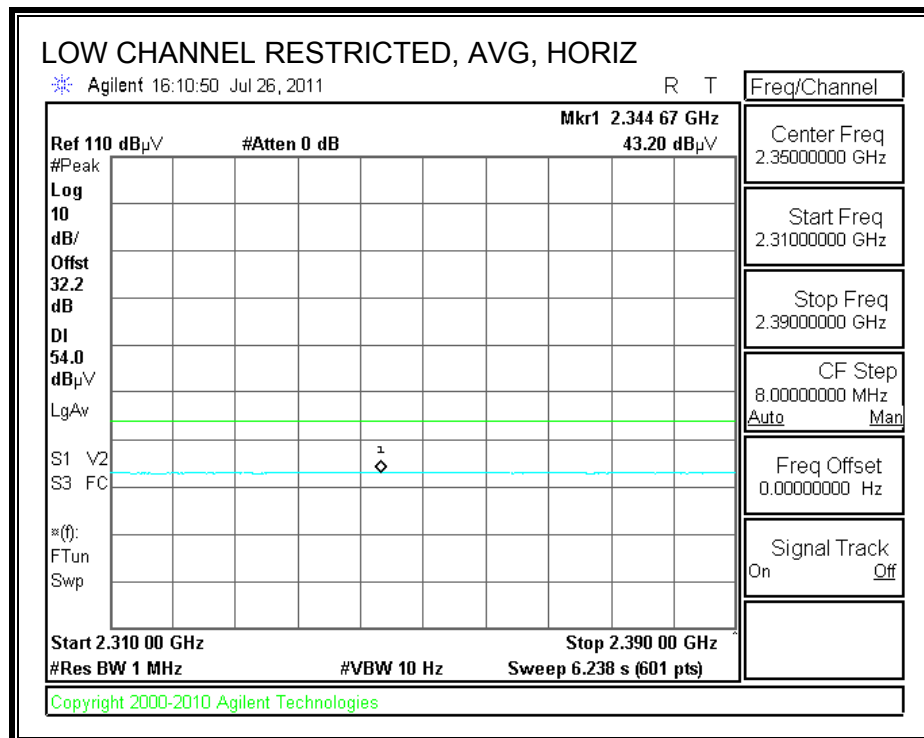
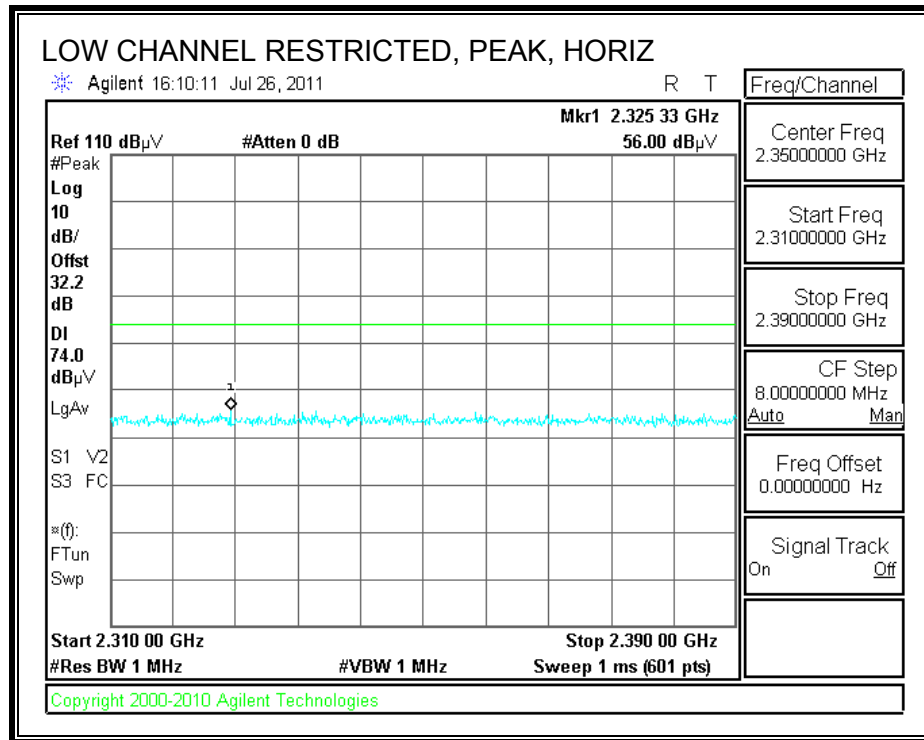


HARMONICS AND SPURIOUS EMISSIONS

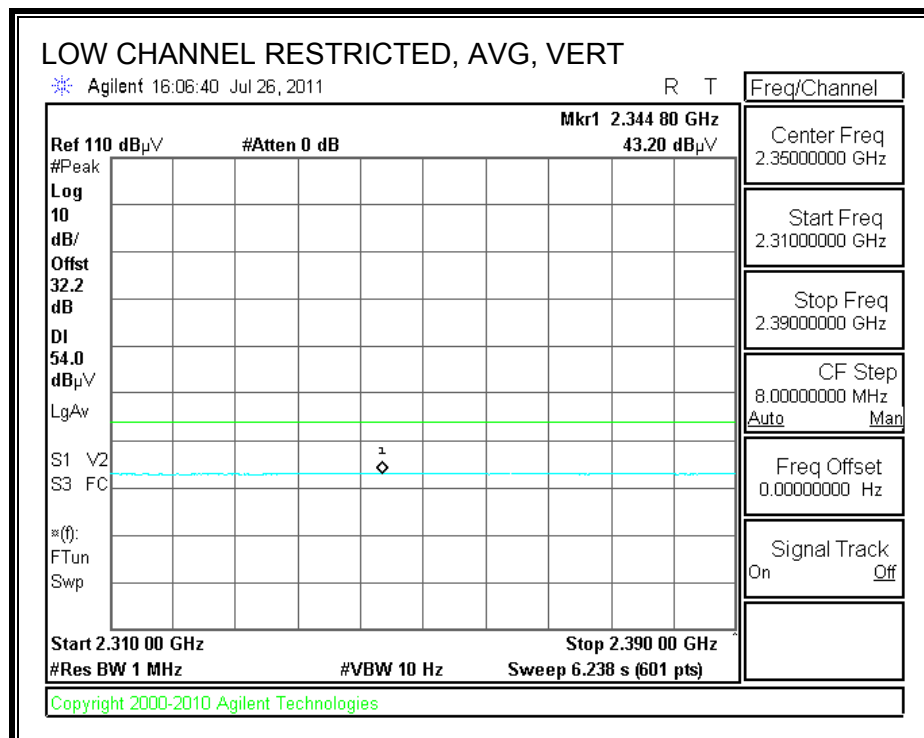
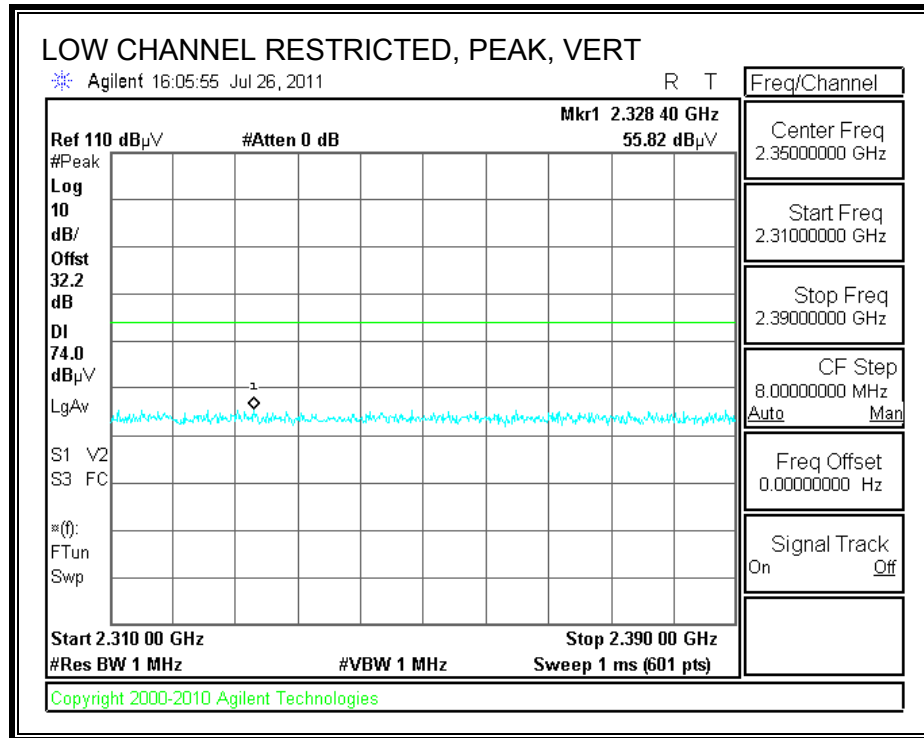
High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Test Engr:		William Zhuang													
Date:		07/26/11													
Project #:		11U13917													
Company:		LG													
Test Target:		FCC Class B													
Mode Oper:		BT, GFSK, Tx On													
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.	Ant.High	Table Angle	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	cm	Degree	
Low Ch. 2402 MHz															
4.804	3.0	45.4	33.9	6.8	-34.1	0.0	0.0	51.9	74.0	-22.1	H	P	101.6	279.0	
4.804	3.0	38.5	33.9	6.8	-34.1	0.0	0.0	45.1	54.0	-8.9	H	A	101.6	279.0	
4.804	3.0	45.7	33.9	6.8	-34.1	0.0	0.0	52.2	74.0	-21.8	V	P	100.0	215.2	
4.804	3.0	38.9	33.9	6.8	-34.1	0.0	0.0	45.5	54.0	-8.5	V	A	100.0	215.2	
12.010	3.0	34.3	39.6	11.0	-32.3	0.0	0.0	52.7	74.0	-21.3	V	P	179.4	268.9	
12.010	3.0	21.9	39.6	11.0	-32.3	0.0	0.0	40.3	54.0	-13.7	V	A	179.4	268.9	
12.010	3.0	33.8	39.6	11.0	-32.3	0.0	0.0	52.2	74.0	-21.8	H	P	143.0	205.2	
12.010	3.0	22.0	39.6	11.0	-32.3	0.0	0.0	40.3	54.0	-13.7	H	A	143.0	205.2	
Mid Ch. 2441 MHz															
4.882	3.0	49.6	33.2	6.3	-34.8	0.0	0.0	54.3	74.0	-19.7	H	P	104.8	246.2	
4.882	3.0	42.2	33.2	6.3	-34.8	0.0	0.0	46.9	54.0	-7.1	H	A	104.8	246.2	
4.882	3.0	54.9	33.2	6.3	-34.8	0.0	0.0	59.6	74.0	-14.4	V	P	100.0	357.4	
4.882	3.0	47.3	33.2	6.3	-34.8	0.0	0.0	52.0	54.0	-2.0	V	A	100.0	357.4	
7.323	3.0	37.3	36.2	8.5	-34.9	0.0	0.0	47.1	74.0	-26.9	V	P	100.7	327.0	
7.323	3.0	27.0	36.2	8.5	-34.9	0.0	0.0	36.8	54.0	-17.2	V	A	100.7	327.0	
7.323	3.0	36.6	36.2	8.5	-34.9	0.0	0.0	46.4	74.0	-27.6	H	P	154.3	149.9	
7.323	3.0	24.3	36.2	8.5	-34.9	0.0	0.0	34.1	54.0	-19.9	H	A	154.3	149.9	
High Ch. 2480 MHz															
4.960	3.0	49.5	33.3	6.4	-34.8	0.0	0.0	54.5	74.0	-19.5	H	P	102.7	15.9	
4.960	3.0	42.5	33.3	6.4	-34.8	0.0	0.0	47.4	54.0	-6.6	H	A	102.7	15.9	
4.960	3.0	50.5	33.3	6.4	-34.8	0.0	0.0	55.4	74.0	-18.6	V	P	100.0	194.1	
4.960	3.0	43.7	33.3	6.4	-34.8	0.0	0.0	48.6	54.0	-5.4	V	A	100.0	194.1	
7.440	3.0	36.5	36.4	8.5	-34.9	0.0	0.0	46.5	74.0	-27.5	V	P	105.0	177.4	
7.440	3.0	24.5	36.4	8.5	-34.9	0.0	0.0	34.5	54.0	-19.5	V	A	105.0	177.4	
7.440	3.0	36.9	36.4	8.5	-34.9	0.0	0.0	46.8	74.0	-27.2	H	P	200.0	297.6	
7.440	3.0	24.4	36.4	8.5	-34.9	0.0	0.0	34.4	54.0	-19.6	H	A	200.0	297.6	
Rev. 4.1.2.7															
Note: No other emissions were detected above the system noise floor.															

8.2.1. ENHANCED DATA RATE 8PSK MODULATION

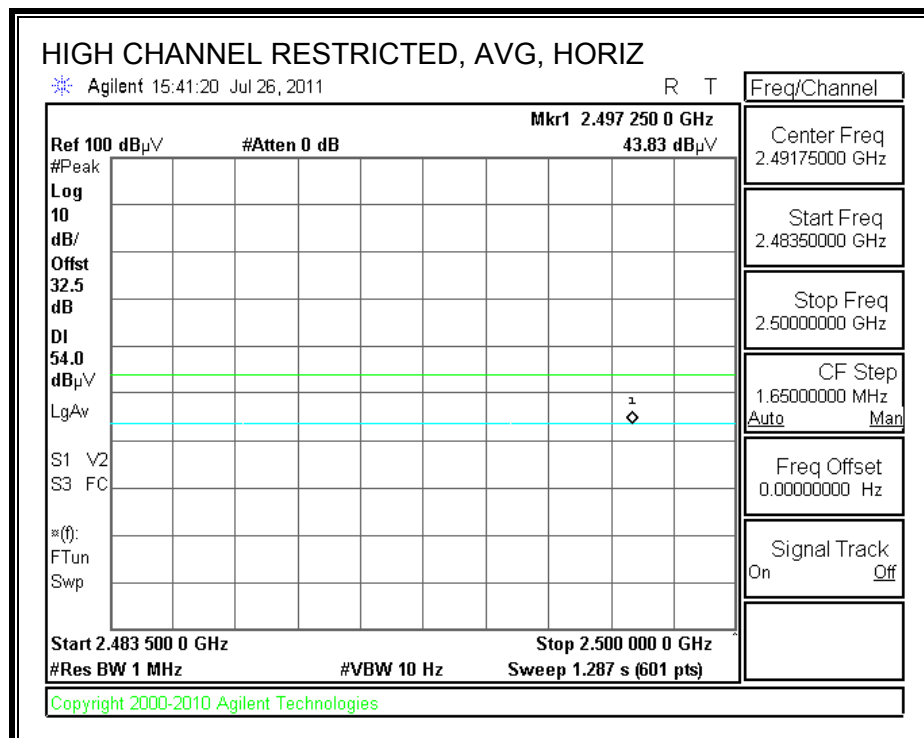
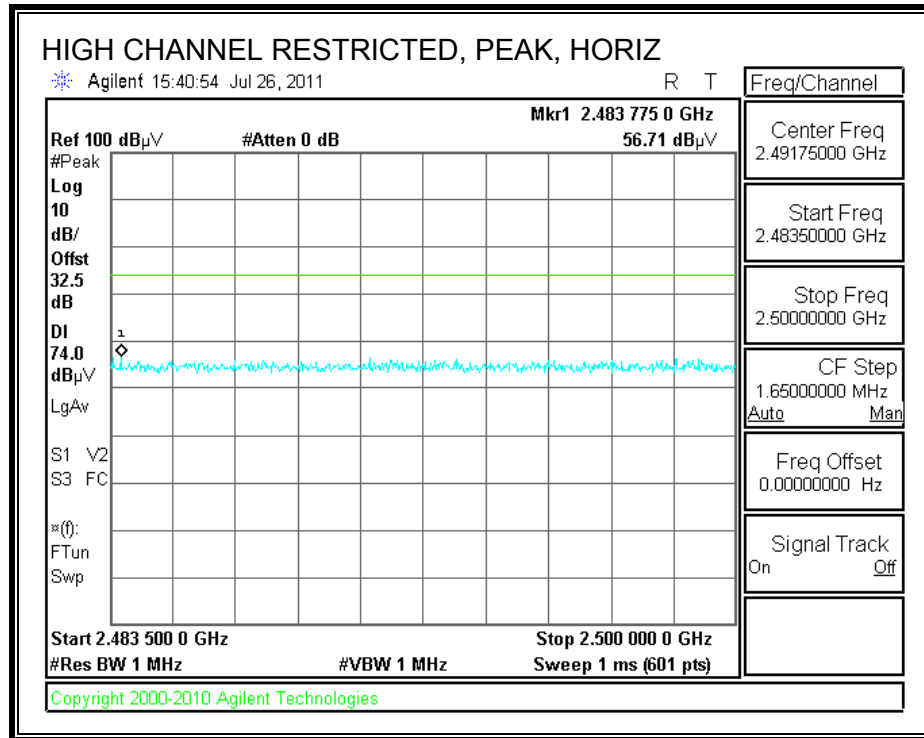
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



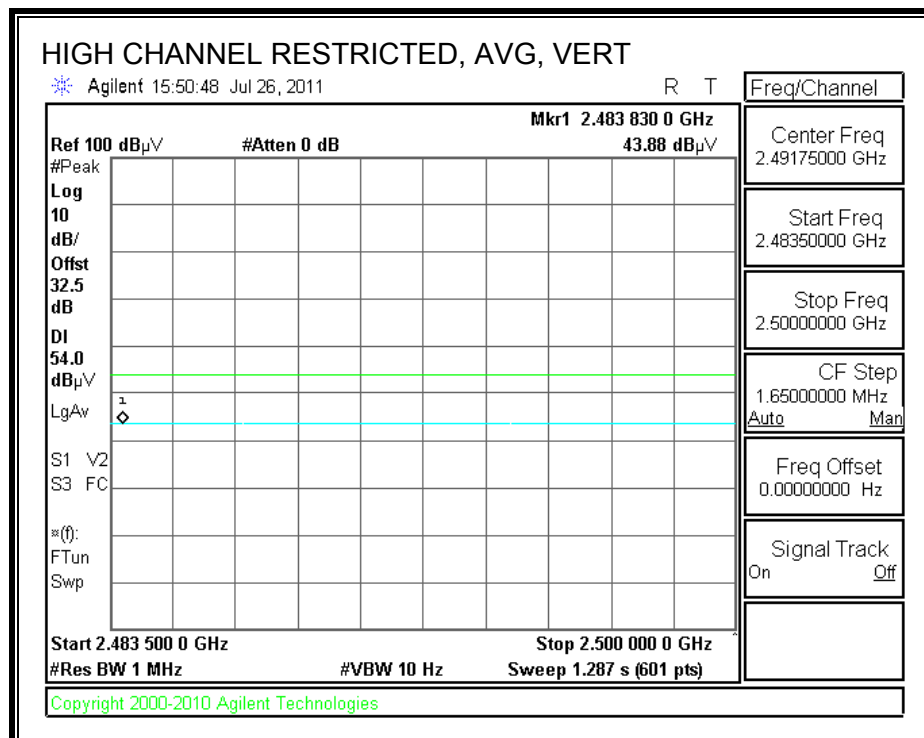
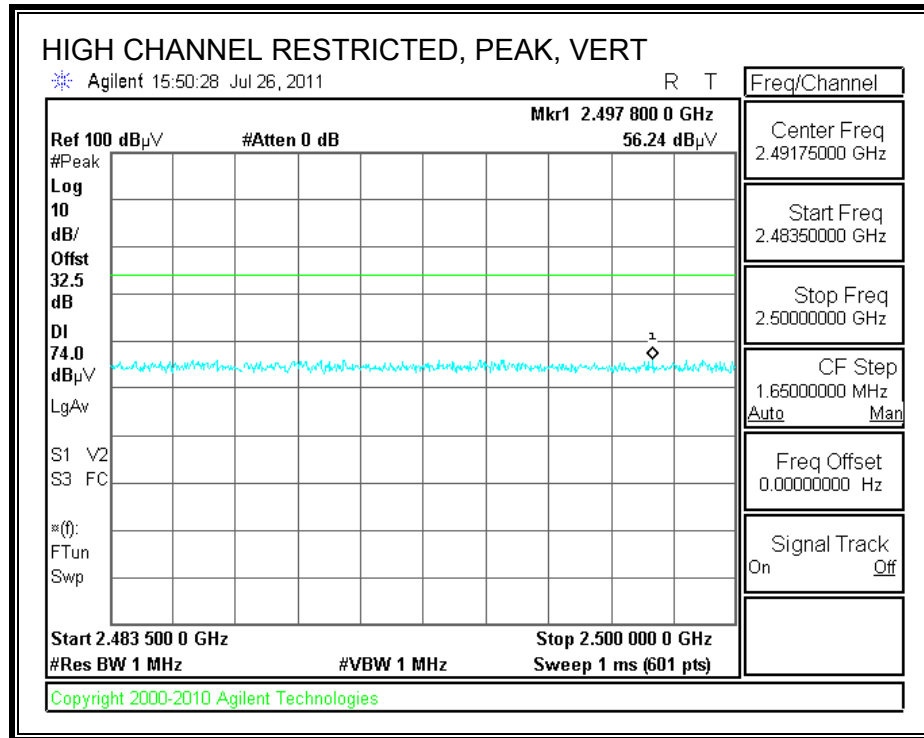
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber

Test Engr: William Zhuang
Date: 07/26/11
Project #: 11U13917
Company: LG
Test Target: FCC Class B
Mode Oper: BT, 8PSK, Tx On

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 GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Ch. 2402 MHz															
4.804	3.0	61.0	33.1	6.3	-34.8	0.0	0.0	65.6	74.0	-8.4	V	P	100.5	210.8	
4.804	3.0	48.8	33.1	6.3	-34.8	0.0	0.0	53.4	54.0	-0.6	V	A	100.5	210.8	
4.804	3.0	51.4	33.1	6.3	-34.8	0.0	0.0	56.0	74.0	-18.0	H	P	103.4	278.4	
4.804	3.0	41.3	33.1	6.3	-34.8	0.0	0.0	45.9	54.0	-8.1	H	A	103.4	278.4	
12.010	3.0	34.8	39.6	11.0	-32.3	0.0	0.0	53.2	74.0	-20.8	V	P	100.0	241.7	
12.010	3.0	22.1	39.6	11.0	-32.3	0.0	0.0	40.5	54.0	-13.5	V	A	100.0	241.7	
12.010	3.0	34.6	39.6	11.0	-32.3	0.0	0.0	53.0	74.0	-21.0	H	P	198.3	3.5	
12.010	3.0	22.1	39.6	11.0	-32.3	0.0	0.0	40.5	54.0	-13.5	H	A	198.3	3.5	
Mid Ch. 2441 MHz															
4.882	3.0	59.7	33.2	6.3	-34.8	0.0	0.0	64.4	74.0	-9.6	V	P	110.2	211.2	
4.882	3.0	48.0	33.2	6.3	-34.8	0.0	0.0	52.8	54.0	-1.2	V	A	110.2	211.2	
4.882	3.0	49.0	33.2	6.3	-34.8	0.0	0.0	53.8	74.0	-20.2	H	P	100.8	212.7	
4.882	3.0	39.4	33.2	6.3	-34.8	0.0	0.0	44.1	54.0	-9.9	H	A	100.8	212.7	
7.323	3.0	36.7	36.2	8.5	-34.9	0.0	0.0	46.5	74.0	-27.5	H	P	112.7	19.1	
7.323	3.0	24.5	36.2	8.5	-34.9	0.0	0.0	34.3	54.0	-19.7	H	A	112.7	19.1	
7.323	3.0	36.7	36.2	8.5	-34.9	0.0	0.0	46.4	74.0	-27.6	V	P	200.0	348.1	
7.323	3.0	24.5	36.2	8.5	-34.9	0.0	0.0	34.3	54.0	-19.7	V	A	200.0	348.1	
12.205	3.0	33.7	39.6	11.1	-32.3	0.0	0.0	52.1	74.0	-21.9	V	P	115.0	3.2	
12.205	3.0	21.5	39.6	11.1	-32.3	0.0	0.0	39.9	54.0	-14.1	V	A	115.0	3.2	
12.205	3.0	33.2	39.6	11.1	-32.3	0.0	0.0	51.6	74.0	-22.4	H	P	132.3	119.4	
12.205	3.0	21.4	39.6	11.1	-32.3	0.0	0.0	39.9	54.0	-14.1	H	A	132.3	119.4	
High Ch. 2480 MHz															
4.960	3.0	47.4	33.3	6.4	-34.8	0.0	0.0	52.3	74.0	-21.7	H	P	101.7	1.5	
4.960	3.0	37.6	33.3	6.4	-34.8	0.0	0.0	42.5	54.0	-11.5	H	A	101.7	1.5	
4.960	3.0	57.8	33.3	6.4	-34.8	0.0	0.0	62.8	74.0	-11.3	V	P	108.6	212.8	
4.960	3.0	46.4	33.3	6.4	-34.8	0.0	0.0	51.3	54.0	-2.7	V	A	108.6	212.8	
7.440	3.0	37.3	36.4	8.5	-34.9	0.0	0.0	47.2	74.0	-26.8	V	P	106.3	193.4	
7.440	3.0	24.5	36.4	8.5	-34.9	0.0	0.0	34.5	54.0	-19.5	V	A	106.3	193.4	
7.440	3.0	36.5	36.4	8.5	-34.9	0.0	0.0	46.5	74.0	-27.5	H	P	130.9	170.3	
7.440	3.0	24.5	36.4	8.5	-34.9	0.0	0.0	34.4	54.0	-19.6	H	A	130.9	170.3	

Rev. 4.1.2.7

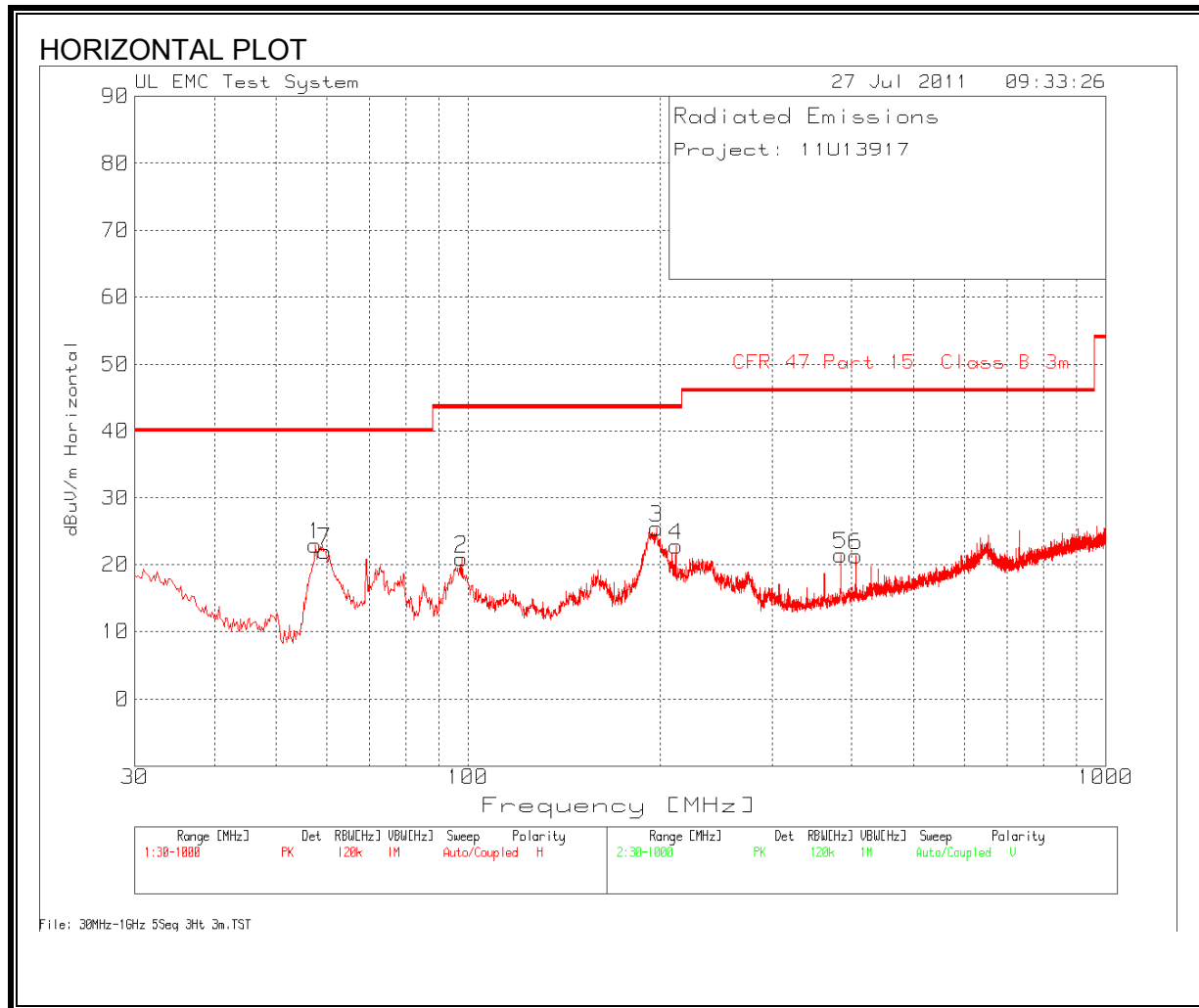
Note: No other emissions were detected above the system noise floor.

8.3. RECEIVER ABOVE 1 GHz

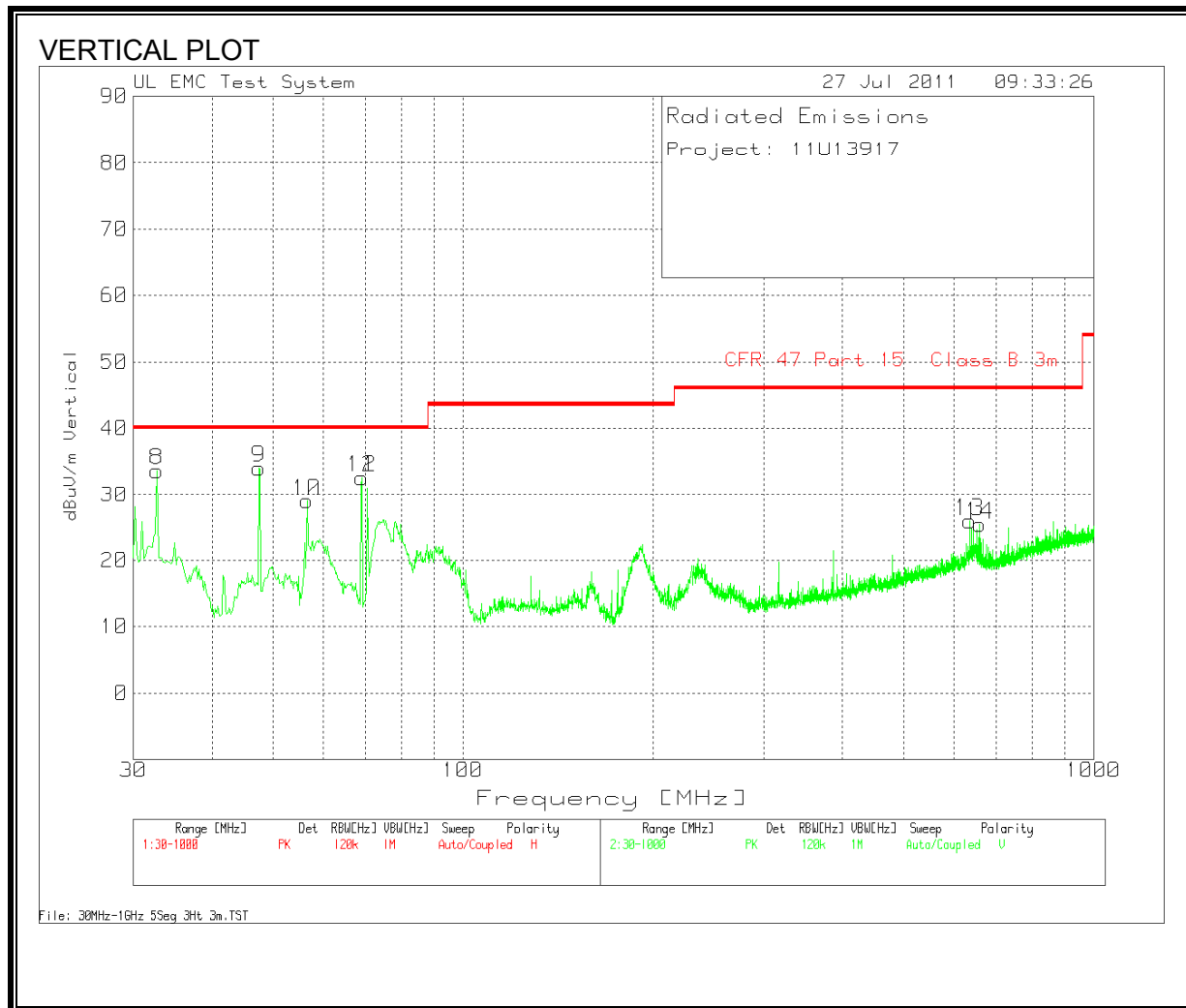
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																	
Company:		LGELECTRONICS															
Project #:		11U13917															
Date:		22/8/2011															
Test Engineer:		MENGISTU MEKURA															
Configuration:		EUT, HEADSET, AND AC ADAPTER															
Mode:		RX MODE, BT															
Test Equipment:																	
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz				Limit	
T59; S/N: 3245 @3m				T145 Agilent 3008A0056												RX RSS 210	
Hi Frequency Cables																	
3' cable 22807700				12' cable 22807600				20' cable 22807500				HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz	
3' cable 22807700				12' cable 22807600				20' cable 22807500									
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)		
1.244	3.0	44.4	32.1	24.8	2.6	-36.0	0.0	0.0	35.9	23.6	74	54	-38.1	-30.4	V		
1.522	3.0	43.3	30.4	25.9	3.0	-35.8	0.0	0.0	36.4	23.5	74	54	-37.6	-30.5	V		
2.662	3.0	42.0	30.4	29.0	4.1	-35.2	0.0	0.0	39.9	28.3	74	54	-34.1	-25.7	V		
1.124	3.0	44.8	32.6	24.4	2.5	-36.1	0.0	0.0	35.6	23.4	74	54	-38.4	-30.6	H		
1.320	3.0	43.8	30.2	25.1	2.7	-35.9	0.0	0.0	35.8	22.1	74	54	-38.2	-31.9	H		
1.870	3.0	43.0	31.0	27.1	3.3	-35.5	0.0	0.0	38.0	26.0	74	54	-36.0	-28.0	H		
Rev. 07.22.09																	
f	Measurement Frequency			Amp	Preamp Gain			Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna			D Corr	Distance Correct to 3 meters			Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading			Avg	Average Field Strength @ 3 m			Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor			Peak	Calculated Peak Field Strength			Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss			HPF	High Pass Filter												

8.4. 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

Horizontal 30 - 1000MHz										
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
57.526	42.01	PK	0.8	-28.2	8.3	22.91	40	-17.09	251	Horz
97.6519	39.04	PK	1	-28.1	8.9	20.84	43.5	-22.66	176	Horz
197.482	39.91	PK	1.4	-27.7	11.8	25.41	43.5	-18.09	176	Horz
211.8265	37.08	PK	1.4	-27.6	11.9	22.78	43.5	-20.72	99	Horz
384.1547	32.44	PK	2	-27.8	14.8	21.44	46	-24.56	99	Horz
405.9622	32.02	PK	2.1	-27.9	15.1	21.32	46	-24.68	176	Horz
59.6583	41.49	PK	0.8	-28.2	7.9	21.99	40	-18.01	251	Horz
Vertical 30 - 1000MHz										
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
32.7138	42.64	PK	0.6	-28.3	18.7	33.64	40	-6.36	176	Vert
47.446	50.81	PK	0.8	-28.2	10.6	34.01	40	-5.99	251	Vert
56.5568	47.94	PK	0.8	-28.2	8.4	28.94	40	-11.06	101	Vert
69.1567	51.58	PK	0.9	-28.1	8.2	32.58	40	-7.42	176	Vert
69.1567	51.58	PK	0.9	-28.1	8.2	32.58	40	-7.42	176	Vert
636.1531	33.1	PK	2.6	-28.4	18.6	25.9	46	-20.1	101	Vert
659.996	32.37	PK	2.7	-28.4	18.7	25.37	46	-20.63	101	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.

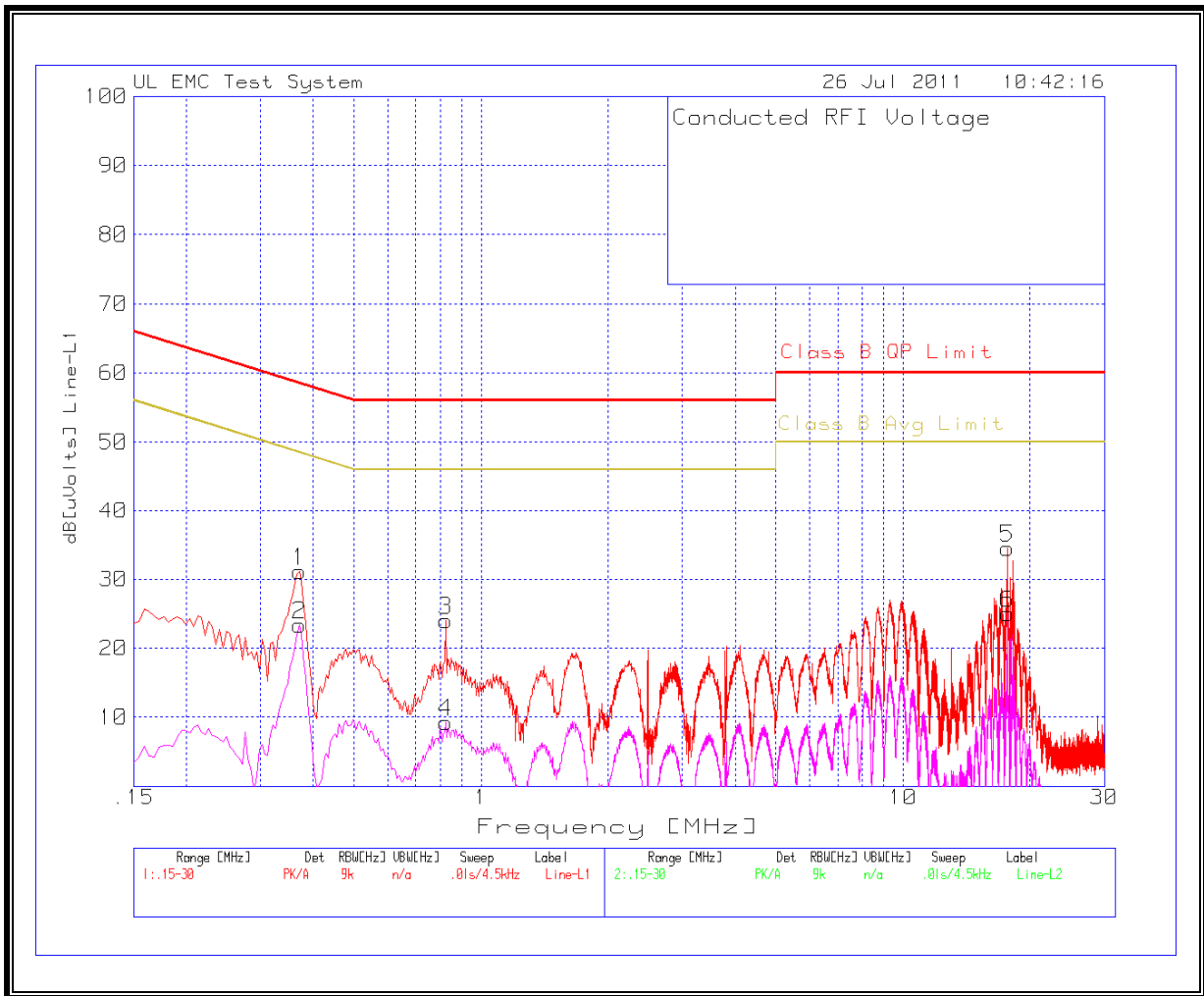
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

LG Electronics									
11U13917									
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
0.3705	31.09	PK	0	0	31.09	58.50	-27.41	48.50	-17.41
0.3705	23.34	Av	0	0	23.34	58.50	-35.16	48.50	-25.16
0.825	24.06	PK	0	0	24.06	56.00	-31.94	46.00	-21.94
0.825	9.23	Av	0	0	9.23	56.00	-46.77	46.00	-36.77
17.6955	34.54	PK	0	0	34.54	60.00	-25.46	50.00	-15.46
17.6955	25.00	Av	0	0	25.00	60.00	-35.00	50.00	-25.00
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
0.3705	29.56	PK	0	0	29.56	58.50	-28.94	48.50	-18.94
0.3705	11.58	Av	0	0	11.58	58.50	-46.92	48.50	-36.92
3.471	21.8	PK	0	0	21.80	56.00	-34.20	46.00	-24.20
3.471	1.92	Av	0	0	1.92	56.00	-54.08	46.00	-44.08
16.53	32.87	PK	0	0	32.87	60.00	-27.13	50.00	-17.13
16.53	7.74	Av	0	0	7.74	60.00	-52.26	50.00	-42.26
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									

LINE 1 RESULTS



LINE 2 RESULTS

