



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

BAR PHONE WITH 802.11b/g/n WLAN, BLUETOOTH AND BLE

MODEL NUMBER: GT-S6810L, GT-S6810B

FCC ID: A3LGTS6810L, A3LGTS6810B

REPORT NUMBER: 13I14813-3

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Prepared for

SAMSUNG ELECTRONICS CO., LTD.

416, MAETAN 3-DONG, YEONGTONG-GU

SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA

Prepared by

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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--	02/04/13	Initial Issue	Tim Lee

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	6
4.1. MEASURING INSTRUMENT CALIBRATION	6
4.2. SAMPLE CALCULATION	6
4.3. MEASUREMENT UNCERTAINTY	6
5. EQUIPMENT UNDER TEST	7
5.1. DESCRIPTION OF EUT	7
5.2. MAXIMUM OUTPUT POWER.....	7
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	7
5.4. SOFTWARE AND FIRMWARE.....	7
5.5. WORST-CASE CONFIGURATION AND MODE.....	8
5.1. DESCRIPTION OF TEST SETUP.....	9
5.2. TEST AND MEASUREMENT EQUIPMENT.....	11
6. ANTENNA PORT TEST RESULTS	12
6.1. BASIC DATA RATE GFSK MODULATION	12
6.1.1. 20 dB BANDWIDTH.....	12
6.1.2. HOPPING FREQUENCY SEPARATION	16
6.1.3. NUMBER OF HOPPING CHANNELS.....	18
6.1.4. AVERAGE TIME OF OCCUPANCY	23
6.1.5. OUTPUT POWER	30
6.1.6. AVERAGE POWER	34
6.1.7. CONDUCTED SPURIOUS EMISSIONS.....	35
6.2. ENHANCED DATA RATE 8PSK MODULATION	44
6.2.1. 20 dB BANDWIDTH.....	44
6.2.2. HOPPING FREQUENCY SEPARATION	48
6.2.3. NUMBER OF HOPPING CHANNELS.....	50
6.2.4. AVERAGE TIME OF OCCUPANCY	55
6.2.5. OUTPUT POWER	62
6.2.6. AVERAGE POWER	66
6.2.7. CONDUCTED SPURIOUS EMISSIONS.....	67
7. RADIATED TEST RESULTS.....	76
7.1. LIMITS AND PROCEDURE	76
7.2. TRANSMITTER ABOVE 1 GHz	77
7.2.1. BASIC DATA RATE GFSK MODULATION	77
7.2.2. ENHANCED DATA RATE 8PSK MODULATION	86

7.3.	<i>WORST-CASE BELOW 1 GHz</i>	95
8.	AC POWER LINE CONDUCTED EMISSIONS	97
9.	SETUP PHOTOS	101
9.1.	<i>ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP</i>	101
9.2.	<i>RADIATED RF MEASUREMENT SETUP</i>	102
9.3.	<i>RADIATED RF MEASUREMENT SETUP FOR XYZ CONFIGURATION</i>	104
9.4.	<i>POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP</i>	110

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO, 443-742, SOUTH KOREA

EUT DESCRIPTION: BAR PHONE WITH WLAN 802.11b/g/n, BT, AND BLE

MODEL: GT-S6810L, GT-S6810B

SERIAL NUMBER: 4790132033afbf00 (RADIATED) and
479013203f5ebf00 (ANTENNA PORT)

DATE TESTED: JANUARY 24, 2013 to FEBRUARY 4, 2013

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

Approved & Released For UL CCS By:

Tested By:



TIM LEE
WISE PROGRAM MANAGER
UL CCS

DENNIS HUANG
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2009, 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:

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

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 bar-style cell phone featuring 802.11b/g/n WLAN, Bluetooth, BLE, GPS and 2.4 GHz mobile hotspot capability.

The unit supports AFH mode. The manufacturer attested the following.

- It is in compliance with Bluetooth Specification 1.2 or later specification.
- The number of hopping channel in AFH mode is 20 channels.
- The output power do not transmit over than 125mW
- The channel separation is based upon 2/3 of 20 dB channel bandwidth.

Testing of Model GT-S6810L (FCC ID: A3LGTS6810L) is considered representative of Model GT-S6810B (FCC ID: A3LGTS6810B). Model GT-S6810L is identical to Model GT-S6810B except for the WWAN functions. Both the WLAN and WWAN antenna locations for both models are identical.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	10.95	12.45
2402 - 2480	Enhanced 8PSK	10.61	11.51

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna with a maximum gain of -1.41 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was S6810L.010.

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 fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that the Y-orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y-orientation.

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

5.1. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung Electronics	ETA0U10EBE	RT3C421mS/7-E	DoC
Headset	Samsung Electronics	EHS61ASFWE	None	DoC

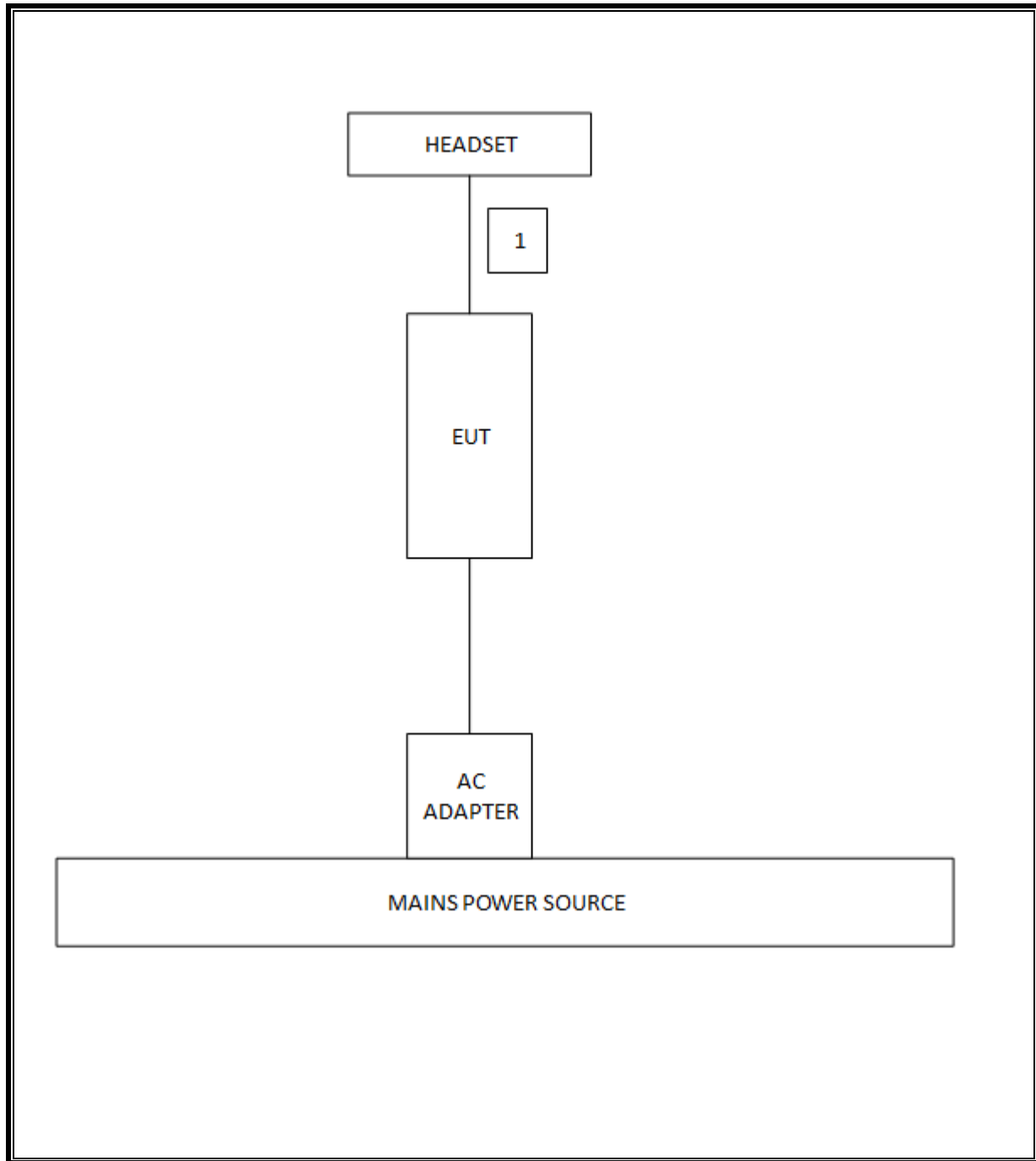
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Headset	1	Audio	Shielded	1m	N/A

TEST SETUP

The EUT is a stand-alone unit that was tested in the worst case orientation and configuration, where applicable, during the tests. Test software exercised the radio.

SETUP DIAGRAM FOR TESTS



5.2. 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
Antenna, Horn, 18 GHz	EMCO	3115	C00872	09/20/12	09/20/13
Antenna, Horn, 26.5 GHz	ARA	SWH-28	C01015	04/23/12	04/23/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/12	10/21/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/21/12	10/21/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	02/21/12	02/21/13
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRC13192	N02683	CNR	CNR
Bilog 30-2000MHz	Sunol	JB1		02/07/12	02/07/13
Power meter	HP	437B	T226	06/25/12	06/25/13
Power Sensor	HP	8481A	T233	06/26/12	06/26/13
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	01/14/13	01/14/14
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	N02481	03/07/12	03/07/13

6. ANTENNA PORT TEST RESULTS

6.1. BASIC DATA RATE GFSK MODULATION

6.1.1. 20 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

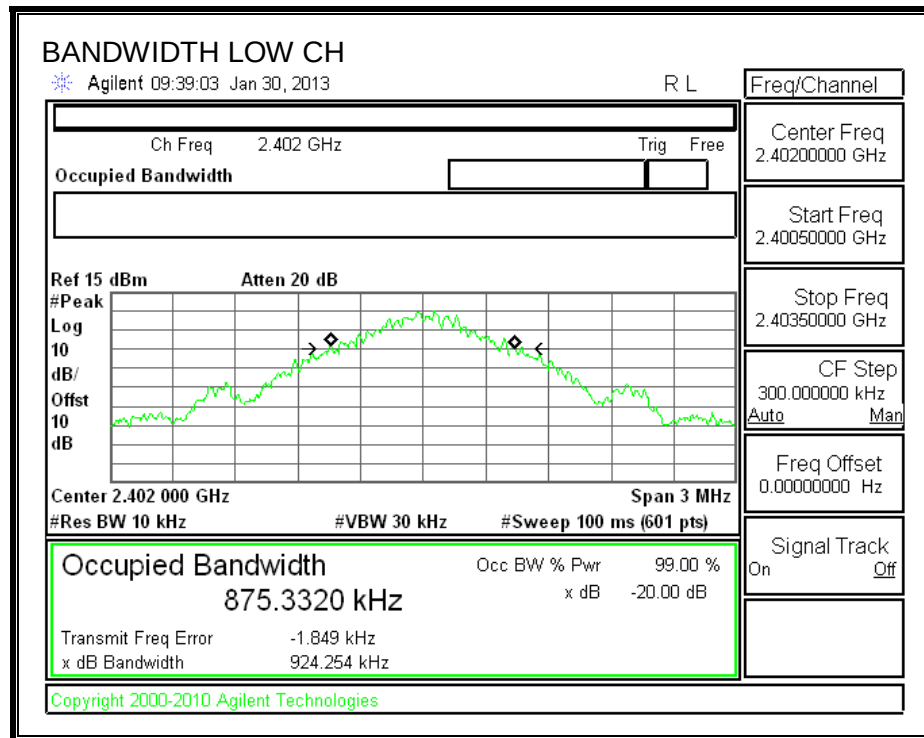
TEST PROCEDURE

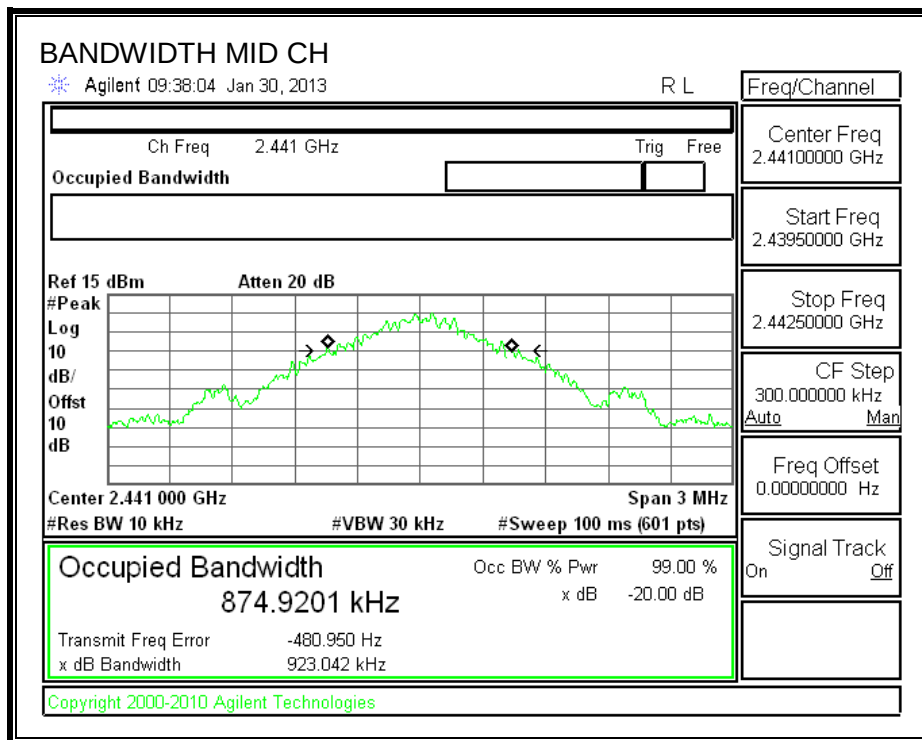
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

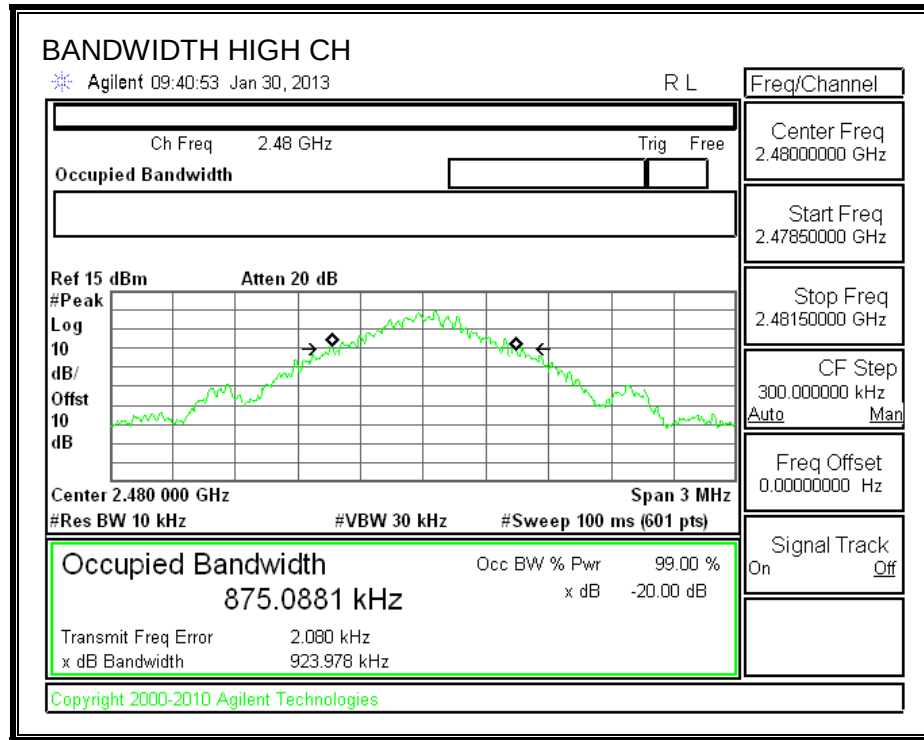
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	2402	924.254
Middle	2441	923.042
High	2480	923.978

20 dB BANDWIDTH







6.1.2. 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.

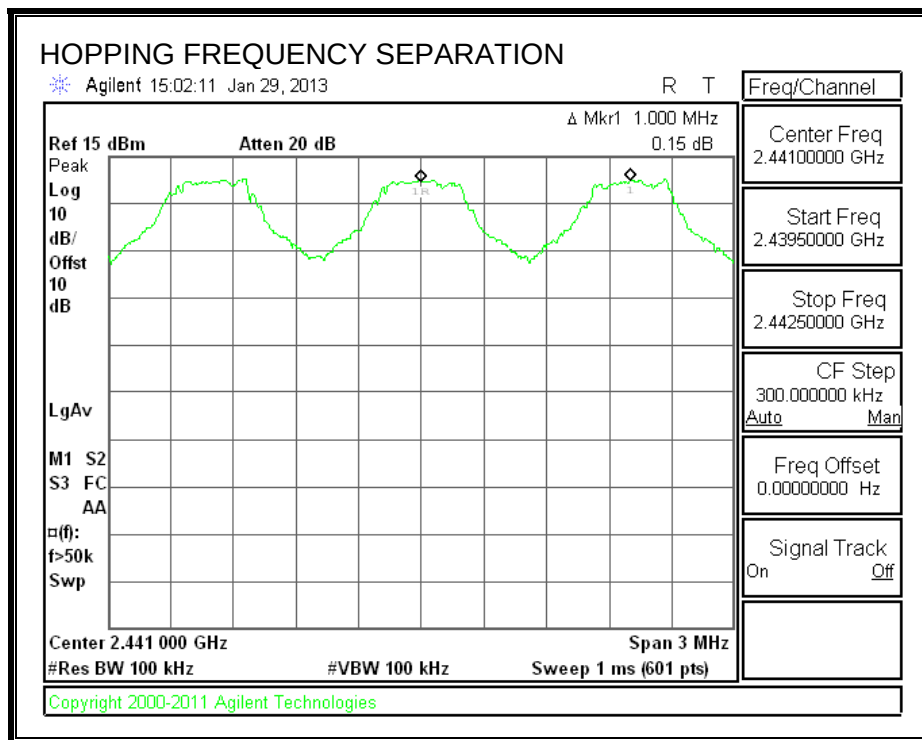
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



6.1.3. 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.

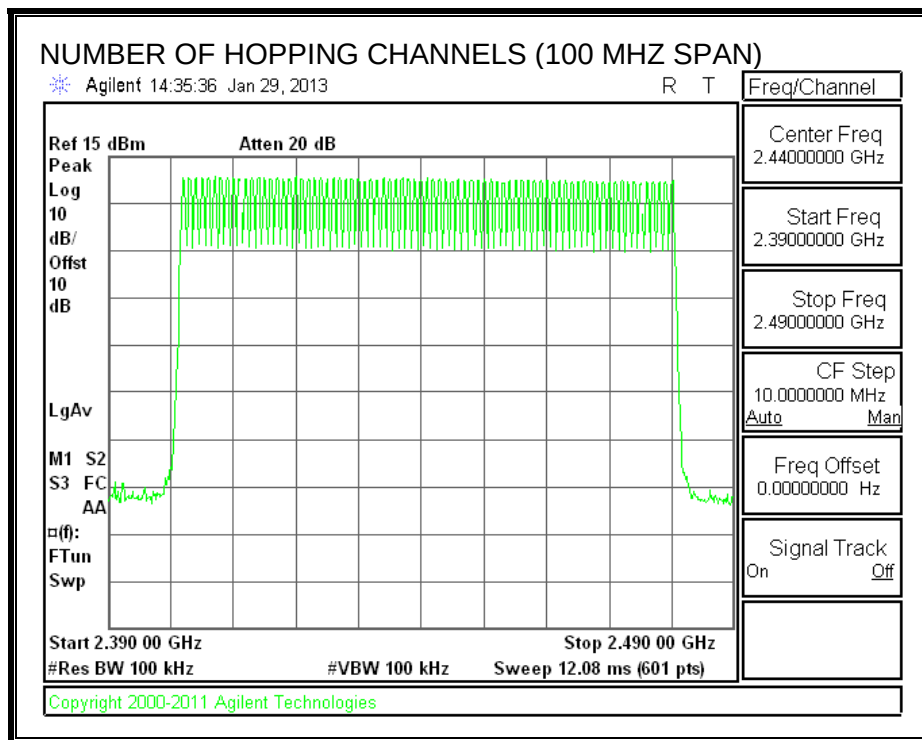
TEST PROCEDURE

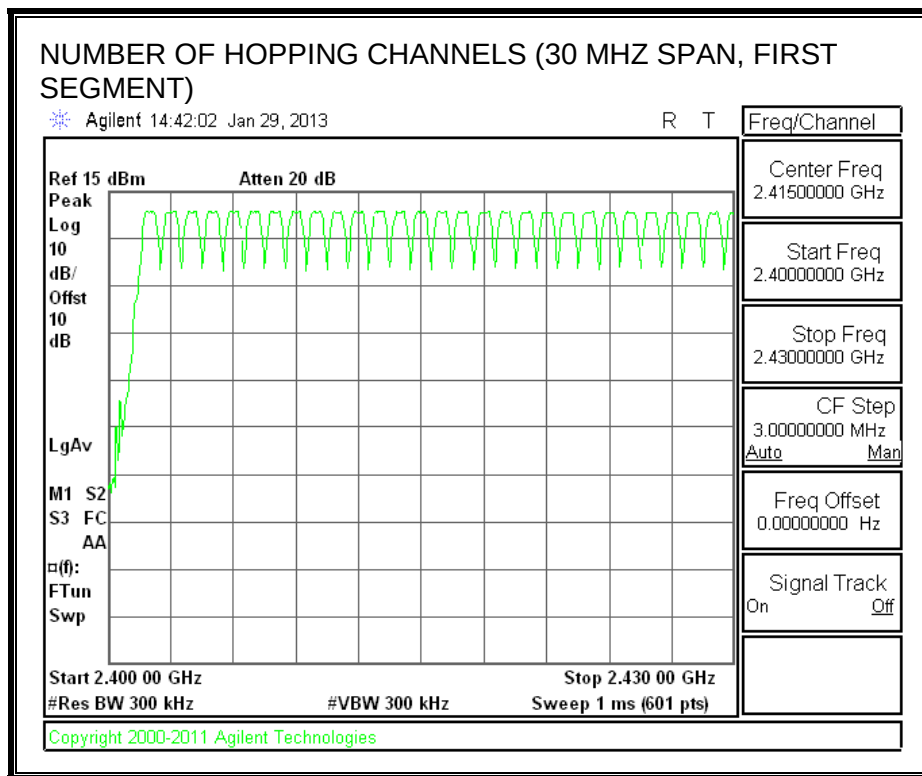
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

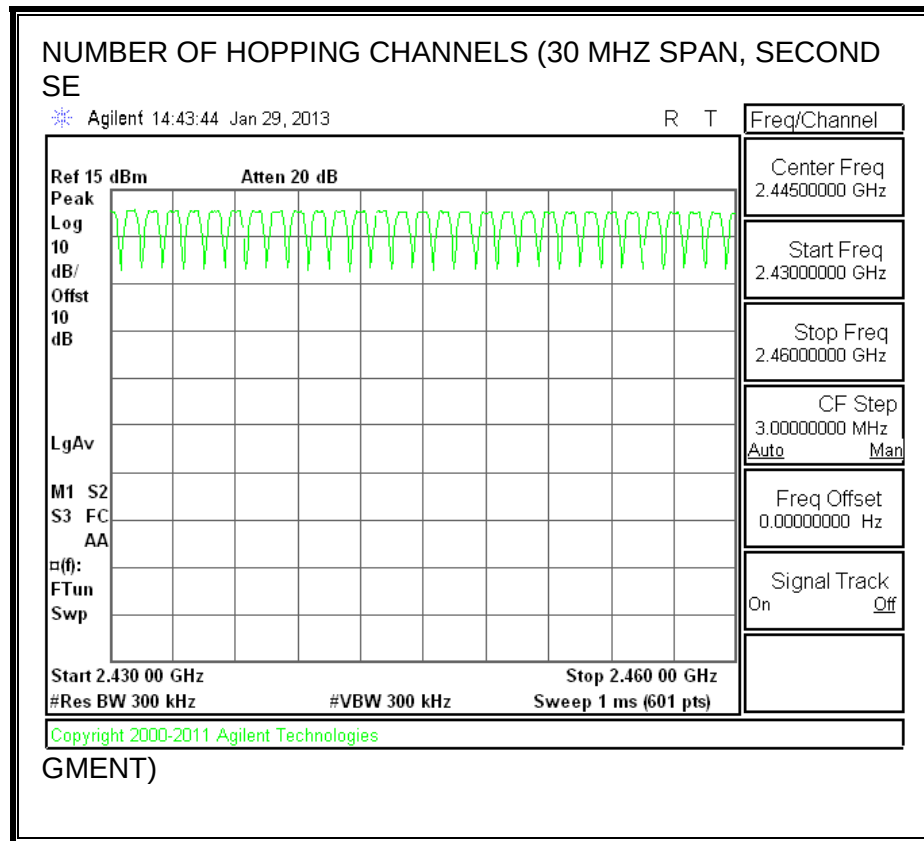
RESULTS

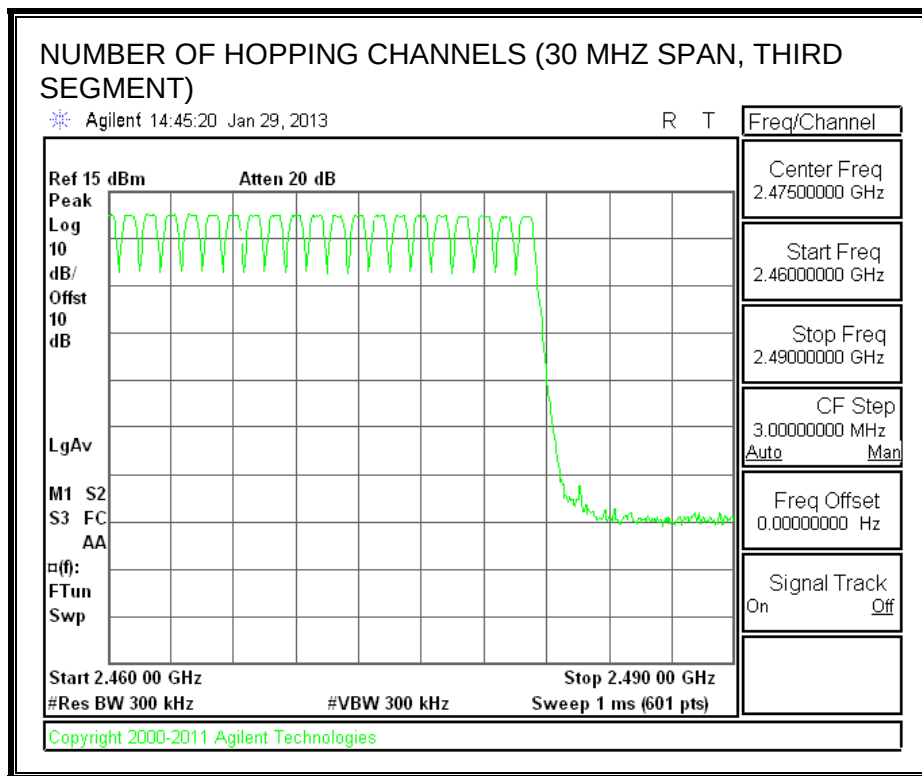
Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS









6.1.4. 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.

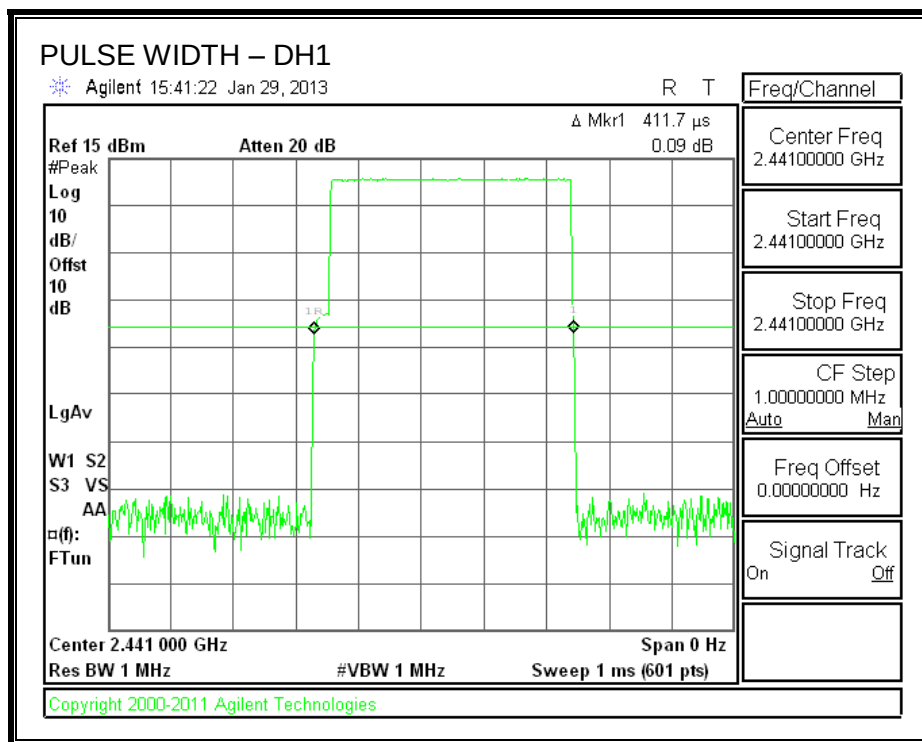
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

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

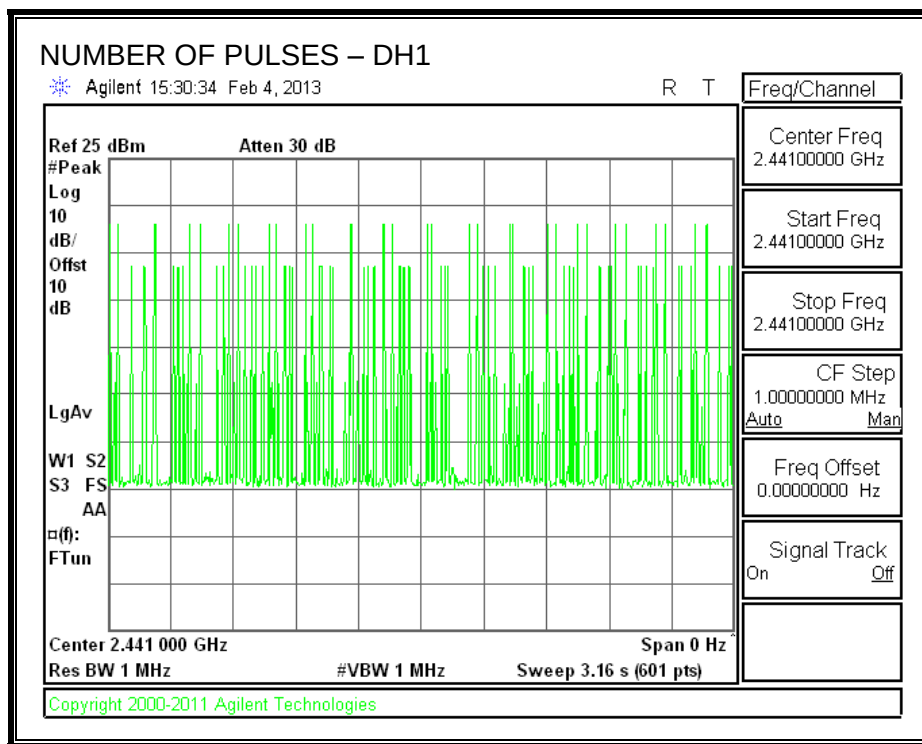
RESULTS

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	0.4117	30	0.124	0.4	-0.276
DH3	1.675	17	0.285	0.4	-0.115
DH5	2.92	12	0.350	0.4	-0.050

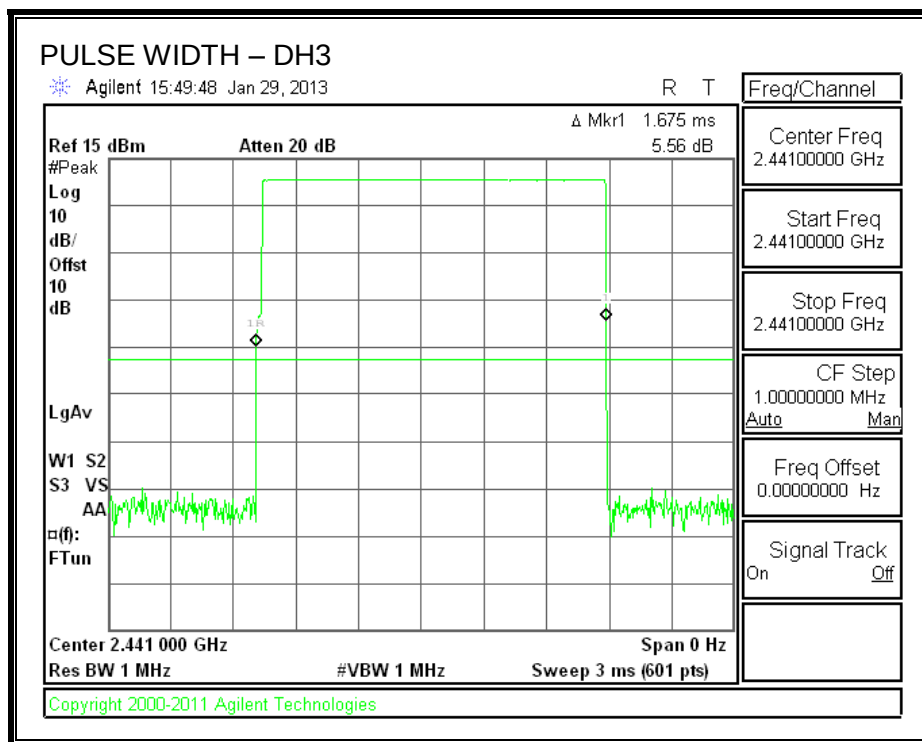
PULSE WIDTH - DH1



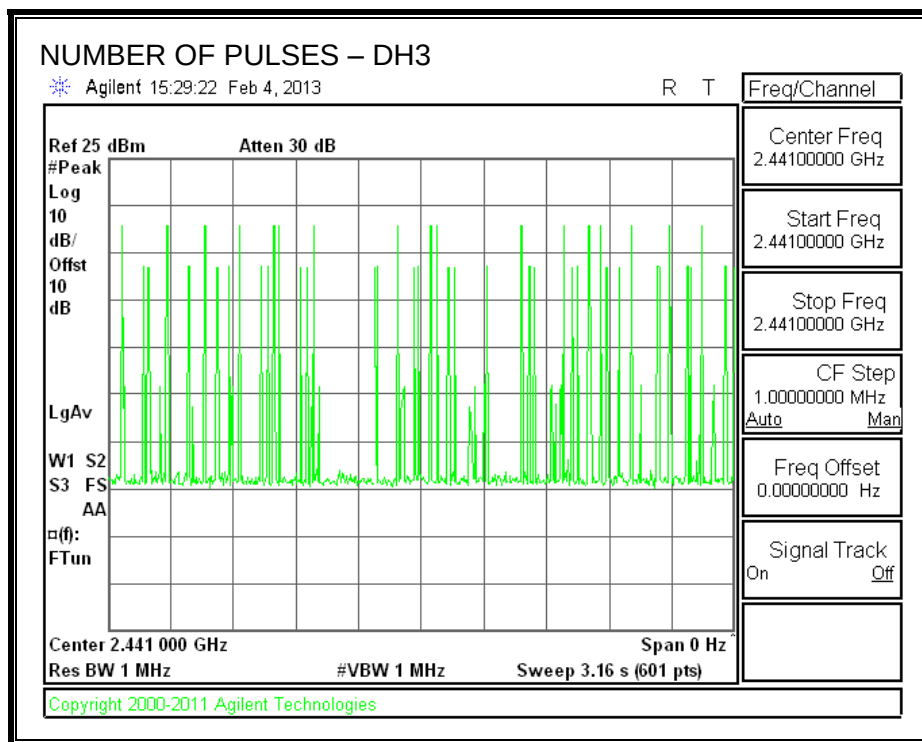
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



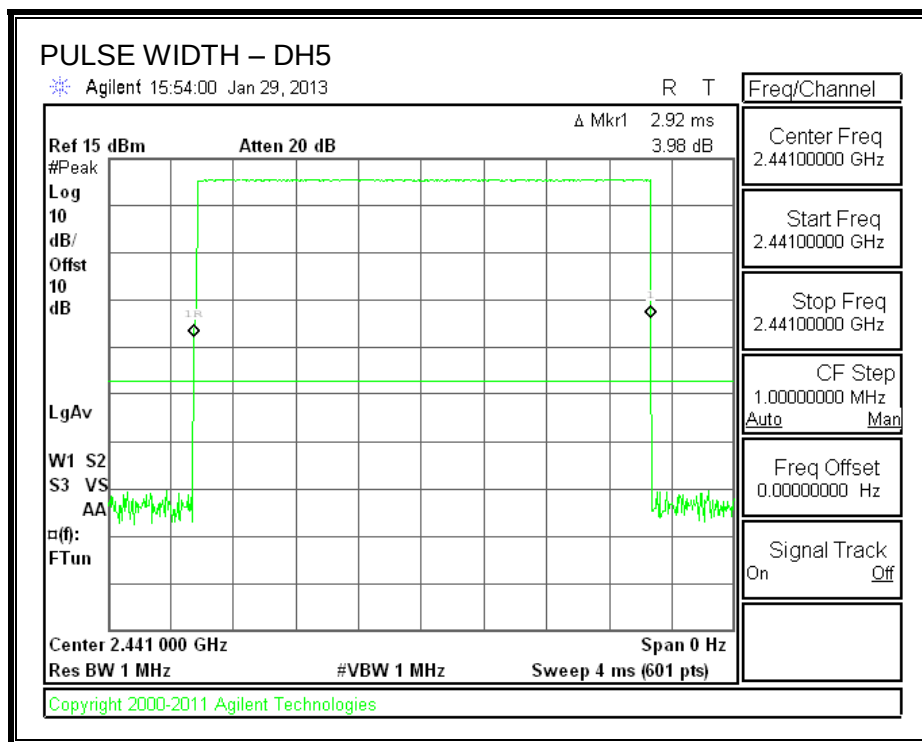
PULSE WIDTH – DH3



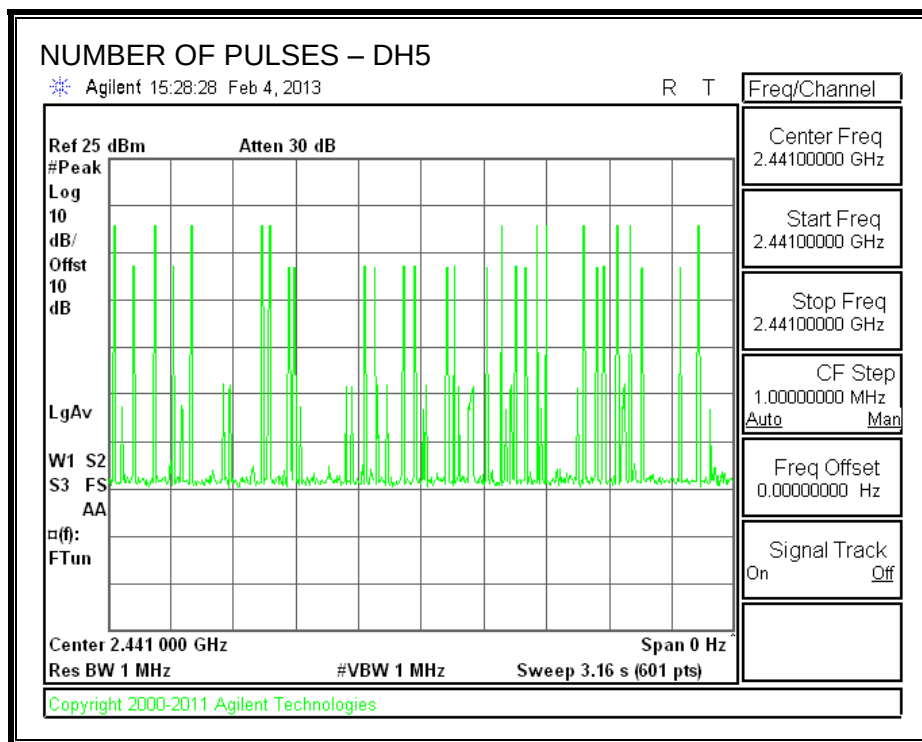
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



6.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

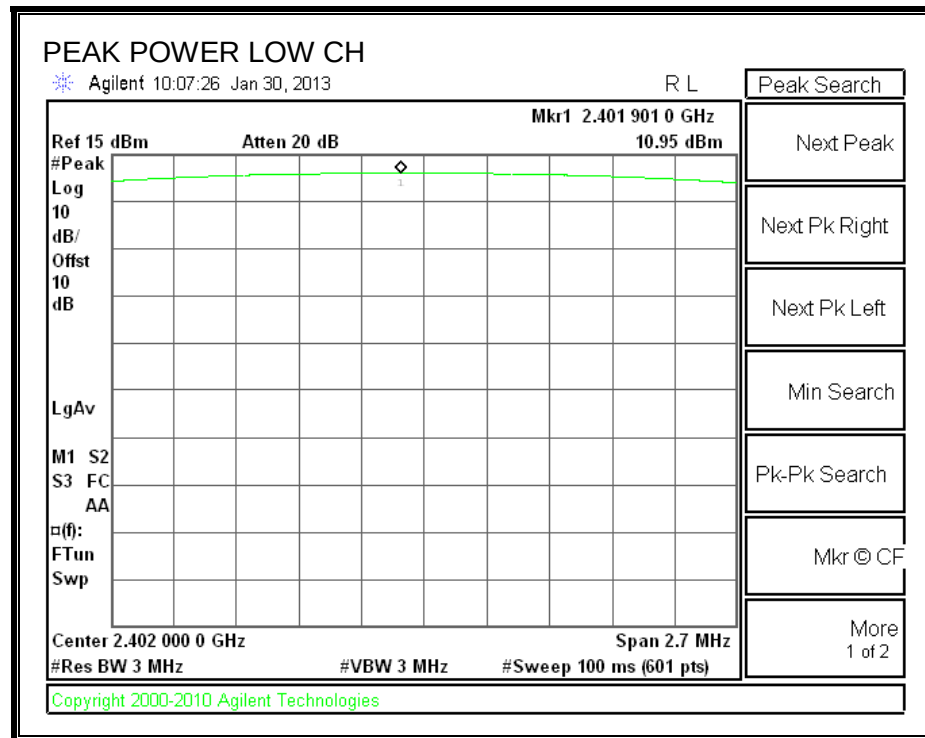
The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

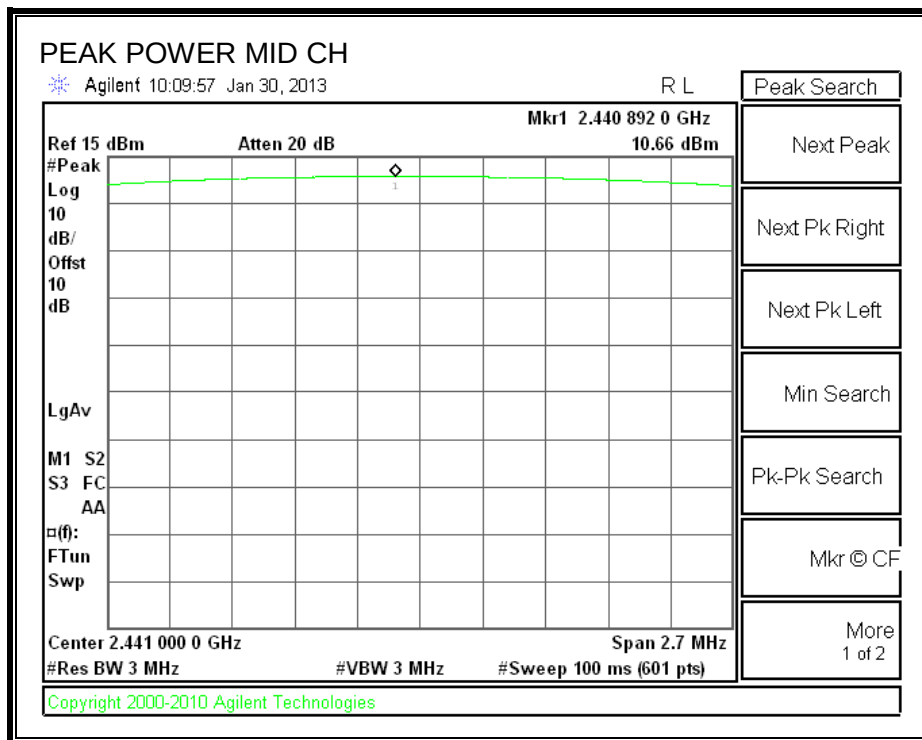
TEST PROCEDURE

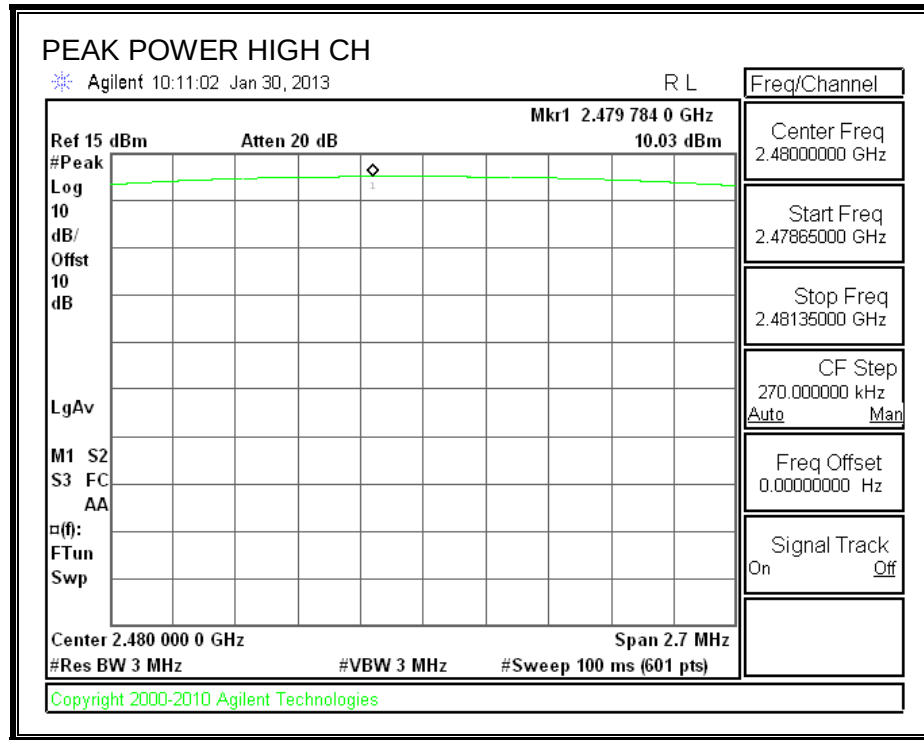
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.95	30	-19.05
Middle	2441	10.66	30	-19.34
High	2480	10.03	30	-19.97







6.1.6. 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 10 dB pad was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.68
Middle	2441	9.39
High	2480	8.81

6.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

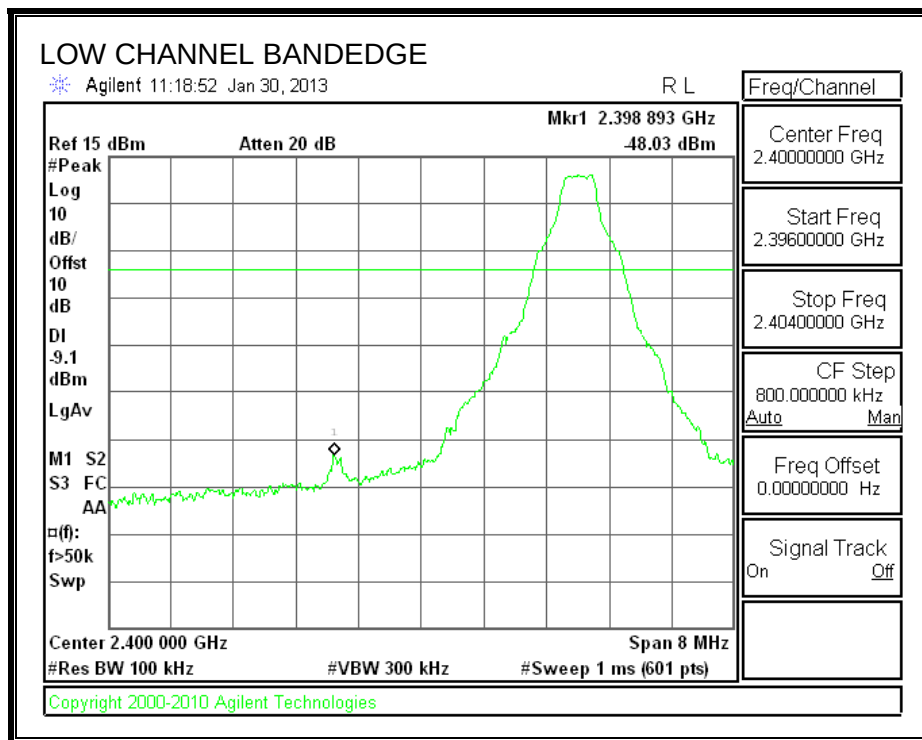
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

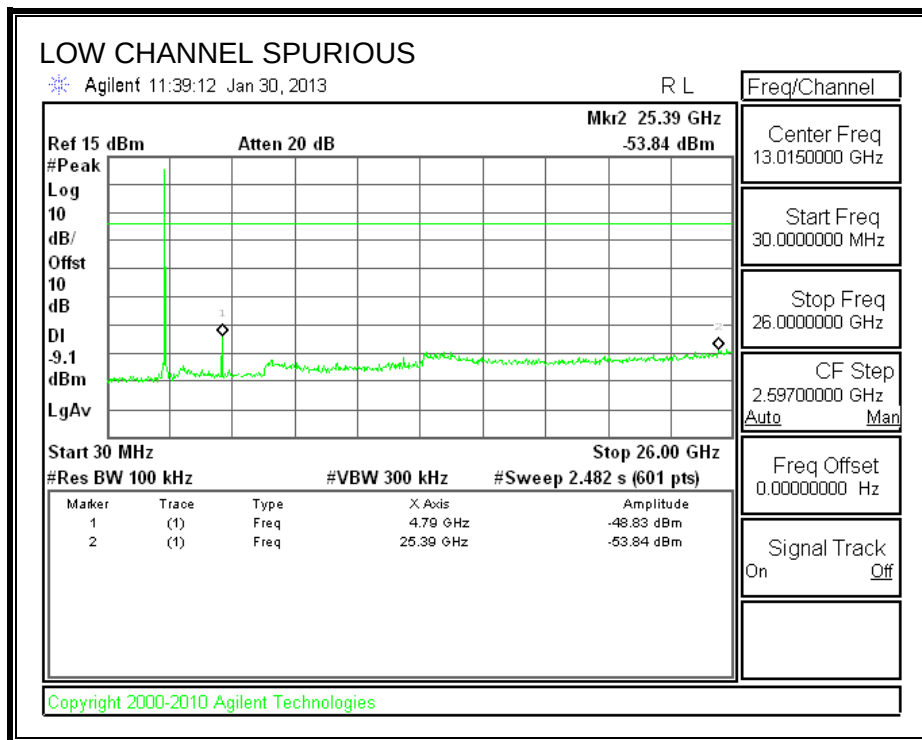
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

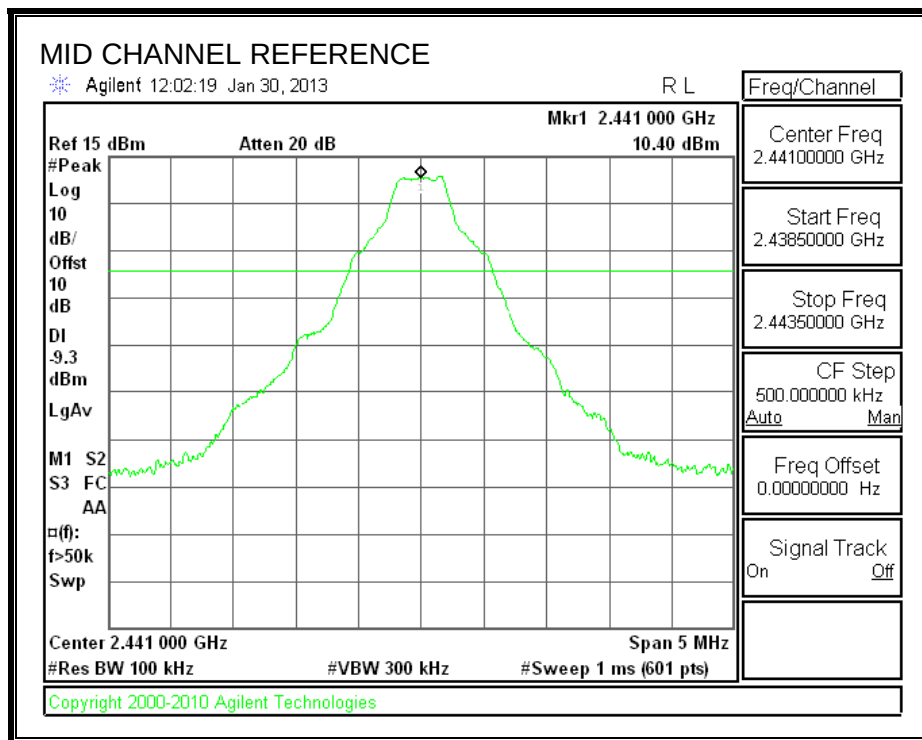
RESULTS

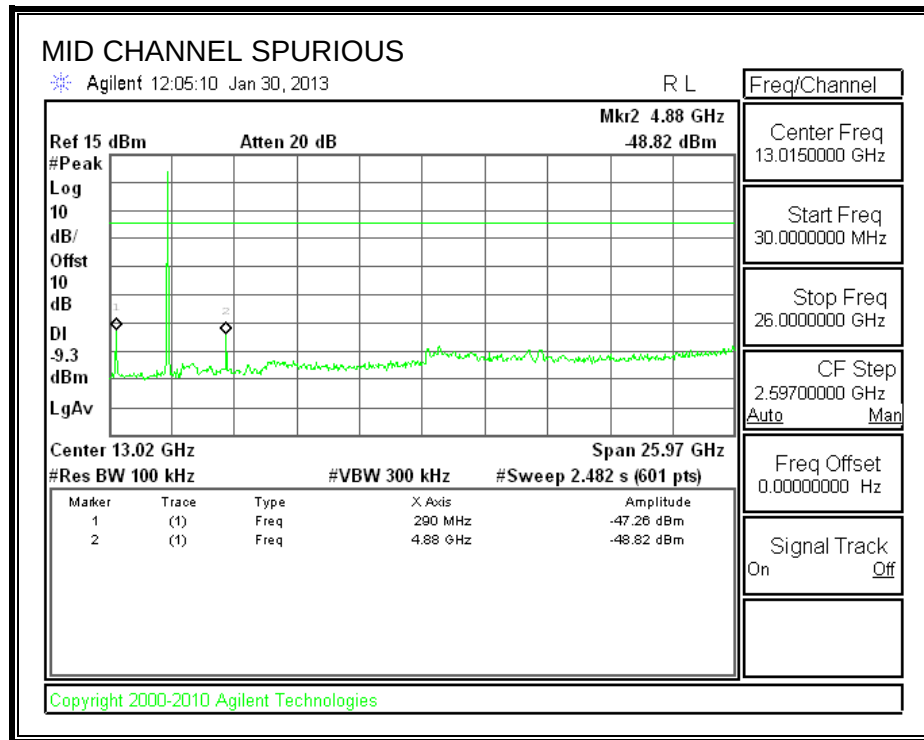
SPURIOUS EMISSIONS, LOW CHANNEL



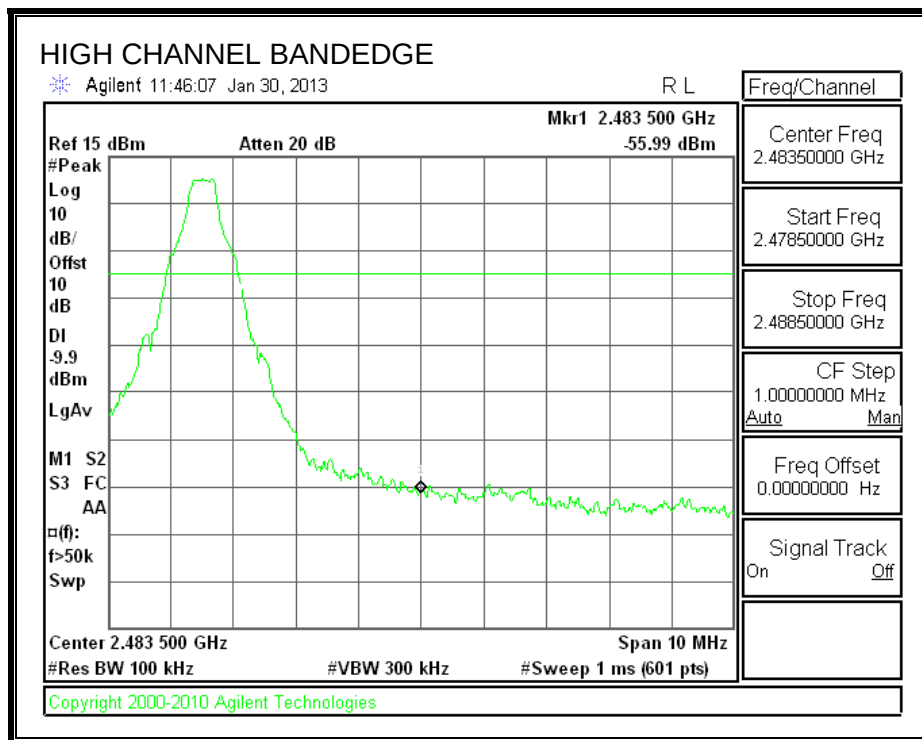


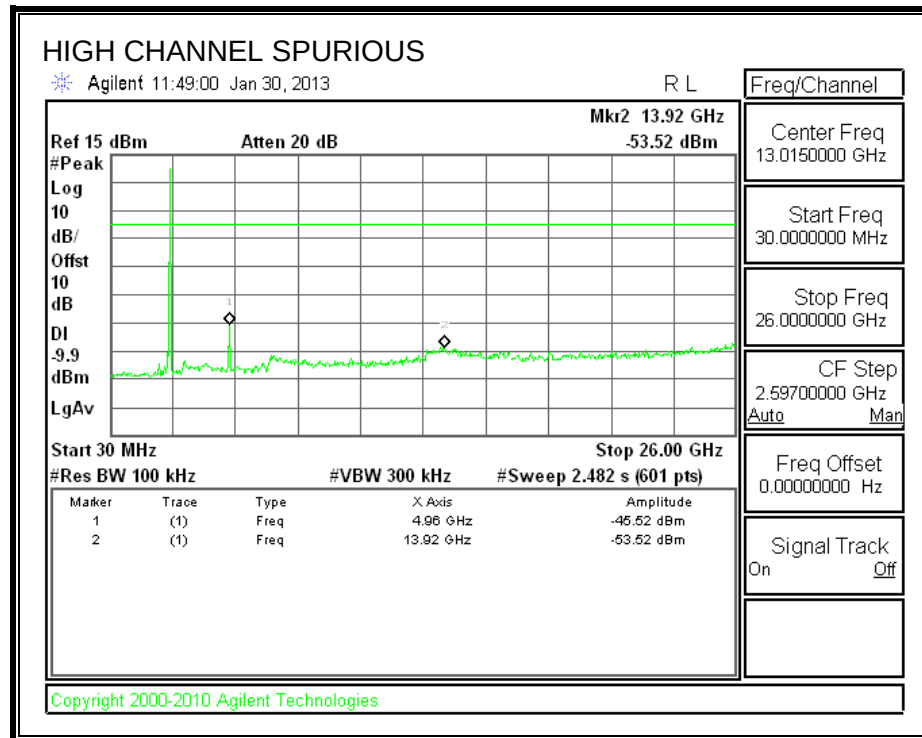
SPURIOUS EMISSIONS, MID CHANNEL



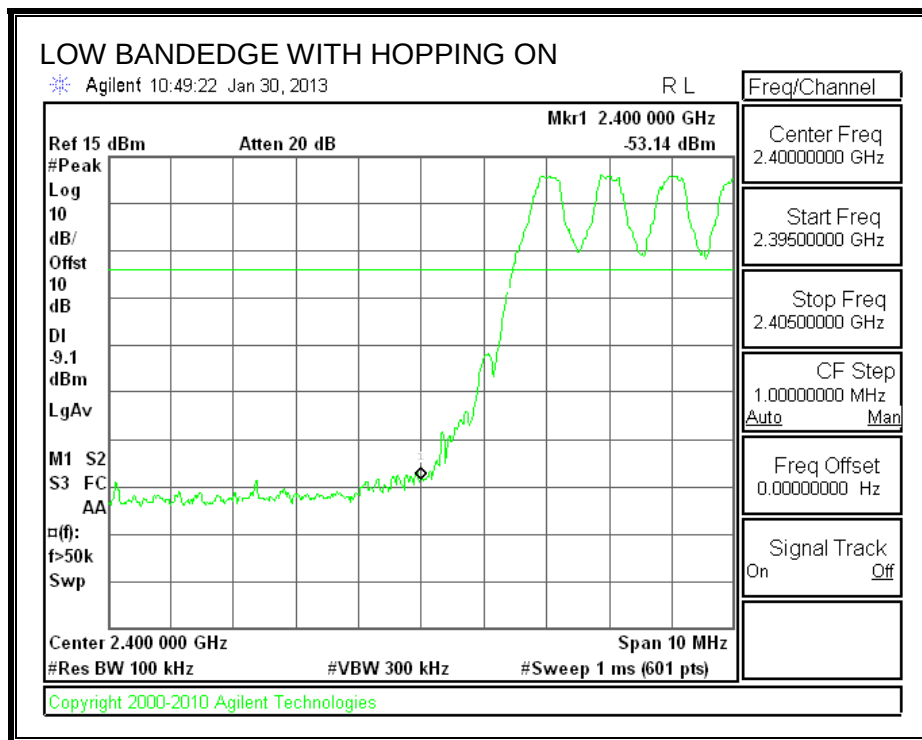


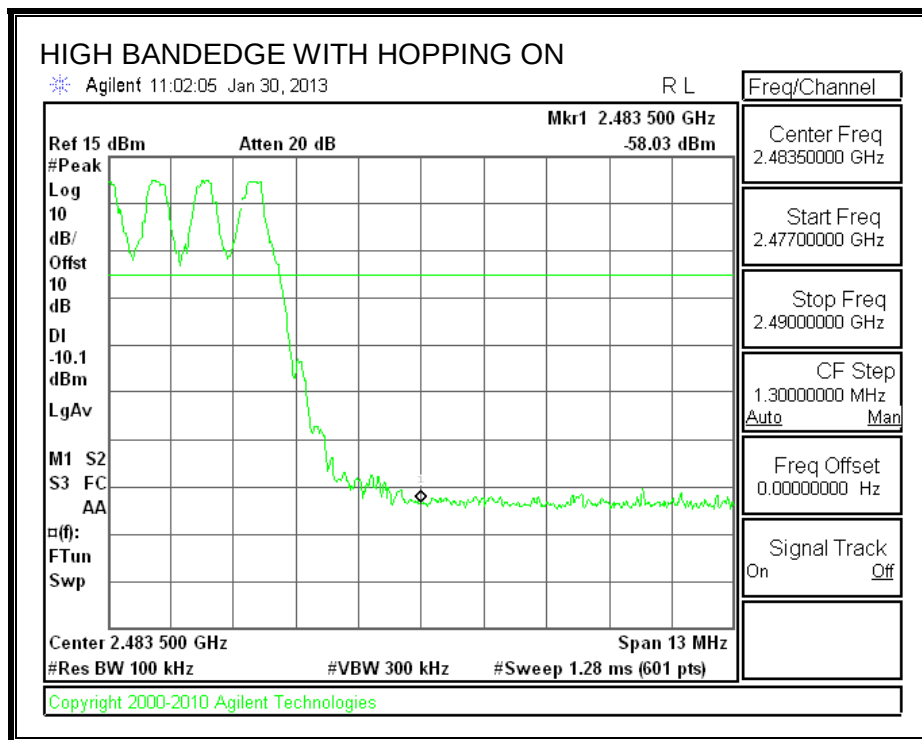
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





6.2. ENHANCED DATA RATE 8PSK MODULATION

6.2.1. 20 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

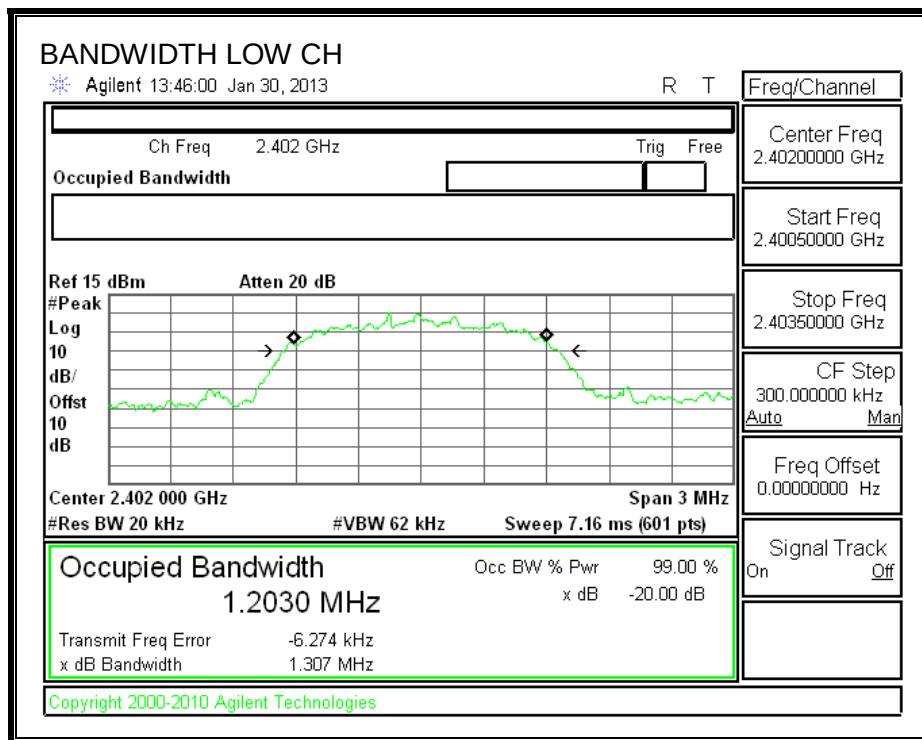
TEST PROCEDURE

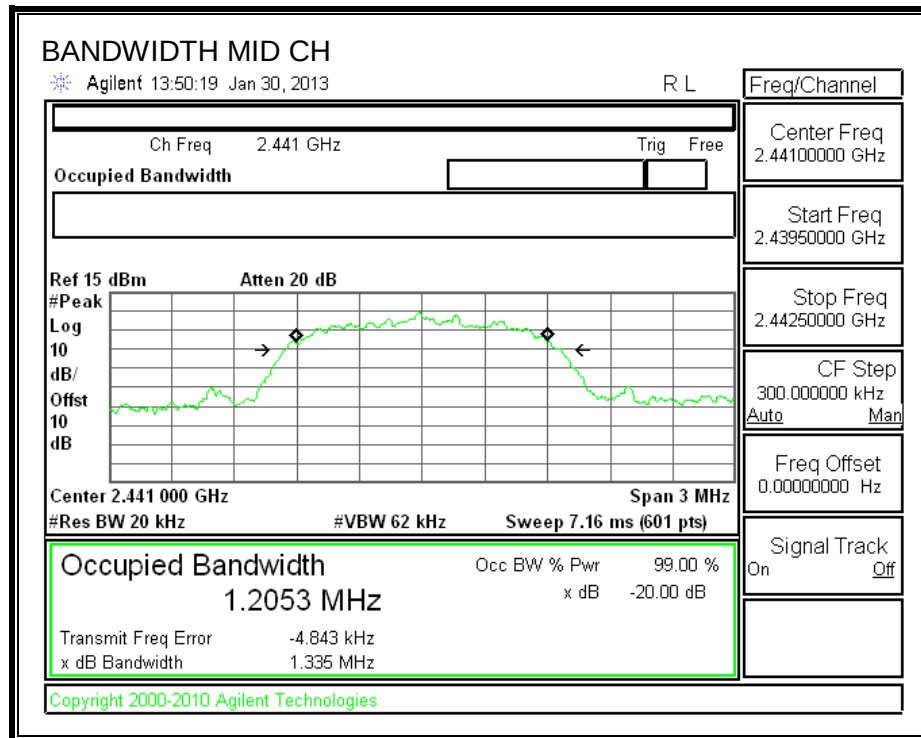
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

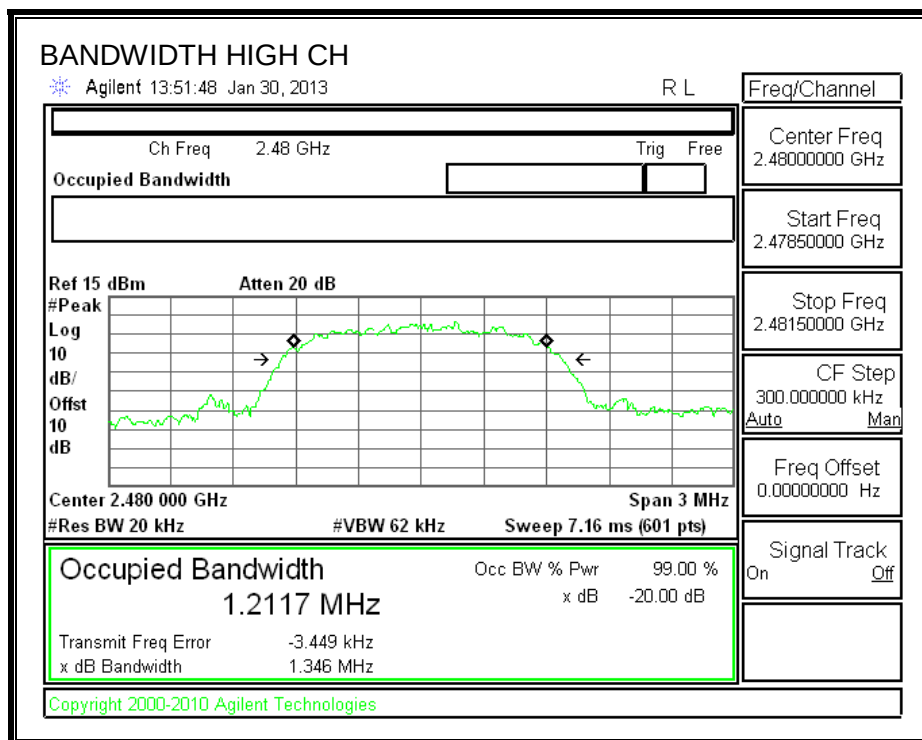
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	2402	1307
Middle	2441	1335
High	2480	1346

20 dB BANDWIDTH







6.2.2. 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.

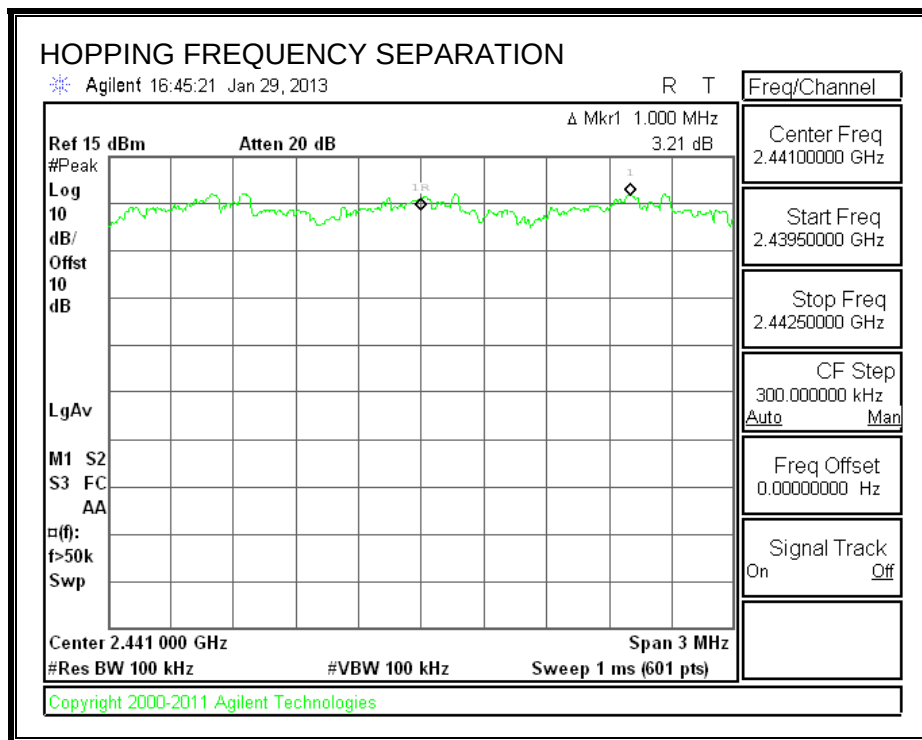
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



6.2.3. 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.

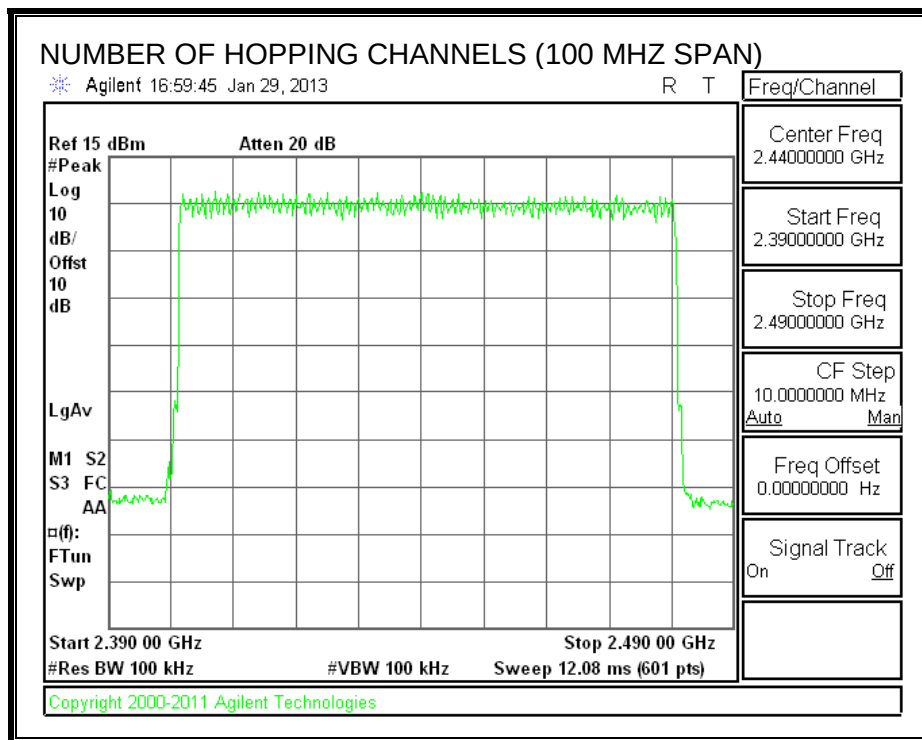
TEST PROCEDURE

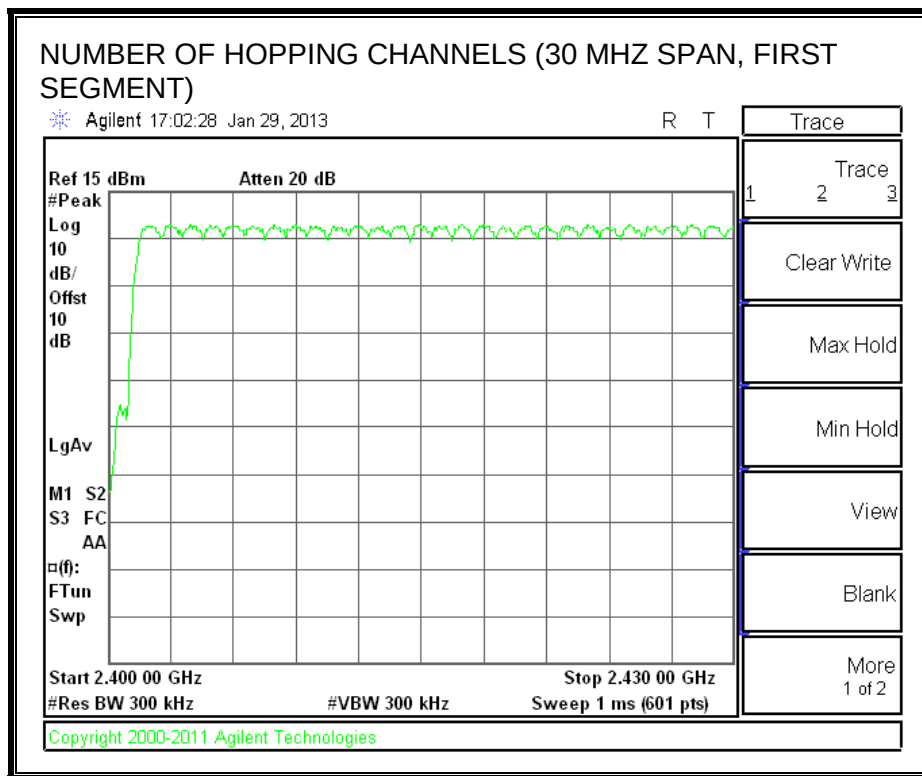
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

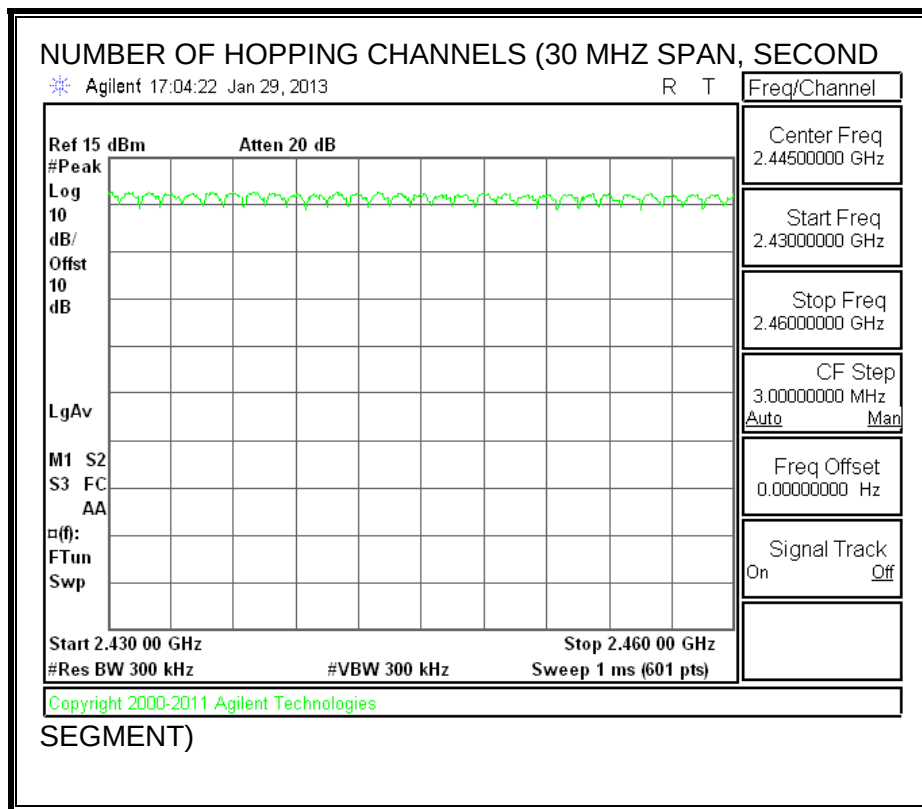
RESULTS

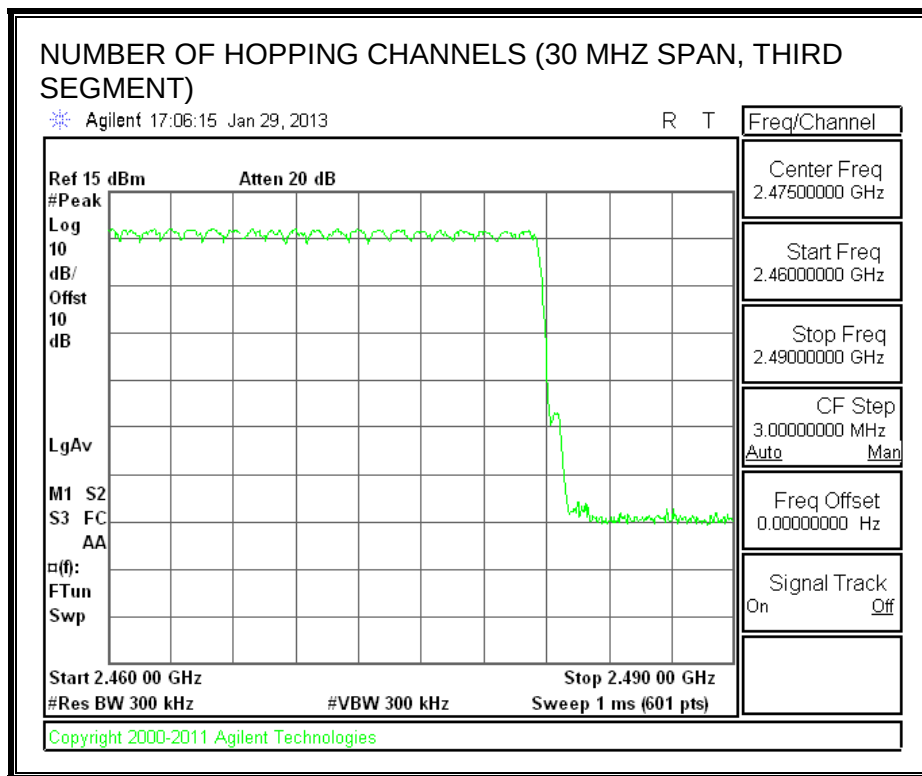
Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS









6.2.4. 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

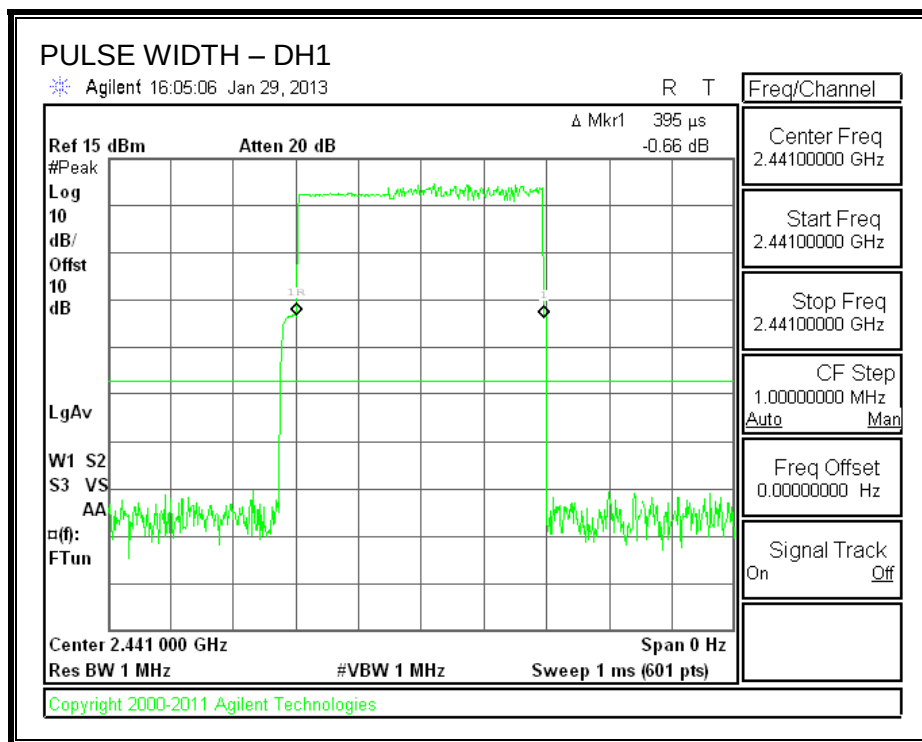
Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

8PSK (EDR) Mode

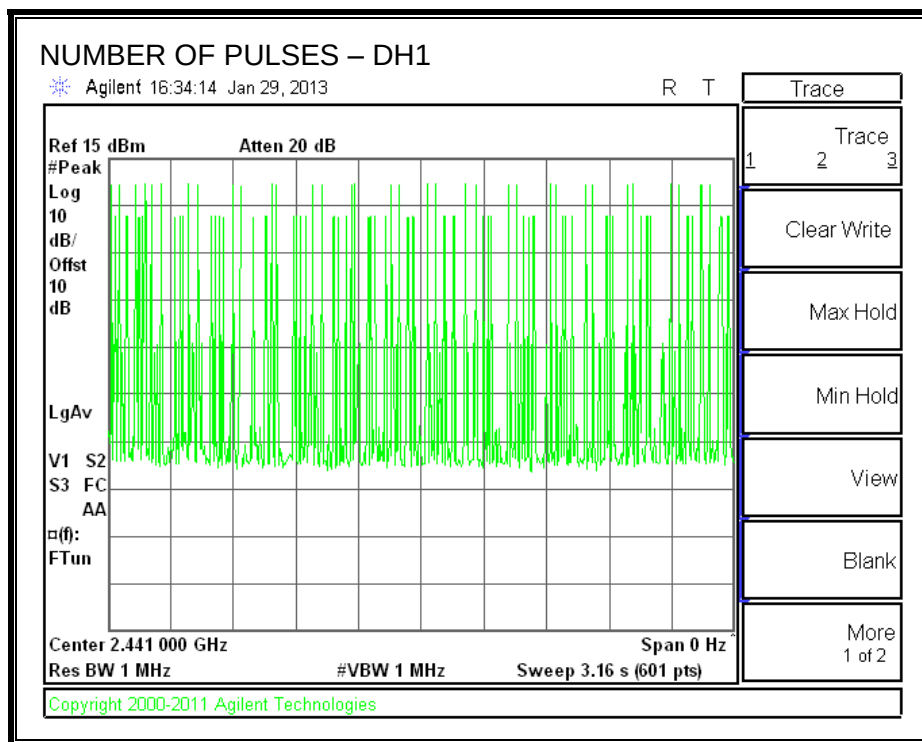
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.395	34	0.134	0.4	-0.266
DH3	1.66	13	0.216	0.4	-0.184
DH5	2.913	13	0.379	0.4	-0.021

Note: for AFH (8PSK) mode, please refer to the results of AFH (GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate on page 21 demonstrates compliance with channel occupancy when AFH is employed.

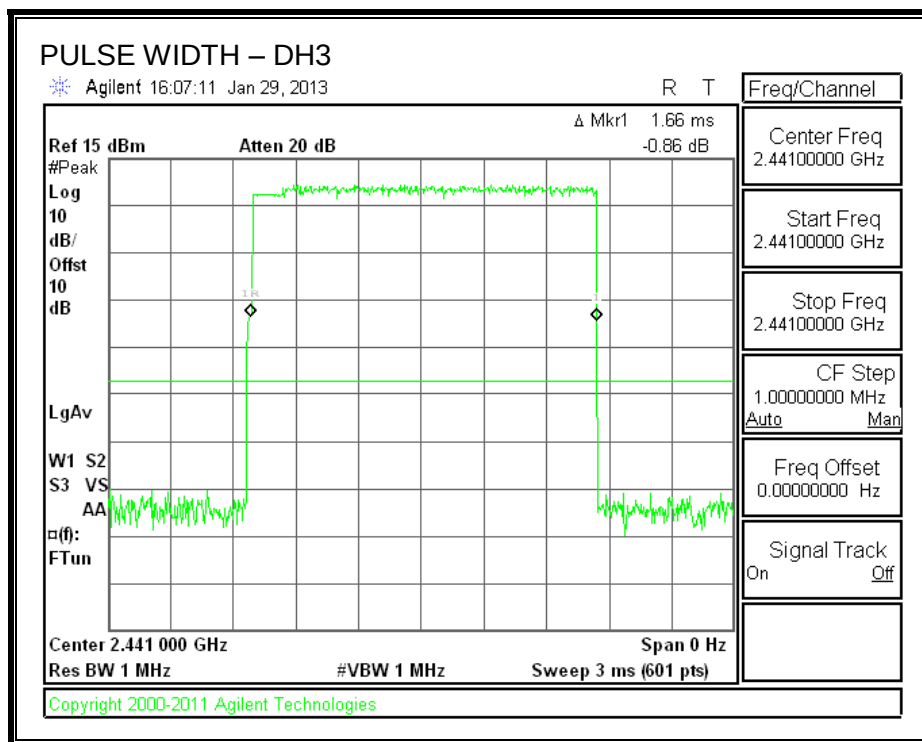
PULSE WIDTH - DH1



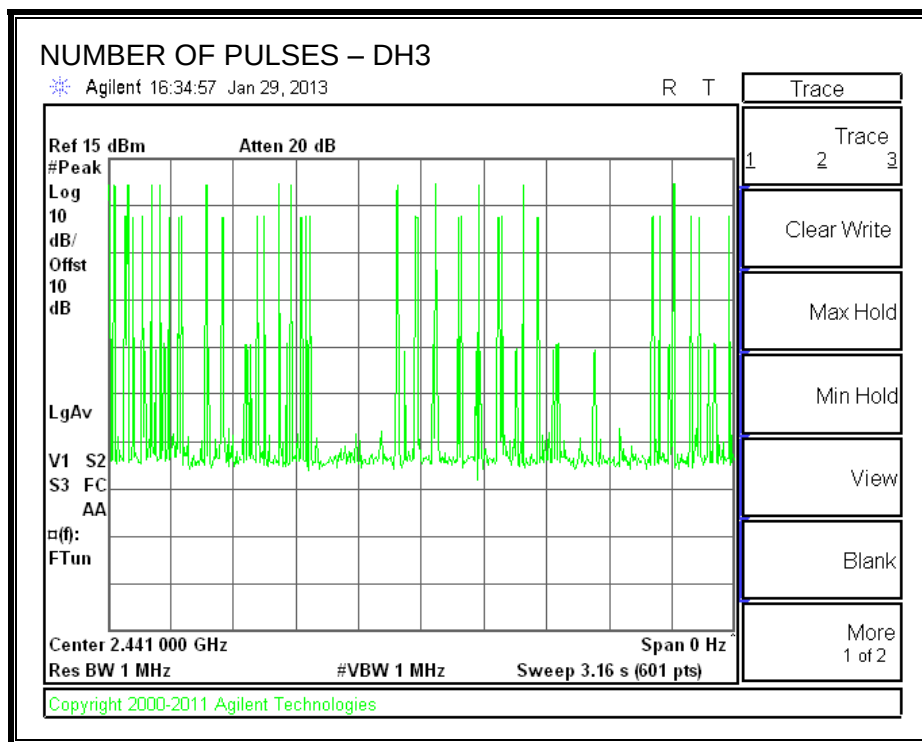
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



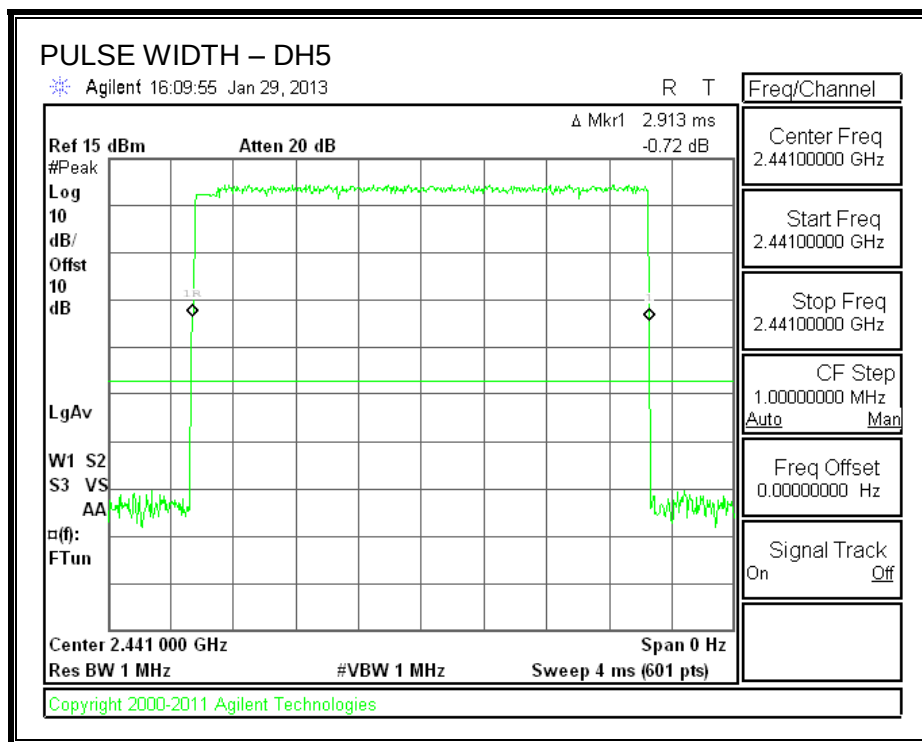
PULSE WIDTH – DH3



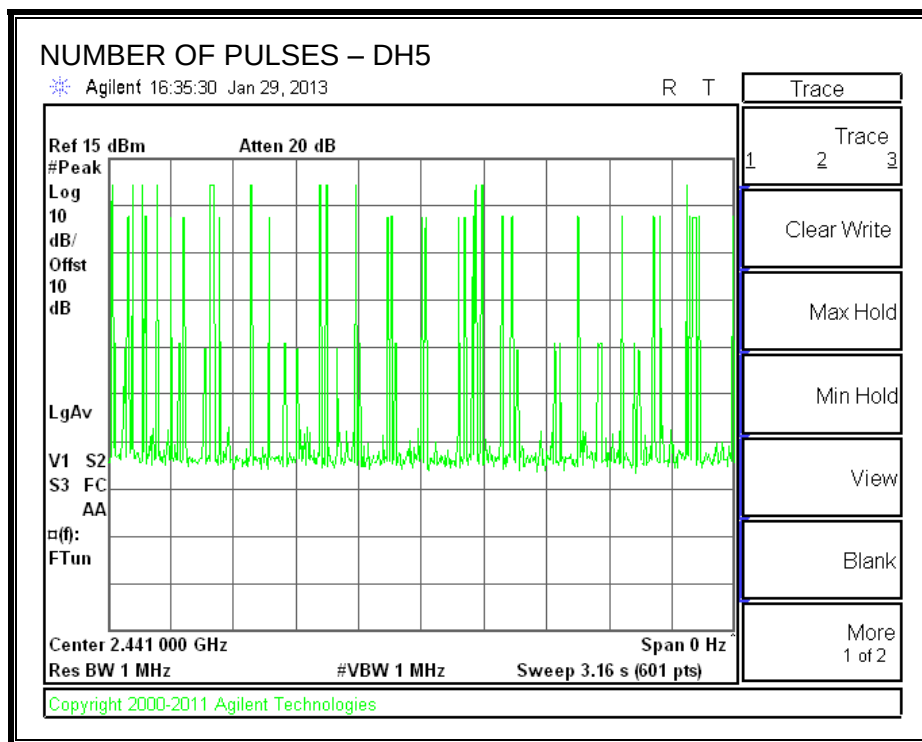
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



6.2.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

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

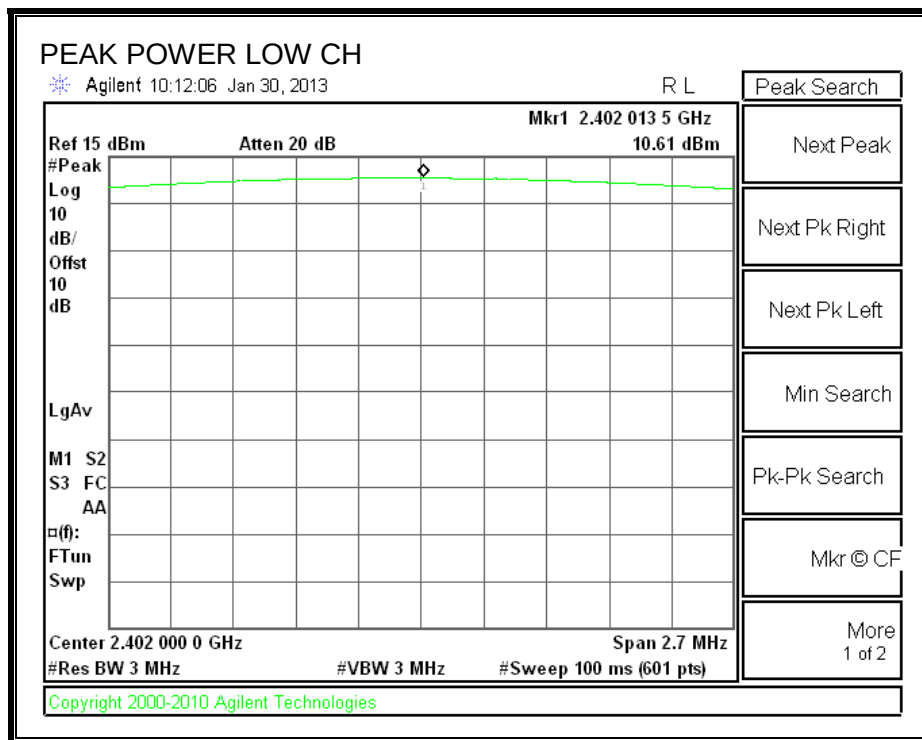
TEST PROCEDURE

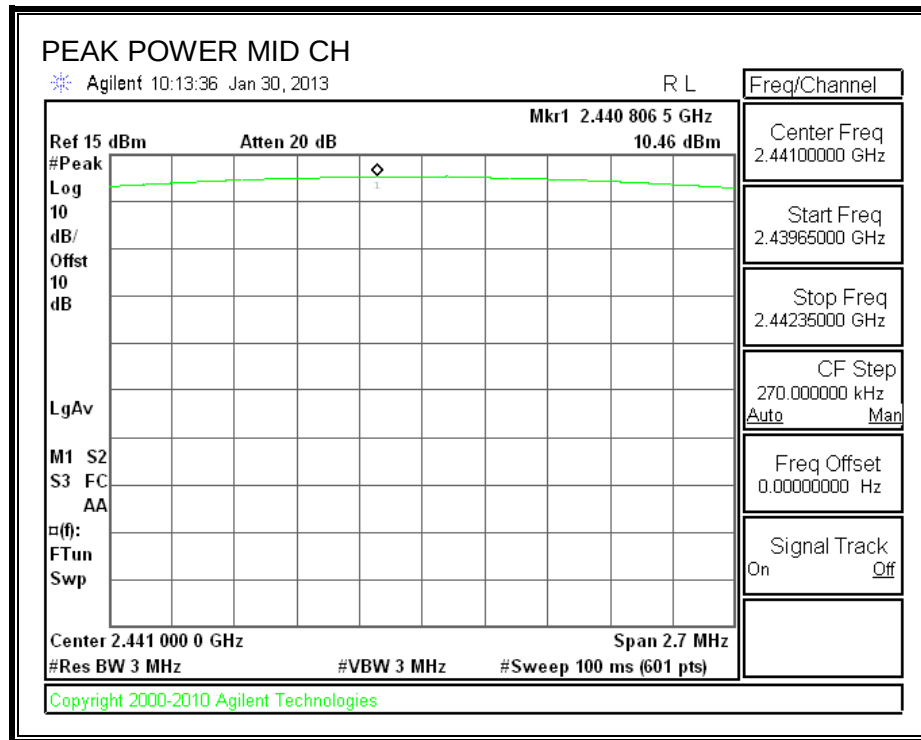
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

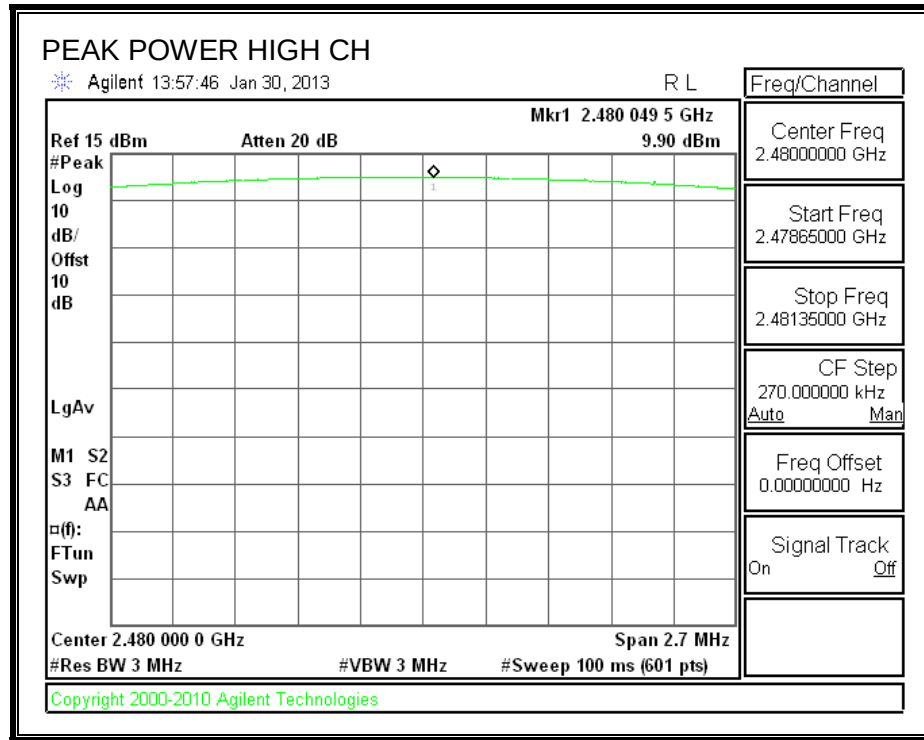
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.61	30	-19.39
Middle	2441	10.46	30	-19.54
High	2480	9.90	30	-20.10

OUTPUT POWER







6.2.6. 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 10 dB pad was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.85
Middle	2441	6.53
High	2480	5.80

6.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Limit = -20 dBc

TEST PROCEDURE

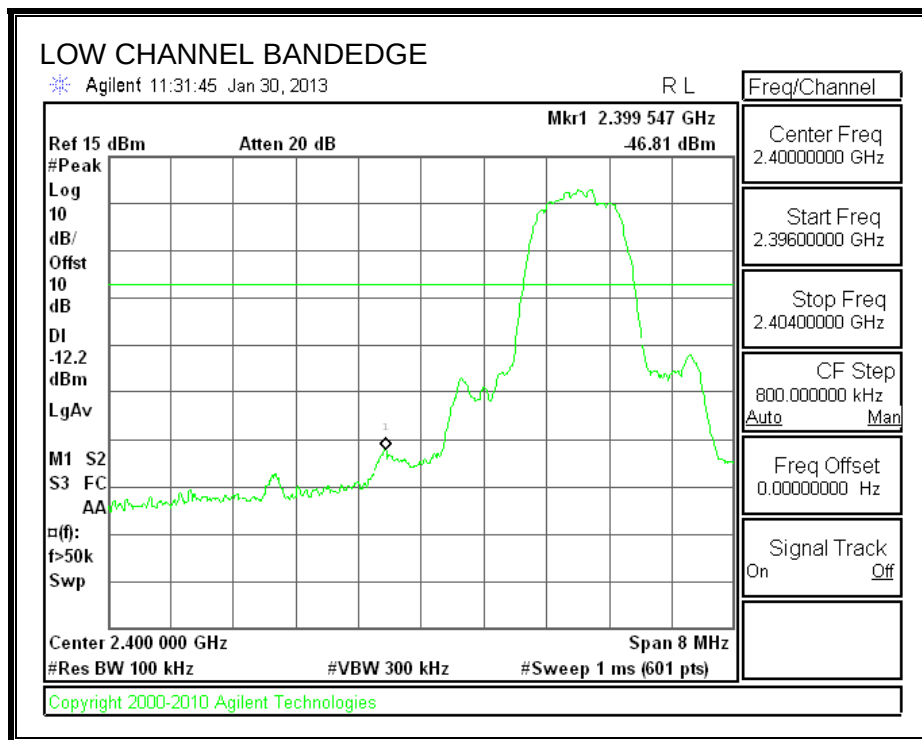
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

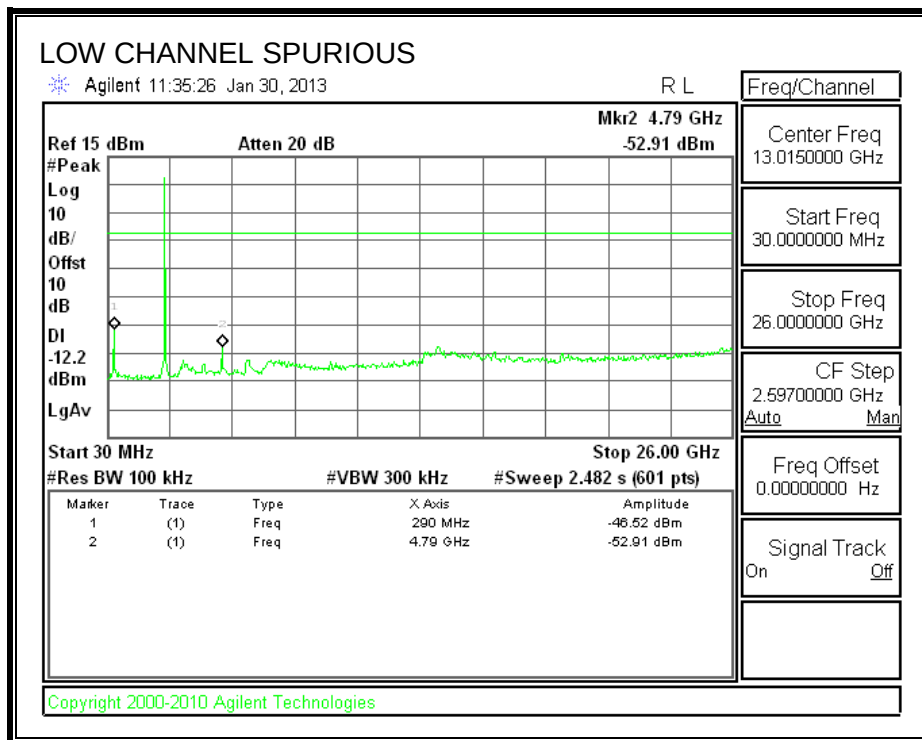
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

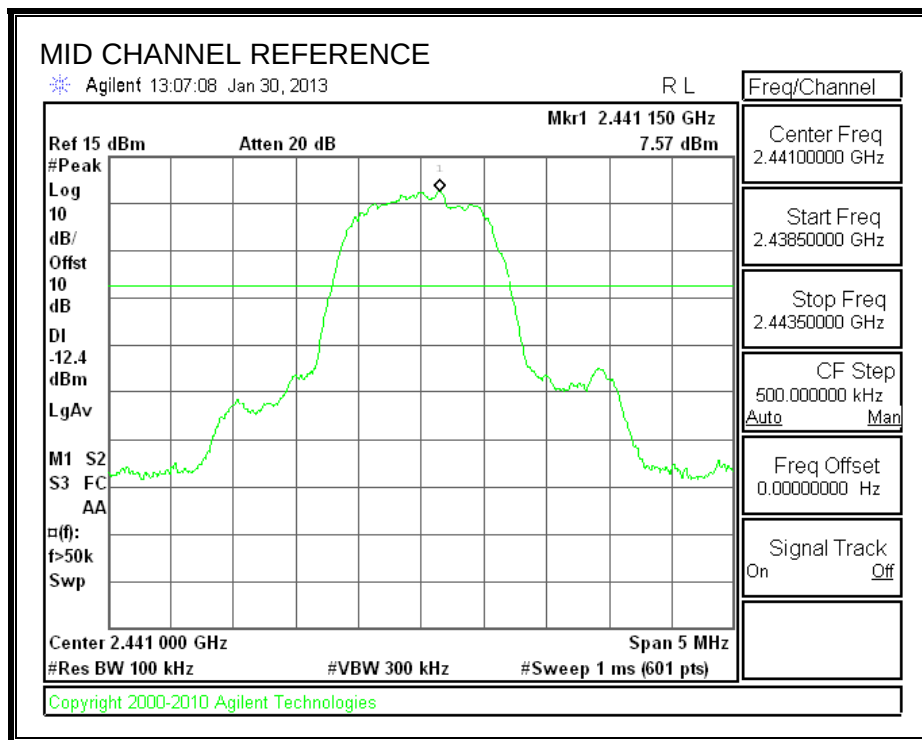
RESULTS

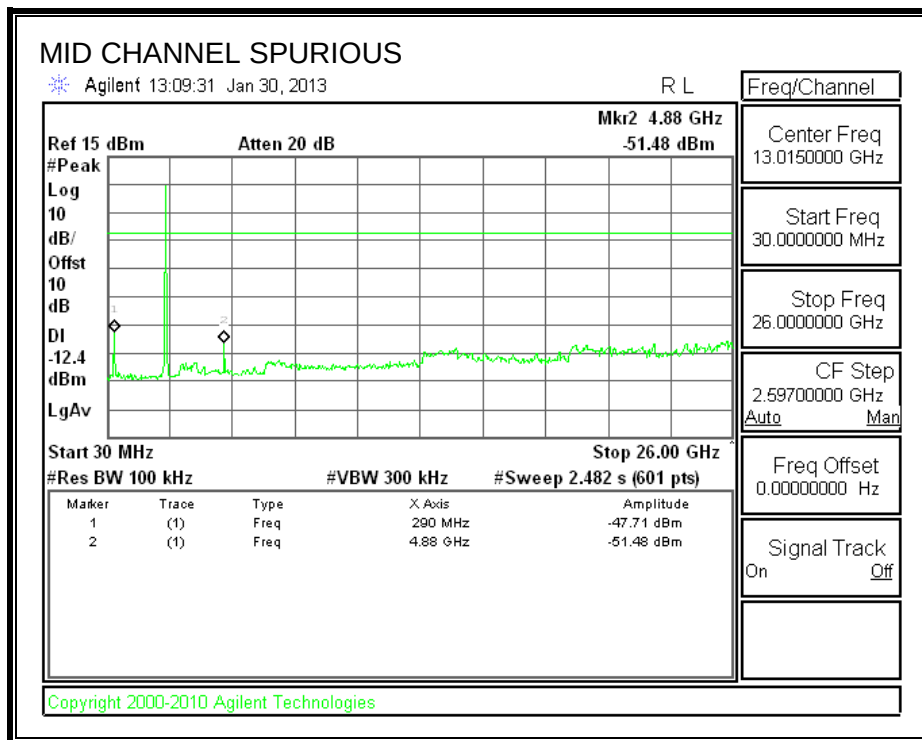
SPURIOUS EMISSIONS, LOW CHANNEL



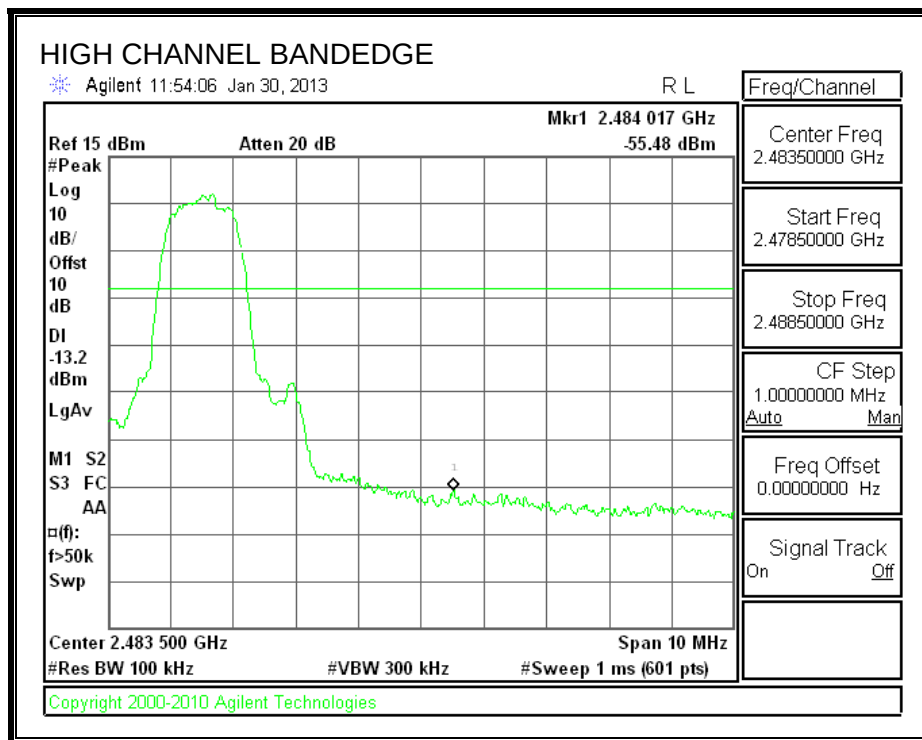


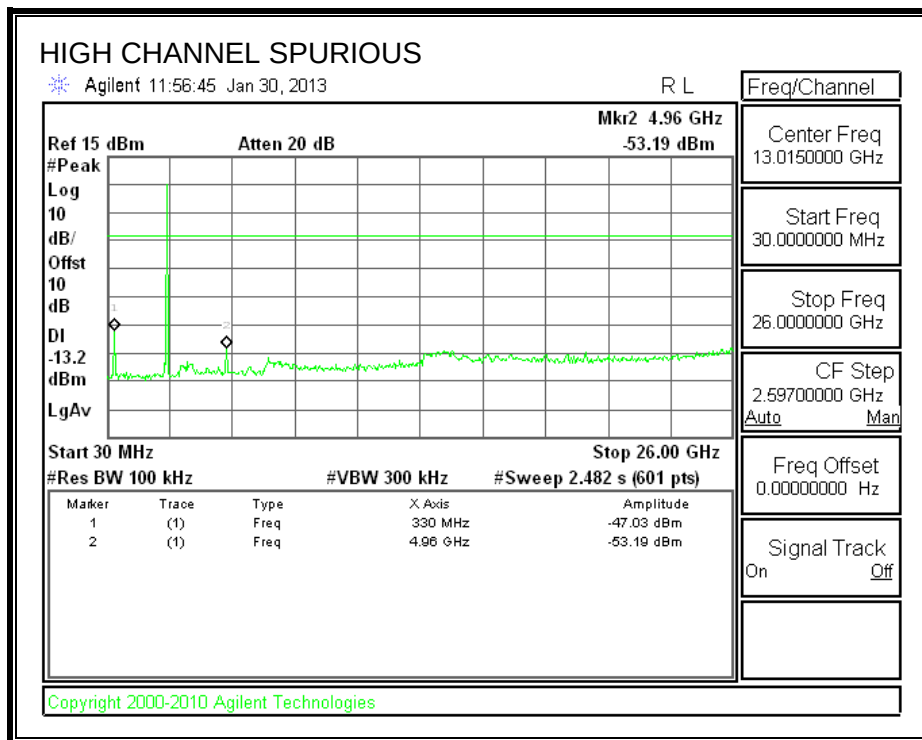
SPURIOUS EMISSIONS, MID CHANNEL



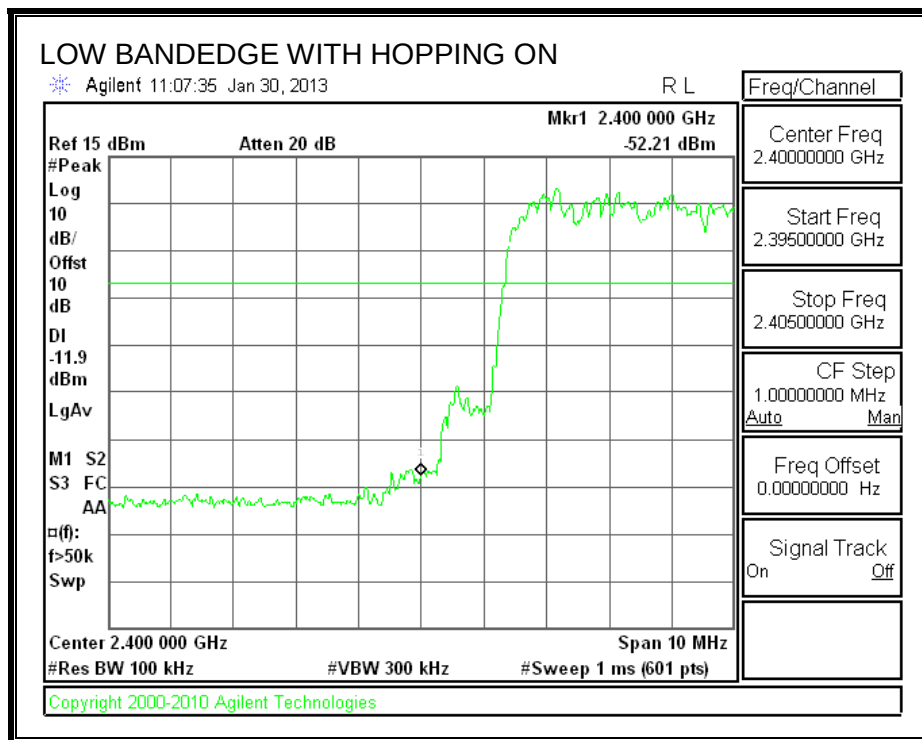


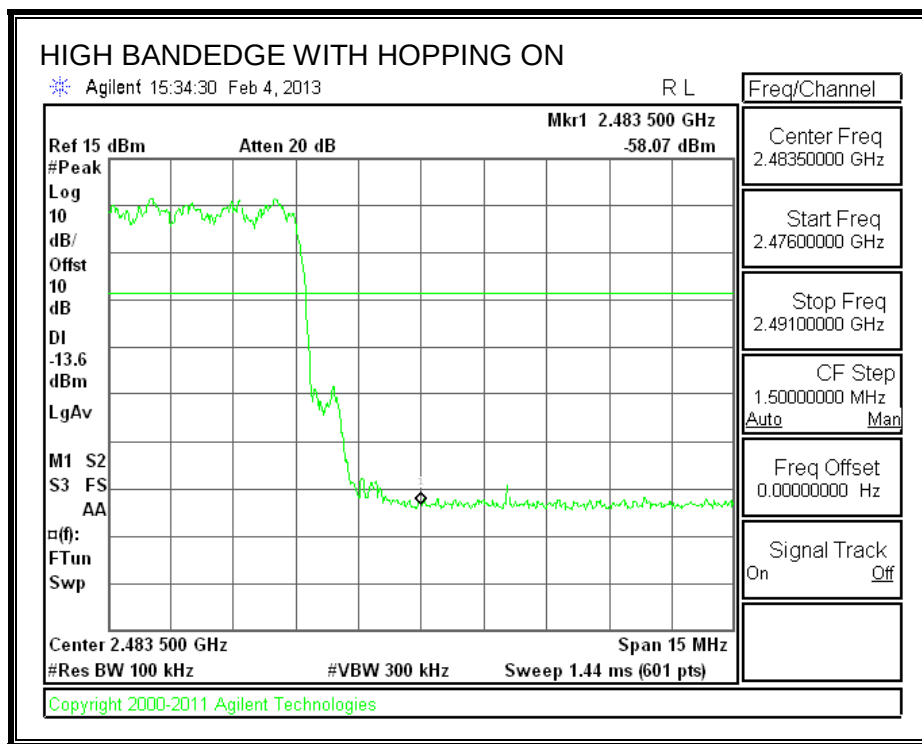
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





7. RADIATED TEST RESULTS

7.1. 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.

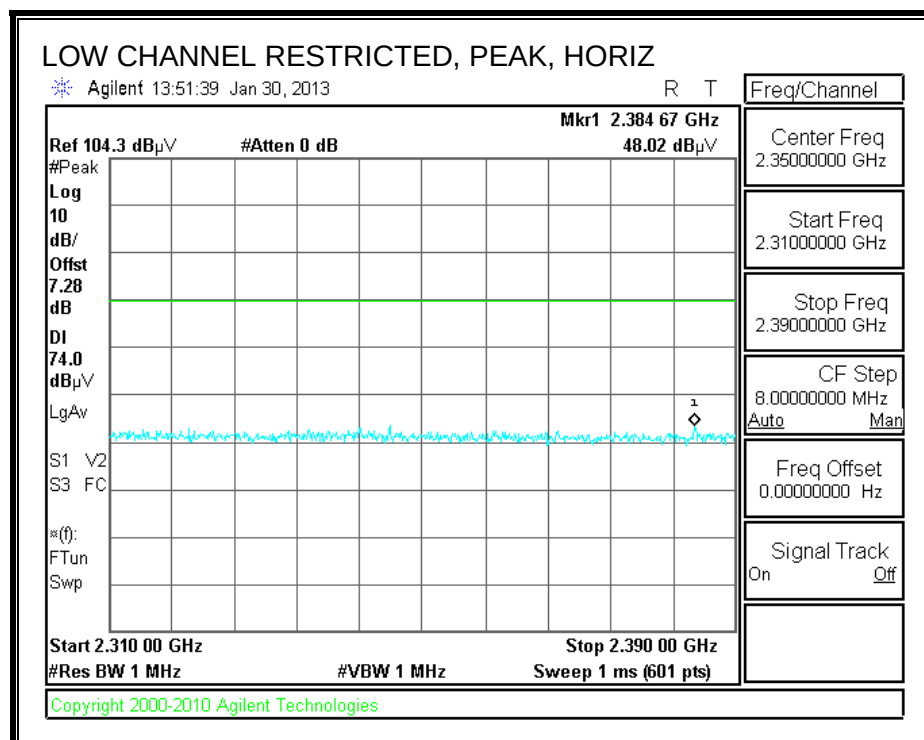
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

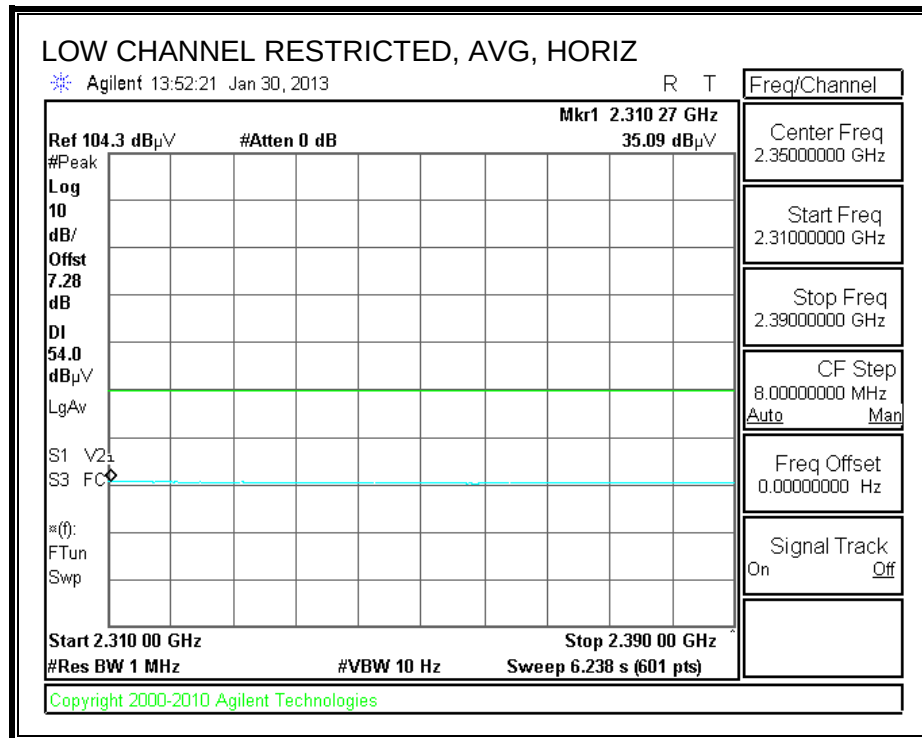
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

7.2. TRANSMITTER ABOVE 1 GHz

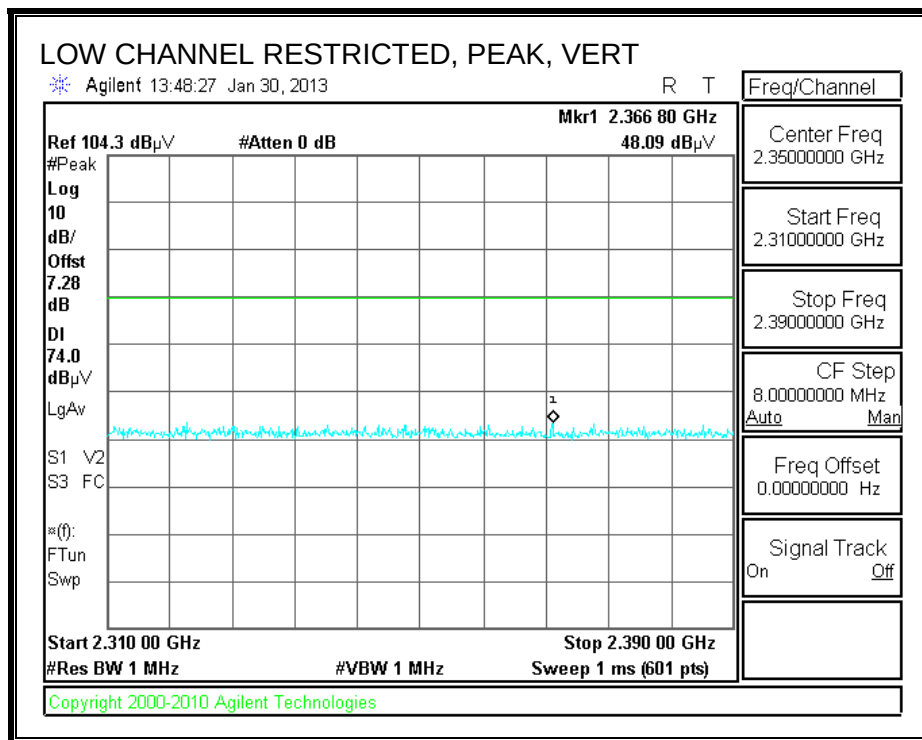
7.2.1. BASIC DATA RATE GFSK MODULATION

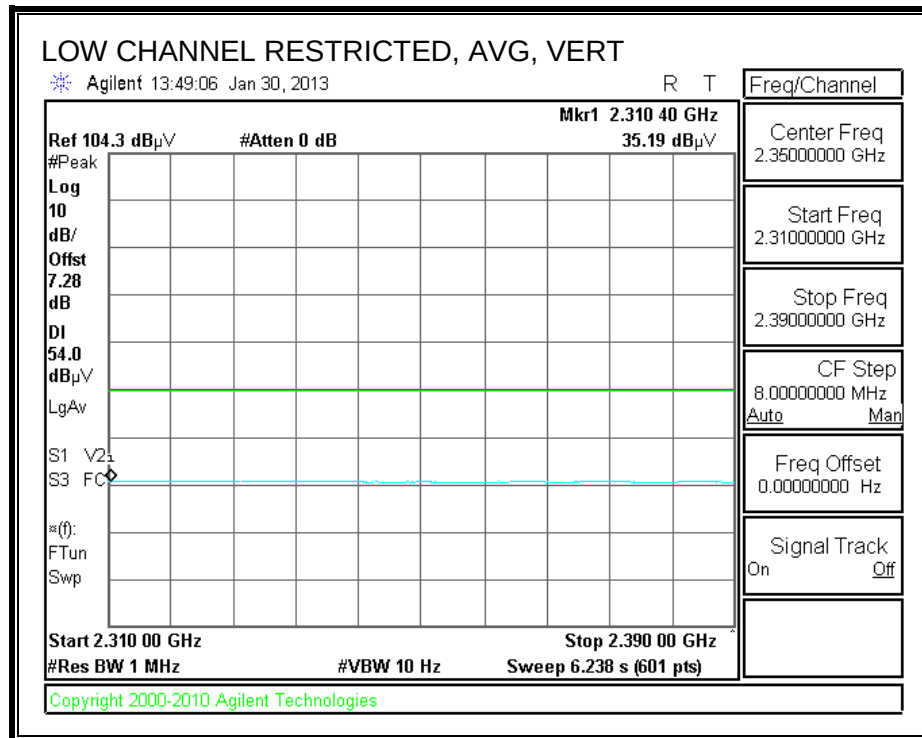
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



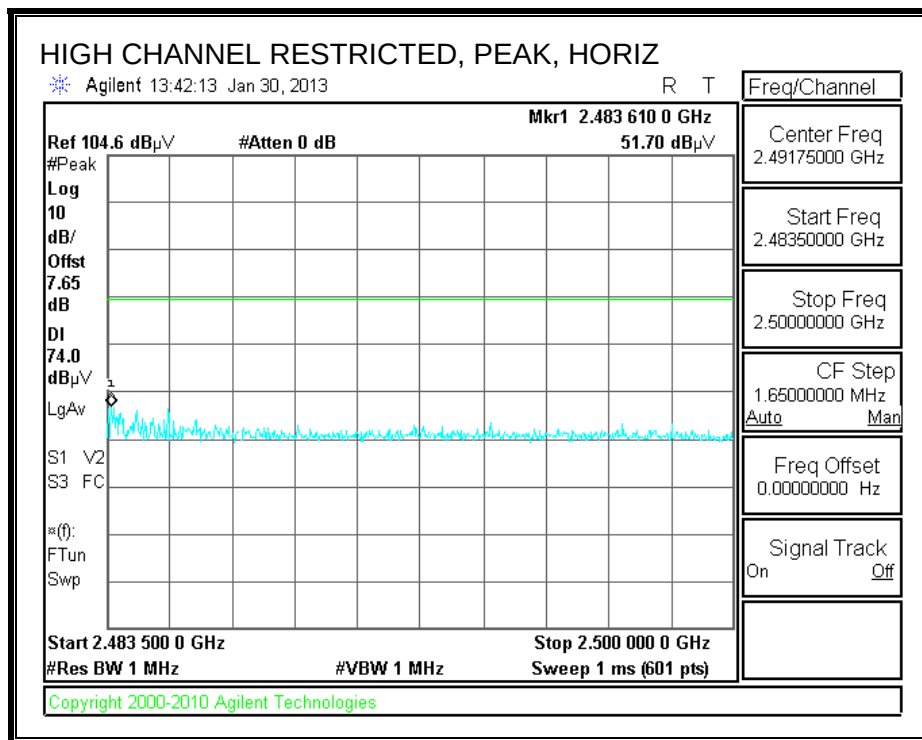


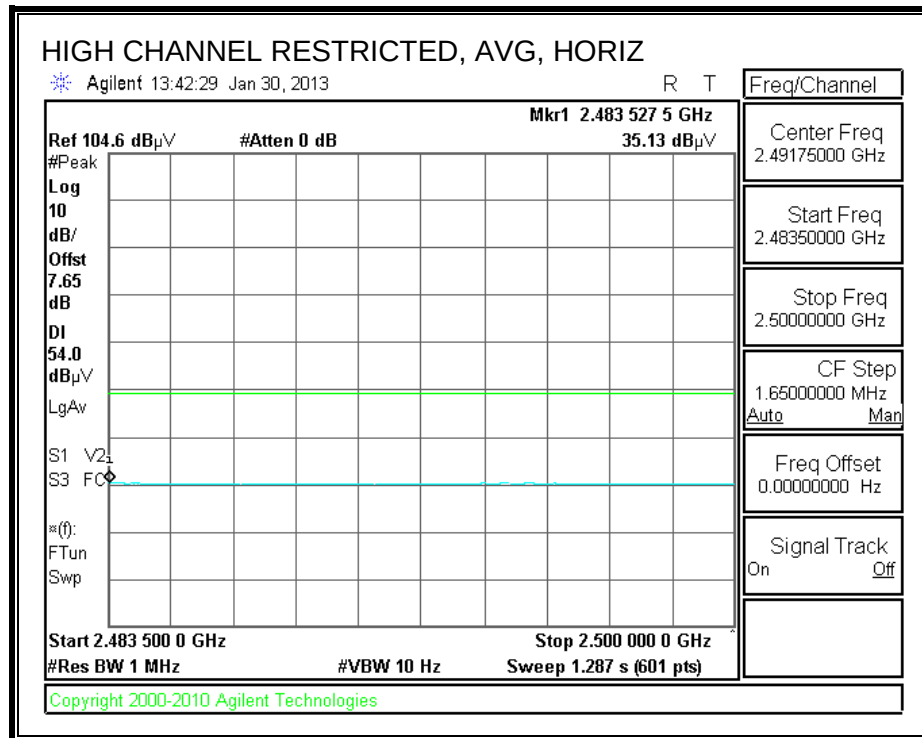
RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)



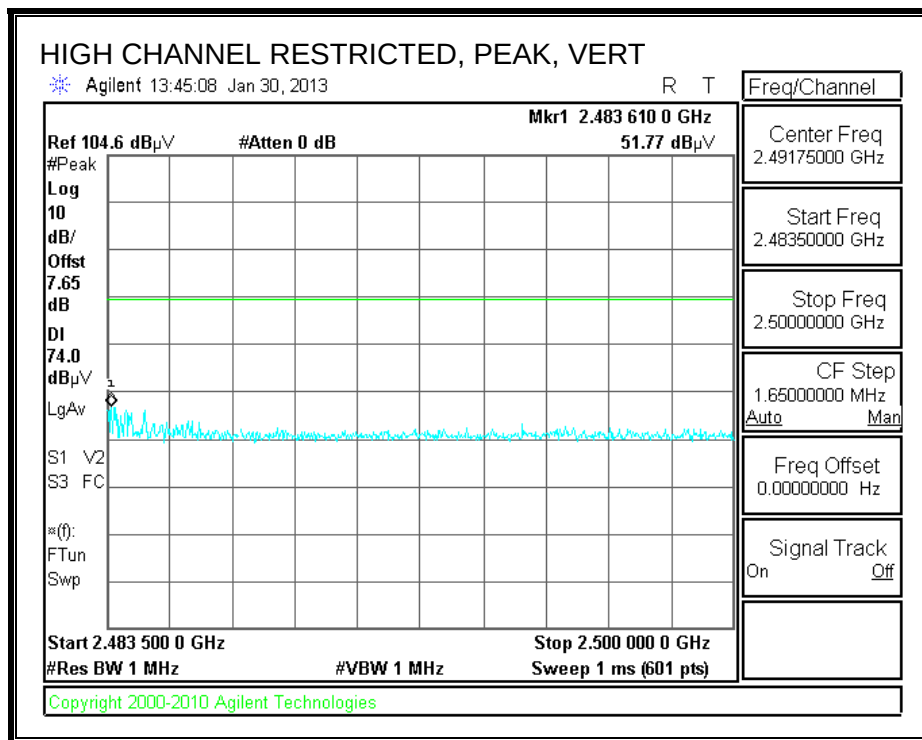


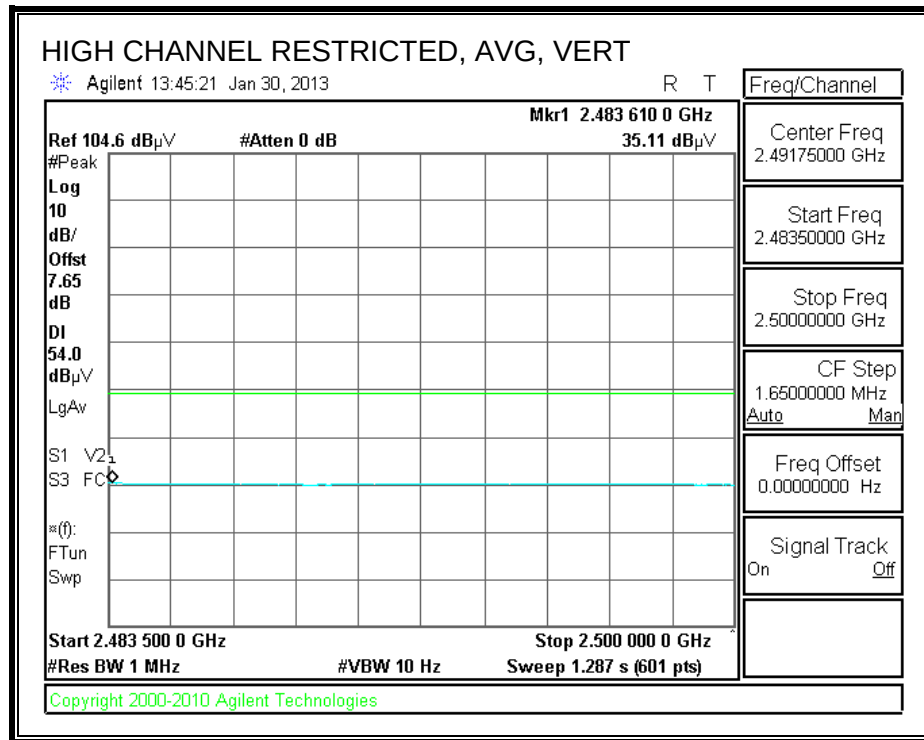
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Dennis Huang
Date: 01/30/13
Project #: 13I14813
Company: SamSung
Test Target: 15.247 BT
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	

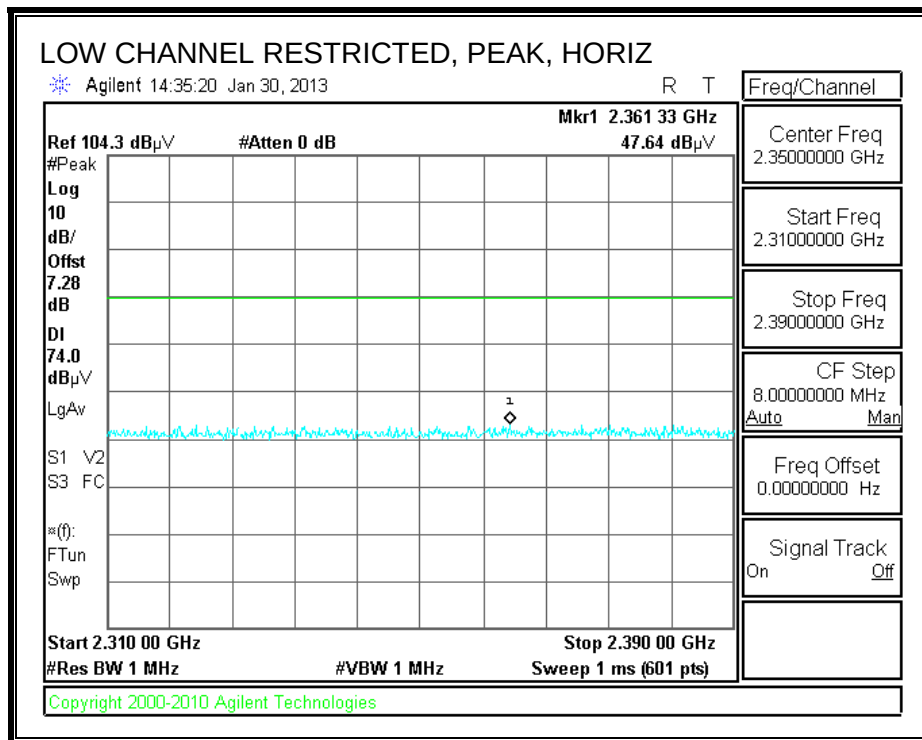
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/Q/P	Ant.High cm	Table Angle Degree	Notes
Low Channel - 2402MHz															
4.804	3.0	46.4	33.1	6.8	-34.1	0.0	0.0	52.2	74.0	-21.8	H	P	98.0	193.0	
4.804	3.0	38.9	33.1	6.8	-34.1	0.0	0.0	44.7	54.0	-9.3	H	A	98.0	193.0	
4.804	3.0	42.4	33.1	6.8	-34.1	0.0	0.0	48.1	74.0	-25.9	V	P	119.0	223.0	
4.804	3.0	34.5	33.1	6.8	-34.1	0.0	0.0	40.3	54.0	-13.7	V	A	119.0	223.0	
Mid Channel - 2437MHz															
4.882	3.0	43.0	33.1	6.8	-34.0	0.0	0.0	48.9	74.0	-25.1	H	P	100.0	177.0	
4.882	3.0	35.3	33.1	6.8	-34.0	0.0	0.0	41.2	54.0	-12.8	H	A	100.0	177.0	
4.882	3.0	39.5	33.1	6.8	-34.0	0.0	0.0	45.4	74.0	-28.6	V	P	146.0	229.0	
4.882	3.0	30.2	33.1	6.8	-34.0	0.0	0.0	36.1	54.0	-17.9	V	A	146.0	229.0	
High Channel - 2480MHz															
4.960	3.0	44.7	33.2	6.9	-34.0	0.0	0.0	50.8	74.0	-23.2	H	P	100.0	180.0	
4.960	3.0	37.1	33.2	6.9	-34.0	0.0	0.0	43.2	54.0	-10.8	H	A	100.0	180.0	
4.960	3.0	39.0	33.2	6.9	-34.0	0.0	0.0	45.1	74.0	-28.9	V	P	100.0	136.0	
4.960	3.0	30.2	33.2	6.9	-34.0	0.0	0.0	36.3	54.0	-17.7	V	A	100.0	136.0	

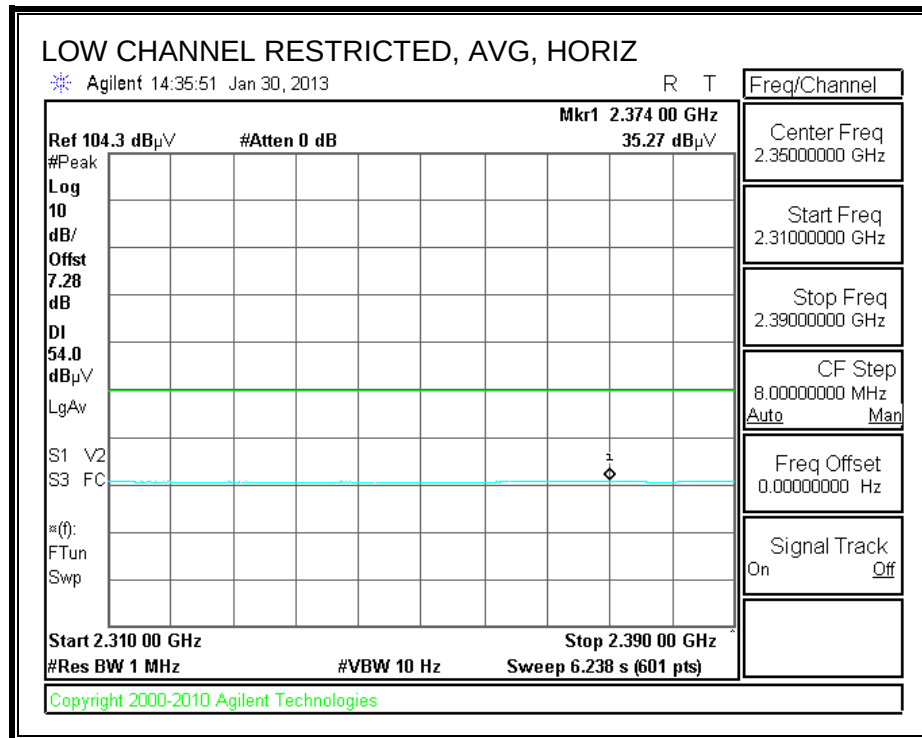
Rev. 4.1.2.7

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

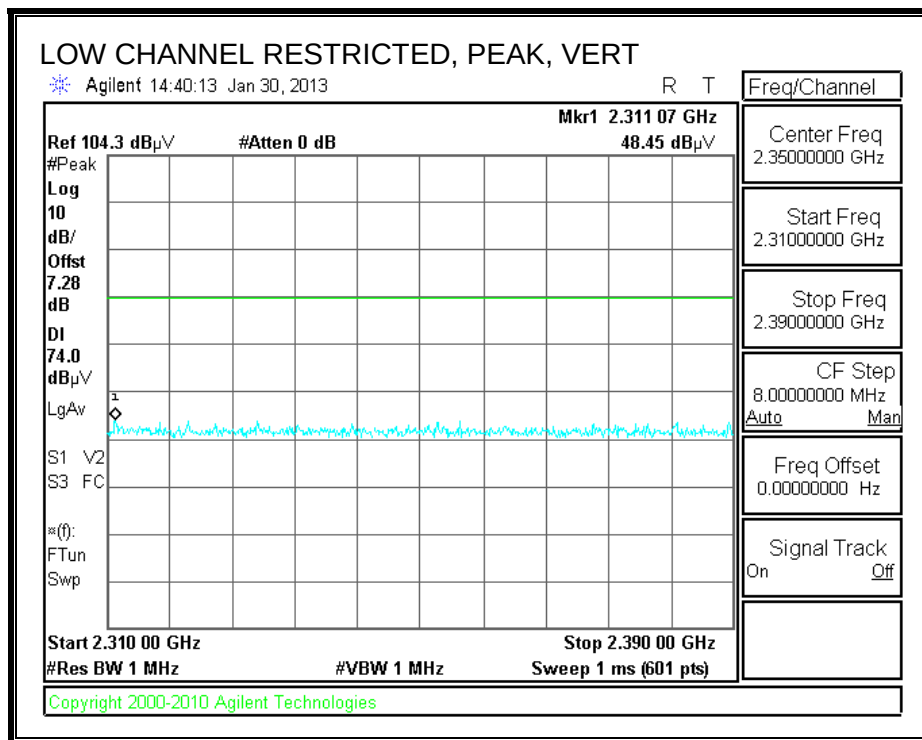
7.2.2. ENHANCED DATA RATE 8PSK MODULATION

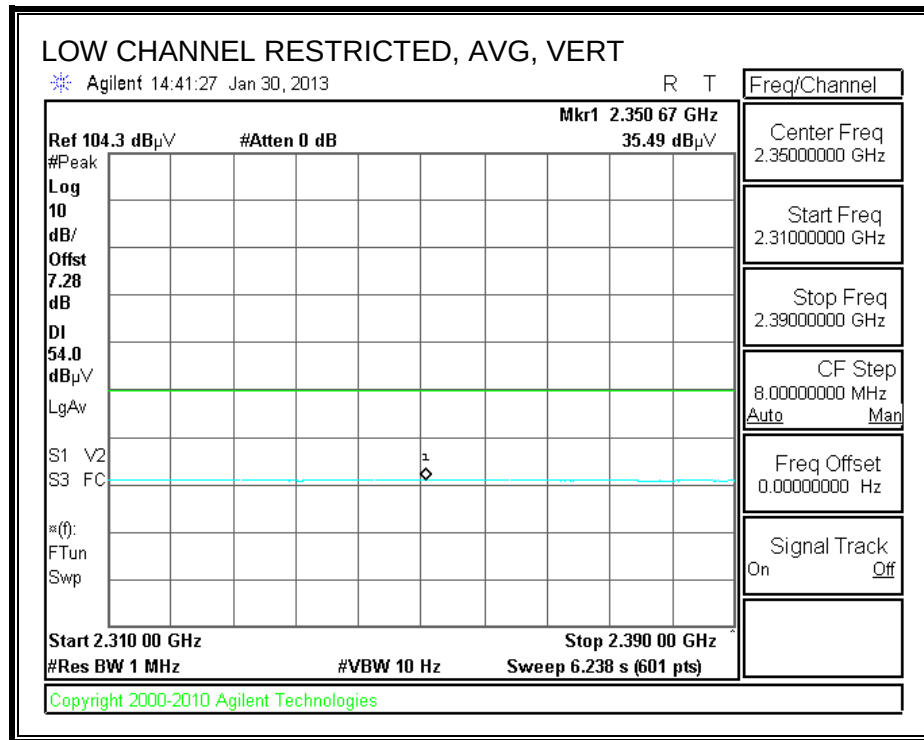
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



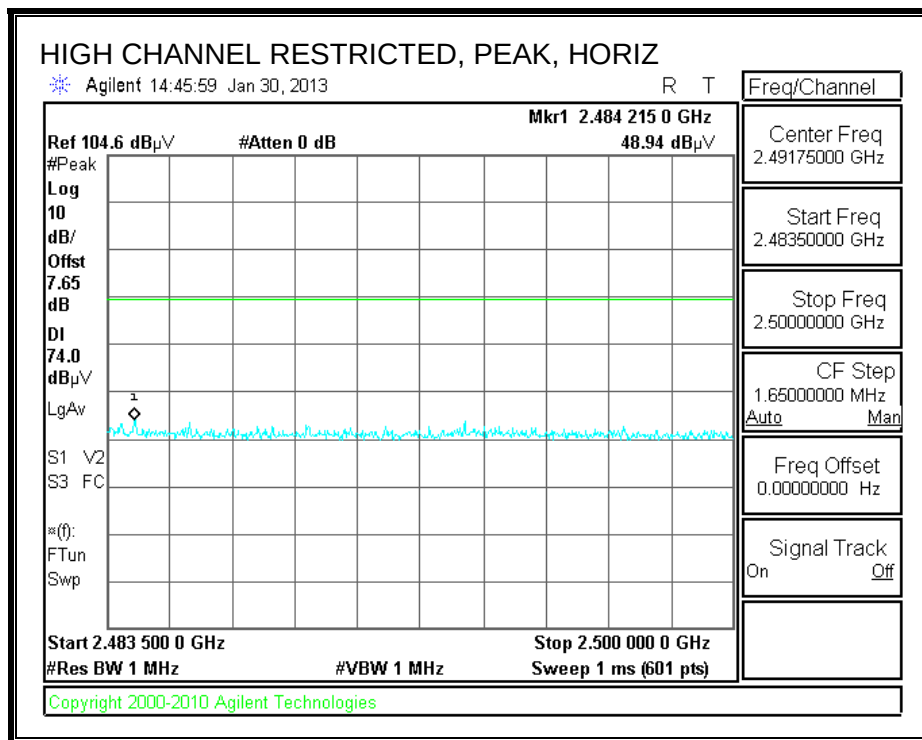


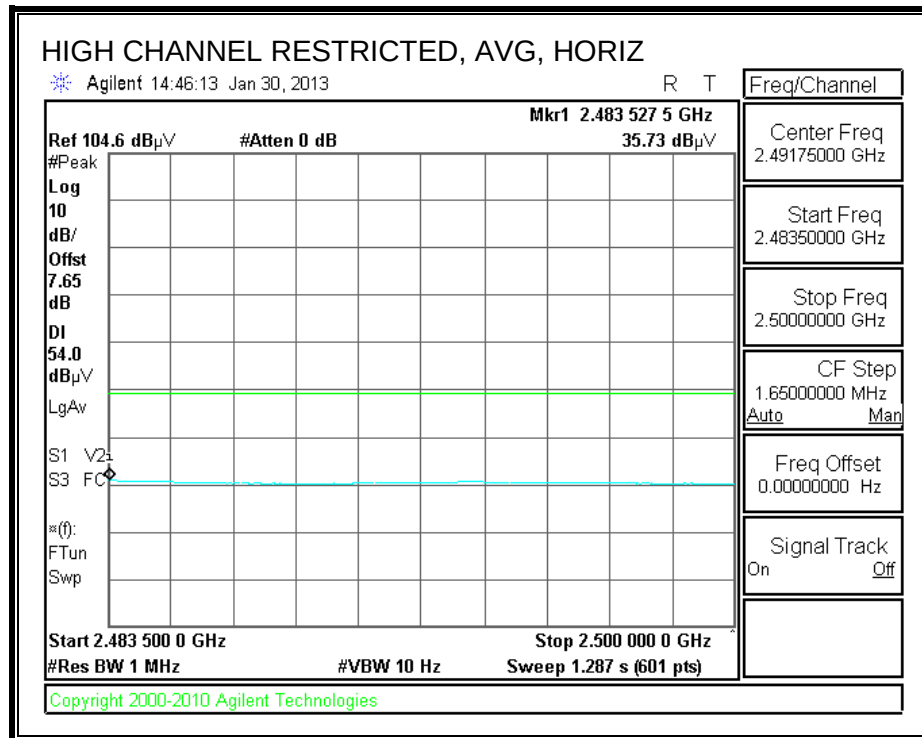
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



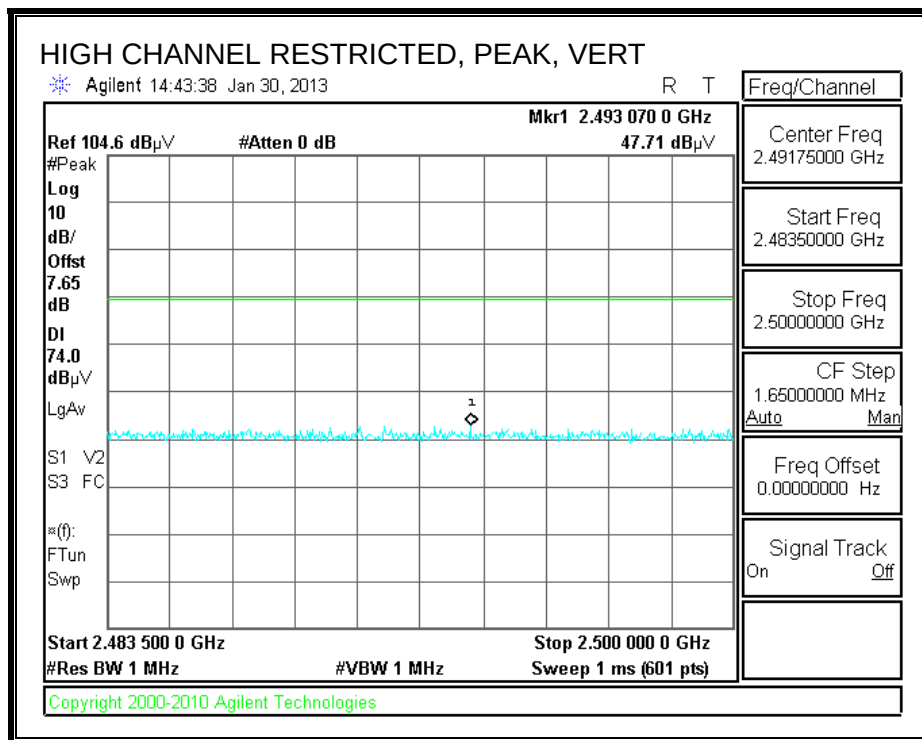


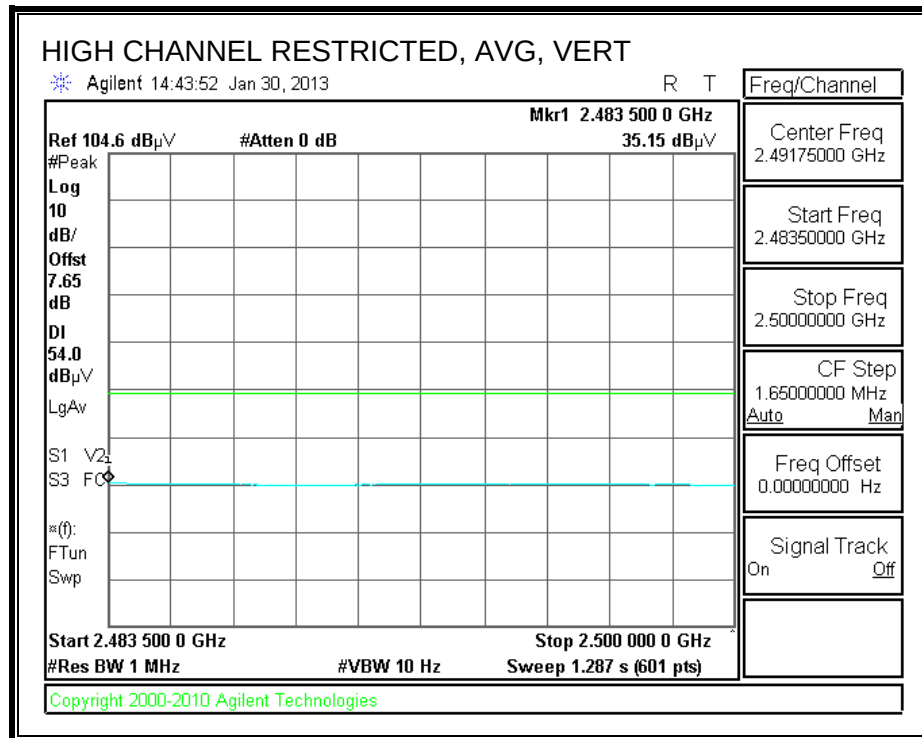
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Dennis Huang
Date: 01/30/13
Project #: 13I14813
Company: SamSung
Test Target: 15.247 BT
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 GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/Q/P	Ant.High cm	Table Angle Degree	Notes
Low Channel - 2402MHz															
4.804	3.0	43.0	33.1	6.8	-34.1	0.0	0.0	48.8	74.0	-25.2	H	P	100.0	174.0	
4.804	3.0	32.9	33.1	6.8	-34.1	0.0	0.0	38.7	54.0	-15.3	H	A	100.0	174.0	
4.804	3.0	39.4	33.1	6.8	-34.1	0.0	0.0	45.1	74.0	-28.9	V	P	115.0	231.0	
4.804	3.0	29.2	33.1	6.8	-34.1	0.0	0.0	35.0	54.0	-19.0	V	A	115.0	231.0	
Mid Channel - 2437MHz															
4.882	3.0	44.4	33.1	6.8	-34.0	0.0	0.0	50.3	74.0	-23.7	H	P	100.0	193.0	
4.882	3.0	34.2	33.1	6.8	-34.0	0.0	0.0	40.1	54.0	-13.9	H	A	100.0	193.0	
4.882	3.0	39.9	33.1	6.8	-34.0	0.0	0.0	45.8	74.0	-28.2	V	P	120.0	242.0	
4.882	3.0	29.2	33.1	6.8	-34.0	0.0	0.0	35.1	54.0	-18.9	V	A	120.0	242.0	
High Channel - 2480MHz															
4.960	3.0	45.2	33.2	6.9	-34.0	0.0	0.0	51.2	74.0	-22.8	H	P	100.0	184.0	
4.960	3.0	35.0	33.2	6.9	-34.0	0.0	0.0	41.0	54.0	-13.0	H	A	100.0	184.0	
4.960	3.0	40.2	33.2	6.9	-34.0	0.0	0.0	46.3	74.0	-27.7	V	P	98.0	113.0	
4.960	3.0	29.2	33.2	6.9	-34.0	0.0	0.0	35.2	54.0	-18.8	V	A	98.0	113.0	

Rev. 4.1.2.7

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

7.3. WORST-CASE BELOW 1 GHz

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



DATA

Project No:13I14813			
Client Name:Samsung			
Model /Device:GTS6810L/Cell Phone			
Config /Other:UET and Head phone /Worst Position			
Test By:Danny Vu			

Horizontal 30 - 1000MHz

Marker No.	Test Frequency	Meter Reading	Detector	T122 Sunol Bilog.TXT (dB)	5mB Amp Path 30-1000MHz (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
1	33.4892	42.6	PK	18.8	-29.2	32.2	40	-7.8	200	Horz
2	166.273	35.25	PK	12.2	-27.9	19.55	43.5	-23.95	100	Horz
3	232.9556	35.44	PK	11.3	-27.3	19.44	46	-26.56	100	Horz
4	449.2866	33.78	PK	16.8	-27	23.58	46	-22.42	200	Horz
5	950.9572	28.41	PK	22.8	-24.5	26.71	46	-19.29	300	Horz

Vertical 30 - 1000MHz

Marker No.	Test Frequency	Meter Reading	Detector	T122 Sunol Bilog.TXT (dB)	5mB Amp Path 30-1000MHz (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
6	30.9692	46.67	PK	20.7	-29.3	38.07	40	-1.93	100	Vert
7	34.6523	47.91	PK	17.9	-29.2	36.61	40	-3.39	100	Vert
8	79.0428	42.17	PK	7.9	-28.8	21.27	40	-18.73	100	Vert
9	929.4404	34.91	PK	22.5	-24.6	32.81	46	-13.19	100	Vert
10	981.5847	33.01	PK	22.8	-24.2	31.61	54	-22.39	100	Vert

8. 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.

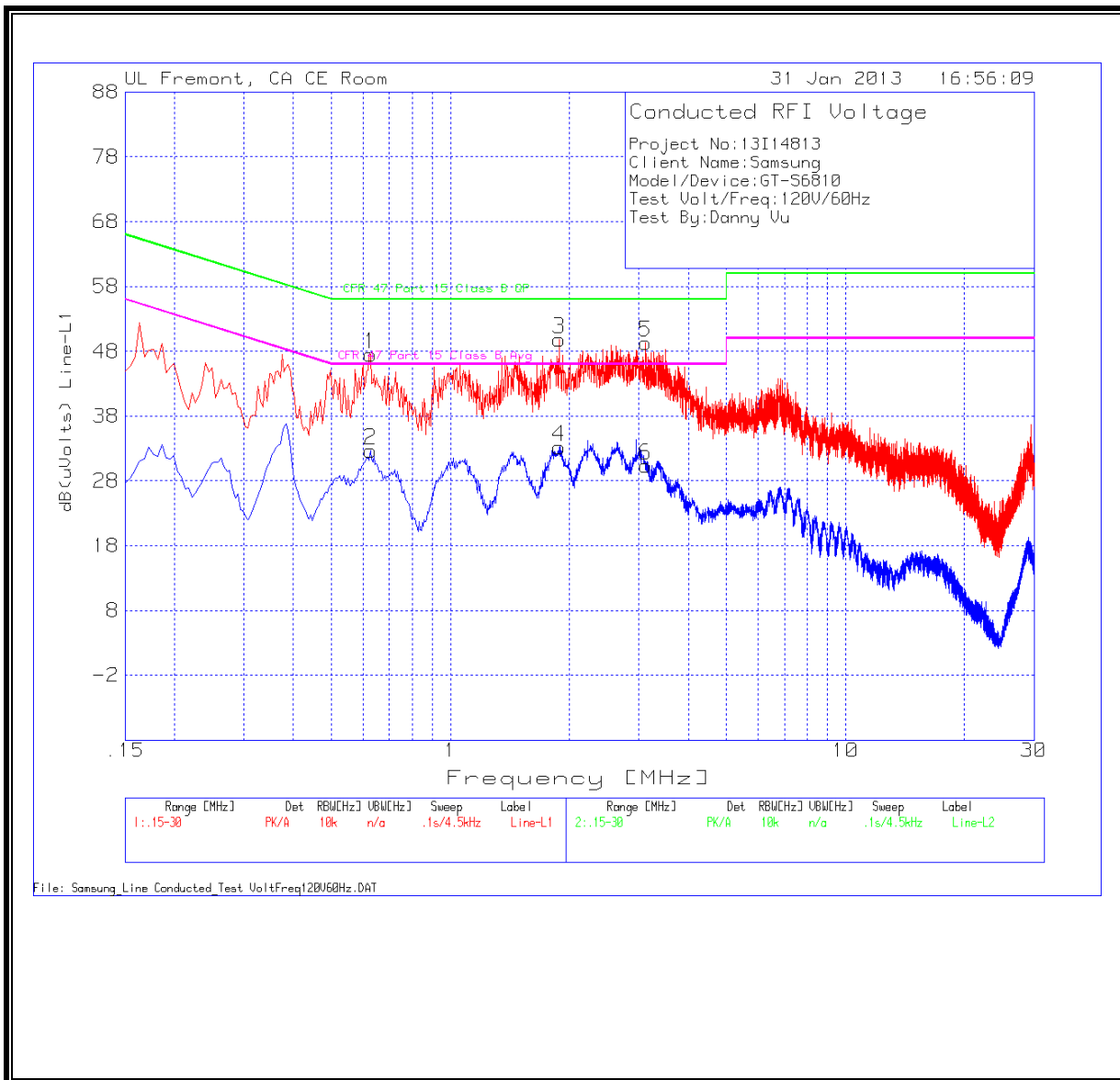
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

Project No:13I14813									
Client Name:Samsung									
Model/Device:GT-S6810									
Test Volt/Freq:120V/60Hz									
Test By:Danny Vu									
Line-L1 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dB(uVolts)	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.627	47.38	PK	0.1	0	47.48	56	-8.52	-	-
0.627	32.61	Av	0.1	0	32.71	-	-	46	-13.29
1.8825	49.62	PK	0.1	0.1	49.82	56	-6.18	-	-
1.8825	33.01	Av	0.1	0.1	33.21	-	-	46	-12.79
3.12	49.07	PK	0.1	0.1	49.27	56	-6.73	-	-
3.12	30.18	Av	0.1	0.1	30.38	-	-	46	-15.62
Line-L2 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L2.TXT (dB)	LC Cables 2&3.TXT (dB)	dB(uVolts)	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
1.3965	46.52	PK	0.1	0.1	46.72	56	-9.28	-	-
1.3965	24.19	Av	0.1	0.1	24.39	-	-	46	-21.61
1.9995	46.92	PK	0.1	0.1	47.12	56	-8.88	-	-
1.9995	23.81	Av	0.1	0.1	24.01	-	-	46	-21.99
2.832	47.51	PK	0.1	0.1	47.71	56	-8.29	-	-
2.832	25.6	Av	0.1	0.1	25.8	-	-	46	-20.2
PK - Peak detector QP - Quasi-Peak detector Av - Average detector									

LINE 1 RESULTS



LINE 2 RESULTS

