FCC CFR47 PART 15 SUBPART C

BLUETOOTH

CERTIFICATION TEST REPORT

FOR

7 INCH TABLET PC GSM/GPRS1900 + 802.11bgn + BT3.0+HS

MODEL NUMBER: GT-P3108

FCC ID: A3LGTP3108

REPORT NUMBER: 12I14352-3A

ISSUE DATE: MAY 29, 2012

Prepared for

SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON CITY, GYEONGGI-DO 443-742
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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/23/12	Initial Issue	T. LEE

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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:	7 INCH TABLET PC GSM/GPRS1900 + 802.11bgn + BT3.0+HS
MODEL:	GT-P3108
SERIAL NUMBER:	02004
DATE TESTED:	APRIL 21-23, 2012

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:

TIM LEE
STAFF ENGINEER
UL CCS

Tested By:

CHIN PANG
EMC TECHNICIAN
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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 7 inch Tablet PC with GSM/GPRS1900MHz + 802.11bgn 1x1 (HT20) + BT3.0 + HS.

5.2. RATIONAL FOR TESTING

Radio module used in this report is identical module used in other models. Therefore, only radiated testing was conducted on this product. Data for conducted testing is leveraged from identical module of other report.

5.3. MAXIMUM OUTPUT POWER

The measured average power values were within ± 0.5 dB of the original values. Refer to report number “12I14206-3 FCC IC BT Report” for exact output power values and for all antenna port results.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an 802.11 b/g/n and a Bluetooth antenna, with a maximum gain as stated in the table below:

No.	Contents	Standards			Unit	Condition	Remarks
		Min.	Avg.	Max.			
1	Gain of BT/WIFI	-6.4	-	-1.4	dBi	Based on Max. Gain in H-Plane.	
2	VSWR of BT/WIFI	1.2	1.7	2.2	-	2213 MHz	Jig Data
		1.2	1.7	2.2	-	2233 MHz	

5.5. SOFTWARE AND FIRMWARE

Bluetooth firmware - BCM4330B1_002.001.003.0634.0678.hcd
Wi-Fi Firmware Rev 4.03
EUT driver software version: 3.08-281811

5.6. 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.

For the fundamental investigation, since the EUT is a portable device that has three orientations; therefore 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 headset alone.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

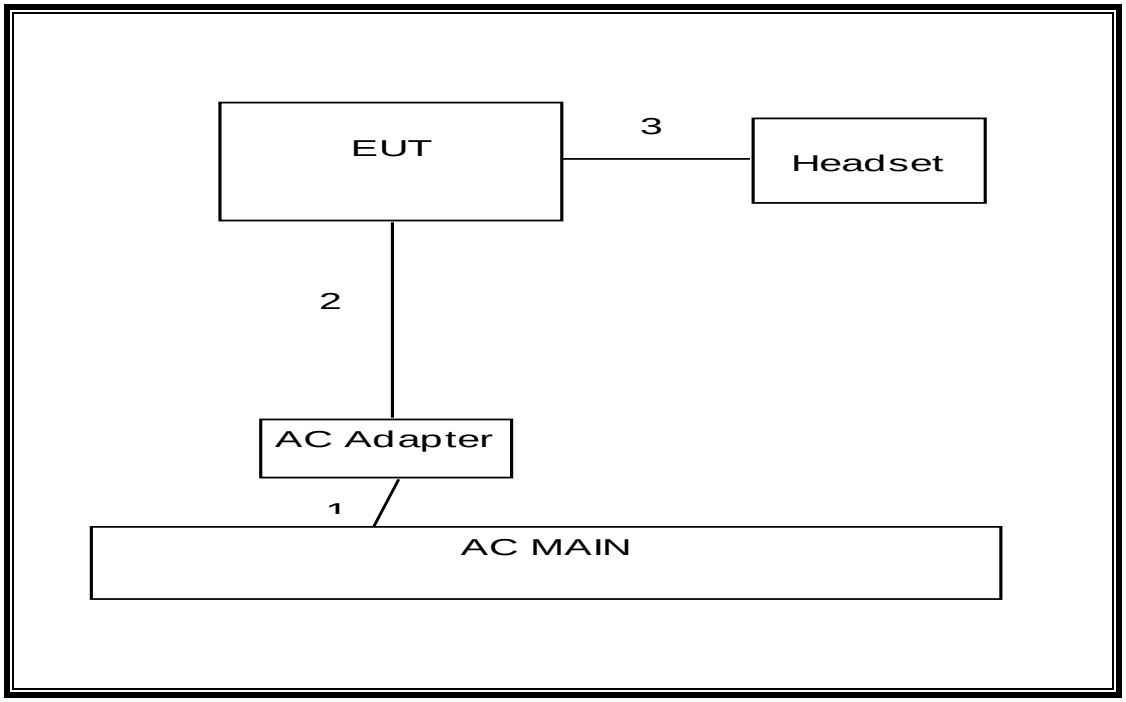
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Samsung	ETA-P11X	3046	N/A
Headset	Samsung	EHS64AVFWE	3040	N/A

I/O CABLES (RADIATED SETUP)

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	115VAC	1	US115	Unshielded	1m	N/A
2	Mini USB	1	USB	Unshielded	1m	N/A
3	Audio	1	Mini-Jack	Unshielded	1.2 m	Volume control attached

TEST SETUP:

SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**Asset**	**Cal Date**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	01/28/11	04/28/13
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/06/11	07/06/12
Bluetooth Tester	R & S	N/A	N/A	04/27/11	04/27/13
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/11	07/16/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06/29/11	06/29/12
Antenna, Horn, 40 GHz	Miteq	NSP 4000-SP2	C00981	06/14/11	06/14/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	11/11/11	11/11/12
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRC13192	N02683	CNR	CNR
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	07/18/11	07/18/12
Directional Coupler	Lambda	N/A	11101300751	CNR	CNR

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

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**Asset**	**Cal Date**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	01/28/11	04/28/12
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/06/11	07/06/12
Bluetooth Tester	R & S	N/A	N/A	04/27/11	04/27/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/11	07/16/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06/29/11	06/29/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	11/11/11	11/11/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	07/18/11	07/18/12
Directional Coupler	RF-:ambda	N/A	11101300751	CNR	CNR
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	12/13/11	12/13/12

7. ANTENNA PORT TEST RESULTS

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

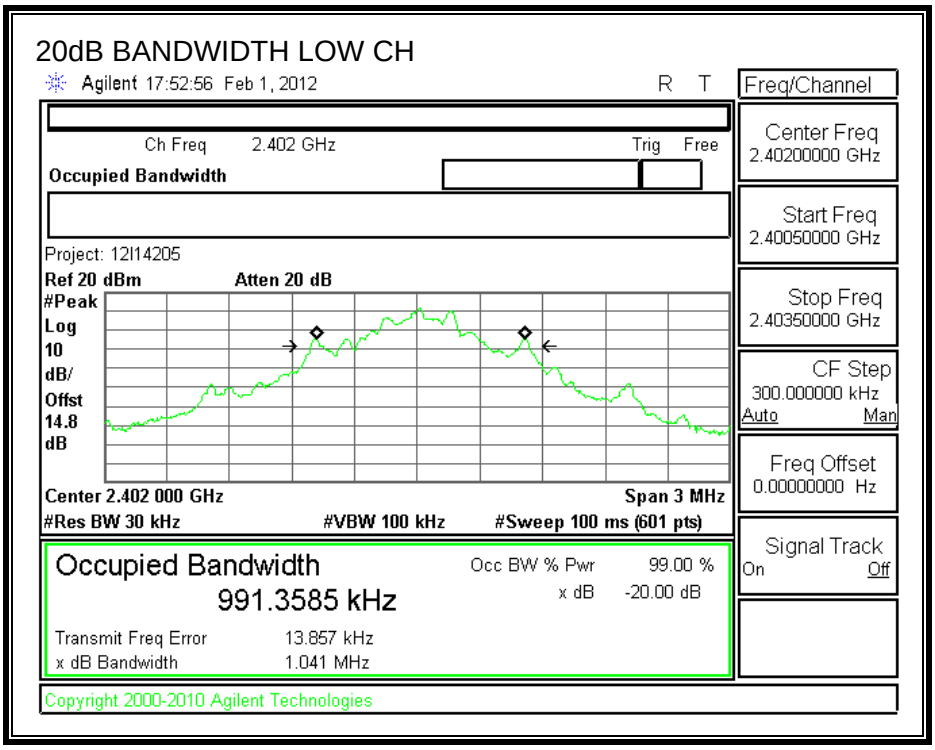
TEST PROCEDURE

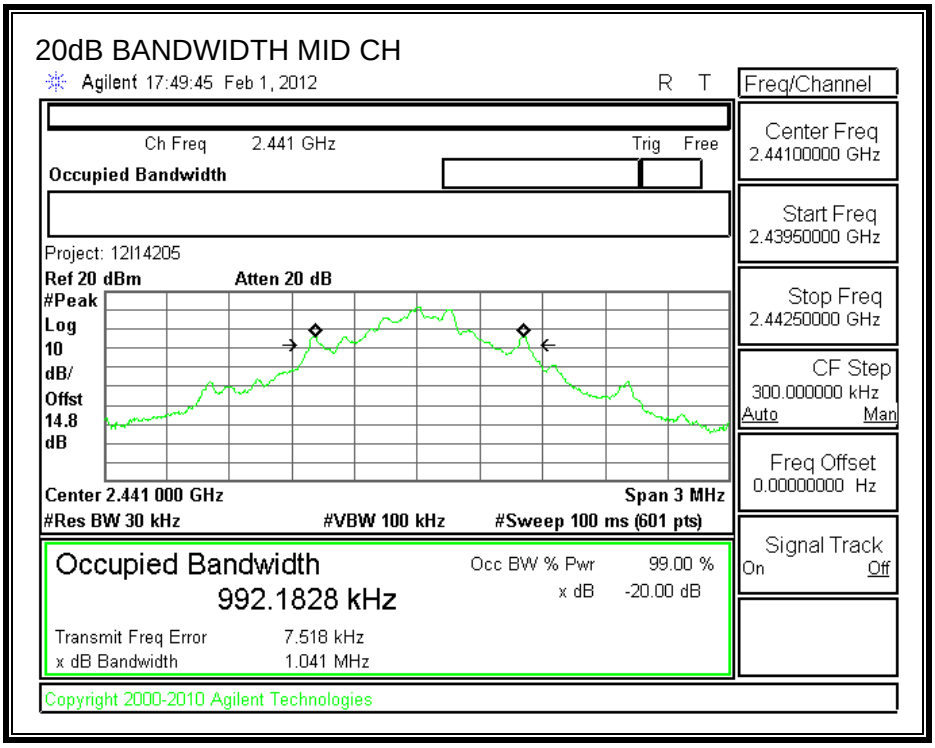
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

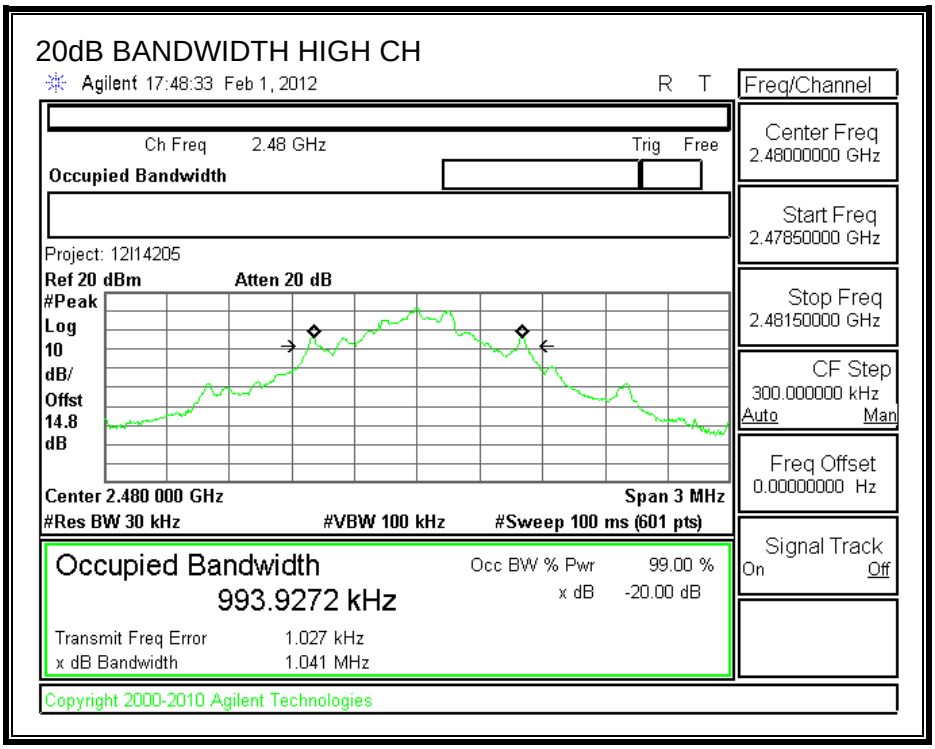
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.041
Middle	2441	1.041
High	2480	1.041

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 hoping channel, whichever is greater.

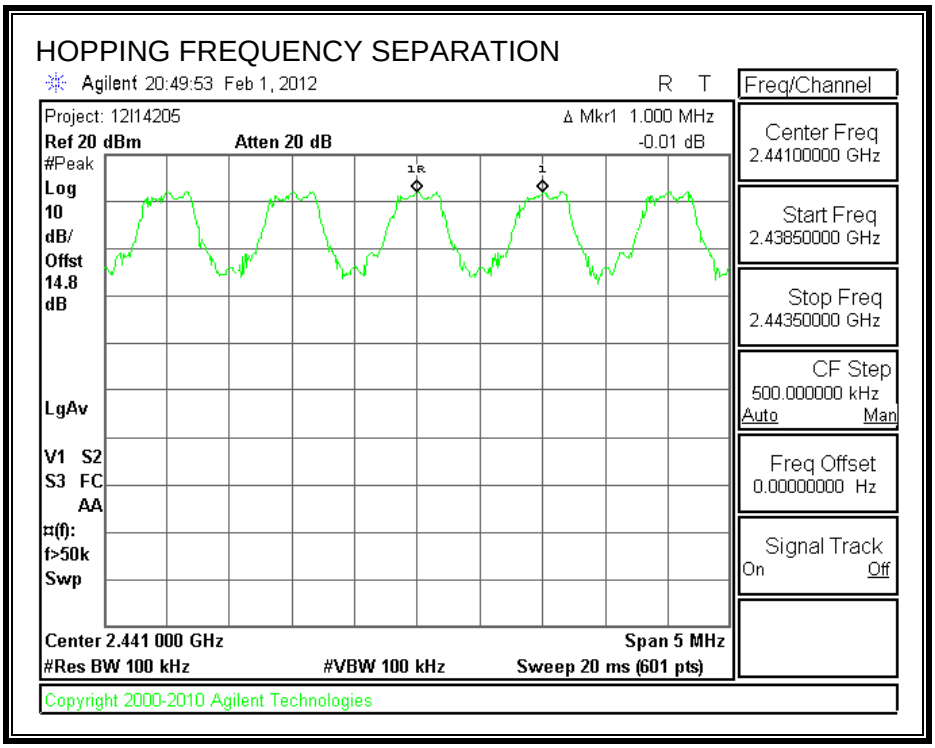
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

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

RESULTS

HOPPING FREQUENCY SEPARATION



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

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

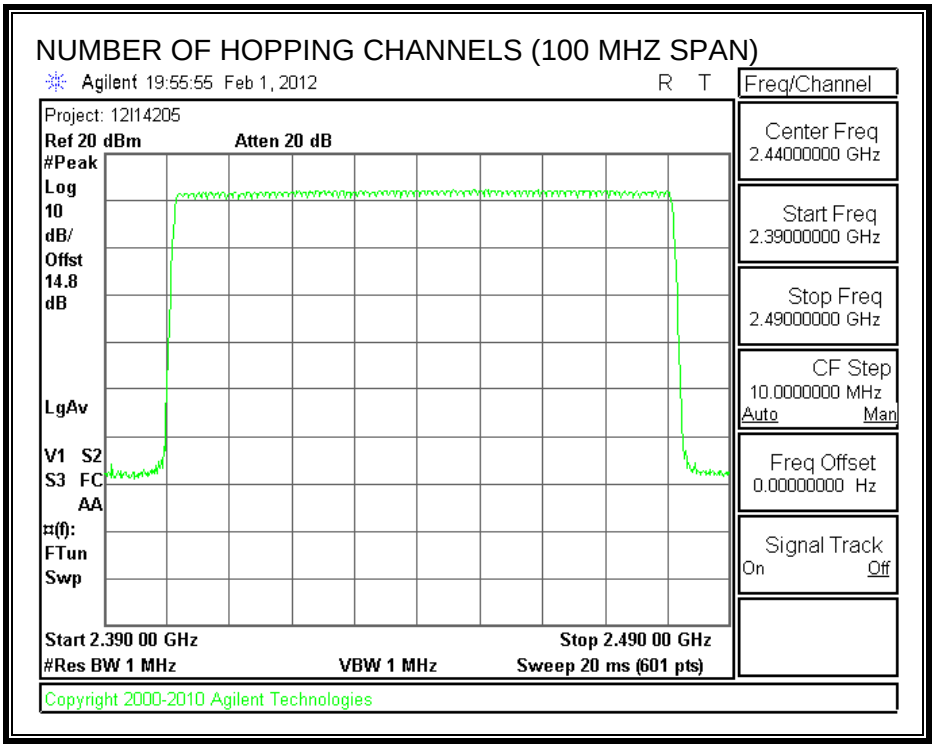
TEST PROCEDURE

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.

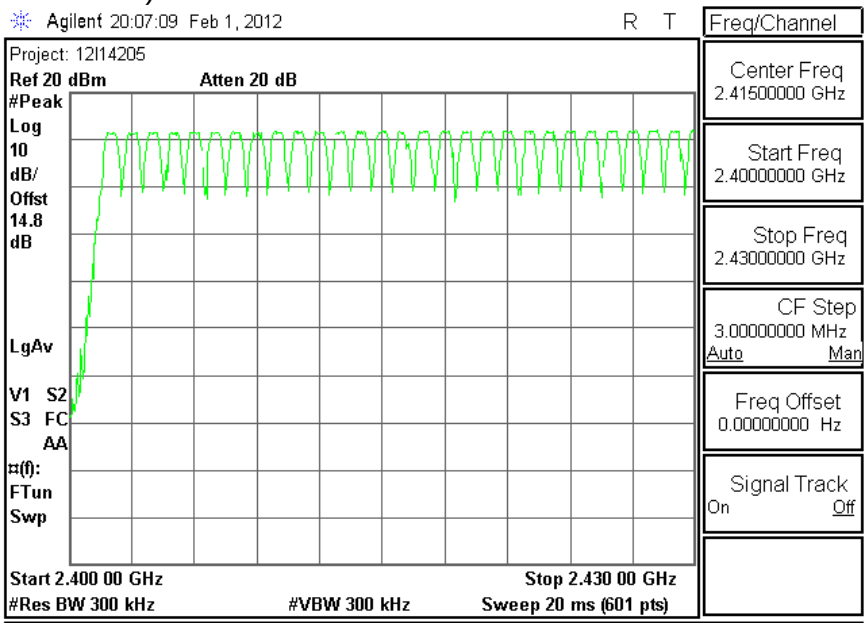
RESULTS

79 Channels observed.

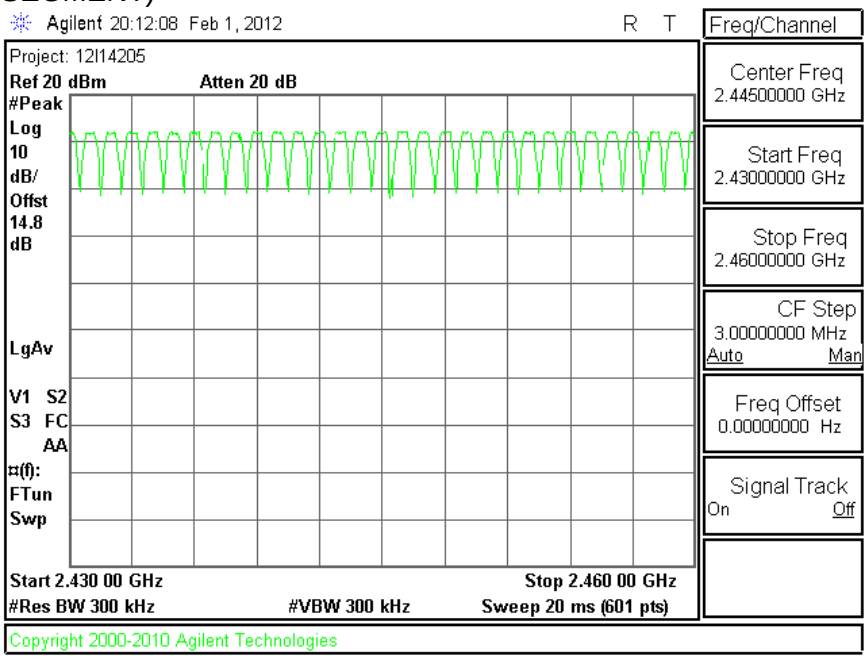
NUMBER OF HOPPING CHANNELS



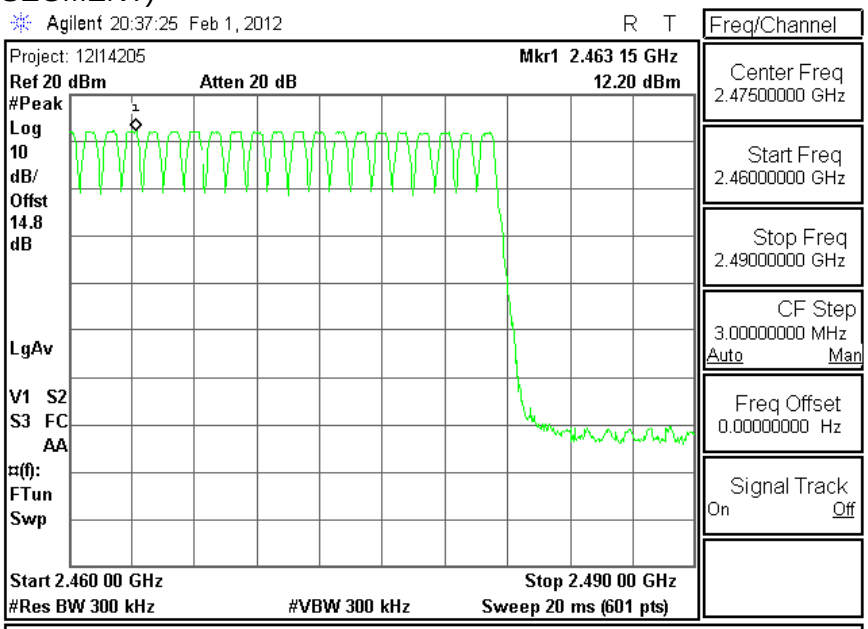
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



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 * (# of pulses in 3.16 s) * pulse width.

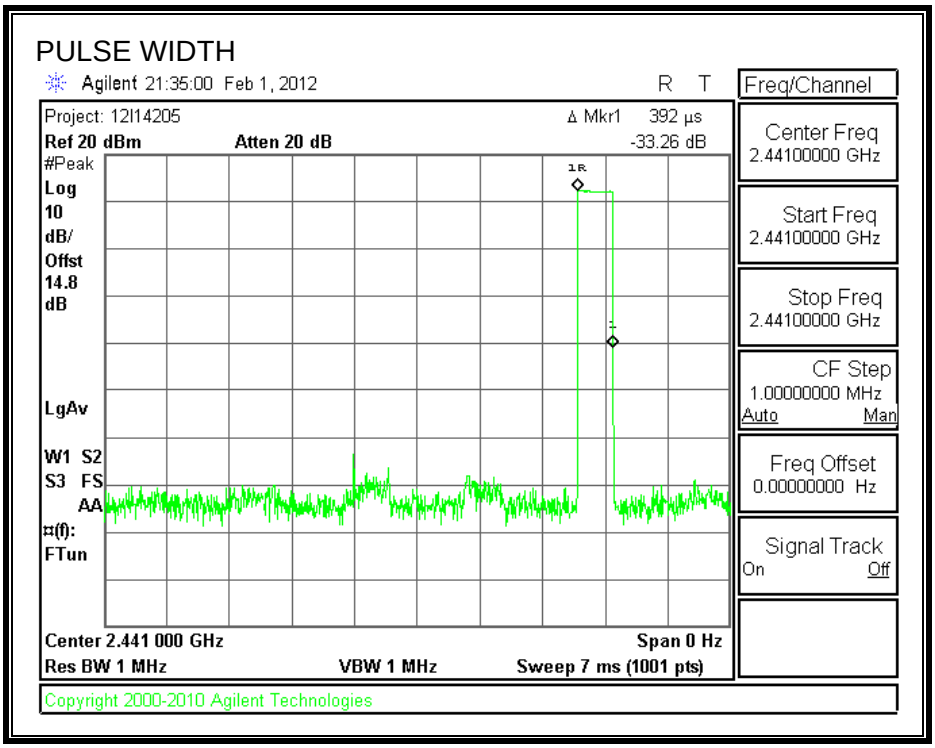
RESULTS

GFSK Mode

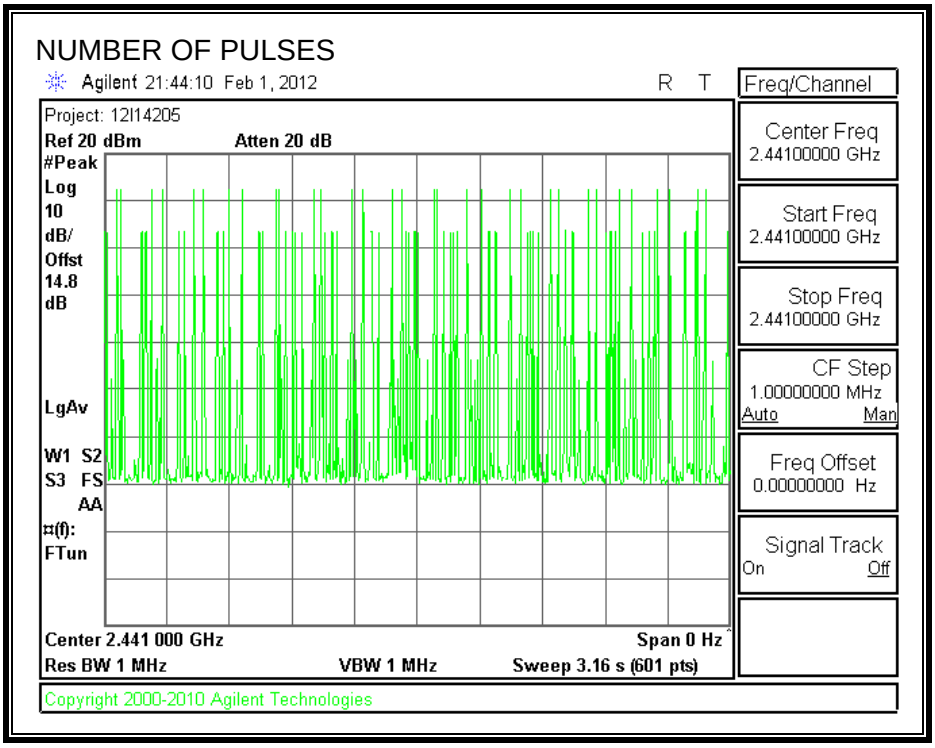
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.392	32	0.125	0.4	-0.275
DH3	1.640	17	0.279	0.4	-0.121
DH5	2.900	11	0.319	0.4	-0.081

DH1

PULSE WIDTH

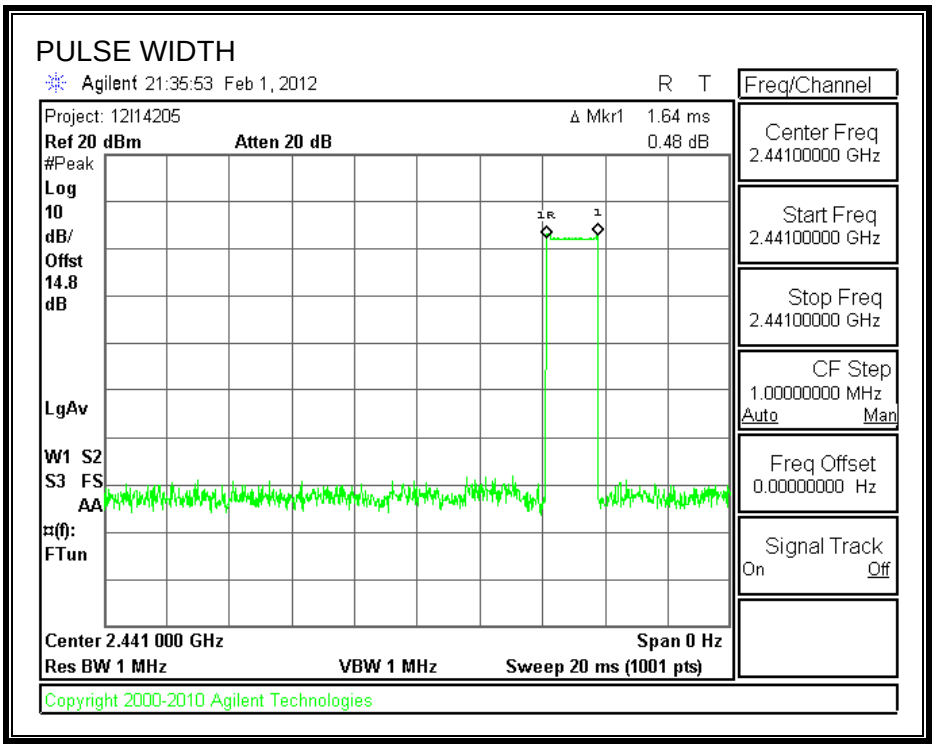


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

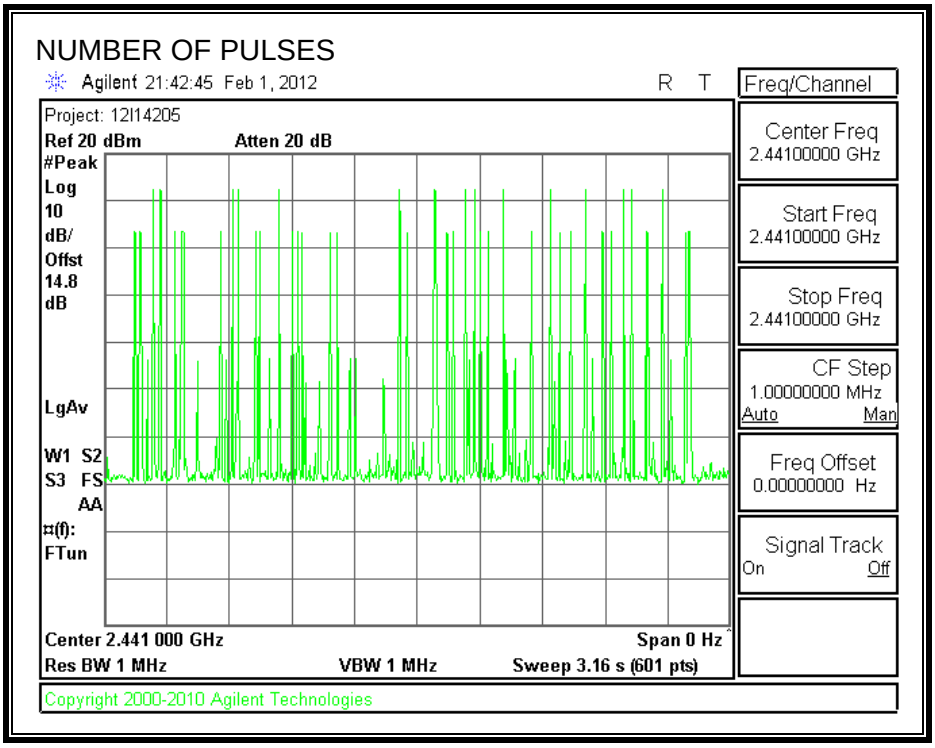


DH3

PULSE WIDTH

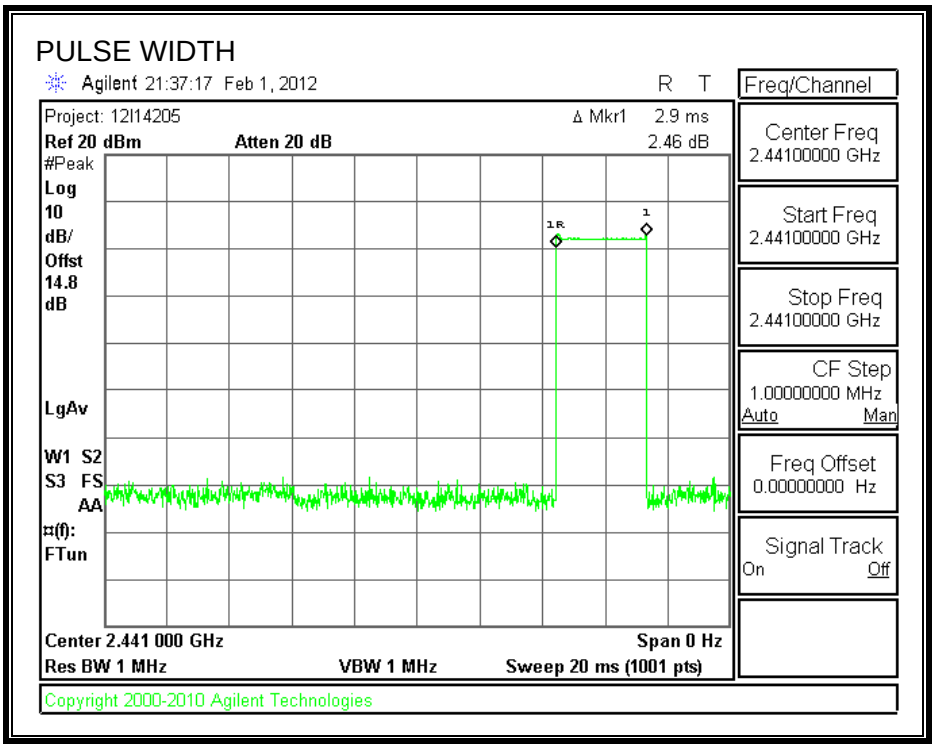


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

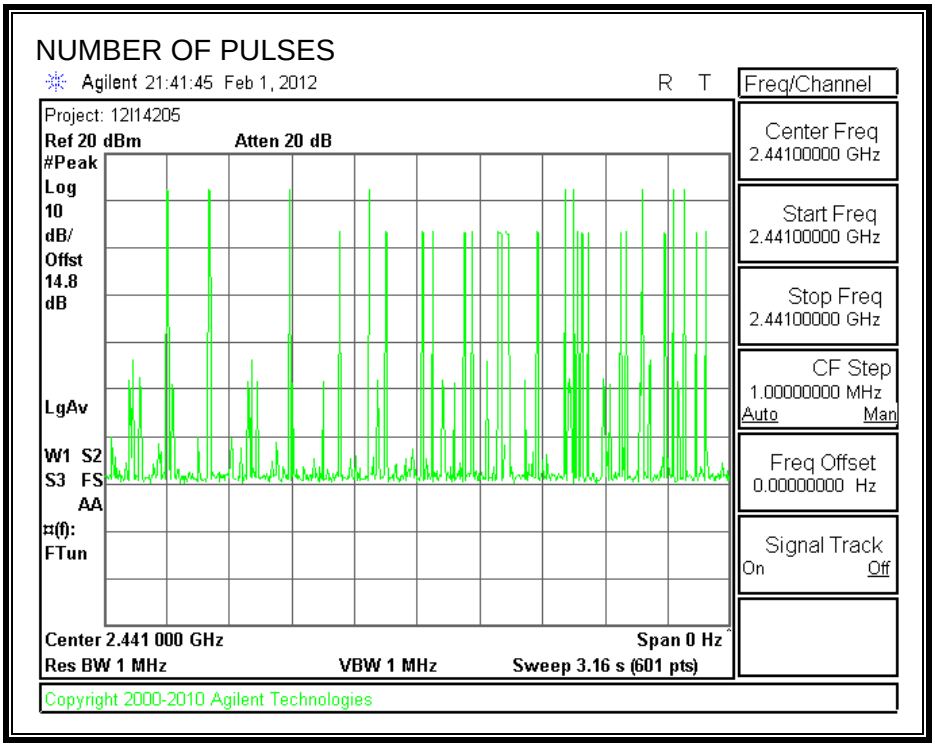


DH5

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.

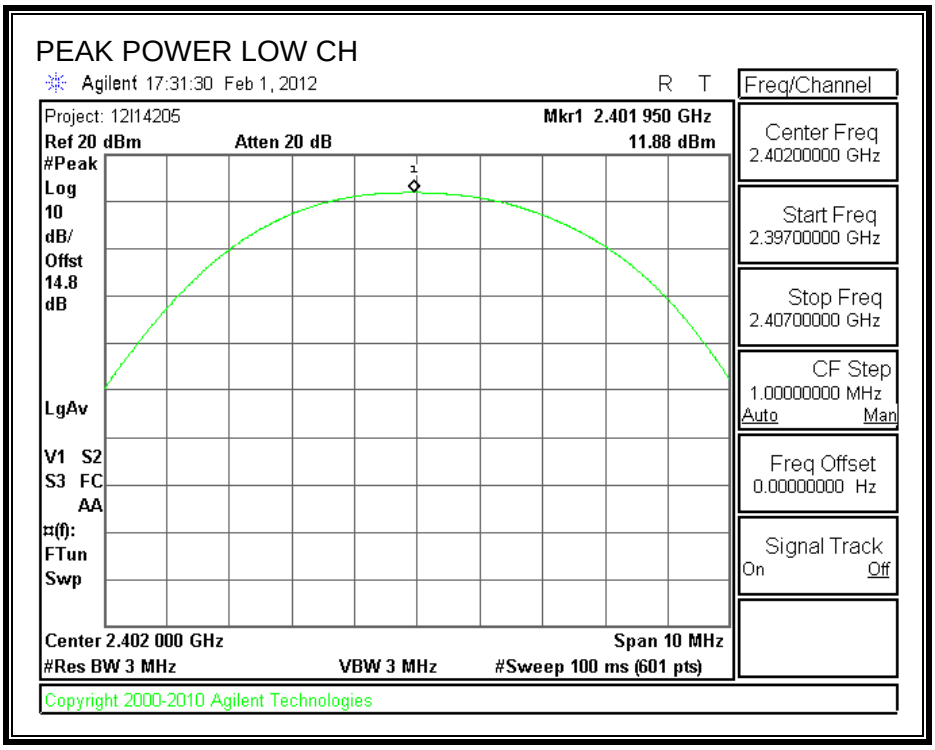
TEST PROCEDURE

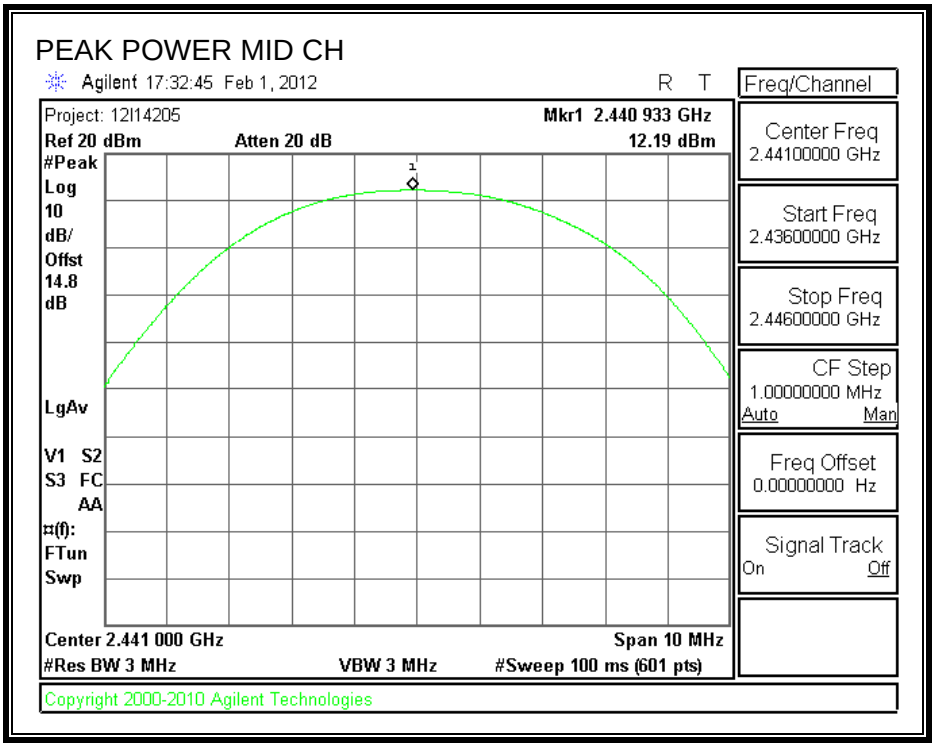
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

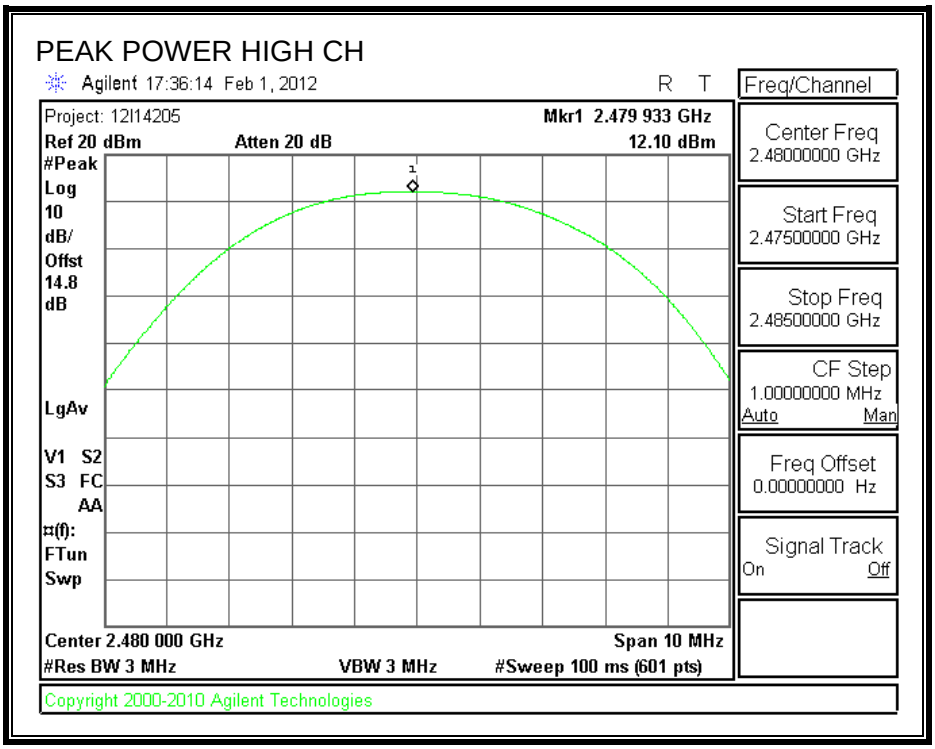
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.88	30	-18.12
Middle	2441	12.19	30	-17.81
High	2480	12.10	30	-17.90

OUTPUT POWER





PEAK POWER HIGH CH



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 11.88 dB (including 10 dB pad and 1.88 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	11.10
Middle	2441	11.30
High	2480	11.10

7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

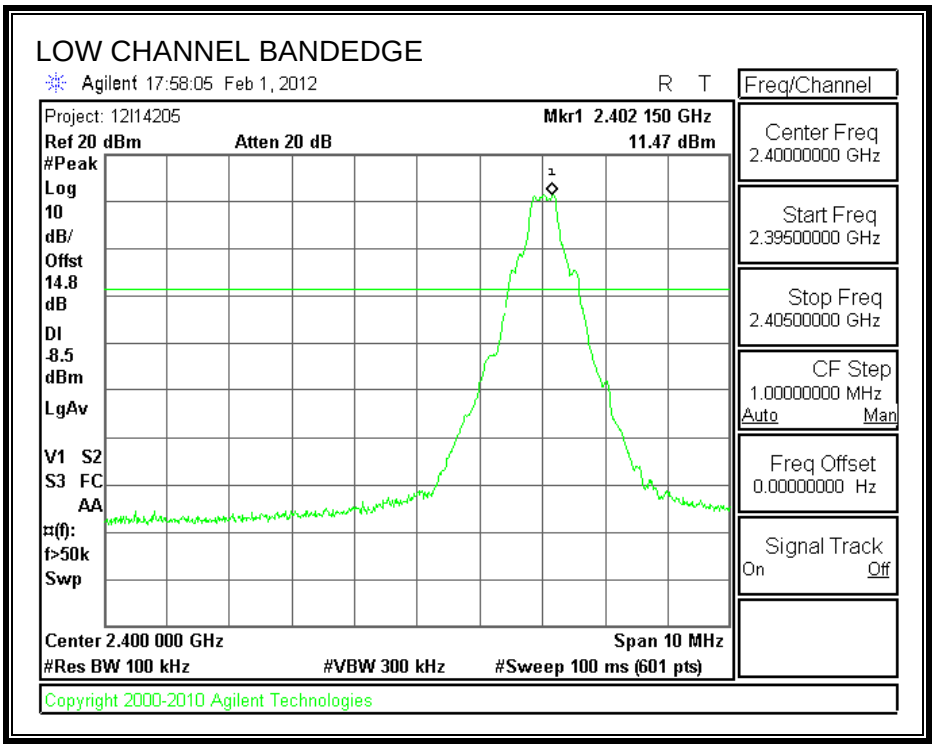
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

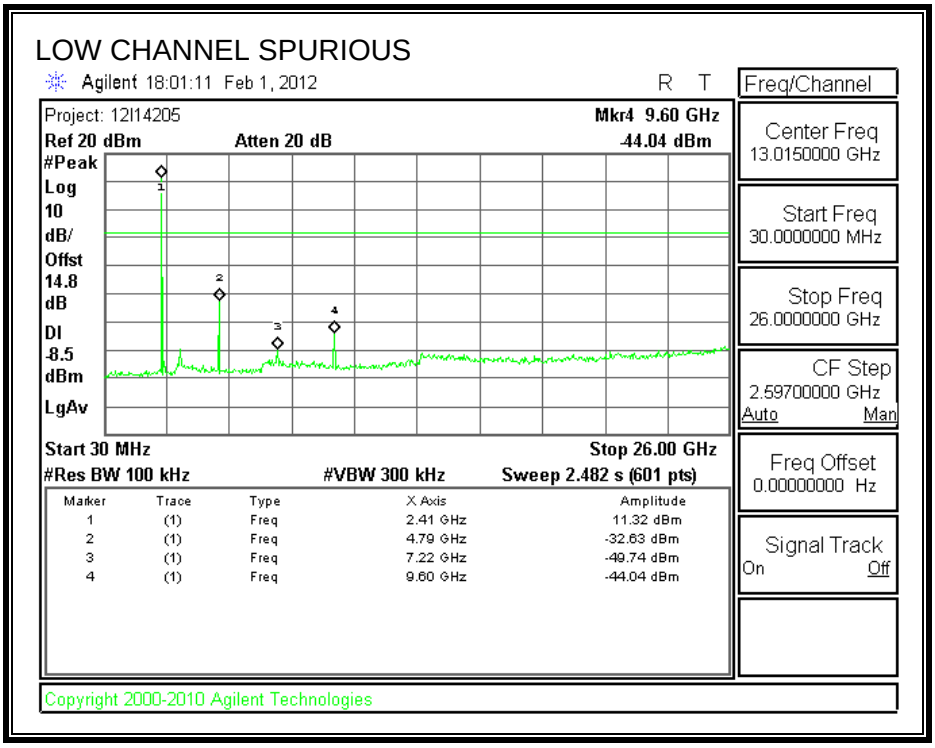
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

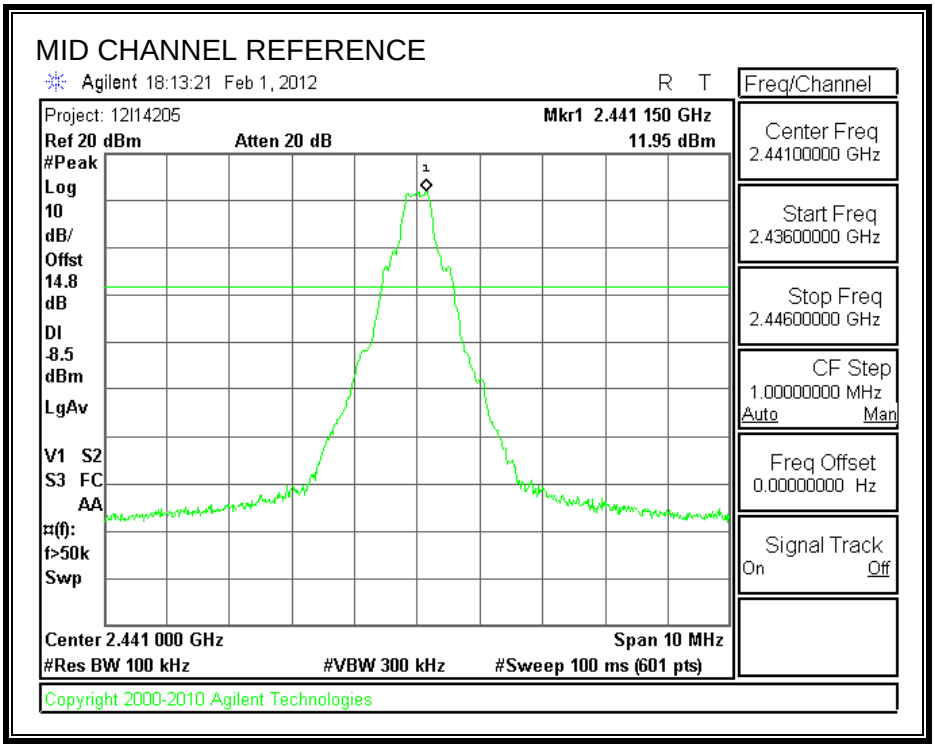
RESULTS

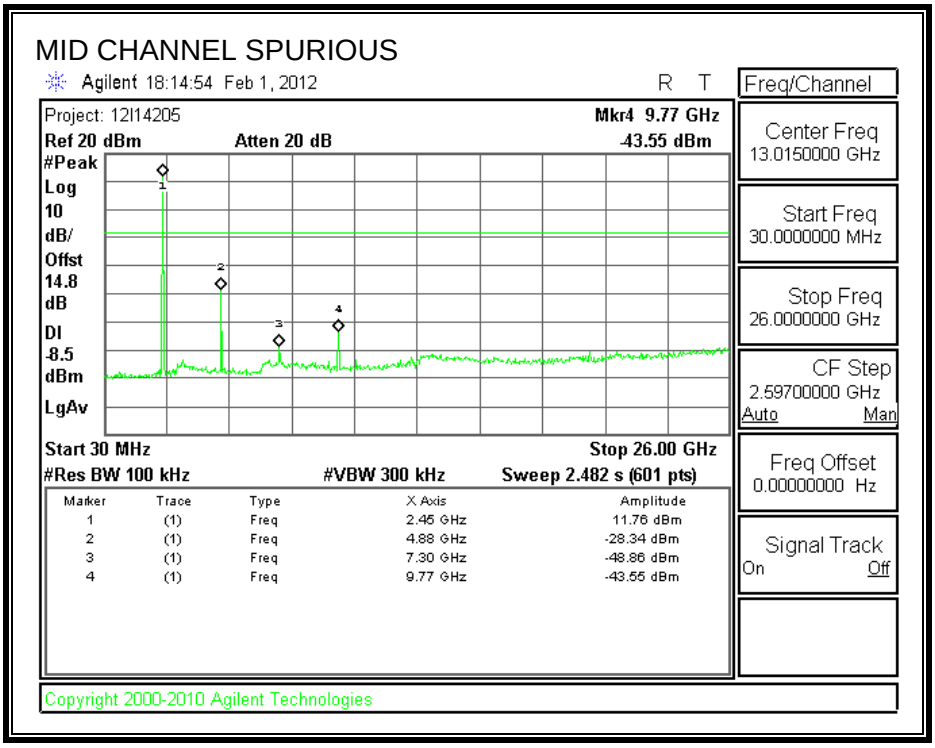
SPURIOUS EMISSIONS, LOW CHANNEL



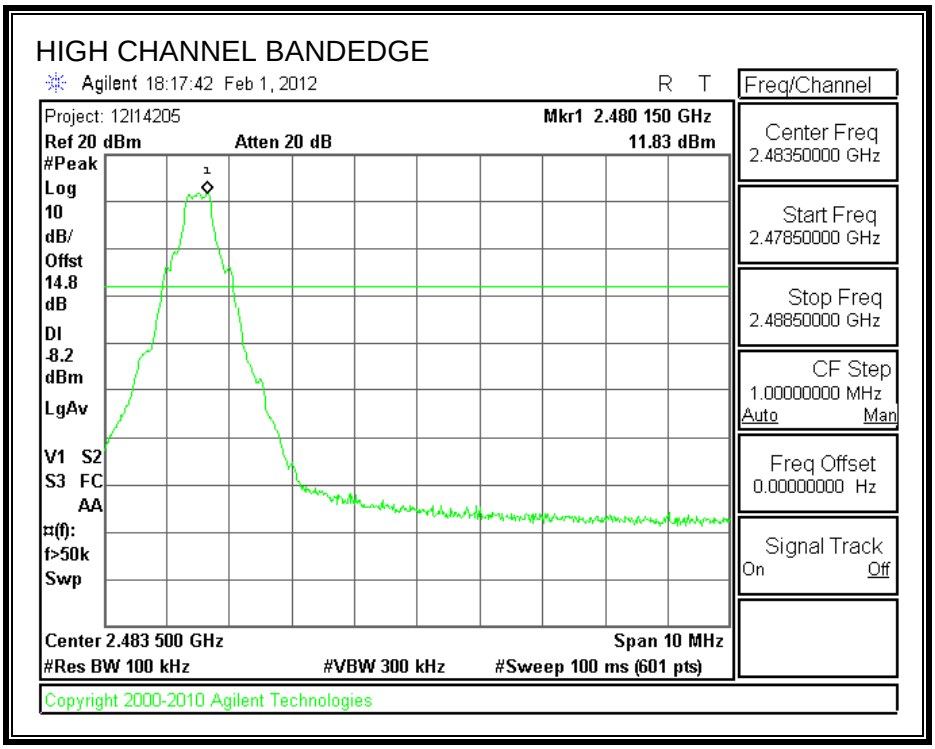


SPURIOUS EMISSIONS, MID CHANNEL

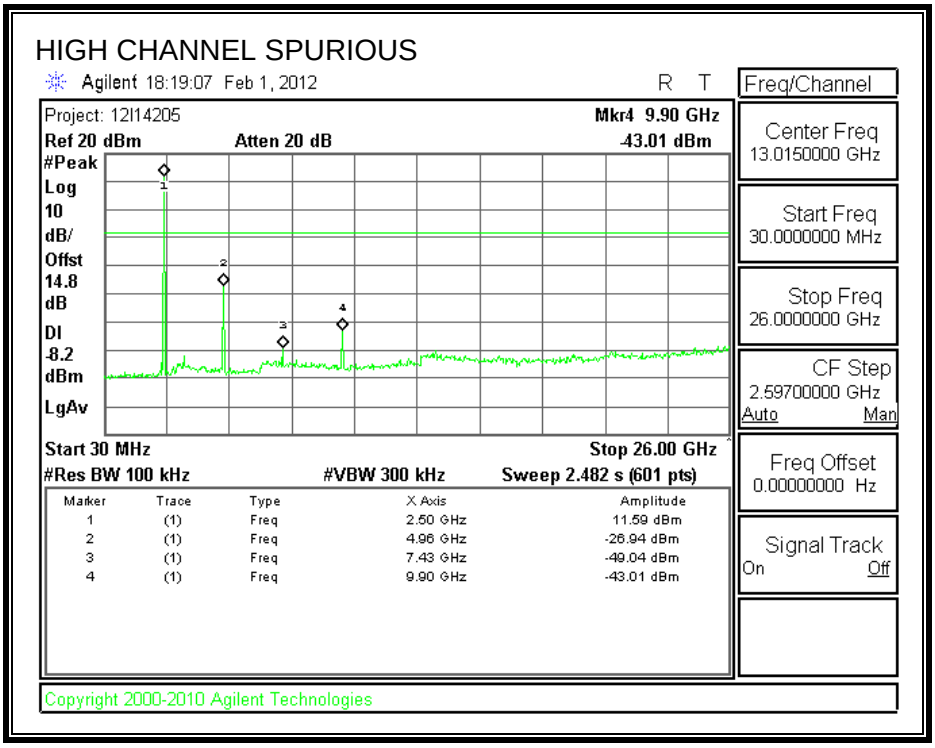




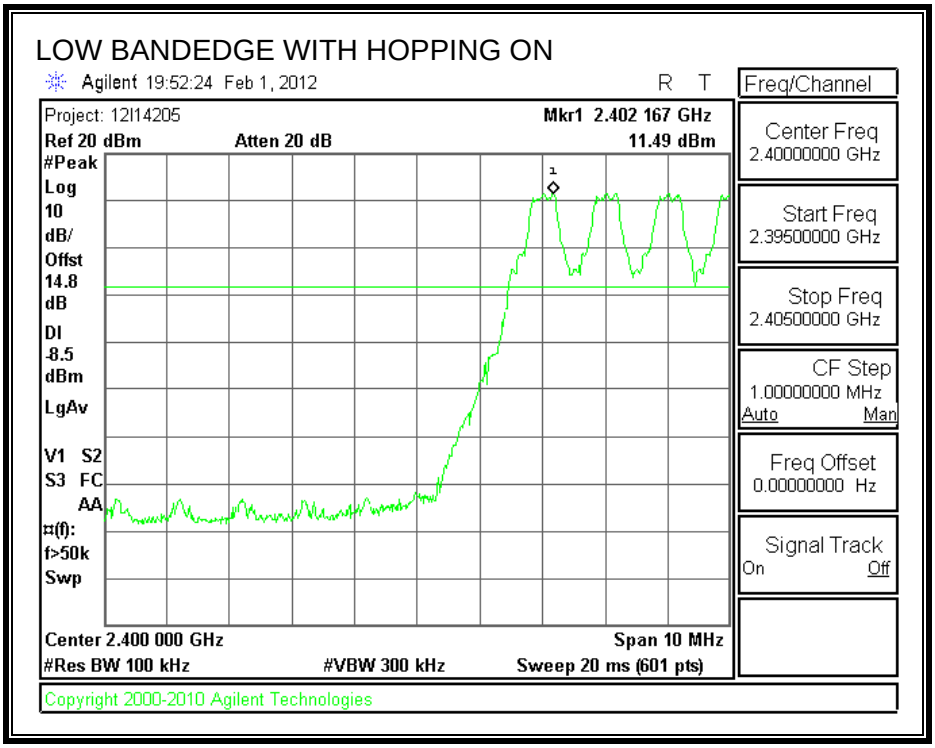
SPURIOUS EMISSIONS, HIGH CHANNEL

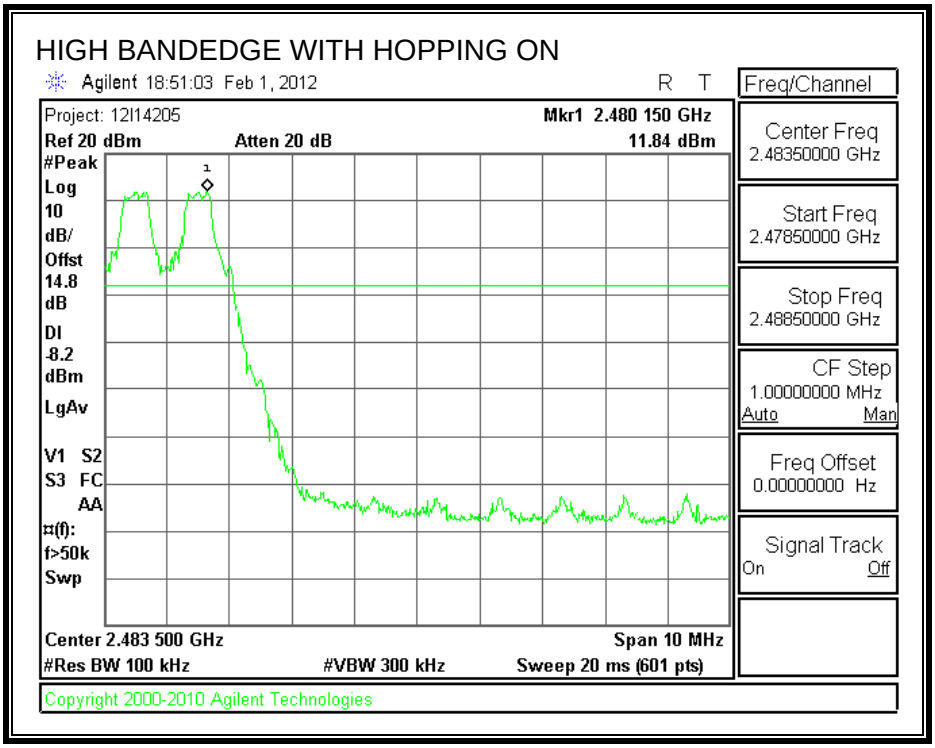


HIGH CHANNEL SPURIOUS



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.

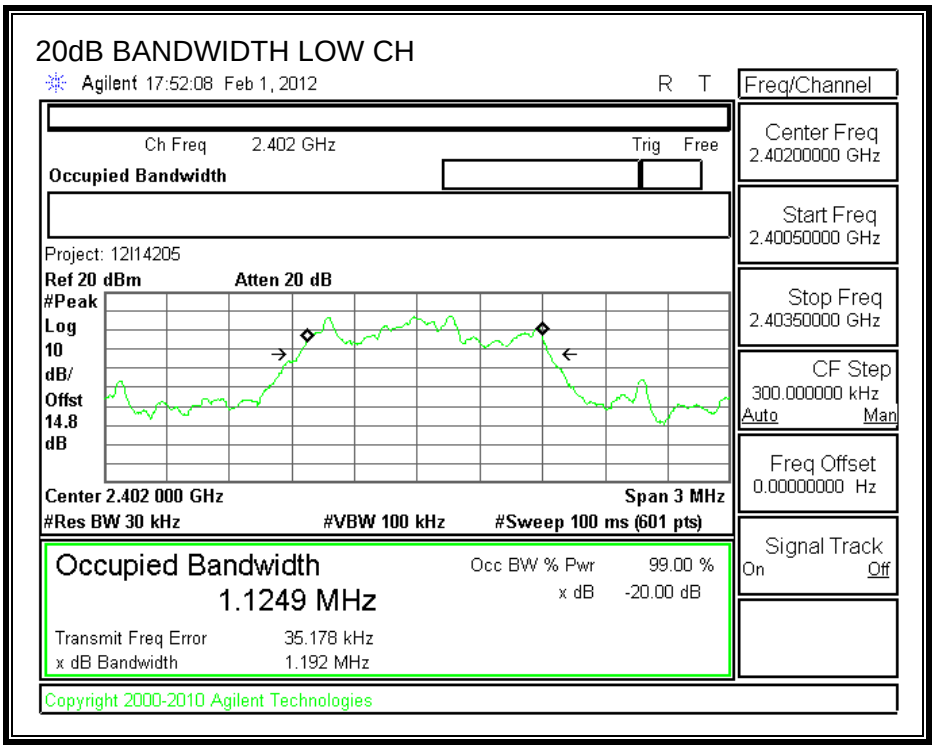
TEST PROCEDURE

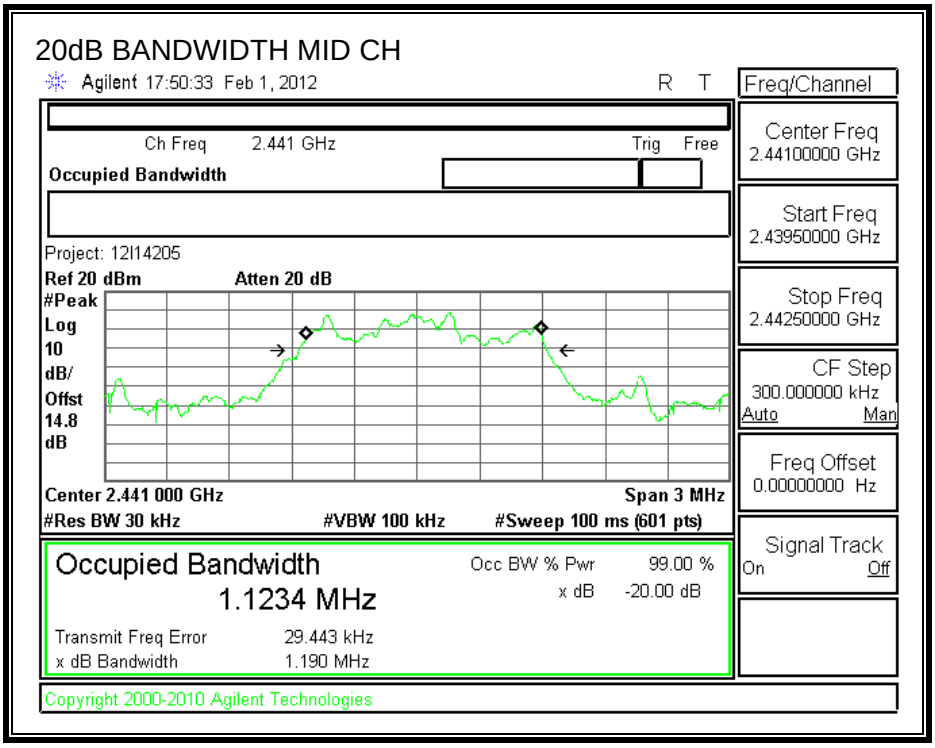
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

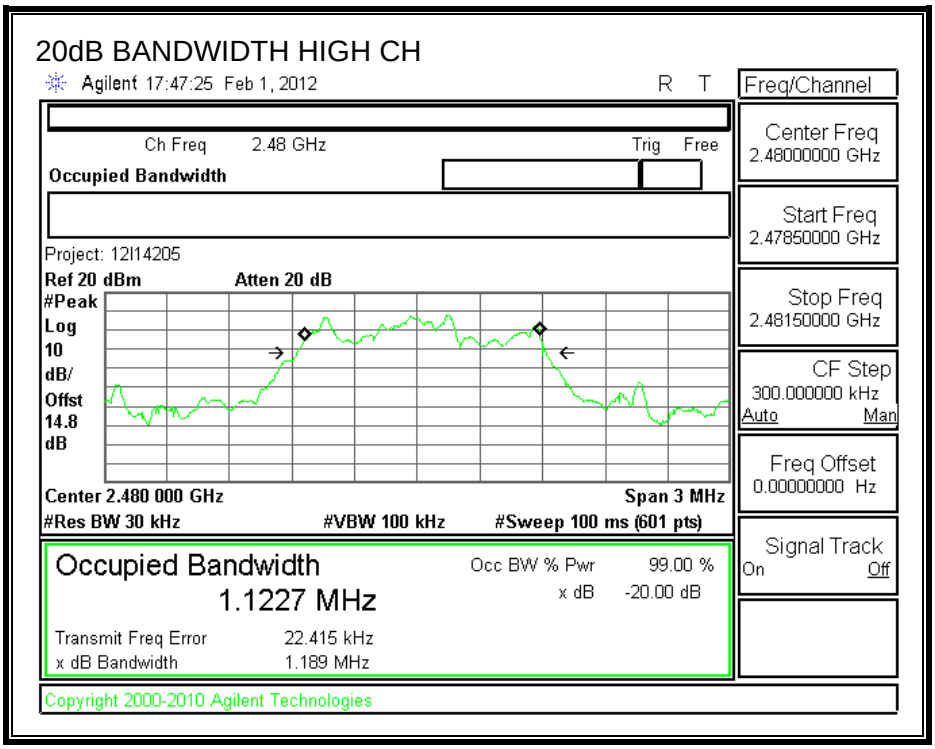
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.192
Middle	2441	1.190
High	2480	1.189

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 hoping channel, whichever is greater.

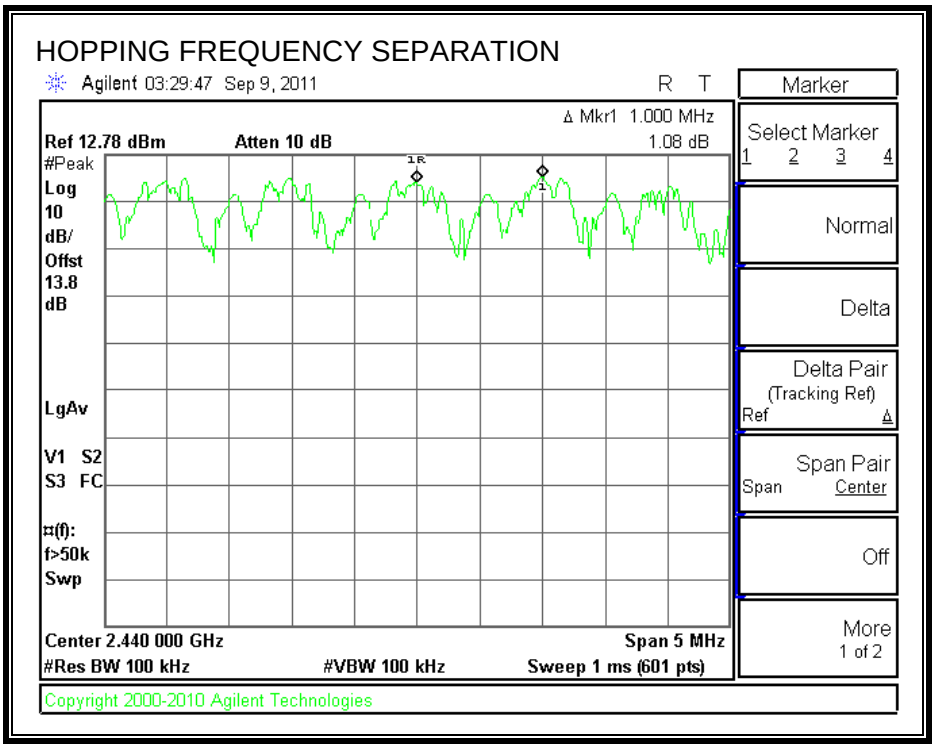
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

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

RESULTS

HOPPING FREQUENCY SEPARATION



7.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

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

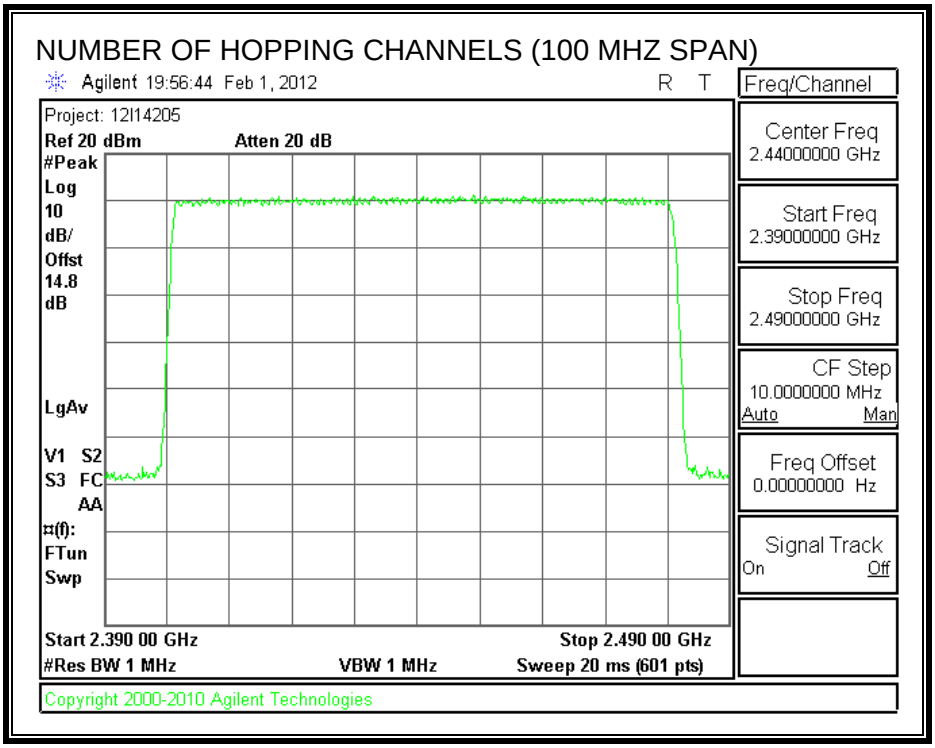
TEST PROCEDURE

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.

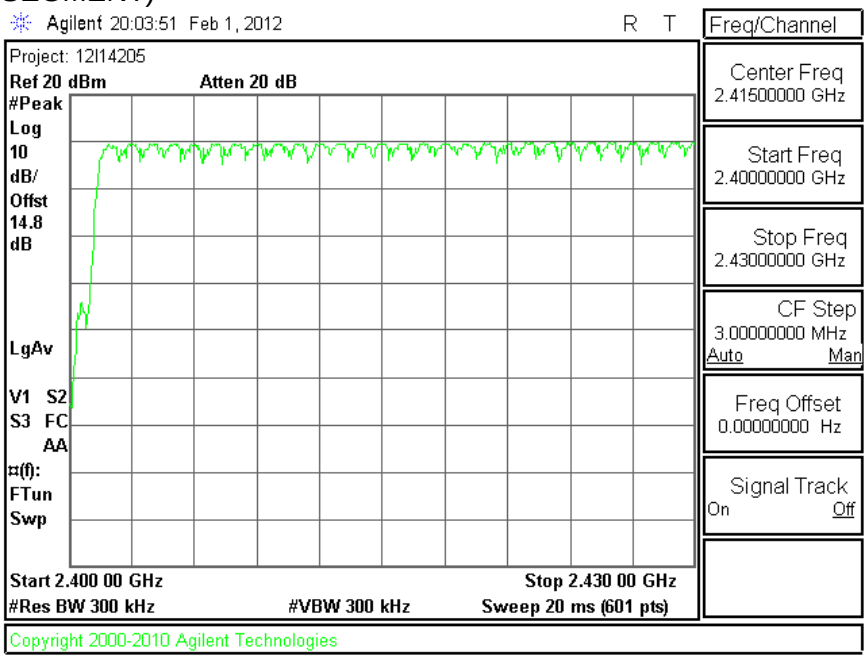
RESULTS

79 Channels observed.

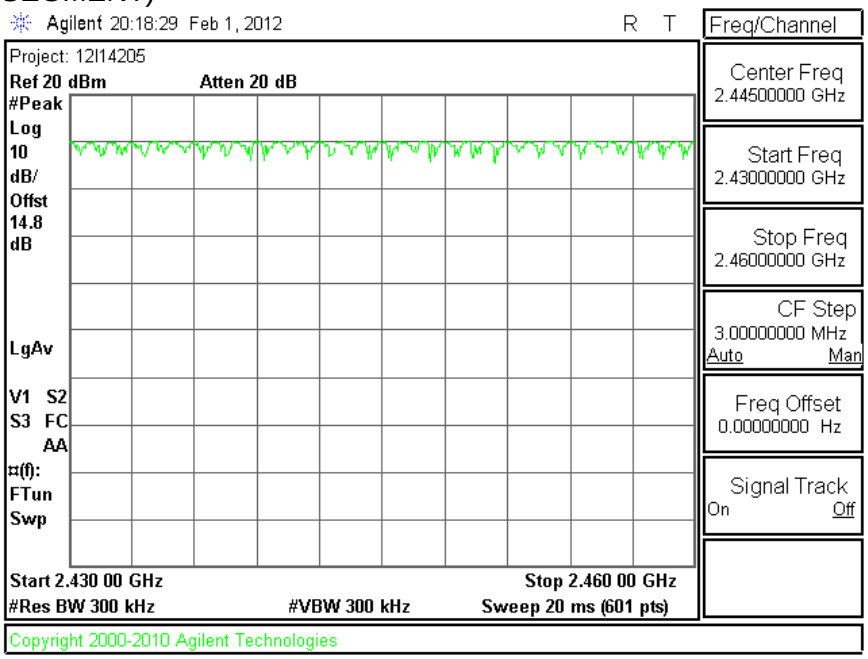
NUMBER OF HOPPING CHANNELS



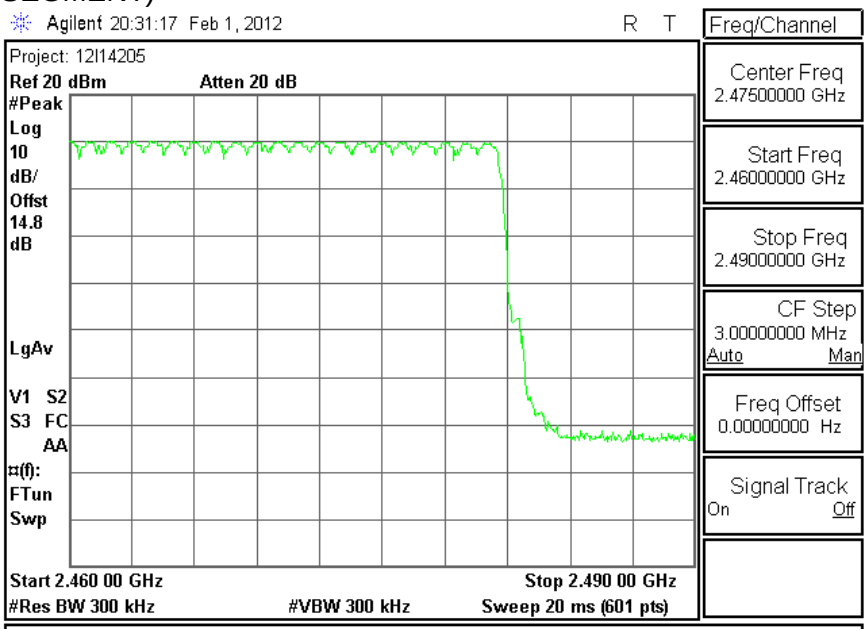
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



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 * (# of pulses in 3.16 s) * pulse width.

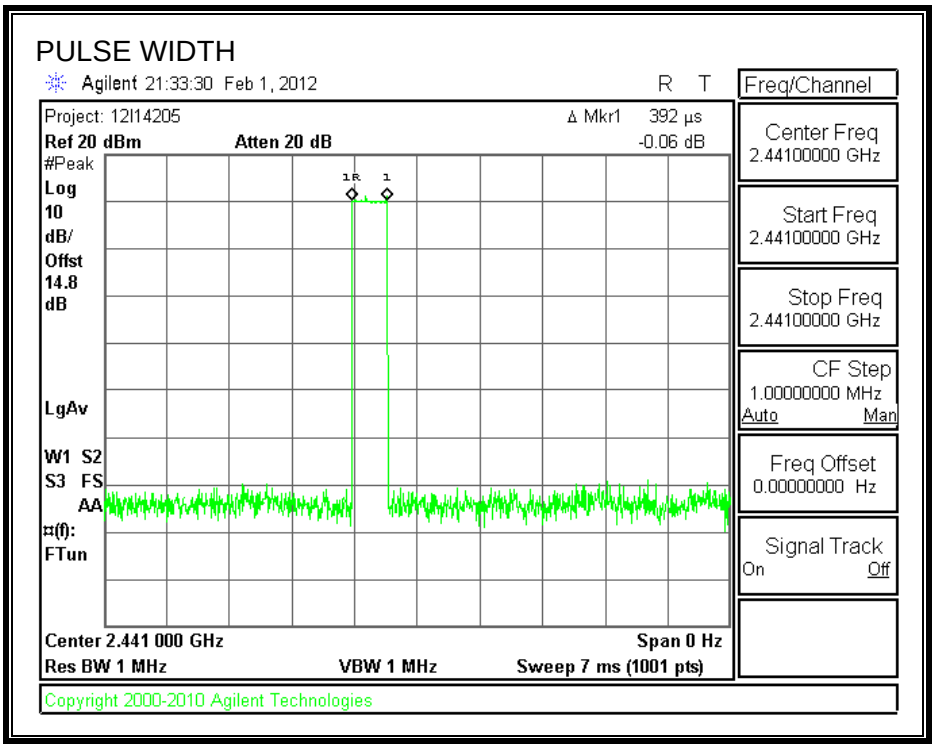
RESULTS

8PSK Mode

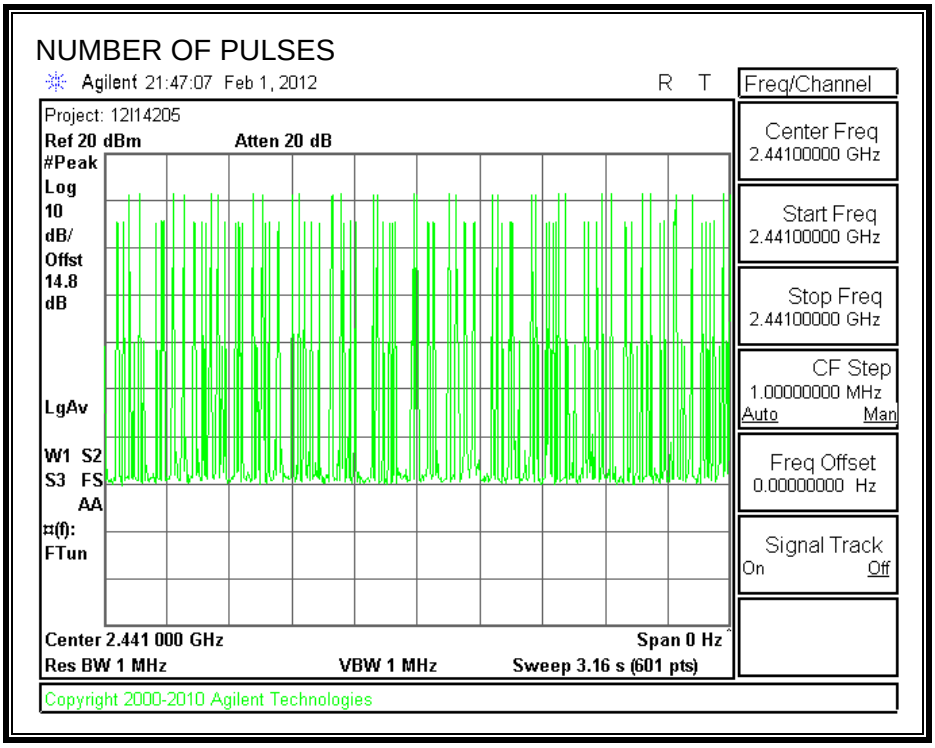
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.392	33	0.129	0.4	-0.271
DH3	1.633	17	0.278	0.4	-0.122
DH5	2.900	13	0.377	0.4	-0.023

DH1

PULSE WIDTH

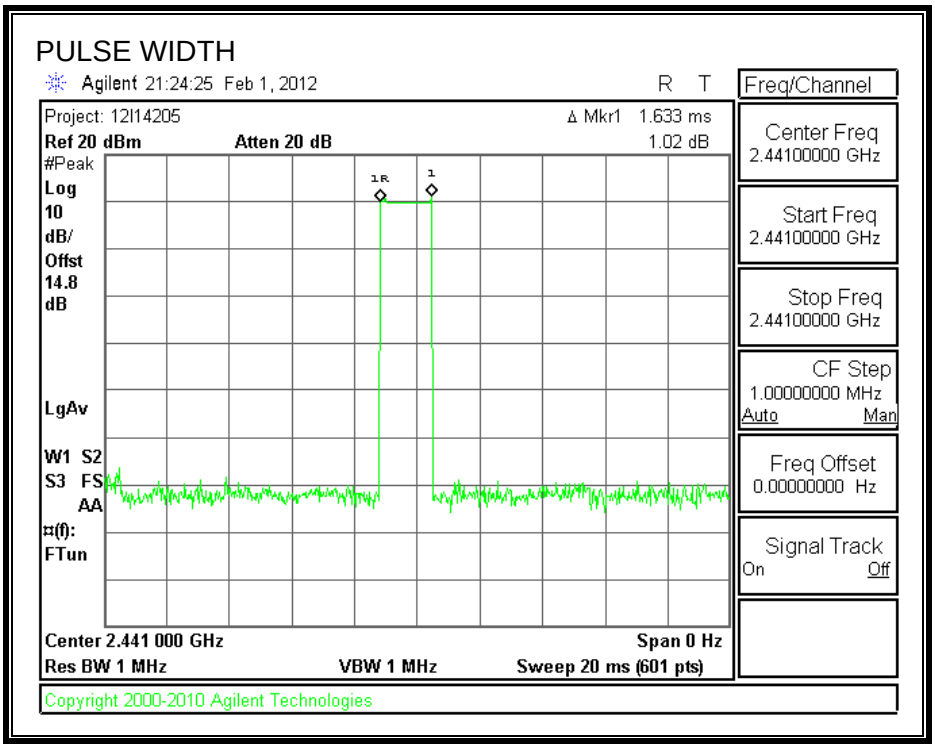


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

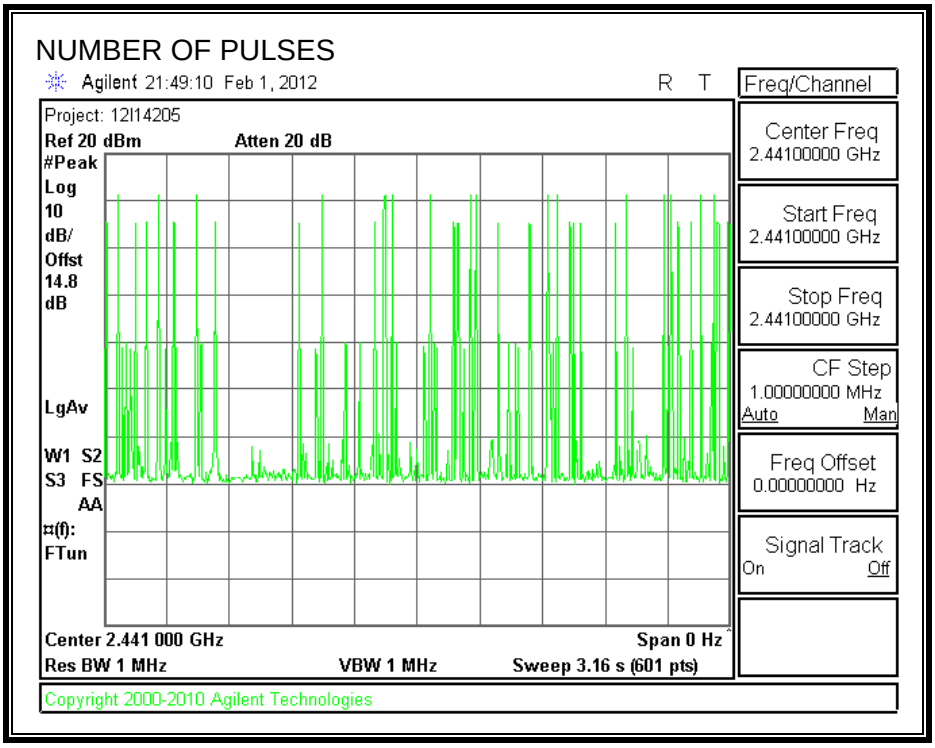


DH3

PULSE WIDTH

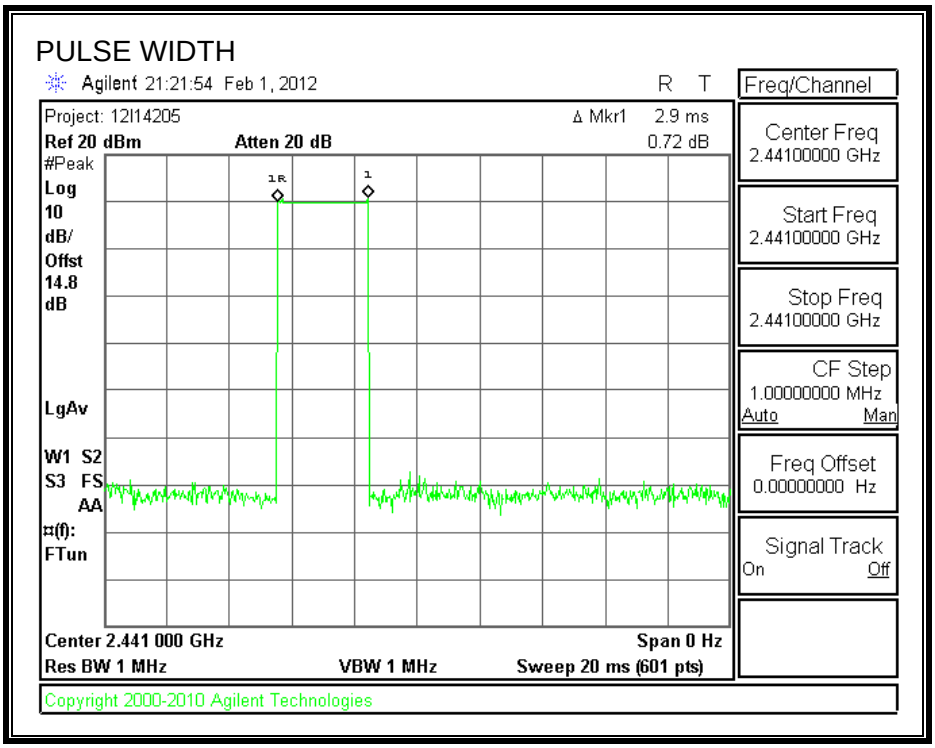


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

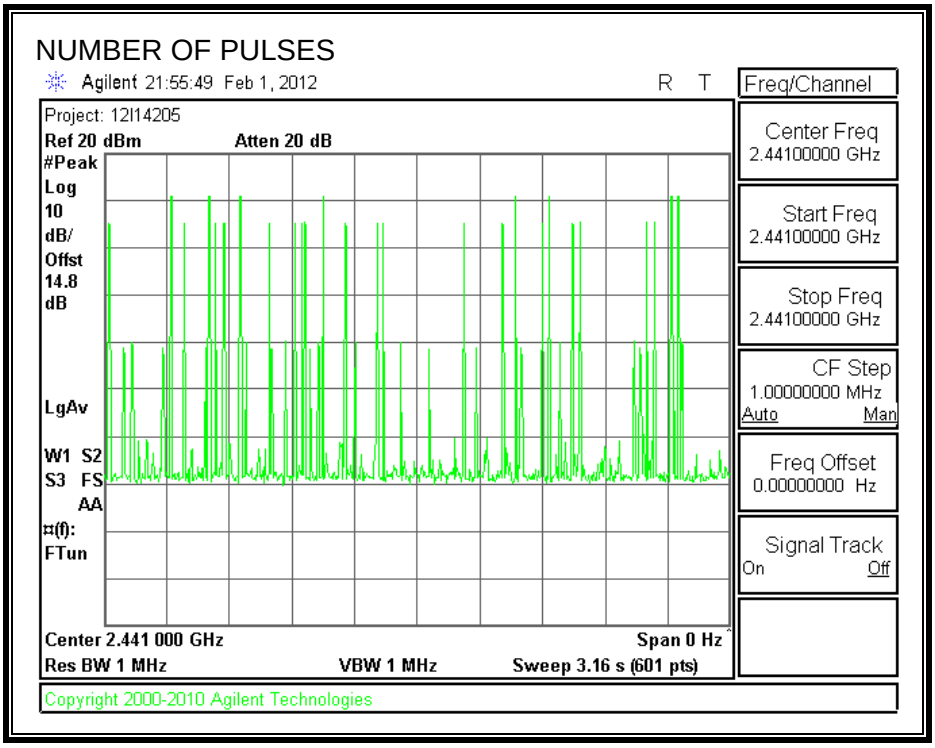


DH5

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.

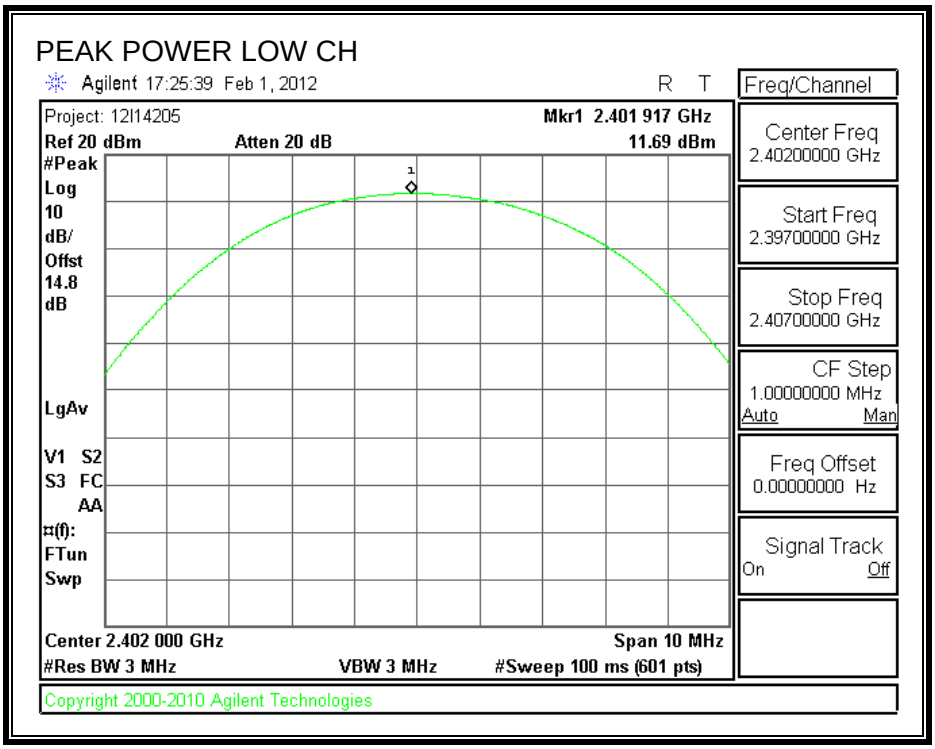
TEST PROCEDURE

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.

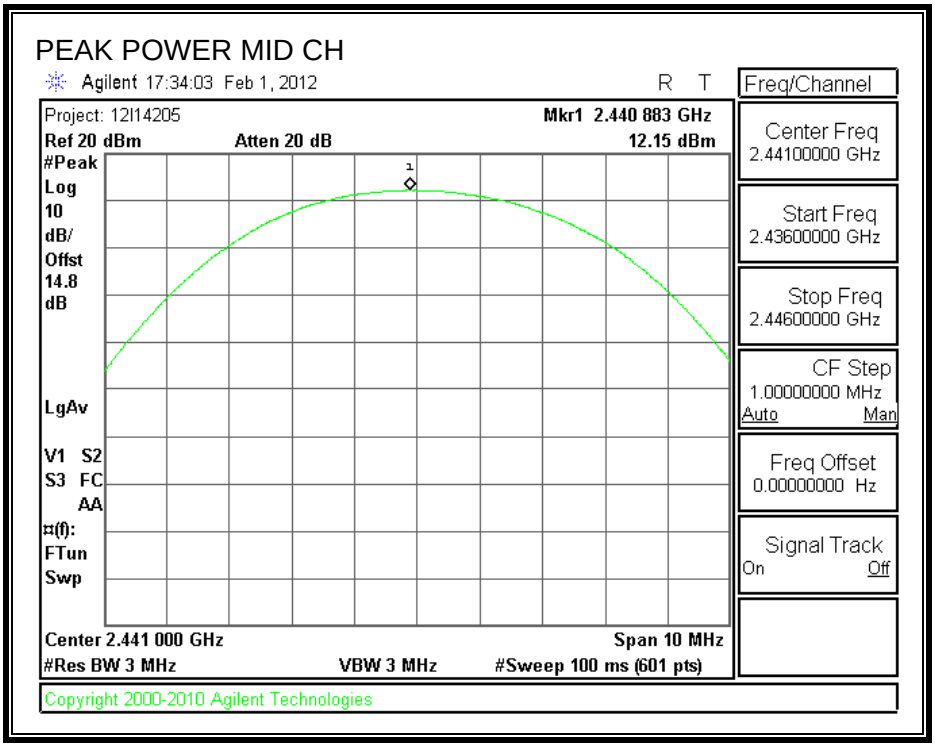
RESULTS

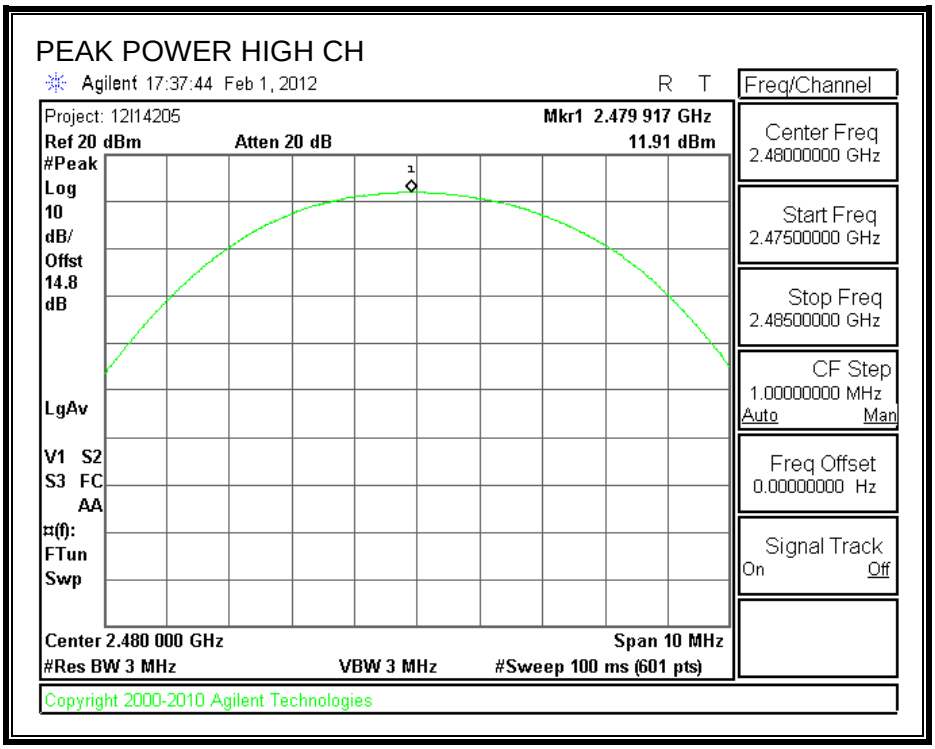
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.69	30	-18.31
Middle	2441	12.15	30	-17.85
High	2480	11.91	30	-18.09

OUTPUT POWER



PEAK POWER MID CH





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 11.88 dB (including 10 dB pad and 1.88dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Frequency (MHz)	Average Power (dBm)
2402	8.90
2441	9.30
2480	9.20

7.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

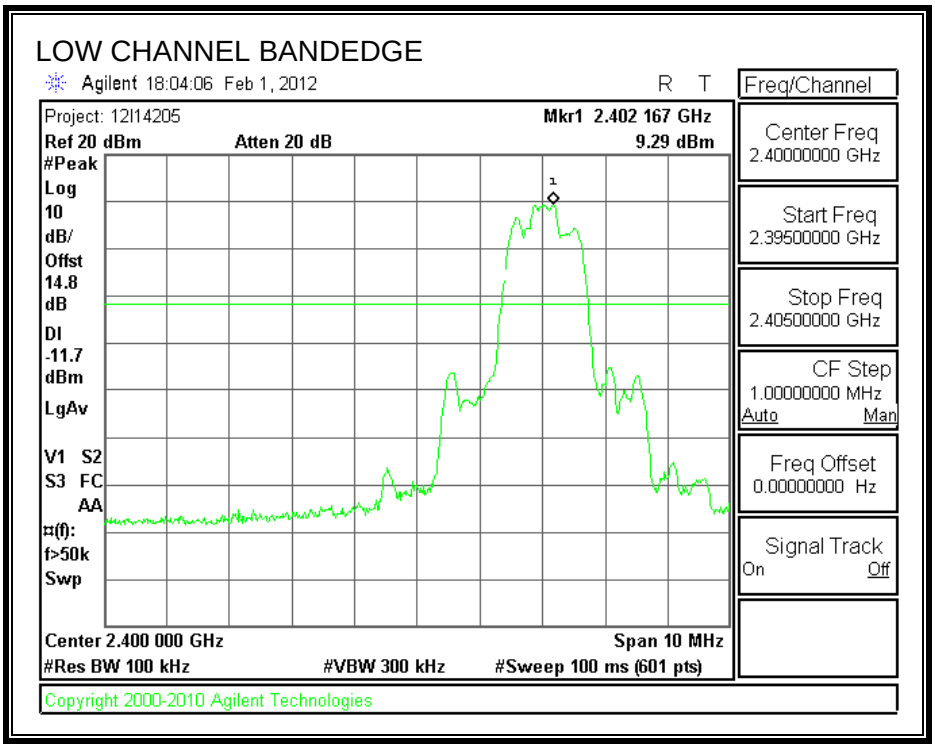
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

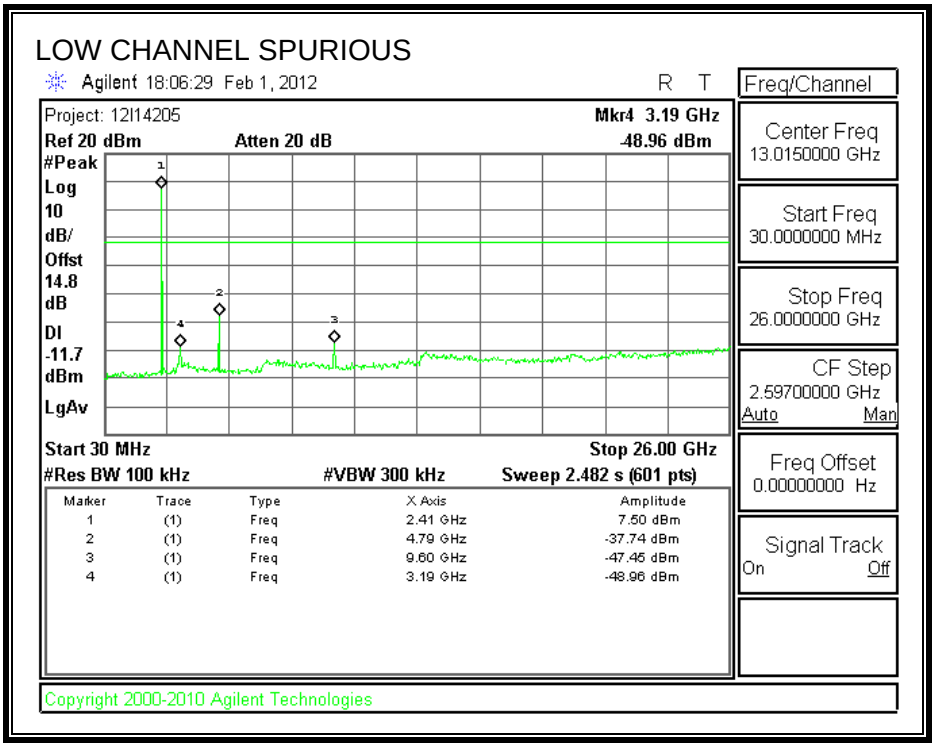
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

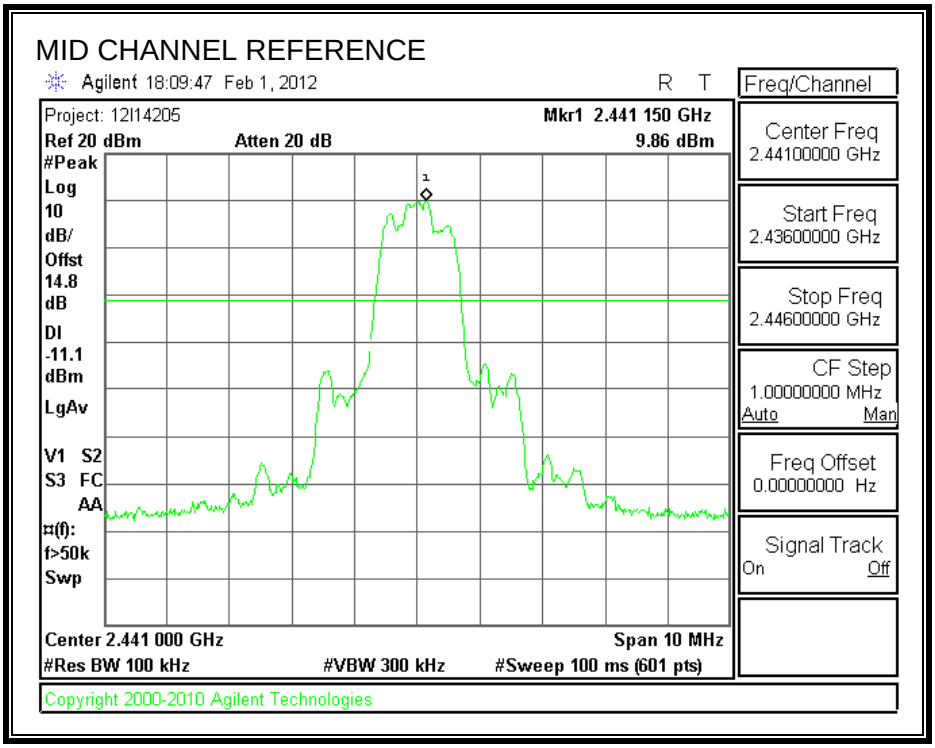
RESULTS

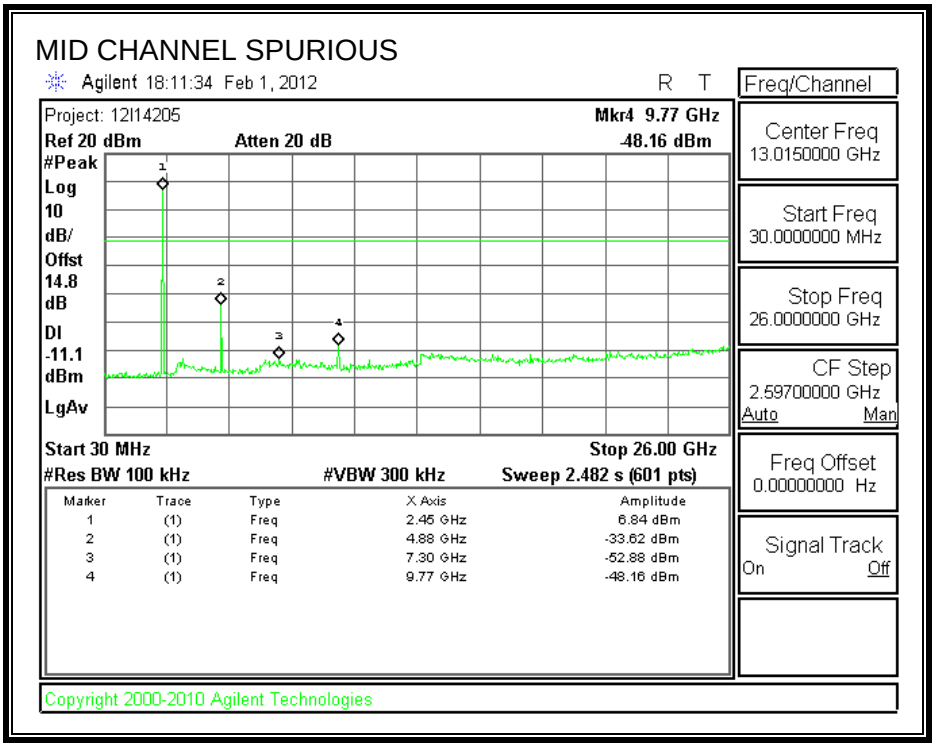
SPURIOUS EMISSIONS, LOW CHANNEL



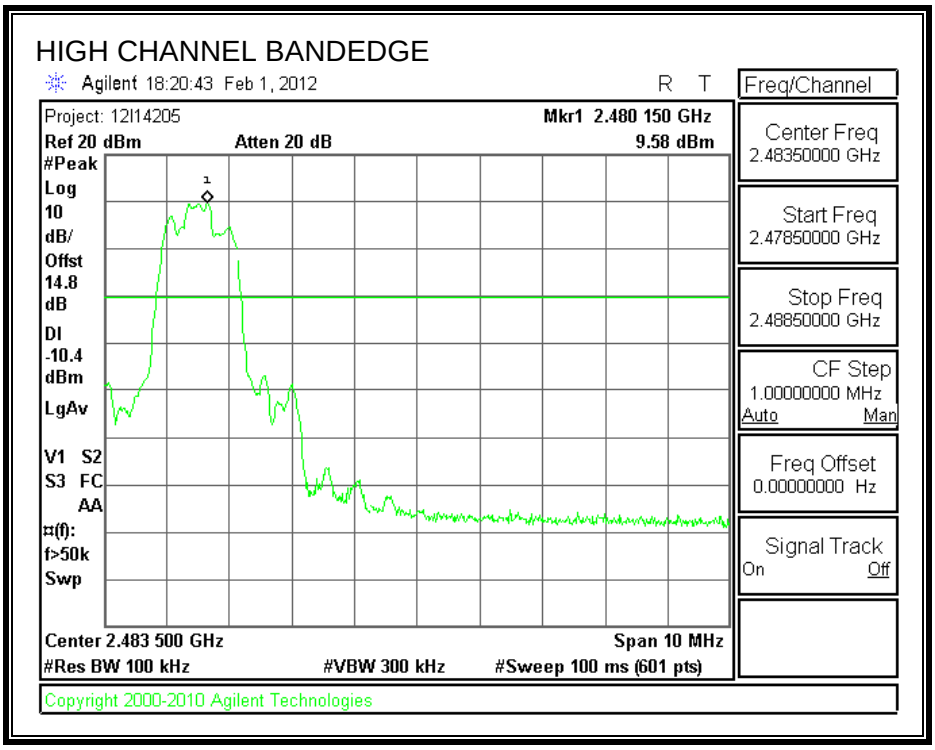


SPURIOUS EMISSIONS, MID CHANNEL

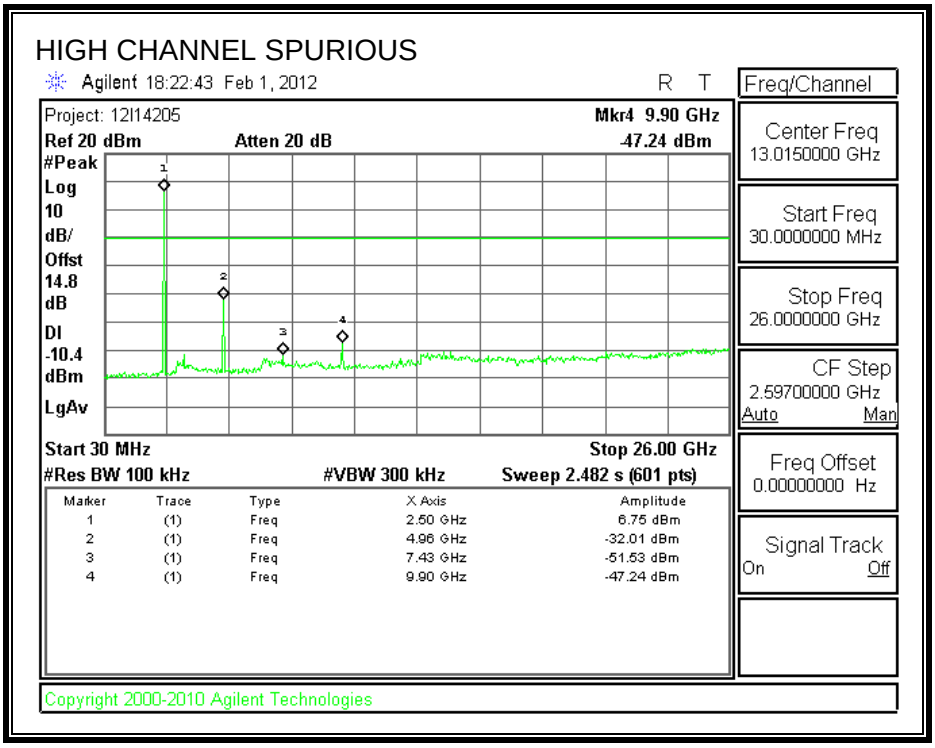




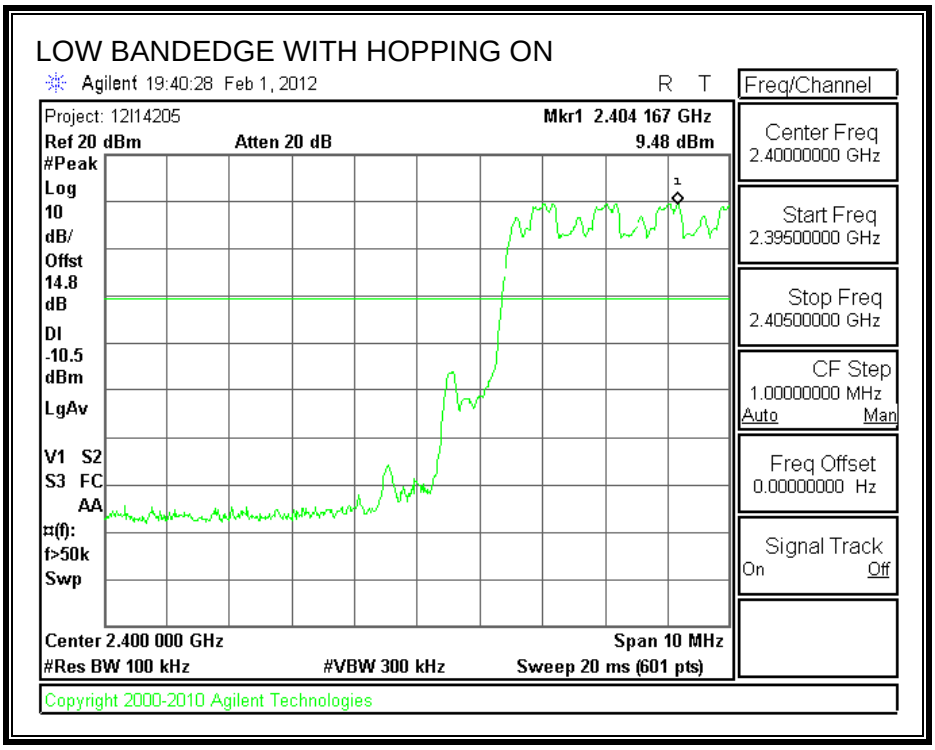
SPURIOUS EMISSIONS, HIGH CHANNEL



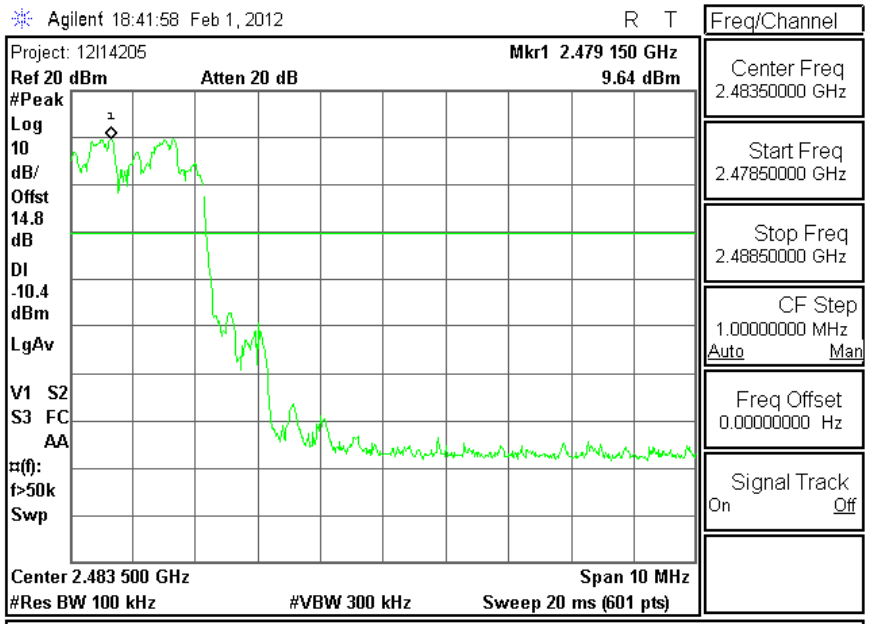
HIGH CHANNEL SPURIOUS



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



HIGH BANDEDGE 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.

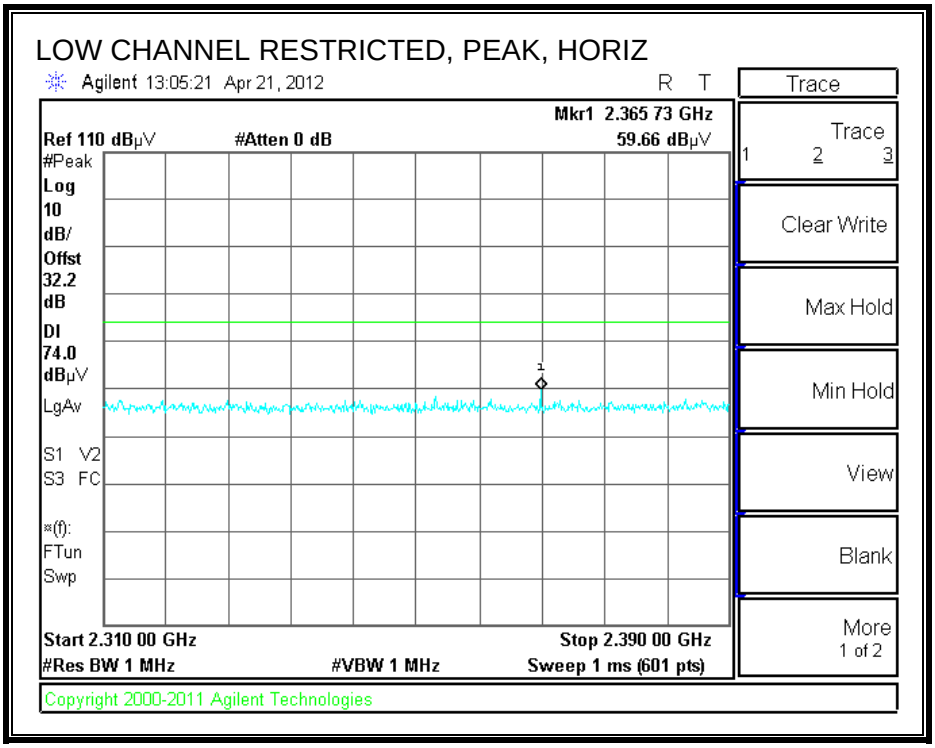
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

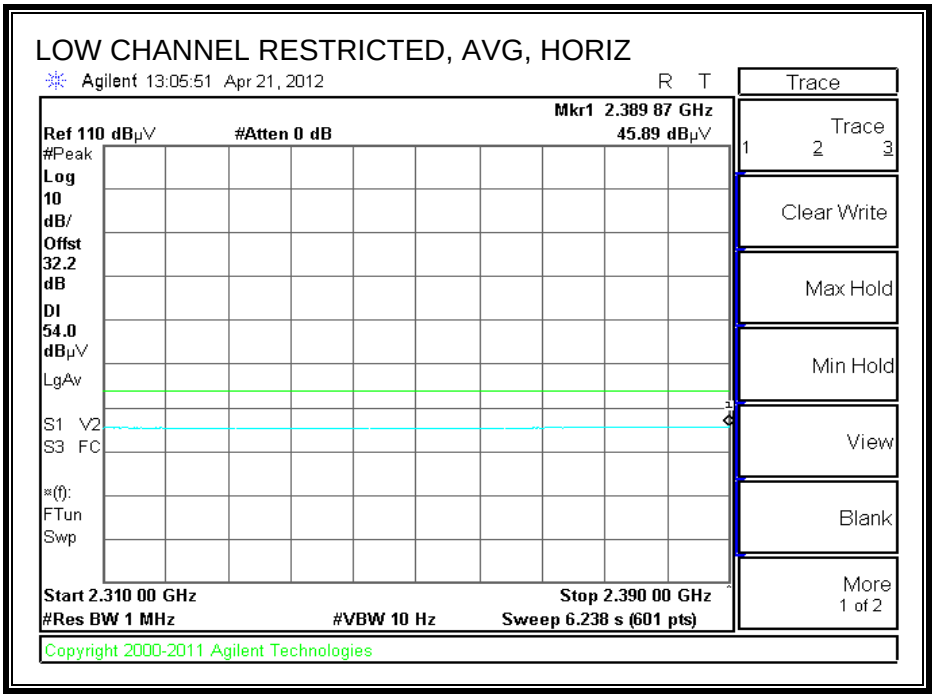
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

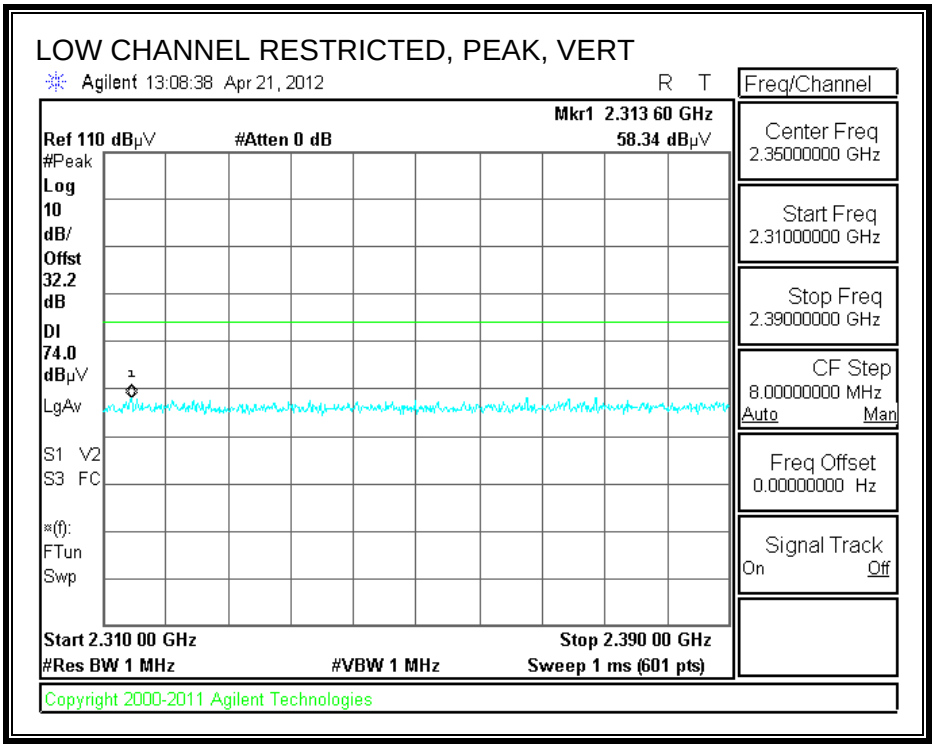
8.2.1. BASIC DATA RATE GFSK MODULATION

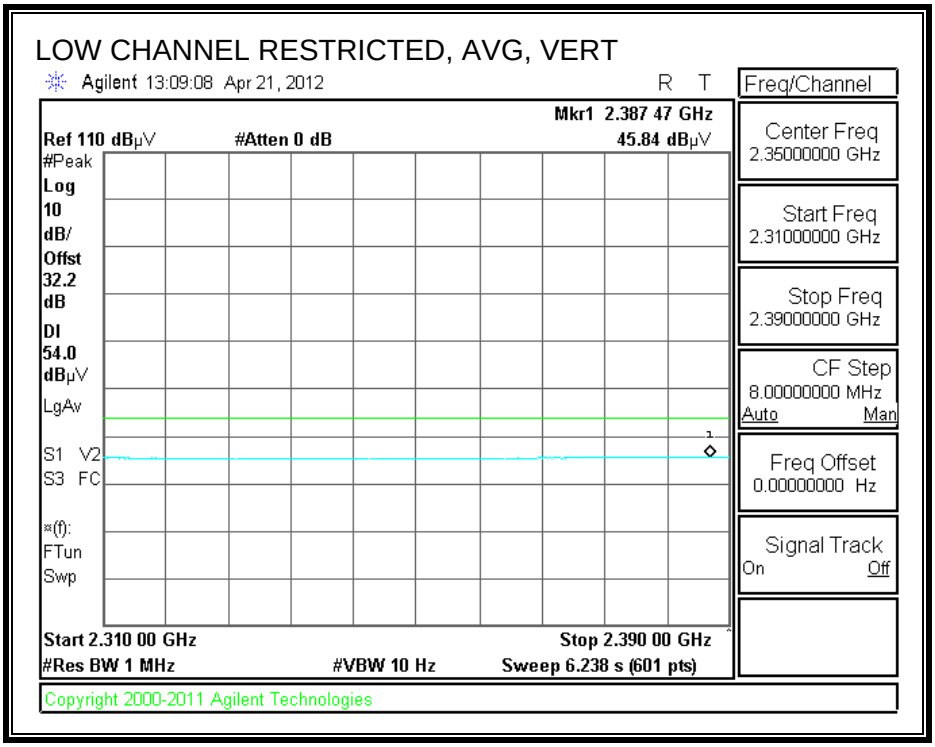
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



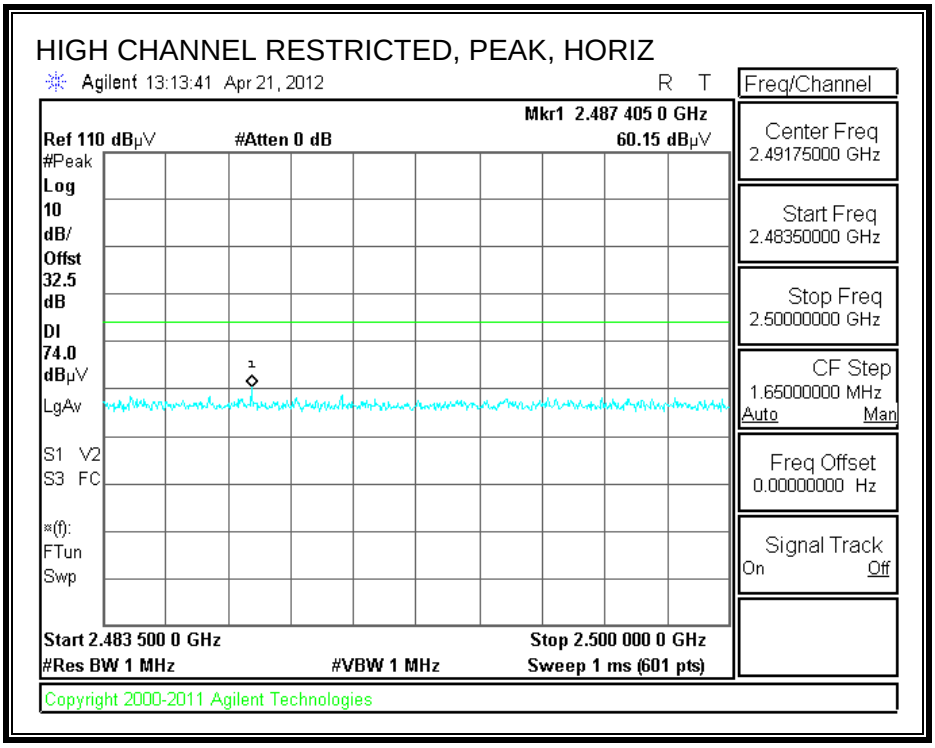


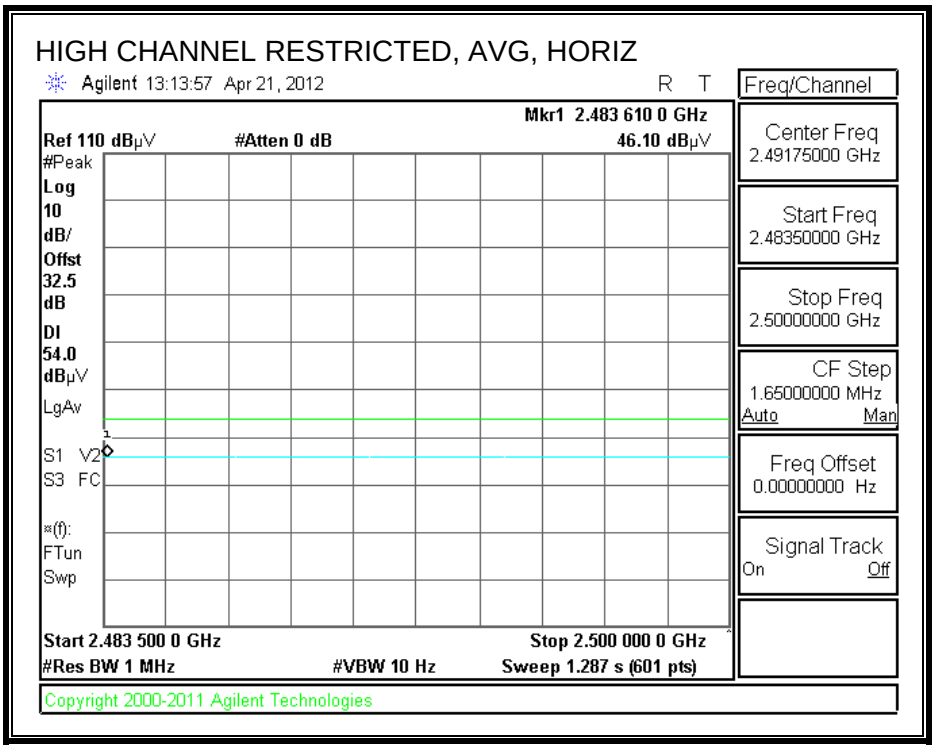
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



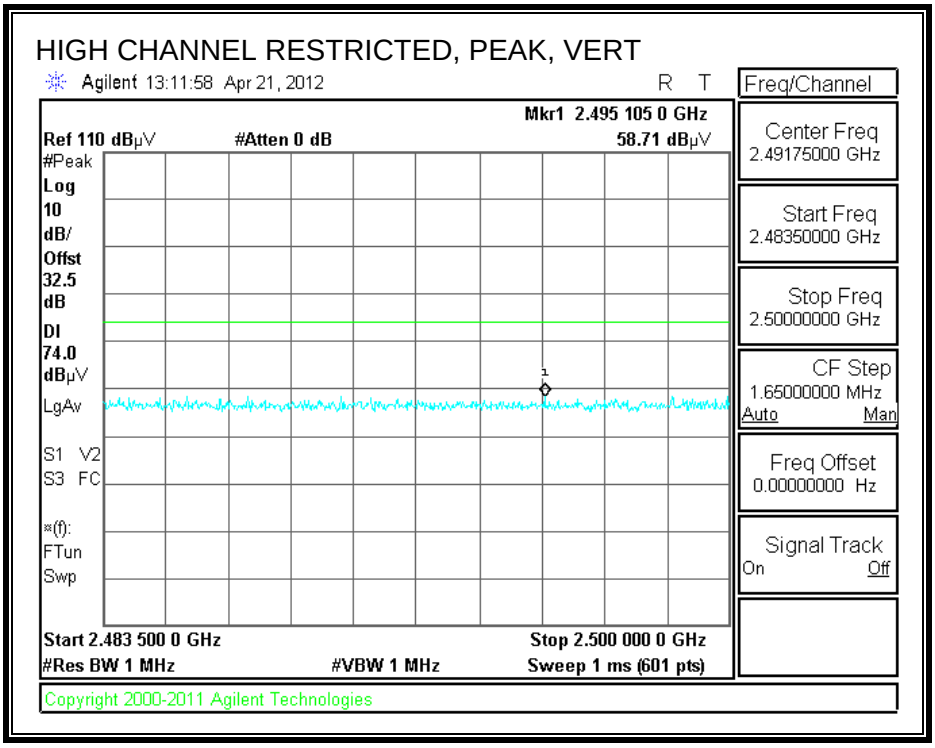


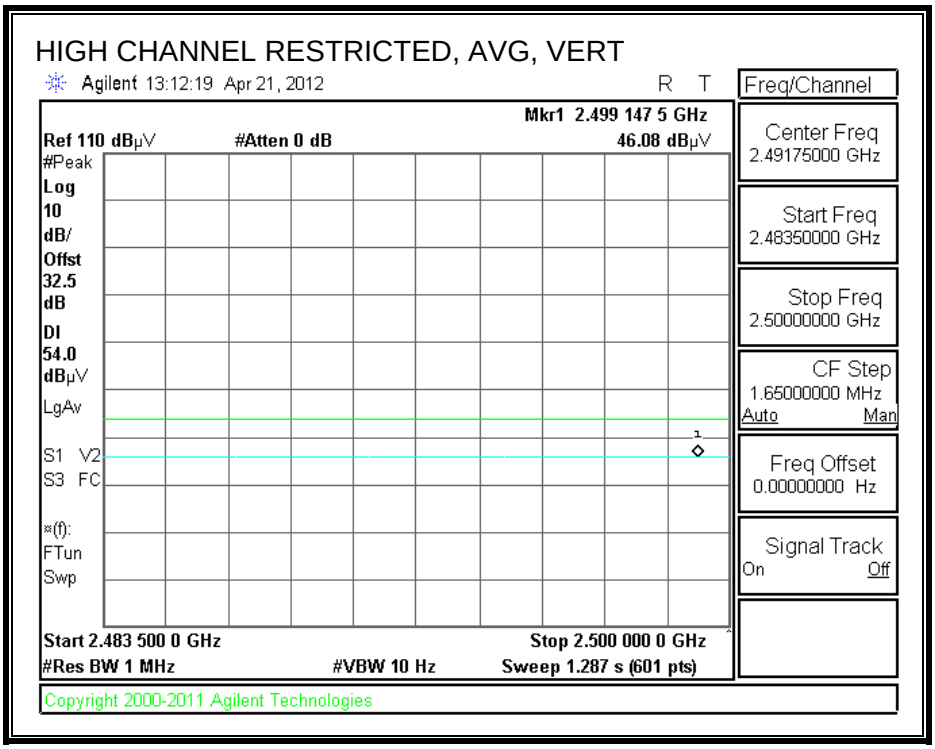
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang
Date: 04/21/12
Project #: 12I14352
Company: Samsung
Test Target: FCC 15.247
Mode Oper: BT, GFSK

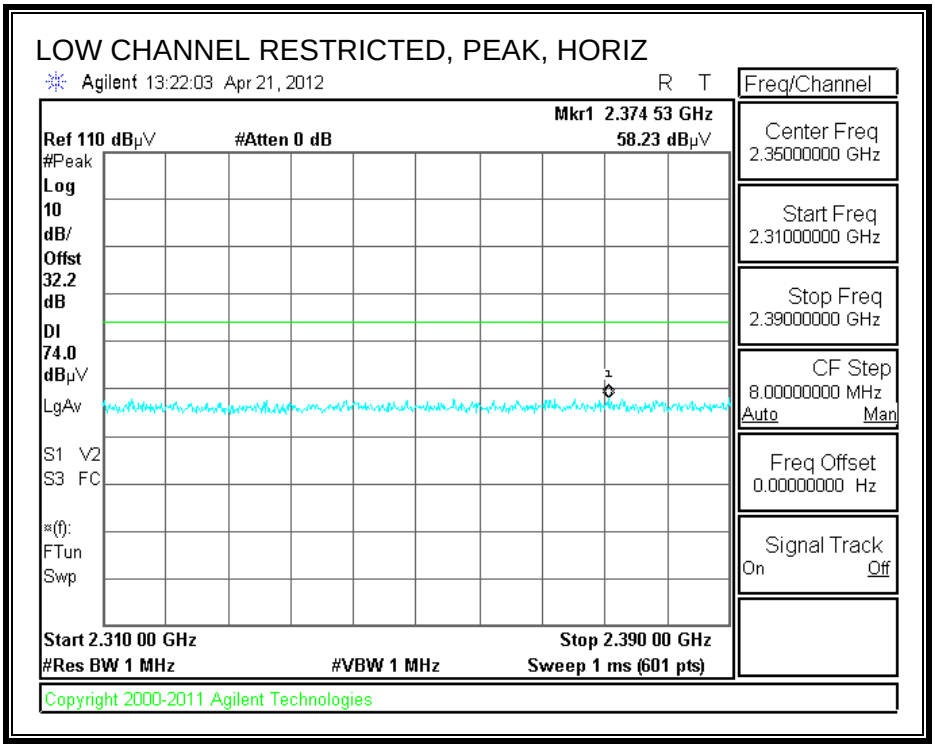
f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter	

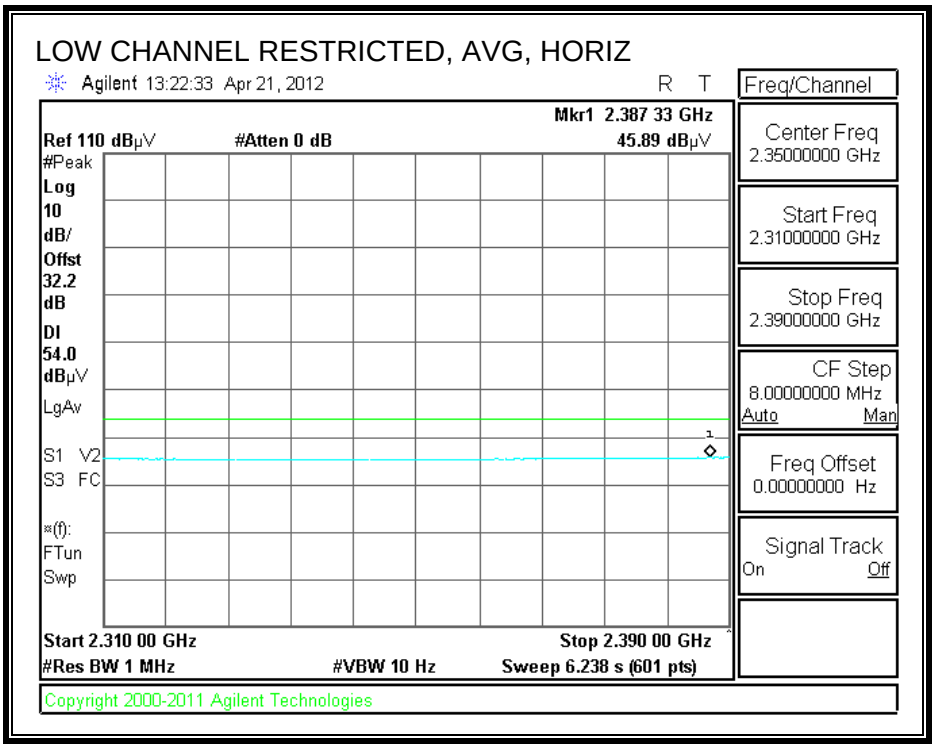
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low Ch, 2402MHz													
4.804	3.0	42.7	33.1	6.3	-34.8	0.0	0.0	47.2	74.0	-26.8	H	P	
4.804	3.0	35.7	33.1	6.3	-34.8	0.0	0.0	40.2	54.0	-13.8	H	A	
4.804	3.0	48.4	33.1	6.3	-34.8	0.0	0.0	52.9	74.0	-21.1	V	P	
4.804	3.0	41.4	33.1	6.3	-34.8	0.0	0.0	45.9	54.0	-8.1	V	A	
4.804	3.0	52.9	33.1	6.3	-34.8	0.0	0.0	57.4	74.0	-16.6	H	P	
4.804	3.0	45.6	33.1	6.3	-34.8	0.0	0.0	50.2	54.0	-3.8	H	A	
Mid Ch, 2441MHz													
4.882	3.0	55.6	33.1	6.3	-34.8	0.0	0.0	60.2	74.0	-13.8	H	P	
4.882	3.0	48.0	33.1	6.3	-34.8	0.0	0.0	52.6	54.0	-1.4	H	A	
7.323	3.0	38.8	35.8	8.5	-34.9	0.0	0.0	48.3	74.0	-25.7	H	P	
7.323	3.0	27.0	35.8	8.5	-34.9	0.0	0.0	36.4	54.0	-17.6	H	A	
4.882	3.0	46.9	33.1	6.3	-34.8	0.0	0.0	51.5	74.0	-22.5	V	P	
4.882	3.0	39.8	33.1	6.3	-34.8	0.0	0.0	44.5	54.0	-9.5	V	A	
7.323	3.0	37.2	35.8	8.5	-34.9	0.0	0.0	46.7	74.0	-27.3	V	P	
7.323	3.0	26.2	35.8	8.5	-34.9	0.0	0.0	35.6	54.0	-18.4	V	A	
High Ch, 2480MHz													
4.960	3.0	46.8	33.2	6.4	-34.8	0.0	0.0	51.5	74.0	-22.5	V	P	
4.960	3.0	39.4	33.2	6.4	-34.8	0.0	0.0	44.2	54.0	-9.8	V	A	
7.440	3.0	38.2	36.0	8.5	-34.9	0.0	0.0	47.8	74.0	-26.2	V	P	
7.440	3.0	27.4	36.0	8.5	-34.9	0.0	0.0	37.0	54.0	-17.0	V	A	
4.960	3.0	59.0	33.2	6.4	-34.8	0.0	0.0	63.8	74.0	-10.2	H	P	
4.960	3.0	48.5	33.2	6.4	-34.8	0.0	0.0	53.3	54.0	-0.7	H	A	
7.440	3.0	39.2	36.0	8.5	-34.9	0.0	0.0	48.8	74.0	-25.2	H	P	
7.440	3.0	29.2	36.0	8.5	-34.9	0.0	0.0	38.9	54.0	-15.1	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

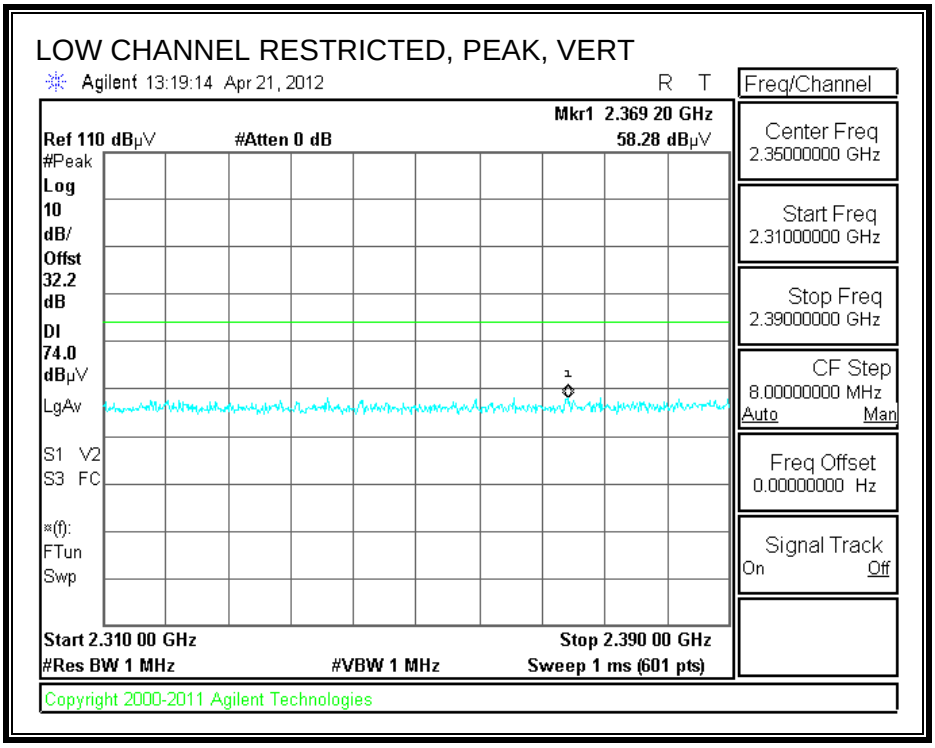
8.2.2. ENHANCED DATA RATE 8PSK MODULATION

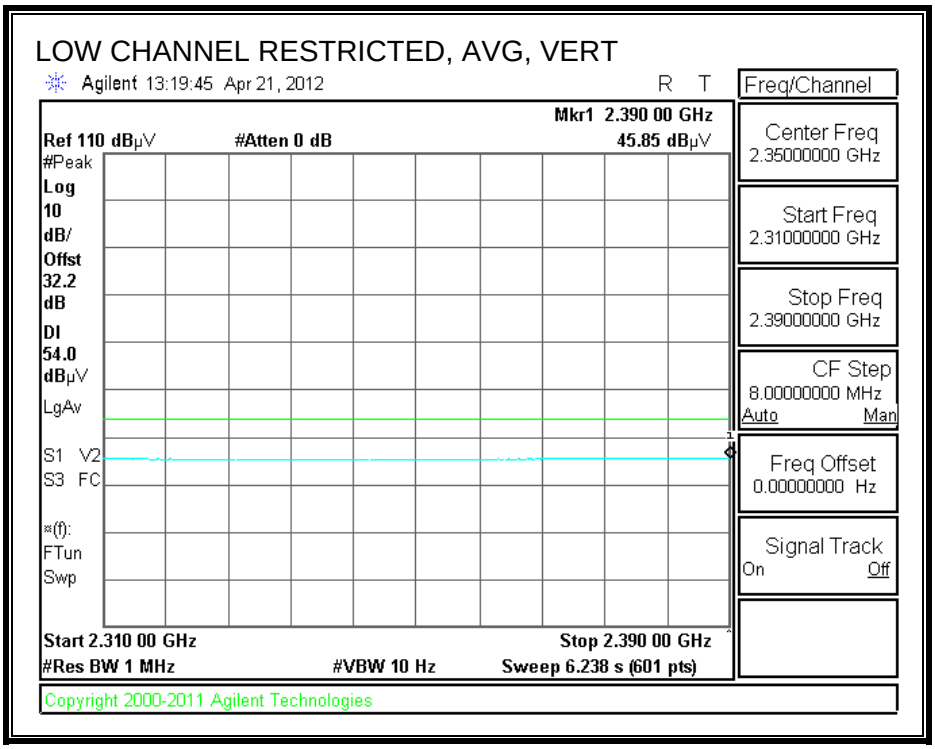
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



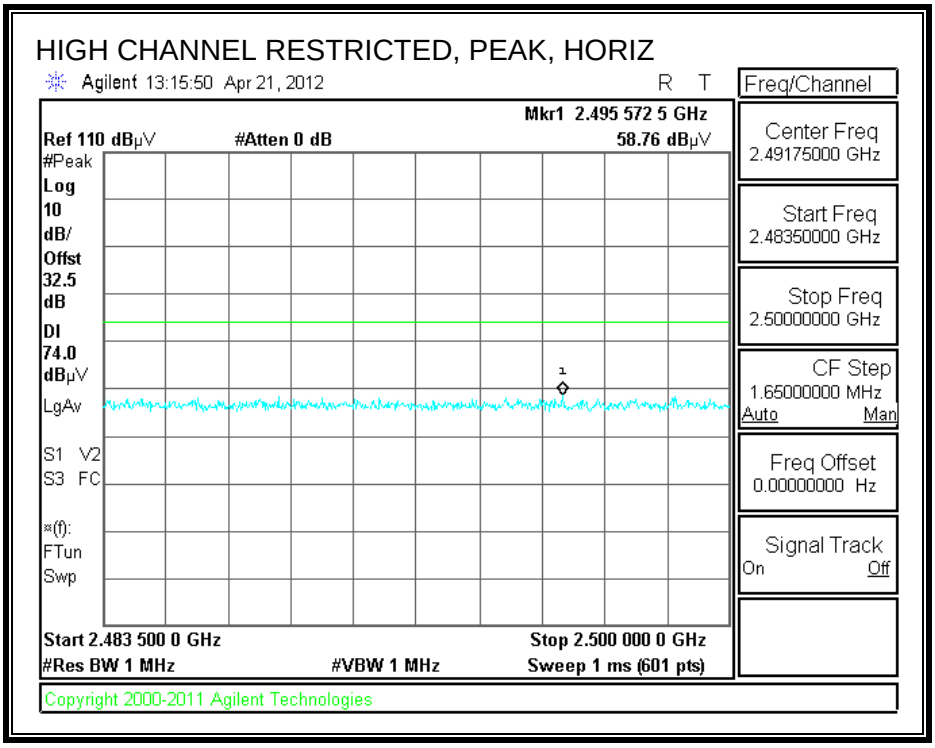


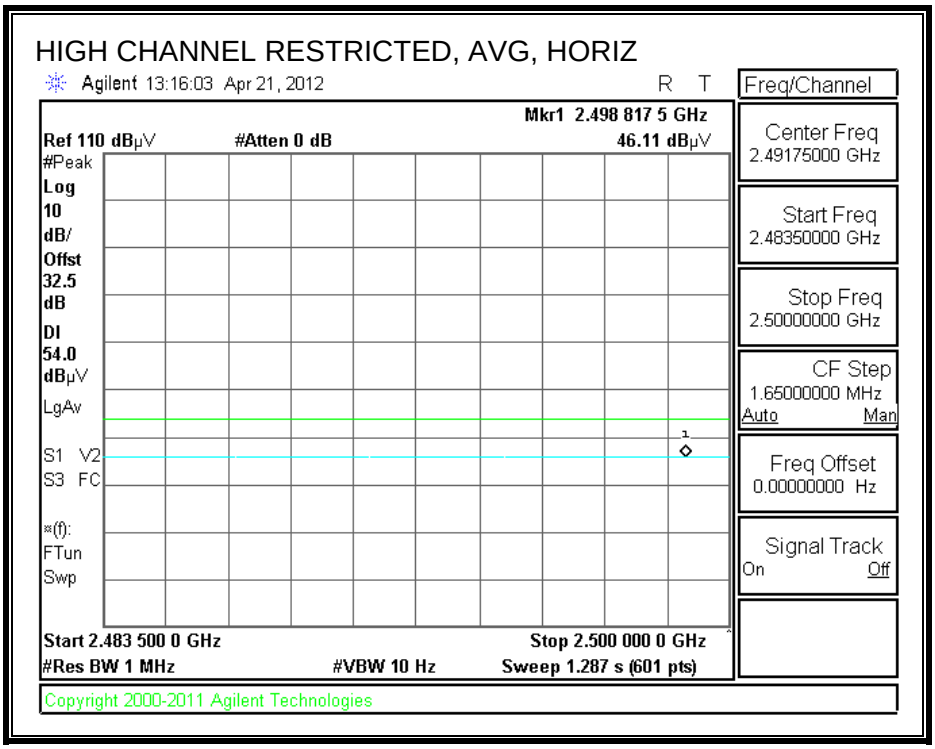
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



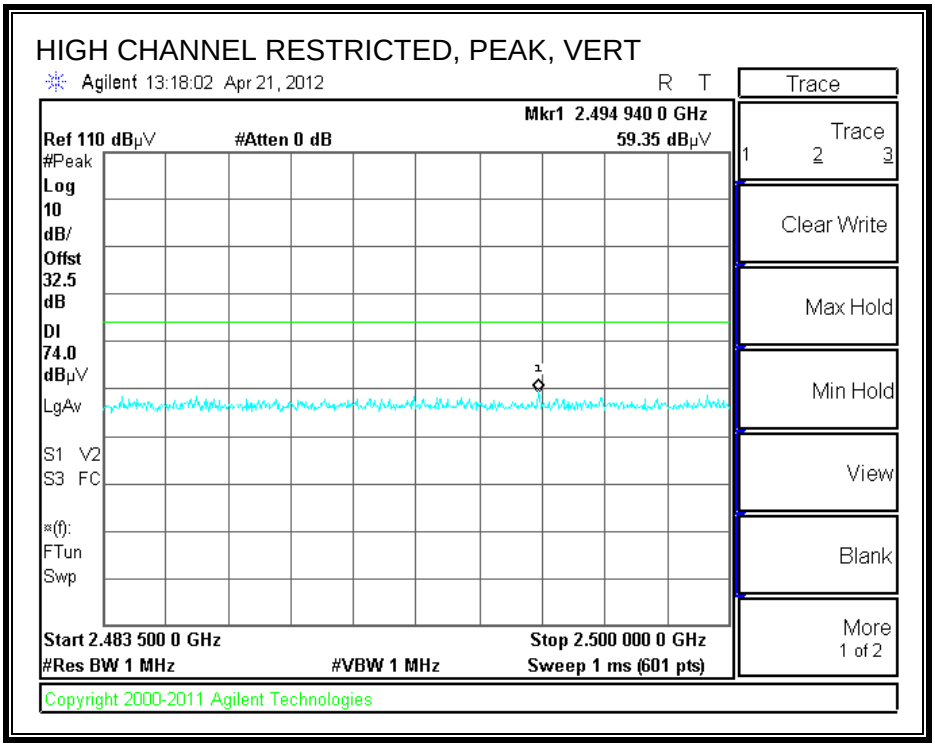


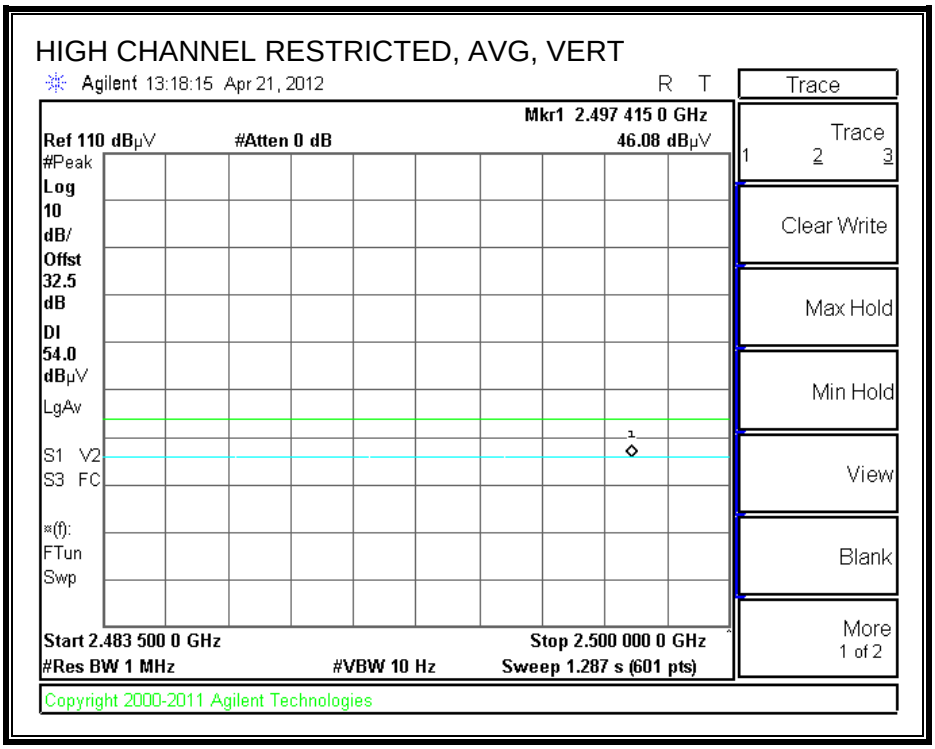
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang
Date: 04/21/12
Project #: 12I14352
Company: Samsung
Test Target: FCC 15.247
Mode Oper: 8PSK, TX

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		

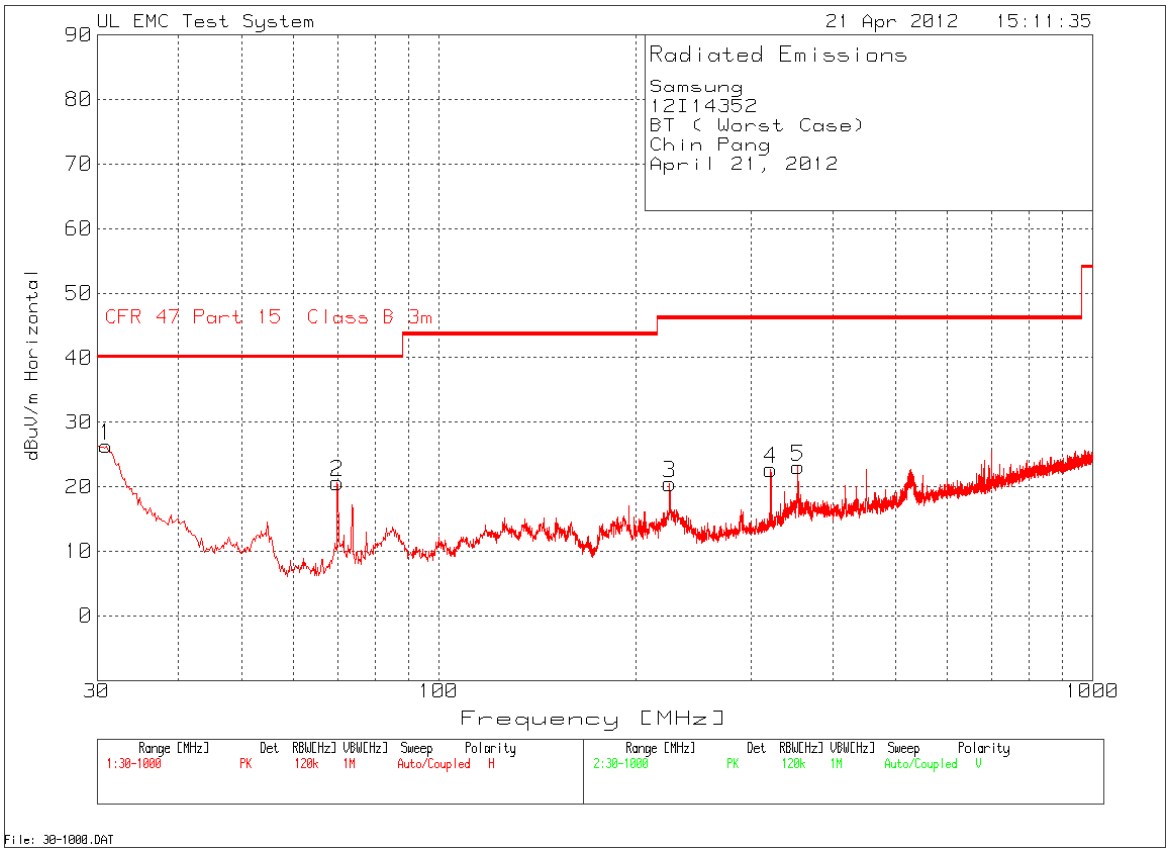
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low Ch, 2402MHz													
4.804	3.0	54.2	33.1	6.3	-34.8	0.0	0.0	58.7	74.0	-15.3	H	P	
4.804	3.0	43.2	33.1	6.3	-34.8	0.0	0.0	47.8	54.0	-6.2	H	A	
4.804	3.0	42.7	33.1	6.3	-34.8	0.0	0.0	47.2	74.0	-26.8	V	P	
4.804	3.0	33.1	33.1	6.3	-34.8	0.0	0.0	37.6	54.0	-16.4	V	A	
Mid Ch, 2441Mhz													
4.882	3.0	54.7	33.1	6.3	-34.8	0.0	0.0	59.4	74.0	-14.6	H	P	
4.882	3.0	43.3	33.1	6.3	-34.8	0.0	0.0	48.0	54.0	-6.0	H	A	
7.323	3.0	37.8	35.8	8.5	-34.9	0.0	0.0	47.3	74.0	-26.7	H	P	
7.323	3.0	26.1	35.8	8.5	-34.9	0.0	0.0	35.5	54.0	-18.5	H	A	
4.882	3.0	45.5	33.1	6.3	-34.8	0.0	0.0	50.1	74.0	-23.9	V	P	
4.882	3.0	35.6	33.1	6.3	-34.8	0.0	0.0	40.2	54.0	-13.8	V	A	
7.323	3.0	36.7	35.8	8.5	-34.9	0.0	0.0	46.1	74.0	-27.9	V	P	
7.323	3.0	24.0	35.8	8.5	-34.9	0.0	0.0	33.5	54.0	-20.5	V	A	
High Ch, 2480MHz													
4.960	3.0	59.7	33.2	6.4	-34.8	0.0	0.0	64.5	74.0	-9.5	H	P	
4.960	3.0	47.6	33.2	6.4	-34.8	0.0	0.0	52.4	54.0	-1.6	H	A	
7.440	3.0	37.0	36.0	8.5	-34.9	0.0	0.0	46.6	74.0	-27.4	H	P	
7.440	3.0	26.3	36.0	8.5	-34.9	0.0	0.0	36.0	54.0	-18.0	H	A	
4.960	3.0	46.9	33.2	6.4	-34.8	0.0	0.0	51.7	74.0	-22.3	V	P	
4.960	3.0	37.2	33.2	6.4	-34.8	0.0	0.0	41.9	54.0	-12.1	V	A	
7.440	3.0	36.4	36.0	8.5	-34.9	0.0	0.0	46.0	74.0	-28.0	V	P	
7.440	3.0	24.5	36.0	8.5	-34.9	0.0	0.0	34.1	54.0	-19.9	V	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

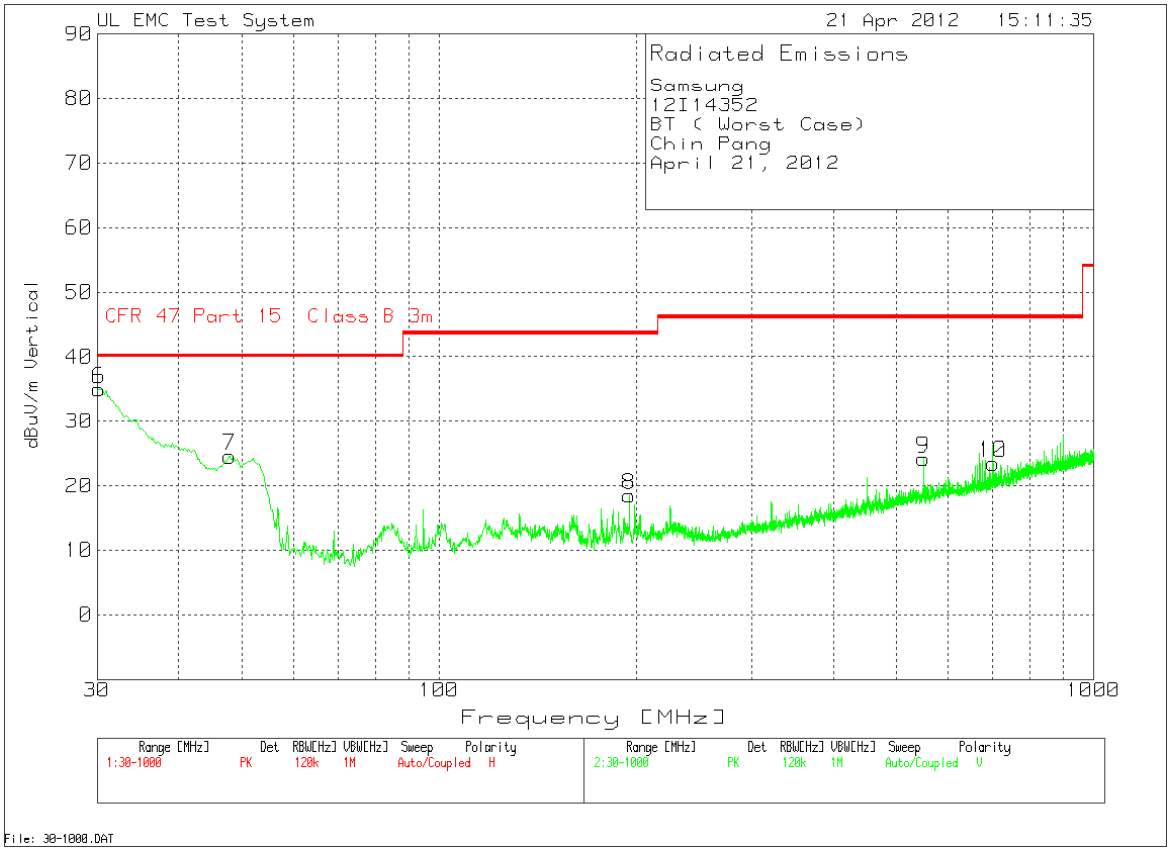
8.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Samsung								
12I14352								
BT (Worst Case)								
Chin Pang								
April 21, 2012								
Range 1 30 - 1000MHz								
Frequency	Reading	Detector	Amp [dB]	Ant Factors	dBuV/m	FCC 15B 3m	Margin	Polarity
30.9692	35.76	PK	-29.3	19.9	26.36	40	-13.64	Horz
69.9321	41.14	PK	-28.8	8.3	20.64	40	-19.36	Horz
225.3957	35.98	PK	-27.4	11.9	20.48	46	-25.52	Horz
321.9305	35.81	PK	-26.8	13.7	22.71	46	-23.29	Horz
354.3026	35.71	PK	-26.8	14.2	23.11	46	-22.89	Horz
Range 2 30 - 1000MHz								
Frequency	Reading	Detector	Amp [dB]	Ant Factors	dBuV/m	FCC 15B 3m	Margin	Polarity
30.1938	43.96	PK	-29.3	20.3	34.96	40	-5.04	Vert
47.8337	44.36	PK	-29.1	9.3	24.56	40	-15.44	Vert
195.1559	34.49	PK	-27.6	11.6	18.49	43.5	-25.01	Vert
549.8921	33.51	PK	-26.8	17.5	24.21	46	-21.79	Vert
702.0604	30.36	PK	-26.2	19.3	23.46	46	-22.54	Vert

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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.

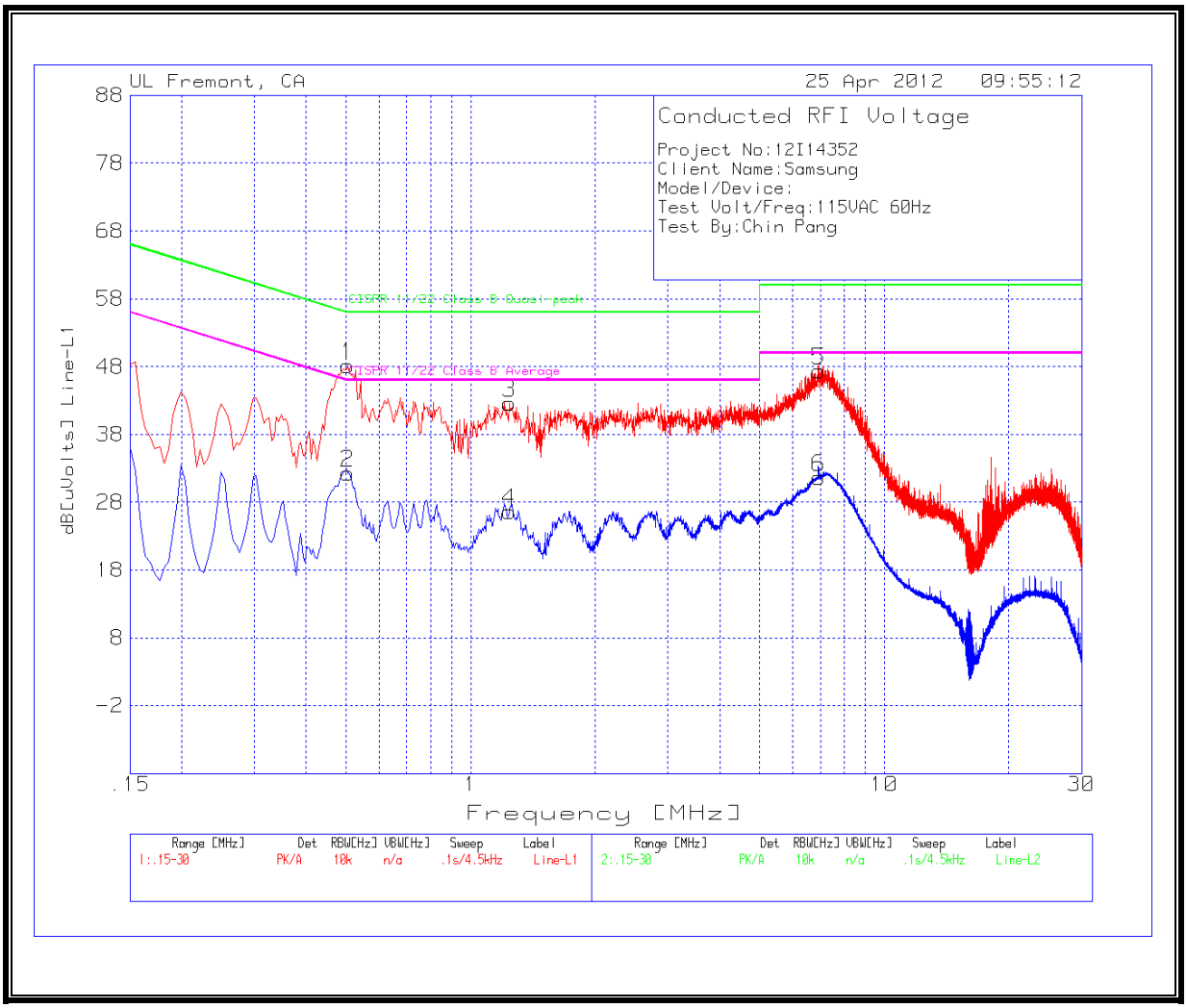
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

Project No:12I14352								
Client Name:Samsung								
Model/Device:								
Test Volt/Freq:115VAC 60Hz								
Test By:Chin Pang								
Line-L1 .15 - 30MHz								
Frequency	Reading	Detector	Cable loss [dB	dB[uVolts	CISPR B Qp	Margin	CISPR B Avg	Margin
0.5055	48.04	PK	0.1	48.14	56	-7.86	-	-
0.5055	32.17	Av	0.1	32.27	-	-	46	-13.73
1.239	42.51	PK	0.1	42.61	56	-13.39	-	-
1.239	26.48	Av	0.1	26.58	-	-	46	-19.42
6.9585	47.13	PK	0.2	47.33	60	-12.67	-	-
6.9585	31.42	Av	0.2	31.62	-	-	50	-18.38
Line-L2 .15 - 30MHz								
Frequency	Reading	Detector	Cable loss [dB	dB[uVolts	CISPR B Qp	Margin	CISPR B Avg	Margin
0.1995	47.38	PK	0.1	47.48	63.6	-16.12	-	-
0.1995	30.18	Av	0.1	30.28	-	-	53.6	-23.32
0.51	43.74	PK	0.1	43.84	56	-12.16	-	-
0.51	21.27	Av	0.1	21.37	-	-	46	-24.63
7.1115	43.62	PK	0.1	43.82	60	-16.18	-	-
7.1115	26.02	Av	0.1	26.22	-	-	50	-23.78

LINE 1 RESULTS



LINE 2 RESULTS