



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: 13I14813-1

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Prepared for

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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
6. TEST AND MEASUREMENT EQUIPMENT	11
7. MEASUREMENT METHODS	12
8. ANTENNA PORT TEST RESULTS	13
8.1. DUTY CYCLE	13
8.2. 802.11b MODE IN THE 2.4 GHz BAND	17
8.2.1. 6 dB BANDWIDTH	17
8.2.2. AVERAGE POWER	20
8.2.3. OUTPUT POWER	21
8.2.4. PSD	25
8.2.5. OUT-OF-BAND EMISSIONS	28
8.3. 802.11g MODE IN THE 2.4 GHz BAND	33
8.3.1. 6 dB BANDWIDTH	33
8.3.2. AVERAGE POWER	36
8.3.3. OUTPUT POWER	37
8.3.4. PSD	41
8.3.5. OUT-OF-BAND EMISSIONS	44
8.4. 802.11n HT20 MODE IN THE 2.4 GHz BAND	49
8.4.1. 6 dB BANDWIDTH	49
8.4.2. AVERAGE POWER	52
8.4.3. OUTPUT POWER	53
8.4.4. PSD	57
8.4.5. OUT-OF-BAND EMISSIONS	60

9. RADIATED TEST RESULTS.....	65
9.1. LIMITS AND PROCEDURE	65
9.2. TRANSMITTER ABOVE 1 GHz	66
9.3. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND	66
9.4. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND	72
9.5. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND.....	81
9.6. WORST-CASE BELOW 1 GHz.....	90
10. AC POWER LINE CONDUCTED EMISSIONS	92
11. SETUP PHOTOS	96
11.1. ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP.....	96
11.2. RADIATED RF MEASUREMENT SETUP	97
11.3. RADIATED RF MEASUREMENT SETUP FOR XYZ CONFIGURATION	99
11.4. POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP	105

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.

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)
2412 - 2462	802.11b	17.26	53.21
2412 - 2462	802.11g	21.71	148.25
2412 - 2462	802.11n HT20	20.01	100.23

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.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20mode: MCS0

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

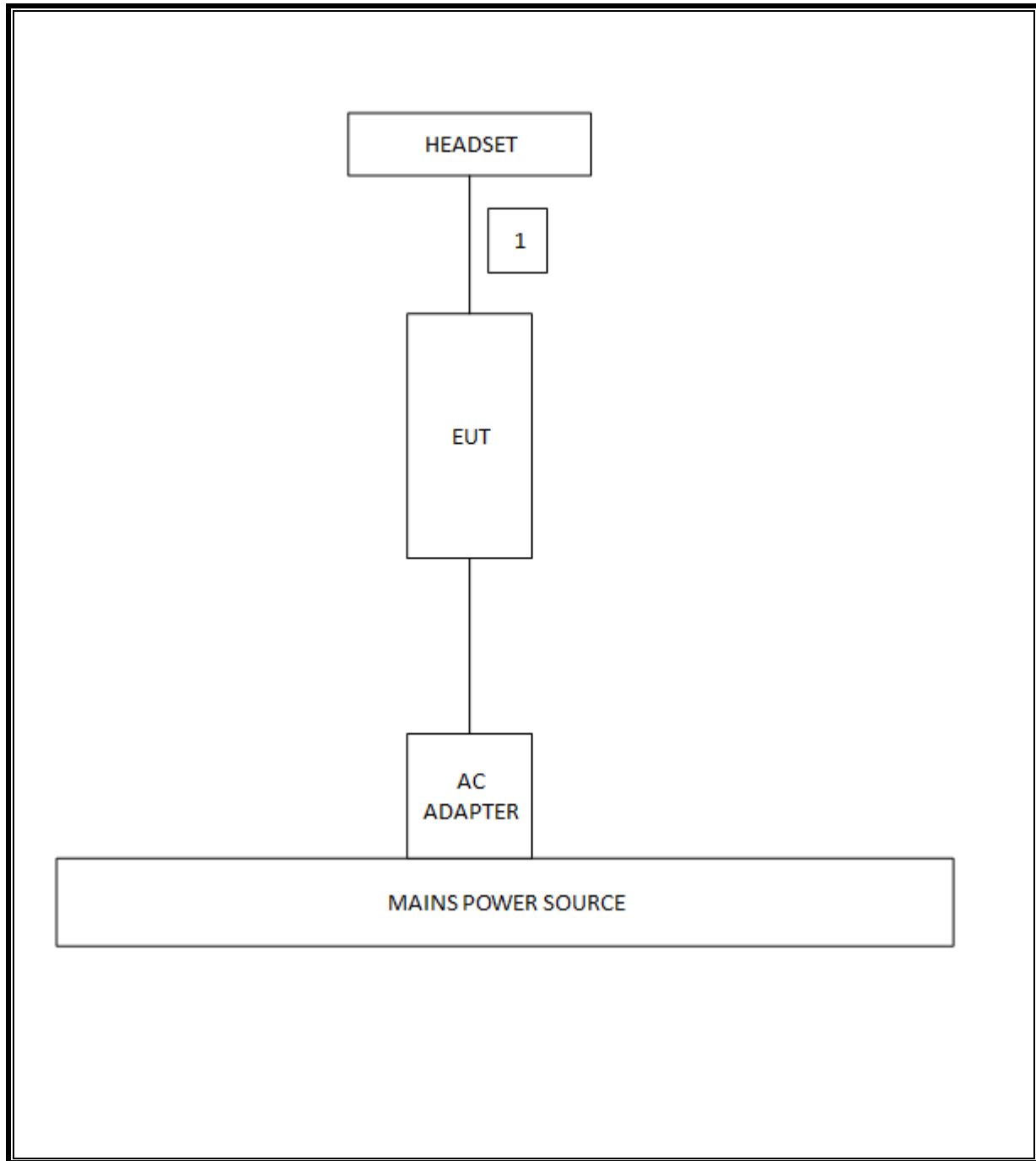
I/O CABLES

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



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
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

7. MEASUREMENT METHODS

KDB 558074 Measurement Procedure PK2 is used for power and PKPSD is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

8. ANTENNA PORT TEST RESULTS

8.1. DUTY CYCLE

LIMITS

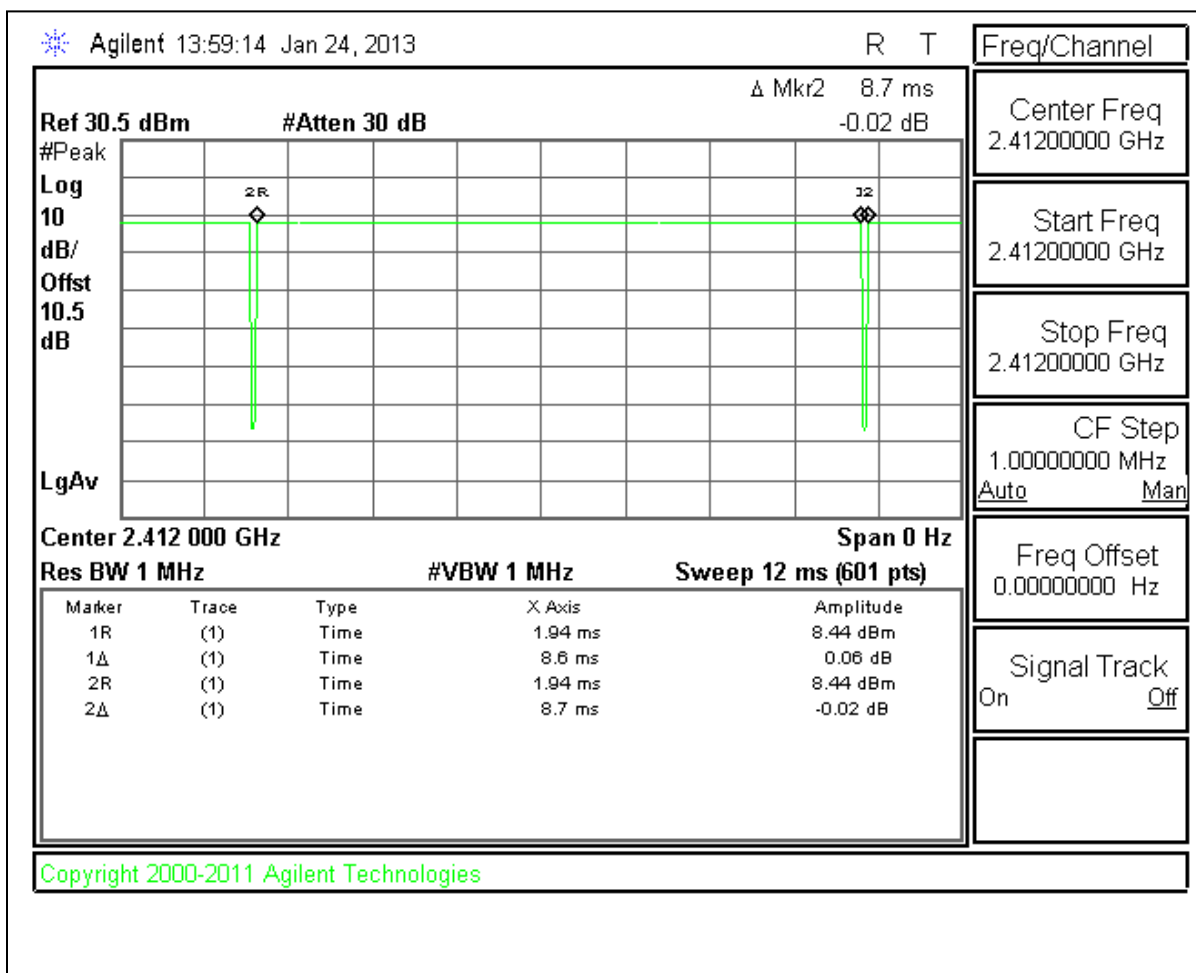
None; for reporting purposes only.

RESULTS

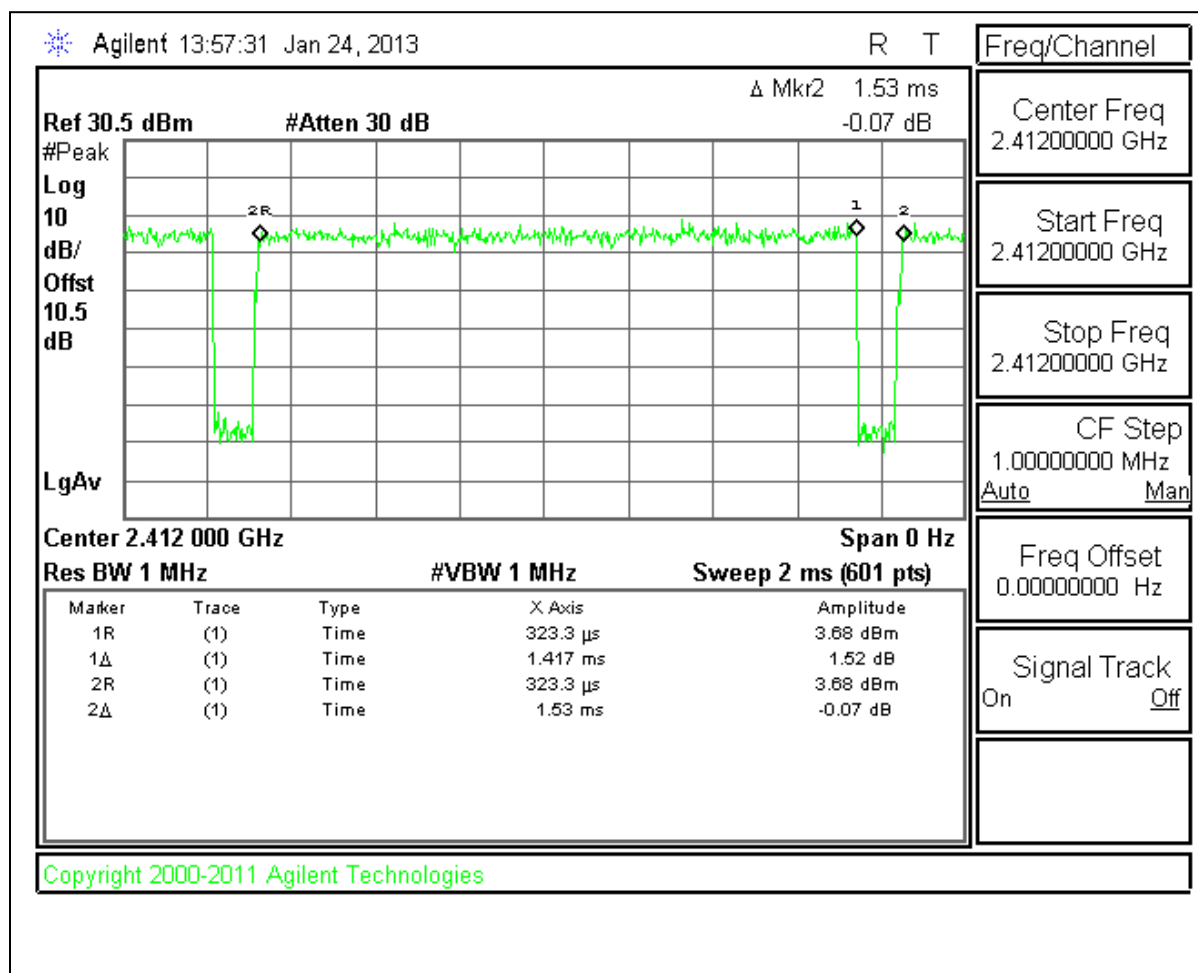
Mode	Tx on (usec)	Tx on + Tx off (usec)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11b	860	870	98.85	0.05
802.11g	1417	1530	92.61	0.33
802.11n	1327	1437	92.35	0.35

Duty Cycle b Mode

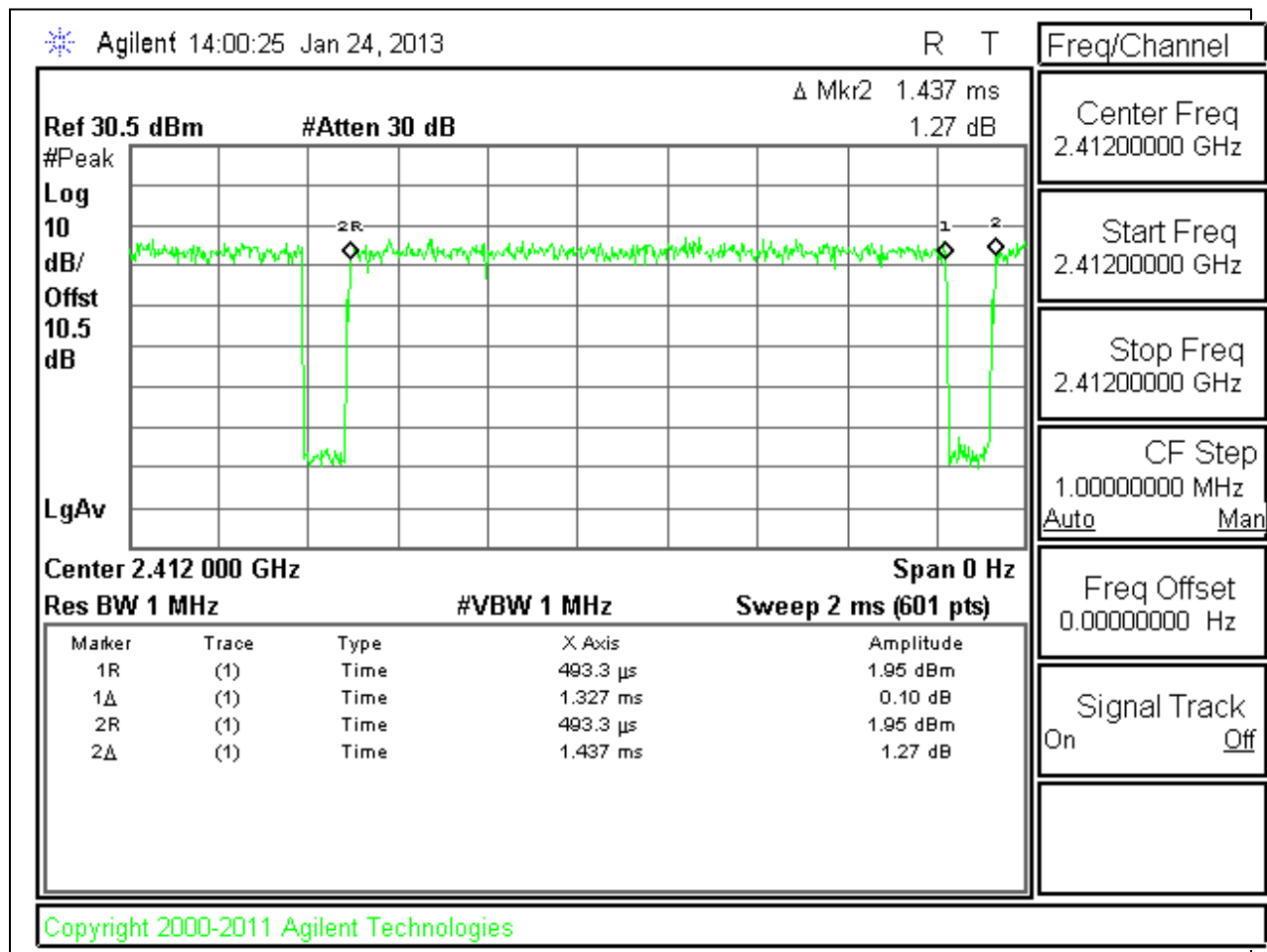
Note: Unit has a continuous on time of more than 100ms.



Duty Cycle g Mode



Duty Cycle n Mode



8.2. 802.11b MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

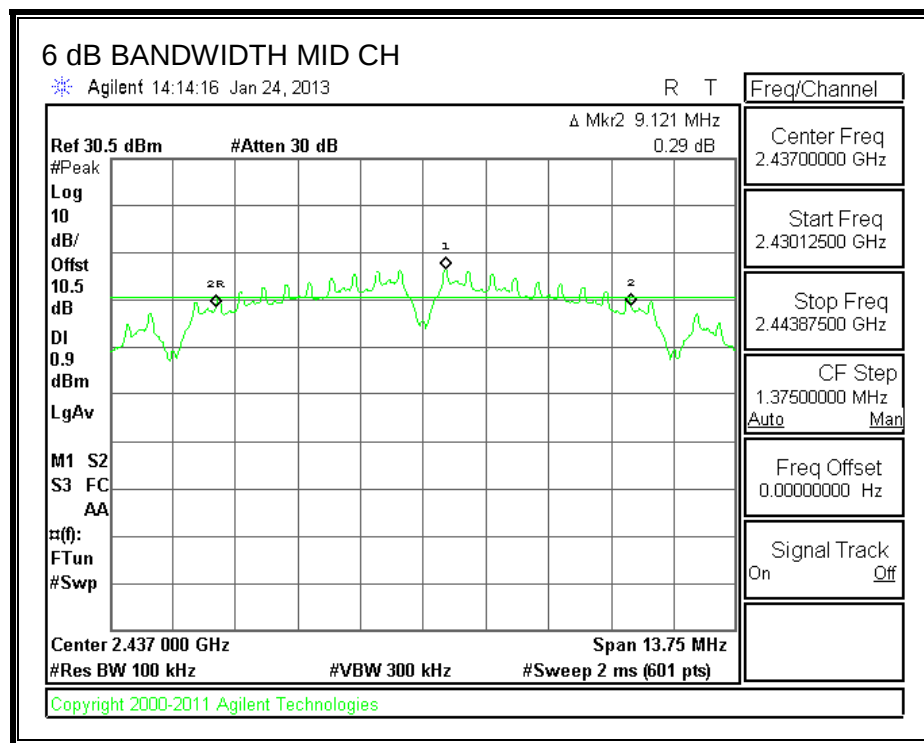
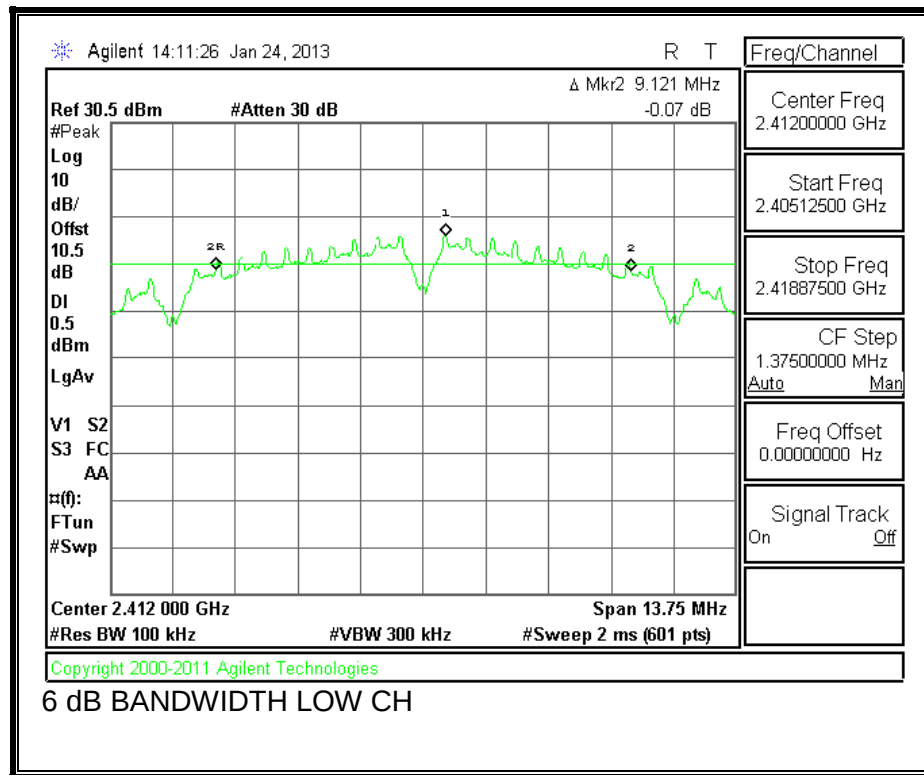
TEST PROCEDURE

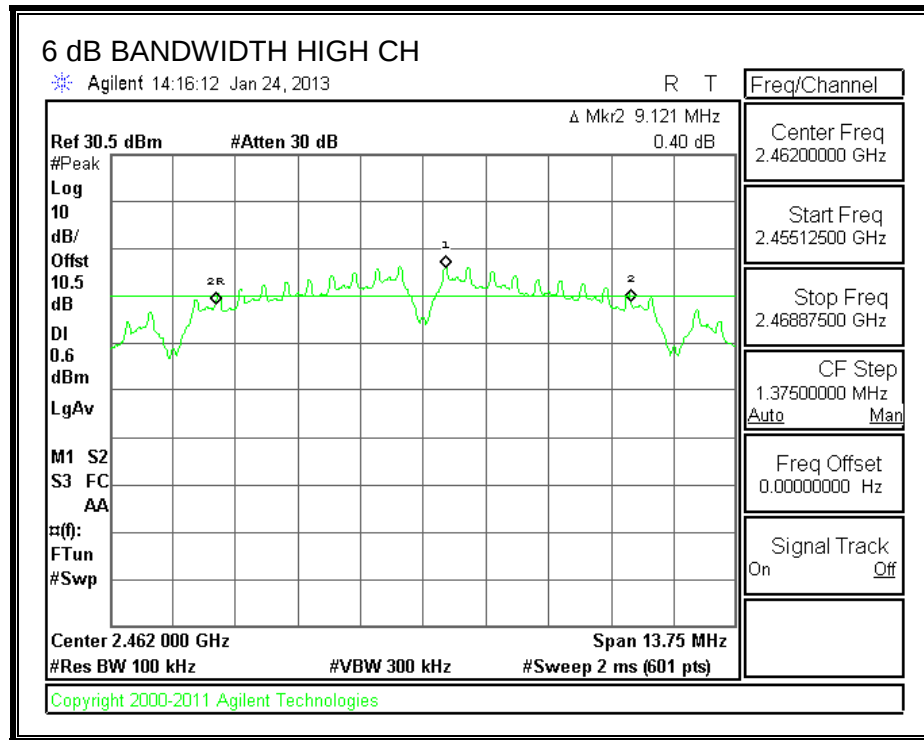
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	9.121	0.5
Mid	2437	9.121	0.5
High	2462	9.121	0.5

6 dB BANDWIDTH





8.2.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	14.50
Mid	2437	14.50
High	2462	14.30

8.2.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

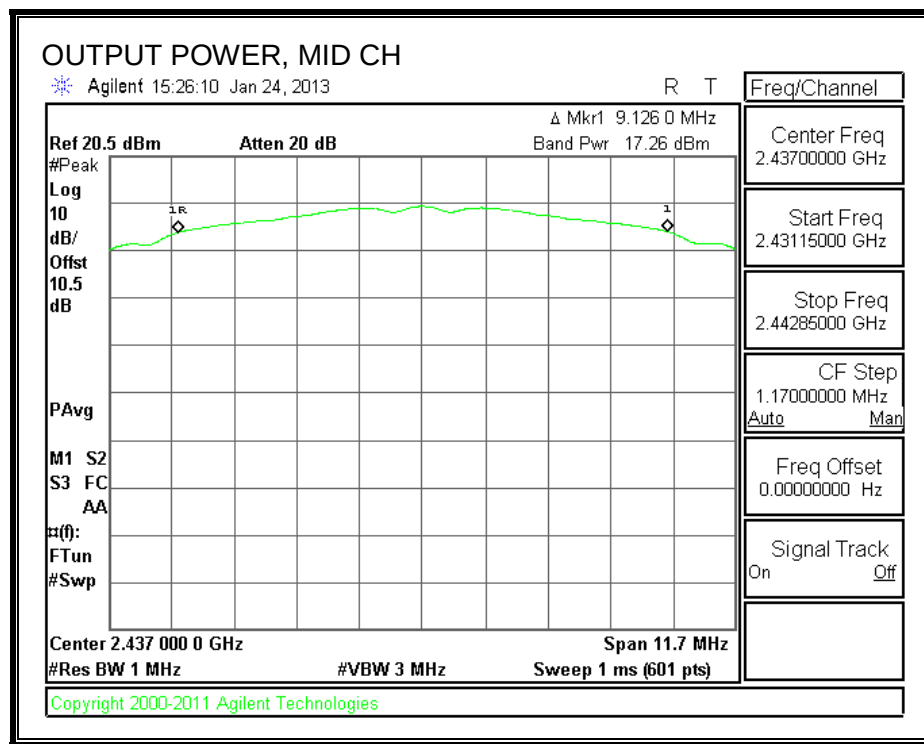
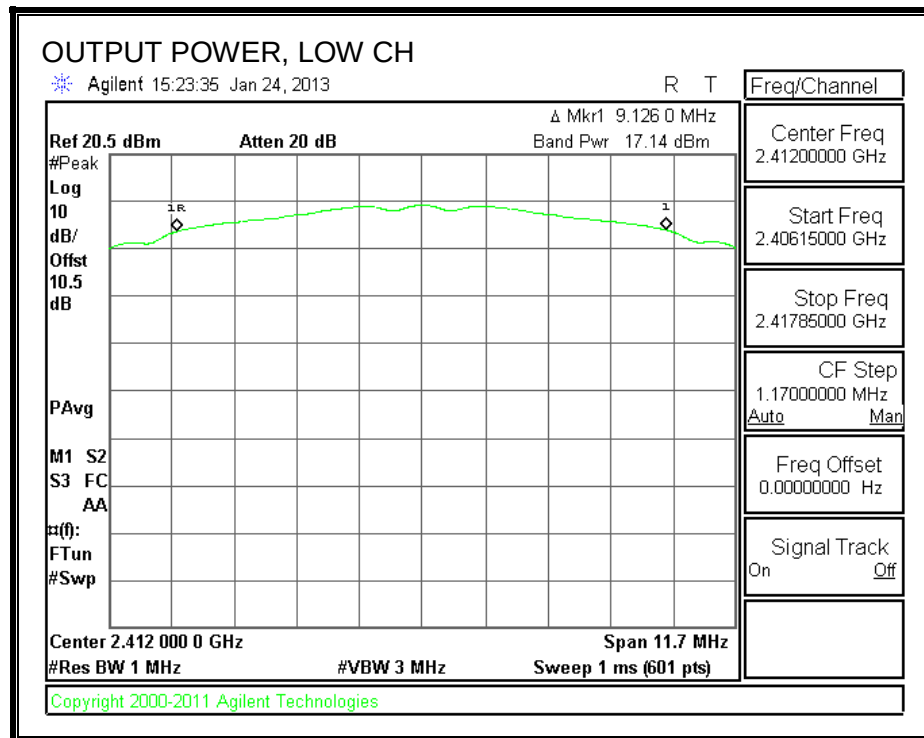
Limits

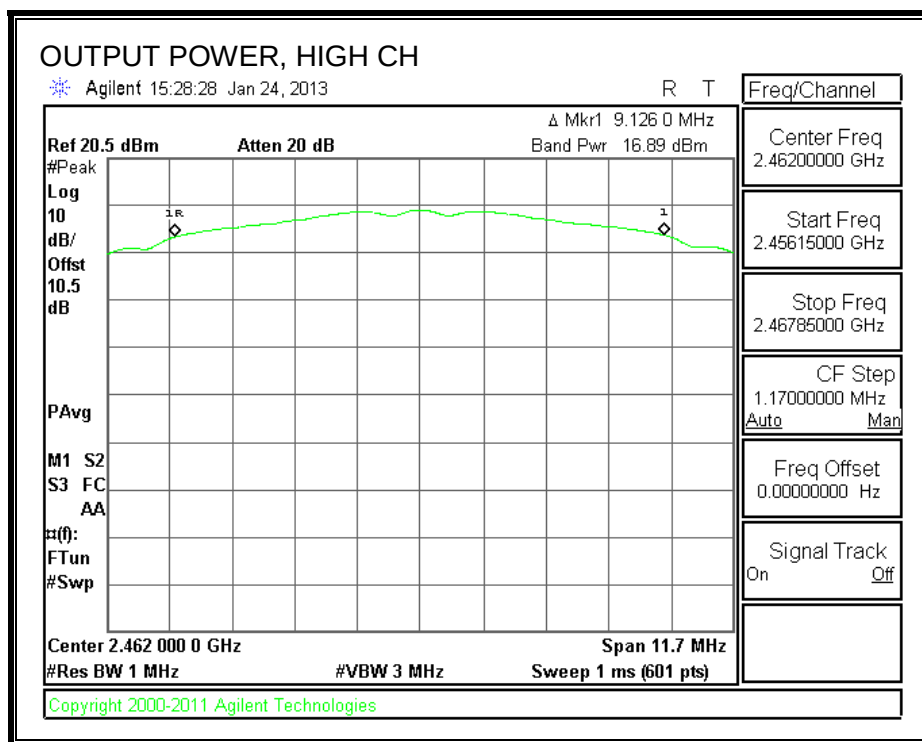
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.41	30.00	30	36	30.00
Mid	2437	-1.41	30.00	30	36	30.00
High	2462	-1.41	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	17.14	17.14	30.00	-12.86
Mid	2437	17.26	17.26	30.00	-12.74
High	2462	16.89	16.89	30.00	-13.11

OUTPUT POWER





8.2.4. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

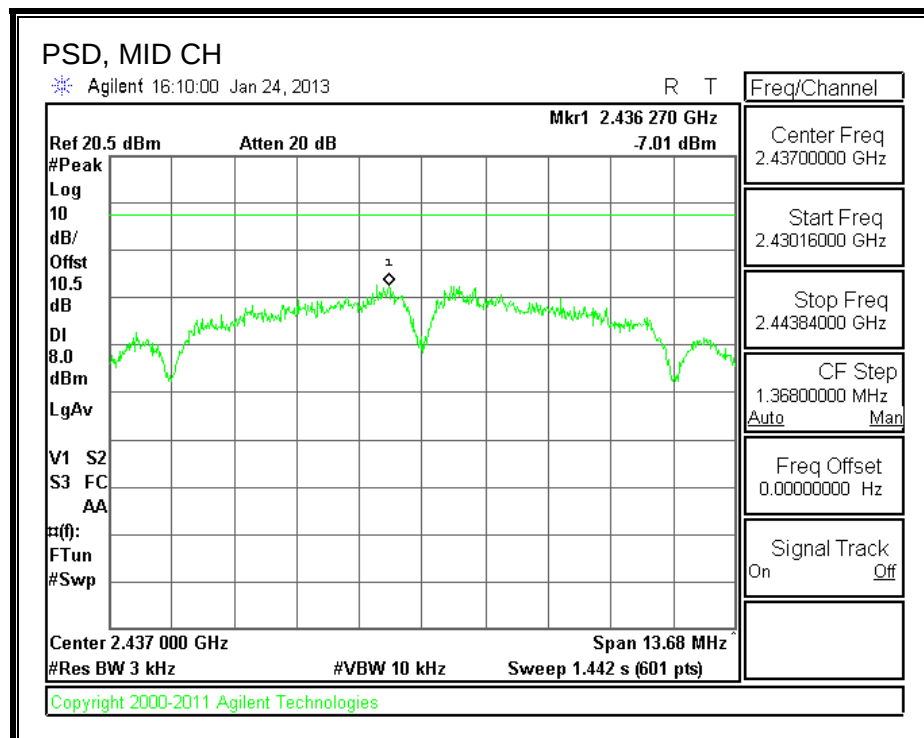
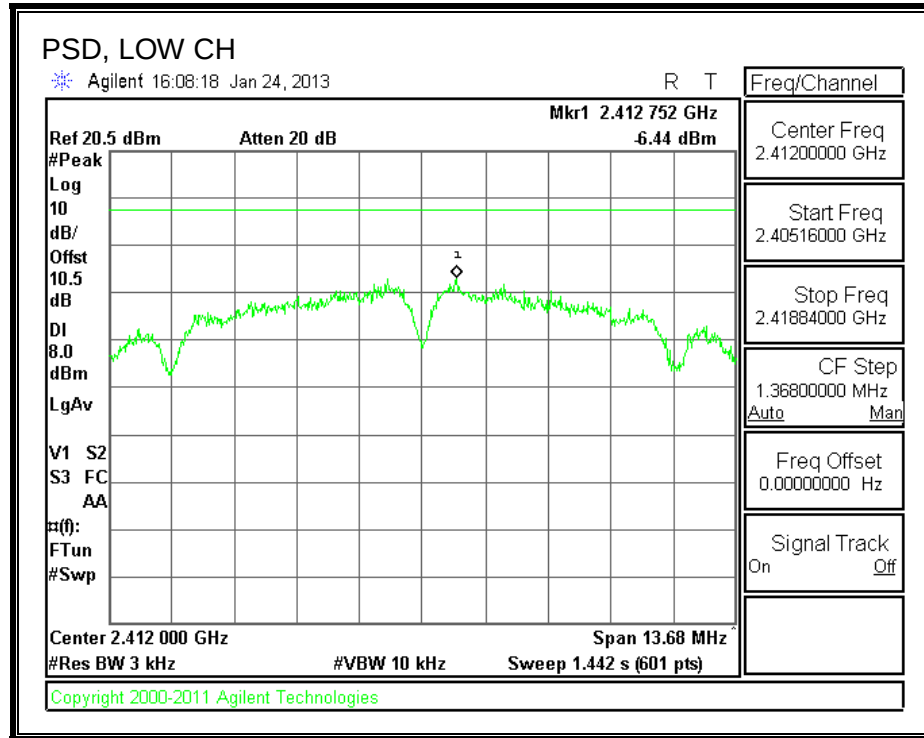
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

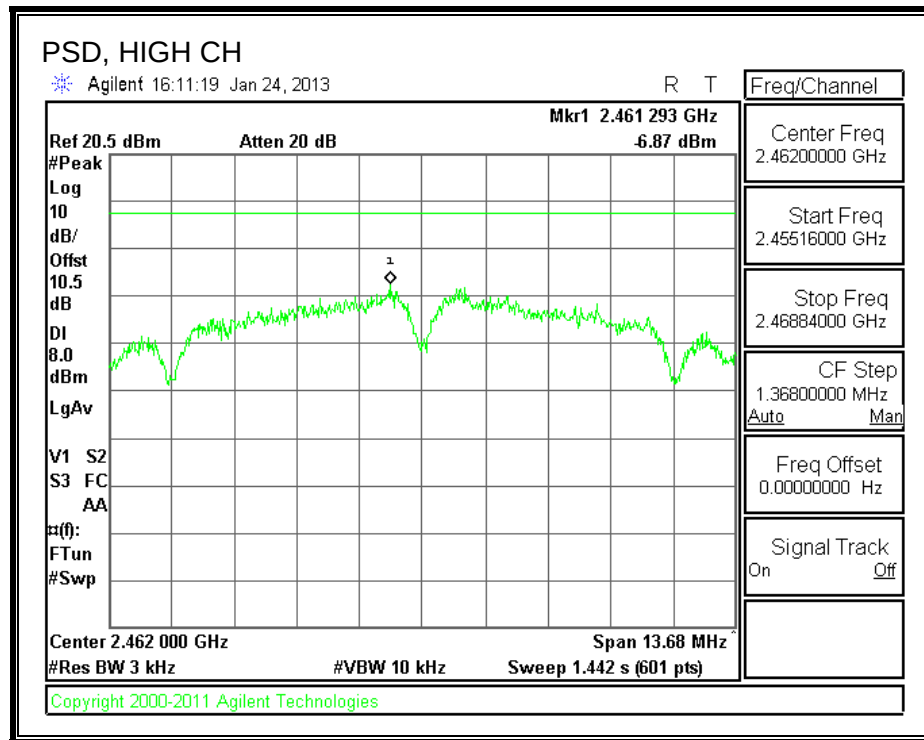
RESULTS

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.44	8.0	-14.4
Mid	2437	-7.01	8.0	-15.0
High	2462	-6.87	8.0	-14.9

PSD





8.2.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

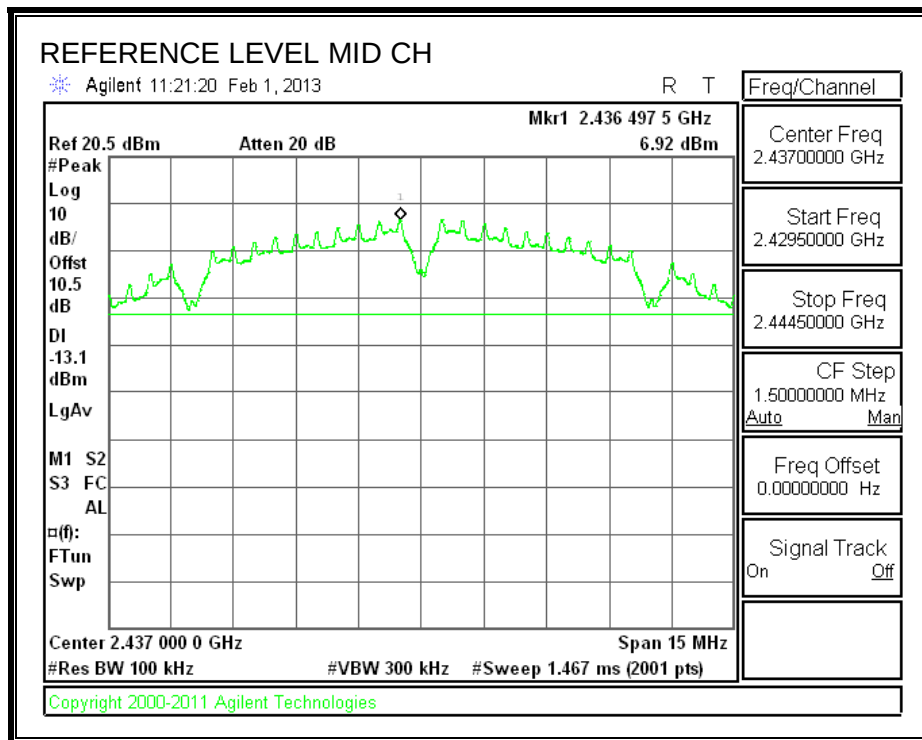
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

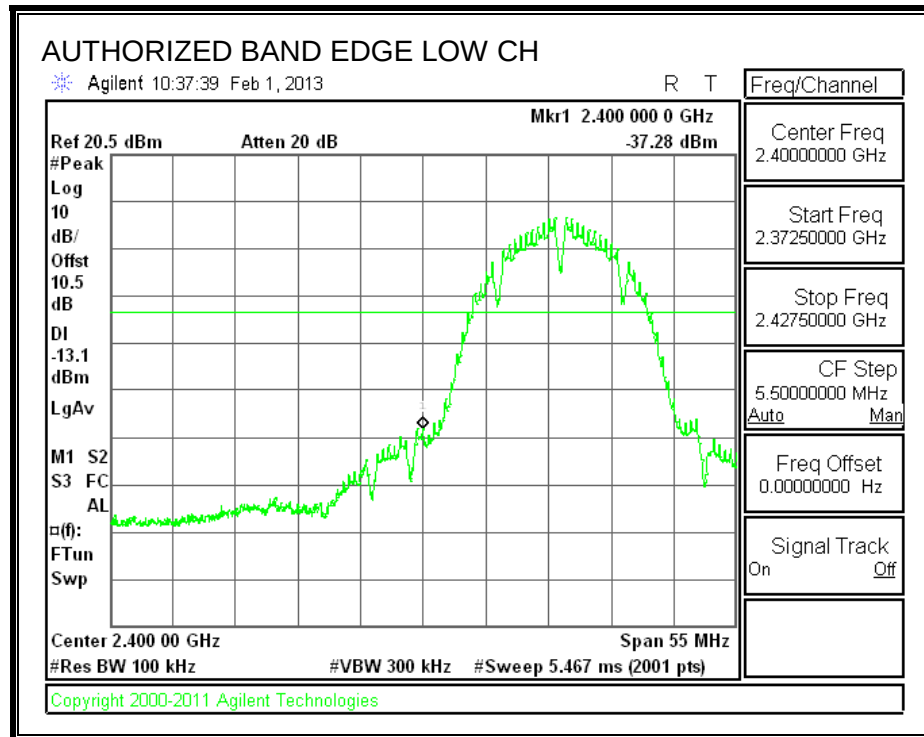
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

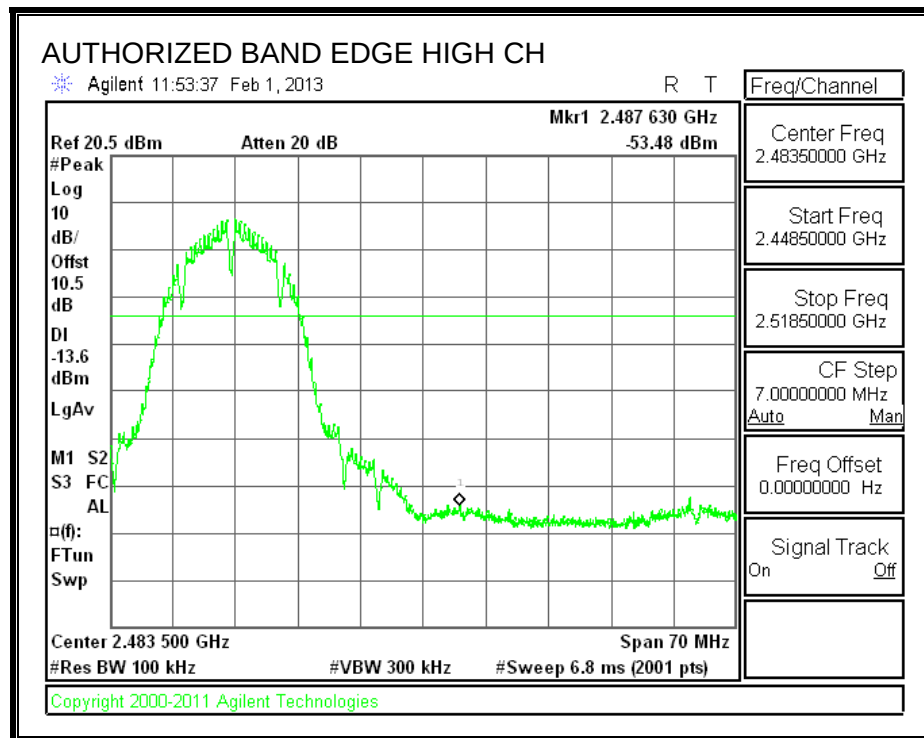
IN-BAND REFERENCE LEVEL



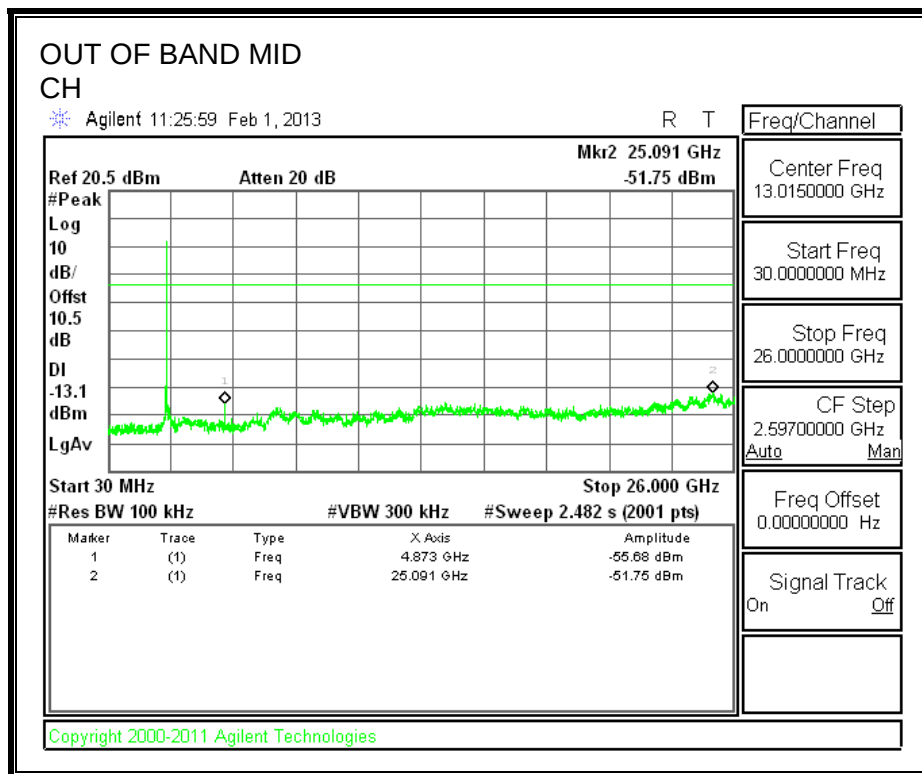
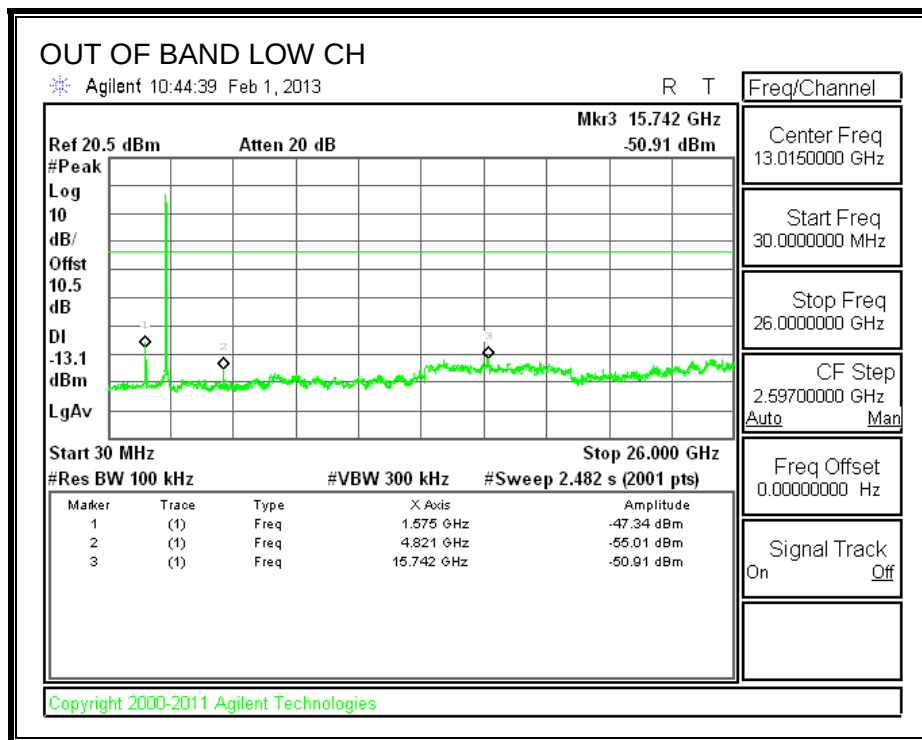
LOW CHANNEL BANDEDGE

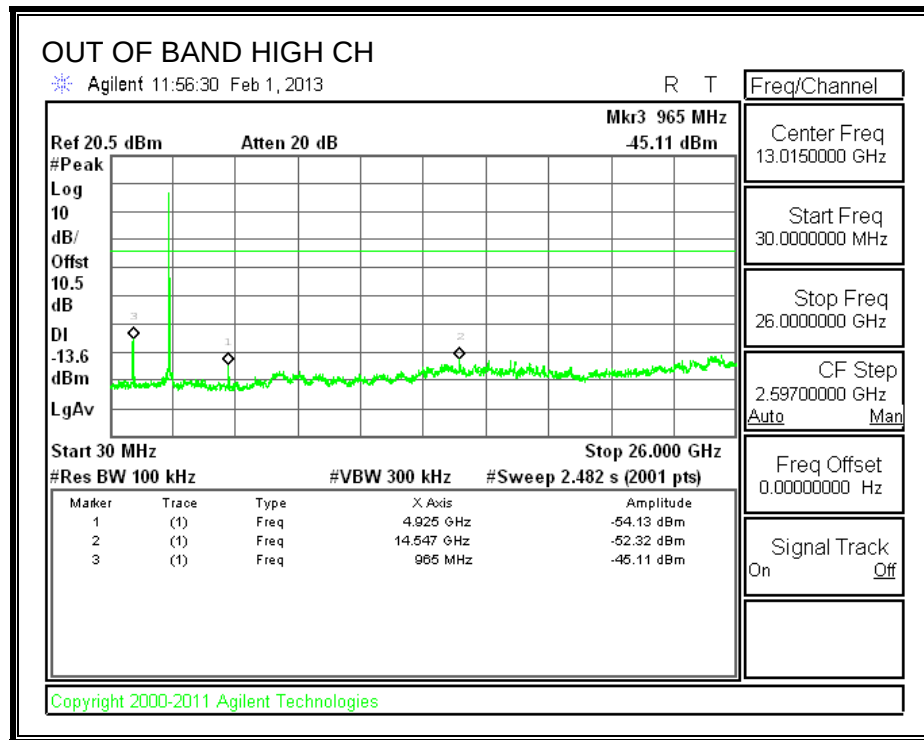


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.3. 802.11g MODE IN THE 2.4 GHz BAND

8.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

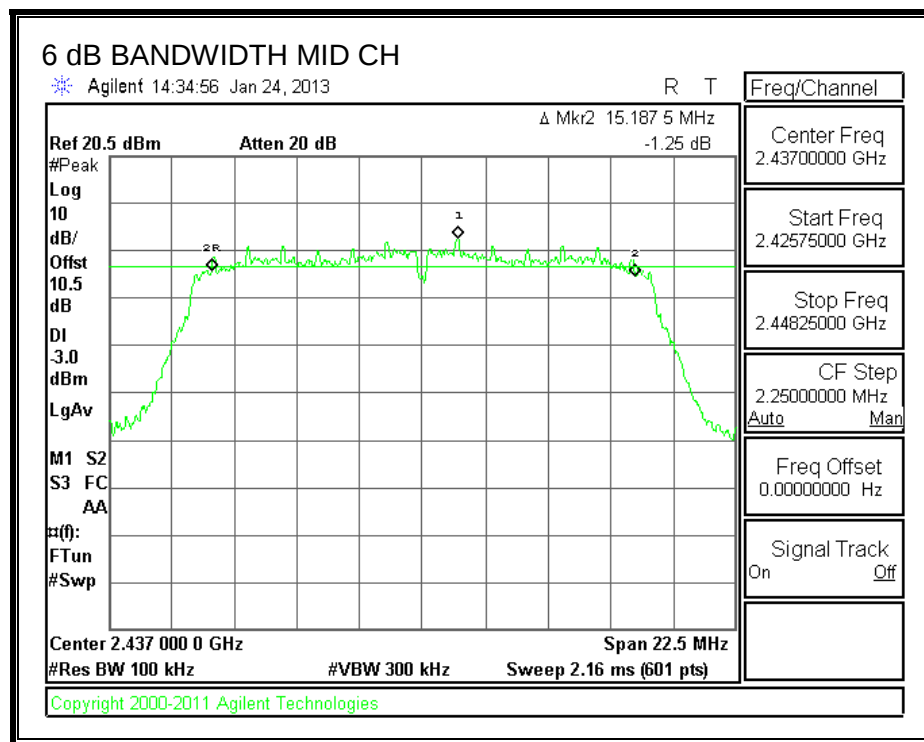
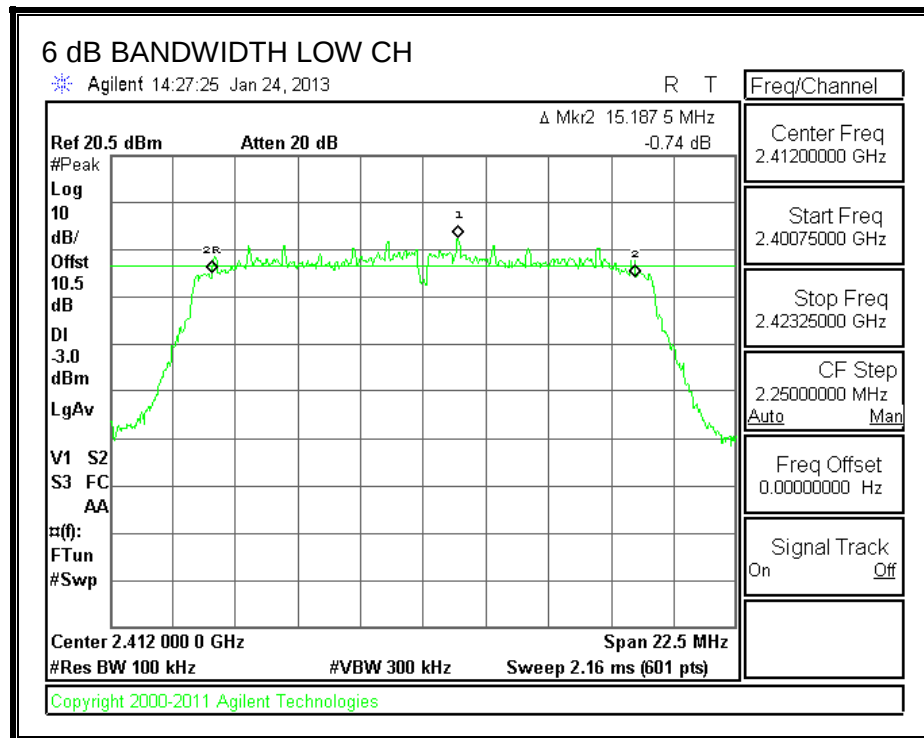
TEST PROCEDURE

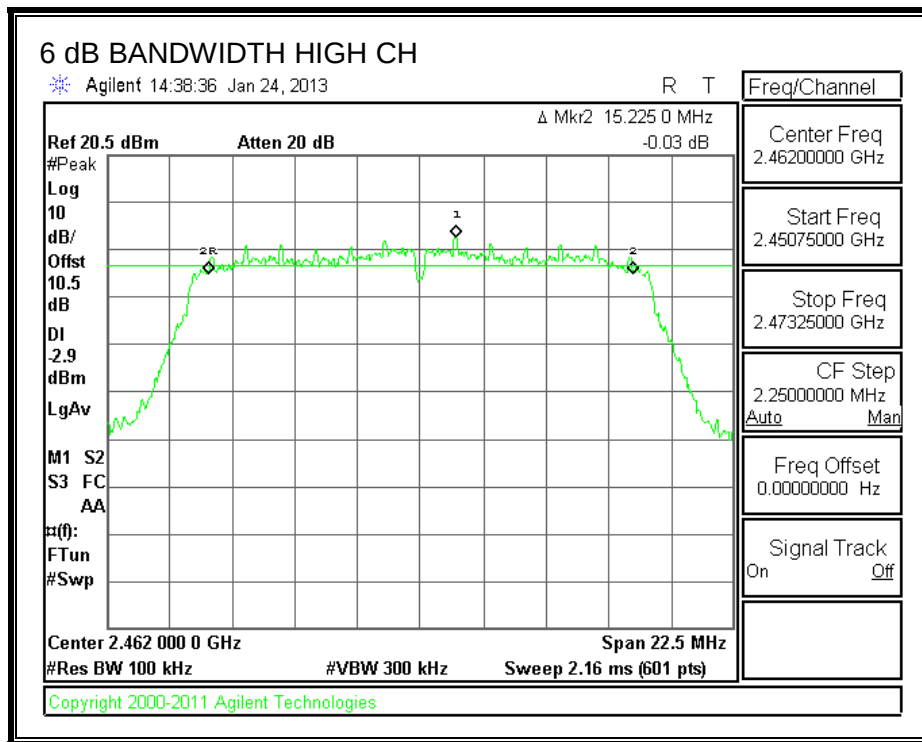
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.188	0.5
Mid	2437	15.188	0.5
High	2462	15.225	0.5

6 dB BANDWIDTH





8.3.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	11.70
Mid	2437	11.60
High	2462	11.40

8.3.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

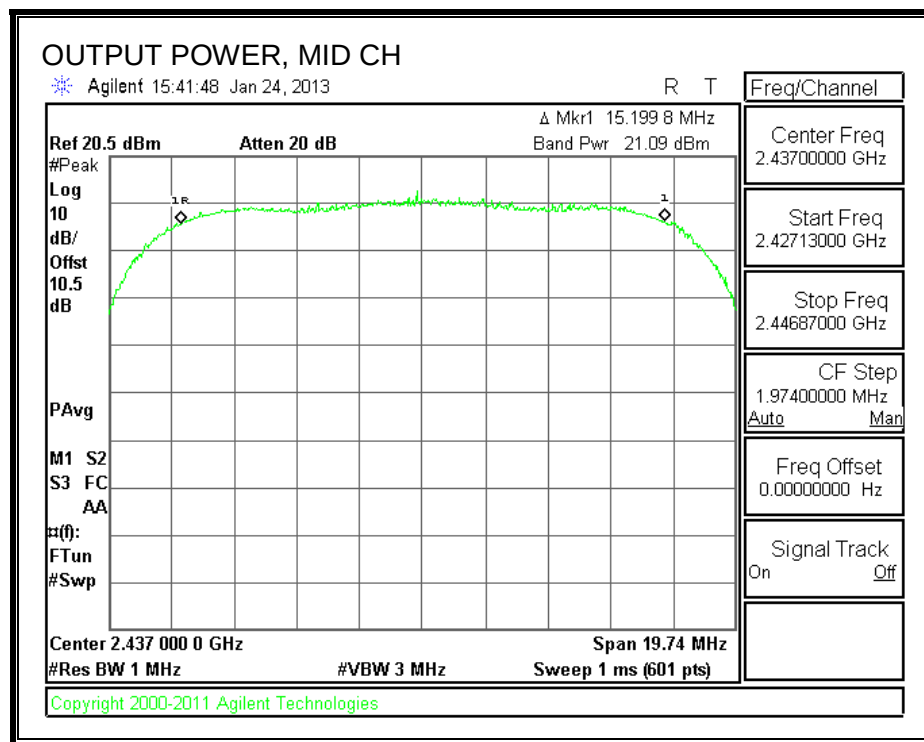
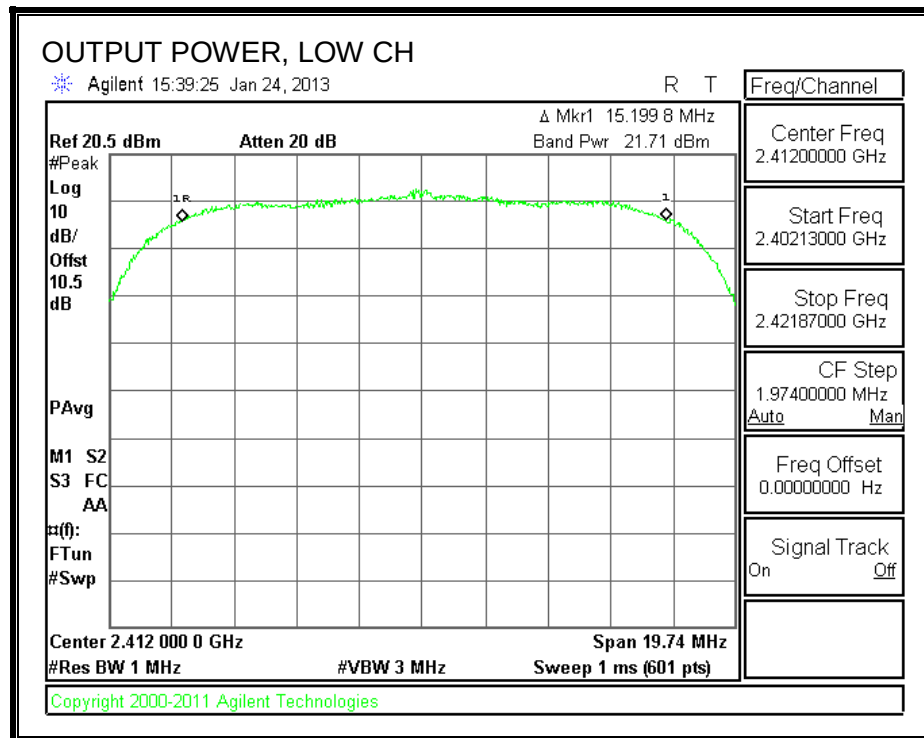
Limits

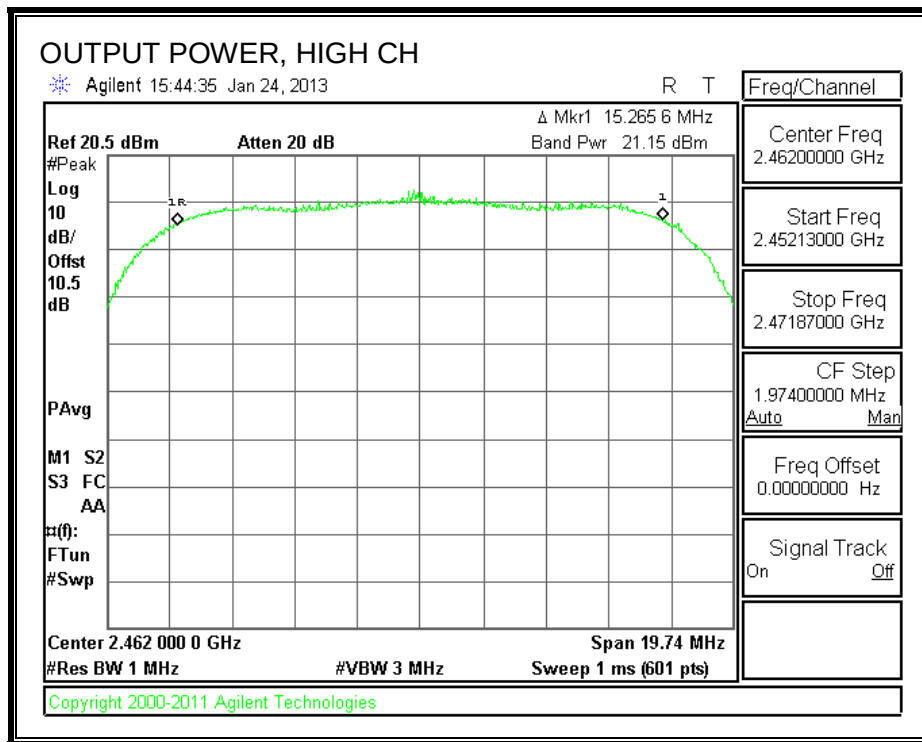
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.41	30.00	30	36	30.00
Mid	2437	-1.41	30.00	30	36	30.00
High	2462	-1.41	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	21.71	21.71	30.00	-8.29
Mid	2437	21.09	21.09	30.00	-8.91
High	2462	21.15	21.15	30.00	-8.85

OUTPUT POWER





8.3.4. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

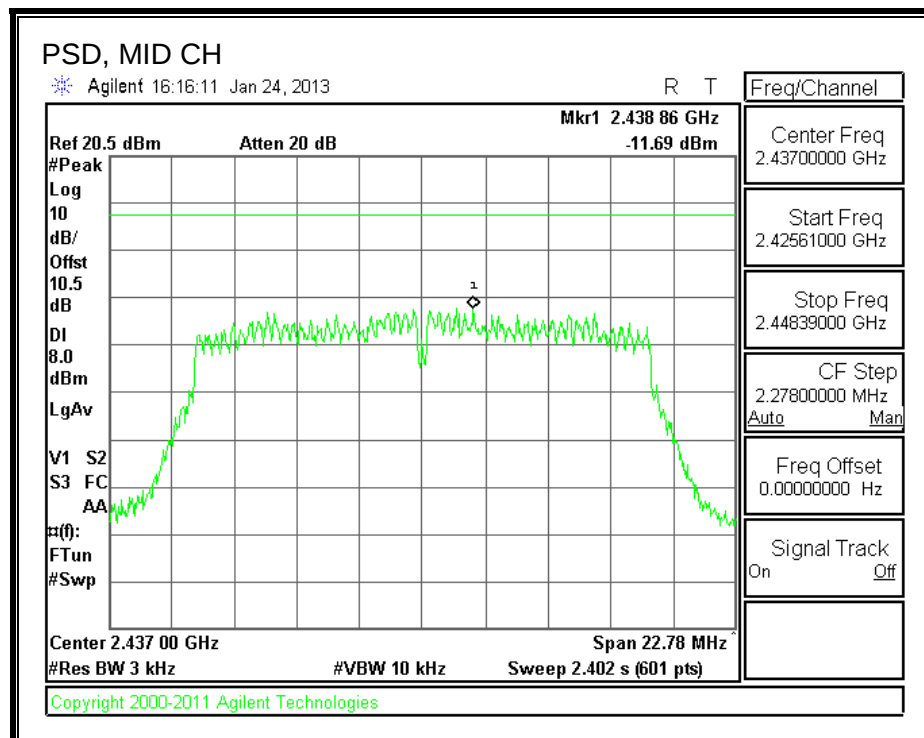
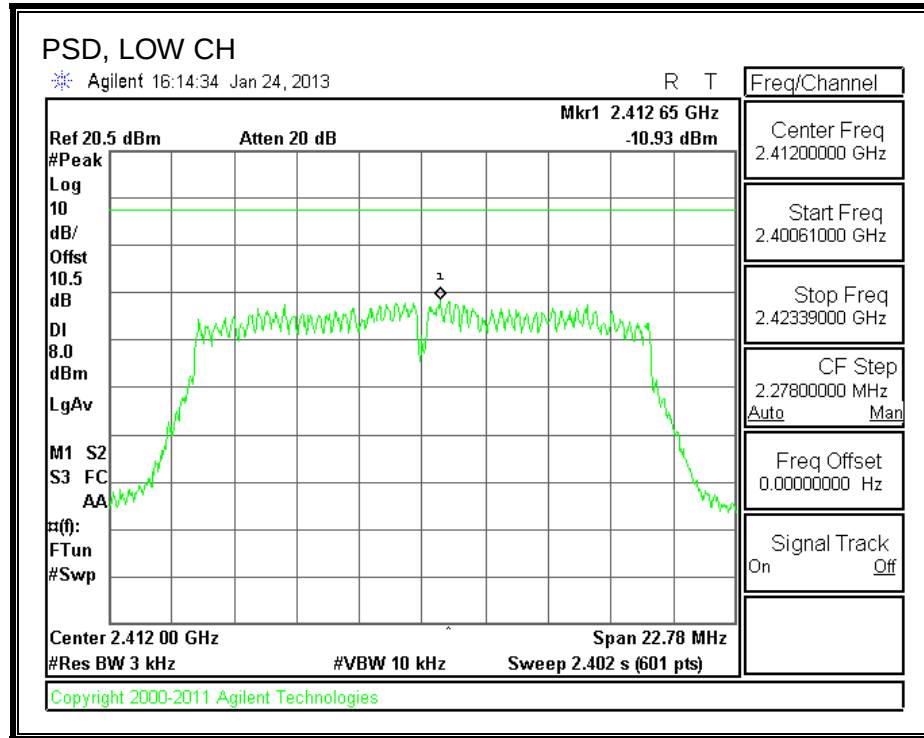
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

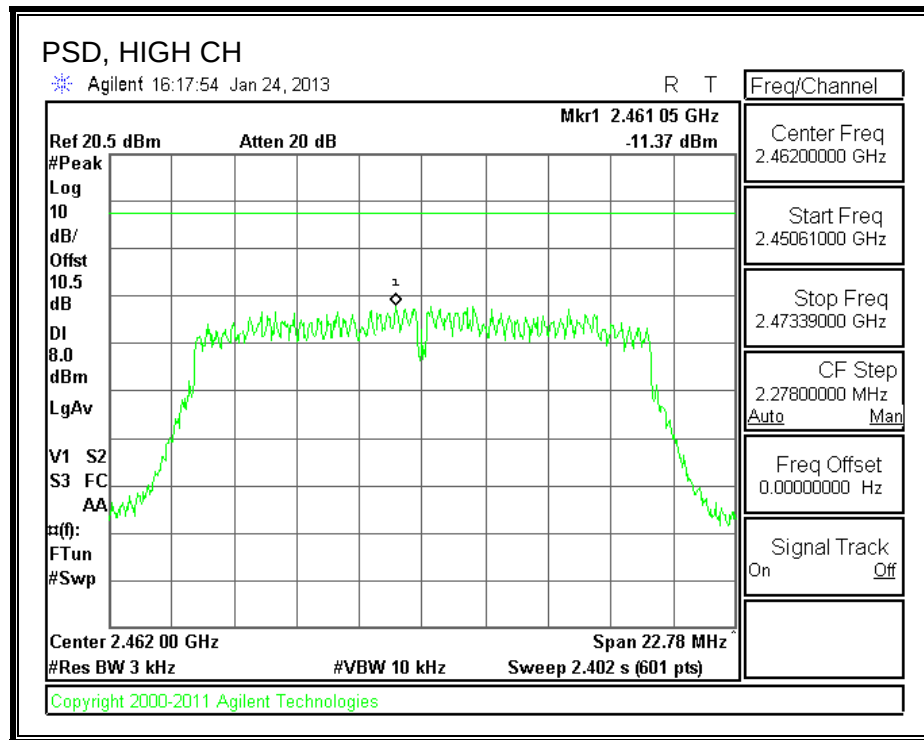
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-10.93	8.0	-18.9
Mid	2437	-11.69	8.0	-19.7
High	2462	-11.37	8.0	-19.4

PSD,





8.3.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

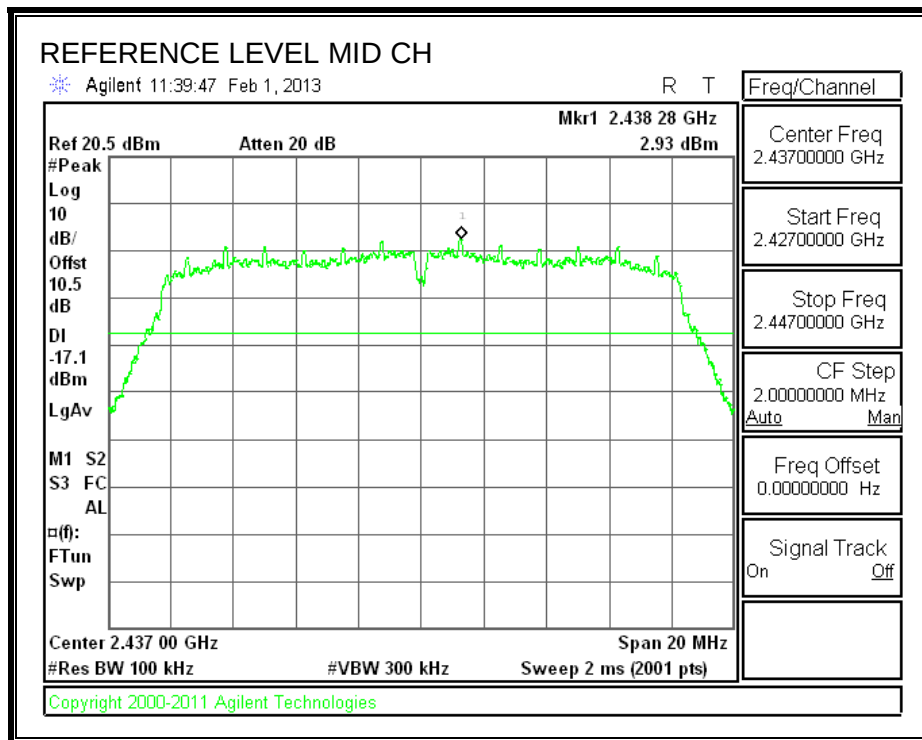
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

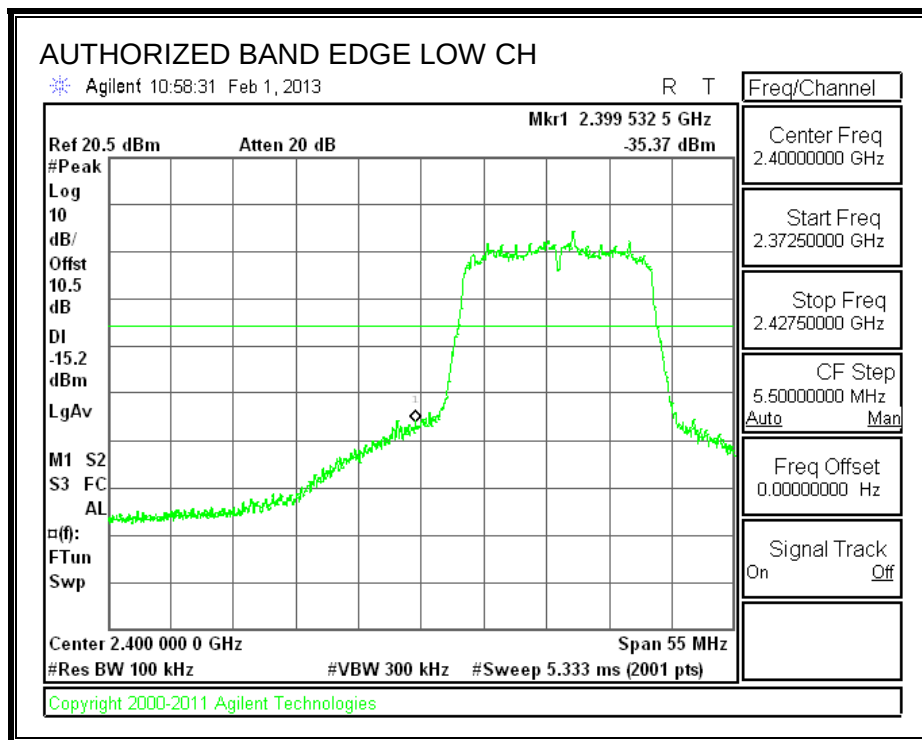
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

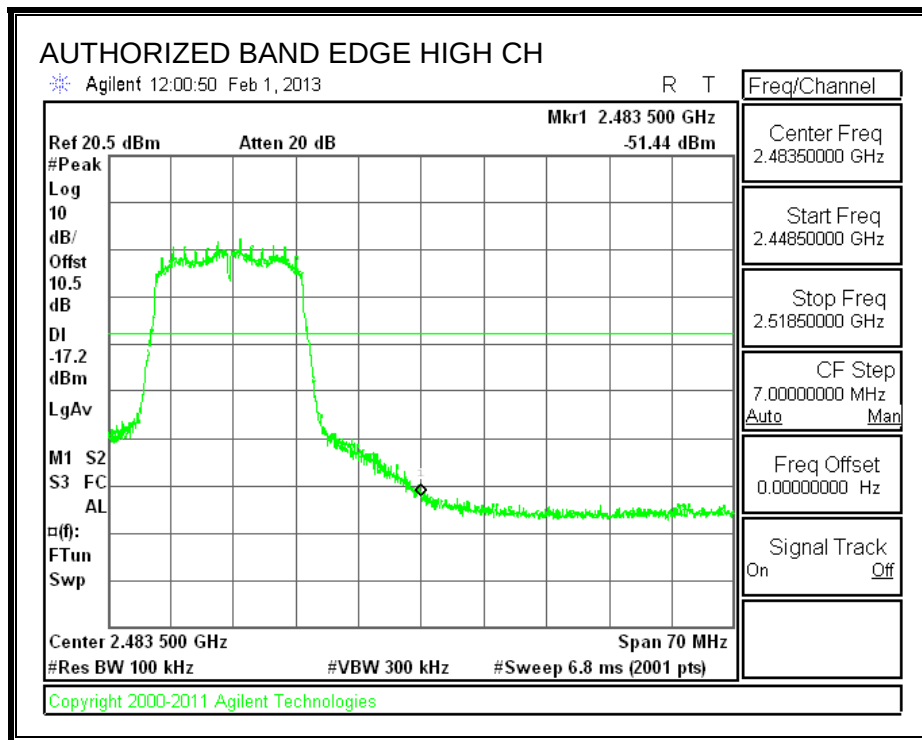
IN-BAND REFERENCE LEVEL



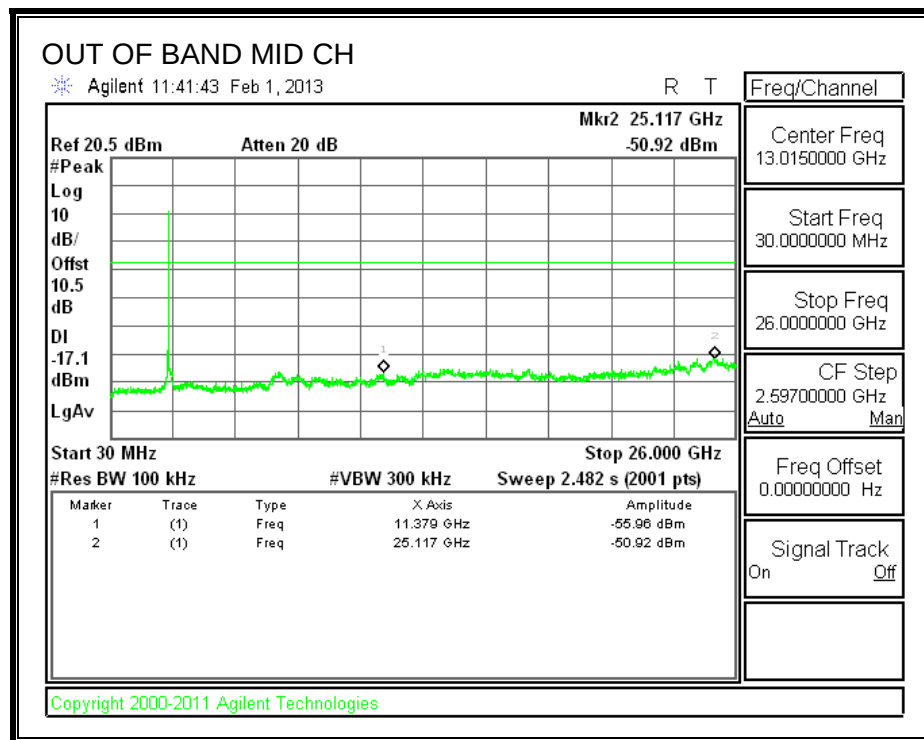
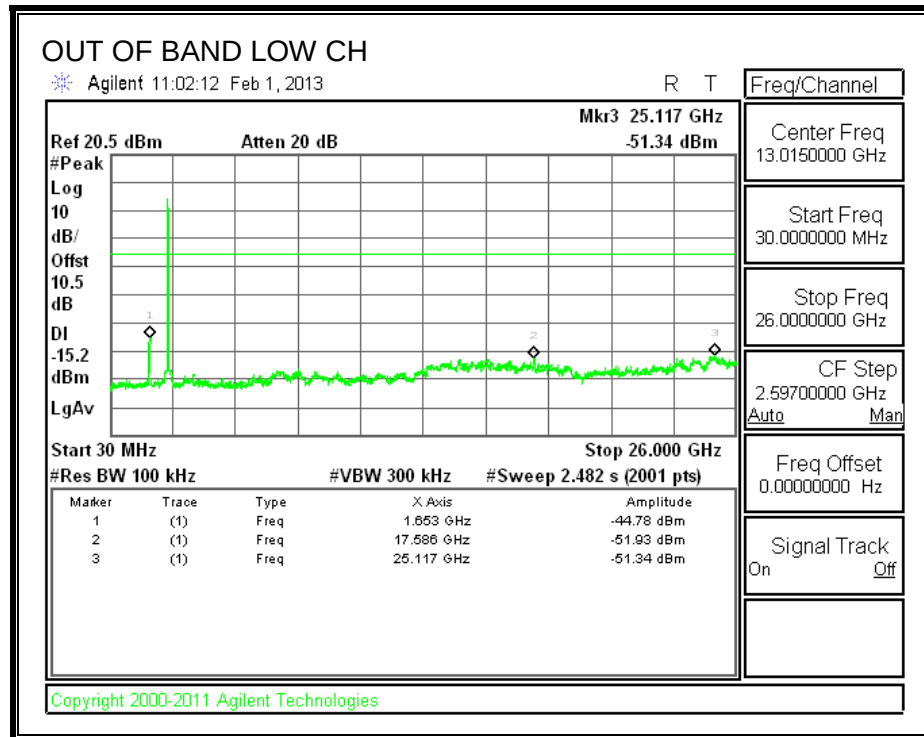
LOW CHANNEL BANDEDGE

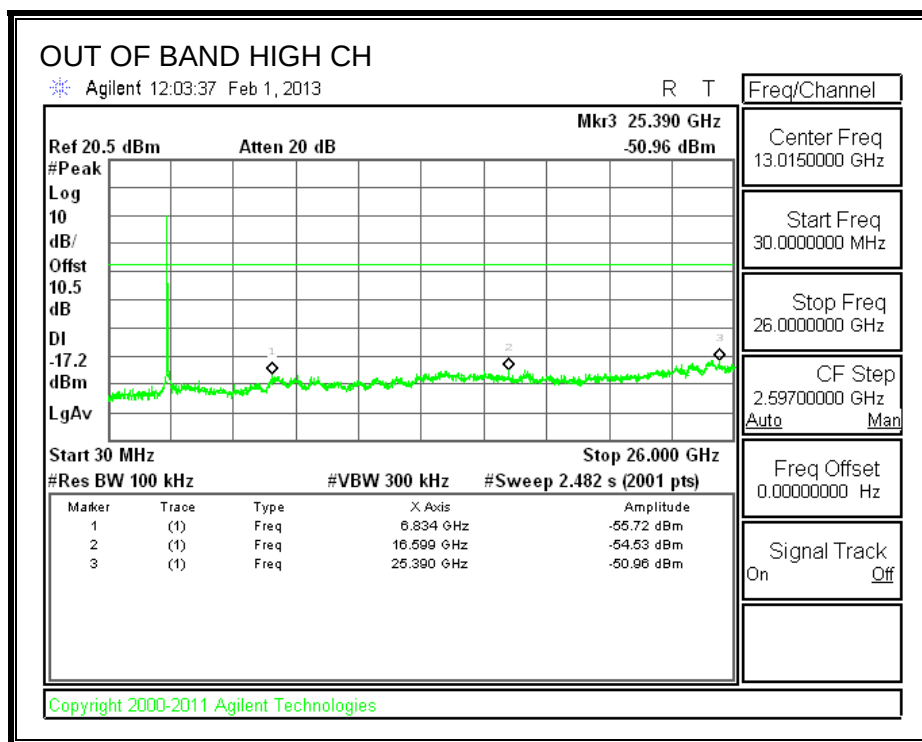


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.4. 802.11n HT20 MODE IN THE 2.4 GHz BAND

8.4.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

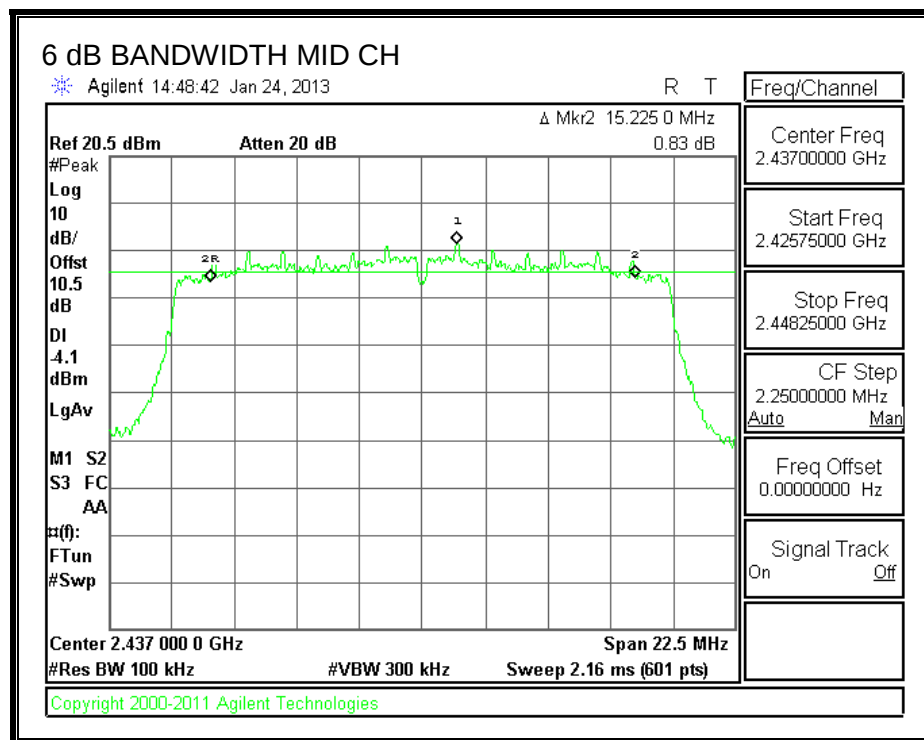
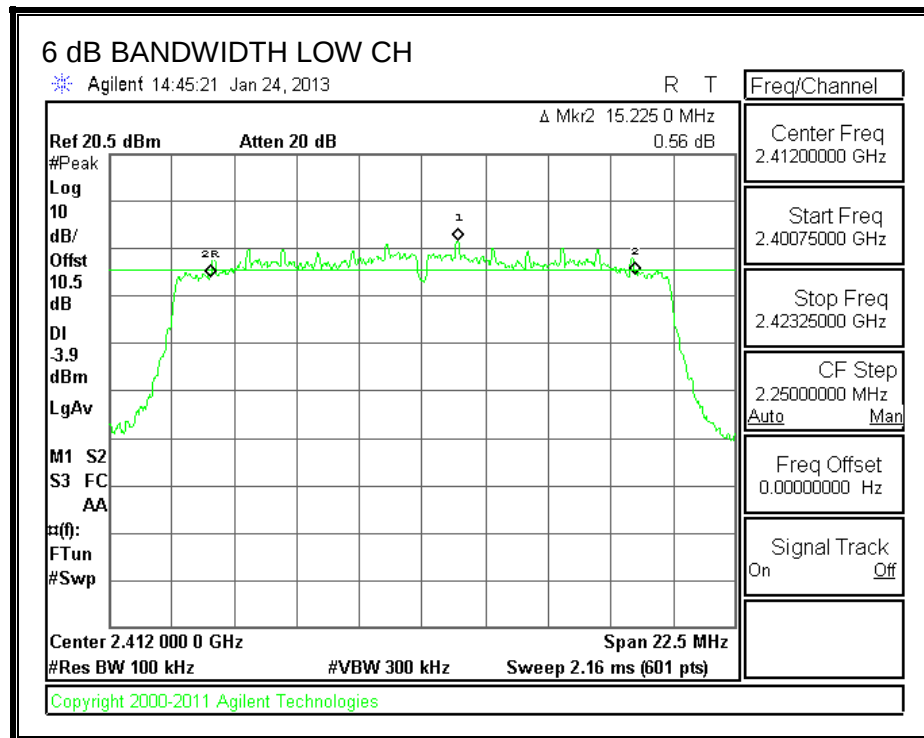
TEST PROCEDURE

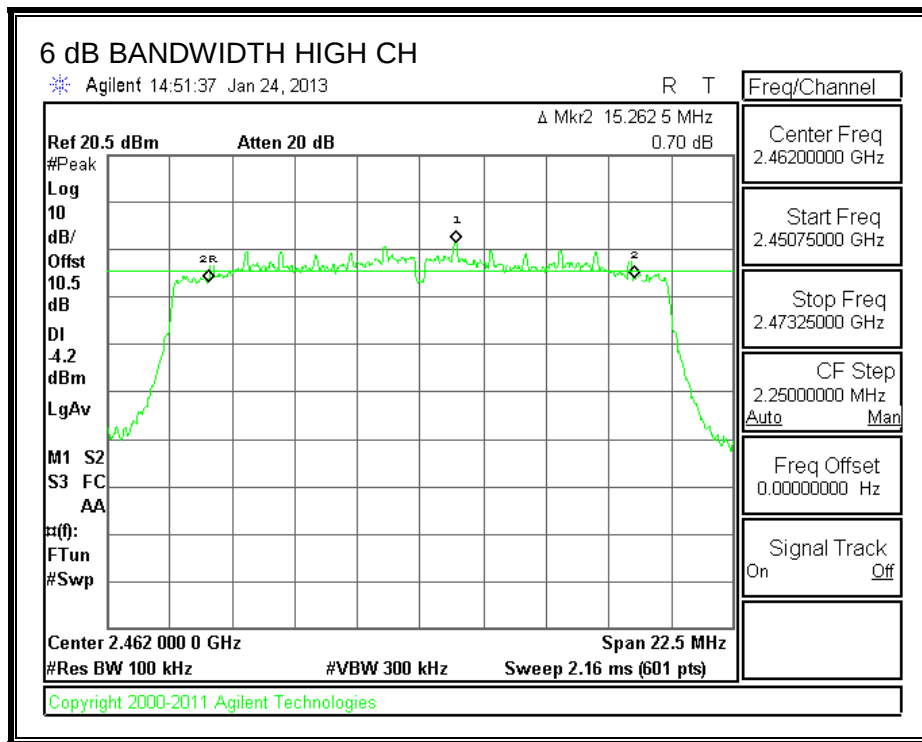
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.225	0.5
Mid	2437	15.225	0.5
High	2462	15.263	0.5

6 dB BANDWIDTH





8.4.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	10.80
Mid	2437	10.60
High	2462	10.40

8.4.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

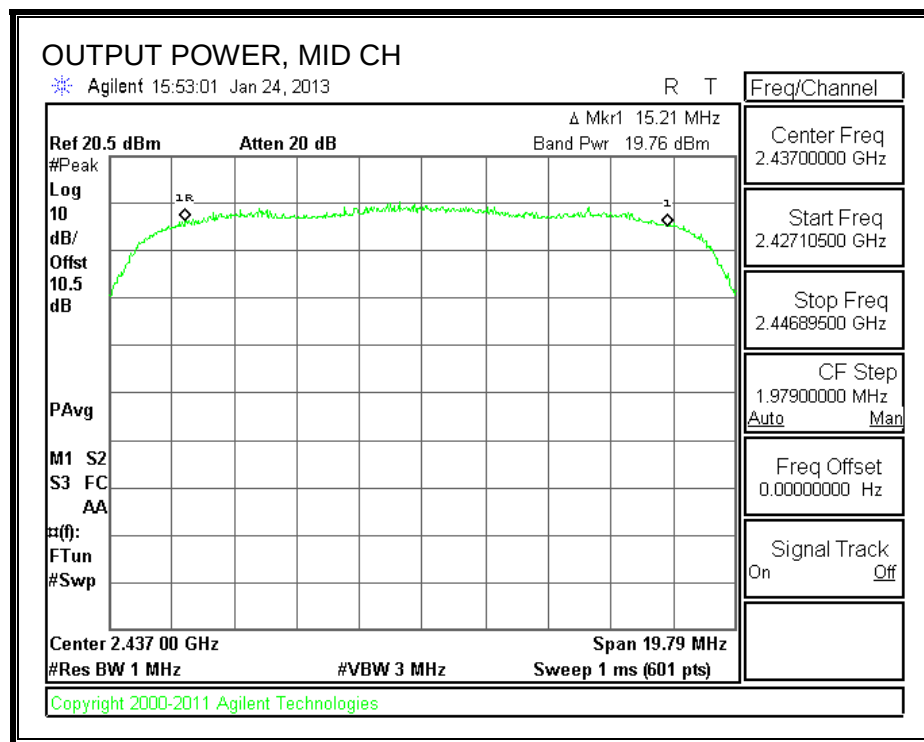
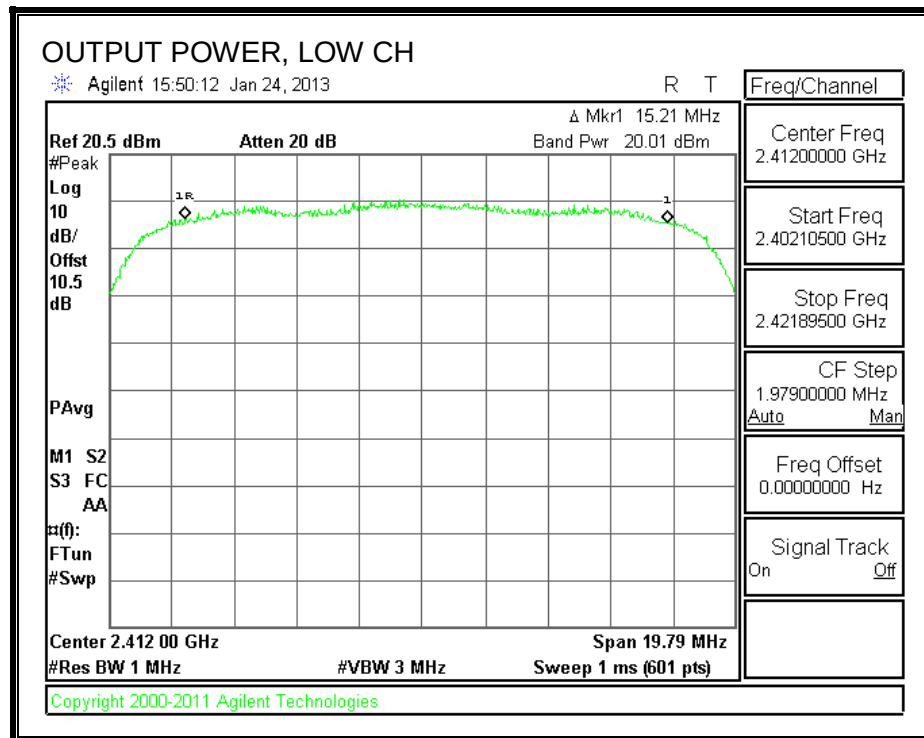
Limits

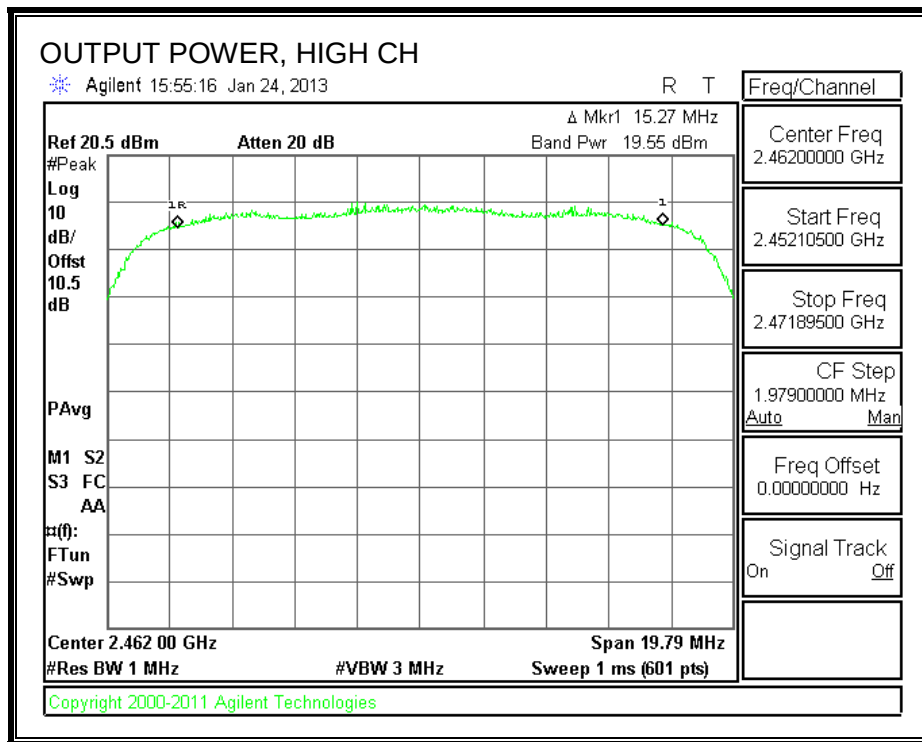
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.41	30.00	30	36	30.00
Mid	2437	-1.41	30.00	30	36	30.00
High	2462	-1.41	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	20.01	20.01	30.00	-9.99
Mid	2437	19.76	19.76	30.00	-10.24
High	2462	19.55	19.55	30.00	-10.45

OUTPUT POWER





8.4.4. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

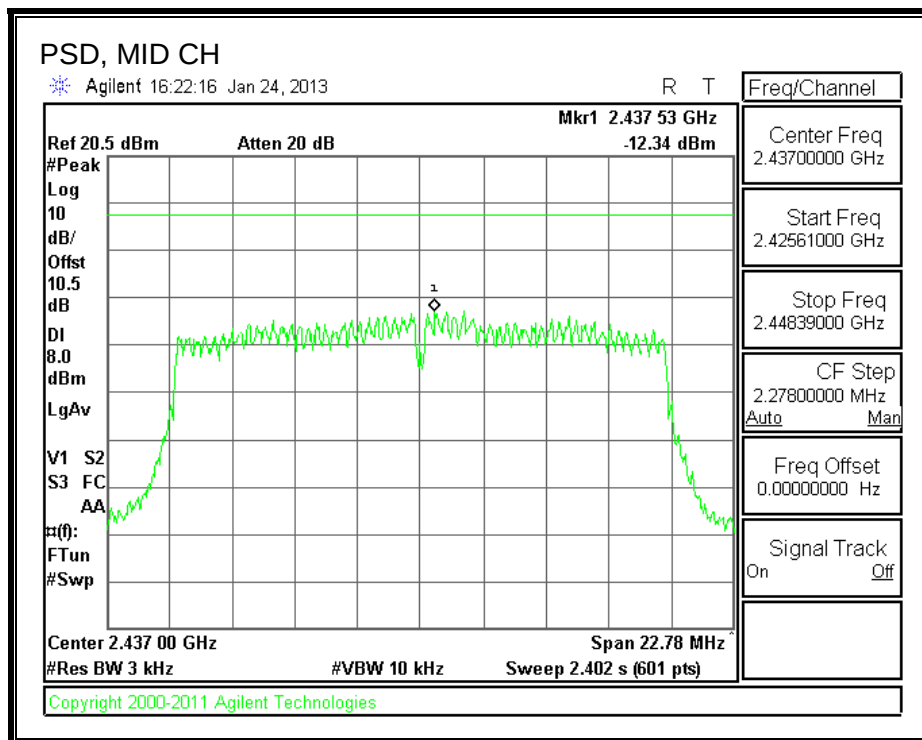
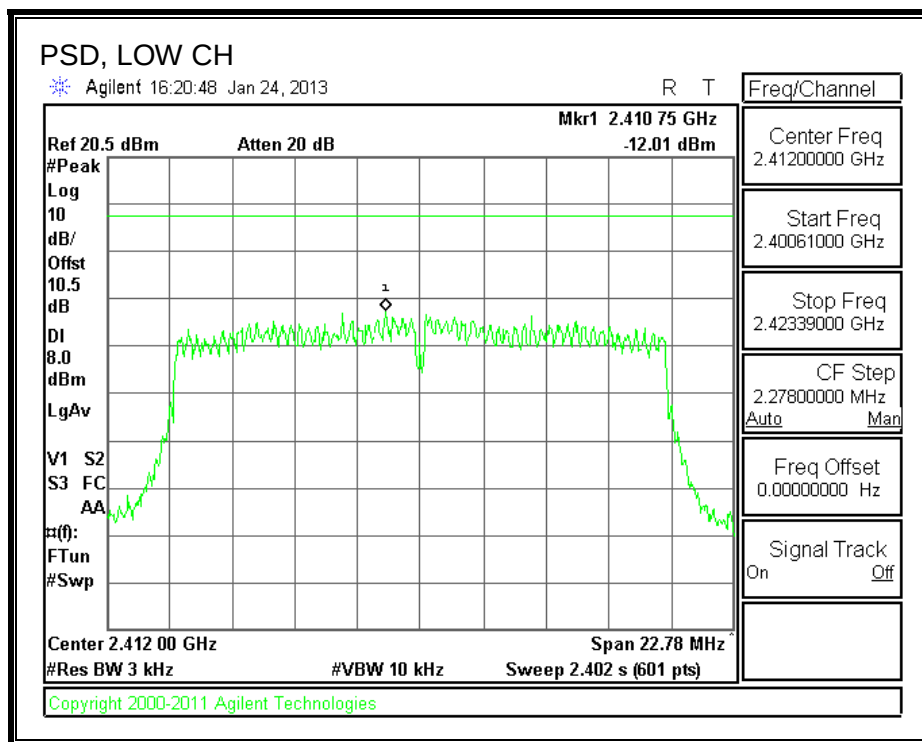
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

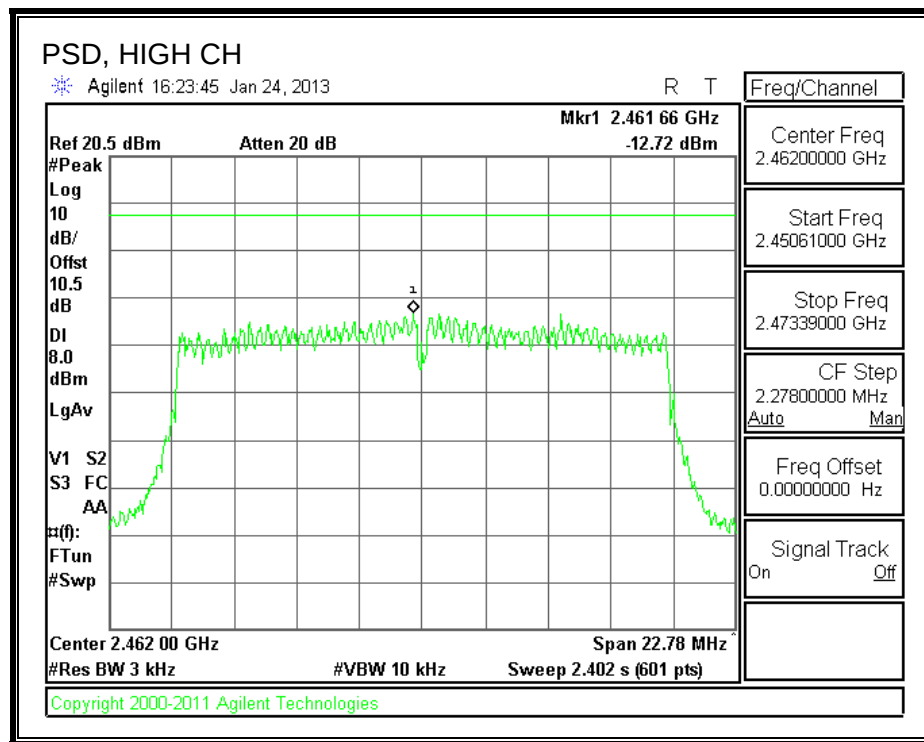
RESULTS

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-12.01	8.0	-20.0
Mid	2437	-12.34	8.0	-20.3
High	2462	-12.72	8.0	-20.7

PSD





8.4.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

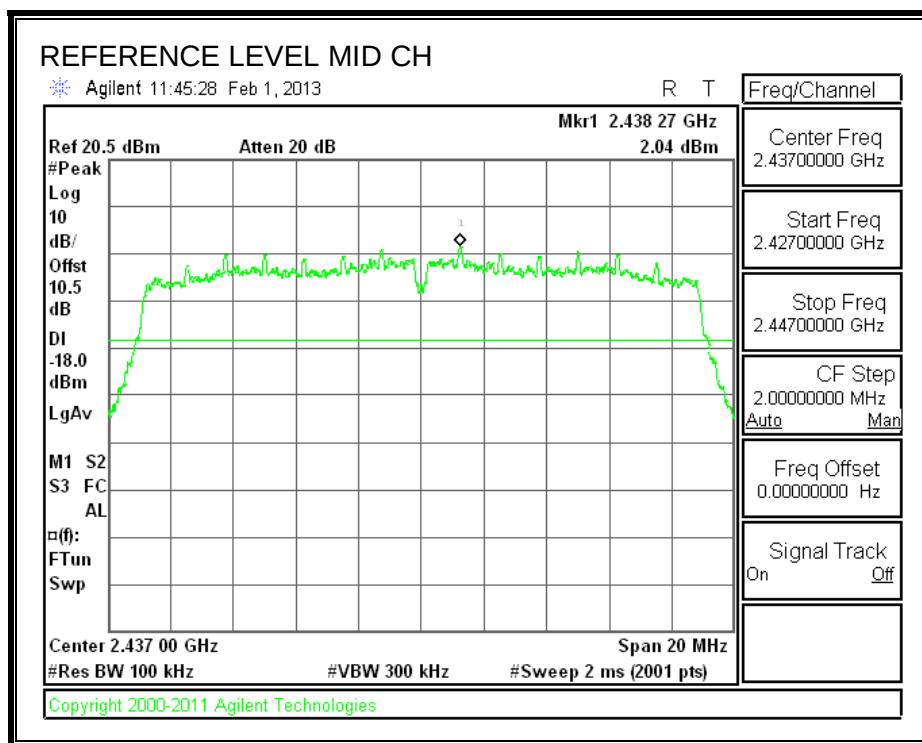
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

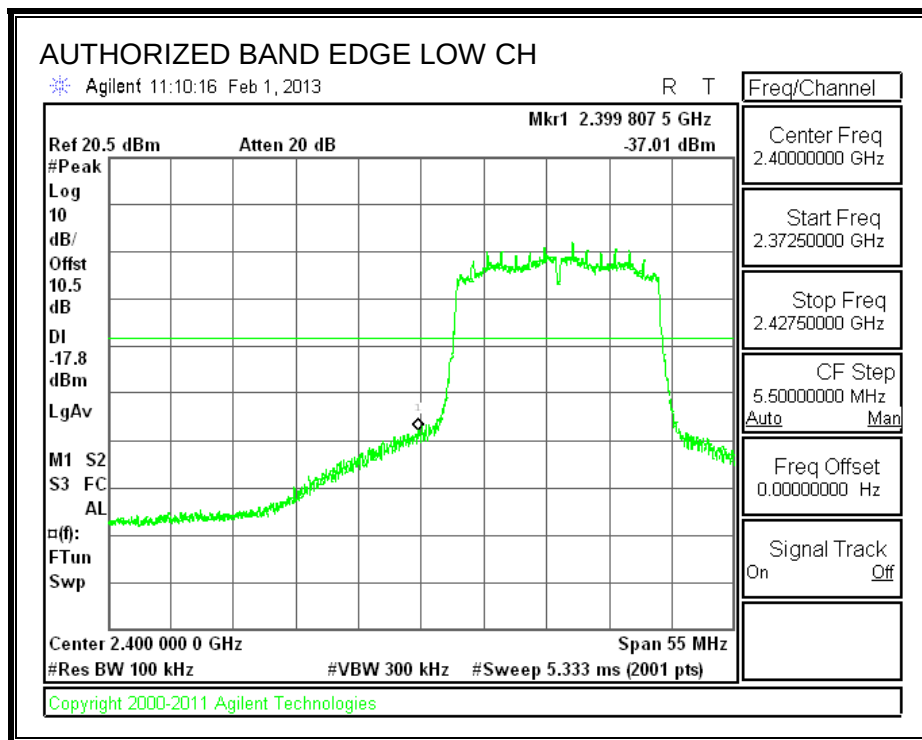
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

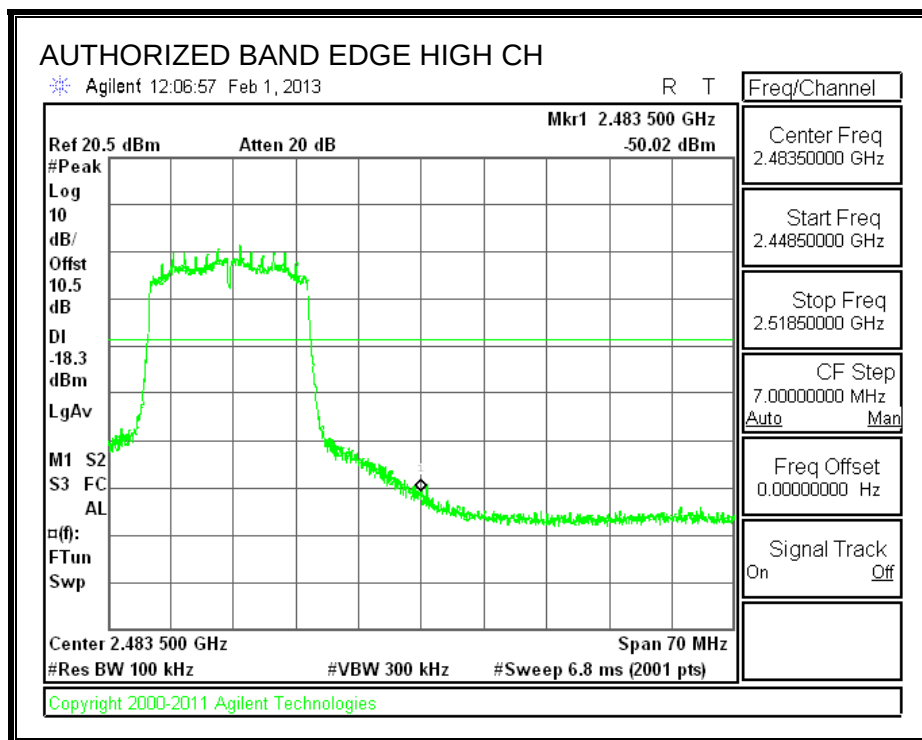
IN-BAND REFERENCE LEVEL



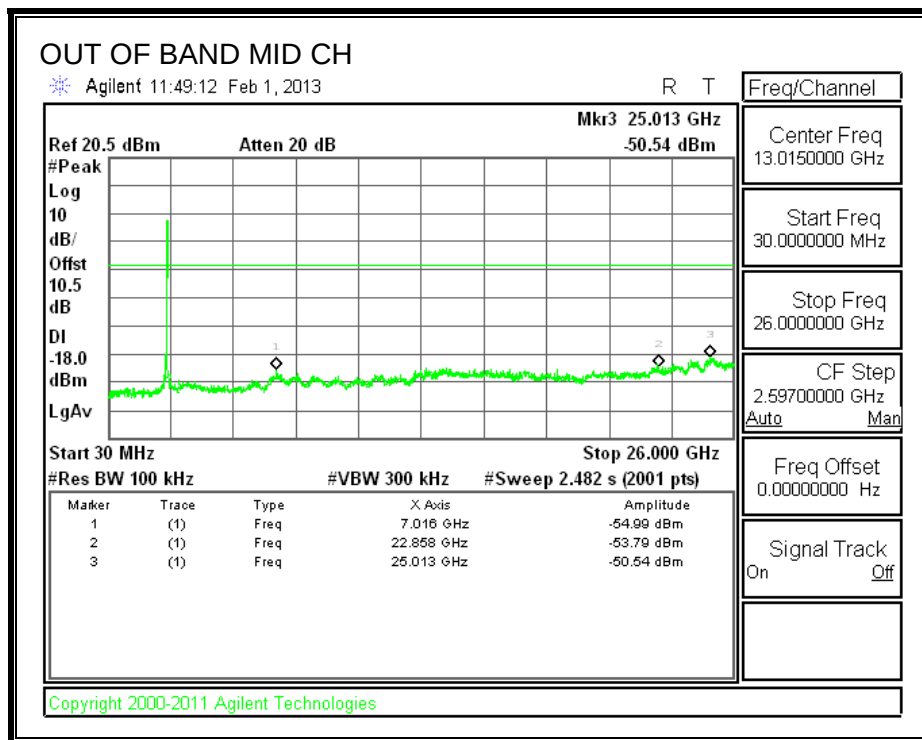
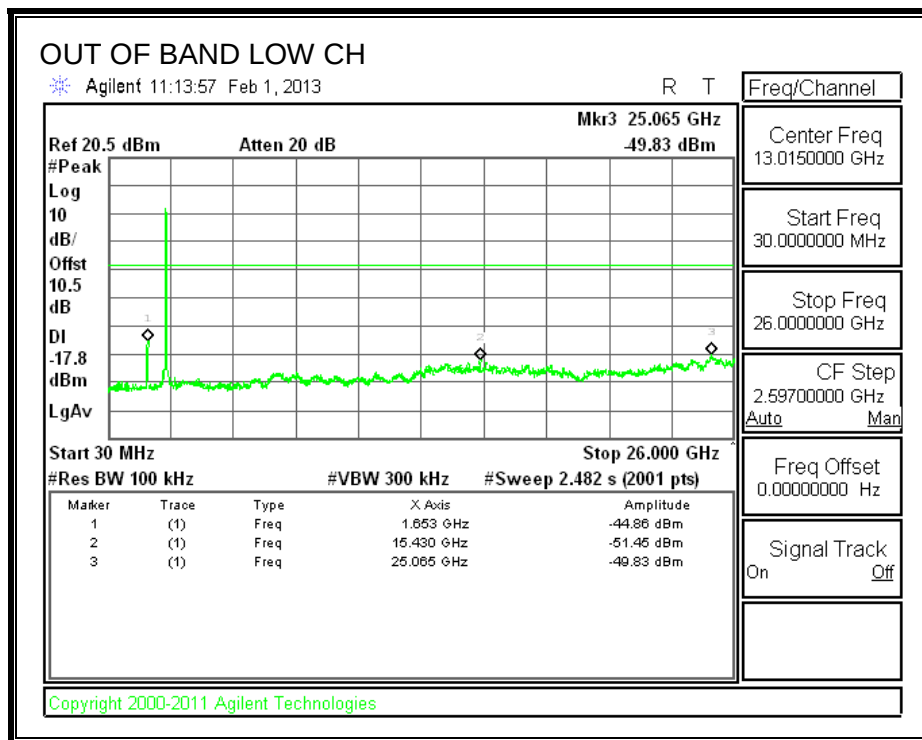
LOW CHANNEL BANDEDGE

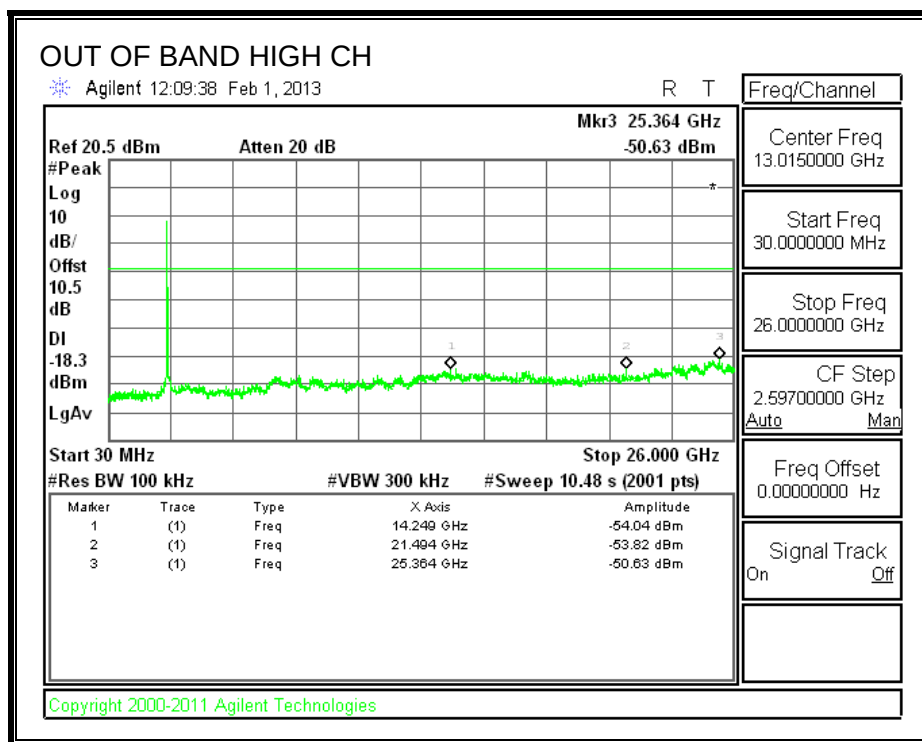


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





9. RADIATED TEST RESULTS

9.1. 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.

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; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

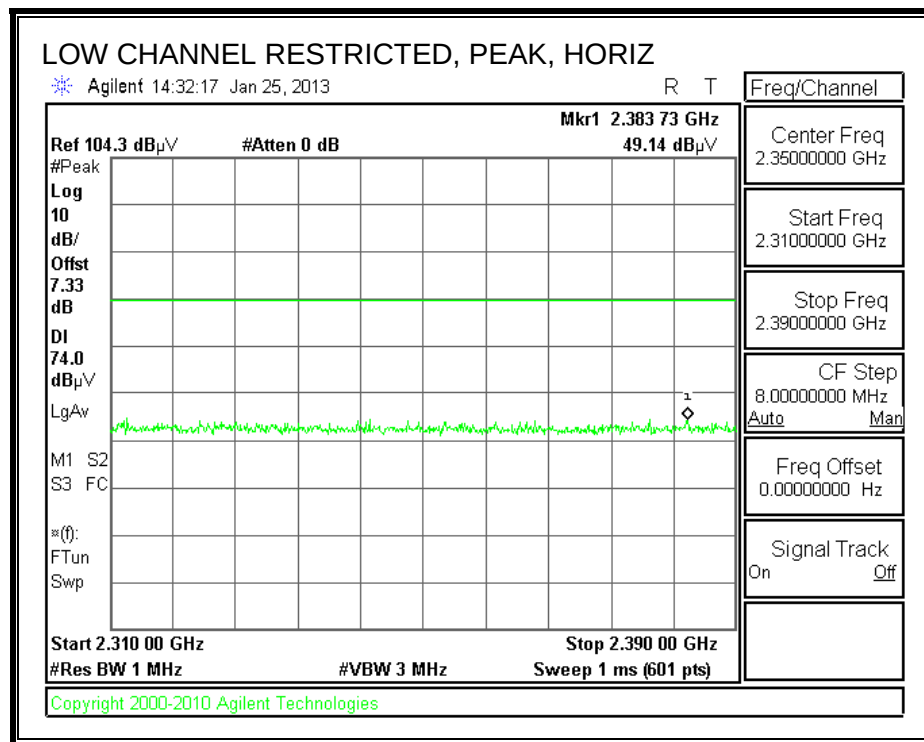
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

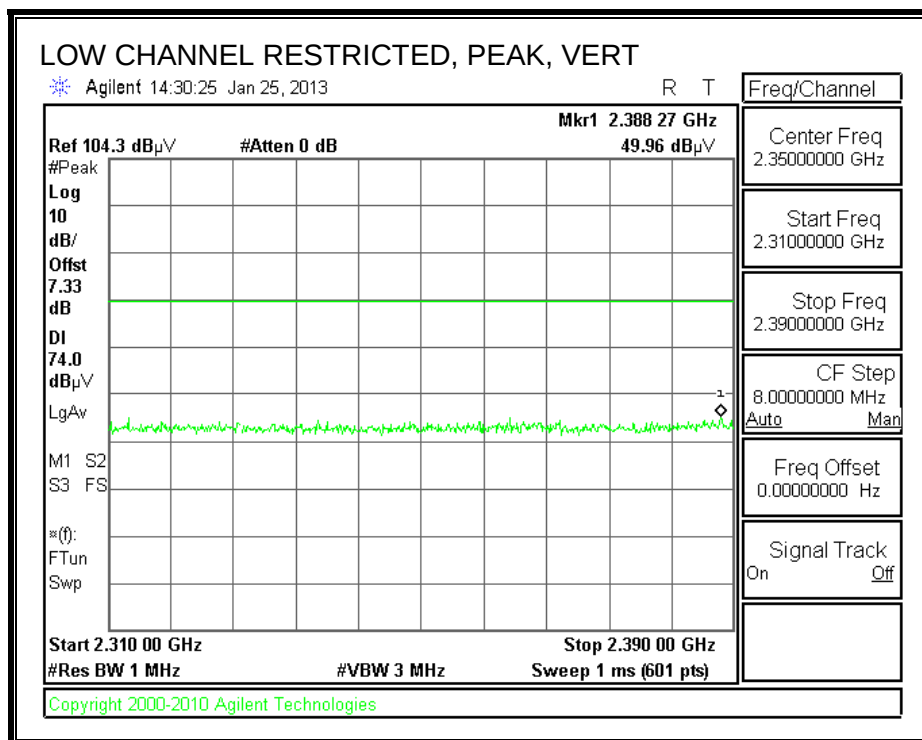
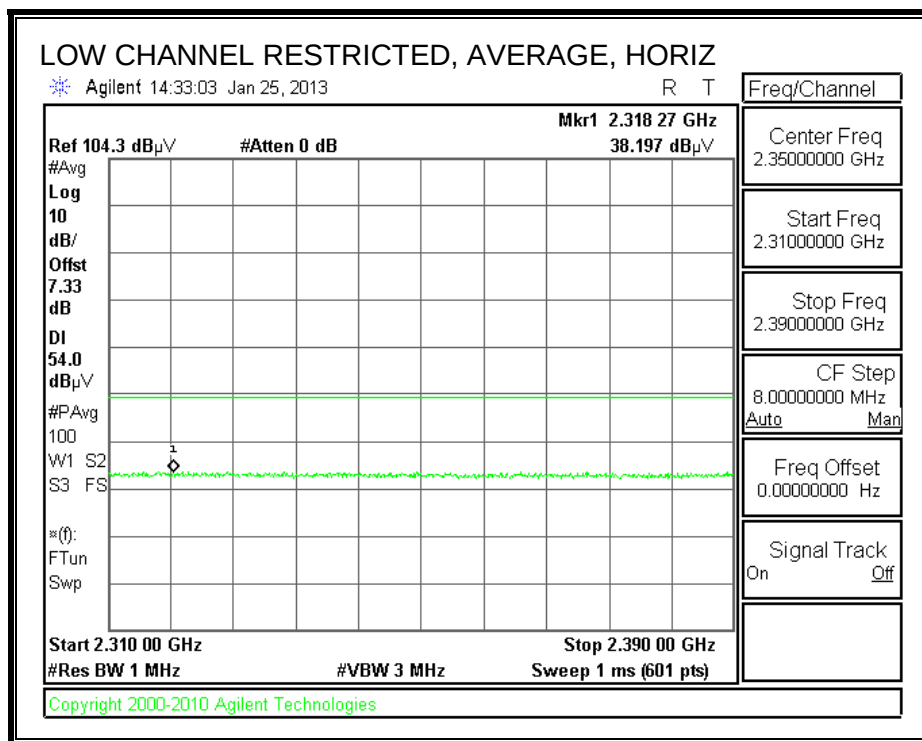
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

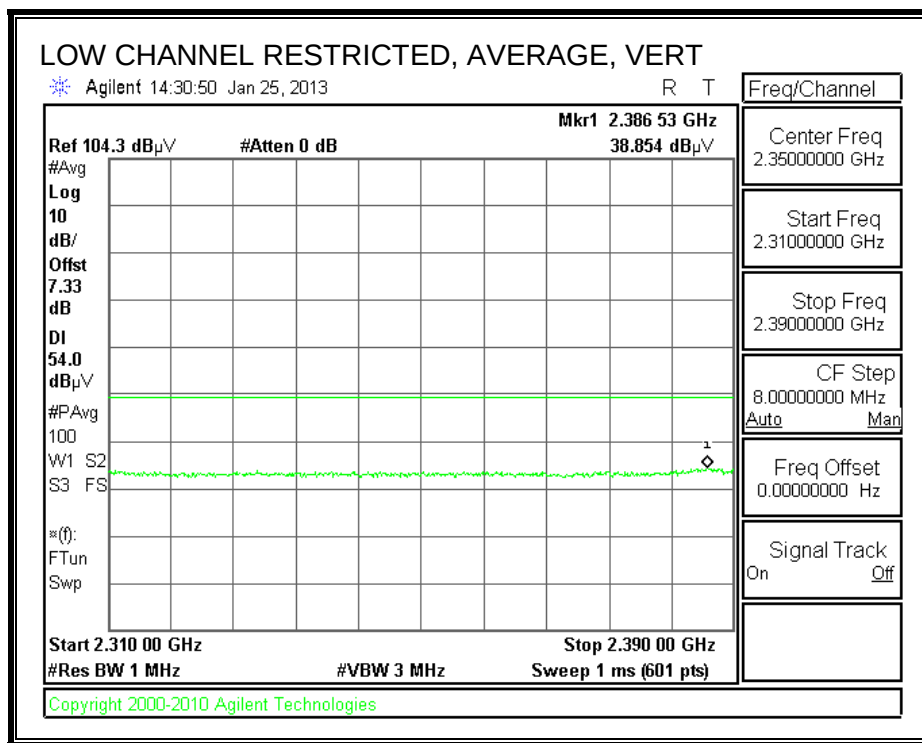
9.2. TRANSMITTER ABOVE 1 GHz

9.3. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

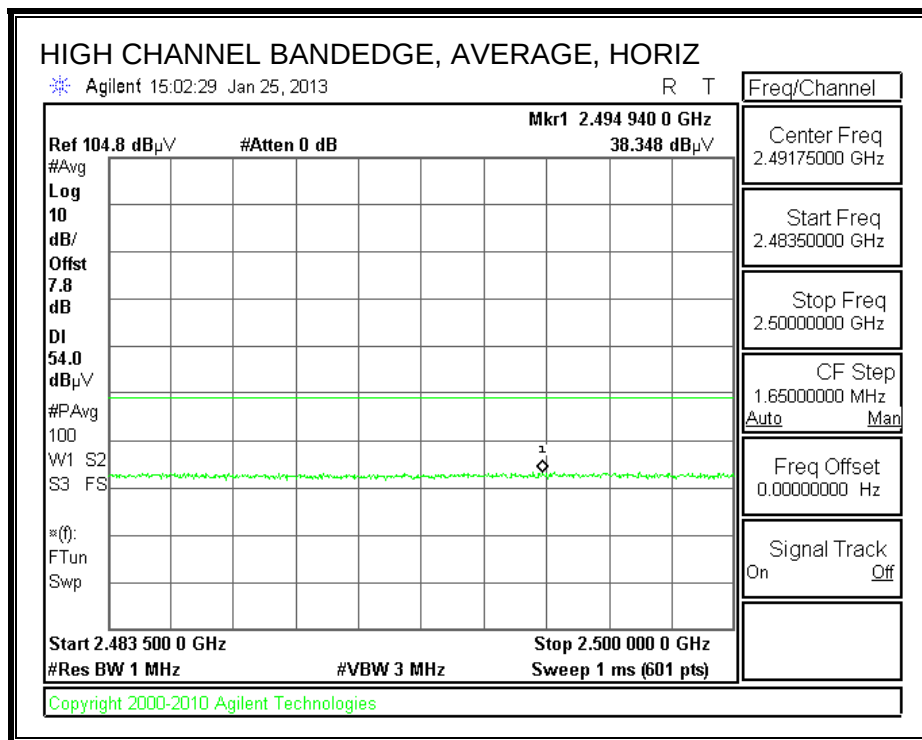
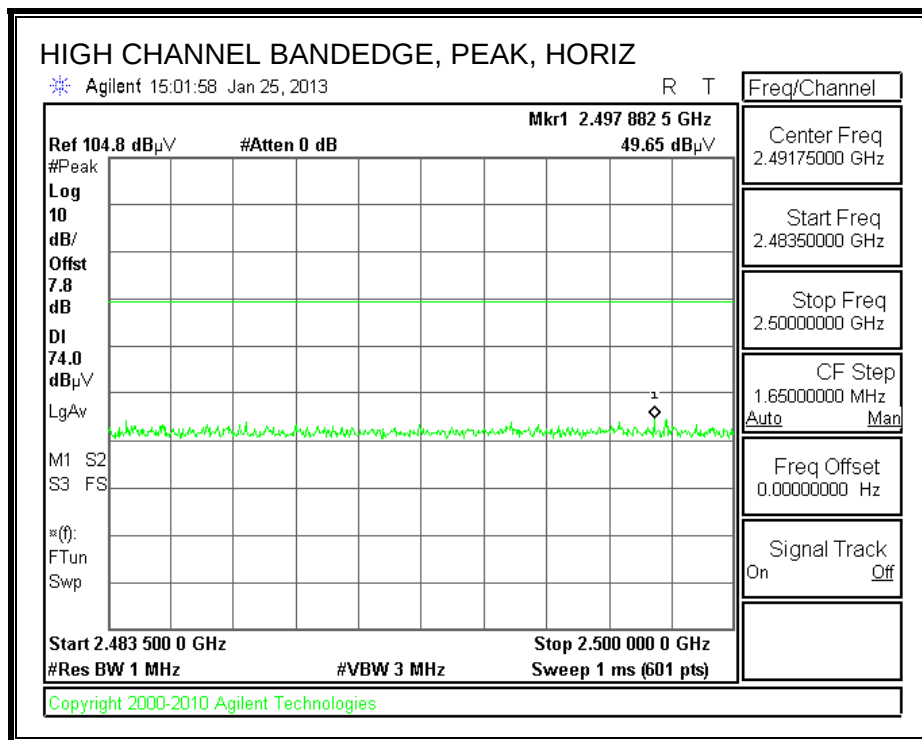
RESTRICTED BANDEGE (LOW CHANNEL)

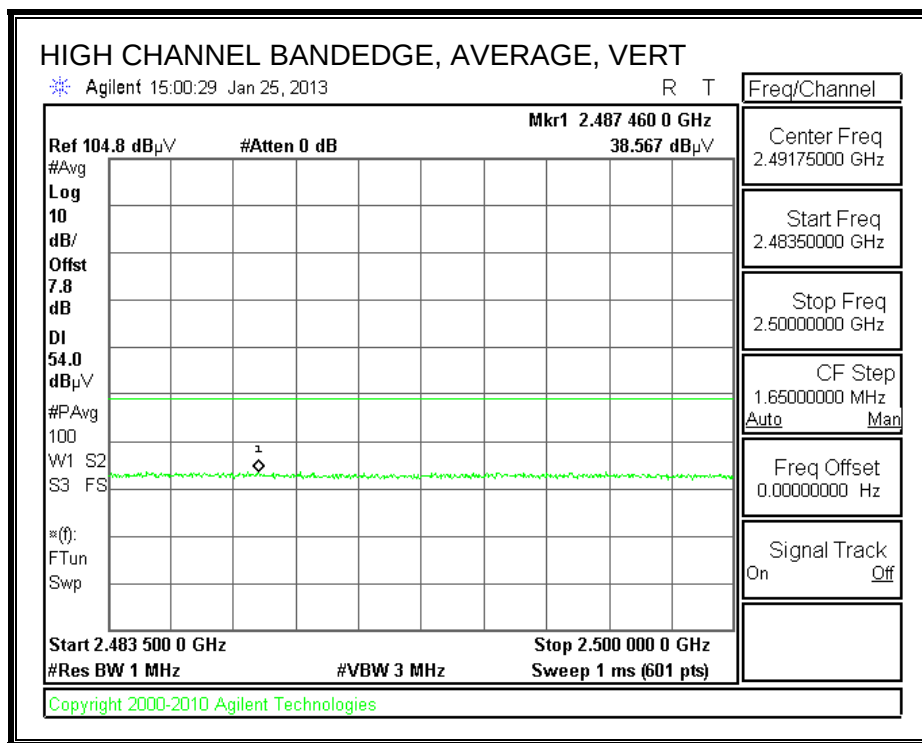
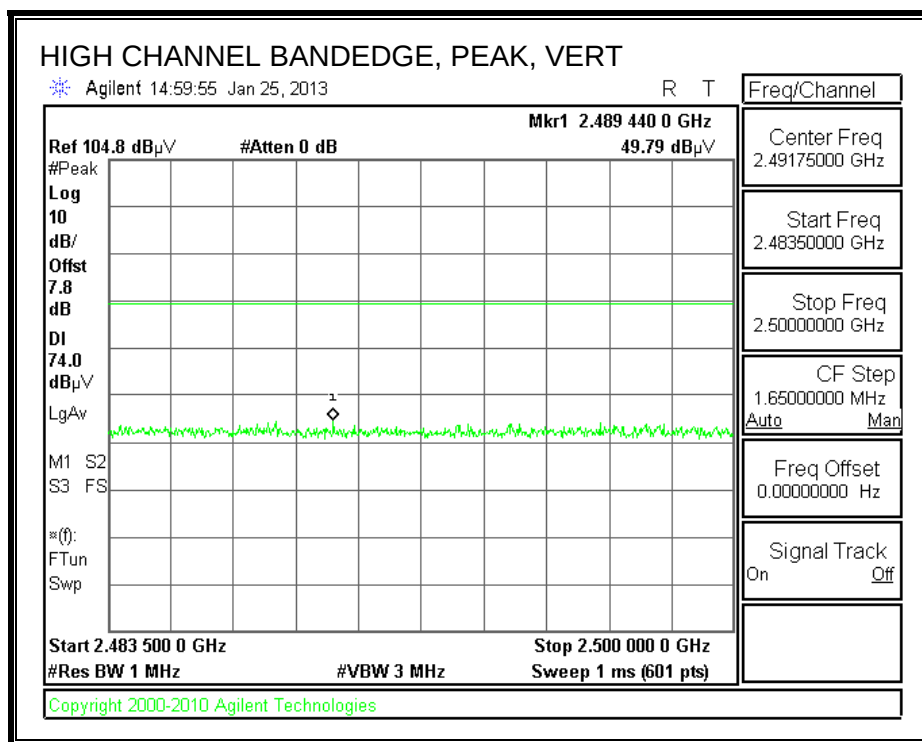






AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber

Test Engr: Dennis Huang
Date: 01/25/13
Project #: 13I14813
Company: SamSung
Test Target: 15.247 WLAN
Mode Oper: Tx 802.11b Mode

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	

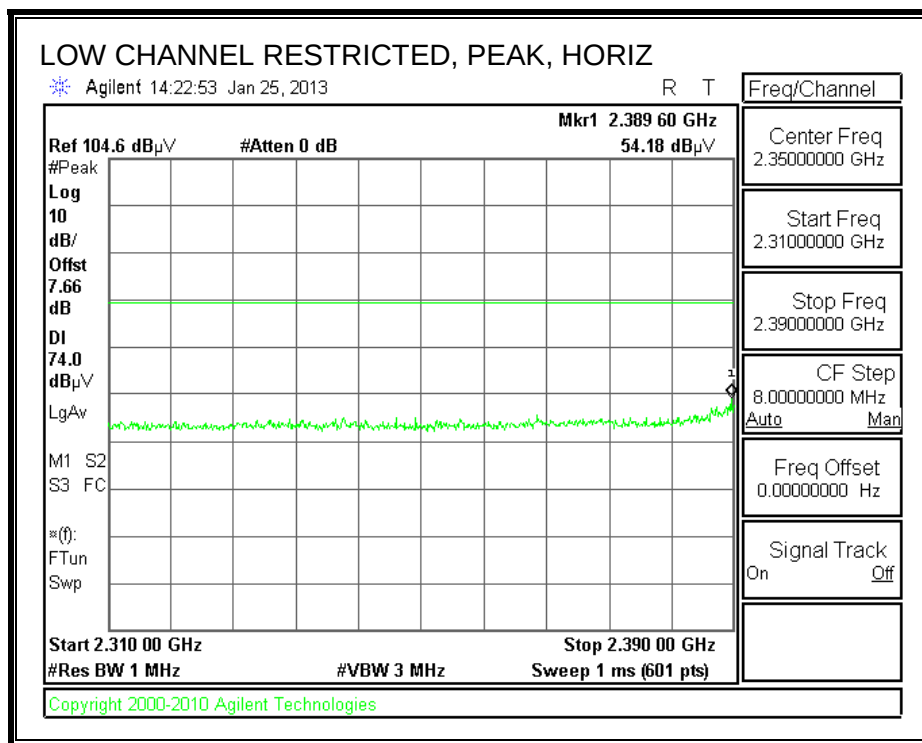
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Ftr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/Q/P	Ant.High cm	Table Angle Degree	Notes
Low Channel - 2412MHz															
4.824	3.0	40.5	33.1	6.8	-34.1	0.0	0.0	46.4	74.0	-27.6	H	P	100.0	137.0	
4.824	3.0	34.7	33.1	6.8	-34.1	0.0	0.0	40.6	54.0	-13.4	H	A	100.0	137.0	
4.824	3.0	39.7	33.1	6.8	-34.1	0.0	0.0	45.5	74.0	-28.5	V	P	173.0	197.0	
4.824	3.0	33.6	33.1	6.8	-34.1	0.0	0.0	39.5	54.0	-14.5	V	A	173.0	197.0	
Mid Channel - 2437MHz															
4.874	3.0	40.9	33.2	6.8	-34.0	0.0	0.0	46.8	74.0	-27.2	H	P	121.0	141.0	
4.874	3.0	35.0	33.2	6.8	-34.0	0.0	0.0	40.9	54.0	-13.1	H	A	121.0	141.0	
4.874	3.0	38.4	33.2	6.8	-34.0	0.0	0.0	44.4	74.0	-29.6	V	P	102.0	106.0	
4.874	3.0	31.0	33.2	6.8	-34.0	0.0	0.0	36.9	54.0	-17.1	V	A	102.0	106.0	
High Channel - 2462MHz															
4.924	3.0	39.3	33.2	6.8	-34.0	0.0	0.0	45.4	74.0	-28.6	H	P	103.0	130.0	
4.924	3.0	32.5	33.2	6.8	-34.0	0.0	0.0	38.5	54.0	-15.5	H	A	103.0	130.0	
4.924	3.0	39.1	33.2	6.8	-34.0	0.0	0.0	45.1	74.0	-28.9	V	P	104.0	199.0	
4.924	3.0	32.4	33.2	6.8	-34.0	0.0	0.0	38.4	54.0	-15.6	V	A	104.0	199.0	

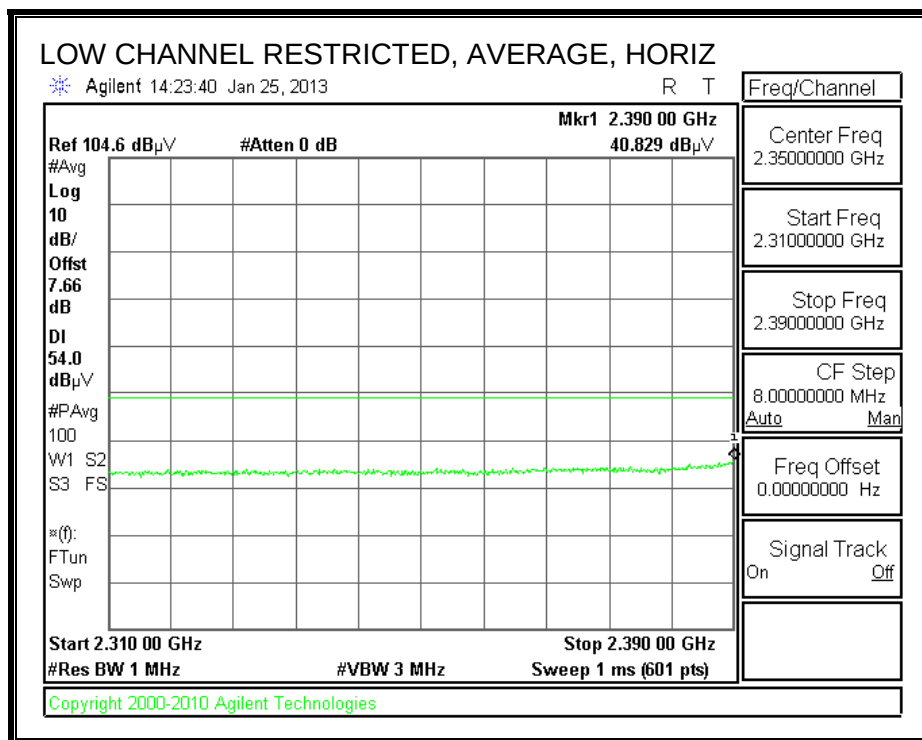
Rev. 4.1.2.7

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

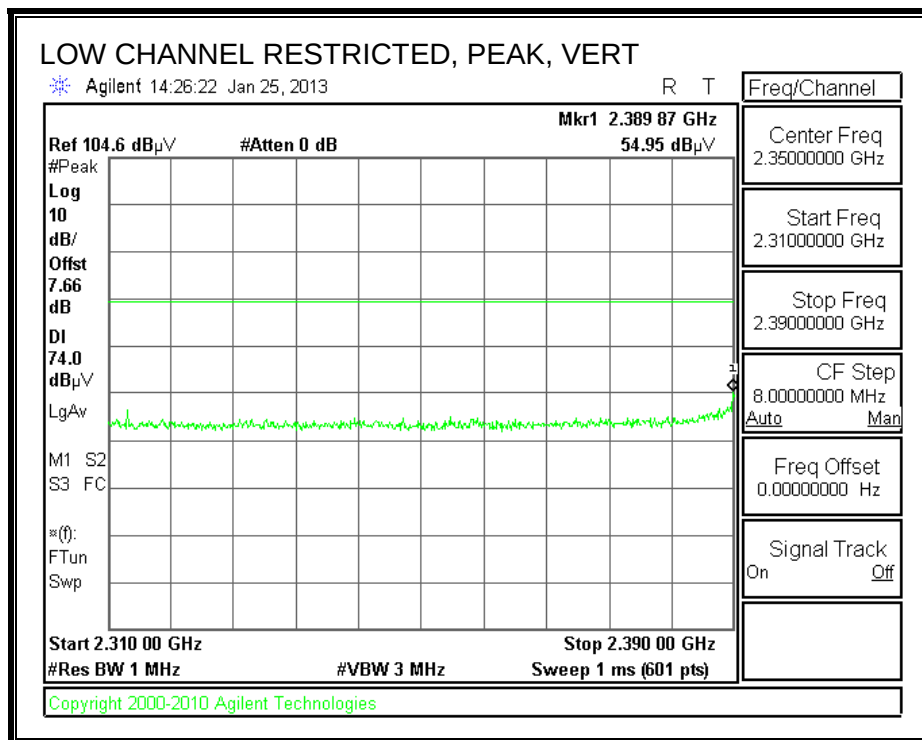
9.4. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

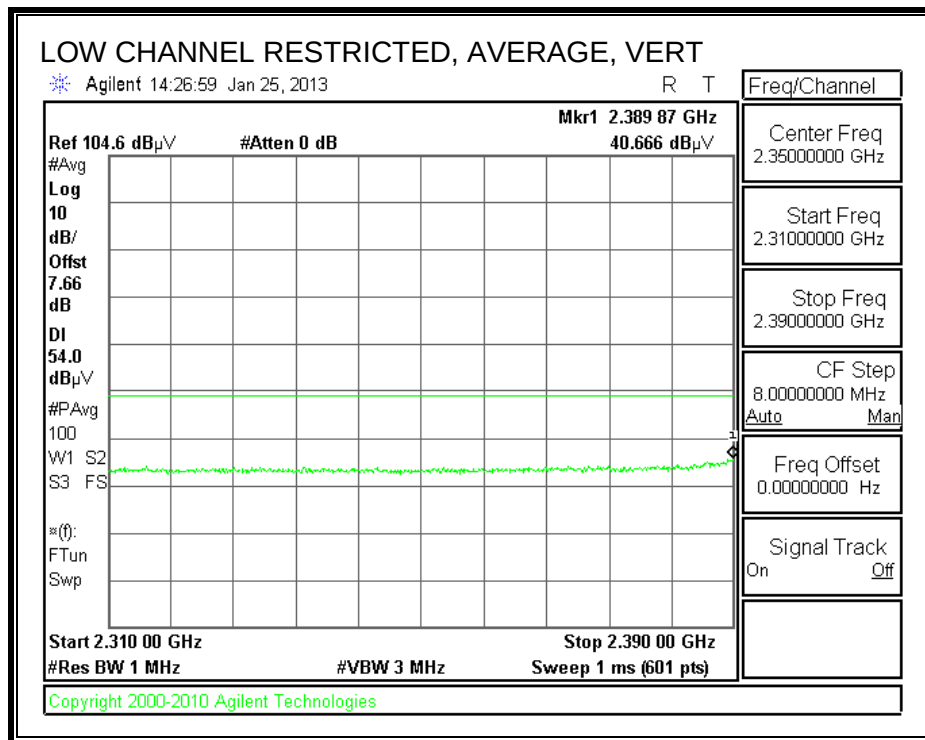
RESTRICTED BANDEDGE (LOW CHANNEL)





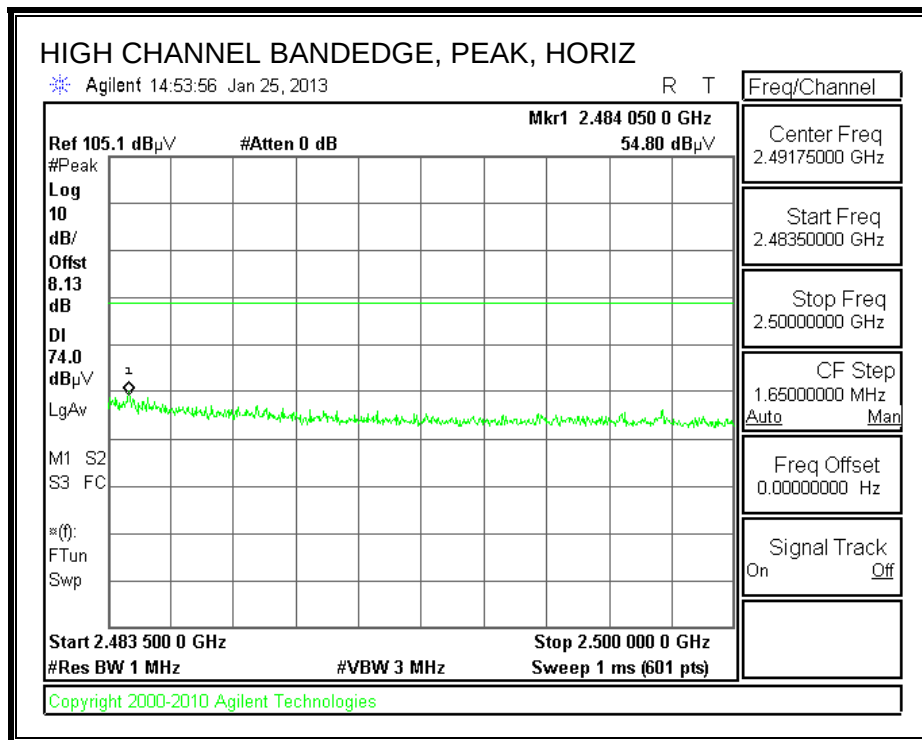
Actual Average
 = Measured Average + Correction Factor
 = 40.829 dB μ V + 0.33
 = 41.159 dB μ V

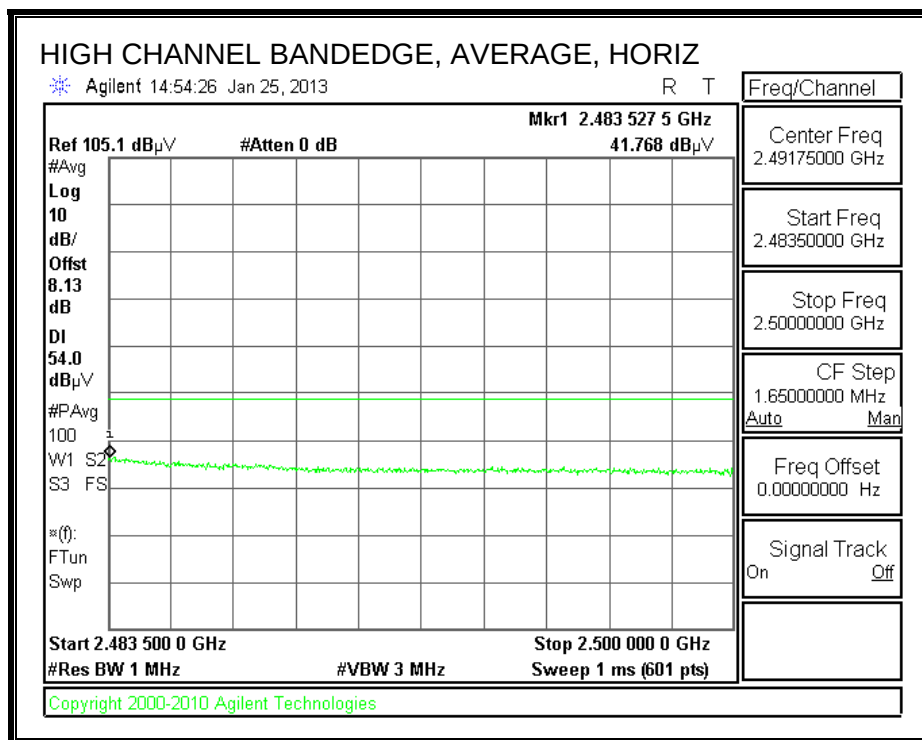




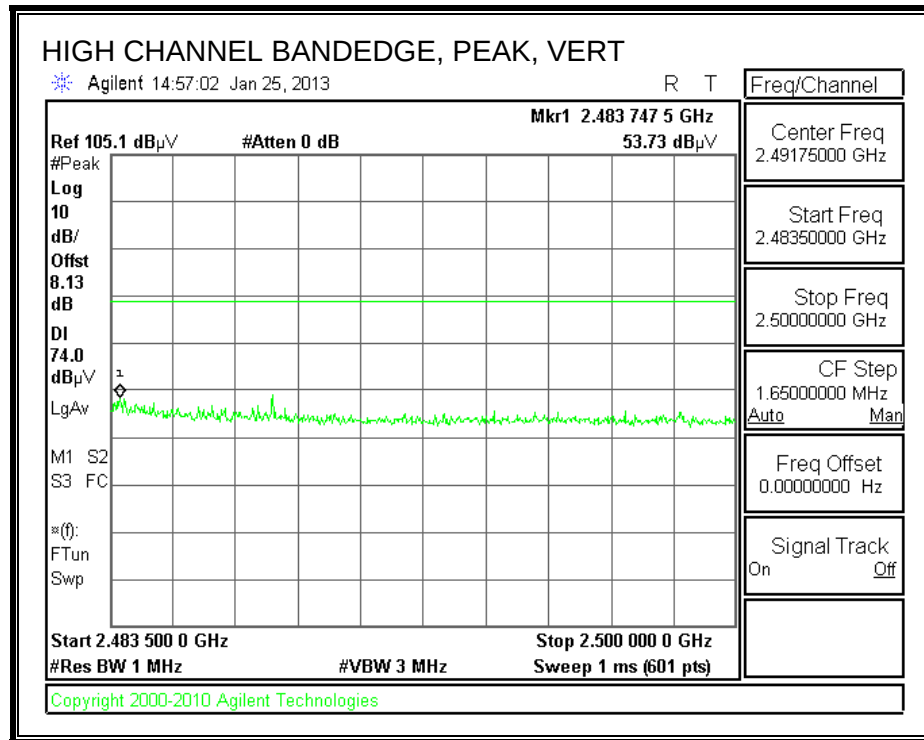
$$\begin{aligned}
 \text{Actual Average} &= \text{Measured Average} + \text{Correction Factor} \\
 &= 40.666 \text{ dB}\mu\text{V} + 0.33 \\
 &= 40.996 \text{ dB}\mu\text{V}
 \end{aligned}$$

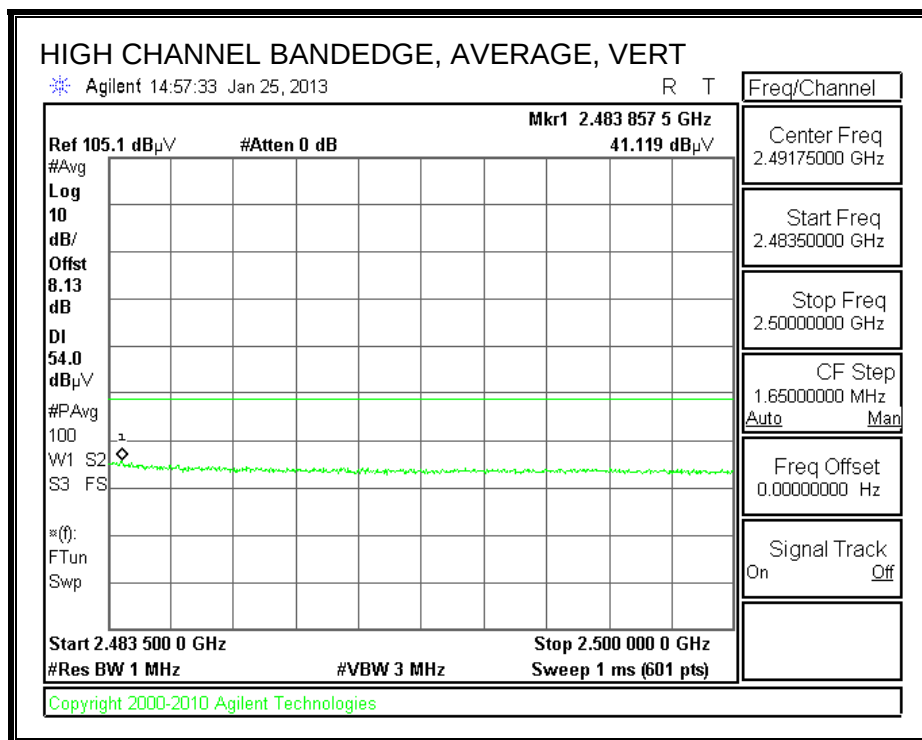
AUTHORIZED BANDEDGE (HIGH CHANNEL)





$$\begin{aligned}
 \text{Actual Average} &= \text{Measured Average} + \text{Correction Factor} \\
 &= 41.768 \text{ dB}\mu\text{V} + 0.33 \\
 &= 42.098 \text{ dB}\mu\text{V}
 \end{aligned}$$





Actual Average
 = Measured Average + Correction Factor
 = 41.119 dB μ V + 0.33
 = 41.449 dB μ V

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber

Test Engr: Dennis Huang
Date: 01/25/13
Project #: 13I14813
Company: SamSung
Test Target: 15.247 WLAN
Mode Oper: Tx 802.11g Mode

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	

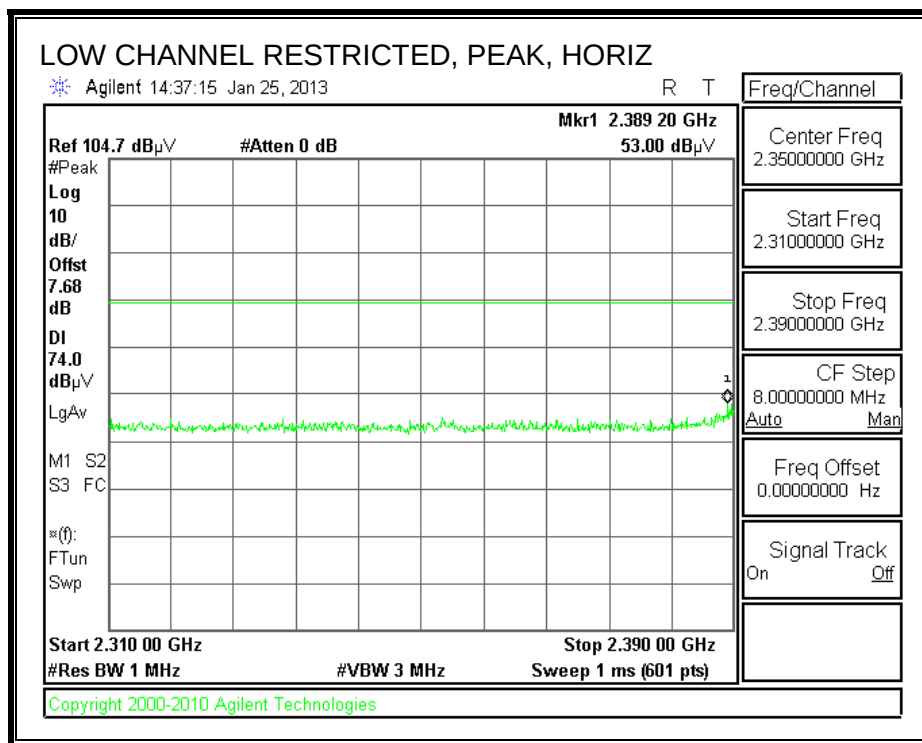
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	DC Corr dB	Fitr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/Q/P	Ant.High cm	Table Angle Degree	Notes
Low Channel - 2412MHz															
4.824	3.0	38.0	33.1	6.8	-34.1	0.0	0.0	43.8	74.0	-30.2	H	P	100.0	138.0	
4.824	3.0	31.3	33.1	6.8	-34.1	0.3	0.0	37.5	54.0	-16.5	H	A	100.0	138.0	
4.824	3.0	38.3	33.1	6.8	-34.1	0.0	0.0	44.1	74.0	-29.9	V	P	196.0	187.0	
4.824	3.0	28.2	33.1	6.8	-34.1	0.3	0.0	34.4	54.0	-19.6	V	A	196.0	187.0	
Mid Channel - 2437MHz															
4.874	3.0	37.3	33.2	6.8	-34.0	0.0	0.0	43.3	74.0	-30.7	H	P	102.0	149.0	
4.874	3.0	27.2	33.2	6.8	-34.0	0.3	0.0	33.4	54.0	-20.6	H	A	102.0	149.0	
4.874	3.0	36.9	33.2	6.8	-34.0	0.0	0.0	42.8	74.0	-31.2	V	P	100.0	82.0	
4.874	3.0	30.0	33.2	6.8	-34.0	0.3	0.0	36.3	54.0	-17.7	V	A	100.0	82.0	
High Channel - 2462MHz															
4.924	3.0	37.8	33.2	6.8	-34.0	0.0	0.0	43.8	74.0	-30.2	H	P	100.0	172.0	
4.924	3.0	27.9	33.2	6.8	-34.0	0.3	0.0	34.2	54.0	-19.8	H	A	100.0	172.0	
4.924	3.0	37.0	33.2	6.8	-34.0	0.0	0.0	43.1	74.0	-30.9	V	P	100.0	169.0	
4.924	3.0	26.3	33.2	6.8	-34.0	0.3	0.0	32.7	54.0	-21.3	V	A	100.0	169.0	

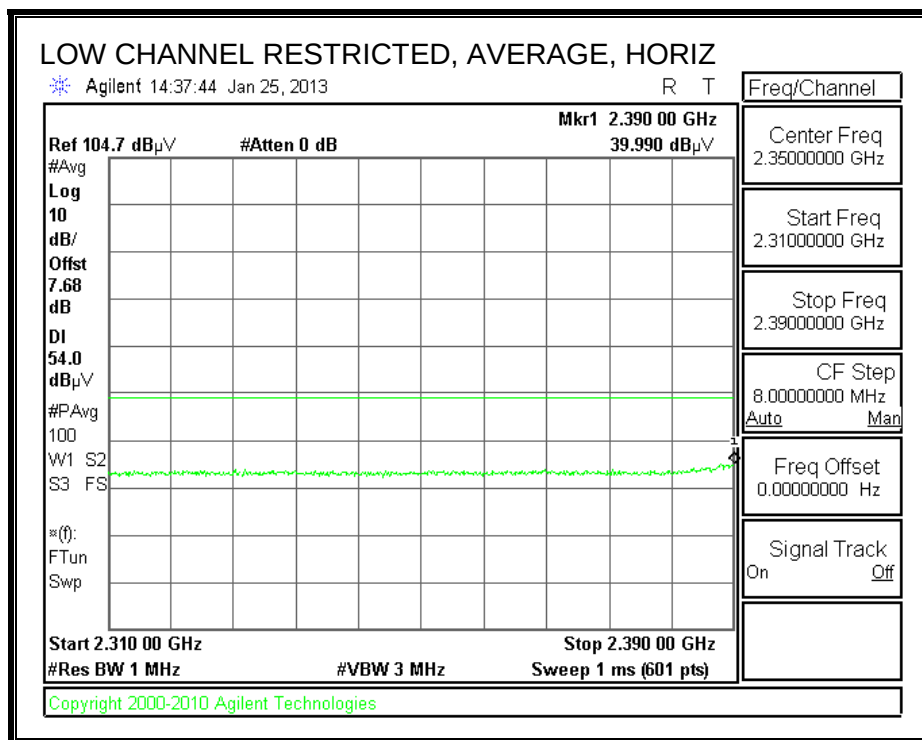
Rev. 4.1.2.7

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

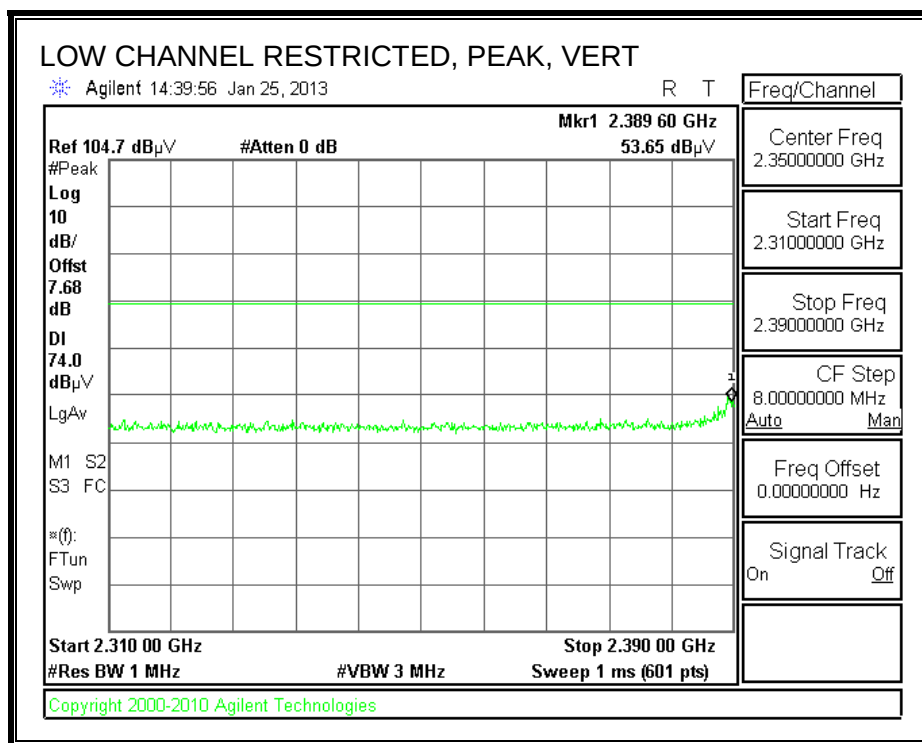
9.5. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

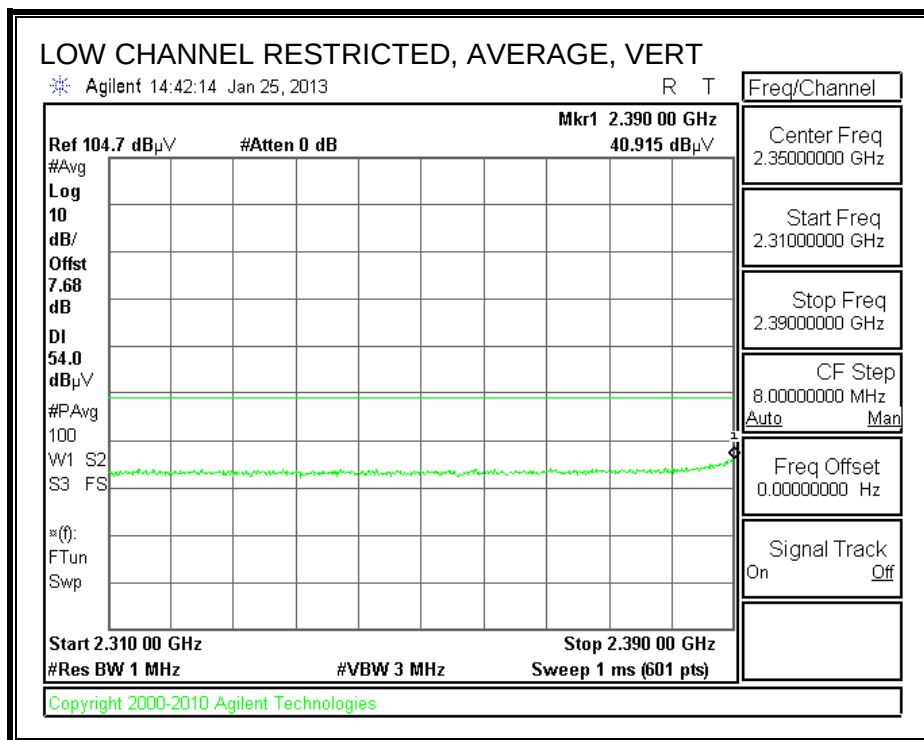
RESTRICTED BANDEDGE (LOW CHANNEL)





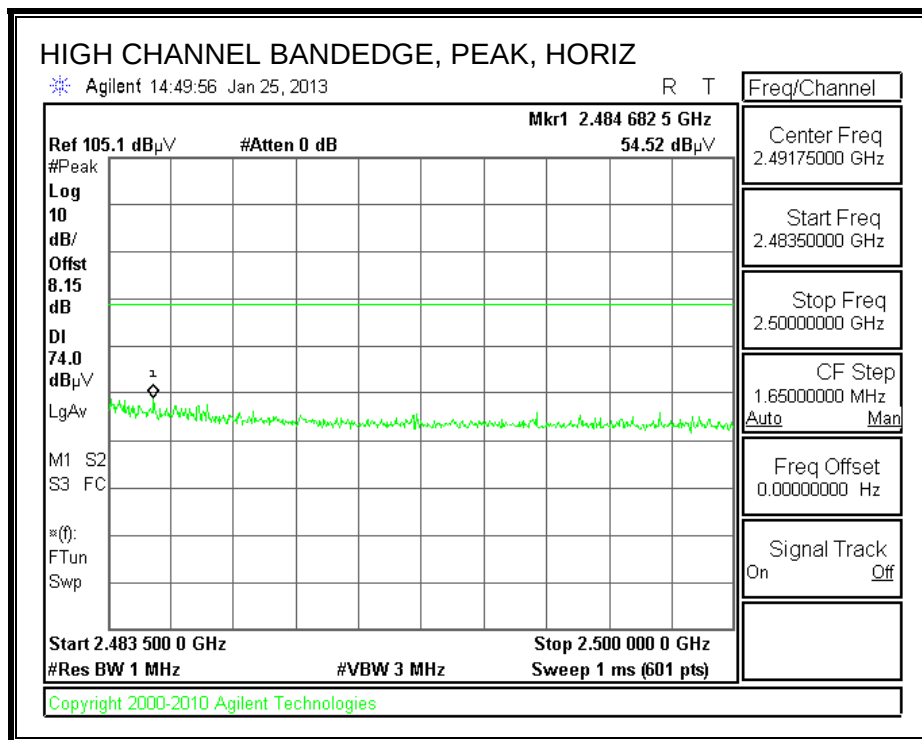
$$\begin{aligned}
 \text{Actual Average} &= \text{Measured Average} + \text{Correction Factor} \\
 &= 39.990 \text{ dB}\mu\text{V} + 0.35 \\
 &= 40.340 \text{ dB}\mu\text{V}
 \end{aligned}$$

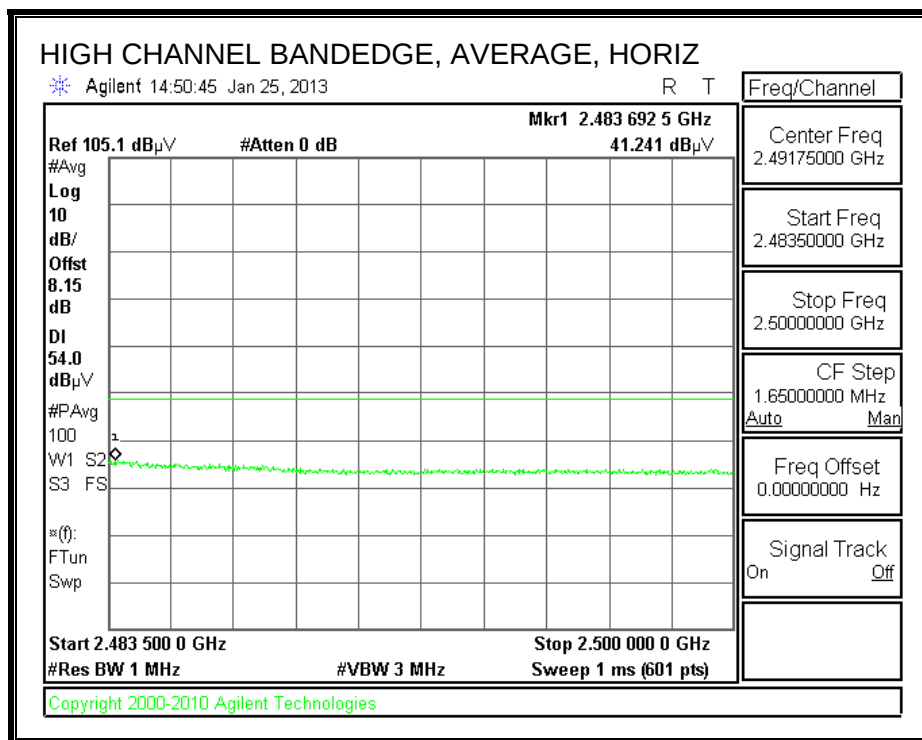




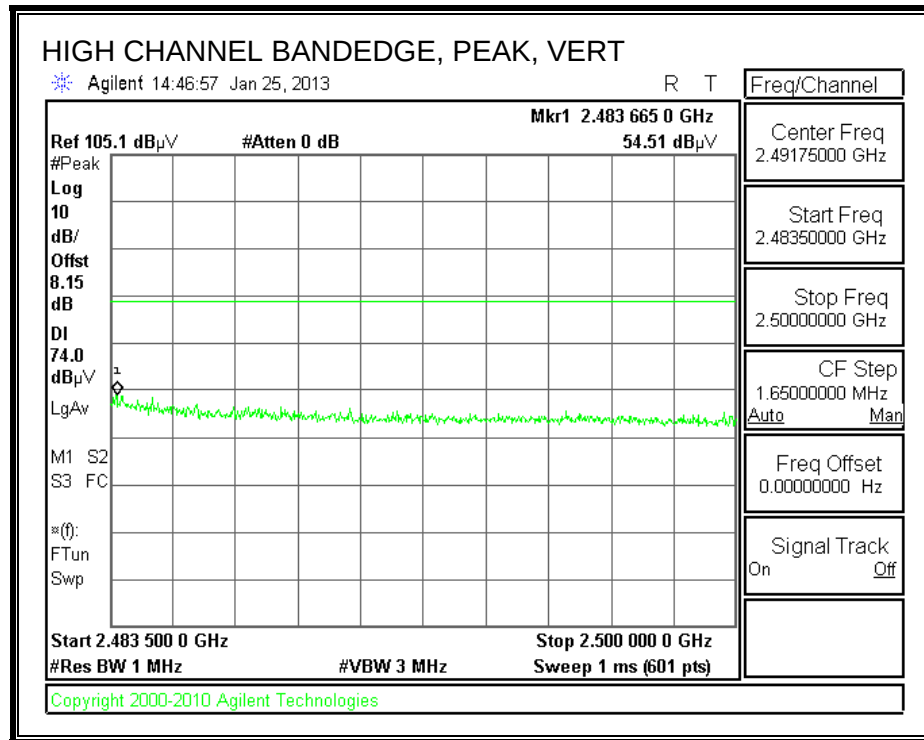
$$\begin{aligned}
 \text{Actual Average} &= \text{Measured Average} + \text{Correction Factor} \\
 &= 40.915 \text{ dB}\mu\text{V} + 0.35 \\
 &= 41.265 \text{ dB}\mu\text{V}
 \end{aligned}$$

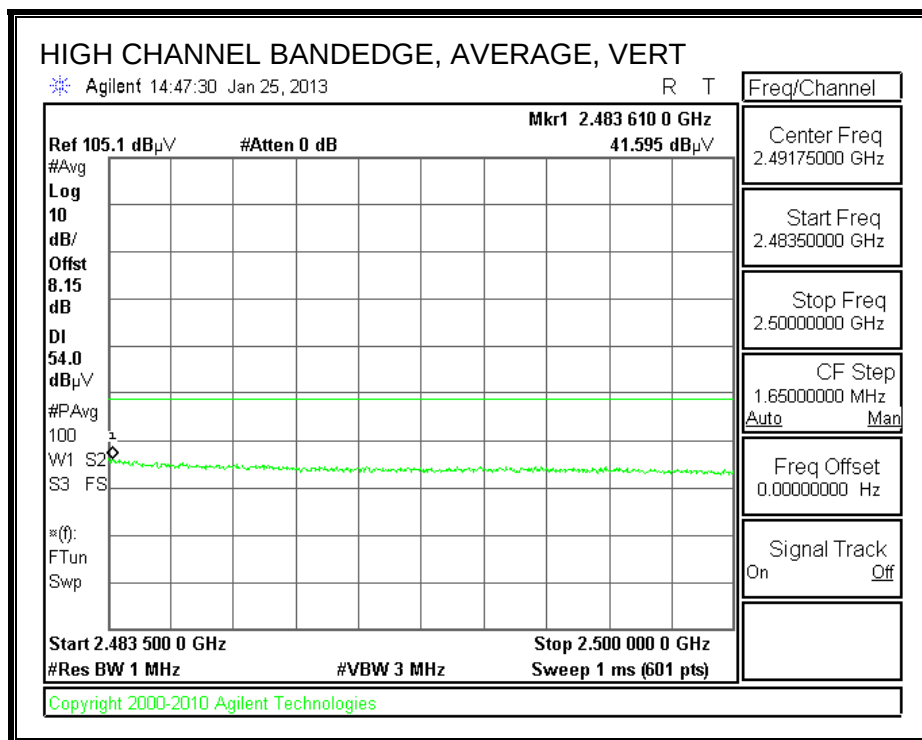
AUTHORIZED BANDEDGE (HIGH CHANNEL)





$$\begin{aligned}
 \text{Actual Average} &= \text{Measured Average} + \text{Correction Factor} \\
 &= 41.241 \text{ dBuV} + 0.35 \\
 &= 41.591 \text{ dBuV}
 \end{aligned}$$





$$\begin{aligned}
 \text{Actual Average} &= \text{Measured Average} + \text{Correction Factor} \\
 &= 41.595 \text{ dB}\mu\text{V} + 0.35 \\
 &= 41.945 \text{ dB}\mu\text{V}
 \end{aligned}$$

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber

Test Engr: Dennis Huang
Date: 01/25/13
Project #: 13I14813
Company: SamSung
Test Target: 15.247 WLAN
Mode Oper: Tx 802.11n Mode

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

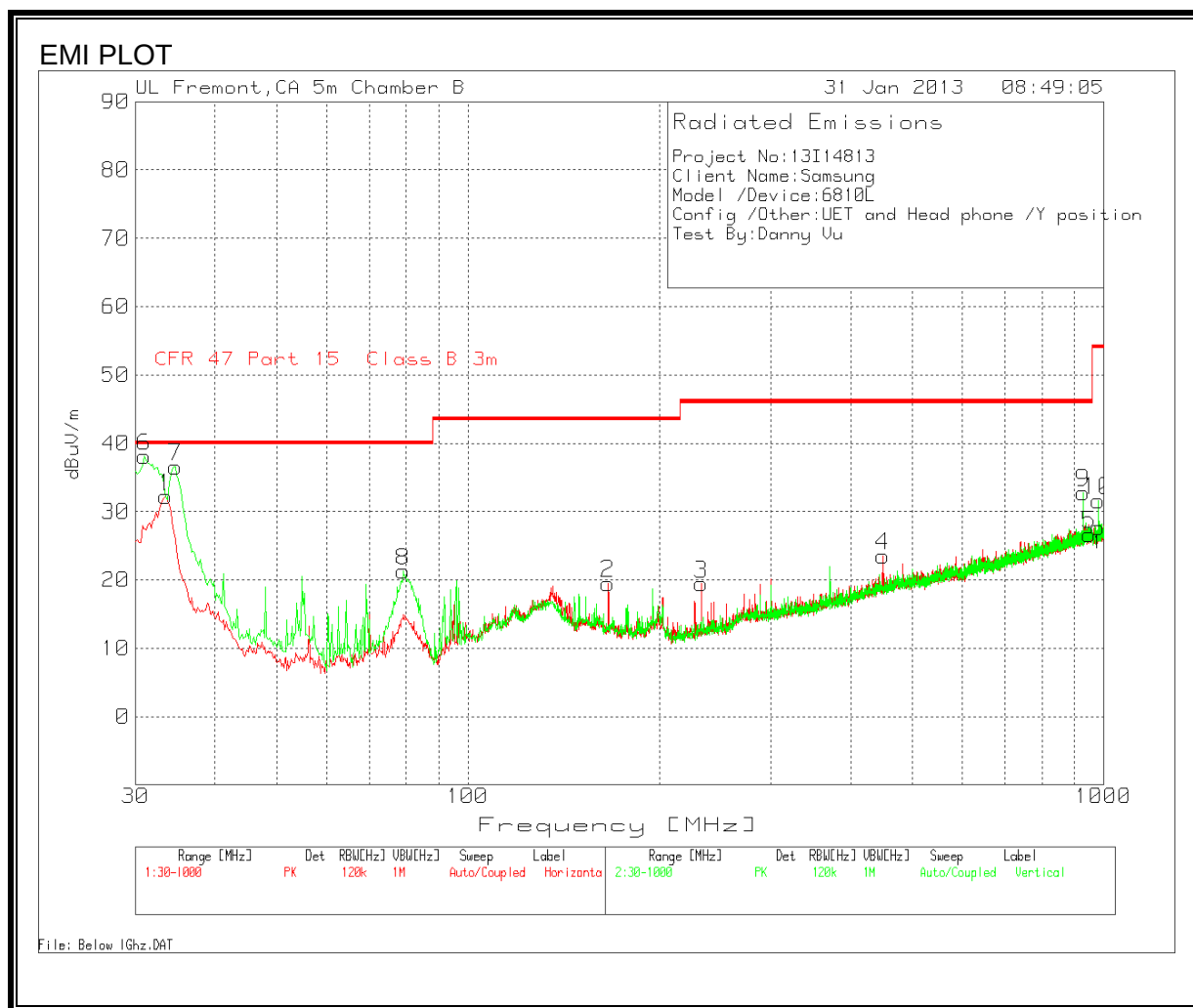
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	DC Corr dB	Filtr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel - 2412MHz															
4.824	3.0	37.1	33.1	6.8	-34.1	0.0	0.0	43.0	74.0	-31.0	H	P	100.0	175.0	
4.824	3.0	27.4	33.1	6.8	-34.1	0.4	0.0	33.5	54.0	-20.5	H	A	100.0	175.0	
4.824	3.0	36.6	33.1	6.8	-34.1	0.0	0.0	42.4	74.0	-31.6	V	P	107.0	120.0	
4.824	3.0	30.0	33.1	6.8	-34.1	0.4	0.0	36.2	54.0	-17.8	V	A	107.0	120.0	
Mid Channel - 2437MHz															
4.874	3.0	37.3	33.2	6.8	-34.0	0.0	0.0	43.2	74.0	-30.8	H	P	116.0	142.0	
4.874	3.0	30.9	33.2	6.8	-34.0	0.4	0.0	37.2	54.0	-16.8	H	A	116.0	142.0	
4.874	3.0	35.6	33.2	6.8	-34.0	0.0	0.0	41.6	74.0	-32.4	V	P	100.0	0.0	
4.874	3.0	29.9	33.2	6.8	-34.0	0.4	0.0	36.1	54.0	-17.9	V	A	100.0	0.0	
High Channel - 2462MHz															
4.924	3.0	37.5	33.2	6.8	-34.0	0.0	0.0	43.5	74.0	-30.5	H	P	137.0	144.0	
4.924	3.0	29.7	33.2	6.8	-34.0	0.4	0.0	36.0	54.0	-18.0	H	A	137.0	144.0	
4.924	3.0	37.6	33.2	6.8	-34.0	0.0	0.0	43.6	74.0	-30.4	V	P	100.0	197.0	
4.924	3.0	29.9	33.2	6.8	-34.0	0.4	0.0	36.3	54.0	-17.7	V	A	100.0	197.0	

Rev. 4.1.2.7

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

9.6. 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

10. 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.

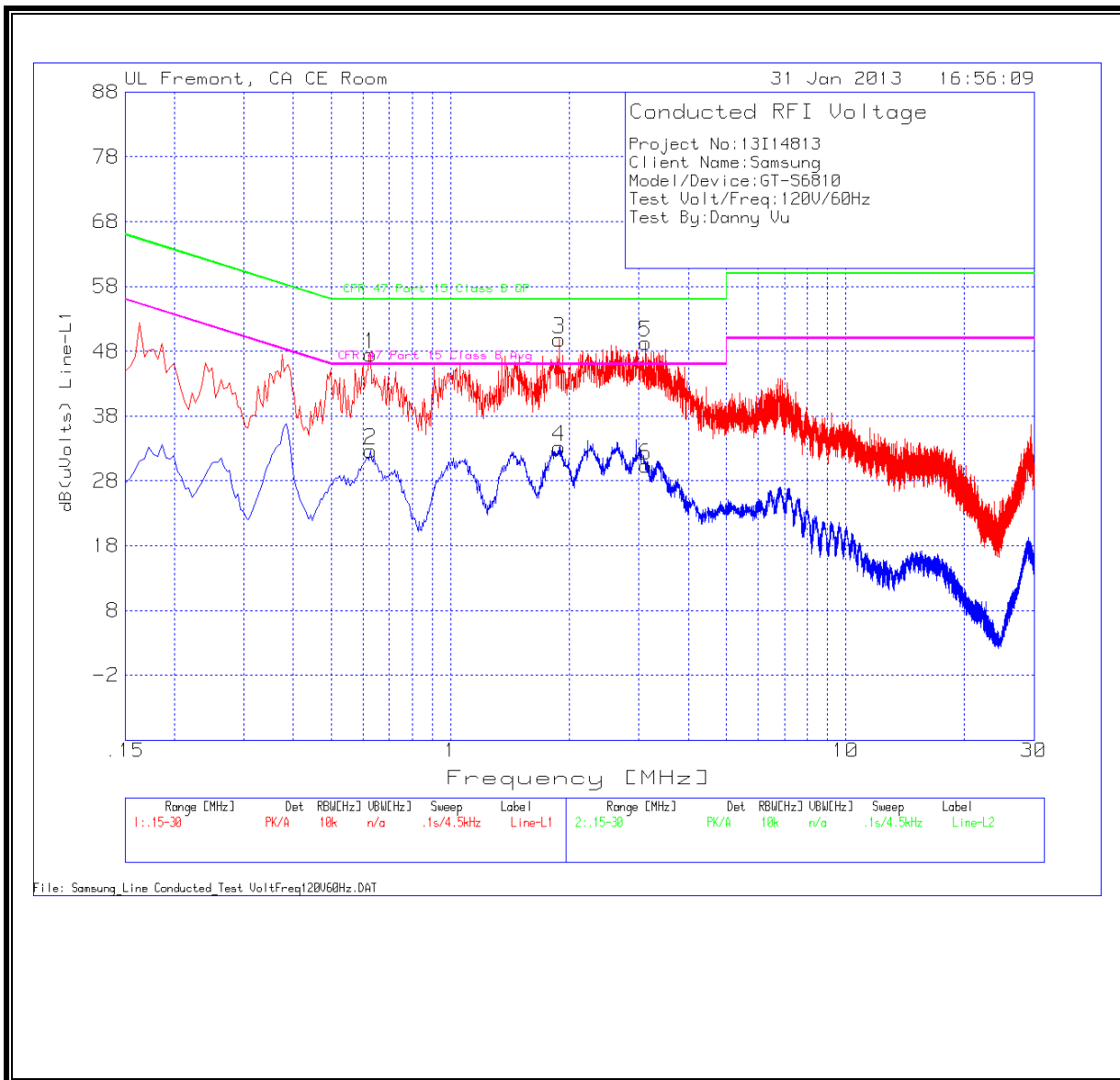
Line conducted data is recorded for both NEUTRAL and HOT lines.

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

