



FCC 47 CFR PART 15 SUBPART C
CERTIFICATION TEST REPORT
FOR
CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS

MODEL NUMBER: A1524

FCC ID: BCG-E2817A

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NVLAP LAB CODE 200065-0

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A	7/30/14	Updated sections 1, 2 and 5	F. de Anda
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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	7
5. EQUIPMENT UNDER TEST	8
5.1. DESCRIPTION OF EUT.....	8
5.2. MAXIMUM OUTPUT POWER.....	8
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	8
5.4. SOFTWARE AND FIRMWARE	8
5.5. WORST-CASE CONFIGURATION AND MODE	9
5.6. DESCRIPTION OF TEST SETUP	10
6. TEST AND MEASUREMENT EQUIPMENT	14
7. MEASUREMENT METHODS	15
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS.....	16
8.1. ON TIME AND DUTY CYCLE RESULTS.....	16
8.2. DUTY CYCLE PLOTS.....	17
9. ANTENNA PORT TEST RESULTS	19
9.1. 802.11b MODE IN THE 2.4 GHz BAND	19
9.1.1. 6 dB BANDWIDTH	19
9.1.2. 99% BANDWIDTH	23
9.1.3. AVERAGE POWER	27
9.1.4. OUTPUT POWER.....	28
9.1.5. PSD	29
9.1.6. OUT-OF-BAND EMISSIONS	33
9.2. 802.11g MODE IN THE 2.4 GHz BAND	39
9.2.1. 6 dB BANDWIDTH	39
9.2.2. 99% BANDWIDTH	44
9.2.3. AVERAGE POWER	49
9.2.4. OUTPUT POWER.....	50
9.2.5. PSD	51
9.2.6. OUT-OF-BAND EMISSIONS	57
9.3. 802.11n HT20 1Tx SISO MODE IN THE 2.4 GHz BAND	63
9.3.1. 6 dB BANDWIDTH	63
9.3.2. 99% BANDWIDTH	68

9.3.3.	AVERAGE POWER	73
9.3.4.	OUTPUT POWER.....	74
9.3.5.	PSD	75
9.3.6.	OUT-OF-BAND EMISSIONS	81
10.	RADIATED TEST RESULTS	87
10.1.	LIMITS AND PROCEDURE.....	87
10.2.	TX RADIATED ABOVE 1 GHz.....	88
10.2.1.	802.11b MODE IN THE 2.4 GHz BAND	88
10.2.2.	802.11g MODE IN THE 2.4 GHz BAND	106
10.2.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND	140
10.3.	WORST-CASE ABOVE 18 to 26GHz	174
10.4.	WORST-CASE BELOW 1 GHz	175
11.	AC POWER LINE CONDUCTED EMISSIONS.....	177
12.	SETUP PHOTOS	182

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS

MODEL: A1524

SERIAL NUMBER: C39MV097G1G3 (Conducted) C39MV004G2YF (Radiated)

DATE TESTED: MAY 28, 2014 – JULY 24, 2014

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

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 Verification Services Inc. By:



Francisco de Anda
PROJECT LEAD
UL VERIFICATION SERVICES INC.

Tested By:



Tri Pham
EMC ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB558074 and ANSI C63.10-2009.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☐ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☒ Chamber F
	☒ Chamber G
	☐ Chamber H

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Model A1524 is a mobile phone with multimedia functions (music, application support, and video), Cellular GSM/GPRS/EGPRS/CDMA2000/EVDO Rev.A/ EVDO Rev.B /WCDMA/HSPA+/DC-HSDPA/LTE FDD & Carrier Aggregation radio, IEEE 802.11a/b/g/n/ac radio, Bluetooth radio and NFC. The rechargeable battery is not user accessible.

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 - 2472	802.11b	21.67	146.89
2412 - 2472	802.11g	25.13	325.84
2412 - 2472	802.11n HT20	25.12	325.09

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PiFA antenna, with a maximum gain of 0.81 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 7.16.121

The test utility software used during testing was wl 7.16 RC121.0.

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 (Flatbed), Y (Landscape), Z (Portrait), it was determined that X orientation was worst-case orientation for 2.4GHz. All final radiated testing was performed with the EUT in X (Flatbed) orientation.

Worst-case data rates as provided by the client were:
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.

There are three vendors of the WiFi/Bluetooth radio modules: variant 1, variant 2 and variant 3 and they have the same mechanical outline, same on board antenna, matching circuit, antenna structure and same specification. Baseline testing was performed on all three variants to determine the worst case on all conducted power and radiated emissions.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Apple	A1401	60812	NA
Earphone	Apple	NA	NA	NA
Laptop	Apple	A1278	C02HJ0A7DTY4	NA
DC power supply	Sorensen	XT 15-4	1319A02780	NA

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-shielded	0.1	N/A
2	USB	1	USB	Shielded	1	N/A
3	DC	1	DC	Un-shielded	0.8	N/A

I/O CABLES (RADIATED ABOVE 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
None used						

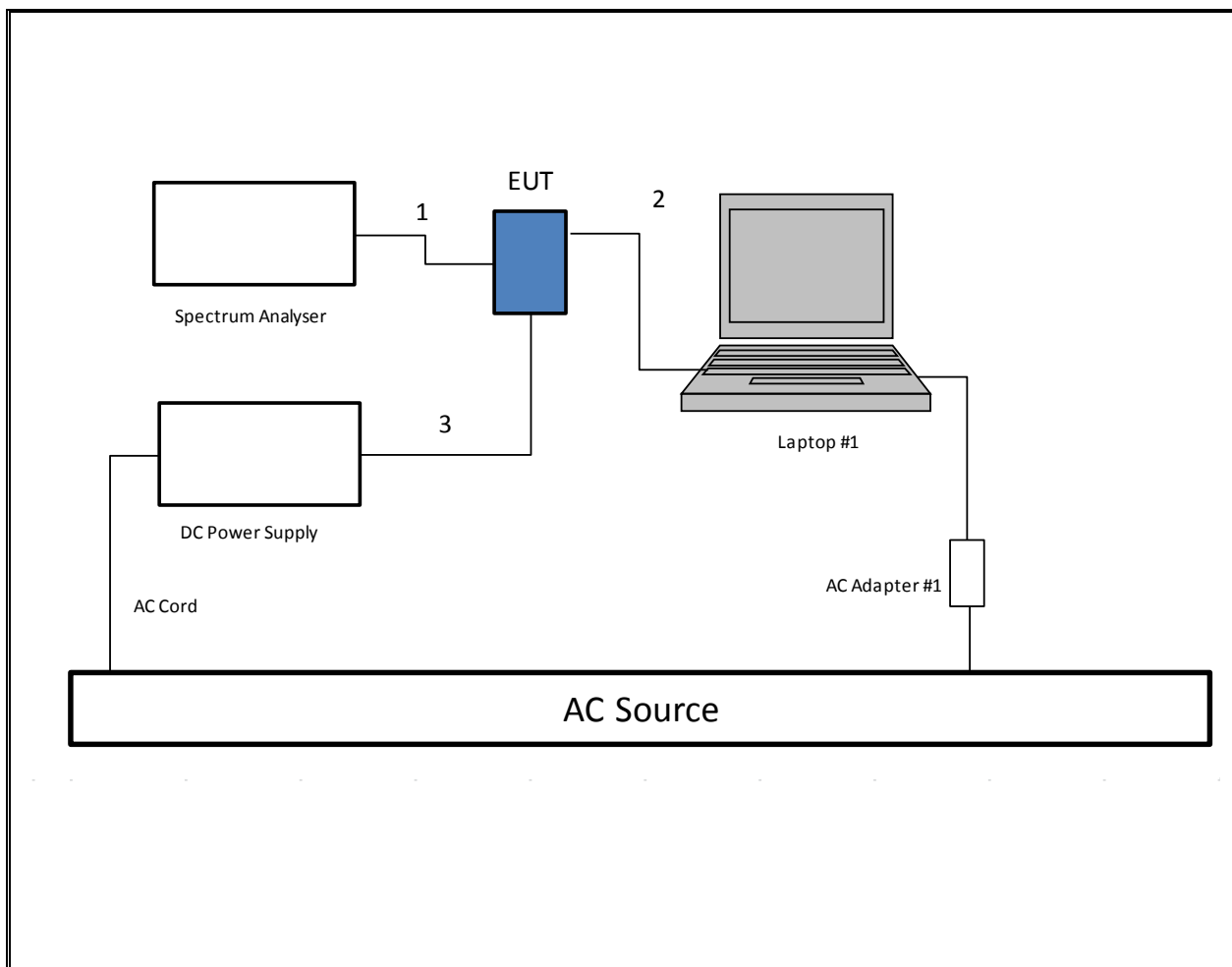
I/O CABLES (BELOW 1GHZ & AC LINE CONDUCTED TESTS)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US115	Un-Shielded	80cm	NA
2	DC	1	USB	Un-Shielded	1m	NA
3	Audio	1	Jack	Un-Shielded	0.5m	NA

TEST SETUP- CONDUCTED PORT

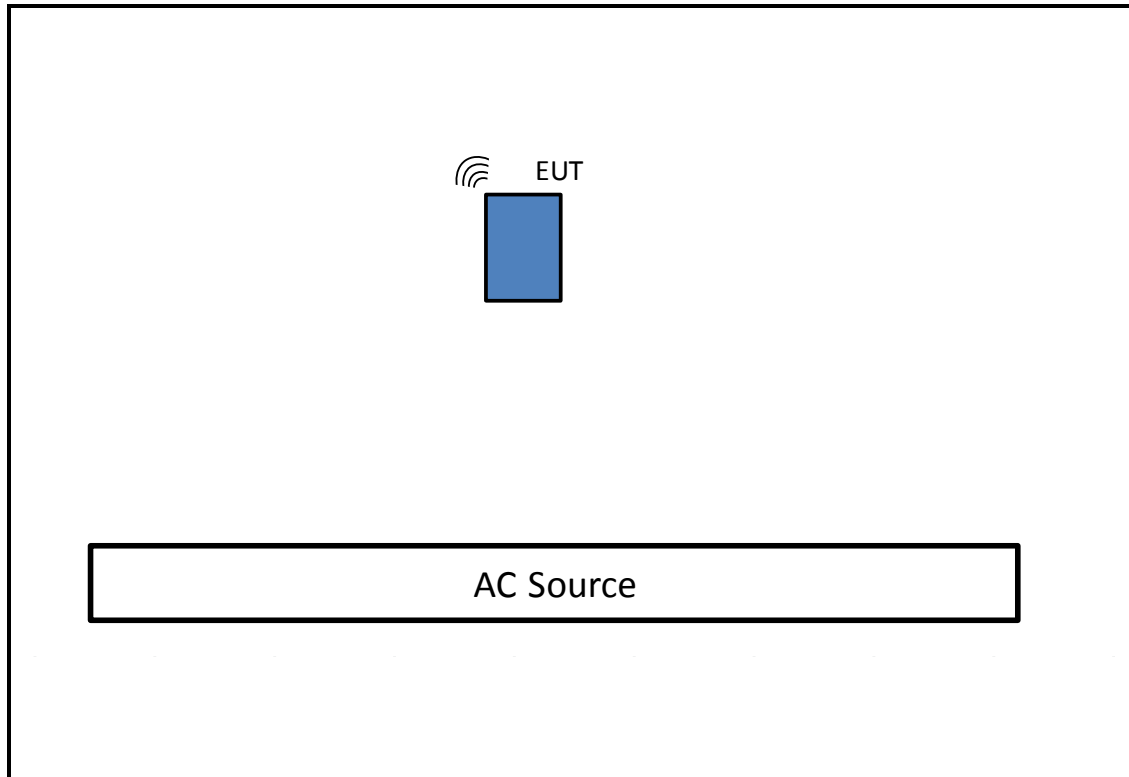
The EUT was tested connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.

SETUP DIAGRAM



TEST SETUP- RADIATED-ABOVE 1 GHZ

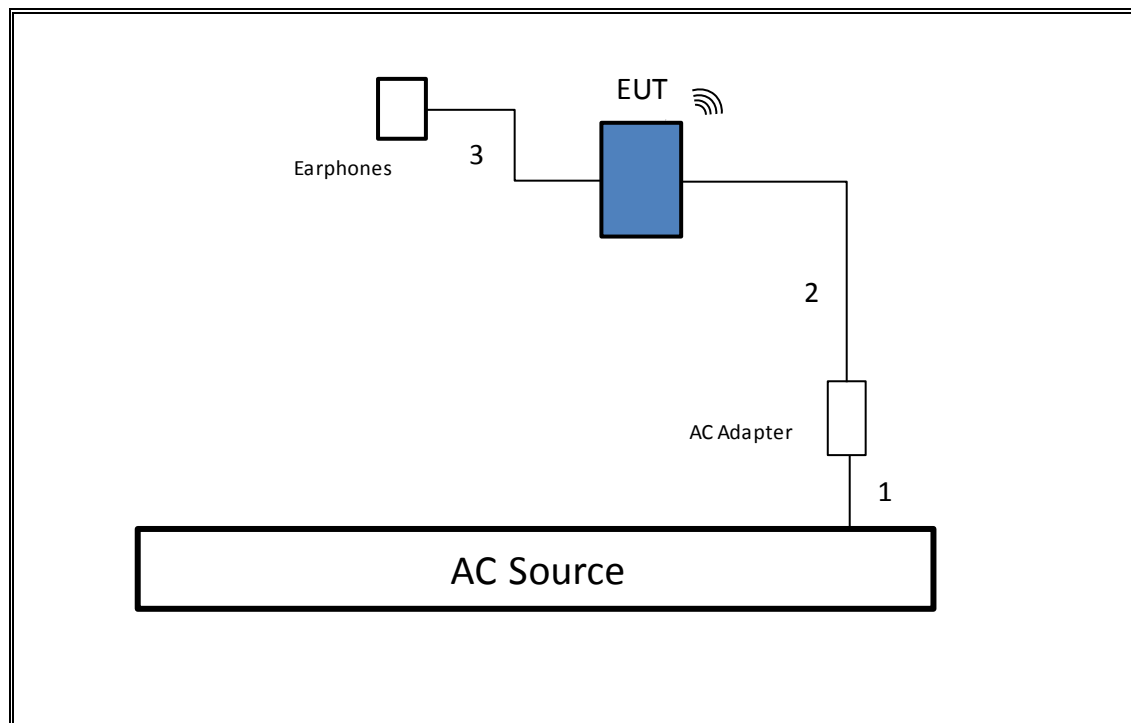
The EUT was tested battery powered. Test software exercised the EUT.

SETUP DIAGRAM

TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS

The EUT was tested with earphones connected and powered by AC adapter. Test software exercised the EUT.

SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB3	F00168	03/28/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/26/14
DC Power Supply, 60 Watts	AMATEK	XT15-4	F00208	N/A
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	F00092	09/05/14
High Pass Filter, fc: 3.0GHz, 50 Ohms	Micro-Tronics	HPM17543	F00180	08/24/14
High Pass Filter, fc: 6GHz, 50 Ohms	Micro-Tronics	HPS17542	F00178	08/24/14
Horn Antenna, 1-18GHz	ETS Lindgren	3117	F00133	02/25/15
Low Pass Filter, fc: 5GHz, 50 Ohms	Micro-Tronics	LPS17541	F00174	08/24/14
PreAmplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	F00353	08/24/14
PreAmplifier, 1-26.5GHz	Agilent	8449B	F00167	03/25/15
PreAmplifier, 30-1000MHz	Sonama	310	981661	10/25/14
Single Channel PK Power Meter	Agilent	N1911A	F00024	03/07/15
Spectrum Analyzer	Agilent	N9030A	F00126	12/10/14
Spectrum Analyzer, 40 GHz	Agilent	8564E	C00951	07/29/14
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	F00129	06/25/15
Wideband Power Sensor, 30MHz video bandwidth	Agilent	N1921A	F00360	09/30/14
LISN, 30 MHz	FCC	LISN-50/250-25-2	C00626	01/14/15

7. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r02, Section 8.1.

Output Power: KDB 558074 D01 v03r02, Section 9.1.2.

Power Spectral Density: KDB 558074 D01 v03r02, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r02, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r02, Section 12.0.

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

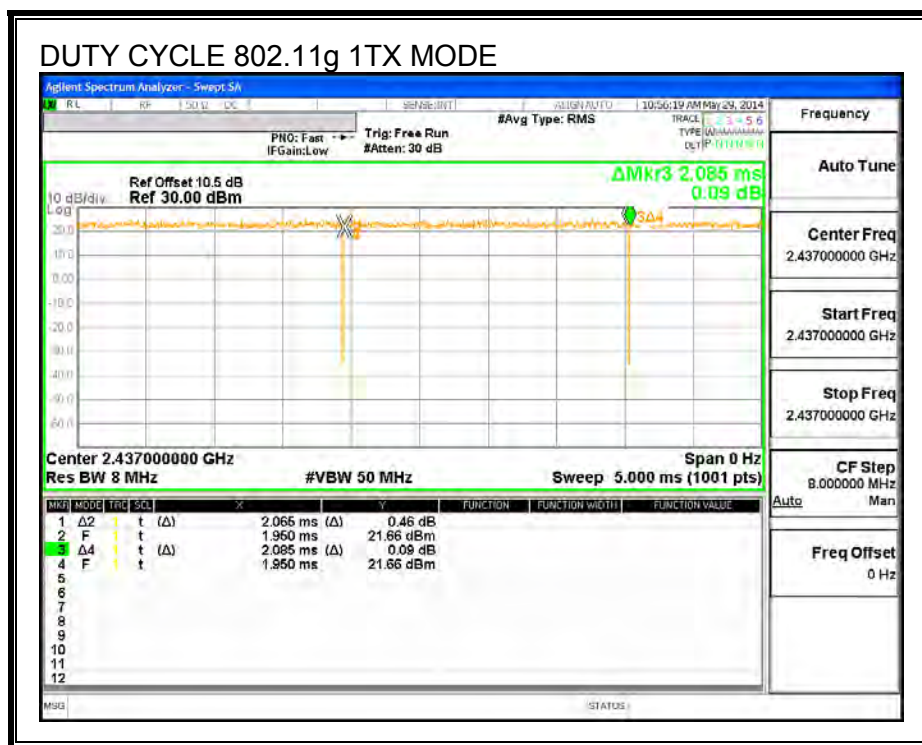
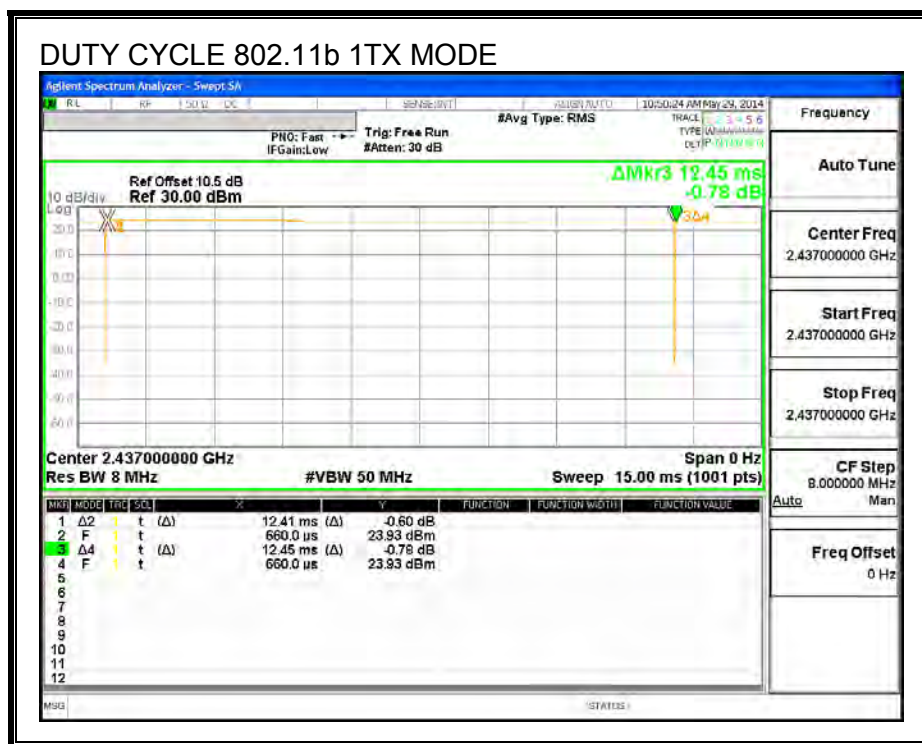
KDB 558074 Zero-Span Spectrum Analyzer Method.

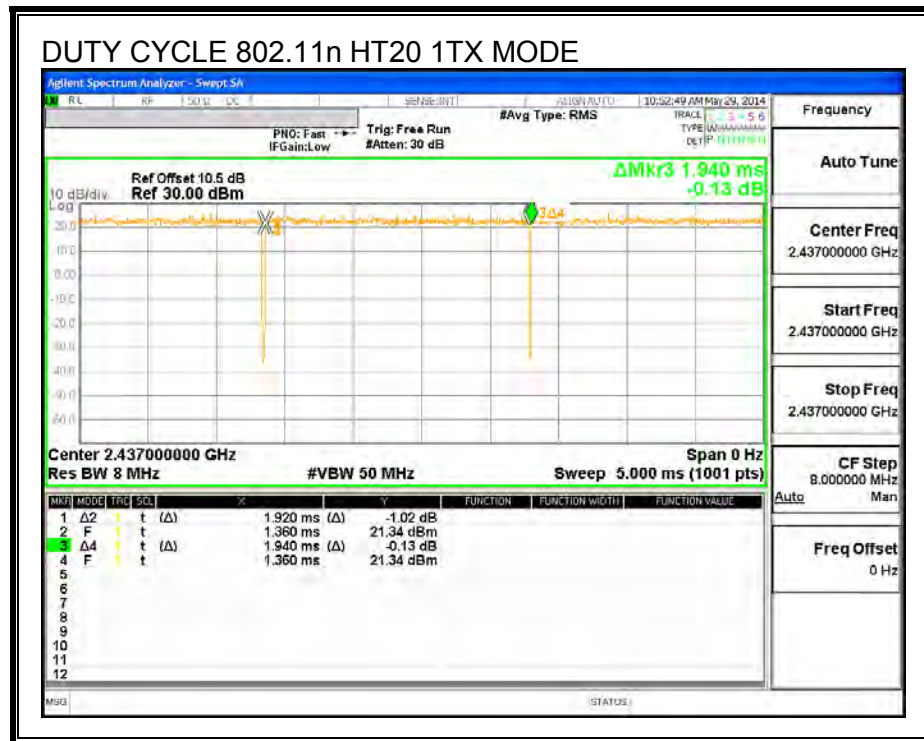
8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b 1TX	12.410	12.450	0.997	99.68%	0.00	0.010
802.11g 1TX	2.065	2.085	0.990	99.04%	0.00	0.010
802.11n HT20 1TX	1.920	1.940	0.990	98.97%	0.00	0.010

8.2. DUTY CYCLE PLOTS

2.4 GHz BAND





9. ANTENNA PORT TEST RESULTS

9.1. 802.11b MODE IN THE 2.4 GHz BAND

9.1.1. 6 dB BANDWIDTH

LIMITS

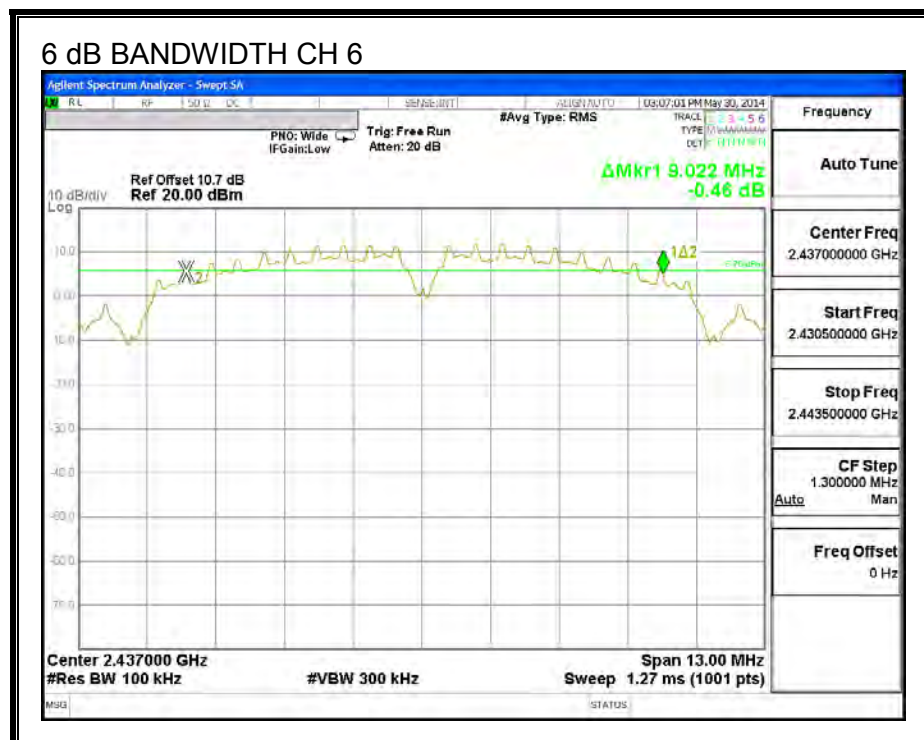
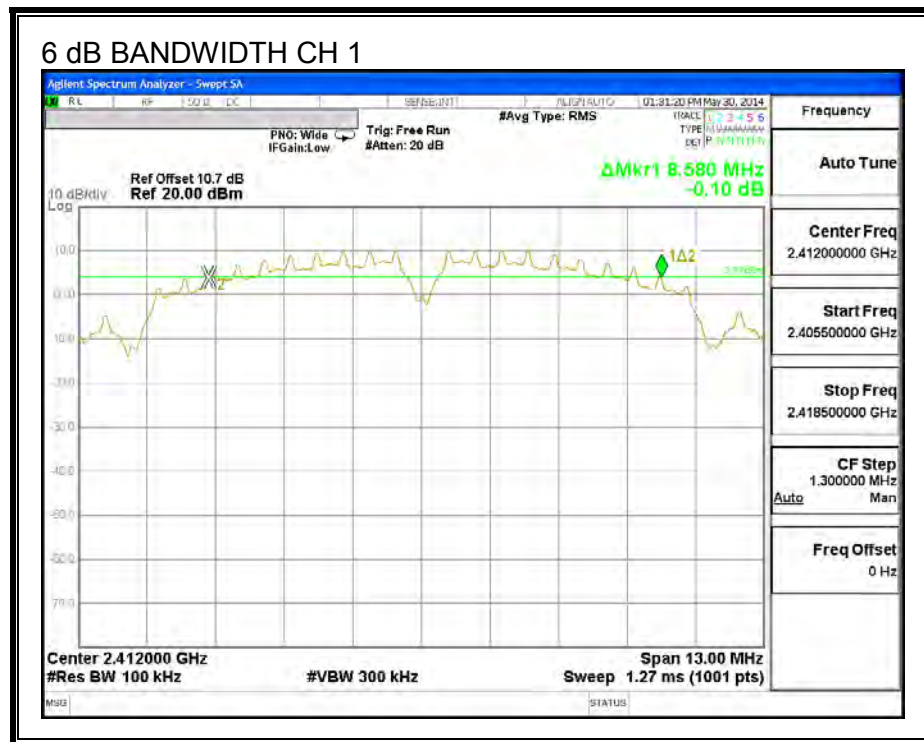
FCC §15.247 (a) (2)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
1	2412	8.580	0.5
6	2437	9.022	0.5
11	2462	8.593	0.5
12	2467	9.087	0.5
13	2472	9.074	0.5

6 dB BANDWIDTH

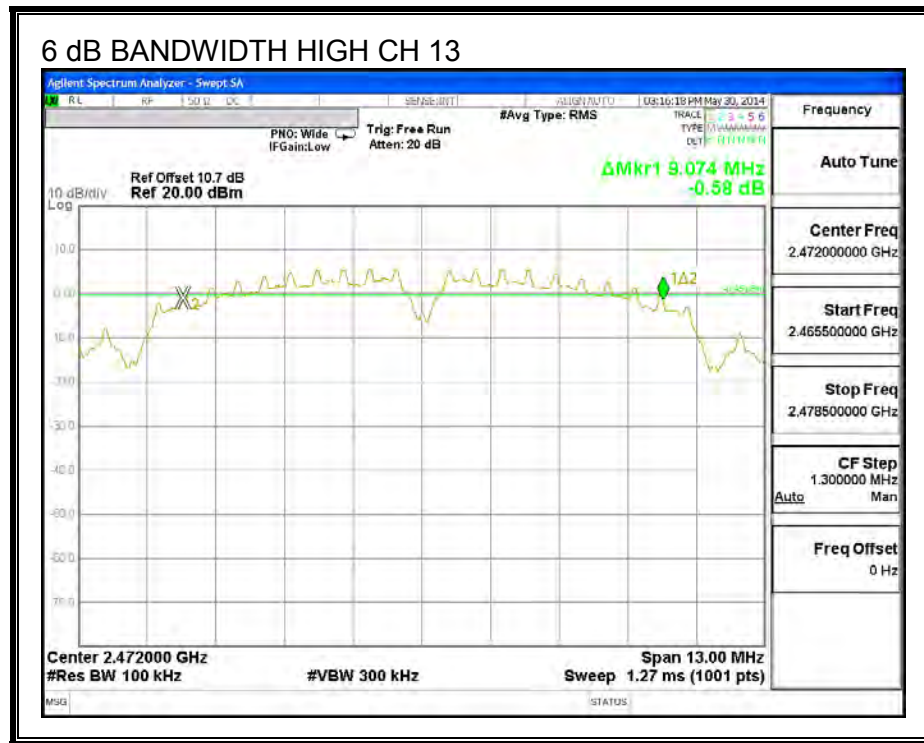


6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12





9.1.2. 99% BANDWIDTH

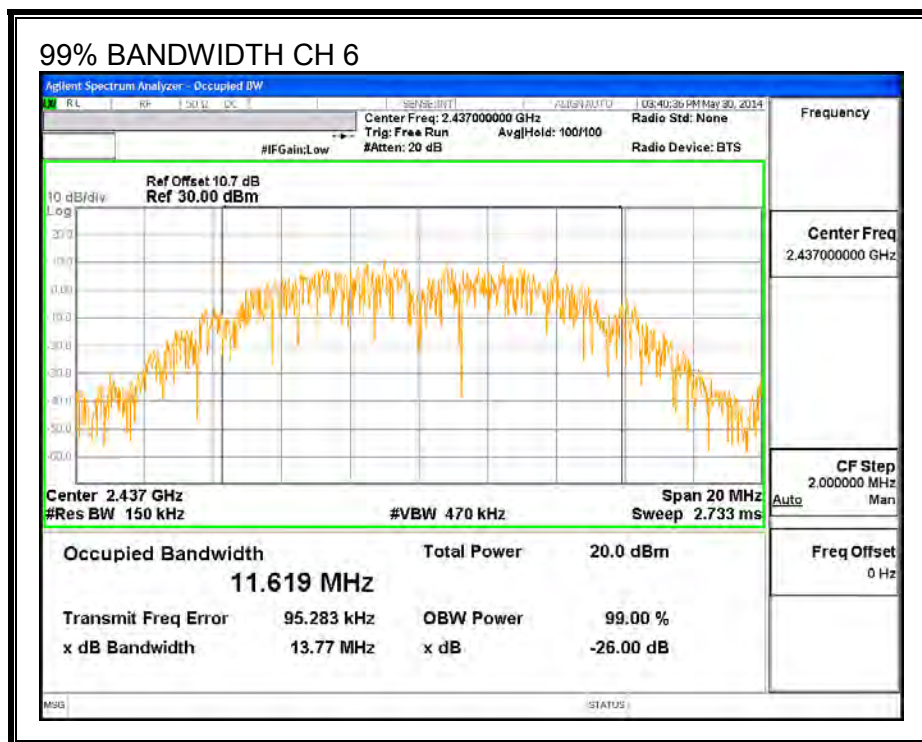
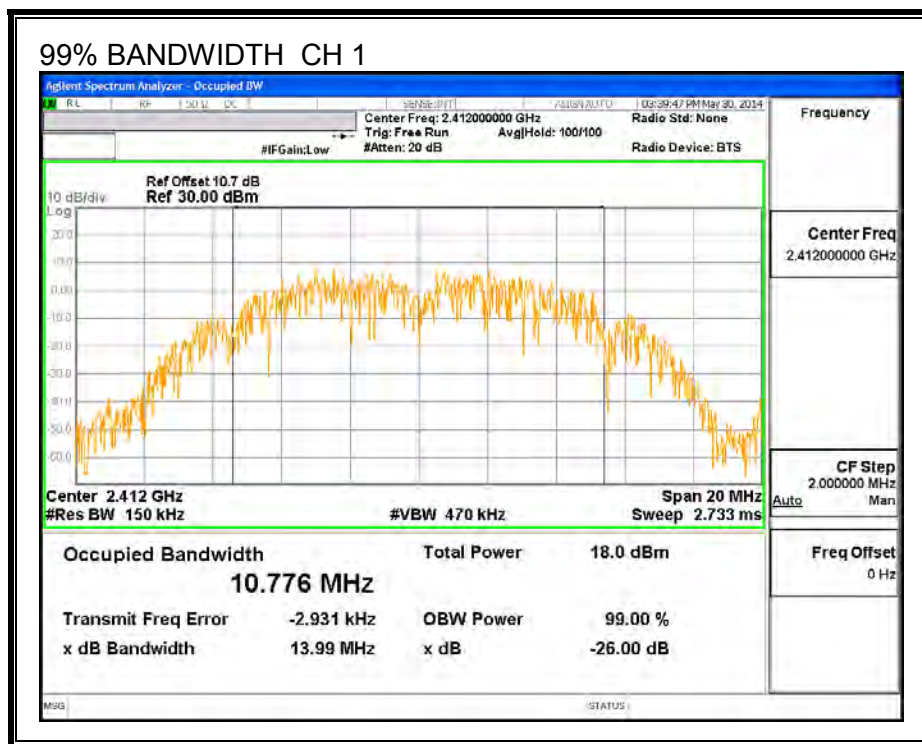
LIMITS

None; for reporting purposes only.

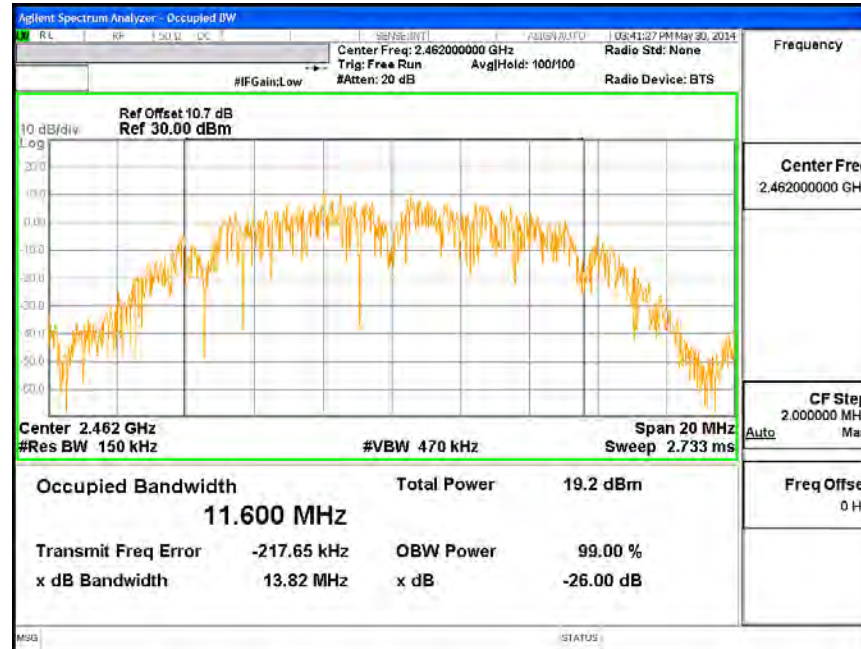
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
1	2412	10.776
6	2437	11.619
11	2462	11.600
12	2467	10.875
13	2472	10.779

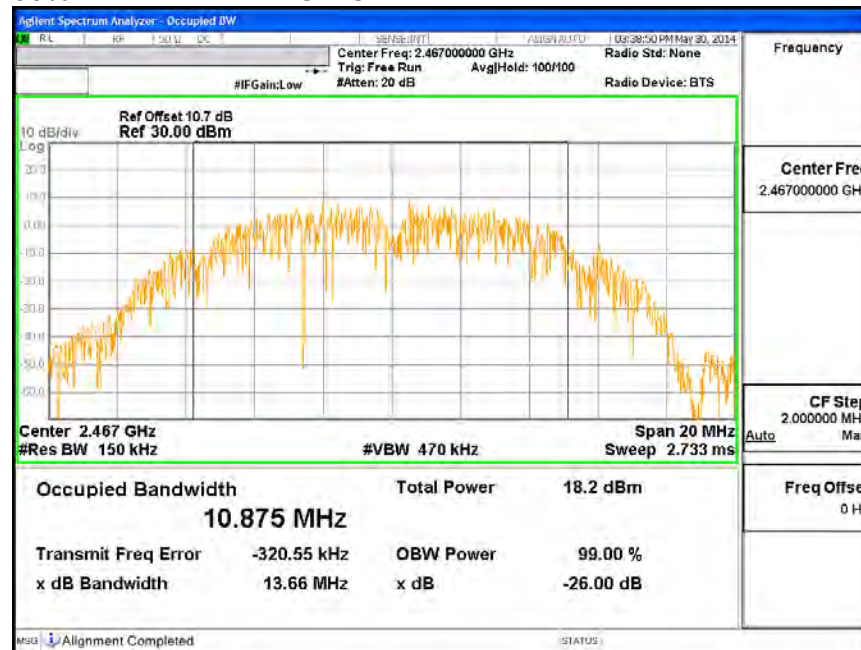
99% BANDWIDTH

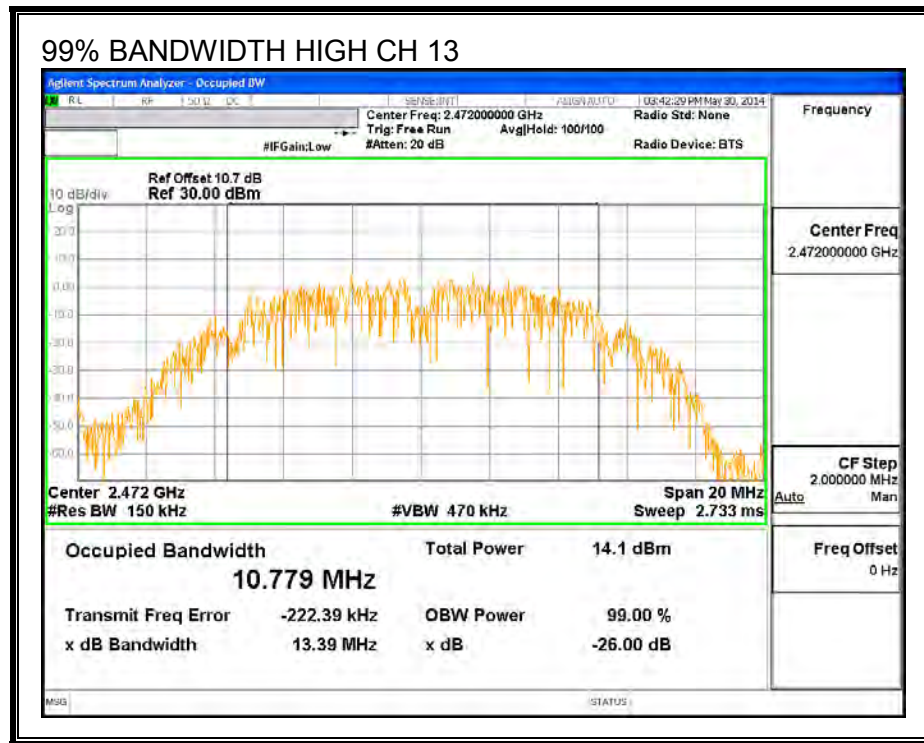


99% BANDWIDTH HIGH CH 11



99% BANDWIDTH HIGH CH 12





9.1.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
1	2412	17.86
6	2437	17.99
11	2462	17.86
12	2467	14.89
13	2472	13.87

9.1.4. OUTPUT POWER

LIMITS

FCC §15.247

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt, based on the use of antennas with directional gains that do not exceed 6dBi. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

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)
1	2412	0.81	30.00	30	36	30.00
6	2437	0.81	30.00	30	36	30.00
11	2462	0.81	30.00	30	36	30.00
12	2467	0.81	30.00	30	36	30.00
13	2472	0.81	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
1	2412	21.55	21.55	30.00	-8.45
6	2437	21.67	21.67	30.00	-8.33
11	2462	21.66	21.66	30.00	-8.34
12	2467	18.48	18.48	30.00	-11.53
13	2472	17.37	17.37	30.00	-12.64

9.1.5. PSD

LIMITS

FCC §15.247 (e)

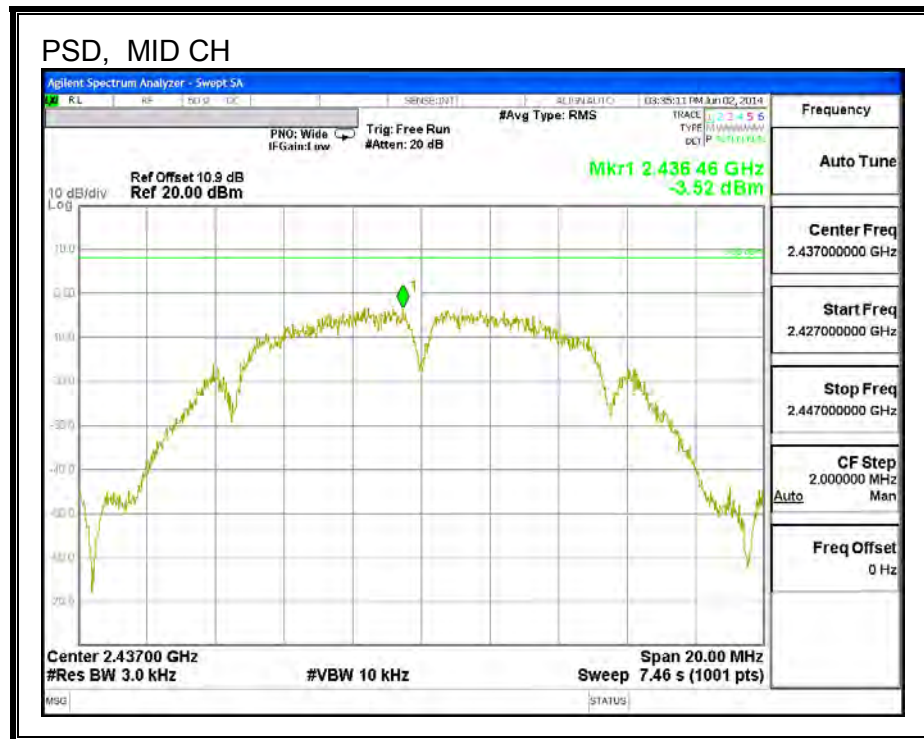
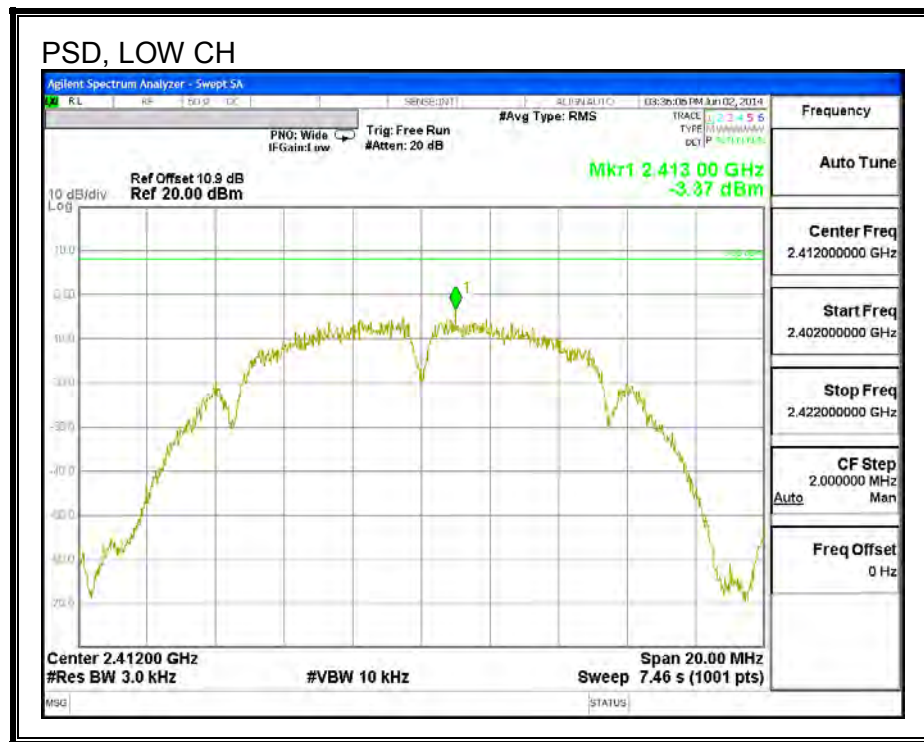
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

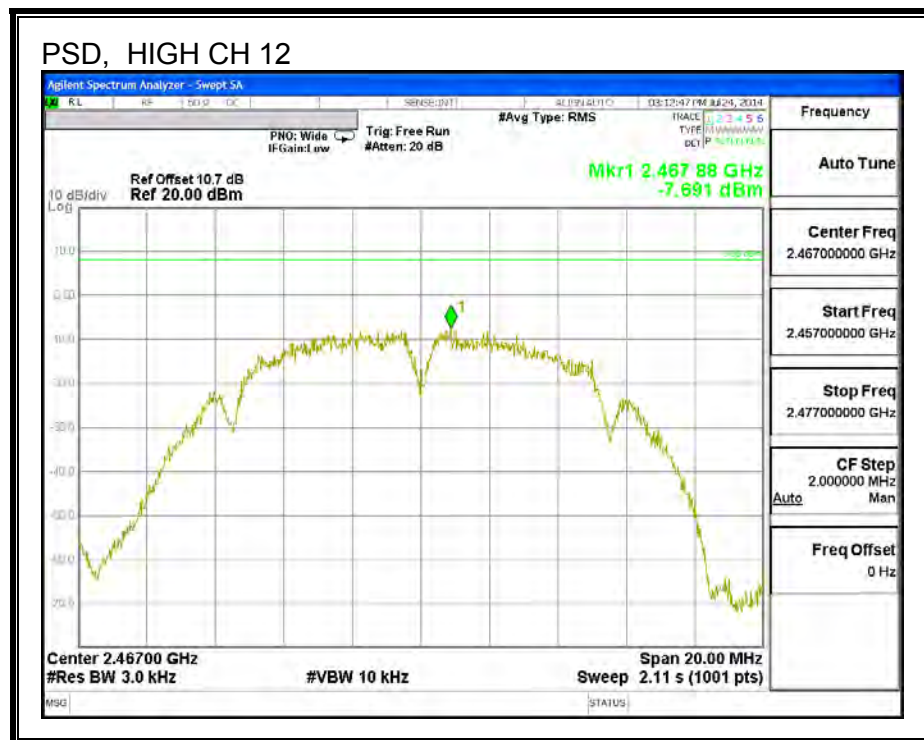
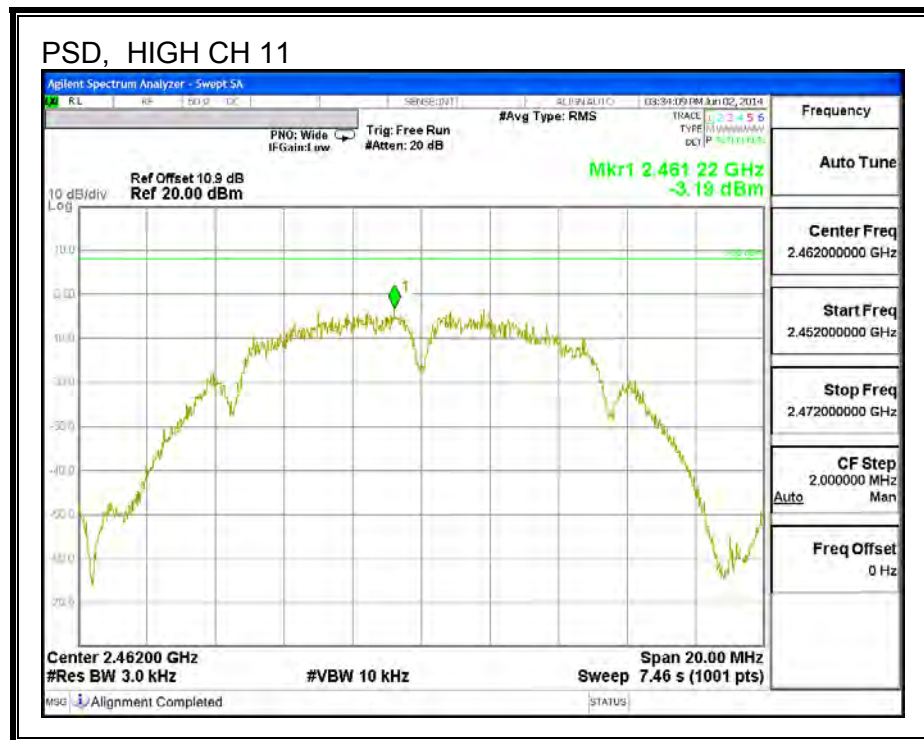
RESULTS

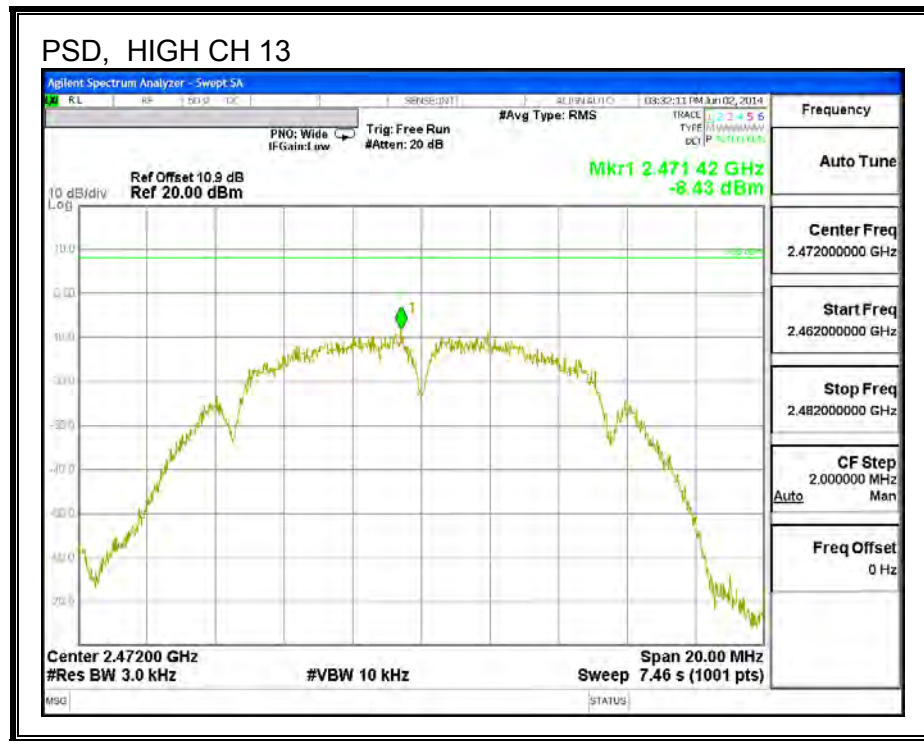
PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
1	2412	-3.370	8.0	-11.4
6	2437	-3.520	8.0	-11.5
11	2462	-3.190	8.0	-11.2
12	2467	-7.691	8.0	-15.7
13	2472	-8.430	8.0	-16.4

PSD







9.1.6. OUT-OF-BAND EMISSIONS

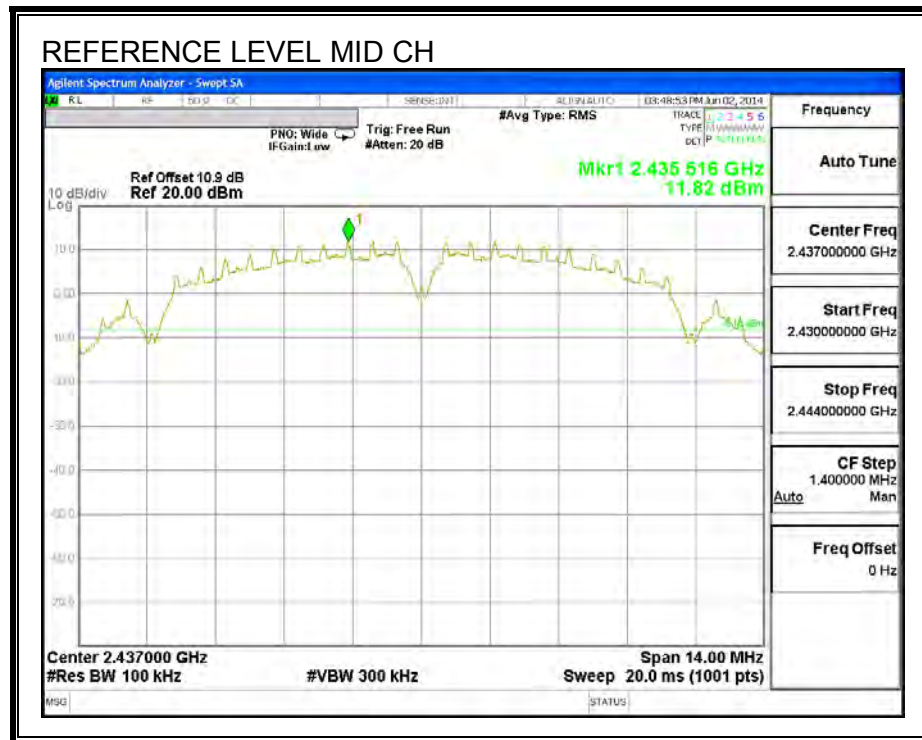
LIMITS

FCC §15.247 (d)

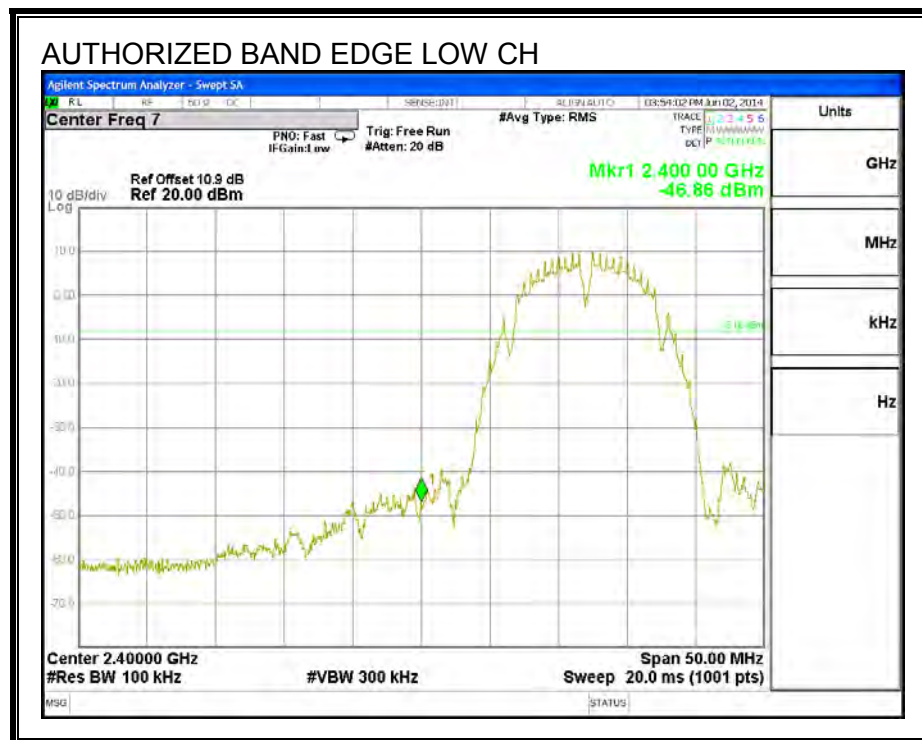
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

RESULTS

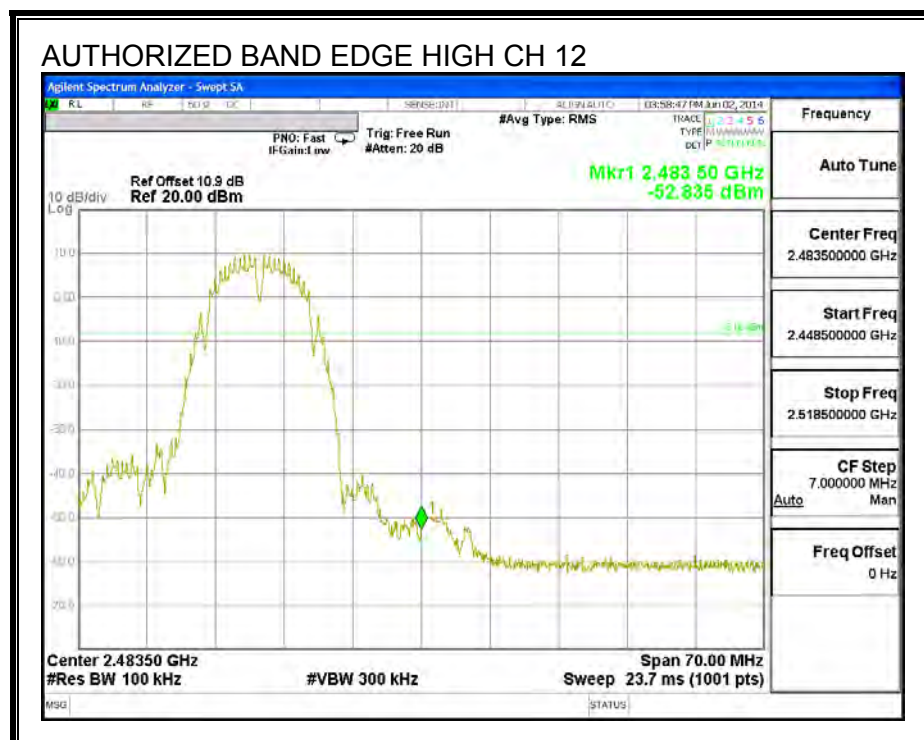
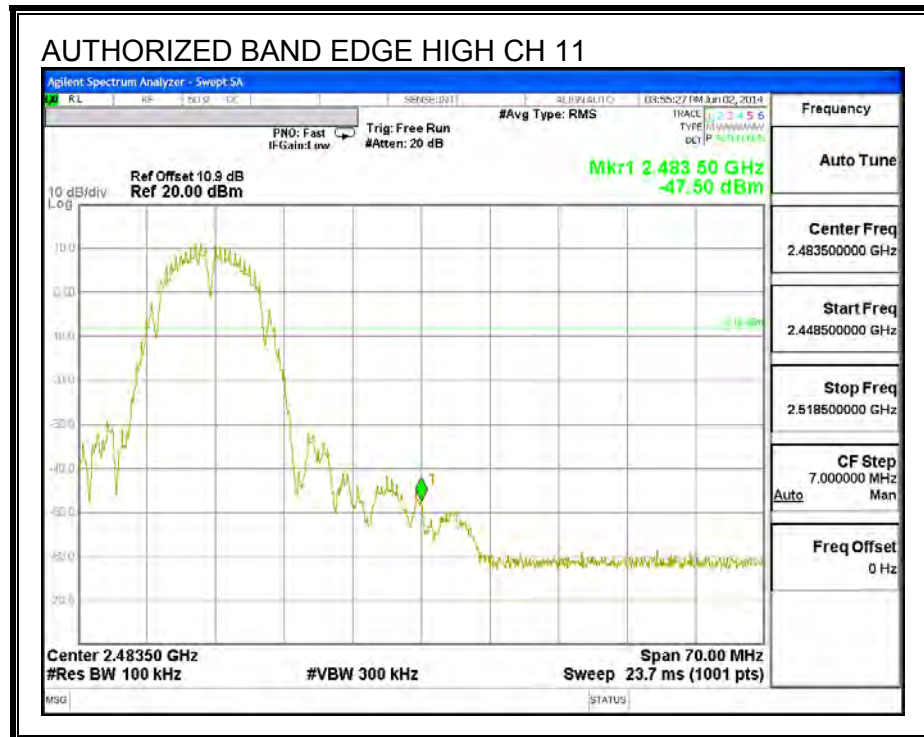
IN-BAND REFERENCE LEVEL



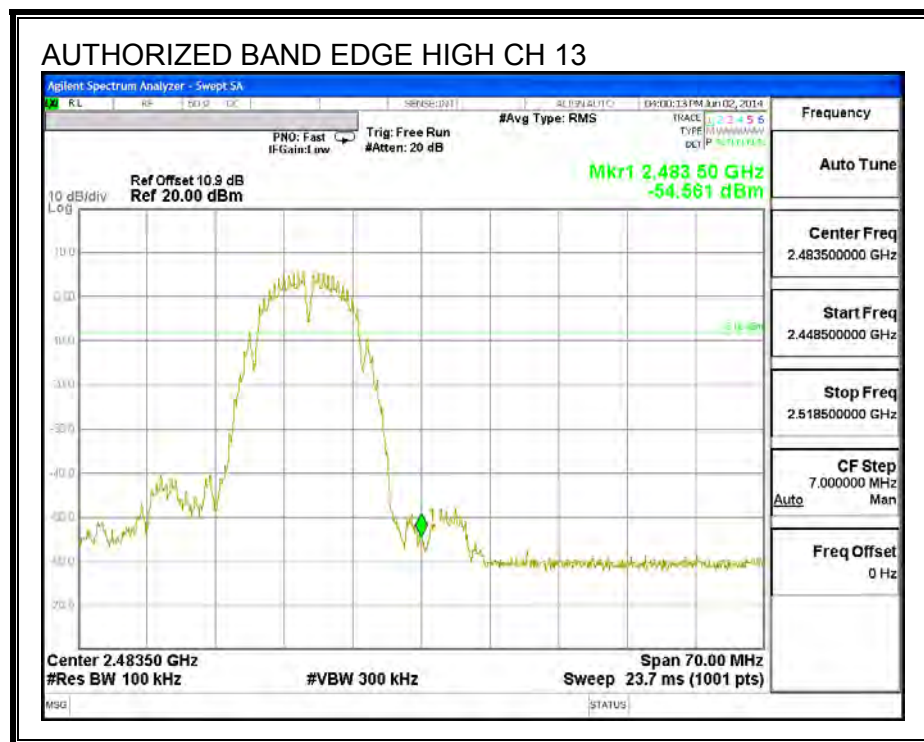
LOW CHANNEL BANDEDGE



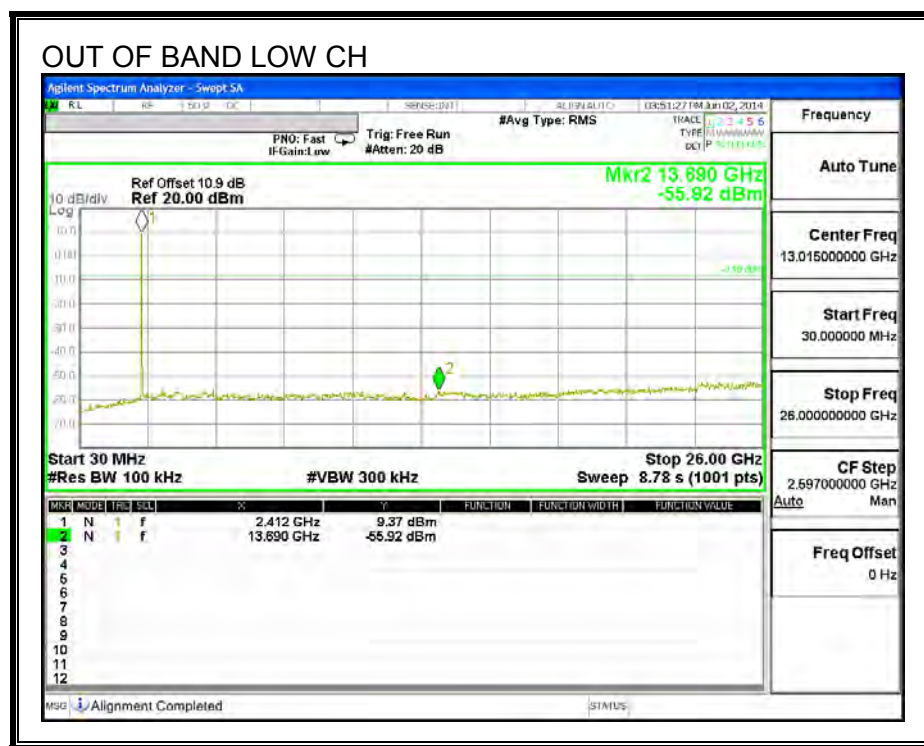
HIGH CHANNEL BANDEDGE

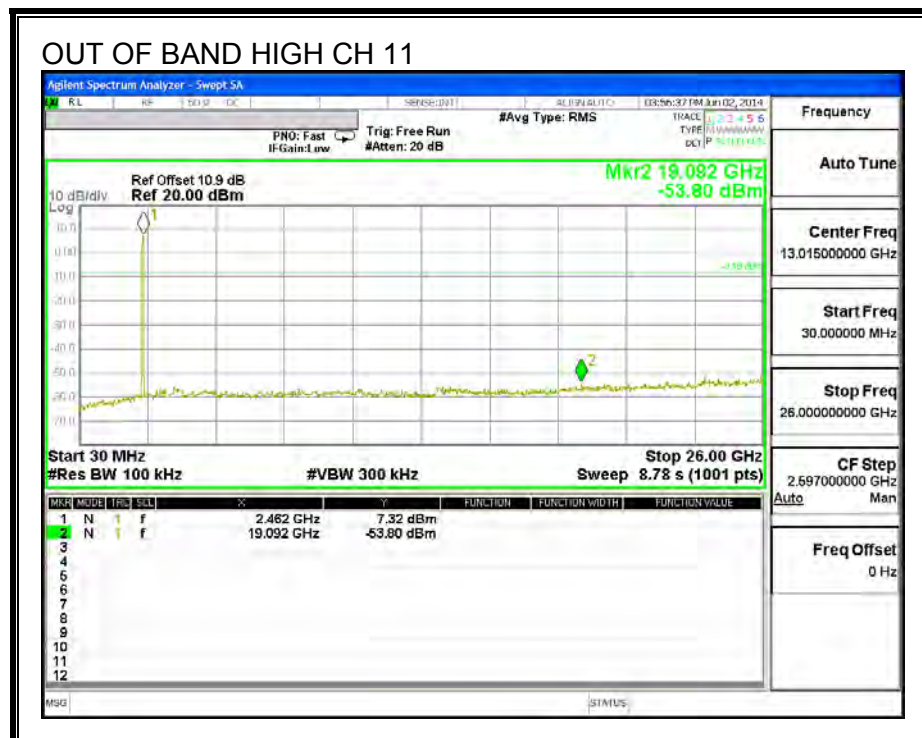
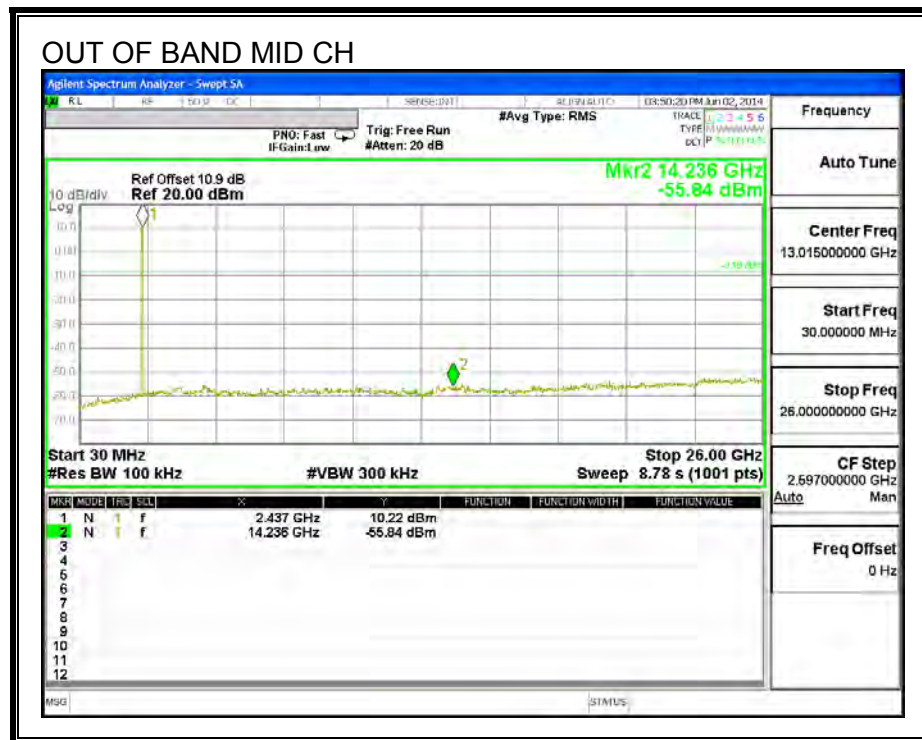


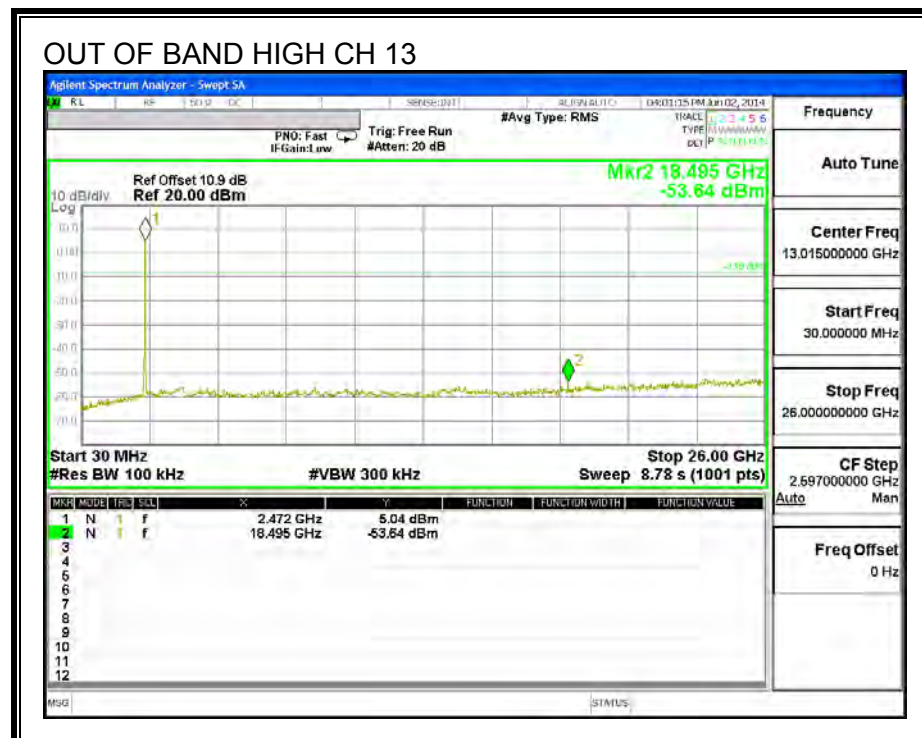
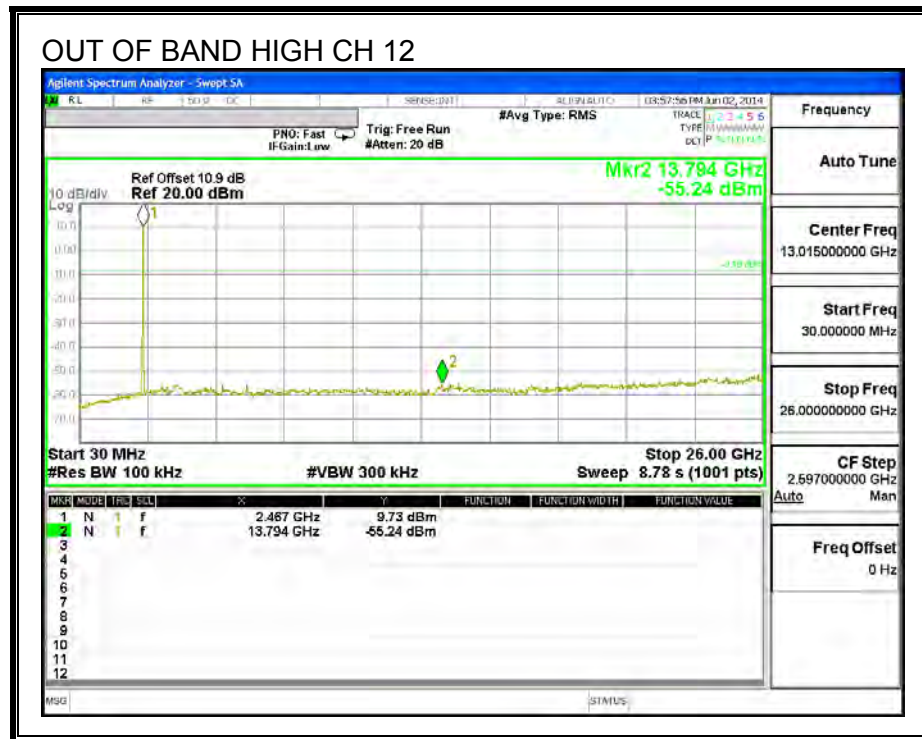
OUT-OF-BAND EMISSIONS



OUT-OF-BAND EMISSIONS







9.2. 802.11g MODE IN THE 2.4 GHz BAND

9.2.1. 6 dB BANDWIDTH

LIMITS

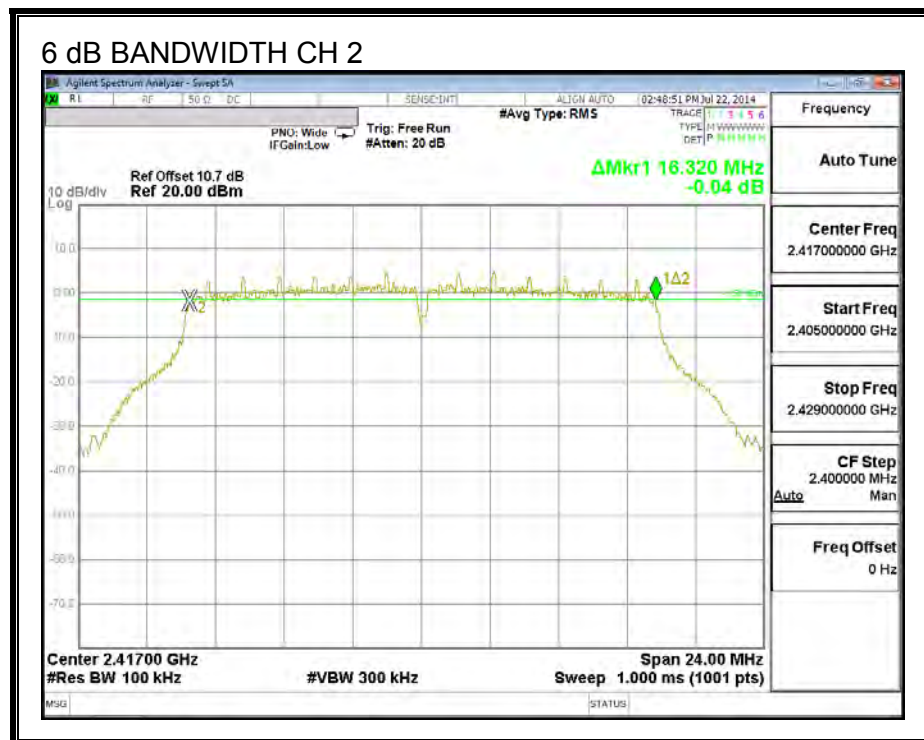
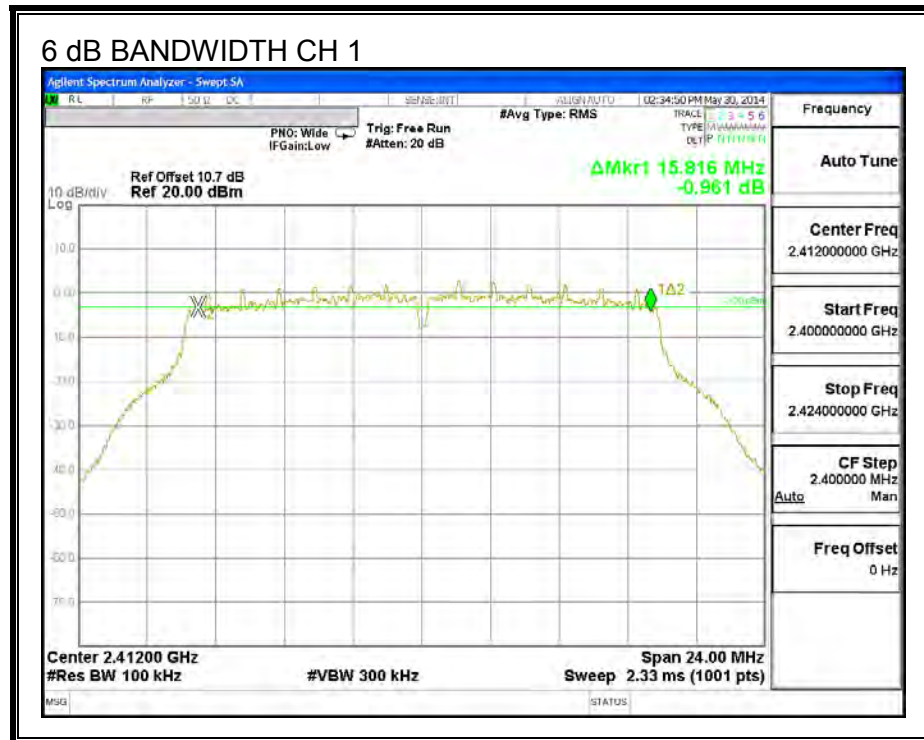
FCC §15.247 (a) (2)

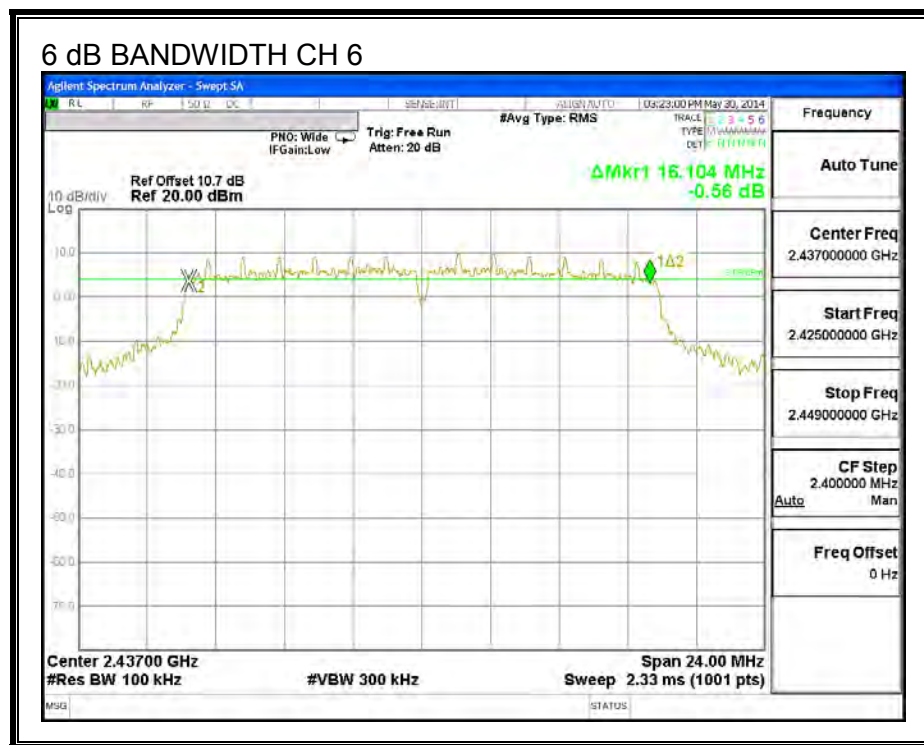
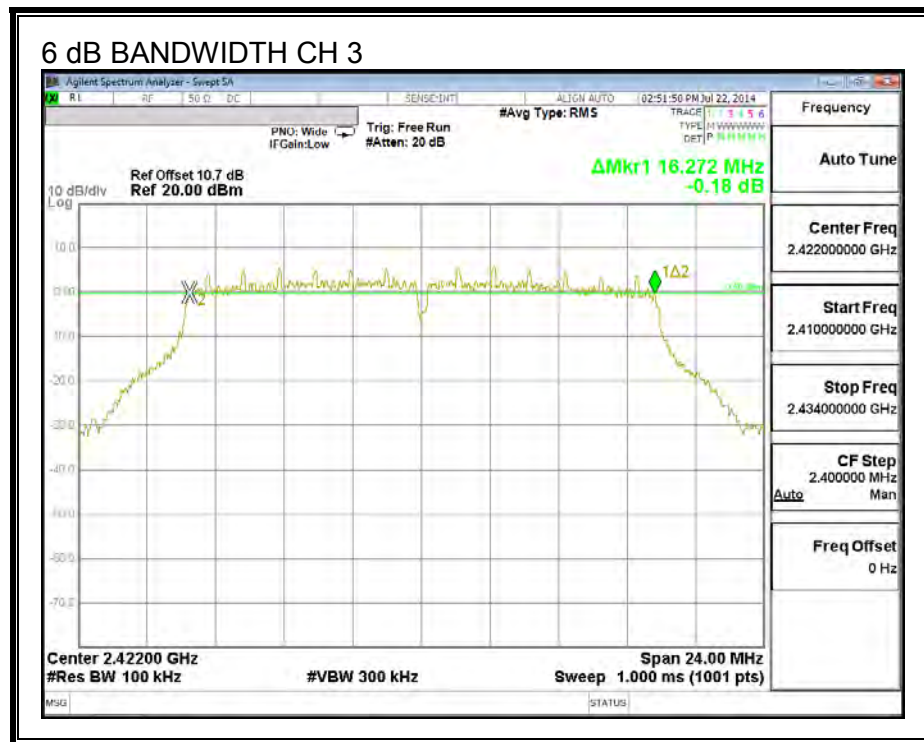
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
1	2412	15.816	0.5
2	2417	16.320	0.5
3	2422	16.272	0.5
6	2437	16.104	0.5
11	2462	16.128	0.5
12	2467	16.344	0.5
13	2472	16.104	0.5

6 dB BANDWIDTH

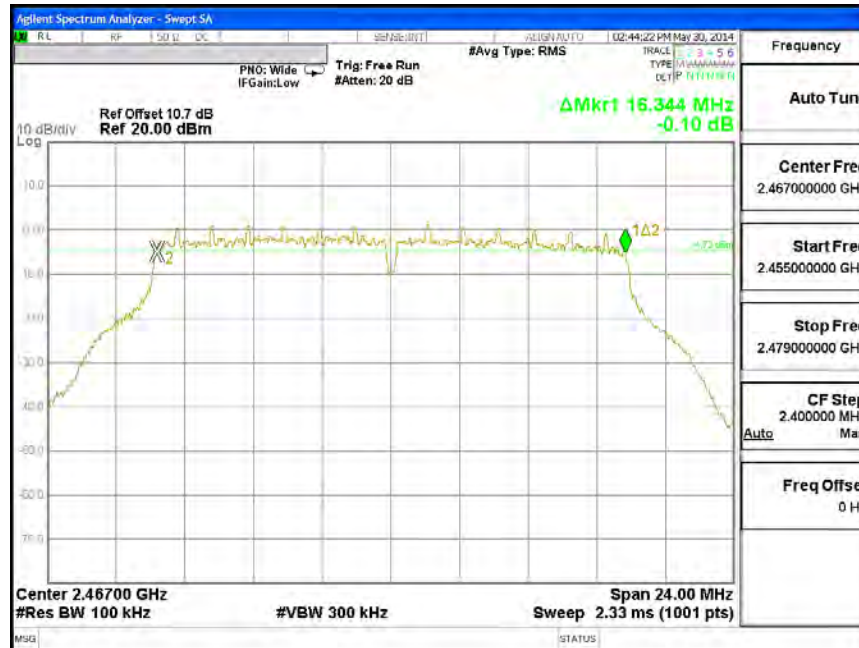


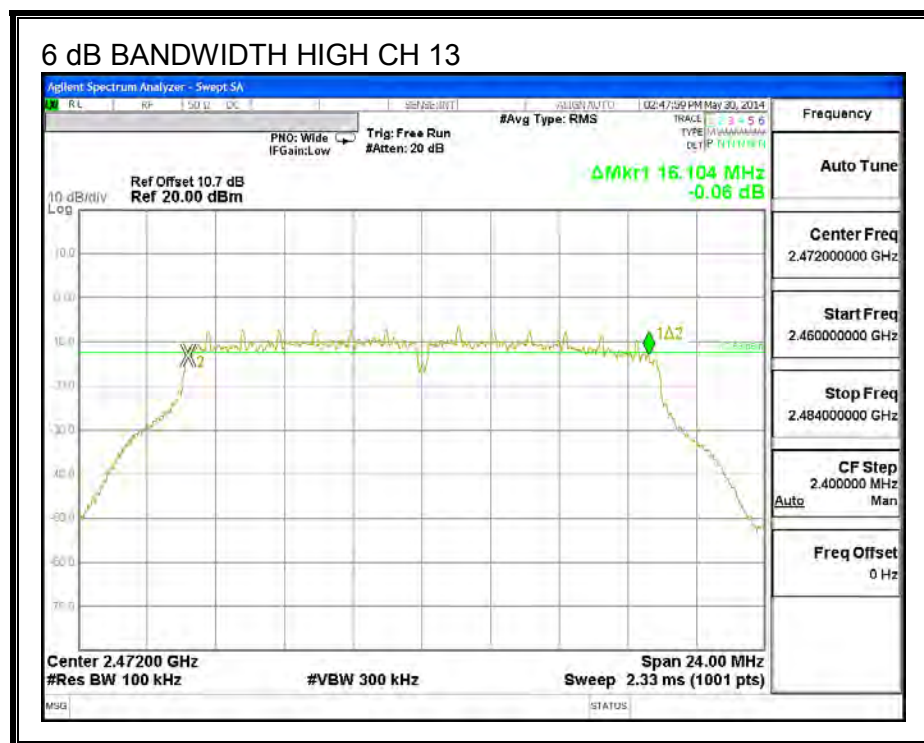


6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12





9.2.2. 99% BANDWIDTH

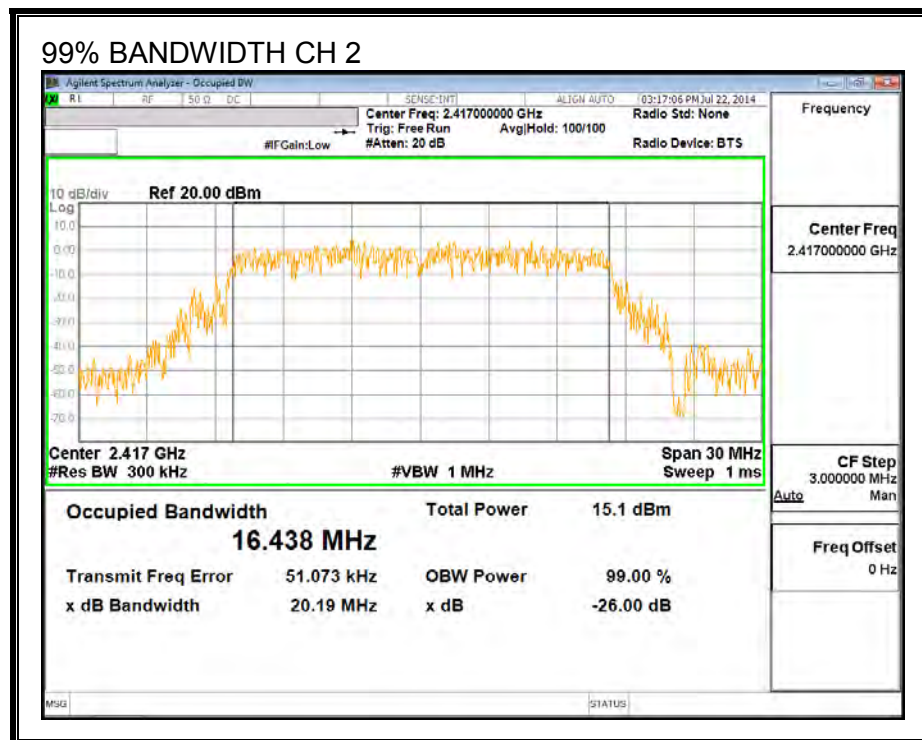
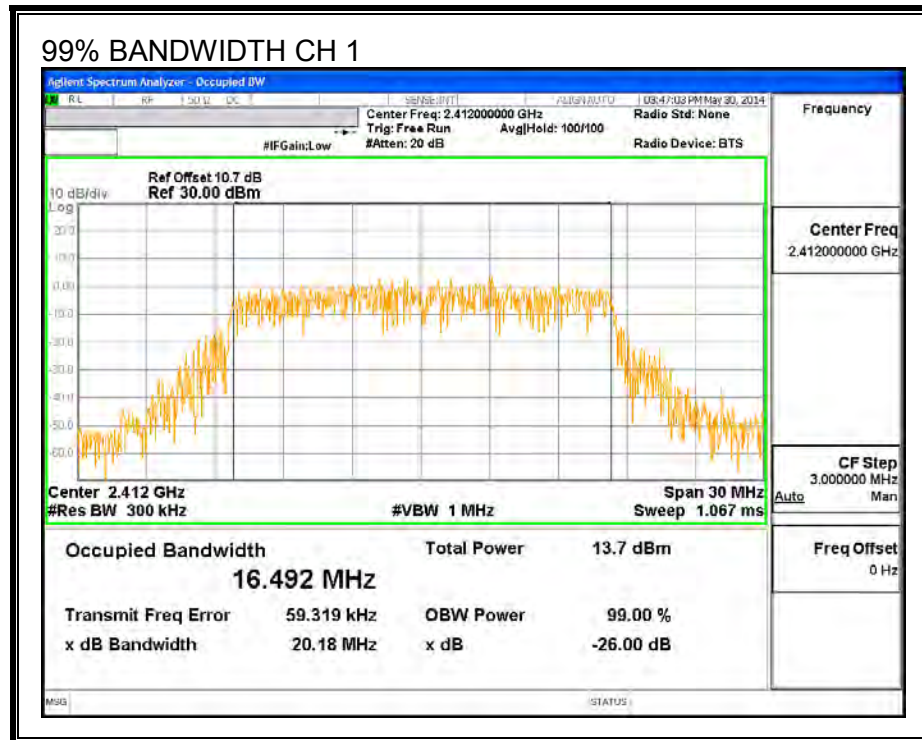
LIMITS

None; for reporting purposes only.

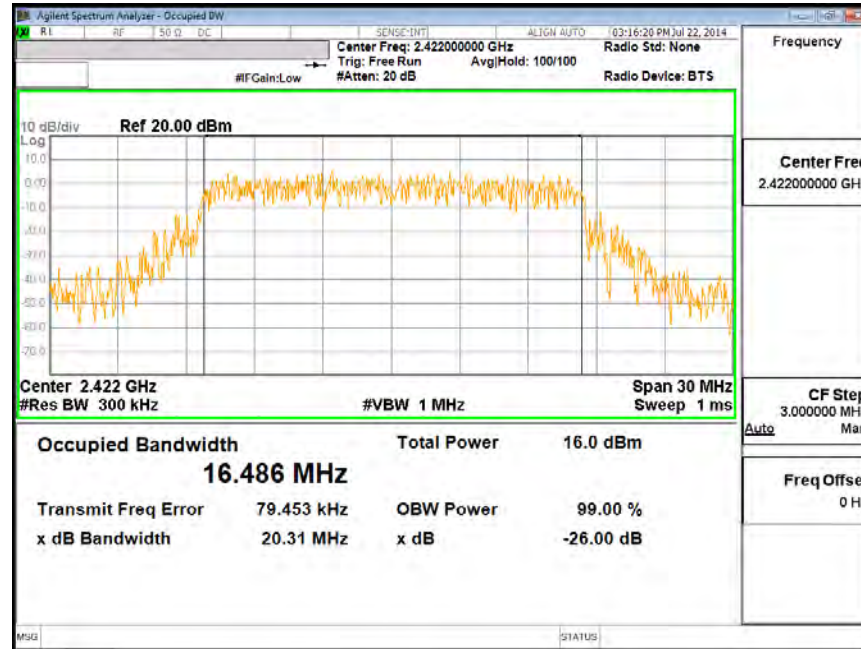
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
1	2412	16.492
2	2417	16.438
3	2422	16.486
6	2437	16.573
11	2462	16.435
12	2467	16.526
13	2472	16.463

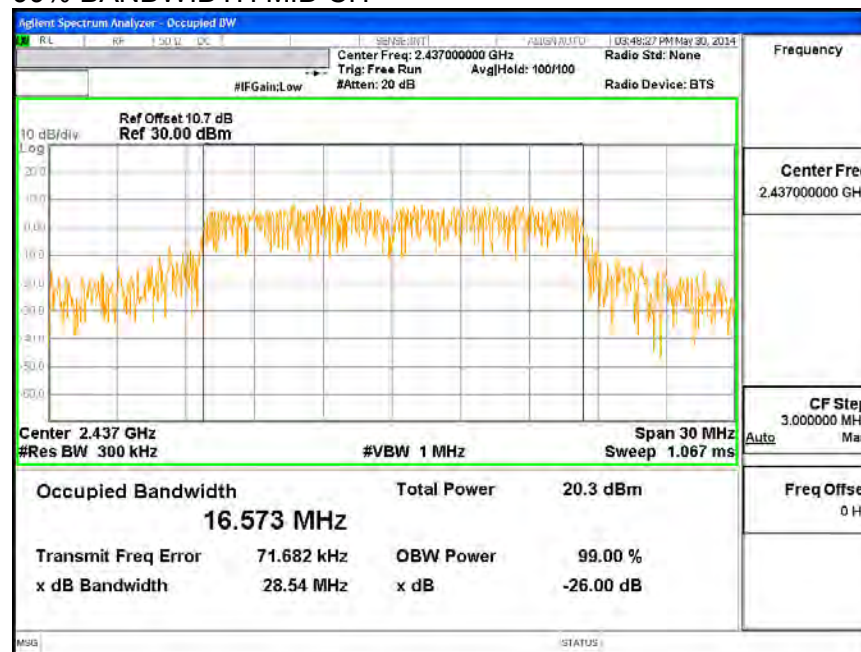
99% BANDWIDTH



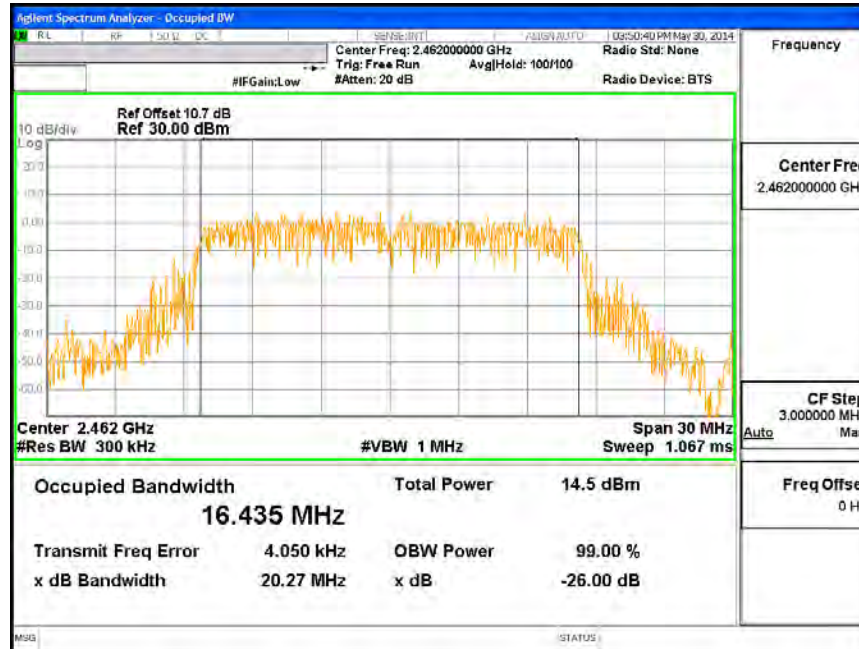
99% BANDWIDTH CH 3



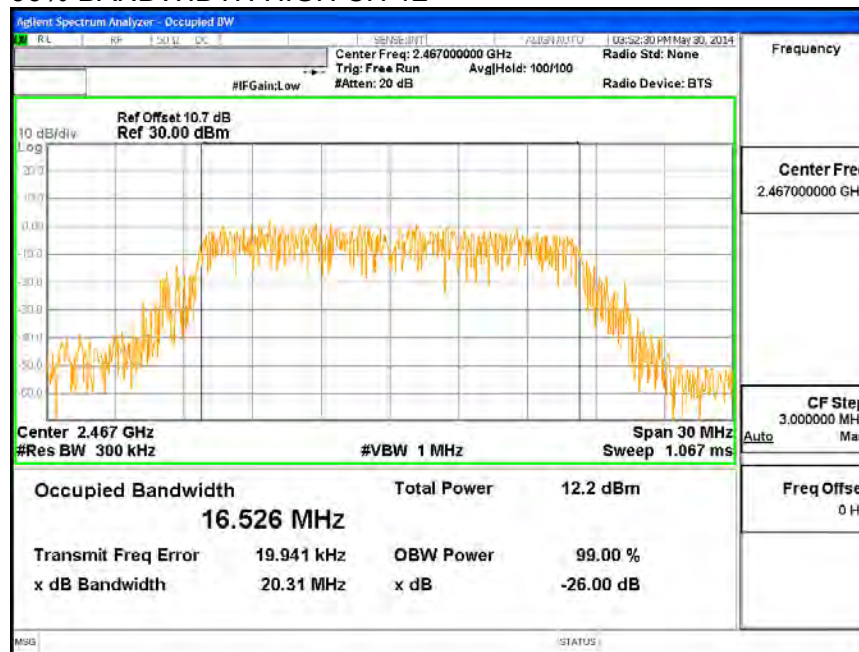
99% BANDWIDTH MID CH

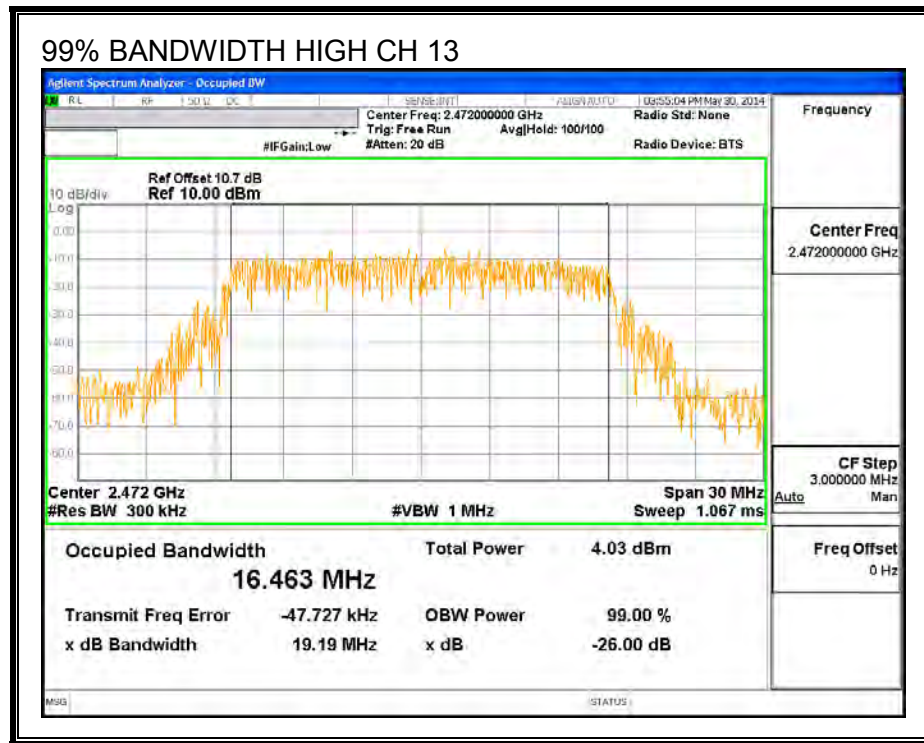


99% BANDWIDTH HIGH CH 11



99% BANDWIDTH HIGH CH 12





9.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
1	2412	13.37
2	2417	14.42
3	2422	15.36
6	2437	18.00
9	2452	16.88
10	2457	15.34
11	2462	14.48
12	2467	11.95
13	2472	4.89

9.2.4. OUTPUT POWER

LIMITS

FCC §15.247

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt, based on the use of antennas with directional gains that do not exceed 6dBi. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

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)
1	2412	0.81	30.00	30	36	30.00
2	2417	0.81	30.00	30	36	30.00
3	2422	0.81	30.00	30	36	30.00
6	2437	0.81	30.00	30	36	30.00
9	2452	0.81	30.00	30	36	30.00
10	2457	0.81	30.00	30	36	30.00
11	2462	0.81	30.00	30	36	30.00
12	2467	0.81	30.00	30	36	30.00
13	2472	0.81	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
1	2412	23.63	23.63	30.00	-6.37
2	2417	24.39	24.39	30.00	-5.61
3	2422	24.60	24.60	30.00	-5.40
6	2437	25.13	25.13	30.00	-4.87
9	2452	24.54	24.54	30.00	-5.46
10	2457	23.67	23.67	30.00	-6.33
11	2462	24.39	24.39	30.00	-5.61
12	2467	22.90	22.90	30.00	-7.10
13	2472	15.62	15.62	30.00	-14.38

9.2.5. PSD

LIMITS

FCC §15.247 (e)

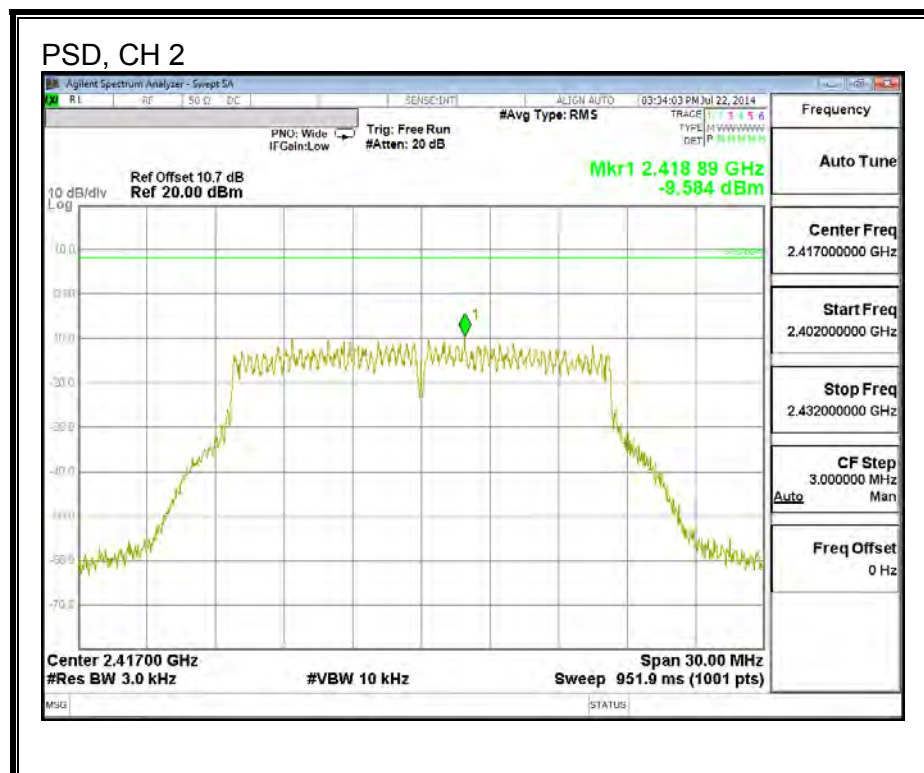
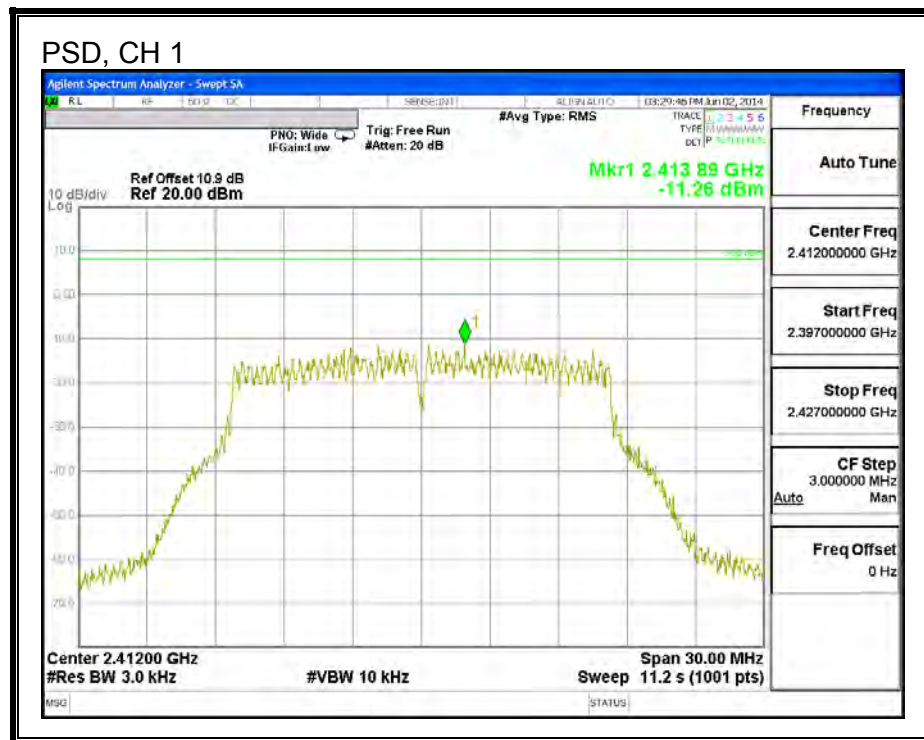
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

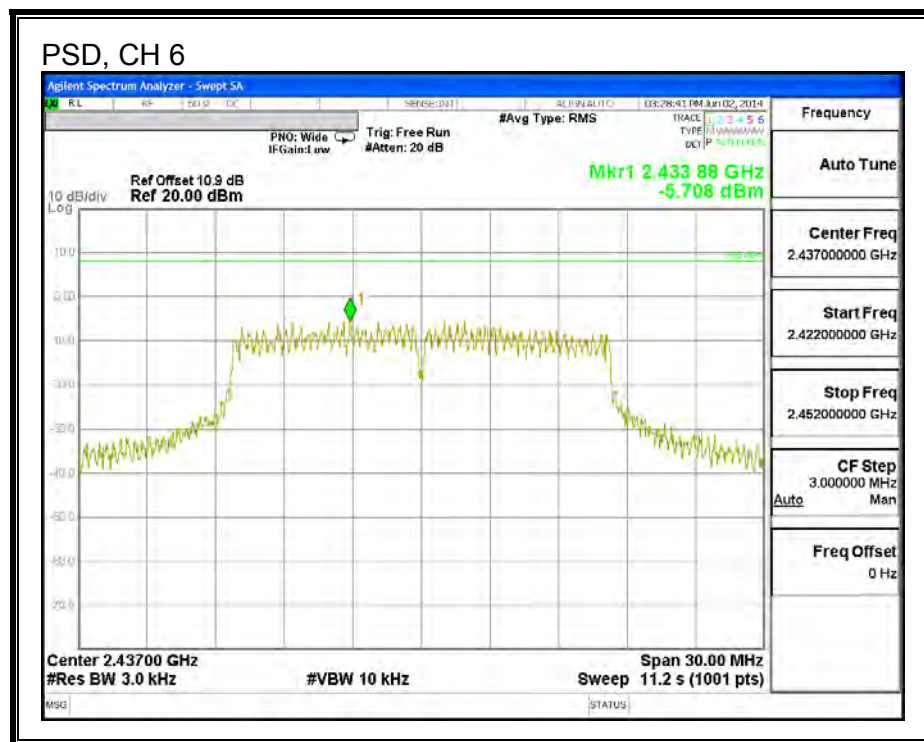
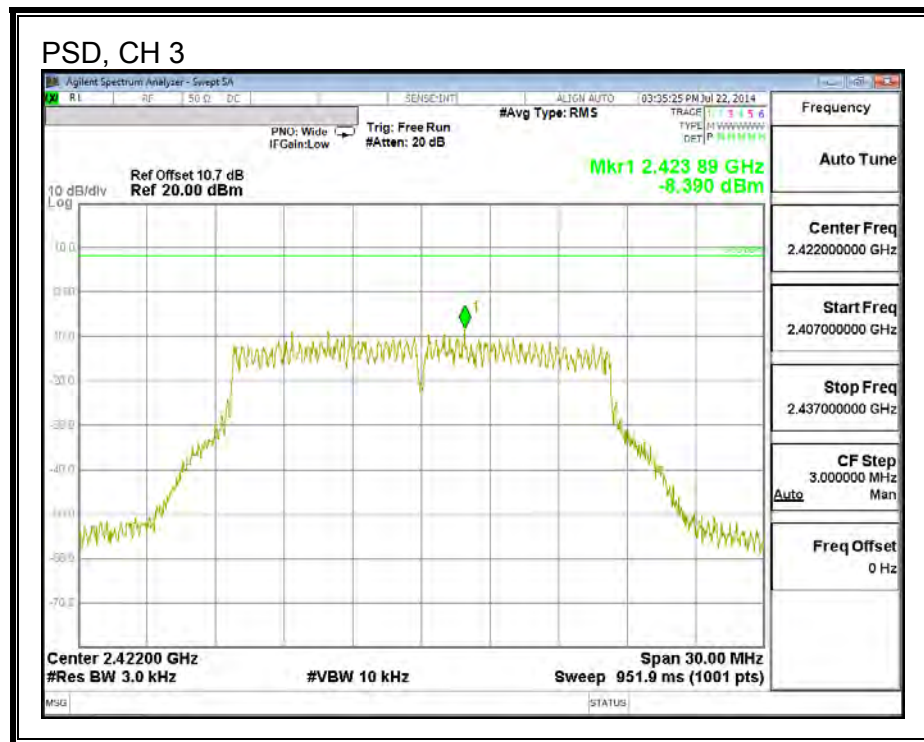
RESULTS

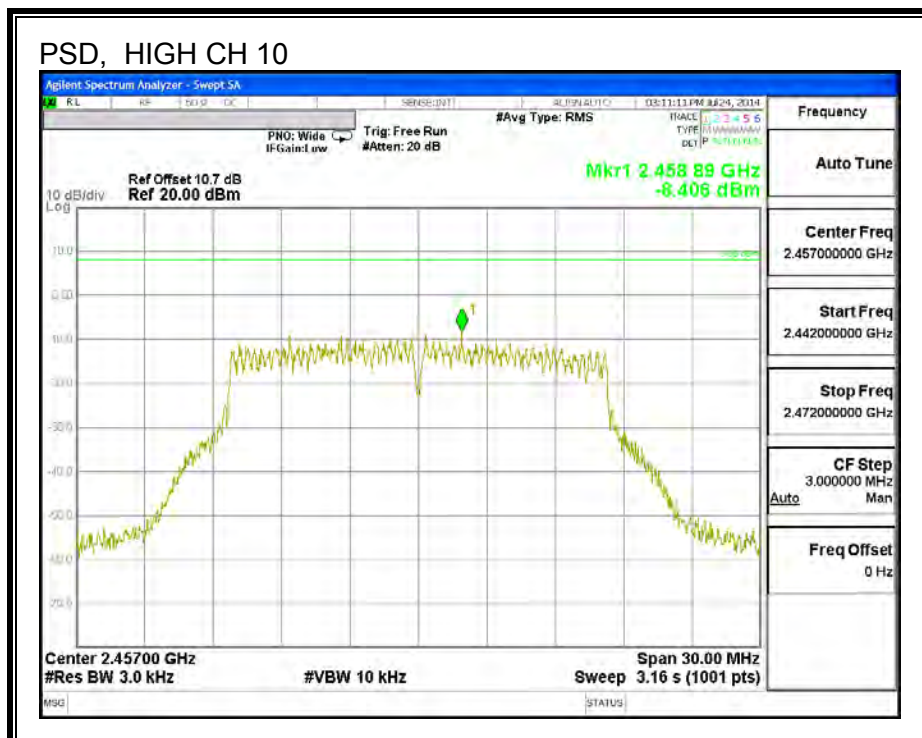
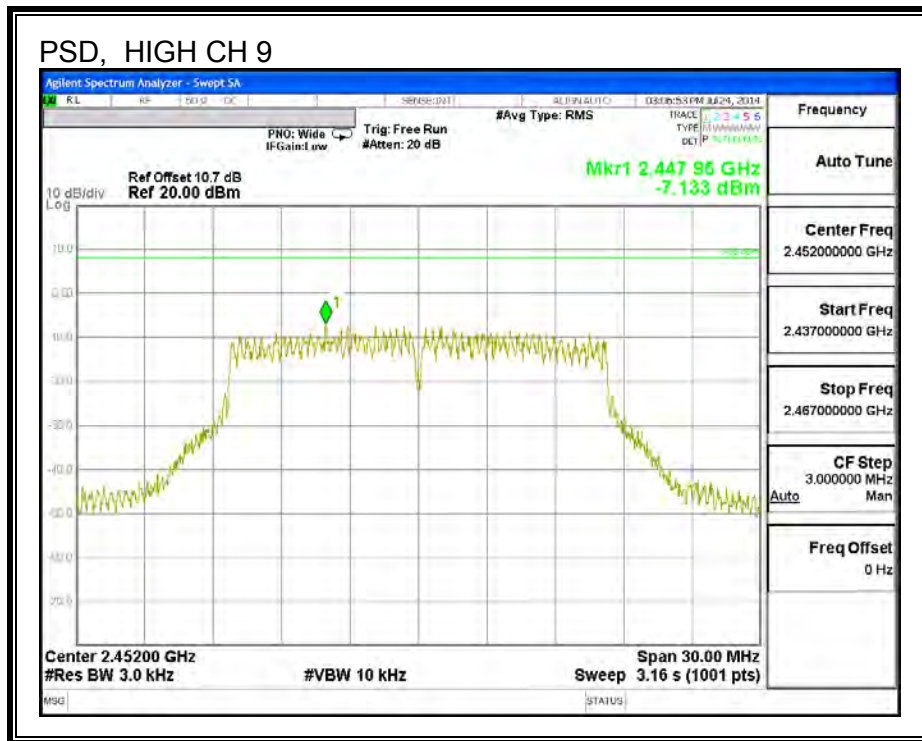
PSD Results

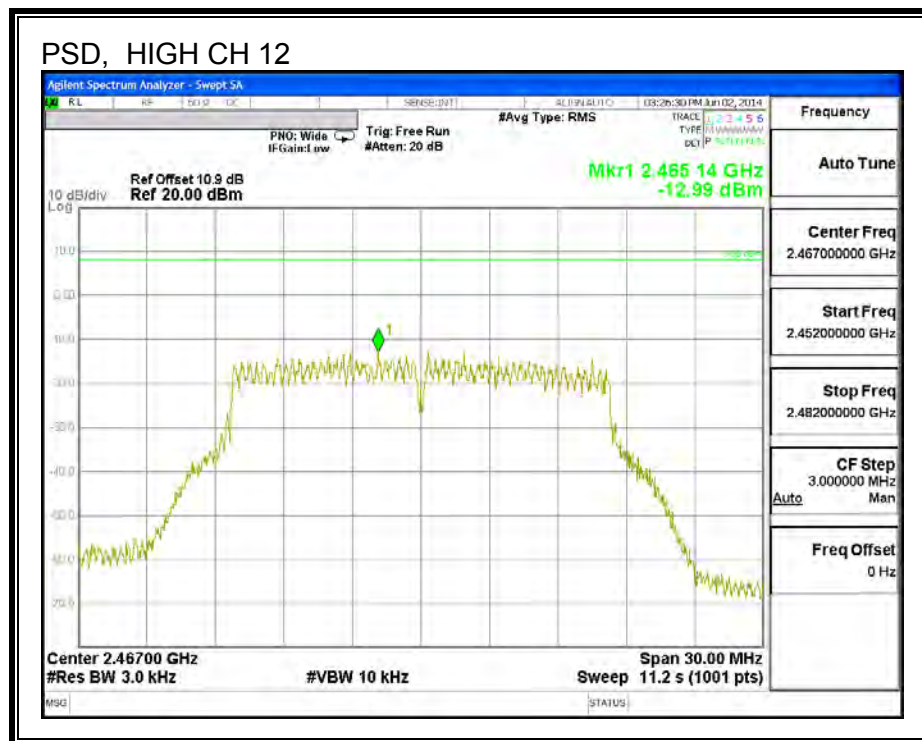
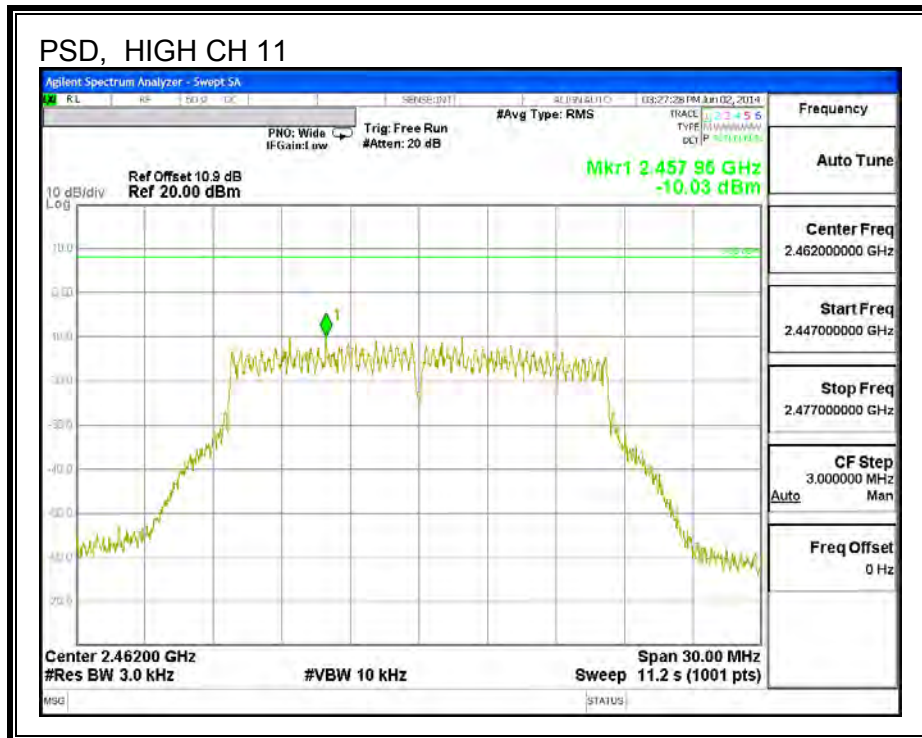
Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
1	2412	-11.26	8.0	-19.3
2	2417	-9.58	8.0	-17.6
3	2422	-8.39	8.0	-16.4
6	2437	-5.71	8.0	-13.7
9	2452	-7.13	8.0	-15.1
10	2457	-8.41	8.0	-16.4
11	2462	-10.03	8.0	-18.0
12	2467	-12.99	8.0	-21.0
13	2472	-20.73	8.0	-28.7

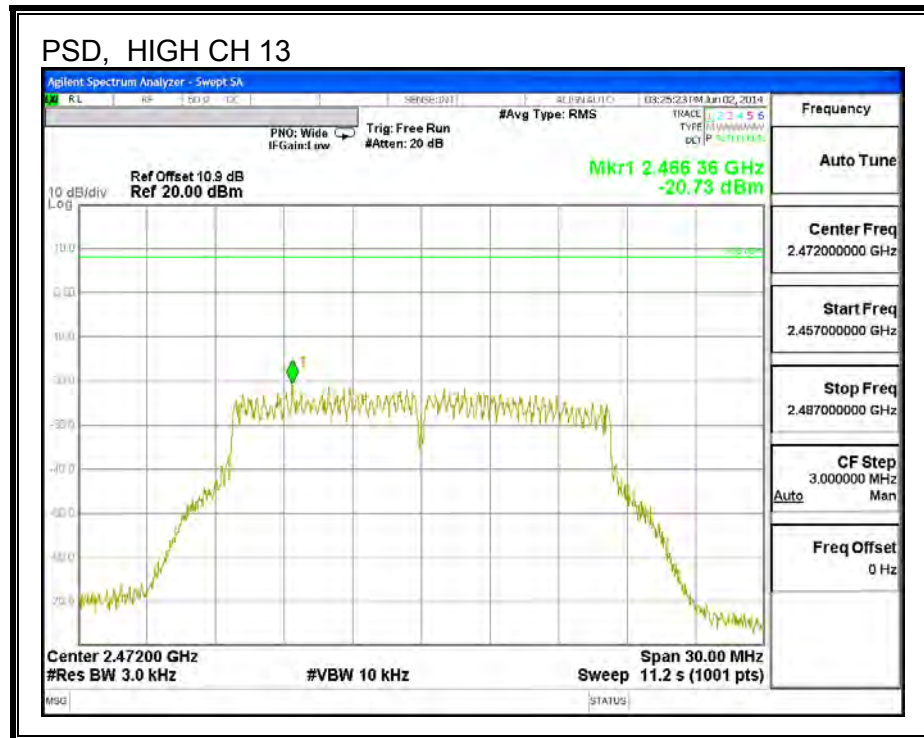
PSD,











9.2.6. OUT-OF-BAND EMISSIONS

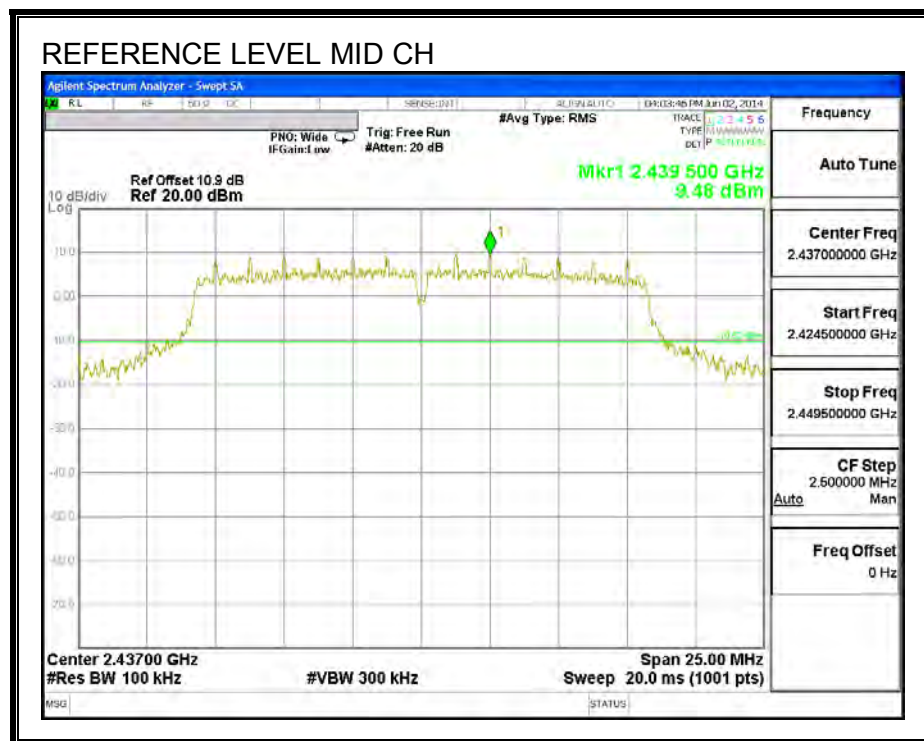
LIMITS

FCC §15.247 (d)

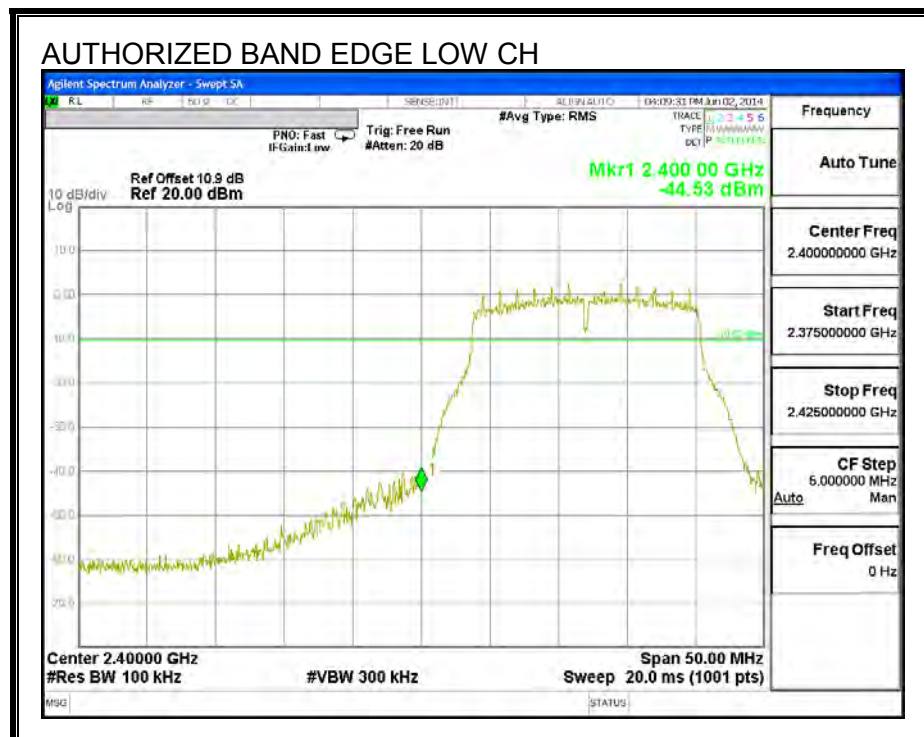
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

RESULTS

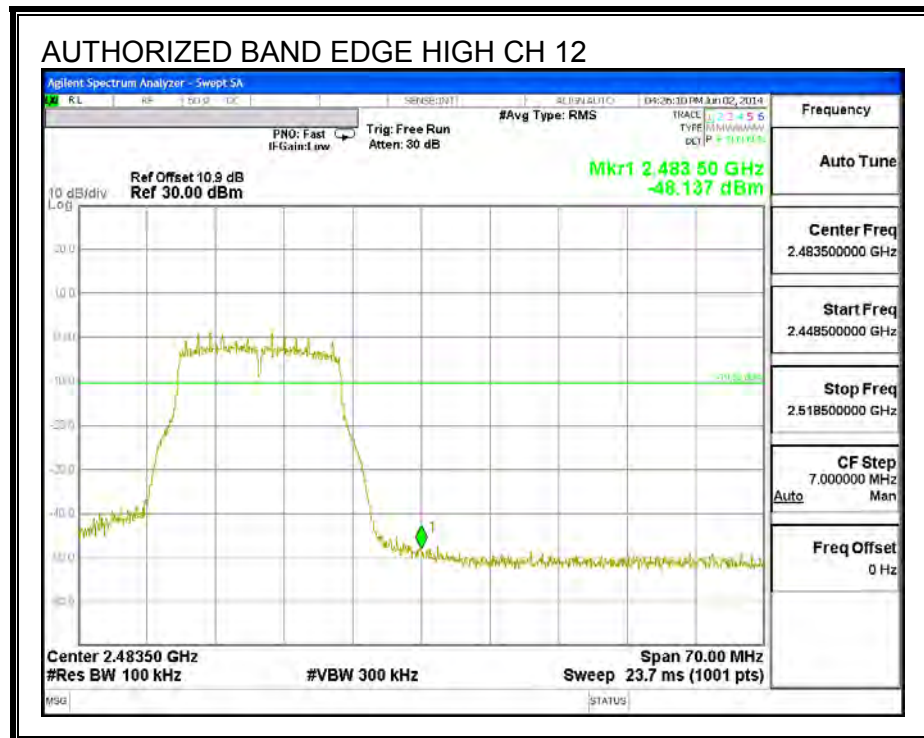
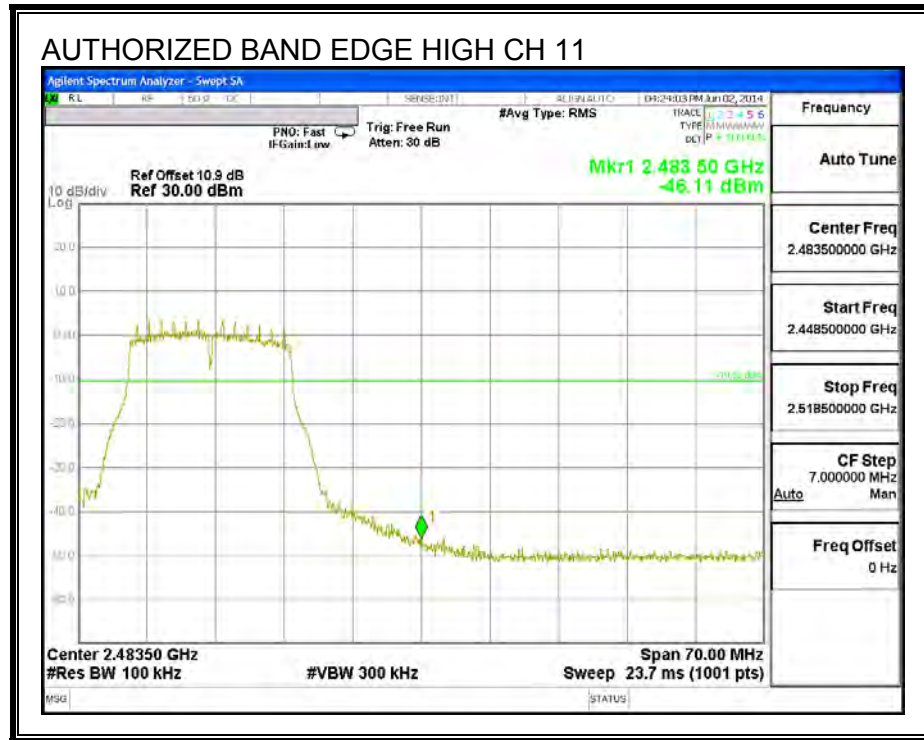
IN-BAND REFERENCE LEVEL

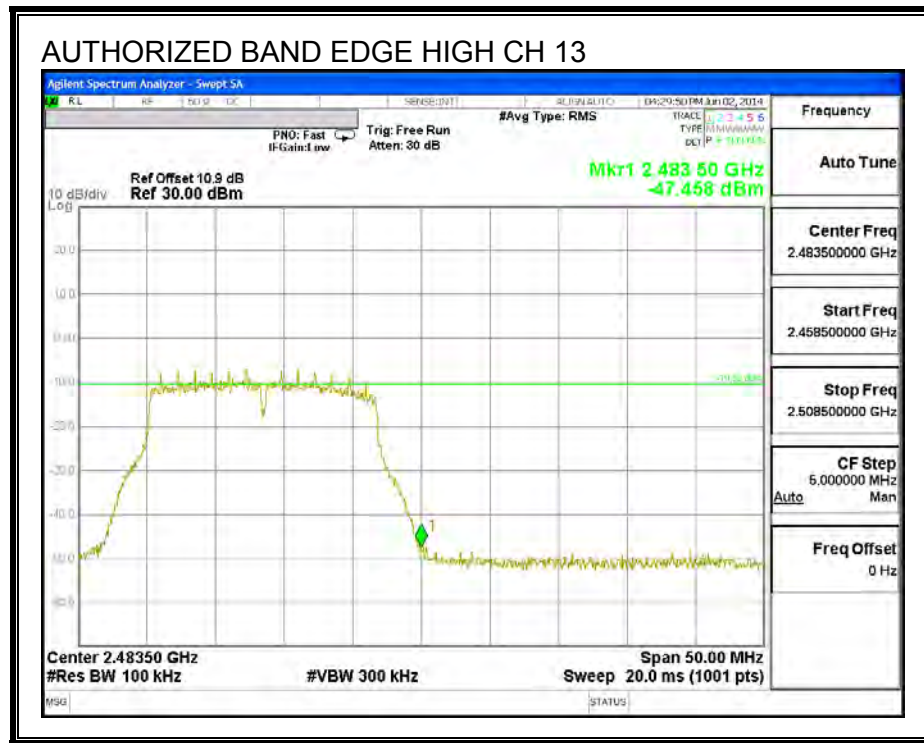


LOW CHANNEL BANDEDGE

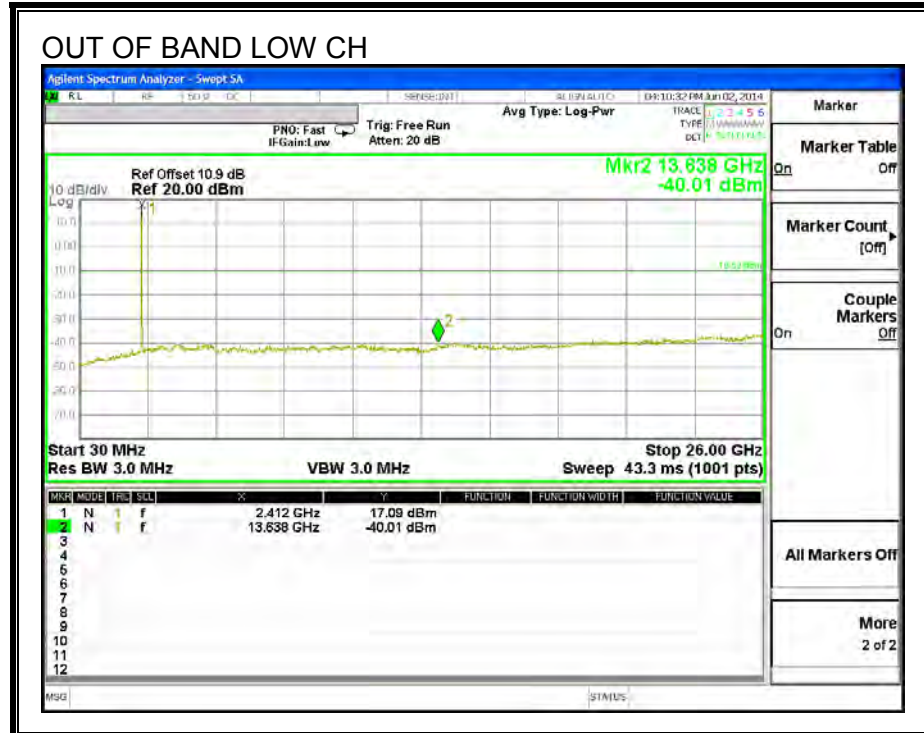


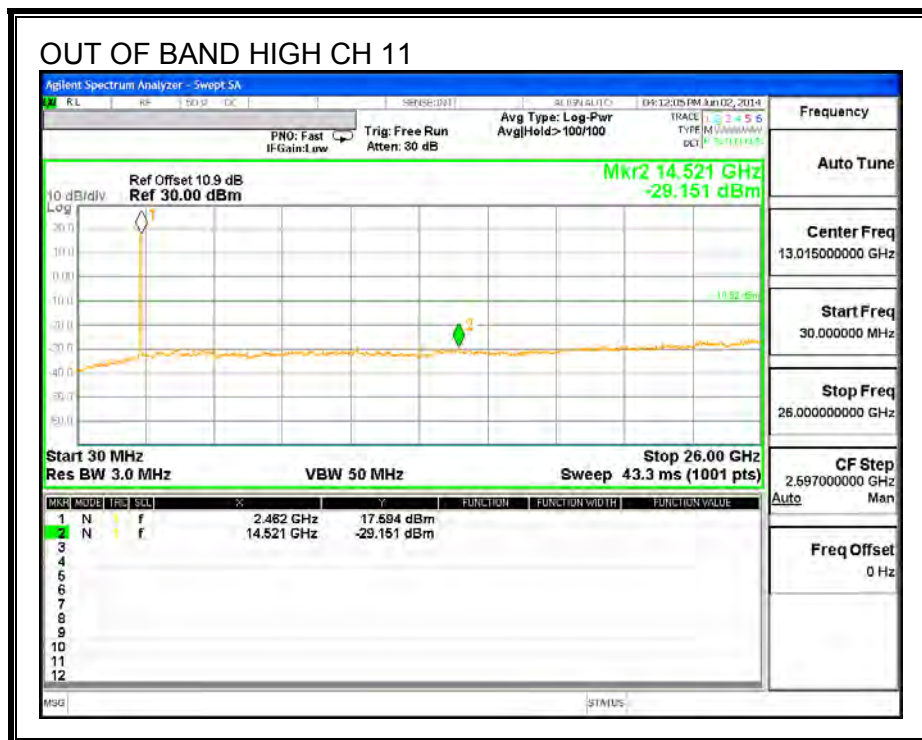
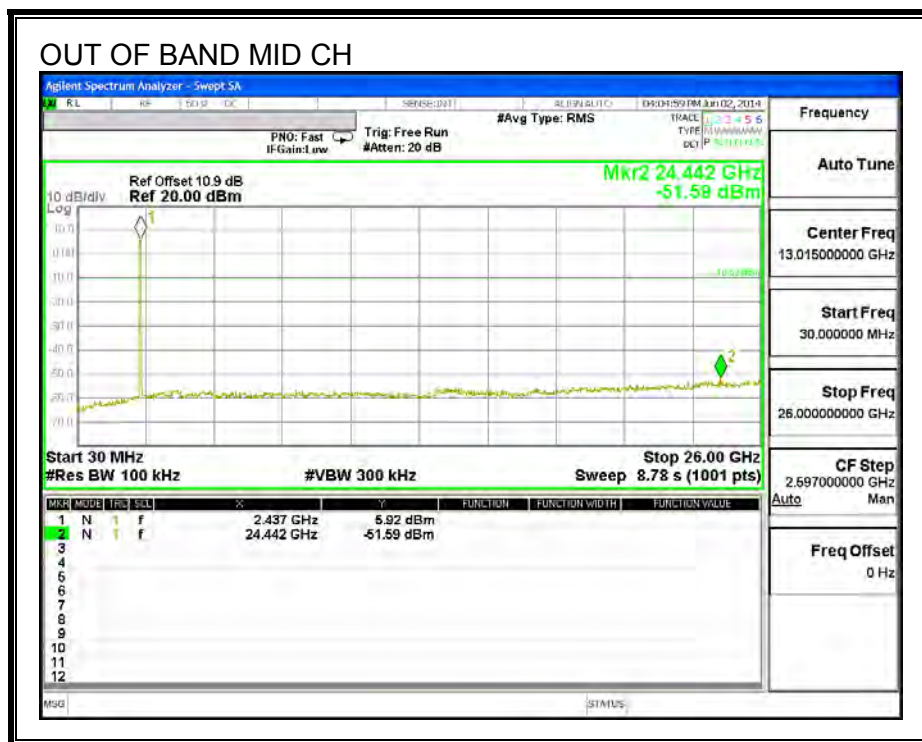
HIGH CHANNEL BANDEDGE

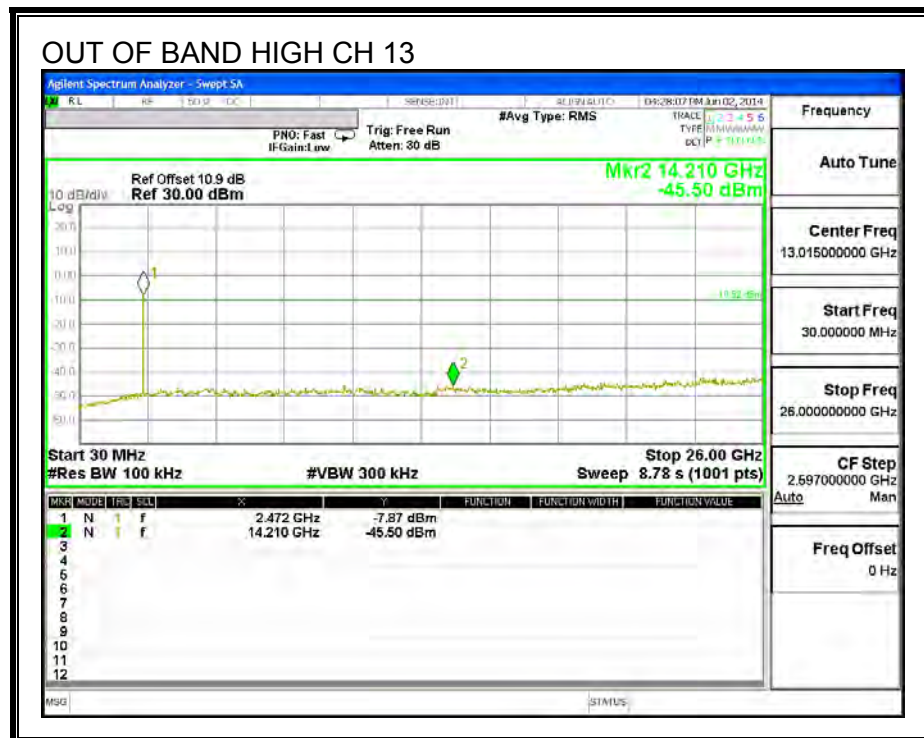
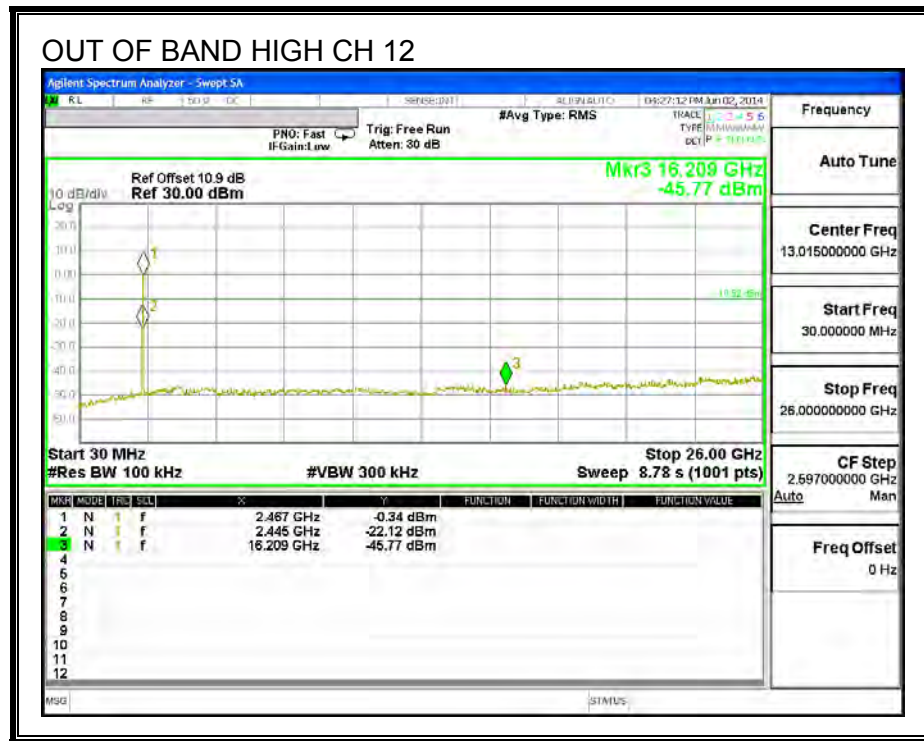




OUT-OF-BAND EMISSIONS







9.3. 802.11n HT20 1Tx SISO MODE IN THE 2.4 GHz BAND

9.3.1. 6 dB BANDWIDTH

LIMITS

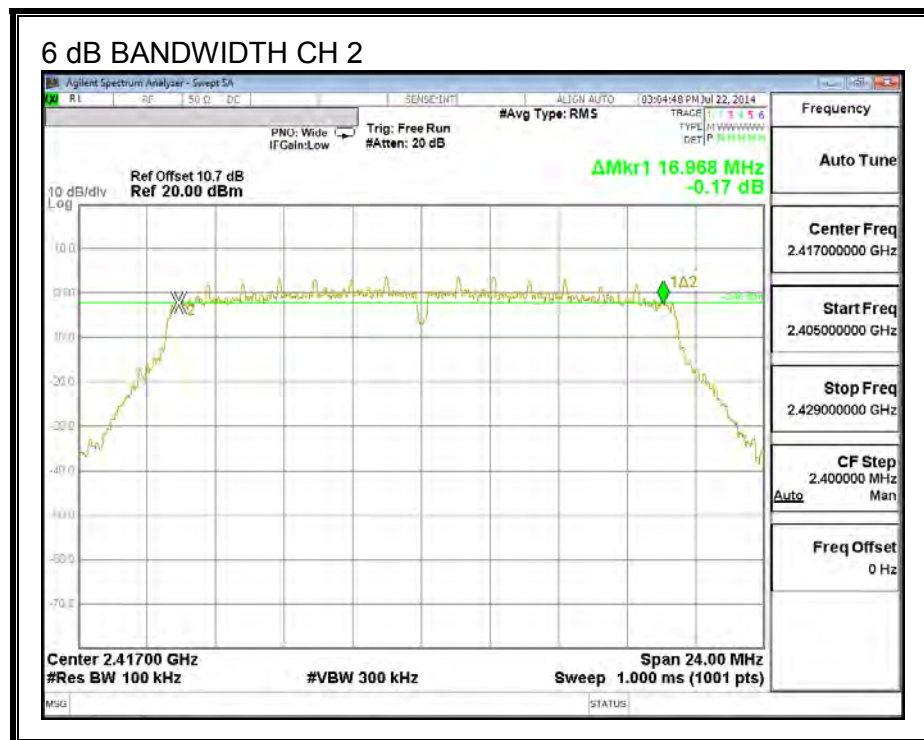
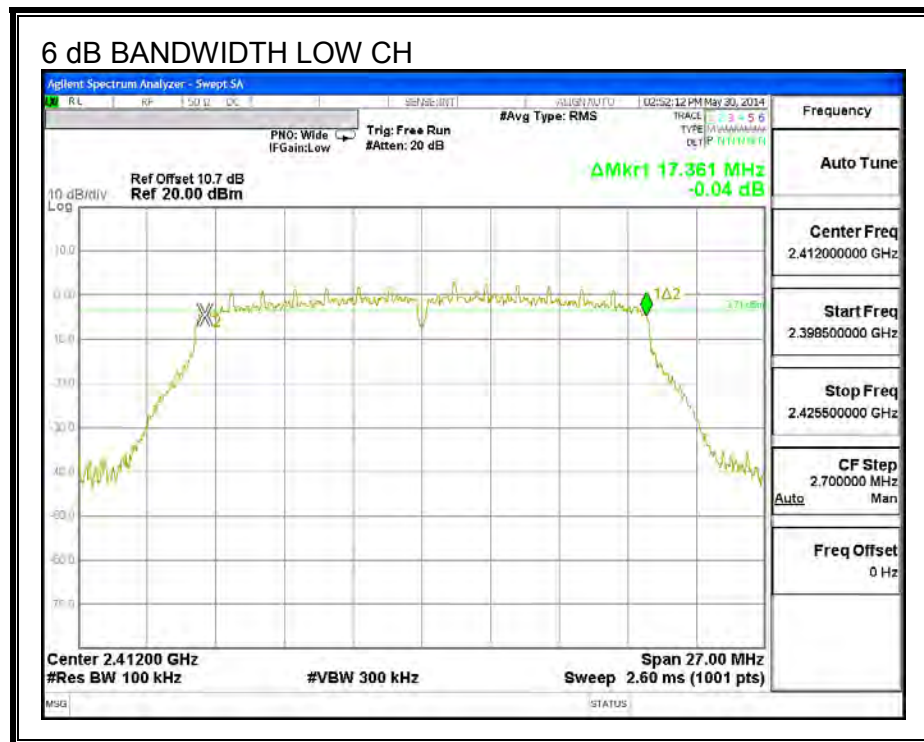
FCC §15.247 (a) (2)

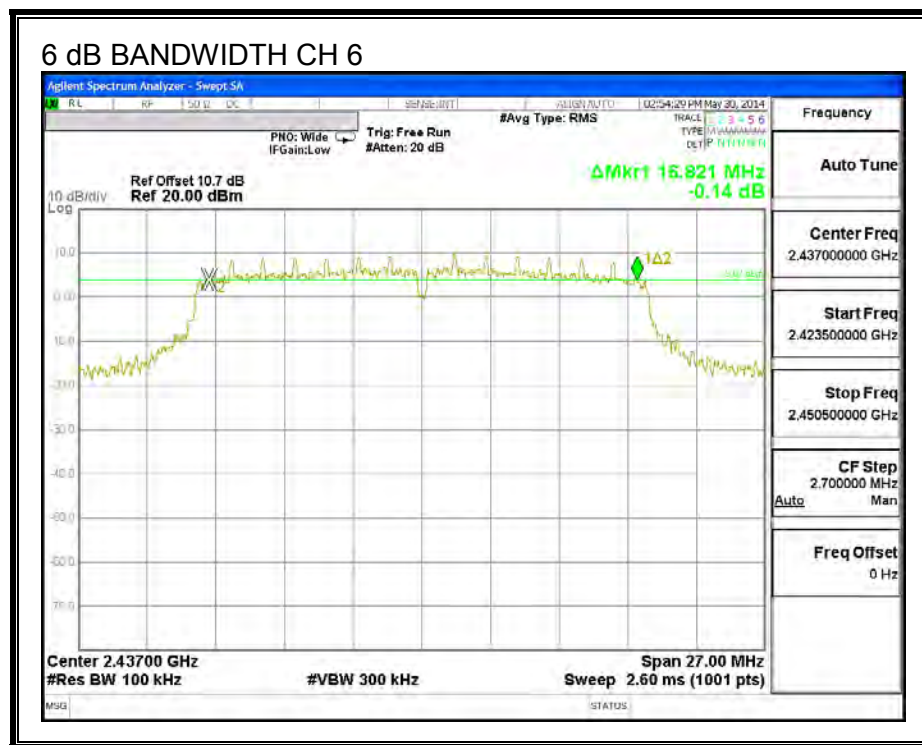
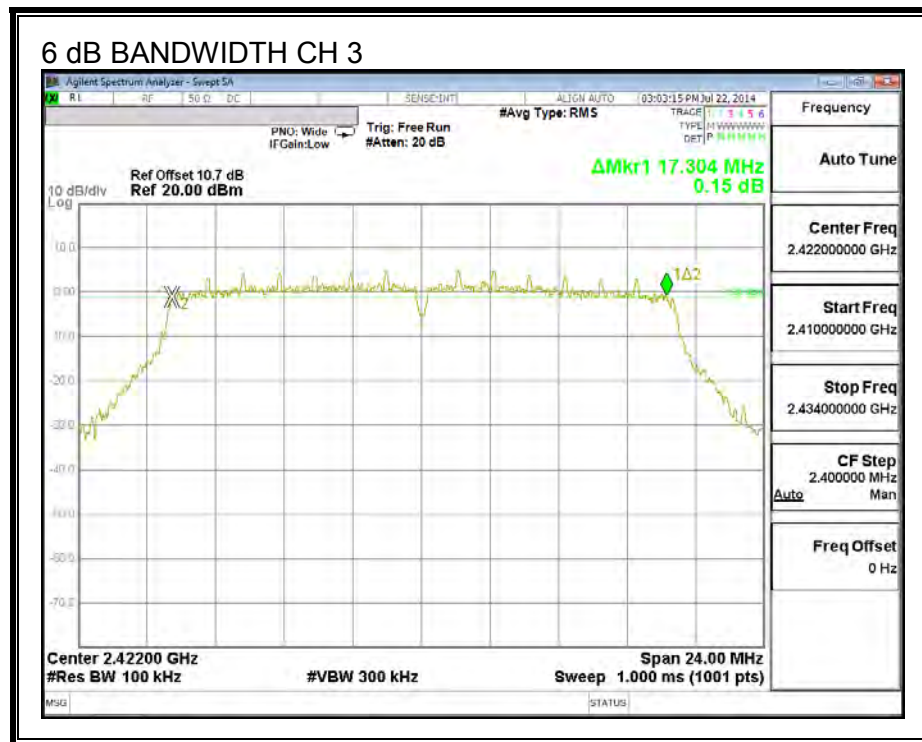
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

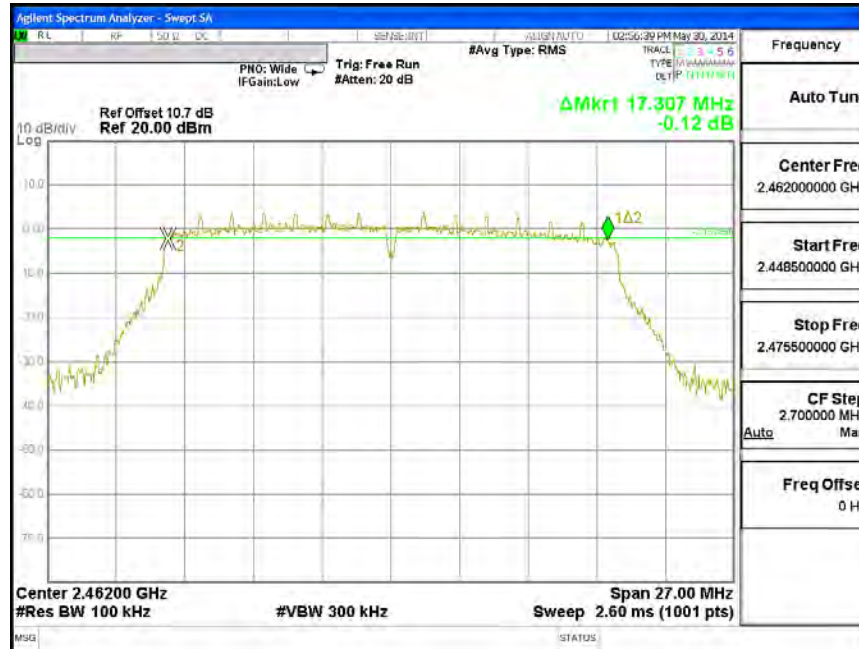
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
1	2412	17.361	0.5
2	2417	16.968	0.5
3	2422	17.304	0.5
6	2437	16.821	0.5
11	2462	17.307	0.5
12	2467	17.253	0.5
13	2472	16.713	0.5

6 dB BANDWIDTH

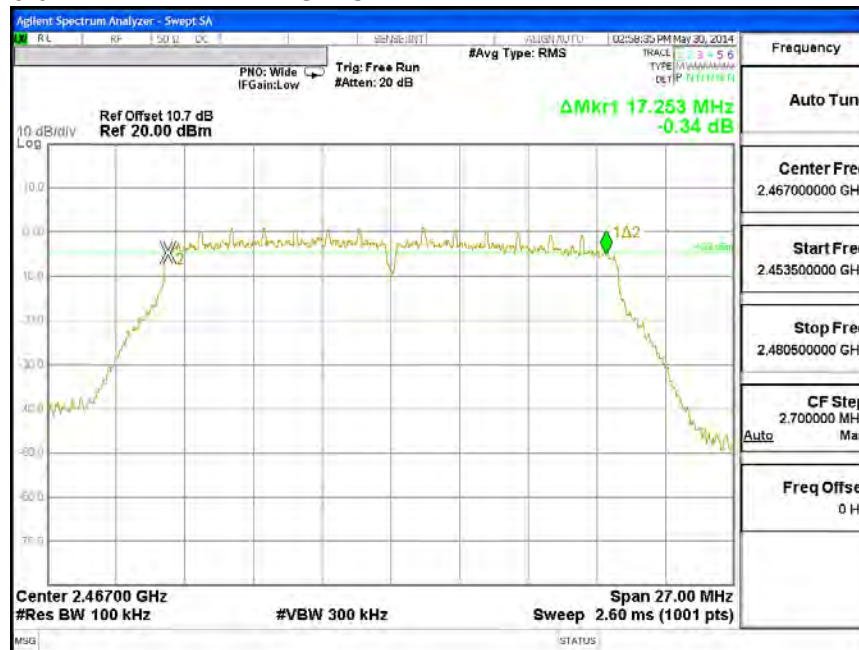


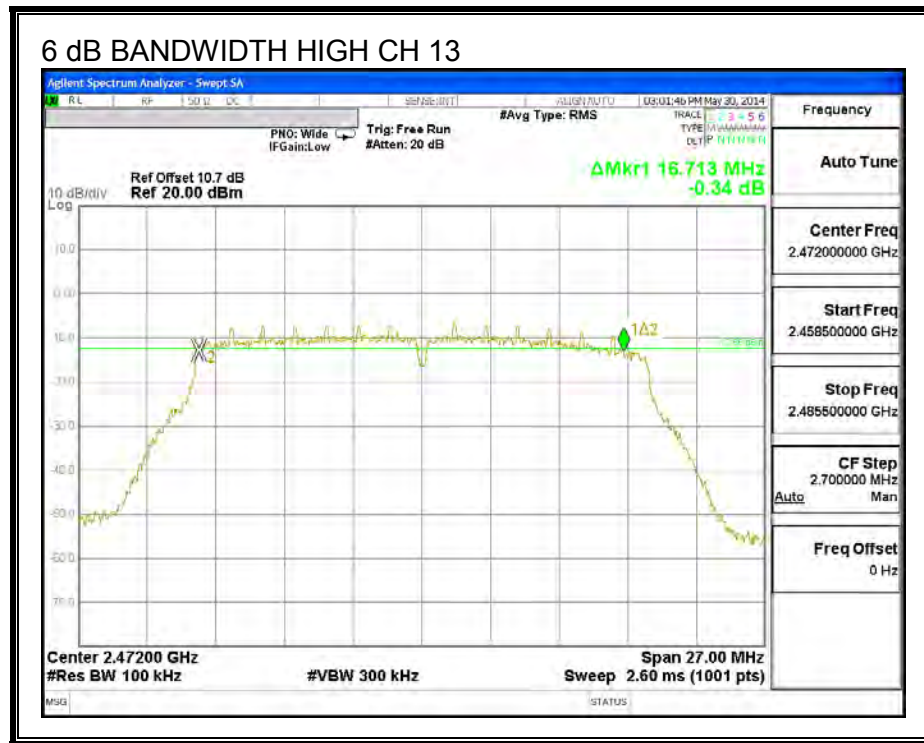


6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12





9.3.2. 99% BANDWIDTH

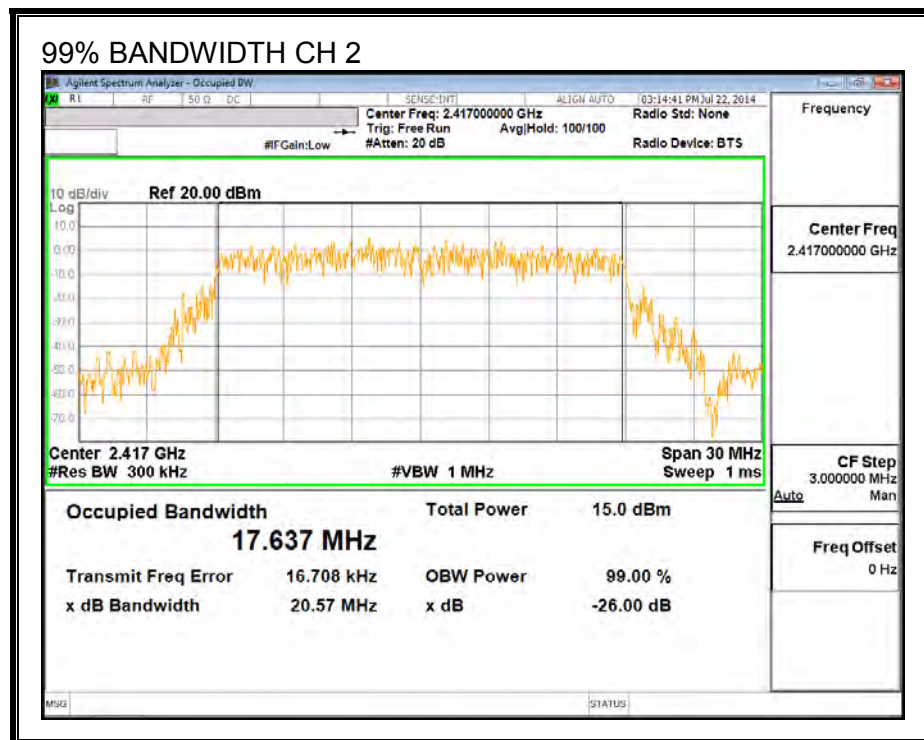
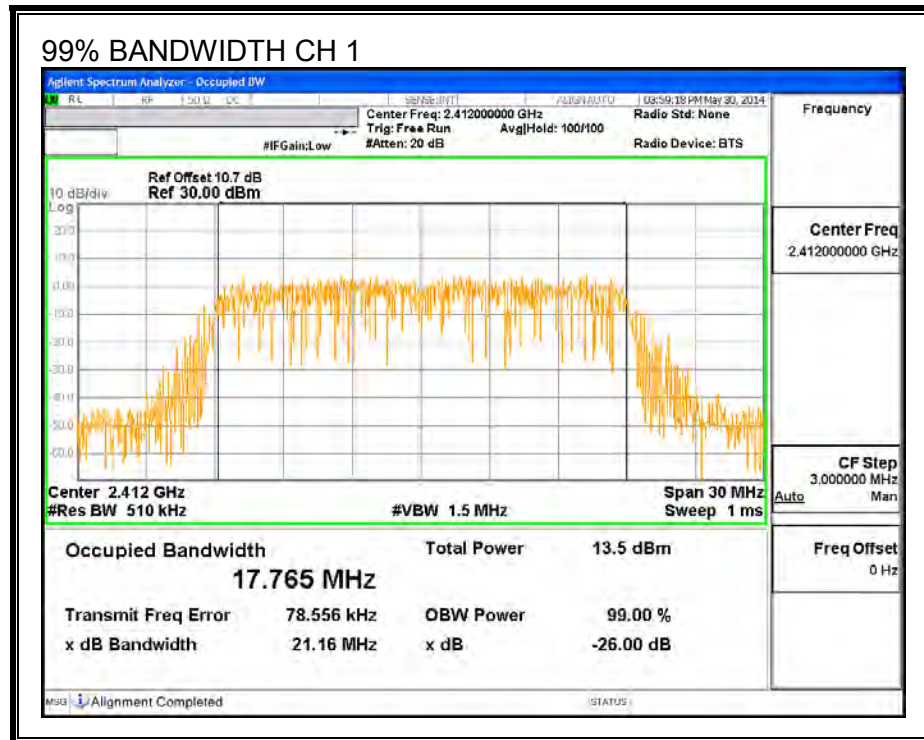
LIMITS

None; for reporting purposes only.

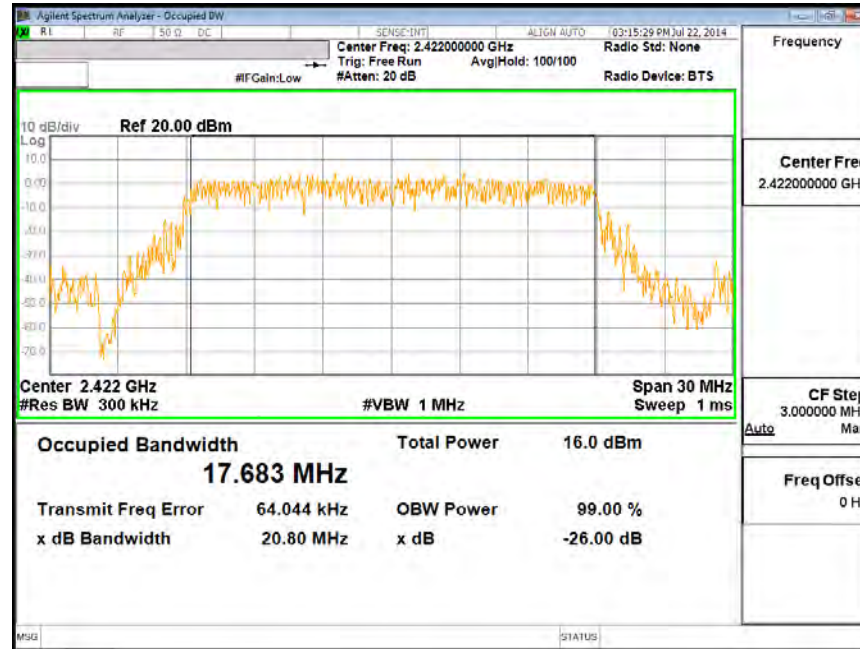
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
1	2412	17.765
2	2417	17.637
3	2422	17.683
6	2437	17.834
11	2462	17.802
12	2467	17.818
13	2472	17.840

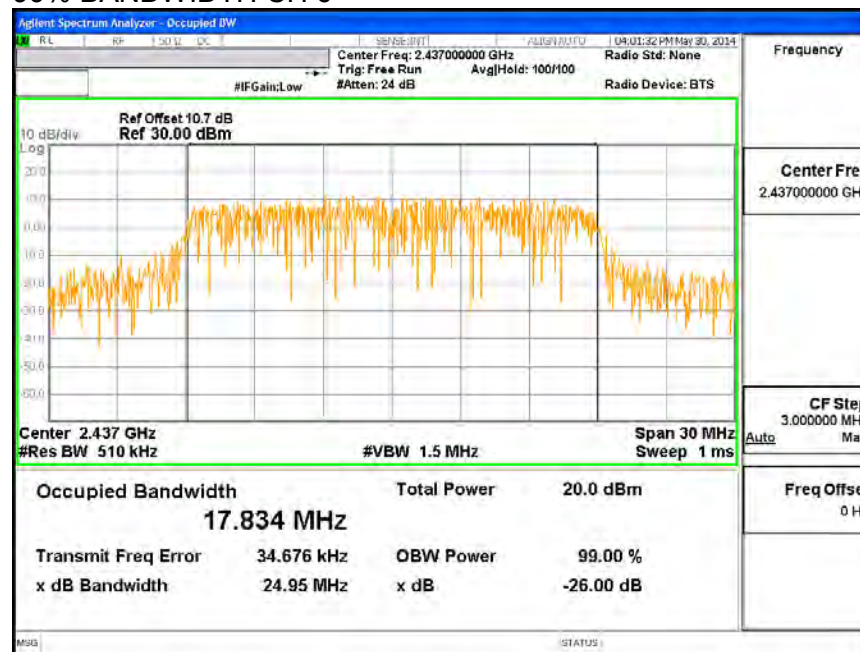
99% BANDWIDTH



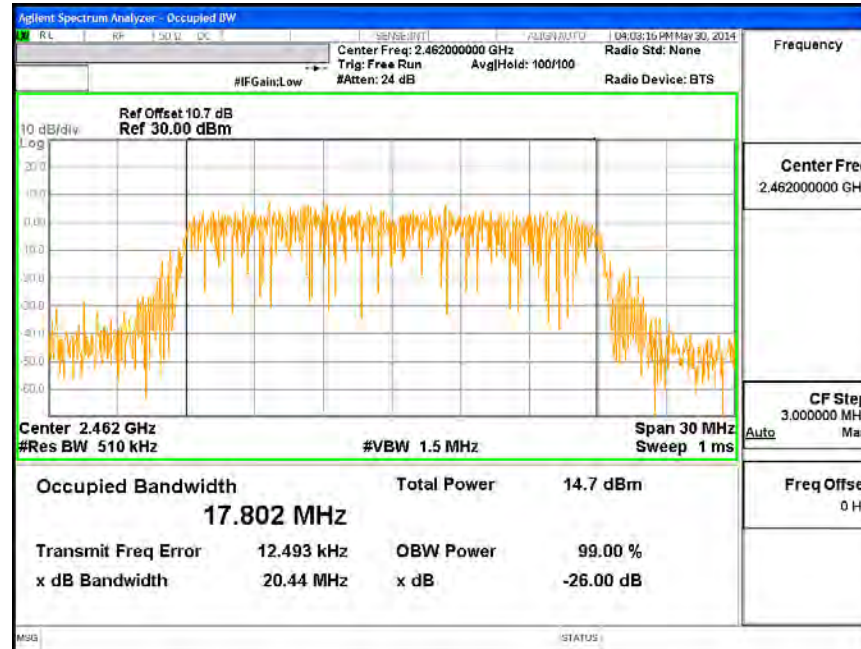
99% BANDWIDTH CH 3



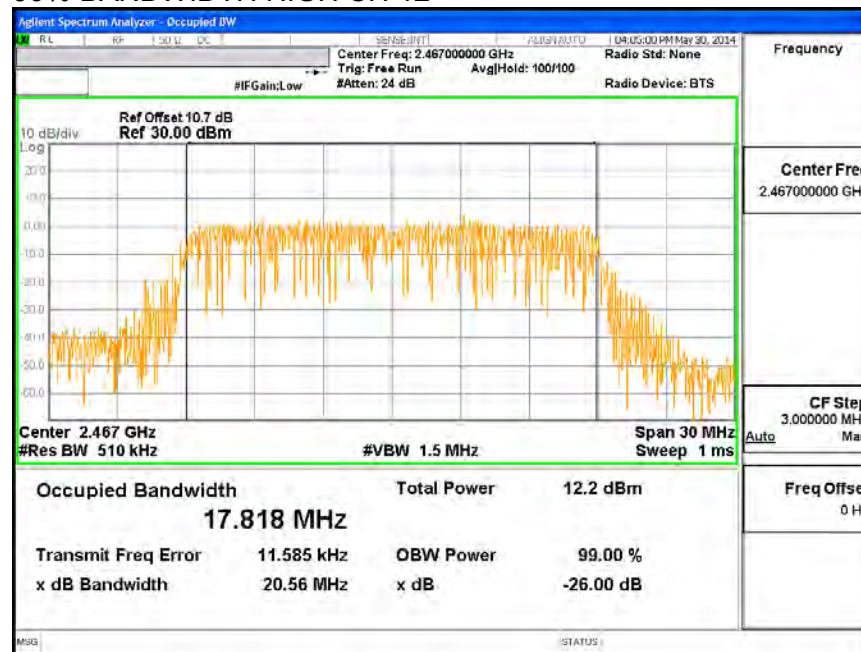
99% BANDWIDTH CH 6

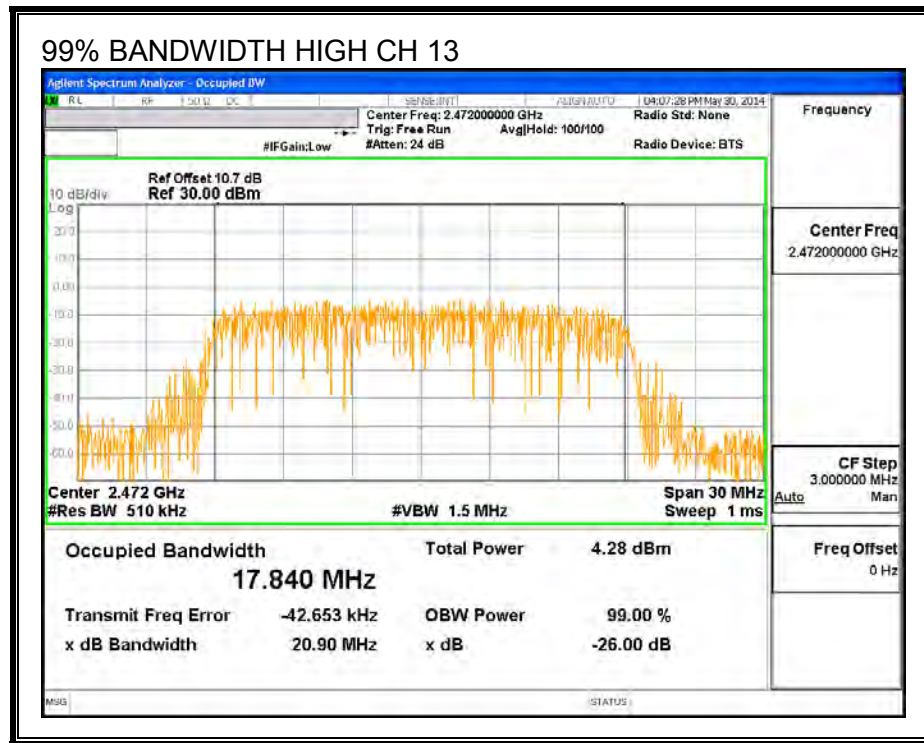


99% BANDWIDTH HIGH CH 11



99% BANDWIDTH HIGH CH 12





9.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
1	2412	13.47
2	2417	14.35
3	2422	15.32
6	2437	17.89
9	2452	16.79
10	2457	15.41
11	2462	14.38
12	2467	11.98
13	2472	4.84

9.3.4. OUTPUT POWER

LIMITS

FCC §15.247

For systems using digital modulation in the 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6dBi. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

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)
1	2412	0.81	30.00	30	36	30.00
2	2417	0.81	30.00	30	36	30.00
3	2422	0.81	30.00	30	36	30.00
6	2437	0.81	30.00	30	36	30.00
9	2452	0.81	30.00	30	36	30.00
10	2457	0.81	30.00	30	36	30.00
11	2462	0.81	30.00	30	36	30.00
12	2467	0.81	30.00	30	36	30.00
13	2472	0.81	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
1	2412	23.78	23.78	30.00	-6.22
2	2417	24.33	24.33	30.00	-5.67
3	2422	24.58	24.58	30.00	-5.42
6	2437	25.12	25.12	30.00	-4.88
9	2452	24.67	24.67	30.00	-5.33
10	2457	23.64	23.64	30.00	-6.36
11	2462	24.36	24.36	30.00	-5.64
12	2467	22.88	22.88	30.00	-7.12
13	2472	15.44	15.44	30.00	-14.56

9.3.5. PSD

LIMITS

FCC §15.247 (e)

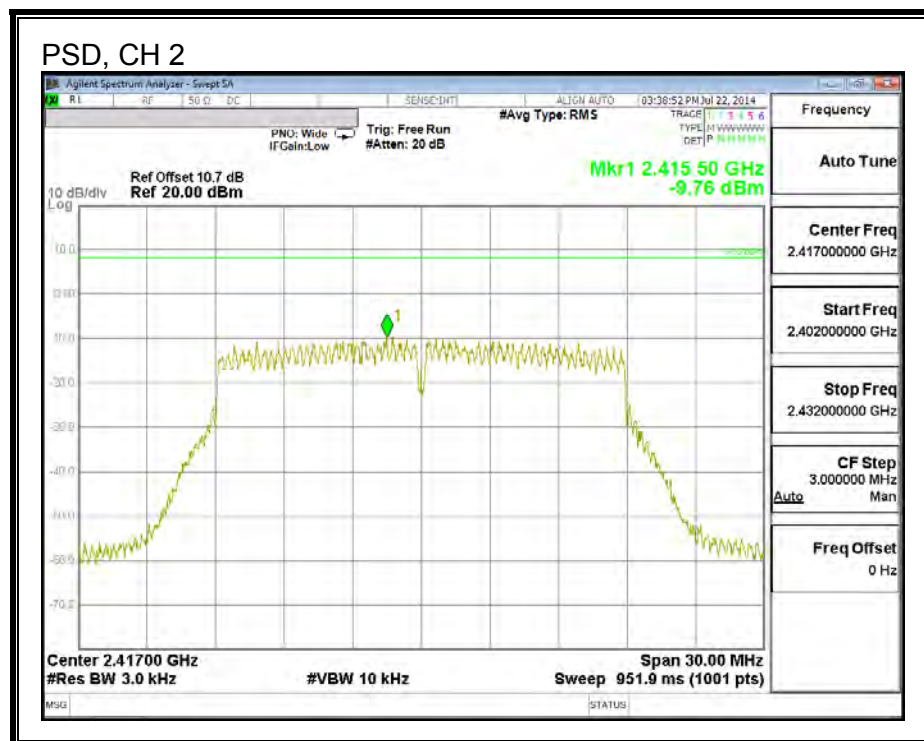
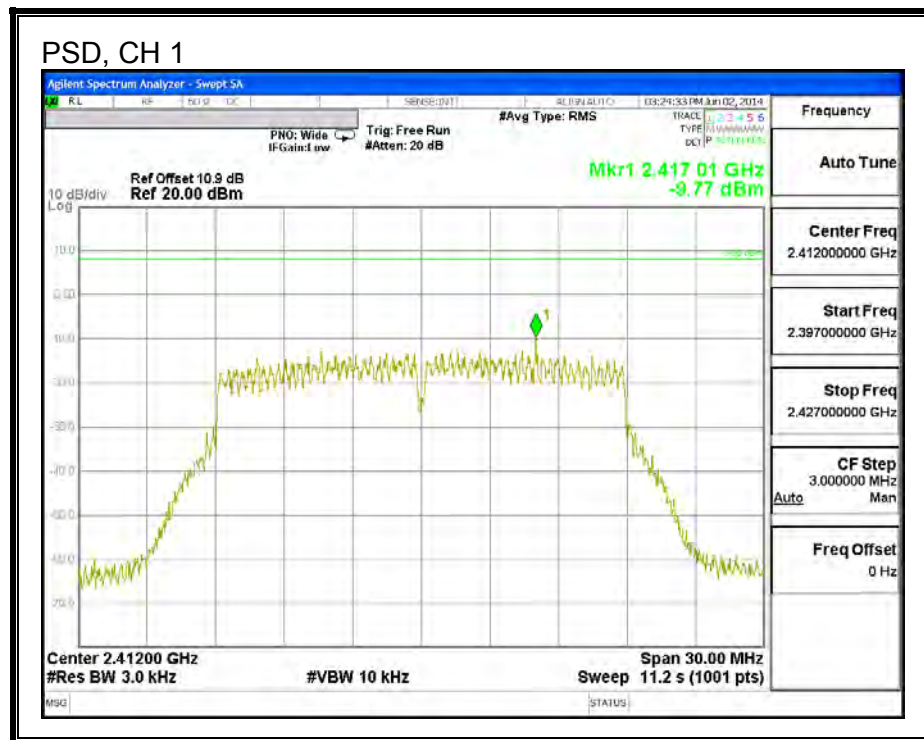
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

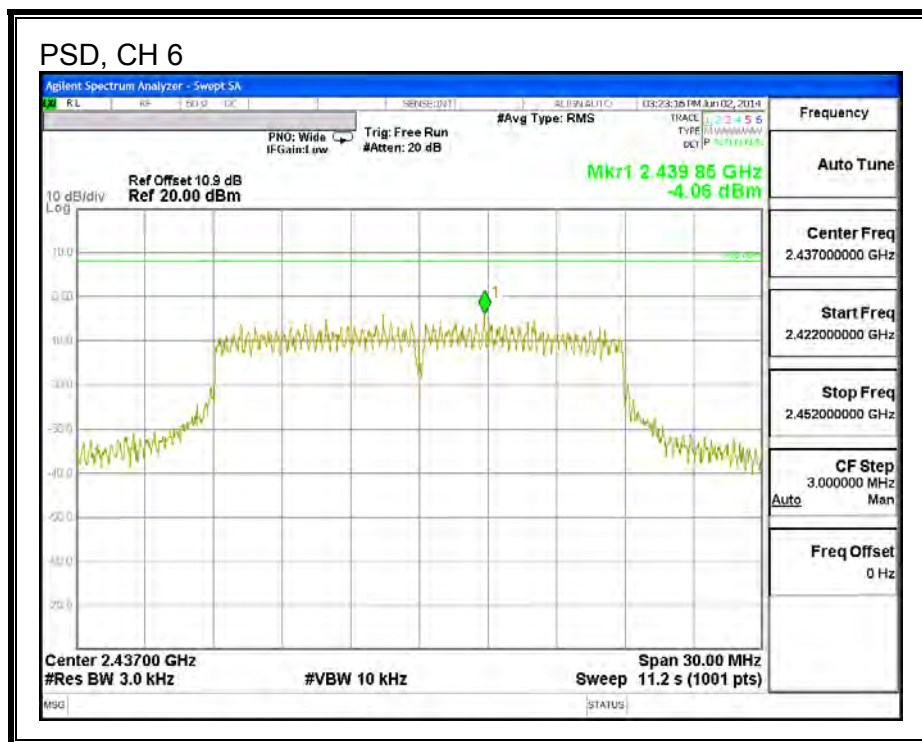
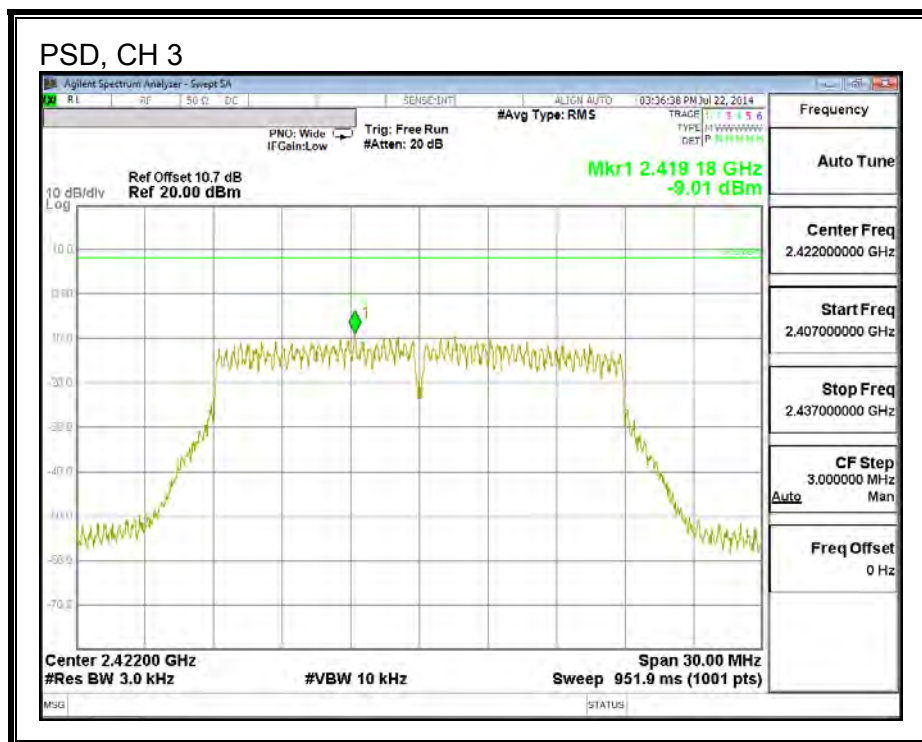
RESULTS

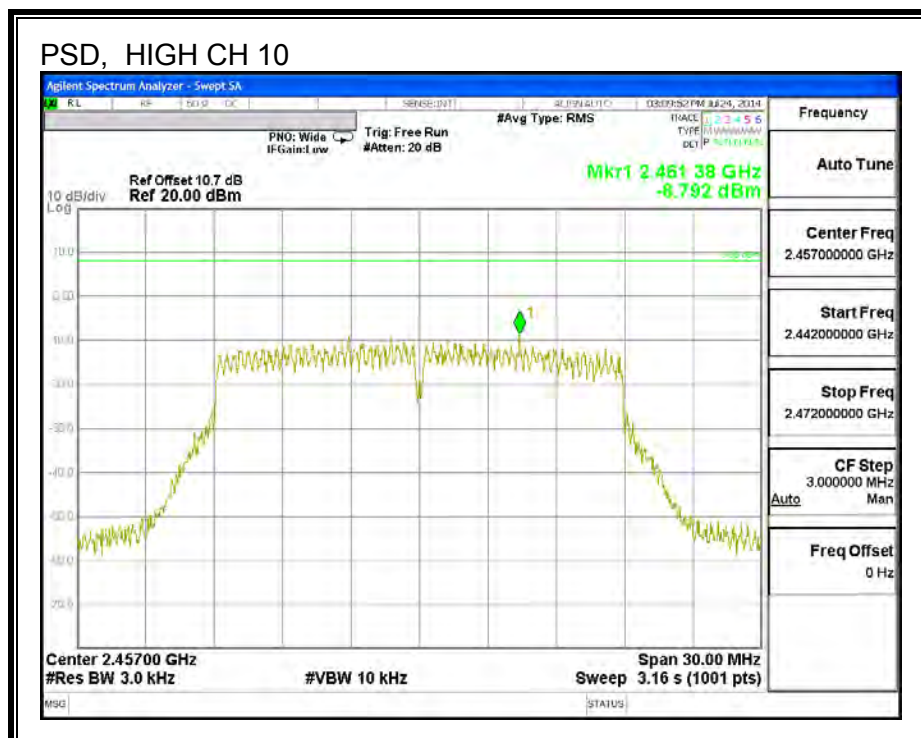
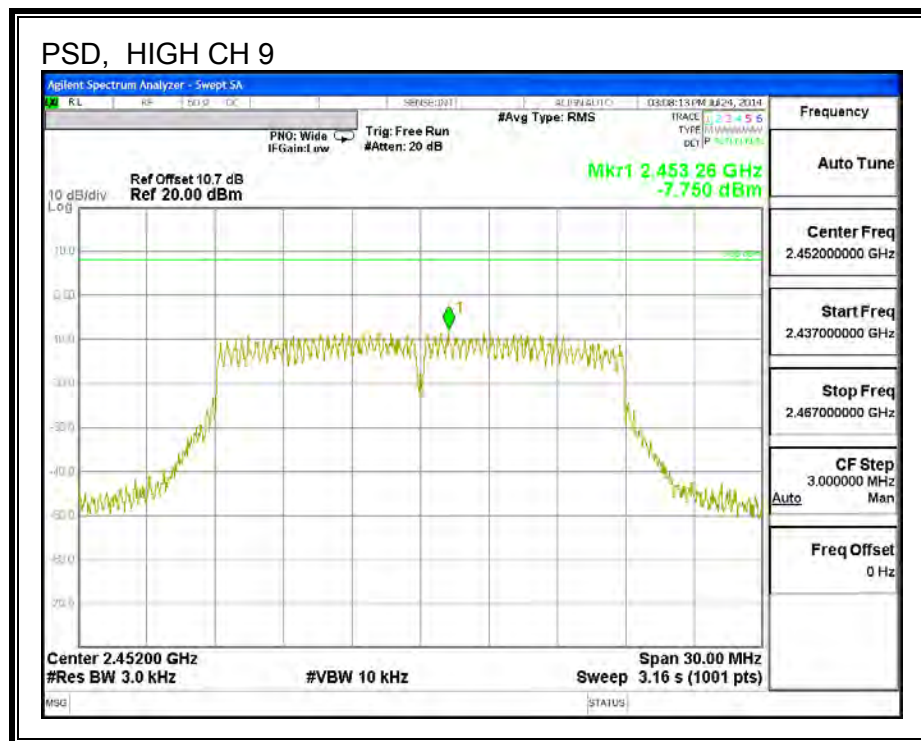
PSD Results

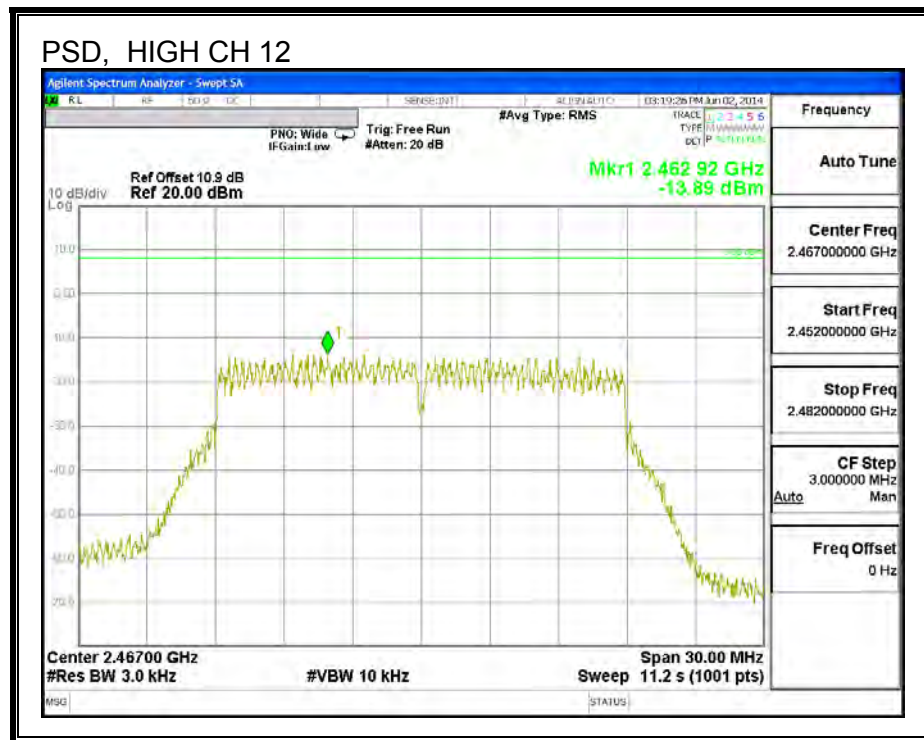
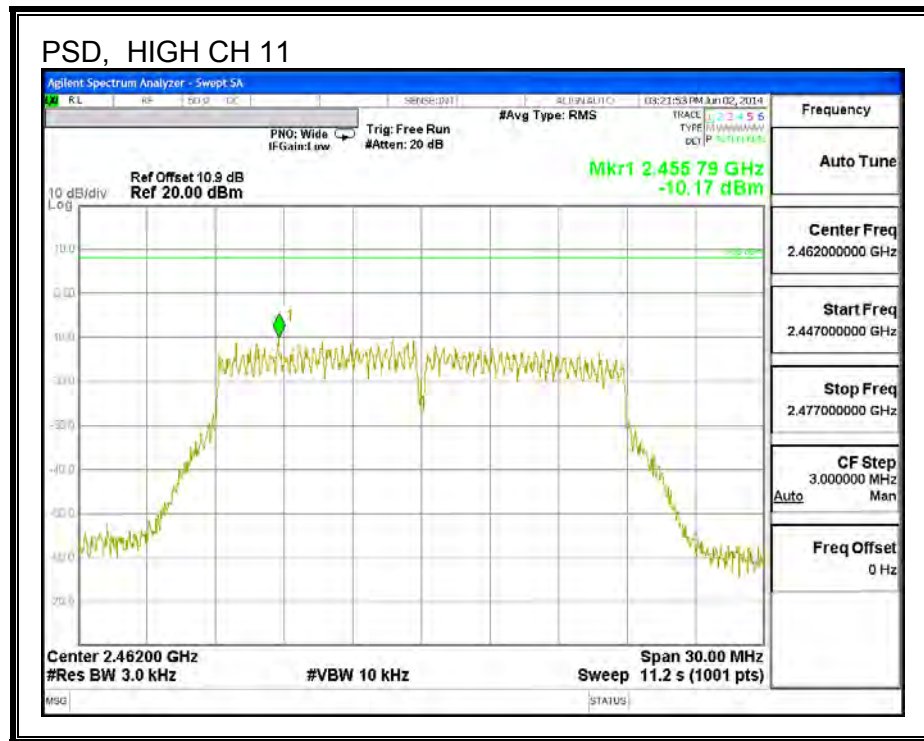
Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
1	2412	-9.77	8.0	-17.8
2	2417	-9.76	8.0	-17.8
3	2422	-9.01	8.0	-17.0
6	2437	-4.06	8.0	-12.1
9	2452	-7.75	8.0	-15.8
10	2457	-8.79	8.0	-16.8
11	2462	-10.17	8.0	-18.2
12	2467	-13.89	8.0	-21.9
13	2472	-21.22	8.0	-29.2

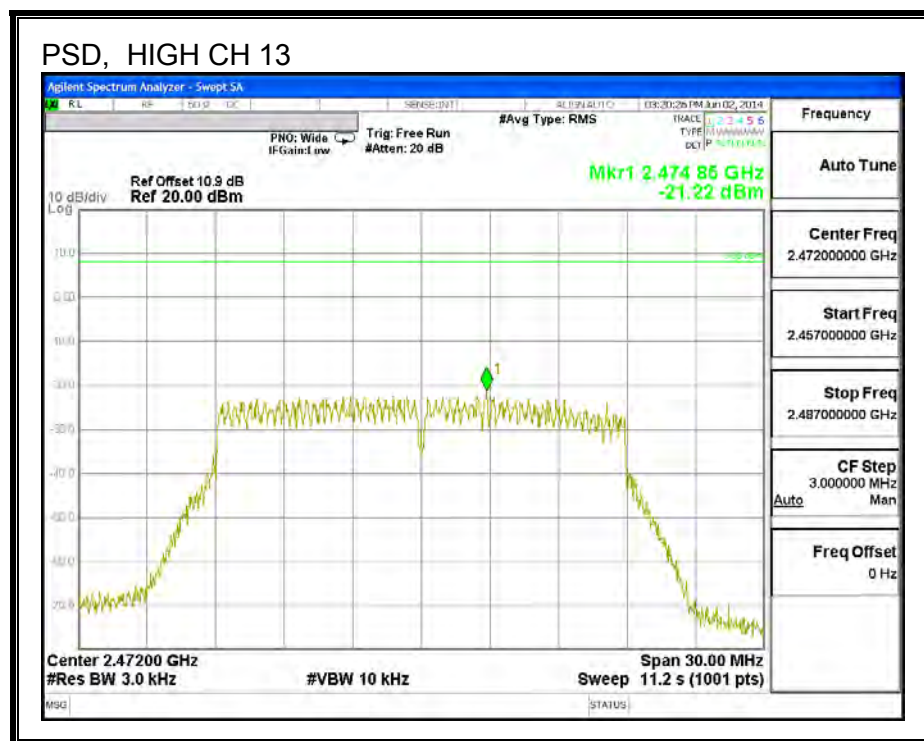
PSD











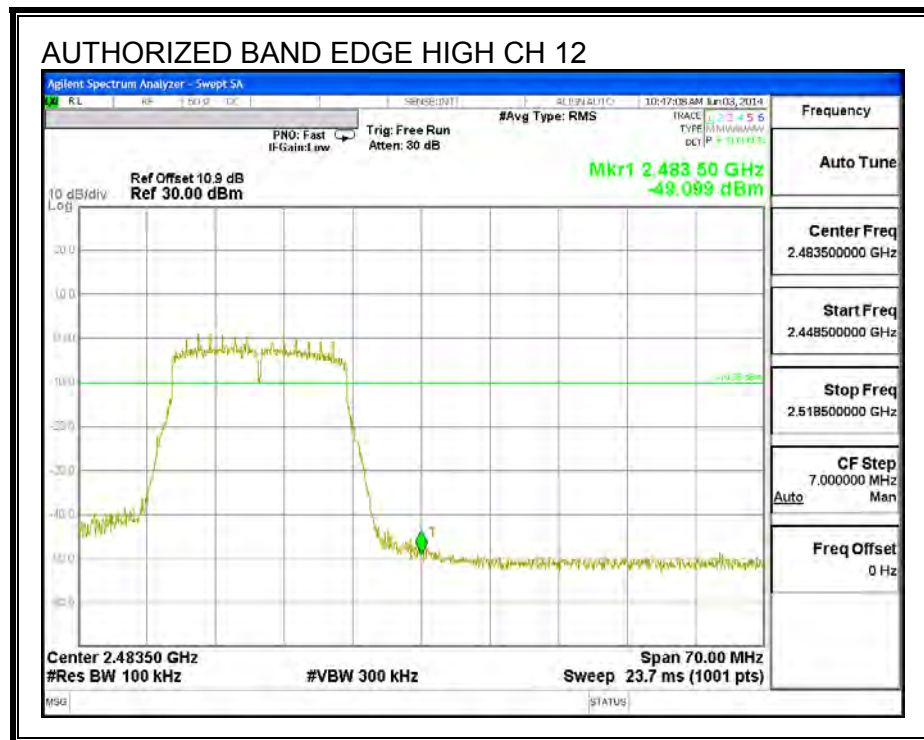
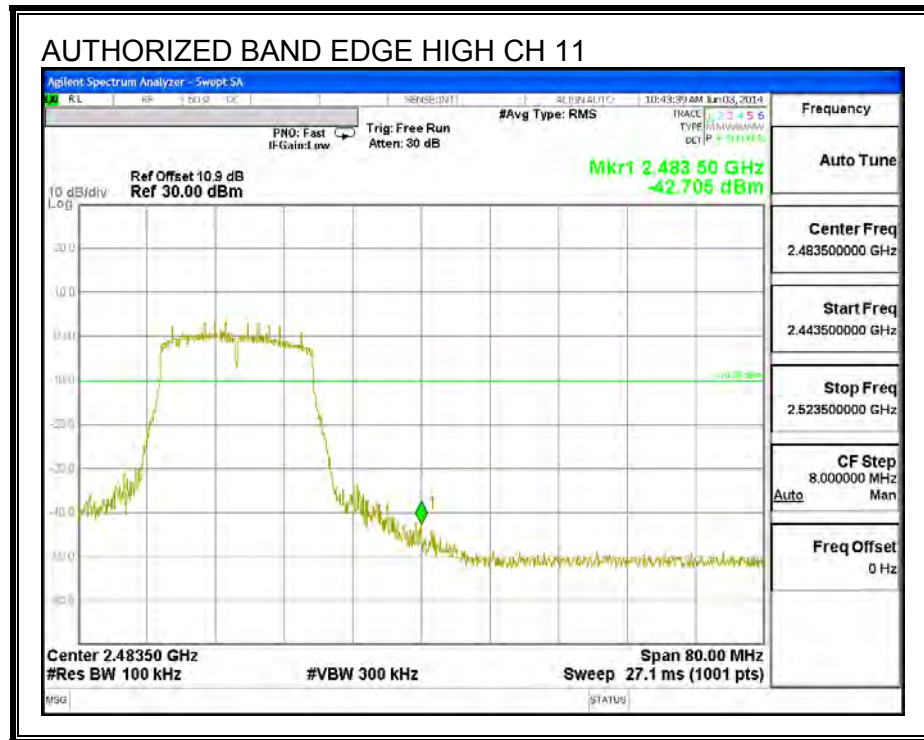
9.3.6. OUT-OF-BAND EMISSIONS

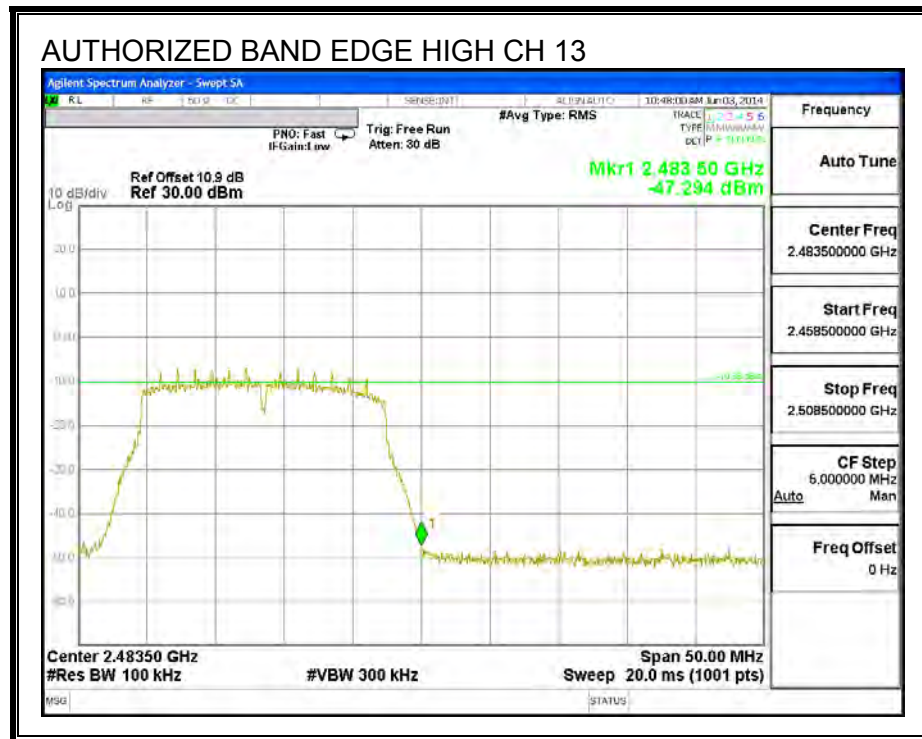
LIMITS

FCC §15.247 (d)

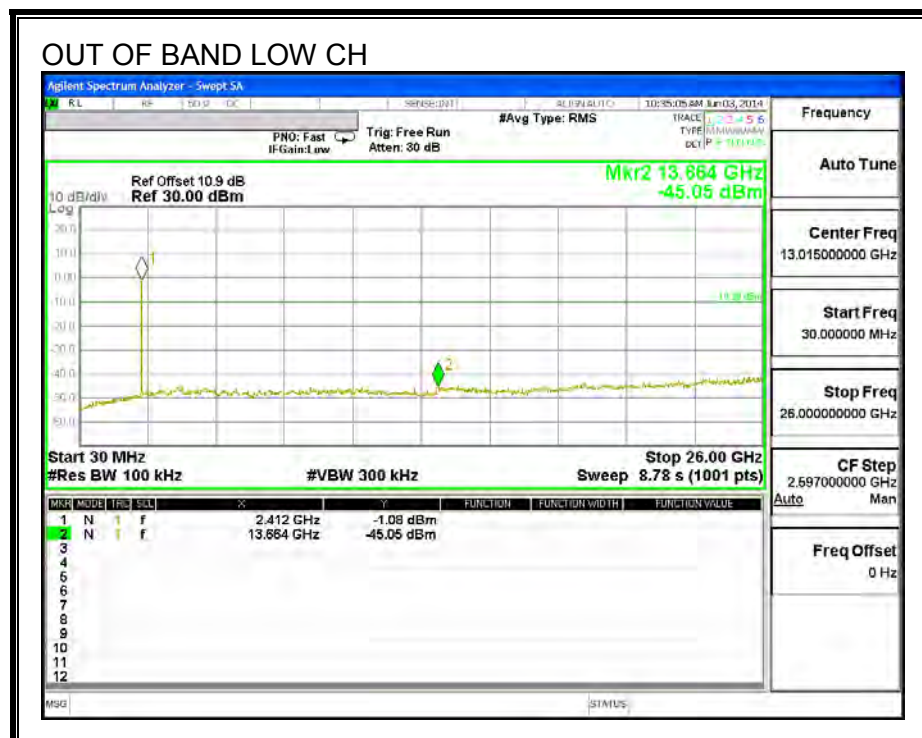
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

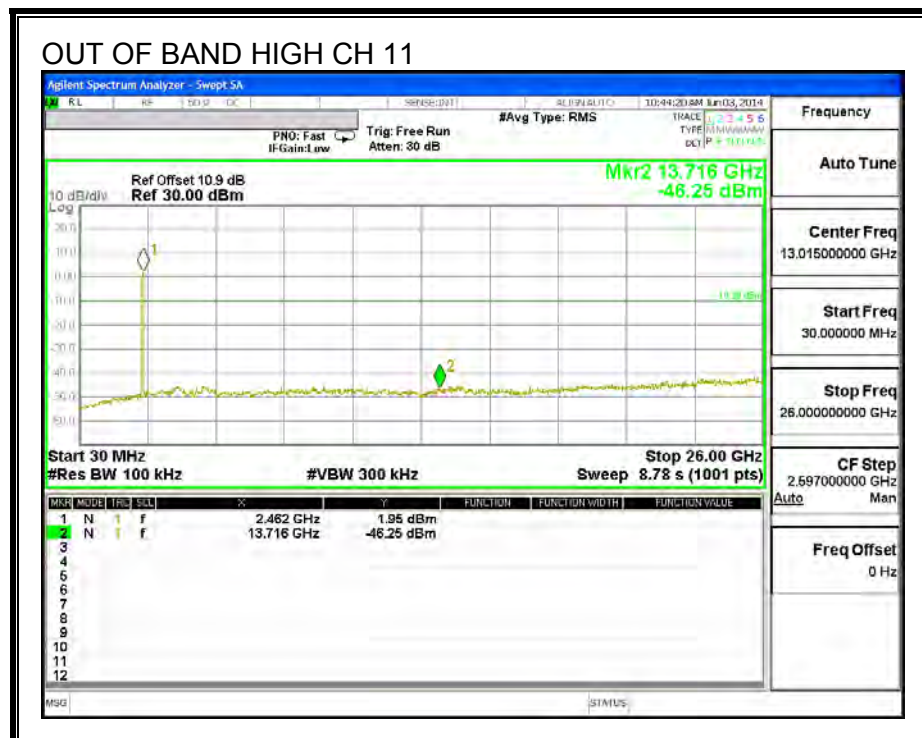
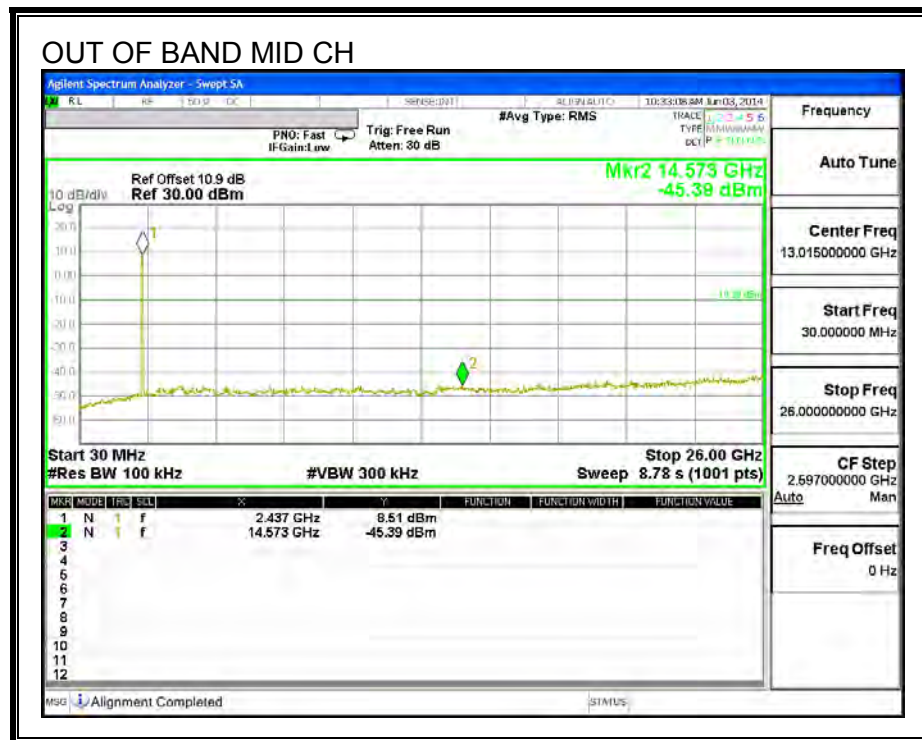
HIGH CHANNEL BANDEDGE

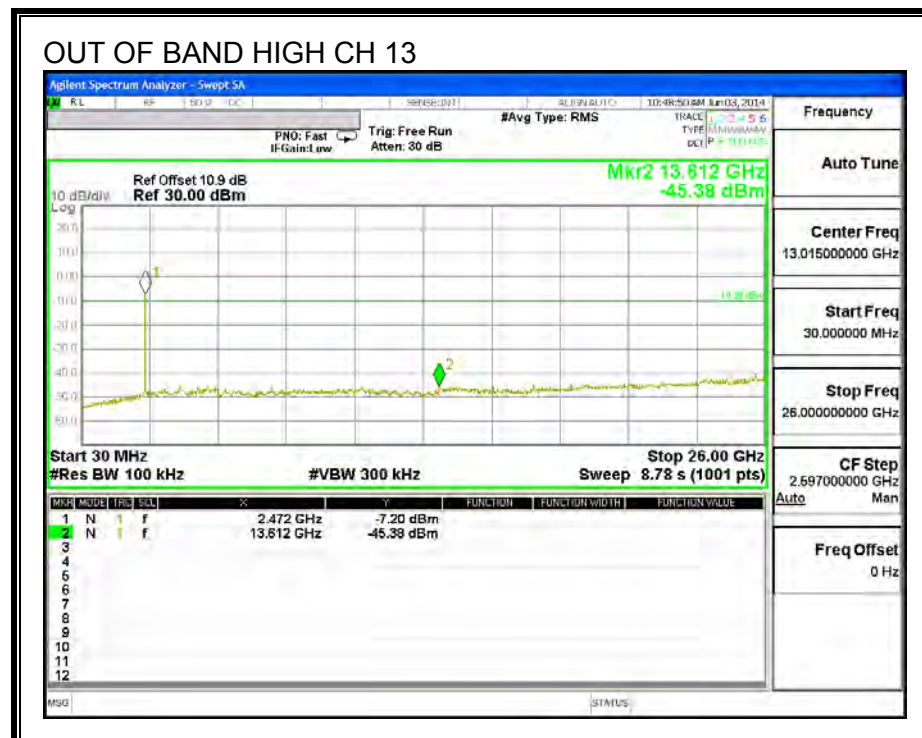
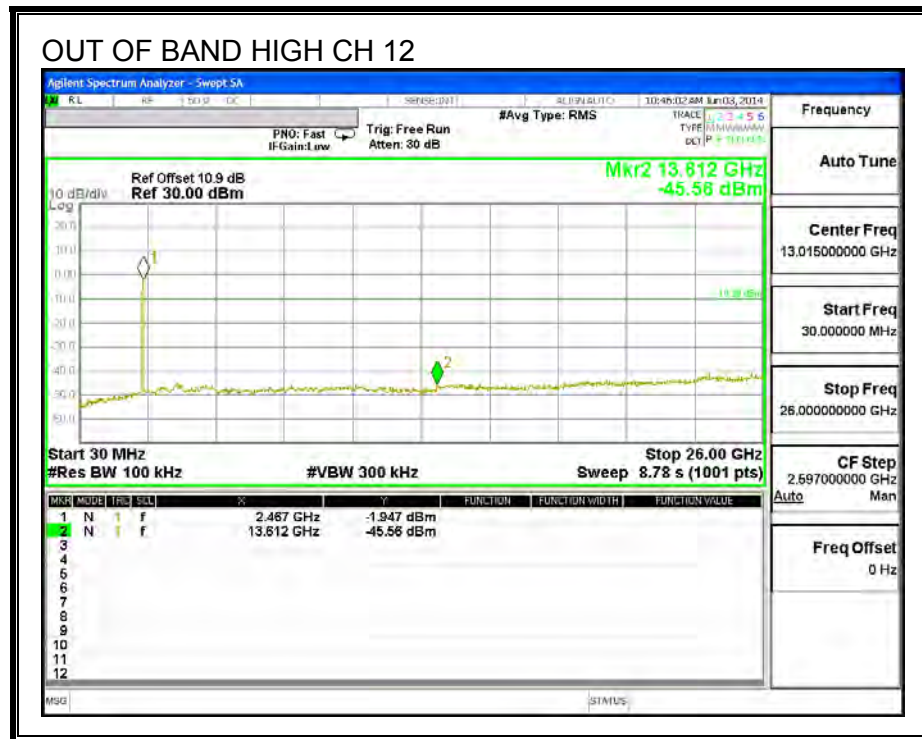




OUT-OF-BAND EMISSIONS







10. RADIATED TEST RESULTS

10.1. 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.

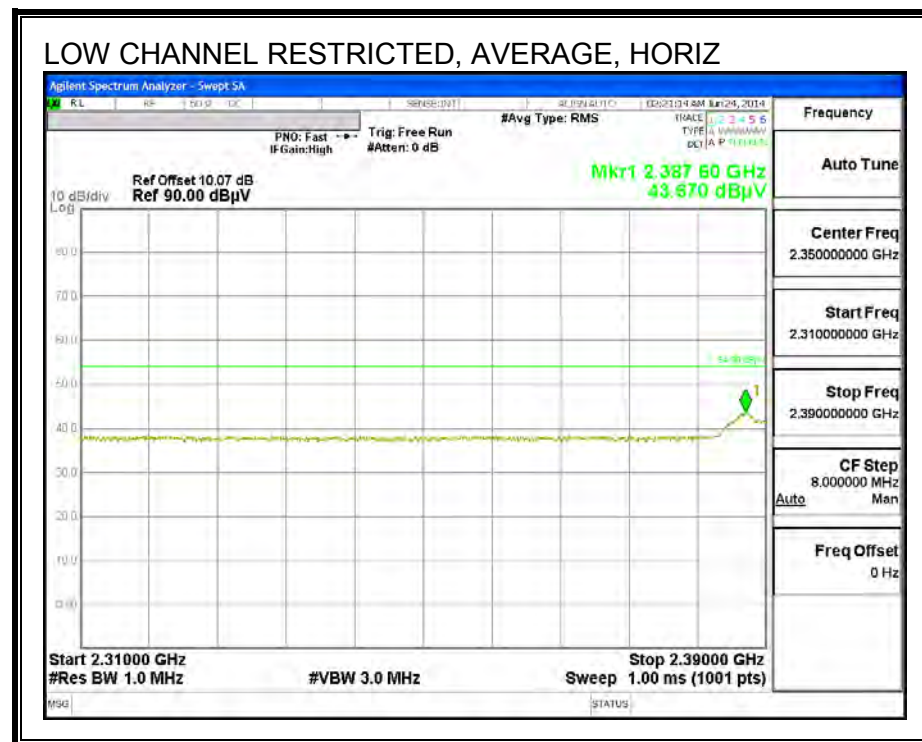
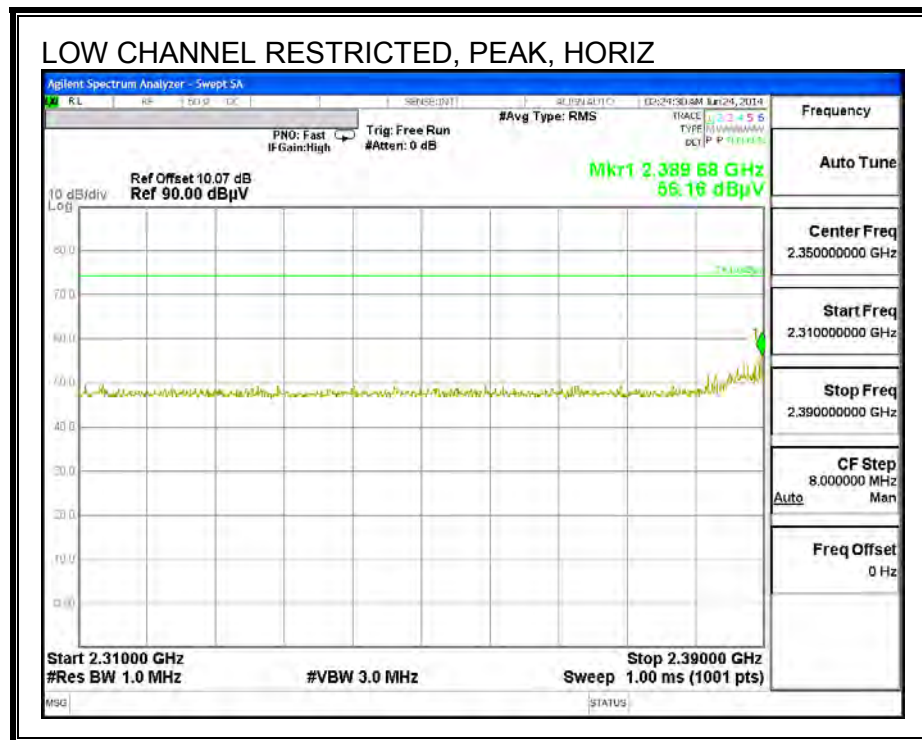
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

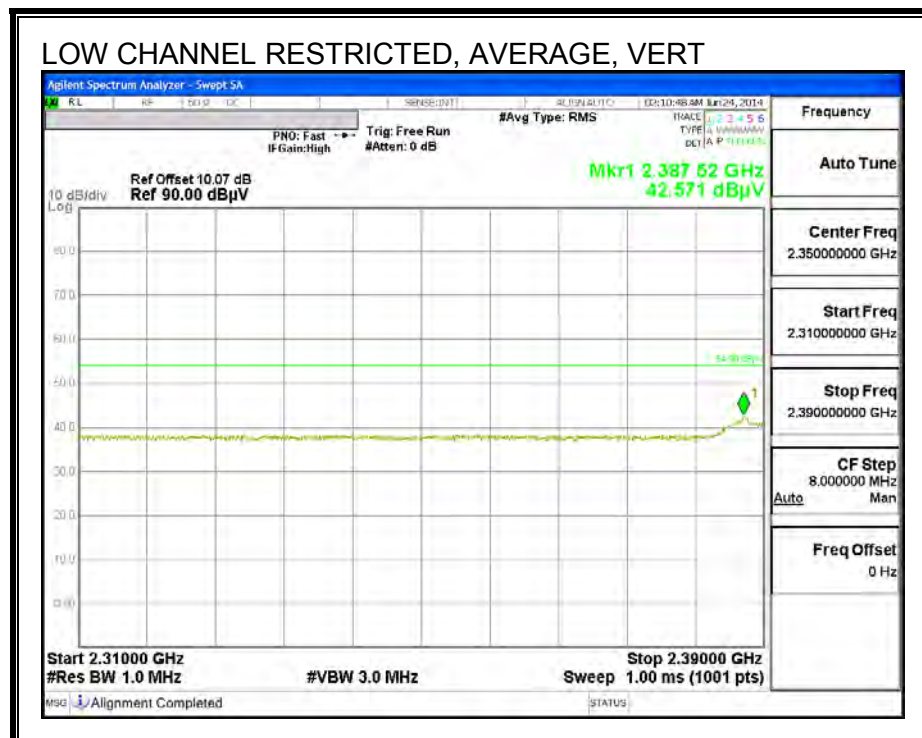
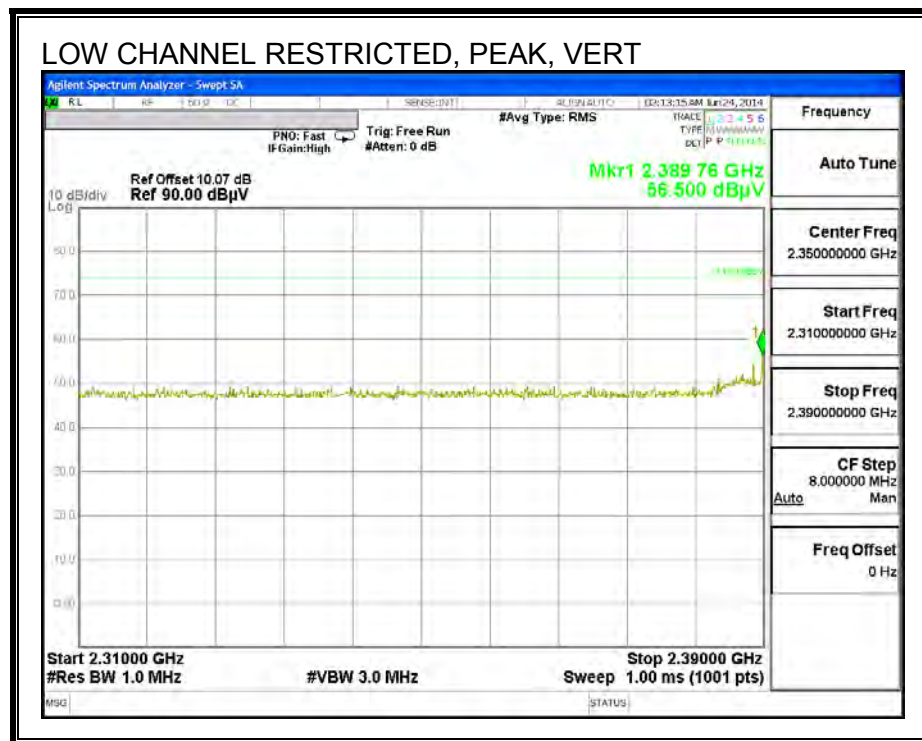
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

10.2. TX RADIATED ABOVE 1 GHz

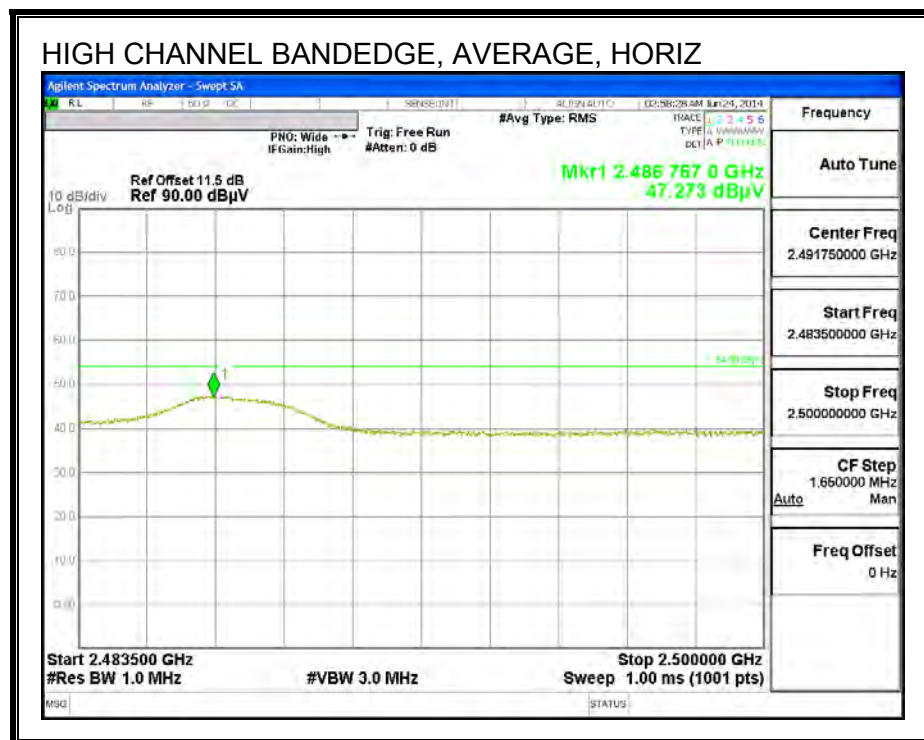
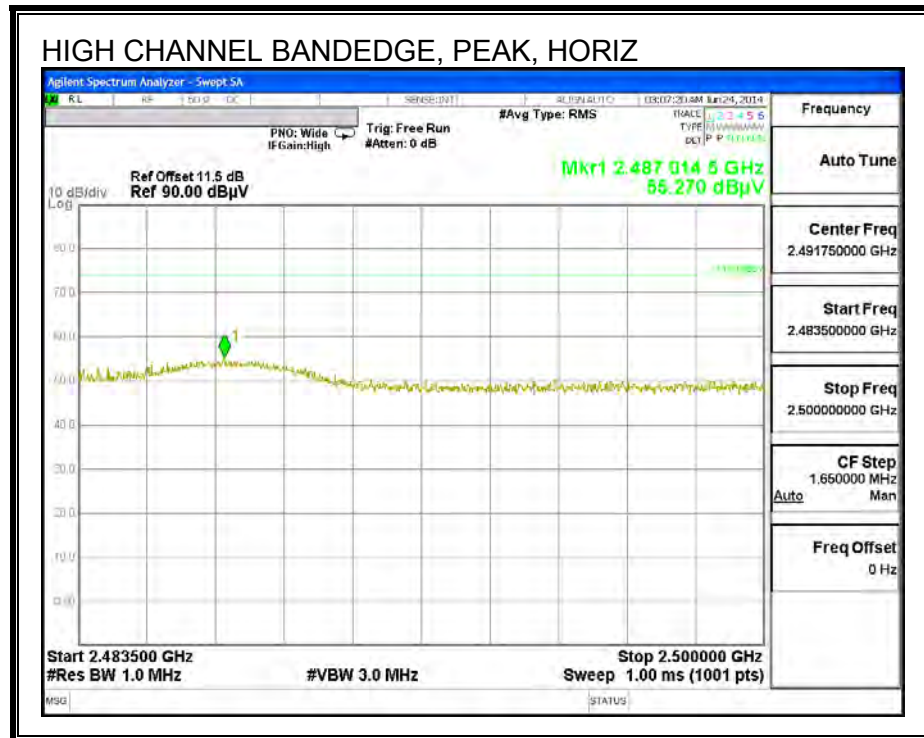
10.2.1.802.11b MODE IN THE 2.4 GHz BAND

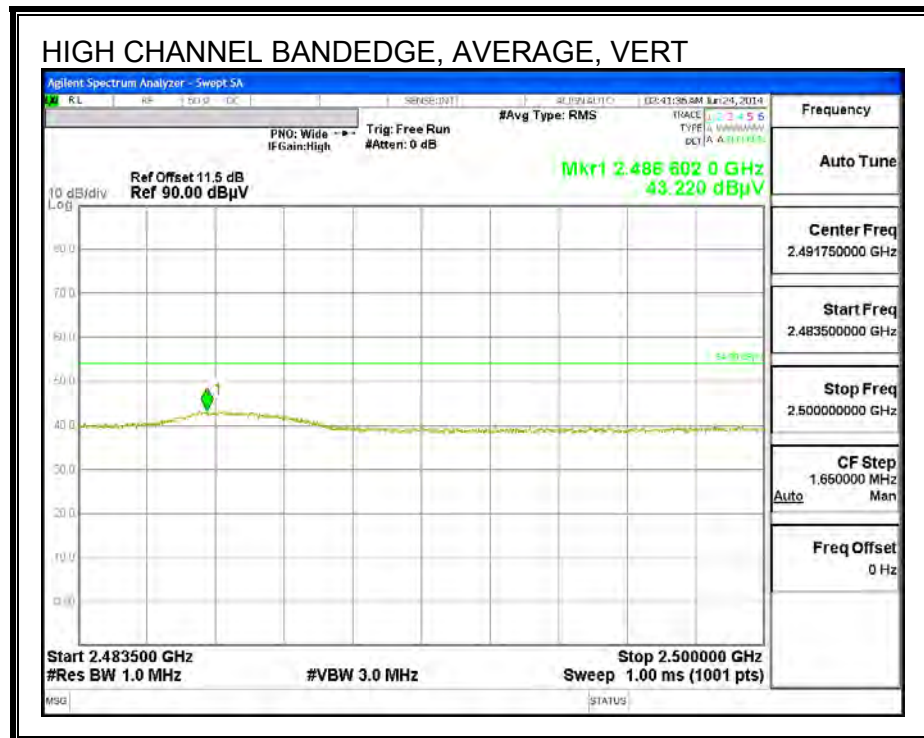
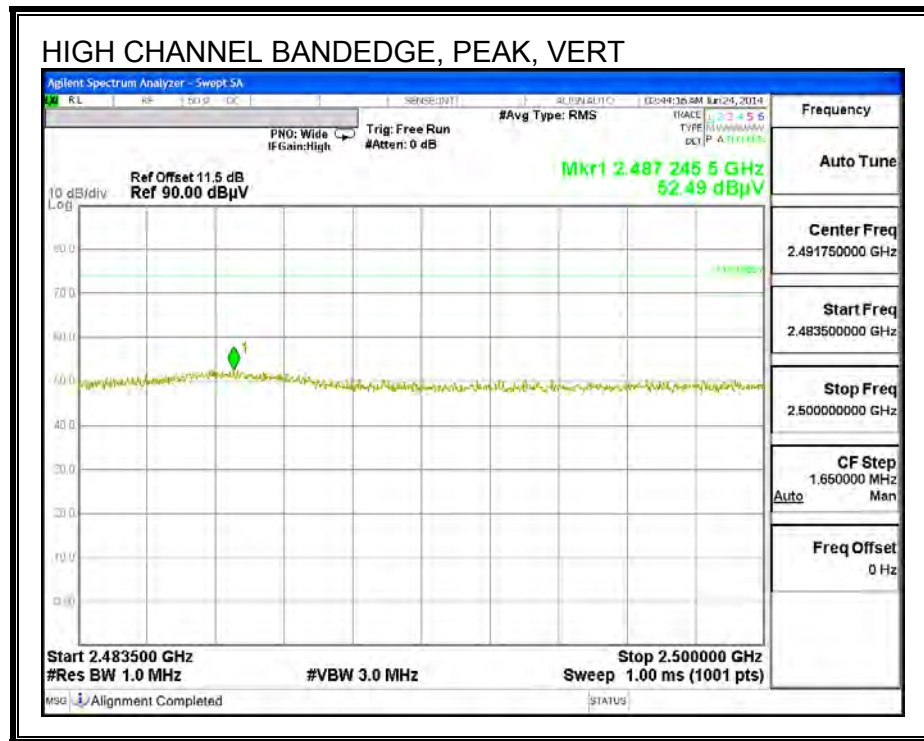
RESTRICTED BANDEDGE (LOW CHANNEL, CHANNEL 1)



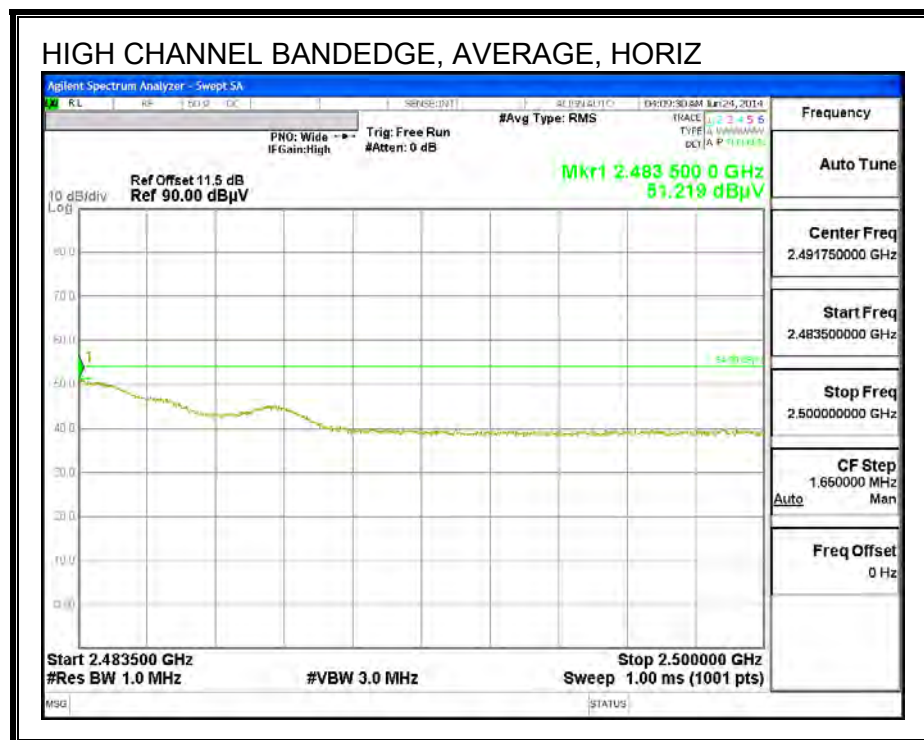
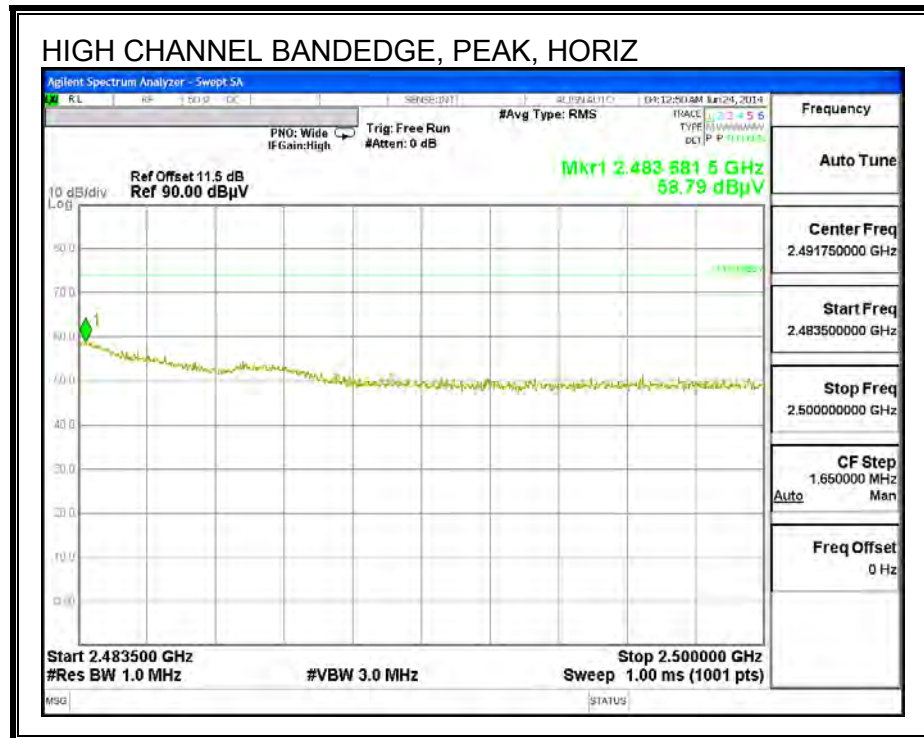


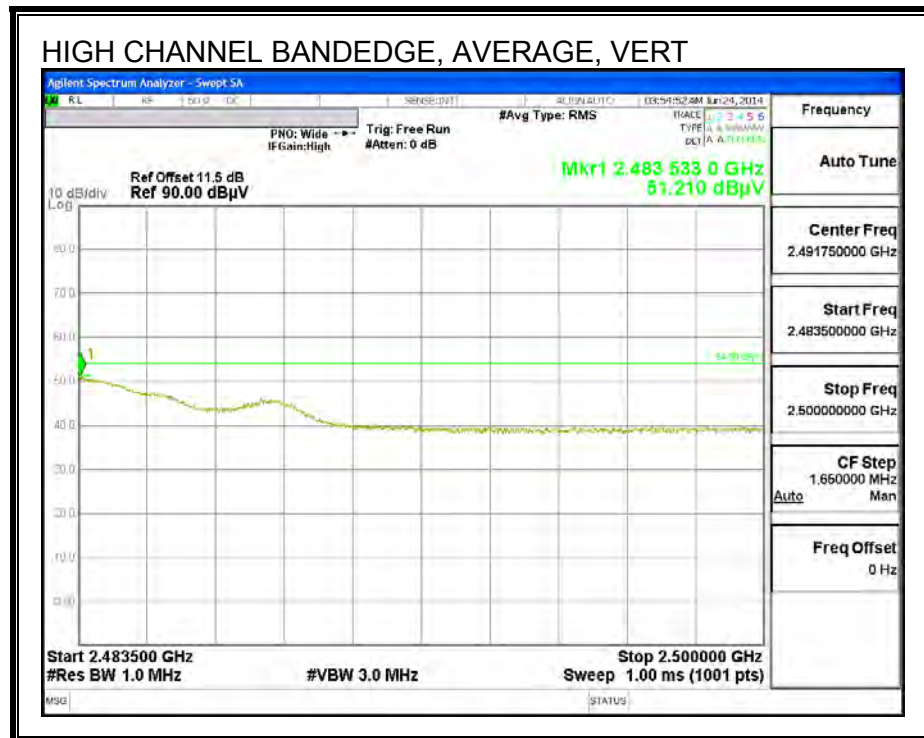
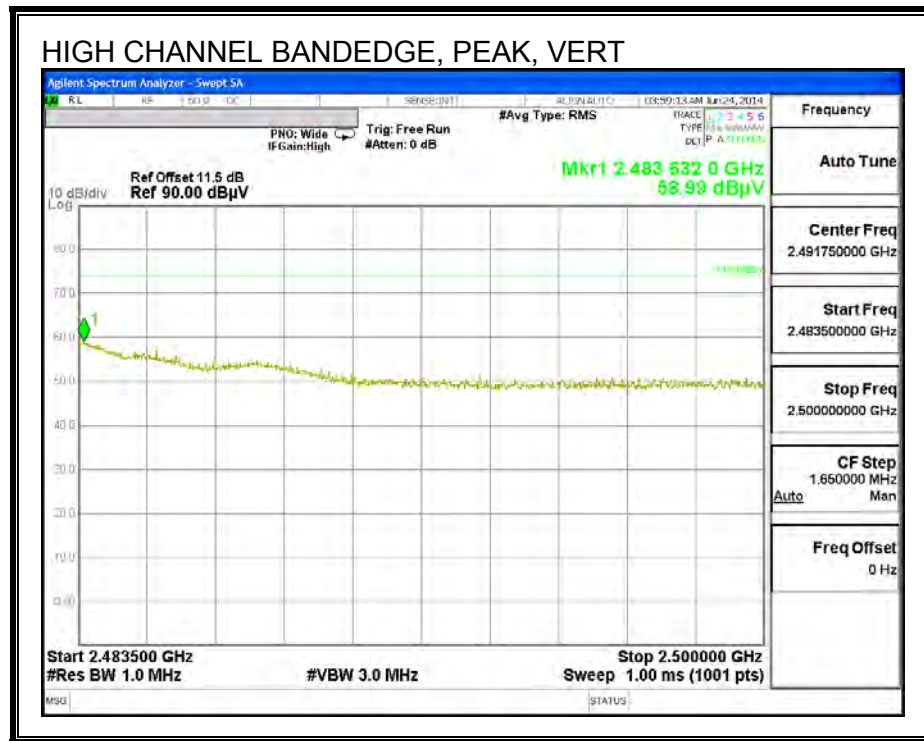
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 11)



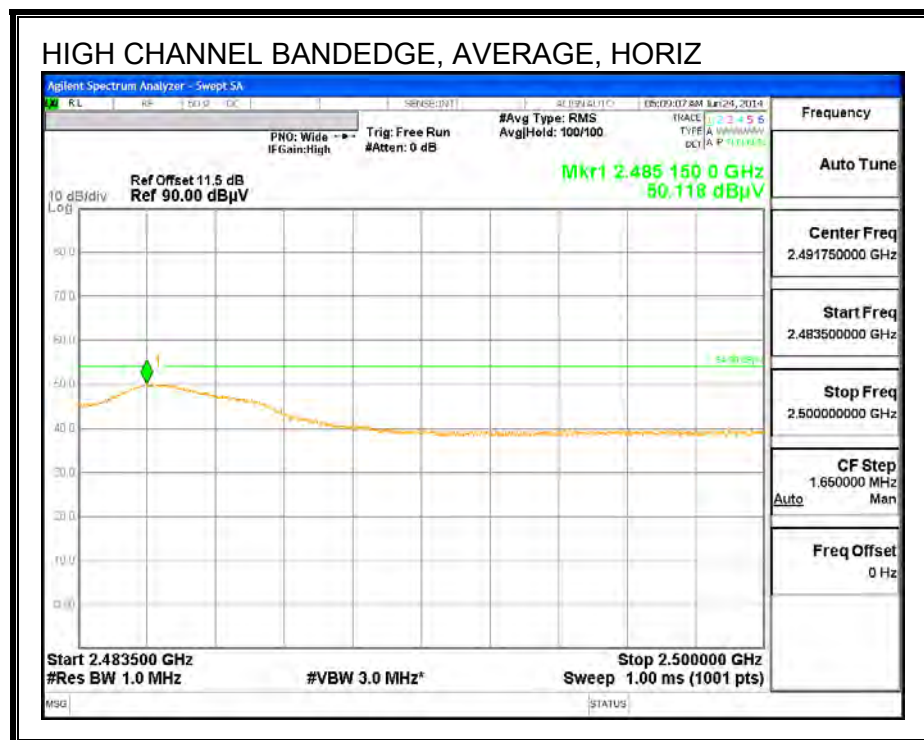
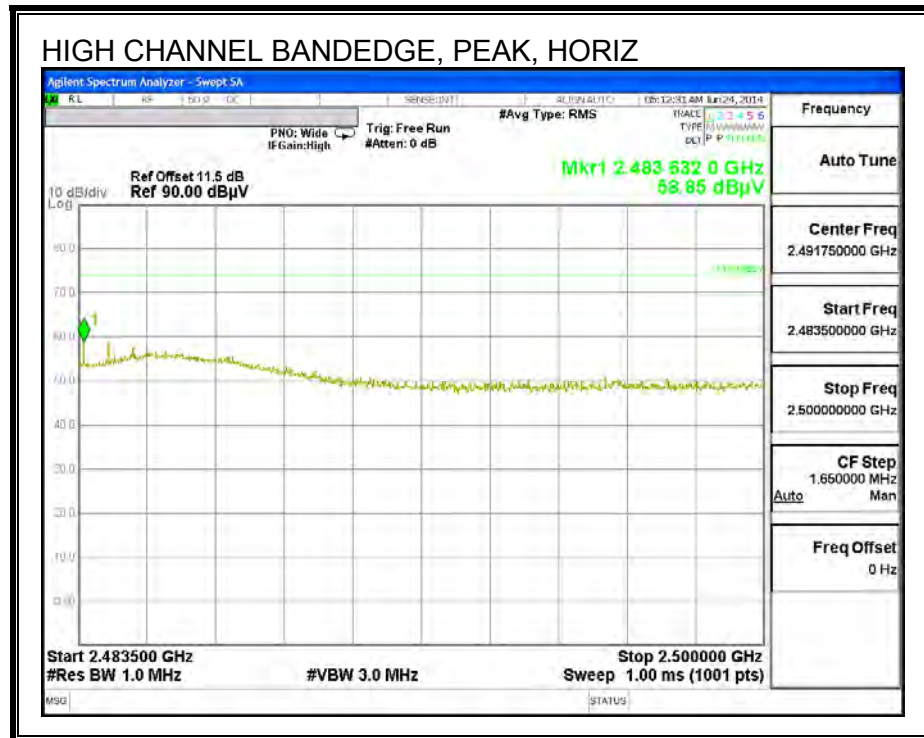


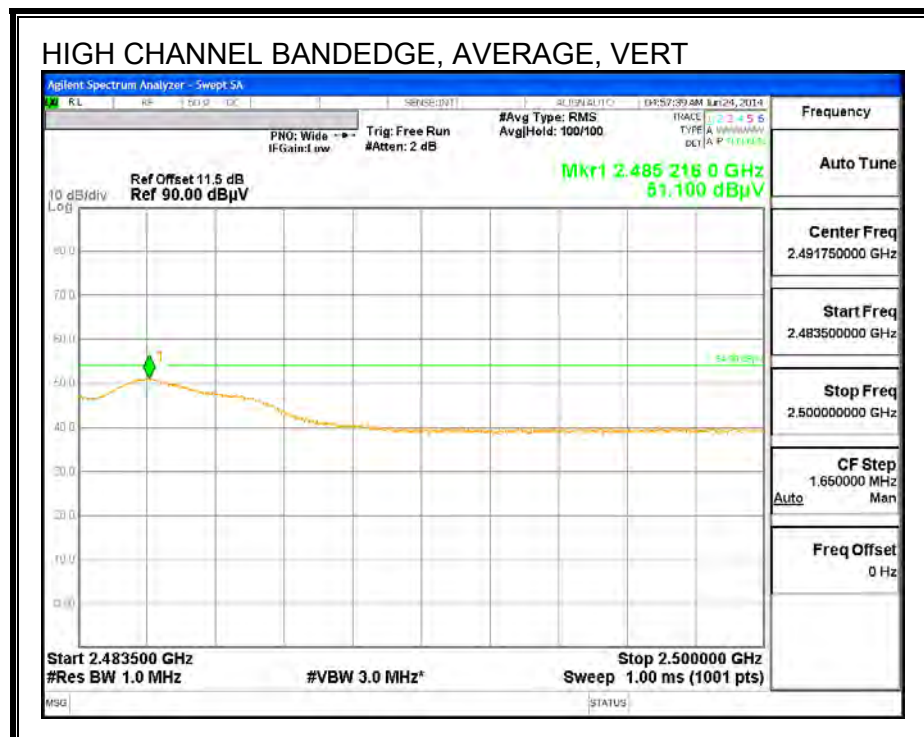
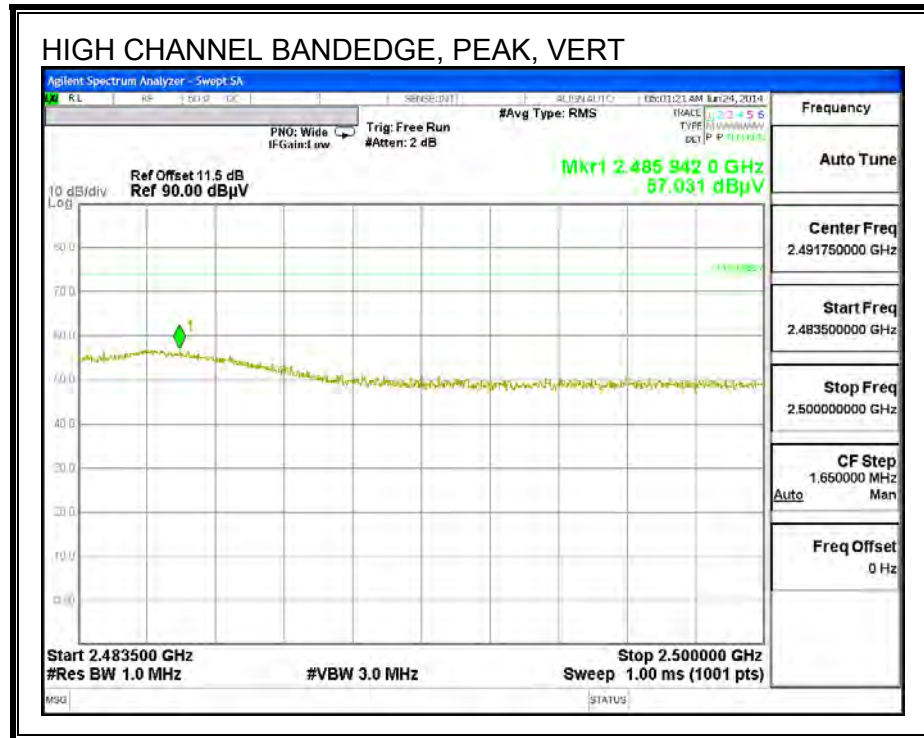
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 12)





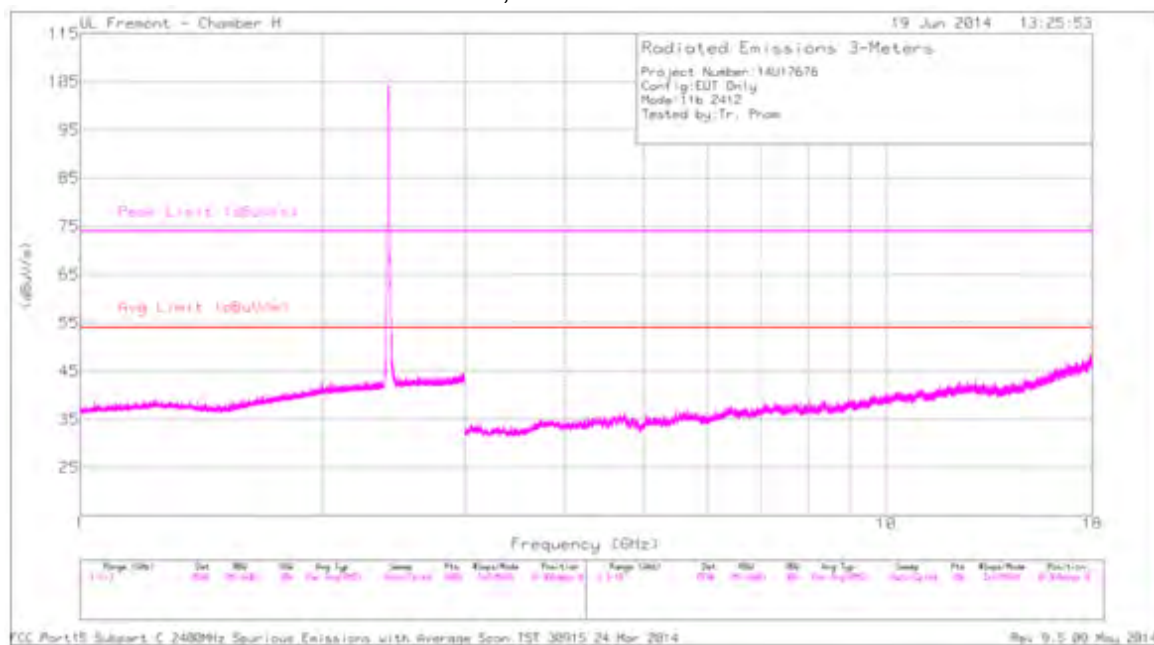
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 13)



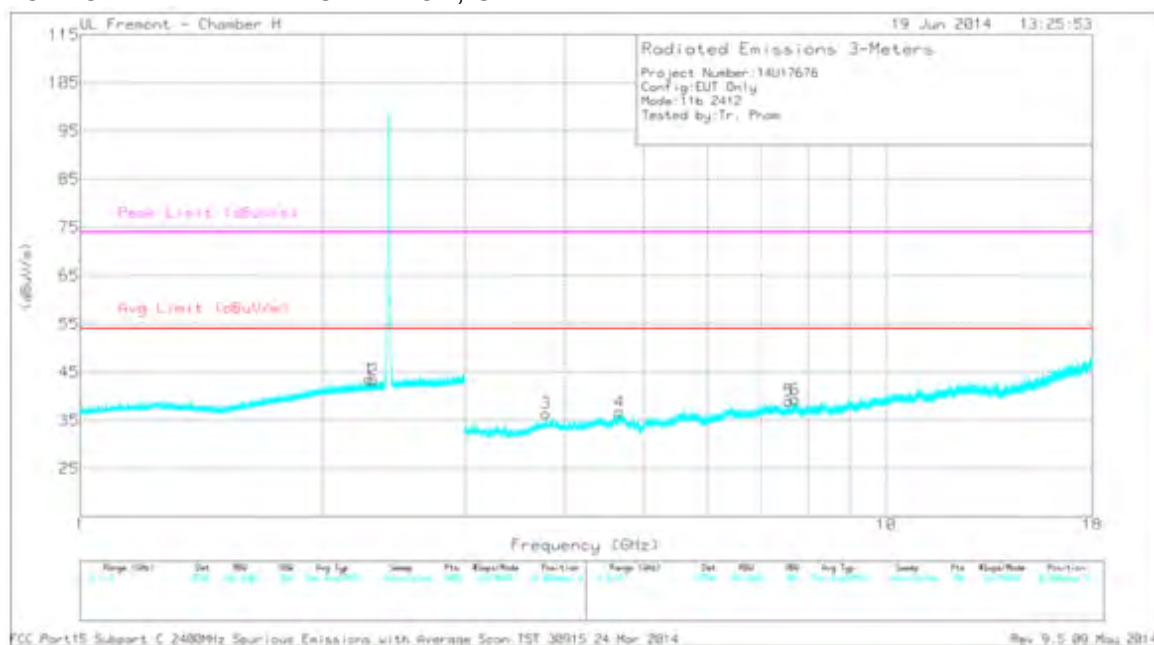


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT, CH 1



LOW CHANNEL VERTICAL PLOT, CH 1



DATA

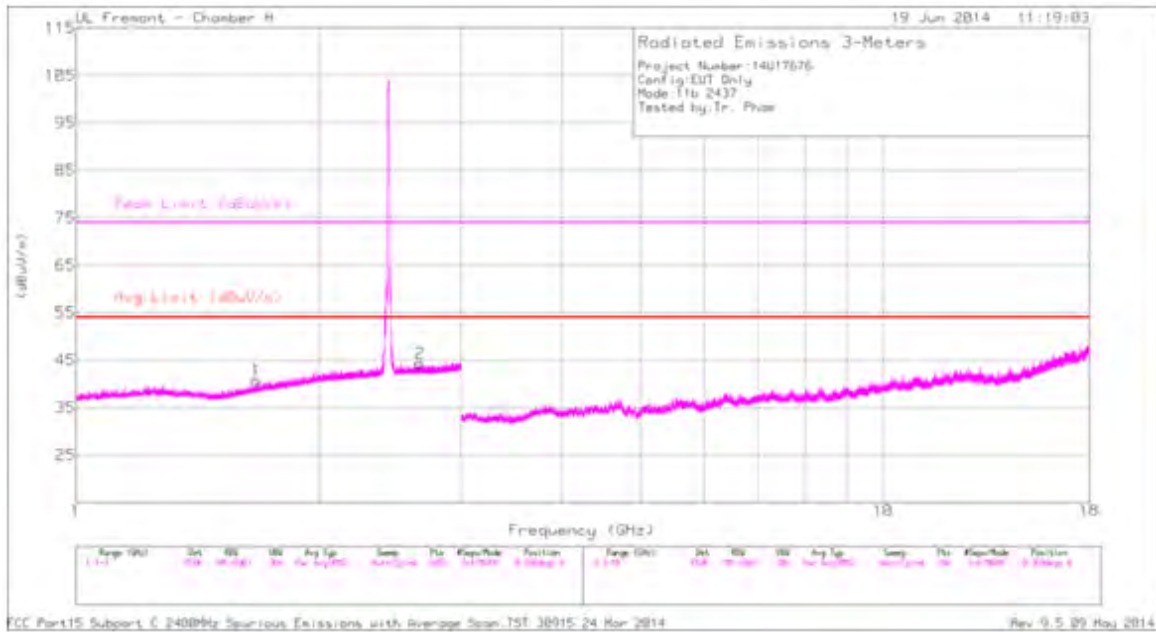
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.287	44.27	PK2	31.8	-24.6	51.47	-	-	74	-22.53	360	152	V
	* 2.286	31.73	MAv1	31.8	-24.6	38.93	54	-15.07	-	-	360	152	V
2	* 2.313	43.57	PK2	31.8	-24.6	50.77	-	-	74	-23.23	360	272	V
	* 2.312	31.7	MAv1	31.8	-24.6	38.9	54	-15.1	-	-	360	272	V
3	* 3.782	45.6	PK2	33.2	-32.6	46.2	-	-	74	-27.8	360	359	V
	* 3.782	33.43	MAv1	33.2	-32.6	34.03	54	-19.97	-	-	360	359	V
4	* 4.667	43.91	PK2	34.2	-31.9	46.21	-	-	74	-27.79	360	339	V
	* 4.668	32.33	MAv1	34.2	-31.9	34.63	54	-19.37	-	-	360	339	V
5	* 7.57	42.72	PK2	36.1	-29.8	49.02	-	-	74	-24.98	353	201	V
	* 7.57	31.01	MAv1	36.1	-29.8	37.31	54	-16.69	-	-	353	201	V
6	* 7.703	42.99	PK2	36.1	-28.5	50.59	-	-	74	-23.41	353	400	V
	* 7.702	30.73	MAv1	36.1	-28.5	38.33	54	-15.67	-	-	353	400	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

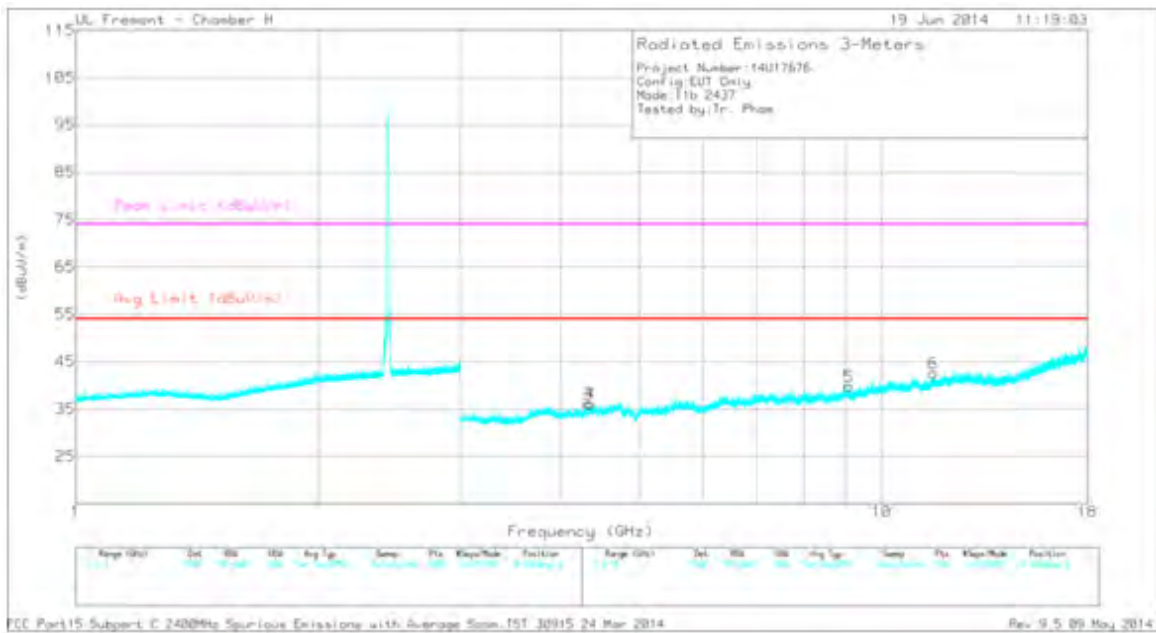
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL PLOT, CH 6



MID CHANNEL VERTICAL PLOT, CH 6



DATA

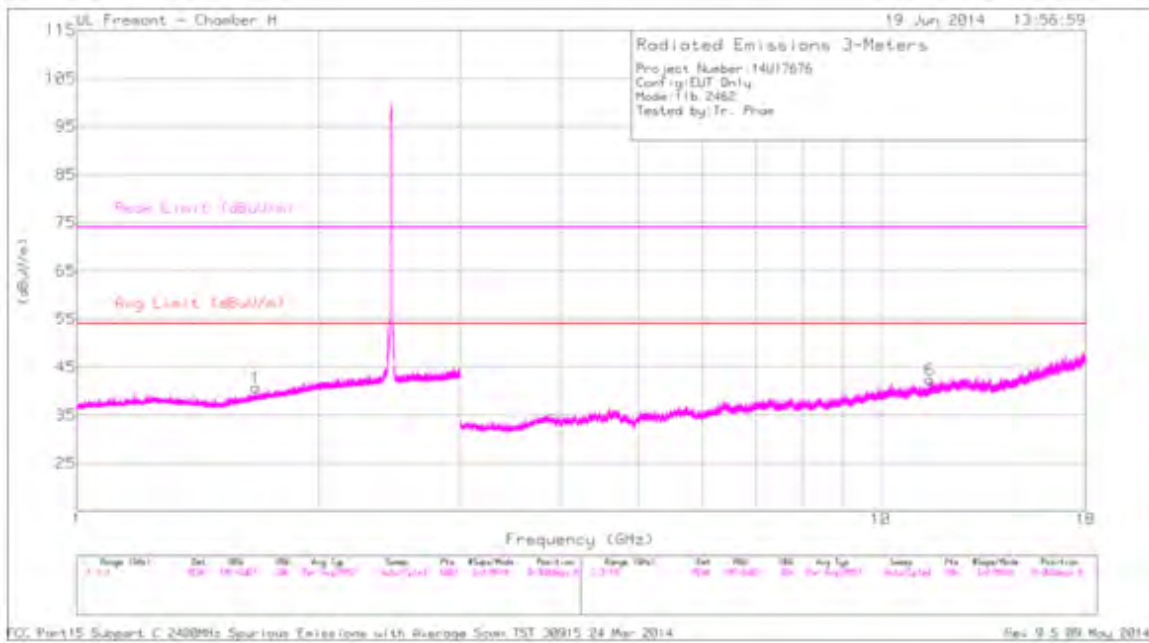
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.671	43.81	PK2	29.1	-25	47.91	-	-	74	-26.09	0	359	H
	* 1.671	31.94	MAv1	29.1	-25	36.04	54	-17.96	-	-	0	359	H
2	* 2.668	43.9	PK2	32.3	-24.3	51.9	-	-	74	-22.1	0	133	H
	* 2.668	31.86	MAv1	32.3	-24.3	39.86	54	-14.14	-	-	0	133	H
3	* 4.319	44.15	PK2	33.6	-32.1	45.65	-	-	74	-28.35	0	206	V
	* 4.319	32.29	MAv1	33.6	-32.1	33.79	54	-20.21	-	-	0	206	V
4	* 4.351	44.14	PK2	33.7	-32	45.84	-	-	74	-28.16	0	132	V
	* 4.351	32.37	MAv1	33.7	-32	34.07	54	-19.93	-	-	0	132	V
5	* 9.11	41.9	PK2	36.5	-27.2	51.2	-	-	74	-22.8	216	202	V
	* 9.11	30.04	MAv1	36.5	-27.3	39.24	54	-14.76	-	-	216	202	V
6	* 11.58	41.3	PK2	38.2	-25.1	54.4	-	-	74	-19.6	216	125	V
	* 11.58	29.77	MAv1	38.2	-25.1	42.87	54	-11.13	-	-	216	125	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 11



DATA

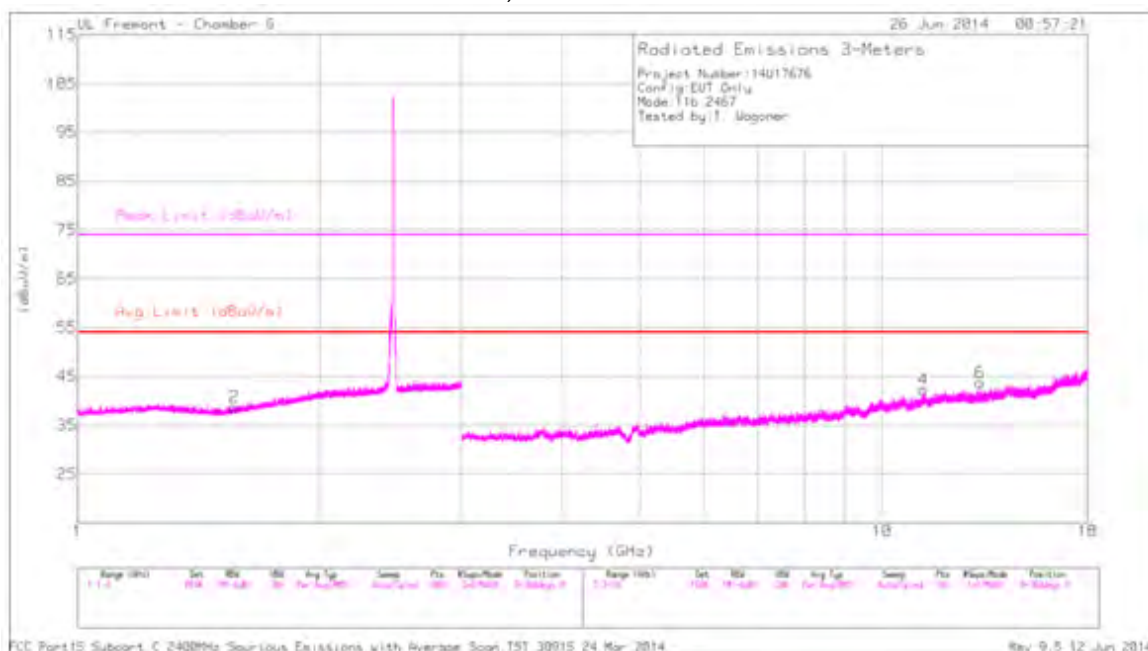
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.672	43.74	PK2	29.1	-25	47.84	-	-	74	-26.16	30	300	H
	* 1.672	31.83	MAv1	29.1	-25	35.93	54	-18.07	-	-	30	300	H
2	* 2.787	44.03	PK2	32.4	-24.3	52.13	-	-	74	-21.87	30	369	V
	* 2.787	31.78	MAv1	32.4	-24.3	39.88	54	-14.12	-	-	30	369	V
6	* 11.519	41.94	PK2	38.1	-25.5	54.54	-	-	74	-19.46	30	286	H
	* 11.52	29.96	MAv1	38.1	-25.5	42.56	54	-11.44	-	-	30	286	H
3	* 4.358	44.45	PK2	33.7	-31.9	46.25	-	-	74	-27.75	30	277	V
	* 4.359	32.29	MAv1	33.7	-31.9	34.09	54	-19.91	-	-	30	277	V
4	* 8.348	42.57	PK2	36.1	-27.4	51.27	-	-	74	-22.73	30	215	V
	* 8.348	30.31	MAv1	36.1	-27.4	39.01	54	-14.99	-	-	30	215	V
5	* 9.375	41.77	PK2	36.7	-26.4	52.07	-	-	74	-21.93	30	346	V
	* 9.376	30.03	MAv1	36.7	-26.5	40.23	54	-13.77	-	-	30	346	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

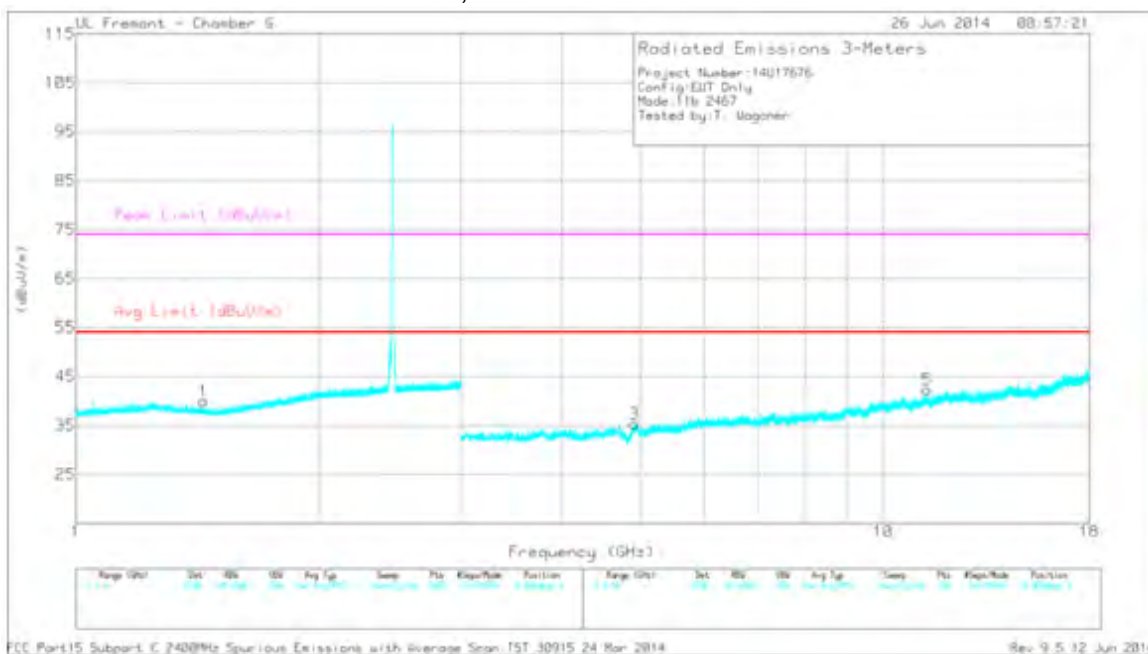
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 12



HIGH CHANNEL VERTICAL PLOT, CH 12



DATA

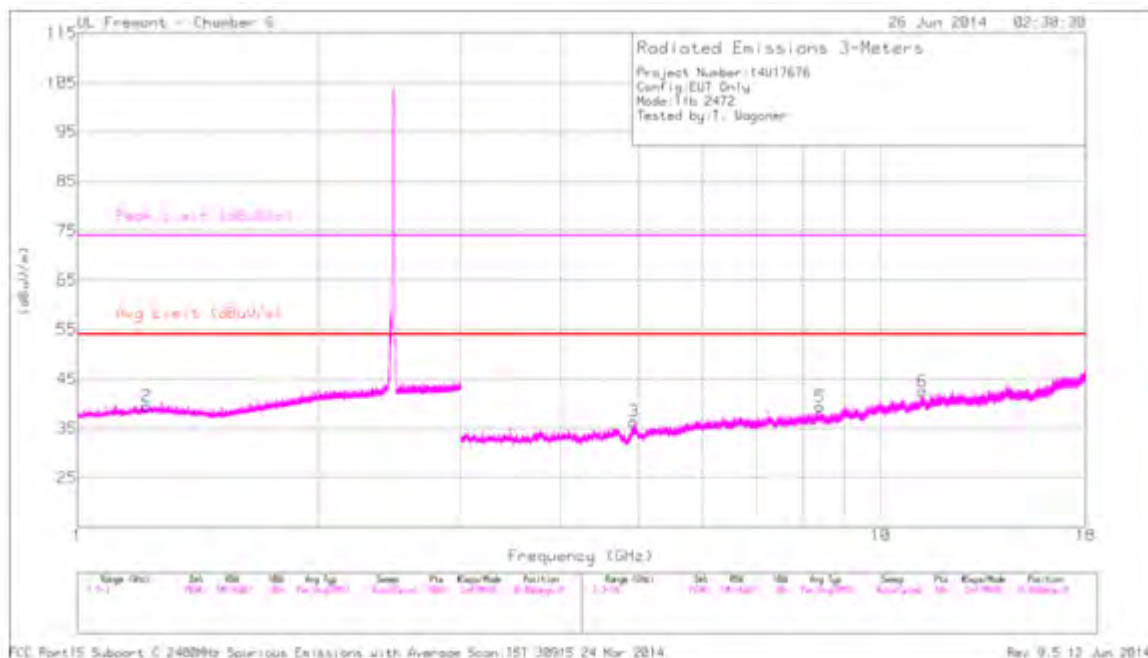
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 1.563	35.83	PK2	28.3	-25.5	0	38.63	-	-	74	-35.37	1	101	H
	* 1.562	32.53	MAv1	28.3	-25.5	0	35.33	54	-18.67	-	-	1	101	H
1	* 1.437	36.86	PK2	28.2	-25.7	0	39.36	-	-	74	-34.64	5	111	V
	* 1.438	32.58	MAv1	28.2	-25.7	0	35.08	54	-18.92	-	-	5	111	V
4	* 11.254	30.9	PK2	38	-26.1	0	42.8	-	-	74	-31.2	10	202	H
	* 11.256	25.78	MAv1	38	-26	0	37.78	54	-16.22	-	-	10	202	H
3	* 4.922	37.34	PK2	34.1	-33.1	0	38.34	-	-	74	-35.66	42	278	V
	* 4.922	30.51	MAv1	34.1	-33.1	0	31.51	54	-22.49	-	-	42	278	V
5	* 11.325	32.58	PK2	38.1	-26.1	0	44.58	-	-	74	-29.42	42	102	V
	* 11.325	25.4	MAv1	38.1	-26.1	0	37.4	54	-16.6	-	-	42	102	V
6	13.239	32.1	PK	39	-27.4	0	43.7	-	-	-	-	0-360	201	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

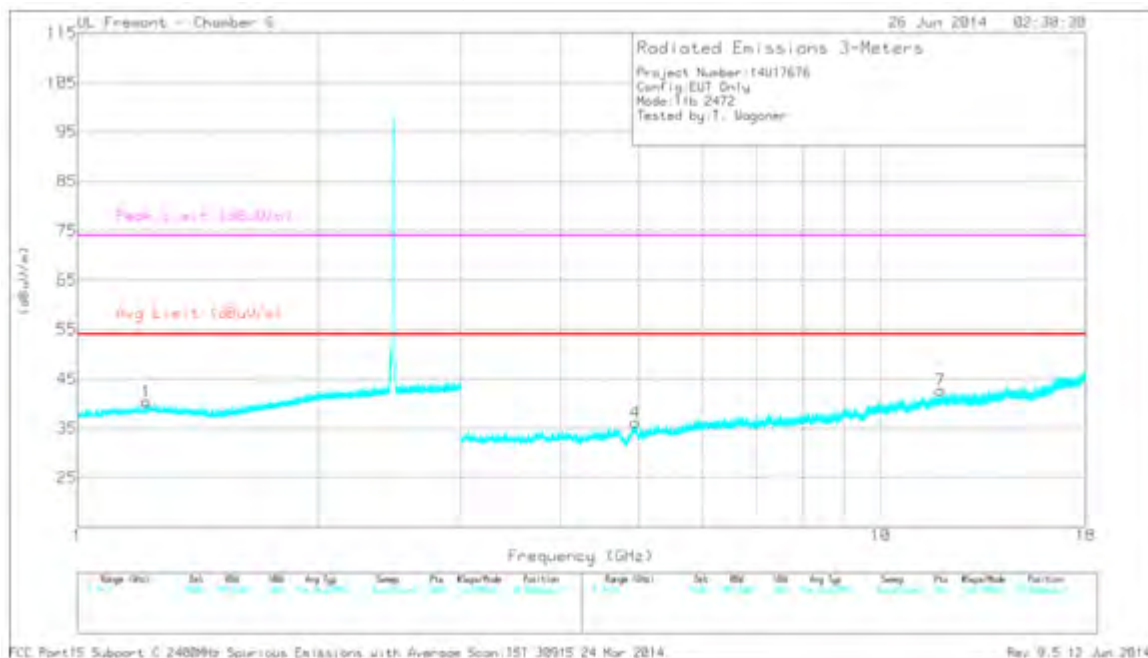
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 13



HIGH CHANNEL VERTICAL PLOT, CH 13



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 1.22	37.22	PK2	29.1	-26.1	0	40.22	-	-	74	-33.78	3	101	H
	* 1.22	32.87	MAv1	29.1	-26.1	0	35.87	54	-18.13	-	-	3	101	H
1	* 1.216	37.09	PK2	29	-26.1	0	39.99	-	-	74	-34.01	23	127	V
	* 1.217	33.02	MAv1	29	-26.1	0	35.92	54	-18.08	-	-	23	127	V
3	* 4.923	37.81	PK2	34.1	-33.1	0	38.81	-	-	74	-35.19	99	316	H
	* 4.922	30.52	MAv1	34.1	-33.1	0	31.52	54	-22.48	-	-	99	316	H
5	* 8.395	34.76	PK2	35.8	-29.4	0	41.16	-	-	74	-32.84	105	111	H
	* 8.399	27.9	MAv1	35.8	-29.5	0	34.2	54	-19.8	-	-	105	111	H
6	* 11.273	32.4	PK2	38	-26	0	44.4	-	-	74	-29.6	155	102	H
	* 11.272	25.42	MAv1	38	-26	0	37.42	54	-16.58	-	-	155	102	H
4	* 4.944	39.38	PK2	34.1	-33	0	40.48	-	-	74	-33.52	219	182	V
	* 4.944	33.59	MAv1	34.1	-33	0	34.69	54	-19.31	-	-	219	182	V
7	* 11.858	33.07	PK2	38.7	-26.9	0	44.87	-	-	74	-29.13	359	319	V
	* 11.855	25.69	MAv1	38.7	-26.9	0	37.49	54	-16.51	-	-	359	319	V

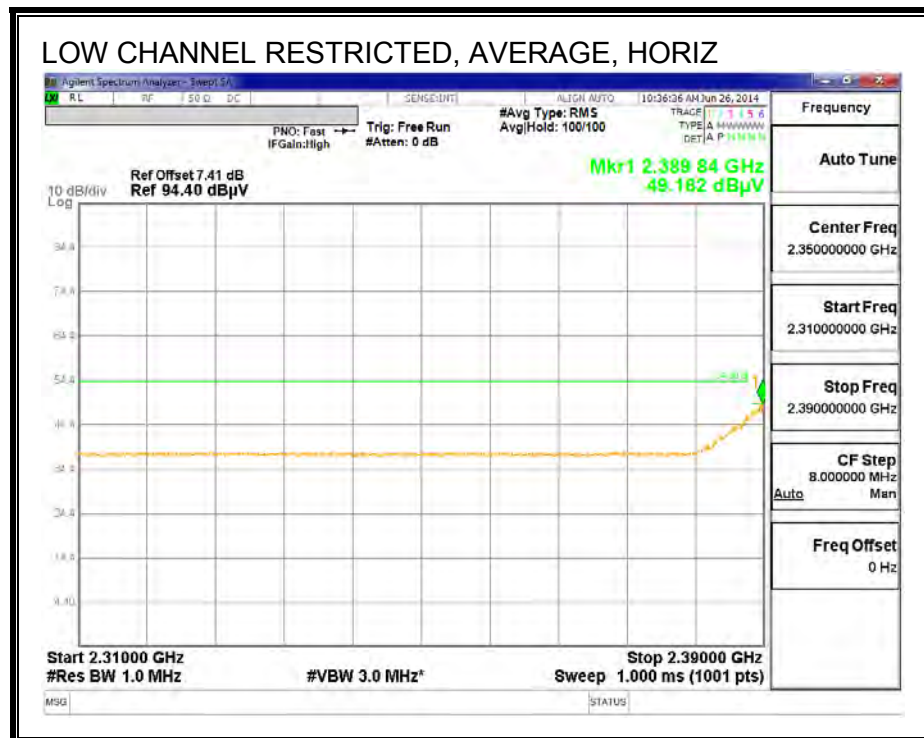
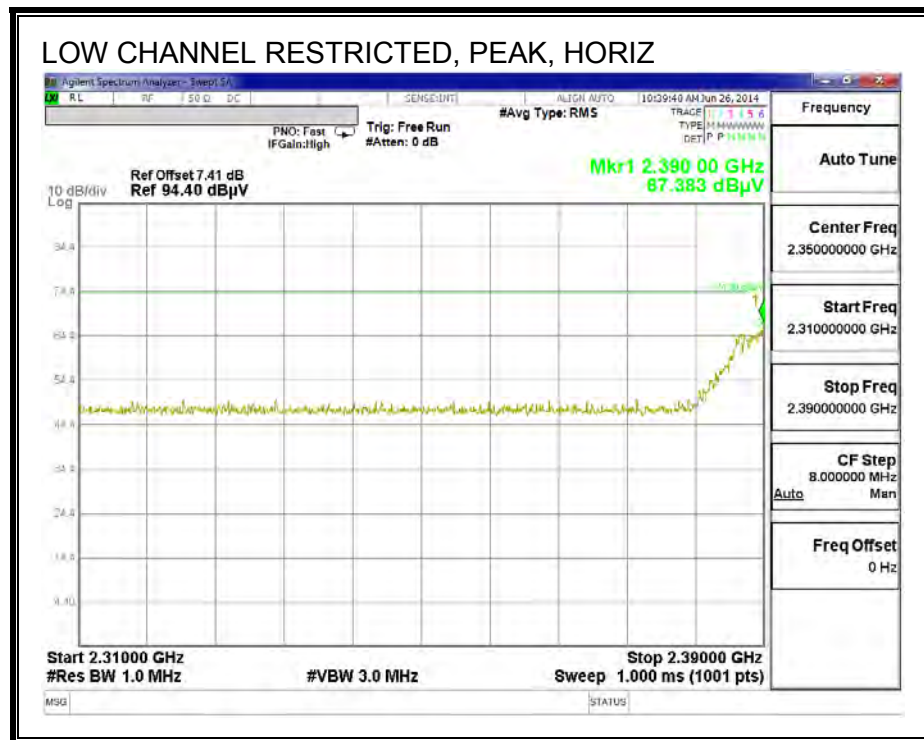
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

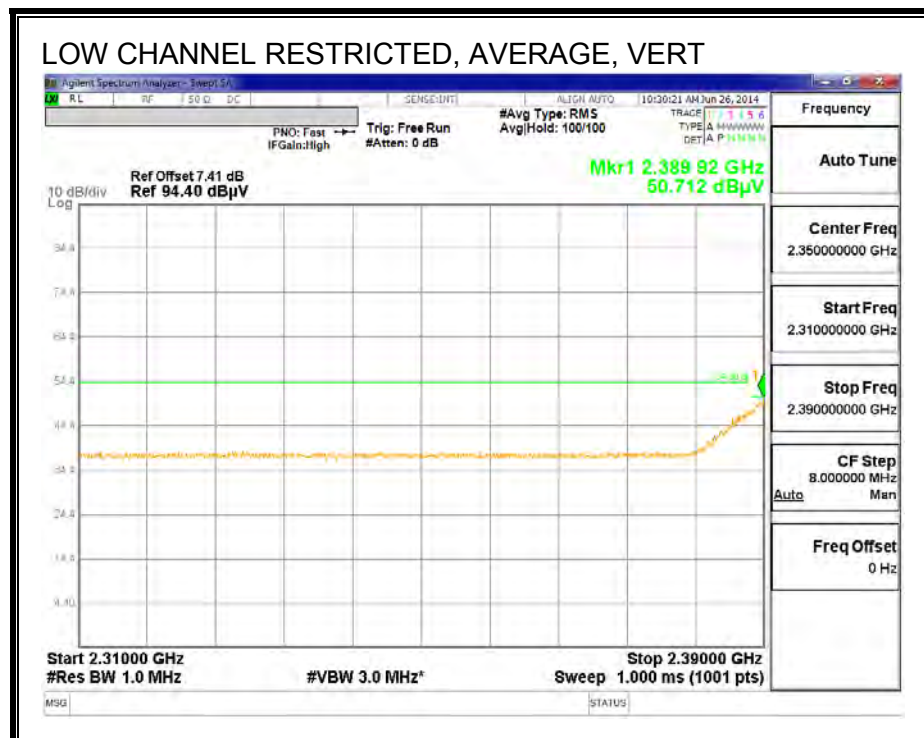
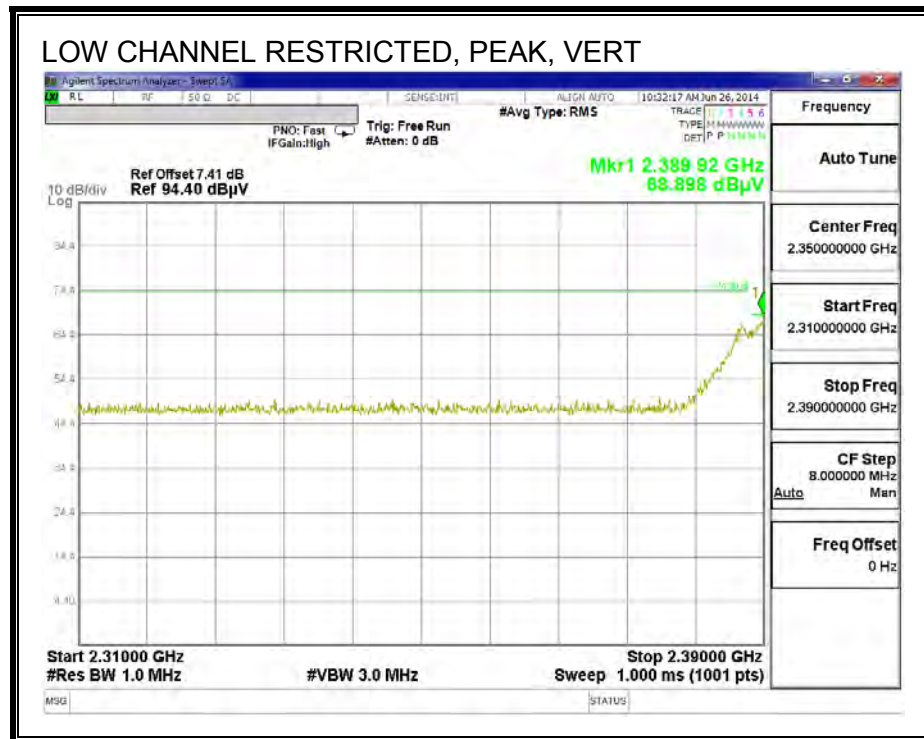
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

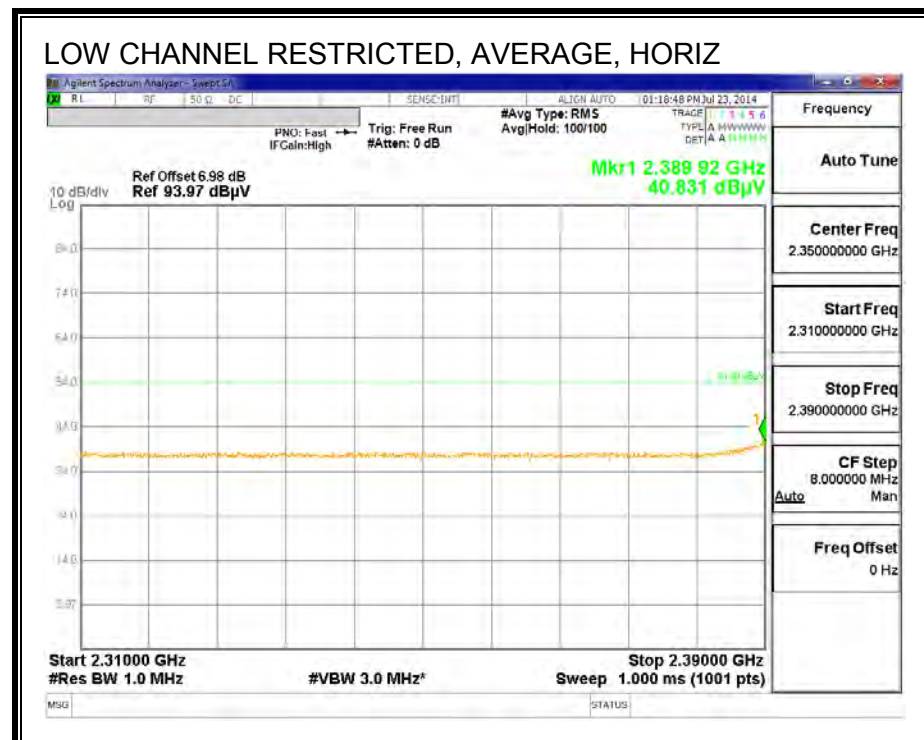
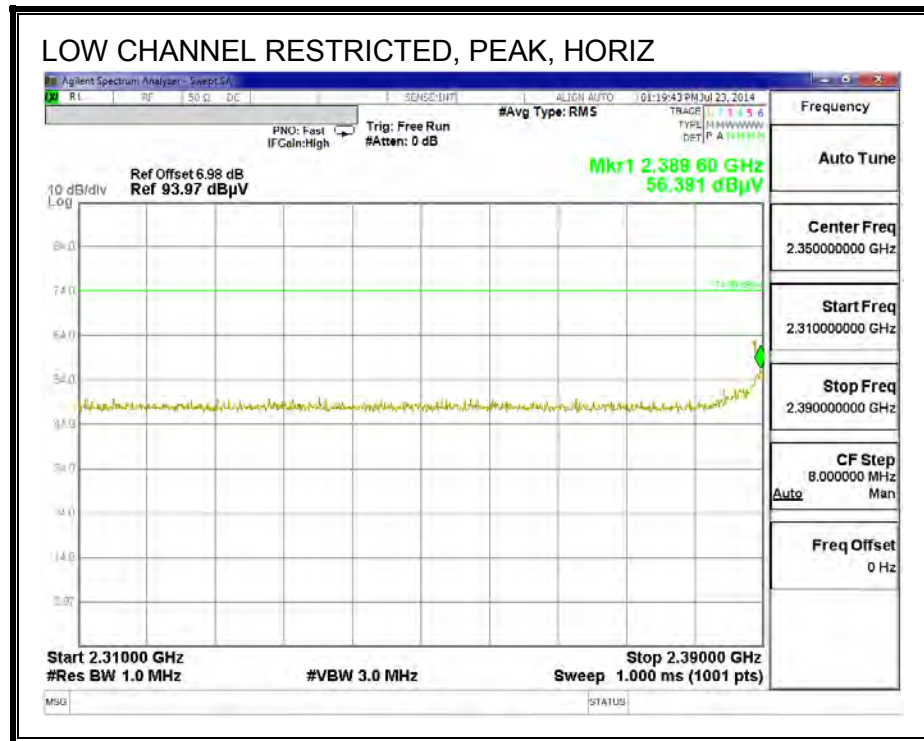
10.2.2.802.11g MODE IN THE 2.4 GHz BAND

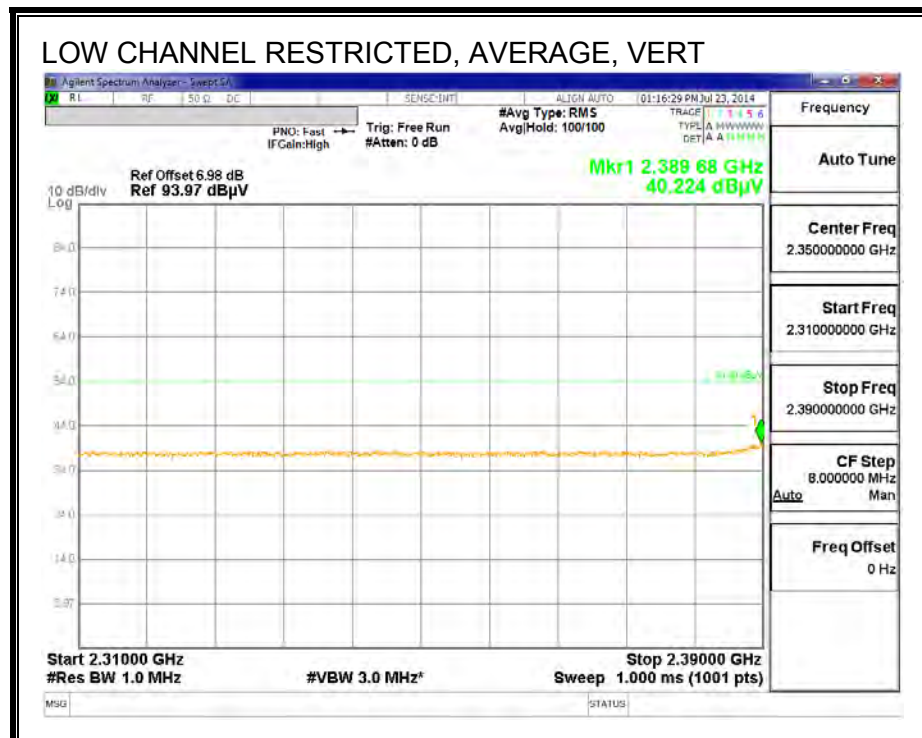
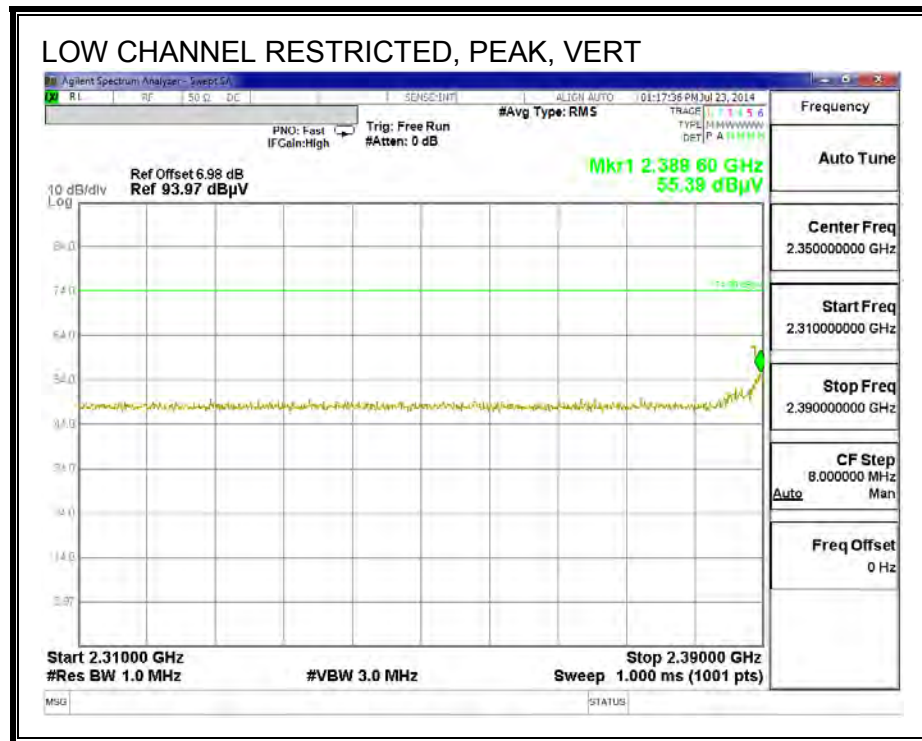
RESTRICTED BANDEDGE (LOW CHANNEL, CHANNEL 1)



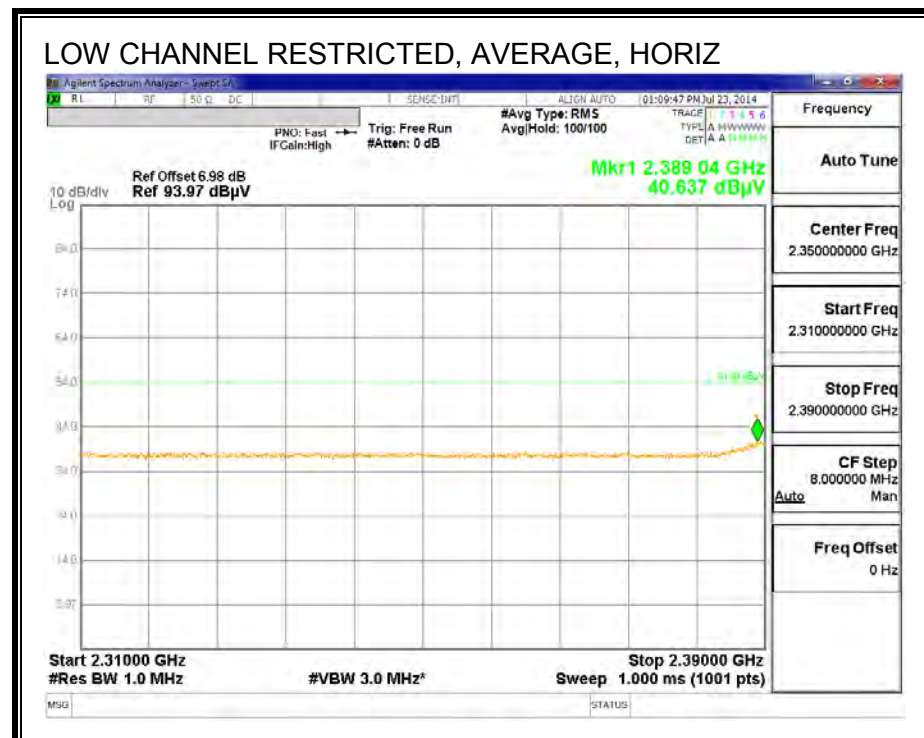
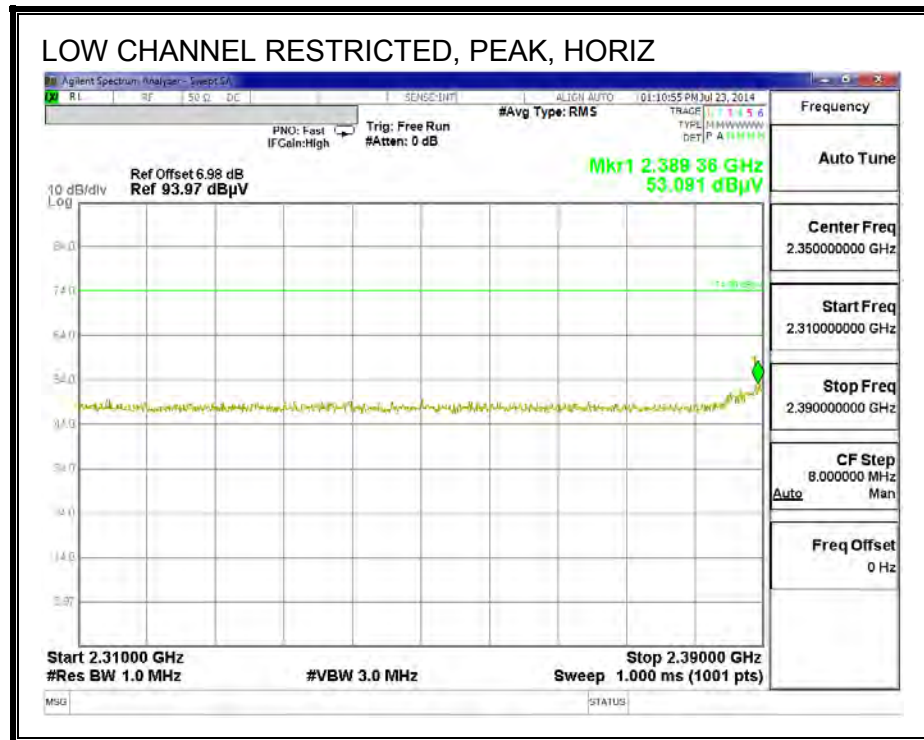


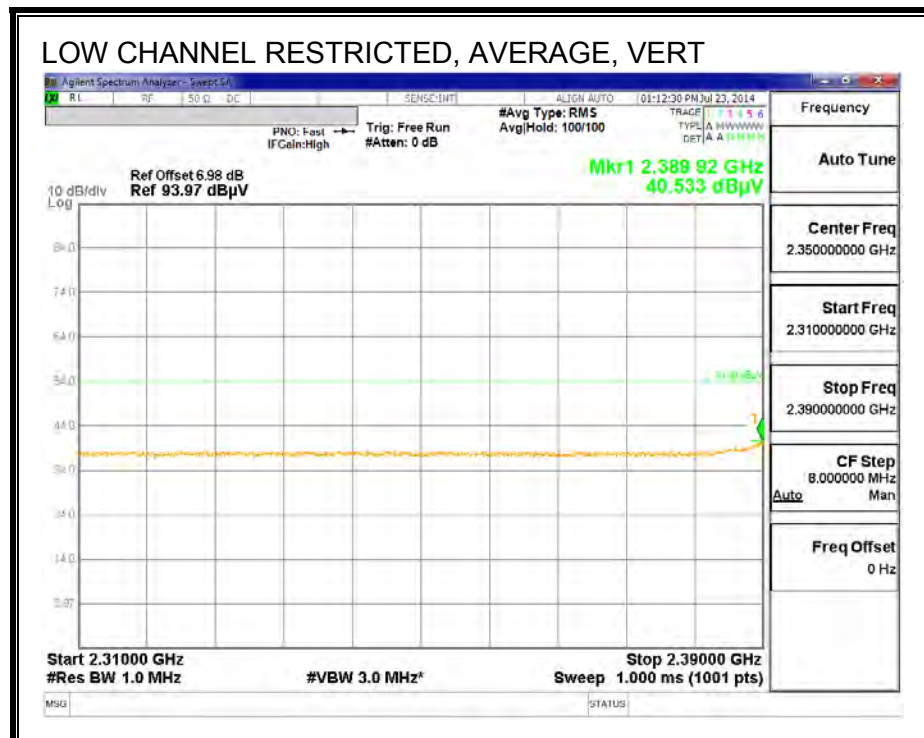
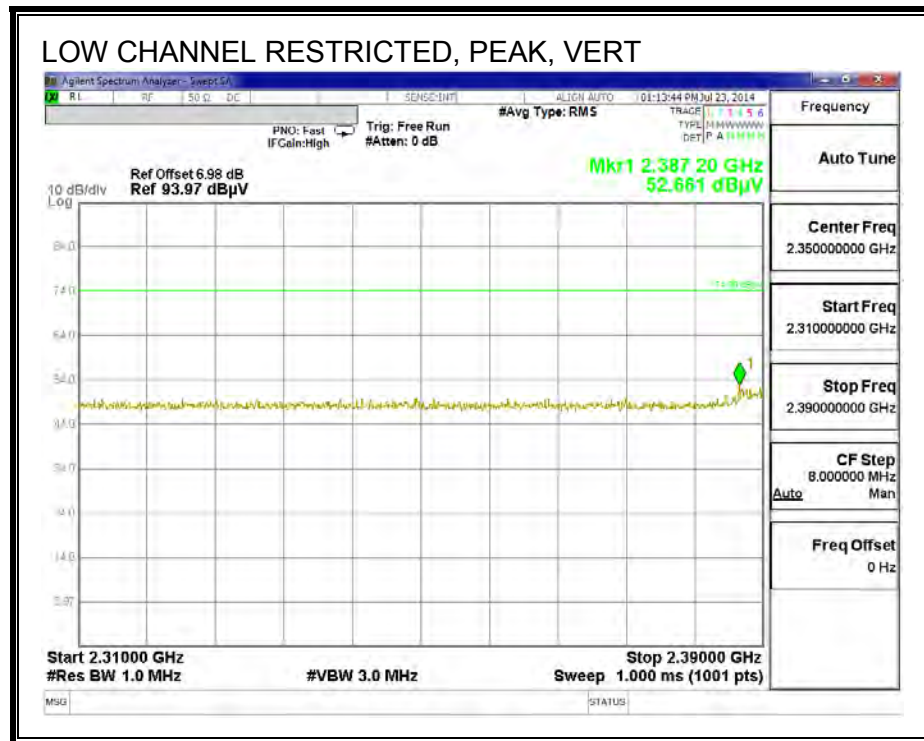
RESTRICTED BANDEDGE (LOW CHANNEL, CHANNEL 2)



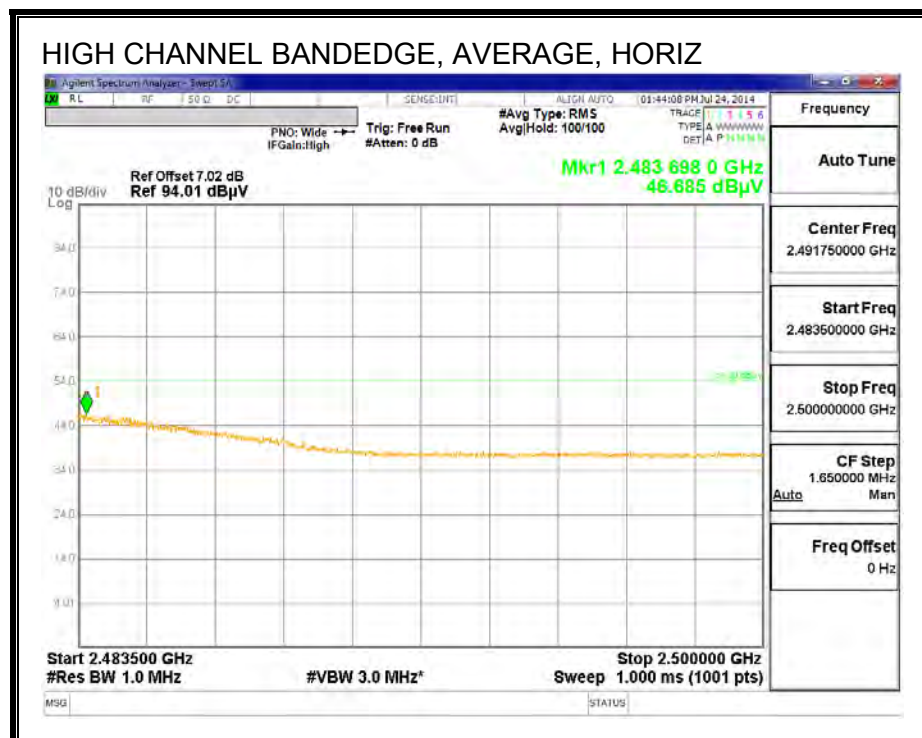
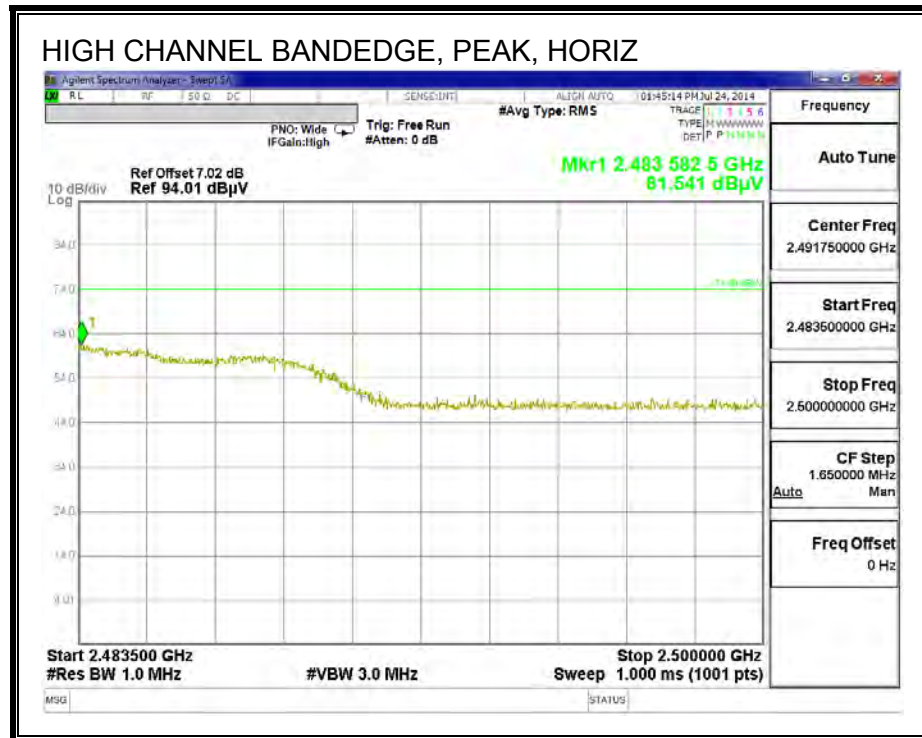


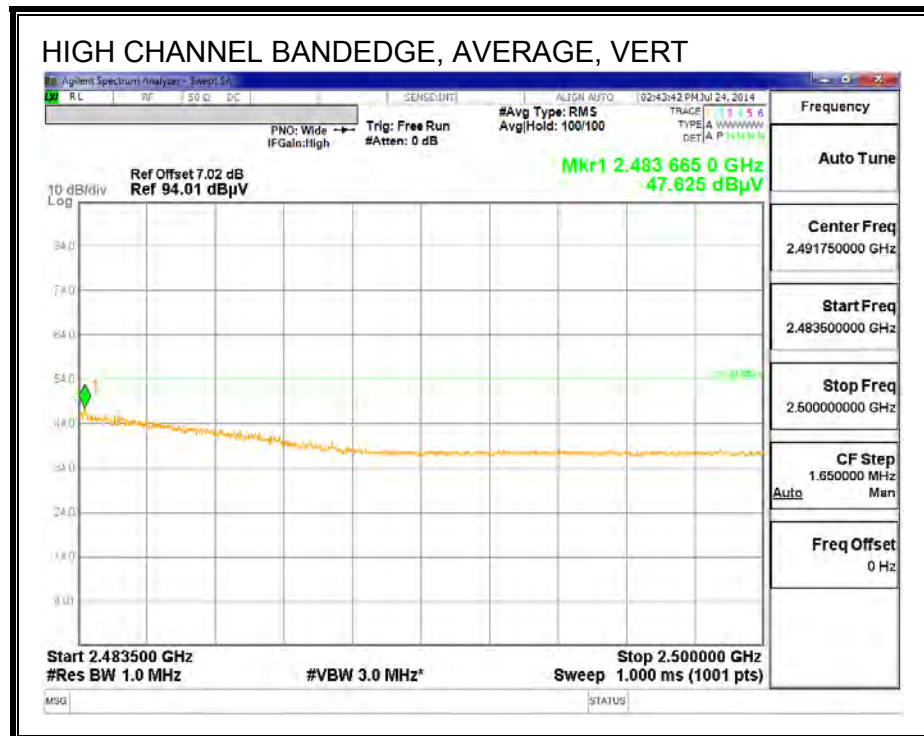
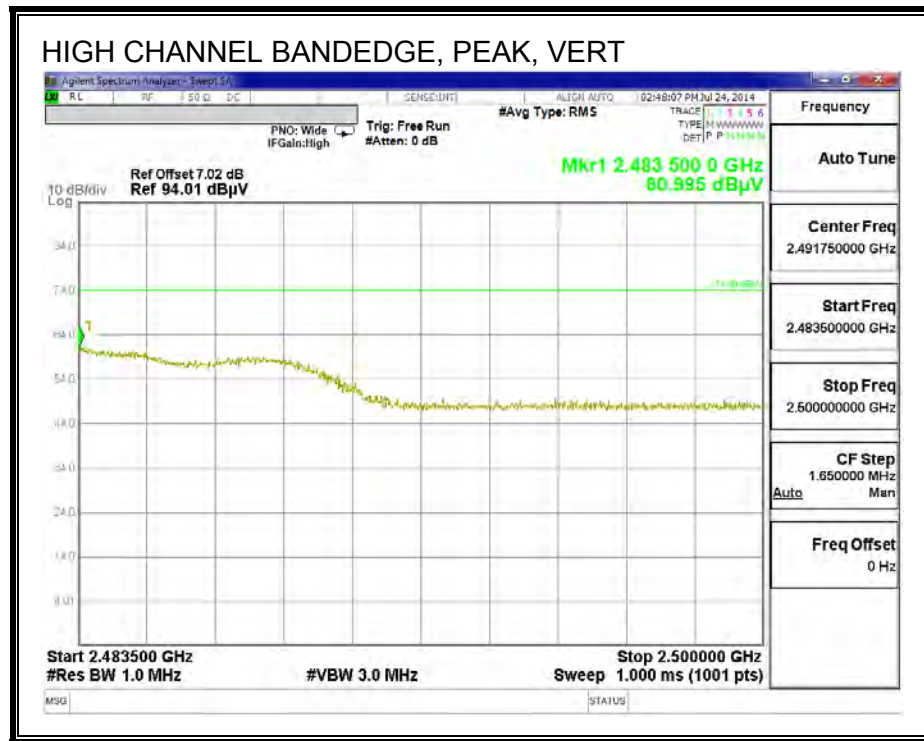
RESTRICTED BANDEDGE (LOW CHANNEL, CHANNEL 3)



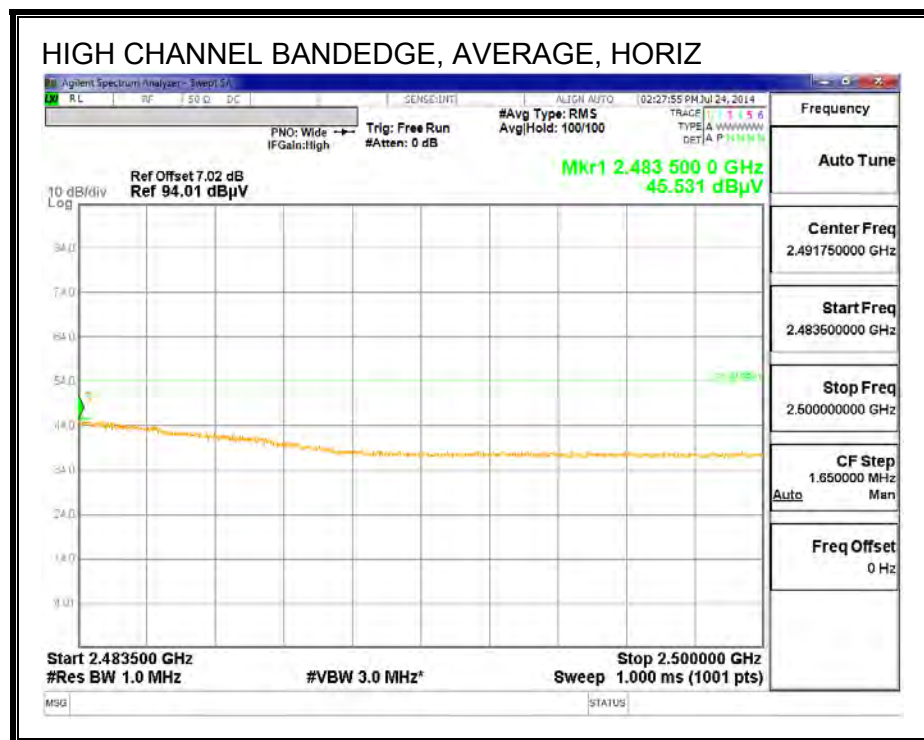
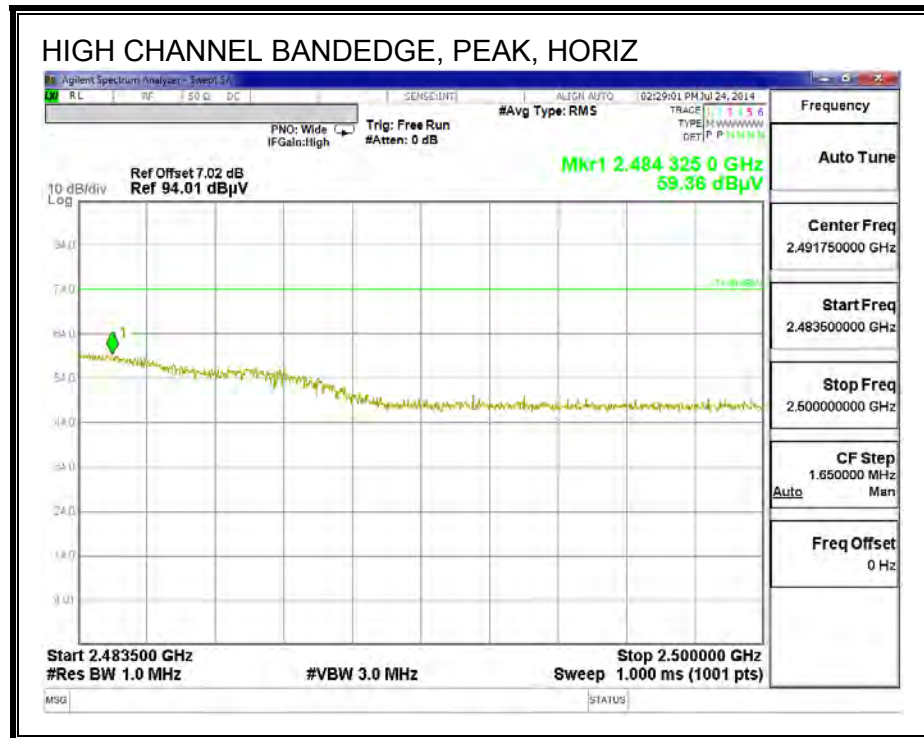


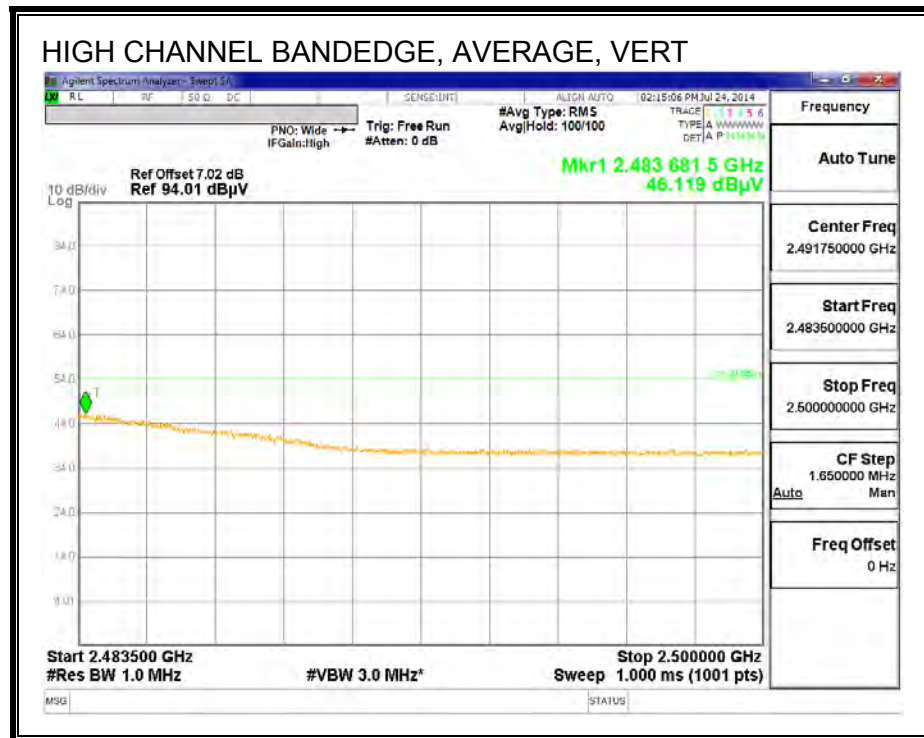
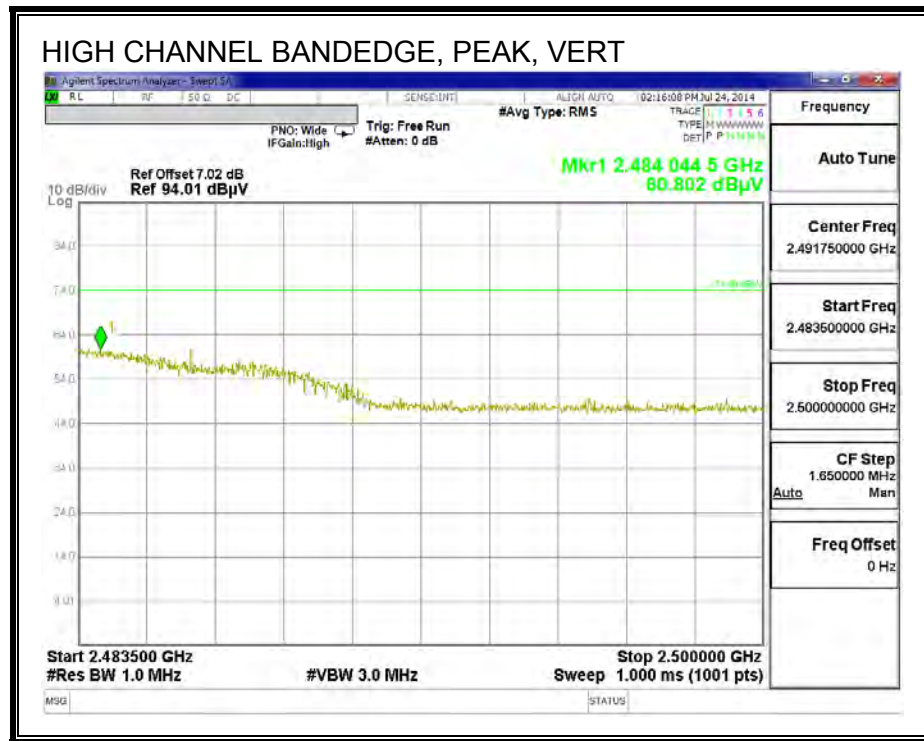
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 9)



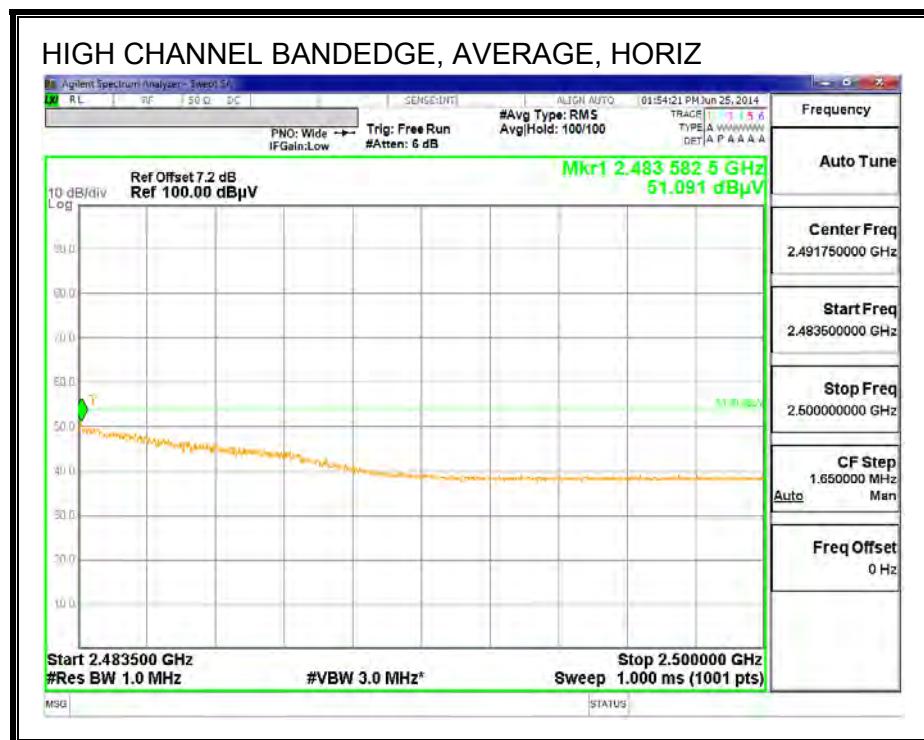
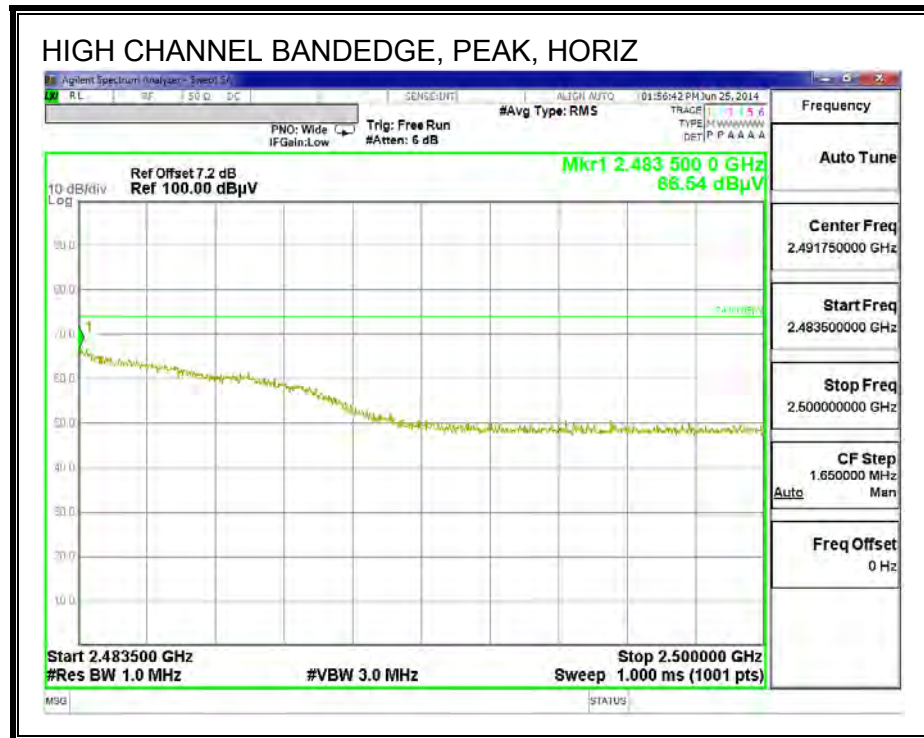


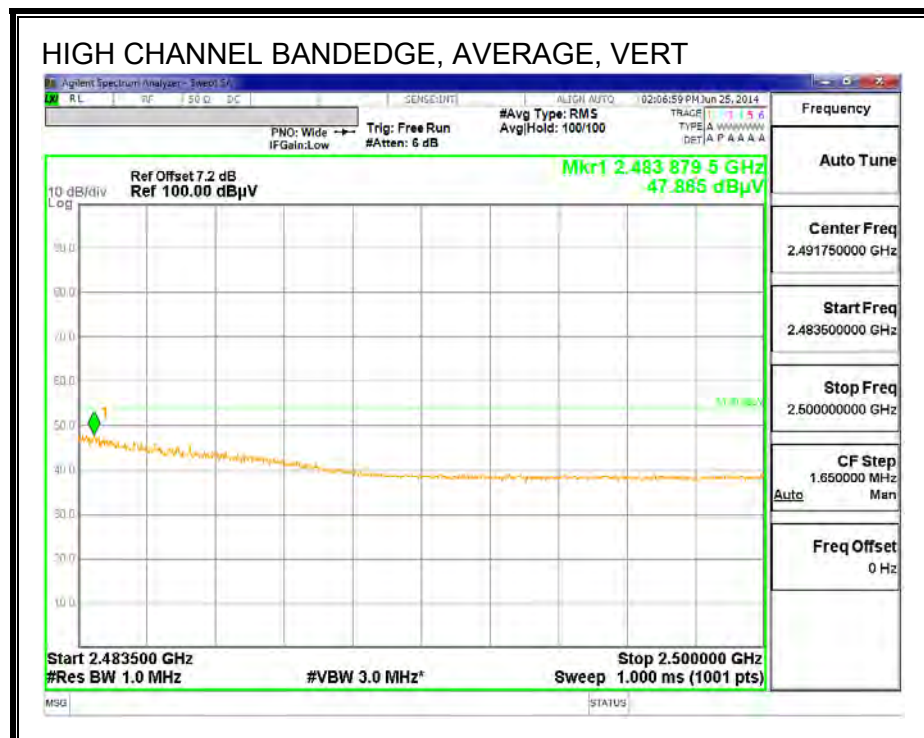
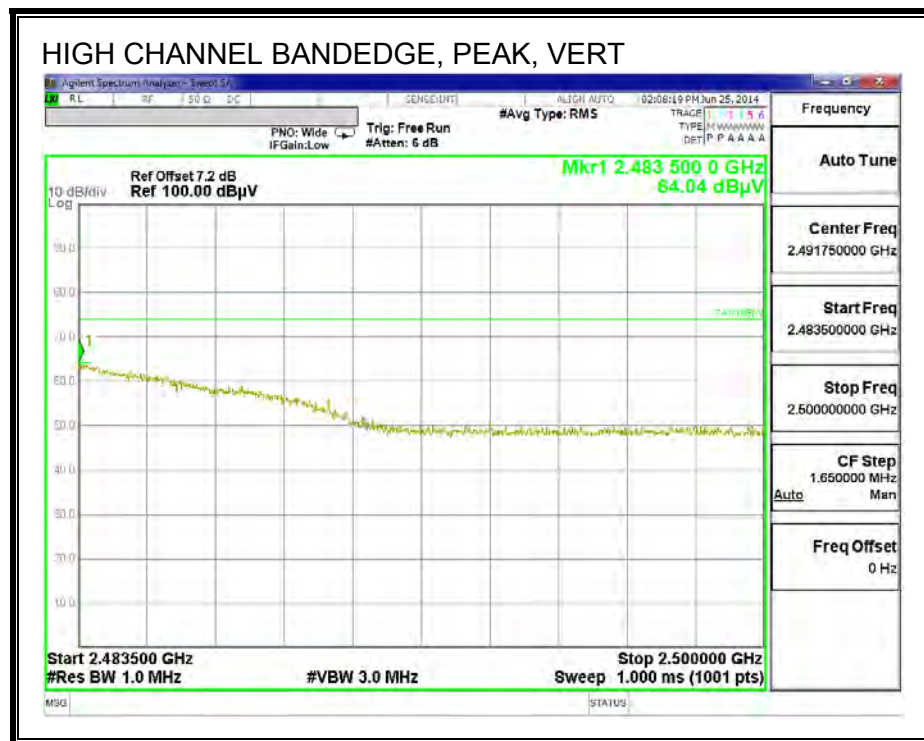
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 10)



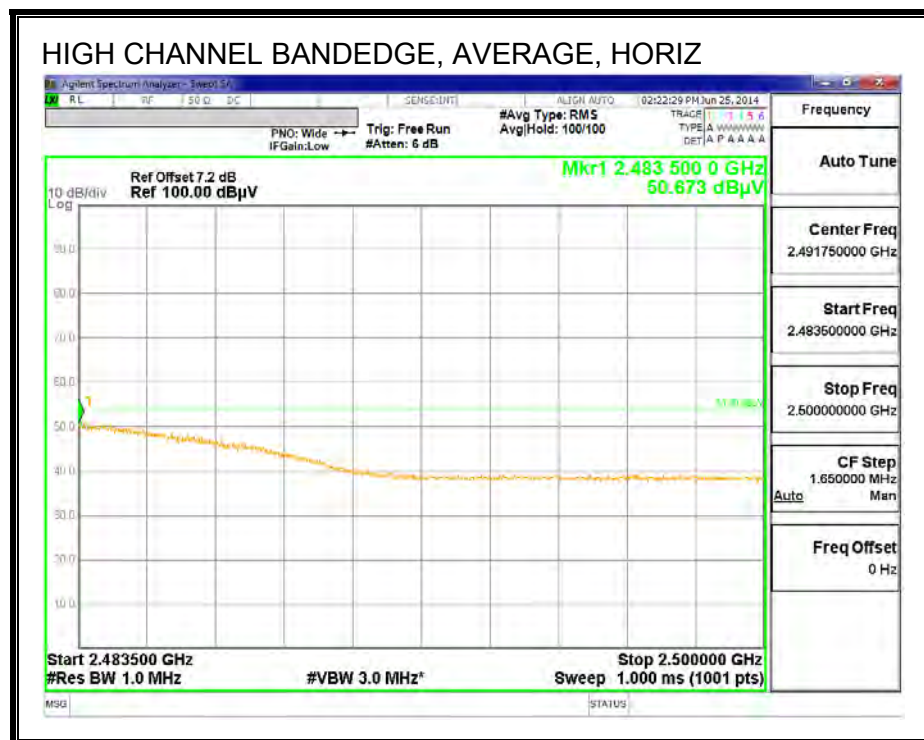
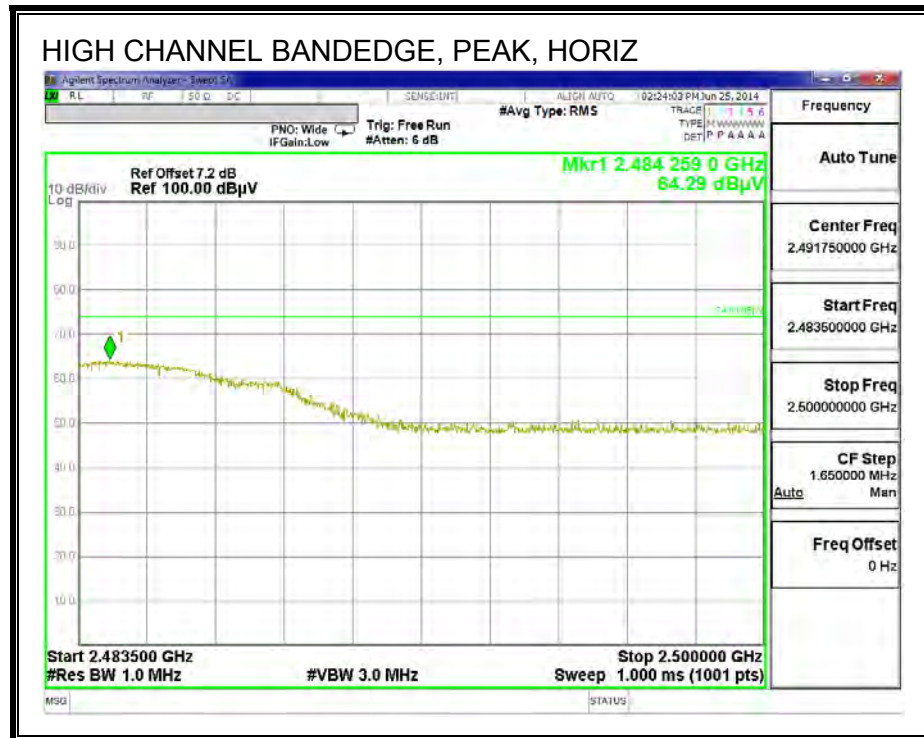


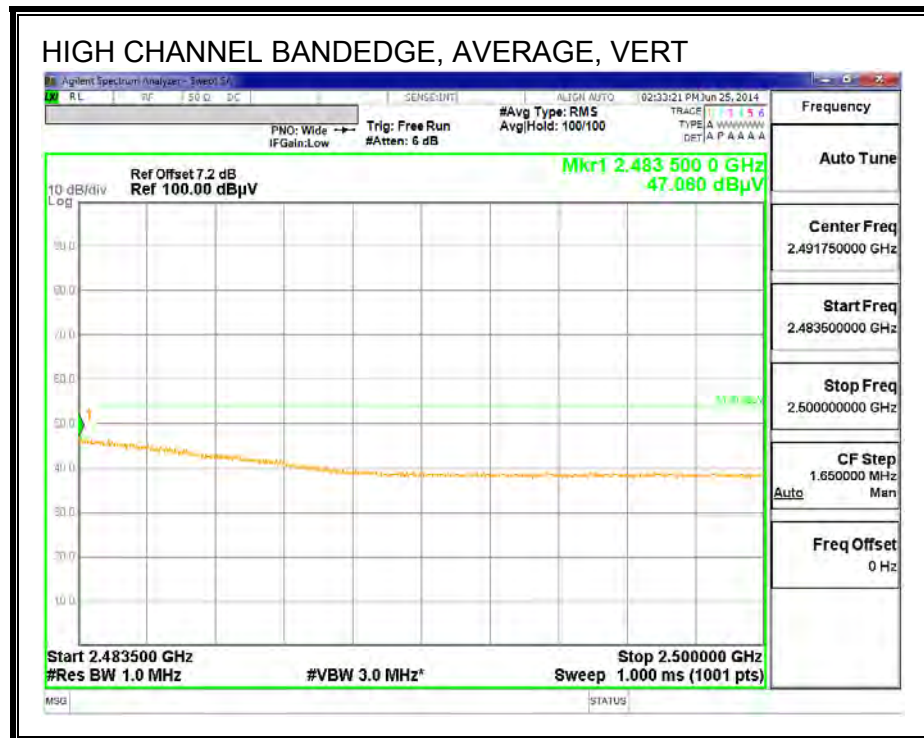
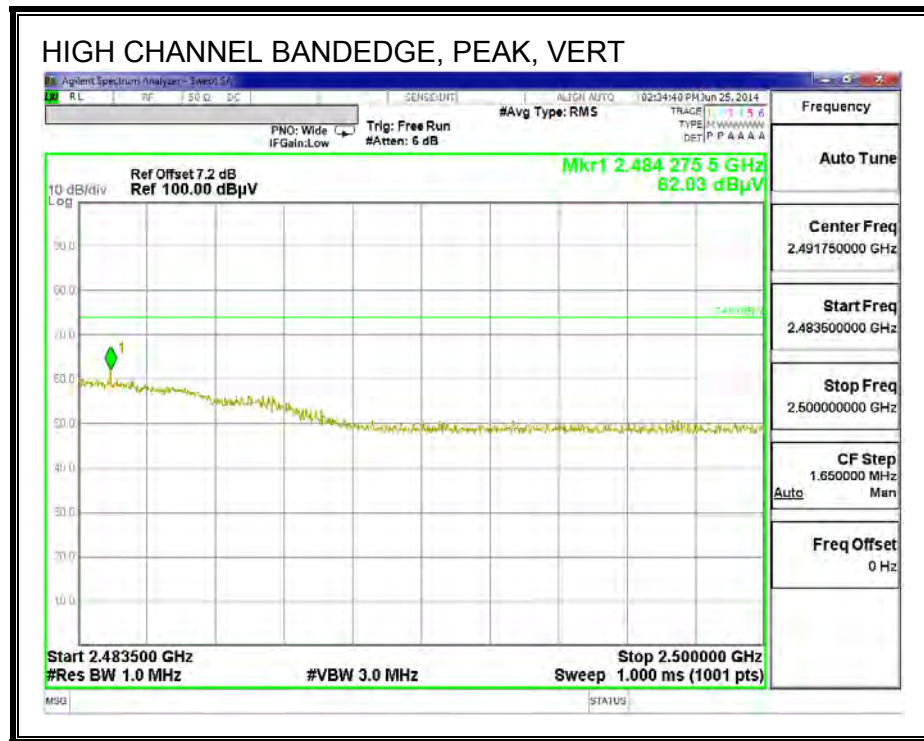
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 11)



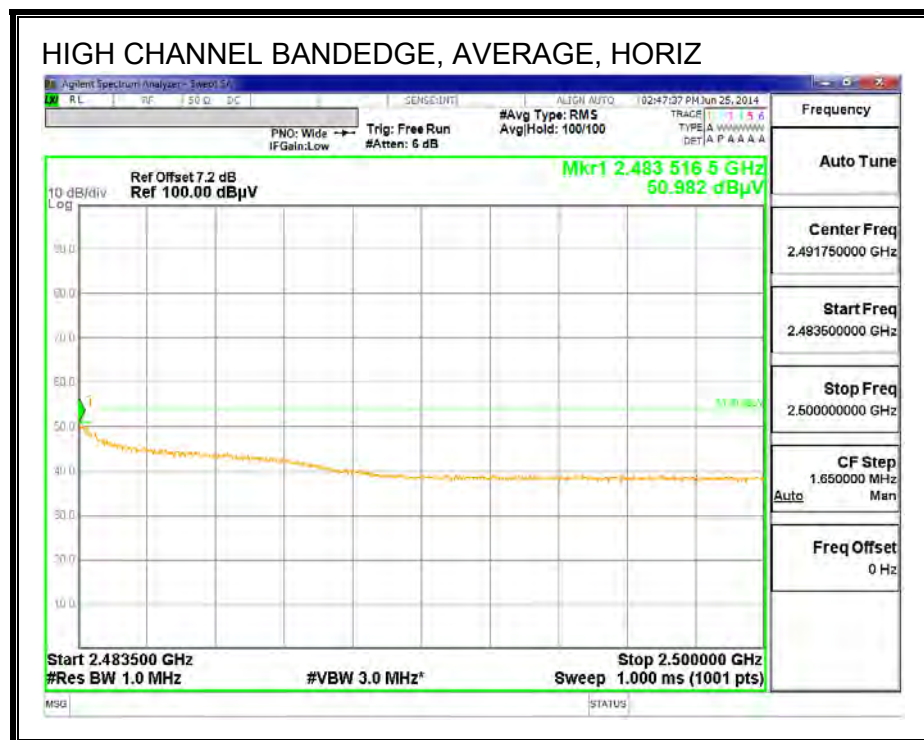
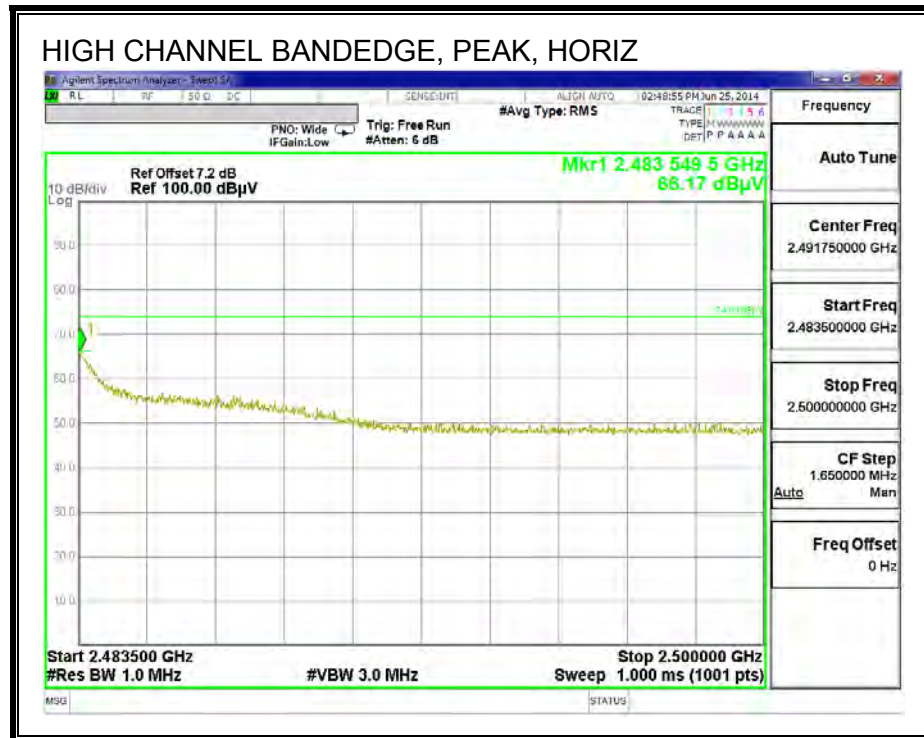


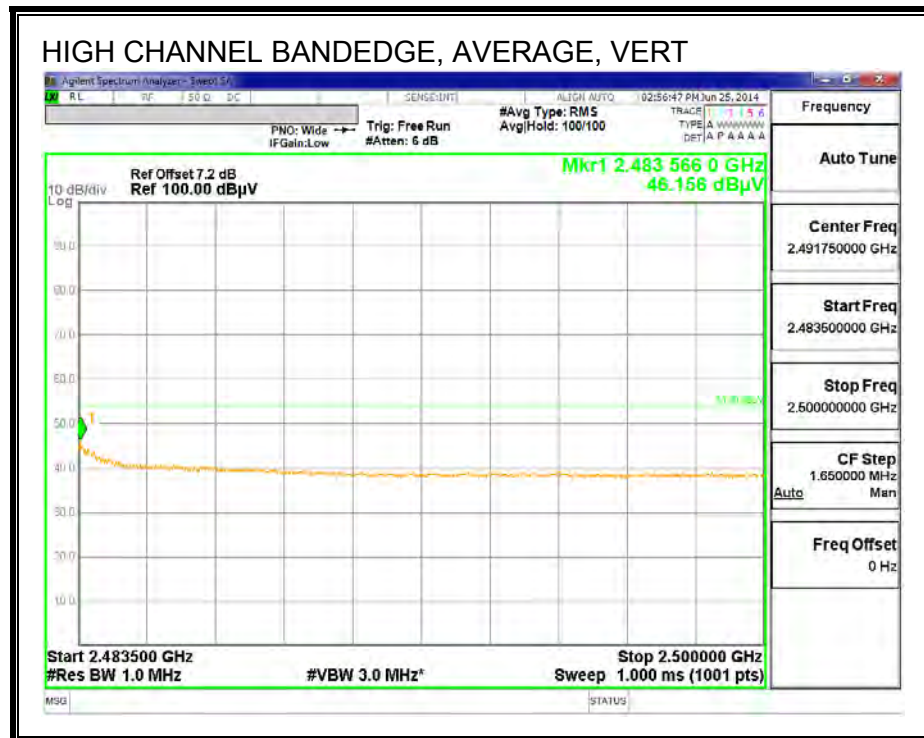
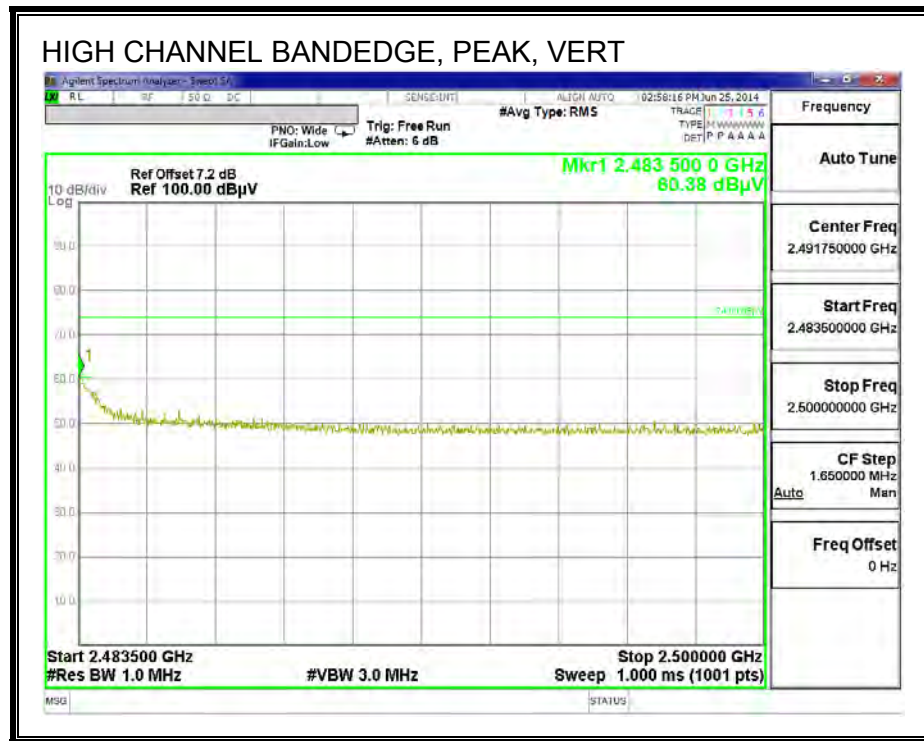
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 12)





RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 13)





DATA

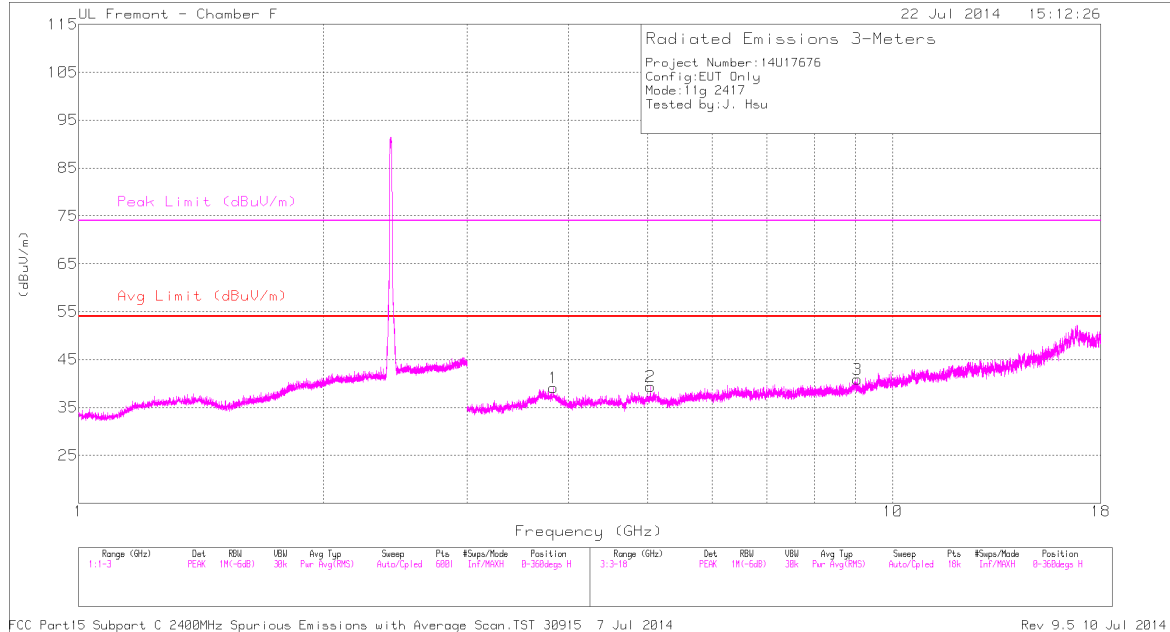
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.485	44.03	PK2	32.2	-24.5	51.73	-	-	74	-22.27	3	100	H
	* 2.485	32.26	MAv1	32.2	-24.5	39.96	54	-14.04	-	-	3	100	H
1	* 1.586	43.84	PK2	28.4	-25.2	47.04	-	-	74	-26.96	252	100	V
	* 1.586	31.89	MAv1	28.4	-25.2	35.09	54	-18.91	-	-	252	100	V
2	* 2.34	43.8	PK2	31.9	-24.5	51.2	-	-	74	-22.8	232	116	V
	* 2.339	31.86	MAv1	31.9	-24.5	39.26	54	-14.74	-	-	232	116	V
4	* 4.156	43.91	PK2	33.5	-32.2	45.21	-	-	74	-28.79	232	182	H
	* 4.157	32.25	MAv1	33.5	-32.2	33.55	54	-20.45	-	-	232	182	H
5	* 5.099	44.26	PK2	34.5	-32.2	46.56	-	-	74	-27.44	232	139	V
	* 5.099	32.65	MAv1	34.5	-32.2	34.95	54	-19.05	-	-	232	139	V
6	* 7.684	43.04	PK2	36.1	-28.8	50.34	-	-	74	-23.66	261	139	V
	* 7.683	30.81	MAv1	36.1	-28.8	38.11	54	-15.89	-	-	261	139	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

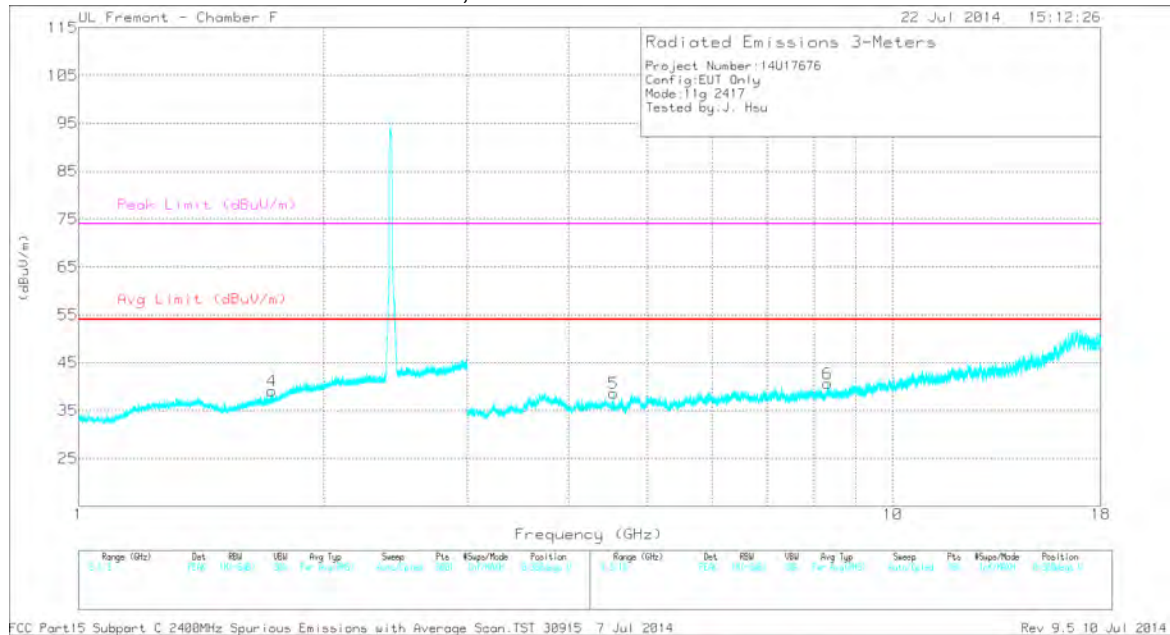
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

LOW CHANNEL HORIZONTAL PLOT, CH 2



LOW CHANNEL VERTICAL PLOT, CH 2



DATA

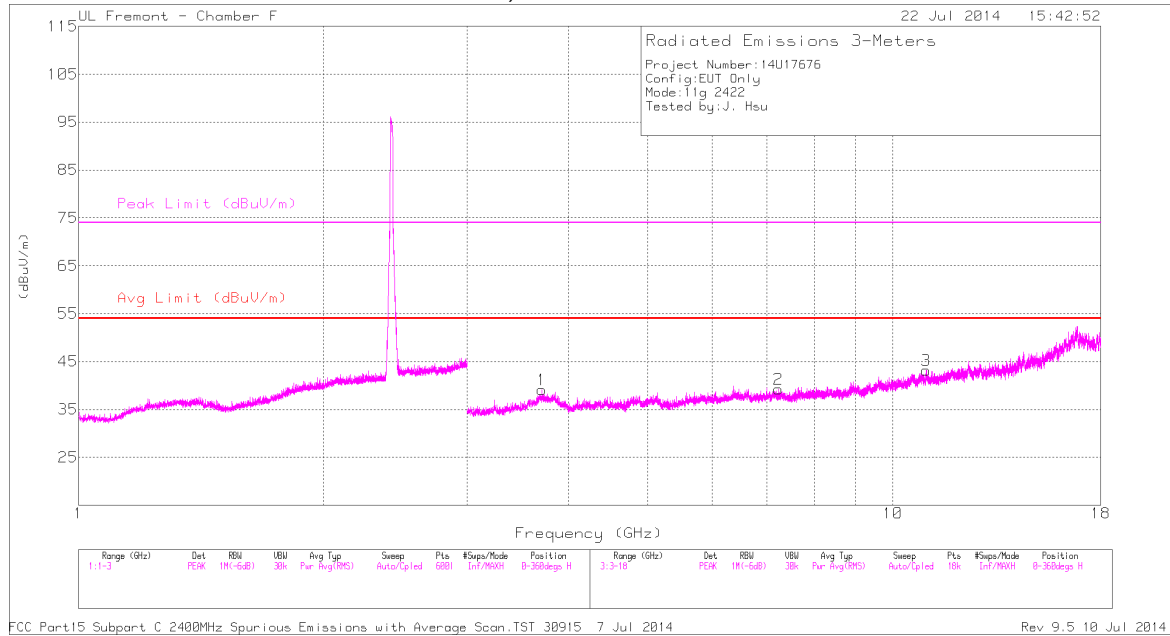
Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.727	42.07	PK2	29.5	-25.3	46.27	-	-	-	-	51	115	V
	1.726	30.5	MAv1	29.5	-25.4	34.6	-	-	-	-	51	115	V
2	* 3.83	38.35	PK2	34.3	-28.8	43.85	-	-	74	-30.15	104	171	H
	* 3.831	27.9	MAv1	34.3	-28.8	33.4	54	-20.6	-	-	104	171	H
3	* 5.037	38.19	PK2	34.3	-28.3	44.19	-	-	74	-29.81	70	212	H
	* 5.036	27.61	MAv1	34.3	-28.3	33.61	54	-20.39	-	-	70	212	H
4	* 9.053	34.26	PK2	36.1	-23	47.36	-	-	74	-26.64	18	194	H
	* 9.052	23.73	MAv1	36.1	-22.9	36.93	54	-17.07	-	-	18	194	H
5	* 4.536	38.34	PK2	34	-28.6	43.74	-	-	74	-30.26	18	194	V
	* 4.538	26.91	MAv1	34	-28.6	32.31	54	-21.69	-	-	18	194	V
6	* 8.316	35.54	PK2	35.7	-24.7	46.54	-	-	74	-27.46	61	211	V
	* 8.317	24.83	MAv1	35.7	-24.7	35.83	54	-18.17	-	-	61	211	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

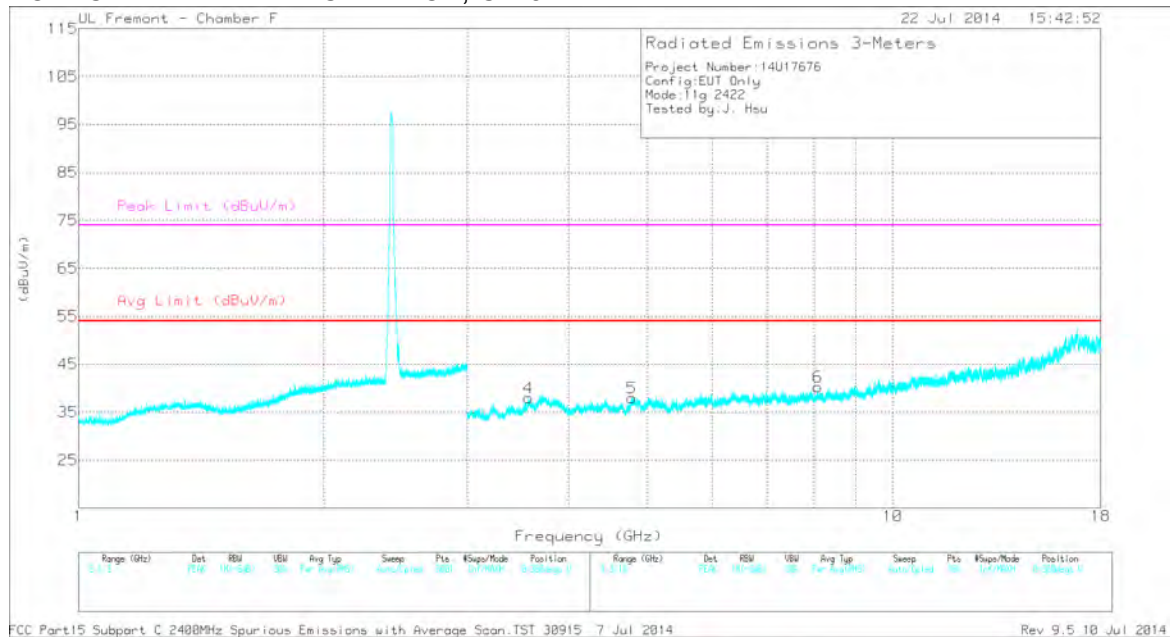
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

LOW CHANNEL HORIZONTAL PLOT, CH 3



LOW CHANNEL VERTICAL PLOT, CH 3



DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.705	38.8	PK2	34.8	-29.4	44.2	-	-	74	-29.8	93	126	H
	* 3.704	27.96	MAv1	34.8	-29.4	33.36	54	-20.64	-	-	93	126	H
2	7.238	37.5	PK2	35.5	-26.5	46.5	-	-	-	-	130	142	H
	7.239	26.42	MAv1	35.5	-26.5	35.42	-	-	-	-	130	142	H
3	* 10.986	34.28	PK2	38.1	-21.8	50.58	-	-	74	-23.42	155	135	H
	* 10.986	23.05	MAv1	38.1	-21.8	39.35	54	-14.65	-	-	155	135	H
4	* 3.571	39.55	PK2	34.8	-28.4	45.95	-	-	74	-28.05	64	168	V
	* 3.57	28.35	MAv1	34.8	-28.5	34.65	54	-19.35	-	-	64	168	V
5	* 4.782	38.67	PK2	34.1	-28	44.77	-	-	74	-29.23	108	187	V
	* 4.781	27.38	MAv1	34.1	-28	33.48	54	-20.52	-	-	108	187	V
6	* 8.095	36.94	PK2	35.7	-25.1	47.54	-	-	74	-26.46	172	216	V
	* 8.096	24.92	MAv1	35.7	-25.2	35.42	54	-18.58	-	-	172	216	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

UL Fremont - Chasben H

19 Jun 2014 14:59:43

Radiated Emissions 3-Meters

Project Number: 14017676
 Config: EUT Only
 Model: Iig 2437
 Tested by: Tr. Phan

Peak Limit: 75dBuV/m

Avg Limit: 55dBuV/m

Frequency (GHz)

Range (GHz)	Set	Min	Max	Avg Lp	Setup	Fix	Setup/Mode	Real Time	Range (dB)	Set	Min	Max	Avg Lp	Setup	Fix	Setup/Mode	Position
1.14	Peak	35	40	36	For EUT Only	None	Subspected	None	120	Peak	35	40	36	For EUT Only	None	Subspected	None

FCC Part 15 Subpart C 2400MHz Spurious Emissions with Average Scan TST 30915 24 Mar 2014

Rev 9.5 09 Mar 2014

UL Fresnost - Chamber H 19 Jun 2014 14:59:43

Radiated Emissions 3-Meters

Project Number: 14017676
 Config: EUT Only
 Model: 11g 2437
 Tested By: Tr. Phao

Peak Limit (dBuV/m)
 Avg Limit (dBuV/m)

dBuV/m

Frequency (GHz)

Range (GHz)	Del	BW	MW	Avg Type	Sweep	Pk	Range/Mode	Position
1 - 18	100	900	100	100	100	100	100	100

FCC Part 15 Subpart C 2400MHz Spurious Emissions with Average Scan. IST 30915 24 Mar 2014 Rev 9.5.09 Mar 2014

DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.455	43.94	PK2	27.9	-25.5	46.34	-	-	74	-27.66	328	117	H
	* 1.455	32.24	MAv1	27.9	-25.5	34.64	54	-19.36	-	-	328	117	H
2	* 2.671	43.67	PK2	32.3	-24.3	51.67	-	-	74	-22.33	285	136	H
	* 2.671	32.2	MAv1	32.3	-24.3	40.2	54	-13.8	-	-	285	136	H
3	* 2.32	43.37	PK2	31.8	-24.6	50.57	-	-	74	-23.43	313	149	V
	* 2.32	32.17	MAv1	31.8	-24.6	39.37	54	-14.63	-	-	313	149	V
4	* 3.692	44.91	PK2	33.1	-32.7	45.31	-	-	74	-28.69	280	149	H
	* 3.692	33.47	MAv1	33.1	-32.7	33.87	54	-20.13	-	-	280	149	H
5	* 4.659	44.57	PK2	34.2	-31.9	46.87	-	-	74	-27.13	241	163	H
	* 4.659	32.93	MAv1	34.2	-31.9	35.23	54	-18.77	-	-	241	163	H
6	* 3.785	45.24	PK2	33.2	-32.6	45.84	-	-	74	-28.16	197	184	V
	* 3.785	33.87	MAv1	33.2	-32.6	34.47	54	-19.53	-	-	197	184	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

UL Freewave - Chamber 2

23 Jul 2014 19:45:13

Radiated Emissions 3-Meters

Project Number 14017676

Config EUT ONLY

Modeling, 2452 MHz

Tested by: C. XIONG

Peak Limit (dBuV/m2)

Avg Limit (dBuV/m2)

Frequency (GHz)

Range (Hz)	Det	RBW	VBW	Avg Tap	Sweep	Pre	ResolvMode	Position
1-1	PK	100kHz	30	Power Avg	Auto	None	Off	1-Midrange
1-16	PK	100kHz	30	Power Avg	Auto	None	Off	1-Midrange

FCC Part 15 Subpart C 2400MHz Spurious Emissions with Average Scan 151.38915 7 Jul 2014

Rev 0.5 22 Jul 2014

UL Freewave - Chamber 5

23 Jul 2014 19:45:13

Radiated Emissions 3-Meters

Project Number: 14017676
 Config: EUT ONLY
 Mode: 11g, 2452 MHz
 Tested by: C. XIONG

Peak Limit (dBuV/m)

Avg Limit (dBuV/m)

Frequency (GHz)

Range (Hz)	Set	BW	SW	Avg Tap	Sweep	Pk	Range/Mode	Position	Range (Hz)	Set	BW	SW	Avg Tap	Sweep	Pk	Range/Mode	Position
1.000	14017676	900 kHz	12 dB	1.000	1.000	1.000	1.000	1.000	1.000	14017676	900 kHz	12 dB	1.000	1.000	1.000	1.000	1.000

FCC Part 15 Subpart C 2400MHz Spurious Emissions with Average Scan 15T 38915 7 Jul 2014

Rev: 0.5 22 Jul 2014

DATA

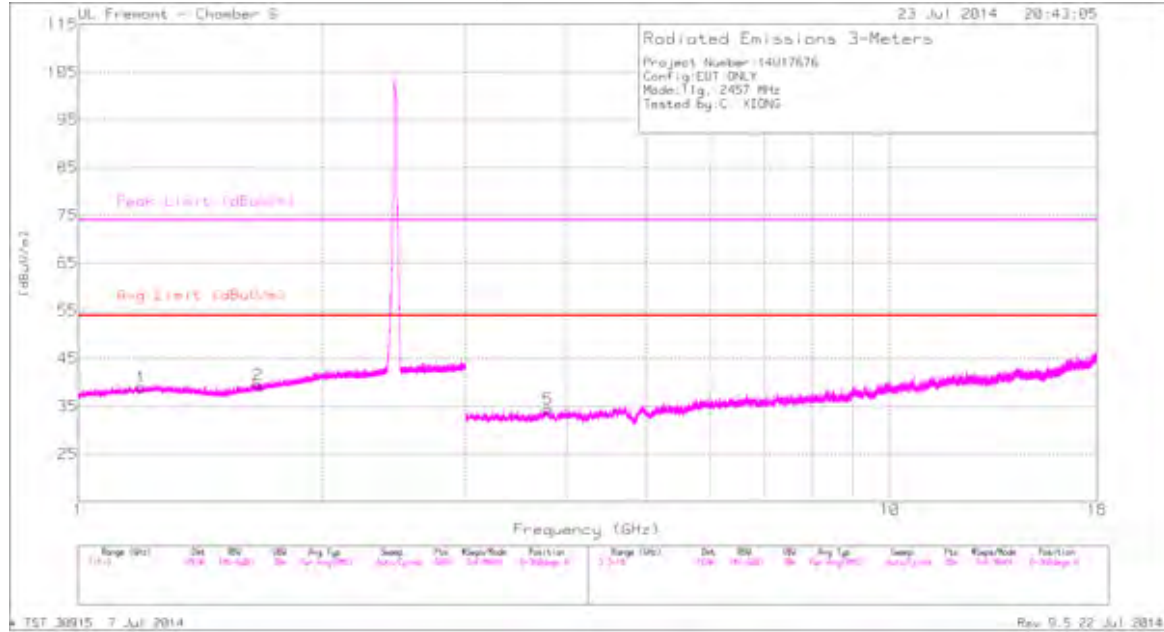
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.251	43.89	PK2	29.2	-26.1	46.99	-	-	74	-27.01	202	190	H
	* 1.25	32.53	MAv1	29.2	-26.1	35.63	54	-18.37	-	-	202	190	H
2	* 2.232	43.9	PK2	31.5	-25.1	50.3	-	-	74	-23.7	224	212	V
	* 2.234	32.2	MAv1	31.5	-25.1	38.6	54	-15.4	-	-	224	212	V
3	* 3.781	41.91	PK2	33	-32.8	42.11	-	-	74	-31.89	173	196	H
	* 3.78	31.02	MAv1	33	-32.8	31.22	54	-22.78	-	-	173	196	H
4	* 7.271	40.12	PK2	35.6	-30.7	45.02	-	-	74	-28.98	196	192	H
	* 7.27	29.14	MAv1	35.6	-30.7	34.04	54	-19.96	-	-	196	192	H
5	* 3.958	41.77	PK2	33.3	-33.1	41.97	-	-	74	-32.03	181	171	V
	* 3.959	30.79	MAv1	33.3	-33.1	30.99	54	-23.01	-	-	181	171	V
6	* 4.93	41.12	PK2	34.1	-33.1	42.12	-	-	74	-31.88	226	175	V
	* 4.93	30.52	MAv1	34.1	-33.1	31.52	54	-22.48	-	-	226	175	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

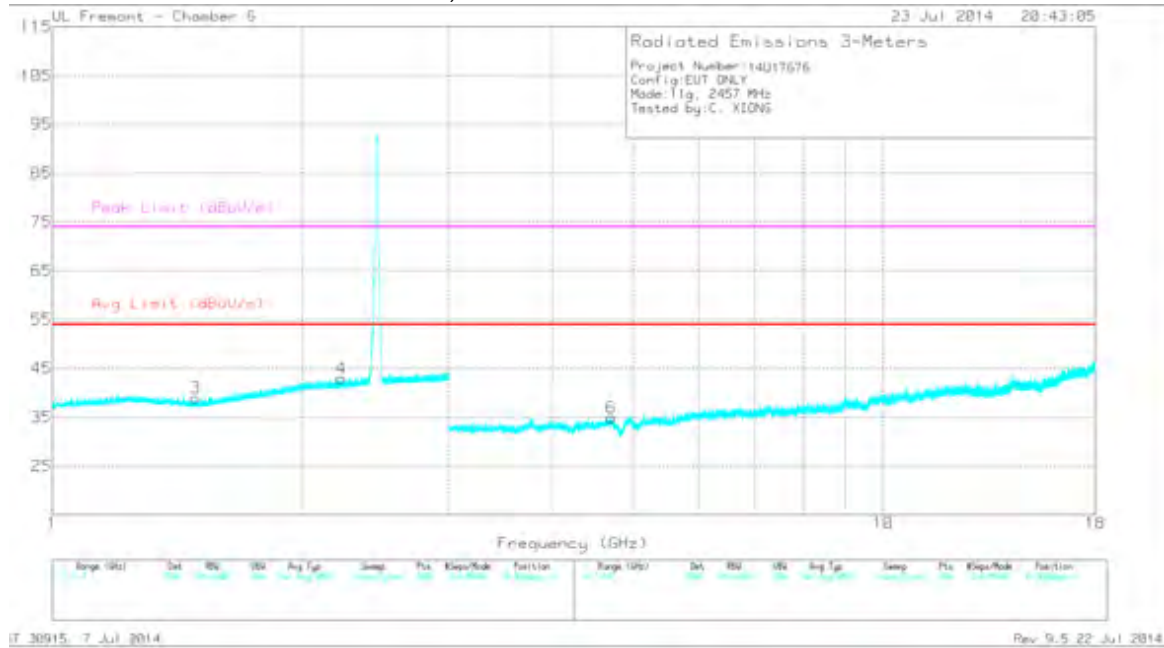
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL PLOT, CH 10



MID CHANNEL VERTICAL PLOT, CH 10



DATA

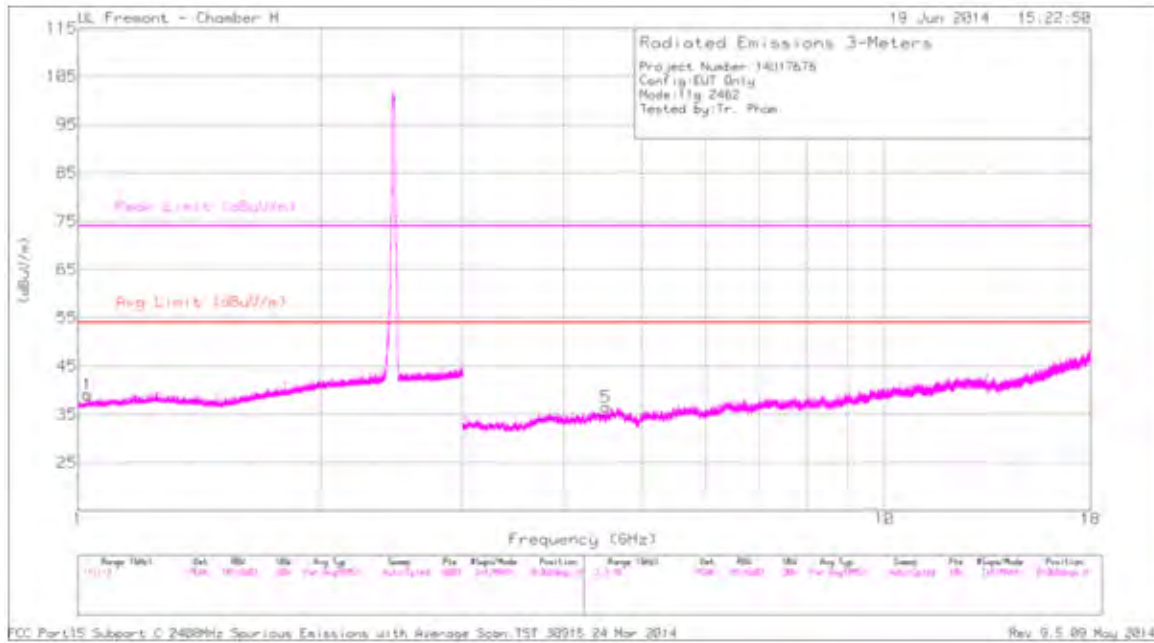
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.197	44.32	PK2	28.9	-26	47.22	-	-	74	-26.78	296	198	H
	* 1.195	32.72	MAv1	28.9	-26	35.62	54	-18.38	-	-	296	198	H
2	* 1.668	44.25	PK2	29	-25.4	47.85	-	-	74	-26.15	276	147	H
	* 1.664	32.43	MAv1	29	-25.4	36.03	54	-17.97	-	-	276	147	H
3	* 1.485	44.4	PK2	28	-25.6	46.8	-	-	74	-27.2	172	192	V
	* 1.488	32.53	MAv1	28	-25.6	34.93	54	-19.07	-	-	172	192	V
4	* 2.226	43.42	PK2	31.5	-25.1	49.82	-	-	74	-24.18	233	157	V
	* 2.226	32.37	MAv1	31.5	-25.1	38.77	54	-15.23	-	-	233	157	V
5	* 3.788	42.19	PK2	33	-32.9	42.29	-	-	74	-31.71	242	215	H
	* 3.788	31.27	MAv1	33	-32.9	31.37	54	-22.63	-	-	242	215	H
6	* 4.709	41.68	PK2	34	-33	42.68	-	-	74	-31.32	215	153	V
	* 4.71	30.87	MAv1	34	-33	31.87	54	-22.13	-	-	215	153	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 11



DATA

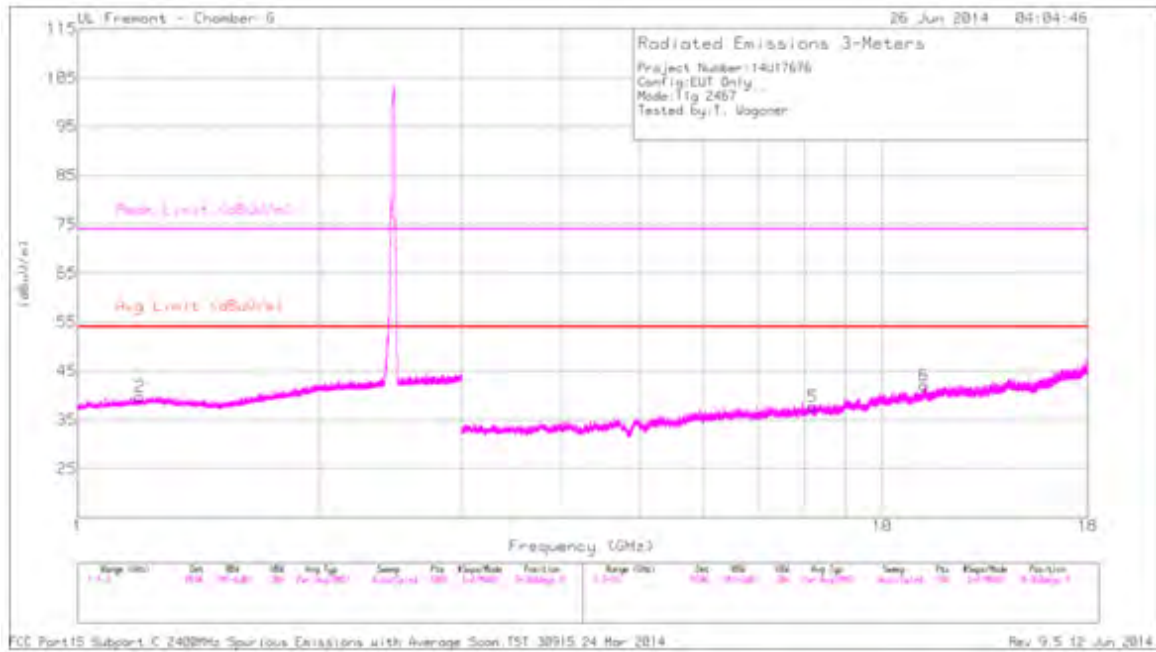
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.029	44.21	PK2	27.8	-25.9	46.11	-	-	74	-27.89	149	201	H
	* 1.029	32.39	MAv1	27.8	-25.9	34.29	54	-19.71	-	-	149	201	H
2	* 1.409	44.07	PK2	28.2	-25.5	46.77	-	-	74	-27.23	49	201	V
	* 1.409	32.21	MAv1	28.2	-25.6	34.81	54	-19.19	-	-	49	201	V
3	* 2.749	43.61	PK2	32.3	-24.3	51.61	-	-	74	-22.39	49	338	V
	* 2.749	31.69	MAv1	32.3	-24.3	39.69	54	-14.31	-	-	49	338	V
4	* 2.855	43.82	PK2	32.5	-24.3	52.02	-	-	74	-21.98	67	242	V
	* 2.856	31.64	MAv1	32.5	-24.3	39.84	54	-14.16	-	-	67	242	V
5	* 4.514	43.84	PK2	34	-32.7	45.14	-	-	74	-28.86	88	113	H
	* 4.514	32.16	MAv1	34	-32.7	33.46	54	-20.54	-	-	88	113	H
6	* 15.742	41.46	PK2	41	-24.8	57.66	-	-	74	-16.34	125	113	V
	* 15.741	29.93	MAv1	41	-24.8	46.13	54	-7.87	-	-	125	113	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

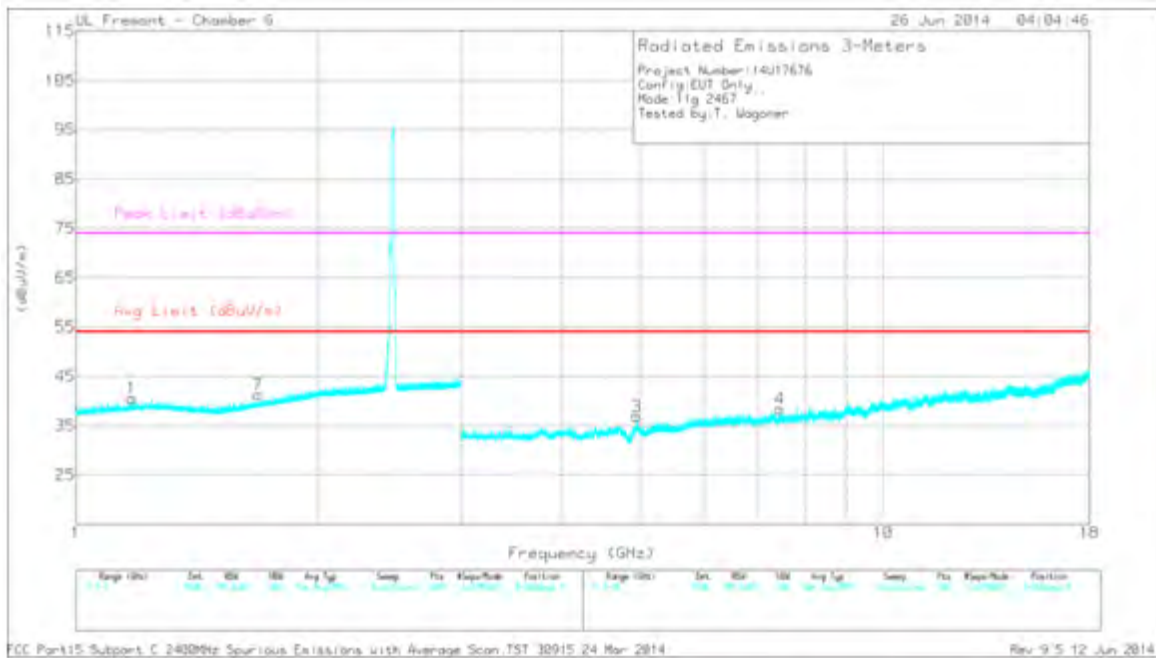
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 12



HIGH CHANNEL VERTICAL PLOT, CH 12



DATA

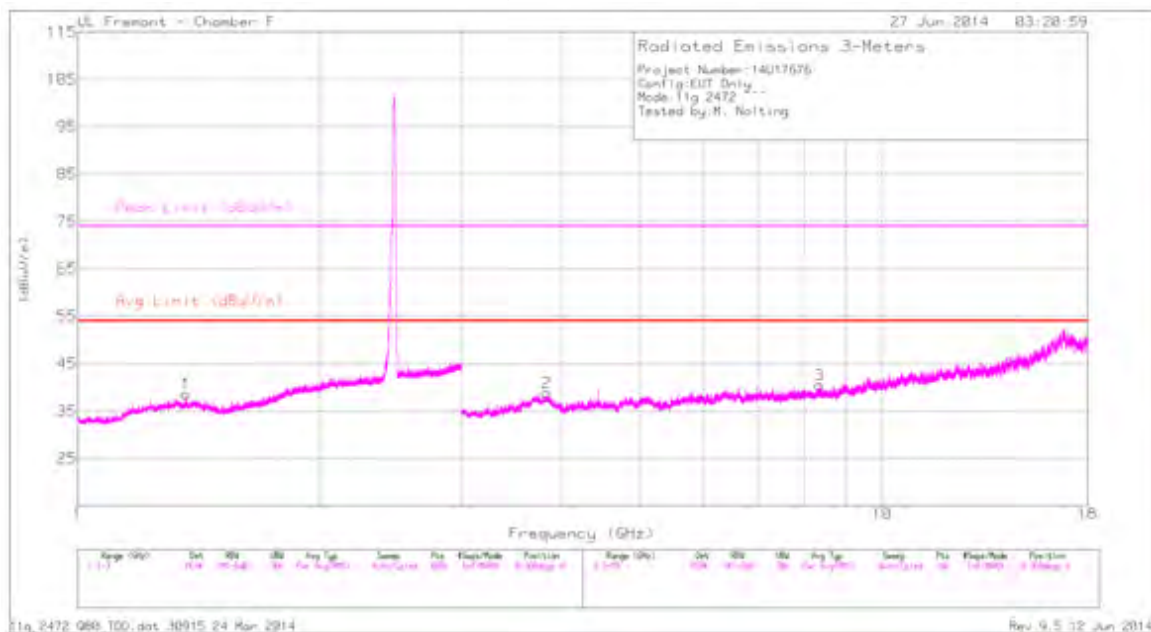
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 1.2	39.33	PK2	29	-26	0	42.33	-	-	74	-31.67	236	272	H
	* 1.194	32.5	MAv1	28.9	-26	0	35.4	54	-18.6	-	-	236	272	H
1	* 1.177	39.46	PK2	28.8	-26	0	42.26	-	-	74	-31.74	141	202	V
	* 1.17	32.69	MAv1	28.8	-26	0	35.49	54	-18.51	-	-	141	202	V
7	* 1.681	39.13	PK2	29.1	-25.4	0	42.83	-	-	74	-31.17	280	201	V
	* 1.681	32.28	MAv1	29.1	-25.4	0	35.98	54	-18.02	-	-	280	201	V
5	* 8.199	34.91	PK2	35.8	-30.1	0	40.61	-	-	74	-33.39	315	202	H
	* 8.199	27.79	MAv1	35.8	-30.1	0	33.49	54	-20.51	-	-	315	202	H
6	* 11.272	32.4	PK2	38	-26	0	44.4	-	-	74	-29.6	263	202	H
	* 11.275	25.31	MAv1	38	-26	0	37.31	54	-16.69	-	-	263	202	H
3	* 4.949	37.24	PK2	34.1	-32.9	0	38.44	-	-	74	-35.56	130	120	V
	* 4.949	30.28	MAv1	34.1	-32.9	0	31.48	54	-22.52	-	-	130	120	V
4	* 7.439	36.02	PK2	35.6	-31.4	0	40.22	-	-	74	-33.78	225	250	V
	* 7.438	29.01	MAv1	35.6	-31.4	0	33.21	54	-20.79	-	-	225	250	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

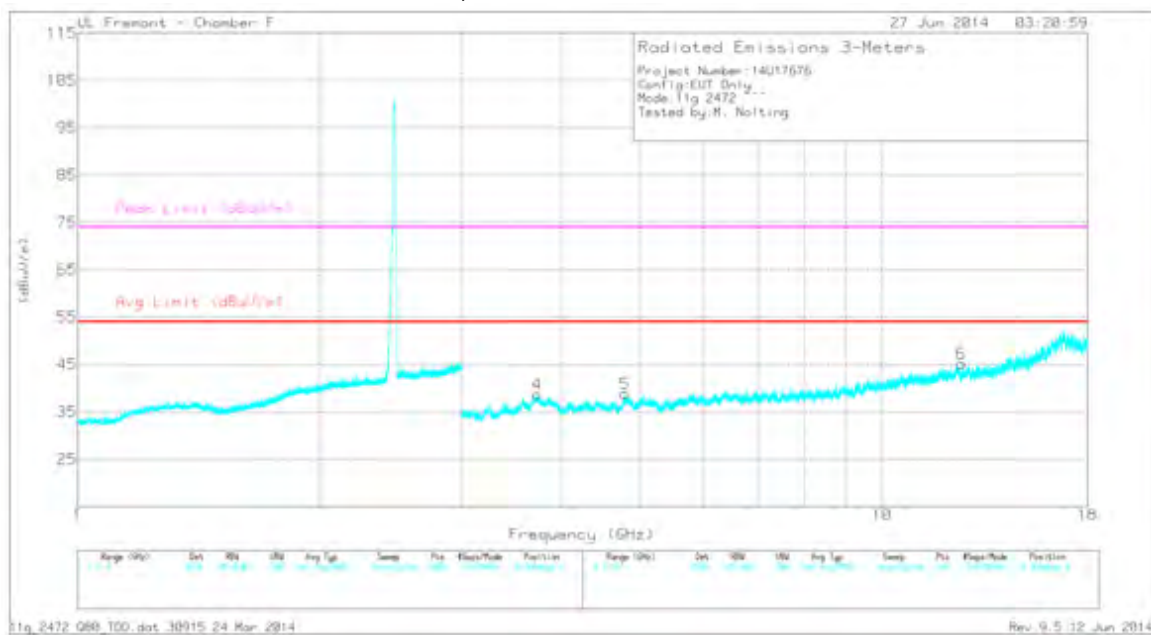
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 13



HIGH CHANNEL VERTICAL PLOT, CH 13



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.372	41.8	PK2	29.5	-26.1	45.2	-	-	74	-28.8	186	127	H
	* 1.368	29.81	MAv1	29.5	-26.1	33.21	54	-20.79	-	-	186	127	H
2	* 3.835	40.34	PK2	34.3	-28.9	45.74	-	-	74	-28.26	289	104	H
	* 3.835	29.33	MAv1	34.3	-28.9	34.73	54	-19.27	-	-	289	104	H
3	* 8.352	35.87	PK2	35.8	-24.3	47.37	-	-	74	-26.63	286	119	H
	* 8.367	24.33	MAv1	35.8	-24.2	35.93	54	-18.07	-	-	286	119	H
4	* 3.731	41.17	PK2	34.7	-29.4	46.47	-	-	74	-27.53	322	236	V
	* 3.714	29.51	MAv1	34.8	-29.4	34.91	54	-19.09	-	-	322	236	V
5	* 4.792	38	PK2	34.1	-27.7	44.4	-	-	74	-29.6	352	182	V
	* 4.789	26.96	MAv1	34.1	-27.8	33.26	54	-20.74	-	-	352	182	V
6	* 12.542	35.33	PK2	39	-23	51.33	-	-	74	-22.67	342	287	V
	* 12.541	24.03	MAv1	39	-23	40.03	54	-13.97	-	-	342	287	V

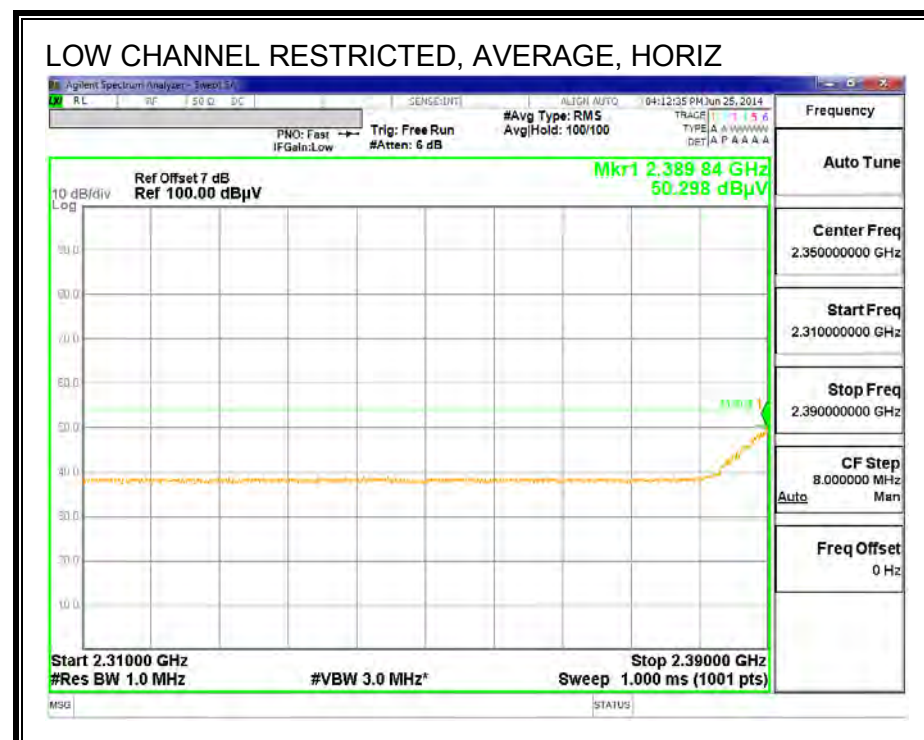
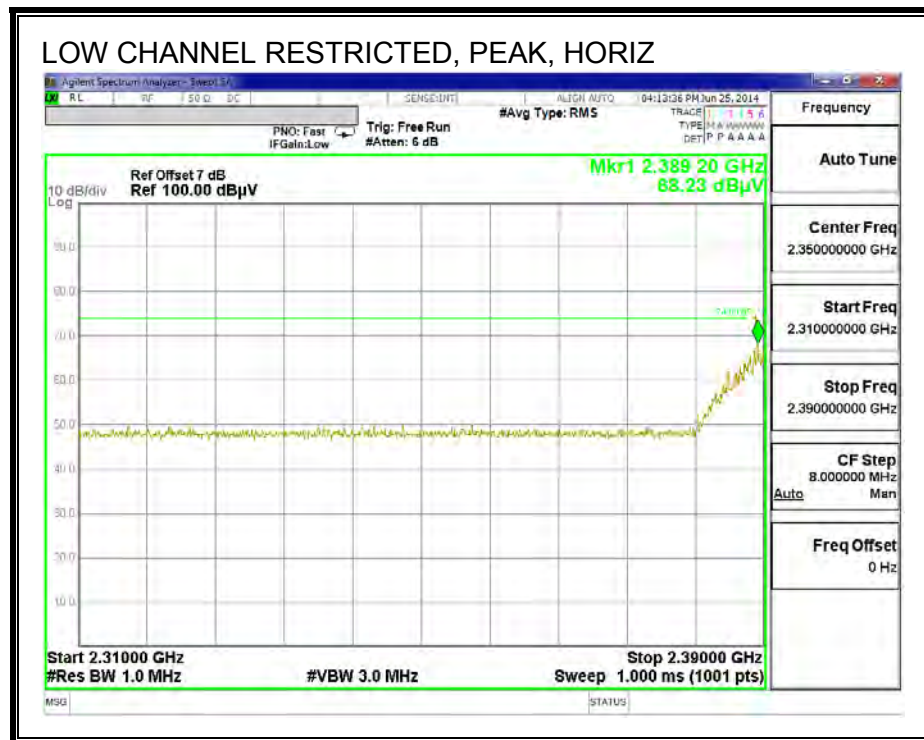
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

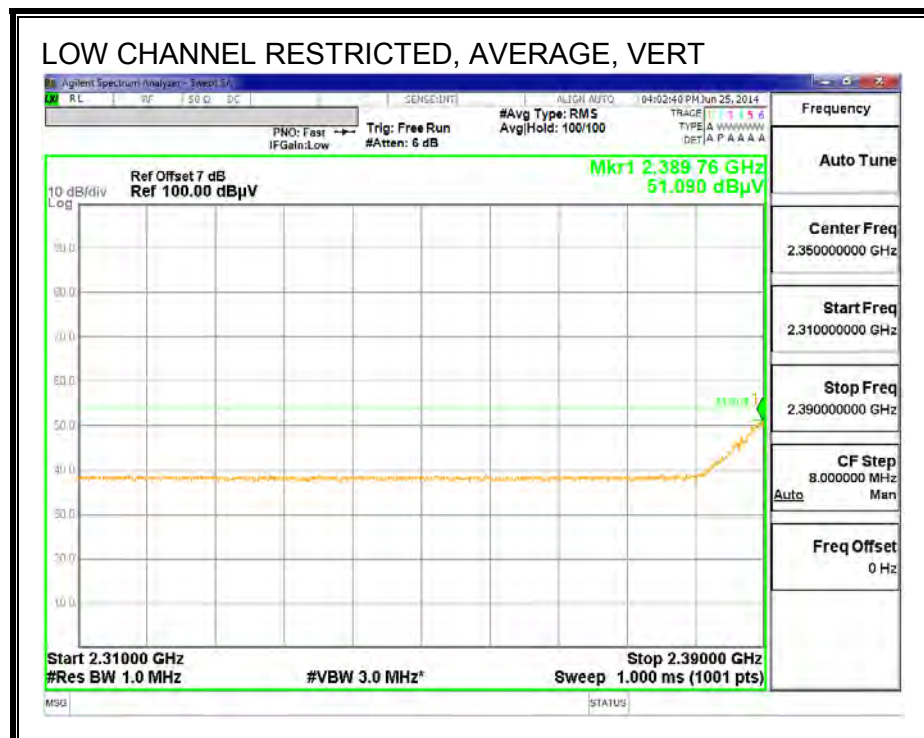
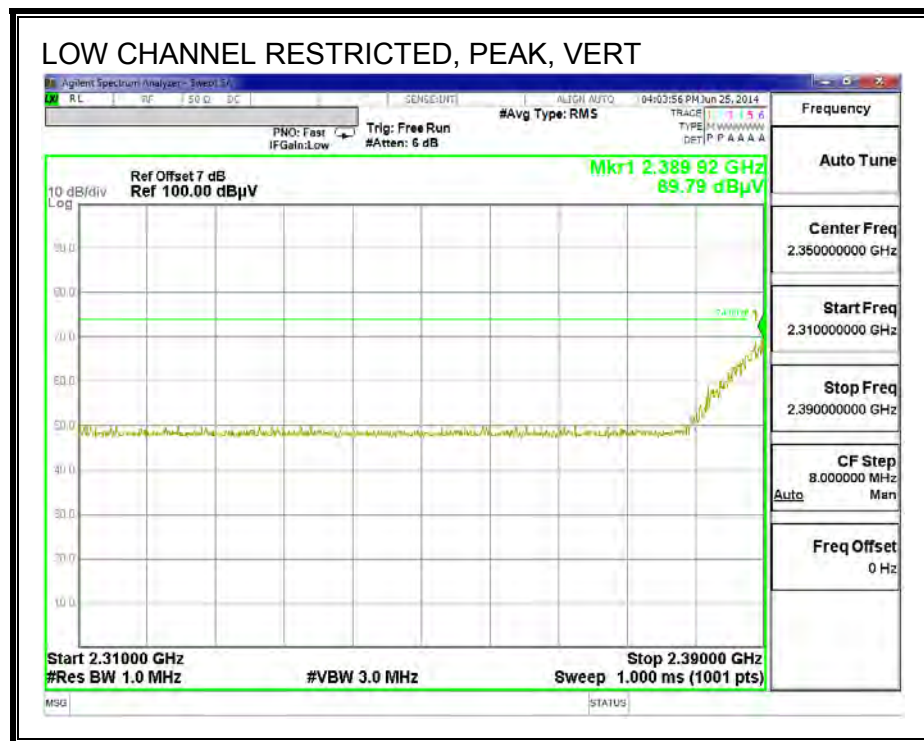
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

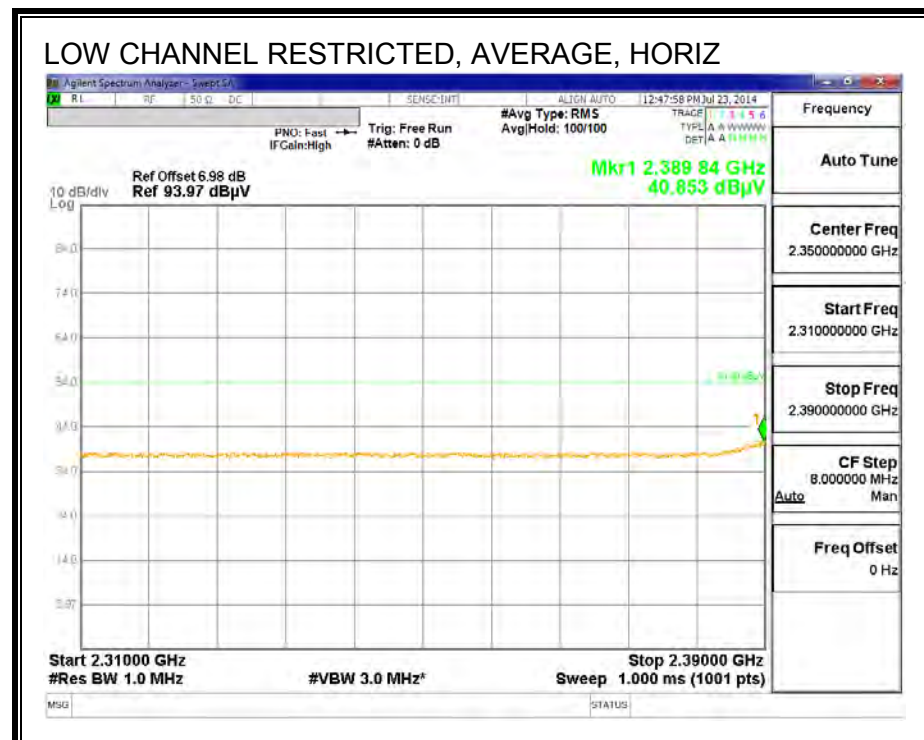
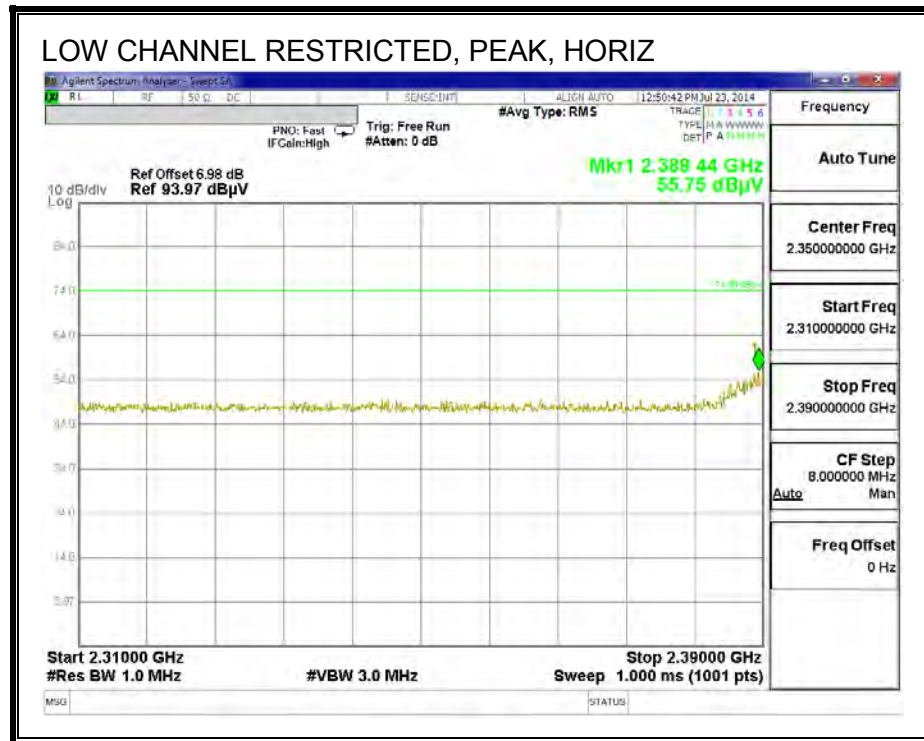
10.2.3.802.11n HT20 MODE IN THE 2.4 GHZ BAND

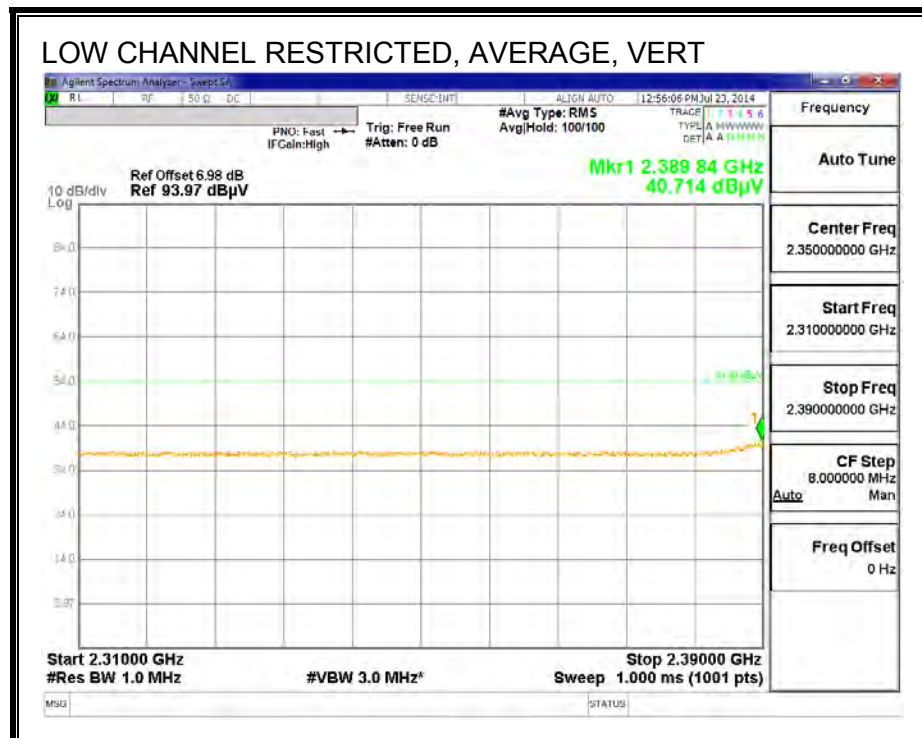
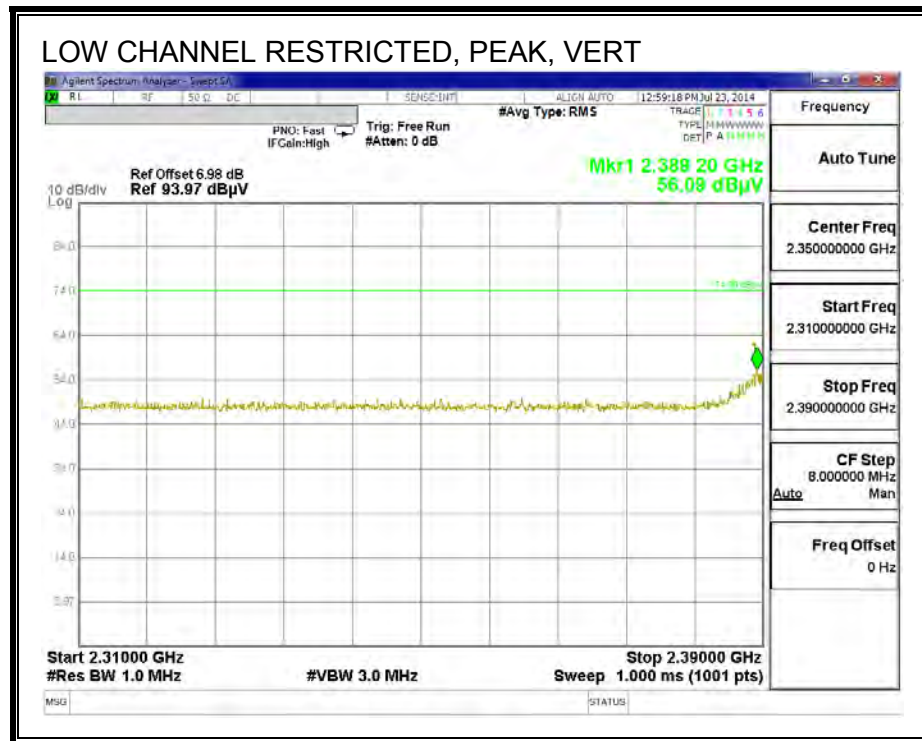
RESTRICTED BANDEDGE (LOW CHANNEL, CHANNEL 1)



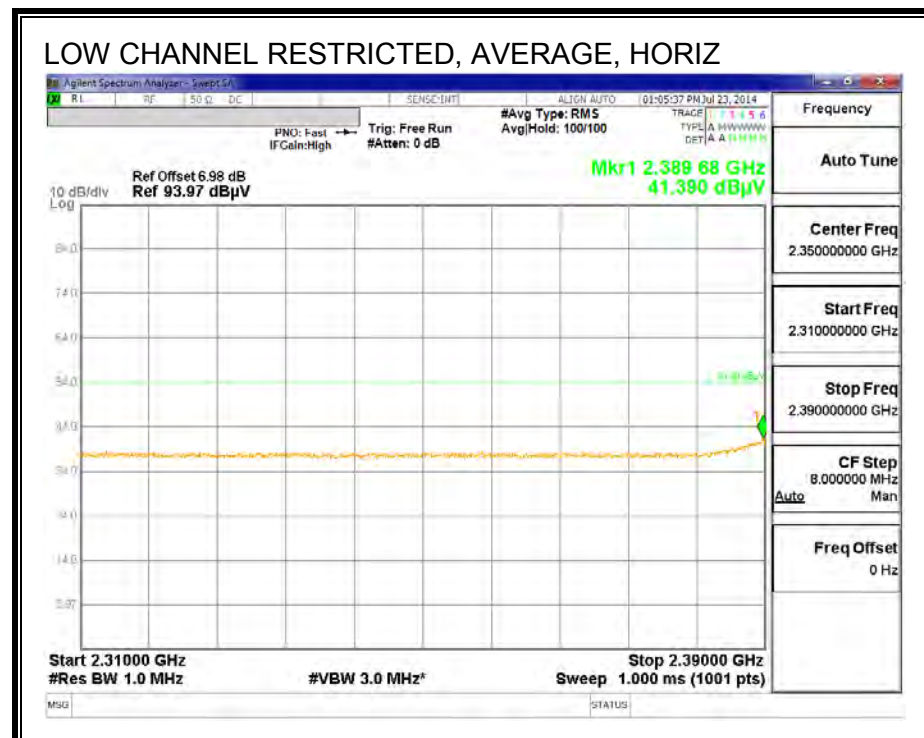
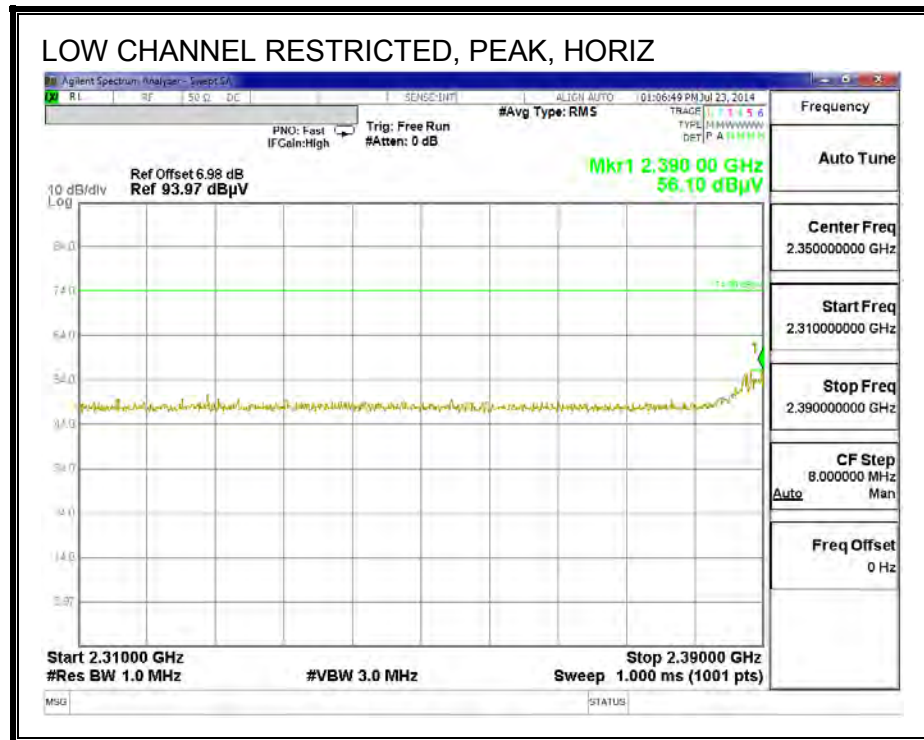


RESTRICTED BANDEDGE (LOW CHANNEL, CHANNEL 2)

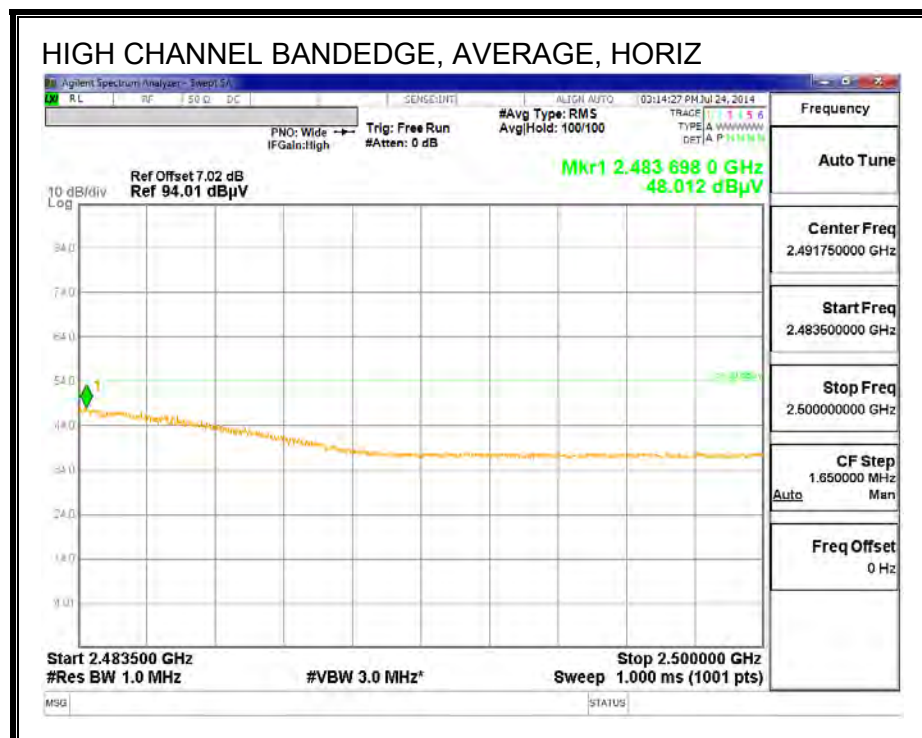
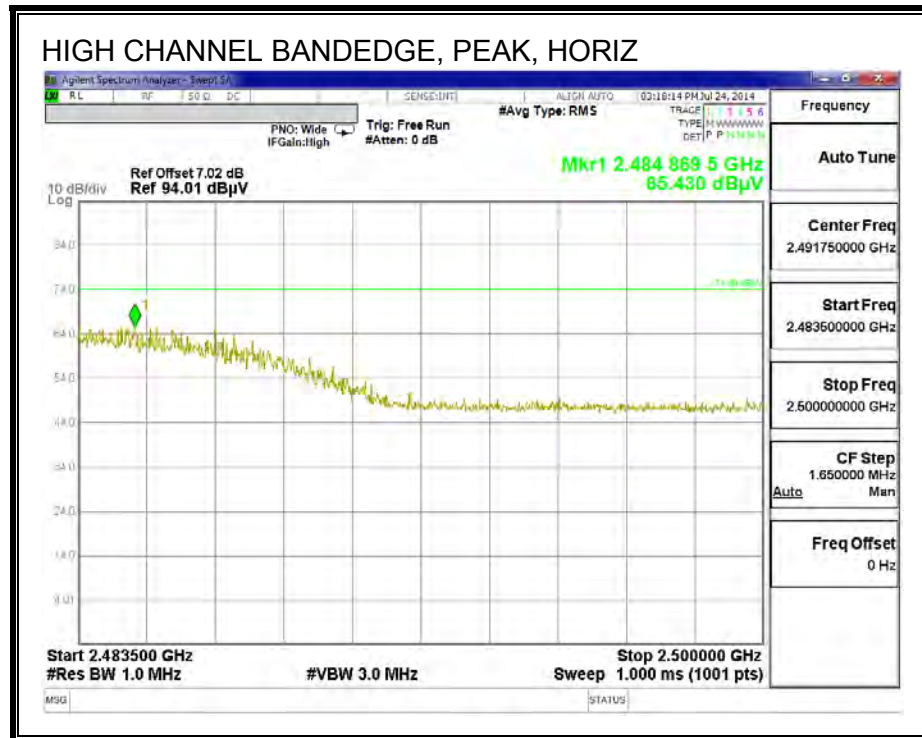


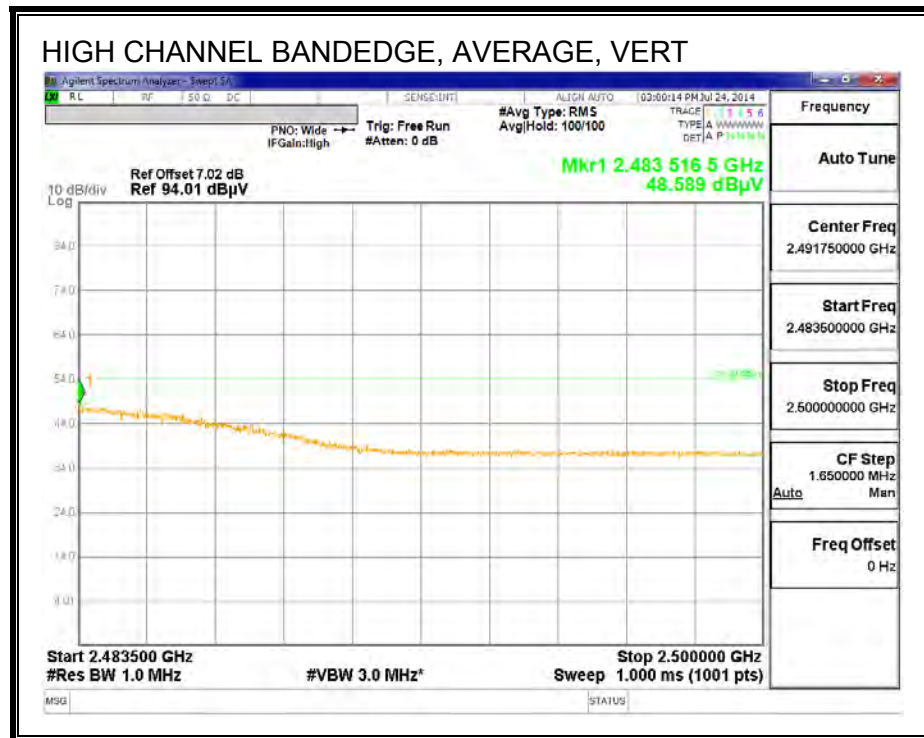
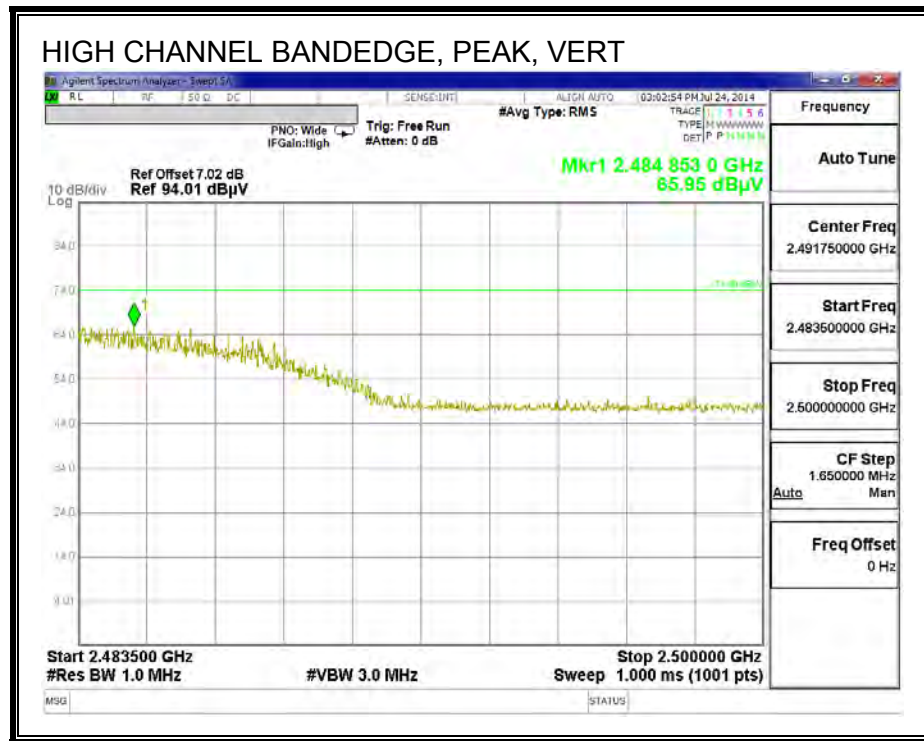


RESTRICTED BANDEDGE (LOW CHANNEL, CHANNEL 3)

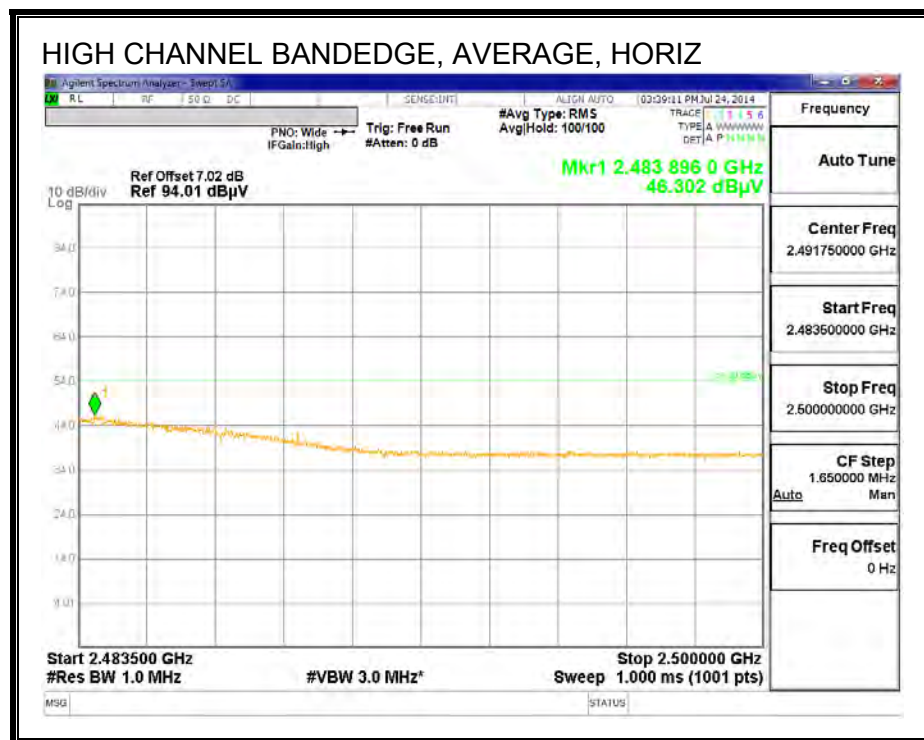
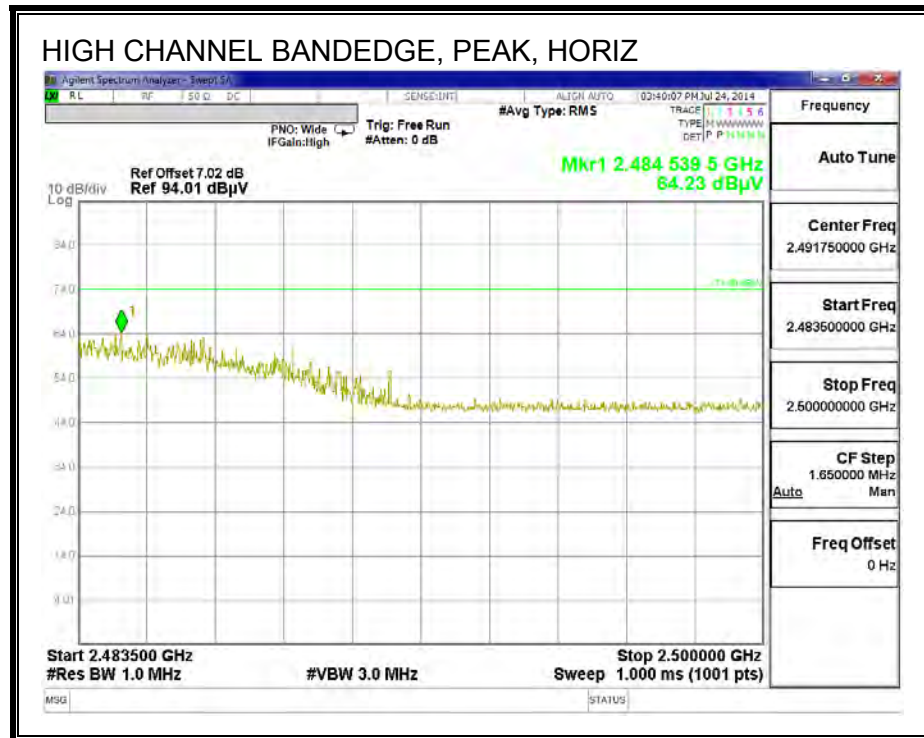


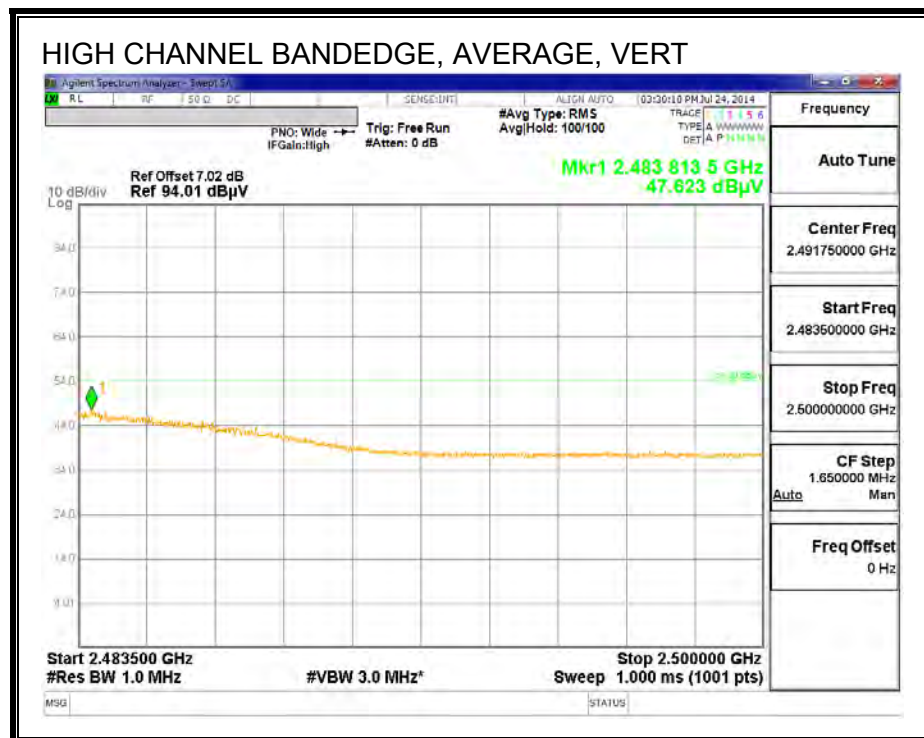
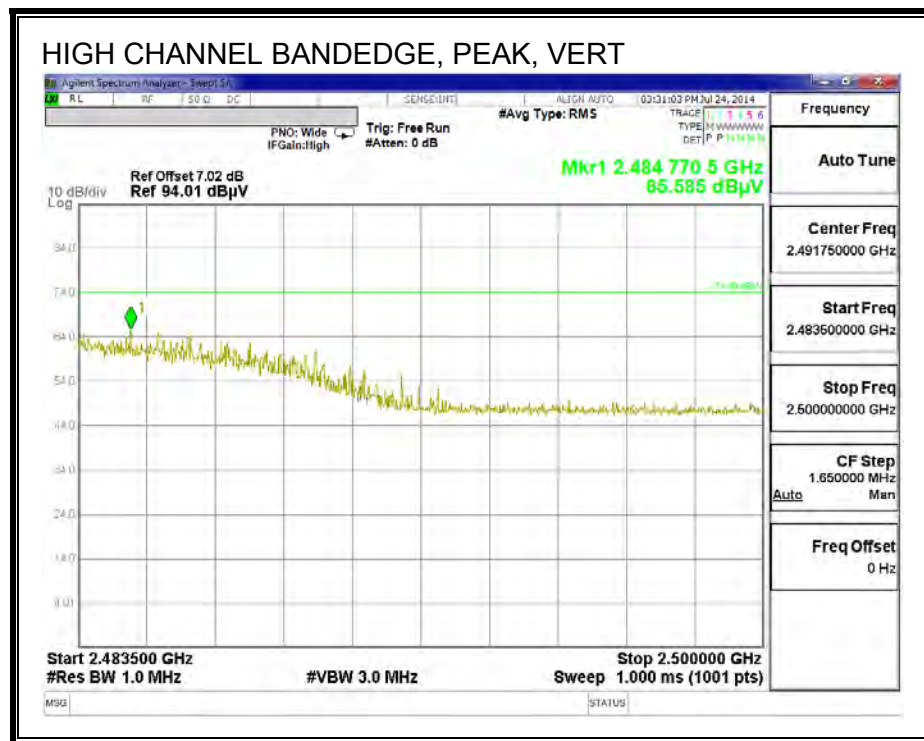
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 9)

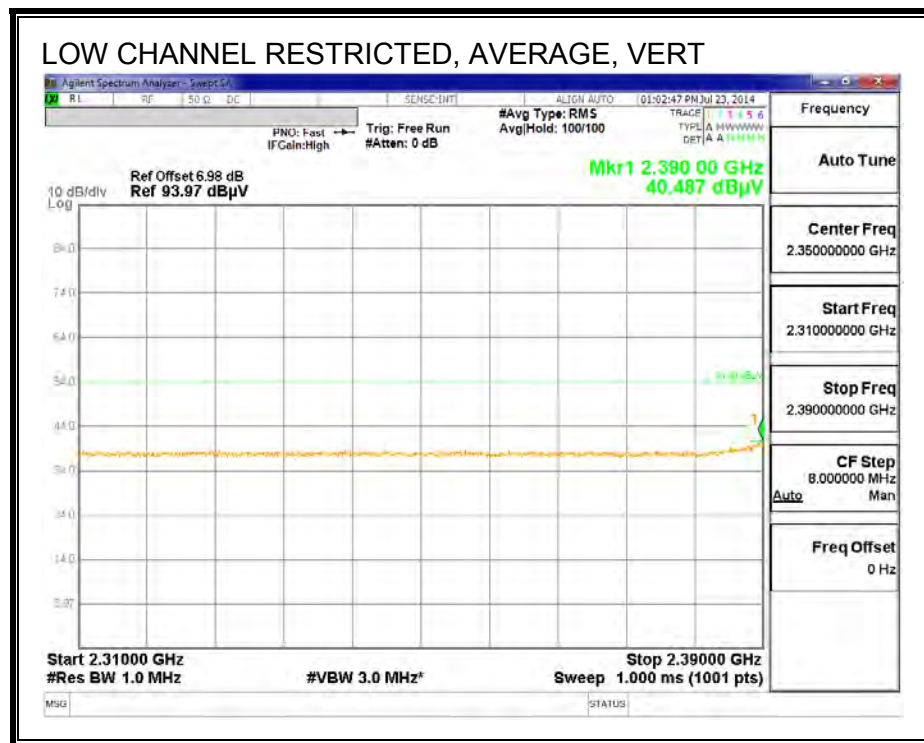
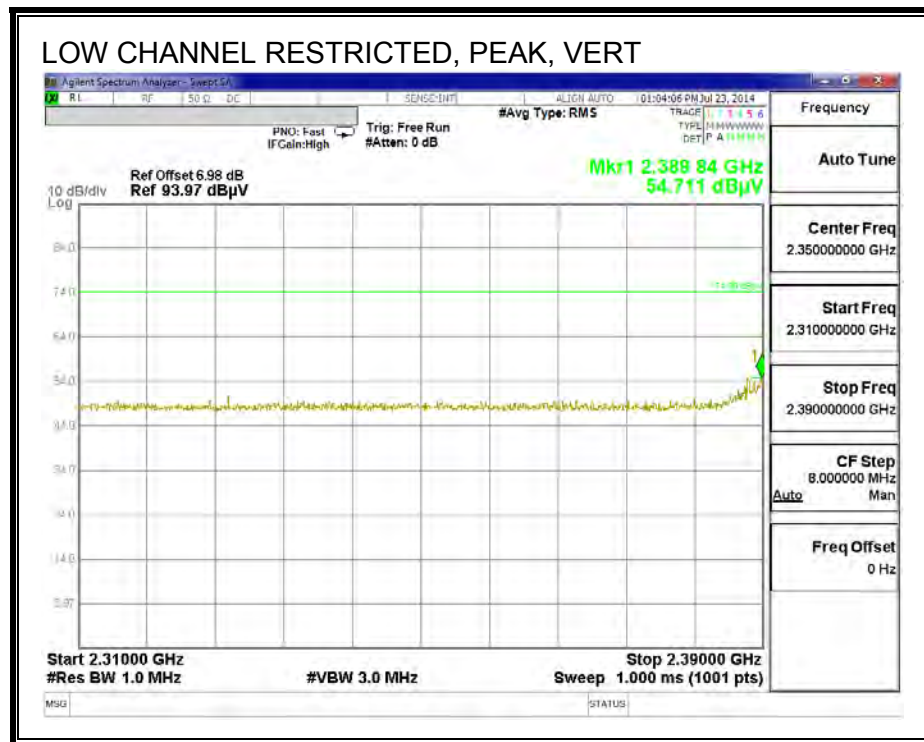




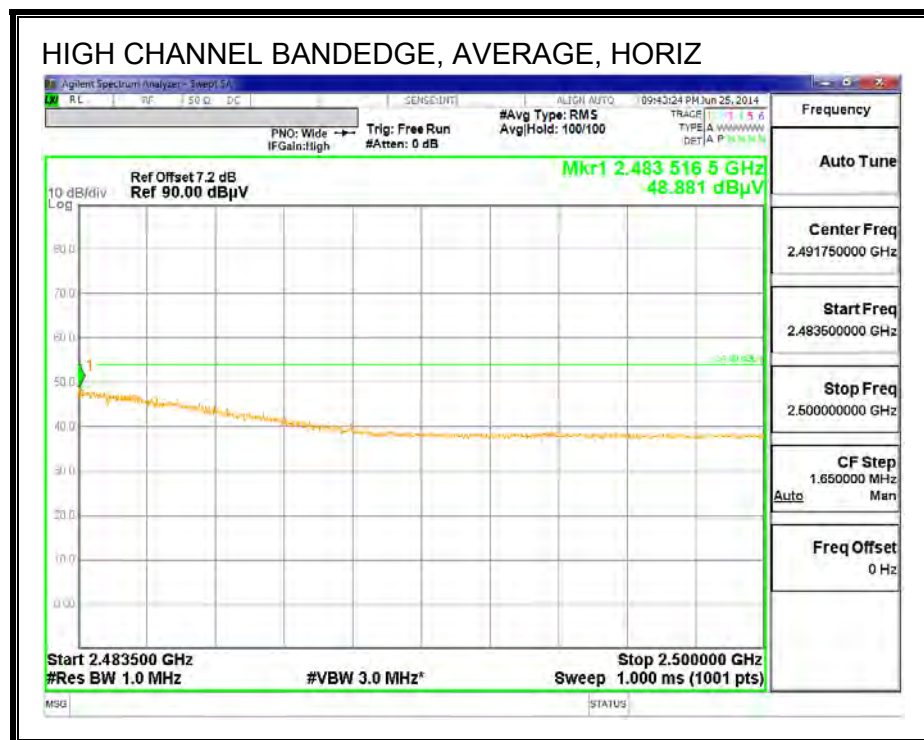
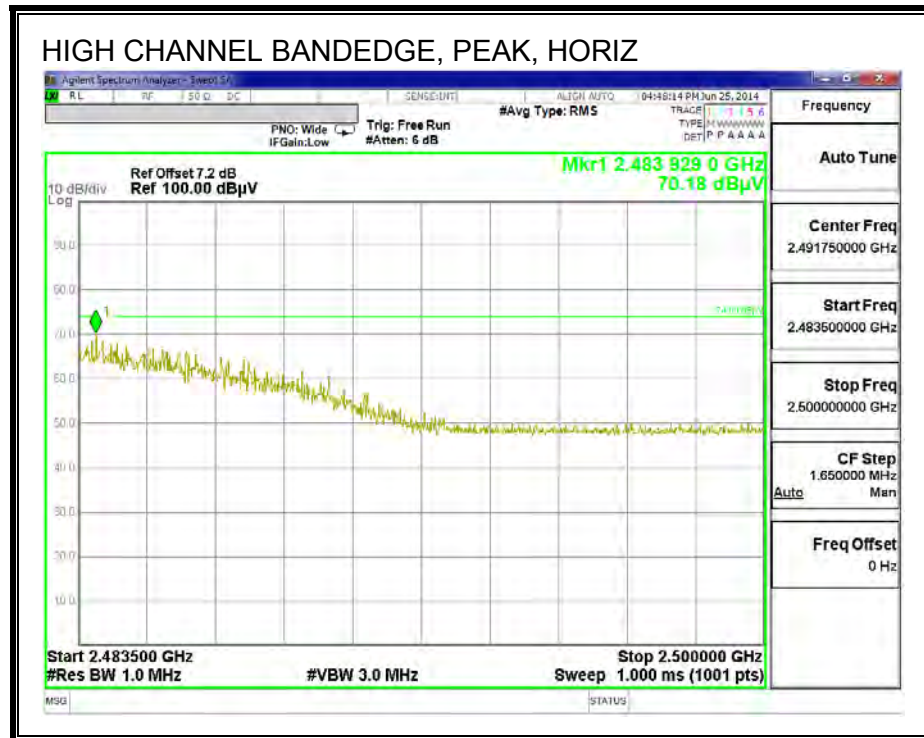
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 10)

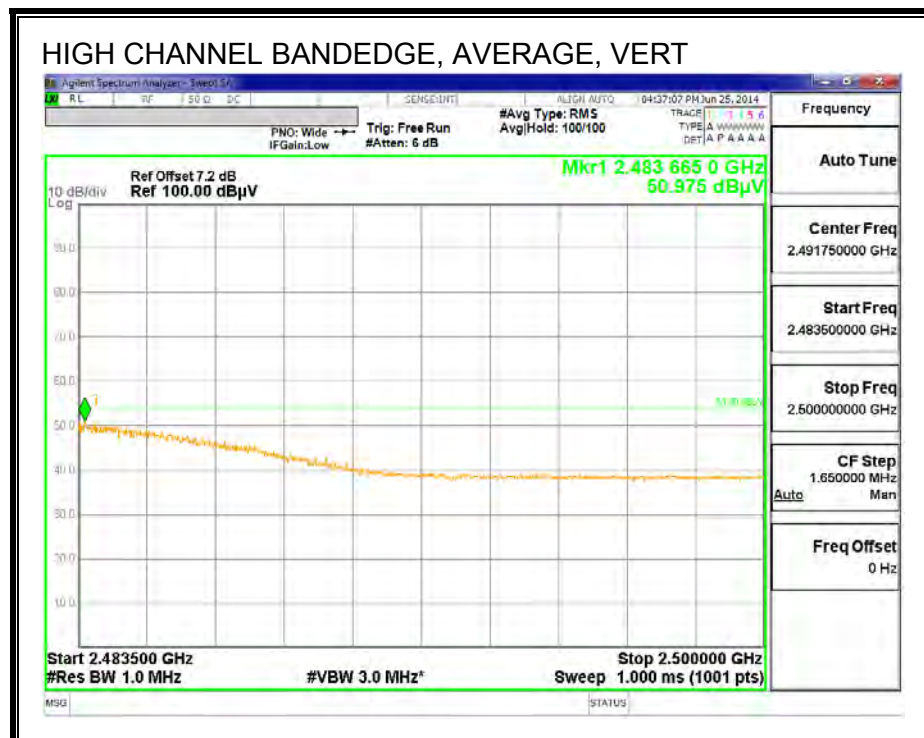
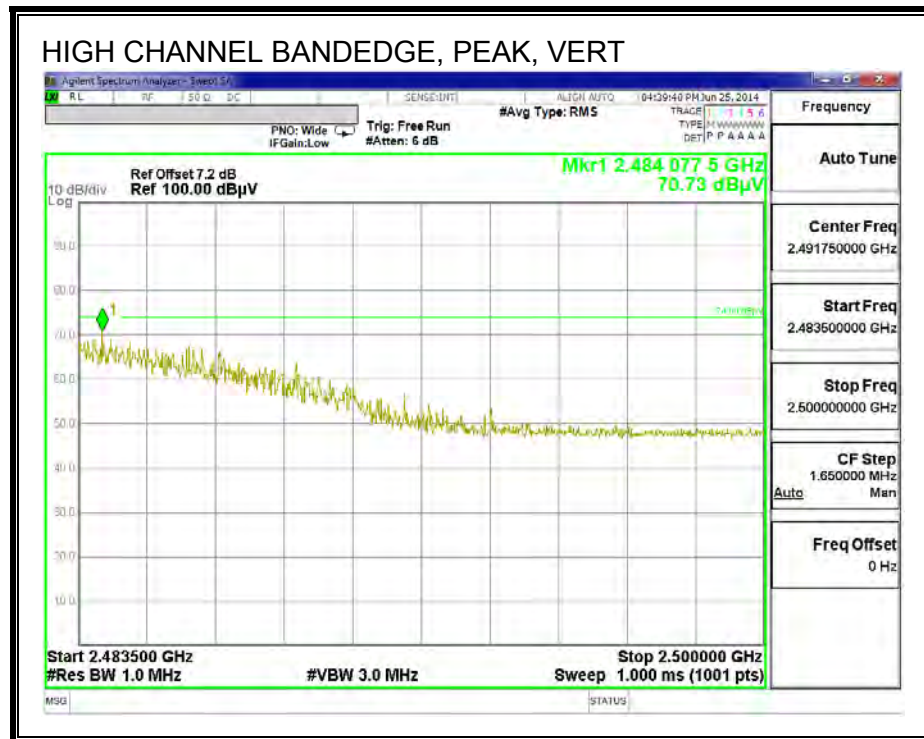




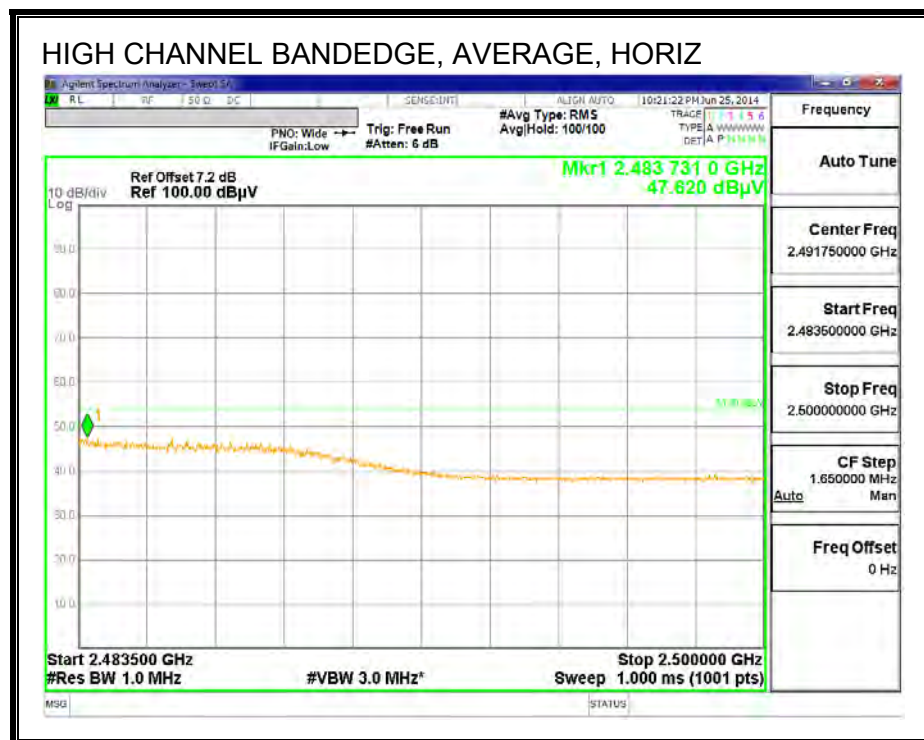
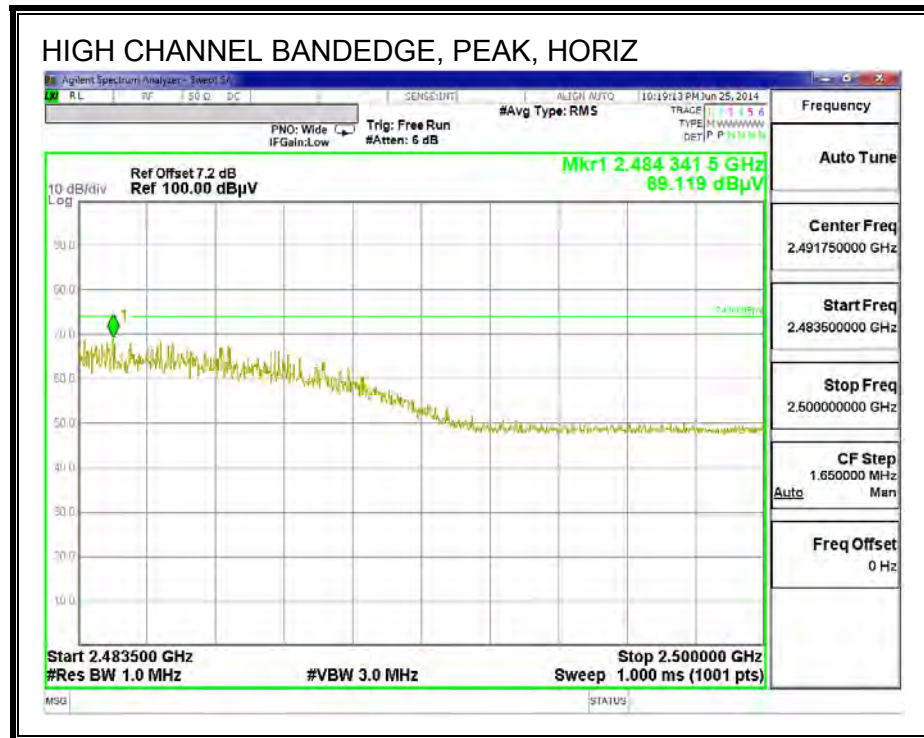


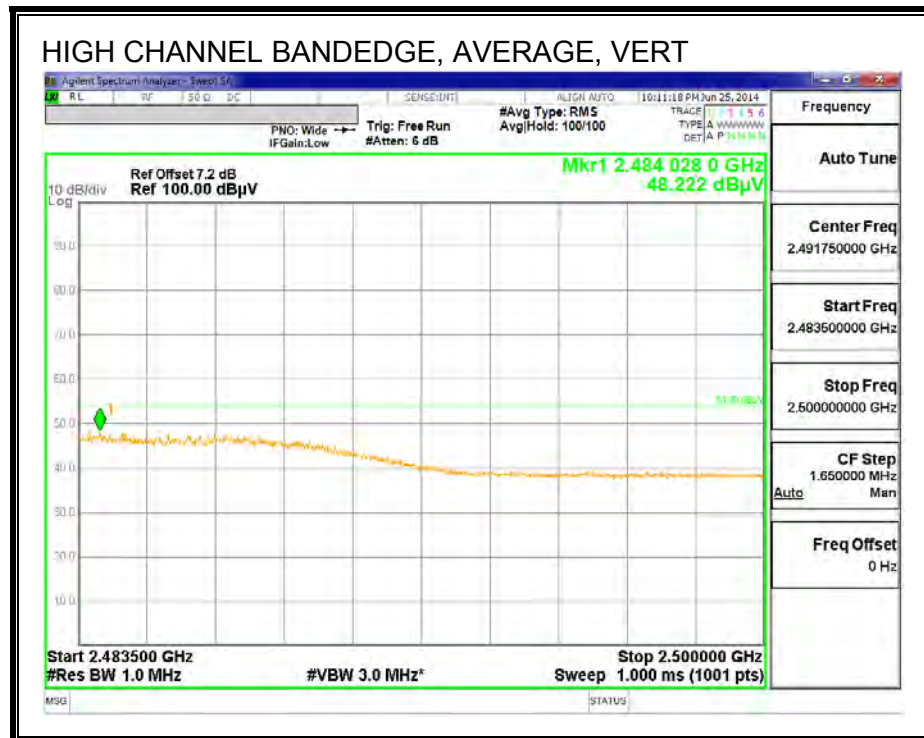
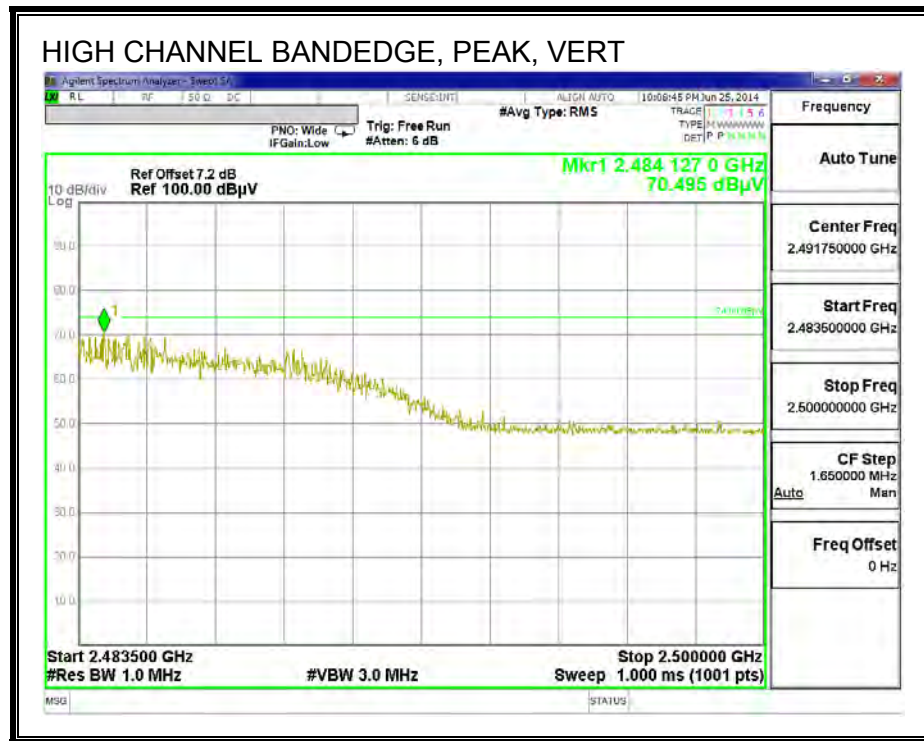
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 11)



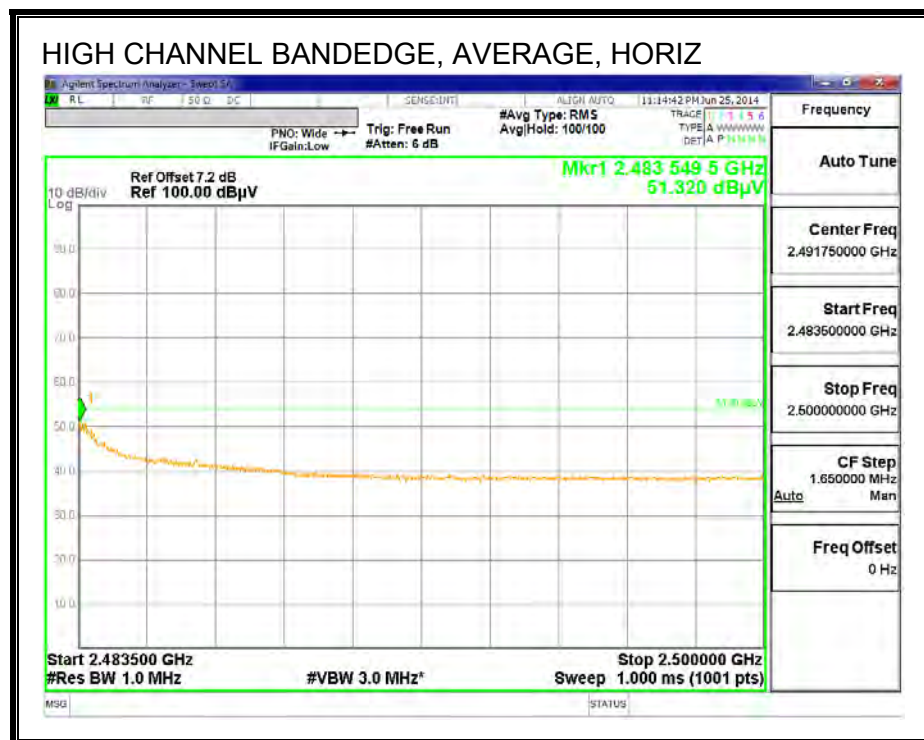
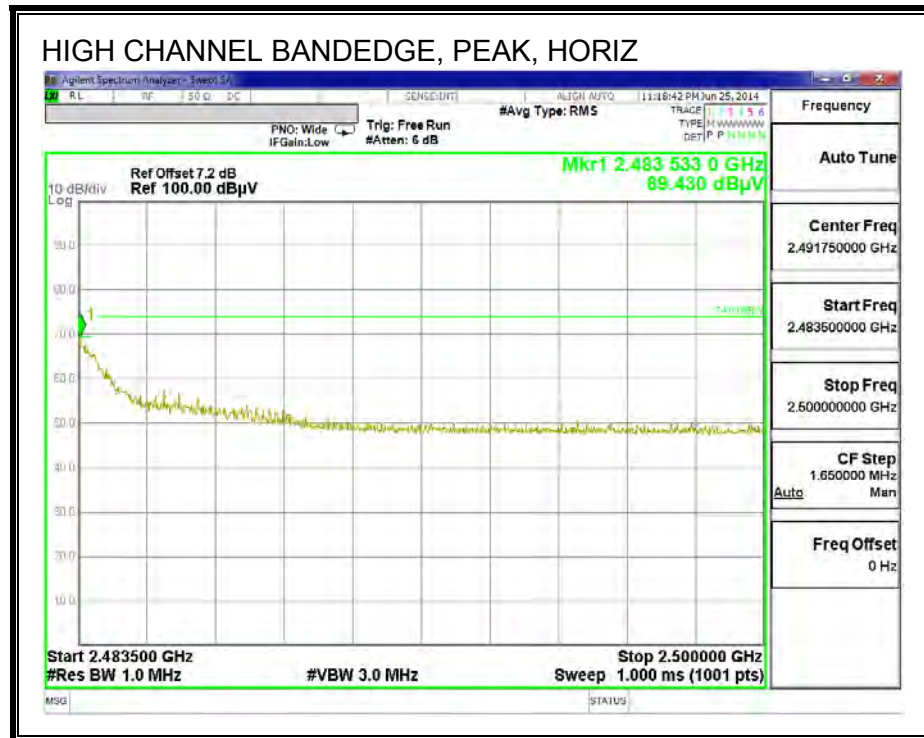


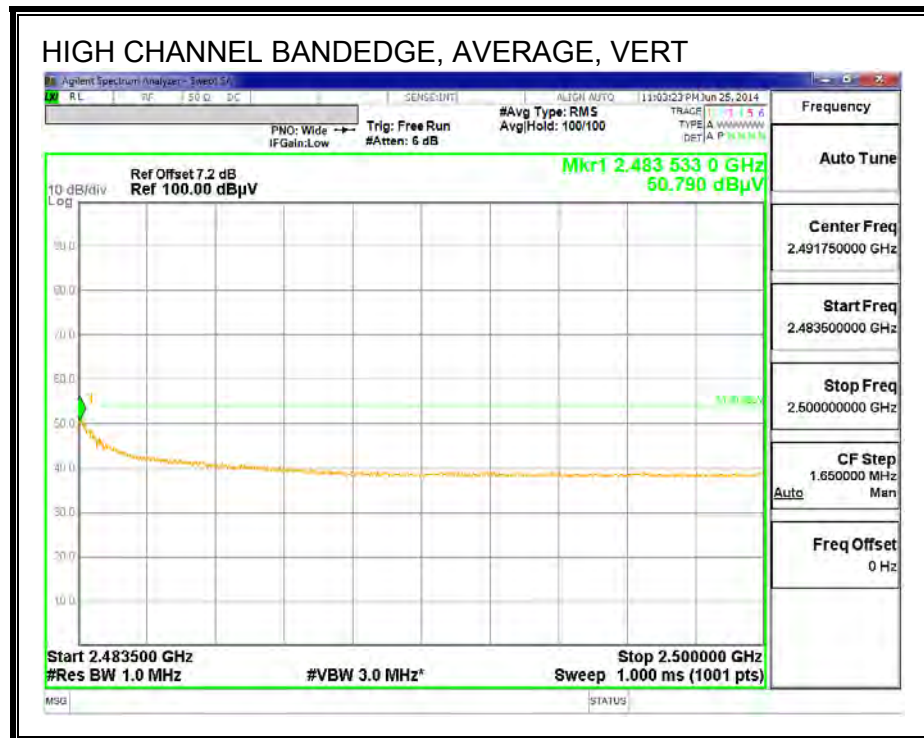
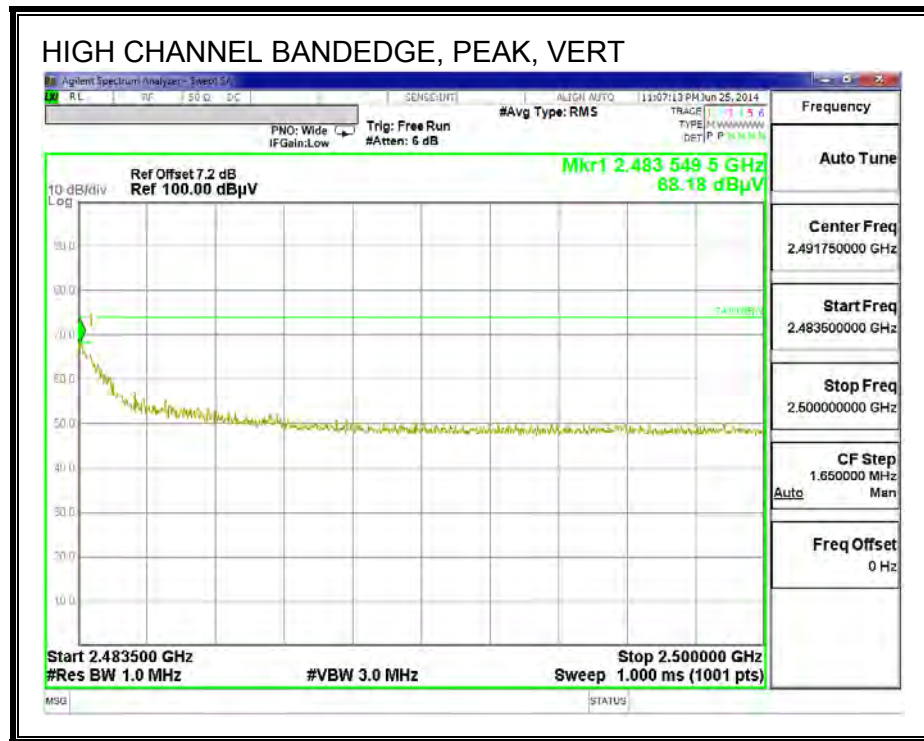
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 12)





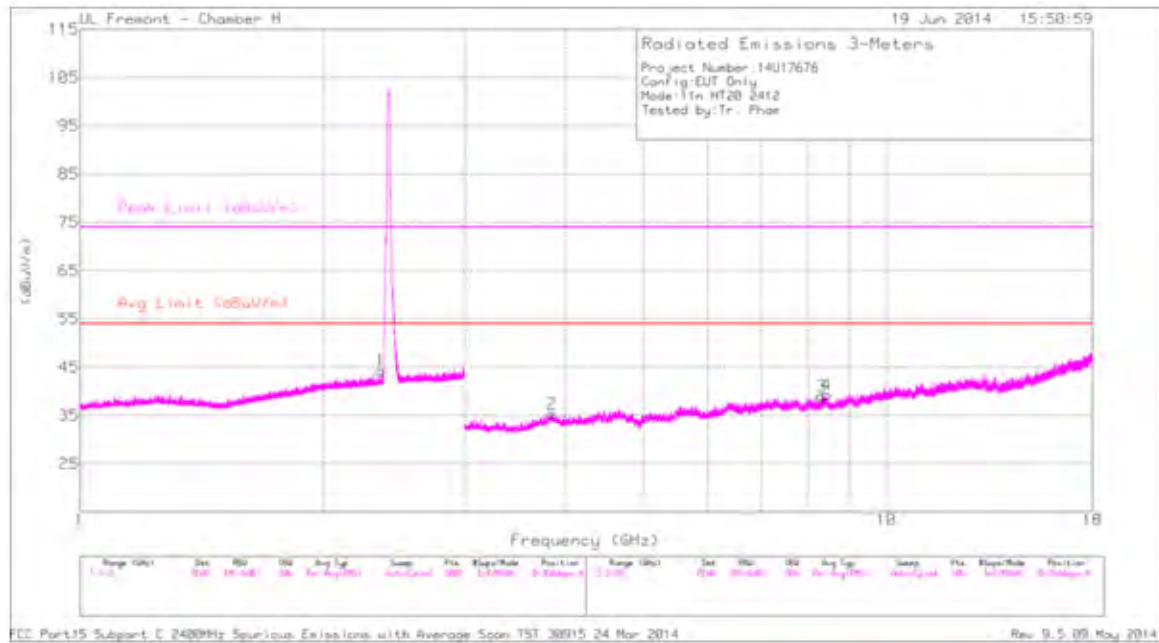
RESTRICTED BANDEDGE (HIGH CHANNEL, CHANNEL 13)



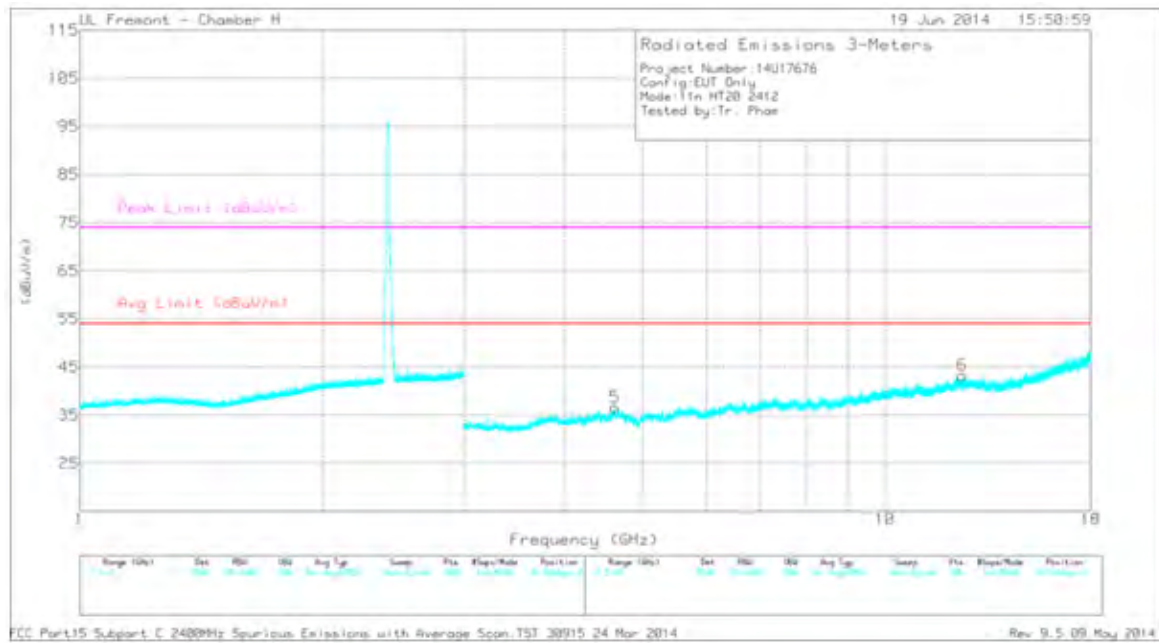


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT, CH 1



LOW CHANNEL VERTICAL PLOT, CH 1



DATA

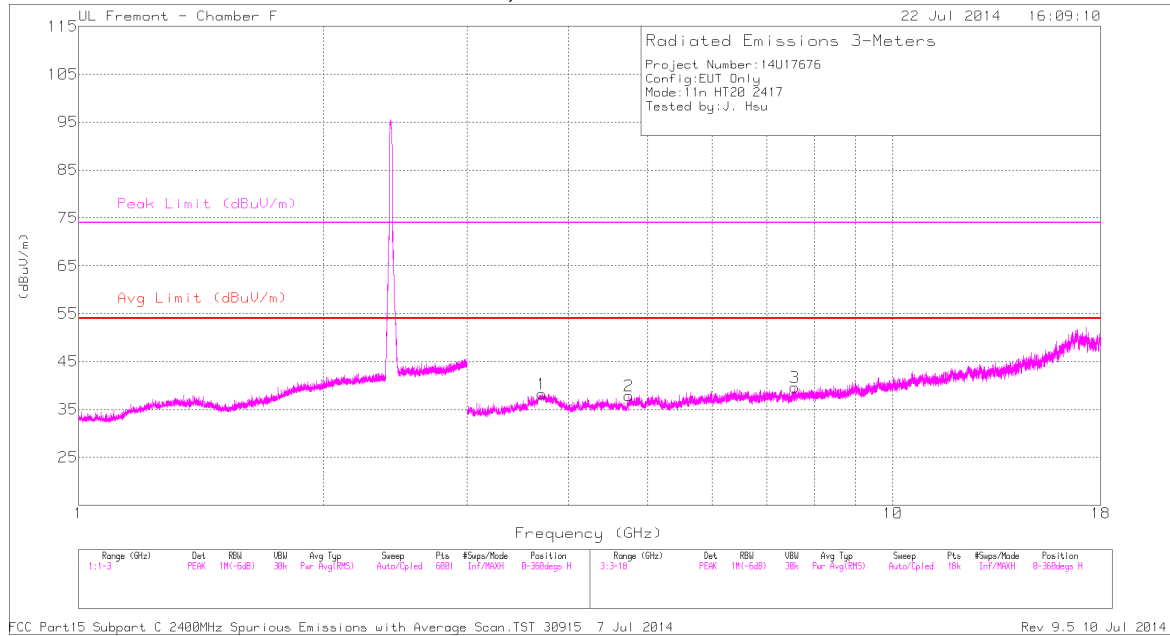
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.36	43.28	PK2	31.9	-24.6	50.58	-	-	74	-23.42	101	197	H
	* 2.36	32.03	MAv1	31.9	-24.6	39.33	54	-14.67	-	-	101	197	H
2	* 3.85	45.23	PK2	33.3	-32.4	46.13	-	-	74	-27.87	166	150	H
	* 3.85	33.76	MAv1	33.3	-32.4	34.66	54	-19.34	-	-	166	150	H
3	* 8.306	42.4	PK2	36.1	-28.5	50	-	-	74	-24	207	150	H
	* 8.306	30.72	MAv1	36.1	-28.5	38.32	54	-15.68	-	-	207	150	H
4	* 8.43	42.45	PK2	36.1	-28.1	50.45	-	-	74	-23.55	268	150	H
	* 8.431	30.95	MAv1	36.1	-28.1	38.95	54	-15.05	-	-	268	150	H
5	* 4.622	44.08	PK2	34.1	-32.2	45.98	-	-	74	-28.02	279	184	V
	* 4.622	32.77	MAv1	34.1	-32.2	34.67	54	-19.33	-	-	279	184	V
6	* 12.467	41.64	PK2	39.1	-25.6	55.14	-	-	74	-18.86	291	184	V
	* 12.467	30.32	MAv1	39.1	-25.6	43.82	54	-10.18	-	-	291	184	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

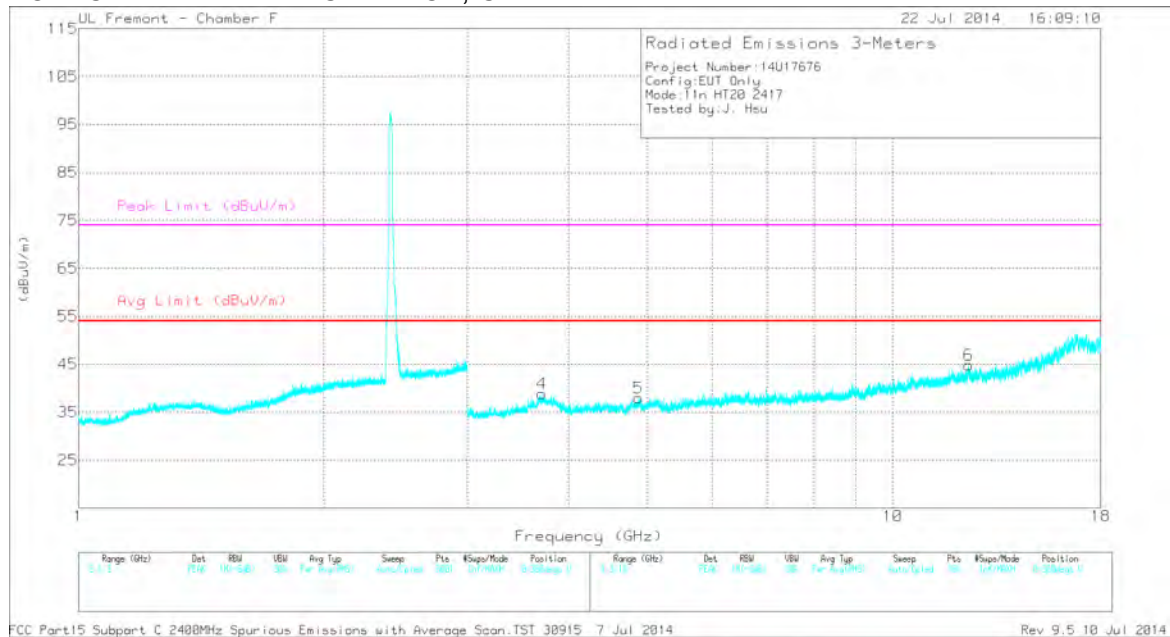
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

LOW CHANNEL HORIZONTAL PLOT, CH 2



LOW CHANNEL VERTICAL PLOT, CH 2



DATA

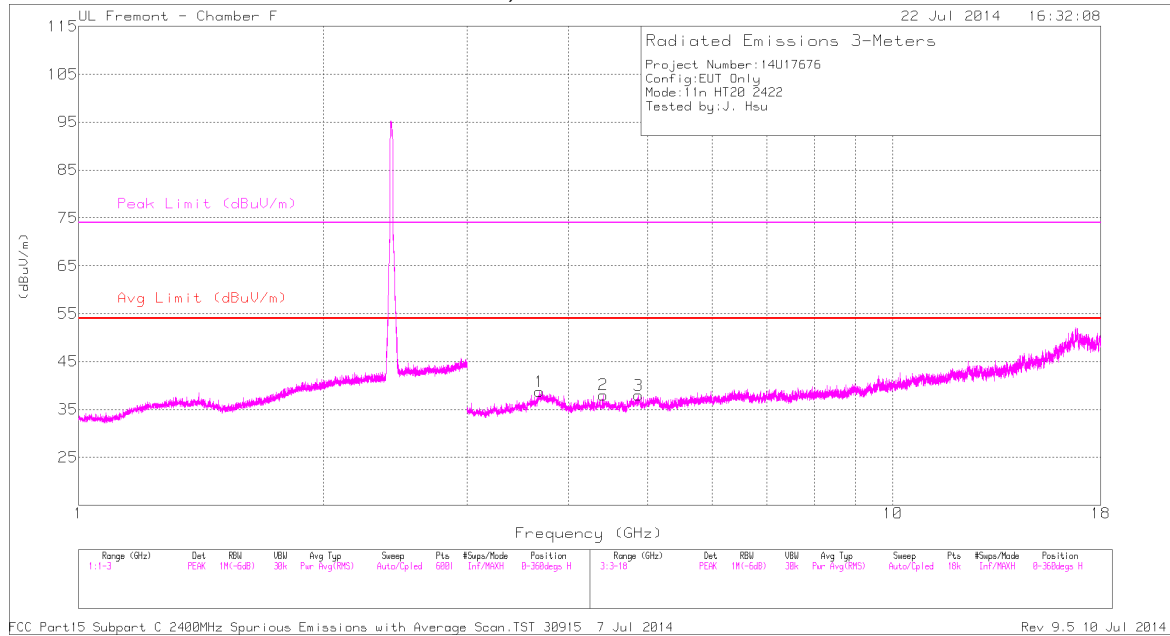
Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.706	39.3	PK2	34.8	-29.4	44.7	-	-	74	-29.3	29	111	H
	* 3.706	27.76	MAv1	34.8	-29.4	33.16	54	-20.84	-	-	29	111	H
2	* 4.742	38.69	PK2	34.1	-28.3	44.49	-	-	74	-29.51	63	124	H
	* 4.742	27.11	MAv1	34.1	-28.3	32.91	54	-21.09	-	-	63	124	H
3	* 7.581	36.69	PK2	35.6	-26.3	45.99	-	-	74	-28.01	116	141	H
	* 7.581	25.57	MAv1	35.6	-26.3	34.87	54	-19.13	-	-	116	141	H
4	* 3.708	39.43	PK2	34.8	-29.4	44.83	-	-	74	-29.17	185	172	V
	* 3.708	28.14	MAv1	34.8	-29.4	33.54	54	-20.46	-	-	185	172	V
5	* 4.874	38.11	PK2	34.2	-27.7	44.61	-	-	74	-29.39	143	188	V
	* 4.874	26.59	MAv1	34.2	-27.7	33.09	54	-20.91	-	-	143	188	V
6	* 12.39	34.96	PK2	38.9	-21.8	52.06	-	-	74	-21.94	109	174	V
	* 12.39	23.94	MAv1	38.9	-21.8	41.04	54	-12.96	-	-	109	174	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

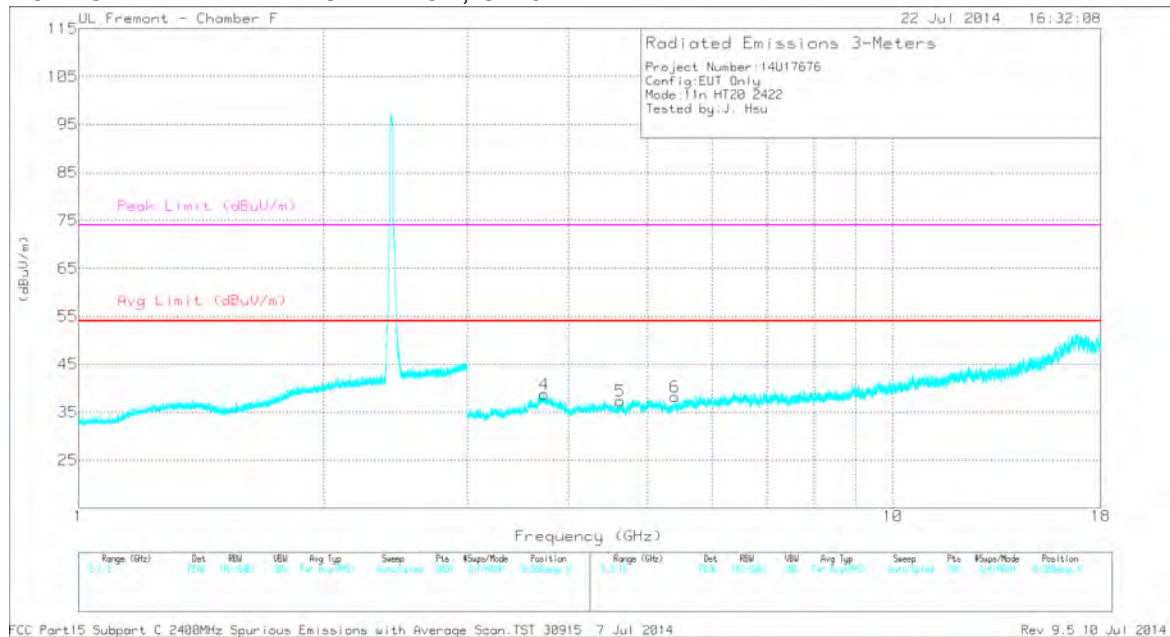
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

LOW CHANNEL HORIZONTAL PLOT, CH 3



LOW CHANNEL VERTICAL PLOT, CH 3



DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.68	39.85	PK2	34.9	-29.2	45.55	-	-	74	-28.45	36	113	H
	* 3.68	27.65	MAv1	34.9	-29.2	33.35	54	-20.65	-	-	36	113	H
2	4.406	38.6	PK2	33.8	-29.2	43.2	-	-	-	-	63	123	H
	4.406	27.76	MAv1	33.8	-29.2	32.36	-	-	-	-	63	123	H
3	* 4.867	38.04	PK2	34.2	-27.6	44.64	-	-	74	-29.36	103	141	H
	* 4.867	26.57	MAv1	34.2	-27.6	33.17	54	-20.83	-	-	103	141	H
4	* 3.733	39.49	PK2	34.7	-29.4	44.79	-	-	74	-29.21	155	165	V
	* 3.734	27.84	MAv1	34.7	-29.4	33.14	54	-20.86	-	-	155	165	V
5	* 4.623	39.33	PK2	34.1	-28.9	44.53	-	-	74	-29.47	110	182	V
	* 4.623	27.56	MAv1	34.1	-28.9	32.76	54	-21.24	-	-	110	182	V
6	* 5.4	38.46	PK2	34.6	-27.7	45.36	-	-	74	-28.64	155	203	V
	* 5.4	26.89	MAv1	34.6	-27.7	33.79	54	-20.21	-	-	155	203	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

19 Jun 2014 15:25:28

LE Fresant - Chamber H

Radiated Emissions 3-Meters

Project Number: 14017676
 Config: EUT Only
 Mode: 11m HT20 J437
 Tested by: Tr. Phan

Peak Limit 100dBuV/m

Avg Limit 55dBuV/m

(dBuV/m)

Frequency (GHz)

Range (Hz)	Del	BW	RBW	Res	Avg Type	Sweep	Pre	FilterMode	Function	Range (dB)	Del	BW	RBW	Res	Avg Type	Sweep	Pre	FilterMode	Function
1.4	20	100kHz	30	30	Peak	Auto	100	0	0	110	20	100kHz	30	30	Peak	Auto	100	0	0

FCC Part 15 Subpart C 2400MHz Spurious Emissions with Average Scan, IST 30015 24 Mar 2014

Rev 3.5.00 May 2014

DATA

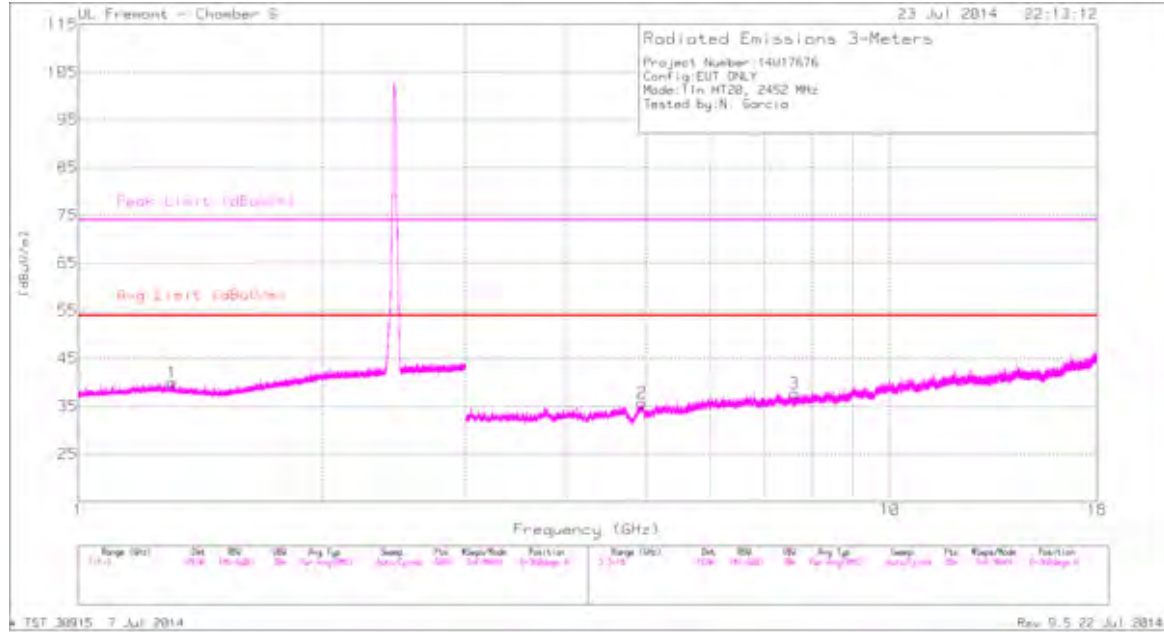
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.304	44.07	PK2	28.7	-25.8	46.97	-	-	74	-27.03	286	144	H
	* 1.307	32.84	MAv1	28.7	-25.8	35.74	54	-18.26	-	-	286	144	H
2	* 1.521	43.68	PK2	27.9	-25.4	46.18	-	-	74	-27.82	16	218	V
	* 1.515	32.55	MAv1	27.8	-25.4	34.95	54	-19.05	-	-	16	218	V
3	* 3.972	43.78	PK2	33.5	-33.2	44.08	-	-	74	-29.92	107	146	H
	* 3.972	33.27	MAv1	33.5	-33.2	33.57	54	-20.43	-	-	107	146	H
4	* 10.707	41.27	PK2	37.6	-25.2	53.67	-	-	74	-20.33	244	318	H
	* 10.703	30.24	MAv1	37.6	-25.2	42.64	54	-11.36	-	-	244	318	H
5	* 10.89	41.22	PK2	37.7	-25	53.92	-	-	74	-20.08	239	310	H
	* 10.885	30.14	MAv1	37.7	-25	42.84	54	-11.16	-	-	239	310	H
6	* 12.666	41.3	PK2	39.2	-25.2	55.3	-	-	74	-18.7	155	258	V
	* 12.663	29.86	MAv1	39.2	-25.2	43.86	54	-10.14	-	-	155	258	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

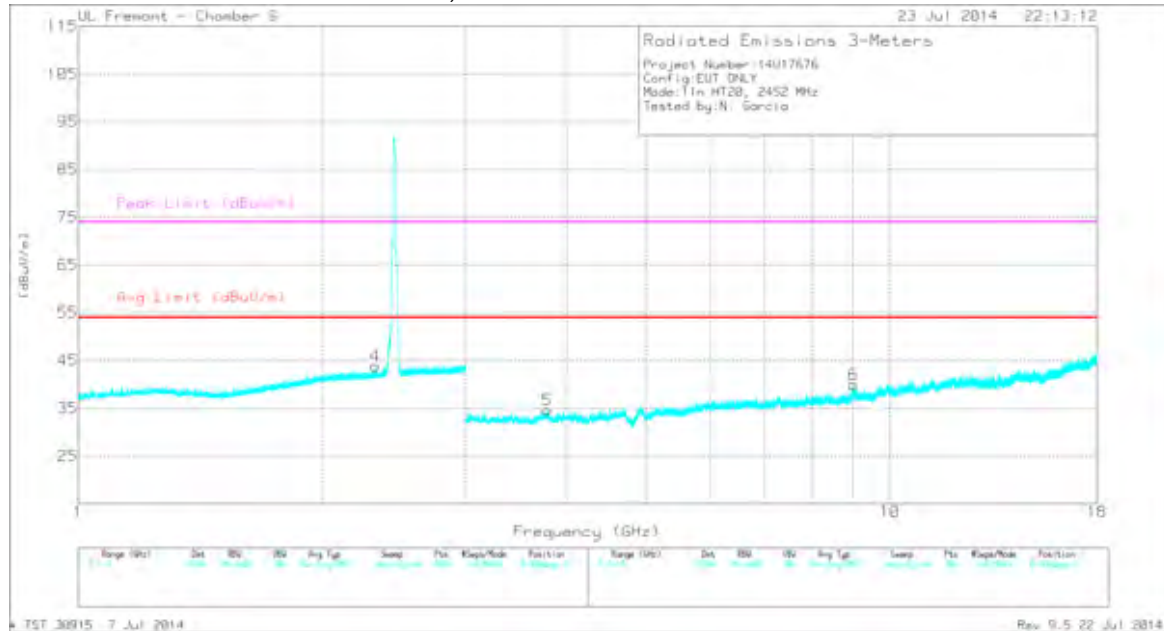
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL PLOT, CH 9



MID CHANNEL VERTICAL PLOT, CH 9



DATA

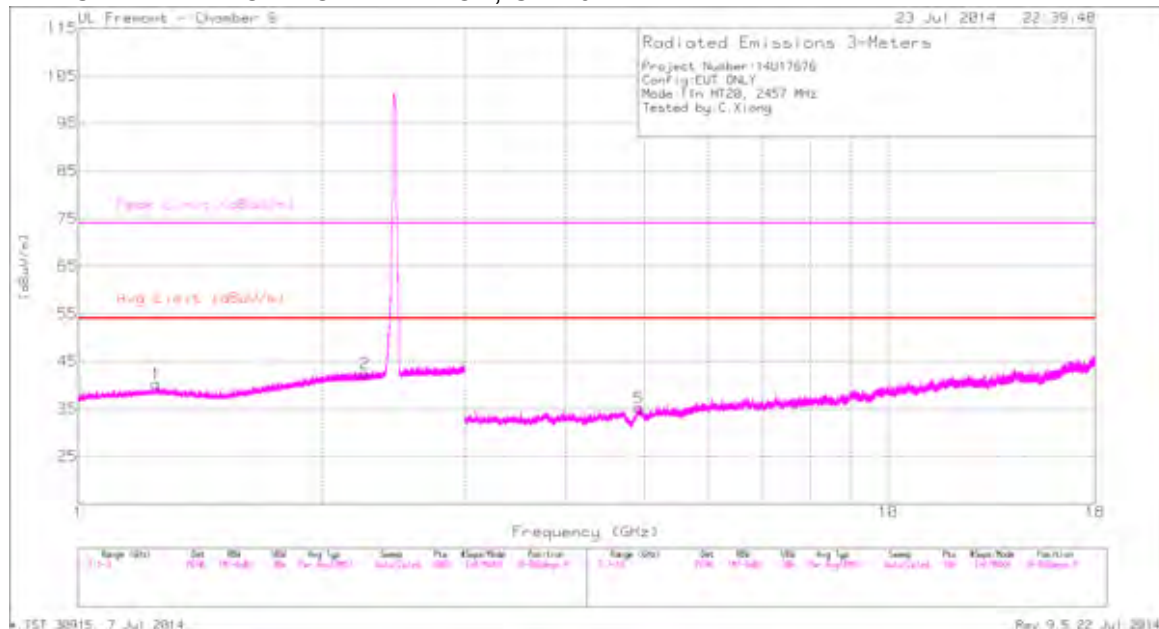
Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.305	44.96	PK2	28.9	-26	47.86	-	-	74	-26.14	64	196	H
	* 1.305	32.74	MAv1	28.9	-26	35.64	54	-18.36	-	-	64	196	H
4	* 2.324	43.63	PK2	31.6	-25	50.23	-	-	74	-23.77	32	289	V
	* 2.322	32.25	MAv1	31.6	-25	38.85	54	-15.15	-	-	32	289	V
2	* 4.948	41.99	PK2	34.1	-32.9	43.19	-	-	74	-30.81	303	111	H
	* 4.947	30.76	MAv1	34.1	-33	31.86	54	-22.14	-	-	303	111	H
3	* 7.626	39.54	PK2	35.7	-31	44.24	-	-	74	-29.76	5	304	H
	* 7.627	29.03	MAv1	35.7	-31	33.73	54	-20.27	-	-	5	304	H
5	* 3.786	42.15	PK2	33	-32.9	42.25	-	-	74	-31.75	18	274	V
	* 3.787	31.22	MAv1	33	-32.9	31.32	54	-22.68	-	-	18	274	V
6	* 9.011	39.22	PK2	36.4	-28.9	46.72	-	-	74	-27.28	26	198	V
	* 9.011	27.73	MAv1	36.4	-28.9	35.23	54	-18.77	-	-	26	198	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

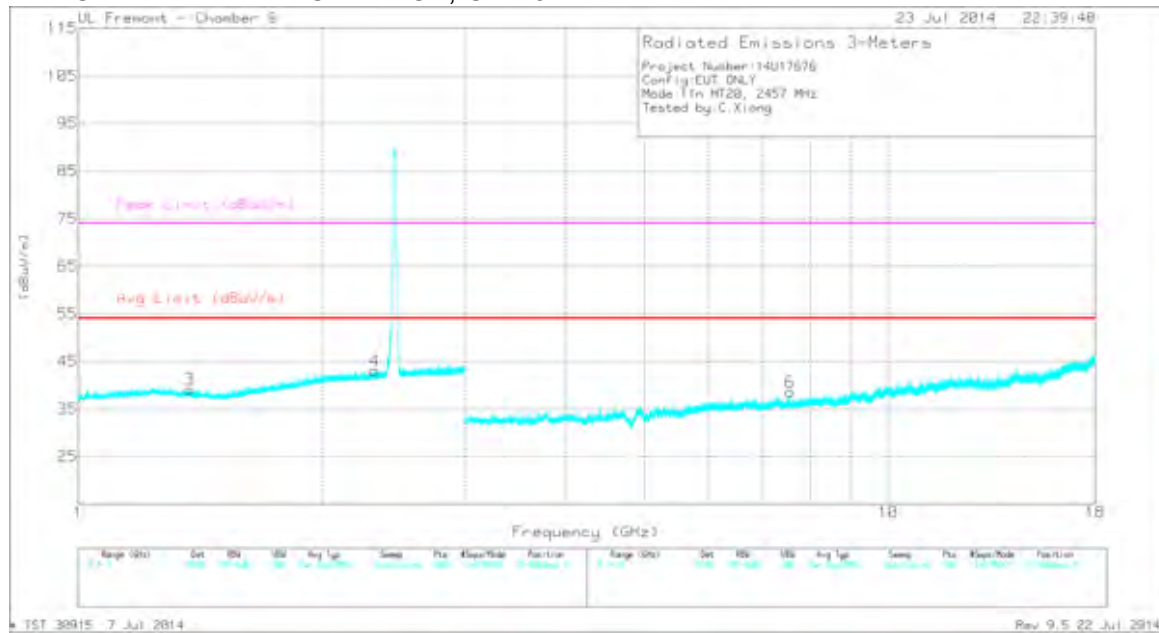
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL PLOT, CH 10



MID CHANNEL VERTICAL PLOT, CH 10



DATA

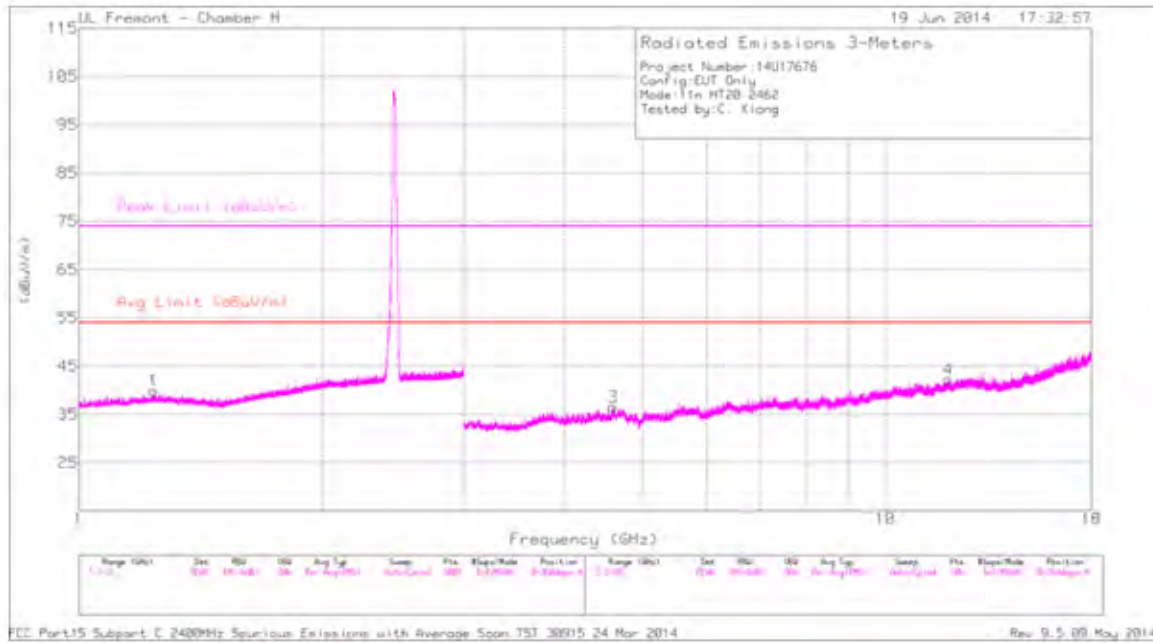
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.247	43.62	PK2	29.2	-26.1	46.72	-	-	74	-27.28	50	159	H
	* 1.246	32.8	MAv1	29.2	-26.1	35.9	54	-18.1	-	-	50	159	H
2	* 2.26	43.75	PK2	31.5	-25.1	50.15	-	-	74	-23.85	188	170	H
	* 2.256	32.22	MAv1	31.5	-25.1	38.62	54	-15.38	-	-	188	170	H
3	* 1.37	44.02	PK2	28.6	-25.9	46.72	-	-	74	-27.28	117	227	V
	* 1.371	32.76	MAv1	28.6	-25.8	35.56	54	-18.44	-	-	117	227	V
4	* 2.324	43.58	PK2	31.6	-25	50.18	-	-	74	-23.82	182	211	V
	* 2.324	32.42	MAv1	31.6	-25	39.02	54	-14.98	-	-	182	211	V
5	* 4.921	41.66	PK2	34.1	-33.1	42.66	-	-	74	-31.34	238	169	H
	* 4.919	30.94	MAv1	34.1	-33.2	31.84	54	-22.16	-	-	238	169	H
6	* 7.559	39.32	PK2	35.6	-30.4	44.52	-	-	74	-29.48	136	216	V
	* 7.558	28.69	MAv1	35.6	-30.4	33.89	54	-20.11	-	-	136	216	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

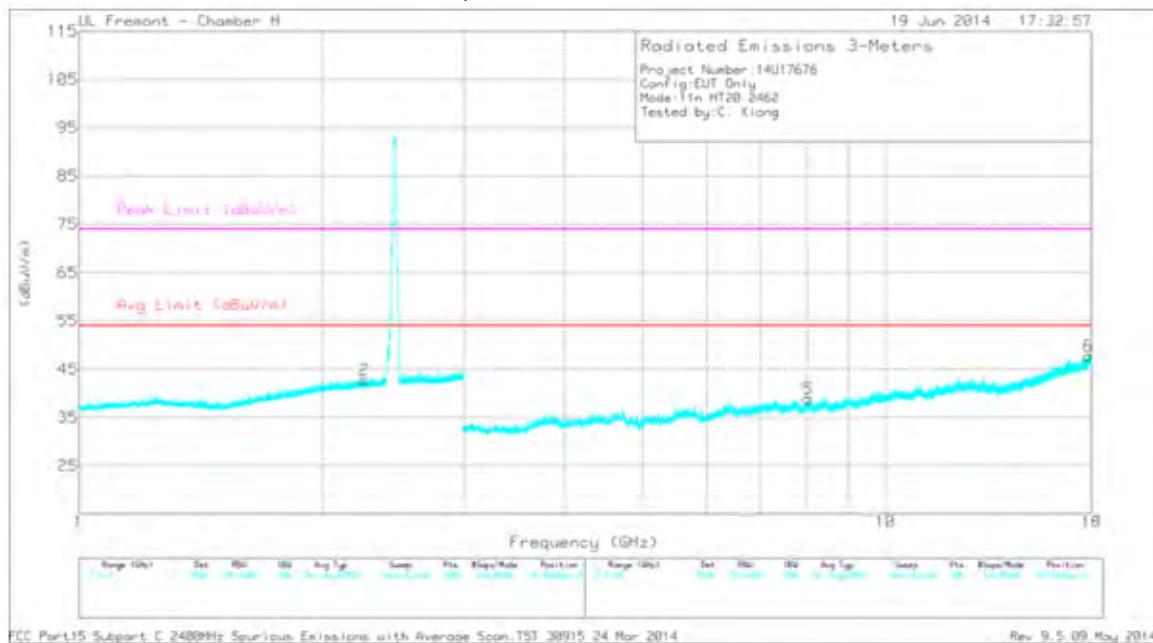
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 11



HIGH CHANNEL VERTICAL PLOT, CH 11



DATA

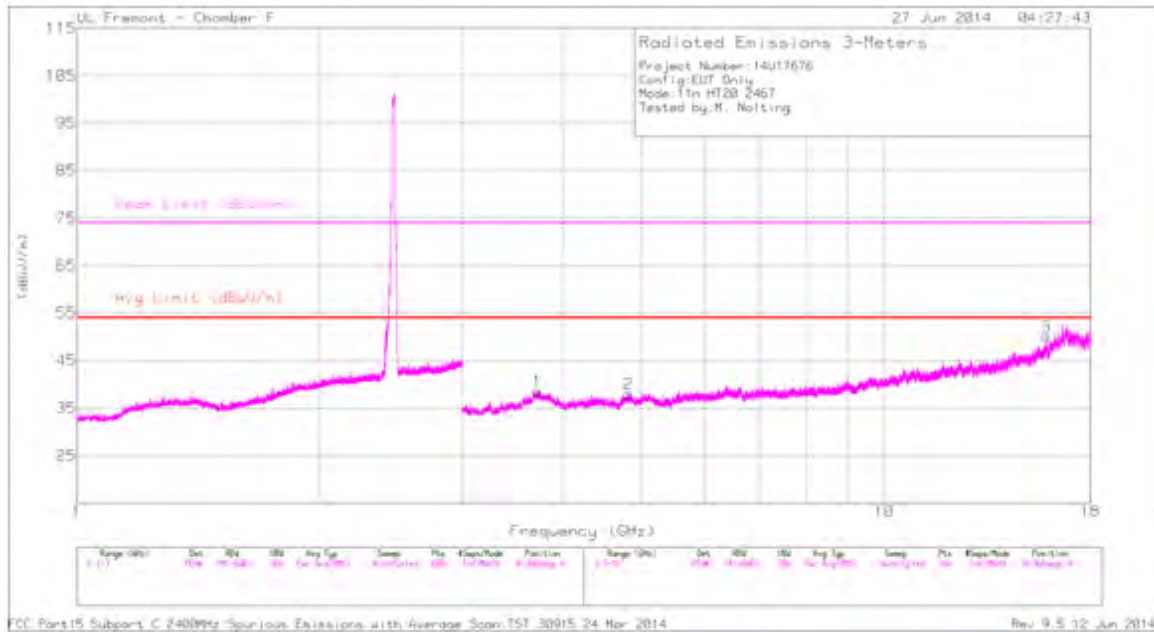
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.238	44.6	PK2	28.9	-25.9	0	47.6	-	-	74	-26.4	99	307	H
	* 1.238	32.9	MAv1	28.9	-25.9	0	35.9	54	-18.1	-	-	99	307	H
2	* 2.261	43.51	PK2	31.7	-24.6	0	50.61	-	-	74	-23.39	186	237	V
	* 2.259	32.4	MAv1	31.7	-24.6	0	39.5	54	-14.5	-	-	186	237	V
3	* 4.599	44.72	PK2	34.1	-32.4	0	46.42	-	-	74	-27.58	49	119	H
	* 4.601	33.46	MAv1	34.1	-32.4	0	35.16	54	-18.84	-	-	49	119	H
4	* 11.971	39.93	PK2	38.8	-24.8	0	53.93	-	-	74	-20.07	108	219	H
	* 11.965	29.81	MAv1	38.8	-24.9	0	43.71	54	-10.29	-	-	108	219	H
5	* 8.028	43.49	PK2	36	-28.2	0	51.29	-	-	74	-22.71	155	151	V
	* 8.028	31.04	MAv1	36	-28.2	0	38.84	54	-15.16	-	-	155	151	V
6	* 17.851	41.69	PK2	42.4	-21.8	0	62.29	-	-	74	-11.71	158	270	V
	* 17.851	30.49	MAv1	42.4	-21.8	0	51.09	54	-2.91	-	-	158	270	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

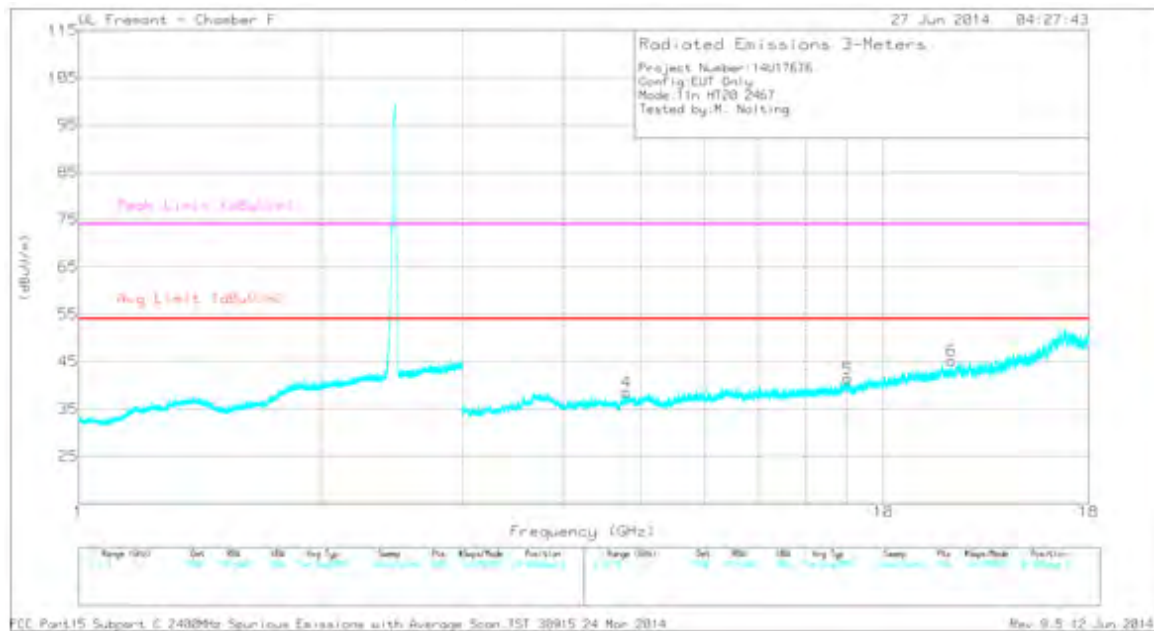
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 12



HIGH CHANNEL VERTICAL PLOT, CH 12



DATA

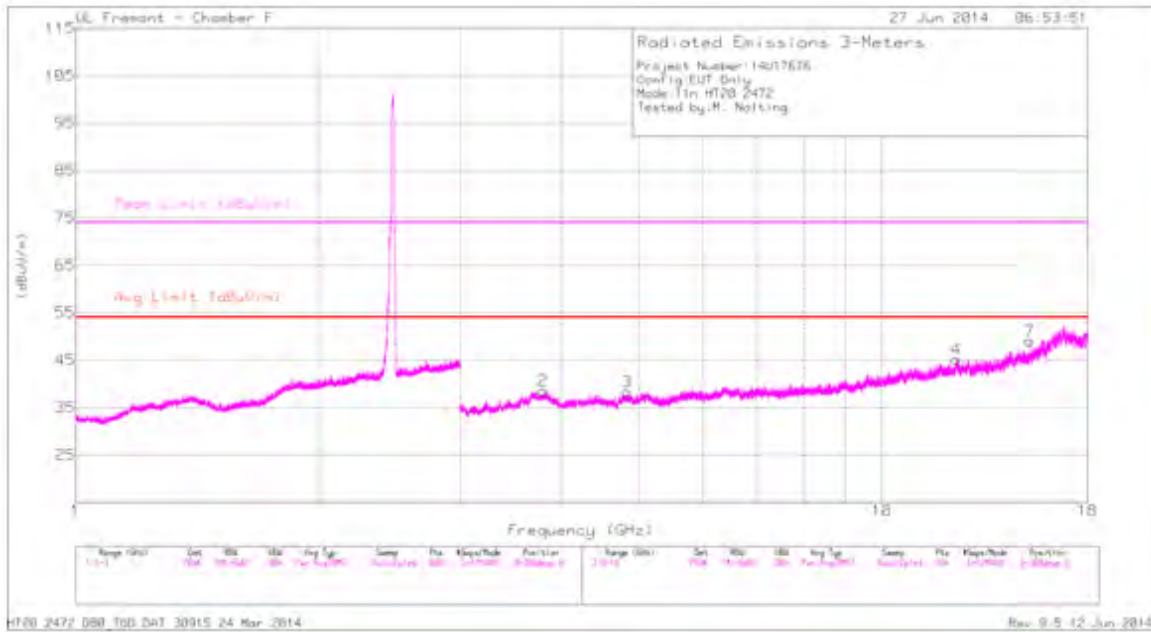
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.721	41.37	PK2	34.8	-29.6	46.57	-	-	74	-27.43	203	254	H
	* 3.692	29.32	MAv1	34.9	-29.3	34.92	54	-19.08	-	-	203	254	H
2	* 4.82	37.18	PK2	34.1	-27.3	43.98	-	-	74	-30.02	14	279	H
	* 4.823	25.83	MAv1	34.1	-27.3	32.63	54	-21.37	-	-	14	279	H
3	* 15.869	35.49	PK2	40.4	-19.9	55.99	-	-	74	-18.01	168	136	H
	* 15.867	24.62	MAv1	40.4	-19.7	45.32	54	-8.68	-	-	168	136	H
4	* 4.792	38.83	PK2	34.1	-27.7	45.23	-	-	74	-28.77	303	281	V
	* 4.79	27.82	MAv1	34.1	-27.7	34.22	54	-19.78	-	-	303	281	V
5	* 9.044	34.75	PK2	36.1	-22.7	48.15	-	-	74	-25.85	51	245	V
	* 9.046	23.4	MAv1	36.1	-22.8	36.7	54	-17.3	-	-	51	245	V
6	* 12.148	35.2	PK2	39	-22.2	52	-	-	74	-22	23	180	V
	* 12.153	23.38	MAv1	39	-22.2	40.18	54	-13.82	-	-	23	180	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

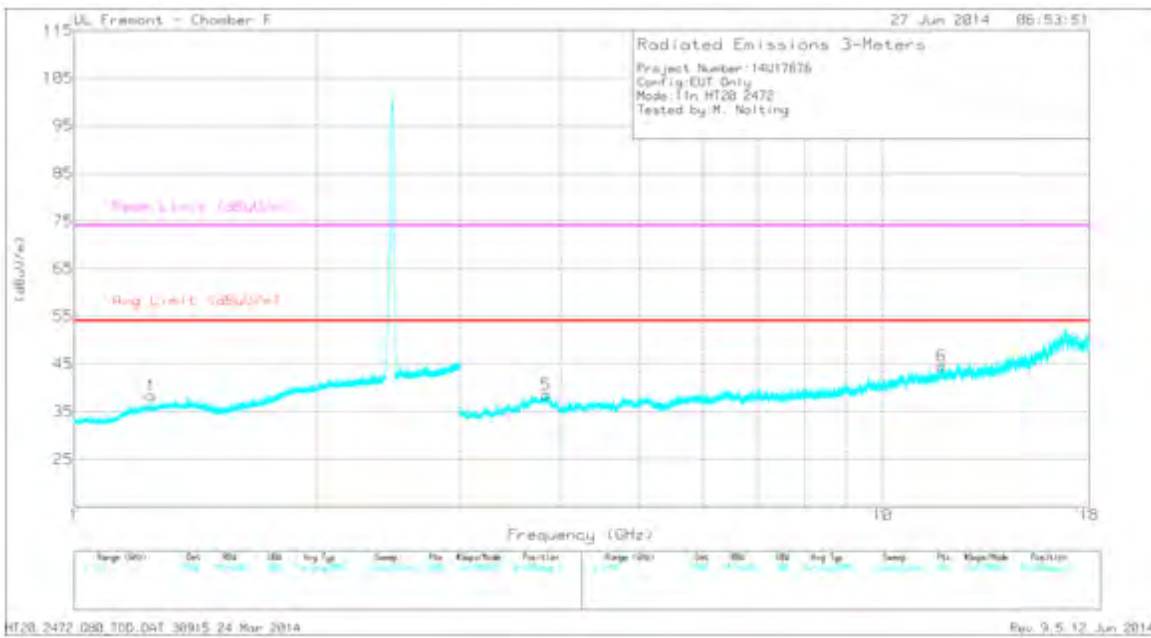
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL PLOT, CH 13



HIGH CHANNEL VERTICAL PLOT, CH 13



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.246	41.63	PK2	29.5	-26.5	44.63	-	-	74	-29.37	55	257	V
	* 1.248	29.93	MAv1	29.5	-26.6	32.83	54	-21.17	-	-	55	257	V
2	* 3.8	38.73	PK2	34.4	-28.8	44.33	-	-	74	-29.67	186	132	H
	* 3.805	27.21	MAv1	34.4	-28.6	33.01	54	-20.99	-	-	186	132	H
3	* 4.83	39.14	PK2	34.1	-27.4	45.84	-	-	74	-28.16	215	213	H
	* 4.822	27.7	MAv1	34.1	-27.3	34.5	54	-19.5	-	-	215	213	H
4	* 12.37	34.76	PK2	38.9	-21.1	52.56	-	-	74	-21.44	199	383	H
	* 12.371	23.62	MAv1	38.9	-21.2	41.32	54	-12.68	-	-	199	383	H
5	* 3.84	40.55	PK2	34.2	-28.9	45.85	-	-	74	-28.15	97	202	V
	* 3.845	29.28	MAv1	34.2	-29	34.48	54	-19.52	-	-	97	202	V
6	* 11.818	34.44	PK2	38.8	-21.7	51.54	-	-	74	-22.46	168	180	V
	* 11.819	23.14	MAv1	38.8	-21.7	40.24	54	-13.76	-	-	168	180	V
7	15.254	30.31	PK	40.1	-21.4	49.01	-	-	-	-	0-360	100	H

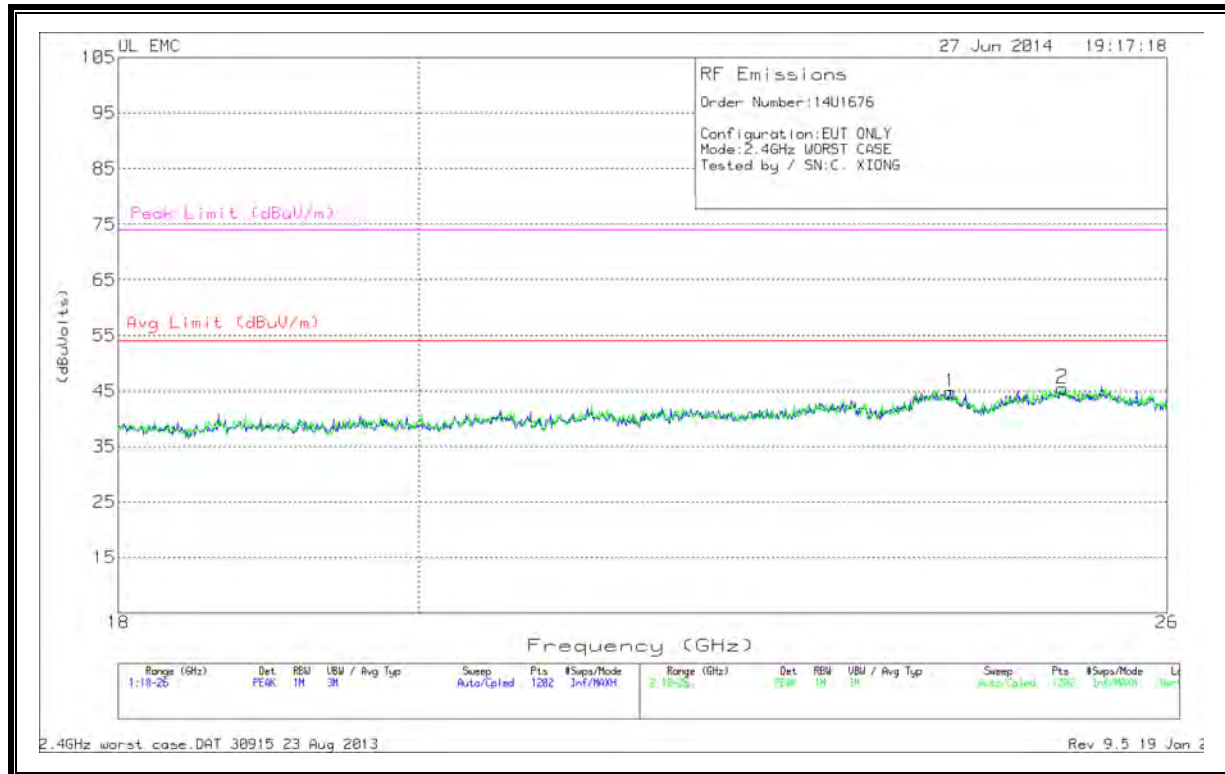
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

10.3. WORST-CASE ABOVE 18 to 26GHz

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION, HORIZONTAL & VERTICAL)



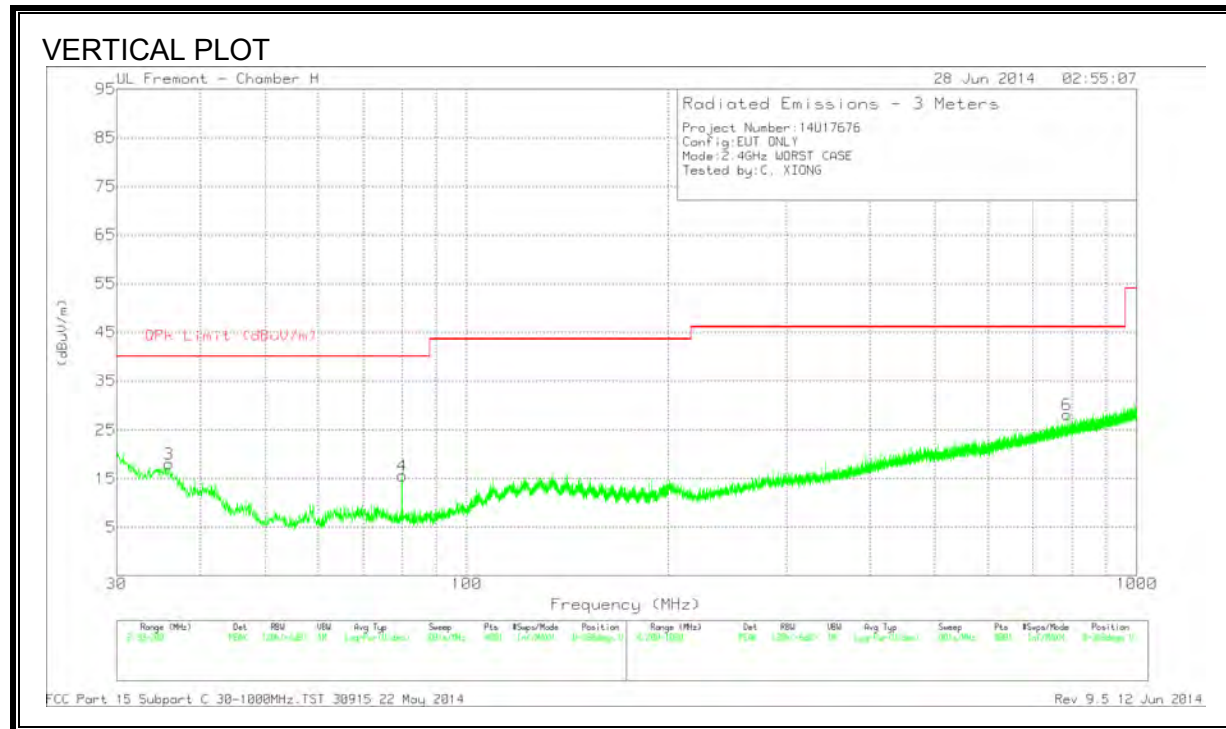
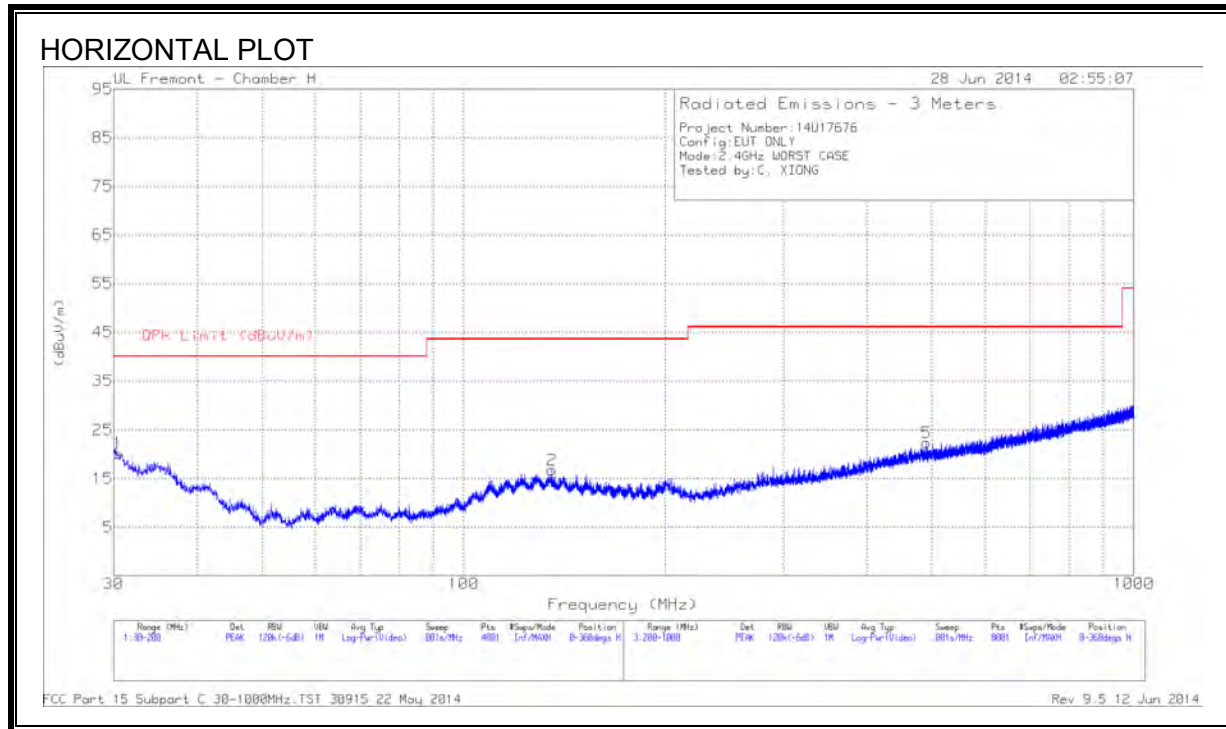
HORIZONTAL & VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	24.098	43.83	PK	33.6	-23.1	-9.5	44.83	54	-9.17	74	-29.17
2	25.061	43.6	PK	34	-22.6	-9.5	45.5	54	-8.5	74	-28.5

PK - Peak detector

10.4. WORST-CASE BELOW 1 GHz

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



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	SS J83 SN A051314-1	Amp/Cbl (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 135.357	29.87	PK	16.7	-29.8	0	16.77	43.52	-26.75	0-360	301	H
1	30.425	27.48	PK	23.7	-31	0	20.18	40	-19.82	0-360	401	H
3	35.9075	28.82	PK	20.1	-30.9	0	18.02	40	-21.98	0-360	100	V
4	80.0225	35.51	PK	10.4	-30.3	0	15.61	40	-24.39	0-360	100	V
5	490.6	29.37	PK	20.6	-27.6	0	22.37	46.02	-23.65	0-360	301	H
6	786.1	30.36	PK	24.1	-26.3	0	28.16	46.02	-17.86	0-360	201	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

11. 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

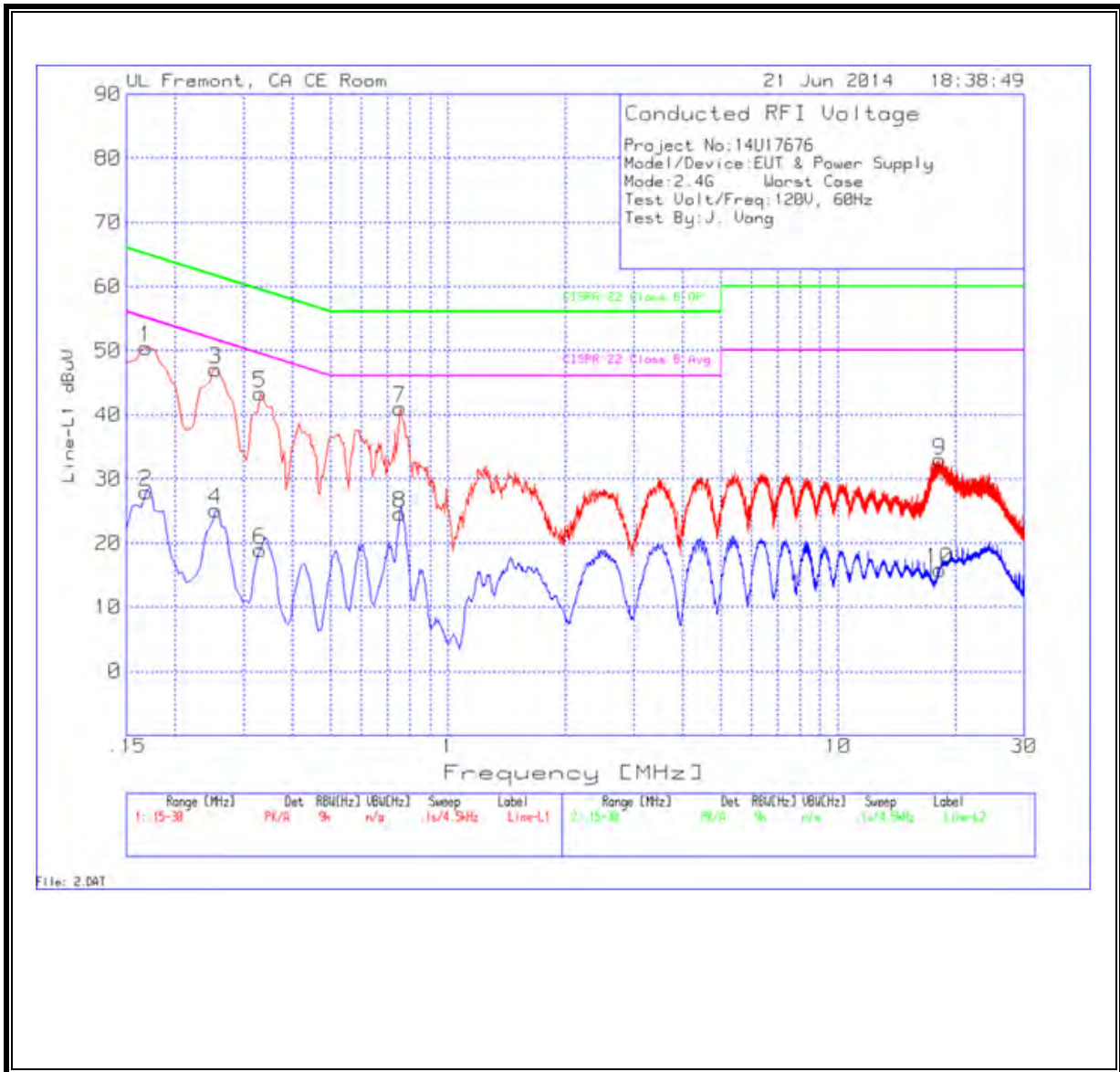
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

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

LINE 1 RESULTS



WORST EMISSIONS

Line-L1 .15 - 30MHz

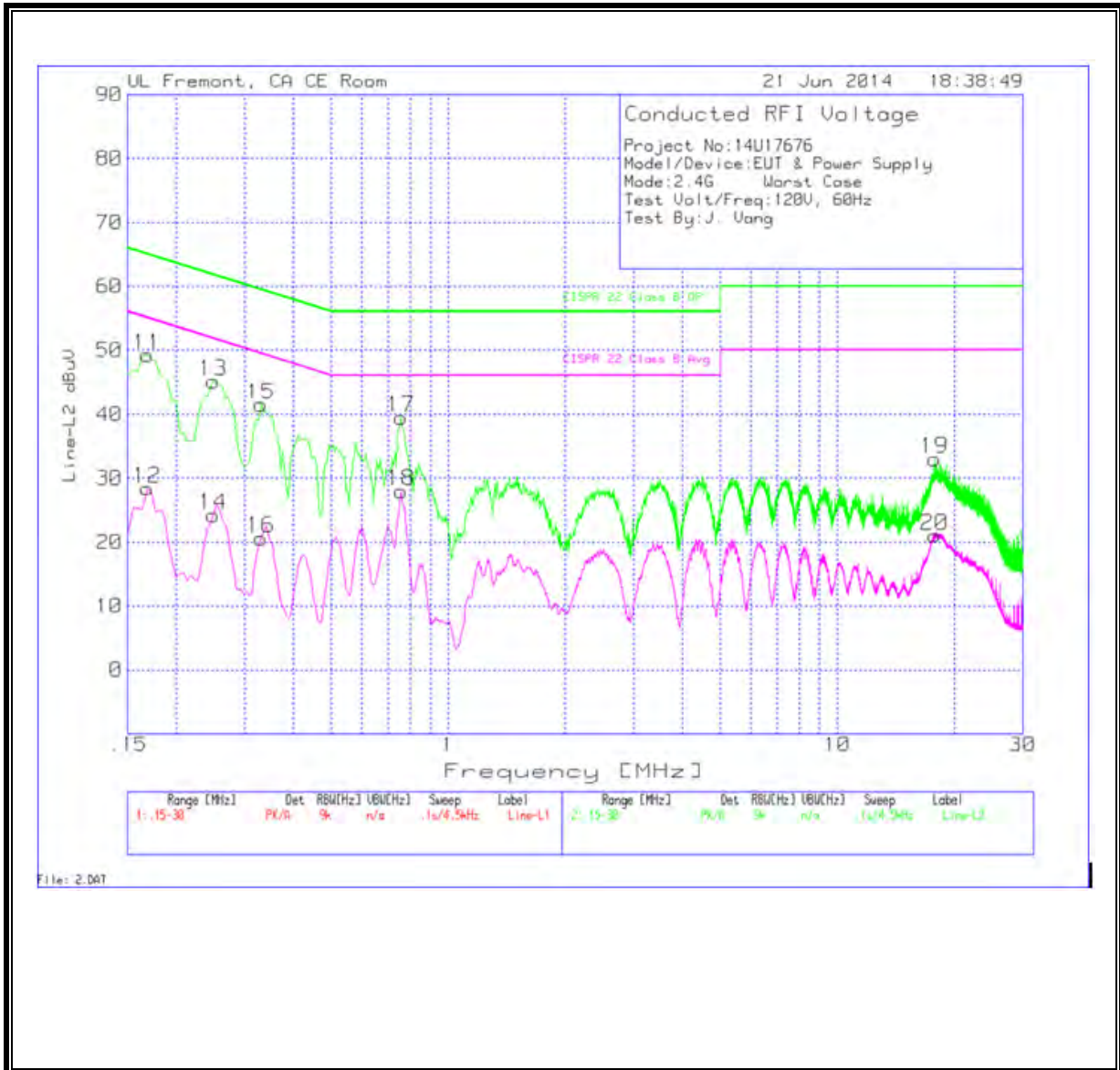
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.168	49.22	PK	1.2	0	50.42	65.1	-14.68	-	-
2	.168	26.76	Av	1.2	0	27.96	-	-	55.1	-27.14
3	.2535	46.37	PK	.7	0	47.07	61.6	-14.53	-	-
4	.2535	24.48	Av	.7	0	25.18	-	-	51.6	-26.42
5	.33	42.9	PK	.5	0	43.4	59.5	-16.1	-	-
6	.33	18.45	Av	.5	0	18.95	-	-	49.5	-30.55
7	.753	40.69	PK	.3	0	40.99	56	-15.01	-	-
8	.753	24.33	Av	.3	0	24.63	-	-	46	-21.37
9	18.258	32.45	PK	.3	.2	32.95	60	-27.05	-	-
10	18.258	15.32	Av	.3	.2	15.82	-	-	50	-34.18

PK - Peak detector

Av - average detection

LINE 2 RESULTS



WORST EMISSIONS

Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
11	.168	47.93	PK	1.3	0	49.23	65.1	-15.87	-	-
12	.168	27.12	Av	1.3	0	28.42	-	-	55.1	-26.68
13	.249	44.41	PK	.7	0	45.11	61.8	-16.69	-	-
14	.249	23.52	Av	.7	0	24.22	-	-	51.8	-27.58
15	.33	40.98	PK	.5	0	41.48	59.5	-18.02	-	-
16	.33	20.08	Av	.5	0	20.58	-	-	49.5	-28.92
17	.7575	39.22	PK	.3	0	39.52	56	-16.48	-	-
18	.7575	27.66	Av	.3	0	27.96	-	-	46	-18.04
19	17.8125	32.49	PK	.3	.2	32.99	60	-27.01	-	-
20	17.8125	20.56	Av	.3	.2	21.06	-	-	50	-28.94

PK - Peak detector

Av - average detection