FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

iPOD TOUCH

MODEL NUMBER: A1574

FCC ID: BCGA1574

REPORT NUMBER: 15U20058-E3, REVISION D

ISSUE DATE: JUNE 03, 2015

Prepared for
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1 INFINITE LOOP
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/20/2015	Initial Issue	T. Chu
A	05/15/2015	Revised report due to power changed, updated EUT name	F. Guarnero
B	05/29/2015	Revised report to address TCB's questions	T. Chu
C	06/02/2015	Revised report to address TCB's questions	T. Chu
D	06/03/2015	Revised report to address TCB's questions	T. Chu

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: iPOD TOUCH

MODEL: A1574

SERIAL NUMBER: CCQP704HGJ1Y (CONDUCTED); CCQP704KGJ1Y (RADIATED)

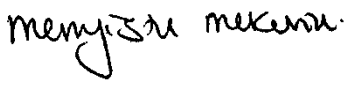
DATE TESTED: MARCH 18, 2015 – MAY 05, 2015

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:



MENGISTU MEKURIA
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.

Tested By:

TRI PHAM
LAB TECHNICIAN
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, ANSI C63.10-2009 and KDB 558074 D01.

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

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT is a multimedia device with IEEE 802.11a/b/g/n/ac and BLUETOOTH Radio.

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	24.61	289.07
	802.11g	Covered by 802.11n HT20 1TX	
	802.11n HT20 1TX	24.72	296.48

Note: The output power on covered modes is equal to or less than one referenced.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain
2.40-2.48	-0.452

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 7.15.99

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 following configurations were investigated and EUT powered by AC/DC adapter was the worst-case scenario. AC power line and below 1G radiated tests were conducted on configuration 1.

Configuration	Descriptions
1	EUT powered by AC/DC adapter via USB cable
2	EUT powered by host PC via USB cable

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

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

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20mode: MCS0

The target power for 802.11g and 802.11n HT20 1TX are the same and use the same modulation (OFDM).

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	Latitude 3540	D49G802	NA
Laptop AC/DC adapter	Dell	HA65NM130	CN-06TFFF-75661-426-030Y-A00	NA
Earphone	Apple	NA	NA	NA
EUT AC/DC adapter	Apple	A1265	1X3276SZZ08QZ	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	0.2	To spectrum Analyzer
2	USB	1	USB	Shielded	1	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						

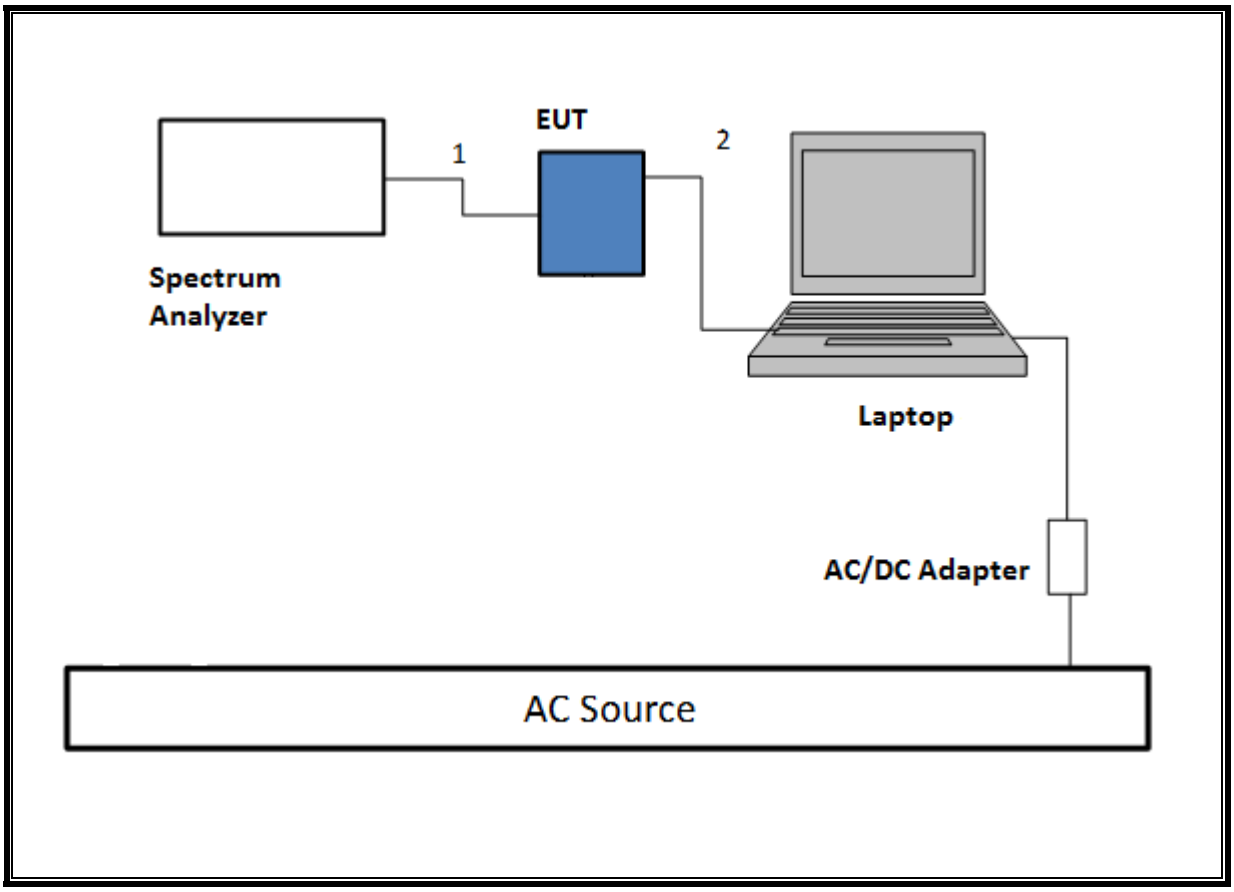
I/O CABLES (AC POWER CONDUCTED TEST and below 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US115	Un-Shielded	0.8	NA
2	DC	1	lightning	Un-Shielded	1	NA
3	Audio	1	Jack	Un-Shielded	0.5	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.

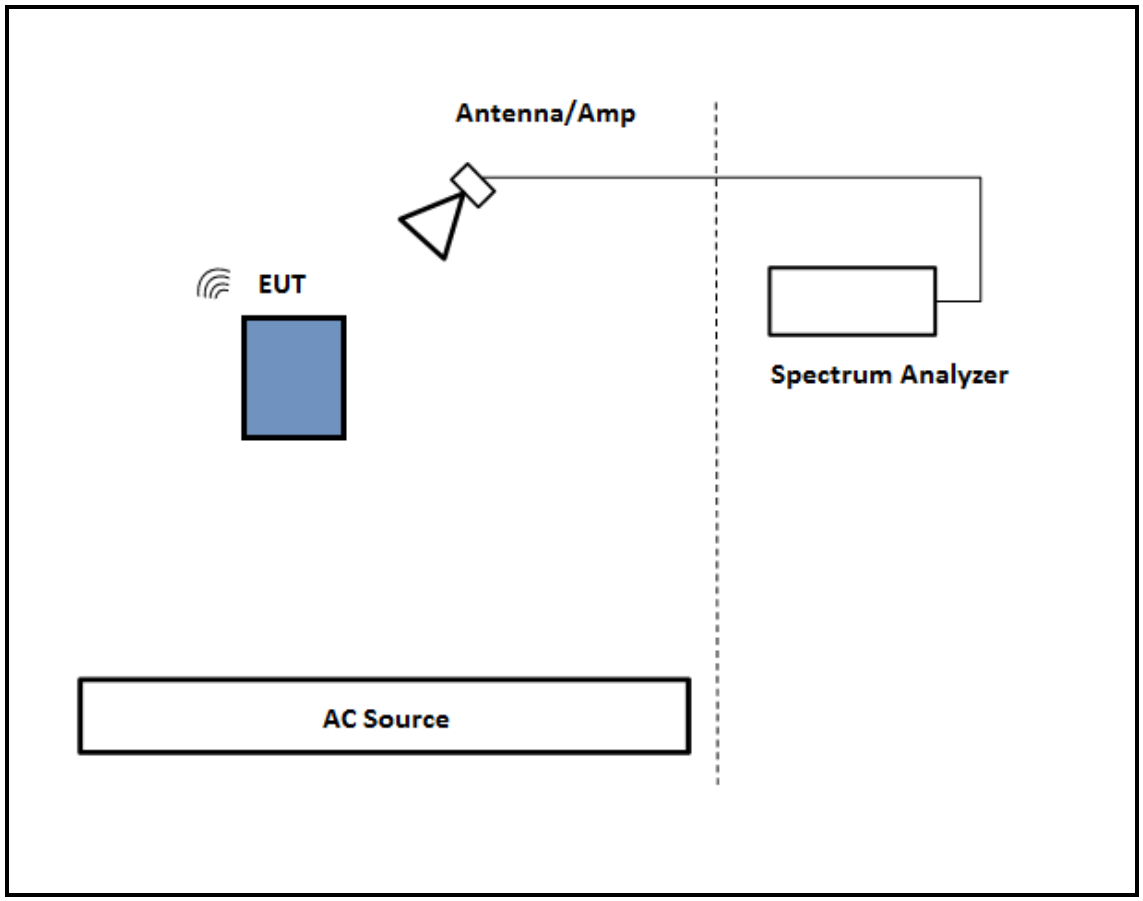
SETUP DIAGRAM



TEST SETUP- RADIATED-ABOVE 1 GHZ

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

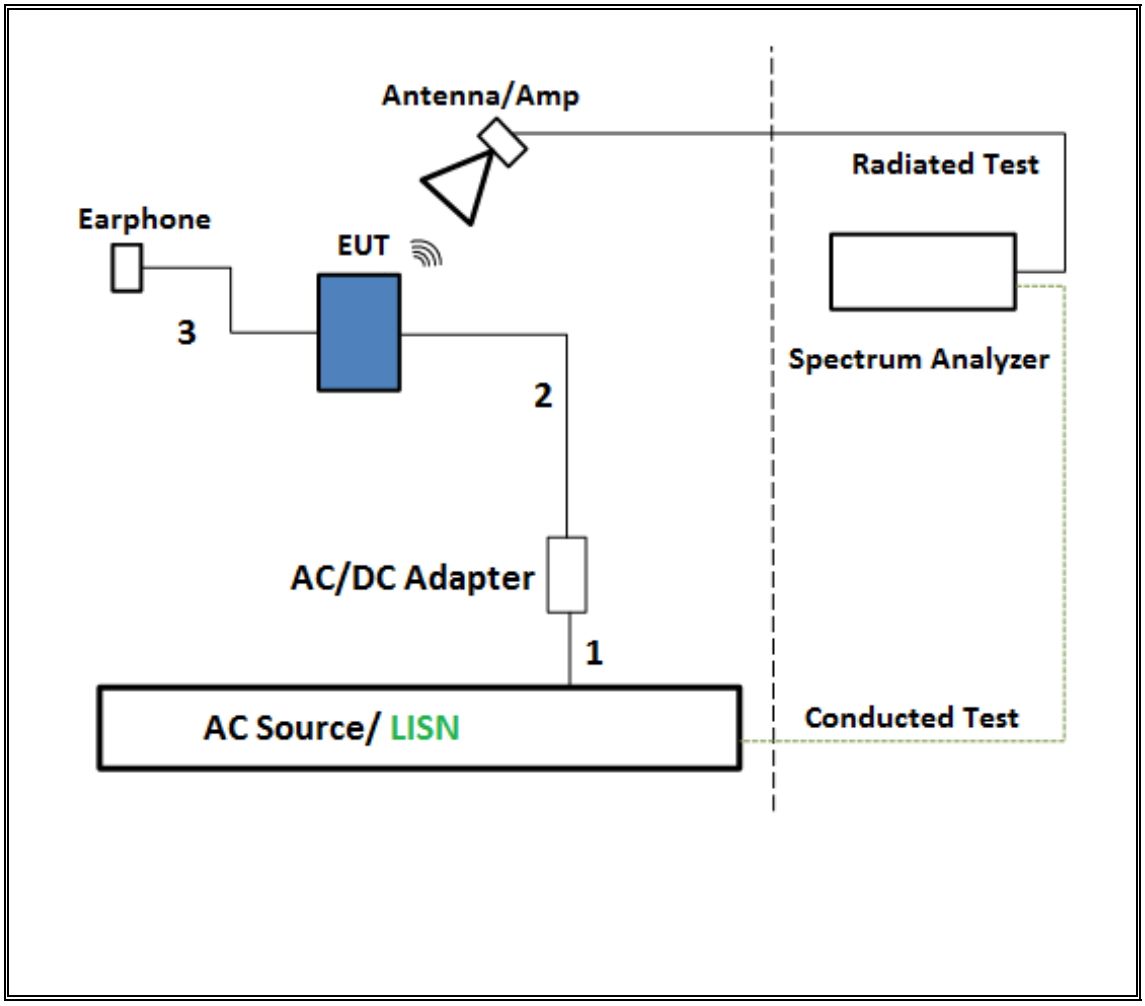
SETUP DIAGRAM



TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS

The EUT was tested with earphone 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**	**Cal Date**	**Cal Due**
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	1/14/2015	1/14/2016
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	11/1/2014	11/1/2015
Spectrum Analyzer, PXA, 3Hz to 50GHz	Agilent	N9030A	9/13/2014	9/13/2015
Antenna, Horn 1-18GHz	ETS Lindgren	3117	2/10/2015	2/10/2016
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	1/14/2015	1/14/2016
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB1	2/13/2015	2/13/2016
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	6/7/2014	6/7/2015
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	2/20/2015	2/20/2016
Power Meter, P-series single channel	Agilent	N1911A	10/13/2014	10/13/2015
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Agilent	N1921A	7/12/2014	7/12/2015
Power Meter, Peak	Boonton	4541	7/17/2014	7/17/2015
Power Sensor, Peak	Boonton	57006	7/17/2014	7/17/2015
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826	12/17/2014	12/17/2015
Spectrum Analyzer, 40 GHz	Agilent	8564E	8/6/2014	8/6/2015
Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum	Agilent	8449B	10/4/2014	10/4/2015
AC Line Conducted				
EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ECSI7	09/16/14	09/16/15
LISN for Conducted Emissions CISPR-16	FCC	50/250-25-2	01/16/15	01/16/16
Power Cable, Line Conducted Emissions ANSI 63.4	U L	PG1	7/28/2014	7/28/2015
UL SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 2.1.3, March 12, 2015 Ver 2.2, March 31, 2015	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, February 26, 2015	

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

7.1. ON TIME AND DUTY CYCLE RESULTS

LIMITS

None; for reporting purposes only.

PROCEDURE

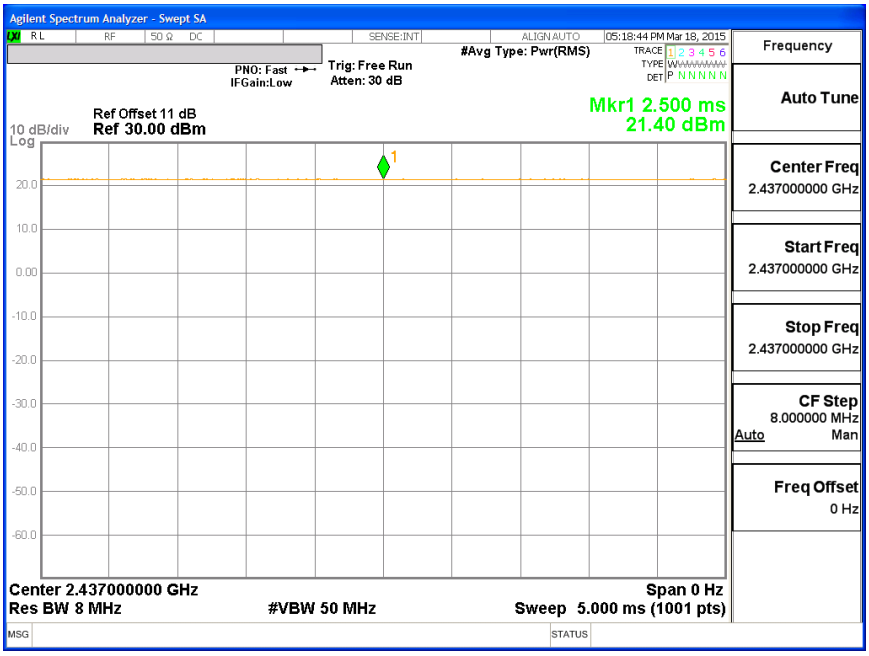
KDB 558074 Zero-Span Spectrum Analyzer Method.

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	1.000	1.000	1.000	100.00%	0.00	0.010
802.11n HT20 1TX	1.920	1.944	0.988	98.77%	0.00	0.010

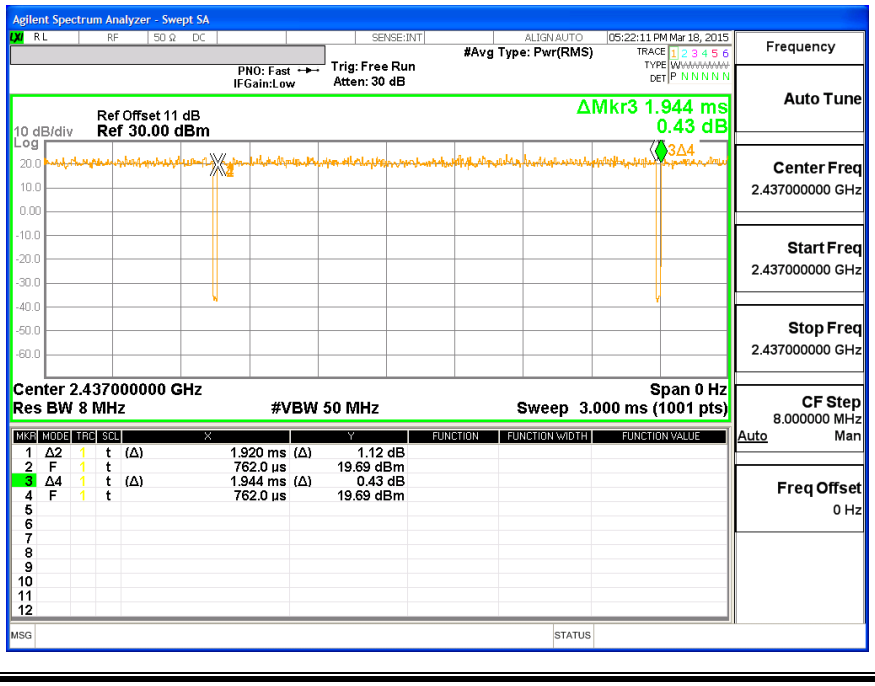
DUTY CYCLE PLOTS

2.4 GHz BAND

DUTY CYCLE 802.11b 1TX MODE



DUTY CYCLE 802.11n HT20 1TX MODE



7.2. MEASUREMENT METHODS

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 12.1.

Band-edge: KDB 558074 D01 v03r02, Section 12.1

8. ANTENNA PORT TEST RESULTS

8.1. 802.11b SISO MODE IN THE 2.4 GHz BAND

8.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

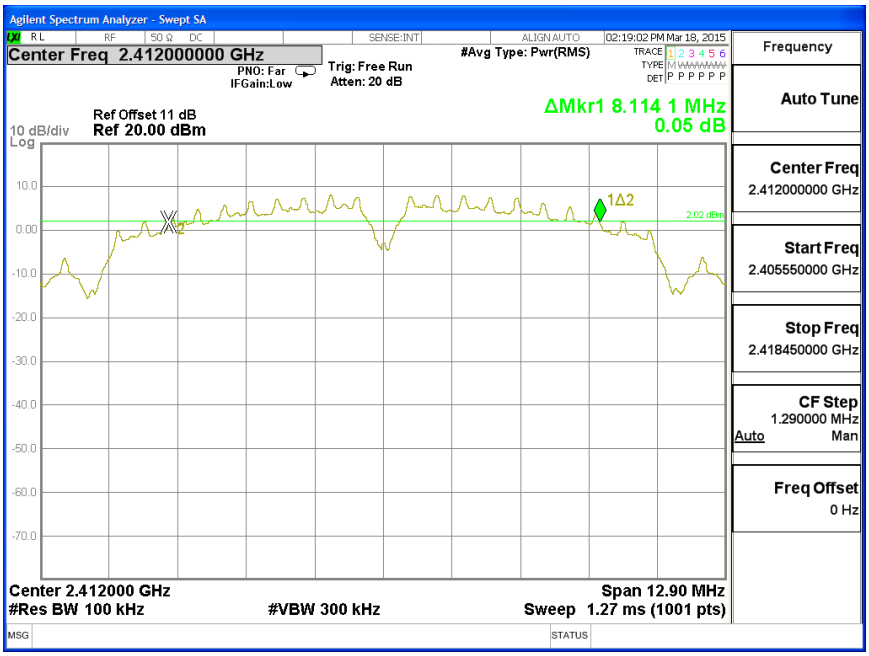
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

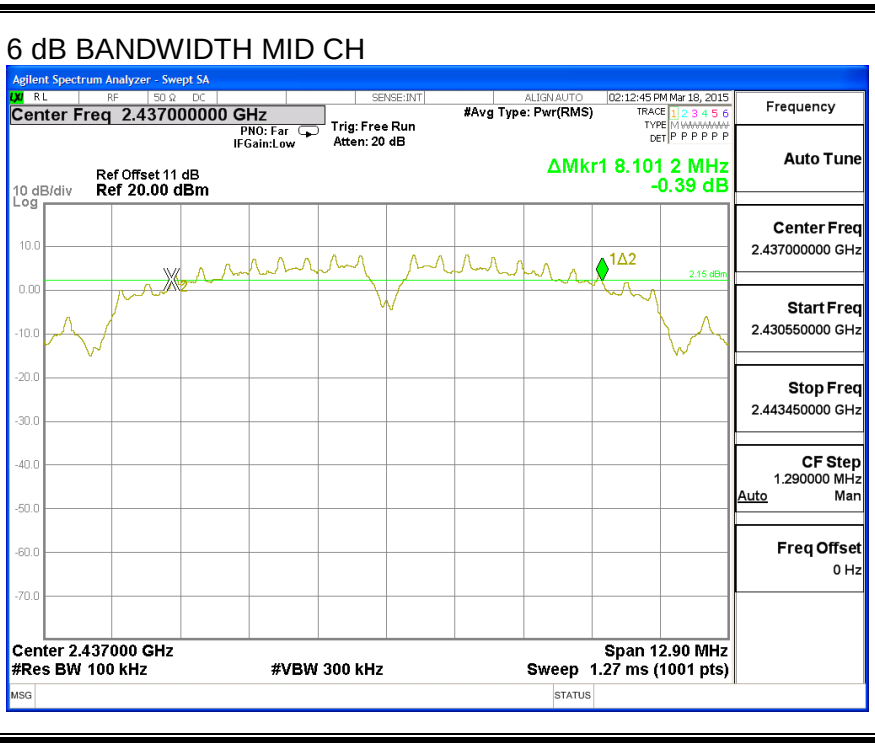
Channel	Frequency (MHz)	6 dB Bandwidth (MHz) Chain 0	Minimum Limit (MHz)
Low	2412	8.114	0.5
Mid	2437	8.101	0.5
High	2462	8.580	0.5
High	2467	8.566	0.5
High	2472	8.579	0.5

6dB BANDWIDTH

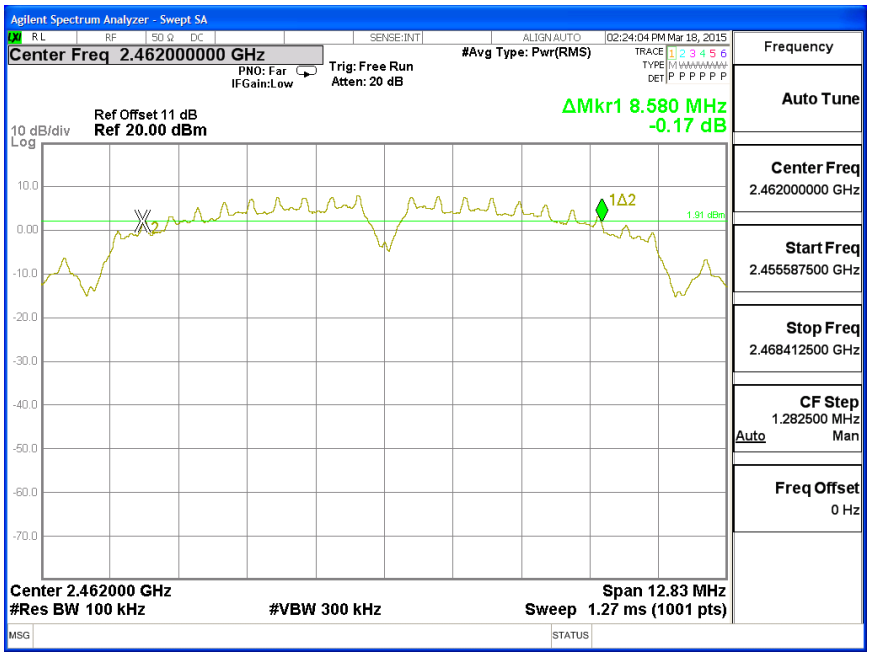
6 dB BANDWIDTH LOW CH



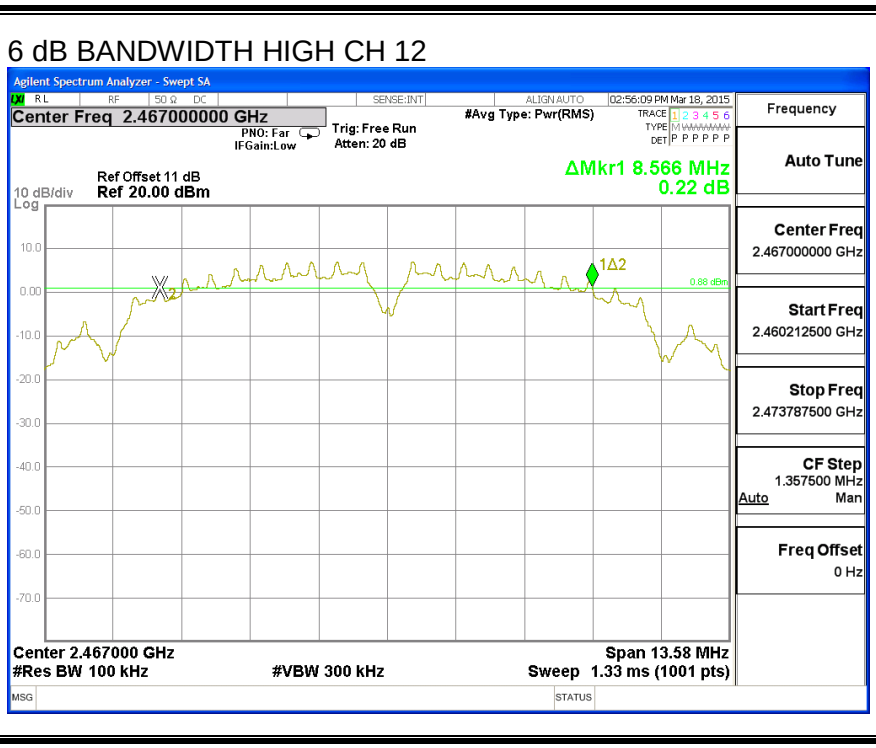
6 dB BANDWIDTH MID CH



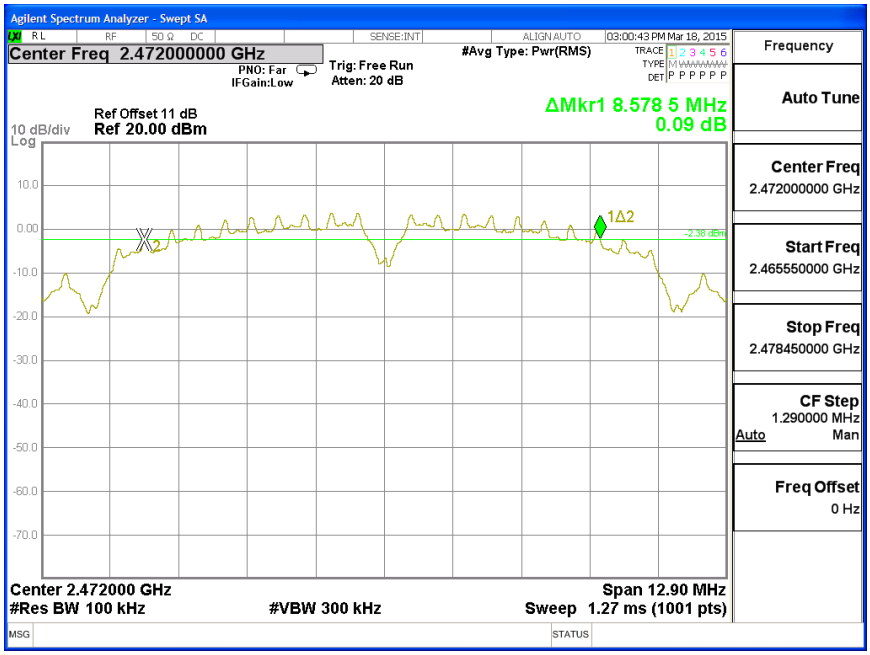
6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12



6 dB BANDWIDTH HIGH CH 13



8.1.2. 99% BANDWIDTH

LIMITS

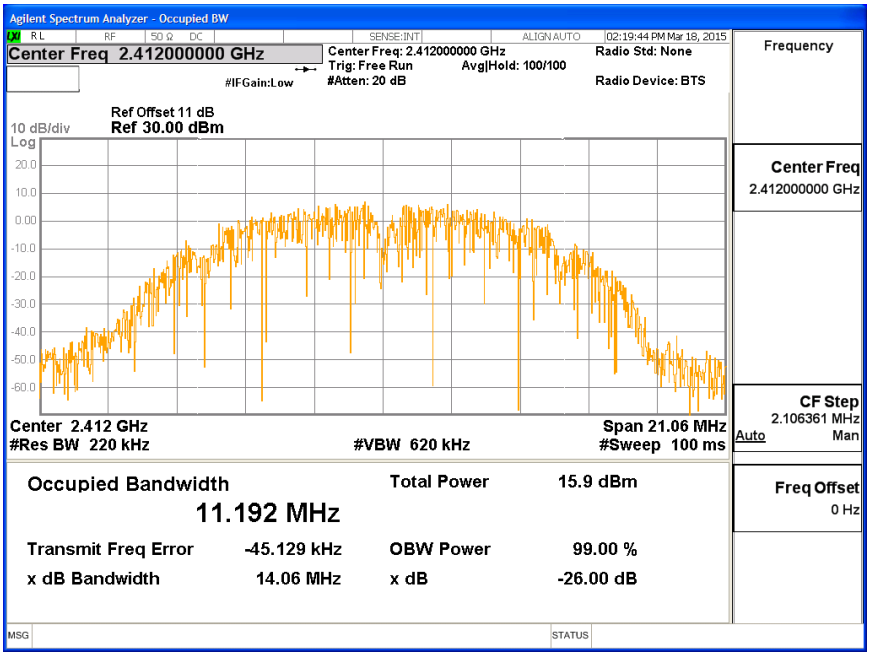
None; for reporting purposes only.

RESULTS

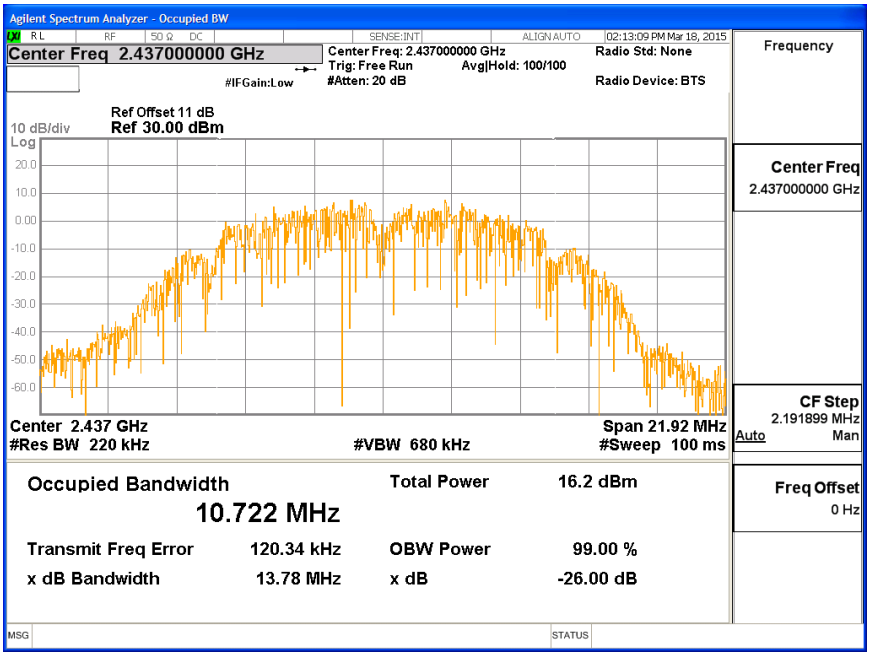
Channel	Frequency (MHz)	99% Bandwidth (MHz) Chain 0
Low	2412	11.192
Mid	2437	10.722
High	2462	10.982
High	2467	10.967
High	2472	11.590

99% BANDWIDTH

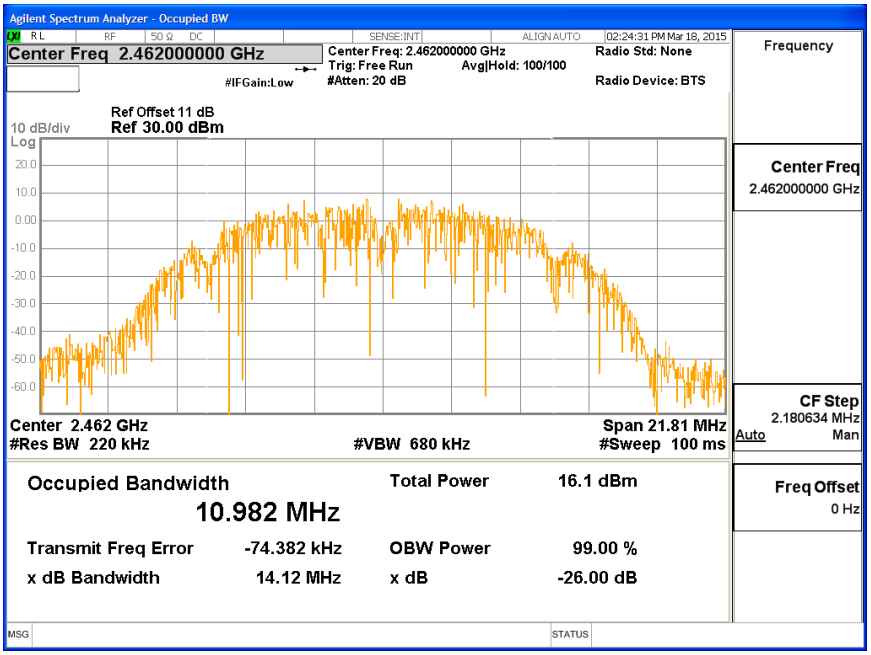
99% BANDWIDTH LOW CH



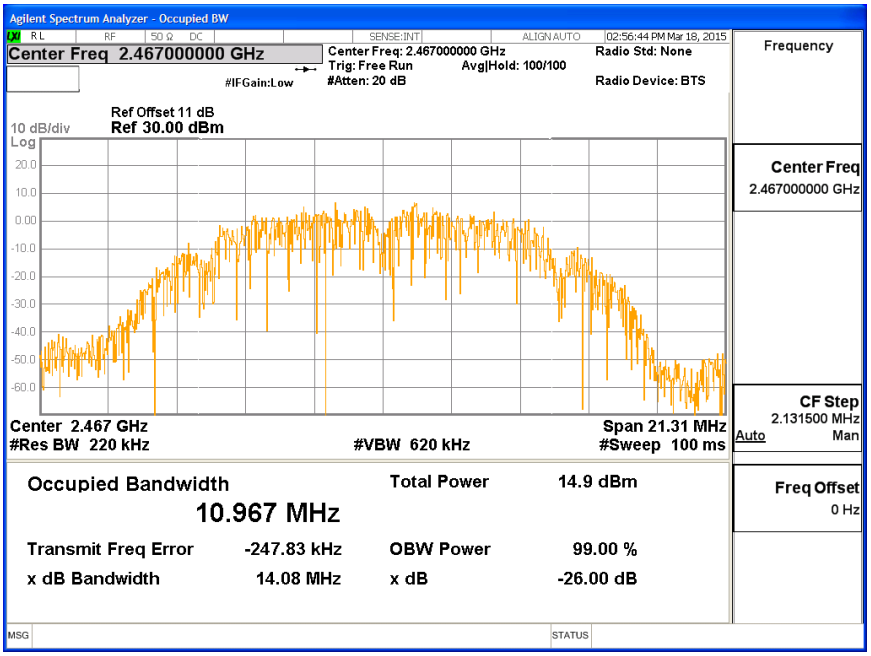
99% BANDWIDTH MID CH



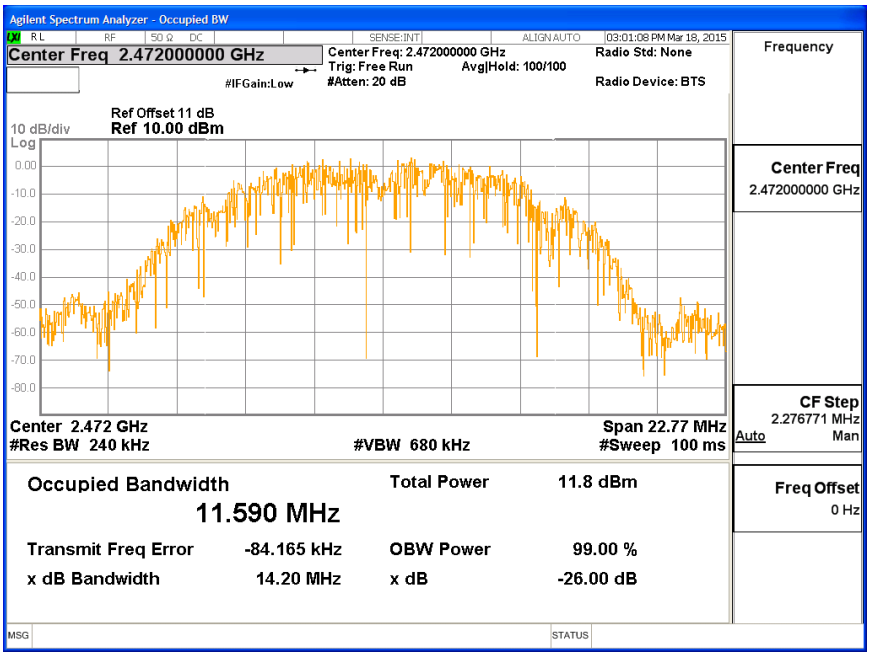
99% BANDWIDTH HIGH CH 11



99% BANDWIDTH HIGH CH 12



99% BANDWIDTH HIGH CH 13



8.1.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm) Chain 0
Low	2412	17.49
Mid	2437	17.46
High	2462	17.50
High	2467	15.31
High	2472	11.89

8.1.4. OUTPUT POWER

LIMITS

FCC §15.247

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

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-0.452	30.00	30	36	30.00
Mid	2437	-0.452	30.00	30	36	30.00
High	2462	-0.452	30.00	30	36	30.00
High	2467	-0.452	30.00	30	36	30.00
High	2472	-0.452	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	24.41	24.41	30.00	-5.59
Mid	2437	24.61	24.61	30.00	-5.39
High	2462	24.59	24.59	30.00	-5.41
High	2467	18.20	18.20	30.00	-11.80
High	2472	14.82	14.82	30.00	-15.18

8.1.5. PSD

LIMITS

FCC §15.247

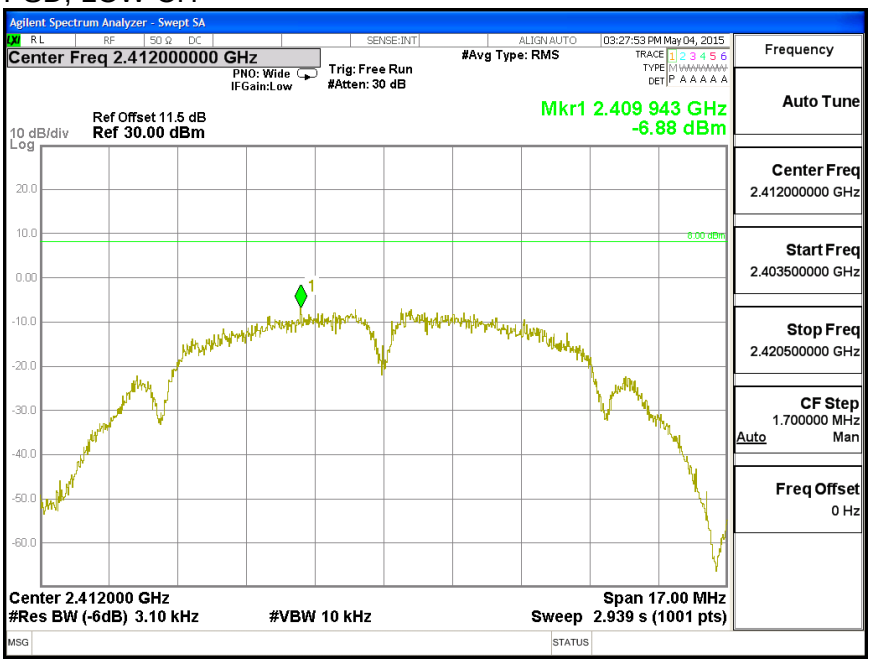
RESULTS

PSD Results

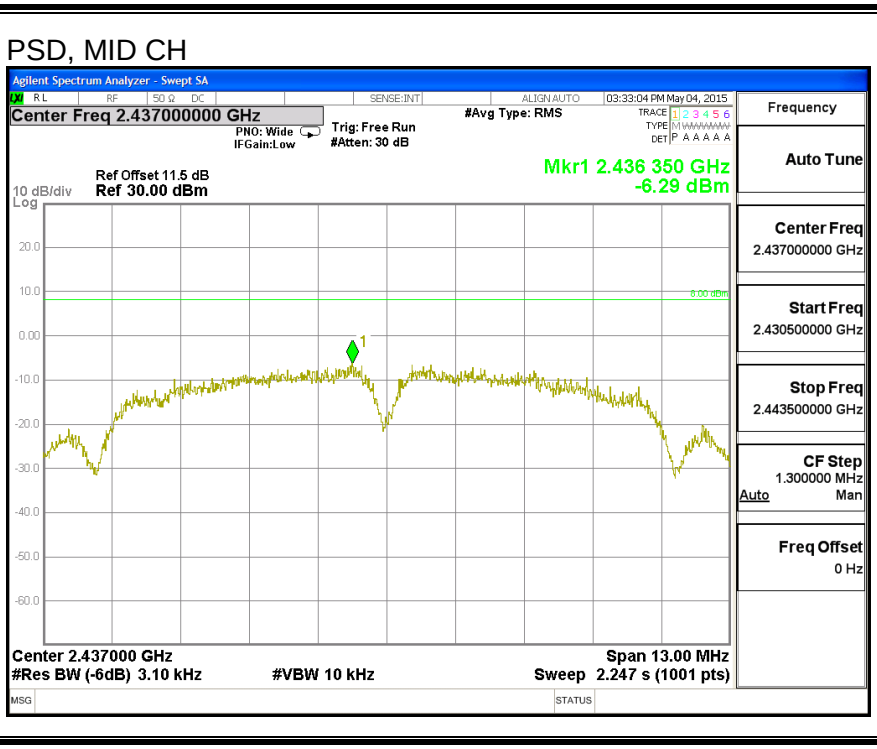
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.88	8.00	-14.88
Mid	2437	-6.29	8.00	-14.29
High	2462	-6.13	8.00	-14.13
High	2467	-6.78	8.00	-14.78
High	2472	-9.82	8.00	-17.82

PSD, CHAIN 0

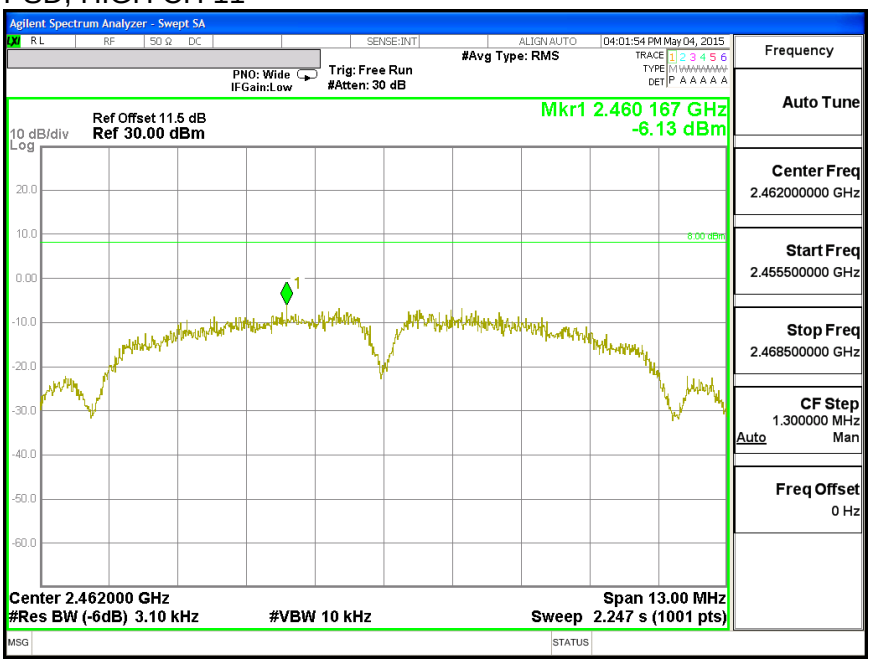
PSD, LOW CH



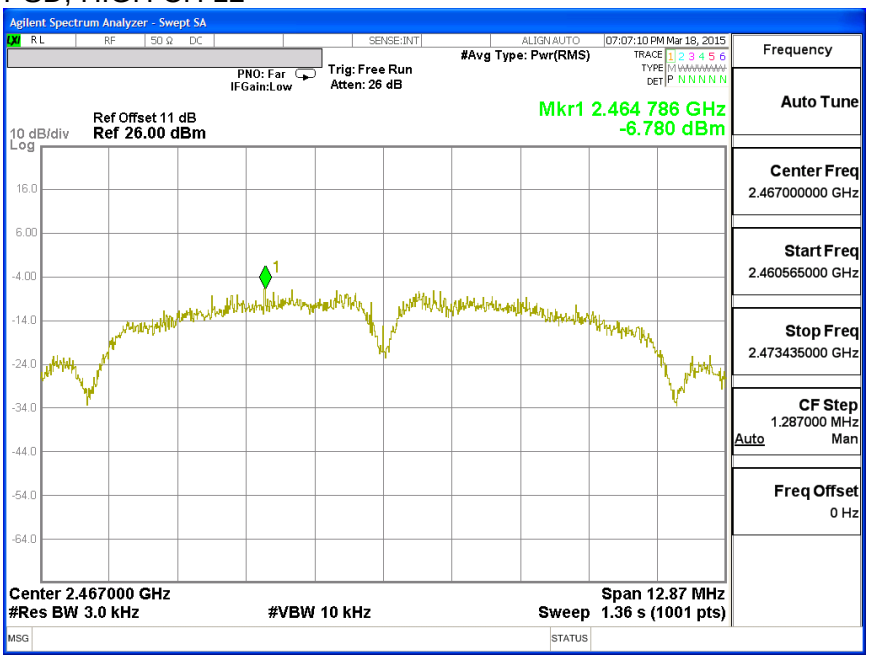
PSD, MID CH



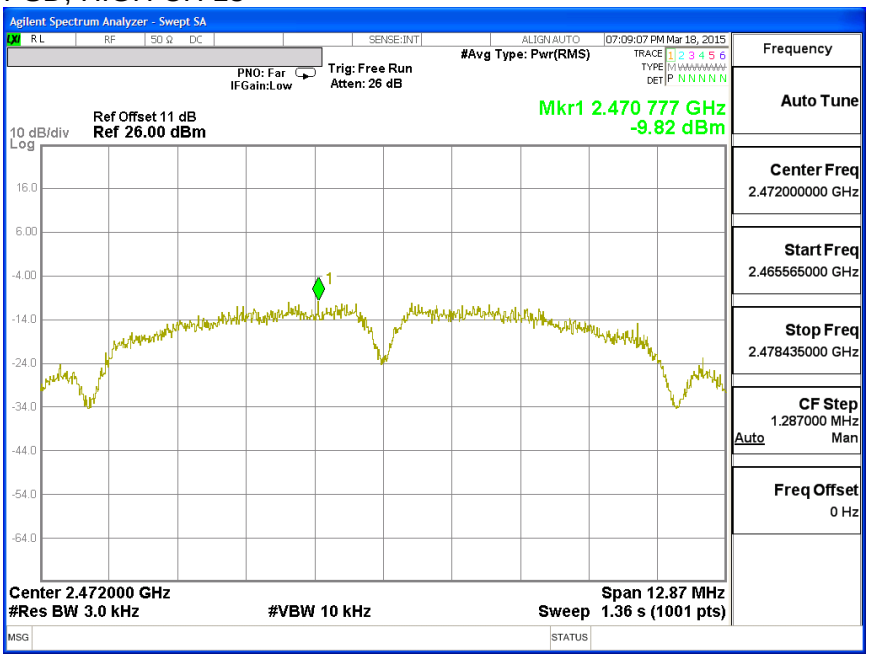
PSD, HIGH CH 11



PSD, HIGH CH 12



PSD, HIGH CH 13



8.1.6. OUT-OF-BAND EMISSIONS

LIMITS

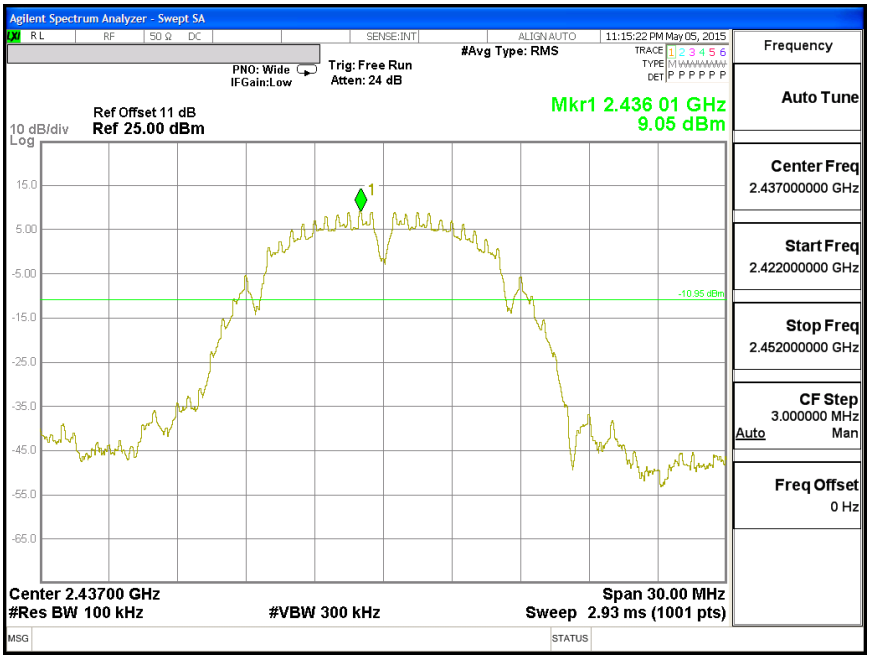
FCC §15.247 (d)

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

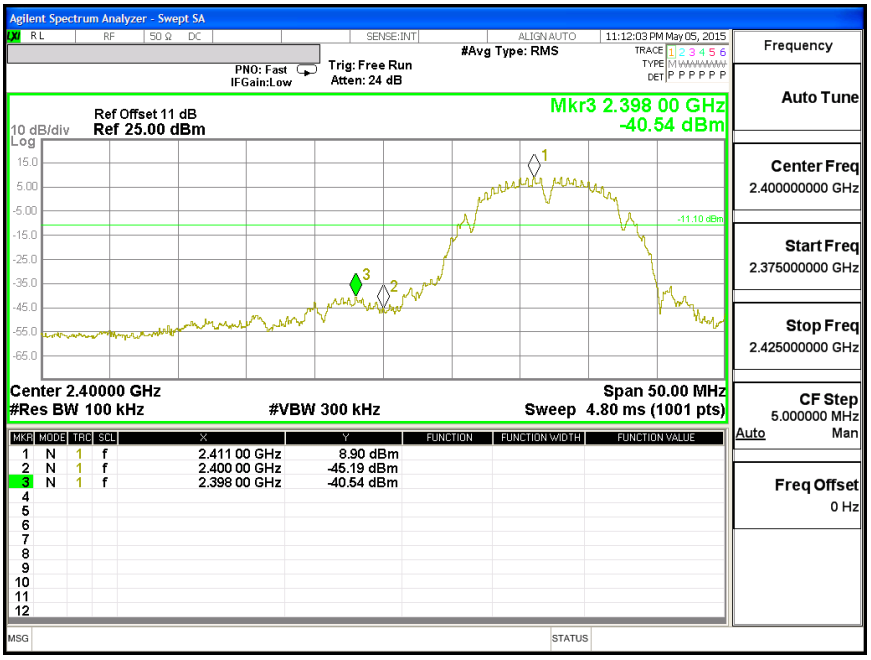
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



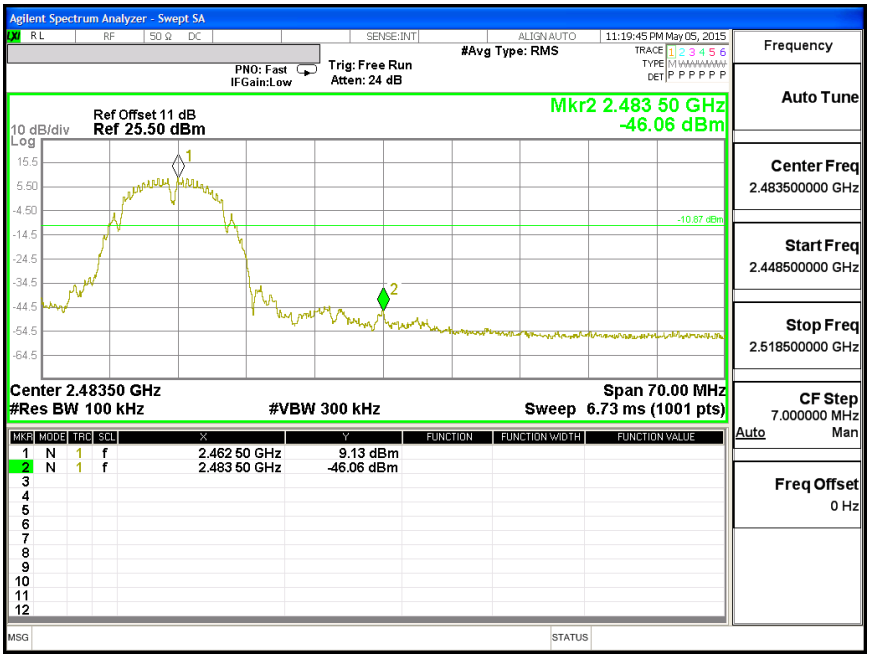
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



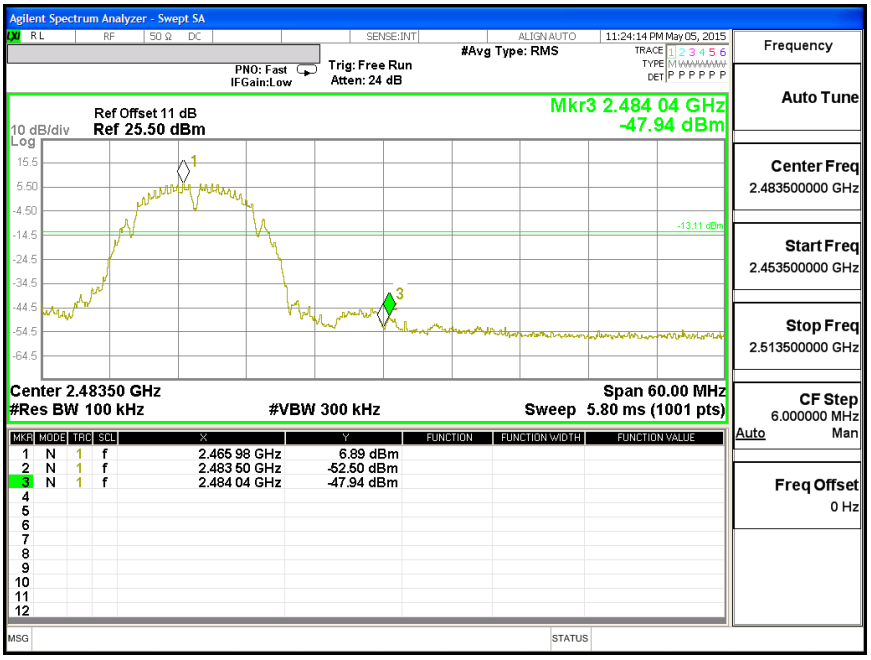
HIGH CHANNEL 11 BANDEDGE

AUTHORIZED BAND EDGE HIGH CH 11



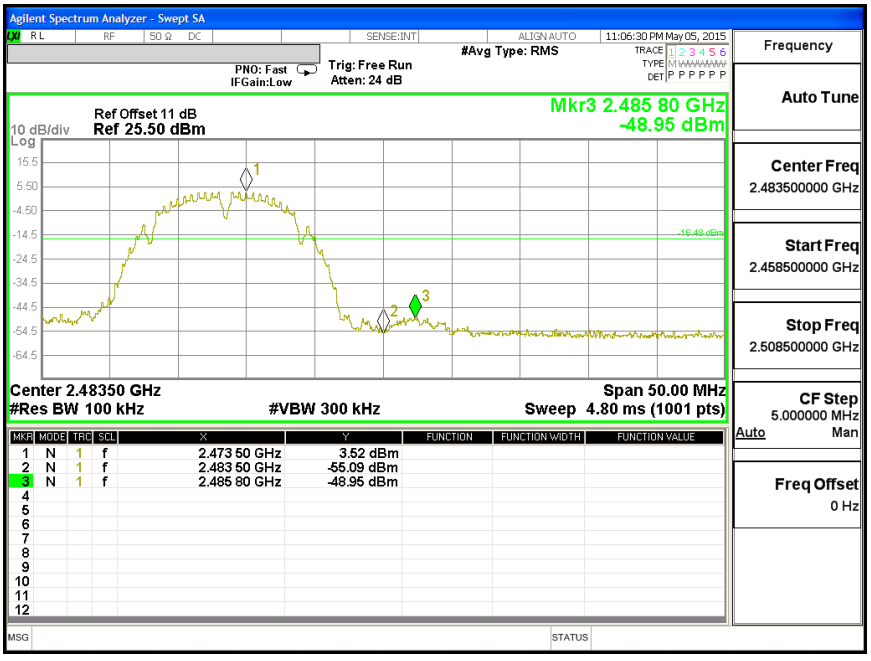
HIGH CHANNEL 12 BANDEDGE

AUTHORIZED BAND EDGE HIGH CH 12



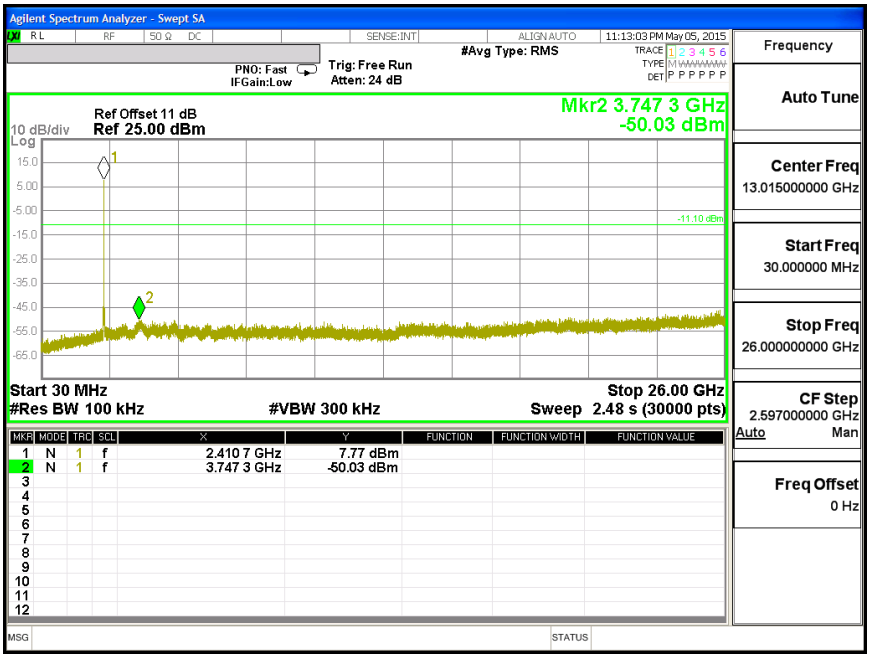
HIGH CHANNEL 13 BANDEDGE

AUTHORIZED BAND EDGE HIGH CH 13

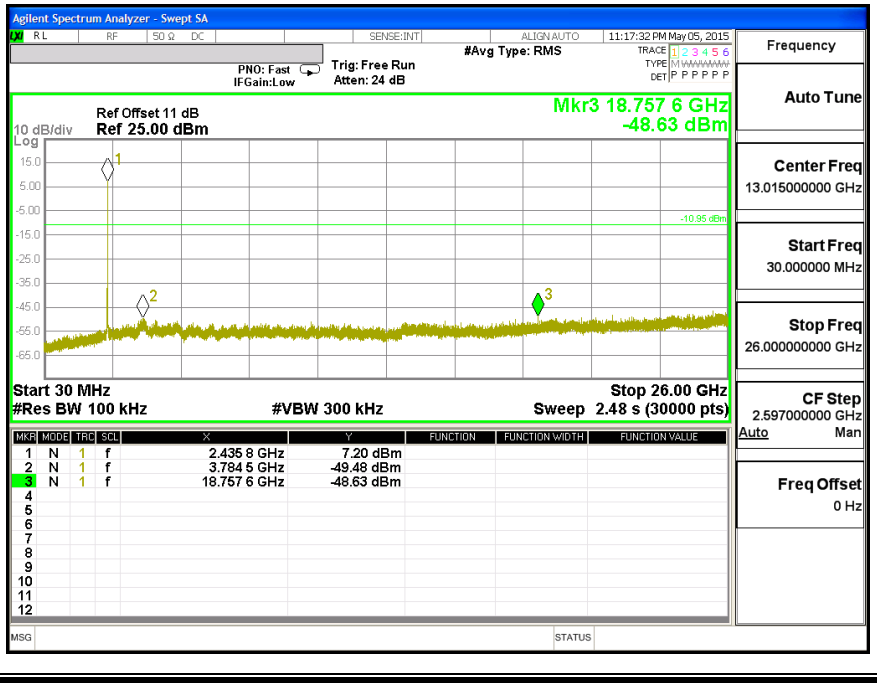


OUT-OF-BAND EMISSIONS

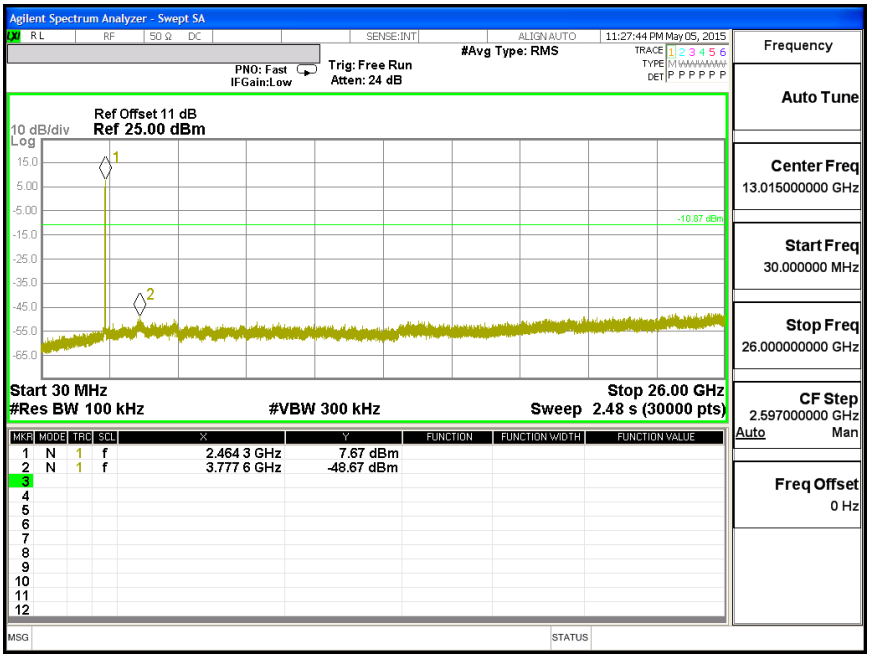
OUT OF BAND LOW CH



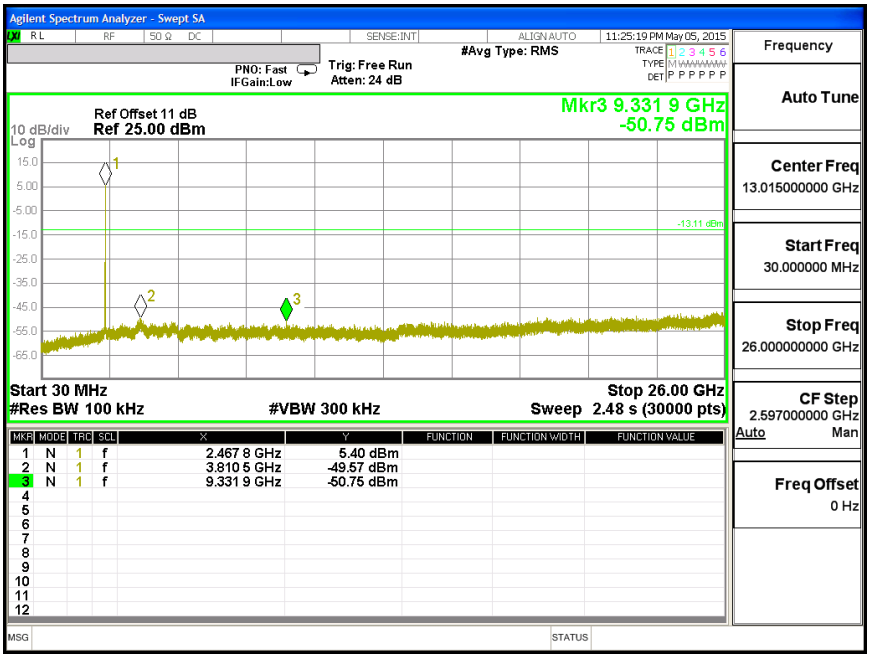
OUT OF BAND MID CH



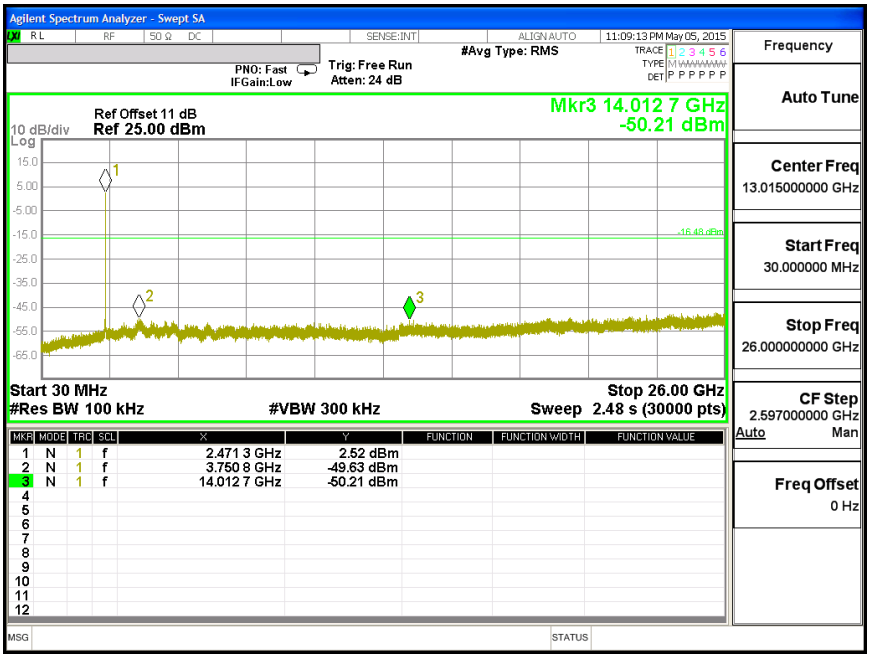
OUT OF BAND HIGH CH 11



OUT OF BAND HIGH CH 12



OUT OF BAND HIGH CH 13



8.2. 802.11n HT20 SISO MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

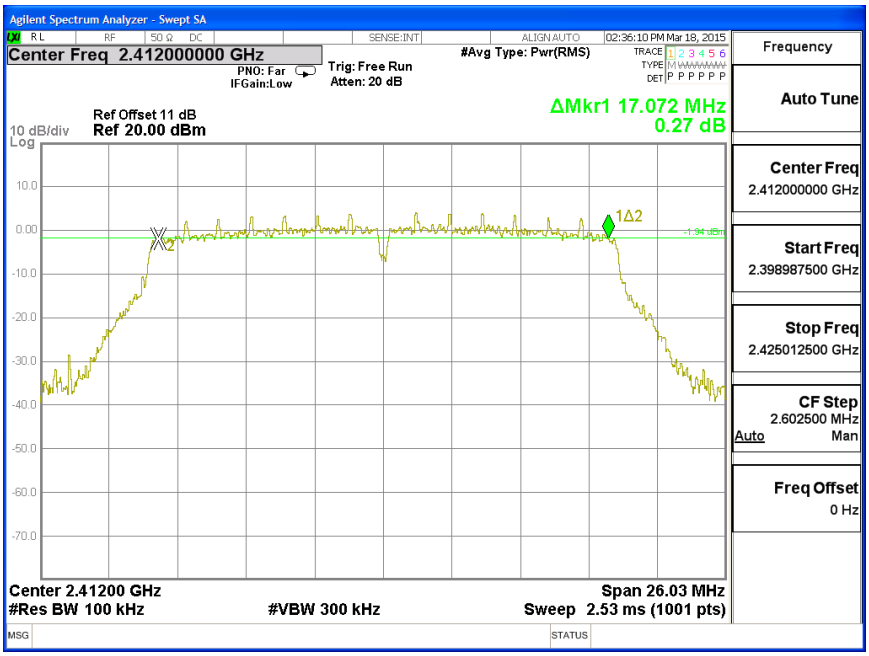
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

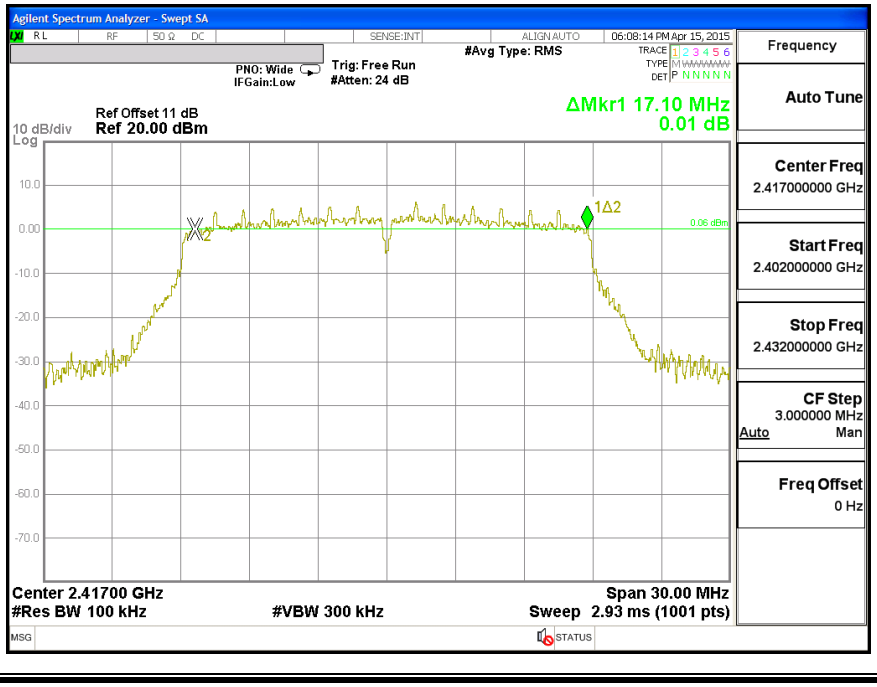
Channel	Frequency (MHz)	6 dB Bandwidth (MHz) Chain 0	Minimum Limit (MHz)
Low	2412	17.072	0.5
Low	2417	17.100	0.5
Low	2422	17.310	0.5
Mid	2437	17.545	0.5
High	2452	17.280	0.5
High	2457	17.187	0.5
High	2462	17.259	0.5
High	2467	17.310	0.5
High	2472	17.069	0.5

6 dB BANDWIDTH

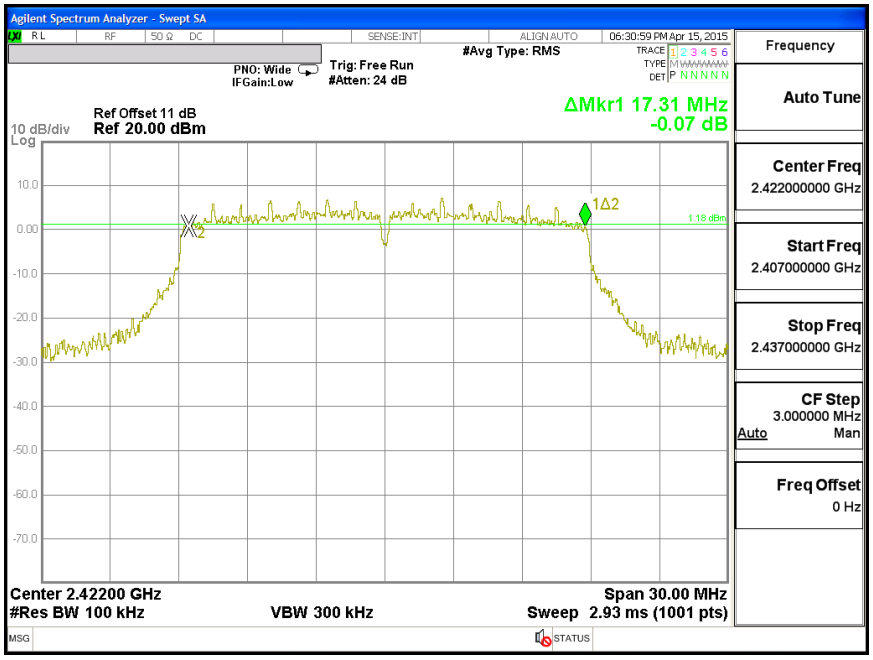
6 dB BANDWIDTH LOW CH 1



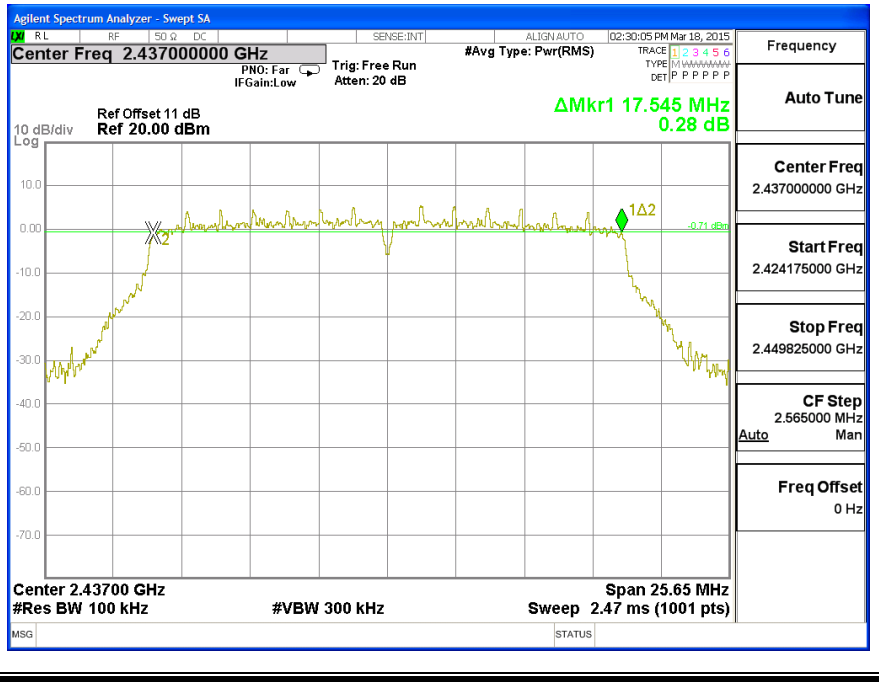
6 dB BANDWIDTH LOW CH 2



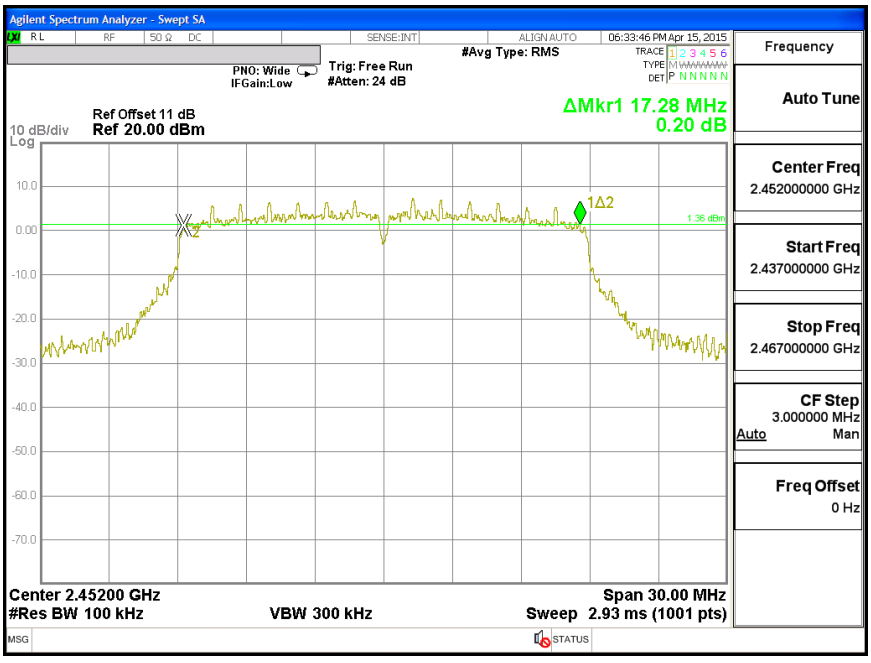
6 dB BANDWIDTH LOW CH 3



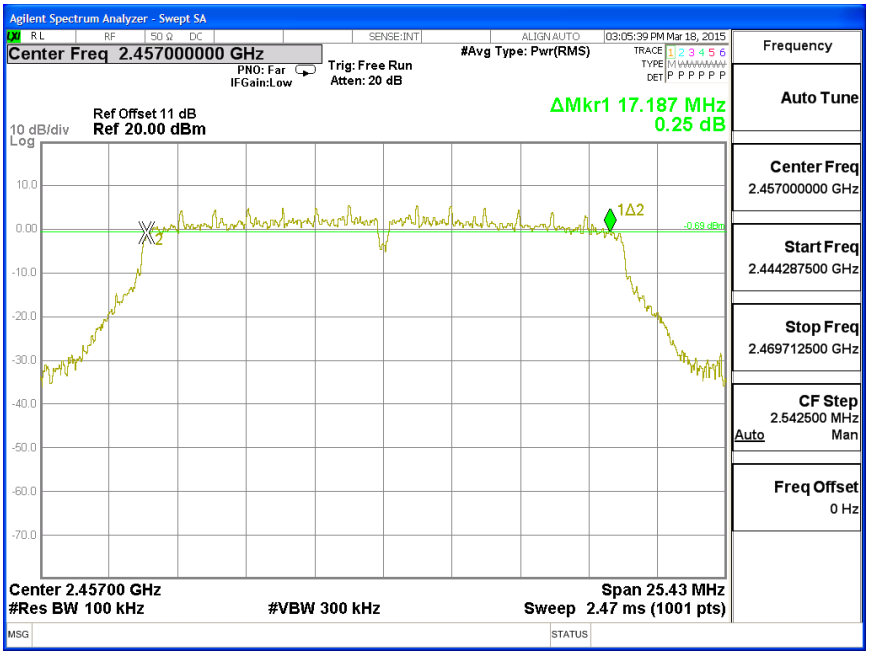
6 dB BANDWIDTH MID CH



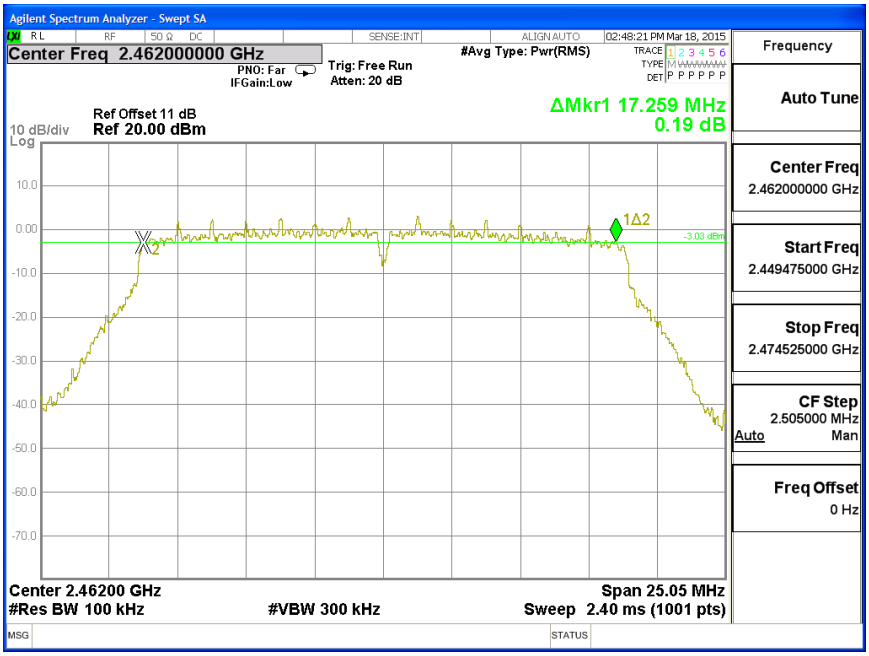
6 dB BANDWIDTH HIGH CH 9



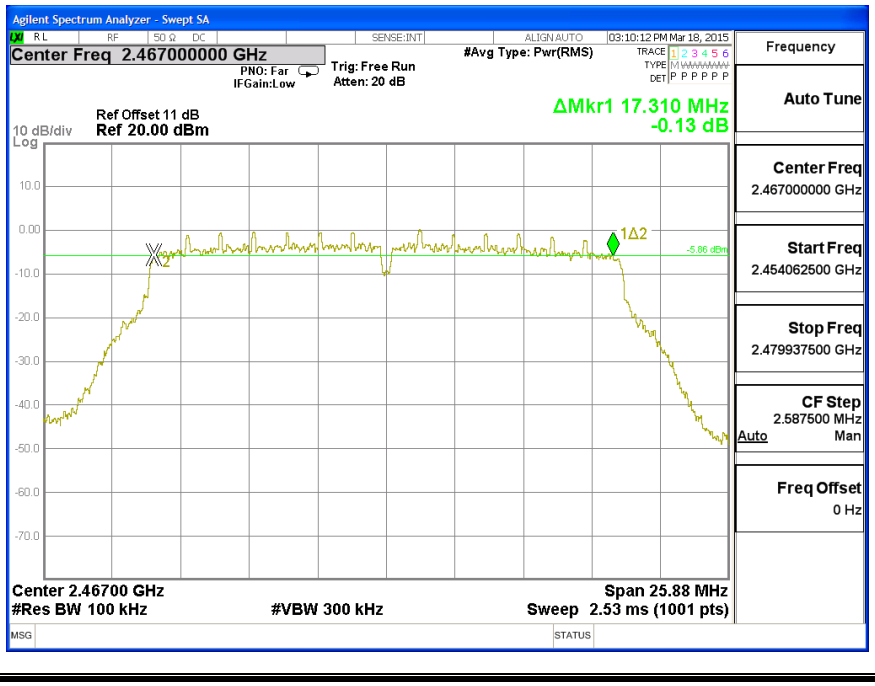
6 dB BANDWIDTH HIGH CH 10



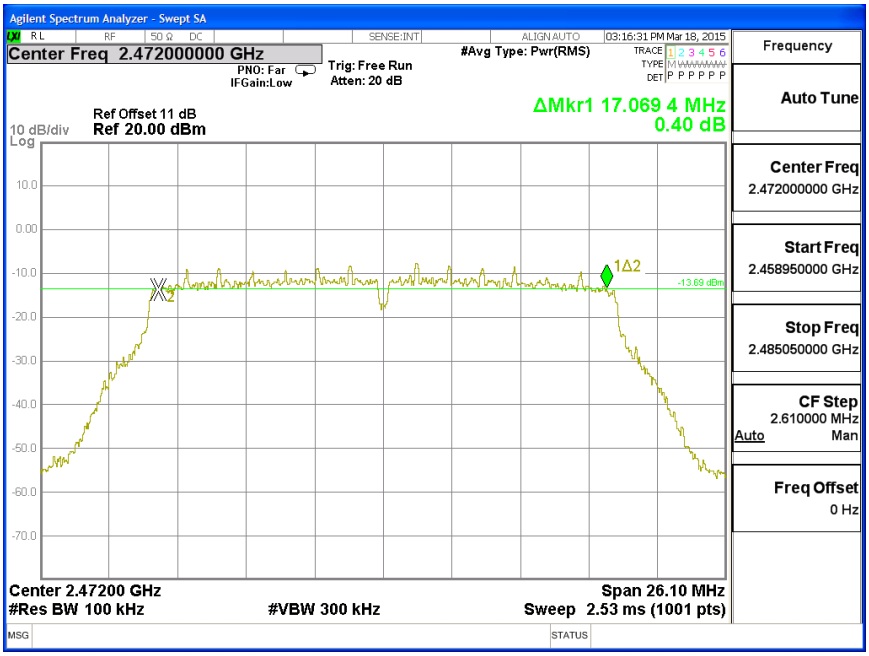
6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12



6 dB BANDWIDTH HIGH CH 13



8.2.2. 99% BANDWIDTH

LIMITS

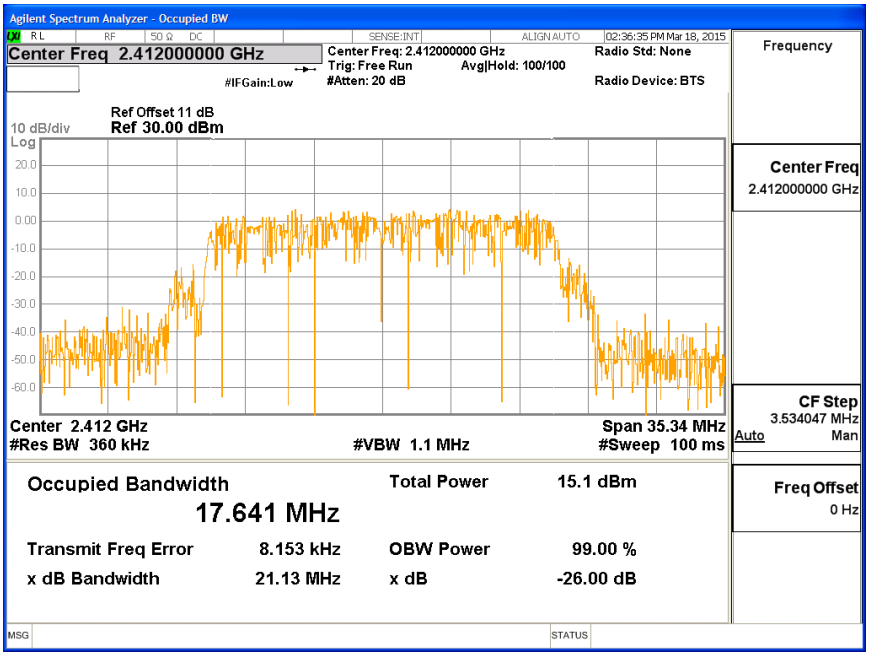
None; for reporting purposes only.

RESULTS

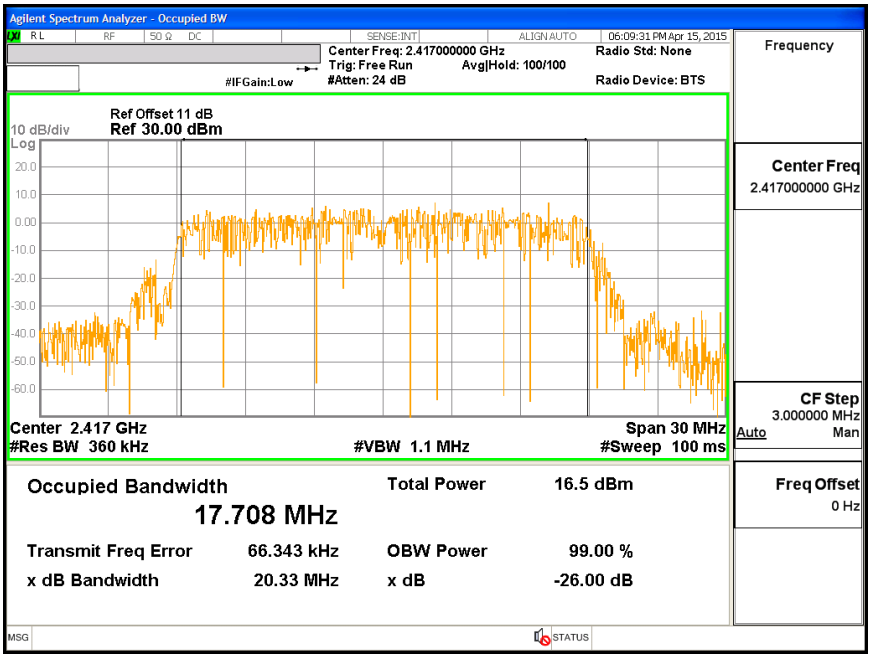
Channel	Frequency (MHz)	99% Bandwidth (MHz) Chain 0
Low	2412	17.641
Low	2417	17.708
Low	2422	17.655
Mid	2437	17.588
High	2452	17.746
High	2457	17.641
High	2462	17.659
High	2467	17.726
High	2472	17.738

99% BANDWIDTH

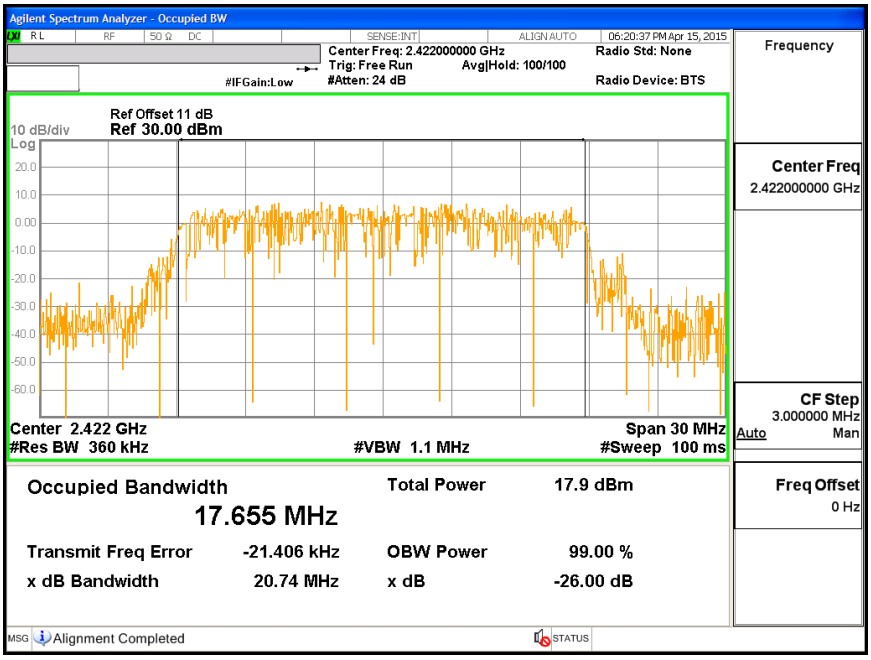
99% BANDWIDTH LOW CH 1



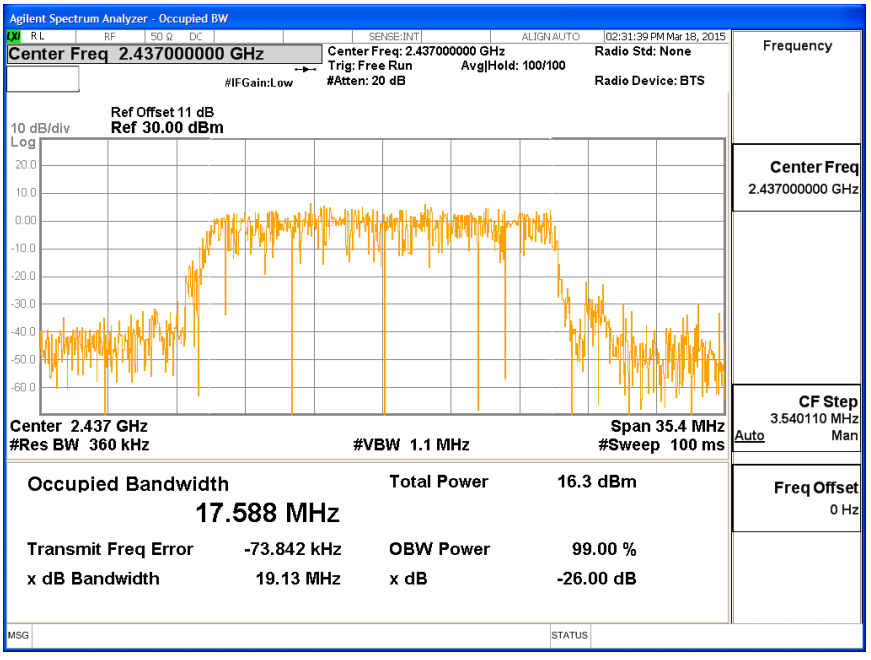
99% BANDWIDTH LOW CH 2



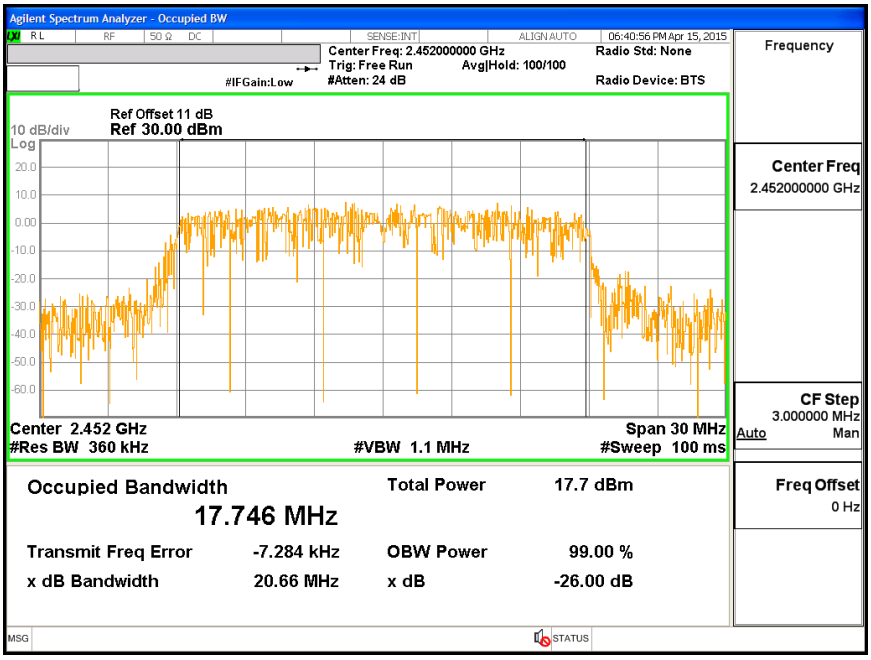
99% BANDWIDTH LOW CH 3



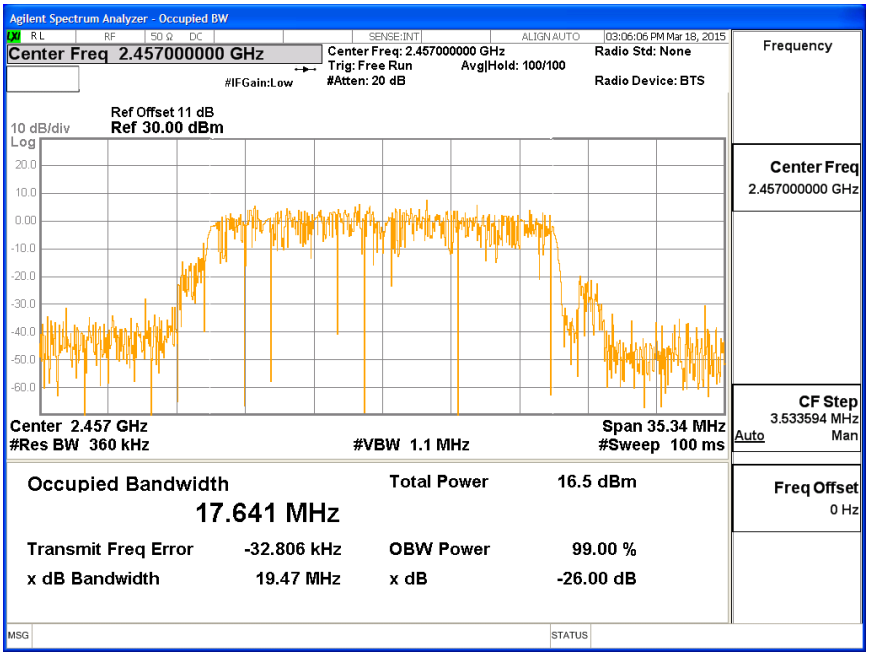
99% BANDWIDTH MID CH



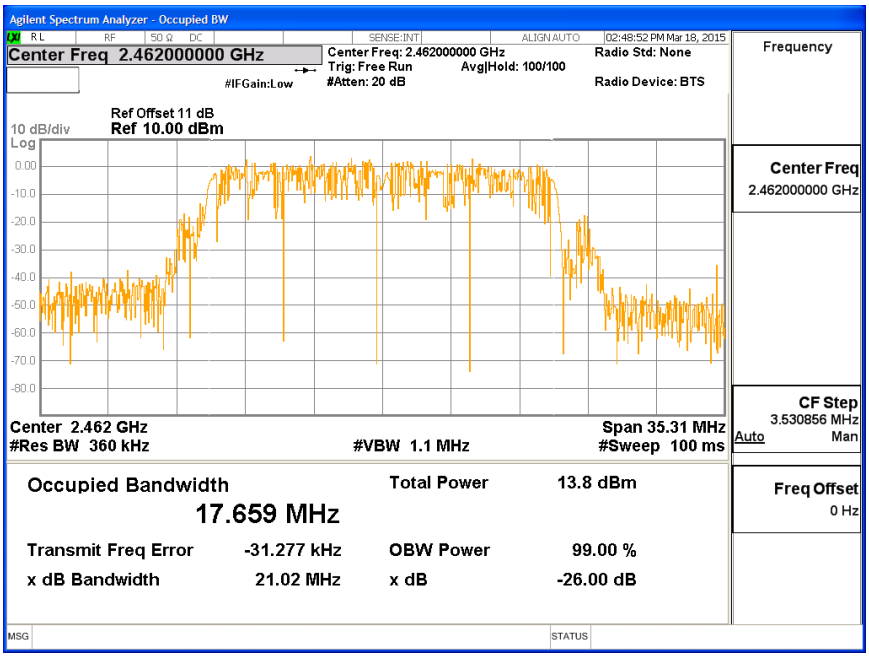
99% BANDWIDTH HIGH CH 9



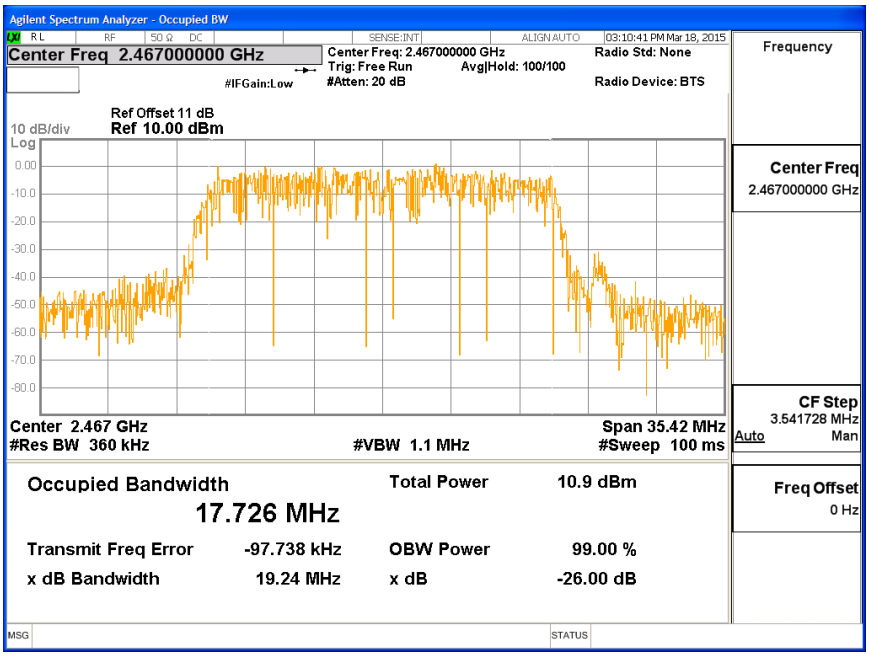
99% BANDWIDTH HIGH CH 10



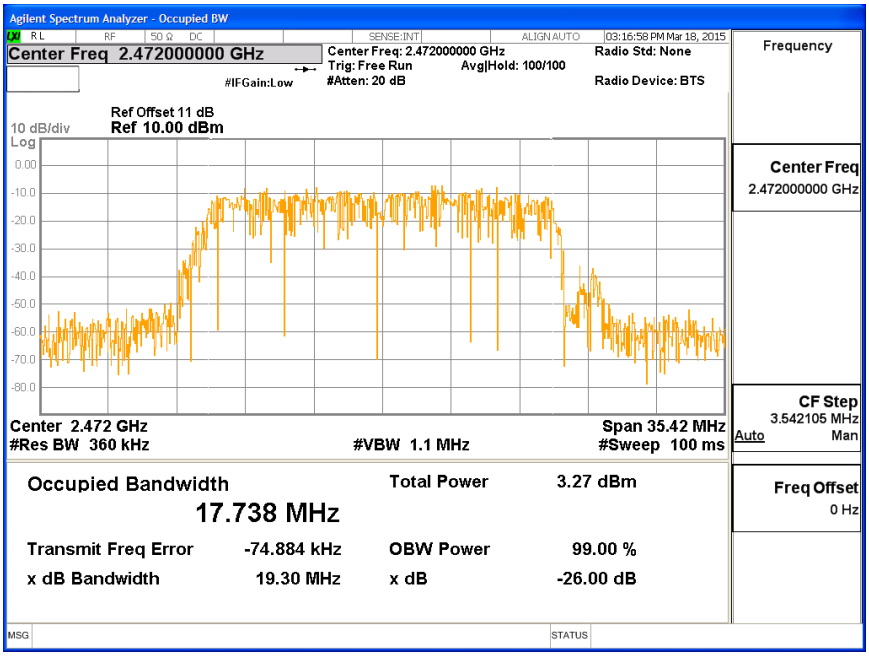
99% BANDWIDTH HIGH CH 11



99% BANDWIDTH HIGH CH 12



99% BANDWIDTH HIGH CH 13



8.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm) Chain 0
Low	2412	14.89
Low	2417	16.43
Low	2422	17.50
Mid	2437	17.48
High	2452	17.46
High	2457	16.30
High	2462	13.45
High	2467	11.00
High	2472	2.99

8.2.4. OUTPUT POWER

LIMITS

FCC §15.247

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

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-0.452	30.00	30	36	30.00
Low	2417	-0.452	30.00	30	36	30.00
Low	2422	-0.452	30.00	30	36	30.00
Mid	2437	-0.452	30.00	30	36	30.00
High	2452	-0.452	30.00	30	36	30.00
High	2457	-0.452	30.00	30	36	30.00
High	2462	-0.452	30.00	30	36	30.00
High	2467	-0.452	30.00	30	36	30.00
High	2472	-0.452	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	22.89	22.89	30.00	-7.11
Low	2417	24.43	24.43	30.00	-5.57
Low	2422	24.57	24.57	30.00	-5.43
Mid	2437	24.72	24.72	30.00	-5.28
High	2452	24.61	24.61	30.00	-5.39
High	2457	24.22	24.22	30.00	-5.78
High	2462	20.70	20.70	30.00	-9.30
High	2467	19.08	19.08	30.00	-10.92
High	2472	11.12	11.12	30.00	-18.88

8.2.5. PSD

LIMITS

FCC §15.247

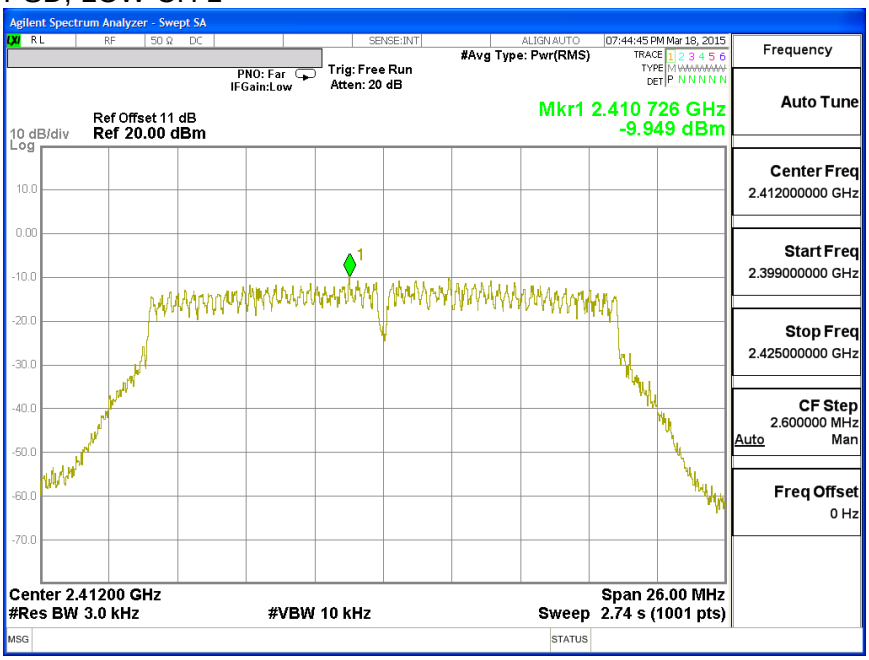
RESULTS

PSD Results

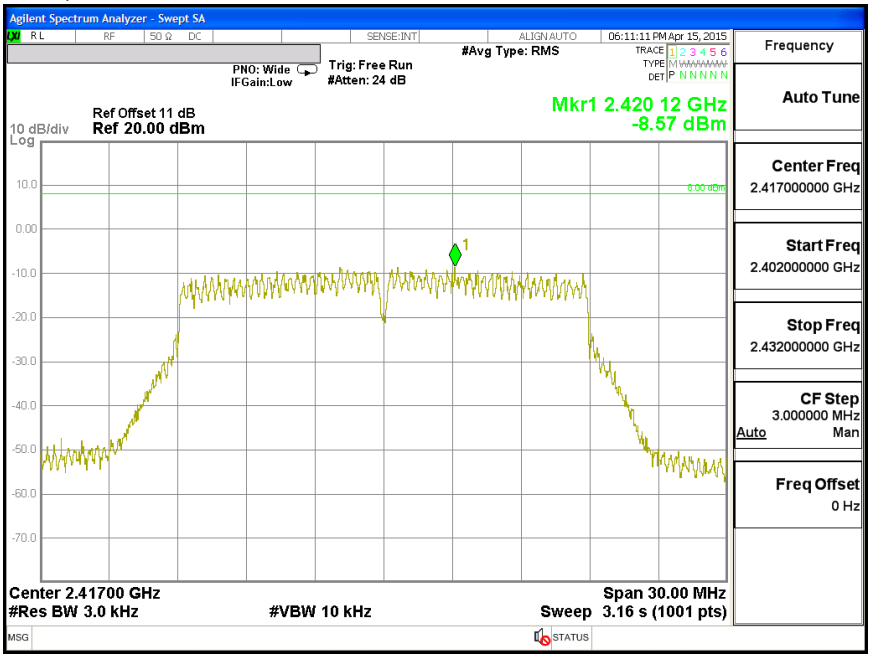
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-9.95	8.0	-17.9
Low	2417	-8.57	8.0	-16.6
Low	2422	-8.24	8.0	-16.2
Mid	2437	-8.14	8.0	-16.1
High	2452	-7.86	8.0	-15.9
High	2457	-8.78	8.0	-16.8
High	2462	-13.69	8.0	-21.7
High	2467	-13.64	8.0	-21.6
High	2472	-21.38	8.0	-29.4

PSD

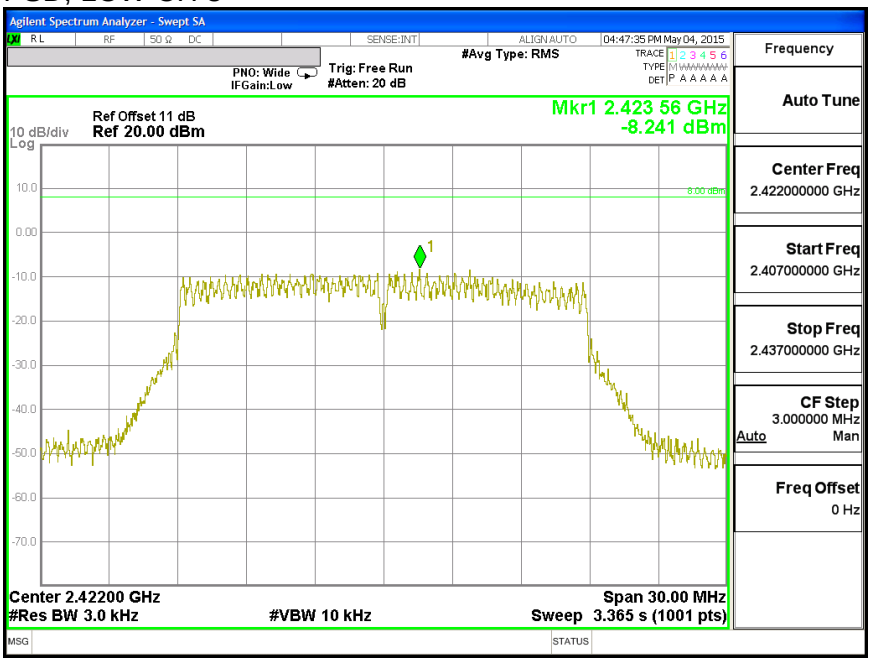
PSD, LOW CH 1



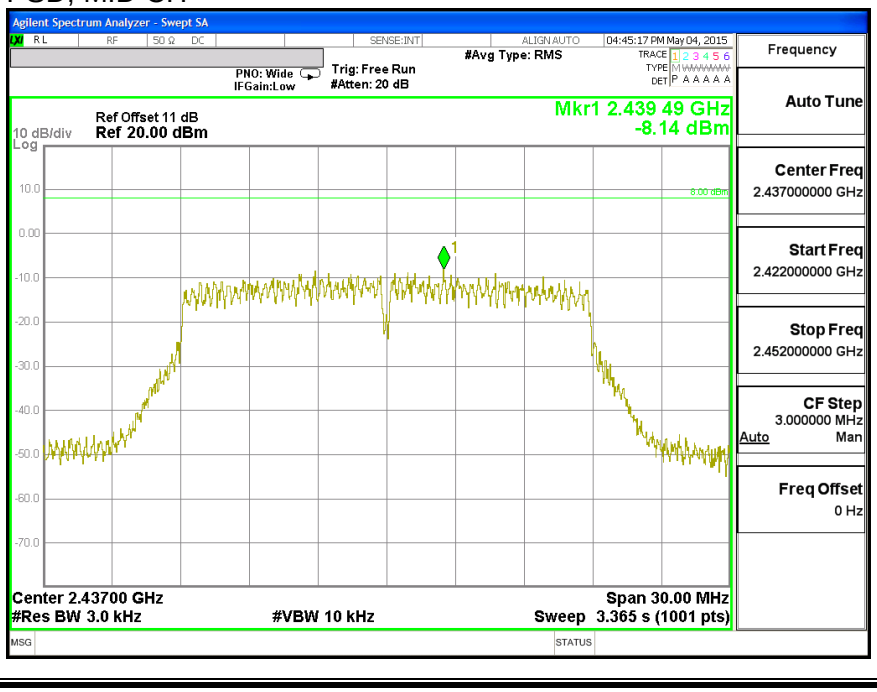
PSD, LOW CH 2



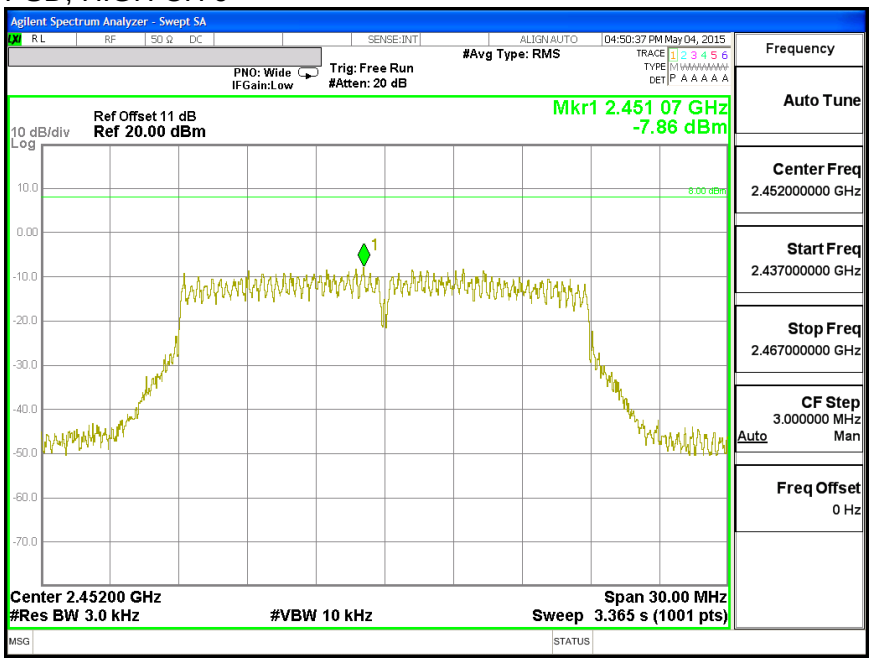
PSD, LOW CH 3



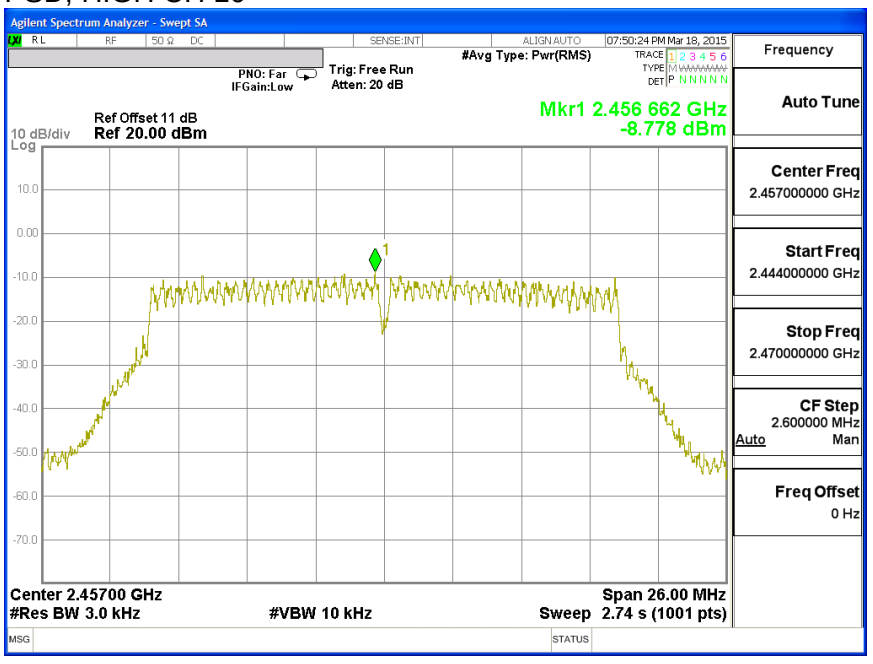
PSD, MID CH



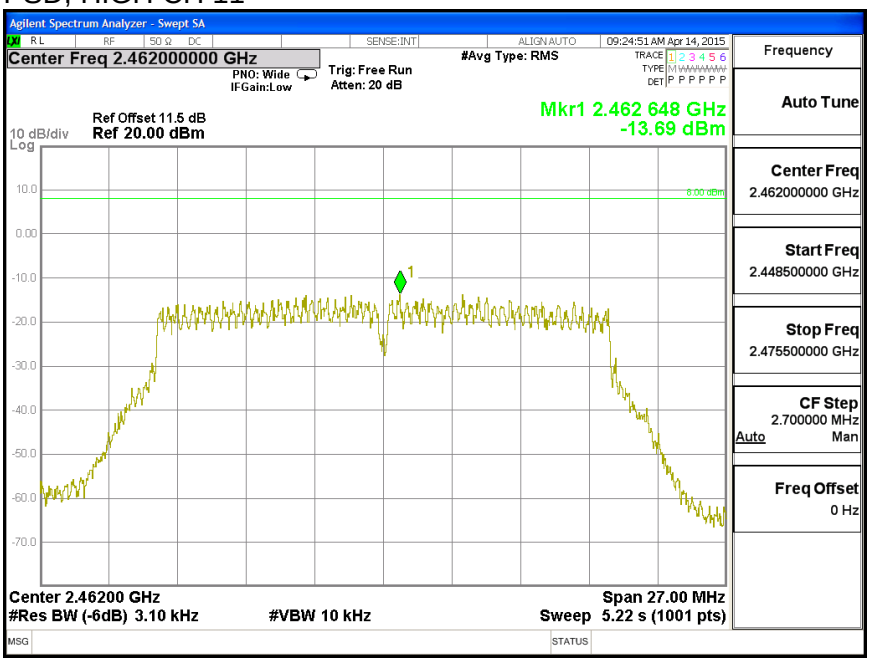
PSD, HIGH CH 9



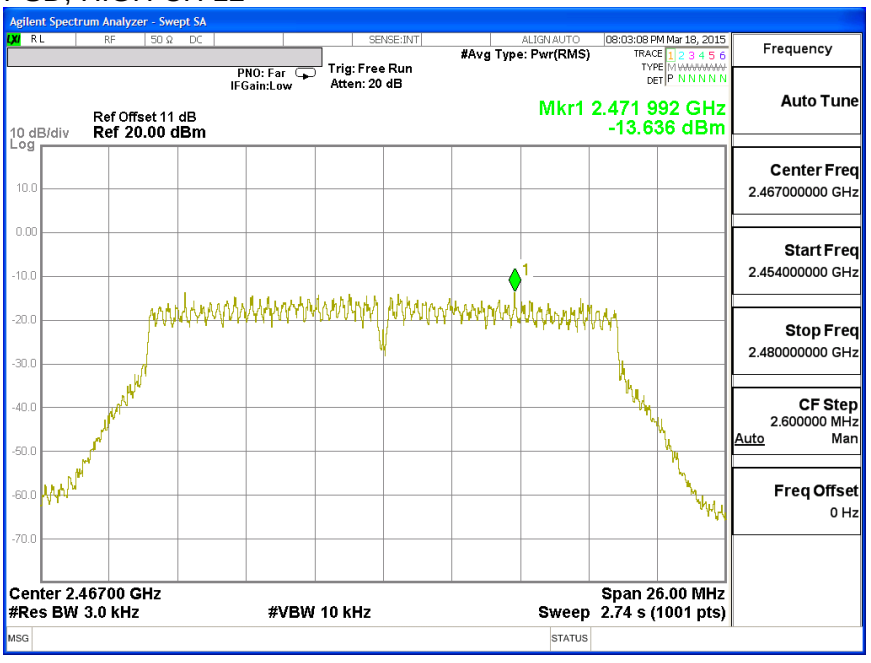
PSD, HIGH CH 10



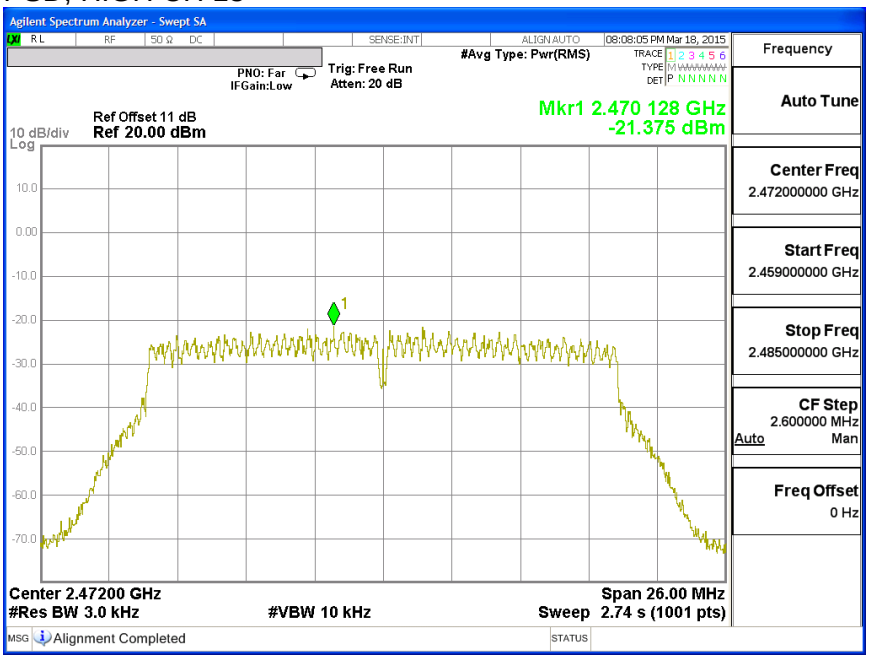
PSD, HIGH CH 11



PSD, HIGH CH 12



PSD, HIGH CH 13



8.2.6. OUT-OF-BAND EMISSIONS

LIMITS

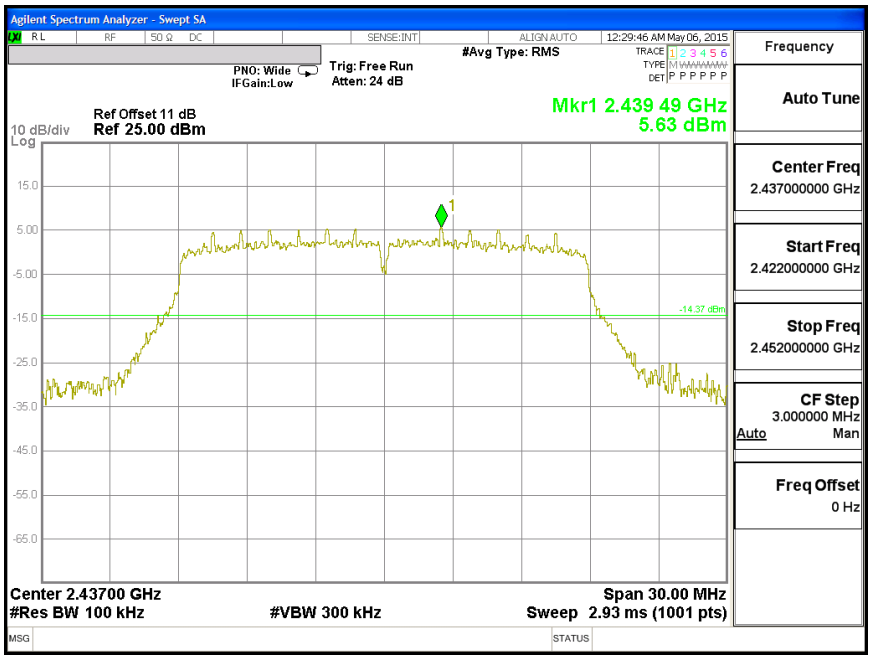
FCC §15.247 (d)

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

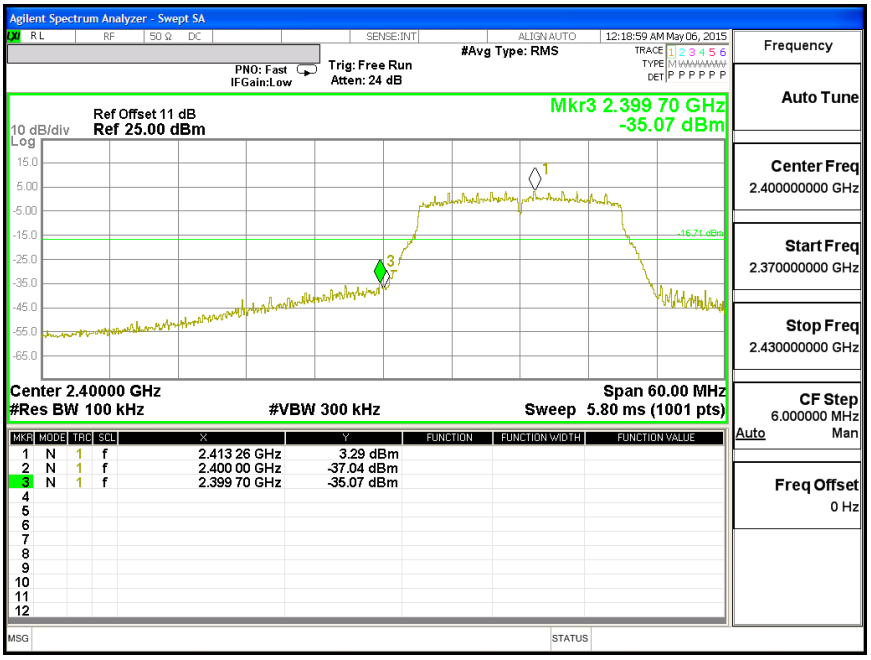
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH

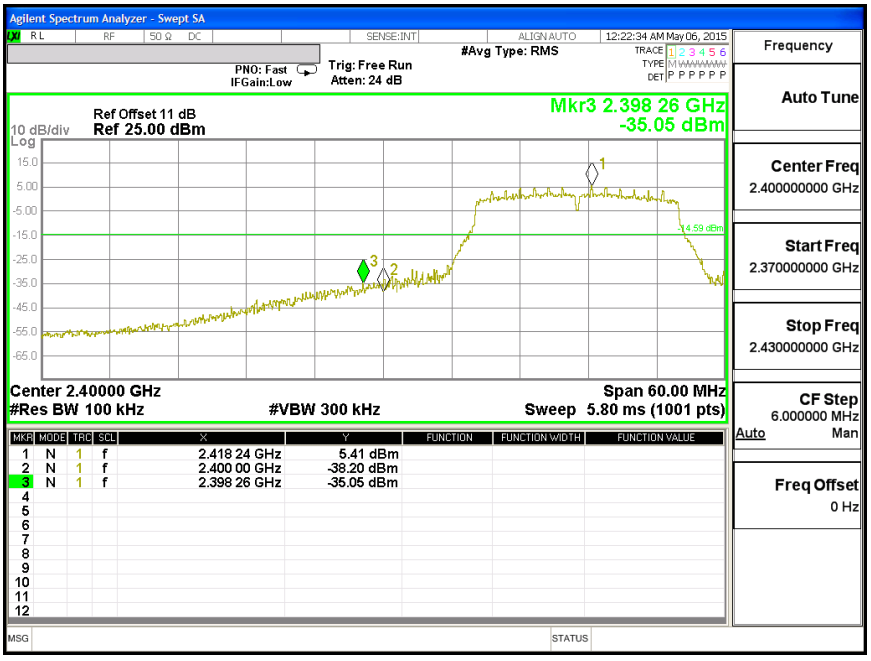


LOW CHANNEL BANDEDGE

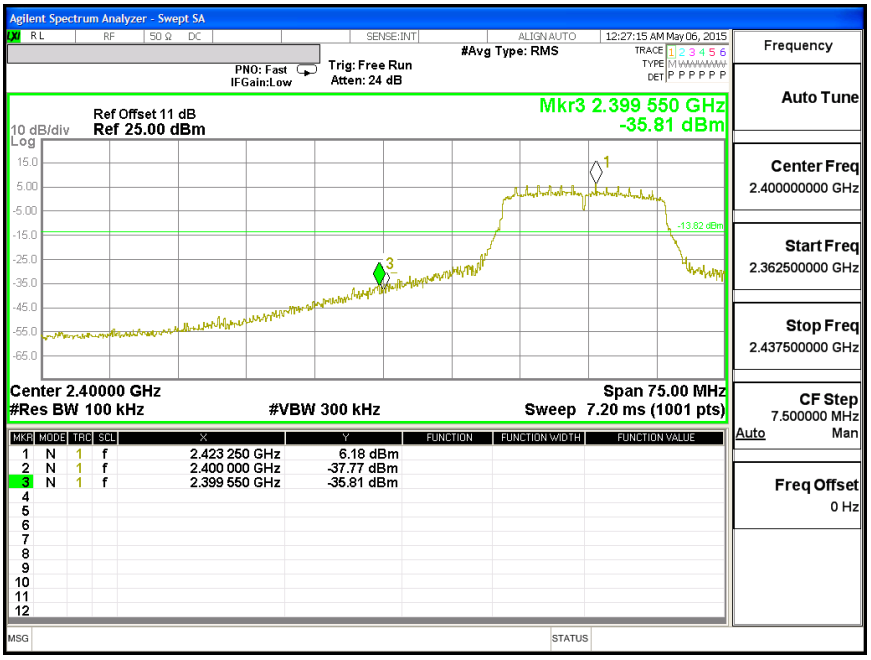
AUTHORIZED BAND EDGE LOW CH 1



AUTHORIZED BAND EDGE LOW CH 2

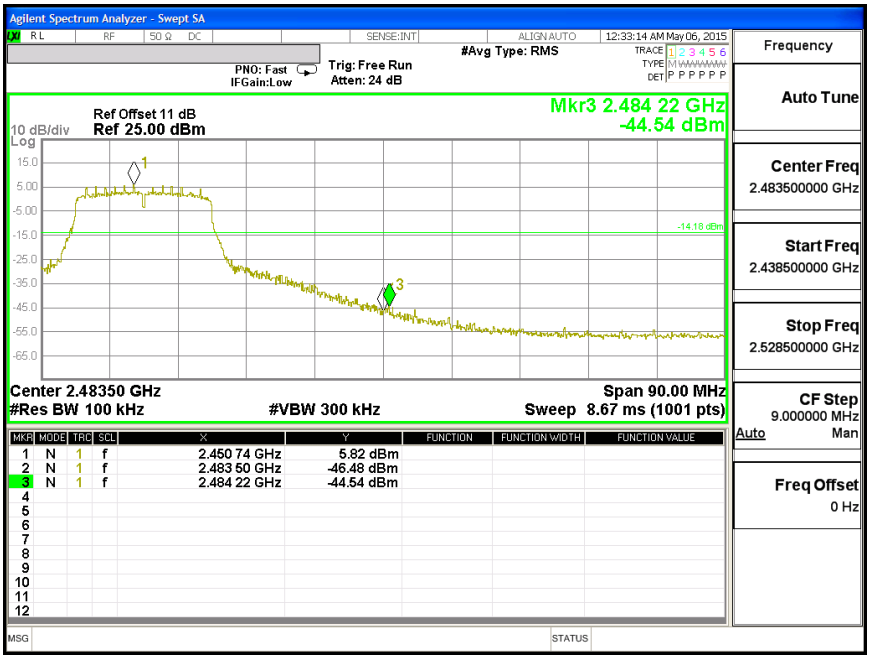


AUTHORIZED BAND EDGE LOW CH 3

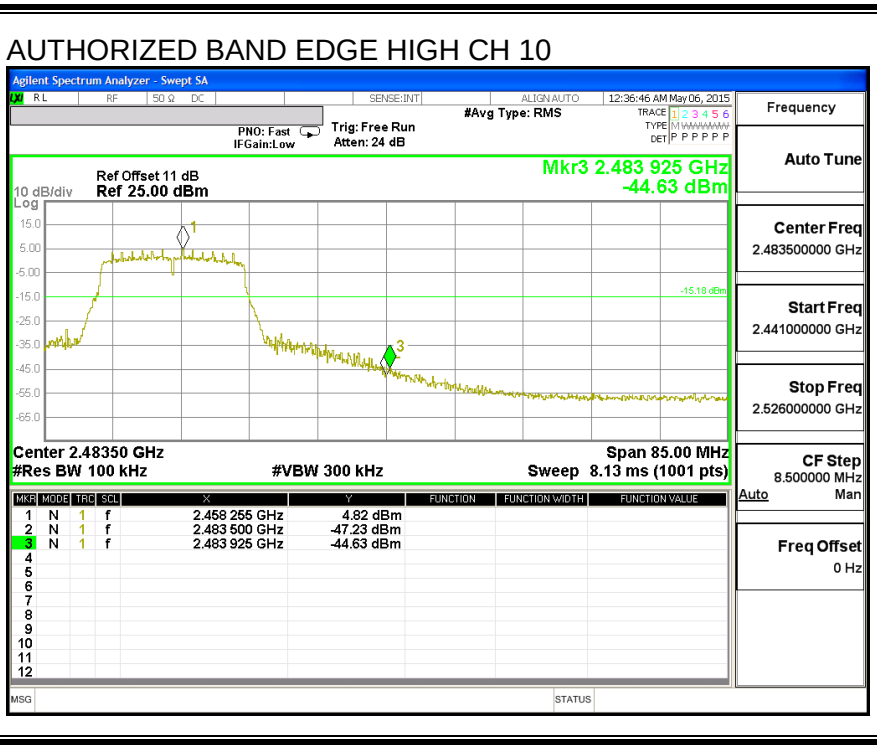


HIGH CHANNEL BANDEDGE

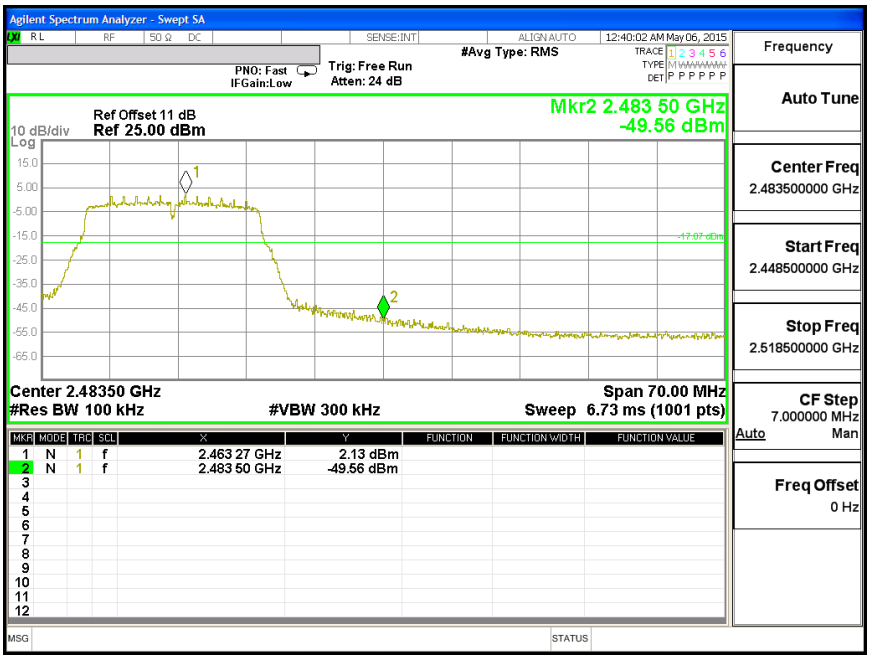
AUTHORIZED BAND EDGE HIGH CH 9



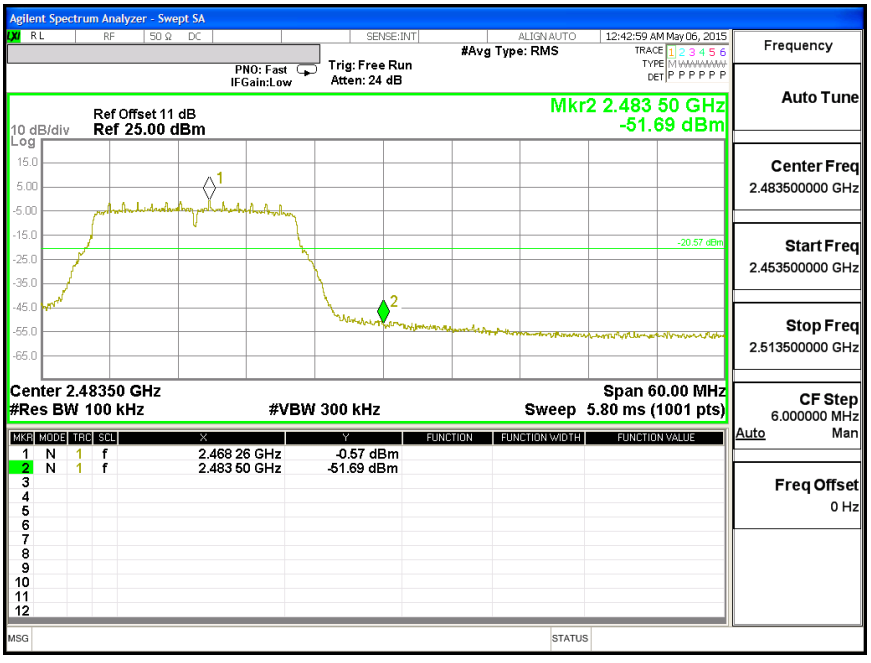
AUTHORIZED BAND EDGE HIGH CH 10



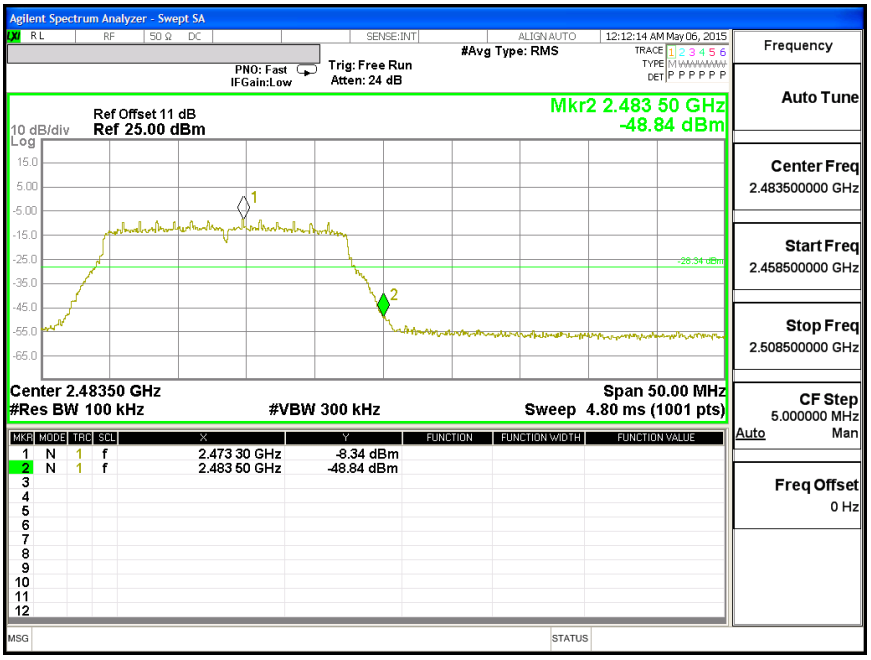
AUTHORIZED BAND EDGE HIGH CH 11



AUTHORIZED BAND EDGE HIGH CH 12

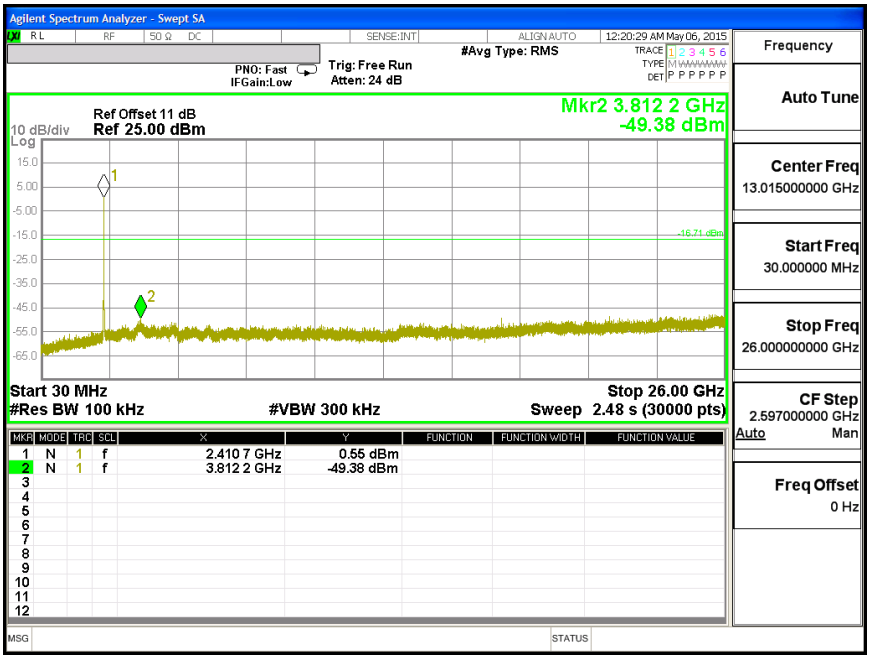


AUTHORIZED BAND EDGE HIGH CH 13

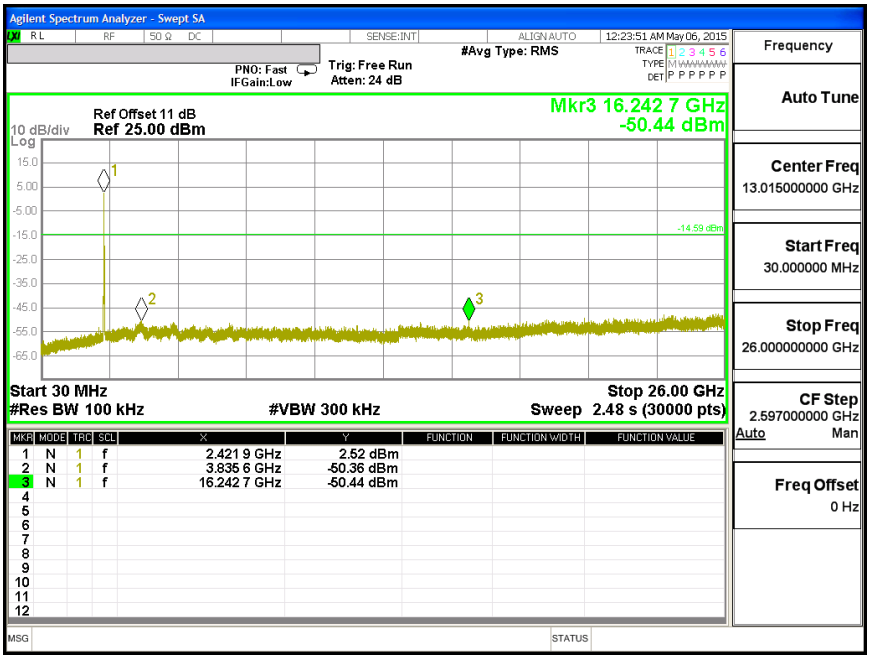


OUT-OF-BAND EMISSIONS

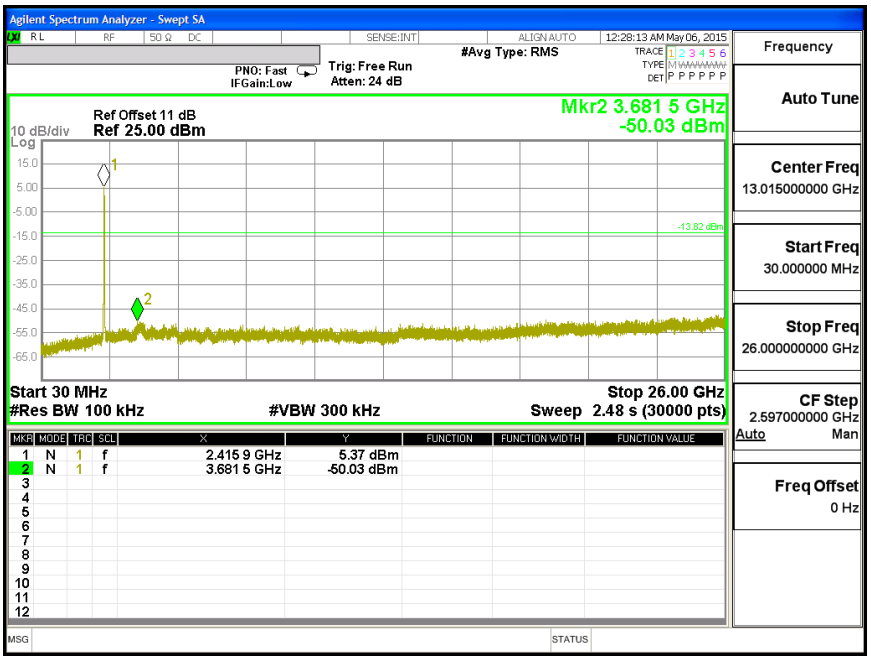
OUT OF BAND LOW CH 1



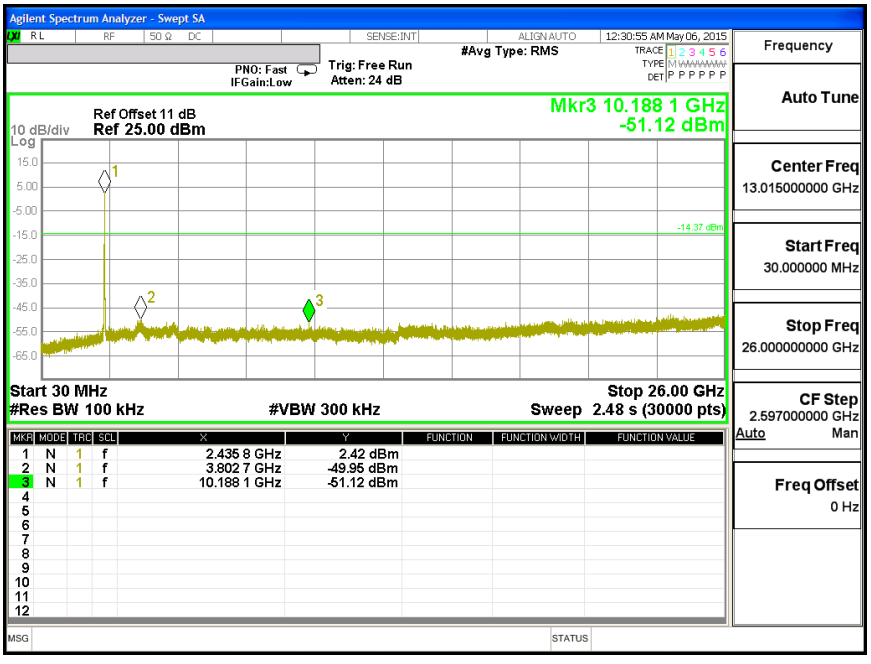
OUT OF BAND LOW CH 2



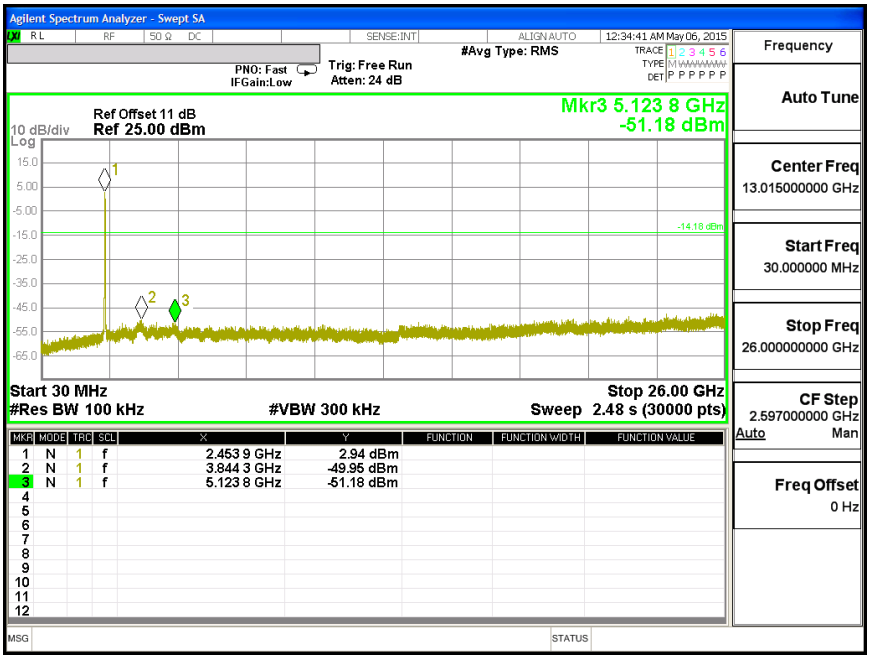
OUT OF BAND LOW CH 3



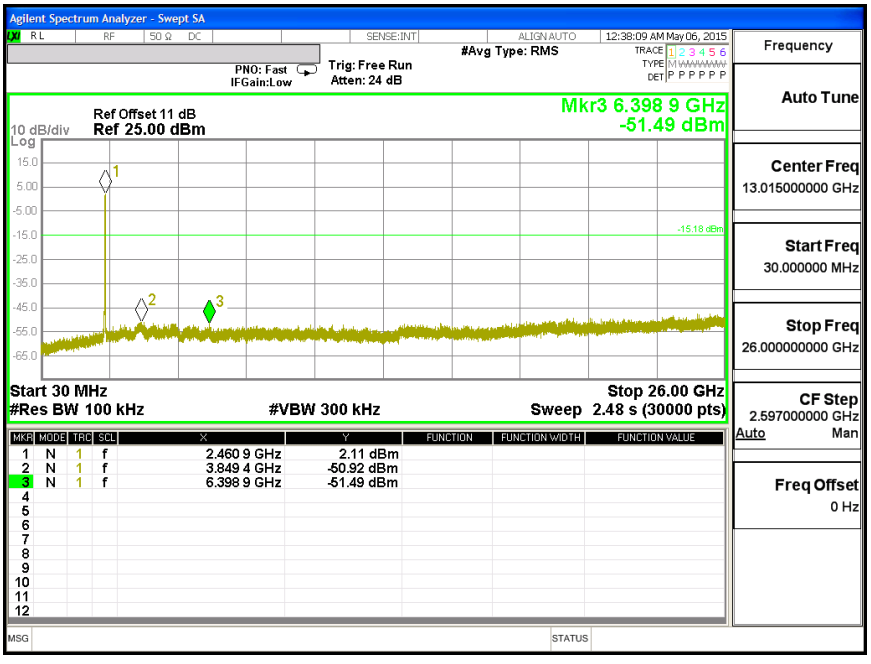
OUT OF BAND MID CH



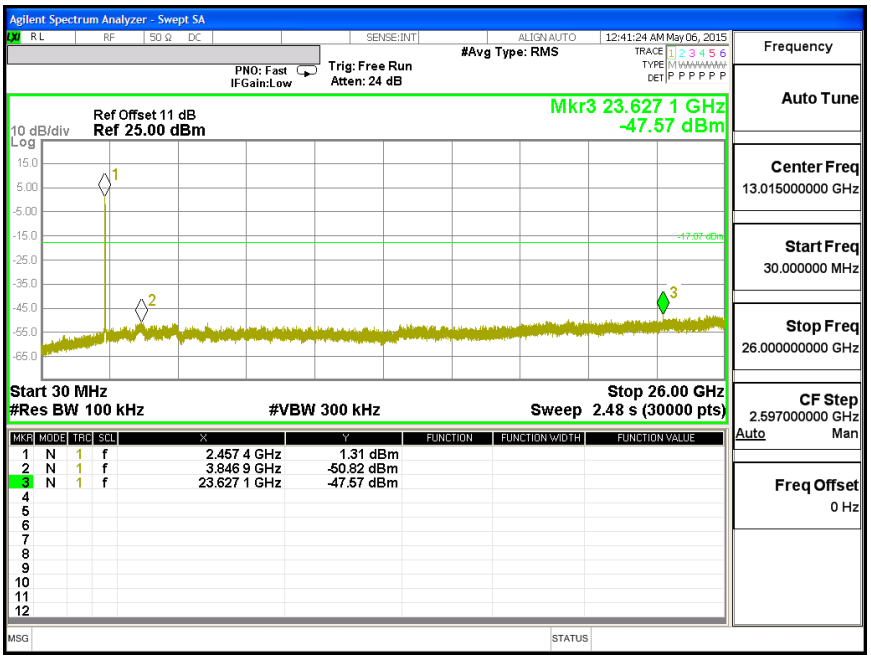
OUT OF BAND HIGH CH 9



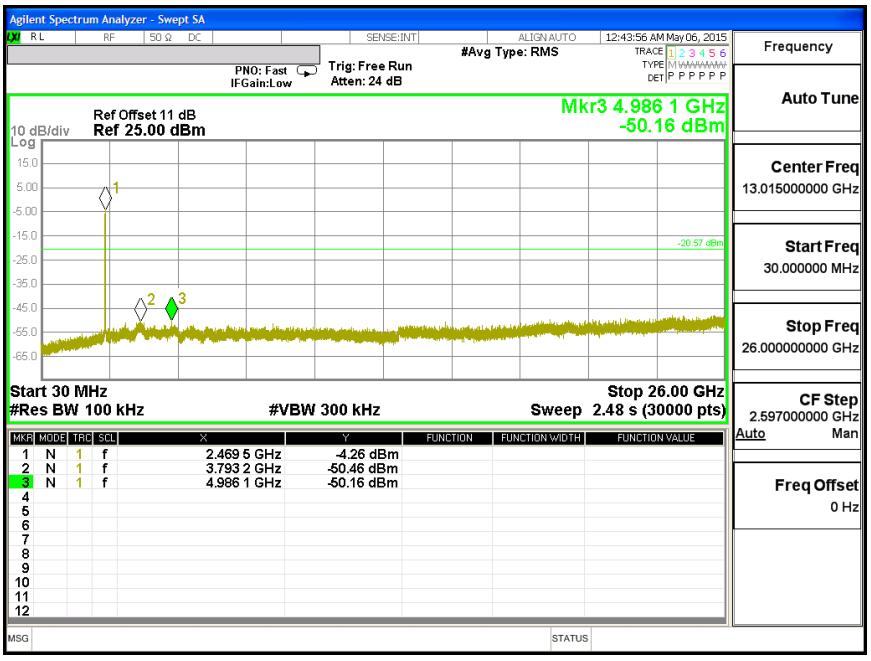
OUT OF BAND HIGH CH 10



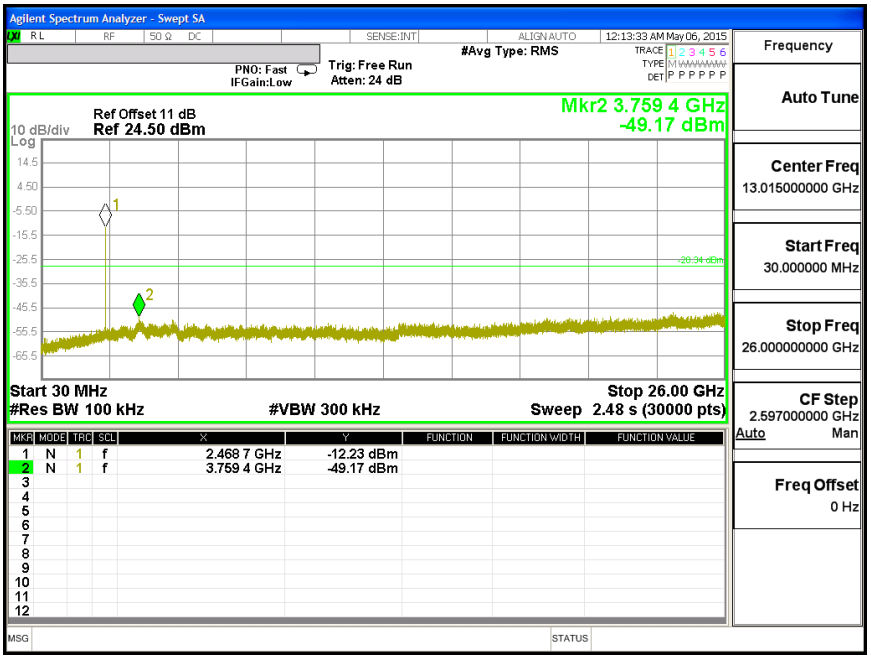
OUT OF BAND HIGH CH 11



OUT OF BAND HIGH CH 12



OUT OF BAND HIGH CH 13



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and and as applicable for average measurements.

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

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

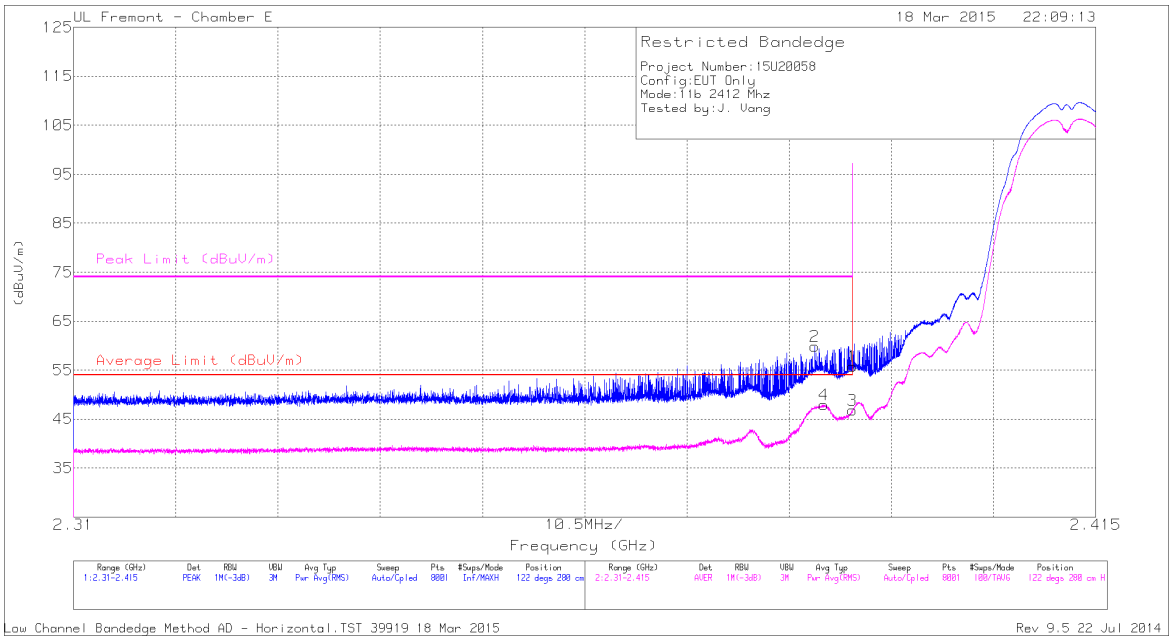
RESULT

2.4G band lowest, mid and highest channels radiated harmonics and spurious emissions was tested based on the maximized transmit power.

9.2. 802.11b 1Tx SISO MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE

LOW CHANNEL HORIZONTAL PLOT



DATA

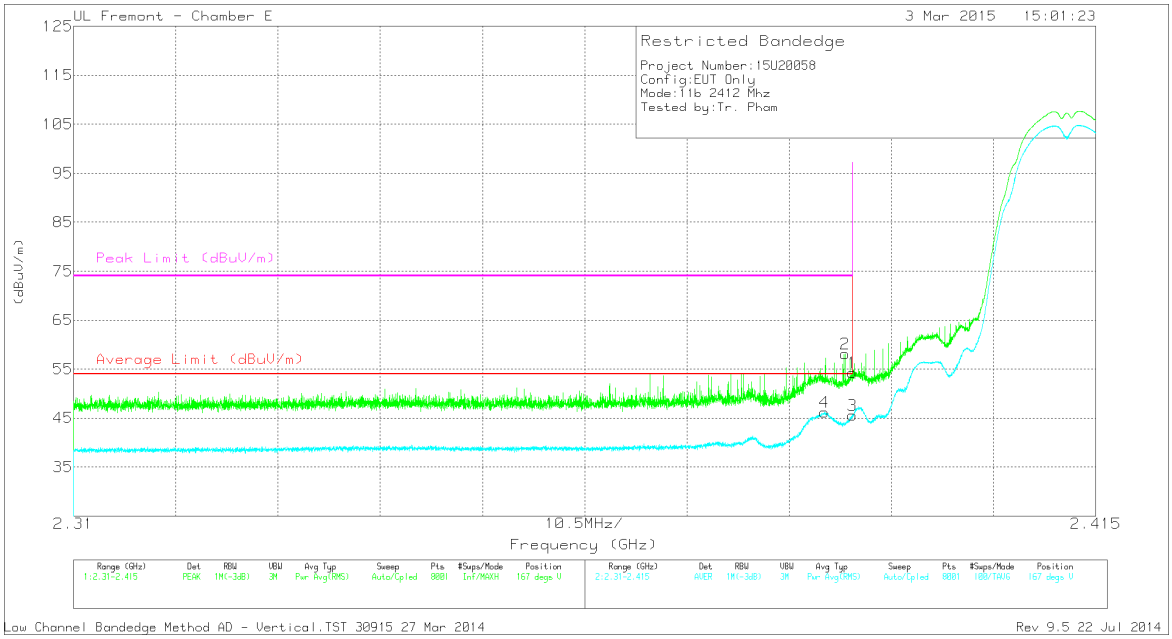
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	48.4	PK	32.1	-24.7	55.8	-	-	74	-18.2	122	280	H
2	* 2.386	52.54	PK	32	-24.7	59.84	-	-	74	-14.16	122	280	H
3	* 2.39	39.37	RMS	32.1	-24.7	46.77	54	-7.23	-	-	122	280	H
4	* 2.387	40.51	RMS	32.1	-24.7	47.91	54	-6.09	-	-	122	280	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

LOW CHANNEL VERTICAL PLOT



DATA

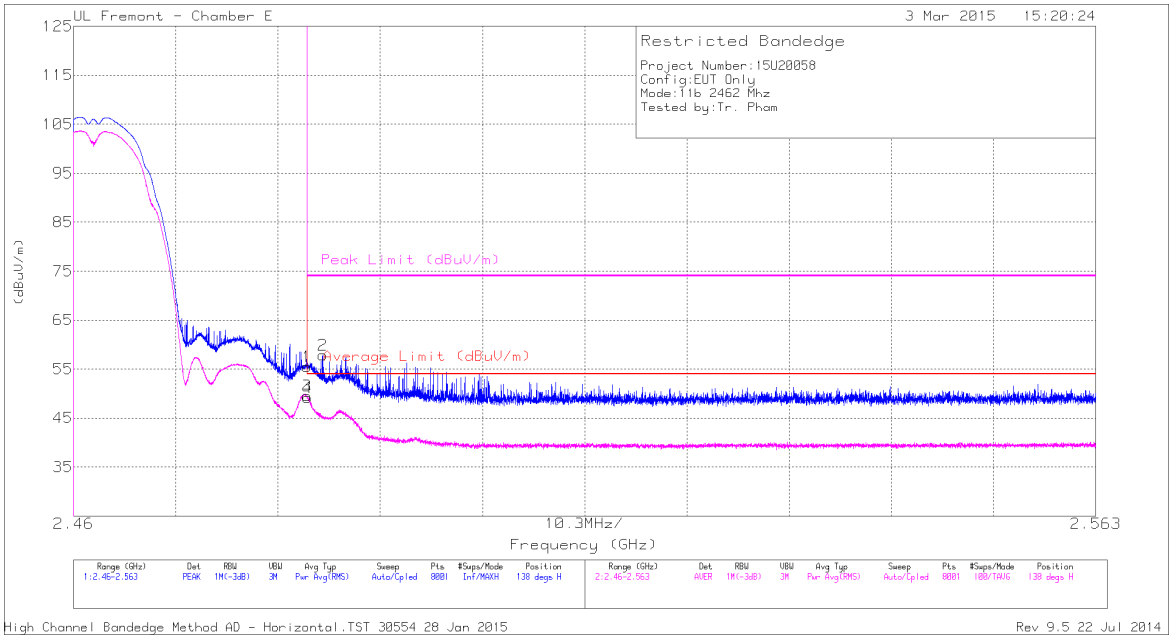
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.387	38.79	RMS	32.1	-24.7	46.19	54	-7.81	-	-	167	351	V
2	* 2.389	50.71	PK	32.1	-24.7	58.11	-	-	74	-15.89	167	351	V
1	* 2.39	46.9	PK	32.1	-24.7	54.3	-	-	74	-19.7	167	351	V
3	* 2.39	38.16	RMS	32.1	-24.7	45.56	54	-8.44	-	-	167	351	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL HORIZONTAL PLOT



DATA

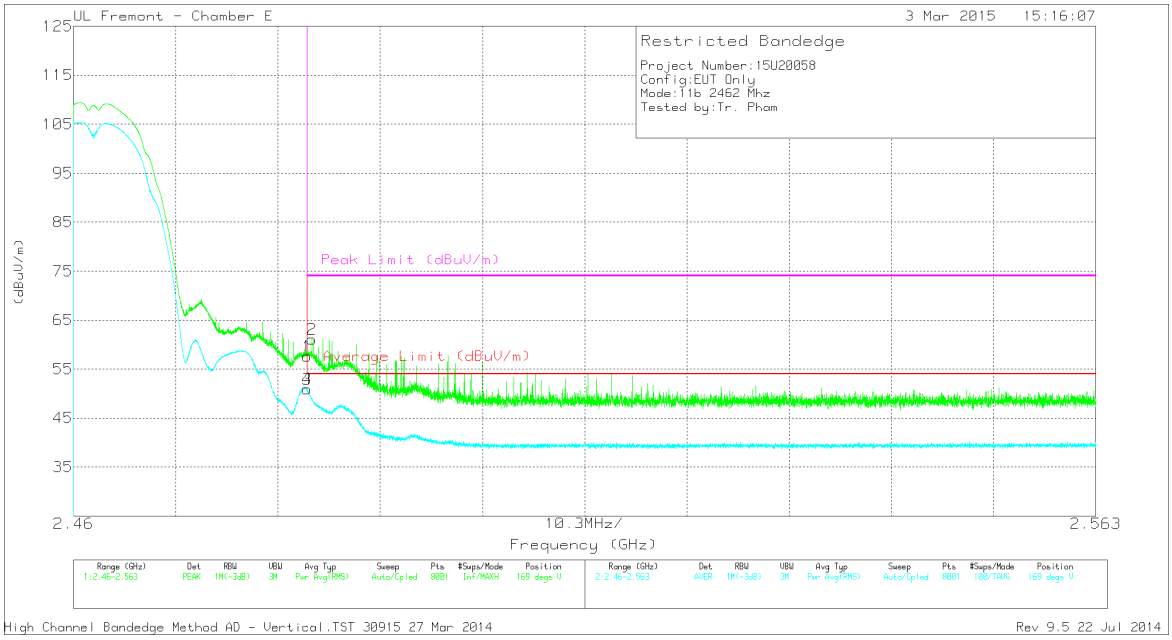
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.62	PK	32.2	-24.3	55.52	-	-	74	-18.48	138	327	H
3	* 2.484	41.68	RMS	32.2	-24.3	49.58	54	-4.42	-	-	138	327	H
4	* 2.484	41.31	RMS	32.2	-24.3	49.21	54	-4.79	-	-	138	327	H
2	* 2.485	49.91	PK	32.2	-24.3	57.81	-	-	74	-16.19	138	327	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL VERTICAL PLOT



DATA

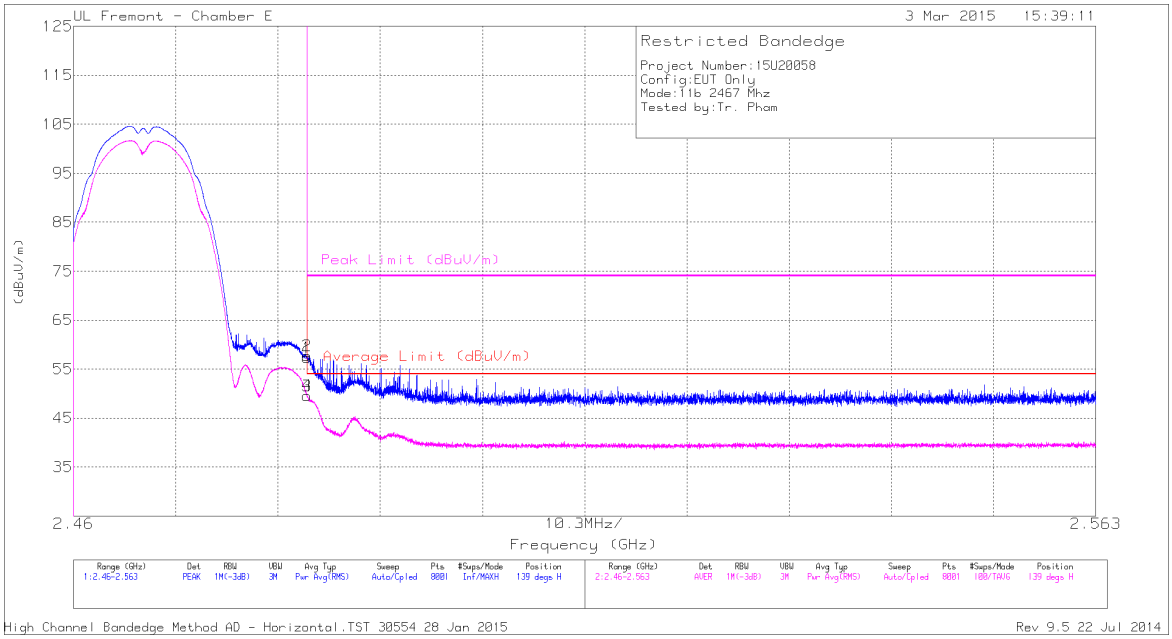
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.69	PK	32.2	-24.3	57.59	-	-	74	-16.41	169	263	V
2	* 2.484	53.25	PK	32.2	-24.3	61.15	-	-	74	-12.85	169	263	V
3	* 2.484	43.03	RMS	32.2	-24.3	50.93	54	-3.07	-	-	169	263	V
4	* 2.484	43.07	RMS	32.2	-24.3	50.97	54	-3.03	-	-	169	263	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

CHANNEL 12 HORIZONTAL PLOT



DATA

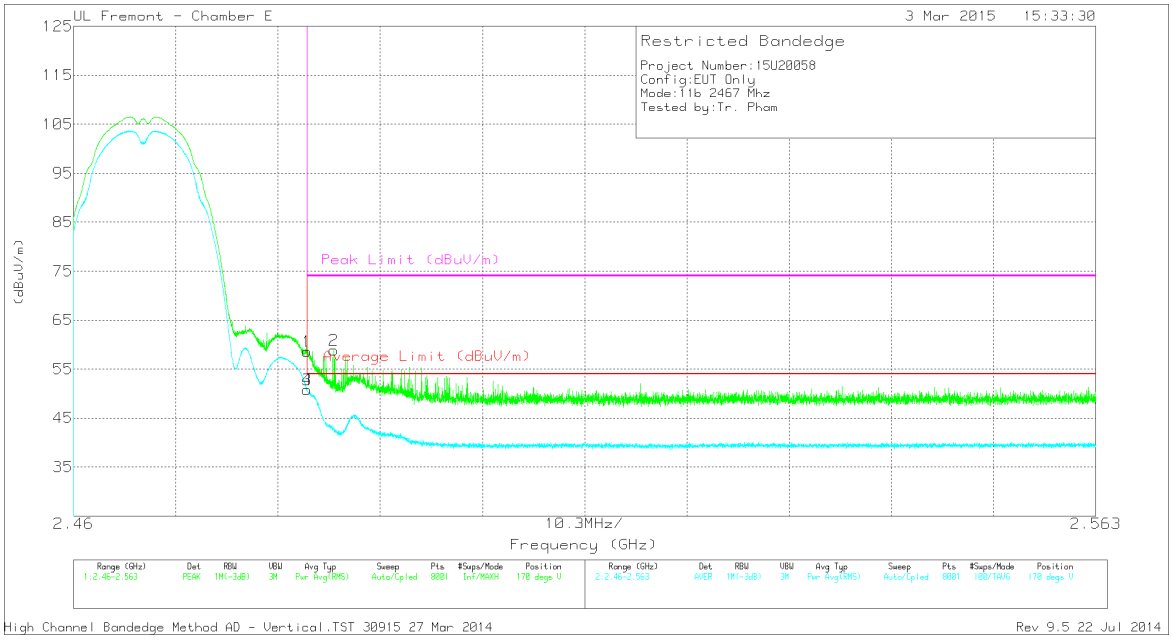
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.43	PK	32.2	-24.3	57.33	-	-	74	-16.67	139	264	H
2	* 2.484	49.82	PK	32.2	-24.3	57.72	-	-	74	-16.28	139	264	H
3	* 2.484	41.6	RMS	32.2	-24.3	49.5	54	-4.5	-	-	139	264	H
4	* 2.484	41.71	RMS	32.2	-24.3	49.61	54	-4.39	-	-	139	264	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

CHANNEL 12 VERTICAL PLOT



DATA

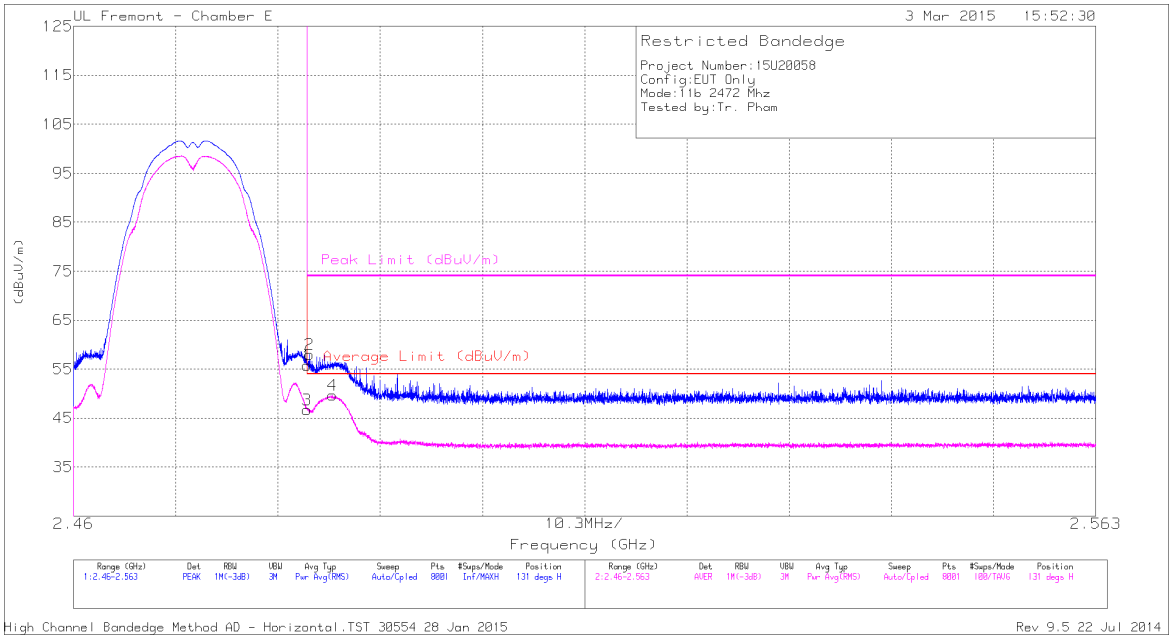
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	50.69	PK	32.2	-24.3	58.59	-	-	74	-15.41	170	331	V
3	* 2.484	42.94	RMS	32.2	-24.3	50.84	54	-3.16	-	-	170	331	V
4	* 2.484	42.87	RMS	32.2	-24.3	50.77	54	-3.23	-	-	170	331	V
2	* 2.486	50.94	PK	32.2	-24.3	58.84	-	-	74	-15.16	170	331	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

CHANNEL 13 HORIZONTAL PLOT



DATA

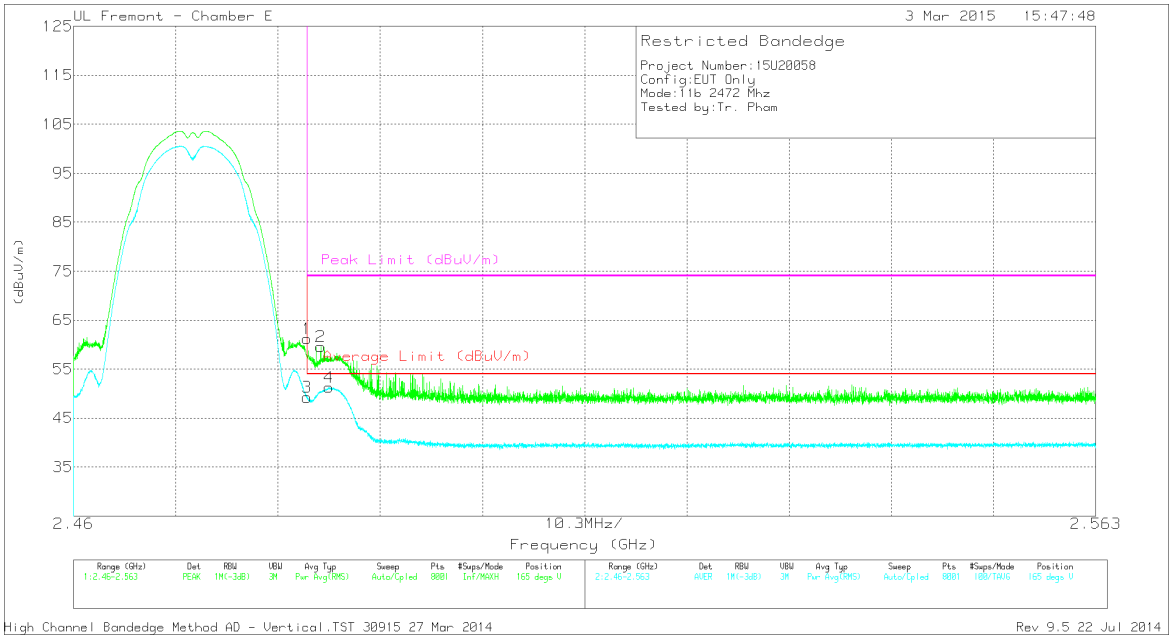
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.81	PK	32.2	-24.3	55.71	-	-	74	-18.29	131	334	H
2	* 2.484	50.06	PK	32.2	-24.3	57.96	-	-	74	-16.04	131	334	H
3	* 2.484	38.8	RMS	32.2	-24.3	46.7	54	-7.3	-	-	131	334	H
4	* 2.486	41.74	RMS	32.2	-24.3	49.64	54	-4.36	-	-	131	334	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

CHANNEL 13 VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	53.28	PK	32.2	-24.3	61.18	-	-	74	-12.82	165	332	V
3	* 2.484	41.34	RMS	32.2	-24.3	49.24	54	-4.76	-	-	165	332	V
2	* 2.485	51.75	PK	32.2	-24.3	59.65	-	-	74	-14.35	165	332	V
4	* 2.486	43.33	RMS	32.2	-24.3	51.23	54	-2.77	-	-	165	332	V

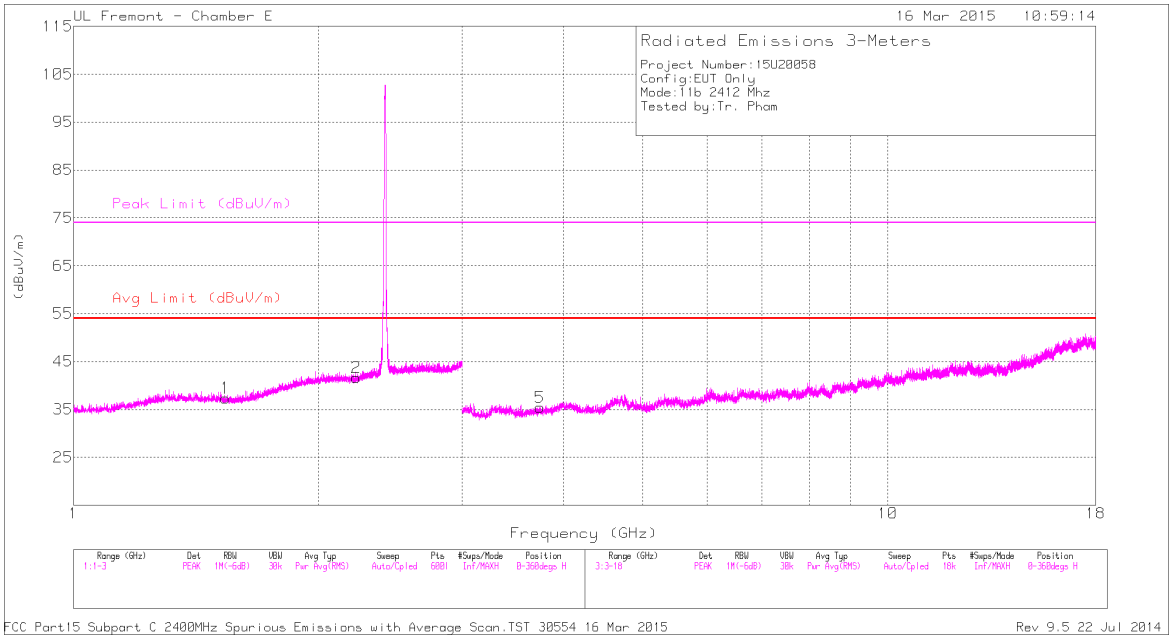
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

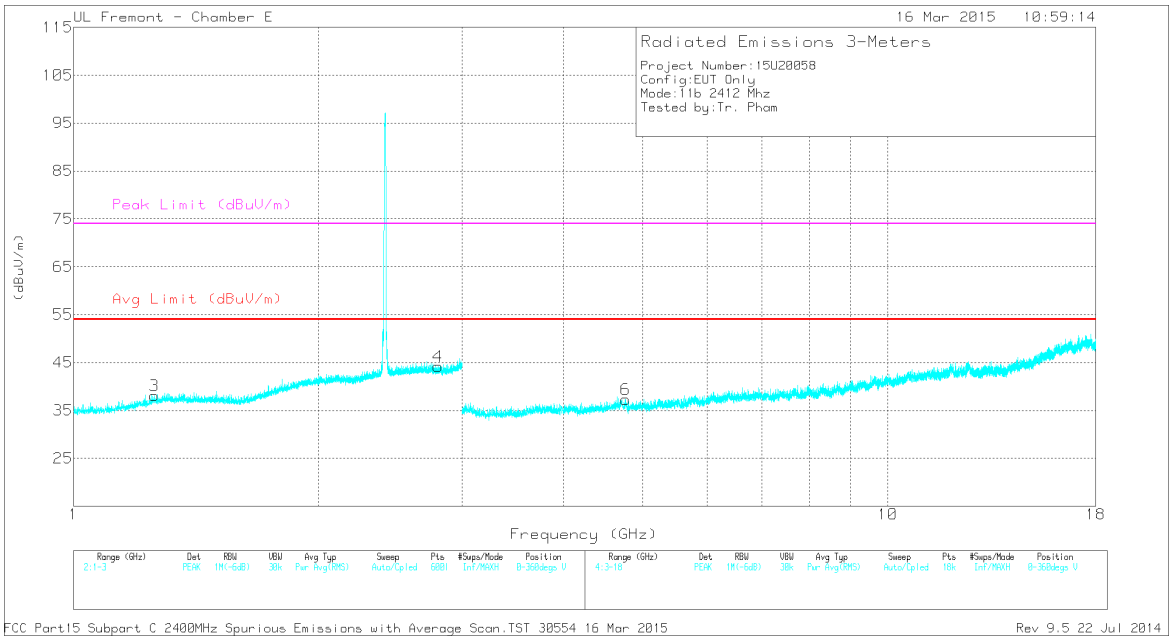
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

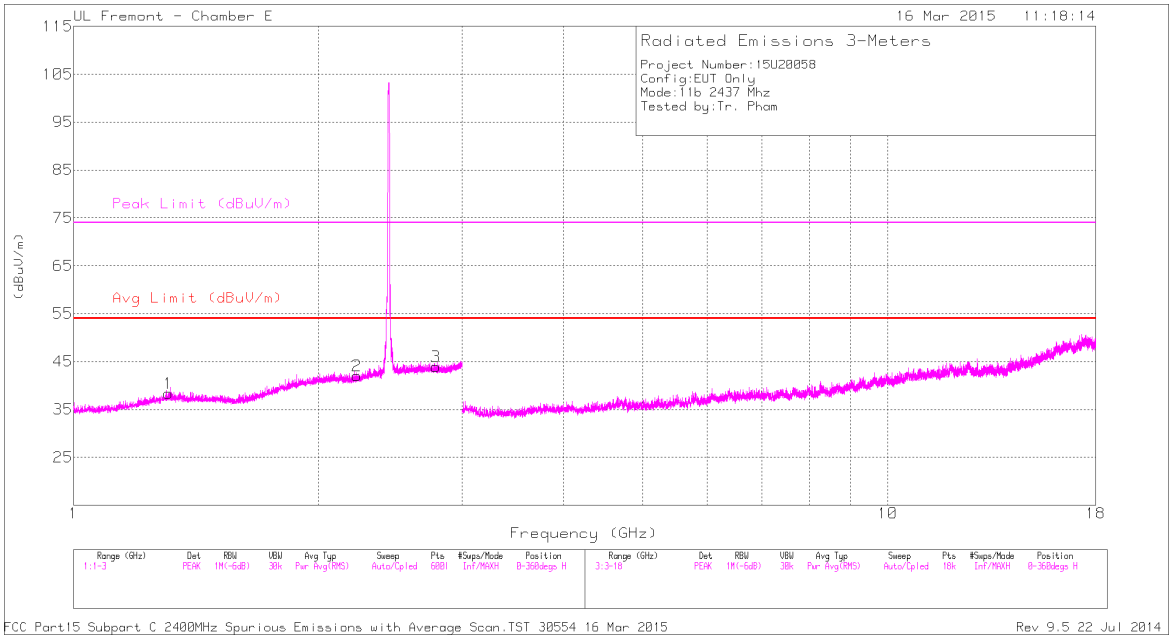
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.536	43.88	PK2	28.1	-26.4	45.58	-	-	74	-28.42	360	101	H
	* 1.536	32.55	MAv1	28.1	-26.4	34.25	54	-19.75	-	-	360	101	H
2	* 2.224	43.66	PK2	31.4	-25.2	49.86	-	-	74	-24.14	360	101	H
	* 2.224	32.47	MAv1	31.4	-25.2	38.67	54	-15.33	-	-	360	101	H
3	* 1.257	44.56	PK2	28.6	-27.2	45.96	-	-	74	-28.04	360	101	V
	* 1.256	32.89	MAv1	28.6	-27.2	34.29	54	-19.71	-	-	360	101	V
4	* 2.803	43.57	PK2	32.4	-24.1	51.87	-	-	74	-22.13	360	101	V
	* 2.802	32.18	MAv1	32.4	-24.1	40.48	54	-13.52	-	-	360	101	V
5	* 3.736	41.98	PK2	33.3	-30.8	44.48	-	-	74	-29.52	360	101	H
	* 3.738	30.51	MAv1	33.3	-30.7	33.11	54	-20.89	-	-	360	101	H
6	* 4.761	43.59	PK2	34.1	-31	46.69	-	-	74	-27.31	360	101	V
	* 4.762	31.66	MAv1	34.1	-31	34.76	54	-19.24	-	-	360	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

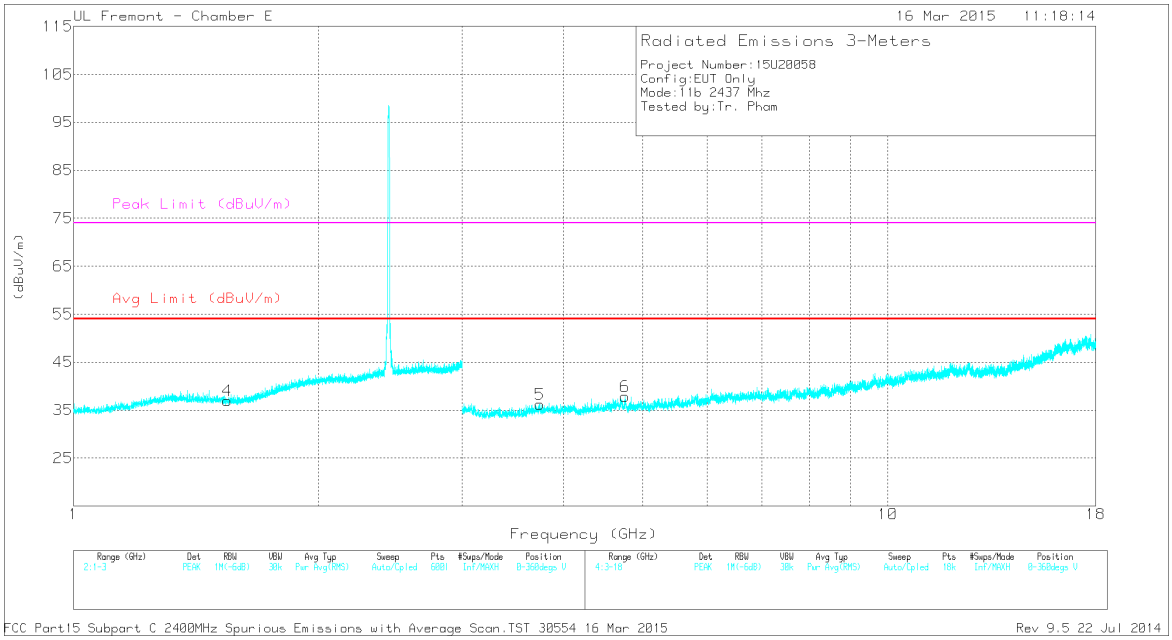
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

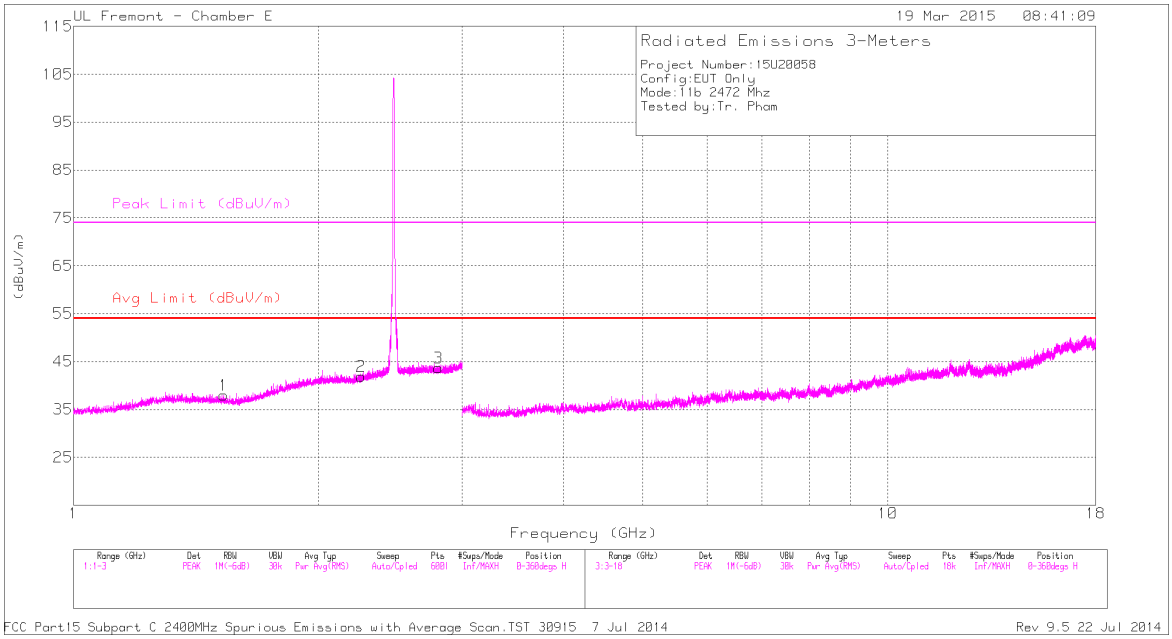
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.308	44.12	PK2	29	-26.9	46.22	-	-	74	-27.78	360	101	H
	* 1.308	32.82	MAv1	29	-26.9	34.92	54	-19.08	-	-	360	101	H
2	* 2.227	44.09	PK2	31.5	-25.2	50.39	-	-	74	-23.61	360	101	H
	* 2.227	32.55	MAv1	31.5	-25.2	38.85	54	-15.15	-	-	360	101	H
3	* 2.785	43.32	PK2	32.4	-24	51.72	-	-	74	-22.28	360	101	H
	* 2.785	32.09	MAv1	32.4	-24	40.49	54	-13.51	-	-	360	101	H
4	* 1.544	44.39	PK2	28.1	-26.3	46.19	-	-	74	-27.81	360	101	V
	* 1.544	32.49	MAv1	28.1	-26.3	34.29	54	-19.71	-	-	360	101	V
5	* 3.74	42.15	PK2	33.3	-30.7	44.75	-	-	74	-29.25	360	101	V
	* 3.741	30.3	MAv1	33.3	-30.7	32.9	54	-21.1	-	-	360	101	V
6	* 4.76	42.26	PK2	34.1	-31	45.36	-	-	74	-28.64	360	101	V
	* 4.76	31.58	MAv1	34.1	-31	34.68	54	-19.32	-	-	360	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

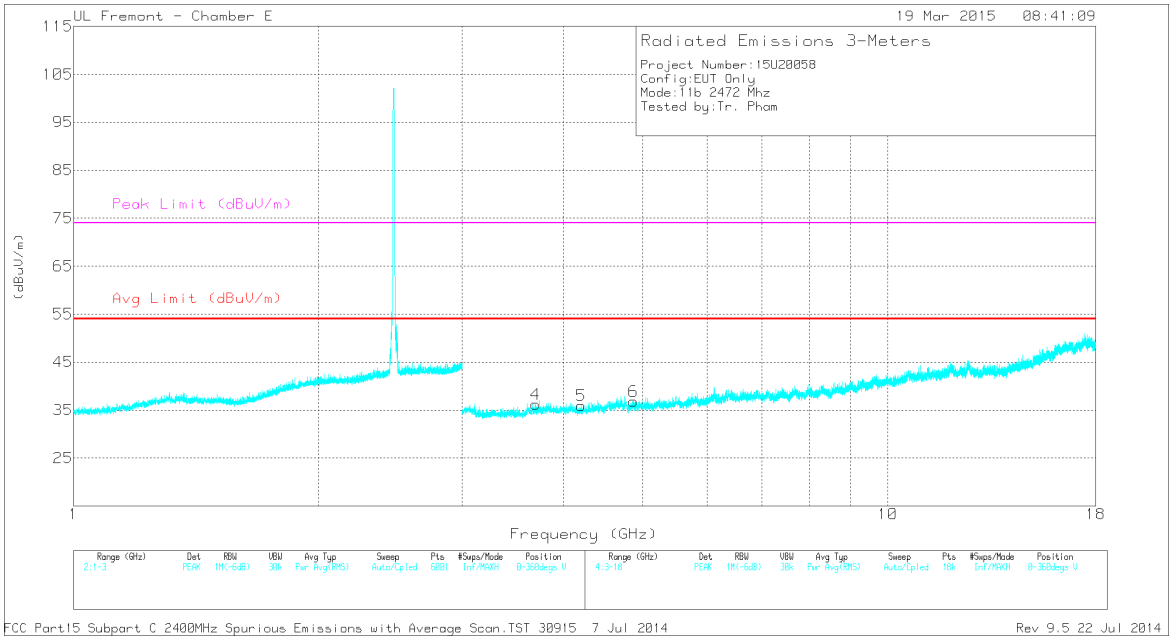
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL 13 HORIZONTAL PLOT



HIGH CHANNEL 13 VERTICAL PLOT



DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/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	* 1.528	44.18	PK2	28.1	-26.4	45.88	-	-	74	-28.12	0	101	H
	* 1.529	32.51	MAv1	28.1	-26.4	34.21	54	-19.79	-	-	0	101	H
2	* 2.252	43.77	PK2	31.6	-25.3	50.07	-	-	74	-23.93	0	101	H
	* 2.253	32.44	MAv1	31.6	-25.3	38.74	54	-15.26	-	-	0	101	H
3	* 2.803	43.95	PK2	32.4	-24.1	52.25	-	-	74	-21.75	0	101	H
	* 2.804	32.18	MAv1	32.4	-24.1	40.48	54	-13.52	-	-	0	101	H
4	* 3.693	41.29	PK2	33.2	-30.7	43.79	-	-	74	-30.21	0	101	V
	* 3.694	30.19	MAv1	33.2	-30.7	32.69	54	-21.31	-	-	0	101	V
5	* 4.204	42.87	PK2	33.5	-31.7	44.67	-	-	74	-29.33	0	101	V
	* 4.205	30.72	MAv1	33.5	-31.6	32.62	54	-21.38	-	-	0	101	V
6	* 4.873	42.05	PK2	34.1	-31	45.15	-	-	74	-28.85	0	101	V
	* 4.875	30.81	MAv1	34.1	-31	33.91	54	-20.09	-	-	0	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

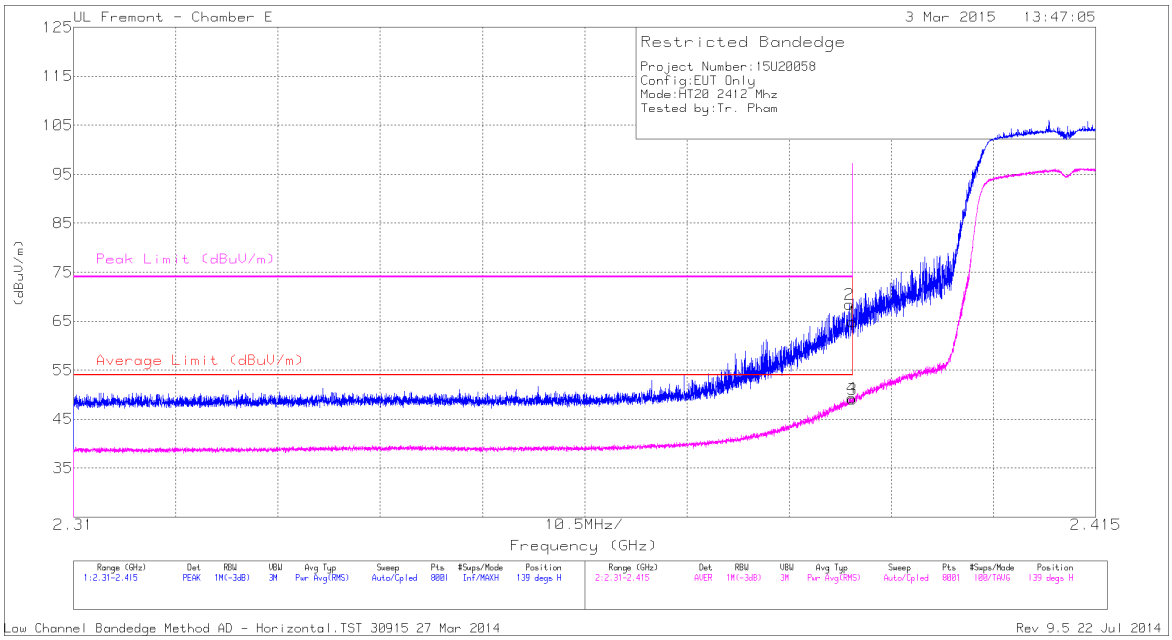
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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

RESTRICTED BANDEDGE

LOW CHANNEL 1 HORIZONTAL PLOT



DATA

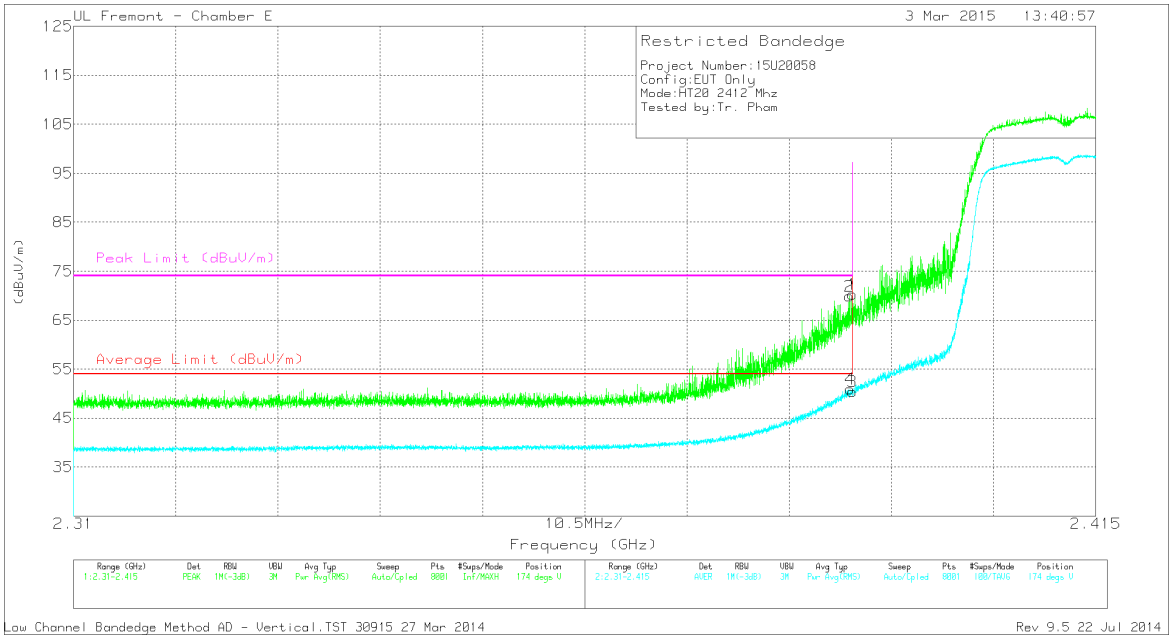
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	57.44	PK	32.1	-24.7	64.84	-	-	74	-9.16	139	361	H
2	* 2.39	60.99	PK	32.1	-24.7	68.39	-	-	74	-5.61	139	361	H
3	* 2.39	41.68	RMS	32.1	-24.7	49.08	54	-4.92	-	-	139	361	H
4	* 2.39	41.94	RMS	32.1	-24.7	49.34	54	-4.66	-	-	139	361	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

LOW CHANNEL 1 VERTICAL PLOT



DATA

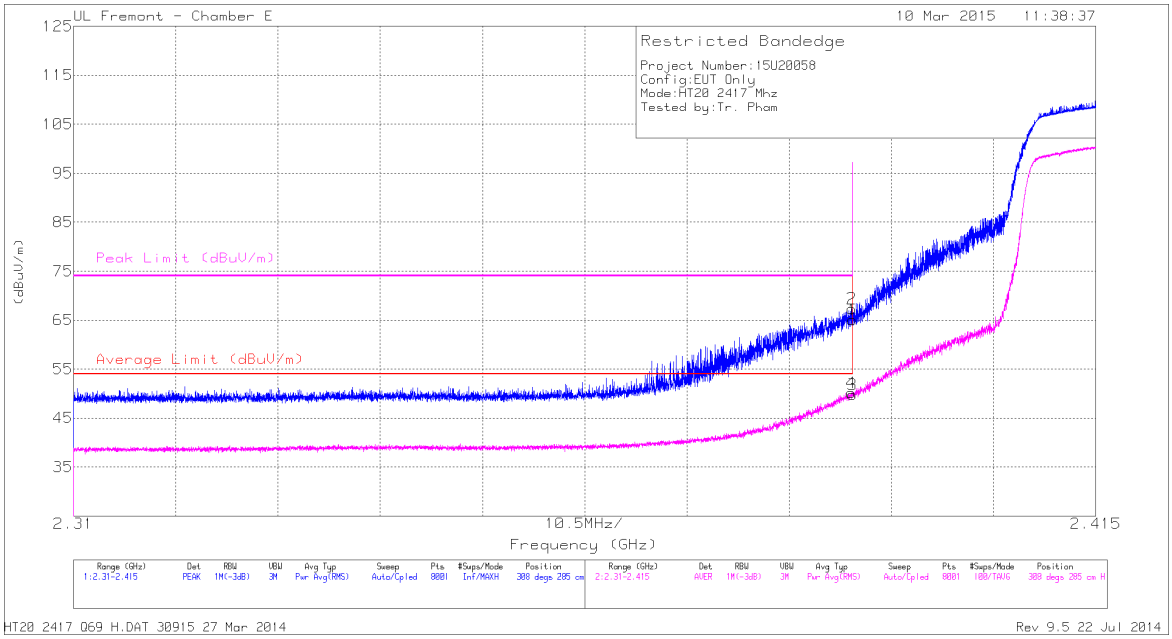
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	62.88	PK	32.1	-24.7	70.28	-	-	74	-3.72	174	345	V
2	* 2.39	62.5	PK	32.1	-24.7	69.9	-	-	74	-4.1	174	345	V
3	* 2.39	43.03	RMS	32.1	-24.7	50.43	54	-3.57	-	-	174	345	V
4	* 2.39	43.57	RMS	32.1	-24.7	50.97	54	-3.03	-	-	174	345	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

LOW CHANNEL 2 HORIZONTAL PLOT



DATA

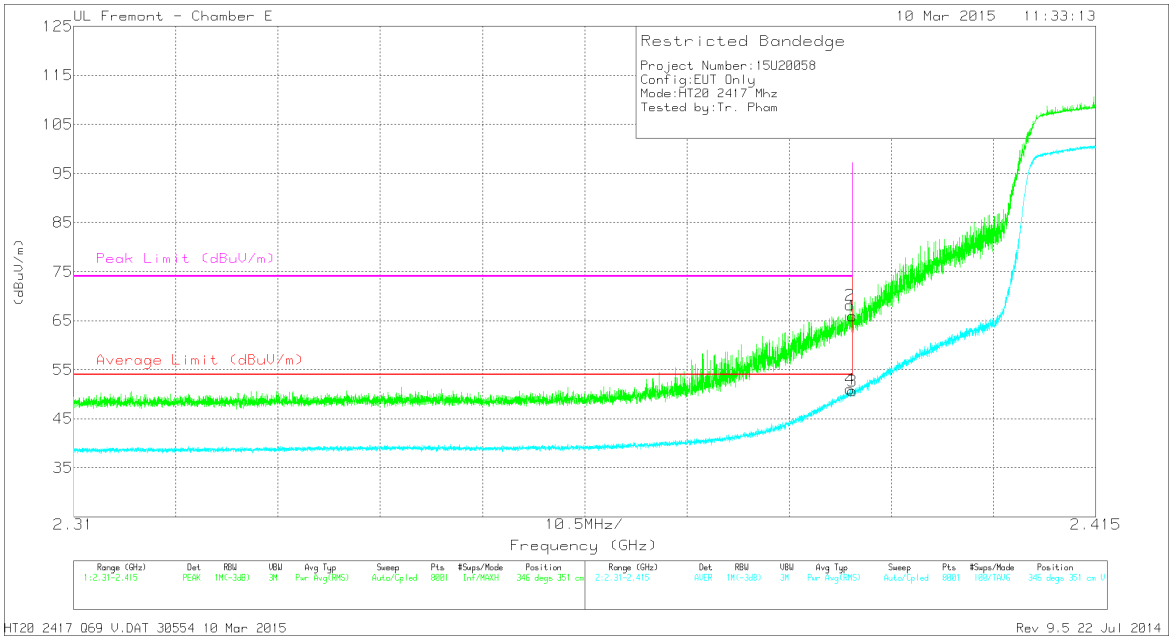
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	57.63	PK	32.1	-24.7	65.03	-	-	74	-8.97	308	285	H
2	* 2.39	59.96	PK	32.1	-24.7	67.36	-	-	74	-6.64	308	285	H
3	* 2.39	42.36	RMS	32.1	-24.7	49.76	54	-4.24	-	-	308	285	H
4	* 2.39	42.78	RMS	32.1	-24.7	50.18	54	-3.82	-	-	308	285	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

LOW CHANNEL 2 VERTICAL PLOT



DATA

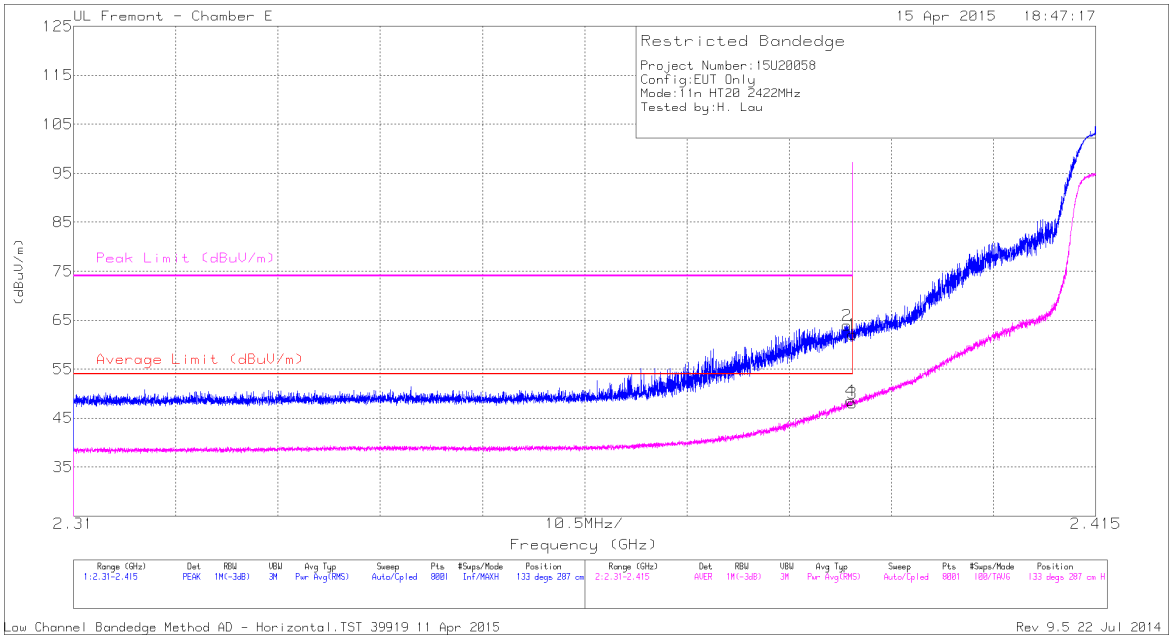
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	58.52	PK	32.1	-24.7	65.92	-	-	74	-8.08	346	351	V
2	* 2.39	60.79	PK	32.1	-24.7	68.19	-	-	74	-5.81	346	351	V
3	* 2.39	43.25	RMS	32.1	-24.7	50.65	54	-3.35	-	-	346	351	V
4	* 2.39	43.61	RMS	32.1	-24.7	51.01	54	-2.99	-	-	346	351	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

LOW CHANNEL 3 HORIZONTAL PLOT



DATA

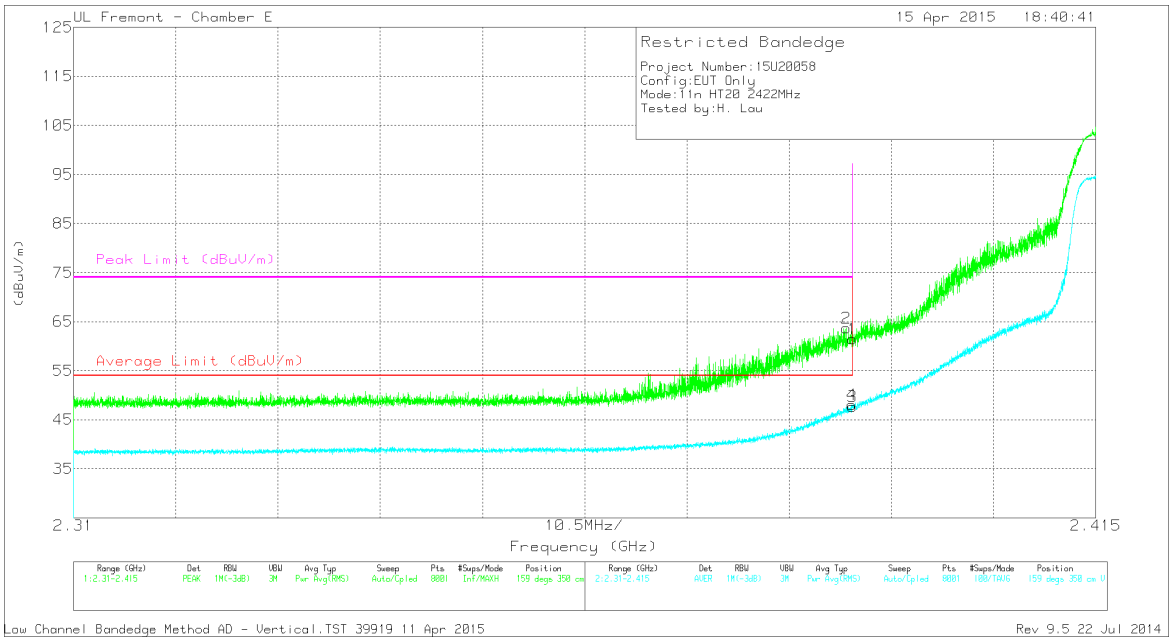
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	54.66	PK	32.1	-24.7	62.06	-	-	74	-11.94	133	287	H
2	* 2.389	56.5	PK	32.1	-24.7	63.9	-	-	74	-10.1	133	287	H
3	* 2.39	40.62	RMS	32.1	-24.7	48.02	54	-5.98	-	-	133	287	H
4	* 2.39	41.2	RMS	32.1	-24.7	48.6	54	-5.4	-	-	133	287	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

LOW CHANNEL 3 VERTICAL PLOT



DATA

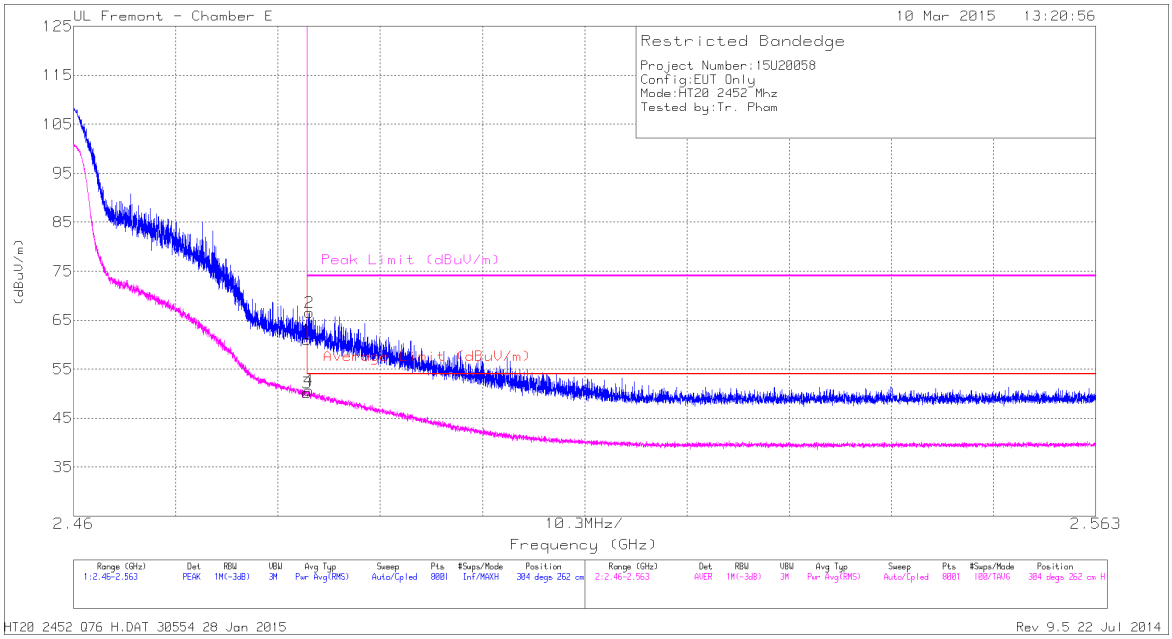
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	54.06	PK	32.1	-24.7	61.46	-	-	74	-12.54	159	350	V
2	* 2.389	56.3	PK	32.1	-24.7	63.7	-	-	74	-10.3	159	350	V
3	* 2.39	40.24	RMS	32.1	-24.7	47.64	54	-6.36	-	-	159	350	V
4	* 2.39	40.64	RMS	32.1	-24.7	48.04	54	-5.96	-	-	159	350	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 9 HORIZONTAL PLOT



DATA

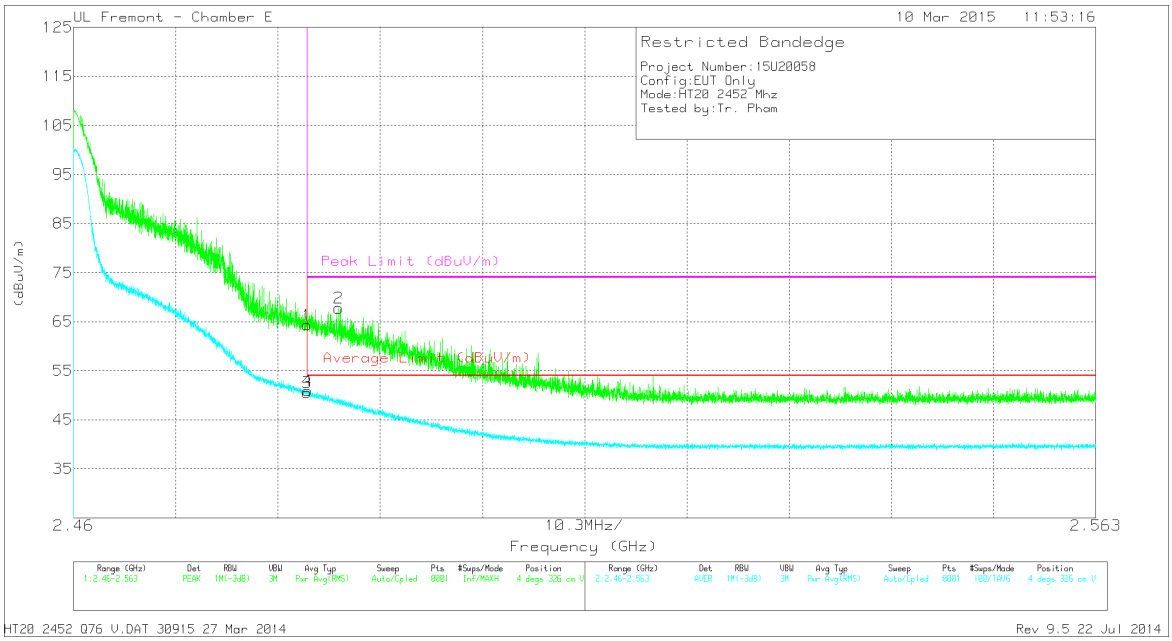
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	53.11	PK	32.2	-24.3	61.01	-	-	74	-12.99	304	262	H
2	* 2.484	58.66	PK	32.2	-24.3	66.56	-	-	74	-7.44	304	262	H
3	* 2.484	42.28	RMS	32.2	-24.3	50.18	54	-3.82	-	-	304	262	H
4	* 2.484	42.72	RMS	32.2	-24.3	50.62	54	-3.38	-	-	304	262	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 9 VERTICAL PLOT



DATA

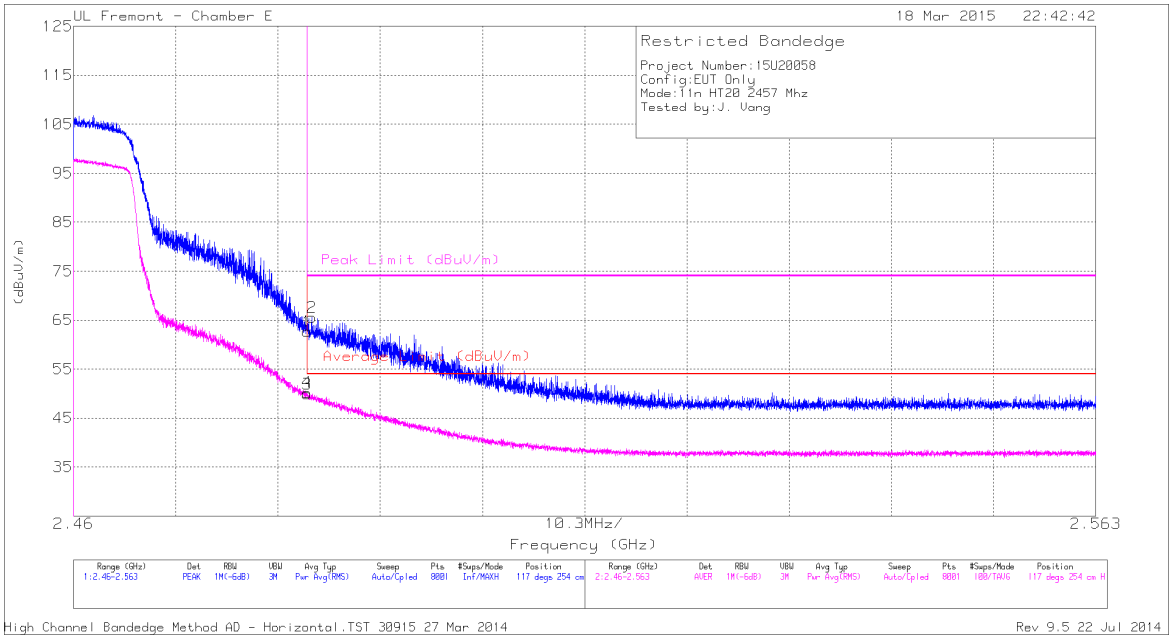
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	56.47	PK	32.2	-24.3	64.37	-	-	74	-9.63	4	326	V
2	* 2.487	59.84	PK	32.2	-24.3	67.74	-	-	74	-6.26	4	326	V
3	* 2.484	42.69	RMS	32.2	-24.3	50.59	54	-3.41	-	-	4	326	V
4	* 2.484	43.02	RMS	32.2	-24.3	50.92	54	-3.08	-	-	4	326	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 10 HORIZONTAL PLOT



DATA

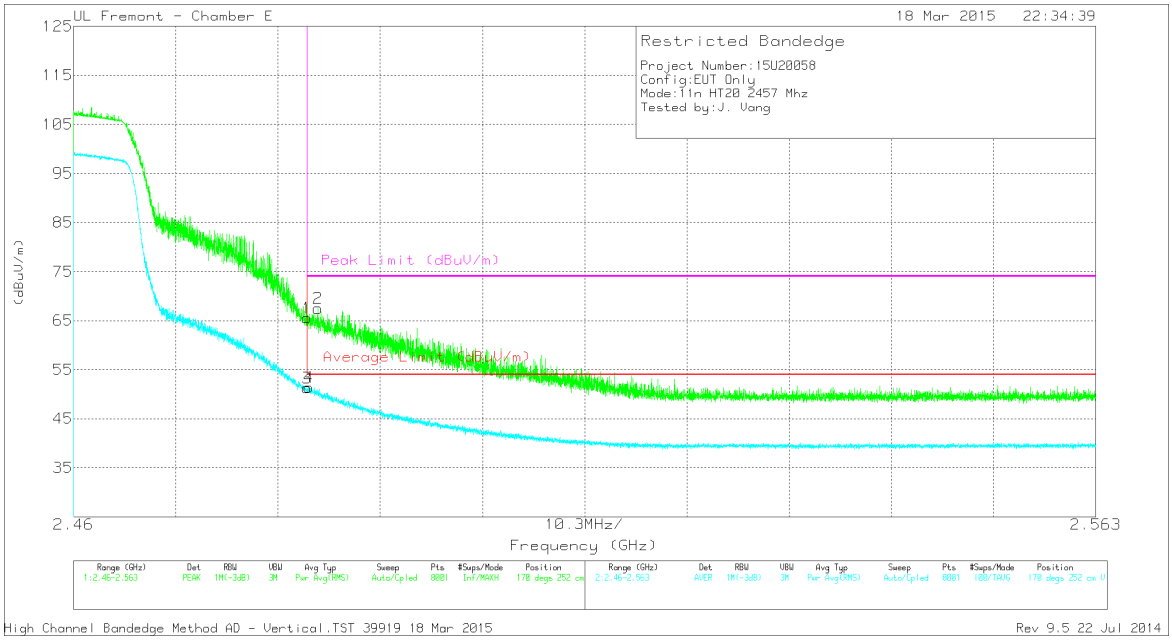
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.76	PK	32.2	-24.3	62.66	-	-	74	-11.34	117	254	H
2	* 2.484	57.67	PK	32.2	-24.3	65.57	-	-	74	-8.43	117	254	H
3	* 2.484	42	RMS	32.2	-24.3	49.9	54	-4.1	-	-	117	254	H
4	* 2.484	42.33	RMS	32.2	-24.3	50.23	54	-3.77	-	-	117	254	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 10 VERTICAL PLOT



DATA

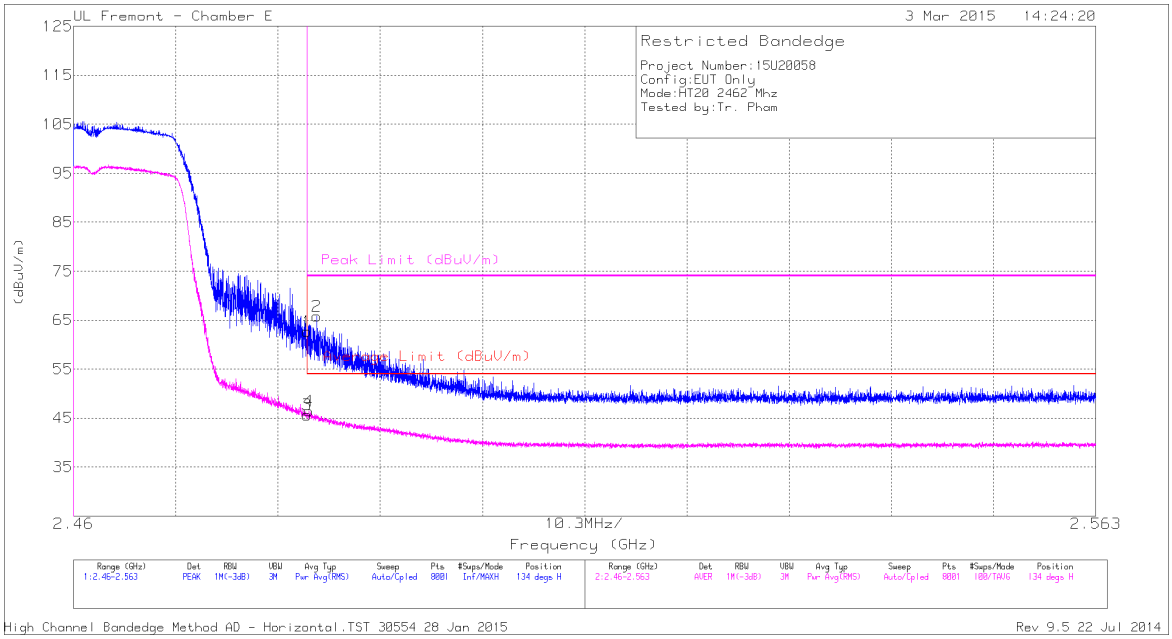
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	57.68	PK	32.2	-24.3	65.58	-	-	74	-8.42	170	252	V
3	* 2.484	43.43	RMS	32.2	-24.3	51.33	54	-2.67	-	-	170	252	V
4	* 2.484	43.48	RMS	32.2	-24.3	51.38	54	-2.62	-	-	170	252	V
2	* 2.485	59.59	PK	32.2	-24.3	67.49	-	-	74	-6.51	170	252	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 11 HORIZONTAL PLOT



DATA

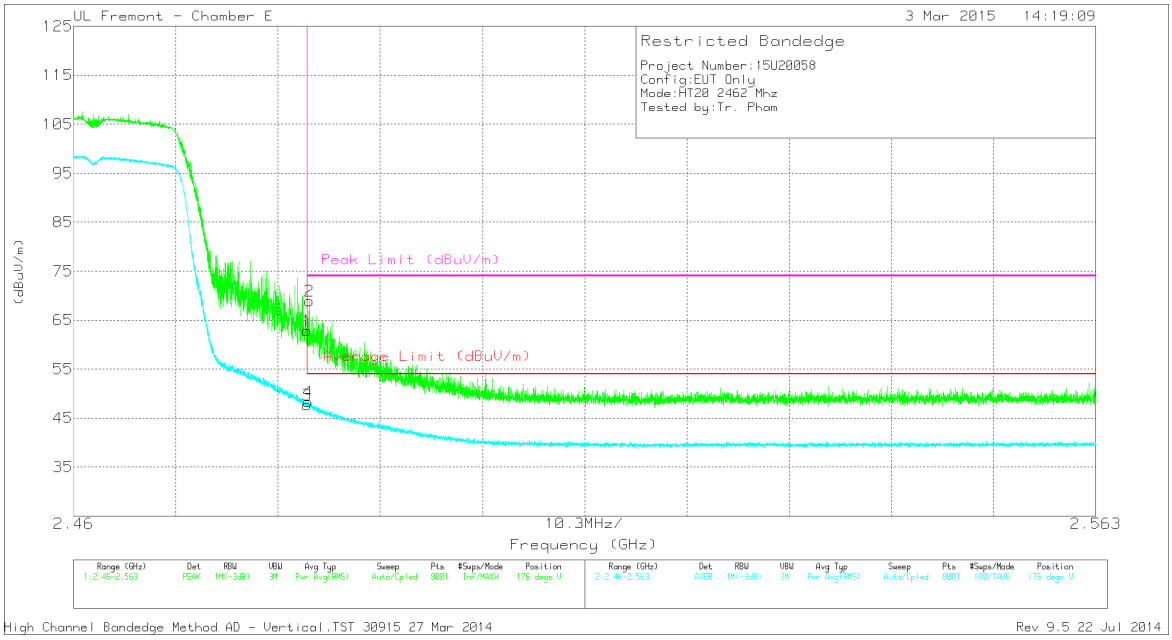
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.82	PK	32.2	-24.3	62.72	-	-	74	-11.28	134	268	H
2	* 2.484	57.94	PK	32.2	-24.3	65.84	-	-	74	-8.16	134	268	H
3	* 2.484	37.74	RMS	32.2	-24.3	45.64	54	-8.36	-	-	134	268	H
4	* 2.484	38.51	RMS	32.2	-24.3	46.41	54	-7.59	-	-	134	268	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 11 VERTICAL PLOT



DATA

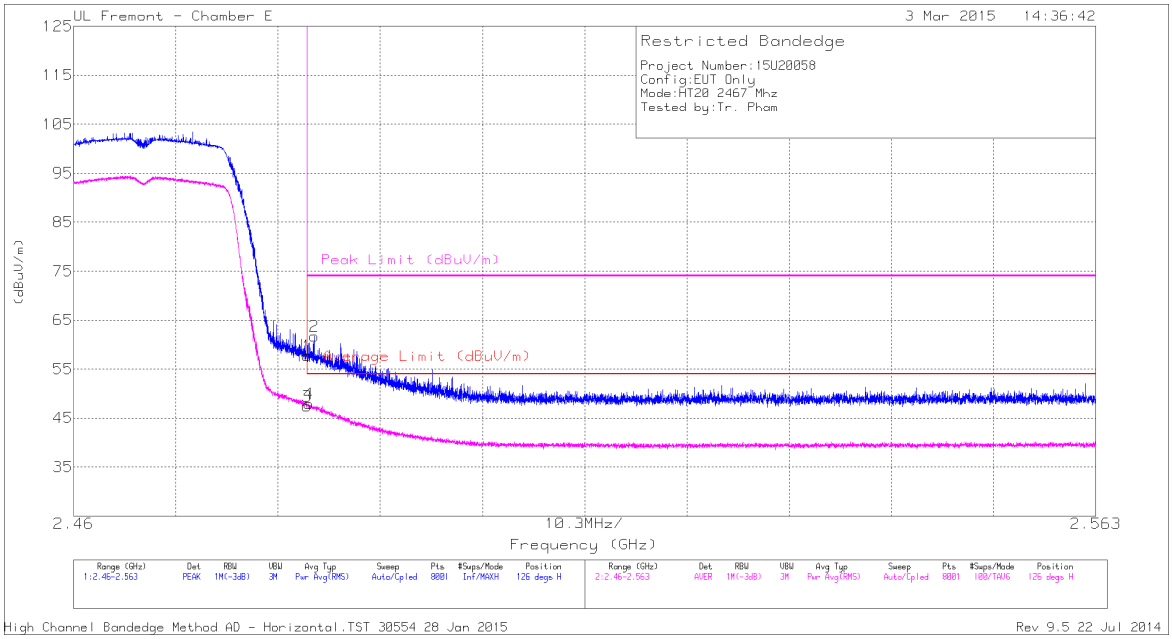
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.91	PK	32.2	-24.3	62.81	-	-	74	-11.19	176	331	V
2	* 2.484	61.02	PK	32.2	-24.3	68.92	-	-	74	-5.08	176	331	V
3	* 2.484	39.8	RMS	32.2	-24.3	47.7	54	-6.3	-	-	176	331	V
4	* 2.484	40.42	RMS	32.2	-24.3	48.32	54	-5.68	-	-	176	331	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 12 HORIZONTAL PLOT



DATA

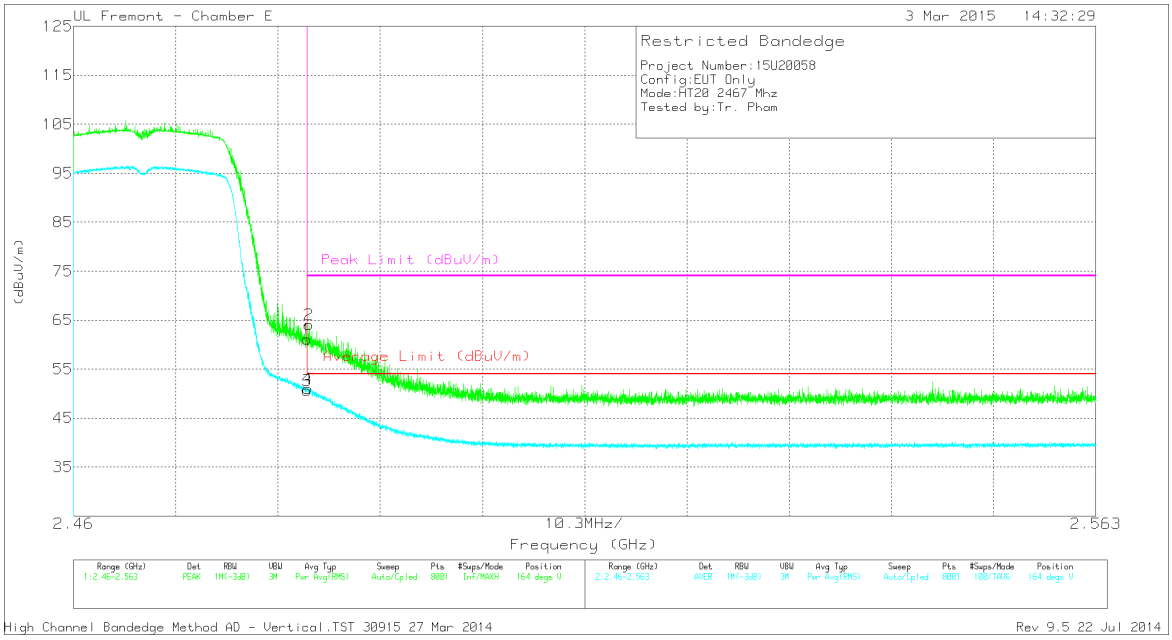
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.89	PK	32.2	-24.3	57.79	-	-	74	-16.21	126	137	H
2	* 2.484	53.83	PK	32.2	-24.3	61.73	-	-	74	-12.27	126	137	H
3	* 2.484	39.5	RMS	32.2	-24.3	47.4	54	-6.6	-	-	126	137	H
4	* 2.484	39.98	RMS	32.2	-24.3	47.88	54	-6.12	-	-	126	137	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 12 VERTICAL PLOT



DATA

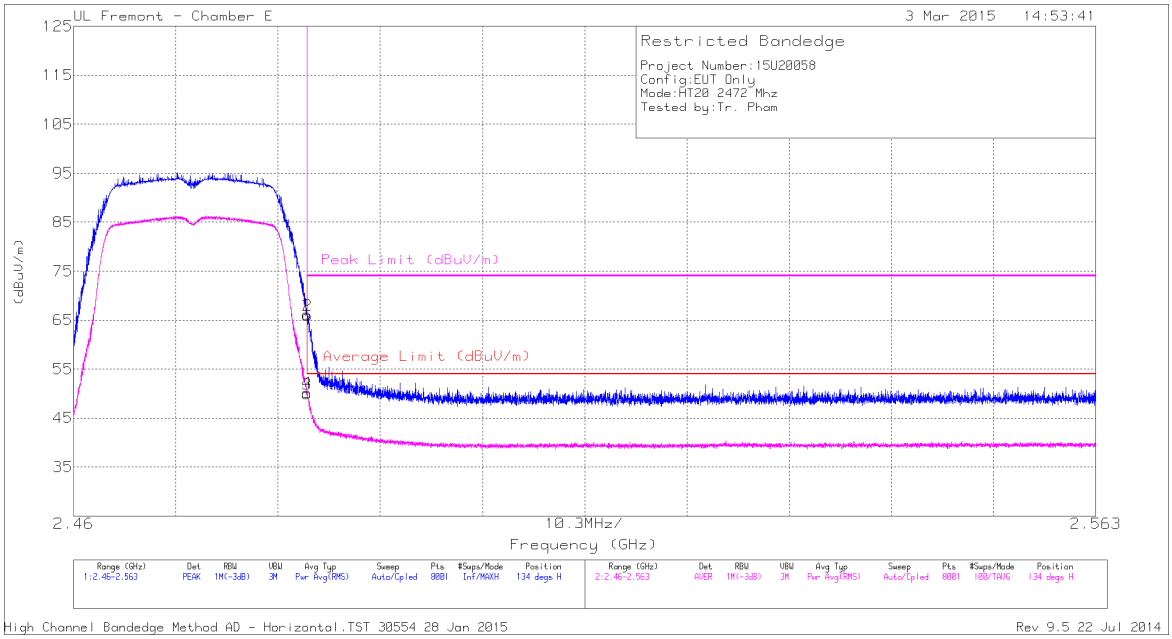
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	53.17	PK	32.2	-24.3	61.07	-	-	74	-12.93	164	331	V
2	* 2.484	56.17	PK	32.2	-24.3	64.07	-	-	74	-9.93	164	331	V
3	* 2.484	42.75	RMS	32.2	-24.3	50.65	54	-3.35	-	-	164	331	V
4	* 2.484	43.19	RMS	32.2	-24.3	51.09	54	-2.91	-	-	164	331	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 13 HORIZONTAL PLOT



DATA

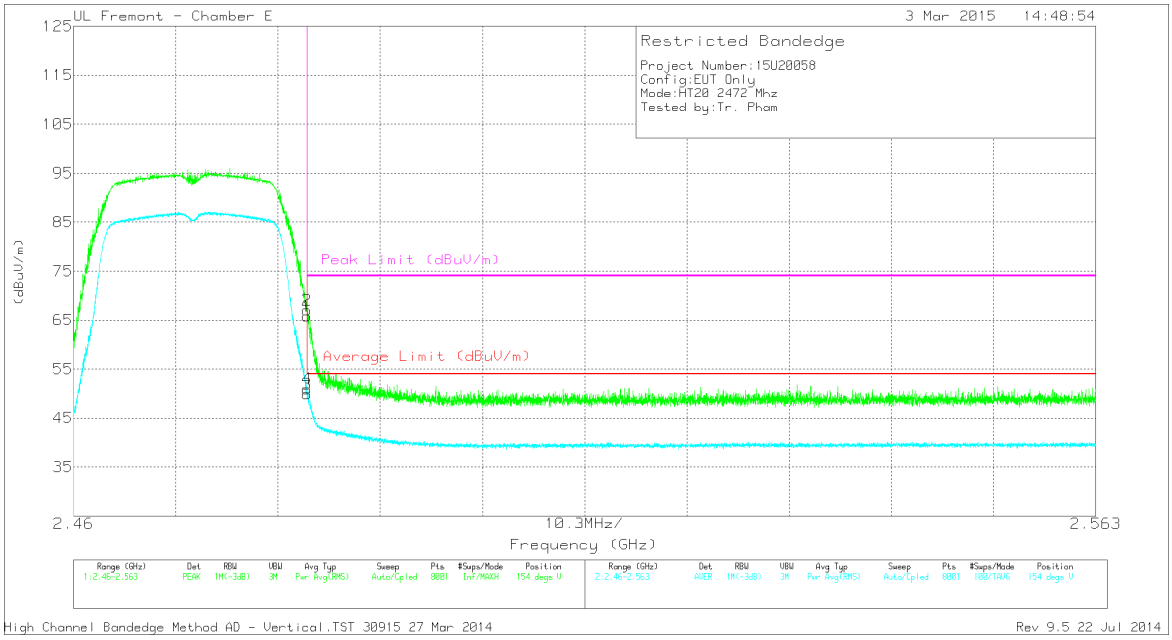
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	58.3	PK	32.2	-24.3	66.2	-	-	74	-7.8	134	334	H
2	* 2.484	58.02	PK	32.2	-24.3	65.92	-	-	74	-8.08	134	334	H
3	* 2.484	42.05	RMS	32.2	-24.3	49.95	54	-4.05	-	-	134	334	H
4	* 2.484	42.29	RMS	32.2	-24.3	50.19	54	-3.81	-	-	134	334	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL 13 VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	57.88	PK	32.2	-24.3	65.78	-	-	74	-8.22	154	333	V
2	* 2.484	59.13	PK	32.2	-24.3	67.03	-	-	74	-6.97	154	333	V
3	* 2.484	42.01	RMS	32.2	-24.3	49.91	54	-4.09	-	-	154	333	V
4	* 2.484	43.07	RMS	32.2	-24.3	50.97	54	-3.03	-	-	154	333	V

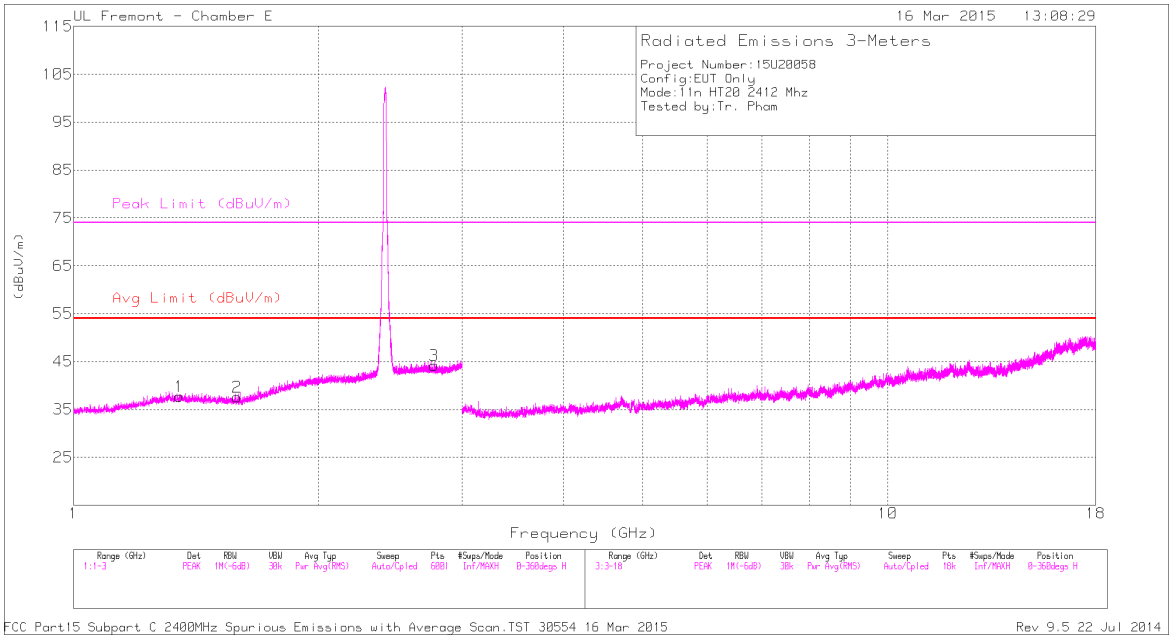
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

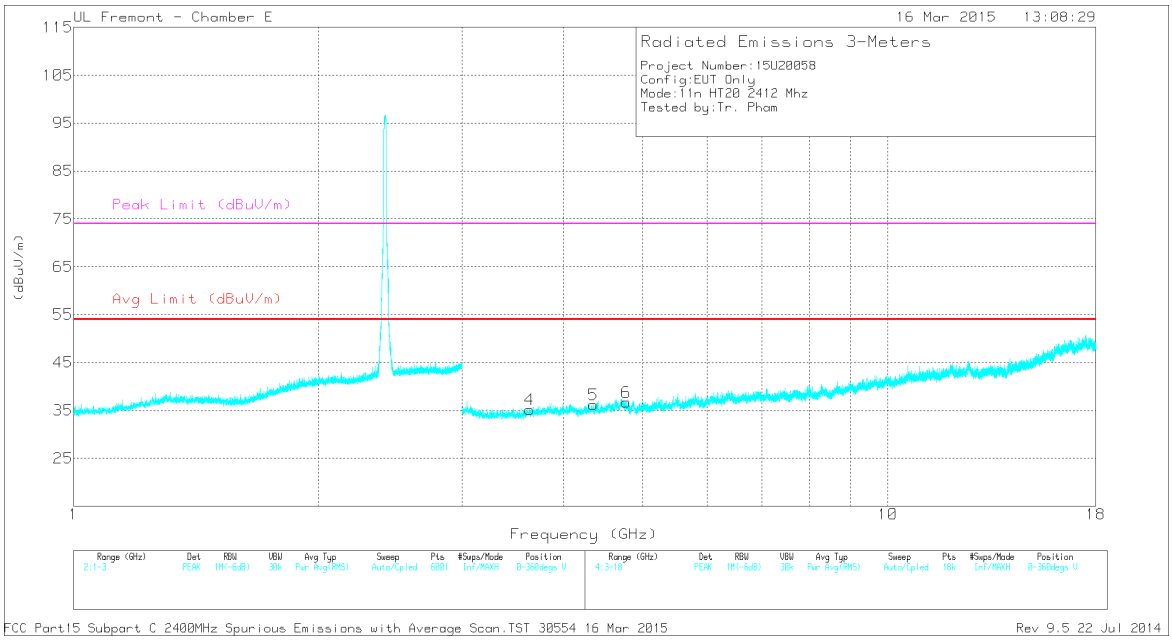
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

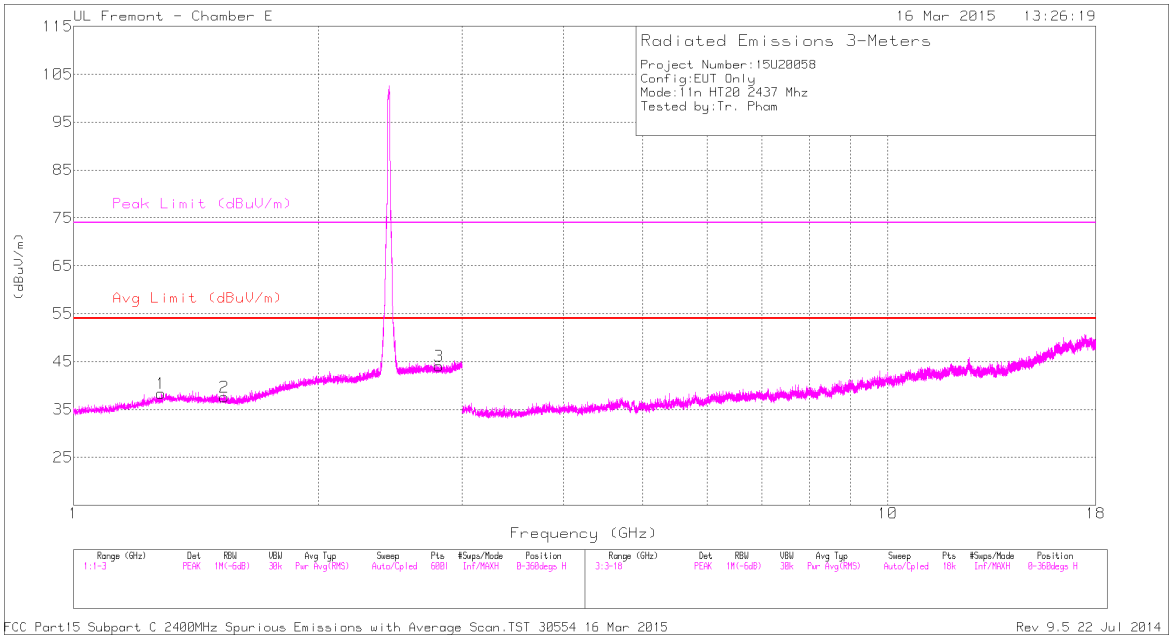
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.35	43.52	PK2	28.8	-26.6	45.72	-	-	74	-28.28	360	101	H
	* 1.349	32.51	MAv1	28.8	-26.6	34.71	54	-19.29	-	-	360	101	H
2	* 1.589	43.74	PK2	28	-26.4	45.34	-	-	74	-28.66	360	101	H
	* 1.588	32.55	MAv1	28	-26.4	34.15	54	-19.85	-	-	360	101	H
3	* 2.772	43.65	PK2	32.4	-23.9	52.15	-	-	74	-21.85	360	101	H
	* 2.773	32	MAv1	32.4	-23.9	40.5	54	-13.5	-	-	360	101	H
4	* 3.627	42.27	PK2	33.1	-31.7	43.67	-	-	74	-30.33	360	101	V
	* 3.628	31.1	MAv1	33.1	-31.7	32.5	54	-21.5	-	-	360	101	V
5	* 4.348	40.82	PK2	33.6	-30.5	43.92	-	-	74	-30.08	360	101	V
	* 4.348	29.85	MAv1	33.6	-30.5	32.95	54	-21.05	-	-	360	101	V
6	* 4.771	42.47	PK2	34.1	-31.1	45.47	-	-	74	-28.53	360	101	V
	* 4.772	31.48	MAv1	34.1	-31.1	34.48	54	-19.52	-	-	360	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

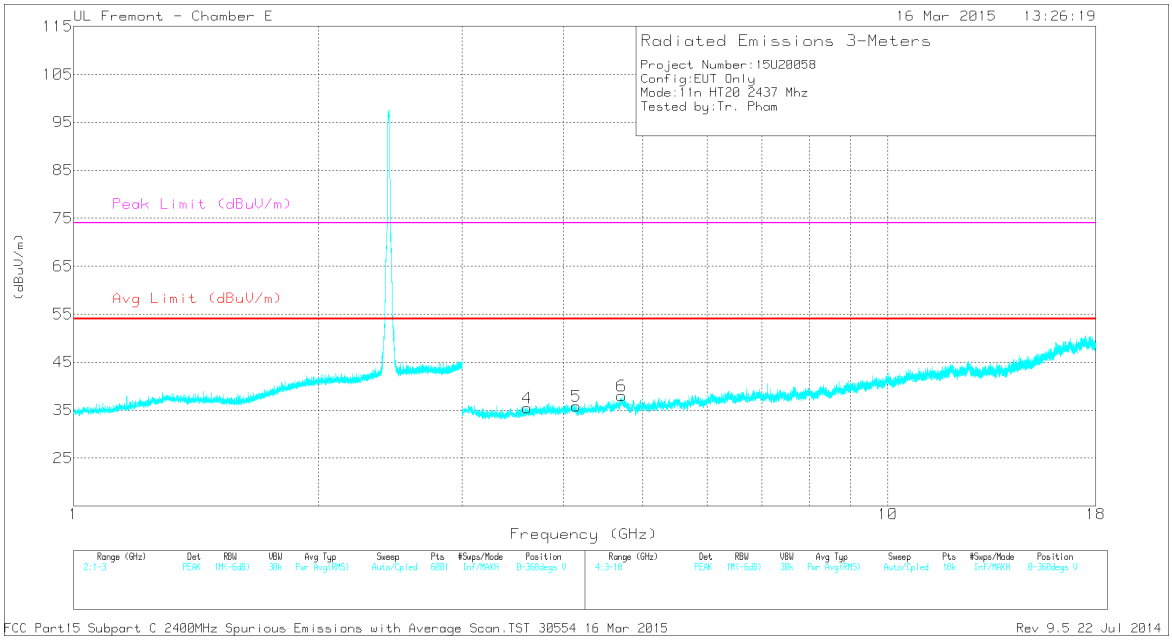
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

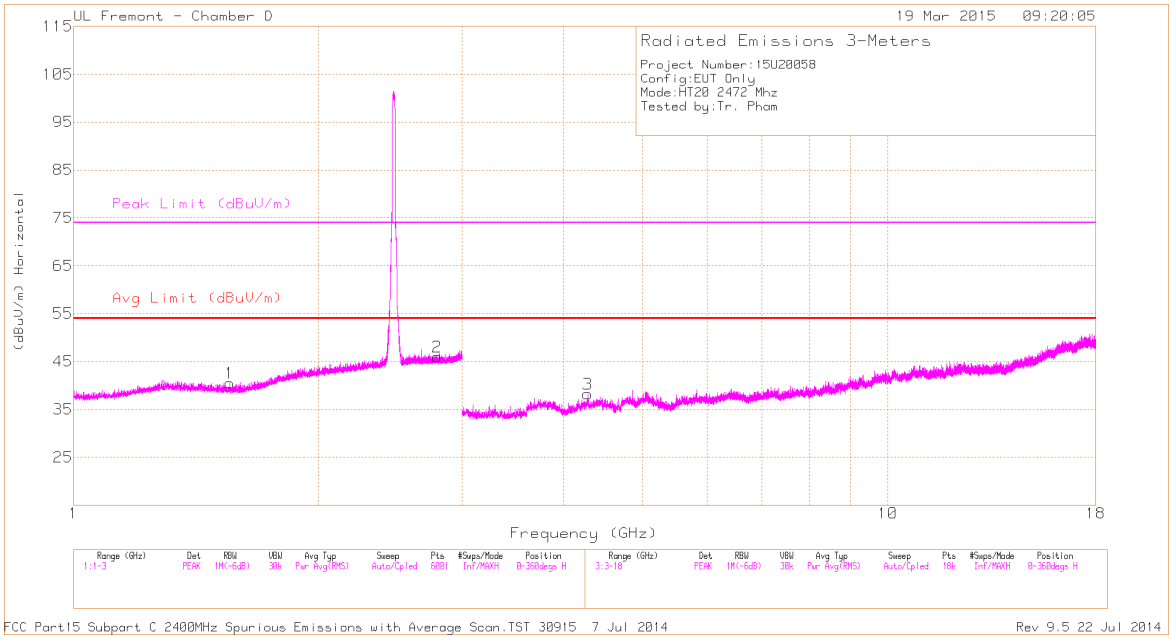
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.281	44.36	PK2	28.8	-27.1	46.06	-	-	74	-27.94	360	101	H
	* 1.282	32.63	MAv1	28.8	-27.1	34.33	54	-19.67	-	-	360	101	H
2	* 1.532	43.69	PK2	28.1	-26.4	45.39	-	-	74	-28.61	360	101	H
	* 1.532	32.44	MAv1	28.1	-26.4	34.14	54	-19.86	-	-	360	101	H
3	* 2.811	43.64	PK2	32.4	-24.1	51.94	-	-	74	-22.06	360	101	H
	* 2.811	32.11	MAv1	32.4	-24.1	40.41	54	-13.59	-	-	360	101	H
4	* 3.609	42.52	PK2	33.1	-31.7	43.92	-	-	74	-30.08	360	101	V
	* 3.609	31.13	MAv1	33.1	-31.7	32.53	54	-21.47	-	-	360	101	V
5	* 4.146	41.45	PK2	33.4	-31.2	43.65	-	-	74	-30.35	360	101	V
	* 4.145	30.49	MAv1	33.4	-31.2	32.69	54	-21.31	-	-	360	101	V
6	* 4.711	43.15	PK2	34.2	-30.6	46.75	-	-	74	-27.25	360	101	V
	* 4.711	31.2	MAv1	34.2	-30.6	34.8	54	-19.2	-	-	360	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

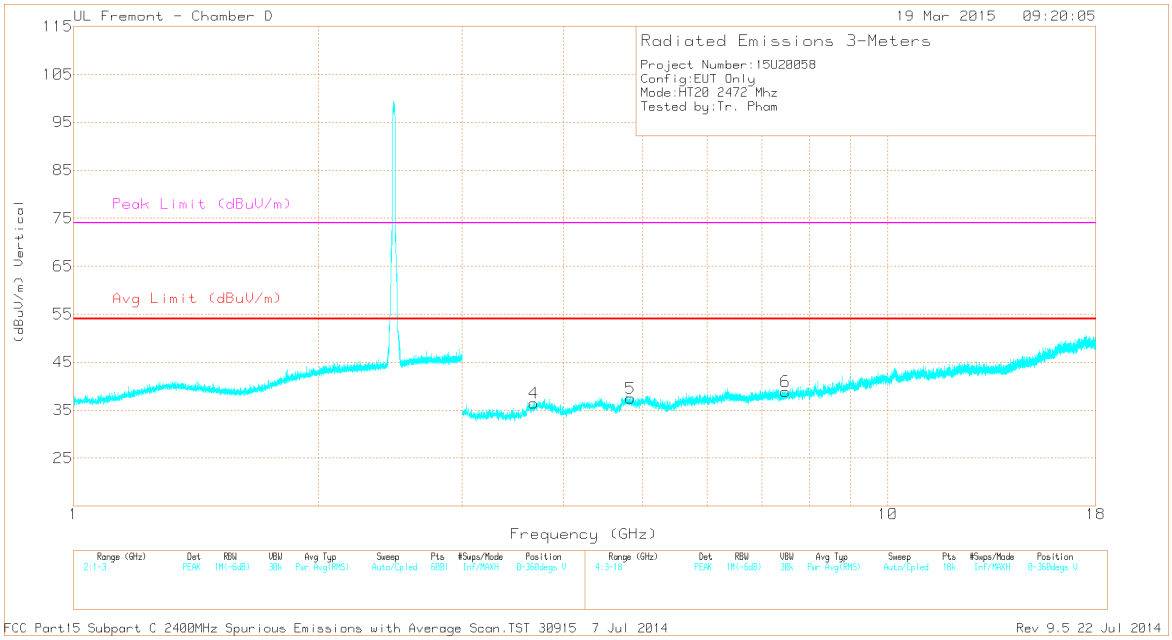
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL 13 HORIZONTAL PLOT



HIGH CHANNEL 13 VERTICAL PLOT



DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/ Fltr/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	* 1.555	41.65	PK2	28.1	-21.9	47.85	-	-	74	-26.15	360	100	H
	* 1.554	30.21	MAv1	28.1	-21.9	36.41	54	-17.59	-	-	360	100	H
2	* 2.797	41.9	PK2	32.5	-20.3	54.1	-	-	74	-19.9	360	100	H
	* 2.797	30.15	MAv1	32.5	-20.3	42.35	54	-11.65	-	-	360	100	H
3	* 4.278	38.56	PK2	33.6	-28.1	44.06	-	-	74	-29.94	360	100	H
	* 4.278	27.3	MAv1	33.6	-28.1	32.8	54	-21.2	-	-	360	100	H
4	* 3.671	39.73	PK2	33.1	-29.1	43.73	-	-	74	-30.27	360	100	V
	* 3.673	28.06	MAv1	33.2	-29.1	32.16	54	-21.84	-	-	360	100	V
5	* 4.832	38.05	PK2	34.1	-27.6	44.55	-	-	74	-29.45	360	100	V
	* 4.831	27.22	MAv1	34.1	-27.6	33.72	54	-20.28	-	-	360	100	V
6	* 7.482	36.16	PK2	35.5	-24.9	46.76	-	-	74	-27.24	360	100	V
	* 7.483	24.89	MAv1	35.5	-24.9	35.49	54	-18.51	-	-	360	100	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

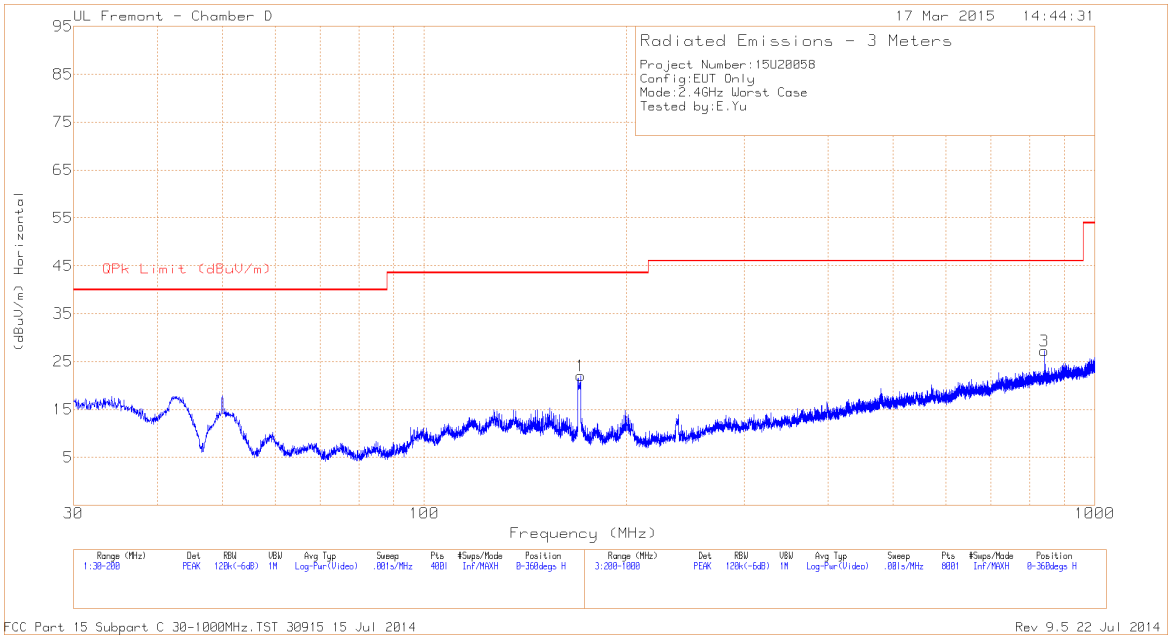
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

9.4. WORST-CASE BELOW 1 GHz

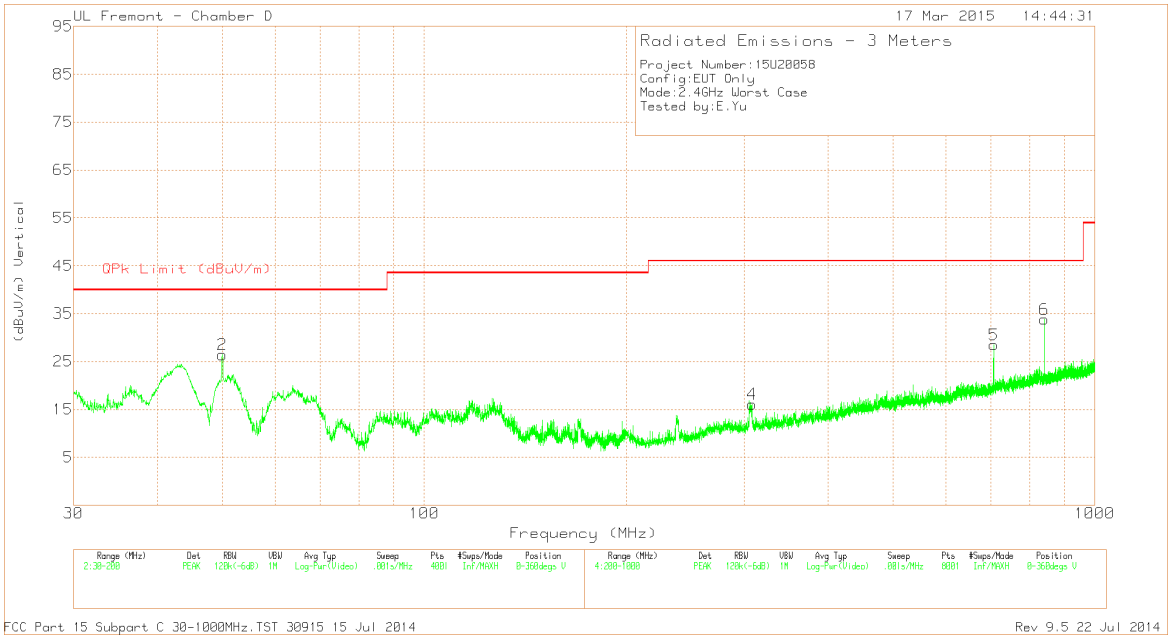
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T407 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 171.0575	41.49	PK	11.5	-31	21.99	43.52	-21.53	0-360	98	H
2	49.975	50.03	PK	8.1	-31.7	26.43	40	-13.57	0-360	100	V
4	308	33.04	PK	13.4	-30.3	16.14	46.02	-29.88	0-360	301	V
5	706.4	37.87	PK	20	-29.3	28.57	46.02	-17.45	0-360	100	V
3	840.9	34.53	PK	21.4	-28.7	27.23	46.02	-18.79	0-360	99	H
6	840.9	41.16	PK	21.4	-28.7	33.86	46.02	-12.16	0-360	100	V

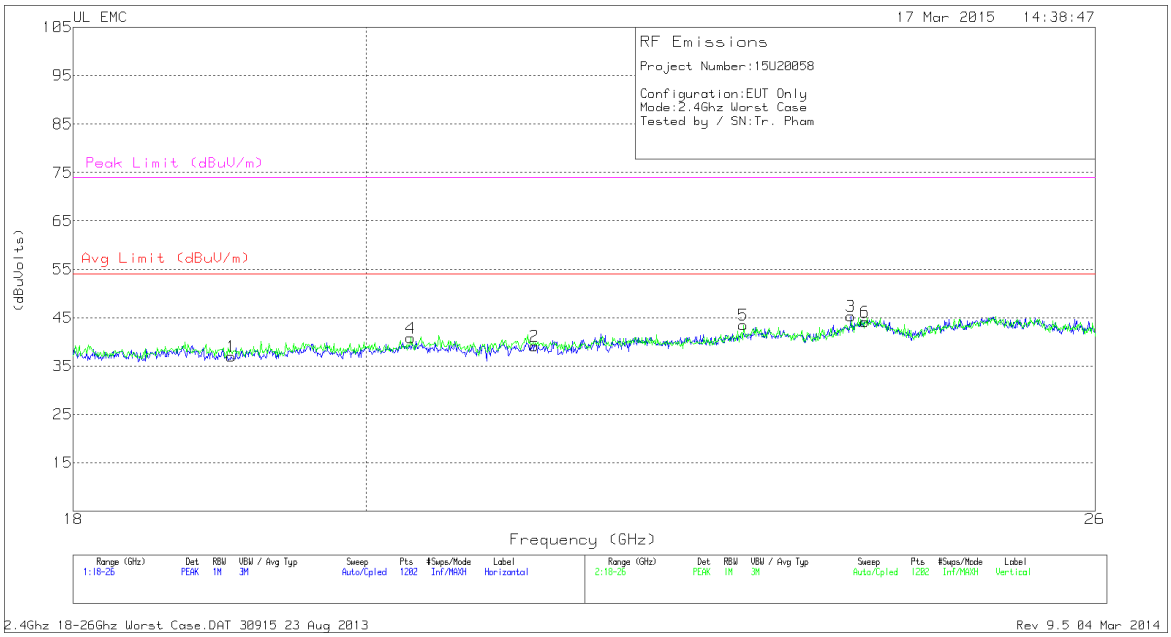
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

9.5. WORST-CASE ABOVE 18 GHz

SPURIOUS EMISSIONS 18000 TO 26000 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL & VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (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	19.052	37.8	PK	32.9	-24.2	-9.5	37	54	-17	74	-37
2	21.251	39.07	PK	33.3	-23.7	-9.5	39.1	54	-14.83	74	-34.8
3	23.815	43.03	PK	34.2	-22.4	-9.5	45.3	54	-8.66	74	-28.6
4	20.325	41.43	PK	32.9	-24	-9.5	40.8	54	-13.16	74	-33.1
5	22.909	42.6	PK	33.9	-23.5	-9.5	43.5	54	-10.5	74	-30.5
6	23.935	42.27	PK	34.2	-22.8	-9.5	44.1	54	-9.83	74	-29.8

PK - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of emission (MHz)	Conducted limit (dBµV)	
	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

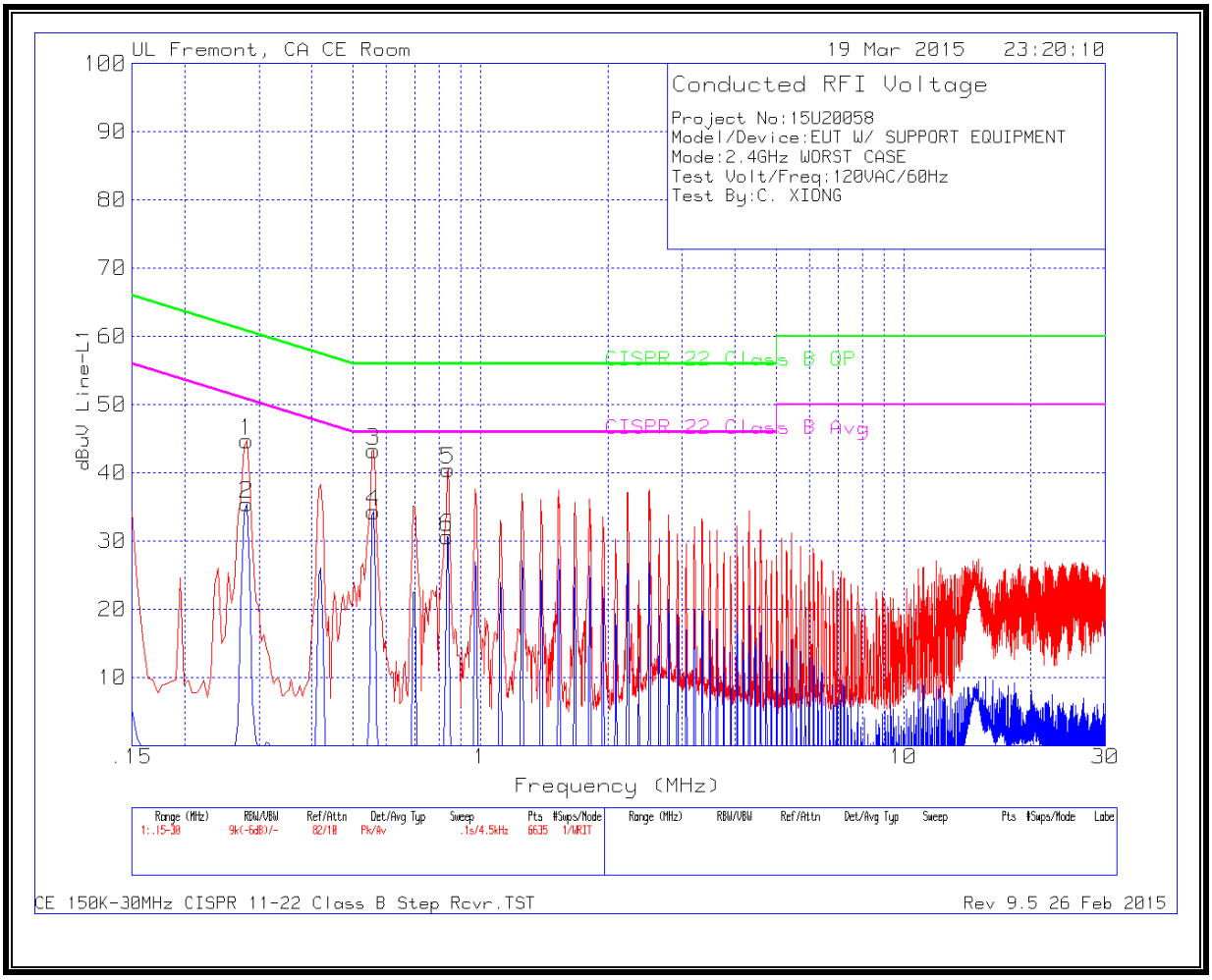
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

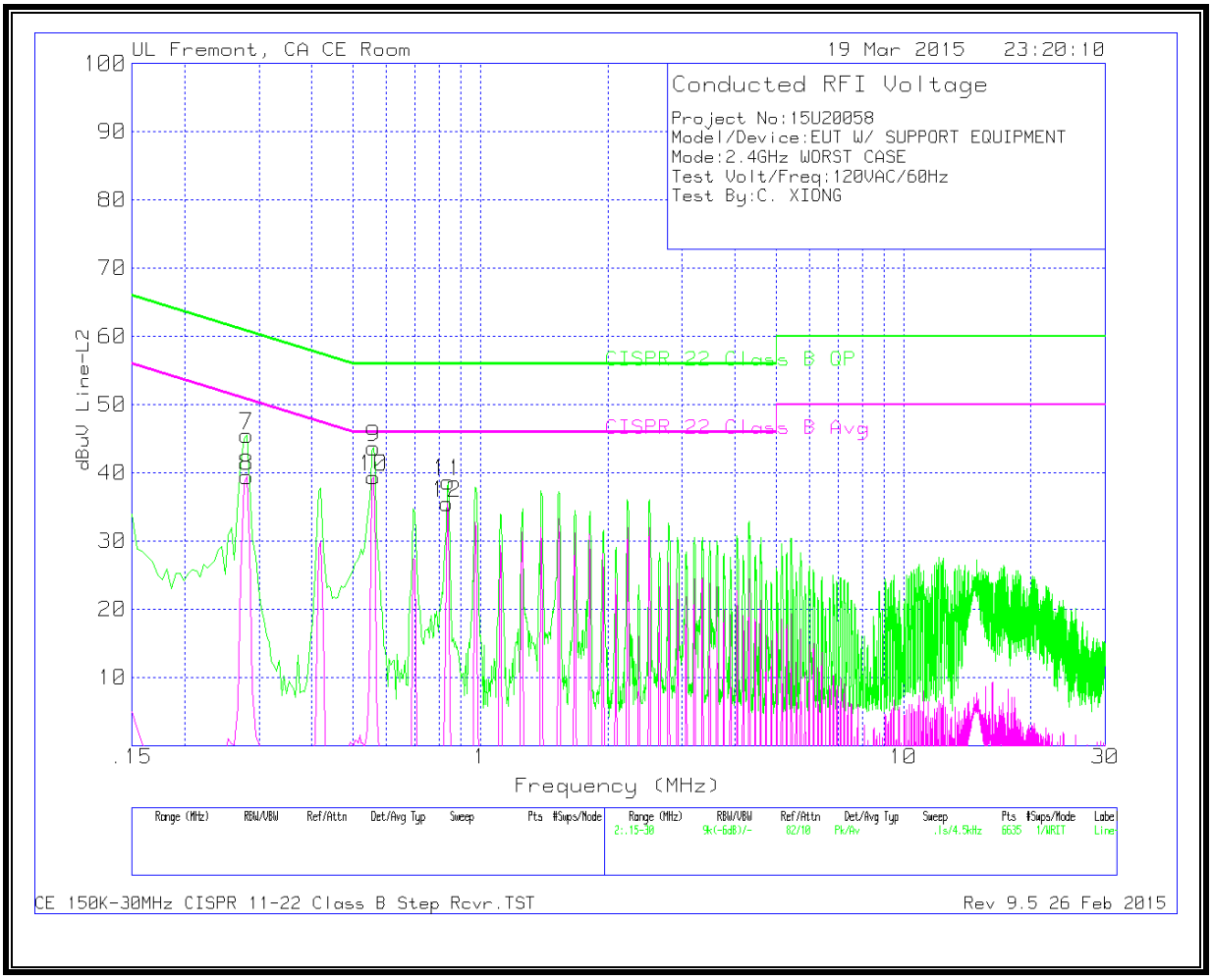
Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
1	.2805	44.11	Pk	.6	0	44.71	60.8	-16.09	-	-
2	.2805	34.84	Av	.6	0	35.44	-	-	50.8	-15.36
3	.5595	42.97	Pk	.3	0	43.27	56	-12.73	-	-
4	.5595	34.01	Av	.3	0	34.31	-	-	46	-11.69
5	.8385	40.18	Pk	.3	0	40.48	56	-15.52	-	-
6	.834	30.35	Av	.3	0	30.65	-	-	46	-15.35

Pk - Peak detector

Av - Average detection

LINE 2 RESULTS



WORST EMISSIONS

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
7	.2805	44.93	Pk	.6	0	45.53	60.8	-15.27	-	-
8	.2805	38.89	Av	.6	0	39.49	-	-	50.8	-11.31
9	.5595	43.41	Pk	.3	0	43.71	56	-12.29	-	-
10	.5595	39.08	Av	.3	0	39.38	-	-	46	-6.62
11	.8385	38.29	Pk	.3	.1	38.69	56	-17.31	-	-
12	.834	35.24	Av	.3	0	35.54	-	-	46	-10.46

Pk - Peak detector

Av - Average detection