



CERTIFICATION TEST REPORT

Report Number. : 11839308-E1V3

Applicant : UNALIWEAR, INC
3410 CHERRY LANE
AUSTIN, TX 78703, UNITED STATES

Model : KANEGA WATCH

FCC ID : 2AM4C-KANEGA

EUT Description : Cellular and 802.11b/g/n Enabled Watch (mPERS device)

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

October 23, 2017

Prepared by:

UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888



NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	9/19/17	Initial Issue	---
V2	10/16/17	Updated sections 9.3 and 9.4 with channel 2 power measurement. Updated sections 10.2.2 and 10.2.3 with channel 2 band edge measurements.	Huda Mustapha
V3	10/23/17	Updated sections 9.3.4 and 9.3.5 with channel 2 measurements Updated sections 9.4.3, 9.4.4 and 9.4.5 with channels 2 and 10 measurement. Updated section 10.2.3 with channel 10 band edge measurements. Updated section 5.5	Huda Mustapha

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>7</i>
4.2. <i>SAMPLE CALCULATION</i>	<i>7</i>
4.3. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>7</i>
5. EQUIPMENT UNDER TEST.....	8
5.1. <i>DESCRIPTION OF EUT</i>	<i>8</i>
5.2. <i>MAXIMUM OUTPUT POWER.....</i>	<i>8</i>
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	<i>8</i>
5.4. <i>SOFTWARE AND FIRMWARE.....</i>	<i>8</i>
5.5. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>9</i>
5.6. <i>DESCRIPTION OF TEST SETUP.....</i>	<i>10</i>
6. TEST AND MEASUREMENT EQUIPMENT	13
7. MEASUREMENT METHODS	14
8. SUMMARY TABLE	15
9. ANTENNA PORT TEST RESULTS.....	16
9.1. <i>ON TIME AND DUTY CYCLE.....</i>	<i>16</i>
9.2. <i>11b MODE IN THE 2.4GHz BAND.....</i>	<i>19</i>
9.2.1. <i>6 dB BANDWIDTH.....</i>	<i>19</i>
9.2.2. <i>99% BANDWIDTH.....</i>	<i>22</i>
9.2.3. <i>OUTPUT POWER</i>	<i>25</i>
9.2.4. <i>POWER SPECTRAL DENSITY</i>	<i>27</i>
9.2.5. <i>CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....</i>	<i>30</i>
9.3. <i>11g MODE IN THE 2.4GHz BAND.....</i>	<i>35</i>
9.3.1. <i>6 dB BANDWIDTH.....</i>	<i>35</i>
9.3.2. <i>99% BANDWIDTH.....</i>	<i>38</i>
9.3.3. <i>OUTPUT POWER</i>	<i>41</i>
9.3.4. <i>POWER SPECTRAL DENSITY</i>	<i>43</i>
9.3.5. <i>CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....</i>	<i>46</i>
9.4. <i>11n HT20 MODE IN THE 2.4GHz BAND</i>	<i>51</i>
9.4.1. <i>6 dB BANDWIDTH.....</i>	<i>51</i>
9.4.2. <i>99% BANDWIDTH.....</i>	<i>54</i>

9.4.3.	OUTPUT POWER	57
9.4.4.	POWER SPECTRAL DENSITY	59
9.4.5.	CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....	63
10.	RADIATED TEST RESULTS	70
10.1.	<i>LIMITS AND PROCEDURE.....</i>	<i>70</i>
10.2.	<i>TRANSMITTER ABOVE 1 GHz.....</i>	<i>71</i>
10.2.1	11b MODE IN THE 2.4GHz BAND.....	71
10.2.2	11g MODE IN THE 2.4GHz BAND.....	81
10.2.3	11n-HT20 MODE IN THE 2.4GHz BAND.....	93
10.3	<i>WORST-CASE BELOW 30 MHz.....</i>	<i>107</i>
10.4	<i>WORST-CASE BELOW 1 GHz.....</i>	<i>108</i>
10.5.	<i>WORST-CASE 18 to 26 GHz.....</i>	<i>110</i>
11.	SETUP PHOTOS	112

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: UNALIWEAR, INC
3410 CHERRY LANE
AUSTIN, TX 78703, UNITED STATES

EUT DESCRIPTION: Cellular and 802.11b/g/n Enabled Watch (mPERS device)

SERIAL NUMBER: 87 (Radiated), 359335050142618 (Conducted)

DATE TESTED: JULY 18 to JULY 24, 2017 and OCTOBER 13 to 20, 2017

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

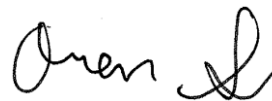
UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement 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:

Prepared By:

Huda Mustapha



HUDA MUSTAPHA
WISE PROJECT LEAD
UL VERIFICATION SERVICES INC.

OREN STOELTING
WISE LABORATORY 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, KDB 558074 D01 v04 and ANSI C63.10-2013.

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
<input checked="" type="checkbox"/> Chamber A(IC: 2324B-1)	<input type="checkbox"/> Chamber D(IC: 22541-1)
<input type="checkbox"/> Chamber B(IC: 2324B-2)	<input type="checkbox"/> Chamber E(IC: 22541-2)
<input type="checkbox"/> Chamber C(IC: 2324B-3)	<input type="checkbox"/> Chamber F(IC: 22541-3)
	<input type="checkbox"/> Chamber G(IC: 22541-4)
	<input type="checkbox"/> Chamber H(IC: 22541-5)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

Parameter	Uncertainty
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Cellular and 802.11 b/g/n WLAN enabled watch (mPERS device).

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	17.23	52.84
2412 - 2472	802.11g	16.75	47.32
2412 - 2472	802.11n HT20 CDD	16.81	47.97

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain (dBi)
2.4	-11.30

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 1493
The test utility software used during testing was Tera Term Ver 4.79.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated bandedge, harmonics, and spurious emissions from 1 GHz to 18 GHz were performed. The EUT was set to transmit at the Low/Middle/High channels.

Radiated emissions below 30 MHz, 30 to 1000 MHz and above 18 GHz were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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

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

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20 mode: MCS0

For 802.11g and n HT20 modes, radiated band edge measurements on the inner channels were compliant. In addition radiated harmonics and spurious on the low, mid and high were showing margins more than 8 dB. Therefore, no additional radiated testing was deemed necessary for channels 2 and 10.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	20B7S0A200	PC015REW	NA
Wireless Router	TP-Link	TL-WR841N	215A270012990	NA
DC Power Supply	Revelry Microsystems	Volt Werks	N/A	N/A

The laptop and wireless router are used to transmit commands to the unit, but are disconnected during testing.

I/O CABLES (CONDUCTED TEST)

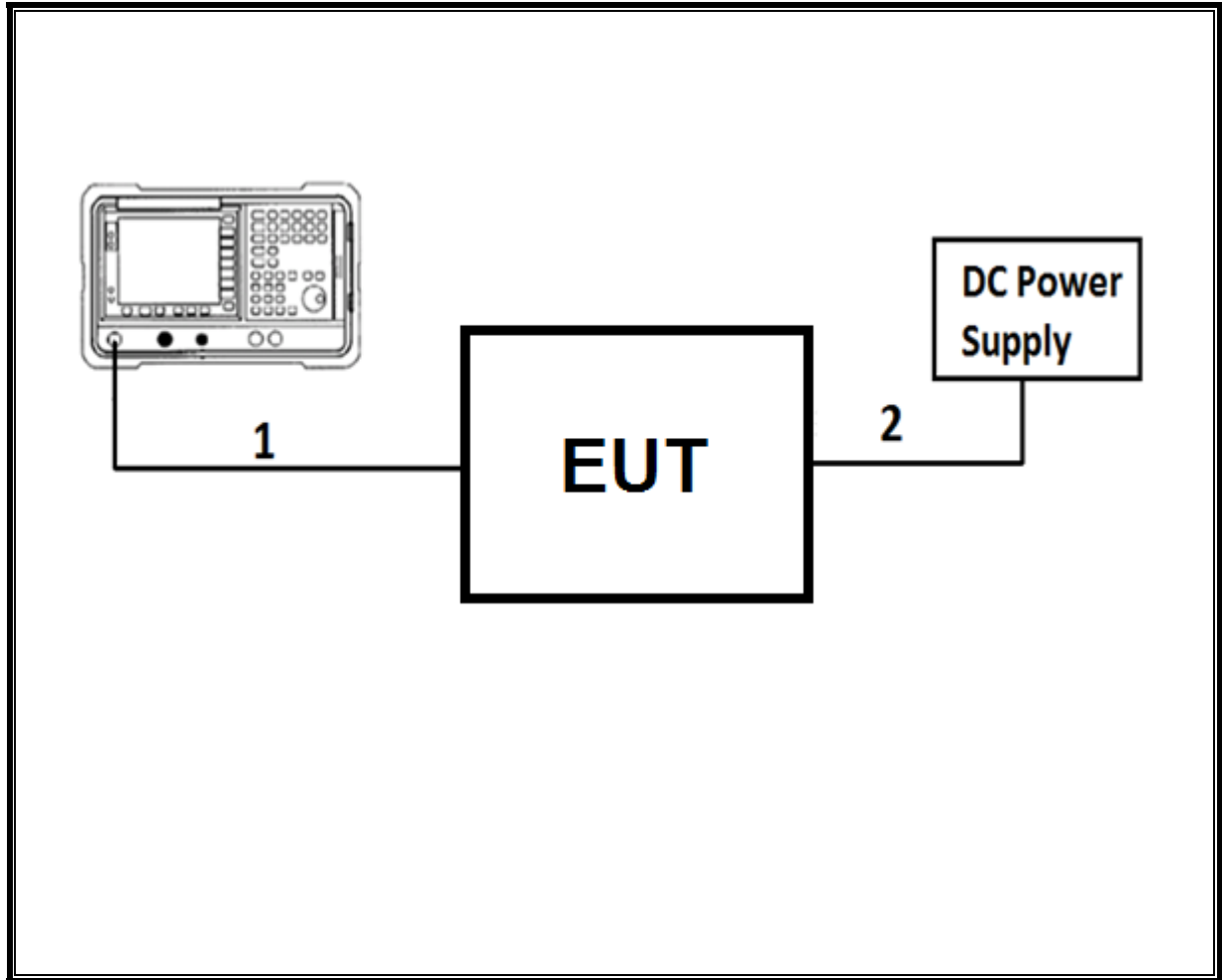
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length m	Remarks
1	Antenna	1	RF	Shielded	0.2	To spectrum analyzer
2	DC	1	1	Micro USB	2	To DC power supply

I/O CABLES (RADIATED)

The EUT is a standalone battery powered unit for radiated testing.

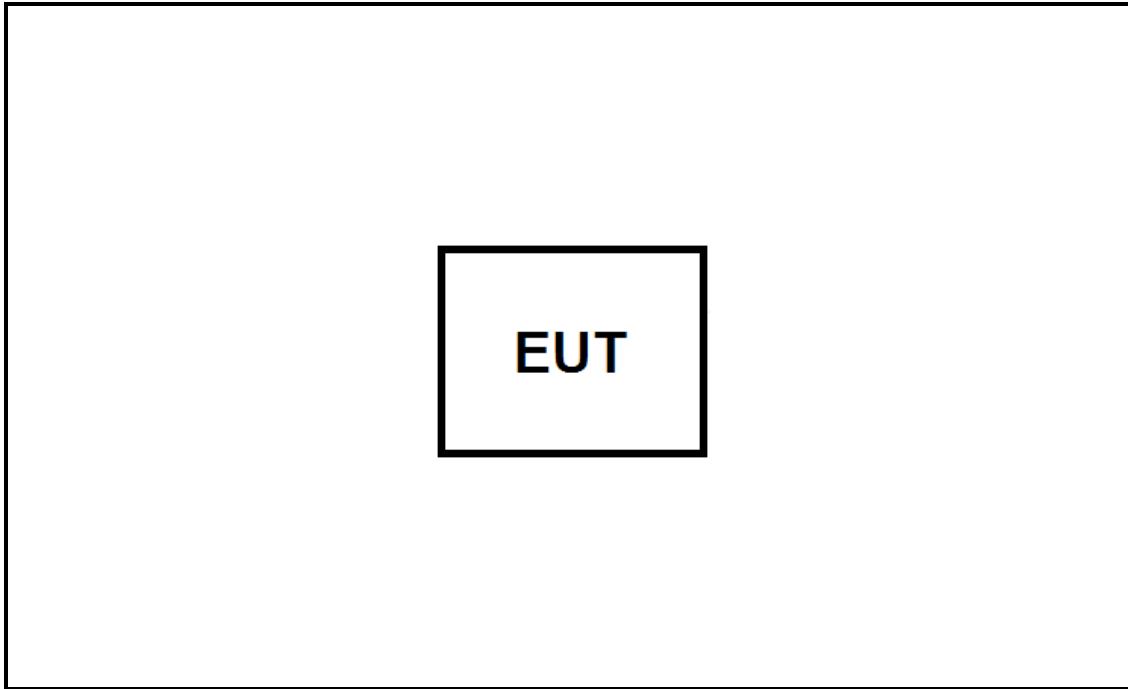
TEST SETUP

CONDUCTED TEST SETUP DIAGRAM



TEST SETUP

RADIATED EMISSIONS 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	T Number	Cal Date	Cal Due
Amplifier, 1 to 18 GHz	Miteq	AFS43-00101800-25-S-42	493	02/15/17	02/15/18
Amplifier, 1 to 8 GHz	Miteq	AMF-4D-01000800-30-29P	1170	04/28/17	04/28/18
Amplifier, 10KHz to 1GHz, 32dB	Keysight	8447D	300	11/10/16	11/10/17
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	130	09/23/16	09/23/17
Antenna, Active Loop 9KHz to 30MHz	ETS-Lindgren	6502	1683	02/17/17	02/17/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	862	06/09/17	06/09/18
PXA Spectrum Analyzer, 3Hz to 44GHz	Agilent	N9030A	1466	04/11/17	04/11/18
EMI Reciever	Rohde & Schwarz	ESR-EMI	1436	01/06/17	01/06/18
18 - 26.5 GHz Horn Antenna	Seavey Division	MWH-1826/B	449	06/12/17	06/12/18
Pre-Amp 1-26.5 GHz	Agilent	8449B	404	07/05/17	07/05/18
Spectrum Analyzer	Agilent	8564E	106	09/07/16	09/07/17

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, Apr 26, 2016
Antenna Port Software	UL	UL RF	Ver 5.1.1, July 15, 2016

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 558074 D01 v04, Section 6.

6 dB BW: KDB 558074 D01 v04, Section 8.1.

99% BW: ANSI C63.10-2013, Section 6.9.3.

Output Power: KDB 558074 D01 v04, Section 9.2.3.2.

Power Spectral Density: KDB 558074 D01 v04, Section 10.3.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.1 (b).

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.1.

Band-edge: KDB 558074 D01 v04, Section 12.1.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

General radiated emissions: ANSI C63.10:2013

8. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	Occupied Band width (6dB)	>500KHz	Conducted	Pass
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-30dBc		Pass
15.247 (b) (3)	TX conducted output power	<30dBm		Pass
15.247 (e)	PSD	<8dBm		Pass
15.205, 15.209, 15.247(d)	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

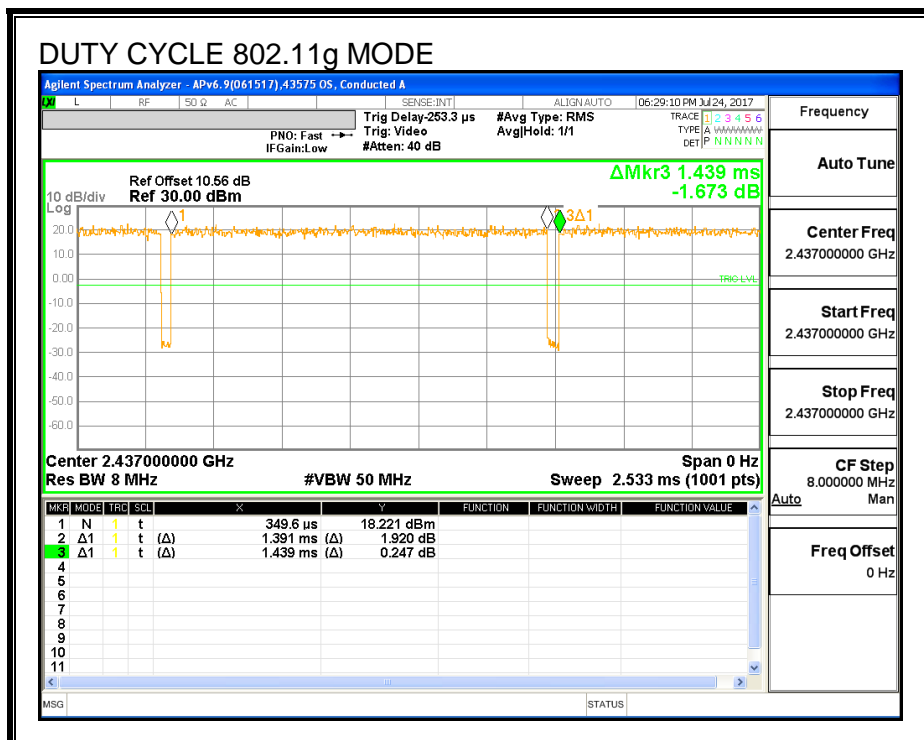
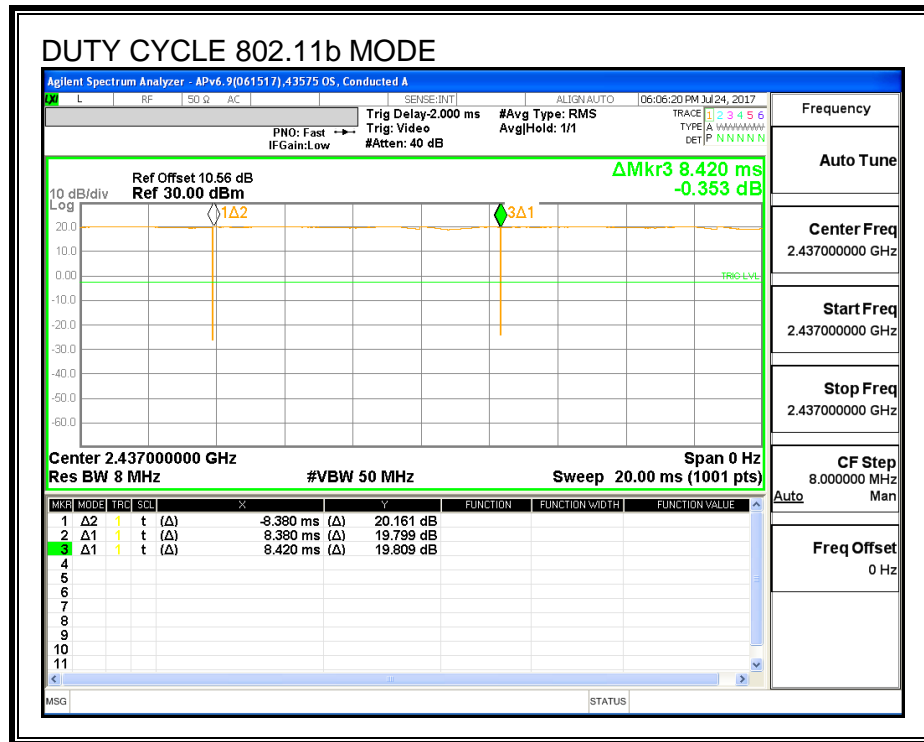
PROCEDURE

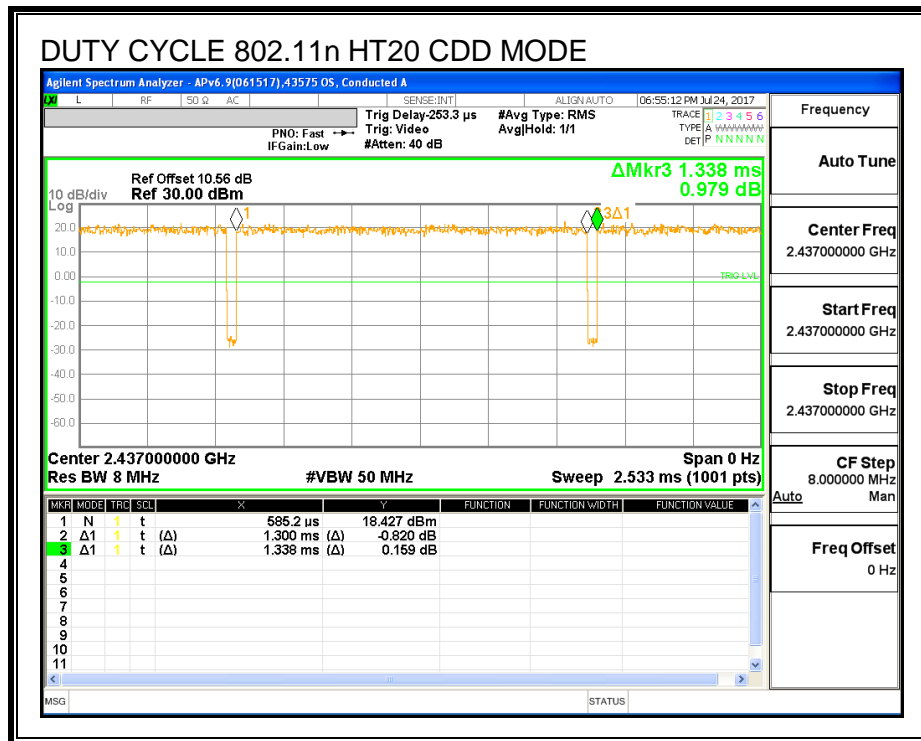
KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11b	8.38	8.42	1.00	99.52%	0.00	0.01
802.11g	1.39	1.44	0.97	96.66%	0.15	0.72
802.11n HT20 CDD	1.30	1.34	0.97	97.16%	0.13	0.77

DUTY CYCLE PLOTS





9.2. 11b MODE IN THE 2.4GHz BAND

9.2.1. 6 dB BANDWIDTH

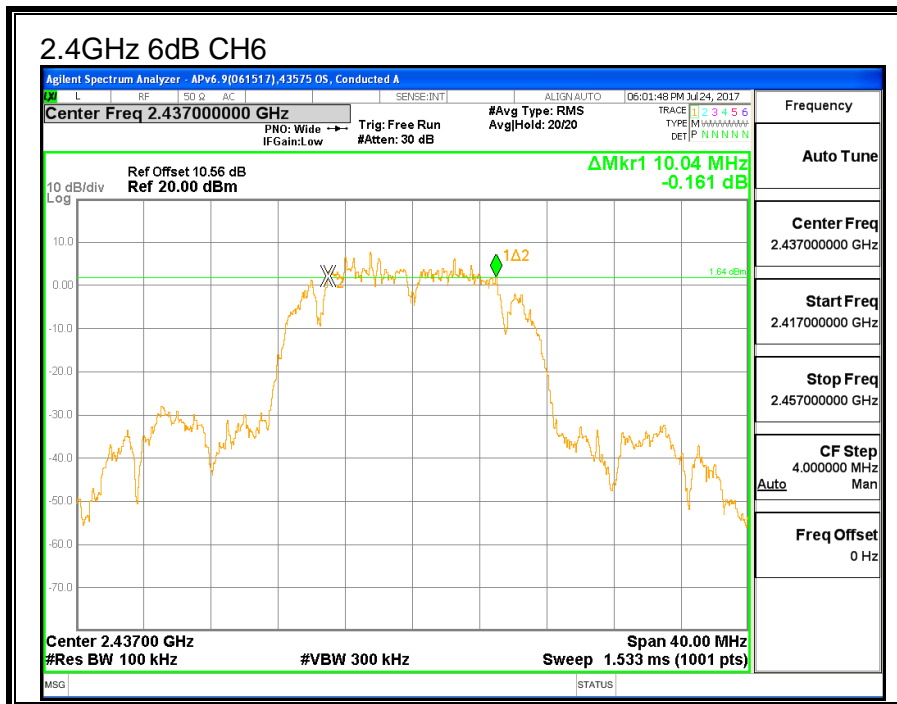
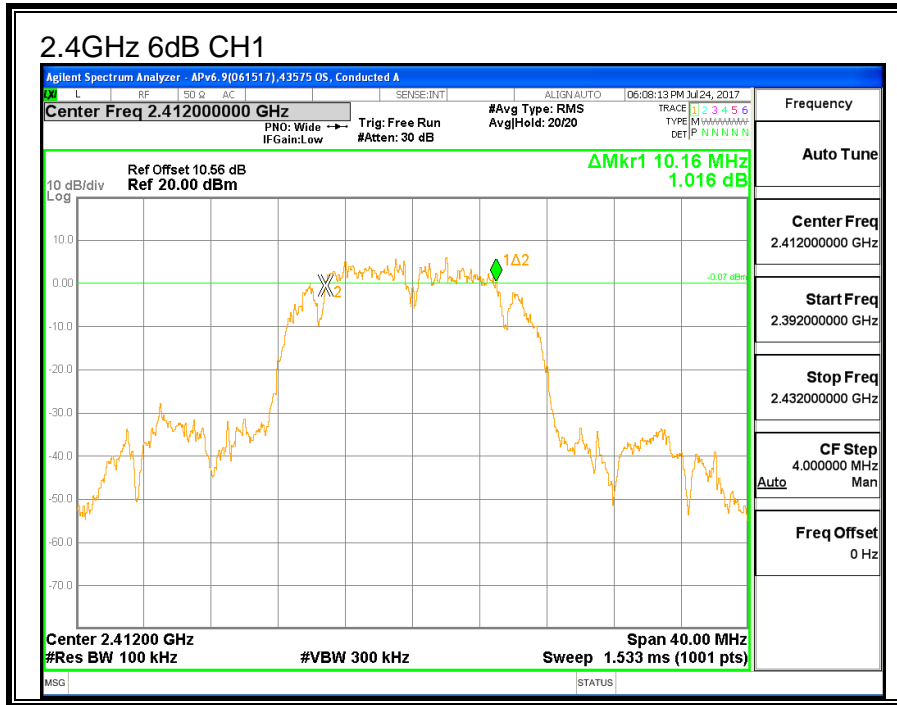
LIMITS

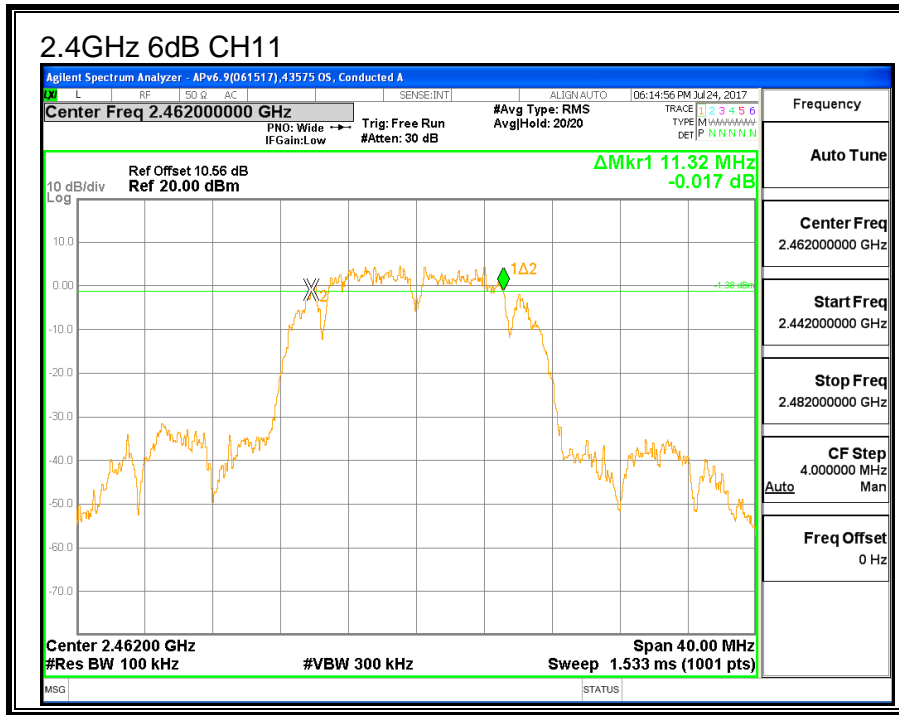
FCC §15.247 (a) (2)

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

RESULTS

Channel	Frequency (MHz)	6 dB BW (MHz)	Minimum Limit (MHz)
CH1	2412	10.16	0.5
CH6	2437	10.04	0.5
CH11	2462	11.32	0.5





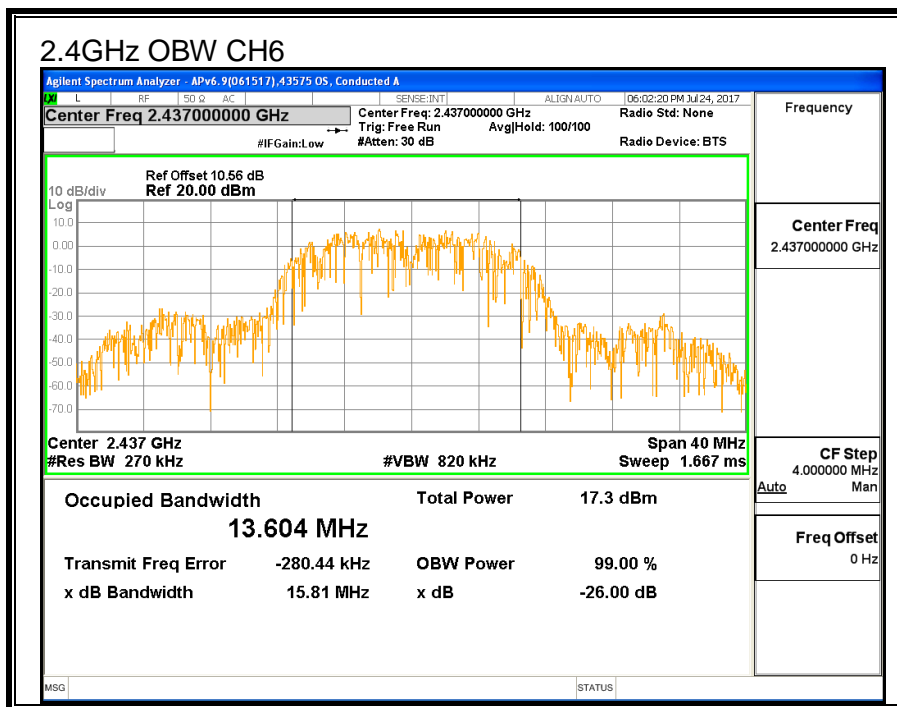
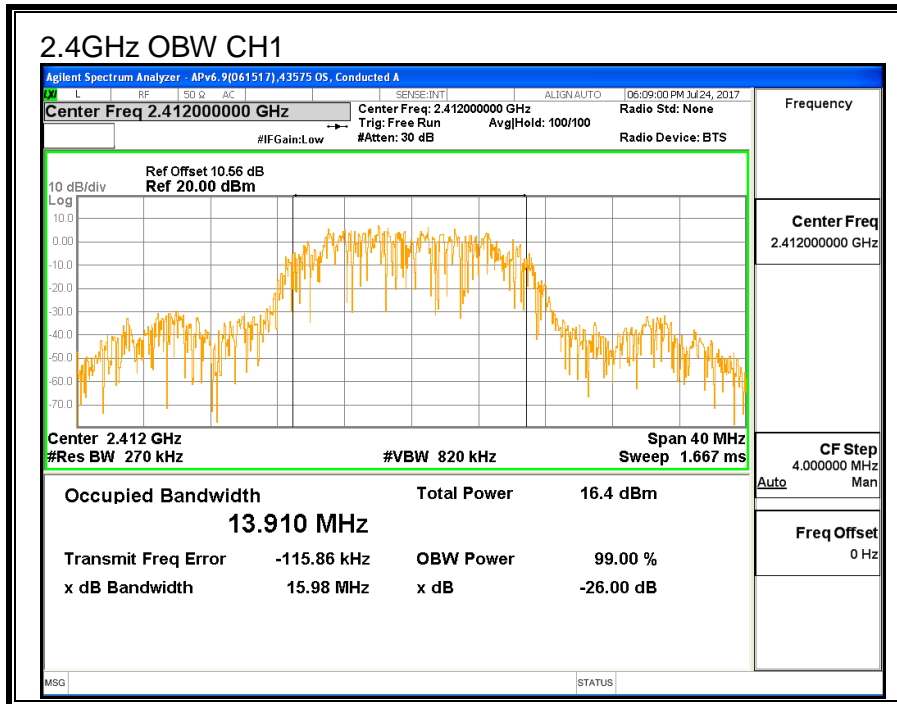
9.2.2. 99% BANDWIDTH

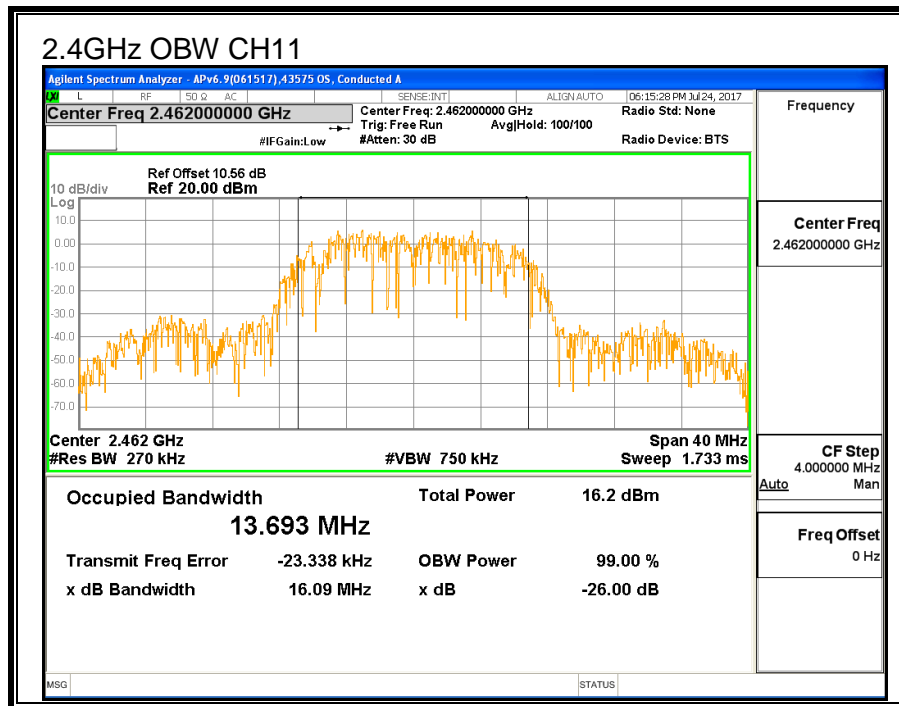
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
CH1	2412	13.910
CH6	2437	13.604
CH11	2462	13.693





9.2.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

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 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.

TEST PROCEDURE

KDB 58074 D01 v04 Section 9.2.3.2

DIRECTIONAL ANTENNA GAIN

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

RESULTS

ID:	43575	Date:	7/24/17
------------	-------	--------------	---------

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-11.30	30.00	30	36	30.00
Mid	2437	-11.30	30.00	30	36	30.00
High	2462	-11.30	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	16.49	16.49	30.00	-13.51
Mid	2437	17.23	17.23	30.00	-12.77
High	2462	16.45	16.45	30.00	-13.55

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

9.2.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

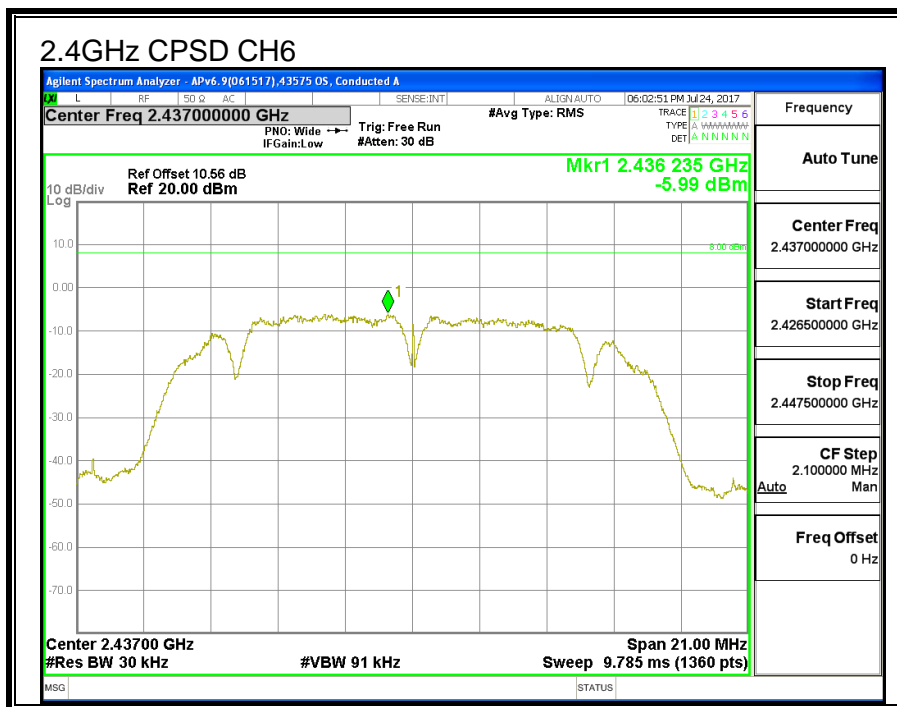
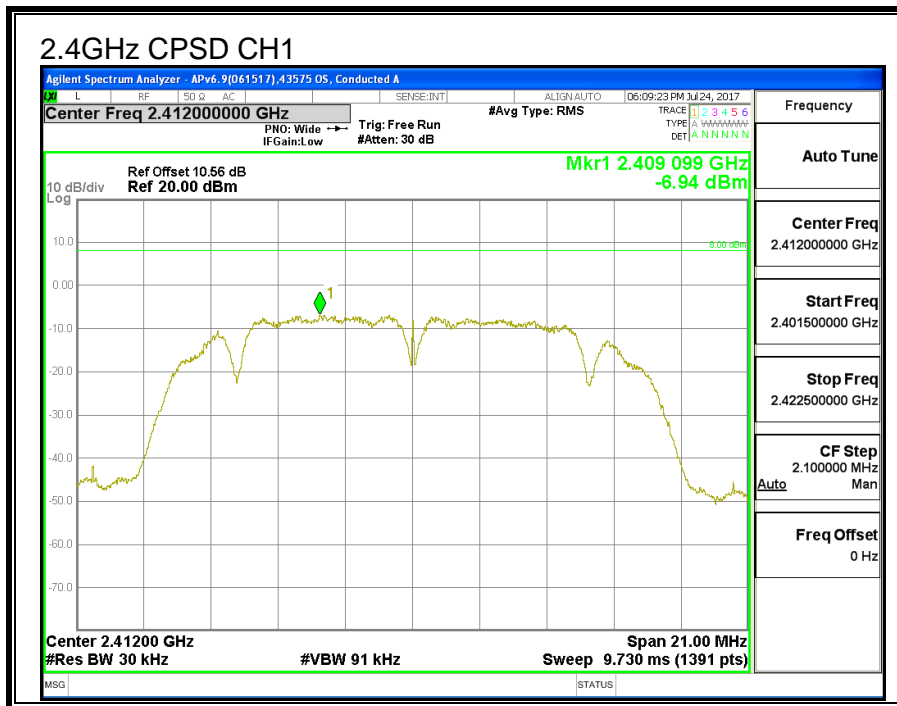
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

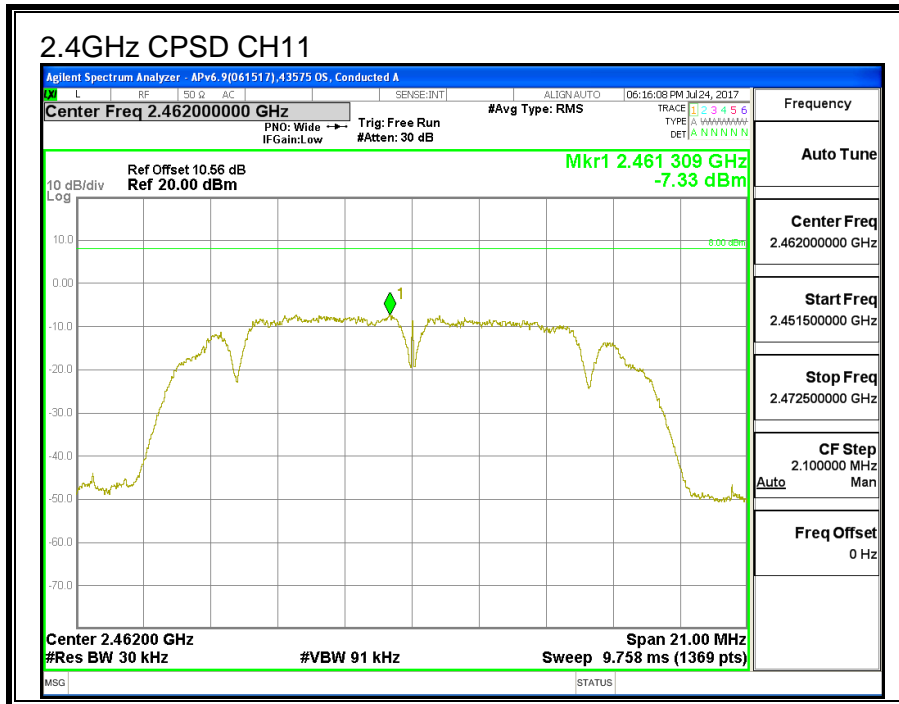
RESULTS

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.94	-6.94	8.0	-14.9
Mid	2437	-5.99	-5.99	8.0	-14.0
High	2462	-7.33	-7.33	8.0	-15.3





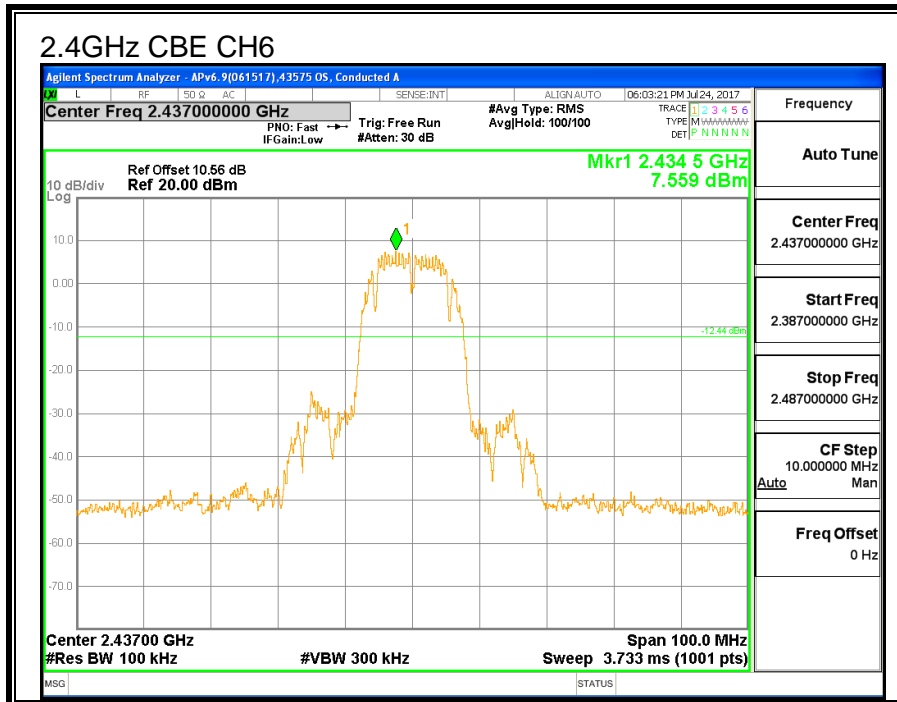
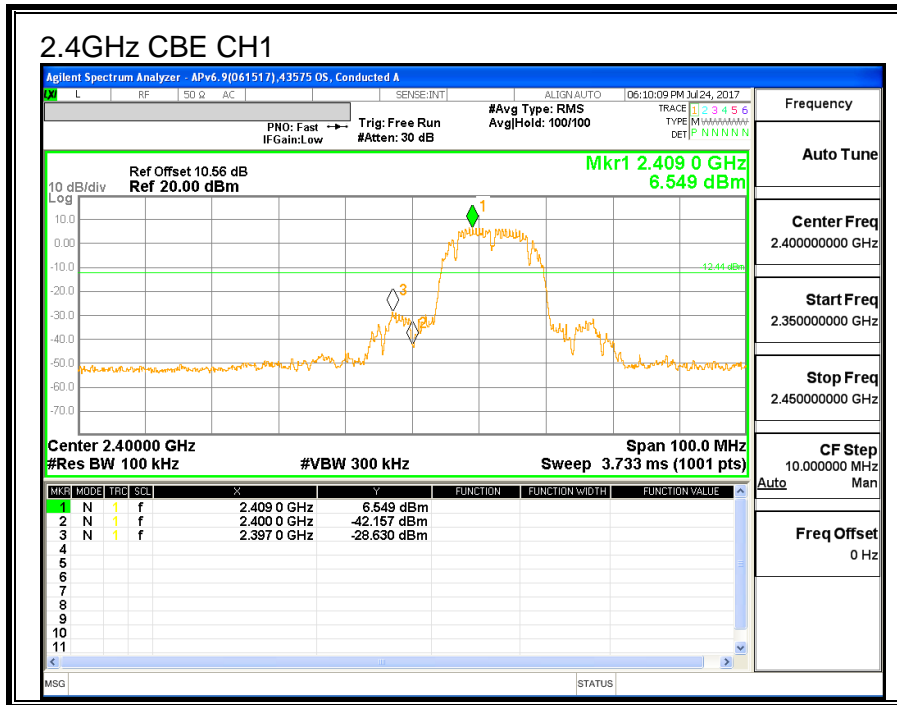
9.2.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

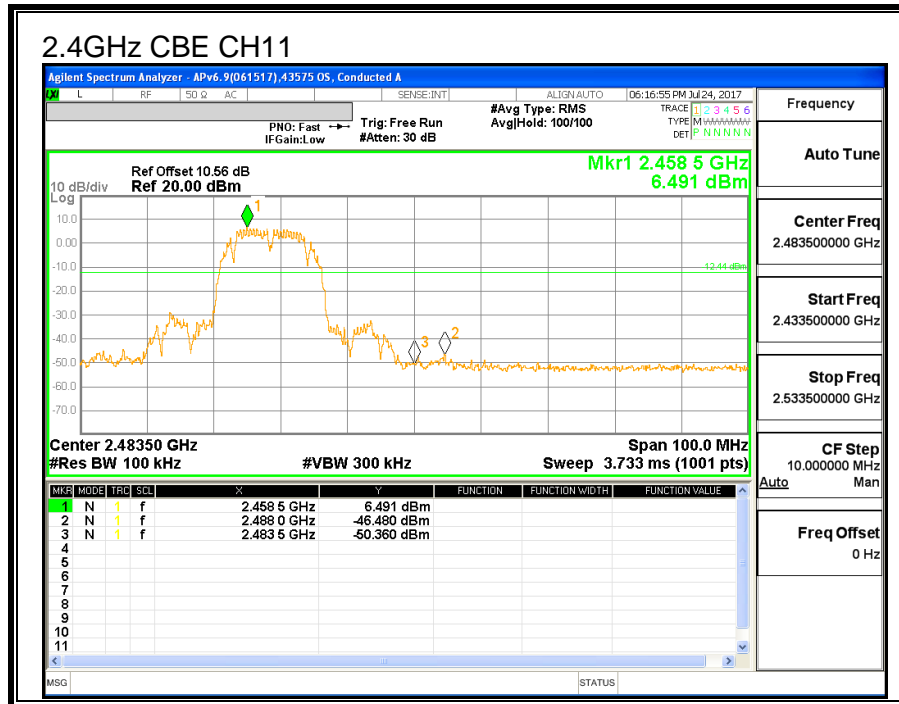
LIMITS

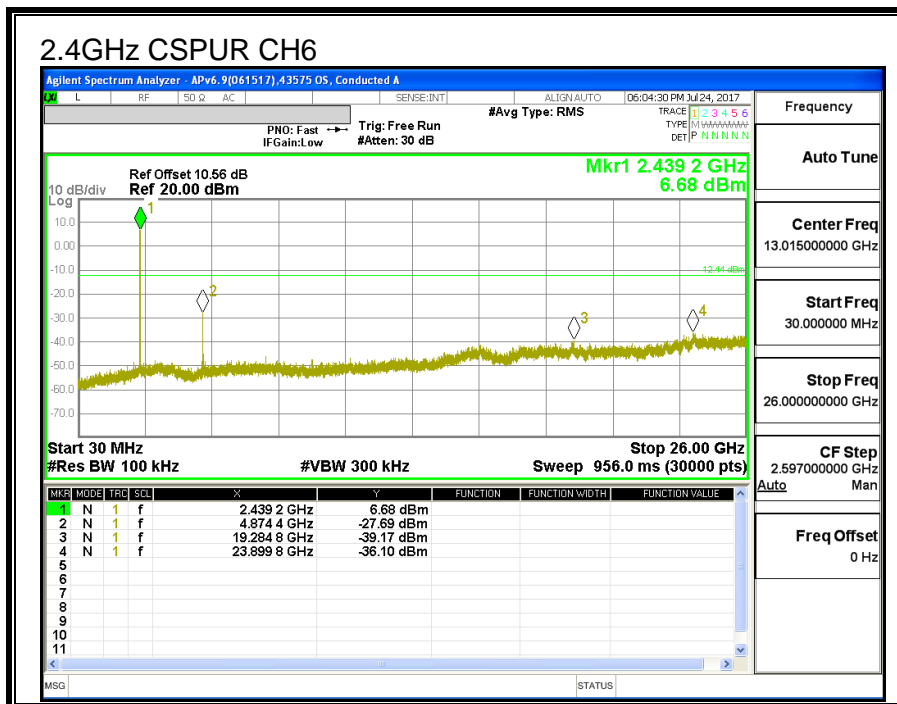
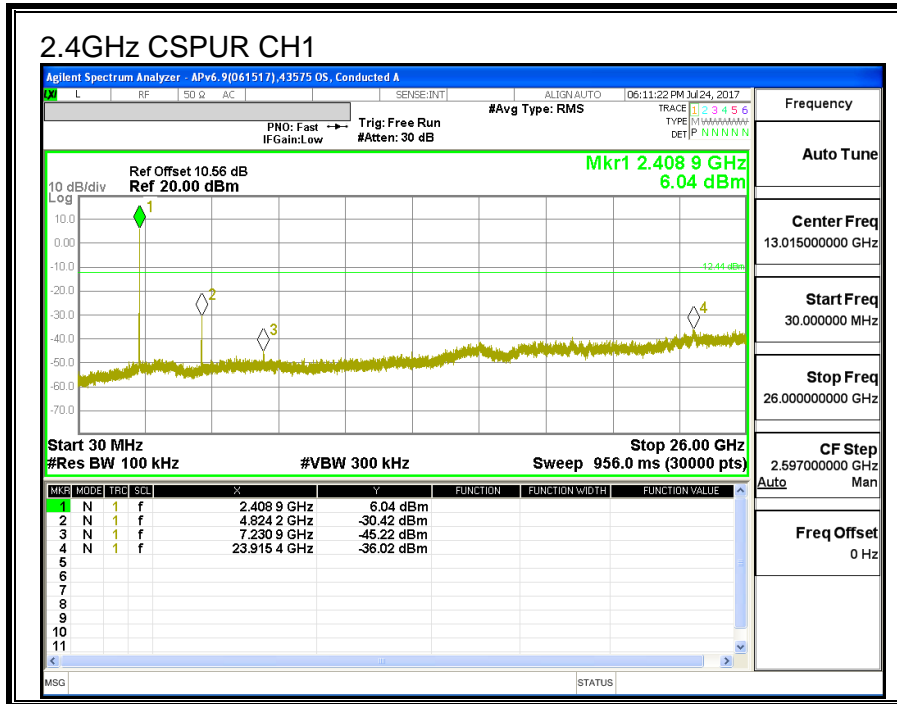
FCC §15.247 (d)

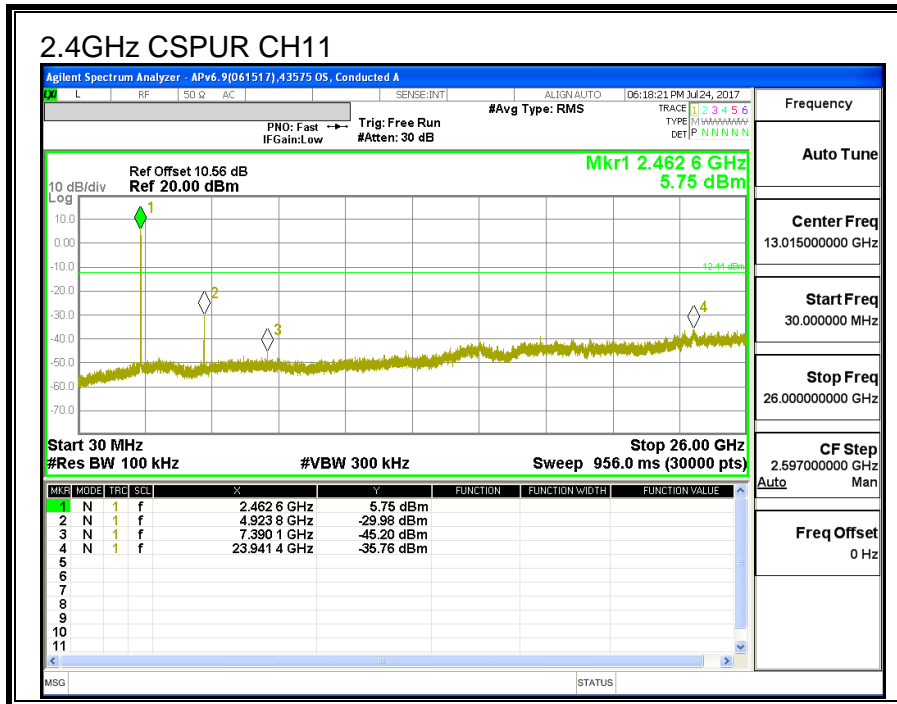
RESULTS

BANDEDGE









9.3. 11g MODE IN THE 2.4GHz BAND

9.3.1. 6 dB BANDWIDTH

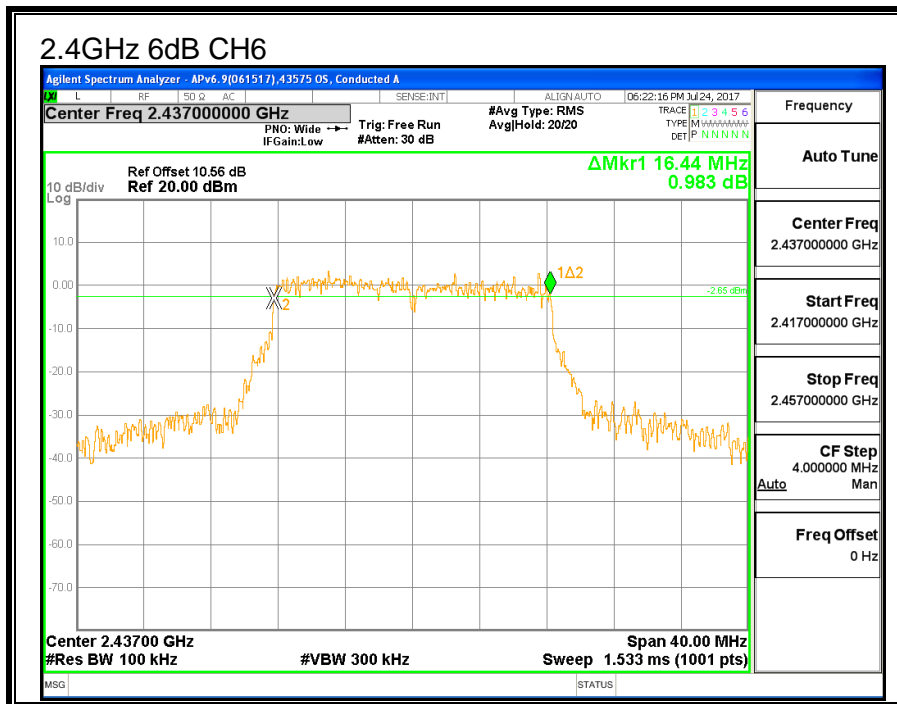
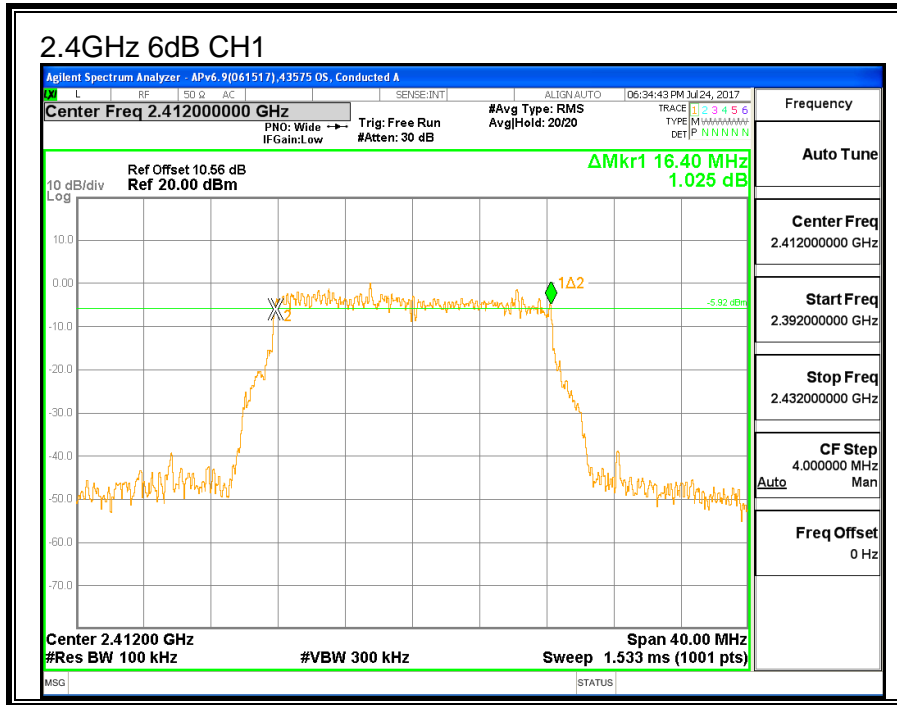
LIMITS

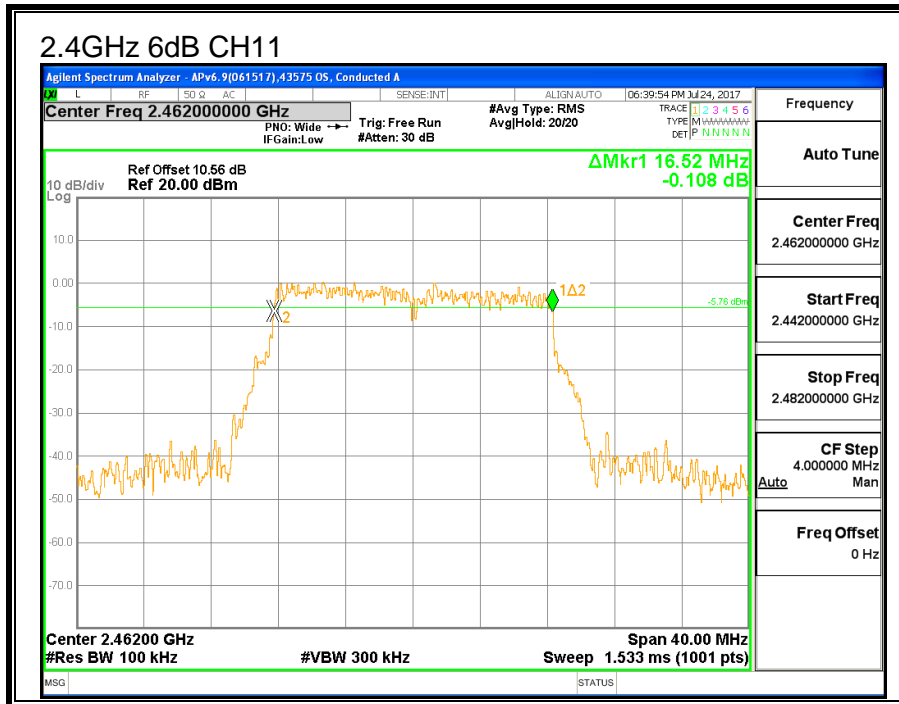
FCC §15.247 (a) (2)

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

RESULTS

Channel	Frequency (MHz)	6 dB BW (MHz)	Minimum Limit (MHz)
CH1	2412	16.40	0.5
CH6	2437	16.44	0.5
CH11	2462	16.52	0.5





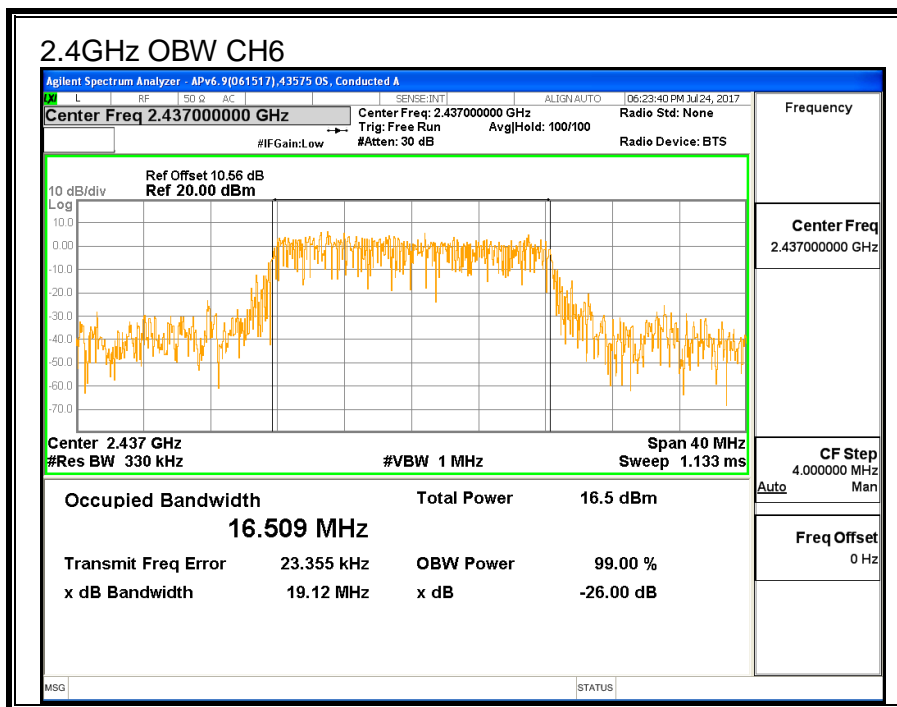
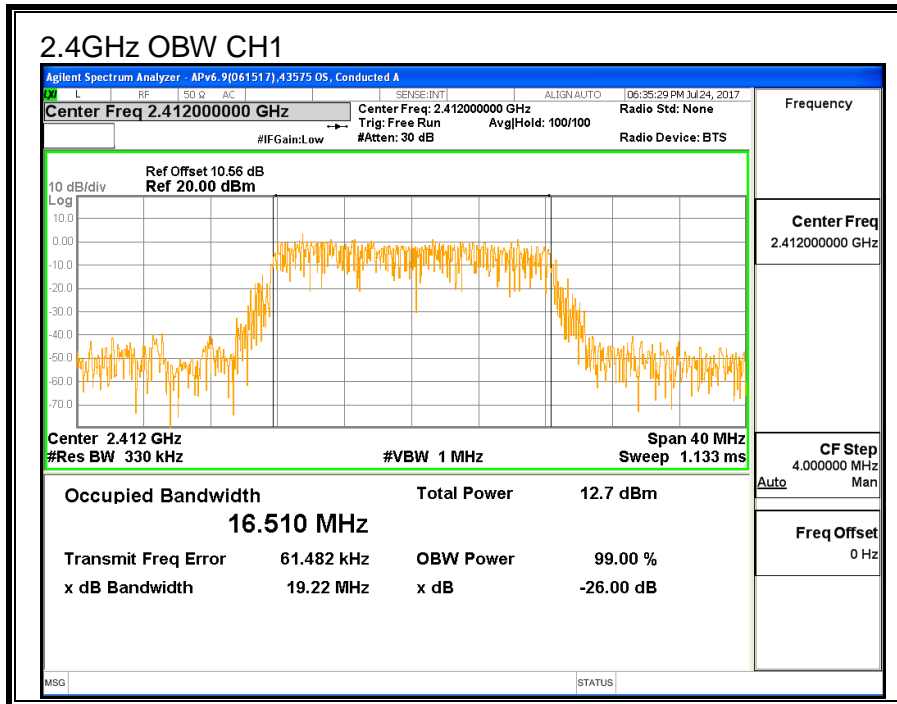
9.3.2. 99% BANDWIDTH

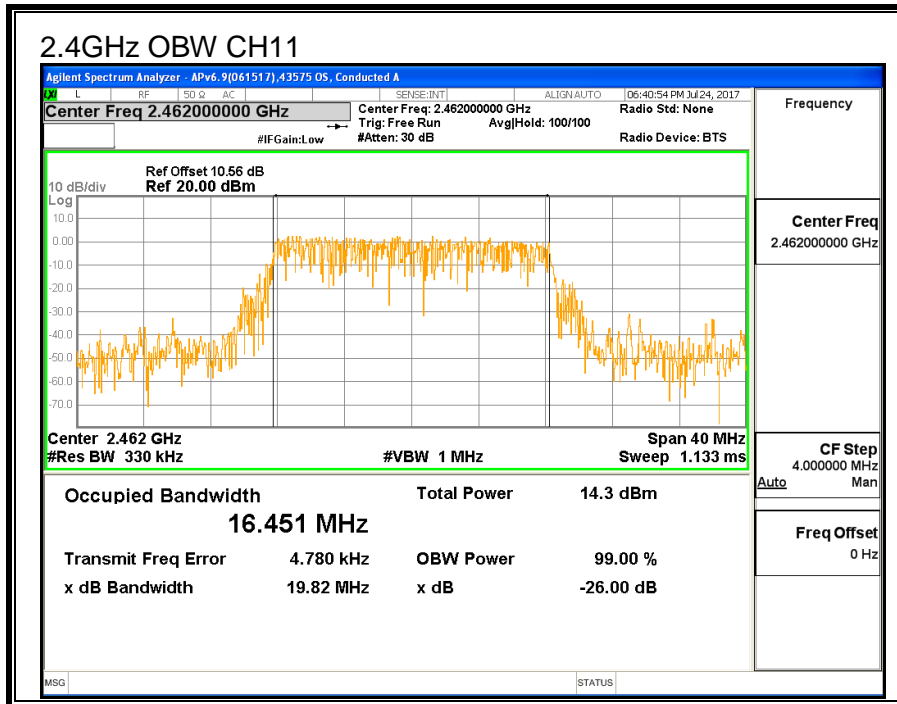
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
CH1	2412	16.510
CH6	2437	16.509
CH11	2462	16.451





9.3.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

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 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.

TEST PROCEDURE

KDB 58074 D01 v04 Section 9.2.3.2

DIRECTIONAL ANTENNA GAIN

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

RESULTS

ID:	43575	Date:	7/24/17
------------	-------	--------------	---------

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-11.30	30.00	30	36	30.00
Mid	2437	-11.30	30.00	30	36	30.00
High	2462	-11.30	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	12.97	12.97	30.00	-17.03
2	2417	16.27	16.27	30.00	-13.73
Mid	2437	16.75	16.75	30.00	-13.25
High	2462	14.70	14.70	30.00	-15.30

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

9.3.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

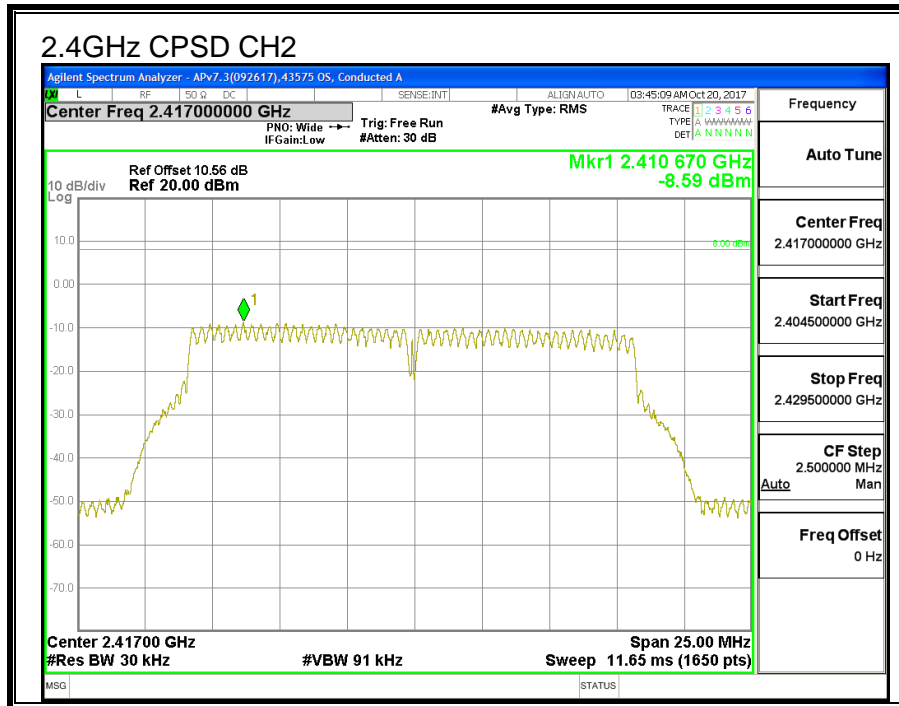
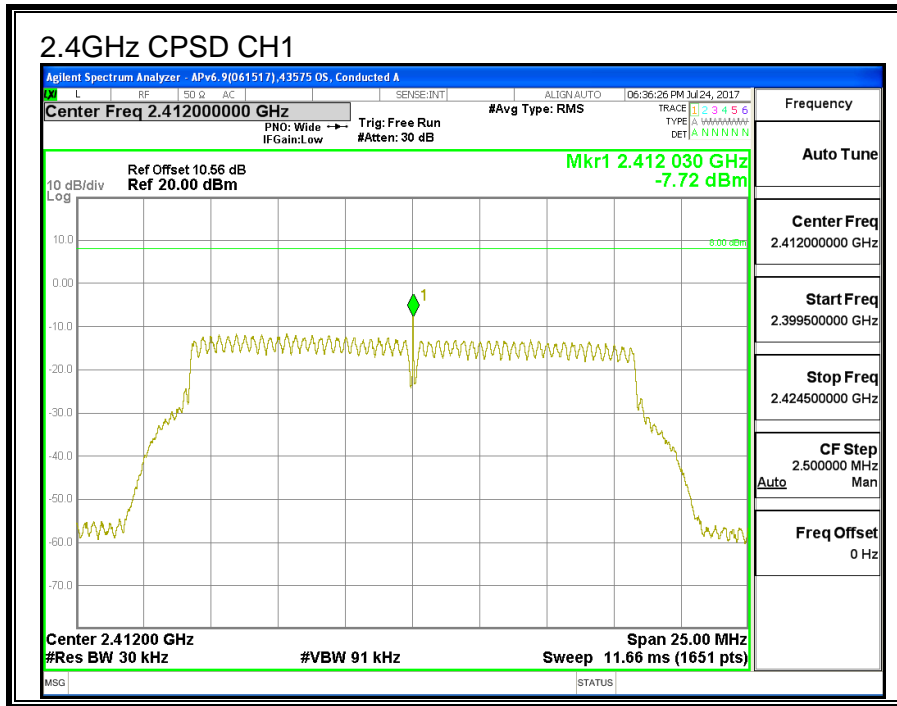
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

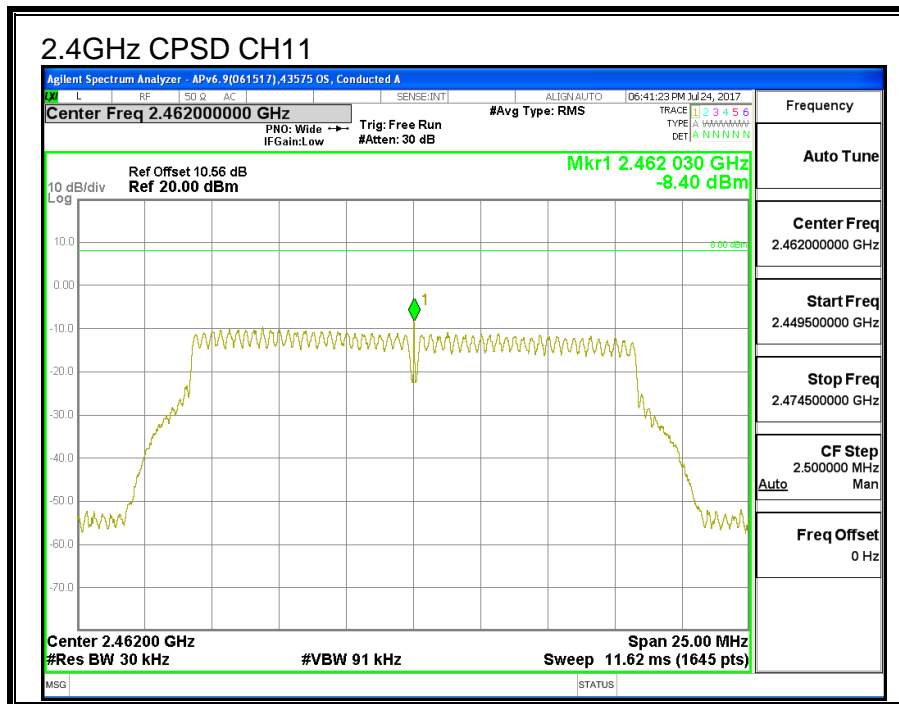
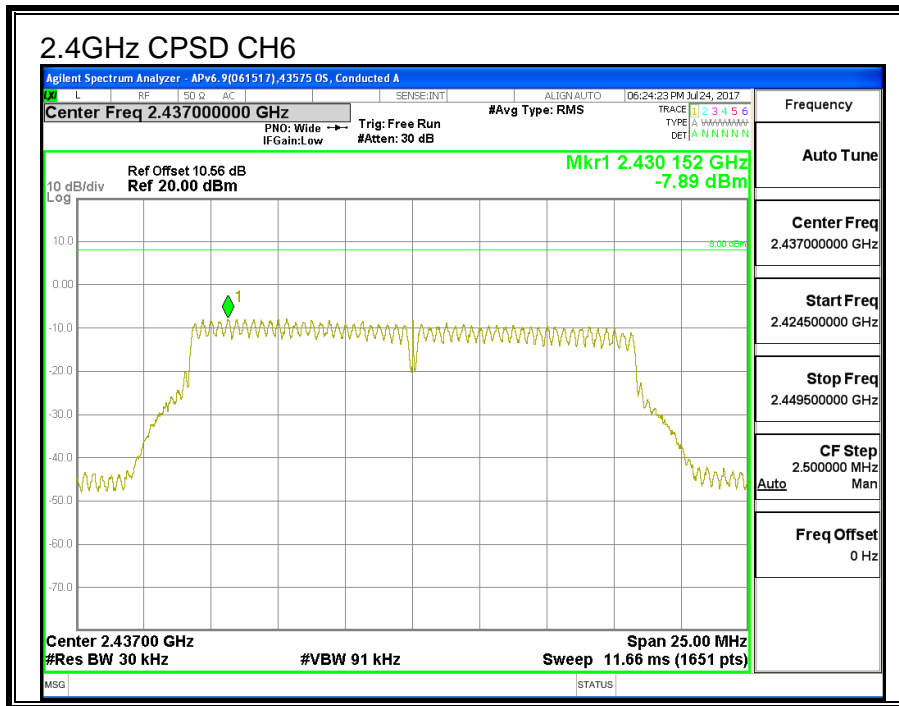
RESULTS

Duty Cycle CF (dB)	0.15	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-7.72	-7.57	8.0	-15.6
2	2417	-8.59	-8.44	8.0	-16.4
Mid	2437	-7.89	-7.74	8.0	-15.7
High	2462	-8.40	-8.25	8.0	-16.3





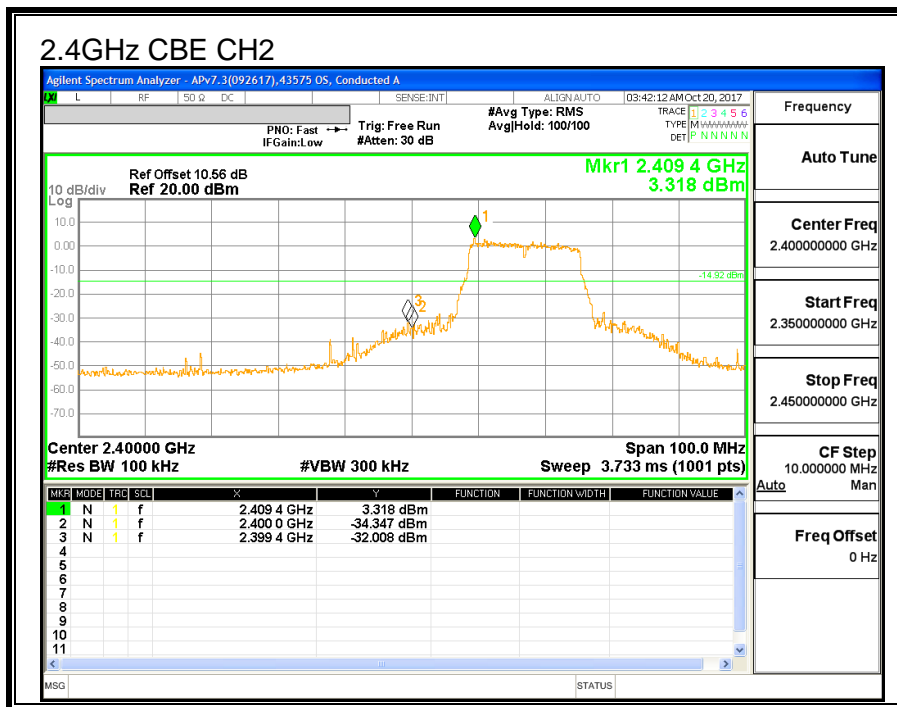
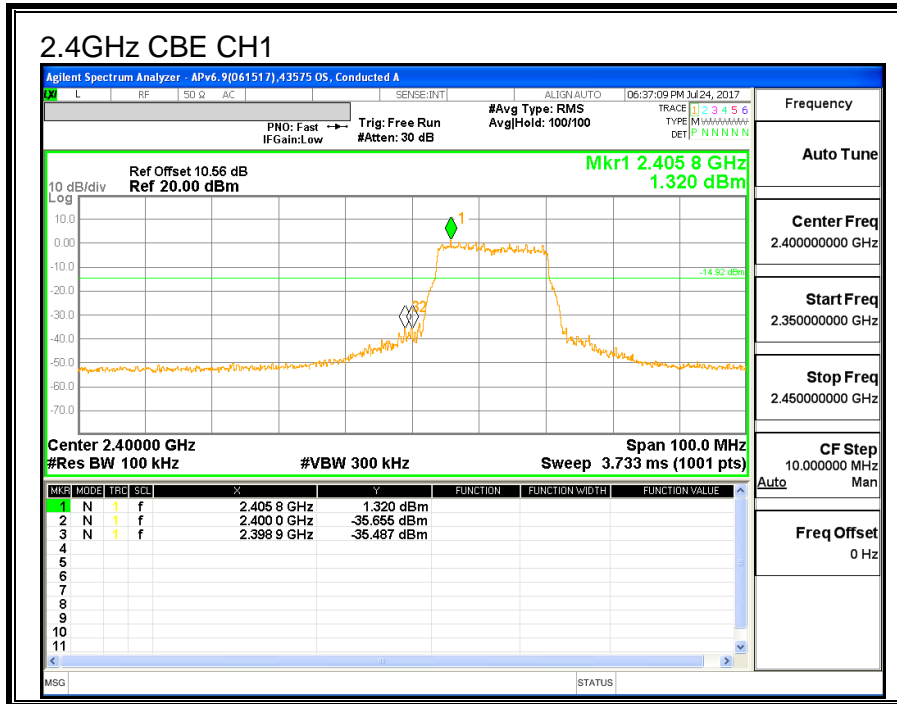
9.3.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

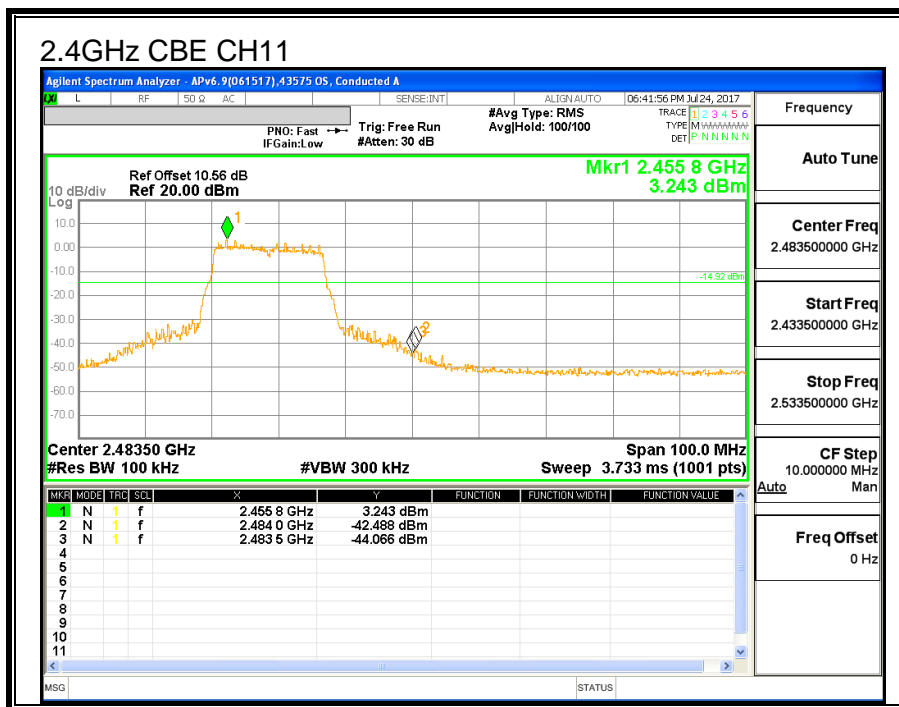
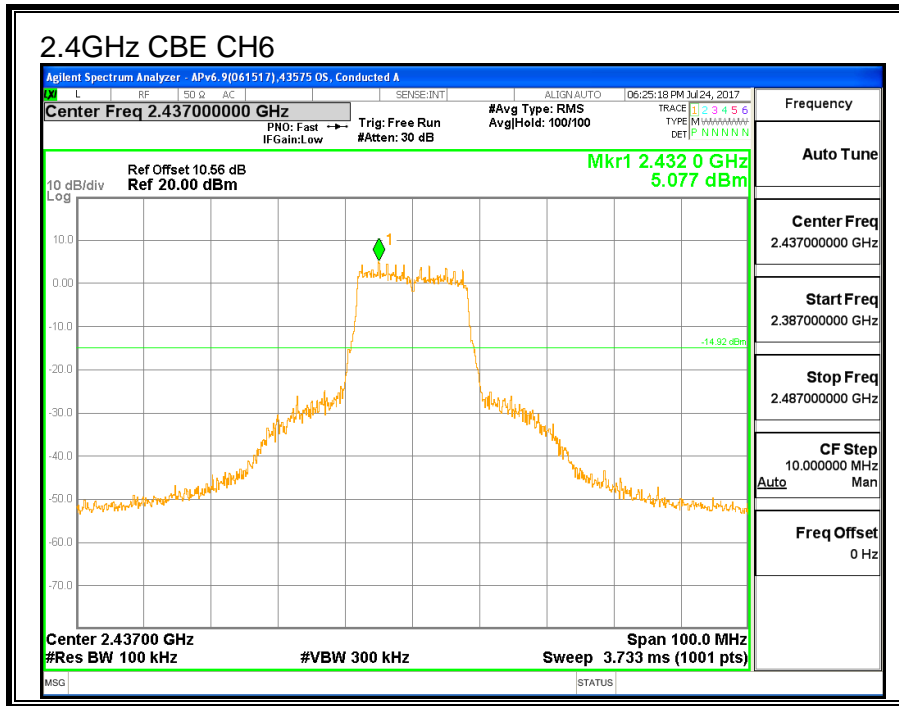
LIMITS

FCC §15.247 (d)

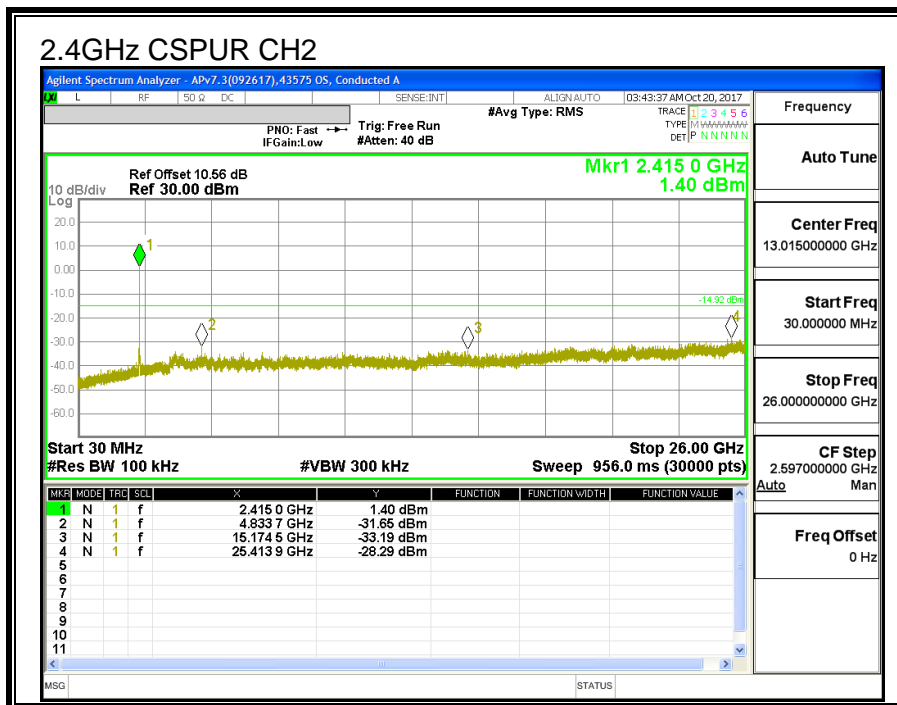
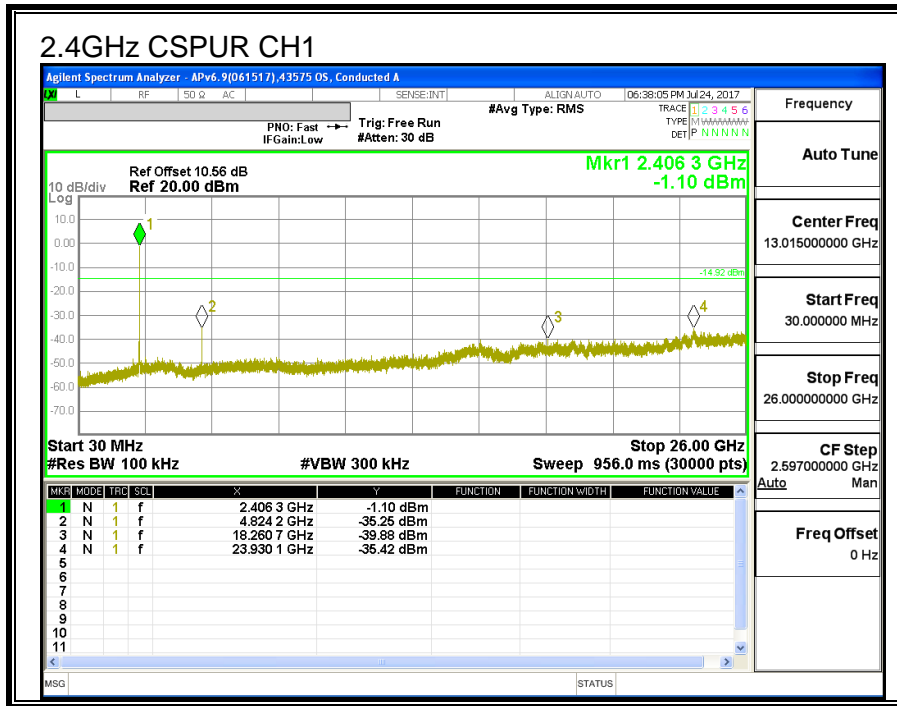
RESULTS

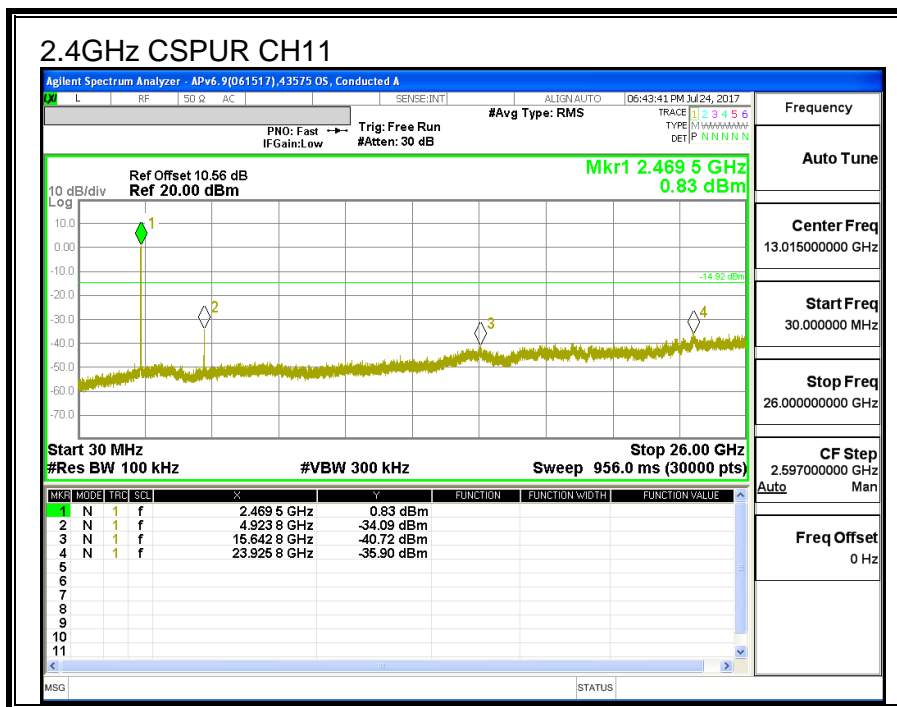
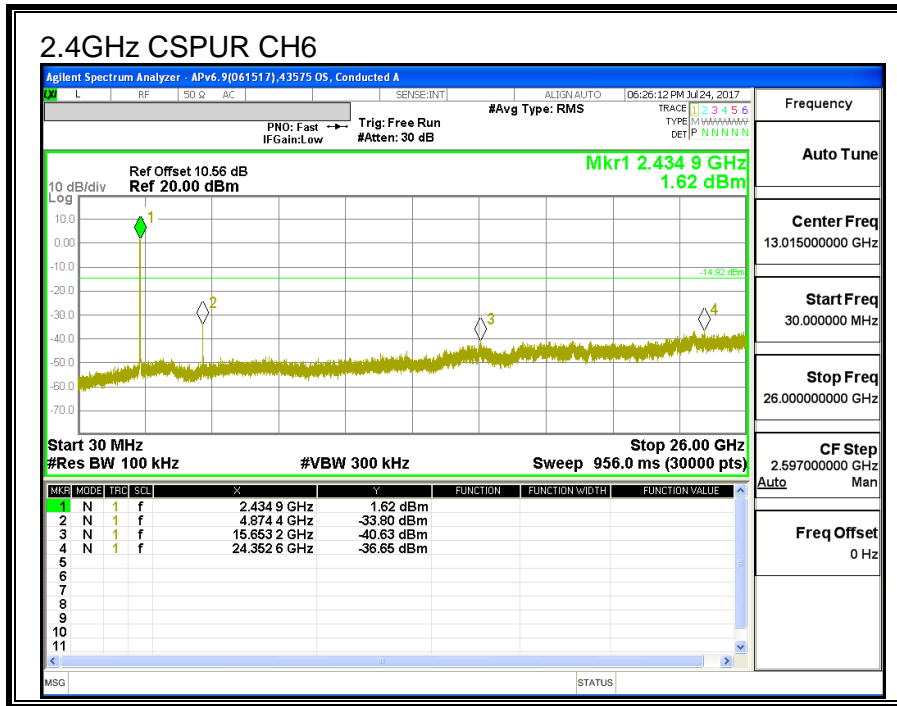
BANDEDGE





SPURIOUS EMISSIONS





9.4. 11n HT20 MODE IN THE 2.4GHz BAND

9.4.1. 6 dB BANDWIDTH

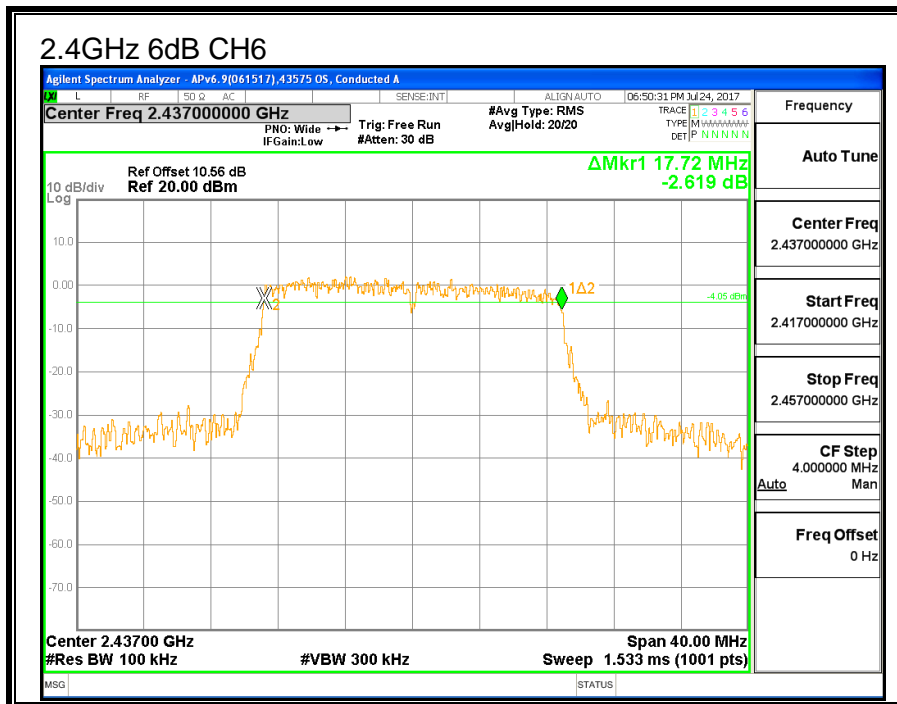
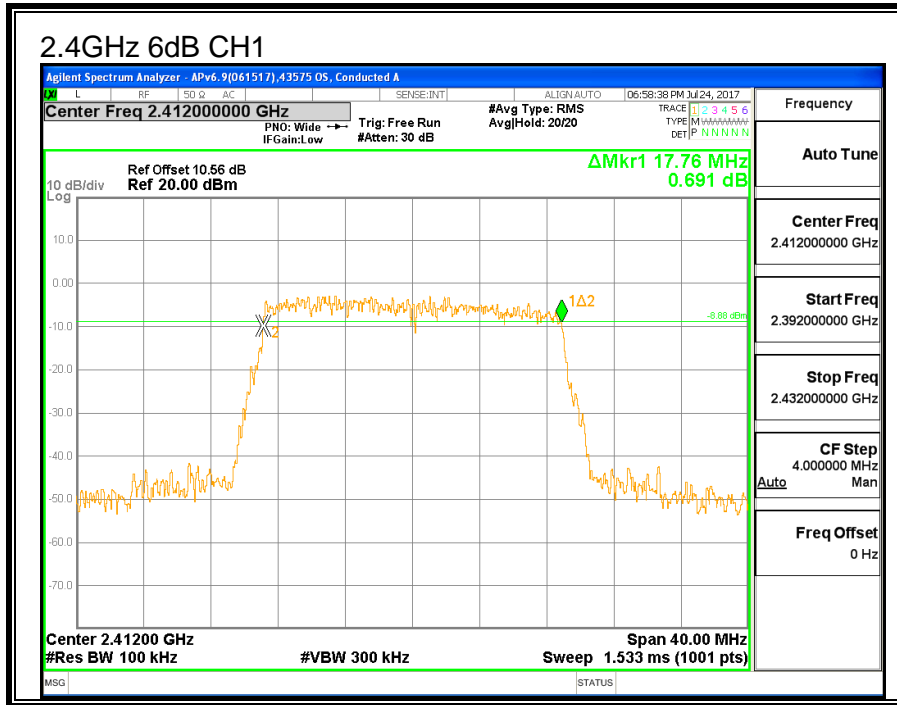
LIMITS

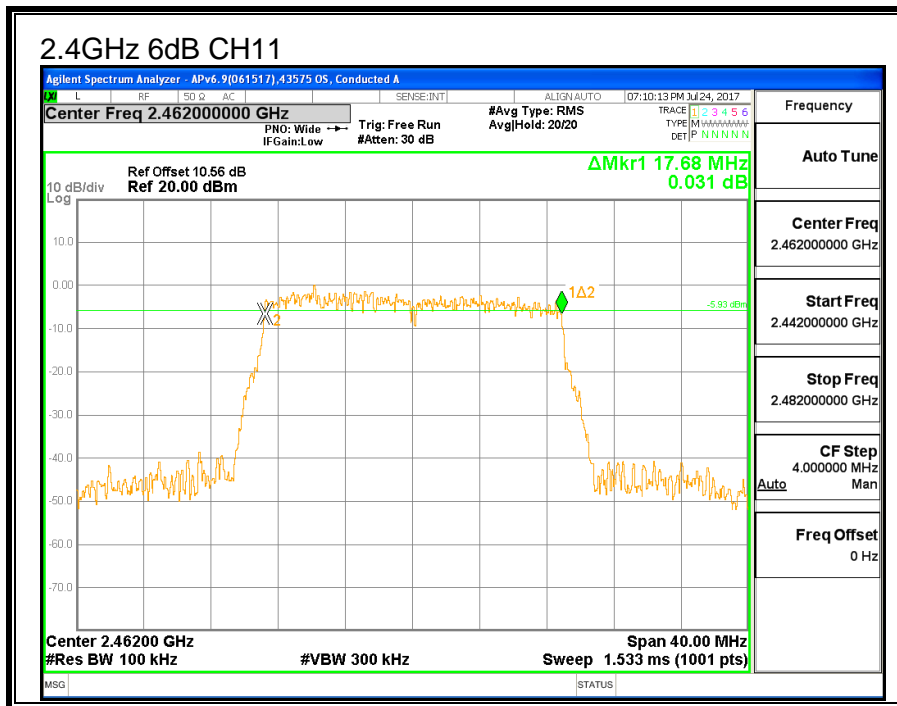
FCC §15.247 (a) (2)

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

RESULTS

Channel	Frequency (MHz)	6 dB BW (MHz)	Minimum Limit (MHz)
CH1	2412	17.76	0.5
CH6	2437	17.72	0.5
CH11	2462	17.68	0.5





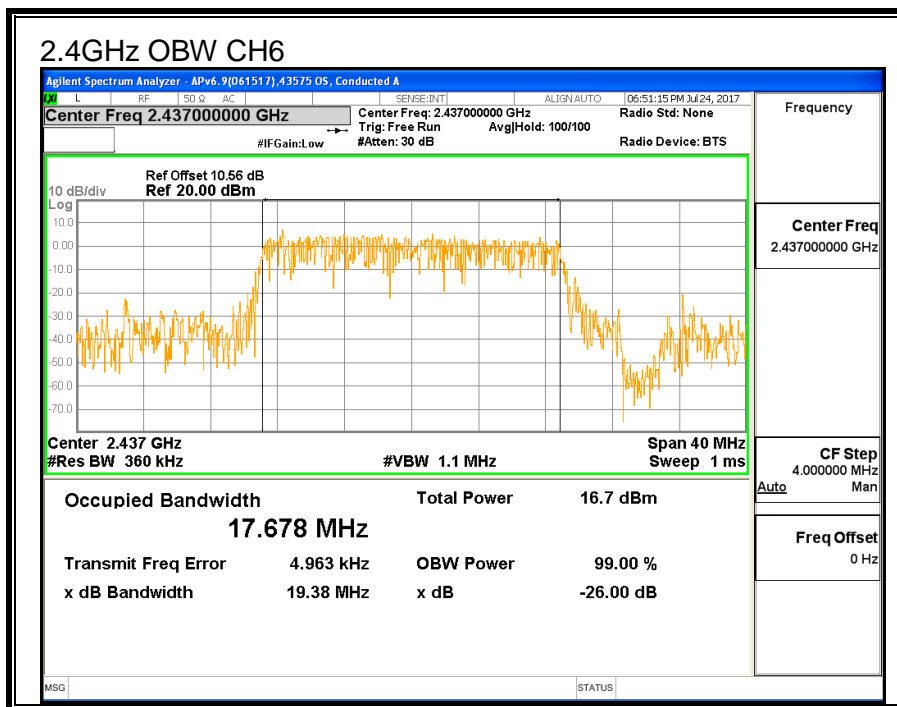
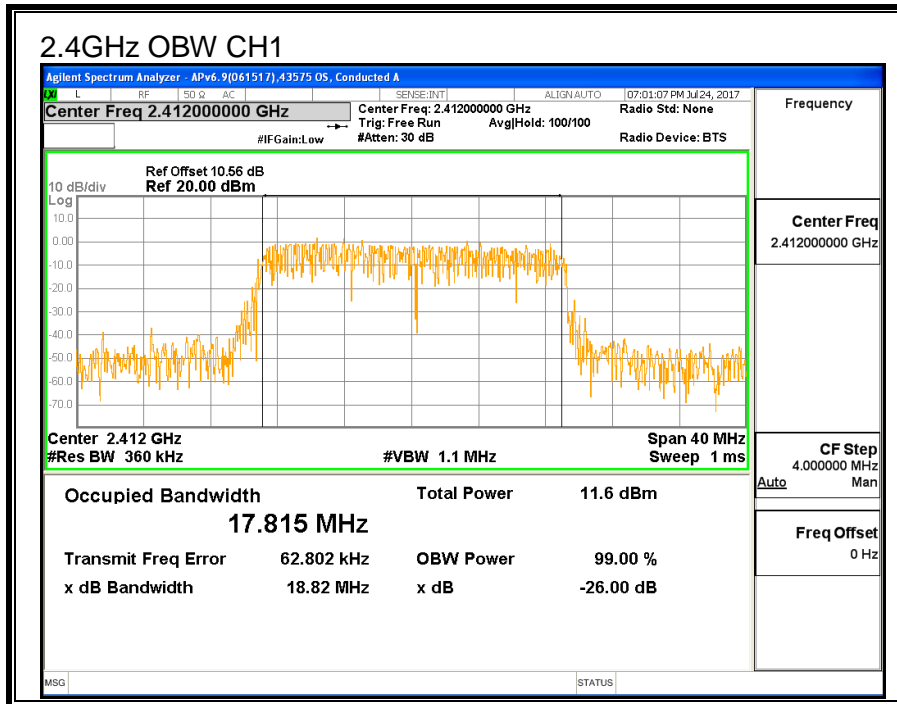
9.4.2. 99% BANDWIDTH

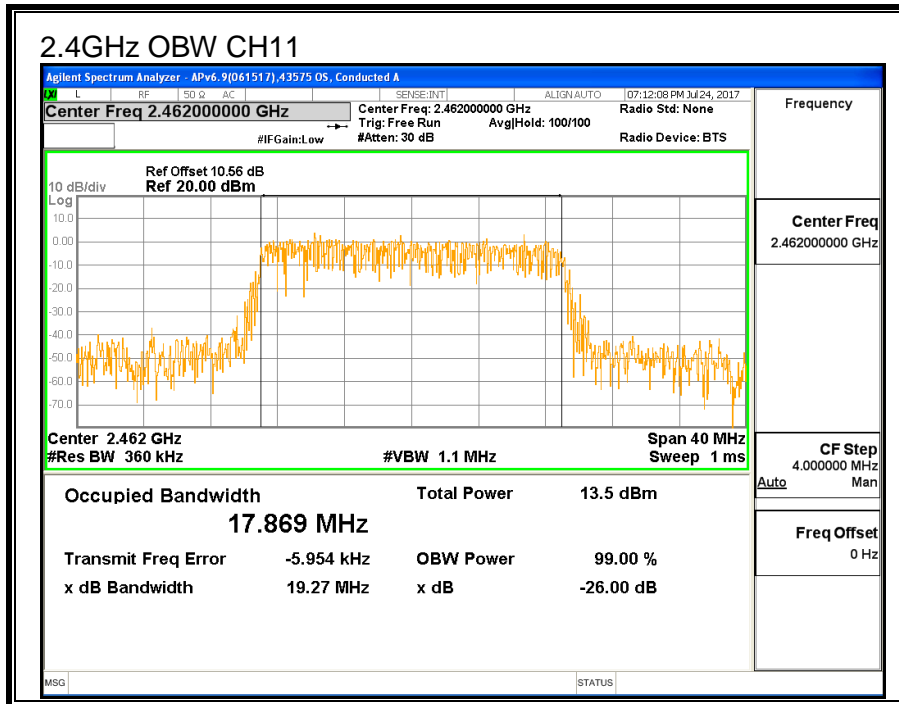
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
CH1	2412	17.815
CH6	2437	17.678
CH11	2462	17.869





9.4.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

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 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.

TEST PROCEDURE

KDB 58074 D01 v04 Section 9.2.3.2

DIRECTIONAL ANTENNA GAIN

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

RESULTS

ID:	43575	Date:	7/24/17
------------	-------	--------------	---------

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-11.30	30.00	30	36	30.00
Mid	2437	-11.30	30.00	30	36	30.00
High	2462	-11.30	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	11.53	11.53	30.00	-18.47
2	2417	15.69	15.69	30.00	-14.31
Mid	2437	16.81	16.81	30.00	-13.19
10	2457	15.75	15.75	30.00	-14.25
High	2462	13.46	13.46	30.00	-16.54

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

9.4.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

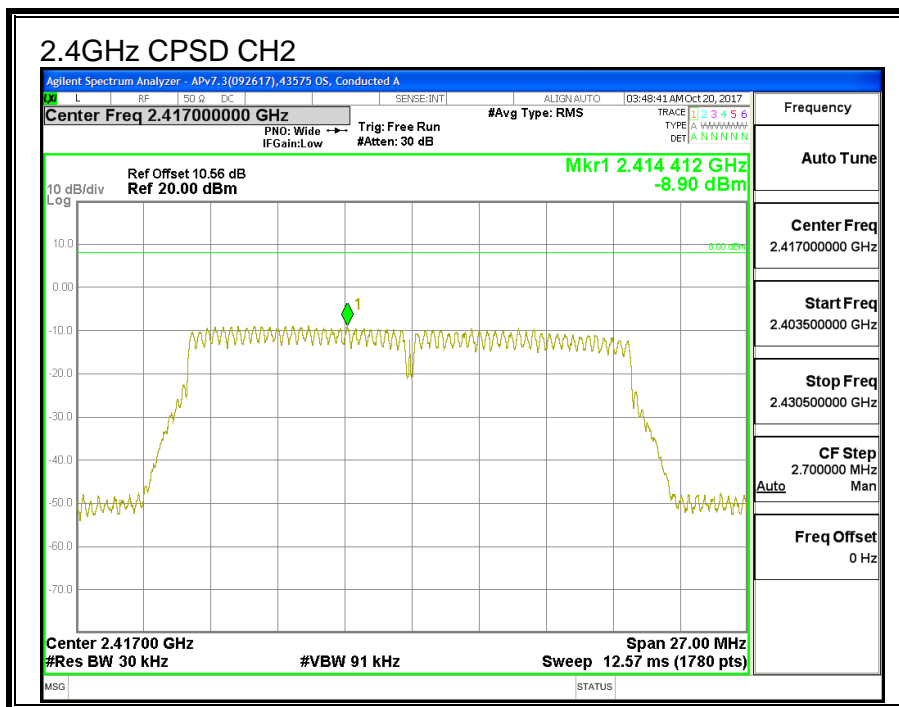
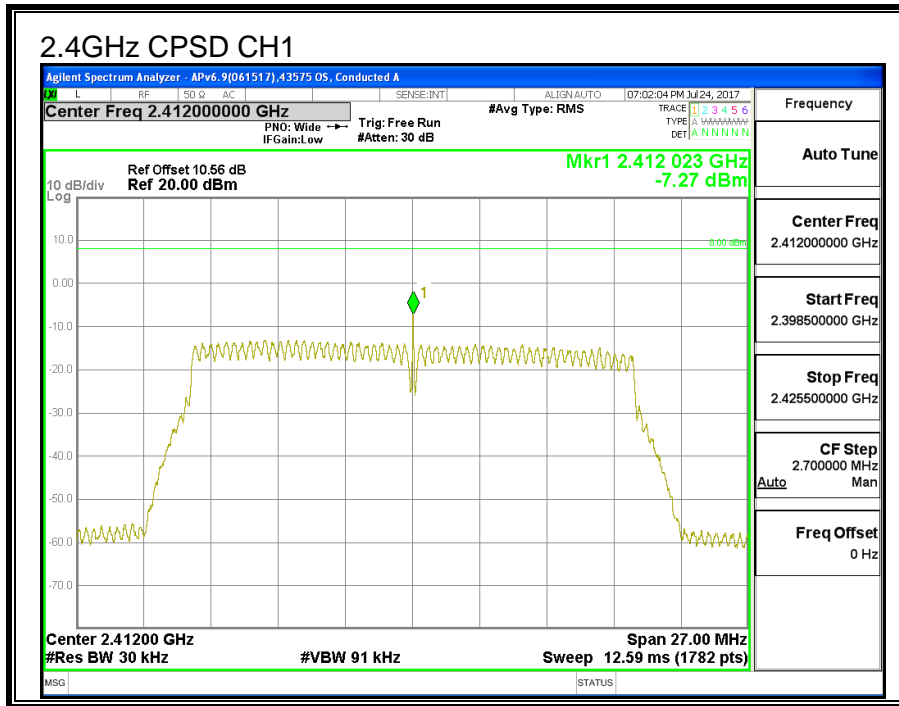
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

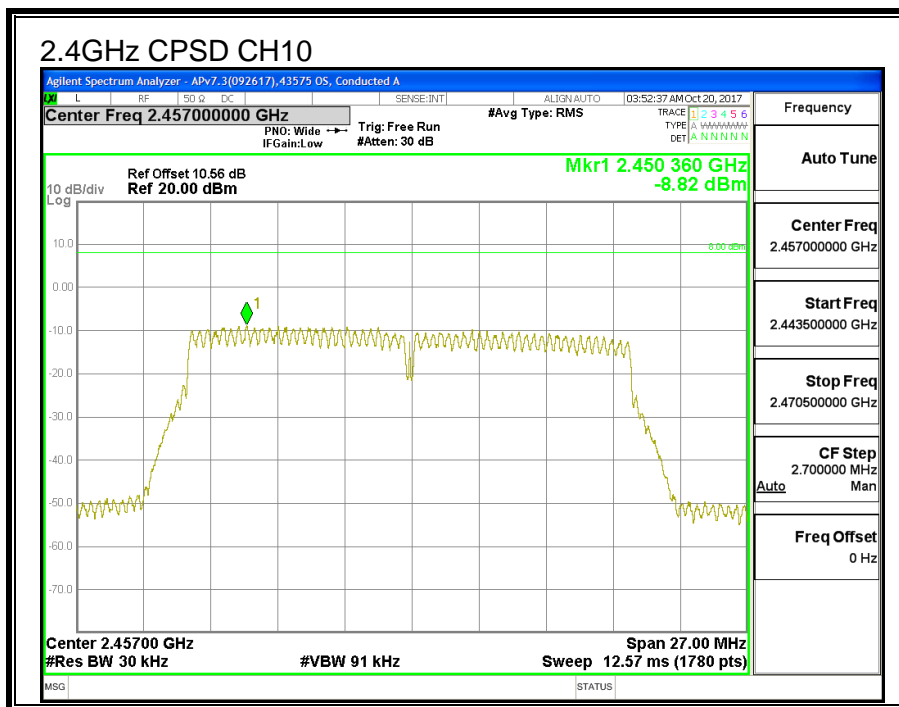
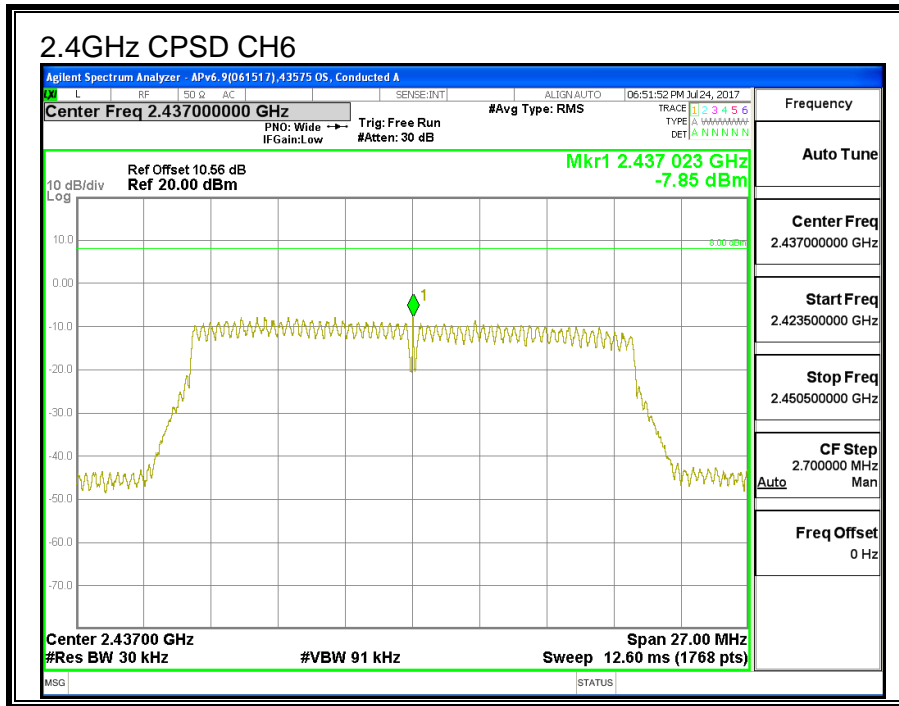
RESULTS

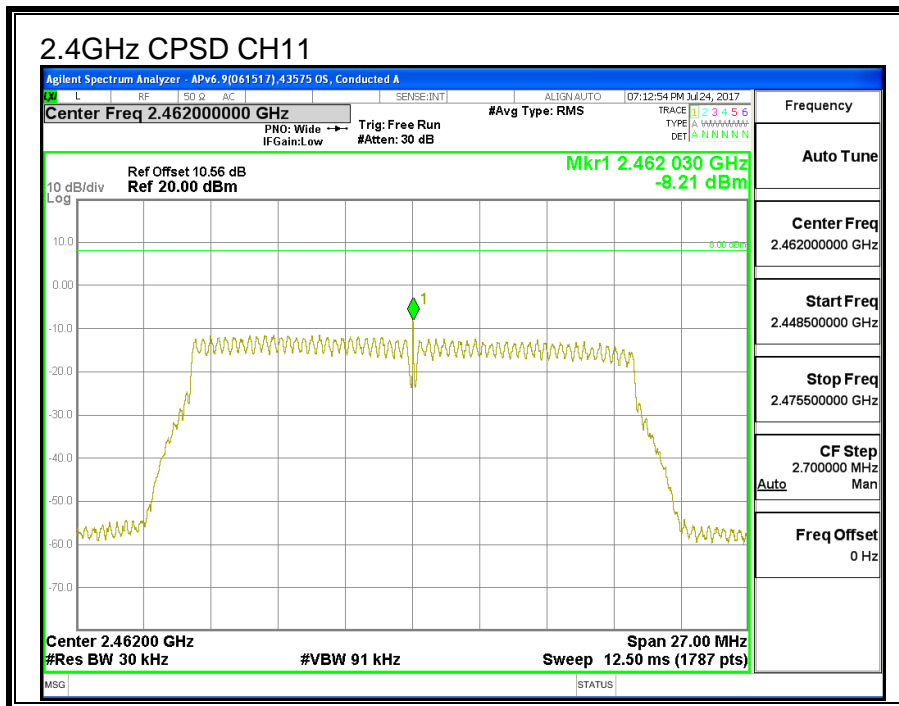
Duty Cycle CF (dB)	0.13	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-7.27	-7.14	8.0	-15.1
2	2417	-8.90	-8.77	8.0	-16.8
Mid	2437	-7.85	-7.72	8.0	-15.7
10	2457	-8.82	-8.69	8.0	-16.7
High	2462	-8.21	-8.08	8.0	-16.1







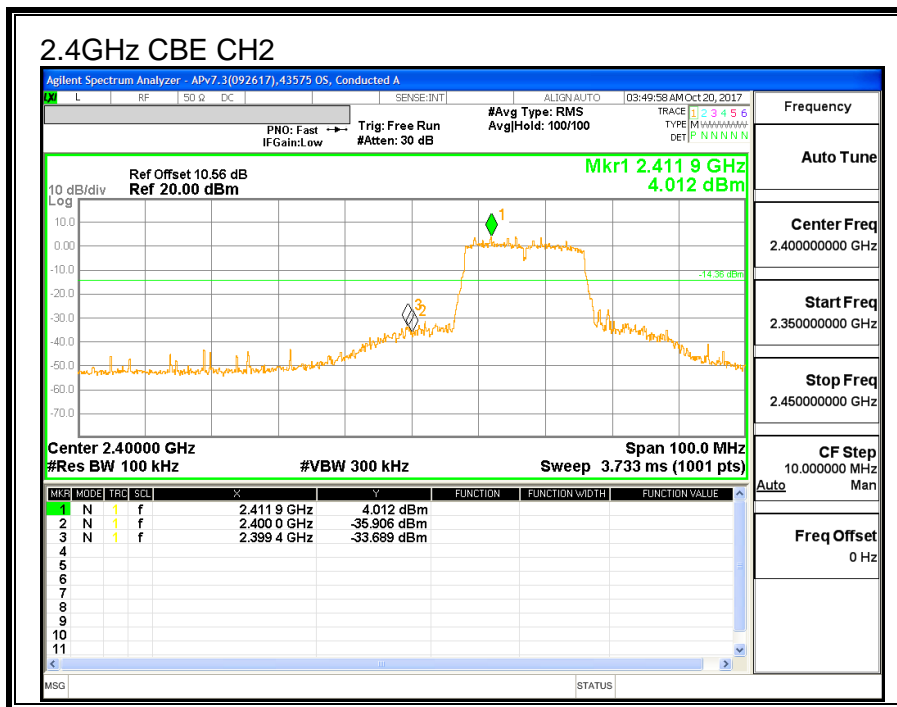
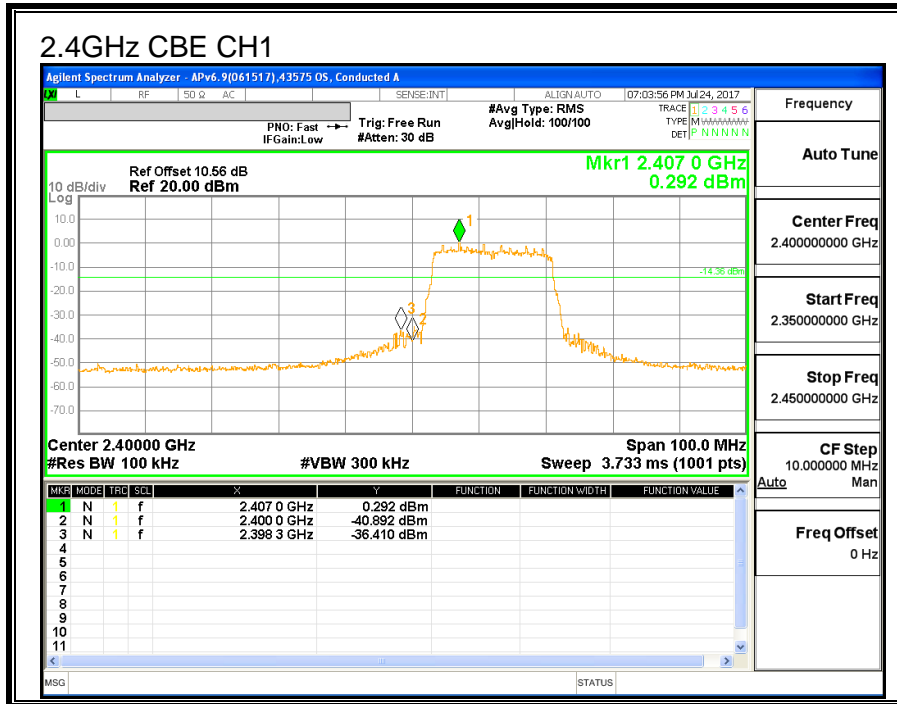
9.4.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

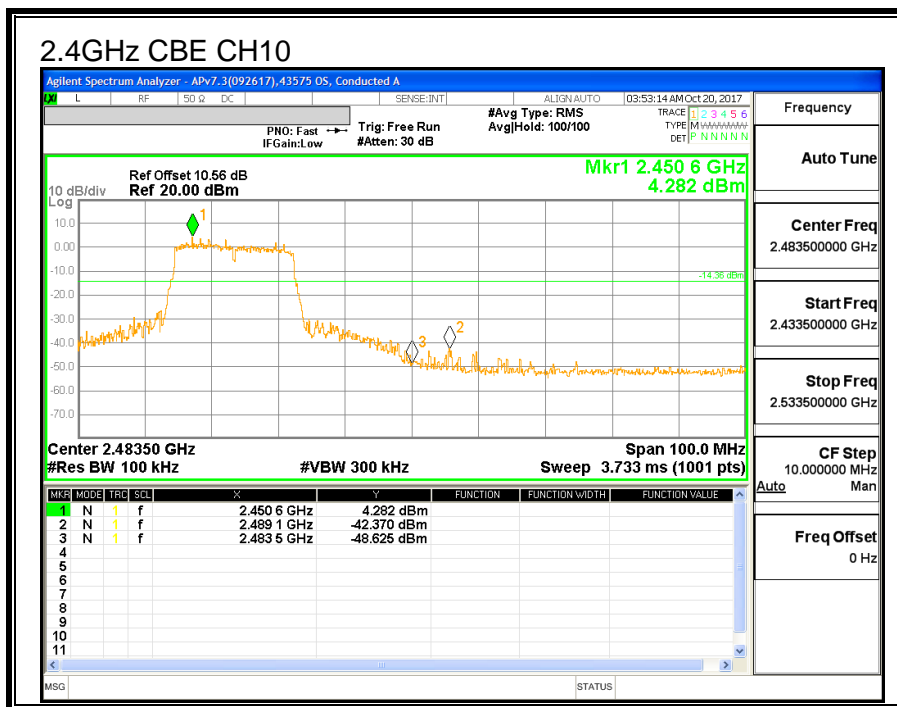
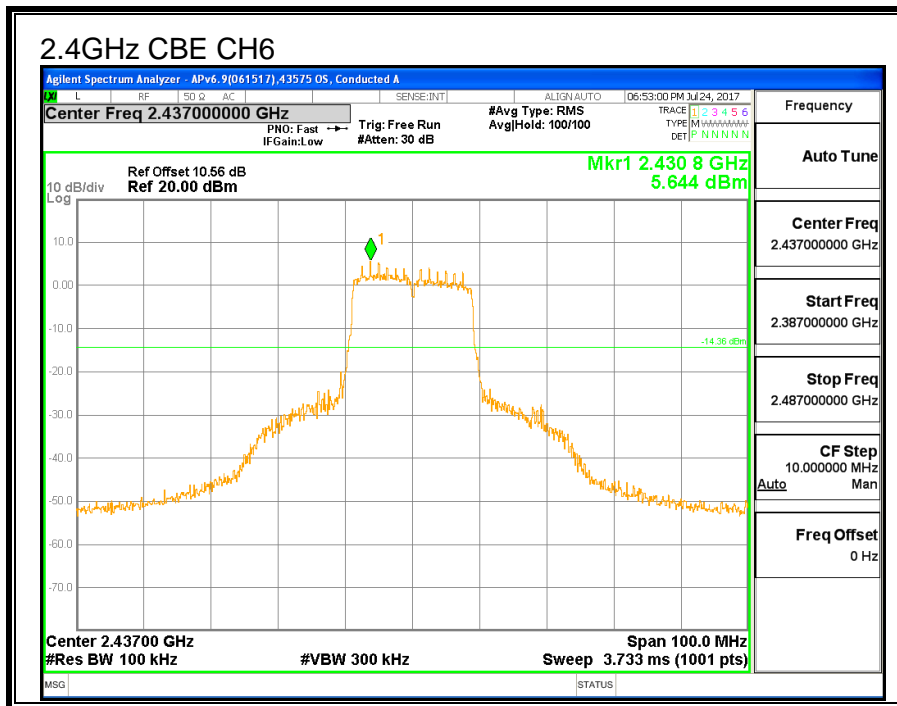
LIMITS

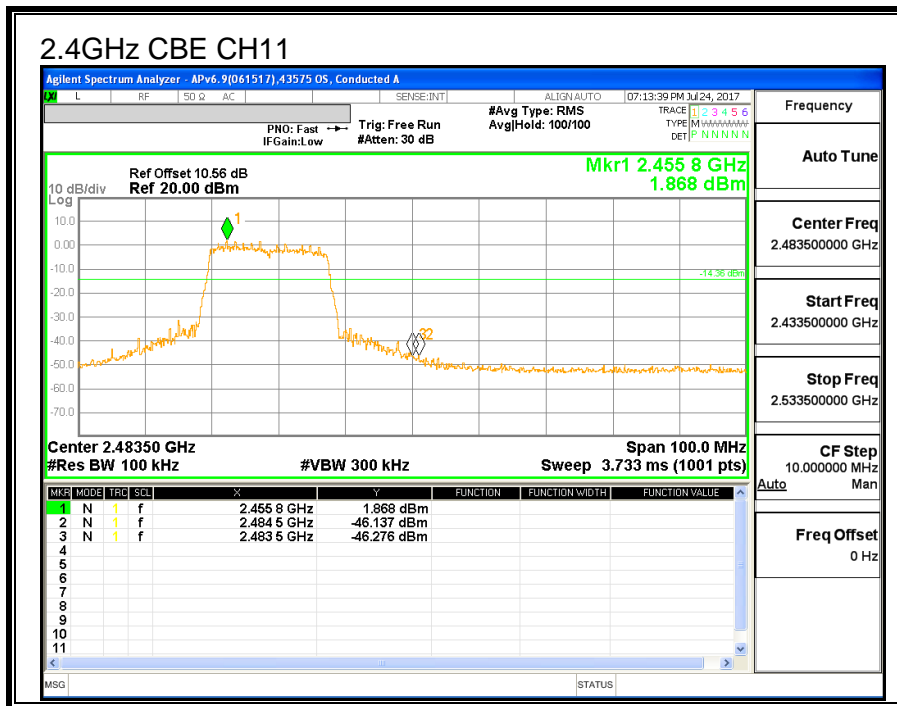
FCC §15.247 (d)

RESULTS

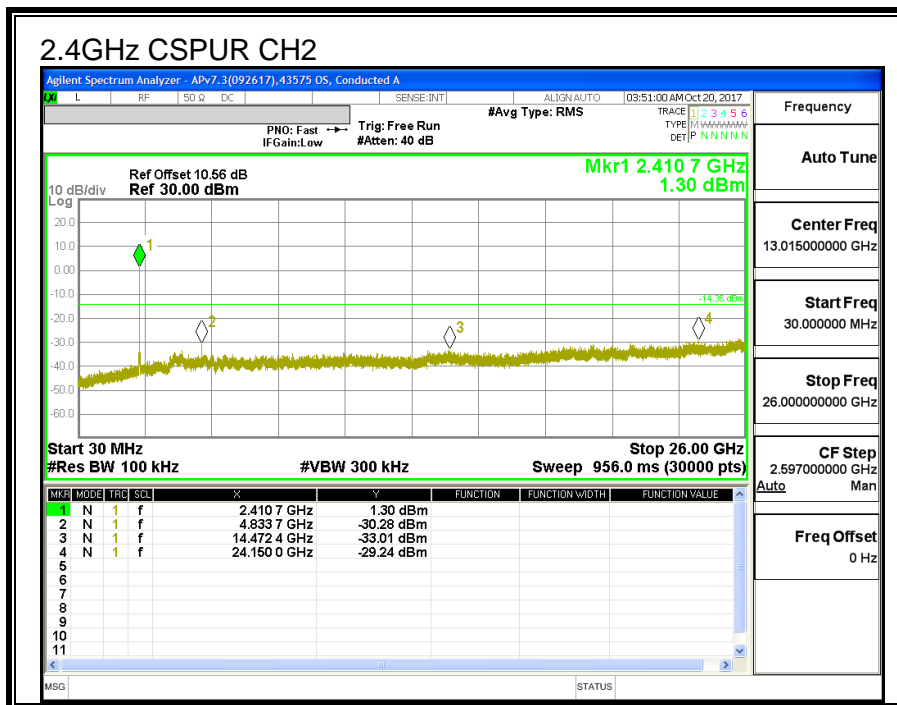
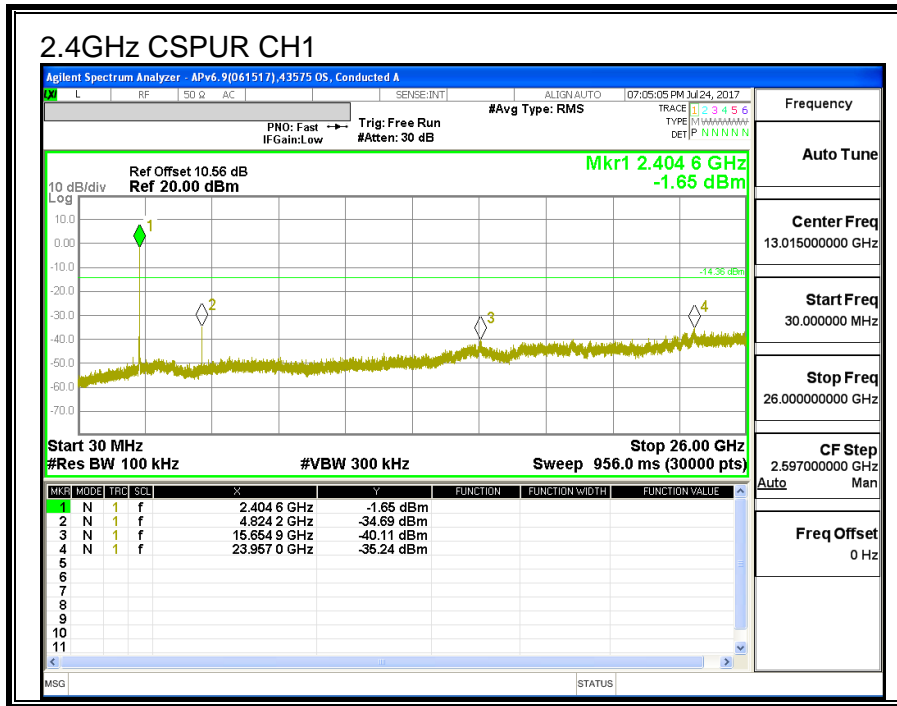
BANDEDGE

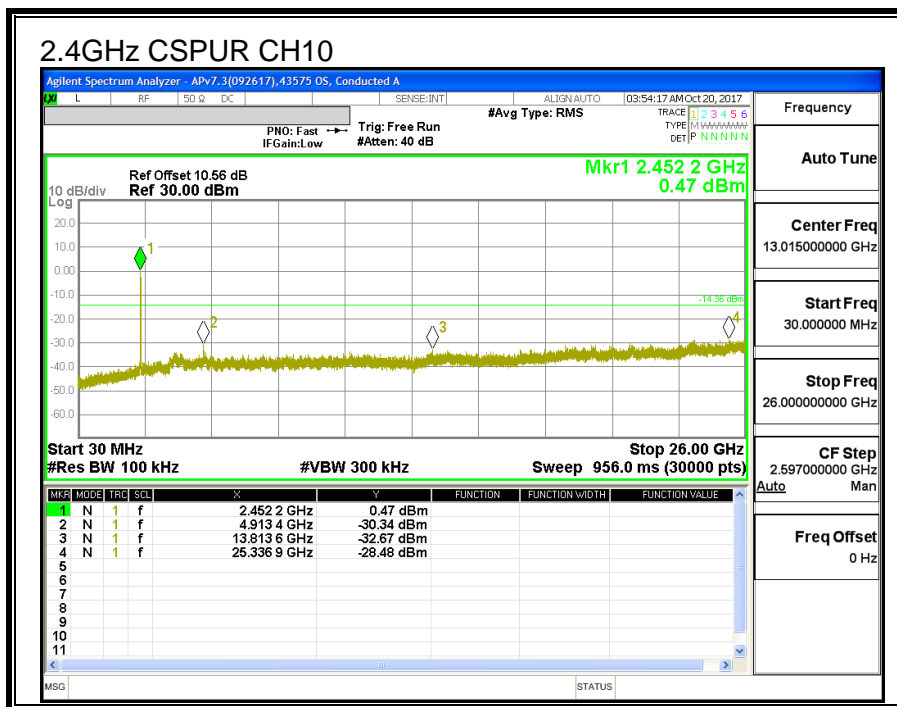
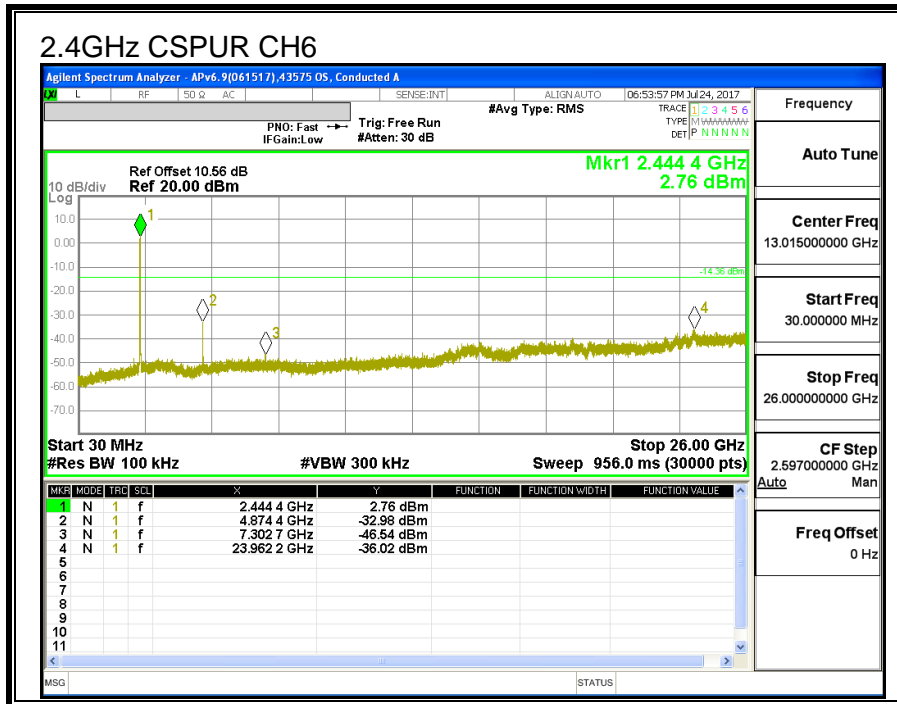


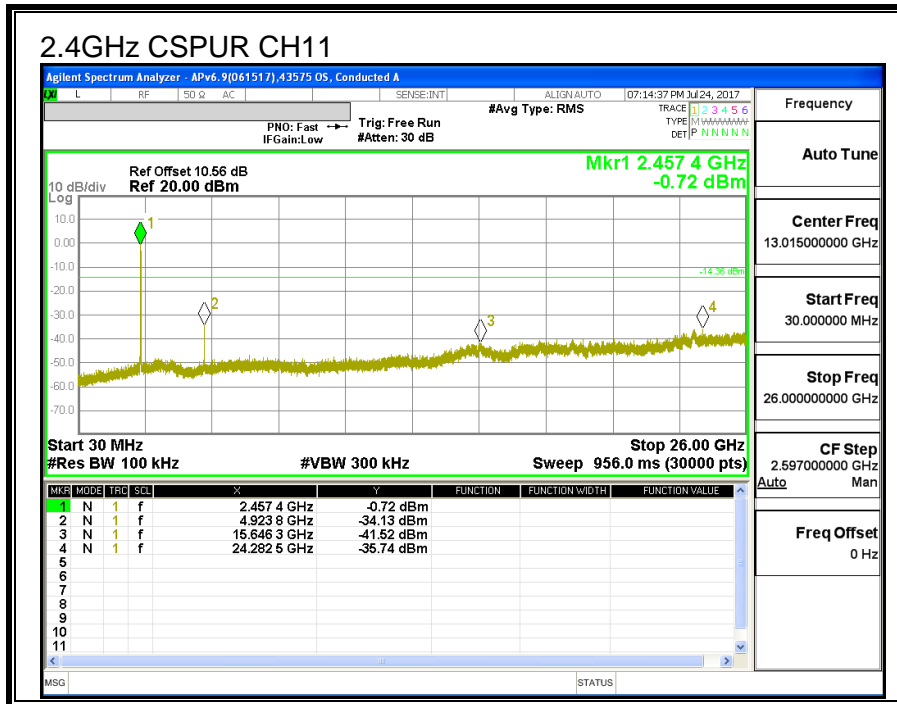




SPURIOUS EMISSIONS







10. RADIATED TEST RESULTS

10.1. 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
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
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 for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. 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 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements for the 30-1000 MHz range, 9 kHz for peak detection measurements or 9 kHz for quasi-peak detection measurements for the 0.15-30 MHz range and 200 Hz for peak detection measurements or 200 Hz for quasi-peak detection measurements for the 9 to 150 kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements.

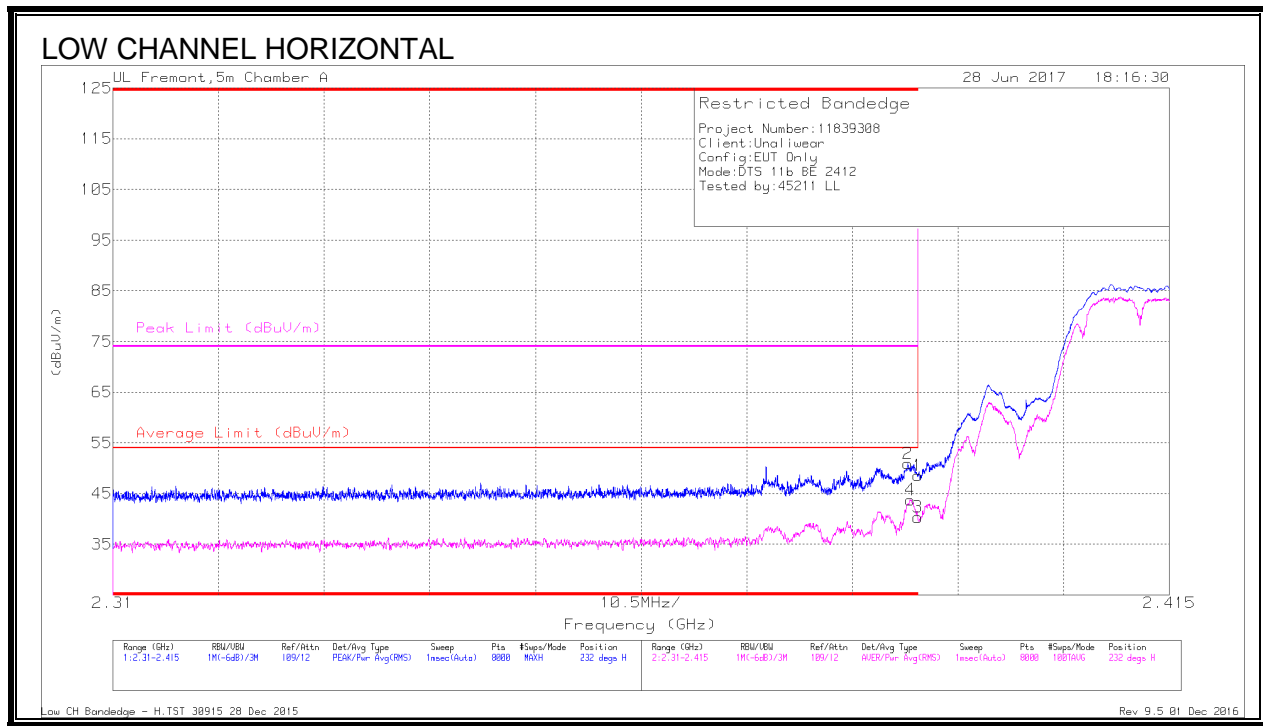
The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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. TRANSMITTER ABOVE 1 GHz

10.2.1 11b MODE IN THE 2.4GHz BAND

AUTHORIZED BANDEDGE (LOW CHANNEL, CH 1)



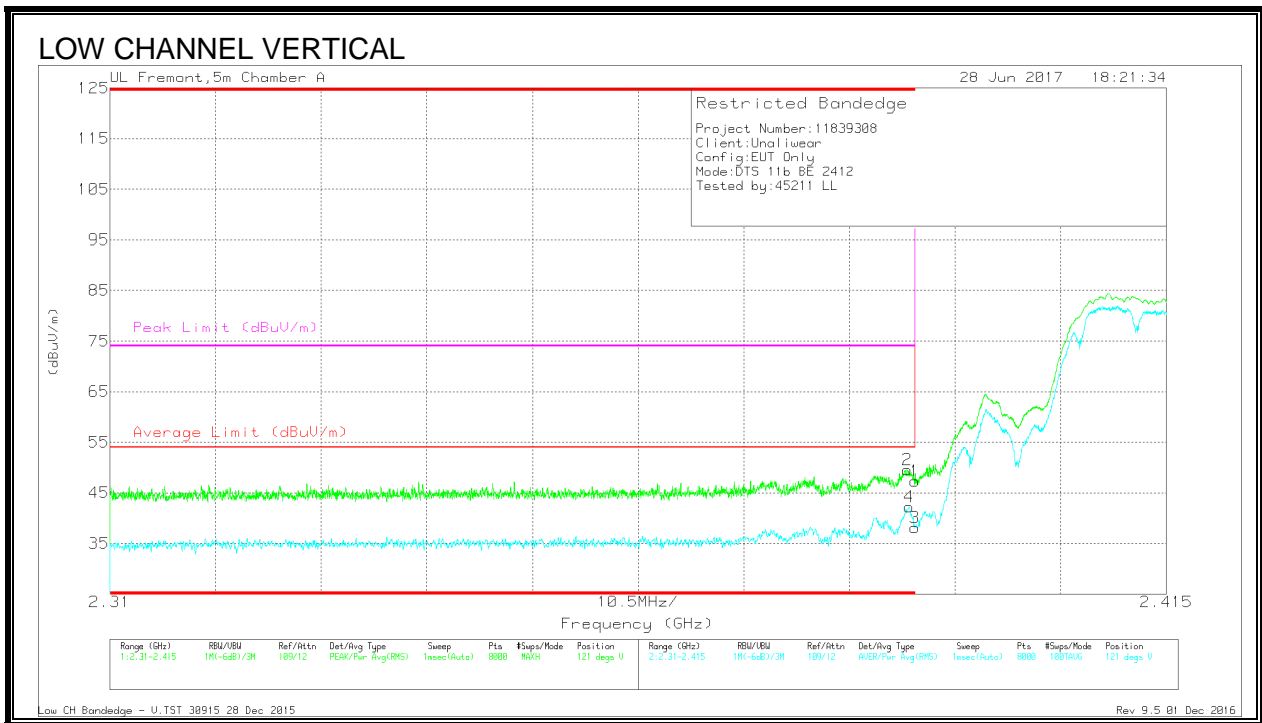
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dBm)	Amp/Cb1/Filtr/P ad (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	39.99	Pk	31.8	-23.2	48.59	-	-	74	-25.41	232	250	H
2	* 2.389	42.28	Pk	31.8	-23.2	50.88	-	-	74	-23.12	232	250	H
3	* 2.39	31.7	RMS	31.8	-23.2	40.3	54	-13.7	-	-	232	250	H
4	* 2.389	35.17	RMS	31.8	-23.2	43.77	54	-10.23	-	-	232	250	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection



Trace Markers

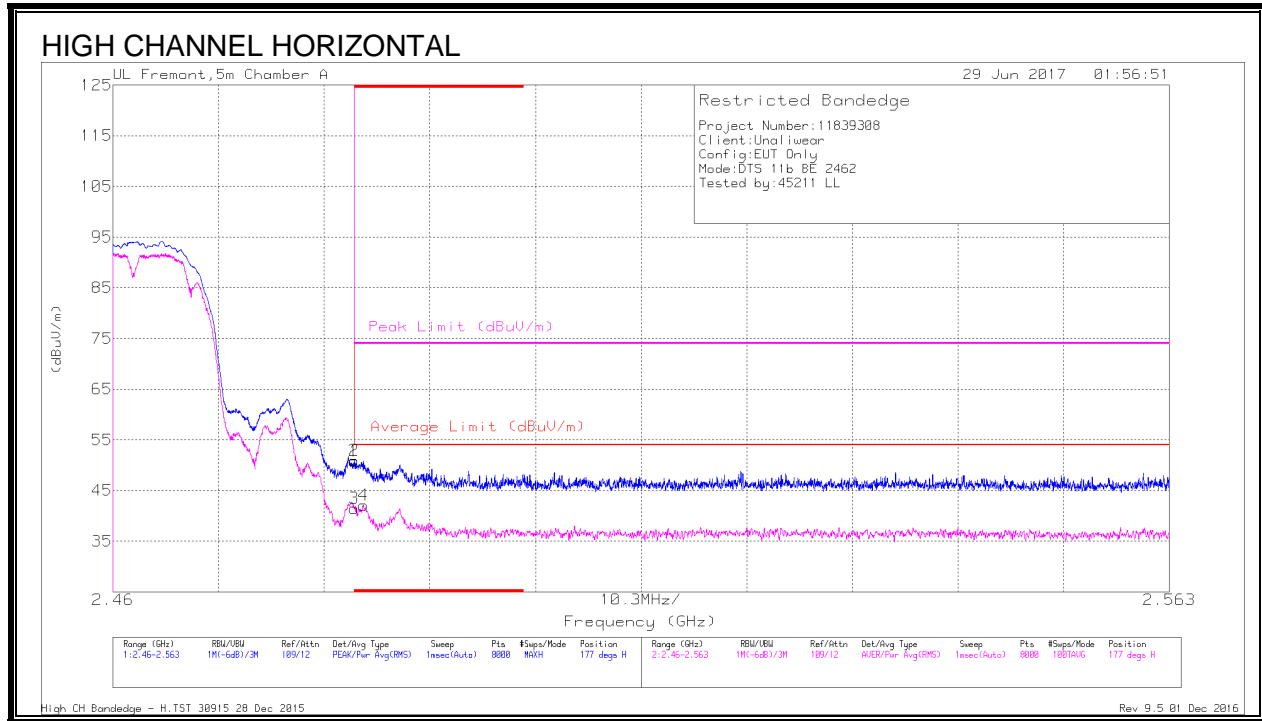
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/P ad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.72	Pk	31.8	-23.2	47.32	-	-	74	-26.68	121	366	V
2	* 2.389	41	Pk	31.8	-23.2	49.6	-	-	74	-24.4	121	366	V
3	* 2.39	29.51	RMS	31.8	-23.2	38.11	54	-15.89	-	-	121	366	V
4	* 2.389	33.6	RMS	31.8	-23.2	42.2	54	-11.8	-	-	121	366	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEGE (HIGH CHANNEL, CH 11)



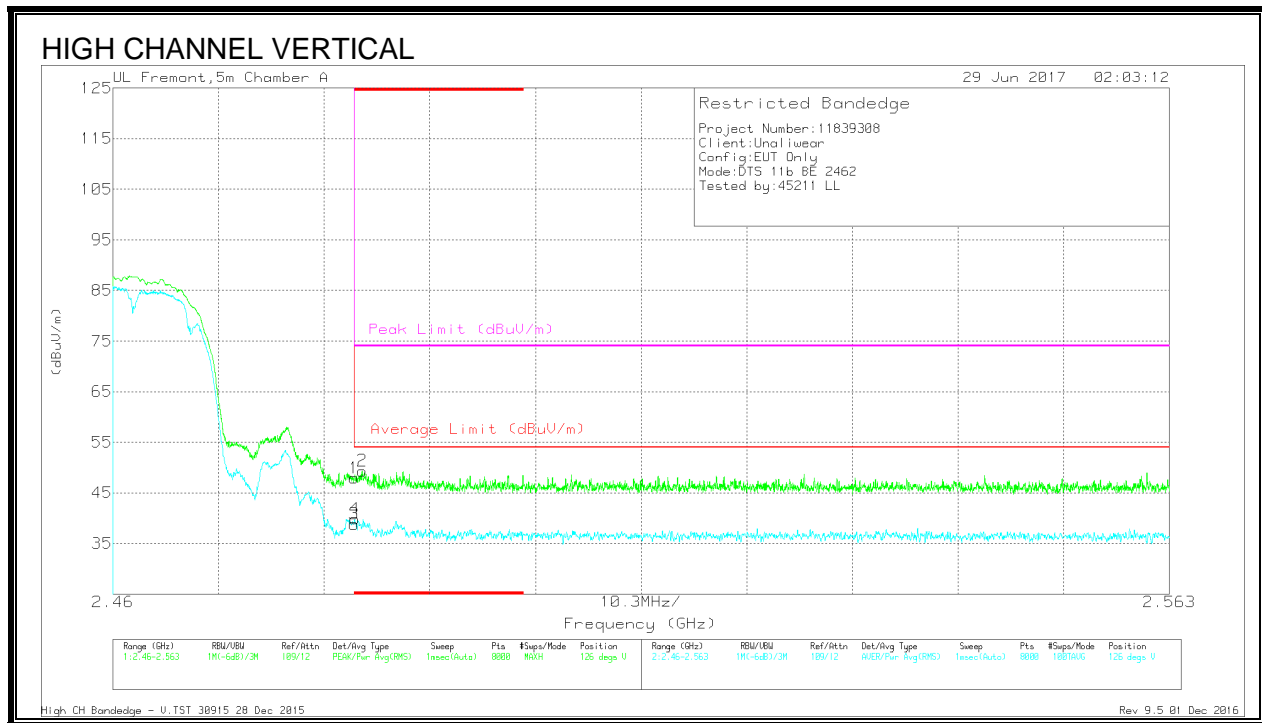
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/P ad (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	41.63	Pk	32.3	-23.1	50.83	-	-	74	-23.17	177	136	H
2	* 2.484	41.72	Pk	32.3	-23.1	50.92	-	-	74	-23.08	177	136	H
3	* 2.484	32.32	RMS	32.3	-23.1	41.52	54	-12.48	-	-	177	136	H
4	* 2.484	32.92	RMS	32.3	-23.1	42.12	54	-11.88	-	-	177	136	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection



Trace Markers

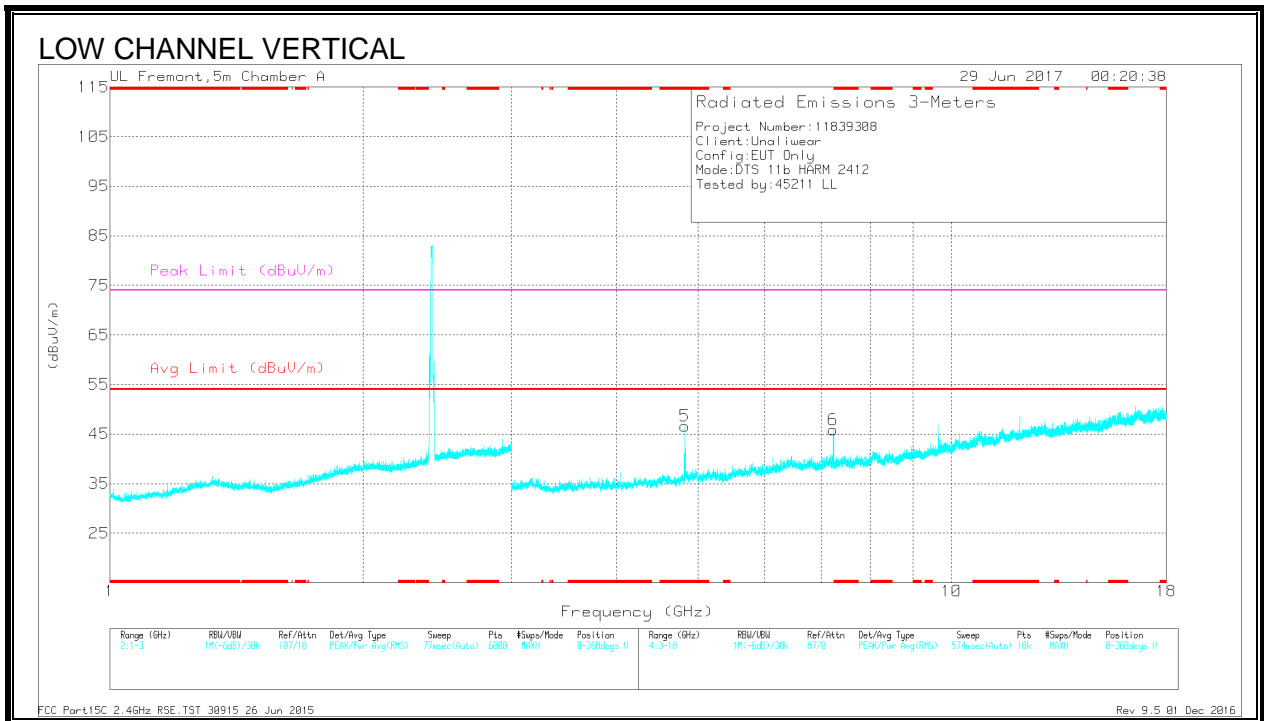
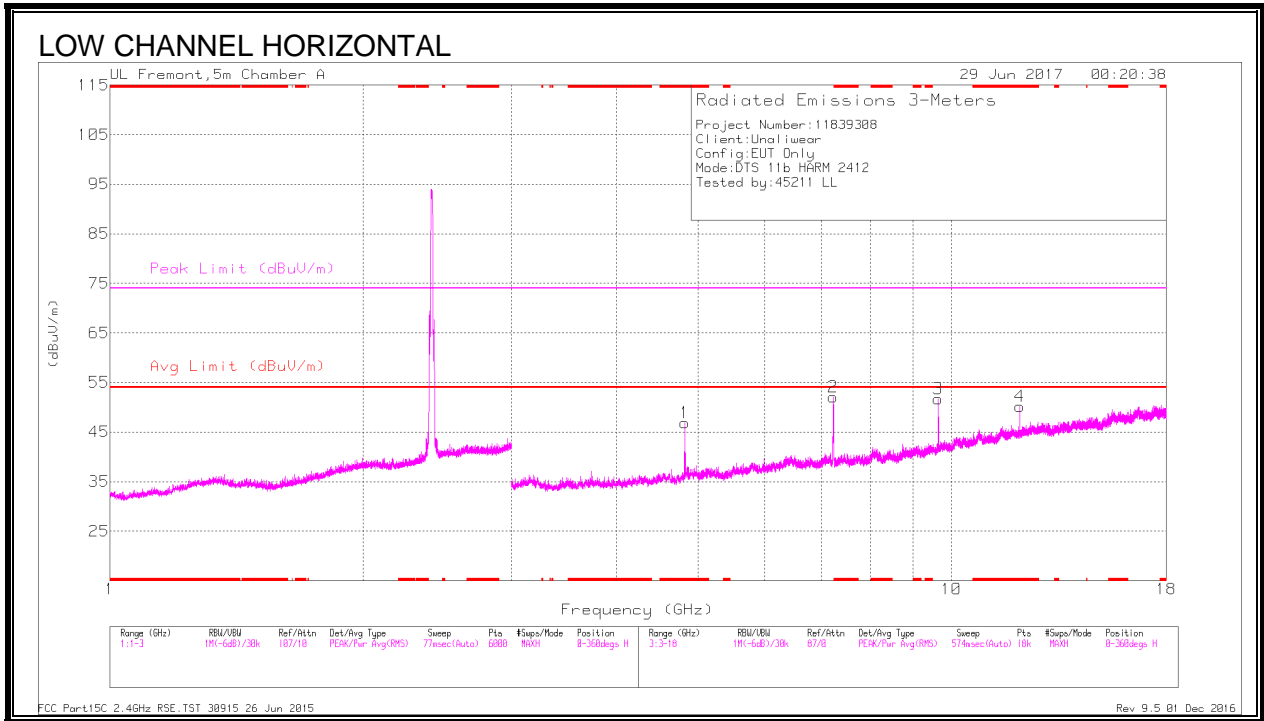
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/P ad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.74	Pk	32.3	-23.1	47.94	-	-	74	-26.06	126	367	V
2	* 2.484	40.16	Pk	32.3	-23.1	49.36	-	-	74	-24.64	126	367	V
3	* 2.484	29.61	RMS	32.3	-23.1	38.81	54	-15.19	-	-	126	367	V
4	* 2.484	30.71	RMS	32.3	-23.1	39.91	54	-14.09	-	-	126	367	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, CH 1)

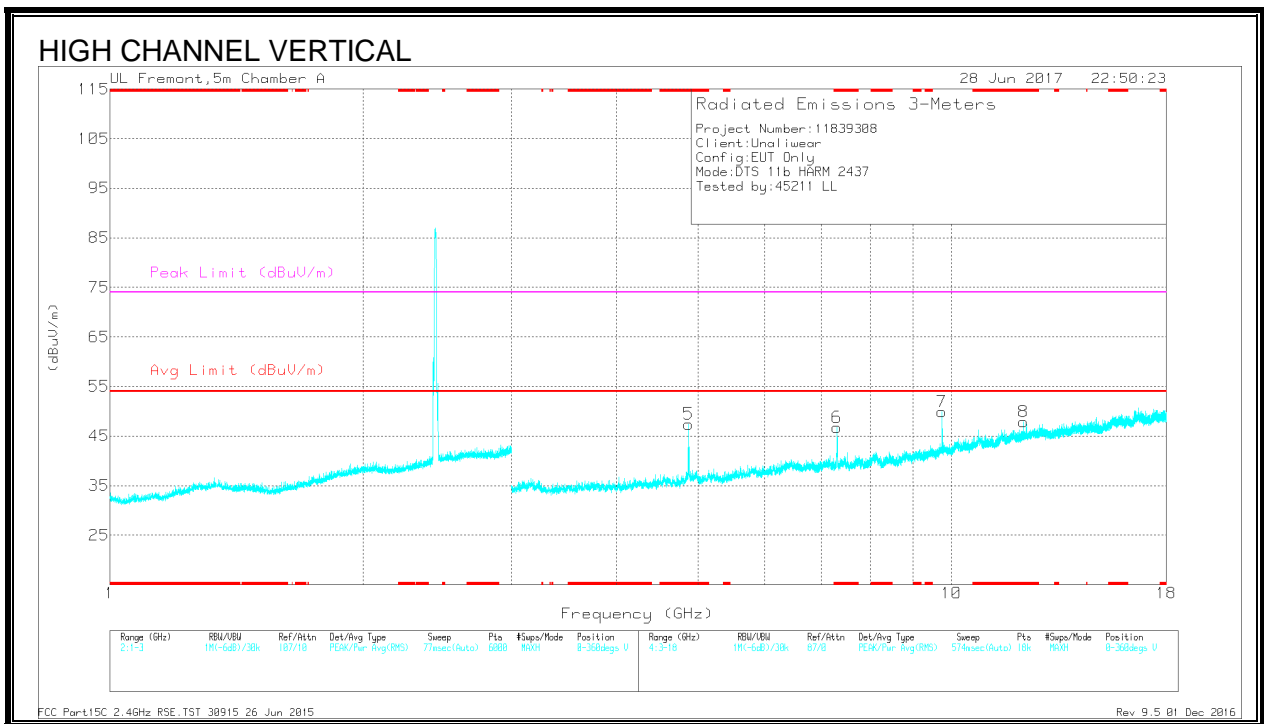
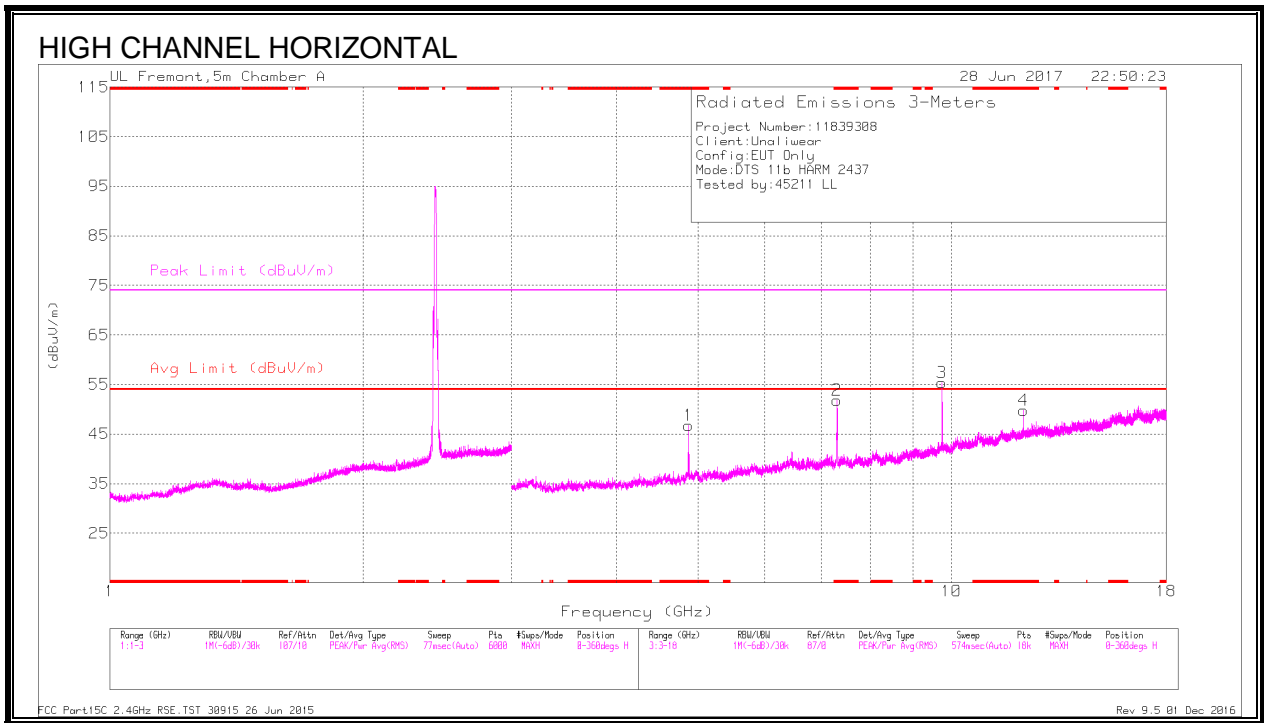


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	42.24	PK2	34.2	-27.3	49.14	-	-	74	-24.86	76	101	H
* 4.824	38	MAv1	34.2	-27.3	44.9	54	-9.1	-	-	76	101	H
* 12.06	36.36	PK2	38.9	-19.2	56.06	-	-	74	-17.94	107	102	H
* 12.06	30.34	MAv1	38.9	-19.2	50.04	54	-3.96	-	-	107	102	H
* 4.824	43.53	PK2	34.2	-27.3	50.43	-	-	74	-23.57	145	232	V
* 4.824	39.51	MAv1	34.2	-27.3	46.41	54	-7.59	-	-	145	232	V
7.236	43.42	PK2	35.7	-24.1	55.02	-	-	-	-	81	222	H
7.239	38.79	MAv1	35.7	-24.1	50.39	-	-	-	-	81	222	H
7.239	39.93	PK2	35.7	-24.1	51.53	-	-	-	-	150	391	V
7.239	33.64	MAv1	35.7	-24.1	45.24	-	-	-	-	150	391	V
9.648	38.37	PK2	36.8	-21.2	53.97	-	-	-	-	151	101	H
9.648	34.05	MAv1	36.8	-21.2	49.65	-	-	-	-	151	101	H

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, CH 6)

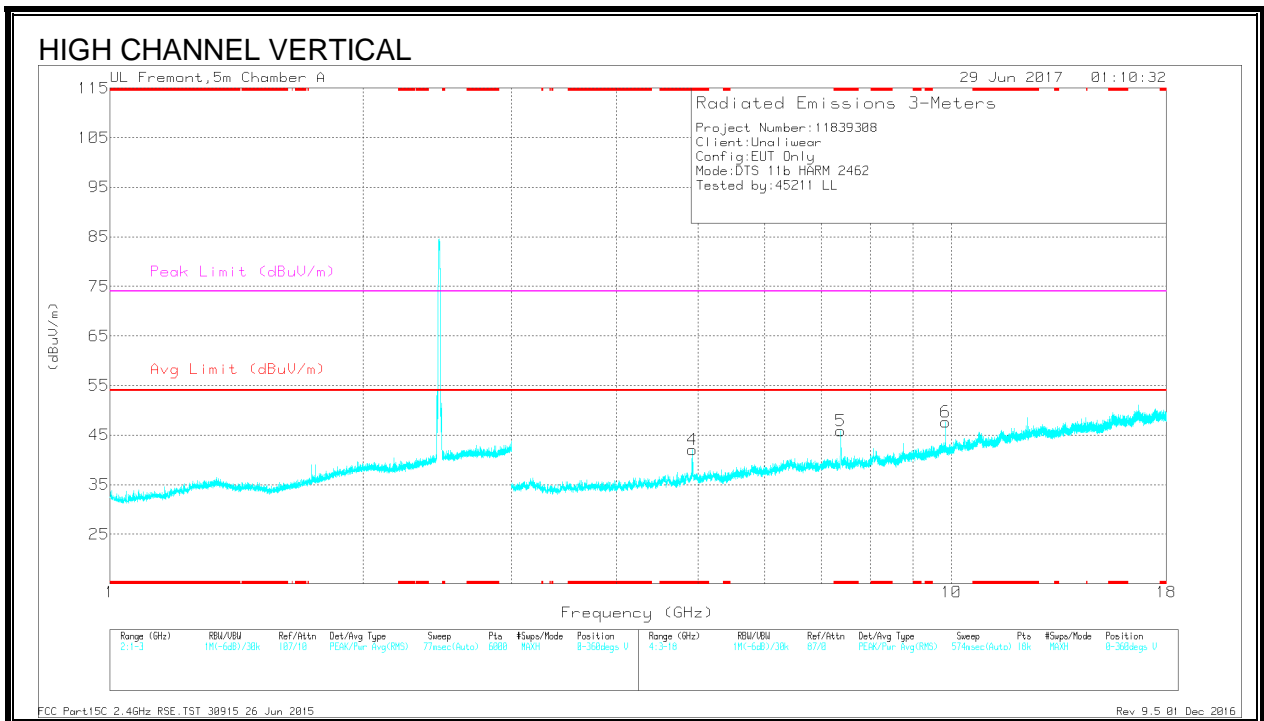
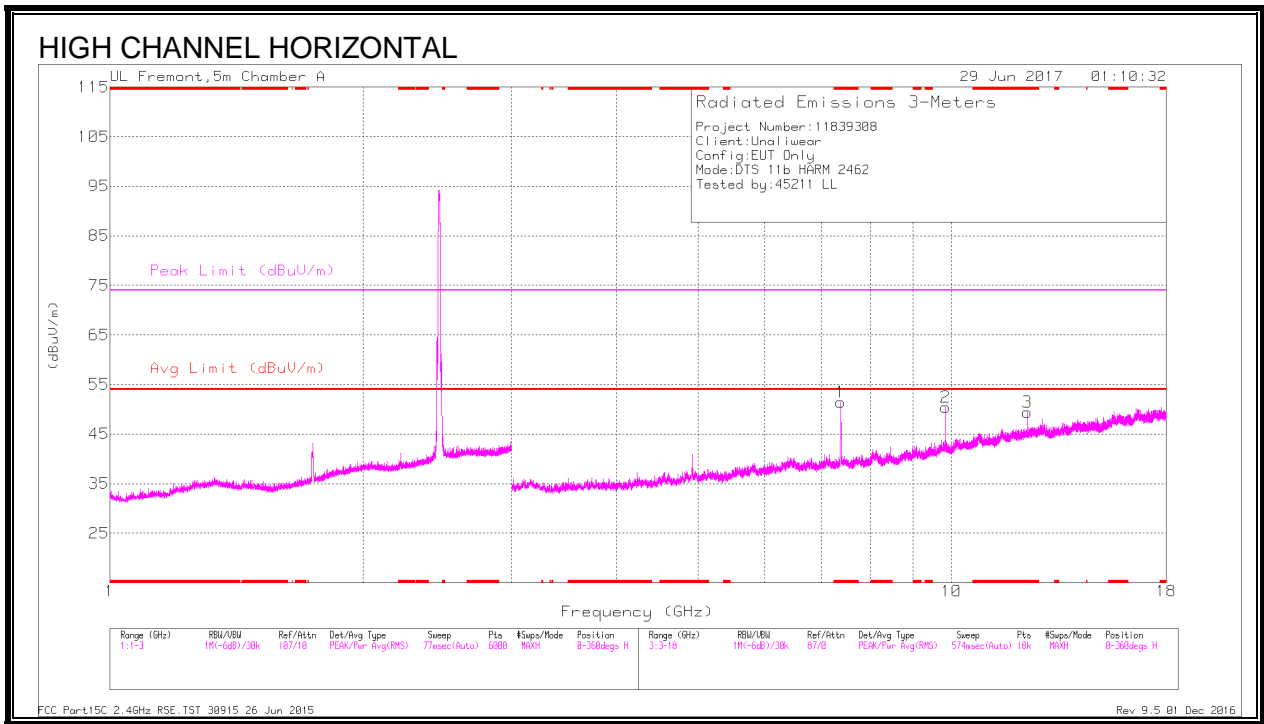


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	42.22	PK2	34.1	-27.2	49.12	-	-	74	-24.88	75	101	H
* 4.874	37.5	MAv1	34.1	-27.2	44.4	54	-9.6	-	-	75	101	H
* 7.313	42.83	PK2	35.7	-24	54.53	-	-	74	-19.47	80	102	H
* 7.312	38.18	MAv1	35.7	-24.1	49.78	54	-4.22	-	-	80	102	H
* 12.185	35	PK2	39	-19.2	54.8	-	-	74	-19.2	173	210	H
* 12.185	28.06	MAv1	39	-19.2	47.86	54	-6.14	-	-	173	210	H
* 4.874	42.81	PK2	34.1	-27.2	49.71	-	-	74	-24.29	135	241	V
* 4.874	39.22	MAv1	34.1	-27.2	46.12	54	-7.88	-	-	135	241	V
* 7.313	41.38	PK2	35.7	-24	53.08	-	-	74	-20.92	135	353	V
* 7.312	36.31	MAv1	35.7	-24.1	47.91	54	-6.09	-	-	135	353	V
* 12.185	33.57	PK2	39	-19.2	53.37	-	-	74	-20.63	174	371	V
* 12.185	25.18	MAv1	39	-19.2	44.98	54	-9.02	-	-	174	371	V
9.748	38.56	PK2	36.9	-20.7	54.76	-	-	-	-	150	101	H
9.748	33.98	MAv1	36.9	-20.7	50.18	-	-	-	-	150	101	H
9.748	36.81	PK2	36.9	-20.7	53.01	-	-	-	-	130	218	V
9.748	30.94	MAv1	36.9	-20.7	47.14	-	-	-	-	130	218	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, CH 11)



Radiated Emissions

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
* 7.389	41.73	PK2	35.6	-22.9	54.43	-	-	74	-19.57	258	105	H
* 7.388	36.56	MAv1	35.6	-22.9	49.26	54	-4.74	-	-	258	105	H
* 12.31	35.07	PK2	38.9	-19.1	54.87	-	-	74	-19.13	282	104	H
* 12.31	27.77	MAv1	38.9	-19.1	47.57	54	-6.43	-	-	282	104	H
* 4.924	40.08	PK2	34.1	-27.1	47.08	-	-	74	-26.92	325	226	V
* 4.924	35.05	MAv1	34.1	-27.1	42.05	54	-11.95	-	-	325	226	V
* 7.387	40.14	PK2	35.6	-22.9	52.84	-	-	74	-21.16	308	356	V
* 7.388	34.5	MAv1	35.6	-22.9	47.2	54	-6.8	-	-	308	356	V
9.848	37.89	PK2	37.1	-20.6	54.39	-	-	-	-	208	241	H
9.848	33.15	MAv1	37.1	-20.6	49.65	-	-	-	-	208	241	H
9.848	36.41	PK2	37.1	-20.6	52.91	-	-	-	-	109	102	V
9.848	29.61	MAv1	37.1	-20.6	46.11	-	-	-	-	109	102	V

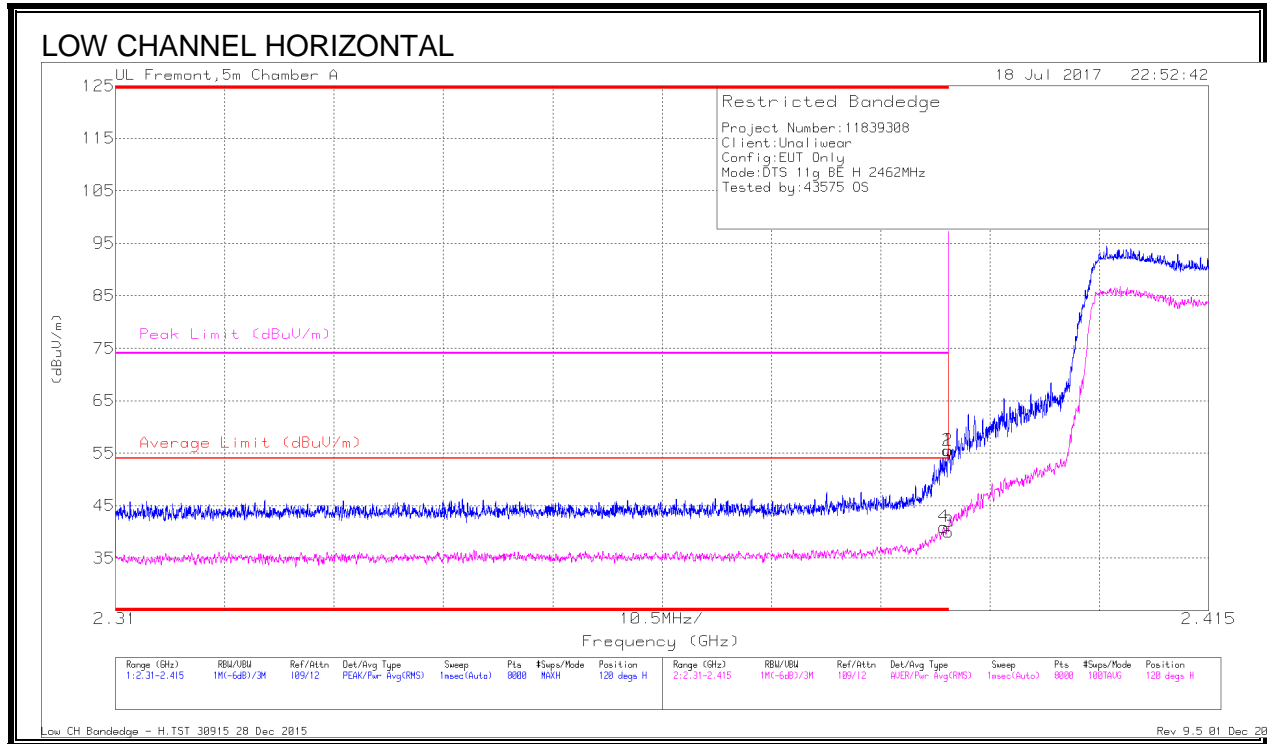
* - indicates frequency in CFR47 Pt 15 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

10.2.2 11g MODE IN THE 2.4GHz BAND

AUTHORIZED BANDEDGE (LOW CHANNEL, CH 1)



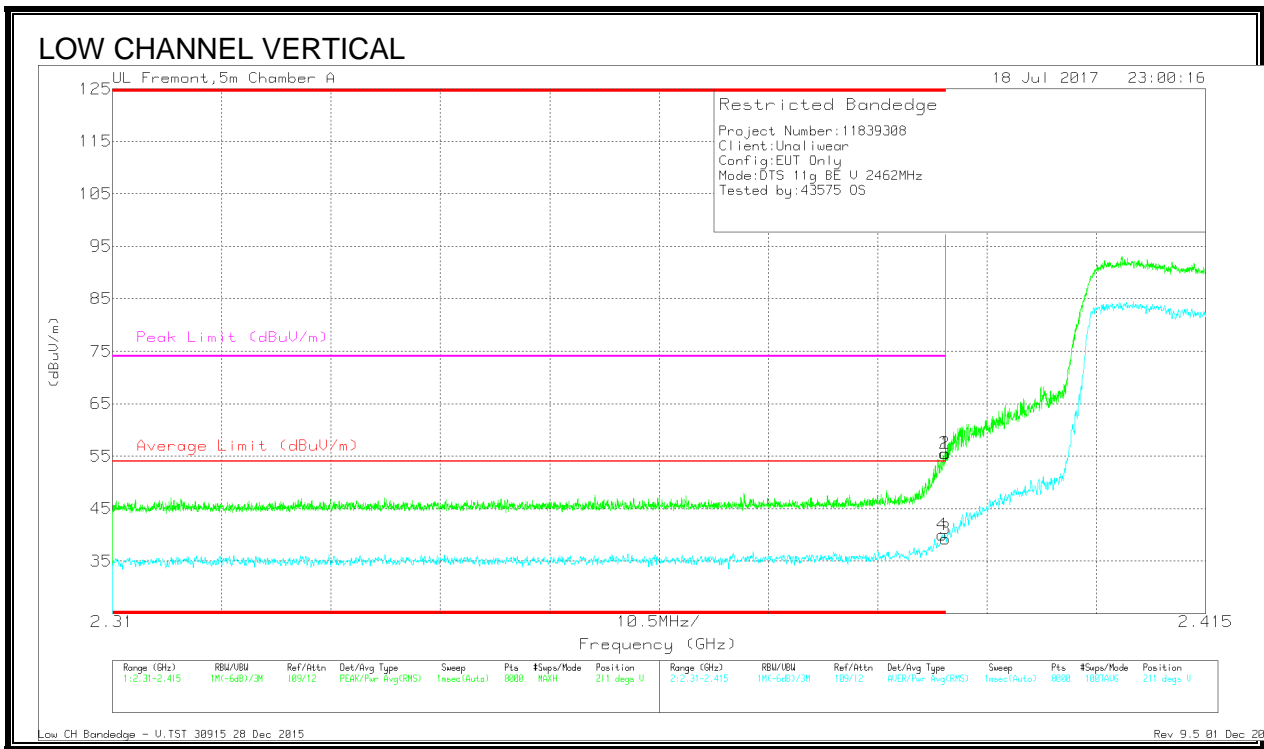
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T662 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	DC Corr (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	46.85	Pk	31.8	-23.2	0	55.45	-	-	74	-18.55	120	355	H
2	* 2.39	46.93	Pk	31.8	-23.2	0	55.53	-	-	74	-18.47	120	355	H
3	* 2.39	31.19	RMS	31.8	-23.2	.14	39.93	54	-14.07	-	-	120	355	H
4	* 2.39	32.18	RMS	31.8	-23.2	.14	40.92	54	-13.08	-	-	120	355	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

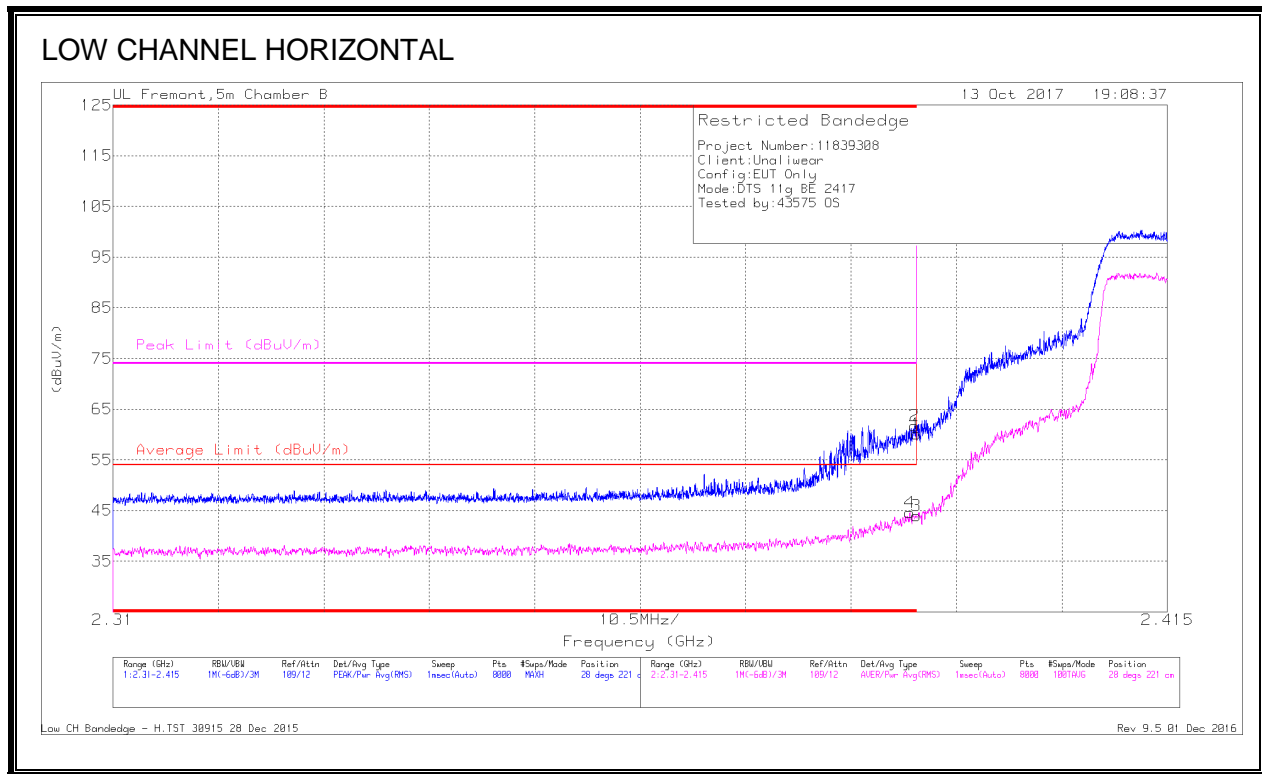


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (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	46.89	Pk	31.8	-23.2	0	55.49	-	-	74	-18.51	211	354	V
2	* 2.39	46.95	Pk	31.8	-23.2	0	55.55	-	-	74	-18.45	211	354	V
3	* 2.39	30.45	RMS	31.8	-23.2	.14	39.19	54	-14.81	-	-	211	354	V
4	* 2.39	31.2	RMS	31.8	-23.2	.14	39.94	54	-14.06	-	-	211	354	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 Pk - Peak detector
 RMS - RMS detection

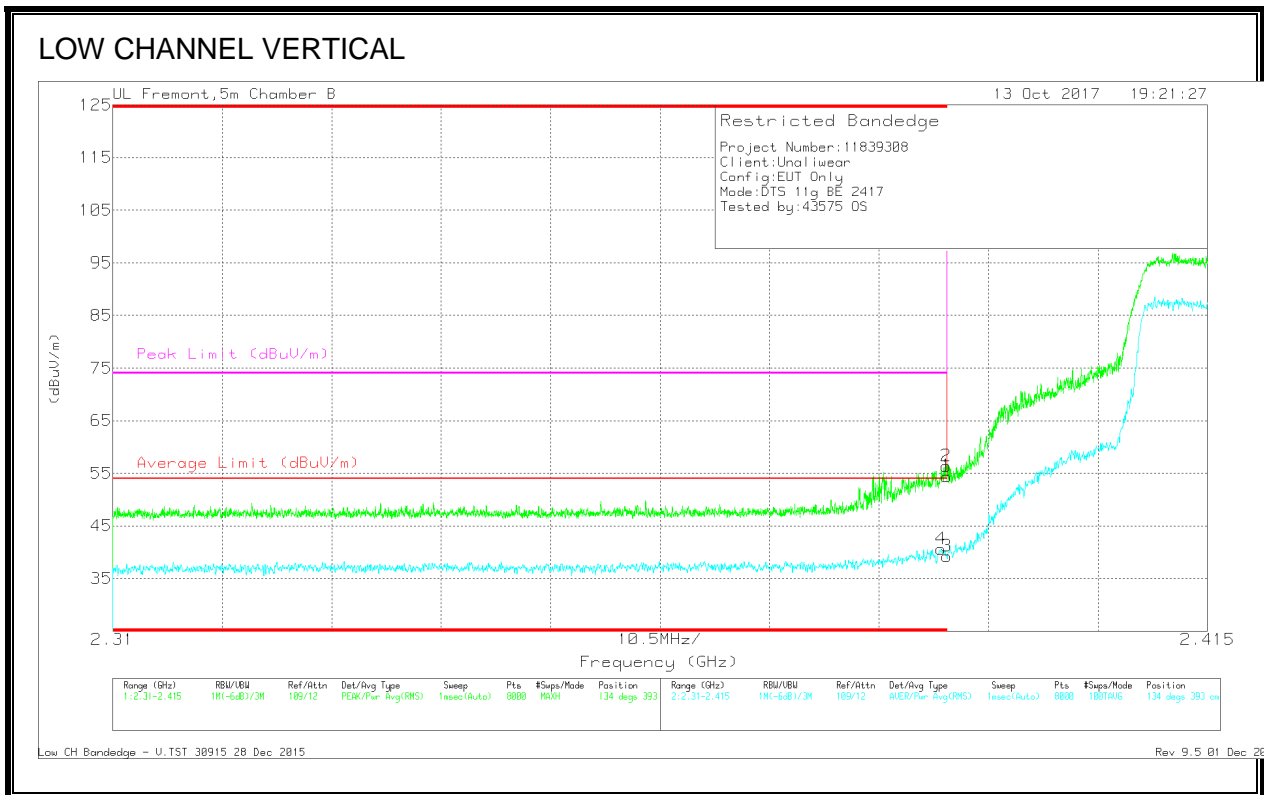
AUTHORIZED BANDEGE (LOW CHANNEL, CH 2)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T663 (dBm)	Amp/Cb/Fltr/Pad (dB)	DC Corr (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	49.32	Pk	32	-21.2	0	60.12	-	-	74	-13.88	28	221	H
2	* 2.39	50.93	Pk	32	-21.2	0	61.73	-	-	74	-12.27	28	221	H
3	* 2.39	33	RMS	32	-21.2	-15	43.95	54	-10.05	-	-	28	221	H
4	* 2.389	33.61	RMS	32	-21.2	-15	44.56	54	-9.44	-	-	28	221	H

* - indicates frequency in CFR47 Pt 15 Restricted Band
 Pk - Peak detector
 RMS - RMS detection



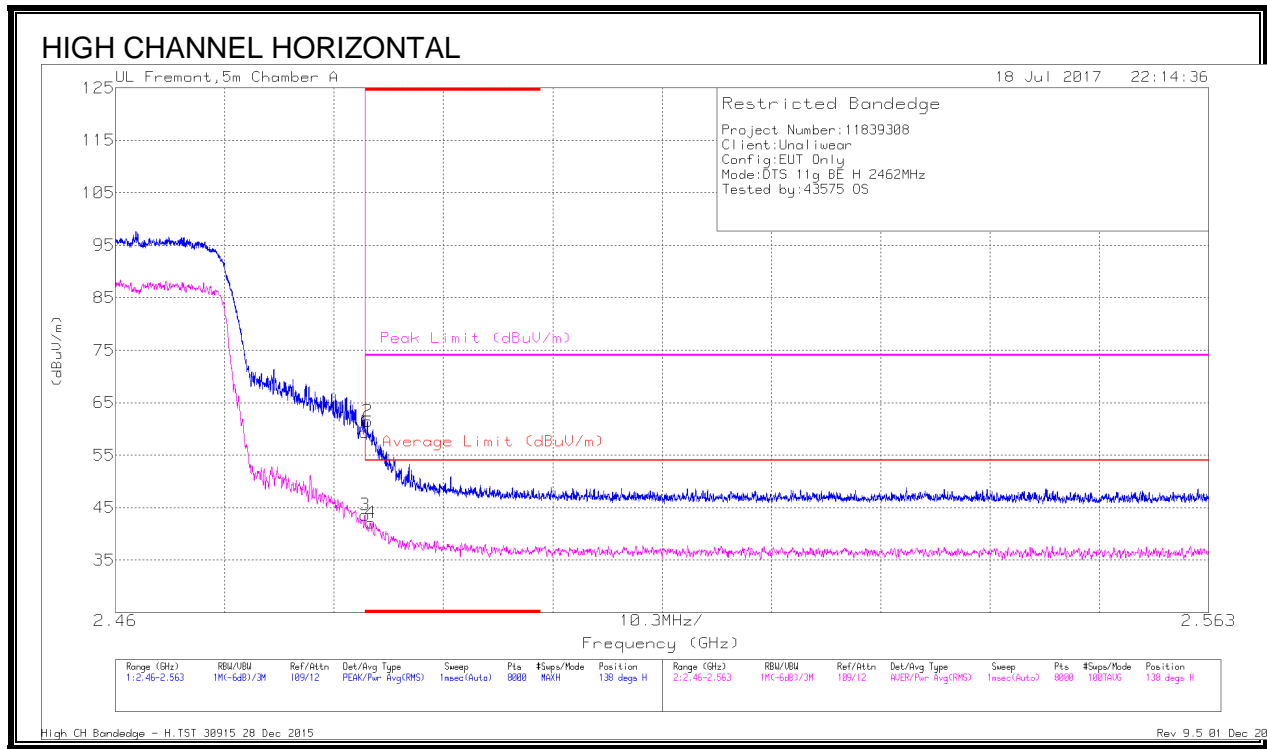
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.389	29.67	RMS	32	-21.2	.15	40.62	54	-13.38	-	-	134	393	V
1	* 2.39	43.65	Pk	32	-21.2	0	54.45	-	-	74	-19.55	134	393	V
2	* 2.39	45.62	Pk	32	-21.2	0	56.42	-	-	74	-17.58	134	393	V
3	* 2.39	28.27	RMS	32	-21.2	.15	39.22	54	-14.78	-	-	134	393	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEGE (HIGH CHANNEL, CH 11)



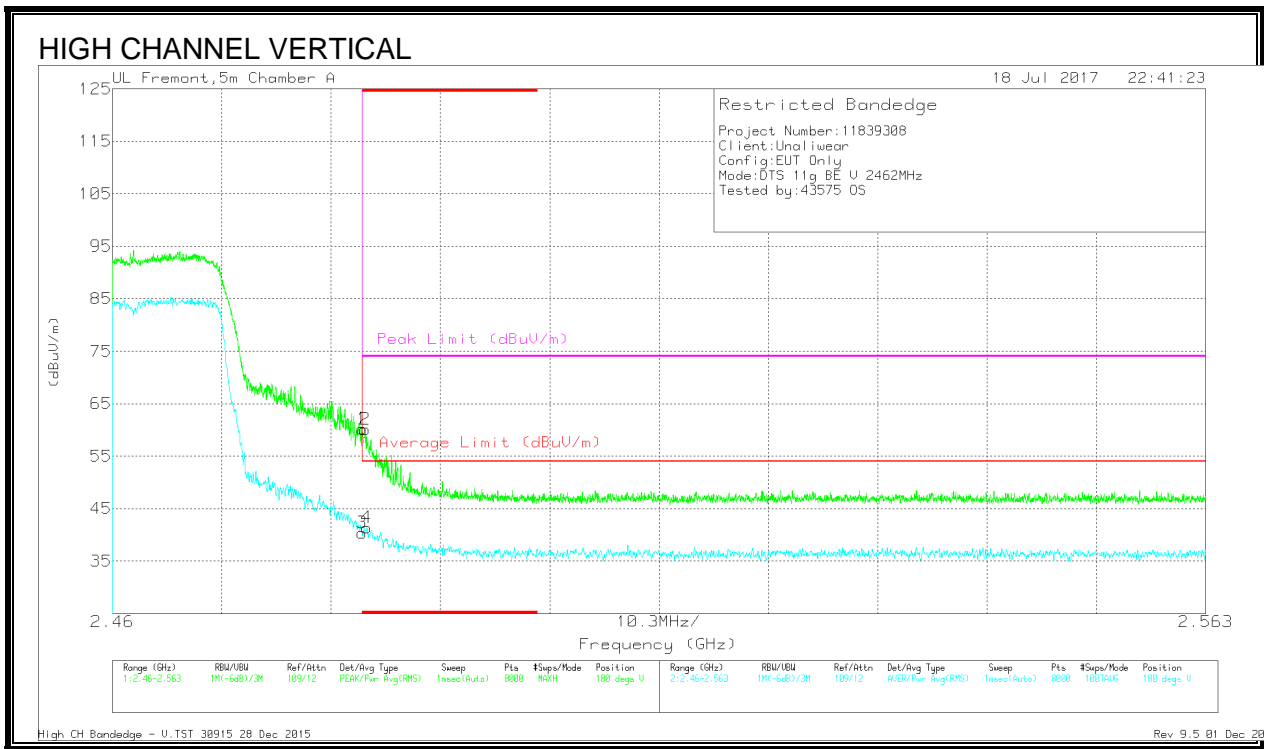
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	DC Corr (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	50.19	Pk	32.3	-23.1	0	59.39	-	-	74	-14.61	138	139	H
2	* 2.484	52.26	Pk	32.3	-23.1	0	61.46	-	-	74	-12.54	138	139	H
3	* 2.484	34.26	RMS	32.3	-23.1	.14	43.6	54	-10.4	-	-	138	139	H
4	* 2.484	32.71	RMS	32.3	-23.1	.14	42.05	54	-11.95	-	-	138	139	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection



Trace Markers

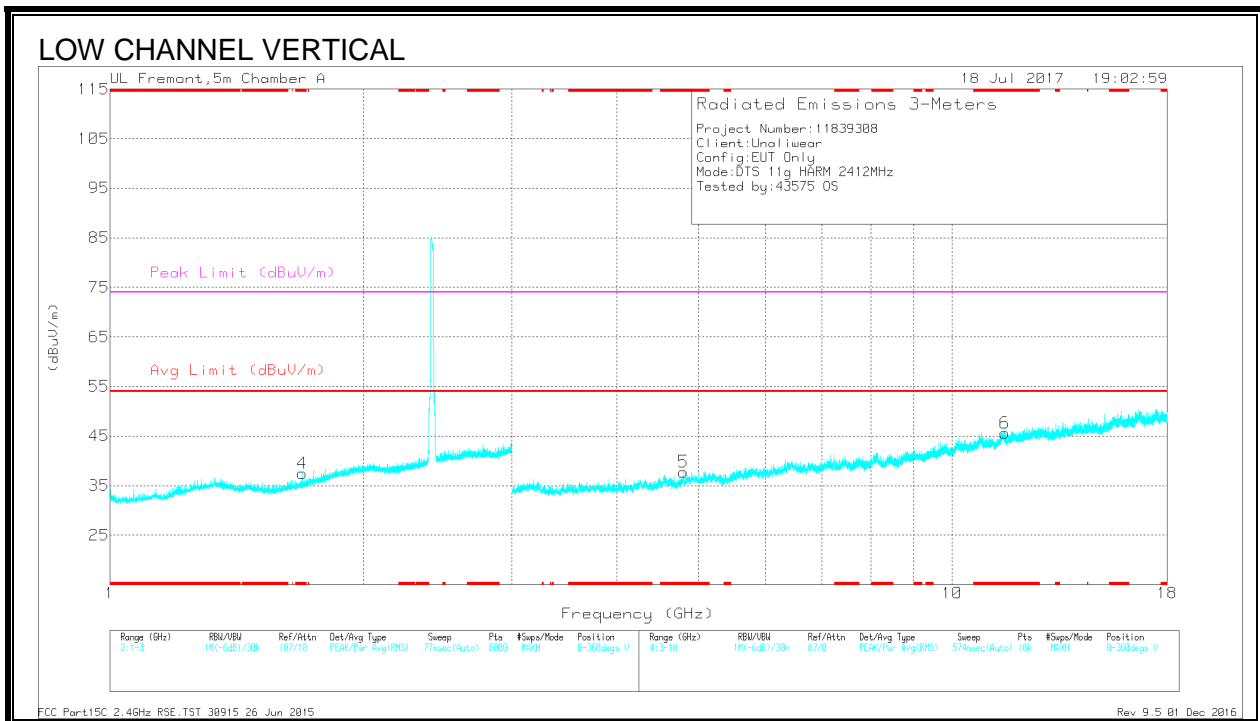
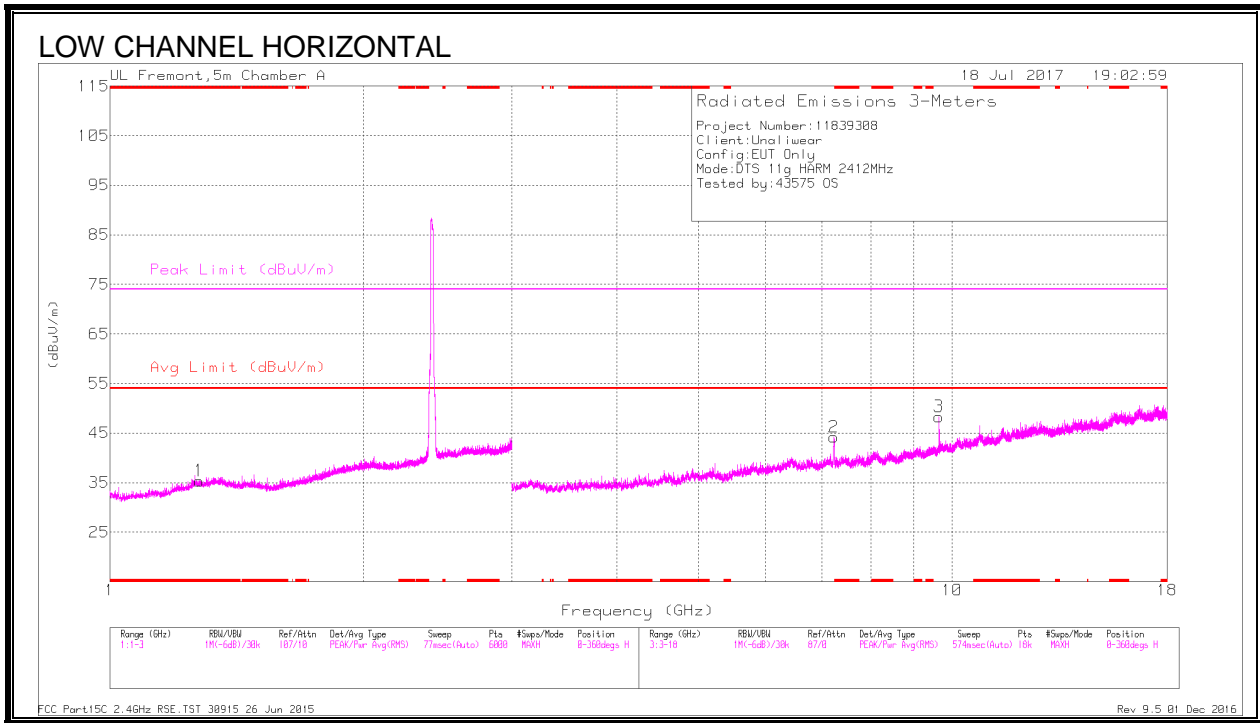
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	51.02	Pk	32.3	-23.1	0	60.22	-	-	74	-13.78	180	387	V
2	* 2.484	50.87	Pk	32.3	-23.1	0	60.07	-	-	74	-13.93	180	387	V
3	* 2.484	31.06	RMS	32.3	-23.1	.14	40.4	54	-13.6	-	-	180	387	V
4	* 2.484	32.06	RMS	32.3	-23.1	.14	41.4	54	-12.6	-	-	180	387	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, CH 1)

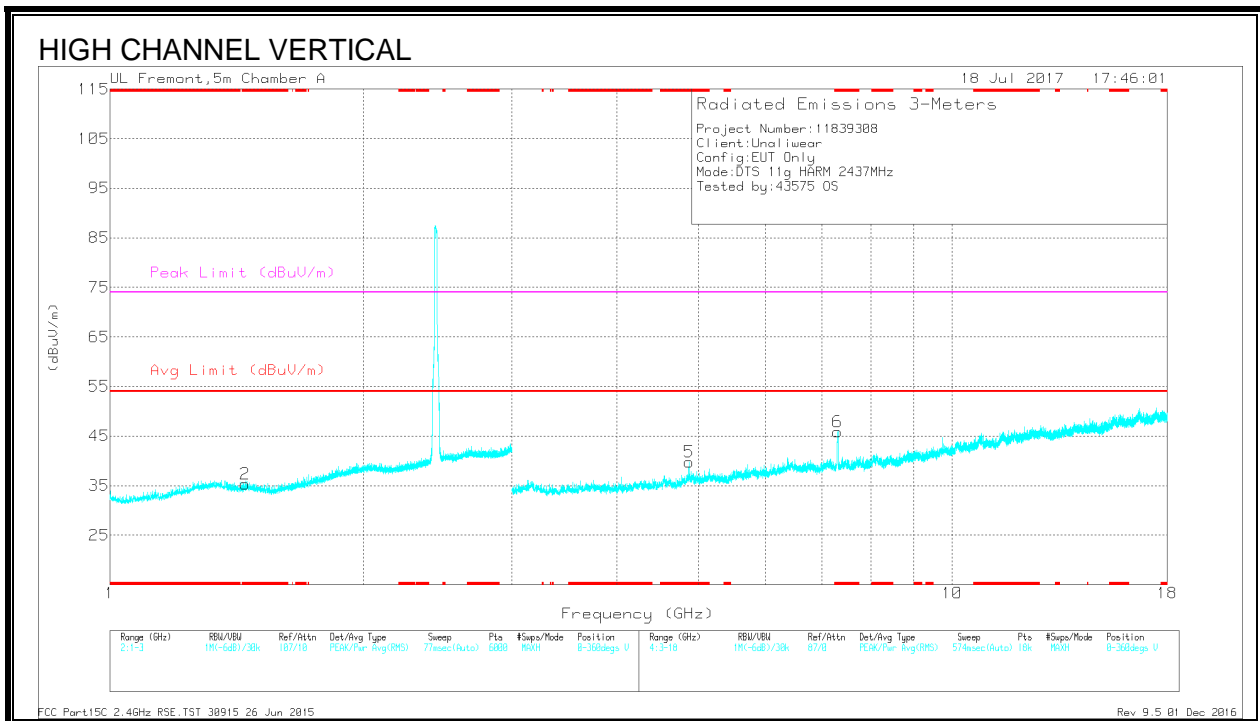
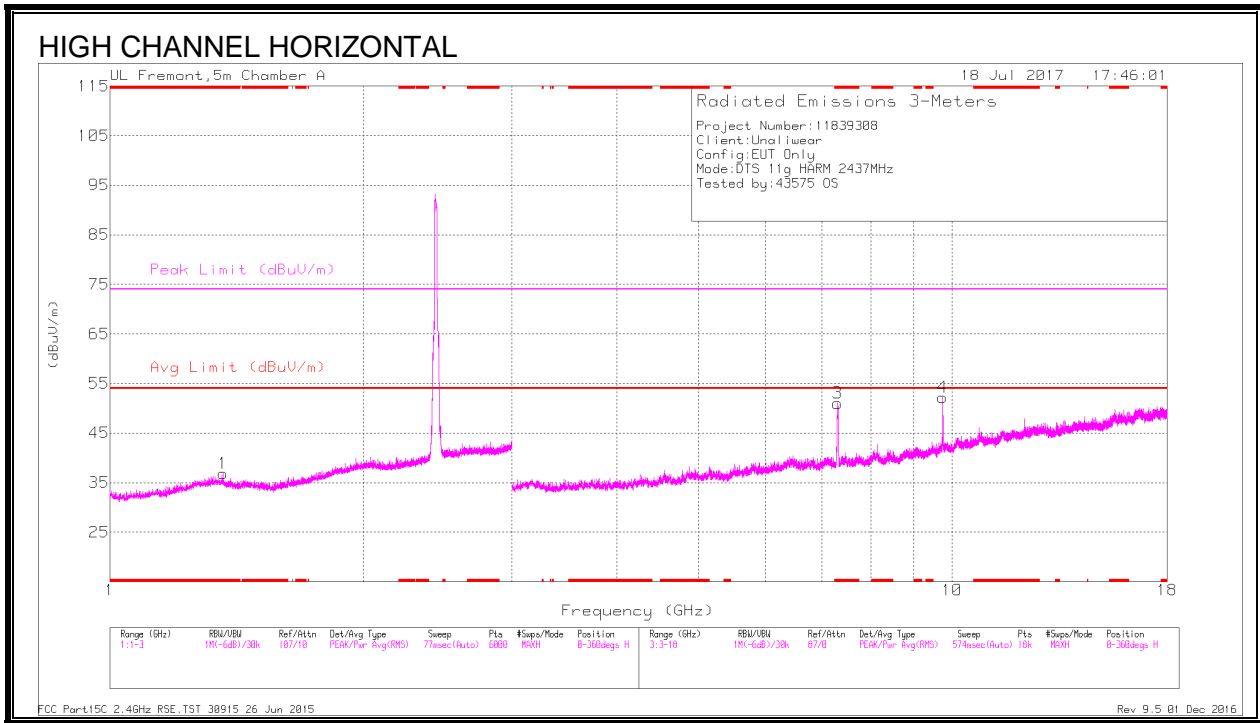


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ 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
* 1.273	35.67	PK2	29.3	-23.5	0	41.47	-	-	74	-32.53	65	150	H
* 1.274	23.86	MAv1	29.3	-23.5	.14	29.8	54	-24.2	-	-	65	150	H
* 1.692	36.4	PK2	28.9	-23.3	0	42	-	-	74	-32	110	328	V
* 1.692	24.52	MAv1	28.9	-23.3	.14	30.26	54	-23.74	-	-	110	328	V
* 4.796	36.65	PK2	34.2	-27.6	0	43.25	-	-	74	-30.75	206	157	V
* 4.797	24.75	MAv1	34.2	-27.6	.14	31.49	54	-22.51	-	-	206	157	V
* 11.539	31.83	PK2	38.4	-19.1	0	51.13	-	-	74	-22.87	3	192	V
* 11.54	20.63	MAv1	38.4	-19.1	.14	40.07	54	-13.93	-	-	3	192	V
7.241	39.17	PK2	35.7	-24.1	0	50.77	-	-	-	-	147	209	H
7.241	28.62	MAv1	35.7	-24.1	.14	40.36	-	-	-	-	147	209	H
9.648	38.6	PK2	36.8	-21.2	0	54.2	-	-	-	-	201	227	H
9.648	33.54	MAv1	36.8	-21.2	.14	49.28	-	-	-	-	201	227	H

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, CH 6)

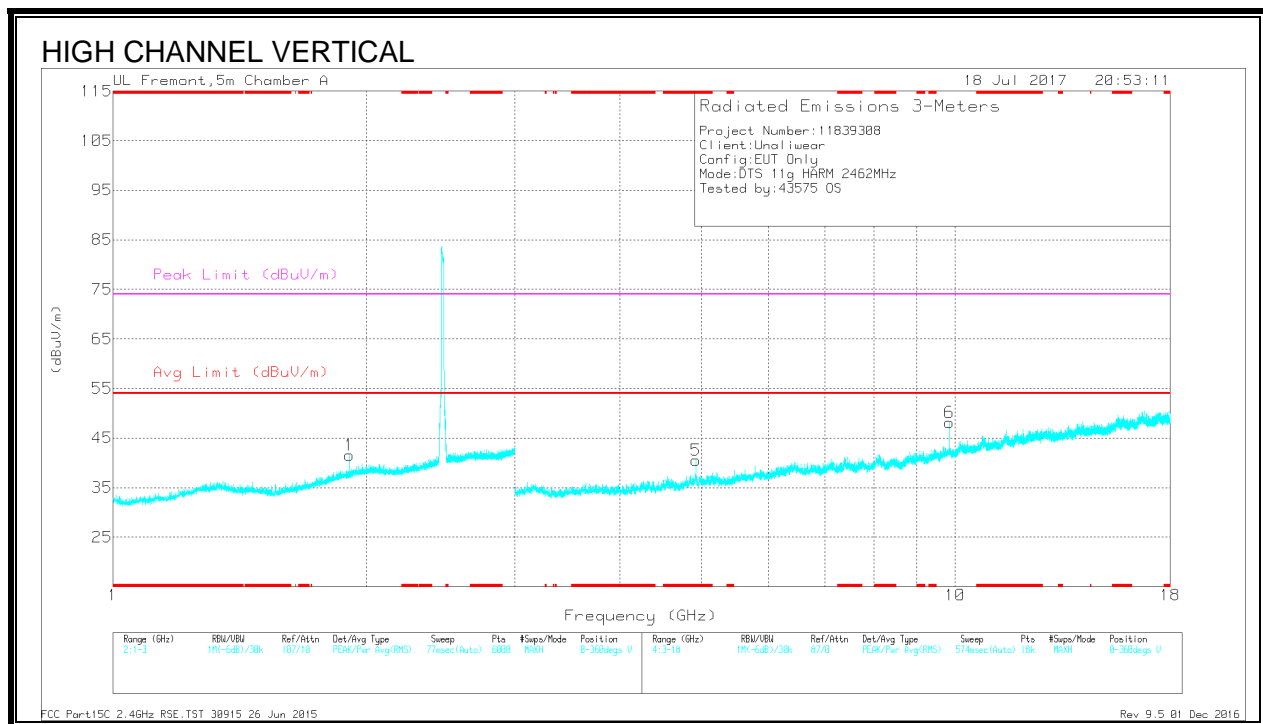
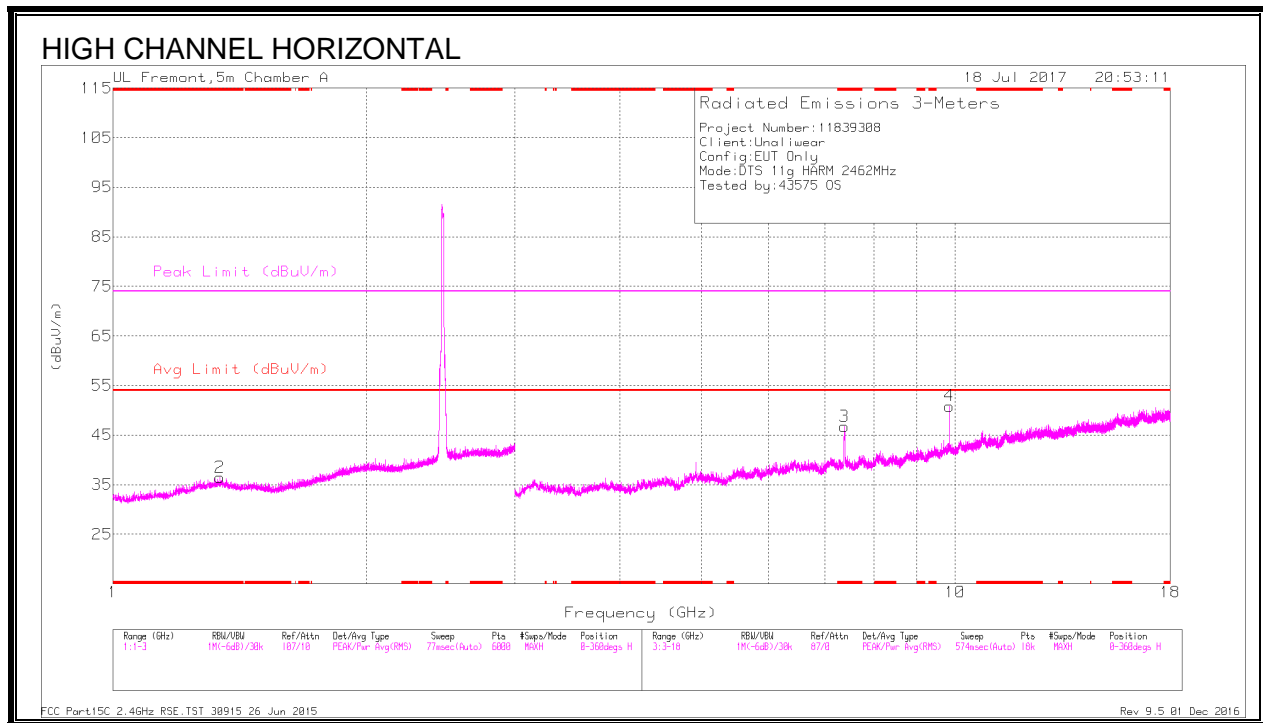


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ 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
* 1.363	35.7	PK2	29.3	-23.4	0	41.6	-	-	74	-32.4	326	114	H
* 1.363	23.96	MAv1	29.3	-23.4	.14	30	54	-24	-	-	326	114	H
* 1.445	35.73	PK2	28.7	-23.3	0	41.13	-	-	74	-32.87	55	119	V
* 1.445	24.02	MAv1	28.7	-23.3	.14	29.56	54	-24.44	-	-	55	119	V
* 7.314	46.96	PK2	35.7	-24	0	58.66	-	-	74	-15.34	251	206	H
* 7.315	33.67	MAv1	35.7	-24	.14	45.51	54	-8.49	-	-	251	206	H
* 4.875	37.04	PK2	34.1	-27.2	0	43.94	-	-	74	-30.06	305	279	V
* 4.874	24.71	MAv1	34.1	-27.2	.14	31.75	54	-22.25	-	-	305	279	V
* 7.312	34.9	PK2	35.7	-24.1	0	46.5	-	-	74	-27.5	55	253	V
* 7.312	22.26	MAv1	35.7	-24.1	.14	34	54	-20	-	-	55	253	V
9.748	40.65	PK2	36.9	-20.7	0	56.85	-	-	-	-	298	198	H
9.748	34.4	MAv1	36.9	-20.7	.14	50.74	-	-	-	-	298	198	H

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, CH 11)



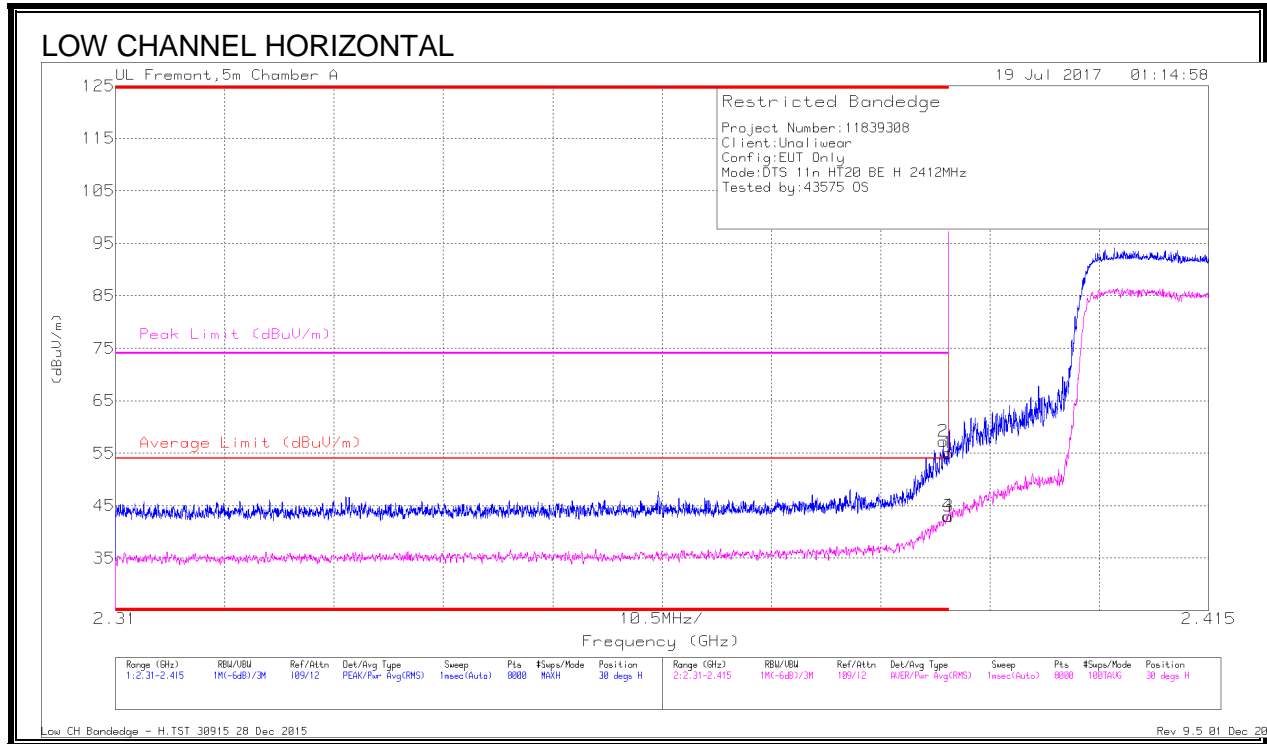
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ 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
* 1.339	36.13	PK2	29.5	-23.4	0	42.23	-	-	74	-31.77	160	122	H
* 1.338	23.98	MAv1	29.5	-23.4	.14	30.22	54	-23.78	-	-	160	122	H
* 7.384	42.53	PK2	35.6	-23	0	55.13	-	-	74	-18.87	250	219	H
* 7.384	29.9	MAv1	35.6	-23	.14	42.64	54	-11.36	-	-	250	219	H
* 4.924	40.44	PK2	34.1	-27.1	0	47.44	-	-	74	-26.56	49	241	V
* 4.924	31.65	MAv1	34.1	-27.1	.14	38.79	54	-15.21	-	-	49	241	V
1.91	36.33	PK2	31.1	-23.2	0	44.23	-	-	-	-	105	212	V
1.91	24.25	MAv1	31.1	-23.2	.14	32.29	-	-	-	-	105	212	V
9.848	39.03	PK2	37.1	-20.6	0	55.53	-	-	-	-	279	217	H
9.848	34.06	MAv1	37.1	-20.6	.14	50.7	-	-	-	-	279	217	H
9.848	37.95	PK2	37.1	-20.6	0	54.45	-	-	-	-	30	232	V
9.848	32.29	MAv1	37.1	-20.6	.14	48.93	-	-	-	-	30	232	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

10.2.3 11n-HT20 MODE IN THE 2.4GHz BAND

AUTHORIZED BANDEDGE (LOW CHANNEL, CH 1)



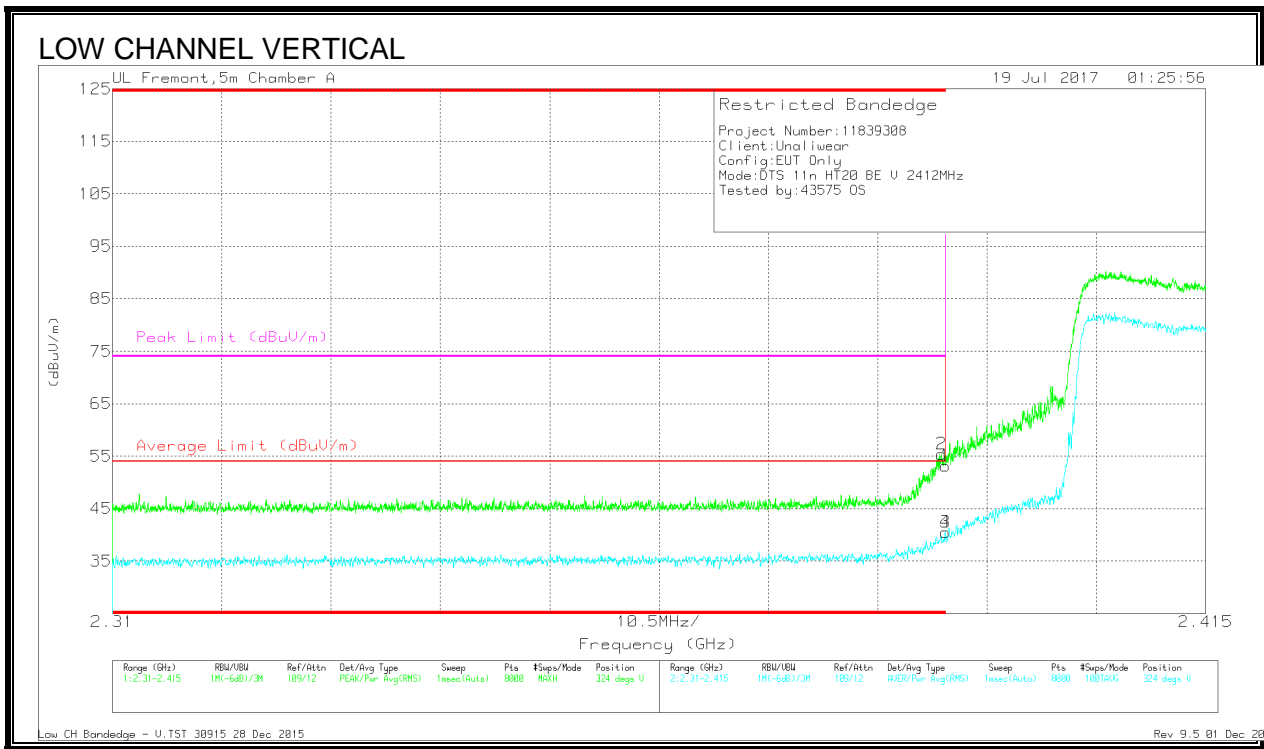
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T652 (dBm)	Amp/Cbl/Fitr/Pad (dB)	DC Corr (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	46.41	Pk	31.8	-23.2	0	55.01	-	-	74	-18.99	30	190	H
2	* 2.39	48.64	Pk	31.8	-23.2	0	57.24	-	-	74	-16.76	30	190	H
3	* 2.39	34.22	RMS	31.8	-23.2	.12	42.94	54	-11.06	-	-	30	190	H
4	* 2.39	34.31	RMS	31.8	-23.2	.12	43.03	54	-10.97	-	-	30	190	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

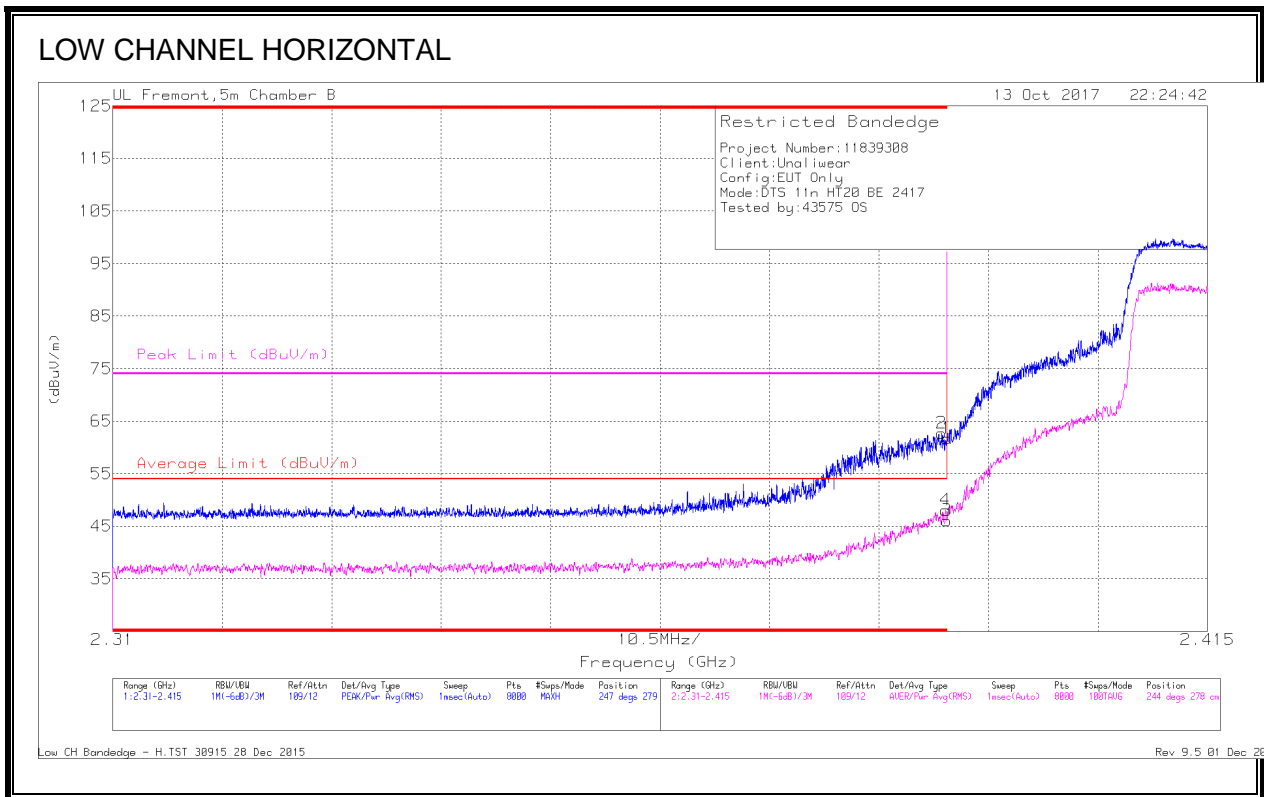


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (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	44.58	Pk	31.8	-23.2	0	53.18	-	-	74	-20.82	324	359	V
2	* 2.39	46.74	Pk	31.8	-23.2	0	55.34	-	-	74	-18.66	324	359	V
3	* 2.39	31.76	RMS	31.8	-23.2	.12	40.48	54	-13.52	-	-	324	359	V
4	* 2.39	31.76	RMS	31.8	-23.2	.12	40.48	54	-13.52	-	-	324	359	V

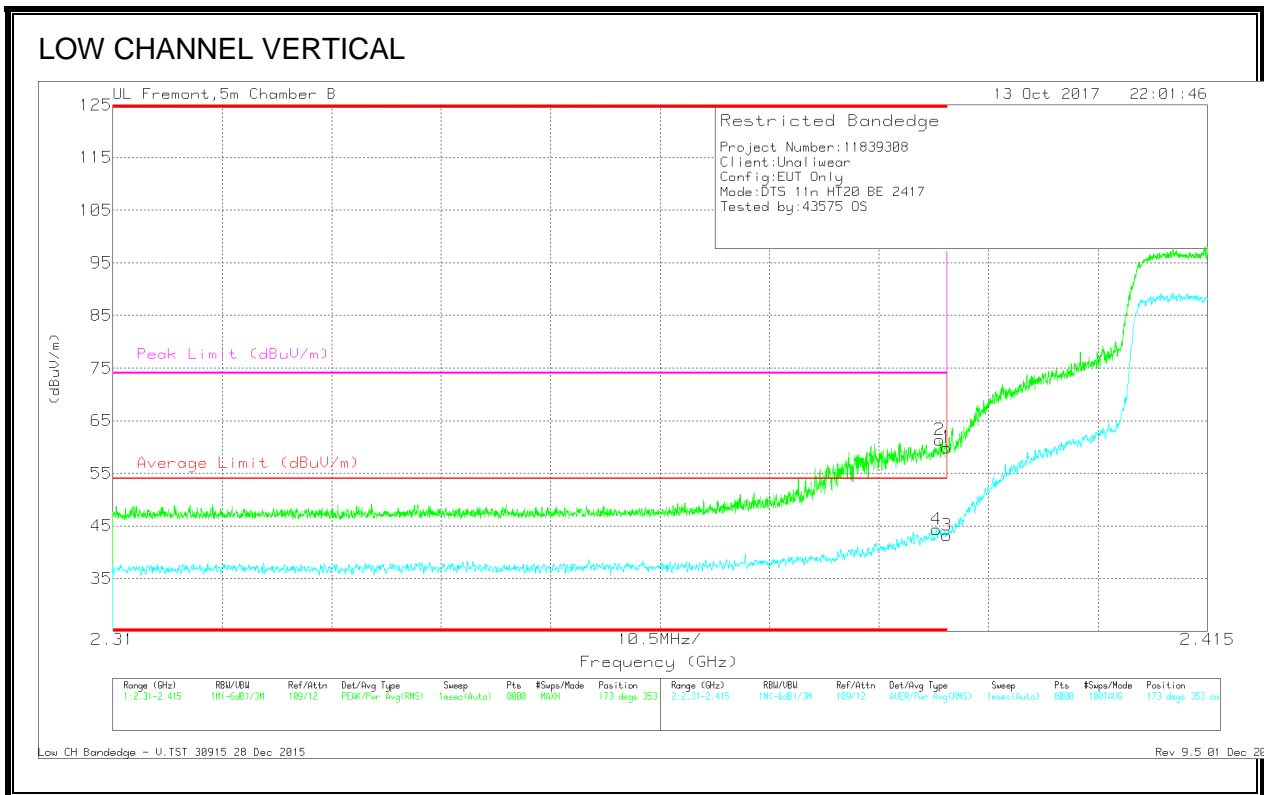
* - indicates frequency in CFR47 Pt 15 Restricted Band
 Pk - Peak detector
 RMS - RMS detection

AUTHORIZED BANDEGE (LOW CHANNEL, CH 2)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cb/Filt/Pad (dB)	DC Corr (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	50.96	Pk	32	-21.2	0	61.76	-	-	74	-12.24	247	279	H
2	* 2.39	51.88	Pk	32	-21.2	0	62.68	-	-	74	-11.32	247	279	H
3	* 2.39	35.18	RMS	32	-21.2	.13	46.11	54	-7.89	-	-	244	278	H
4	* 2.39	37.08	RMS	32	-21.2	.13	48.01	54	-5.99	-	-	244	278	H

* - indicates frequency in CFR47 Pt 15 Restricted Band
 Pk - Peak detector
 RMS - RMS detection

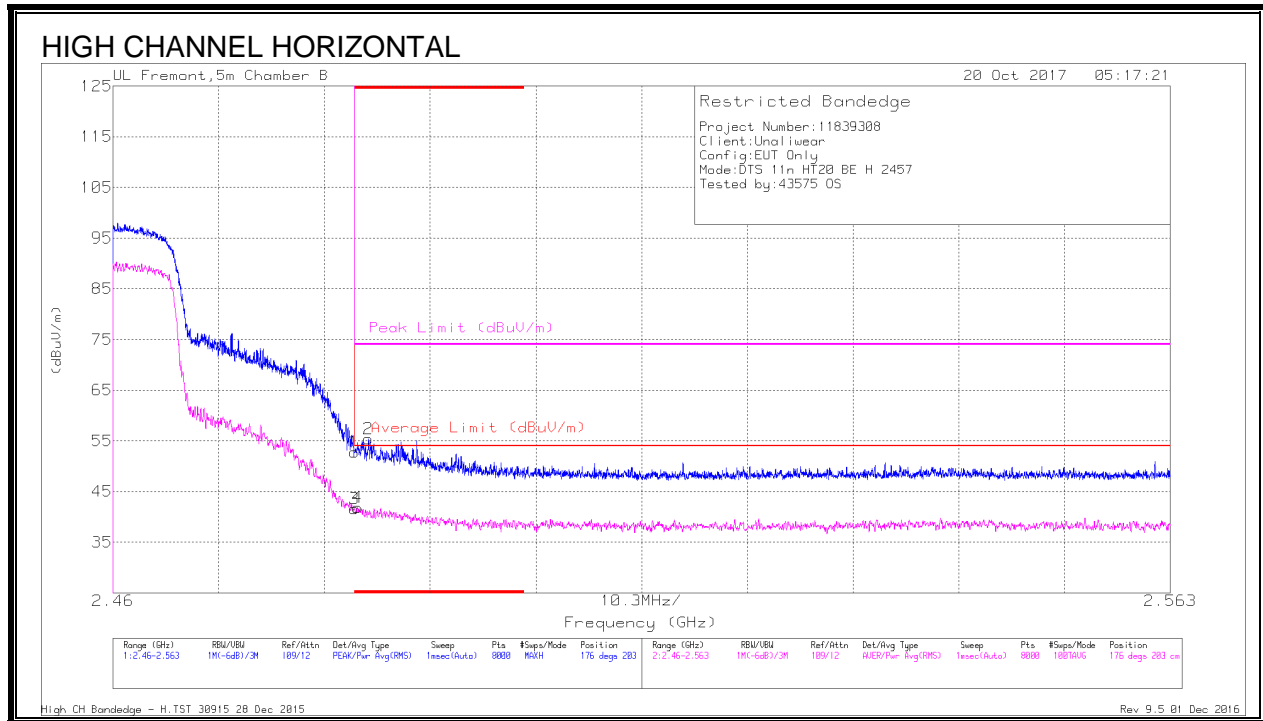


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/CB/Fitr/Pad (dB)	DC Corr (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	44.58	Pk	31.8	-23.2	0	53.18	-	-	74	-20.82	324	359	V
2	* 2.39	46.74	Pk	31.8	-23.2	0	55.34	-	-	74	-18.66	324	359	V
3	* 2.39	31.76	RMS	31.8	-23.2	.12	40.48	54	-13.52	-	-	324	359	V
4	* 2.39	31.76	RMS	31.8	-23.2	.12	40.48	54	-13.52	-	-	324	359	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 Pk - Peak detector
 RMS - RMS detection

AUTHORIZED BANDEGE (HIGH CHANNEL, CH 10)



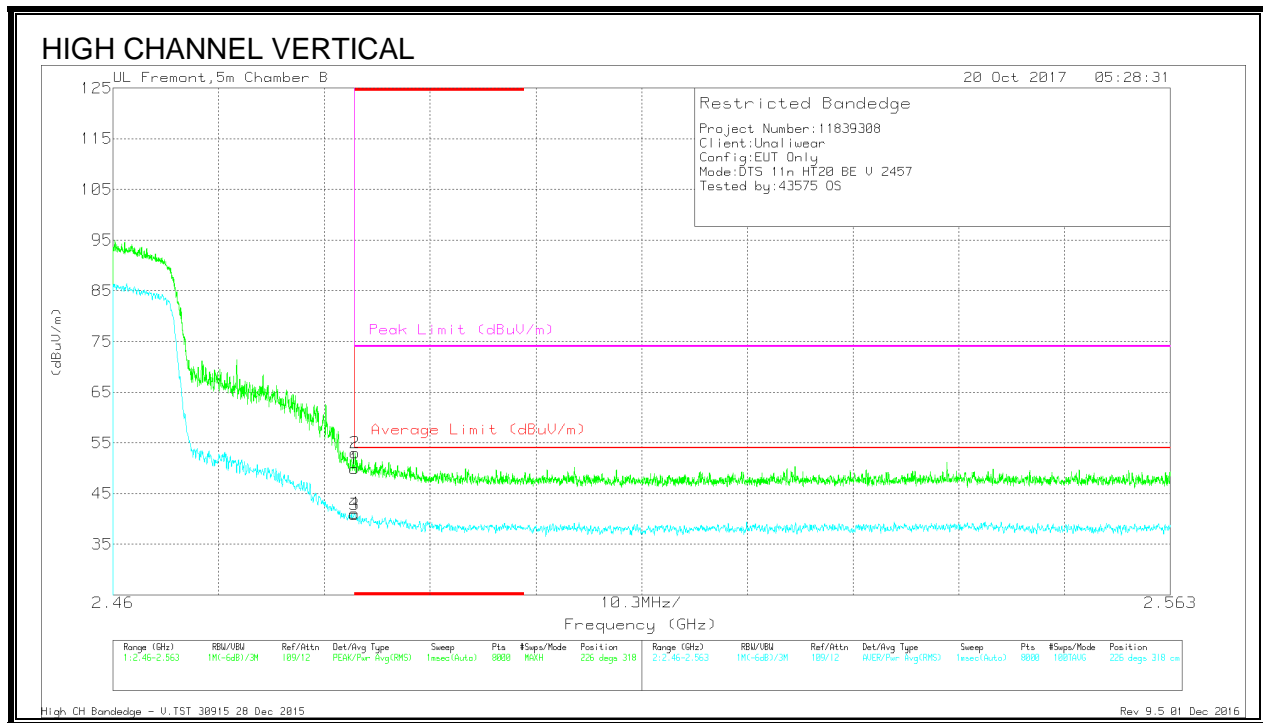
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (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	41.18	Pk	32.5	-20.9	0	52.78	-	-	74	-21.22	176	203	H
2	* 2.485	43.66	Pk	32.5	-20.8	0	55.36	-	-	74	-18.64	176	203	H
3	* 2.484	29.89	RMS	32.5	-20.9	.12	41.61	54	-12.39	-	-	176	203	H
4	* 2.484	30.1	RMS	32.5	-20.9	.12	41.82	54	-12.18	-	-	176	203	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection



Trace Markers

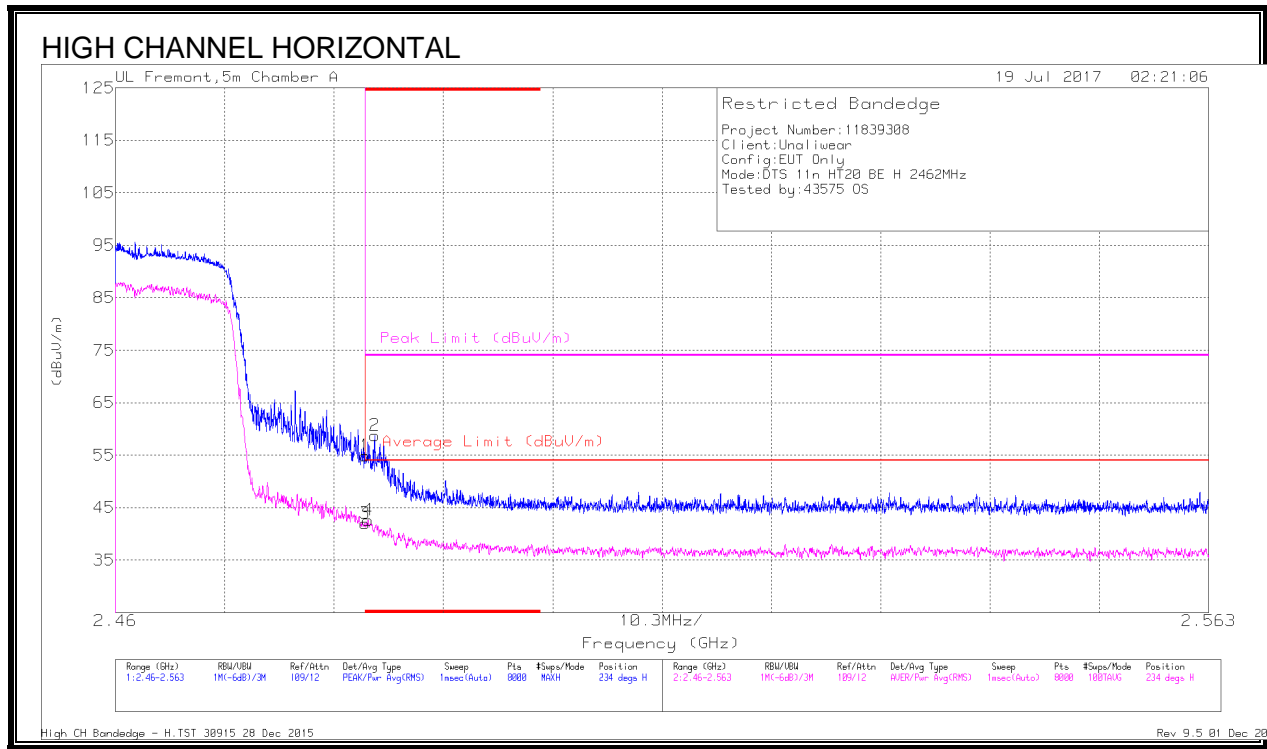
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.34	Pk	32.5	-20.9	0	49.54	-	-	74	-24.06	226	318	V
2	* 2.484	41.45	Pk	32.5	-20.9	0	53.05	-	-	74	-20.95	226	318	V
3	* 2.484	29.18	RMS	32.5	-20.9	.12	40.9	54	-13.1	-	-	226	318	V
4	* 2.484	29.37	RMS	32.5	-20.9	.12	41.09	54	-12.91	-	-	226	318	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEGE (HIGH CHANNEL, CH 11)



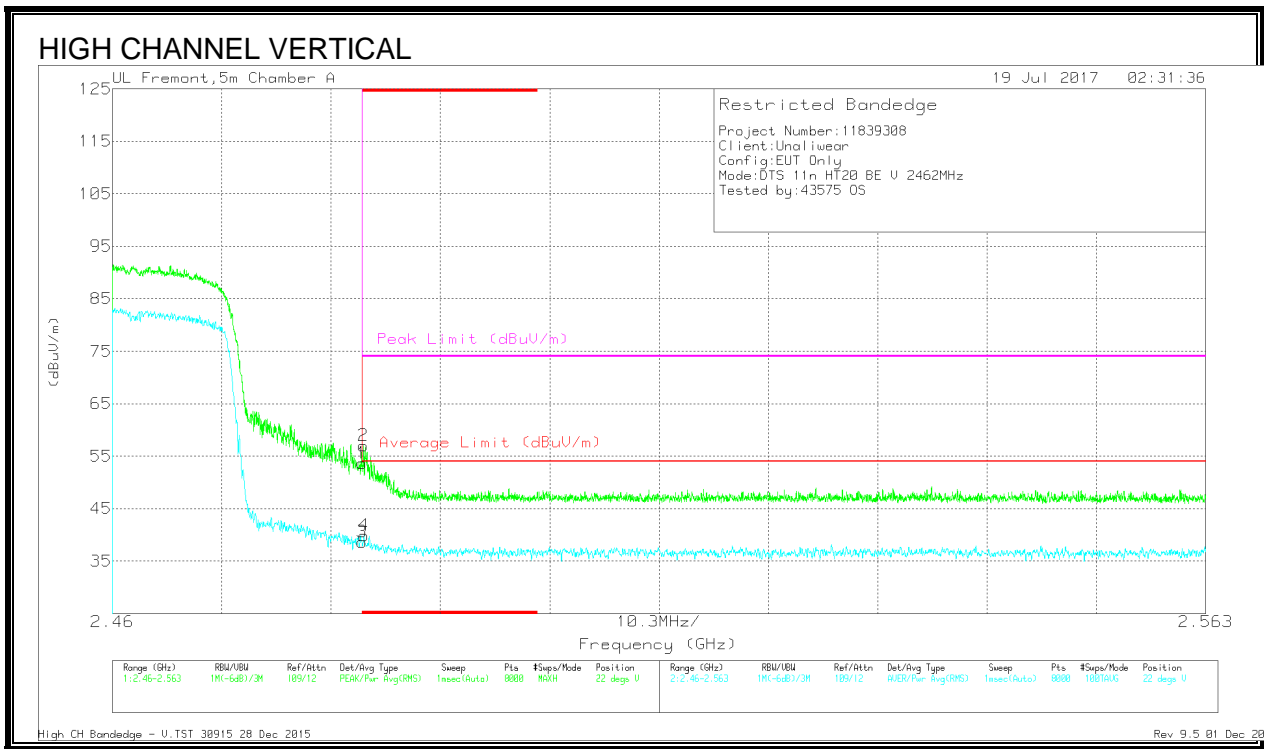
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/CbI/Fitr/Pad (dB)	DC Corr (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	45.64	Pk	32.3	-23.1	0	54.84	-	-	74	-19.16	234	146	H
2	* 2.484	49.54	Pk	32.3	-23.1	0	58.74	-	-	74	-15.26	234	146	H
3	* 2.484	32.63	RMS	32.3	-23.1	.12	41.95	54	-12.05	-	-	234	146	H
4	* 2.484	33.25	RMS	32.3	-23.1	.12	42.57	54	-11.43	-	-	234	146	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

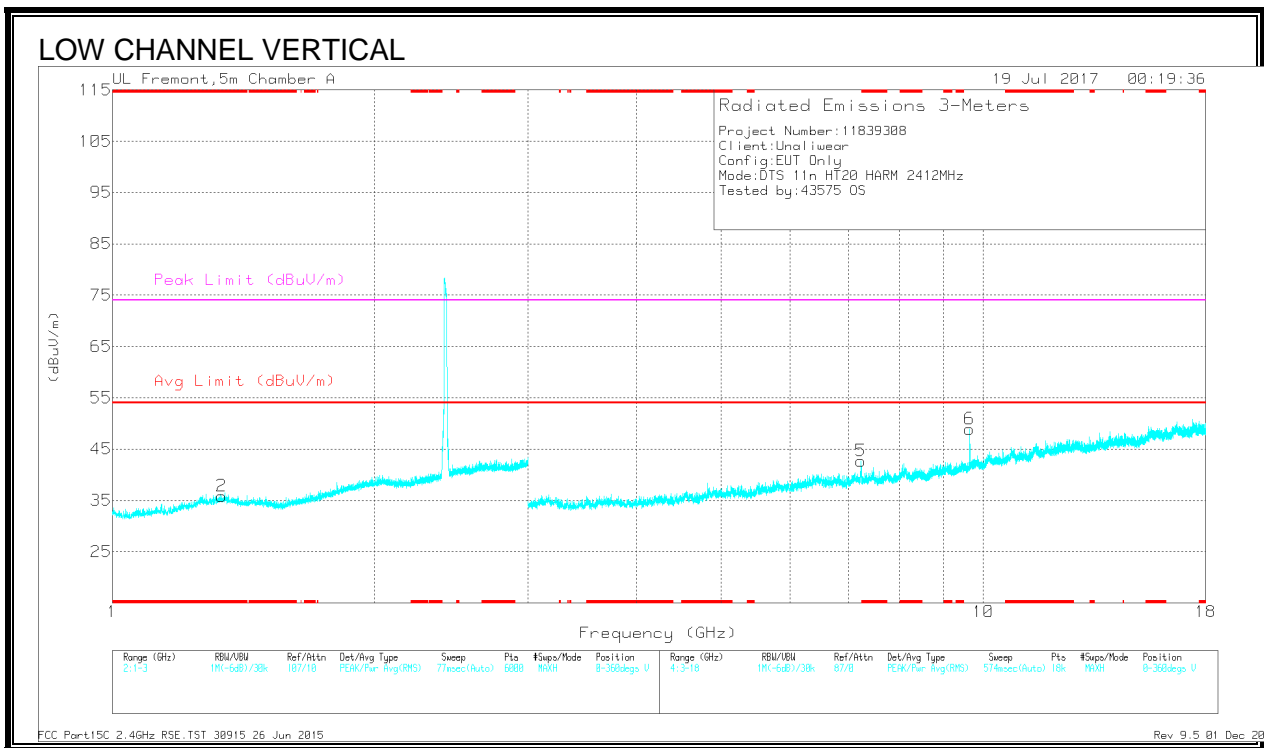
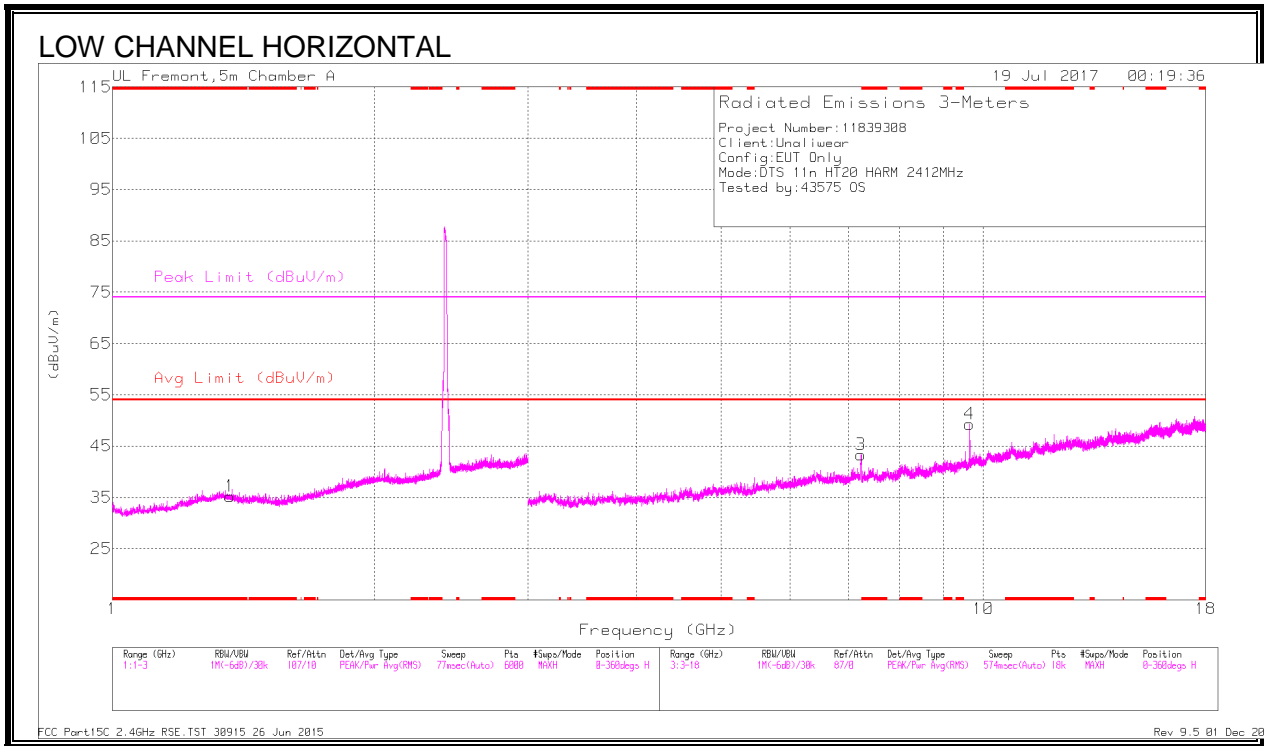


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (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	44.47	Pk	32.3	-23.1	0	53.67	-	-	74	-20.33	22	376	V
2	* 2.484	47.74	Pk	32.3	-23.1	0	56.94	-	-	74	-17.06	22	376	V
3	* 2.484	29.31	RMS	32.3	-23.1	.12	38.63	54	-15.37	-	-	22	376	V
4	* 2.484	30.49	RMS	32.3	-23.1	.12	39.81	54	-14.19	-	-	22	376	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, CH 1)

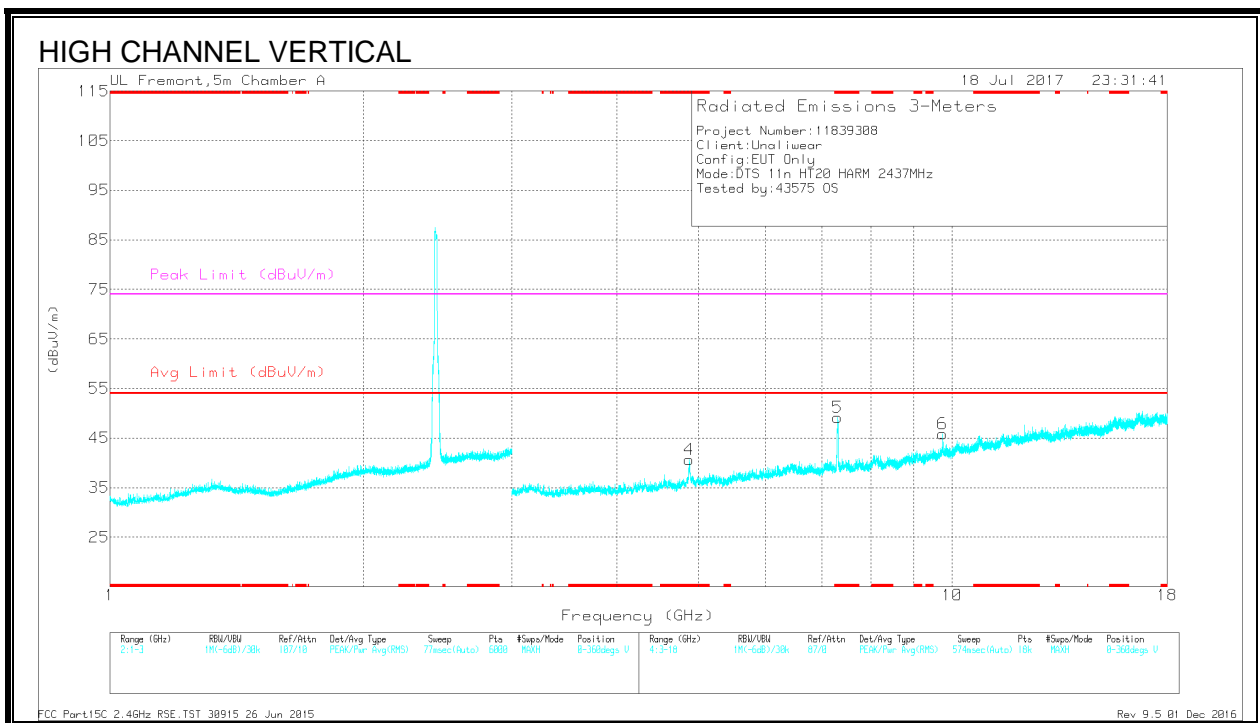
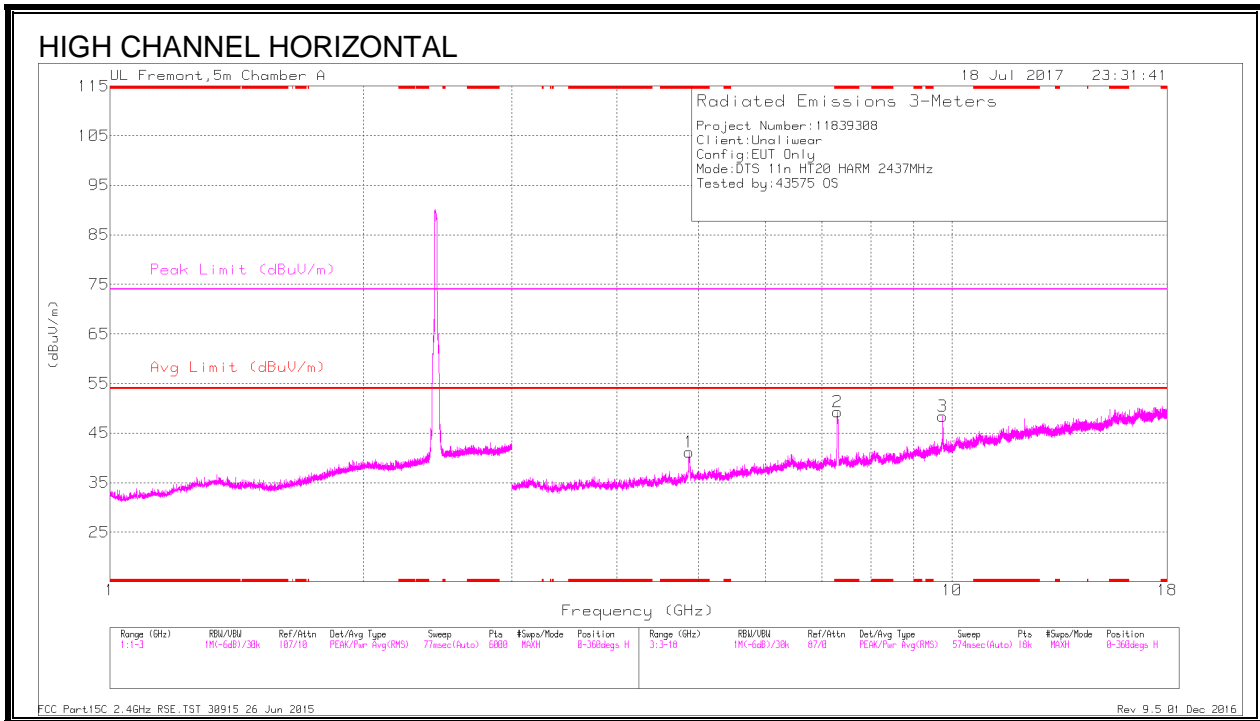


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/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
* 1.364	35.88	PK2	29.3	-23.4	0	41.78	-	-	74	-32.22	323	230	H
* 1.363	23.97	MAv1	29.3	-23.4	.12	29.99	54	-24.01	-	-	323	230	H
* 1.332	36.69	PK2	29.5	-23.5	0	42.69	-	-	74	-31.31	352	351	V
* 1.332	24.16	MAv1	29.5	-23.5	.12	30.28	54	-23.72	-	-	352	351	V
7.233	37.61	PK2	35.7	-24	0	49.31	-	-	-	-	192	357	V
7.233	26.17	MAv1	35.7	-24	.12	37.99	-	-	-	-	192	357	V
7.236	37.95	PK2	35.7	-24.1	0	49.55	-	-	-	-	274	108	H
7.239	26.9	MAv1	35.7	-24.1	.12	38.62	-	-	-	-	274	108	H
9.648	37.51	PK2	36.8	-21.2	0	53.11	-	-	-	-	200	223	H
9.648	31.54	MAv1	36.8	-21.2	.12	47.26	-	-	-	-	200	223	H
9.648	36.91	PK2	36.8	-21.2	0	52.51	-	-	-	-	208	220	V
9.648	31.21	MAv1	36.8	-21.2	.12	46.93	-	-	-	-	208	220	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, CH 6)

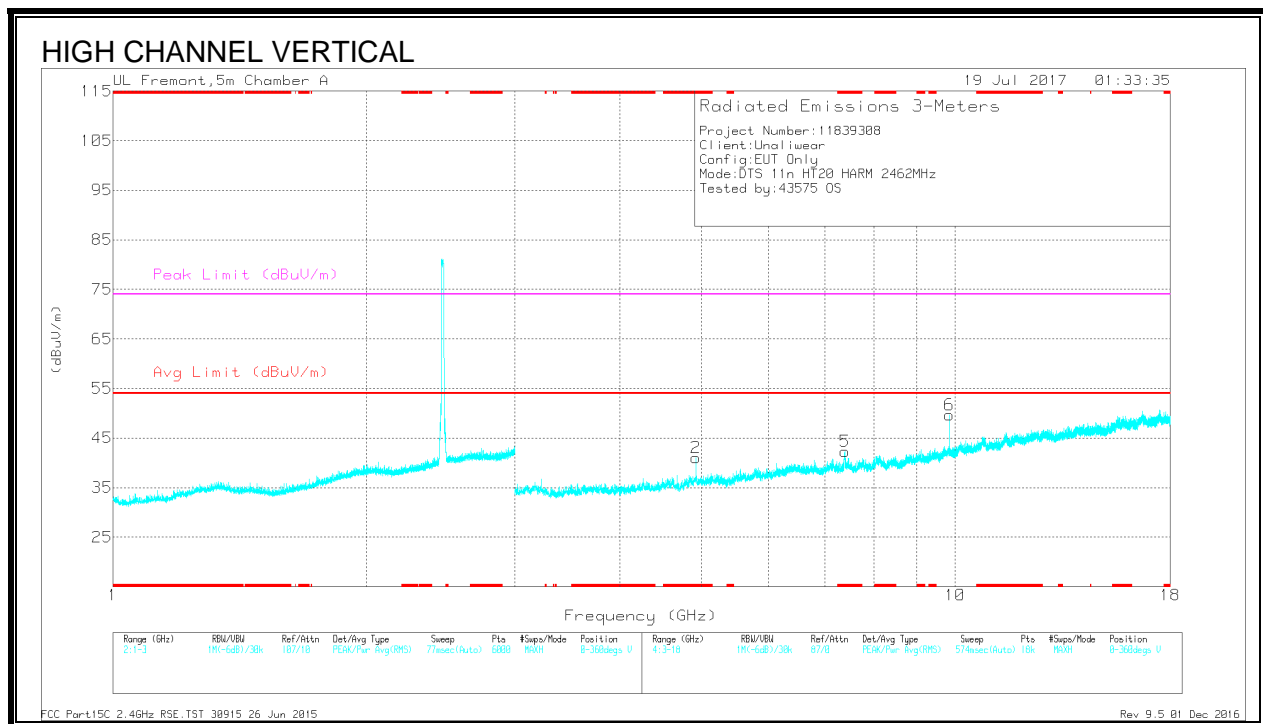
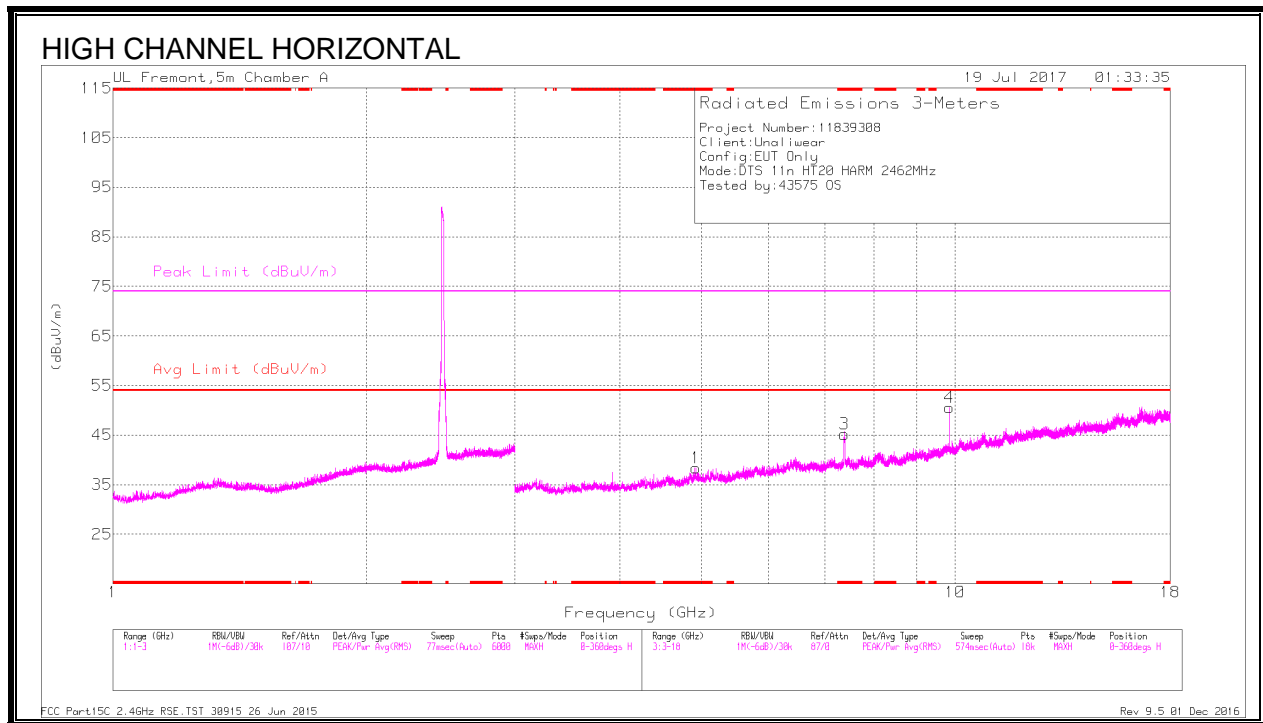


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ 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
* 7.312	44.71	PK2	35.7	-24.1	0	56.31	-	-	74	-17.69	315	102	H
* 7.314	31.23	MAv1	35.7	-24	.12	43.05	54	-10.95	-	-	315	102	H
* 4.871	44.48	PK2	34.1	-27.2	0	51.38	-	-	74	-22.62	15	189	H
* 4.874	29.92	MAv1	34.1	-27.2	.12	36.94	54	-17.06	-	-	15	189	H
* 7.309	44.05	PK2	35.7	-24.1	0	55.65	-	-	74	-18.35	307	114	V
* 7.309	30.86	MAv1	35.7	-24.1	.12	42.58	54	-11.42	-	-	307	114	V
* 4.872	41.88	PK2	34.1	-27.2	0	48.78	-	-	74	-25.22	223	117	V
* 4.874	28.13	MAv1	34.1	-27.2	.12	35.15	54	-18.85	-	-	223	117	V
9.748	35.99	PK2	36.9	-20.7	0	52.19	-	-	-	-	157	166	H
9.748	28.29	MAv1	36.9	-20.7	.12	44.61	-	-	-	-	157	166	H
9.748	36.63	PK2	36.9	-20.7	0	52.83	-	-	-	-	185	222	V
9.748	28.55	MAv1	36.9	-20.7	.12	44.87	-	-	-	-	185	222	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, CH 11)



Radiated Emissions

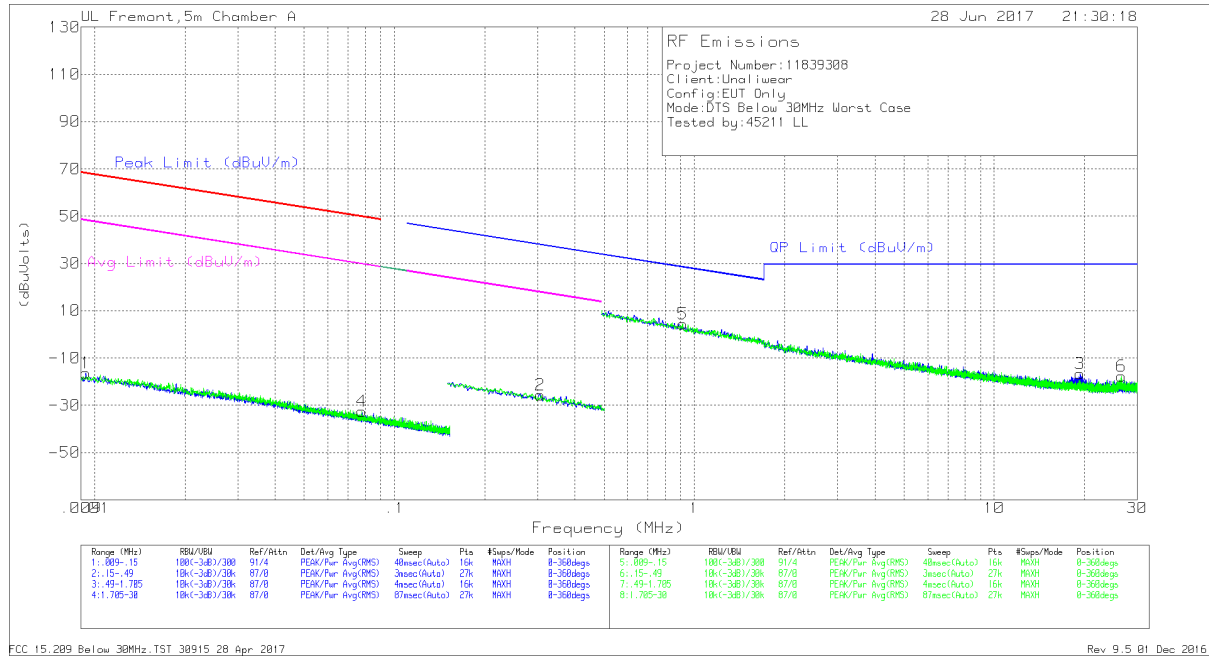
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	37.41	PK2	34.1	-27.1	0	44.41	-	-	74	-29.59	15	103	H
* 4.924	27.71	MAv1	34.1	-27.1	.12	34.83	54	-19.17	-	-	15	103	H
* 7.383	38.6	PK2	35.6	-23	0	51.2	-	-	74	-22.8	355	118	H
* 7.384	27.13	MAv1	35.6	-23	.12	39.85	54	-14.15	-	-	355	118	H
* 4.924	39.77	PK2	34.1	-27.1	0	46.77	-	-	74	-27.23	32	228	V
* 4.924	32.86	MAv1	34.1	-27.1	.12	39.98	54	-14.02	-	-	32	228	V
* 7.392	38.23	PK2	35.6	-22.8	0	51.03	-	-	74	-22.97	35	337	V
* 7.391	27.12	MAv1	35.6	-22.8	.12	40.04	54	-13.96	-	-	35	337	V
9.848	38.1	PK2	37.1	-20.6	0	54.6	-	-	-	-	12	235	H
9.848	33.33	MAv1	37.1	-20.6	.12	49.95	-	-	-	-	12	235	H
9.848	37.45	PK2	37.1	-20.6	0	53.95	-	-	-	-	27	201	V
9.848	31.1	MAv1	37.1	-20.6	.12	47.72	-	-	-	-	27	201	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

10.3 WORST-CASE BELOW 30 MHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL AND VERTICAL PLOTS



NOTE: KDB 414788 OATS and Chamber Correlation Justification

- Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
- OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Dist	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300 m	Corrected Reading (dBuV)	Peak Limit (dBuV/m)	Margi n (dB)	Avg Limit (dBuV/m)	Margi n (dB)	QP Limit (dBuV/m)	Margi n (dB)	QP Limit (dBuV/m)	Margi n (dB)	Peak Limit (dBuV/m)	Margi n (dB)	Avg Limit (dBuV/m)	Margi n (dB)	Azimu t (Degs)	
1	00934	43.51	Pk	20	-1	-80	-18.30	68.18	-84.57	48.18	-84.57	-	-	-	-	-	-	-	-	-	0-360
4	07778	35.44	Pk	11.9	-1	-80	-32.56	49.77	-82.33	29.77	-82.33	-	-	-	-	-	-	-	-	-	0-360
2	30591	42.75	Pk	11.5	-1	-80	-25.65	-	-	-	-	-	-	-	-	37.9	-63.55	17.9	-43.55	-	0-360

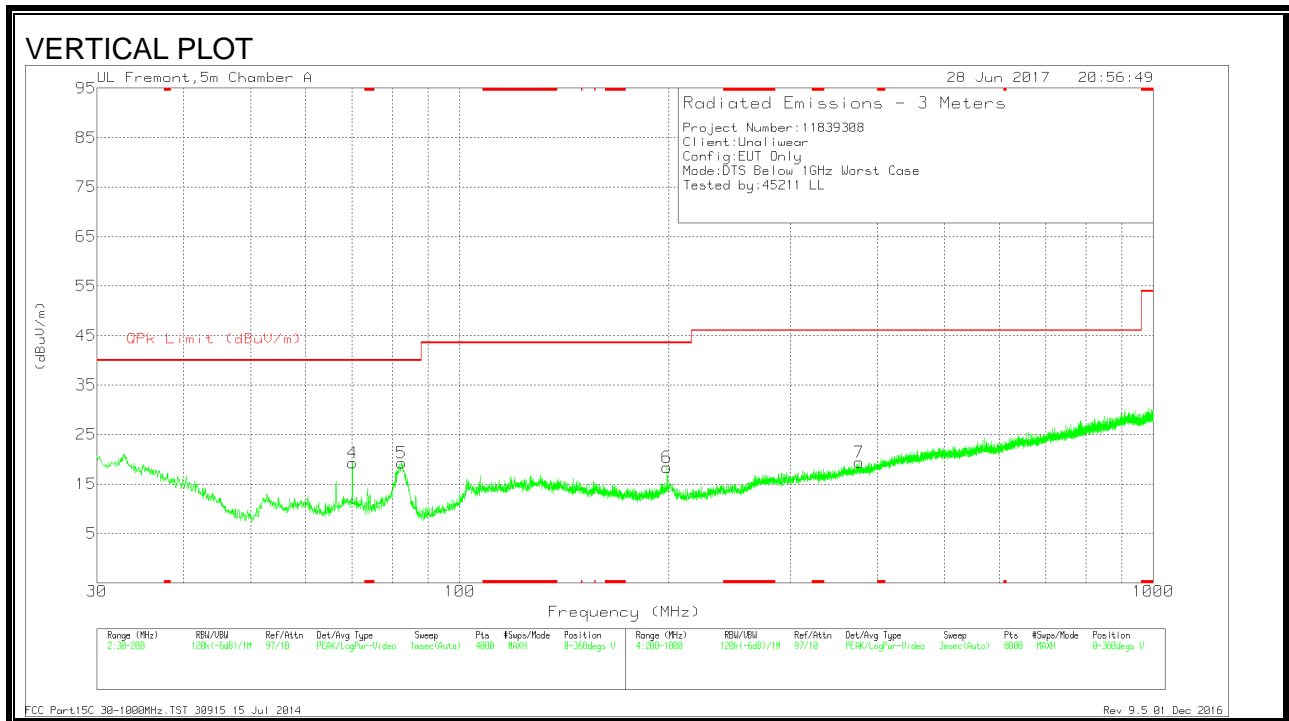
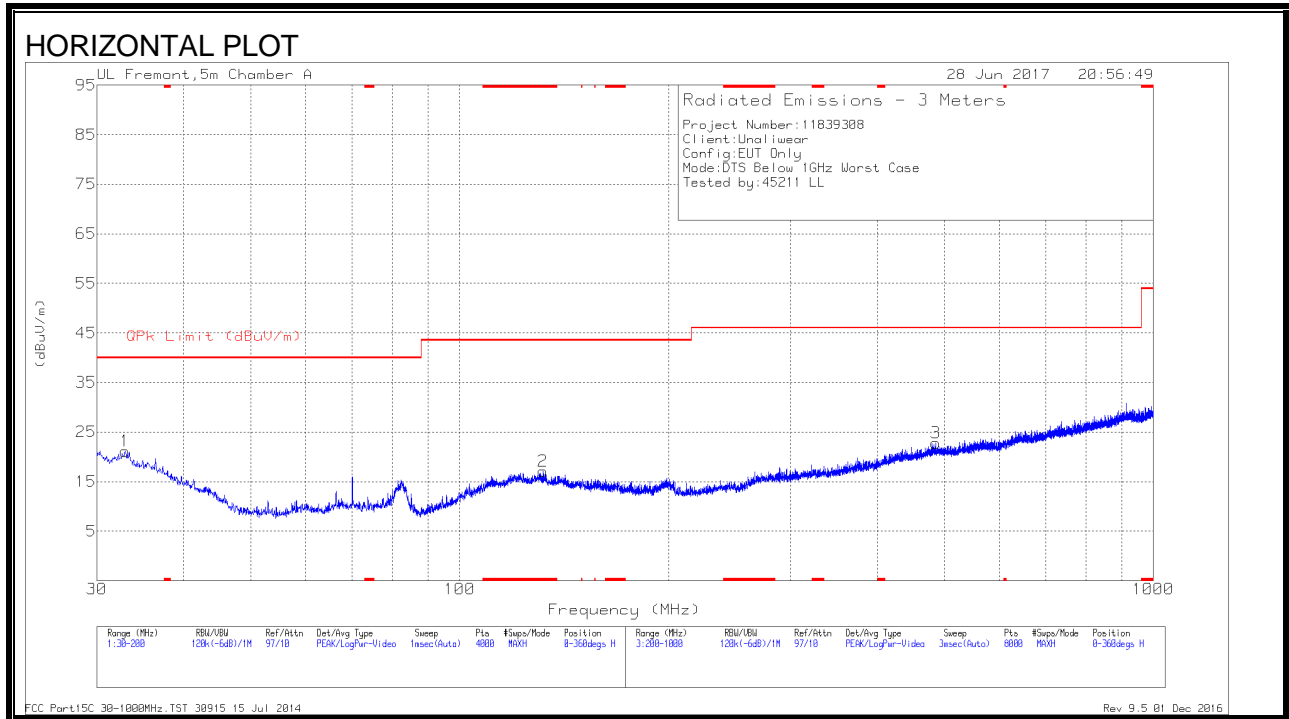
Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Dist	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 30 m	Corrected Reading (dBuV)	Peak Limit (dBuV/m)	Margi n (dB)	Avg Limit (dBuV/m)	Margi n (dB)	QP Limit (dBuV/m)	Margi n (dB)	QP Limit (dBuV/m)	Margi n (dB)	Peak Limit (dBuV/m)	Margi n (dB)	Avg Limit (dBuV/m)	Margi n (dB)	Azimu t (Degs)	
5	.914	32.62	Pk	11.5	2	-40	4.32	-	-	-	-	-	-	28.4	-24.08	-	-	-	-	-	0-360
3	19.35437	12.86	Pk	9.8	7	-40	-16.64	-	-	-	-	-	-	29.5	-46.14	-	-	-	-	-	0-360
6	26.56251	12.92	Pk	8.6	8	-40	-17.68	-	-	-	-	-	-	29.5	-47.18	-	-	-	-	-	0-360

Pk - Peak detector

10.4 WORST-CASE BELOW 1 GHz

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

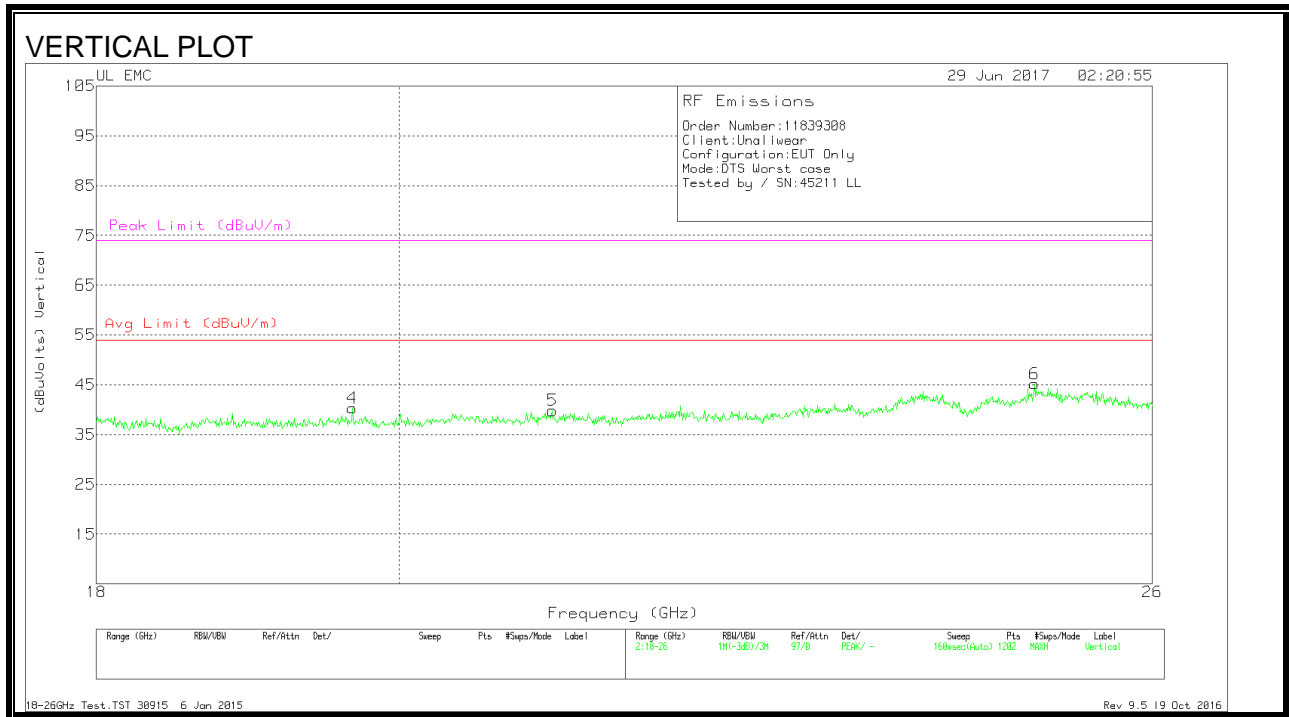
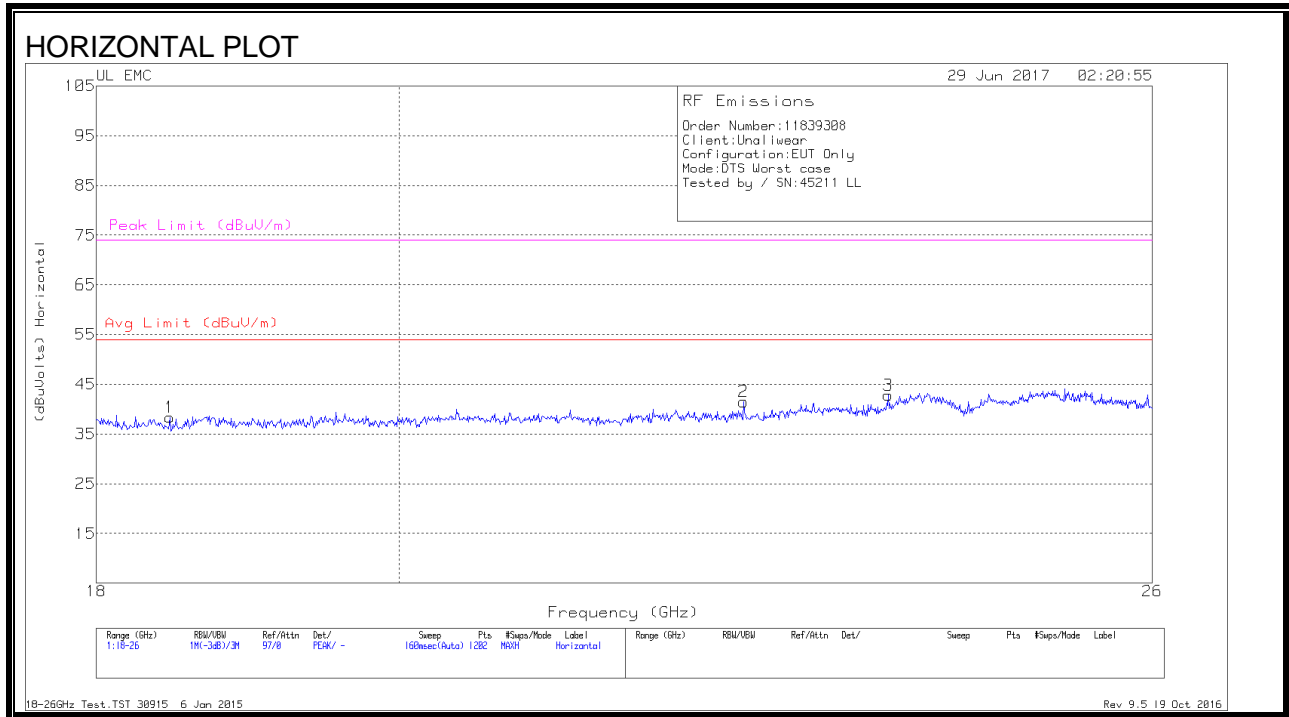


Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	131.9201	29.64	Pk	17.8	-30.4	17.04	43.52	-26.48	0-360	400	H
1	32.9333	28.4	Pk	23.9	-31.2	21.1	40	-18.9	0-360	100	H
4	70.0454	37.61	Pk	12.5	-30.8	19.31	40	-20.69	0-360	100	V
5	82.5011	38.43	Pk	11.5	-30.7	19.23	40	-20.77	0-360	100	V
6	199.0237	31.58	Pk	16.7	-29.9	18.38	43.52	-25.14	0-360	100	V
7	376.4229	29.51	Pk	19	-29.1	19.41	46.02	-26.61	0-360	200	V
3	485.5371	29.75	Pk	21.7	-28.7	22.75	46.02	-23.27	0-360	400	H

10.5. WORST-CASE 18 to 26 GHz

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



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T449 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	18.466	41.03	Pk	32.3	-25.5	-9.5	38.33	54	-15.67	74	-35.67
2	22.55	42.4	Pk	33.5	-24.9	-9.5	41.5	54	-12.5	74	-32.5
3	23.715	42.73	Pk	33.8	-24.2	-9.5	42.83	54	-11.17	74	-31.17
4	19.679	42.13	Pk	32.7	-25	-9.5	40.33	54	-13.67	74	-33.67
5	21.097	41.23	Pk	33.2	-25.1	-9.5	39.83	54	-14.17	74	-34.17
6	24.954	44.77	Pk	34.3	-24.4	-9.5	45.17	54	-8.83	74	-28.83

Pk - Peak detector