



CERTIFICATION TEST REPORT

Report Number. : 11724033-E2V4

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

Model : A1898

FCC ID : BCG-E3173A

IC : 579C-E3173A

EUT Description : SMARTPHONE

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS - 247 ISSUE 2

Date Of Issue:

July 24, 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	7/14/2017	Initial Issue	Francisco Guarnero
V2	7/18/2017	Address TCB's Question	Chin Pang
V3	7/19/2017	Address TCB's Question	Chin Pang
V4	7/24/2017	Added additional worst case config info & Updated output power method in section 7	Francisco Guarnero

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	6
2. TEST METHODOLOGY	7
3. FACILITIES AND ACCREDITATION	7
4. CALIBRATION AND UNCERTAINTY	8
4.1. MEASURING INSTRUMENT CALIBRATION	8
4.2. SAMPLE CALCULATION	8
4.3. MEASUREMENT UNCERTAINTY.....	8
5. EQUIPMENT UNDER TEST	9
5.1. DESCRIPTION OF EUT	9
5.2. MAXIMUM OUTPUT POWER.....	9
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	9
5.4. SOFTWARE AND FIRMWARE.....	9
5.5. WORST-CASE CONFIGURATION AND MODE.....	10
5.6. DESCRIPTION OF TEST SETUP.....	11
6. TEST AND MEASUREMENT EQUIPMENT	16
7. ANTENNA PORT TEST RESULTS	17
7.1. MEASUREMENT METHODS	17
7.2. ON TIME, DUTY CYCLE	18
7.3. UAT 1 BLE 1M P _{MAX}	20
7.3.1. 6 dB BANDWIDTH.....	20
7.3.2. 99% BANDWIDTH.....	23
7.3.3. AVERAGE POWER	26
7.3.4. OUTPUT POWER	27
7.3.5. POWER SPECTRAL DENSITY	28
7.3.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....	31
7.4. UAT 1 BLE 1M P _{LOW}	35
7.4.1. 6 dB BANDWIDTH.....	35
7.4.2. 99% BANDWIDTH.....	38
7.4.3. AVERAGE POWER	41
7.4.4. OUTPUT POWER	42
7.4.5. POWER SPECTRAL DENSITY	43
7.4.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....	46
7.5. UAT 1 BLE 2M P _{MAX}	50
7.5.1. AVERAGE POWER	50
7.5.2. OUTPUT POWER	51
7.6. UAT 1 BLE 2M P _{LOW}	52

7.6.1.	AVERAGE POWER	52
7.6.2.	OUTPUT POWER	53
7.7.	LAT 3 BLE 1M PMAX	54
7.7.1.	6 dB BANDWIDTH.....	54
7.7.2.	99% BANDWIDTH.....	57
7.7.3.	AVERAGE POWER	60
7.7.4.	OUTPUT POWER	61
7.7.5.	POWER SPECTRAL DENSITY	62
7.7.6.	CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....	65
7.8.	LAT 3 BLE 1M PLOW.....	69
7.8.1.	6 dB BANDWIDTH.....	69
7.8.2.	99% BANDWIDTH.....	72
7.8.3.	AVERAGE POWER	75
7.8.4.	OUTPUT POWER	76
7.8.5.	POWER SPECTRAL DENSITY	77
7.8.6.	CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....	80
7.9.	LAT 3 BLE 2M PMAX	84
7.9.1.	AVERAGE POWER	84
7.9.2.	OUTPUT POWER	85
7.10.	LAT 3 BLE 2M PLOW.....	86
7.10.1.	AVERAGE POWER	86
7.10.2.	OUTPUT POWER.....	87
8.	RADIATED TEST RESULTS.....	88
8.1.	LIMITS AND PROCEDURE	88
8.2.	UAT 1 BLE 1M PMAX.....	89
8.2.1.	RESTRICTED BANDEDGE (LOW CHANNEL).....	89
8.2.2.	AUTHORIZED BANDEDGE (HIGH CHANNEL).....	91
8.2.3.	HARMONICS AND SPURIOUS EMISSIONS	93
8.3.	UAT 1 BLE 1M PLOW	99
8.3.1.	RESTRICTED BANDEDGE (LOW CHANNEL).....	99
8.3.2.	AUTHORIZED BANDEDGE (HIGH CHANNEL).....	101
8.3.3.	HARMONICS AND SPURIOUS EMISSIONS	103
8.4.	LAT 3 BLE 1M PMAX	109
8.4.1.	RESTRICTED BANDEDGE (LOW CHANNEL).....	109
8.4.2.	AUTHORIZED BANDEDGE (HIGH CHANNEL).....	111
8.4.3.	HARMONICS AND SPURIOUS EMISSIONS	113
8.5.	LAT 3 BLE 1M PLOW.....	119
8.5.1.	RESTRICTED BANDEDGE (LOW CHANNEL).....	119
8.5.2.	AUTHORIZED BANDEDGE (HIGH CHANNEL).....	121
8.5.3.	HARMONICS AND SPURIOUS EMISSIONS	123
8.6.	WORST-CASE BELOW 1 GHz.....	129
8.7.	WORST-CASE ABOVE 18 GHz	131
8.8.	AC POWER LINE CONDUCTED EMISSIONS	133
8.8.1.	EUT POWERED BY AC/DC ADAPTER VIA USB CABLE	134
8.8.2.	EUT POWERED BY HOST PC VIA USB CABLE	136

9. SETUP PHOTOS.....138

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A1898

SERIAL NUMBER: C39TQ005J6LP

DATE TESTED: MARCH 08, 2017 – JULY 11, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 2	Pass
INDUSTRY CANADA RSS-GEN Issue 4	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:



CHIN PANG
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.



JINGANG LI
LAB ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v04, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 2.

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 (IC:2324B-1)	☐ Chamber D (IC:22541-1)
☐ Chamber B (IC:2324B-2)	☒ Chamber E (IC:22541-2)
☐ Chamber C (IC:2324B-3)	☒ Chamber F (IC:22541-3)
	☐ Chamber G (IC:22541-4)
	☐ 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. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

Parameter	Uncertainty
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
Occupied Channel Bandwidth	±0.39 %

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The equipment under Test is a mobile phone with GSM, GPRS, EGPRS, UMTS, LTE and TD-SCDMA technologies. It also supports IEEE 802.11a/b/g/n/ac, Bluetooth, GPS and NFC. The device has a built-in inductive charging receiver which is not user accessible. The rechargeable battery is not user accessible.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Antenna	Configuration	Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
UAT1	PMax	2402 - 2480	BLE 1M	19.77	94.84
	PLow			9.98	9.95
	PMax		BLE 2M	19.60	91.20
	PLow			9.71	9.35
LAT3	PMax	2402 - 2480	BLE 1M	19.98	99.54
	PLow			9.91	9.79
	PMax		BLE 2M	19.58	90.78
	PLow			9.77	9.48

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	UAT1 (dBi)	LAT3 (dBi)
2.4	1.01	-2.24

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was Firmware version 1.8 rev 55147 and Software tool version was NCI_UART_RTM4_B1_V1.07

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated band edge, harmonic, and spurious emissions from 1GHz to 18GHz were performed with the EUT set to transmit at highest power on Low/Middle/High channels.

Radiated emissions below 30MHz, below 1GHz, above 18GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations, X (Flatbed), Y (Landscape), and Z (Portrait), on both primary and diversity antennas. In addition, the EUT was also investigated with and without AC/DC charger, headphones & laptop. It was determined that X (Flatbed) orientation was the worst-case orientation for both antennas without AC/DC charger, headphones, or laptop; therefore, all final radiated testing was performed with EUT only in X-orientation for 1 - 18GHz and 18 – 26GHz. And for 30-1000MHz EUT was tested with AC/DC charger.

Worst-case data rate as provided by the client and baseline scan was:

BLE: 1Mbps

BLE 1M mode has been verified to have the highest power.

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. The Wi-Fi/Bluetooth radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances.

Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

For simultaneous transmission of multiple channels from the same antenna LAT 3 in the 2.4GHz BT and 5GHz bands, tests were conducted for various configurations having the highest power. No noticeable new emission was found.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop AC/DC adapter	HP	HSTNN-DA40	744481-003	NA
Laptop	HP	3160HMMW	CND5340FPD	NA
Dongle	N/A	N/A	HDG1409226823	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
3	AC	1	AC	Un-shielded	3	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
N/A						

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	AC	Un-shielded	3	N/A

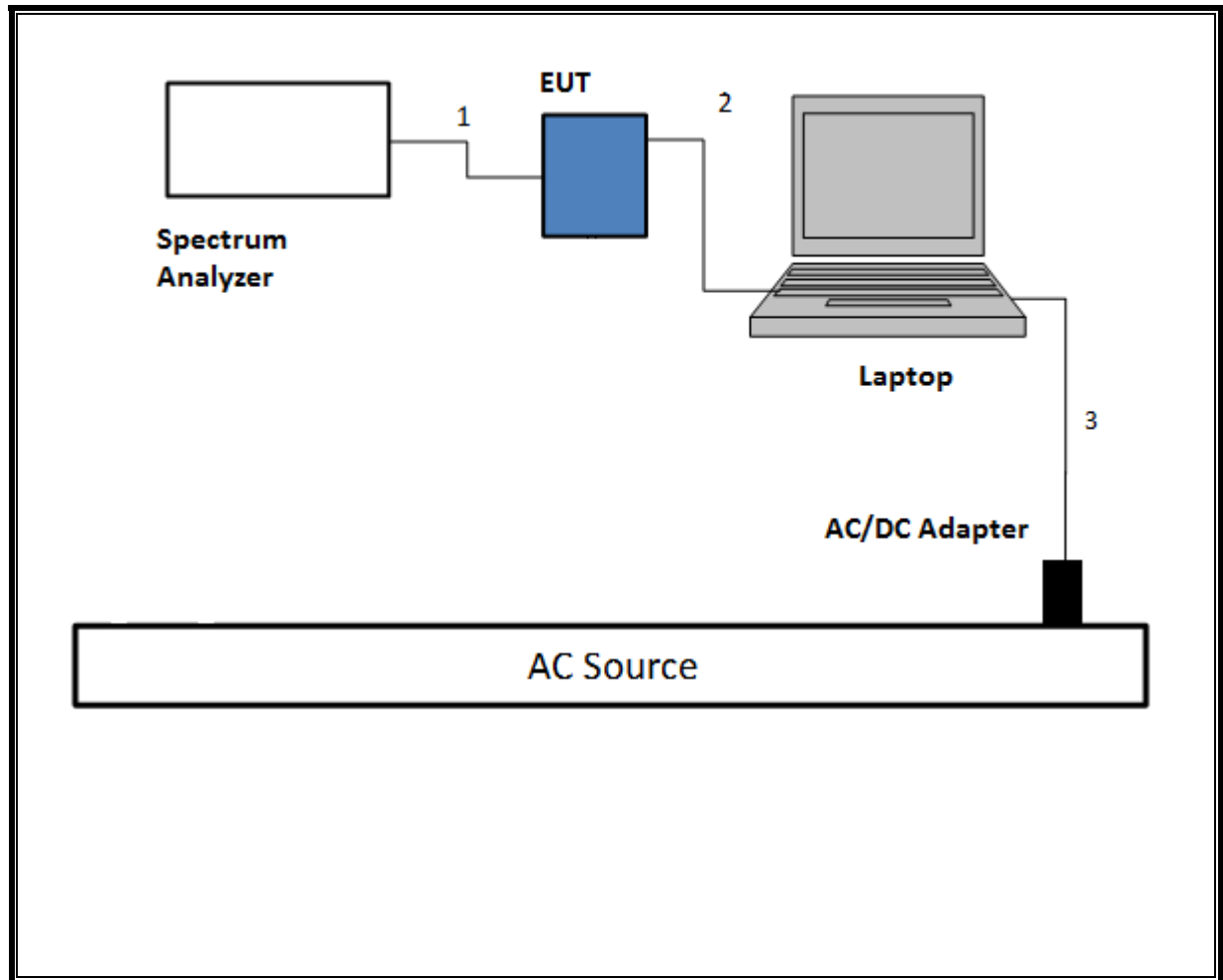
I/O CABLES (AC LINE CONDUCTED: LAPTOP CONFIGURATION)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Un-shielded	3	N/A
2	USB	1	USB	Shielded	1	N/A

TEST SETUP

The EUT was powered by AC cord. Test software exercised the radio card.

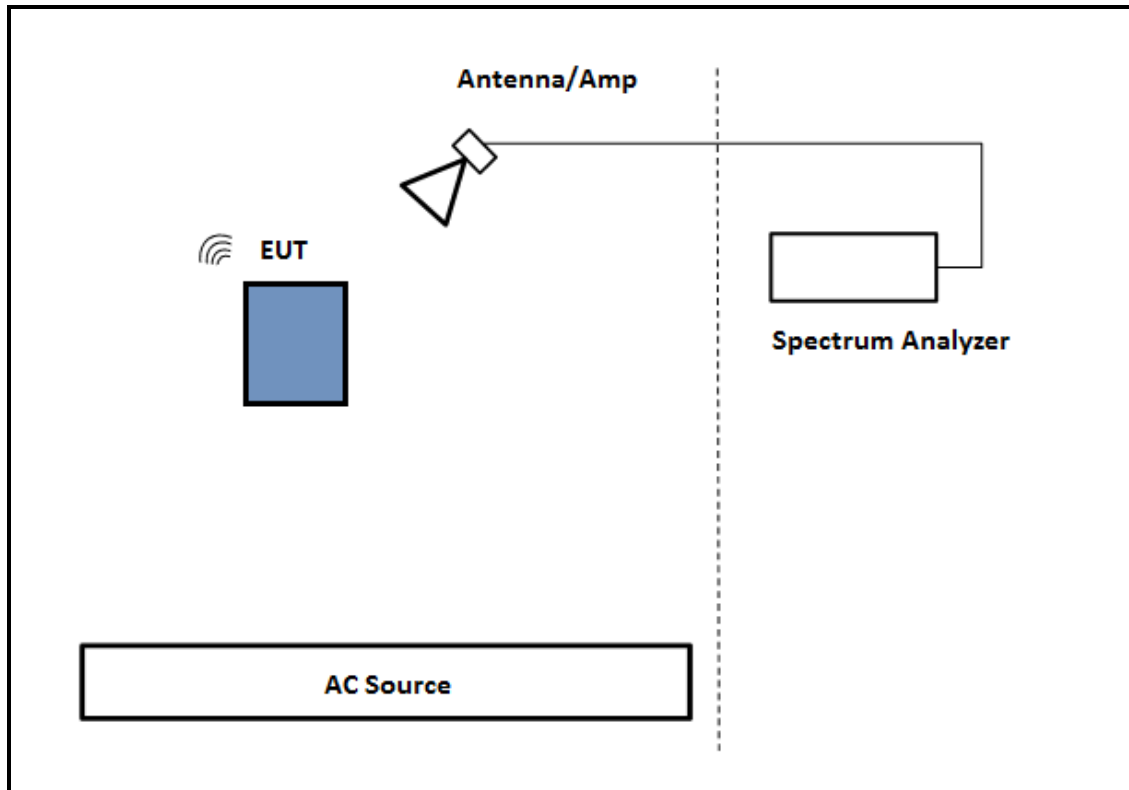
SETUP DIAGRAM



TEST SETUP- RADIATED-ABOVE 1 GHZ

The EUT was powered by Battery. Test software exercised the EUT.

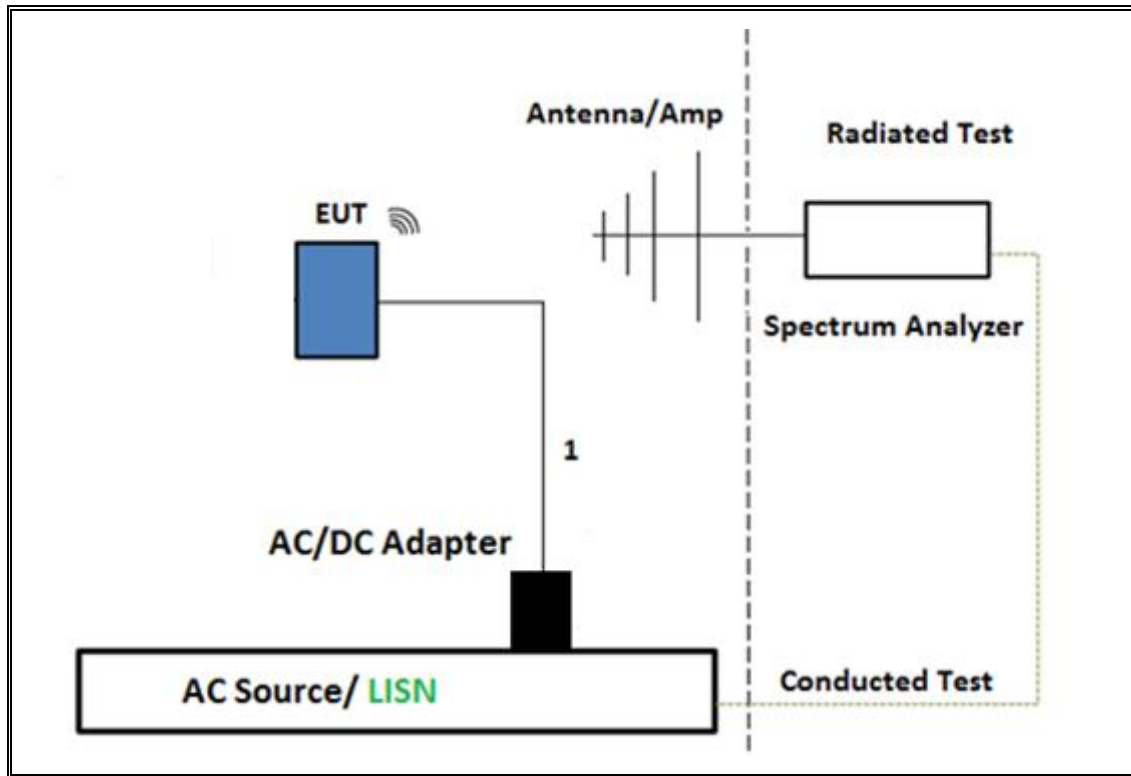
SETUP DIAGRAM



TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS

The EUT was powered by AC cord. Test software exercised the EUT.

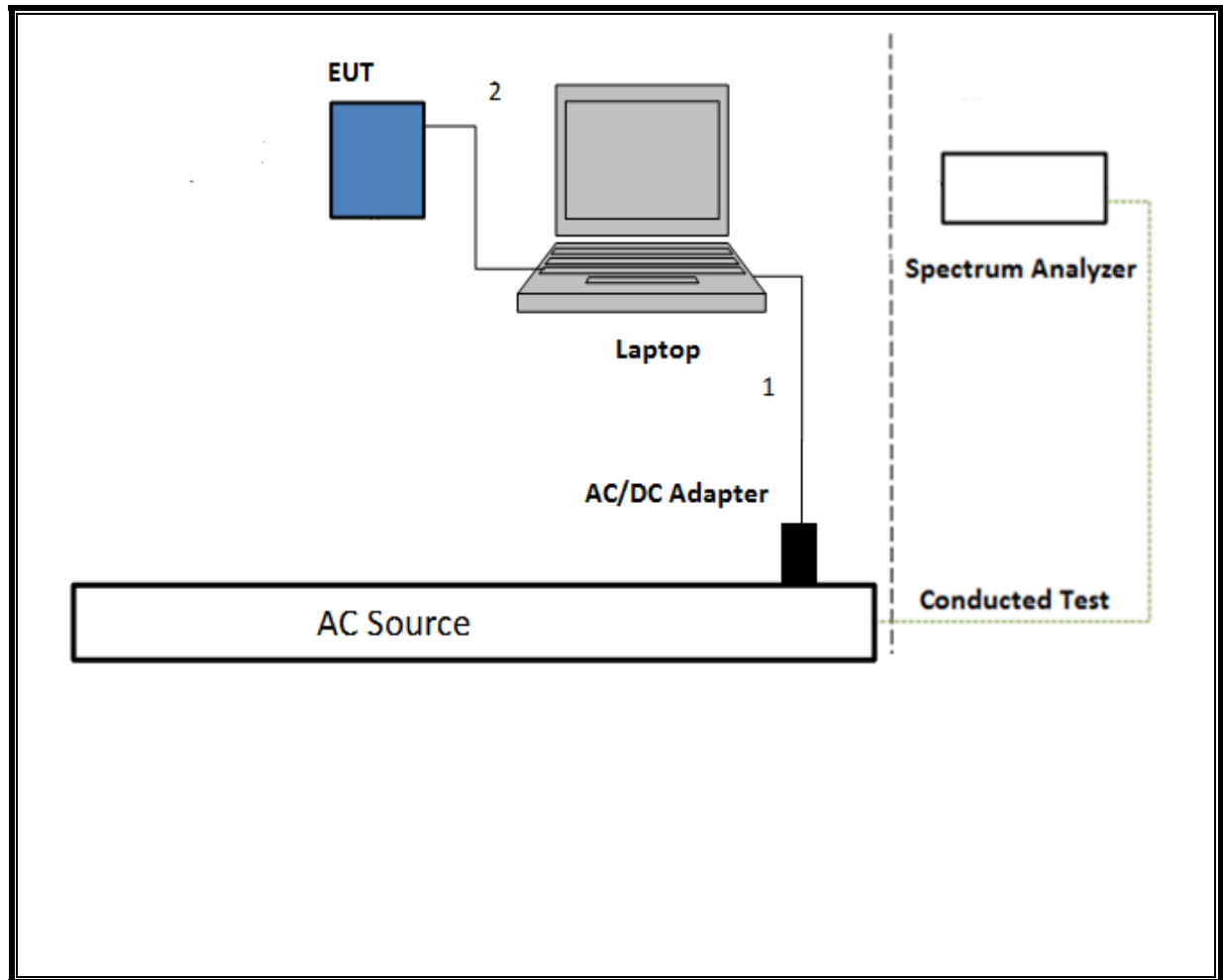
SETUP DIAGRAM



TEST SETUP

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



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
*Antenna, Horn 1-18GHz	ETS Lindgren	3117	T863	4/26/2017
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T741	11/29/2017
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T1113	12/20/2017
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB1	T122	1/31/2018
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T742	11/29/2017
*Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T173	6/17/2017
Spectrum Analyzer, PSA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T339	9/22/2017
*Antenna Horn, 18 to 26GHz	ARA	MWH-1826	T447	6/16/2017
Spectrum Analyzer, 40GHz	Agilent	8564E	T106	9/7/2017
Amplifier, 1 to 26.5GHz 23.5dB gain Minimum	Keysight	8449B	T402	7/5/2017
Power Meter, P-series single channel	Keysight	N1912A	T1273	07/08/2017
Power Sensor	Keysight	N1921A	T750	10/1/2017
AC Line Conducted				
EMI Test Receiver 9KHz-7GHz	Rohde & Schwarz	ESC17	T1124	10/07/2017
*LISN for Conducted Emissions CISPR-16	Fischer	50/250-25-2-01	T1310	06/08/2017
Power Cable, Line Conducted Emissions	UL	PG1	T861	9/1/2017
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, April 26, 2016	
Conducted Software	UL	UL EMC	Ver 5.4, October 13, 2016	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015	

NOTE: *testing is completed before equipment calibration expiration date.

7. ANTENNA PORT TEST RESULTS

7.1. MEASUREMENT METHODS

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

Output Power: KDB 558074 D01 v04, Section 9.1.3.

Power Spectral Density: KDB 558074 D01 v04, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.0.

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

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

Conducted line emissions: C63.10, Clause 6.2

7.2. ON TIME, DUTY CYCLE

LIMITS

None; for reporting purposes only.

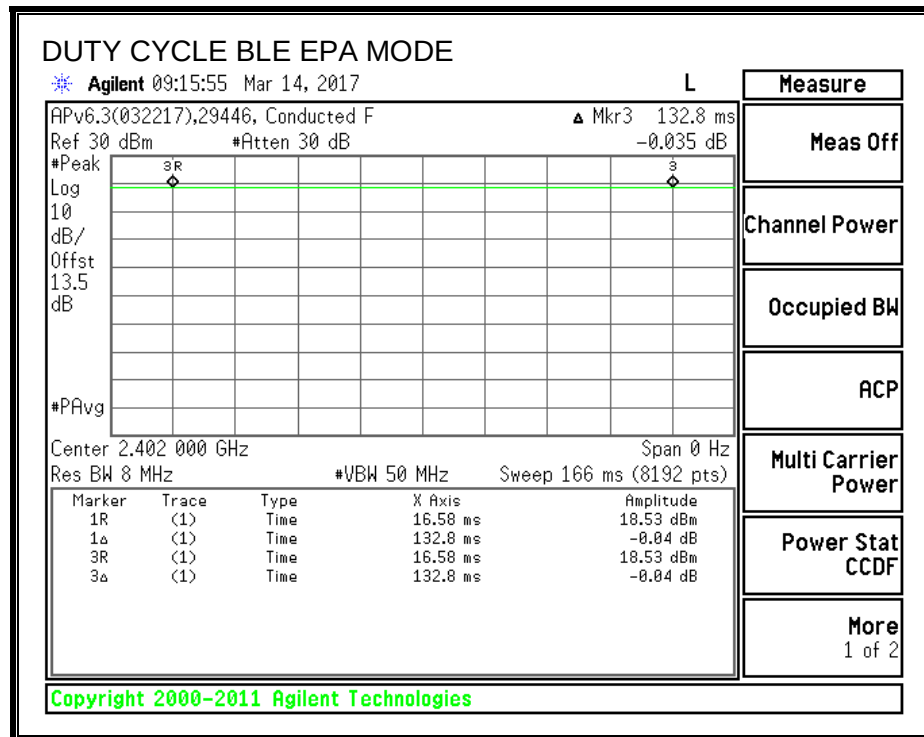
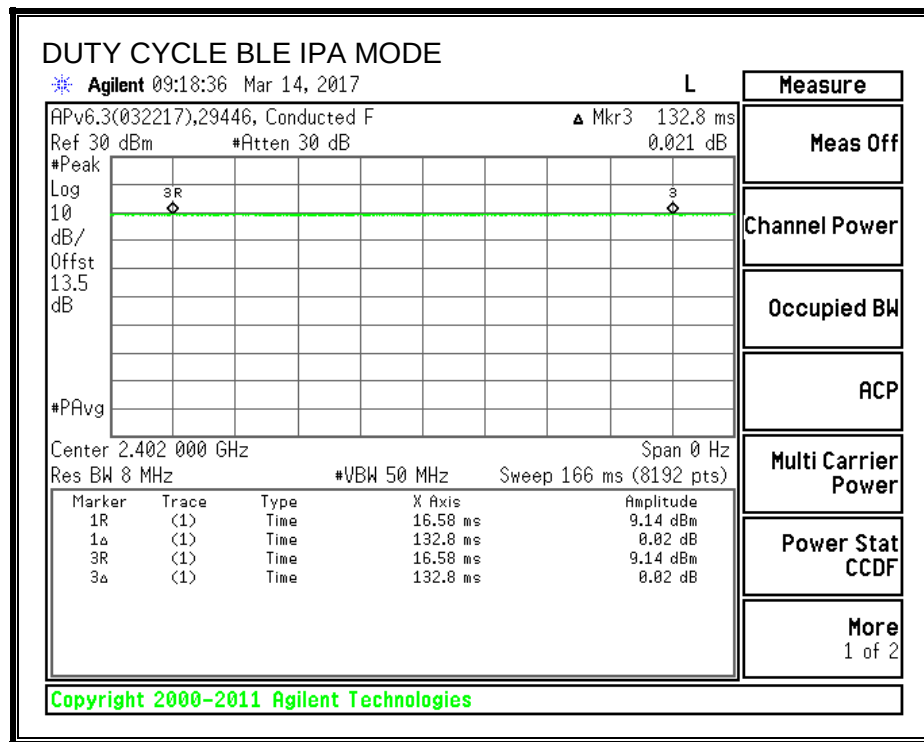
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (khz)
BLE PLOW	16.58	16.58	1.00	100%	0.00	0.010
BLE PMAX	16.58	16.58	1.00	100%	0.00	0.010

DUTY CYCLE PLOTS



7.3. UAT 1 BLE 1M PMAX

7.3.1. 6 dB BANDWIDTH

LIMITS

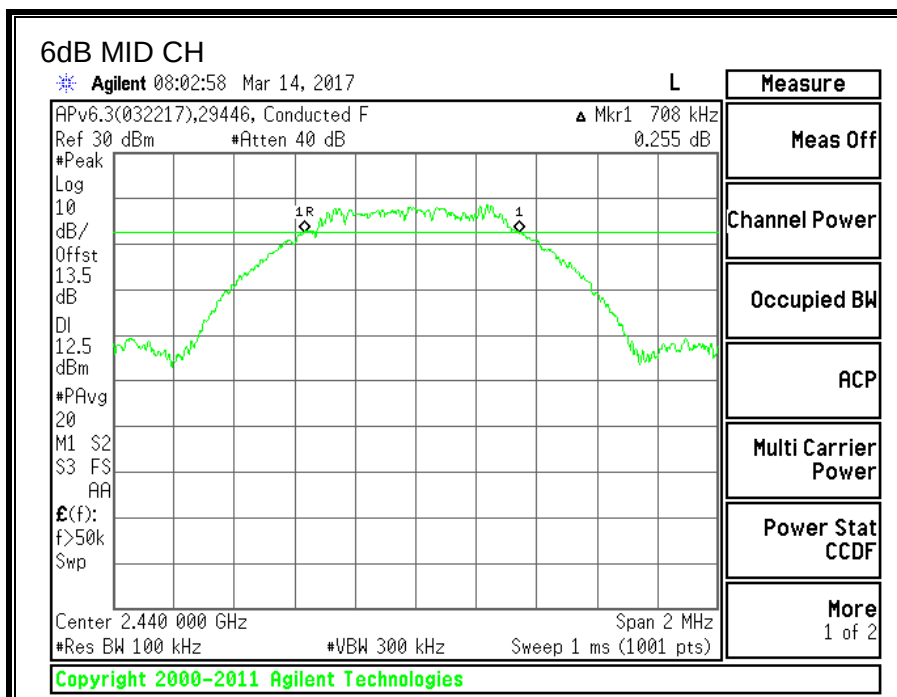
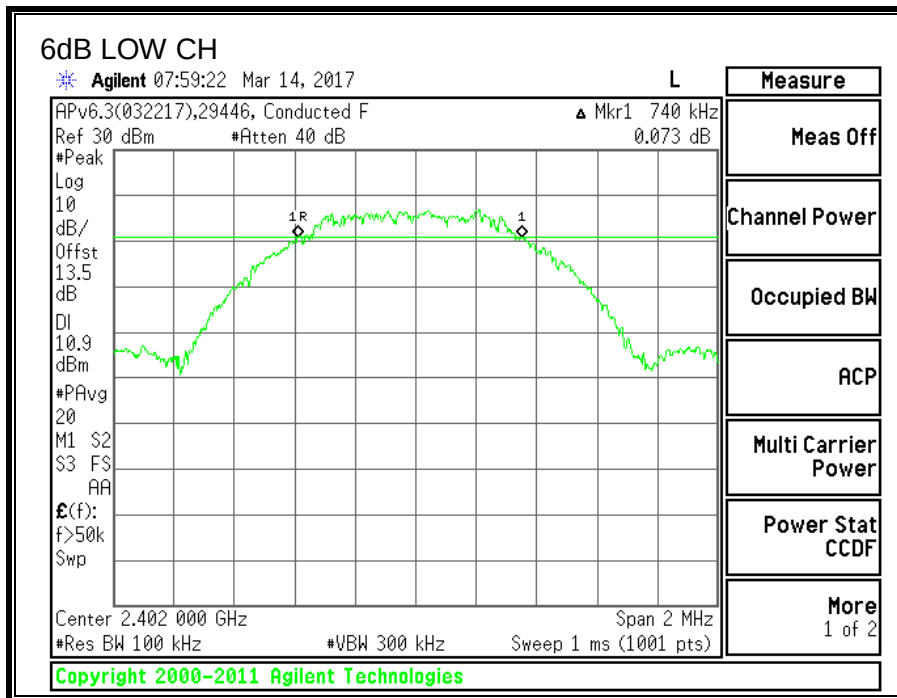
FCC §15.247 (a) (2)

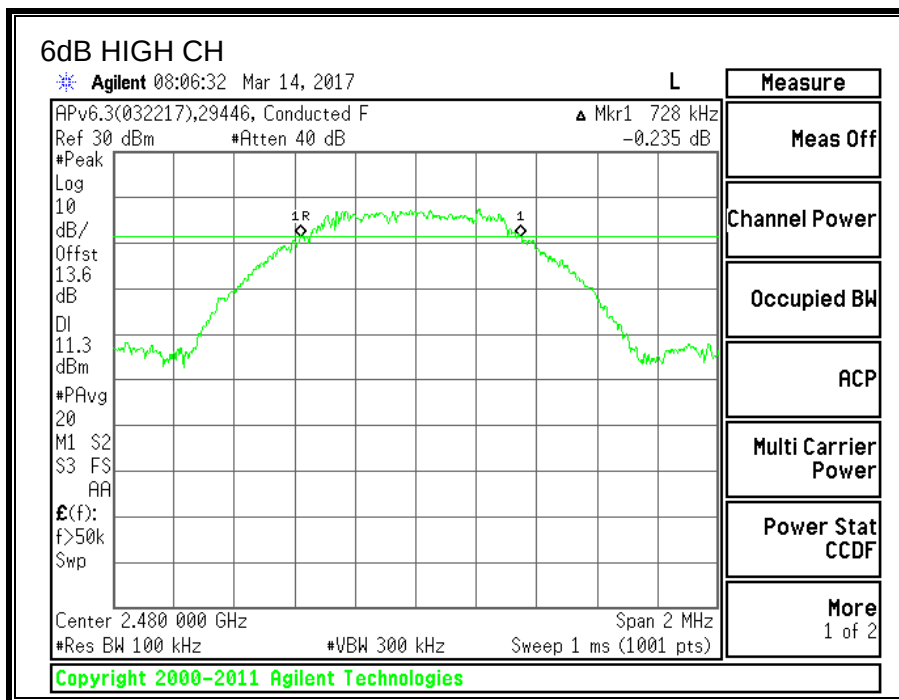
IC RSS-247 (5.2) (a)

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

RESULTS

Channel	Frequency	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.740	0.5
Middle	2440	0.708	0.5
High	2480	0.728	0.5





7.3.2. 99% BANDWIDTH

LIMITS

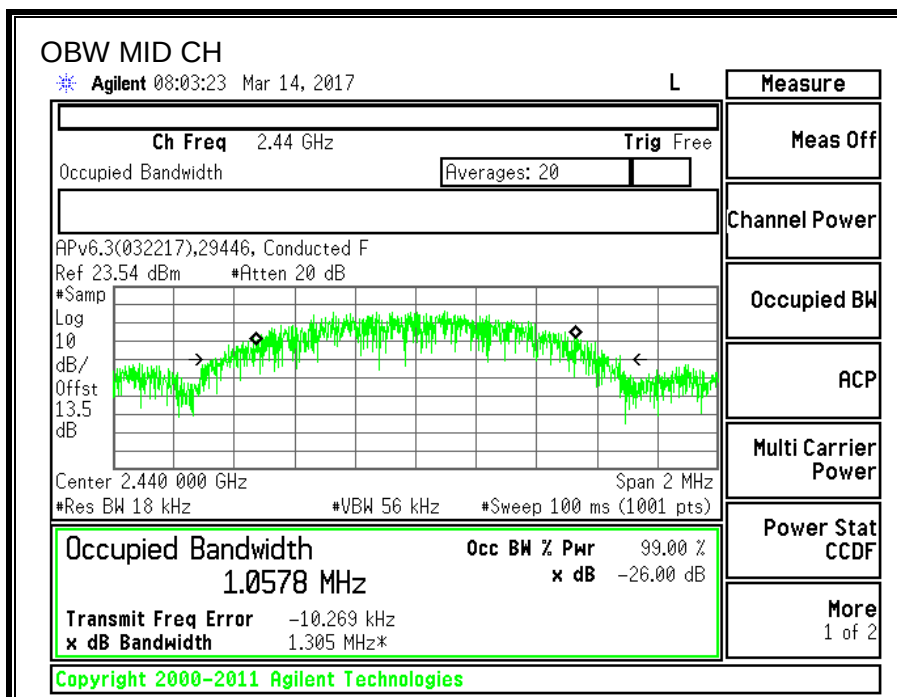
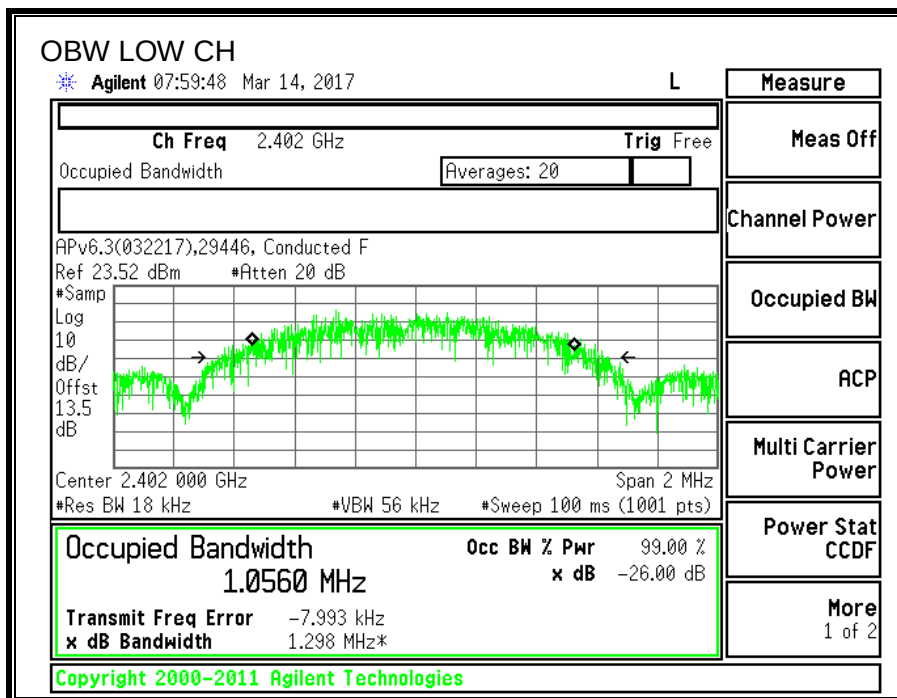
None; for reporting purposes only.

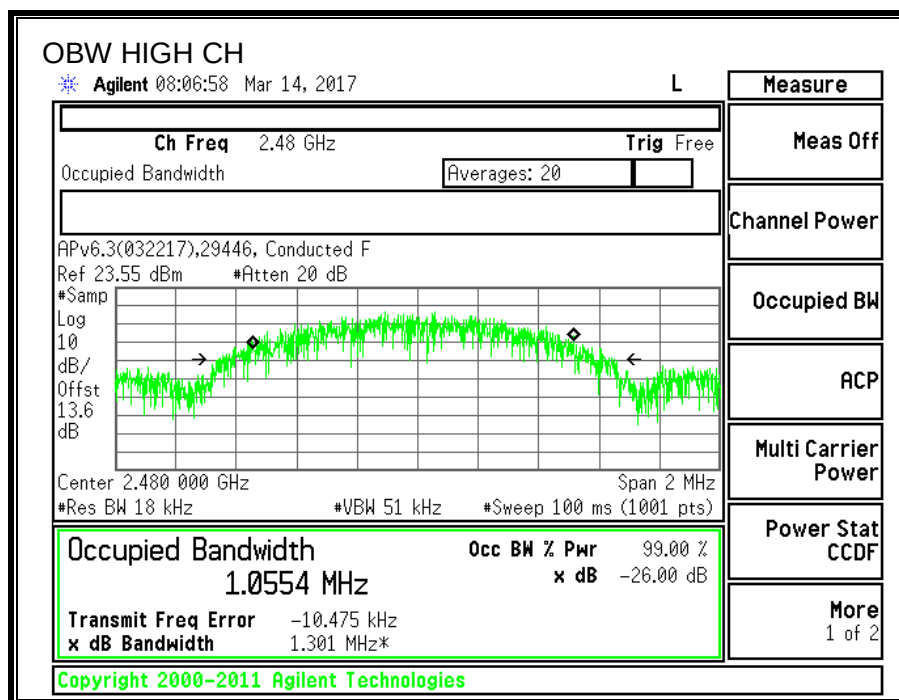
Test Procedure

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0560
Middle	2440	1.0578
High	2480	1.0554





7.3.3. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	19.38
Middle	2440	19.51
High	2480	19.37

7.3.4. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.69	30	-13.62
Middle	2440	19.77	30	-13.52
High	2480	19.71	30	-13.63

7.3.5. POWER SPECTRAL DENSITY

LIMITS

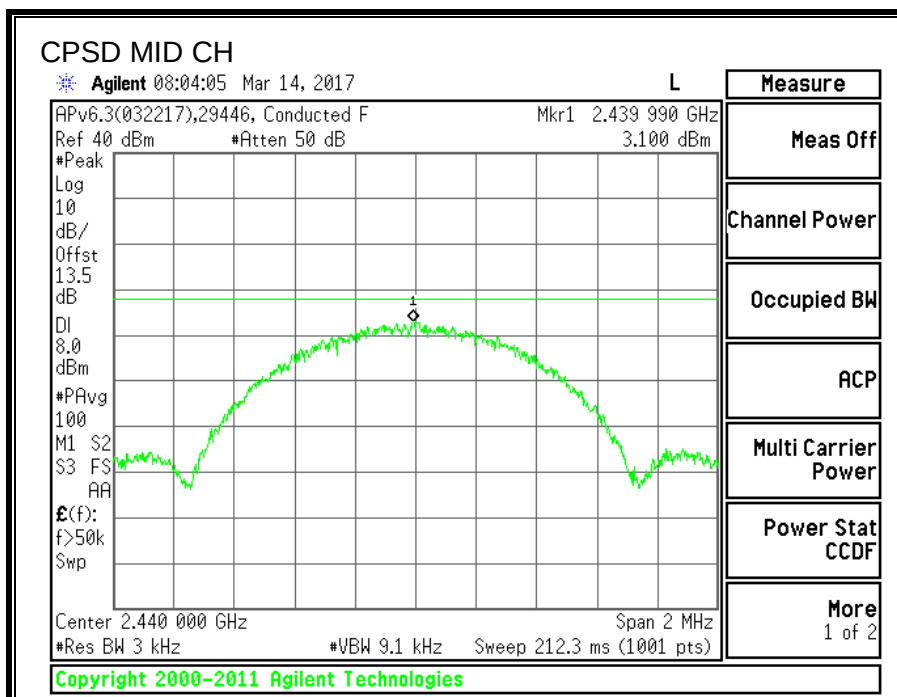
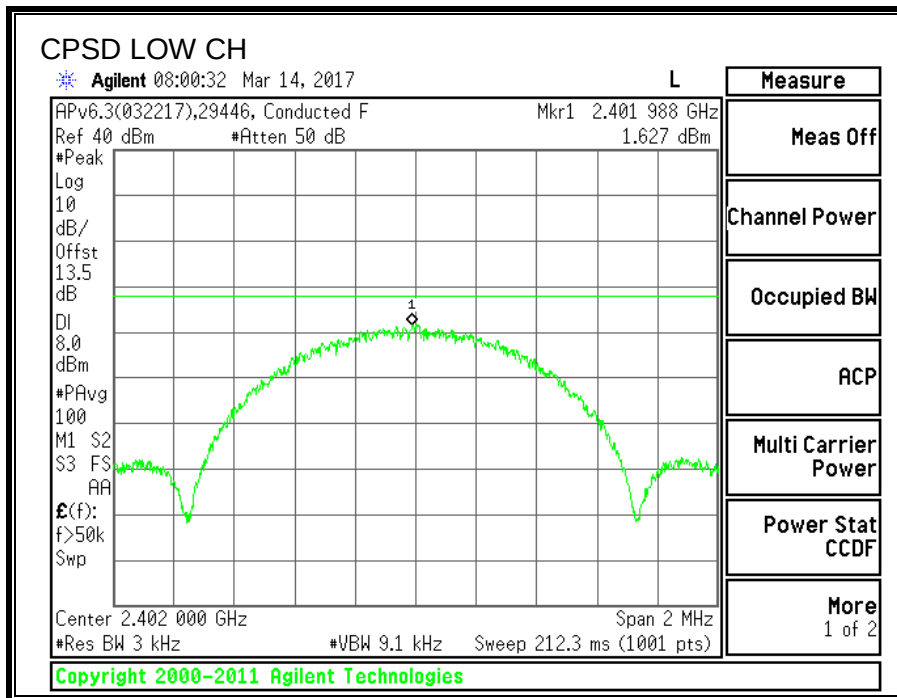
FCC §15.247 (e)

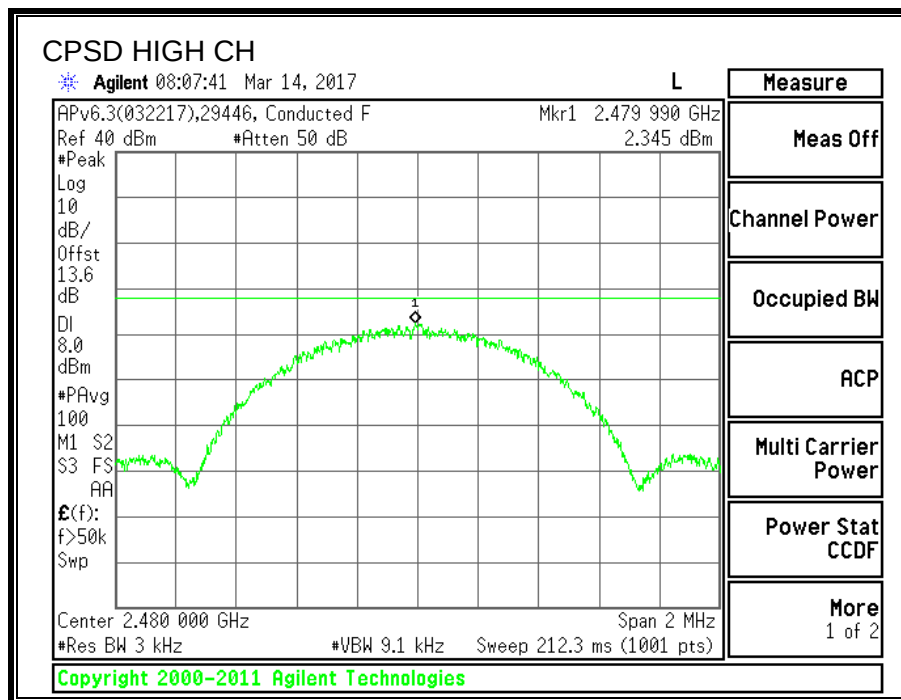
IC RSS-247 (5.2) (b)

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

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.627	8	-6.373
Middle	2440	3.100	8	-4.900
High	2480	2.345	8	-5.655





7.3.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

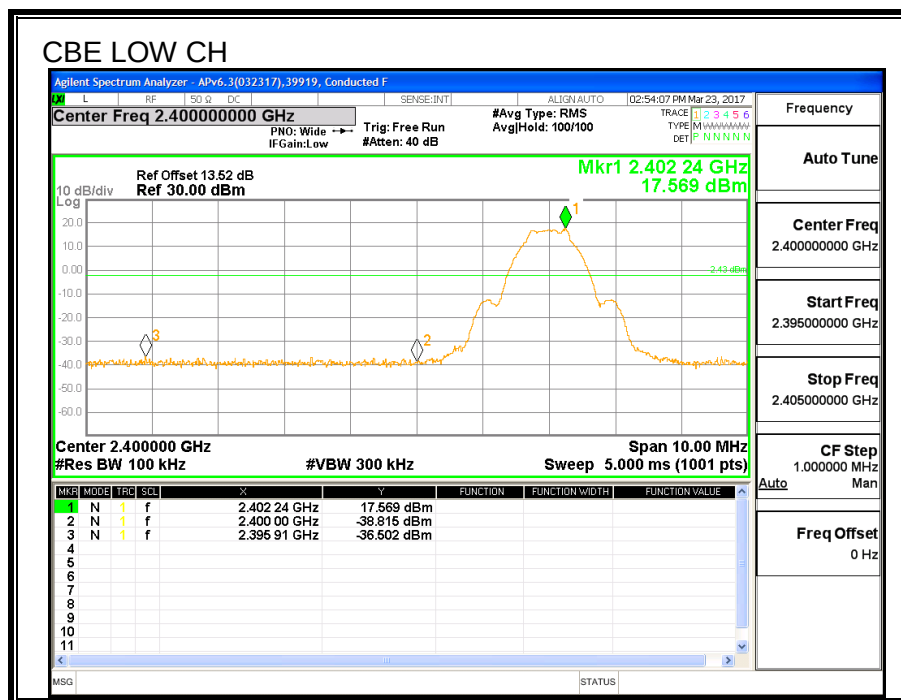
LIMITS

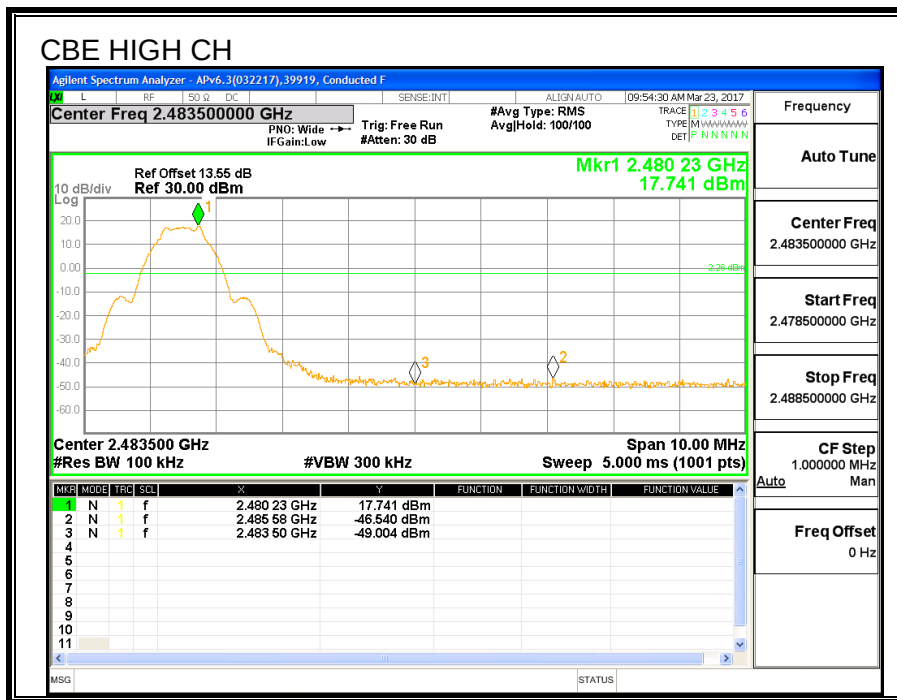
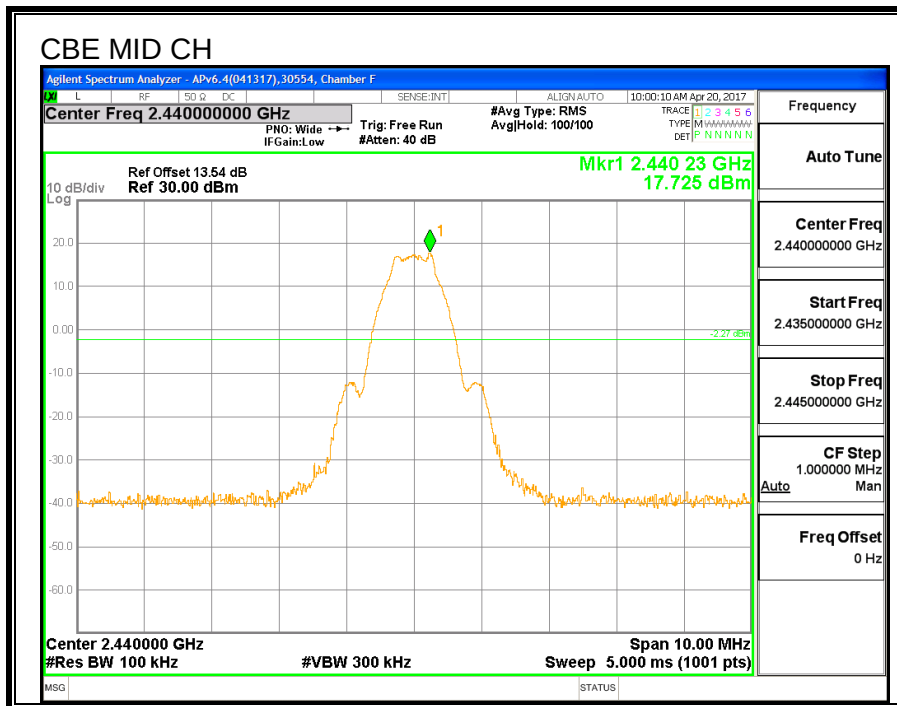
FCC §15.247 (d)

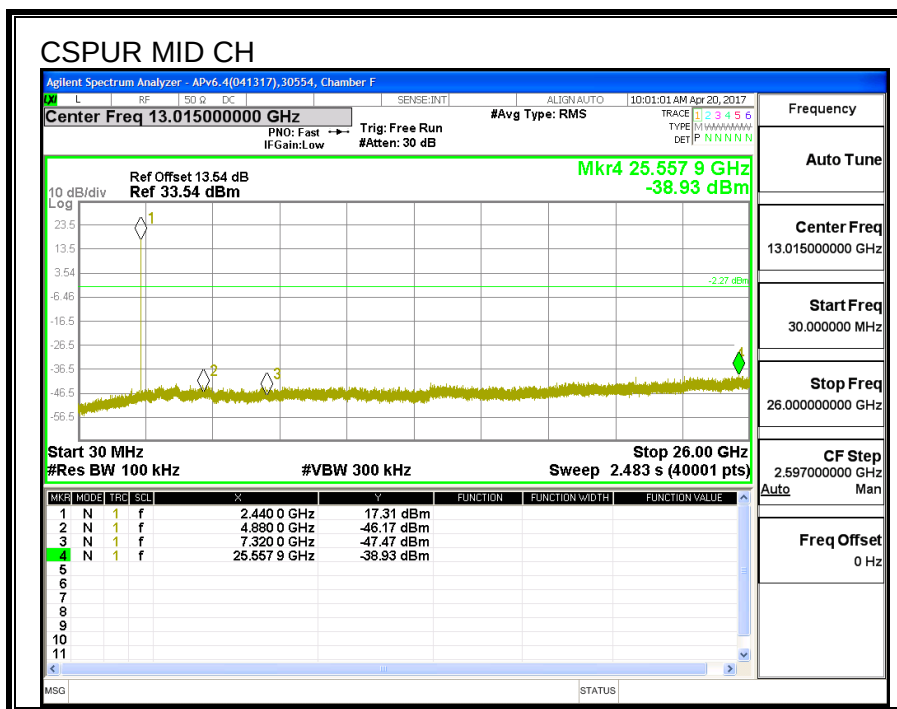
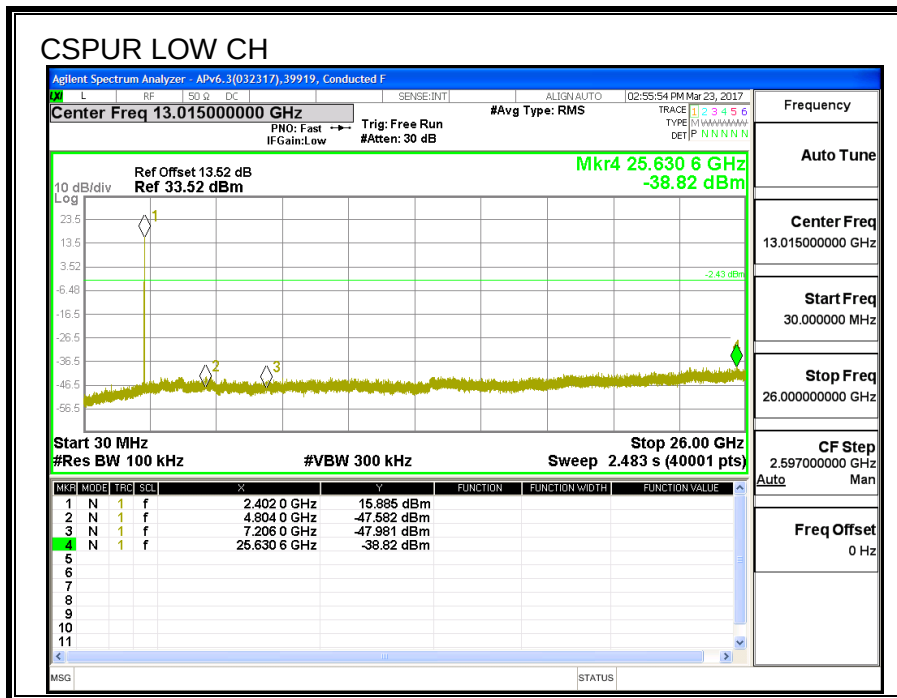
IC RSS-247 (5.5)

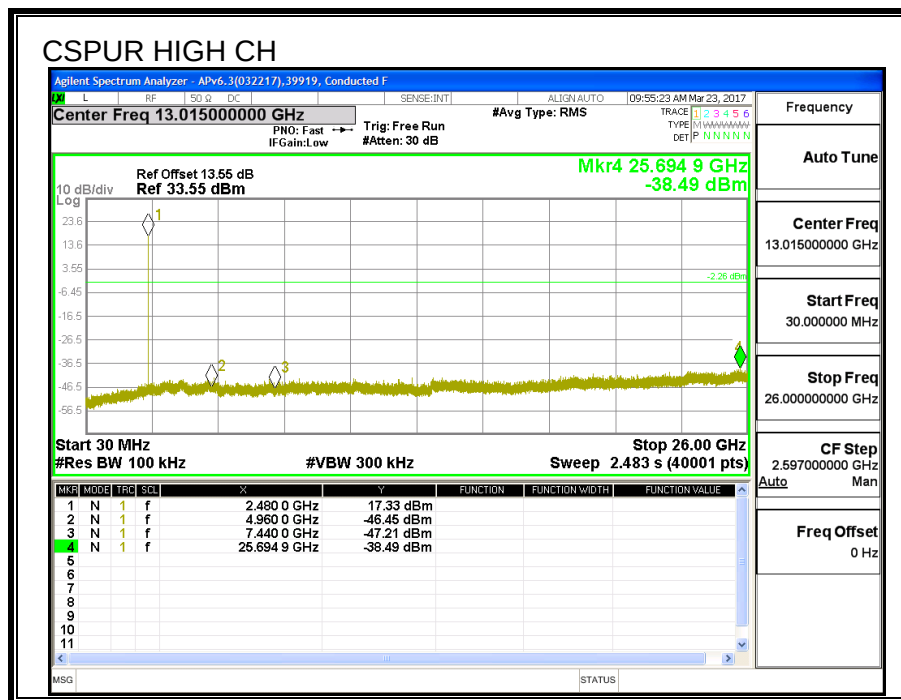
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS









7.4. UAT 1 BLE 1M PLOW

7.4.1. 6 dB BANDWIDTH

LIMITS

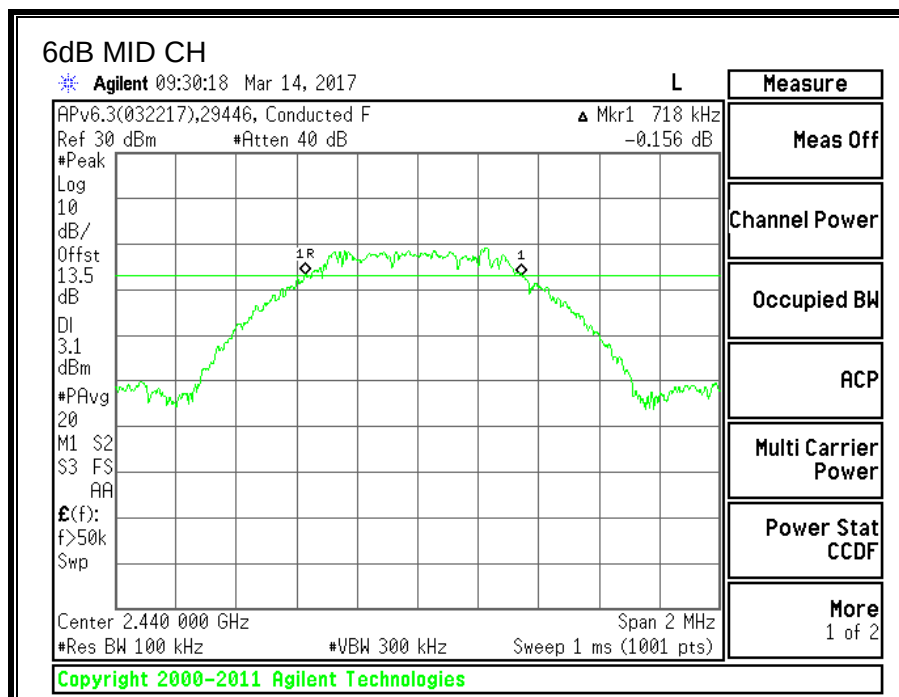
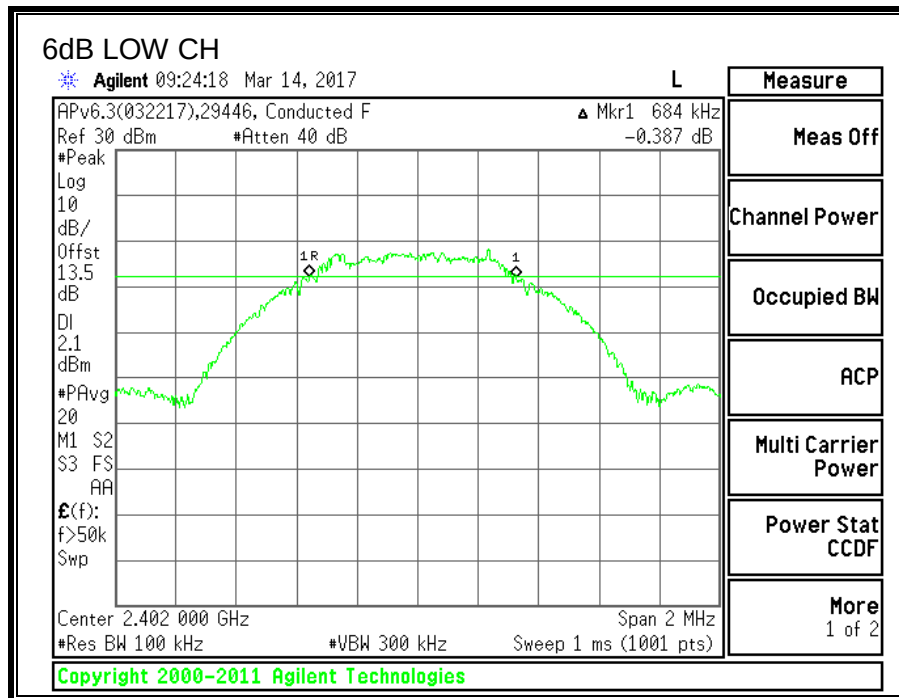
FCC §15.247 (a) (2)

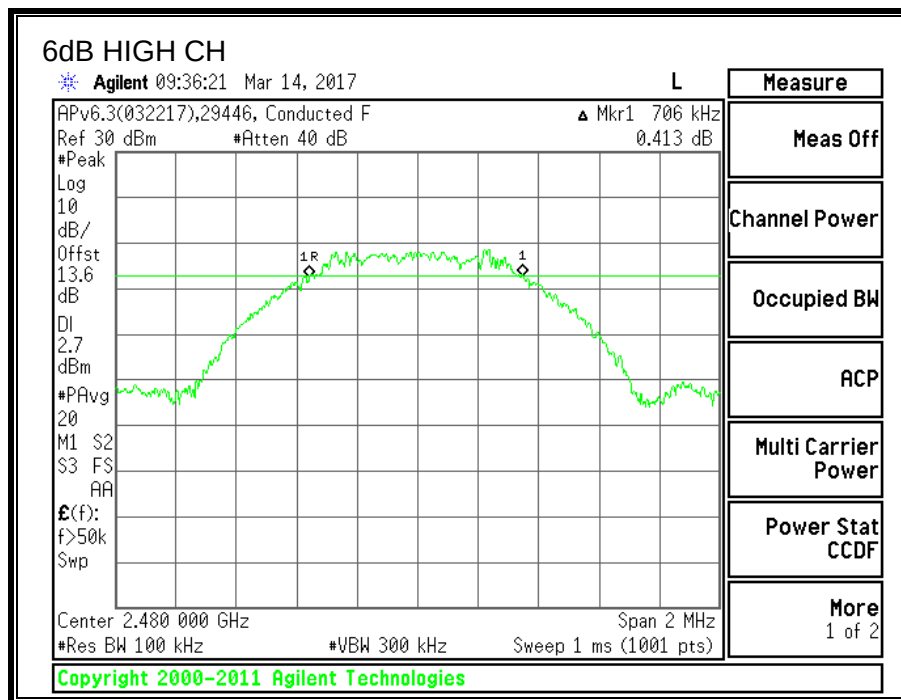
IC RSS-247 (5.2) (a)

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

RESULTS

Channel	Frequency	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.684	0.5
Middle	2440	0.718	0.5
High	2480	0.706	0.5





7.4.2. 99% BANDWIDTH

LIMITS

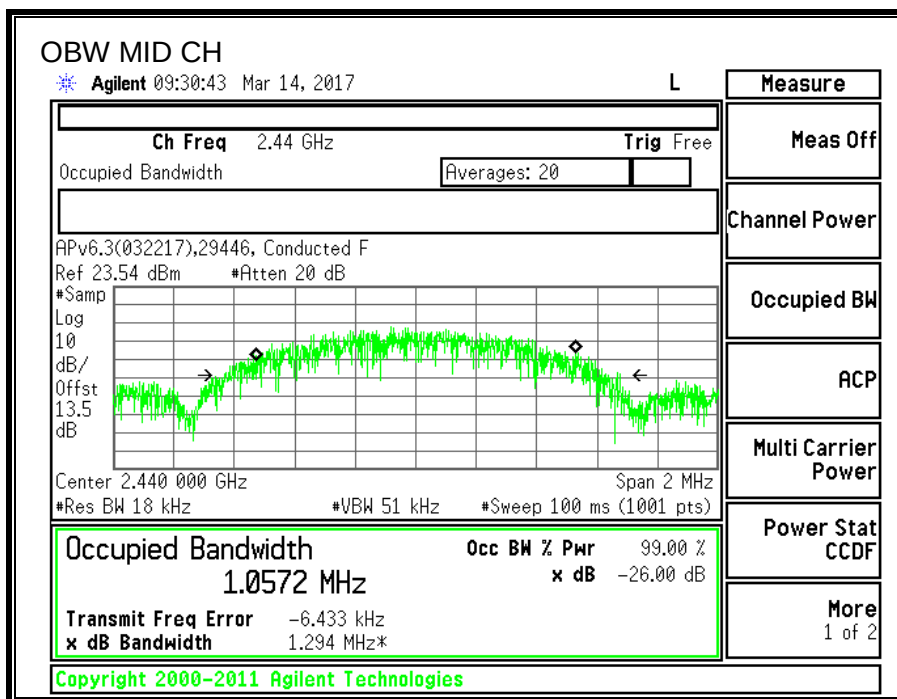
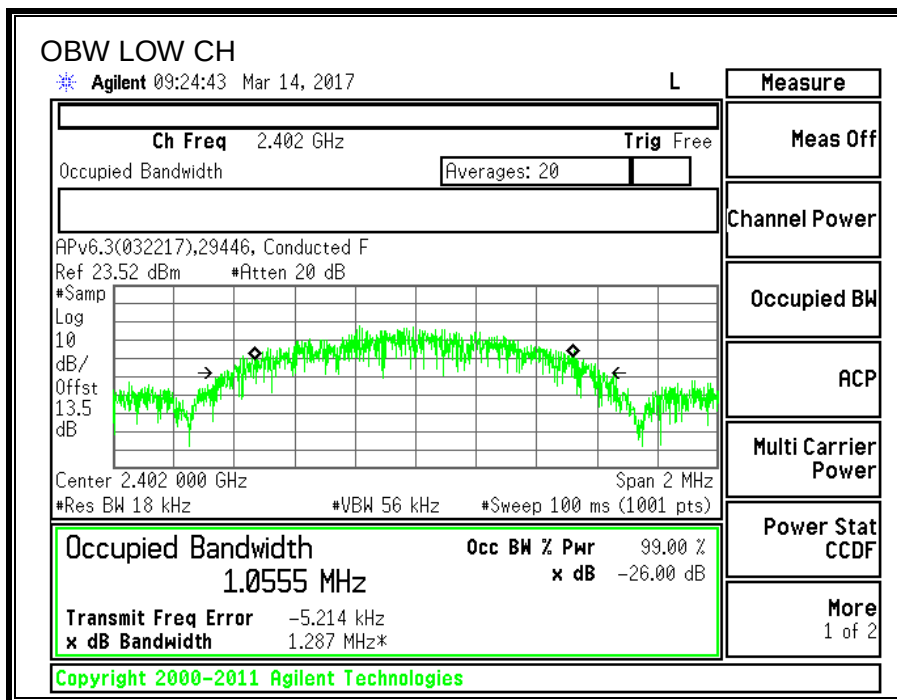
None; for reporting purposes only.

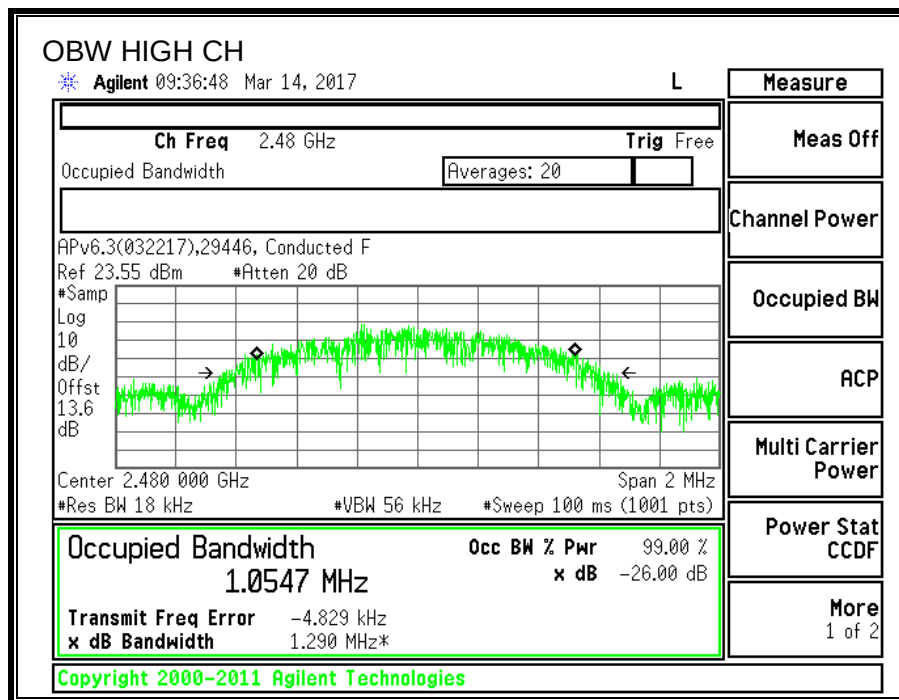
Test Procedure

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0555
Middle	2440	1.0572
High	2480	1.0547





7.4.3. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	9.45
Middle	2440	9.69
High	2480	9.56

7.4.4. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.76	30	-20.24
Middle	2440	9.98	30	-20.02
High	2480	9.86	30	-20.14

7.4.5. POWER SPECTRAL DENSITY

LIMITS

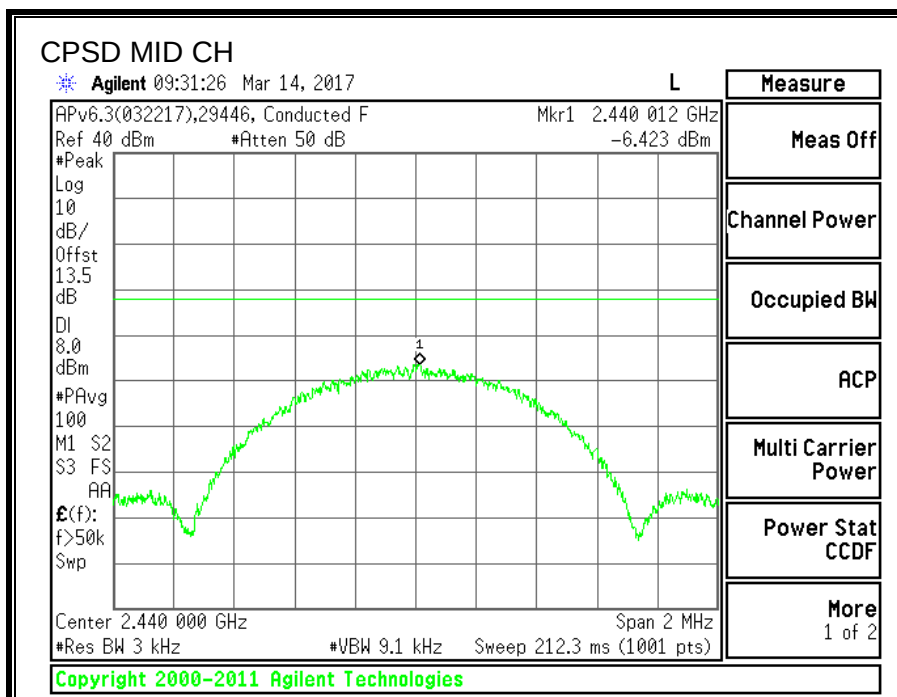
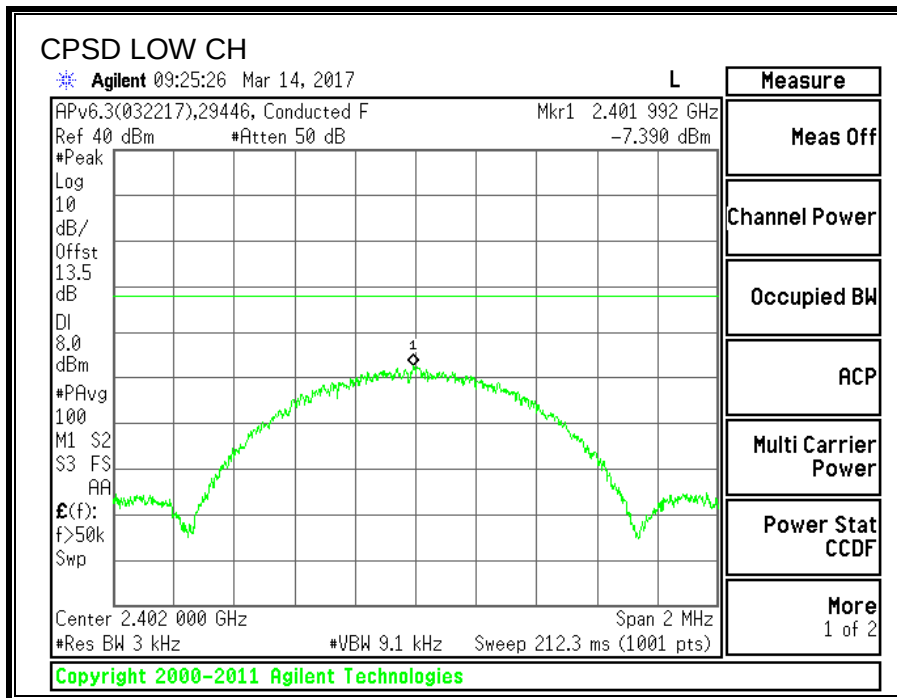
FCC §15.247 (e)

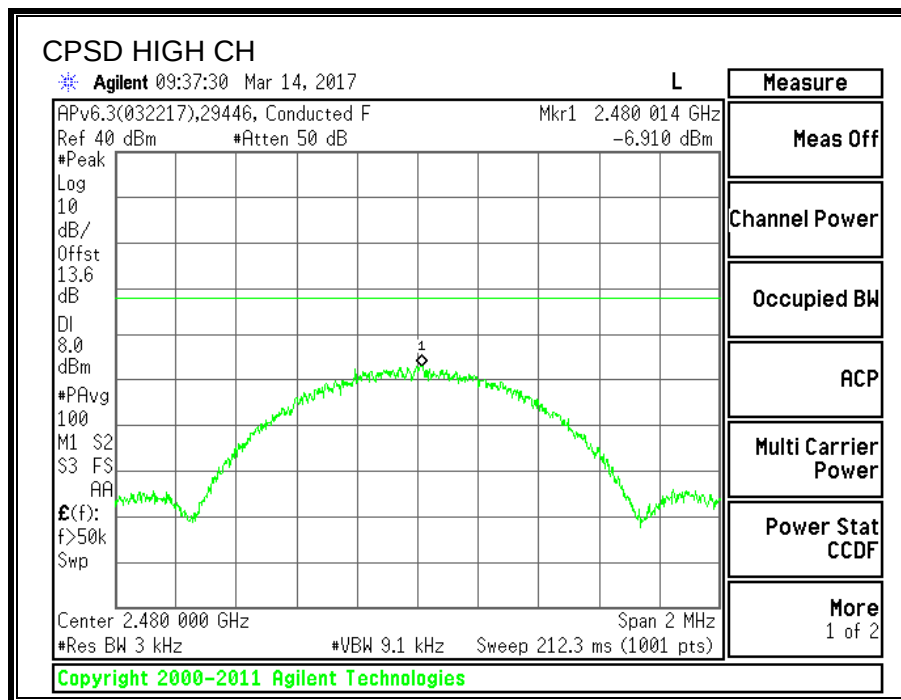
IC RSS-247 (5.2) (b)

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

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-7.390	8	-15.390
Middle	2440	-6.423	8	-14.423
High	2480	-6.910	8	-14.910





7.4.6. CONDUCTED BANEDGE AND SPURIOUS EMISSIONS

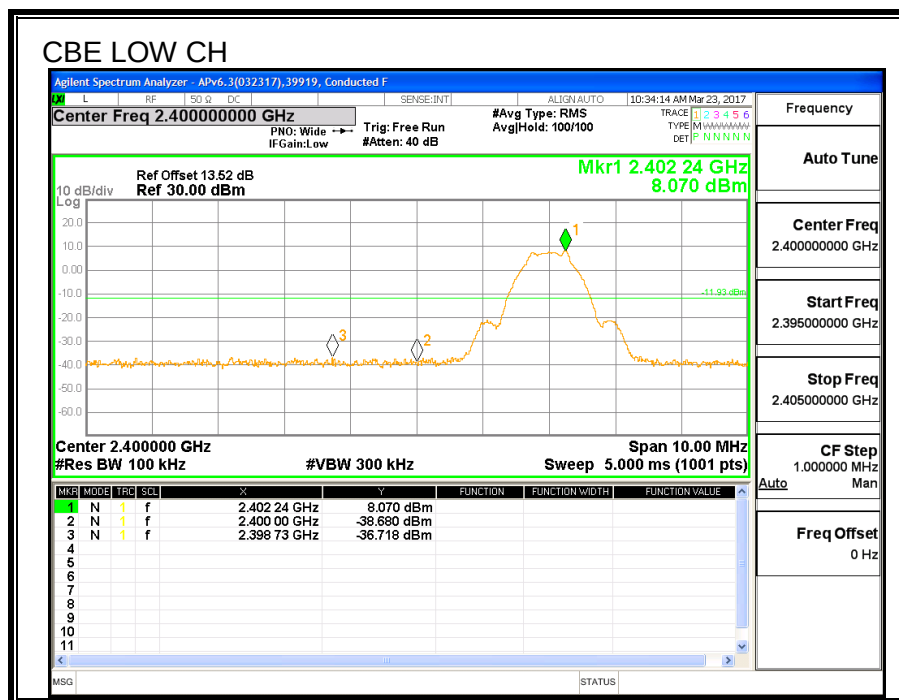
LIMITS

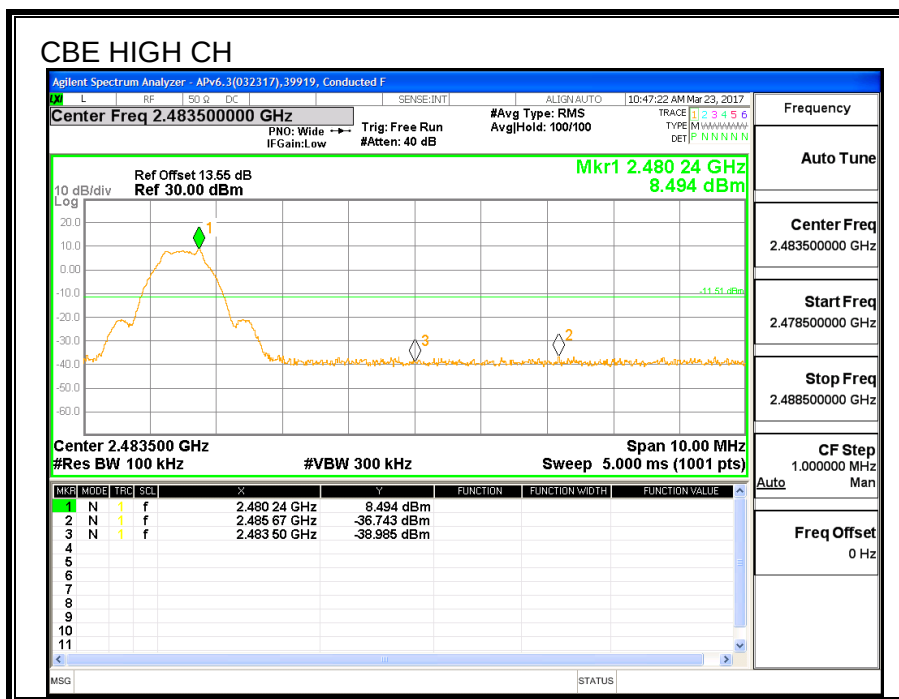
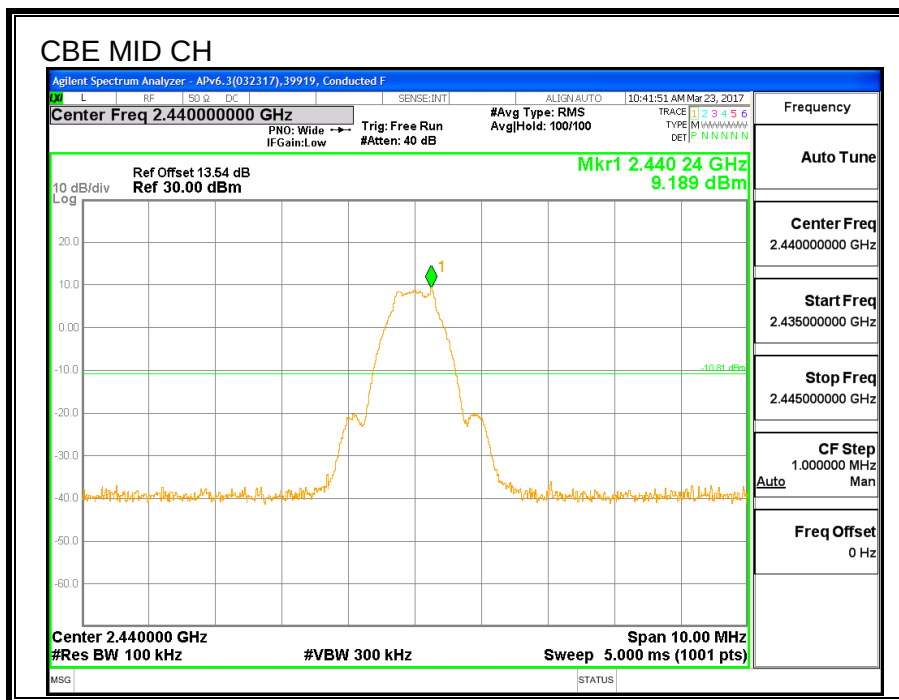
FCC §15.247 (d)

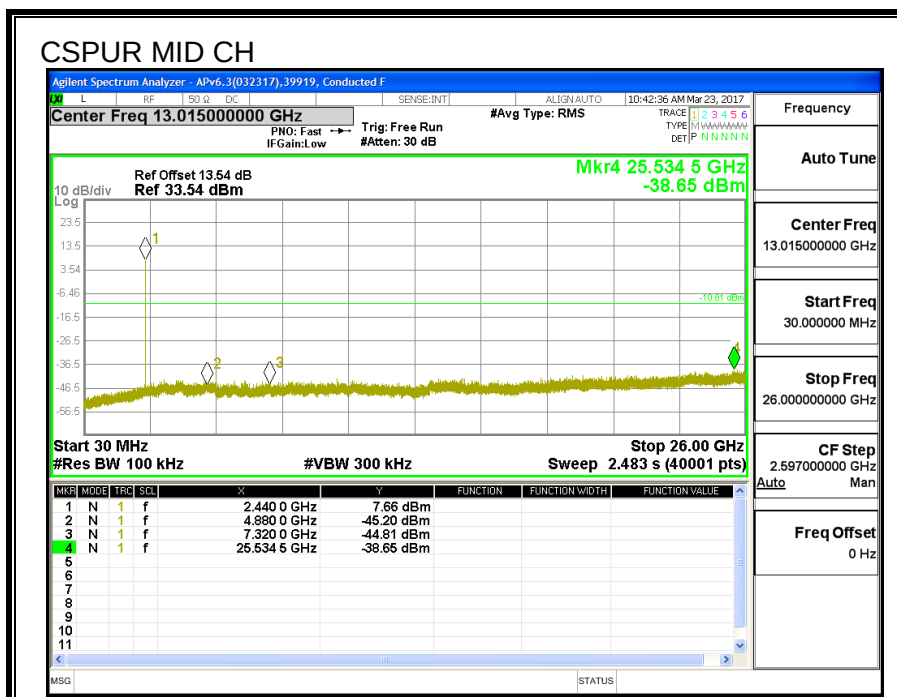
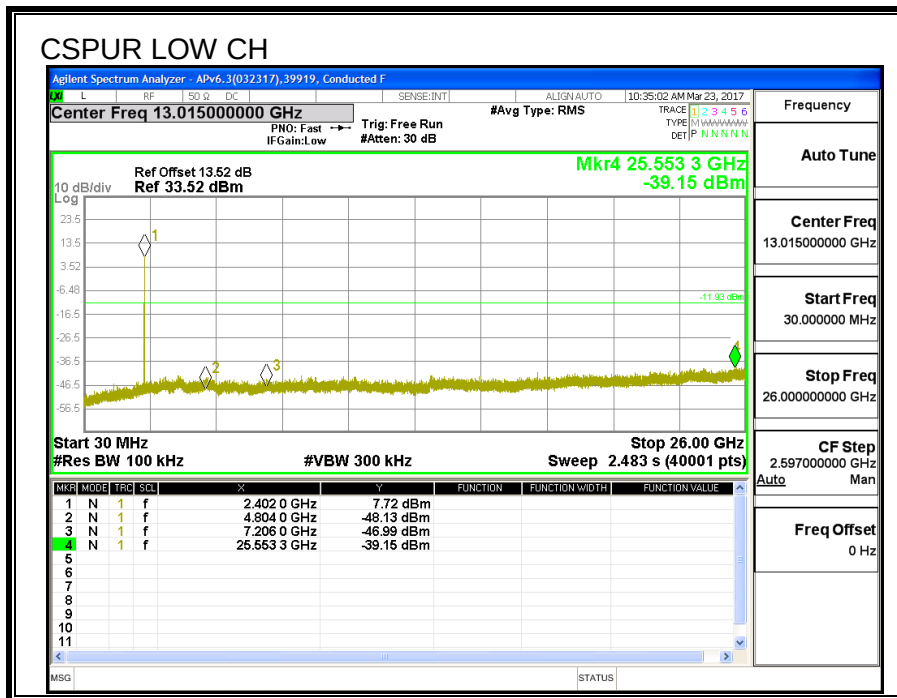
IC RSS-247 (5.5)

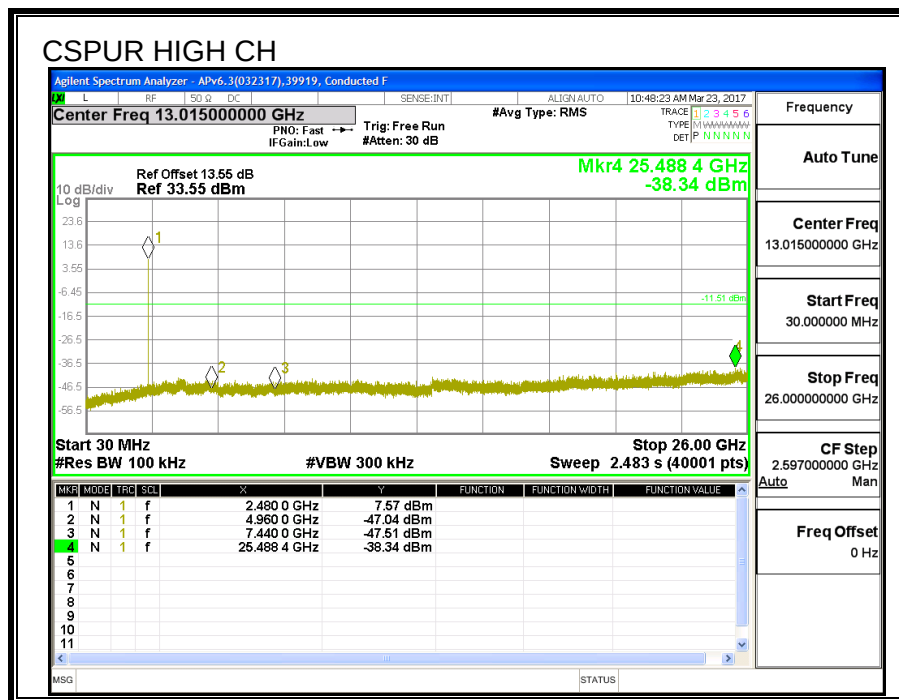
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS









7.5. UAT 1 BLE 2M PMAX

7.5.1. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	19.30
Middle	2440	19.39
High	2480	19.32

7.5.2. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a broadband Peak/average RF power meter

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.44	30	-13.51
Middle	2440	19.60	30	-13.45
High	2480	19.58	30	-13.59

7.6. UAT 1 BLE 2M PLOW

7.6.1. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	9.18
Middle	2440	9.54
High	2480	9.29

7.6.2. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a broadband Peak/average RF power meter

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.47	30	-20.53
Middle	2440	9.71	30	-20.29
High	2480	9.53	30	-20.47

7.7. LAT 3 BLE 1M PMAX

7.7.1. 6 dB BANDWIDTH

LIMITS

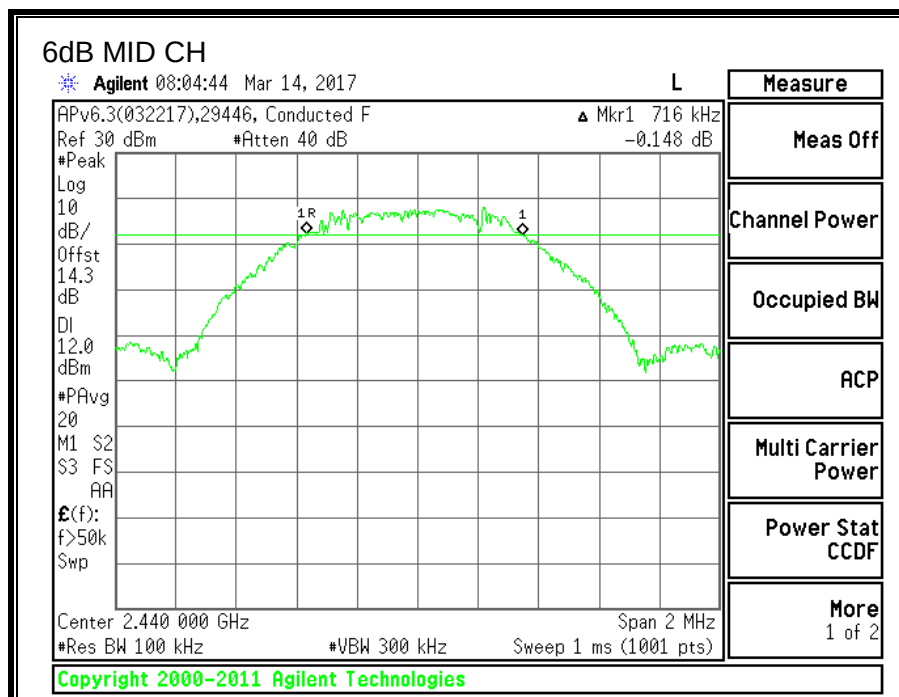
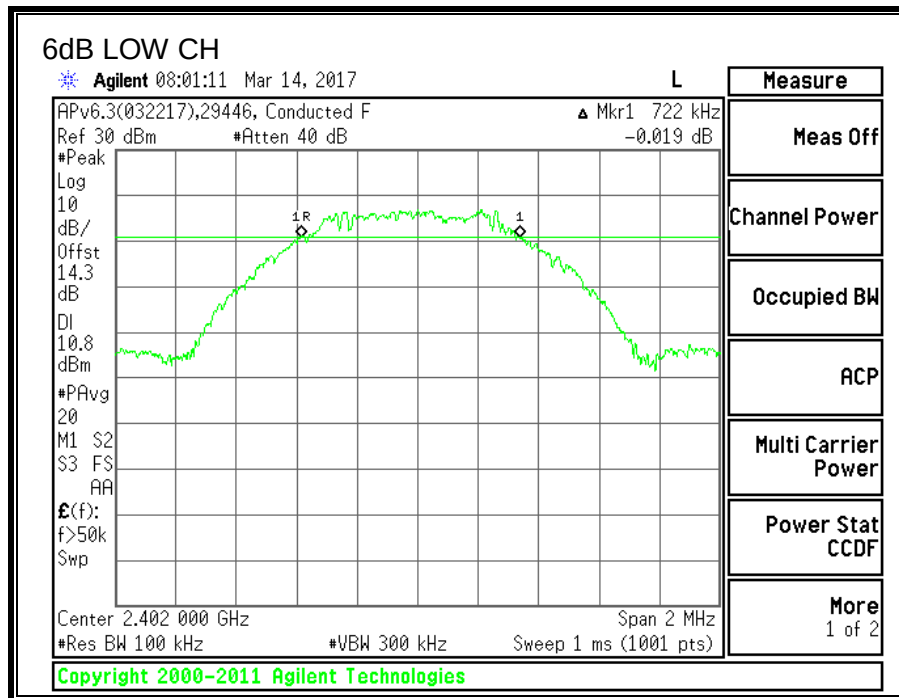
FCC §15.247 (a) (2)

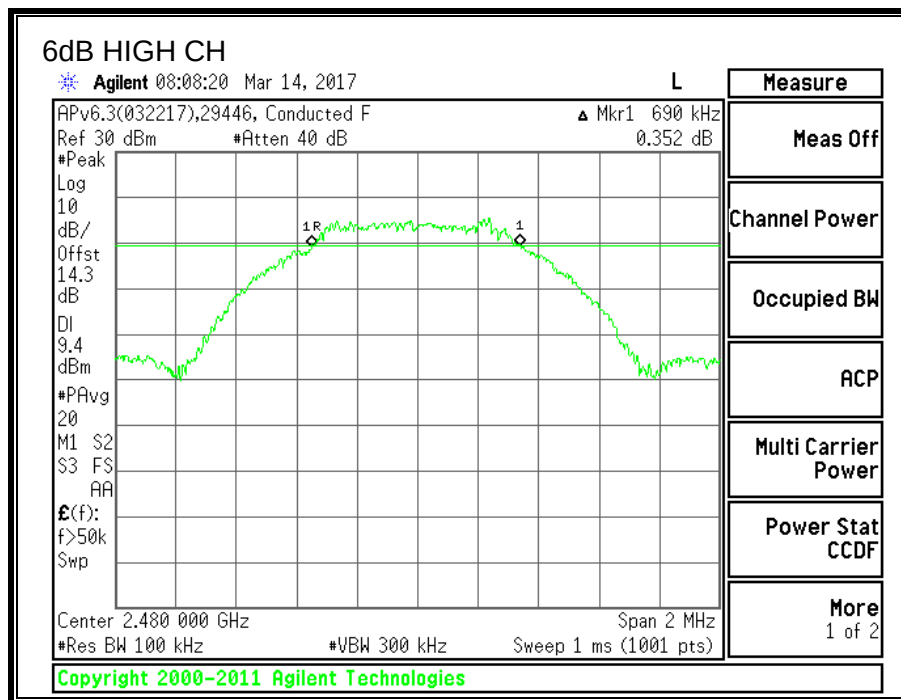
IC RSS-247 (5.2) (a)

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

RESULTS

Channel	Frequency	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.722	0.5
Middle	2440	0.716	0.5
High	2480	0.690	0.5





7.7.2. 99% BANDWIDTH

LIMITS

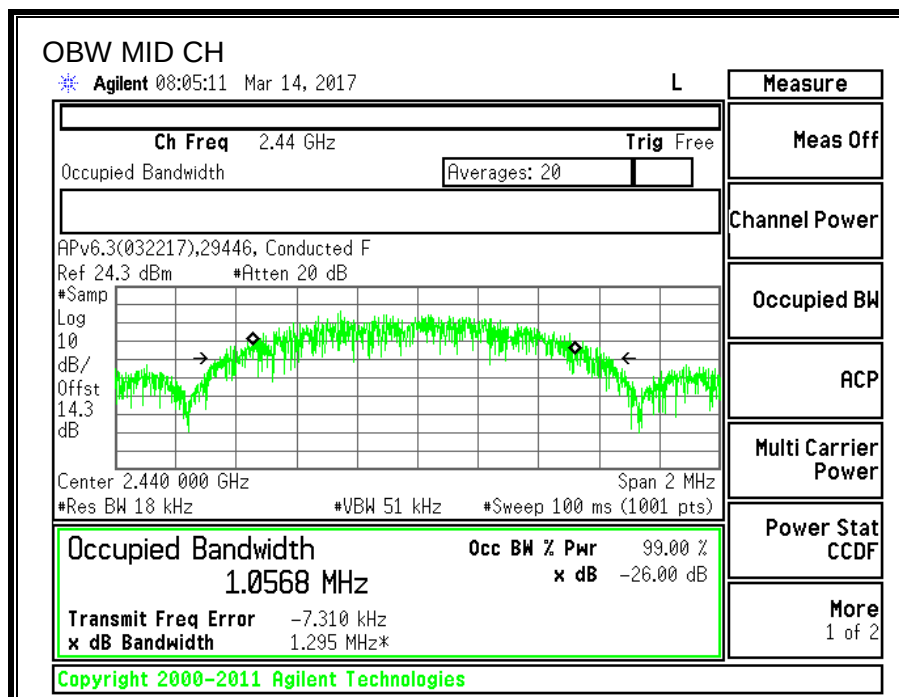
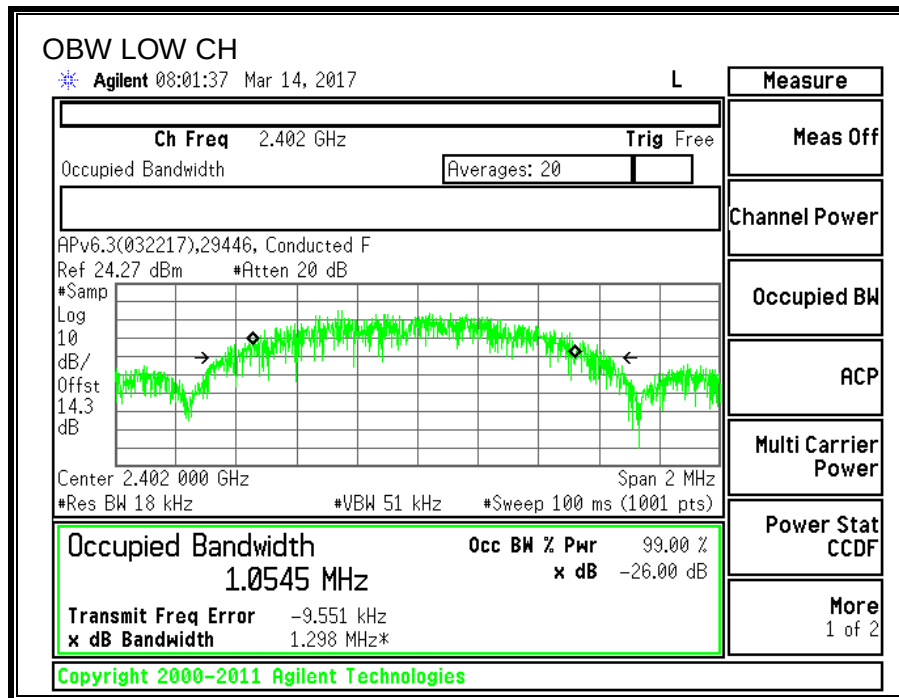
None; for reporting purposes only.

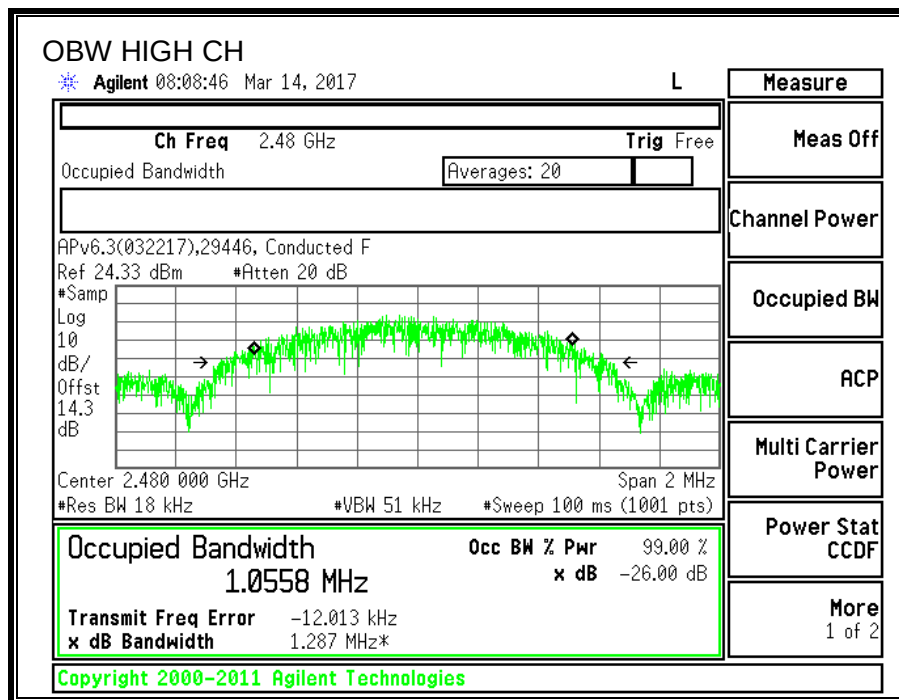
Test Procedure

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0545
Middle	2440	1.0568
High	2480	1.0558





7.7.3. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	19.48
Middle	2440	19.45
High	2480	19.38

7.7.4. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.91	30	-10.09
Middle	2440	19.98	30	-10.02
High	2480	19.79	30	-10.21

7.7.5. POWER SPECTRAL DENSITY

LIMITS

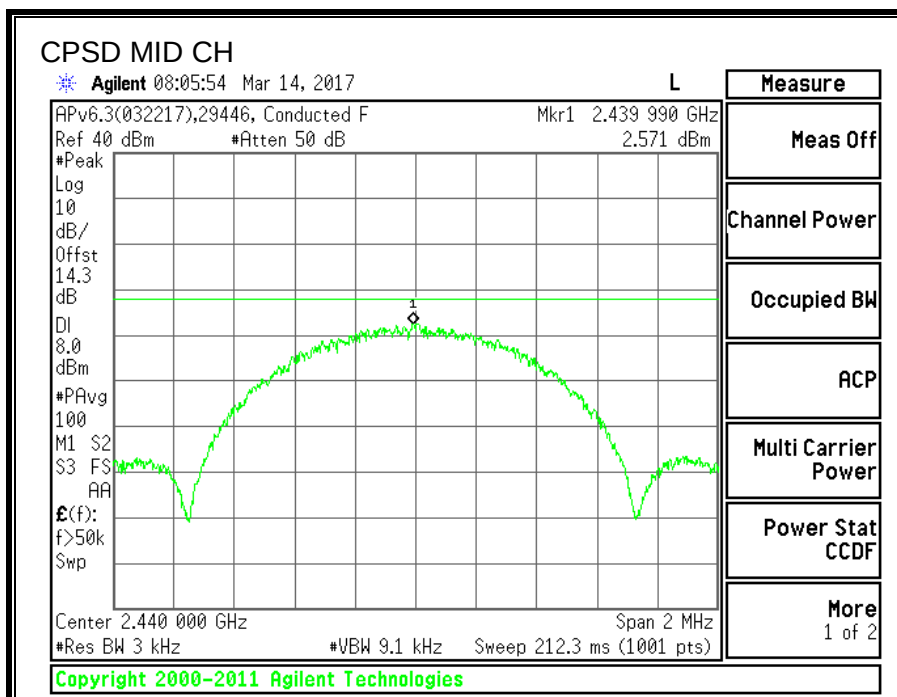
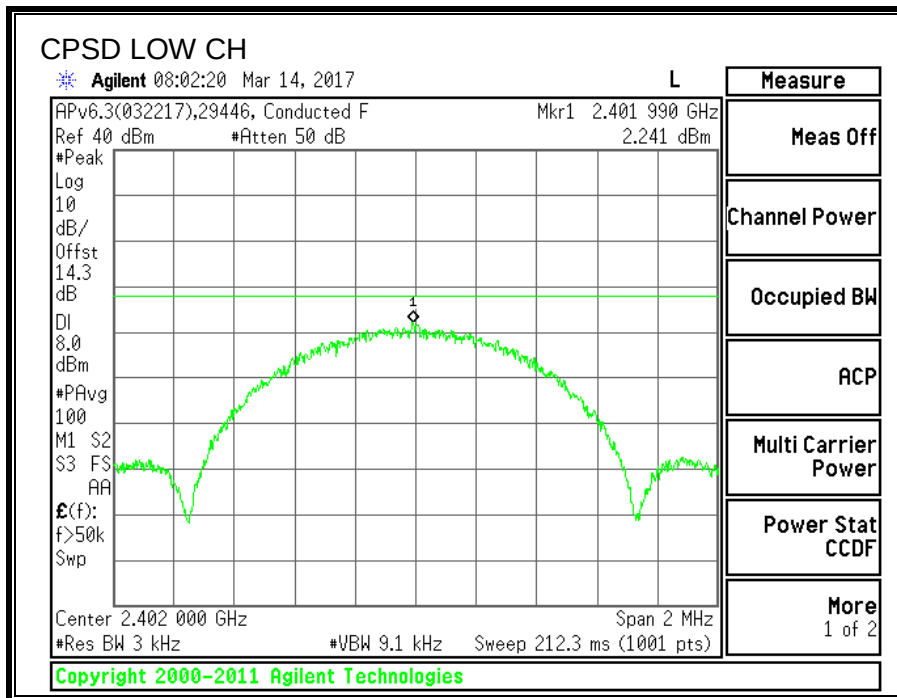
FCC §15.247 (e)

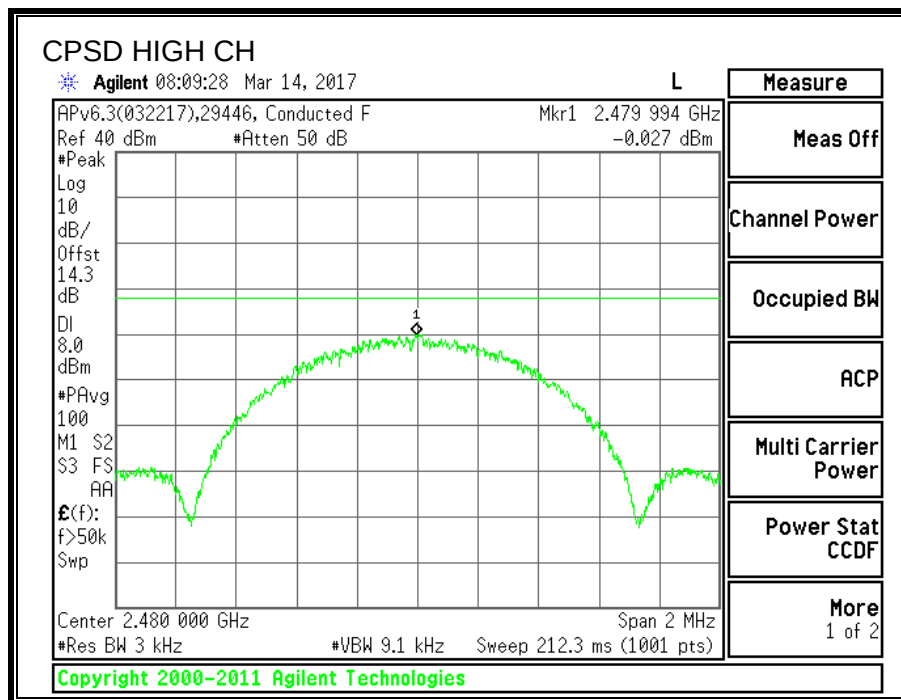
IC RSS-247 (5.2) (b)

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

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.241	8	-5.759
Middle	2440	2.571	8	-5.429
High	2480	-0.027	8	-8.027





7.7.6. CONDUCTED BANEDGE AND SPURIOUS EMISSIONS

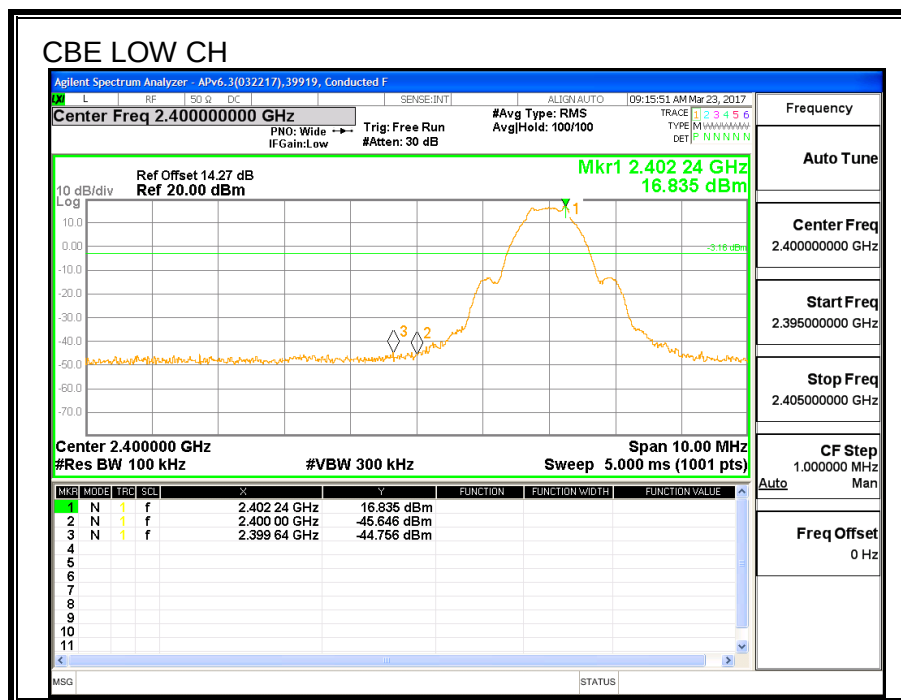
LIMITS

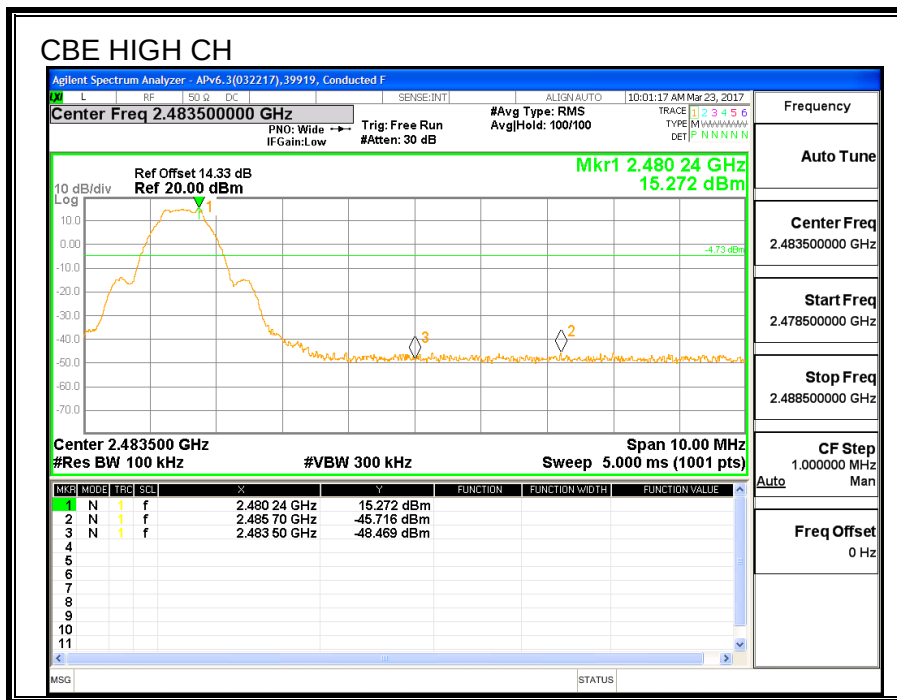
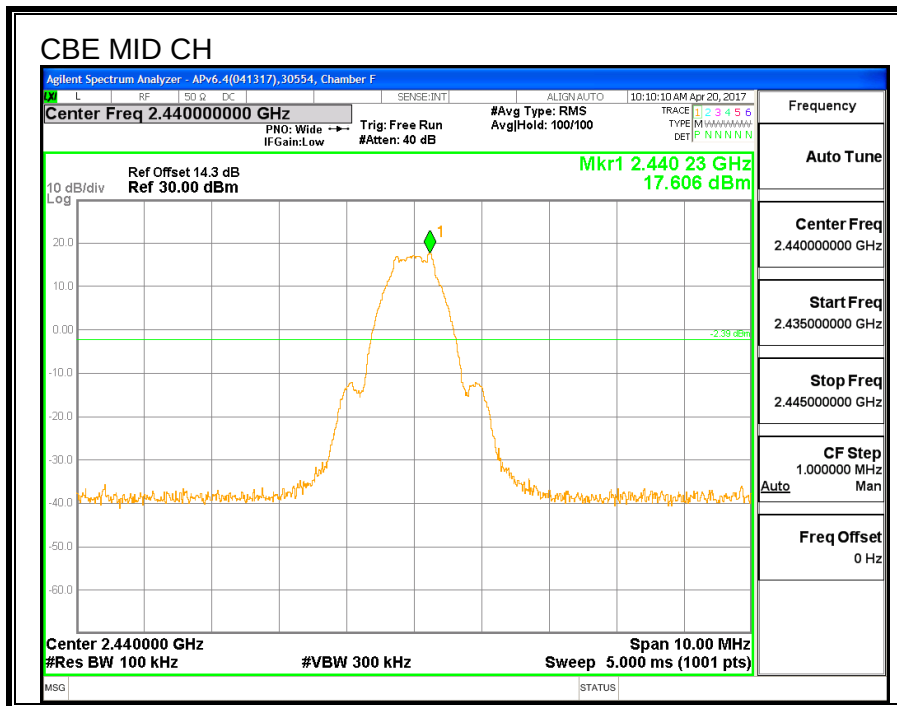
FCC §15.247 (d)

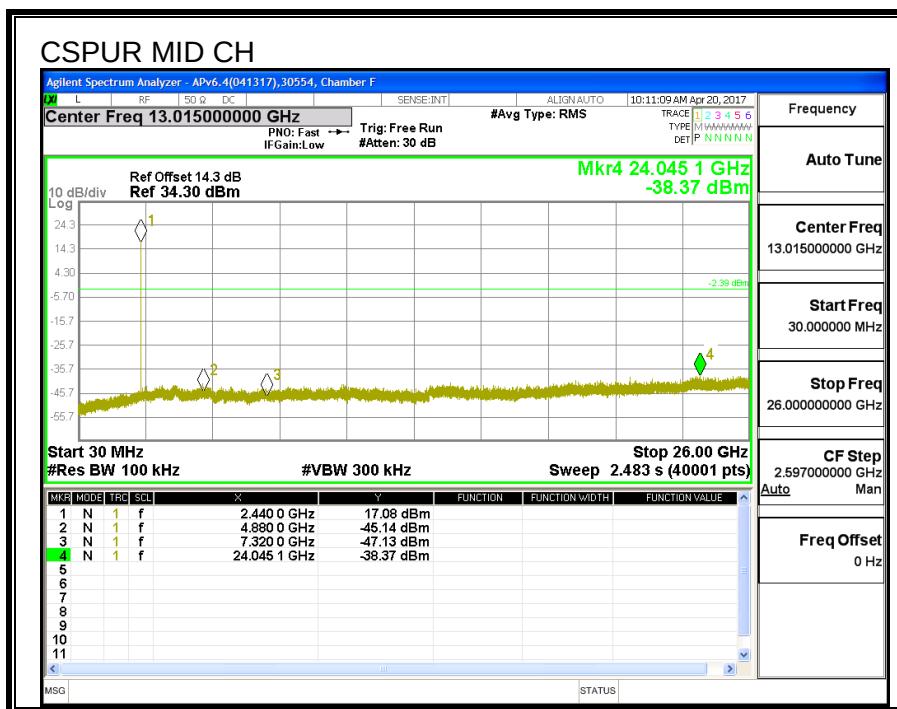
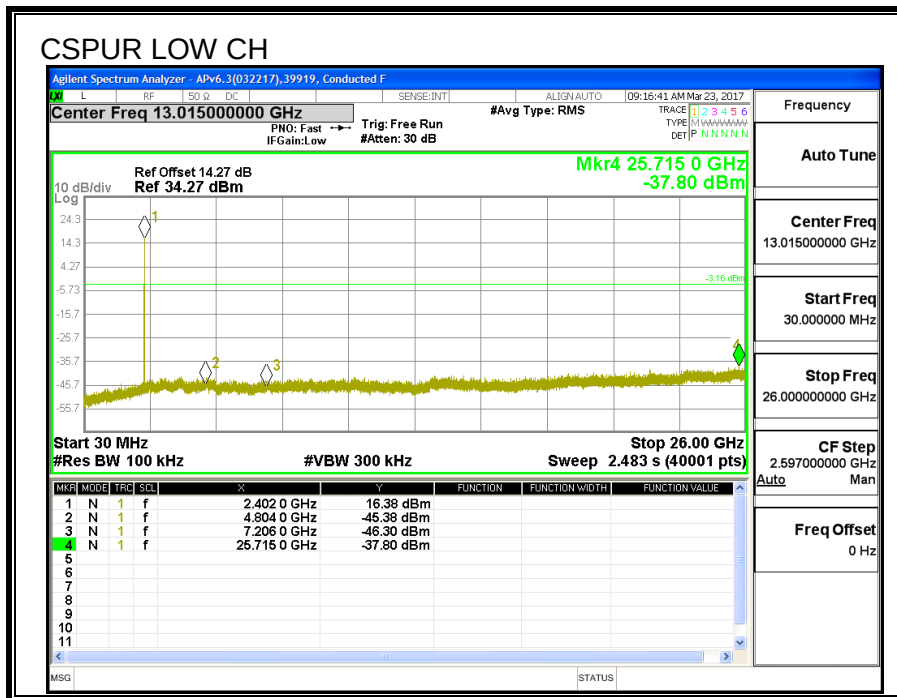
IC RSS-247 (5.5)

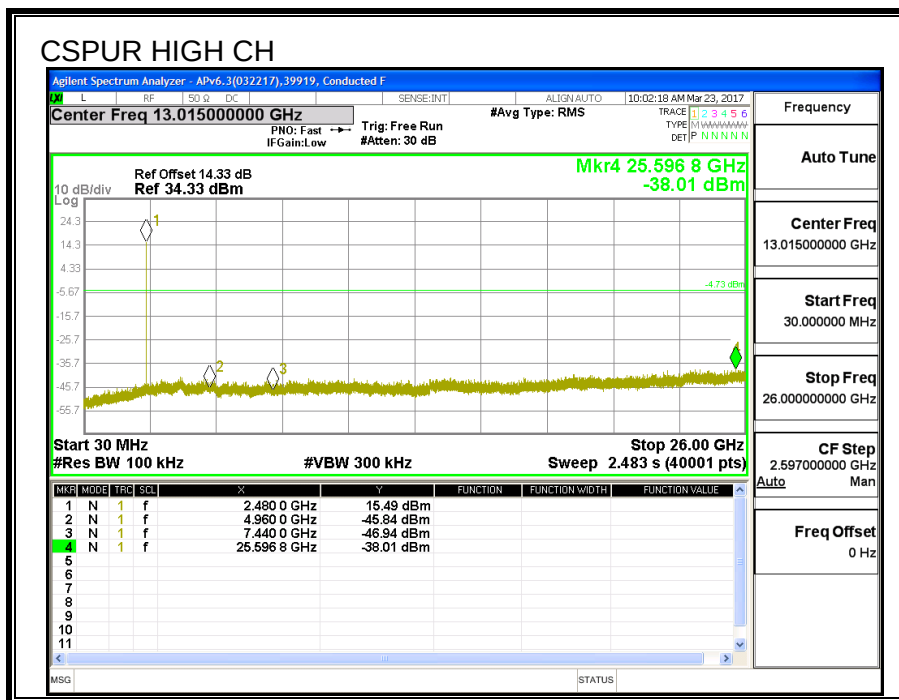
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS









7.8. LAT 3 BLE 1M PLOW

7.8.1. 6 dB BANDWIDTH

LIMITS

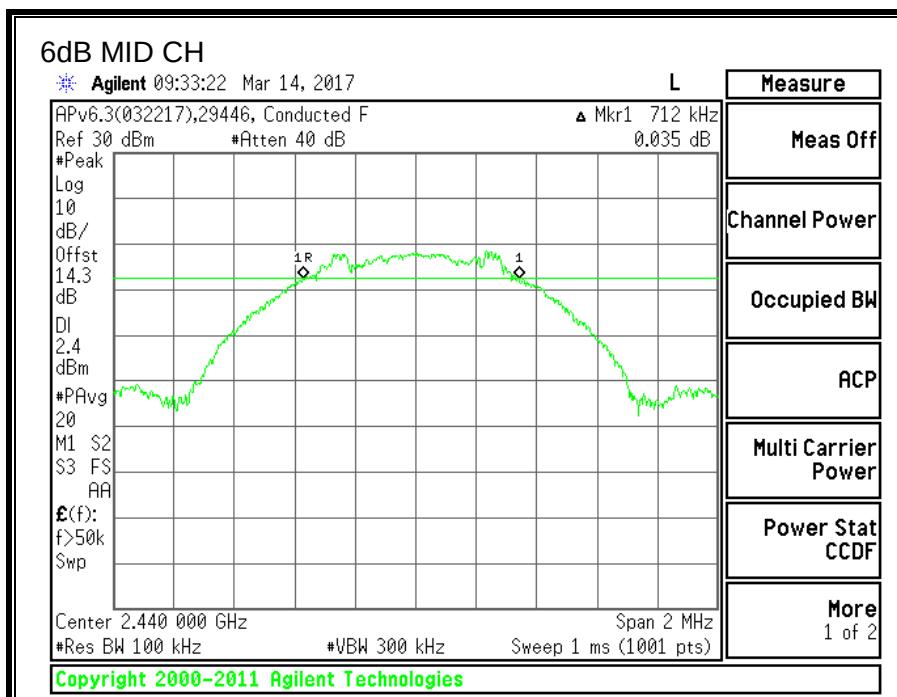
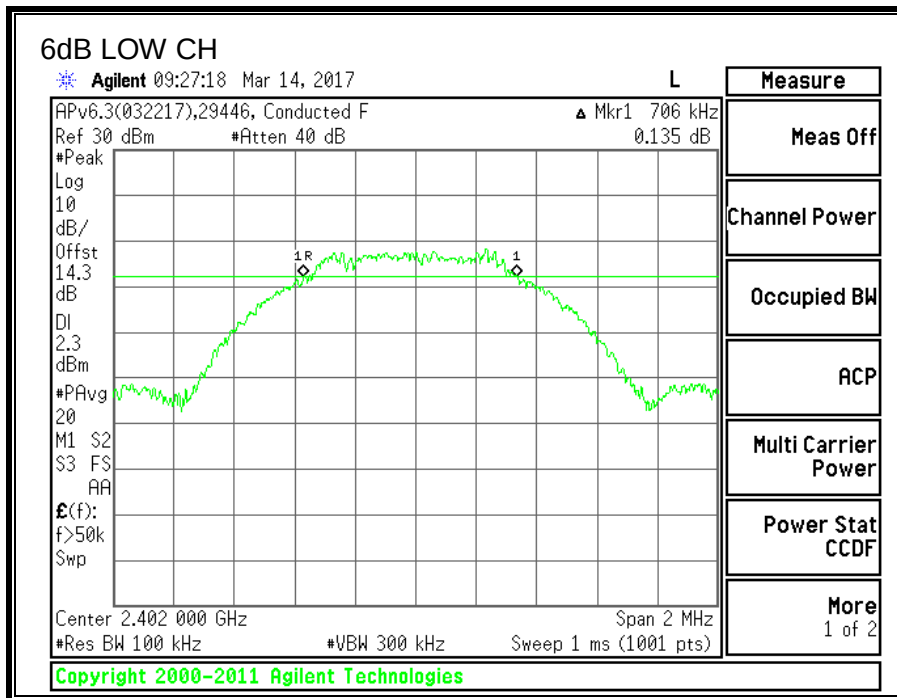
FCC §15.247 (a) (2)

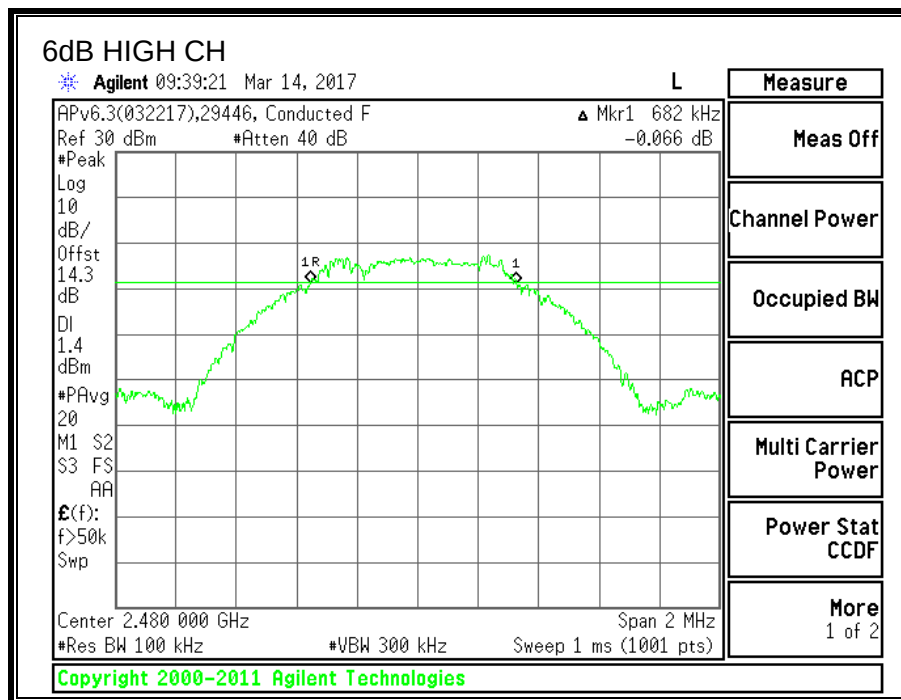
IC RSS-247 (5.2) (a)

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

RESULTS

Channel	Frequency	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.706	0.5
Middle	2440	0.712	0.5
High	2480	0.682	0.5





7.8.2. 99% BANDWIDTH

LIMITS

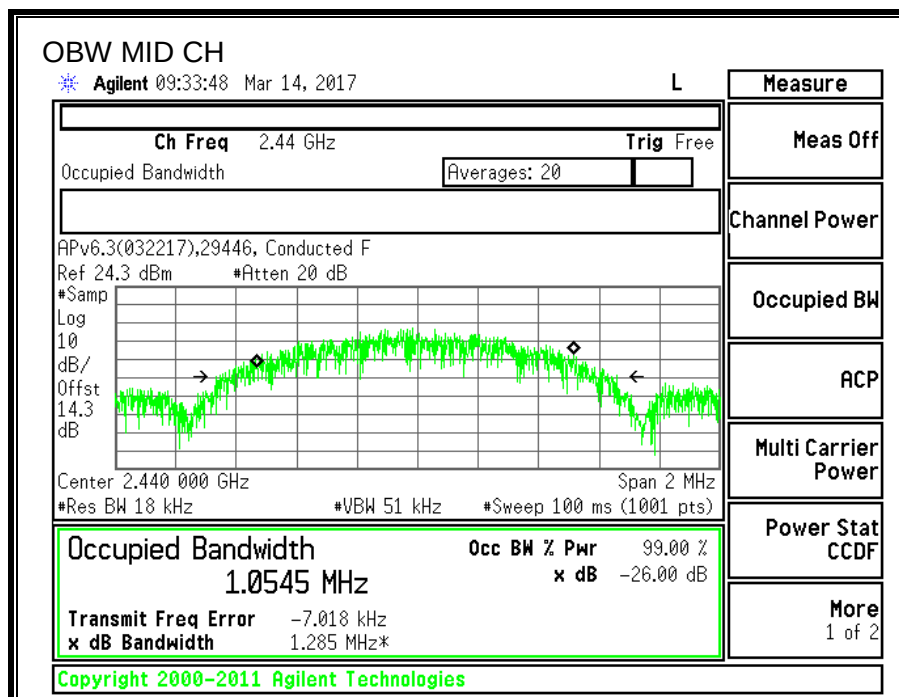
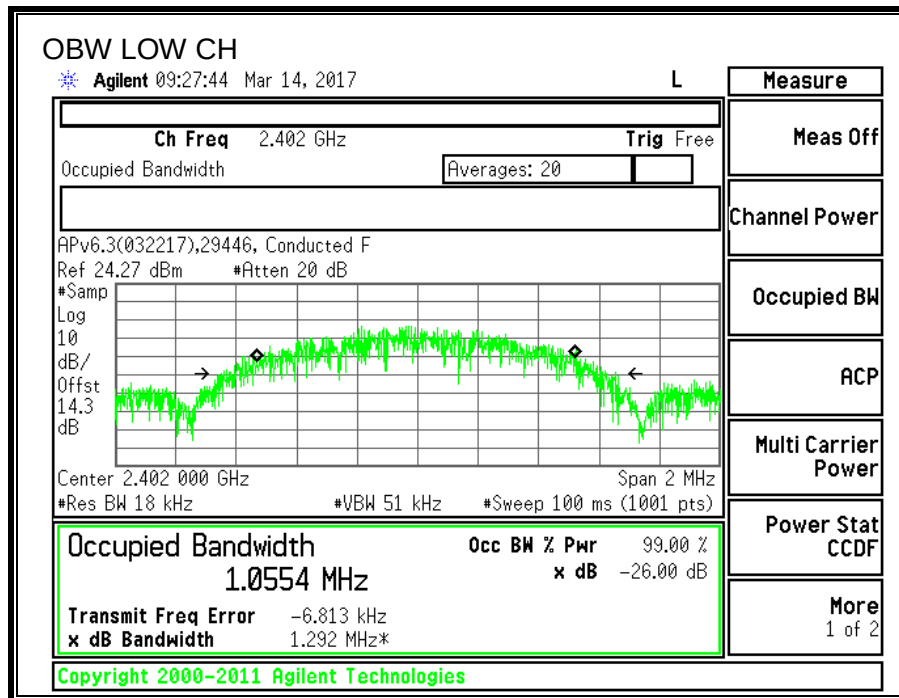
None; for reporting purposes only.

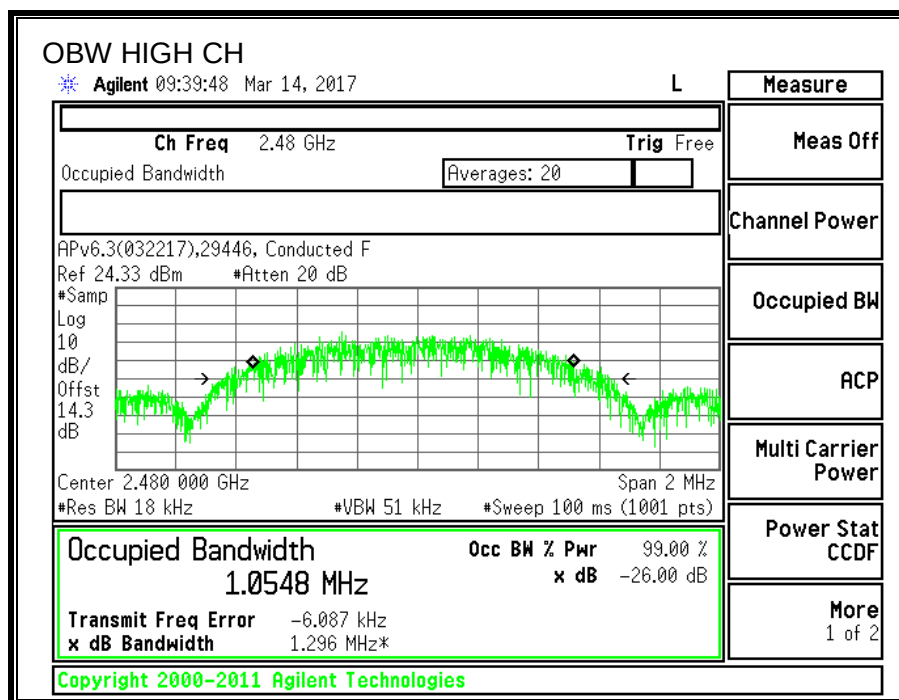
Test Procedure

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0554
Middle	2440	1.0545
High	2480	1.0548





7.8.3. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	9.51
Middle	2440	9.63
High	2480	9.55

7.8.4. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.82	30	-20.18
Middle	2440	9.91	30	-20.09
High	2480	9.86	30	-20.14

7.8.5. POWER SPECTRAL DENSITY

LIMITS

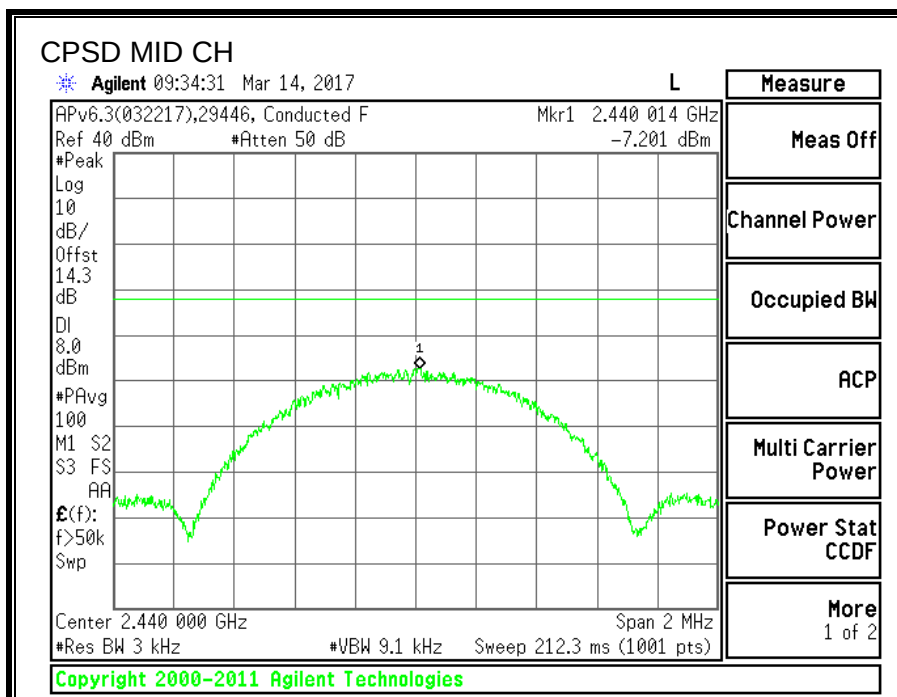
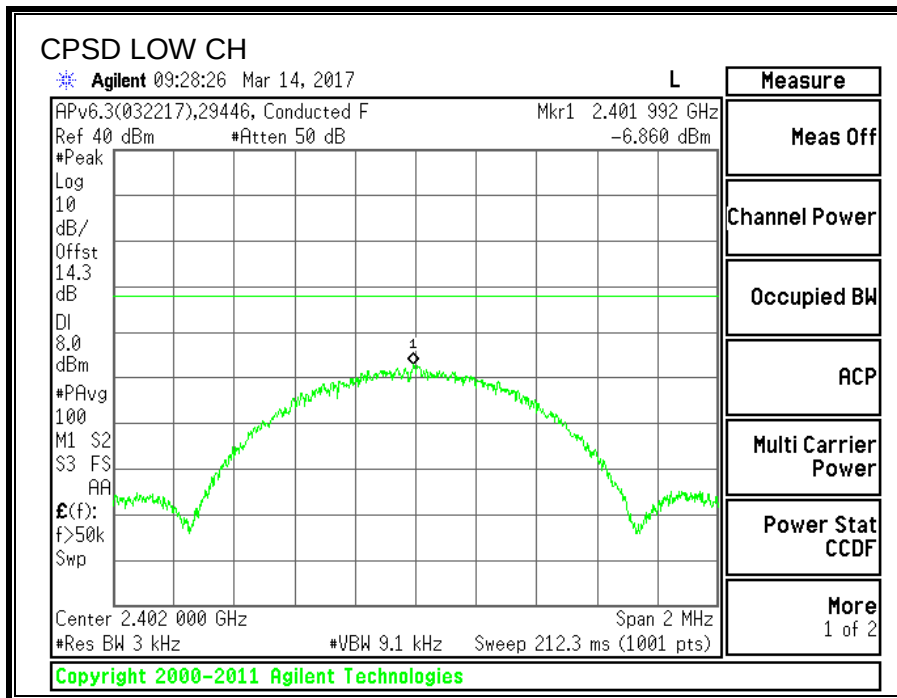
FCC §15.247 (e)

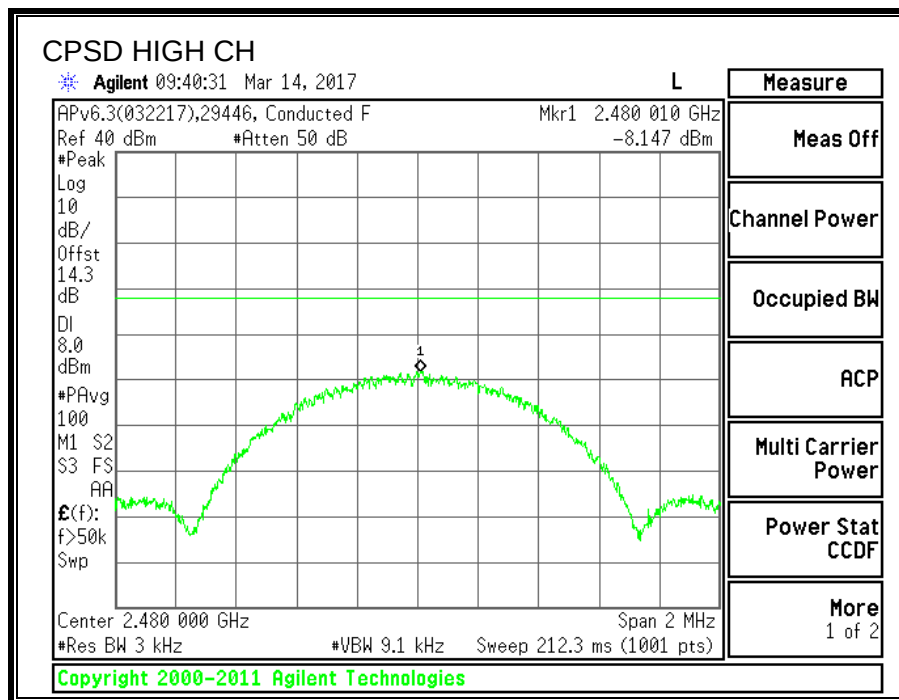
IC RSS-247 (5.2) (b)

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

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-6.860	8	-14.860
Middle	2440	-7.201	8	-15.201
High	2480	-8.147	8	-16.147





7.8.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

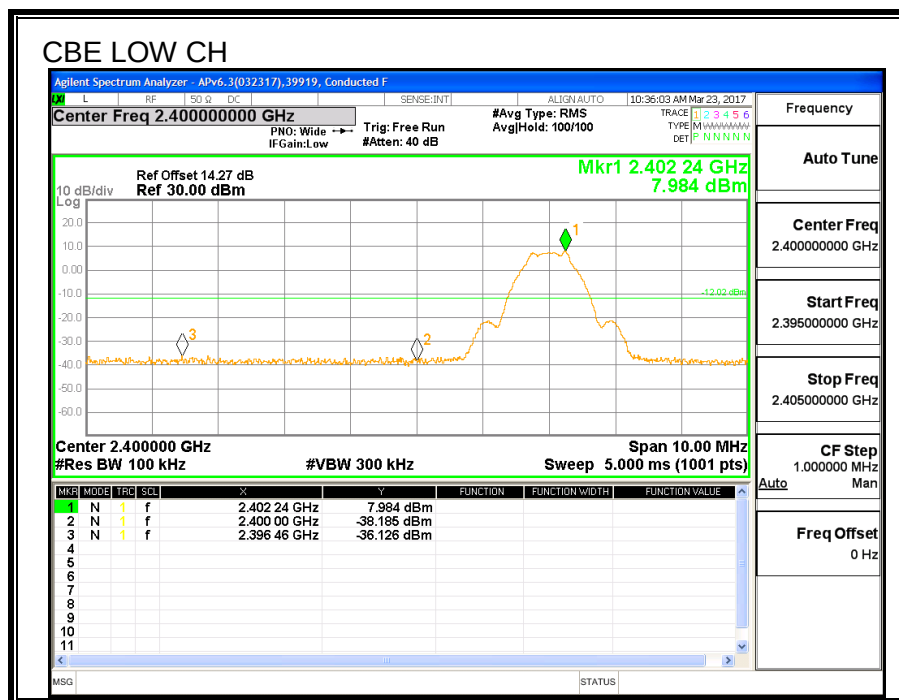
LIMITS

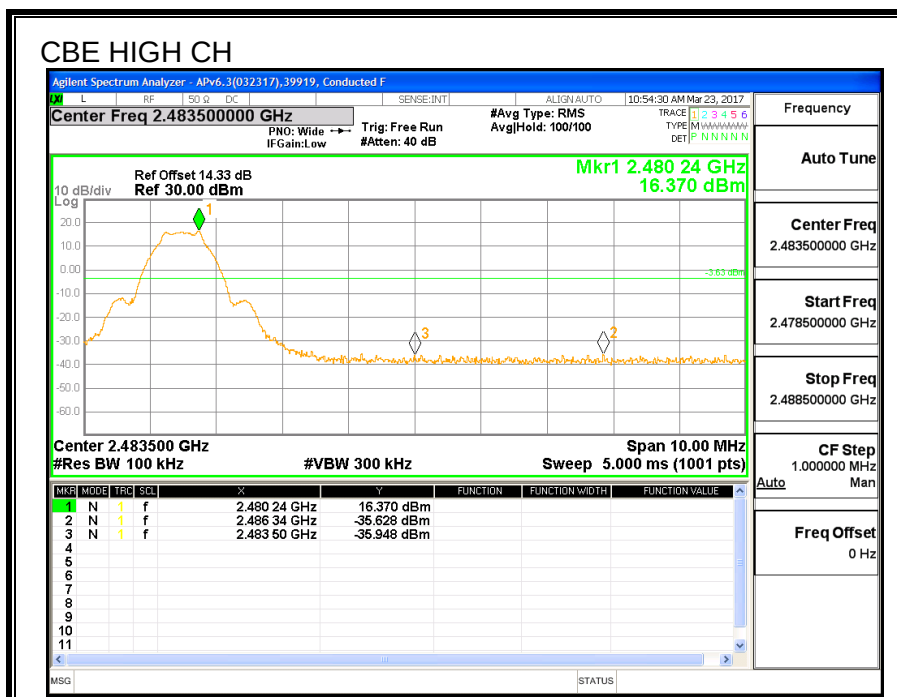
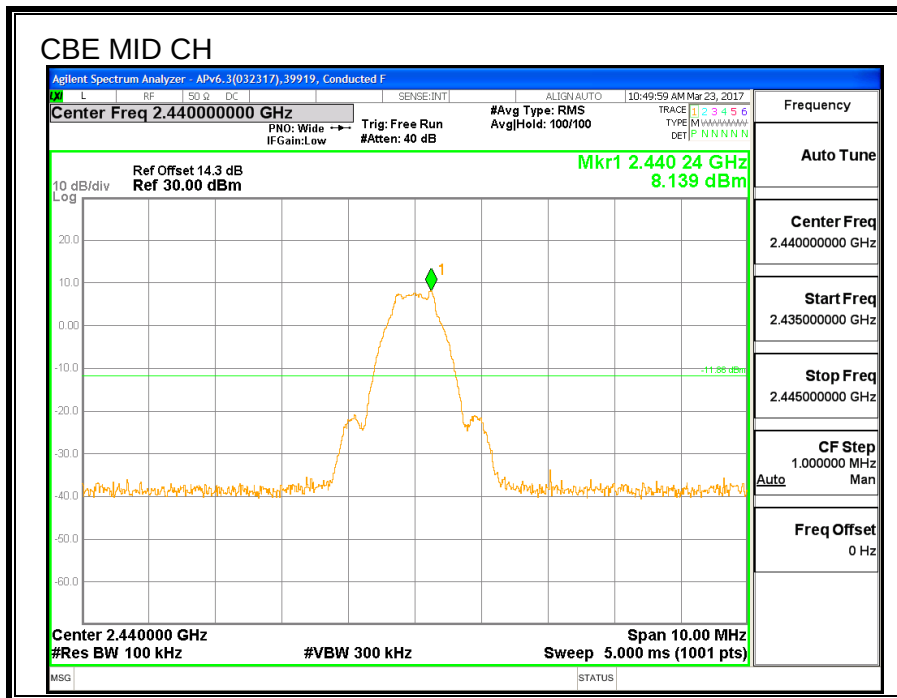
FCC §15.247 (d)

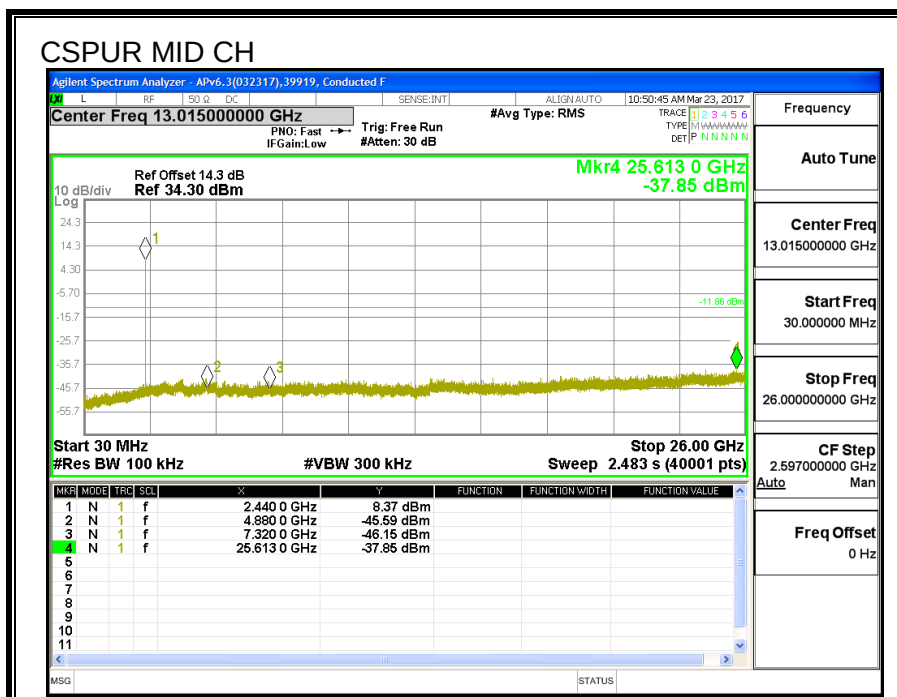
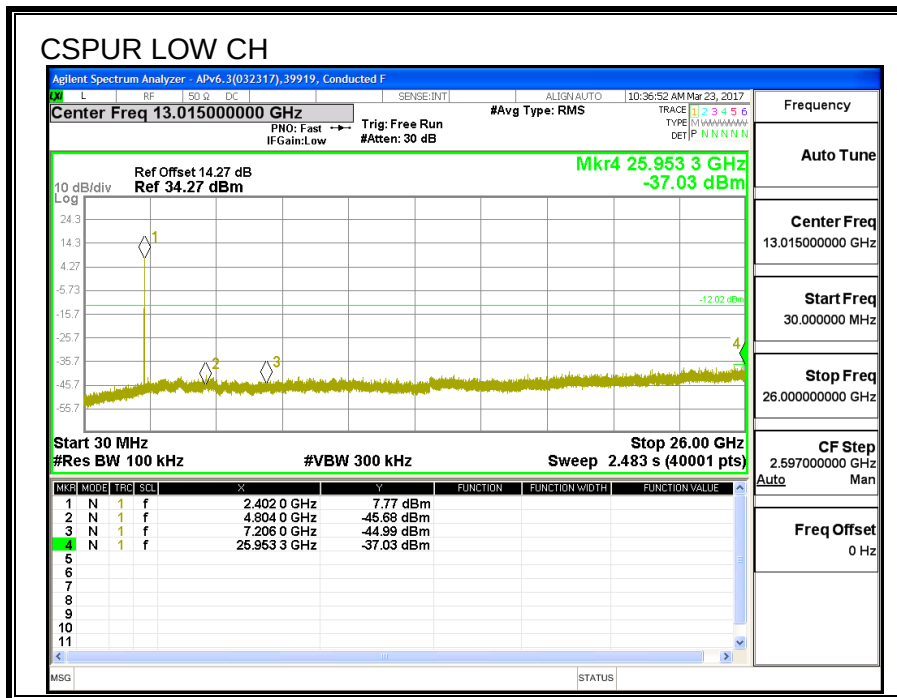
IC RSS-247 (5.5)

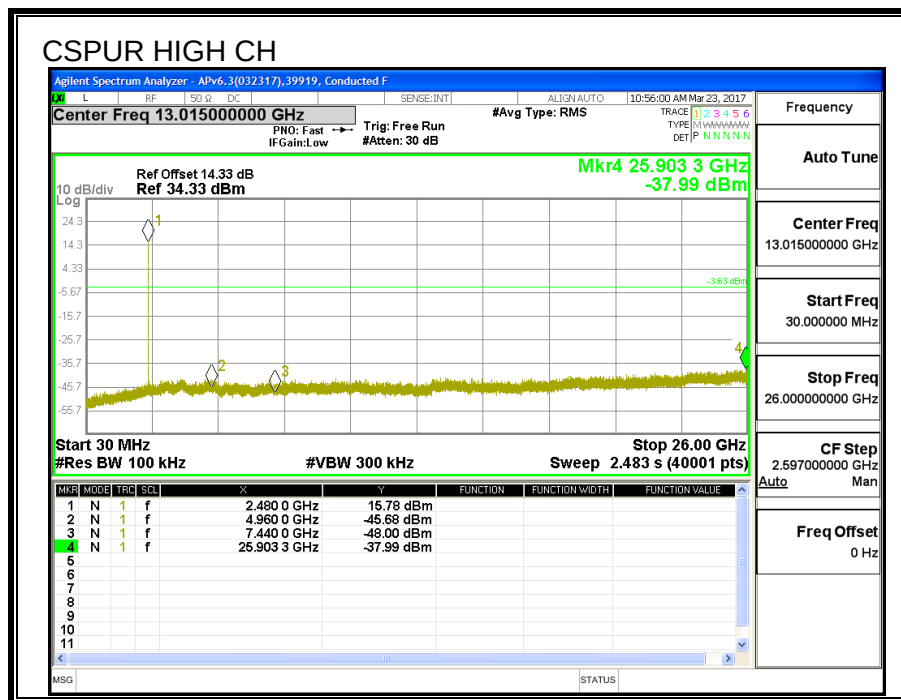
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS









7.9. LAT 3 BLE 2M PMAX

7.9.1. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	19.25
Middle	2440	19.18
High	2480	19.14

7.9.2. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a broadband Peak/average RF power meter

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.58	30	-10.42
Middle	2440	19.46	30	-10.54
High	2480	19.51	30	-10.49

7.10. LAT 3 BLE 2M PLOW

7.10.1. AVERAGE POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	AV Power (MHz)
Low	2402	9.30
Middle	2440	9.41
High	2480	9.22

7.10.2. OUTPUT POWER

ID:	30554	Date:	6/19/2017
------------	-------	--------------	-----------

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a broadband Peak/average RF power meter

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.65	30	-20.45
Middle	2440	9.77	30	-20.23
High	2480	9.56	30	-20.44

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.8

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 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 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

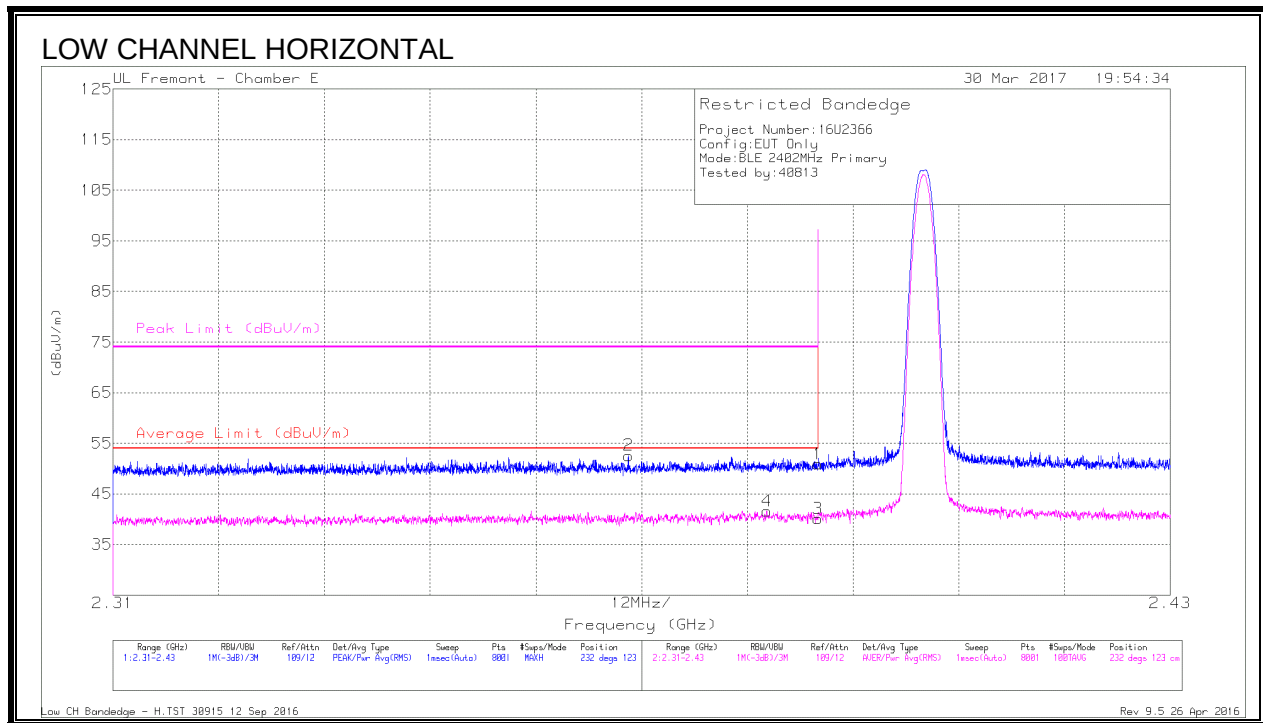
For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

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 as applicable for average measurements.

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

8.2. UAT 1 BLE 1M PMAX

8.2.1. RESTRICTED BANDEGE (LOW CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.39	38.56	Pk	32	-19.7	50.86	-	-	74	-23.14	232	123	H
2	* 2.369	40.39	Pk	32	-19.8	52.59	-	-	74	-21.41	232	123	H
3	* 2.39	27.79	RMS	32	-19.7	40.09	54	-13.91	-	-	232	123	H
4	* 2.384	29.12	RMS	32	-19.5	41.62	54	-12.38	-	-	232	123	H

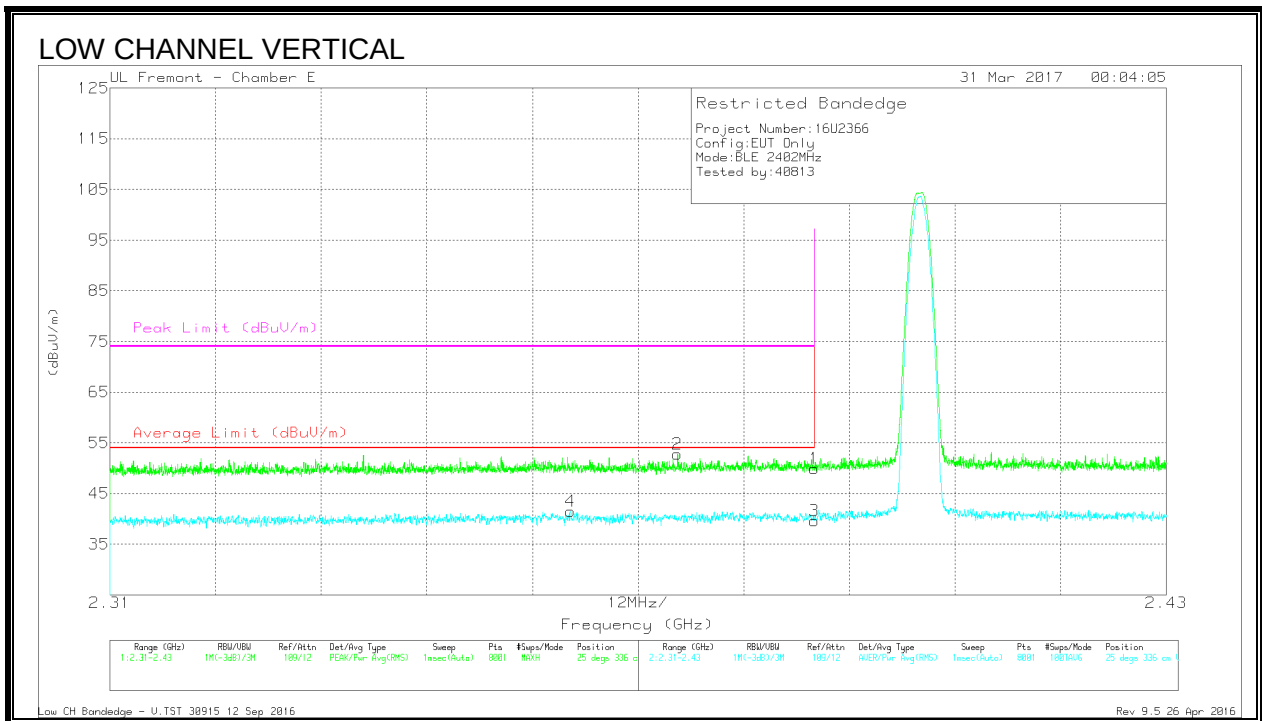
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/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	37.62	Pk	32	-19.7	49.92	-	-	74	-24.08	25	336	V
2	* 2.374	40.45	Pk	32	-19.7	52.75	-	-	74	-21.25	25	336	V
3	* 2.39	27.31	RMS	32	-19.7	39.61	54	-14.39	-	-	25	336	V
4	* 2.362	29.25	RMS	31.9	-19.7	41.45	54	-12.55	-	-	25	336	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

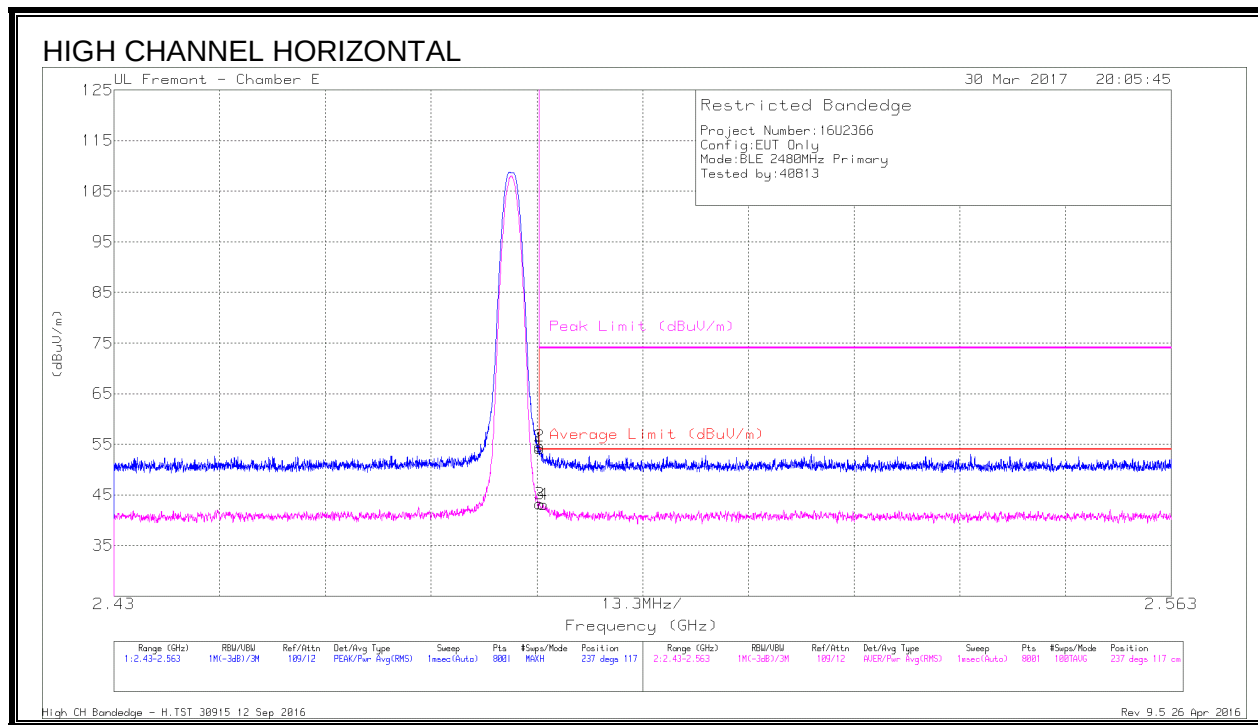
Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.2.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.484	41.32	Pk	32.5	-19.7	54.12	-	-	74	-19.88	237	117	H
2	* 2.484	41.83	Pk	32.5	-19.7	54.63	-	-	74	-19.37	237	117	H
3	* 2.484	30.4	RMS	32.5	-19.7	43.2	54	-10.8	-	-	237	117	H
4	* 2.484	30.29	RMS	32.5	-19.7	43.09	54	-10.91	-	-	237	117	H

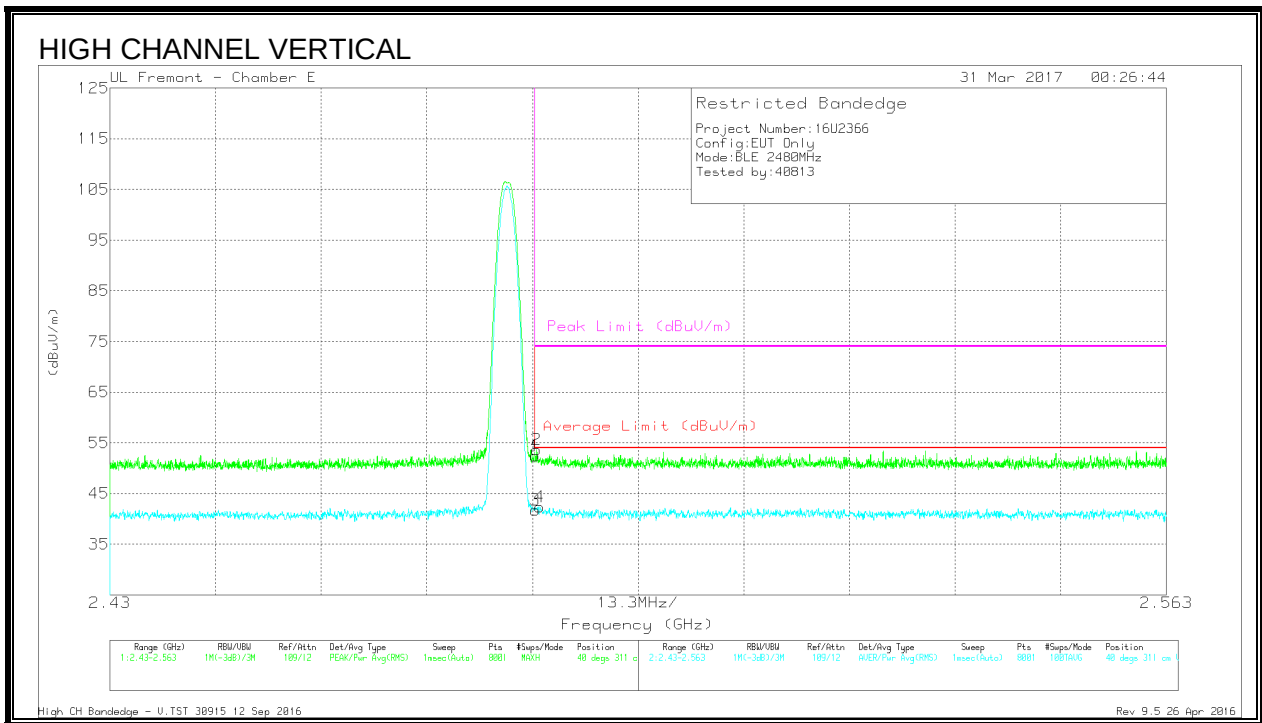
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

High CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/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	39.56	Pk	32.5	-19.7	52.36	-	-	74	-21.64	40	311	V
2	* 2.484	40.84	Pk	32.5	-19.7	53.64	-	-	74	-20.36	40	311	V
3	* 2.484	28.87	RMS	32.5	-19.7	41.67	54	-12.33	-	-	40	311	V
4	* 2.484	29.56	RMS	32.5	-19.7	42.36	54	-11.64	-	-	40	311	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

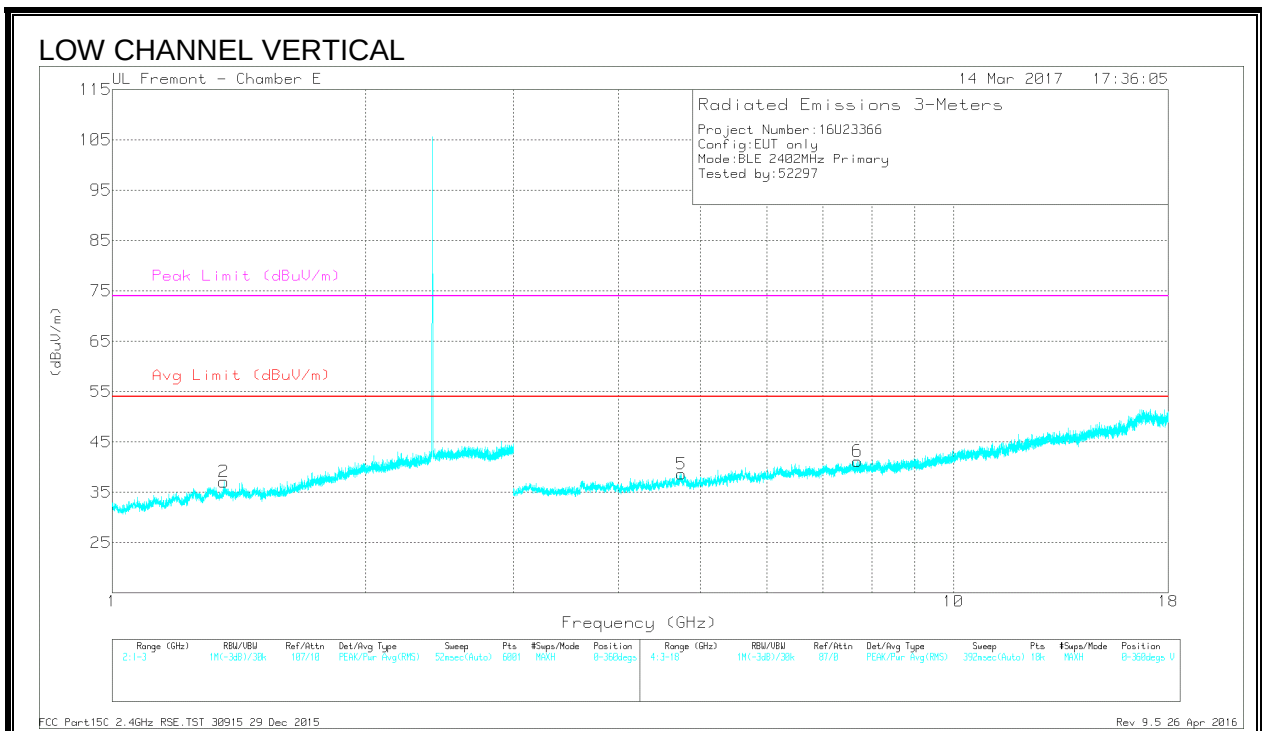
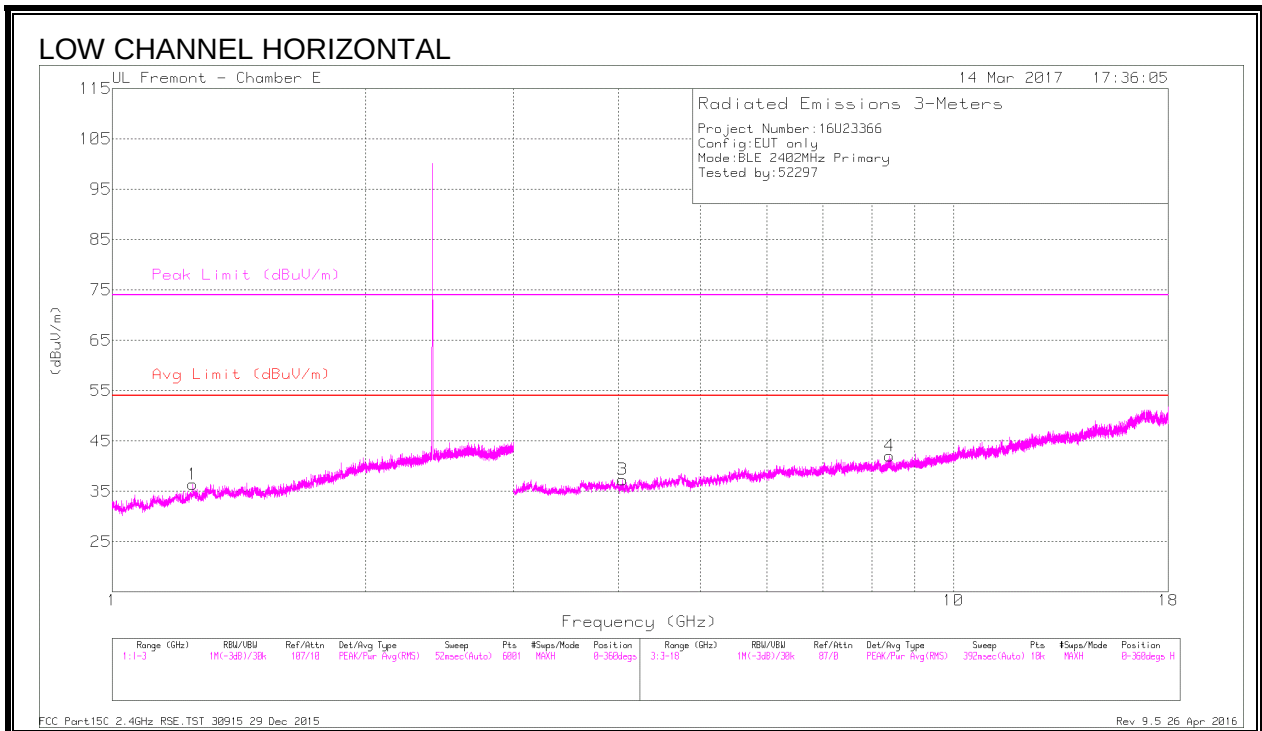
Pk - Peak detector

RMS - RMS detection

High CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.2.3. HARMONICS AND SPURIOUS EMISSIONS



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
1	* 1.245	37.19	PK2	28.5	-22.1	43.59	-	-	74	-30.41	181	159	H
	* 1.245	23.26	MAV1	28.5	-22.2	29.56	54	-24.44	-	-	181	159	H
2	* 1.357	37.11	PK2	28.7	-21.5	44.31	-	-	74	-29.69	230	188	V
	* 1.356	22.65	MAV1	28.7	-21.5	29.85	54	-24.15	-	-	230	188	V
3	* 4.042	40.39	PK2	33.4	-30.3	43.49	-	-	74	-30.51	325	237	H
	* 4.044	30.42	MAV1	33.4	-30.3	33.52	54	-20.48	-	-	325	237	H
4	* 8.393	37.98	PK2	36	-25.6	48.38	-	-	74	-25.62	162	178	H
	* 8.392	27.56	MAV1	36	-25.6	37.96	54	-16.04	-	-	162	178	H
5	* 4.748	42.28	PK2	34.3	-29	47.58	-	-	74	-26.42	226	207	V
	* 4.75	30.06	MAV1	34.3	-28.9	35.46	54	-18.54	-	-	226	207	V
6	* 7.692	38.16	PK2	36.1	-27.2	47.06	-	-	74	-26.94	242	380	V
	* 7.694	27.37	MAV1	36.1	-27.2	36.27	54	-17.73	-	-	242	380	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

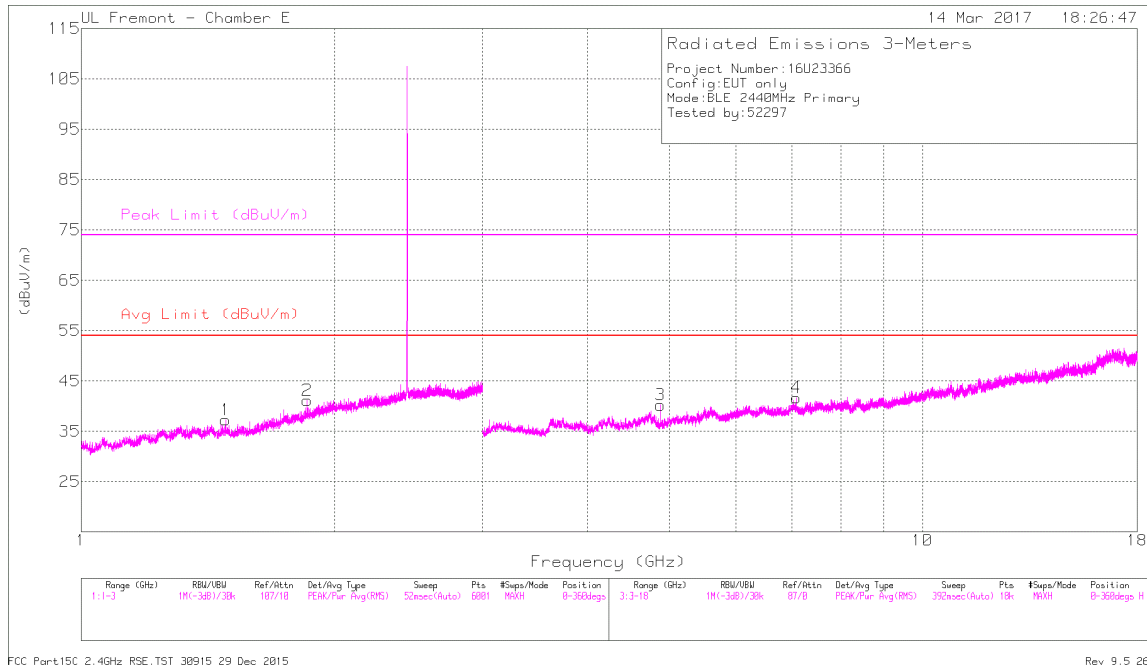
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

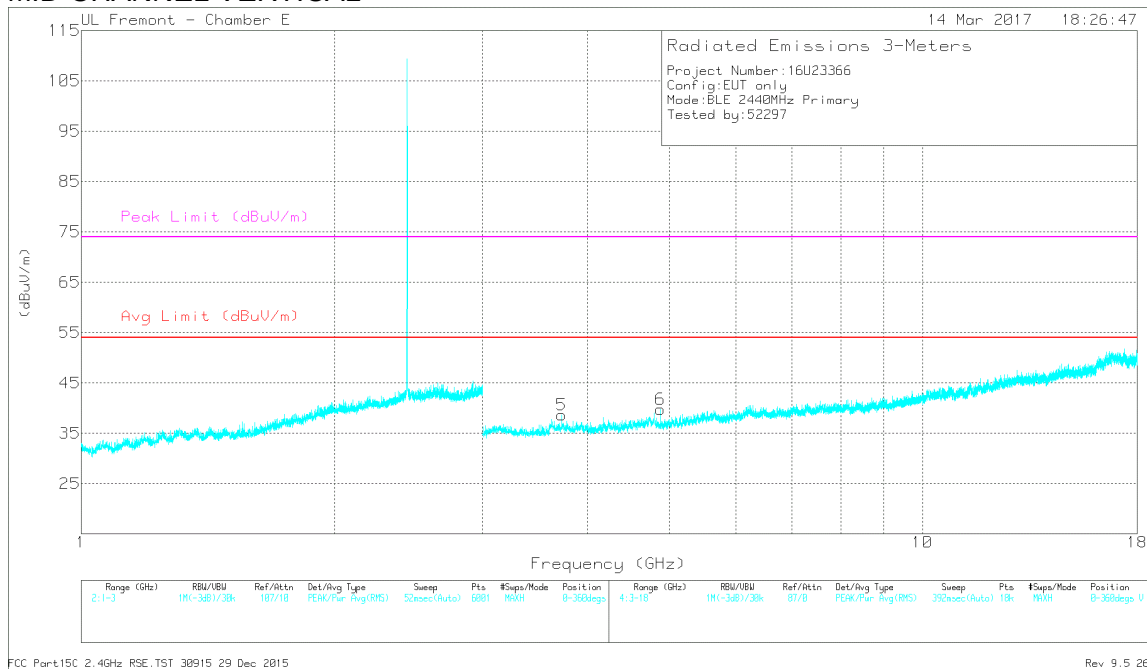
FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/F ltr/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	* 1.485	37	PK2	28.1	-21	44.1	-	-	74	-29.9	348	199	H
	* 1.484	23.03	MAv1	28.1	-21.1	30.03	54	-23.97	-	-	348	199	H
3	* 4.879	41.71	PK2	34.2	-30.4	45.51	-	-	74	-28.49	191	246	H
	* 4.88	32.22	MAv1	34.2	-30.4	36.02	54	-17.98	-	-	191	246	H
5	* 3.724	41.56	PK2	33.4	-30	44.96	-	-	74	-29.04	170	228	V
	* 3.726	29.97	MAv1	33.4	-30	33.37	54	-20.63	-	-	170	228	V
6	* 4.879	40.82	PK2	34.2	-30.4	44.62	-	-	74	-29.38	235	311	V
	* 4.88	30.62	MAv1	34.2	-30.4	34.42	54	-19.58	-	-	235	311	V
2	1.855	37.56	PK2	30.6	-20.5	47.66	-	-	-	-	124	294	H
4	7.083	38.98	PK2	35.8	-27.4	47.38	-	-	-	-	242	177	H

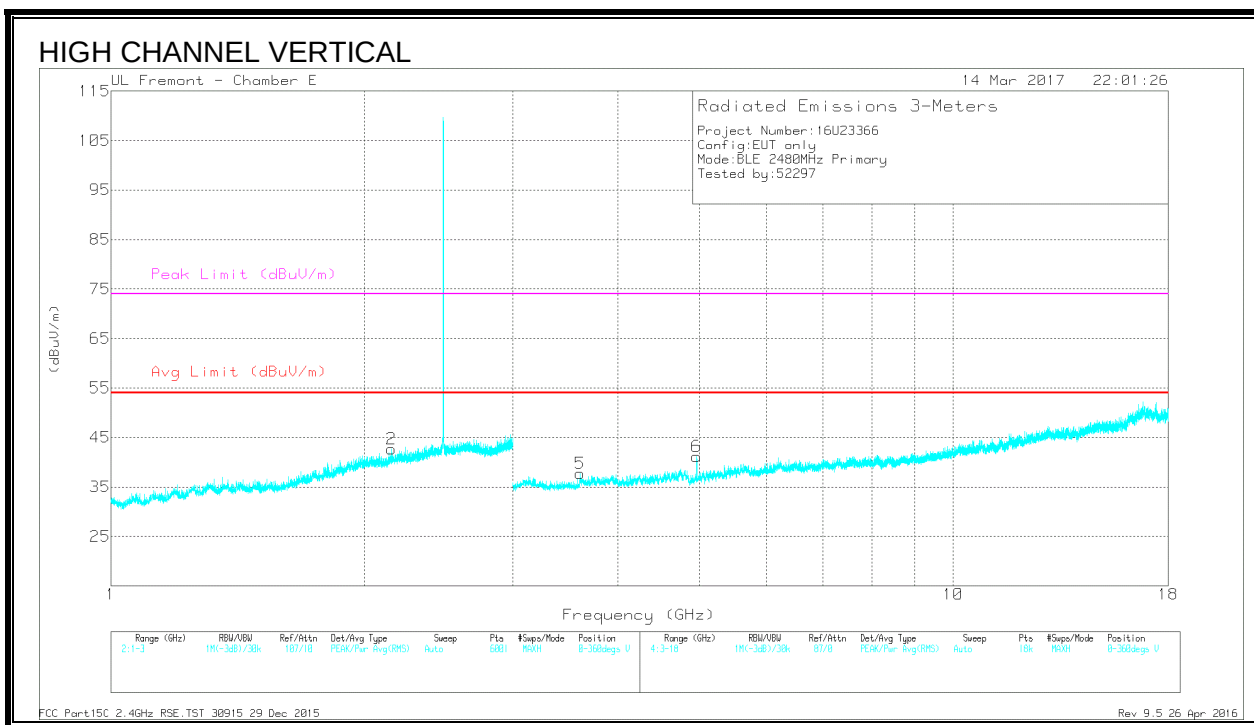
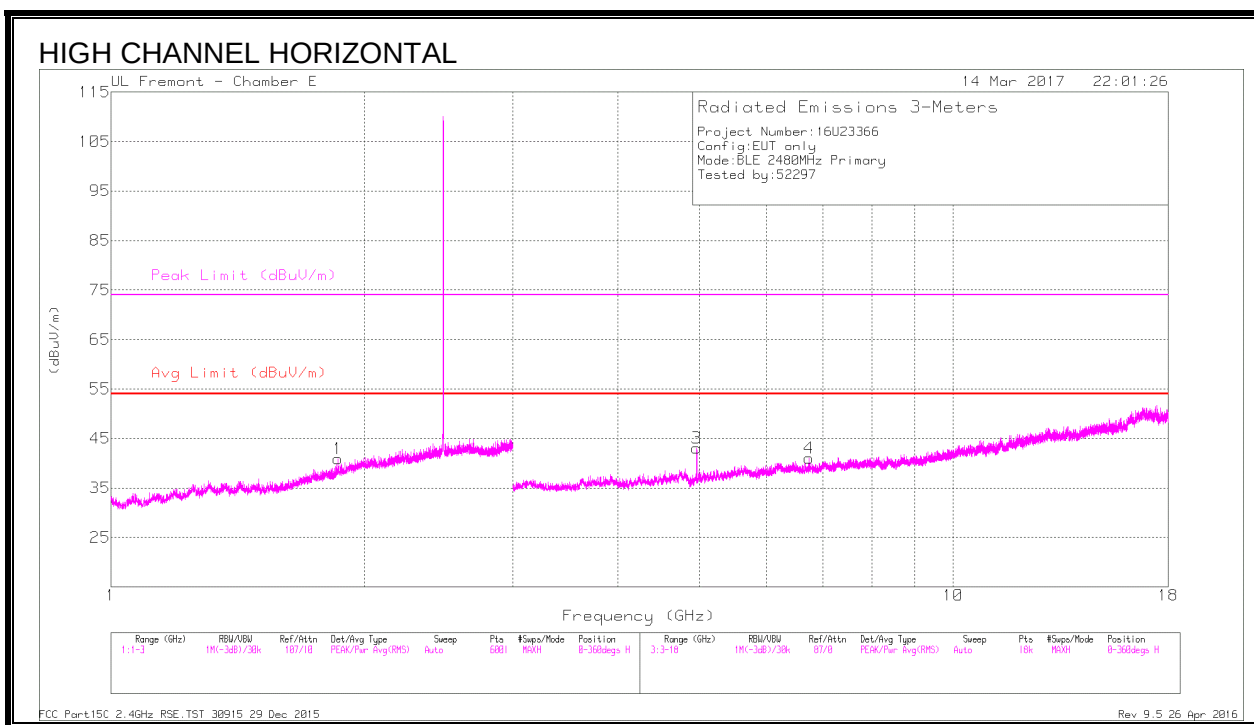
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016



Marker	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
3	* 4.96	44.37	PK2	34.2	-30.3	48.27	-	-	74	-25.73	199	107	H
	* 4.96	37.16	MAv1	34.2	-30.3	41.06	54	-12.94	-	-	199	107	H
5	* 4.96	42.97	PK2	34.2	-30.3	46.87	-	-	74	-27.13	170	101	V
	* 4.96	34.86	MAv1	34.2	-30.3	38.76	54	-15.24	-	-	170	101	V
6	* 3.608	40.7	PK2	32.9	-30.4	43.2	-	-	74	-30.8	47	176	V
	* 3.607	29.84	MAv1	32.9	-30.5	32.24	54	-21.76	-	-	47	176	V
1	1.859	37.35	PK2	30.6	-20.4	47.55	-	-	-	-	331	381	H
2	2.152	38.19	PK2	31.5	-19.7	49.99	-	-	-	-	354	119	V
4	6.74	37.96	PK2	35.6	-26.7	46.86	-	-	-	-	315	286	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

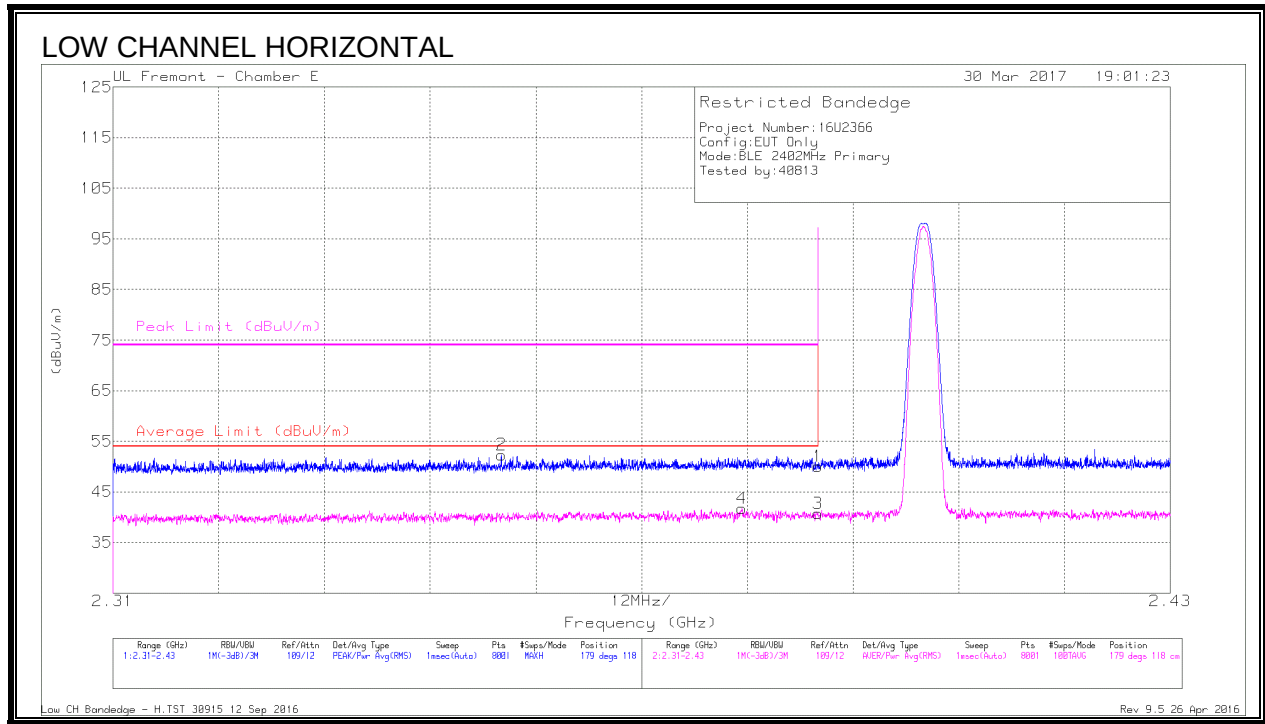
MAv1 - KDB558074 Option 1 Maximum RMS Average

*.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016

8.3. UAT 1 BLE 1M PLOW

8.3.1. RESTRICTED BANDEDGE (LOW CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/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	37.7	Pk	32	-19.7	50	-	-	74	-24	179	118	H
2	* 2.354	40.14	Pk	31.9	-19.7	52.34	-	-	74	-21.66	179	118	H
3	* 2.39	28.47	RMS	32	-19.7	40.77	54	-13.23	-	-	179	118	H
4	* 2.381	29.27	RMS	32	-19.5	41.77	54	-12.23	-	-	179	118	H

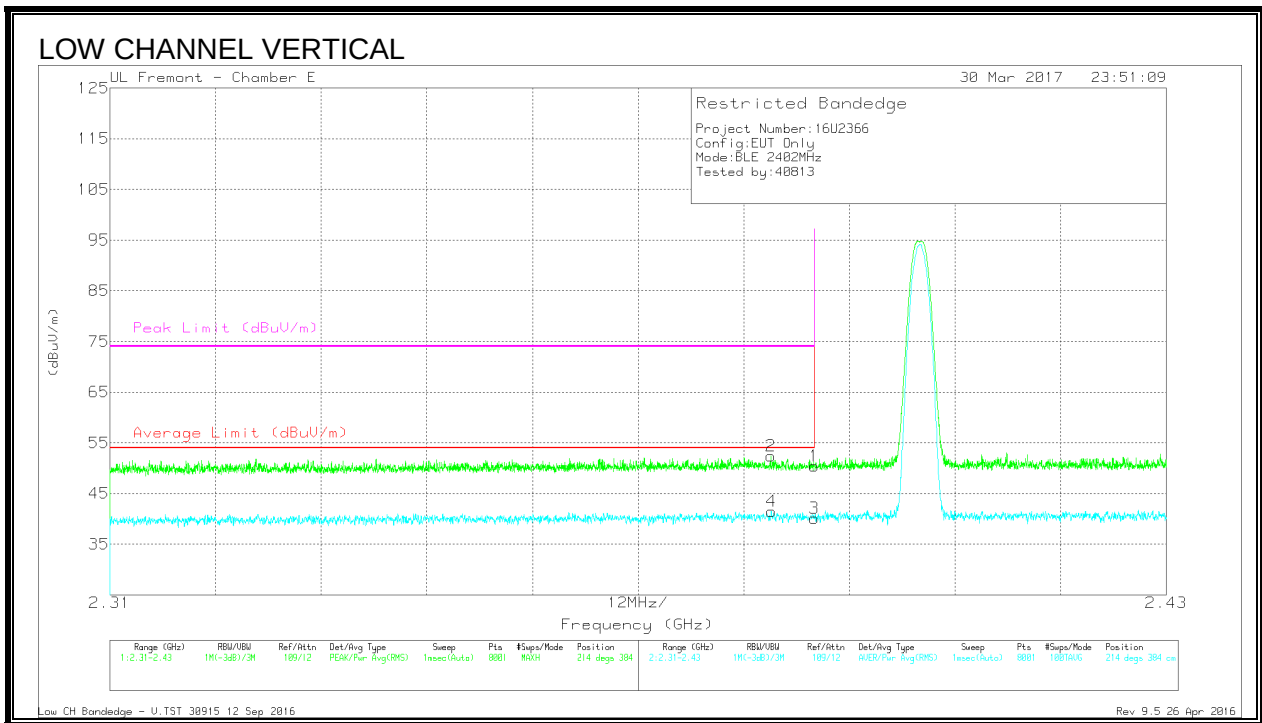
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/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	38.06	Pk	32	-19.7	50.36	-	-	74	-23.64	214	384	V
2	* 2.385	40.02	Pk	32	-19.6	52.42	-	-	74	-21.58	214	384	V
3	* 2.39	27.76	RMS	32	-19.7	40.06	54	-13.94	-	-	214	384	V
4	* 2.385	29.12	RMS	32	-19.6	41.52	54	-12.48	-	-	214	384	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

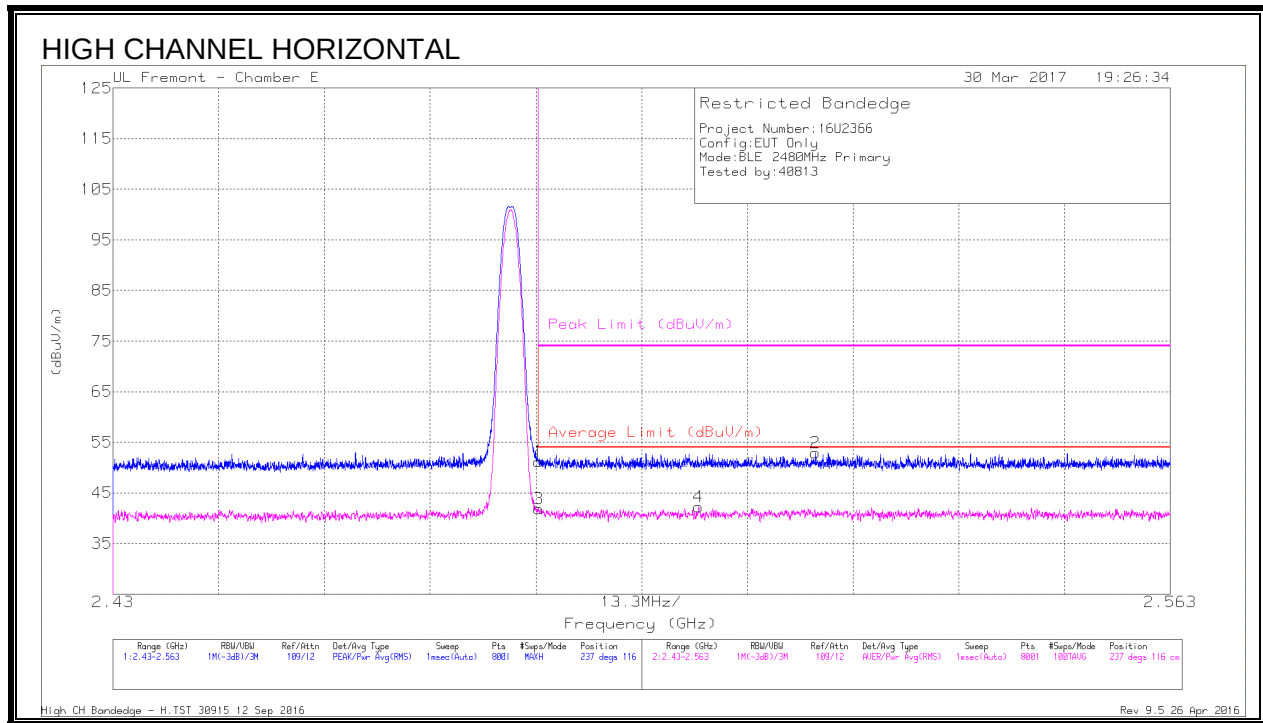
Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.3.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.484	38.41	Pk	32.5	-19.7	51.21	-	-	74	-22.79	237	116	H
3	* 2.484	29.1	RMS	32.5	-19.7	41.9	54	-12.1	-	-	237	116	H
4	2.504	29.51	RMS	32.6	-19.9	42.21	54	-11.79	-	-	237	116	H
2	2.518	40.11	Pk	32.6	-19.8	52.91	-	-	74	-21.09	237	116	H

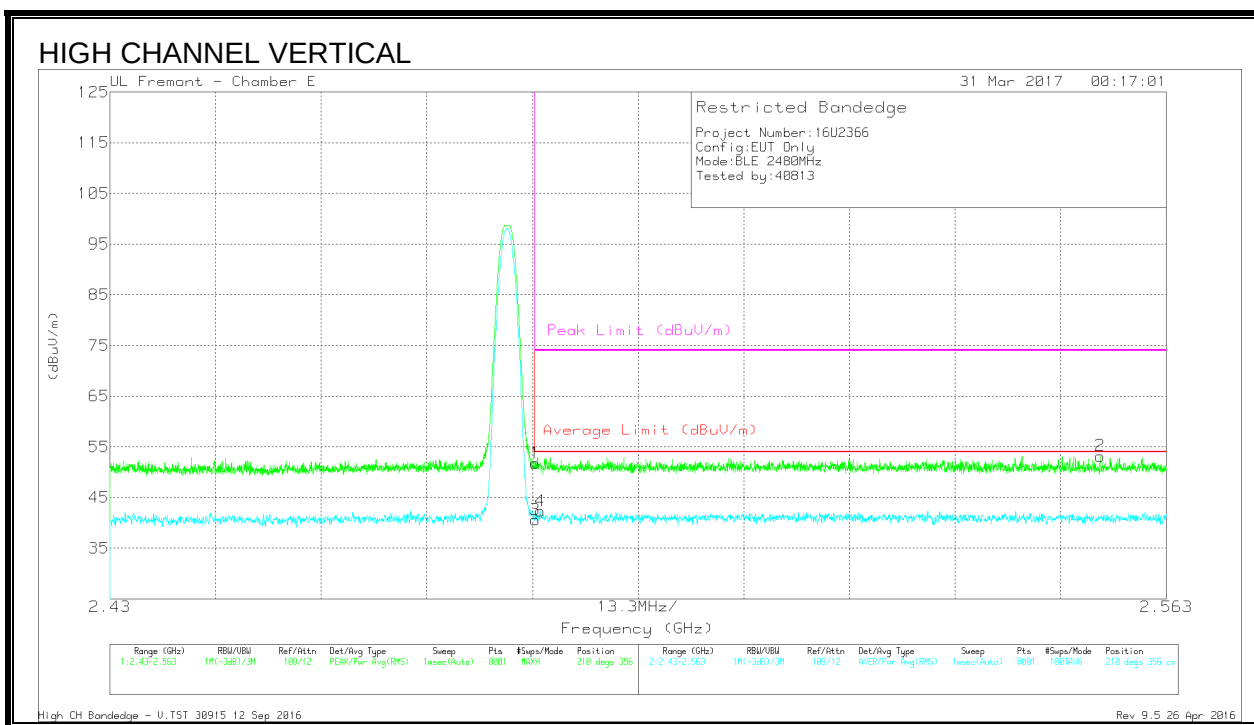
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

High CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/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	38.94	Pk	32.5	-19.7	51.74	-	-	74	-22.26	210	356	V
3	* 2.484	27.81	RMS	32.5	-19.7	40.61	54	-13.39	-	-	210	356	V
4	* 2.484	29.52	RMS	32.5	-19.7	42.32	54	-11.68	-	-	210	356	V
2	2.555	40.51	Pk	32.5	-19.8	53.21	-	-	74	-20.79	210	356	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

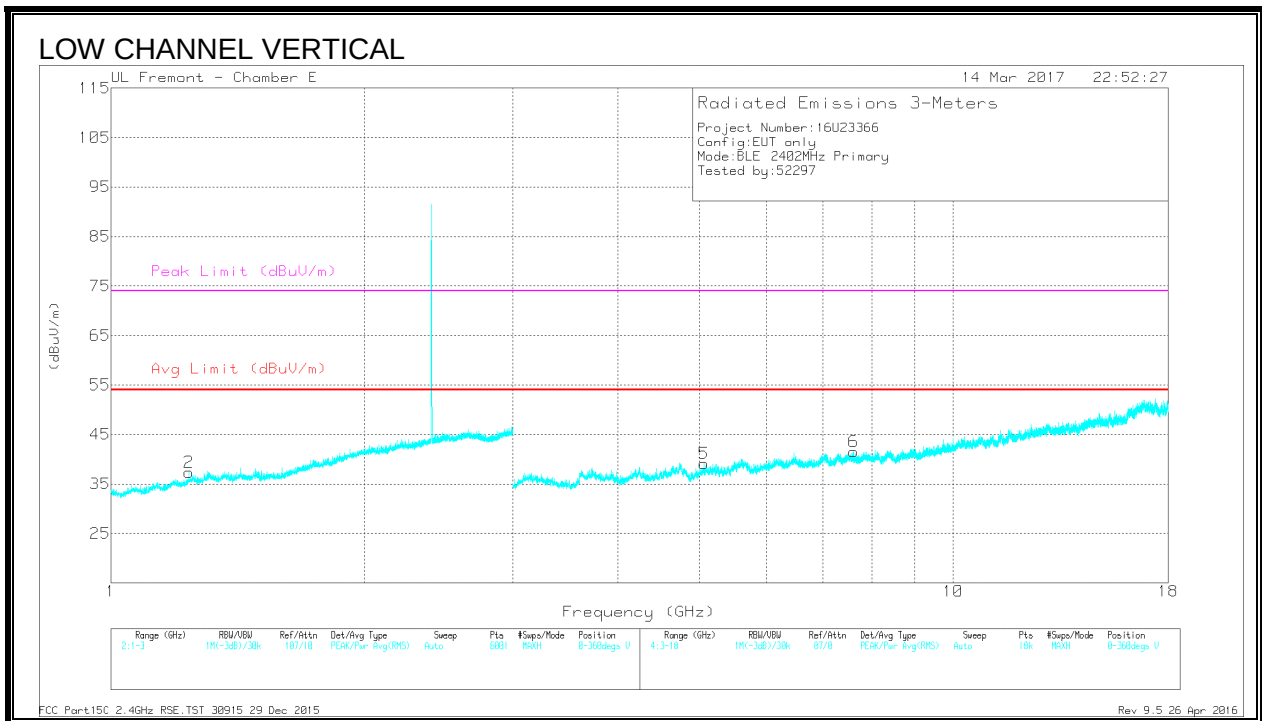
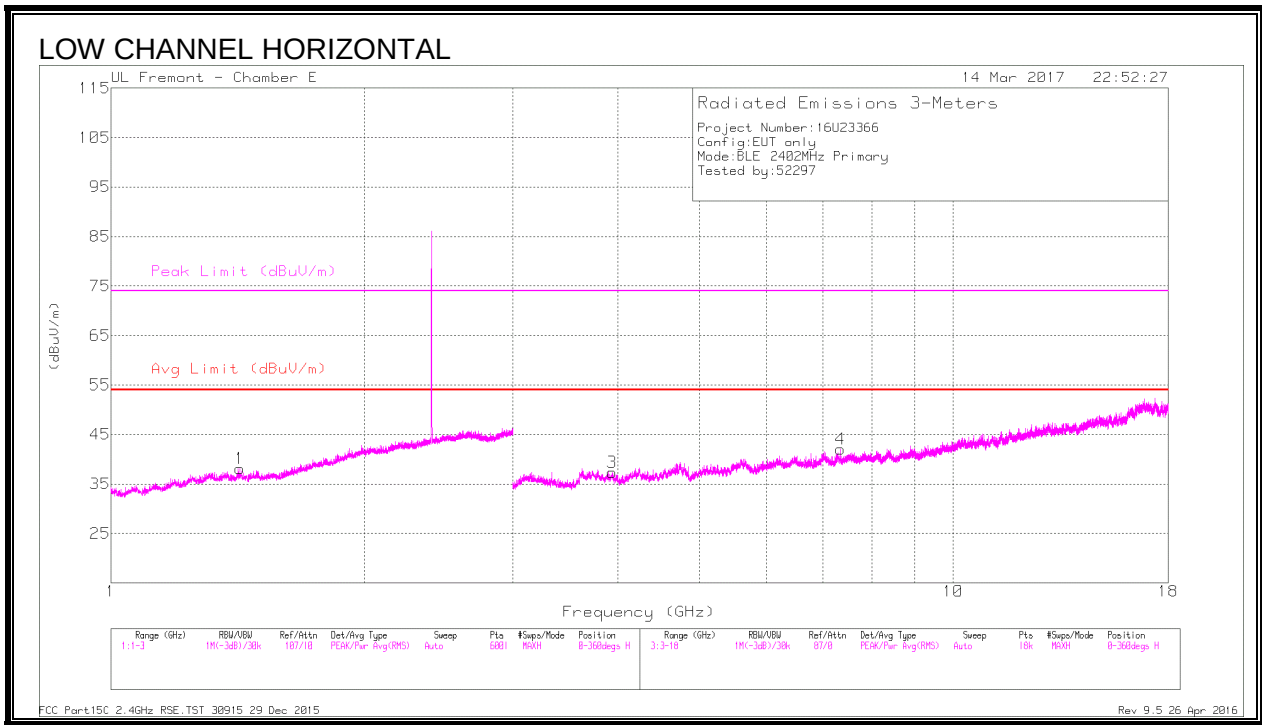
Pk - Peak detector

RMS - RMS detection

High CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.3.3. HARMONICS AND SPURIOUS EMISSIONS



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
1	* 1.422	37.26	PK2	28.5	-21.4	44.36	-	-	74	-29.64	144	143	H
	* 1.424	26.42	MAv1	28.5	-21.2	33.72	54	-20.28	-	-	144	143	H
2	* 1.236	37.29	PK2	28.4	-22	43.69	-	-	74	-30.31	173	242	V
	* 1.24	26.25	MAv1	28.4	-21.9	32.75	54	-21.25	-	-	173	242	V
3	* 3.934	40.72	PK2	33.4	-29.2	44.92	-	-	74	-29.08	247	202	H
	* 3.934	30.01	MAv1	33.4	-29.2	34.21	54	-19.79	-	-	247	202	H
4	* 7.345	37.73	PK2	35.9	-26.6	47.03	-	-	74	-26.97	197	171	H
	* 7.345	28.37	MAv1	35.9	-26.6	37.67	54	-16.33	-	-	197	171	H
5	* 5.058	40	PK2	34.3	-29.8	44.5	-	-	74	-29.5	242	298	V
	* 5.057	30.13	MAv1	34.3	-29.8	34.63	54	-19.37	-	-	242	298	V
6	* 7.616	37.91	PK2	36.1	-26.5	47.51	-	-	74	-26.49	304	270	V
	* 7.614	27.7	MAv1	36.1	-26.4	37.4	54	-16.6	-	-	304	270	V

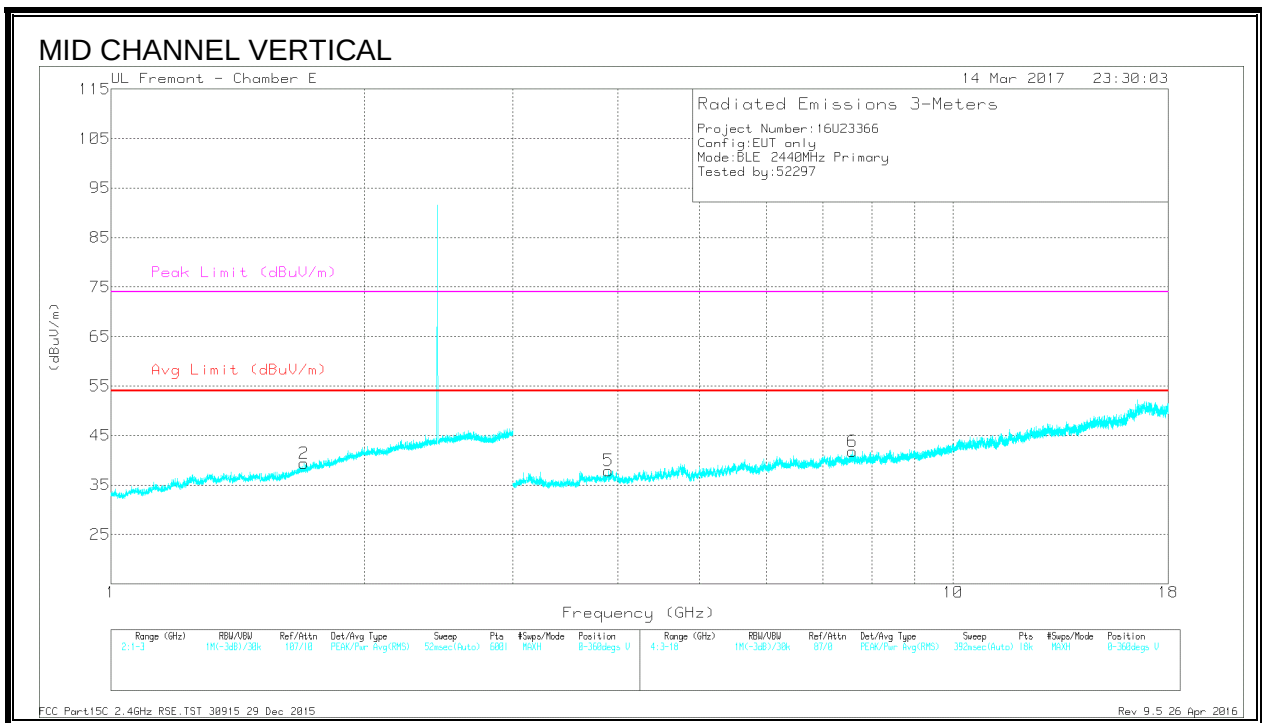
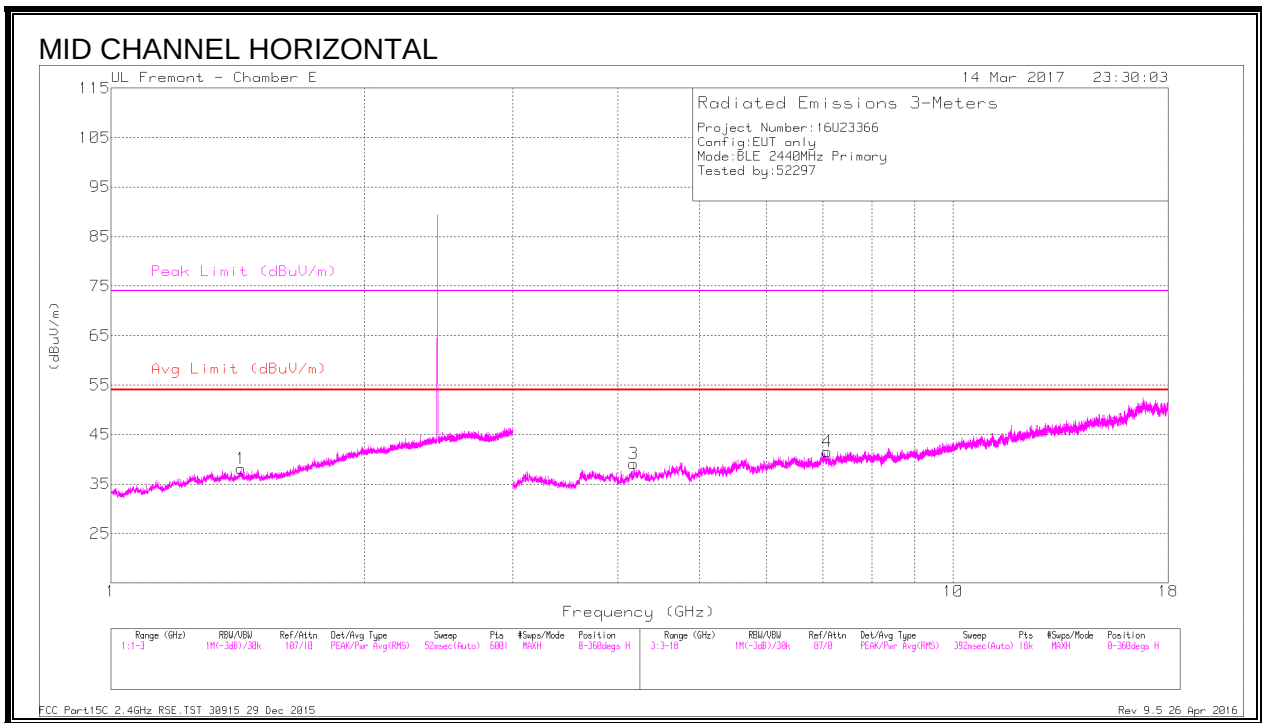
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

*,TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 1.695	37.2	PK2	29.2	-20.6	45.8	-	-	74	-28.2	323	169	V
	* 1.693	25.98	MAv1	29.2	-20.6	34.58	54	-19.42	-	-	323	169	V
3	* 4.176	41.32	PK2	33.5	-30.1	44.72	-	-	74	-29.28	243	215	H
	* 4.177	30.56	MAv1	33.5	-30.1	33.96	54	-20.04	-	-	243	215	H
5	* 3.893	41.26	PK2	33.4	-30.3	44.36	-	-	74	-29.64	187	245	V
	* 3.892	30.56	MAv1	33.4	-30.3	33.66	54	-20.34	-	-	187	245	V
6	* 7.592	37.7	PK2	36.1	-25.6	48.2	-	-	74	-25.8	237	337	V
	* 7.593	27.12	MAv1	36.1	-25.6	37.62	54	-16.38	-	-	237	337	V
1	1.428	36.82	PK2	28.5	-21	44.32	-	-	-	-	310	133	H
4	7.084	39.25	PK2	35.8	-27.4	47.65	-	-	-	-	131	261	H

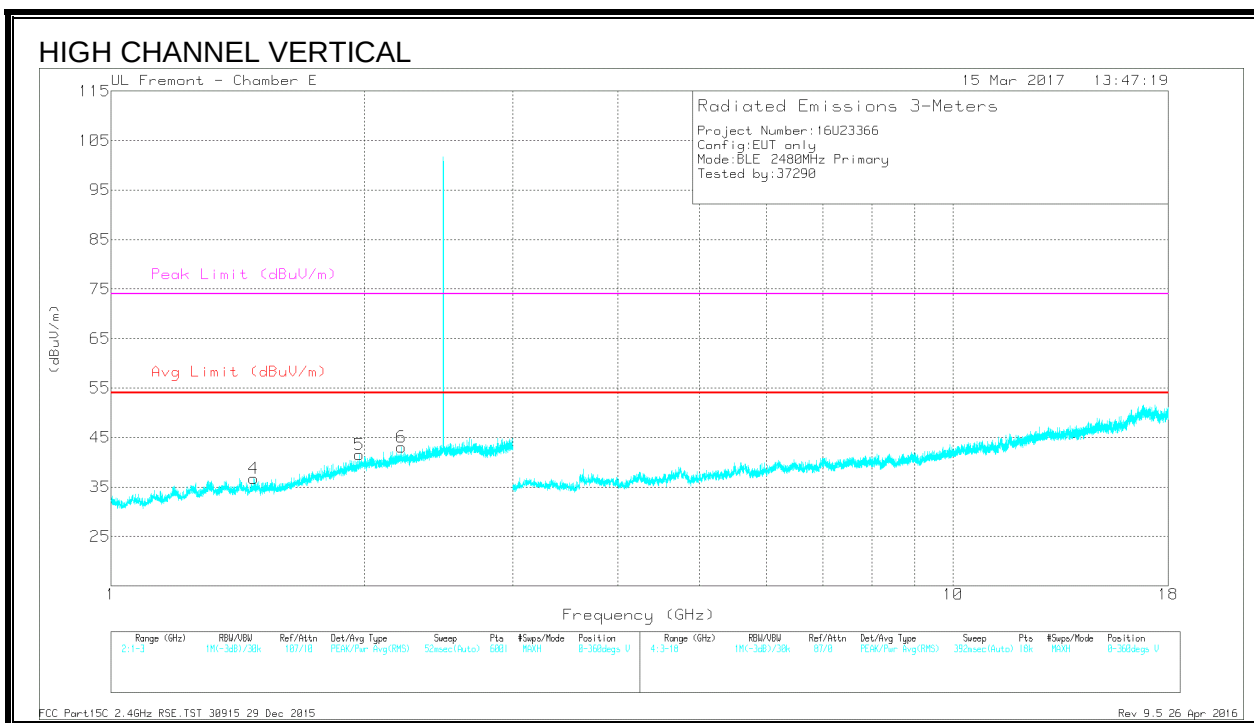
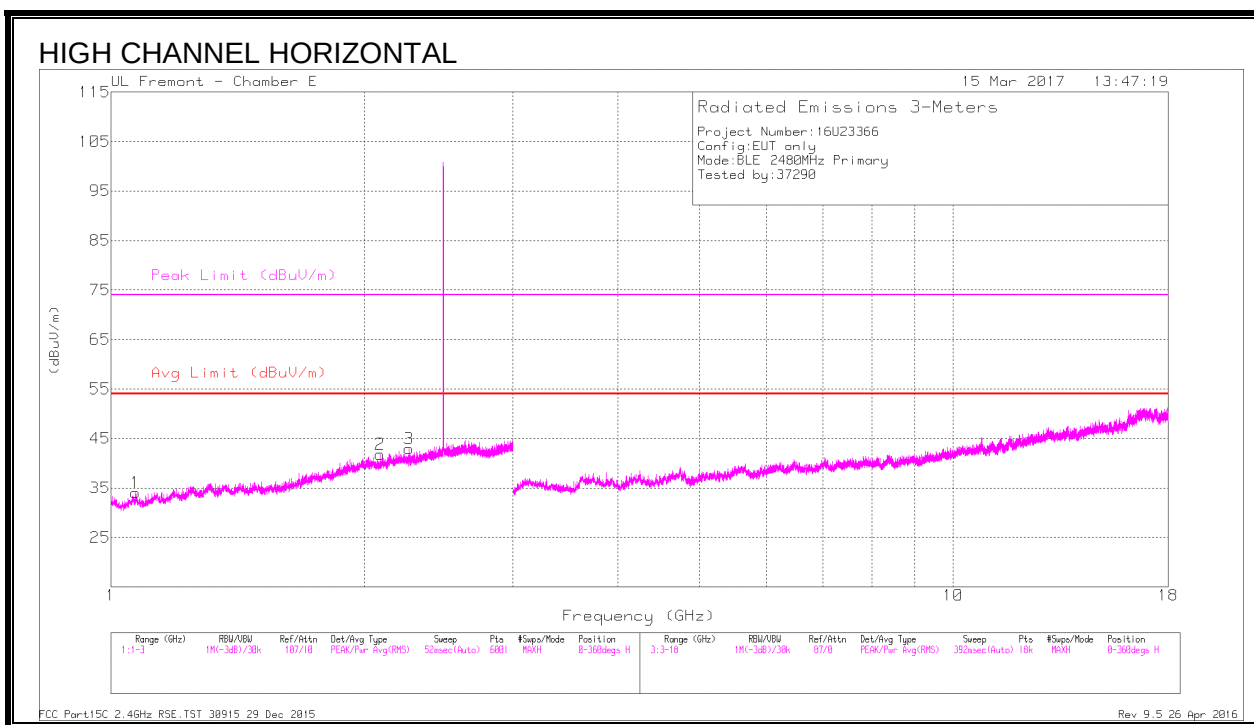
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016



Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.071	36.74	PK2	27.6	-23.1	41.24	-	-	74	-32.76	0	101	H
* 1.069	23.74	MAV1	27.6	-23.3	28.04	54	-25.96	-	-	0	101	H
* 2.261	37.65	PK2	31.7	-19.8	49.55	-	-	74	-24.45	0	200	H
* 2.261	23.54	MAV1	31.7	-19.8	35.44	54	-18.56	-	-	0	200	H
* 1.479	36.51	PK2	28.2	-21	43.71	-	-	74	-30.29	0	101	V
* 1.479	22.65	MAV1	28.2	-21	29.85	54	-24.15	-	-	0	101	V
* 2.212	37.69	PK2	31.6	-19.6	49.69	-	-	74	-24.31	0	101	V
* 2.212	22.99	MAV1	31.6	-19.6	34.99	54	-19.01	-	-	0	101	V
1.974	37.17	PK2	31.3	-20	48.47	-	-	-	-	0	200	V
2.087	37.34	PK2	31.3	-20.2	48.44	-	-	-	-	0	200	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

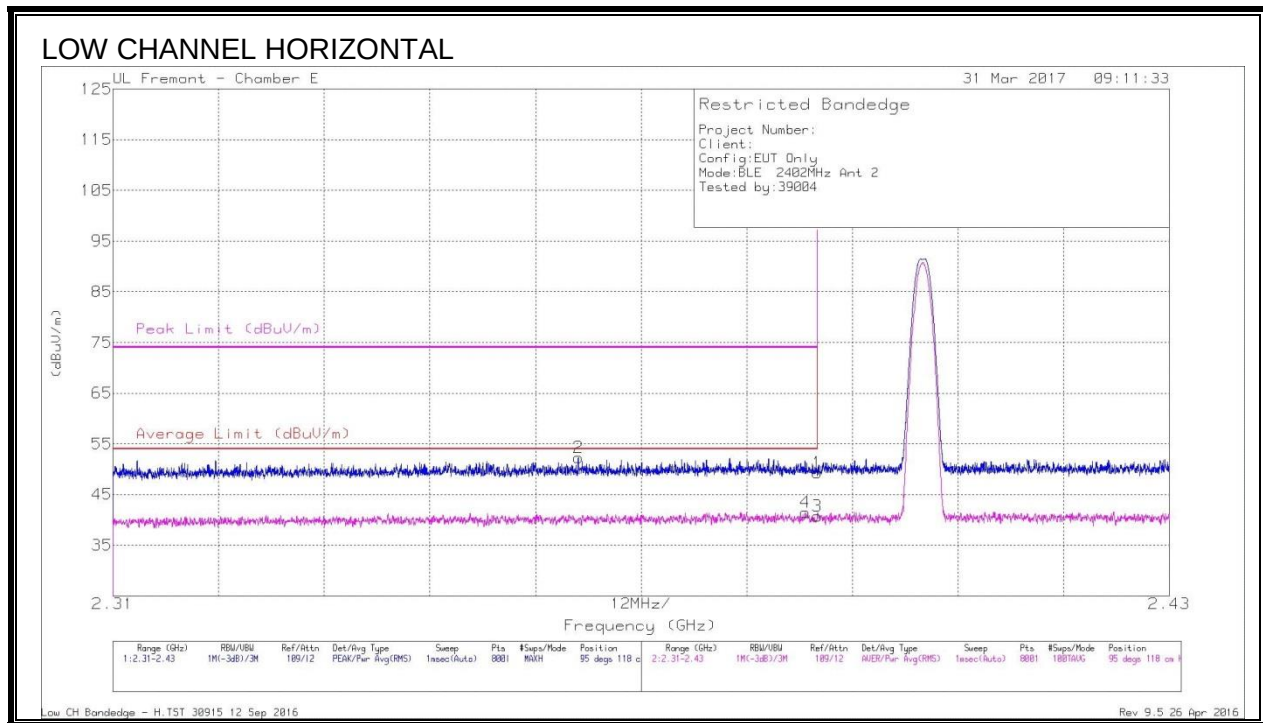
MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016

8.4. LAT 3 BLE 1M PMAX

8.4.1. RESTRICTED BANDEDGE (LOW CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.39	37.05	Pk	32	-19.7	49.35	-	-	74	-24.65	95	118	H
2	* 2.363	40.09	Pk	31.9	-19.7	52.29	-	-	74	-21.71	95	118	H
3	* 2.39	28.43	RMS	32	-19.7	40.73	54	-13.27	-	-	95	118	H
4	* 2.389	29.23	RMS	32	-19.7	41.53	54	-12.47	-	-	95	118	H

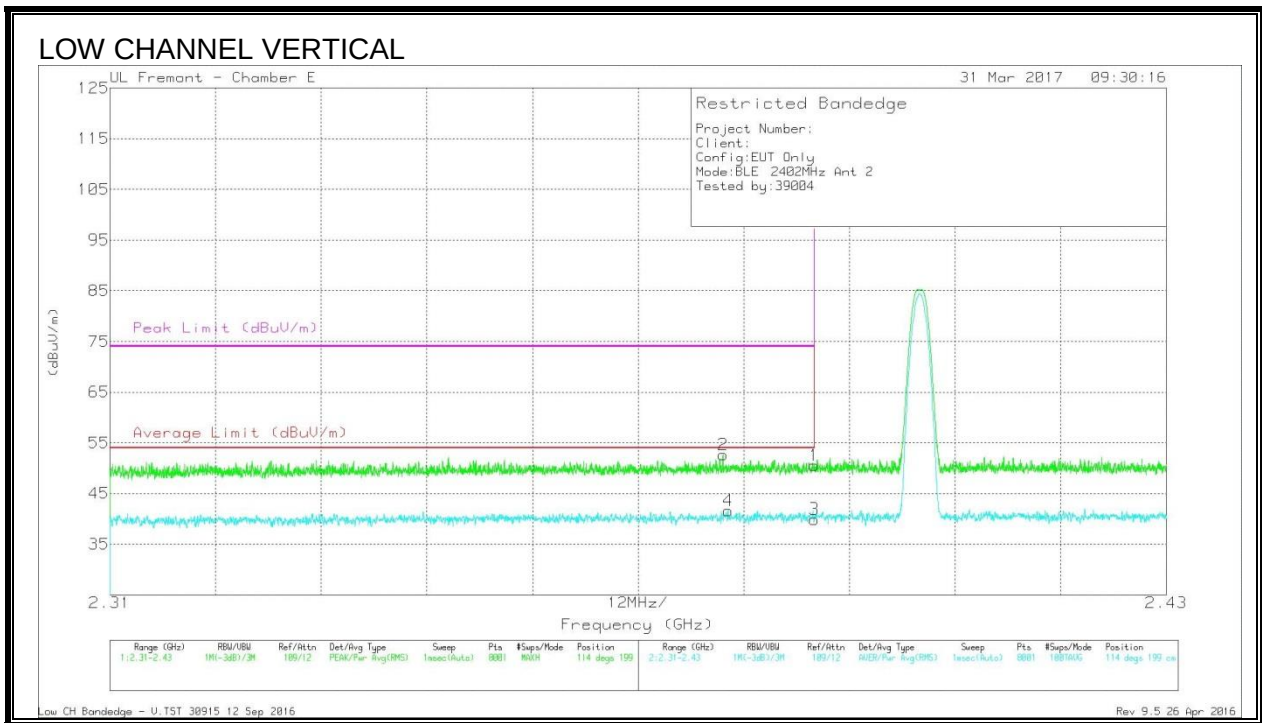
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.39	38.21	Pk	32	-19.7	50.51	-	-	74	-23.49	114	199	V
2	* 2.38	40.29	Pk	32	-19.6	52.69	-	-	74	-21.31	114	199	V
3	* 2.39	27.62	RMS	32	-19.7	39.92	54	-14.08	-	-	114	199	V
4	* 2.38	29.18	RMS	32	-19.6	41.58	54	-12.42	-	-	114	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

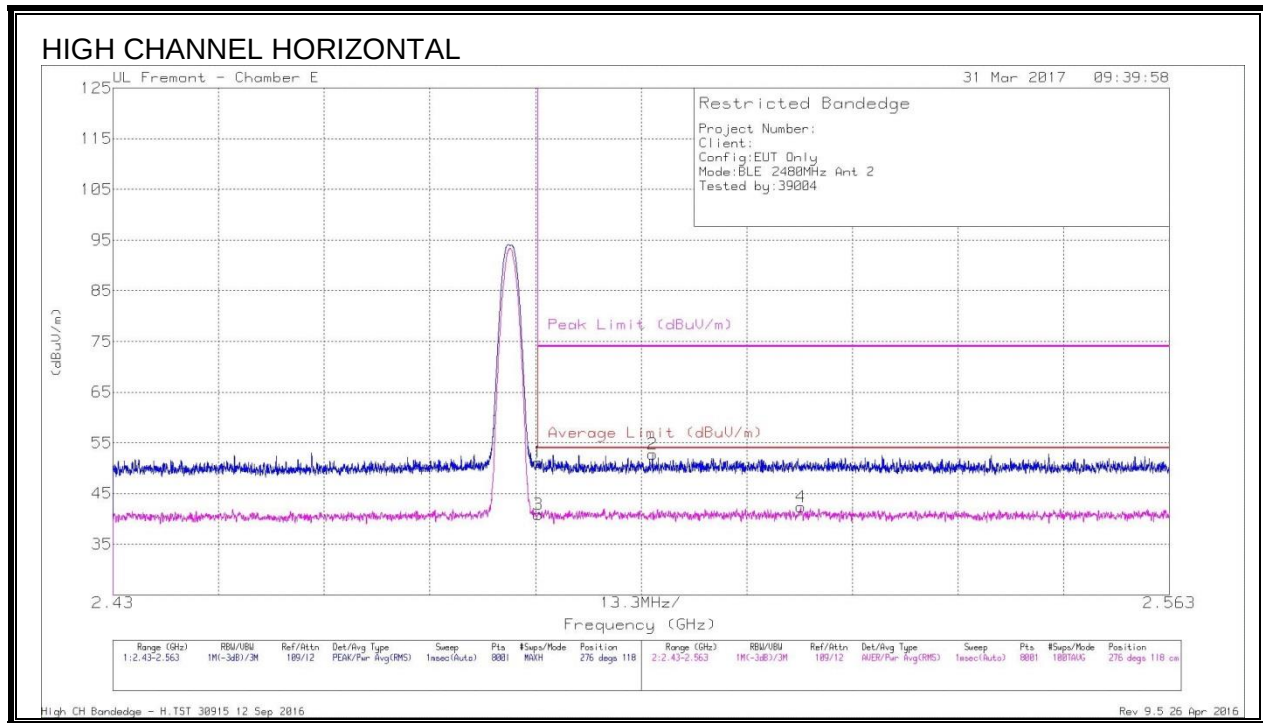
Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.4.2. AUTHORIZED BANDEGE (HIGH CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/C bl/Filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.484	38.4	Pk	32.5	-19.7	51.2	-	-	74	-22.8	276	118	H
2	* 2.498	40.09	Pk	32.6	-19.9	52.79	-	-	74	-21.21	276	118	H
3	* 2.484	28.05	RMS	32.5	-19.7	40.85	54	-13.15	-	-	276	118	H
4	2.517	29.41	RMS	32.6	-19.7	42.31	54	-11.69	-	-	276	118	H

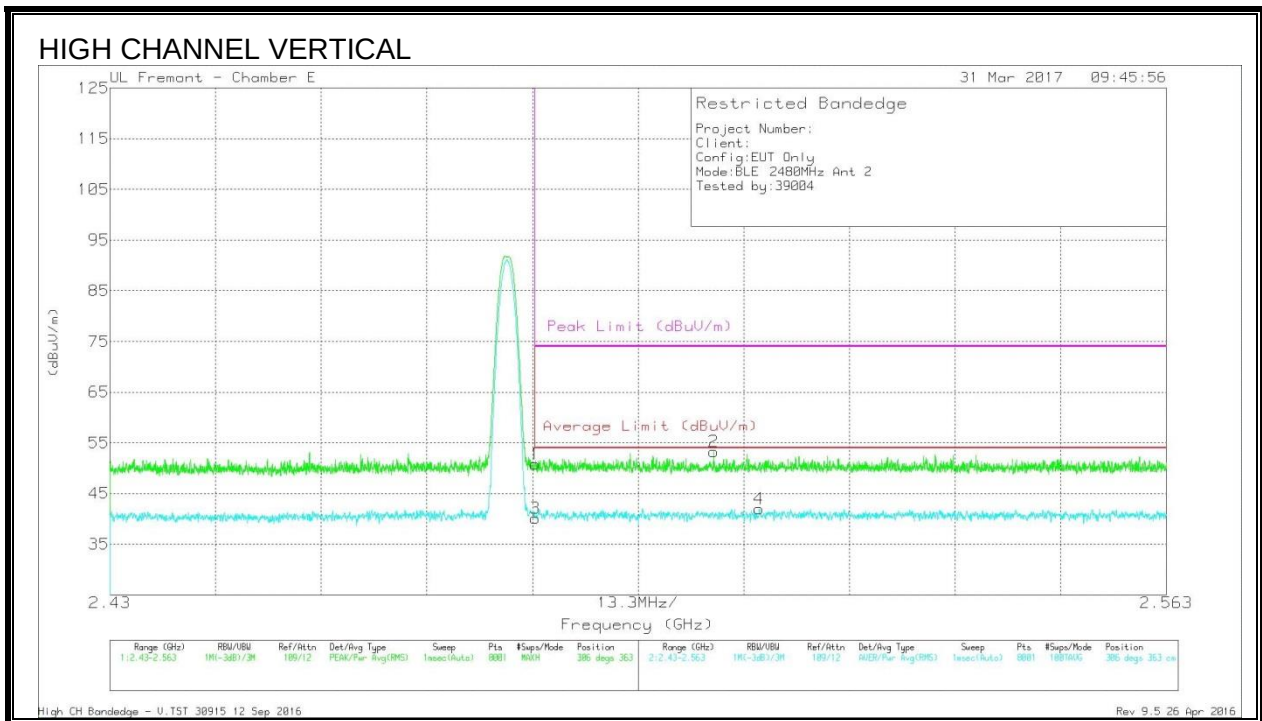
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

High CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequ ncy (GHz)	Meter Readin g (dBuV)	Det	AF T863 (dB/m)	Amp/C bl/Fitr/ Pad (dB)	Correct ed Readin g (dBuV/ m)	Averag e Limit (dBuV/ m)	Margin (dB)	Peak Limit (dBuV/ m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarit y
1	* 2.484	38	Pk	32.5	-19.7	50.8	-	-	74	-23.2	306	363	V
3	* 2.484	27.35	RMS	32.5	-19.7	40.15	54	-13.85	-	-	306	363	V
2	2.506	40.46	Pk	32.6	-19.8	53.26	-	-	74	-20.74	306	363	V
4	2.512	29.22	RMS	32.6	-19.8	42.02	54	-11.98	-	-	306	363	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

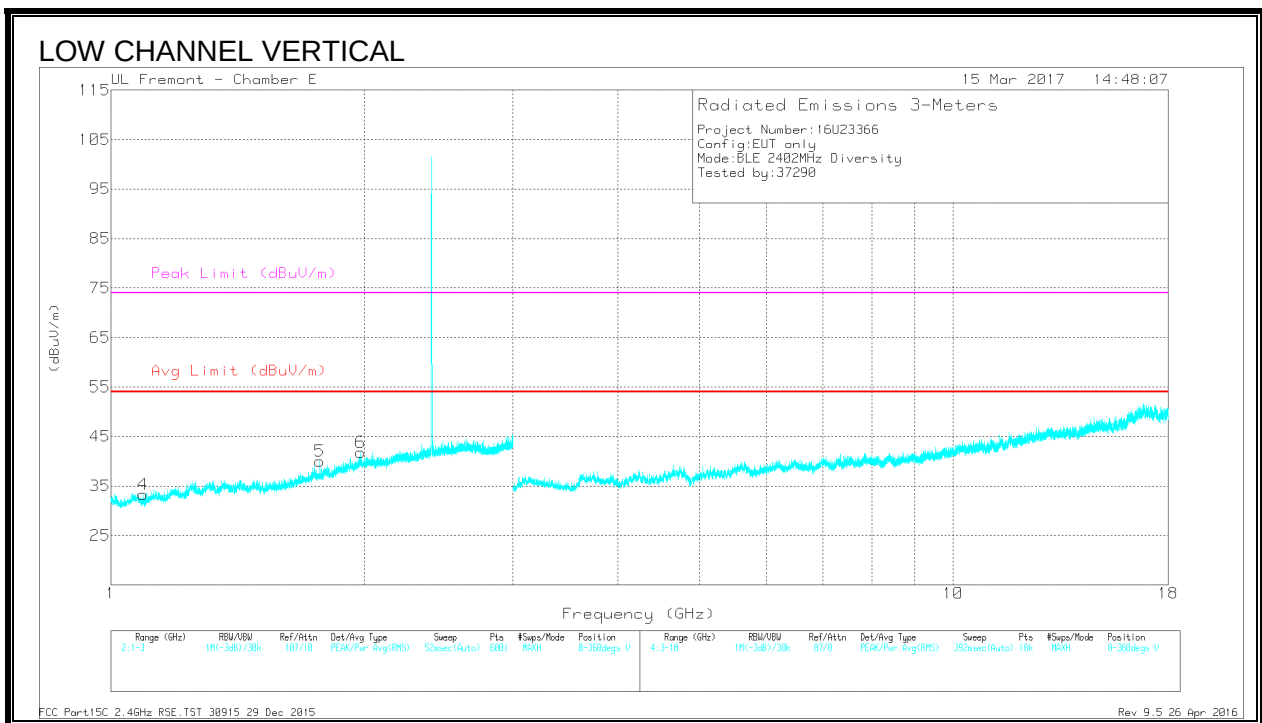
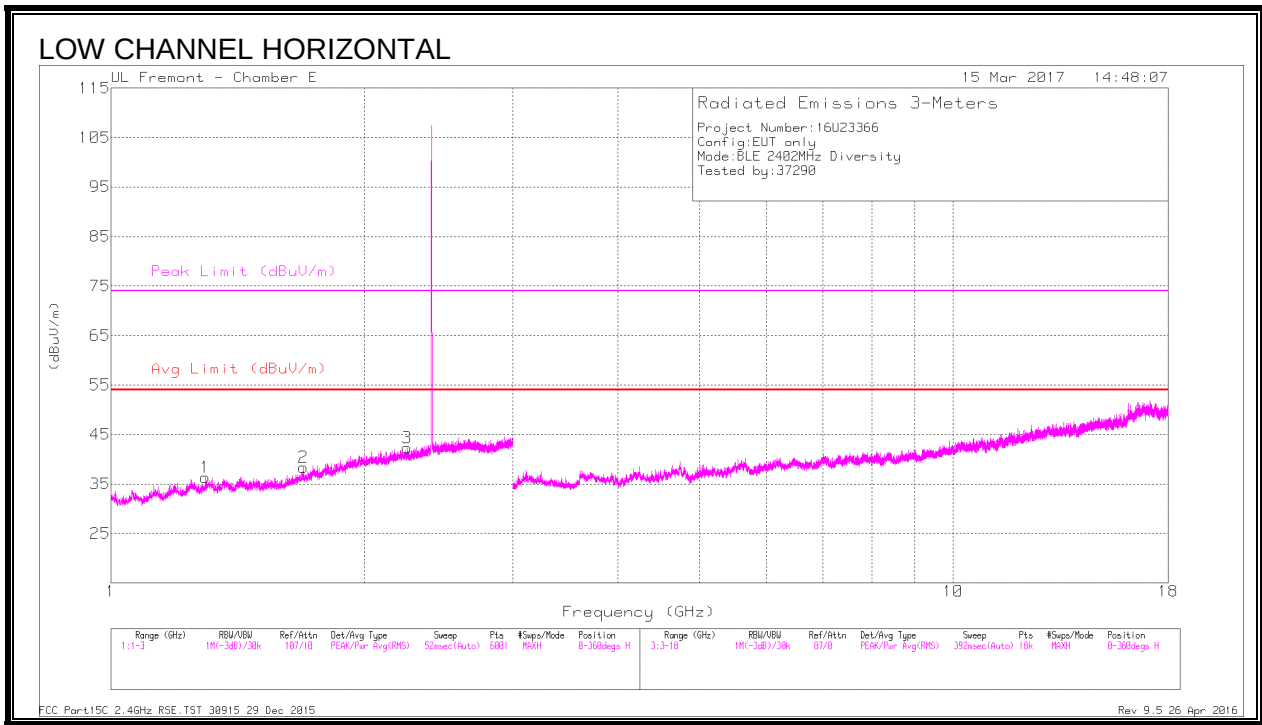
Pk - Peak detector

RMS - RMS detection

High CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.4.3. HARMONICS AND SPURIOUS EMISSIONS



Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.293	36.76	PK2	28.8	-21.8	43.76	-	-	74	-30.24	360	100	H
* 1.294	22.89	MAv1	28.8	-21.9	29.79	54	-24.21	-	-	360	100	H
* 1.693	36.79	PK2	29.2	-20.5	45.49	-	-	74	-28.51	360	100	H
* 1.693	22.12	MAv1	29.2	-20.6	30.72	54	-23.28	-	-	360	100	H
* 2.247	38.09	PK2	31.6	-19.5	50.19	-	-	74	-23.81	360	100	H
* 2.248	22.94	MAv1	31.7	-19.6	35.04	54	-18.96	-	-	360	100	H
* 1.09	36.62	PK2	27.7	-23.2	41.12	-	-	74	-32.88	360	200	V
* 1.09	22.57	MAv1	27.7	-23.2	27.07	54	-26.93	-	-	360	200	V
1.77	37.1	PK2	29.9	-20.6	46.4	-	-	-	-	360	101	V
1.978	37.79	PK2	31.3	-20	49.09	-	-	-	-	360	101	V

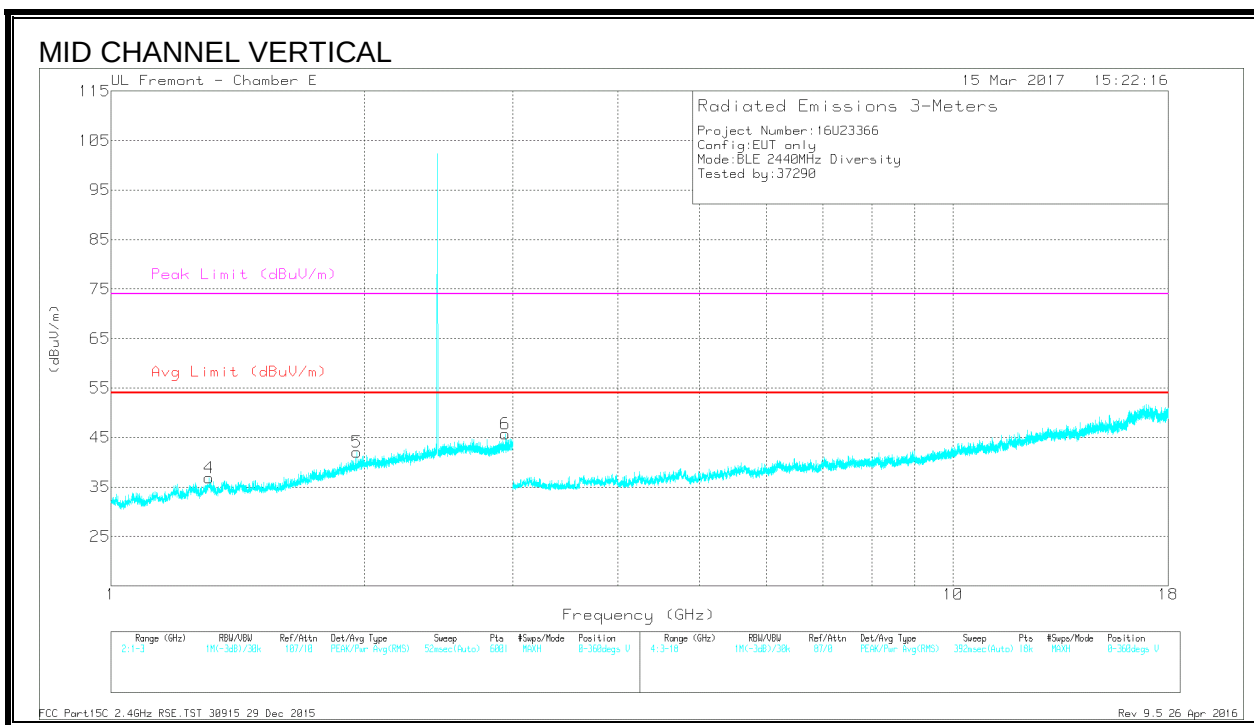
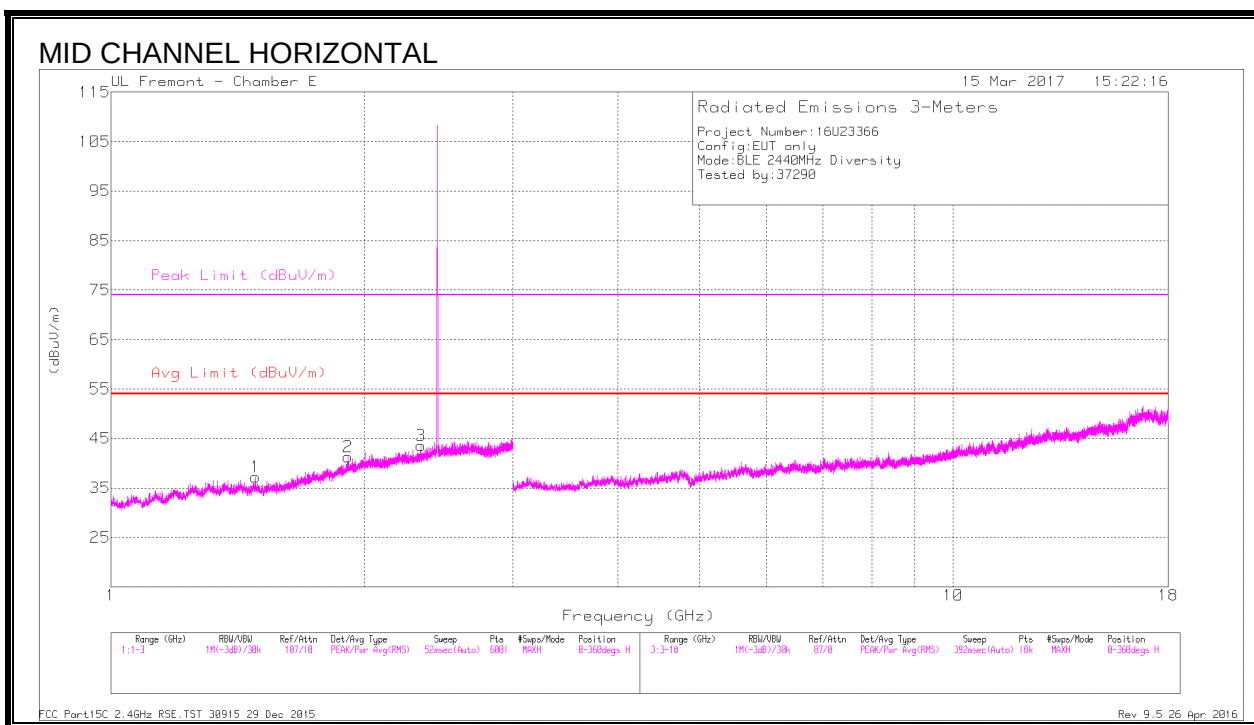
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016



Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.485	36.78	PK2	28.1	-21	43.88	-	-	74	-30.12	360	101	H
* 1.483	22.58	MAv1	28.1	-21.1	29.58	54	-24.42	-	-	360	101	H
* 2.334	39.01	PK2	31.8	-19.8	51.01	-	-	74	-22.99	360	200	H
* 2.334	22.72	MAv1	31.8	-19.8	34.72	54	-19.28	-	-	360	200	H
* 1.307	37	PK2	28.8	-21.7	44.1	-	-	74	-29.9	360	101	V
* 1.307	23.31	MAv1	28.8	-21.7	30.41	54	-23.59	-	-	360	101	V
1.912	36.85	PK2	30.9	-19.9	47.85	-	-	-	-	360	200	H
1.957	37.06	PK2	31.2	-20.1	48.16	-	-	-	-	360	200	V
2.935	38.7	PK2	32.6	-18.9	52.4	-	-	-	-	360	200	V

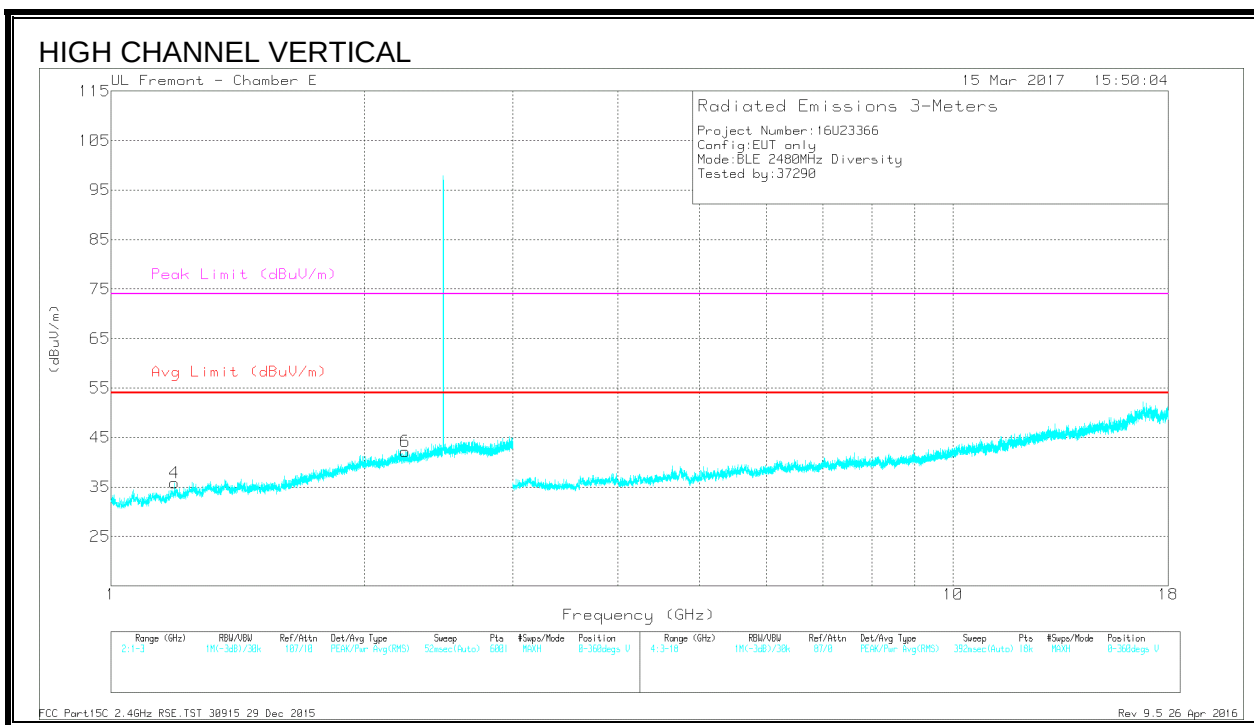
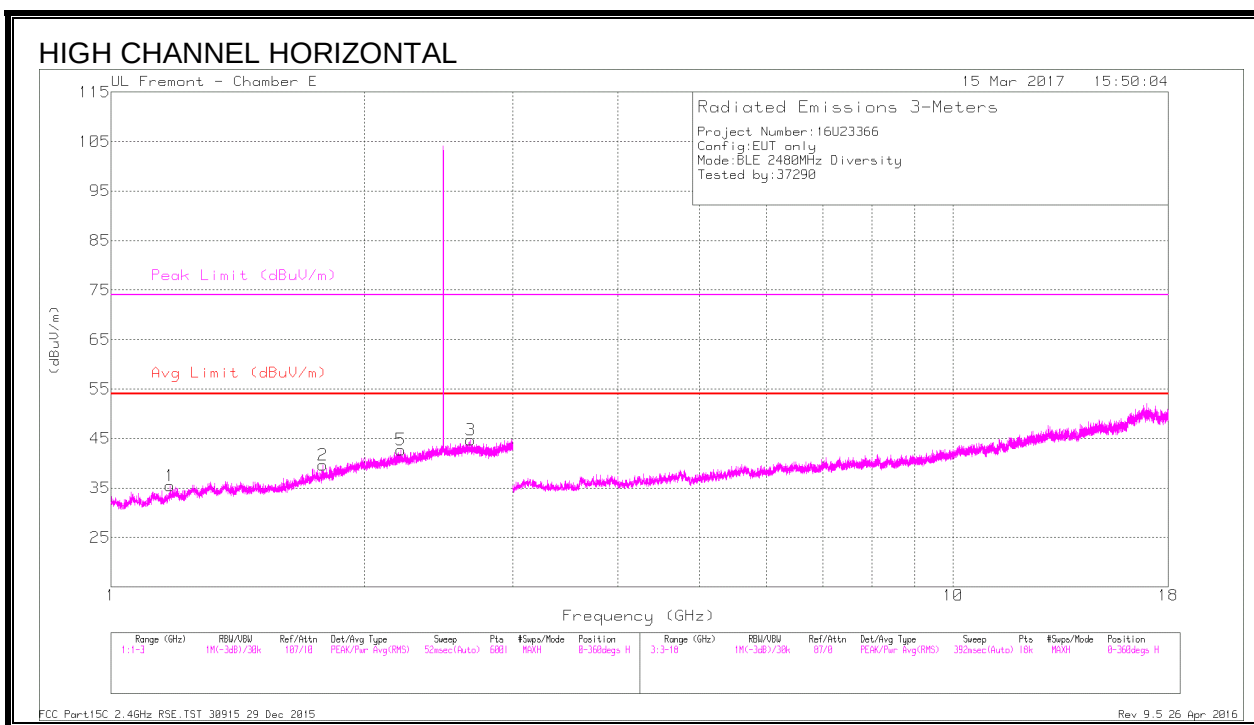
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016



Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.174	36.48	PK2	28.1	-22.6	41.98	-	-	74	-32.02	360	200	H
* 1.175	22.57	MAV1	28.1	-22.7	27.97	54	-26.03	-	-	360	200	H
* 2.676	38.73	PK2	32.4	-19.4	51.73	-	-	74	-22.27	360	101	H
* 2.675	23.26	MAV1	32.4	-19.4	36.26	54	-17.74	-	-	360	101	H
* 2.207	37.72	PK2	31.6	-19.5	49.82	-	-	74	-24.18	360	200	H
* 2.207	22.85	MAV1	31.6	-19.5	34.95	54	-19.05	-	-	360	200	H
* 1.189	37.37	PK2	28.1	-22.4	43.07	-	-	74	-30.93	360	101	V
* 1.192	23.32	MAV1	28.1	-22.4	29.02	54	-24.98	-	-	360	101	V
* 2.236	37.65	PK2	31.6	-19.4	49.85	-	-	74	-24.15	360	101	V
* 2.235	23.33	MAV1	31.6	-19.5	35.43	54	-18.57	-	-	360	101	V
1.782	36.78	PK2	30	-20.6	46.18	-	-	-	-	360	101	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

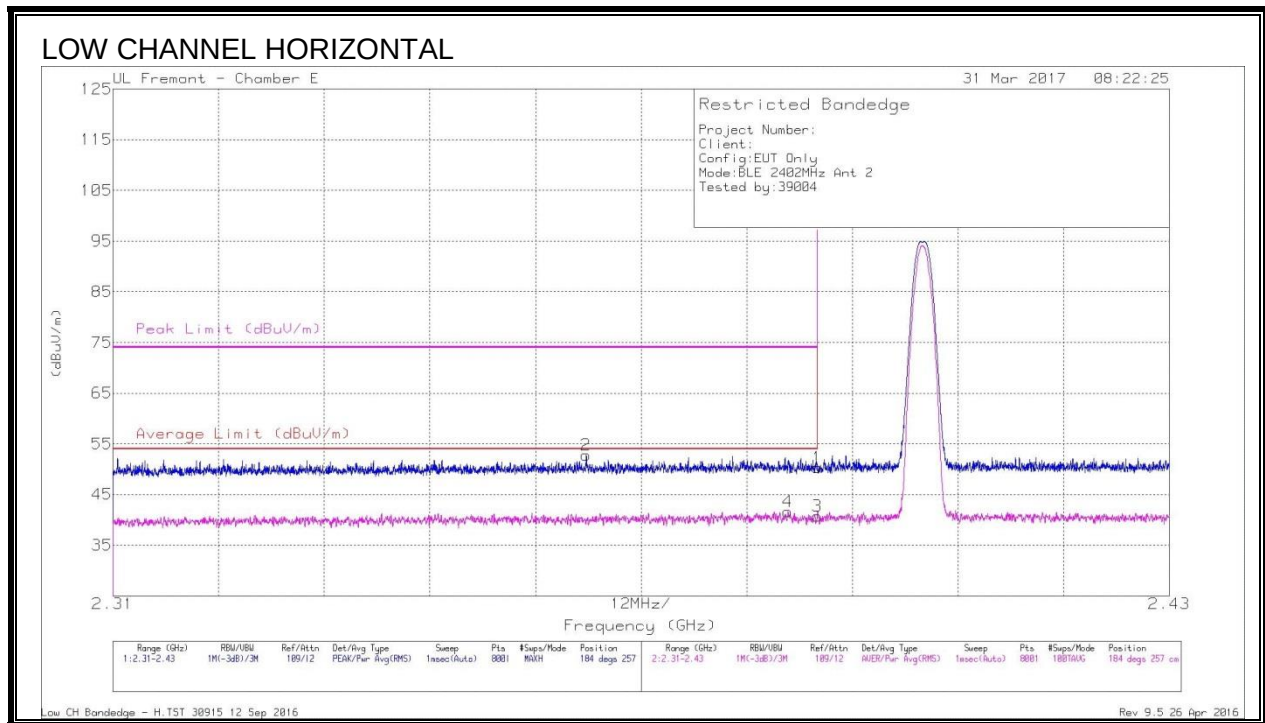
MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016

8.5. LAT 3 BLE 1M PLOW

8.5.1. RESTRICTED BANDEDGE (LOW CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.39	38.02	Pk	32	-19.7	50.32	-	-	74	-23.68	184	257	H
2	* 2.364	40.62	Pk	31.9	-19.7	52.82	-	-	74	-21.18	184	257	H
3	* 2.39	28.41	RMS	32	-19.7	40.71	54	-13.29	-	-	184	257	H
4	* 2.387	29.31	RMS	32	-19.7	41.61	54	-12.39	-	-	184	257	H

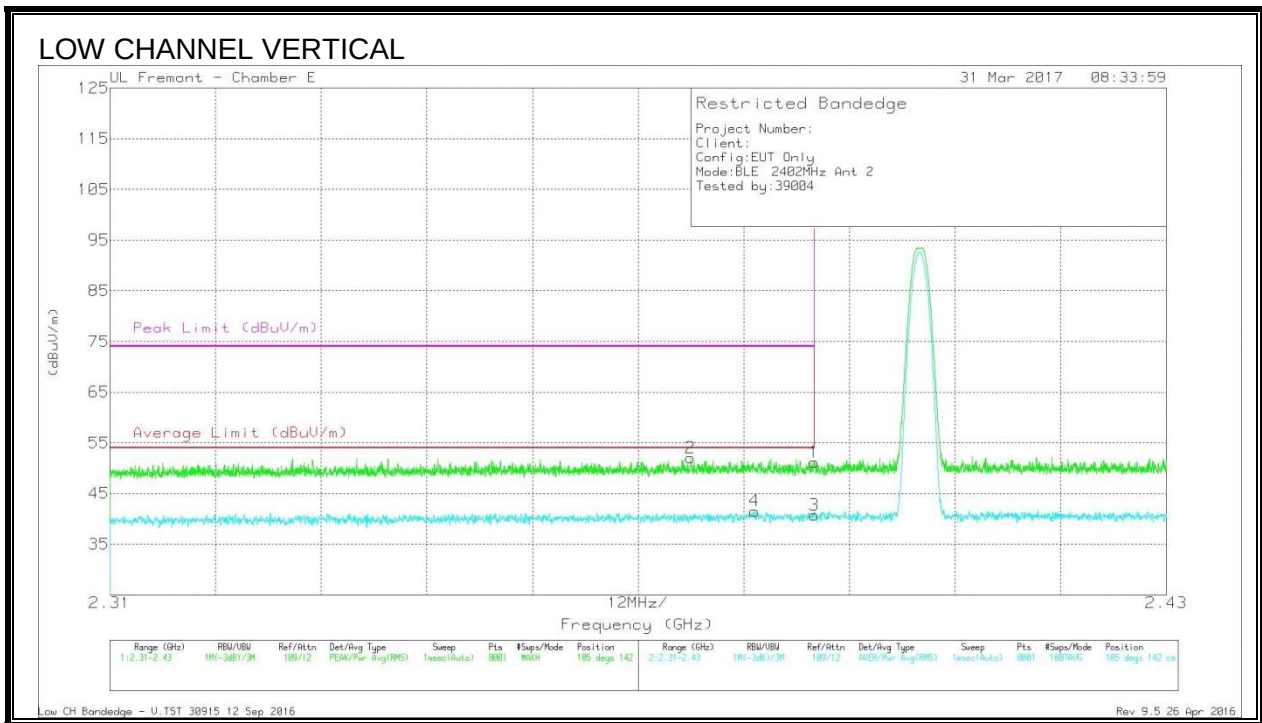
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/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	38.83	Pk	32	-19.7	51.13	-	-	74	-22.87	105	142	V
2	* 2.376	39.8	Pk	32	-19.8	52	-	-	74	-22	105	142	V
3	* 2.39	28.38	RMS	32	-19.7	40.68	54	-13.32	-	-	105	142	V
4	* 2.383	29.04	RMS	32	-19.5	41.54	54	-12.46	-	-	105	142	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

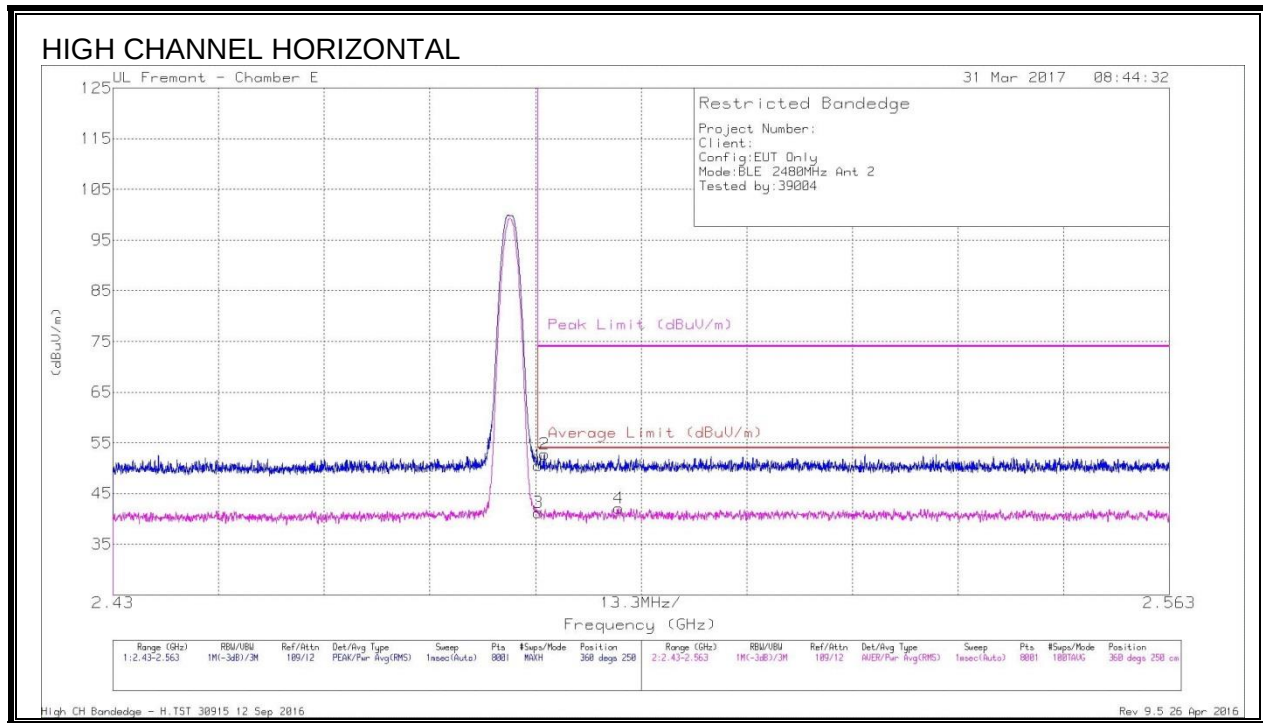
Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.5.2. AUTHORIZED BANDEGE (HIGH CHANNEL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/C bl/Filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.484	37.79	Pk	32.5	-19.7	50.59	-	-	74	-23.41	360	250	H
2	* 2.484	40	Pk	32.5	-19.7	52.8	-	-	74	-21.2	360	250	H
3	* 2.484	28.39	RMS	32.5	-19.7	41.19	54	-12.81	-	-	360	250	H
4	* 2.494	29.28	RMS	32.6	-19.8	42.08	54	-11.92	-	-	360	250	H

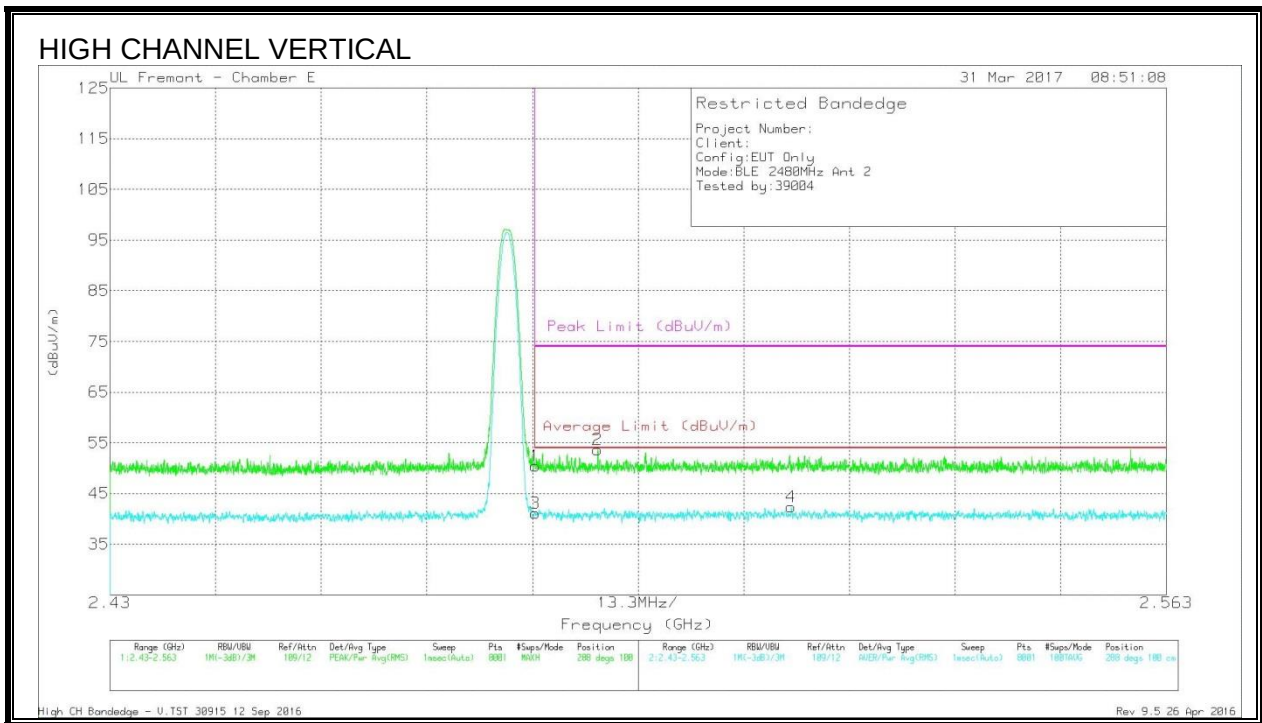
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

High CH Bandedge - H.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016



DATA

Marker	Frequ ncy (GHz)	Meter Readin g (dBuV)	Det	AF T863 (dB/m)	Amp/C bl/Fitr/ Pad (dB)	Correct ed Readin g (dBuV/ m)	Averag e Limit (dBuV/ m)	Margin (dB)	Peak Limit (dBuV/ m)	PK Margin (dB)	Azimut h (Degs)	Height (cm)	Polarit y
1	* 2.484	37.56	Pk	32.5	-19.7	50.36	-	-	74	-23.64	288	100	V
2	* 2.491	40.96	Pk	32.6	-19.9	53.66	-	-	74	-20.34	288	100	V
3	* 2.484	28.28	RMS	32.5	-19.7	41.08	54	-12.92	-	-	288	100	V
4	2.516	29.45	RMS	32.6	-19.7	42.35	54	-11.65	-	-	288	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

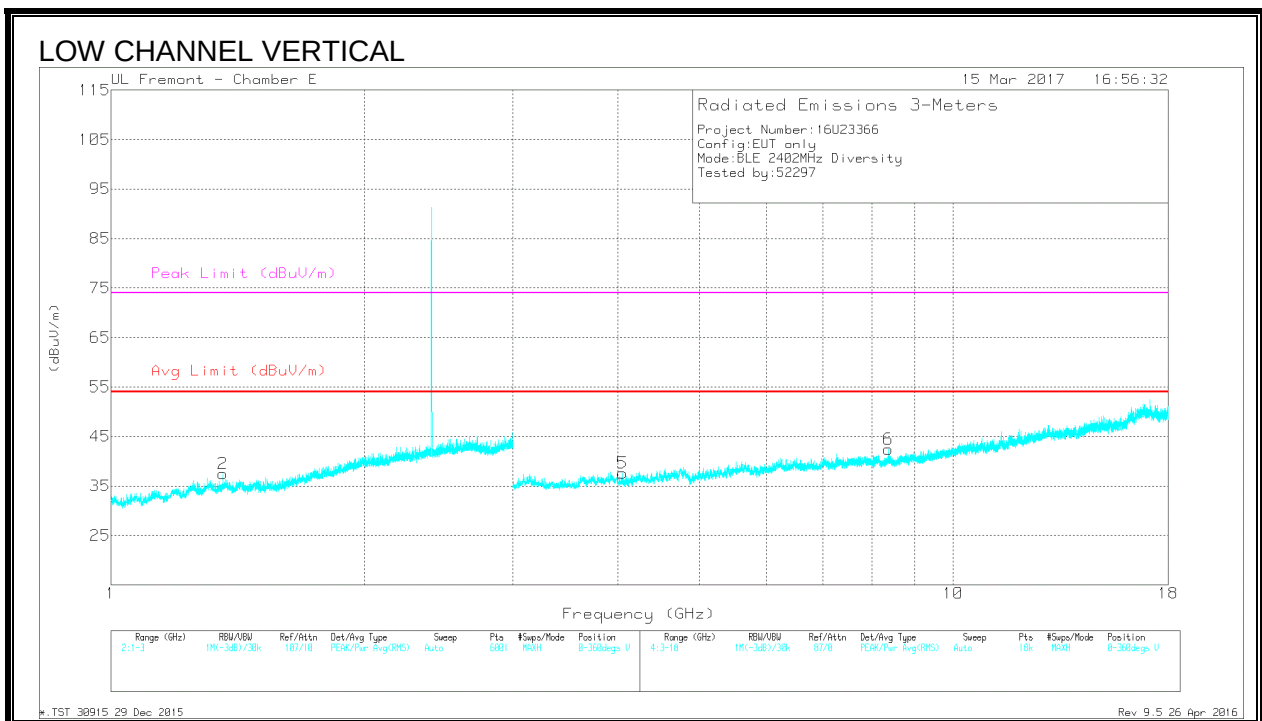
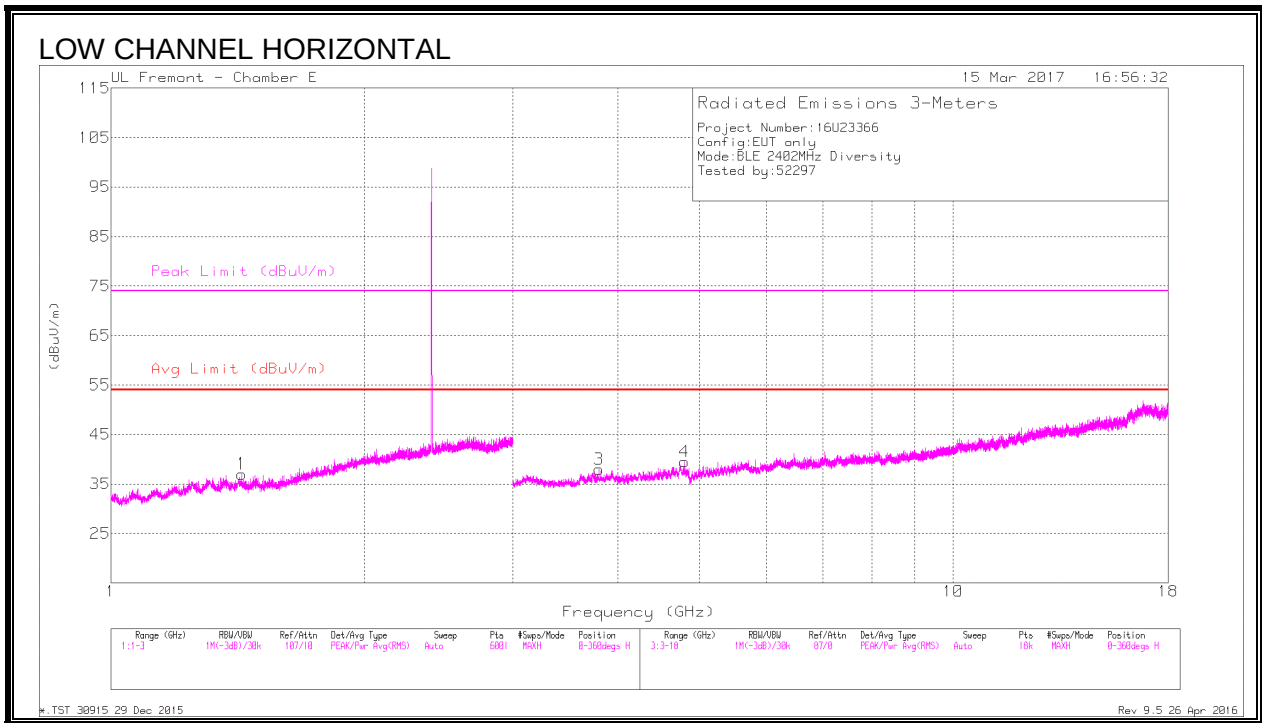
Pk - Peak detector

RMS - RMS detection

High CH Bandedge - V.TST 30915 12 Sep 2016

Rev 9.5 26 Apr 2016

8.5.3. HARMONICS AND SPURIOUS EMISSIONS



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.429	37.23	PK2	28.5	-21.1	44.63	-	-	-	-	283	361	H
2	* 1.359	37.41	PK2	28.7	-21.5	44.61	-	-	74	-29.39	9	166	V
	* 1.357	21.7	MAv1	28.7	-21.5	28.9	54	-25.1	-	-	9	166	V
3	* 3.793	41.01	PK2	33.4	-30.4	44.01	-	-	74	-29.99	360	138	H
	* 3.796	29.75	MAv1	33.4	-30.4	32.75	54	-21.25	-	-	360	138	H
4	* 4.8	41.14	PK2	34.2	-29.5	45.84	-	-	74	-28.16	107	396	H
	* 4.798	29.76	MAv1	34.2	-29.4	34.56	54	-19.44	-	-	107	396	H
5	* 4.05	40.01	PK2	33.4	-30.4	43.01	-	-	74	-30.99	325	334	V
	* 4.051	29.39	MAv1	33.4	-30.4	32.39	54	-21.61	-	-	325	334	V
6	* 8.369	38.15	PK2	36	-25.5	48.65	-	-	74	-25.35	328	345	V
	* 8.37	27.5	MAv1	36	-25.5	38	54	-16	-	-	328	345	V

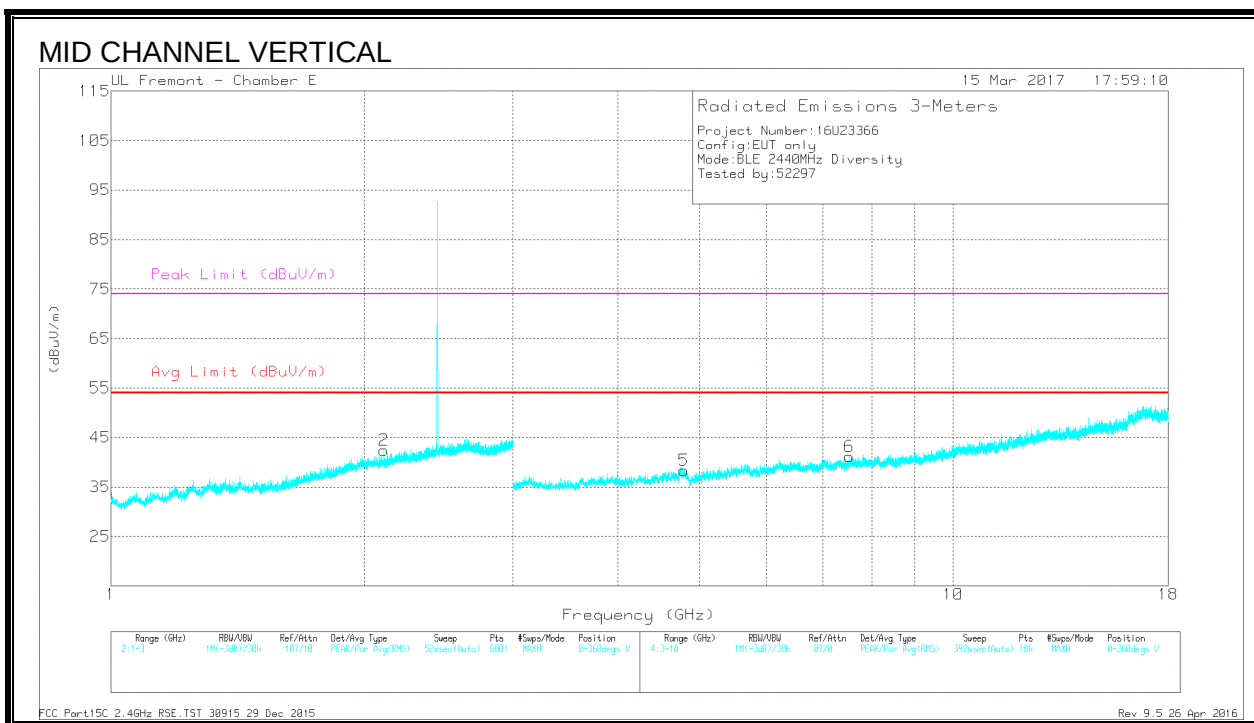
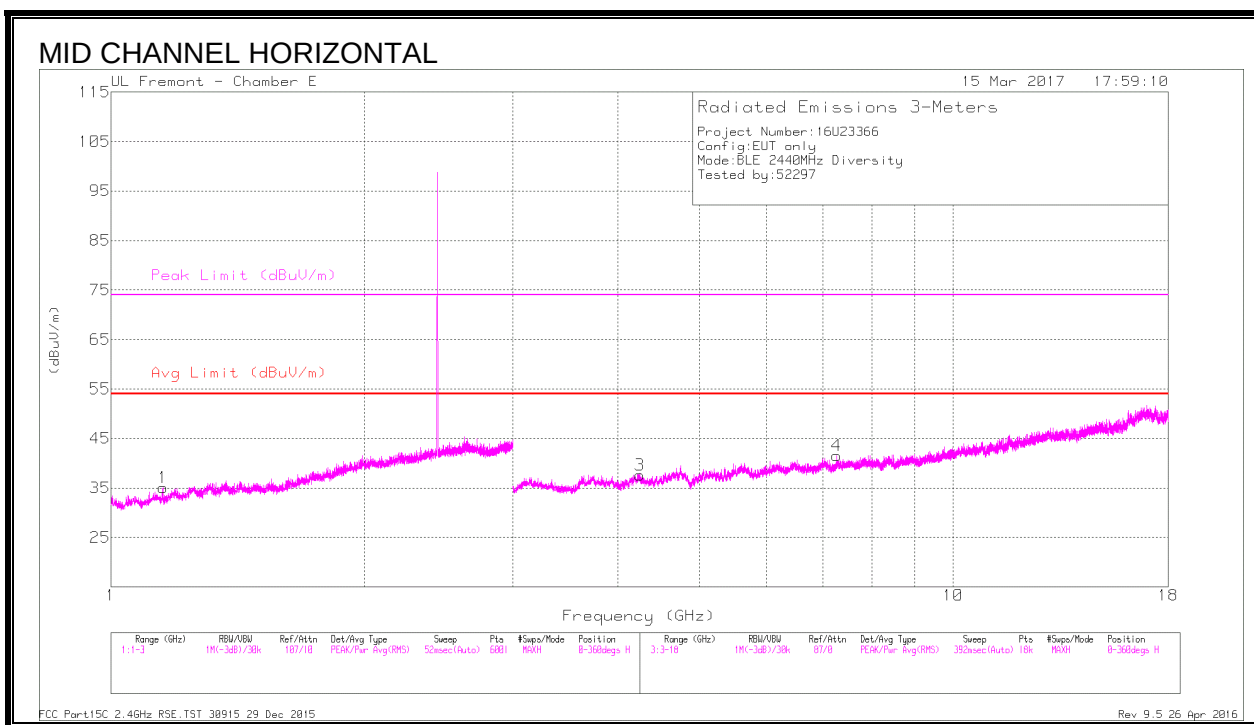
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

*.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
1	* 1.153	36.7	PK2	28	-22.8	41.9	-	-	74	-32.1	240	296	H
	* 1.154	20.87	MAV1	28	-22.8	26.07	54	-27.93	-	-	240	296	H
3	* 4.242	39.5	PK2	33.5	-28.6	44.4	-	-	74	-29.6	191	307	H
	* 4.244	28.54	MAV1	33.5	-28.6	33.44	54	-20.56	-	-	191	307	H
4	* 7.274	38.06	PK2	35.9	-26.2	47.76	-	-	74	-26.24	333	384	H
	* 7.277	26.59	MAV1	35.9	-26.2	36.29	54	-17.71	-	-	333	384	H
5	* 4.786	40.42	PK2	34.2	-29.5	45.12	-	-	74	-28.88	147	278	V
	* 4.786	29.39	MAV1	34.2	-29.5	34.09	54	-19.91	-	-	147	278	V
6	* 7.533	38.71	PK2	36.1	-26.3	48.51	-	-	74	-25.49	93	120	V
	* 7.53	26.35	MAV1	36.1	-26.3	36.15	54	-17.85	-	-	93	120	V
2	2.108	38.05	PK2	31.4	-20.1	49.35	-	-	-	-	231	213	V

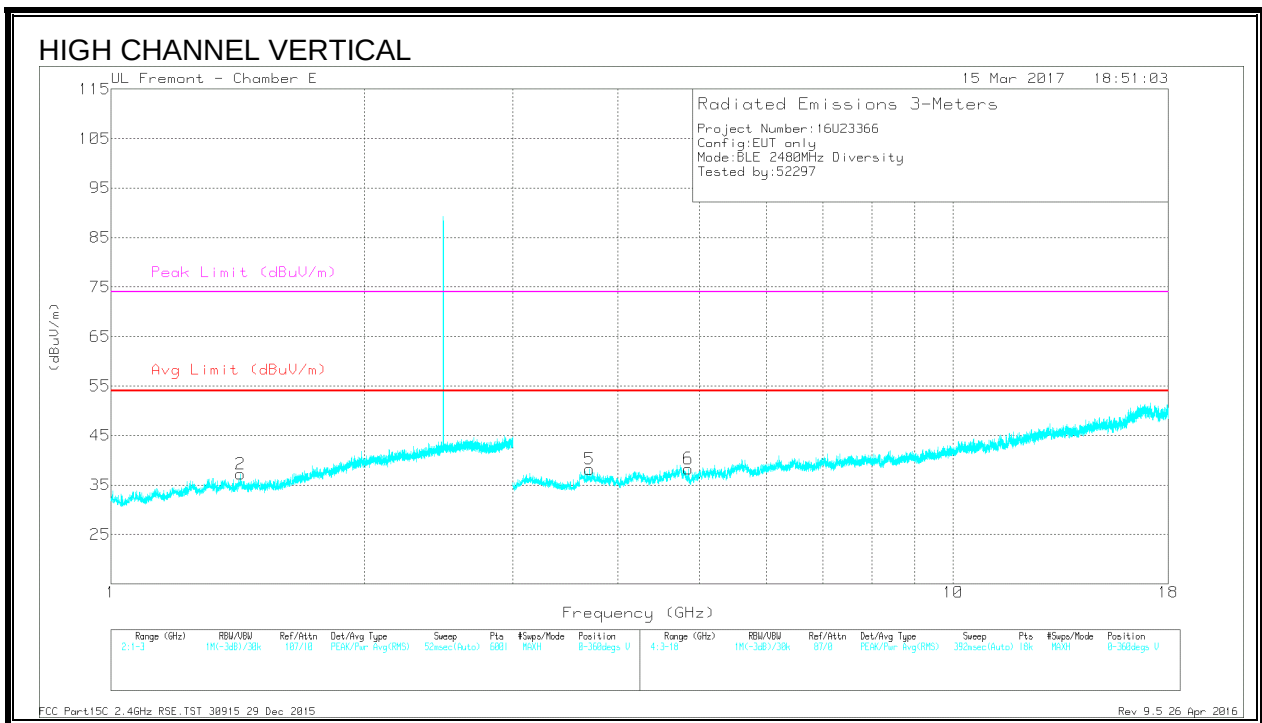
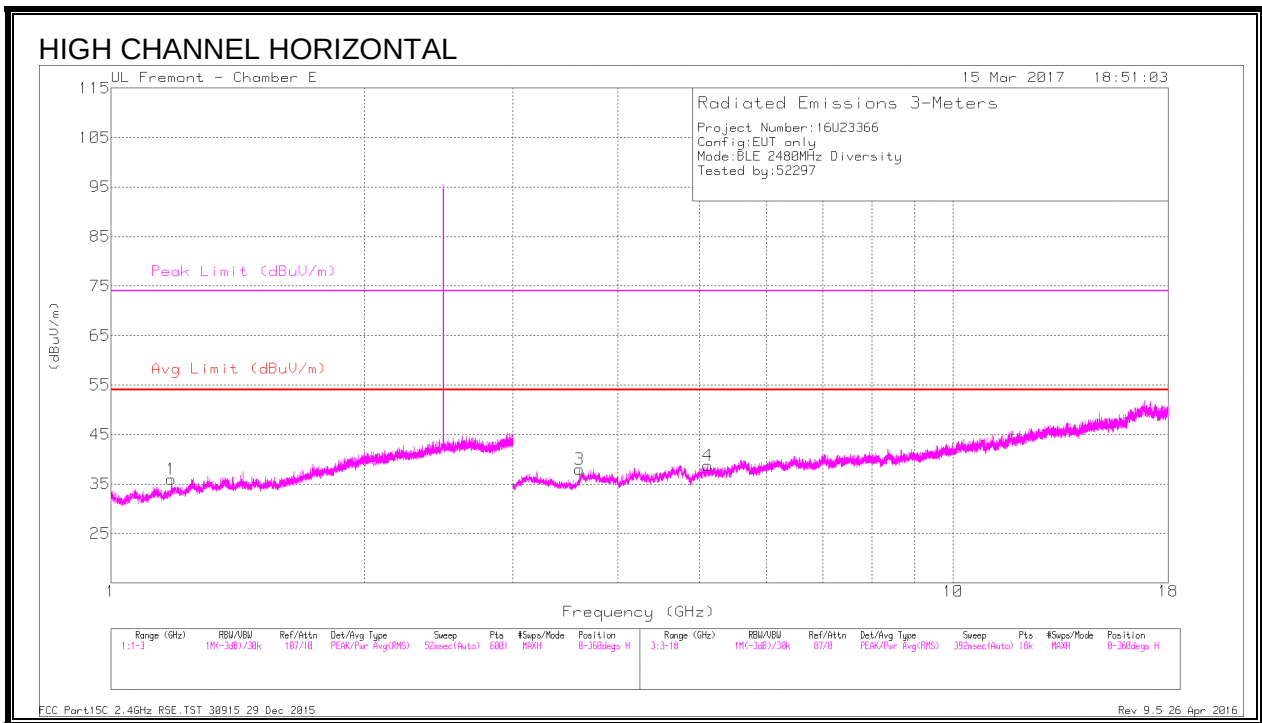
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/F ltr/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	* 1.179	36.39	PK2	28.1	-22.3	42.19	-	-	74	-31.81	15	339	H
	* 1.18	21.64	MAv1	28.1	-22.4	27.34	54	-26.66	-	-	15	339	H
2	* 1.423	36.73	PK2	28.5	-21.3	43.93	-	-	74	-30.07	4	320	V
	* 1.422	21.57	MAv1	28.5	-21.4	28.67	54	-25.33	-	-	4	320	V
3	* 3.601	42.06	PK2	32.9	-30.6	44.36	-	-	74	-29.64	295	151	H
	* 3.601	29.75	MAv1	32.9	-30.6	32.05	54	-21.95	-	-	295	151	H
4	* 5.107	40.44	PK2	34.3	-29.7	45.04	-	-	74	-28.96	250	298	H
	* 5.11	29.56	MAv1	34.3	-29.8	34.06	54	-19.94	-	-	250	298	H
5	* 3.699	40.7	PK2	33.4	-30.2	43.9	-	-	74	-30.1	328	351	V
	* 3.701	29.67	MAv1	33.4	-30.2	32.87	54	-21.13	-	-	328	351	V
6	* 4.852	40.02	PK2	34.2	-30.1	44.12	-	-	74	-29.88	98	242	V
	* 4.852	28.9	MAv1	34.2	-30.1	33	54	-21	-	-	98	242	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

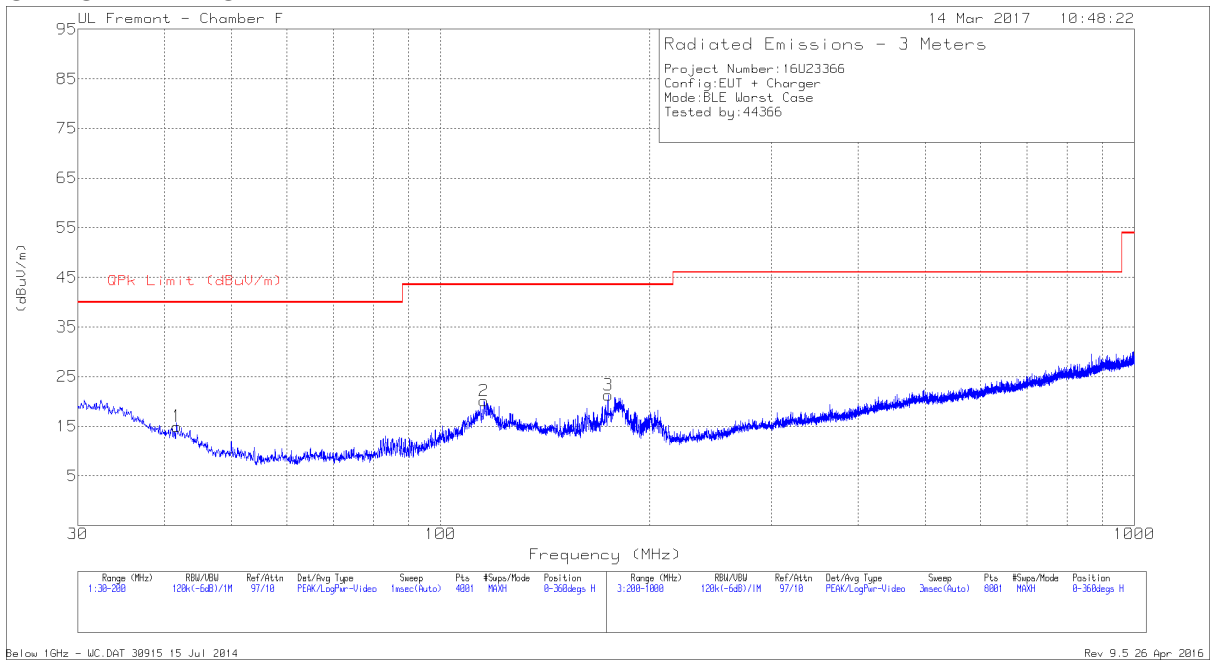
FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

Rev 9.5 26 Apr 2016

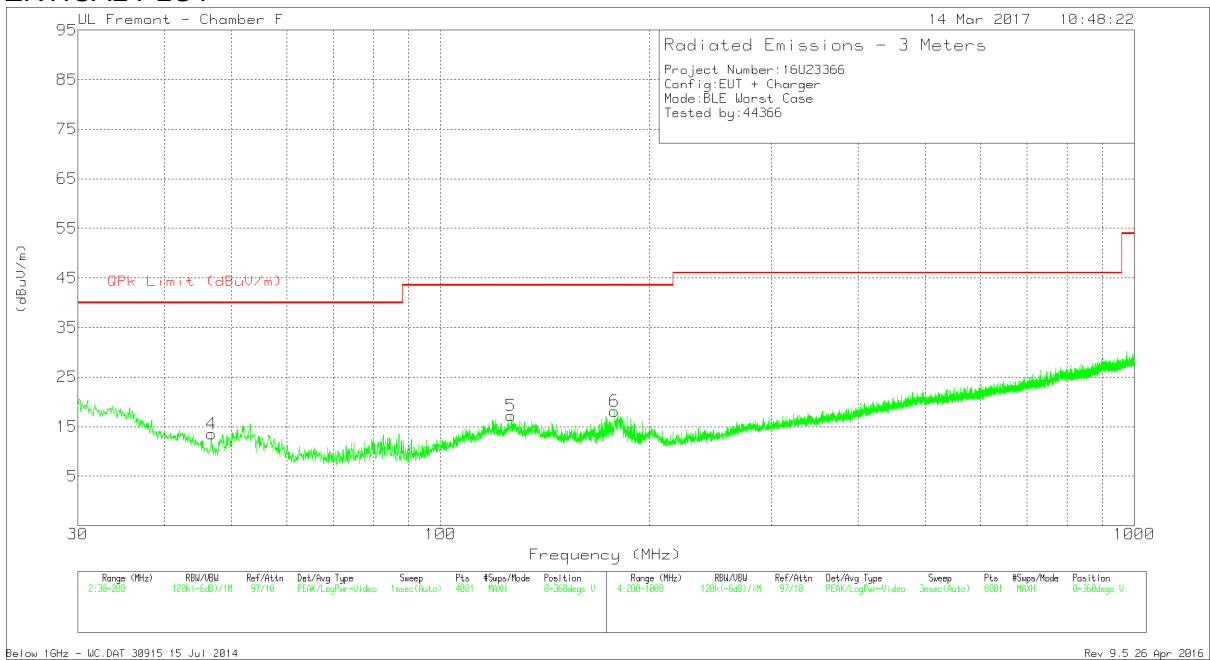
8.6. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T122 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degr)	Height (cm)	Polarity
1	41.645	29.8	Pk	16.9	-31.7	15	40	-25	0-360	99	H
2	* 115.5525	33.81	Pk	17.3	-31	20.11	43.52	-23.41	0-360	199	H
3	174.33	36.17	Pk	15.7	-30.6	21.27	43.52	-22.25	0-360	199	H
4	46.745	31.09	Pk	14.1	-31.7	13.49	40	-26.51	0-360	100	V
5	* 126.3475	30.22	Pk	18	-31	17.22	43.52	-26.3	0-360	100	V
6	178.1338	33.21	Pk	15.4	-30.5	18.11	43.52	-25.41	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

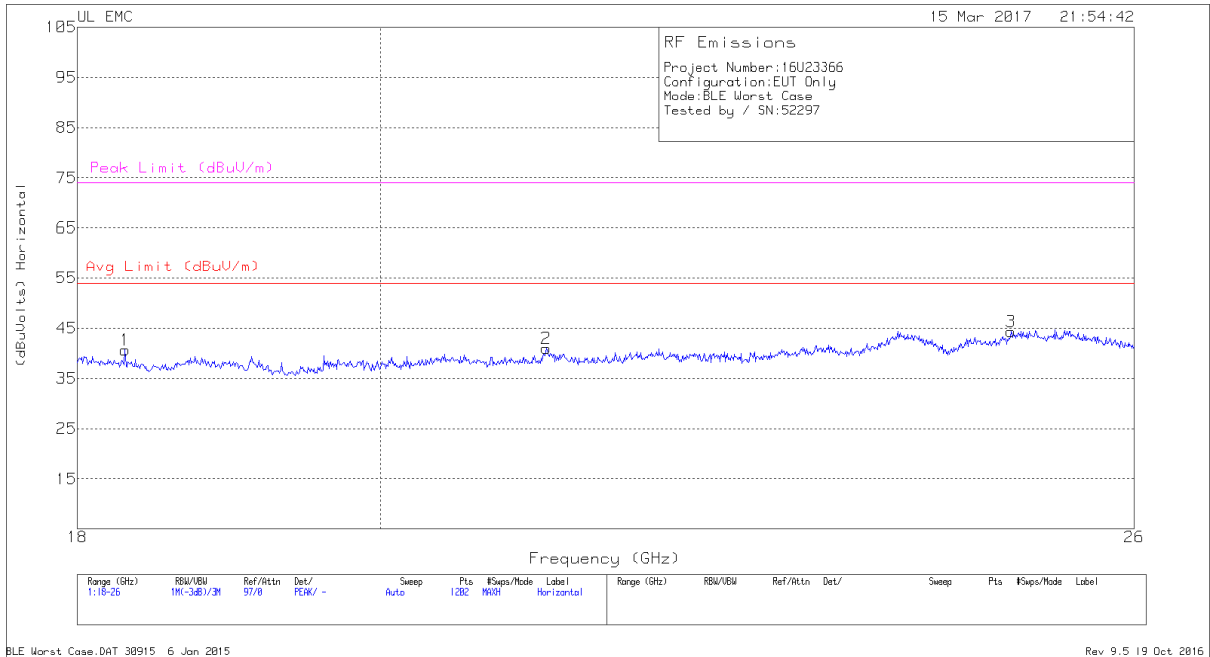
FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014

Rev 9.5 01 Dec 2016

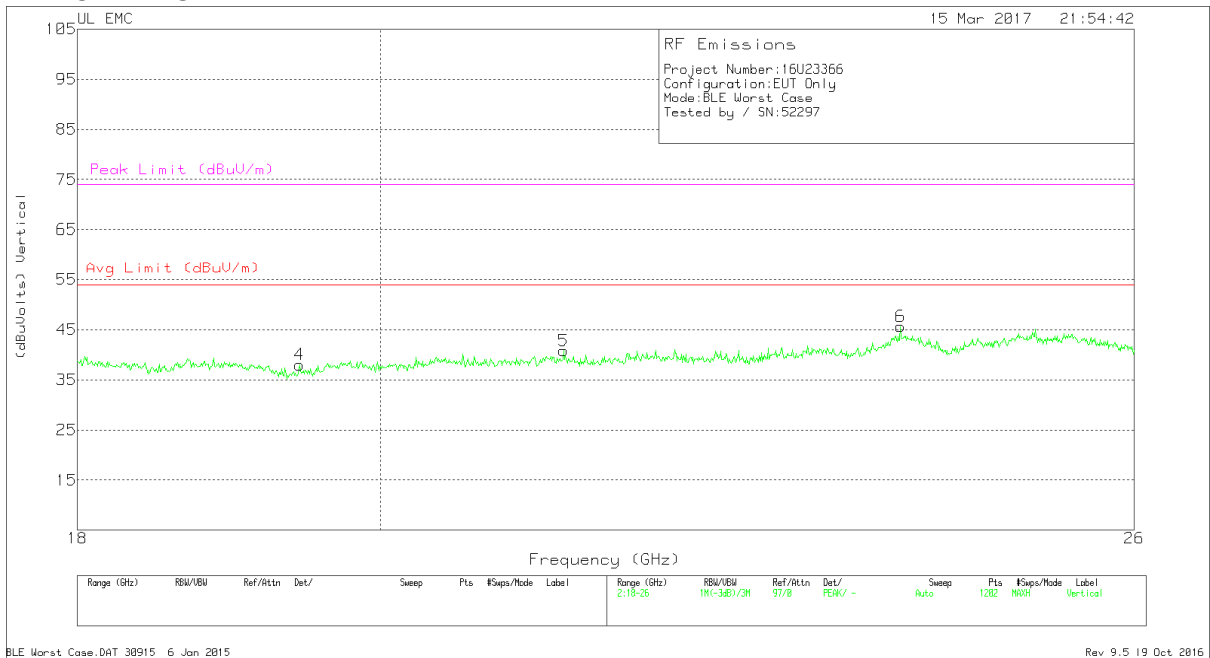
8.7. WORST-CASE ABOVE 18 GHz

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION)

HORIZONTAL PLOT



VERTICAL PLOT



Data

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T449 (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	18.3	42.97	Pk	32.4	-25.2	-9.5	40.67	54	-13.333	74	-33.33
2	21.191	42.5	Pk	33.1	-25.1	-9.5	41	54	-13	74	-33
3	24.908	43.93	Pk	34.2	-24.3	-9.5	44.33	54	-9.67	74	-29.67
4	19.445	39.5	Pk	32.7	-24.7	-9.5	38	54	-16	74	-36
5	21.317	42.43	Pk	33.1	-25.2	-9.5	40.83	54	-13.17	74	-33.167
6	23.968	45.37	Pk	34	-24.2	-9.5	45.67	54	-8.33	74	-28.33

Pk - Peak detector

18-26GHz Test.TST 30915 6 Jan 2015
Rev 9.5 19 Oct 2016

8.8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

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.

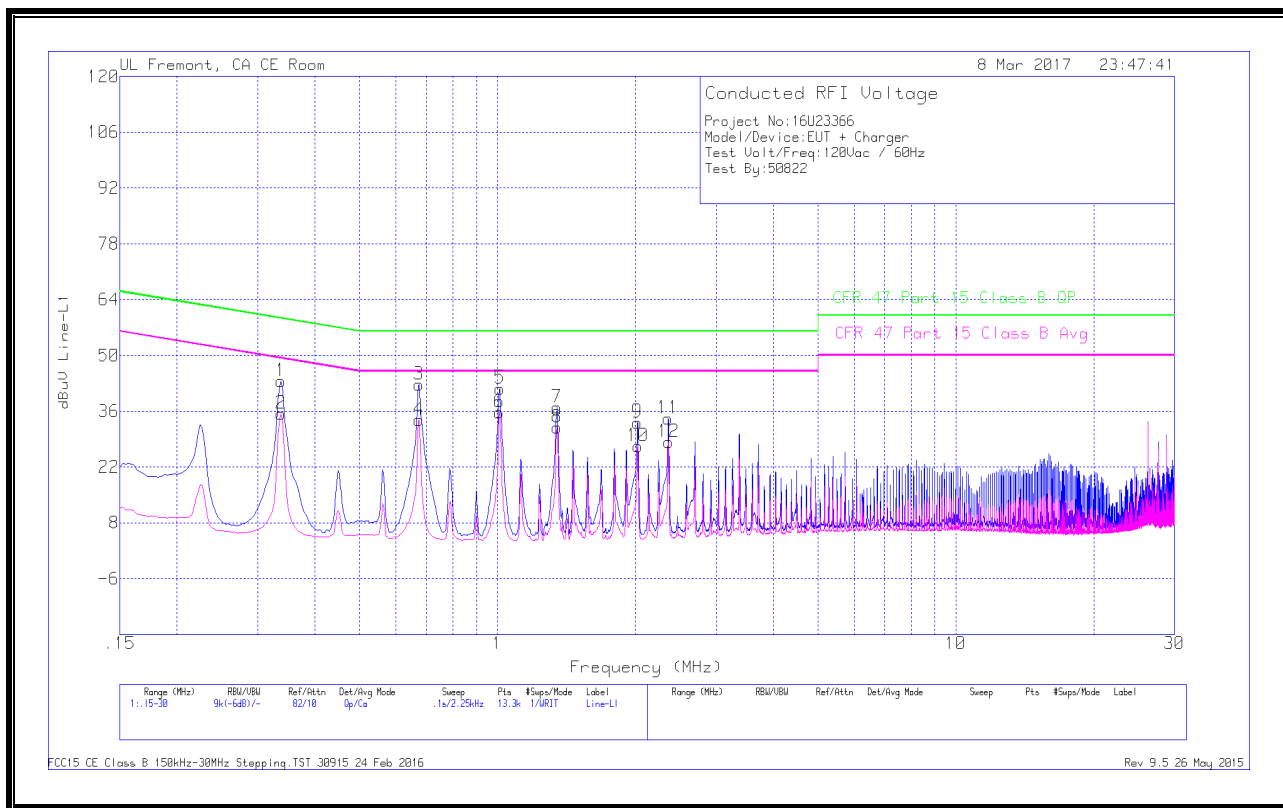
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

8.8.1. EUT POWERED BY AC/DC ADAPTER VIA USB CABLE

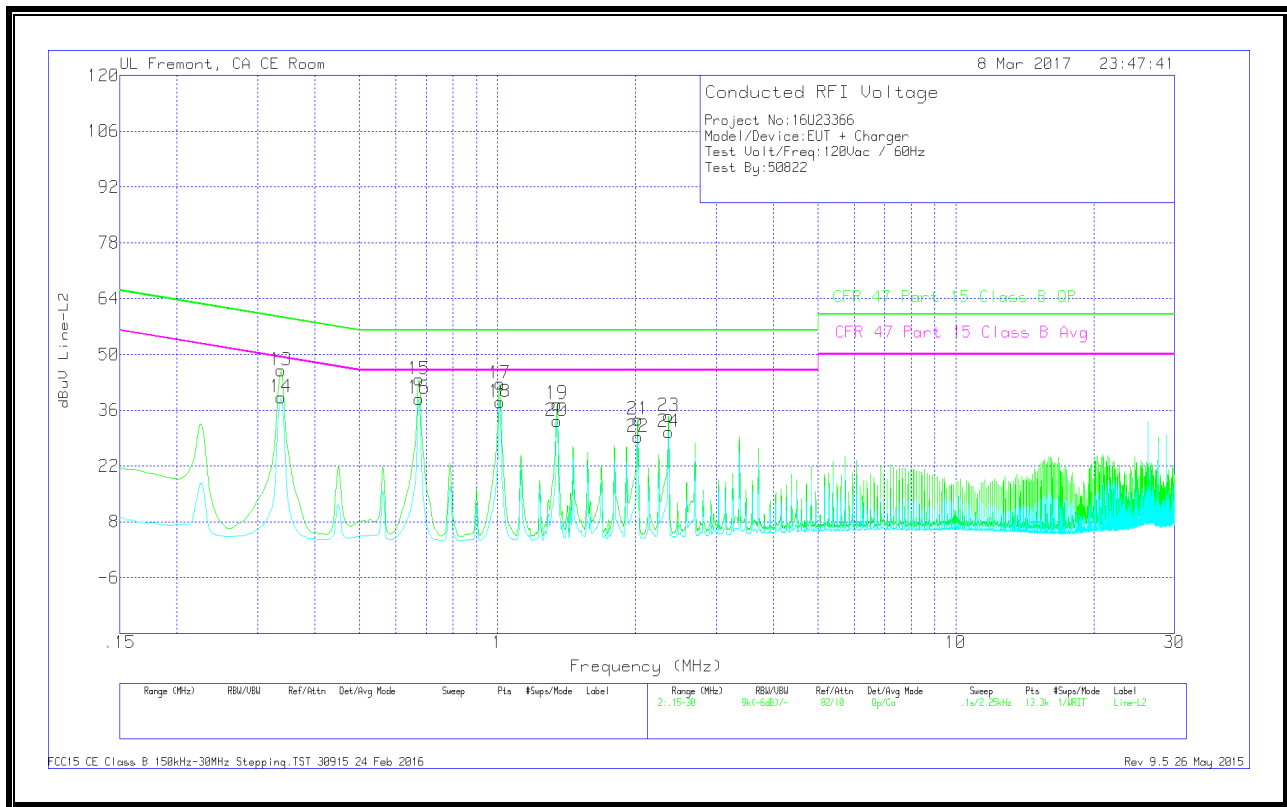
LINE 1 RESULTS



WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.33675	33.38	Qp	0	.1	10.1	43.58	59.28	-15.7	-	-
2	.33675	25.2	Ca	0	.1	10.1	35.4	-	-	49.28	-13.88
3	.67425	32.56	Qp	0	.1	10.1	42.76	56	-13.24	-	-
4	.67425	23.61	Ca	0	.1	10.1	33.81	-	-	46	-12.19
5	1.01175	31.54	Qp	0	.1	10.1	41.74	56	-14.26	-	-
6	1.0095	25.54	Ca	0	.1	10.1	35.74	-	-	46	-10.26
7	1.34925	26.81	Qp	0	.1	10.1	37.01	56	-18.99	-	-
8	1.347	21.72	Ca	0	.1	10.1	31.92	-	-	46	-14.08
9	2.022	23.02	Qp	0	.1	10.1	33.22	56	-22.78	-	-
10	2.02425	17.05	Ca	0	.1	10.1	27.25	-	-	46	-18.75
11	2.3595	24.02	Qp	0	.1	10.1	34.22	56	-21.78	-	-
12	2.36175	18.05	Ca	0	.1	10.1	28.25	-	-	46	-17.75

LINE 2 RESULTS

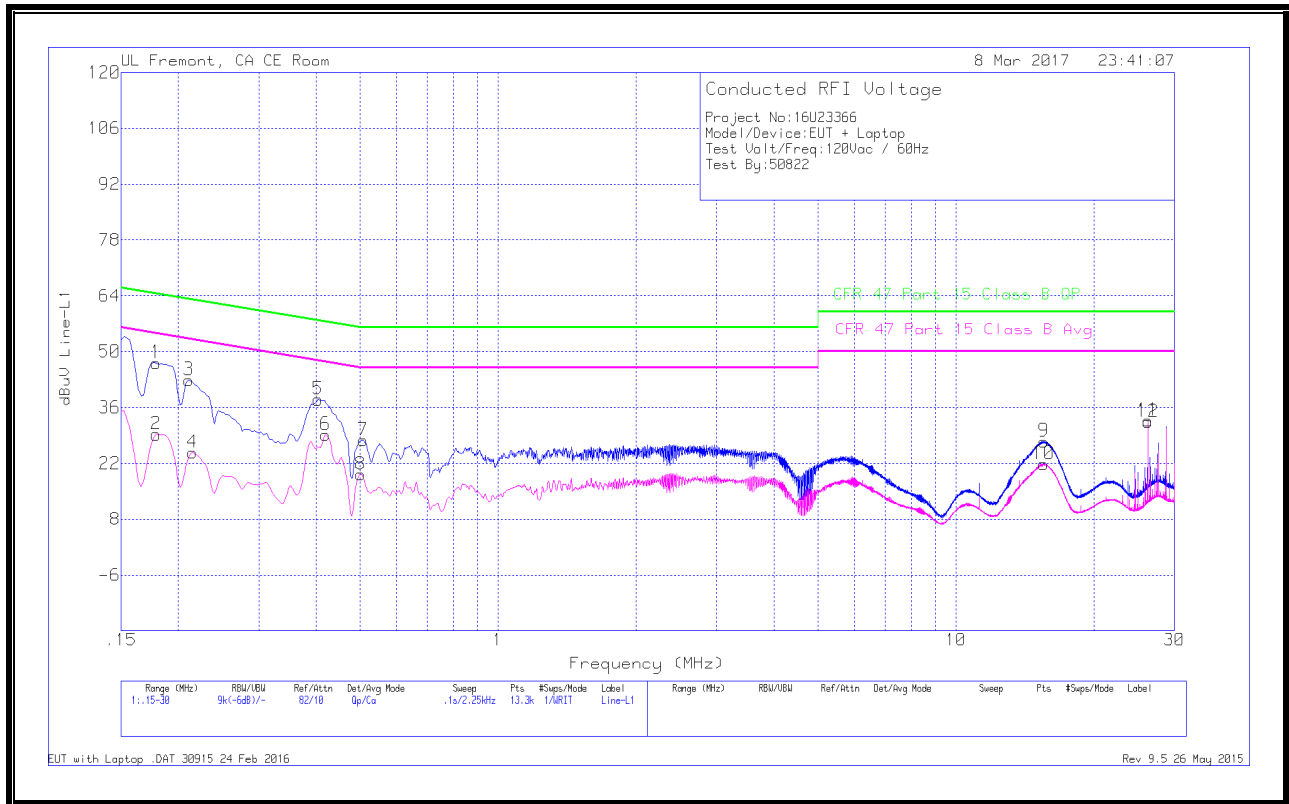


WORST EMISSIONS

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.33675	35.77	Qp	0	.1	10.1	45.97	59.28	-13.31	-	-
14	.33675	29.07	Ca	0	.1	10.1	39.27	-	-	49.28	-10.01
15	.67425	33.52	Qp	0	.1	10.1	43.72	56	-12.28	-	-
16	.67425	28.76	Ca	0	.1	10.1	38.96	-	-	46	-7.04
17	1.01175	32.46	Qp	0	.1	10.1	42.66	56	-13.34	-	-
18	1.01175	27.84	Ca	0	.1	10.1	38.04	-	-	46	-7.96
19	1.34925	27.37	Qp	0	.1	10.1	37.57	56	-18.43	-	-
20	1.347	23.17	Ca	0	.1	10.1	33.37	-	-	46	-12.63
21	2.02425	23.41	Qp	0	.1	10.1	33.61	56	-22.39	-	-
22	2.02425	19.08	Ca	0	.1	10.1	29.28	-	-	46	-16.72
23	2.36175	24.32	Qp	0	.1	10.1	34.52	56	-21.48	-	-
24	2.36175	20.27	Ca	0	.1	10.1	30.47	-	-	46	-15.53

8.8.2. EUT POWERED BY HOST PC VIA USB CABLE

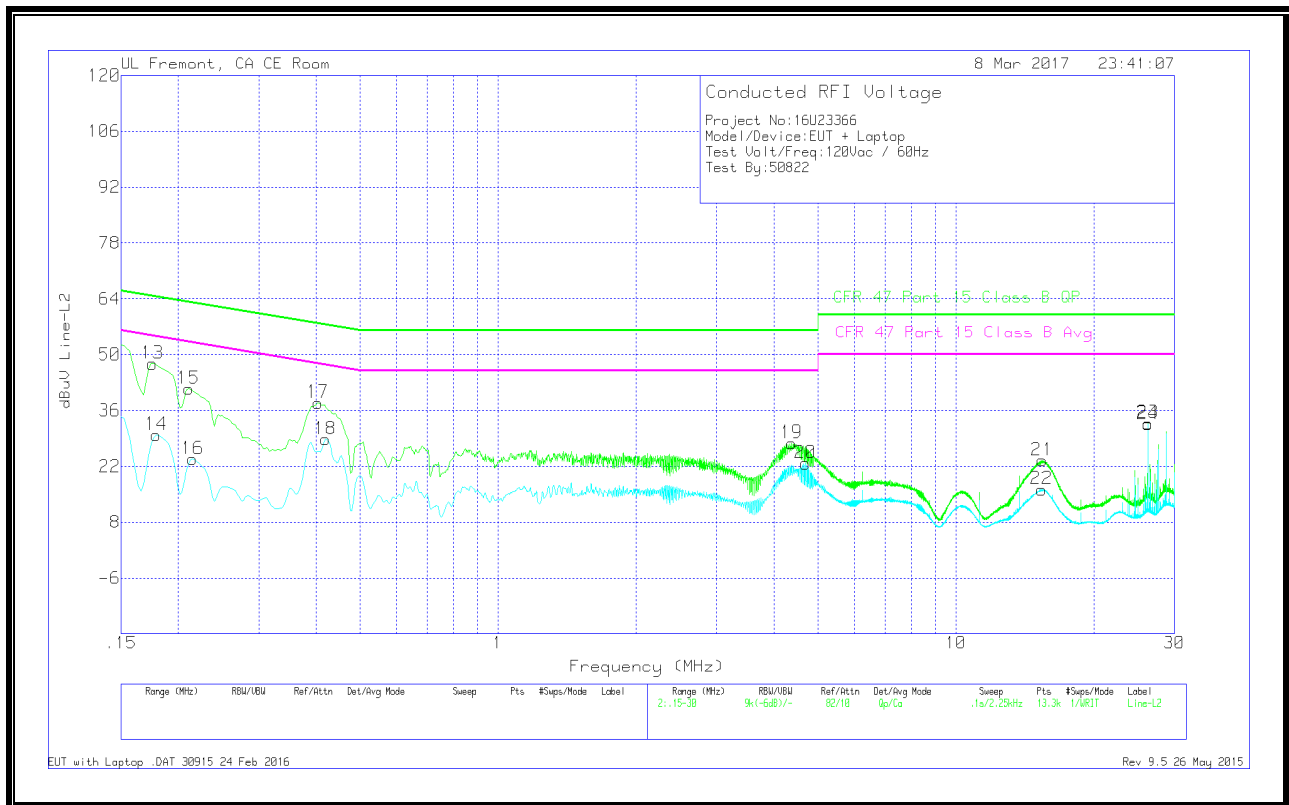
LINE 1 RESULTS



WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.17925	36.95	Qp	0	.1	10.1	47.15	64.52	-17.37	-	-
2	.17925	19.04	Ca	0	.1	10.1	29.24	-	-	54.52	-25.28
3	.21075	32.79	Qp	0	0	10.1	42.89	63.18	-20.29	-	-
4	.21525	14.5	Ca	0	.1	10.1	24.7	-	-	53	-28.3
5	.40425	27.78	Qp	0	.1	10.1	37.98	57.77	-19.79	-	-
6	.42	18.97	Ca	0	.1	10.1	29.17	-	-	47.45	-18.28
7	.50775	17.53	Qp	0	.1	10.1	27.73	56	-28.27	-	-
8	.501	9.01	Ca	0	.1	10.1	19.21	-	-	46	-26.79
9	15.5693	17.08	Qp	0	.2	10.2	27.48	60	-32.52	-	-
10	15.5344	11.44	Ca	0	.2	10.2	21.84	-	-	50	-28.16
11	26.25	21.82	Qp	.1	.3	10.5	32.72	60	-27.28	-	-
12	26.25	21.45	Ca	.1	.3	10.5	32.35	-	-	50	-17.65

LINE 2 RESULTS



WORST EMISSIONS

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.17588	37.52	Qp	0	.1	10.1	47.72	64.68	-16.96	-	-
14	.17925	19.66	Ca	0	.1	10.1	29.86	-	-	54.52	-24.66
15	.21075	31.32	Qp	0	0	10.1	41.42	63.18	-21.76	-	-
16	.21525	13.64	Ca	0	.1	10.1	23.84	-	-	53	-29.16
17	.40425	27.72	Qp	0	.1	10.1	37.92	57.77	-19.85	-	-
18	.42	18.59	Ca	0	.1	10.1	28.79	-	-	47.45	-18.66
19	4.3755	17.6	Qp	0	.1	10.1	27.8	56	-28.2	-	-
20	4.68825	12.54	Ca	0	.1	10.1	22.74	-	-	46	-23.26
21	15.432	13.08	Qp	0	.2	10.2	23.48	60	-36.52	-	-
22	15.3848	5.83	Ca	0	.2	10.2	16.23	-	-	50	-33.77
23	26.25	21.91	Qp	.1	.3	10.5	32.81	60	-27.19	-	-
24	26.25	21.7	Ca	.1	.3	10.5	32.6	-	-	50	-17.4