



CERTIFICATION TEST REPORT

Report Number : 11735596-E2V2

Applicant : MICROSOFT CORP
ONE MICROSOFT WAY
REDMOND, WA 98052, U.S.A.

Model : 1807

FCC ID : C3K1807

IC : 3048A-1807

EUT Description : PORTABLE COMPUTING DEVICE

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

Date Of Issue:
October 02, 2017

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	08/23/17	Initial Release	---
V2	10/02/17	- Updated section 2 - Updated section 7.1 - Updated test procedure in section 7.5 and 7.6	C. Susa

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORP
ONE MICROSOFT WAY
REDMOND, WA 98052, U.S.A.

EUT DESCRIPTION: PORTABLE COMPUTING DEVICE

MODEL: 1807

SERIAL NUMBER: RADIATED: 032012672953
CONDUCTED: 031936672953

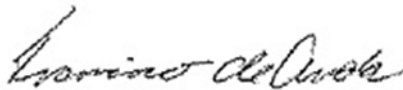
DATE TESTED: AUGUST 04 – AUGUST 14, 2017

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, or any agency of the U.S. Government.

Approved & Released For
UL Verification Services Inc. By:



FRANCISCO DE ANDA
WiSE Program Manager
UL VERIFICATION SERVICES INC.

Prepared By:



ERIC YU
WiSE 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 558704 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. 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:

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a handheld computing device with 802.11 2x2, a/b/g/n/ac WLAN, Bluetooth, Bluetooth LE.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	2.73	1.87

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	1.76	1.50

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes integrated antenna, with the maximum gains:

Frequency Band (GHz)	Antenna Gain (dBi)
2402-2480	0.20

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 14.2.201.159

The test utility software used during testing was Wifi tool v2.0.0.77

5.5. WORST-CASE CONFIGURATION AND MODE

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

Radiated emission below 30MHz, below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT was 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 Z-Axis orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z-Axis orientation.

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

BLE: 1 Mbps.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop AC/DC adapter	Lenovo	ADLX45NCC2A	11S36200281ZZ20059W0H5	NA
Laptop	Lenovo	11e	LR-04N7BL	NA
USB Ethernet Adapter	Linksys	USB3GIGV1	15710S08406242	NA

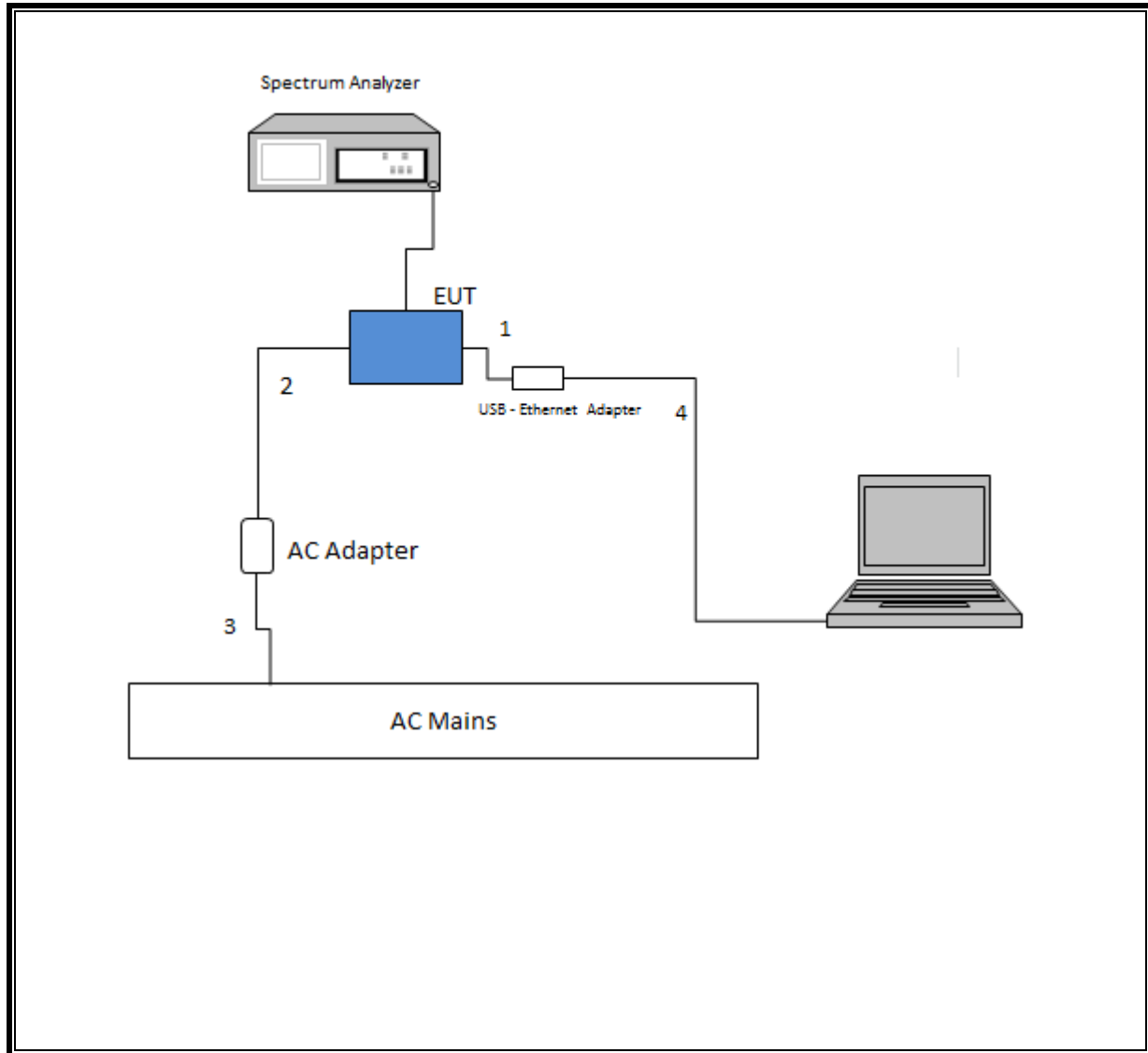
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Un-Shielded	0.17	
2	DC	1	Proprietary	Un-Shielded	1.75	
3	AC	1	2-prong	Un-Shielded	0.5	
4	Ethernet	1	RJ45	Un-Shielded	2	

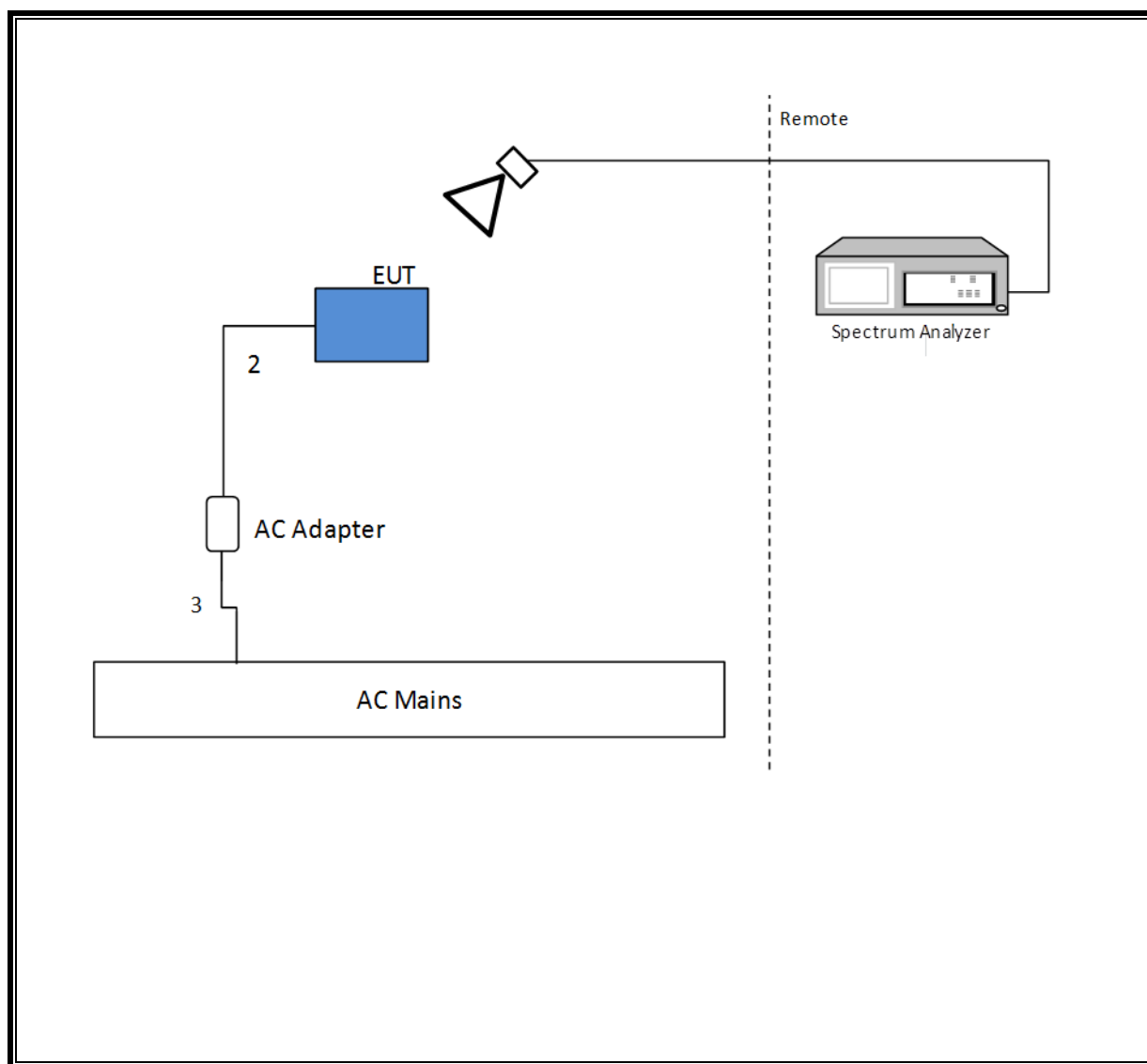
TEST SETUP

The EUT was tested connected to a host Laptop via RJ45/USB cable and AC adapter for antenna port. For radiated and AC line, tests were performed with EUT connected to AC adapter. Laptop was used to program settings then removed from setup.. Test software exercised the radio card.

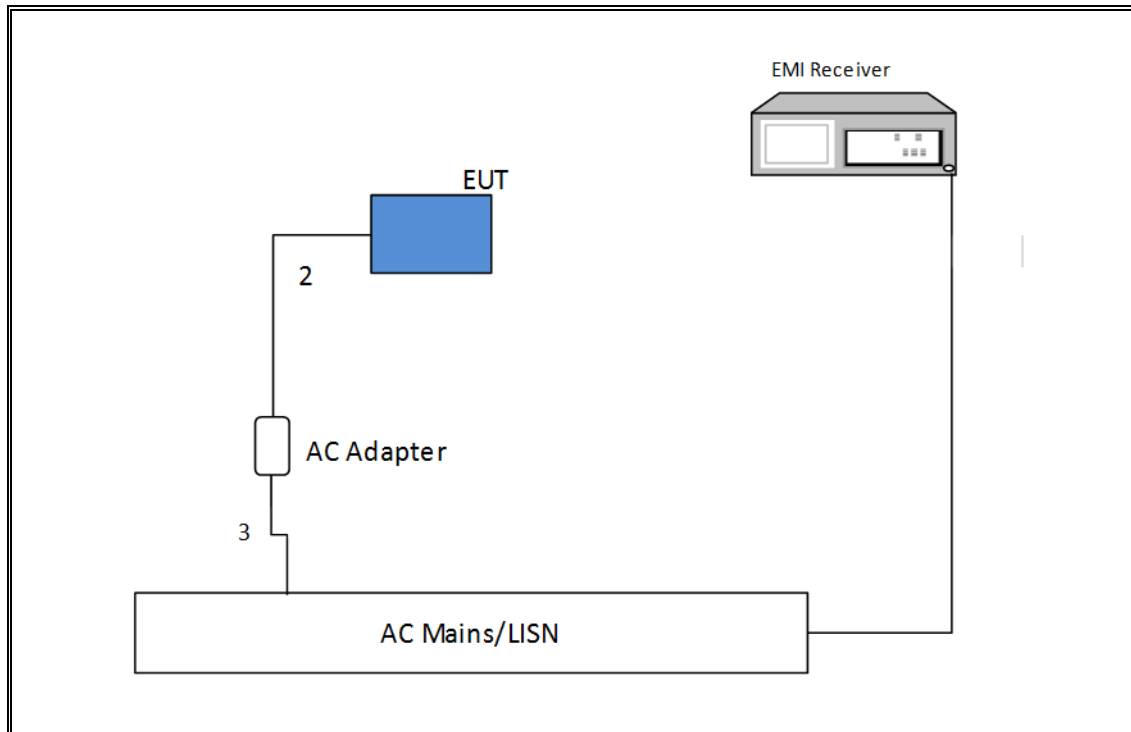
SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR AC LINE CONDUCTED TESTS



5.7. 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, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad	Sunol Sciences Corp.	JB3	T477	06/22/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	03/07/2018
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	T449	05/26/2018
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1264	07/08/2018
Power Sensor, P – series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T413	06/20/2018
Amplifier, 1-26.5GHz	Agilent (Keysight) Technologies	8449B	T404	07/05/2018
Amplifier, 10kHz-1GHz	Agilent (Keysight) Technologies	8447D	T15	08/26/2017
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	T493	02/15/2018
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E4440A	T199	07/22/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T907	01/23/2018
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E9030A	T905	01/11/2018
LISN	FISCHER	FCC-LISN-50/250-25-2-01	T1310	01/17/2018

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, Apr 26, 2016
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
Antenna Port Software	UL	UL RF	Ver 5.1.1, July 15, 2016

6. 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	-20dBc		Pass
15.247	TX conducted output power	<30dBm		Pass
15.247	PSD	<8dBm/3kHz		Pass
15.207 (a)	AC Power Line conducted emissions	Section 10		Pass
15.205, 15.209, 15.247(d)	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass
		< 74dBuV/m		

7. ANTENNA PORT TEST RESULTS

7.1. MEASUREMENT METHODS

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

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.

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

7.2. ON TIME, DUTY CYCLE

LIMITS

None; for reporting purposes only.

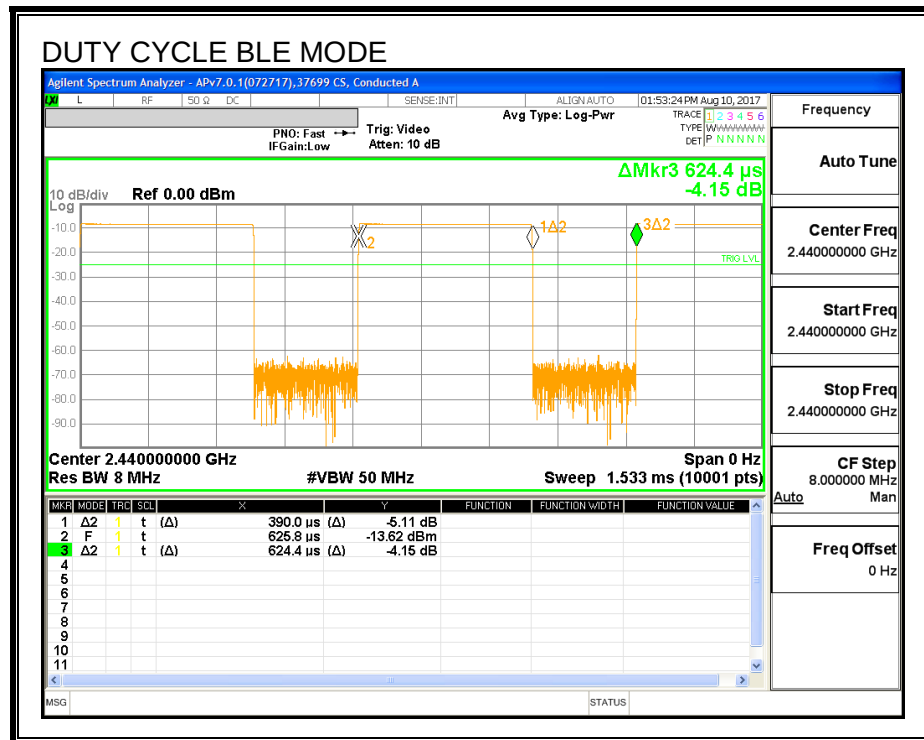
PROCEDURE

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/T Minimum VBW (kHz)
BLE	0.390	0.624	0.625	62.46%	2.04	2.564

DUTY CYCLE PLOT



7.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

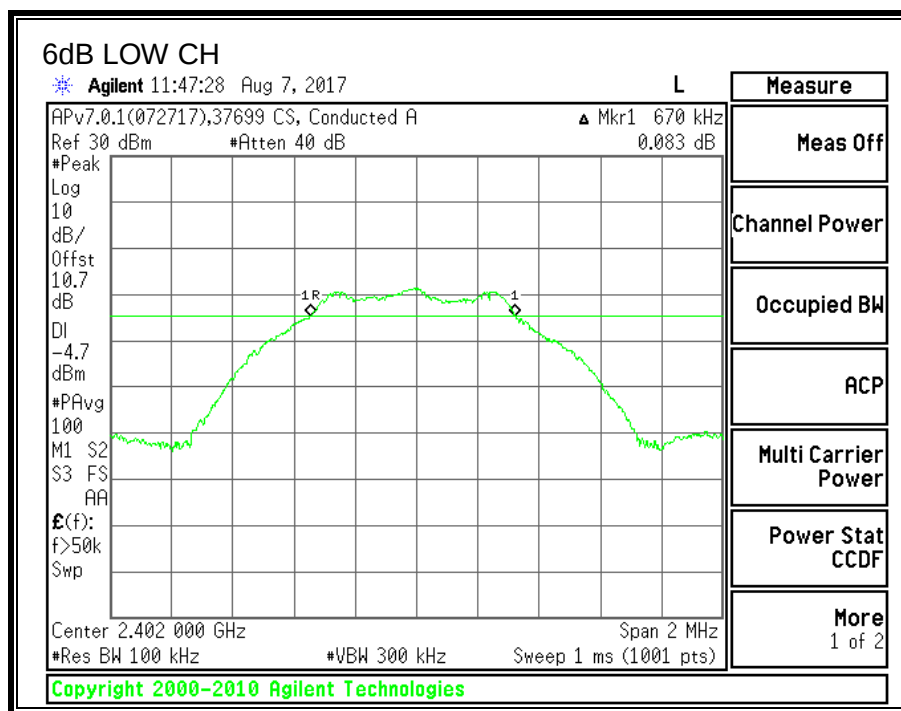
IC RSS-247 (5.2) (a)

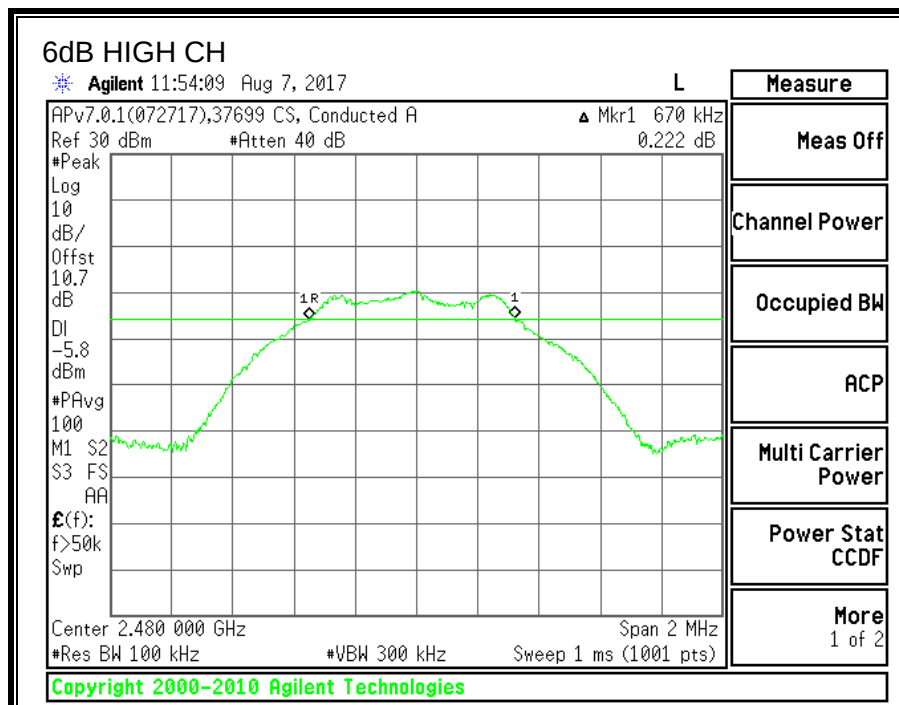
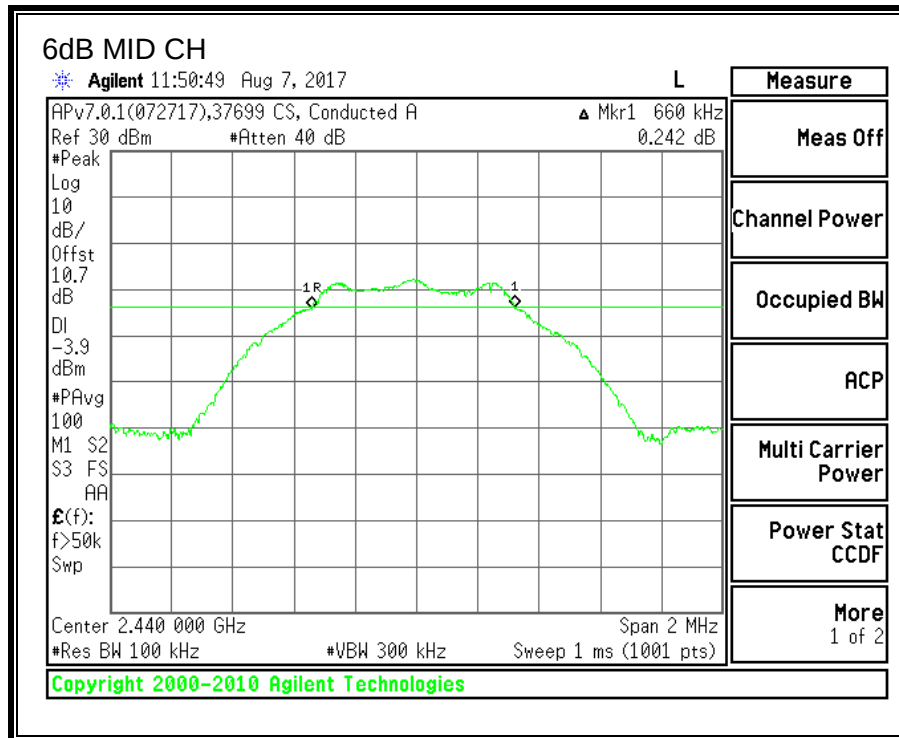
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

6 dB BANDWIDTH

Channel	Frequency	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.67	0.5
Middle	2440	0.66	0.5
High	2480	0.67	0.5





7.4. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

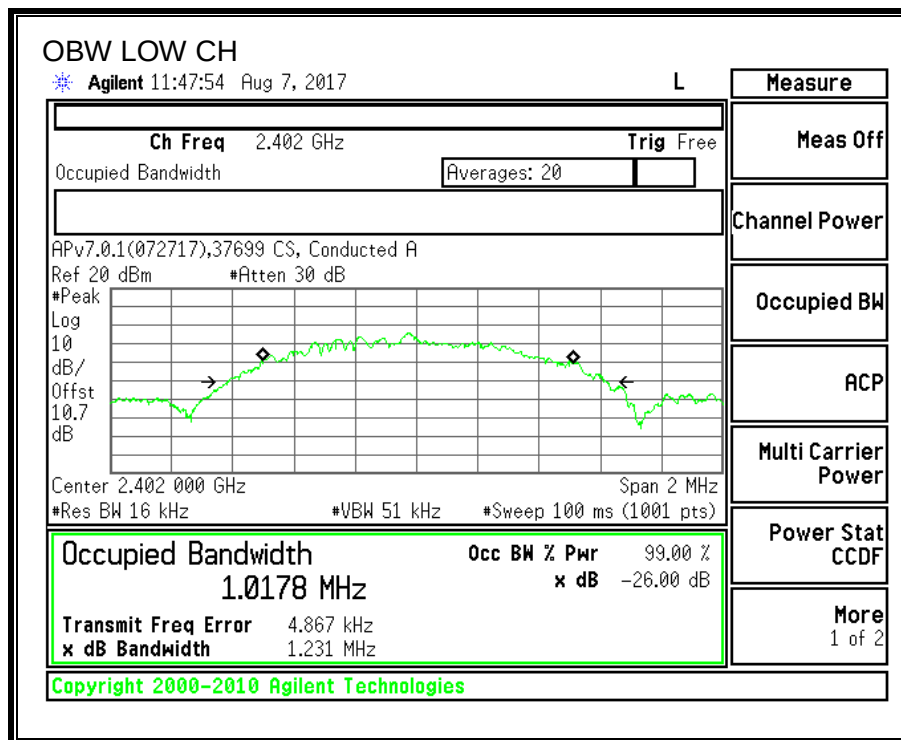
Test Procedure

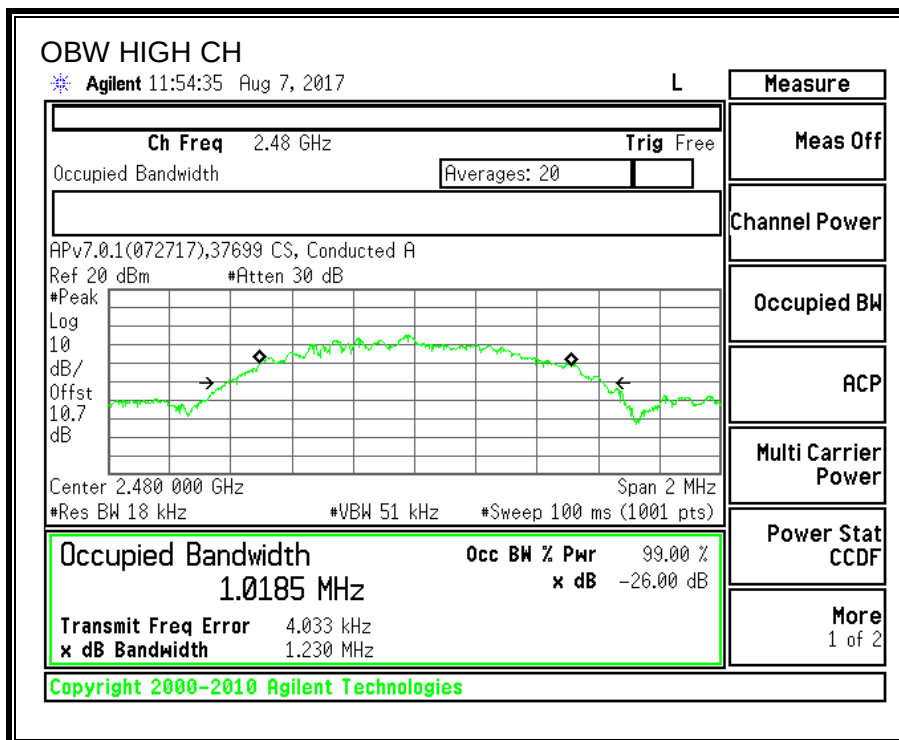
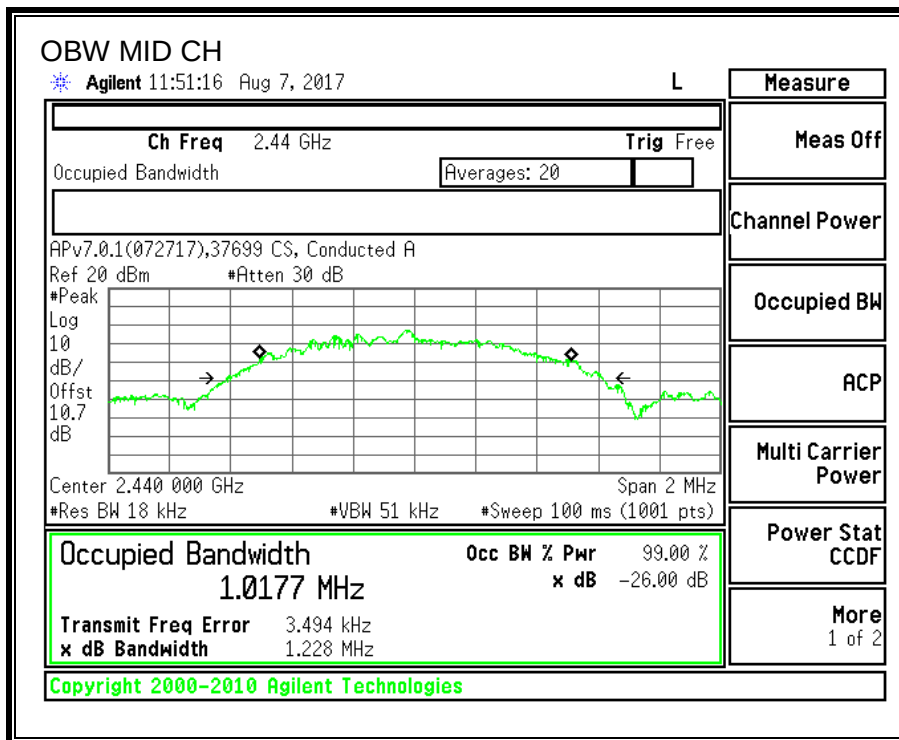
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

99% BANDWIDTH

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0178
Middle	2440	1.0177
High	2480	1.0185





7.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.7 dB (including 10 dB pad and 10.7 dB cable) was entered as an offset in the power meter to allow for a gated reading of average power.

RESULTS

TEST ENGINEER:	37699	Date:	08/04/17
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1Mbps

Channel	Frequency (MHz)	AV Power (dBm)
Low	2402	1.04
Middle	2440	1.76
High	2480	0.05

7.6. OUTPUT POWER

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 power meter.

The cable assembly insertion loss of 10.7 dB (including 10 dB pad and 10.7 dB cable) was entered as an offset in the power meter to allow for a gated reading of power.

RESULTS

OUTPUT POWER

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.87	30	-28.13
Middle	2440	2.73	30	-27.27
High	2480	1.34	30	-28.66

7.7. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

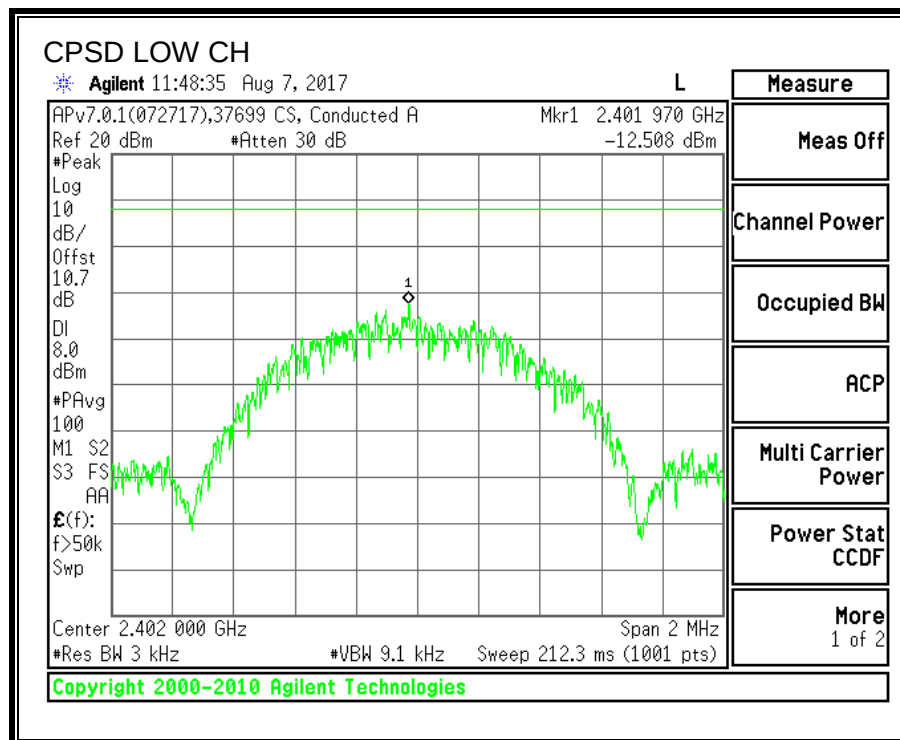
IC RSS-247 (5.2) (b)

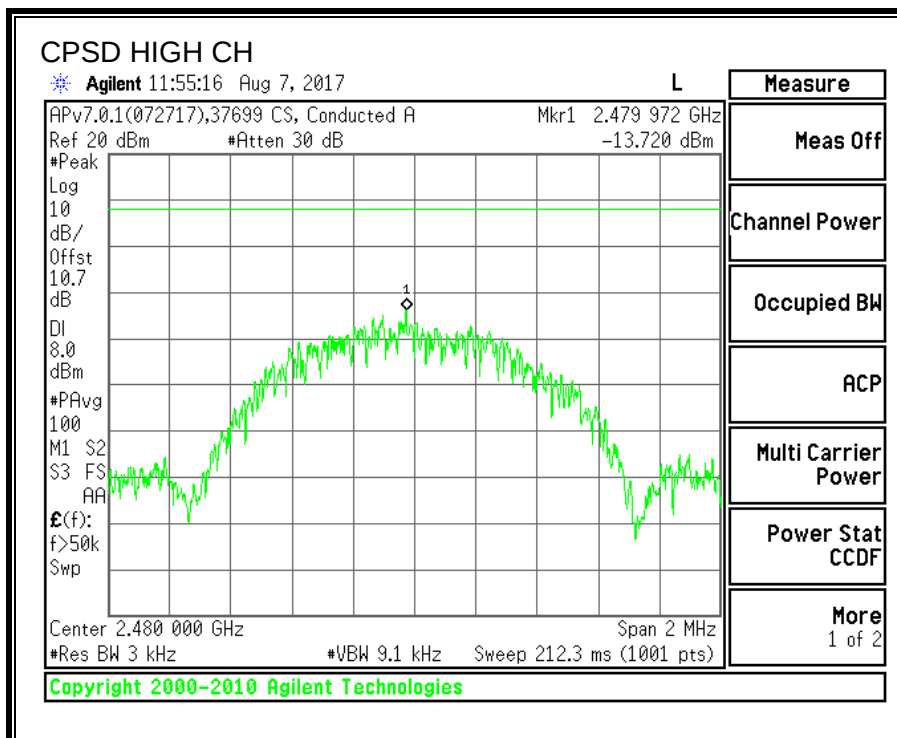
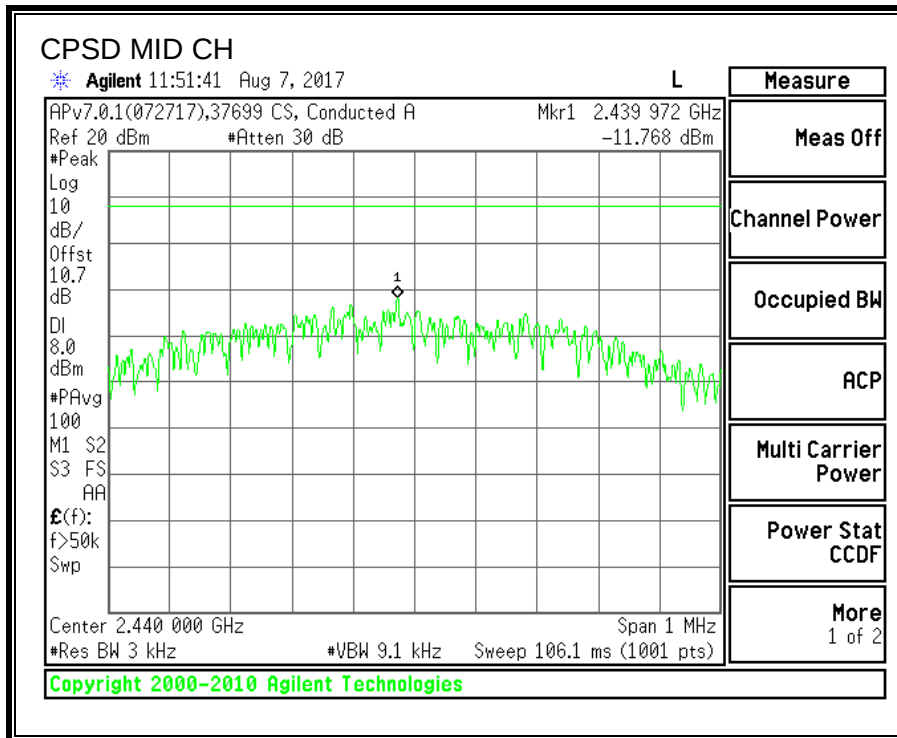
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

POWER SPECTRAL DENSITY

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-12.508	8	-20.508
Middle	2440	-11.768	8	-19.768
High	2480	-13.720	8	-21.720





7.8. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

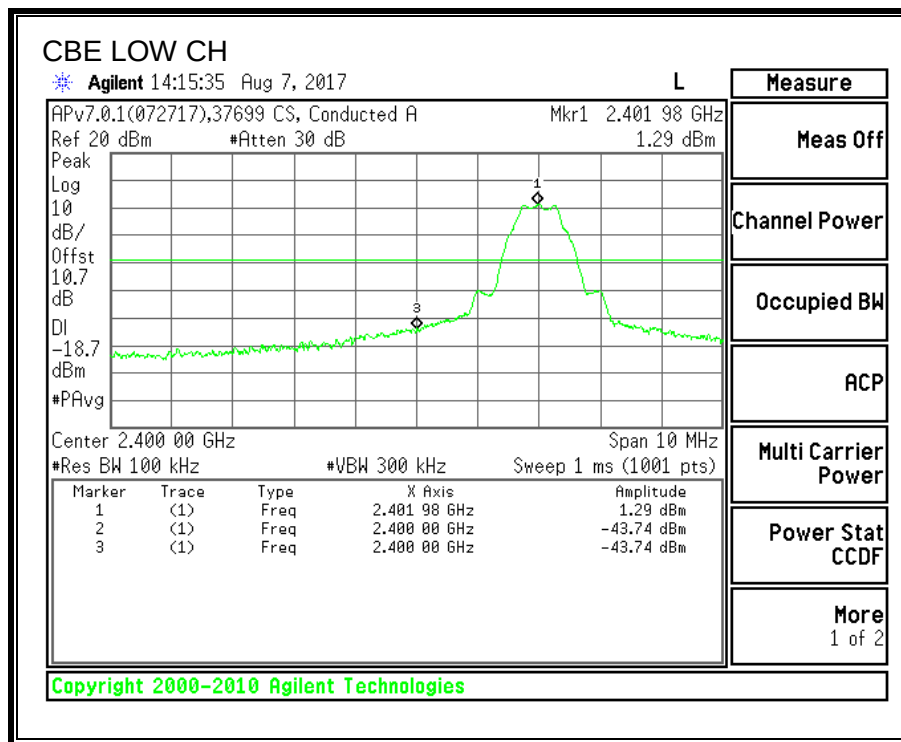
FCC §15.247 (d)

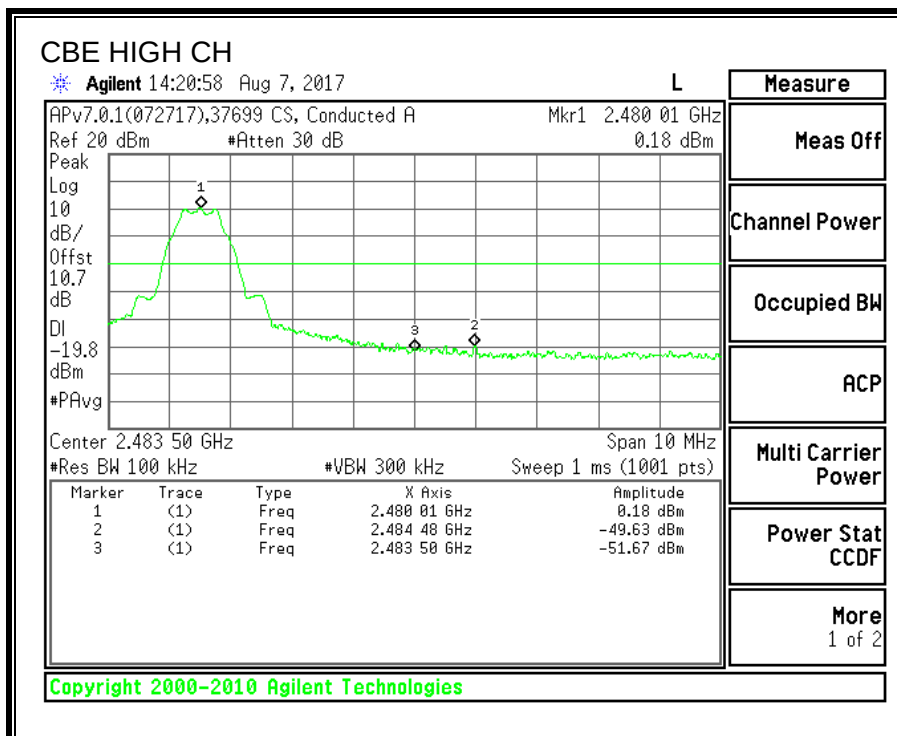
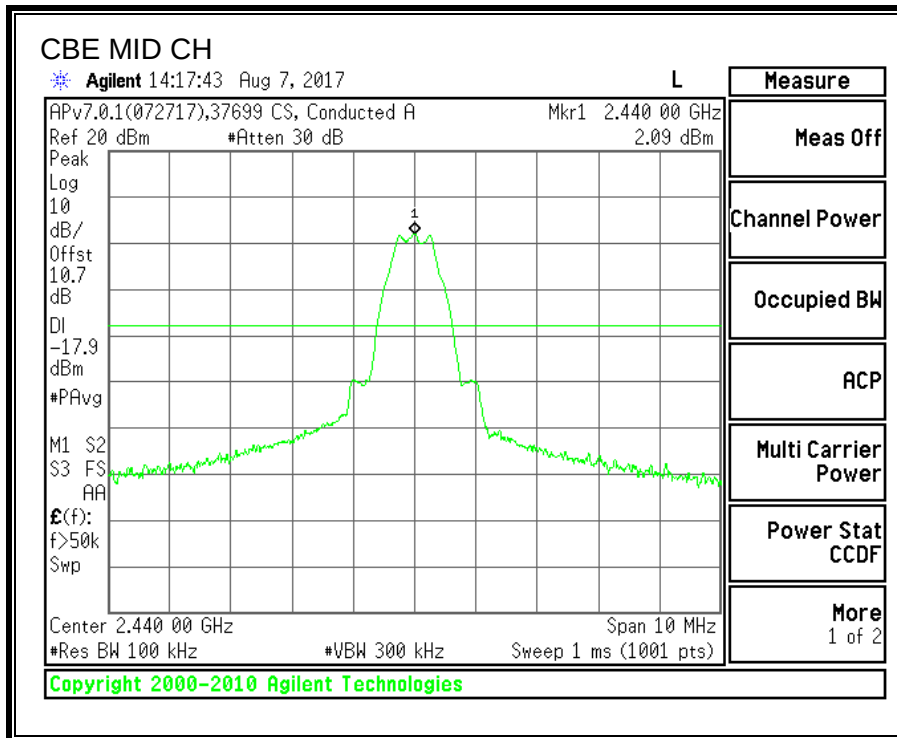
IC RSS-247 (5.5)

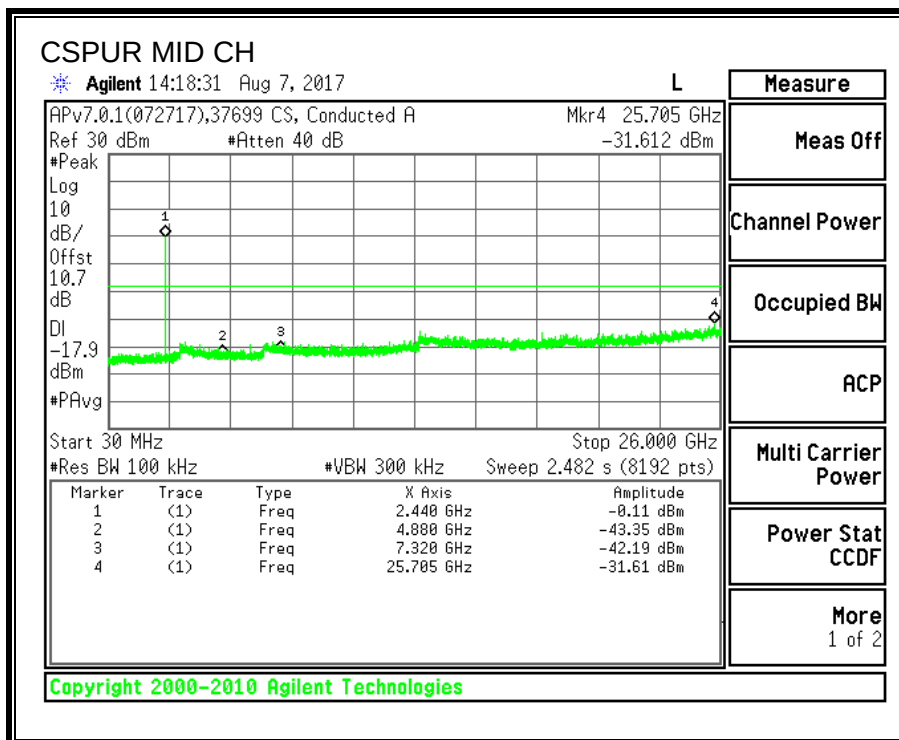
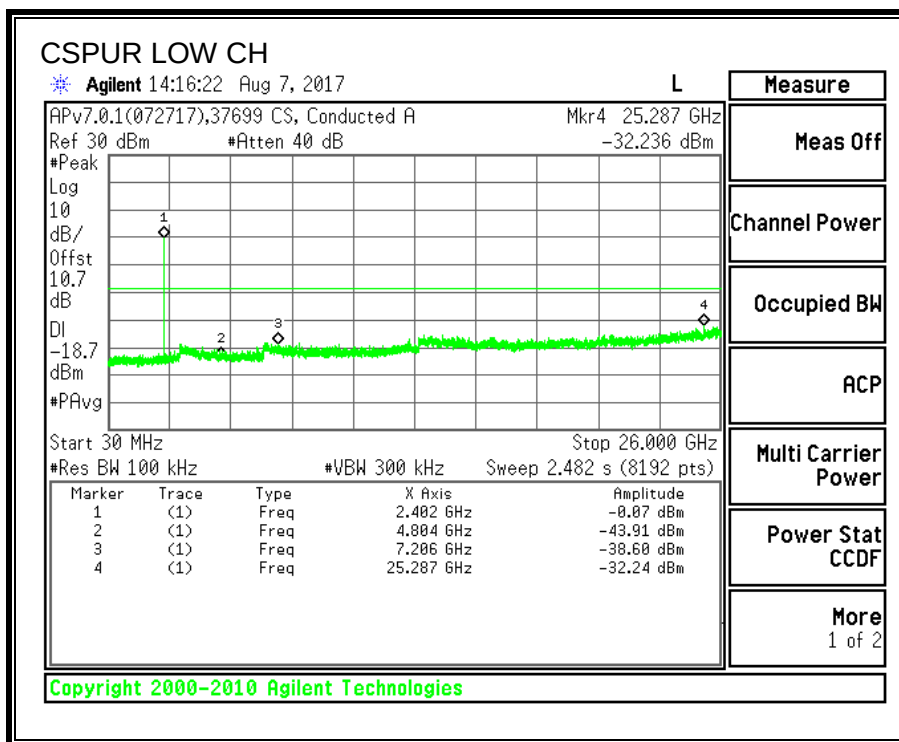
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

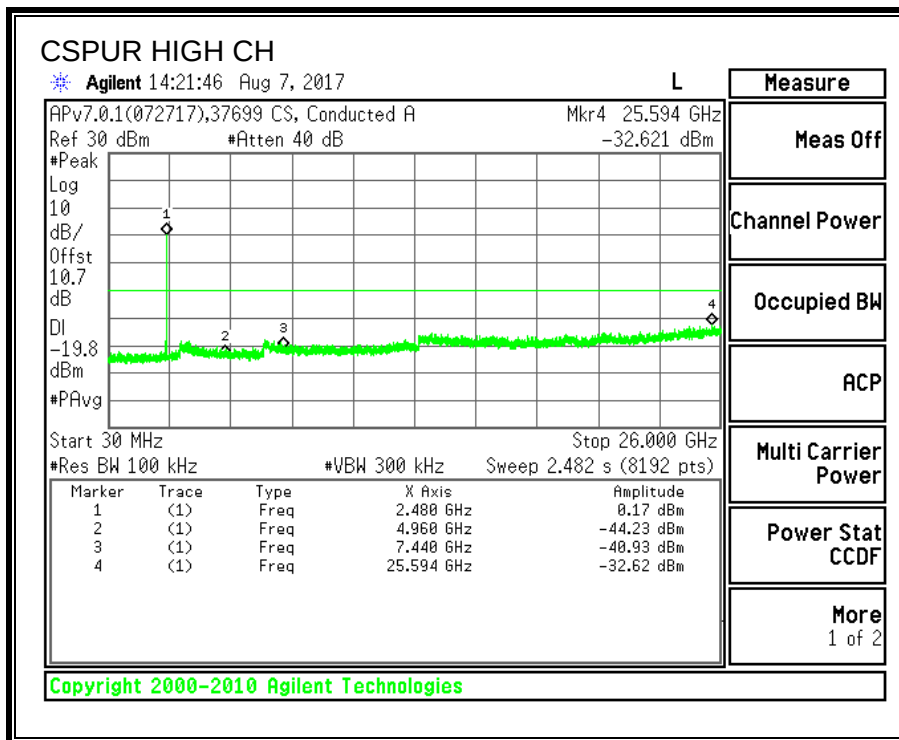
RESULTS

CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS









8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

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 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.

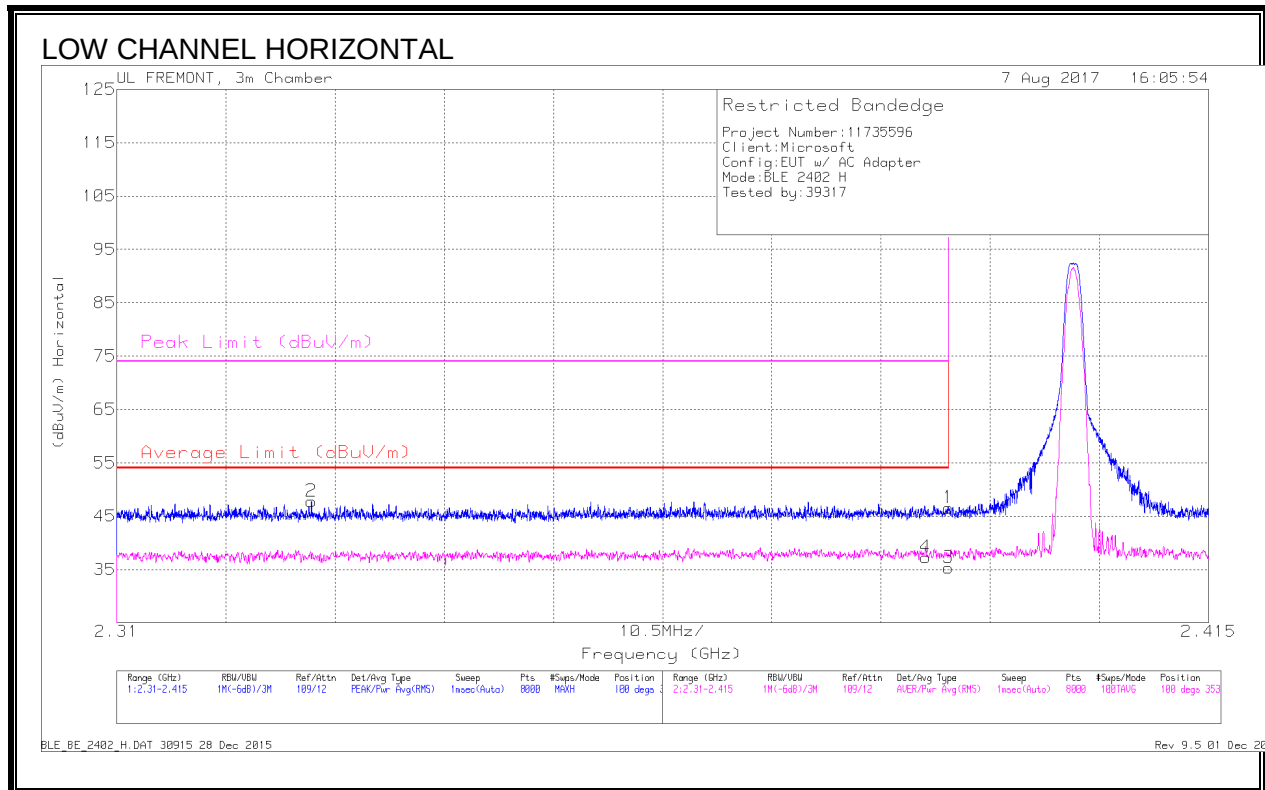
The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

Results

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. RESTRICTED BANDEDGE (LOW CHANNEL)

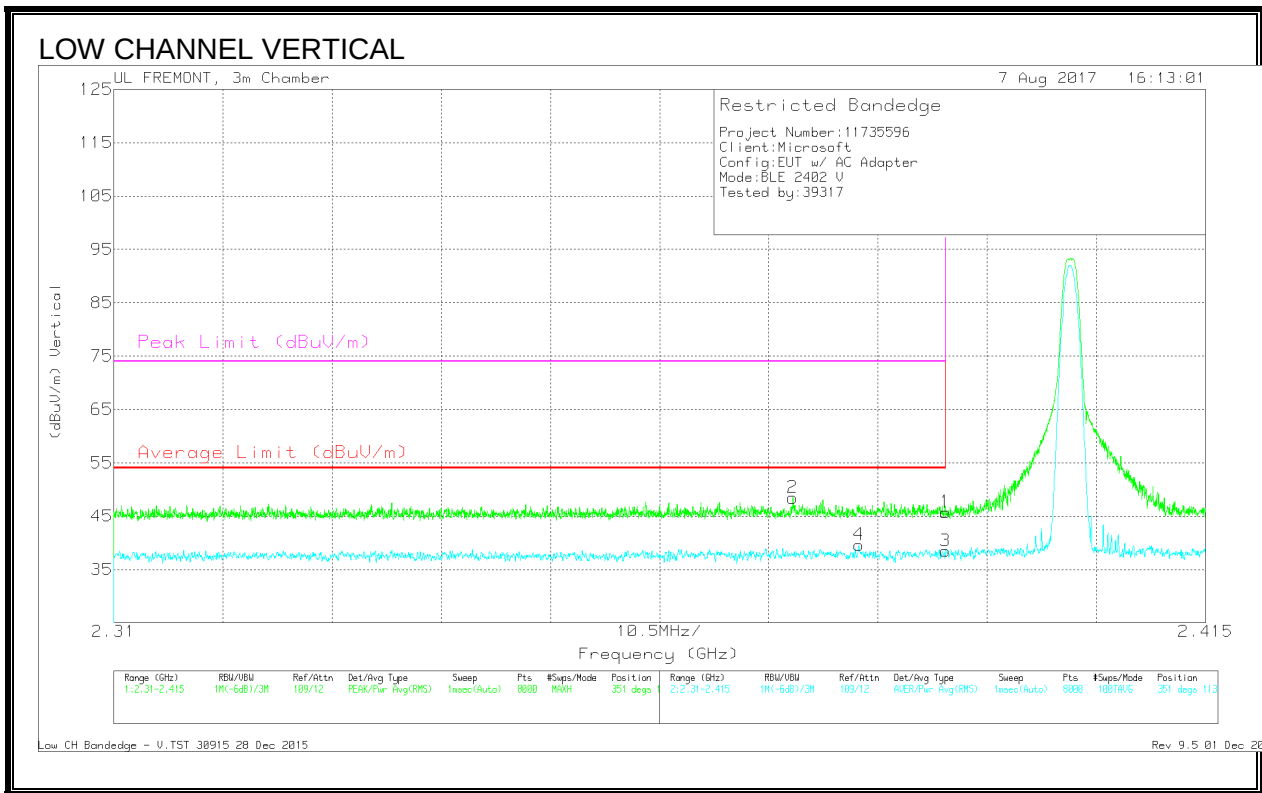


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 1712 (dB/m)	Amp/Ch/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
2	2.329	38.58	Pk	31.8	-22.6	0	47.78	-	-	74	-26.22	100	353	H
4	2.388	27.79	RMS	31.9	-22.4	2.04	39.31	54	-14.69	-	-	100	353	H
1	2.39	37.27	Pk	31.9	-22.6	0	46.57	-	-	74	-27.43	100	353	H
3	2.39	26.05	RMS	31.9	-22.6	2.04	37.37	54	-16.63	-	-	100	353	H

Pk - Peak detector

RMS - RMS detection

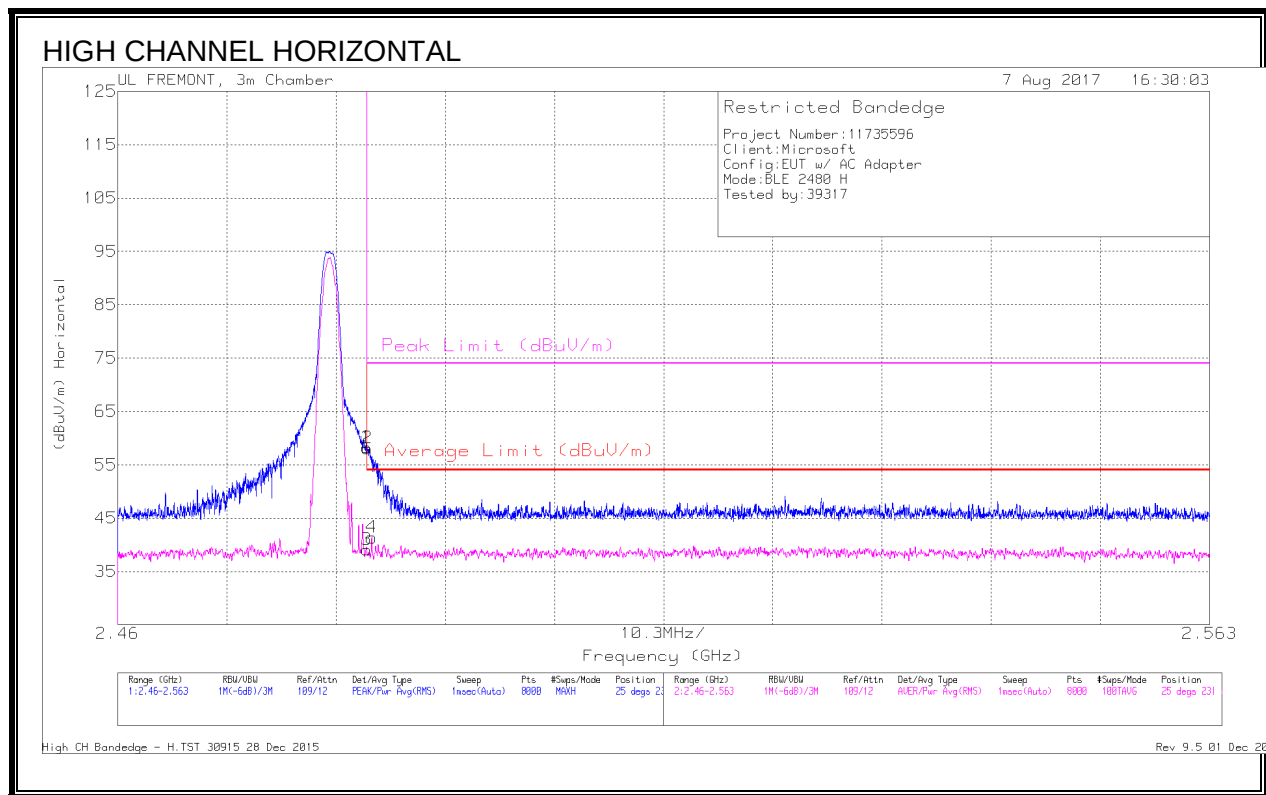


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT712 (dB/m)	Amp/Ch/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
2	2.375	39.05	Pk	31.9	-22.5	0	48.45	-	-	74	-25.55	351	113	V
4	2.382	28.1	RMS	31.9	-22.4	2.04	39.62	54	-14.38	-	-	351	113	V
1	2.39	36.42	Pk	31.9	-22.6	0	45.72	-	-	74	-28.28	351	113	V
3	2.39	27.13	RMS	31.9	-22.6	2.04	38.45	54	-15.55	-	-	351	113	V

Pk - Peak detector
RMS - RMS detection

8.2.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)

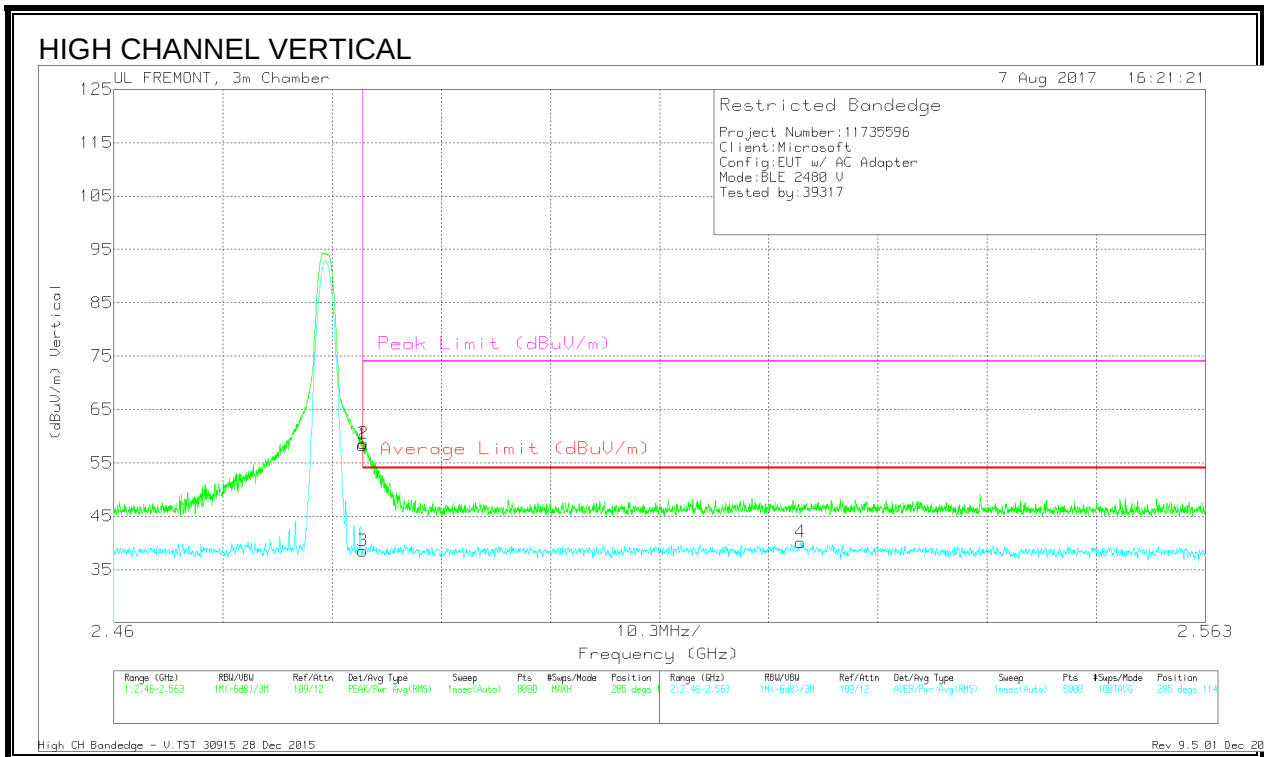


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	48.58	Pk	32.4	-22.7	0	58.28	-	-	74	-15.72	25	231	H
2	2.484	48.38	Pk	32.4	-22.7	0	58.08	-	-	74	-15.92	25	231	H
3	2.484	27.37	RMS	32.4	-22.7	2.04	39.09	54	-14.91	-	-	25	231	H
4	2.484	29.64	RMS	32.4	-22.7	2.04	41.36	54	-12.64	-	-	25	231	H

Pk - Peak detector

RMS - RMS detection

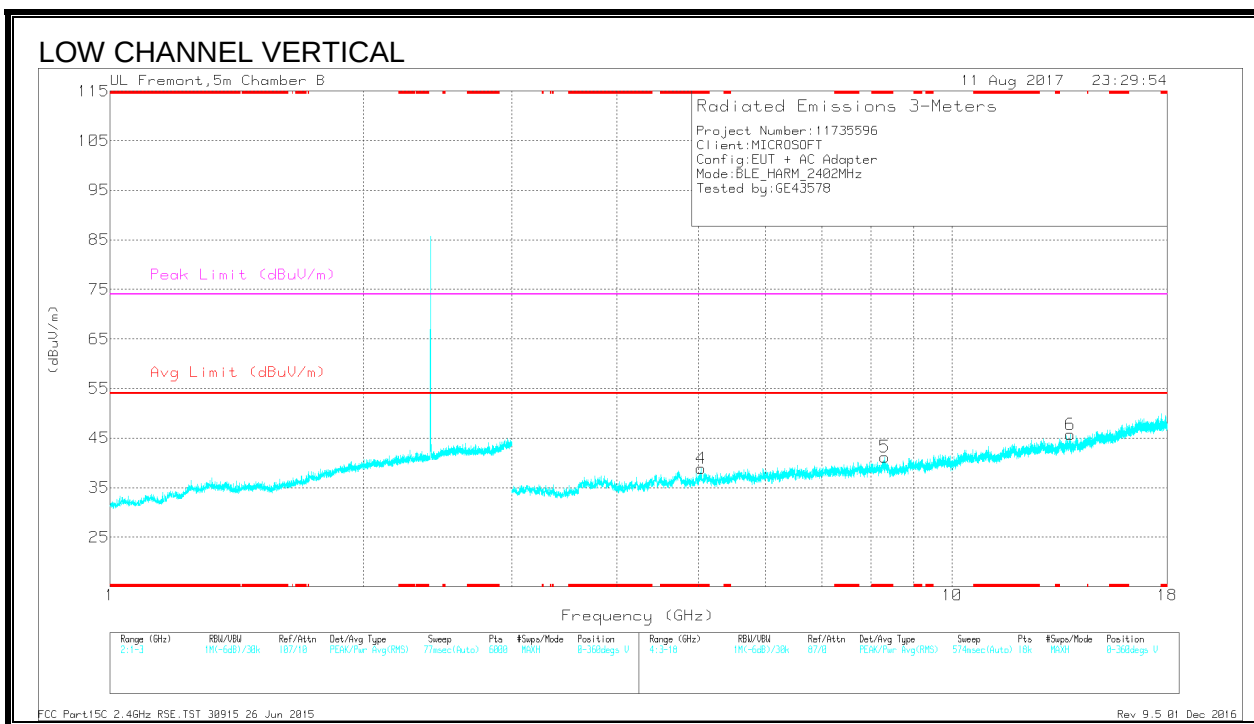
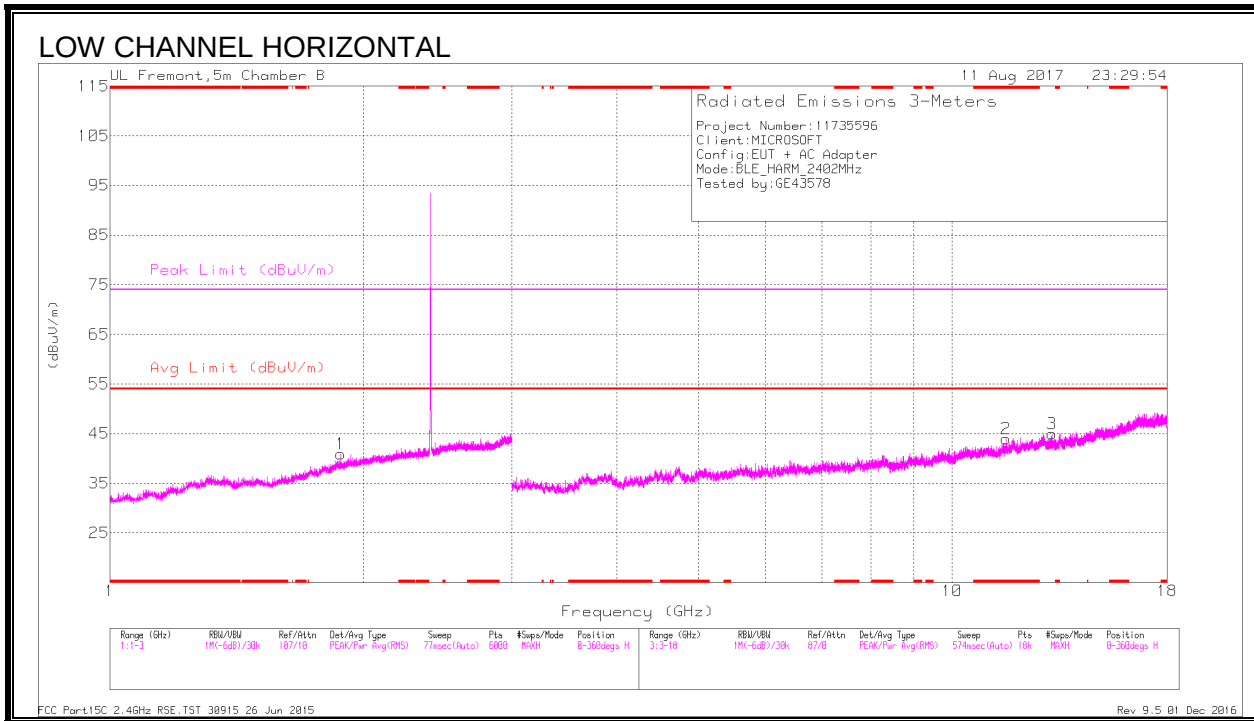


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT712 (dB/m)	Amp/Ch/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	2.484	48.64	Pk	32.4	-22.7	0	58.34	-	-	74	-15.66	285	114	V
2	2.484	48.91	Pk	32.4	-22.7	0	58.61	-	-	74	-15.39	285	114	V
3	2.484	26.75	RMS	32.4	-22.7	2.04	38.47	54	-15.53	-	-	285	114	V
4	2.525	27.86	RMS	32.4	-22.2	2.04	40.08	54	-13.92	-	-	285	114	V

Pk - Peak detector
RMS - RMS detection

8.2.3. HARMONICS AND SPURIOUS EMISSIONS



Radiated Emissions

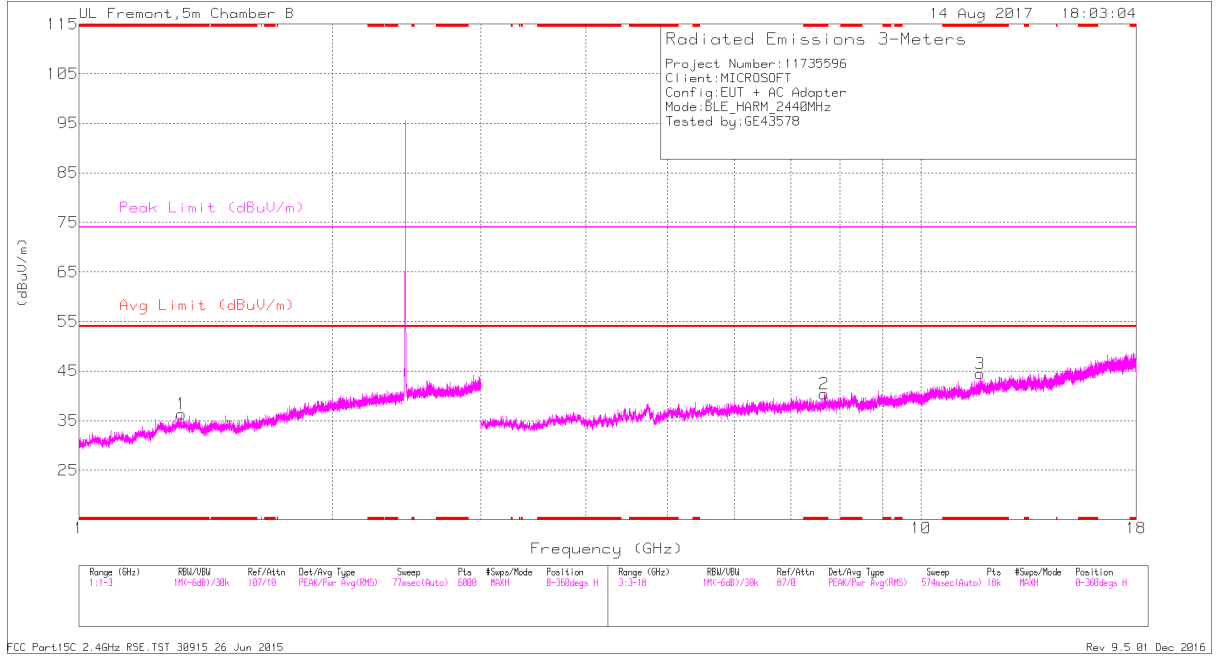
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cb/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 11.594	34.06	PK2	38.2	-22.5	0	49.76	-	-	74	-24.24	112	101	H
	* 11.594	22.09	MAv1	38.2	-22.5	2.04	39.83	54	-14.17	-	-	112	101	H
4	* 5.033	38.7	PK2	34.4	-28.3	0	44.8	-	-	74	-29.2	103	200	V
	* 5.034	26.56	MAv1	34.4	-28.3	2.04	34.7	54	-19.3	-	-	103	200	V
5	* 8.318	36.21	PK2	36.1	-25	0	47.31	-	-	74	-26.69	21	200	V
	* 8.319	24.29	MAv1	36.1	-25	2.04	37.43	54	-16.57	-	-	21	200	V
1	1.877	41.23	PK2	30.9	-20.8	0	51.33	-	-	-	-	65	100	H
3	13.132	32.33	PK2	39.3	-21.9	0	49.73	-	-	-	-	271	101	H
6	13.82	32.09	PK2	39.1	-20.9	0	50.29	-	-	-	-	301	200	V

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

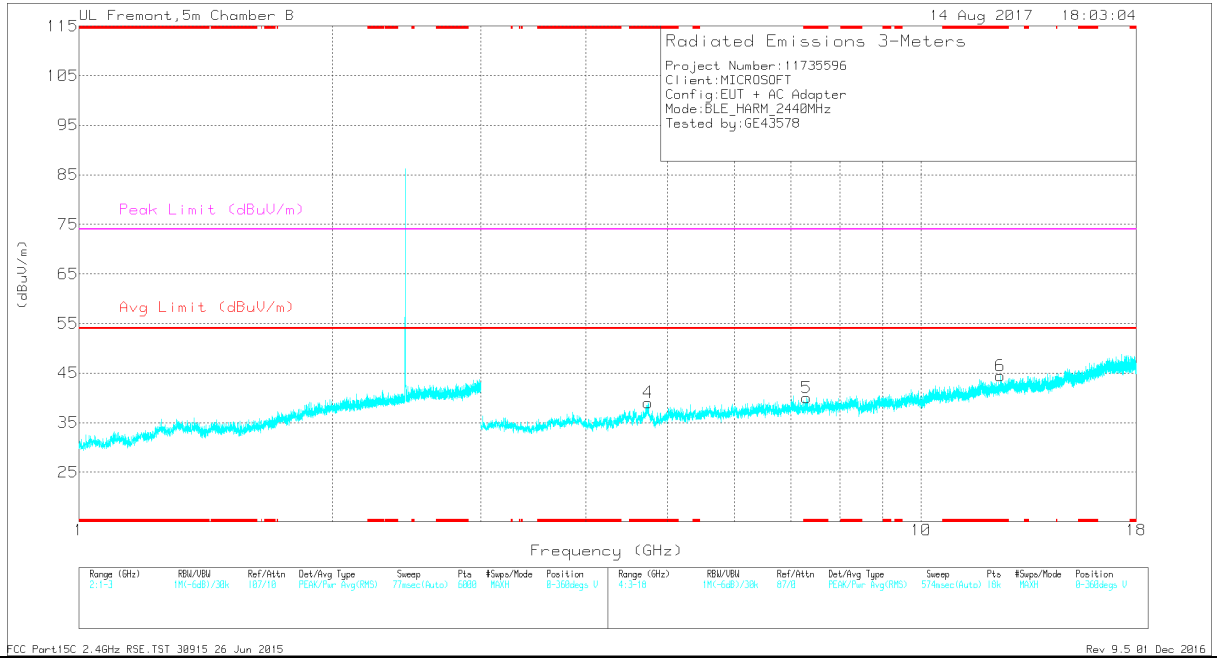
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



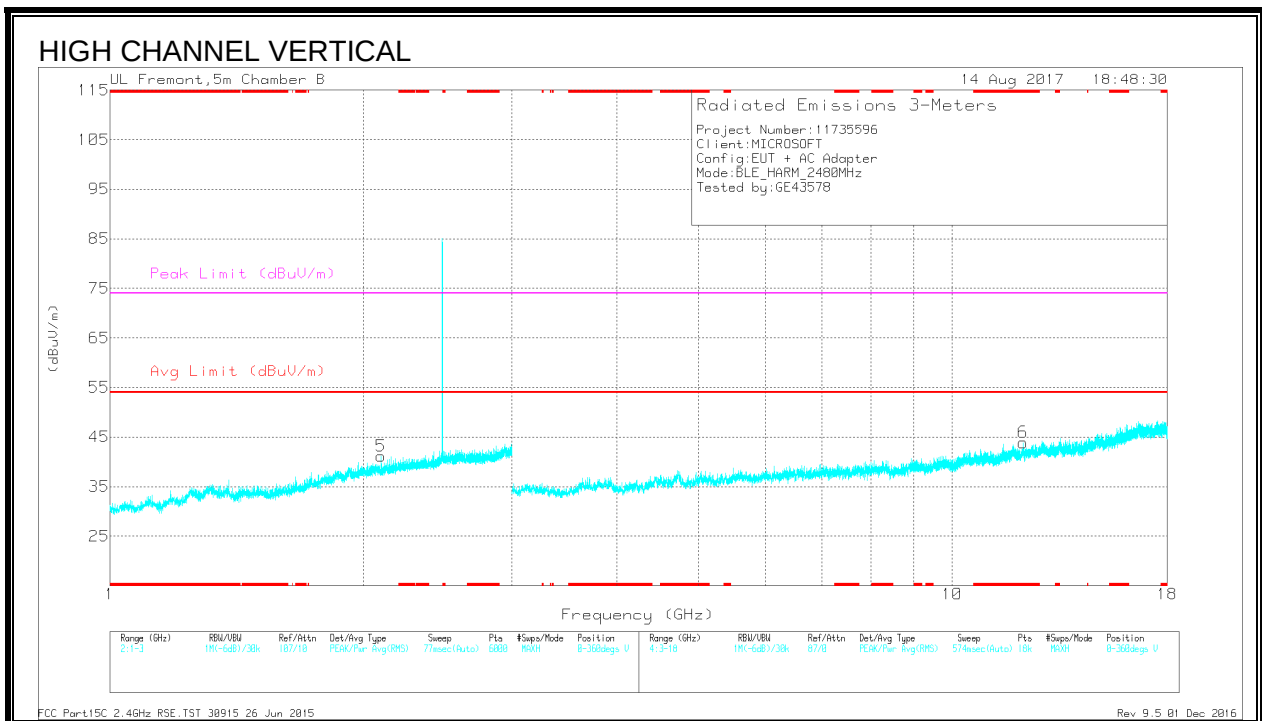
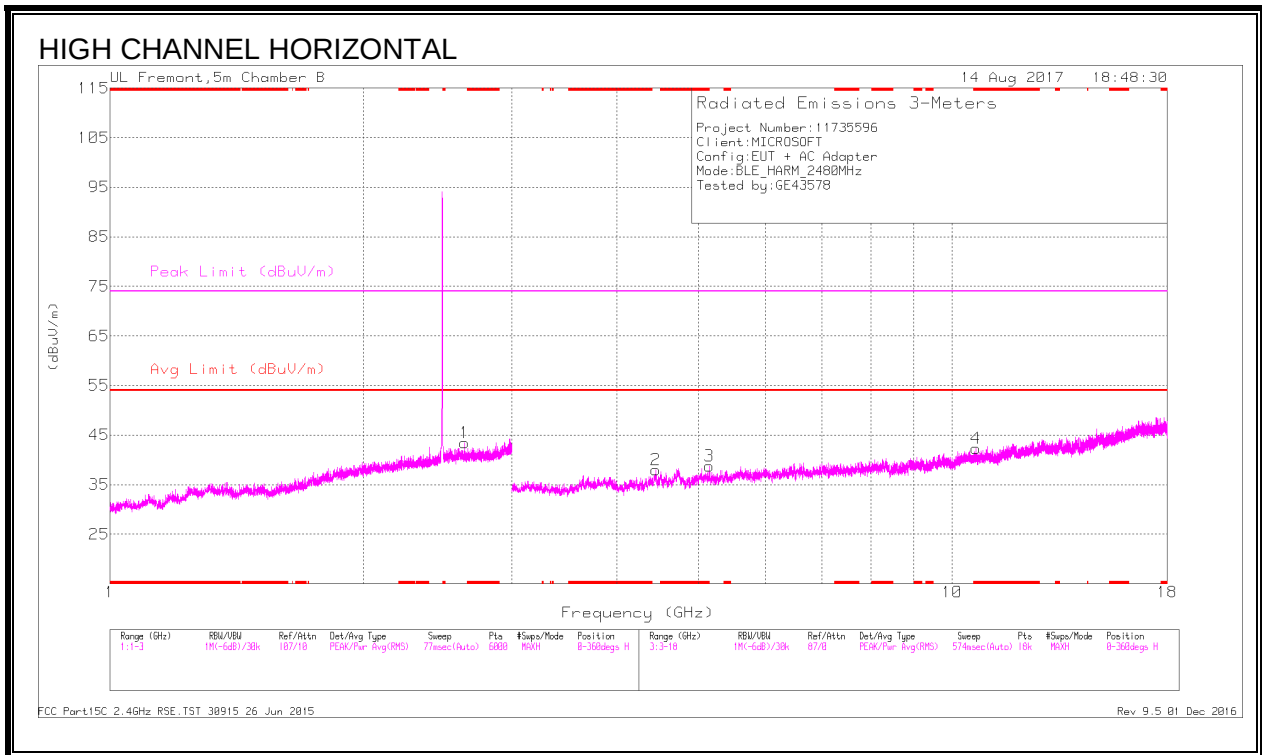
Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Ch/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.324	36.31	PK2	28.9	-21.7	0	43.51	-	-	74	-30.49	268	199	H
	* 1.323	17.71	MAV1	28.9	-21.6	2.04	27.05	54	-26.95	-	-	268	199	H
2	* 7.675	35.72	PK2	36	-26	0	45.72	-	-	74	-28.28	288	104	H
	* 7.674	23.23	MAV1	36	-26	2.04	35.27	54	-18.73	-	-	288	104	H
3	* 11.749	33.05	PK2	38.5	-21.9	0	49.65	-	-	74	-24.35	319	104	H
	* 11.749	19.53	MAV1	38.5	-21.9	2.04	38.17	54	-15.83	-	-	319	104	H
4	* 4.738	39.25	PK2	34.2	-28.3	0	45.15	-	-	74	-28.85	351	104	V
	* 4.739	26.85	MAV1	34.2	-28.3	2.04	34.79	54	-19.21	-	-	351	104	V
5	* 7.307	37.37	PK2	35.8	-27.2	0	45.97	-	-	74	-28.03	182	104	V
	* 7.308	24.93	MAV1	35.8	-27.1	2.04	35.67	54	-18.33	-	-	182	104	V
6	* 12.422	32.49	PK2	39	-21.6	0	49.89	-	-	74	-24.11	360	199	V
	* 12.423	19.56	MAV1	39	-21.6	2.04	39	54	-15	-	-	360	199	V

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

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cb/Filt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 10.672	33.33	PK2	37.6	-22.6	0	48.33	-	-	74	-25.67	80	104	H
	* 10.672	19.62	MAv1	37.6	-22.6	2.04	36.66	54	-17.34	-	-	80	104	H
6	* 12.14	32.8	PK2	39	-22	0	49.8	-	-	74	-24.2	342	104	V
	* 12.139	19.36	MAv1	39	-22	2.04	38.4	54	-15.6	-	-	342	104	V
5	2.099	35.87	PK2	31.4	-21.1	0	46.17	-	-	-	-	268	199	V
1	2.635	35.29	PK2	32.5	-21	0	46.79	-	-	-	-	57	199	H
2	4.446	38.33	PK2	33.8	-28.3	0	43.83	-	-	-	-	146	104	H
3	5.151	39.93	PK2	34.4	-29.6	0	44.73	-	-	-	-	262	104	H

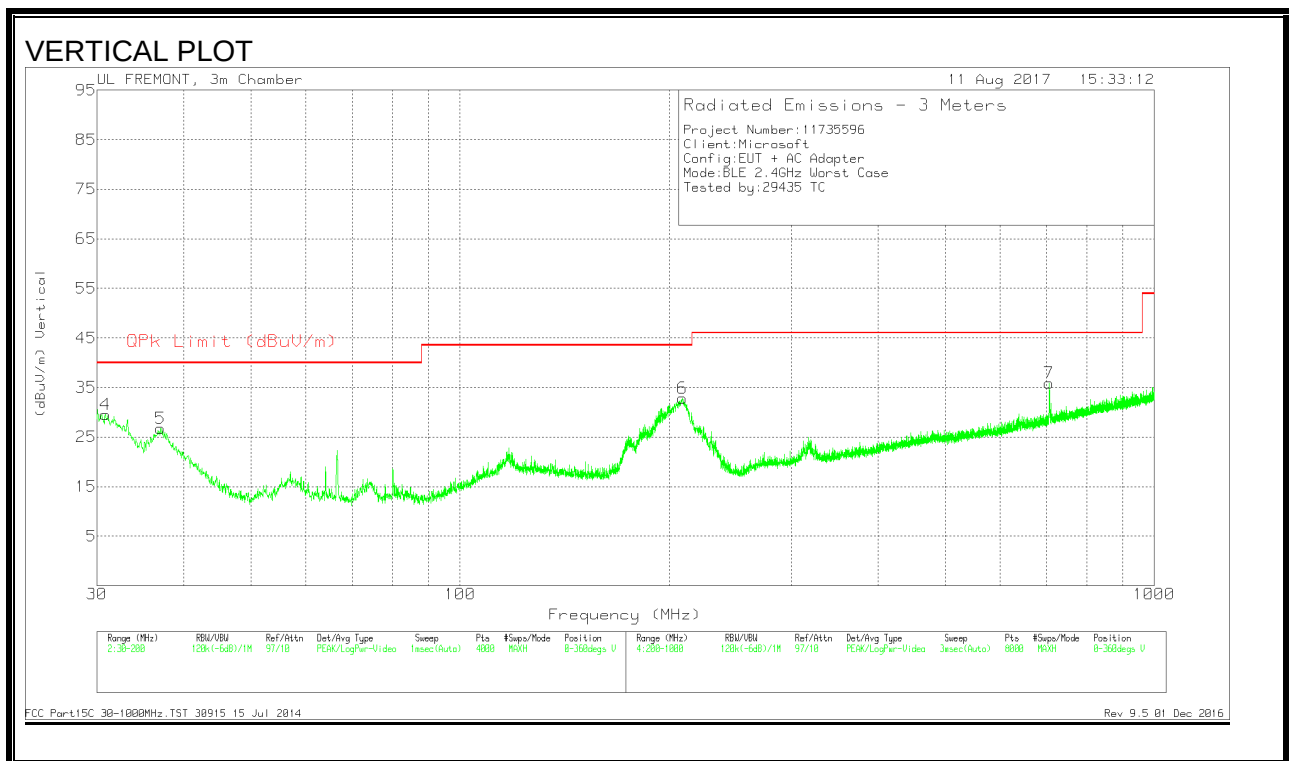
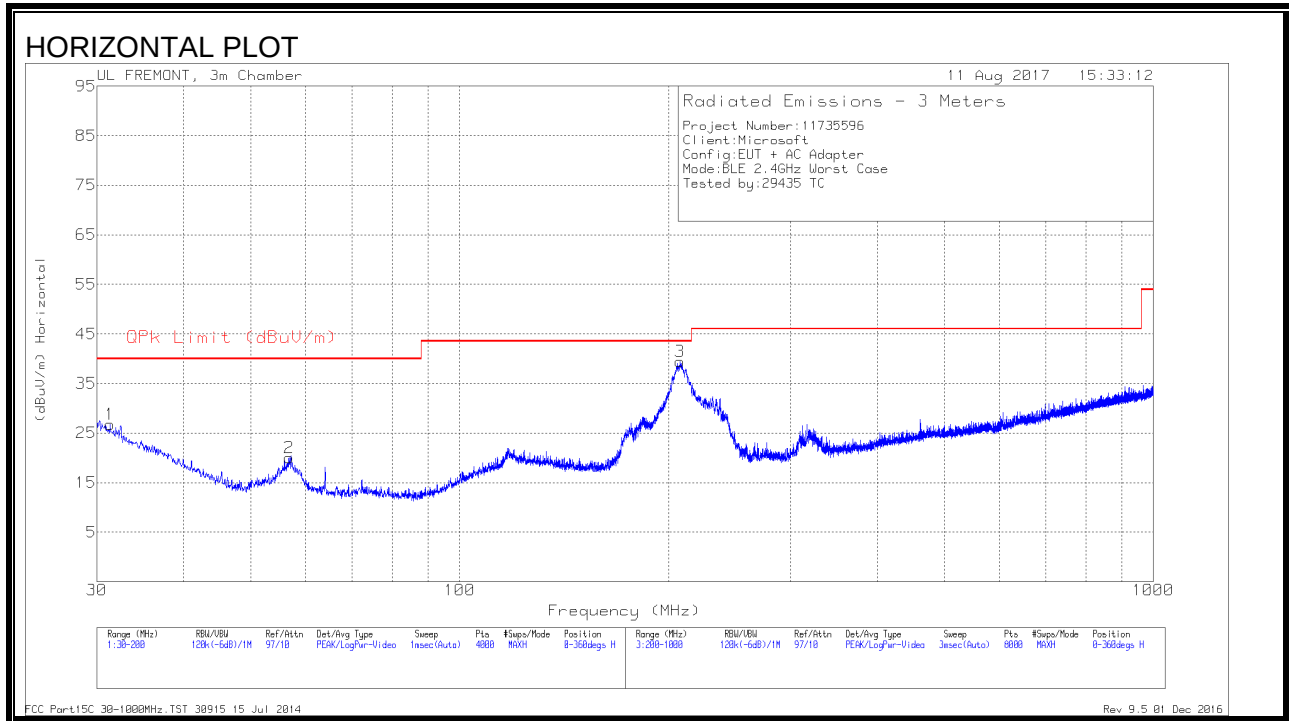
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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

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



Radiated Emissions

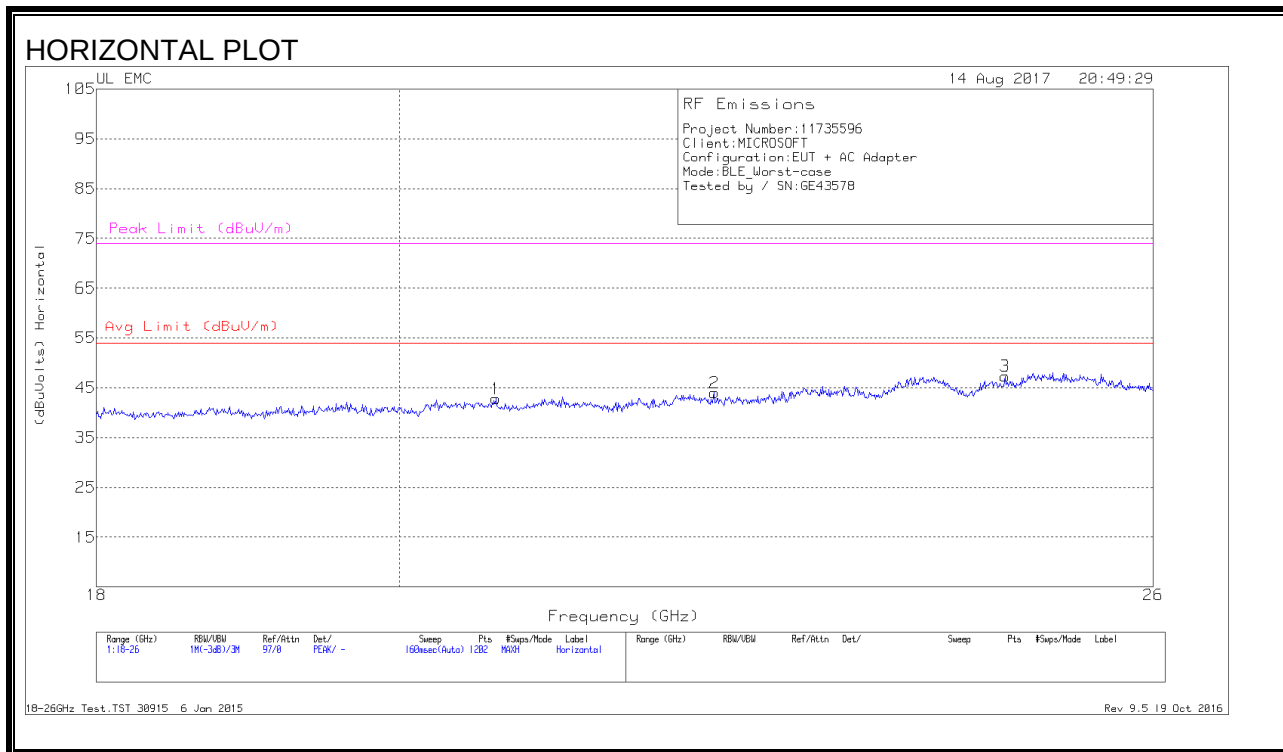
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T408 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	30.8502	32.16	Pk	24.6	-27.2	29.56	40	-10.44	0-360	100	V
1	31.3604	29.62	Pk	24.3	-27.2	26.72	40	-13.28	0-360	200	H
5	37.0568	33.72	Pk	20.2	-27.2	26.72	40	-13.28	0-360	100	V
2	56.7394	35.72	Pk	11.2	-26.9	20.02	40	-19.98	0-360	400	H
3	208.1362	49.8	Pk	14.8	-25	39.6	43.52	-3.92	205	165	H
		45.69	Qp	14.8	-25	35.49	43.52	-8.03	205	165	H
6	209.1012	43.26	Pk	14.6	-25	32.86	43.52	-10.66	0-360	200	V
7	705.9658	35.3	Pk	24.2	-23.6	35.9	46.02	-10.12	0-360	200	V

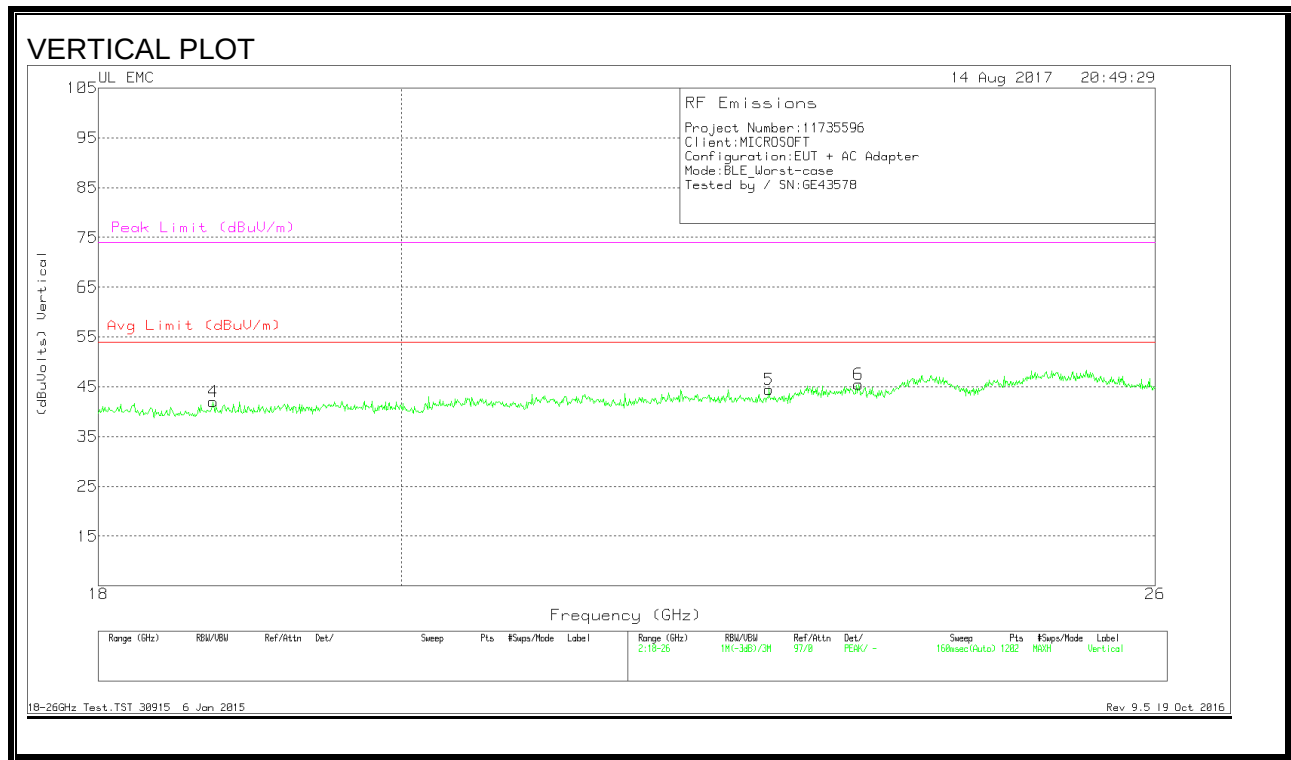
Pk - Peak detector

Qp - Quasi-Peak detector

8.4. WORST-CASE 18 to 26 GHz

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





DATA

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	20.684	41.03	Pk	33	-21.7	-9.5	42.83	54	-11.17	74	-31.17
2	22.316	40.7	Pk	33.5	-20.7	-9.5	44	54	-10	74	-30
3	24.694	42.93	Pk	34.1	-20.2	-9.5	47.33	54	-6.67	74	-26.67
4	18.733	41.1	Pk	32.3	-21.9	-9.5	42	54	-12	74	-32
5	22.729	41.5	Pk	33.4	-20.9	-9.5	44.5	54	-9.5	74	-29.5
6	23.449	41.6	Pk	33.9	-20.5	-9.5	45.5	54	-8.5	74	-28.5

Pk - Peak detector

9. 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

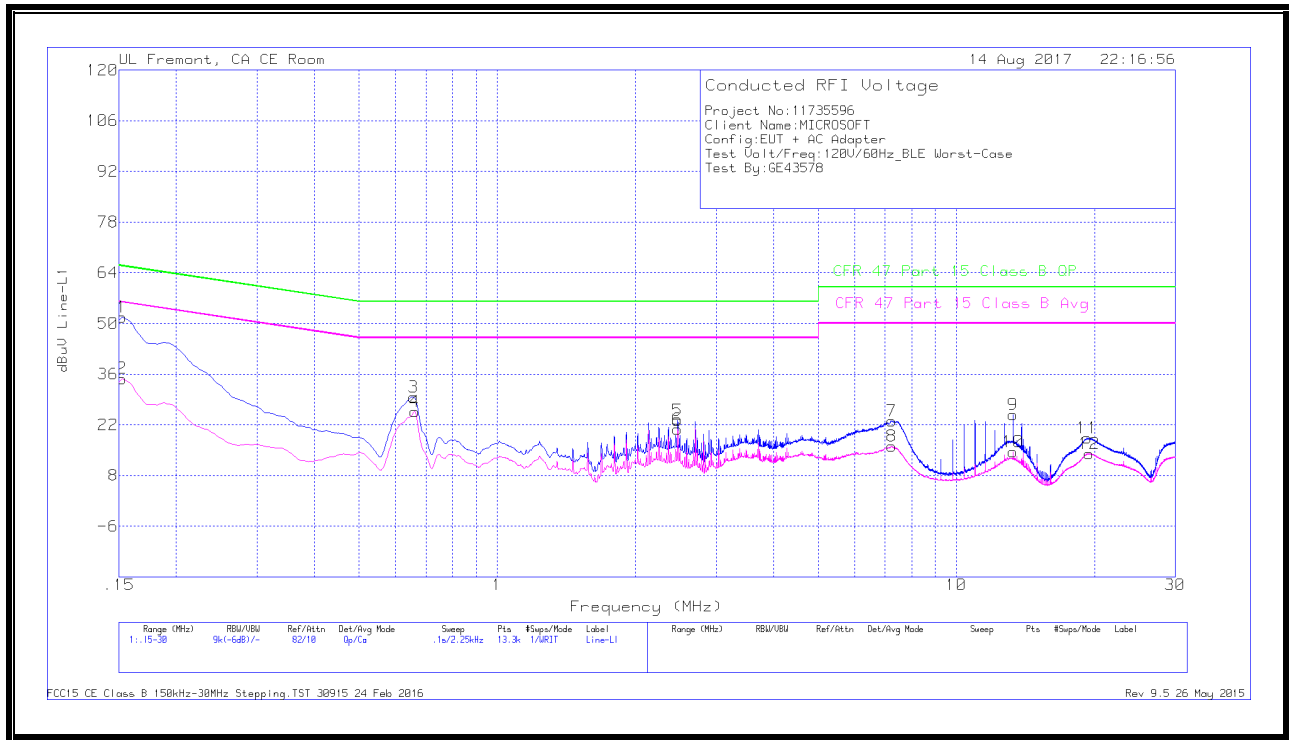
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

LINE 1 RESULTS



WORST EMISSIONS

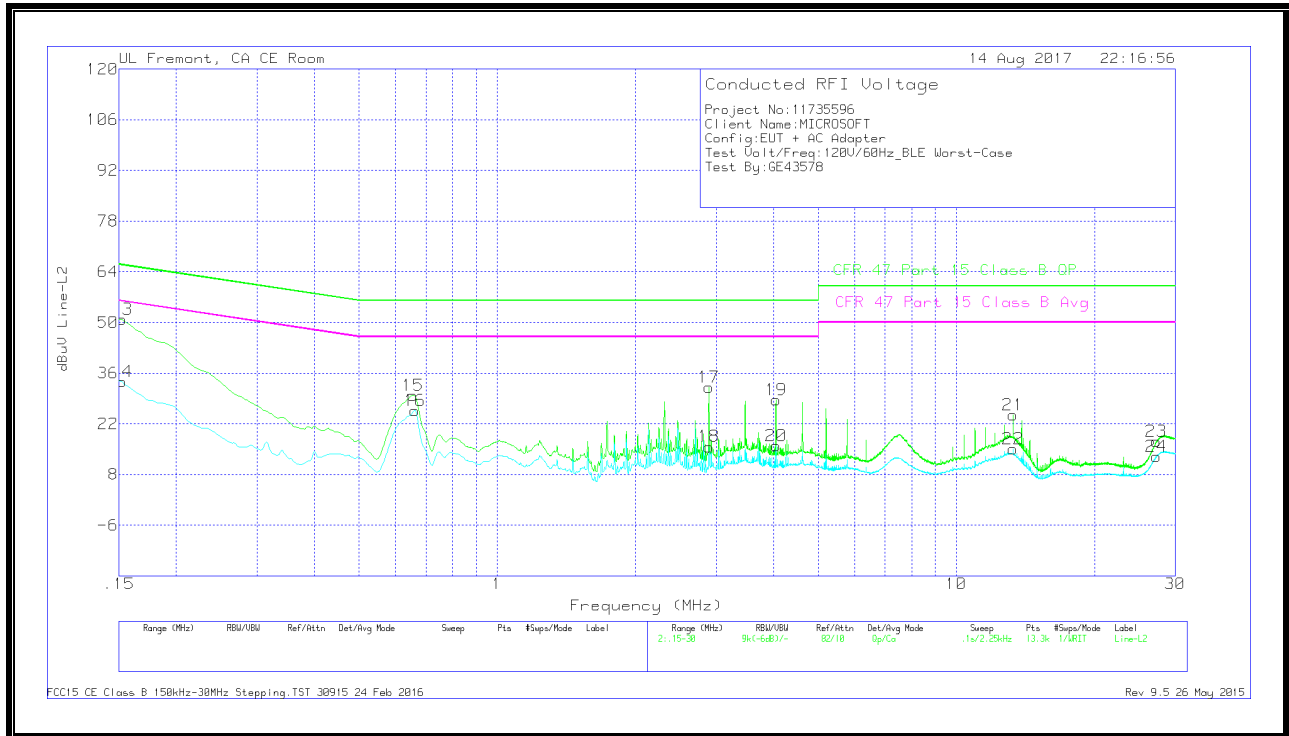
Range 1: Line-L1 .15 - 30MHz

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	.15225	41.42	Qp	.1	.1	10.1	51.72	65.88	-14.16	-	-
2	.15225	24.49	Ca	.1	.1	10.1	34.79	-	-	55.88	-21.09
3	.65737	19.5	Qp	0	.1	10.1	29.7	56	-26.3	-	-
4	.66075	15.45	Ca	0	.1	10.1	25.65	-	-	46	-20.35
5	2.47425	13.02	Qp	0	.1	10.1	23.22	56	-32.78	-	-
6	2.47425	10.67	Ca	0	.1	10.1	20.87	-	-	46	-25.13
7	7.22625	12.73	Qp	0	.2	10.2	23.13	60	-36.87	-	-
8	7.2285	5.69	Ca	0	.2	10.2	16.09	-	-	50	-33.91
9	13.299	14.34	Qp	.1	.2	10.2	24.84	60	-35.16	-	-
10	13.299	4	Ca	.1	.2	10.2	14.5	-	-	50	-35.5
11	19.28625	7.62	Qp	.1	.3	10.3	18.32	60	-41.68	-	-
12	19.4685	3.36	Ca	.1	.3	10.3	14.06	-	-	50	-35.94

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



WORST EMISSIONS

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	.15225	40.79	Qp	0	0	10.1	50.89	65.88	-14.99	-	-
14	.15225	23.49	Ca	0	0	10.1	33.59	-	-	55.88	-22.29
15	.65625	19.66	Qp	0	.1	10.1	29.86	56	-26.14	-	-
16	.66075	15.5	Ca	0	.1	10.1	25.7	-	-	46	-20.3
17	2.8905	21.94	Qp	0	.1	10.1	32.14	56	-23.86	-	-
18	2.8905	5.47	Ca	0	.1	10.1	15.67	-	-	46	-30.33
19	4.047	18.45	Qp	0	.1	10.1	28.65	56	-27.35	-	-
20	4.04925	5.68	Ca	0	.1	10.1	15.88	-	-	46	-30.12
21	13.299	13.89	Qp	.1	.2	10.2	24.39	60	-35.61	-	-
22	13.299	4.61	Ca	.1	.2	10.2	15.11	-	-	50	-34.89
23	27.28613	6.18	Qp	.1	.3	10.5	17.08	60	-42.92	-	-
24	27.285	2.05	Ca	.1	.3	10.5	12.95	-	-	50	-37.05

Qp - Quasi-Peak detector

Ca - CISPR average detection