CERTIFICATION TEST REPORT

Report Number. : 12681939-E6V3 (Right)

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2083
FCC ID	:	BCG-A2083
IC	:	579C-A2083
EUT Description	:	Bluetooth Earbud
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
October 09, 2019

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
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TEL: (510) 319-4000
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NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	9/19/2019	Initial Issue	Chin Pang
V2	10/04/2019	Address TCB's Questions, add below 30MHz scan	Chin Pang
V3	10/09/2019	Address TCB's question on section 8.4.2	Chin Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
EUT DESCRIPTION:	Bluetooth Earbud
MODEL:	A2083
SERIAL NUMBER:	Radiated - DLC9326002DJQH32N, DLC9326000ZJQH328 Conducted - DLC9326001NJQH32G
DATE TESTED:	AUGUST 30 - SEPTEMBER 05, 2019 & OCTOBER 04-09, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.
The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.
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 the U.S. government.

Approved & Released By:

Chin Pang
Senior Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:

Tony Li
Test Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D02 v01r01, RSS-GEN Issue 5, 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, and 47658 Kato Road, 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	47658 Kato Rd
☐ Chamber A (ISED:2324B-1)	☒ Chamber D (ISED:22541-1)	☐ Chamber I (ISED:2324A-5)
☐ Chamber B (ISED:2324B-2)	☒ Chamber E (ISED:22541-2)	☐ Chamber J (ISED:2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☐ Chamber K (ISED:2324A-1)
	☒ Chamber G (ISED:22541-4)	☐ Chamber L (ISED:2324A-3)
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

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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

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

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

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT, model A2083 is a Bluetooth earbud for the right ear. It has an integral battery, microphone and antenna. It can charge via bottom contacts with charging case. It is designed to work in conjunction with left earbud, A2084

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 1M	10.04	10.09
2404 - 2478	BLE 2M	9.97	9.93

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an LDS antenna, with a maximum gain of -2.8 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 2A62820o.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

Radiated emissions below 30MHz, below 1GHz, 18-26GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario

For AC line conducted emission, test was investigated with AC power adapter and laptop.

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

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Apple	Macbook Pro	C02P41RZG086	FCC DoC
Laptop AC/DC adapter	Liteon Technology	PA-1450-BA1	B123	NA
EUT AC Adapter	Apple	A1385	D292365CDYADHLHC3	NA
Charger Case	Apple	A1602	DLCYX1FZLKKT	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	2	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**
NA						

I/O CABLES (BELOW 1GHz AND AC POWER LINE TEST WITH ADAPTER AND LAPTOP)

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

TEST SETUP

The EUT is connected to a test laptop during the tests. Test software exercised the radio card.

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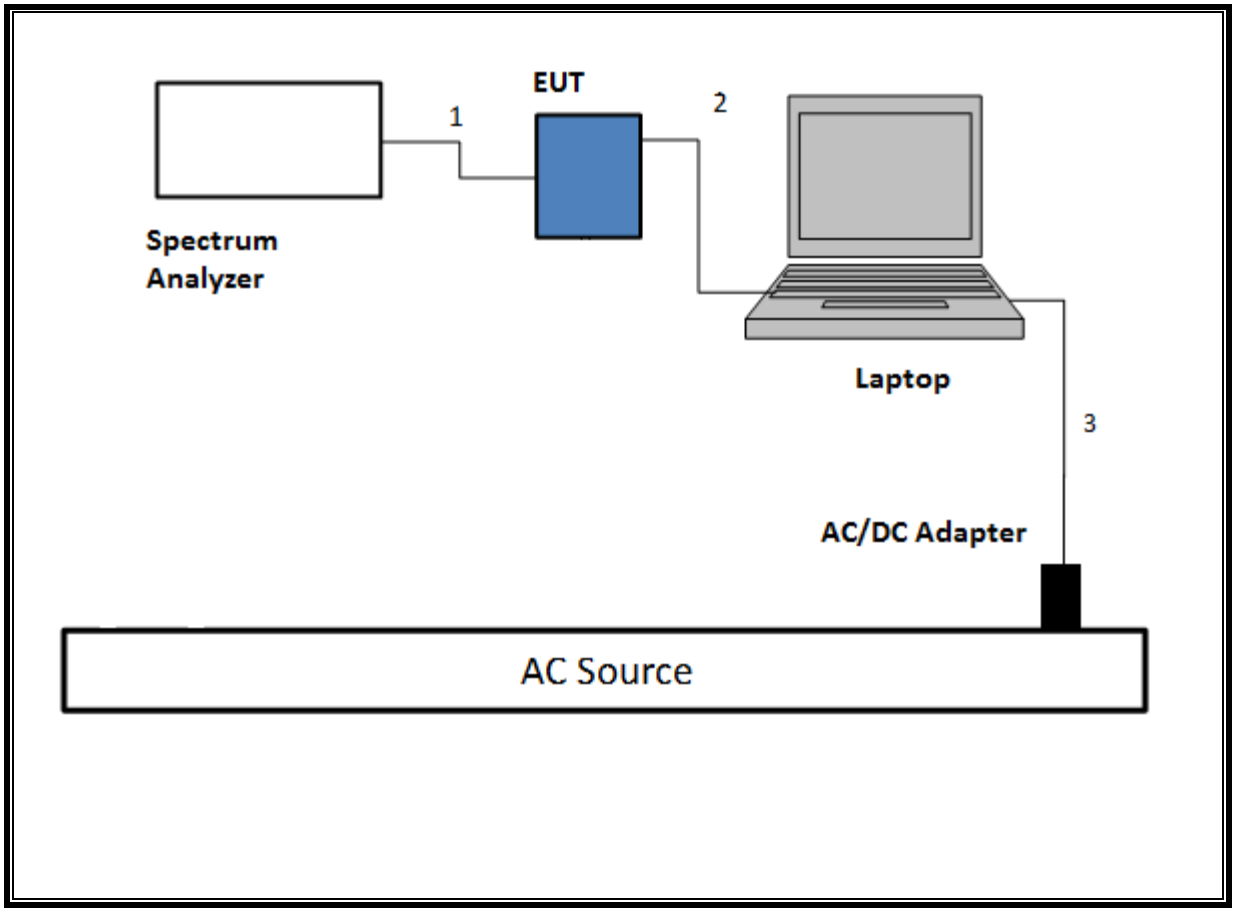
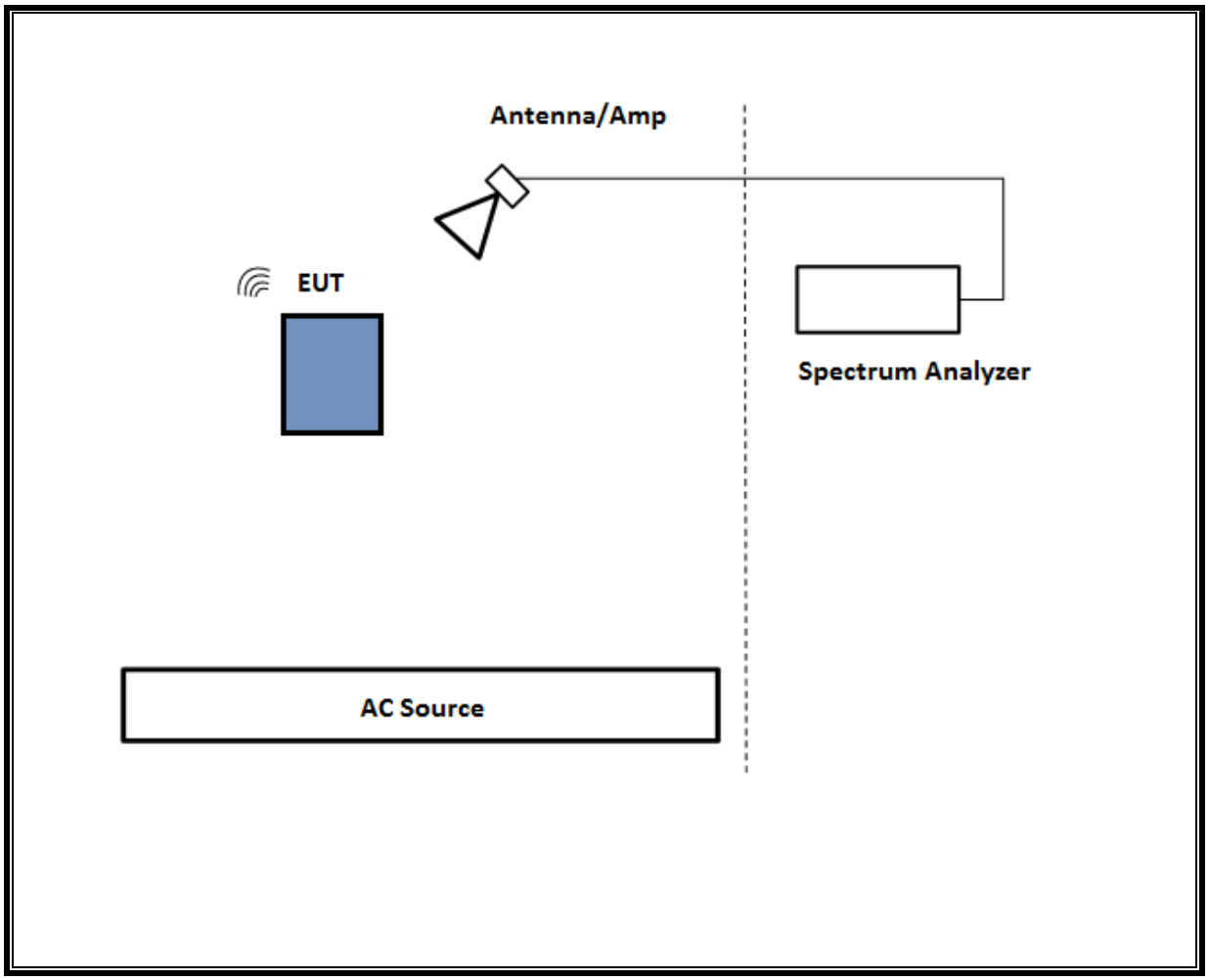
SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS ABOVE 1GHz



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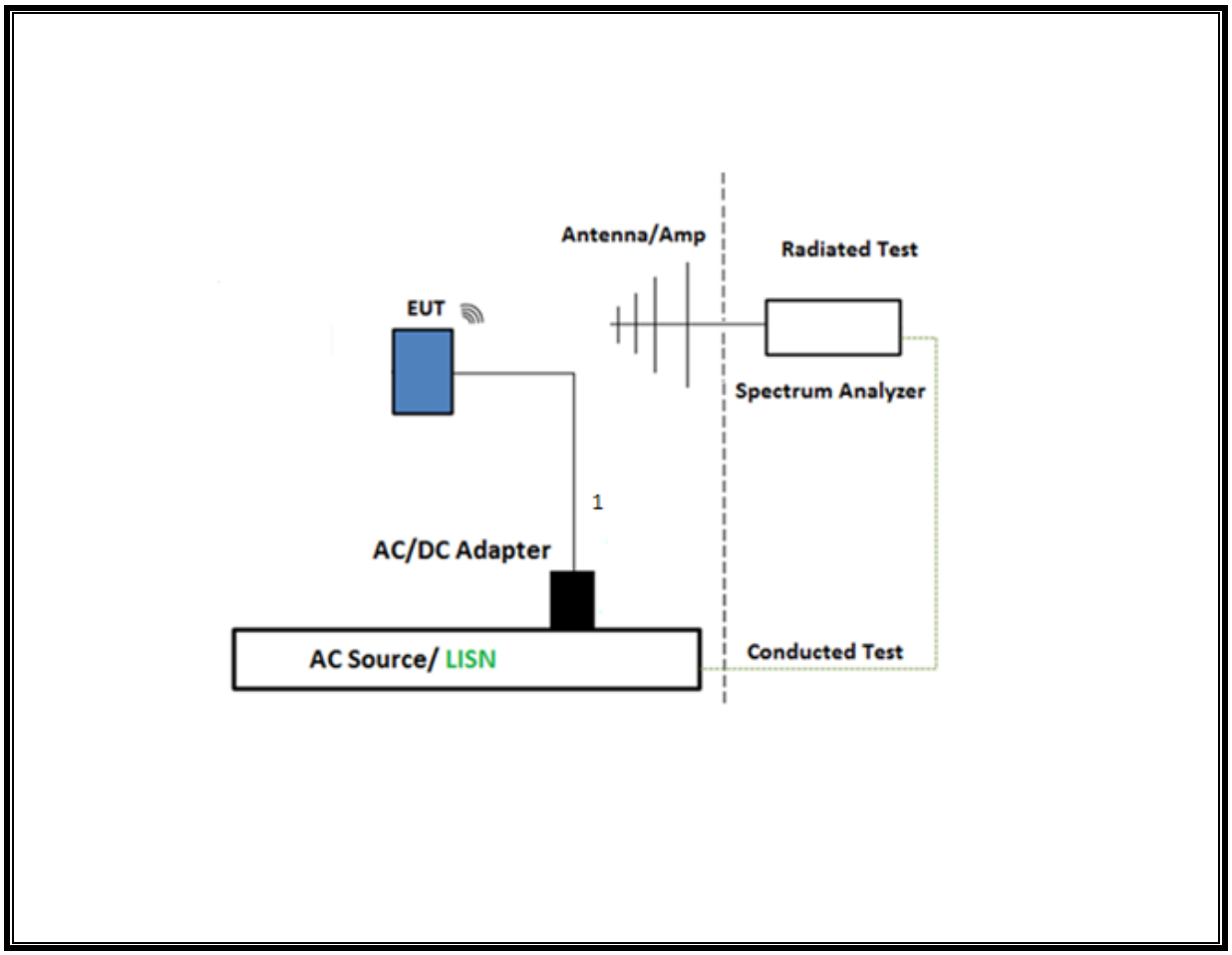
SETUP DIAGRAM FOR BELOW 1GHz and AC LINE CONDUCTED TEST



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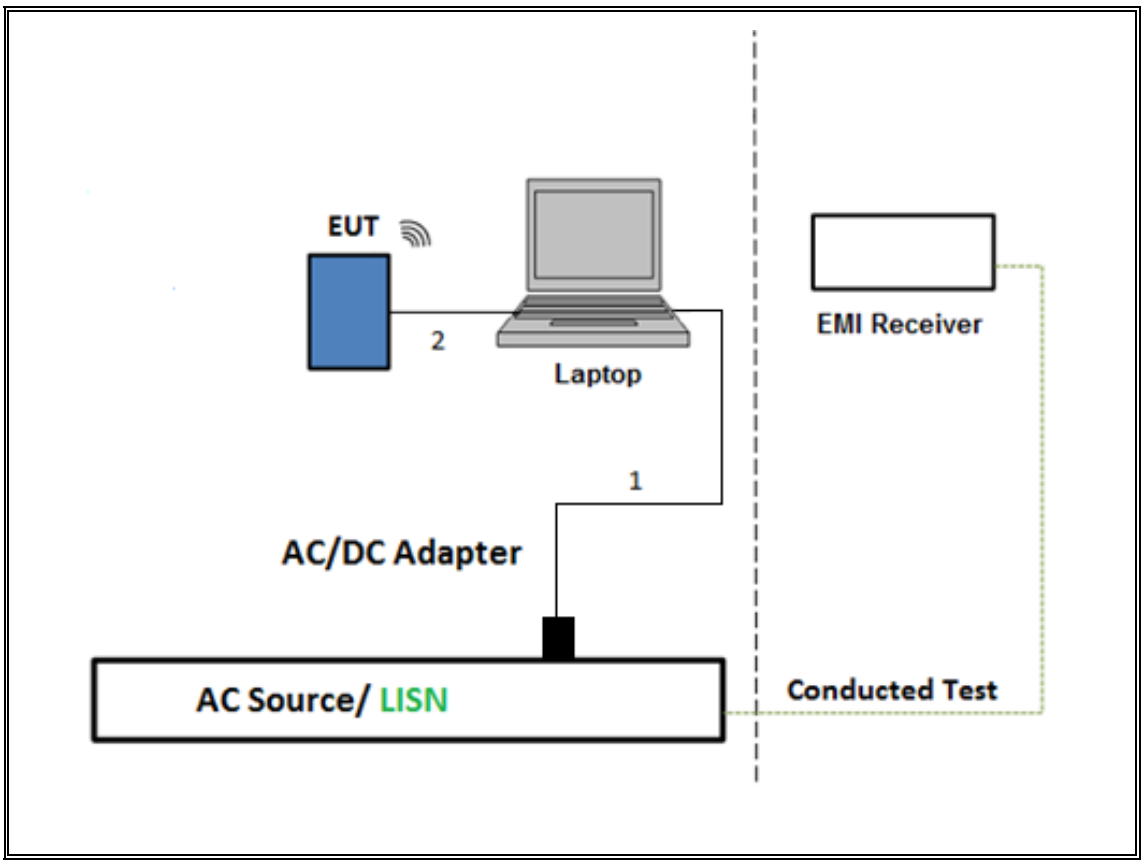
TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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**	**ID Num**	**Cal Due**	**Last Cal**
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	138301	08/03/2020	08/03/2019
Amplifier, 10kHz to 1GHz, 32dB	Sonoma Instrument Co.	310N	T286	07/31/2020	07/31/2019
Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T742	07/21/2020	07/21/2019
Antenna, Active Loop 9KHz to 30MHz	ETS-Lindgren	6502	T1683	02/21/2020	02/21/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB1	T185	06/06/2020	06/06/2019
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T712	02/26/2020	02/26/2019
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T119	03/22/2020	03/22/2019
Horn Antenna, 18-26.5GHz	A.R.A	MWH-1826/B	PRE0182188	08/29/2020	08/29/2019
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T227	10/29/2019	10/29/2018
Power Sensor	Agilent (Keysight) Technologies	N1921A	T1226	02/06/2020	02/06/2019
Pre-Amp 18-26GHz	Agilent (Keysight) Technologies	8449B	T404	03/23/2020	03/23/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T906	01/22/2020	01/22/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1466	01/23/2020	01/23/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T905	01/24/2020	01/24/2019
Thermometer - Digital	Control Company	14-650-118	PRE0177862	02/22/2020	02/22/2019

AC Line Conducted					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ESCI7	T1436	02/14/2020	02/14/2019
Power Cable, Line Conducted Emissions	UL	PG1	T861	10/19/2019	10/19/2018
LISN for Conducted Emissions CISPR-16	Fischer	50/250-25-2-01	T1310	01/24/2020	01/24/2019
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, April 26, 2016		
Conducted Software	UL	UL EMC	Ver 10.1, August 27, 2019		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015		

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7. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.10-2013 Section 11.6

6 dB BW: ANSI C63.10 Subclause -11.8.1 RBW ≥ DTS BW

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Output Power: ANSI C63.10 Subclause -11.9.1.3 Method PKPM1 Peak-reading power meter

Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Measurement using gated average power Meter

PSD: ANSI C63.10 Subclause -11.10.2 Method PKPSD (peak PSD)

Radiated emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11

Radiated emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1

Conducted emissions in restricted frequency bands: ANSI C63.10 Subclause -11.12.2

Band-edge: ANSI C63.10 Subclause -11.13.3.2 Integration method -Peak detection

Band-edge: ANSI C63.10 Subclause -11.13.3.3 Integration method -Trace averaging with continuous transmission at full power

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

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

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8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

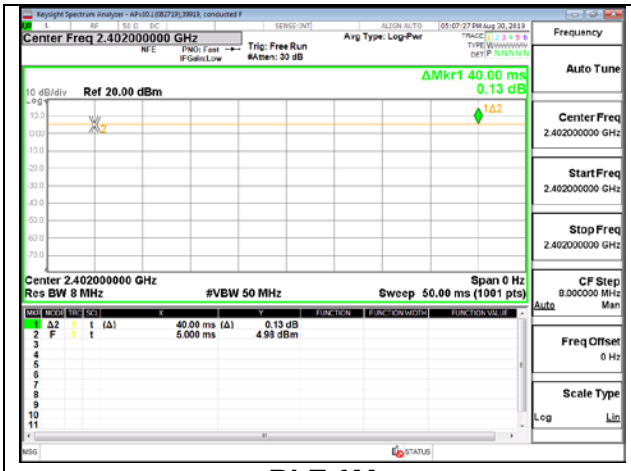
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

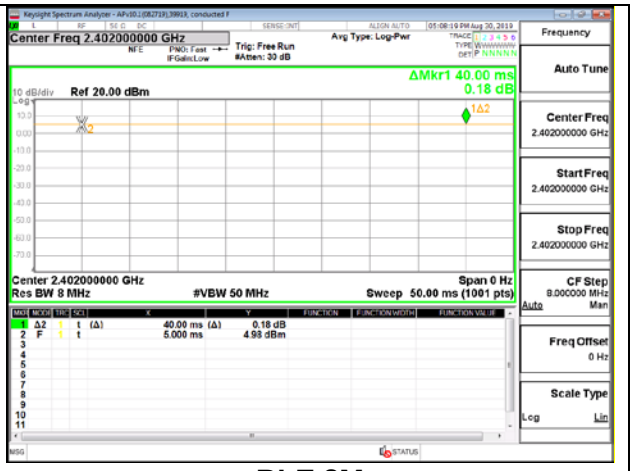
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
BLE 1M	40.00	40.00	1.00	100.00%	0.00	0.010
BLE 2M	40.00	40.00	1.00	100.00%	0.00	0.010

DUTY CYCLE PLOTS



BLE 1M



BLE 2M

8.2. 99% BANDWIDTH

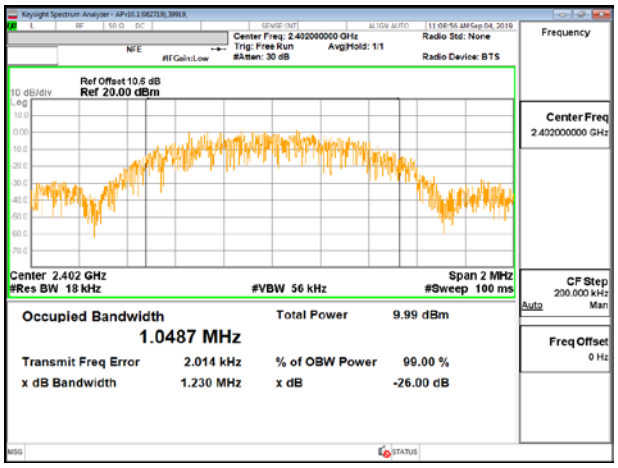
LIMITS

None; for reporting purposes only.

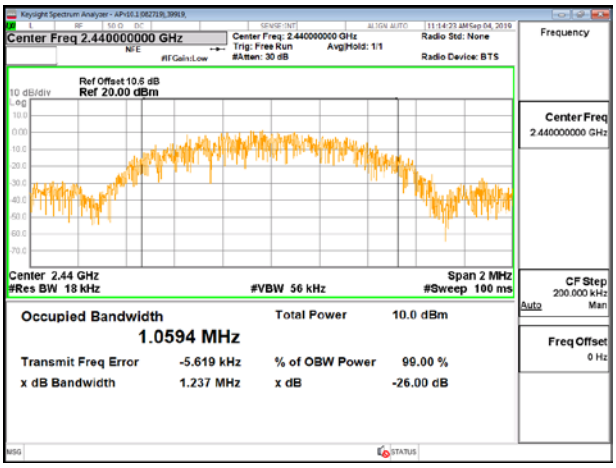
RESULTS

8.2.1. BLE (1Mbps)

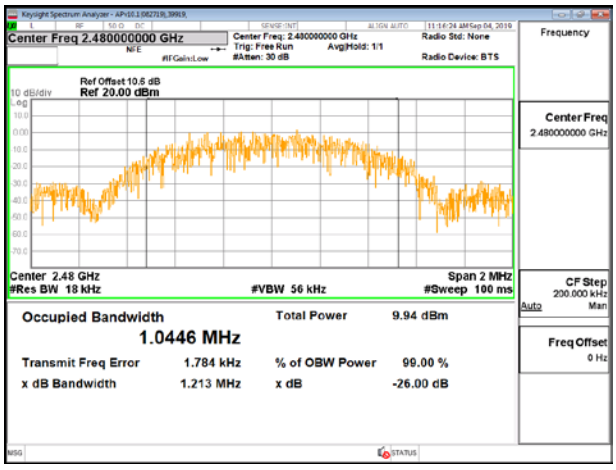
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0487
Middle	2440	1.0594
High	2480	1.0446



LOW CHANNEL



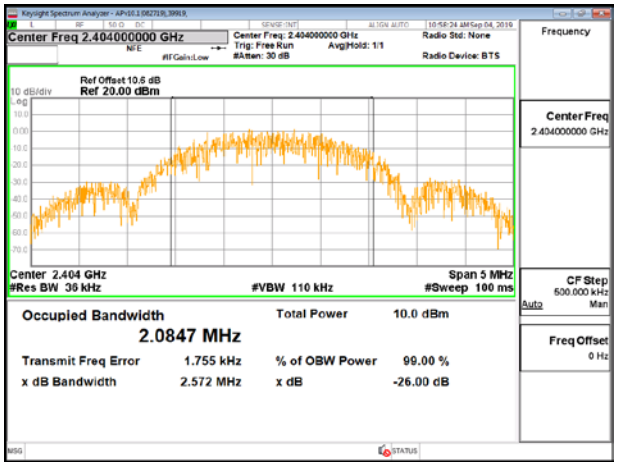
MID CHANNEL



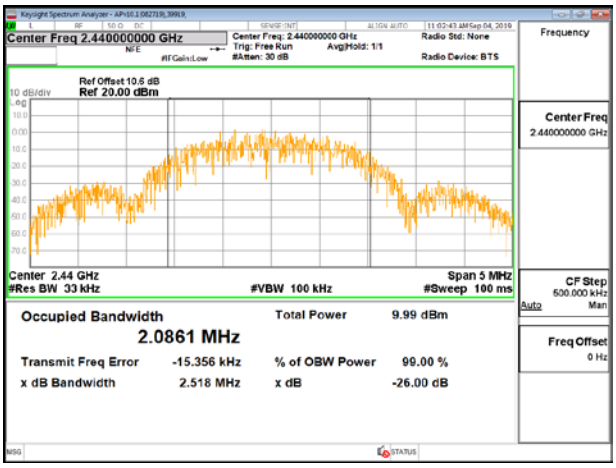
HIGH CHANNEL

8.2.2. BLE (2Mbps)

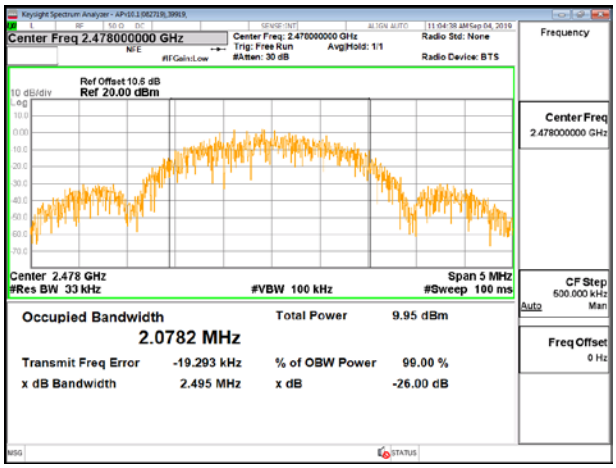
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	2.0847
Middle	2440	2.0861
High	2478	2.0782



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

RESULTS

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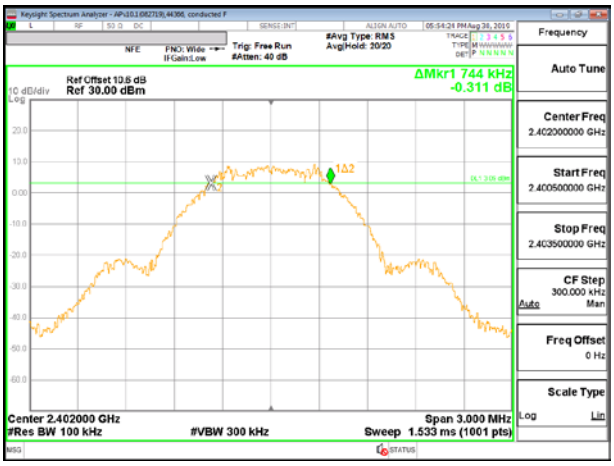
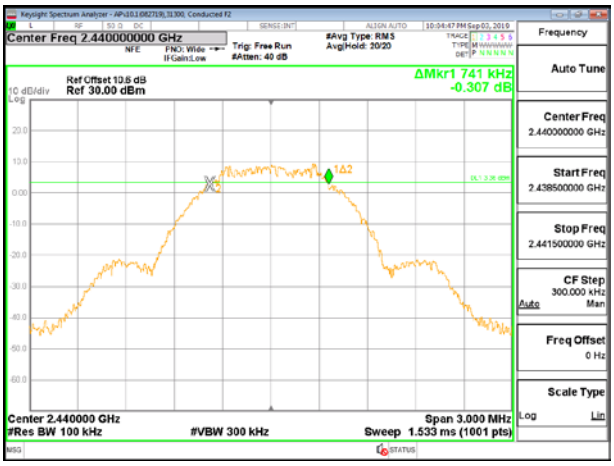
8.3.1. BLE (1Mbps)

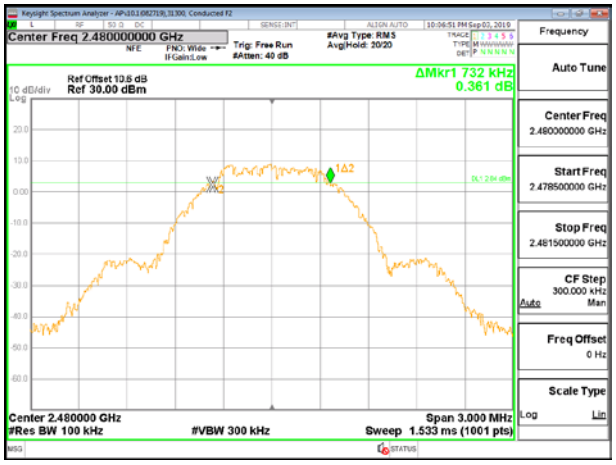
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7440	0.5
Middle	2440	0.7410	0.5
High	2480	0.7320	0.5



LOW CHANNEL



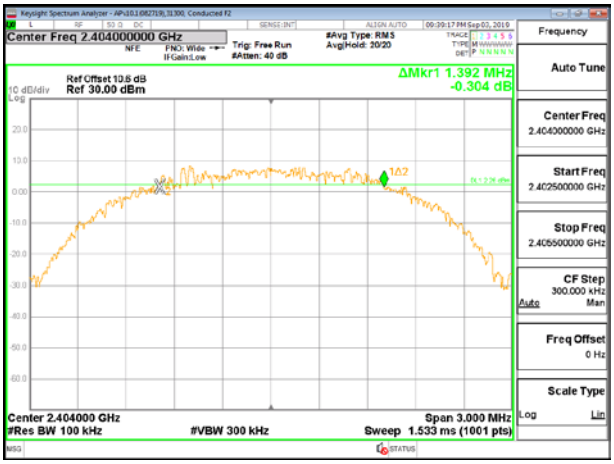
MID CHANNEL



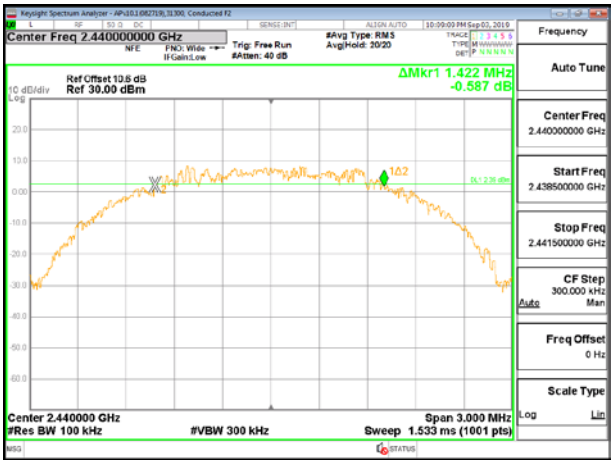
HIGH CHANNEL

8.3.2. BLE (2Mbps)

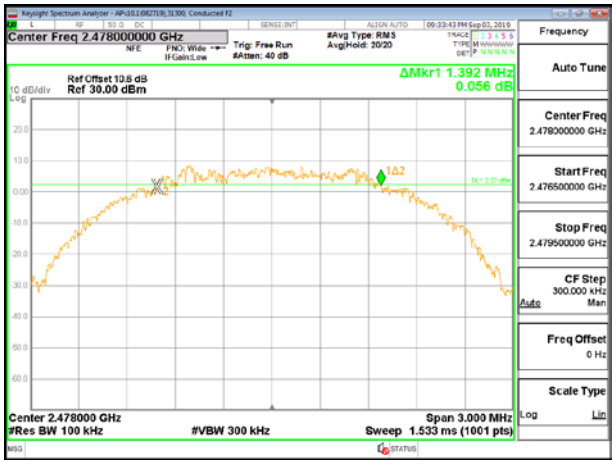
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2404	1.3920	0.5
Middle	2440	1.4220	0.5
High	2478	1.3920	0.5



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

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 10.6 dB (including 10 dB pad and 0.6 dB cable) was entered as an offset in the power meter to allow for a gated peak reading of power.

RESULTS

8.4.1. BLE (1Mbps)

Tested By:	44366
Date:	9/4/2019

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.04	30	-19.960
Middle	2440	9.91	30	-20.090
High	2480	9.80	30	-20.200

8.4.2. BLE (2Mbps)

Tested By:	44366
Date:	9/4/2019

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	9.97	30	-20.030
Middle	2440	9.90	30	-20.100
High	2478	9.80	30	-20.200

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8.5. 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 10.6 dB (including 10 dB pad and 0.6 dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

RESULTS

8.5.1. BLE (1Mbps)

Tested By:	44366
Date:	9/4/2019

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	9.96
Middle	2440	9.84
High	2480	9.73

8.5.2. BLE (2Mbps)

Tested By:	44366
Date:	9/4/2019

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	9.88
Middle	2440	9.81
High	2478	9.72

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8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

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

UL VERIFICATION SERVICES INC.
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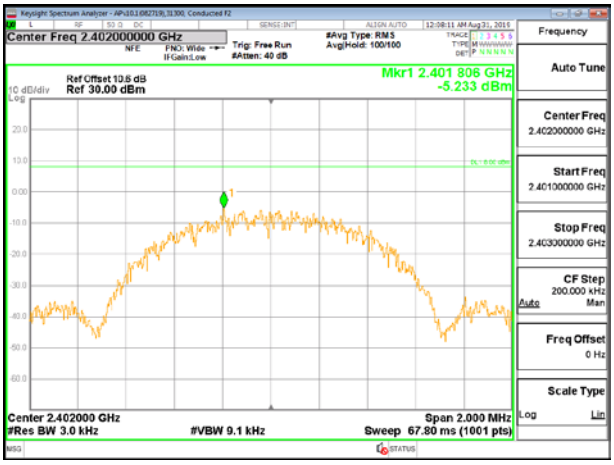
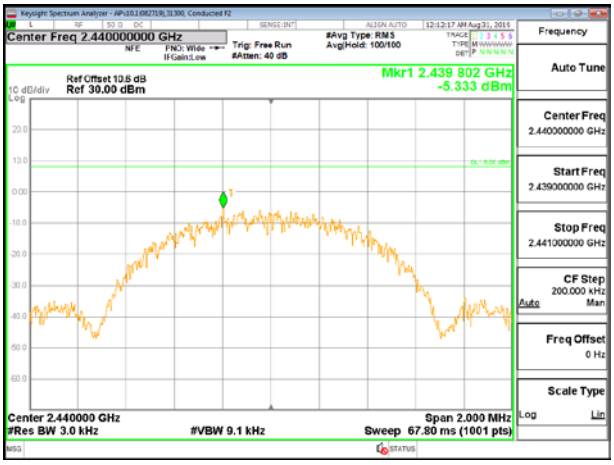
8.6.1. BLE (1Mbps)

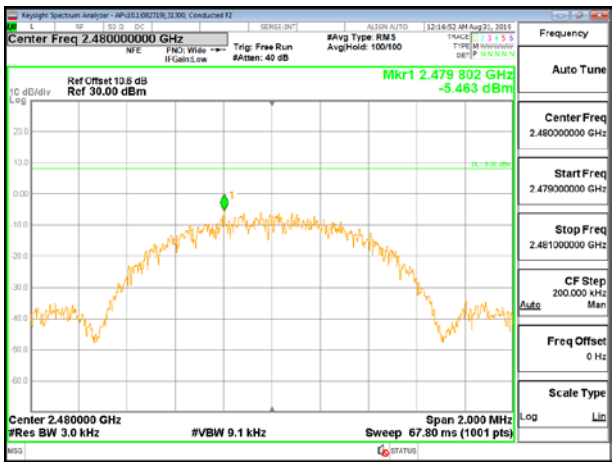
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-5.23	8	-13.23
Middle	2440	-5.33	8	-13.33
High	2480	-5.46	8	-13.46



LOW CHANNEL



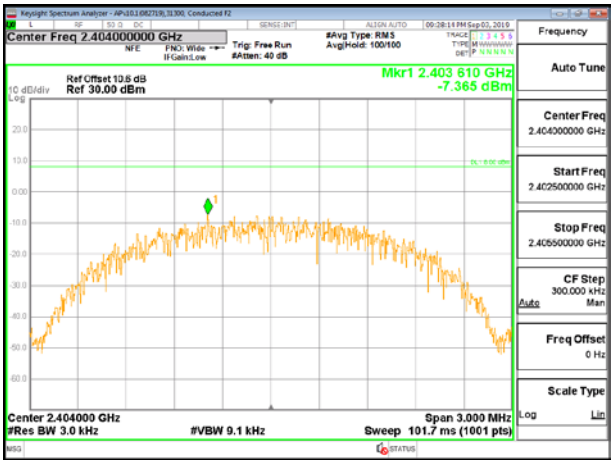
MID CHANNEL



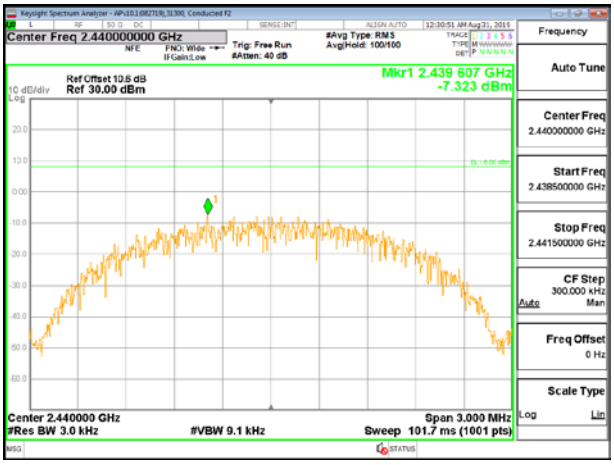
HIGH CHANNEL

8.6.2. BLE (2Mbps)

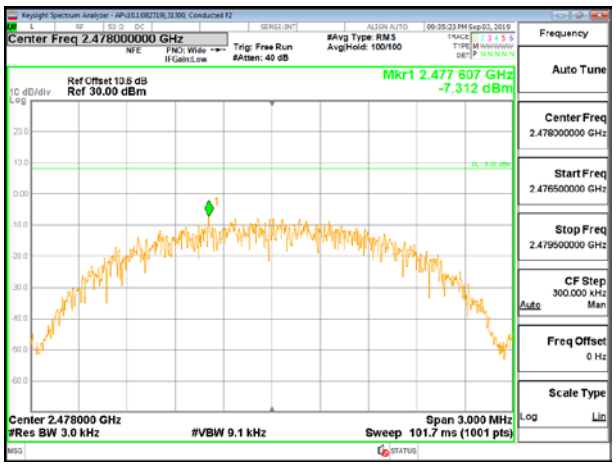
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-7.37	8	-15.37
Middle	2440	-7.32	8	-15.32
High	2478	-7.31	8	-15.31



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

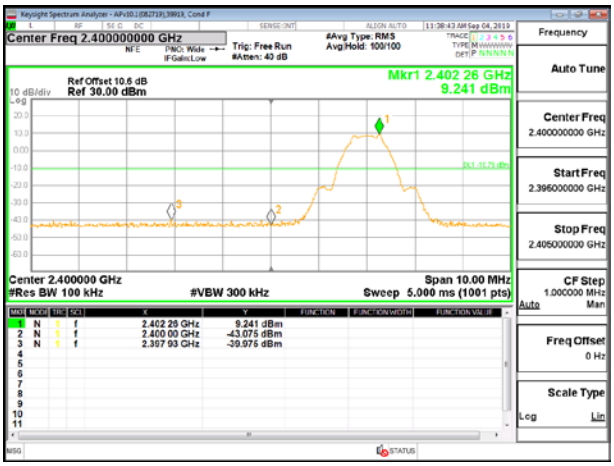
FCC §15.247 (d)

RSS-247 5.5

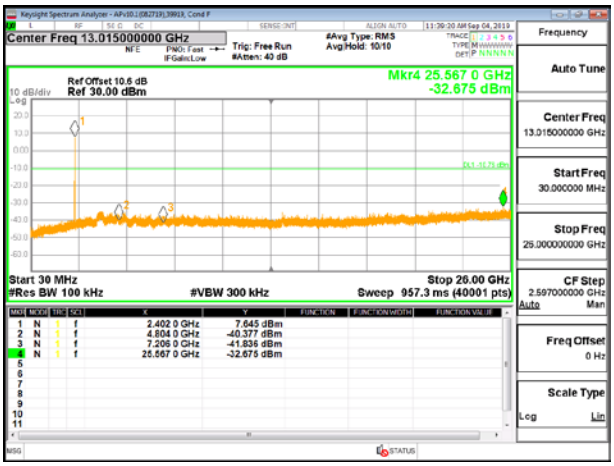
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS

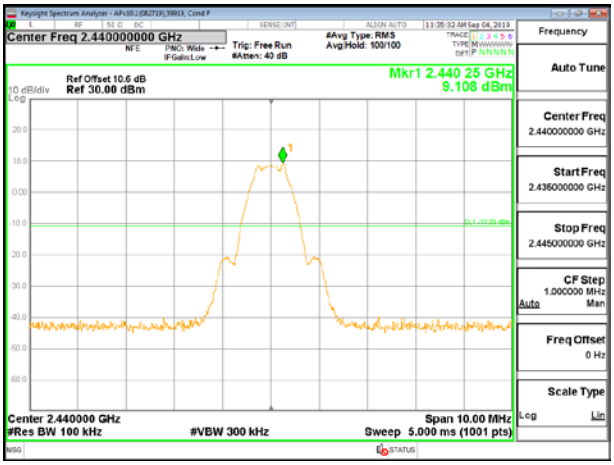
8.7.1. BLE (1Mbps)



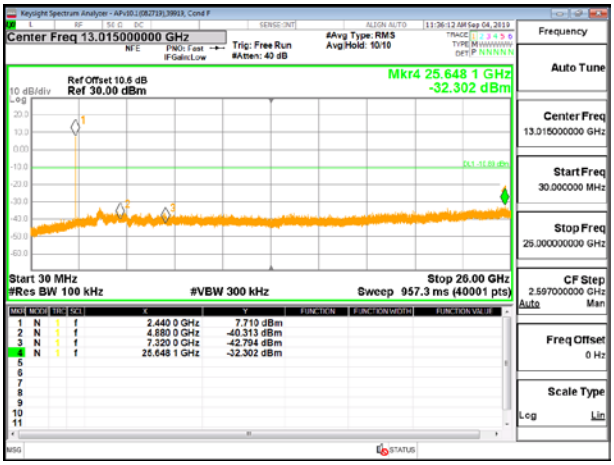
LOW CHANNEL BANDEDGE



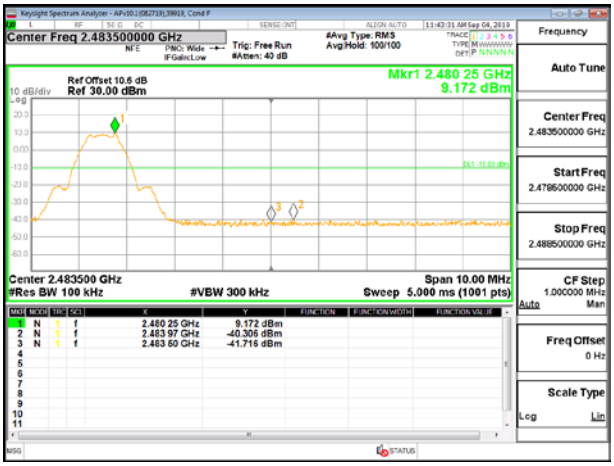
OUT-OF-BAND LOW CHANNEL



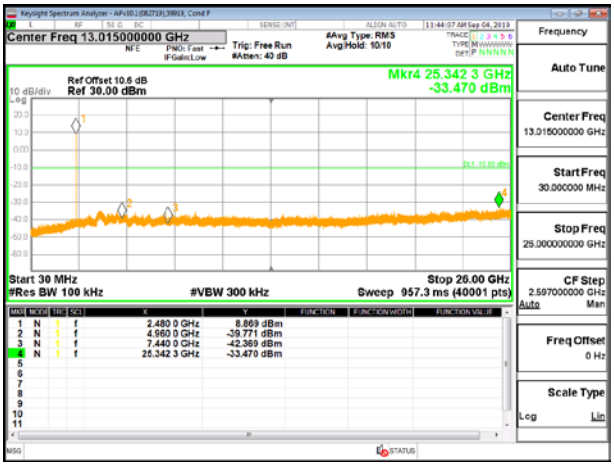
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

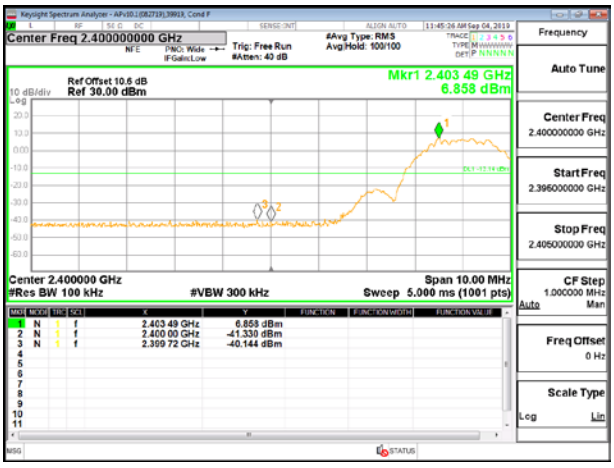


HIGH CHANNEL BANDEDGE

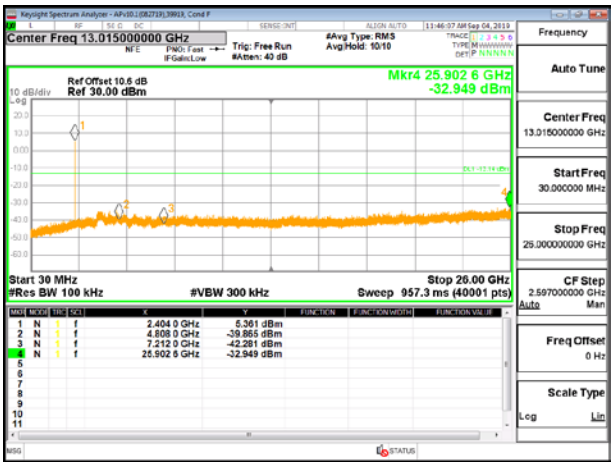


OUT-OF-BAND HIGH CHANNEL

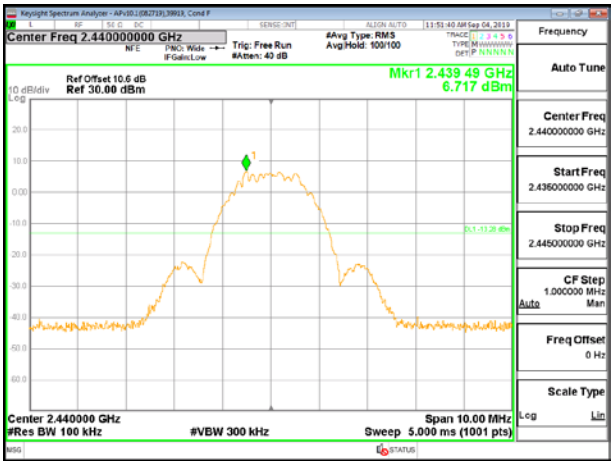
8.7.2. BLE (2Mbps)



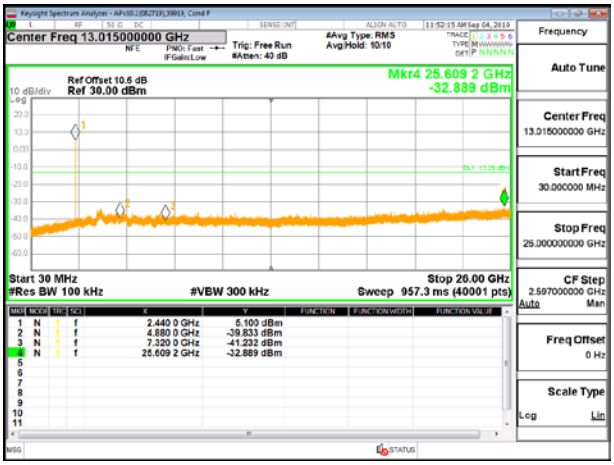
LOW CHANNEL BANDEDGE



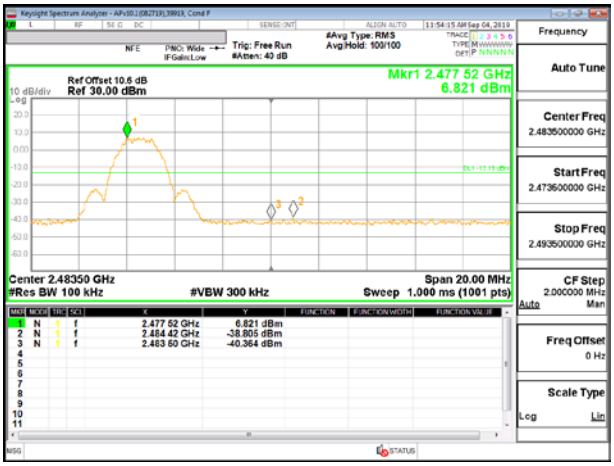
OUT-OF-BAND LOW CHANNEL



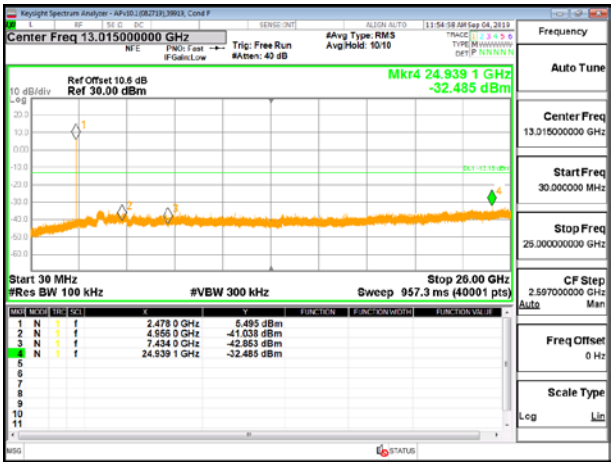
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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.

For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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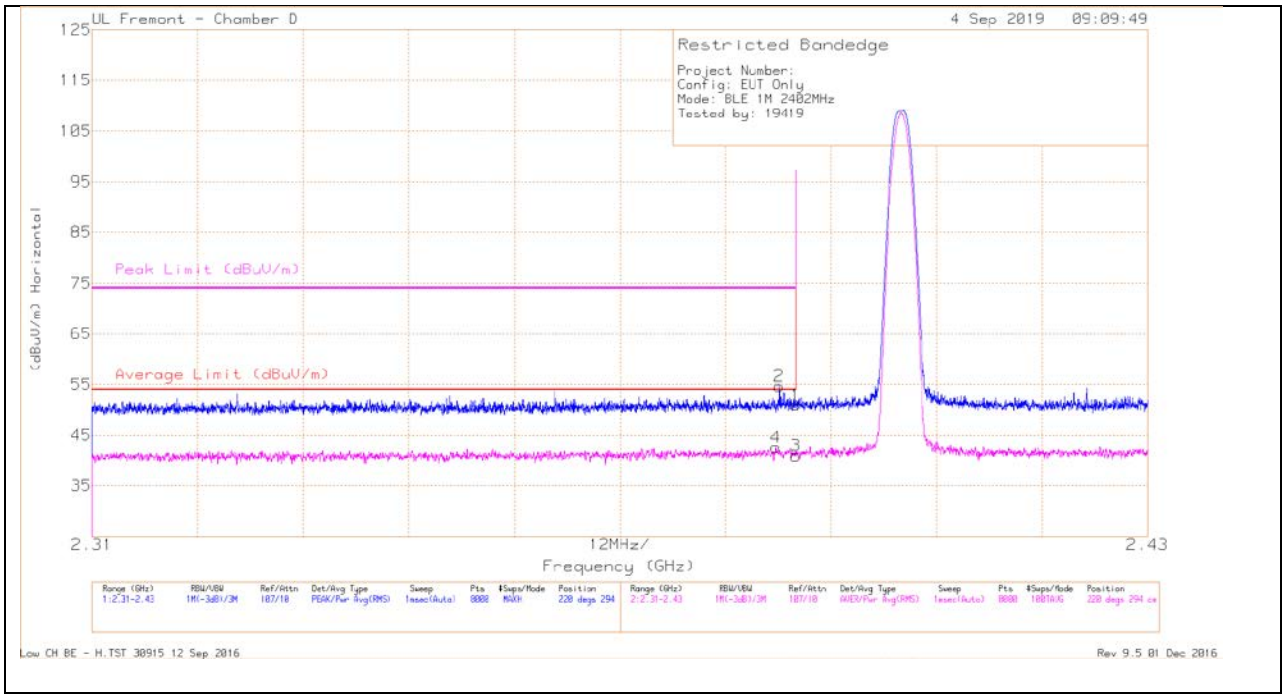
9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BLE (1Mbps)

BANDEDGE (LOW CHANNEL)

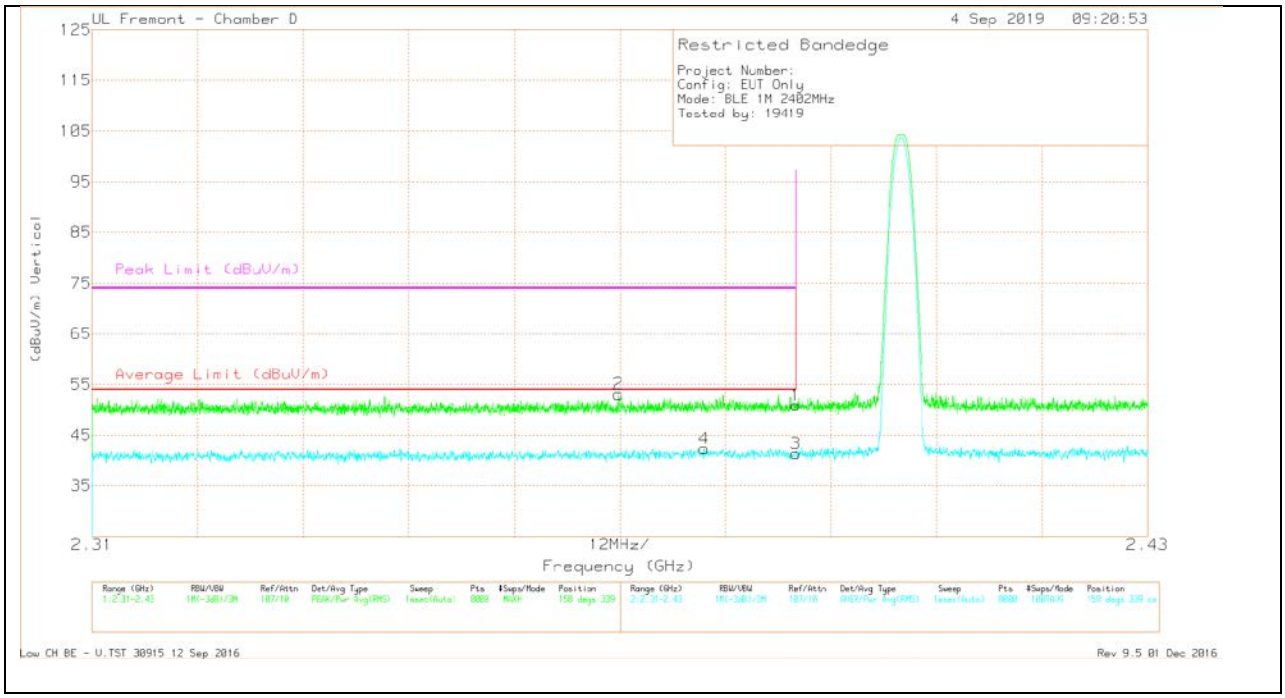
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.41	Pk	32	-20.5	50.91	-	-	74	-23.09	220	294	H
2	* 2.388	43.26	Pk	32	-20.6	54.66	-	-	74	-19.34	220	294	H
3	* 2.39	29.42	RMS	32	-20.5	40.92	54	-13.08	-	-	220	294	H
4	* 2.388	31.19	RMS	32	-20.6	42.59	54	-11.41	-	-	220	294	H

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

VERTICAL RESULT

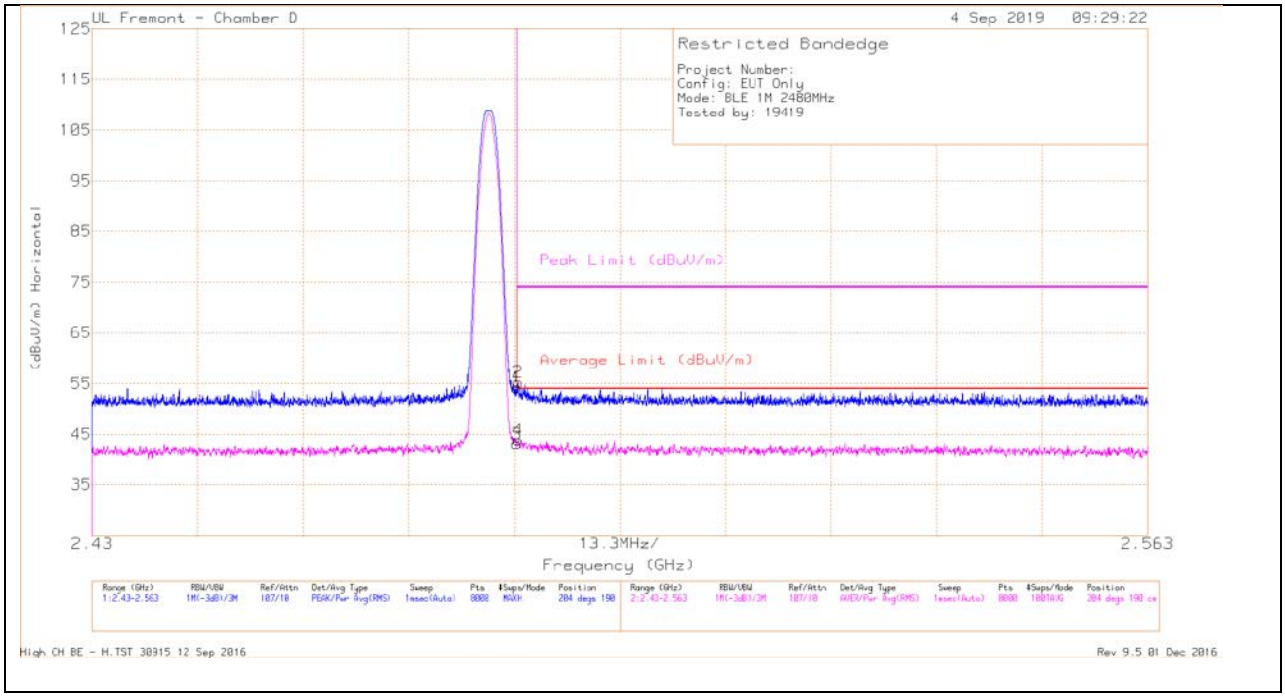


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.38	Pk	32	-20.5	50.88	-	-	74	-23.12	158	339	V
2	* 2.37	41.79	Pk	31.9	-20.6	53.09	-	-	74	-20.91	158	339	V
3	* 2.39	29.9	RMS	32	-20.5	41.4	54	-12.6	-	-	158	339	V
4	* 2.38	30.9	RMS	31.9	-20.5	42.3	54	-11.7	-	-	158	339	V

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

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.35	Pk	32.4	-20.5	54.25	-	-	74	-19.75	204	190	H
2	* 2.484	43.33	Pk	32.4	-20.5	55.23	-	-	74	-18.77	204	190	H
3	* 2.484	31.15	RMS	32.4	-20.5	43.05	54	-10.95	-	-	204	190	H
4	* 2.484	31.91	RMS	32.4	-20.5	43.81	54	-10.19	-	-	204	190	H

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

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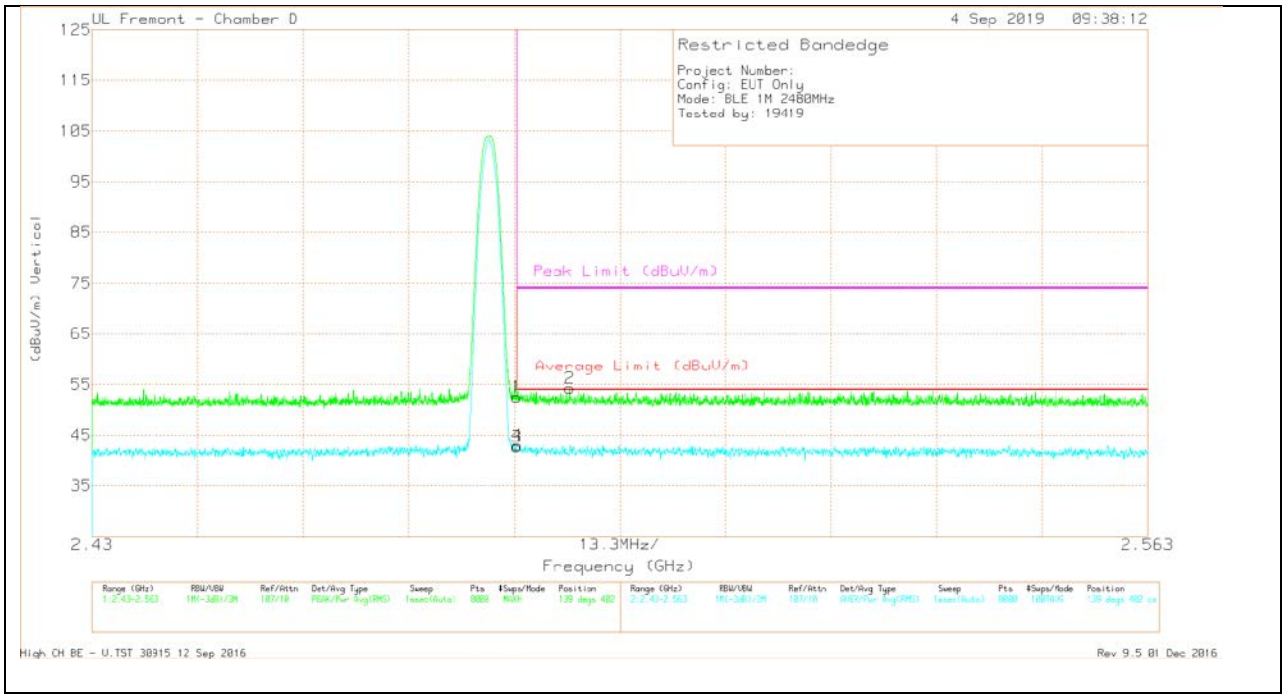
VERTICAL RESULT

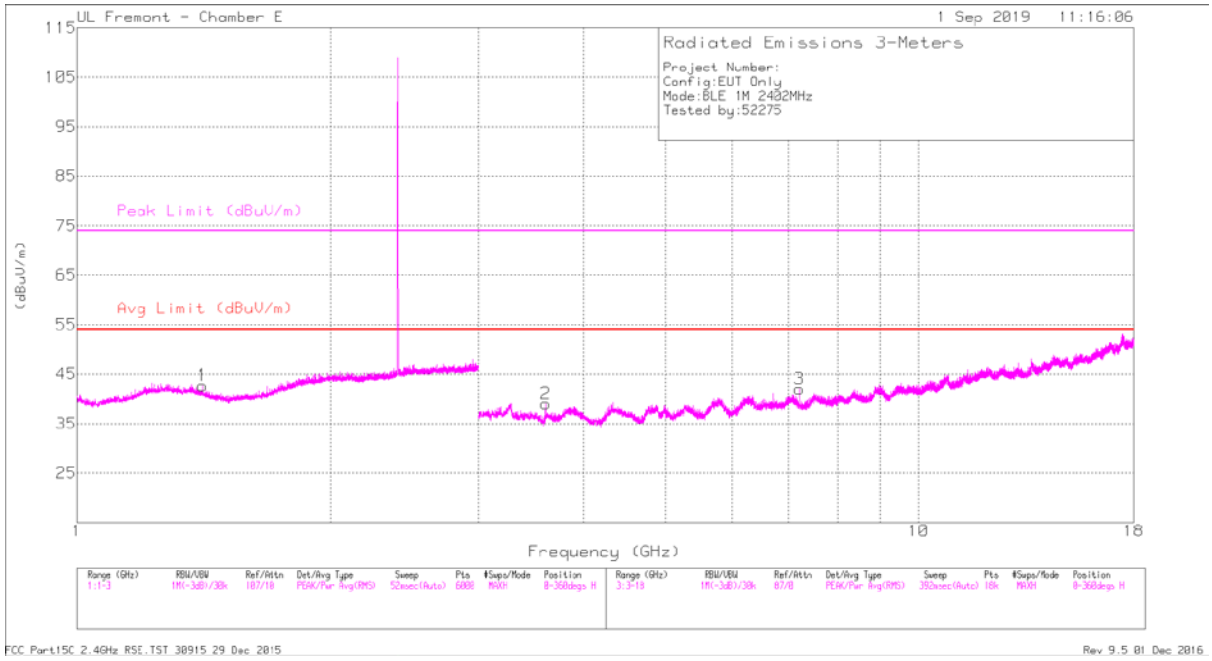


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.57	Pk	32.4	-20.5	52.47	-	-	74	-21.53	139	402	V
2	* 2.49	42.41	Pk	32.3	-20.4	54.31	-	-	74	-19.69	139	402	V
3	* 2.484	30.82	RMS	32.4	-20.5	42.72	54	-11.28	-	-	139	402	V
4	* 2.484	31.03	RMS	32.4	-20.5	42.93	54	-11.07	-	-	139	402	V

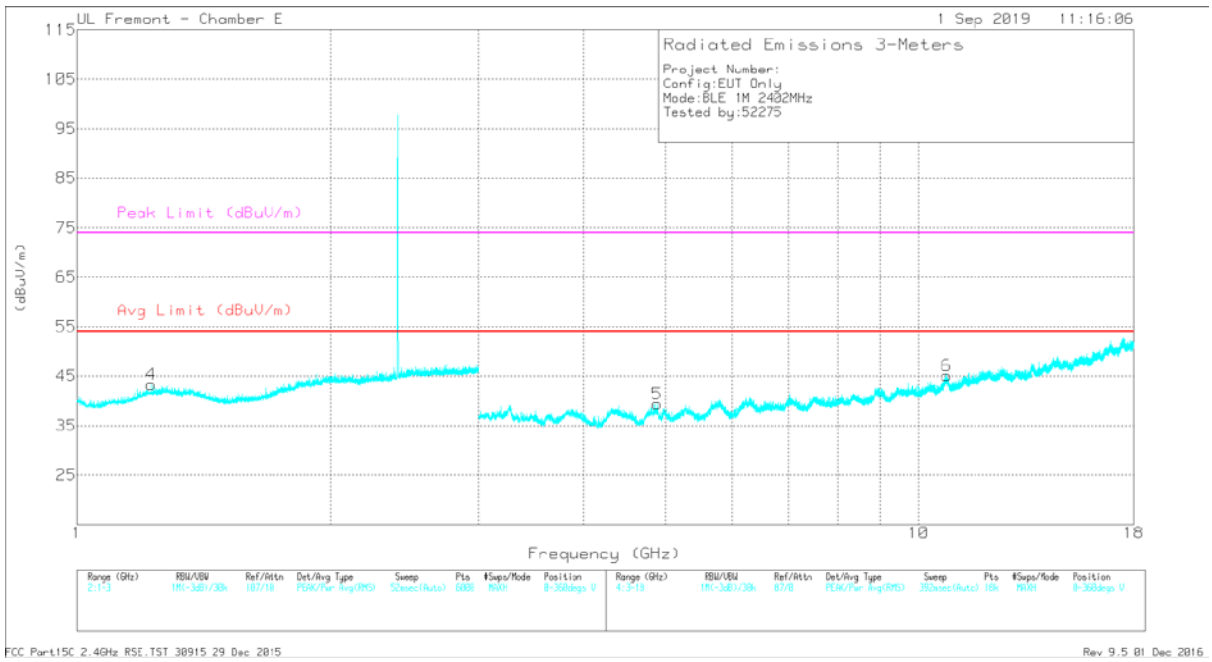
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.406	45.05	PK2	29	-26.2	47.85	-	-	74	-26.15	296	164	H
	* 1.405	32.83	MAv1	29	-26.2	35.63	54	-18.37	-	-	296	164	H
2	* 3.604	42.41	PK2	33.2	-32.9	42.71	-	-	74	-31.29	117	245	H
	* 3.603	31.27	MAv1	33.2	-32.9	31.57	54	-22.43	-	-	117	245	H
3	7.205	40.01	PK2	35.6	-28.1	47.51	-	-	-	-	226	266	H
4	* 1.224	44.11	PK2	29.8	-26.1	47.81	-	-	74	-26.19	335	357	V
	* 1.226	32.61	MAv1	29.8	-26.1	36.31	54	-17.69	-	-	335	357	V
5	* 4.889	40.71	PK2	33.9	-30	44.61	-	-	74	-29.39	230	326	V
	* 4.889	29	MAv1	33.9	-30	32.9	54	-21.1	-	-	230	326	V
6	* 10.791	36.12	PK2	37.9	-23	51.02	-	-	74	-22.98	152	246	V
	* 10.791	24.18	MAv1	37.9	-23	39.08	54	-14.92	-	-	152	246	V

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

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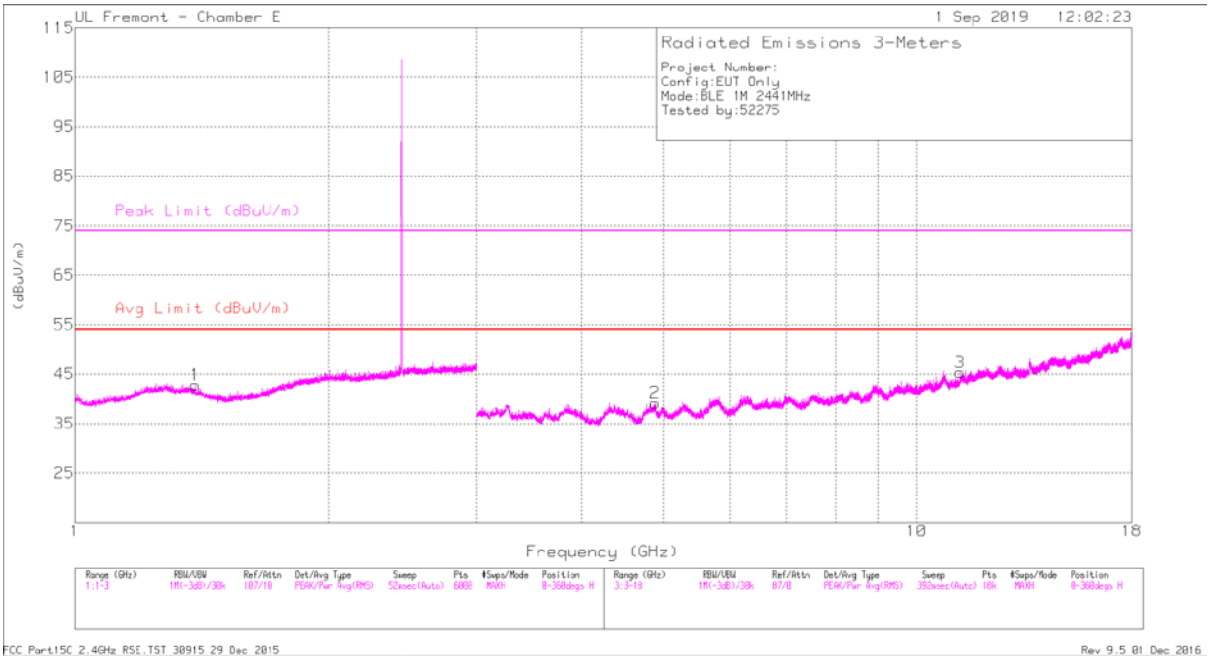
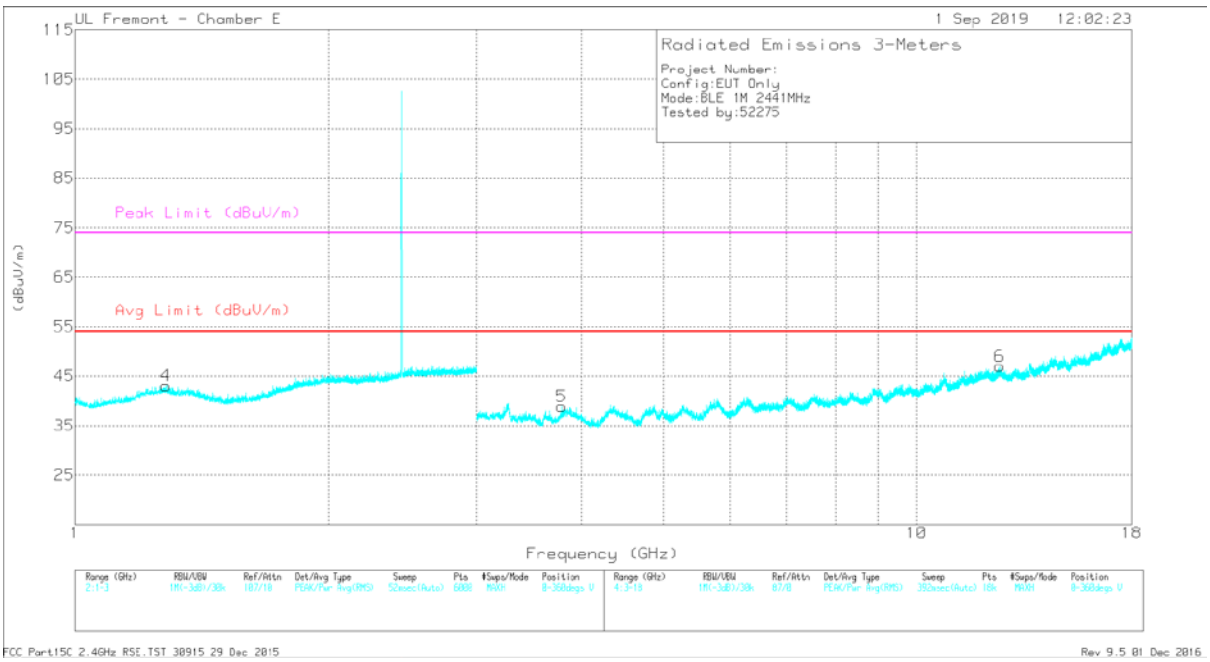
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.39	44.34	PK2	29.2	-26.2	47.34	-	-	74	-26.66	206	183	H
	* 1.387	32.83	MAv1	29.4	-26.3	35.93	54	-18.07	-	-	206	183	H
2	* 4.887	41.05	PK2	33.9	-30	44.95	-	-	74	-29.05	167	228	H
	* 4.885	29.25	MAv1	33.9	-30	33.15	54	-20.85	-	-	167	228	H
3	* 11.254	34.91	PK2	38	-22.9	50.01	-	-	74	-23.99	316	314	H
	* 11.253	23.34	MAv1	38	-22.9	38.44	54	-15.56	-	-	316	314	H
4	* 1.279	44.58	PK2	30.2	-26.2	48.58	-	-	74	-25.42	256	334	V
	* 1.279	32.74	MAv1	30.2	-26.2	36.74	54	-17.26	-	-	256	334	V
5	* 3.783	42.84	PK2	33.3	-32.1	44.04	-	-	74	-29.96	147	275	V
	* 3.783	30.82	MAv1	33.3	-32.1	32.02	54	-21.98	-	-	147	275	V
6	* 12.532	34.28	PK2	39.1	-21.1	52.28	-	-	74	-21.72	313	326	V
	* 12.534	22.7	MAv1	39.1	-21.1	40.7	54	-13.3	-	-	313	326	V

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

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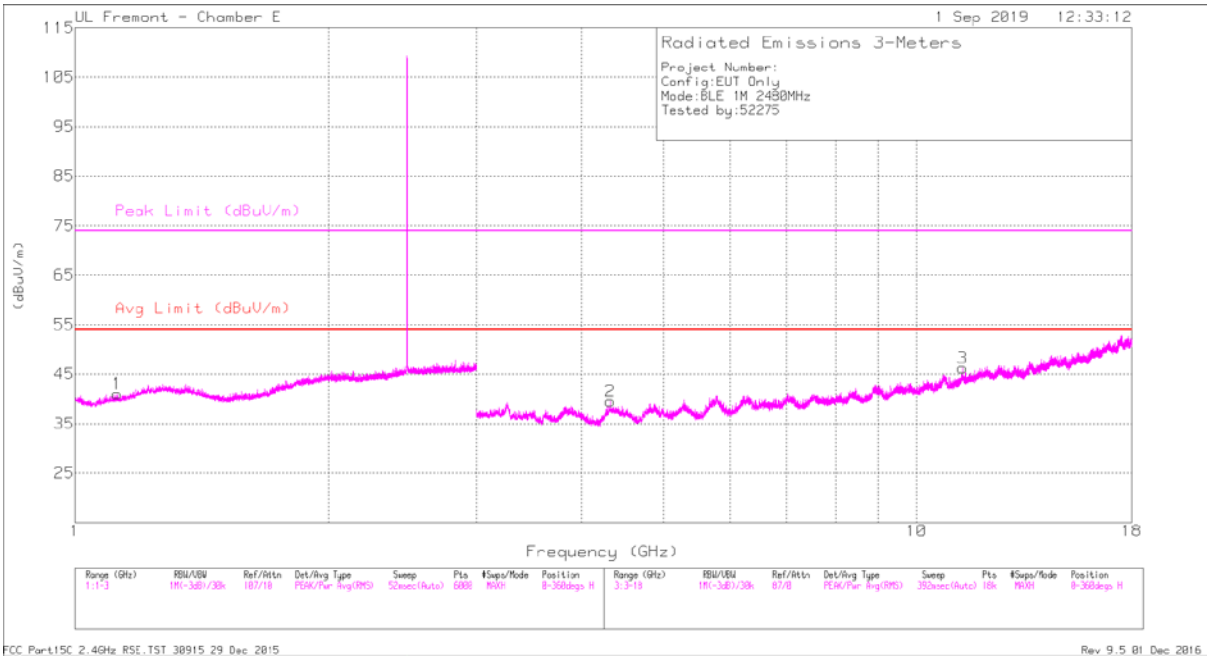
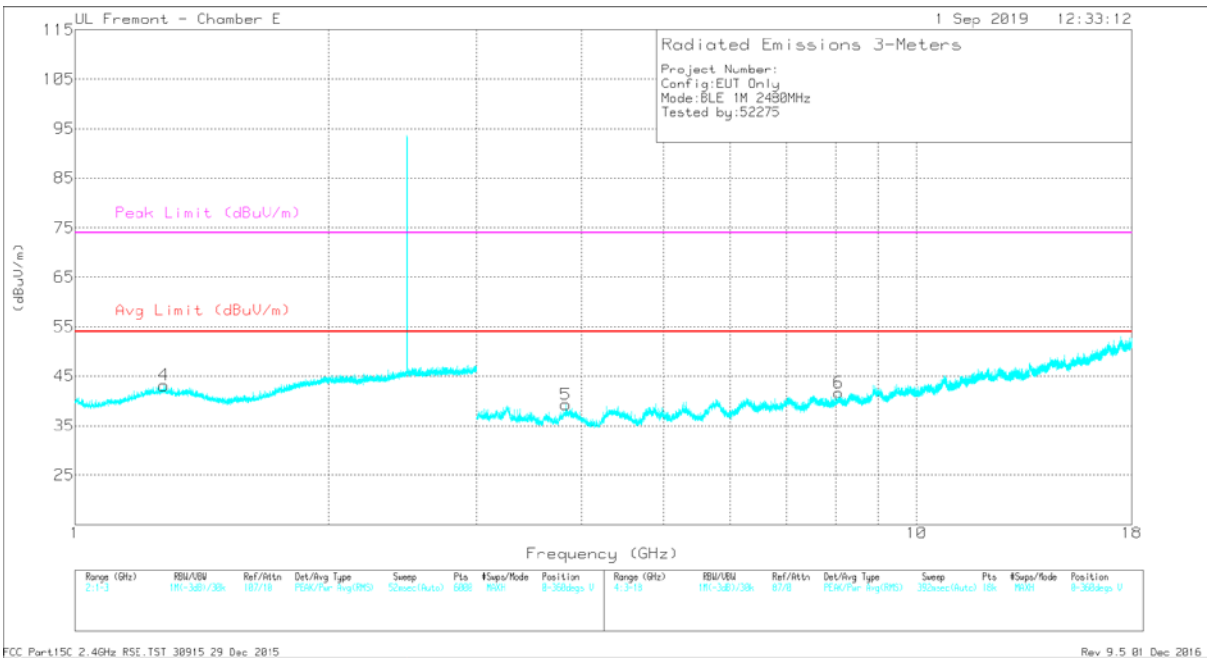
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.125	44.3	PK2	28	-26	46.3	-	-	74	-27.7	247	122	H
	* 1.124	32.47	MAv1	28	-26	34.47	54	-19.53	-	-	247	122	H
2	* 4.328	41.37	PK2	33.6	-30	44.97	-	-	74	-29.03	102	282	H
	* 4.327	29.4	MAv1	33.6	-30	33	54	-21	-	-	102	282	H
3	* 11.325	35.44	PK2	38.1	-22.2	51.34	-	-	74	-22.66	336	349	H
	* 11.326	23.17	MAv1	38.1	-22.2	39.07	54	-14.93	-	-	336	349	H
4	* 1.277	44.19	PK2	30.2	-26.2	48.19	-	-	74	-25.81	117	234	V
	* 1.276	32.76	MAv1	30.2	-26.2	36.76	54	-17.24	-	-	117	234	V
5	* 3.826	42.32	PK2	33.4	-30.9	44.82	-	-	74	-29.18	288	336	V
	* 3.828	30.28	MAv1	33.4	-30.8	32.88	54	-21.12	-	-	288	336	V
6	* 8.079	37.05	PK2	35.8	-26.7	46.15	-	-	74	-27.85	261	233	V
	* 8.076	25.69	MAv1	35.9	-26.7	34.89	54	-19.11	-	-	261	233	V

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

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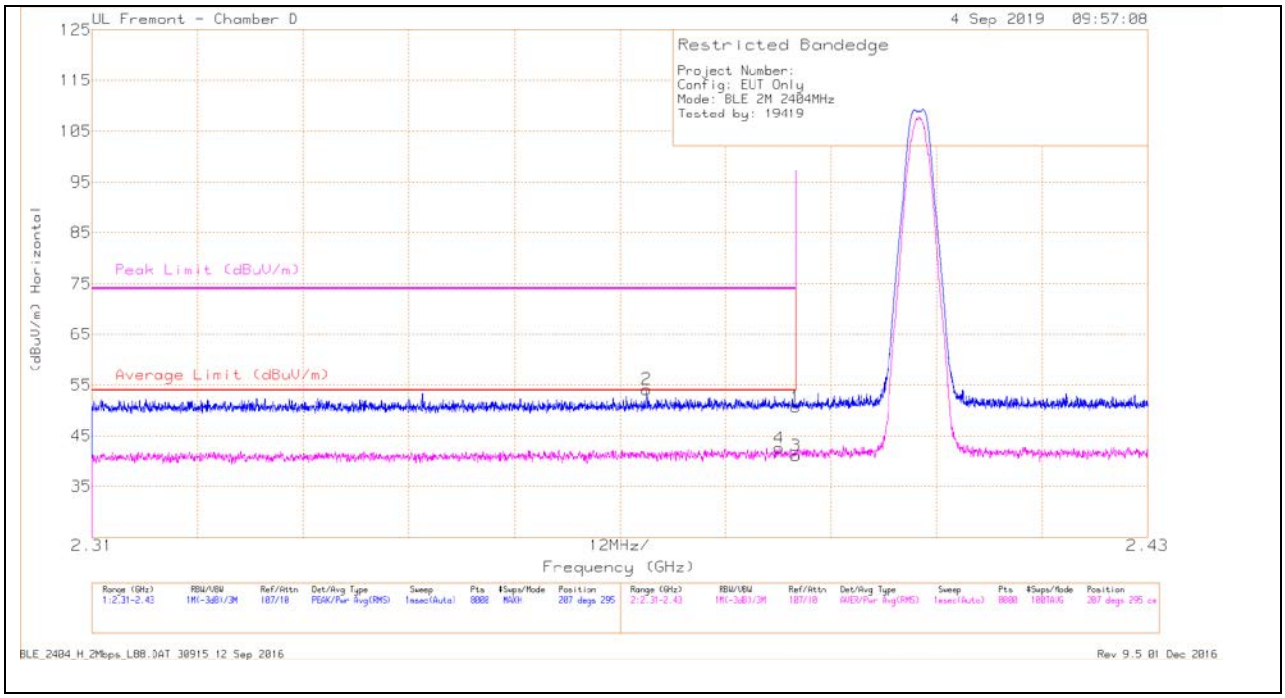
9.2.2. BLE (2Mbps)

BANDEDGE (LOW CHANNEL)

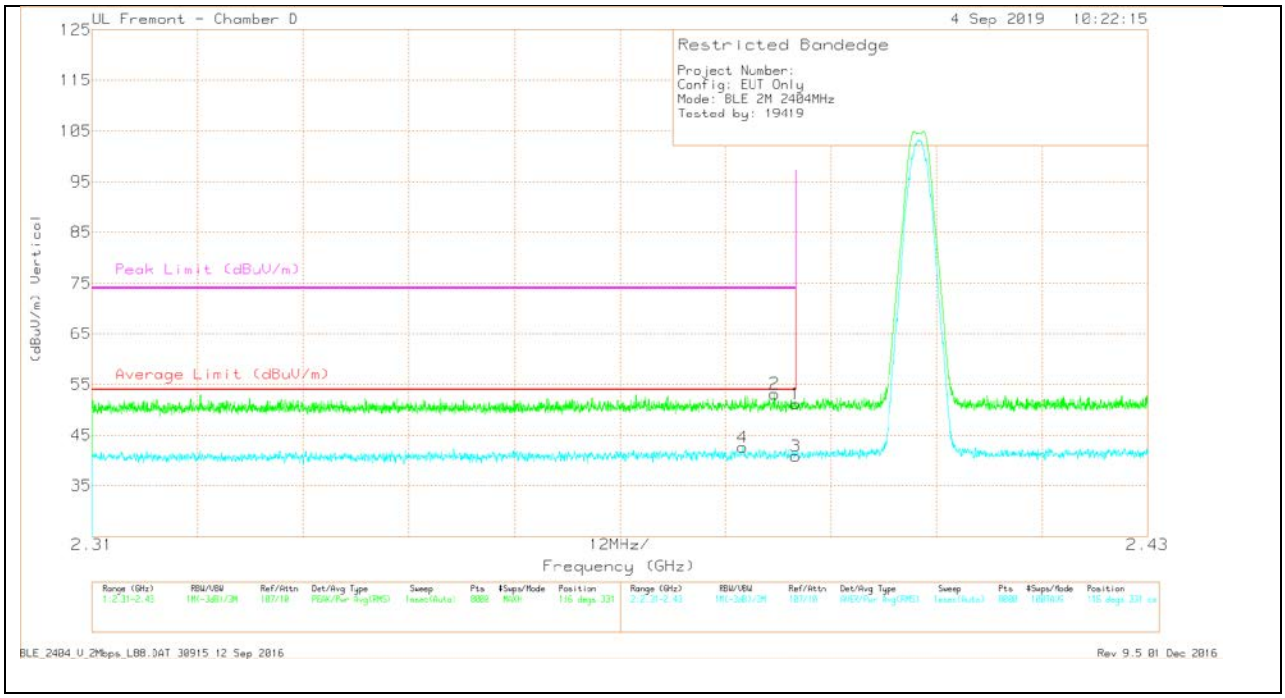
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.11	Pk	32	-20.5	50.61	-	-	74	-23.39	207	295	H
2	* 2.373	42.83	Pk	31.9	-20.6	54.13	-	-	74	-19.87	207	295	H
3	* 2.39	29.61	RMS	32	-20.5	41.11	54	-12.89	-	-	207	295	H
4	* 2.388	31.18	RMS	32	-20.6	42.58	54	-11.42	-	-	207	295	H

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

VERTICAL RESULT

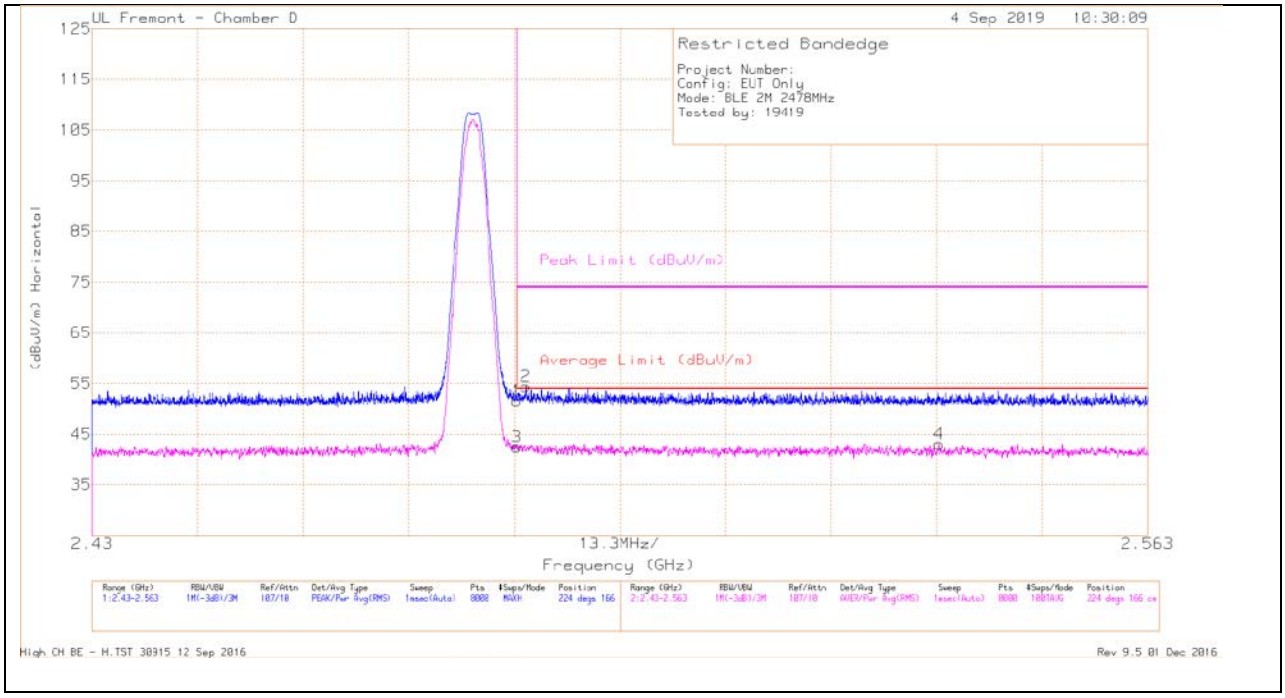


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.68	Pk	32	-20.5	51.18	-	-	74	-22.82	116	331	V
2	* 2.388	41.8	Pk	32	-20.6	53.2	-	-	74	-20.8	116	331	V
3	* 2.39	29.32	RMS	32	-20.5	40.82	54	-13.18	-	-	116	331	V
4	* 2.384	31.15	RMS	32	-20.6	42.55	54	-11.45	-	-	116	331	V

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

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.6	Pk	32.4	-20.5	51.5	-	-	74	-22.5	224	166	H
2	* 2.485	42.58	Pk	32.3	-20.5	54.38	-	-	74	-19.62	224	166	H
3	* 2.484	30.61	RMS	32.4	-20.5	42.51	54	-11.49	-	-	224	166	H
4	2.537	31.13	RMS	32.2	-20.3	43.03	54	-10.97	-	-	224	166	H

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

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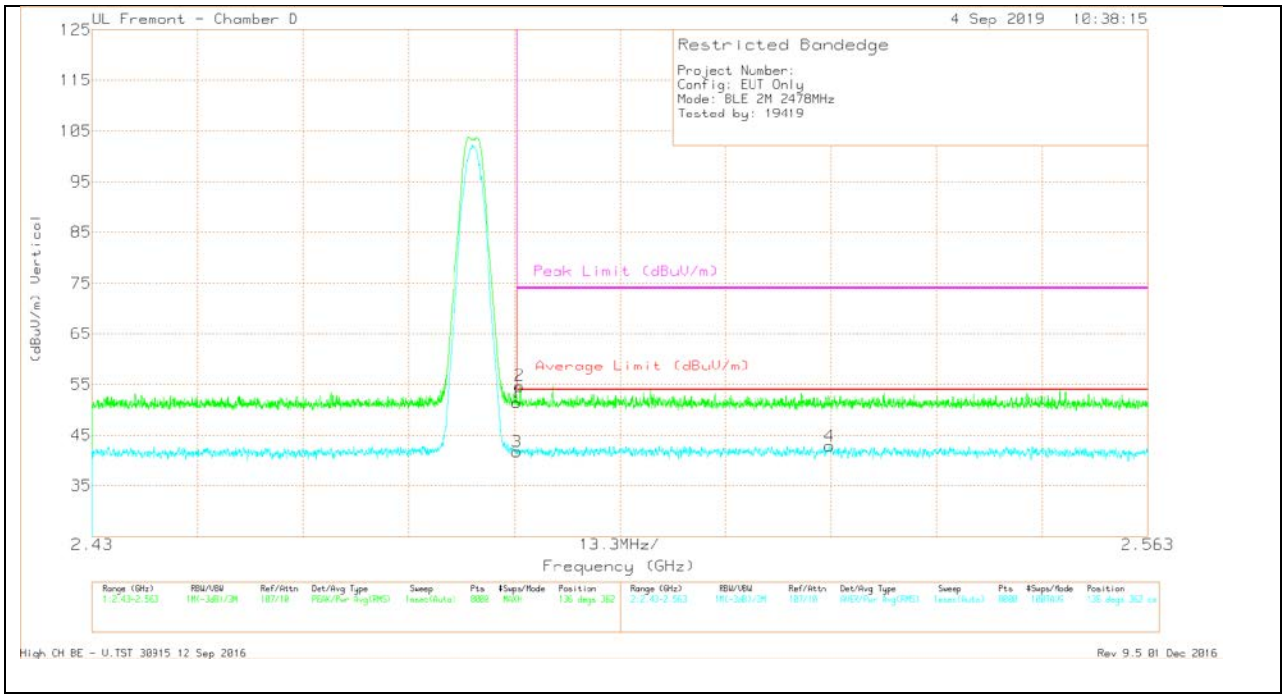
VERTICAL RESULT

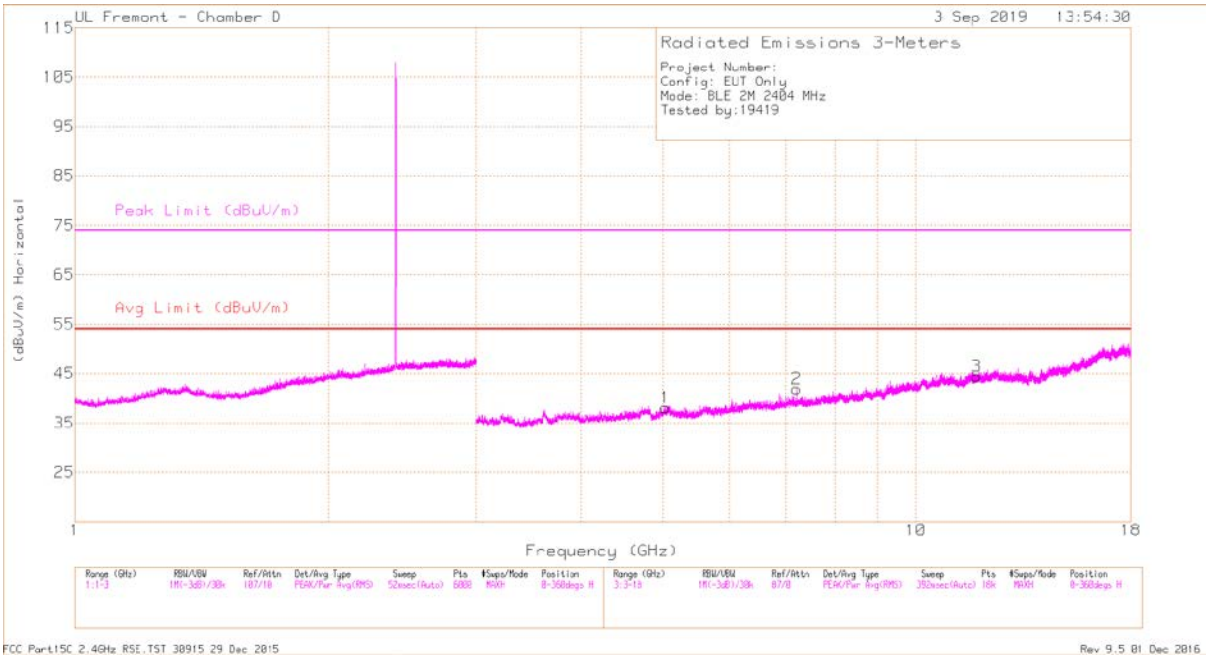


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.5	Pk	32.4	-20.5	51.4	-	-	74	-22.6	136	362	V
2	* 2.484	42.9	Pk	32.3	-20.5	54.7	-	-	74	-19.3	136	362	V
3	* 2.484	29.85	RMS	32.4	-20.5	41.75	54	-12.25	-	-	136	362	V
4	2.523	30.93	RMS	32.3	-20.4	42.83	54	-11.17	-	-	136	362	V

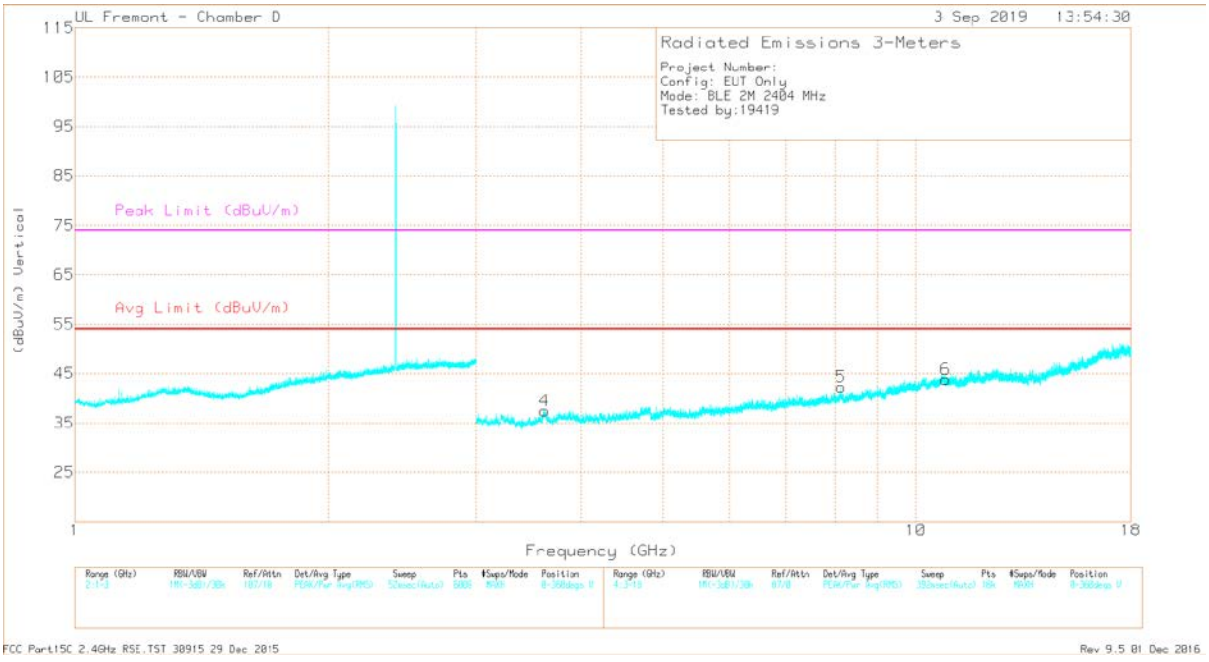
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.032	39.04	PK2	34	-26.5	46.54	-	-	74	-27.46	344	124	H
	* 5.032	26.73	MAv1	34	-26.5	34.23	54	-19.77	-	-	344	124	H
2	7.212	36.78	PK2	35.5	-25	47.28	-	-	-	-	298	233	H
3	* 11.814	34.18	PK2	38.5	-20.7	51.98	-	-	74	-22.02	265	175	H
	* 11.815	23.17	MAv1	38.5	-20.7	40.97	54	-13.03	-	-	265	175	H
4	* 3.619	39.17	PK2	33.5	-28.2	44.47	-	-	74	-29.53	220	144	V
	* 3.62	28.02	MAv1	33.5	-28.2	33.32	54	-20.68	-	-	220	144	V
5	* 8.143	35.09	PK2	35.7	-23	47.79	-	-	74	-26.21	189	118	V
	* 8.144	24.44	MAv1	35.8	-23	37.24	54	-16.76	-	-	189	118	V
6	* 10.865	34.72	PK2	37.9	-20.9	51.72	-	-	74	-22.28	156	169	V
	* 10.864	22.86	MAv1	37.9	-20.9	39.86	54	-14.14	-	-	156	169	V

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

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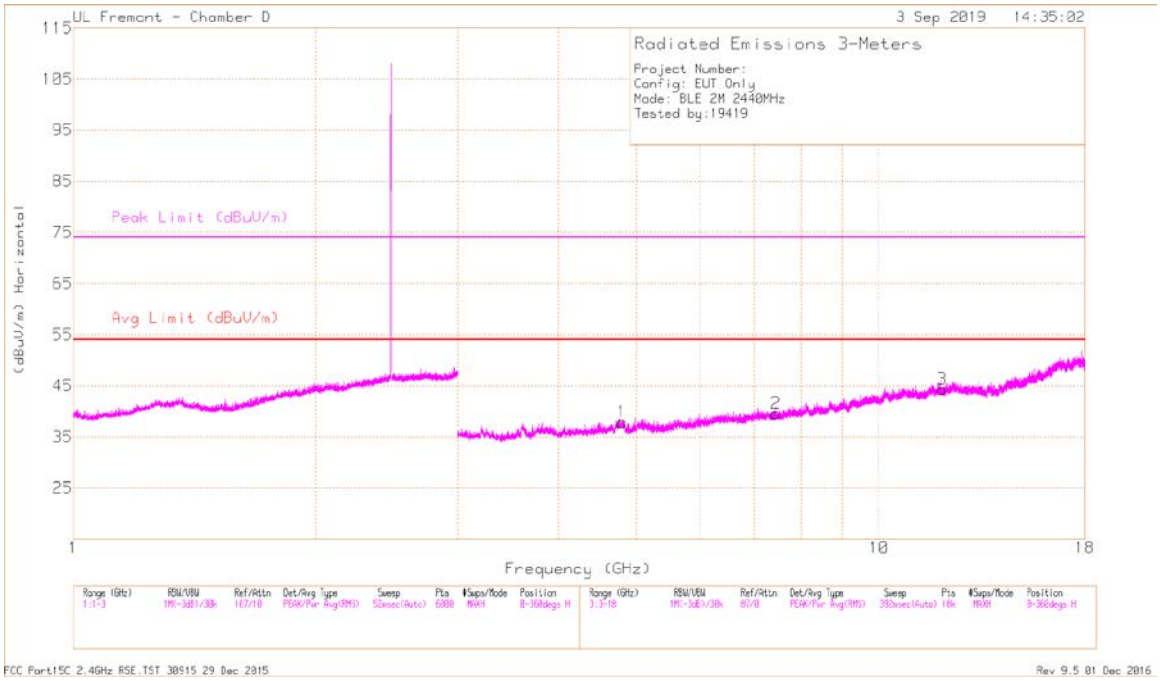
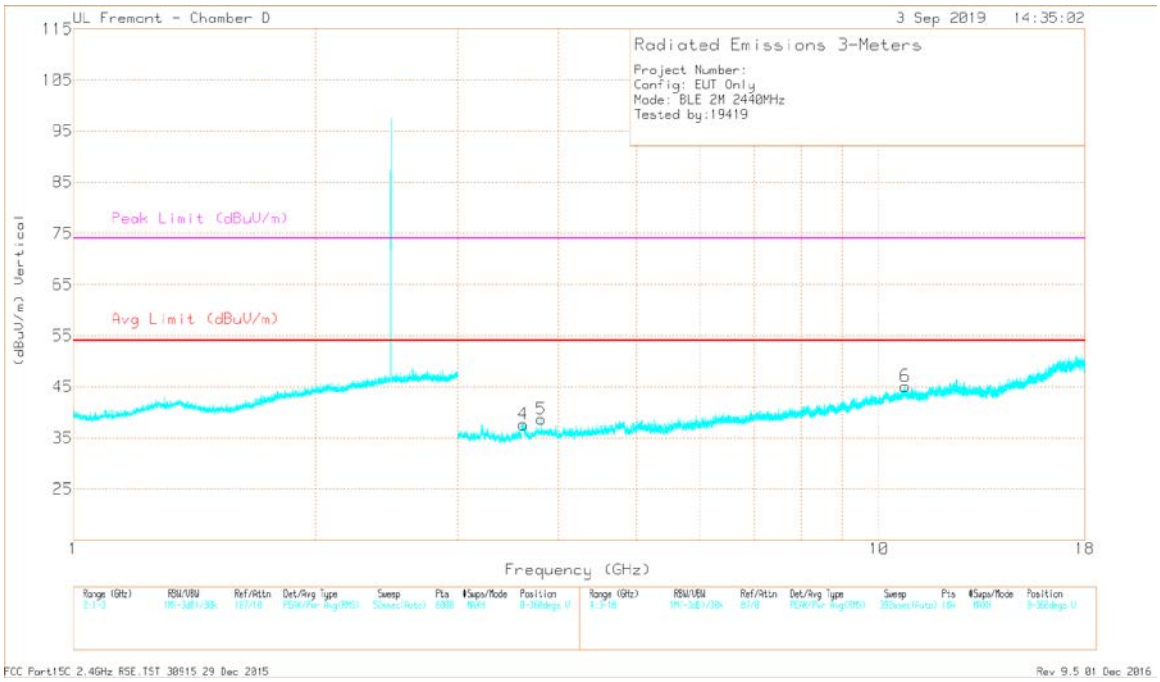
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.802	38.72	PK2	34.1	-26.9	45.92	-	-	74	-28.08	12	212	H
	* 4.799	27.5	MAv1	34.1	-26.9	34.7	54	-19.3	-	-	12	212	H
2	* 7.446	35.6	PK2	35.5	-24.6	46.5	-	-	74	-27.5	65	202	H
	* 7.448	24.61	MAv1	35.4	-24.6	35.41	54	-18.59	-	-	65	202	H
3	* 11.968	35.39	PK2	38.6	-21.6	52.39	-	-	74	-21.61	176	166	H
	* 11.97	23.41	MAv1	38.7	-21.6	40.51	54	-13.49	-	-	176	166	H
4	* 3.619	38.71	PK2	33.5	-28.2	44.01	-	-	74	-29.99	236	230	V
	* 3.62	27.96	MAv1	33.5	-28.2	33.26	54	-20.74	-	-	236	230	V
5	* 3.807	39	PK2	33.4	-28.1	44.3	-	-	74	-29.7	250	288	V
	* 3.811	28.19	MAv1	33.4	-28.1	33.49	54	-20.51	-	-	250	288	V
6	* 10.785	34.16	PK2	37.8	-20.3	51.66	-	-	74	-22.34	198	145	V
	* 10.786	22.92	MAv1	37.8	-20.3	40.42	54	-13.58	-	-	198	145	V

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

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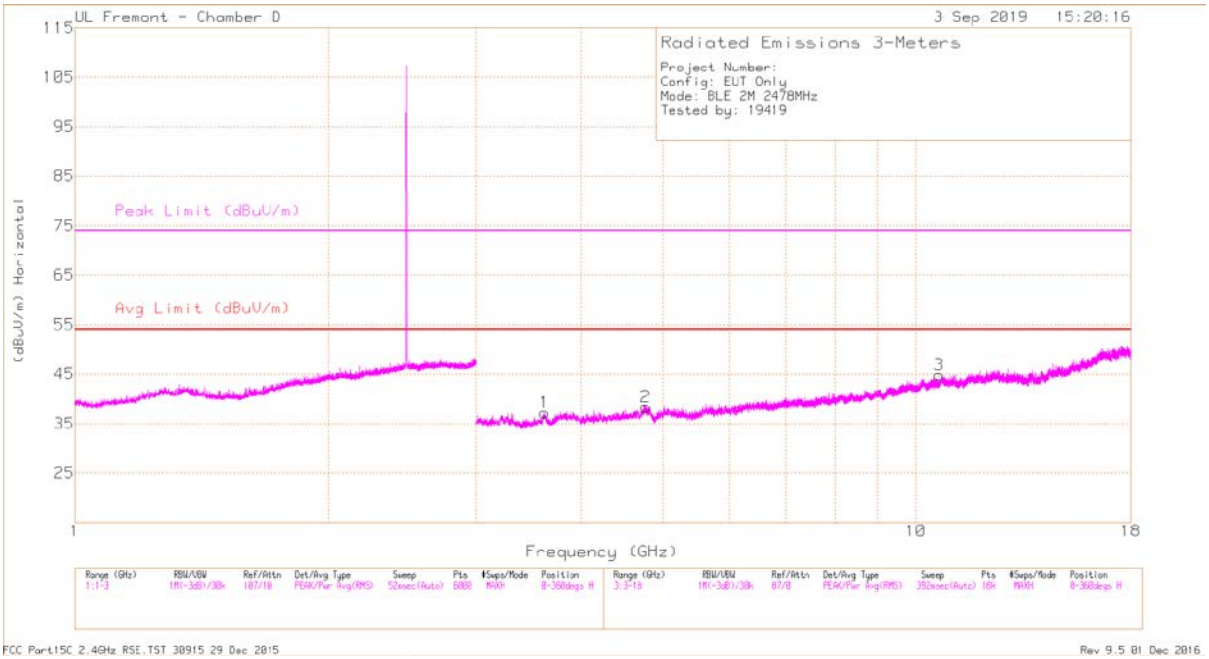
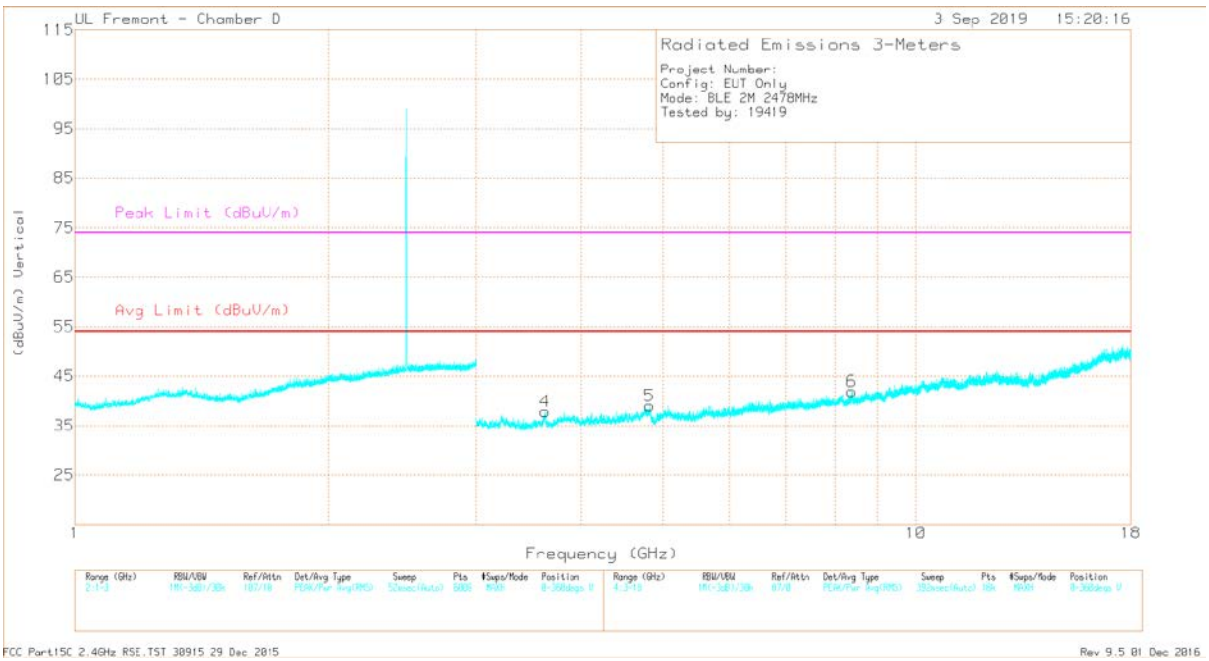
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.615	39.06	PK2	33.5	-28.1	44.46	-	-	74	-29.54	330	176	H
	* 3.619	28.26	MAv1	33.5	-28.2	33.56	54	-20.44	-	-	330	176	H
2	* 4.77	37.91	PK2	34	-26.4	45.51	-	-	74	-28.49	265	199	H
	* 4.771	26.16	MAv1	34	-26.4	33.76	54	-20.24	-	-	265	199	H
3	* 10.644	34.07	PK2	37.8	-21.3	50.57	-	-	74	-23.43	205	147	H
	* 10.646	22.92	MAv1	37.8	-21.3	39.42	54	-14.58	-	-	205	147	H
4	* 3.62	39.38	PK2	33.5	-28.2	44.68	-	-	74	-29.32	28	314	V
	* 3.623	27.58	MAv1	33.3	-28.3	32.58	54	-21.42	-	-	28	314	V
5	* 4.821	38.78	PK2	34	-27.1	45.68	-	-	74	-28.32	103	258	V
	* 4.822	28.07	MAv1	34	-27.1	34.97	54	-19.03	-	-	103	258	V
6	* 8.38	35.69	PK2	35.8	-22.8	48.69	-	-	74	-25.31	224	178	V
	* 8.379	24.22	MAv1	35.8	-22.8	37.22	54	-16.78	-	-	224	178	V

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

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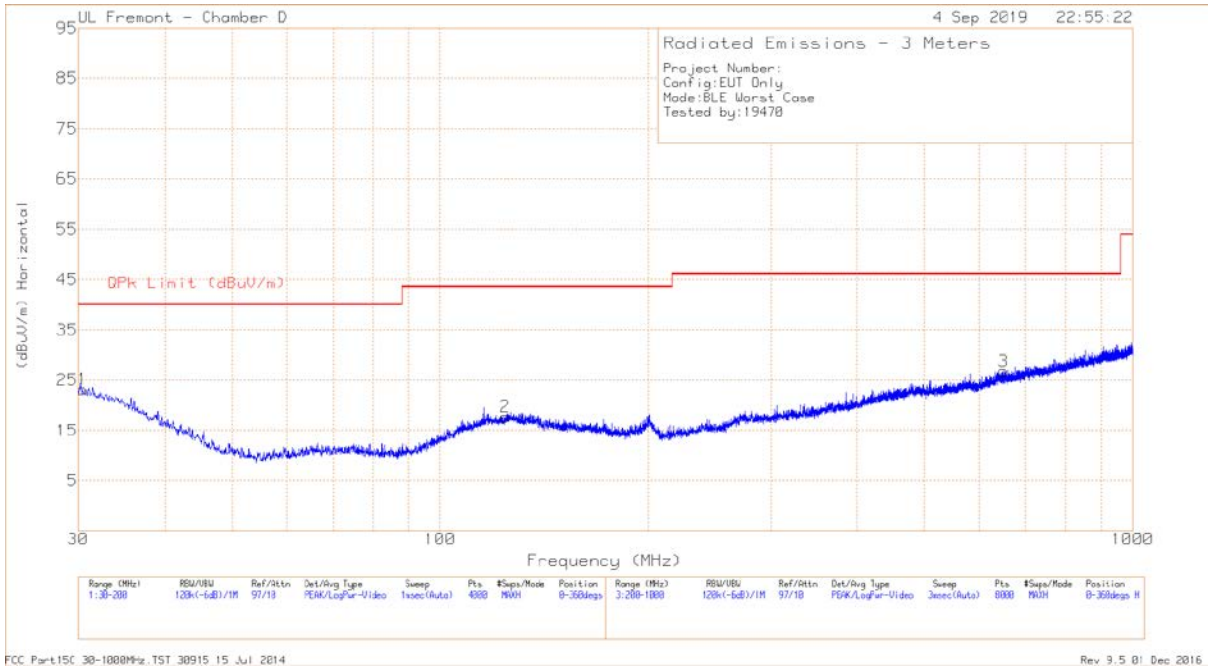
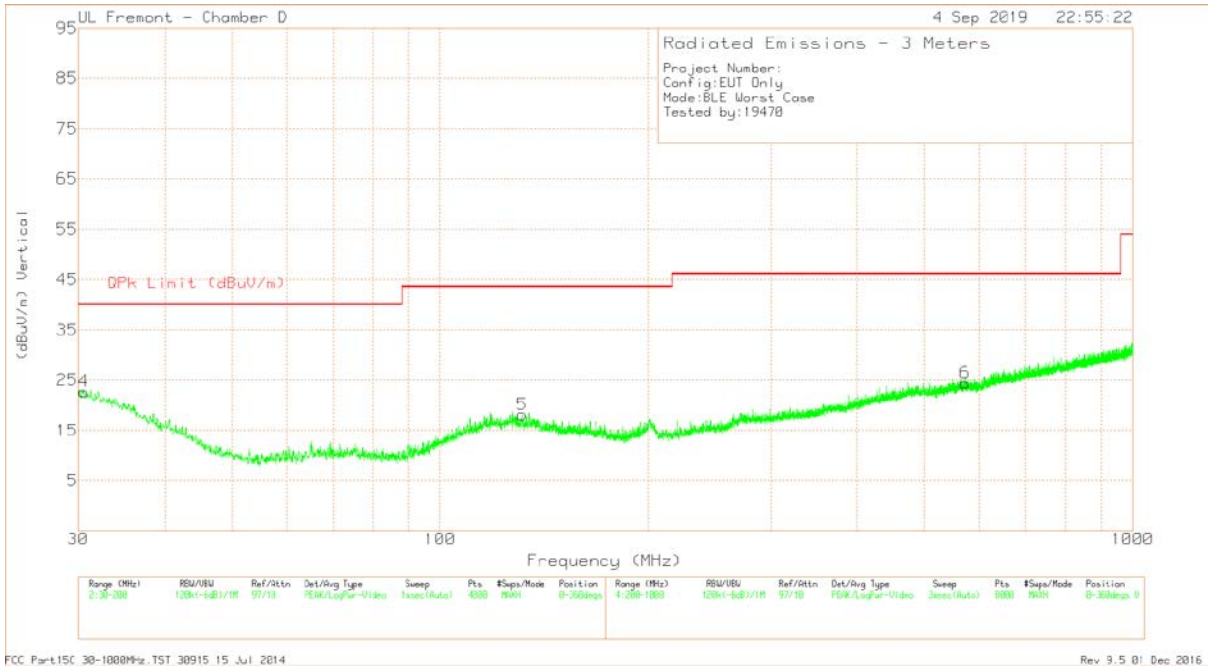
9.3. WORST CASE BELOW 1 GHz

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



HORIZONTAL



VERTICAL

Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 124.0426	21.1	Qp	19.9	-30.8	10.2	43.52	-33.32	281	324	H
5	* 131.0699	20.9	Qp	19.8	-30.7	10	43.52	-33.52	263	395	V
1	30.308	21.3	Qp	26.3	-31.7	15.9	40	-24.1	67	385	H
4	30.5246	21.26	Qp	26.2	-31.7	15.76	40	-24.24	277	109	V
6	572.9487	20.2	Qp	24.6	-28.4	16.4	46.02	-29.62	116	254	V
3	650.8887	20.13	Qp	25.7	-28.2	17.63	46.02	-28.39	314	147	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Qp - Quasi-Peak detector

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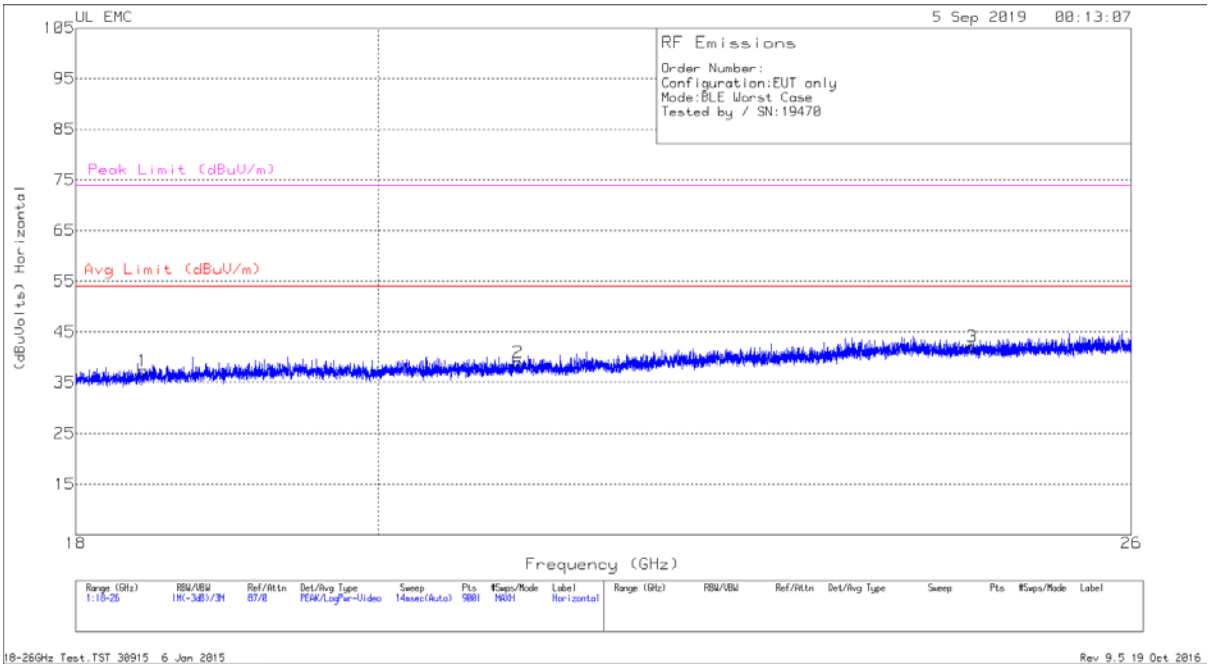
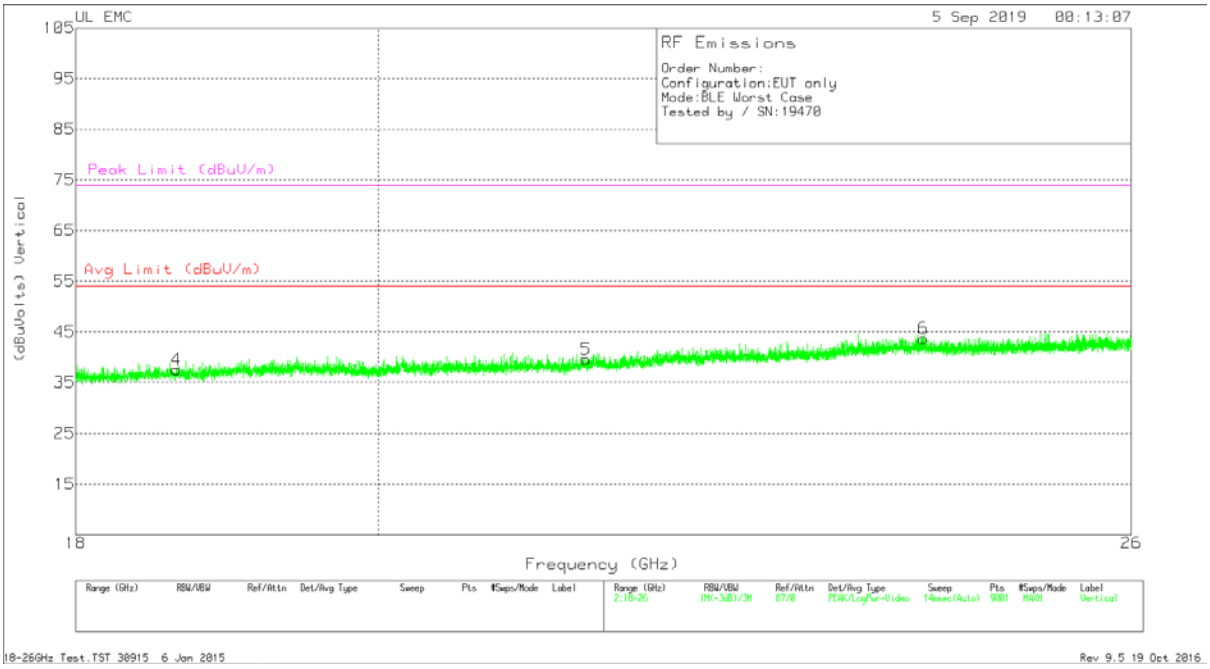
9.4. WORST CASE 18-26 GHz

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



HORIZONTAL



VERTICAL

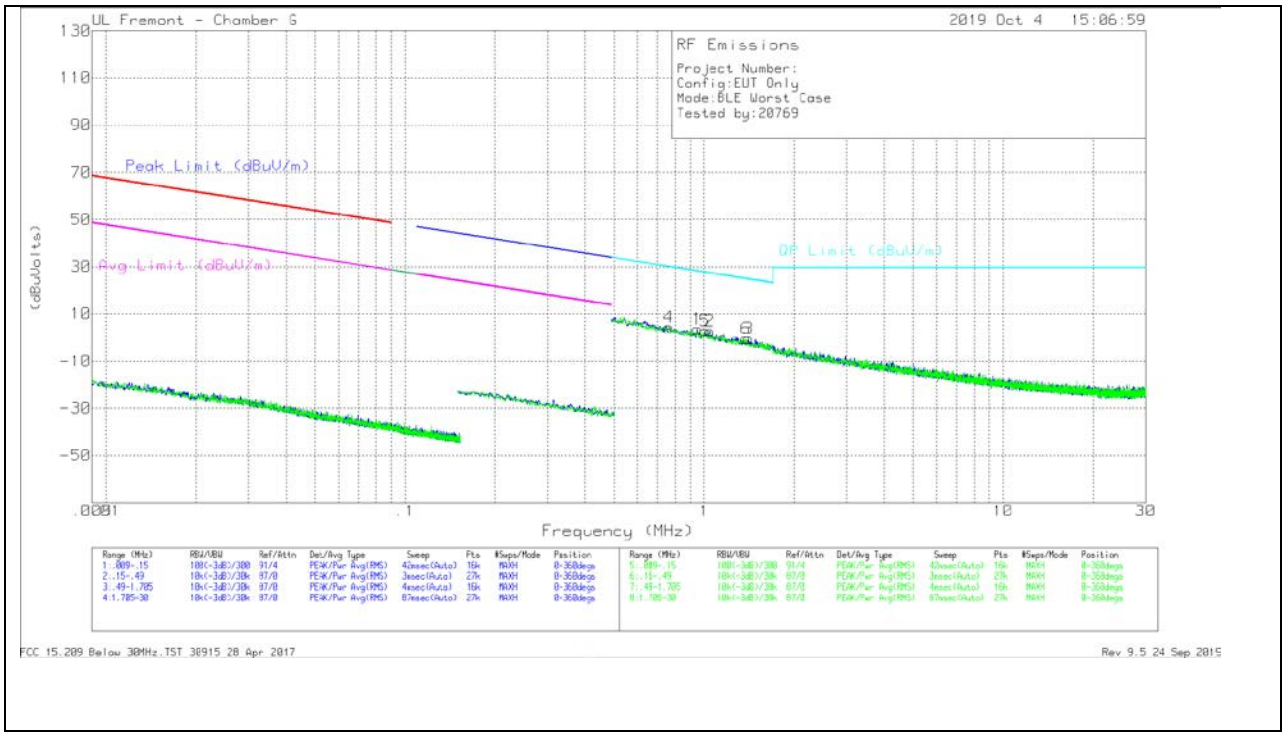
18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T447 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.423	36.33	Pk	32.4	-21.9	-9.5	37.33	54	-16.67	74	-36.67
2	20.997	36.49	Pk	33.1	-21.1	-9.5	38.99	54	-15.01	74	-35.01
3	24.598	36.47	Pk	34.4	-19.3	-9.5	42.07	54	-11.93	74	-31.93
4	18.644	36.55	Pk	32.4	-21.9	-9.5	37.55	54	-16.45	74	-36.45
5	21.501	37.19	Pk	33.1	-21.2	-9.5	39.59	54	-14.41	74	-34.41
6	24.183	38.21	Pk	34.2	-19.2	-9.5	43.71	54	-10.29	74	-30.29

Pk - Peak detector

9.1. WORST CASE BELOW 30MHz

Parallel and Perpendicular



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 30m	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
4	.76333	33.37	Pk	11	.1	-40	4.47	29.96	-25.49	0-360
1	.95079	32.15	Pk	11.2	.1	-40	3.45	28.06	-24.61	0-360
5	1.00976	31.4	Pk	11.3	.1	-40	2.8	27.54	-24.74	0-360
2	1.04792	31.34	Pk	11.3	.1	-40	2.74	27.22	-24.48	0-360
6	1.38418	28.2	Pk	11.3	.1	-40	-.4	24.81	-25.21	0-360
3	1.41169	28.16	Pk	11.3	.1	-40	-.44	24.64	-25.08	0-360

Pk - Peak detector

FCC 15.209 Below 30MHz.TST 30915 28 Apr 2017
Rev 9.5 24 Sep 2019

10. AC POWER LINE CONDUCTED EMISSIONS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

UL VERIFICATION SERVICES INC.
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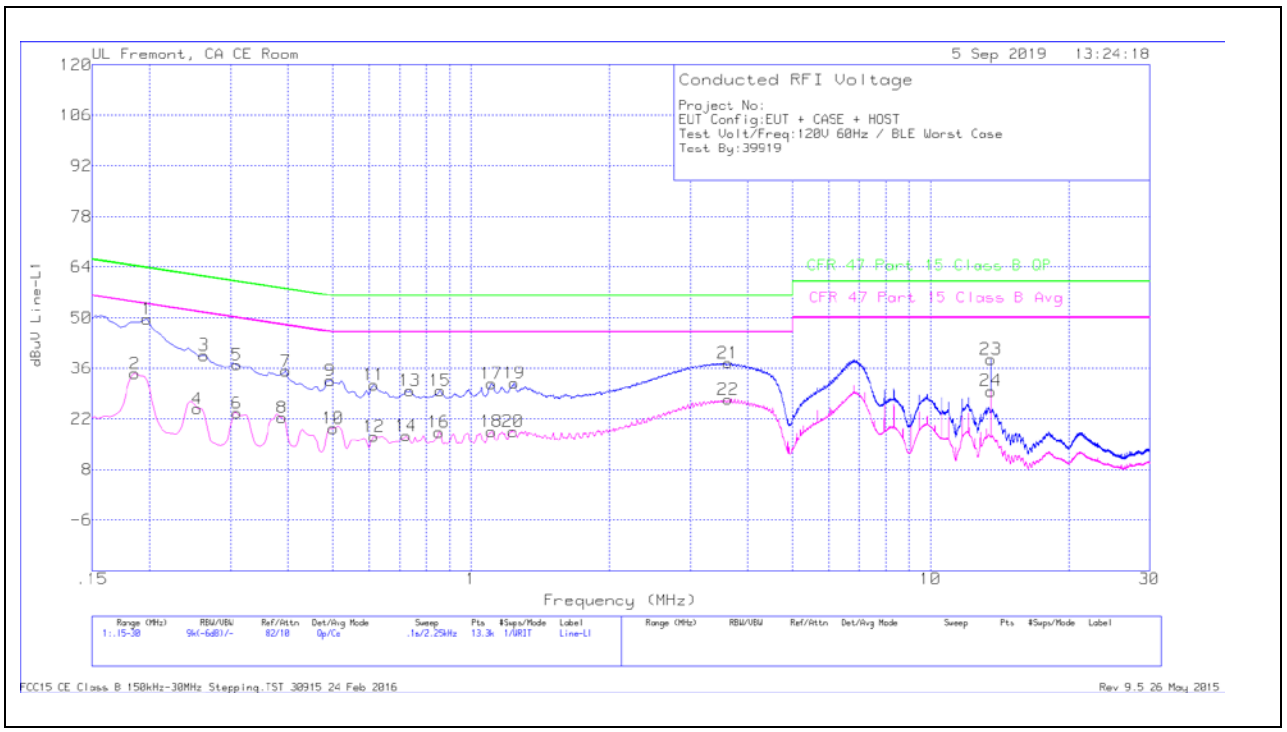
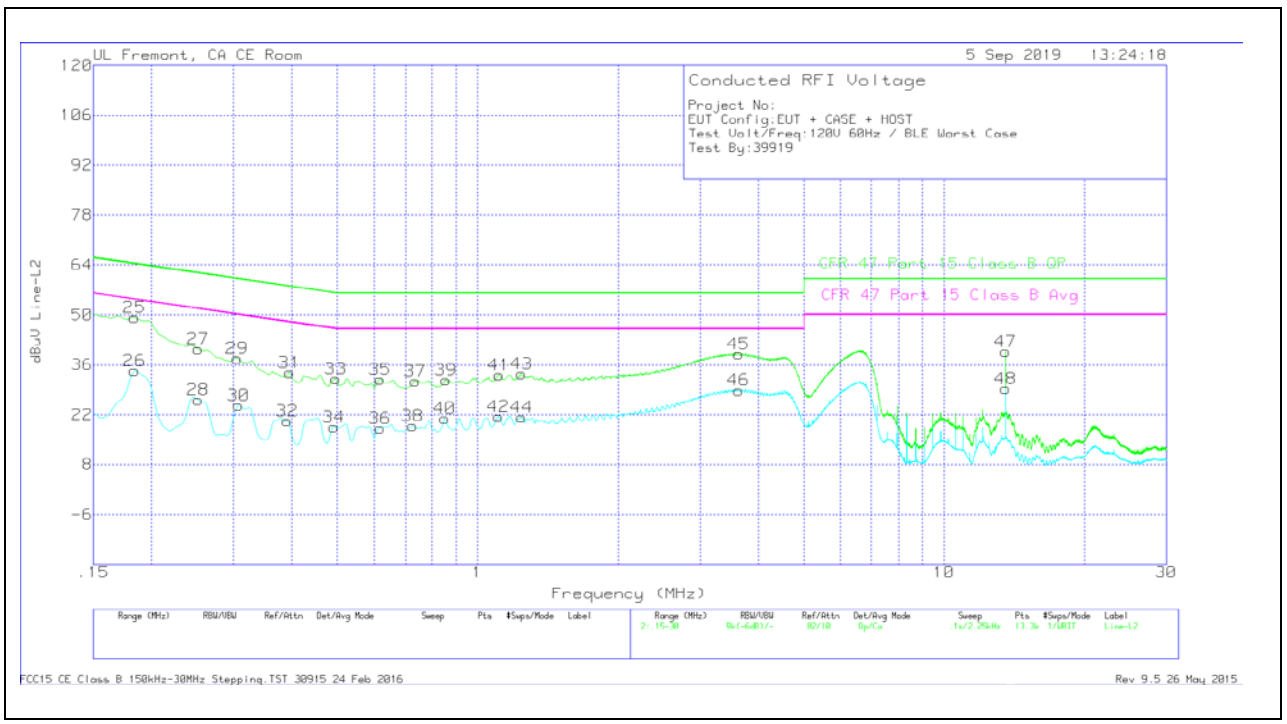
10.1.1. AC Power Line Host

LINE 1 RESULTS



LINE 2 RESULTS



AC LINE DATA

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	.19725	39.57	Qp	0	0	10.1	49.67	63.73	-14.06	-	-
2	.186	24.42	Ca	0	0	10.1	34.52	-	-	54.21	-19.69
3	.2625	29.55	Qp	0	0	10.1	39.65	61.35	-21.7	-	-
4	.2535	14.75	Ca	0	0	10.1	24.85	-	-	51.64	-26.79
5	.30975	26.91	Qp	0	0	10.1	37.01	59.98	-22.97	-	-
6	.30975	13.4	Ca	0	0	10.1	23.5	-	-	49.98	-26.48
7	.39525	25.08	Qp	0	0	10.1	35.18	57.95	-22.77	-	-
8	.3885	12.19	Ca	0	0	10.1	22.29	-	-	48.1	-25.81
9	.49312	22.49	Qp	0	0	10.1	32.59	56.12	-23.53	-	-
10	.501	9.24	Ca	0	0	10.1	19.34	-	-	46	-26.66
11	.61575	21.28	Qp	0	0	10.1	31.38	56	-24.62	-	-
12	.61575	7.08	Ca	0	0	10.1	17.18	-	-	46	-28.82
13	.73725	19.76	Qp	0	0	10.1	29.86	56	-26.14	-	-
14	.72375	7.22	Ca	0	0	10.1	17.32	-	-	46	-28.68
15	.8565	19.79	Qp	0	0	10.1	29.89	56	-26.11	-	-
16	.852	8.27	Ca	0	0	10.1	18.37	-	-	46	-27.63
17	1.1085	21.51	Qp	0	.1	10.1	31.71	56	-24.29	-	-
18	1.11075	8.41	Ca	0	.1	10.1	18.61	-	-	46	-27.39
19	1.24125	21.65	Qp	0	.1	10.1	31.85	56	-24.15	-	-
20	1.2345	8.4	Ca	0	.1	10.1	18.6	-	-	46	-27.4
21	3.6285	27.34	Qp	0	.1	10.1	37.54	56	-18.46	-	-
22	3.6285	17.23	Ca	0	.1	10.1	27.43	-	-	46	-18.57
*23	13.56	28.08	Qp	.1	.2	10.2	38.58	60	-21.42	-	-
*24	13.56	19.25	Ca	.1	.2	10.2	29.75	-	-	50	-20.25

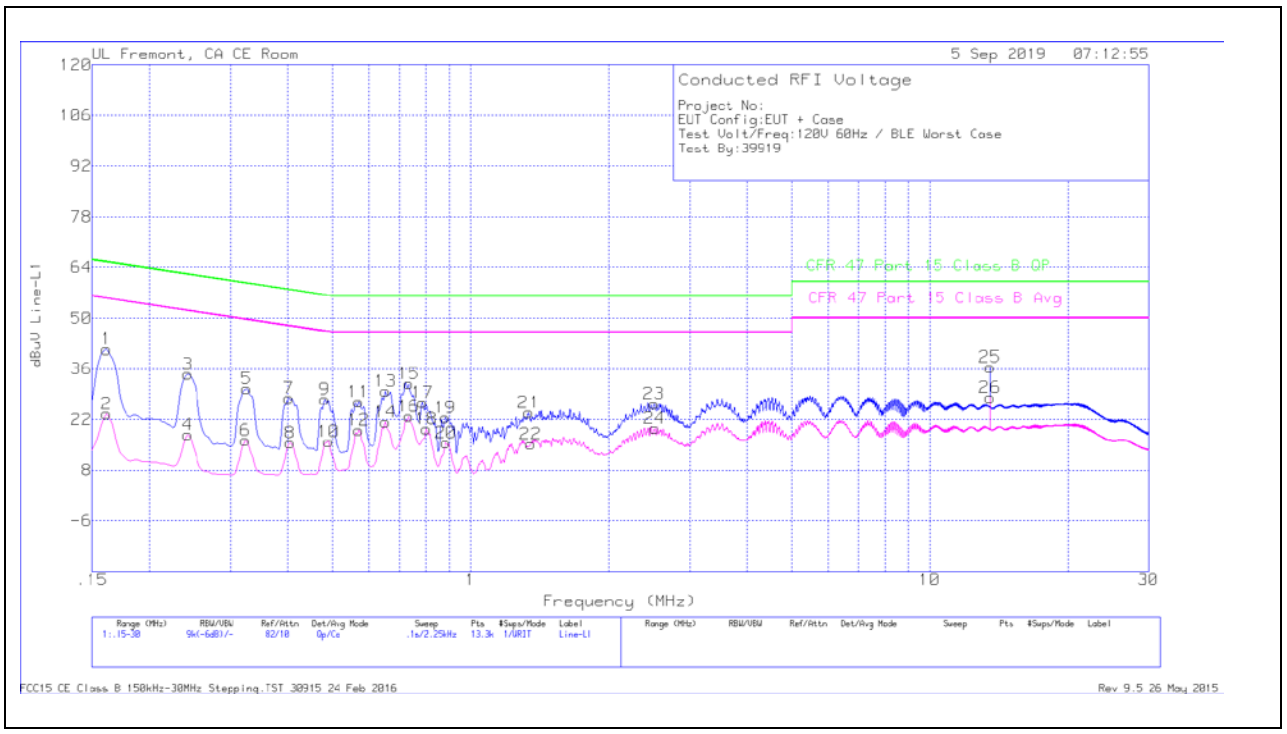
Range 2: Line-L2 .15 - 30MHz

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)
25	.18375	39.18	Qp	0	0	10.1	49.28	64.31	-15.03	-	-
26	.18375	24.27	Ca	0	0	10.1	34.37	-	-	54.31	-19.94
27	.25125	30.32	Qp	0	0	10.1	40.42	61.72	-21.3	-	-
28	.25125	16.04	Ca	0	0	10.1	26.14	-	-	51.72	-25.58
29	.30525	27.71	Qp	0	0	10.1	37.81	60.1	-22.29	-	-
30	.3075	14.45	Ca	0	0	10.1	24.55	-	-	50.04	-25.49
31	.39525	23.75	Qp	0	0	10.1	33.85	57.95	-24.1	-	-
32	.39075	10.22	Ca	0	0	10.1	20.32	-	-	48.05	-27.73
33	.4965	21.99	Qp	0	0	10.1	32.09	56.06	-23.97	-	-
34	.492	8.5	Ca	0	0	10.1	18.6	-	-	46.13	-27.53
35	.618	21.83	Qp	0	0	10.1	31.93	56	-24.07	-	-
36	.618	8.14	Ca	0	0	10.1	18.24	-	-	46	-27.76
37	.735	21.28	Qp	0	0	10.1	31.38	56	-24.62	-	-
38	.726	8.86	Ca	0	0	10.1	18.96	-	-	46	-27.04
39	.8565	21.7	Qp	0	0	10.1	31.8	56	-24.2	-	-
40	.852	10.8	Ca	0	0	10.1	20.9	-	-	46	-25.1
41	1.113	22.96	Qp	0	.1	10.1	33.16	56	-22.84	-	-
42	1.11075	11.26	Ca	0	.1	10.1	21.46	-	-	46	-24.54
43	1.24125	23.27	Qp	0	.1	10.1	33.47	56	-22.53	-	-
44	1.24463	11.08	Ca	0	.1	10.1	21.28	-	-	46	-24.72
45	3.624	28.89	Qp	0	.1	10.1	39.09	56	-16.91	-	-
46	3.62625	18.68	Ca	0	.1	10.1	28.88	-	-	46	-17.12
*47	13.56	29.32	Qp	.1	.2	10.2	39.82	60	-20.18	-	-
*48	13.56	18.8	Ca	.1	.2	10.2	29.3	-	-	50	-20.7

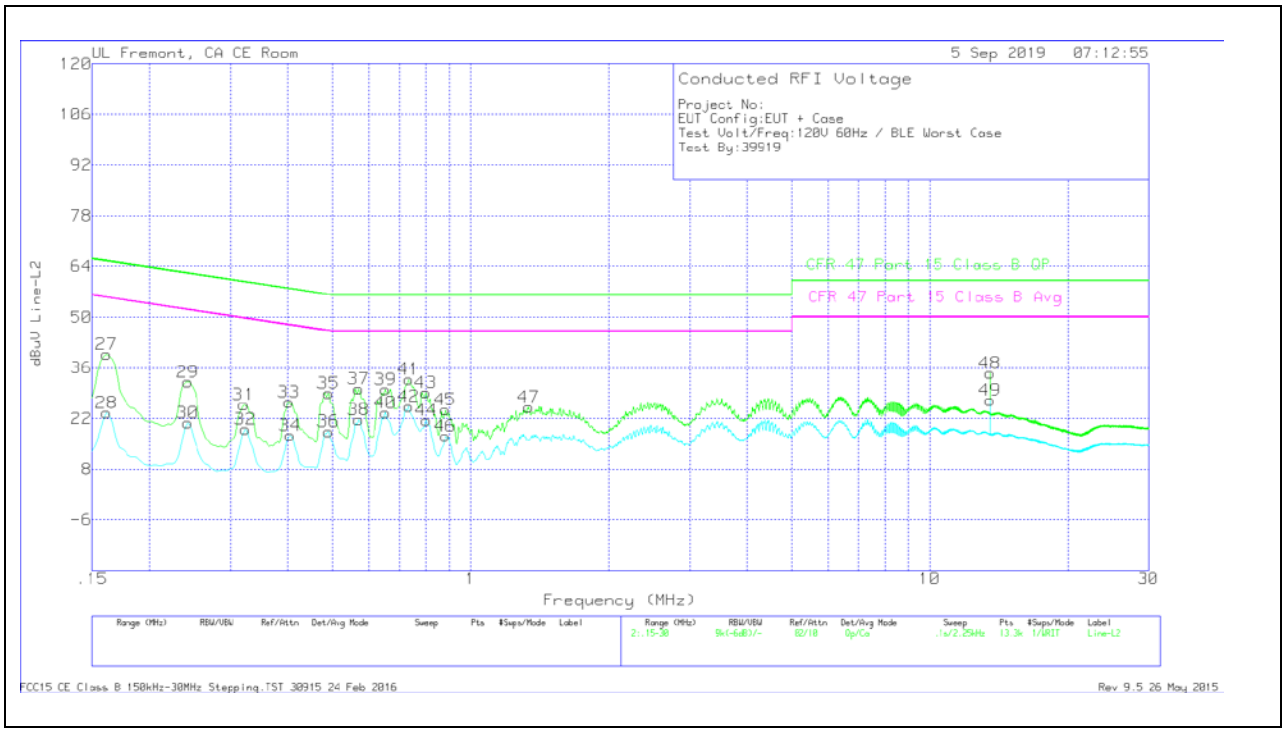
Qp - Quasi-Peak detector
Ca - CISPR average detection
*Indicates UL RFID signal. Not from device

10.1.2. AC Power Line Norm

LINE 1 RESULTS



LINE 2 RESULTS



AC LINE DATA

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	.16125	31.2	Qp	.1	0	10.1	41.4	65.4	-24	-	-
2	.16125	13.45	Ca	.1	0	10.1	23.65	-	-	55.4	-31.75
3	.24225	24.5	Qp	0	0	10.1	34.6	62.02	-27.42	-	-
4	.24225	7.8	Ca	0	0	10.1	17.9	-	-	52.02	-34.12
5	.3255	20.37	Qp	0	0	10.1	30.47	59.57	-29.1	-	-
6	.32325	6.18	Ca	0	0	10.1	16.28	-	-	49.62	-33.34
7	.402	17.89	Qp	0	0	10.1	27.99	57.81	-29.82	-	-
8	.40425	5.43	Ca	0	0	10.1	15.53	-	-	47.77	-32.24
9	.48075	17.51	Qp	0	0	10.1	27.61	56.33	-28.72	-	-
10	.48975	5.82	Ca	0	0	10.1	15.92	-	-	46.17	-30.25
11	.57075	16.81	Qp	0	0	10.1	26.91	56	-29.09	-	-
12	.57075	9.03	Ca	0	0	10.1	19.13	-	-	46	-26.87
13	.654	19.66	Qp	0	0	10.1	29.76	56	-26.24	-	-
14	.654	11.17	Ca	0	0	10.1	21.27	-	-	46	-24.73
15	.735	21.82	Qp	0	0	10.1	31.92	56	-24.08	-	-
16	.735	12.76	Ca	0	0	10.1	22.86	-	-	46	-23.14
17	.78675	16.53	Qp	0	0	10.1	26.63	56	-29.37	-	-
18	.8025	9.23	Ca	0	0	10.1	19.33	-	-	46	-26.67
19	.88125	12.45	Qp	0	0	10.1	22.55	56	-33.45	-	-
20	.8835	5.46	Ca	0	0	10.1	15.56	-	-	46	-30.44
21	1.3425	13.66	Qp	0	.1	10.1	23.86	56	-32.14	-	-
22	1.3515	4.96	Ca	0	.1	10.1	15.16	-	-	46	-30.84
23	2.51025	16.2	Qp	0	.1	10.1	26.4	56	-29.6	-	-
24	2.517	9.32	Ca	0	.1	10.1	19.52	-	-	46	-26.48
*25	13.56	26.02	Qp	.1	.2	10.2	36.52	60	-23.48	-	-
*26	13.56	17.54	Ca	.1	.2	10.2	28.04	-	-	50	-21.96

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)
27	.16125	29.54	Qp	.1	0	10.1	39.74	65.4	-25.66	-	-
28	.16125	13.34	Ca	.1	0	10.1	23.54	-	-	55.4	-31.86
29	.24225	22.03	Qp	0	0	10.1	32.13	62.02	-29.89	-	-
30	.24225	10.72	Ca	0	0	10.1	20.82	-	-	52.02	-31.2
31	.321	15.69	Qp	0	0	10.1	25.79	59.68	-33.89	-	-
32	.32325	8.92	Ca	0	0	10.1	19.02	-	-	49.62	-30.6
33	.402	16.44	Qp	0	0	10.1	26.54	57.81	-31.27	-	-
34	.40425	7.17	Ca	0	0	10.1	17.27	-	-	47.77	-30.5
35	.48975	18.87	Qp	0	0	10.1	28.97	56.17	-27.2	-	-
36	.48975	8.35	Ca	0	0	10.1	18.45	-	-	46.17	-27.72
37	.57075	20.13	Qp	0	0	10.1	30.23	56	-25.77	-	-
38	.57075	11.59	Ca	0	0	10.1	21.69	-	-	46	-24.31
39	.654	19.93	Qp	0	0	10.1	30.03	56	-25.97	-	-
40	.654	13.42	Ca	0	0	10.1	23.52	-	-	46	-22.48
41	.735	22.77	Qp	0	0	10.1	32.87	56	-23.13	-	-
42	.735	15.23	Ca	0	0	10.1	25.33	-	-	46	-20.67
43	.80025	19.09	Qp	0	0	10.1	29.19	56	-26.81	-	-
44	.80137	11.46	Ca	0	0	10.1	21.56	-	-	46	-24.44
45	.88125	14.32	Qp	0	0	10.1	24.42	56	-31.58	-	-
46	.88125	7.01	Ca	0	0	10.1	17.11	-	-	46	-28.89
47	1.34025	14.88	Qp	0	.1	10.1	25.08	56	-30.92	-	-
*48	13.56	23.98	Qp	.1	.2	10.2	34.48	60	-25.52	-	-
*49	13.56	16.55	Ca	.1	.2	10.2	27.05	-	-	50	-22.95

Qp - Quasi-Peak detector
Ca - CISPR average detection
*Indicates UL RFID signal. Not from device.

11. SETUP PHOTOS

Please refer to 12681939-EP1V1 for setup photos

END OF TEST REPORT

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