CERTIFICATION TEST REPORT

Report Number. : 12681939-E2V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2084
FCC ID	:	BCG-A2084
IC	:	579C-A2084
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 04, 2019

Prepared by:
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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
V1	10/4/2019	Add below 30MHz radiated emissions scan	Chin Pang

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TABLE OF CONTENTS

REPORT REVISION HISTORY 2

TABLE OF CONTENTS 3

1. ATTESTATION OF TEST RESULTS 5

2. TEST METHODOLOGY 6

3. FACILITIES AND ACCREDITATION 6

4. CALIBRATION AND UNCERTAINTY 7

4.1. MEASURING INSTRUMENT CALIBRATION 7

4.2. SAMPLE CALCULATION 7

4.3. MEASUREMENT UNCERTAINTY 7

5. EQUIPMENT UNDER TEST 8

5.1. EUT DESCRIPTION 8

5.2. MAXIMUM OUTPUT POWER 8

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 8

5.4. SOFTWARE AND FIRMWARE 8

5.5. WORST-CASE CONFIGURATION AND MODE 8

5.6. DESCRIPTION OF TEST SETUP 9

6. TEST AND MEASUREMENT EQUIPMENT 14

7. MEASUREMENT METHOD 15

8. ANTENNA PORT TEST RESULTS 16

8.1. ON TIME AND DUTY CYCLE 16

8.2. 99% BANDWIDTH 17

8.2.1. BLE (1Mbps) 18

8.2.2. BLE (2Mbps) 19

8.3. 6 dB BANDWIDTH 20

8.3.1. BLE (1Mbps) 21

8.3.2. BLE (2Mbps) 22

8.4. OUTPUT POWER 23

8.4.1. BLE (1Mbps) 24

8.4.2. BLE (2Mbps) 24

8.5. AVERAGE POWER 25

8.5.1. BLE (1Mbps) 25

8.5.2. BLE (2Mbps) 25

8.6. POWER SPECTRAL DENSITY 26

8.6.1. BLE (1Mbps) 27

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8.6.2. BLE (2Mbps) 28

8.7. CONDUCTED SPURIOUS EMISSIONS 29
8.7.1. BLE (1Mbps) 30
8.7.2. BLE (2Mbps) 31

9. RADIATED TEST RESULTS 32

9.1. LIMITS AND PROCEDURE 32

9.2. TRANSMITTER ABOVE 1 GHz 34
9.2.1. BLE (1Mbps) 34
9.2.2. BLE (2Mbps) 44

9.3. WORST CASE BELOW 1 GHZ 54

9.4. WORST CASE 18-26 GHZ 56

9.1. WORST CASE BELOW 30MHz 58

10. AC POWER LINE CONDUCTED EMISSIONS 59

10.1.1. AC Power Line Host 60
10.1.2. AC Power Line Norm 62

11. SETUP PHOTOS 64

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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: A2084

SERIAL NUMBER: DLC9326002DJQH32N (RADIATED)
DLC9326001GJQH32N (CONDUCTED)

DATE TESTED: AUGUST 30 - SEPTEMBER 05, 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:

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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, 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: 2324A.

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 A2084 is a Bluetooth earbud for the left 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 right earbud, A2083

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	10.00	10.00
2404- 2478	BLE 2M	10.02	10.05

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an IFA antenna, with a maximum gain of -2.4 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 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 with 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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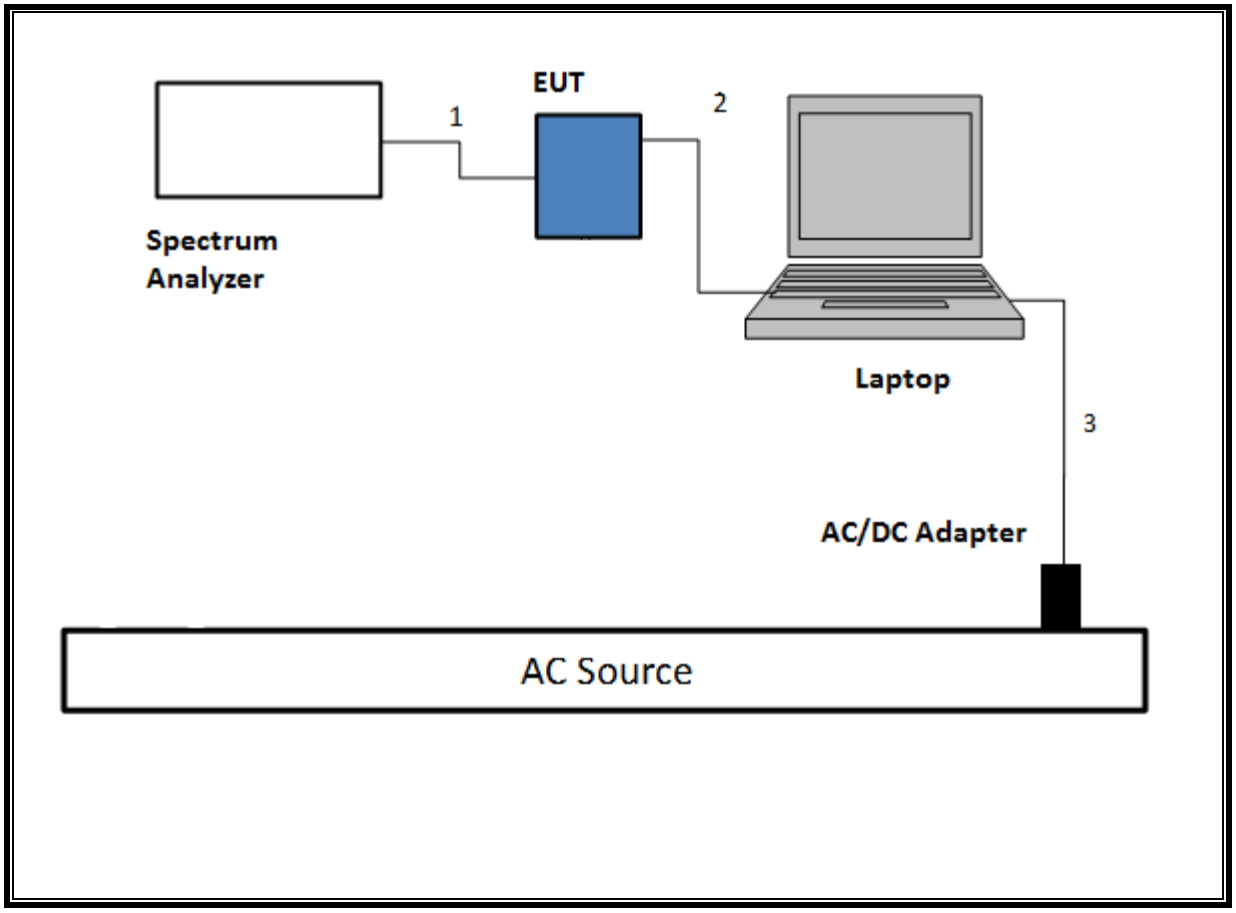
SETUP DIAGRAM FOR CONDUCTED TESTS



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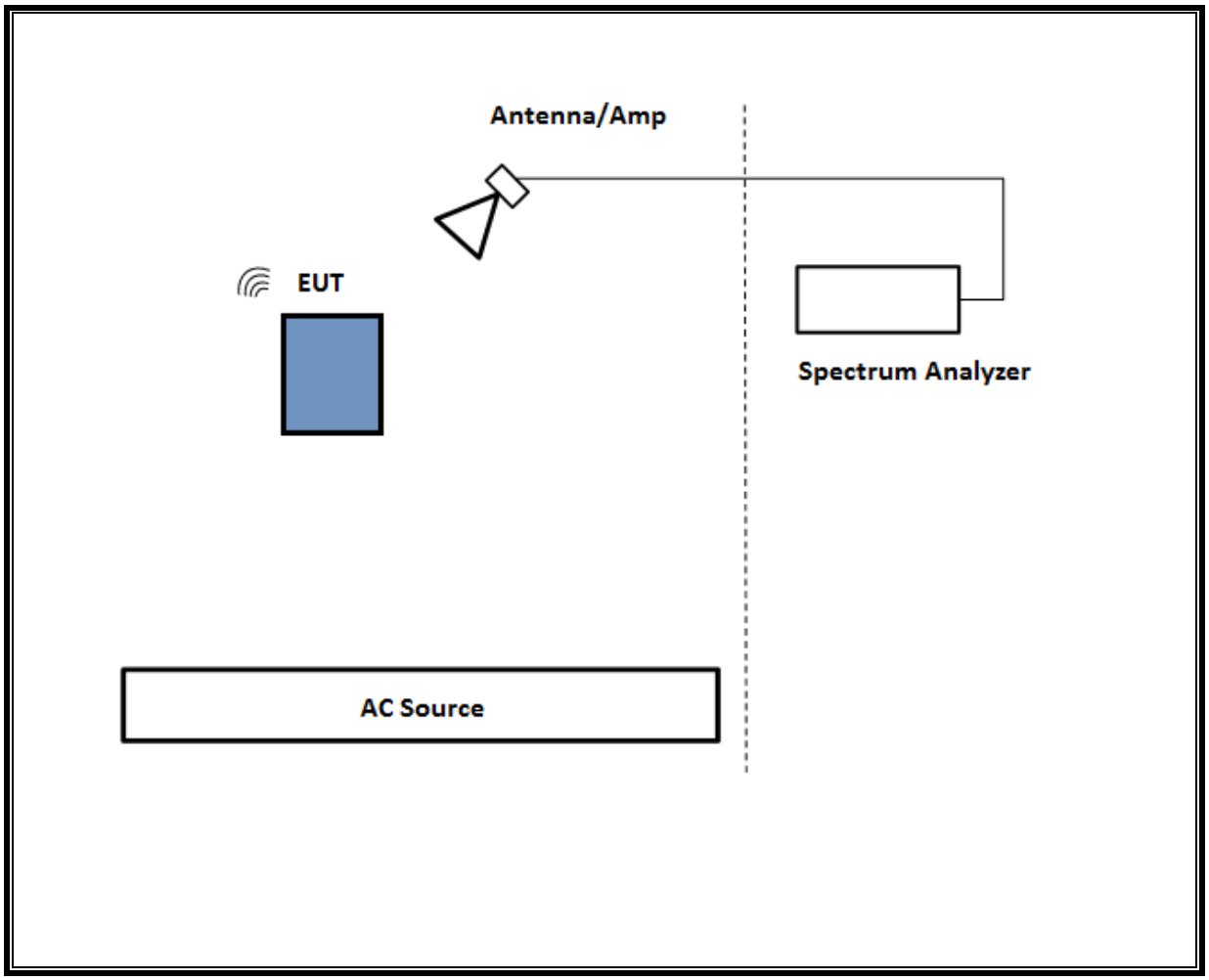
SETUP DIAGRAM FOR RADIATED TESTS ABOVE 1GHz



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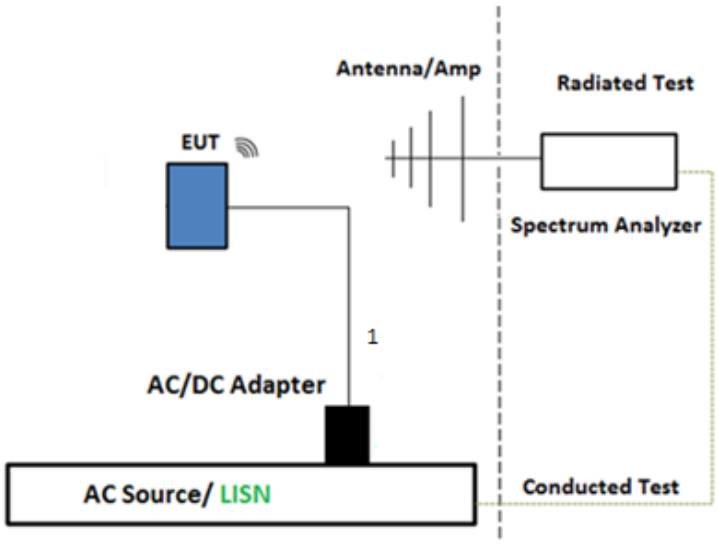
SETUP DIAGRAM FOR BELOW 1GHz and AC LINE CONDUCTED TEST



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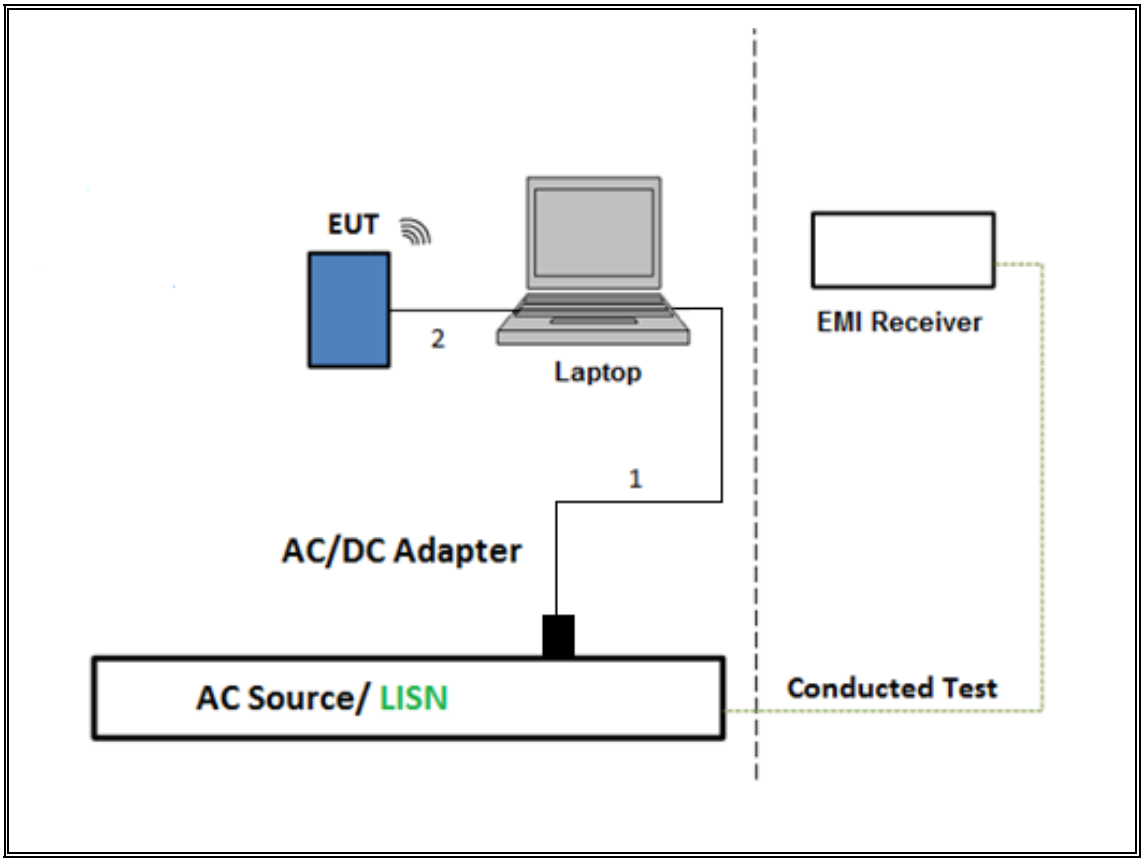
TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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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**
Antenna, Active Loop 9KHz to 30MHz	ETS-Lindgren	6502	T1683	06/06/2020	06/06/2019
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
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T227	10/29/2019	10/29/2018
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T740	07/31/2020	07/31/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T907	01/24/2020	01/24/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T906	01/22/2020	01/22/2019
Thermometer - Digital	Control Company	14-650-118	PRE0177862	02/22/2020	02/22/2019
Antenna Horn, 18 to 26GHz	ARA	MWH-1826	T447	06/16/2020	06/16/2019
Pre-Amp 18-26GHz	Agilent Technology	8449B	T404	03/23/2020	03/23/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T342	01/23/2020	01/23/2019

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.

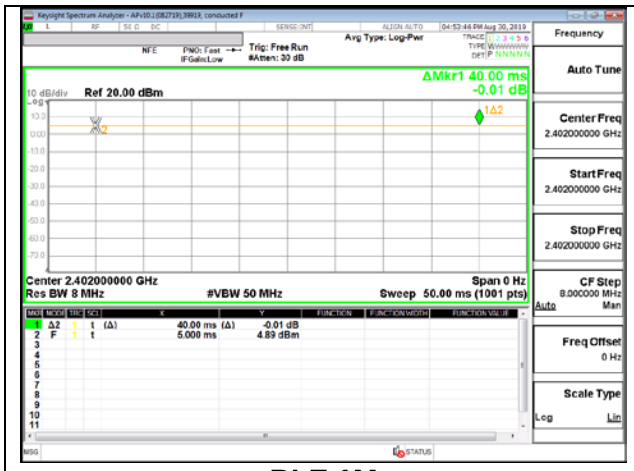
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

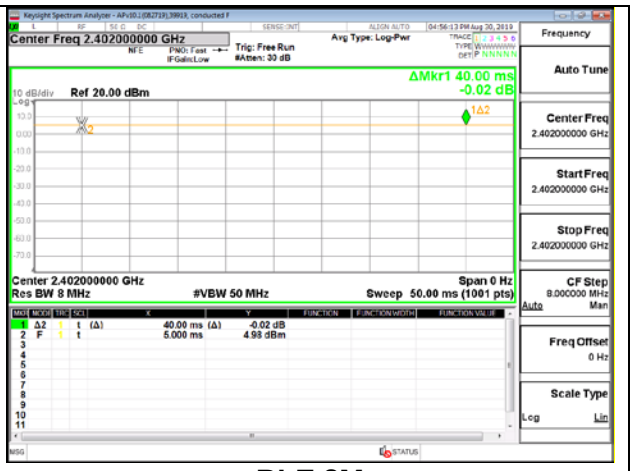
ON TIME AND DUTY CYCLE RESULTS

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	40.000	40.000	1.000	100.00%	0.00	0.010
BLE 2M	40.000	40.000	1.000	100.00%	0.00	0.010

DUTY CYCLE PLOTS



BLE 1M



BLE 2M

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8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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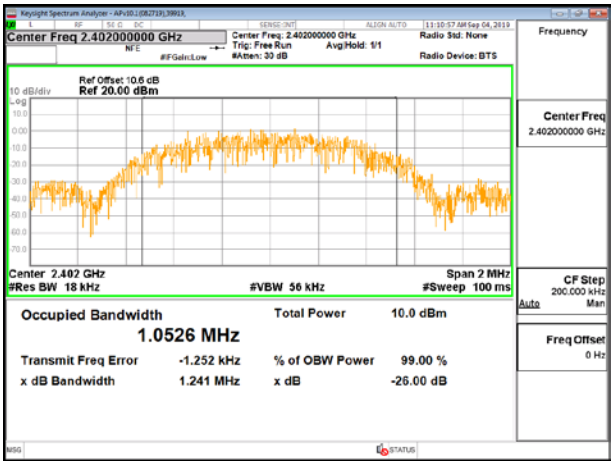
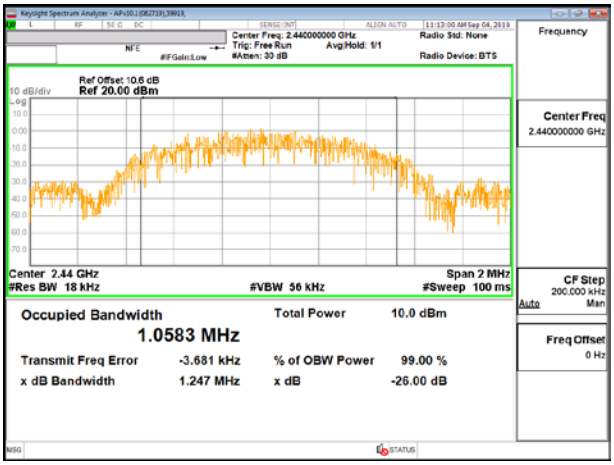
8.2.1. BLE (1Mbps)

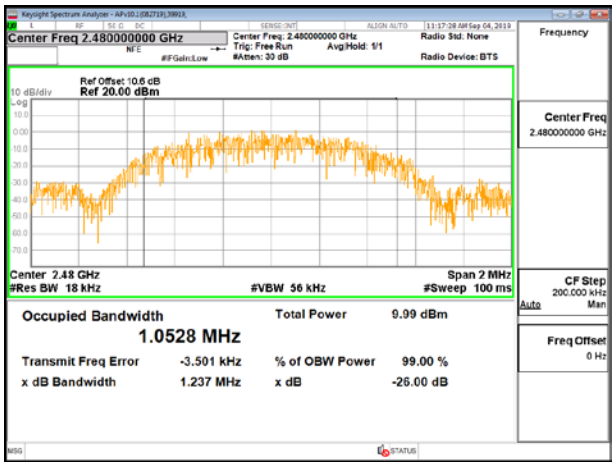
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0526
Middle	2440	1.0583
High	2480	1.0528



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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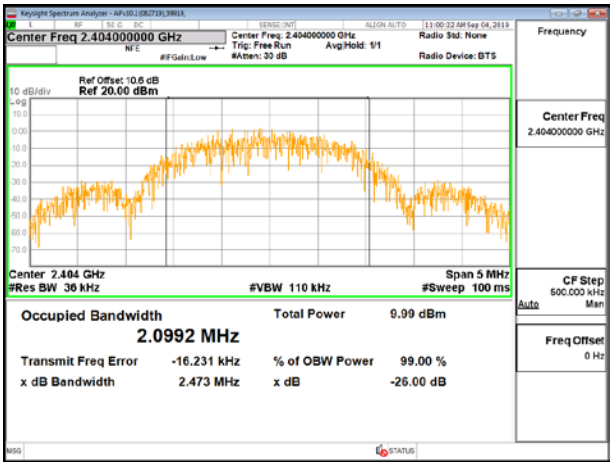
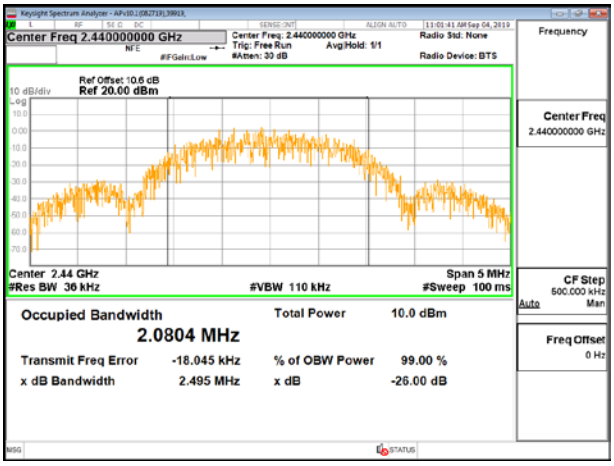
8.2.2. BLE (2Mbps)

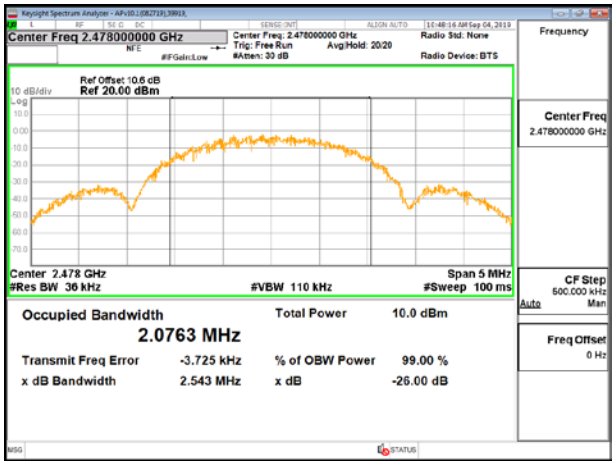
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	2.0992
Middle	2440	2.0804
High	2478	2.0763



LOW CHANNEL



MID CHANNEL



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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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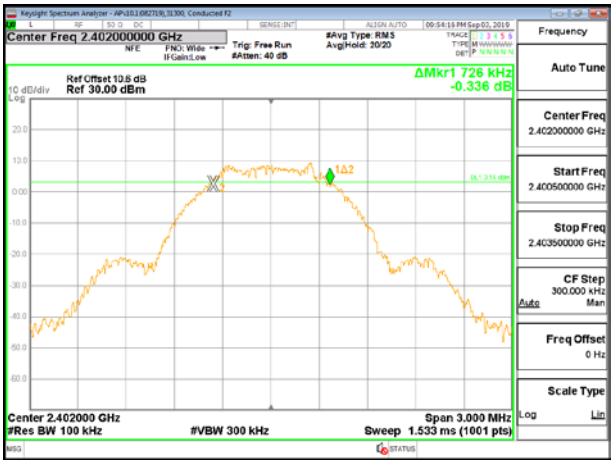
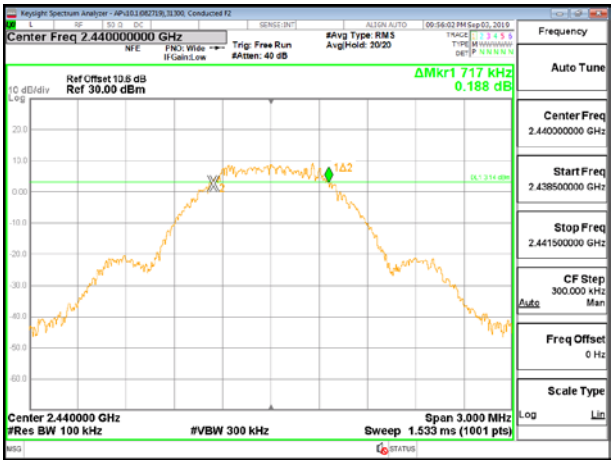
8.3.1. BLE (1Mbps)

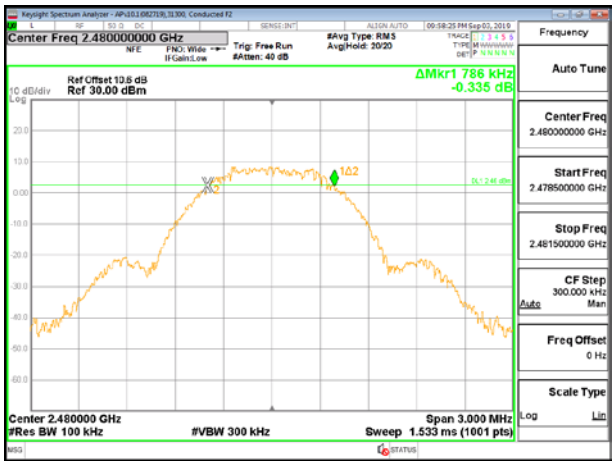
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7260	0.5
Middle	2440	0.7170	0.5
High	2480	0.7860	0.5



LOW CHANNEL



MID CHANNEL



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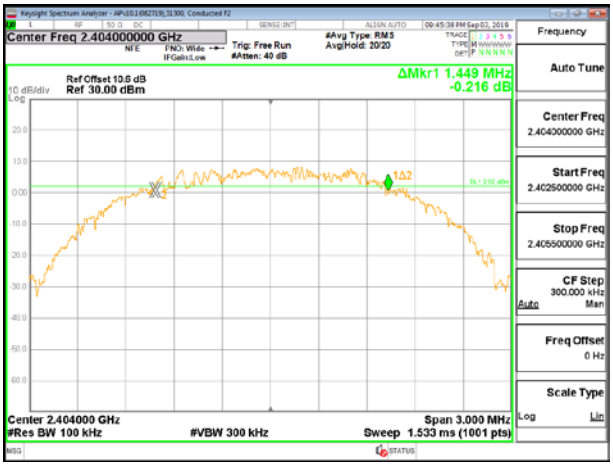
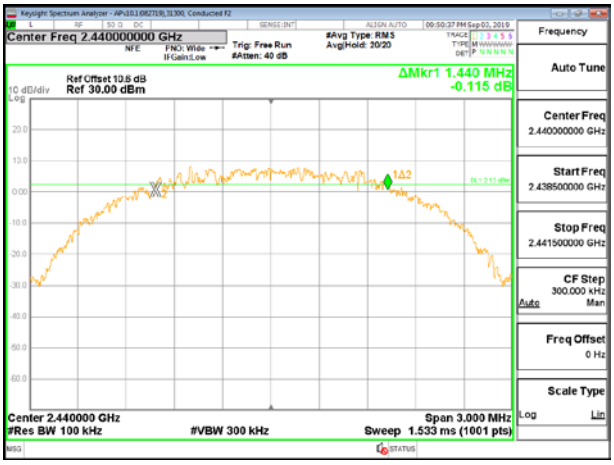
8.3.2. BLE (2Mbps)

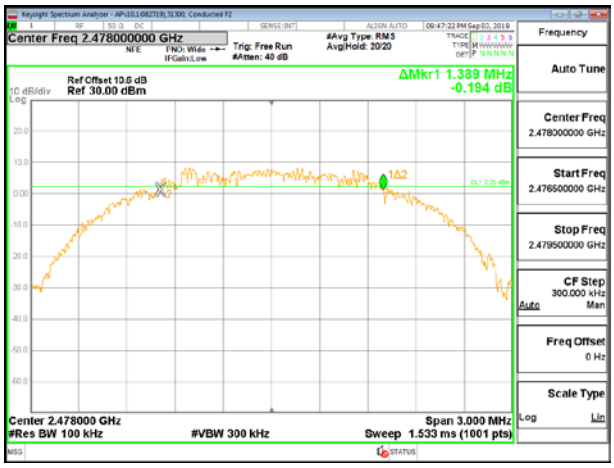
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2404	1.4490	0.5
Middle	2440	1.4400	0.5
High	2478	1.3890	0.5



LOW CHANNEL



MID CHANNEL



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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

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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	10.00	30	-20.000
Middle	2440	9.88	30	-20.120
High	2480	9.98	30	-20.020

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	10.02	30	-19.980
Middle	2440	9.88	30	-20.120
High	2478	9.97	30	-20.030

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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	9.90
Middle	2440	9.81
High	2480	9.94

8.5.2. BLE (2Mbps)

Tested By:	44366
Date:	9/4/2019

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	9.95
Middle	2440	9.81
High	2478	9.94

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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

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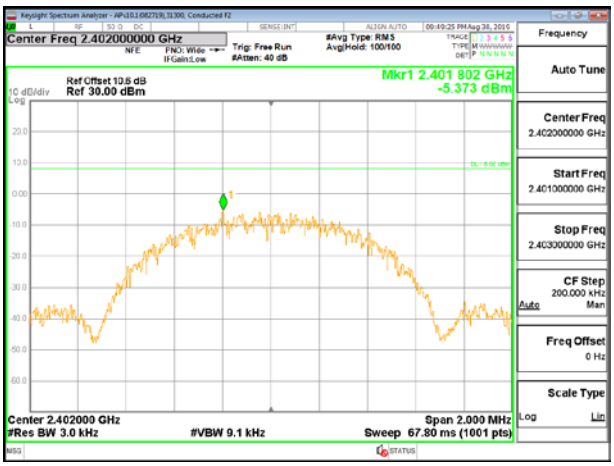
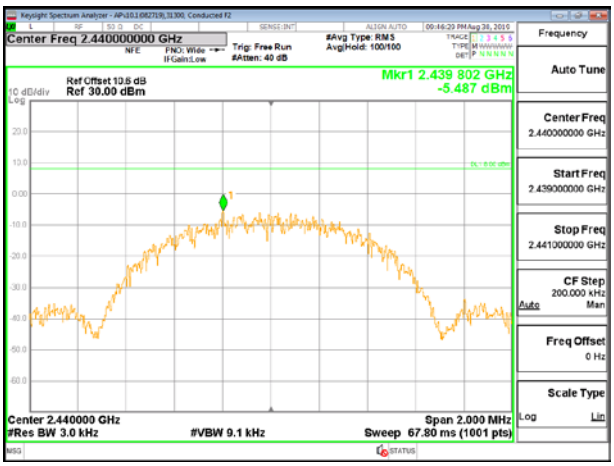
8.6.1. BLE (1Mbps)

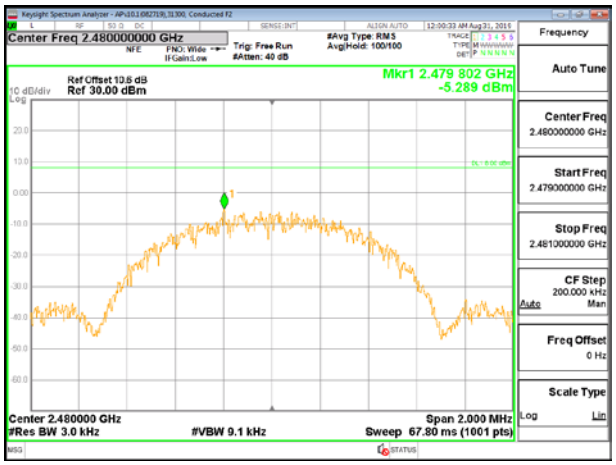
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-5.37	8	-13.37
Middle	2440	-5.49	8	-13.49
High	2480	-5.29	8	-13.29



LOW CHANNEL



MID CHANNEL



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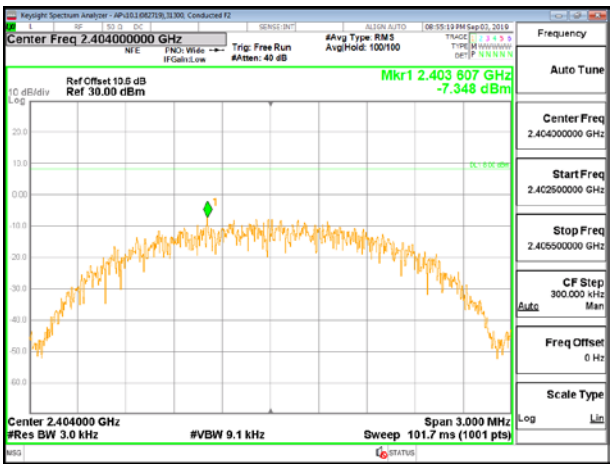
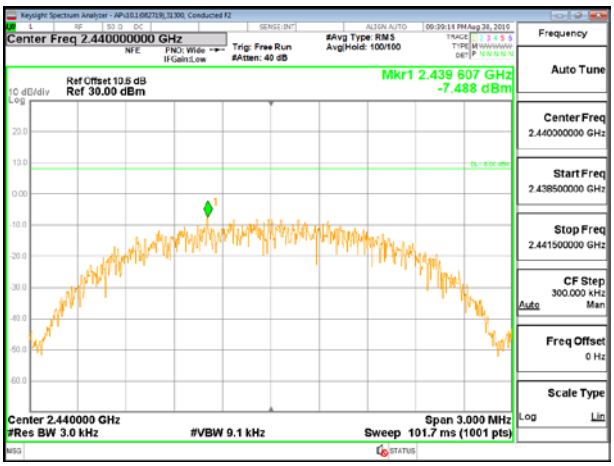
8.6.2. BLE (2Mbps)

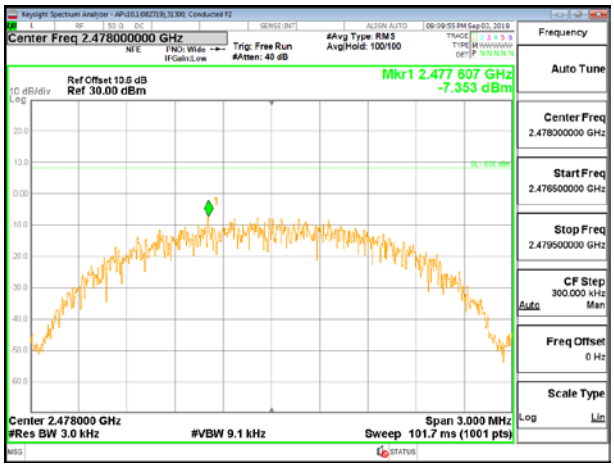
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-7.35	8	-15.35
Middle	2440	-7.49	8	-15.49
High	2478	-7.35	8	-15.35



LOW CHANNEL



MID CHANNEL



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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

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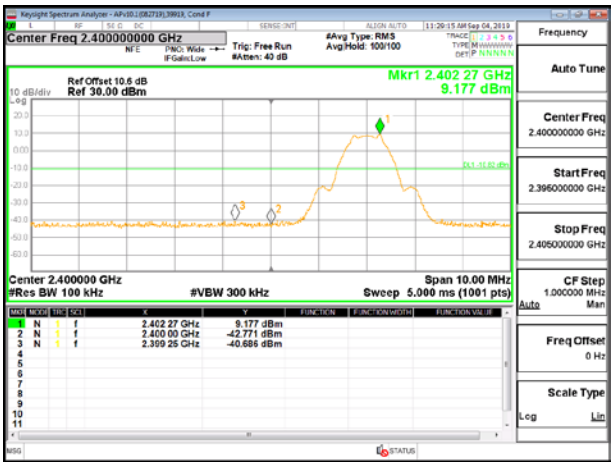
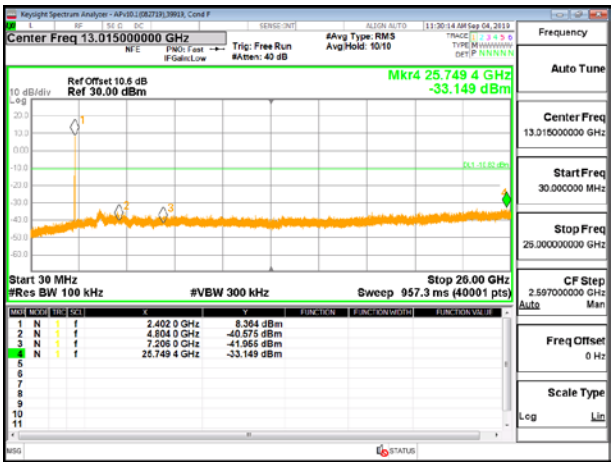
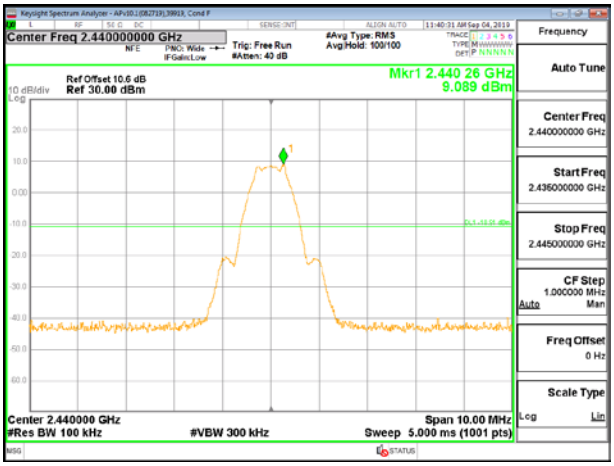
8.7.1. BLE (1Mbps)



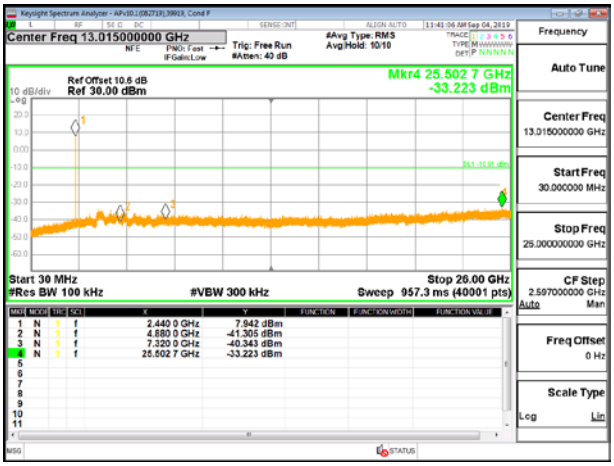
LOW CHANNEL BANDEDGE



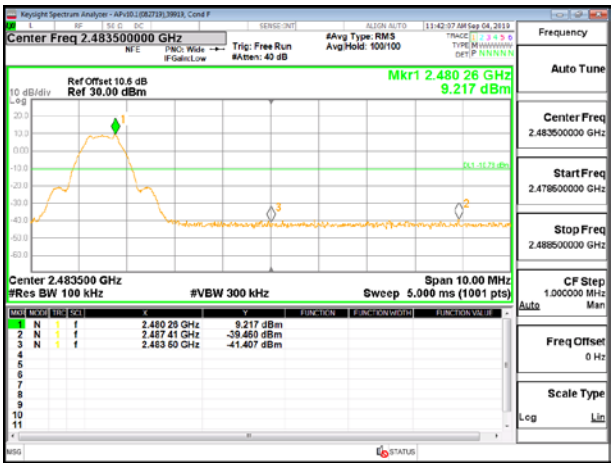
OUT-OF-BAND LOW CHANNEL



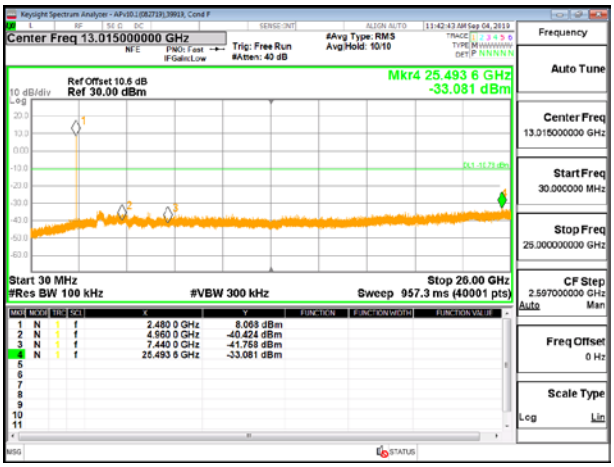
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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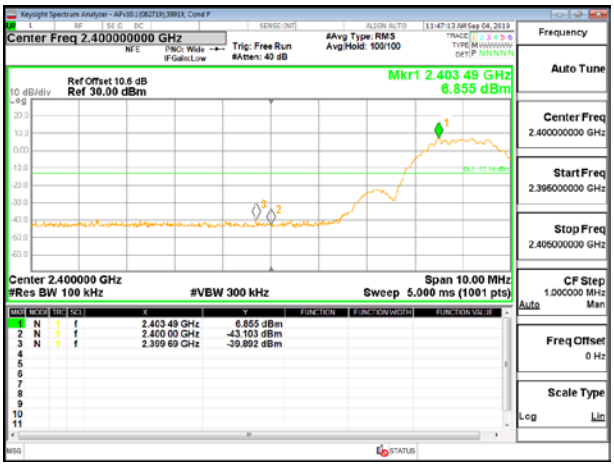
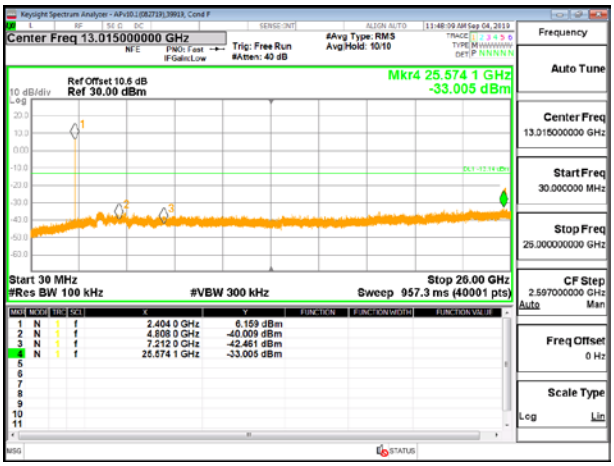
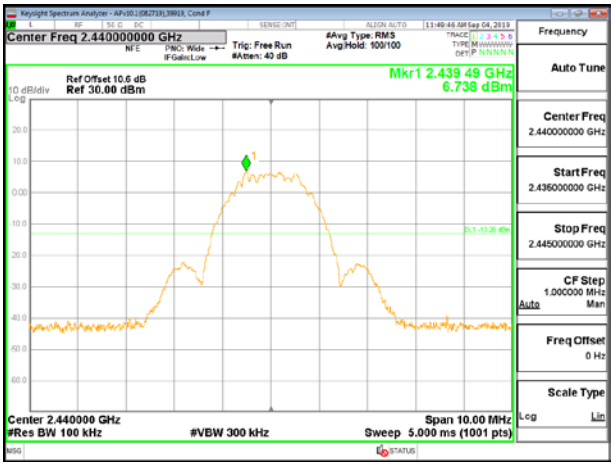
8.7.2. BLE (2Mbps)



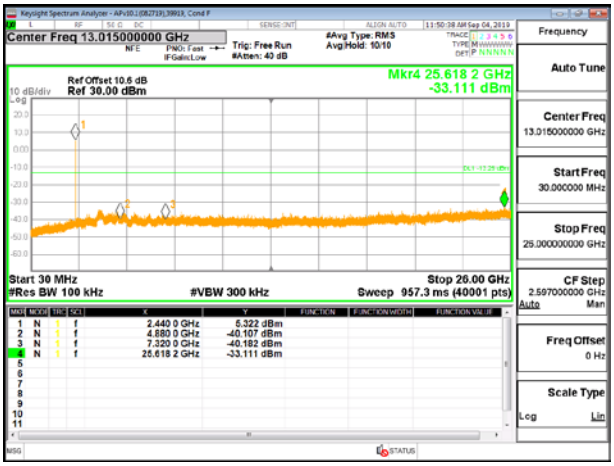
LOW CHANNEL BANDEDGE



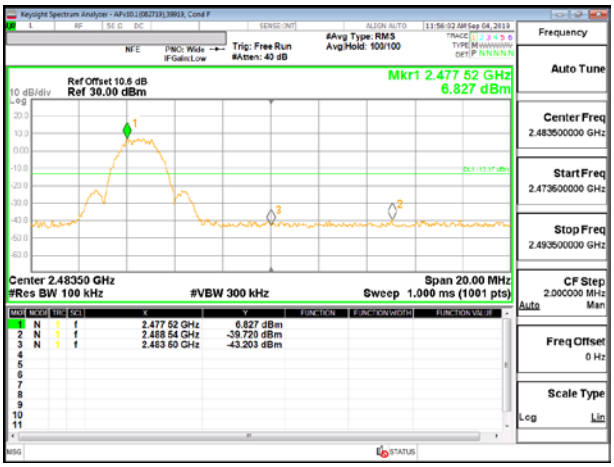
OUT-OF-BAND LOW CHANNEL



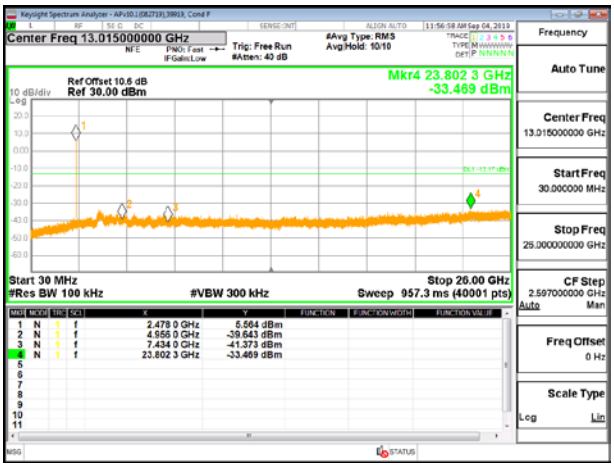
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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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.

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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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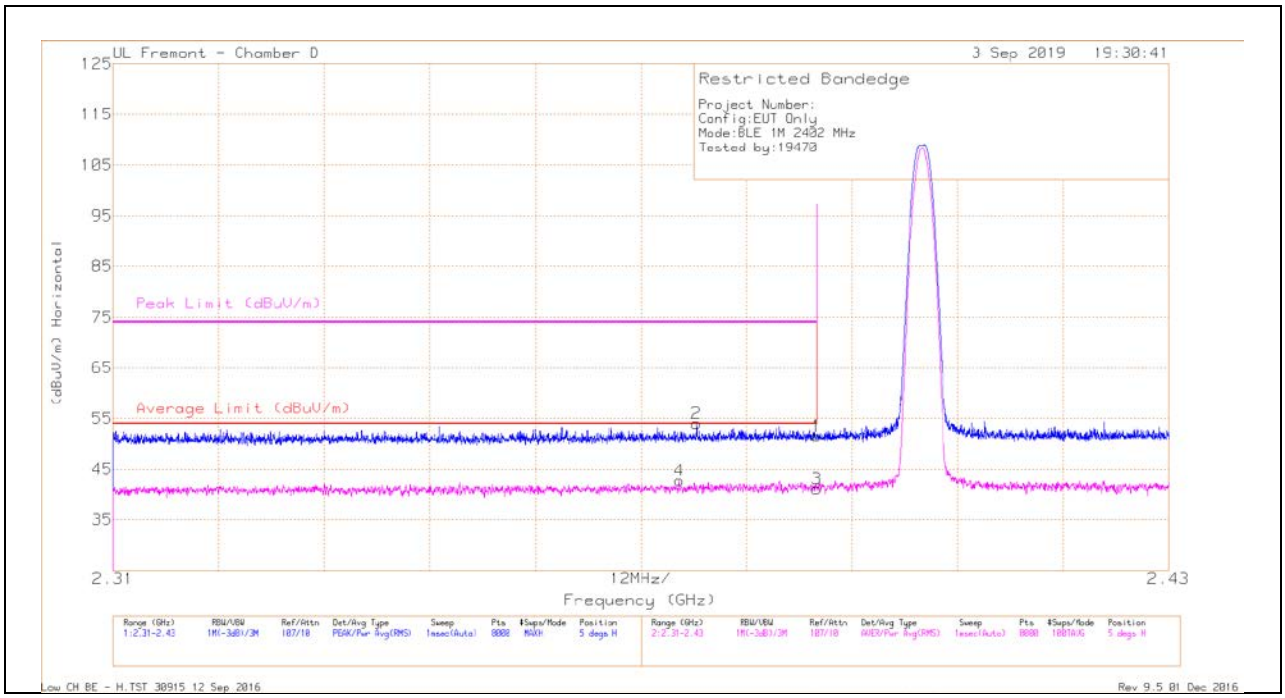
9.2. TRANSMITTER ABOVE 1 GHz

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
4	* 2.374	31.43	RMS	31.9	-20.6	42.73	54	-11.27	-	-	5	294	H
2	* 2.376	42.56	Pk	31.9	-20.5	53.96	-	-	74	-20.04	5	294	H
1	* 2.39	40.02	Pk	32	-20.5	51.52	-	-	74	-22.48	5	294	H
3	* 2.39	29.65	RMS	32	-20.5	41.15	54	-12.85	-	-	5	294	H

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

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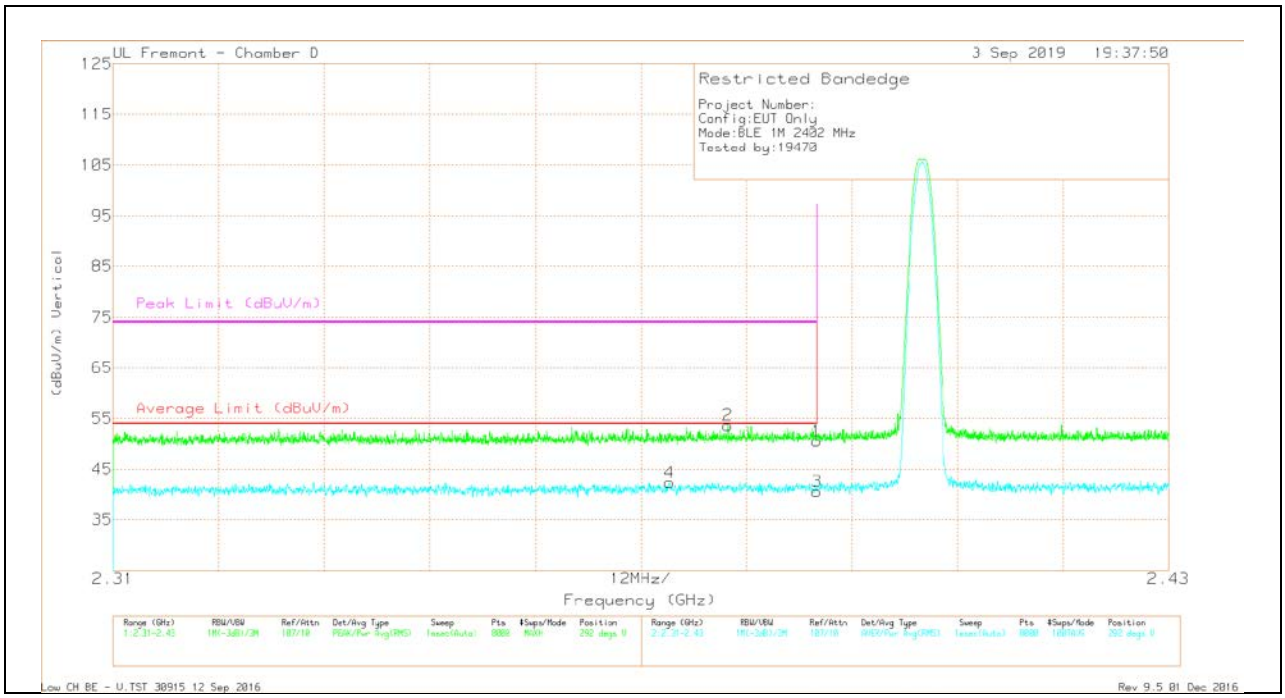
VERTICAL RESULT



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
4	* 2.373	31.06	RMS	31.9	-20.6	42.36	54	-11.64	-	-	292	338	V
2	* 2.38	42.26	Pk	31.9	-20.5	53.66	-	-	74	-20.34	292	338	V
1	* 2.39	39.03	Pk	32	-20.5	50.53	-	-	74	-23.47	292	338	V
3	* 2.39	29.16	RMS	32	-20.5	40.66	54	-13.34	-	-	292	338	V

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

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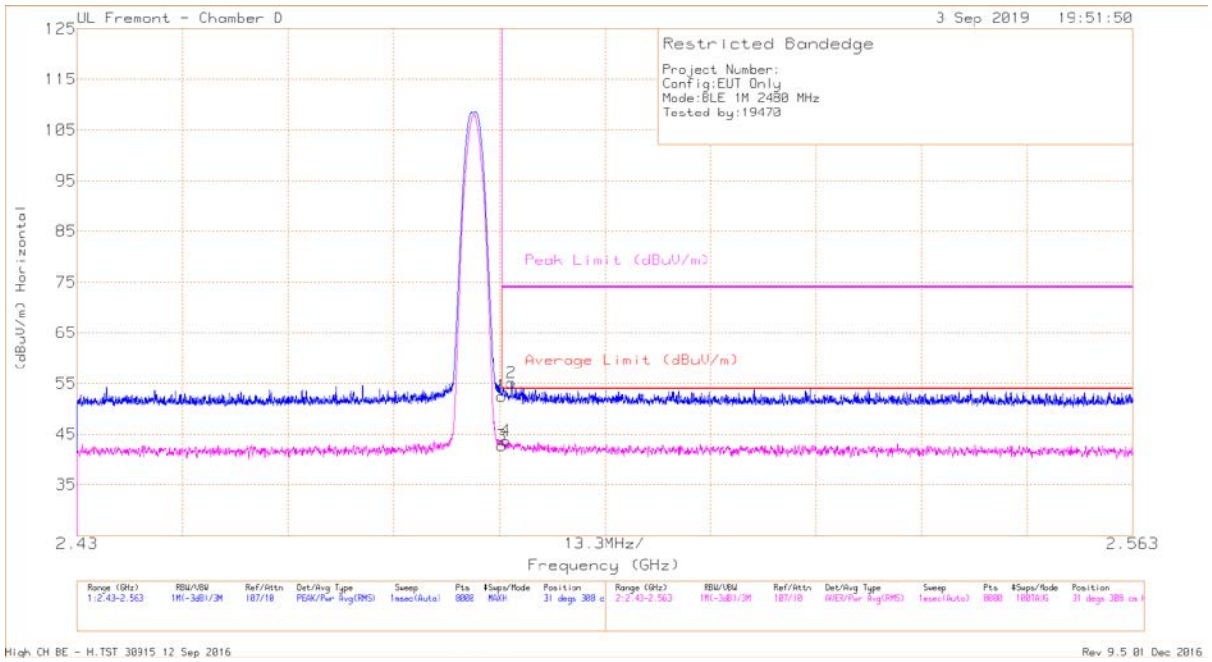
BANDEDGE (HIGH CHANNEL)

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	40.65	Pk	32.4	-20.5	52.55	-	-	74	-21.45	31	308	H
3	* 2.484	30.78	RMS	32.4	-20.5	42.68	54	-11.32	-	-	31	308	H
4	* 2.484	31.88	RMS	32.3	-20.5	43.68	54	-10.32	-	-	31	308	H
2	* 2.485	43.31	Pk	32.3	-20.5	55.11	-	-	74	-18.89	31	308	H

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

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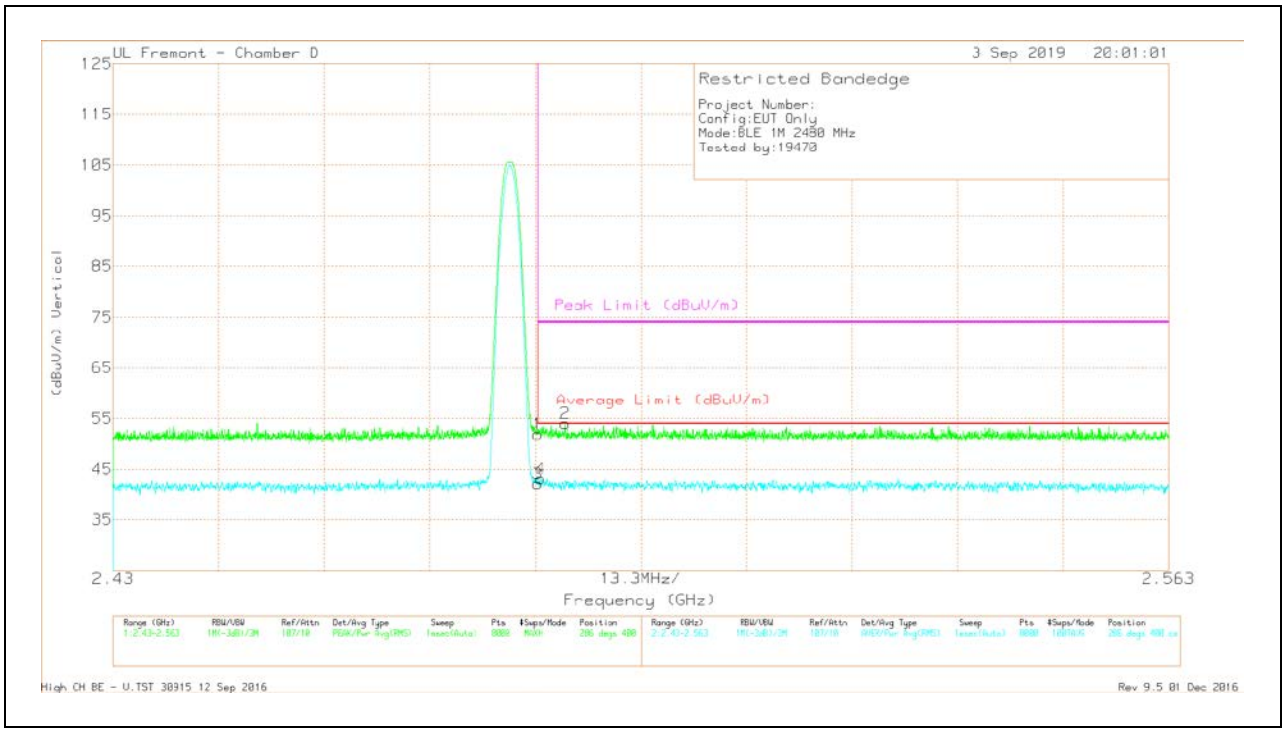
VERTICAL RESULT



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	40.06	Pk	32.4	-20.5	51.96	-	-	74	-22.04	286	400	V
3	* 2.484	30.15	RMS	32.4	-20.5	42.05	54	-11.95	-	-	286	400	V
4	* 2.484	31.15	RMS	32.4	-20.5	43.05	54	-10.95	-	-	286	400	V
2	* 2.487	42.18	Pk	32.3	-20.5	53.98	-	-	74	-20.02	286	400	V

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

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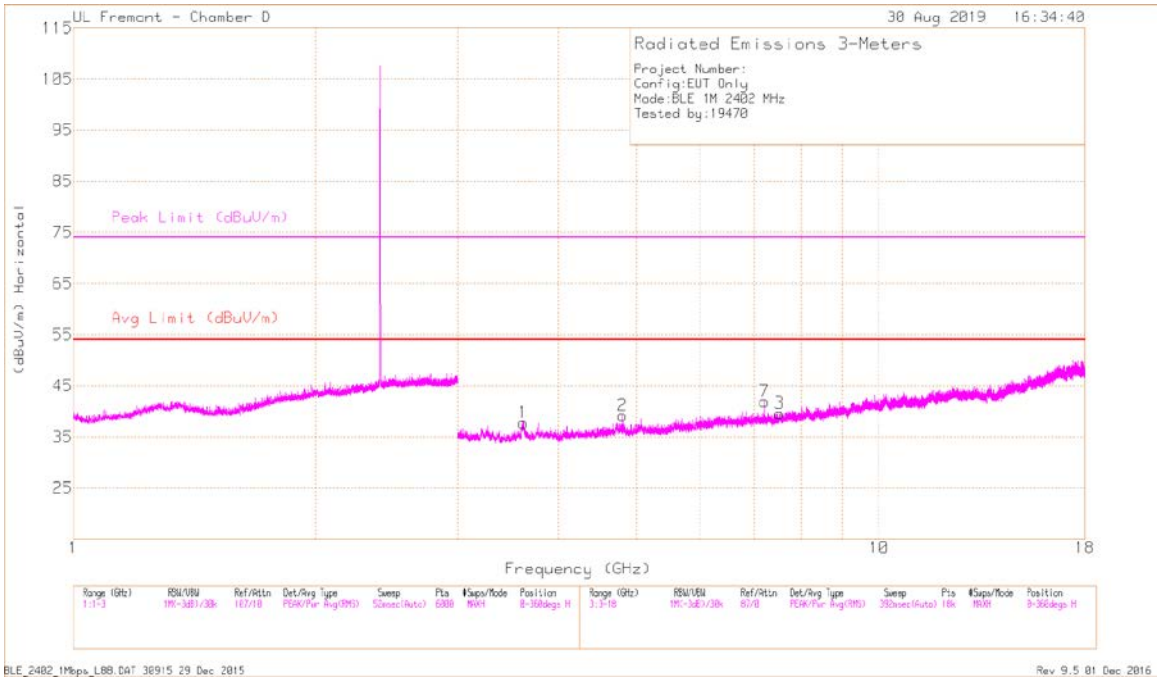
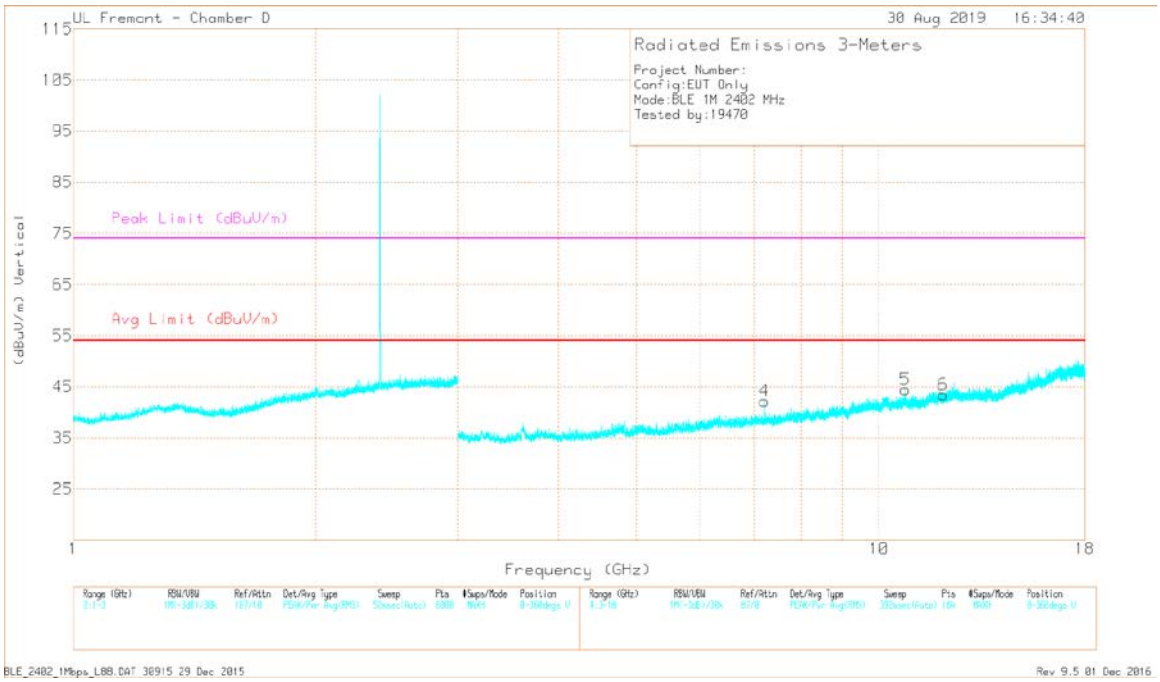
HARMONICS AND SPURIOUS EMISSIONS

LOW 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	* 3.618	39.03	PK2	33.5	-28.3	44.23	-	-	74	-29.77	0	101	H
	* 3.619	27.57	MAv1	33.5	-28.3	32.77	54	-21.23	-	-	0	101	H
2	* 4.804	39.15	PK2	34.1	-26.9	46.35	-	-	74	-27.65	0	101	H
	* 4.804	27.45	MAv1	34.1	-26.9	34.65	54	-19.35	-	-	0	101	H
3	* 7.528	36.23	PK2	35.5	-25	46.73	-	-	74	-27.27	0	101	H
	* 7.528	23.94	MAv1	35.5	-25	34.44	54	-19.56	-	-	0	101	H
5	* 10.783	33.55	PK2	37.8	-20.4	50.95	-	-	74	-23.05	0	101	V
	* 10.786	19.82	MAv1	37.8	-20.5	37.12	54	-16.88	-	-	0	101	V
6	* 12.009	34.66	PK2	38.7	-21.7	51.66	-	-	74	-22.34	0	101	V
	* 12.011	21.51	MAv1	38.7	-21.8	38.41	54	-15.59	-	-	0	101	V
4	7.205	38.58	PK2	35.4	-25.1	48.88	-	-	-	-	36	107	H
7	7.207	38.55	PK2	35.4	-25.1	48.85	-	-	-	-	0	101	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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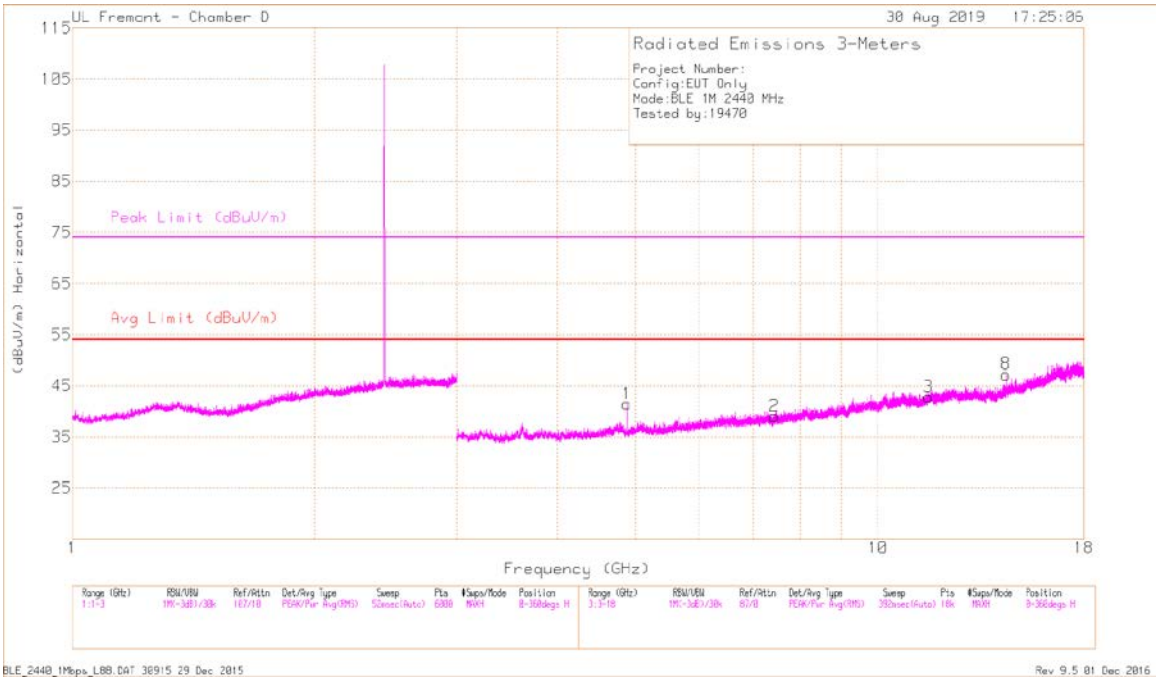
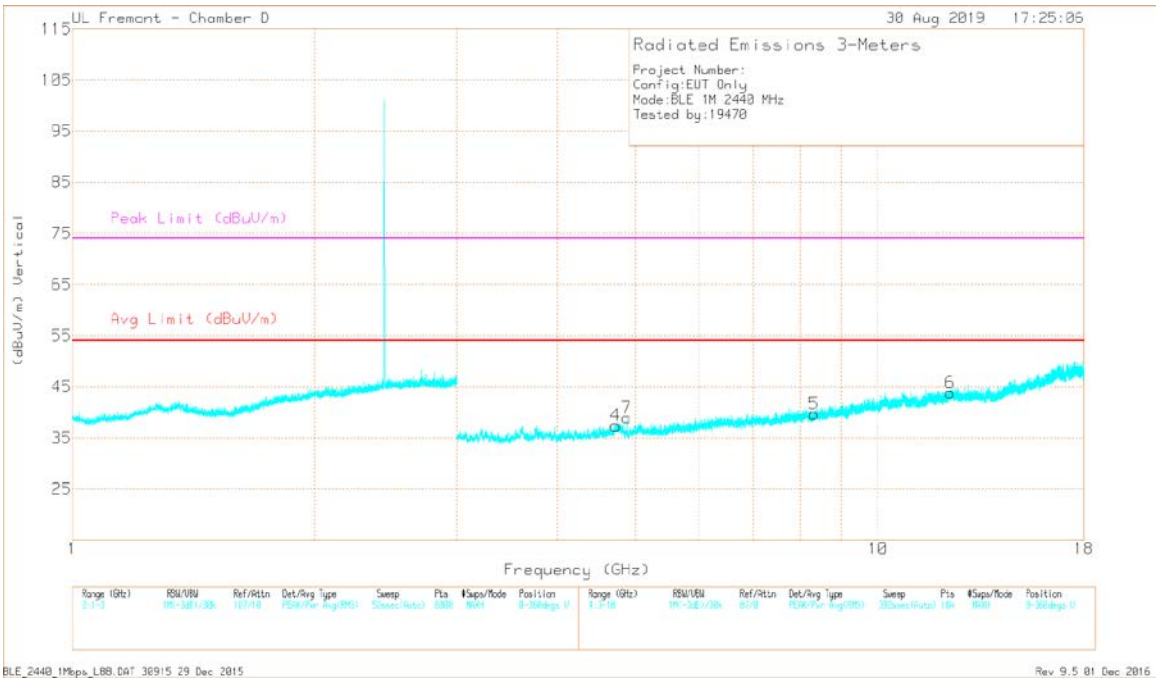
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Markers	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	* 4.881	40.86	PK2	33.9	-28	46.76	-	-	74	-27.24	216	101	H
	* 4.88	32.98	MAv1	34	-28	38.98	54	-15.02	-	-	216	101	H
2	* 7.435	35.39	PK2	35.5	-24.6	46.29	-	-	74	-27.71	216	101	H
	* 7.436	23.45	MAv1	35.5	-24.6	34.35	54	-19.65	-	-	216	101	H
3	* 11.547	32.97	PK2	38.2	-20.9	50.27	-	-	74	-23.73	216	100	H
	* 11.546	18.01	MAv1	38.2	-20.9	35.31	54	-18.69	-	-	216	100	H
4	* 4.727	37.87	PK2	33.9	-26.7	45.07	-	-	74	-28.93	216	101	V
	* 4.725	25.81	MAv1	33.9	-26.7	33.01	54	-20.99	-	-	216	101	V
5	* 8.327	35.52	PK2	35.7	-23.6	47.62	-	-	74	-26.38	216	101	V
	* 8.328	22.97	MAv1	35.7	-23.6	35.07	54	-18.93	-	-	216	101	V
6	* 12.284	34.77	PK2	38.9	-22	51.67	-	-	74	-22.33	216	101	V
	* 12.283	21.91	MAv1	38.9	-21.9	38.91	54	-15.09	-	-	216	101	V
7	* 4.88	38.62	PK2	33.9	-28	44.52	-	-	74	-29.48	157	319	V
	* 4.88	27.64	MAv1	33.9	-28	33.54	54	-20.46	-	-	157	319	V
8	14.422	35.6	PK2	39.3	-22.3	52.6	-	-	-	-	196	156	H
	14.43	23.94	MAv1	39.4	-22.4	40.94	-	-	-	-	196	156	H

* - 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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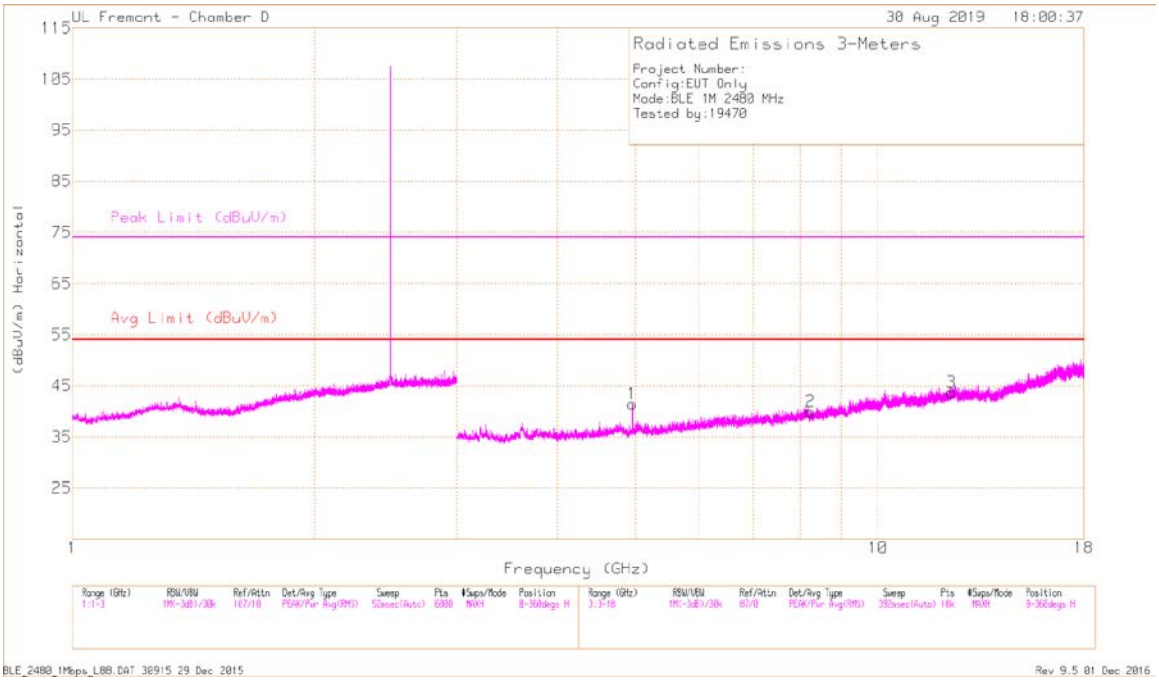
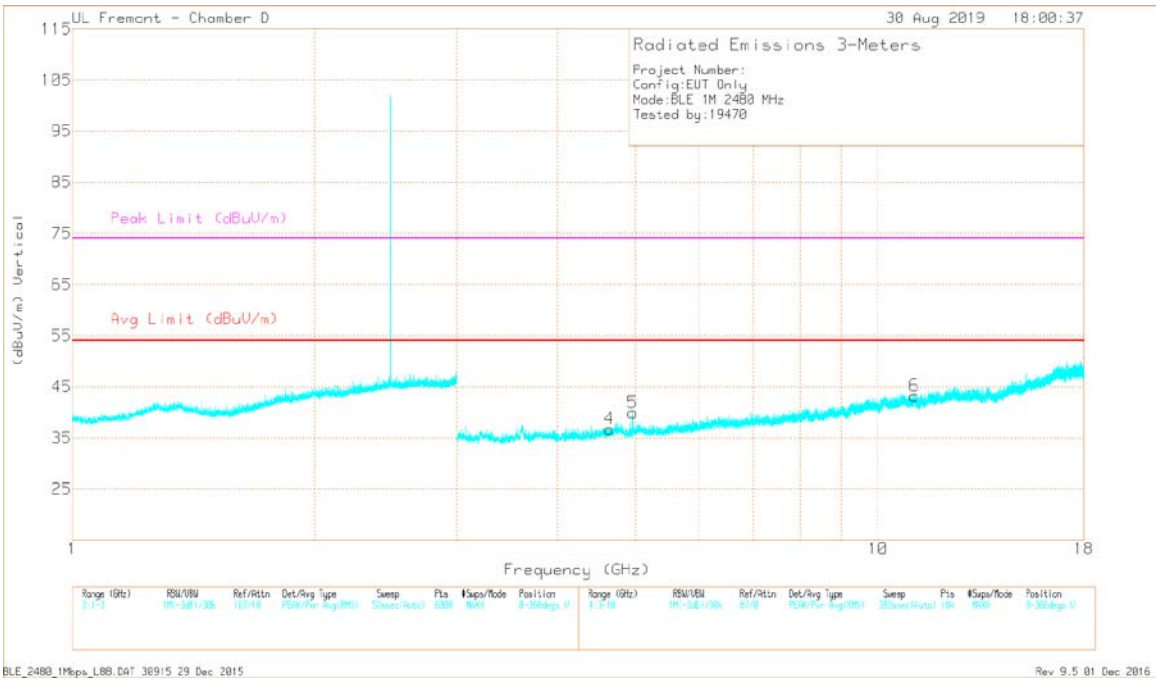
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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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	* 4.96	41.01	PK2	34	-27.5	47.51	-	-	74	-26.49	50	101	H
	* 4.96	32.94	MAv1	34	-27.5	39.44	54	-14.56	-	-	50	101	H
2	* 8.244	36.28	PK2	35.8	-24.4	47.68	-	-	74	-26.32	0	101	H
	* 8.243	23.57	MAv1	35.8	-24.4	34.97	54	-19.03	-	-	0	101	H
3	* 12.331	34.75	PK2	38.9	-21.6	52.05	-	-	74	-21.95	0	101	H
	* 12.331	21.72	MAv1	38.9	-21.6	39.02	54	-14.98	-	-	0	101	H
4	* 4.644	38.81	PK2	34	-28.3	44.51	-	-	74	-29.49	0	101	V
	* 4.642	27.27	MAv1	34	-28.3	32.97	54	-21.03	-	-	0	101	V
5	* 4.961	37.67	PK2	34	-27.5	44.17	-	-	74	-29.83	231	127	V
	* 4.958	26.09	MAv1	34	-27.5	32.59	54	-21.41	-	-	231	127	V
6	* 11.105	34.15	PK2	37.8	-21	50.95	-	-	74	-23.05	329	398	V
	* 11.103	22.67	MAv1	37.8	-20.9	39.57	54	-14.43	-	-	329	398	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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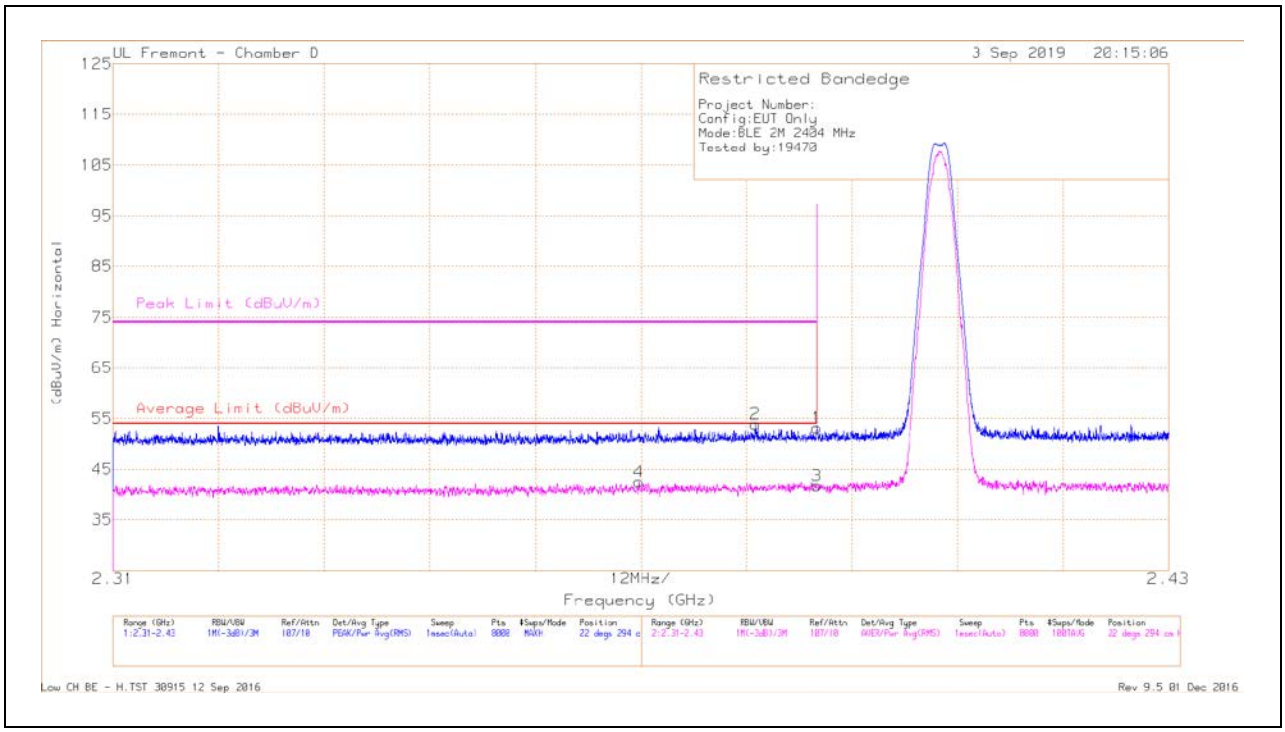
9.2.2. BLE (2Mbps)

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
4	* 2.37	31.12	RMS	31.9	-20.6	42.42	54	-11.58	-	-	22	294	H
2	* 2.383	42.5	Pk	32	-20.6	53.9	-	-	74	-20.1	22	294	H
1	* 2.39	41.69	Pk	32	-20.5	53.19	-	-	74	-20.81	22	294	H
3	* 2.39	30.21	RMS	32	-20.5	41.71	54	-12.29	-	-	22	294	H

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

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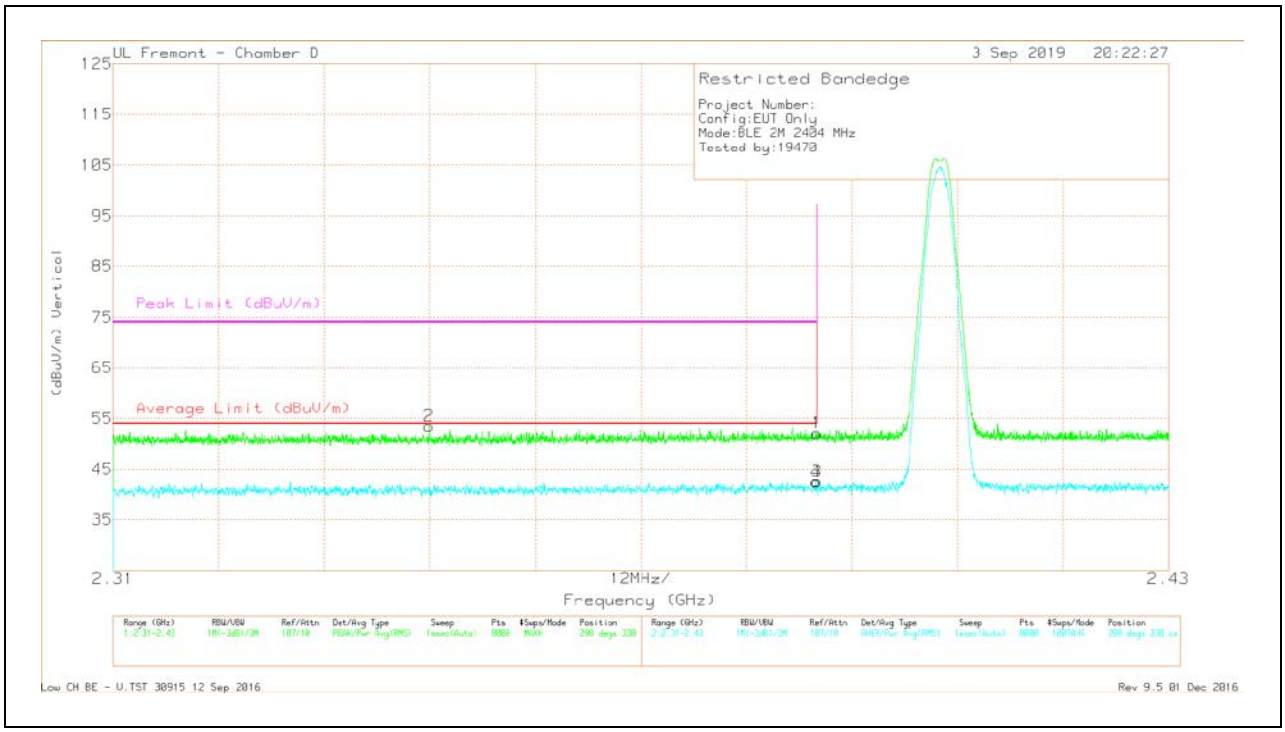
VERTICAL RESULT



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
2	* 2.346	42.3	Pk	31.8	-20.6	53.5	-	-	74	-20.5	298	330	V
1	* 2.39	40.63	Pk	32	-20.5	52.13	-	-	74	-21.87	298	330	V
3	* 2.39	31.1	RMS	32	-20.5	42.6	54	-11.4	-	-	298	330	V
4	* 2.39	31.01	RMS	32	-20.5	42.51	54	-11.49	-	-	298	330	V

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

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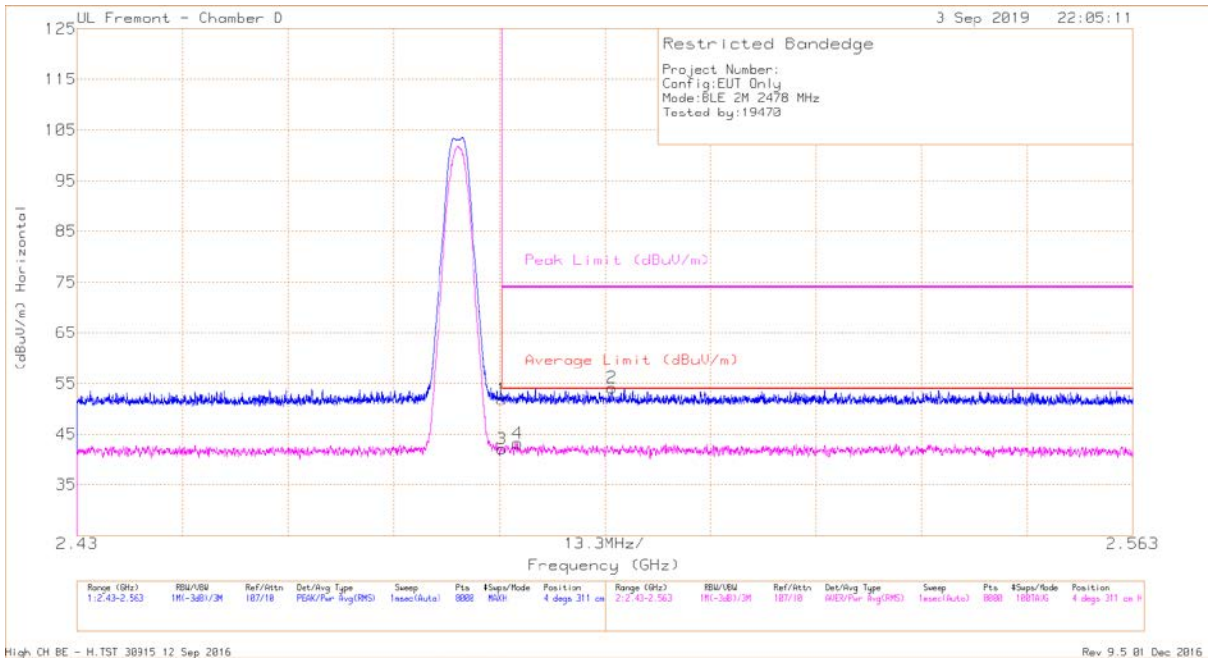
BANDEDGE (HIGH CHANNEL)

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	39.99	Pk	32.4	-20.5	51.89	-	-	74	-22.11	4	311	H
3	* 2.484	30.21	RMS	32.4	-20.5	42.11	54	-11.89	-	-	4	311	H
4	* 2.486	31.44	RMS	32.3	-20.5	43.24	54	-10.76	-	-	4	311	H
2	* 2.497	42.24	Pk	32.3	-20.4	54.14	-	-	74	-19.86	4	311	H

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

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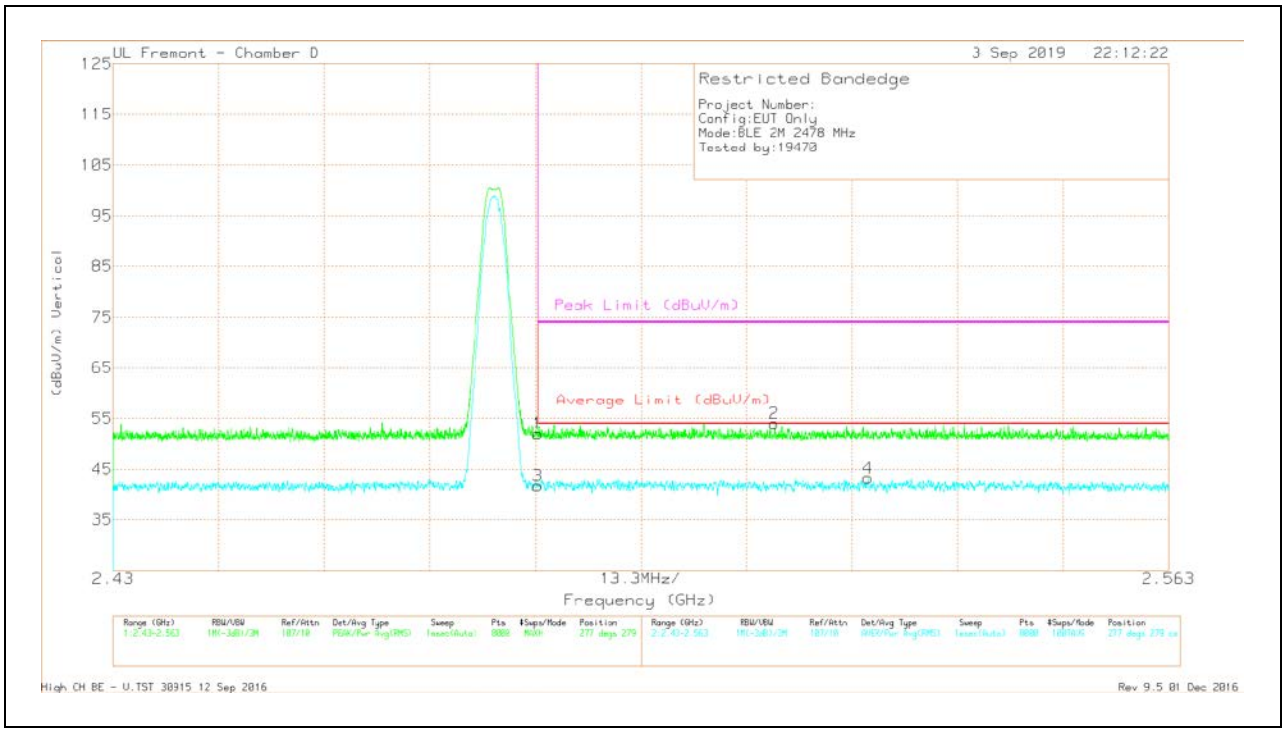
VERTICAL RESULT



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	40.1	Pk	32.4	-20.5	52	-	-	74	-22	277	279	V
3	* 2.484	29.77	RMS	32.4	-20.5	41.67	54	-12.33	-	-	277	279	V
2	2.513	42.06	Pk	32.3	-20.4	53.96	-	-	74	-20.04	277	279	V
4	2.525	31.27	RMS	32.3	-20.3	43.27	54	-10.73	-	-	277	279	V

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

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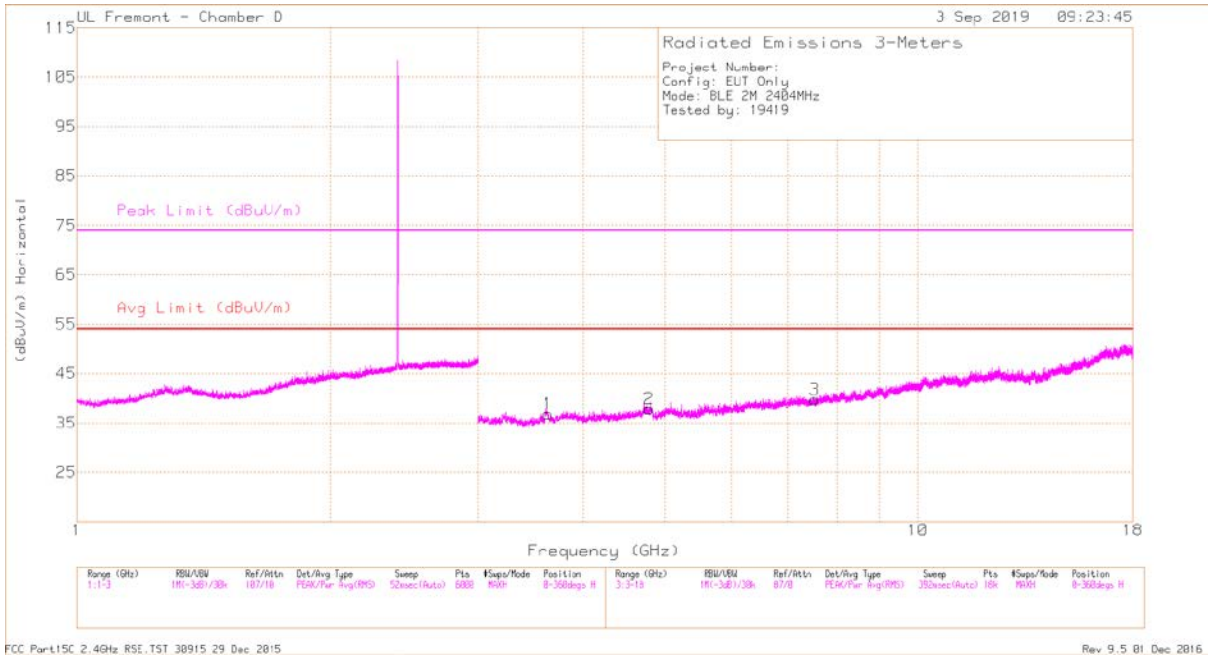
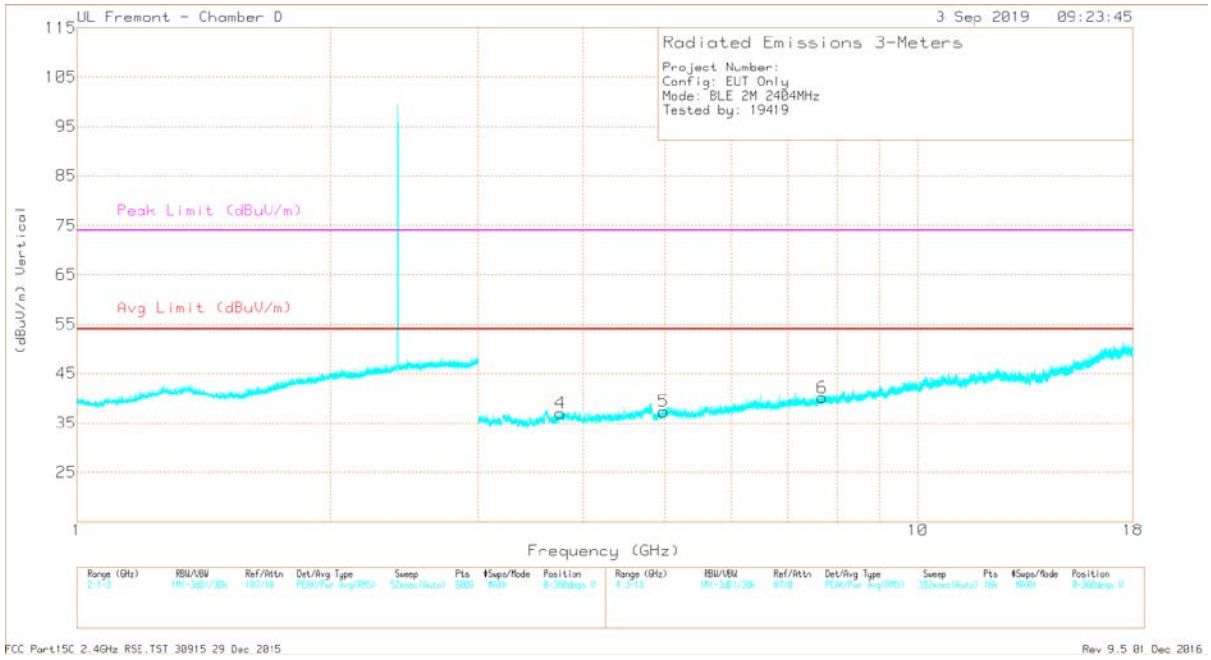
HARMONICS AND SPURIOUS EMISSIONS

LOW 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	* 3.626	39.13	PK2	33.2	-28.4	43.93	-	-	74	-30.07	193	312	H
	* 3.629	27.43	MAv1	33.1	-28.4	32.13	54	-21.87	-	-	193	312	H
2	* 4.786	38.39	PK2	34.1	-26.8	45.69	-	-	74	-28.31	249	133	H
	* 4.786	26.78	MAv1	34.1	-26.8	34.08	54	-19.92	-	-	249	133	H
3	* 7.536	35.74	PK2	35.5	-24.9	46.34	-	-	74	-27.66	150	233	H
	* 7.536	25.09	MAv1	35.5	-24.9	35.69	54	-18.31	-	-	150	233	H
4	* 3.754	39.34	PK2	33.2	-27.9	44.64	-	-	74	-29.36	194	243	V
	* 3.754	28.11	MAv1	33.2	-27.9	33.41	54	-20.59	-	-	194	243	V
5	* 4.979	37.87	PK2	34	-27.1	44.77	-	-	74	-29.23	248	191	V
	* 4.978	26.76	MAv1	34	-27.1	33.66	54	-20.34	-	-	248	191	V
6	* 7.698	36.47	PK2	35.7	-24.7	47.47	-	-	74	-26.53	329	215	V
	* 7.697	24.99	MAv1	35.6	-24.7	35.89	54	-18.11	-	-	329	215	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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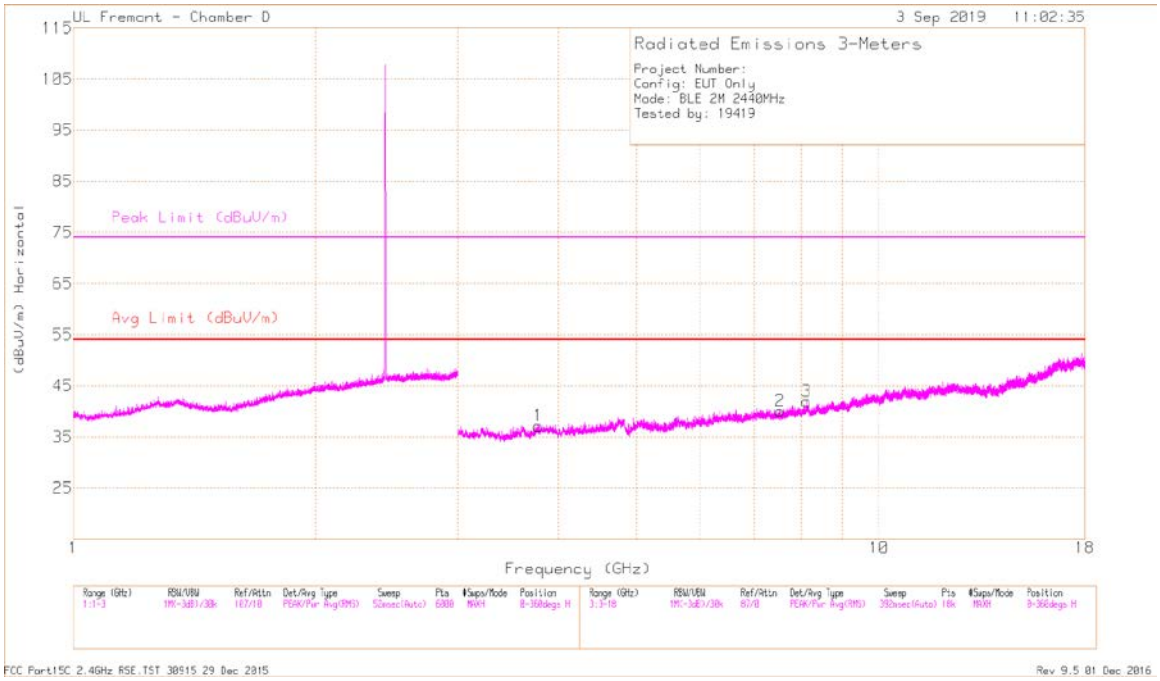
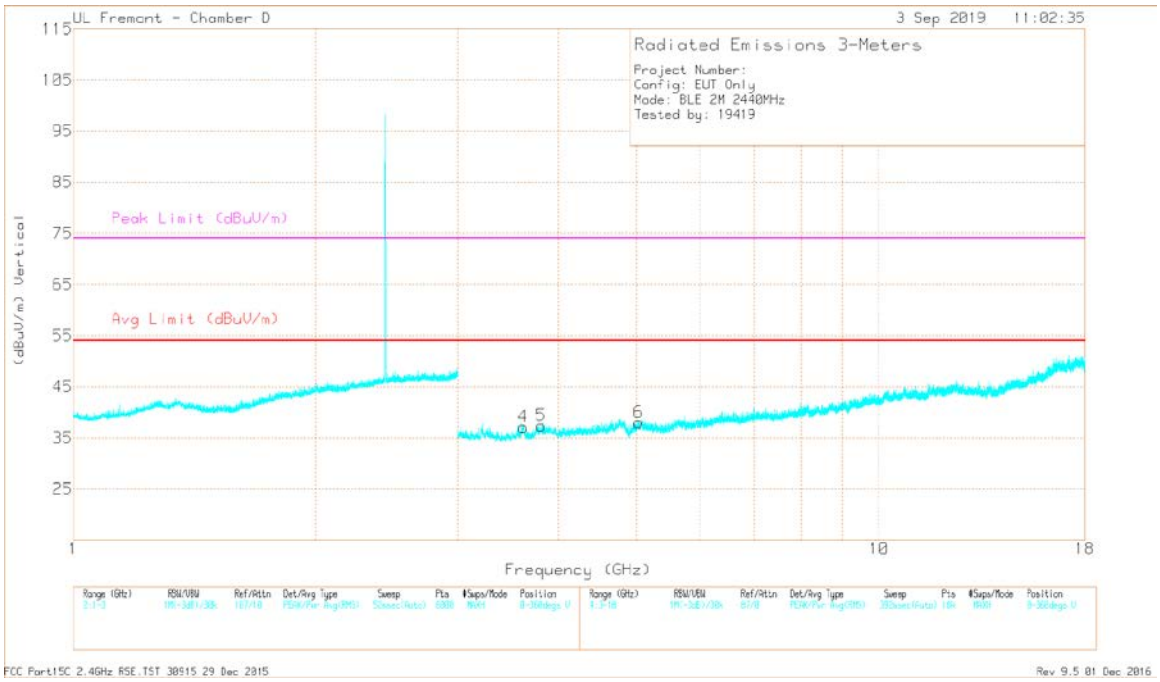
MID CHANNEL RESULTS



HORIZONTAL



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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	* 3.78	39.66	PK2	33.4	-28	45.06	-	-	74	-28.94	49	133	H
	* 3.779	28.39	MAv1	33.4	-28	33.79	54	-20.21	-	-	49	133	H
2	* 7.534	36.48	PK2	35.5	-24.9	47.08	-	-	74	-26.92	148	102	H
	* 7.535	25.1	MAv1	35.5	-24.9	35.7	54	-18.3	-	-	148	102	H
3	* 8.135	35.54	PK2	35.7	-23.2	48.04	-	-	74	-25.96	220	181	H
	* 8.134	24.54	MAv1	35.7	-23.1	37.14	54	-16.86	-	-	220	181	H
4	* 3.617	39.61	PK2	33.6	-28.2	45.01	-	-	74	-28.99	176	221	V
	* 3.617	28.36	MAv1	33.6	-28.2	33.76	54	-20.24	-	-	176	221	V
5	* 3.81	40.34	PK2	33.4	-28.1	45.64	-	-	74	-28.36	300	201	V
	* 3.81	28.43	MAv1	33.4	-28.1	33.73	54	-20.27	-	-	300	201	V
6	* 5.03	39.25	PK2	34	-26.5	46.75	-	-	74	-27.25	256	261	V
	* 5.03	27	MAv1	34	-26.5	34.5	54	-19.5	-	-	256	261	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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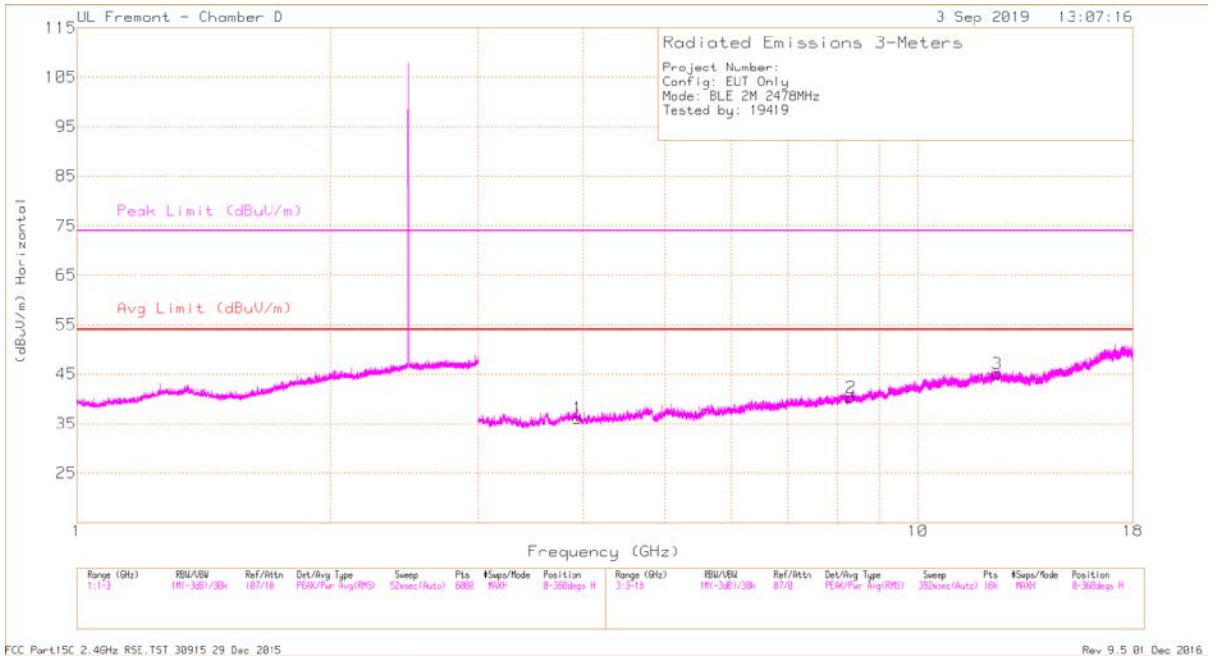
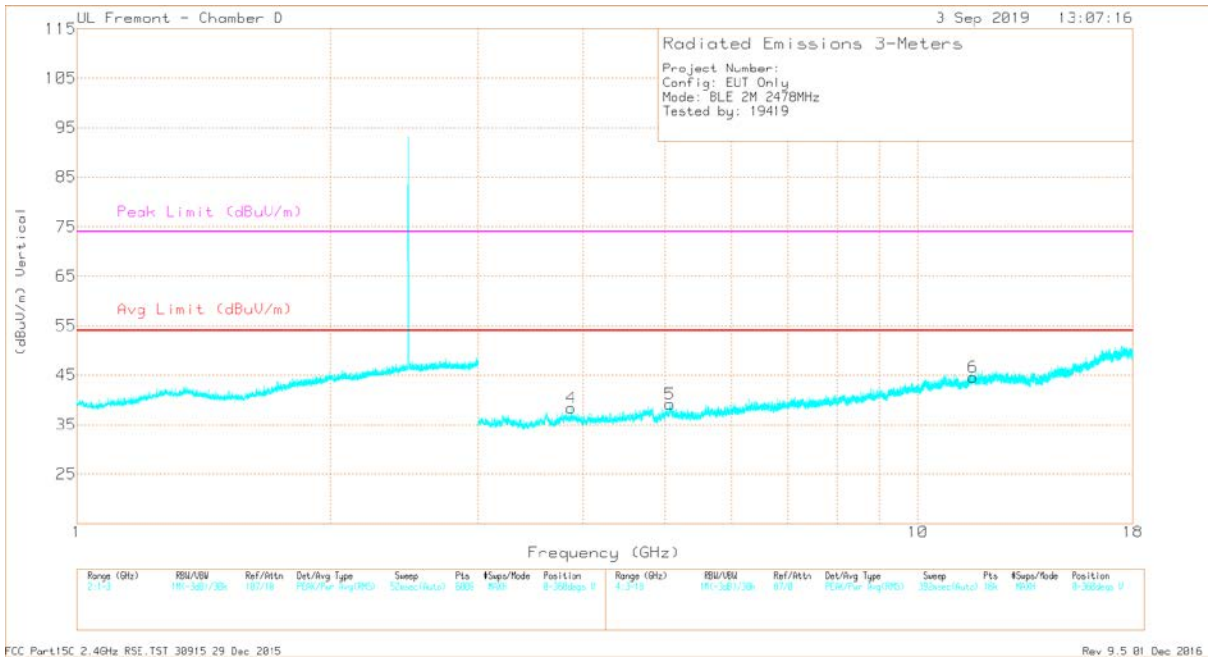
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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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	* 3.946	39.2	PK2	33.4	-28.2	44.4	-	-	74	-29.6	320	136	H
	* 3.947	27.98	MAv1	33.4	-28.2	33.18	54	-20.82	-	-	320	136	H
2	* 8.328	35.58	PK2	35.7	-23.4	47.88	-	-	74	-26.12	290	210	H
	* 8.33	24.53	MAv1	35.7	-23.4	36.83	54	-17.17	-	-	290	210	H
3	* 12.409	34.59	PK2	38.9	-21.1	52.39	-	-	74	-21.61	223	186	H
	* 12.41	23.49	MAv1	38.9	-21.2	41.19	54	-12.81	-	-	223	186	H
4	* 3.866	40.42	PK2	33.3	-28	45.72	-	-	74	-28.28	256	166	V
	* 3.867	28.35	MAv1	33.4	-28	33.75	54	-20.25	-	-	256	166	V
5	* 5.072	38.62	PK2	34.1	-26.5	46.22	-	-	74	-27.78	188	123	V
	* 5.071	26.98	MAv1	34.1	-26.5	34.58	54	-19.42	-	-	188	123	V
6	* 11.628	33.85	PK2	38.3	-20.9	51.25	-	-	74	-22.75	61	330	V
	* 11.628	22.64	MAv1	38.3	-20.8	40.14	54	-13.86	-	-	61	330	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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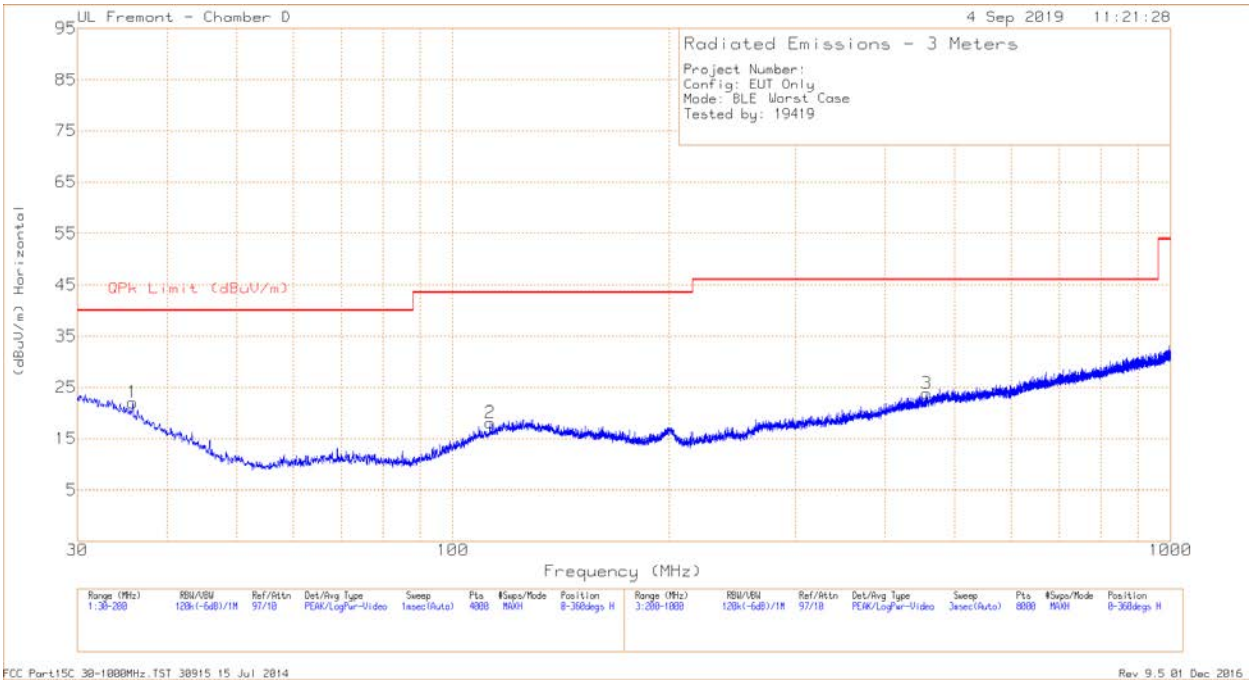
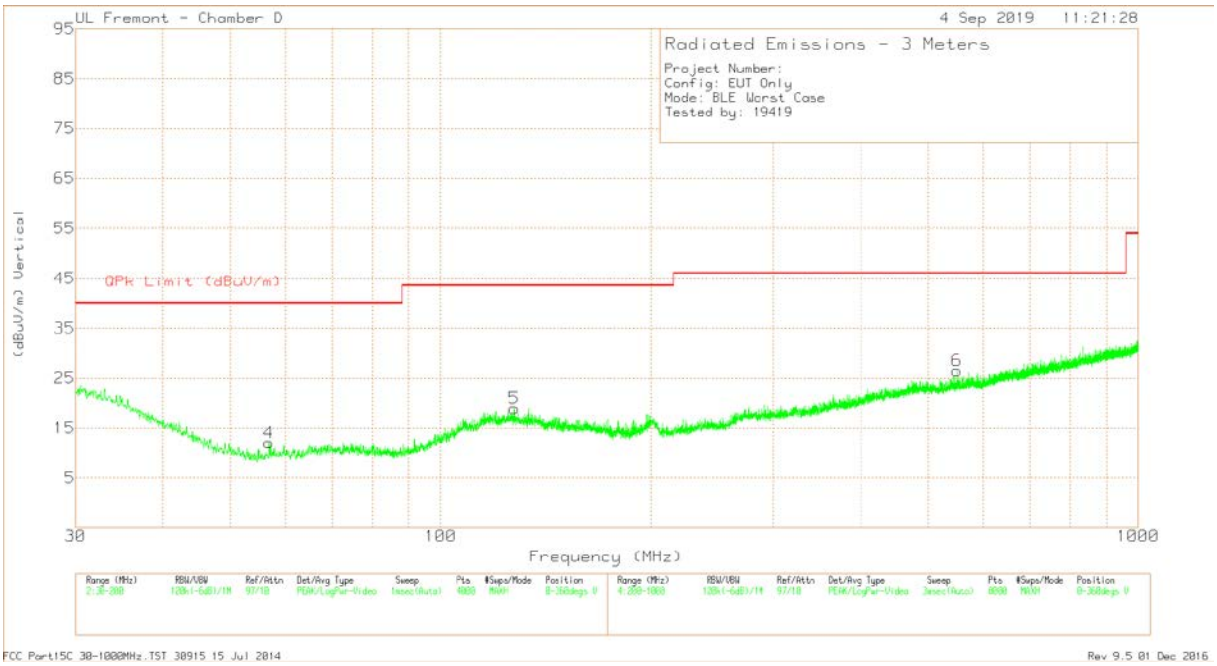
9.3. WORST CASE BELOW 1 GHZ

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



HORIZONTAL



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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	* 112.477	23.54	Qp	18.9	-30.9	11.54	43.52	-31.98	98	123	H
5	* 127.9302	23.95	Qp	19.9	-30.8	13.05	43.52	-30.47	220	198	V
1	35.6381	24.28	Qp	22.9	-31.7	15.48	40	-24.52	23	100	H
4	57.0045	24.12	Qp	13	-31.4	5.72	40	-34.28	260	213	V
3	457.0991	23.22	Qp	22.8	-28.9	17.12	46.02	-28.9	270	310	H
6	549.2139	23.08	Qp	24.1	-28.5	18.68	46.02	-27.34	198	300	V

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

Qp - Quasi-Peak detector

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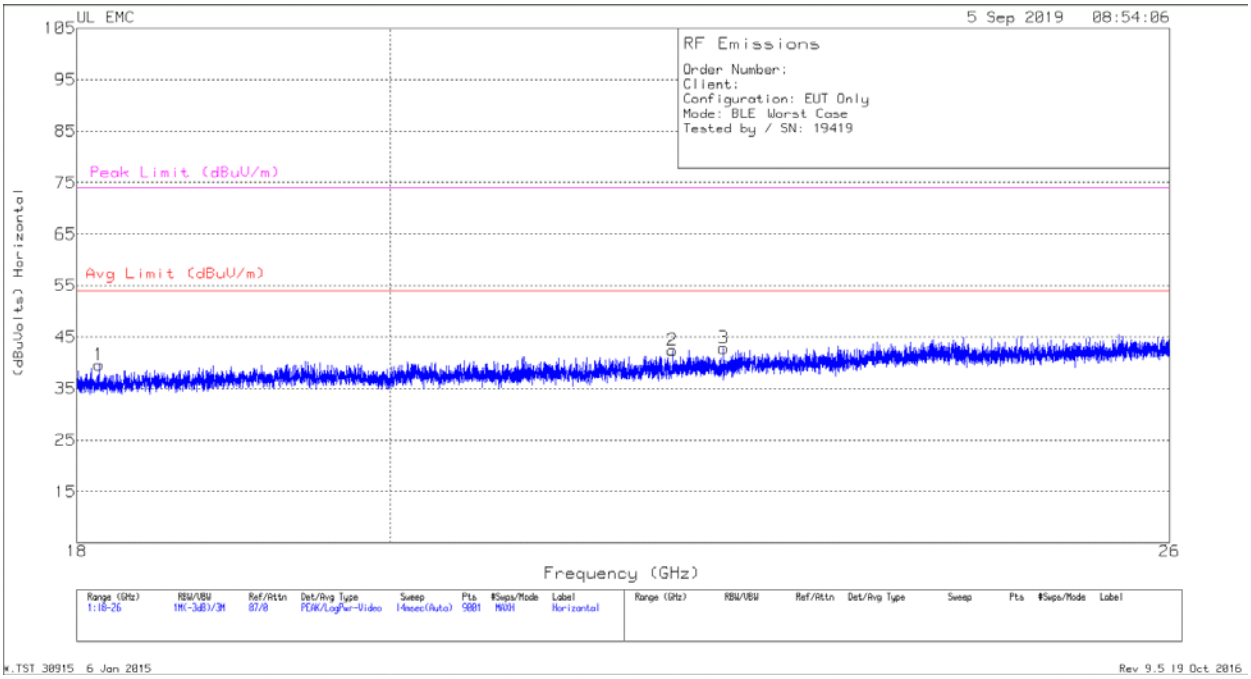
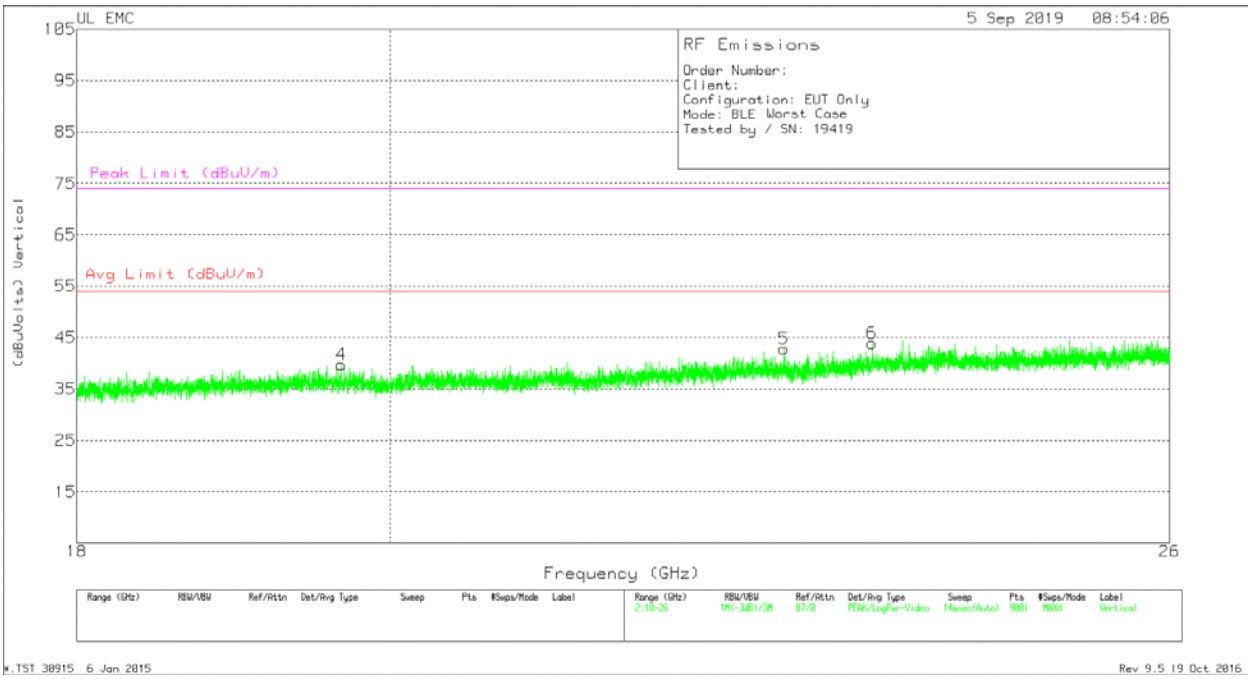
9.4. WORST CASE 18-26 GHZ

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



HORIZONTAL



VERTICAL

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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	18.134	39.12	Pk	32.4	-22.4	-9.5	39.62	54	-14.38	74	-34.38
2	21.996	39.24	Pk	33.3	-20.6	-9.5	42.44	54	-11.56	74	-31.56
3	22.375	39.07	Pk	33.5	-20.2	-9.5	42.87	54	-11.13	74	-31.13
4	19.675	37.89	Pk	32.7	-21.4	-9.5	39.69	54	-14.31	74	-34.31
5	22.836	39.21	Pk	33.6	-20.5	-9.5	42.81	54	-11.19	74	-31.19
6	23.522	39.3	Pk	34.1	-20	-9.5	43.9	54	-10.1	74	-30.1

Pk - Peak detector

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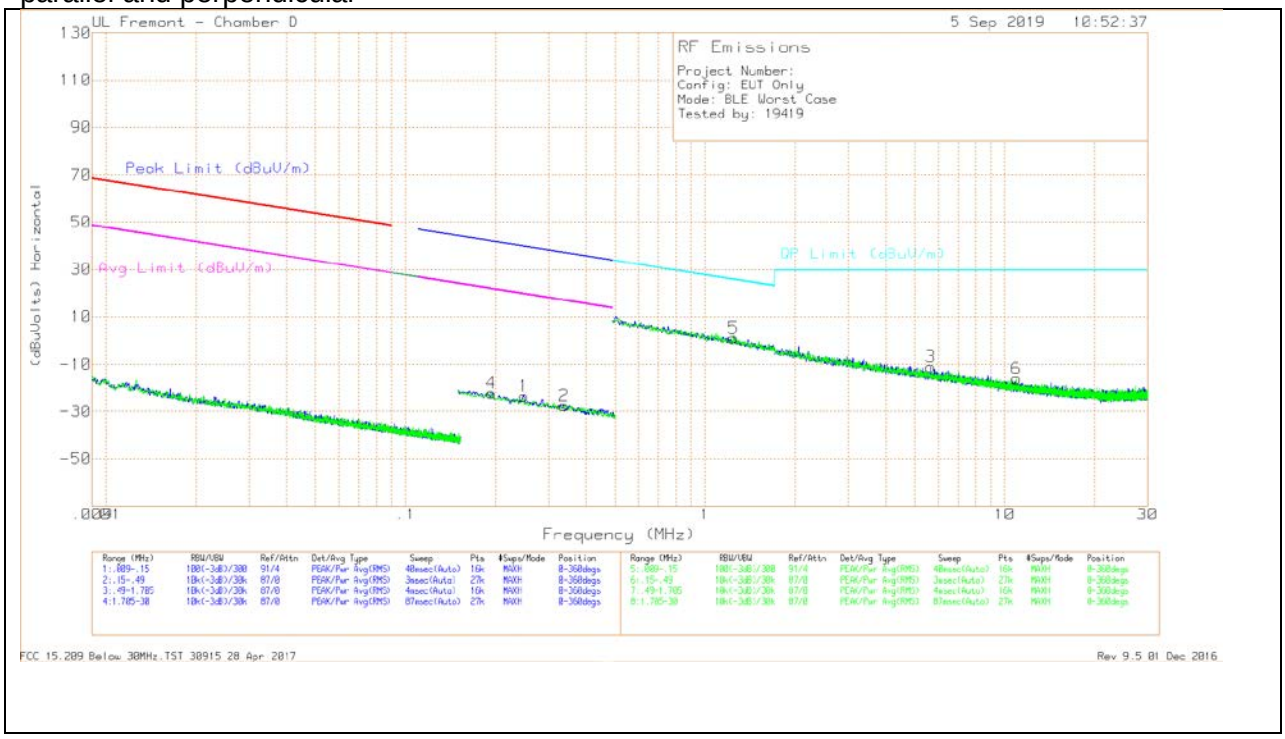
9.5. WORST CASE BELOW 30MHz

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

parallel and perpendicular



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
4	.19382	46.16	Pk	11.6	.1	-80	-22.14	41.87	-64.01	21.87	-44.01	0-360
1	.24872	44.94	Pk	11.5	.1	-80	-23.46	39.7	-63.16	19.7	-43.16	0-360
2	.33816	40.96	Pk	11.5	.1	-80	-27.44	37.03	-64.47	17.03	-44.47	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 30m	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
5	1.24772	29.34	Pk	11.5	.2	-40	1.04	25.7	-24.66	0-360
3	5.67797	17.46	Pk	11.2	.3	-40	-11.04	29.5	-40.54	0-360
6	10.92164	12.68	Pk	10.6	.5	-40	-16.22	29.5	-45.72	0-360

Pk - Peak detector
FCC 15.209 Below 30MHz.TST 30915 28 Apr 2017
Rev 9.5 01 Dec 2016

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

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

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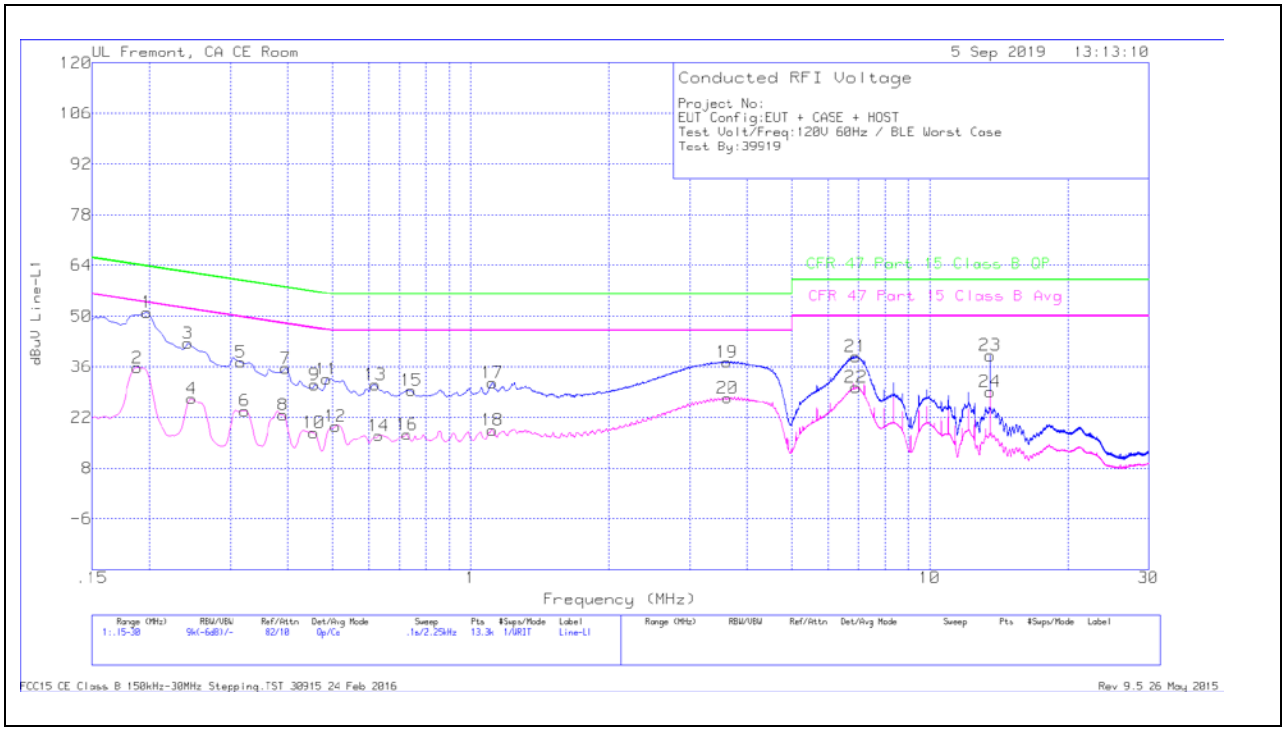
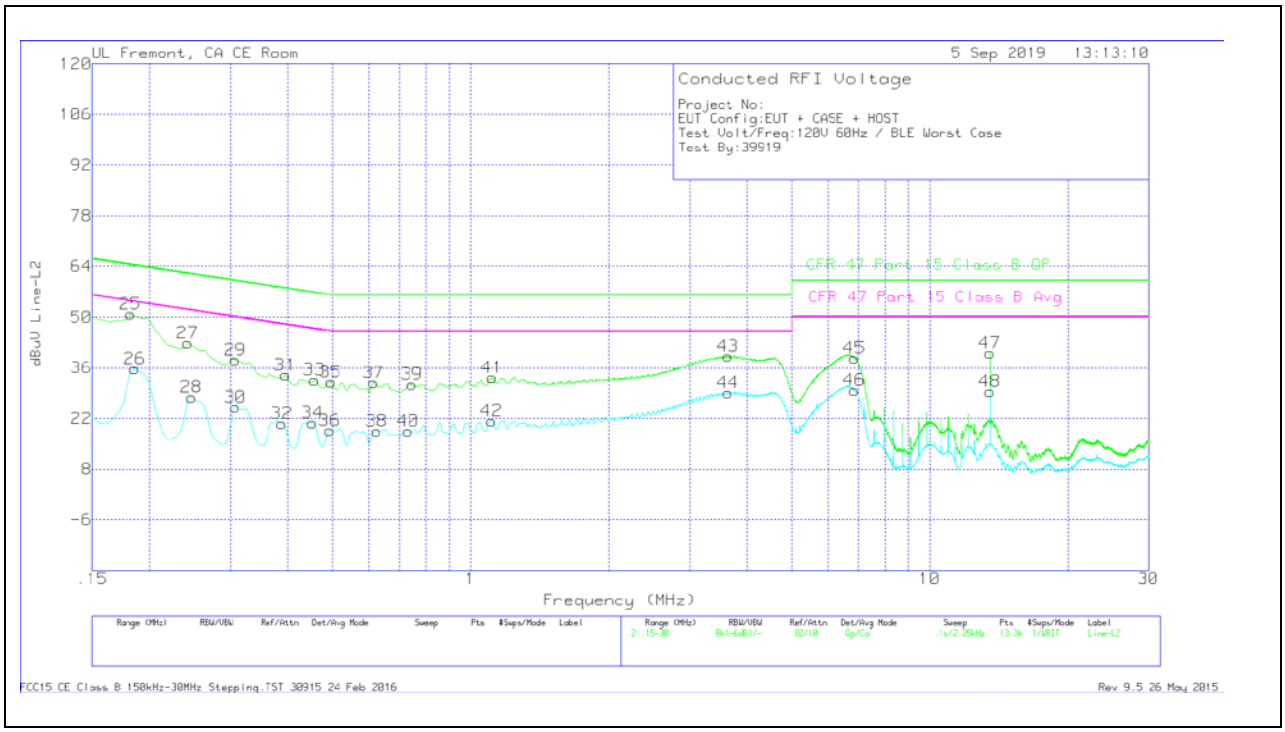
10.1.1. AC Power Line Host

LINE 1 RESULTS



LINE 2 RESULTS



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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	40.99	Qp	0	0	10.1	51.09	63.73	-12.64	-	-
2	.18825	25.58	Ca	0	0	10.1	35.68	-	-	54.11	-18.43
3	.24225	32.39	Qp	0	0	10.1	42.49	62.02	-19.53	-	-
4	.24675	17.13	Ca	0	0	10.1	27.23	-	-	51.87	-24.64
5	.3165	27.15	Qp	0	0	10.1	37.25	59.8	-22.55	-	-
6	.32212	13.74	Ca	0	0	10.1	23.84	-	-	49.65	-25.81
7	.39525	25.43	Qp	0	0	10.1	35.53	57.95	-22.42	-	-
8	.39075	12.58	Ca	0	0	10.1	22.68	-	-	48.05	-25.37
9	.45825	20.9	Qp	0	0	10.1	31	56.72	-25.72	-	-
10	.456	7.79	Ca	0	0	10.1	17.89	-	-	46.77	-28.88
11	.48525	22.55	Qp	0	0	10.1	32.65	56.25	-23.6	-	-
12	.50775	9.45	Ca	0	0	10.1	19.55	-	-	46	-26.45
13	.62025	21.02	Qp	0	0	10.1	31.12	56	-24.88	-	-
14	.6315	6.89	Ca	0	0	10.1	16.99	-	-	46	-29.01
15	.744	19.43	Qp	0	0	10.1	29.53	56	-26.47	-	-
16	.72825	7.22	Ca	0	0	10.1	17.32	-	-	46	-28.68
17	1.11525	21.38	Qp	0	.1	10.1	31.58	56	-24.42	-	-
18	1.11525	8.39	Ca	0	.1	10.1	18.59	-	-	46	-27.41
19	3.62175	27.1	Qp	0	.1	10.1	37.3	56	-18.7	-	-
20	3.6285	17.15	Ca	0	.1	10.1	27.35	-	-	46	-18.65
21	6.9045	28.42	Qp	0	.2	10.2	38.82	60	-21.18	-	-
22	6.9135	19.88	Ca	0	.2	10.2	30.28	-	-	50	-19.72
*23	13.56	28.64	Qp	.1	.2	10.2	39.14	60	-20.86	-	-
*24	13.56	18.71	Ca	.1	.2	10.2	29.21	-	-	50	-20.79

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	.1815	40.75	Qp	0	0	10.1	50.85	64.42	-13.57	-	-
26	.186	25.57	Ca	0	0	10.1	35.67	-	-	54.21	-18.54
27	.24225	32.73	Qp	0	0	10.1	42.83	62.02	-19.19	-	-
28	.24675	17.81	Ca	0	0	10.1	27.91	-	-	51.87	-23.96
29	.3075	28.15	Qp	0	0	10.1	38.25	60.04	-21.79	-	-
30	.3075	15.07	Ca	0	0	10.1	25.17	-	-	50.04	-24.87
31	.39525	23.9	Qp	0	0	10.1	34	57.95	-23.95	-	-
32	.3885	10.52	Ca	0	0	10.1	20.62	-	-	48.1	-27.48
33	.45825	22.6	Qp	0	0	10.1	32.7	56.72	-24.02	-	-
34	.45375	10.72	Ca	0	0	10.1	20.82	-	-	46.81	-25.99
35	.4965	22	Qp	0	0	10.1	32.1	56.06	-23.96	-	-
36	.49425	8.61	Ca	0	0	10.1	18.71	-	-	46.1	-27.39
37	.61575	21.87	Qp	0	0	10.1	31.97	56	-24.03	-	-
38	.62475	8.44	Ca	0	0	10.1	18.54	-	-	46	-27.46
39	.74625	21.38	Qp	0	0	10.1	31.48	56	-24.52	-	-
40	.73275	8.47	Ca	0	0	10.1	18.57	-	-	46	-27.43
41	1.1175	23.04	Qp	0	.1	10.1	33.24	56	-22.76	-	-
42	1.11413	11.1	Ca	0	.1	10.1	21.3	-	-	46	-24.7
43	3.63975	29.06	Qp	0	.1	10.1	39.26	56	-16.74	-	-
44	3.6375	18.88	Ca	0	.1	10.1	29.08	-	-	46	-16.92
45	6.86963	28.24	Qp	0	.2	10.2	38.64	60	-21.36	-	-
46	6.85838	19.47	Ca	0	.2	10.2	29.87	-	-	50	-20.13
*47	13.56	29.57	Qp	.1	.2	10.2	40.07	60	-19.93	-	-
*48	13.56	19.01	Ca	.1	.2	10.2	29.51	-	-	50	-20.49

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

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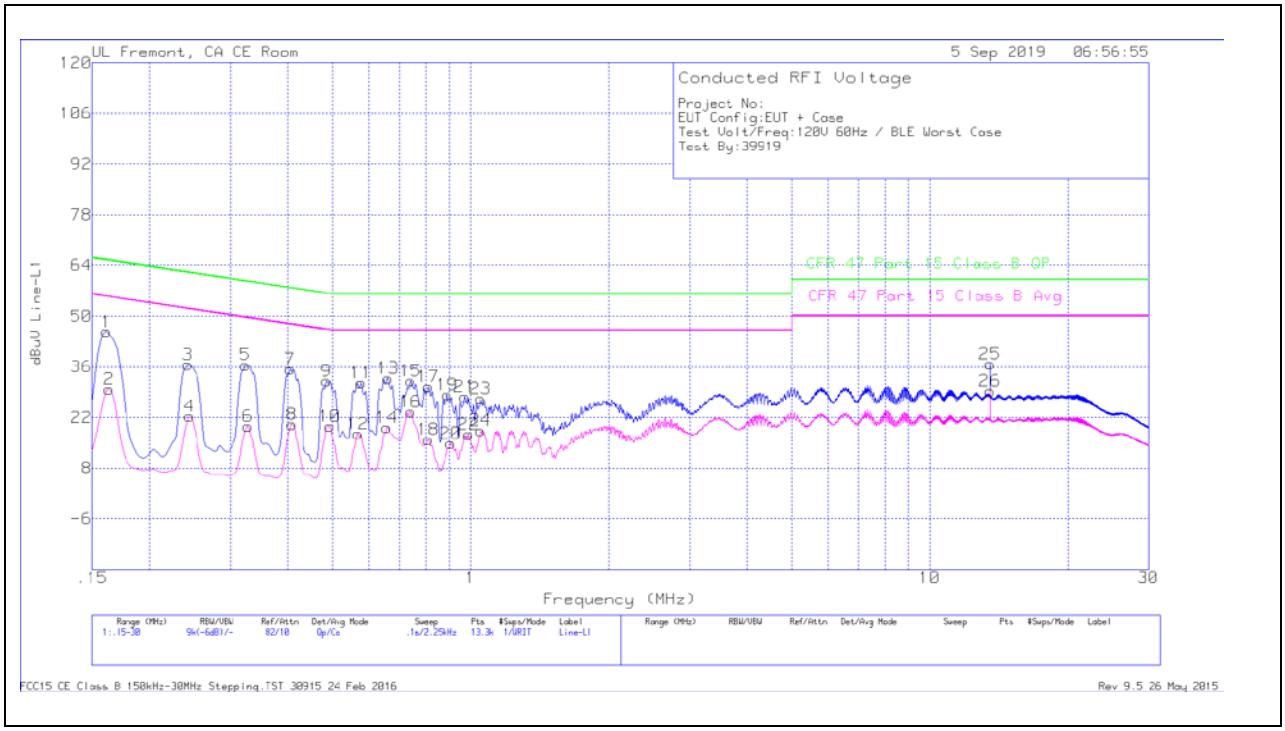
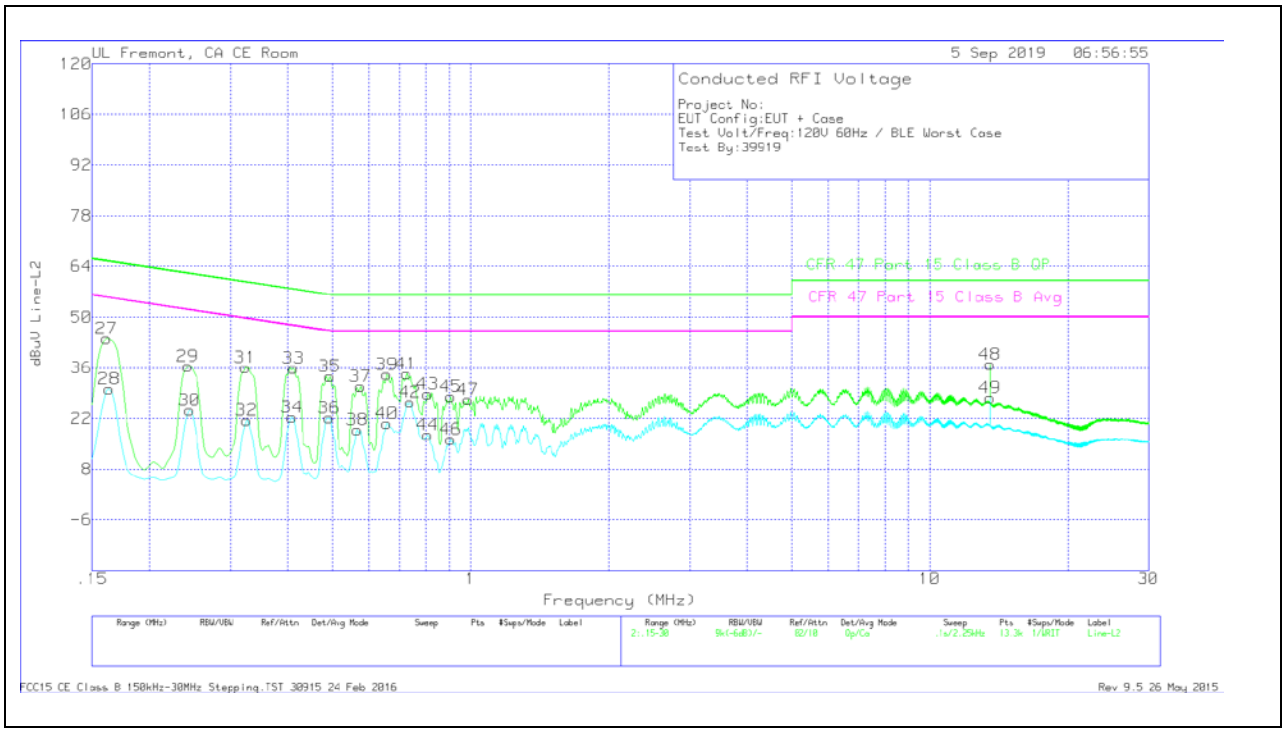
10.1.2. AC Power Line Norm

LINE 1 RESULTS



LINE 2 RESULTS



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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	35.44	Qp	.1	0	10.1	45.64	65.4	-19.76	-	-
2	.1635	19.65	Ca	.1	0	10.1	29.85	-	-	55.28	-25.43
3	.24225	26.51	Qp	0	0	10.1	36.61	62.02	-25.41	-	-
4	.2445	12.2	Ca	0	0	10.1	22.3	-	-	51.94	-29.64
5	.32325	26.43	Qp	0	0	10.1	36.53	59.62	-23.09	-	-
6	.32775	9.5	Ca	0	0	10.1	19.6	-	-	49.51	-29.91
7	.40425	25.28	Qp	0	0	10.1	35.38	57.77	-22.39	-	-
8	.40875	10.06	Ca	0	0	10.1	20.16	-	-	47.67	-27.51
9	.48525	22.07	Qp	0	0	10.1	32.17	56.25	-24.08	-	-
10	.49425	9.51	Ca	0	0	10.1	19.61	-	-	46.1	-26.49
11	.5775	21.47	Qp	0	0	10.1	31.57	56	-24.43	-	-
12	.5685	7.37	Ca	0	0	10.1	17.47	-	-	46	-28.53
13	.66075	22.77	Qp	0	0	10.1	32.87	56	-23.13	-	-
14	.6585	9.14	Ca	0	0	10.1	19.24	-	-	46	-26.76
15	.74175	21.94	Qp	0	0	10.1	32.04	56	-23.96	-	-
16	.74175	13.42	Ca	0	0	10.1	23.52	-	-	46	-22.48
17	.80925	20.41	Qp	0	0	10.1	30.51	56	-25.49	-	-
18	.80925	5.88	Ca	0	0	10.1	15.98	-	-	46	-30.02
19	.89025	18.11	Qp	0	0	10.1	28.21	56	-27.79	-	-
20	.906	4.71	Ca	0	0	10.1	14.81	-	-	46	-31.19
21	.97125	17.51	Qp	0	.1	10.1	27.71	56	-28.29	-	-
22	.98925	7.16	Ca	0	.1	10.1	17.36	-	-	46	-28.64
23	1.05225	16.97	Qp	0	.1	10.1	27.17	56	-28.83	-	-
24	1.05225	8.25	Ca	0	.1	10.1	18.45	-	-	46	-27.55
*25	13.56	26.24	Qp	.1	.2	10.2	36.74	60	-23.26	-	-
*26	13.56	18.84	Ca	.1	.2	10.2	29.34	-	-	50	-20.66

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	33.91	Qp	.1	0	10.1	44.11	65.4	-21.29	-	-
28	.1635	19.96	Ca	.1	0	10.1	30.16	-	-	55.28	-25.12
29	.24225	26.41	Qp	0	0	10.1	36.51	62.02	-25.51	-	-
30	.2445	14.24	Ca	0	0	10.1	24.34	-	-	51.94	-27.6
31	.32325	26.05	Qp	0	0	10.1	36.15	59.62	-23.47	-	-
32	.3255	11.36	Ca	0	0	10.1	21.46	-	-	49.57	-28.11
33	.411	25.89	Qp	0	0	10.1	35.99	57.63	-21.64	-	-
34	.40875	12.19	Ca	0	0	10.1	22.29	-	-	47.67	-25.38
35	.49425	23.48	Qp	0	0	10.1	33.58	56.1	-22.52	-	-
36	.492	12.02	Ca	0	0	10.1	22.12	-	-	46.13	-24.01
37	.57525	20.7	Qp	0	0	10.1	30.8	56	-25.2	-	-
38	.56625	8.77	Ca	0	0	10.1	18.87	-	-	46	-27.13
39	.6585	24.05	Qp	0	0	10.1	34.15	56	-21.85	-	-
40	.6585	10.59	Ca	0	0	10.1	20.69	-	-	46	-25.31
41	.726	24.33	Qp	0	0	10.1	34.43	56	-21.57	-	-
42	.7395	16.48	Ca	0	0	10.1	26.58	-	-	46	-19.42
43	.807	18.65	Qp	0	0	10.1	28.75	56	-27.25	-	-
44	.807	7.38	Ca	0	0	10.1	17.48	-	-	46	-28.52
45	.906	18.06	Qp	0	0	10.1	28.16	56	-27.84	-	-
46	.906	6.16	Ca	0	0	10.1	16.26	-	-	46	-29.74
47	.987	17.09	Qp	0	.1	10.1	27.29	56	-28.71	-	-
*48	13.56	26.52	Qp	.1	.2	10.2	37.02	60	-22.98	-	-
*49	13.56	17.17	Ca	.1	.2	10.2	27.67	-	-	50	-22.33

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

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11. SETUP PHOTOS

Please refer to 12681939-EP1V1 for setup photos

END OF TEST REPORT

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