CERTIFICATION TEST REPORT

Report Number. : 12696785-E1V5

Applicant	:	Loop Labs, Inc. DBA Notion 1530 Blake Street Suite 220 Denver, CO, 80202
Model	:	0011
FCC ID	:	2AE5C-5280-B3
IC ID	:	20391-5280B3
EUT Description	:	Notion Bridge
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date of Issue:
Tuesday, March 12, 2019

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
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NVLAP TESTING ilac-MRA
NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	02/13/19	Initial Issue	---
V2	02/13/19	Updated Section 1, 5.2, 6 and 9.3	Kiya Kedida
V3	03/05/19	Updated Section 5.2 – Frequency range	Kiya Kedida
V4	03/07/19	Updated Section 7, 8.3 & Added PSD plot on Section 8.5	Kiya Kedida
V5	03/12/19	Updated Cover Page, Section 1 & 2	Kiya Kedida

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UL VERIFICATION SERVICES INC.
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Loop Labs, Inc. DBA Notion
1530 Blake Street Suite 220
Denver, CO, 80202

EUT DESCRIPTION: NOTION BRIDGE

MODEL: 0011

SERIAL NUMBER: 0000025, 0000026, 0000007

DATE TESTED: JANUARY 23 – MARCH 7, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 2.	Pass
INDUSTRY CANADA RSS-GEN Issue 5	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

DAN CORONIA
CONSUMER TECHNOLOGY DIVISION
OPERATIONS LEADER
UL Verification Services Inc.

Reviewed By:

Kiya Kedida
CONSUMER TECHNOLOGY DIVISION
SENIOR PROJECT ENGINEER
UL Verification Services Inc

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v5, ANSI C63.10-2013, 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 A through C are covered under ISED company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under ISED company address code 22541 with site numbers 22541 -1 through 22541-5, respectively. Chambers K and L are covered under ISED company address code 2324A with site numbers 2324A-1 and 2324A-3, respectively.

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Radiated Disturbance,1000 to 18000 MHz	4.32 dB
Radiated Disturbance,18000 to 26000 MHz	4.45 dB
Radiated Disturbance,26000 to 40000 MHz	5.24 dB

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

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

This device is an Notion bridge.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency (MHz)	Output Power (dBm)	Output Power (mW)
906 - 924	13.34	21.58

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a monopole antenna, with a maximum gain of 2.1dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the version 3.12.5 with RAIL adapter 2.3.7.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 30MHz was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emissions between 30MHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

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

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Sony	SVP112A1CL	N/A	PD97260NG

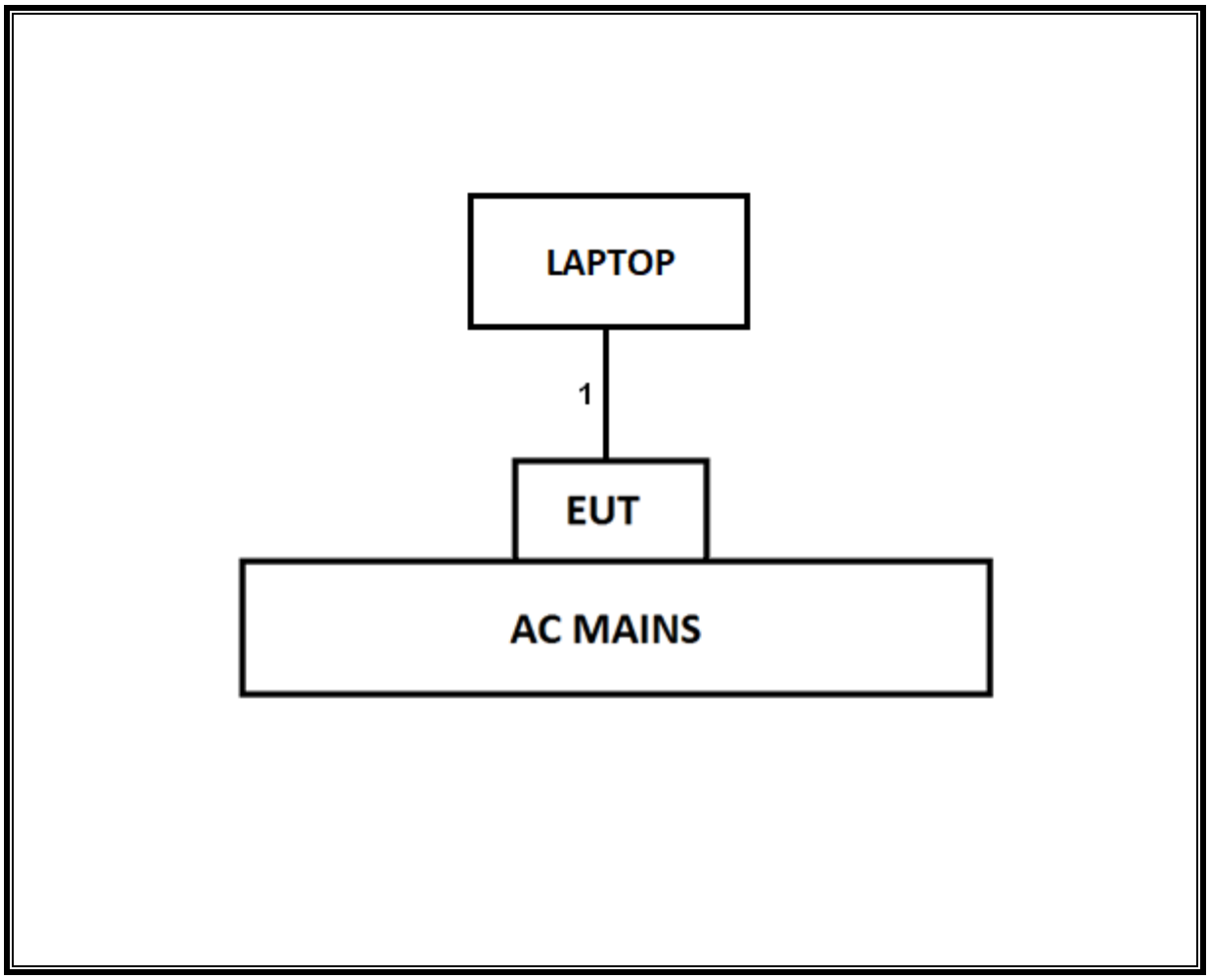
I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	3-pin serial	1	USB	Unshielded	2	

TEST SETUP

The laptop and cable were used to set transmission and removed for radiated testing. For conducted testing, the support equipment remained in place.

CONDUCTED TEST SETUP DIAGRAM



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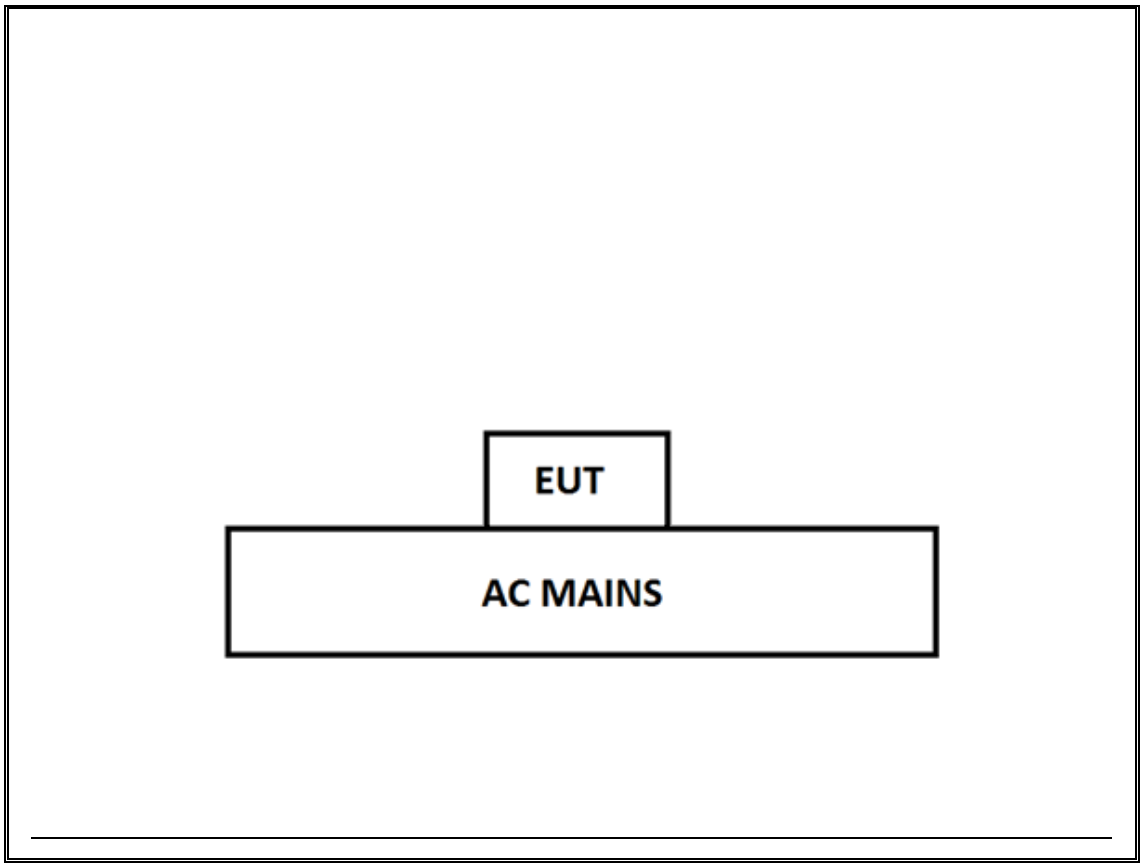
RADIATED SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
6 port rf switch, 1-18GHz	Pasternack	PE7159	171455	08/01/2019	08/01/2018
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	PRE0181575	08/01/2019	08/01/2018
Amplifier, 10kHz to 1GHz, 32dB	Sonoma Instrument Co.	8447D	T15	08/14/2019	08/14/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	AT0067	03/26/2019	03/26/2018
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179367	04/25/2019	04/25/2018
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T1165	12/01/2019	12/01/2018
Spectrum Analyzer PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T818	06/15/2019	06/15/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1466	04/16/2019	04/16/2018
Antenna, Active Loop 9kHz-30MHz	Com-Power Corp.	AL-130R	PRE0165308	01/08/2020	01/08/2019
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1269	04/05/2019	04/05/2018
L.I.S.N.	FCC INC.	FCC LISN 50/250	T1310	06/15/2019	06/15/2018
L.I.S.N.	FCC INC.	FCC LISN 50/250	T24	03/06/2019	03/06/2018
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179367	04/25/2019	04/25/2018

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Rev 9.5, Jun 22, 2018
Antenna Port Software	UL	UL RF	Rev 8.9.1, Oct 18, 2018

7. MEASUREMENT METHOD

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

Occupied BW (6dB): ANSI C63.10-2013 Section 11.8.1

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

Power Spectral Density: ANSI C63.10 Section 11.10

Peak Output Power: ANSI C63.10-2013 Section 11.9.1.1

Conducted Spurious Emissions: ANSI C63.10-2013 Section 11.11

Conducted Band-Edge: ANSI C63.10-2013 Section 6.10.4

Radiated Spurious Emissions 30-1000MHz: ANSI C63.10-2013 Section 6.3 and 6.5

Radiated Spurious Emissions above 1GHz: ANSI C63.10-2013 Section 6.3 and 6.6

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8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE

LIMITS

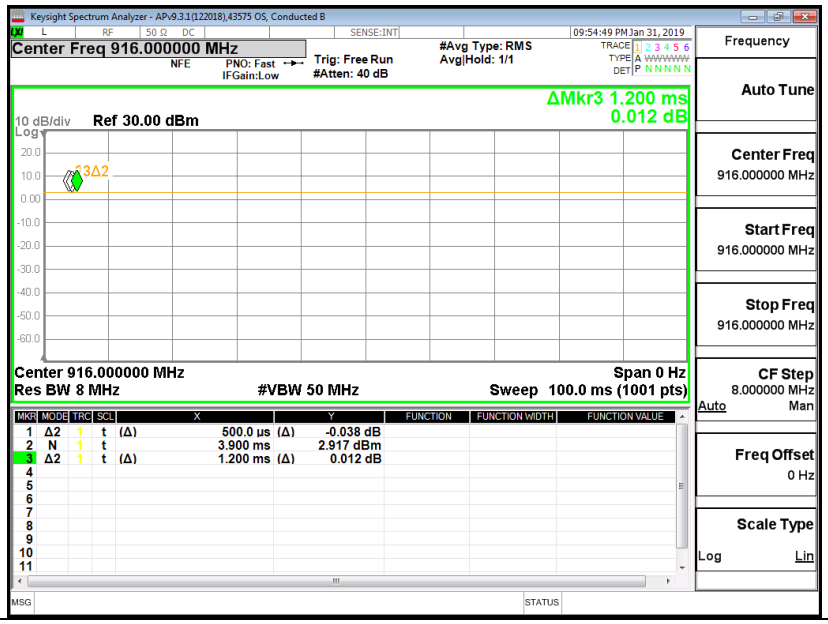
None; for reporting purposes only.

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)
916MHz	N/A	N/A	1.000	100.00%	0.00	0.010

DUTY CYCLE PLOTS

DUTY CYCLE PLOT



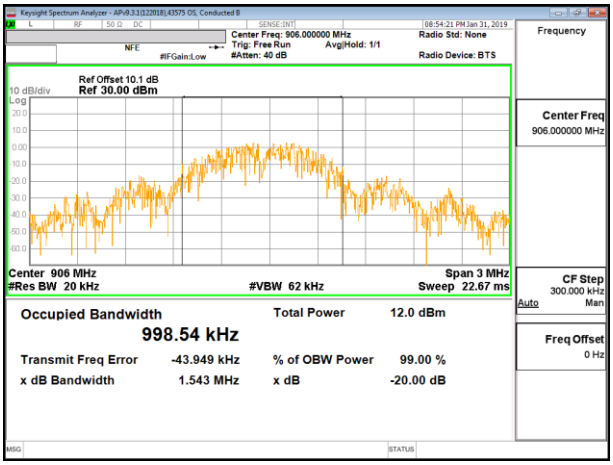
8.2. 99% BANDWIDTH

LIMITS

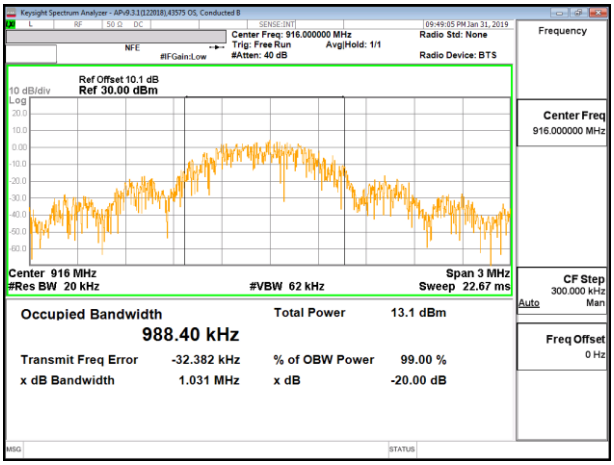
None; for reporting purposes only.

RESULTS

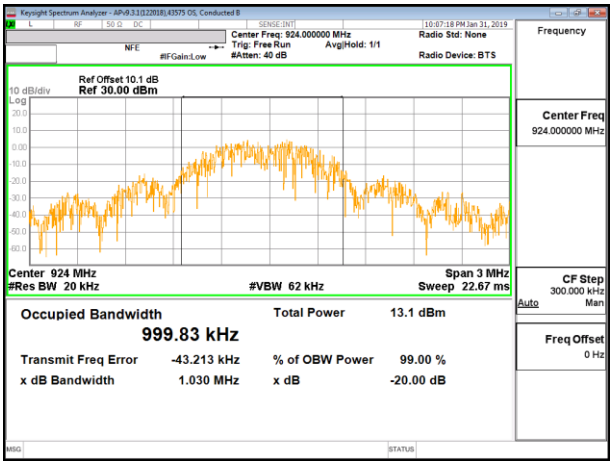
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	906	1543.0	998.54
Mid	916	1031.0	988.4
High	924	1030.0	999.83



Low Channel 20dB and 99% Bandwidth



Mid Channel 20dB and 99% Bandwidth



High Channel 20dB and 99% Bandwidth

8.3. 6 dB BANDWIDTH

LIMITS

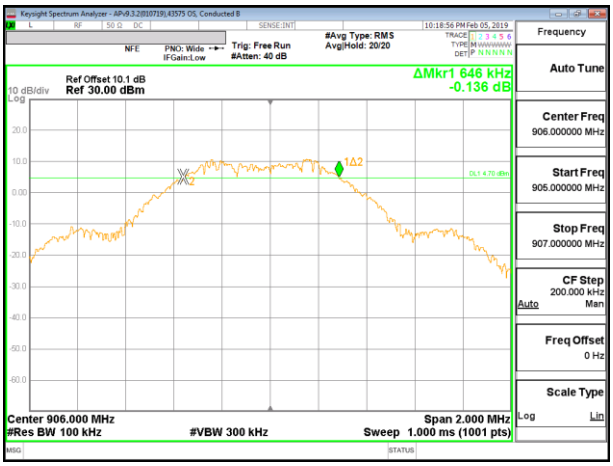
FCC §15.247(a)(2)

RSS-247 5.2 (a)

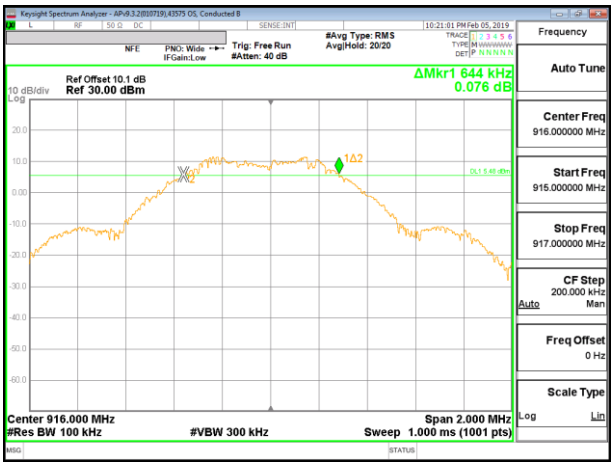
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

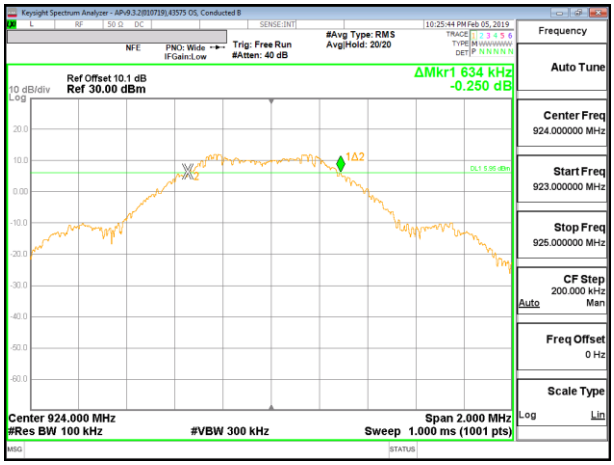
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	906	0.646	0.5
Middle	916	0.644	0.5
High	924	0.634	0.5



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

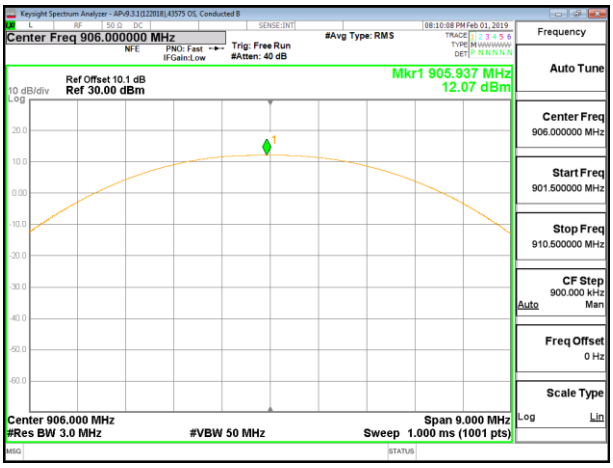
RESULTS

Limits

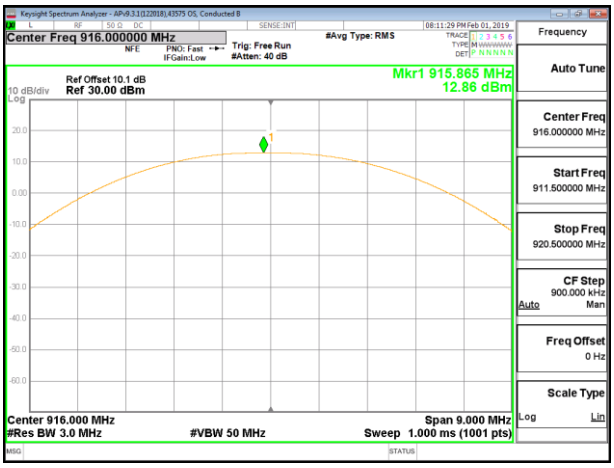
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low	906	2.10	30.00	30	36	30.00
Mid	916	2.10	30.00	30	36	30.00
High	924	2.10	30.00	30	36	30.00

Results

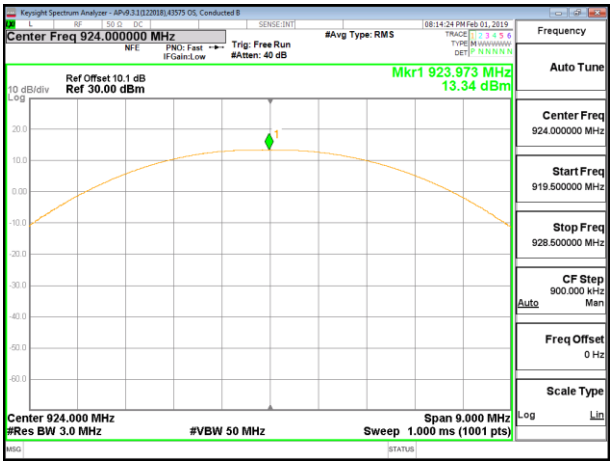
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	906	12.07	12.07	30.00	-17.93
Mid	916	12.86	12.86	30.00	-17.14
High	924	13.34	13.34	30.00	-16.66



Low Channel Output Power



Mid Channel Output Power



High Channel Output Power

8.5. POWER SPECTRAL DENSITY

LIMITS

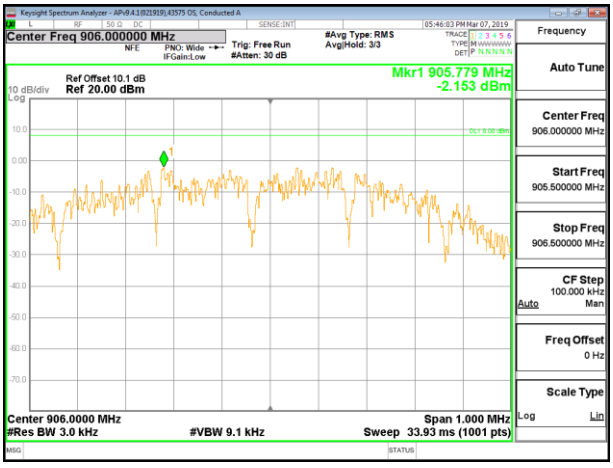
FCC §15.247 (e)

RSS-247 (5.2) (b)

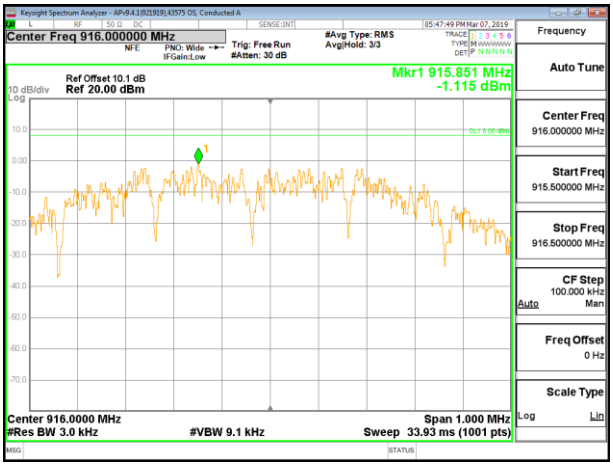
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

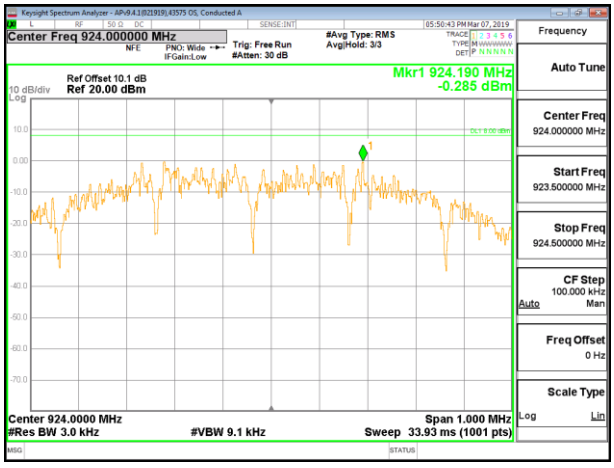
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	906	-2.15	8	-10.15
Middle	916	-1.15	8	-9.15
High	924	-0.29	8	-8.29



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.6. CONDUCTED SUPRIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

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

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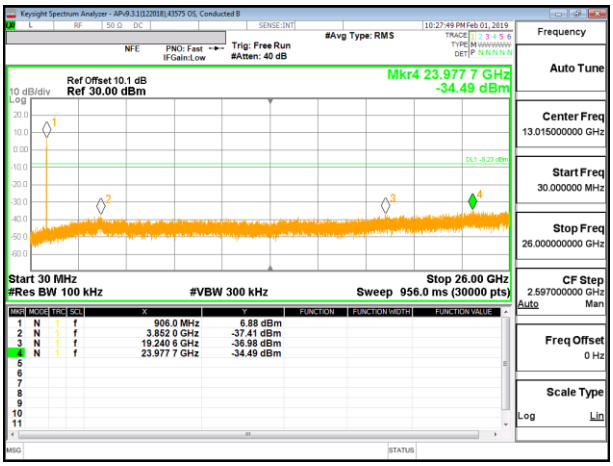
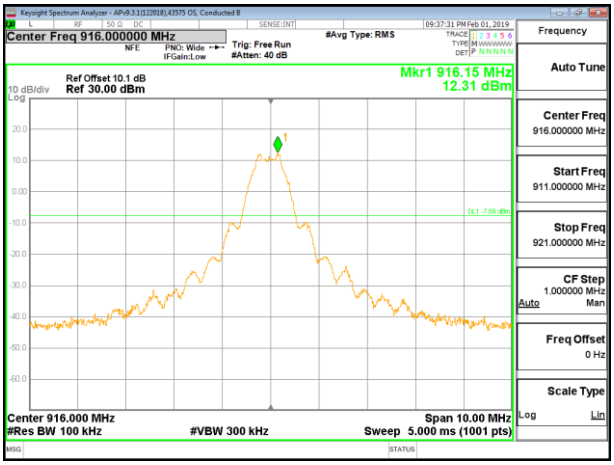
RESULTS

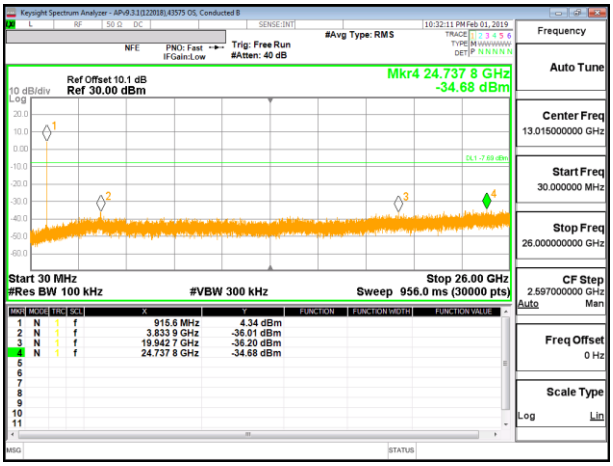
LOW CHANNEL BANDEDGE



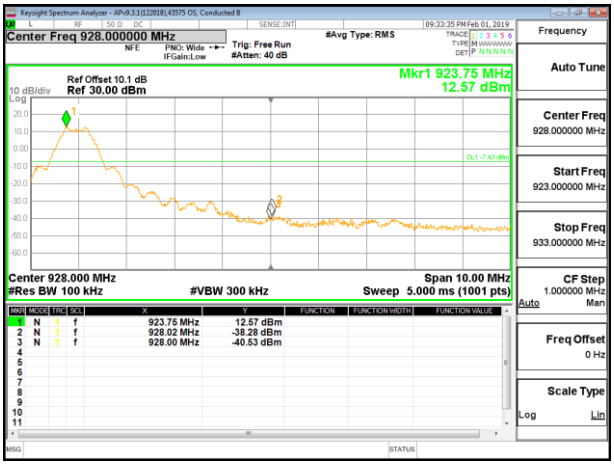
OUT-OF-BAND LOW CHANNEL



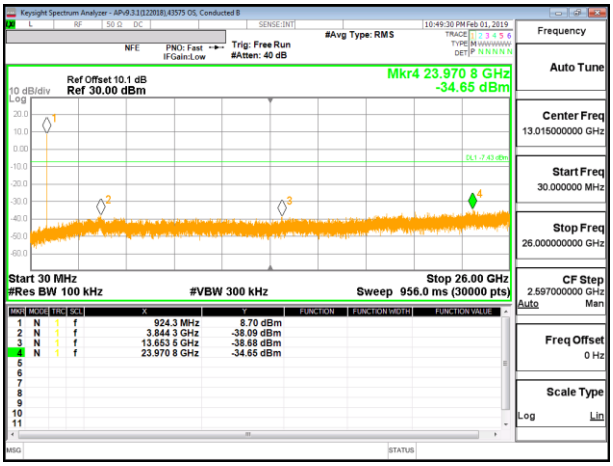
IN-BAND REFERNCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

9. RADIATED TEST RESULTS

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.

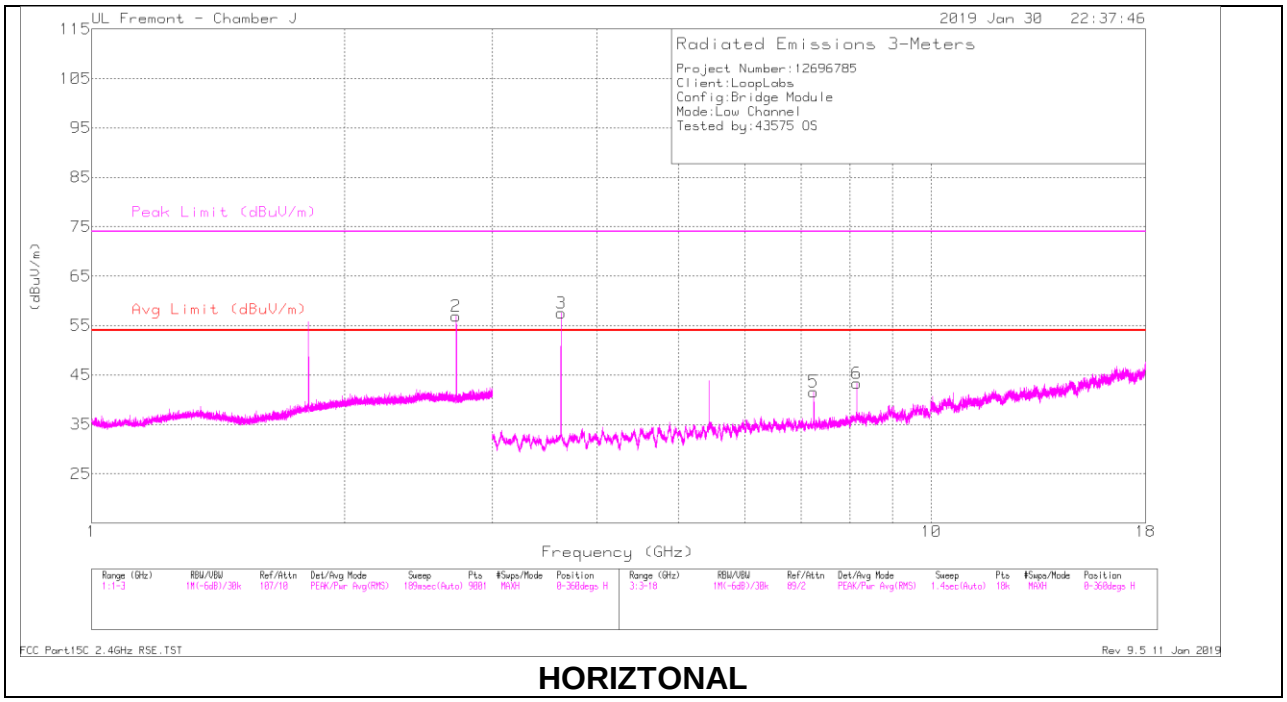
The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

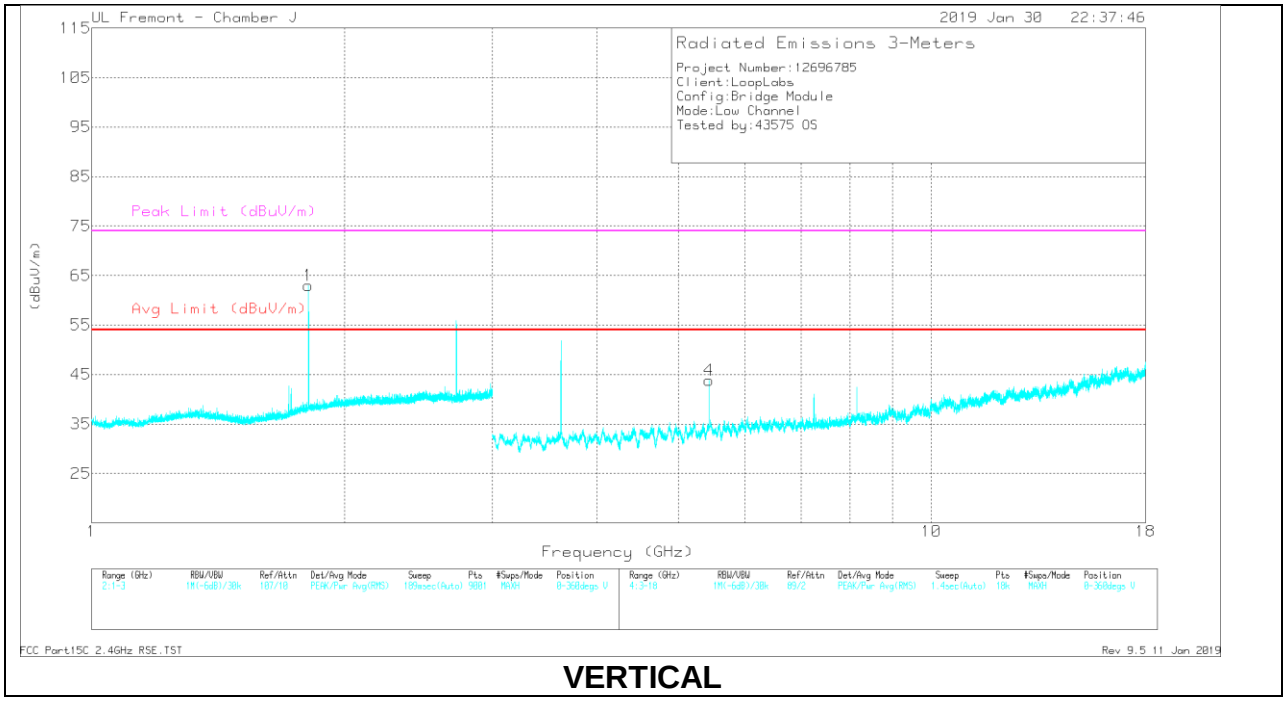
9.1. TRANSMITTER ABOVE 1 GHz

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZTONAL



VERTICAL

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (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
2	* 2.718	50.34	Pk	32.1	-25.5	56.94	-	-	74	-17.06	0-360	101	H
1	1.812	58.6	Pk	30.5	-26.1	63	-	-	-	-	0-360	198	V
3	* 3.624	56.89	Pk	33.1	-32.5	57.49	-	-	74	-16.51	0-360	102	H
5	7.246	33.5	Pk	35.6	-27.5	41.6	-	-	-	-	0-360	102	H
6	* 8.152	34.34	Pk	35.7	-26.7	43.34	-	-	74	-30.66	0-360	102	H
4	* 5.434	39.37	Pk	34.5	-30	43.87	-	-	74	-30.13	0-360	198	V

* - indicates frequency in CFR15.205/IC8.10 RSS-Restricted Band
Pk - Peak detector

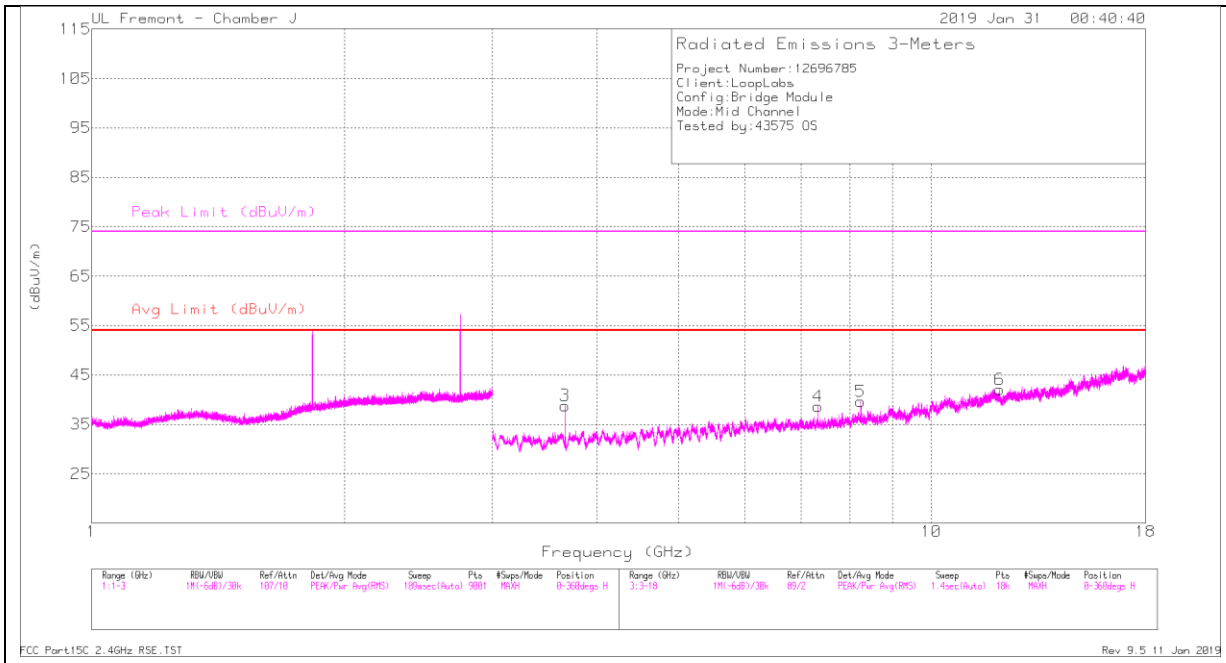
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (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
* 2.718	53.27	PK2	32.1	-25.5	59.87	-	-	74	-14.13	225	123	H
* 2.717	45.18	MAv1	32.1	-25.5	51.78	54	-2.22	-	-	225	123	H
1.812	60.13	PK2	30.5	-26.1	64.53	-	-	-	-	357	125	V
1.812	55.6	MAv1	30.5	-26.1	60	-	-	-	-	357	125	V
* 3.625	59.53	PK2	33.1	-32.5	60.13	-	-	74	-13.87	177	113	H
* 3.625	52.01	MAv1	33.1	-32.5	52.61	54	-1.39	-	-	177	113	H
7.246	37.96	PK2	35.6	-27.5	46.06	-	-	-	-	313	112	H
7.246	29.2	MAv1	35.6	-27.5	37.3	-	-	-	-	313	112	H
* 8.152	40.07	PK2	35.7	-26.7	49.07	-	-	74	-24.93	59	104	H
* 8.152	31.91	MAv1	35.7	-26.7	40.91	54	-13.09	-	-	59	104	H
* 5.434	43.75	PK2	34.5	-30	48.25	-	-	74	-25.75	70	199	V
* 5.435	36.78	MAv1	34.5	-30	41.28	54	-12.72	-	-	70	199	V

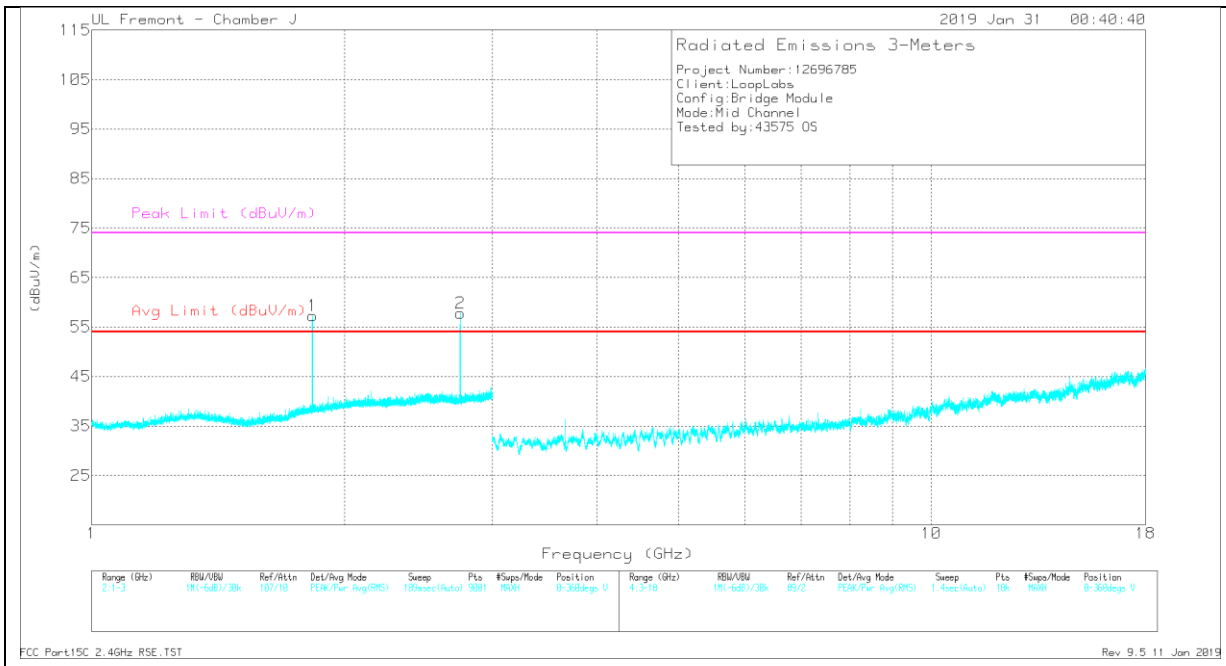
* - indicates frequency in CFR15.205/IC8.10 RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

MID CHANNEL RESULTS



HORIZTONAL



VERTICAL

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (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	1.832	52.77	Pk	30.6	-26.1	57.27	-	-	-	-	0-360	102	V
2	* 2.747	51.06	Pk	32.2	-25.5	57.76	-	-	74	-16.24	0-360	102	V
3	* 3.663	38.31	Pk	33.2	-32.7	38.81	-	-	74	-35.19	0-360	198	H
4	* 7.329	30.57	Pk	35.6	-27.5	38.67	-	-	74	-35.33	0-360	102	H
5	* 8.242	30.48	Pk	35.8	-26.6	39.68	-	-	74	-34.32	0-360	102	H
6	* 12.072	25.69	Pk	38.8	-22.4	42.09	-	-	74	-31.91	0-360	198	H

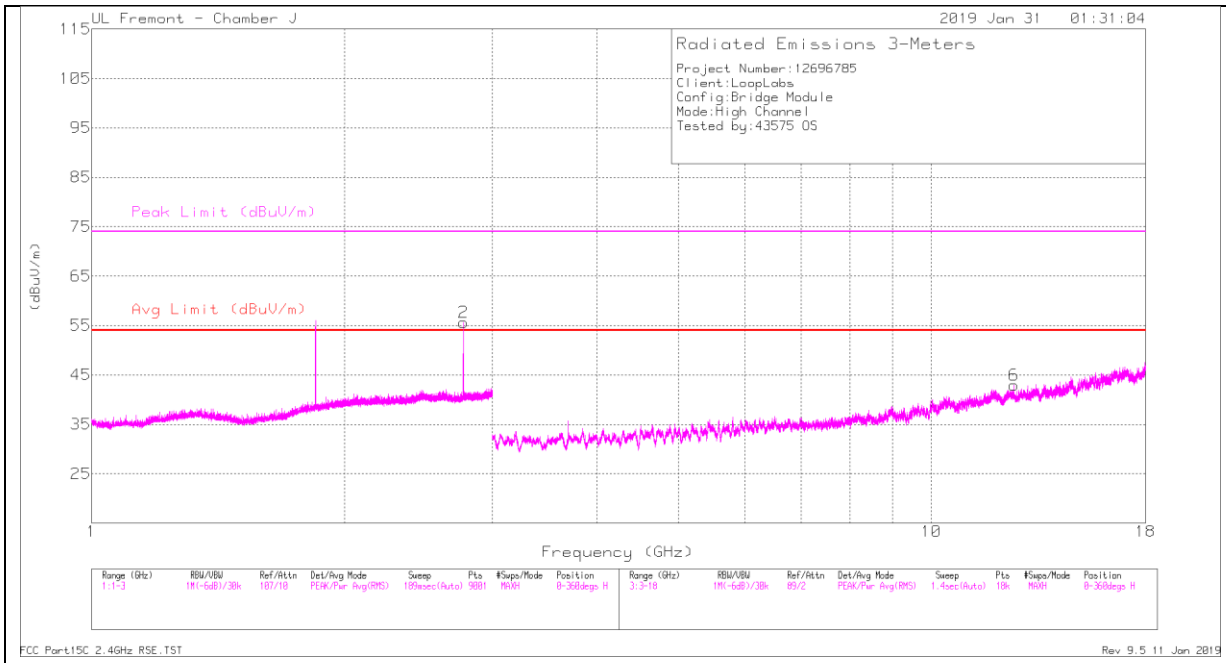
* - indicates frequency in CFR15.205/IC8.10 RSS-Restricted Band
Pk - Peak detector

Radiated Emissions

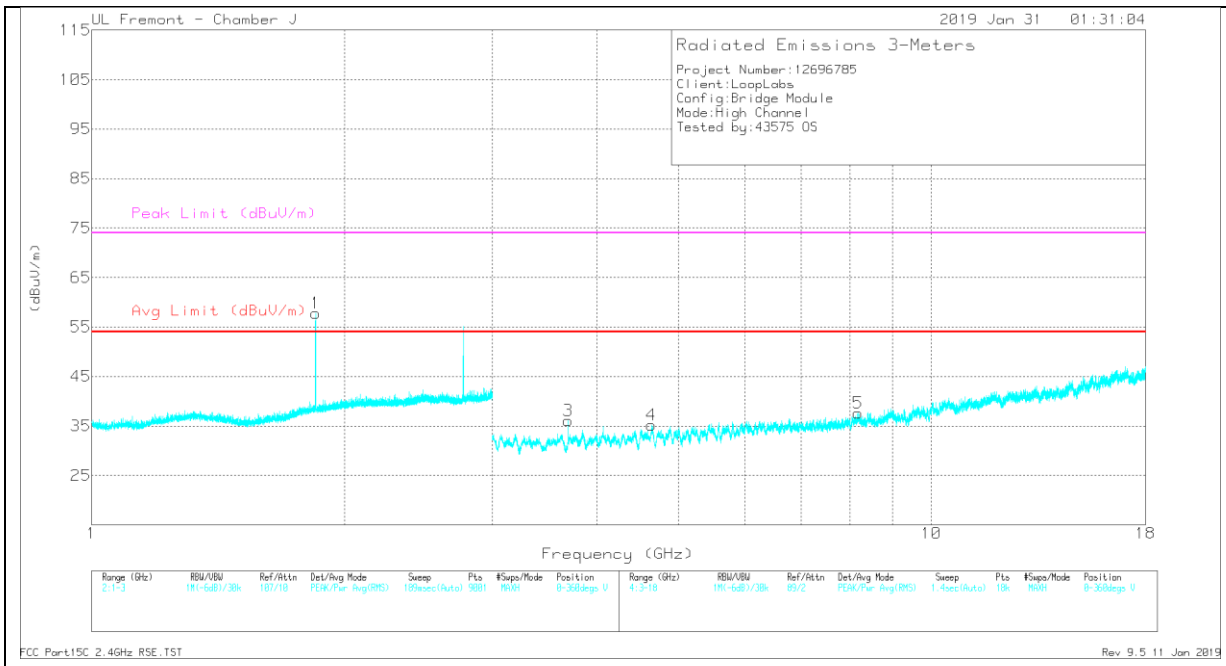
Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.832	53.33	PK2	30.6	-26.1	57.83	-	-	-	-	42	104	V
1.832	48.56	MAv1	30.6	-26.1	53.06	-	-	-	-	42	104	V
* 2.747	53.53	PK2	32.2	-25.5	60.23	-	-	74	-13.77	290	166	V
* 2.747	46.52	MAv1	32.2	-25.5	53.22	54	-.78	-	-	290	166	V
* 3.663	43.82	PK2	33.2	-32.7	44.32	-	-	74	-29.68	167	105	H
* 3.663	36.01	MAv1	33.2	-32.7	36.51	54	-17.49	-	-	167	105	H
* 7.33	36.58	PK2	35.6	-27.5	44.68	-	-	74	-29.32	3	199	H
* 7.329	28.34	MAv1	35.6	-27.5	36.44	54	-17.56	-	-	3	199	H
* 8.242	36.58	PK2	35.8	-26.6	45.78	-	-	74	-28.22	50	104	H
* 8.242	29.34	MAv1	35.8	-26.6	38.54	54	-15.46	-	-	50	104	H
* 12.071	31.08	PK2	38.8	-22.4	47.48	-	-	74	-26.52	352	278	H
* 12.071	22.34	MAv1	38.8	-22.4	38.74	54	-15.26	-	-	352	278	H

* - indicates frequency in CFR15.205/IC8.10 RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL RESULTS



HORIZTONAL



VERTICAL

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (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
2	* 2.773	48.82	Pk	32.3	-25.5	55.62	-	-	74	-18.38	0-360	198	H
1	1.848	53.03	Pk	30.7	-26	57.73	-	-	-	-	0-360	101	V
6	* 12.551	26.08	Pk	39.1	-22.2	42.98	-	-	74	-31.02	0-360	101	H
3	* 3.696	35.85	Pk	33.3	-33.1	36.05	-	-	74	-37.95	0-360	102	V
4	* 4.645	32.34	Pk	34.1	-31.3	35.14	-	-	74	-38.86	0-360	102	V
5	* 8.181	28.47	Pk	35.7	-26.6	37.57	-	-	74	-36.43	0-360	102	V

* - indicates frequency in CFR15.205/IC8.10 RSS-Restricted Band
Pk - Peak detector

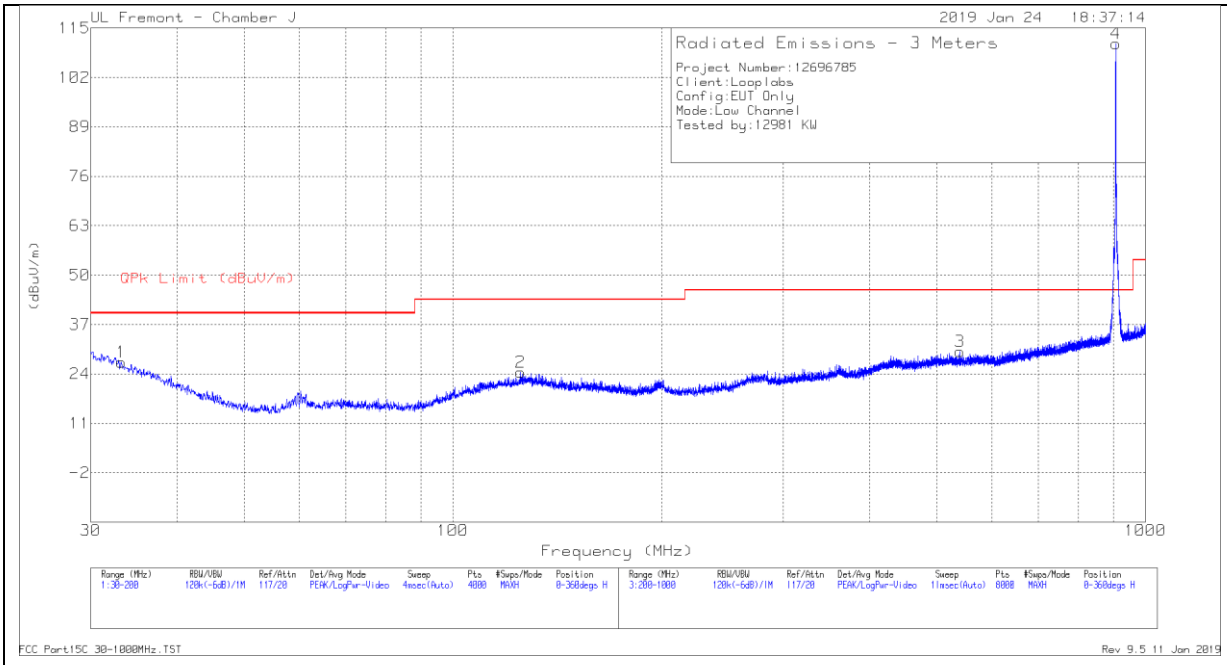
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (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
* 2.771	52.24	PK2	32.3	-25.5	59.04	-	-	74	-14.96	87	277	H
* 2.771	44.83	MAv1	32.3	-25.5	51.63	54	-2.37	-	-	87	277	H
1.848	55.55	PK2	30.7	-26	60.25	-	-	-	-	184	104	V
1.848	50.69	MAv1	30.7	-26	55.39	-	-	-	-	184	104	V
* 12.553	31.66	PK2	39.1	-22.2	48.56	-	-	74	-25.44	344	196	H
* 12.552	22.21	MAv1	39.1	-22.2	39.11	54	-14.89	-	-	344	196	H
* 3.697	41.68	PK2	33.3	-33.1	41.88	-	-	74	-32.12	181	280	V
* 3.697	32.4	MAv1	33.3	-33.1	32.6	54	-21.4	-	-	181	280	V
* 4.645	38.25	PK2	34.1	-31.3	41.05	-	-	74	-32.95	341	257	V
* 4.647	29.5	MAv1	34.1	-31.3	32.3	54	-21.7	-	-	341	257	V
* 8.182	35.66	PK2	35.7	-26.6	44.76	-	-	74	-29.24	77	351	V
* 8.181	25.98	MAv1	35.7	-26.6	35.08	54	-18.92	-	-	77	351	V

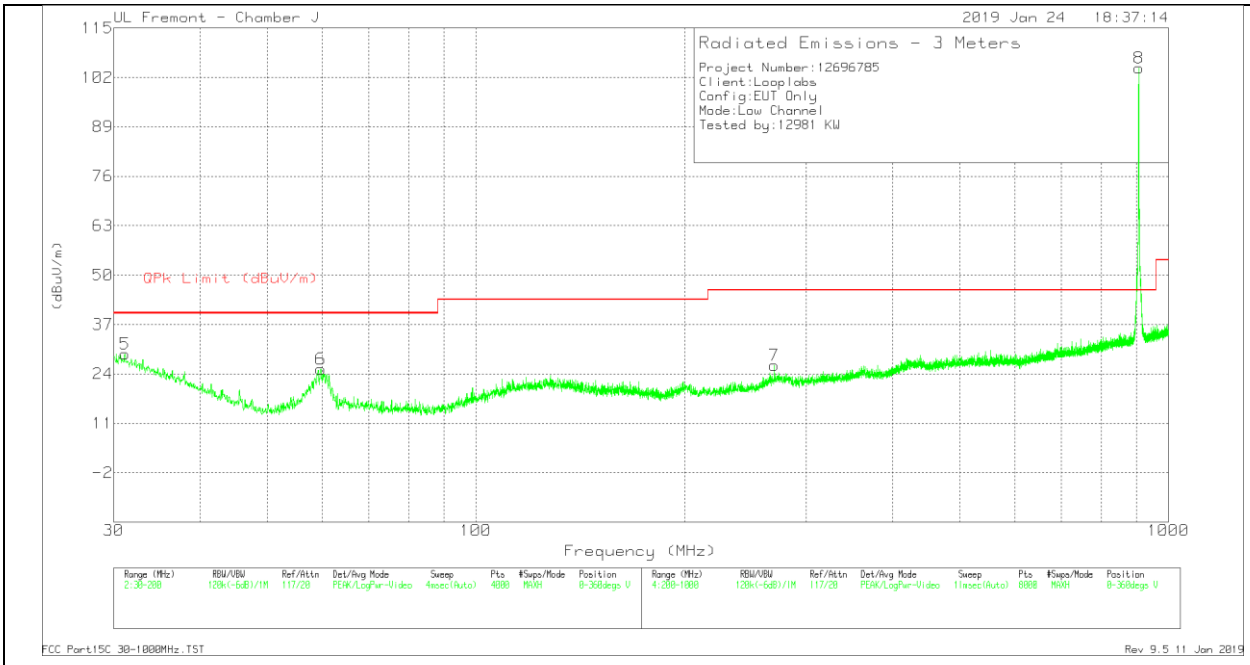
* - indicates frequency in CFR15.205/IC8.10 RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

9.2. TRANSMITTER BELOW 1 GHz

LOW CHANNEL RESULTS



HORIZONTAL



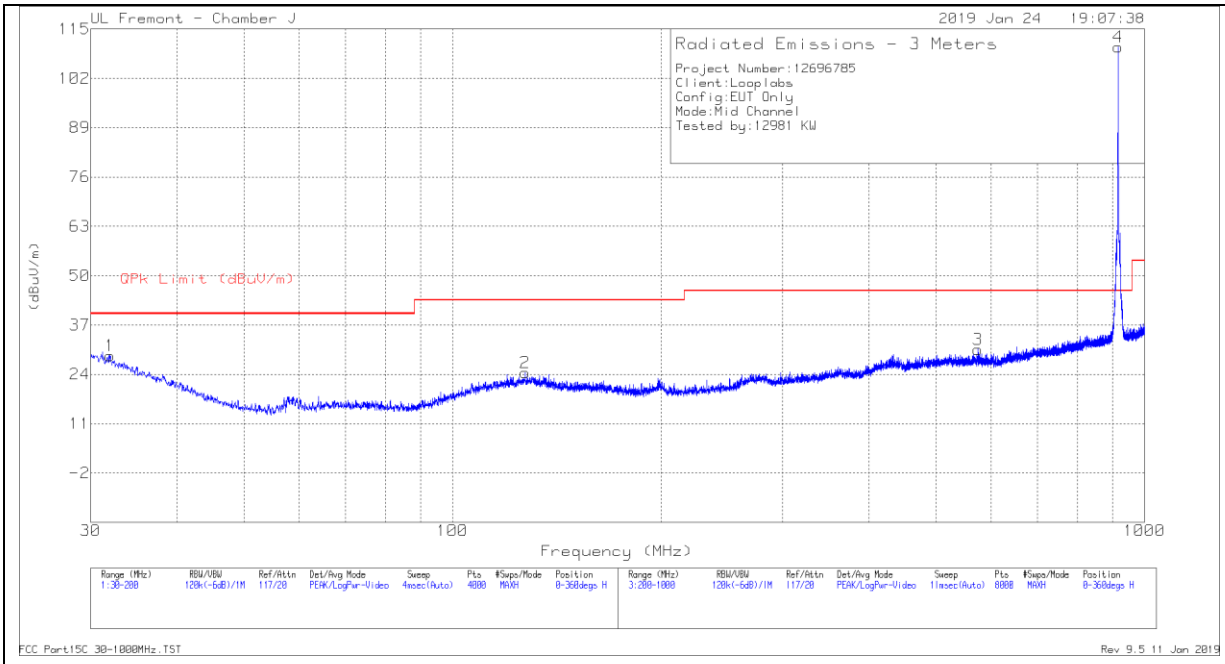
VERTICAL

Trace Markers

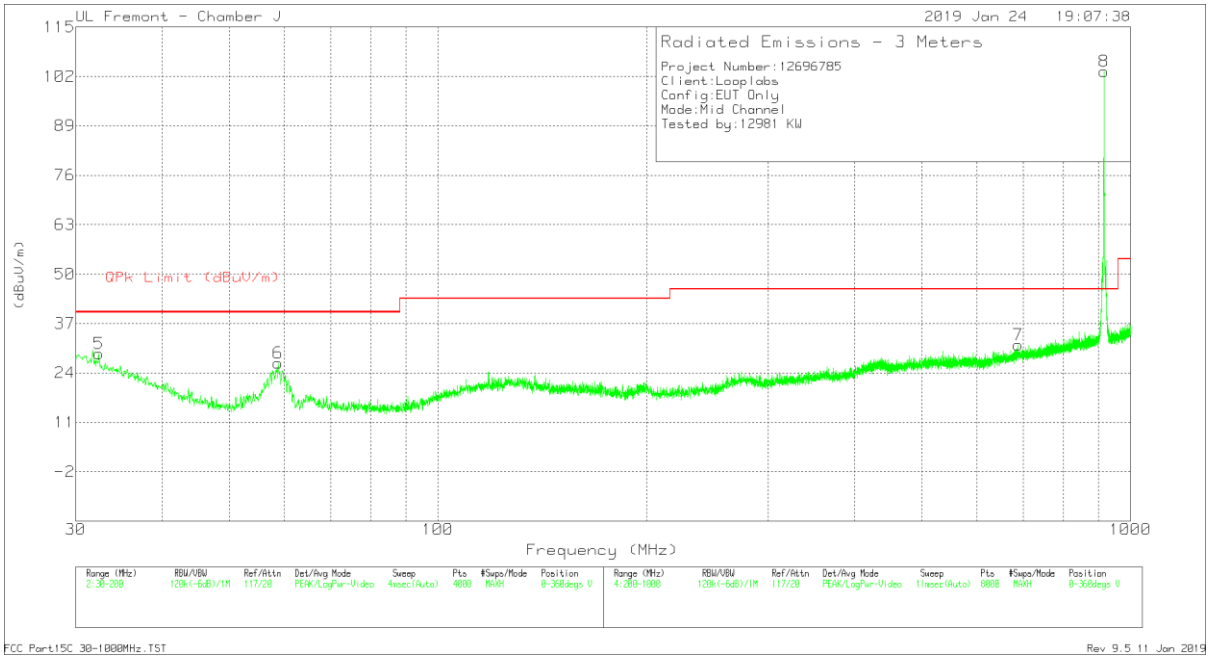
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181575 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	33.1883	34.12	Pk	24.5	-31.5	27.12	40	-12.88	296	358	H
2	* 125.1821	35.47	Pk	19.8	-30.8	24.47	43.52	-19.05	168	166	H
5	31.1478	34.79	Pk	25.9	-31.5	29.19	40	-10.81	268	248	V
6	59.7152	43.14	Pk	13.3	-31.2	25.24	40	-14.76	35	176	V
3	539.2441	35.26	Pk	24	-29.3	29.96	46.02	-16.06	274	293	H
4	** 905.7917	109.99	Pk	28.3	-27.4	110.89	46.02	64.87	0-360	101	H
7	* 269.7091	37.31	Pk	19.1	-30.1	26.31	46.02	-19.71	138	134	V
8	** 905.9918	103.57	Pk	28.3	-27.4	104.47	46.02	58.45	0-360	101	V

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

MID CHANNEL RESULTS



HORIZTONAL



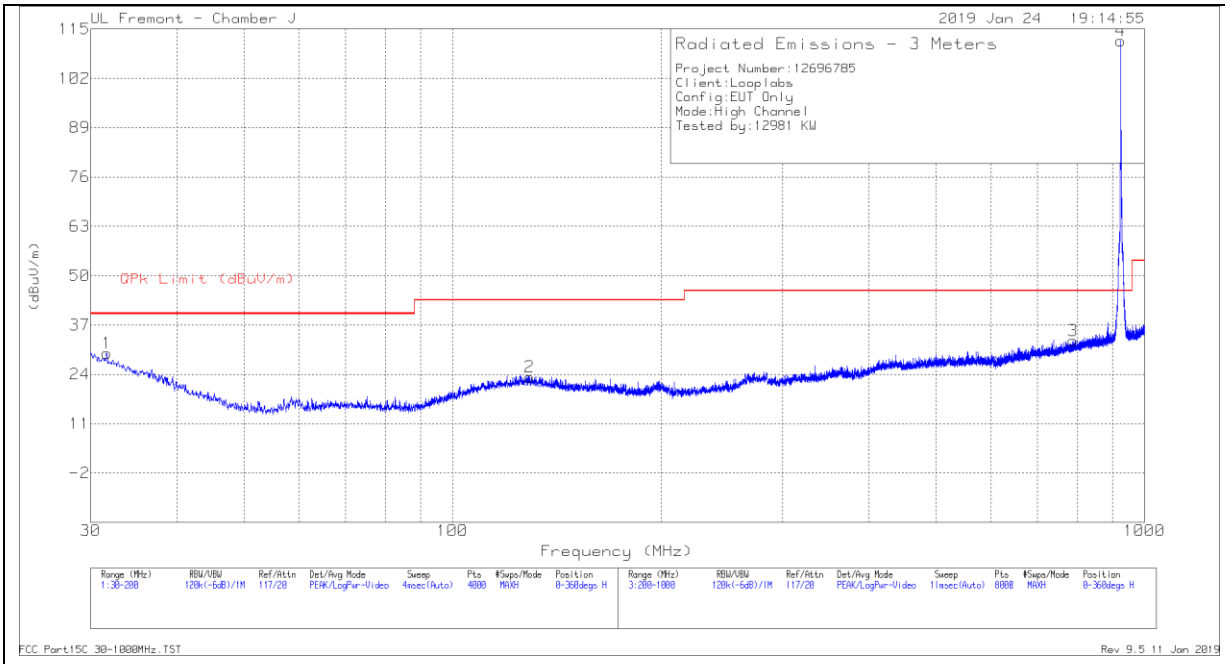
VERTICAL

Trace Markers

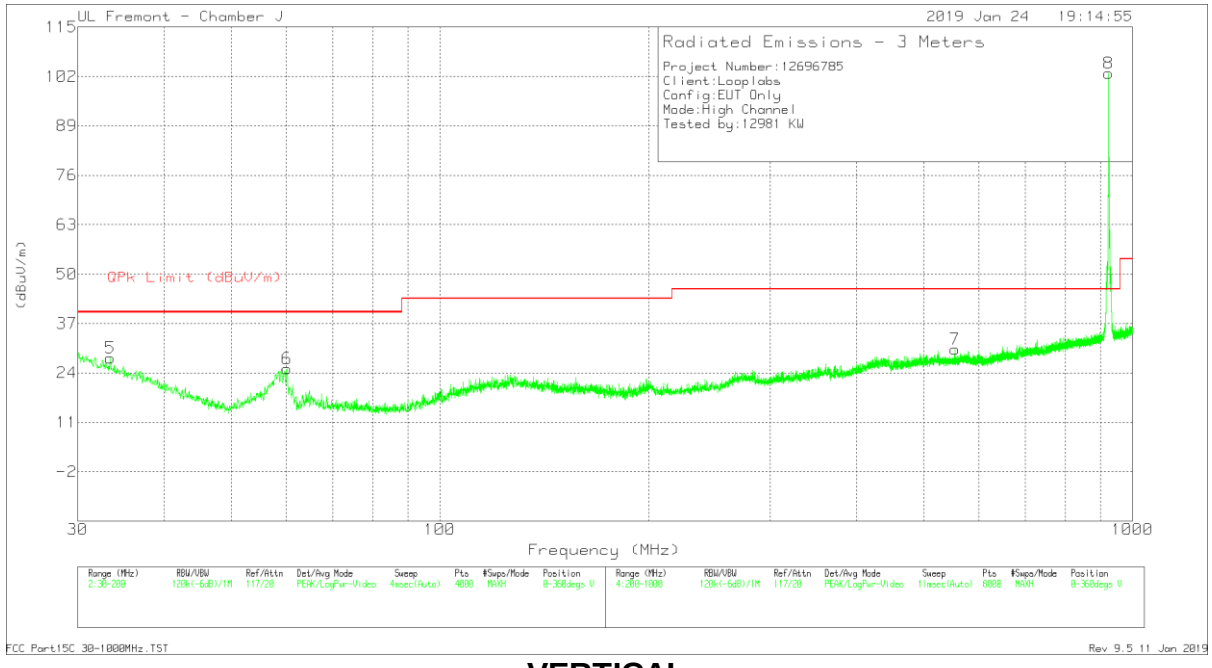
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181575 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.998	34.81	Pk	25.6	-31.5	28.91	40	-11.09	111	159	H
2	* 127.3077	35.35	Pk	19.8	-30.7	24.45	43.52	-19.07	342	360	H
5	32.3806	35.44	Pk	25.2	-31.5	29.14	40	-10.86	186	149	V
6	58.7799	44.6	Pk	13.2	-31.2	26.6	40	-13.4	271	136	V
3	574.9487	35.09	Pk	24.6	-29.1	30.59	46.02	-15.43	232	245	H
4	** 916.1931	109.25	Pk	28.3	-27.3	110.25	46.02	64.23	0-360	101	H
7	688.6635	34.41	Pk	25.9	-28.9	31.41	46.02	-14.61	186	295	V
8	** 915.793	102.26	Pk	28.3	-27.3	103.26	46.02	57.24	0-360	101	V

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

HIGH CHANNEL RESULTS



HORIZTONAL



VERTICAL

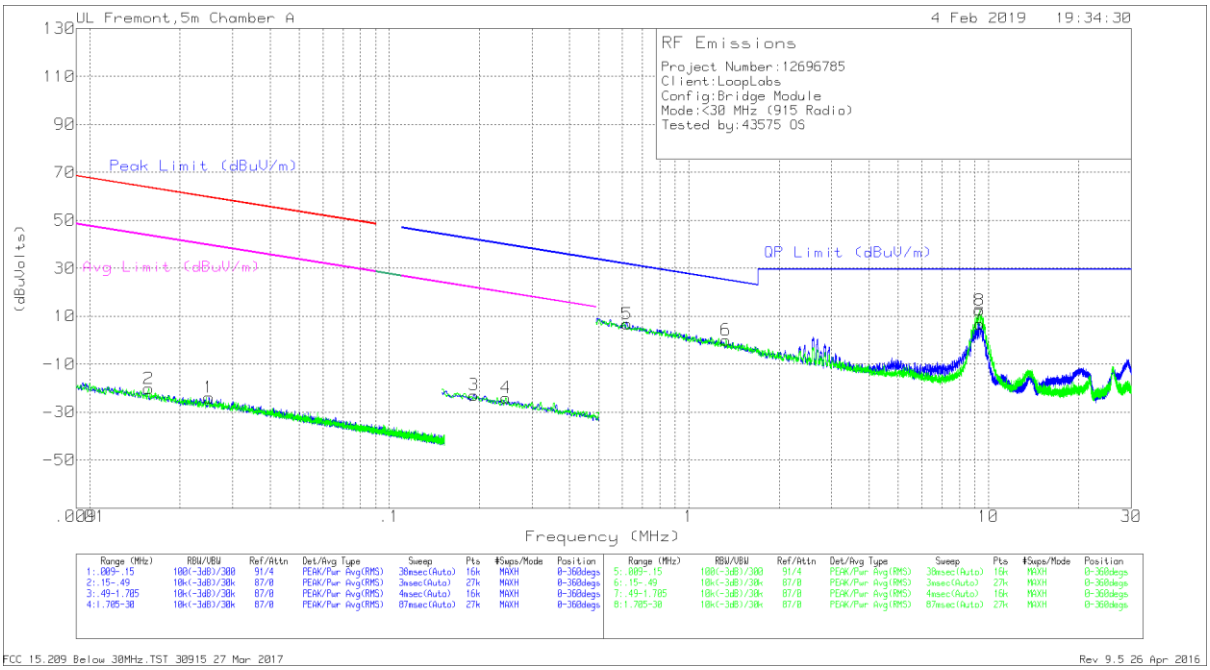
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181575 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.6579	35.31	Pk	25.7	-31.5	29.51	40	-10.49	312	244	H
2	* 129.3482	34.25	Pk	19.7	-30.7	23.25	43.52	-20.27	79	167	H
5	33.4434	35.06	Pk	24.3	-31.5	27.86	40	-12.14	258	141	V
6	60.0978	43.07	Pk	13.3	-31.2	25.17	40	-14.83	352	195	V
3	789.0766	34.15	Pk	27	-28.3	32.85	46.02	-13.17	118	190	H
4	** 924.1941	110.75	Pk	28.4	-27.2	111.95	46.02	65.93	0-360	101	H
7	554.4461	35.24	Pk	24.2	-29.2	30.24	46.02	-15.78	69	168	V
8	** 923.7941	101.63	Pk	28.4	-27.2	102.83	46.02	56.81	0-360	101	V

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

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

9.3. WORST CASE BELOW 30 MHz



NOTE: KDB 414788 OFS and Chamber Correlation Justification

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

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	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)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
2	.01573	43.24	Pk	16.6	0	-80	-20.16	63.65	-83.81	43.65	-63.81	-	-	-	-	0-360
1	.02501	41.6	Pk	14.5	0	-80	-23.9	59.62	-83.52	39.62	-63.52	-	-	-	-	0-360
3	.19137	45.8	Pk	11.2	.1	-80	-22.9	-	-	-	-	41.98	-64.88	21.98	-44.88	0-360
4	.2451	44.86	Pk	11	.1	-80	-24.04	-	-	-	-	39.83	-63.87	19.83	-43.87	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)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
5	.62171	35.83	Pk	10.8	.1	-40	6.73	31.74	-25.01	-	-	-	-	0-360
6	1.32874	29.15	Pk	10.7	.2	-40	.05	25.16	-25.11	-	-	-	-	0-360
8	9.3423	41.48	Pk	10.6	.4	-40	12.48	29.5	-17.02	-	-	-	-	0-360
7	9.35697	35.8	Pk	10.6	.4	-40	6.8	29.5	-22.7	-	-	-	-	0-360

Pk - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

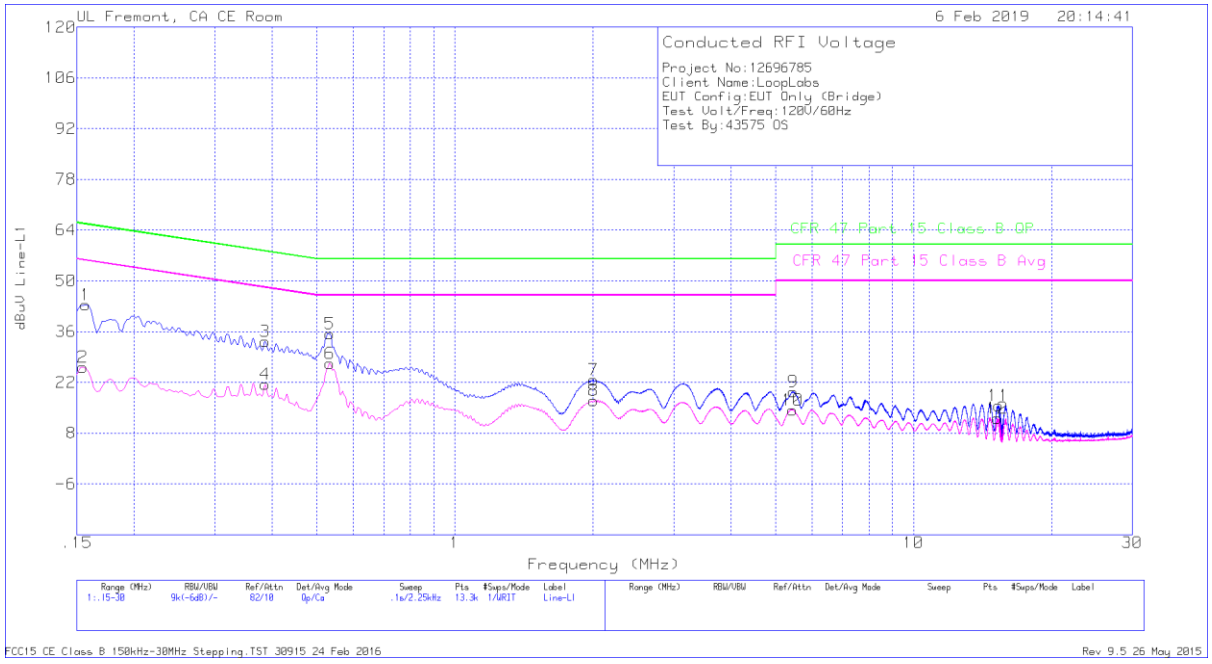
Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

RESULTS

10.1. AC POWER LINE NORM

LINE 1 RESULTS

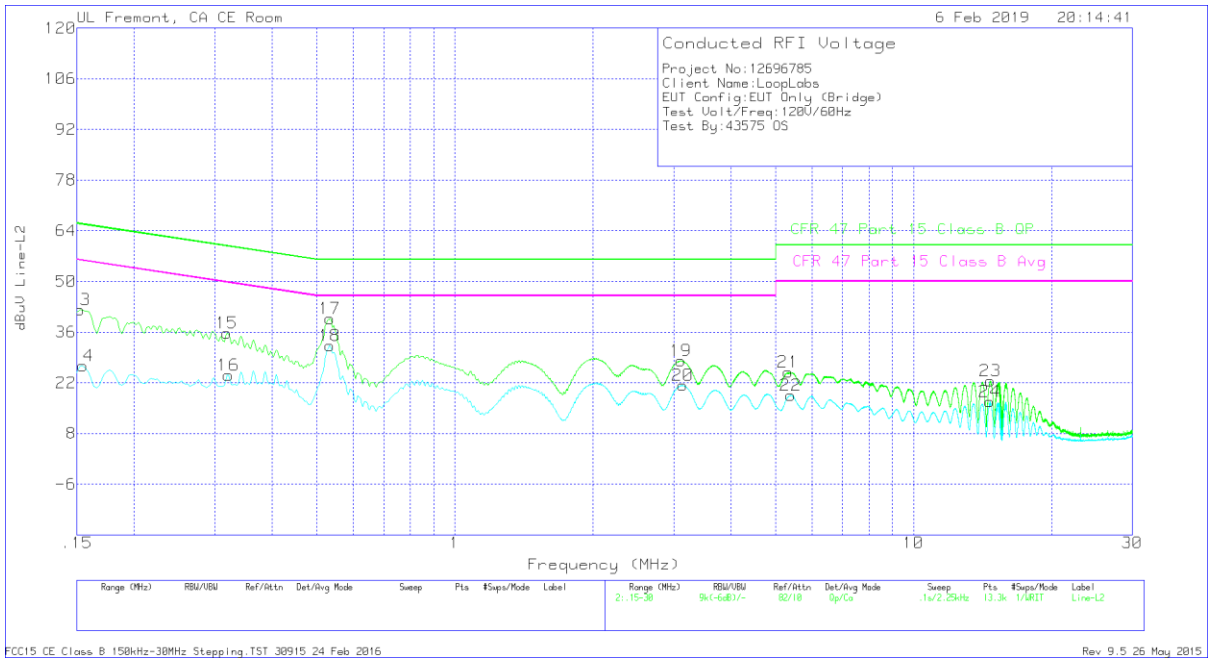


Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CISPR 32 Class B QP	Margin (dB)	CISPR 32 Class B Avg	Margin (dB)
1	.15675	33.12	Qp	.1	0	10.1	43.32	65.63	-22.31	-	-
2	.1545	16.02	Ca	.1	0	10.1	26.22	-	-	55.75	-29.53
3	.38625	23.29	Qp	0	0	10.1	33.39	58.14	-24.75	-	-
4	.38625	11.39	Ca	0	0	10.1	21.49	-	-	48.14	-26.65
5	.53475	25.29	Qp	0	0	10.1	35.39	56	-20.61	-	-
6	.53475	17.17	Ca	0	0	10.1	27.27	-	-	46	-18.73
7	2.004	12.49	Qp	0	.1	10.1	22.69	56	-33.31	-	-
8	2.00625	6.81	Ca	0	.1	10.1	17.01	-	-	46	-28.99
9	5.46225	9.22	Qp	0	.1	10.1	19.42	60	-40.58	-	-
10	5.45663	4.2	Ca	0	.1	10.1	14.4	-	-	50	-35.6
11	15.33075	4.92	Qp	.1	.3	10.2	15.52	60	-44.48	-	-
12	15.2295	1.48	Ca	.1	.3	10.2	12.08	-	-	50	-37.92

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



Trace Markers

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CISPR 32 Class B QP	Margin (dB)	CISPR 32 Class B Avg	Margin (dB)
13	.15225	32.02	Qp	.1	0	10.1	42.22	65.88	-23.66	-	-
14	.1545	16.44	Ca	.1	0	10.1	26.64	-	-	55.75	-29.11
15	.31875	25.58	Qp	0	0	10.1	35.68	59.74	-24.06	-	-
16	.321	14.02	Ca	0	0	10.1	24.12	-	-	49.68	-25.56
17	.53475	29.65	Qp	0	0	10.1	39.75	56	-16.25	-	-
18	.53475	22.12	Ca	0	0	10.1	32.22	-	-	46	-13.78
19	3.10763	17.86	Qp	0	.1	10.1	28.06	56	-27.94	-	-
20	3.13575	11.08	Ca	0	.1	10.1	21.28	-	-	46	-24.72
21	5.33625	14.71	Qp	0	.1	10.1	24.91	60	-35.09	-	-
22	5.40038	8.34	Ca	0	.1	10.1	18.54	-	-	50	-31.46
23	14.72775	11.86	Qp	.1	.3	10.2	22.46	60	-37.54	-	-
24	14.68275	6.16	Ca	.1	.3	10.2	16.76	-	-	50	-33.24

Qp - Quasi-Peak detector
Ca - CISPR average detection