CERTIFICATION TEST REPORT

Report Number. : 11908391-E1V1

Applicant	:	Loop Labs, Inc. 1530 Blake St. Denver, CO 80202
Model	:	0008
FCC ID	:	2AE5C-5280-B2
IC	:	20391-5280B2
EUT Description	:	BRIDGE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C INDUSTRY CANADA RSS - 247 ISSUE 2

Date Of Issue:
August 25, 2017

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	8/25/17	Initial Issue	---

TABLE OF CONTENTS

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. DESCRIPTION OF EUT 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 12

7. MEASUREMENT METHODS 13

8. ANTENNA PORT TEST RESULTS 14

8.1. ON TIME, DUTY CYCLE 14

8.2. 6 dB BANDWIDTH 15

8.2.1. 6 dB BANDWIDTH PLOTS AND TABLE 16

8.3. 99% BANDWIDTH 17

8.3.1. 99% BANDWIDTH PLOTS AND TABLE 18

8.4. OUTPUT POWER 19

8.5. AVERAGE POWER 20

8.6. POWER SPECTRAL DENSITY 21

8.6.1. POWER SPECTRAL DENSITY PLOTS AND TABLE 22

8.7. CONDUCTED SPURIOUS EMISSIONS 23

8.7.1. BANDEDGE AND SPURIOUS EMISSIONS PLOTS 24

9. RADIATED TEST RESULTS 25

9.1. LIMITS AND PROCEDURE 25

9.2. TX ABOVE 1 GHz FOR 802.15.4 MODE IN THE 2.4 GHz BAND 26

9.3. WORST-CASE BELOW 1 GHz 36

9.4. WORST-CASE 18 to 26 GHz 38

10. AC POWER LINE CONDUCTED EMISSIONS 40

11. SETUP PHOTOS 43

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Loop Labs, Inc.
1530 Blake St.
Denver, CO 80202

EUT DESCRIPTION: BRIDGE

MODEL: 0008

SERIAL NUMBER: 00200014(radiated); 00200030 (conducted)

DATE TESTED: August 23rd, 2017 – August 24th, 2017

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

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

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

Approved & Released For
UL Verification Services Inc. By:

Francisco de Anda
CONSUMER TECHNOLOGY DIVISION
Program Manager
UL Verification Services Inc.

Prepared By:

Jordan Bailey
CONSUMER TECHNOLOGY DIVISION
Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ Chamber D
☐ Chamber B	☐ Chamber E
☐ Chamber C	☐ Chamber F
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bridge intended for use in smart homes.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power Average (dBm)	Output Power Average (mW)	Output Power Peak (dBm)	Output Power Peak (mW)
2405-2480	802.15.4	4.41	2.76	4.65	2.92

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 3.71 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was FCCV1.2

5.5. WORST-CASE CONFIGURATION AND MODE

For below 1GHz radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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

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

802.15.4 250kHz Mbps

5.6. DESCRIPTION OF TEST SETUP

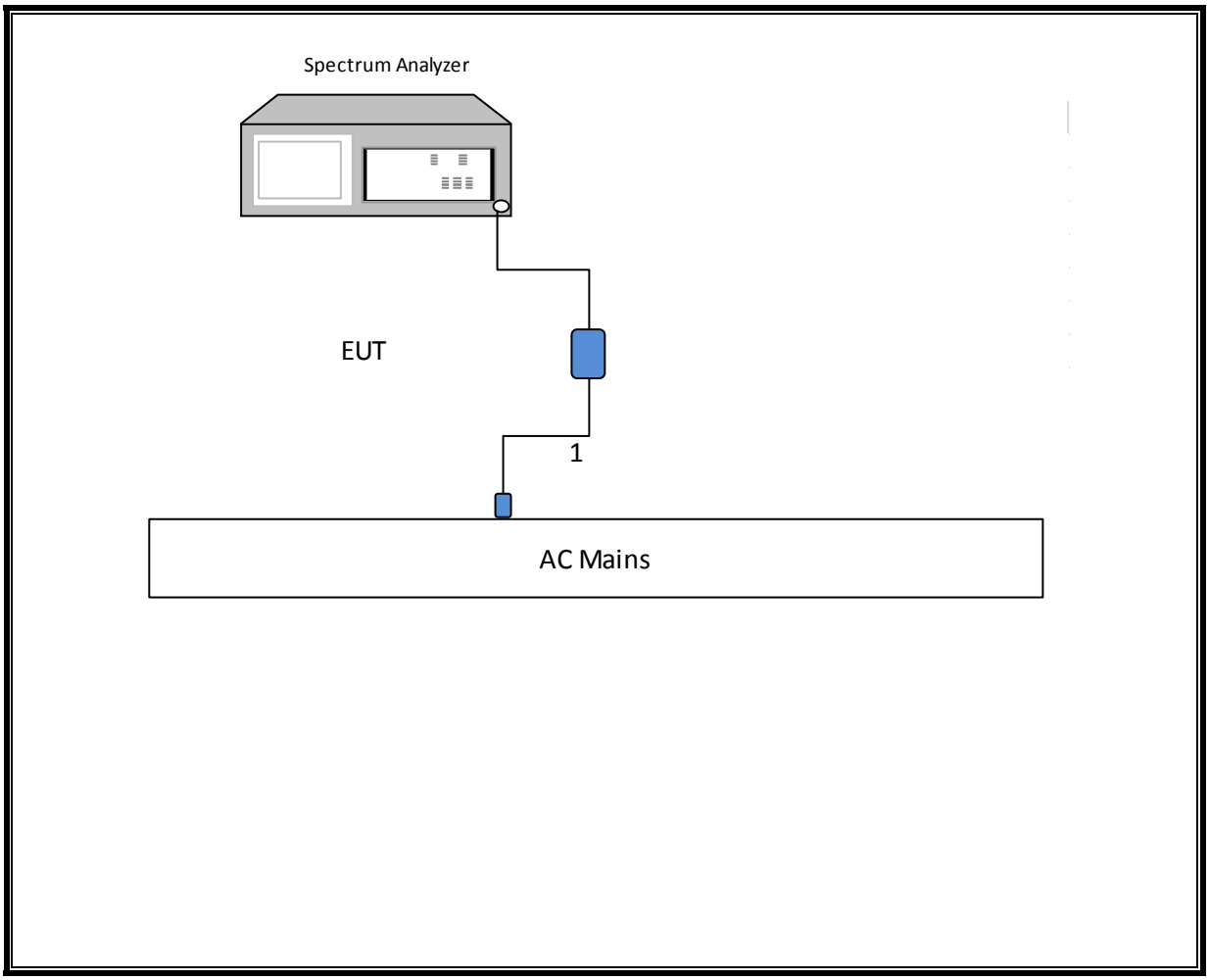
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Shielded	0.17	Use to connect to AC adapter

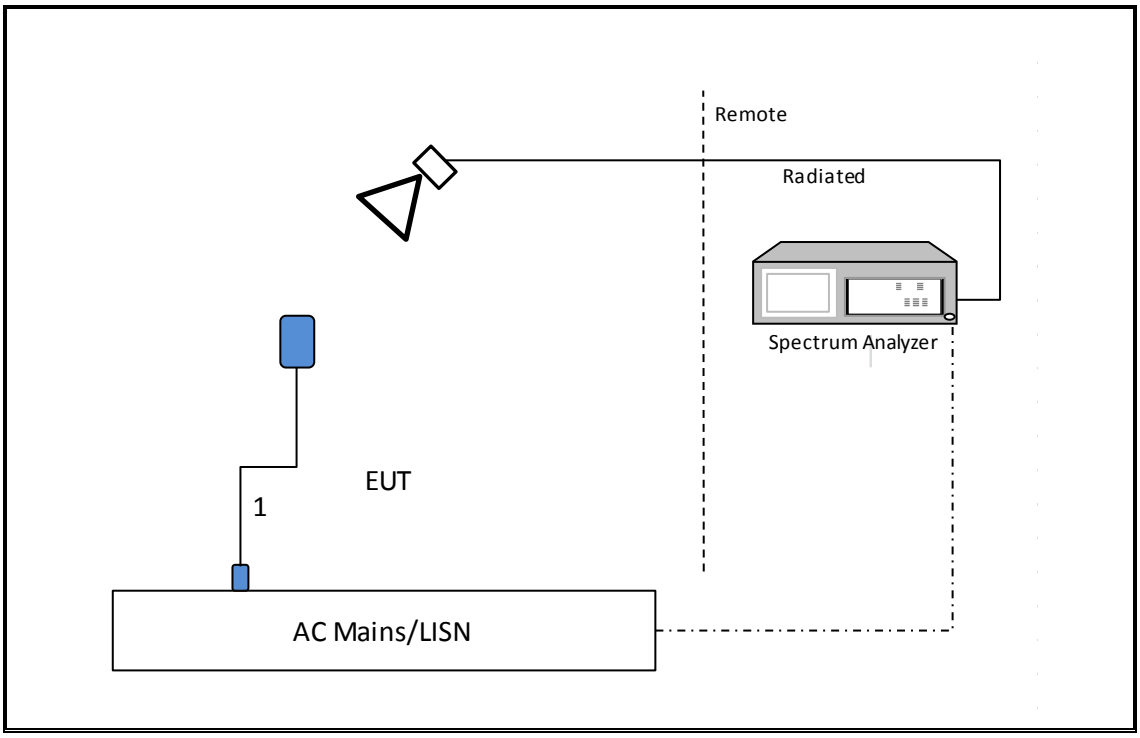
TEST SETUP

The EUT is powered by an AC Adapter and transmits without any support equipment. Once the powered, the EUT turns on. To change channels, short out the black and purple wires together for a brief moment. Single blinking light is unmodulated, double blinking light is modulated transmission, and no blinking is Rx mode. Red is Low Channel, Green in Mid Channel, Blue is High Channel.

SETUP DIAGRAM FOR ANTENNA PORT CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED and AC LINE TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Spectrum Analyzer	Agilent	E4446A	T146	07/18/18
Power Meter	Agilent	N1911A	T1269	3/29/18
Power Sensor	Agilent	N1921A	T1225	3/29/18
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	T130	09/23/17
Antenna, Horn, 1-18GHz	ETS Lindgren	3117	T862	06/09/18
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	T449	06/12/18
Amplifier, 1-26.5GHz	Agilent	8449B	T404	07/23/18
Spectrum Analyzer	Agilent	N9030A	T1466	4/11/18
Amplifier, 10KHz to 1GHz, 32dB	SONOMA	310N	T300	11/10/17
RF Preamplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	06/24/18

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	9.5, 12/01/16
Antenna Port Software	UL	UL RF	7.1, 8/16/17
Conducted Emissions Software	UL	UL EMC	9.5, 5/26/15

7. MEASUREMENT METHODS

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

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

Average Power: KDB 558074 D01 v04, Section 9.2.3.2.

Output Power: KDB 558074 D01 v04, Section 9.1.3

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

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.1.

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.2.5.1

Band-edge: KDB 558074 D01 v04, Section 13.3.1

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

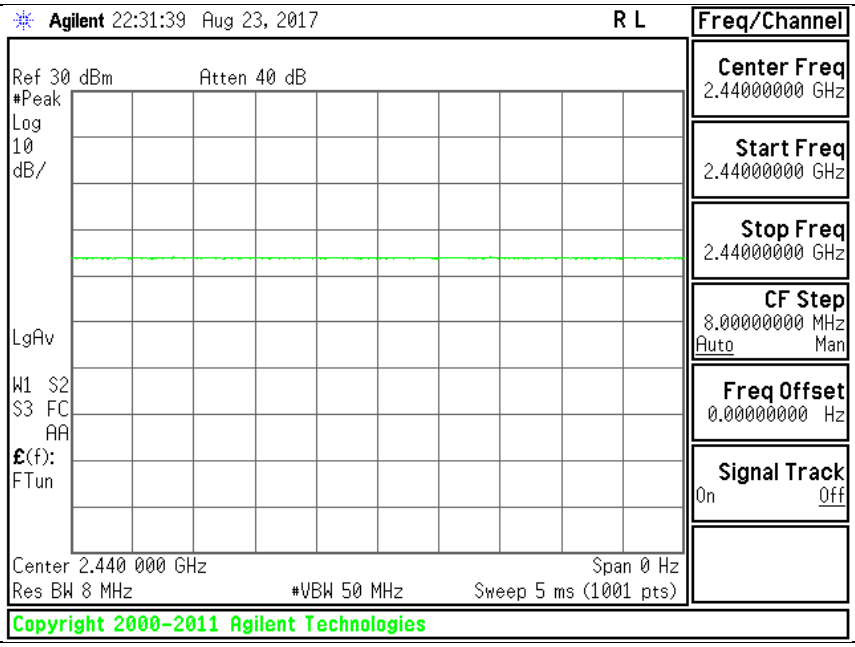
KDB 558074 Zero-Span Spectrum Analyzer Method.

RESULTS

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
ZIGBEE	1.00	1.00	1.00	100.00%	0.00	0.010

DUTY CYCLE PLOTS



NOTE: --

8.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (a)

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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

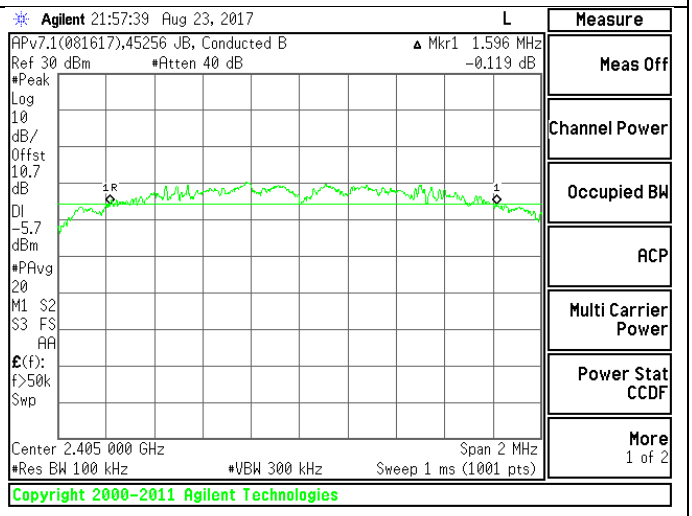
RESULTS

8.2.1. 6 dB BANDWIDTH PLOTS AND TABLE

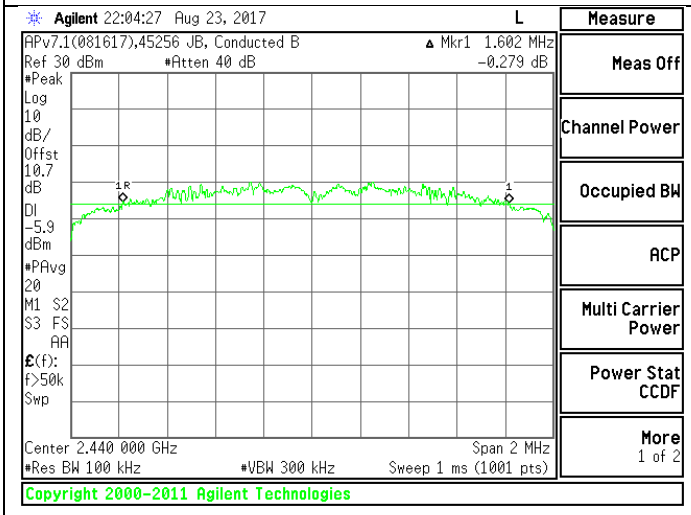
TEST RESULT TABLE

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
Low	2405	1.596
Middle	2440	1.602
High	2480	1.582

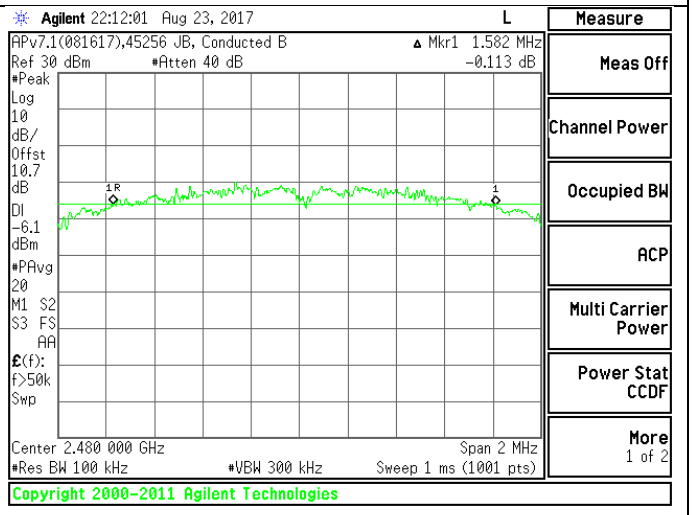
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Refer to KDB558074 D01 DTS Meas Guidance v04: The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

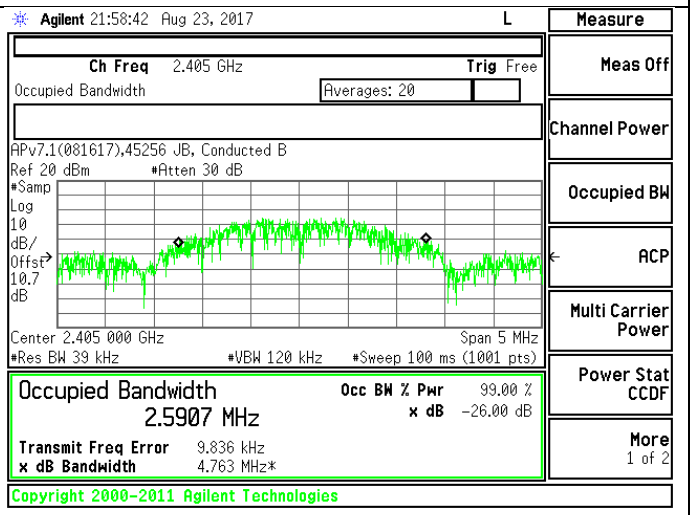
RESULTS

8.3.1. 99% BANDWIDTH PLOTS AND TABLE

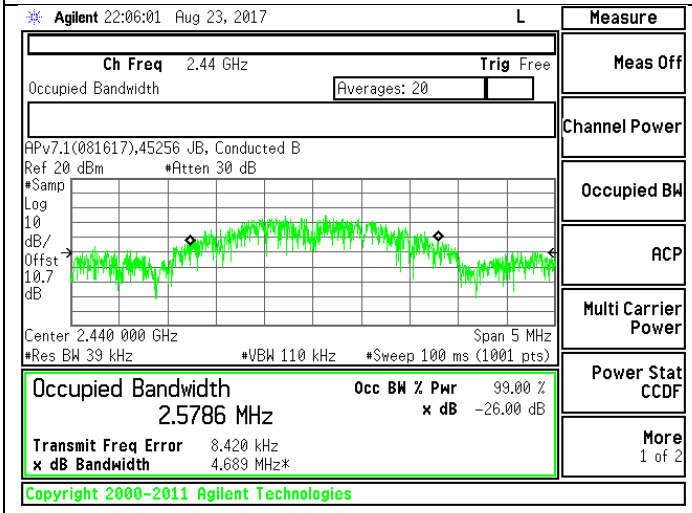
TEST RESULT TABLE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.591
Middle	2440	2.579
High	2480	2.572

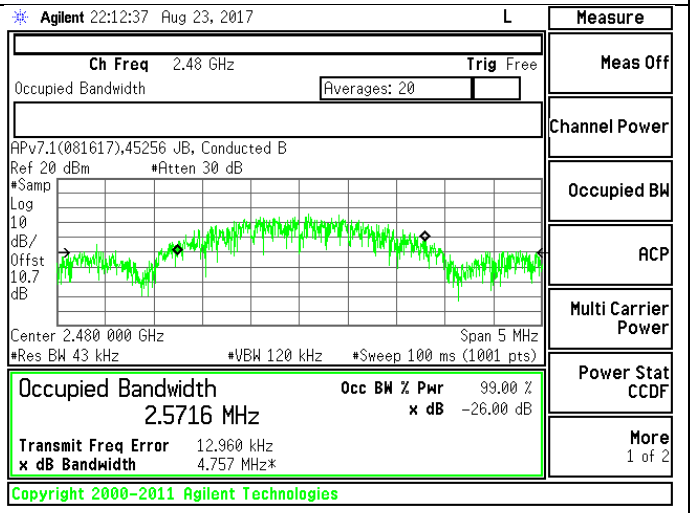
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

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

TEST PROCEDURE

Peak power is measured using KDB558074 D01 DTS Meas Guidance v04 power meter.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2405	4.610	30	-25.39
Middle	2440	4.650	30	-25.35
High	2480	4.000	30	-26

TEST INFORMATION

Date: August 24, 2017
Project No: 11908391
Tester: 37699 CS

8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.66 dB (including 10 dB pad and 0.66 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2405	4.37
Middle	2440	4.41
High	2480	4.28

TEST INFORMATION

Date: August 24, 2017
Project No: 11908391
Tester: 37699 CS

8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-247 (5.2) (b)

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

TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v04.

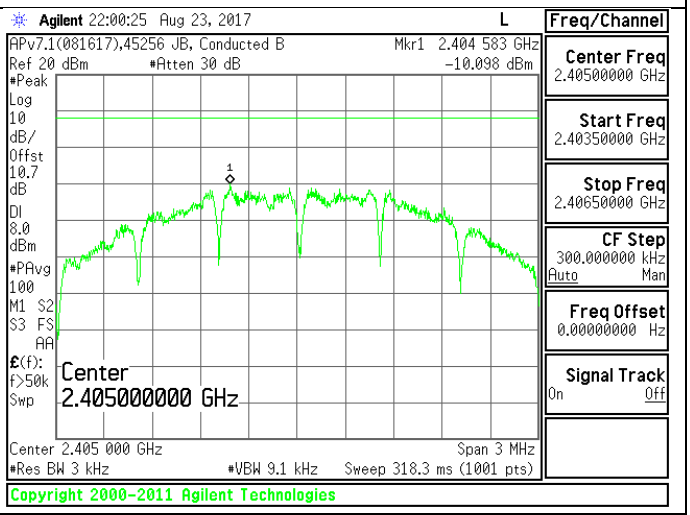
RESULTS

8.6.1. POWER SPECTRAL DENSITY PLOTS AND TABLE

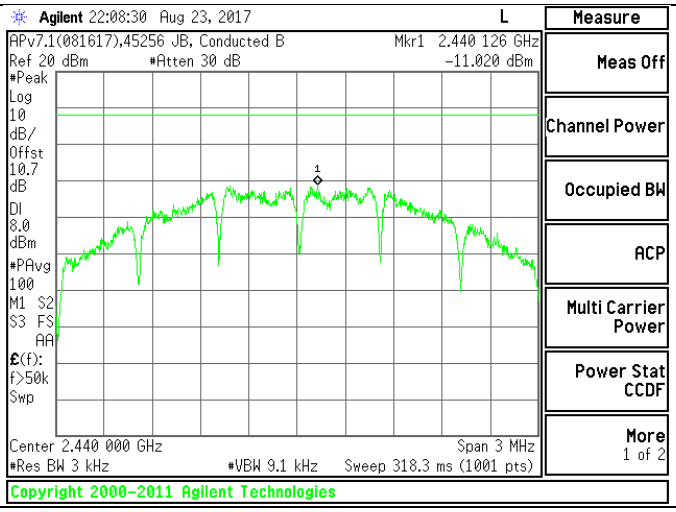
TEST RESULT TABLE

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2405	-10.098	8	-18.098
Middle	2440	-11.020	8	-19.02
High	2480	-11.473	8	-19.473

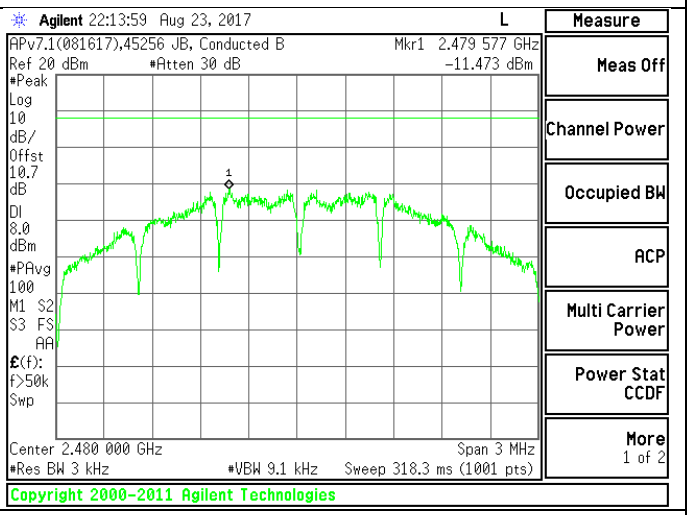
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



NOTE:

8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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

TEST PROCEDURE

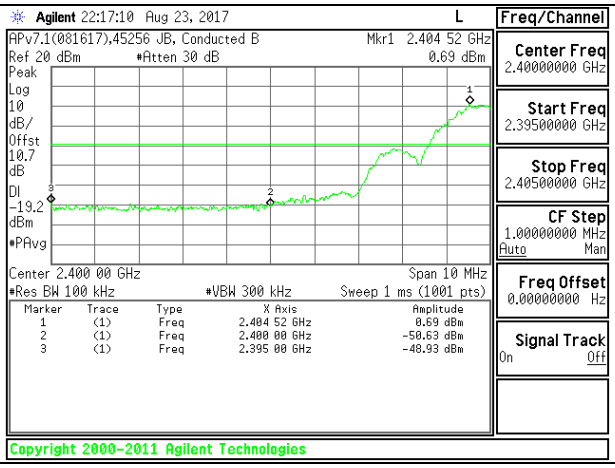
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

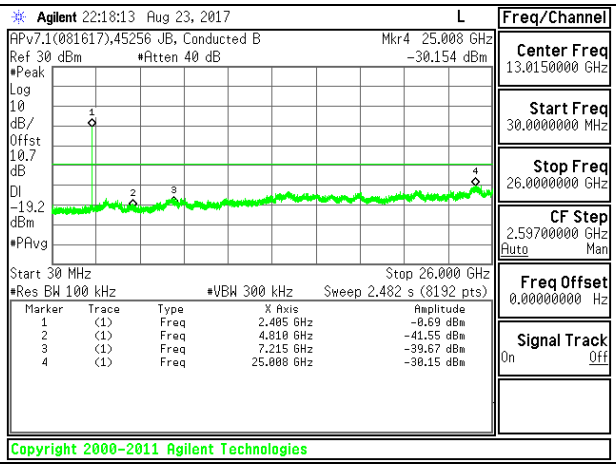
RESULTS

8.7.1. BANDEDGE AND SPURIOUS EMISSIONS PLOTS

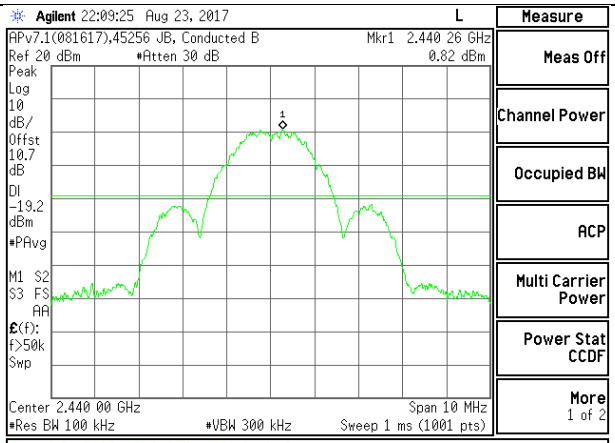
LOW CHANNEL BANDEDGE



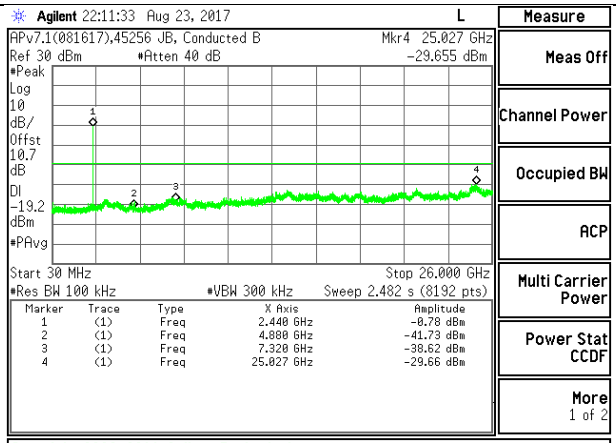
LOW CHANNEL SPURIOUS



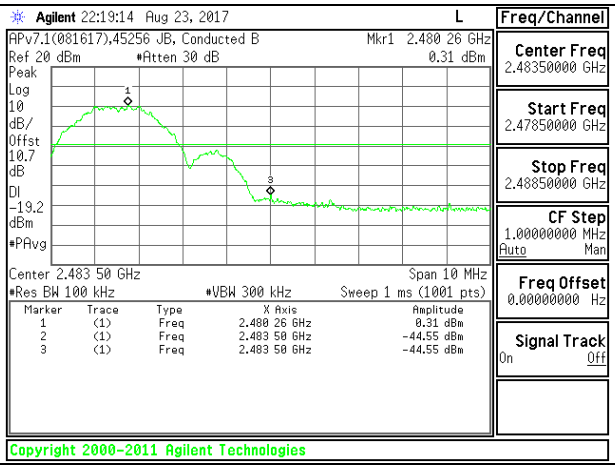
MID CHANNEL REFERENCE



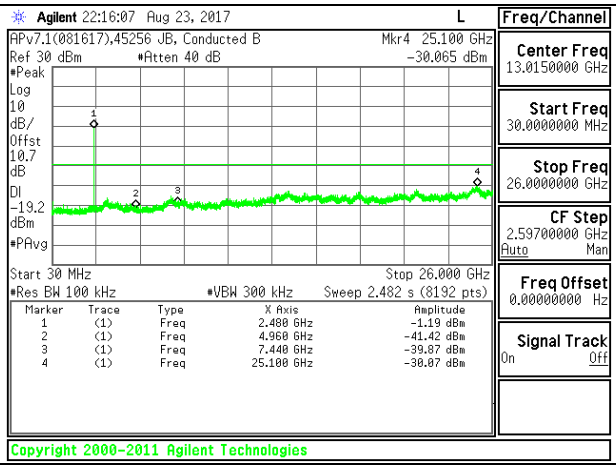
MID CHANNEL SPURIOUS



HIGH CHANNEL BANDEDGE



HIGH CHANNEL SPURIOUS



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
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 was set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and average measurements.

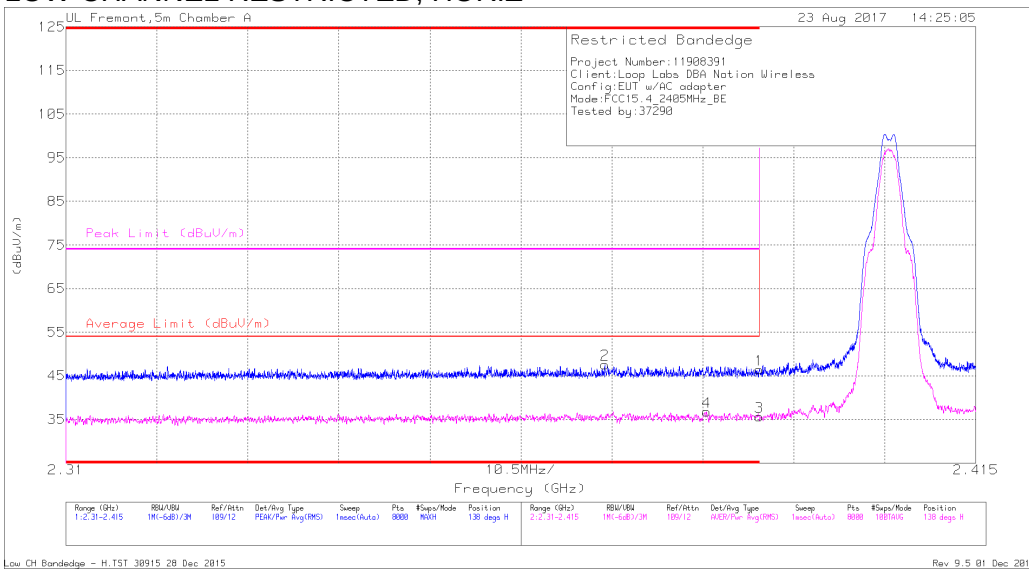
The spectrum from 30 MHz to 1GHz and 18GHz to 26 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 2.4 GHz band

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.

9.2. TX ABOVE 1 GHz FOR 802.15.4 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, HORIZ

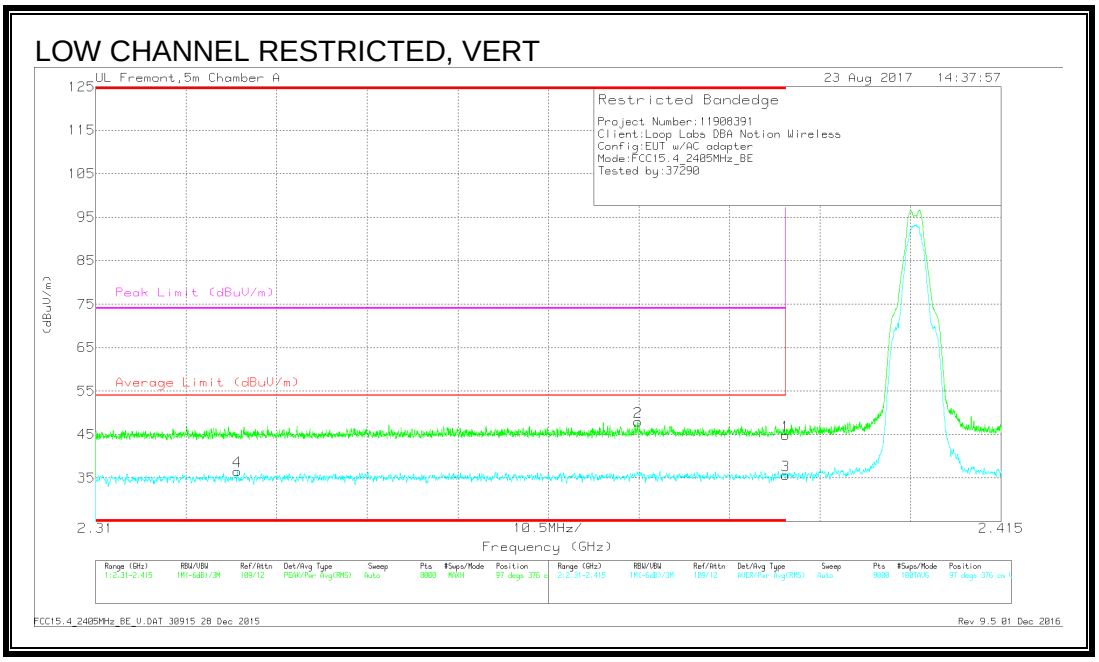


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	37.82	Pk	31.8	-23.2	46.42	-	-	74	-27.58	138	375	H
2	* 2.372	39.12	Pk	31.7	-23.2	47.62	-	-	74	-26.38	138	375	H
3	* 2.39	27.09	RMS	31.8	-23.2	35.69	54	-18.31	-	-	138	375	H
4	* 2.384	28.21	RMS	31.8	-23.2	36.81	54	-17.19	-	-	138	375	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
Low CH Bandedge - H.TST 30915 28 Dec 2015
Rev 9.5 01 Dec 2016

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

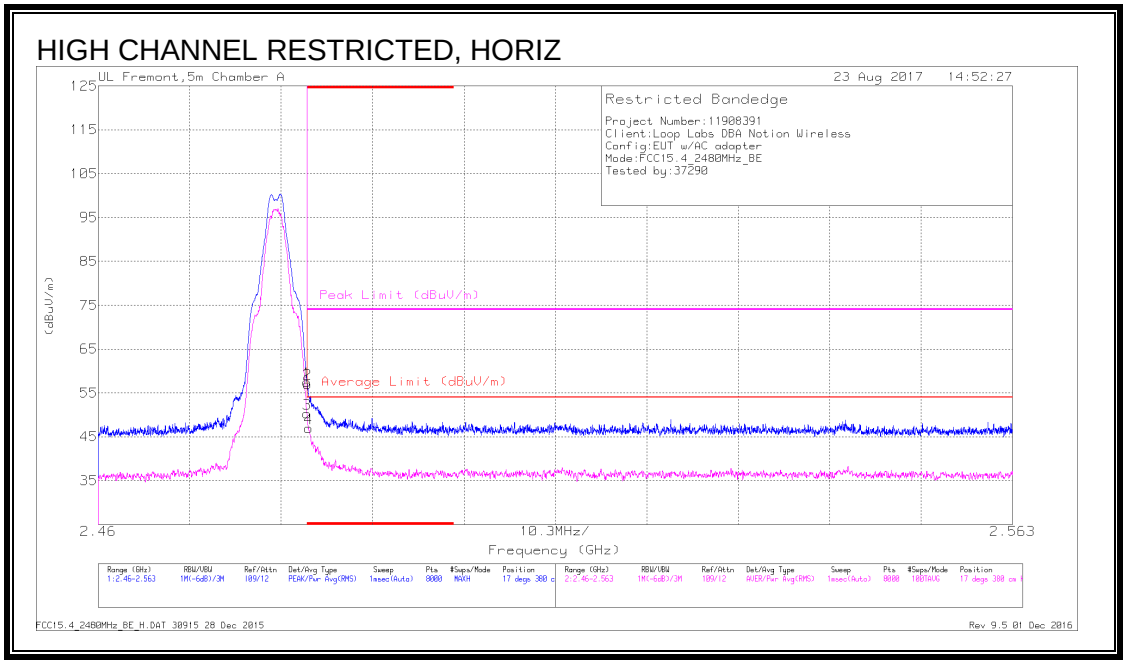


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	36.26	Pk	31.8	-23.2	44.86	-	-	74	-29.14	97	376	V
2	* 2.373	39.38	Pk	31.7	-23.2	47.88	-	-	74	-26.12	97	376	V
3	* 2.39	27	RMS	31.8	-23.2	35.6	54	-18.4	-	-	97	376	V
4	* 2.326	28.27	RMS	31.6	-23.3	36.57	54	-17.43	-	-	97	376	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
FCC15.4_2405MHz_BE_V.DAT 30915 28 Dec 2015
Rev 9.5 01 Dec 2016

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

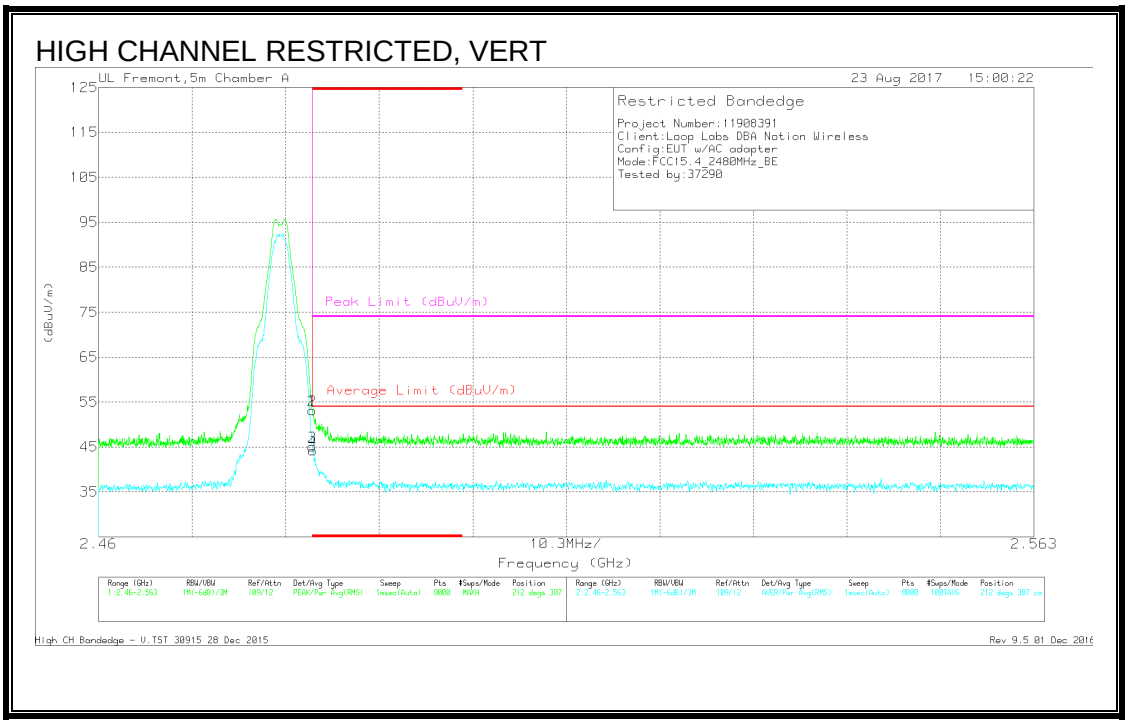


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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	48.32	Pk	32.3	-23.1	57.52	-	-	74	-16.48	17	380	H
2	* 2.484	47.86	Pk	32.3	-23.1	57.06	-	-	74	-16.94	17	380	H
3	* 2.484	41.05	RMS	32.3	-23.1	50.25	54	-3.75	-	-	17	380	H
4	* 2.484	37.76	RMS	32.3	-23.1	46.96	54	-7.04	-	-	17	380	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
FCC15.4_2480MHz_BE_H.DAT 30915 28 Dec 2015
Rev 9.5 01 Dec 2016

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

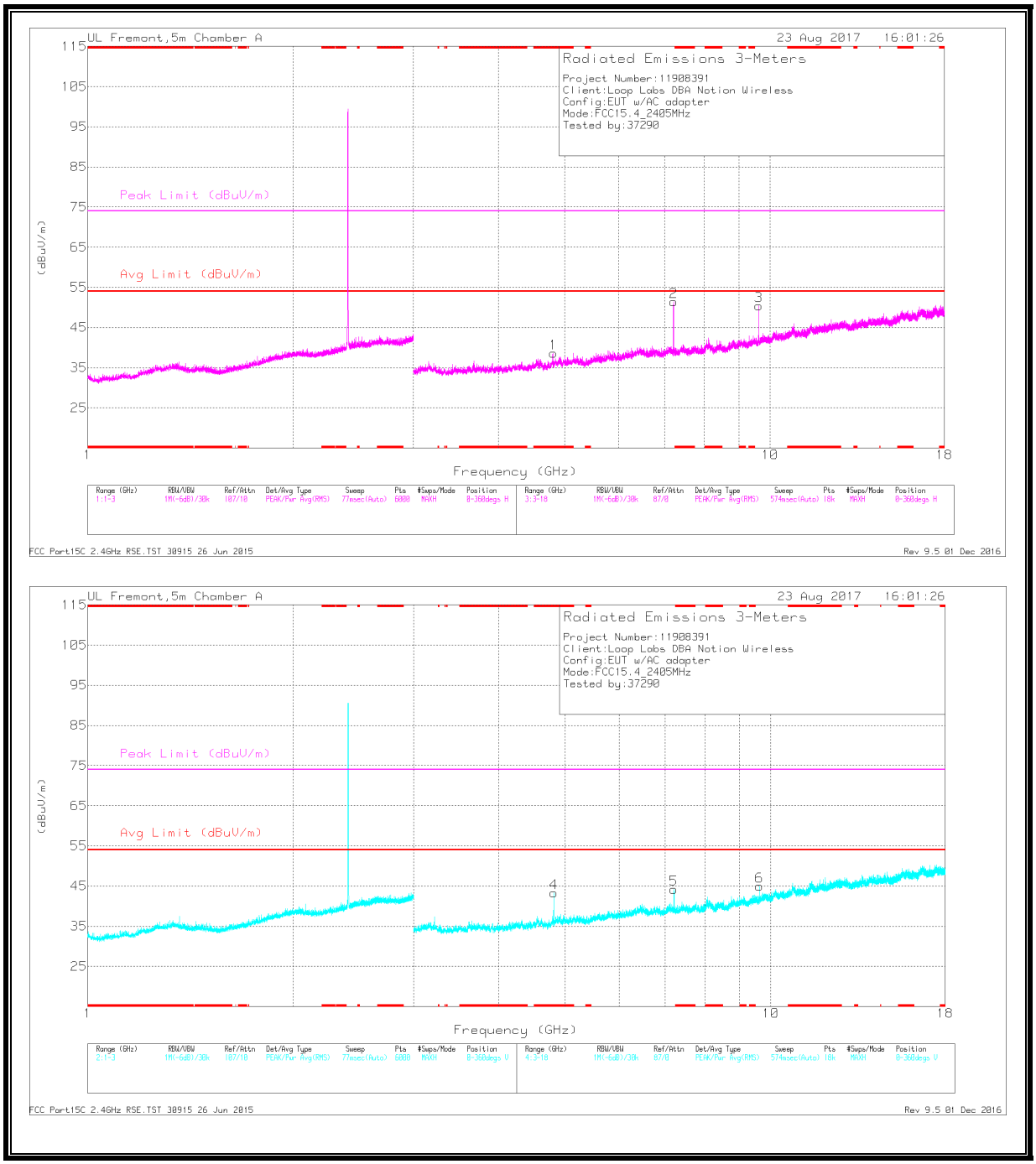


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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	43.91	Pk	32.3	-23.1	53.11	-	-	74	-20.89	212	387	V
2	* 2.484	43.98	Pk	32.3	-23.1	53.18	-	-	74	-20.82	212	387	V
3	* 2.484	35.91	RMS	32.3	-23.1	45.11	54	-8.89	-	-	212	387	V
4	* 2.484	34.97	RMS	32.3	-23.1	44.17	54	-9.83	-	-	212	387	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
High CH Bandedge - V.TST 30915 28 Dec 2015
Rev 9.5 01 Dec 2016

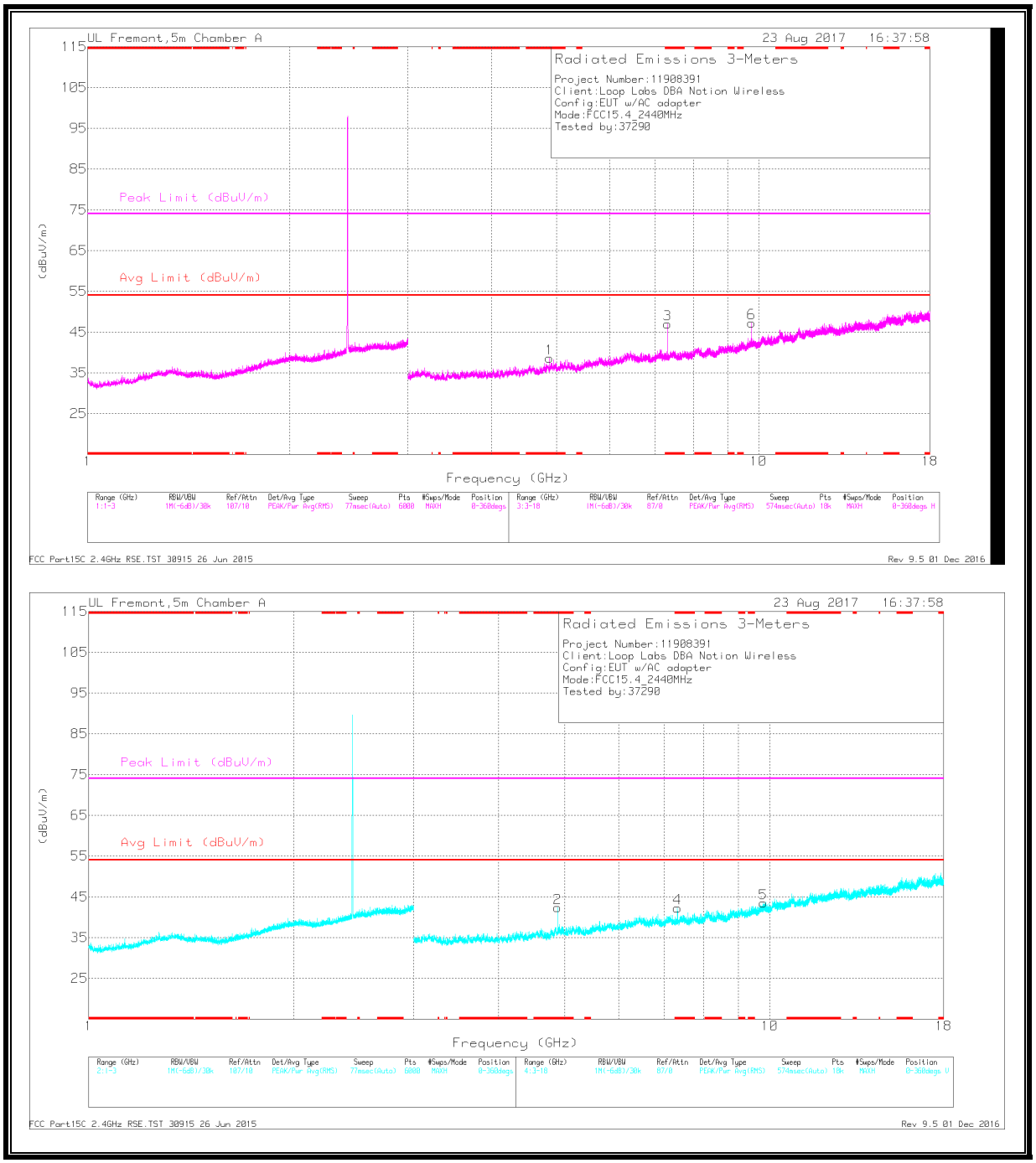
Low Channel Harmonics



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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	* 4.81	38.38	PK2	34.2	-27.6	44.98	-	-	74	-29.02	93	205	H
	* 4.81	31.21	MAv1	34.2	-27.6	37.81	54	-16.19	-	-	93	205	H
4	* 4.81	40.71	PK2	34.2	-27.6	47.31	-	-	74	-26.69	119	185	V
	* 4.81	34.15	MAv1	34.2	-27.6	40.75	54	-13.25	-	-	119	185	V
5	7.216	43.69	PK2	35.7	-23.9	55.49	-	-	-	-	36	107	H
2	9.618	40.03	PK2	36.8	-21.3	55.53	-	-	-	-	61	103	H
3	9.618	34.93	PK2	36.8	-21.3	50.43	-	-	-	-	0	101	H
6	9.621	29.5	PK2	36.8	-21.3	45	-	-	-	-	0	200	V

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

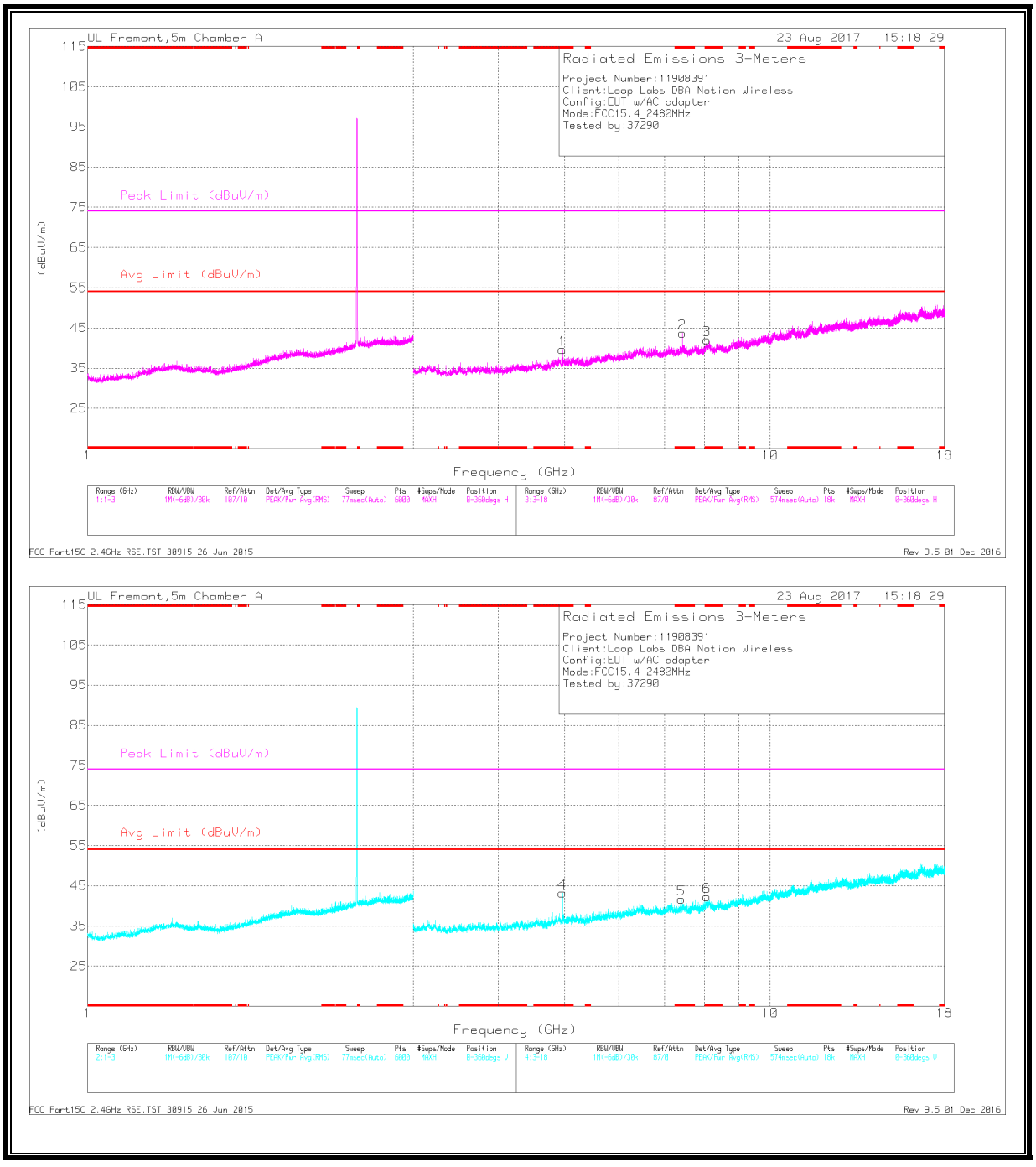
Mid Channel Harmonics



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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	* 4.88	38.72	PK2	34.1	-27.3	45.52	-	-	74	-28.48	94	191	H
	* 4.88	31.32	MAv1	34.1	-27.3	38.12	54	-15.88	-	-	94	191	H
3	* 7.322	37.36	PK2	35.7	-24	49.06	-	-	74	-24.94	1	106	H
	* 7.321	28.24	MAv1	35.7	-24	39.94	54	-14.06	-	-	1	106	H
2	* 4.88	41.6	PK2	34.1	-27.3	48.4	-	-	74	-25.6	117	179	V
	* 4.88	36.44	MAv1	34.1	-27.3	43.24	54	-10.76	-	-	117	179	V
4	* 7.321	33.28	PK2	35.7	-24	44.98	-	-	74	-29.02	35	114	V
	* 7.321	25.24	MAv1	35.7	-24	36.94	54	-17.06	-	-	35	114	V
6	9.761	31.14	PK2	36.9	-20.8	47.24	-	-	-	-	0	101	H
5	9.789	27.15	PK2	37	-20.7	43.45	-	-	-	-	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

High Channel Harmonics



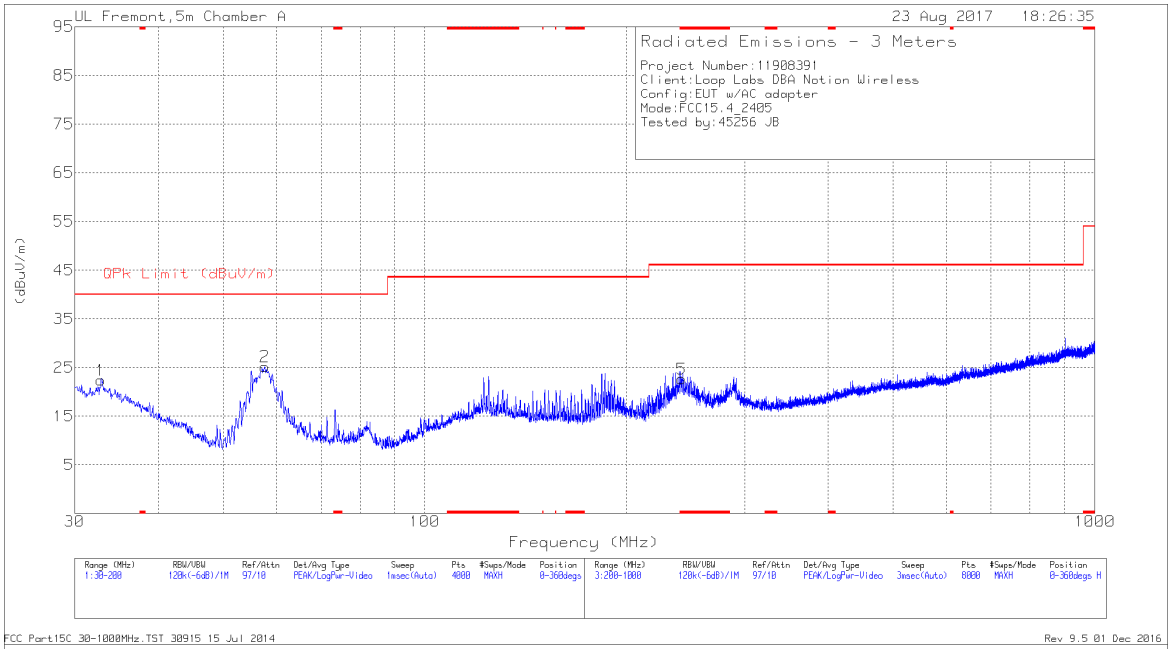
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.96	38.15	PK2	34.2	-27.9	44.45	-	-	74	-29.55	149	112	H
	* 4.96	29.14	MAv1	34.2	-27.9	35.44	54	-18.56	-	-	149	112	H
5	* 7.441	34.95	PK2	35.6	-22.2	48.35	-	-	74	-25.65	39	230	H
	* 7.441	25.69	MAv1	35.6	-22.2	39.09	54	-14.91	-	-	39	230	H
6	* 8.075	32.96	PK2	35.8	-21.6	47.16	-	-	74	-26.84	75	193	H
	* 8.07	21.5	MAv1	35.8	-21.5	35.8	54	-18.2	-	-	75	193	H
4	* 4.96	42.58	PK2	34.2	-27.9	48.88	-	-	74	-25.12	121	167	V
	* 4.96	37.31	MAv1	34.2	-27.9	43.61	54	-10.39	-	-	121	167	V
2	* 7.404	33.37	PK2	35.6	-22.6	46.37	-	-	74	-27.63	213	292	V
	* 7.405	21.63	MAv1	35.6	-22.6	34.63	54	-19.37	-	-	213	292	V
3	* 8.072	32.99	PK2	35.8	-21.5	47.29	-	-	74	-26.71	213	102	V
	* 8.07	22.13	MAv1	35.8	-21.5	36.43	54	-17.57	-	-	213	102	V

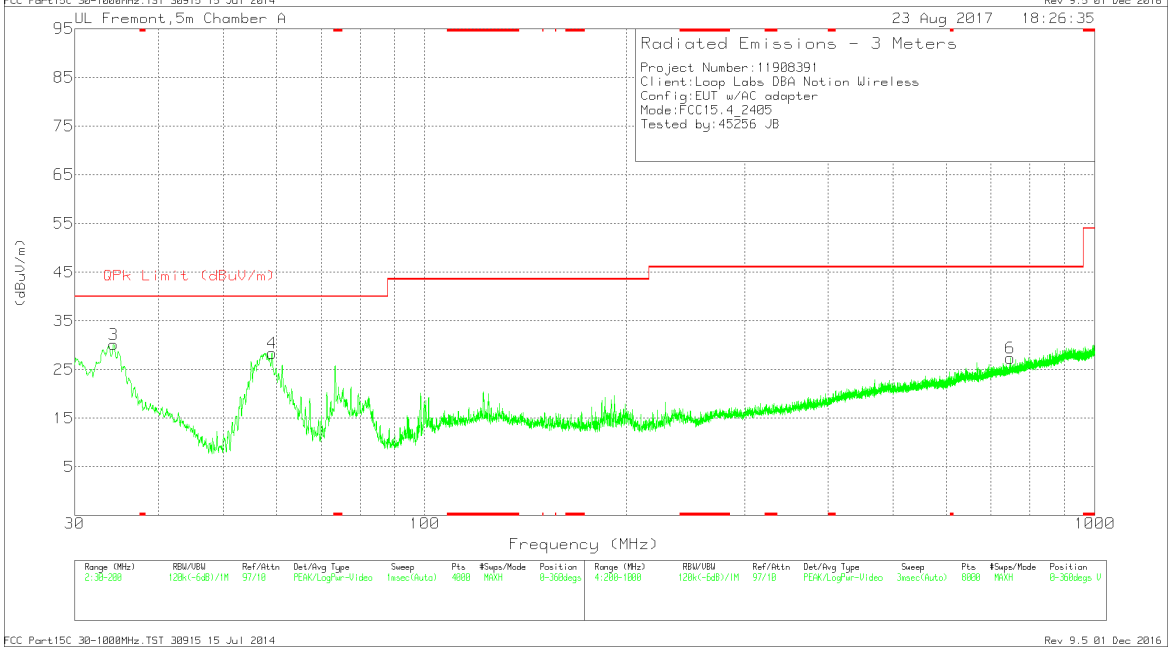
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

9.3. WORST-CASE BELOW 1 GHz

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

PLOT





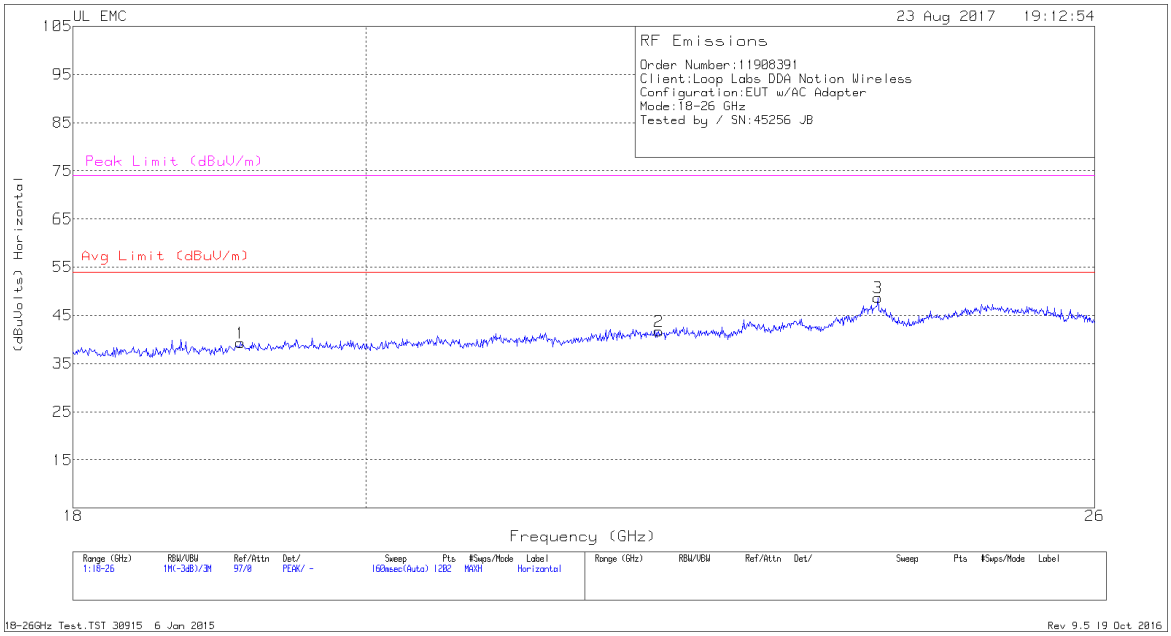
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 241.637	33.96	Qp	15.6	-29.7	19.86	46.02	-26.16	126	134	H
1	32.8482	29.78	Pk	23.8	-31.2	22.38	40	-17.62	0-360	200	H
3	34.2936	39.73	Pk	21.6	-31.2	30.13	40	-9.87	0-360	100	V
2	57.6747	44.68	Pk	11.4	-30.9	25.18	40	-14.82	0-360	400	H
4	59.12	47.66	Pk	11.6	-30.9	28.36	40	-11.64	0-360	100	V
6	747.9712	30.96	Pk	24.7	-28.3	27.36	46.02	-18.66	0-360	200	V

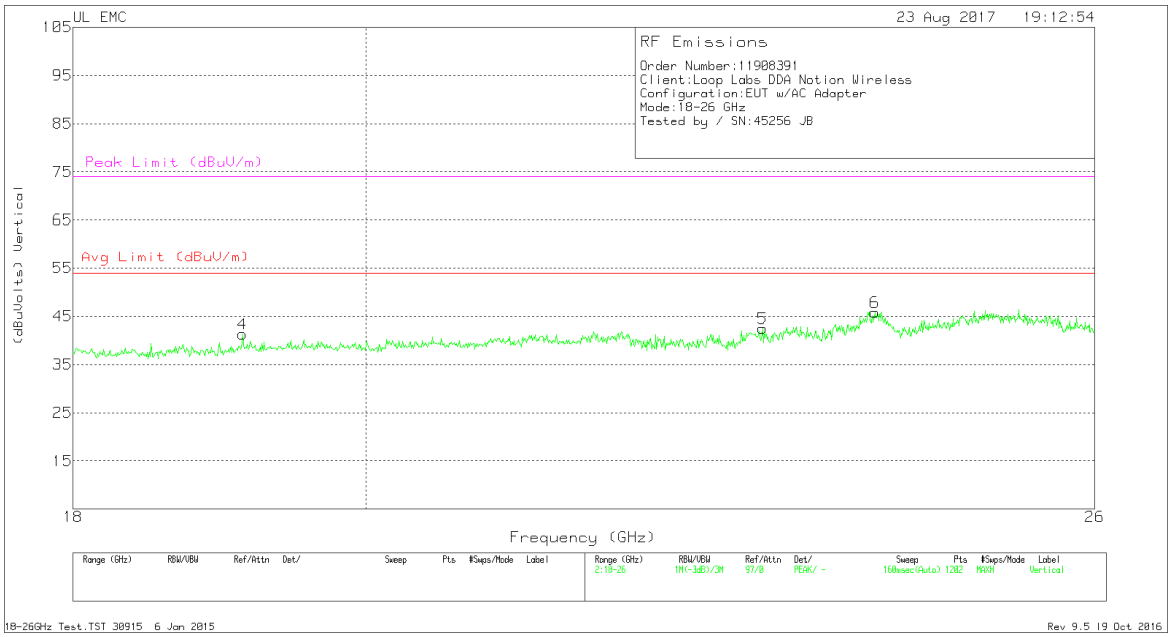
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Qp - Quasi-Peak detector
Pk - Peak detector

9.4. WORST-CASE 18 to 26 GHz

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

PLOT





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T449 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.119	38.03	Pk	32.5	-21.7	-9.5	39.33	54	-14.66	74	-34.66
2	22.223	38.27	Pk	33.5	-20.6	-9.5	41.66	54	-12.33	74	-32.33
3	24.048	44.47	Pk	33.9	-20.2	-9.5	48.67	54	-5.33	74	-25.33
4	19.132	40.13	Pk	32.5	-21.8	-9.5	41.33	54	-12.66	74	-32.66
5	23.069	39.3	Pk	33.6	-20.9	-9.5	42.5	54	-11.5	74	-31.5
6	24.022	41.63	Pk	33.9	-20.2	-9.5	45.83	54	-8.16	74	-28.16

Pk - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

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

*Decreases with the logarithm of the frequency.

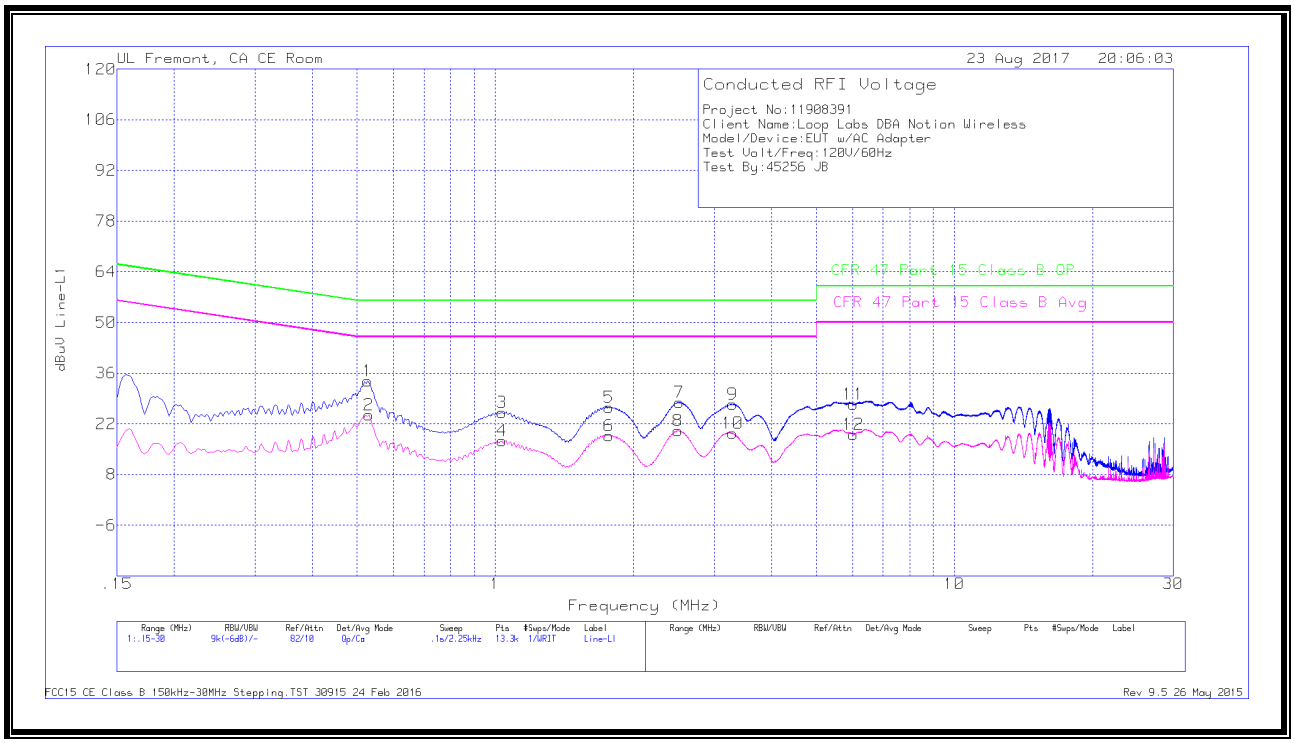
TEST PROCEDURE

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

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

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

LINE 1 RESULTS

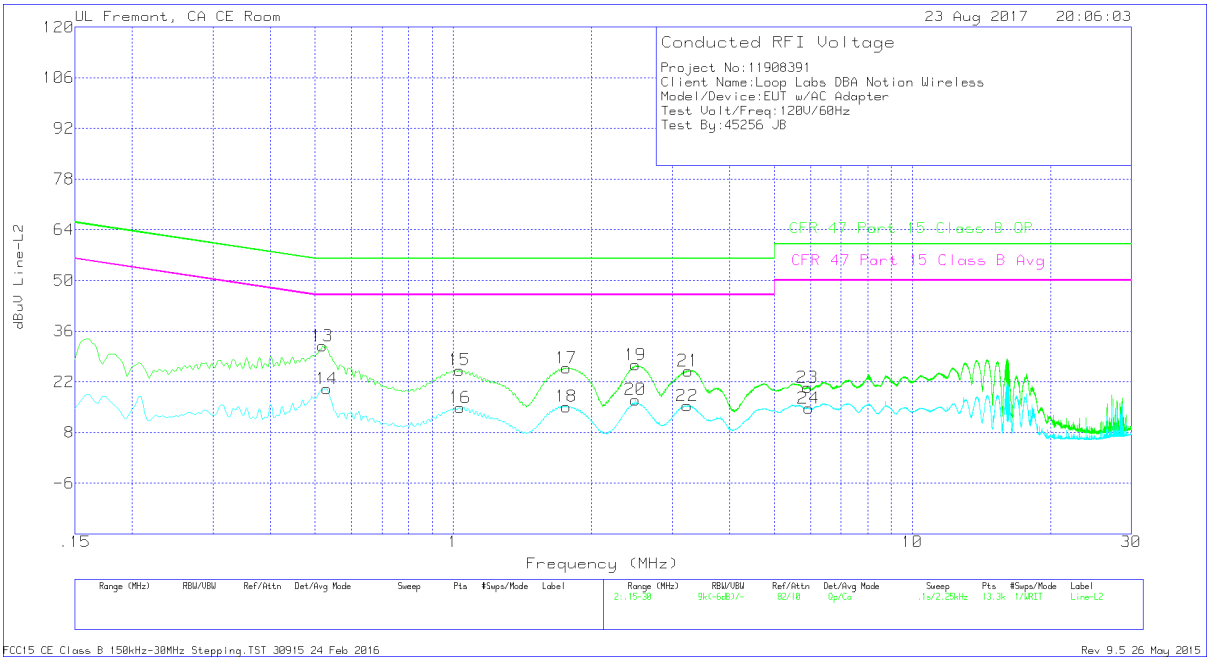


Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.528	23.58	Qp	0	.1	10.1	33.78	56	-22.22	-	-
2	.53025	14.28	Ca	0	.1	10.1	24.48	-	-	46	-21.52
3	1.03425	15	Qp	0	.1	10.1	25.2	56	-30.8	-	-
4	1.03425	7.05	Ca	0	.1	10.1	17.25	-	-	46	-28.75
5	1.77	16.39	Qp	0	.1	10.1	26.59	56	-29.41	-	-
6	1.76888	8.55	Ca	0	.1	10.1	18.75	-	-	46	-27.25
7	2.51475	17.75	Qp	0	.1	10.1	27.95	56	-28.05	-	-
8	2.50463	9.83	Ca	0	.1	10.1	20.03	-	-	46	-25.97
9	3.28875	17.25	Qp	0	.1	10.1	27.45	56	-28.55	-	-
10	3.28875	9.15	Ca	0	.1	10.1	19.35	-	-	46	-26.65
11	6.02025	17.08	Qp	0	.2	10.2	27.48	60	-32.52	-	-
12	6.02138	8.68	Ca	0	.2	10.2	19.08	-	-	50	-30.92

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	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.519	21.74	Qp	0	.1	10.1	31.94	56	-24.06	-	-
14	.53025	9.89	Ca	0	.1	10.1	20.09	-	-	46	-25.91
15	1.032	15.03	Qp	0	.1	10.1	25.23	56	-30.77	-	-
16	1.03425	4.7	Ca	0	.1	10.1	14.9	-	-	46	-31.1
17	1.76325	15.6	Qp	0	.1	10.1	25.8	56	-30.2	-	-
18	1.76325	4.95	Ca	0	.1	10.1	15.15	-	-	46	-30.85
19	2.4945	16.5	Qp	0	.1	10.1	26.7	56	-29.3	-	-
20	2.4945	6.86	Ca	0	.1	10.1	17.06	-	-	46	-28.94
21	3.2505	14.85	Qp	0	.1	10.1	25.05	56	-30.95	-	-
22	3.23475	5.17	Ca	0	.1	10.1	15.37	-	-	46	-30.63
23	5.9235	10.21	Qp	0	.1	10.2	20.51	60	-39.49	-	-
24	5.94375	4.46	Ca	0	.1	10.2	14.76	-	-	50	-35.24

Qp - Quasi-Peak detector
Ca - CISPR average detection