



TEST REPORT

Report Number. : 13571607-E12V3

Applicant : APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A.

Model : A2482 (Parent Model, Full Test)
A2635, A2631, A2633, A2634 (Variant Models)

FCC ID : BCG-E3997A (Parent Model)
BCG-E3999A, BCG-E4031A, BCG-E4032A (Variant Models)

IC : 579C-E3997A (Parent Model)
579C-E3999A, 579C-E4031A, 579C-E4032A (Variant Models)

EUT Description : SMARTPHONE

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-210 ISSUE 10
ISED RSS-GEN ISSUE 5 + A1 + A2

Date of Issue:
July 28, 2021

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888



Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	7/19/2021	Initial Issue	Frank Ibrahim
V2	7/20/2021	Address TCB's Questions on page 14, page 23, 27, 31, 41, 45	Chin Pang
V3	7/28/2021	Addressed TCB's 2 nd review updating Max Field Strength table	Francisco Guarnero

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	7
3. FACILITIES AND ACCREDITATION	7
4. DECISION RULES AND MEASUREMENT UNCERTAINTY	7
4.1. METROLOGICAL TRACEABILITY	7
4.2. DECISION RULES.....	7
4.3. MEASUREMENT UNCERTAINTY.....	7
4.4. SAMPLE CALCULATION	8
5. EQUIPMENT UNDER TEST.....	9
5.1. DESCRIPTION OF EUT	9
5.2. MAXIMUM E-FIELD STRENGTH	9
5.3. WORST-CASE CONFIGURATION AND MODE.....	10
5.4. SUPPORT EQUIPMENT	11
6. TEST AND MEASUREMENT EQUIPMENT	14
7. OCCUPIED BANDWIDTH	15
7.1. PRIMARY ANTENNA.....	16
7.1.1. READER MODE, Type B 848 Kbps	16
7.1.2. CE MODE, Type B 848 Kbps.....	16
7.2. SECONDARY ANTENNA	17
7.2.1. READER MODE, Type B 848 Kbps	17
8. RADIATED EMISSION TEST RESULTS.....	18
8.1. LIMITS AND PROCEDURE	18
8.2. PRIMARY ANTENNA FUNDAMENTAL & SPURIOUS EMISSION 0.15-30 MHz.....	20
8.2.1. READER MODE, Type B 848 Kbps	20
8.2.2. TAG MODE, Type B 848 Kbps.....	24
8.2.3. CE MODE, Type B 848 Kbps.....	28
8.3. PRIMARY ANTENNA TX SPURIOUS EMISSION 30-1000 MHz	32
8.3.1. READER MODE, Type B 848 Kbps	32
8.3.2. TAG MODE, Type B 848 Kbps.....	34
8.3.3. CE MODE, Type B 848 Kbps.....	36
8.4. SECONDARY ANTENNA FUNDAMENTAL & SPURIOUS EMISSION 0.15-30 MHz..	38
8.4.1. READER MODE, Type B 848 Kbps	38
8.4.2. TAG MODE, Type B 848 Kbps.....	42
8.5. SECONDARY ANTENNA TX SPURIOUS EMISSION 30-1000 MHz	46
8.5.1. READER MODE, Type B 848 Kbps	46
8.5.2. TAG MODE, Type B 848 Kbps.....	48
9. FREQUENCY STABILITY	50

9.1. PRIMARY ANTENNA.....	51
9.1.1. READER MODE, Type B 848 Kbps.....	51
9.1.2. CE MODE, Type B 848 Kbps.....	51
9.2. SECONDARY ANTENNA.....	52
9.2.1. READER MODE, Type B 848 Kbps.....	52
10. AC MAINS LINE CONDUCTED EMISSIONS	53
10.1. PRIMARY ANTENNA.....	54
10.1.1. READER MODE, Type B 848 Kbps, with Antenna.....	54
10.1.2. READER MODE, Type B 848 Kbps, Antenna Port Terminated.....	56
10.1.3. CE MODE, Type B 848 Kbps, with Antenna.....	58
10.1.4. CE MODE, Type B 848 Kbps, Antenna Port Terminated.....	60
10.2. SECONDARY ANTENNA.....	62
10.2.1. READER MODE, Type B 848 Kbps, with Antenna.....	62
10.2.2. READER MODE, Type B 848 Kbps, Antenna Port Terminated.....	64
11. SETUP PHOTOS	66

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: SMARTPHONE

MODEL: A2482 (Parent Model)
A2631, A2633, A2634, A2635 (Variant Models)

BRAND: APPLE

FCC ID: BCG-E3997A (Parent Model)
BCG-E3999A, BCG-E4031A, BCG-E4032A (Variant Models)

IC ID: 579C-E3997A (Parent Model)
579C-E3999A, 579C-E4031A, 579C-E4032A (Variant Models)

SERIAL NUMBER: CQF9R4NQNJ, F57V097CR6

SAMPLE RECEIPT DATE: JANUARY 13, 2021; JUNE 21, 2021

DATE TESTED: MAY 13, 2021 – JULY 15, 2021

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Complies
ISED RSS-210 Issue 10, Annex B	Complies
ISED RSS-GEN Issue 5 + A1 + A2	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 A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



Frank Ibrahim
Staff Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:



Francisco Guarnero
Test Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- ANSI C63.10-2013
- KDB 414788 D01 Radiated Test Site v01r01
- RSS-GEN Issue 5 + A1 + A2
- RSS-210 Issue 10

3. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	208313
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	208313
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	208313

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.).

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U_{Lab}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB

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

4.4. 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)

$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

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.

$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS and NFC. All models support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM) or e-SIM (electronic SIM). The device supports a built-in inductive charging transmitter and receiver. The rechargeable battery is not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

The Model and FCC and IC ID covered by this report includes:

Parent Model: A2482; FCC ID: BCG-E3997A; IC ID: 579C-E3997A

Variant Models: A2635; FCC ID: BCG-E4032A; IC ID: 579C-E4032A
 A2631; FCC ID: BCG-E3999A; IC ID: 579C-E3999A
 A2633; FCC ID: BCG-E4031A; IC ID: 579C-E4031A
 A2634; FCC ID: BCG-E4032A; IC ID: 579C-E4032A

5.2. MAXIMUM E-FIELD STRENGTH

The transmitter has a maximum peak radiated E-field strength as follows:

Antenna	Frequency Range (MHz)	Mode		Kbps	E Field at 30m distance (dBuV/m)
Primary	13.56	Type B	Reader	848	25.32
			Tag	848	25.56
			CE	848	25.26
Secondary	13.56	Type B	Reader	848	2.78
			Tag	848	6.83

5.3. WORST-CASE CONFIGURATION AND MODE

The fundamental of the EUT was investigated under three orthogonal orientations X (Flatbed), Y (Landscape), and Z (Portrait). The Y (Landscape) orientation was determined to be the worst-case orientation. The EUT has primary and secondary antennas and worst case was investigated on the primary antenna since it has the highest power.

The worst-case position of the EUT was investigated under two configurations: EUT with power supply, EUT with earphones. The EUT with power supply configuration was determined to be worst-case configurations; therefore, all final tests were performed on the EUT with power supply.

In addition, Tag, Reader, and CE mode mode were investigated with Type A, B and F with data rates, such as 106Kbp/s, 212Kbp/s, 424Kbp/s and 848Kbp/s and ISO 15693 configuration to determine the worst case based on the highest power and spurious emissions. Type B 848 Kbps was determined to be the worst case and therefore Type B was selected for all final tests

For below 30MHz testing, investigation was done on three antenna orientations: RX antenna Face-on, Face-off and horizontal (parallel to ground). The worst-case configurations were determined on RX antenna Face-on and Face-off; therefore, all final tests were performed using these two orientations.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 meter open area test site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

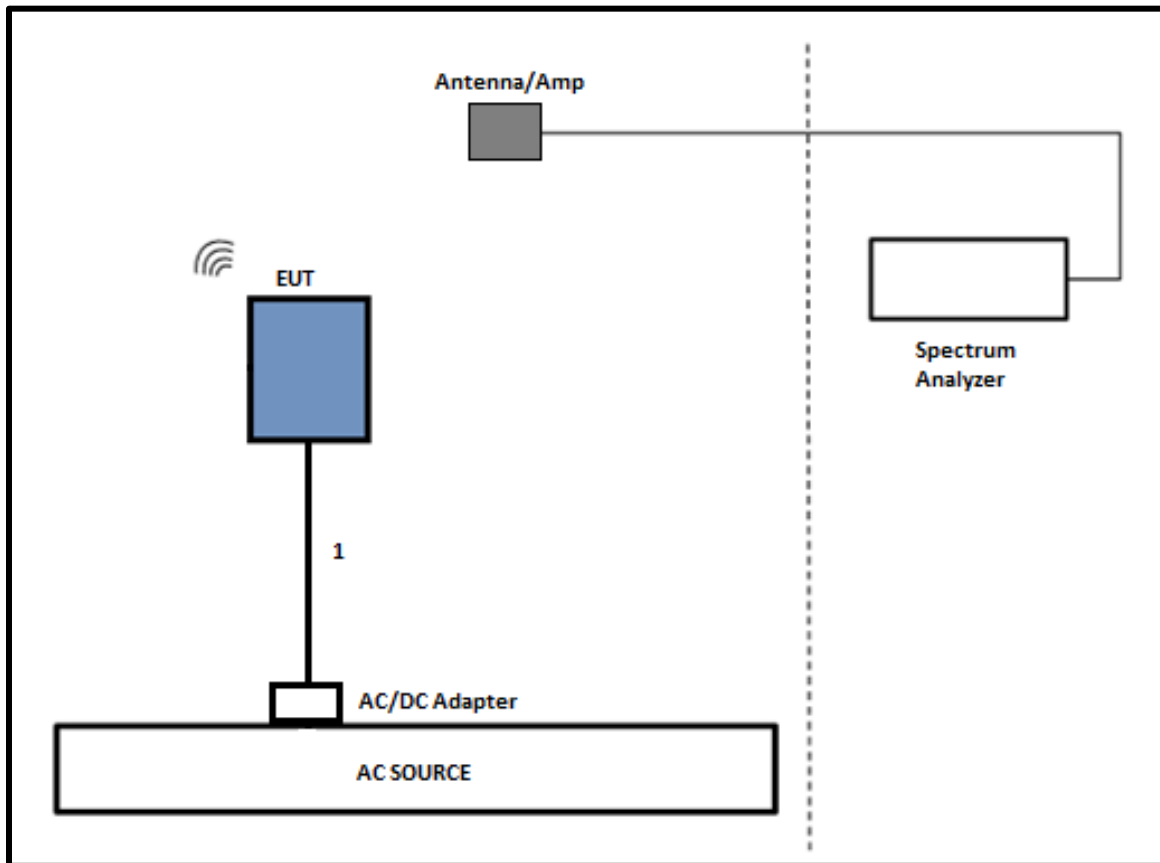
5.4. SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Apple	Macbook Pro	C02SM041GTFL	BCGA1707
Laptop AC/DC adapter	Apple	A1424	NSW25679	DoC
EUT AC/DC adapter	Apple	A1720	C3D8417A7R93KVPA8	DoC

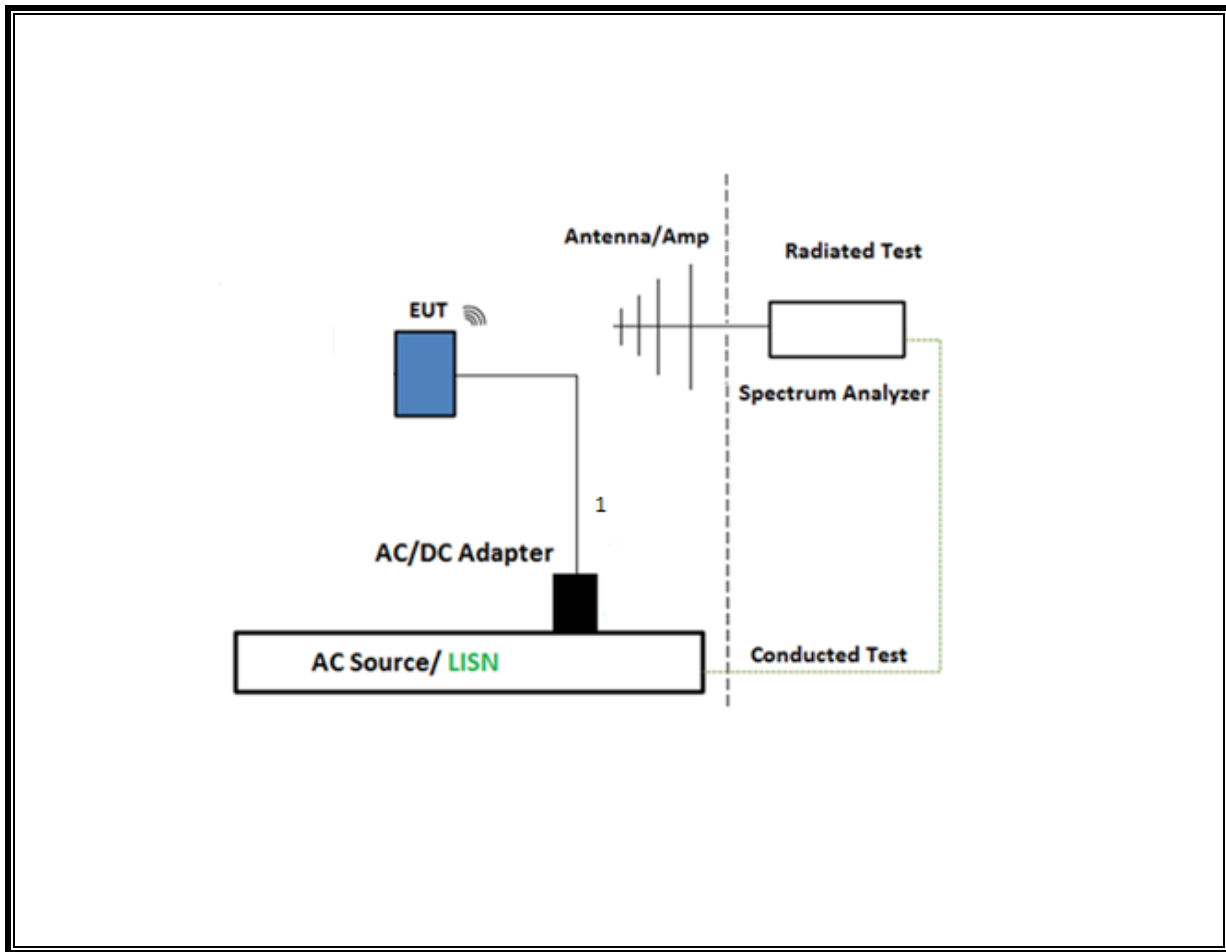
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Un-Shielded	1	N/A

SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	T900	02/24/2022	02/24/2021
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T173	07/22/2021	07/22/2020
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T35	11/23/2021	11/23/2020
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T342	01/25/2022	01/25/2021
EMI Test Receiver	Rohde & Schwarz	ESW44	201497	02/25/2022	02/25/2021
*Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T754	06/21/2021	06/21/2020
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T459	09/21/2021	09/21/2020

AC Line Conducted					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	T1436	02/19/2022	02/19/2021
Power Cable, Line Conducted Emissions	UL	PR1	T861	10/27/2021	10/27/2020
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01	PRE0186446	01/20/2022	01/20/2021
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, Mar 6, 2020		
Conducted Software	UL	UL EMC	2020.2.26		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, February 21, 2020		

Note: *Testing is completed before equipment expiration date.

7. OCCUPIED BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 10kHz. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

Note: Because the measured signal is CW or CW-like adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

RESULTS

99% and 20dB BW

Primary Antenna

Type B (Reader Mode)

Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	21.967	25.40

Type B (CE Mode)

Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	22.082	25.77

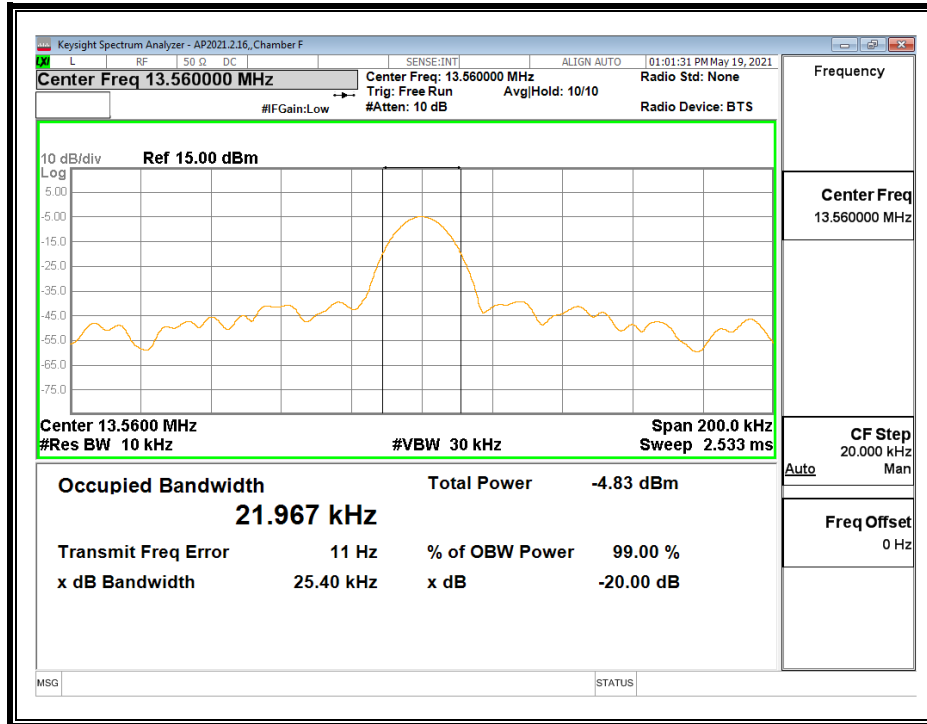
Secondary Antenna

Type B (Reader Mode)

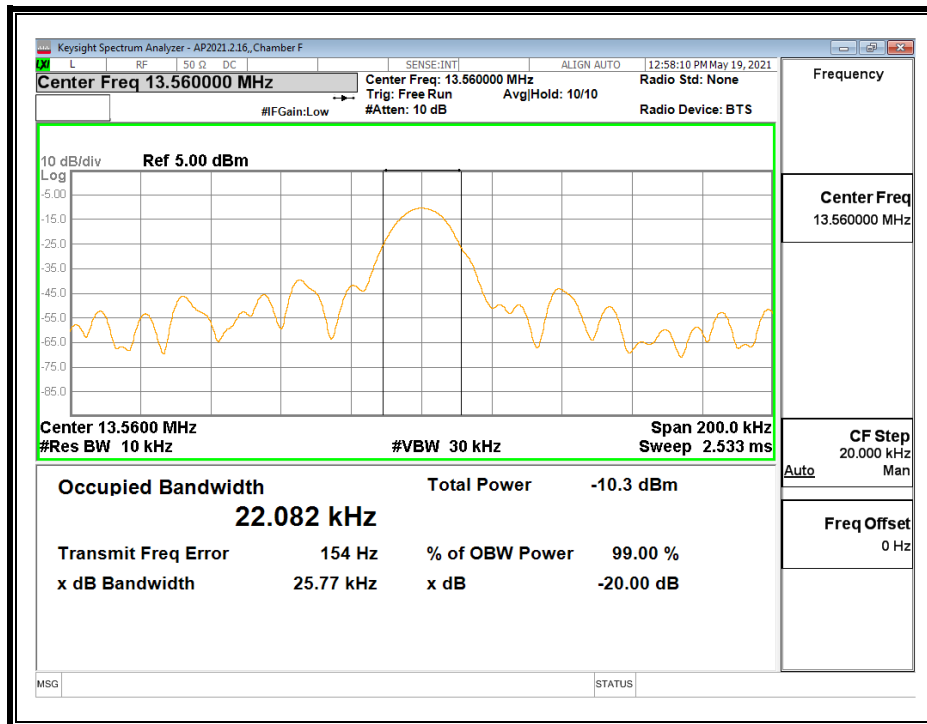
Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	22.075	25.28

7.1. PRIMARY ANTENNA

7.1.1. READER MODE, Type B 848 Kbps

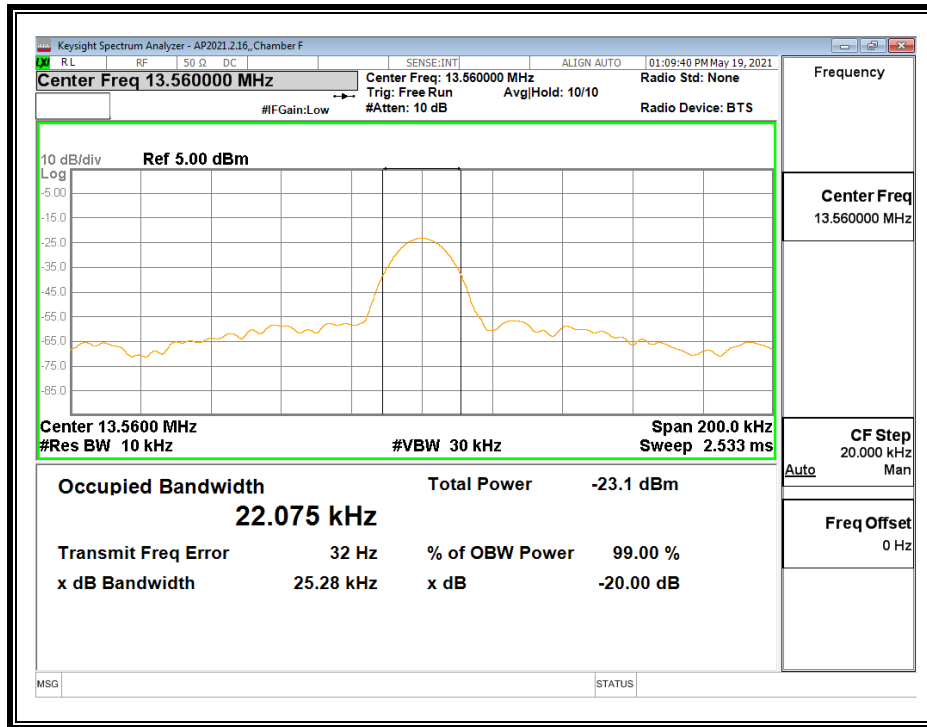


7.1.2. CE MODE, Type B 848 Kbps



7.2. SECONDARY ANTENNA

7.2.1. READER MODE, Type B 848 Kbps



8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMIT

§15.225

IC RSS-210, Annex B.6

IC RSS-GEN, Section 8.9 (Transmitter)

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/ meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110– 14.010 MHz and shall not exceed the general radiated emission limits in § 15.209 as follows:

§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Formula for converting the filed strength from uV/m to dBuV/m is:

Limit (dBuV/m) = 20 log limit (uV/m)

In addition:

§15.209 (d) The emission limits shown the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

§15.209 (d) The provisions in §§ 15.225, measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

TEST PROCEDURE

ANSI C63.10, 2013

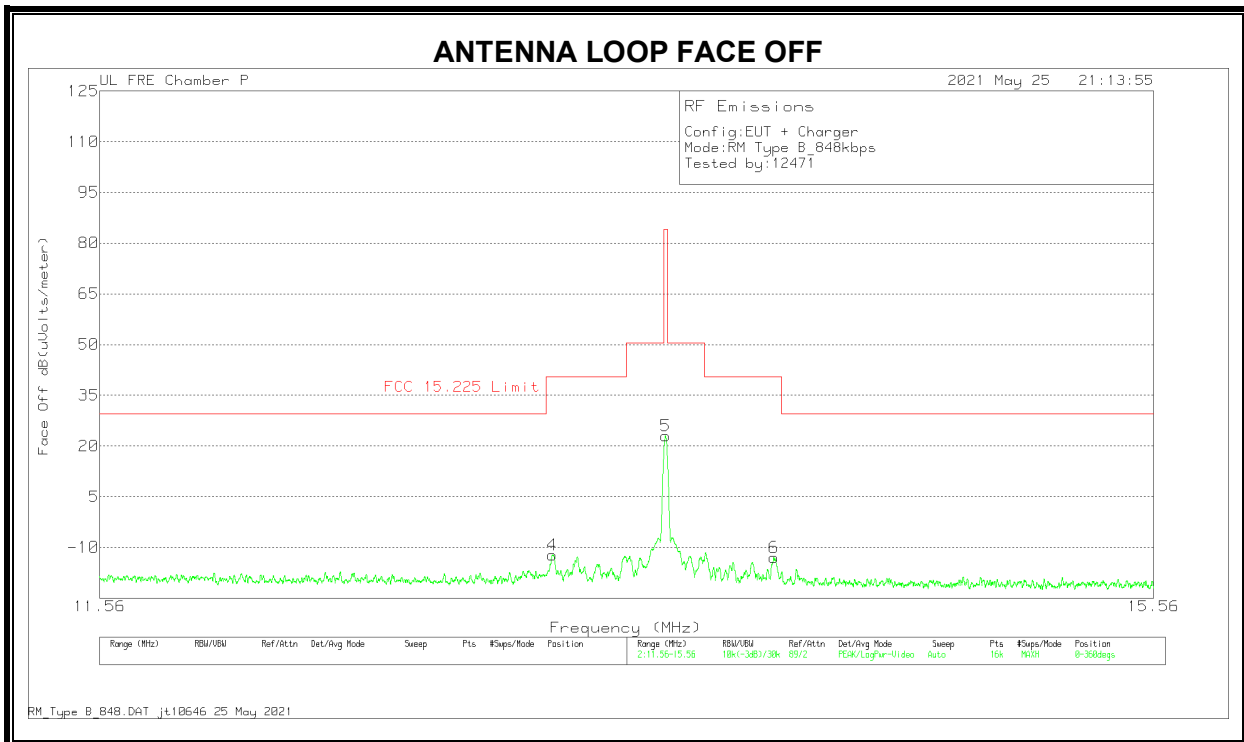
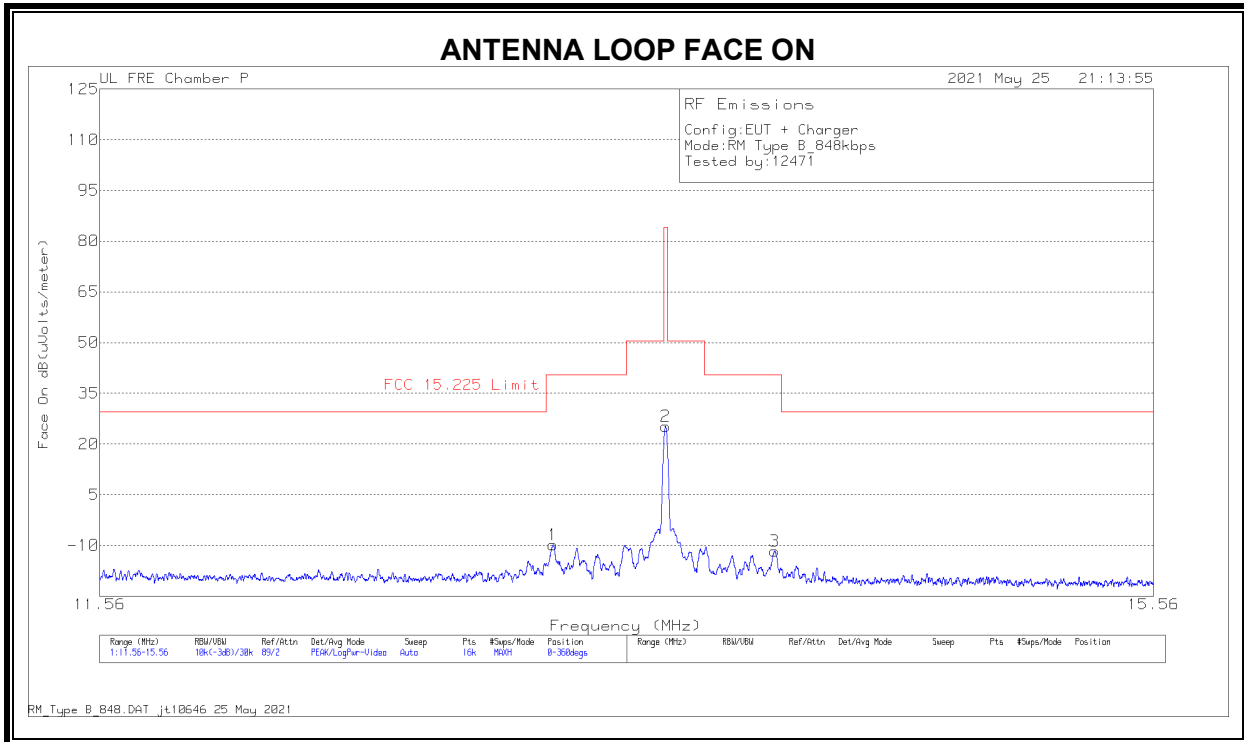
The EUT is an intentional radiator that incorporates a digital device, the highest fundamental frequency generated or used in the device is 13.56 MHz; therefore, the frequency range was investigated from 0.15 MHz to the 10th harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater.

RESULTS

8.2. PRIMARY ANTENNA FUNDAMENTAL & SPURIOUS EMISSION 0.15-30 MHz

8.2.1. READER MODE, Type B 848 Kbps

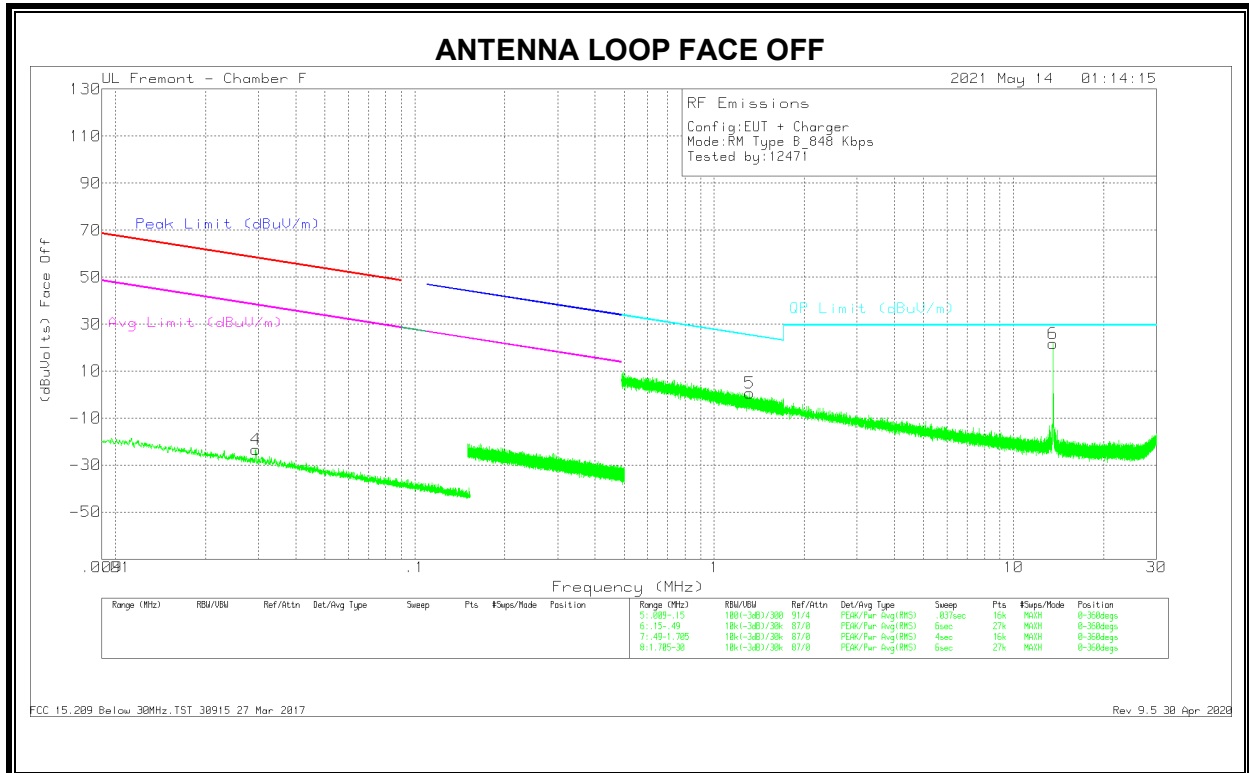
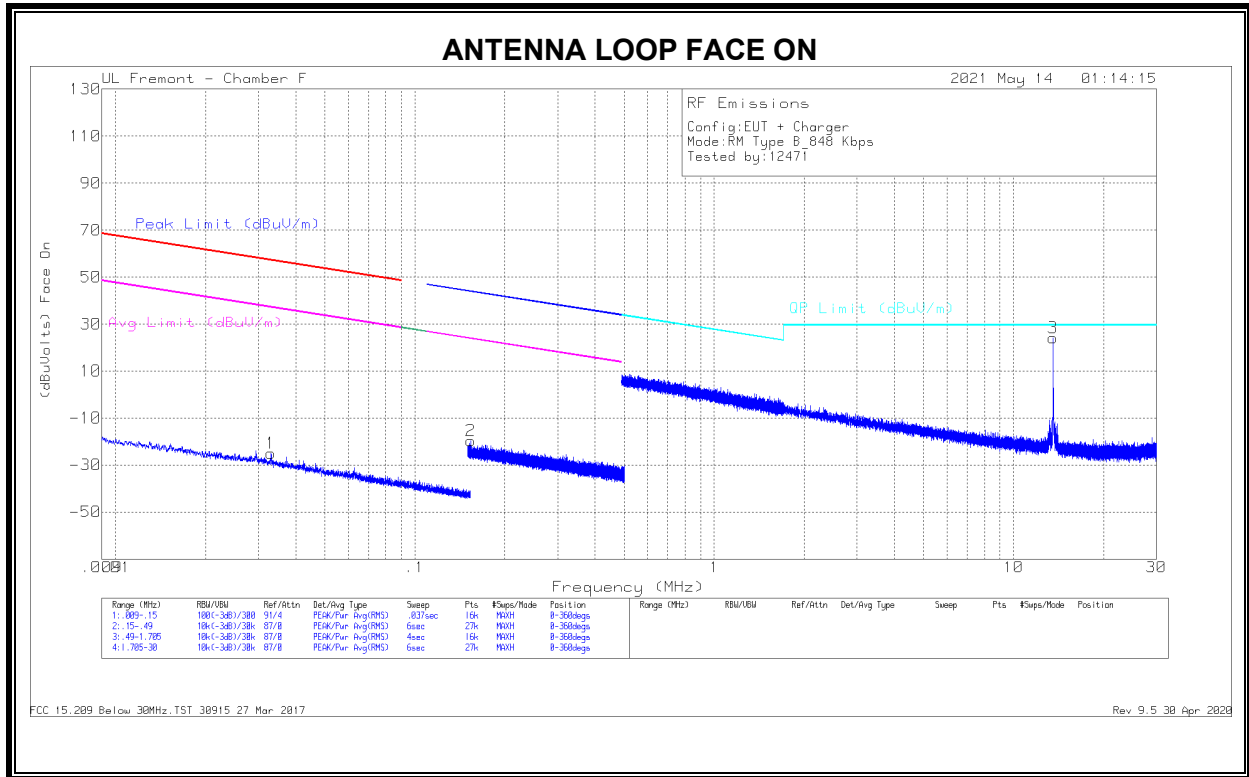
FUNDAMENTAL



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading dB(uVolts/ meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Polarity
1	13.13613	19.22	Pk	10.5	.5	-40	-9.78	40.51	-50.29	0-360	Face On
2	13.5595	54.42	PK	10.4	.5	-40	25.32	84	-58.68	0-360	Face On
3	13.98375	17.48	Pk	10.4	.5	-40	-11.62	40.51	-52.13	0-360	Face On
4	13.1345	16.83	PK	10.5	.5	-40	-12.17	40.51	-52.68	0-360	Face Off
5	13.5595	52.09	Pk	10.4	.5	-40	22.99	84	-61.01	0-360	Face Off
6	13.98	16.13	PK	10.4	.5	-40	-12.97	40.51	-53.48	0-360	Face Off

Pk - Peak detector



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	.03311	41.08	Pk	13.9	0	-80	-25.02	57.19	-82.21	37.19	-62.21	0-360	Face On
2	.15404	49.14	Pk	11.2	.1	-80	-19.56	43.87	-63.43	23.87	-43.43	0-360	Face On
4	.02939	42.46	Pk	14.2	0	-80	-23.34	58.22	-81.56	38.22	-61.56	0-360	Face Off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
5	1.31403	29.7	Pk	10.8	.1	-40	.6	25.26	-24.66	0-360	Face Off

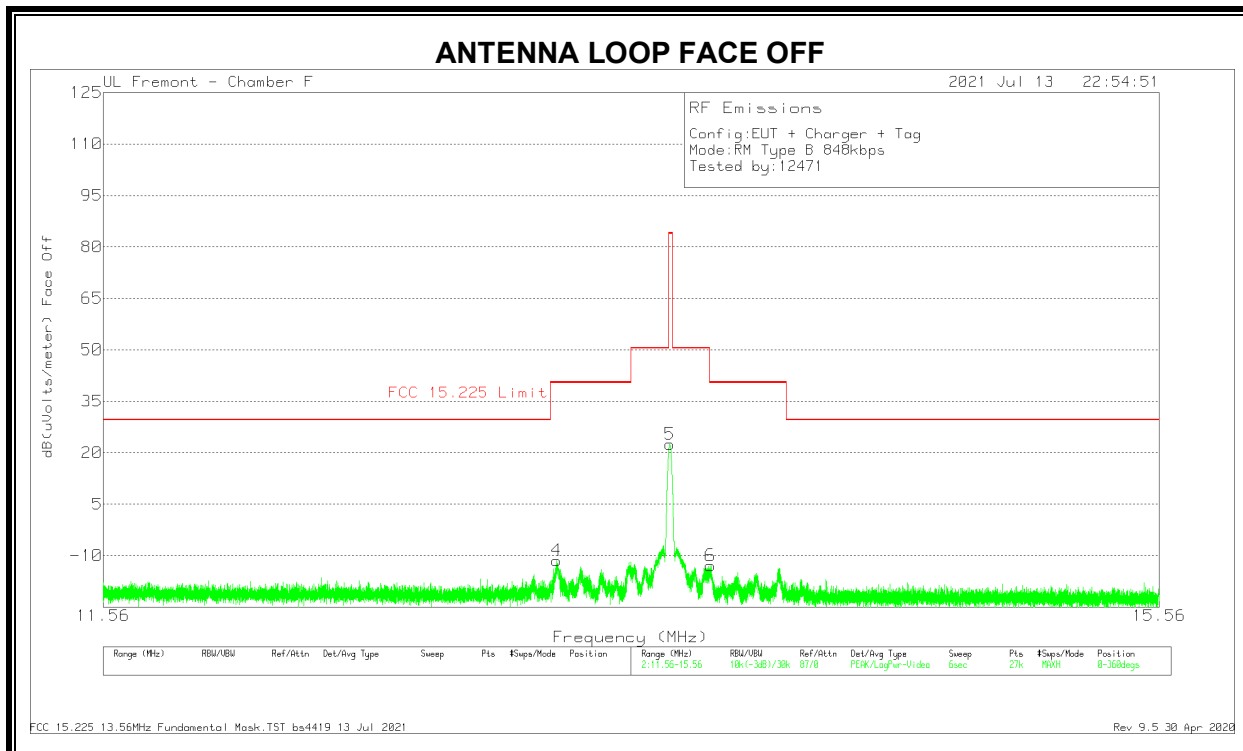
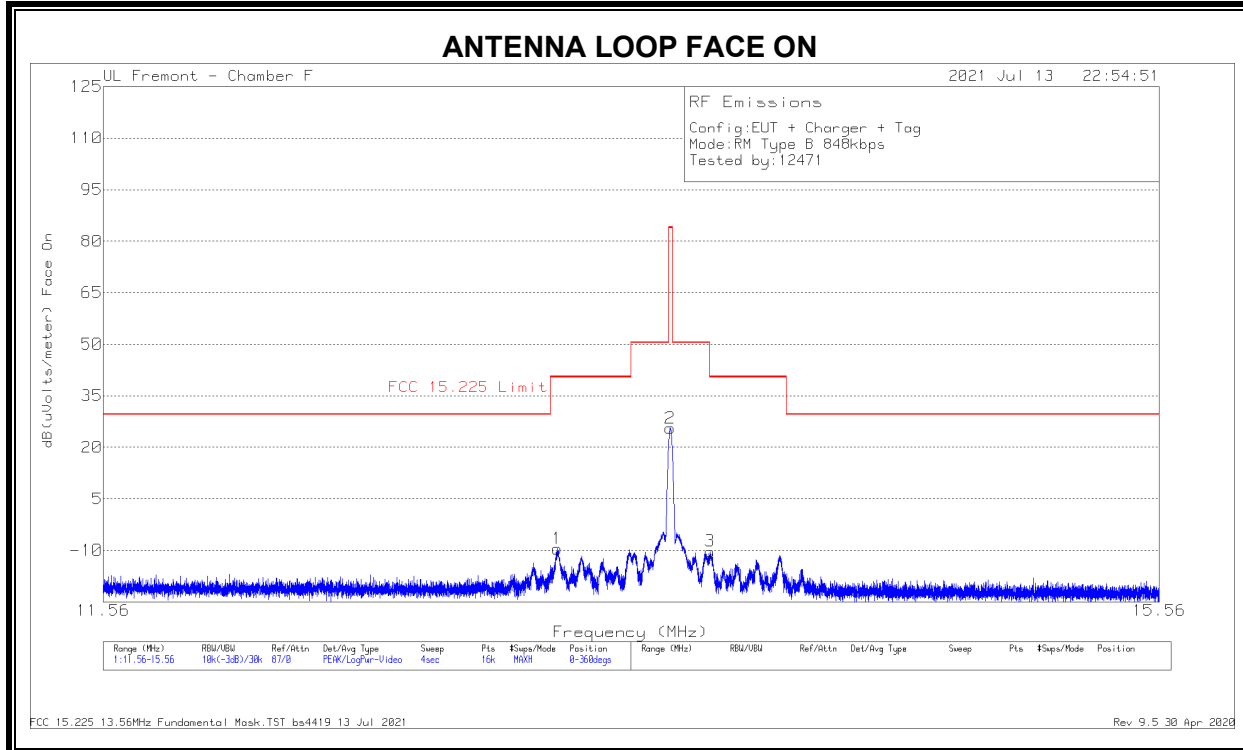
Pk - Peak detector

Qp - Quasi-Peak detector

Note: Marker 3 and 6 are from Fundamental signals.

8.2.2. TAG MODE, Type B 848 Kbps

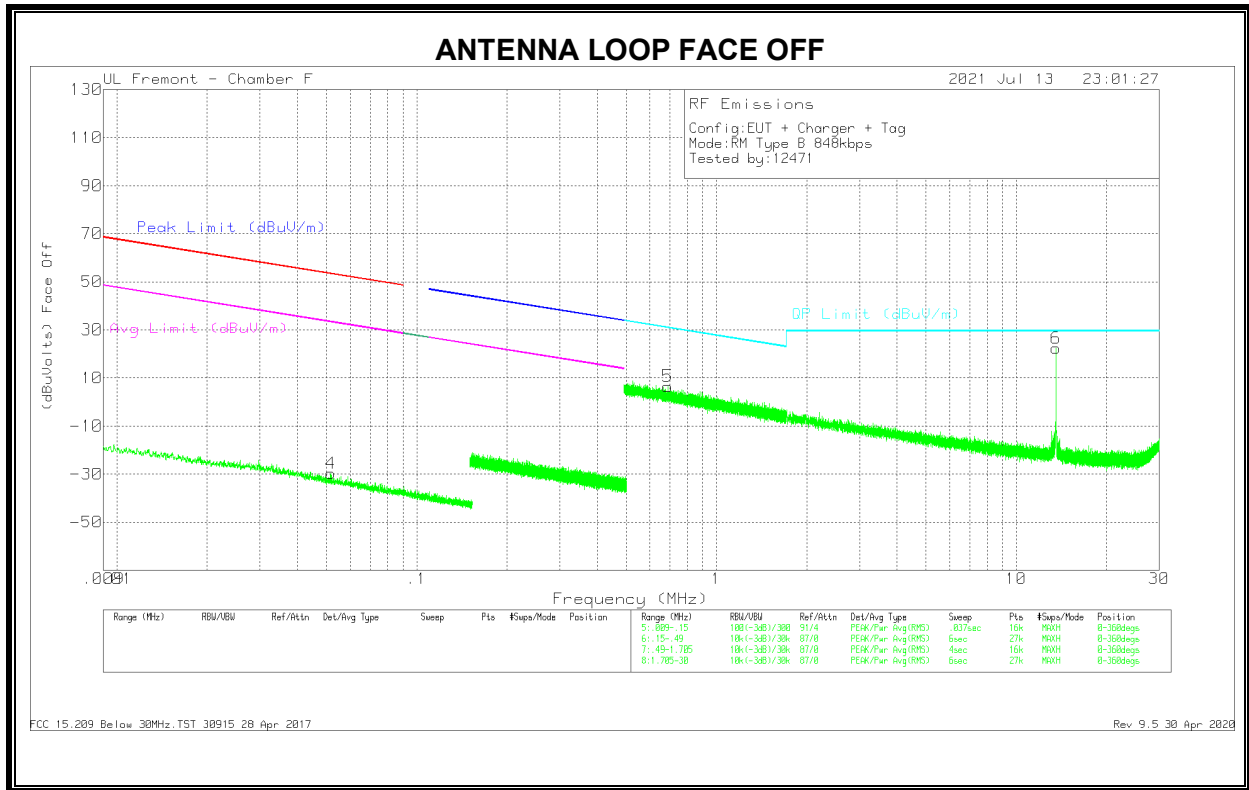
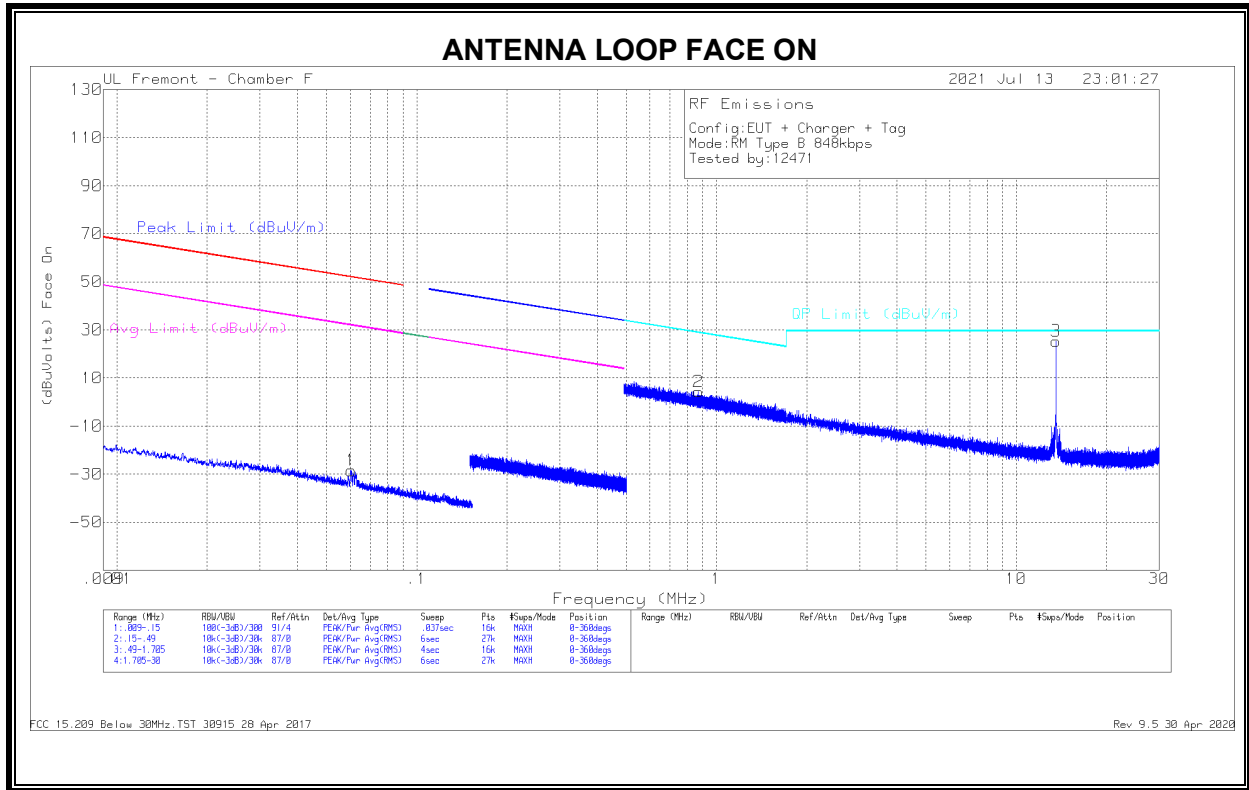
FUNDAMENTAL



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Polarity
1	13.13575	19.3	Pk	10.8	.4	-40	-9.5	40.51	-50.01	0-360	Face On
2	13.5595	54.46	Pk	10.7	.4	-40	25.56	84	-58.44	0-360	Face On
3	13.7125	18.62	Pk	10.7	.4	-40	-10.28	40.51	-50.79	0-360	Face On
4	13.13309	17.4	Pk	10.8	.4	-40	-11.4	40.51	-51.91	0-360	Face Off
5	13.5577	51.37	Pk	10.7	.4	-40	22.47	84	-61.53	0-360	Face Off
6	13.7137	15.98	Pk	10.7	.4	-40	-12.92	40.51	-53.43	0-360	Face Off

Pk - Peak detector



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	.06047	38.79	Pk	12.7	0	-80	-28.51	51.95	-80.46	31.95	-60.46	0-360	Face On
4	.05168	37.5	Pk	12.8	0	-80	-29.7	53.32	-83.02	33.32	-63.02	0-360	Face Off

Pk - Peak detector

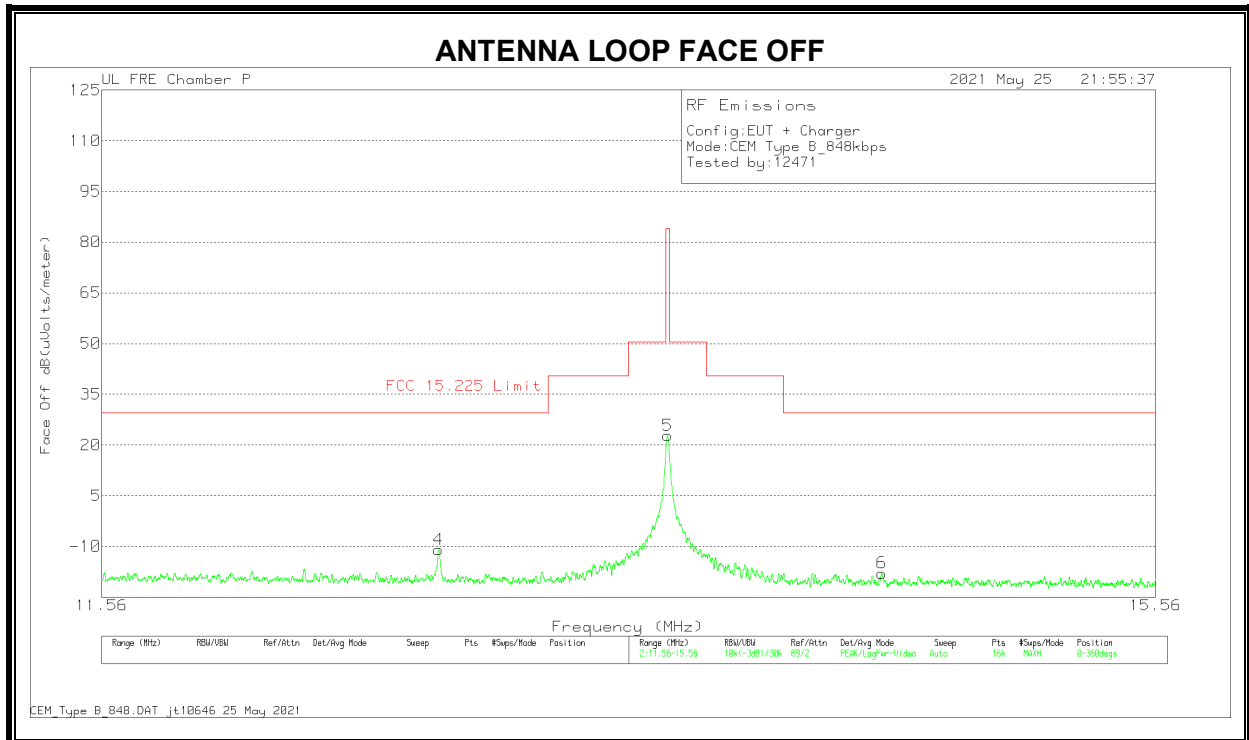
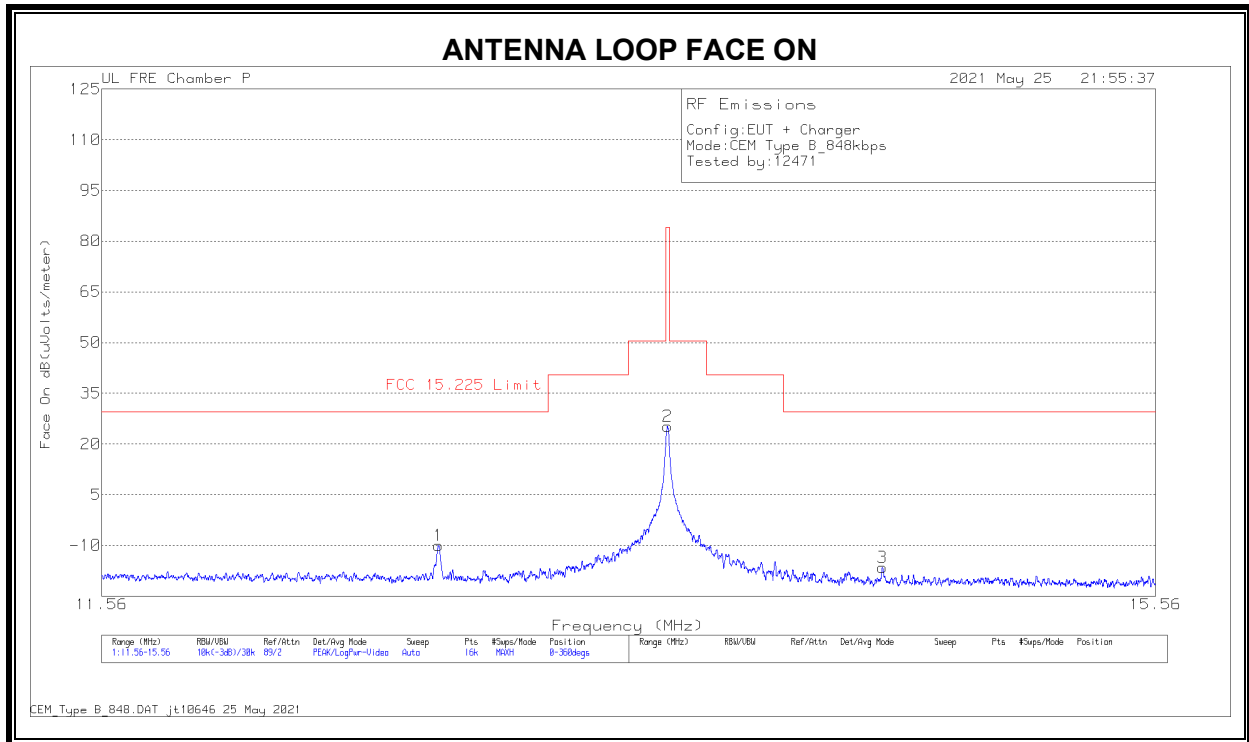
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
2	.87053	32.77	Pk	11.4	.1	-40	4.27	28.82	-24.55	0-360	Face On
5	.68752	35.03	Pk	11.3	.1	-40	6.43	30.87	-24.44	0-360	Face Off

Pk - Peak detector

Note: Marker 3 and 6 are Fundamental signals.

8.2.3. CE MODE, Type B 848 Kbps

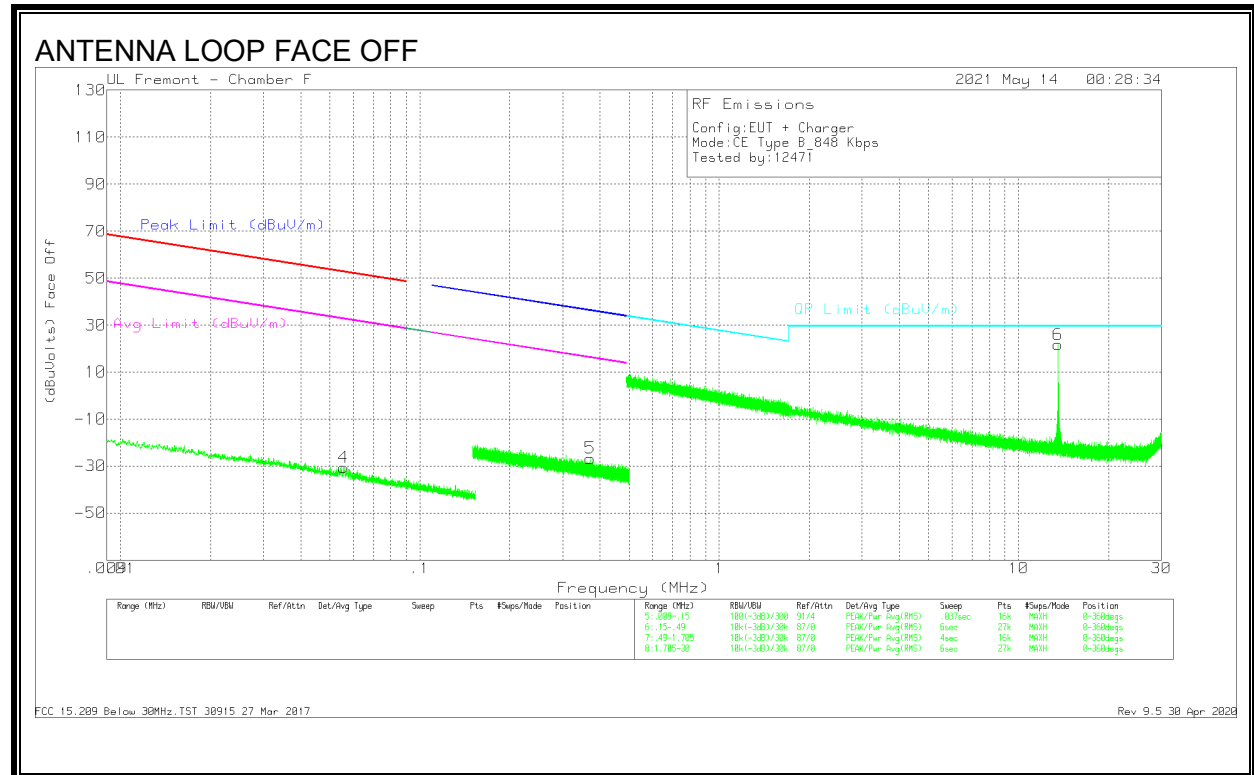
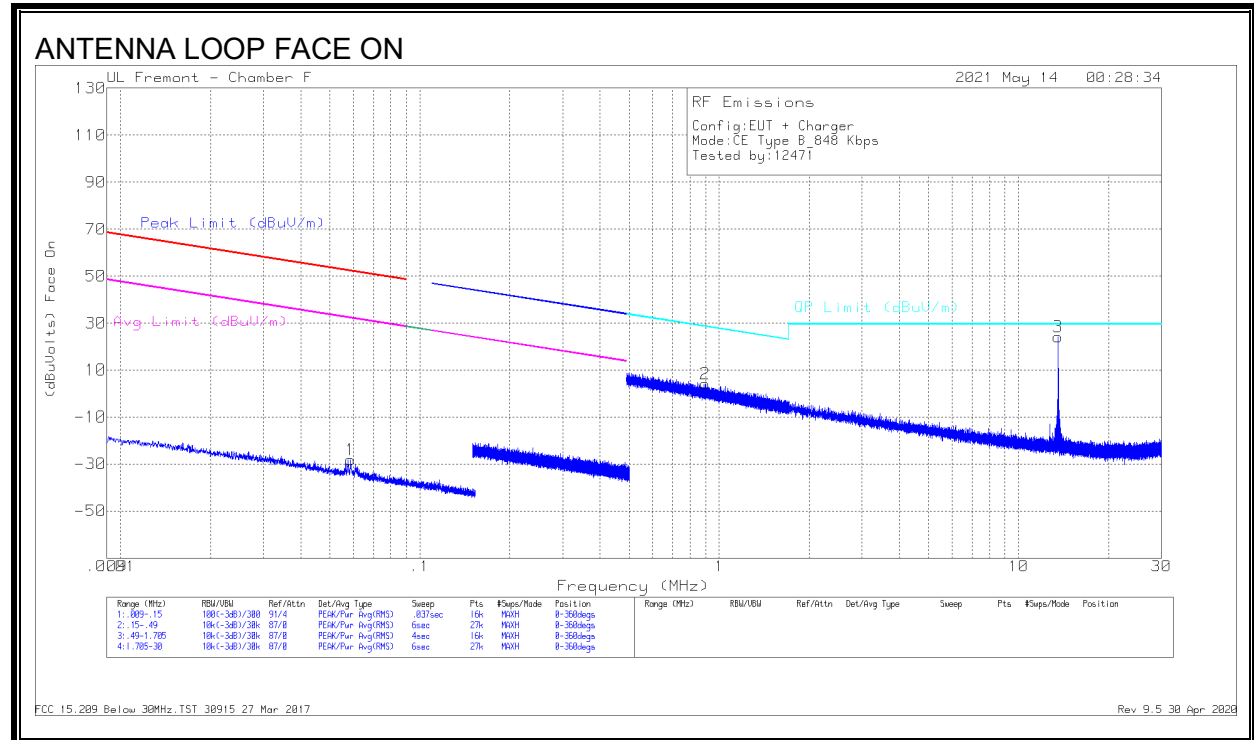
FUNDAMENTAL



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Polarity
1	12.71238	18.98	Pk	10.5	.5	-40	-10.02	29.54	-39.56	0-360	Face On
2	13.5595	54.36	Pk	10.4	.5	-40	25.26	84	-58.74	0-360	Face On
3	14.40663	12.65	Pk	10.4	.5	-40	-16.45	29.54	-45.99	0-360	Face On
4	12.7125	18.06	Pk	10.5	.5	-40	-10.94	29.54	-40.48	0-360	Face Off
5	13.5595	51.87	Pk	10.4	.5	-40	22.77	84	-61.23	0-360	Face Off
6	14.40388	11.2	Pk	10.4	.5	-40	-17.9	29.54	-47.44	0-360	Face Off

Pk - Peak detector



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	.05861	39.71	Pk	12.2	0	-80	-28.09	52.23	-80.32	32.23	-60.32	0-360	Face On
4	.05563	37.24	Pk	12.3	0	-80	-30.46	52.68	-83.14	32.68	-63.14	0-360	Face Off
5	.37069	42.3	Pk	10.9	.1	-80	-26.7	36.23	-62.93	16.23	-42.93	0-360	Face Off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
2	.89956	33.1	Pk	10.8	.1	-40	4	28.54	-24.54	0-360	Face On

Pk - Peak detector

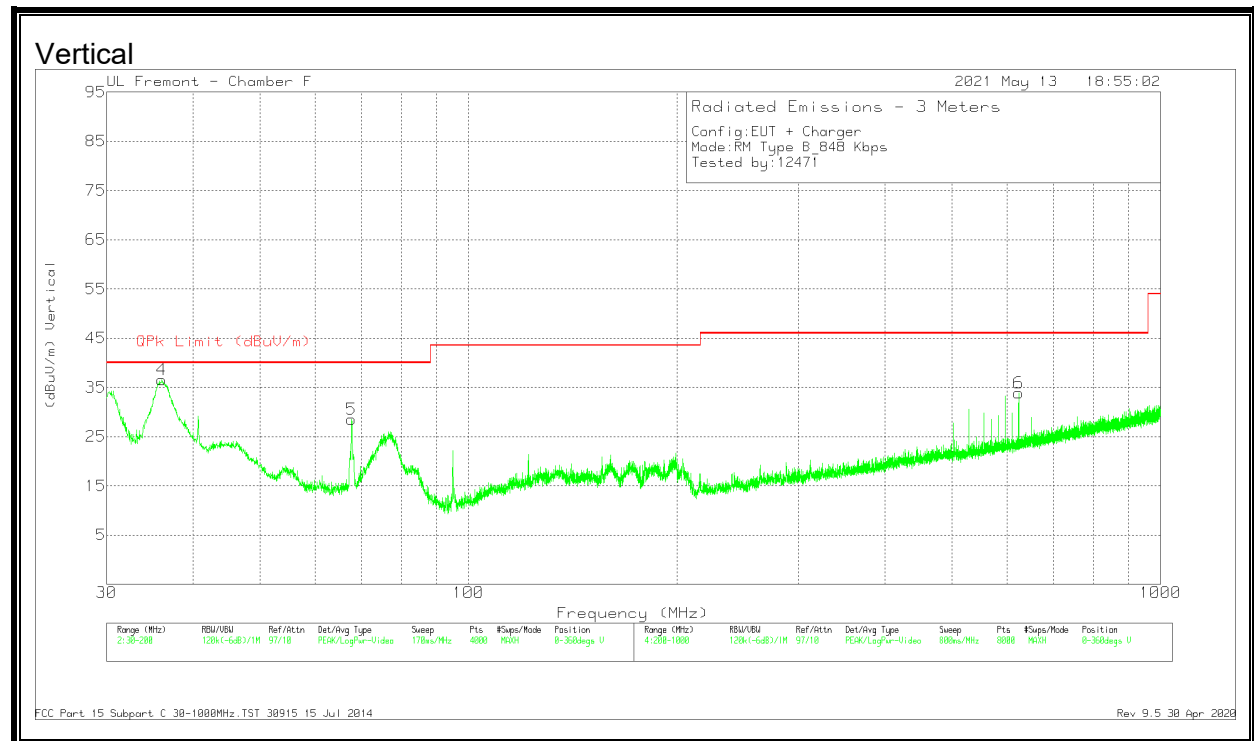
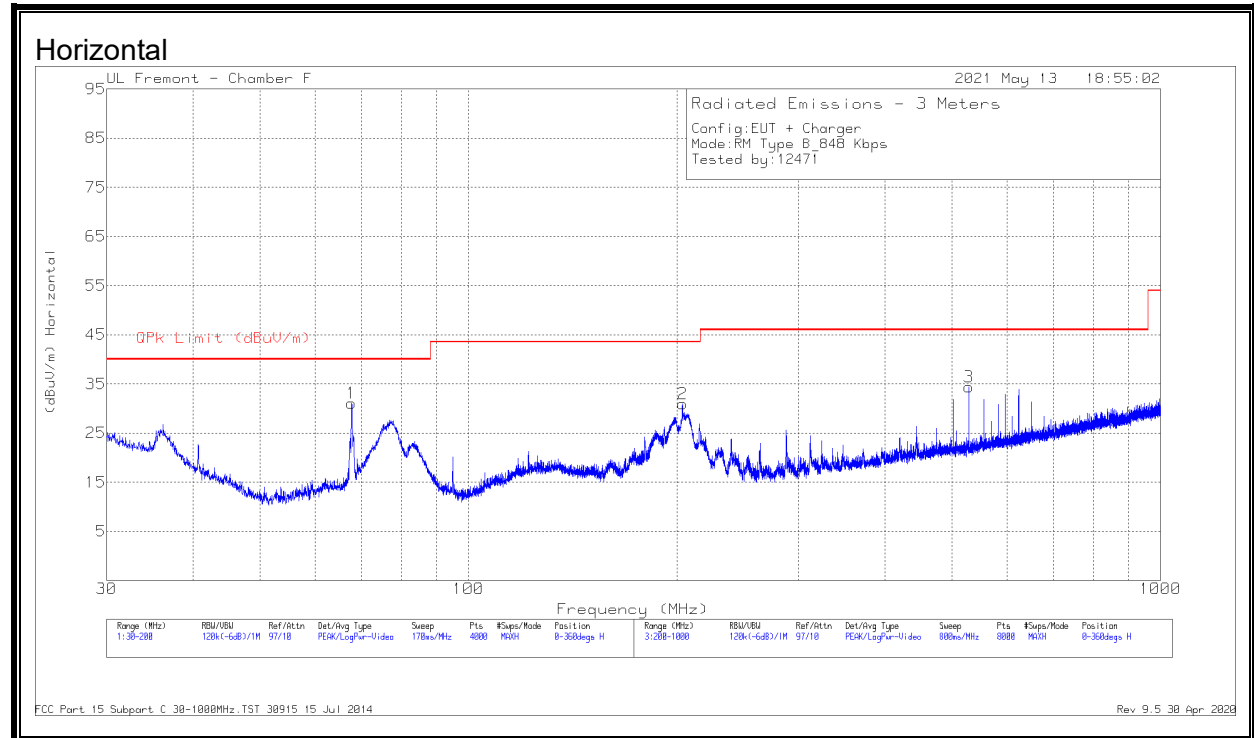
Qp - Quasi-Peak detector

Note: Marker 3 and 6 are from Fundamental signals

8.3. PRIMARY ANTENNA TX SPURIOUS EMISSION 30-1000 MHz

8.3.1. READER MODE, Type B 848 Kbps

SPURIOUS EMISSION



DATA

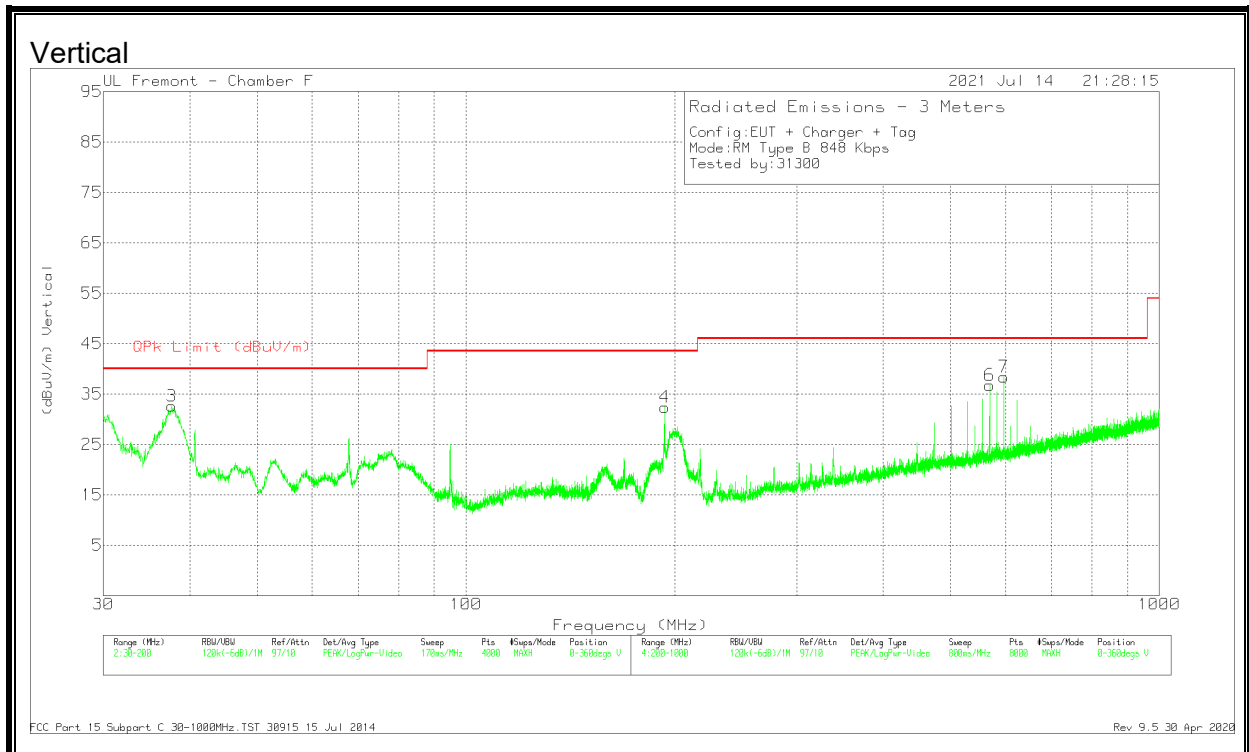
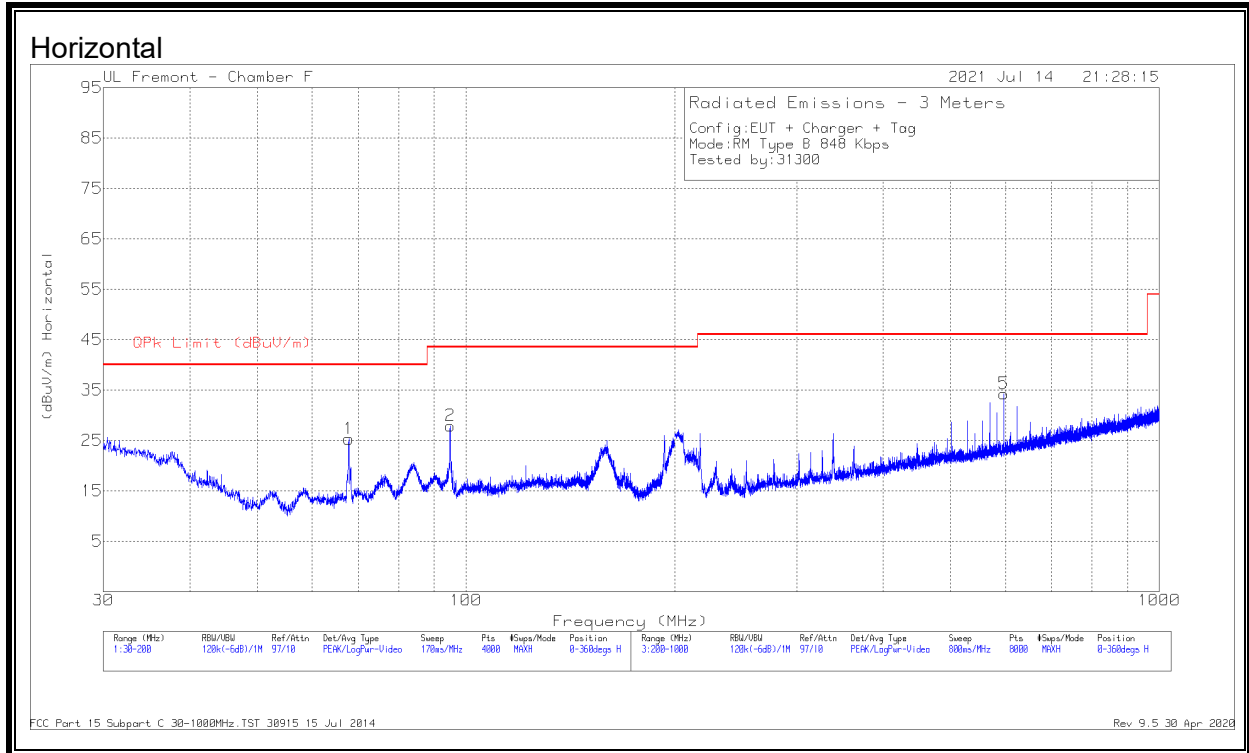
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T900 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	67.7923	48.41	Pk	14.2	-31.5	31.11	40	-8.89	0-360	201	H
2	203.8005	43.43	Pk	17.9	-30.4	30.93	43.52	-12.59	0-360	200	H
3	528.8427	39.53	Pk	23.7	-28.9	34.33	46.02	-11.69	0-360	200	H
4	36.4986	38.33	Qp	23.5	-31.8	30.03	40	-9.97	275	108	V
5	67.7923	45.77	Pk	14.2	-31.5	28.47	40	-11.53	0-360	100	V
6	623.7551	37.22	Pk	25.1	-28.5	33.82	46.02	-12.2	0-360	99	V

Pk - Peak detector

Qp - Quasi-Peak detector

8.3.2. TAG MODE, Type B 848 Kbps

SPURIOUS EMISSION



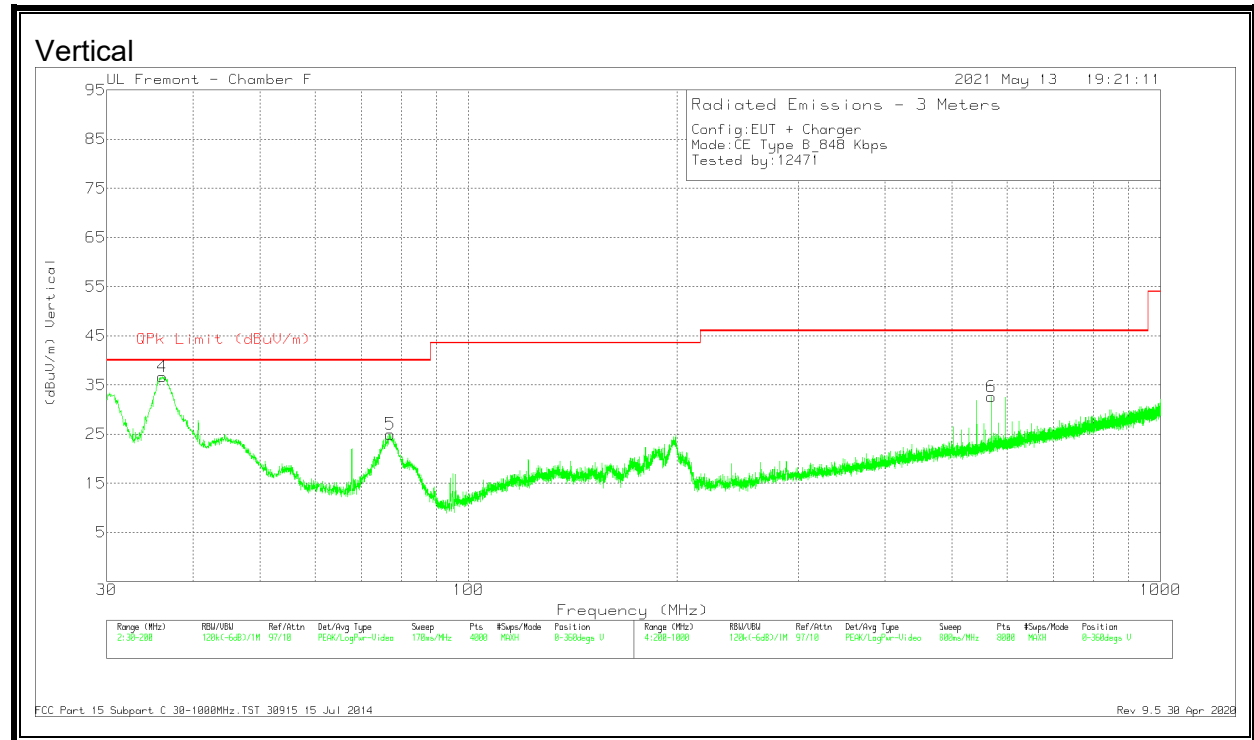
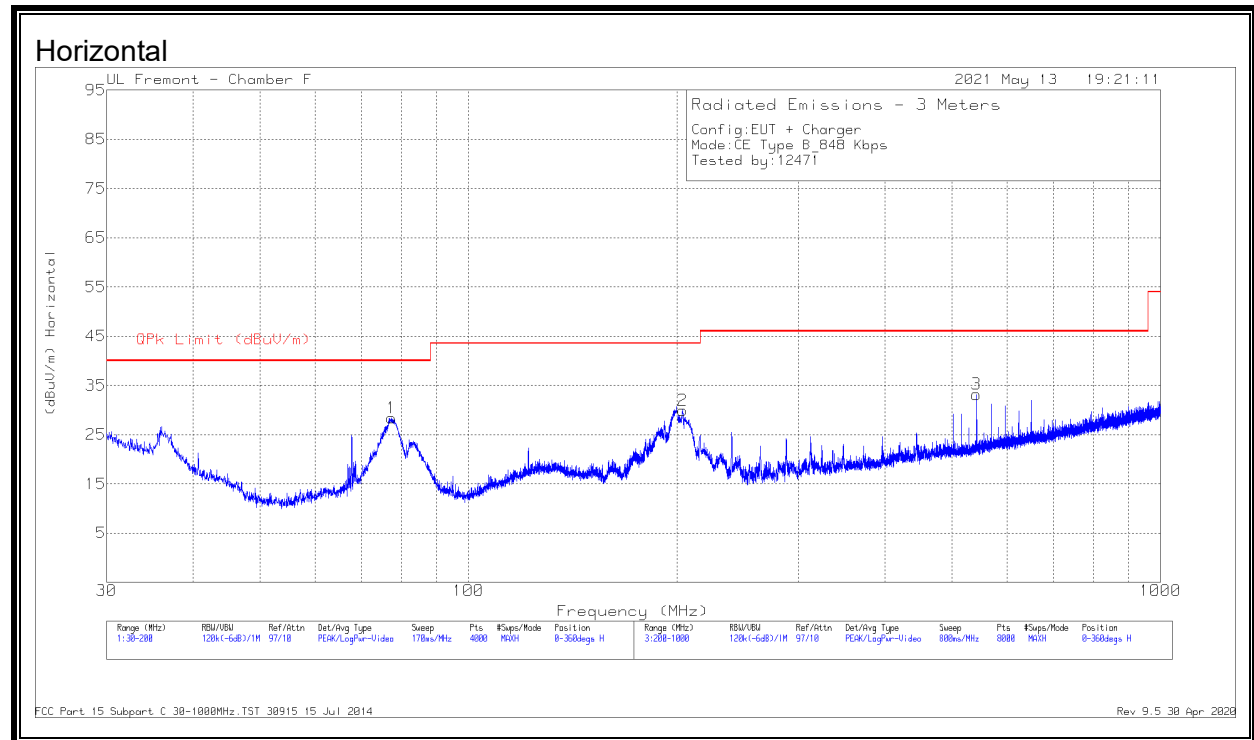
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T900 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	67.7923	42.62	Pk	14.2	-31.5	25.32	40	-14.68	0-360	301	H
2	94.9143	44.82	Pk	14.3	-31.2	27.92	43.52	-15.6	0-360	301	H
3	* 37.652	41.79	Pk	22.6	-31.8	32.59	40	-7.41	0-360	100	V
4	193.5398	45.39	Pk	17.4	-30.4	32.39	43.52	-11.13	0-360	100	V
5	596.6516	38.28	Pk	24.7	-28.7	34.28	46.02	-11.74	0-360	301	H
6	569.548	41.04	Pk	24.4	-28.7	36.74	46.02	-9.28	0-360	99	V
7	596.6516	42.38	Pk	24.7	-28.7	38.38	46.02	-7.64	0-360	99	V

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

Pk - Peak detector

8.3.3. CE MODE, Type B 848 Kbps



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T900 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	77.4423	46.04	Pk	13.8	-31.4	28.44	40	-11.56	0-360	201	H
2	203.8005	42.41	Pk	17.9	-30.4	29.91	43.52	-13.61	0-360	99	H
3	542.4445	37.97	Pk	24	-28.8	33.17	46.02	-12.85	0-360	201	H
4	36.1911	41.33	Qp	23.7	-31.8	33.23	40	-6.77	286	104	V
5	77.0597	42.61	Pk	13.8	-31.4	25.01	40	-14.99	0-360	100	V
6	569.548	36.92	Pk	24.4	-28.7	32.62	46.02	-13.4	0-360	99	V

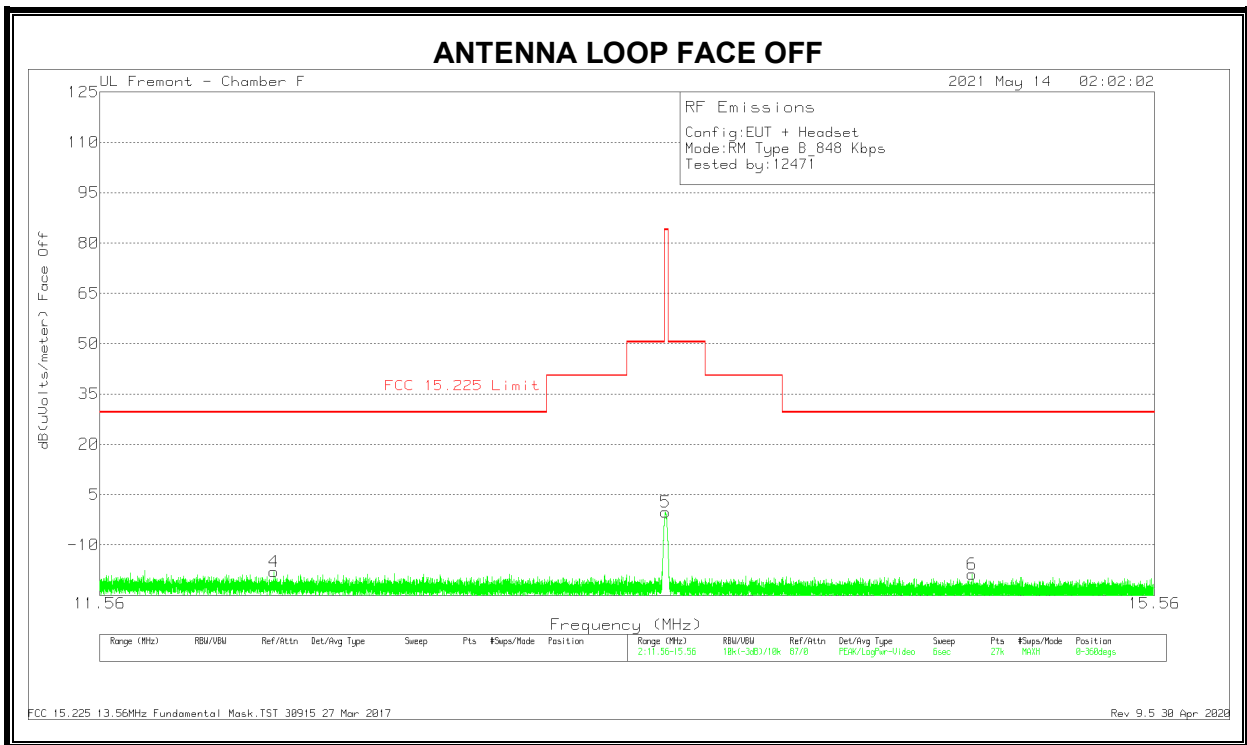
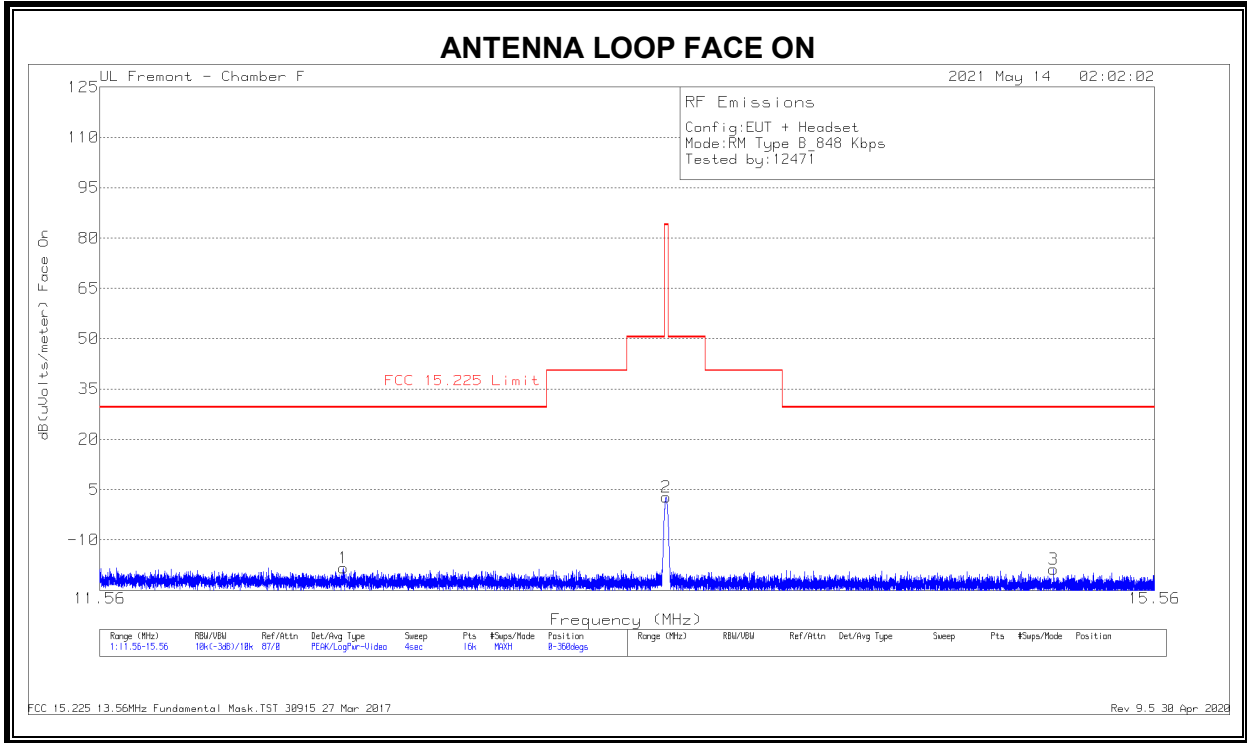
Pk - Peak detector

Qp - Quasi-Peak detector

8.4. SECONDARY ANTENNA FUNDAMENTAL & SPURIOUS EMISSION 0.15-30 MHz

8.4.1. READER MODE, Type B 848 Kbps

FUNDAMENTAL

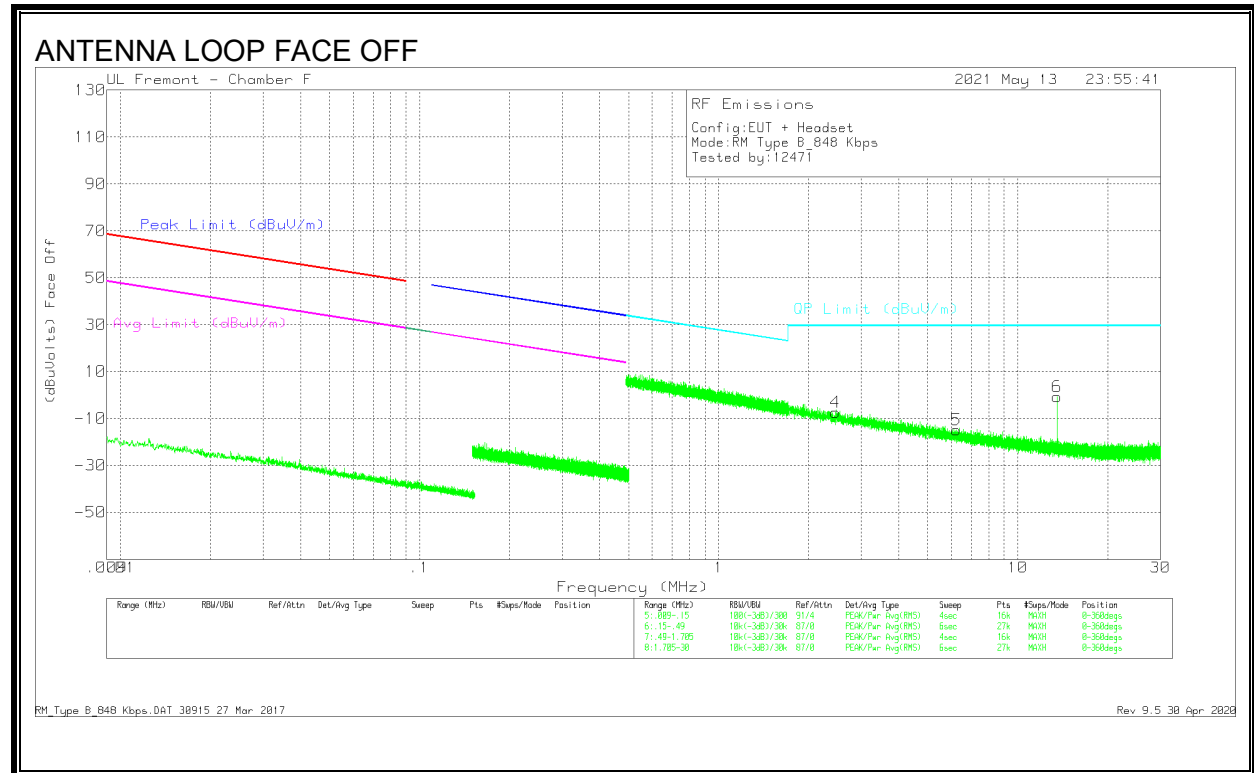
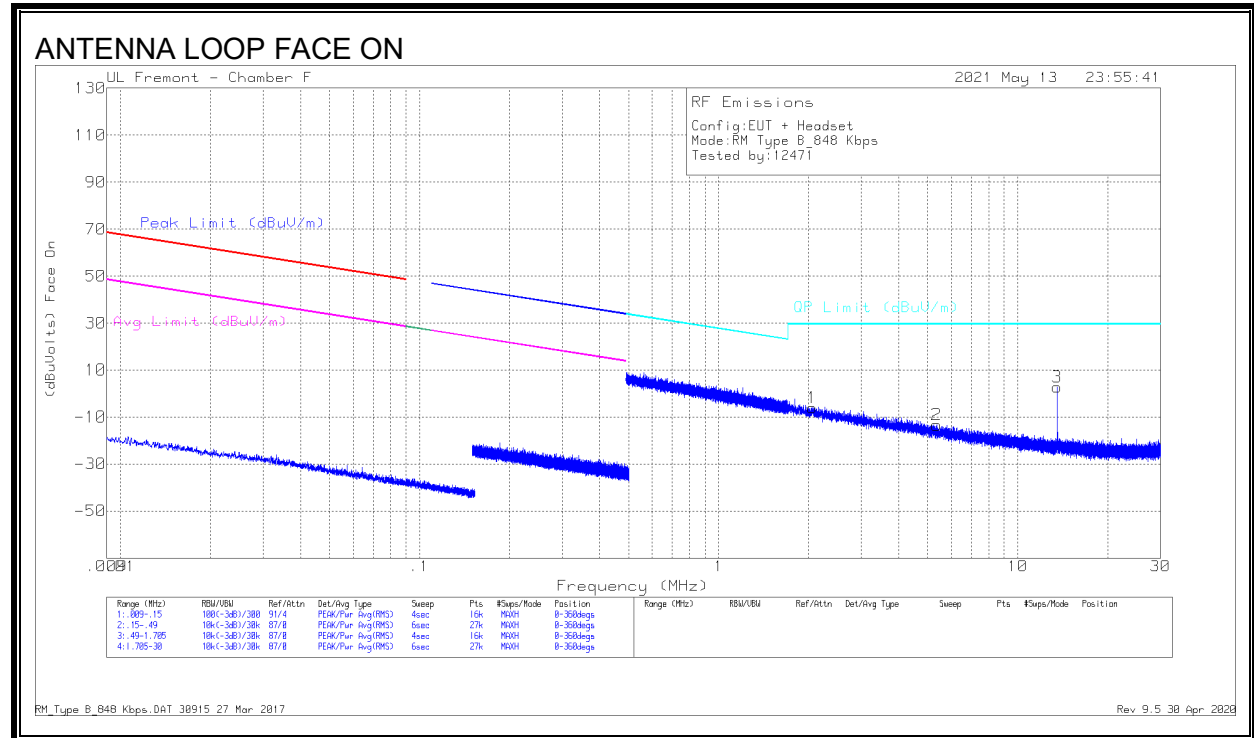


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Polarity
1	12.38075	10.84	Pk	10.4	.4	-40	-18.36	29.54	-47.9	0-360	Face On
2	13.55975	32.08	Pk	10.3	.4	-40	2.78	84	-81.22	0-360	Face On
3	15.12375	10.62	Pk	10.2	.4	-40	-18.78	29.54	-48.32	0-360	Face On
4	12.14075	11.27	Pk	10.4	.4	-40	-17.93	29.54	-47.47	0-360	Face Off
5	13.55815	29.05	Pk	10.3	.4	-40	-.25	84	-84.25	0-360	Face Off
6	14.78063	10.75	Pk	10.2	.4	-40	-18.65	29.54	-48.19	0-360	Face Off

Pk - Peak detector

SPURIOUS EMISSION



DATA

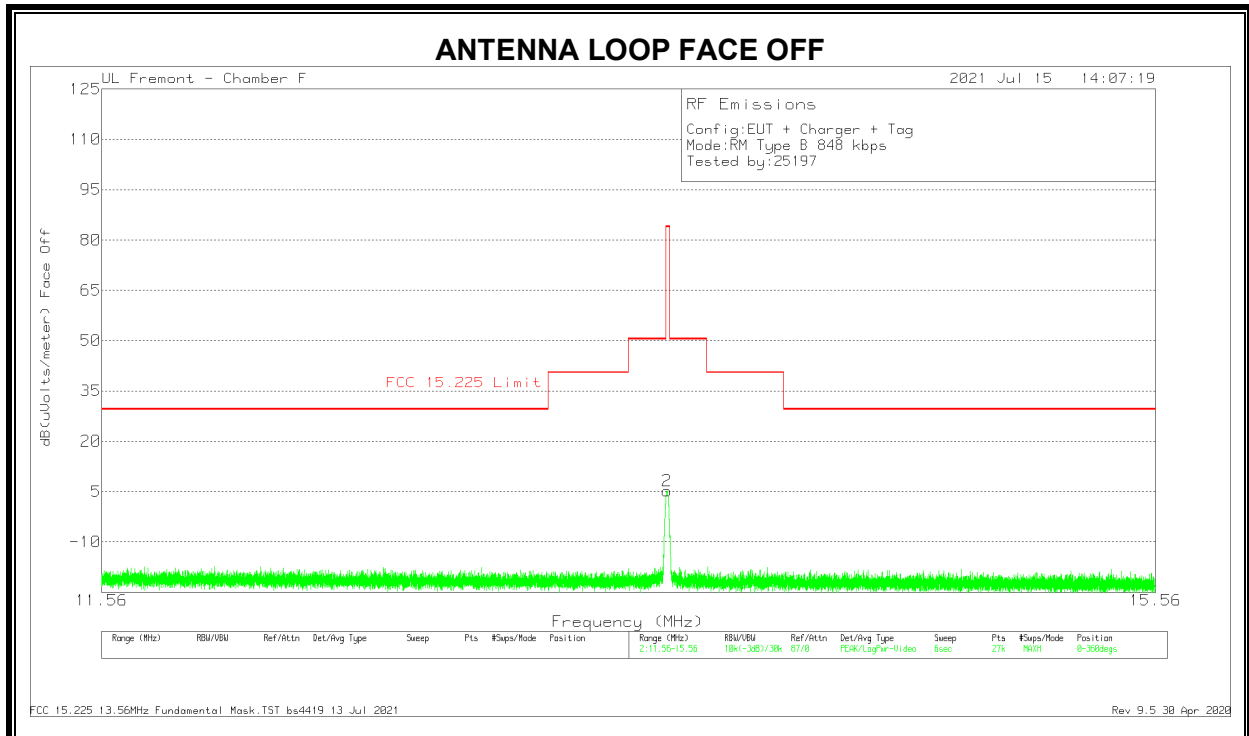
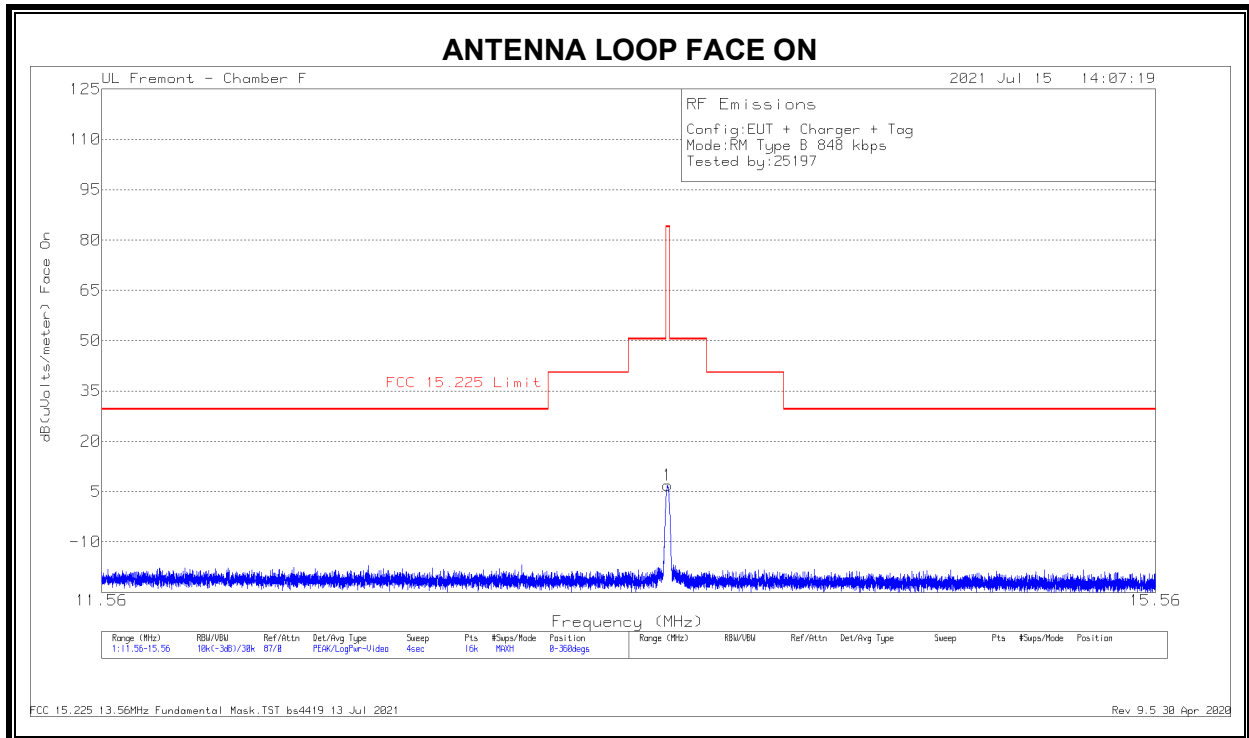
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	2.05189	23.1	Pk	10.8	.2	-40	-5.9	29.5	-35.4	0-360	Face On
2	5.35414	15.45	Pk	10.9	.3	-40	-13.35	29.5	-42.85	0-360	Face On
4	2.46061	21.65	Pk	10.8	.2	-40	-7.35	29.5	-36.85	0-360	Face Off
5	6.2397	14.18	Pk	10.8	.3	-40	-14.72	29.5	-44.22	0-360	Face Off

Pk - Peak detector

Note: Marker 3 and 6 are from Fundamental signals

8.4.2. TAG MODE, Type B 848 Kbps

FUNDAMENTAL

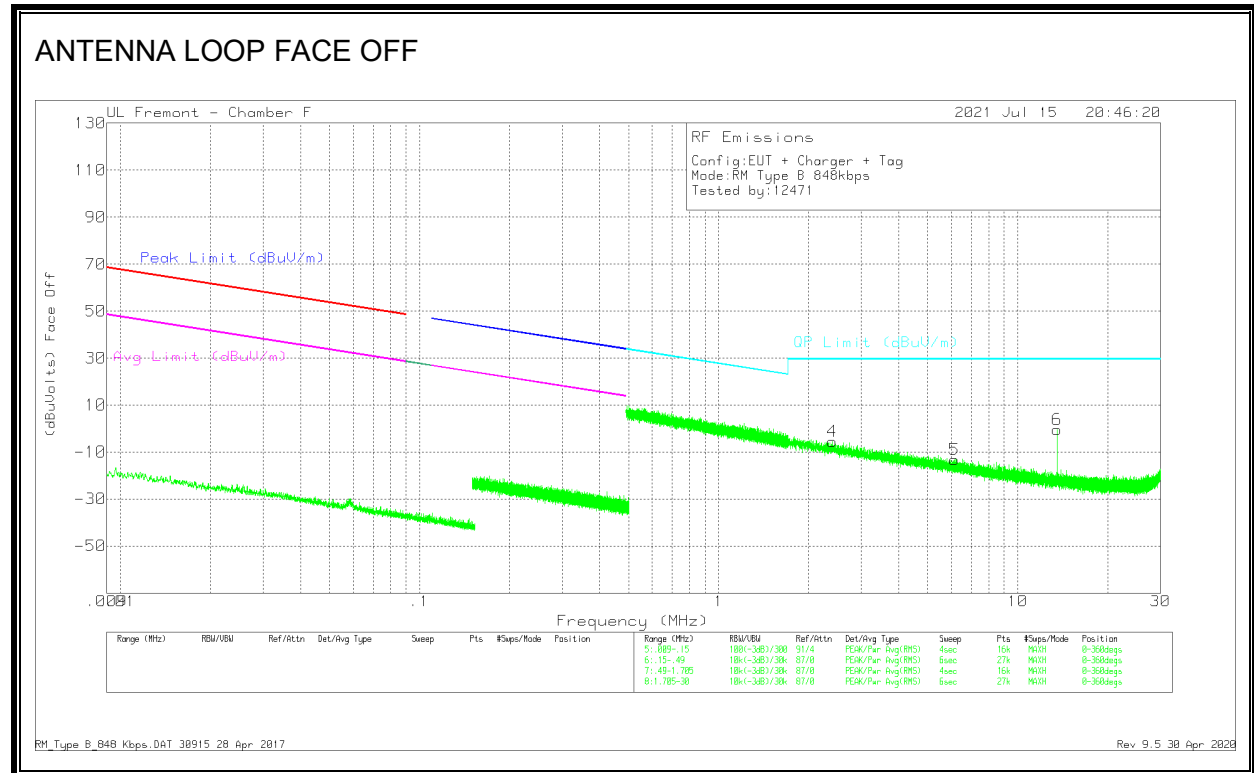
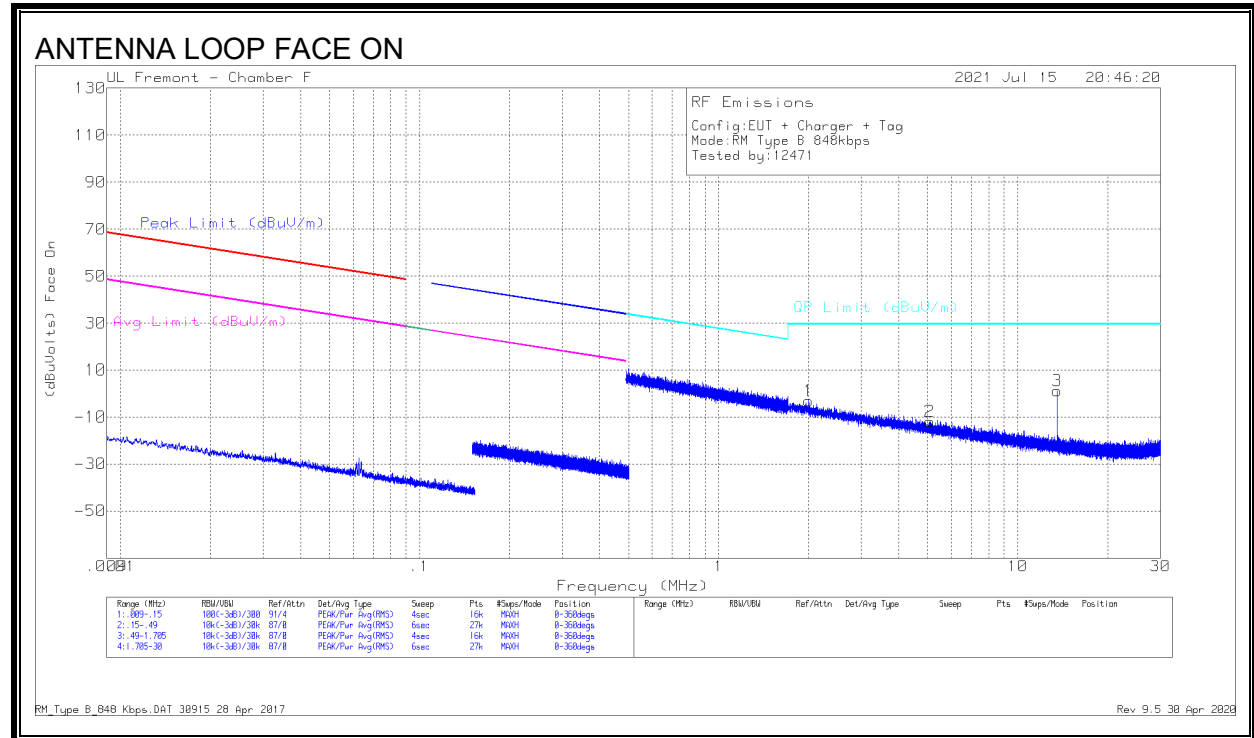


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Polarity
1	13.55975	35.73	Pk	10.7	.4	-40	6.83	84	-77.17	0-360	Face On
2	13.55889	34.15	Pk	10.7	.4	-40	5.25	84	-78.75	0-360	Face Off

Pk - Peak detector

SPURIOUS EMISSION



DATA

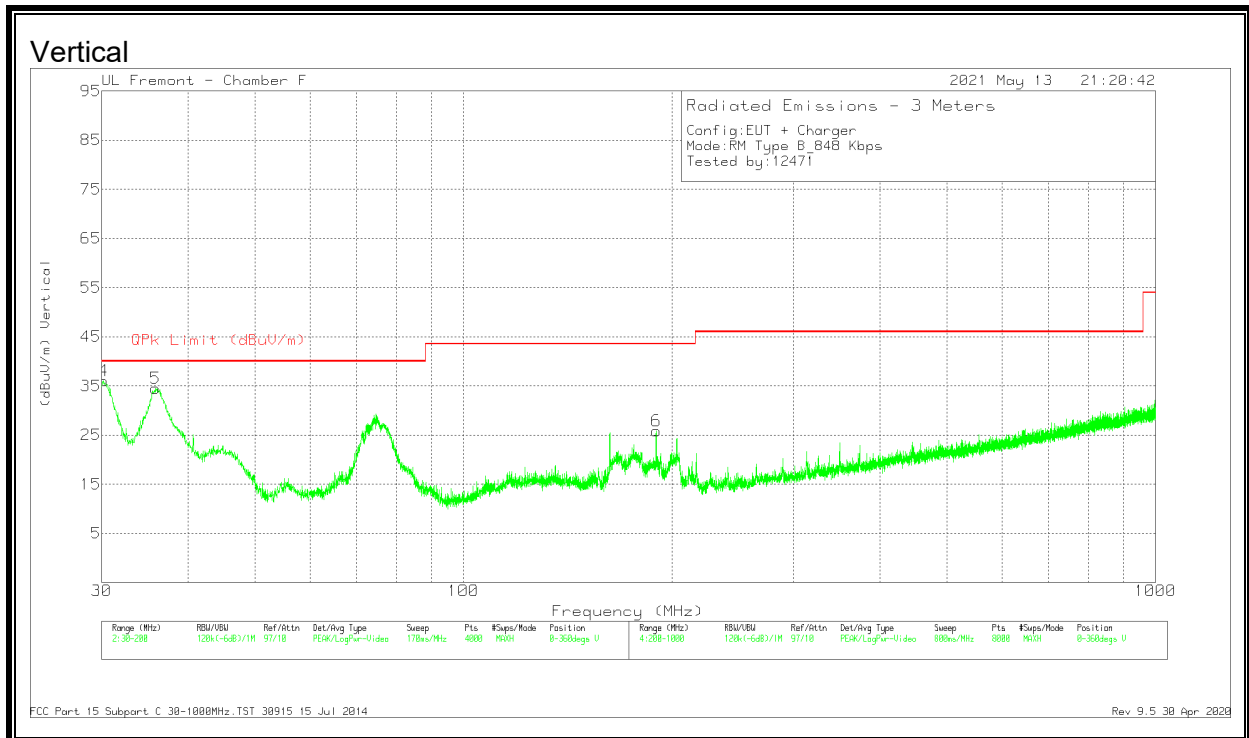
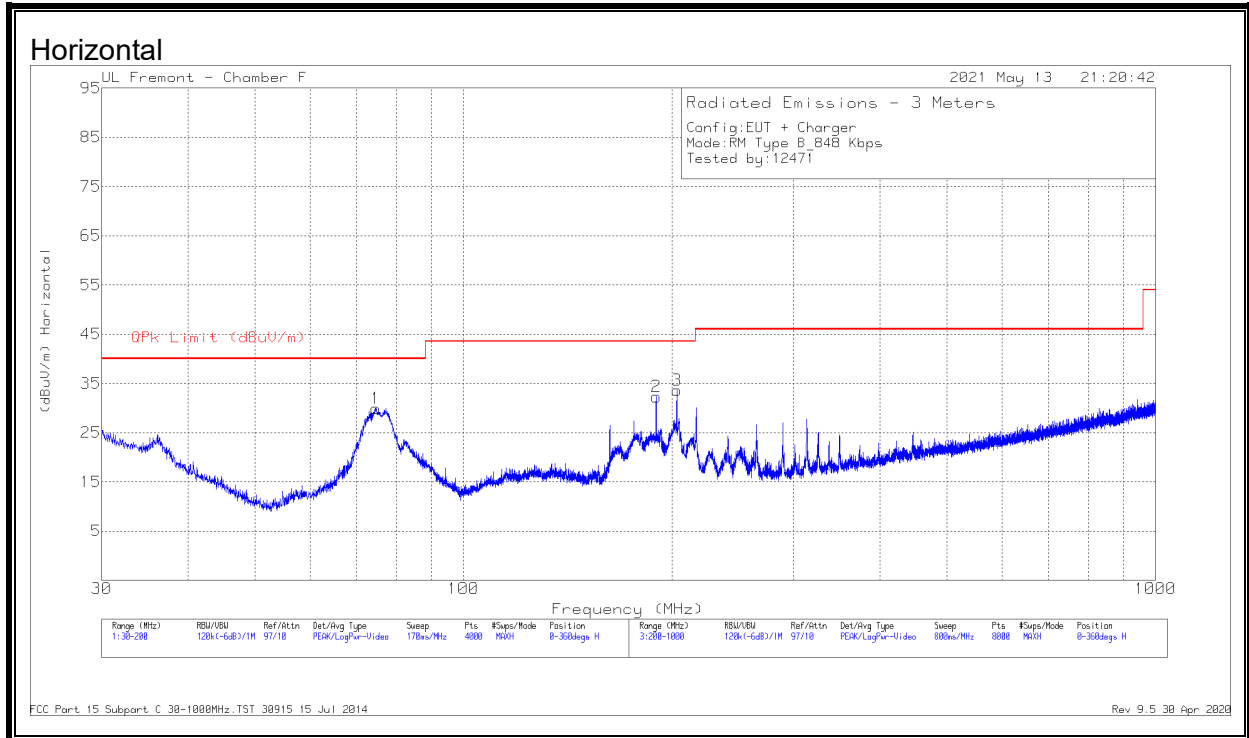
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	1.99634	25.05	Pk	11.7	.2	-40	-3.05	29.5	-32.55	0-360	Face On
2	5.07746	16.33	Pk	11.6	.2	-40	-11.87	29.5	-41.37	0-360	Face On
4	2.39878	22.54	Pk	11.7	.2	-40	-5.56	29.5	-35.06	0-360	Face Off
5	6.14538	15.06	Pk	11.4	.3	-40	-13.24	29.5	-42.74	0-360	Face Off

Pk - Peak detector

Note: Marker 3 and 6 are from Fundamental signals

8.5. SECONDARY ANTENNA TX SPURIOUS EMISSION 30-1000 MHz

8.5.1. READER MODE, Type B 848 Kbps



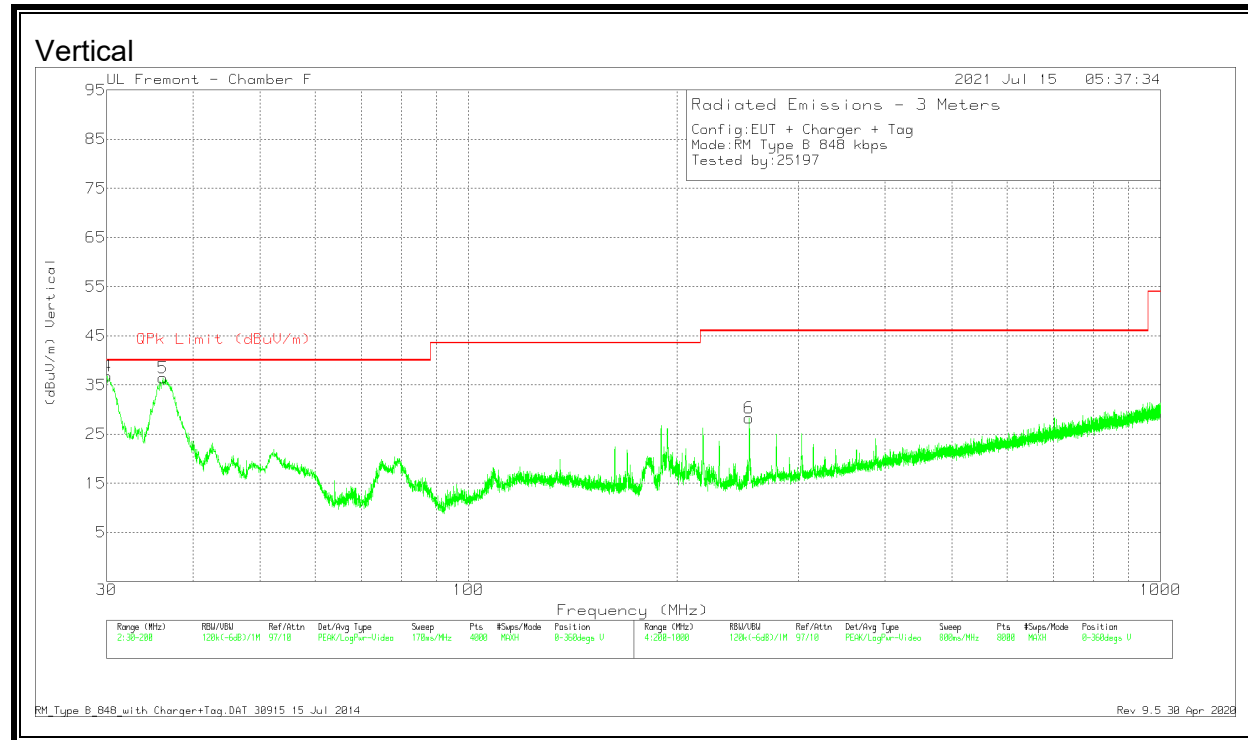
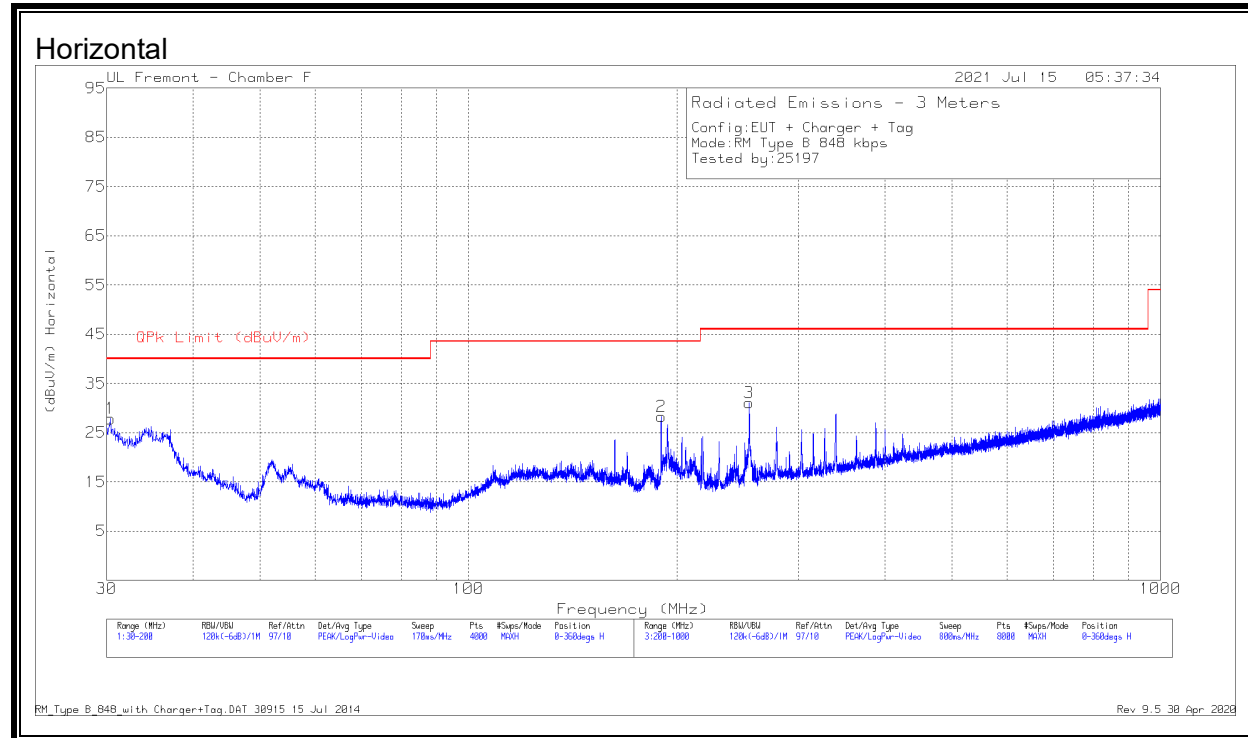
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T900 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	74.7641	47.34	Pk	14	-31.4	29.94	40	-10.06	0-360	300	H
2	189.8414	45.78	Pk	17.1	-30.6	32.28	43.52	-11.24	0-360	201	H
3	203.4004	45.92	Pk	18.1	-30.4	33.62	43.52	-9.9	0-360	201	H
4	30.24	35.98	Qp	27.9	-31.9	31.98	40	-8.02	275	109	V
5	36.045	39.04	Qp	23.9	-31.8	31.14	40	-8.86	283	104	V
6	189.8414	39.32	Pk	17.1	-30.6	25.82	43.52	-17.7	0-360	100	V

Pk - Peak detector

Qp - Quasi-Peak detector

8.5.2. TAG MODE, Type B 848 Kbps



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T900 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.3401	31.82	Pk	27.9	-31.9	27.82	40	-12.18	0-360	201	H
2	189.8414	41.76	Pk	17.1	-30.6	28.26	43.52	-15.26	0-360	99	H
3	* 254.3071	43.48	Pk	17.7	-30.1	31.08	46.02	-14.94	0-360	100	H
4	30	35.74	Qp	28.1	-31.9	31.94	40	-8.06	247	105	V
5	36.0861	39.33	Qp	23.8	-31.8	31.33	40	-8.67	292	100	V
6	* 254.6071	40.65	Pk	17.7	-30.1	28.25	46.02	-17.77	0-360	99	V

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

Pk - Peak detector

Qp - Quasi-Peak detector

9. FREQUENCY STABILITY

LIMIT

§15.225 (e) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency, over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

IC RSS-210, Annex B.6

Carrier frequency stability shall be maintained to $\pm 0.01\%$ (± 100 ppm).

TEST PROCEDURE

ANSI C63.10-2013 Clause 6.8

RESULTS

No non-compliance noted.

ID:	31300	Date:	05/08/2021
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9.1. PRIMARY ANTENNA

9.1.1. READER MODE, Type B 848 Kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20°C										
Limit: ± 100 ppm = 1.35600 KHz										
Power Supply	Envir. Temp	Frequency Deviation Measured with Time Elapse								
(VAC)	(°C)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	13.55989609	-2.339	13.55989695	-2.404	13.5598976	-2.451	13.55989866	-2.529	± 100
	40	13.55986305	0.097	13.55986527	-0.067	13.55986547	-0.081	13.5598657	-0.098	± 100
	30	13.55985814	0.459	13.55985788	0.478	13.55985784	0.481	13.55985787	0.479	± 100
	20	13.55986436	0.000	13.55986443	-0.005	13.55986444	-0.006	13.55986453	-0.012	± 100
	10	13.55987629	-0.880	13.55987649	-0.894	13.55987665	-0.906	13.55987679	-0.917	± 100
	0	13.55990733	-3.169	13.55990765	-3.192	13.55990793	-3.213	13.55990825	-3.237	± 100
	-10	13.55993417	-5.148	13.55993565	-5.257	13.55993622	-5.300	13.55993694	-5.352	± 100
	-20	13.55997432	-8.109	13.55996677	-7.552	13.55997527	-8.179	13.55997801	-8.381	± 100
3.23	20	13.55986354	0.061	13.5598633	0.078	13.55986322	0.084	13.55986309	0.094	± 100
4.37	20	13.5598656	-0.091	13.55986578	-0.104	13.55986583	-0.108	13.55985887	0.405	± 100

9.1.2. CE MODE, Type B 848 Kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20°C										
Limit: ± 100 ppm = 1.35600 KHz										
Power Supply	Envir. Temp	Frequency Deviation Measured with Time Elapse								
(VAC)	(°C)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	13.55989591	-2.331	13.55989662	-2.383	13.55989744	-2.444	13.55989831	-2.508	± 100
	40	13.559863	0.096	13.55986514	-0.062	13.55986609	-0.132	13.55986614	-0.136	± 100
	30	13.55985798	0.466	13.55985768	0.489	13.55985758	0.496	13.55985774	0.484	± 100
	20	13.5598643	0.000	13.55986432	-0.002	13.55986441	-0.008	13.55986454	-0.017	± 100
	10	13.55987389	-0.707	13.55987654	-0.902	13.55987678	-0.920	13.55987683	-0.924	± 100
	0	13.55990689	-3.141	13.5599071	-3.156	13.55990795	-3.219	13.55990813	-3.232	± 100
	-10	13.55993398	-5.139	13.55993481	-5.200	13.55993601	-5.289	13.55993696	-5.358	± 100
	-20	13.55997238	-7.970	13.55996896	-7.718	13.55997764	-8.358	13.55998123	-8.623	± 100
3.23	20	13.55986338	0.068	13.55986302	0.094	13.55986312	0.087	13.55986402	0.021	± 100
4.37	20	13.55986553	-0.090	13.55986569	-0.102	13.55986583	-0.113	13.55985891	0.398	± 100

9.2. SECONDARY ANTENNA

9.2.1. READER MODE, Type B 848 Kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20°C										
Limit: ± 100 ppm = 1.35600 KHz										
Power Supply	Envir. Temp	Frequency Deviation Measured with Time Elapse								
(VAC)	(°C)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	13.55993933	0.171	13.55993945	0.162	13.55994028	0.101	13.55994196	-0.023	± 100
	40	13.55994356	-0.141	13.55993976	0.140	13.55993952	0.157	13.55994001	0.121	± 100
	30	13.55994206	-0.030	13.55994046	0.088	13.5599399	0.129	13.55994273	-0.080	± 100
	20	13.55994165	0.000	13.55994161	0.003	13.55994014	0.112	13.55994055	0.081	± 100
	10	13.55997009	-2.097	13.55995096	-0.687	13.55995133	-0.714	13.55995155	-0.730	± 100
	0	13.5599634	-1.604	13.5599629	-1.567	13.55996587	-1.786	13.55996631	-1.818	± 100
	-10	13.55997988	-2.819	13.55998052	-2.866	13.55998136	-2.928	13.55998038	-2.856	± 100
	-20	13.55999868	-4.206	13.55999886	-4.219	13.55999983	-4.290	13.56000153	-4.416	± 100
3.23	20	13.55996617	-1.808	13.55995027	-0.636	13.5599471	-0.402	13.55994654	-0.360	± 100
4.37	20	13.55994475	-0.228	13.55994548	-0.283	13.55994512	-0.255	13.55942717	37.941	± 100

10. AC MAINS LINE CONDUCTED EMISSIONS**LIMITS**

§15.207

IC RSS-GEN, Section 8.8

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Notes:
 1. The lower limit shall apply at the transition frequencies
 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

TEST PROCEDURE

ANSI C63.10:2013

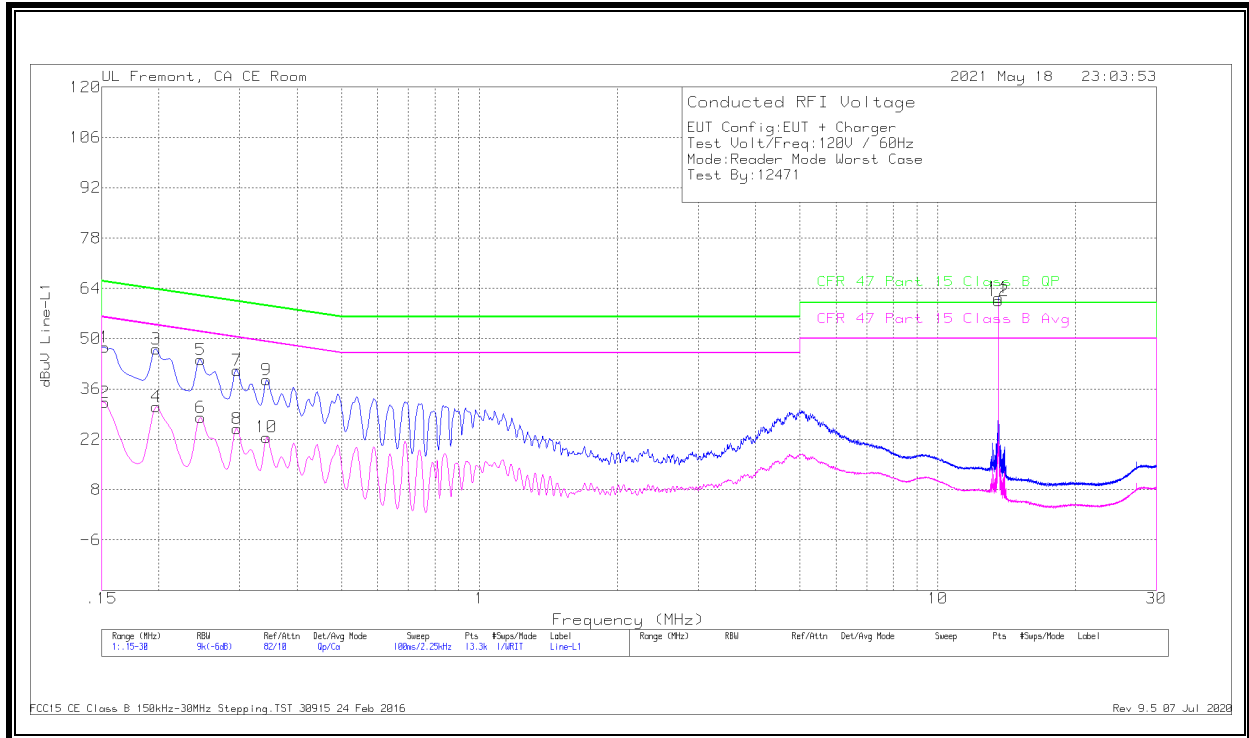
RESULTS

No non-compliance noted:

10.1. PRIMARY ANTENNA

10.1.1. READER MODE, Type B 848 Kbps, with Antenna

LINE 1 RESULTS



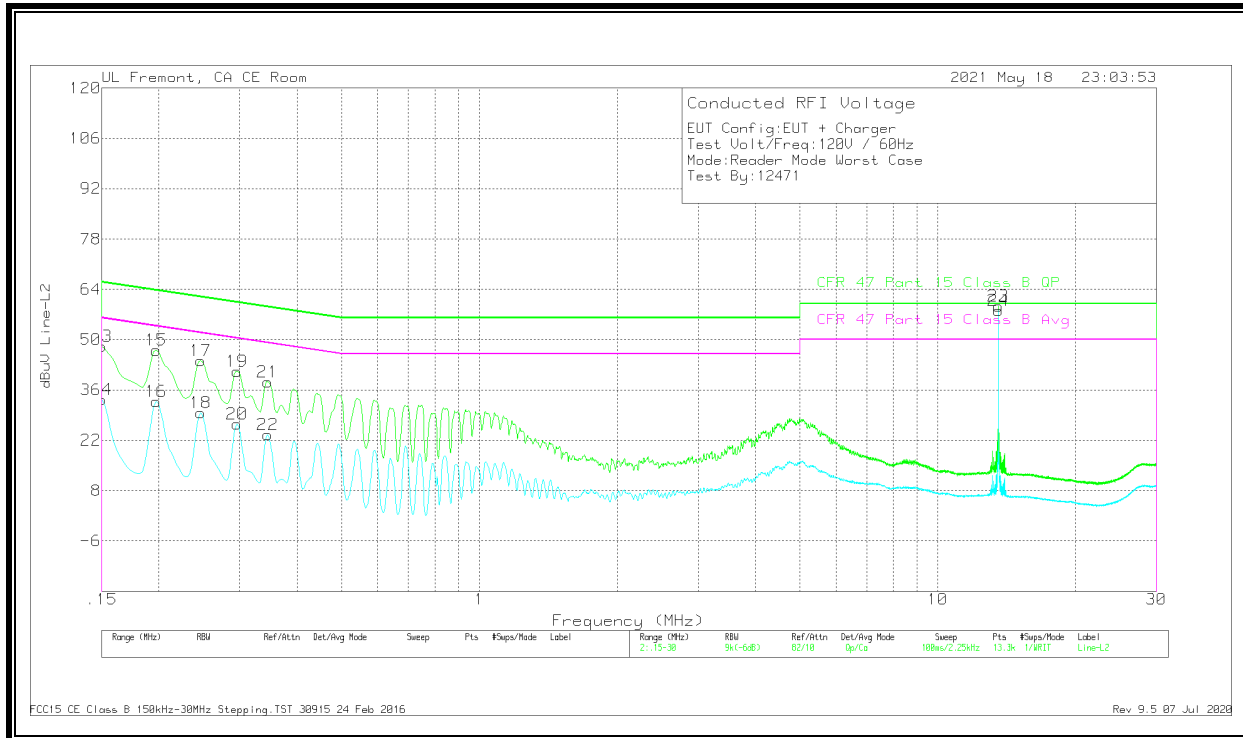
Worst Emission

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.15225	37.42	Qp	.1	0	10.1	47.62	65.88	-18.26	-	-
2	.15225	22.13	Ca	.1	0	10.1	32.33	-	-	55.88	-23.55
3	.19725	37.06	Qp	0	0	10.1	47.16	63.73	-16.57	-	-
4	.19725	20.97	Ca	0	0	10.1	31.07	-	-	53.73	-22.66
5	.24675	34.03	Qp	0	0	10.1	44.13	61.87	-17.74	-	-
6	.24675	17.97	Ca	0	0	10.1	28.07	-	-	51.87	-23.8
7	.29625	31.12	Qp	0	0	10.1	41.22	60.35	-19.13	-	-
8	.29625	14.93	Ca	0	0	10.1	25.03	-	-	50.35	-25.32
9	.3435	28.49	Qp	0	0	10.1	38.59	59.12	-20.53	-	-
10	.3435	12.5	Ca	0	0	10.1	22.6	-	-	49.12	-26.52
11	13.56	50.9	Qp	.1	.2	10.2	61.4	60	1.4	-	-
12	13.56	50	Ca	.1	.2	10.2	60.5	-	-	50	10.5

Qp - Quasi-Peak detector
 Ca - CISPR average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicate that when the antenna terminal is terminated the fundamental amplitude is lowering below the limit line.

LINE 2 RESULTS



Worst Emission

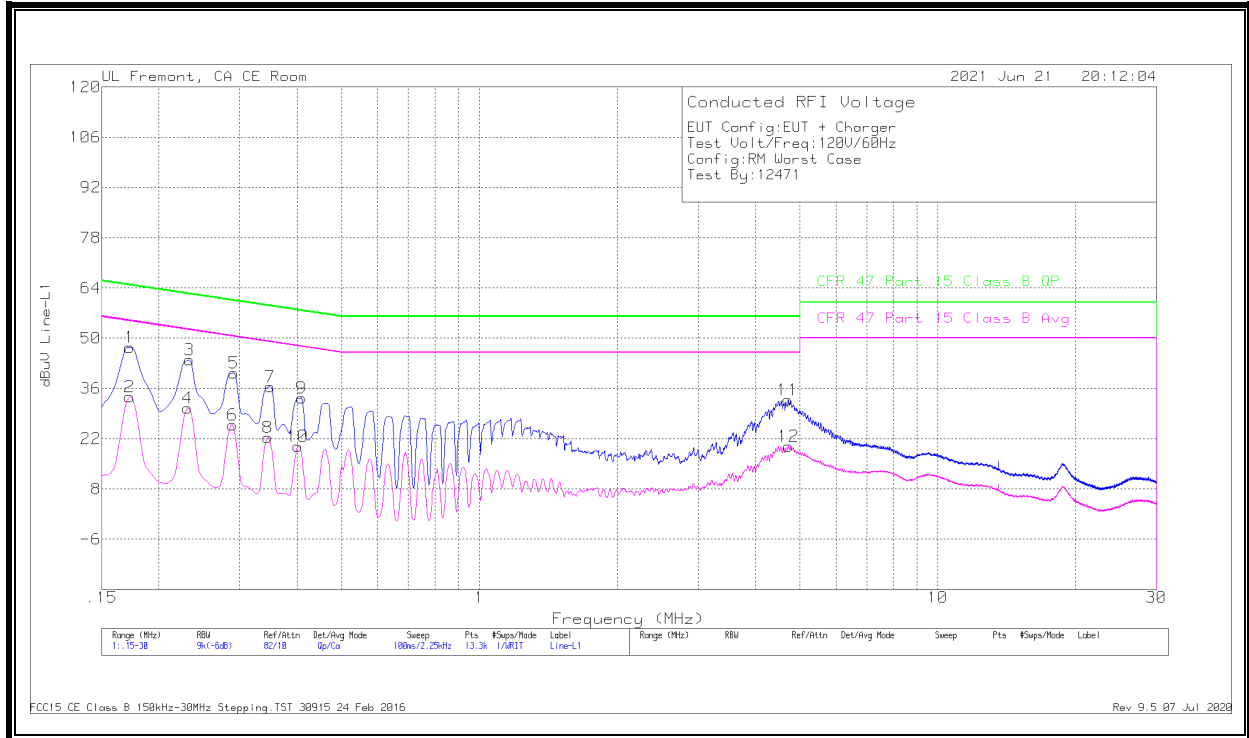
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
13	.15	37.97	Qp	.1	0	10.1	48.17	66	-17.83	-	-
14	.15	23.19	Ca	.1	0	10.1	33.39	-	-	56	-22.61
15	.19725	36.93	Qp	0	0	10.1	47.03	63.73	-16.7	-	-
16	.19725	22.68	Ca	0	0	10.1	32.78	-	-	53.73	-20.95
17	.24675	33.98	Qp	0	0	10.1	44.08	61.87	-17.79	-	-
18	.24675	19.63	Ca	0	0	10.1	29.73	-	-	51.87	-22.14
19	.29625	31.12	Qp	0	0	10.1	41.22	60.35	-19.13	-	-
20	.29625	16.5	Ca	0	0	10.1	26.6	-	-	50.35	-23.75
21	.34575	28.1	Qp	0	0	10.1	38.2	59.06	-20.86	-	-
22	.34575	13.51	Ca	0	0	10.1	23.61	-	-	49.06	-25.45
23	13.56	48.78	Qp	.1	.2	10.2	59.28	60	-.72	-	-
24	13.56	47.62	Ca	.1	.2	10.2	58.12	-	-	50	8.12

Qp - Quasi-Peak detector
 Ca - CISPR average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicates that when the antenna terminal is terminated the fundamental amplitude is lowering below the limit line.

10.1.2. READER MODE, Type B 848 Kbps, Antenna Port Terminated

LINE 1 RESULTS

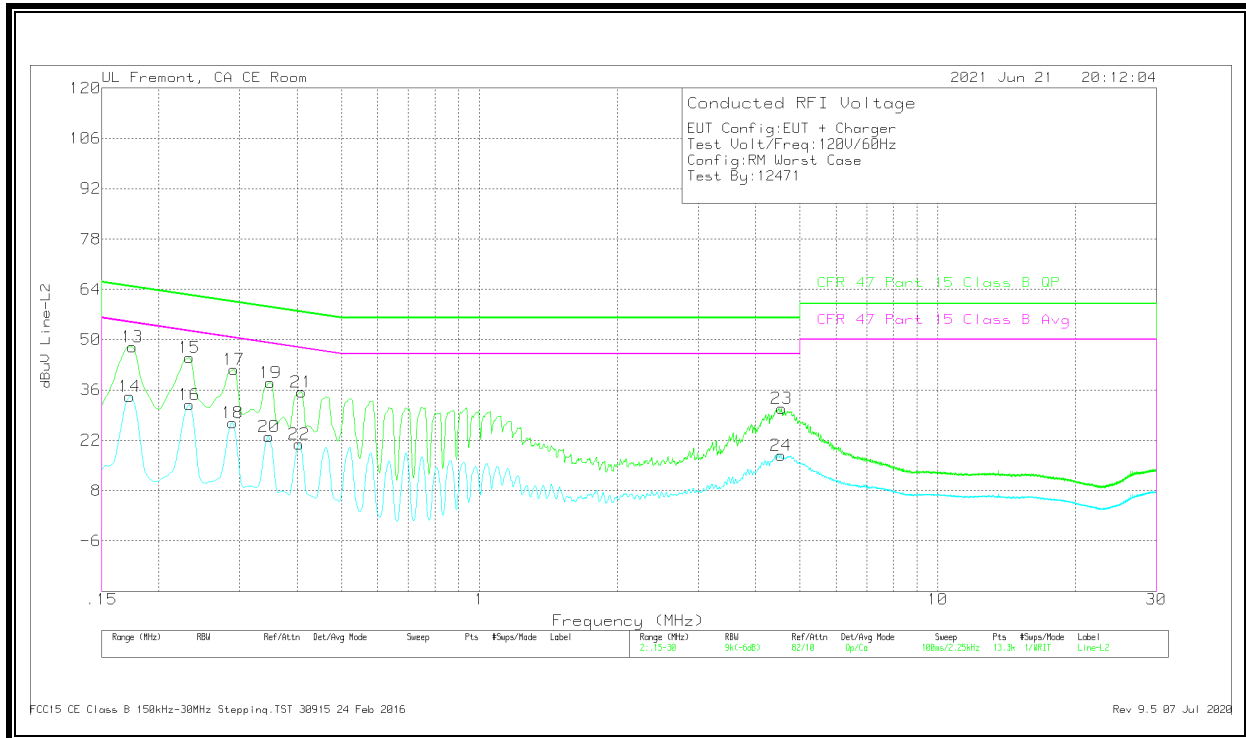


Worst Emission

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	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	.1725	38.06	Qp	0	0	9.4	47.46	64.84	-17.38	-	-
2	.1725	24.3	Ca	0	0	9.4	33.7	-	-	54.84	-21.14
3	.23325	34.62	Qp	0	0	9.3	43.92	62.33	-18.41	-	-
4	.231	21.22	Ca	0	0	9.3	30.52	-	-	52.41	-21.89
5	.29175	31.05	Qp	0	0	9.3	40.35	60.47	-20.12	-	-
6	.2895	16.49	Ca	0	0	9.3	25.79	-	-	50.54	-24.75
7	.35025	27.23	Qp	0	0	9.3	36.53	58.96	-22.43	-	-
8	.34575	13.11	Ca	0	0	9.3	22.41	-	-	49.06	-26.65
9	.40875	24.04	Qp	0	0	9.3	33.34	57.67	-24.33	-	-
10	.402	10.63	Ca	0	0	9.3	19.93	-	-	47.81	-27.88
11	4.7175	23.46	Qp	0	.1	9.3	32.86	56	-23.14	-	-
12	4.71975	10.56	Ca	0	.1	9.3	19.96	-	-	46	-26.04

Qp - Quasi-Peak detector
 Ca - CISPR average detection

LINE 2 RESULTS



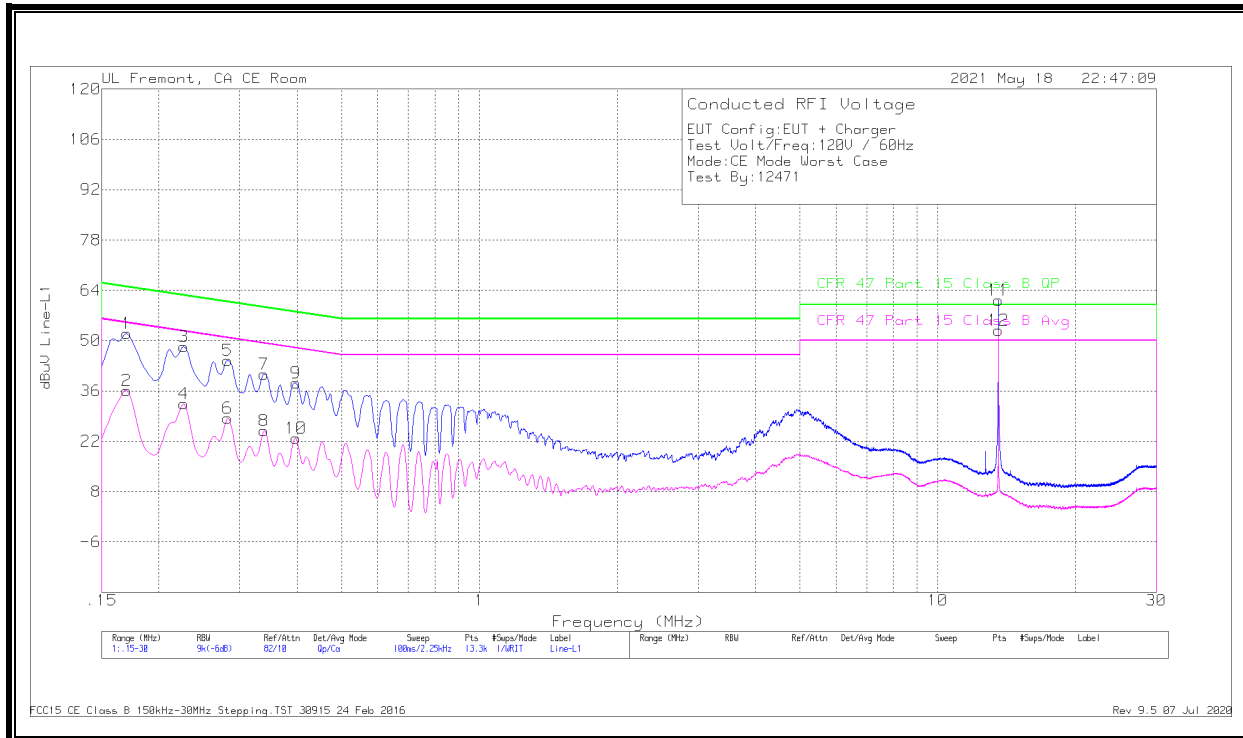
Worst Emission

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	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	.17475	38.64	Qp	0	0	9.4	48.04	64.73	-16.69	-	-
14	.1725	24.76	Ca	0	0	9.4	34.16	-	-	54.84	-20.68
15	.23325	35.73	Qp	0	0	9.3	45.03	62.33	-17.3	-	-
16	.23325	22.56	Ca	0	0	9.3	31.86	-	-	52.33	-20.47
17	.29175	32.45	Qp	0	0	9.3	41.75	60.47	-18.72	-	-
18	.2895	17.56	Ca	0	0	9.3	26.86	-	-	50.54	-23.68
19	.35025	28.8	Qp	0	0	9.3	38.1	58.96	-20.86	-	-
20	.348	13.67	Ca	0	0	9.3	22.97	-	-	49.01	-26.04
21	.40875	26.12	Qp	0	0	9.3	35.42	57.67	-22.25	-	-
22	.40425	11.58	Ca	0	0	9.3	20.88	-	-	47.77	-26.89
23	4.56225	21.44	Qp	0	.1	9.3	30.84	56	-25.16	-	-
24	4.5465	8.44	Ca	0	.1	9.3	17.84	-	-	46	-28.16

Qp - Quasi-Peak detector
 Ca - CISPR average detection

10.1.3. CE MODE, Type B 848 Kbps, with Antenna

LINE 1 RESULTS



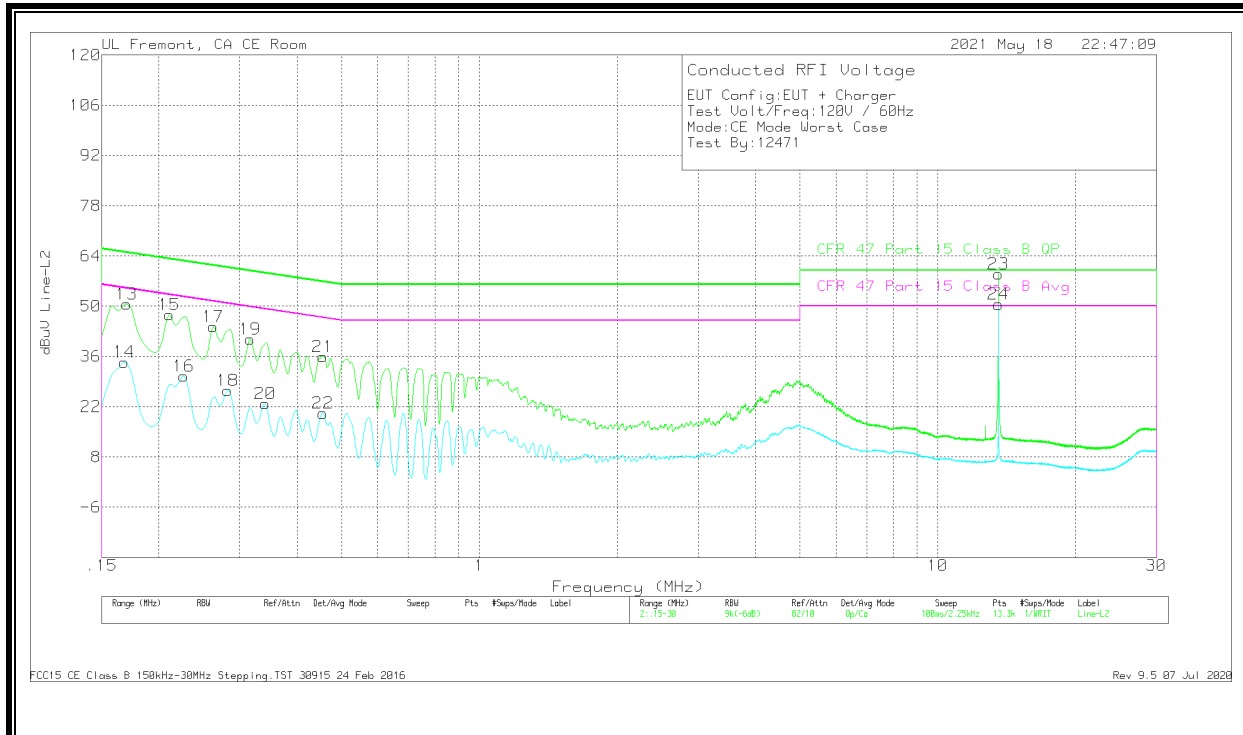
Worst Emission

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBUV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	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	.17025	41.82	Qp	0	0	10.1	51.92	64.95	-13.03	-	-
2	.17025	25.96	Ca	0	0	10.1	36.06	-	-	54.95	-18.89
3	.2265	38.19	Qp	0	0	10.1	48.29	62.58	-14.29	-	-
4	.2265	22.32	Ca	0	0	10.1	32.42	-	-	52.58	-20.16
5	.28275	34.43	Qp	0	0	10.1	44.53	60.73	-16.2	-	-
6	.28275	18.32	Ca	0	0	10.1	28.42	-	-	50.73	-22.31
7	.339	30.56	Qp	0	0	10.1	40.66	59.23	-18.57	-	-
8	.339	14.8	Ca	0	0	10.1	24.9	-	-	49.23	-24.33
9	.3975	28.15	Qp	0	0	10.1	38.25	57.91	-19.66	-	-
10	.3975	12.8	Ca	0	0	10.1	22.9	-	-	47.91	-25.01
11	13.56	50.7	Qp	.1	.2	10.2	61.2	60	1.2	-	-
12	13.56	42.37	Ca	.1	.2	10.2	52.87	-	-	50	2.87

Qp - Quasi-Peak detector
 Ca - CISPR average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicates that when the antenna terminal is terminated the fundamental amplitude is lowering below the limit line.

LINE 2 RESULTS



Worst Emission

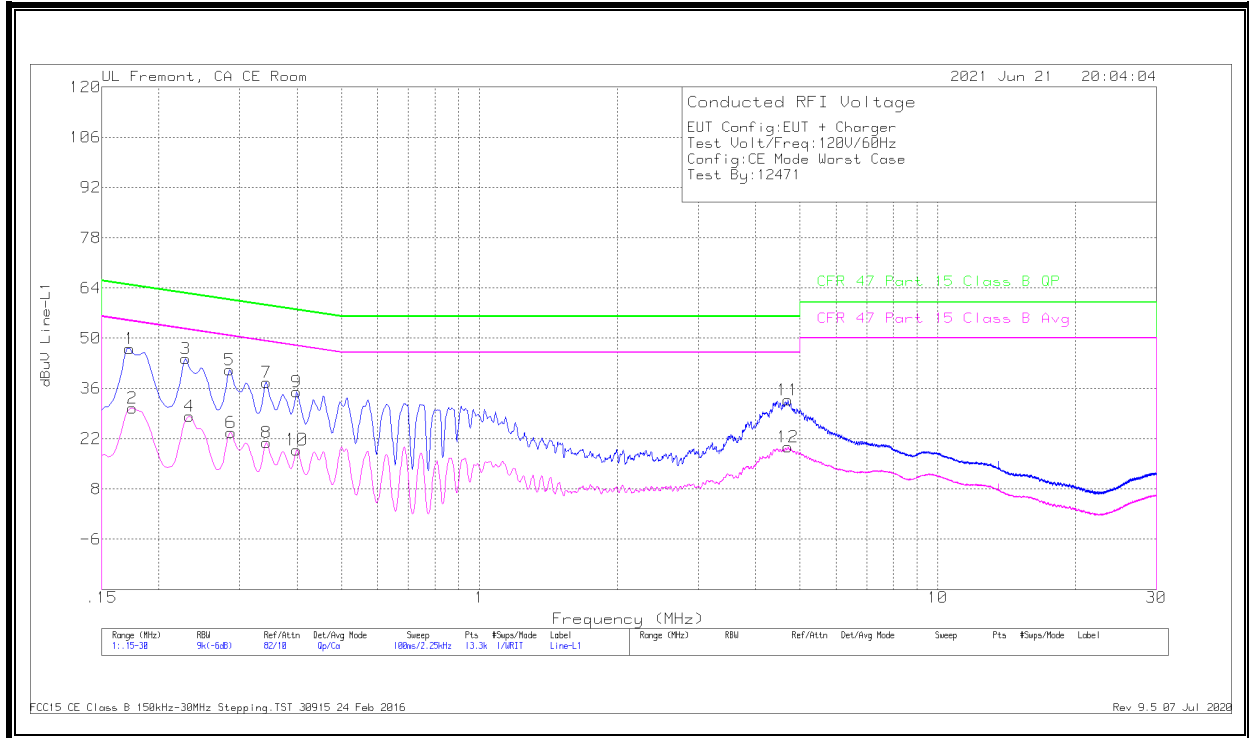
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.17025	40.5	Qp	0	0	10.1	50.6	64.95	-14.35	-	-
14	.168	24.36	Ca	0	0	10.1	34.46	-	-	55.06	-20.6
15	.21075	37.51	Qp	0	0	10.1	47.61	63.18	-15.57	-	-
16	.2265	20.43	Ca	0	0	10.1	30.53	-	-	52.58	-22.05
17	.2625	34.19	Qp	0	0	10.1	44.29	61.35	-17.06	-	-
18	.28275	16.41	Ca	0	0	10.1	26.51	-	-	50.73	-24.22
19	.3165	30.67	Qp	0	0	10.1	40.77	59.8	-19.03	-	-
20	.34125	12.77	Ca	0	0	10.1	22.87	-	-	49.17	-26.3
21	.456	25.91	Qp	0	0	10.1	36.01	56.77	-20.76	-	-
22	.456	10.06	Ca	0	0	10.1	20.16	-	-	46.77	-26.61
23	13.56	48.47	Qp	.1	.2	10.2	58.97	60	-1.03	-	-
24	13.56	40.02	Ca	.1	.2	10.2	50.52	-	-	50	.52

Qp - Quasi-Peak detector
Ca - CISPR average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicates that when the antenna terminal is terminated the fundamental amplitude is lowering below the limit line.

10.1.4. CE MODE, Type B 848 Kbps, Antenna Port Terminated

LINE 1 RESULTS



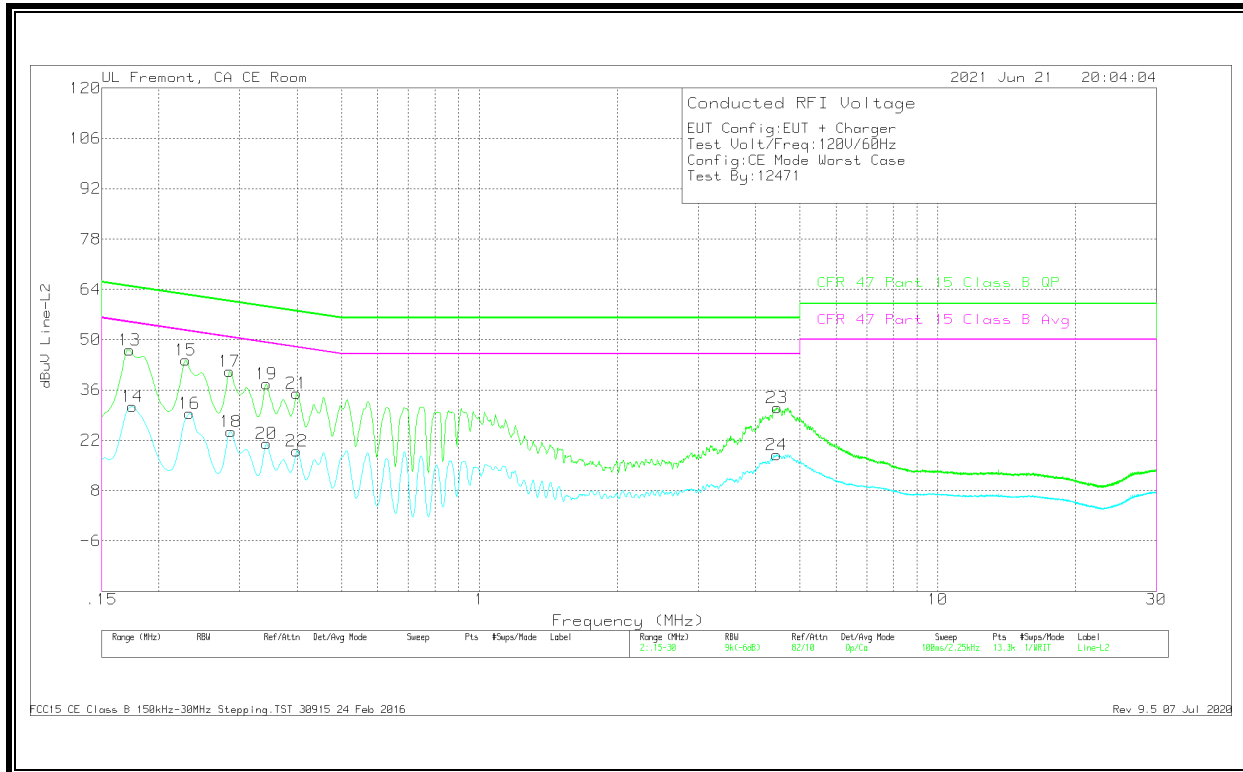
Worst Emission

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
1	.1725	37.73	Qp	0	0	9.4	47.13	64.84	-17.71	-	-
2	.17475	21.15	Ca	0	0	9.4	30.55	-	-	54.73	-24.18
3	.22875	34.96	Qp	0	0	9.3	44.26	62.49	-18.23	-	-
4	.23325	18.93	Ca	0	0	9.3	28.23	-	-	52.33	-24.1
5	.285	31.88	Qp	0	0	9.3	41.18	60.67	-19.49	-	-
6	.28725	14.38	Ca	0	0	9.3	23.68	-	-	50.6	-26.92
7	.3435	28.41	Qp	0	0	9.3	37.71	59.12	-21.41	-	-
8	.3435	11.63	Ca	0	0	9.3	20.93	-	-	49.12	-28.19
9	.39975	25.77	Qp	0	0	9.3	35.07	57.86	-22.79	-	-
10	.39975	9.63	Ca	0	0	9.3	18.93	-	-	47.86	-28.93
11	4.71075	23.36	Qp	0	.1	9.3	32.76	56	-23.24	-	-
12	4.713	10.27	Ca	0	.1	9.3	19.67	-	-	46	-26.33

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



Worst Emission

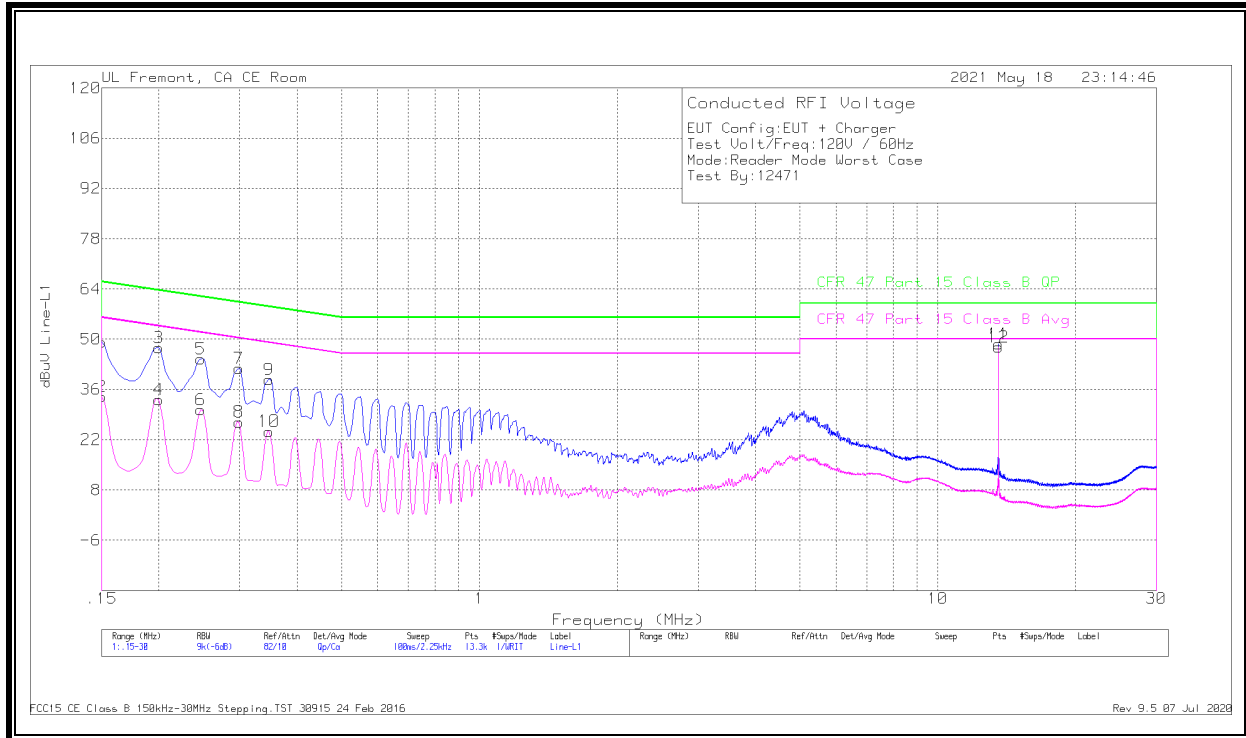
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Aw(CISPR)M argin (dB)
13	.1725	37.77	Qp	0	0	9.4	47.17	64.84	-17.67	-	-
14	.17475	21.96	Ca	0	0	9.4	31.36	-	-	54.73	-23.37
15	.22875	35.05	Qp	0	0	9.3	44.35	62.49	-18.14	-	-
16	.23325	20.24	Ca	0	0	9.3	29.54	-	-	52.33	-22.79
17	.285	31.83	Qp	0	0	9.3	41.13	60.67	-19.54	-	-
18	.28725	15.13	Ca	0	0	9.3	24.43	-	-	50.6	-26.17
19	.3435	28.32	Qp	0	0	9.3	37.62	59.12	-21.5	-	-
20	.3435	11.8	Ca	0	0	9.3	21.1	-	-	49.12	-28.02
21	.39975	25.77	Qp	0	0	9.3	35.07	57.86	-22.79	-	-
22	.39975	9.75	Ca	0	0	9.3	19.05	-	-	47.86	-28.81
23	4.45875	21.73	Qp	0	.1	9.3	31.13	56	-24.87	-	-
24	4.4565	8.54	Ca	0	.1	9.3	17.94	-	-	46	-28.06

Qp - Quasi-Peak detector
 Ca - CISPR average detection

10.2. SECONDARY ANTENNA

10.2.1. READER MODE, Type B 848 Kbps, with Antenna

LINE 1 RESULTS



Worst Emission

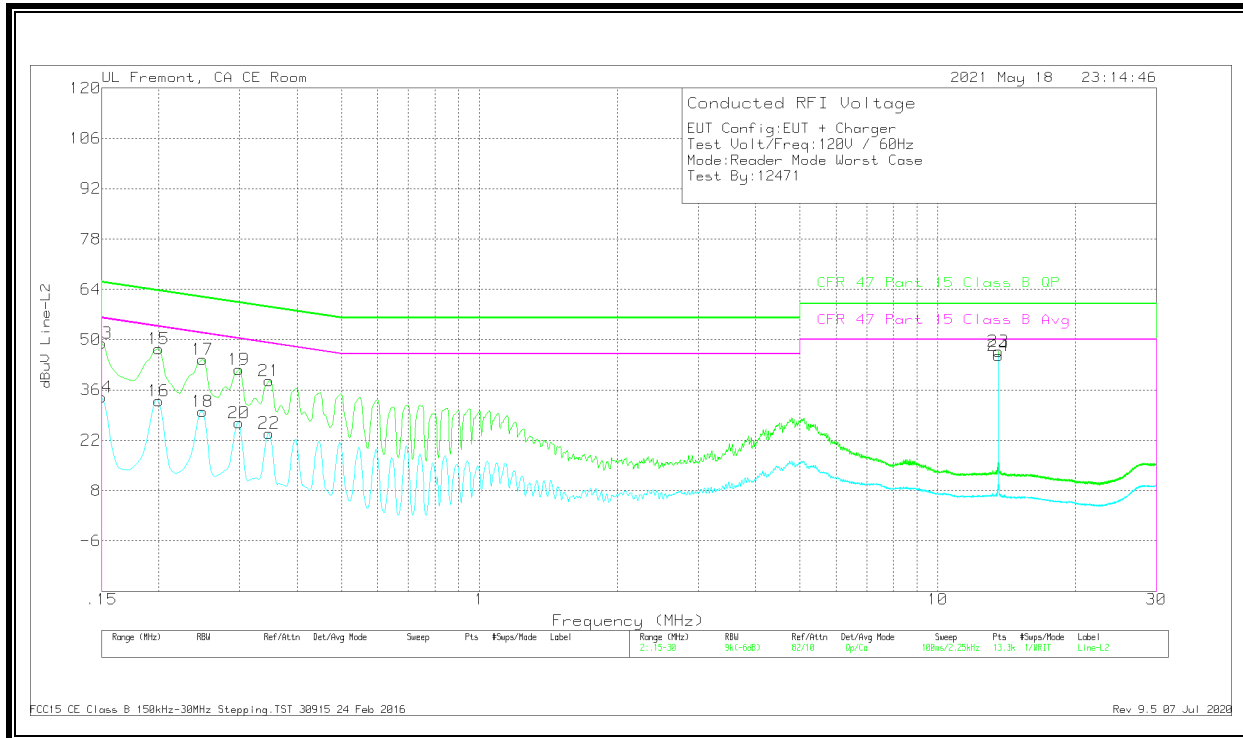
Range 1: Line-L1 .15 - 30MHz												
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)	
1	.15	39.04	Qp	.1	0	10.1	49.24	66	-16.76	-	-	
2	.15	23.89	Ca	.1	0	10.1	34.09	-	-	56	-21.91	
3	.1995	37.56	Qp	0	0	10.1	47.66	63.63	-15.97	-	-	
4	.1995	23.01	Ca	0	0	10.1	33.11	-	-	53.63	-20.52	
5	.24675	34.39	Qp	0	0	10.1	44.49	61.87	-17.38	-	-	
6	.24675	20.25	Ca	0	0	10.1	30.35	-	-	51.87	-21.52	
7	.2985	31.7	Qp	0	0	10.1	41.8	60.28	-18.48	-	-	
8	.2985	16.86	Ca	0	0	10.1	26.96	-	-	50.28	-23.32	
9	.348	28.67	Qp	0	0	10.1	38.77	59.01	-20.24	-	-	
10	.348	14.24	Ca	0	0	10.1	24.34	-	-	49.01	-24.67	
11	13.56	38.17	Qp	.1	.2	10.2	48.67	60	-11.33	-	-	
12	13.56	37.26	Ca	.1	.2	10.2	47.76	-	-	50	-2.24	

Qp - Quasi-Peak detector

Ca - CISPR average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicates that when the antenna terminal is terminated the fundamental amplitude is lowering below the limit line.

LINE 2 RESULTS



Worst Emission

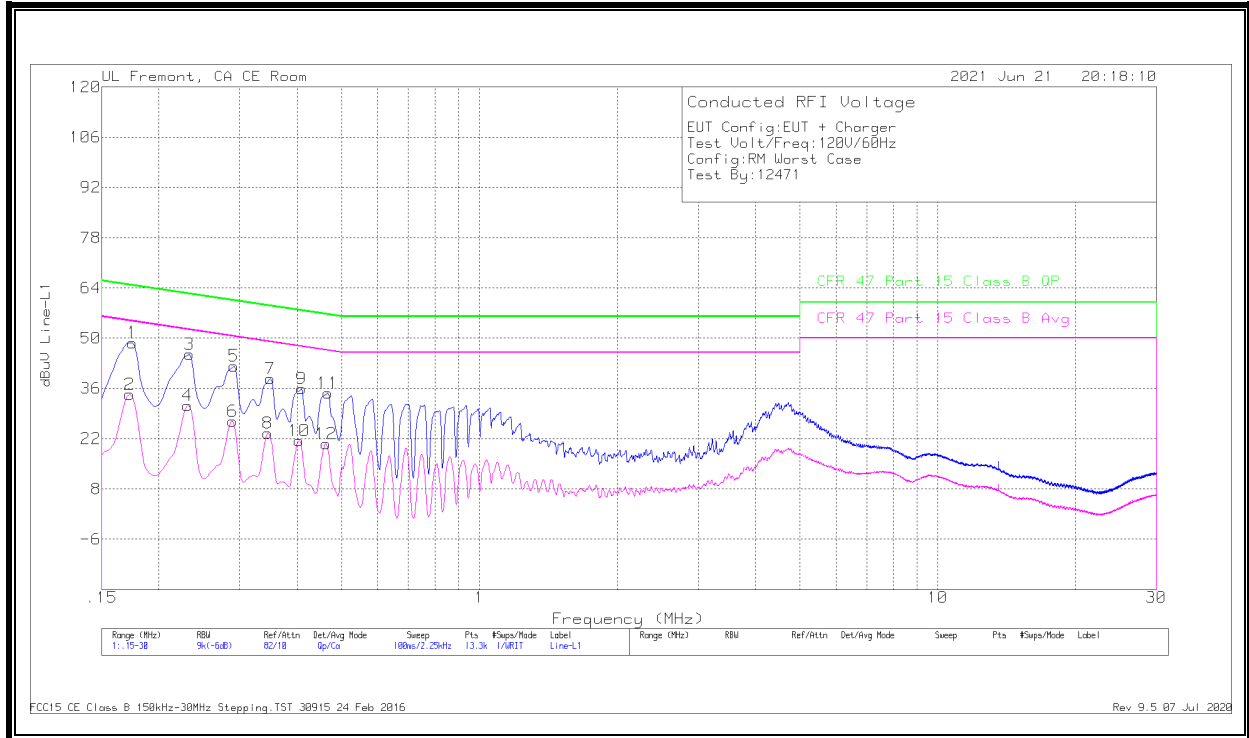
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
13	.15	38.87	Qp	.1	0	10.1	49.07	66	-16.93	-	-
14	.15	23.76	Ca	.1	0	10.1	33.96	-	-	56	-22.04
15	.1995	37.36	Qp	0	0	10.1	47.46	63.63	-16.17	-	-
16	.1995	22.87	Ca	0	0	10.1	32.97	-	-	53.63	-20.66
17	.249	34.47	Qp	0	0	10.1	44.57	61.79	-17.22	-	-
18	.249	19.91	Ca	0	0	10.1	30.01	-	-	51.79	-21.78
19	.2985	31.54	Qp	0	0	10.1	41.64	60.28	-18.64	-	-
20	.2985	16.83	Ca	0	0	10.1	26.93	-	-	50.28	-23.35
21	.348	28.42	Qp	0	0	10.1	38.52	59.01	-20.49	-	-
22	.348	13.89	Ca	0	0	10.1	23.99	-	-	49.01	-25.02
23	13.56	36.19	Qp	.1	.2	10.2	46.69	60	-13.31	-	-
24	13.56	35.01	Ca	.1	.2	10.2	45.51	-	-	50	-4.49

Qp - Quasi-Peak detector
 Ca - CISPR average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicates that when the antenna terminal is terminated the fundamental amplitude is lowering below the limit line.

10.2.2. READER MODE, Type B 848 Kbps, Antenna Port Terminated

LINE 1 RESULTS

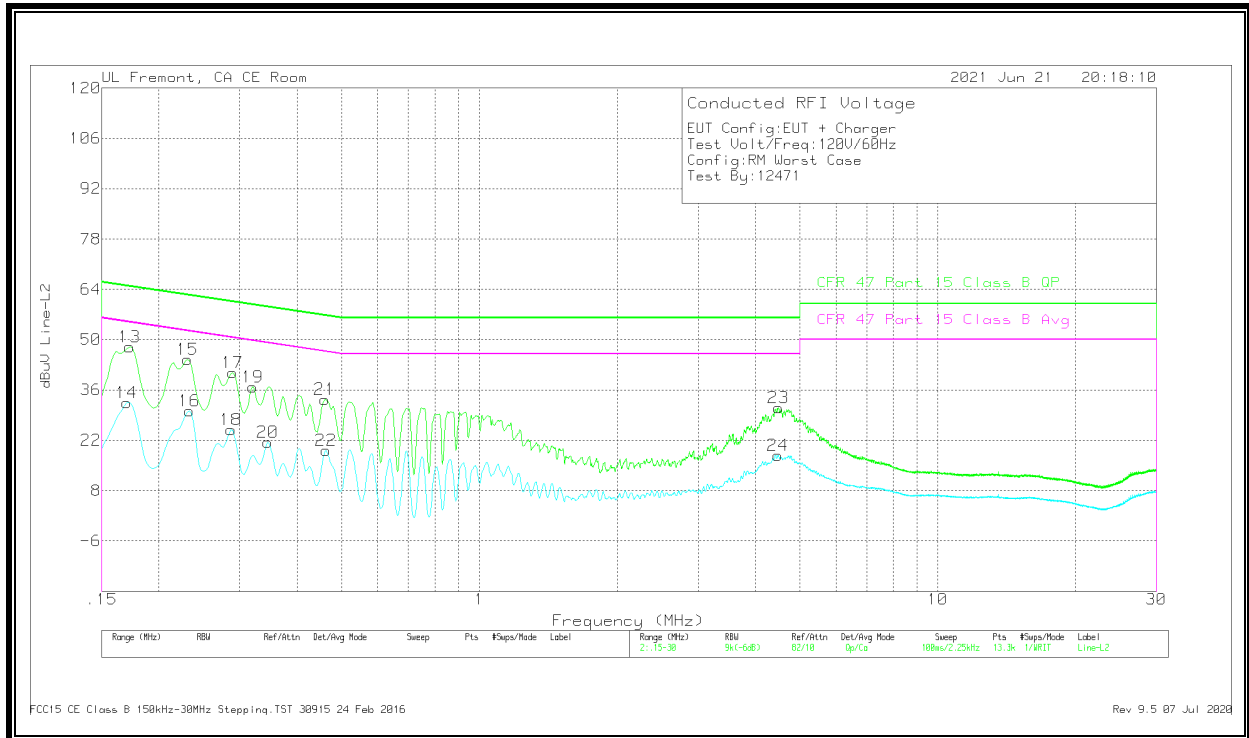


Worst Emission

Range 1: Line-L1 .15 - 30MHz												
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)	
1	.17475	39.37	Qp	0	0	9.4	48.77	64.73	-15.96	-	-	
2	.1725	24.95	Ca	0	0	9.4	34.35	-	-	54.84	-20.49	
3	.23325	36.24	Qp	0	0	9.3	45.54	62.33	-16.79	-	-	
4	.231	21.97	Ca	0	0	9.3	31.27	-	-	52.41	-21.14	
5	.29175	33.01	Qp	0	0	9.3	42.31	60.47	-18.16	-	-	
6	.2895	17.52	Ca	0	0	9.3	26.82	-	-	50.54	-23.72	
7	.35025	29.39	Qp	0	0	9.3	38.69	58.96	-20.27	-	-	
8	.34575	14.28	Ca	0	0	9.3	23.58	-	-	49.06	-25.48	
9	.40875	26.57	Qp	0	0	9.3	35.87	57.67	-21.8	-	-	
10	.40425	12.13	Ca	0	0	9.3	21.43	-	-	47.77	-26.34	
11	.46725	25.38	Qp	0	0	9.3	34.68	56.56	-21.88	-	-	
12	.46275	11.25	Ca	0	0	9.3	20.55	-	-	46.64	-26.09	

Qp - Quasi-Peak detector
 Ca - CISPR average detection

LINE 2 RESULTS



Worst Emission

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	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	.1725	38.57	Qp	0	0	9.4	47.97	64.84	-16.87	-	-
14	.17025	23.11	Ca	0	0	9.4	32.51	-	-	54.95	-22.44
15	.231	35.25	Qp	0	0	9.3	44.55	62.41	-17.86	-	-
16	.23325	20.84	Ca	0	0	9.3	30.14	-	-	52.33	-22.19
17	.2895	31.47	Qp	0	0	9.3	40.77	60.54	-19.77	-	-
18	.28725	15.69	Ca	0	0	9.3	24.99	-	-	50.6	-25.61
19	.31988	27.48	Qp	0	0	9.3	36.78	59.71	-22.93	-	-
20	.34575	12.13	Ca	0	0	9.3	21.43	-	-	49.06	-27.63
21	.4605	24.11	Qp	0	0	9.3	33.41	56.68	-23.27	-	-
22	.46275	9.88	Ca	0	0	9.3	19.18	-	-	46.64	-27.46
23	4.497	21.72	Qp	0	.1	9.3	31.12	56	-24.88	-	-
24	4.48575	8.45	Ca	0	.1	9.3	17.85	-	-	46	-28.15

Qp - Quasi-Peak detector
 Ca - CISPR average detection

11. SETUP PHOTOS

Please refer to 13571607-EP1V1 for setup photos.

END OF TEST REPORT