



TEST REPORT

Report Number. : 13571601-E12V4

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

Model : A2483 (Parent Model, Full Test)
A2640, A2636, A2638, A2639 (Variant Models)

Brand : APPLE

FCC ID : BCG-E4000A (Parent Model)
BCG-E4034A, BCG-E4002A, BCG-E4033A (Variant Models)

IC : 579C-E4000A (Parent Model)
579C-E4034A, 579C-E4002A, 579C-E4033A (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:

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	6/24/2021	Initial Issue	Chin Pang
V2	7/12/2021	Address TCB's Quetions	Chris Xiong
V3	7/19/2021	Added Tag Mode and remark page 44 and add note to page 27	Francisco Guarnero
V4	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.....	8
4.4. SAMPLE CALCULATION	8
5. EQUIPMENT UNDER TEST	9
5.1. DESCRIPTION OF EUT	9
5.2. MAXIMUM FIELD STRENGTH.....	9
5.3. WORST-CASE CONFIGURATION AND MODE.....	10
5.4. DESCRIPTION OF TEST SETUP.....	11
6. TEST AND MEASUREMENT EQUIPMENT	14
7. OCCUPIED BANDWIDTH	15
7.1. PRIMARY ANTENNA.....	16
7.2. SECONDARY ANTENNA	17
8. RADIATED EMISSION TEST RESULTS.....	18
8.1. LIMITS AND PROCEDURE	18
8.2. PRIMARY ANTENNA FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 - 30 MHz), EUT WITH AC/DC ADAPTER.....	20
8.2.1. READER MODE, TYPE B 848Kbps.....	20
8.2.2. TAG MODE, TYPE B 848Kbps	24
8.2.3. CE MODE, TYPE B 848Kbps	28
8.3. TX SPURIOUS EMISSION 30 TO 1000 MHz, EUT WITH AC/DC ADAPTER.....	32
8.4. SECONDARY ANTENNA FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 - 30 MHz), EUT WITH AC/DC ADAPTER.....	38
8.4.1. READER MODE, TYPE B 848Kbps.....	38
8.4.2. TAG MODE, TYPE B 848Kbps	42
8.4.3. TX SPURIOUS EMISSION 30 TO 1000 MHz, EUT WITH AC/DC ADAPTER.....	46
9. FREQUENCY STABILITY	50
9.1. PRIMARY ANTENNA.....	51
9.2. SECONDARY ANTENNA	52
10. AC MAINS LINE CONDUCTED EMISSIONS	53

10.1.	PRIMARY ANTENNA.....	54
10.1.1.	READER MODE, NORMAL OPERATION.....	54
10.1.2.	CE Mode, TYPE B 848Kbps.....	58
10.2.	SECONDARY ANTENNA.....	62
10.2.1.	READER MODE, NORMAL OPERATION.....	62
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: A2483 (PARENT MODEL)
A2640, A2636, A2638, A2639 (VARIANT MODELS)

BRAND: APPLE

FCC IC: BCG-E4000A (PARENT MODEL)
BCG-E4034A, BCG-E4002A, BCG-E4033A (VARIANT MODELS)

IC ID: 579C-E4000A (PARENT MODEL)
579C-E4034A, 579C-E4002A, 579C-E4033A (VARIANT MODELS)

SERIAL NUMBER: HXKPFXHXK2

SAMPLE RECEIPT DATE: APRIL 29, 2021

DATE TESTED: APRIL 29, 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.

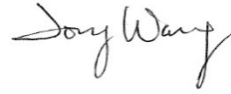
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Approved & Released For
UL Verification Services Inc. By:



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

Prepared By:



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

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, F KDB 414788 D01 Radiated Test Site v01r01, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 5 + A1 + A2, and 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
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538	US0104	2324A	208313
☐	Building 2: 47266 Benicia Street, Fremont, CA 94538	US0104	22541	208313
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538	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 Loop, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Worst Case Occupied Bandwidth	1.22%

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

4.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\text{Final Voltage (dBuV)} = \text{Measured Voltage (dBuV)} + \text{Cable Loss (dB)} + \text{Limiter Factor (dB)} + \text{LISN Insertion Loss.}$$

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

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/IC ID covered by this report includes:

Parent Model: A2483, FCC ID: BCG-E4000A, IC ID: 579C-E4000A

Variant Models: A2640; FCC ID: BCG-E4034A, IC ID: 579C-E4034A
 A2636; FCC ID: BCG-E4002A, IC ID: 579C-E4002A
 A2638; FCC ID: BCG-E4033A, IC ID: 579C-E4033A
 A2639; FCC ID: BCG-E4034A, IC ID: 579C-E4034A

5.2. MAXIMUM FIELD STRENGTH

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

Antenna	Frequency Range (MHz)	Mode		Kbps	E Field at 30m distance (dBuV/m)
Primary	13.56	Type B	Reader	848	25.80
			Tag	848	26.33
			CE	848	25.57
Secondary	13.56	Type B	Reader	848	4.37
			Tag	848	6.57

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 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 848Kbp/s 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.

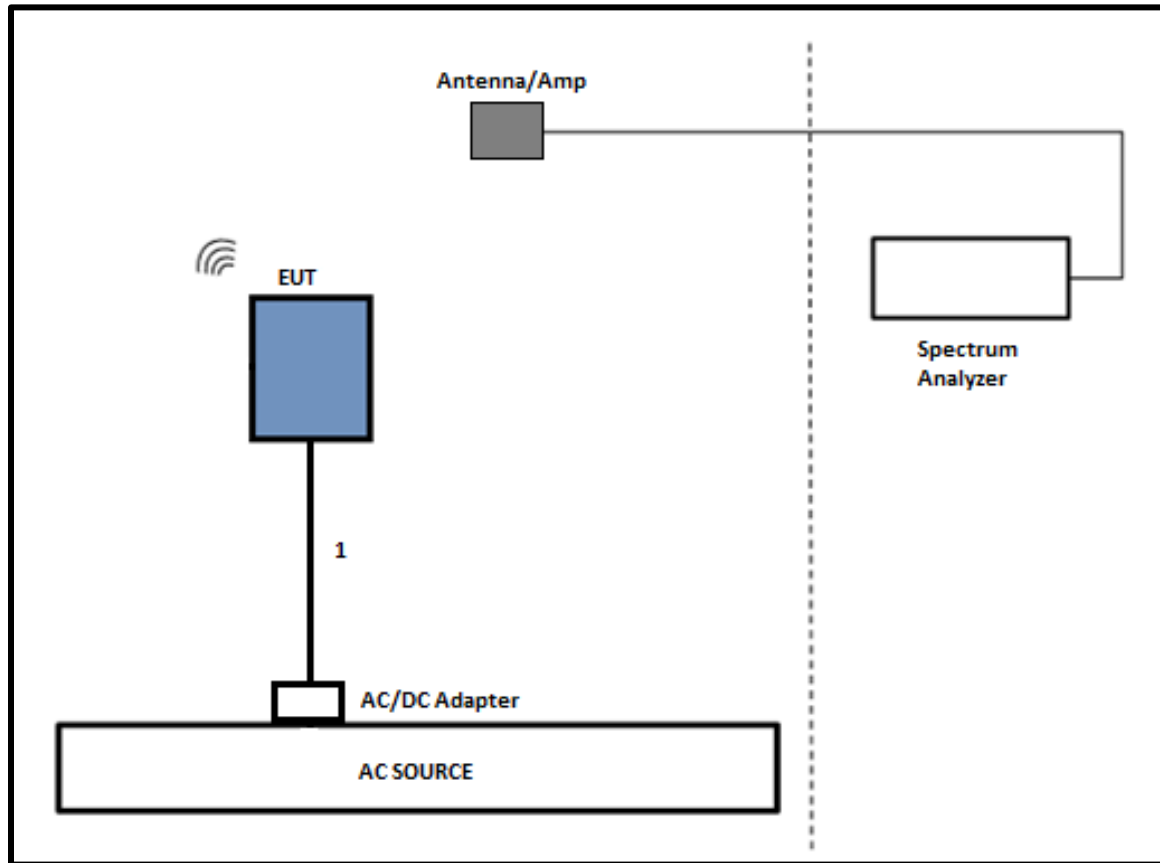
5.4. DESCRIPTION OF TEST SETUP

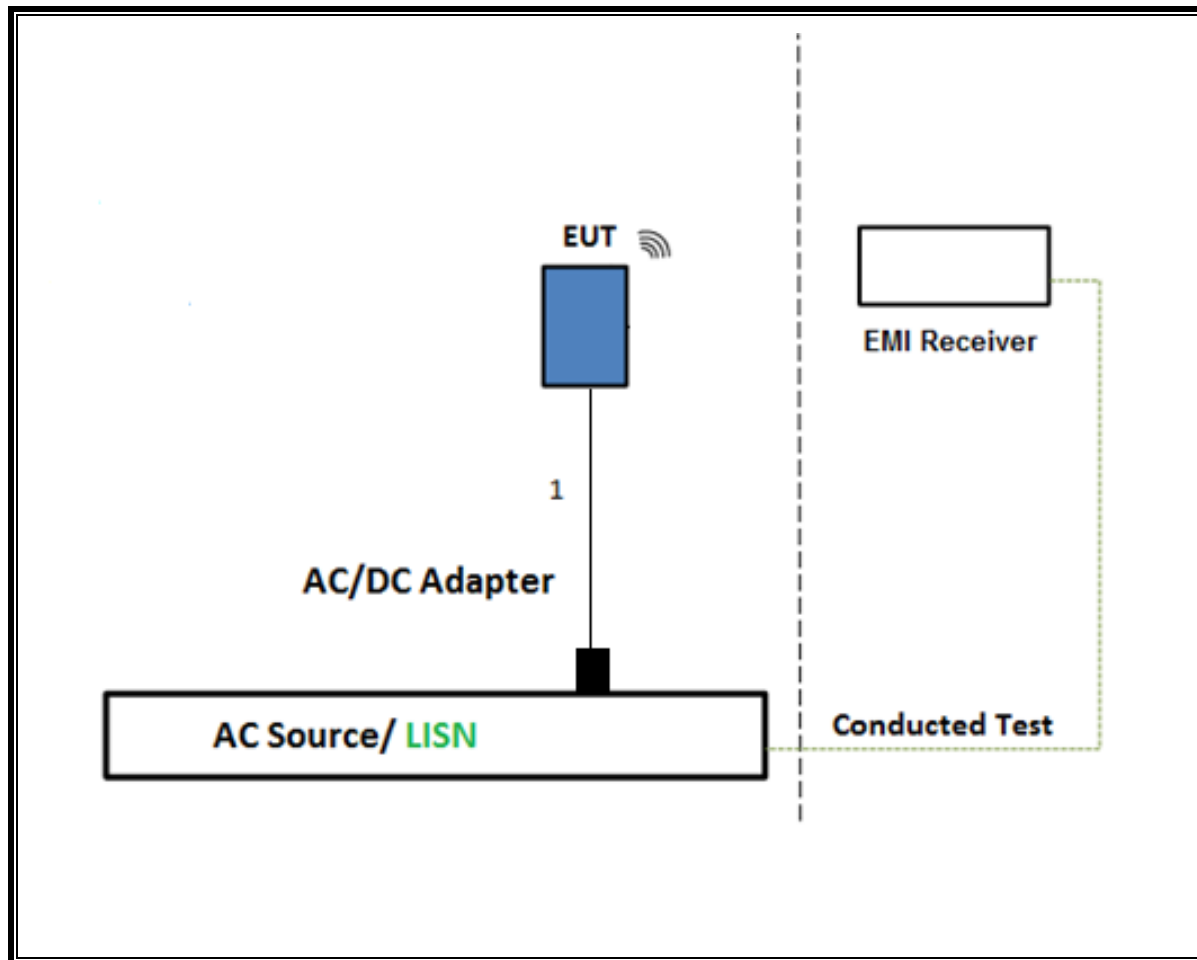
SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
laptop	Apple	Macbook Pro	C02SM041GTFL	BCG-A1707
Laptop AC/DC adapter	Liteon Technology	A1424	NSW25679	DoC
EUT AC 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 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	ID Num	Cal Due	Last Cal
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	203089	12/08/2021	12/08/2020
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	204040	01/06/2022	01/06/2021
Antenna, Active Loop 9KHz to 30MHz	ETS-Lindgren	6502	T757	11/12/2021	11/12/2020
EMI Receiver	Rohde & Schwarz	ESW44	201502	09/17/2021	09/17/2020
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T342	01/22/2022	01/22/2021
*Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T1154	06/21/2021	06/21/2020

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		

*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	21.181	24.84

Type B (CE Mode)

Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	21.177	24.81

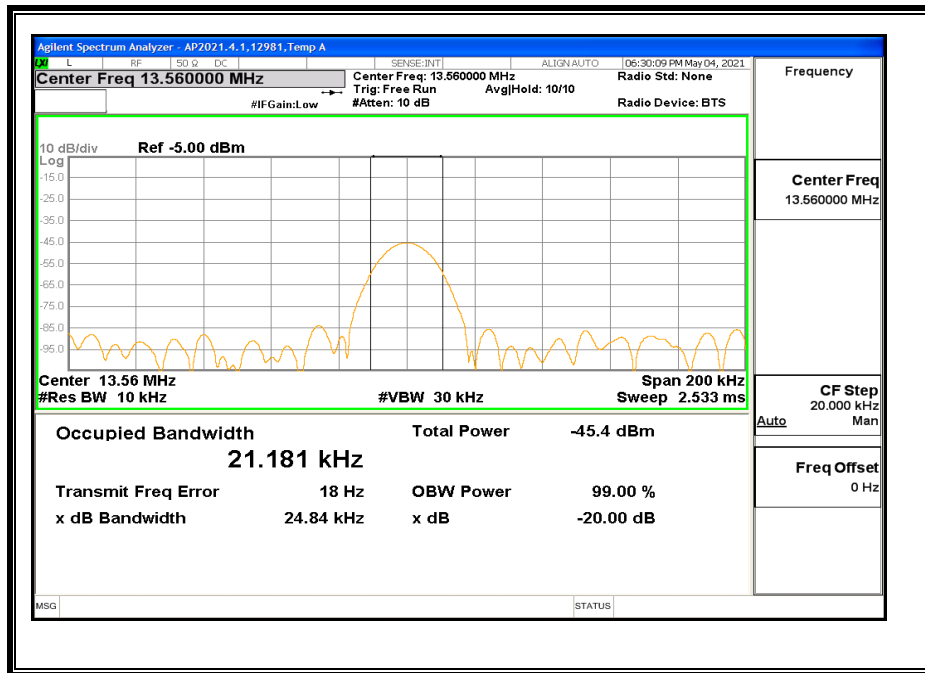
Secondary Antenna

Type B (Reader Mode)

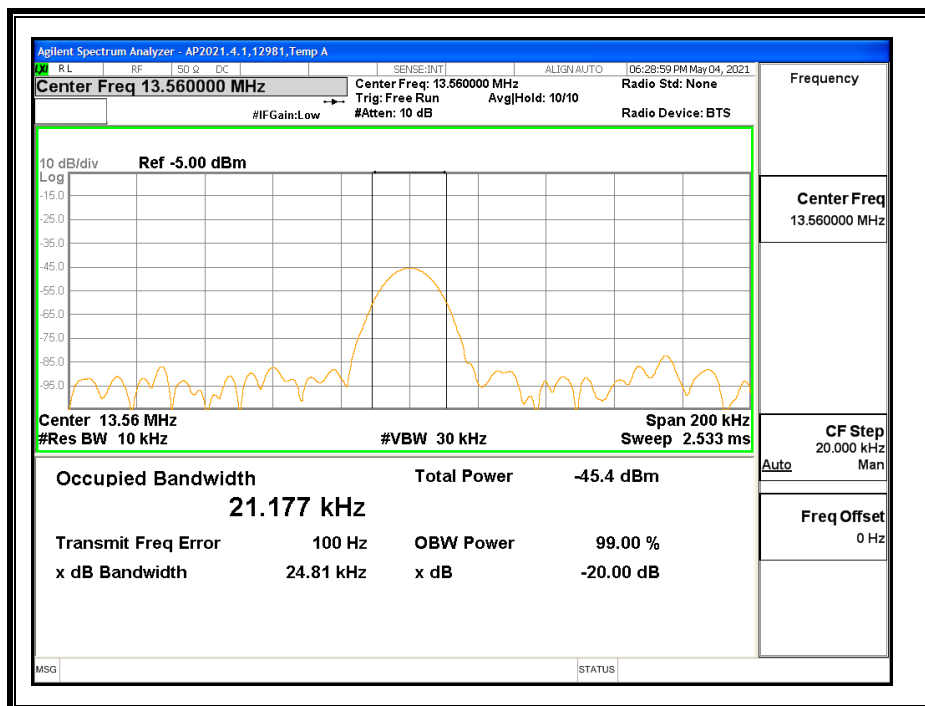
Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	22.146	25.42

7.1. PRIMARY ANTENNA

Type B, Reader Mode, 848Kbps



Type B, CE Mode, 848Kbps



7.2. SECONDARY ANTENNA

Type B, Reader Mode, 8 48Kbps



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 field strength from µV/m to dBµV/m is:

Limit (dBµV/m) = 20 log limit (µV/m)

Note: The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as report in the table) using free space impedance of 377 Ohms. For example, the measurement at frequency X kHz resulted in a level of Y dBµV/m, which is equivalent to $Y - 51.5 = Z$ dBµA/m, which has the same margin, W dB to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

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

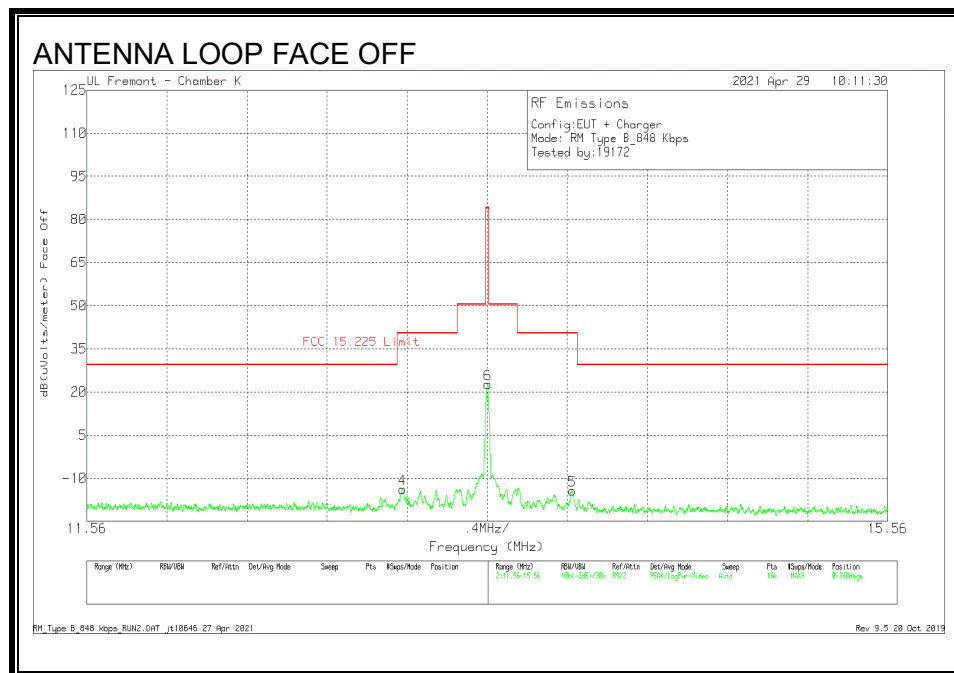
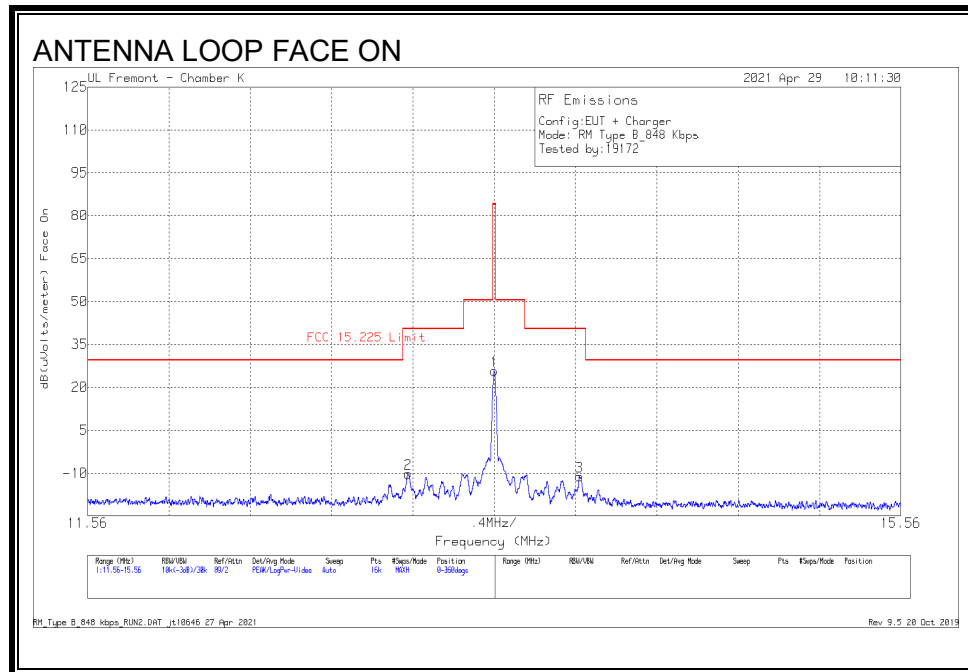
The EUT is an intentional radiator that incorporates a digital device, the highest fundamental frequency generated or used in the device is 13.56 MHz; therefore, the frequency range was investigated from 0.15 MHz to the 10th harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater.

RESULTS

8.2. PRIMARY ANTENNA FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 - 30 MHz), EUT WITH AC/DC ADAPTER

8.2.1. READER MODE, TYPE B 848Kbps

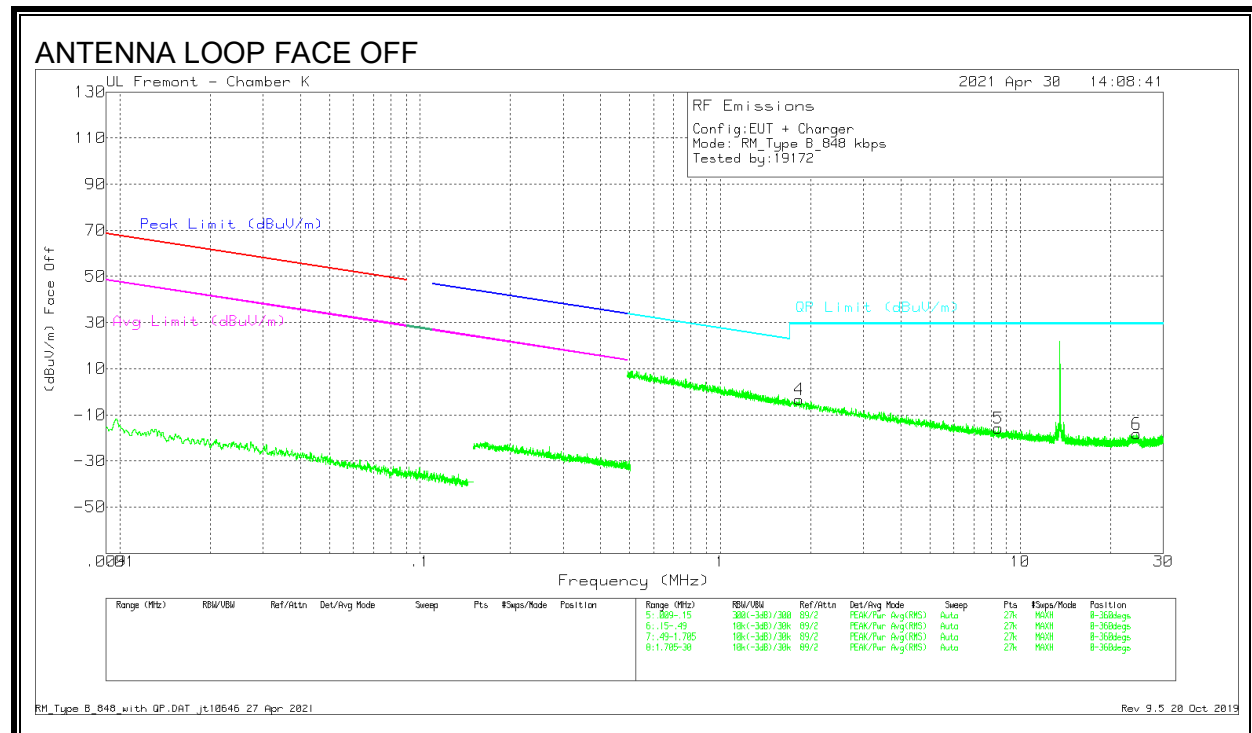
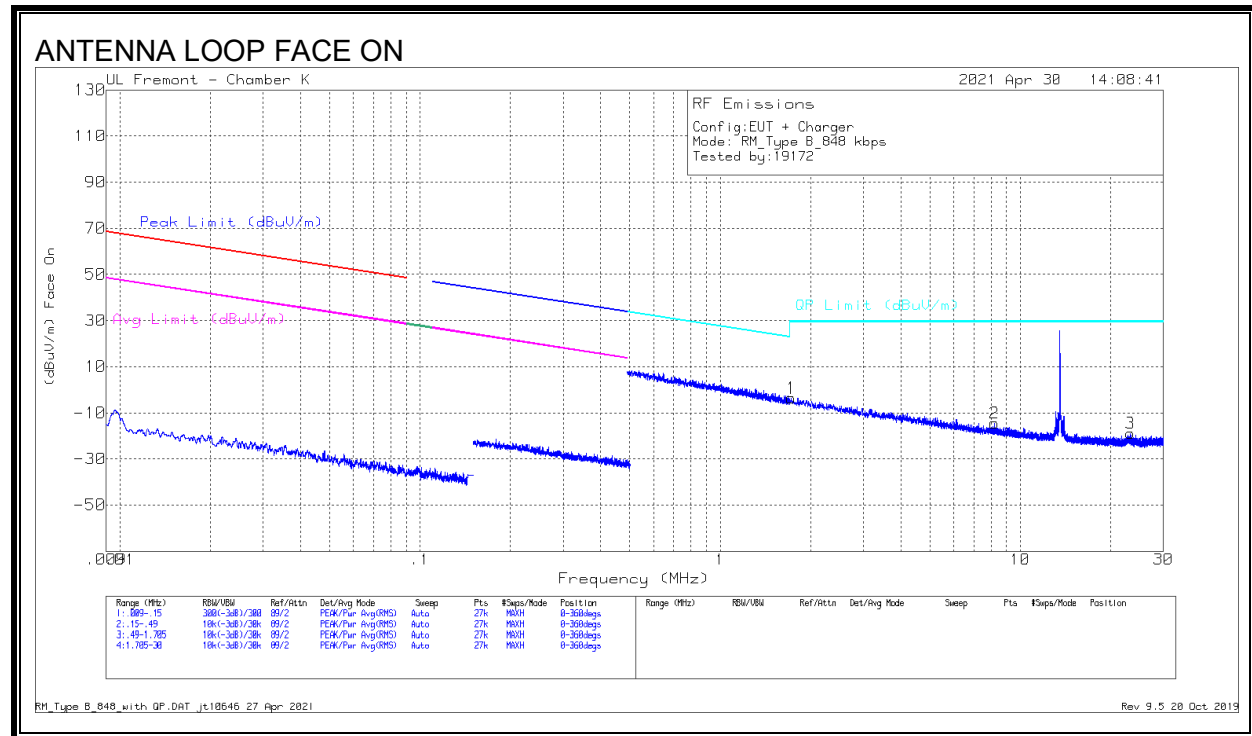
FUNDAMENTAL 848Kbps



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading dB(uVolts/m eter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Antenna Orientation
2	13.1355	19.03	Pk	10.3	.5	-40	-10.17	40.51	-50.68	0-360	Face on
4	13.13563	15.42	Pk	10.3	.5	-40	-13.78	40.51	-54.29	0-360	Face off
1	13.55963	55.1	Pk	10.2	.5	-40	25.8	84	-58.2	0-360	Face on
3	13.97863	18.18	Pk	10.2	.5	-40	-11.12	40.51	-51.63	0-360	Face on
5	13.98413	14.99	Pk	10.2	.5	-40	-14.31	40.51	-54.82	0-360	Face off
6	13.55963	53.09	Pk	10.2	.5	-40	23.79	84	-60.21	0-360	Face off

Pk - Peak detector

SPURIOUS EMISSION 848Kbps

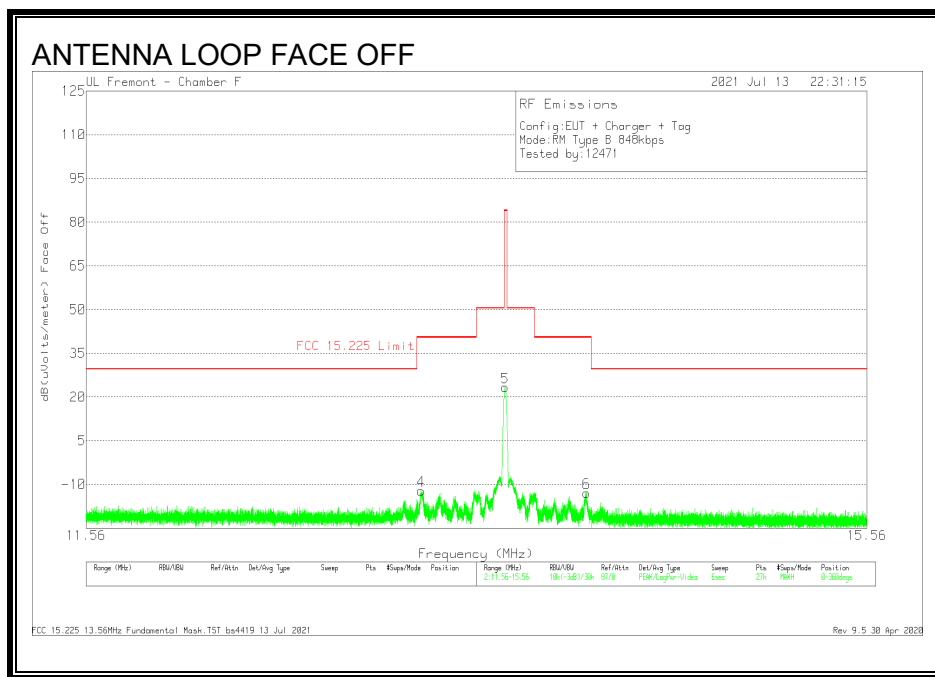
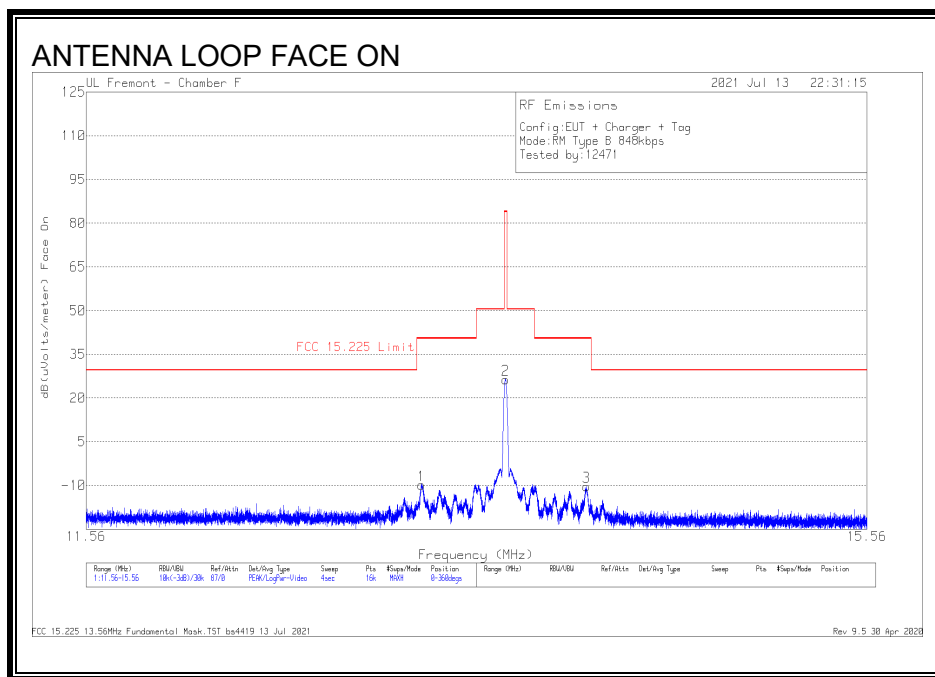
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	1.7424	17.9	Qp	10.8	.1	-40	-11.2	29.5	-40.7	290	Face on
4	1.8347	17.41	Qp	10.8	.1	-40	-11.69	29.5	-41.19	345	Face off
2	8.20001	3.78	Qp	10.7	.3	-40	-25.22	29.5	-54.72	0	Face on
5	8.4654	3.75	Qp	10.7	.3	-40	-25.25	29.5	-54.75	345	Face off
3	23.296	1.19	Qp	9.1	.6	-40	-29.11	29.5	-58.61	149	Face on
6	24.453	3.31	Qp	8.9	.6	-40	-27.19	29.5	-56.69	92	Face off

Qp - Quasi-Peak detector

8.2.2. TAG MODE, TYPE B 848Kbps

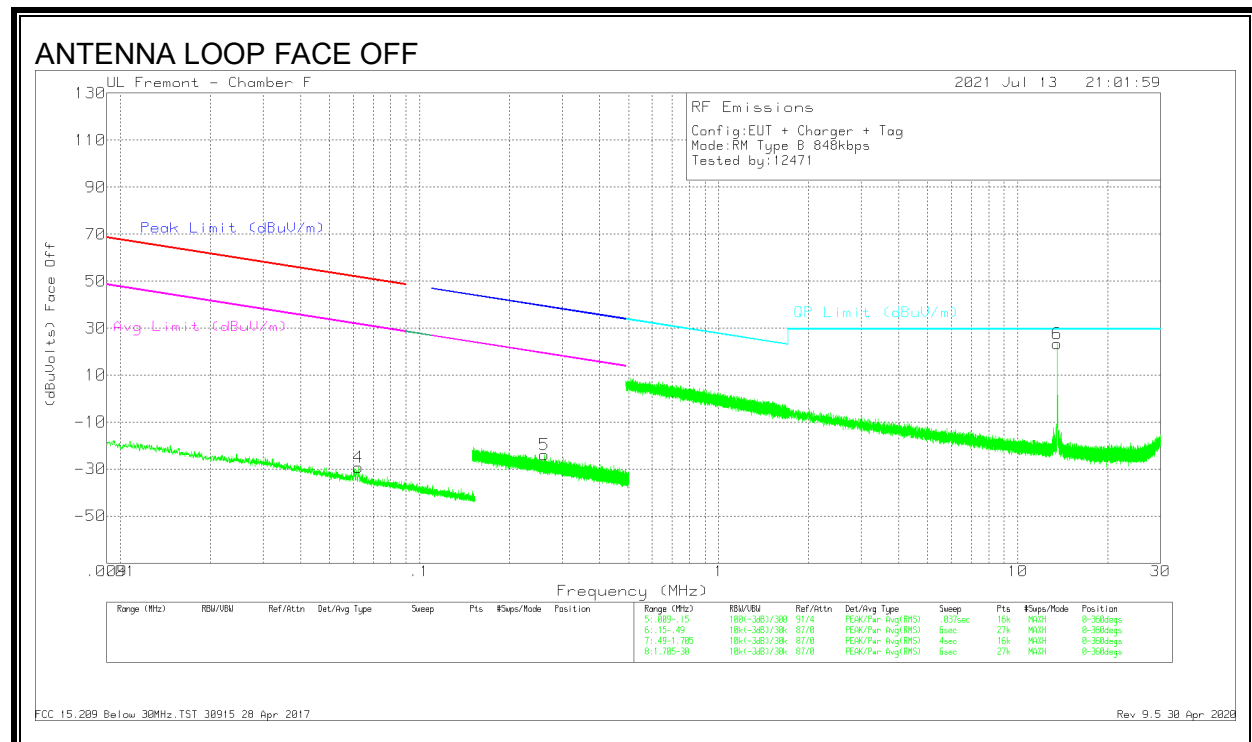
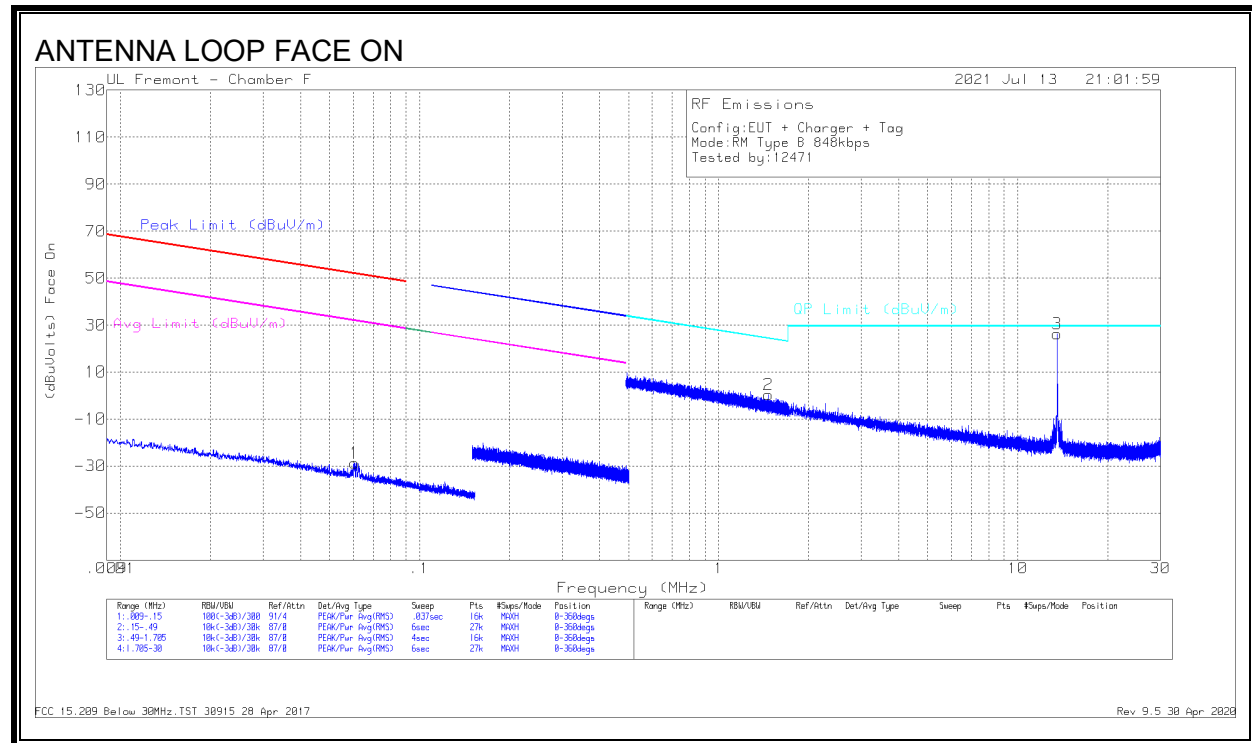
FUNDAMENTAL 848Kbps



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)	Antenna Orientation
1	13.13325	18.96	Pk	10.8	.4	-40	-9.84	40.51	-50.35	0-360	Face On
2	13.56025	55.23	Pk	10.7	.4	-40	26.33	84	-57.67	0-360	Face On
3	13.98425	18.57	Pk	10.7	.4	-40	-10.33	40.51	-50.84	0-360	Face On
4	13.13161	16.62	Pk	10.8	.4	-40	-12.18	40.51	-52.69	0-360	Face Off
5	13.55778	52.26	Pk	10.7	.4	-40	23.36	84	-60.64	0-360	Face Off
6	13.98394	16.03	Pk	10.7	.4	-40	-12.87	40.51	-53.38	0-360	Face Off

Pk - Peak detector

SPURIOUS EMISSION 848Kbps

DATA

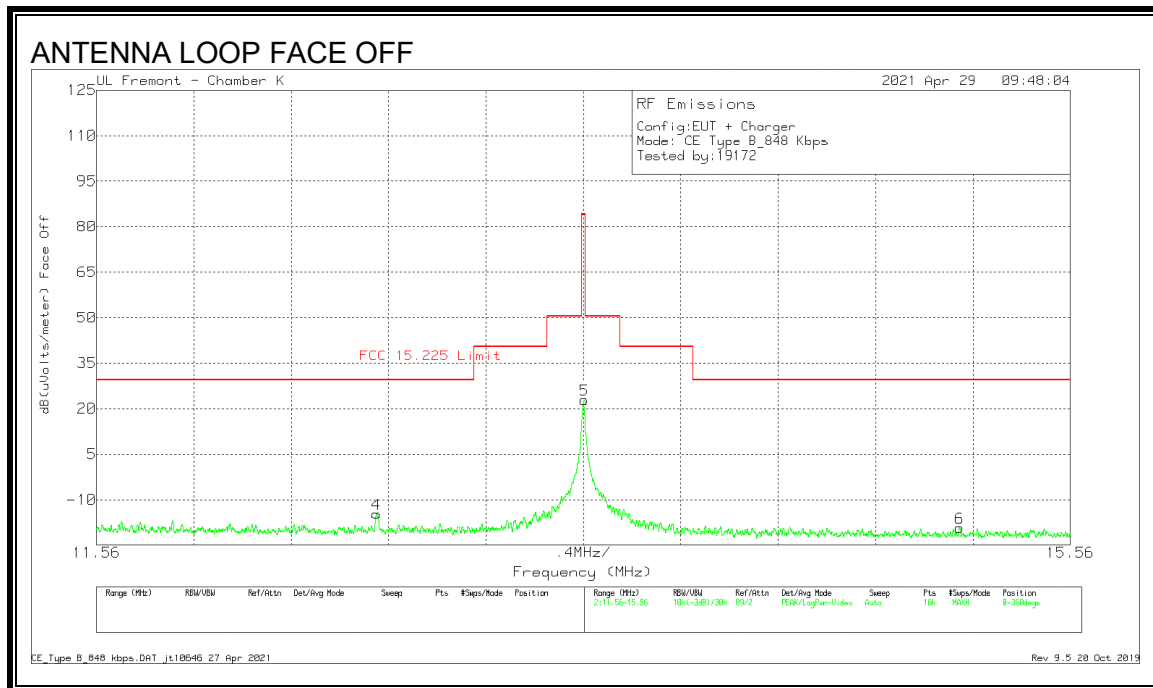
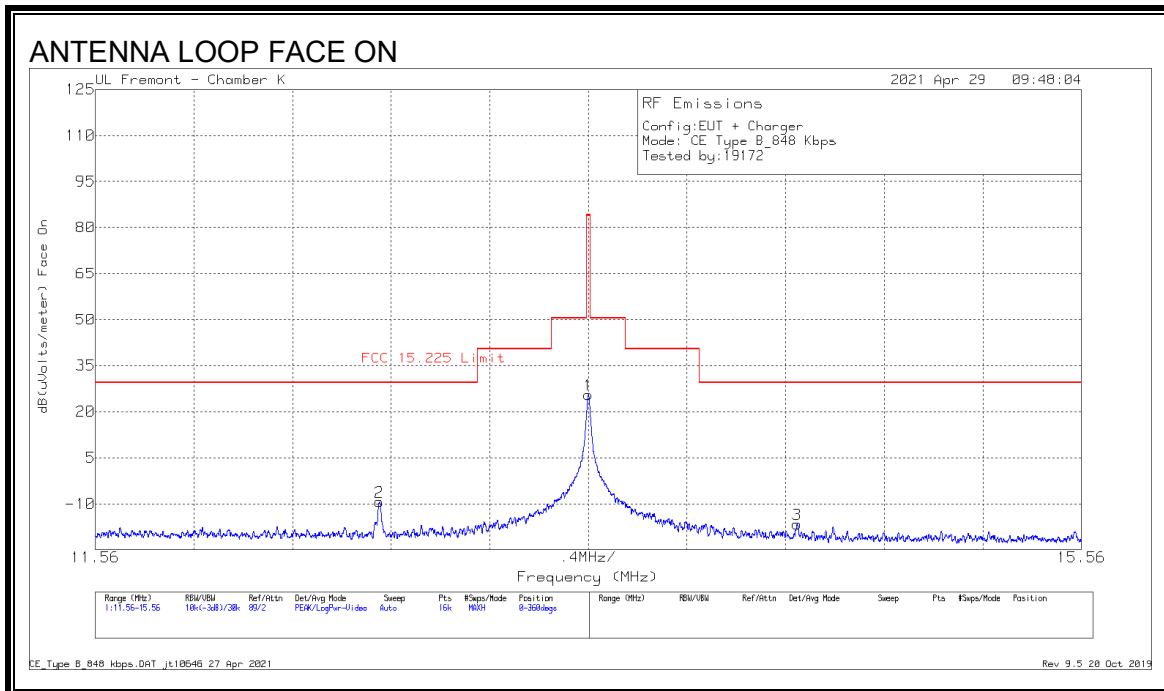
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	.06059	38.7	Pk	12.7	0	-80	-28.6	51.94	-80.54	31.94	-60.54	0-360	Face On
4	.0625	38.23	Pk	12.6	0	-80	-29.17	51.67	-80.84	31.67	-60.84	0-360	Face Off
5	.26158	44.65	Pk	11.3	.1	-80	-23.95	39.26	-63.21	19.26	-43.21	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)	Antenna Orientation
2	1.46789	28.72	Pk	11.5	.1	-40	.32	24.3	-23.98	0-360	Face On
3	13.55945	55.11	Pk	10.7	.4	-40	26.21	29.5	-3.29	0-360	Face On
6	13.55998	52.19	Pk	10.7	.4	-40	23.29	29.5	-6.21	0-360	Face Off

Pk - Peak detector

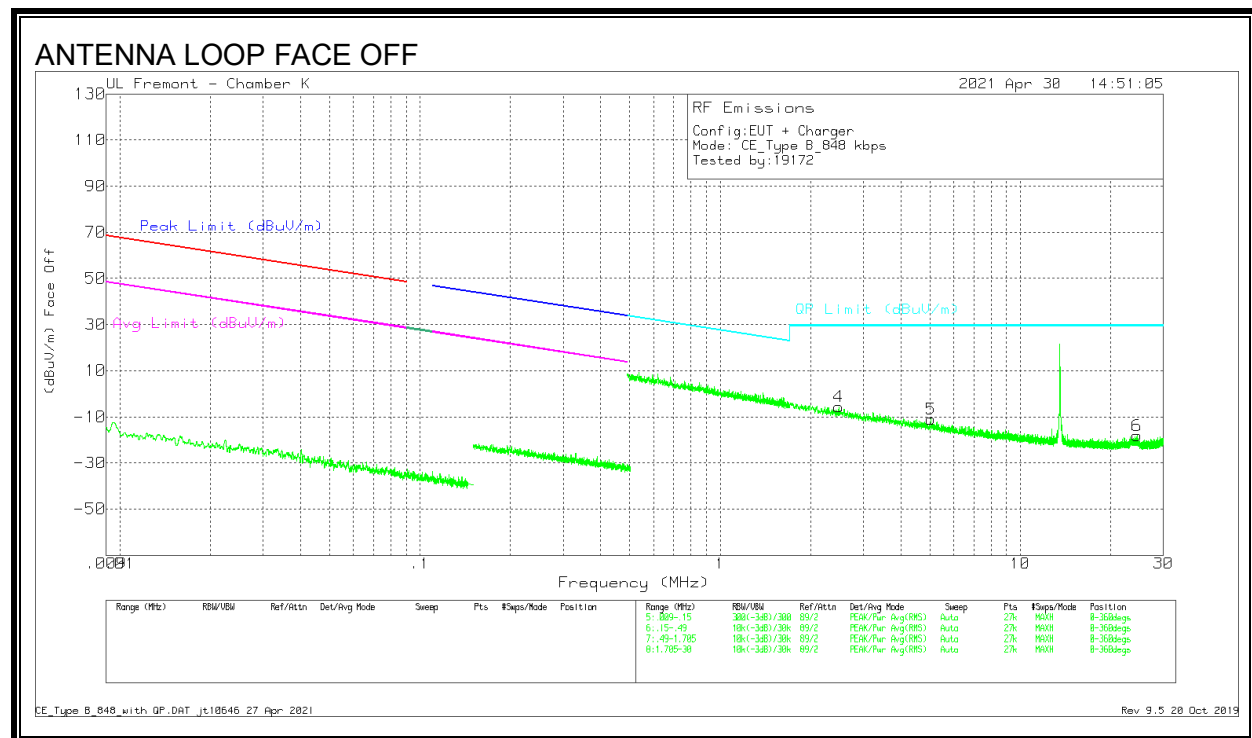
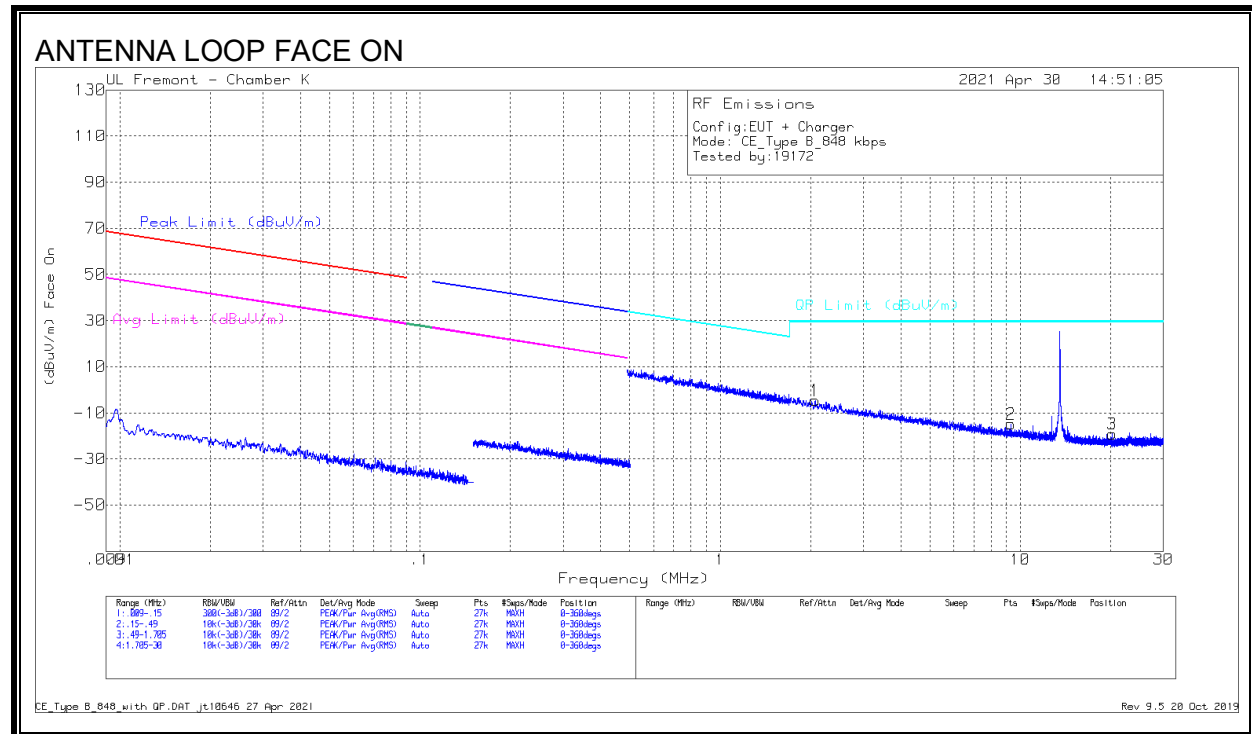
Note: Marker 3 and 6 are the fundamental signal

8.2.3. CE MODE, TYPE B 848Kbps**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)	Antenna Orientation
4	12.71038	14.54	Pk	10.3	.5	-40	-14.66	29.54	-44.2	0-360	Face off
2	12.71163	19.82	Pk	10.3	.5	-40	-9.38	29.54	-38.92	0-360	Face on
5	13.55925	51.64	Pk	10.2	.5	-40	22.34	84	-61.66	0-360	Face off
1	13.55925	54.87	Pk	10.2	.5	-40	25.57	84	-58.43	0-360	Face on
3	14.40625	12.71	Pk	10.2	.5	-40	-16.59	29.54	-46.13	0-360	Face on
6	15.10538	10.14	Pk	10.1	.5	-40	-19.26	29.54	-48.8	0-360	Face off

Pk - Peak detector

SPURIOUS EMISSION 848Kbps

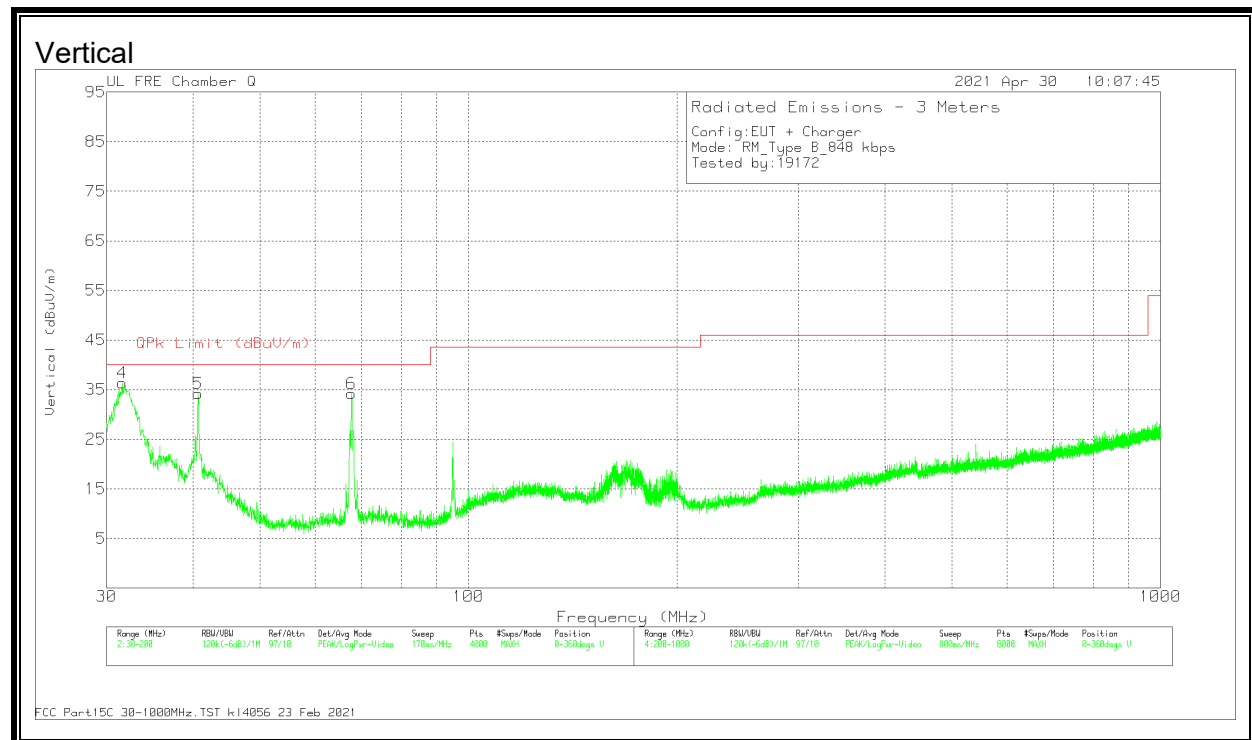
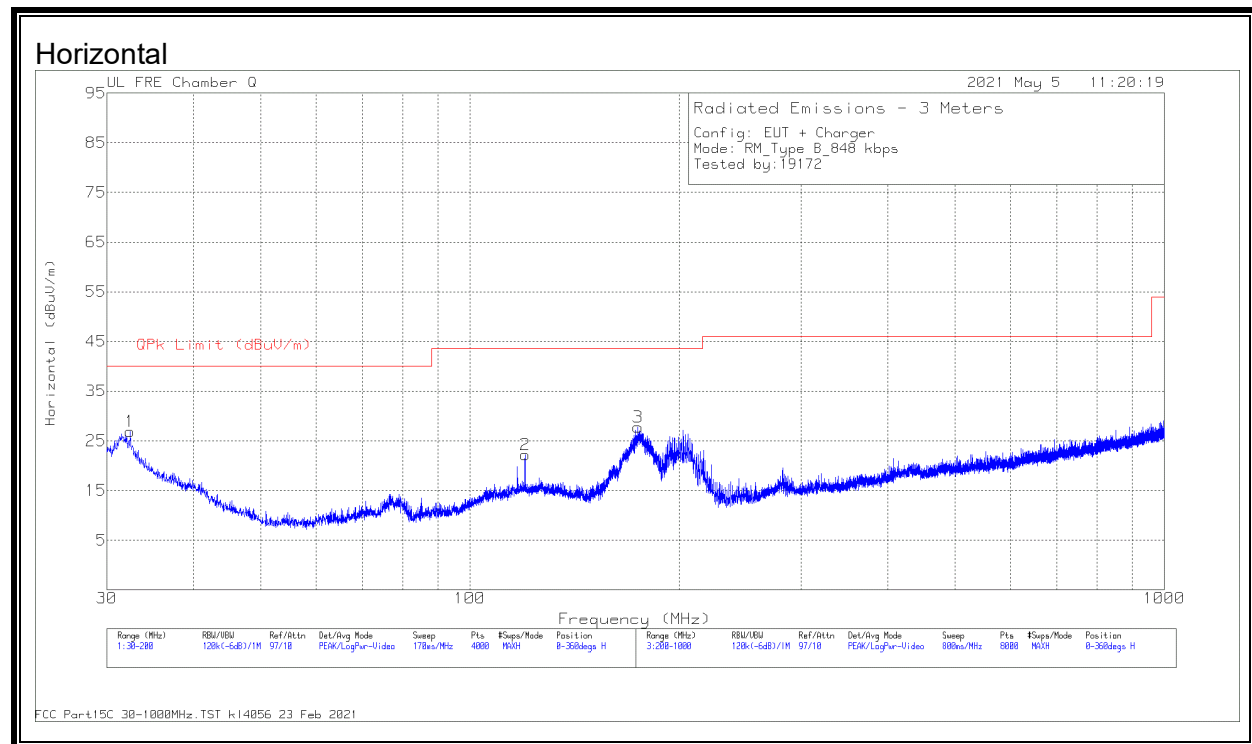
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	2.07346	16.22	Qp	10.8	.1	-40	-12.88	29.5	-42.38	98	Face on
2	9.32143	4.09	Qp	10.6	.4	-40	-24.91	29.5	-54.41	57	Face on
3	20.2513	-.37	Qp	9.6	.5	-40	-30.27	29.5	-59.77	227	Face on
4	2.48641	14.51	Qp	10.8	.2	-40	-14.49	29.5	-43.99	351	Face off
5	5.03712	7.86	Qp	10.9	.3	-40	-20.94	29.5	-50.44	345	Face off
6	24.5264	2.73	Qp	8.9	.6	-40	-27.77	29.5	-57.27	189	Face off

Qp - Quasi-Peak detector

8.3. TX SPURIOUS EMISSION 30 TO 1000 MHz, EUT WITH AC/DC ADAPTER

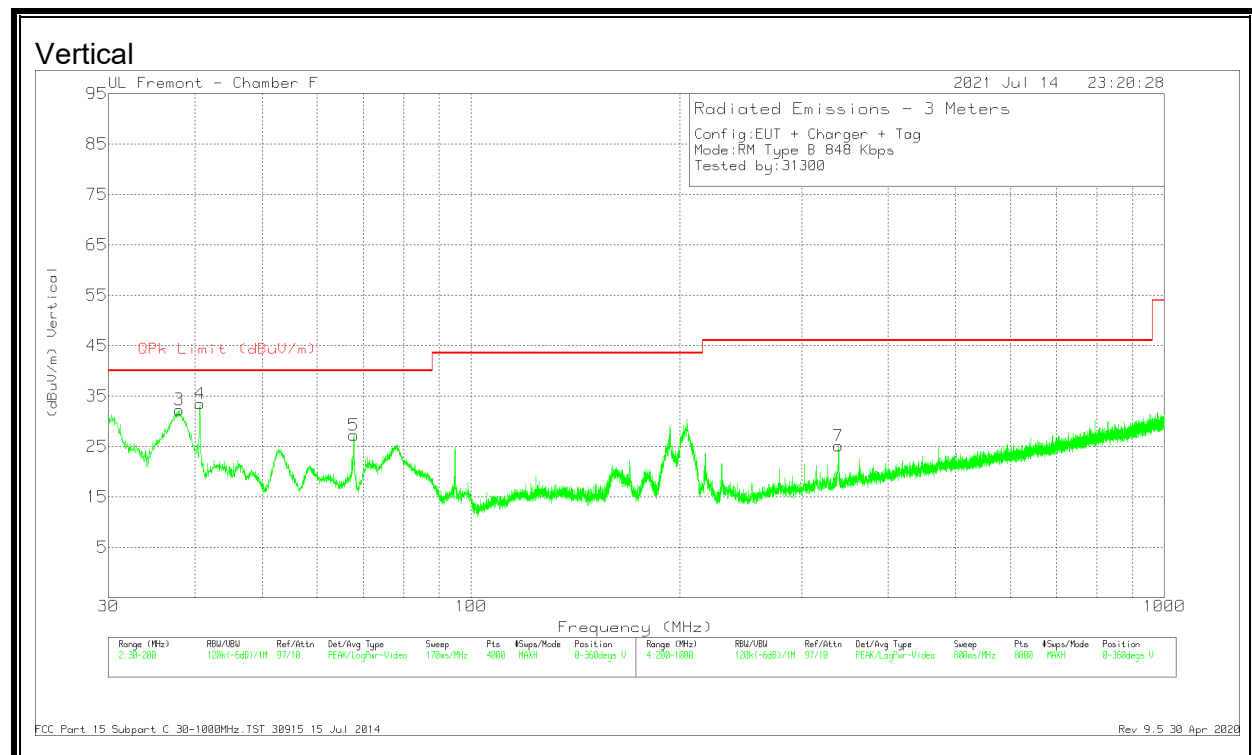
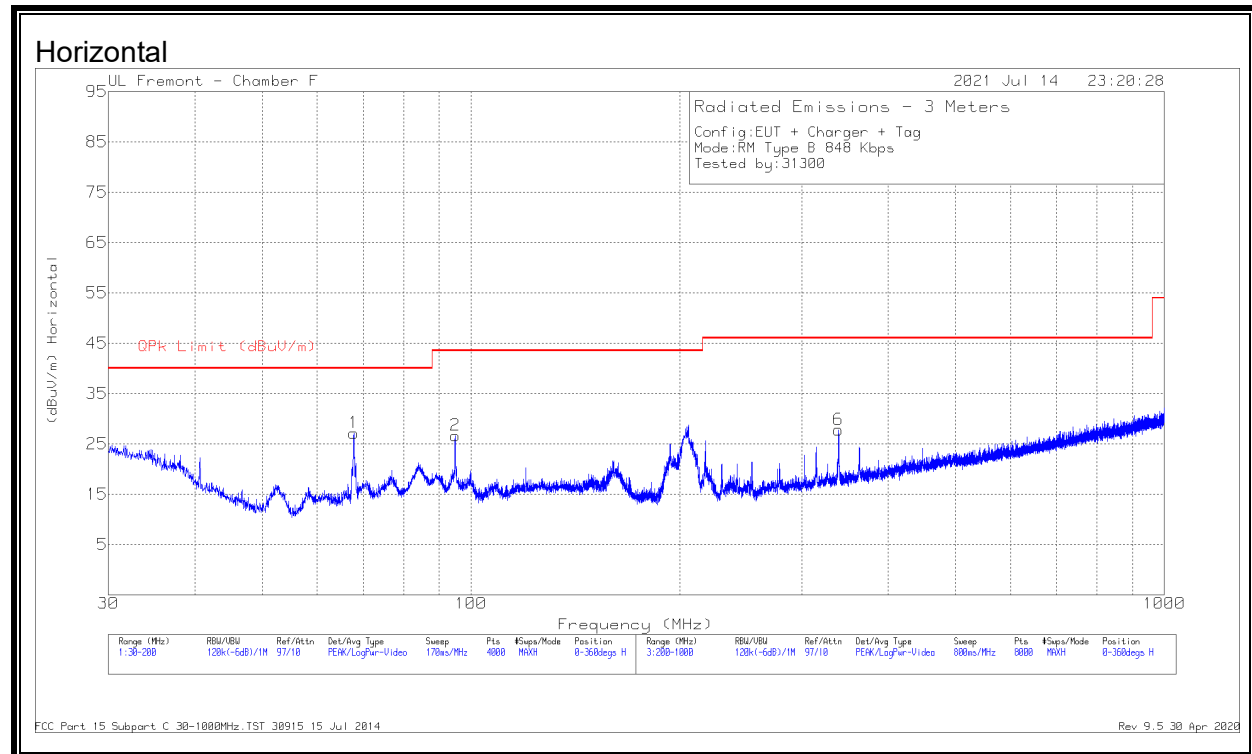
TYPE B (READER MODE), SPURIOUS EMISSION 848Kbps



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF 203089 (dB/m)	Amp Cbl (Db)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.6528	36.17	Qp	25.9	-32.3	29.77	40	-10.23	134	127	V
2	40.6828	39	Qp	19.2	-32.3	25.9	40	-14.1	78	375	H
5	40.6871	46.58	Qp	19.2	-32.3	33.48	40	-6.52	332	103	V
1	67.7957	52.61	Qp	13.9	-32	34.51	40	-5.49	241	256	H
6	67.8029	54.6	Qp	13.9	-32	36.5	40	-3.5	156	105	V
3	120.023	30.5	Qp	19.6	-31.7	18.4	43.52	-25.12	108	228	H

Qp - Quasi-Peak detector

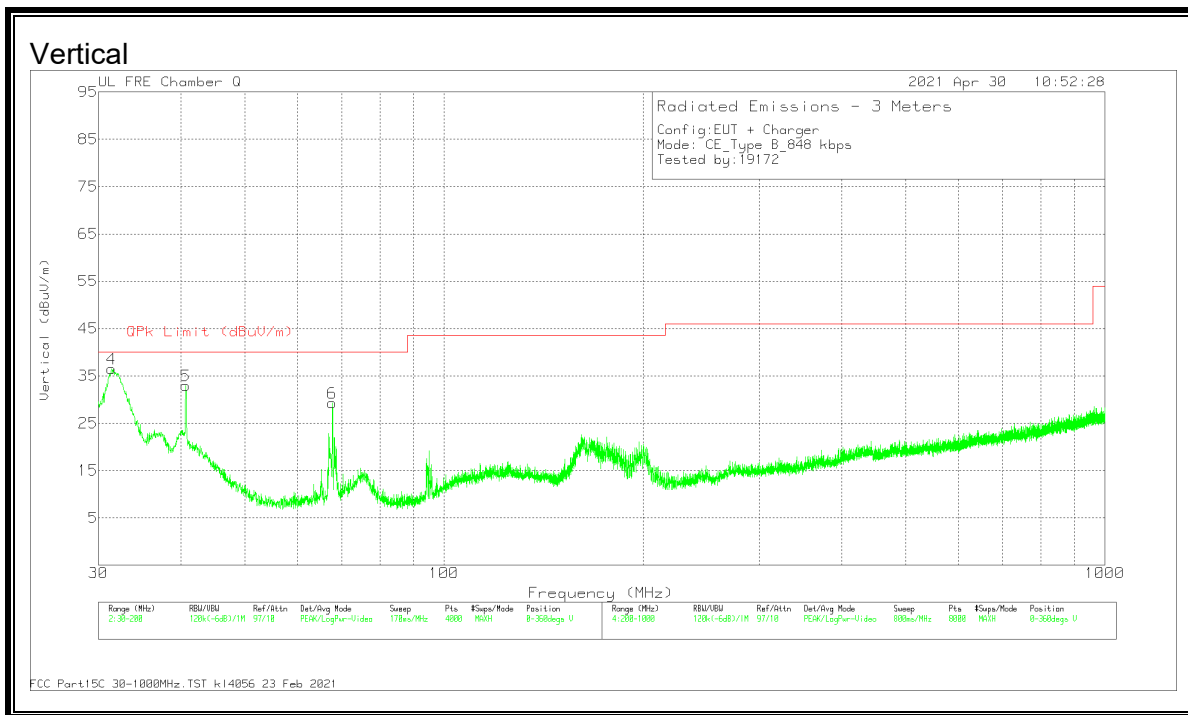
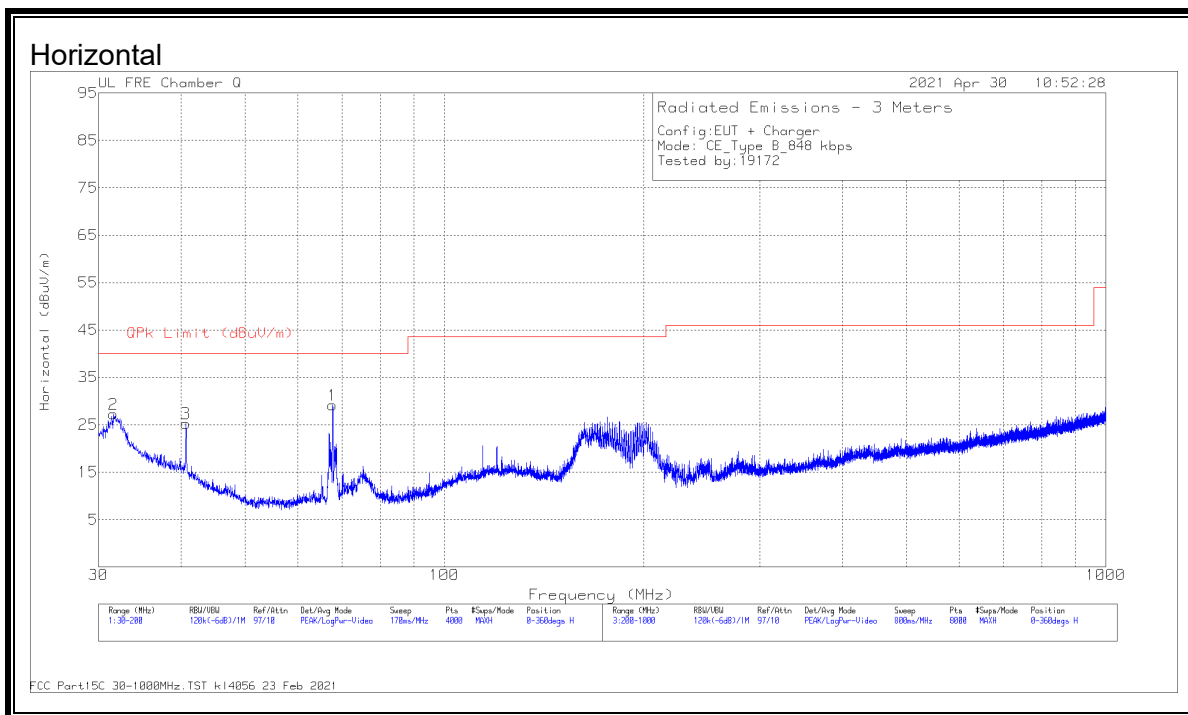
TYPE B (TAG MODE), SPURIOUS EMISSION 848Kbps

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	67.8081	44.08	Qp	14.2	-31.5	26.78	40	-13.22	172	237	H
2	94.9244	42.47	Qp	14.3	-31.2	25.57	43.52	-17.95	161	187	H
3	* 38.1096	36.83	Qp	22.3	-31.8	27.33	40	-12.67	89	107	V
4	40.6823	44.26	Qp	20.4	-31.8	32.86	40	-7.14	44	100	V
5	67.8081	43.42	Qp	14.2	-31.5	26.12	40	-13.88	196	100	V
6	338.8473	34.82	Qp	20.2	-29.7	25.32	46.02	-20.7	11	100	H
7	338.9111	35.23	Qp	20.2	-29.7	25.73	46.02	-20.29	34	140	V

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

Pk - Peak detector

TYPE B (CE Mode)**SPURIOUS EMISSION 848Kbps**

DATA

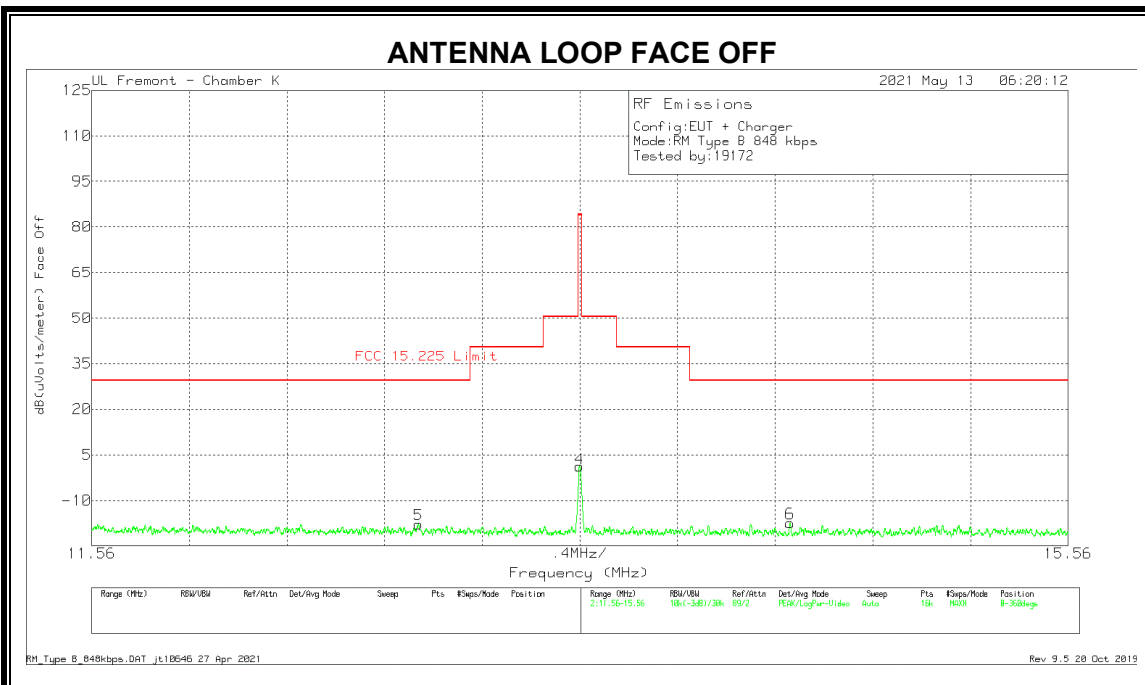
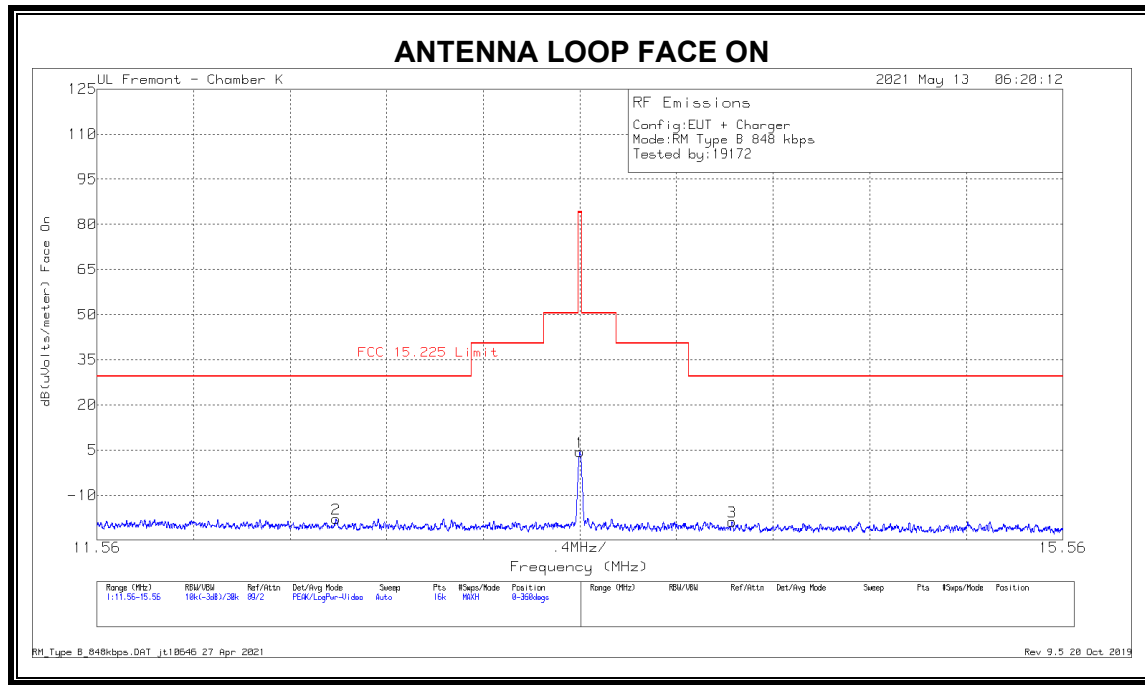
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF 203089 (dB/m)	Amp Cbl (Db)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.3466	28.11	Qp	26.1	-32.3	21.91	40	-18.09	135	288	H
2	31.554	39.07	Qp	26	-32.3	32.77	40	-7.23	176	104	V
3	40.6665	34.11	Qp	19.2	-32.3	21.01	40	-18.99	260	153	H
5	40.6856	44.65	Qp	19.2	-32.3	31.55	40	-8.45	345	104	V
1	67.7952	47.24	Qp	13.9	-32	29.14	40	-10.86	241	292	H
6	67.8014	49.13	Qp	13.9	-32	31.03	40	-8.97	154	109	V

Qp - Quasi-Peak detector

8.4. SECONDARY ANTENNA FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 - 30 MHz), EUT WITH AC/DC ADAPTER

8.4.1. READER MODE, TYPE B 848Kbps

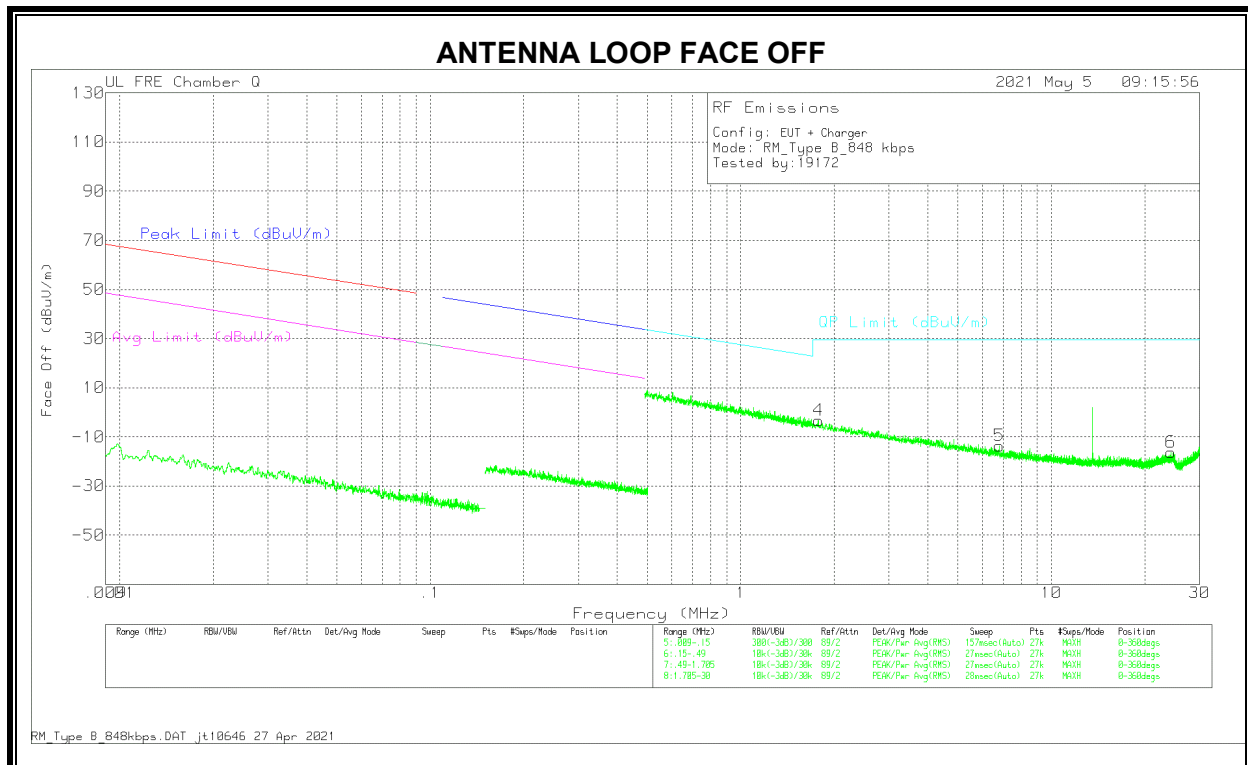
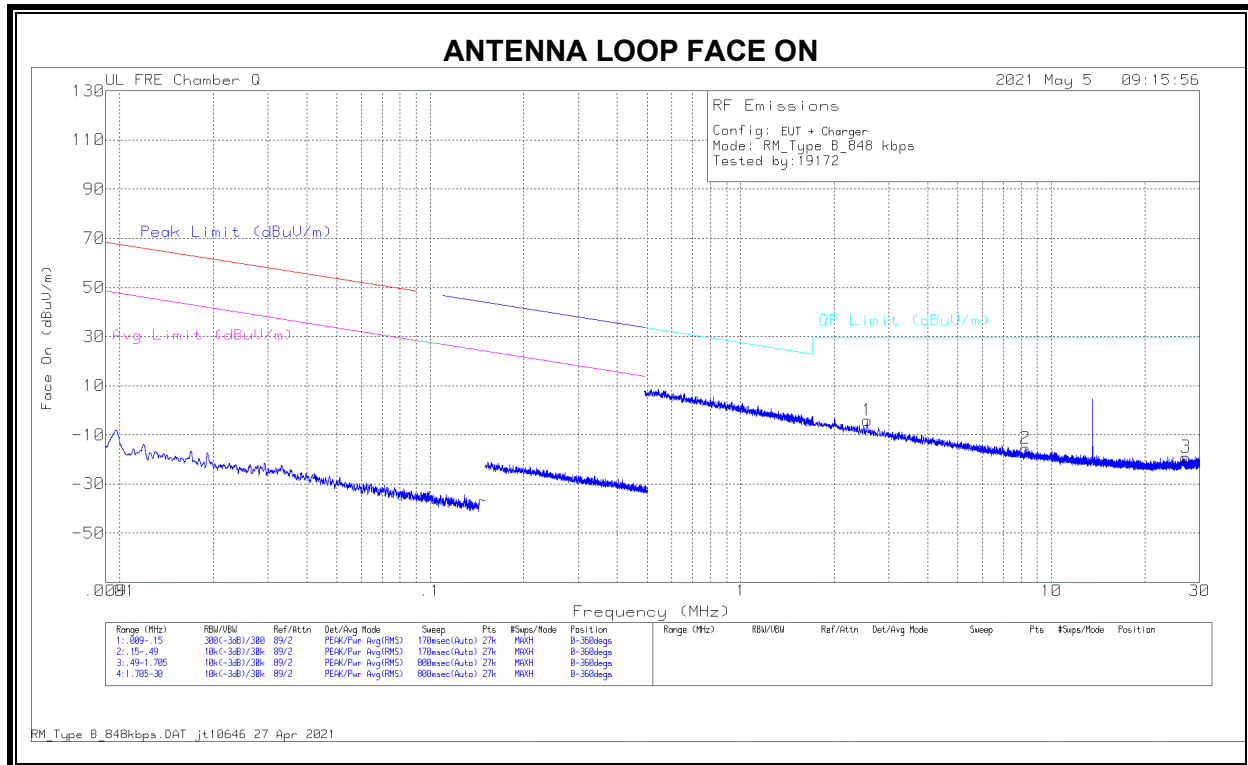
FUNDAMENTAL



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)	Antenna Orientation
4	13.55963	31.47	Pk	10.3	.4	-40	2.17	84	-81.83	0-360	Face off
2	12.55013	11.34	Pk	10.4	.4	-40	-17.86	29.54	-47.4	0-360	Face on
5	12.898	11.38	Pk	10.4	.4	-40	-17.82	29.54	-47.36	0-360	Face off
1	13.55963	33.67	Pk	10.3	.4	-40	4.37	84	-79.63	0-360	Face on
3	14.19	10.48	Pk	10.3	.4	-40	-18.82	29.54	-48.36	0-360	Face on
6	14.42063	11.8	Pk	10.2	.5	-40	-17.5	29.54	-47.04	0-360	Face off

Pk - Peak detector

SPURIOUS EMISSION

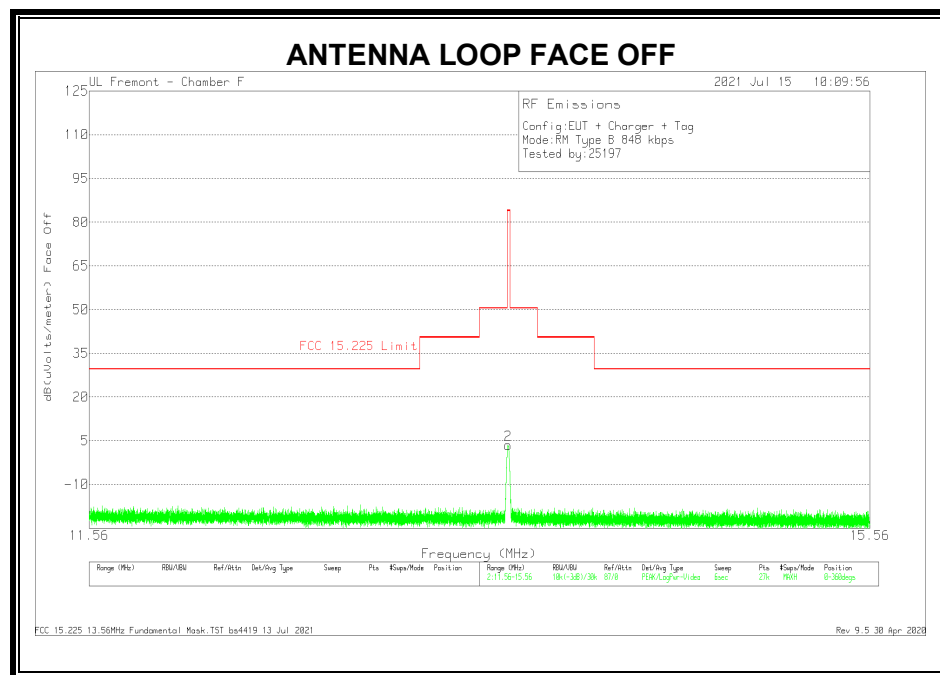
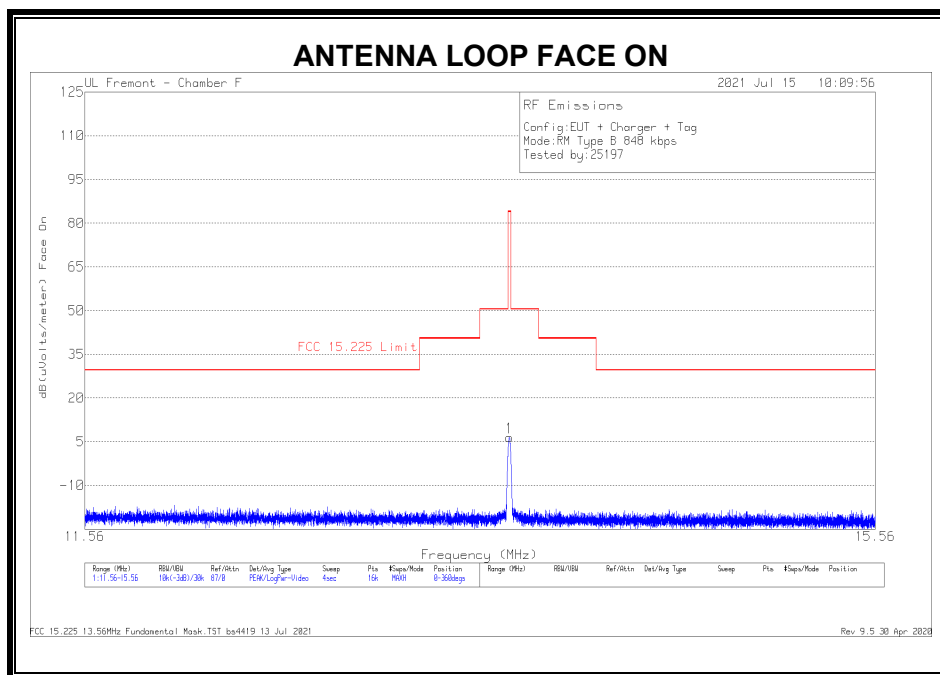
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
4	1.77553	17.81	Qp	10.8	.1	-40	-11.29	29.5	-40.79	133	Face off
1	2.55334	14.12	Qp	10.8	.2	-40	-14.88	29.5	-44.38	146	Face on
5	6.80052	5.21	Qp	10.8	.3	-40	-23.69	29.5	-53.19	63	Face off
2	8.23667	3.67	Qp	10.7	.3	-40	-25.33	29.5	-54.83	4	Face on
6	24.2952	1.91	Qp	8.9	.6	-40	-28.59	29.5	-58.09	300	Face off
3	27.1182	1.35	Qp	8.4	.6	-40	-29.65	29.5	-59.15	190	Face on

Qp - Quasi-Peak detector

8.4.2. TAG MODE, TYPE B 848Kbps

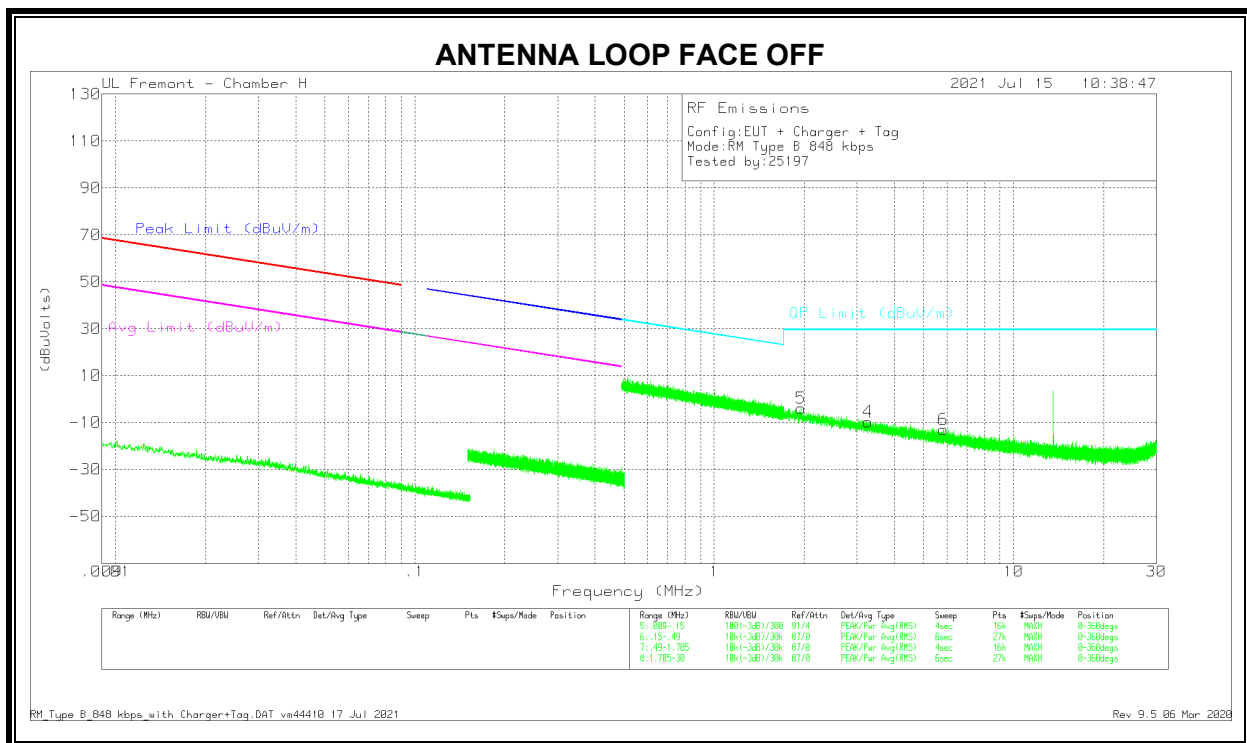
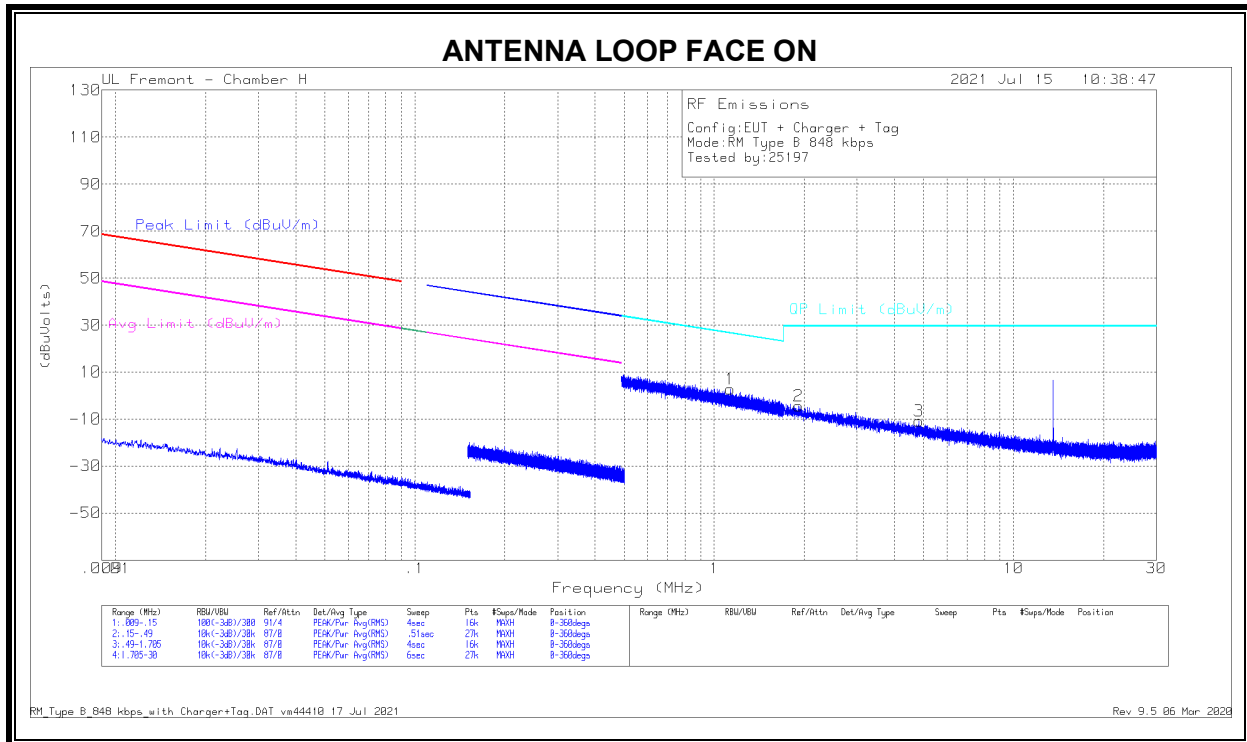
FUNDAMENTAL



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	35.47	Pk	10.7	.4	-40	6.57	84	-77.43	0-360	Face On
2	13.55874	32.39	Pk	10.7	.4	-40	3.49	84	-80.51	0-360	Face Off

Pk - Peak detector

SPURIOUS EMISSION

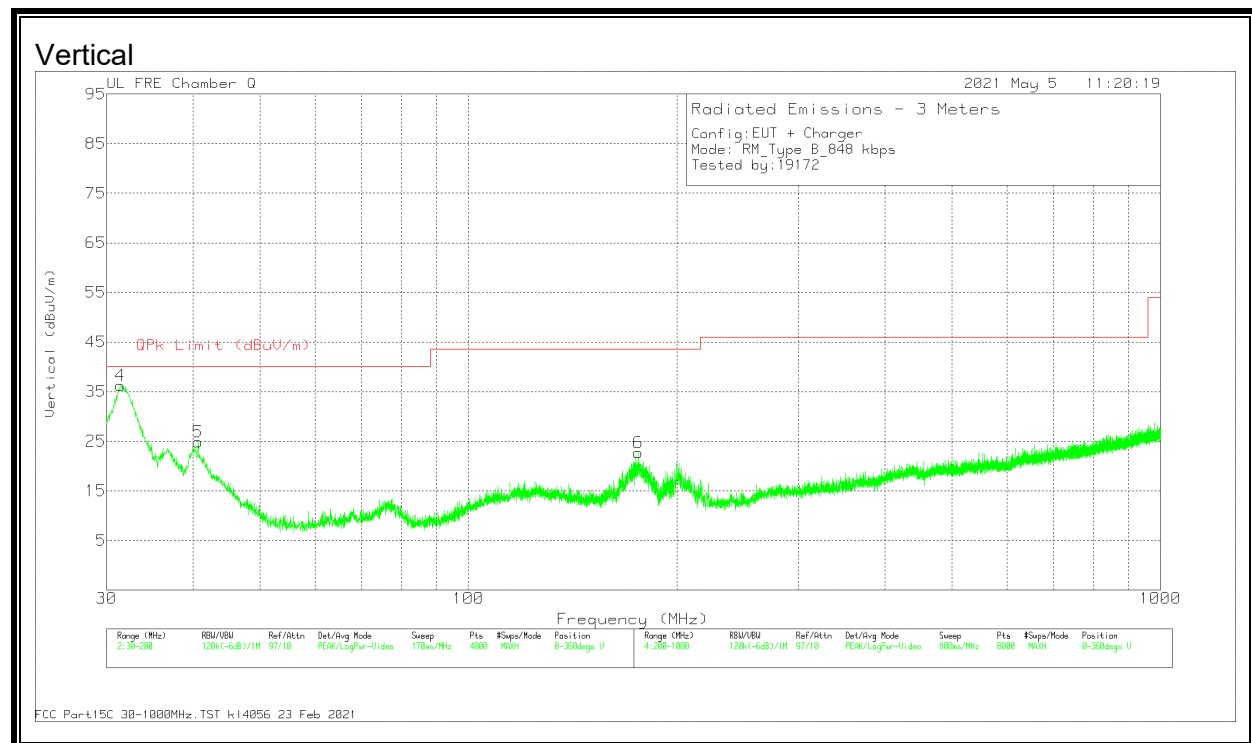
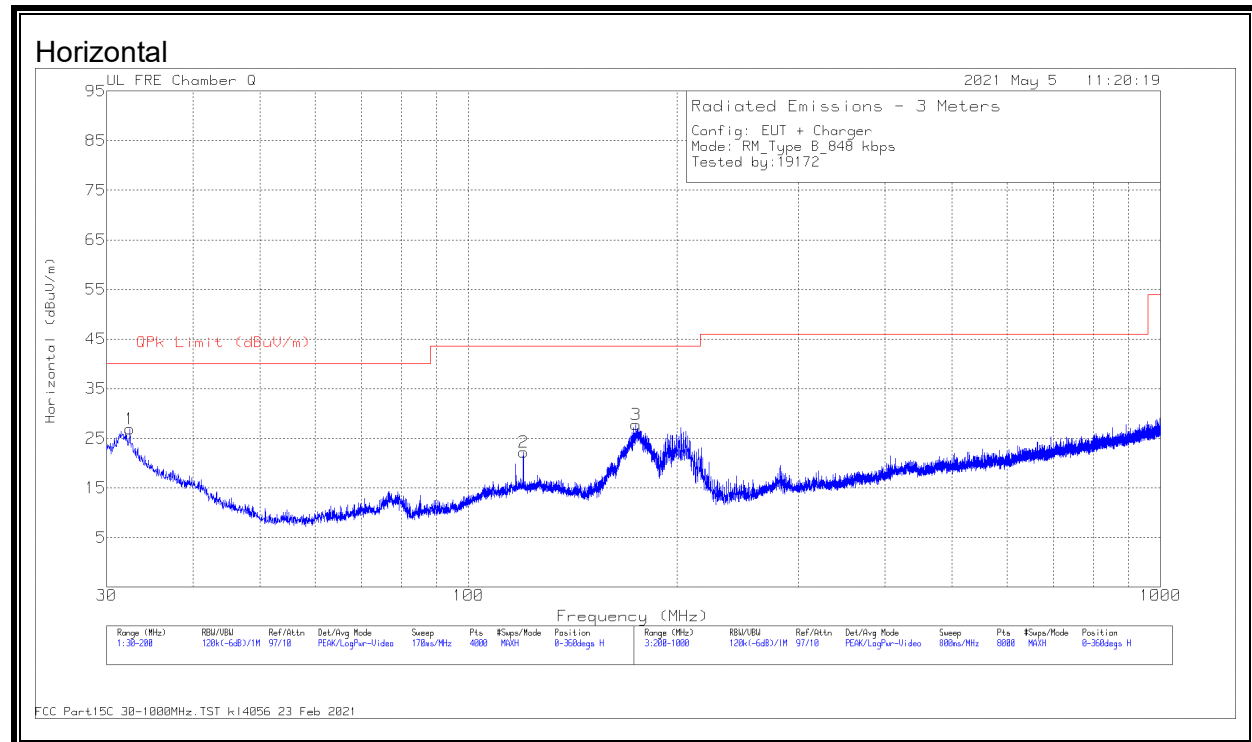
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Correct ed Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	1.13182	31.25	Pk	11.5	.1	-40	2.85	26.55	-23.7	0-360	Face On
2	1.91355	24.1	Pk	11.4	.2	-40	-4.3	29.5	-33.8	0-360	Face On
5	1.95338	24.43	Pk	11.4	.2	-40	-3.97	29.5	-33.47	0-360	Face Off
4	3.26547	18.77	Pk	11.4	.2	-40	-9.63	29.5	-39.13	0-360	Face Off
3	4.81966	17.58	Pk	11.3	.2	-40	-10.92	29.5	-40.42	0-360	Face On
6	5.83622	15.58	Pk	11.2	.3	-40	-12.92	29.5	-42.42	0-360	Face Off

Pk - Peak detector

8.4.3. TX SPURIOUS EMISSION 30 TO 1000 MHz, EUT WITH AC/DC ADAPTER

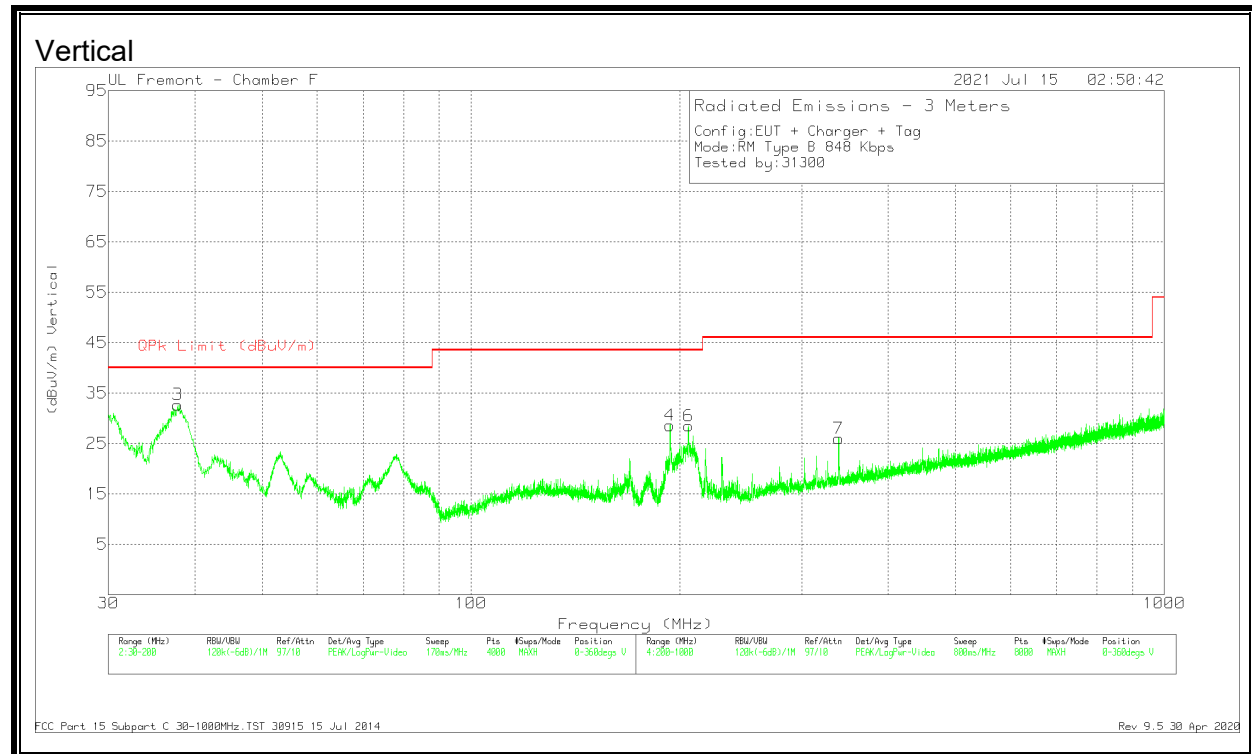
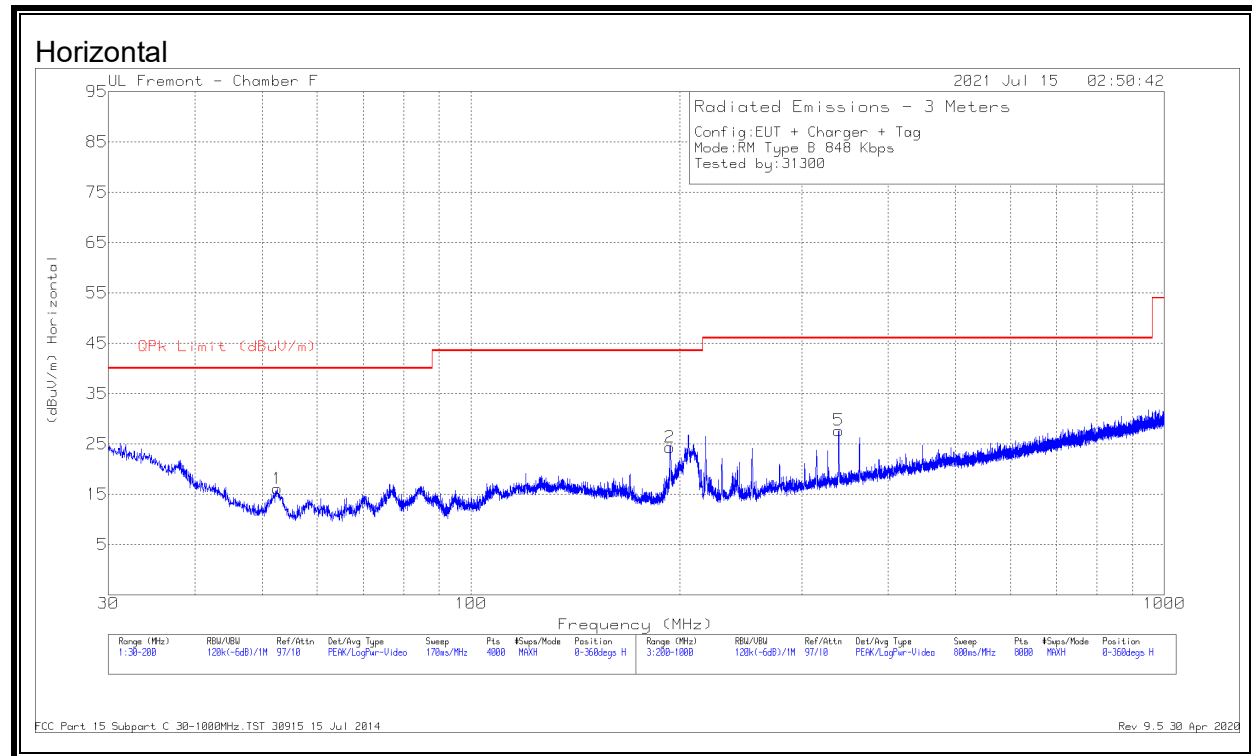
Type B (READER MODE), SPURIOUS EMISSION 848Kbps



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF 203089 (dB/m)	Amp Cbl (Db)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.4955	39.04	Qp	26	-32.3	32.74	40	-7.26	203	101	V
1	32.1905	28.4	Qp	25.5	-32.3	21.6	40	-18.4	110	327	H
5	40.6713	32.78	Qp	19.2	-32.3	19.68	40	-20.32	88	104	V
2	120.0228	32.12	Qp	19.6	-31.7	20.02	43.52	-23.5	114	169	H
3	174.7687	37.82	Qp	17.2	-31.4	23.62	43.52	-19.9	123	125	H
6	175.7008	31.96	Qp	17.1	-31.4	17.66	43.52	-25.86	136	106	V

Qp - Quasi-Peak detector

Type B (TAG MODE), SPURIOUS EMISSION 848Kbps

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	52.6159	34.5	Pk	13.3	-31.7	16.1	40	-23.9	0-360	400	H
2	193.7099	37.31	Pk	17.4	-30.4	24.31	43.52	-19.21	0-360	99	H
3	* 37.7795	41.87	Pk	22.6	-31.8	32.67	40	-7.33	0-360	100	V
4	193.7524	41.57	Pk	17.4	-30.4	28.57	43.52	-14.95	0-360	100	V
5	339.2181	37.17	Pk	20.2	-29.7	27.67	46.02	-18.35	0-360	99	H
6	206.0008	41.78	Pk	17.1	-30.4	28.48	43.52	-15.04	0-360	99	V
7	339.2181	35.48	Pk	20.2	-29.7	25.98	46.02	-20.04	0-360	201	V

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

Pk - 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:	38602	Date:	05/05/2021
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9.1. PRIMARY ANTENNA

READER MODE, TYPE B 848Kbps

848Kbps

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	13.55981129	5.452	13.55980687	5.778	13.55980039	6.256	13.55979674	6.525	± 100
	40	13.55983698	3.558	13.55983316	3.839	13.55982768	4.243	13.55982014	4.800	± 100
	30	13.55985833	1.983	13.55985135	2.498	13.5598489	2.679	13.55984604	2.890	± 100
	20	13.55988522	0.000	13.55988679	-0.116	13.55989021	-0.368	13.55988083	0.324	± 100
	10	13.55990332	-1.335	13.55991101	-1.902	13.55991584	-2.258	13.55991937	-2.518	± 100
	0	13.55992783	-3.142	13.55993289	-3.516	13.55993601	-3.746	13.5599411	-4.121	± 100
	-10	13.55995289	-4.991	13.55995682	-5.280	13.55996044	-5.547	13.55996236	-5.689	± 100
	-20	13.55997818	-6.855	13.55998915	-7.665	13.55999508	-8.102	13.55999888	-8.382	± 100
3.23	20	13.55989186	-0.489	13.55989135	-0.452	13.5598881	-0.213	13.55990065	-1.138	± 100
4.37	20	13.55988046	0.351	13.55988154	0.271	13.5598703	1.100	13.55988107	0.306	± 100

CE MODE, TYPE B 848Kbps

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	13.55981977	5.346	13.55981472	5.718	13.55981262	5.873	13.55980543	6.403	± 100
	40	13.55984366	3.584	13.55983521	4.207	13.55982865	4.691	13.55982717	4.800	± 100
	30	13.55986853	1.750	13.55986101	2.304	13.55985592	2.680	13.55985299	2.896	± 100
	20	13.55989226	0.000	13.55989208	0.013	13.55989668	-0.326	13.5598867	0.410	± 100
	10	13.55991766	-1.873	13.55992342	-2.298	13.55993188	-2.922	13.55993912	-3.456	± 100
	0	13.55993942	-3.478	13.55994643	-3.995	13.55995419	-4.567	13.55995788	-4.839	± 100
	-10	13.55995386	-4.543	13.55995974	-4.977	13.55996557	-5.406	13.55996853	-5.625	± 100
	-20	13.55998829	-7.082	13.56000001	-7.946	13.56000509	-8.321	13.56000953	-8.648	± 100
3.23	20	13.5598953	-0.224	13.5599034	-0.822	13.55990752	-1.125	13.55990687	-1.078	± 100
4.37	20	13.55988298	0.685	13.55987846	1.017	13.55988329	0.662	13.55987753	1.086	± 100

9.2. SECONDARY ANTENNA

READER MODE, TYPE B 848Kbps

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	13.55987323	4.693	13.55986416	5.362	13.55985903	5.740	13.55985504	6.035	± 100
	40	13.55989407	3.156	13.55988705	3.674	13.55988203	4.044	13.55987961	4.223	± 100
	30	13.55991785	1.402	13.55991353	1.721	13.55990867	2.080	13.55990132	2.622	± 100
	20	13.55993687	0.000	13.55993567	0.088	13.55993258	0.316	13.55994109	-0.312	± 100
	10	13.55995739	-1.513	13.55996112	-1.789	13.55996364	-1.975	13.55997005	-2.447	± 100
	0	13.5599719	-2.584	13.55998009	-3.188	13.55998777	-3.754	13.55999374	-4.194	± 100
	-10	13.55998519	-3.563	13.55998717	-3.709	13.55999437	-4.240	13.55999978	-4.639	± 100
	-20	13.56001804	-5.986	13.56002176	-6.261	13.56002354	-6.392	13.56002635	-6.599	± 100
3.23	20	13.55994959	-0.938	13.55995558	-1.380	13.55994878	-0.879	13.55994861	-0.866	± 100
4.37	20	13.5599203	1.222	13.55993043	0.475	13.55992597	0.804	13.55992875	0.599	± 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:

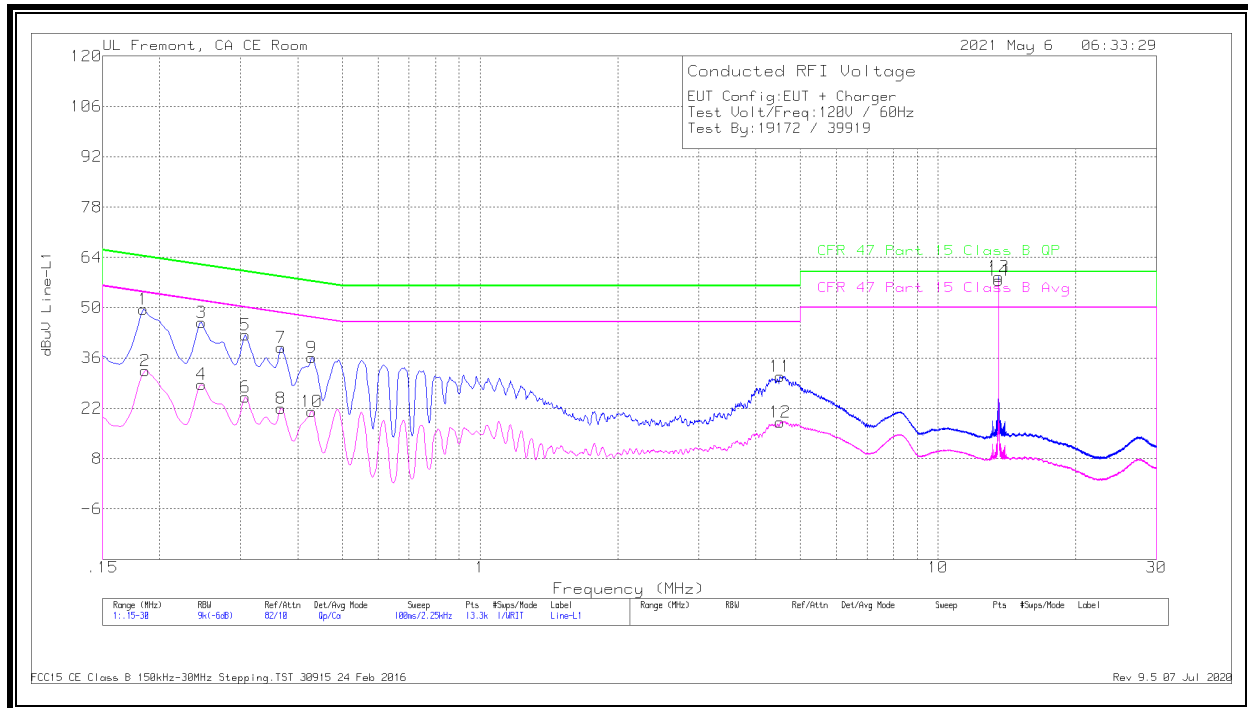
1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

TEST PROCEDURE

ANSI C63.10:2013

RESULTS

No non-compliance noted:

10.1. PRIMARY ANTENNA**10.1.1. READER MODE, NORMAL OPERATION****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	.18375	39.49	Qp	0	0	10.1	49.59	64.31	-14.72	-	-
2	.186	22.33	Ca	0	0	10.1	32.43	-	-	54.21	-21.78
3	.24675	35.78	Qp	0	0	10.1	45.88	61.87	-15.99	-	-
4	.24675	18.6	Ca	0	0	10.1	28.7	-	-	51.87	-23.17
5	.3075	32.33	Qp	0	0	10.1	42.43	60.04	-17.61	-	-
6	.3075	15.03	Ca	0	0	10.1	25.13	-	-	50.04	-24.91
7	.36825	28.8	Qp	0	0	10.1	38.9	58.54	-19.64	-	-
8	.36825	11.9	Ca	0	0	10.1	22	-	-	48.54	-26.54
9	.429	25.98	Qp	0	0	10.1	36.08	57.27	-21.19	-	-
10	.429	11.06	Ca	0	0	10.1	21.16	-	-	47.27	-26.11
11	4.51838	20.63	Qp	0	.1	10.2	30.93	56	-25.07	-	-
12	4.52738	7.81	Ca	0	.1	10.2	18.11	-	-	46	-27.89
13	13.56	48.13	Qp	.1	.2	10.2	58.63	60	-1.37	-	-
14	13.56	47.14	Ca	.1	.2	10.2	57.64	-	-	50	7.64

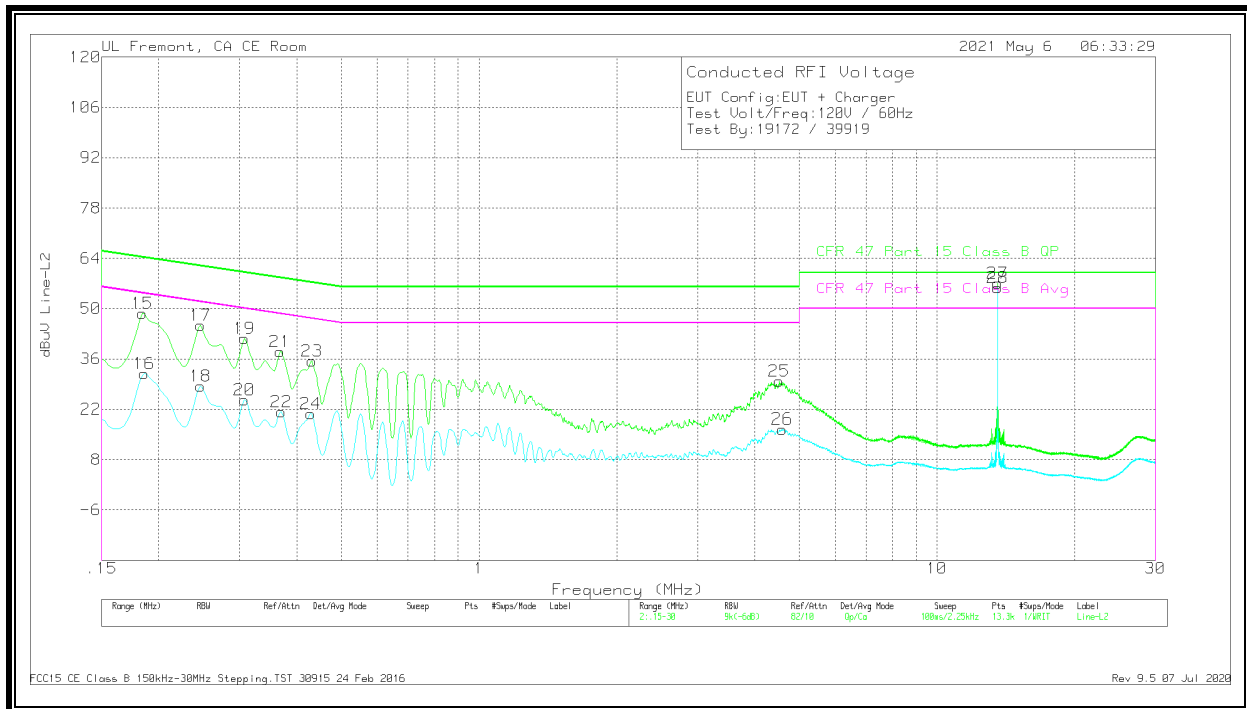
Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

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)Margin (dB)
15	.18375	38.65	Qp	0	0	10.1	48.75	64.31	-15.56	-	-
16	.186	21.85	Ca	0	0	10.1	31.95	-	-	54.21	-22.26
17	.24675	35.2	Qp	0	0	10.1	45.3	61.87	-16.57	-	-
18	.24675	18.27	Ca	0	0	10.1	28.37	-	-	51.87	-23.5
19	.3075	31.6	Qp	0	0	10.1	41.7	60.04	-18.34	-	-
20	.3075	14.53	Ca	0	0	10.1	24.63	-	-	50.04	-25.41
21	.36825	27.97	Qp	0	0	10.1	38.07	58.54	-20.47	-	-
22	.3705	11.13	Ca	0	0	10.1	21.23	-	-	48.49	-27.26
23	.43125	25.25	Qp	0	0	10.1	35.35	57.23	-21.88	-	-
24	.429	10.73	Ca	0	0	10.1	20.83	-	-	47.27	-26.44
25	4.52175	19.51	Qp	0	.1	10.2	29.81	56	-26.19	-	-
26	4.58925	6.19	Ca	0	.1	10.2	16.49	-	-	46	-29.51
27	13.56	46.55	Qp	.1	.2	10.2	57.05	60	-2.95	-	-
28	13.56	45.4	Ca	.1	.2	10.2	55.9	-	-	50	5.9

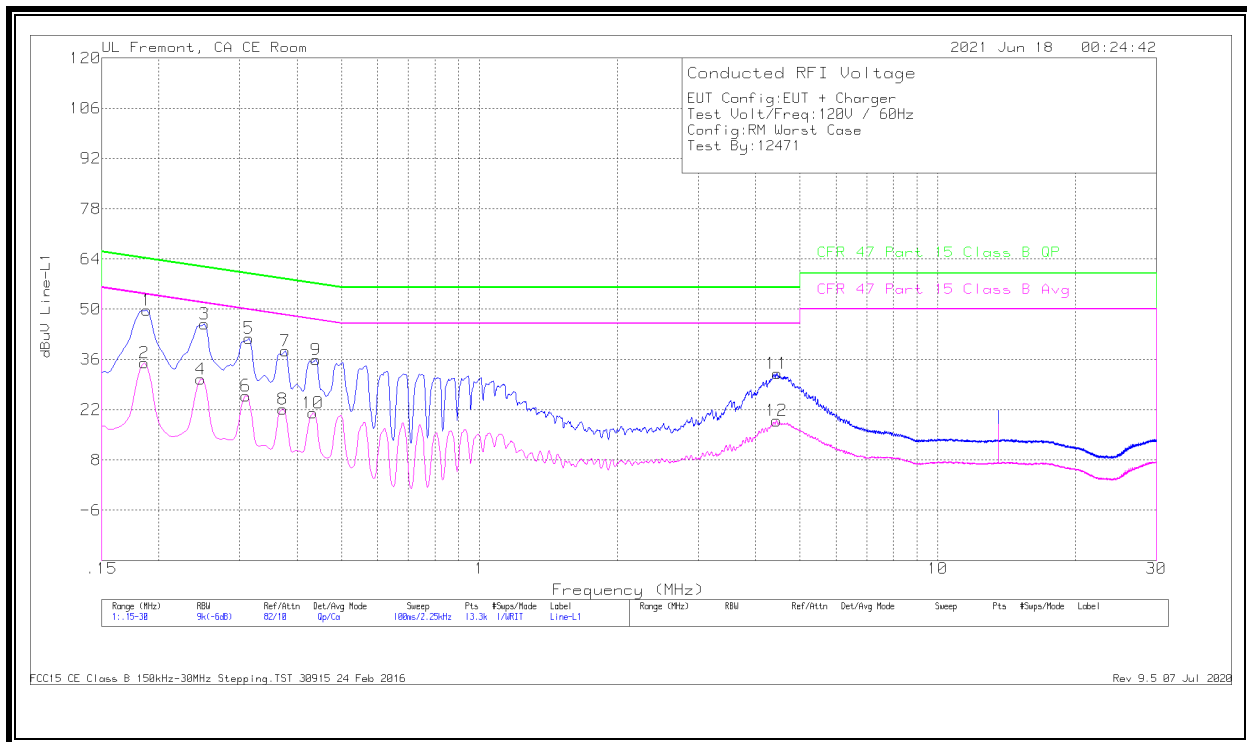
Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

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.

NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 848Kbps**LINE 1 RESULTS****Worst Emission****Range 1: Line-L1 .15 - 30MHz**

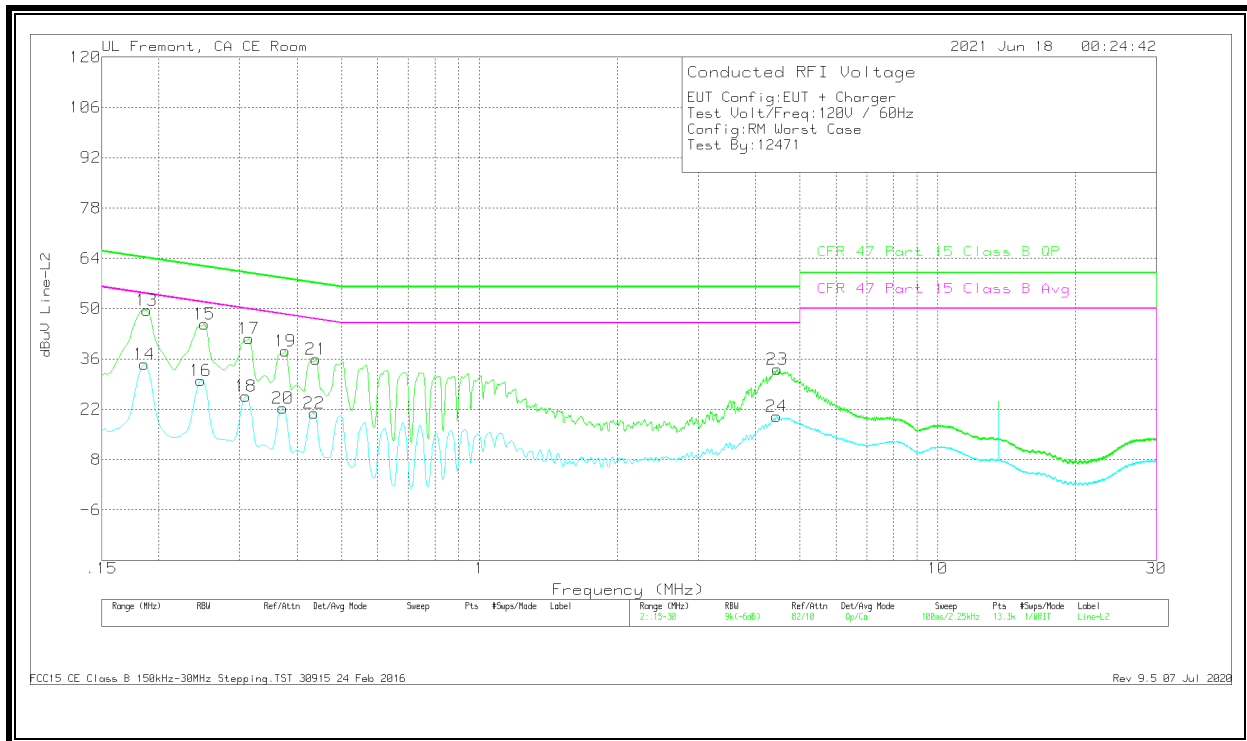
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.18825	40.37	Qp	0	0	9.4	49.77	64.11	-14.34	-	-
2	.186	25.64	Ca	0	0	9.4	35.04	-	-	54.21	-19.17
3	.25125	36.63	Qp	0	0	9.3	45.93	61.72	-15.79	-	-
4	.24675	21.27	Ca	0	0	9.3	30.57	-	-	51.87	-21.3
5	.31425	32.66	Qp	0	0	9.3	41.96	59.86	-17.9	-	-
6	.30975	16.61	Ca	0	0	9.3	25.91	-	-	49.98	-24.07
7	.37725	29.03	Qp	0	0	9.3	38.33	58.34	-20.01	-	-
8	.37275	12.93	Ca	0	0	9.3	22.23	-	-	48.44	-26.21
9	.44025	26.6	Qp	0	0	9.3	35.9	57.06	-21.16	-	-
10	.4335	11.75	Ca	0	0	9.3	21.05	-	-	47.19	-26.14
11	4.45875	22.76	Qp	0	.1	9.3	32.16	56	-23.84	-	-
12	4.44525	9.54	Ca	0	.1	9.3	18.94	-	-	46	-27.06

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

LINE 2 RESULTS**Worst Emission****Range 2: Line-L2 .15 - 30MHz**

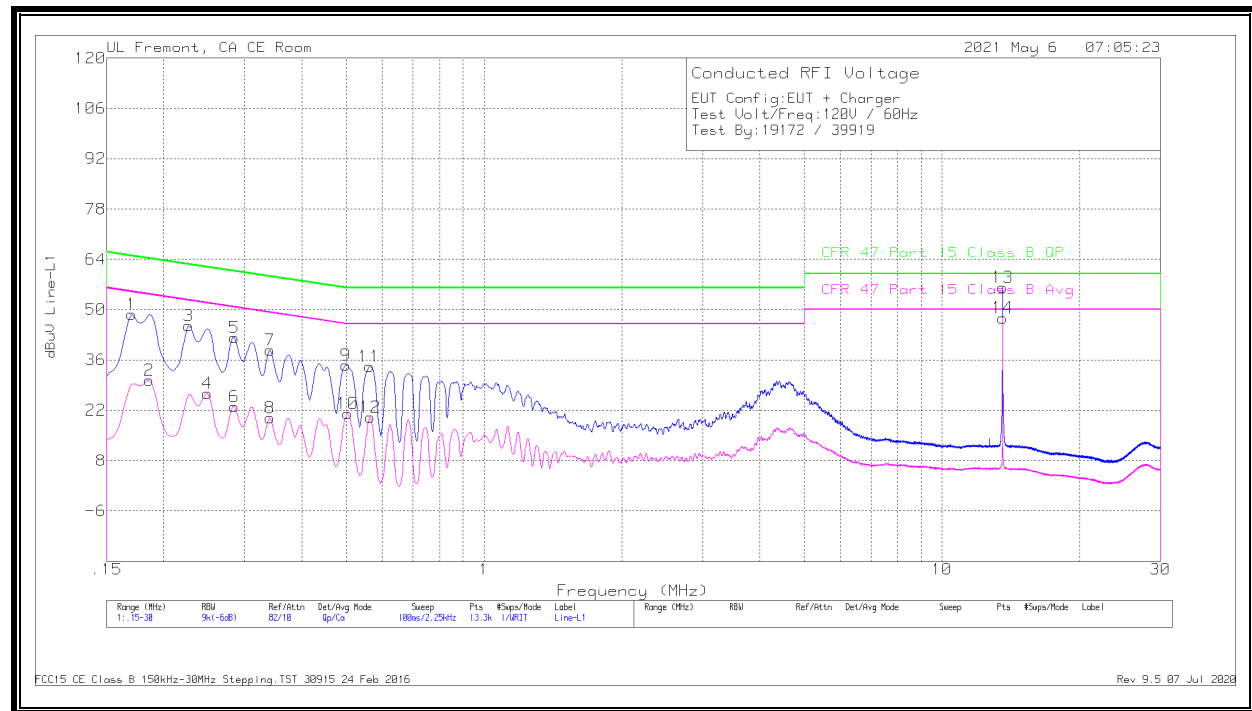
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
13	.18825	40.09	Qp	0	0	9.4	49.49	64.11	-14.62	-	-
14	.186	25.12	Ca	0	0	9.4	34.52	-	-	54.21	-19.69
15	.25125	36.37	Qp	0	0	9.3	45.67	61.72	-16.05	-	-
16	.24675	20.78	Ca	0	0	9.3	30.08	-	-	51.87	-21.79
17	.31425	32.48	Qp	0	0	9.3	41.78	59.86	-18.08	-	-
18	.30975	16.29	Ca	0	0	9.3	25.59	-	-	49.98	-24.39
19	.37725	28.96	Qp	0	0	9.3	38.26	58.34	-20.08	-	-
20	.37275	13	Ca	0	0	9.3	22.3	-	-	48.44	-26.14
21	.44025	26.6	Qp	0	0	9.3	35.9	57.06	-21.16	-	-
22	.43575	11.69	Ca	0	0	9.3	20.99	-	-	47.14	-26.15
23	4.461	23.71	Qp	0	.1	9.3	33.11	56	-22.89	-	-
24	4.44975	10.69	Ca	0	.1	9.3	20.09	-	-	46	-25.91

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

10.1.2. CE Mode, TYPE B 848Kbps**NORMAL OPERATION****LINE 1 RESULTS****Worst Emission****Range 1: Line-L1 15 - 30MHz**

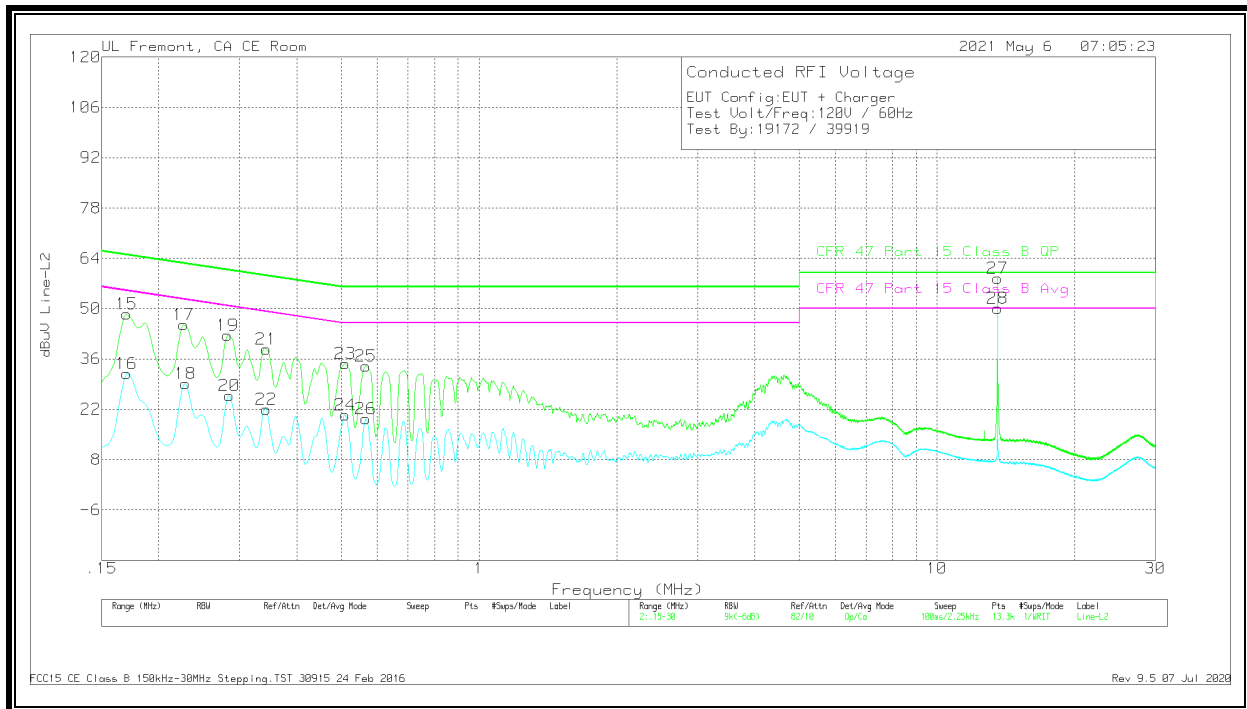
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
1	.17025	38.58	Qp	0	0	10.1	48.68	64.95	-16.27	-	-
2	.186	20.24	Ca	0	0	10.1	30.34	-	-	54.21	-23.87
3	.2265	35.37	Qp	0	0	10.1	45.47	62.58	-17.11	-	-
4	.249	16.52	Ca	0	0	10.1	26.62	-	-	51.79	-25.17
5	.285	32.18	Qp	0	0	10.1	42.28	60.67	-18.39	-	-
6	.285	13.01	Ca	0	0	10.1	23.11	-	-	50.67	-27.56
7	.34125	28.61	Qp	0	0	10.1	38.71	59.17	-20.46	-	-
8	.34125	9.74	Ca	0	0	10.1	19.84	-	-	49.17	-29.33
9	.49875	24.46	Qp	0	0	10.1	34.56	56.02	-21.46	-	-
10	.50325	10.99	Ca	0	0	10.1	21.09	-	-	46	-24.91
11	.56175	24.07	Qp	0	0	10.1	34.17	56	-21.83	-	-
12	.564	10.01	Ca	0	0	10.1	20.11	-	-	46	-25.89
13	13.56	45.66	Qp	.1	.2	10.2	56.16	60	-3.84	-	-
14	13.56	37.22	Ca	.1	.2	10.2	47.72	-	-	50	-2.28

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016
Rev 9.5 07 Jul 2020

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)Margin (dB)
15	.17025	38.36	Qp	0	0	10.1	48.46	64.95	-16.49	-	-
16	.17025	21.85	Ca	0	0	10.1	31.95	-	-	54.95	-23
17	.2265	35.39	Qp	0	0	10.1	45.49	62.58	-17.09	-	-
18	.22875	18.98	Ca	0	0	10.1	29.08	-	-	52.49	-23.41
19	.28275	32.42	Qp	0	0	10.1	42.52	60.73	-18.21	-	-
20	.285	15.74	Ca	0	0	10.1	25.84	-	-	50.67	-24.83
21	.3435	28.58	Qp	0	0	10.1	38.68	59.12	-20.44	-	-
22	.3435	11.89	Ca	0	0	10.1	21.99	-	-	49.12	-27.13
23	.51	24.61	Qp	0	0	10.1	34.71	56	-21.29	-	-
24	.51	10.39	Ca	0	0	10.1	20.49	-	-	46	-25.51
25	.56625	23.88	Qp	0	0	10.1	33.98	56	-22.02	-	-
26	.56625	9.22	Ca	0	0	10.1	19.32	-	-	46	-26.68
27	13.56	47.93	Qp	.1	.2	10.2	58.43	60	-1.57	-	-
28	13.56	39.57	Ca	.1	.2	10.2	50.07	-	-	50	.07

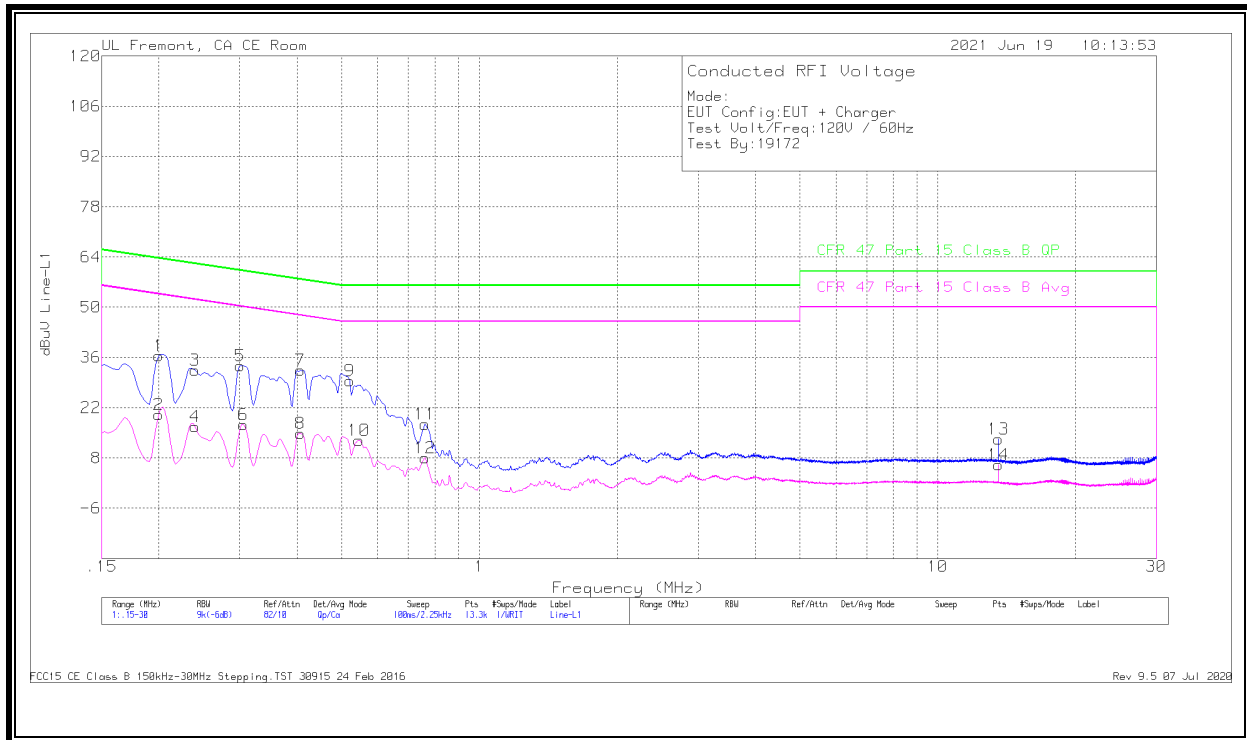
Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

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.

NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 848Kbps**LINE 1 RESULTS****Worst Emission****Range 1: Line-L1 .15 - 30MHz**

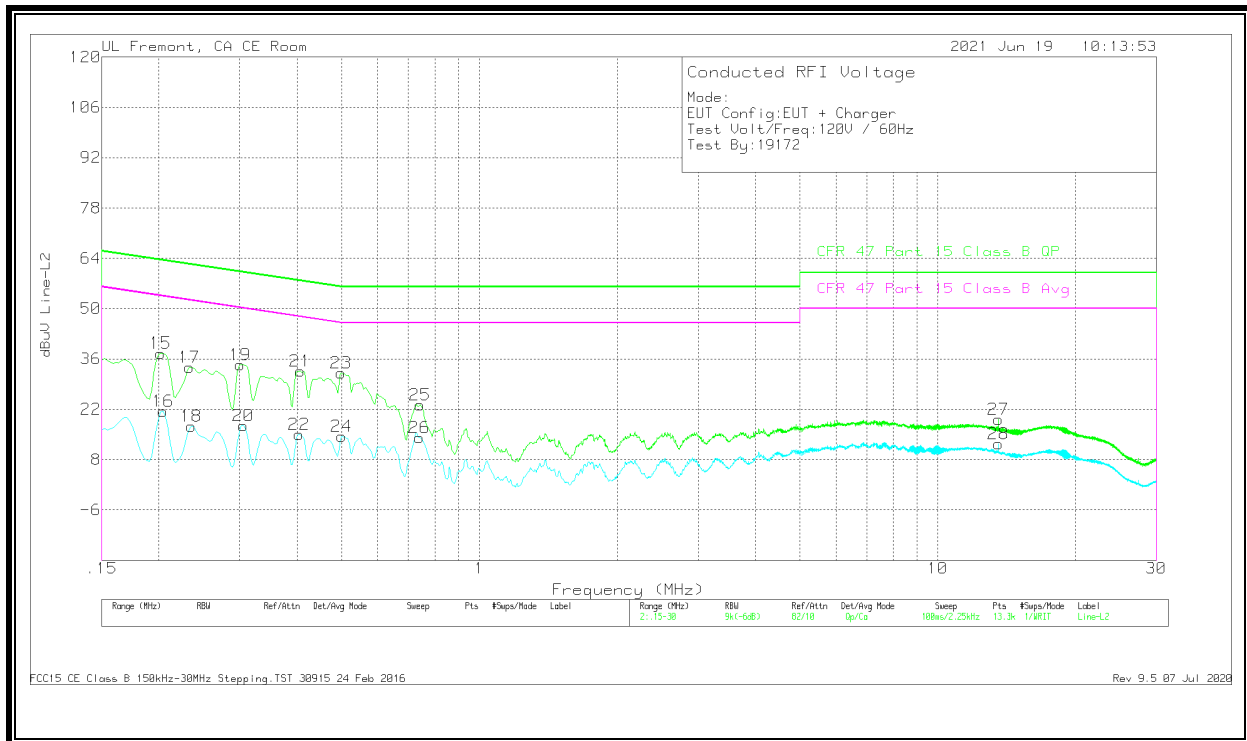
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.1995	27.16	Qp	0	0	9.3	36.46	63.63	-27.17	-	-
2	.1995	10.71	Ca	0	0	9.3	20.01	-	-	53.63	-33.62
3	.24	23.23	Qp	0	0	9.3	32.53	62.1	-29.57	-	-
4	.24	7.45	Ca	0	0	9.3	16.75	-	-	52.1	-35.35
5	.30075	24.36	Qp	0	0	9.3	33.66	60.22	-26.56	-	-
6	.30525	7.96	Ca	0	0	9.3	17.26	-	-	50.1	-32.84
7	.4065	23.09	Qp	0	0	9.3	32.39	57.72	-25.33	-	-
8	.4065	5.49	Ca	0	0	9.3	14.79	-	-	47.72	-32.93
9	.52125	20.26	Qp	0	0	9.3	29.56	56	-26.44	-	-
10	.546	3.65	Ca	0	0	9.3	12.95	-	-	46	-33.05
11	.762	7.97	Qp	0	.1	9.3	17.37	56	-38.63	-	-
12	.76088	-1.31	Ca	0	.1	9.3	8.09	-	-	46	-37.91
13	13.56	3.67	Qp	.1	.2	9.3	13.27	60	-46.73	-	-
14	13.56	-3.41	Ca	.1	.2	9.3	6.19	-	-	50	-43.81

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

LINE 2 RESULTS**Worst Emission****Range 2: Line-L2 .15 - 30MHz**

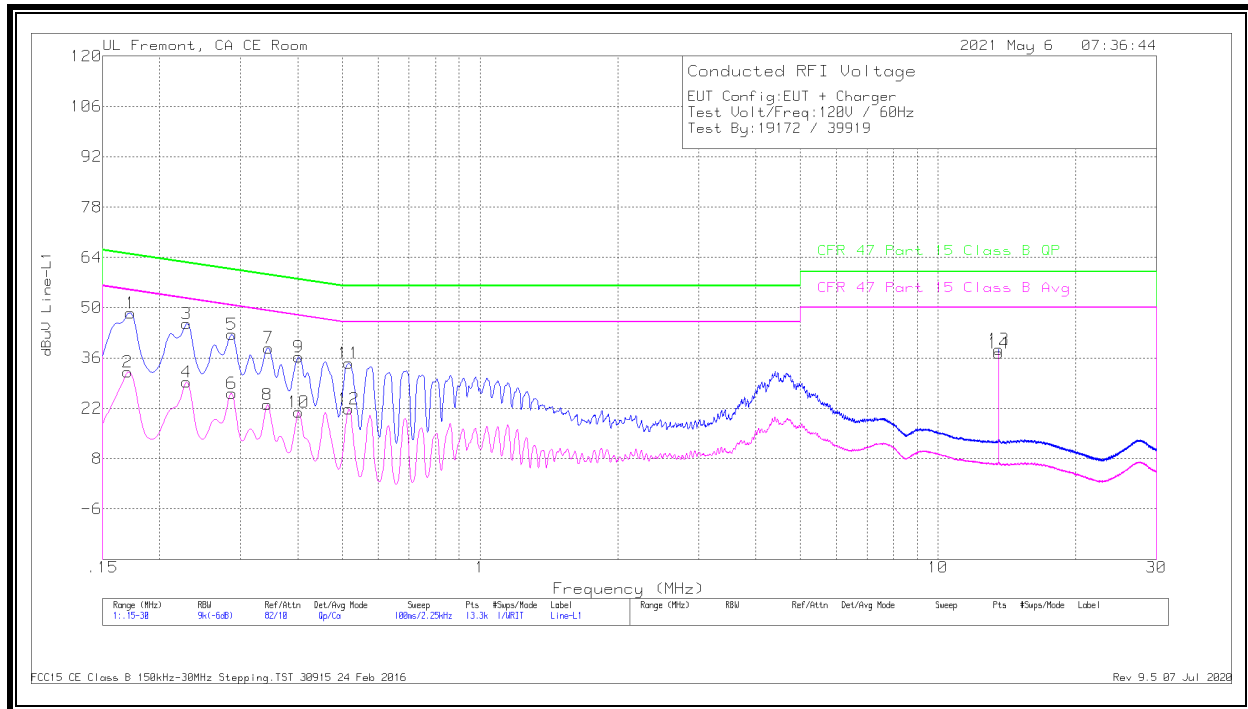
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
15	.20175	28.3	Qp	0	0	9.3	37.6	63.54	-25.94	-	-
16	.204	12.2	Ca	0	0	9.3	21.5	-	-	53.45	-31.95
17	.23325	24.39	Qp	0	0	9.3	33.69	62.33	-28.64	-	-
18	.2355	8	Ca	0	0	9.3	17.3	-	-	52.25	-34.95
19	.30075	25.14	Qp	0	0	9.3	34.44	60.22	-25.78	-	-
20	.30525	8.18	Ca	0	0	9.3	17.48	-	-	50.1	-32.62
21	.4065	23.26	Qp	0	0	9.3	32.56	57.72	-25.16	-	-
22	.40425	5.7	Ca	0	0	9.3	15	-	-	47.77	-32.77
23	.49875	22.76	Qp	0	0	9.3	32.06	56.02	-23.96	-	-
24	.501	5.2	Ca	0	0	9.3	14.5	-	-	46	-31.5
25	.74175	13.9	Qp	0	0	9.3	23.2	56	-32.8	-	-
26	.7395	4.79	Ca	0	0	9.3	14.09	-	-	46	-31.91
27	13.56	9.6	Qp	.1	.2	9.3	19.2	60	-40.8	-	-
28	13.56	2.77	Ca	.1	.2	9.3	12.37	-	-	50	-37.63

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

10.2. SECONDARY ANTENNA**10.2.1. READER MODE, NORMAL OPERATION****LINE 1 RESULTS****Worst Emission****Range 1: Line-L1 .15 - 30MHz**

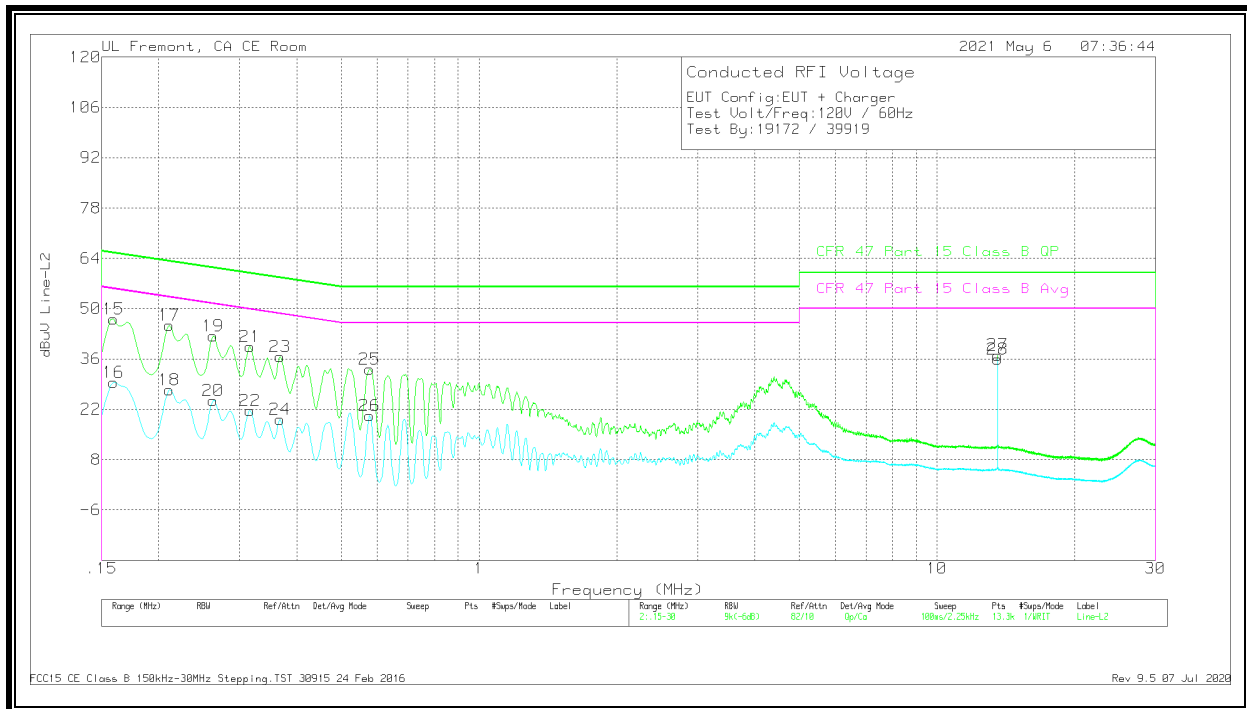
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
1	.1725	38.44	Qp	0	0	10.1	48.54	64.84	-16.3	-	-
2	.17025	22.02	Ca	0	0	10.1	32.12	-	-	54.95	-22.83
3	.22875	35.43	Qp	0	0	10.1	45.53	62.49	-16.96	-	-
4	.22875	19.28	Ca	0	0	10.1	29.38	-	-	52.49	-23.11
5	.28725	32.41	Qp	0	0	10.1	42.51	60.6	-18.09	-	-
6	.28725	16.02	Ca	0	0	10.1	26.12	-	-	50.6	-24.48
7	.34575	28.72	Qp	0	0	10.1	38.82	59.06	-20.24	-	-
8	.3435	12.97	Ca	0	0	10.1	23.07	-	-	49.12	-26.05
9	.402	26.19	Qp	0	0	10.1	36.29	57.81	-21.52	-	-
10	.402	10.89	Ca	0	0	10.1	20.99	-	-	47.81	-26.82
11	.51675	24.45	Qp	0	0	10.1	34.55	56	-21.45	-	-
12	.51675	11.77	Ca	0	0	10.1	21.87	-	-	46	-24.13
13	13.56	27.84	Qp	.1	.2	10.2	38.34	60	-21.66	-	-
14	13.56	26.78	Ca	.1	.2	10.2	37.28	-	-	50	-12.72

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

LINE 2 RESULTS**Worst Emission****Range 2: Line-L2 .15 - 30MHz**

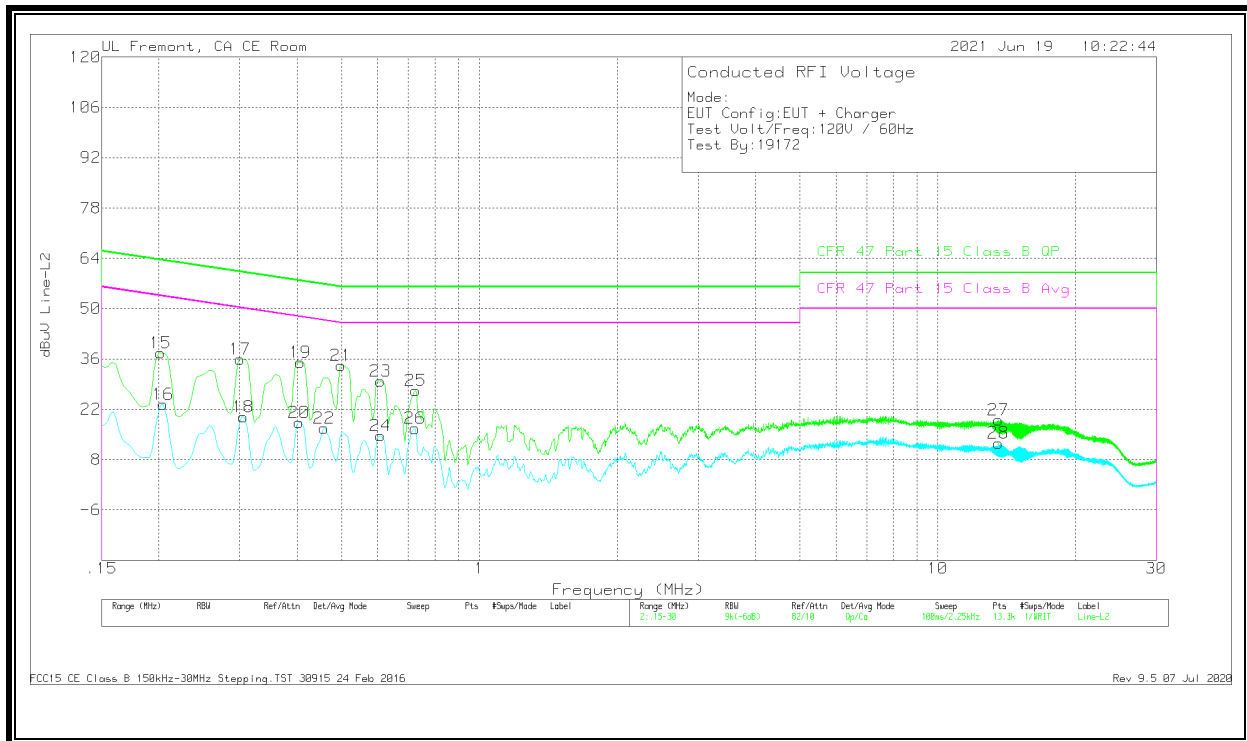
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
15	.159	37.02	Qp	0	0	10.1	47.12	65.52	-18.4	-	-
16	.159	19.44	Ca	0	0	10.1	29.54	-	-	55.52	-25.98
17	.21075	35.23	Qp	0	0	10.1	45.33	63.18	-17.85	-	-
18	.21075	17.27	Ca	0	0	10.1	27.37	-	-	53.18	-25.81
19	.2625	32.35	Qp	0	0	10.1	42.45	61.35	-18.9	-	-
20	.2625	14.3	Ca	0	0	10.1	24.4	-	-	51.35	-26.95
21	.3165	29.34	Qp	0	0	10.1	39.44	59.8	-20.36	-	-
22	.3165	11.54	Ca	0	0	10.1	21.64	-	-	49.8	-28.16
23	.36825	26.58	Qp	0	0	10.1	36.68	58.54	-21.86	-	-
24	.36825	9.05	Ca	0	0	10.1	19.15	-	-	48.54	-29.39
25	.5775	23.1	Qp	0	0	10.1	33.2	56	-22.8	-	-
26	.5775	10.09	Ca	0	0	10.1	20.19	-	-	46	-25.81
27	13.56	26.58	Qp	.1	.2	10.2	37.08	60	-22.92	-	-
28	13.56	25.41	Ca	.1	.2	10.2	35.91	-	-	50	-14.09

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

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)M argin (dB)
15	.20175	28.37	Qp	0	0	9.3	37.67	63.54	-25.87	-	-
16	.204	14.01	Ca	0	0	9.3	23.31	-	-	53.45	-30.14
17	.30075	26.64	Qp	0	0	9.3	35.94	60.22	-24.28	-	-
18	.30525	10.64	Ca	0	0	9.3	19.94	-	-	50.1	-30.16
19	.4065	25.84	Qp	0	0	9.3	35.14	57.72	-22.58	-	-
20	.40425	9.08	Ca	0	0	9.3	18.38	-	-	47.77	-29.39
21	.49875	24.98	Qp	0	0	9.3	34.28	56.02	-21.74	-	-
22	.45825	7.46	Ca	0	0	9.3	16.76	-	-	46.72	-29.96
23	.609	20.57	Qp	0	0	9.3	29.87	56	-26.13	-	-
24	.609	5.32	Ca	0	0	9.3	14.62	-	-	46	-31.38
25	.726	17.9	Qp	0	0	9.3	27.2	56	-28.8	-	-
26	.72375	7.37	Ca	0	0	9.3	16.67	-	-	46	-29.33
27	13.56	9.5	Qp	.1	.2	9.3	19.1	60	-40.9	-	-
28	13.56	3.05	Ca	.1	.2	9.3	12.65	-	-	50	-37.35

Qp - Quasi-Peak detector

Ca - CISPR average detection

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016

Rev 9.5 07 Jul 2020

11. SETUP PHOTOS

Please refer to 13571601-EP1V1 for setup photos

END OF TEST REPORT