



TEST REPORT

Report Number. : 13573771-E12V1

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

Model : A2484 (Parent Model, Full Test)
A2641, A2643, A2644, A2645 (Variant Models)

Brand : APPLE

FCC ID : BCG-E4003A (Parent Model)
BCG-E4005A, BCG-E4035A, BCG-E4036A (Variant Models)

IC : 579C-E4003A (Parent Model)
579C-E4005A, 579C-E4035A, 579C-E4036A (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 30, 2021

Prepared by:

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A2484 (PARENT MODEL)
A2641, A2643, A2644, A2645 (VARIANT MODELS)

BRAND: APPLE

FCC IC: BCG-E4003A (PARENT MODEL)
BCG-E4005A, BCG-E4035A, BCG-E4036A (VARIANT MODELS)

IC ID: 579C-E4003A (PARENT MODEL)
579C-E4005A, 579C-E4035A, 579C-E4036A (VARIANT MODELS)

SERIAL NUMBER: Q7X92R9C06

SAMPLE RECEIPT DATE: MAY 11, 2021

DATE TESTED: MAY 05, 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.

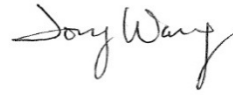
This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This 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:



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, USA	US0104	2324A	208313
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	208313
☒	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 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:

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 Models and FCC/IC ID covered by this report includes:

Parent Model: A2484; FCC ID: BCG-E4003A, IC ID: 579C-E4003A

Variant Models: A2641; FCC ID: BCG-E4005A, IC ID: 579C-E4005A
 A2643; FCC ID: BCG-E4035A, IC ID: 579C-E4035A
 A2644; FCC ID: BCG-E4036A, IC ID: 579C-E4036A
 A2645; FCC ID: BCG-E4036A, IC ID: 579C-E4036A

5.2. MAXIMUM 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	28.22
			Tag	848	26.55
			CE	848	27.71
Secondary	13.56	Type B	Reader	848	2.0
			Tag	848	7.2

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 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.

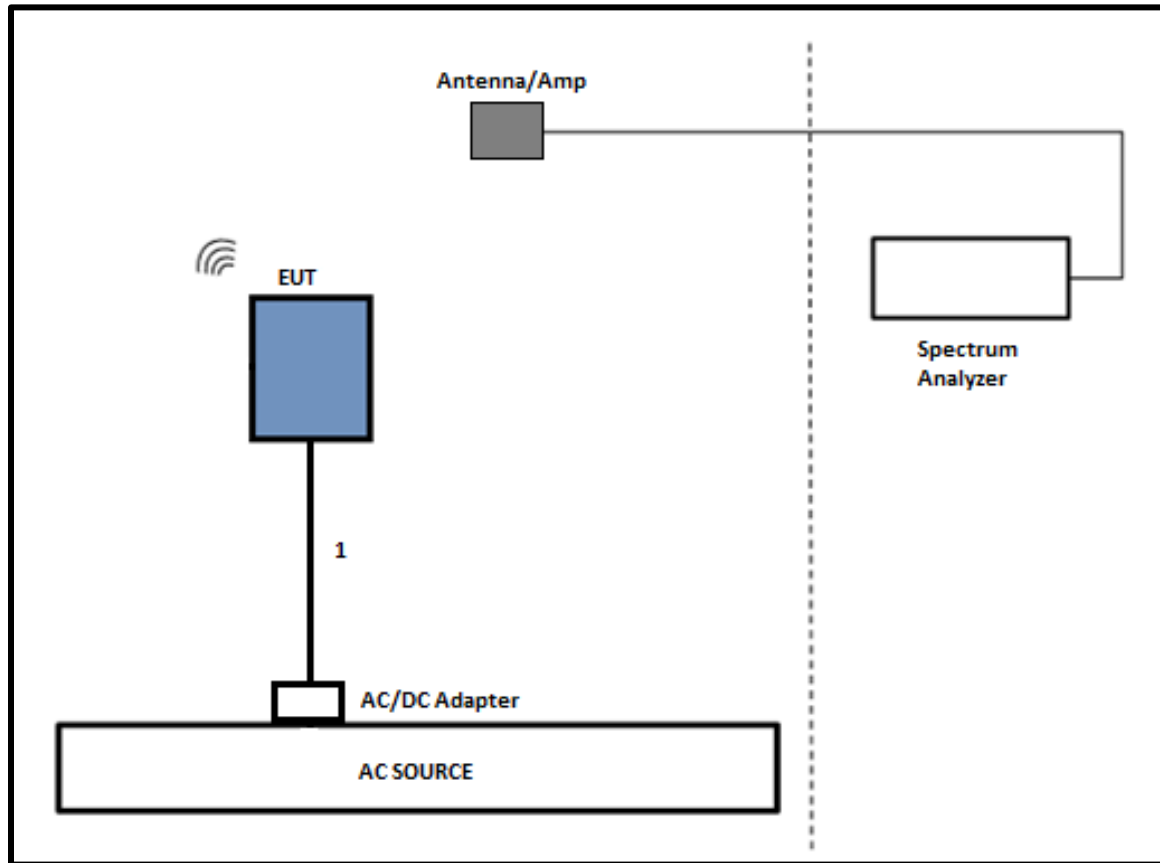
5.4. DESCRIPTION OF TEST SETUP

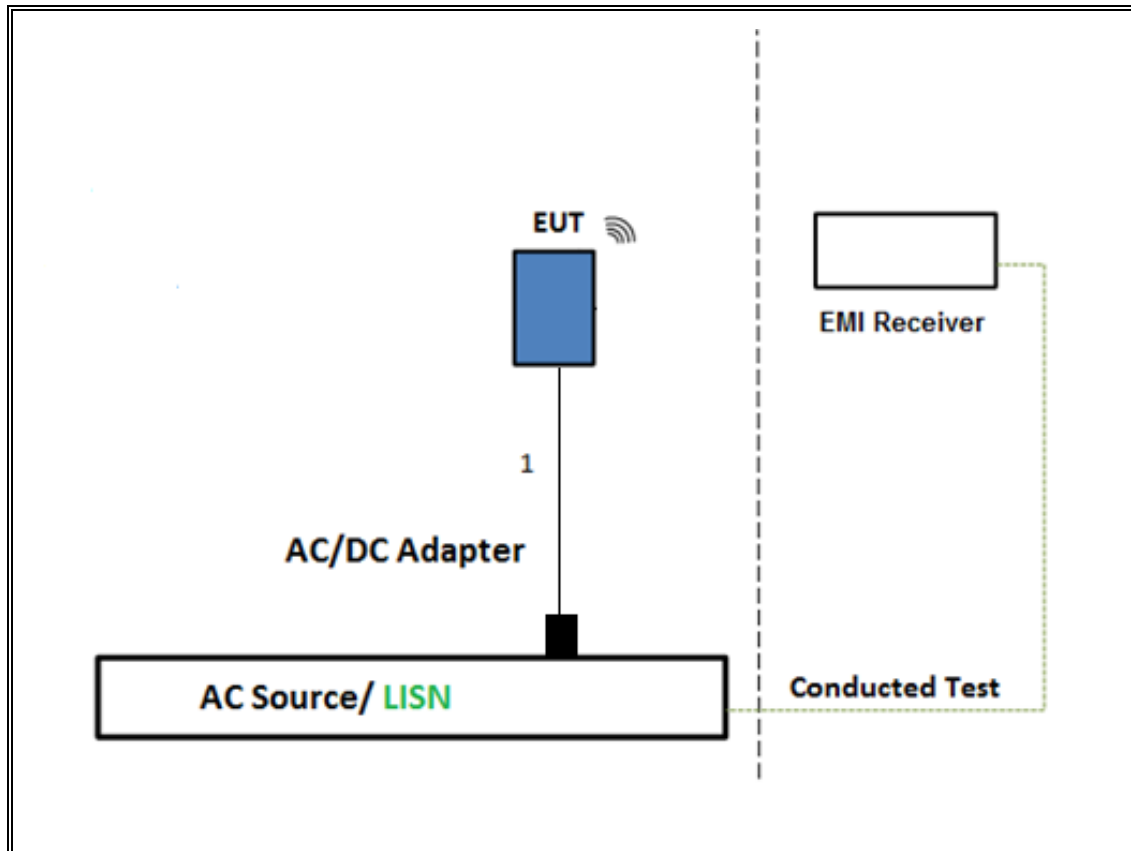
SUPPORT EQUIPMENT

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

TEST SETUP- AC LINE CONDUCTED:

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	01/25/2022	01/25/2021
*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		

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	21.282	25.01

Type B (CE Mode)

Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	21.196	24.89

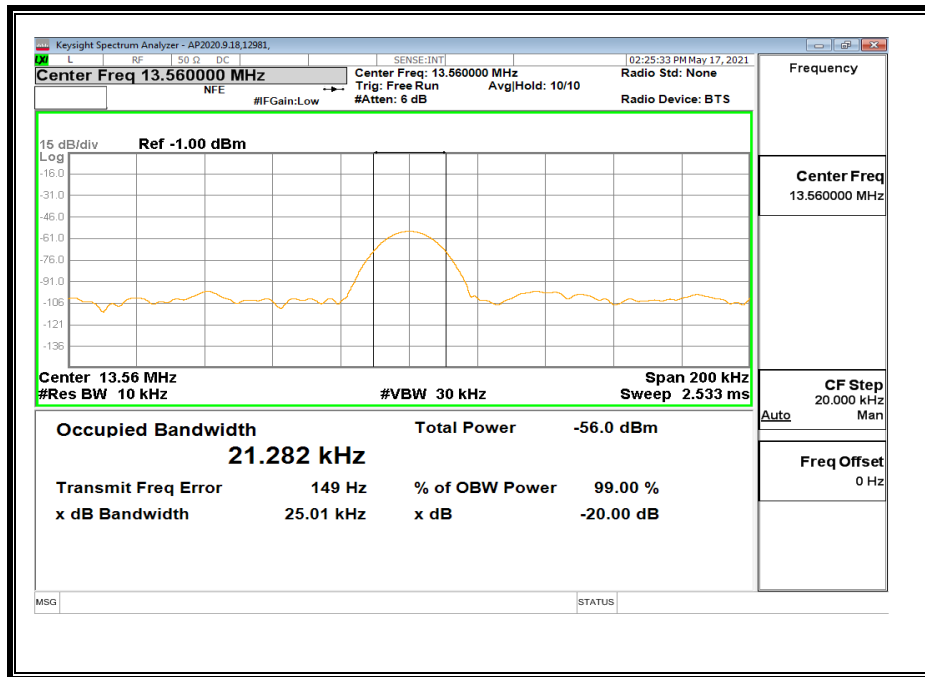
Secondary Antenna

Type B (Reader Mode)

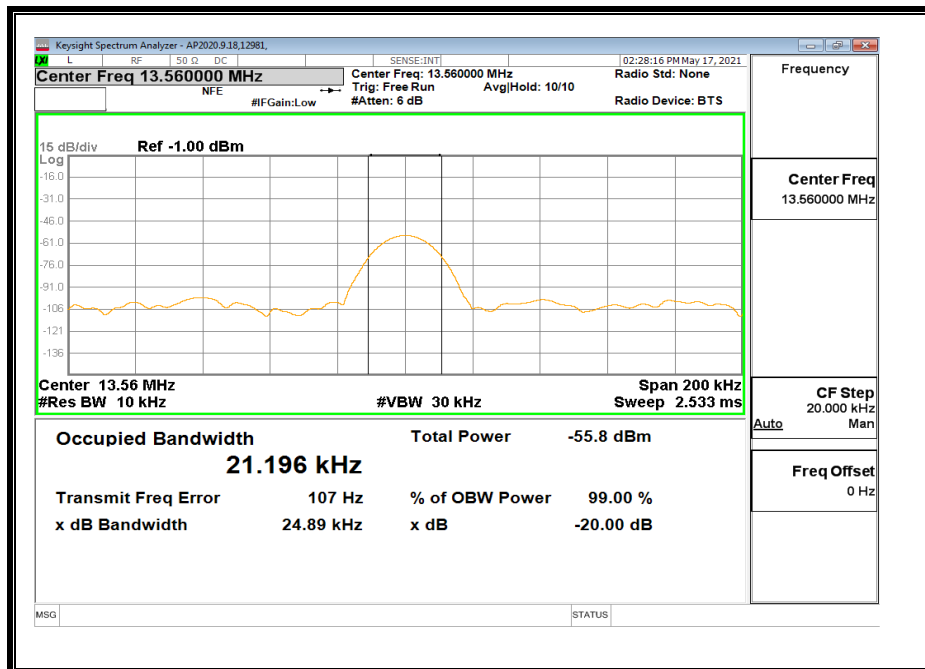
Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	21.276	25.00

7.1. PRIMARY ANTENNA

Reader Mode, Type B 848Kbps

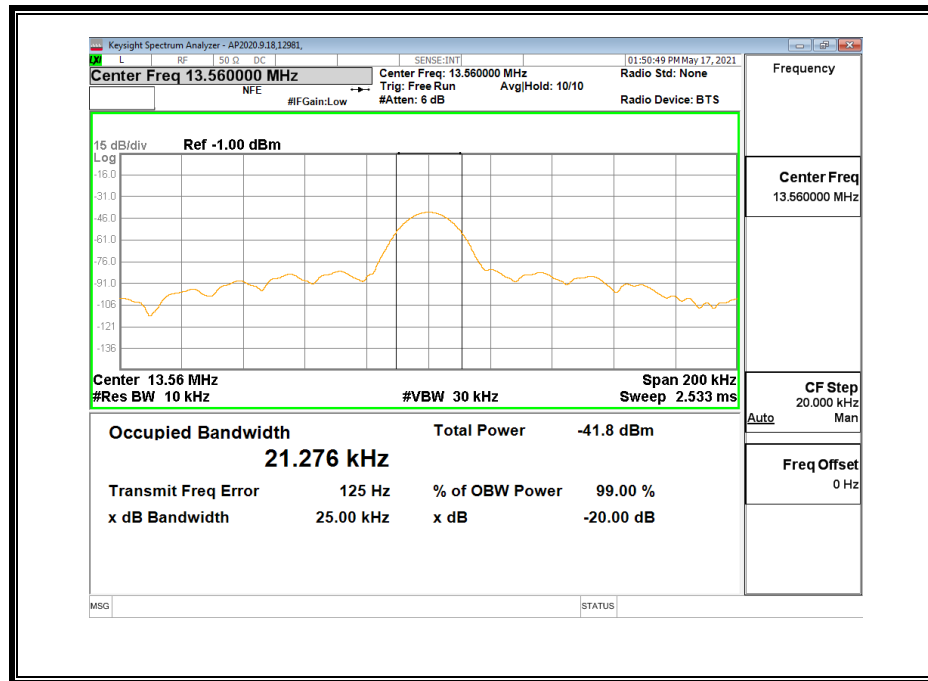


CE Mode, Type B 848Kbps



7.2. SECONDARY ANTENNA

Reader Mode, Type B 848Kbps



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

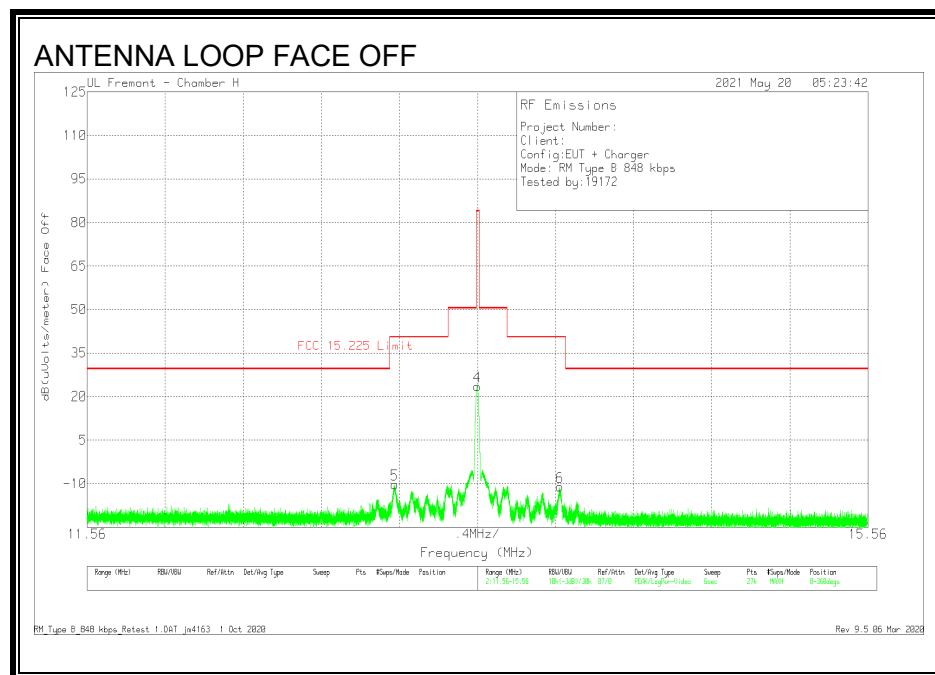
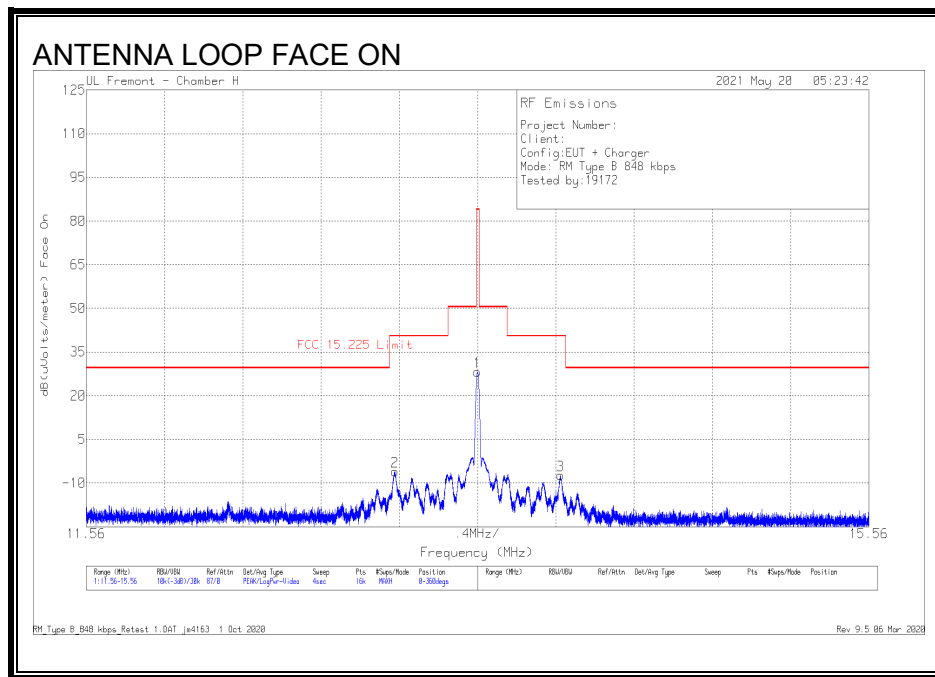
ANSI C63.10, 2013

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 AND SPURIOUS EMISSIONS (0.15 - 30 MHz), EUT WITH AC/DC ADAPTER

8.2.1. READER MODE, TYPE B 848Kbps



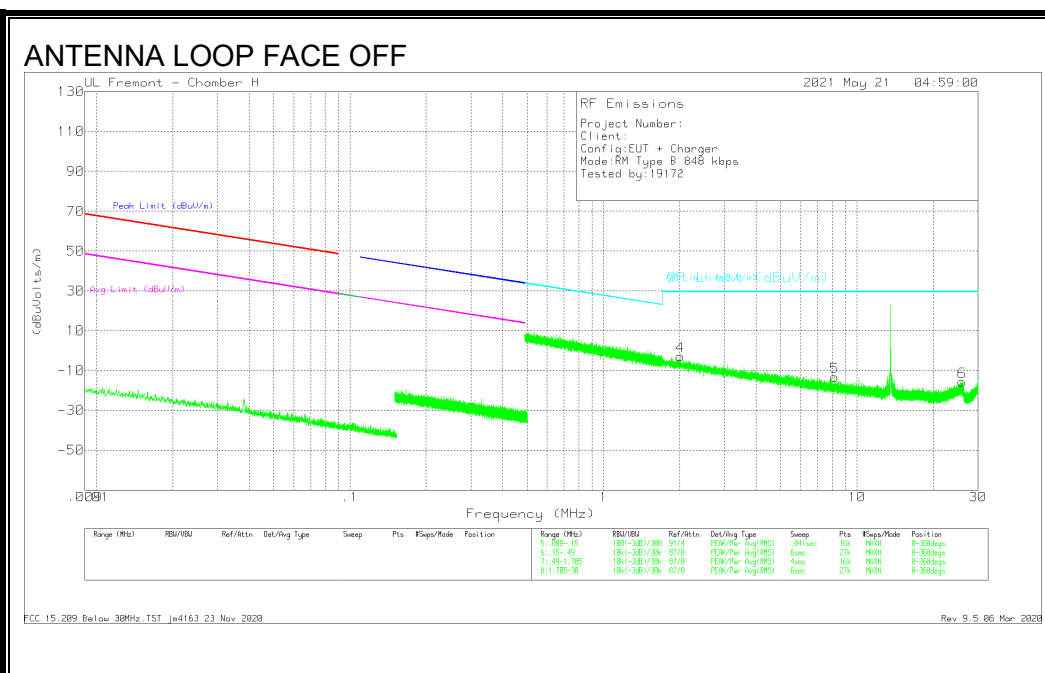
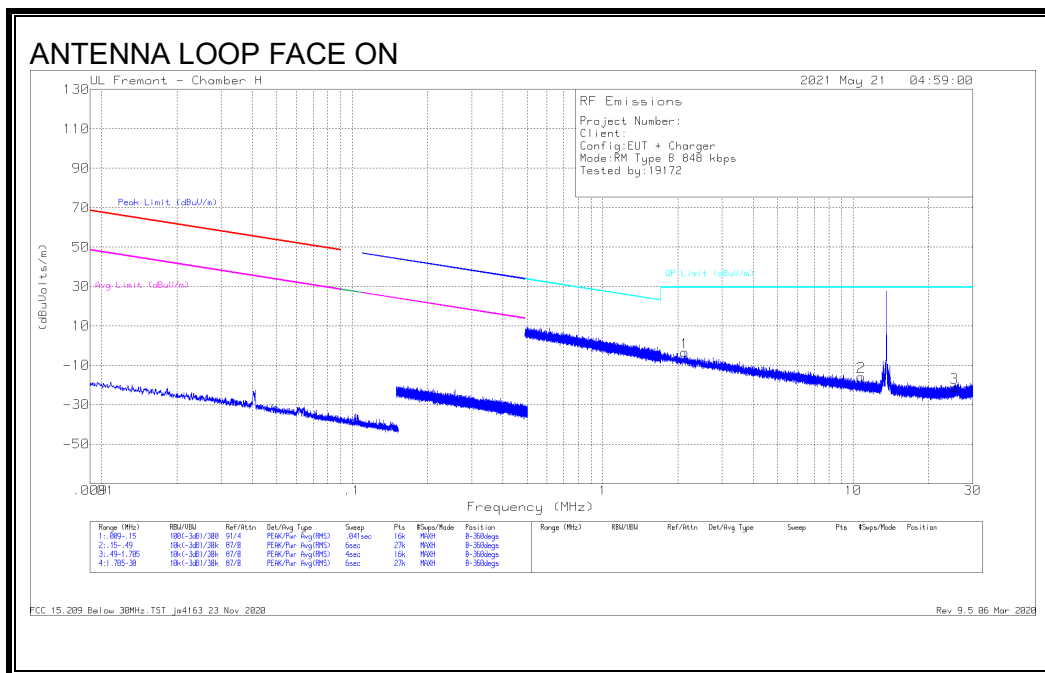
DATA

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)	Polarity
5	13.13605	18.99	Pk	10.3	.5	-40	-10.21	40.51	-50.72	0-360	Face-Off
2	13.137	23.19	Pk	10.3	.5	-40	-6.01	40.51	-46.52	0-360	Face-On
4	13.55785	52.7	Pk	10.3	.5	-40	23.5	84	-60.5	0-360	Face-Off
1	13.5595	57.42	Pk	10.3	.5	-40	28.22	84	-55.78	0-360	Face-On
6	13.98202	18.12	Pk	10.3	.5	-40	-11.08	40.51	-51.59	0-360	Face-Off
3	13.98425	21.82	Pk	10.3	.5	-40	-7.38	40.51	-47.89	0-360	Face-On

Pk - Peak detector

*.TST jm4163 1 Oct 2020

Rev 9.5 06 Mar 2020

SPURIOUS EMISSION 848Kbps

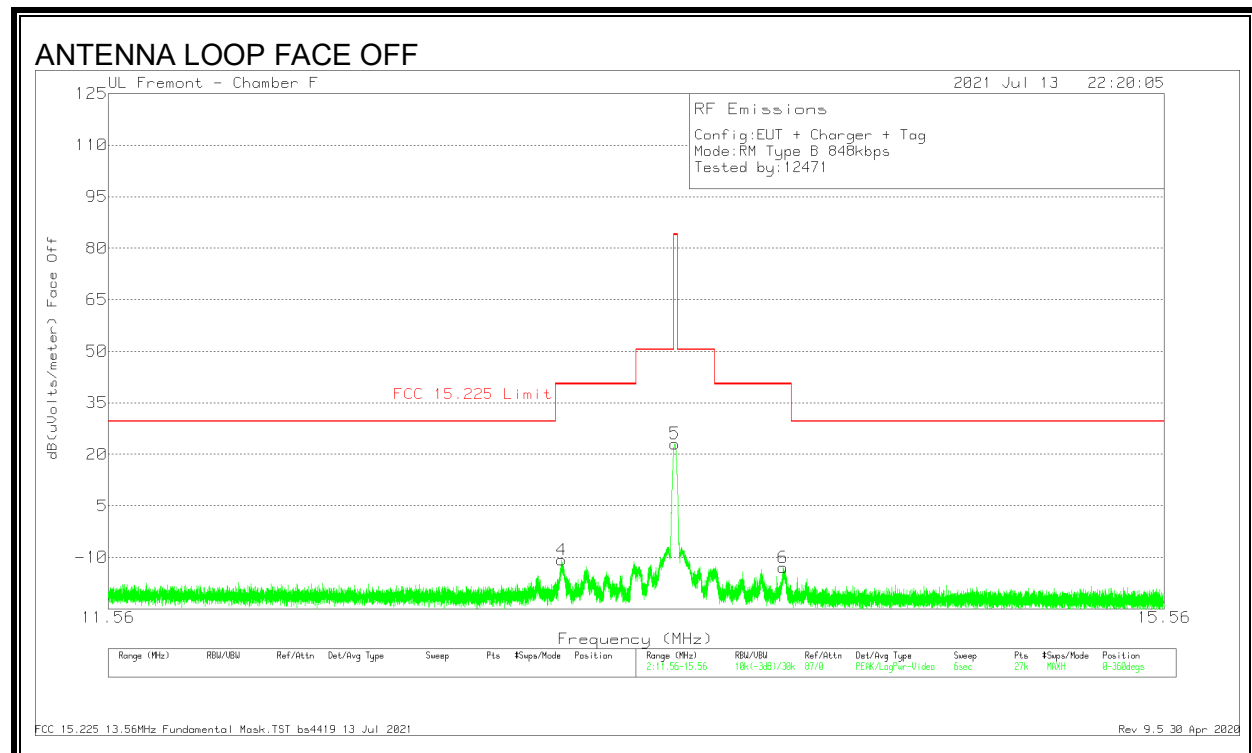
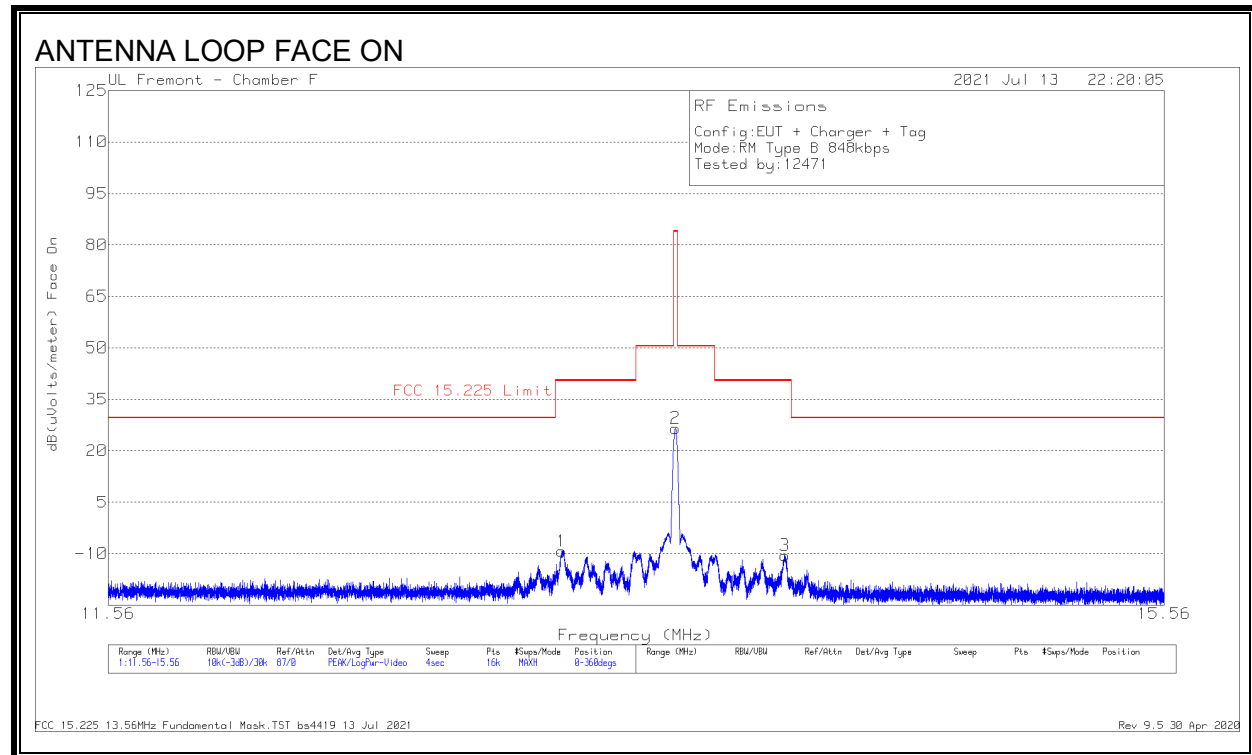
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
4	2.01426	17.81	Qp	11.7	.2	-40	-10.29	29.5	-39.79	320	Face-Off
1	2.14226	17.08	Qp	11.7	.2	-40	-11.02	29.5	-40.52	96	Face-On
5	8.16342	6.68	Qp	11.1	.4	-40	-21.82	29.5	-51.32	294	Face-Off
2	10.7541	4.88	Qp	10.7	.5	-40	-23.92	29.5	-53.42	124	Face-On
3	25.3407	3.33	Qp	8.7	.7	-40	-27.27	29.5	-56.77	267	Face-On
6	25.9853	5.42	Qp	8.6	.7	-40	-25.28	29.5	-54.78	266	Face-Off

Qp - Quasi-Peak detector

FCC 15.209 Below 30MHz.TST jm4163 23 Nov 2020

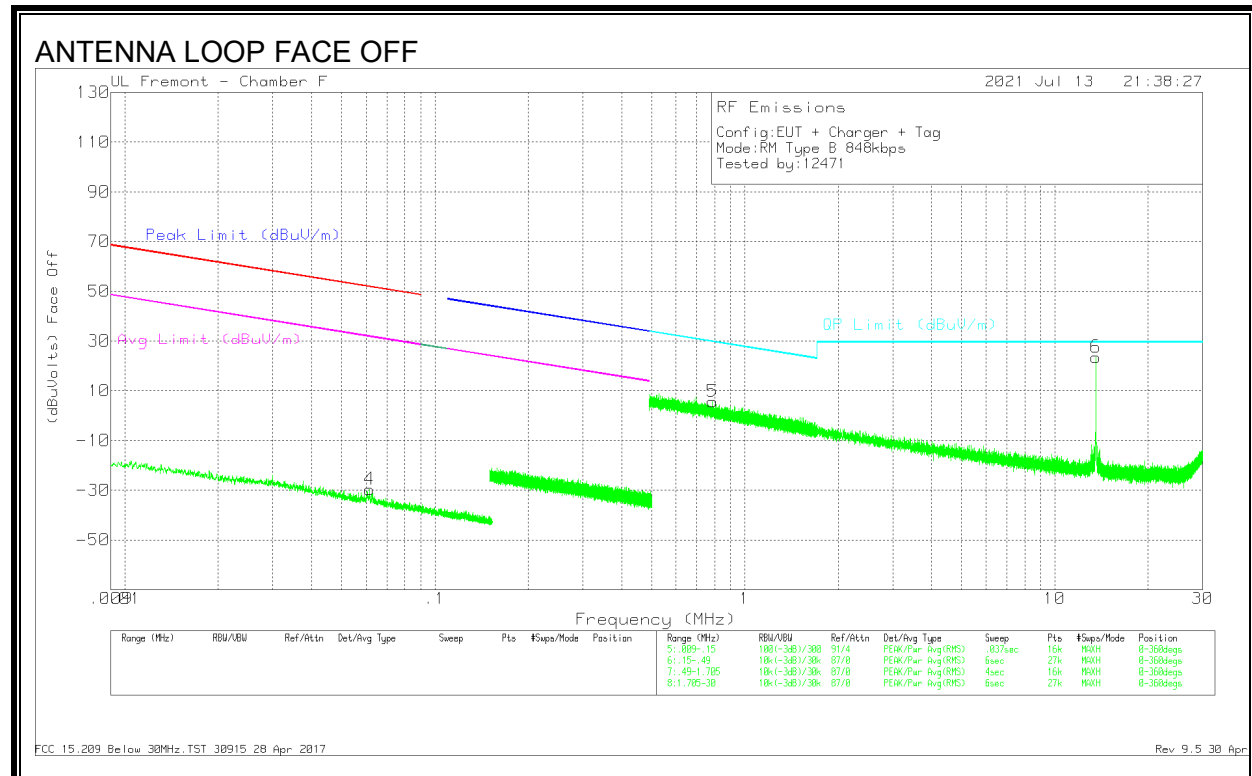
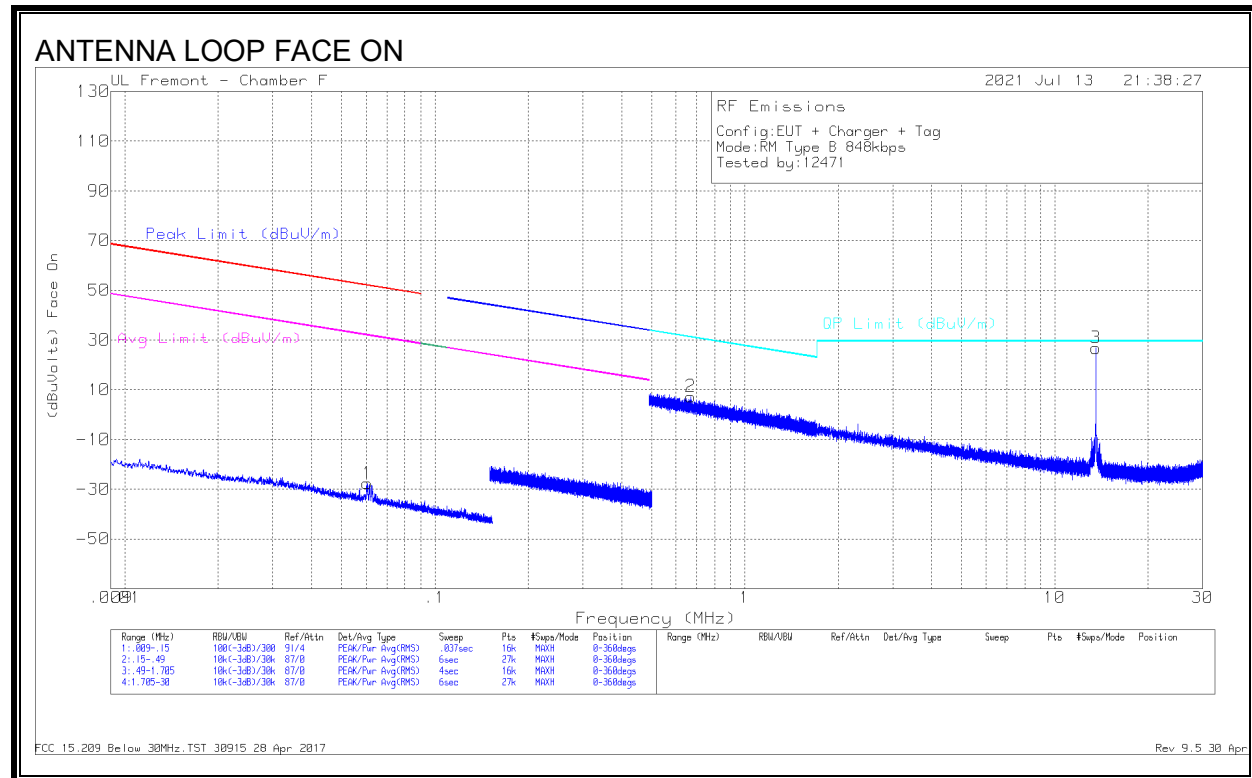
Rev 9.5 06 Mar 2020

8.2.2. TAG MODE, TYPE B 848Kbps

DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/m eter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Polarity
1	13.13225	19.54	Pk	10.8	.4	-40	-9.26	40.51	-49.77	0-360	Face on
2	13.56025	55.45	Pk	10.7	.4	-40	26.55	84	-57.45	0-360	Face on
3	13.98525	18.36	Pk	10.7	.4	-40	-10.54	40.51	-51.05	0-360	Face on
4	13.1325	18.04	Pk	10.8	.4	-40	-10.76	40.51	-51.27	0-360	Face Off
5	13.55793	51.98	Pk	10.7	.4	-40	23.08	84	-60.92	0-360	Face Off
6	13.97788	15.92	Pk	10.7	.4	-40	-12.98	40.51	-53.49	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)	Polarity
1	.06051	39.66	Pk	12.7	0	-80	-27.64	51.95	-79.59	31.95	-59.59	0-360	Face on
4	.06144	37.75	Pk	12.6	0	-80	-29.65	51.82	-81.47	31.82	-61.47	0-360	Face Off

Pk - Peak detector

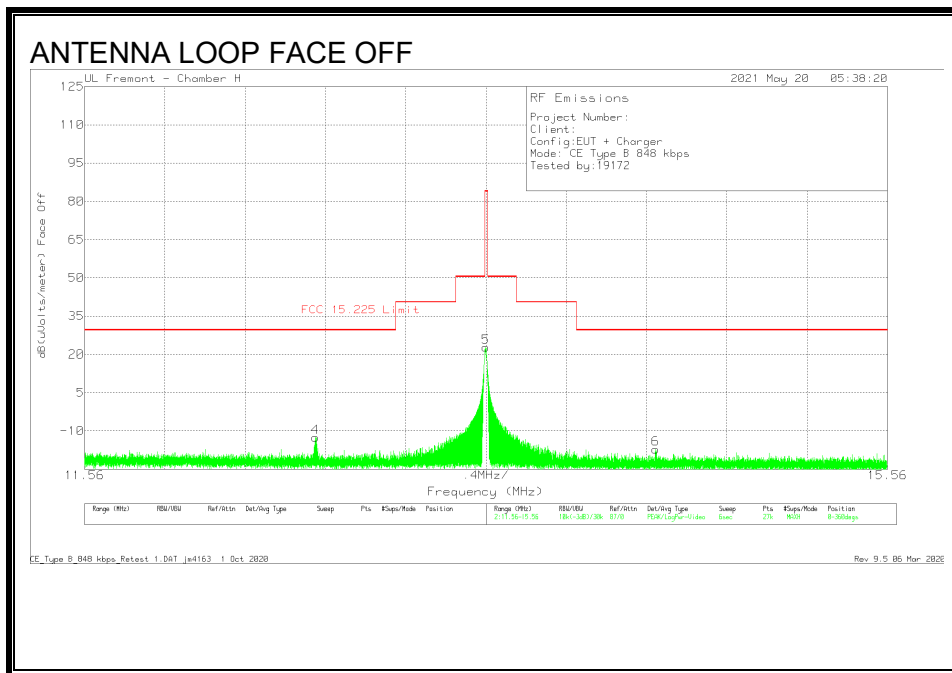
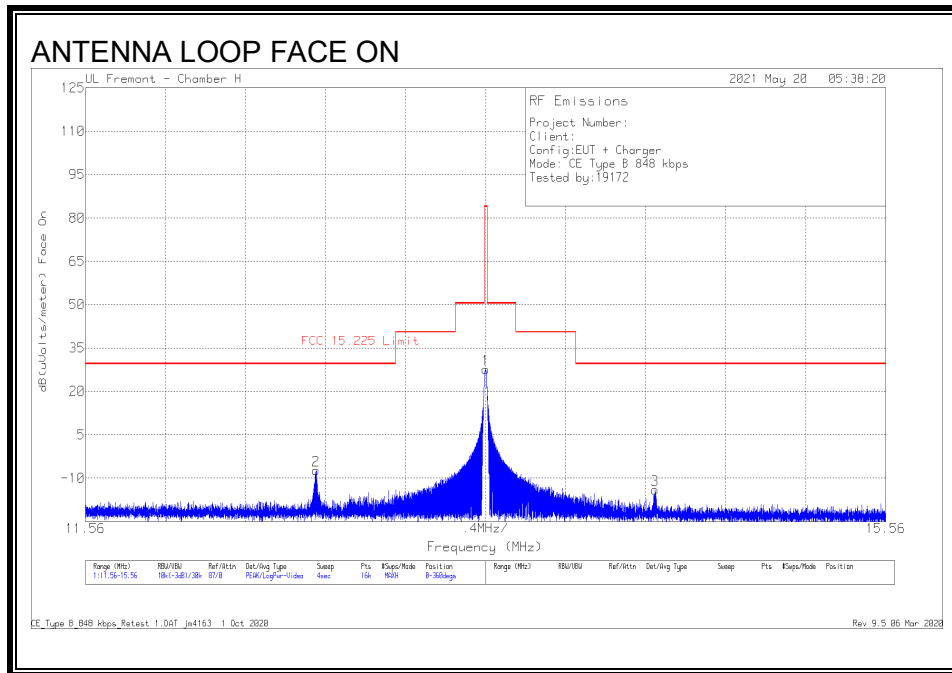
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
2	.6683	35.82	Pk	11.3	.1	-40	7.22	31.11	-23.89	0-360	Face On
3	13.55893	55.66	Pk	10.7	.4	-40	26.76	29.5	-2.74	0-360	Face On
5	.78655	34.22	Pk	11.3	.1	-40	5.62	29.7	-24.08	0-360	Face Off
6	13.55998	52.35	Pk	10.7	.4	-40	23.45	29.5	-6.05	0-360	Face Off

Pk - Peak detector

Note: Marker 3 and 6 are fundamental signals.

8.2.3. CE MODE, TYPE B 848Kbps

FUNDAMENTAL



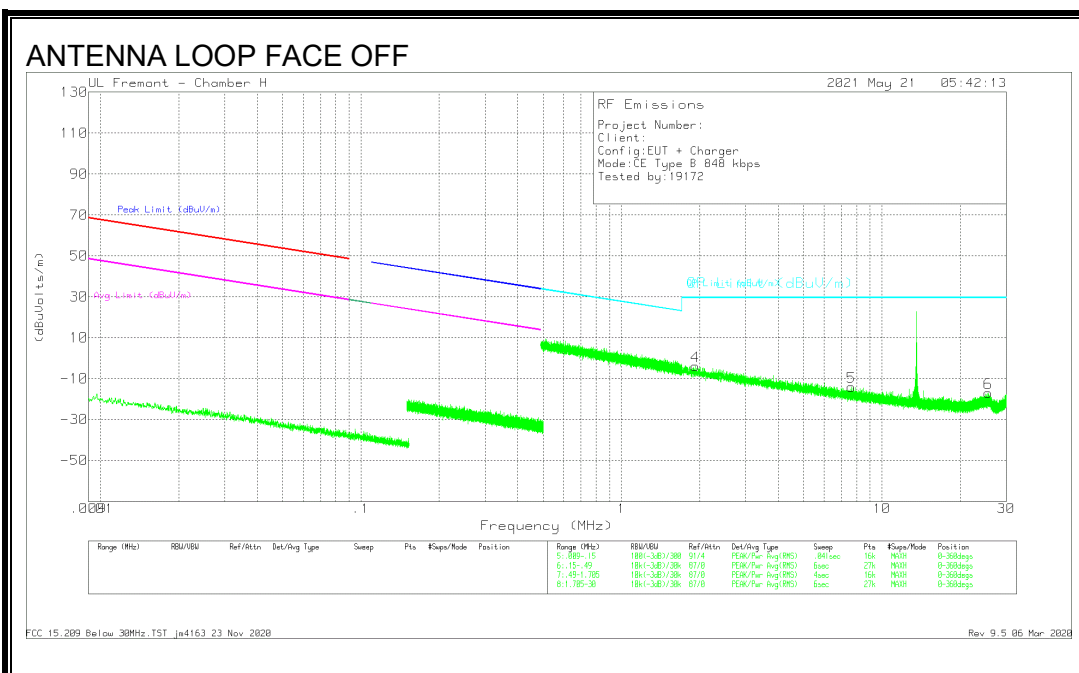
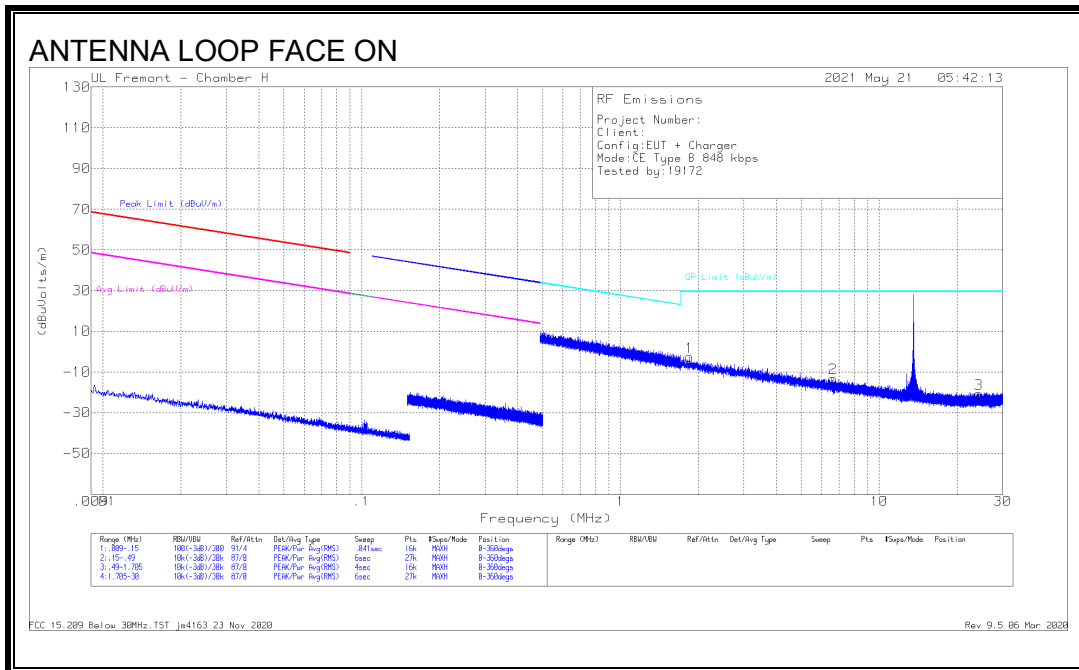
DATA

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
4	12.71011	16.63	Pk	10.4	.5	-40	-12.47	29.54	-42.01	0-360	Face-Off
2	12.713	21.75	Pk	10.4	.5	-40	-7.35	29.54	-36.89	0-360	Face-On
5	13.55844	51.99	Pk	10.3	.5	-40	22.79	84	-61.21	0-360	Face-Off
1	13.56063	56.91	Pk	10.3	.5	-40	27.71	84	-56.29	0-360	Face-On
6	14.40382	12.08	Pk	10.2	.6	-40	-17.12	29.54	-46.66	0-360	Face-Off
3	14.4075	15.24	Pk	10.2	.6	-40	-13.96	29.54	-43.5	0-360	Face-On

Pk - Peak detector

*.TST jm4163 1 Oct 2020

Rev 9.5 06 Mar 2020

SPURIOUS EMISSION 848Kbps

DATA

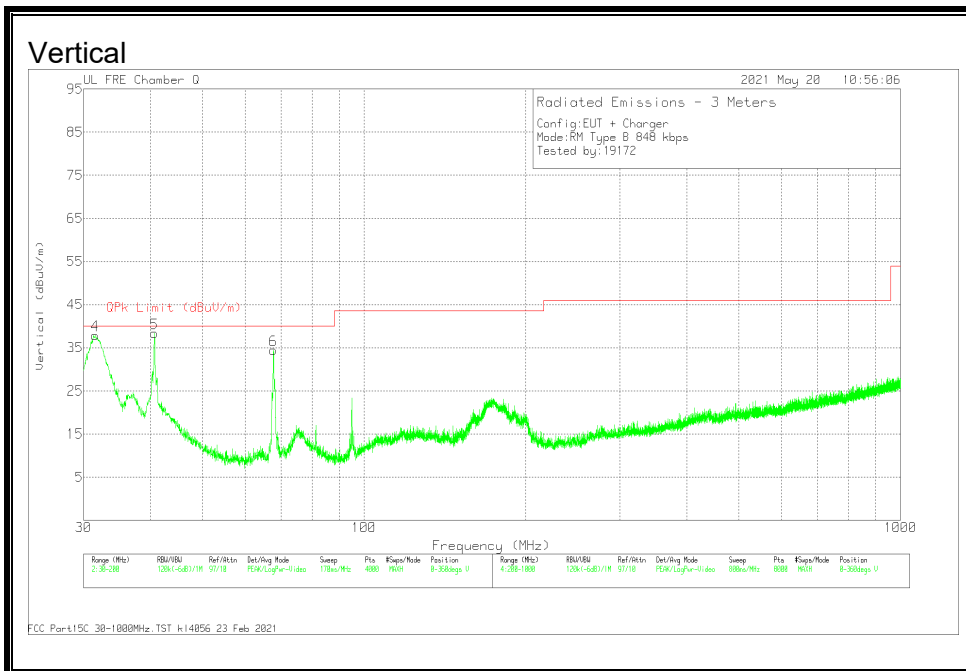
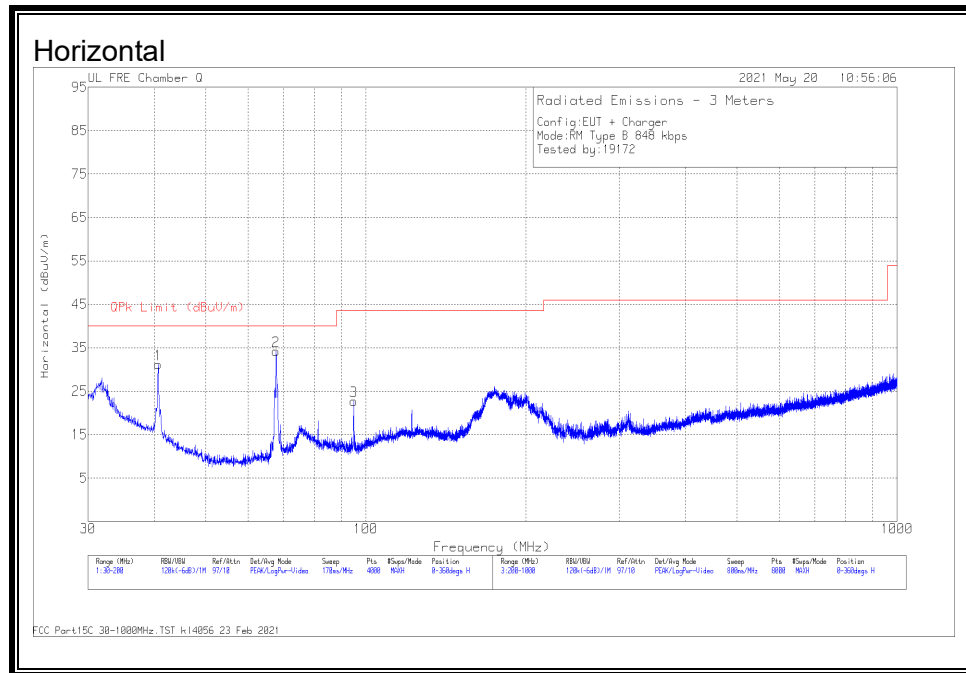
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts /m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	polarity
1	1.84329	18.59	Qp	11.7	.2	-40	-9.51	29.5	-39.01	226	Face-On
4	6.6107	8.03	Qp	11.3	.4	-40	-20.27	29.5	-49.77	146	Face-Off
2	24.2622	3.19	Qp	8.9	.7	-40	-27.21	29.5	-56.71	46	Face-On
5	1.92758	17.96	Qp	11.7	.2	-40	-10.14	29.5	-39.64	148	Face-Off
3	7.61712	7.23	Qp	11.2	.4	-40	-21.17	29.5	-50.67	0	Face-On
6	25.545	6.34	Qp	8.7	.7	-40	-24.26	29.5	-53.76	290	Face-Off

Qp - Quasi-Peak detector

FCC 15.209 Below 30MHz.TST jm4163 23 Nov 2020
Rev 9.5 06 Mar 2020

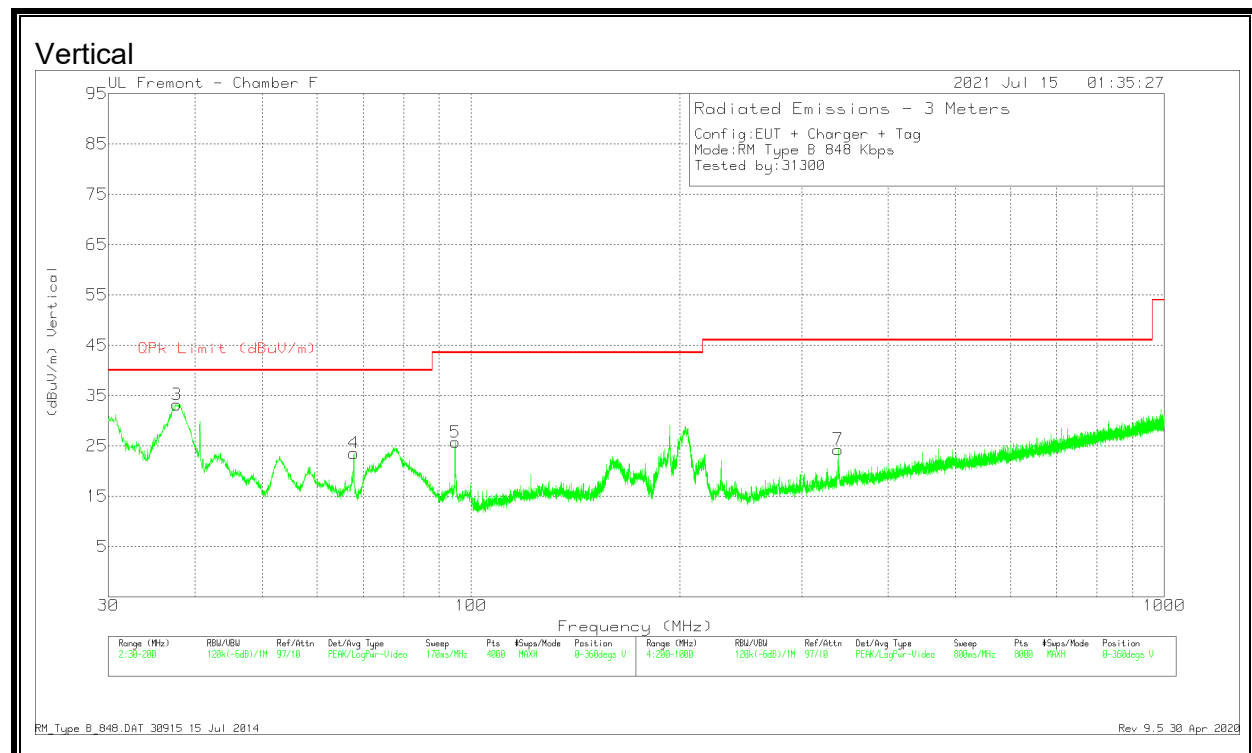
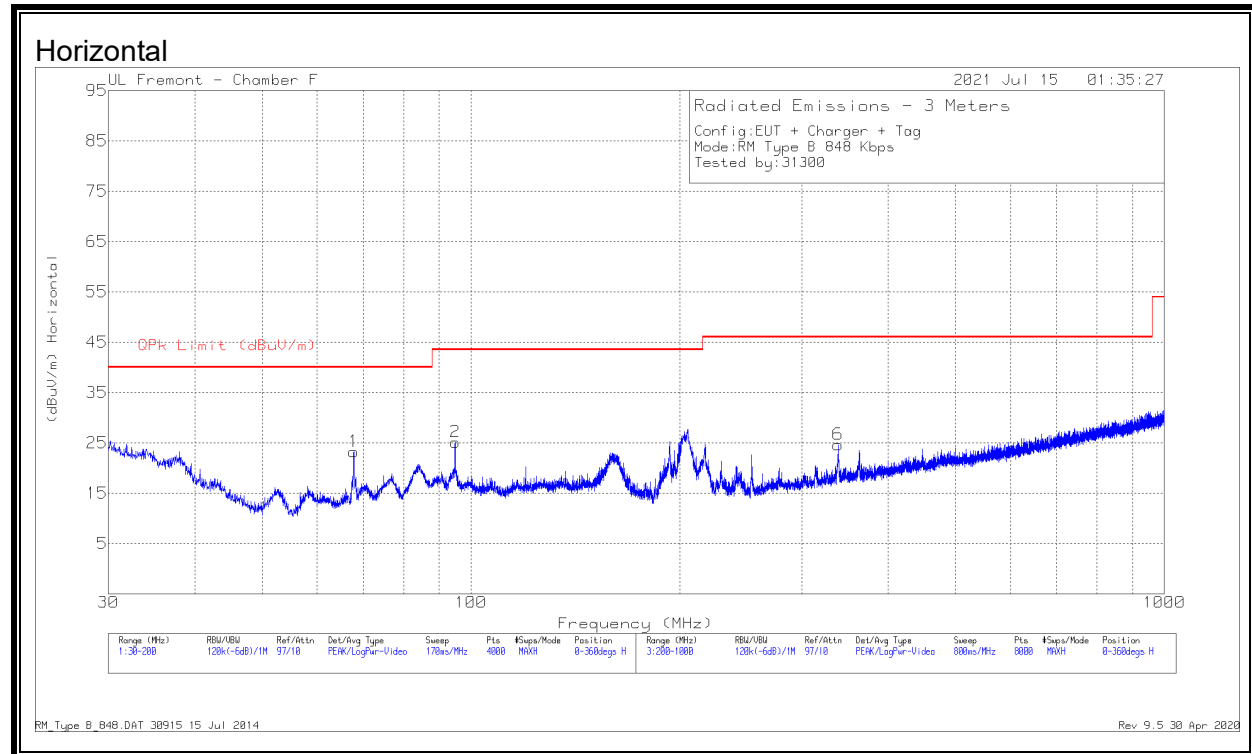
8.2.4. TX SPURIOUS EMISSION 30 TO 1000 MHz, EUT WITH AC/DC ADAPTER

READER MODE, TYPE B, SPURIOUS EMISSION 848Kbps



DATA

Marker	Frequenc y (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	31.4422	40.75	Qp	26	-32.3	34.45	40	-5.55	188	103	V
1	40.6732	43.65	Qp	19.2	-32.3	30.55	40	-9.45	246	382	H
5	40.6818	50.53	Qp	19.2	-32.3	37.43	40	-2.57	343	151	V
2	67.7952	52.41	Qp	13.9	-32	34.31	40	-5.69	149	101	V
6	67.8	51.34	Qp	13.9	-32	33.24	40	-6.76	221	254	H
3	94.9172	38.97	Qp	14.8	-31.9	21.87	43.52	-21.65	150	162	H

TAG MODE, TYPE B, SPURIOUS EMISSION 848Kbps

DATA

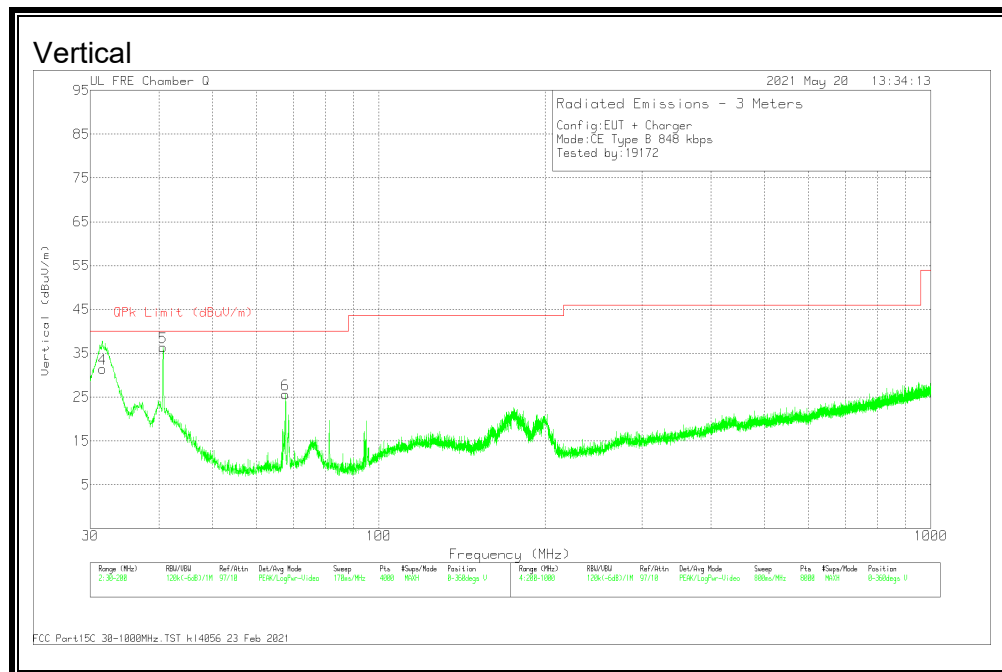
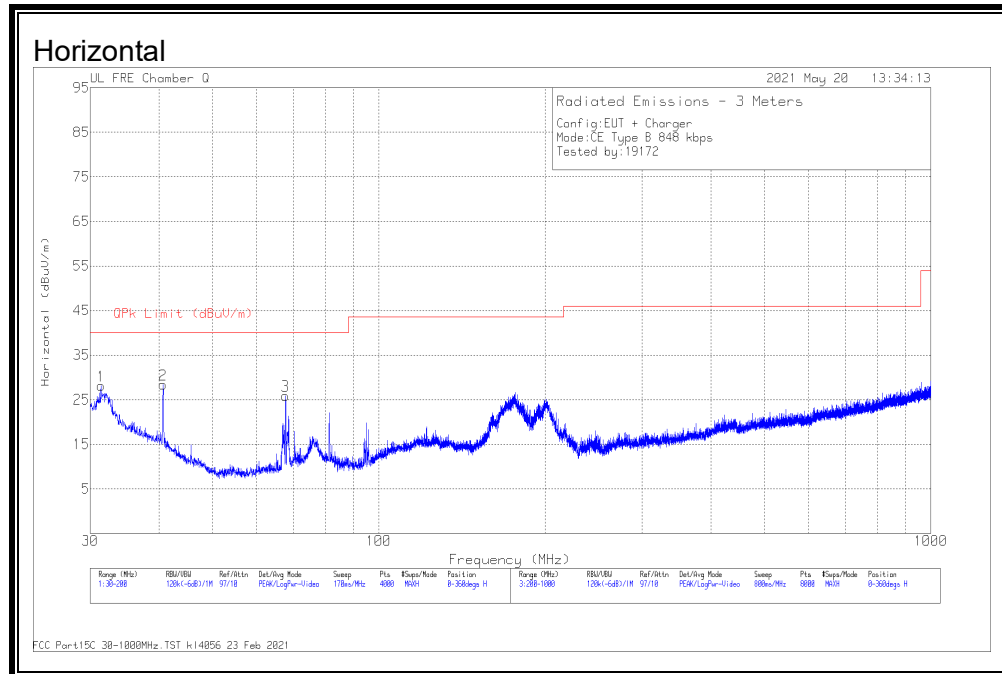
Marker	Frequency (MHz)	Meter Reading (dBUV)	Det	AF T900 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBUV/m)	QPk Limit (dBUV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	67.7966	40.59	Qp	14.2	-31.5	23.29	40	-16.71	165	223	H
2	94.9277	41.1	Qp	14.3	-31.2	24.2	43.52	-19.32	156	336	H
3	* 37.972	37.48	Qp	22.4	-31.8	28.08	40	-11.92	93	102	V
4	67.8067	39.55	Qp	14.2	-31.5	22.25	40	-17.75	156	104	V
5	94.9231	41.22	Qp	14.3	-31.2	24.32	43.52	-19.2	212	139	V
6	338.8444	34.91	Qp	20.2	-29.7	25.41	46.02	-20.61	160	102	H
7	338.9854	31.69	Qp	20.2	-29.7	22.19	46.02	-23.83	225	172	V

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

Qp - Quasi-Peak detector

RM_Type B_848.DAT 30915 15 Jul 2014

Rev 9.5 30 Apr 2020

CE Mode, Type B SPURIOUS EMISSION 848Kbps

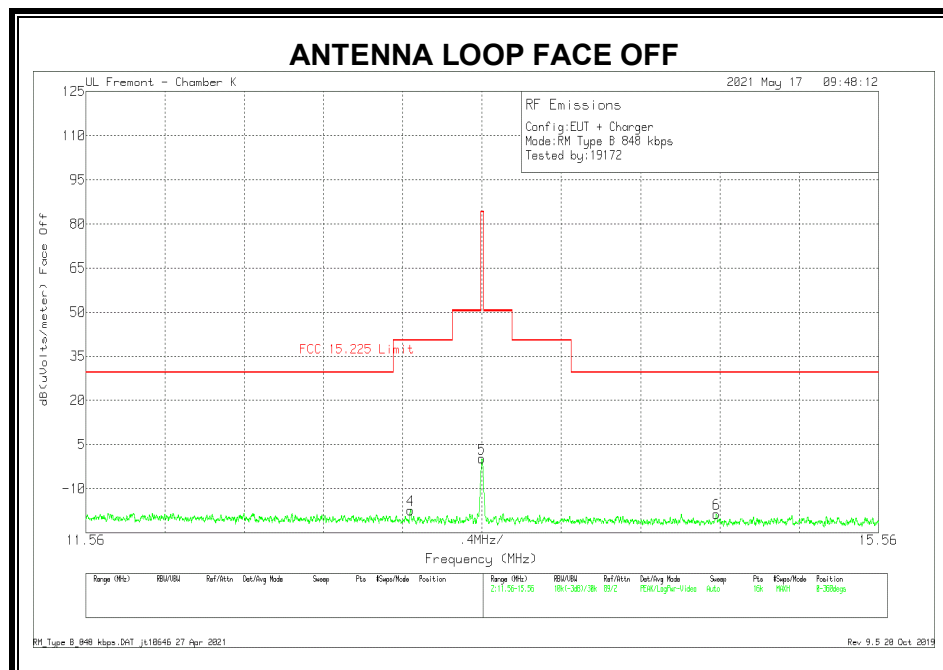
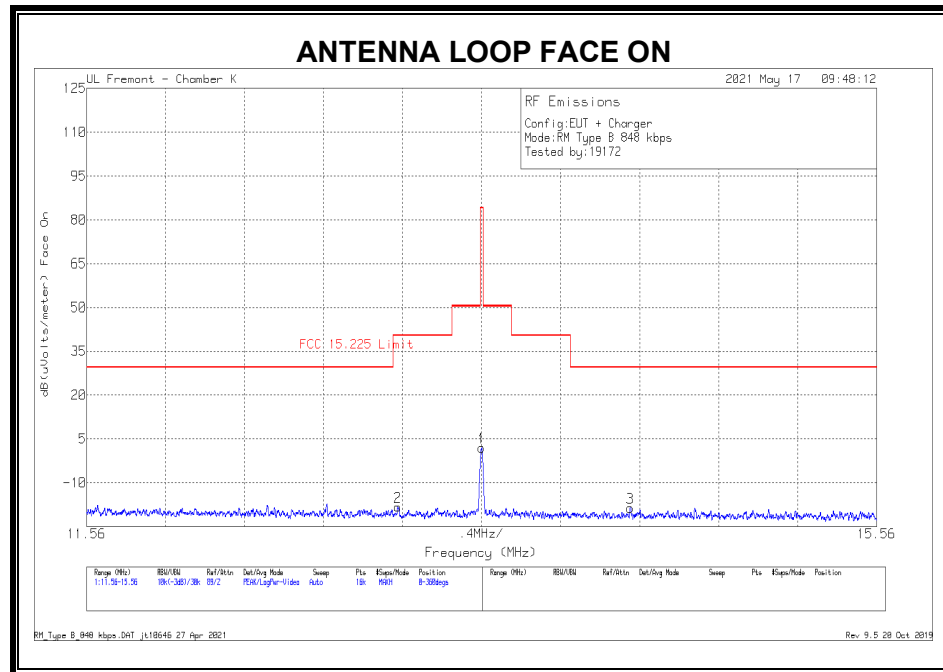
DATA

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
1	31.3022	28.05	Qp	26.2	-32.3	21.95	40	-18.05	138	228	H
4	31.4904	39.96	Qp	26	-32.3	33.66	40	-6.34	181	102	V
2	40.6751	47.95	Qp	19.2	-32.3	34.85	40	-5.15	343	139	V
5	40.6785	39	Qp	19.2	-32.3	25.9	40	-14.1	196	363	H
3	67.7947	43.44	Qp	13.9	-32	25.34	40	-14.66	152	106	V
6	67.8057	44.17	Qp	13.9	-32	26.07	40	-13.93	219	398	H

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

8.3.1. READER MODE, TYPE B 848Kbps

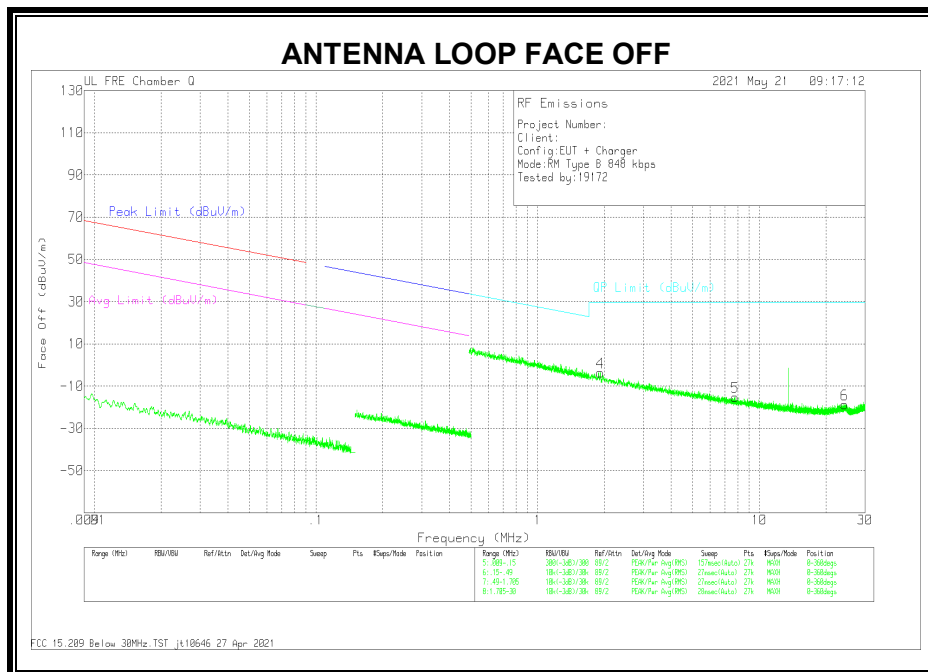
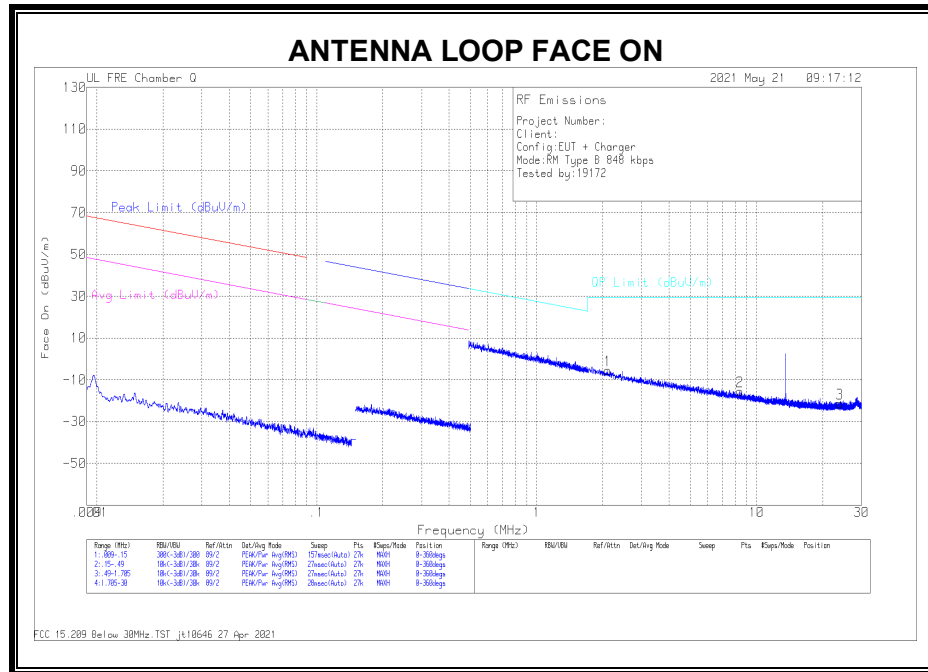
FUNDAMENTAL



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)	Polarity
2	13.136	11.08	Pk	10.3	.4	-40	-18.22	40.51	-58.73	0-360	Face-On
4	13.19888	12.01	Pk	10.3	.4	-40	-17.29	40.51	-57.8	0-360	Face-Off
1	13.55963	31.3	Pk	10.3	.4	-40	2	84	-82	0-360	Face-On
5	13.56963	30.99	Pk	10.3	.4	-40	1.69	84	-82.31	0-360	Face-Off
3	14.312	10.63	Pk	10.3	.5	-40	-18.57	29.54	-48.11	0-360	Face-On
6	14.74275	10.73	Pk	10.2	.5	-40	-18.57	29.54	-48.11	0-360	Face-Off

Pk - Peak detector

SPURIOUS EMISSION

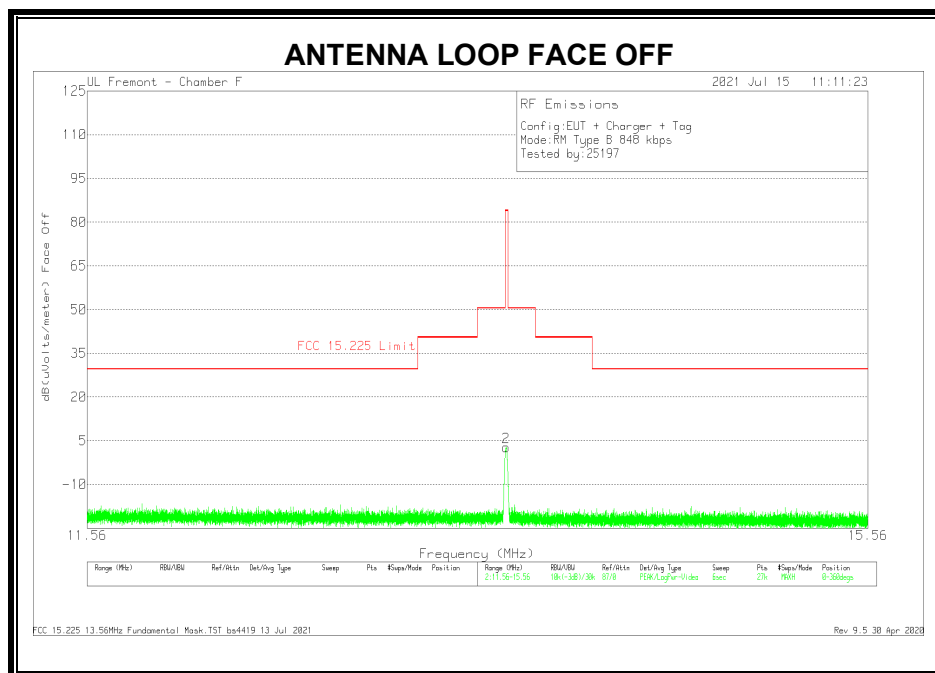
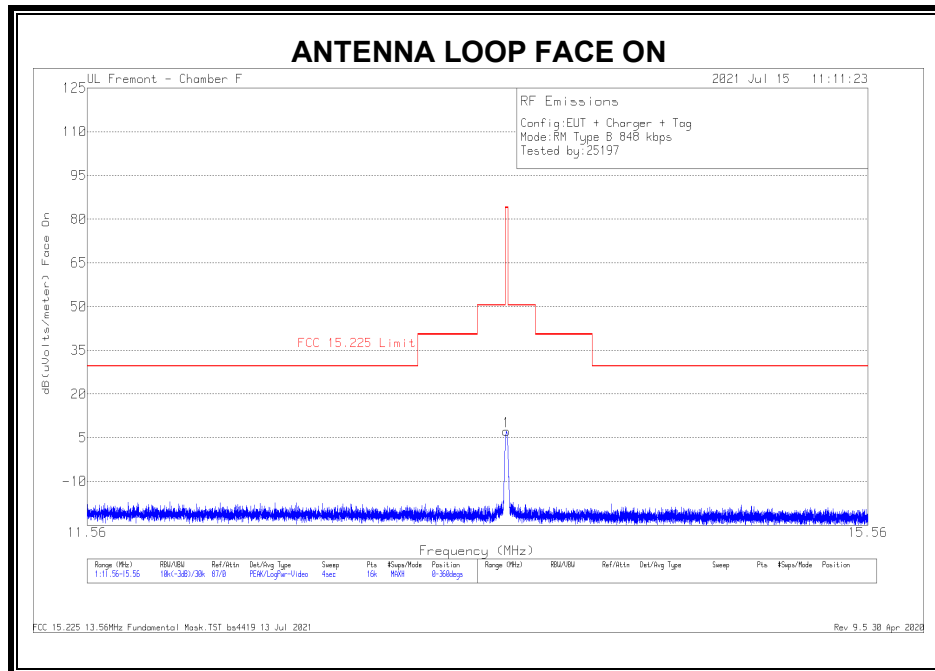
DATA

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)	Ppolarity
4	1.91728	16.71	Qp	10.8	.1	-40	-12.39	29.5	-41.89	278	Face-Off
1	2.0912	15.89	Qp	10.8	.1	-40	-13.21	29.5	-42.71	13	Face-On
5	7.79174	4.52	Qp	10.7	.3	-40	-24.48	29.5	-53.98	28	Face-Off
2	8.38566	4.26	Qp	10.7	.3	-40	-24.74	29.5	-54.24	71	Face-On
3	23.9096	.38	Qp	9	.6	-40	-30.02	29.5	-59.52	158	Face-On
6	24.2464	3.51	Qp	8.9	.6	-40	-26.99	29.5	-56.49	43	Face-Off

Qp - Quasi-Peak detector

8.3.2. TAG MODE, TYPE B 848Kbps

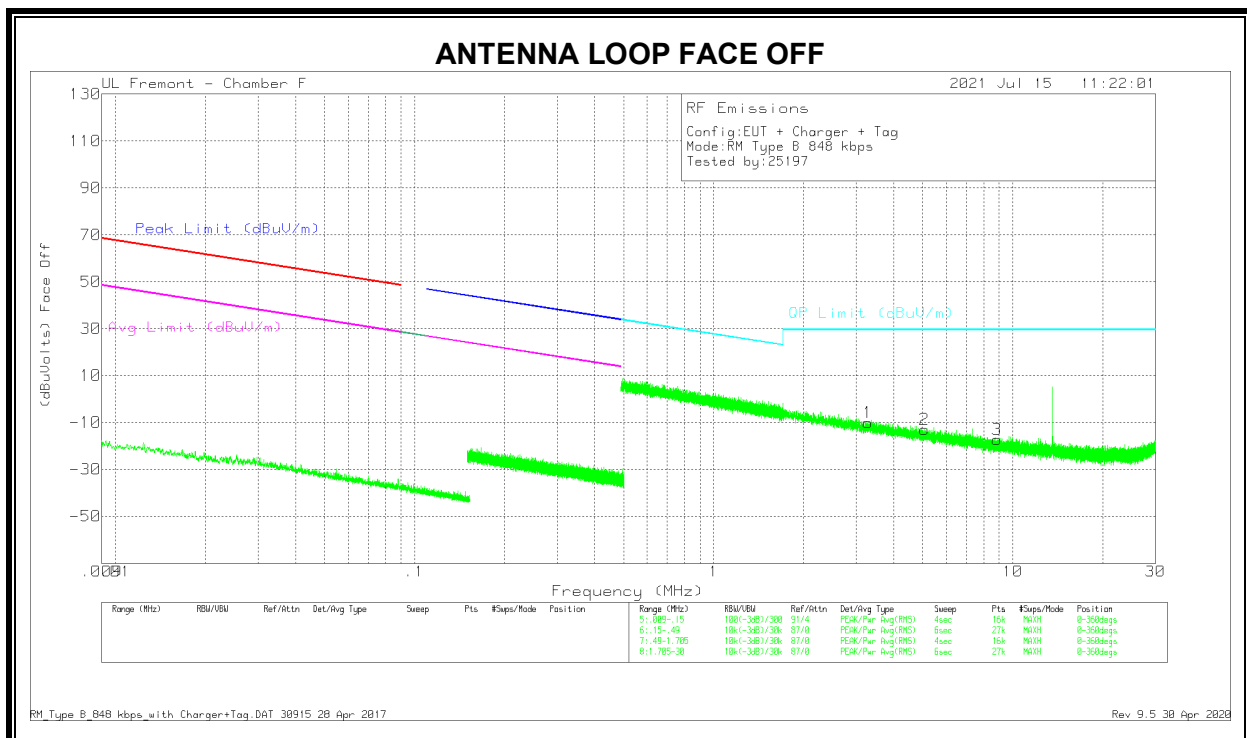
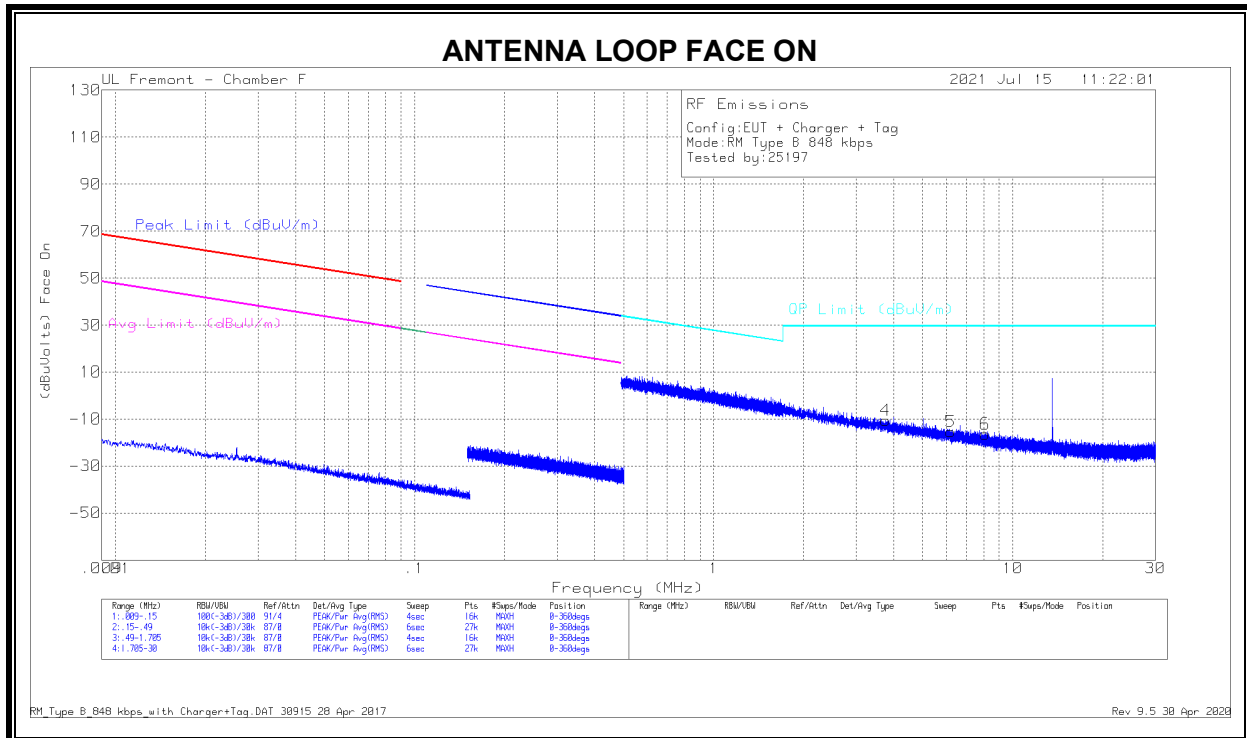
FUNDAMENTAL



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	13.55963	36.1	Pk	10.7	.4	-40	7.2	84	-76.8	0-360	Face On
2	13.5583	31.67	Pk	10.7	.4	-40	2.77	84	-81.23	0-360	Face Off

Pk - Peak detector

SPURIOUS EMISSION

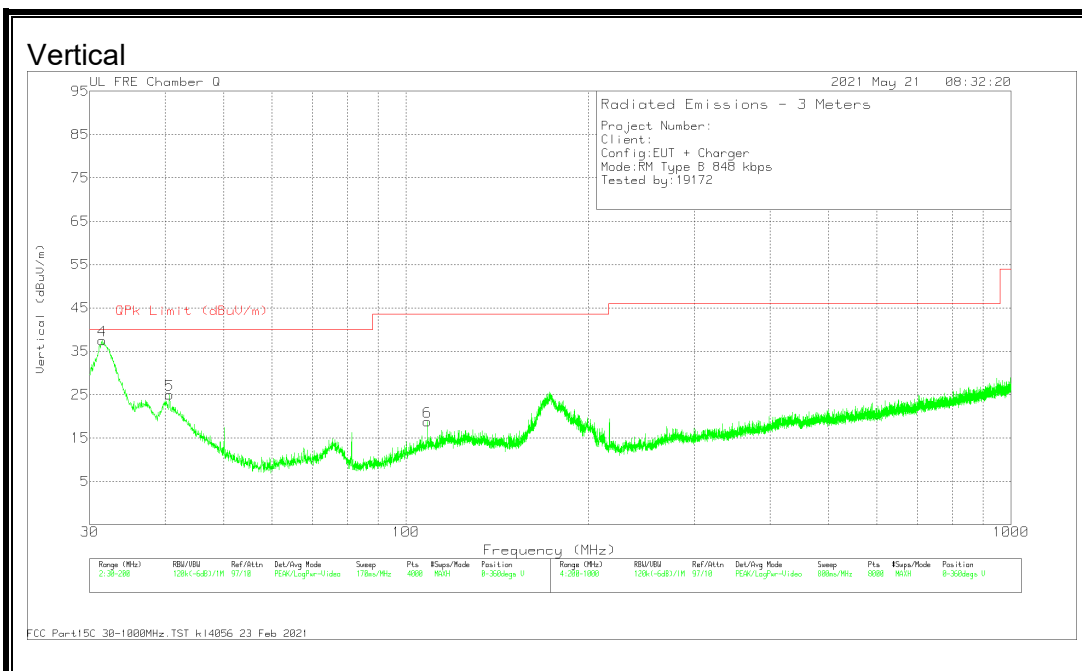
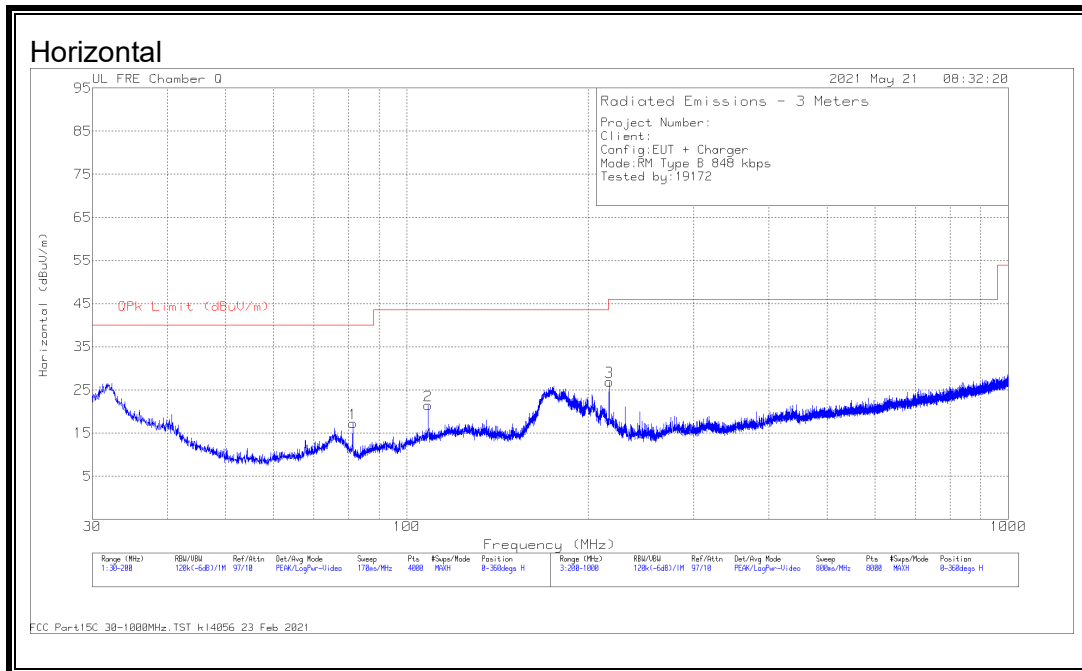
DATA

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
4	3.75489	17.7	Pk	11.5	.2	-40	-10.6	29.5	-40.1	0-360	Face-On
5	6.19358	13.13	Pk	11.2	.3	-40	-15.37	29.5	-44.87	0-360	Face-On
6	8.09675	12.4	Pk	11	.3	-40	-16.3	29.5	-45.8	0-360	Face-On
1	3.28224	18.41	Pk	11.4	.2	-40	-9.99	29.5	-39.49	0-360	Face-Off
2	5.05965	15.53	Pk	11.3	.2	-40	-12.97	29.5	-42.47	0-360	Face-Off
3	8.84293	11.77	Pk	10.8	.3	-40	-17.13	29.5	-46.63	0-360	Face-Off

Pk - Peak detector

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

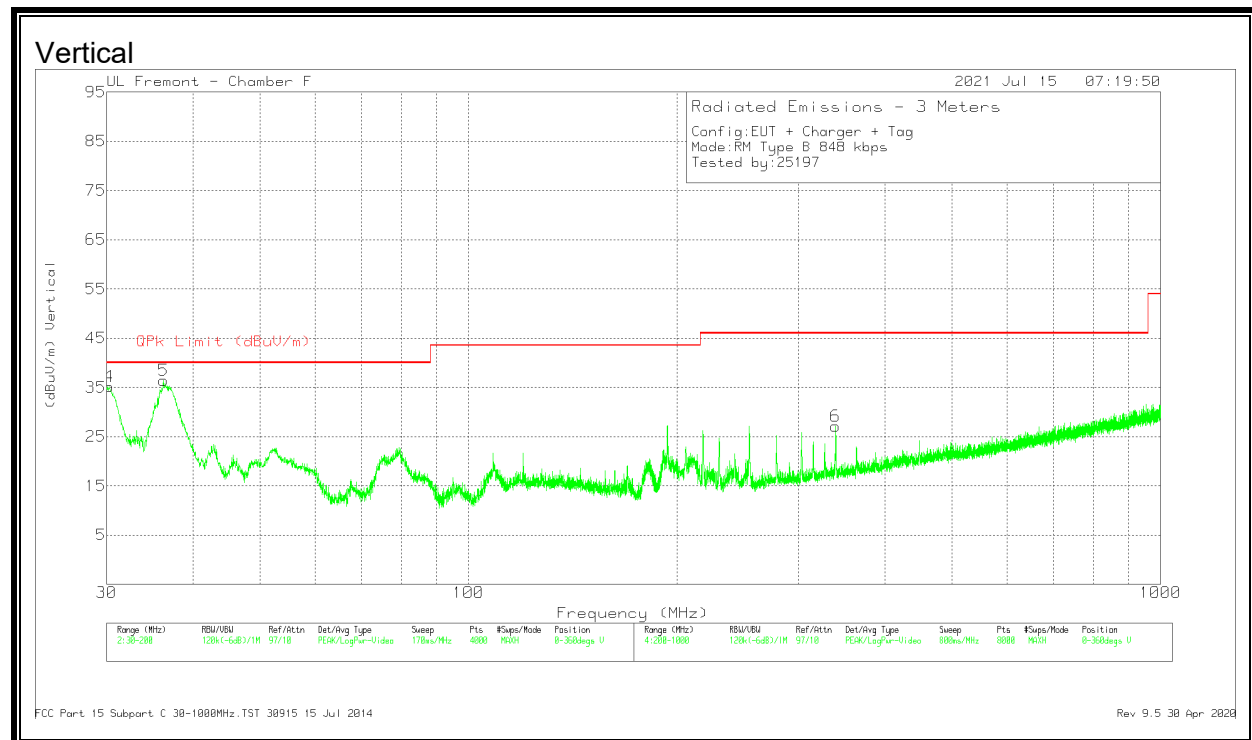
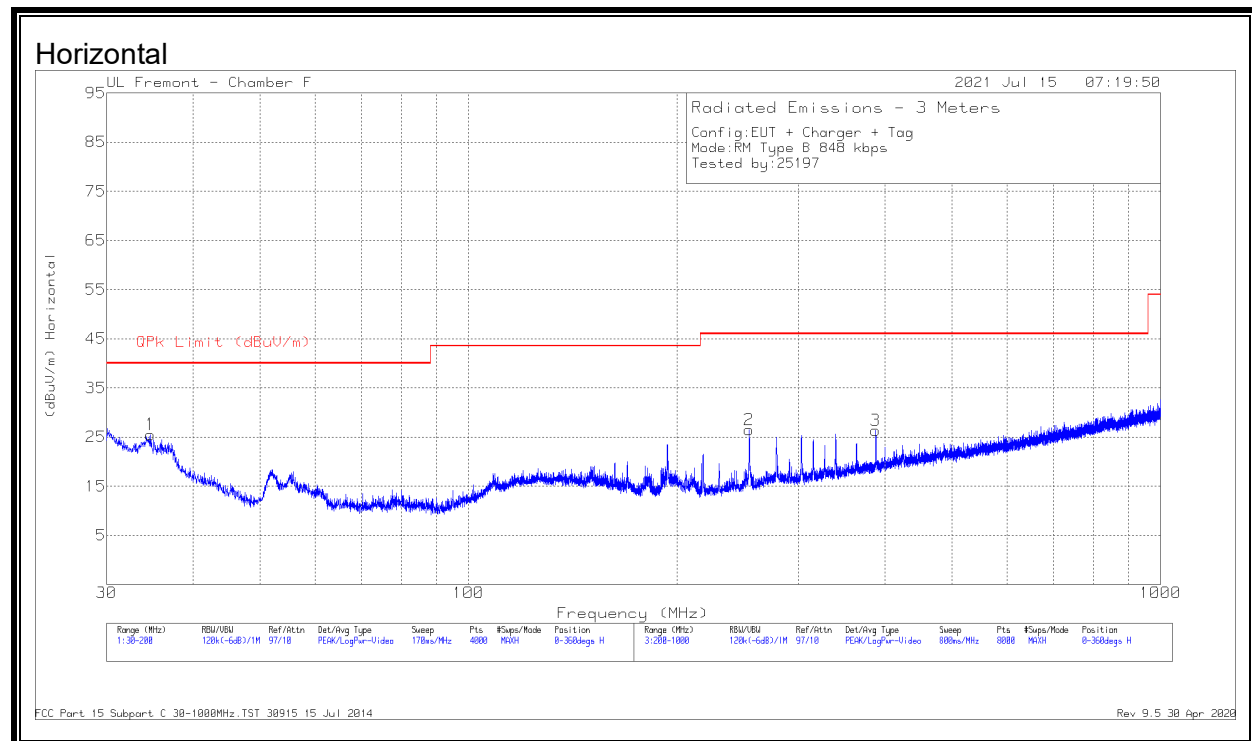
Type B (Reader Mode), SPURIOUS EMISSION 848Kbps



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	31.618	40.74	Qp	25.9	-32.3	34.34	40	-5.66	183	101	V
5	40.67	35.08	Qp	19.2	-32.3	21.98	40	-18.02	186	109	V
1	81.3634	32.48	Qp	13.4	-31.9	13.98	40	-26.02	200	149	H
2	108.4686	34.95	Qp	18.2	-31.8	21.35	43.52	-22.17	122	287	H
6	108.4763	28.84	Qp	18.2	-31.8	15.24	43.52	-28.28	107	143	V
3	216.953	41.22	Qp	16.4	-31.3	26.32	46.02	-19.7	192	132	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	34.7187	32.62	Pk	24.8	-31.9	25.52	40	-14.48	0-360	201	H
2	* 254.4071	38.87	Pk	17.7	-30.1	26.47	46.02	-19.55	0-360	99	H
3	387.7244	34.6	Pk	21.3	-29.5	26.4	46.02	-19.62	0-360	99	H
4	30.1518	34.51	Qp	28	-31.9	30.61	40	-9.39	259	104	V
5	36.2831	38.69	Qp	23.7	-31.8	30.59	40	-9.41	82	100	V
6	339.3181	36.57	Pk	20.2	-29.7	27.07	46.02	-18.95	0-360	99	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:	5/5/2021
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9.1. PRIMARY 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	13.55989822	4.423	13.55989276	4.826	13.55988981	5.044	13.55988854	5.137	± 100
	40	13.55991488	3.195	13.55991047	3.520	13.55990741	3.746	13.55990485	3.935	± 100
	30	13.55994029	1.321	13.55993255	1.892	13.55993133	1.982	13.55992815	2.216	± 100
	20	13.5599582	0.000	13.55995779	0.030	13.55996482	-0.488	13.55995294	0.387	± 100
	10	13.55998005	-1.611	13.55998225	-1.774	13.55998572	-2.029	13.55998825	-2.216	± 100
	0	13.55999206	-2.497	13.55999807	-2.941	13.56000317	-3.316	13.56000472	-3.430	± 100
	-10	13.56000749	-3.635	13.56001448	-4.150	13.56001945	-4.517	13.56002386	-4.843	± 100
	-20	13.56002699	-5.073	13.56003225	-5.461	13.56003855	-5.926	13.56004426	-6.347	± 100
3.23	20	13.55997444	-1.198	13.55998205	-1.759	13.55998097	-1.679	13.55997348	-1.127	± 100
4.37	20	13.55994599	0.901	13.55994352	1.082	13.55994906	0.674	13.55994725	0.807	± 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	13.55990215	4.279	13.55989832	4.562	13.559897263	4.640	13.559894151	4.869	± 100
	40	13.55992578	2.537	13.55992321	2.726	13.559920536	2.923	13.559919744	2.982	± 100
	30	13.55993993	1.493	13.55993308	1.999	13.559929771	2.242	13.559928728	2.319	± 100
	20	13.55996018	0.000	13.55995809	0.154	13.559961416	-0.091	13.559966635	-0.476	± 100
	10	13.55998192	-1.603	13.55998775	-2.034	13.559991638	-2.320	13.559998393	-2.818	± 100
	0	13.55999700	-2.715	13.55999879	-2.848	13.560002612	-3.129	13.560005942	-3.375	± 100
	-10	13.56000960	-3.645	13.56001692	-4.185	13.560019265	-4.357	13.560022971	-4.631	± 100
	-20	13.56002369	-4.684	13.56002803	-5.004	13.560035723	-5.571	13.560039965	-5.884	± 100
3.23	20	13.55997134	-0.823	13.55997916	-1.400	13.559974024	-1.021	13.559977746	-1.296	± 100
4.37	20	13.55994798	0.900	13.55995094	0.681	13.559942459	1.307	13.559952261	0.584	± 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	13.55989345	5.084	13.55988668	5.583	13.55988448	5.746	13.55988339	5.826	± 100
	40	13.55992472	2.777	13.55991924	3.181	13.55991528	3.474	13.55991429	3.547	± 100
	30	13.55994019	1.637	13.55993876	1.742	13.55993523	2.002	13.55993306	2.163	± 100
	20	13.55996239	0.000	13.5599679	-0.407	13.55996633	-0.291	13.5599582	0.309	± 100
	10	13.55997322	-0.799	13.55997726	-1.097	13.5599816	-1.417	13.5599873	-1.838	± 100
	0	13.55999314	-2.268	13.55999566	-2.454	13.55999911	-2.708	13.5600022	-2.936	± 100
	-10	13.56001487	-3.871	13.56002238	-4.425	13.56002496	-4.615	13.56002912	-4.922	± 100
	-20	13.56003846	-5.610	13.56004656	-6.207	13.56005424	-6.774	13.56006101	-7.273	± 100
3.23	20	13.55996505	-0.196	13.55996896	-0.485	13.5599652	-0.208	13.55996757	-0.382	± 100
4.37	20	13.55995084	0.852	13.55995439	0.590	13.55995284	0.704	13.55995396	0.621	± 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.

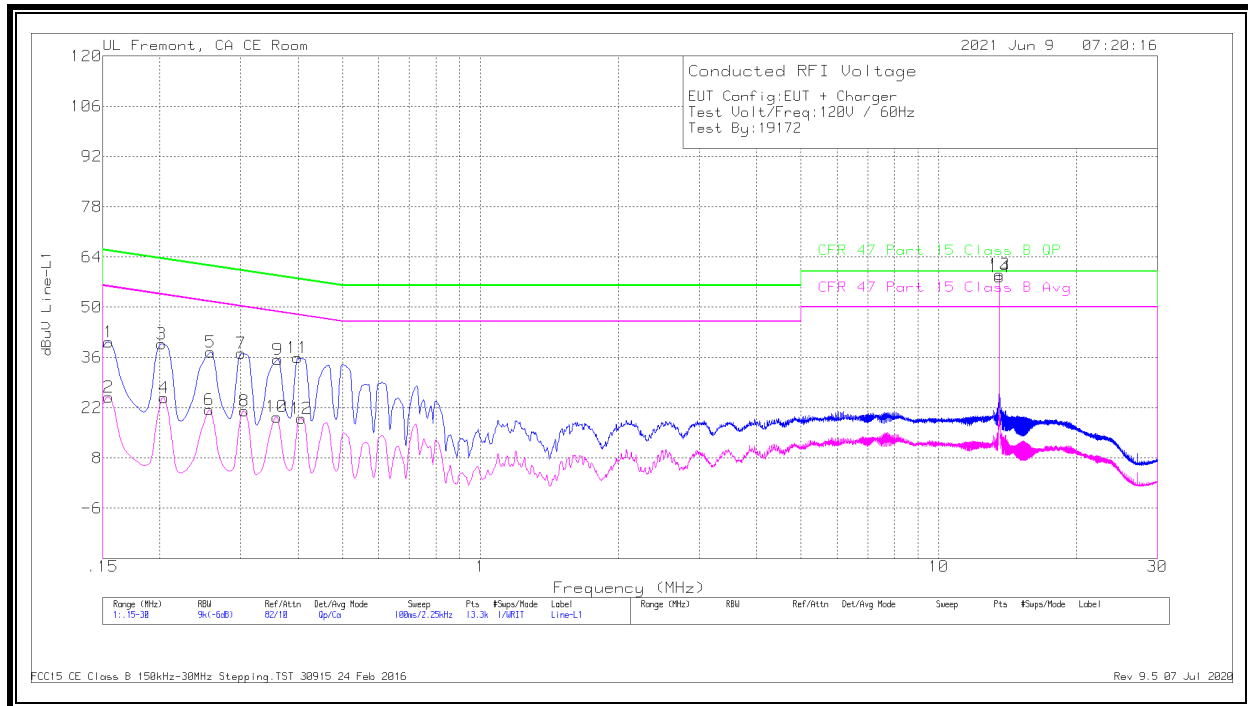
Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Notes:		
1. The lower limit shall apply at the transition frequencies		
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

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	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	.1545	30.85	Qp	.1	0	9.4	40.35	65.75	-25.4	-	-
2	.1545	15.49	Ca	.1	0	9.4	24.99	-	-	55.75	-30.76
3	.20175	30.46	Qp	0	0	9.3	39.76	63.54	-23.78	-	-
4	.204	15.54	Ca	0	0	9.3	24.84	-	-	53.45	-28.61
5	.258	28.2	Qp	0	0	9.3	37.5	61.5	-24	-	-
6	.25575	12.24	Ca	0	0	9.3	21.54	-	-	51.57	-30.03
7	.30075	27.83	Qp	0	0	9.3	37.13	60.22	-23.09	-	-
8	.30525	11.82	Ca	0	0	9.3	21.12	-	-	50.1	-28.98
9	.3615	26.14	Qp	0	0	9.3	35.44	58.69	-23.25	-	-
10	.35925	10.16	Ca	0	0	9.3	19.46	-	-	48.75	-29.29
11	.39975	26.59	Qp	0	0	9.3	35.89	57.86	-21.97	-	-
12	.4065	9.68	Ca	0	0	9.3	18.98	-	-	47.72	-28.74
13	13.56	49.6	Qp	.1	.2	9.3	59.2	60	-.8	-	-
14	13.56	48.79	Ca	.1	.2	9.3	58.39	-	-	50	8.39

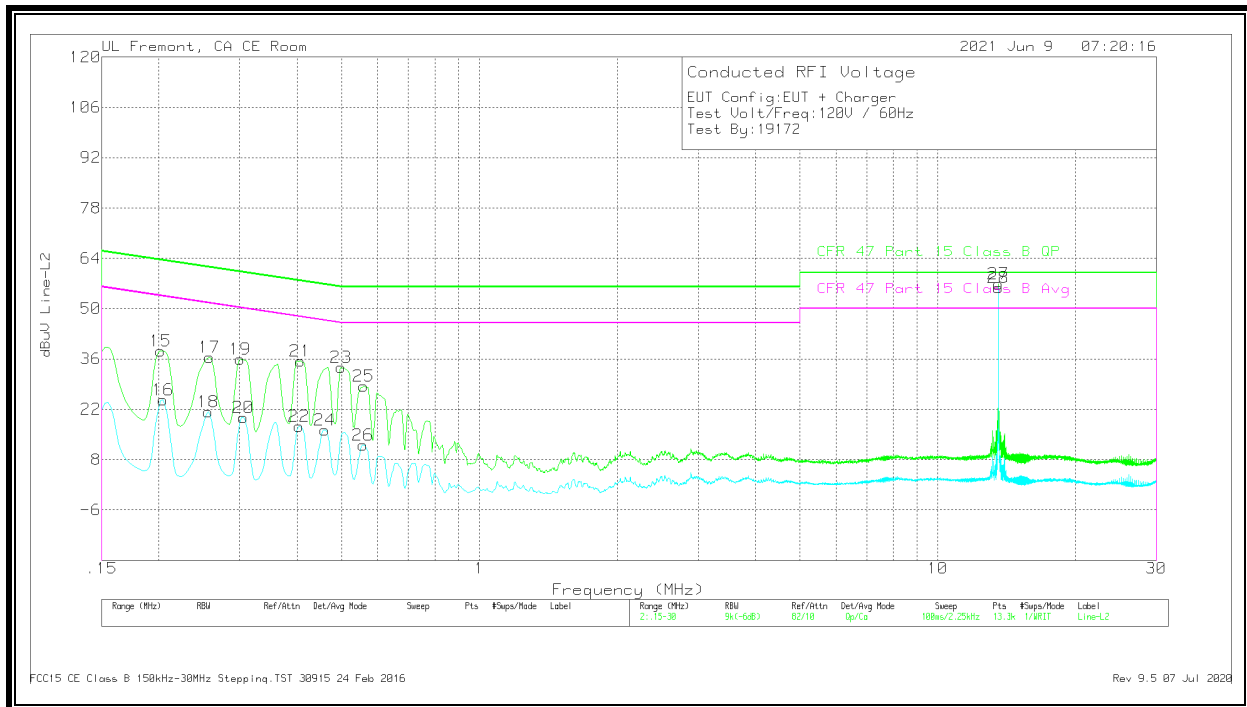
Qp - Quasi-Peak detector

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	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	28.97	Qp	0	0	9.3	38.27	63.54	-25.27	-	-
16	.204	15.35	Ca	0	0	9.3	24.65	-	-	53.45	-28.8
17	.258	27.24	Qp	0	0	9.3	36.54	61.5	-24.96	-	-
18	.25575	11.95	Ca	0	0	9.3	21.25	-	-	51.57	-30.32
19	.30075	26.58	Qp	0	0	9.3	35.88	60.22	-24.34	-	-
20	.30525	10.49	Ca	0	0	9.3	19.79	-	-	50.1	-30.31
21	.4065	26.11	Qp	0	0	9.3	35.41	57.72	-22.31	-	-
22	.40425	7.91	Ca	0	0	9.3	17.21	-	-	47.77	-30.56
23	.49875	24.37	Qp	0	0	9.3	33.67	56.02	-22.35	-	-
24	.4605	6.99	Ca	0	0	9.3	16.29	-	-	46.68	-30.39
25	.5595	19.17	Qp	0	0	9.3	28.47	56	-27.53	-	-
26	.55725	2.75	Ca	0	0	9.3	12.05	-	-	46	-33.95
27	13.56	47.29	Qp	.1	.2	9.3	56.89	60	-3.11	-	-
28	13.56	46.16	Ca	.1	.2	9.3	55.76	-	-	50	5.76

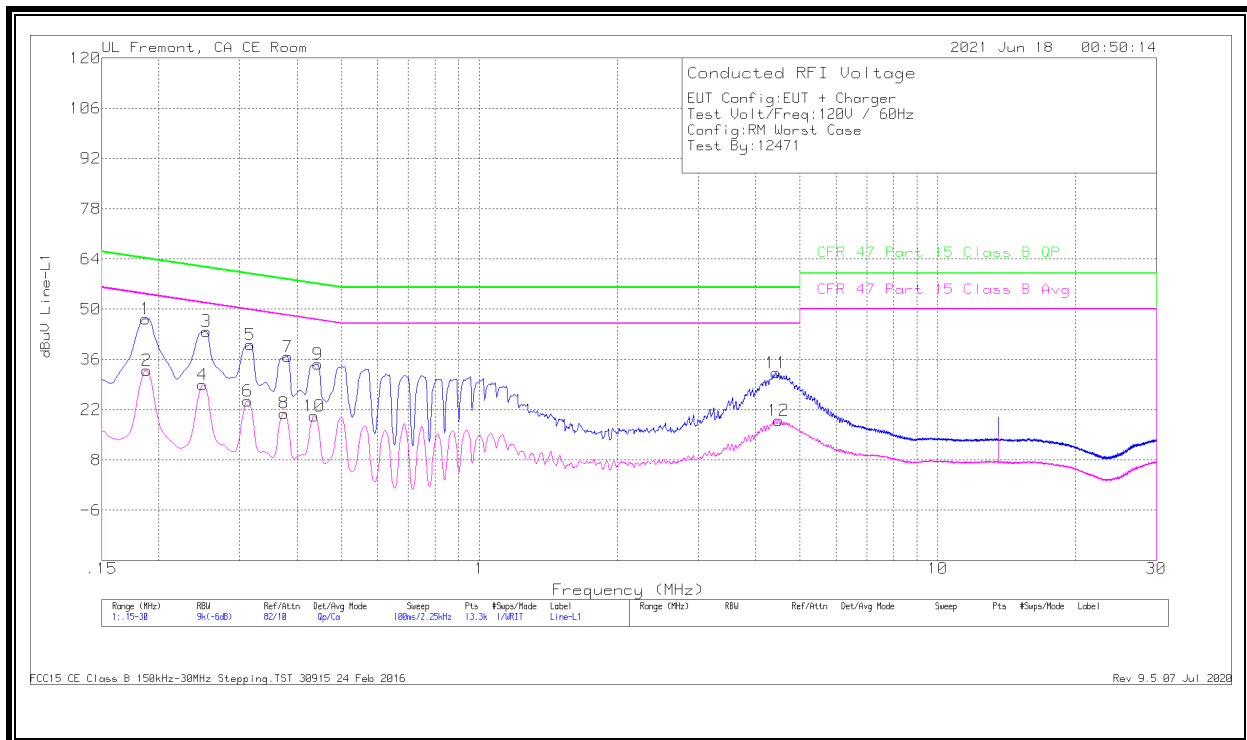
Qp - Quasi-Peak detector

Ca - CISPR average detection

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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**

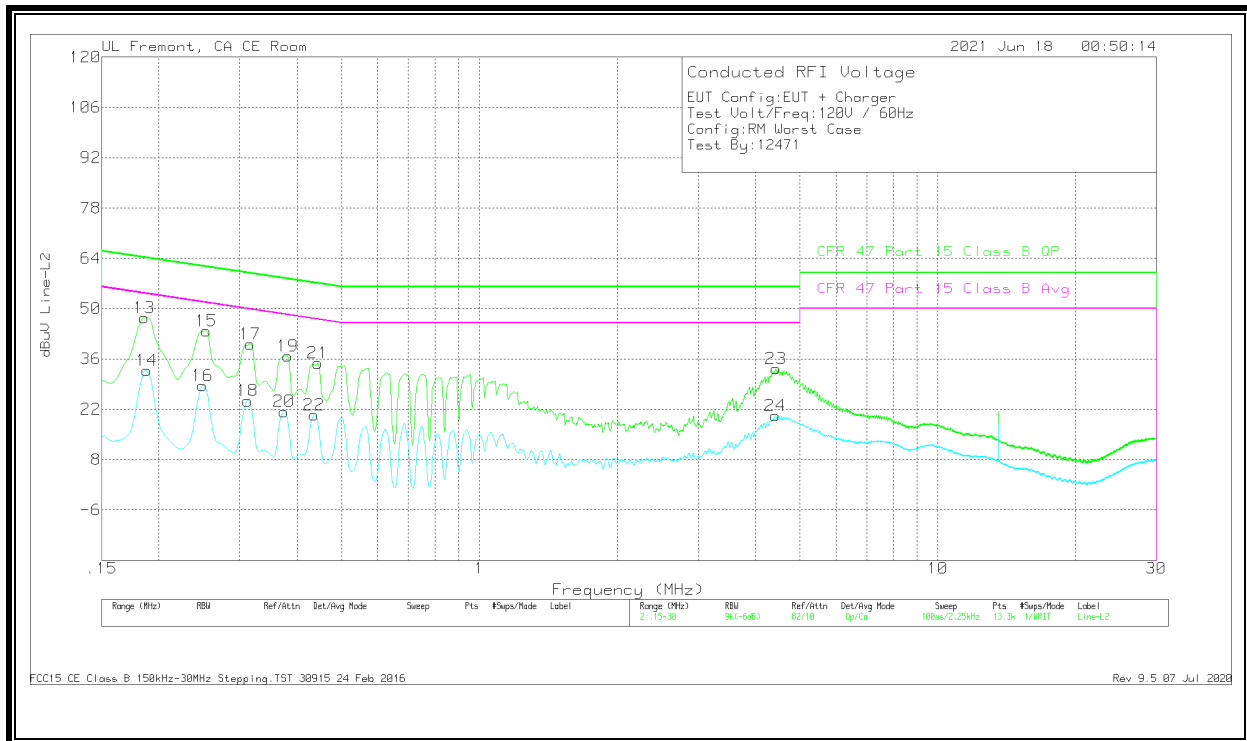
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
1	.18713	37.97	Qp	0	0	9.4	47.37	64.16	-16.79	-	-
2	.18825	23.55	Ca	0	0	9.4	32.95	-	-	54.11	-21.16
3	.2535	34.58	Qp	0	0	9.3	43.88	61.64	-17.76	-	-
4	.249	19.6	Ca	0	0	9.3	28.9	-	-	51.79	-22.89
5	.3165	30.86	Qp	0	0	9.3	40.16	59.8	-19.64	-	-
6	.312	15.16	Ca	0	0	9.3	24.46	-	-	49.92	-25.46
7	.38175	27.48	Qp	0	0	9.3	36.78	58.24	-21.46	-	-
8	.375	11.73	Ca	0	0	9.3	21.03	-	-	48.39	-27.36
9	.44475	25.42	Qp	0	0	9.3	34.72	56.97	-22.25	-	-
10	.43575	11	Ca	0	0	9.3	20.3	-	-	47.14	-26.84
11	4.43738	22.91	Qp	0	.1	9.3	32.31	56	-23.69	-	-
12	4.4925	9.66	Ca	0	.1	9.3	19.06	-	-	46	-26.94

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

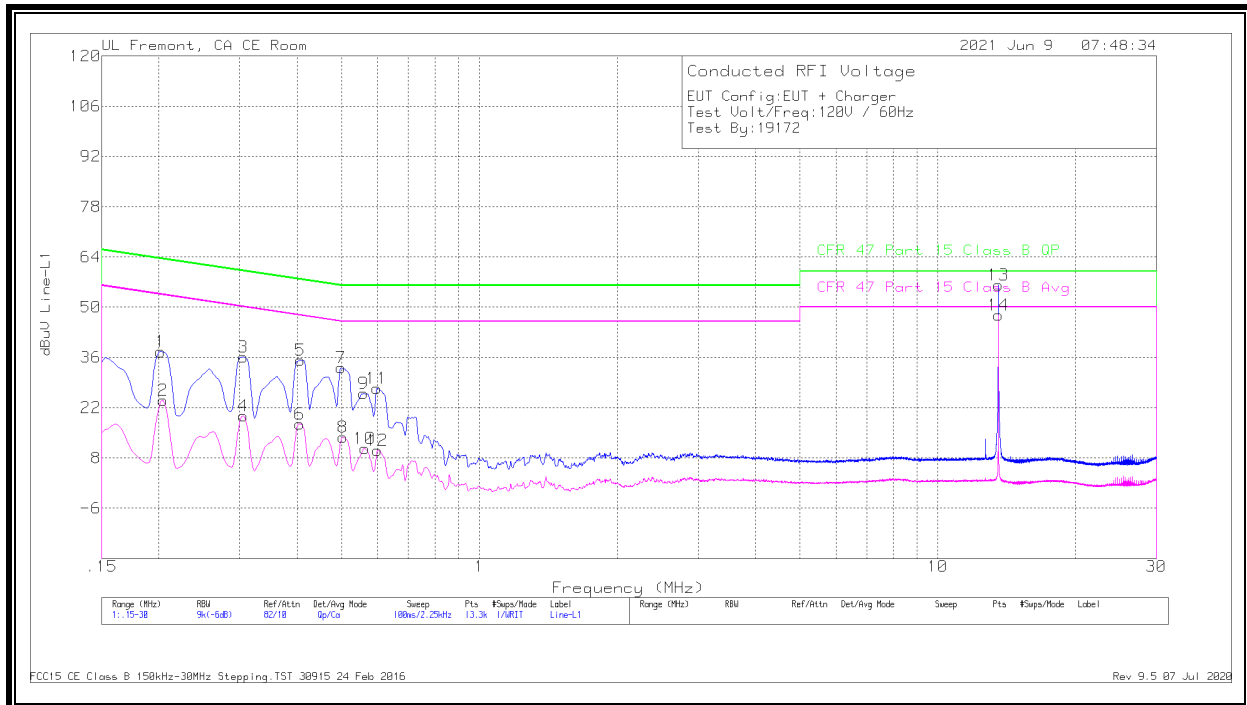
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.186	38	Qp	0	0	9.4	47.4	64.21	-16.81	-	-
14	.18825	23.35	Ca	0	0	9.4	32.75	-	-	54.11	-21.36
15	.2535	34.51	Qp	0	0	9.3	43.81	61.64	-17.83	-	-
16	.249	19.35	Ca	0	0	9.3	28.65	-	-	51.79	-23.14
17	.3165	30.88	Qp	0	0	9.3	40.18	59.8	-19.62	-	-
18	.312	15.05	Ca	0	0	9.3	24.35	-	-	49.92	-25.57
19	.38175	27.58	Qp	0	0	9.3	36.88	58.24	-21.36	-	-
20	.375	12.08	Ca	0	0	9.3	21.38	-	-	48.39	-27.01
21	.44475	25.52	Qp	0	0	9.3	34.82	56.97	-22.15	-	-
22	.43575	11.13	Ca	0	0	9.3	20.43	-	-	47.14	-26.71
23	4.434	23.92	Qp	0	.1	9.3	33.32	56	-22.68	-	-
24	4.42613	10.83	Ca	0	.1	9.3	20.23	-	-	46	-25.77

Qp - Quasi-Peak detector

Ca - CISPR average detection

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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	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	.20175	28.31	Qp	0	0	9.3	37.61	63.54	-25.93	-	-
2	.204	14.81	Ca	0	0	9.3	24.11	-	-	53.45	-29.34
3	.30525	26.77	Qp	0	0	9.3	36.07	60.1	-24.03	-	-
4	.30525	10.35	Ca	0	0	9.3	19.65	-	-	50.1	-30.45
5	.4065	25.91	Qp	0	0	9.3	35.21	57.72	-22.51	-	-
6	.40538	8.19	Ca	0	0	9.3	17.49	-	-	47.74	-30.25
7	.49875	23.84	Qp	0	0	9.3	33.14	56.02	-22.88	-	-
8	.50325	4.41	Ca	0	0	9.3	13.71	-	-	46	-32.29
9	.5595	16.69	Qp	0	0	9.3	25.99	56	-30.01	-	-
10	.56175	1.32	Ca	0	0	9.3	10.62	-	-	46	-35.38
11	.59775	18.17	Qp	0	0	9.3	27.47	56	-28.53	-	-
12	.6	.82	Ca	0	0	9.3	10.12	-	-	46	-35.88
13	13.56	46.6	Qp	.1	.2	9.3	56.2	60	-3.8	-	-
14	13.56	38.15	Ca	.1	.2	9.3	47.75	-	-	50	-2.25

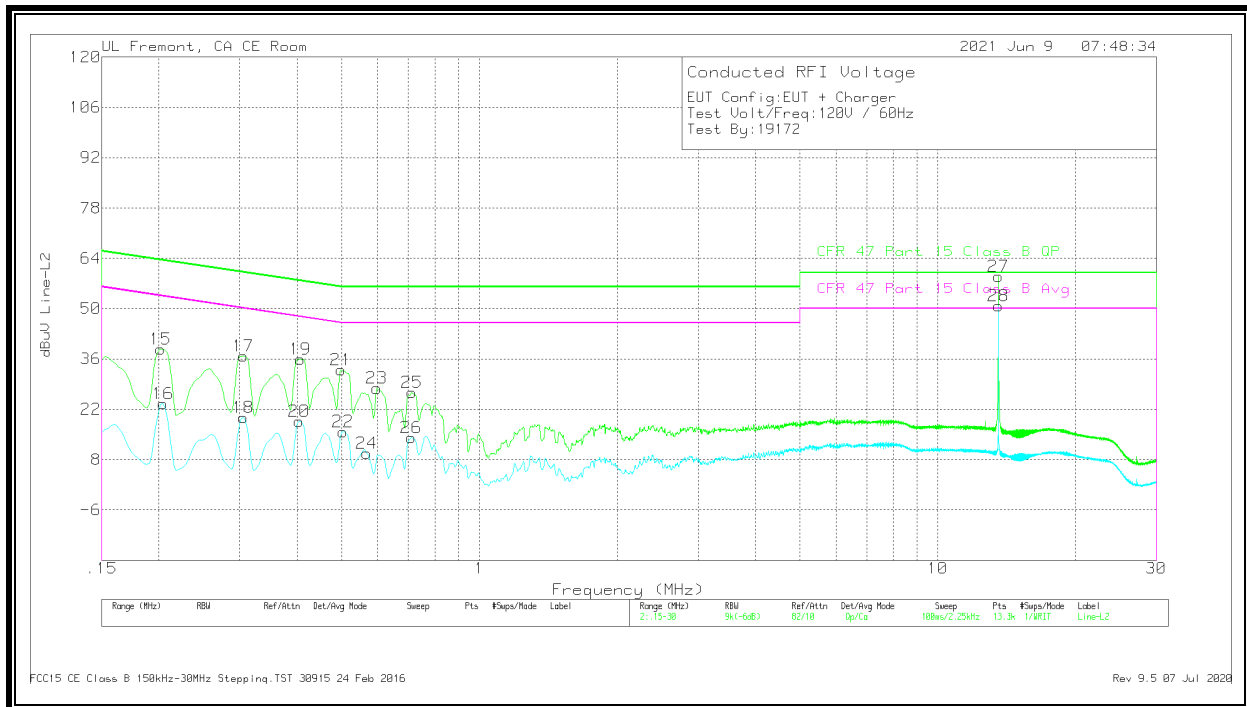
Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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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	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	29.39	Qp	0	0	9.3	38.69	63.54	-24.85	-	-
16	.204	14.32	Ca	0	0	9.3	23.62	-	-	53.45	-29.83
17	.30525	27.45	Qp	0	0	9.3	36.75	60.1	-23.35	-	-
18	.30525	10.4	Ca	0	0	9.3	19.7	-	-	50.1	-30.4
19	.4065	26.63	Qp	0	0	9.3	35.93	57.72	-21.79	-	-
20	.40425	9.3	Ca	0	0	9.3	18.6	-	-	47.77	-29.17
21	.49875	23.61	Qp	0	0	9.3	32.91	56.02	-23.11	-	-
22	.50325	6.49	Ca	0	0	9.3	15.79	-	-	46	-30.21
23	.59775	18.54	Qp	0	0	9.3	27.84	56	-28.16	-	-
24	.5685	.53	Ca	0	0	9.3	9.83	-	-	46	-36.17
25	.7125	17.35	Qp	0	0	9.3	26.65	56	-29.35	-	-
26	.71025	4.91	Ca	0	0	9.3	14.21	-	-	46	-31.79
27	13.56	49.45	Qp	.1	.2	9.3	59.05	60	-.95	-	-
28	13.56	41.2	Ca	.1	.2	9.3	50.8	-	-	50	.8

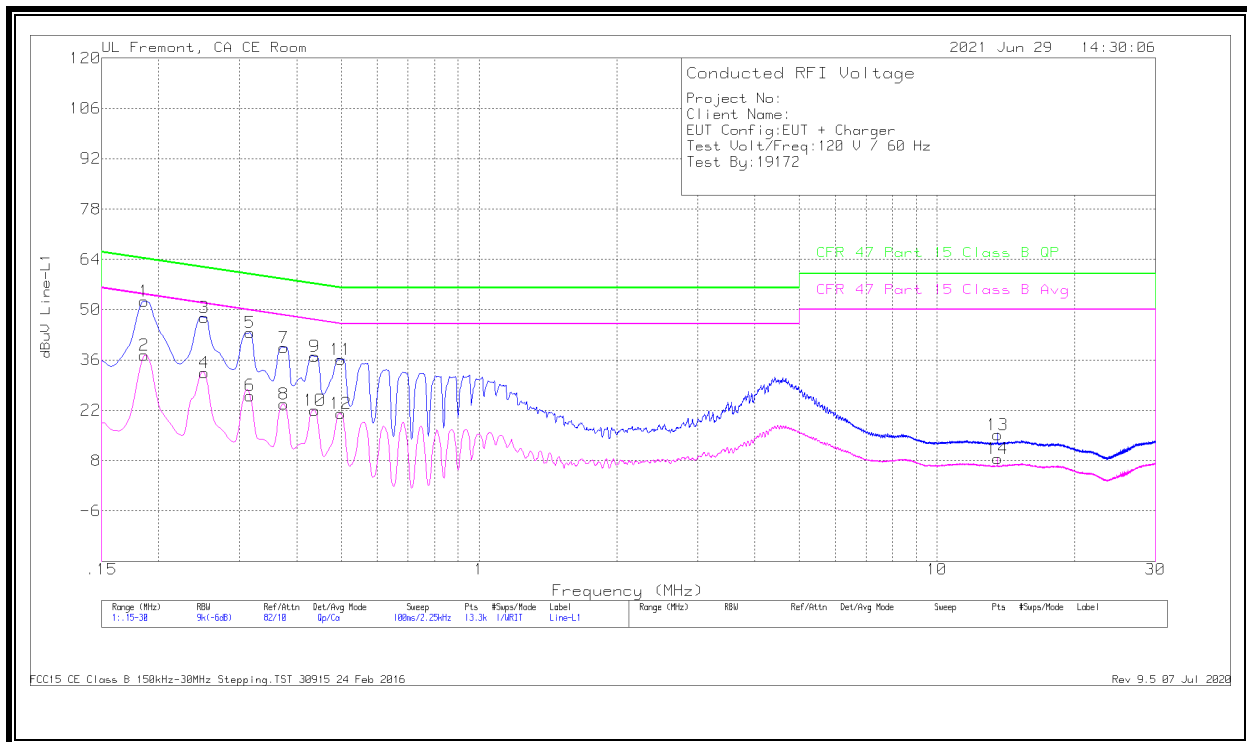
Qp - Quasi-Peak detector

Ca - CISPR average detection

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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**

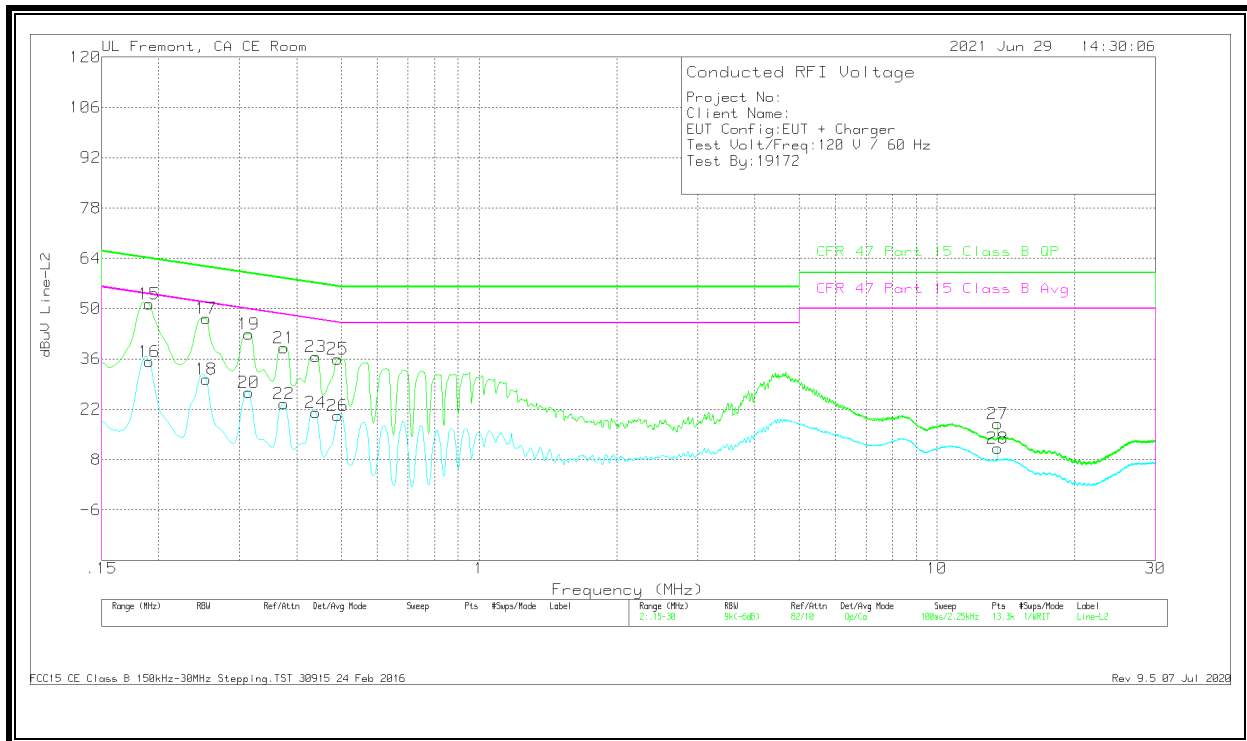
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.186	42.98	Qp	0	0	9.4	52.38	64.21	-11.83	-	-
2	.186	28	Ca	0	0	9.4	37.4	-	-	54.21	-16.81
3	.25125	38.58	Qp	0	0	9.3	47.88	61.72	-13.84	-	-
4	.25125	23.1	Ca	0	0	9.3	32.4	-	-	51.72	-19.32
5	.3165	34.29	Qp	0	0	9.3	43.59	59.8	-16.21	-	-
6	.3165	16.79	Ca	0	0	9.3	26.09	-	-	49.8	-23.71
7	.375	30.18	Qp	0	0	9.3	39.48	58.39	-18.91	-	-
8	.375	14.42	Ca	0	0	9.3	23.72	-	-	48.39	-24.67
9	.438	27.69	Qp	0	0	9.3	36.99	57.1	-20.11	-	-
10	.438	12.66	Ca	0	0	9.3	21.96	-	-	47.1	-25.14
11	.49875	26.85	Qp	0	0	9.3	36.15	56.02	-19.87	-	-
12	.49875	11.74	Ca	0	0	9.3	21.04	-	-	46.02	-24.98
13	13.56225	5.53	Qp	.1	.2	9.3	15.13	60	-44.87	-	-
14	13.56225	-1.07	Ca	.1	.2	9.3	8.53	-	-	50	-41.47

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

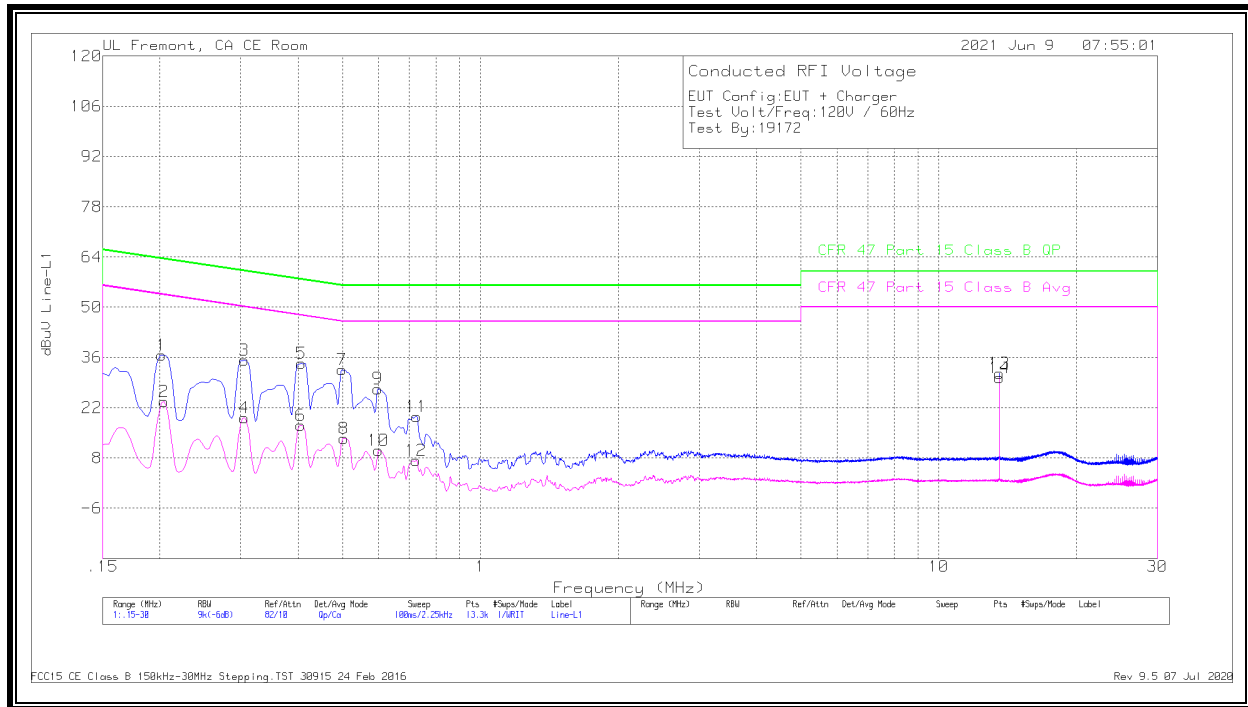
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
15	.1905	41.99	Qp	0	0	9.3	51.29	64.01	-12.72	-	-
16	.1905	26	Ca	0	0	9.3	35.3	-	-	54.01	-18.71
17	.2535	37.93	Qp	0	0	9.3	47.23	61.64	-14.41	-	-
18	.2535	21.01	Ca	0	0	9.3	30.31	-	-	51.64	-21.33
19	.31425	33.65	Qp	0	0	9.3	42.95	59.86	-16.91	-	-
20	.31425	17.43	Ca	0	0	9.3	26.73	-	-	49.86	-23.13
21	.375	29.8	Qp	0	0	9.3	39.1	58.39	-19.29	-	-
22	.375	14.18	Ca	0	0	9.3	23.48	-	-	48.39	-24.91
23	.44025	27.4	Qp	0	0	9.3	36.7	57.06	-20.36	-	-
24	.44025	11.82	Ca	0	0	9.3	21.12	-	-	47.06	-25.94
25	.492	26.73	Qp	0	0	9.3	36.03	56.13	-20.1	-	-
26	.492	10.97	Ca	0	0	9.3	20.27	-	-	46.13	-25.86
27	13.56	8.3	Qp	.1	.2	9.3	17.9	60	-42.1	-	-
28	13.56	1.59	Ca	.1	.2	9.3	11.19	-	-	50	-38.81

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

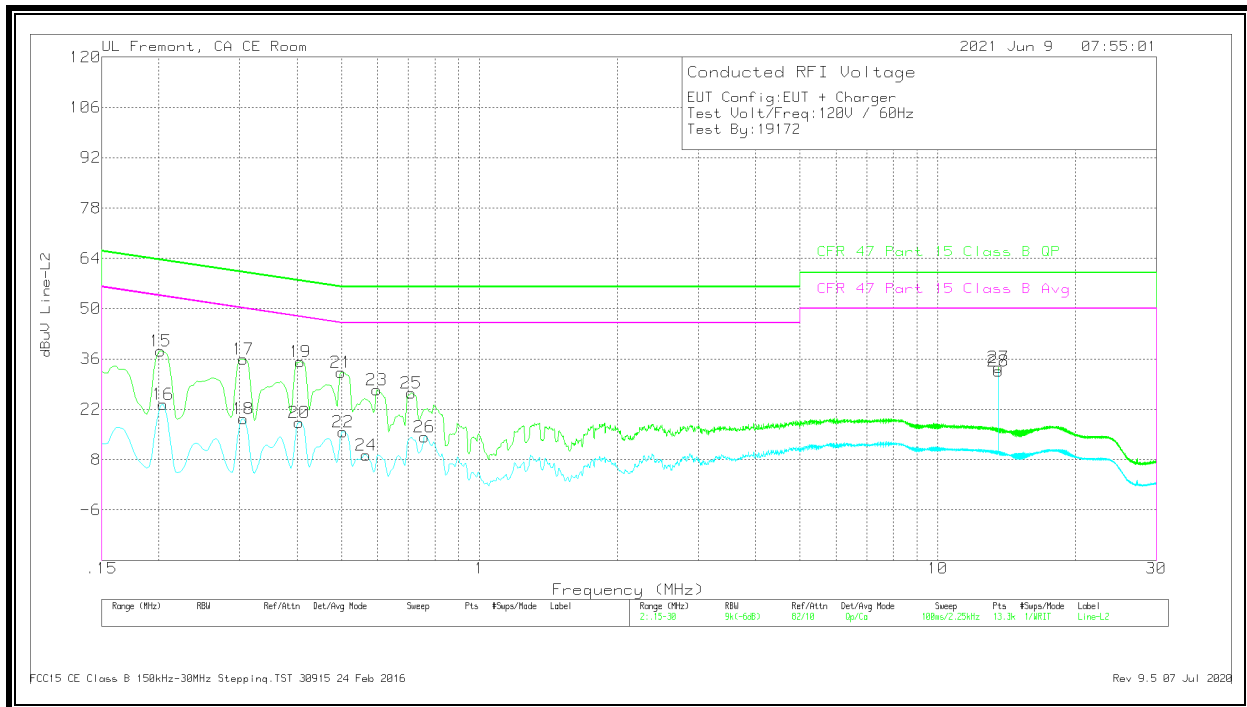
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.20175	27.37	Qp	0	0	9.3	36.67	63.54	-26.87	-	-
2	.204	14.43	Ca	0	0	9.3	23.73	-	-	53.45	-29.72
3	.30525	25.88	Qp	0	0	9.3	35.18	60.1	-24.92	-	-
4	.30525	9.84	Ca	0	0	9.3	19.14	-	-	50.1	-30.96
5	.4065	25.11	Qp	0	0	9.3	34.41	57.72	-23.31	-	-
6	.40538	7.73	Ca	0	0	9.3	17.03	-	-	47.74	-30.71
7	.49875	23.33	Qp	0	0	9.3	32.63	56.02	-23.39	-	-
8	.50438	4.16	Ca	0	0	9.3	13.46	-	-	46	-32.54
9	.59775	18.01	Qp	0	0	9.3	27.31	56	-28.69	-	-
10	.6	.83	Ca	0	0	9.3	10.13	-	-	46	-35.87
11	.726	10.3	Qp	0	0	9.3	19.6	56	-36.4	-	-
12	.72375	-1.94	Ca	0	0	9.3	7.36	-	-	46	-38.64
13	13.56	21.92	Qp	.1	.2	9.3	31.52	60	-28.48	-	-
14	13.56	20.81	Ca	.1	.2	9.3	30.41	-	-	50	-19.59

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

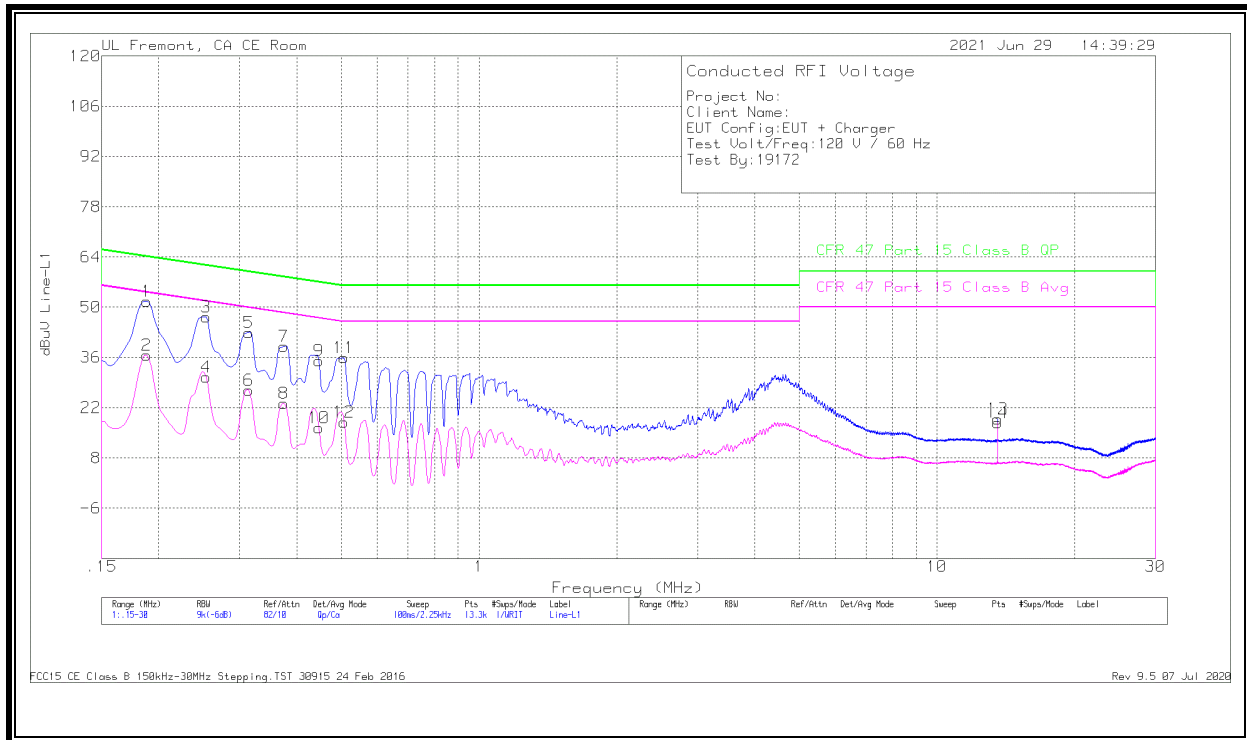
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L2	LC Cables C2&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
15	.20175	28.89	Qp	0	0	9.3	38.19	63.54	-25.35	-	-
16	.204	14.09	Ca	0	0	9.3	23.39	-	-	53.45	-30.06
17	.30525	26.63	Qp	0	0	9.3	35.93	60.1	-24.17	-	-
18	.30525	10.03	Ca	0	0	9.3	19.33	-	-	50.1	-30.77
19	.4065	25.9	Qp	0	0	9.3	35.2	57.72	-22.52	-	-
20	.40425	9.02	Ca	0	0	9.3	18.32	-	-	47.77	-29.45
21	.49875	23.05	Qp	0	0	9.3	32.35	56.02	-23.67	-	-
22	.50325	6.45	Ca	0	0	9.3	15.75	-	-	46	-30.25
23	.59775	18.1	Qp	0	0	9.3	27.4	56	-28.6	-	-
24	.56625	.03	Ca	0	0	9.3	9.33	-	-	46	-36.67
25	.71025	17.28	Qp	0	0	9.3	26.58	56	-29.42	-	-
26	.75975	4.99	Ca	0	0	9.3	14.29	-	-	46	-31.71
27	13.56	24.1	Qp	.1	.2	9.3	33.7	60	-26.3	-	-
28	13.56	22.96	Ca	.1	.2	9.3	32.56	-	-	50	-17.44

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

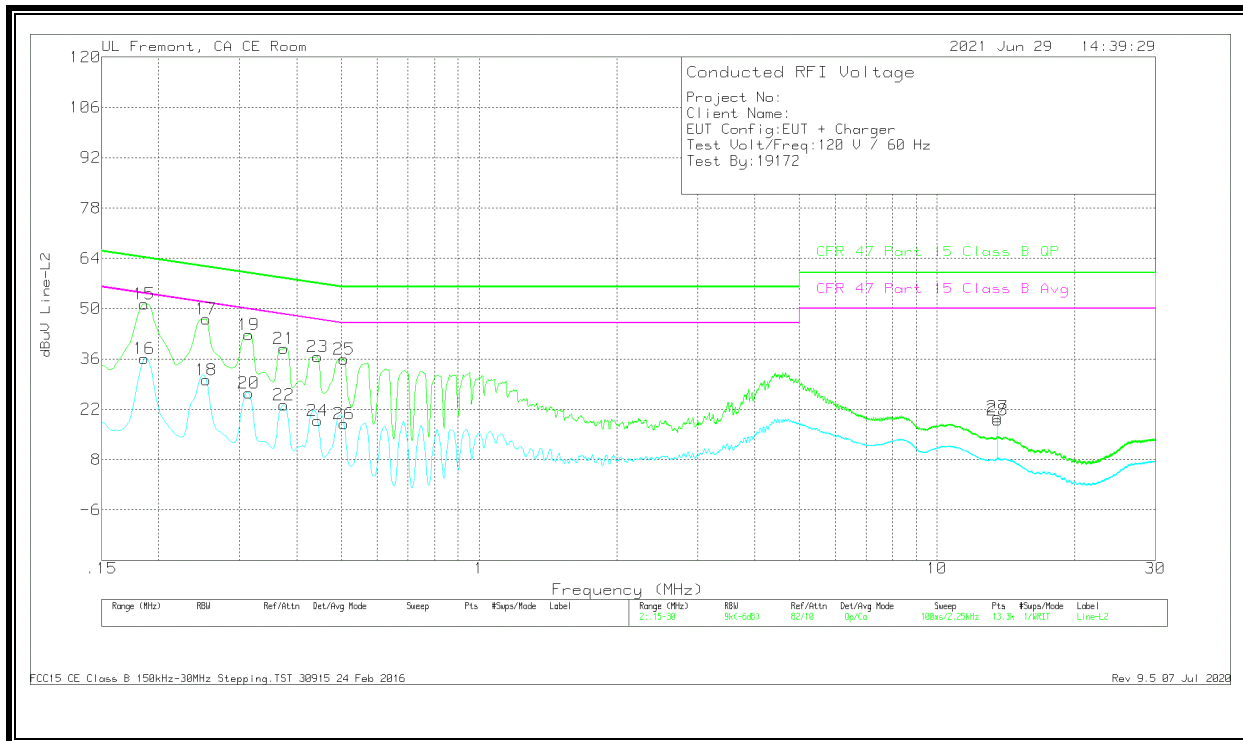
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE018644 6 L1	LC Cables C1&C3 dB	TekBox Limiter TBFL1 Model 207	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)M argin (dB)
1	.18825	42.19	Qp	0	0	9.4	51.59	64.11	-12.52	-	-
2	.18825	27.31	Ca	0	0	9.4	36.71	-	-	54.11	-17.4
3	.2535	38.01	Qp	0	0	9.3	47.31	61.64	-14.33	-	-
4	.2535	21.19	Ca	0	0	9.3	30.49	-	-	51.64	-21.15
5	.31425	33.65	Qp	0	0	9.3	42.95	59.86	-16.91	-	-
6	.31425	17.53	Ca	0	0	9.3	26.83	-	-	49.86	-23.03
7	.375	29.72	Qp	0	0	9.3	39.02	58.39	-19.37	-	-
8	.375	13.98	Ca	0	0	9.3	23.28	-	-	48.39	-25.11
9	.447	25.72	Qp	0	0	9.3	35.02	56.93	-21.91	-	-
10	.447	7.07	Ca	0	0	9.3	16.37	-	-	46.93	-30.56
11	.50775	26.62	Qp	0	0	9.3	35.92	56	-20.08	-	-
12	.50775	8.64	Ca	0	0	9.3	17.94	-	-	46	-28.06
13	13.56	8.72	Qp	.1	.2	9.3	18.32	60	-41.68	-	-
14	13.56	8.07	Ca	.1	.2	9.3	17.67	-	-	50	-32.33

Qp - Quasi-Peak detector

Ca - CISPR average detection

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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	.186	41.9	Qp	0	0	9.4	51.3	64.21	-12.91	-	-
16	.186	26.79	Ca	0	0	9.4	36.19	-	-	54.21	-18.02
17	.2535	37.8	Qp	0	0	9.3	47.1	61.64	-14.54	-	-
18	.2535	20.94	Ca	0	0	9.3	30.24	-	-	51.64	-21.4
19	.31425	33.43	Qp	0	0	9.3	42.73	59.86	-17.13	-	-
20	.31425	17.29	Ca	0	0	9.3	26.59	-	-	49.86	-23.27
21	.375	29.55	Qp	0	0	9.3	38.85	58.39	-19.54	-	-
22	.375	13.91	Ca	0	0	9.3	23.21	-	-	48.39	-25.18
23	.44475	27.4	Qp	0	0	9.3	36.7	56.97	-20.27	-	-
24	.44475	9.57	Ca	0	0	9.3	18.87	-	-	46.97	-28.1
25	.50775	26.72	Qp	0	0	9.3	36.02	56	-19.98	-	-
26	.50775	8.71	Ca	0	0	9.3	18.01	-	-	46	-27.99
27	13.56	9.12	Qp	.1	.2	9.3	18.72	60	-41.28	-	-
28	13.56	8.42	Ca	.1	.2	9.3	18.02	-	-	50	-31.98

Qp - Quasi-Peak detector

Ca - CISPR average detection

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11. SETUP PHOTOS

Please refer to 13573771-EP1V1 for setup photos

END OF TEST REPORT