We ha FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-216 ISSUE 2

CERTIFICATION TEST REPORT

FOR

MAGNETIC CHARGING CABLE

MODEL NUMBER: A1768

REPORT NUMBER: 16U23041-E1V7

FCC ID: BCGA1768
IC: 579C-A1768

ISSUE DATE: AUGUST 24, 2016

Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	08/02/2016	Initial Issue	Chin Pang
V2	08/03/2016	Address TCB's Questions	Chin Pang
V3	08/03/2016	Address TCB's Questions	Chin Pang
V4	08/04/2016	Address TCB's Questions	Chin Pang
V5	08/16/2016	Address TCB's Questions	Chin Pang
V6	08/23/2016	Address TCB's Questions, add Note Section 5.4 and Section 8 CISPR 11 Limit	Chin Pang
V7	08/24/2016	Add CISPR 11 limit in Section 8	Chin Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: MAGNETIC CHARGING CABLE

MODELNUMBER: A1768

SERIAL NUMBER: DLC616200ZYHE1Y835

DATE TESTED: JULY 12, 2016 - AUGUST 24, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	Pass
INDUSTRY CANADA RSS-216 Issue 2	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

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

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

Approved & Released For
UL Verification Services Inc. By:

CHIN PANG
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.

Prepared By:

TOM CHEN
EMC ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, and FCC CFR 47 Part 15, RSS-GEN Issue 4 and RSS-216 Issue 2 January 2016.

3. FACILITIES AND ACCREDITATION

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

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

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a magnetic charging cable which includes an inductive charging coil to charge Apple Watch

5.2. MAXIMUM OUTPUT POWER

The transmitter has maximum peak radiated electric field strength at 300m distance as follows:

Fundamental Frequency (KHz)	Mode	E field (300m distance) (dBuV/m)
326.5	Standby	-15.92

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was v9.1.6

5.4. WORST-CASE CONFIGURATION AND MODE

The EUT is a single frequency stainless steel magnetic charger enclosed in a plastic case. For the entire radiated emissions test, the EUT was examining on the following configuration.

Configuration	Mode	Descriptions
1	Standby	EUT Alone powered by AC/DC adapter
2	Operating	EUT and Watch powered by AC/DC adapter

AC power line conducted emissions were also investigated on the following configurations.

Configuration	Mode	Descriptions
1	Standby	EUT Alone powered by AC/DC adapter
2	Operating	EUT and Watch powered by AC/DC adapter

Note that the EUT was tested as standby and operation modes. During operational mode, EUT was tested with two different sizes of watches of having similar mechanical structure. One of the watches was smaller and the other one was bigger. During the charging process, the watch actively indicates the status of the charging process. Device being charges was at a state of 20 – 50% charged

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 300 m 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 937606

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Apple	A1385	D293154U2DTDHLHCW	N/A
Watch	Apple	A1803	FH7RM066H91N	BCG-E3103

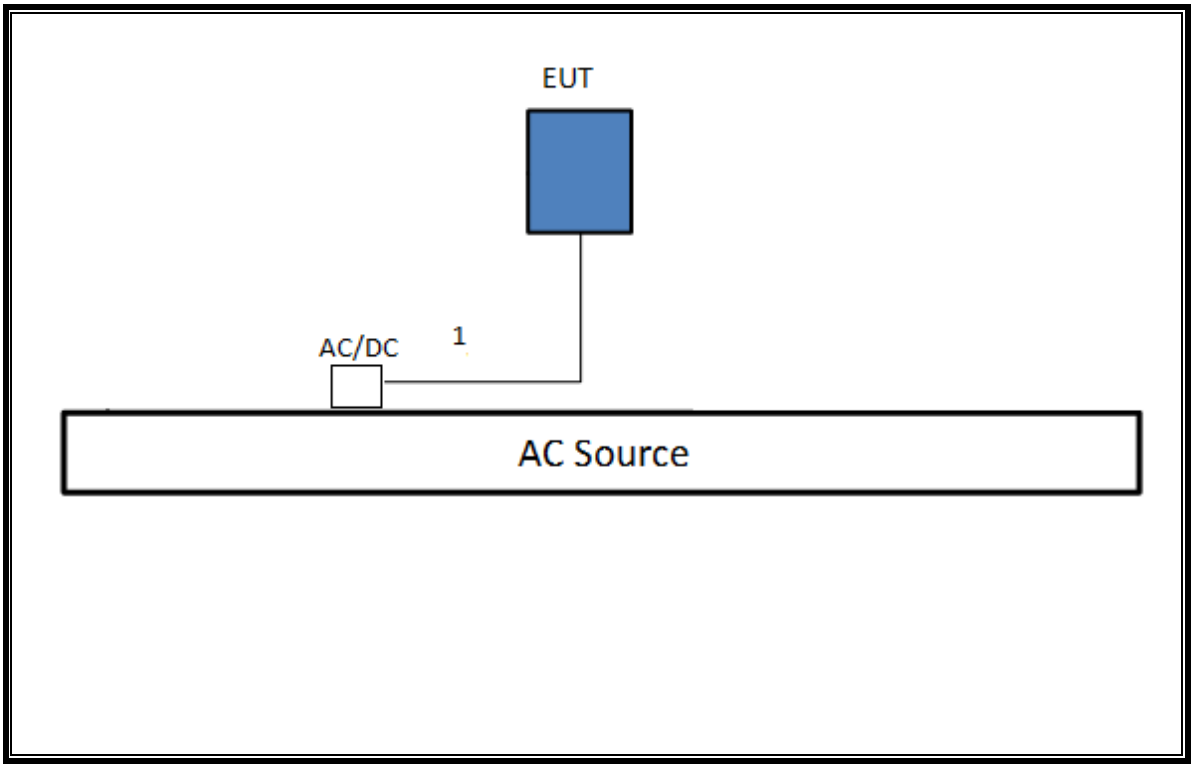
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	USB	Un-shielded	2	5W Power Supply

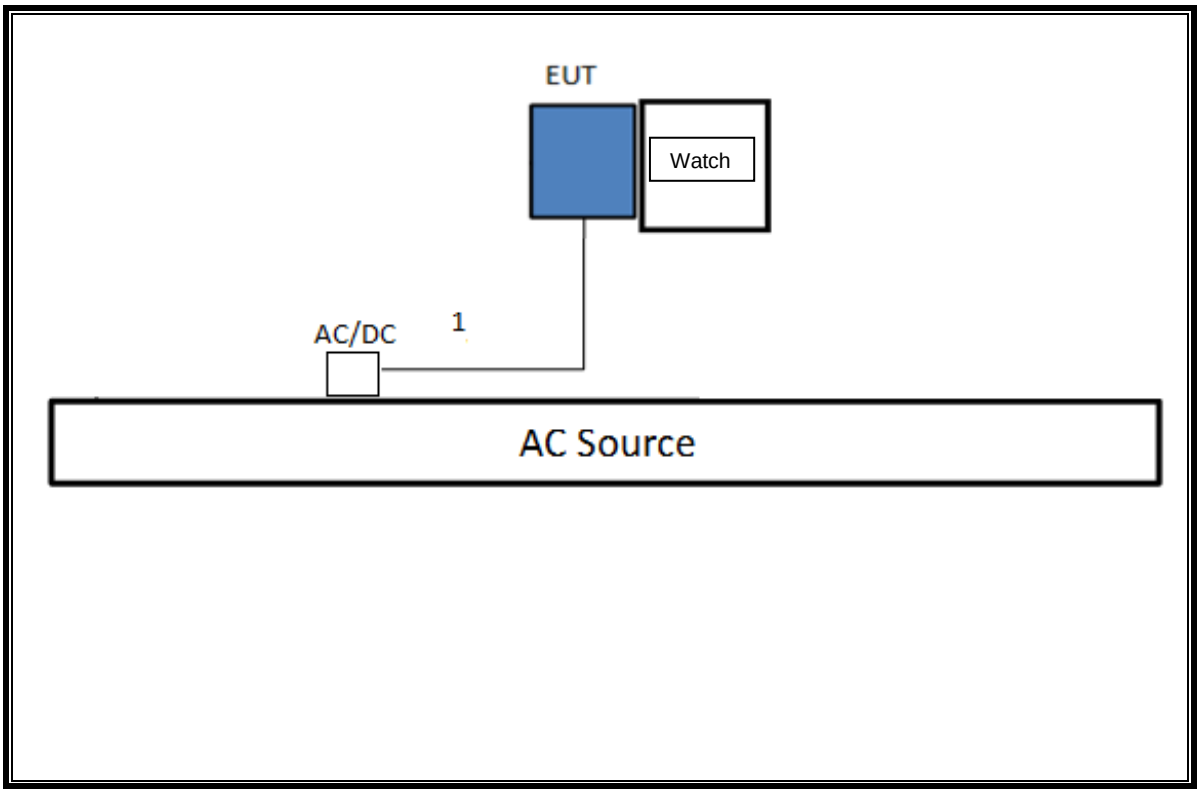
TEST SETUP

Please see the following configurations for the test setups. Both configurations indicate that the EUT is directly connected to an AC/DC adapter via USB cable.

CONFIGURATION 1: STANDBY MODE POWERED WITH AC ADPTER



CONFIGURATION 2: OPERATING MODE POWERED WITH AC ADPTER



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	A022813-1	10/28/16
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	171202	11/05/16
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY55410147	12/09/16
Antenna, Loop, 30 MHz	ETS Lindgren	6502	T757	05/31/17
EMI Test Receiver	R & S	ESCI 7	T284	09/10/16
LISN, 10 kHz - 30 MHz	FCC	50/250-25-2	T24	01/17/17

7. OCCUPIED BANDWIDTH

The emission bandwidth (×dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated × dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of ~1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be greater or equal 3×RBW.

Note: Video averaging is not permitted.

A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.

The difference between the two recorded frequencies is the 99% occupied bandwidth.

Note that when the EUT was in standby mode the only signal that comes out from the EUT was the intentional charging signal of 326.5 KHz. On the other hand, when the EUT was in operational mode there were two signals. One was the intentional charging signal of 326.5 KHz and the other one the control signal of 340 KHz that controls the communication/charging status between EUT and the client device-the watch.

EUT SETUP

Configuration 1: Charger in stand-by mode, transmitting low duty cycle CW signal at 326.5 kHz test.

Configuration 2: Charger in paring mode with FSK modulation (-0/+15 kHz) which occurs over a very short period of time as soon as the watch is placed on the charger.

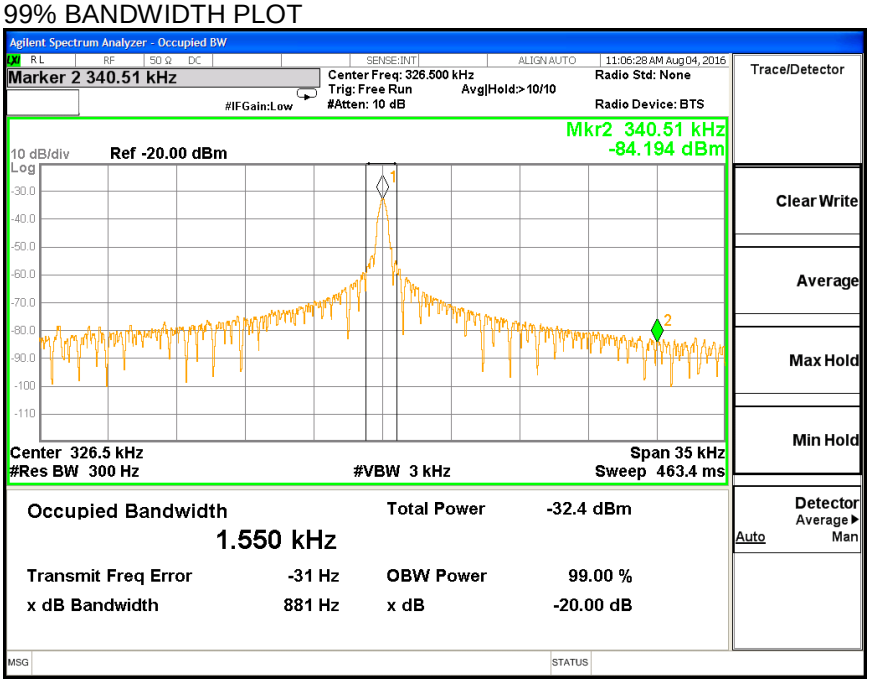
Configuration 3: Charger in charging mode with CW signal and duty cycle varied to control charge level via load modulation from watch.

RESULTS

ID:	29435	Date:	8/4/16

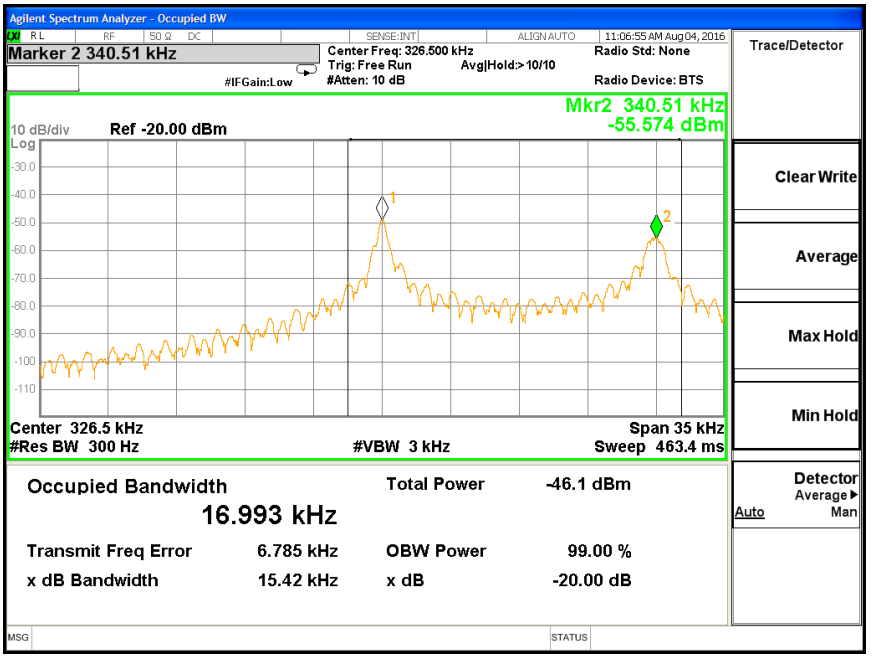
CONFIGURATION 1

99% BANDWIDTH PLOT



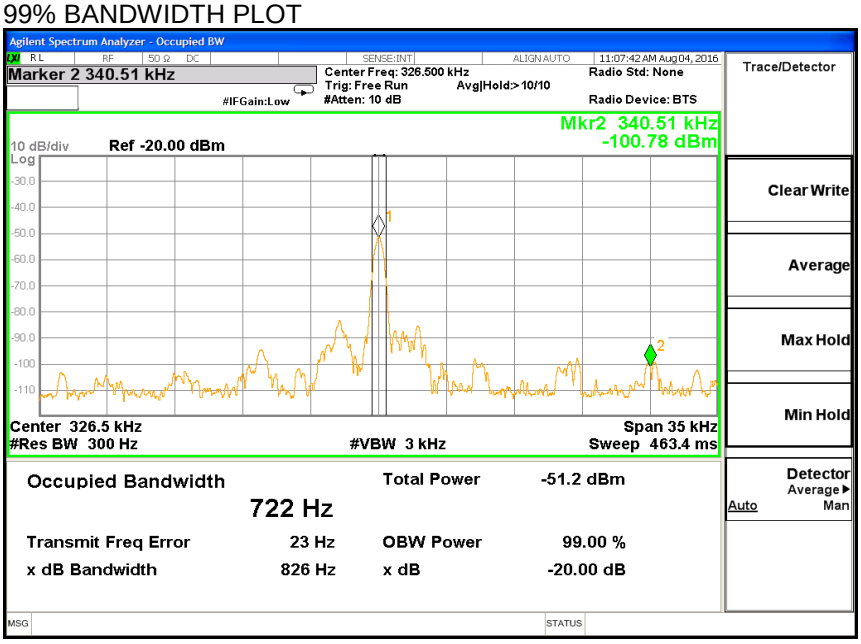
CONFIGURATION 2

99% BANDWIDTH PLOT



CONFIGURATION 3

99% BANDWIDTH PLOT



8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.209 (a)
IC RSS-GEN, Section 8.9 and 8.10.

Frequency (MHz)	Field Strength (microvolts/meter)	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 to 216	150	3
216 to 960	200	3
Above 960 MHz	500	3
Note: The lower limit shall apply at the transition frequency.		

CISPR 11:04

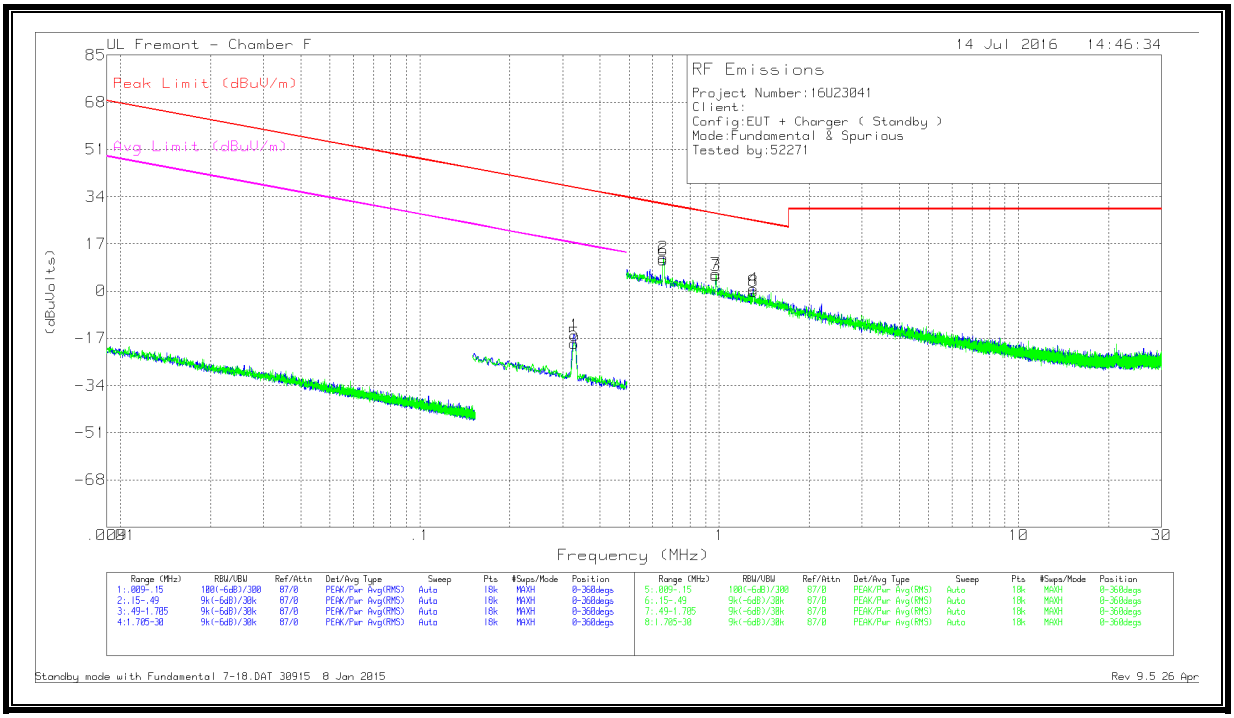
Electromagnetic radiation disturbance limits for class B group 2 equipment measured on a test site

Frequency range	Limits for a measuring distance D in m				
	Electric field				**Magnetic field**
	D = 10 m		**D = 3 m b**		**D = 3 m**
	Quasi-peak	**Average**	**Quasi-peak**	**Average**	**Quasi-peak**
	dB(µV/m)		**dB(µV/m)**		**dB(µA/m)**
0,15 – 30	–	–	–	–	39, Decreasing linearly with the logarithm of frequency to 3
30 – 80,872	30	25	40	35	–
80,872 – 81,848	50	45	60	55	–
81,848 – 134,786	30	25	40	35	–
134,786 – 136,414	50	45	60	55	–
136,414 – 230	30	25	40	35	–
230 – 1 000	37	32	47	42	–

RESULTS

8.2. FCC TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 0.15 TO 30 MHz

8.2.1. STANDBY CONFIGURATION



DATA

FUNDAMENTAL

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.32873	52.28	Pk	11.7	.1	-80	-15.92	37.27	-53.19	17.27	-33.19	0-360
5	.3285	49.43	Pk	11.7	.1	-80	-18.77	37.27	-56.04	17.27	-36.04	0-360

Pk - Peak detector

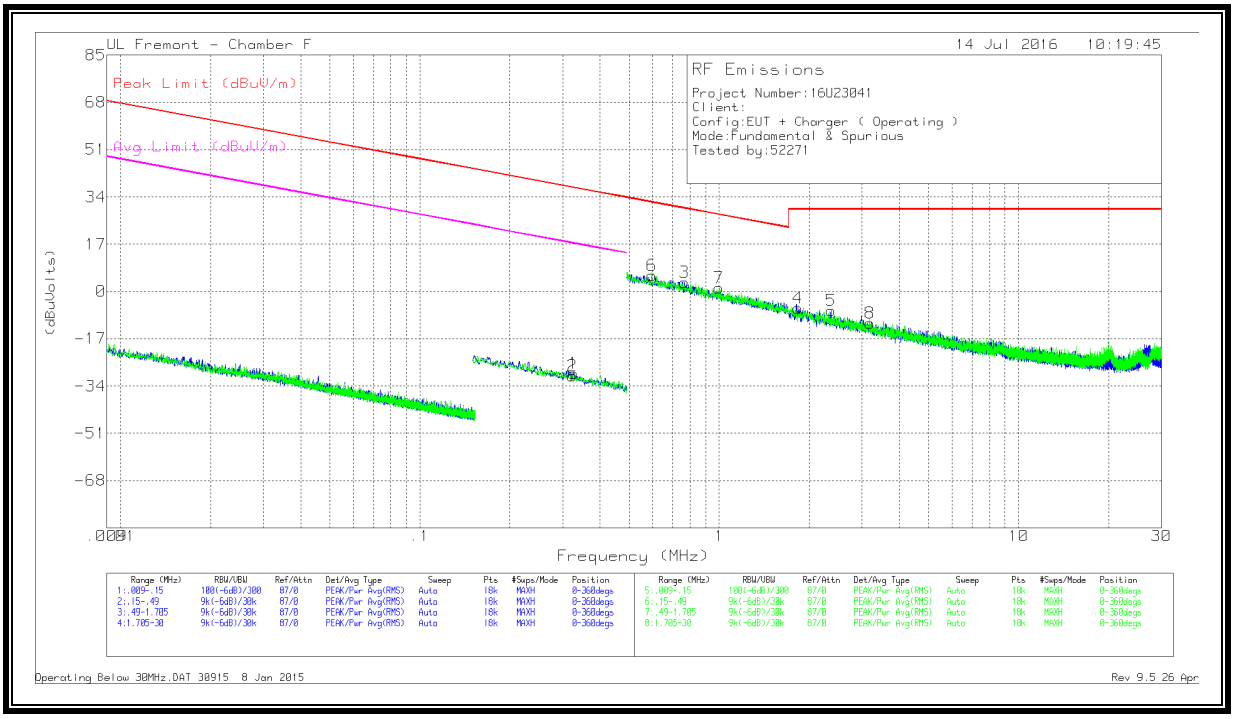
SPURIOUS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
2	.6502	40.21	Pk	11.8	.1	-40	12.11	31.34	-19.23	-	-	0-360
3	.97471	33.71	Pk	11.8	.1	-40	5.61	27.83	-22.22	-	-	0-360
4	1.30026	28.95	Pk	11.8	.1	-40	.85	25.32	-24.47	-	-	0-360
6	.65067	39.3	Pk	11.8	.1	-40	11.2	31.34	-20.14	-	-	0-360
7	.97588	34.33	Pk	11.8	.1	-40	6.23	27.82	-21.59	-	-	0-360
8	1.30087	28.03	Pk	11.8	.1	-40	-.07	25.32	-25.39	-	-	0-360

Pk - Peak detector

8.2.2. OPERATING CONFIGURATION

OPERATING WITH WATCH



DATA

FUNDAMENTAL

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.32547	38.64	Pk	11.7	.1	-80	-29.56	37.35	-66.91	17.35	-46.91	0-360
2	.32355	37.93	Pk	11.7	.1	-80	-30.27	37.41	-67.68	17.41	-47.68	0-360

Pk - Peak detector

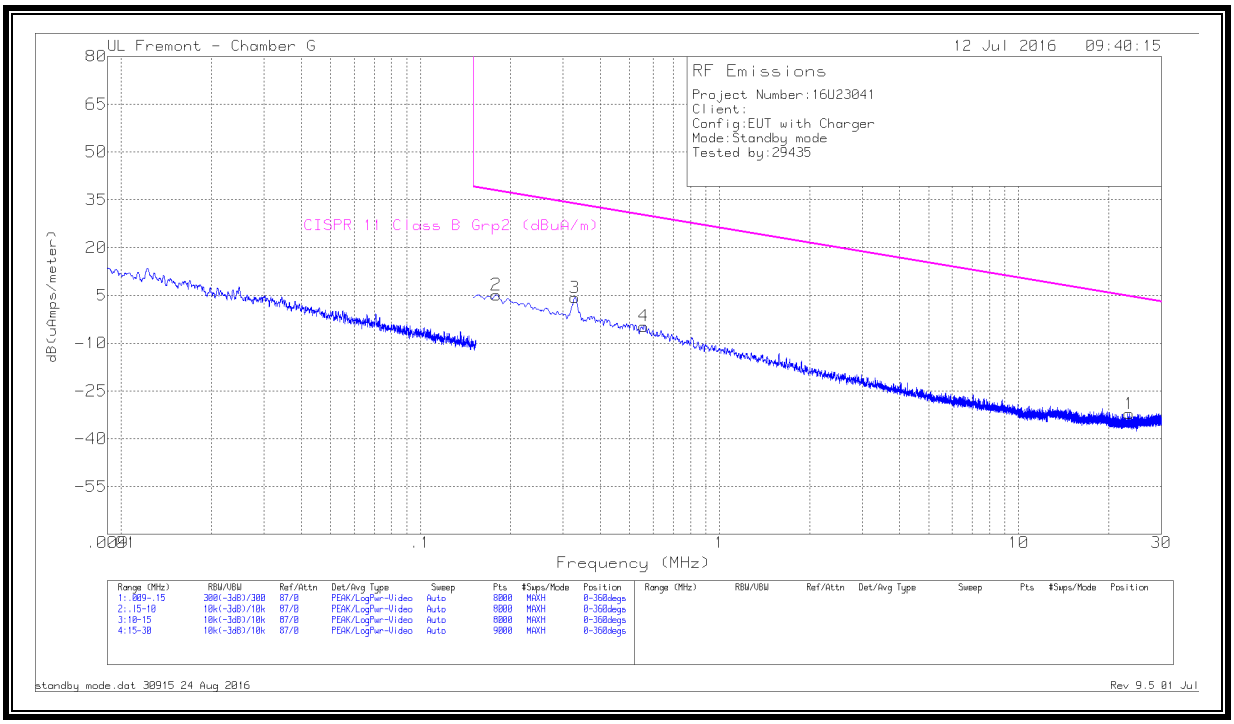
SPURIOUS

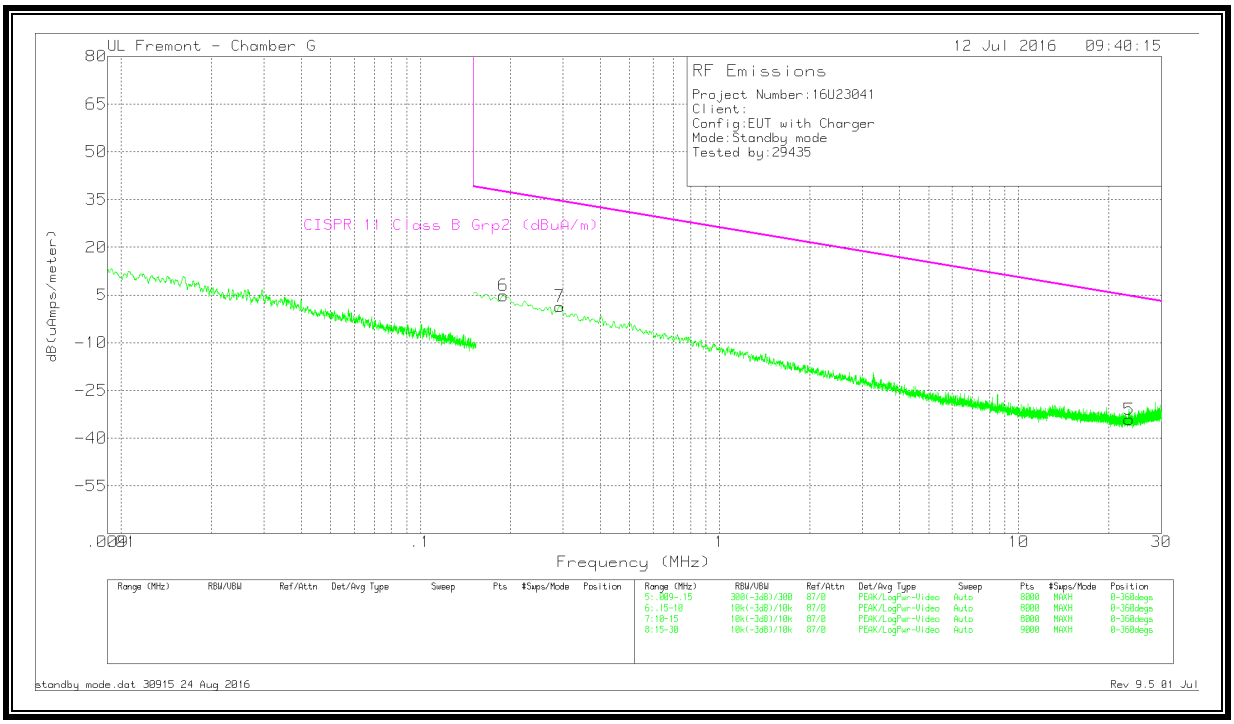
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
3	.76467	31.46	Pk	11.8	.1	-40	3.36	29.93	-26.57	-	-	0-360
4	1.82919	21.96	Pk	11.9	.1	-40	-6.04	29.54	-35.58	-	-	0-360
5	2.36524	21.03	Pk	11.9	.2	-40	-6.87	29.54	-36.41	-	-	0-360
6	.59666	33.88	Pk	11.7	.1	-40	5.68	32.09	-26.41	-	-	0-360
7	1	29.42	Pk	11.8	.1	-40	1.32	27.6	-26.28	-	-	0-360
8	3.18268	16.55	Pk	11.8	.2	-40	-11.45	29.54	-40.99	-	-	0-360

Pk - Peak detector

8.3. CISPR 11 TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 0.15 TO 30 MHz

8.3.1. STANDBY CONFIGURATION





DATA

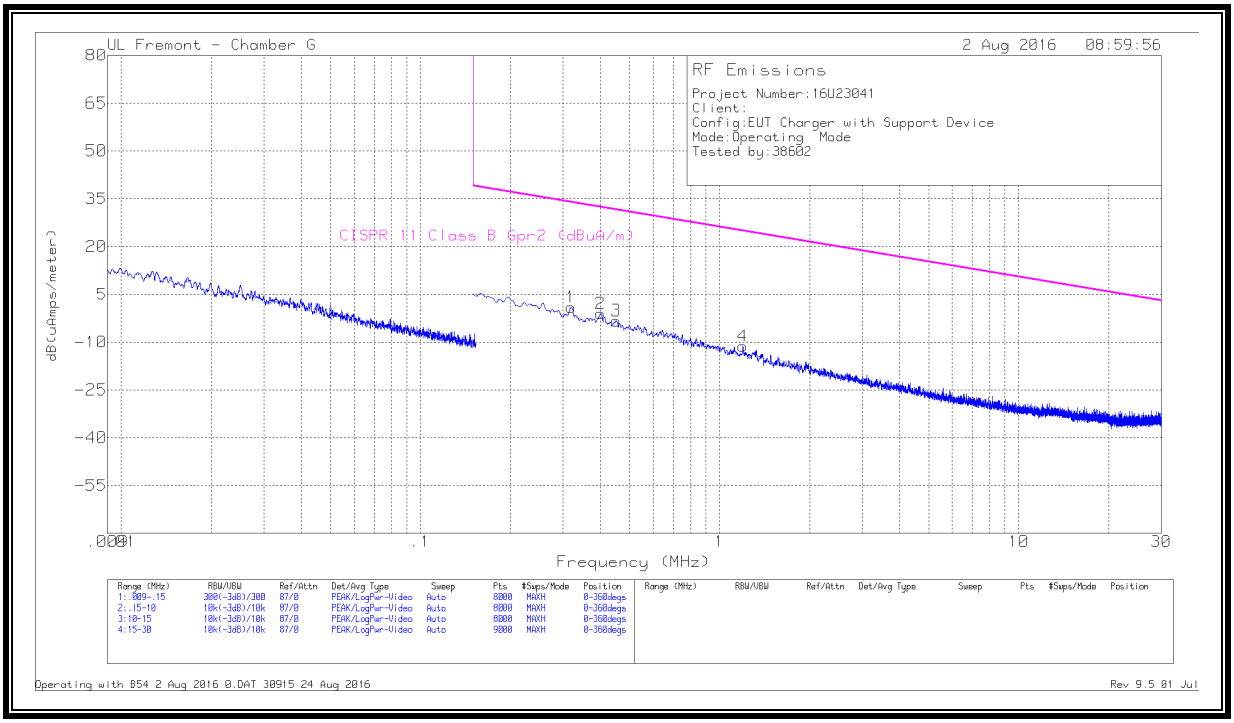
Trace Markers

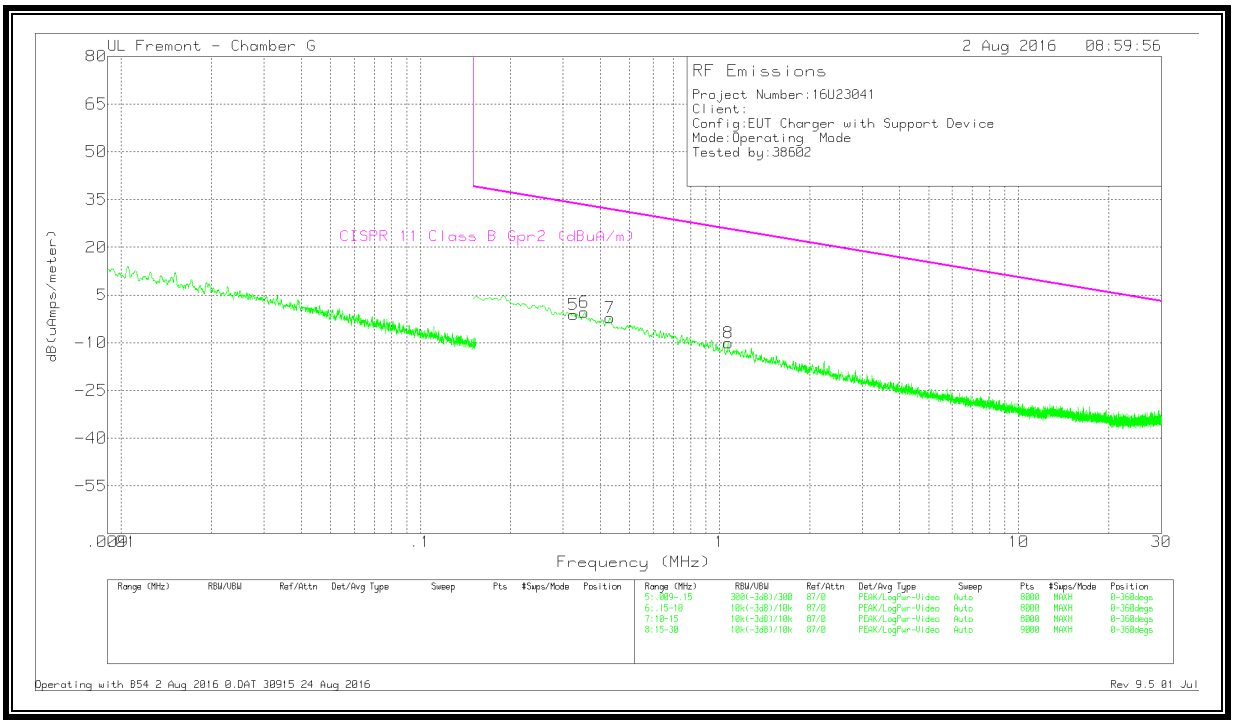
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Corrected Reading dB(uAmps/meter)	CISPR 11 Class B Grp2 (dBuA/m)	Margin (dB)	Azimuth (Degs)
2	.17926	45.78	Pk	-40.7	.1	5.18	37.79	-32.61	0-360
6	.18973	45.43	Pk	-40.7	.1	4.83	37.4	-32.57	0-360
7	.29291	42.04	Pk	-40.7	.1	1.44	34.45	-33.01	0-360
3	.32864	45	Pk	-40.8	.1	4.3	33.67	-29.37	0-360
4	.55718	36.06	Pk	-40.9	.2	-4.64	30.08	-34.72	0-360
1	23.407	9.08	Pk	-42	.8	-32.12	4.69	-36.81	0-360
5	23.40922	7.14	Pk	-42	.8	-34.06	4.69	-38.75	0-360

Pk - Peak detector
standby mode.dat 30915 24 Aug 2016
Rev 9.5 01 Jul 2016

8.3.2. CISPR 11 OPERATING CONFIGURATION

OPERATING WITH WATCH





8.4. DATA

Trace Markers

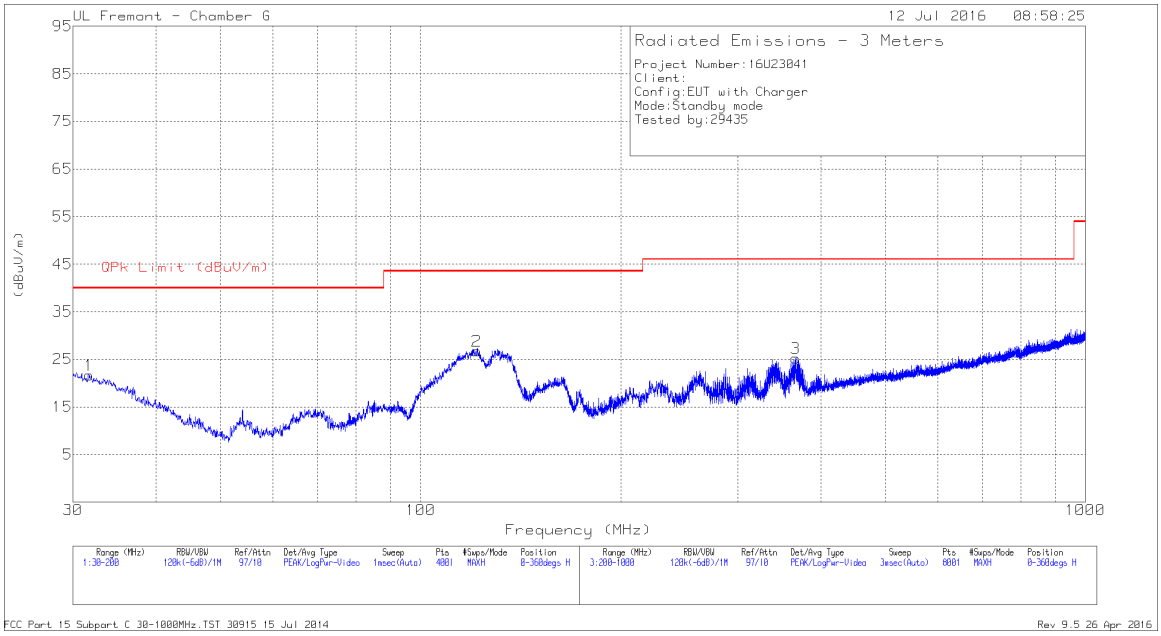
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Corrected Reading dB(uAmps/meter)	CISPR 11 Class B Gpr2 (dBuA/m)	Margin (dB)	Azimuth (Degs)
1	.31909	41.61	Pk	-40.8	.1	.91	33.87	-32.96	0-360
5	.32525	39.52	Pk	-40.8	.1	-1.18	33.74	-34.92	0-360
6	.35359	40.23	Pk	-40.8	.1	-.47	33.17	-33.64	0-360
2	.4004	39.63	Pk	-40.8	.2	-.97	32.33	-33.3	0-360
7	.42997	38.4	Pk	-40.8	.2	-2.2	31.84	-34.04	0-360
3	.45184	37.42	Pk	-40.9	.2	-3.28	31.51	-34.79	0-360
8	1.07	30.57	Pk	-40.8	.2	-10.03	25.65	-35.68	0-360
4	1.19597	29.35	Pk	-40.8	.2	-11.25	24.89	-36.14	0-360

Pk - Peak detector
Operating with B54 2 Aug 2016 0.DAT 30915 24 Aug 2016
Rev 9.5 01 Jul 2016

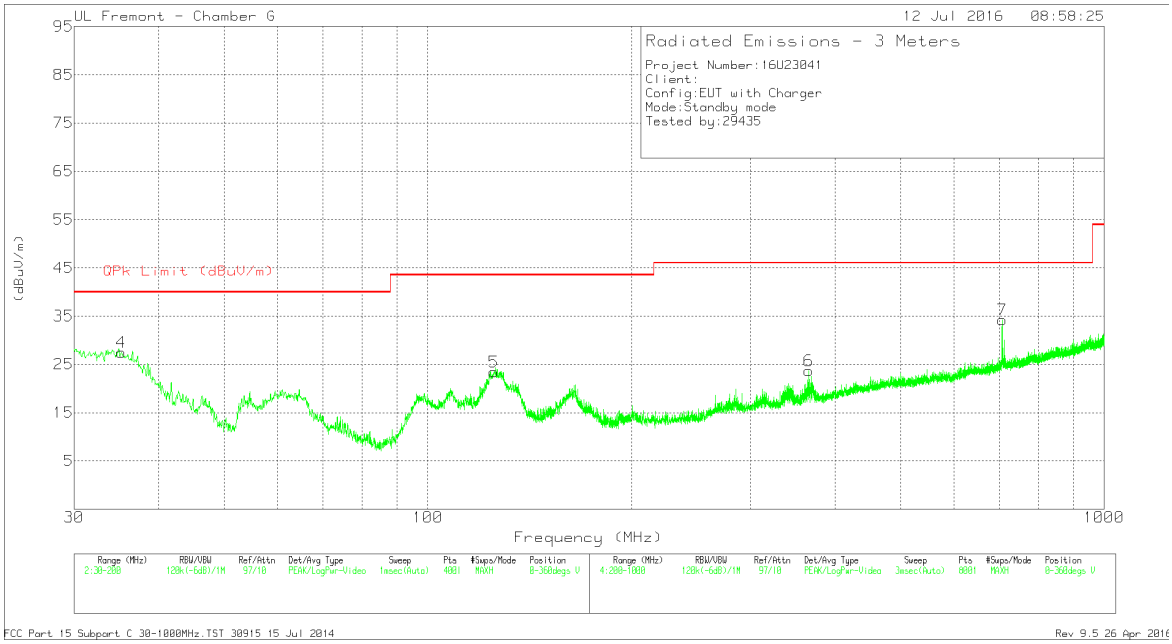
8.5. FCC TX SPURIOUS EMISSION 30 TO 1000 MHz

8.5.1. STANDBY CONFIGURATION

HORIZONTAL PLOT



VERTICAL PLOT



DATA

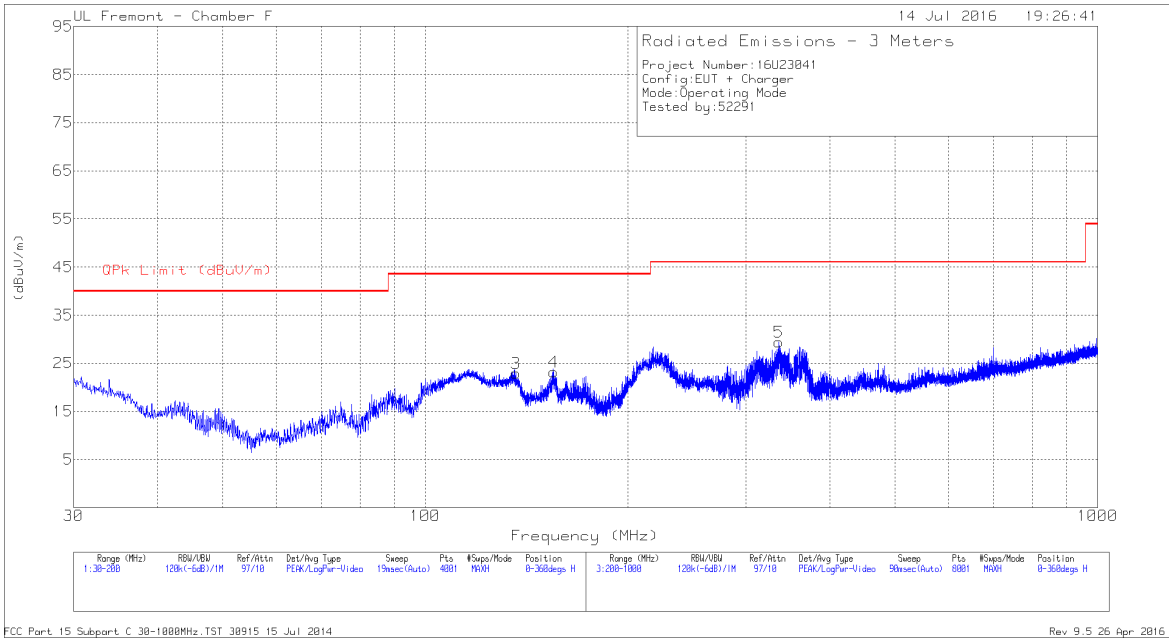
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T900 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 121.46	39.3	Pk	17.7	-30.2	26.8	43.52	-16.72	0-360	199	H
5	* 125.1575	35.79	Pk	17.9	-30.3	23.39	43.52	-20.13	0-360	100	V
1	31.7	28.61	Pk	24.3	-31.3	21.61	40	-18.39	0-360	98	H
4	35.185	36.77	Pk	21.9	-31.2	27.47	40	-12.53	0-360	100	V
6	366	33.62	Pk	18.7	-28.6	23.72	46.02	-22.3	0-360	100	V
3	366.4	35.1	Pk	18.7	-28.6	25.2	46.02	-20.82	0-360	200	H
7	707.2	37.06	Pk	24.3	-27.1	34.26	46.02	-11.76	0-360	300	V

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

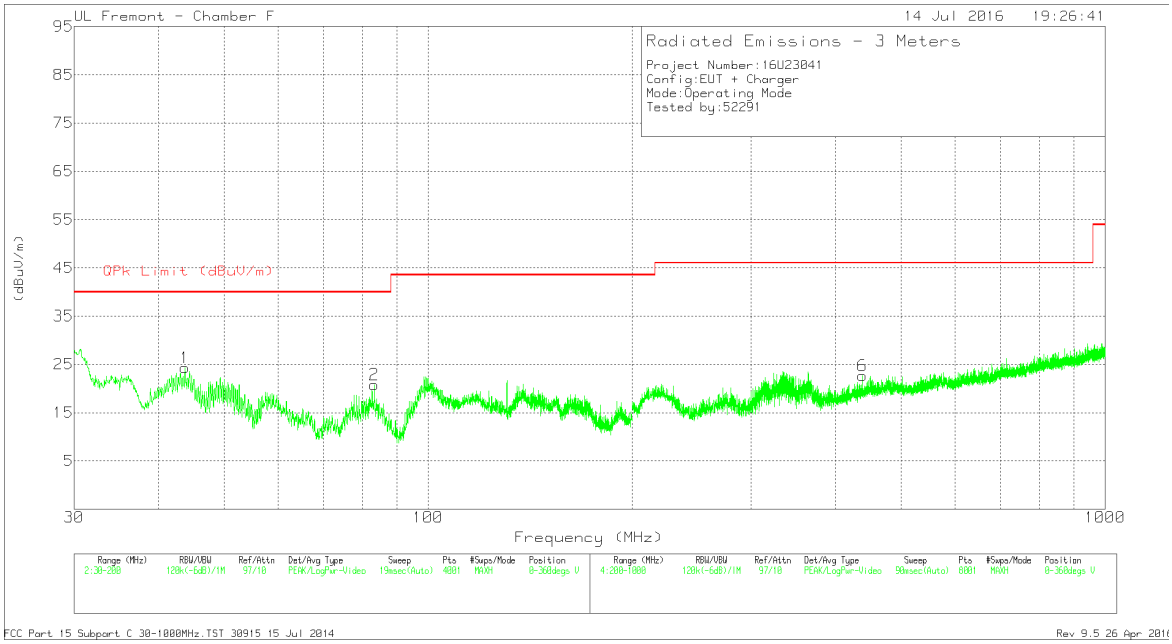
8.5.2. OPERATING CONFIGURATION

OPERATING WITH WATCH

HORIZONTAL PLOT



VERTICAL PLOT



DATA

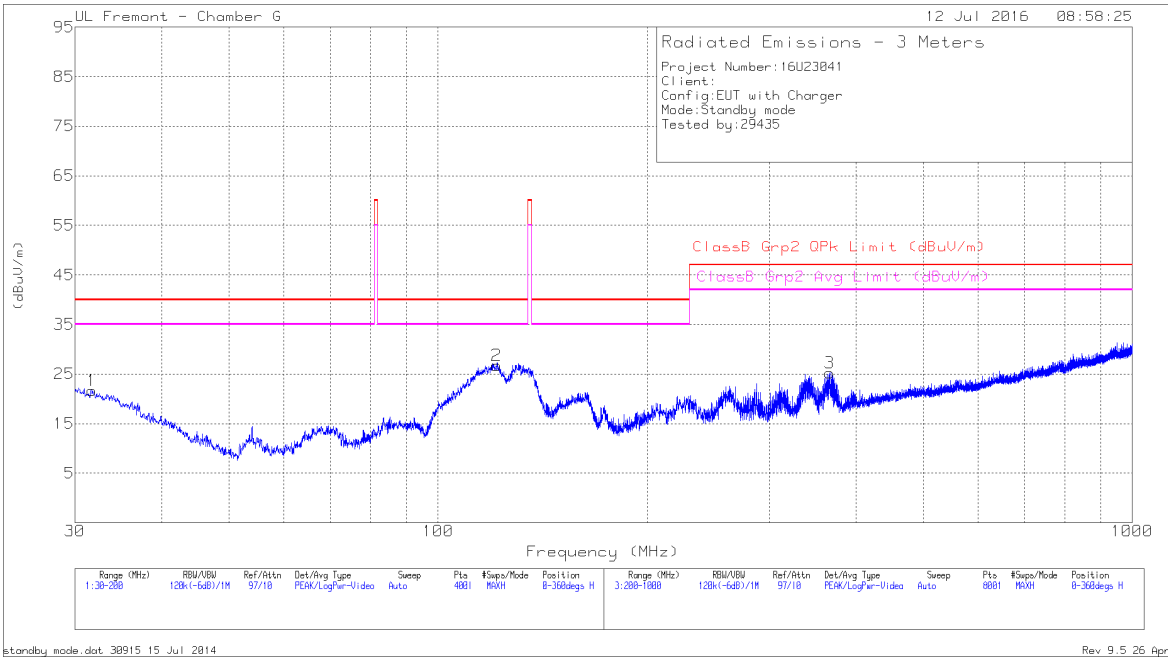
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 136.505	36.43	Pk	17.4	-30.9	22.93	43.52	-20.59	0-360	199	H
4	155.0775	37.53	Pk	16.4	-30.7	23.23	43.52	-20.29	0-360	199	H
1	43.7275	40.95	Pk	15.1	-31.7	24.35	40	-15.65	0-360	100	V
2	83.2525	40.64	Pk	11.5	-31.3	20.84	40	-19.16	0-360	100	V
5	335.4	41.06	Pk	18	-29.6	29.46	46.02	-16.56	0-360	99	H
6	437.9	31.33	Pk	20.6	-29.2	22.73	46.02	-23.29	0-360	299	V

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

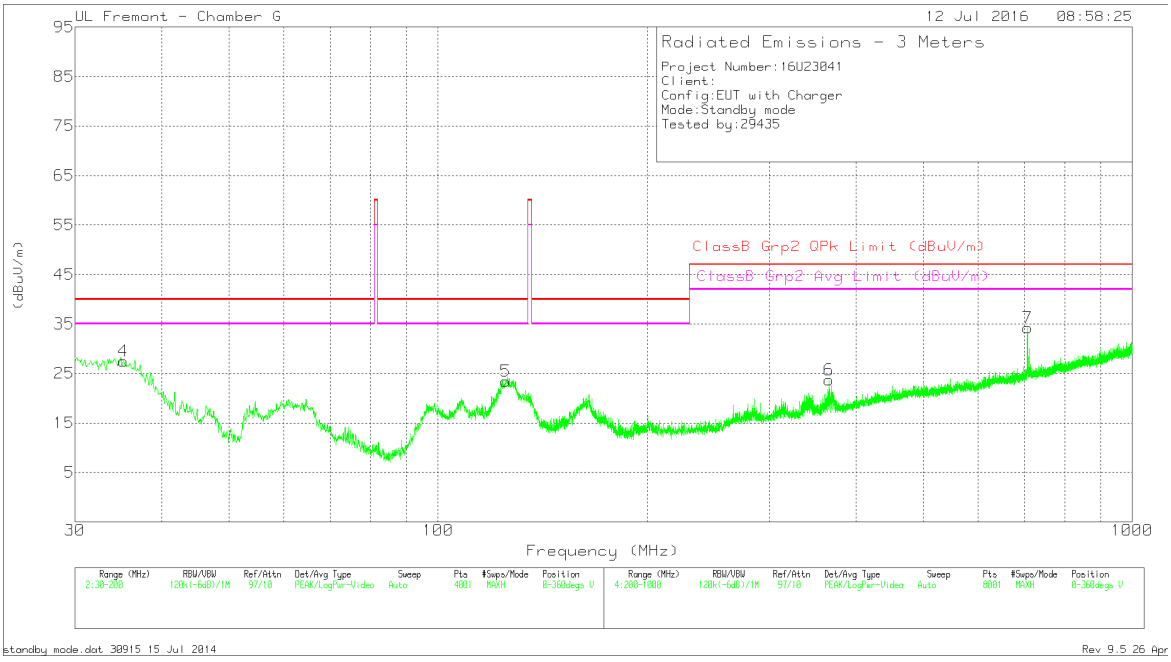
8.6. CISPR 11 TX SPURIOUS EMISSION 30 TO 1000 MHz

8.6.1. STANDBY CONFIGURATION

HORIZONTAL PLOT



VERTICAL PLOT



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T900 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	ClassB Grp2 QPk Limit (dBuV/m)	Margin (dB)	ClassB Grp2 Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 121.46	39.3	Pk	17.7	-30.2	26.8	40	-13.2	35	-8.2	0-360	199	H
5	* 125.1575	35.79	Pk	17.9	-30.3	23.39	40	-16.61	35	-11.61	0-360	100	V
1	31.7	28.61	Pk	24.3	-31.3	21.61	40	-18.39	35	-13.39	0-360	98	H
4	35.185	36.77	Pk	21.9	-31.2	27.47	40	-12.53	35	-7.53	0-360	100	V
6	366	33.62	Pk	18.7	-28.6	23.72	47	-23.28	42	-18.28	0-360	100	V
3	366.4	35.1	Pk	18.7	-28.6	25.2	47	-21.8	42	-16.8	0-360	200	H
7	707.2	37.06	Pk	24.3	-27.1	34.26	47	-12.74	42	-7.74	0-360	300	V

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

Pk - Peak detector

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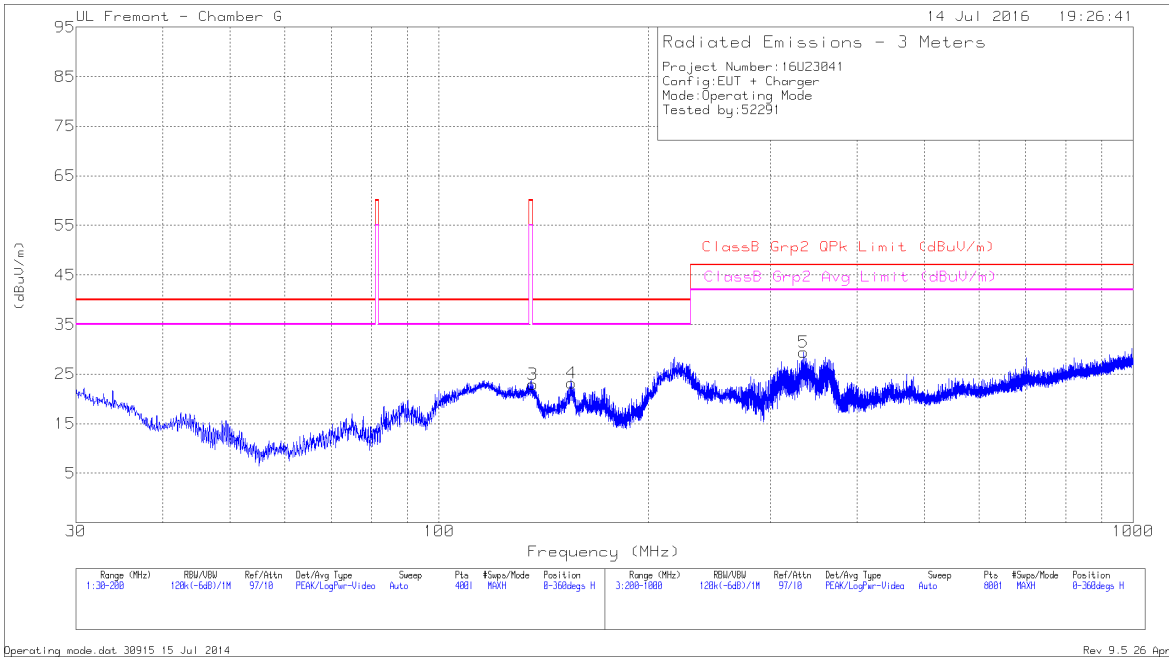
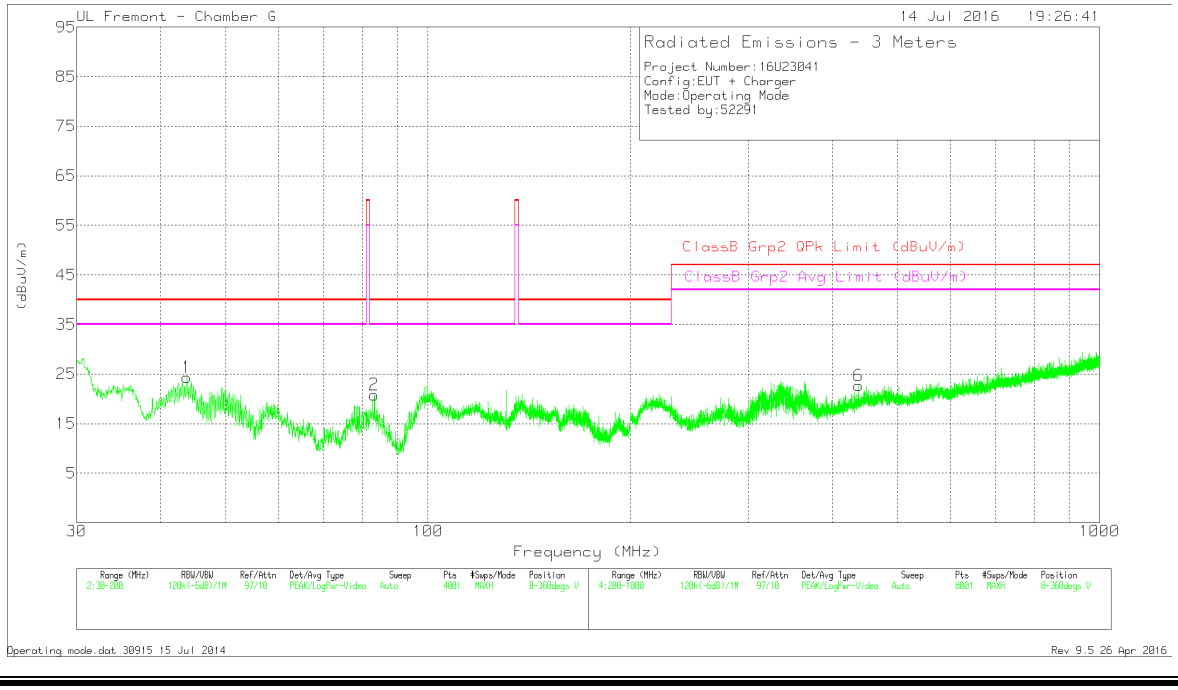
8.6.2. CISPR 11 OPERATING CONFIGURATION

OPERATING WITH WATCH

HORIZONTAL PLOT



VERTICAL PLOT



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	ClassB Grp2 QPk Limit (dBuV/m)	Margin (dB)	ClassB Grp2 Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 136.505	36.43	Pk	17.4	-30.9	22.93	40	-17.07	35	-12.07	0-360	199	H
1	43.7275	40.95	Pk	15.1	-31.7	24.35	40	-15.65	35	-10.65	0-360	100	V
2	83.2525	40.64	Pk	11.5	-31.3	20.84	40	-19.16	35	-14.16	0-360	100	V
4	155.0775	37.53	Pk	16.4	-30.7	23.23	40	-16.77	35	-11.77	0-360	199	H
5	335.4	41.06	Pk	18	-29.6	29.46	47	-17.54	42	-12.54	0-360	99	H
6	437.9	31.33	Pk	20.6	-29.2	22.73	47	-24.27	42	-19.27	0-360	299	V

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

Pk - Peak detector

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9. AC MAINS LINE CONDUCTED EMISSIONS W/ POWER SUPPLY

LIMITS

§15.207 (a)

IC RSS-GEN, Section 8.8

Frequency of emission (MHz)	Conducted Limit (dBµV)	
	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
* Decreases with the logarithm of the frequency.		

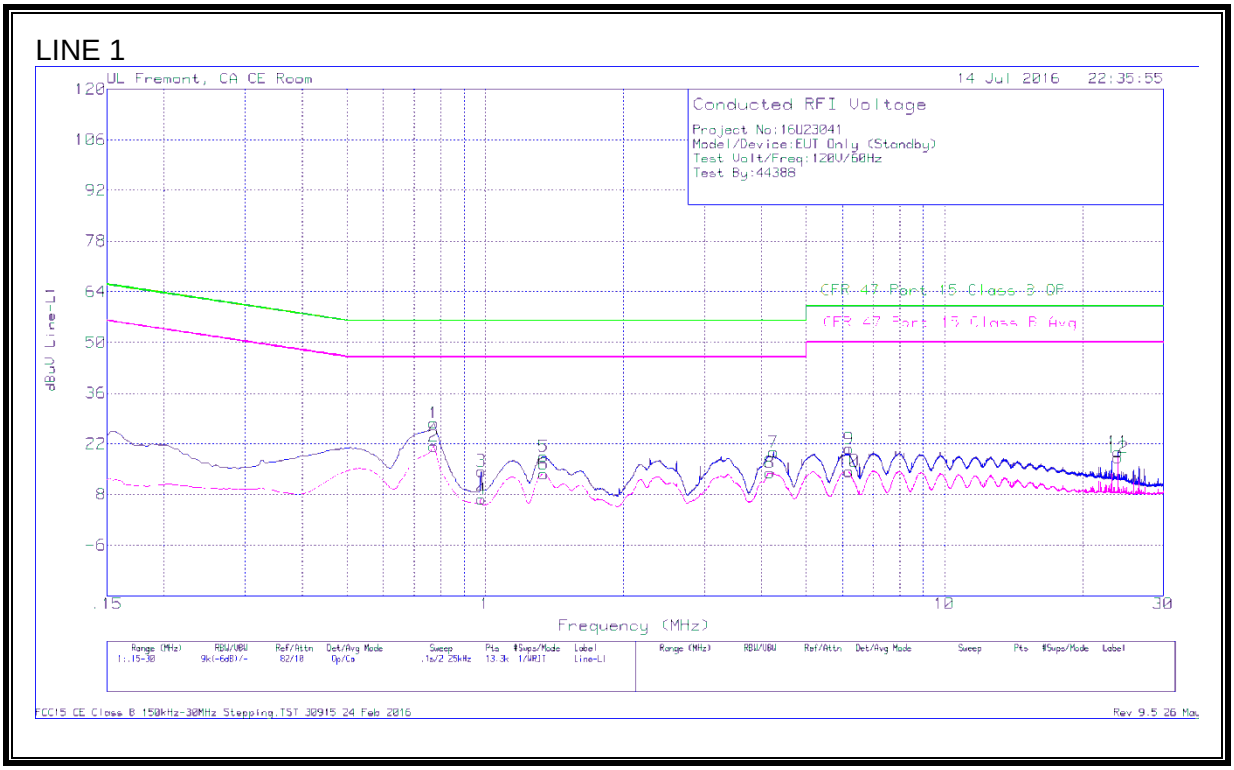
TEST PROCEDURE

ANSI C63.10-2013

RESULTS

9.1. STANDBY CONFIGURATION POWERED FROM AC ADAPTER

LINE 1



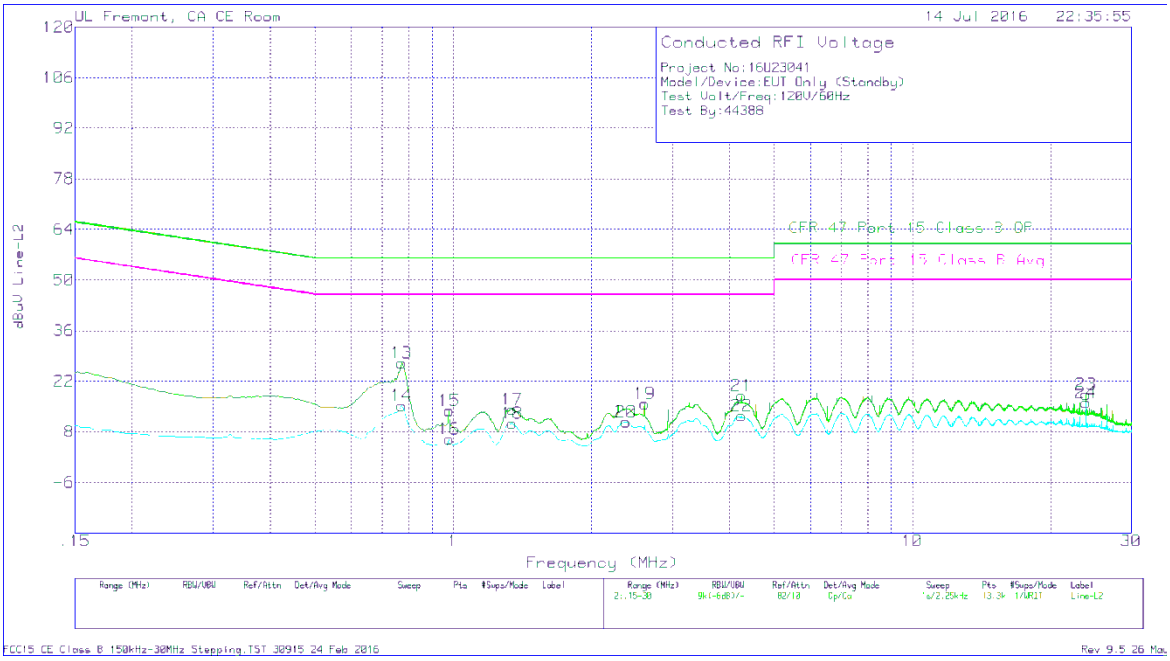
DATA

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.77325	17.59	Qp	0	0	10.1	27.69	56	-28.31	-	-
2	.771	11.14	Ca	0	0	10.1	21.24	-	-	46	-24.76
3	.98025	4.25	Qp	0	.1	10.1	14.45	56	-41.55	-	-
4	.98025	-3.43	Ca	0	.1	10.1	6.77	-	-	46	-39.23
5	1.34025	8.26	Qp	0	.1	10.1	18.46	56	-37.54	-	-
6	1.34025	3.53	Ca	0	.1	10.1	13.73	-	-	46	-32.27
7	4.245	9.62	Qp	0	.1	10.1	19.82	56	-36.18	-	-
8	4.16625	3.77	Ca	0	.1	10.1	13.97	-	-	46	-32.03
9	6.20475	10.27	Qp	0	.1	10.2	20.57	60	-39.43	-	-
10	6.20475	4.15	Ca	0	.1	10.2	14.45	-	-	50	-35.55
11	23.92125	9.12	Qp	.1	.2	10.4	19.82	60	-40.18	-	-
12	23.92125	7.54	Ca	.1	.2	10.4	18.24	-	-	50	-31.76

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2



DATA

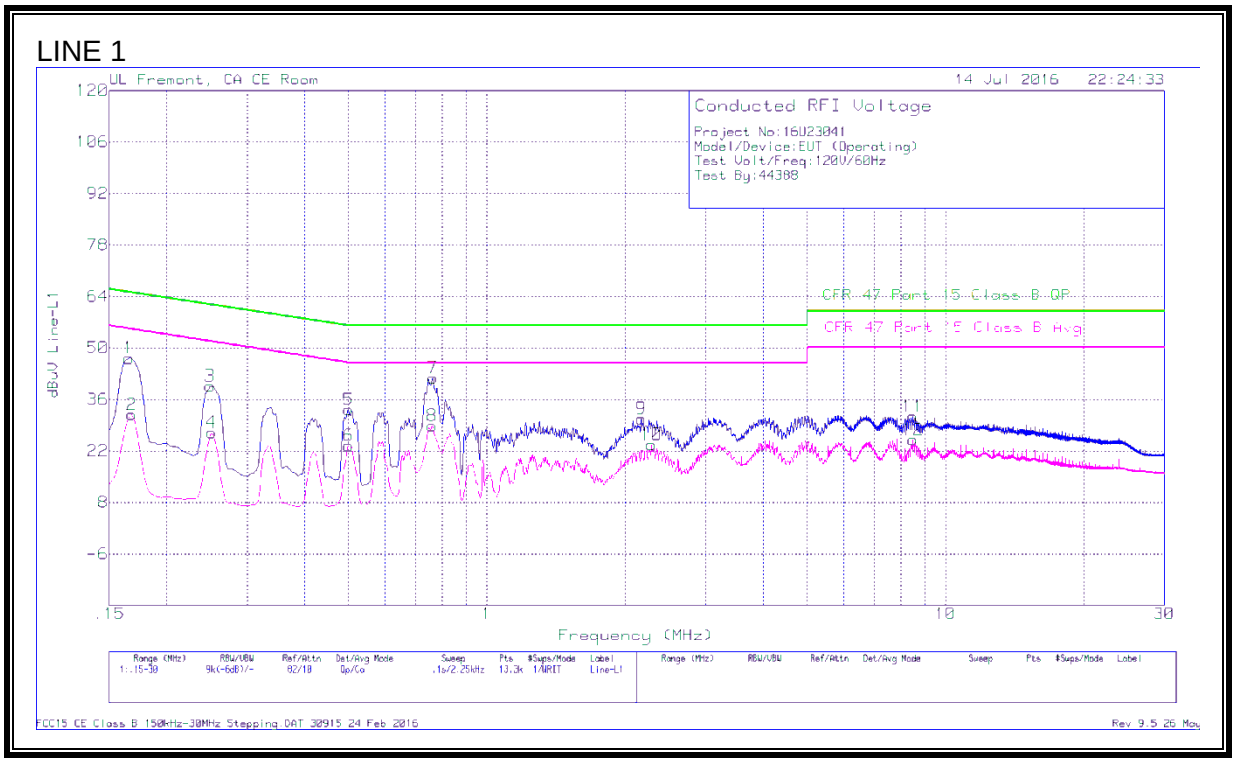
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables 2&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.77325	16.95	Qp	0	0	10.1	27.05	56	-28.95	-	-
14	.77325	5.21	Ca	0	0	10.1	15.31	-	-	46	-30.69
15	.98025	3.65	Qp	0	.1	10.1	13.85	56	-42.15	-	-
16	.98025	-4.17	Ca	0	.1	10.1	6.03	-	-	46	-39.97
17	1.34475	4.06	Qp	0	0	10.1	14.16	56	-41.84	-	-
18	1.34475	.2	Ca	0	0	10.1	10.3	-	-	46	-35.7
19	2.6115	5.54	Qp	0	.1	10.1	15.74	56	-40.26	-	-
20	2.3775	.57	Ca	0	.1	10.1	10.77	-	-	46	-35.23
21	4.245	7.85	Qp	0	.1	10.1	18.05	56	-37.95	-	-
22	4.245	2.2	Ca	0	.1	10.1	12.4	-	-	46	-33.6
23	23.92125	7.63	Qp	.1	.2	10.4	18.33	60	-41.67	-	-
24	23.92125	5.41	Ca	.1	.2	10.4	16.11	-	-	50	-33.89

Qp - Quasi-Peak detector

Ca - CISPR average detection

9.2. OPERATING CONFIGURATION POWERED FORM AC ADAPTER

OPERATING WITH WATCH



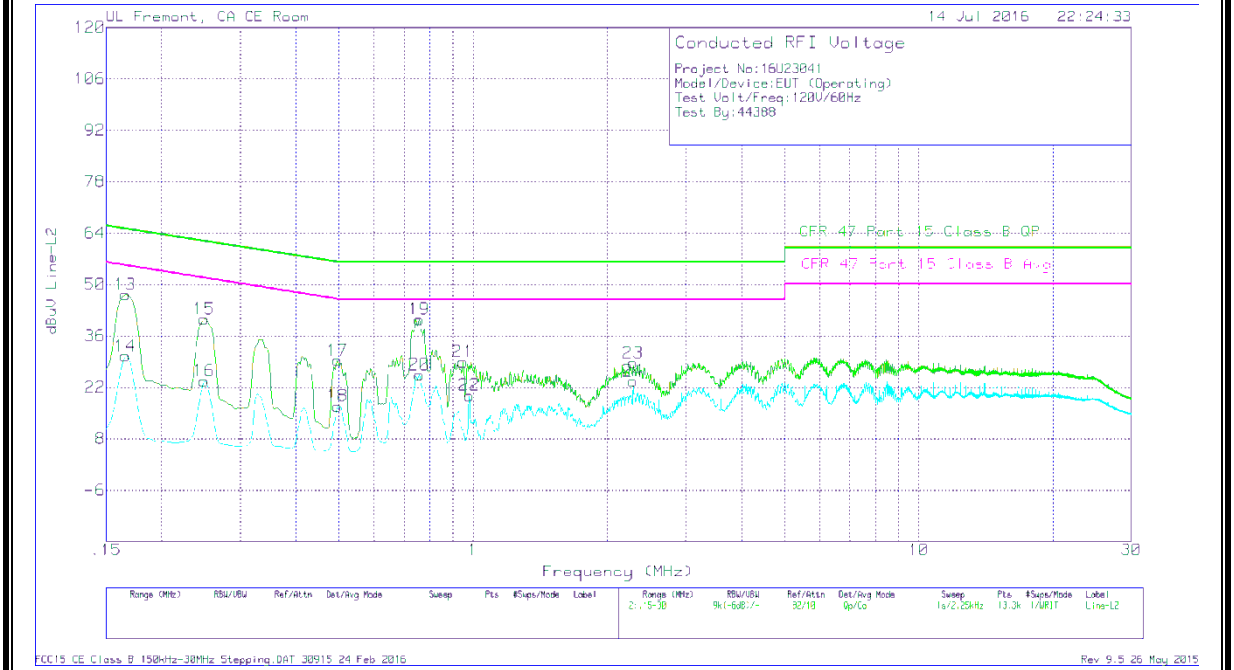
DATA

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.16575	37.1	Qp	0	0	10.1	47.2	65.17	-17.97	-	-
2	.168	21.73	Ca	0	0	10.1	31.83	-	-	55.06	-23.23
3	.249	29.51	Qp	0	0	10.1	39.61	61.79	-22.18	-	-
4	.25125	16.89	Ca	0	0	10.1	26.99	-	-	51.72	-24.73
5	.49875	23.15	Qp	0	0	10.1	33.25	56.02	-22.77	-	-
6	.49875	13.33	Ca	0	0	10.1	23.43	-	-	46.02	-22.59
7	.762	31.75	Qp	0	0	10.1	41.85	56	-14.15	-	-
8	.75975	18.74	Ca	0	0	10.1	28.84	-	-	46	-17.16
9	2.1705	20.55	Qp	0	.1	10.1	30.75	56	-25.25	-	-
10	2.28525	13.5	Ca	0	.1	10.1	23.7	-	-	46	-22.3
11	8.49075	21	Qp	0	.1	10.2	31.3	60	-28.7	-	-
12	8.49075	14.73	Ca	0	.1	10.2	25.03	-	-	50	-24.97

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2



DATA

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables 2&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.16575	37.18	Qp	0	0	10.1	47.28	65.17	-17.89	-	-
14	.16575	20.37	Ca	0	0	10.1	30.47	-	-	55.17	-24.7
15	.249	30.51	Qp	0	0	10.1	40.61	61.79	-21.18	-	-
16	.249	13.65	Ca	0	0	10.1	23.75	-	-	51.79	-28.04
17	.4965	19.19	Qp	0	0	10.1	29.29	56.06	-26.77	-	-
18	.4965	6.8	Ca	0	0	10.1	16.9	-	-	46.06	-29.16
19	.7575	30.42	Qp	0	0	10.1	40.52	56	-15.48	-	-
20	.7575	15.33	Ca	0	0	10.1	25.43	-	-	46	-20.57
21	.94875	18.81	Qp	0	0	10.1	28.91	56	-27.09	-	-
22	.98025	9.62	Ca	0	.1	10.1	19.82	-	-	46	-26.18
23	2.28525	18.4	Qp	0	.1	10.1	28.6	56	-27.4	-	-
24	2.28525	13.51	Ca	0	.1	10.1	23.71	-	-	46	-22.29

Qp - Quasi-Peak detector

Ca - CISPR average detection