FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

WIRELESS DEVICE

MODEL NUMBER: A1846

FCC ID: BCGA1846

REPORT NUMBER: 16U23820-E2V3

ISSUE DATE: JANUARY 04, 2017

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

Prepared by
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	12/14/2016	Initial Issue	Mengistu Mekuria
V2	01/03/2017	Address TCB's Questions	Chin Pang
V3	01/04/2017	Address TCB's Questions	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: WIRELESS DEVICE

MODEL: A1846

SERIAL NUMBER: 3137

DATE TESTED: SEPTEMBER 16 - NOVEMBER 09, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	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:

MENGISTU MEKURIA
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.

Prepared By:

TOM CHEN
EMC ENGINEER
UL VERIFICATION SERVICES INC.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 937606

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

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4.3. MEASUREMENT UNCERTAINTY

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

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

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is wireless device with BLE and NFC capability

5.2. MAXIMUM FIELD STRENGTH

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

EUT WITH DC POWER SUPPLY

Frequency Range (MHz)	Mode	Kbps	E Field at 30m distance (dBuV/m)
13.56	14443A	848	40.02
		424	40.06
		212	40.13
		106	40.23
	14443B	848	40.07
		424	40.21
		212	**40.63**
		106	40.11
	15693	26.48	40.00

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was Cool Term for Mac, version 1.4.6

5.4. WORST-CASE CONFIGURATION AND MODE

The fundamental of the EUT was investigated in three orthogonal orientations X (Flatbed), Y (Landscape) and Z (Portrait). It was determined that Z orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in Z orientation.

There is no significant difference between OAT and chamber readings by comparison based on KDB 937606.

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Apple	MacBook Pro	73043BDQAGU	N/A
DC power supply	Sorensen	XT 15-4	1319A02779	N/A

I/O CABLES (RADIATED BELOW 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	**DC**	**1**	**4 pins connector**	**Un-Shielded**	**1**	**N/A**

I/O CABLES (AC LINE CONDUCTED)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	DC	Un-shielded	1	N/A
2	AC	1	AC	Un-shielded	3	N/A

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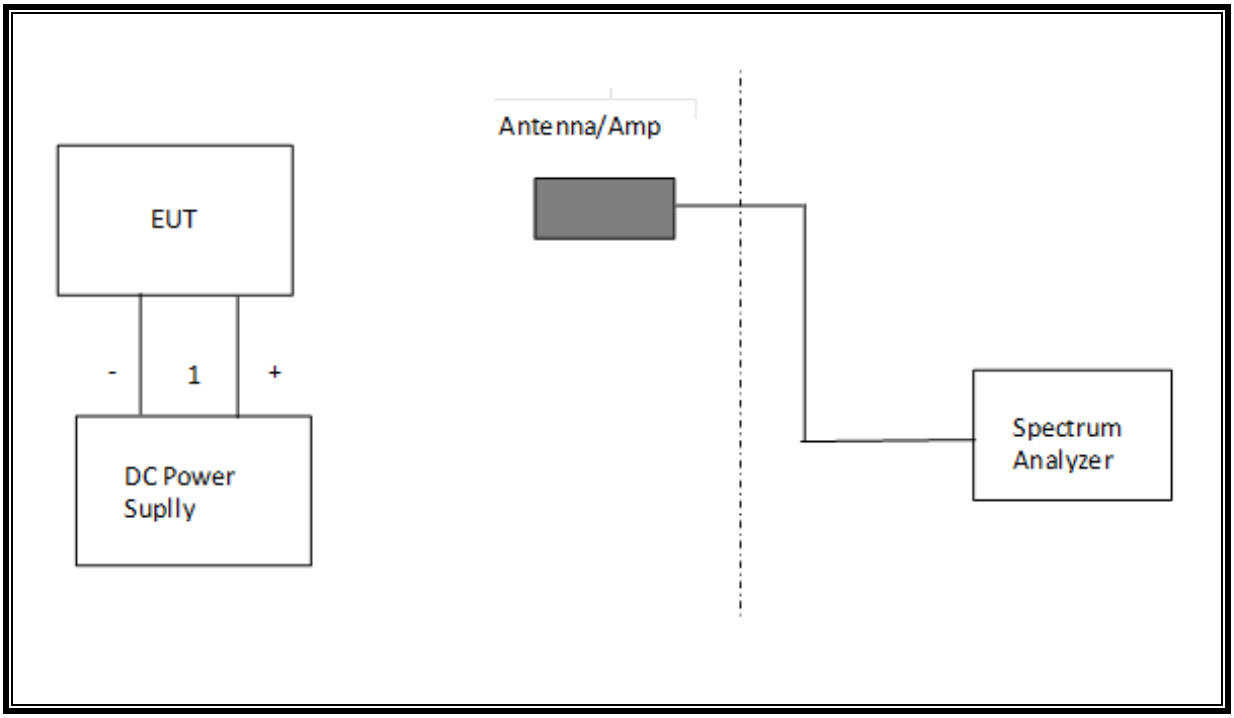
SETUP DIAGRAM RADIATED



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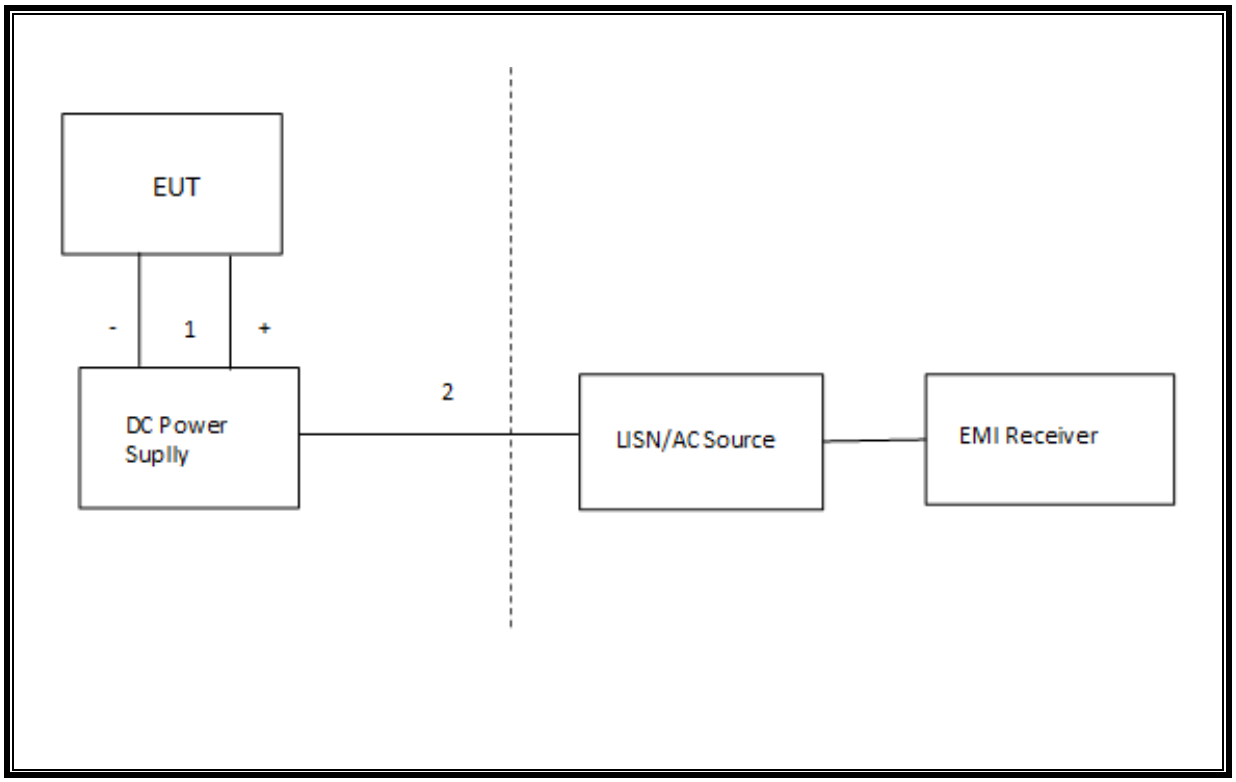
SETUP DIAGRAM LINE CONDUCTED



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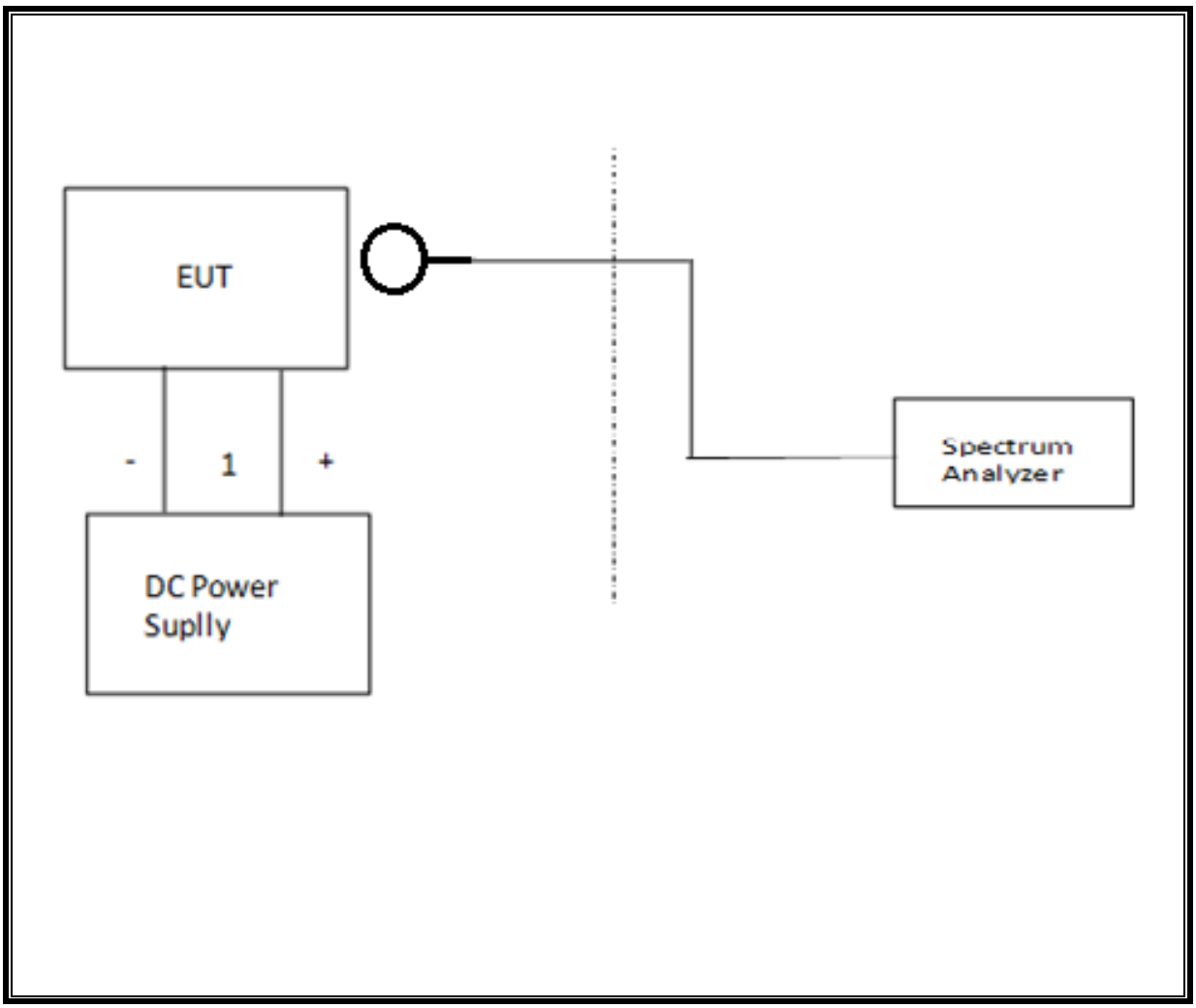
SETUP DIAGRAM FREQUENCY STABILITY



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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**	**T No.**	**Cal Due**
Spectrum Analyzer	Agilent	N9030A	906	02/03/17
Antenna, Broadband Hybrid	Sunol Sciences	JB3	900	05/03/17
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	835	06/18/17
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	834	06/17/17
Antenna, Loop, 30 MHz	ETS Lindgren	6502	757	05/31/17
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	754	03/12/17
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	212	09/13/17
LISN for Conducted Emissions CISPR-16	FCC	LISN-50/250-25-2	24	02/09/17
Line conducted Power cable ANSI 63.4	UL	PG1	861	09/01/17
UL SOFTWARE				
*Radiated Software	UL	UL EMC	Fundamental mask, 5/7/15	
*Conducted Software	UL	UL EMC	Ver 2.2, March 31, 2015	
*Radiated Software	UL	UL EMC	Below 30Mhz, 6/24/15	
*Radiated Software	UL	UL EMC	Below 1Ghz, 7/15/14	
*AC Line Conducted Software	UL	UL EMC	Ver 9.5, April 3, 2015	

Note: * indicates automation software version used in the compliance certification testing

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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% and 20dB bandwidth function are utilized.

RESULTS

ID:	29435	Date:	11/7/16

99% and 20dB BW

14443A

Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	24.098	28.40
424	13.56	24.129	28.47
212	13.56	24.126	28.45
106	13.56	24.142	28.44

14443B

Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
848	13.56	24.128	28.47
424	13.56	24.130	28.47
212	13.56	24.140	28.48
106	13.56	24.139	28.48

15693

Mode Kbps	Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
26.48	13.56	24.187	28.53

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7.1. 14443A

848Kbps

424Kbps

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212Kbps

106Kbps

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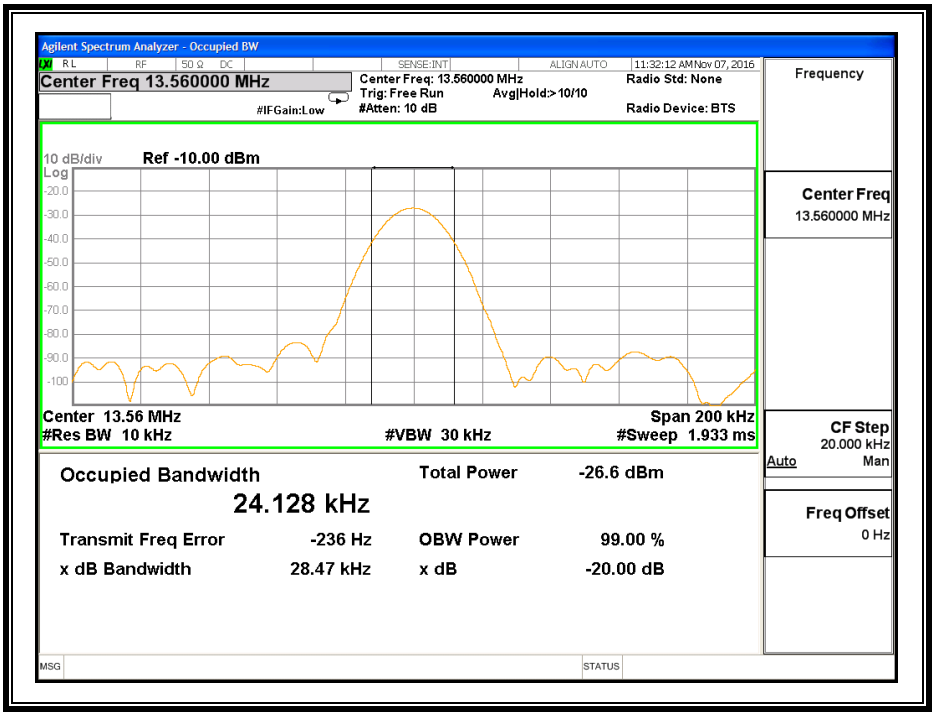
7.2. 14443B

848Kbps



424Kbps

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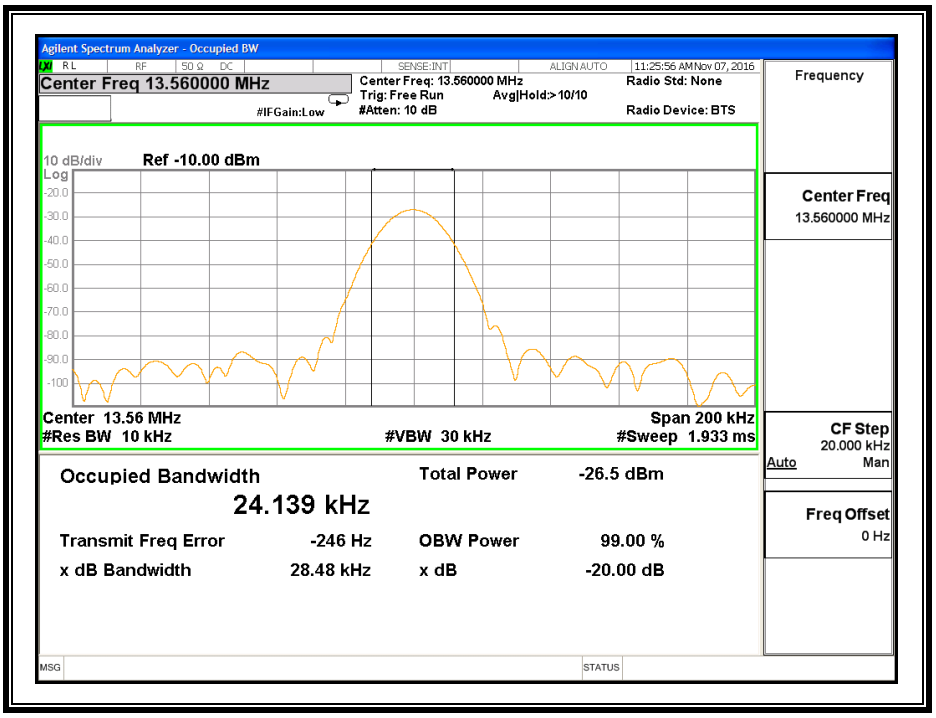
212Kbps

106Kbps



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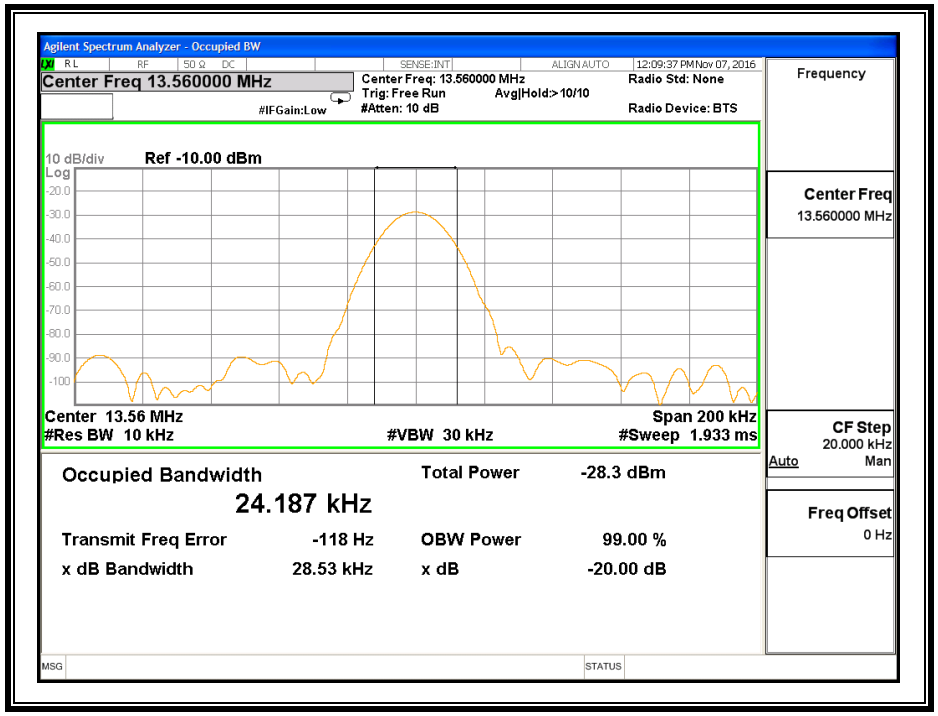
7.3. 15693

26.48Kbps



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8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMIT

§15.225

(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)

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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

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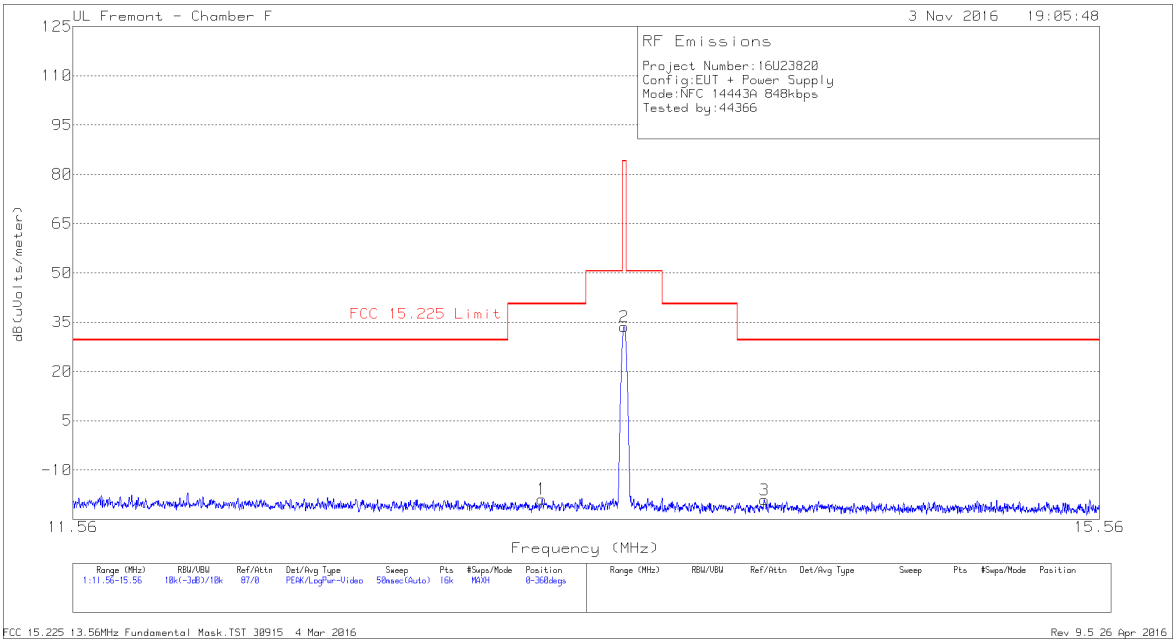
8.2. FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 – 30 MHz), EUT WITH DC POWER SUPPLY

8.2.1. 14443A

FUNDAMENTAL 848Kbps

ANTENNA LOOP FACE ON



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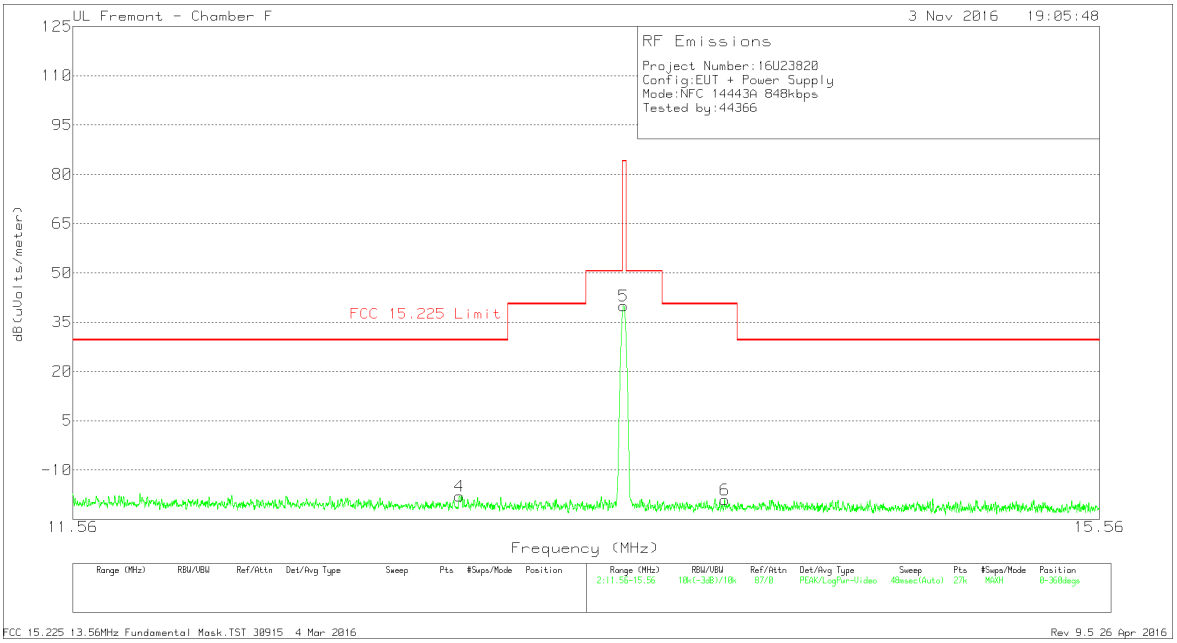

DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	13.24163	10.08	Pk	10.7	.4	-40	-18.82	40.51	-59.33	0-360
2	13.55975	62.6	Pk	10.6	.4	-40	33.6	84	-50.4	0-360
3	14.12138	9.94	Pk	10.6	.4	-40	-19.06	29.54	-48.6	0-360
4	12.92856	10.93	Pk	10.7	.4	-40	-17.97	29.54	-47.51	0-360
5	13.55807	69.02	Pk	10.6	.4	-40	40.02	84	-43.98	0-360
6	13.96004	9.94	Pk	10.6	.4	-40	-19.06	40.51	-59.57	0-360

Pk - Peak detector

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SPURIOUS EMISSIONS 848kbps

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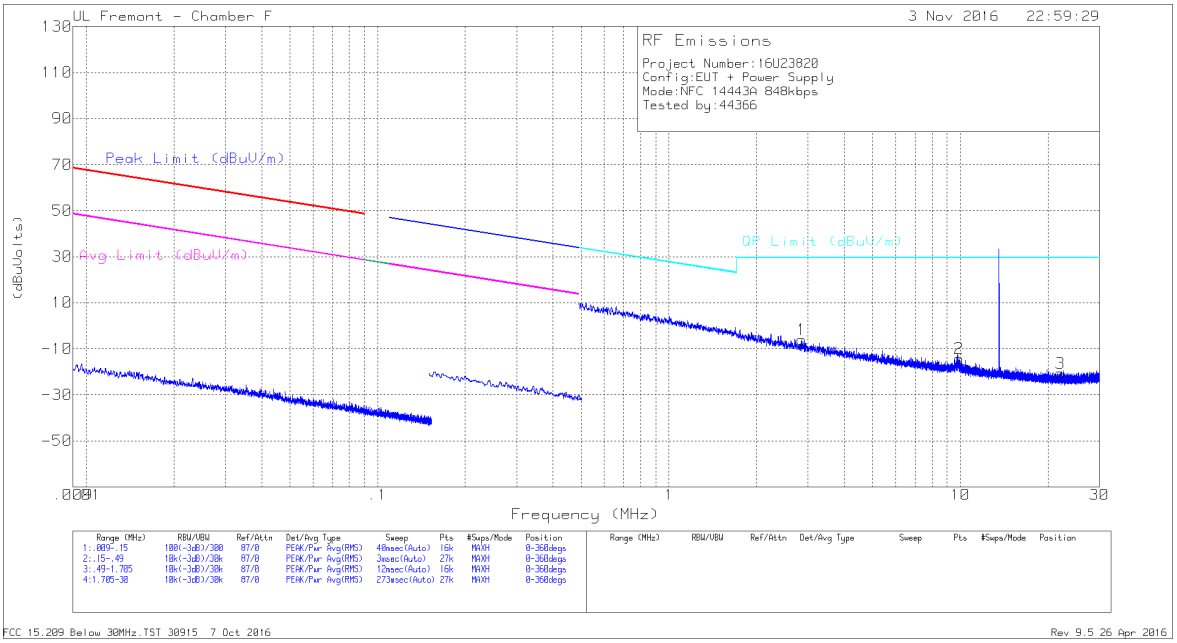

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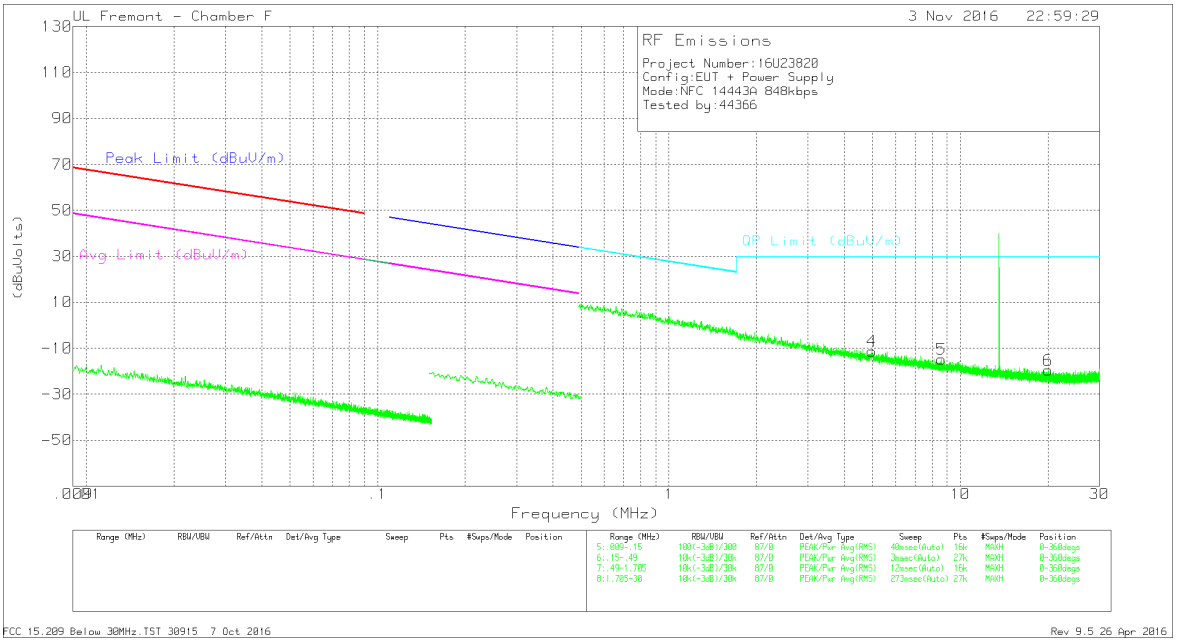

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	2.85151	22.07	Pk	11.8	.2	-40	-5.93	29.5	-35.43	0-360
2	9.89984	14.36	Pk	11	.3	-40	-14.34	29.5	-43.84	0-360
3	22.02729	9.37	Pk	9.5	.6	-40	-20.53	29.5	-50.03	0-360
4	4.97162	17.08	Pk	11.5	.2	-40	-11.22	29.5	-40.72	0-360
5	8.61866	13.93	Pk	11.1	.3	-40	-14.67	29.5	-44.17	0-360
6	19.98264	10.05	Pk	9.8	.5	-40	-19.65	29.5	-49.15	0-360

Pk - Peak detector

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FUNDAMENTAL 424Kbps

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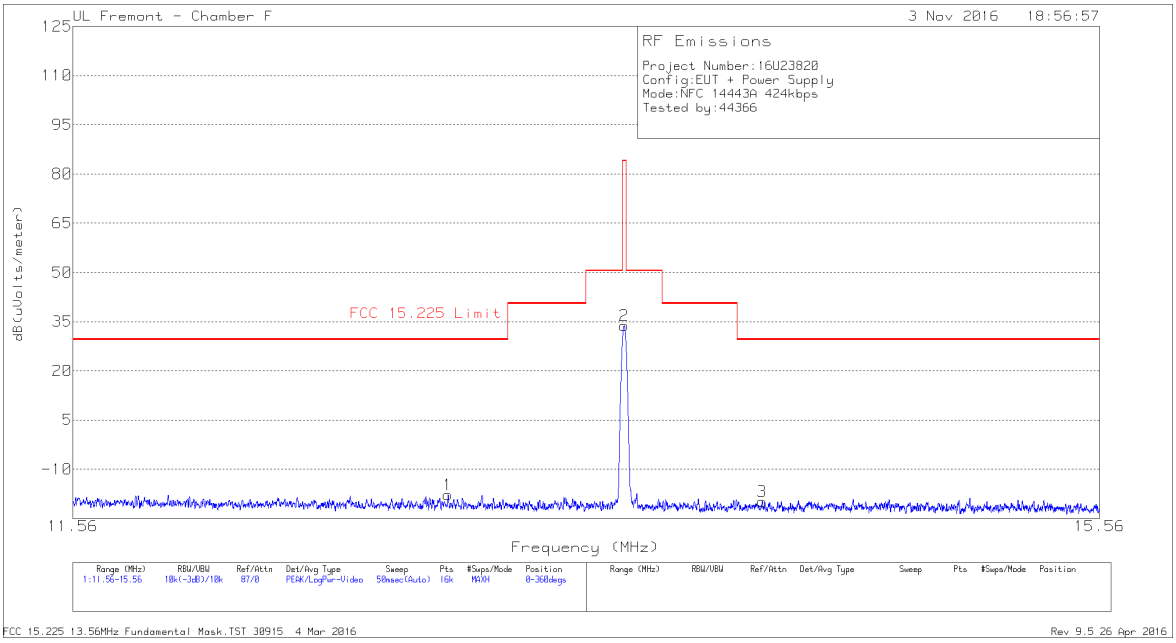

ANTENNA LOOP FACE OFF

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	12.8865	11.05	Pk	10.7	.4	-40	-17.85	29.54	-47.39	0-360
2	13.55988	62.72	Pk	10.6	.4	-40	33.72	84	-50.28	0-360
3	14.11325	9.22	Pk	10.6	.4	-40	-19.78	29.54	-49.32	0-360
4	13.14589	10.3	Pk	10.7	.4	-40	-18.6	40.51	-59.11	0-360
5	13.55807	69.06	Pk	10.6	.4	-40	40.06	84	-43.94	0-360
6	14.36231	9.86	Pk	10.6	.4	-40	-19.14	29.54	-48.68	0-360

Pk - Peak detector

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SPURIOUS EMISSIONS 424kbps

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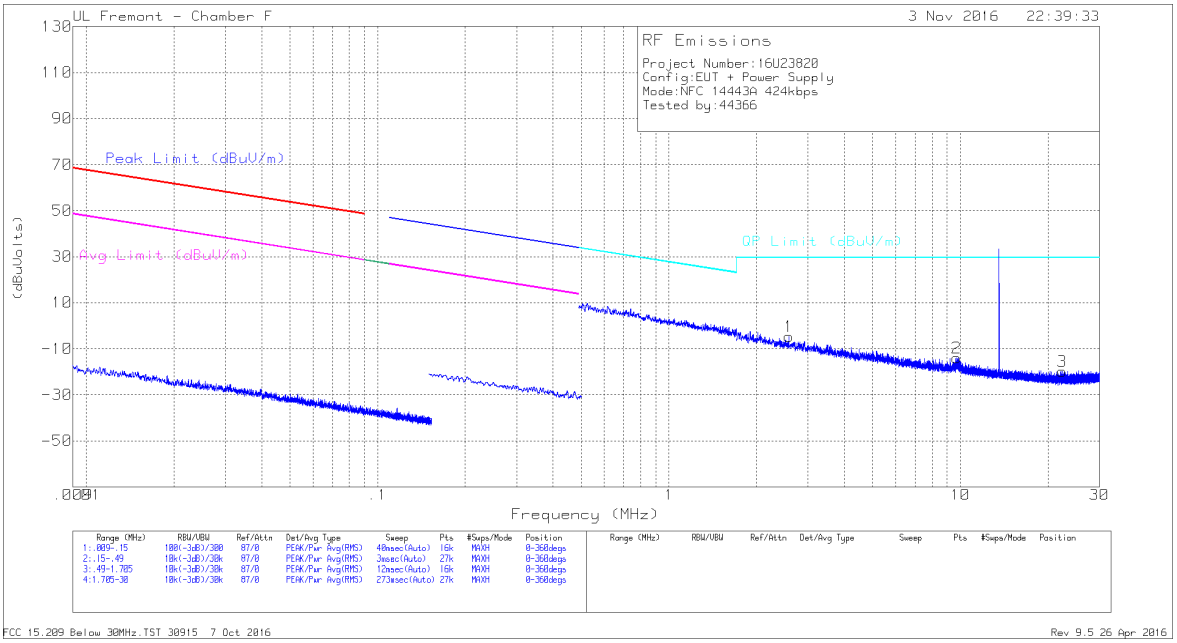
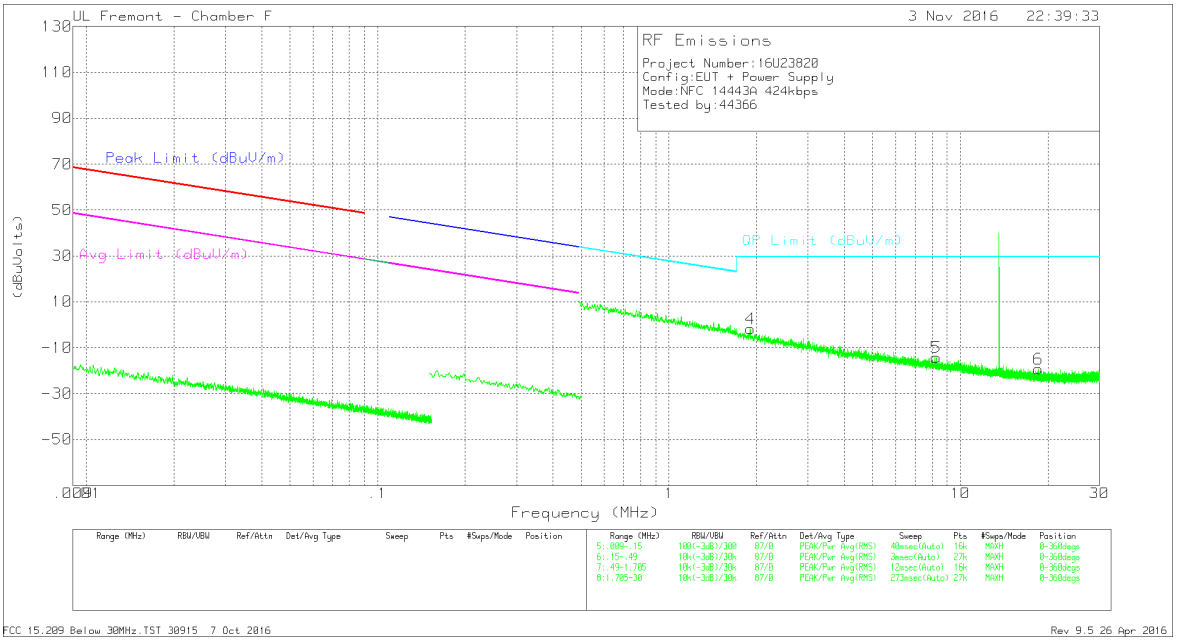


ANTENNA LOOP FACE OFF



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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	2.58008	23.45	Pk	11.8	.2	-40	-4.55	29.5	-34.05	0-360
2	9.71172	14.82	Pk	11	.3	-40	-13.88	29.5	-43.38	0-360
3	22.37575	10.05	Pk	9.5	.6	-40	-19.85	29.5	-49.35	0-360
4	1.89993	26.26	Pk	11.9	.1	-40	-1.74	29.5	-31.24	0-360
5	8.26129	14.25	Pk	11.2	.3	-40	-14.25	29.5	-43.75	0-360
6	18.55684	10.1	Pk	10	.5	-40	-19.4	29.5	-48.9	0-360

Pk - Peak detector

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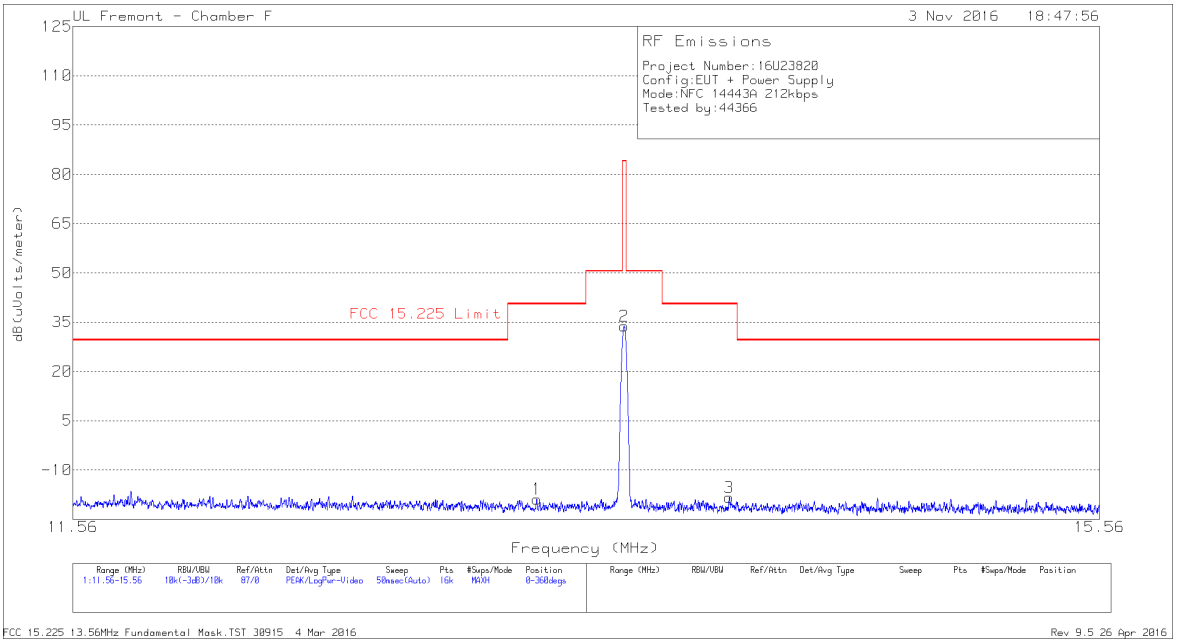
FUNDAMENTAL 212Kbps

ANTENNA LOOP FACE ON



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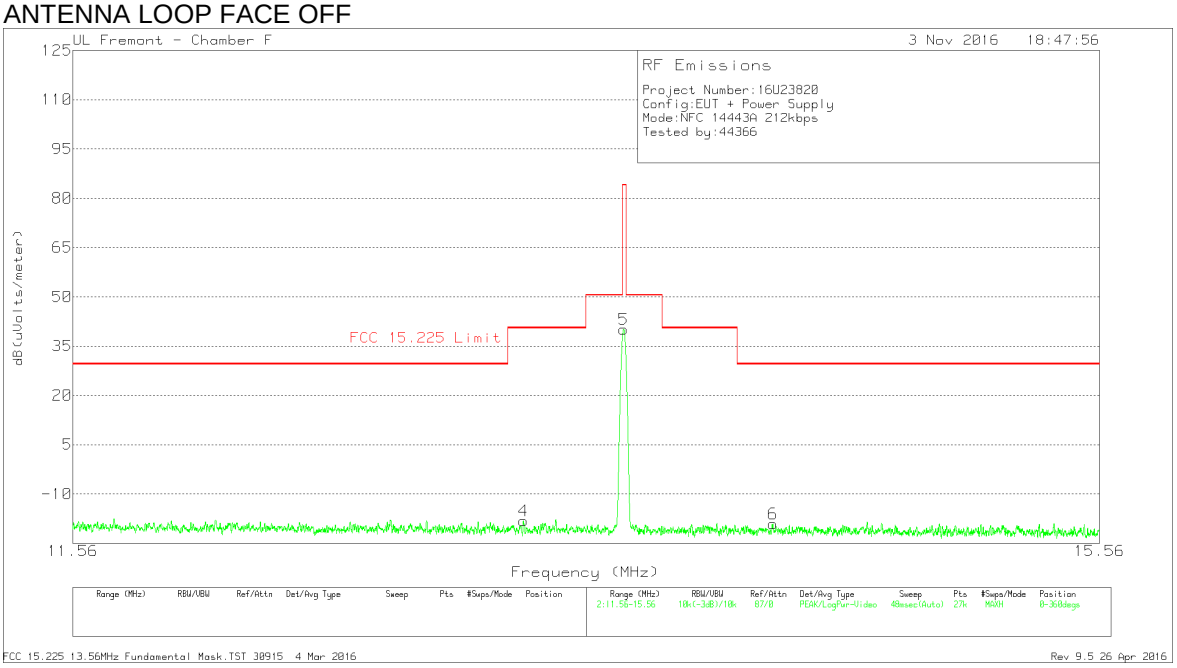

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	13.22113	10.08	Pk	10.7	.4	-40	-18.82	40.51	-59.33	0-360
2	13.56025	62.73	Pk	10.6	.4	-40	33.73	84	-50.27	0-360
3	13.97925	10.61	Pk	10.6	.4	-40	-18.39	40.51	-58.9	0-360
4	13.17054	10.71	Pk	10.7	.4	-40	-18.19	40.51	-58.7	0-360
5	13.55807	69.13	Pk	10.6	.4	-40	40.13	84	-43.87	0-360
6	14.15673	9.99	Pk	10.6	.4	-40	-19.01	29.54	-48.55	0-360

Pk - Peak detector

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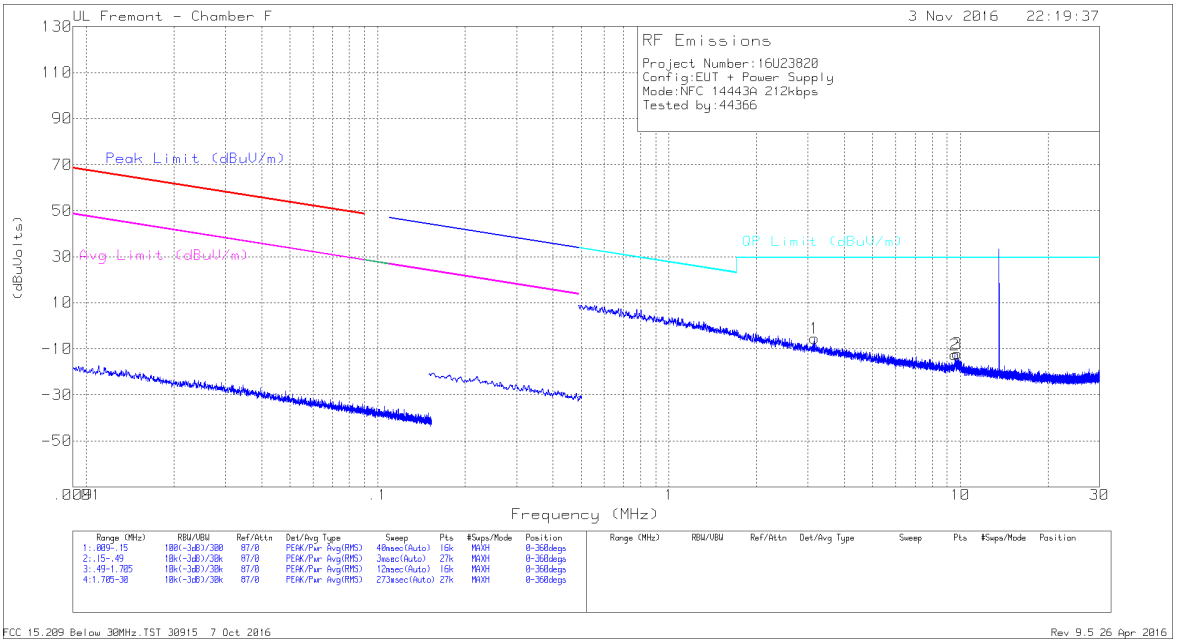
SPURIOUS EMISSIONS 212kbps

ANTENNA LOOP FACE ON



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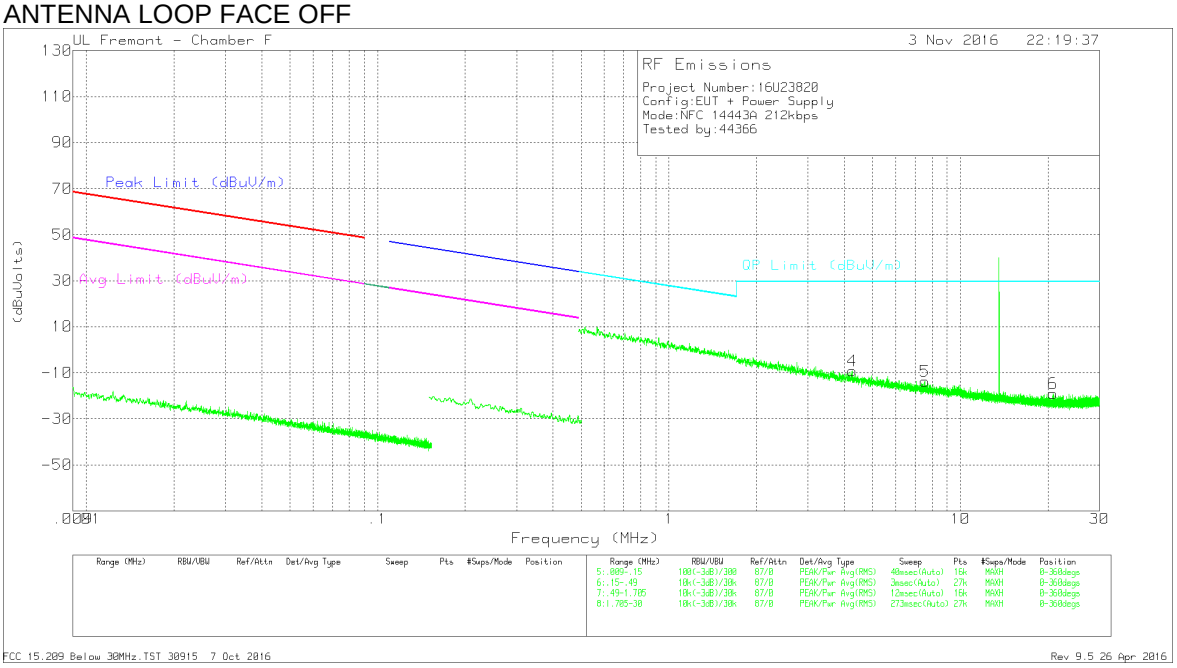

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	3.15334	22.45	Pk	11.8	.2	-40	-5.55	29.5	-35.05	0-360
2	9.58229	16.11	Pk	11	.3	-40	-12.59	29.5	-42.09	0-360
3	9.77617	16.55	Pk	11	.3	-40	-12.15	29.5	-41.65	0-360
4	4.24954	19.12	Pk	11.6	.2	-40	-9.08	29.5	-38.58	0-360
5	7.56175	14.89	Pk	11.2	.3	-40	-13.61	29.5	-43.11	0-360
6	20.78908	10.83	Pk	9.7	.5	-40	-18.97	29.5	-48.47	0-360

Pk - Peak detector

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FUNDAMENTAL 106Kbps

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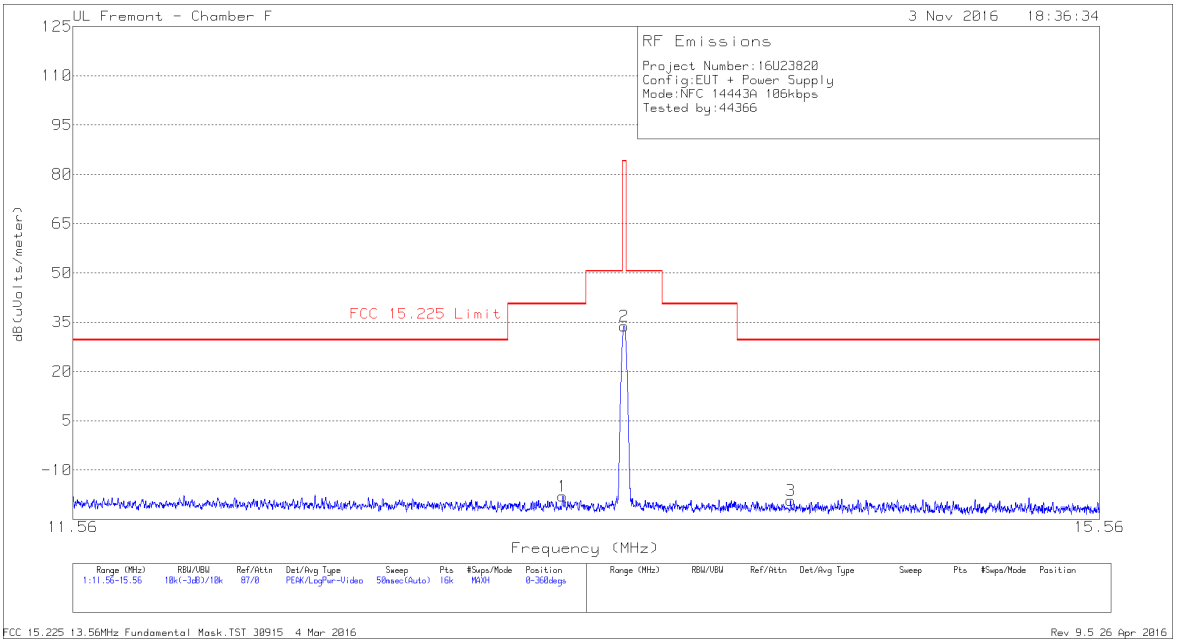

ANTENNA LOOP FACE OFF

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	13.32163	10.92	Pk	10.7	.4	-40	-17.98	40.51	-58.49	0-360
2	13.55988	62.78	Pk	10.6	.4	-40	33.78	84	-50.22	0-360
3	14.22913	9.68	Pk	10.6	.4	-40	-19.32	29.54	-48.86	0-360
4	13.01269	10.38	Pk	10.7	.4	-40	-18.52	29.54	-48.06	0-360
5	13.55807	69.23	Pk	10.6	.4	-40	40.23	84	-43.77	0-360
6	14.29497	9.75	Pk	10.6	.4	-40	-19.25	29.54	-48.79	0-360

Pk - Peak detector

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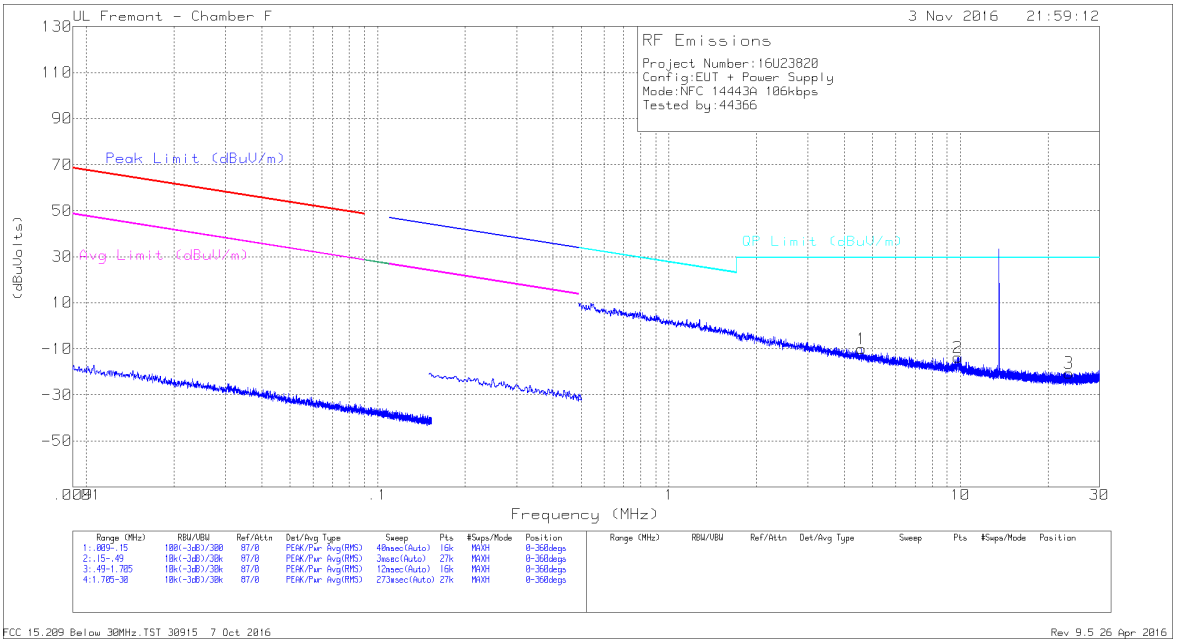
SPURIOUS EMISSIONS 106Kbps

ANTENNA LOOP FACE ON



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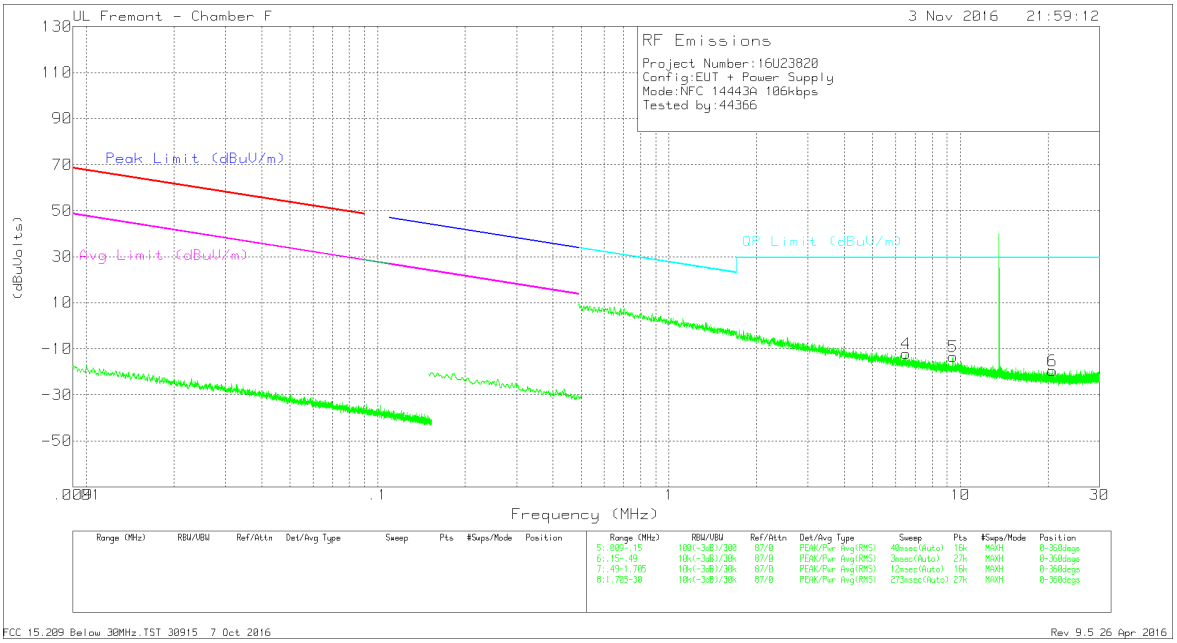

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	4.58019	18.23	Pk	11.5	.2	-40	-10.07	29.5	-39.57	0-360
2	9.78194	15.1	Pk	11	.3	-40	-13.6	29.5	-43.1	0-360
3	23.59038	9.61	Pk	9.3	.6	-40	-20.49	29.5	-49.99	0-360
4	6.51742	16.27	Pk	11.3	.2	-40	-12.23	29.5	-41.73	0-360
5	9.41199	15.05	Pk	11.1	.3	-40	-13.55	29.5	-43.05	0-360
6	20.65598	10.16	Pk	9.7	.5	-40	-19.64	29.5	-49.14	0-360

Pk - Peak detector

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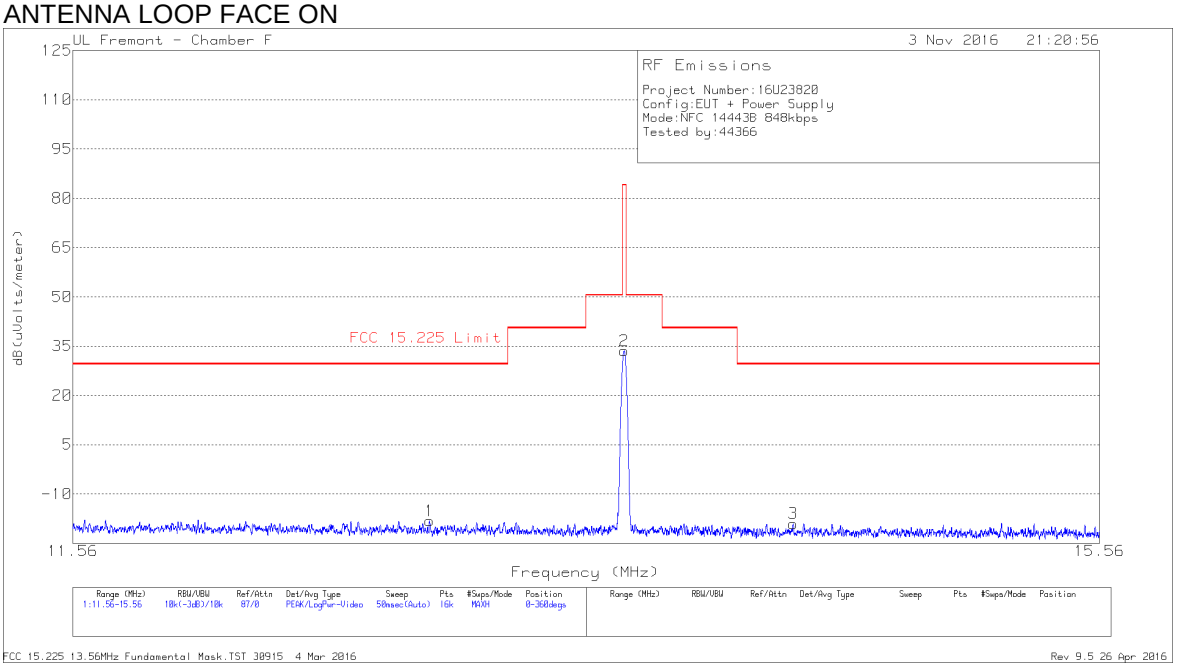
8.2.2. 14443B

FUNDAMENTAL 848Kbps

ANTENNA LOOP FACE ON



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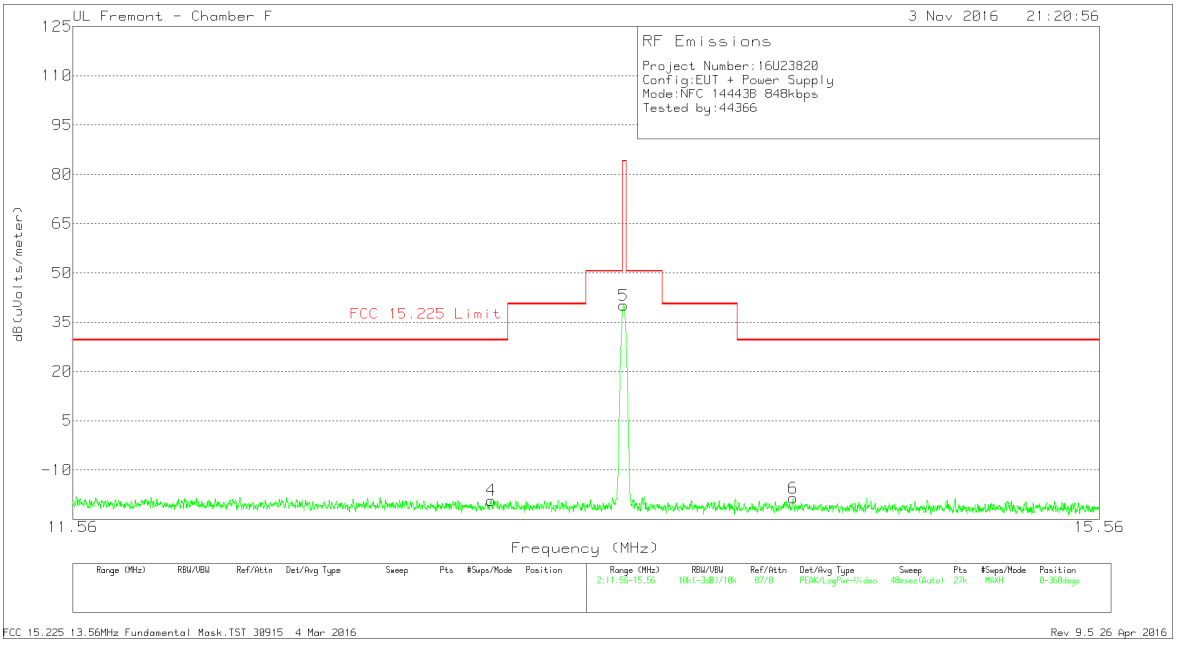

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	12.81738	10.75	Pk	10.7	.4	-40	-18.15	29.54	-47.69	0-360
2	13.56025	62.55	Pk	10.6	.4	-40	33.55	84	-50.45	0-360
3	14.23988	10	Pk	10.6	.4	-40	-19	29.54	-48.54	0-360
4	13.04807	9.71	Pk	10.7	.4	-40	-19.19	29.54	-48.73	0-360
5	13.55793	69.07	Pk	10.6	.4	-40	40.07	84	-43.93	0-360
6	14.23991	10.46	Pk	10.6	.4	-40	-18.54	29.54	-48.08	0-360

Pk - Peak detector

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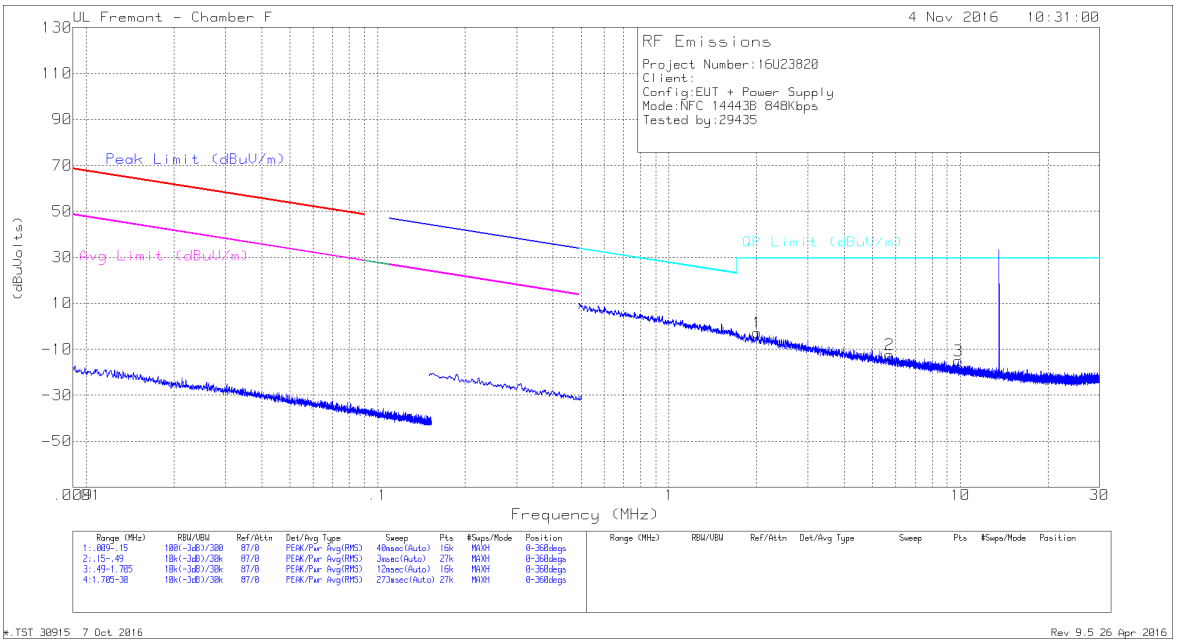
SPURIOUS EMISSIONS 848Kbps

ANTENNA LOOP FACE ON



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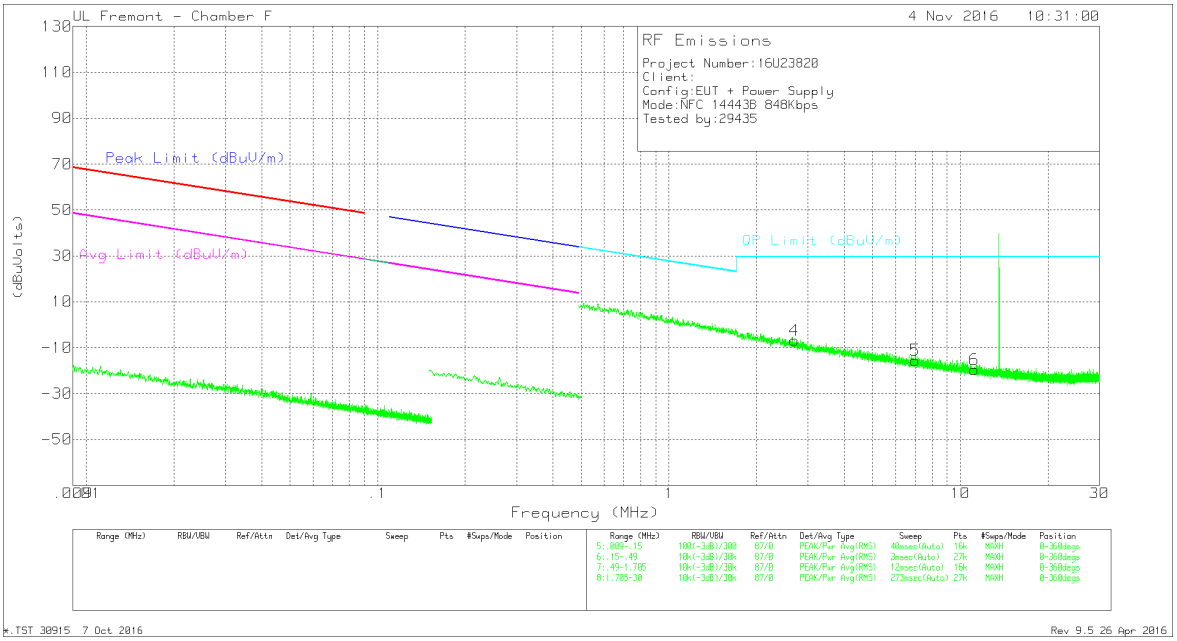

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	2.01206	25.12	Pk	11.9	.2	-40	-2.78	29.5	-32.28	0-360
2	5.72565	15.9	Pk	11.4	.2	-40	-12.5	29.5	-42	0-360
3	9.85792	13.7	Pk	11	.3	-40	-15	29.5	-44.5	0-360
4	2.69641	21.2	Pk	11.8	.2	-40	-6.8	29.5	-36.3	0-360
5	7.00159	12.96	Pk	11.3	.3	-40	-15.44	29.5	-44.94	0-360
6	11.1632	9.21	Pk	10.9	.3	-40	-19.59	29.5	-49.09	0-360

Pk - Peak detector

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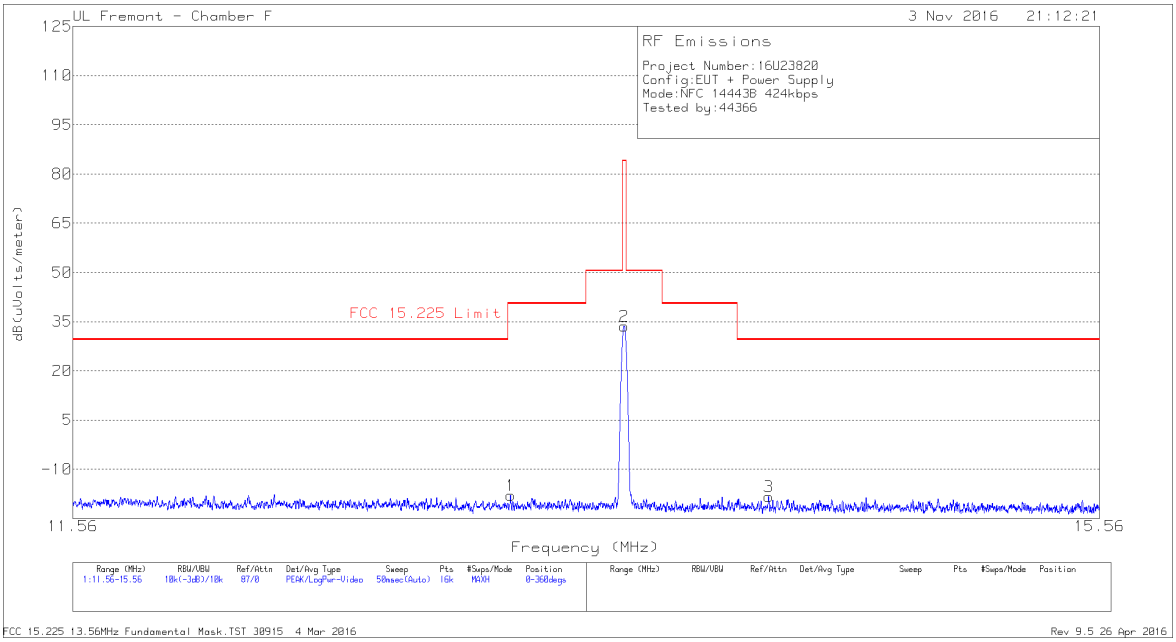
FUNDAMENTAL 424Kbps

ANTENNA LOOP FACE ON



ANTENNA LOOP FACE OFF

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	13.12113	10.92	Pk	10.7	.4	-40	-17.98	40.51	-58.49	0-360
2	13.55988	62.69	Pk	10.6	.4	-40	33.69	84	-50.31	0-360
3	14.139	10.72	Pk	10.6	.4	-40	-18.28	29.54	-47.82	0-360
4	12.75813	11.27	Pk	10.7	.4	-40	-17.63	29.54	-47.17	0-360
5	13.55807	69.21	Pk	10.6	.4	-40	40.21	84	-43.79	0-360
6	14.08118	9.84	Pk	10.6	.4	-40	-19.16	29.54	-48.7	0-360

Pk - Peak detector

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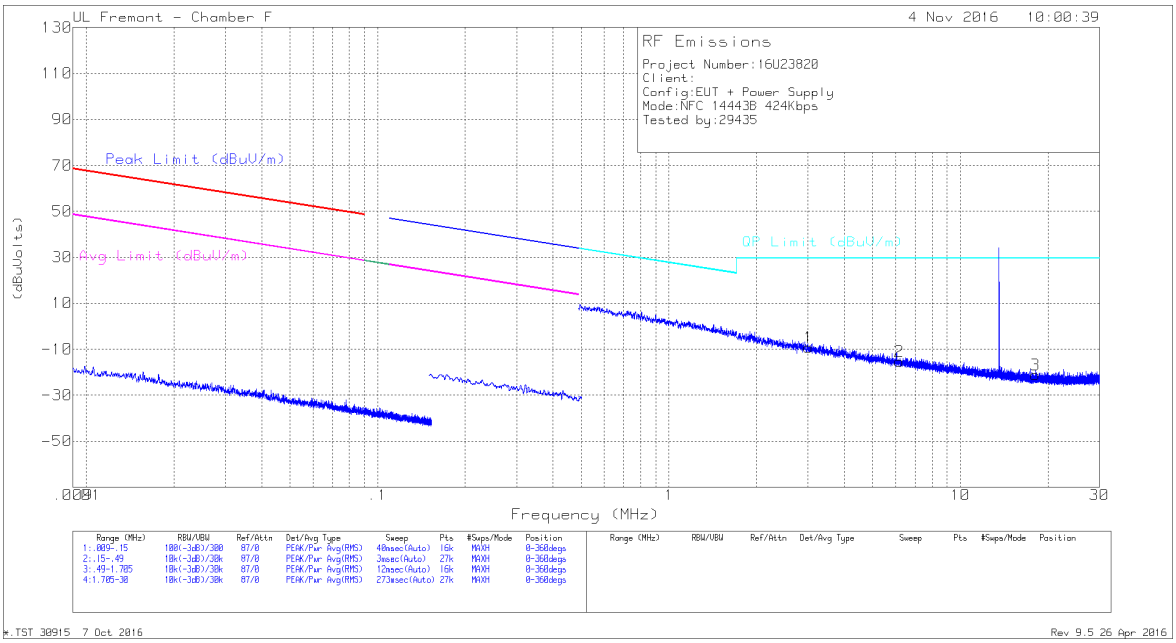
SPURIOUS EMISSIONS 424Kbps

ANTENNA LOOP FACE ON



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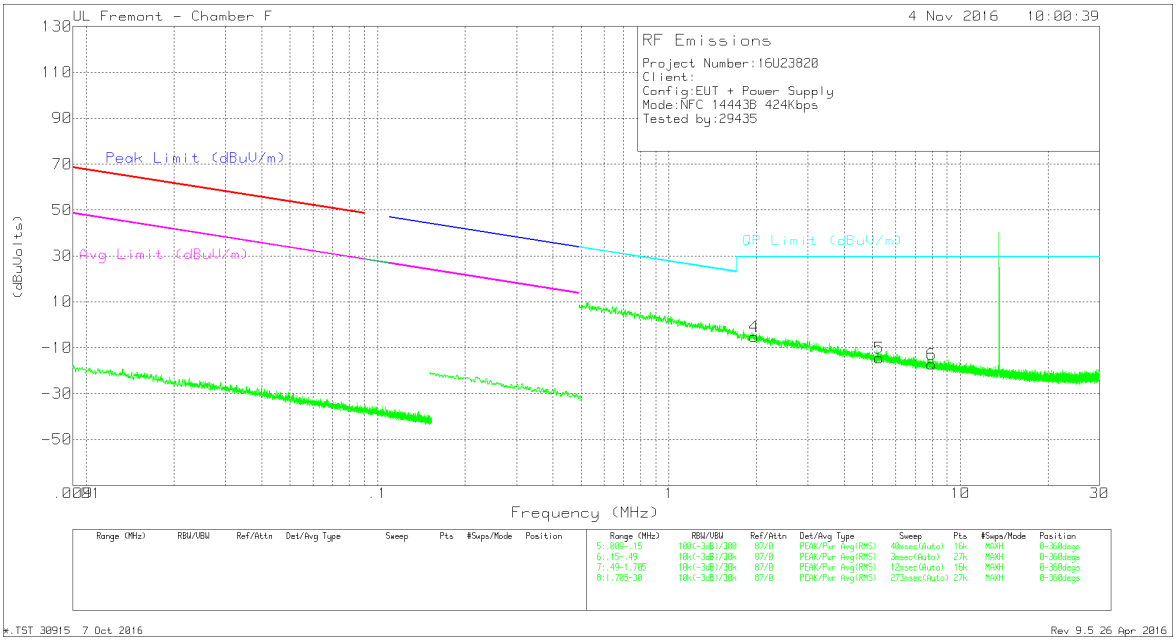

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	3.01238	18.75	Pk	11.8	.2	-40	-9.25	29.5	-38.75	0-360
2	6.17158	13.15	Pk	11.4	.2	-40	-15.25	29.5	-44.75	0-360
3	18.07686	8.18	Pk	10.1	.5	-40	-21.22	29.5	-50.72	0-360
4	1.96386	22.83	Pk	11.9	.1	-40	-5.17	29.5	-34.67	0-360
5	5.2703	13.88	Pk	11.5	.2	-40	-14.42	29.5	-43.92	0-360
6	7.96418	11.22	Pk	11.2	.3	-40	-17.28	29.5	-46.78	0-360

Pk - Peak detector

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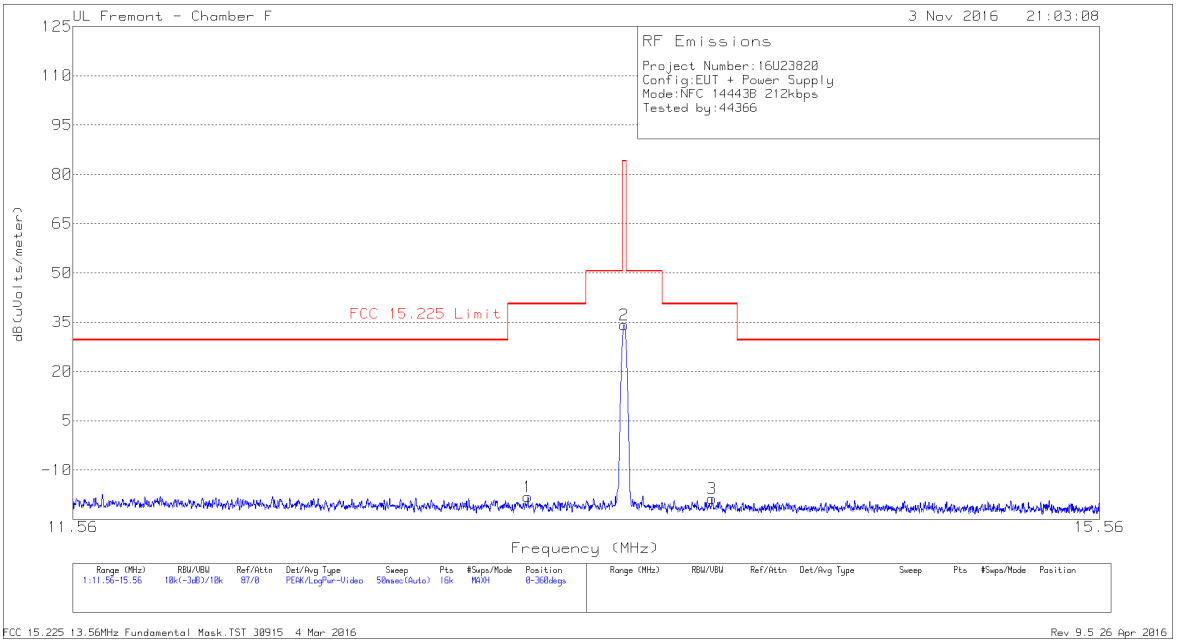
FUNDAMENTAL 212Kbps

ANTENNA LOOP FACE ON



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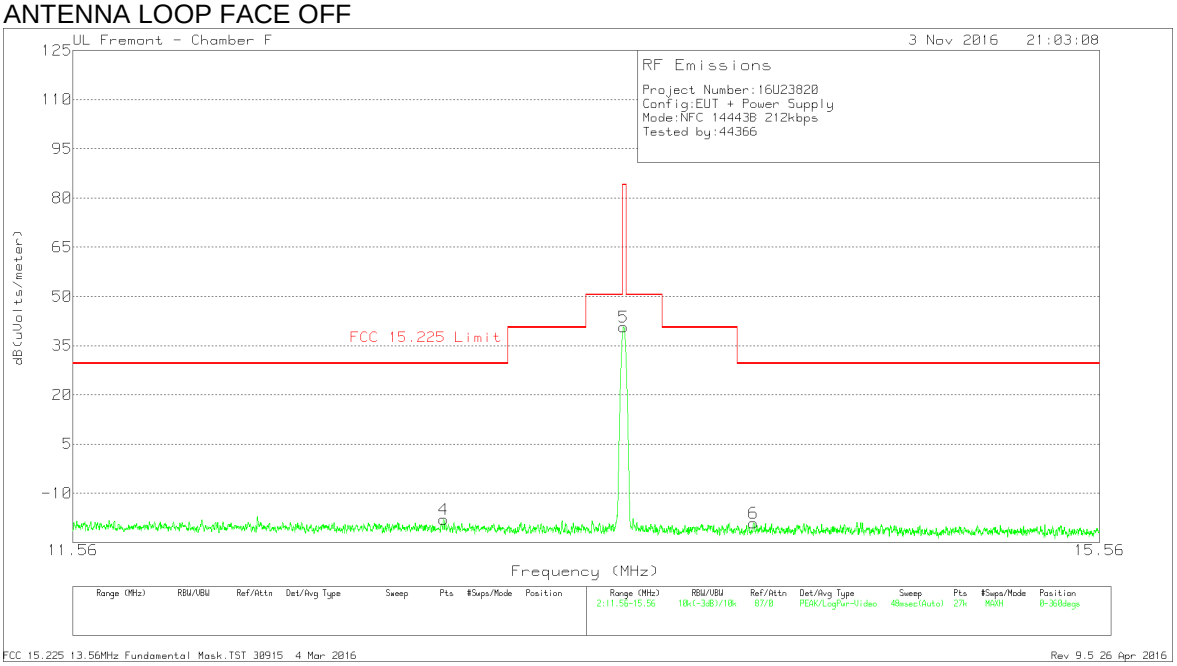

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	13.18763	10.69	Pk	10.7	.4	-40	-18.21	40.51	-58.72	0-360
2	13.55988	63.15	Pk	10.6	.4	-40	34.15	84	-49.85	0-360
3	13.90888	10.31	Pk	10.6	.4	-40	-18.69	40.51	-59.2	0-360
4	12.87002	10.89	Pk	10.7	.4	-40	-18.01	29.54	-47.55	0-360
5	13.55793	69.63	Pk	10.6	.4	-40	40.63	84	-43.37	0-360
6	14.07815	9.92	Pk	10.6	.4	-40	-19.08	29.54	-48.62	0-360

Pk - Peak detector

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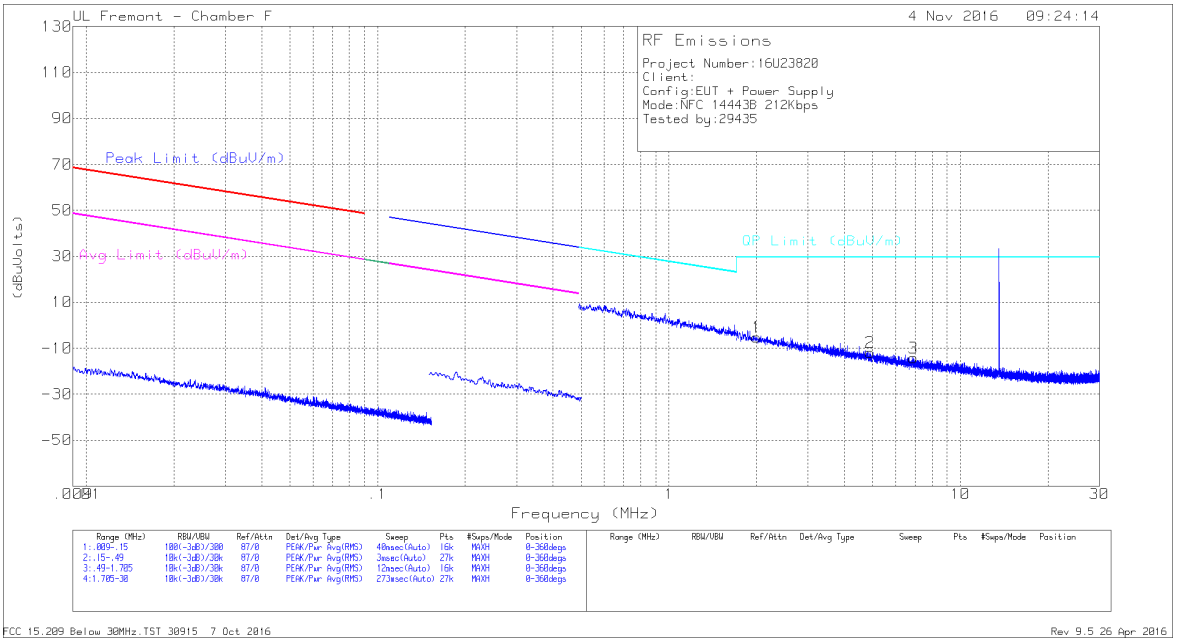
SPURIOUS EMISSIONS 212Kbps

ANTENNA LOOP FACE ON



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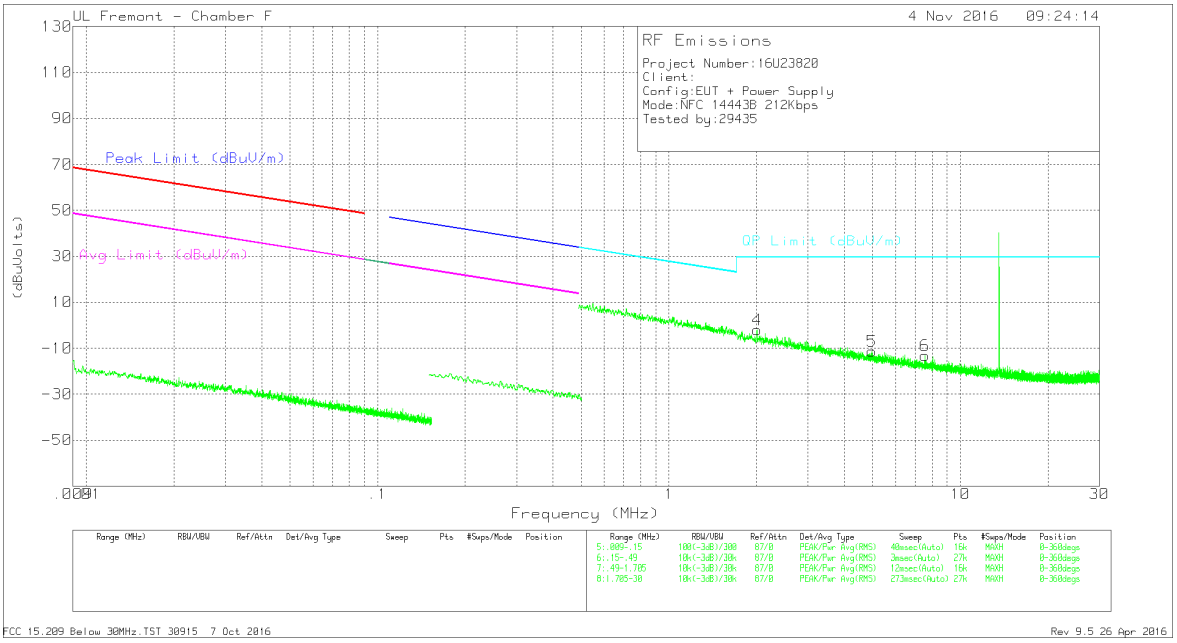

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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	2.00054	22.76	Pk	11.9	.2	-40	-5.14	-	29.5	-34.64	0-360
2	4.90769	16.42	Pk	11.5	.2	-40	-11.88	-	29.5	-41.38	0-360
3	6.89208	14.09	Pk	11.3	.3	-40	-14.31	-	29.5	-43.81	0-360
4	2.0042	25.91	Pk	11.9	.2	-40	-1.99	-	29.5	-31.49	0-360
5	4.95799	16.96	Pk	11.5	.2	-40	-11.34	-	29.5	-40.84	0-360
6	7.56542	15.22	Pk	11.2	.3	-40	-13.28	-	29.5	-42.78	0-360

Pk - Peak detector

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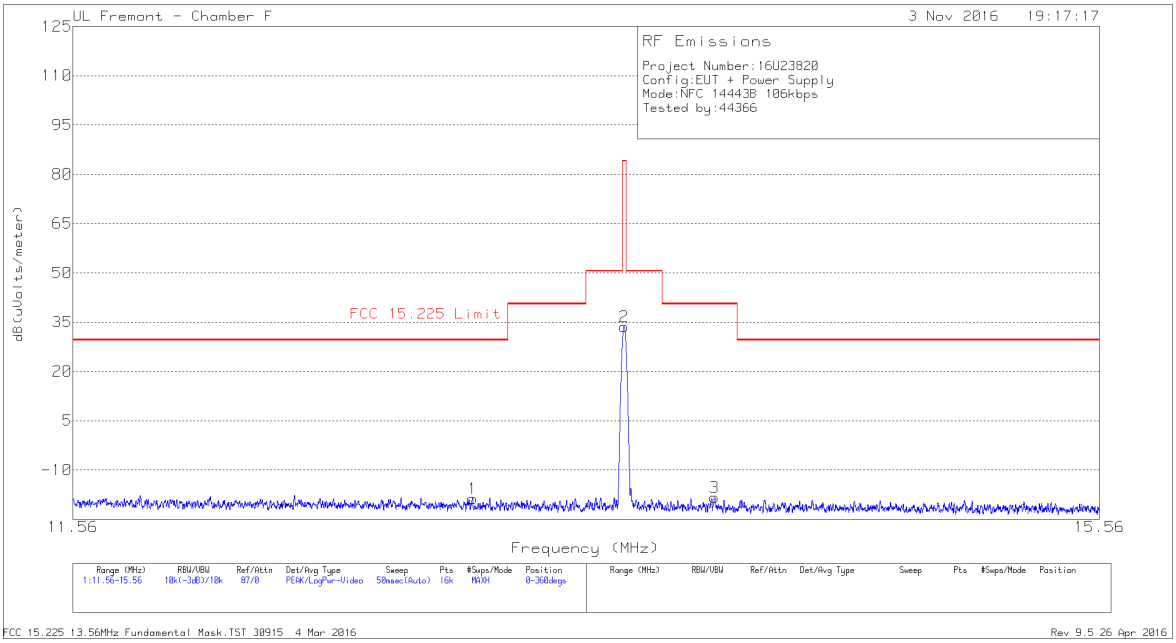
FUNDAMENTAL 106Kbps

ANTENNA LOOP FACE ON



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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	12.97825	10.12	Pk	10.7	.4	-40	-18.78	29.54	-48.32	0-360
2	13.55988	62.65	Pk	10.6	.4	-40	33.65	84	-50.35	0-360
3	13.91963	10.6	Pk	10.6	.4	-40	-18.4	40.51	-58.91	0-360
4	12.85123	10.49	Pk	10.7	.4	-40	-18.41	29.54	-47.95	0-360
5	13.55785	69.11	Pk	10.6	.4	-40	40.11	84	-43.89	0-360
6	14.46206	10.6	Pk	10.6	.4	-40	-18.4	29.54	-47.94	0-360

Pk - Peak detector

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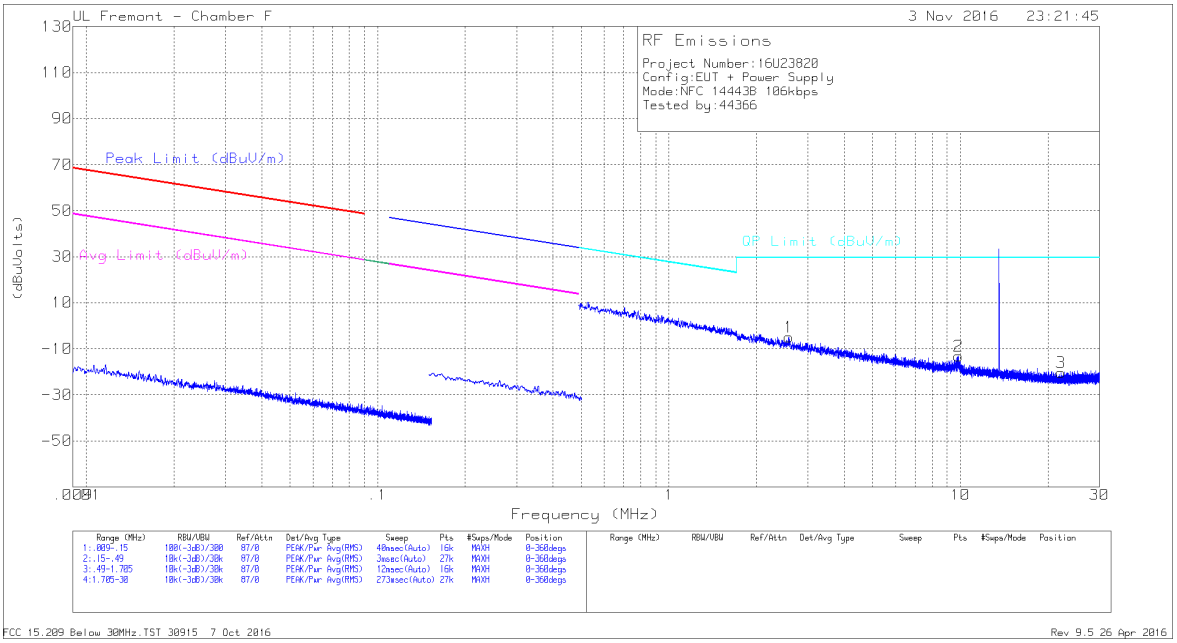
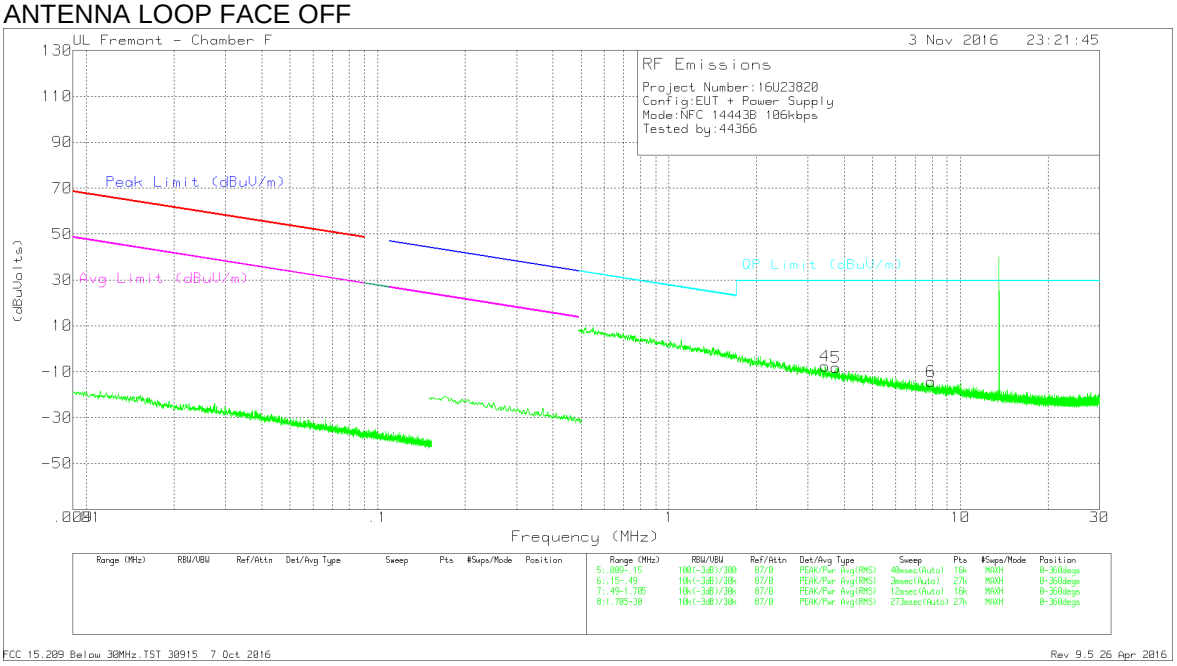
SPURIOUS EMISSIONS 106Kbps

ANTENNA LOOP FACE ON



ANTENNA LOOP FACE OFF



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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	2.58375	23.15	Pk	11.8	.2	-40	-4.85	29.5	-34.35	0-360
2	9.83119	15.52	Pk	11	.3	-40	-13.18	29.5	-42.68	0-360
3	22.16301	9.53	Pk	9.5	.6	-40	-20.37	29.5	-49.87	0-360
4	3.4342	20.49	Pk	11.7	.2	-40	-7.61	29.5	-37.11	0-360
5	3.73445	19.87	Pk	11.7	.2	-40	-8.23	29.5	-37.73	0-360
6	7.9296	14.3	Pk	11.2	.3	-40	-14.2	29.5	-43.7	0-360

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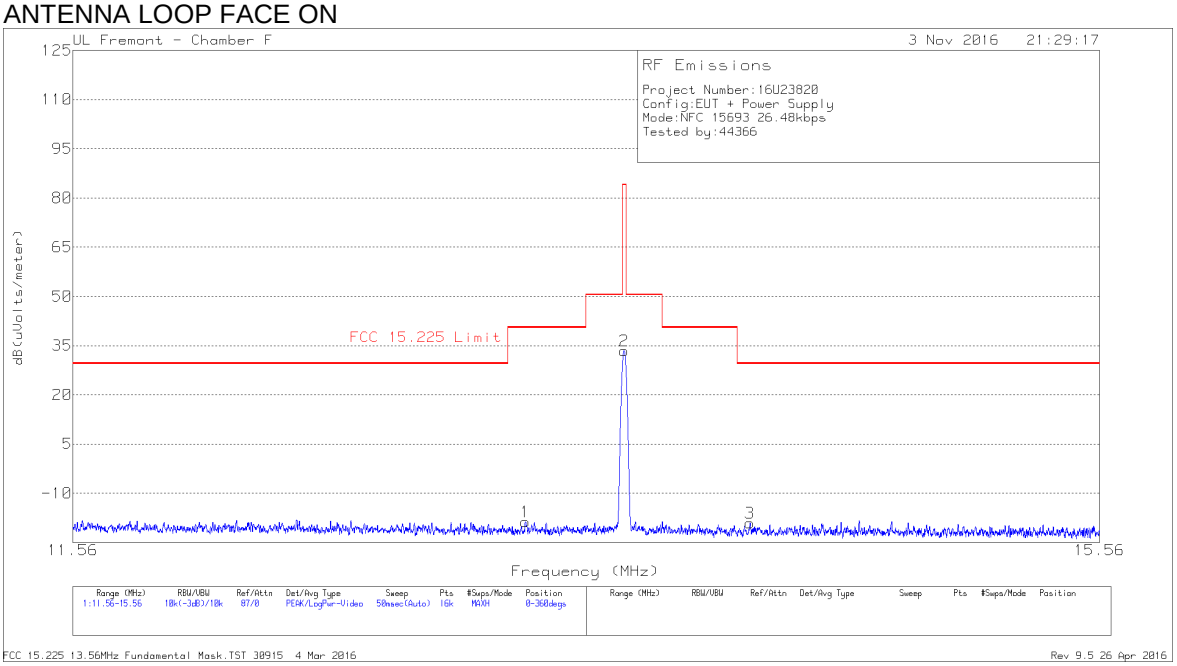
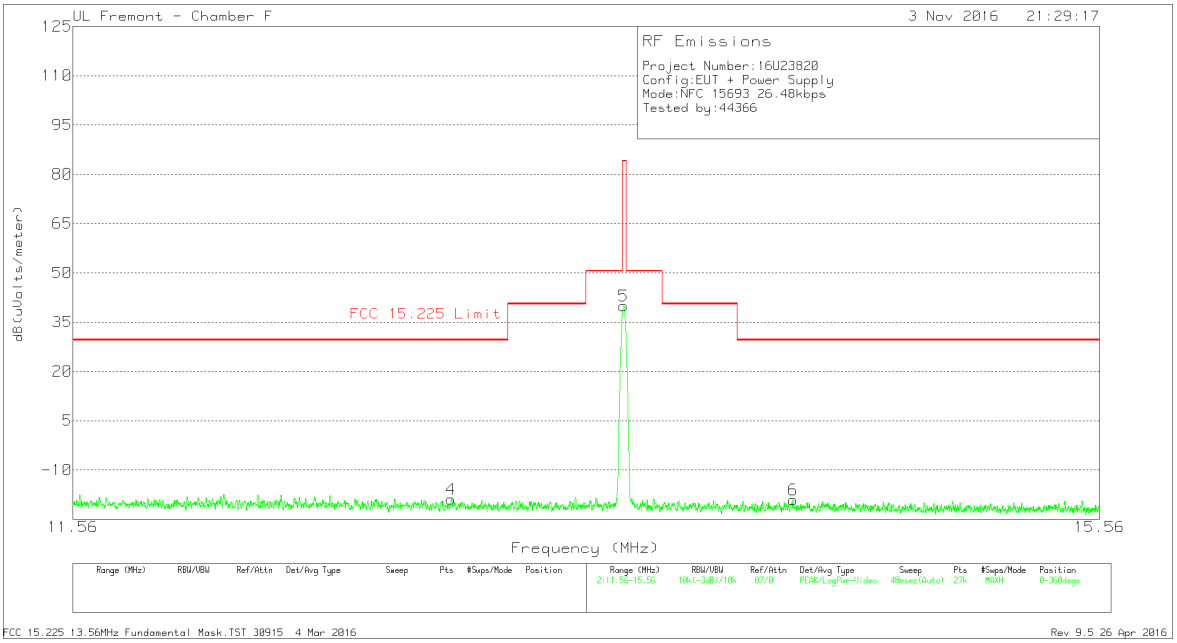
8.2.3. 15693

FUNDAMENTAL 26.48kbps

ANTENNA LOOP FACE ON



ANTENNA LOOP FACE OFF



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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)
1	13.17813	10.12	Pk	10.7	.4	-40	-18.78	40.51	-59.29	0-360
2	13.55988	62.49	Pk	10.6	.4	-40	33.49	84	-50.51	0-360
3	14.0635	9.88	Pk	10.6	.4	-40	-19.12	29.54	-48.66	0-360
4	12.89799	10.05	Pk	10.7	.4	-40	-18.85	29.54	-48.39	0-360
5	13.55807	69	Pk	10.6	.4	-40	40	84	-44	0-360
6	14.23932	9.95	Pk	10.6	.4	-40	-19.05	29.54	-48.59	0-360

Pk - Peak detector

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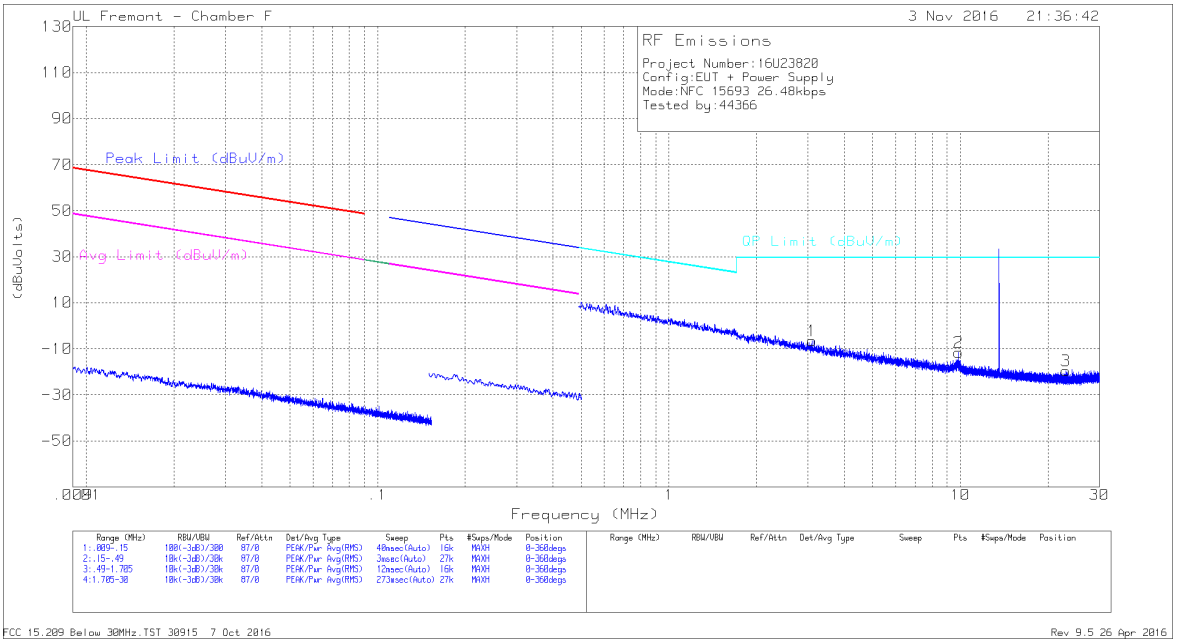
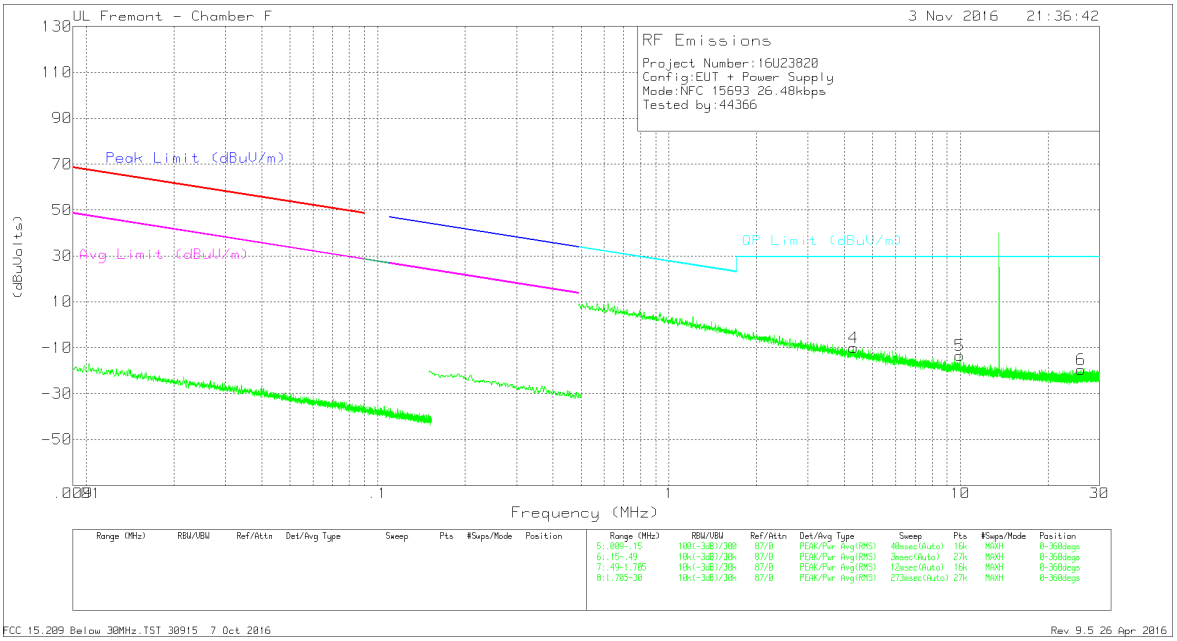
SPURIOUS EMISSIONS 26.48kbps

ANTENNA LOOP FACE ON



ANTENNA LOOP FACE OFF



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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Amp/Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	3.10094	21.39	Pk	11.8	.2	-40	-6.61	29.5	-36.11	0-360
2	9.83276	17.06	Pk	11	.3	-40	-11.64	29.5	-41.14	0-360
3	22.9794	10.38	Pk	9.4	.6	-40	-19.62	29.5	-49.12	0-360
4	4.30509	18.3	Pk	11.6	.2	-40	-9.9	29.5	-39.4	0-360
5	9.96638	15.31	Pk	11	.3	-40	-13.39	29.5	-42.89	0-360
6	25.95572	10.75	Pk	9	.6	-40	-19.65	29.5	-49.15	0-360

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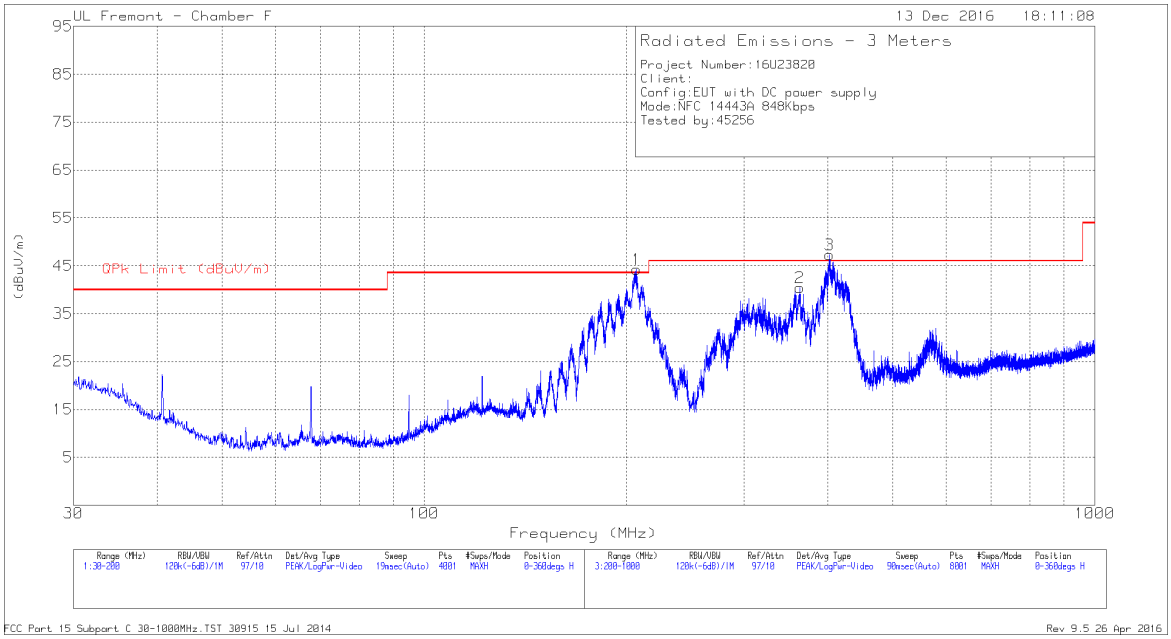
8.3. TX SPURIOUS EMISSION 30 TO 1000 MHz

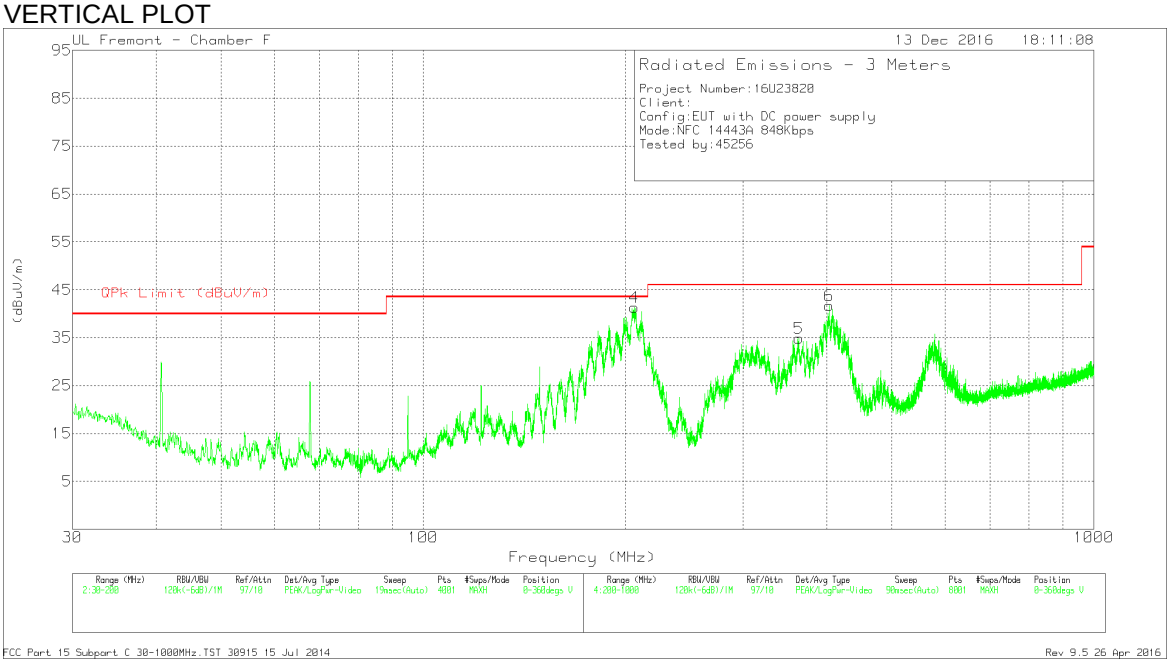
8.3.1. 14443A

848Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	207.2	53.69	Qp	15	-30.4	38.29	43.52	-5.23	287	243	H
2	363.6	45.52	Qp	18.9	-29.6	34.82	46.02	-11.2	129	112	H
3	* 402.5	52.43	Qp	19.7	-29.4	42.73	46.02	-3.29	297	260	H
4	206.5	51.94	Qp	15.1	-30.4	36.64	43.52	-6.88	314	108	V
5	363.3	45.6	Pk	18.9	-29.6	34.9	46.02	-11.12	0-360	100	V
6	* 403.1	46.8	Qp	19.7	-29.5	37	46.02	-9.02	119	156	V

Pk - Peak detector

Qp - Quasi-Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014
Rev 9.5 26 Apr 2016

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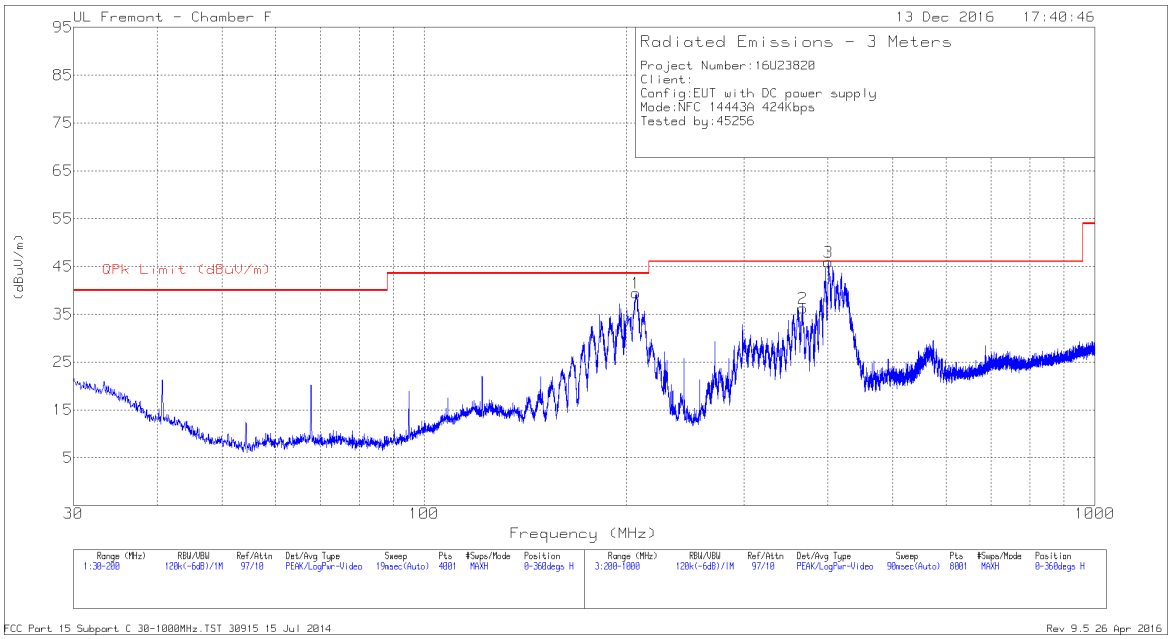
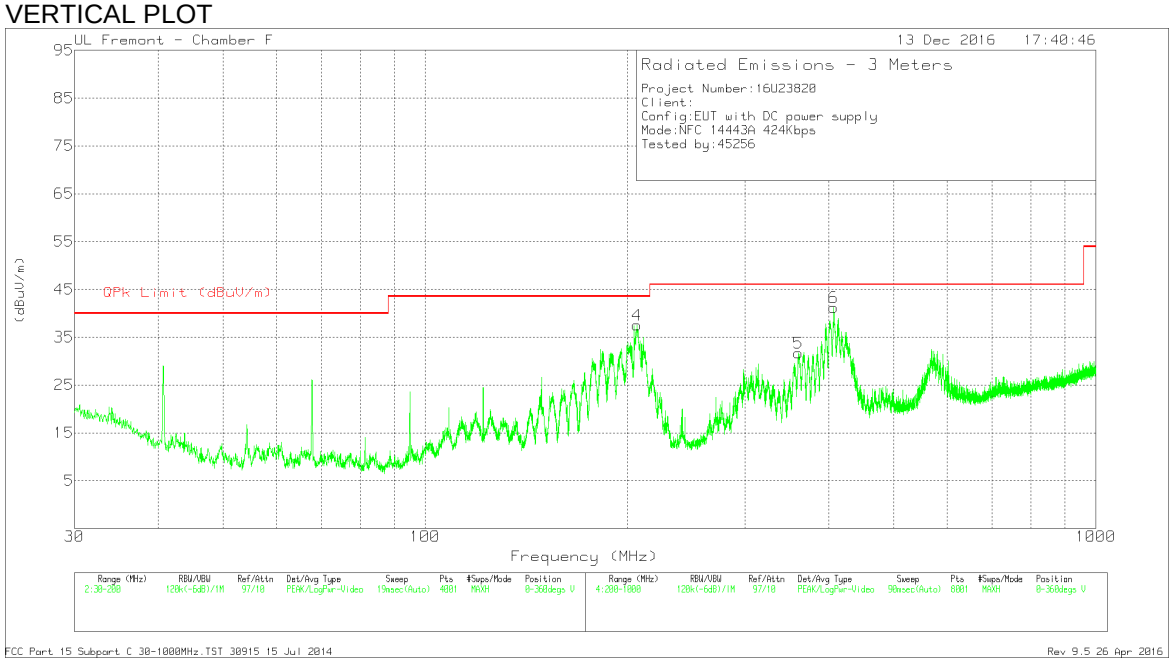
424Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	207.1	53.69	Qp	15	-30.5	38.19	43.52	-5.33	292	141	H
2	367	47.02	Pk	18.9	-29.6	36.32	46.02	-9.7	0-360	100	H
3	* 400.9	51.95	Qp	19.6	-29.4	42.15	46.02	-3.87	298	102	H
4	206.9	52.9	Pk	15	-30.4	37.5	43.52	-6.02	0-360	100	V
5	360.5	42.45	Pk	18.8	-29.6	31.65	46.02	-14.37	0-360	100	V
6	* 406.8	46.96	Qp	19.9	-29.3	37.56	46.02	-8.46	303	218	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
Qp - Quasi-Peak detector
FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014
Rev 9.5 26 Apr 2016

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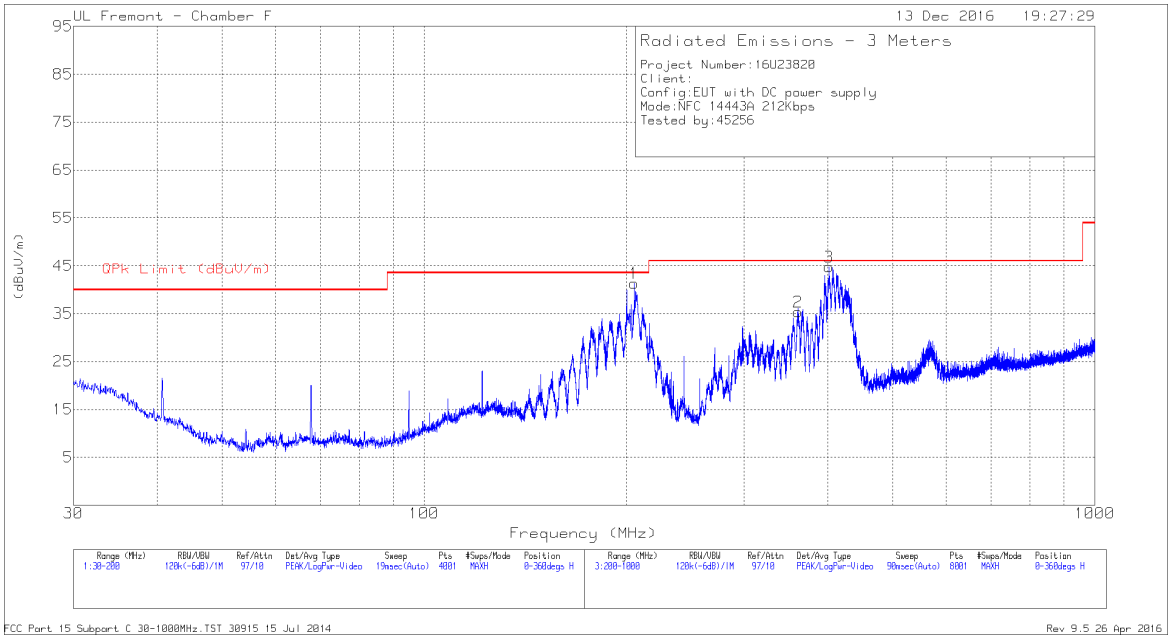
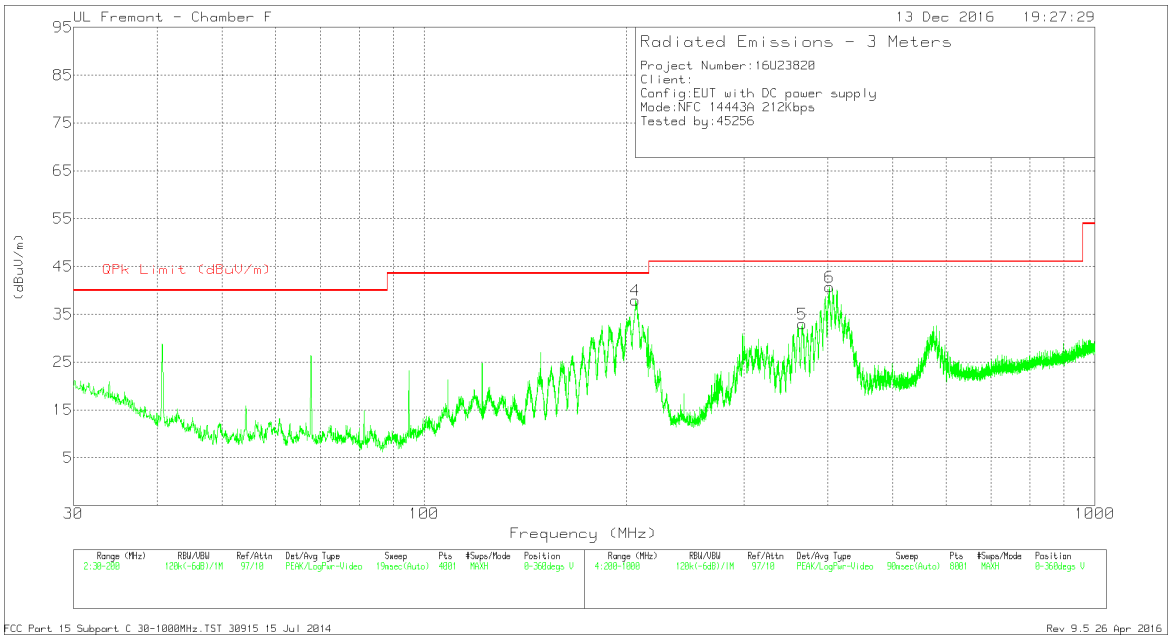
212Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	205.8	50.54	Qp	15.2	-30.4	35.34	43.52	-8.18	289	161	H
2	361.2	46.28	Pk	18.8	-29.7	35.38	46.02	-10.64	0-360	99	H
3	* 401.2	51.87	Qp	19.6	-29.4	42.07	46.02	-3.95	295	100	H
4	206.6	49.19	Qp	15.1	-30.4	33.89	43.52	-9.63	10	116	V
5	366.4	43.72	Pk	18.9	-29.6	33.02	46.02	-13	0-360	100	V
6	* 401.9	46.88	Qp	19.7	-29.4	37.18	46.02	-8.84	15	122	V

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

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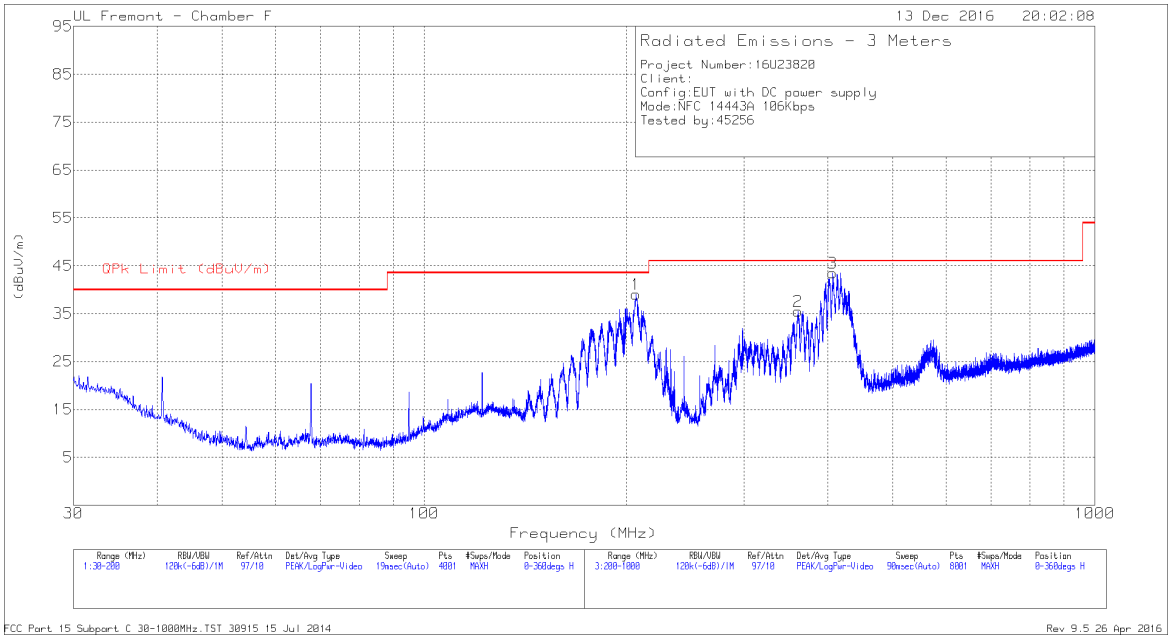
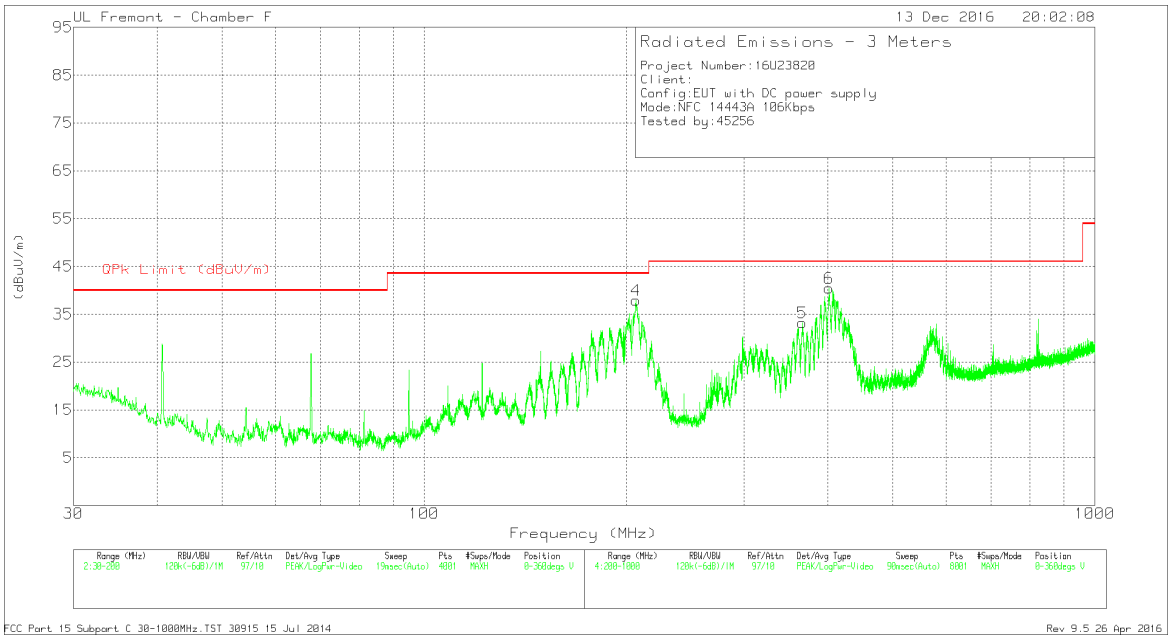
106Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	207.2	53.37	Qp	15	-30.5	37.87	43.52	-5.65	298	155	H
2	361.3	46.43	Pk	18.8	-29.7	35.53	46.02	-10.49	0-360	100	H
3	* 406.8	50.74	Qp	19.9	-29.3	41.34	46.02	-4.68	292	236	H
4	206.83	49.97	Qp	15	-30.4	34.57	43.52	-8.95	328	104	V
5	366.1	43.89	Pk	18.9	-29.6	33.19	46.02	-12.83	0-360	97	V
6	* 401.5	46.69	Qp	19.7	-29.4	36.99	46.02	-9.03	134	200	V

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

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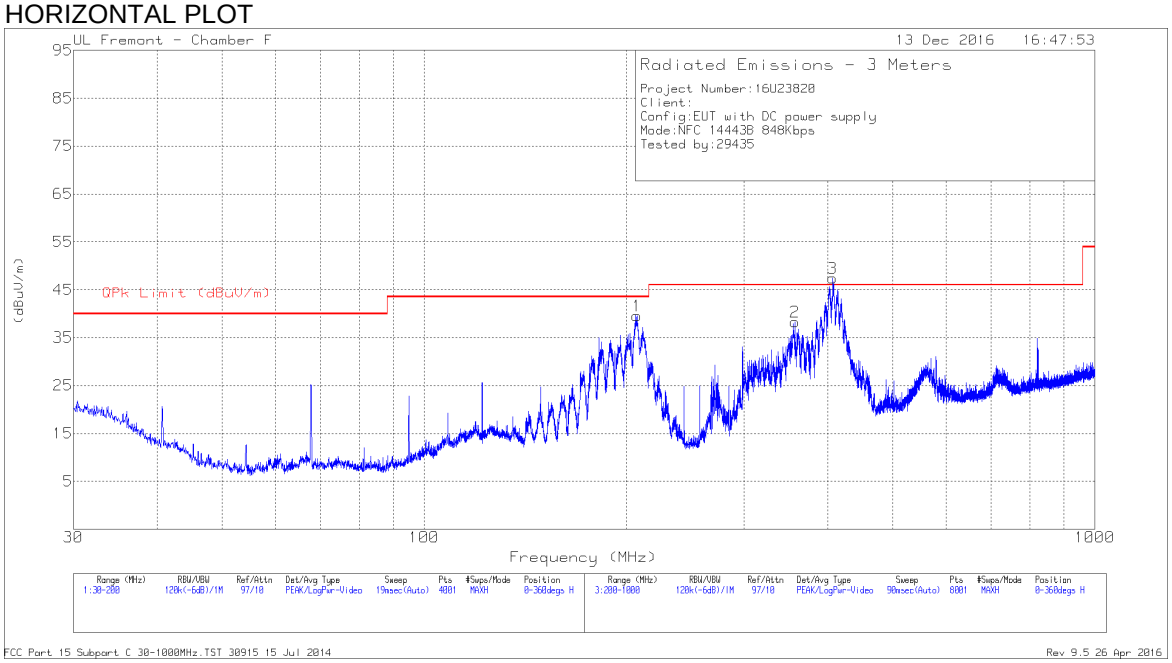
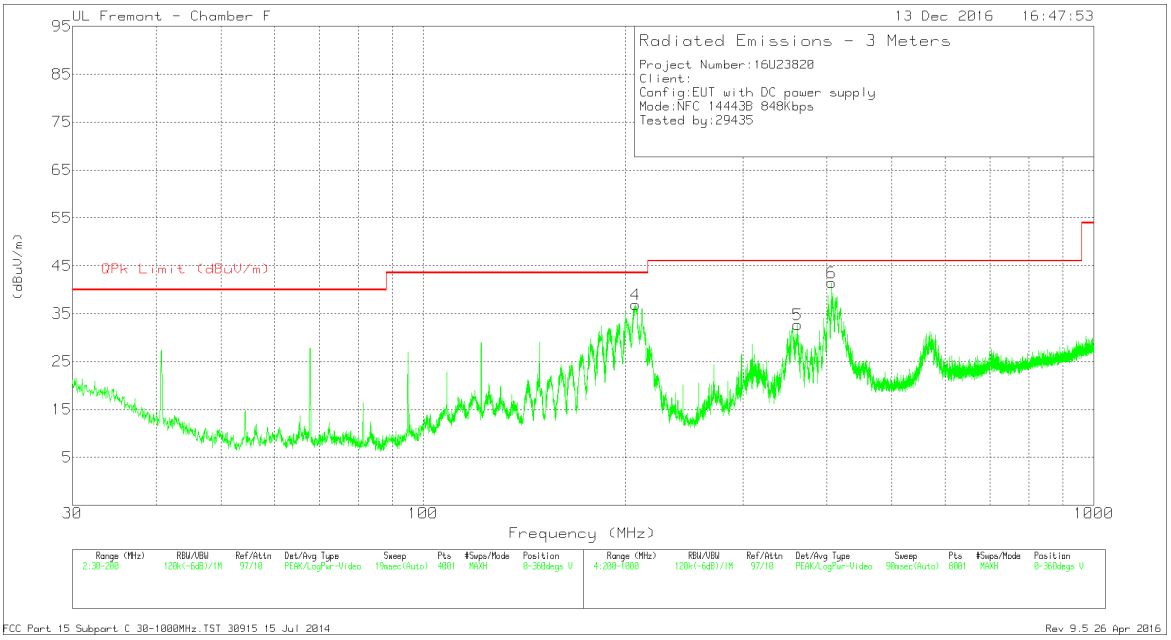
8.3.2. 14443B

848Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	207.4	52.65	Qp	14.9	-30.4	37.15	43.52	-6.37	251	177	H
2	357	49.3	Pk	18.6	-29.6	38.3	46.02	-7.72	0-360	99	H
3	* 406.8	52.39	Qp	19.9	-29.3	42.99	46.02	-3.03	319	105	H
4	207.3	52.43	Pk	14.9	-30.4	36.93	43.52	-6.59	0-360	99	V
5	362	43.53	Pk	18.8	-29.6	32.73	46.02	-13.29	0-360	99	V
6	* 406.8	48.04	Qp	19.9	-29.3	38.64	46.02	-7.38	287	207	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
Qp - Quasi-Peak detector
FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014
Rev 9.5 26 Apr 2016

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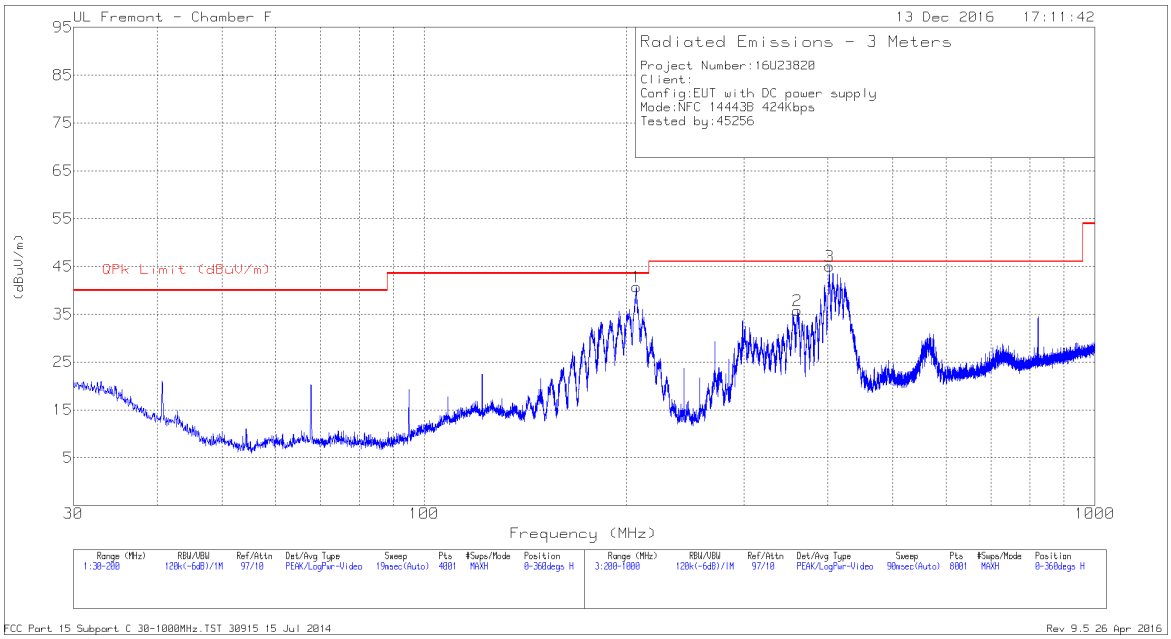
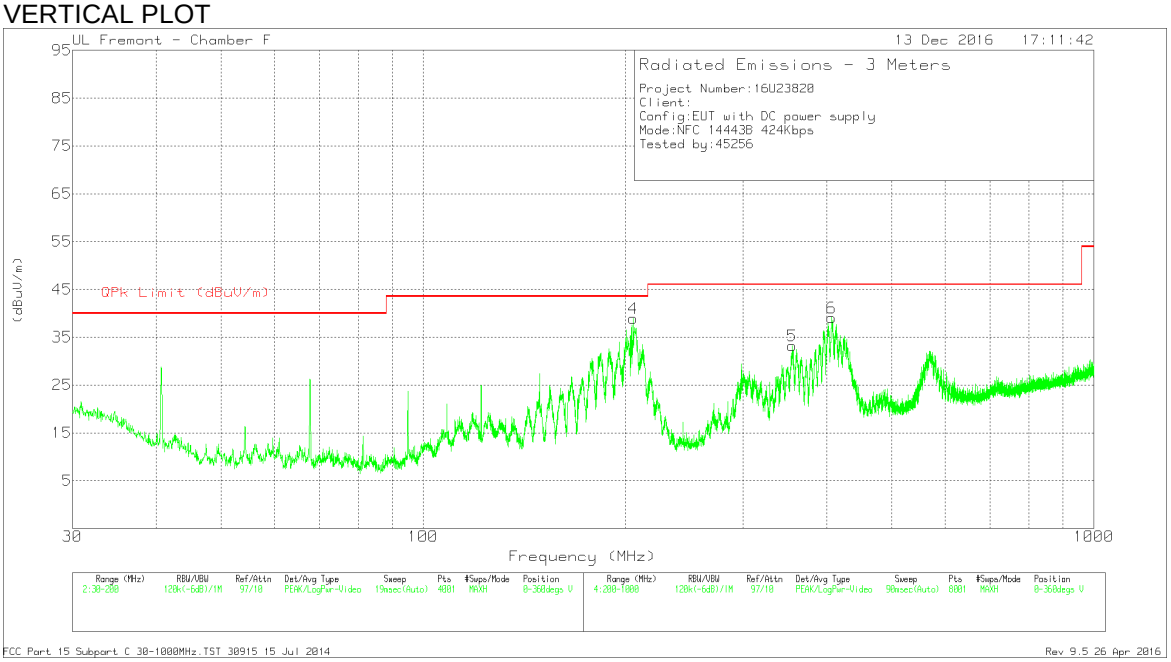
424Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	207.1	53.26	Qp	15	-30.5	37.76	43.52	-5.76	292	132	H
2	360.2	46.61	Pk	18.8	-29.6	35.81	46.02	-10.21	0-360	99	H
3	* 402.2	47.59	Qp	19.7	-29.4	37.89	46.02	-8.13	268	104	H
4	205.9	47.17	Qp	15.2	-30.4	31.97	43.52	-11.55	332	110	V
5	354.9	44.25	Pk	18.5	-29.5	33.25	46.02	-12.77	0-360	97	V
6	* 406.8	48.49	Pk	19.9	-29.3	39.09	46.02	-6.93	0-360	201	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
Qp - Quasi-Peak detector
FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014
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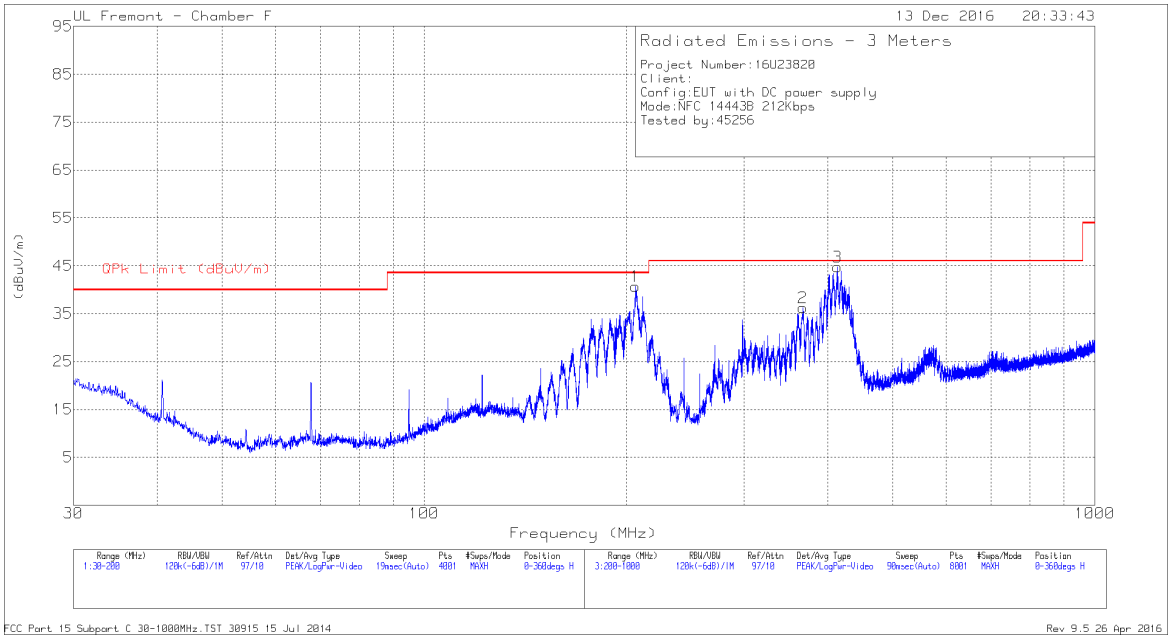
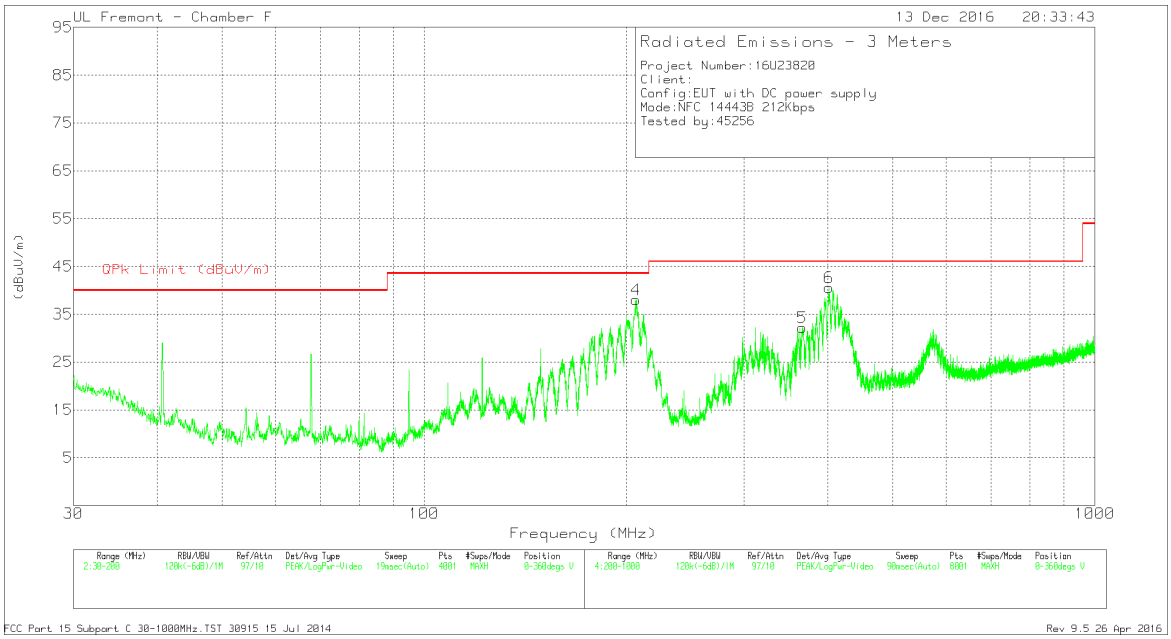
212Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	206.89	52.58	Qp	15	-30.4	37.18	43.52	-6.34	299	150	H
2	367.4	47	Pk	18.9	-29.6	36.3	46.02	-9.72	0-360	100	H
3	413.3	49.73	Qp	20.1	-29.3	40.53	46.02	-5.49	38	100	H
4	206.9	50.18	Qp	15	-30.4	34.78	43.52	-8.74	5	104	V
5	366.1	42.95	Pk	18.9	-29.6	32.25	46.02	-13.77	0-360	94	V
6	* 401.7	47.42	Qp	19.7	-29.4	37.72	46.02	-8.3	12	125	V

Pk - Peak detector

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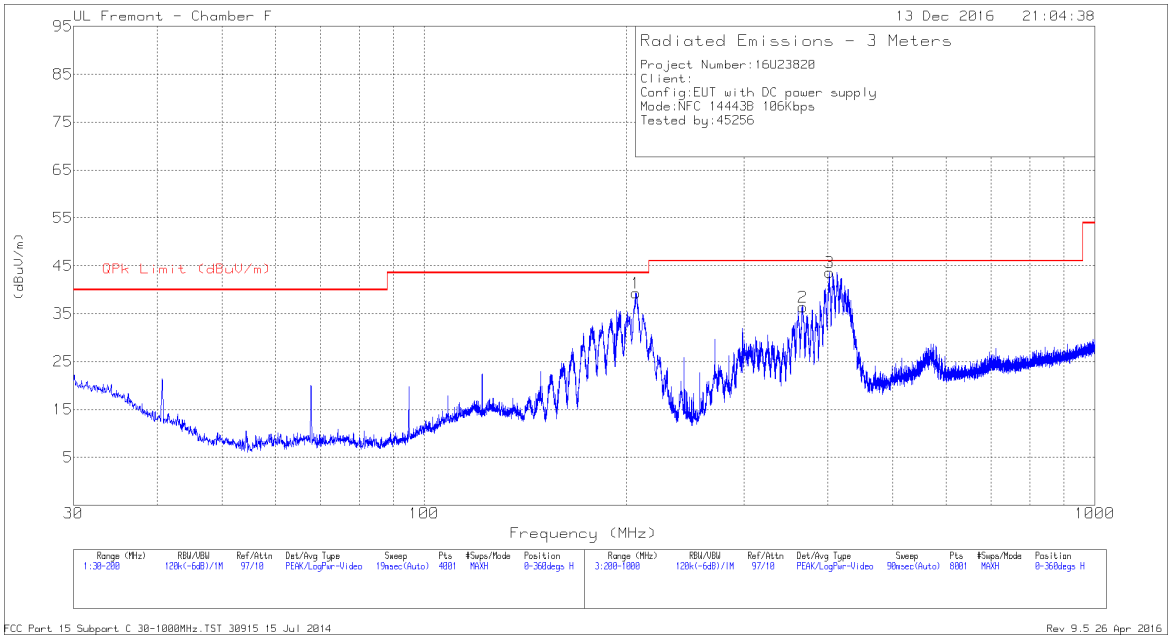
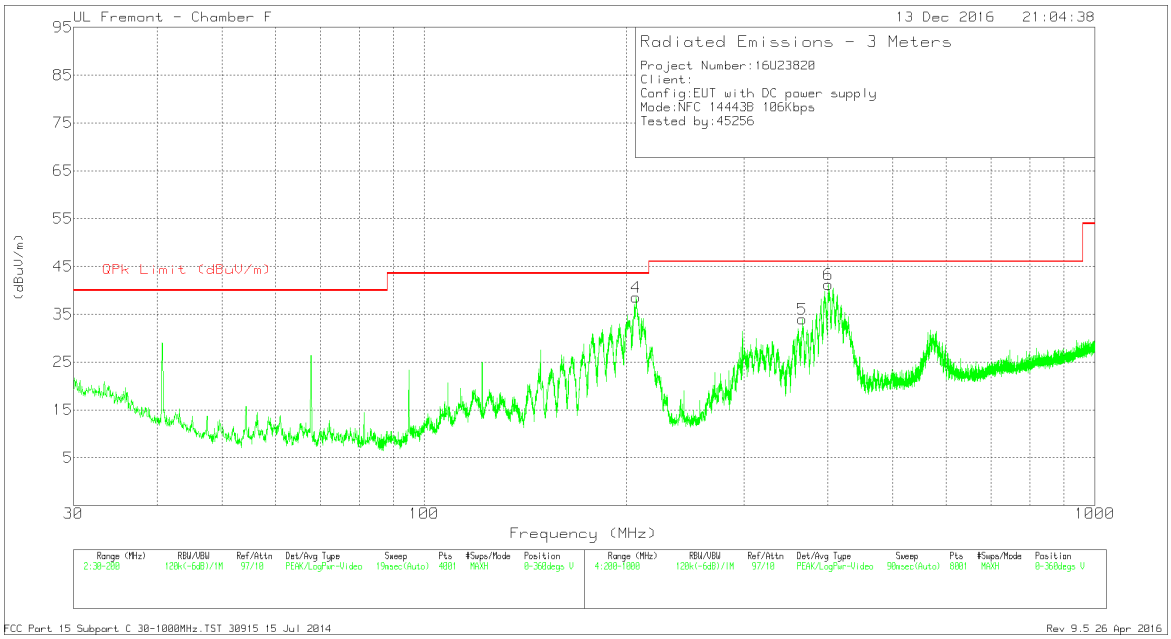
106Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	207.1	53.03	Qp	15	-30.5	37.53	43.52	-5.99	282	143	H
2	366.9	47.04	Pk	18.9	-29.6	36.34	46.02	-9.68	0-360	99	H
3	* 401.8	49.48	Qp	19.7	-29.4	39.78	46.02	-6.24	303	104	H
4	206.9	50.23	Qp	15	-30.5	34.73	43.52	-8.79	349	114	V
5	366.1	44.66	Pk	18.9	-29.6	33.96	46.02	-12.06	0-360	100	V
6	* 400.8	46.5	Qp	19.6	-29.4	36.7	46.02	-9.32	123	191	V

Pk - Peak detector

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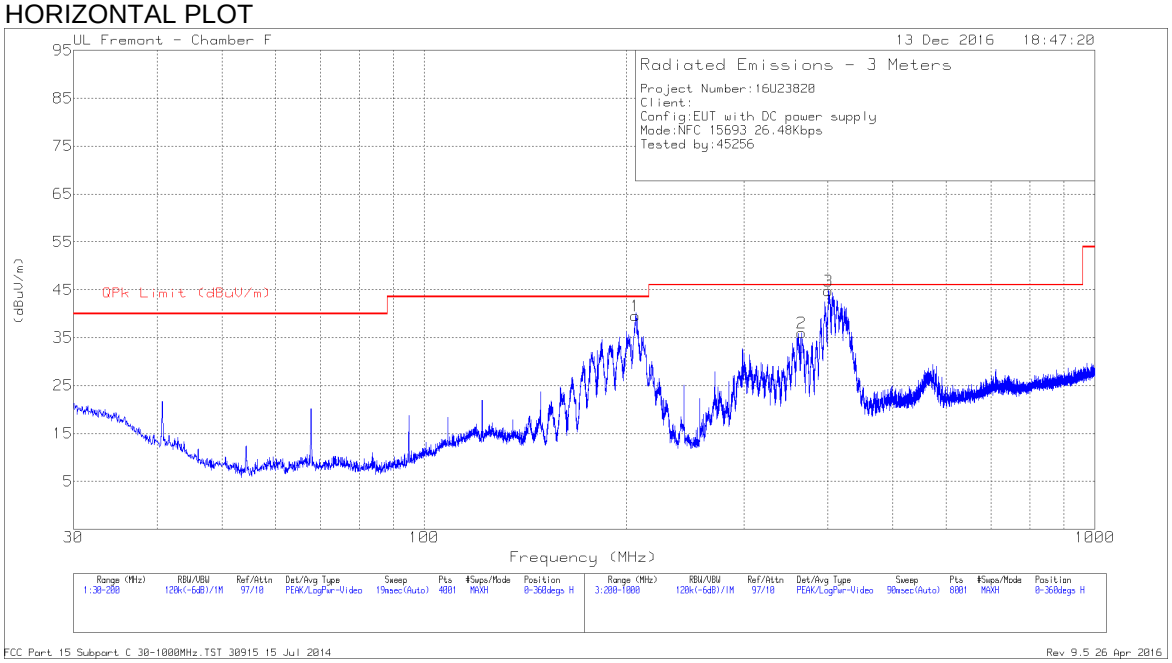
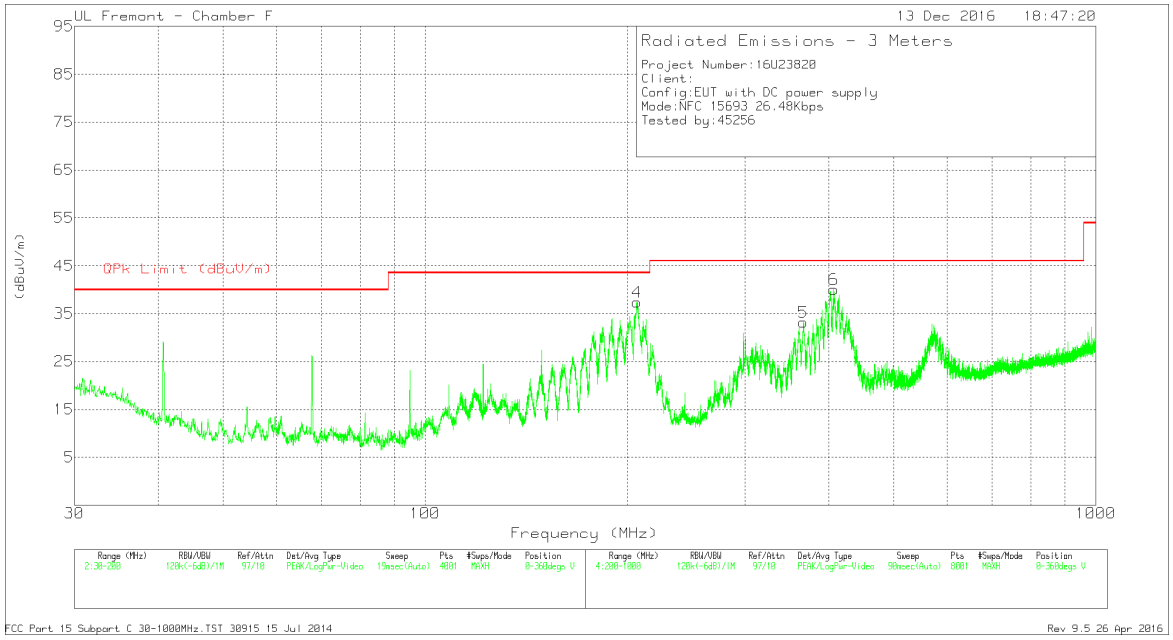
8.3.3. 15693

26.48Kbps

HORIZONTAL PLOT



VERTICAL PLOT



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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
1	206.4	51.64	Qp	15.1	-30.4	36.34	43.52	-7.18	277	173	H
2	365.4	46.65	Pk	18.9	-29.5	36.05	46.02	-9.97	0-360	99	H
3	* 400.9	50.88	Qp	19.6	-29.4	41.08	46.02	-4.94	280	101	H
4	206.9	52.78	Pk	15	-30.4	37.38	43.52	-6.14	0-360	100	V
5	366	43.88	Pk	18.9	-29.6	33.18	46.02	-12.84	0-360	201	V
6	* 406.8	48.43	Qp	19.9	-29.3	39.03	46.02	-6.99	122	153	V

Pk - Peak detector

Qp - Quasi-Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014
Rev 9.5 26 Apr 2016

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9. FREQUENCY STABILITY

LIMIT

§15.225 (e) The frequency tolerance of the carrier signal shall be maintained within ±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.

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

TEST PROCEDURE

ANSI C63.10 Clause 6.8

RESULTS

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9.1. 14443A

ID:	50822	Date:	9/16/16

848kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594299	6.787	13.5594283	6.906	13.5594266	7.031	13.5594247	7.165	± 100
12.00	40	13.5594415	5.929	13.5594410	5.968	13.5594403	6.020	13.5594393	6.088	± 100
12.00	30	13.5594759	3.394	13.5594839	2.804	13.5594748	3.477	13.5594739	3.536	± 100
12.00	***20***	***13.5595219***	***0.000***	***13.5595217***	***0.017***	***13.5595215***	***0.026***	***13.5595215***	***0.032***	***± 100***
12.00	10	13.5595715	-3.659	13.5595726	-3.736	13.5595739	-3.835	13.5595757	-3.968	± 100
12.00	0	13.5595982	-5.629	13.5596044	-6.081	13.5596110	-6.572	13.5596185	-7.123	± 100
12.00	-10	13.5596934	-12.649	13.5596938	-12.673	13.5596944	-12.721	13.5596954	-12.792	± 100
12.00	-20	13.5597154	-14.269	13.5597201	-14.617	13.5597254	-15.010	13.5597254	-15.010	± 100
10.20	20	13.5595214	0.035	13.5595214	0.038	13.5595214	0.040	13.5595213	0.043	± 100
13.8	20	13.5595217	0.017	13.5595220	-0.005	13.5595221	-0.016	13.5595222	-0.021	± 100

424kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594223	7.491	13.5594220	7.509	13.5594217	7.530	13.5594214	7.552	± 100
12.00	40	13.5594681	4.112	13.5594601	4.698	13.5594510	5.372	13.5594557	5.027	± 100
12.00	30	13.5594853	2.841	13.5594839	2.948	13.5594822	3.072	13.5594799	3.239	± 100
12.00	***20***	***13.5595238***	***0.000***	***13.5595239***	***-0.005***	***13.5595240***	***-0.010***	***13.5595241***	***-0.017***	***± 100***
12.00	10	13.5595636	-2.928	13.5595651	-3.042	13.5595672	-3.199	13.5595619	-2.803	± 100
12.00	0	13.5596207	-7.141	13.5596226	-7.281	13.5596250	-7.461	13.5596285	-7.720	± 100
12.00	-10	13.5596893	-12.199	13.5596902	-12.269	13.5596915	-12.363	13.5596932	-12.489	± 100
12.00	-20	13.5597333	-15.448	13.5597346	-15.544	13.5597363	-15.664	13.5597363	-15.664	± 100
10.20	20	13.5595235	0.022	13.5595223	0.116	13.5595228	0.074	13.5595232	0.044	± 100
13.8	20	13.5595233	0.040	13.5595223	0.114	13.5595218	0.152	13.5595214	0.177	± 100

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212kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594213	7.366	13.5594212	7.372	13.5594211	7.379	13.5594210	7.388	± 100
12.00	40	13.5594467	5.493	13.5594455	5.579	13.5594440	5.686	13.5594423	5.818	± 100
12.00	30	13.5594993	1.611	13.5594955	1.889	13.5594913	2.198	13.5594867	2.544	± 100
12.00	***20***	***13.5595211***	***0.000***	***13.5595212***	***-0.004***	***13.5595213***	***-0.008***	***13.5595214***	***-0.017***	***± 100***
12.00	10	13.5595509	-2.194	13.5595535	-2.382	13.5595569	-2.640	13.5595478	-1.968	± 100
12.00	0	13.5596294	-7.985	13.5596305	-8.067	13.5596321	-8.180	13.5596341	-8.333	± 100
12.00	-10	13.5596810	-11.788	13.5596827	-11.913	13.5596849	-12.074	13.5596880	-12.306	± 100
12.00	-20	13.5597395	-16.101	13.5597400	-16.143	13.5597408	-16.201	13.5597420	-16.289	± 100
10.20	20	13.5595211	0.003	13.5595207	0.031	13.5595206	0.043	13.5595205	0.047	± 100
13.8	20	13.5595218	-0.051	13.5595213	-0.011	13.5595211	0.004	13.5595210	0.008	± 100

106kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594209	8.129	13.5594209	8.131	13.5594209	8.135	13.5594208	8.136	± 100
12.00	40	13.5594387	6.818	13.5594386	6.824	13.5594384	6.838	13.5594380	6.868	± 100
12.00	30	13.5594792	3.829	13.5594786	3.875	13.5594777	3.944	13.5594763	4.044	± 100
12.00	***20***	***13.5595312***	***0.000***	***13.5595274***	***0.274***	***13.5595241***	***0.519***	***13.5595214***	***0.719***	***± 100***
12.00	10	13.5595314	-0.017	13.5595351	-0.294	13.5595403	-0.676	13.5595478	-1.230	± 100
12.00	0	13.5596351	-7.666	13.5596358	-7.717	13.5596368	-7.791	13.5596380	-7.879	± 100
12.00	-10	13.5596588	-9.415	13.5596651	-9.878	13.5596716	-10.358	13.5596787	-10.877	± 100
12.00	-20	13.5597433	-15.643	13.5597436	-15.663	13.5597439	-15.689	13.5597444	-15.724	± 100
10.20	20	13.5595312	0.000	13.5595274	0.274	13.5595241	0.519	13.5595214	0.719	± 100
13.8	20	13.5595213	0.729	13.5595220	0.672	13.5595222	0.663	13.5595223	0.657	± 100

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9.2. 14443B

848kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594636	6.685	13.5594551	7.313	13.5594562	7.231	13.5594423	8.252	± 100
12.00	40	13.5594499	7.693	13.5594461	7.975	13.5594540	7.391	13.5594482	7.816	± 100
12.00	30	13.5594744	5.890	13.5594740	5.918	13.5594736	5.948	13.5594730	5.990	± 100
12.00	***20***	***13.5595542***	***0.000***	***13.5595542***	***-0.001***	***13.5595543***	***-0.004***	***13.5595543***	***-0.003***	***± 100***
12.00	10	13.5595362	1.332	13.5595421	0.897	13.5595482	0.441	13.5595548	-0.045	± 100
12.00	0	13.5596313	-5.683	13.5596314	-5.689	13.5596315	-5.698	13.5596318	-5.721	± 100
12.00	-10	13.5596522	-7.228	13.5596577	-7.631	13.5596636	-8.069	13.5596702	-8.551	± 100
12.00	-20	13.5597390	-13.629	13.5597391	-13.632	13.5597392	-13.638	13.5597392	-13.638	± 100
10.20	20	13.5595018	3.869	13.5595035	3.738	13.5595059	3.563	13.5595092	3.321	± 100
13.8	20	13.5595095	3.297	13.5595100	3.265	13.5595110	3.188	13.5595128	3.058	± 100

424kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594387	8.520	13.5594360	8.718	13.5594353	8.774	13.5594328	8.954	± 100
12.00	40	13.5594472	7.891	13.5594462	7.966	13.5594450	8.054	13.5594480	7.839	± 100
12.00	30	13.5594761	5.763	13.5594759	5.776	13.5594756	5.803	13.5594749	5.852	± 100
12.00	***20***	***13.5595543***	***0.000***	***13.5595541***	***0.008***	***13.5595541***	***0.013***	***13.5595541***	***0.009***	***± 100***
12.00	10	13.5595573	-0.226	13.5595590	-0.347	13.5595610	-0.497	13.5595639	-0.709	± 100
12.00	0	13.5596319	-5.724	13.5596315	-5.696	13.5596312	-5.676	13.5596312	-5.677	± 100
12.00	-10	13.5596720	-8.684	13.5596738	-8.816	13.5596761	-8.987	13.5596792	-9.213	± 100
12.00	-20	13.5597377	-13.526	13.5597379	-13.544	13.5597382	-13.566	13.5597385	-13.590	± 100
10.20	20	13.5594825	5.292	13.5594877	4.908	13.5594934	4.488	13.5595000	4.001	± 100
13.8	20	13.5595542	0.004	13.5595543	-0.003	13.5595544	-0.012	13.5595545	-0.020	± 100

212kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594276	9.305	13.5594269	9.356	13.5594260	9.424	13.5594247	9.516	± 100
12.00	40	13.5594467	7.899	13.5594464	7.919	13.5594460	7.949	13.5594454	7.992	± 100
12.00	30	13.5594731	5.951	13.5594749	5.813	13.5594761	5.724	13.5594764	5.704	± 100
12.00	***20***	***13.5595538***	***0.000***	***13.5595538***	***-0.005***	***13.5595540***	***-0.016***	***13.5595541***	***-0.026***	***± 100***
12.00	10	13.5595656	-0.869	13.5595664	-0.930	13.5595676	-1.021	13.5595693	-1.142	± 100
12.00	0	13.5596446	-6.696	13.5596399	-6.350	13.5596356	-6.034	13.5596328	-5.828	± 100
12.00	-10	13.5596830	-9.528	13.5596837	-9.578	13.5596846	-9.649	13.5596860	-9.751	± 100
12.00	-20	13.5597345	-13.330	13.5597350	-13.364	13.5597357	-13.414	13.5597366	-13.480	± 100
10.20	20	13.5595544	-0.048	13.5595543	-0.036	13.5595541	-0.022	13.5595540	-0.016	± 100
13.8	20	13.5595540	-0.019	13.5595540	-0.019	13.5595540	-0.016	13.5595540	-0.015	± 100

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106kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594237	9.525	13.5594234	9.551	13.5594230	9.581	13.5594224	9.622	± 100
12.00	40	13.5594366	8.573	13.5594373	8.523	13.5594381	8.465	13.5594392	8.387	± 100
12.00	30	13.5594594	6.896	13.5594519	7.448	13.5594483	7.710	13.5594551	7.212	± 100
12.00	***20***	***13.5595529***	***0.000***	***13.5595531***	***-0.014***	***13.5595533***	***-0.031***	***13.5595536***	***-0.054***	***± 100***
12.00	10	13.5595700	-1.261	13.5595707	-1.309	13.5595715	-1.368	13.5595725	-1.447	± 100
12.00	0	13.5596175	-4.760	13.5596191	-4.881	13.5596212	-5.038	13.5596241	-5.249	± 100
12.00	-10	13.5596880	-9.963	13.5596883	-9.982	13.5596887	-10.016	13.5596892	-10.053	± 100
12.00	-20	13.5597282	-12.929	13.5597293	-13.007	13.5597306	-13.106	13.5597325	-13.246	± 100
10.20	20	13.5595549	-0.150	13.5595549	-0.145	13.5595547	-0.136	13.5595547	-0.133	± 100
13.8	20	13.5595548	-0.137	13.5595548	-0.142	13.5595550	-0.152	13.5595550	-0.153	± 100

9.3. 15693

26.48kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
12.00	50	13.5594222	9.745	13.5594220	9.759	13.5594218	9.777	13.5594224	9.730	± 100
12.00	40	13.5594275	9.353	13.5594297	9.195	13.5594320	9.020	13.5594347	8.824	± 100
12.00	30	13.5594570	7.179	13.5594581	7.098	13.5594595	6.994	13.5594614	6.853	± 100
12.00	***20***	***13.5595544***	***0.000***	***13.5595544***	***-0.002***	***13.5595544***	***-0.002***	***13.5595544***	***-0.002***	***± 100***
12.00	10	13.5595730	-1.374	13.5595732	-1.393	13.5595737	-1.424	13.5595742	-1.461	± 100
12.00	0	13.5595939	-2.914	13.5596000	-3.364	13.5596066	-3.850	13.5596136	-4.372	± 100
12.00	-10	13.5596902	-10.020	13.5596903	-10.025	13.5596904	-10.034	13.5596906	-10.051	± 100
12.00	-20	13.5597086	-11.376	13.5597134	-11.727	13.5597183	-12.092	13.5597236	-12.478	± 100
10.20	20	13.5595546	-0.014	13.5595547	-0.025	13.5595549	-0.038	13.5595549	-0.042	± 100
13.8	20	13.5595547	-0.024	13.5595545	-0.010	13.5595544	0.000	13.5595543	0.006	± 100

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10. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207

(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 50µH/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 (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
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:

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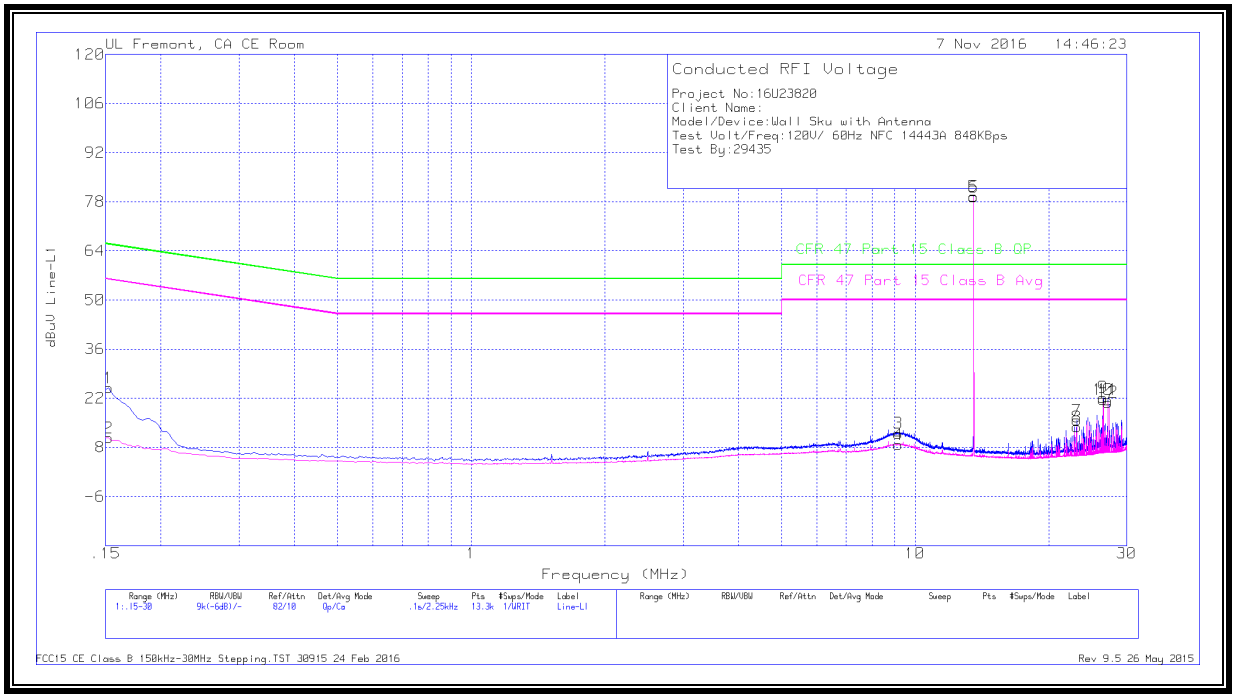
10.1. 14443A

NORMAL OPERATION, 848 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	14.73	Qp	.1	0	10.1	24.93	65.88	-40.95	-	-
2	.15225	.57	Ca	.1	0	10.1	10.77	-	-	55.88	-45.11
3	9.17475	1.62	Qp	0	.2	10.2	12.02	60	-47.98	-	-
4	9.17813	-1.56	Ca	0	.2	10.2	8.84	-	-	50	-41.16
5	13.56	68.97	Qp	.1	.2	10.2	79.47	**60**	**19.47**	-	-
6	13.56	68.95	Ca	.1	.2	10.2	79.45	-	-	**50**	**29.45**
7	23.1315	5.03	Qp	.1	.2	10.4	15.73	60	-44.27	-	-
8	23.1315	3.16	Ca	.1	.2	10.4	13.86	-	-	50	-36.14
9	26.49075	11.37	Qp	.1	.3	10.5	22.27	60	-37.73	-	-
10	26.49075	10.72	Ca	.1	.3	10.5	21.62	-	-	50	-28.38
11	27.16125	10.68	Qp	.1	.3	10.5	21.58	60	-38.42	-	-
12	27.1635	9.98	Ca	.1	.3	10.5	20.88	-	-	50	-29.12

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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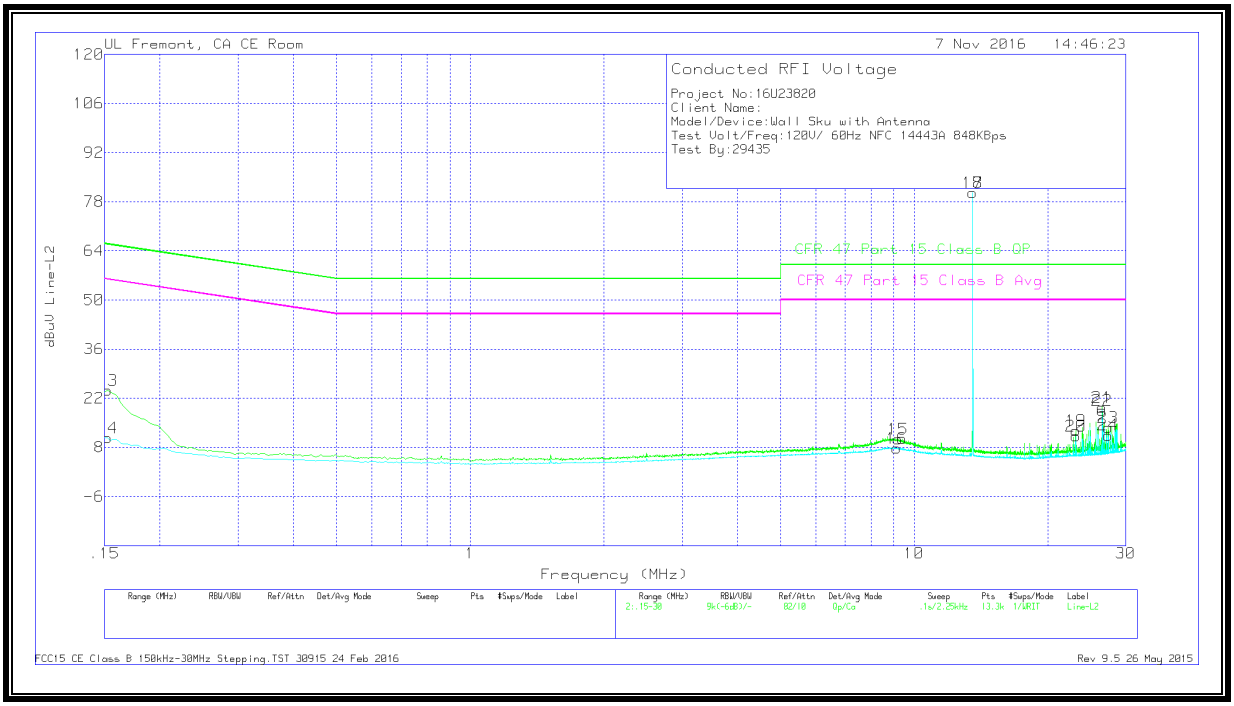
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	14.22	Qp	0	0	10.1	24.32	65.88	-41.56	-	-
14	.15225	.69	Ca	0	0	10.1	10.79	-	-	55.88	-45.09
15	9.195	-.05	Qp	0	.2	10.2	10.35	60	-49.65	-	-
16	9.1455	-2.63	Ca	0	.2	10.2	7.77	-	-	50	-42.23
17	13.56	70.1	Qp	.1	.2	10.2	80.6	**60**	**20.6**	-	-
18	13.56	70.08	Ca	.1	.2	10.2	80.58	-	-	**50**	**30.58**
19	23.1315	2.17	Qp	.1	.2	10.4	12.87	60	-47.13	-	-
20	23.1315	.49	Ca	.1	.2	10.4	11.19	-	-	50	-38.81
21	26.49075	8.43	Qp	.1	.3	10.5	19.33	60	-40.67	-	-
22	26.49075	7.58	Ca	.1	.3	10.5	18.48	-	-	50	-31.52
23	27.3435	2.82	Qp	.1	.3	10.5	13.72	60	-46.28	-	-
24	27.34575	.6	Ca	.1	.3	10.5	11.5	-	-	50	-38.5

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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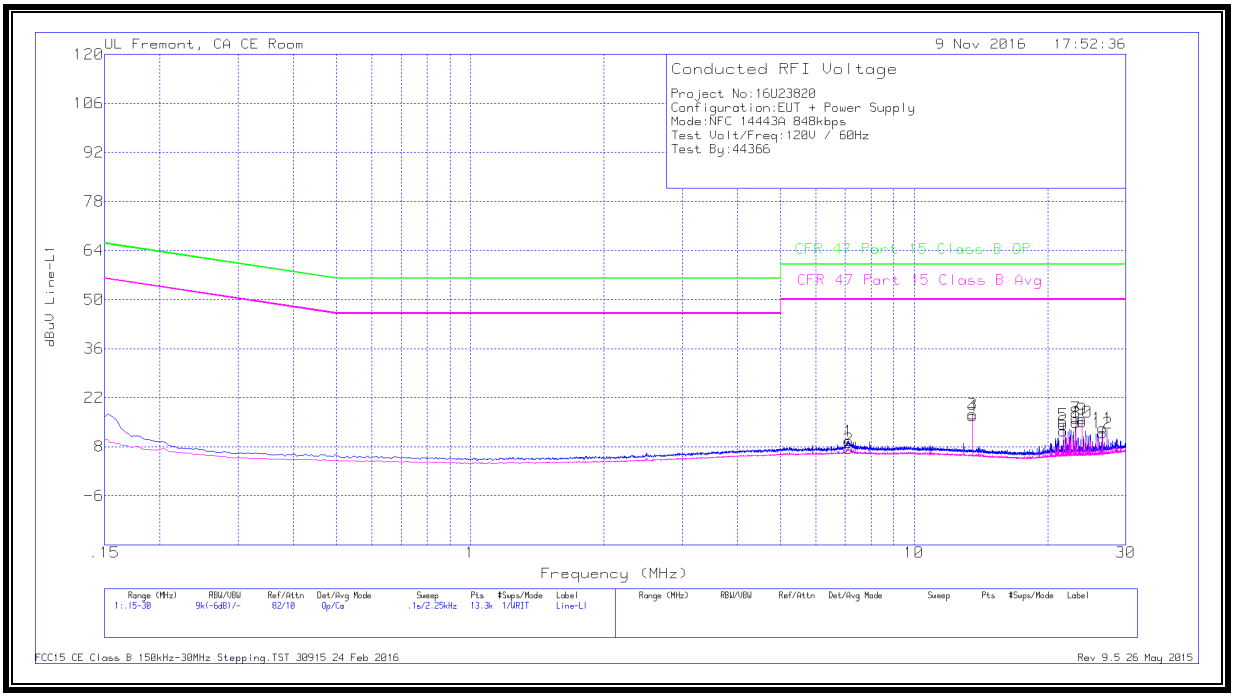
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 848 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	7.11375	-.59	Qp	0	.1	10.2	9.71	60	-50.29	-	-
2	7.116	-2.82	Ca	0	.1	10.2	7.48	-	-	50	-42.52
3	13.56	6.75	Qp	.1	.2	10.2	17.25	60	-42.75	-	-
4	13.56	6.26	Ca	.1	.2	10.2	16.76	-	-	50	-33.24
5	21.6645	3.78	Qp	0	.2	10.4	14.38	60	-45.62	-	-
6	21.66675	1.88	Ca	0	.2	10.4	12.48	-	-	50	-37.52
7	23.1315	5.49	Qp	.1	.2	10.4	16.19	60	-43.81	-	-
8	23.1315	4.2	Ca	.1	.2	10.4	14.9	-	-	50	-35.1
9	23.919	5.18	Qp	.1	.2	10.4	15.88	60	-44.12	-	-
10	23.919	4.38	Ca	.1	.2	10.4	15.08	-	-	50	-34.92
11	26.6235	2.35	Qp	.1	.3	10.5	13.25	60	-46.75	-	-
12	26.6235	1.04	Ca	.1	.3	10.5	11.94	-	-	50	-38.06

Qp - Quasi-Peak detector

Ca - CISPR average detection

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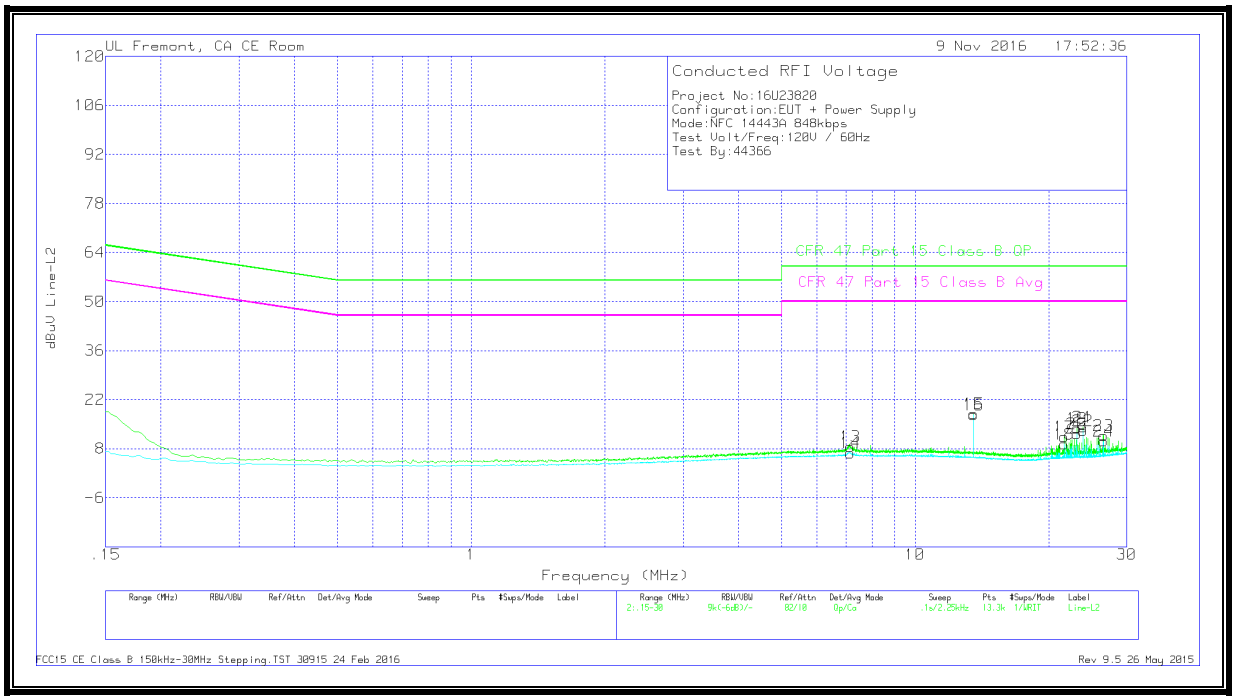
LINE 2 RESULTS



WORST EMISSIONS

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	7.14075	-1.61	Qp	0	.1	10.2	8.69	60	-51.31	-	-
14	7.14525	-3.49	Ca	0	.1	10.2	6.81	-	-	50	-43.19
15	13.56	7.52	Qp	.1	.2	10.2	18.02	60	-41.98	-	-
16	13.56	7.09	Ca	.1	.2	10.2	17.59	-	-	50	-32.41
17	21.6645	.8	Qp	0	.2	10.4	11.4	60	-48.6	-	-
18	21.66675	-1.28	Ca	0	.2	10.4	9.32	-	-	50	-40.68
19	23.1315	3.16	Qp	.1	.2	10.4	13.86	60	-46.14	-	-
20	23.1315	1.53	Ca	.1	.2	10.4	12.23	-	-	50	-37.77
21	23.919	3.47	Qp	.1	.2	10.4	14.17	60	-45.83	-	-
22	23.919	2.39	Ca	.1	.2	10.4	13.09	-	-	50	-36.91
23	26.6235	.82	Qp	.1	.3	10.5	11.72	60	-48.28	-	-
24	26.6235	-.69	Ca	.1	.3	10.5	10.21	-	-	50	-39.79

Qp - Quasi-Peak detector

Ca - CISPR average detection

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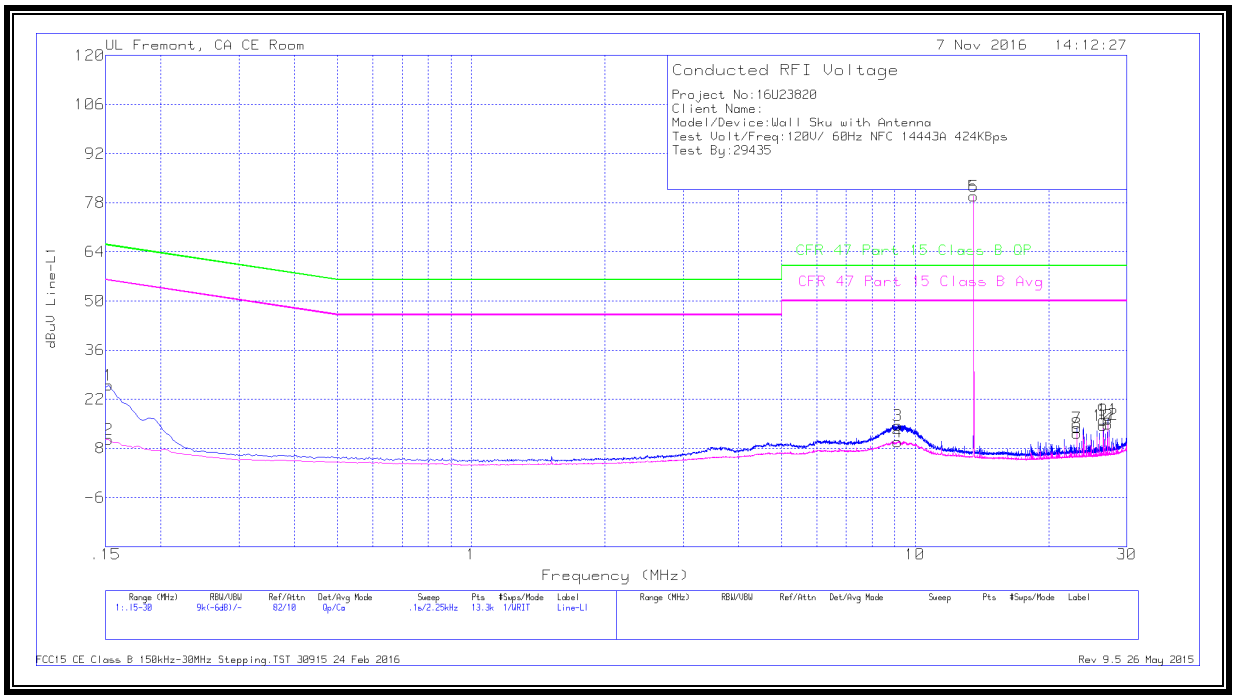
NORMAL OPERATION, 424 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	15.79	Qp	.1	0	10.1	25.99	65.88	-39.89	-	-
2	.15225	.42	Ca	.1	0	10.1	10.62	-	-	55.88	-45.26
3	9.12975	4.07	Qp	0	.2	10.2	14.47	60	-45.53	-	-
4	9.13313	-.53	Ca	0	.2	10.2	9.87	-	-	50	-40.13
5	13.56	69.38	Qp	.1	.2	10.2	79.88			-	-
6	13.56	69.37	Ca	.1	.2	10.2	79.87	-	-		
7	23.1315	3.07	Qp	.1	.2	10.4	13.77	60	-46.23	-	-
8	23.1315	1.58	Ca	.1	.2	10.4	12.28	-	-	50	-37.72
9	26.5515	5.12	Qp	.1	.3	10.5	16.02	60	-43.98	-	-
10	26.5515	3.67	Ca	.1	.3	10.5	14.57	-	-	50	-35.43
11	27.16125	5.45	Qp	.1	.3	10.5	16.35	60	-43.65	-	-
12	27.1635	3.99	Ca	.1	.3	10.5	14.89	-	-	50	-35.11

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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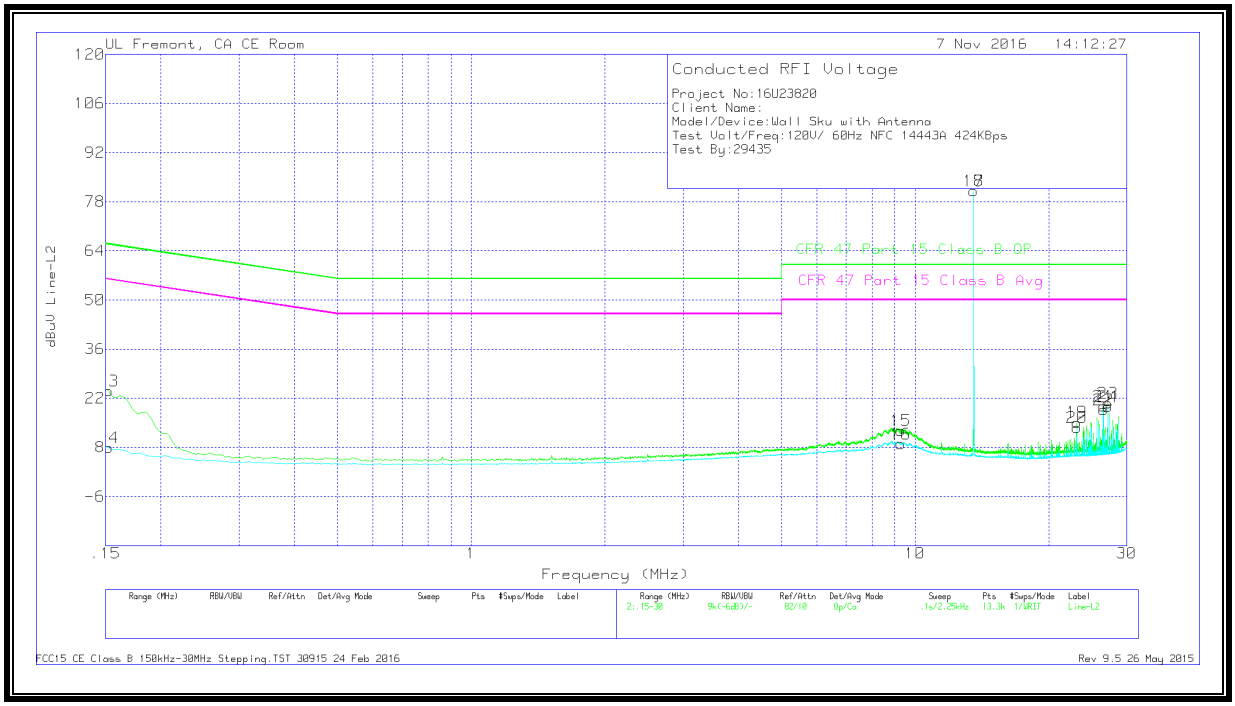
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	13.98	Qp	0	0	10.1	24.08	65.88	-41.8	-	-
14	.15225	-2.1	Ca	0	0	10.1	8	-	-	55.88	-47.88
15	9.2715	2.58	Qp	0	.1	10.2	12.88	60	-47.12	-	-
16	9.2715	-1.36	Ca	0	.1	10.2	8.94	-	-	50	-41.06
17	13.56	70.57	Qp	.1	.2	10.2	81.07			-	-
18	13.56	70.55	Ca	.1	.2	10.2	81.05	-	-		
19	23.1315	4.45	Qp	.1	.2	10.4	15.15	60	-44.85	-	-
20	23.1315	3.04	Ca	.1	.2	10.4	13.74	-	-	50	-36.26
21	26.61225	8.89	Qp	.1	.3	10.5	19.79	60	-40.21	-	-
22	26.61225	7.8	Ca	.1	.3	10.5	18.7	-	-	50	-31.3
23	27.16125	9.75	Qp	.1	.3	10.5	20.65	60	-39.35	-	-
24	27.1635	8.69	Ca	.1	.3	10.5	19.59	-	-	50	-30.41

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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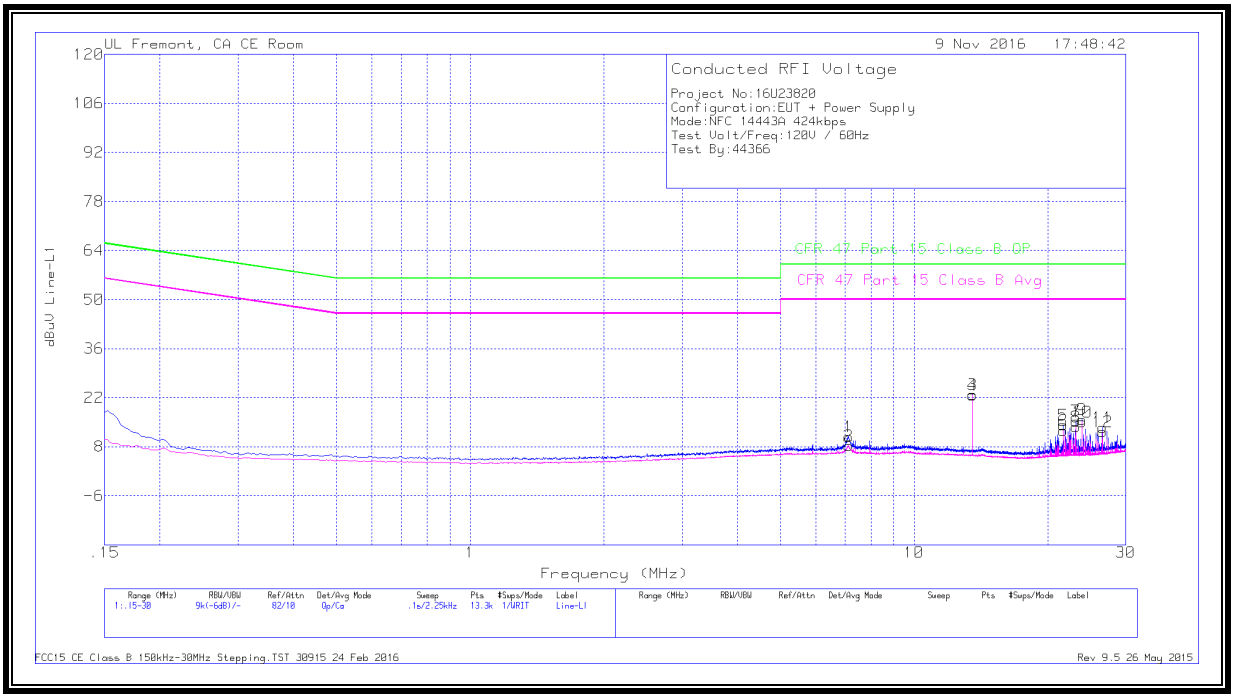
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 424 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	7.11375	.65	Qp	0	.1	10.2	10.95	60	-49.05	-	-
2	7.116	-1.98	Ca	0	.1	10.2	8.32	-	-	50	-41.68
3	13.56	12.36	Qp	.1	.2	10.2	22.86	60	-37.14	-	-
4	13.56	12.27	Ca	.1	.2	10.2	22.77	-	-	50	-27.23
5	21.6645	3.67	Qp	0	.2	10.4	14.27	60	-45.73	-	-
6	21.66675	2.03	Ca	0	.2	10.4	12.63	-	-	50	-37.37
7	23.1315	4.62	Qp	.1	.2	10.4	15.32	60	-44.68	-	-
8	23.1315	2.99	Ca	.1	.2	10.4	13.69	-	-	50	-36.31
9	23.919	5.13	Qp	.1	.2	10.4	15.83	60	-44.17	-	-
10	23.919	4.34	Ca	.1	.2	10.4	15.04	-	-	50	-34.96
11	26.6235	2.57	Qp	.1	.3	10.5	13.47	60	-46.53	-	-
12	26.6235	1.31	Ca	.1	.3	10.5	12.21	-	-	50	-37.79

Qp - Quasi-Peak detector

Ca - CISPR average detection

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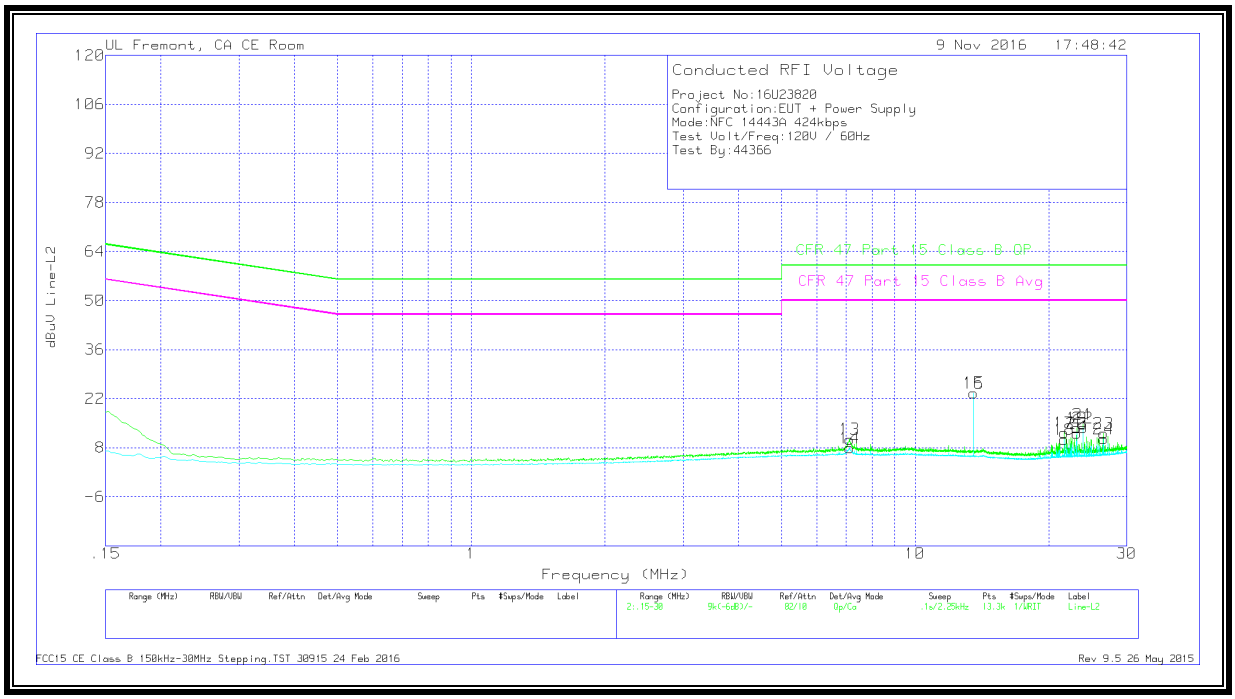
LINE 2 RESULTS



WORST EMISSIONS

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	7.116	.15	Qp	0	.1	10.2	10.45	60	-49.55	-	-
14	7.116	-2.42	Ca	0	.1	10.2	7.88	-	-	50	-42.12
15	13.56	13.16	Qp	.1	.2	10.2	23.66	60	-36.34	-	-
16	13.56	13.13	Ca	.1	.2	10.2	23.63	-	-	50	-26.37
17	21.6645	1.68	Qp	0	.2	10.4	12.28	60	-47.72	-	-
18	21.66675	-.26	Ca	0	.2	10.4	10.34	-	-	50	-39.66
19	23.1315	2.95	Qp	.1	.2	10.4	13.65	60	-46.35	-	-
20	23.1315	1.42	Ca	.1	.2	10.4	12.12	-	-	50	-37.88
21	23.919	3.96	Qp	.1	.2	10.4	14.66	60	-45.34	-	-
22	23.919	2.94	Ca	.1	.2	10.4	13.64	-	-	50	-36.36
23	26.6235	1.17	Qp	.1	.3	10.5	12.07	60	-47.93	-	-
24	26.6235	-.35	Ca	.1	.3	10.5	10.55	-	-	50	-39.45

Qp - Quasi-Peak detector

Ca - CISPR average detection

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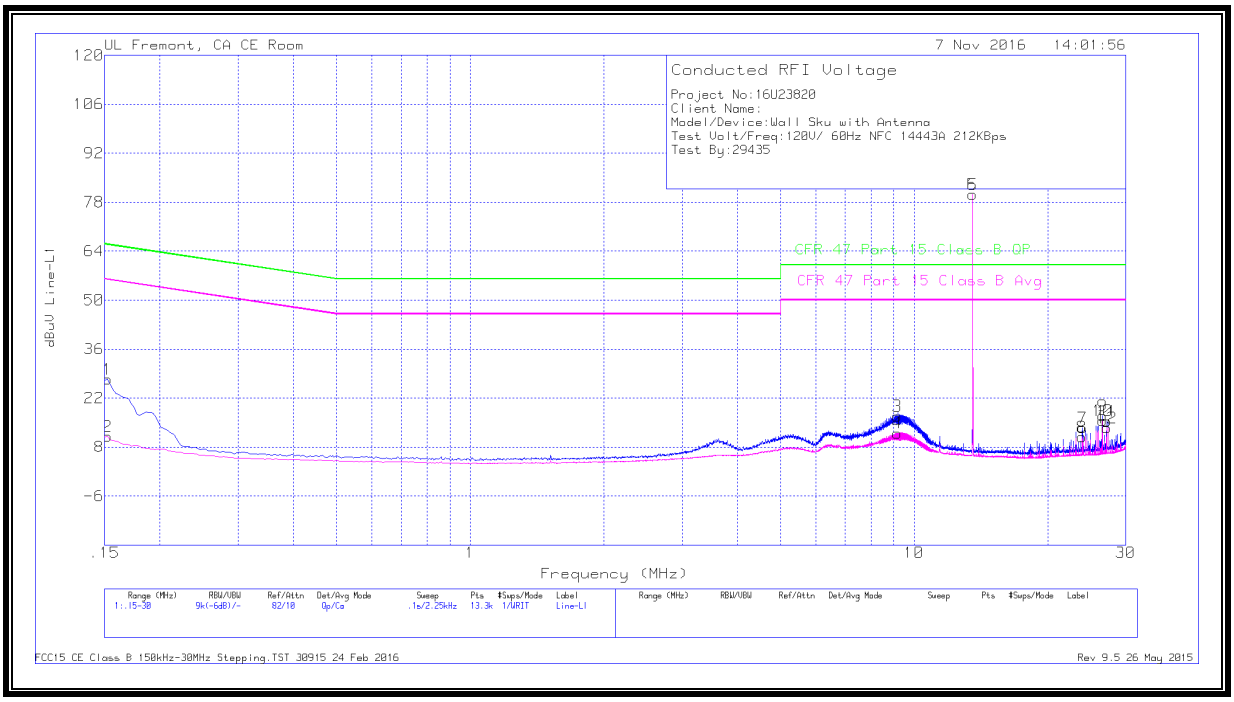
NORMAL OPERATION, 212 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	17.26	Qp	.1	0	10.1	27.46	65.88	-38.42	-	-
2	.15225	.79	Ca	.1	0	10.1	10.99	-	-	55.88	-44.89
3	9.159	6.48	Qp	0	.2	10.2	16.88	60	-43.12	-	-
4	9.159	1.62	Ca	0	.2	10.2	12.02	-	-	50	-37.98
5	13.56	69.7	Qp	.1	.2	10.2	80.2			-	-
6	13.56	69.69	Ca	.1	.2	10.2	80.19	-	-		
7	24	2.73	Qp	.1	.2	10.5	13.53	60	-46.47	-	-
8	23.92125	.15	Ca	.1	.2	10.4	10.85	-	-	50	-39.15
9	26.61225	6.02	Qp	.1	.3	10.5	16.92	60	-43.08	-	-
10	26.61225	4.7	Ca	.1	.3	10.5	15.6	-	-	50	-34.4
11	27.16125	4.53	Qp	.1	.3	10.5	15.43	60	-44.57	-	-
12	27.1635	2.62	Ca	.1	.3	10.5	13.52	-	-	50	-36.48

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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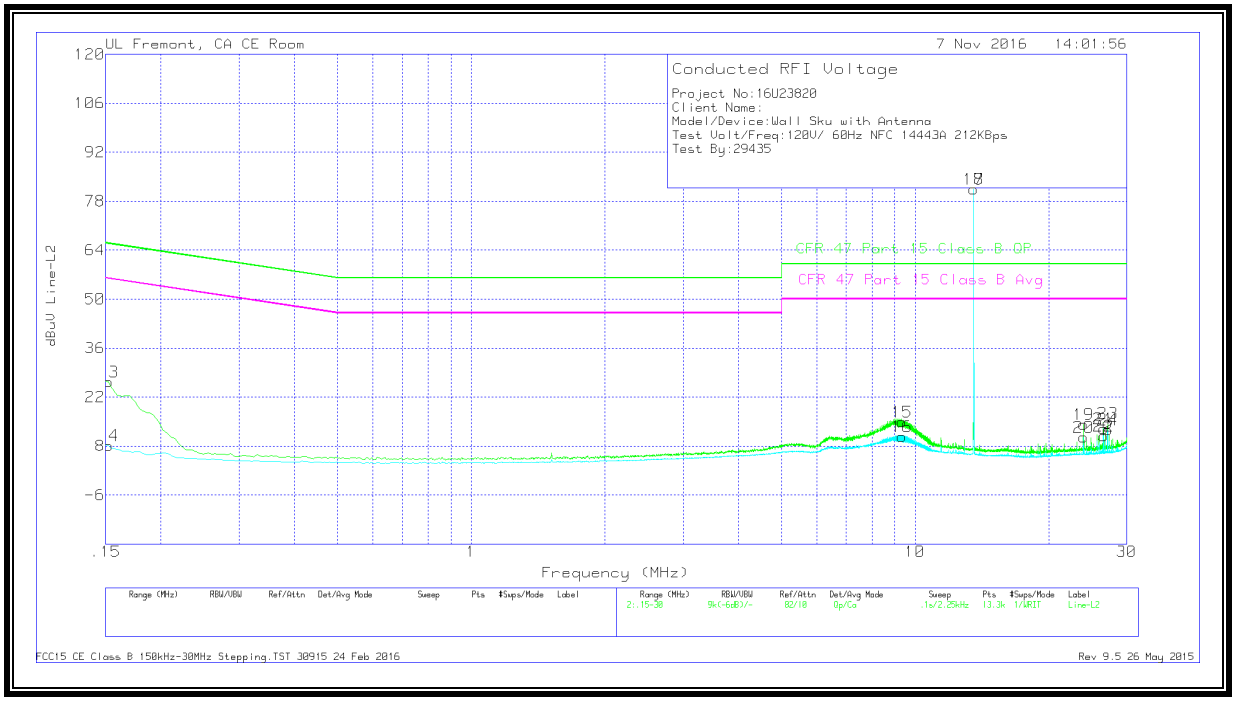
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	16.24	Qp	0	0	10.1	26.34	65.88	-39.54	-	-
14	.15225	-1.91	Ca	0	0	10.1	8.19	-	-	55.88	-47.69
15	9.33	4.57	Qp	0	.1	10.2	14.87	60	-45.13	-	-
16	9.3525	.45	Ca	0	.1	10.2	10.75	-	-	50	-39.25
17	13.56	70.9	Qp	.1	.2	10.2	81.4			-	-
18	13.56	70.88	Ca	.1	.2	10.2	81.38	-	-		
19	24	3.32	Qp	.1	.2	10.5	14.12	60	-45.88	-	-
20	24	-.27	Ca	.1	.2	10.5	10.53	-	-	50	-39.47
21	26.61225	2.02	Qp	.1	.3	10.5	12.92	60	-47.08	-	-
22	26.61225	.03	Ca	.1	.3	10.5	10.93	-	-	50	-39.07
23	27.16125	3.67	Qp	.1	.3	10.5	14.57	60	-45.43	-	-
24	27.1635	1.81	Ca	.1	.3	10.5	12.71	-	-	50	-37.29

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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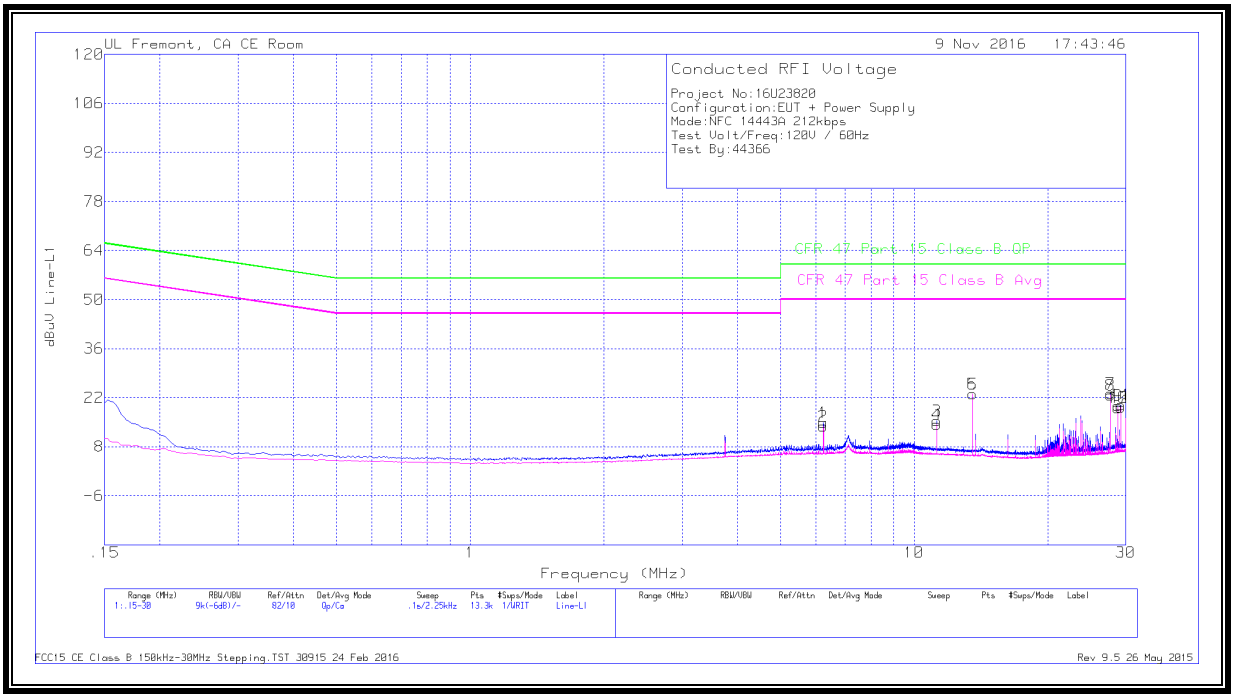
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 212 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	6.24975	4.52	Qp	0	.1	10.2	14.82	60	-45.18	-	-
2	6.24975	3.55	Ca	0	.1	10.2	13.85	-	-	50	-36.15
3	11.24925	5	Qp	0	.2	10.2	15.4	60	-44.6	-	-
4	11.24925	3.97	Ca	0	.2	10.2	14.37	-	-	50	-35.63
5	13.56	12.55	Qp	.1	.2	10.2	23.05	60	-36.95	-	-
6	13.56	12.5	Ca	.1	.2	10.2	23	-	-	50	-27
7	27.69225	12.3	Qp	.1	.3	10.5	23.2	60	-36.8	-	-
8	27.69225	11.75	Ca	.1	.3	10.5	22.65	-	-	50	-27.35
9	28.74975	9.03	Qp	.1	.3	10.4	19.83	60	-40.17	-	-
10	28.74975	8.35	Ca	.1	.3	10.4	19.15	-	-	50	-30.85
11	29.23125	9.16	Qp	.1	.3	10.4	19.96	60	-40.04	-	-
12	29.23125	8.36	Ca	.1	.3	10.4	19.16	-	-	50	-30.84

Qp - Quasi-Peak detector

Ca - CISPR average detection

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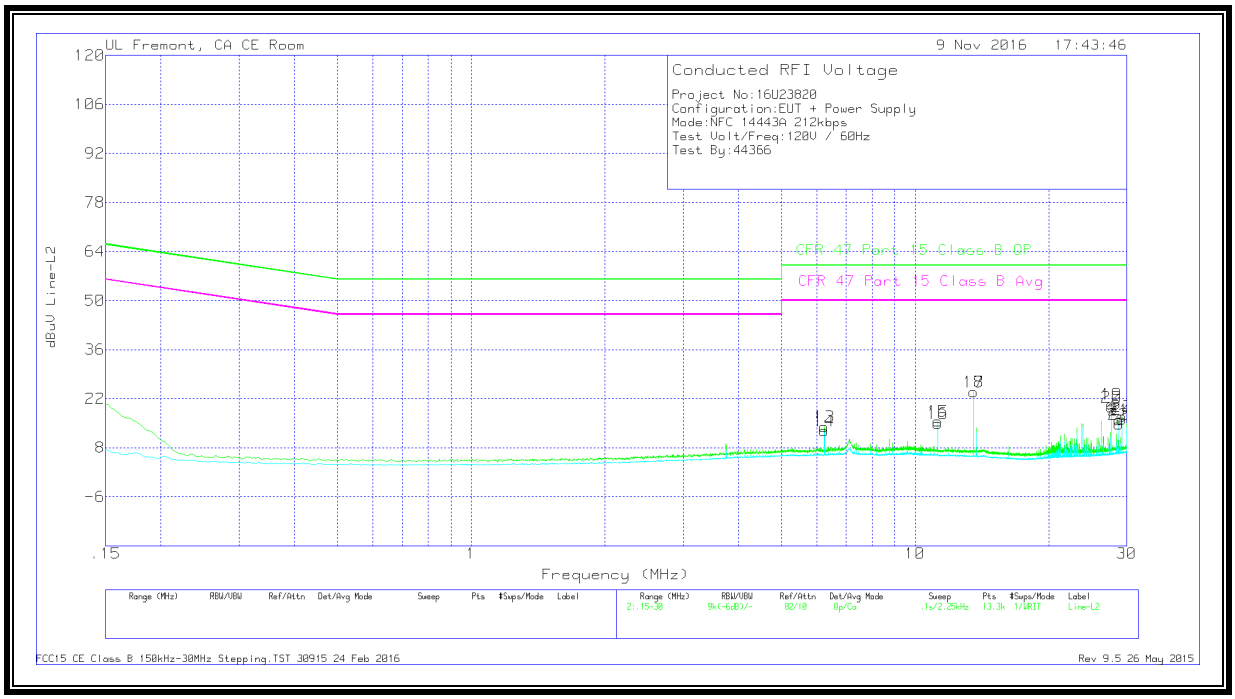
LINE 2 RESULTS



WORST EMISSIONS

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	6.24975	3.66	Qp	0	.1	10.2	13.96	60	-46.04	-	-
14	6.24975	2.48	Ca	0	.1	10.2	12.78	-	-	50	-37.22
15	11.24925	5.18	Qp	0	.2	10.2	15.58	60	-44.42	-	-
16	11.24925	4.42	Ca	0	.2	10.2	14.82	-	-	50	-35.18
17	13.56	13.36	Qp	.1	.2	10.2	23.86	60	-36.14	-	-
18	13.56	13.36	Ca	.1	.2	10.2	23.86	-	-	50	-26.14
19	27.69225	9.49	Qp	.1	.3	10.5	20.39	60	-39.61	-	-
20	27.69225	8.75	Ca	.1	.3	10.5	19.65	-	-	50	-30.35
21	28.74975	5.06	Qp	.1	.3	10.4	15.86	60	-44.14	-	-
22	28.74975	3.92	Ca	.1	.3	10.4	14.72	-	-	50	-35.28
23	29.23125	6.24	Qp	.1	.3	10.4	17.04	60	-42.96	-	-
24	29.23125	5.23	Ca	.1	.3	10.4	16.03	-	-	50	-33.97

Qp - Quasi-Peak detector

Ca - CISPR average detection

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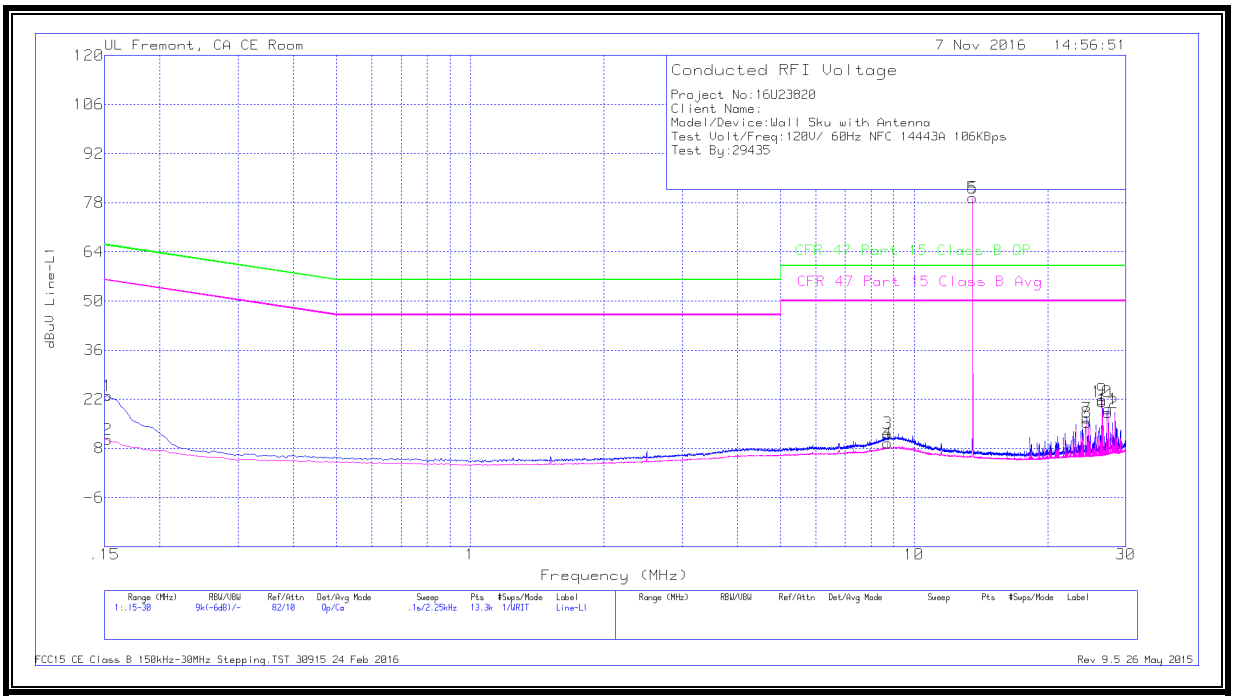
NORMAL OPERATION, 106 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	12.83	Qp	.1	0	10.1	23.03	65.88	-42.85	-	-
2	.15225	.4	Ca	.1	0	10.1	10.6	-	-	55.88	-45.28
3	8.718	2.06	Qp	0	.1	10.2	12.36	60	-47.64	-	-
4	8.718	-.87	Ca	0	.1	10.2	9.43	-	-	50	-40.57
5	13.56	68.96	Qp	.1	.2	10.2	79.46			-	-
6	13.56	68.94	Ca	.1	.2	10.2	79.44	-	-		
7	24.5355	5.8	Qp	.1	.2	10.5	16.6	60	-43.4	-	-
8	24.5355	4.67	Ca	.1	.2	10.5	15.47	-	-	50	-34.53
9	26.49075	11.02	Qp	.1	.3	10.5	21.92	60	-38.08	-	-
10	26.49075	10.37	Ca	.1	.3	10.5	21.27	-	-	50	-28.73
11	27.34575	8.39	Qp	.1	.3	10.5	19.29	60	-40.71	-	-
12	27.34575	7.28	Ca	.1	.3	10.5	18.18	-	-	50	-31.82

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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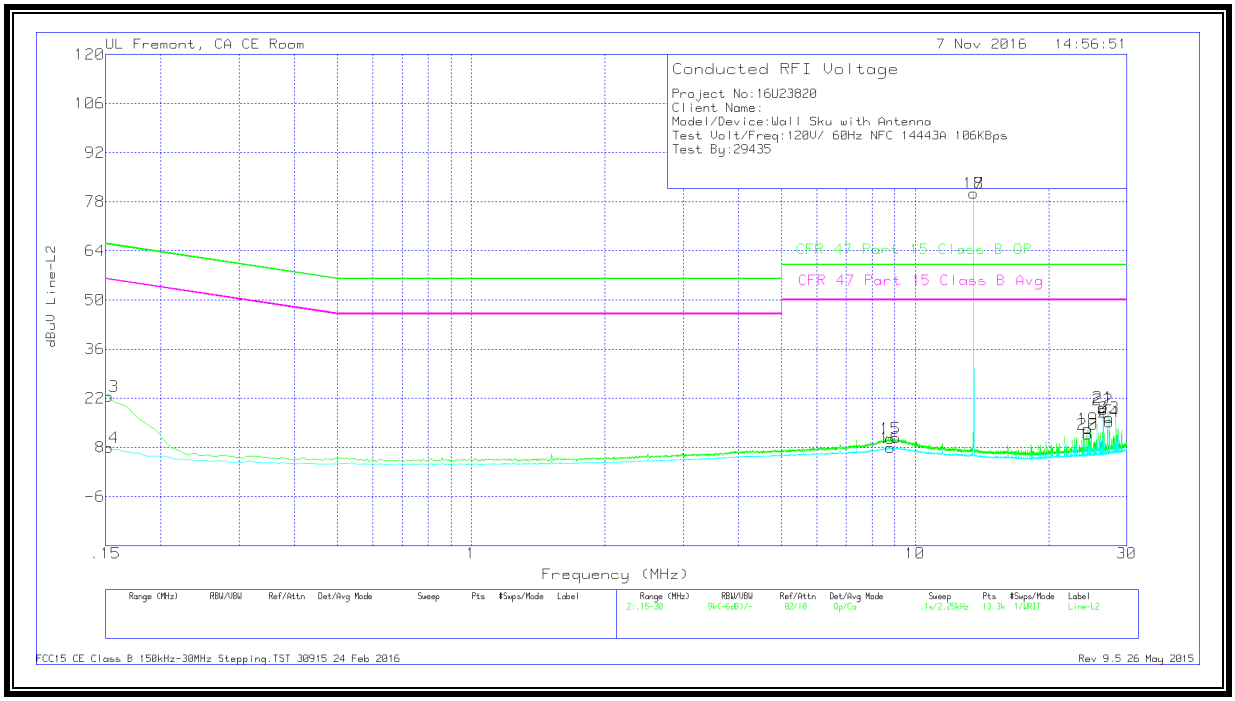
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	12.42	Qp	0	0	10.1	22.52	65.88	-43.36	-	-
14	.15225	-2.11	Ca	0	0	10.1	7.99	-	-	55.88	-47.89
15	8.81025	.21	Qp	0	.1	10.2	10.51	60	-49.49	-	-
16	8.81025	-2.43	Ca	0	.1	10.2	7.87	-	-	50	-42.13
17	13.56	69.99	Qp	.1	.2	10.2	80.49			-	-
18	13.56	69.97	Ca	.1	.2	10.2	80.47	-	-		
19	24.5355	2.46	Qp	.1	.3	10.5	13.36	60	-46.64	-	-
20	24.5355	.84	Ca	.1	.3	10.5	11.74	-	-	50	-38.26
21	26.5515	8.51	Qp	.1	.3	10.5	19.41	60	-40.59	-	-
22	26.5515	7.78	Ca	.1	.3	10.5	18.68	-	-	50	-31.32
23	27.34575	5.61	Qp	.1	.3	10.5	16.51	60	-43.49	-	-
24	27.34575	4.3	Ca	.1	.3	10.5	15.2	-	-	50	-34.8

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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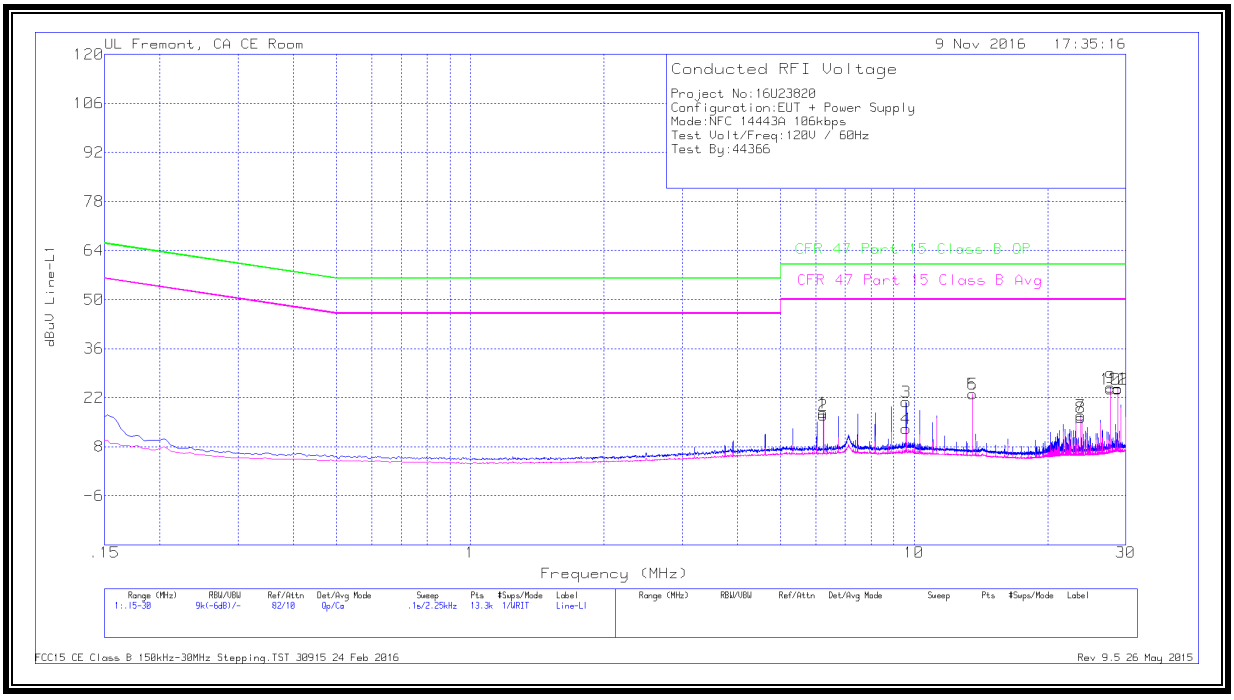
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 106 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	6.24975	7.34	Qp	0	.1	10.2	17.64	60	-42.36	-	-
2	6.24975	6.71	Ca	0	.1	10.2	17.01	-	-	50	-32.99
3	9.5955	10.39	Qp	0	.2	10.2	20.79	60	-39.21	-	-
4	9.5955	2.71	Ca	0	.2	10.2	13.11	-	-	50	-36.89
5	13.56	12.59	Qp	.1	.2	10.2	23.09	60	-36.91	-	-
6	13.56	12.55	Ca	.1	.2	10.2	23.05	-	-	50	-26.95
7	23.75025	6.23	Qp	.1	.2	10.4	16.93	60	-43.07	-	-
8	23.75025	5.55	Ca	.1	.2	10.4	16.25	-	-	50	-33.75
9	27.69225	14.08	Qp	.1	.3	10.5	24.98	60	-35.02	-	-
10	27.69225	13.56	Ca	.1	.3	10.5	24.46	-	-	50	-25.54
11	28.74975	13.81	Qp	.1	.3	10.4	24.61	60	-35.39	-	-
12	28.74975	13.62	Ca	.1	.3	10.4	24.42	-	-	50	-25.58

Qp - Quasi-Peak detector

Ca - CISPR average detection

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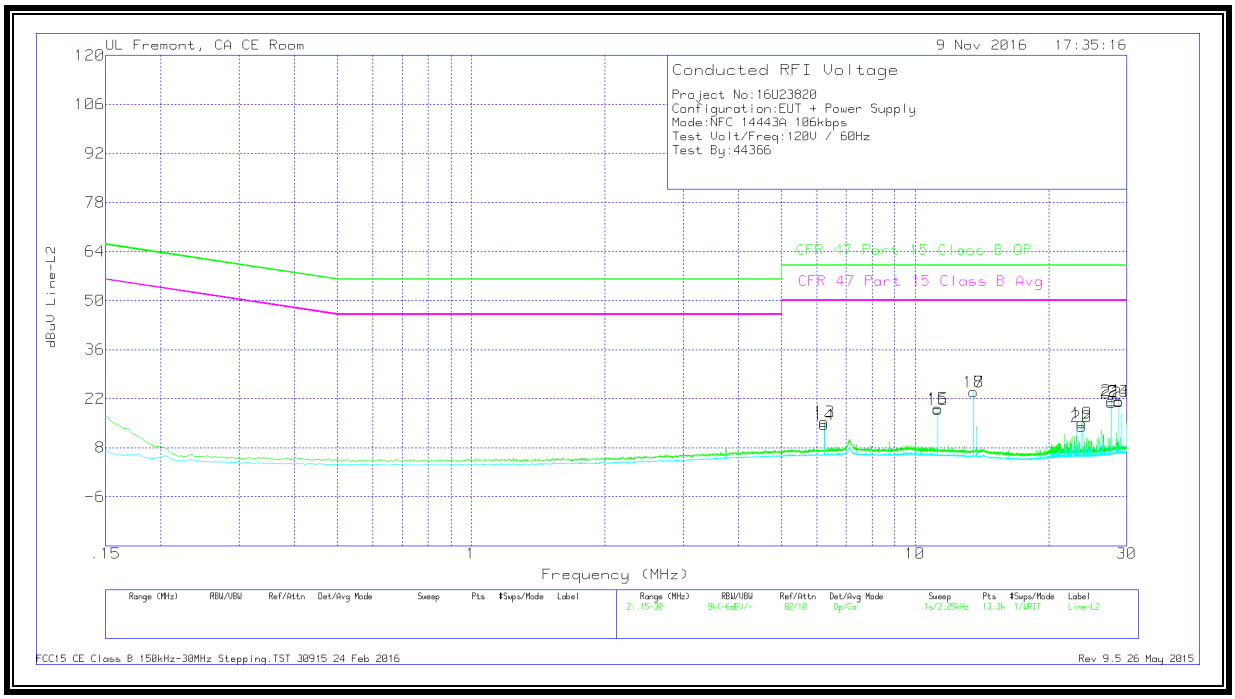
LINE 2 RESULTS



WORST EMISSIONS

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	6.24975	5.13	Qp	0	.1	10.2	15.43	60	-44.57	-	-
14	6.24975	4.29	Ca	0	.1	10.2	14.59	-	-	50	-35.41
15	11.24925	8.8	Qp	0	.2	10.2	19.2	60	-40.8	-	-
16	11.24925	8.47	Ca	0	.2	10.2	18.87	-	-	50	-31.13
17	13.56	13.46	Qp	.1	.2	10.2	23.96	60	-36.04	-	-
18	13.56	13.45	Ca	.1	.2	10.2	23.95	-	-	50	-26.05
19	23.75025	4.33	Qp	.1	.2	10.4	15.03	60	-44.97	-	-
20	23.75025	3.31	Ca	.1	.2	10.4	14.01	-	-	50	-35.99
21	27.69225	10.51	Qp	.1	.3	10.5	21.41	60	-38.59	-	-
22	27.69225	9.85	Ca	.1	.3	10.5	20.75	-	-	50	-29.25
23	28.74975	10.58	Qp	.1	.3	10.4	21.38	60	-38.62	-	-
24	28.74975	10.32	Ca	.1	.3	10.4	21.12	-	-	50	-28.88

Qp - Quasi-Peak detector

Ca - CISPR average detection

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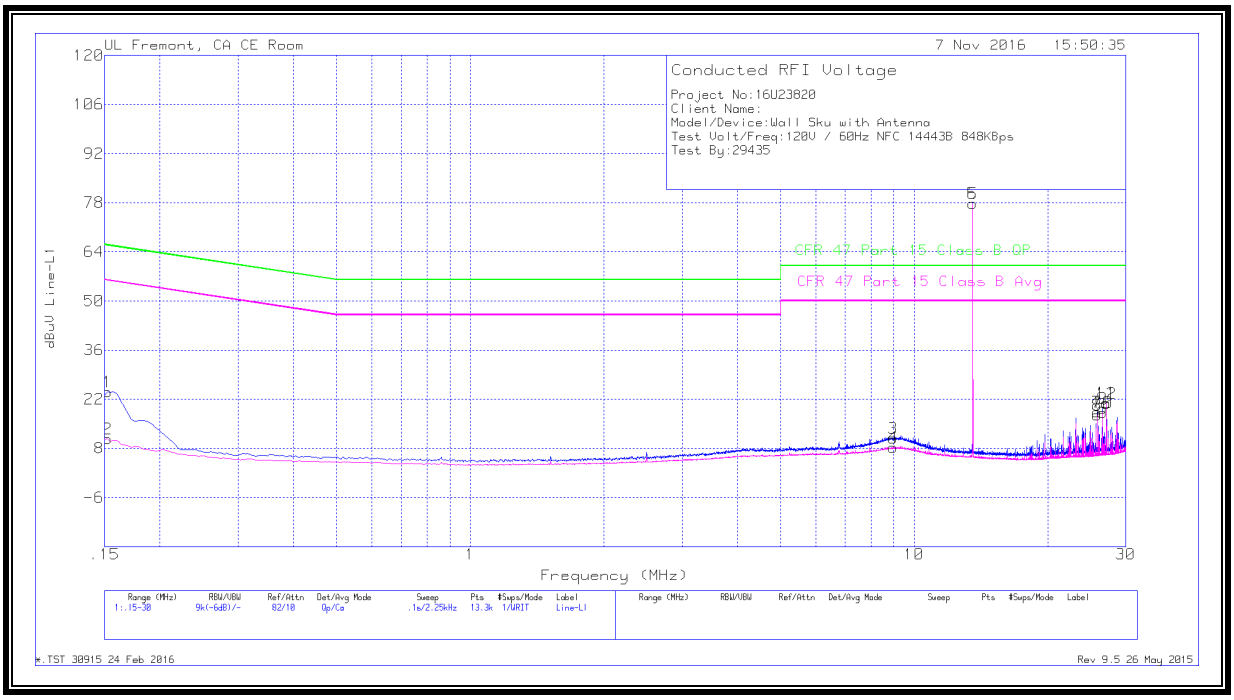
10.2. 14443B

NORMAL OPERATION, 848 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	13.91	Qp	.1	0	10.1	24.11	65.88	-41.77	-	-
2	.15225	.5	Ca	.1	0	10.1	10.7	-	-	55.88	-45.18
3	8.96325	.54	Qp	0	.1	10.2	10.84	60	-49.16	-	-
4	8.96438	-2.05	Ca	0	.1	10.2	8.25	-	-	50	-41.75
5	13.56	67.26	Qp	.1	.2	10.2	77.76			-	-
6	13.56	67.24	Ca	.1	.2	10.2	77.74	-	-		
7	25.87875	7.44	Qp	.1	.3	10.5	18.34	60	-41.66	-	-
8	25.881	6.6	Ca	.1	.3	10.5	17.5	-	-	50	-32.5
9	26.61225	8.44	Qp	.1	.3	10.5	19.34	60	-40.66	-	-
10	26.61225	7.26	Ca	.1	.3	10.5	18.16	-	-	50	-31.84
11	27.1185	10.12	Qp	.1	.3	10.5	21.02	60	-38.98	-	-
12	27.1185	9.83	Ca	.1	.3	10.5	20.73	-	-	50	-29.27

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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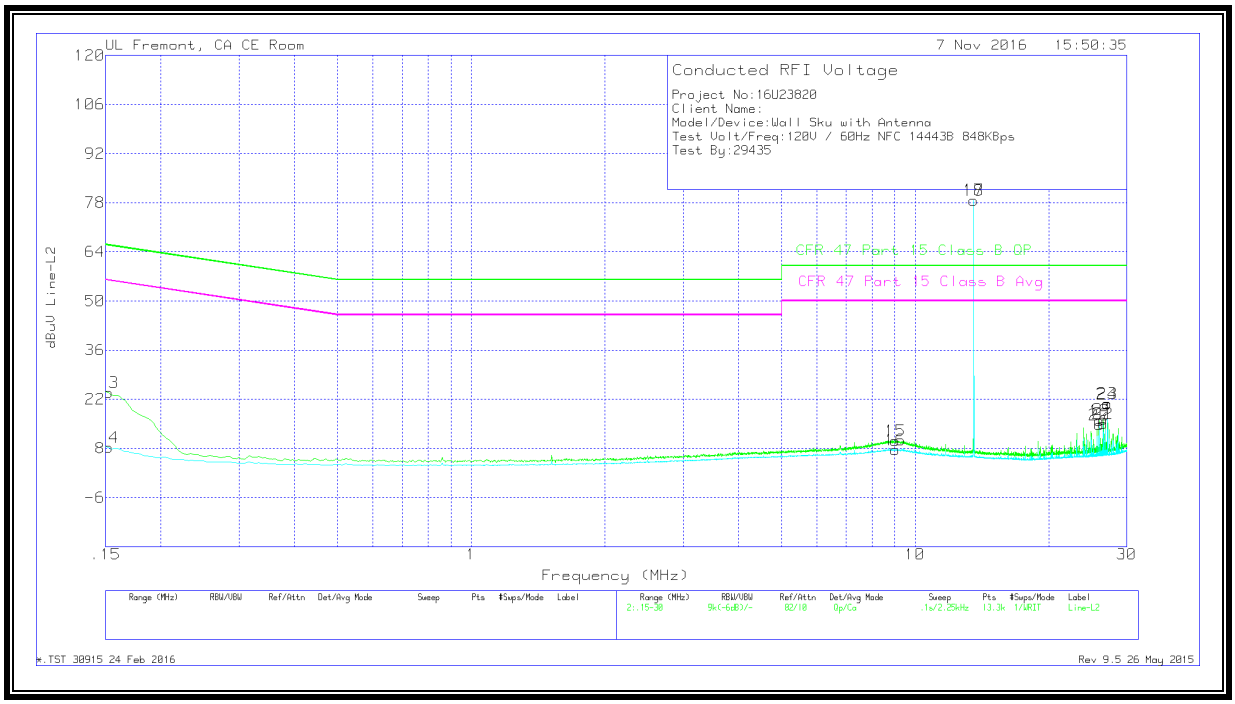
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	13.77	Qp	0	0	10.1	23.87	65.88	-42.01	-	-
14	.15225	-1.79	Ca	0	0	10.1	8.31	-	-	55.88	-47.57
15	9.02625	-.06	Qp	0	.1	10.2	10.24	60	-49.76	-	-
16	9.01275	-2.65	Ca	0	.1	10.2	7.65	-	-	50	-42.35
17	13.56	68.26	Qp	.1	.2	10.2	78.76			-	-
18	13.56	68.25	Ca	.1	.2	10.2	78.75	-	-		
19	26.0025	4.97	Qp	.1	.3	10.5	15.87	60	-44.13	-	-
20	26.0025	3.85	Ca	.1	.3	10.5	14.75	-	-	50	-35.25
21	26.5515	5.35	Qp	.1	.3	10.5	16.25	60	-43.75	-	-
22	26.5515	4.09	Ca	.1	.3	10.5	14.99	-	-	50	-35.01
23	27.1185	9.96	Qp	.1	.3	10.5	20.86	60	-39.14	-	-
24	27.1185	9.67	Ca	.1	.3	10.5	20.57	-	-	50	-29.43

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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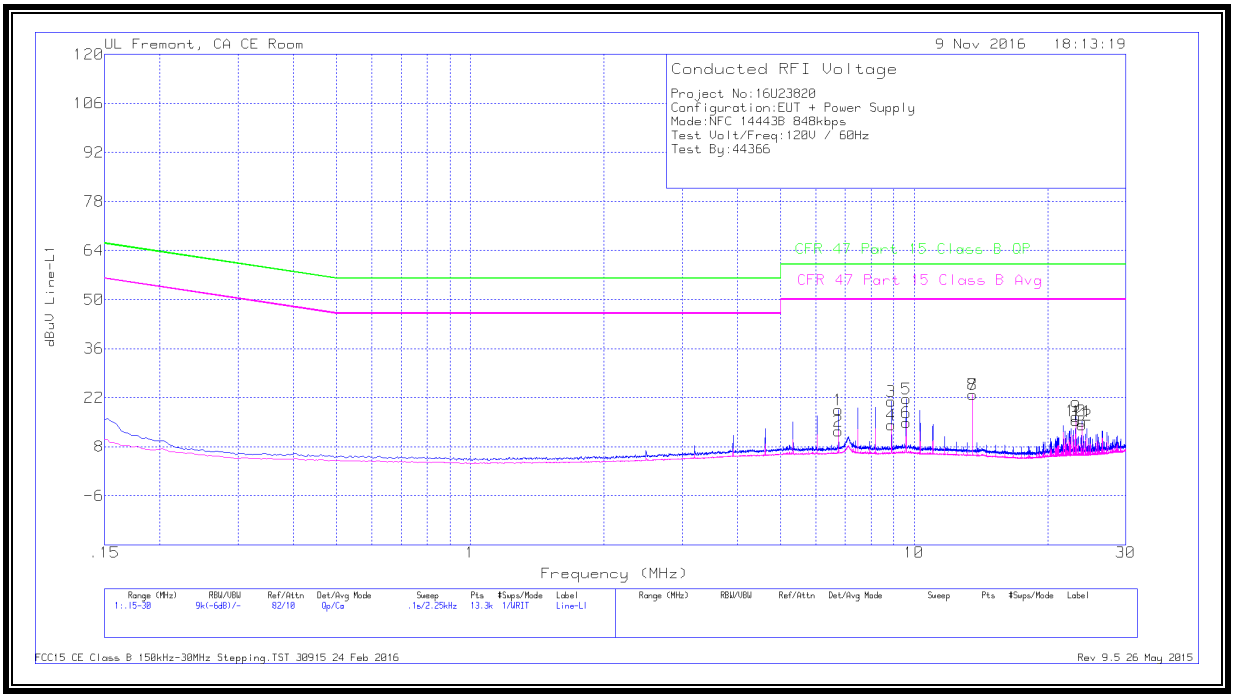
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 848 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	6.756	8.22	Qp	0	.1	10.2	18.52	60	-41.48	-	-
2	6.756	2.12	Ca	0	.1	10.2	12.42	-	-	50	-37.58
3	8.89125	10.66	Qp	0	.1	10.2	20.96	60	-39.04	-	-
4	8.89125	3.93	Ca	0	.1	10.2	14.23	-	-	50	-35.77
5	9.60225	11.2	Qp	0	.2	10.2	21.6	60	-38.4	-	-
6	9.60225	4.45	Ca	0	.2	10.2	14.85	-	-	50	-35.15
7	13.56	12.42	Qp	.1	.2	10.2	22.92	60	-37.08	-	-
8	13.56	12.37	Ca	.1	.2	10.2	22.87	-	-	50	-27.13
9	23.1315	5.9	Qp	.1	.2	10.4	16.6	60	-43.4	-	-
10	23.1315	4.66	Ca	.1	.2	10.4	15.36	-	-	50	-34.64
11	23.919	4.51	Qp	.1	.2	10.4	15.21	60	-44.79	-	-
12	23.919	3.54	Ca	.1	.2	10.4	14.24	-	-	50	-35.76

Qp - Quasi-Peak detector

Ca - CISPR average detection

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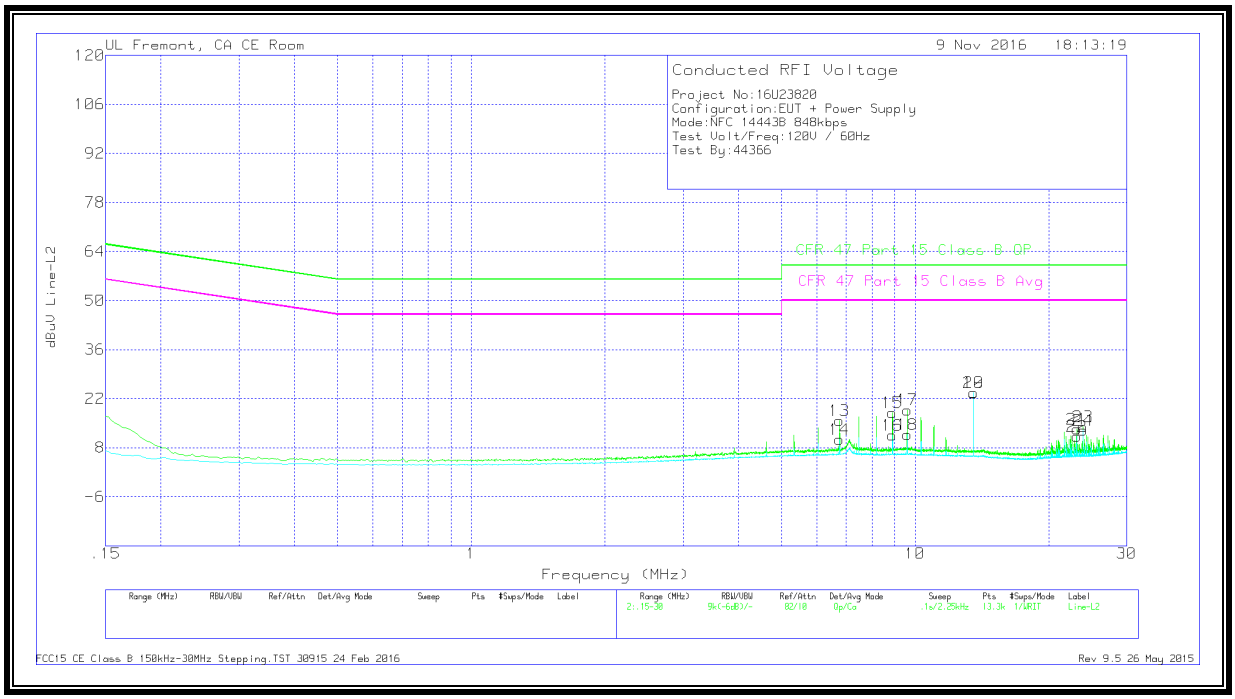
LINE 2 RESULTS



WORST EMISSIONS

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	6.7605	5.53	Qp	0	.1	10.2	15.83	60	-44.17	-	-
14	6.75825	.02	Ca	0	.1	10.2	10.32	-	-	50	-39.68
15	8.89575	7.75	Qp	0	.1	10.2	18.05	60	-41.95	-	-
16	8.8935	1.35	Ca	0	.1	10.2	11.65	-	-	50	-38.35
17	9.60225	8.4	Qp	0	.2	10.2	18.8	60	-41.2	-	-
18	9.6045	1.3	Ca	0	.2	10.2	11.7	-	-	50	-38.3
19	13.56	13.2	Qp	.1	.2	10.2	23.7	60	-36.3	-	-
20	13.56	13.17	Ca	.1	.2	10.2	23.67	-	-	50	-26.33
21	23.1315	2.65	Qp	.1	.2	10.4	13.35	60	-46.65	-	-
22	23.1315	.61	Ca	.1	.2	10.4	11.31	-	-	50	-38.69
23	23.919	3.38	Qp	.1	.2	10.4	14.08	60	-45.92	-	-
24	23.919	2.27	Ca	.1	.2	10.4	12.97	-	-	50	-37.03

Qp - Quasi-Peak detector

Ca - CISPR average detection

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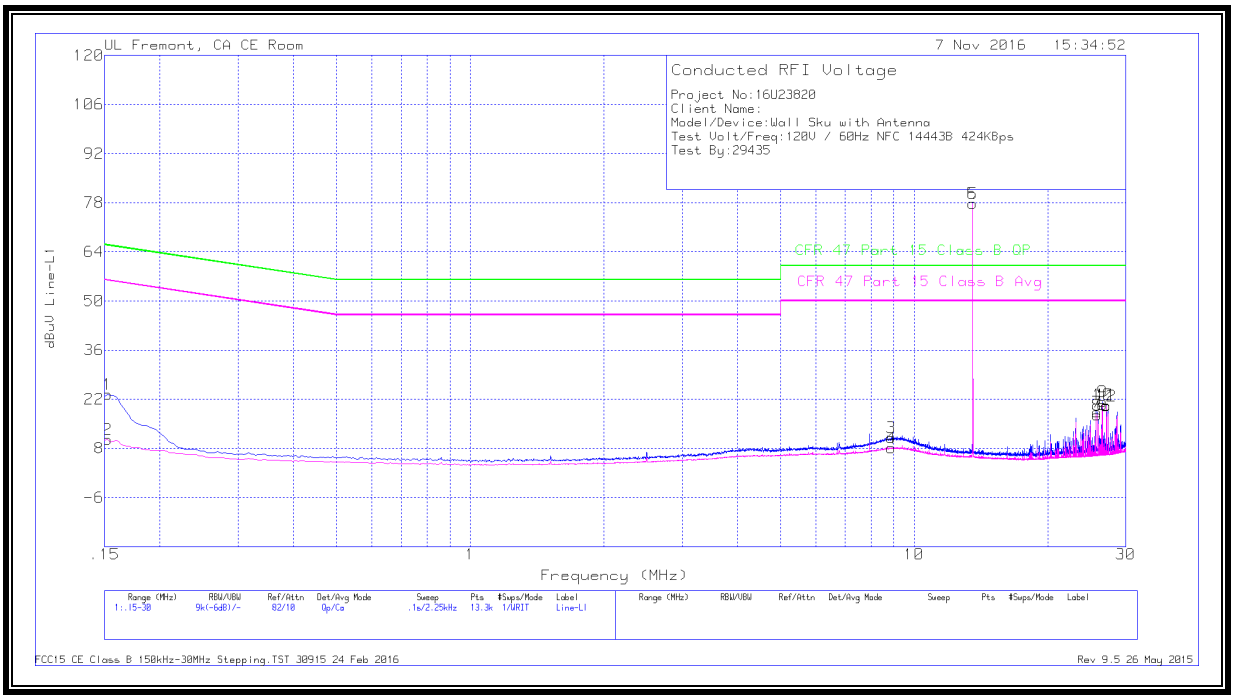
NORMAL OPERATION, 424 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	13.22	Qp	.1	0	10.1	23.42	65.88	-42.46	-	-
2	.15225	.35	Ca	.1	0	10.1	10.55	-	-	55.88	-45.33
3	8.87325	.69	Qp	0	.1	10.2	10.99	60	-49.01	-	-
4	8.871	-2.18	Ca	0	.1	10.2	8.12	-	-	50	-41.88
5	13.56	67.3	Qp	.1	.2	10.2	77.8			-	-
6	13.56	67.28	Ca	.1	.2	10.2	77.78	-	-		
7	25.87875	7.42	Qp	.1	.3	10.5	18.32	60	-41.68	-	-
8	25.881	6.52	Ca	.1	.3	10.5	17.42	-	-	50	-32.58
9	26.61225	10.42	Qp	.1	.3	10.5	21.32	60	-38.68	-	-
10	26.61225	9.5	Ca	.1	.3	10.5	20.4	-	-	50	-29.6
11	27.1185	9.46	Qp	.1	.3	10.5	20.36	60	-39.64	-	-
12	27.1185	9.15	Ca	.1	.3	10.5	20.05	-	-	50	-29.95

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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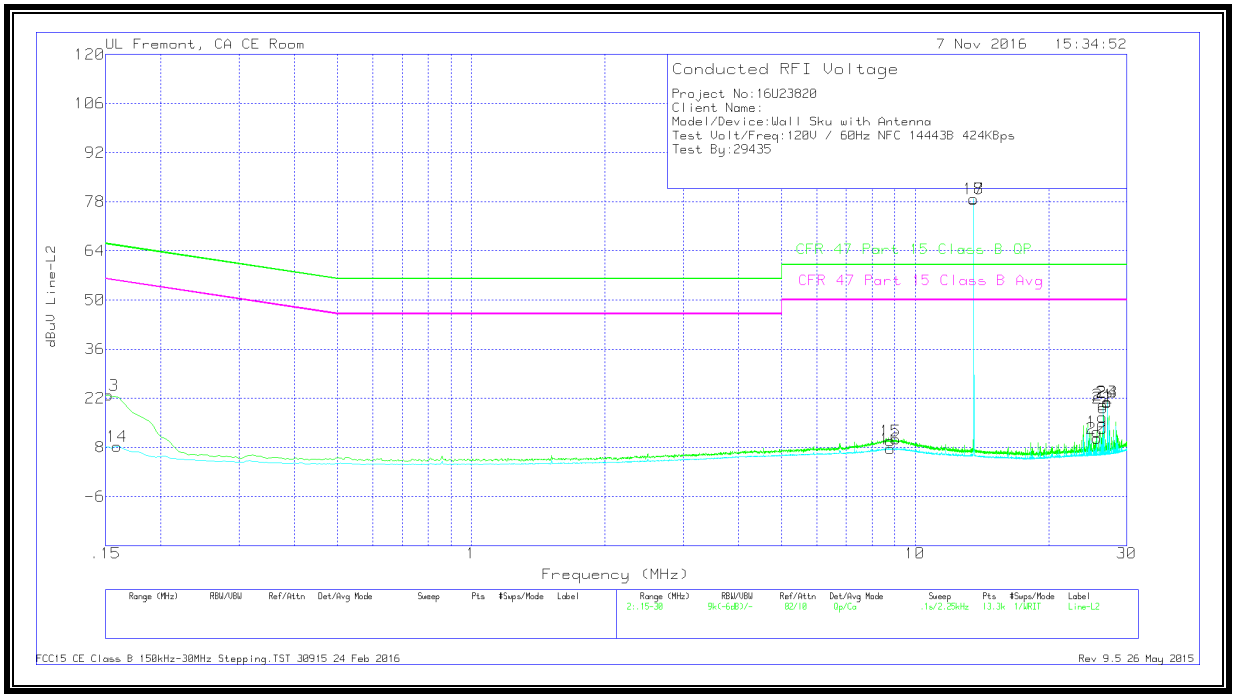
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	12.74	Qp	0	0	10.1	22.84	65.88	-43.04	-	-
14	.159	-1.83	Ca	0	0	10.1	8.27	-	-	55.52	-47.25
15	8.79	-.47	Qp	0	.1	10.2	9.83	60	-50.17	-	-
16	8.78775	-2.79	Ca	0	.1	10.2	7.51	-	-	50	-42.49
17	13.56	68.28	Qp	.1	.2	10.2	78.78			-	-
18	13.56	68.27	Ca	.1	.2	10.2	78.77	-	-		
19	25.6965	1.56	Qp	.1	.3	10.5	12.46	60	-47.54	-	-
20	25.6965	-.4	Ca	.1	.3	10.5	10.5	-	-	50	-39.5
21	26.49075	9.16	Qp	.1	.3	10.5	20.06	60	-39.94	-	-
22	26.49075	8.34	Ca	.1	.3	10.5	19.24	-	-	50	-30.76
23	27.1185	10.06	Qp	.1	.3	10.5	20.96	60	-39.04	-	-
24	27.1185	9.82	Ca	.1	.3	10.5	20.72	-	-	50	-29.28

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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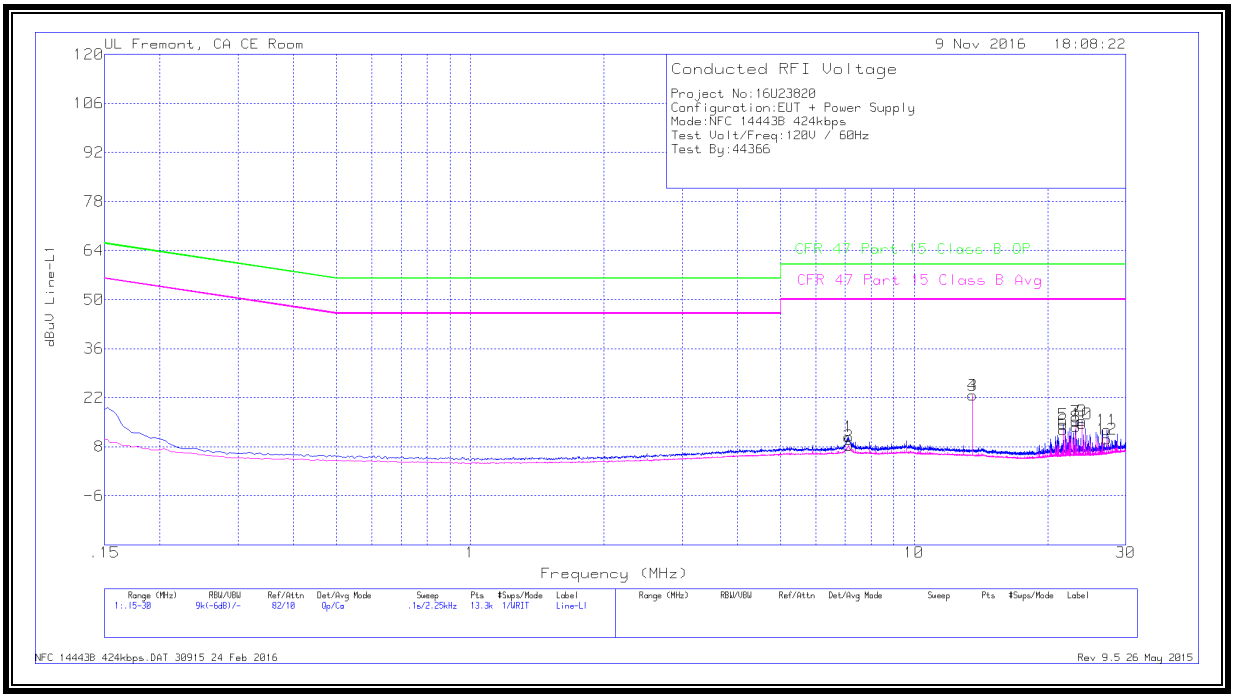
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 424 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	7.116	.54	Qp	0	.1	10.2	10.84	60	-49.16	-	-
2	7.11375	-2.06	Ca	0	.1	10.2	8.24	-	-	50	-41.76
3	13.56	12.25	Qp	.1	.2	10.2	22.75	60	-37.25	-	-
4	13.56	12.17	Ca	.1	.2	10.2	22.67	-	-	50	-27.33
5	21.6645	3.83	Qp	0	.2	10.4	14.43	60	-45.57	-	-
6	21.66675	2.14	Ca	0	.2	10.4	12.74	-	-	50	-37.26
7	23.1315	4.52	Qp	.1	.2	10.4	15.22	60	-44.78	-	-
8	23.1315	2.97	Ca	.1	.2	10.4	13.67	-	-	50	-36.33
9	23.919	4.71	Qp	.1	.2	10.4	15.41	60	-44.59	-	-
10	23.919	3.9	Ca	.1	.2	10.4	14.6	-	-	50	-35.4
11	27.16125	1.86	Qp	.1	.3	10.5	12.76	60	-47.24	-	-
12	27.16125	-.65	Ca	.1	.3	10.5	10.25	-	-	50	-39.75

Qp - Quasi-Peak detector

Ca - CISPR average detection

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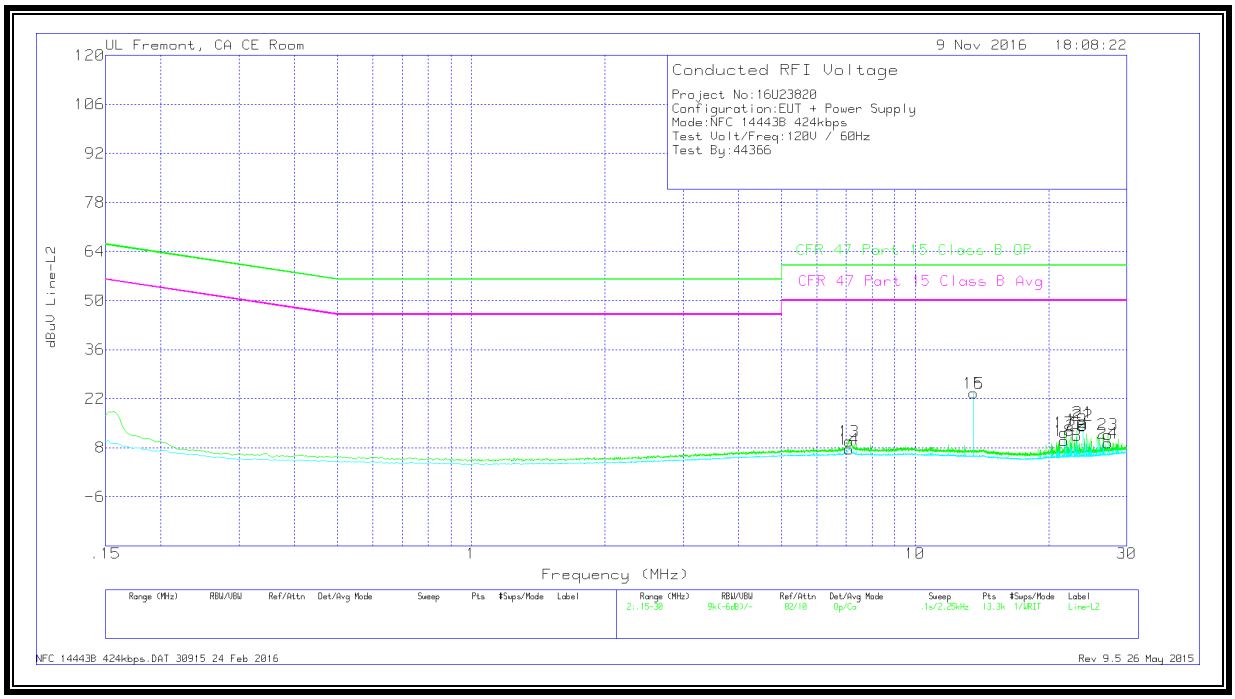
LINE 2 RESULTS



WORST EMISSIONS

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	7.09125	-.39	Qp	0	.1	10.2	9.91	60	-50.09	-	-
14	7.09125	-2.77	Ca	0	.1	10.2	7.53	-	-	50	-42.47
15	13.56	13.08	Qp	.1	.2	10.2	23.58	60	-36.42	-	-
16	13.56	13.06	Ca	.1	.2	10.2	23.56	-	-	50	-26.44
17	21.6645	1.61	Qp	0	.2	10.4	12.21	60	-47.79	-	-
18	21.66675	-.51	Ca	0	.2	10.4	10.09	-	-	50	-39.91
19	23.1315	2.37	Qp	.1	.2	10.4	13.07	60	-46.93	-	-
20	23.1315	.67	Ca	.1	.2	10.4	11.37	-	-	50	-38.63
21	23.919	4.57	Qp	.1	.2	10.4	15.27	60	-44.73	-	-
22	23.919	3.74	Ca	.1	.2	10.4	14.44	-	-	50	-35.56
23	27.16125	.81	Qp	.1	.3	10.5	11.71	60	-48.29	-	-
24	27.16125	-1.55	Ca	.1	.3	10.5	9.35	-	-	50	-40.65

Qp - Quasi-Peak detector

Ca - CISPR average detection

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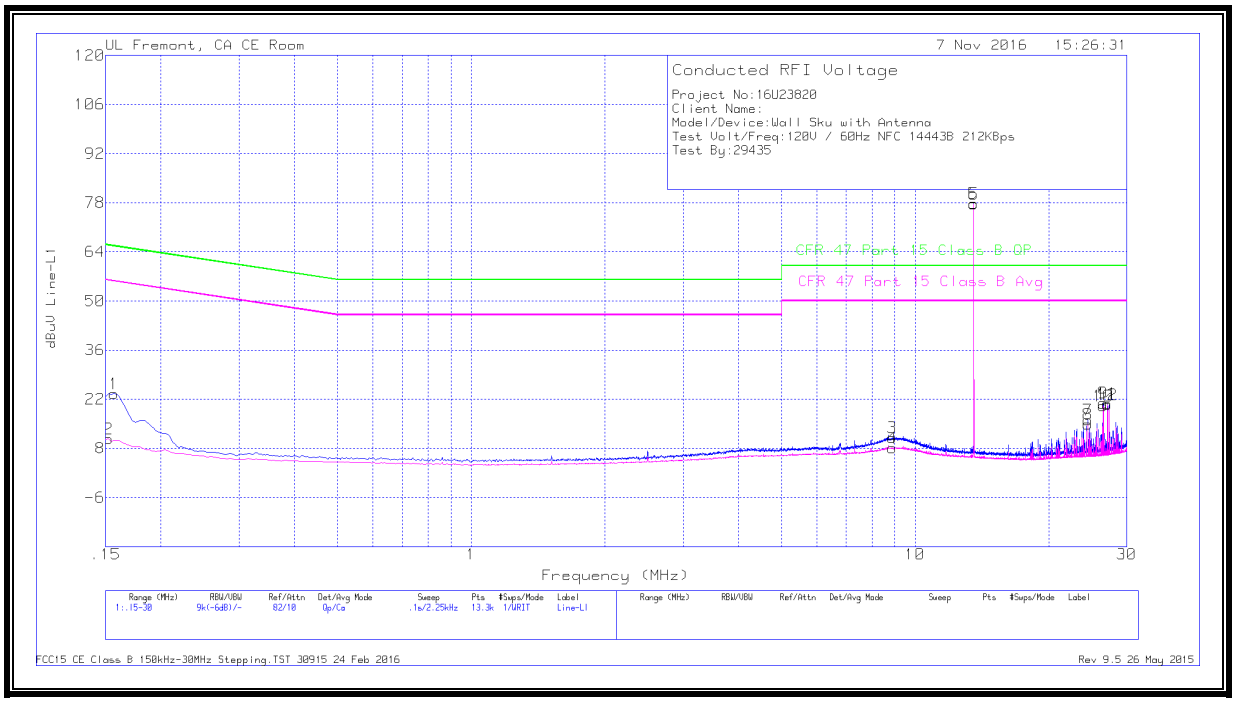
NORMAL OPERATION, 212 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15675	13.55	Qp	0	0	10.1	23.65	65.63	-41.98	-	-
2	.15225	.5	Ca	.1	0	10.1	10.7	-	-	55.88	-45.18
3	8.889	.76	Qp	0	.1	10.2	11.06	60	-48.94	-	-
4	8.871	-2.16	Ca	0	.1	10.2	8.14	-	-	50	-41.86
5	13.56	67.24	Qp	.1	.2	10.2	77.74			-	-
6	13.56	67.22	Ca	.1	.2	10.2	77.72	-	-		
7	24.5355	5.28	Qp	.1	.2	10.5	16.08	60	-43.92	-	-
8	24.5355	4.1	Ca	.1	.2	10.5	14.9	-	-	50	-35.1
9	26.49075	9.99	Qp	.1	.3	10.5	20.89	60	-39.11	-	-
10	26.49075	9.24	Ca	.1	.3	10.5	20.14	-	-	50	-29.86
11	27.1185	9.89	Qp	.1	.3	10.5	20.79	60	-39.21	-	-
12	27.1185	9.56	Ca	.1	.3	10.5	20.46	-	-	50	-29.54

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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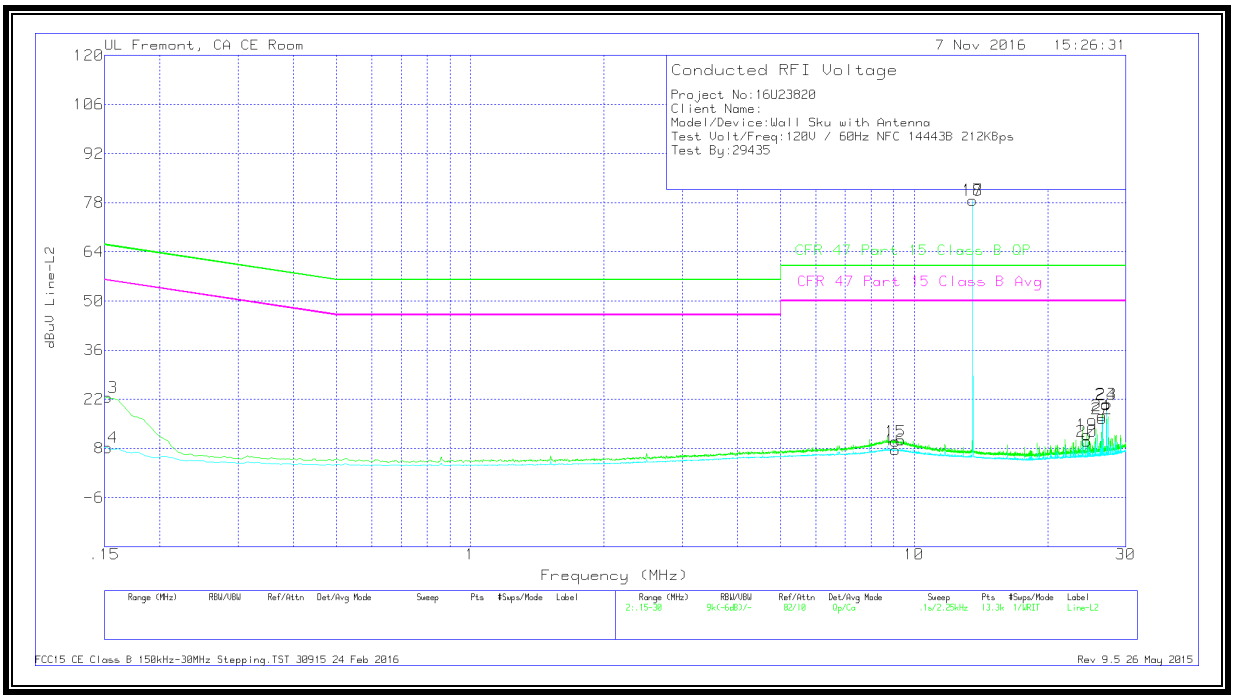
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	12.47	Qp	0	0	10.1	22.57	65.88	-43.31	-	-
14	.15225	-1.9	Ca	0	0	10.1	8.2	-	-	55.88	-47.68
15	9.07575	-.21	Qp	0	.1	10.2	10.09	60	-49.91	-	-
16	9.07125	-2.76	Ca	0	.1	10.2	7.54	-	-	50	-42.46
17	13.56	68.26	Qp	.1	.2	10.2	78.76			-	-
18	13.56	68.25	Ca	.1	.2	10.2	78.75	-	-		
19	24.5355	1.07	Qp	.1	.3	10.5	11.97	60	-48.03	-	-
20	24.5355	-.83	Ca	.1	.3	10.5	10.07	-	-	50	-39.93
21	26.49075	6.46	Qp	.1	.3	10.5	17.36	60	-42.64	-	-
22	26.49075	5.59	Ca	.1	.3	10.5	16.49	-	-	50	-33.51
23	27.1185	9.79	Qp	.1	.3	10.5	20.69	60	-39.31	-	-
24	27.1185	9.49	Ca	.1	.3	10.5	20.39	-	-	50	-29.61

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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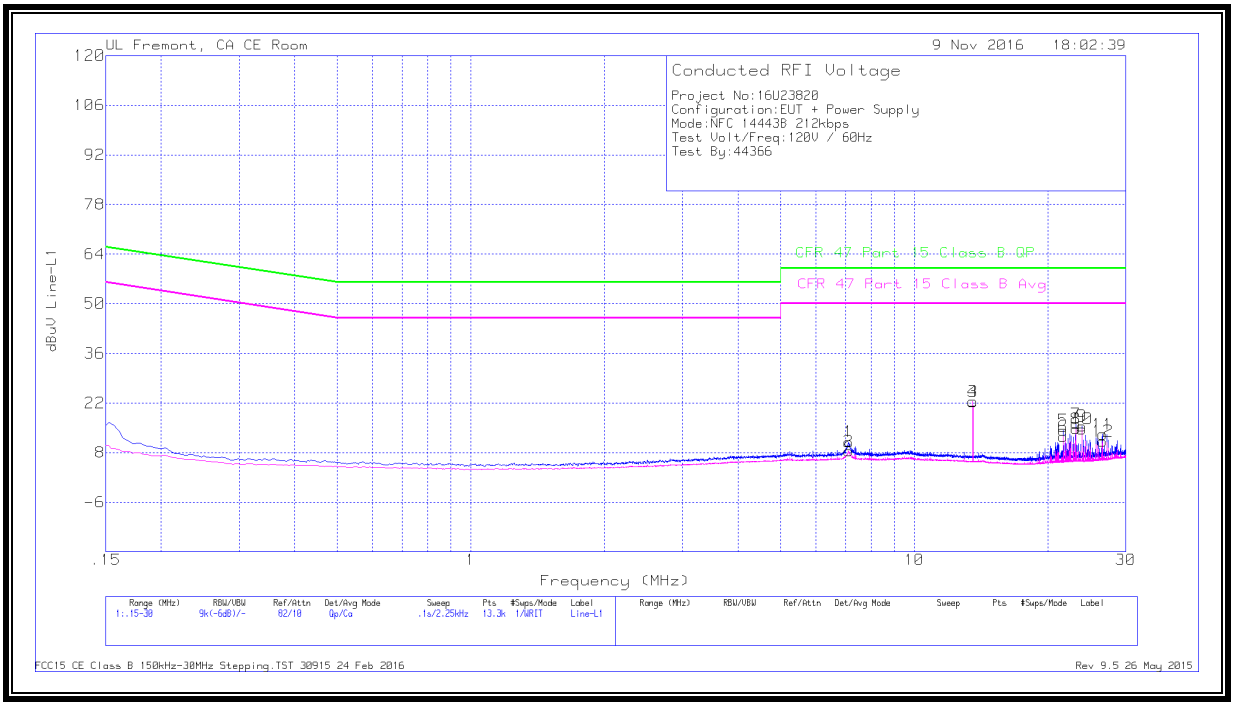
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 212 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	7.116	.79	Qp	0	.1	10.2	11.09	60	-48.91	-	-
2	7.116	-1.9	Ca	0	.1	10.2	8.4	-	-	50	-41.6
3	13.56	11.98	Qp	.1	.2	10.2	22.48	60	-37.52	-	-
4	13.56	11.9	Ca	.1	.2	10.2	22.4	-	-	50	-27.6
5	21.6645	3.72	Qp	0	.2	10.4	14.32	60	-45.68	-	-
6	21.66675	1.98	Ca	0	.2	10.4	12.58	-	-	50	-37.42
7	23.1315	5.42	Qp	.1	.2	10.4	16.12	60	-43.88	-	-
8	23.1315	4.05	Ca	.1	.2	10.4	14.75	-	-	50	-35.25
9	23.919	4.79	Qp	.1	.2	10.4	15.49	60	-44.51	-	-
10	23.919	3.99	Ca	.1	.2	10.4	14.69	-	-	50	-35.31
11	26.61225	2.27	Qp	.1	.3	10.5	13.17	60	-46.83	-	-
12	26.6235	.34	Ca	.1	.3	10.5	11.24	-	-	50	-38.76

Qp - Quasi-Peak detector

Ca - CISPR average detection

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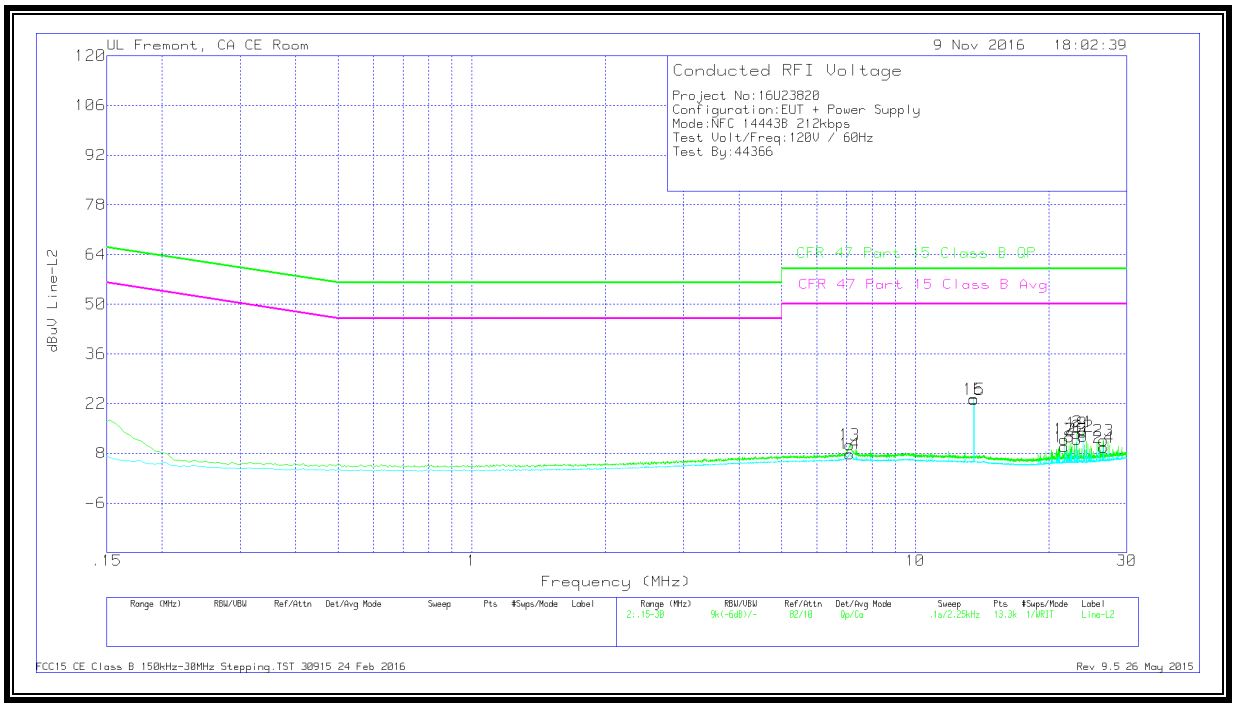
LINE 2 RESULTS



WORST EMISSIONS

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	7.11375	.06	Qp	0	.1	10.2	10.36	60	-49.64	-	-
14	7.11488	-2.45	Ca	0	.1	10.2	7.85	-	-	50	-42.15
15	13.56	12.79	Qp	.1	.2	10.2	23.29	60	-36.71	-	-
16	13.56	12.72	Ca	.1	.2	10.2	23.22	-	-	50	-26.78
17	21.6645	1.3	Qp	0	.2	10.4	11.9	60	-48.1	-	-
18	21.66675	-.82	Ca	0	.2	10.4	9.78	-	-	50	-40.22
19	23.1315	2.92	Qp	.1	.2	10.4	13.62	60	-46.38	-	-
20	23.1315	1.22	Ca	.1	.2	10.4	11.92	-	-	50	-38.08
21	23.919	3.3	Qp	.1	.2	10.4	14	60	-46	-	-
22	23.919	2.08	Ca	.1	.2	10.4	12.78	-	-	50	-37.22
23	26.61225	.74	Qp	.1	.3	10.5	11.64	60	-48.36	-	-
24	26.6235	-1.26	Ca	.1	.3	10.5	9.64	-	-	50	-40.36

Qp - Quasi-Peak detector

Ca - CISPR average detection

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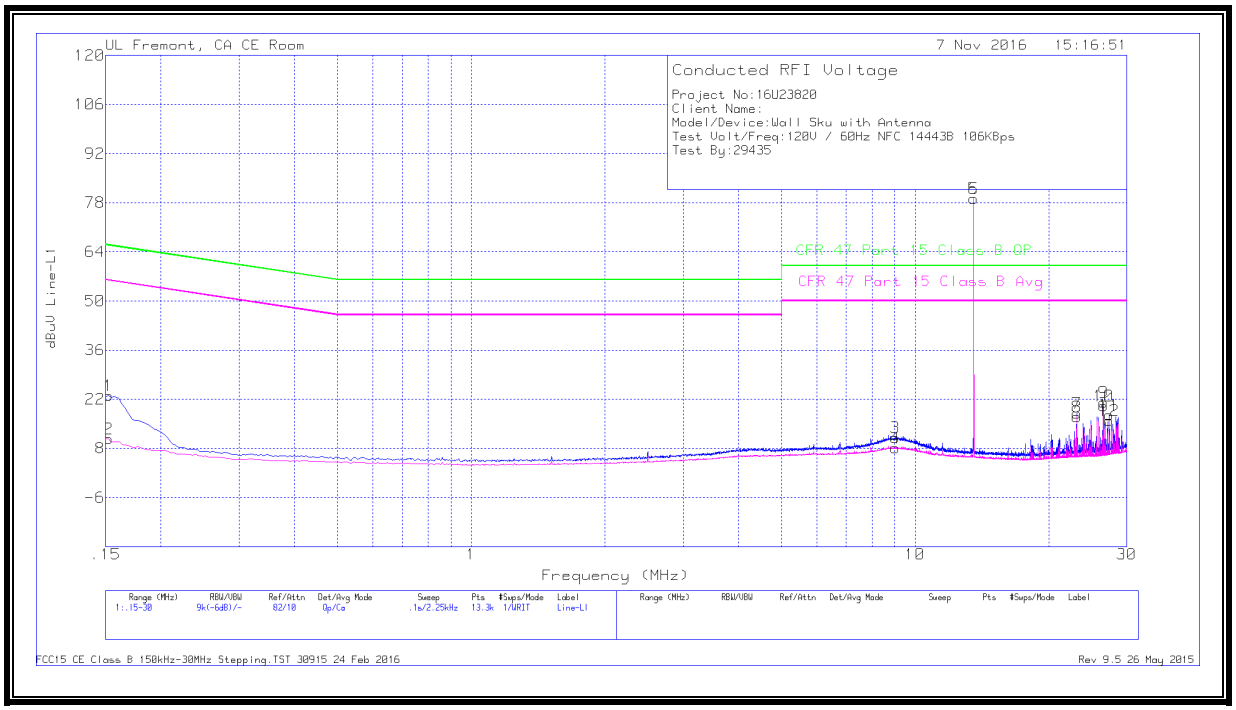
NORMAL OPERATION, 106 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	12.83	Qp	.1	0	10.1	23.03	65.88	-42.85	-	-
2	.15225	.49	Ca	.1	0	10.1	10.69	-	-	55.88	-45.19
3	9.033	.8	Qp	0	.1	10.2	11.1	60	-48.9	-	-
4	9.0285	-2.14	Ca	0	.1	10.2	8.16	-	-	50	-41.84
5	13.56	68.67	Qp	.1	.2	10.2	79.17			-	-
6	13.56	68.65	Ca	.1	.2	10.2	79.15	-	-		
7	23.1315	7.36	Qp	.1	.2	10.4	18.06	60	-41.94	-	-
8	23.1315	6.27	Ca	.1	.2	10.4	16.97	-	-	50	-33.03
9	26.61225	10.2	Qp	.1	.3	10.5	21.1	60	-38.9	-	-
10	26.61225	9.15	Ca	.1	.3	10.5	20.05	-	-	50	-29.95
11	27.34575	6.6	Qp	.1	.3	10.5	17.5	60	-42.5	-	-
12	27.34575	4.99	Ca	.1	.3	10.5	15.89	-	-	50	-34.11

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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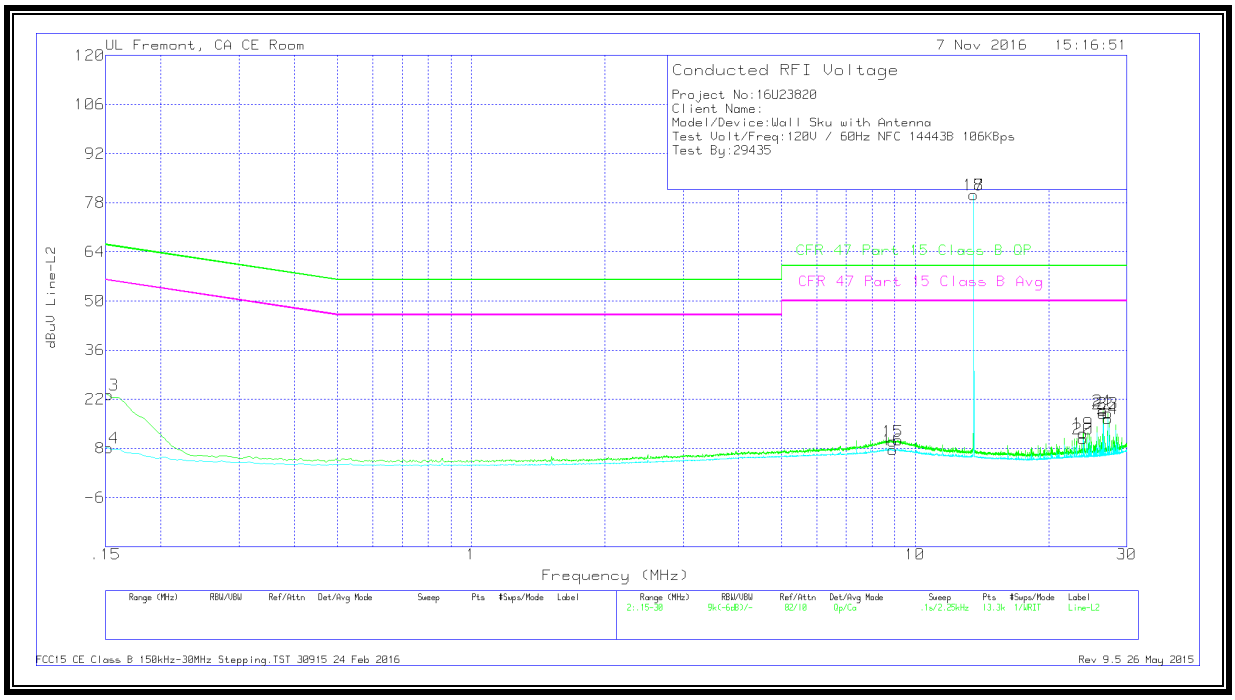
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	13.14	Qp	0	0	10.1	23.24	65.88	-42.64	-	-
14	.15225	-1.97	Ca	0	0	10.1	8.13	-	-	55.88	-47.75
15	8.9025	-.25	Qp	0	.1	10.2	10.05	60	-49.95	-	-
16	8.90138	-2.69	Ca	0	.1	10.2	7.61	-	-	50	-42.39
17	13.56	69.7	Qp	.1	.2	10.2	80.2			-	-
18	13.56	69.69	Ca	.1	.2	10.2	80.19	-	-		
19	23.92125	1.56	Qp	.1	.2	10.4	12.26	60	-47.74	-	-
20	23.92125	-.02	Ca	.1	.2	10.4	10.68	-	-	50	-39.32
21	26.5515	7.89	Qp	.1	.3	10.5	18.79	60	-41.21	-	-
22	26.5515	6.94	Ca	.1	.3	10.5	17.84	-	-	50	-32.16
23	27.16125	7.12	Qp	.1	.3	10.5	18.02	60	-41.98	-	-
24	27.1635	5.48	Ca	.1	.3	10.5	16.38	-	-	50	-33.62

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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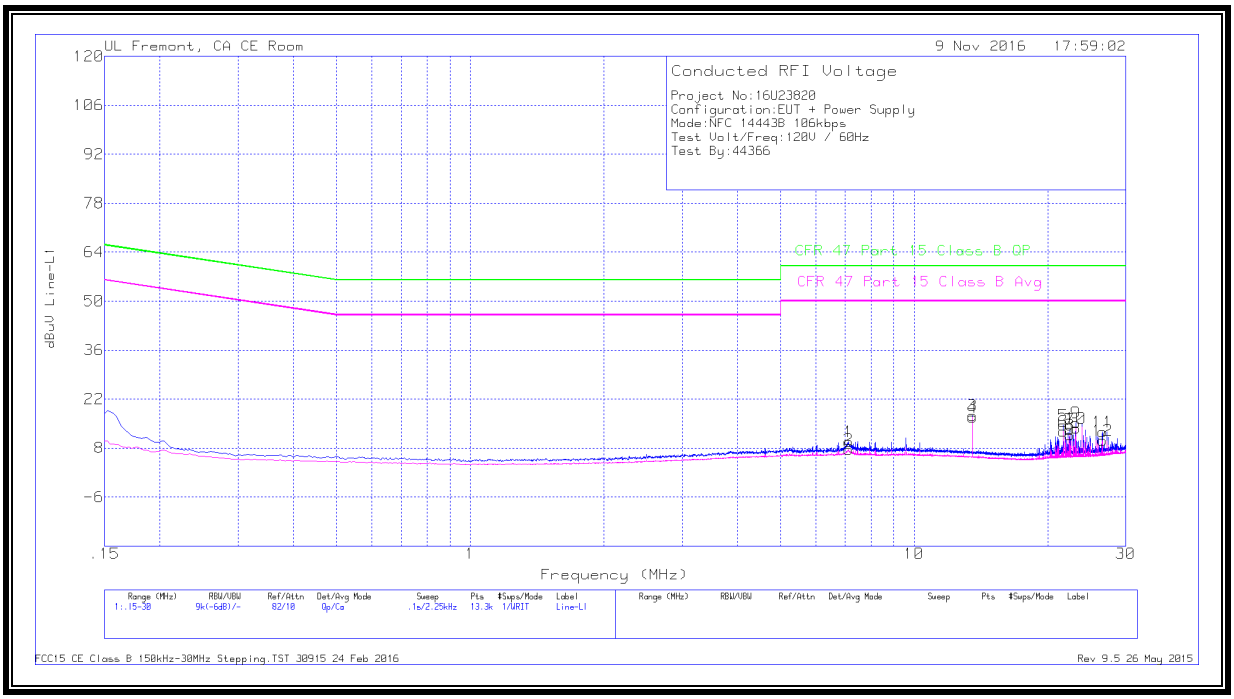
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 106 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	7.116	-.53	Qp	0	.1	10.2	9.77	60	-50.23	-	-
2	7.116	-2.69	Ca	0	.1	10.2	7.61	-	-	50	-42.39
3	13.56	6.81	Qp	.1	.2	10.2	17.31	60	-42.69	-	-
4	13.56	6.38	Ca	.1	.2	10.2	16.88	-	-	50	-33.12
5	21.6645	3.9	Qp	0	.2	10.4	14.5	60	-45.5	-	-
6	21.66675	2.28	Ca	0	.2	10.4	12.88	-	-	50	-37.12
7	22.45875	2.66	Qp	.1	.2	10.4	13.36	60	-46.64	-	-
8	22.45988	1.05	Ca	.1	.2	10.4	11.75	-	-	50	-38.25
9	23.1315	4.55	Qp	.1	.2	10.4	15.25	60	-44.75	-	-
10	23.1315	2.97	Ca	.1	.2	10.4	13.67	-	-	50	-36.33
11	26.61225	1.67	Qp	.1	.3	10.5	12.57	60	-47.43	-	-
12	26.6235	-.65	Ca	.1	.3	10.5	10.25	-	-	50	-39.75

Qp - Quasi-Peak detector

Ca - CISPR average detection

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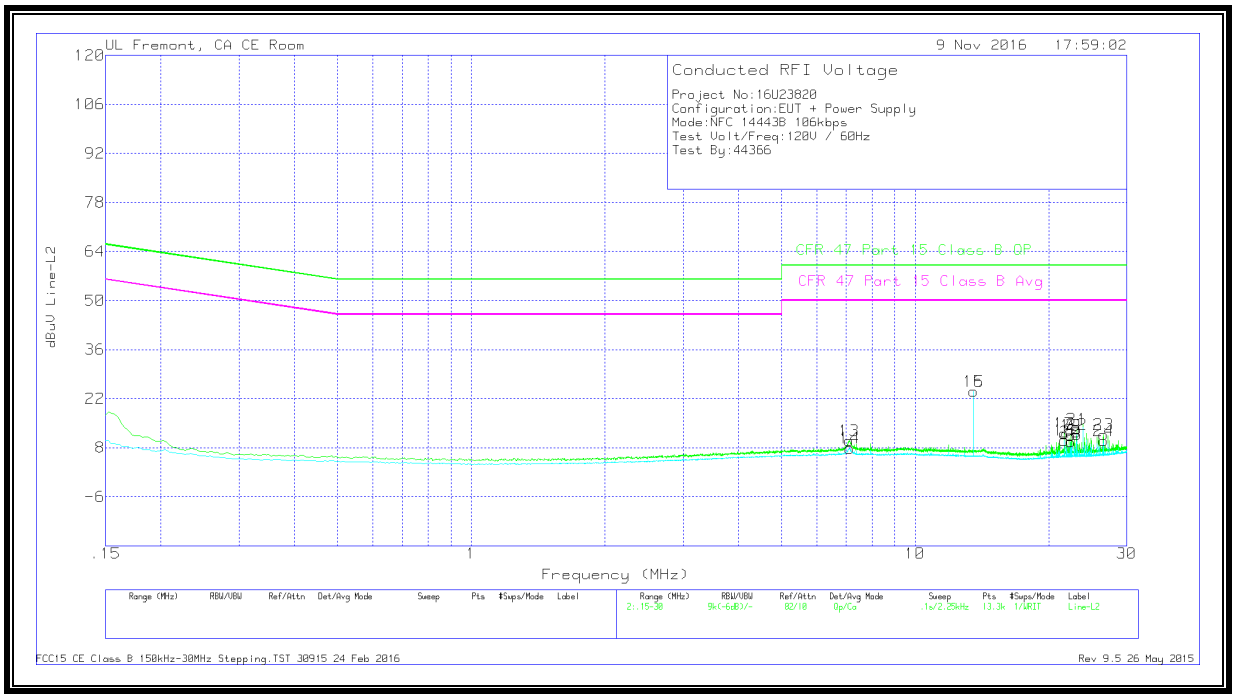
LINE 2 RESULTS



WORST EMISSIONS

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	7.10025	-.25	Qp	0	.1	10.2	10.05	60	-49.95	-	-
14	7.116	-2.45	Ca	0	.1	10.2	7.85	-	-	50	-42.15
15	13.56	13.55	Qp	.1	.2	10.2	24.05	60	-35.95	-	-
16	13.56	13.53	Ca	.1	.2	10.2	24.03	-	-	50	-25.97
17	21.6645	1.52	Qp	0	.2	10.4	12.12	60	-47.88	-	-
18	21.66675	-.49	Ca	0	.2	10.4	10.11	-	-	50	-39.89
19	22.45875	.99	Qp	0	.2	10.4	11.59	60	-48.41	-	-
20	22.461	-.92	Ca	0	.2	10.4	9.68	-	-	50	-40.32
21	23.1315	2.65	Qp	.1	.2	10.4	13.35	60	-46.65	-	-
22	23.1315	1.02	Ca	.1	.2	10.4	11.72	-	-	50	-38.28
23	26.6235	.78	Qp	.1	.3	10.5	11.68	60	-48.32	-	-
24	26.6235	-.81	Ca	.1	.3	10.5	10.09	-	-	50	-39.91

Qp - Quasi-Peak detector

Ca - CISPR average detection

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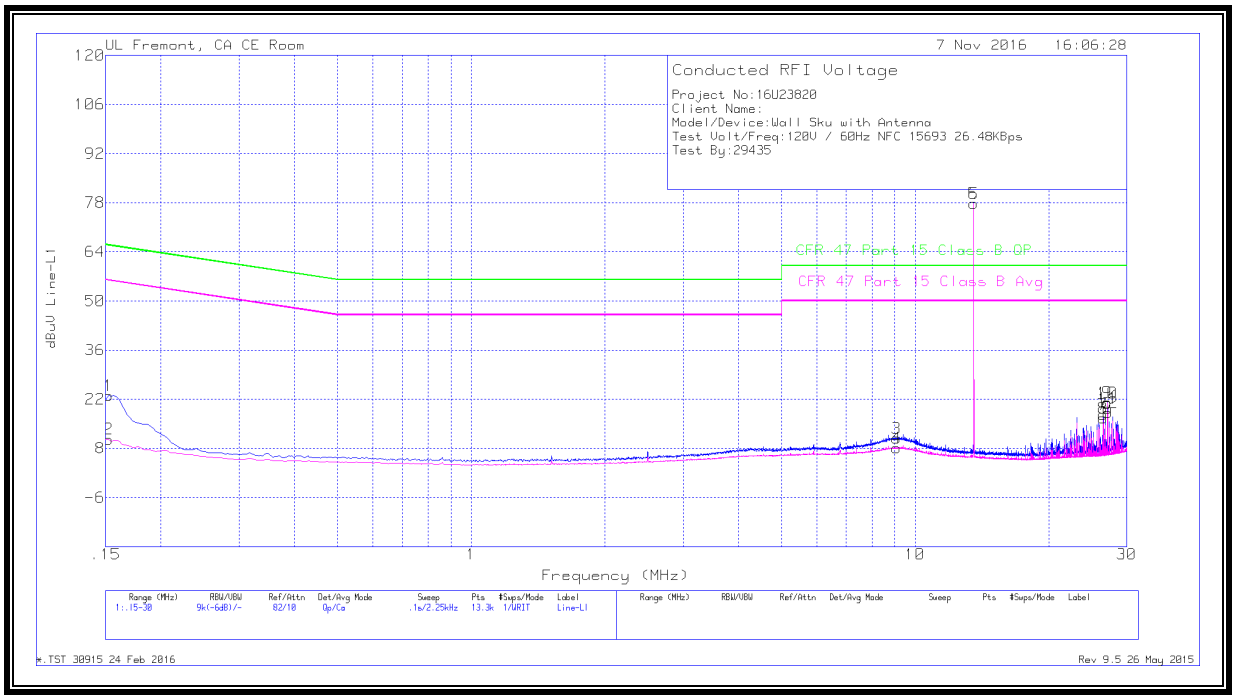
10.3. 15693

NORMAL OPERATION, 26.48 KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	.15225	12.83	Qp	.1	0	10.1	23.03	65.88	-42.85	-	-
2	.15225	.43	Ca	.1	0	10.1	10.63	-	-	55.88	-45.25
3	9.0915	.53	Qp	0	.1	10.2	10.83	60	-49.17	-	-
4	9.09038	-2.27	Ca	0	.1	10.2	8.03	-	-	50	-41.97
5	13.56	67.25	Qp	.1	.2	10.2	77.75			-	-
6	13.56	67.23	Ca	.1	.2	10.2	77.73	-	-		
7	26.5515	6.84	Qp	.1	.3	10.5	17.74	60	-42.26	-	-
8	26.5515	5.72	Ca	.1	.3	10.5	16.62	-	-	50	-33.38
9	27.1185	10.26	Qp	.1	.3	10.5	21.16	60	-38.84	-	-
10	27.1185	9.99	Ca	.1	.3	10.5	20.89	-	-	50	-29.11
11	27.16125	8.45	Qp	.1	.3	10.5	19.35	60	-40.65	-	-
12	27.1635	7.21	Ca	.1	.3	10.5	18.11	-	-	50	-31.89

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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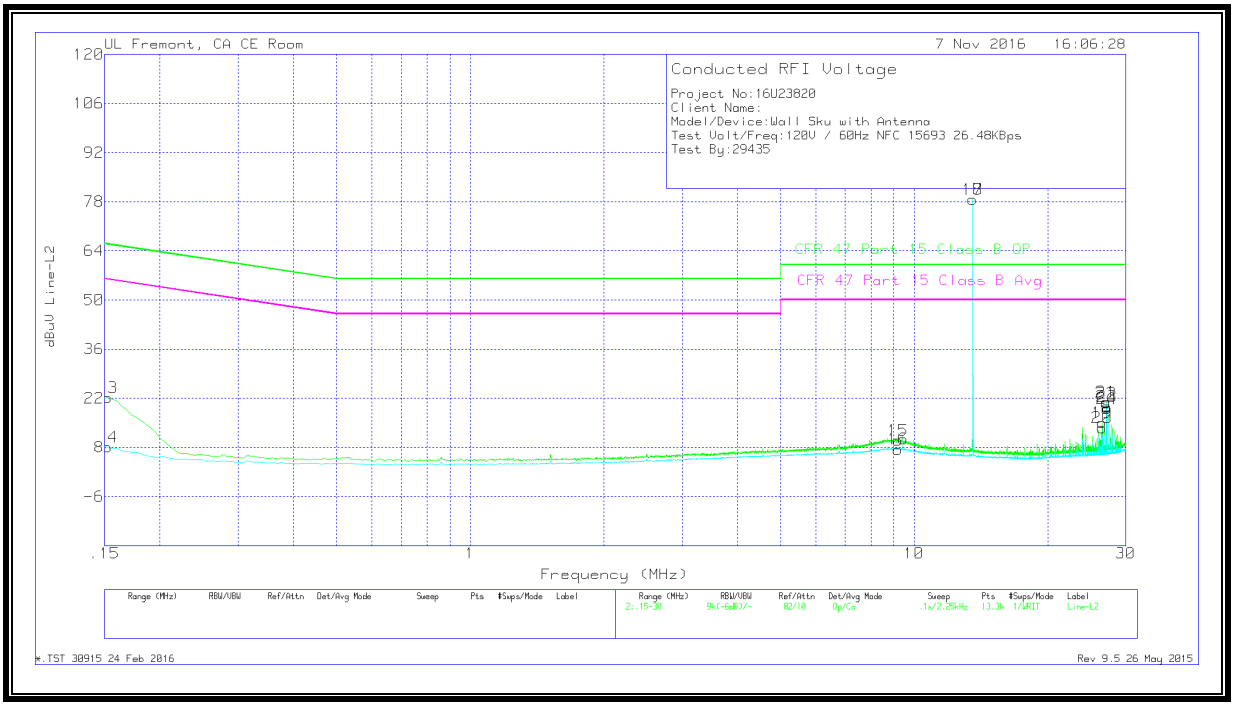
LINE 2 RESULTS



WORST EMISSIONS

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	.15225	12.16	Qp	0	0	10.1	22.26	65.88	-43.62	-	-
14	.15225	-2.02	Ca	0	0	10.1	8.08	-	-	55.88	-47.8
15	9.1905	-.36	Qp	0	.2	10.2	10.04	60	-49.96	-	-
16	9.1905	-2.9	Ca	0	.2	10.2	7.5	-	-	50	-42.5
17	13.56	68.24	Qp	.1	.2	10.2	78.74			-	-
18	13.56	68.22	Ca	.1	.2	10.2	78.72	-	-		
19	26.49075	4.1	Qp	.1	.3	10.5	15	60	-45	-	-
20	26.49075	2.69	Ca	.1	.3	10.5	13.59	-	-	50	-36.41
21	27.1185	10.07	Qp	.1	.3	10.5	20.97	60	-39.03	-	-
22	27.1185	9.77	Ca	.1	.3	10.5	20.67	-	-	50	-29.33
23	27.16125	8.86	Qp	.1	.3	10.5	19.76	60	-40.24	-	-
24	27.1635	8.14	Ca	.1	.3	10.5	19.04	-	-	50	-30.96

Qp - Quasi-Peak detector

Ca - CISPR average detection

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

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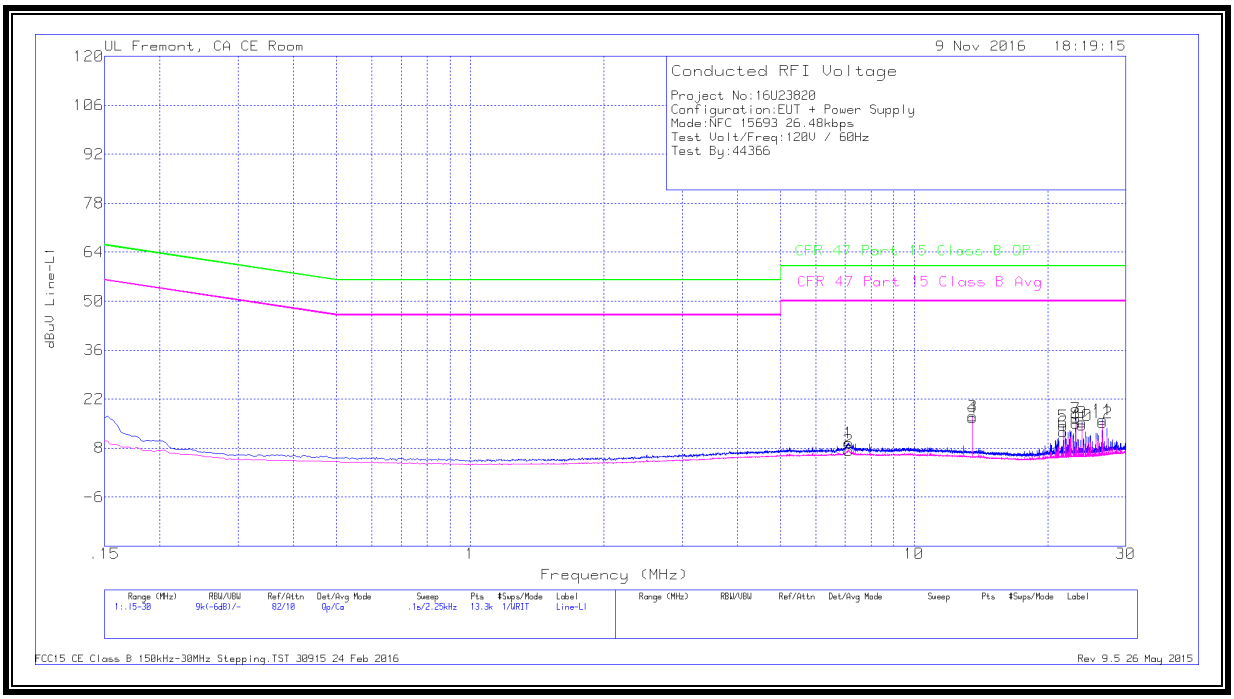
NORMAL OPERATION WITH ANTENNA PORT TERMINATED, 26.48KBPS

LINE 1 RESULTS



WORST EMISSIONS

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	7.11375	-.81	Qp	0	.1	10.2	9.49	60	-50.51	-	-
2	7.11375	-2.97	Ca	0	.1	10.2	7.33	-	-	50	-42.67
3	13.56	6.7	Qp	.1	.2	10.2	17.2	60	-42.8	-	-
4	13.56	6.21	Ca	.1	.2	10.2	16.71	-	-	50	-33.29
5	21.6645	3.84	Qp	0	.2	10.4	14.44	60	-45.56	-	-
6	21.66675	2.08	Ca	0	.2	10.4	12.68	-	-	50	-37.32
7	23.1315	5.75	Qp	.1	.2	10.4	16.45	60	-43.55	-	-
8	23.1315	4.42	Ca	.1	.2	10.4	15.12	-	-	50	-34.88
9	23.919	4.71	Qp	.1	.2	10.4	15.41	60	-44.59	-	-
10	23.919	3.76	Ca	.1	.2	10.4	14.46	-	-	50	-35.54
11	26.6235	5.2	Qp	.1	.3	10.5	16.1	60	-43.9	-	-
12	26.6235	4.41	Ca	.1	.3	10.5	15.31	-	-	50	-34.69

Qp - Quasi-Peak detector

Ca - CISPR average detection

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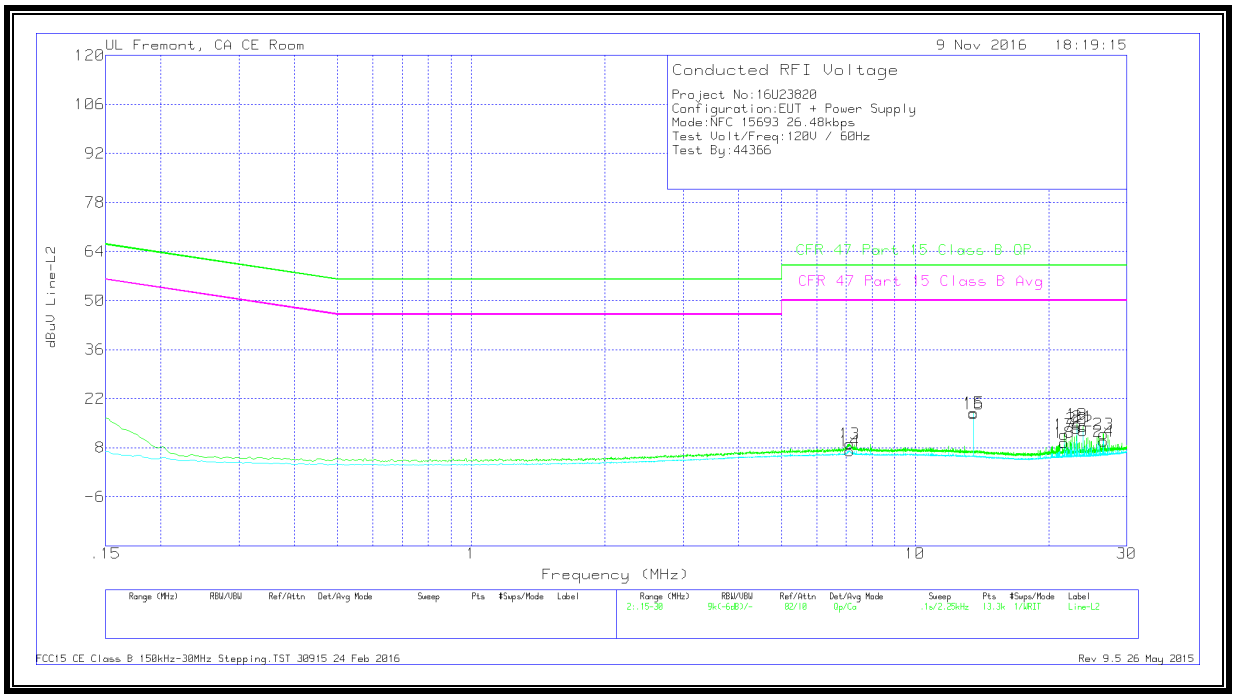
LINE 2 RESULTS



WORST EMISSIONS

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	7.11375	-1.17	Qp	0	.1	10.2	9.13	60	-50.87	-	-
14	7.11488	-3.19	Ca	0	.1	10.2	7.11	-	-	50	-42.89
15	13.56	7.52	Qp	.1	.2	10.2	18.02	60	-41.98	-	-
16	13.56	7.12	Ca	.1	.2	10.2	17.62	-	-	50	-32.38
17	21.6645	1.11	Qp	0	.2	10.4	11.71	60	-48.29	-	-
18	21.66675	-1.04	Ca	0	.2	10.4	9.56	-	-	50	-40.44
19	23.1315	4.03	Qp	.1	.2	10.4	14.73	60	-45.27	-	-
20	23.1315	2.73	Ca	.1	.2	10.4	13.43	-	-	50	-36.57
21	23.919	3.35	Qp	.1	.2	10.4	14.05	60	-45.95	-	-
22	23.919	2.16	Ca	.1	.2	10.4	12.86	-	-	50	-37.14
23	26.61225	1.1	Qp	.1	.3	10.5	12	60	-48	-	-
24	26.61225	-1.06	Ca	.1	.3	10.5	9.84	-	-	50	-40.16

Qp - Quasi-Peak detector

Ca - CISPR average detection

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