



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8**

CERTIFICATION TEST REPORT

FOR

TABLE TOP DIMMER

MODEL NUMBER: PD-APS

**FCC ID: JPZ0106
IC: 2851A-JPZ0106**

REPORT NUMBER: 10045641

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Prepared for
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7200 SUTER RD.
COOPERBURG PA, 18036, USA**

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	2014-03-24	Initial Issue	B. DeLisi
1	2014-03-31	Updated calibration due date for dipole antenna. Typographical error only.	B. DeLisi

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LUTRON ELECTRONICS INC.
7200 SUTER RD.
COOPERBURG PA, 18036, USA

EUT DESCRIPTION: Table top dimmer

MODEL: PD-APS

SERIAL NUMBER: Non-serialized production unit

DATE TESTED: 2014-02-06 through 2014-03-24

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Pass
INDUSTRY CANADA RSS-210 Issue 8, Annex 1	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations of these calculations. The results show that the equipment 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 by the referenced documents. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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 By:

Tested By:



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WiSE Lead Engineer
UL LLC

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/1002550.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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.3 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.00 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a table top dimmer for lighting applications. A lamp can plug directly into the plug and it will control the lamp output intensity.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral internal antenna.

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 0793561.

The test utility software used during testing was _RRD_3LD_VA_FCC_C2

5.4. WORST-CASE CONFIGURATION AND MODE

Testing was conducted on the low and high channels for radiated and conducted emissions and occupied bandwidth testing. For duty cycle and transmission time testing was conducted on the default channel when the device is configured in the field.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Lamp	GE	100W	NA	NA

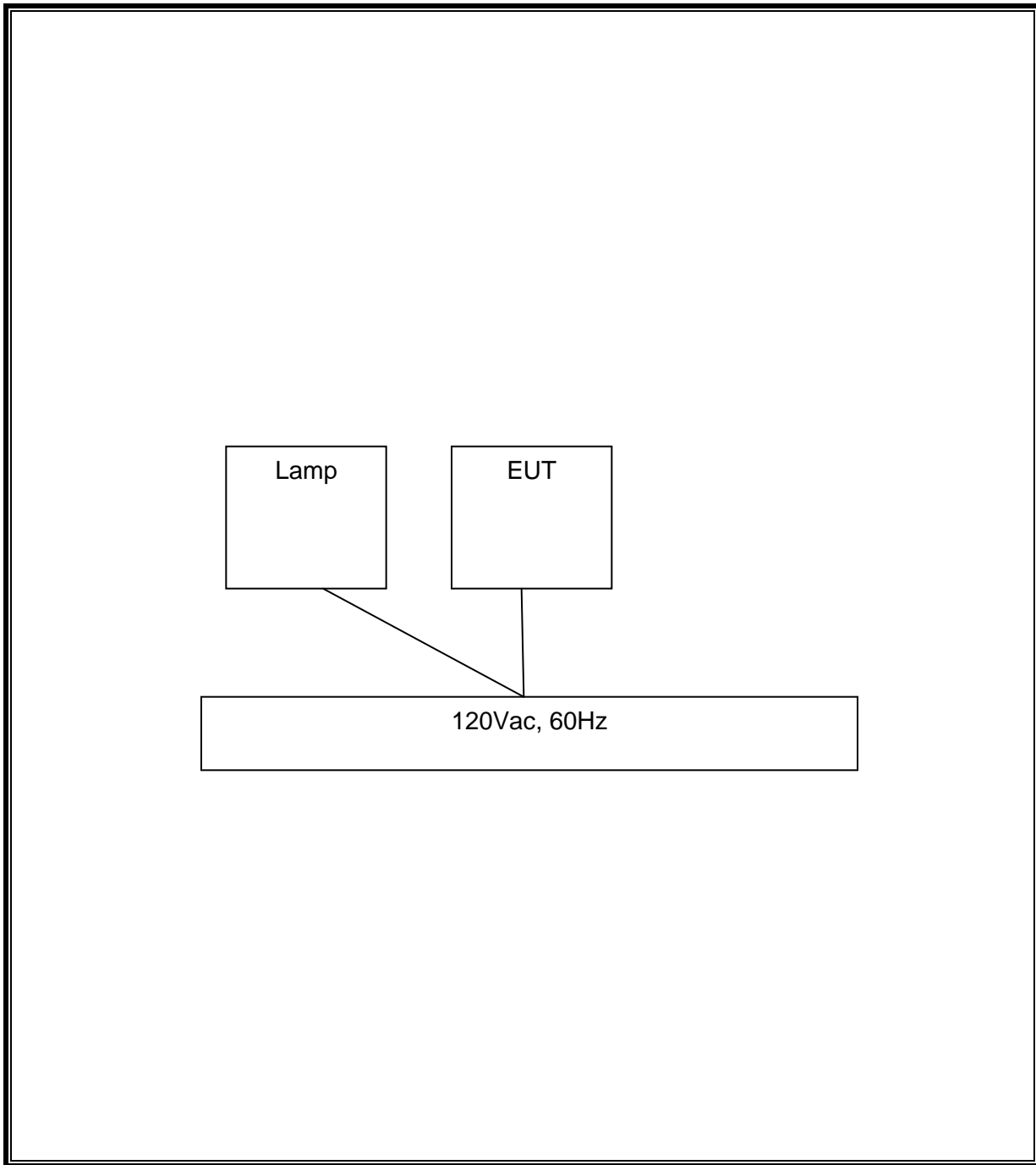
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC Plug	Unshielded	<3m	None
2	AC	1	AC Plug	Unshielded	<3m	Connection from AC plug to lamp

TEST SETUP

The EUT is a stand-alone device. A lamp was connected to the AC plug to simulate actual use.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
60Hz-30MHz					
EMI Receiver	Rohde & Schwarz	ESCI7	75141	2014-01-29	2015-01-31
Active Loop Antenna	EMCO	6507	ME5A-288	2013-12-02	2014-12-02
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43736	2012-12-21	2014-12-21
Multimeter	Fluke	87V	64386	2014-01-28	2015-01-31
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESCI7	75141	2014-01-29	2015-01-31
Biconilog Antenna	Sunol	JB-1	84106	2014-02-19	2015-02-19
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43736	2012-12-21	2014-12-21
Multimeter	Fluke	87V	64386	2014-01-28	2015-01-31
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72823	2014-01-28	2015-01-31
Horn Antenna (1-2 GHz)	ETS	3161-01 (26°)**	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02 (22°)**	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03 (22°)**	48106	2007-09-27	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22
Multimeter	Fluke	83III	ME5B-305	2014-01-28	2015-01-31
<p>* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration.</p> <p>Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.</p> <p>** - Number in parentheses denotes antenna beam width.</p>					

Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2014-01-28	2015-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2014-01-28	2015-01-31
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-12-22	2014-12-22
Multimeter	Fluke	83III	ME5B-305	2014-01-28	2015-01-31

Antenna Port Tests					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Occupied Bandwidth – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2014-01-28	2015-01-31
Antenna	EMCO	3121C-DB4	ME5-751	2014-10-01	2015-10-01
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-12-22	2014-12-22
Multimeter	Fluke	83III	ME5B-305	2014-01-28	2015-01-31
RF Room 1					
Spectrum Analyzer	Agilent	E4446A	72823	2014-01-27	2015-01-31
Dipole Antenna	EMCO	3121C-DB4	3359	2014-01-10	2015-01-10
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22
Multimeter	Fluke	87V	44547	2014-01-29	2015-01-31

7. ANTENNA PORT TEST RESULTS

7.1. 20 dB AND 99% BW

LIMITS

FCC §15.231 (c)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

IC A1.1.3

For the purpose of Section A1.1, the 99% Bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

TEST PROCEDURE

ANSI C63.10

The transmitter output is connected to the spectrum analyzer.

20dB Bandwidth: The RBW is set to 10 KHz. The VBW is set to 30 KHz. The sweep time is coupled. Bandwidth is determined at the points 20 dB down from the modulated carrier.

99% Bandwidth: The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

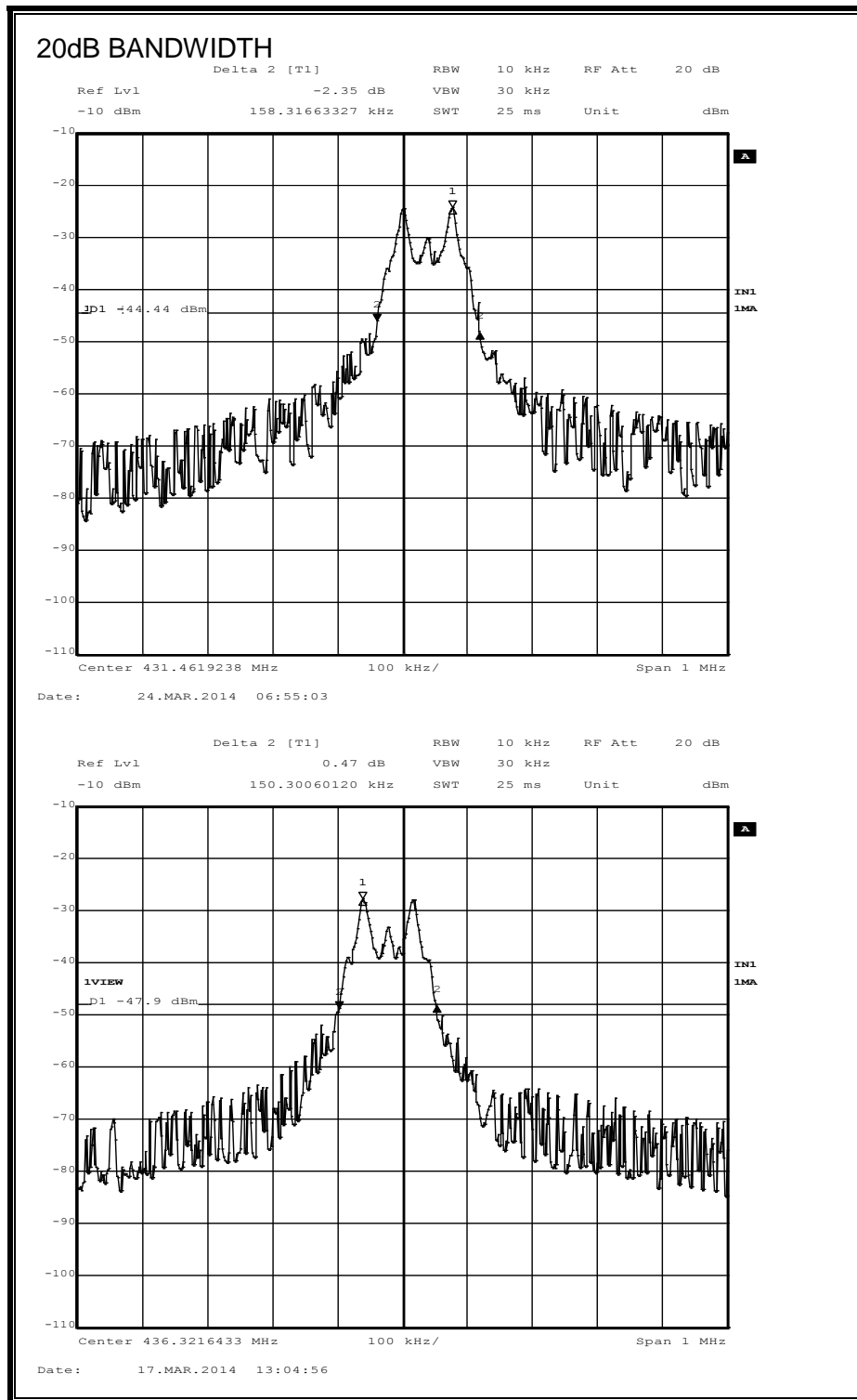
No non-compliance noted:

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431.5	158.3	1078.75	-920.45
436.6	150.3	1091.5	-941.2

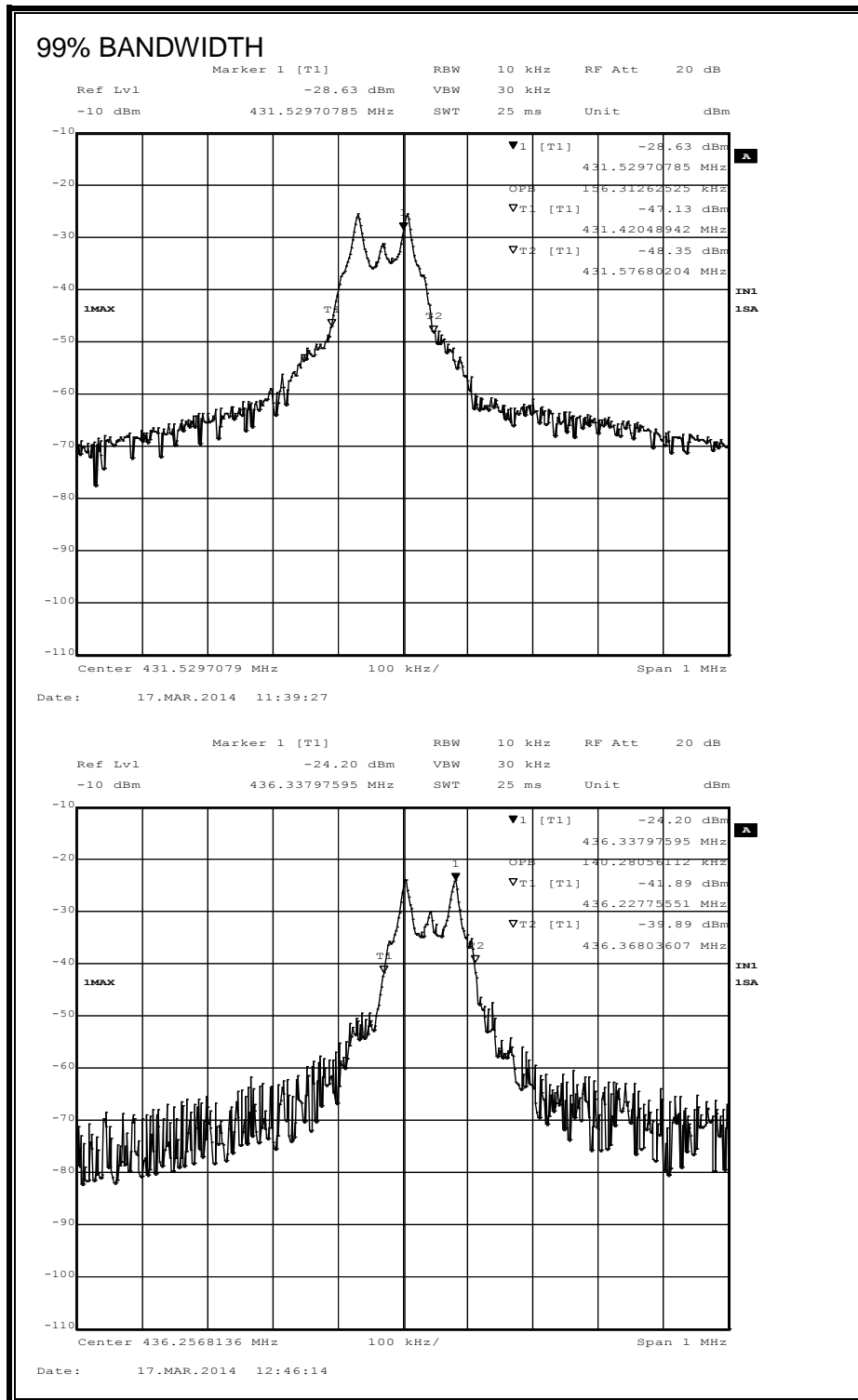
99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431.5	156.3	1078.75	-922.45
436.6	140.2	1091.5	-951.3

20dB BANDWIDTH



99% BANDWIDTH



7.2. DUTY CYCLE

LIMITS

FCC §15.35 (c)

The measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1 MHz and the VBW is set to 1 MHz. The sweep time is coupled and the span is set to 0 Hz. The number of pulses is measured and calculated in a 100 ms scan.

CALCULATION

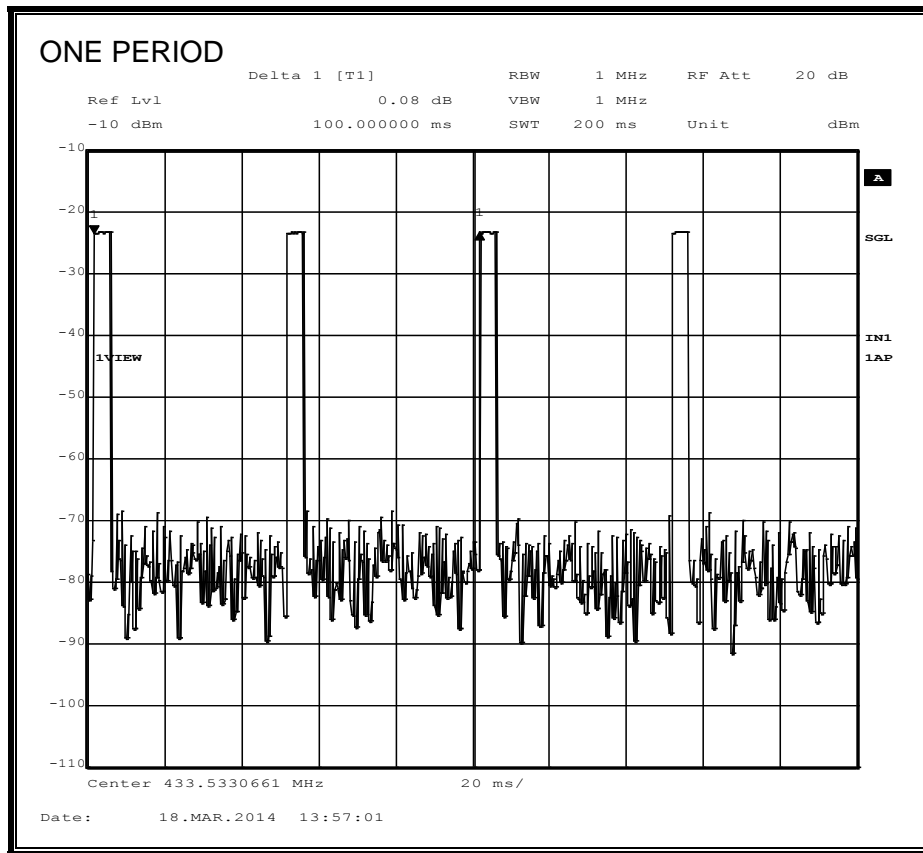
Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is (# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

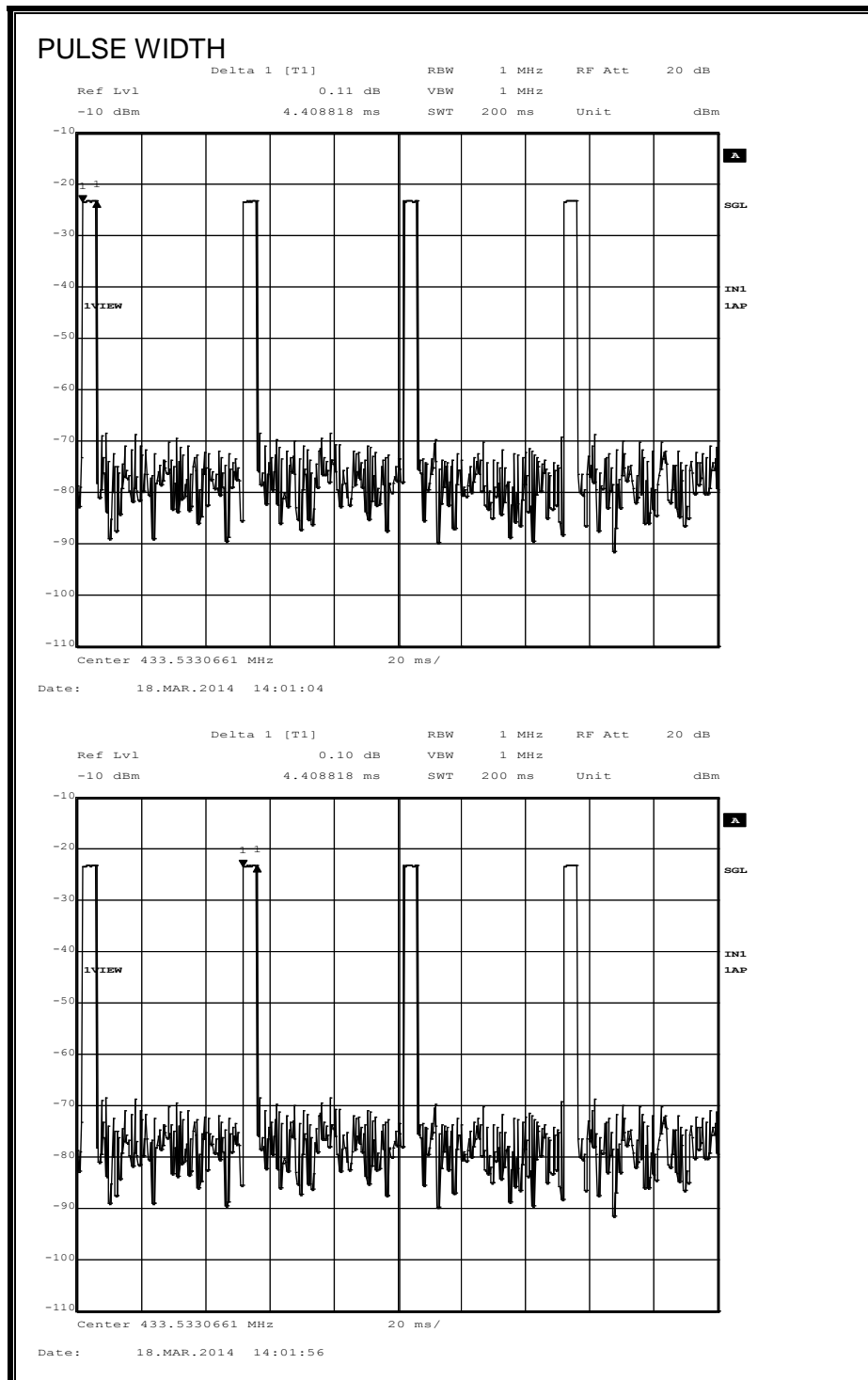
No non-compliance noted:

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	4.4	2	0.00	0	0.088	-21.11

ONE PERIOD



PULSE WIDTH



7.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)

IC A1.1.1 (b)

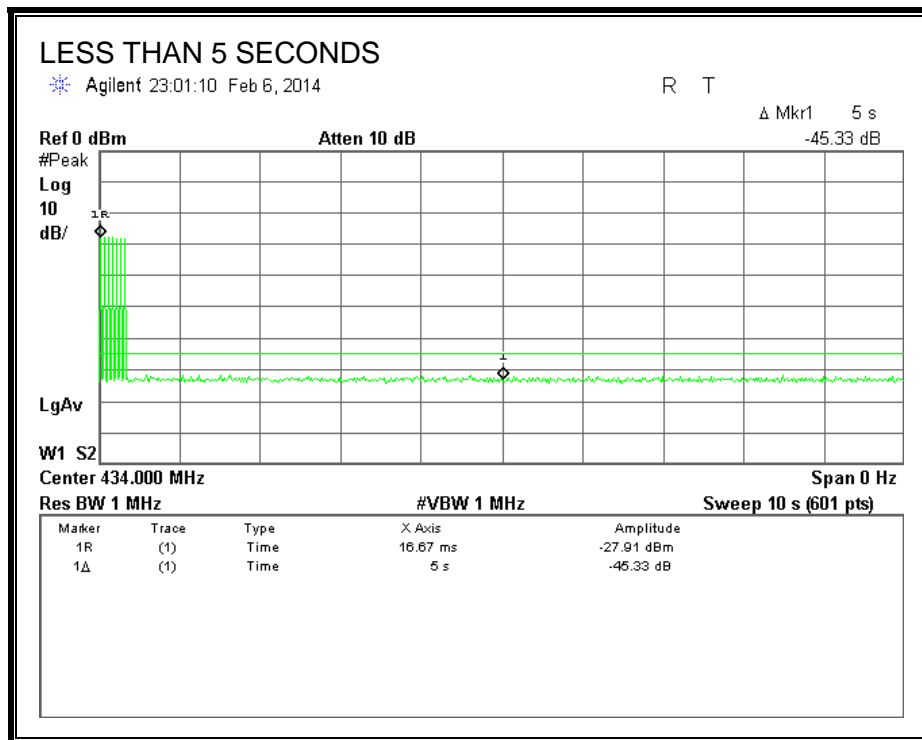
A transmitter activated automatically shall cease transmission within 5 seconds after activation.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1 MHz and the VBW is set to 1 MHz. The sweep time is set to 10 seconds and the span is set to 0 Hz.

RESULTS

No non-compliance noted:



8. RADIATED EMISSION TEST RESULTS

8.1. TX RADIATED SPURIOUS EMISSION

LIMITS

FCC §15.231 (b)
 IC A1.1.2

In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Frequency (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,750 ¹	125 to 375 ¹
174 - 260	3,750	375
260 - 470	3,750 to 12,500 ¹	375 to 1,250 ¹
Above 470	12,500	1,250

¹ Linear interpolation

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2 Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§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:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
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., Sections 15.231 and 15.241.

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

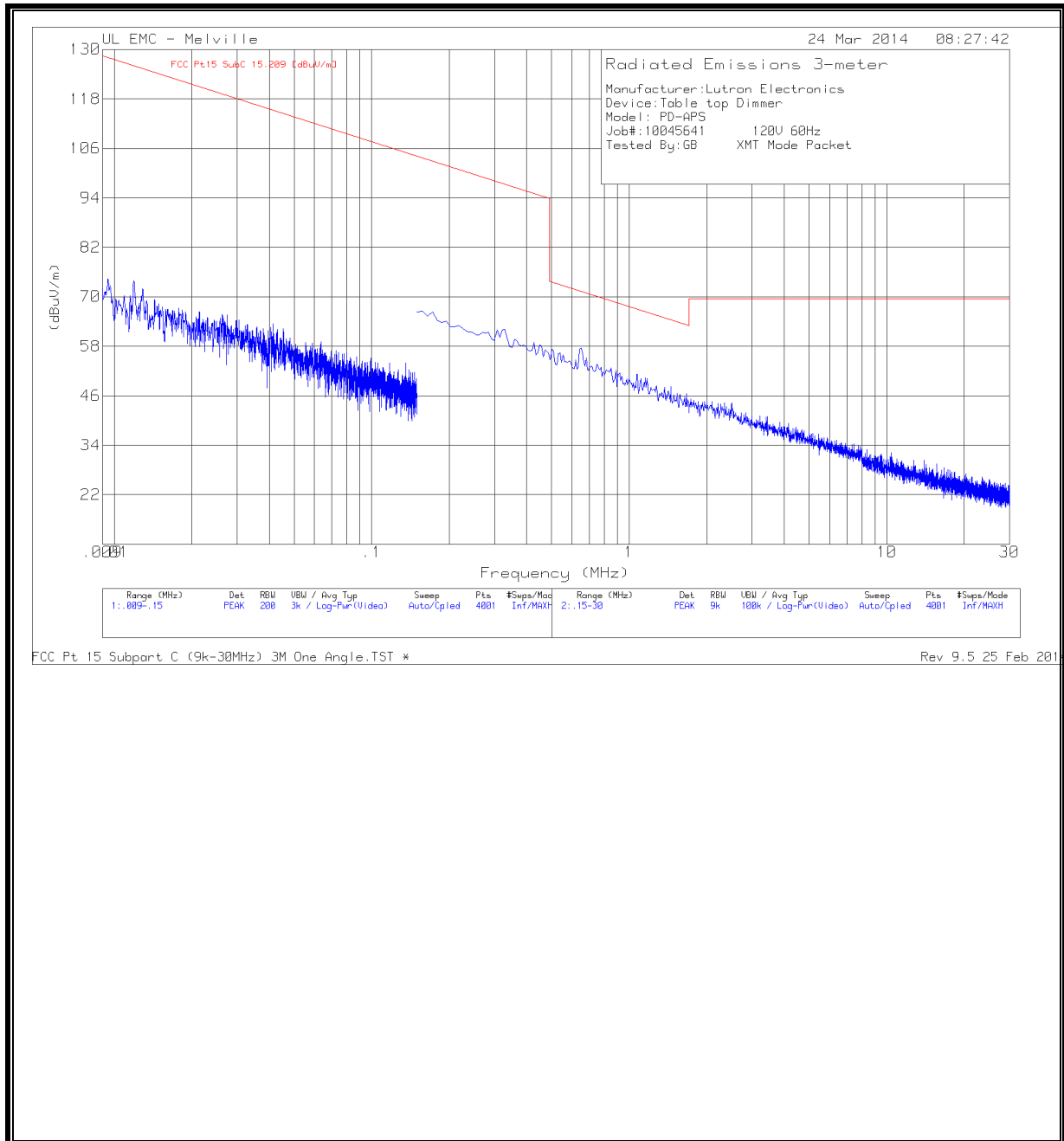
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the peak readings are corrected by the duty cycle correction factor to obtain an average value.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

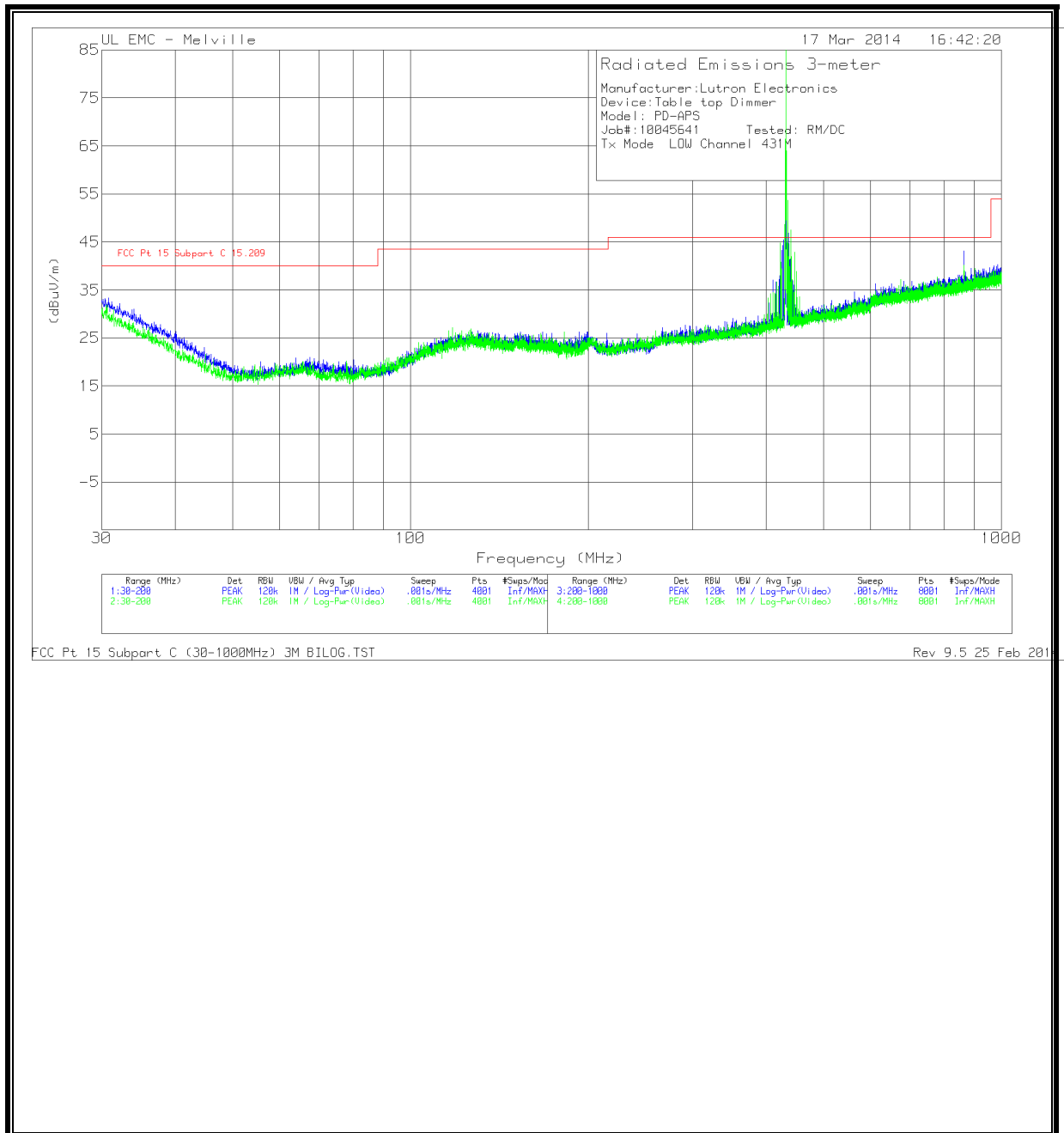
TX SPURIOUS EMISSION (9kHz – 30 MHz)



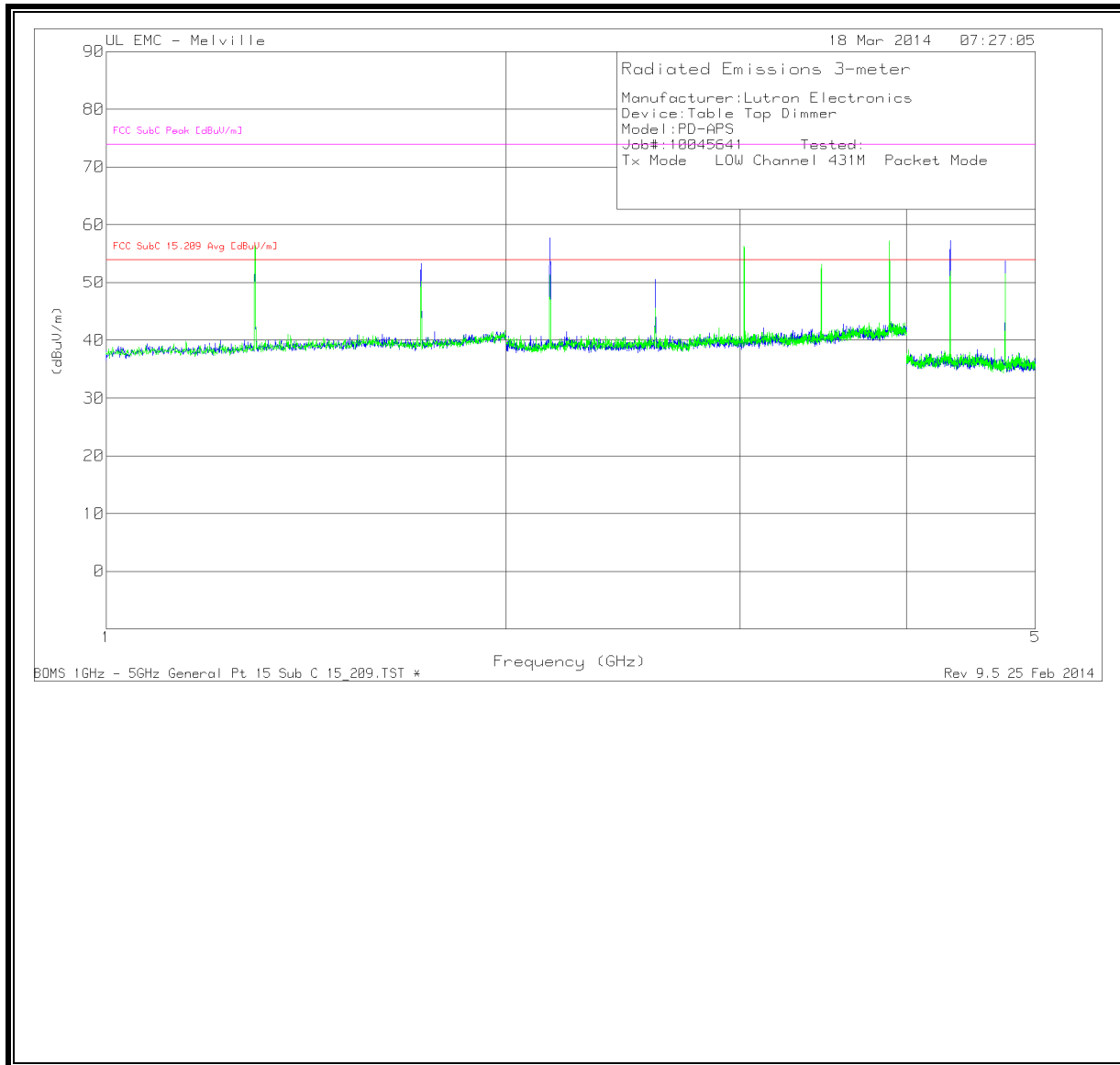
Frequency (MHz)	Meter Reading (dBuV)	Det	AF-5A288 [dB/m]	GL-3M [dB]	Corrected Reading (dBuV/m)	FCC Pt15 SubC 15.209 [dBuV/m]	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
.011926	45.06	PK	28.7	.2	73.96	-	-	0-360	100	V
.012913	43.6	PK	28.2	.2	72	-	-	0-360	100	V
.041501	43.05	PK	20.2	.2	63.45	-	-	0-360	100	V
.063743	41.02	PK	17.7	.3	59.02	-	-	0-360	100	V
.3291	45.54	PK	16.2	.3	62.04	-	-	0-360	100	V
.64999	41.13	PK	16.2	.3	57.63	-	-	0-360	100	V

PK - Peak detector

FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz) – Low Channel



HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz – Low Channel



Frequency (GHz)	Meter Reading (dBuV)	Det	AF-51442 [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.294	77.23	PK	20.5	-44.15	53.58	-21.1	32.48	54	-21.52	74	-20.42	124	163	H
* 1.295	80.71	PK	20.5	-44.21	57	-21.1	35.9	54	-18.1	74	-17	328	400	V
1.726	75.24	PK	20.8	-43.83	52.21	-21.1	31.11	54	-22.89	74	-21.79	240	386	V
1.726	76.47	PK	20.8	-43.83	53.44	-21.1	32.34	54	-21.66	74	-20.56	353	275	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48107 [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.157	81.09	PK	21.4	-43.26	59.23	-21.1	38.13	54	-15.87	74	-14.77	292	368	H
2.157	55.88	PK	21.4	-43.26	34.02	-21.1	12.92	54	-41.08	74	-39.98	249	348	V
2.589	69.86	PK	21.3	-42.47	48.69	-21.1	27.59	54	-26.41	74	-25.31	166	335	V
2.589	73.44	PK	21.3	-42.47	52.27	-21.1	31.17	54	-22.83	74	-21.73	218	339	H
3.02	72.62	PK	21.5	-41.64	52.48	-21.1	31.38	54	-22.62	74	-21.52	121	335	H
3.02	70.77	PK	21.5	-41.64	50.63	-21.1	29.53	54	-24.47	74	-23.37	121	335	V
3.452	73	PK	22.2	-41.25	53.95	-21.1	32.85	54	-21.15	74	-20.05	338	309	V
3.452	69.73	PK	22.2	-41.25	50.68	-21.1	29.58	54	-24.42	74	-23.32	102	309	H
* 3.884	76.02	PK	22.6	-41.48	57.14	-21.1	36.04	54	-17.96	74	-16.86	40	398	H
* 3.884	72.93	PK	22.6	-41.48	54.05	-21.1	32.95	54	-21.05	74	-19.95	314	335	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

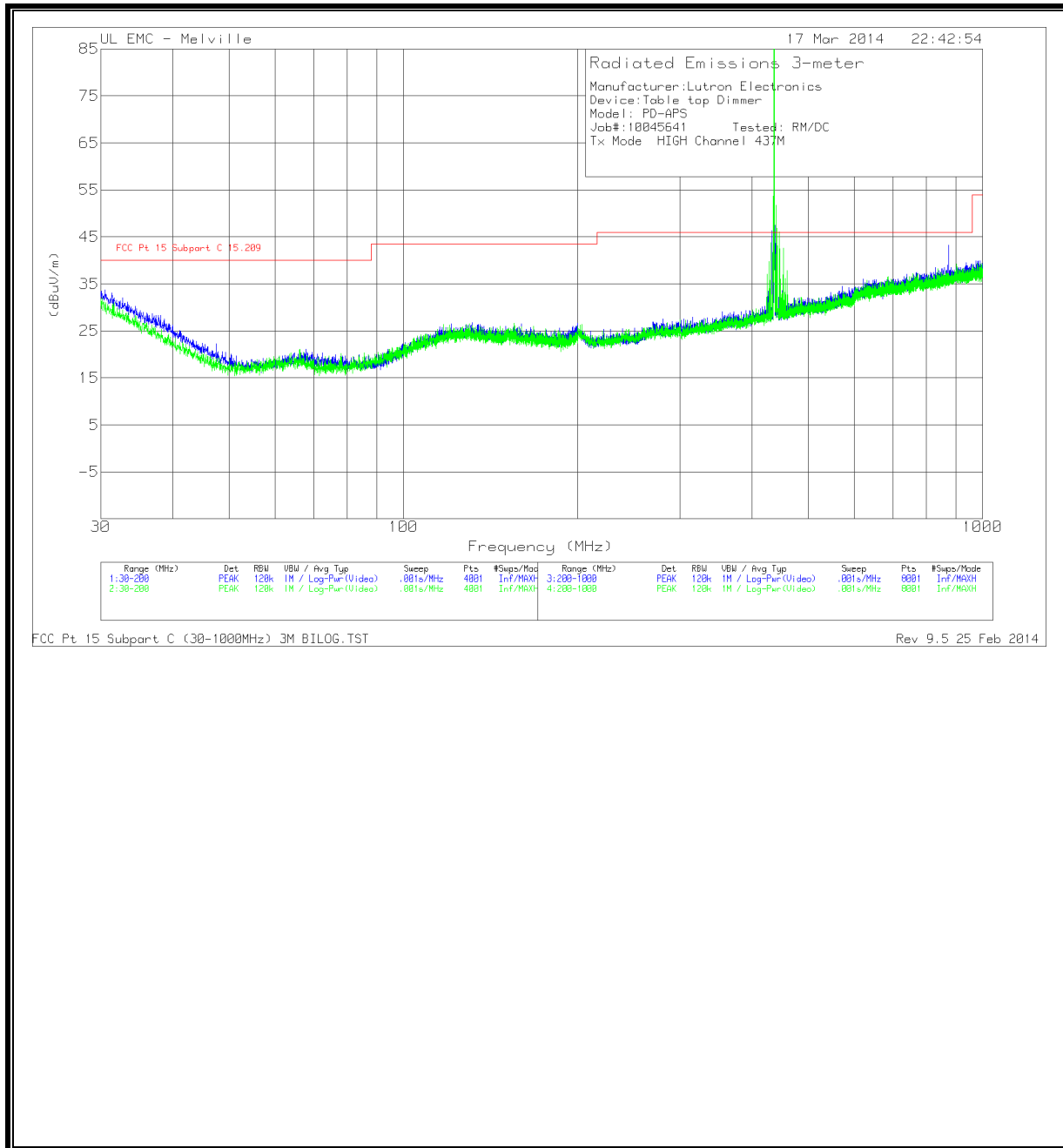
PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48106 [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.315	77.84	PK	27.7	-51.36	54.18	-21.1	33.08	54	-20.92	74	-19.82	105	383	V
* 4.315	79.42	PK	27.7	-51.36	55.76	-21.1	34.66	54	-19.34	74	-18.24	262	196	H
* 4.746	81.16	PK	27.2	-52.01	56.35	-21.1	35.25	54	-18.75	74	-17.65	238	235	H
* 4.746	76.12	PK	27.2	-52.01	51.31	-21.1	30.21	54	-23.79	74	-22.69	39	238	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

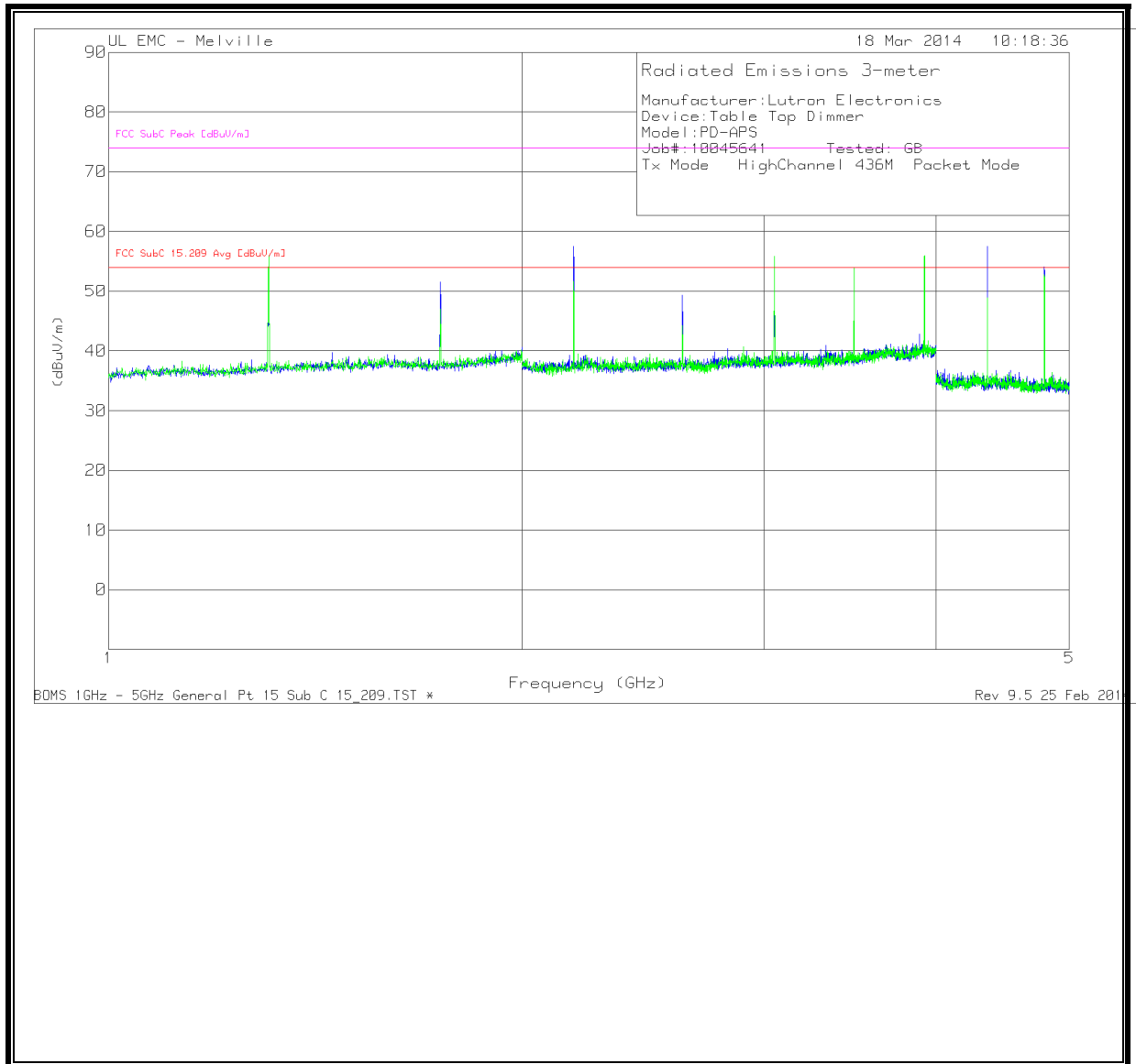
PK - Peak detector

FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz) – High Channel



Frequency	Meter	Det	AF-84106	GL-3M	Corrected	DCF	Corrected	FCC Pt 15	15.231	FCC Pt 15	Margin	FCC SubC	PK Margin	Azimuth	Height	Polarity
(MHz)	Reading		[dB/m]	[dB]	Reading	(dB)	Average	Subpart C	Margin	Subpart C	(dB)	Peak	(dB)	(Degs)	(cm)	
	(dBuV)				(dBuV/m)		Reading	15.231	(dB)	15.209		[dBuV/m]				
436.6358	74.54	PK	17	1.5	93.04	-21.1	71.94	80.9	-8.96	-	-	100.9	-7.86	125	104	H
436.6358	81.19	PK	17	1.5	99.69	-21.1	78.59	80.9	-2.31	-	-	100.9	-1.21	211	111	V
873.27	27.55	PK	22.5	2.1	52.15	-21.1	31.05	60.9	-29.85	-	-	80.9	-28.75	302	102	H
873.27	26.62	PK	22.5	2.1	51.22	-21.1	30.12	60.9	-30.78	-	-	80.9	-29.68	144	275	V
433	1.73	QP	16.9	1.5	20.13	-	-	-	-	46	-25.87	-	-	225	212	H
433.7	4.79	QP	16.9	1.4	23.09	-	-	-	-	46	-22.91	-	-	204	208	H
435.1	10.46	QP	17	1.4	28.86	-	-	-	-	46	-17.14	-	-	206	198	H
439.5	8.37	QP	17.1	1.4	26.87	-	-	-	-	46	-19.13	-	-	211	190	H
434.9	10.76	QP	17	1.4	29.16	-	-	-	-	46	-16.84	-	-	197	206	H
439	10.13	QP	17.1	1.4	28.63	-	-	-	-	46	-17.37	-	-	211	190	H
440.7	4.78	QP	17.1	1.5	23.38	-	-	-	-	46	-22.62	-	-	206	189	H
441.8	2.51	QP	17.1	1.6	21.21	-	-	-	-	46	-24.79	-	-	210	186	H
430.3	3.81	QP	16.8	1.4	22.01	-	-	-	-	46	-23.99	-	-	335	145	V
434.4	15.12	QP	17	1.4	33.52	-	-	-	-	46	-12.48	-	-	195	100	V
435	18.4	QP	17	1.4	36.8	-	-	-	-	46	-9.2	-	-	201	100	V
438.8	20.8	QP	17.1	1.5	39.4	-	-	-	-	46	-6.6	-	-	199	102	V
439.7	17.38	QP	17.1	1.5	35.98	-	-	-	-	46	-10.02	-	-	198	111	V
440.1	15.8	QP	17.1	1.5	34.4	-	-	-	-	46	-11.6	-	-	196	118	V
440.6	14.63	QP	17.1	1.5	33.23	-	-	-	-	46	-12.77	-	-	201	109	V
441.7	11.95	QP	17.1	1.6	30.65	-	-	-	-	46	-15.35	-	-	197	102	V
440.3	15.31	QP	17.1	1.5	33.91	-	-	-	-	46	-12.09	-	-	198	108	V
445.6	8.15	QP	17	1.4	26.55	-	-	-	-	46	-19.45	-	-	205	111	V
446.7	7.9	QP	17	1.5	26.4	-	-	-	-	46	-19.6	-	-	201	103	V
453.4	7.01	QP	17.1	1.5	25.61	-	-	-	-	46	-20.39	-	-	209	102	V

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz – High Channel



Frequency (GHz)	Meter Reading (dBuV)	Det	AF-51442 [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.308	80.86	PK	20.5	-44.19	57.17	-21.1	36.07	54	-17.93	74	-16.83	122	169	V
* 1.308	79.49	PK	20.5	-44.19	55.8	-21.1	34.7	54	-19.3	74	-18.2	122	169	H
1.744	74.06	PK	20.8	-43.82	51.04	-21.1	29.94	54	-24.06	74	-22.96	344	179	H
1.744	72.21	PK	20.8	-43.82	49.19	-21.1	28.09	54	-25.91	74	-24.81	230	378	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
 PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48107 [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.18	79.04	PK	21.4	-43.14	57.3	-21.1	36.2	54	-17.8	74	-16.7	240	344	V
2.18	80.09	PK	21.4	-43.14	58.35	-21.1	37.25	54	-16.75	74	-15.65	321	354	H
2.616	72.27	PK	21.3	-42.33	51.24	-21.1	30.14	54	-23.86	74	-22.76	223	340	H
2.616	67.2	PK	21.3	-42.33	46.17	-21.1	25.07	54	-28.93	74	-27.83	223	340	V
3.052	75.81	PK	21.6	-41.65	55.76	-21.1	34.66	54	-19.34	74	-18.24	332	150	V
3.052	65.93	PK	21.6	-41.65	45.88	-21.1	24.78	54	-29.22	74	-28.12	332	150	H
3.488	73.72	PK	22.2	-41.41	54.51	-21.1	33.41	54	-20.59	74	-19.49	354	248	V
3.488	71.26	PK	22.2	-41.41	52.05	-21.1	30.95	54	-23.05	74	-21.95	243	138	H
* 3.924	77.35	PK	22.7	-41.32	58.73	-21.1	37.63	54	-16.37	74	-15.27	259	389	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
 PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48106 [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.36	82.14	PK	27.6	-51.7	58.04	-21.1	36.94	54	-17.06	74	-15.96	249	387	H
* 4.36	77.25	PK	27.6	-51.7	53.15	-21.1	32.05	54	-21.95	74	-20.85	134	388	V
* 4.796	76.54	PK	27.1	-52.36	51.28	-21.1	30.18	54	-23.82	74	-22.72	16	353	V
* 4.796	78.9	PK	27.1	-52.36	53.64	-21.1	32.54	54	-21.46	74	-20.36	227	316	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
 PK - Peak detector

9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207 (a)
IC RSS-GEN, Section 7.2.2

Frequency of emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.10

RESULTS

No non-compliance noted:

6 WORST EMISSIONS – Low Channel

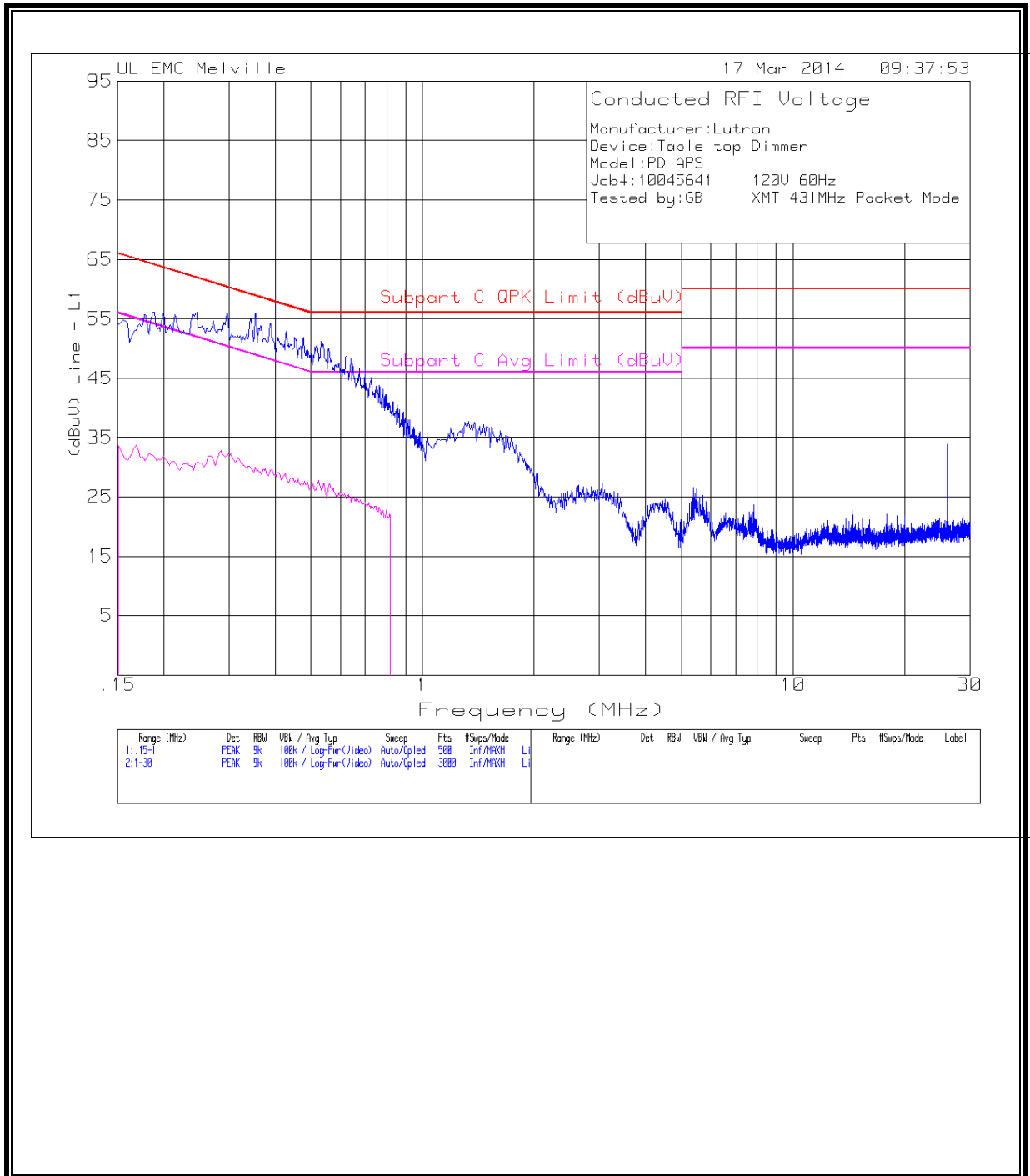
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.17726	45.64	PK	10	55.64	64.61	-8.97	-	-
.24539	46.02	PK	10	56.02	61.91	-5.89	-	-
.29649	45.81	PK	10	55.81	60.34	-4.53	-	-
.35441	45.94	PK	10	55.94	58.86	-2.92	-	-
.53838	40.8	PK	10	50.8	56	-5.2	-	-
26.00634	22.04	PK	11.8	33.84	60	-26.16	50	-16.16
.16898	23.68	Av	10	33.68	-	-	55.01	-21.33
.28373	22.56	Av	10	32.56	-	-	50.71	-18.15
.52448	17.74	Av	10	27.74	-	-	46	-18.26

PK - Peak detector
 Av - average detection

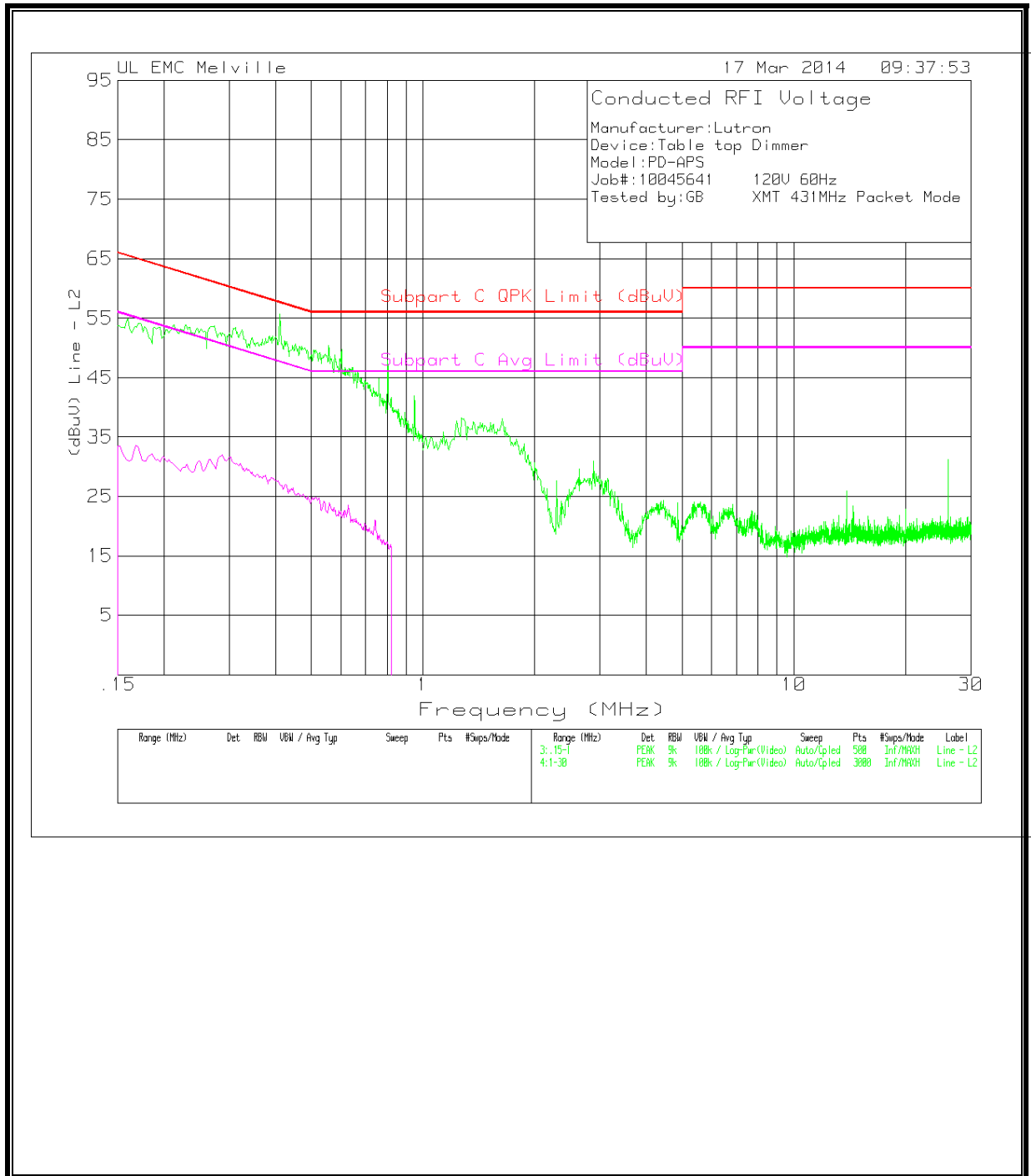
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 2 G/L (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.17385	44.03	PK	10	54.03	64.77	-10.74	-	-
.31182	43.49	PK	10	53.49	59.92	-6.43	-	-
.41062	45.73	PK	10	55.73	57.64	-1.91	-	-
.60311	39.57	PK	10.1	49.67	56	-6.33	-	-
.80241	37.74	PK	10.1	47.84	56	-8.16	-	-
26.00634	19.37	PK	11.8	31.17	60	-28.83	-	-
.16825	23.63	Av	10	33.63	-	-	55.05	-21.42
.3145	20.49	Av	10	30.49	-	-	49.85	-19.36
.63175	12.45	Av	10.1	22.55	-	-	46	-23.45

PK - Peak detector
 Av - average detection

LINE 1 RESULTS – Low Channel



LINE 2 RESULTS – Low Channel



6 WORST EMISSIONS – High Channel

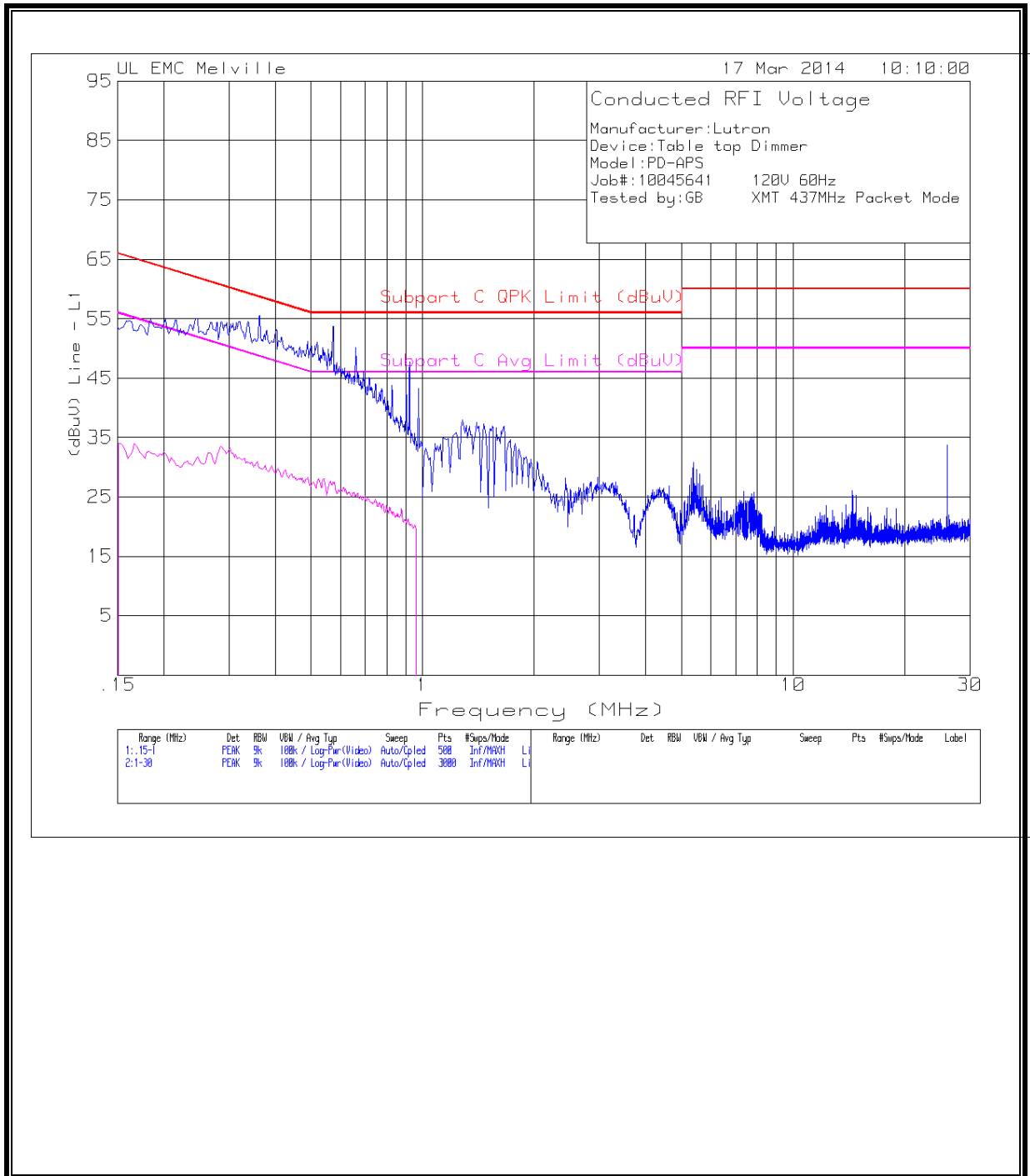
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.21643	44.77	PK	10	54.77	62.95	-8.18	-	-
.36293	45.53	PK	10	55.53	58.66	-3.13	-	-
.57245	43.7	PK	10	53.7	56	-2.3	-	-
.66102	40.1	PK	10	50.1	56	-5.9	-	-
.92164	37.77	PK	10	47.77	56	-8.23	-	-
26.00634	21.86	PK	11.8	33.66	60	-26.34	-	-
.16673	23.98	Av	10	33.98	-	-	55.12	-21.14
.28373	23.38	Av	10	33.38	-	-	50.71	-17.33
.57848	17.44	Av	10	27.44	-	-	46	-18.56
.87548	12.96	Av	10	22.96	-	-	46	-23.04

PK - Peak detector
 Av - average detection

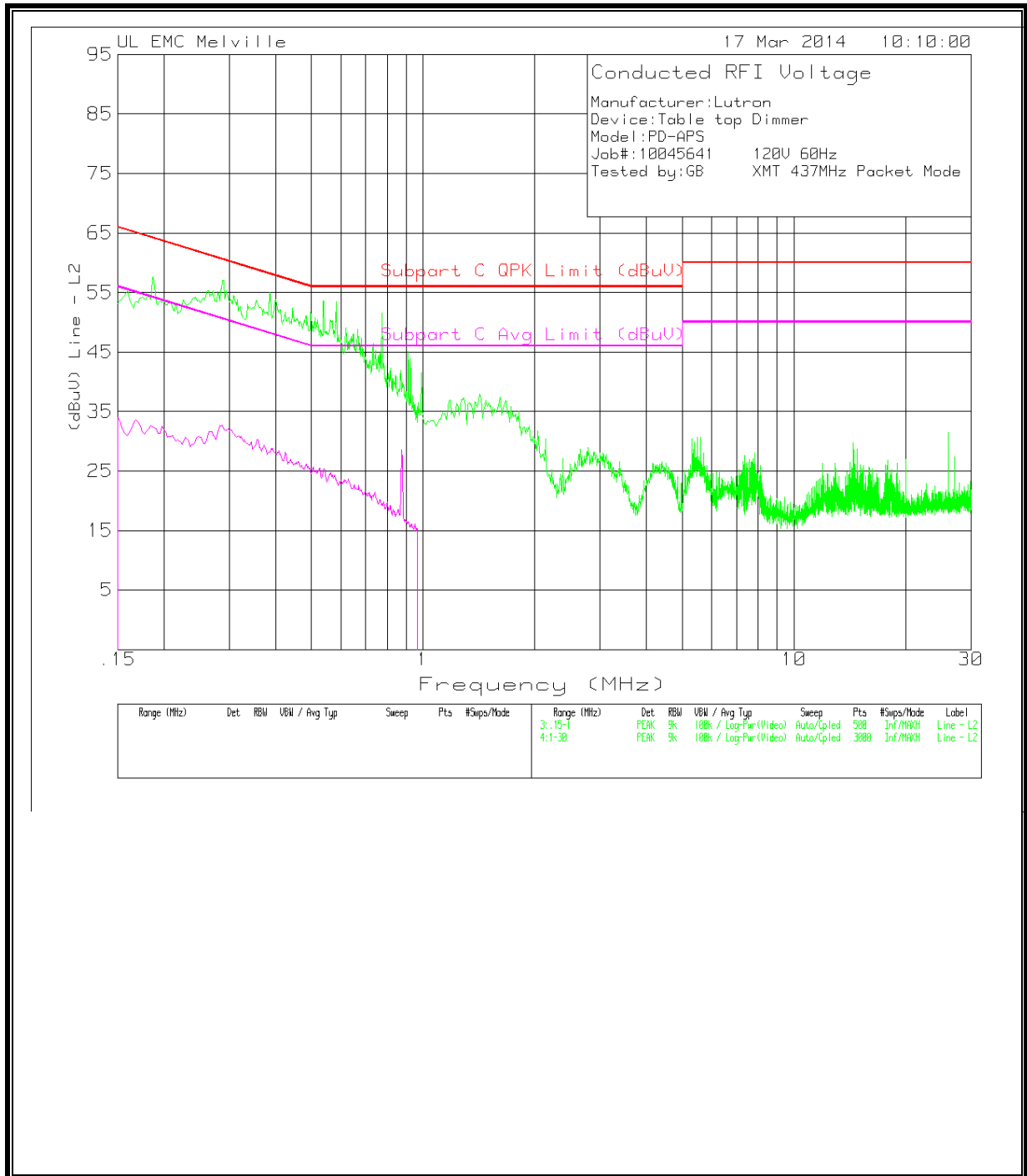
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 2 G/L (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.18748	47.62	PK	10	57.62	64.15	-6.53	-	-
.28798	46.98	PK	10	56.98	60.58	-3.6	-	-
.38507	45.08	PK	10	55.08	58.17	-3.09	-	-
.54008	43.47	PK	10.1	53.57	56	-2.43	-	-
.77345	41.46	PK	10.1	51.56	56	-4.44	-	-
26.00634	19.61	PK	11.8	31.41	60	-28.59	-	-
.15475	21.96	Av	10.1	32.06	-	-	55.74	-23.68
.26725	21.56	Av	10	31.56	-	-	51.2	-19.64
.39325	18.78	Av	10	28.78	-	-	47.99	-19.21
.877	18.49	Av	10.1	28.59	-	-	46	-17.41

PK - Peak detector
 Av - average detection

LINE 1 RESULTS – High Channel

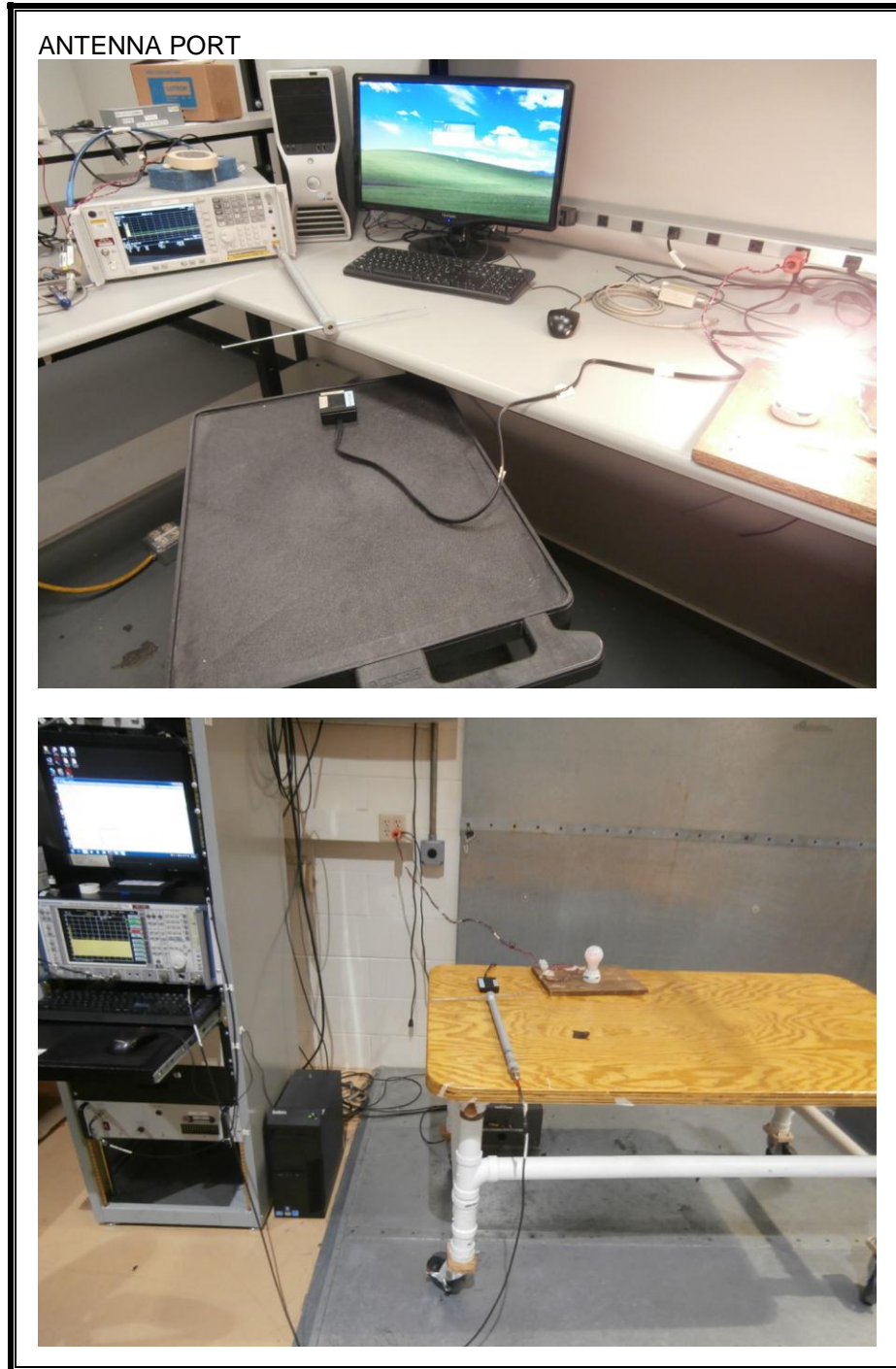


LINE 2 RESULTS – High Channel

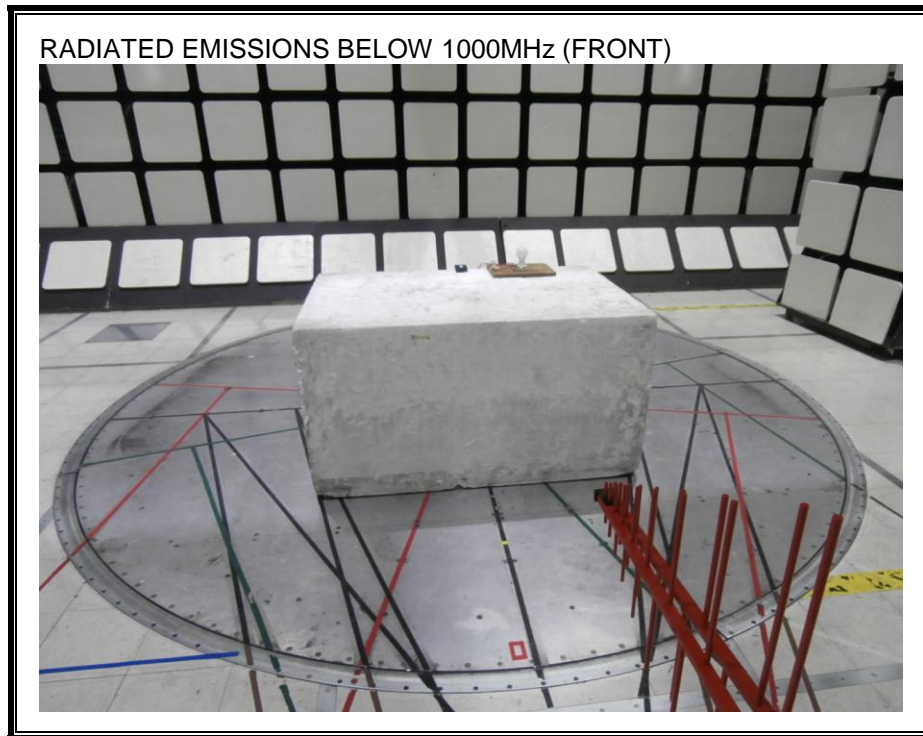


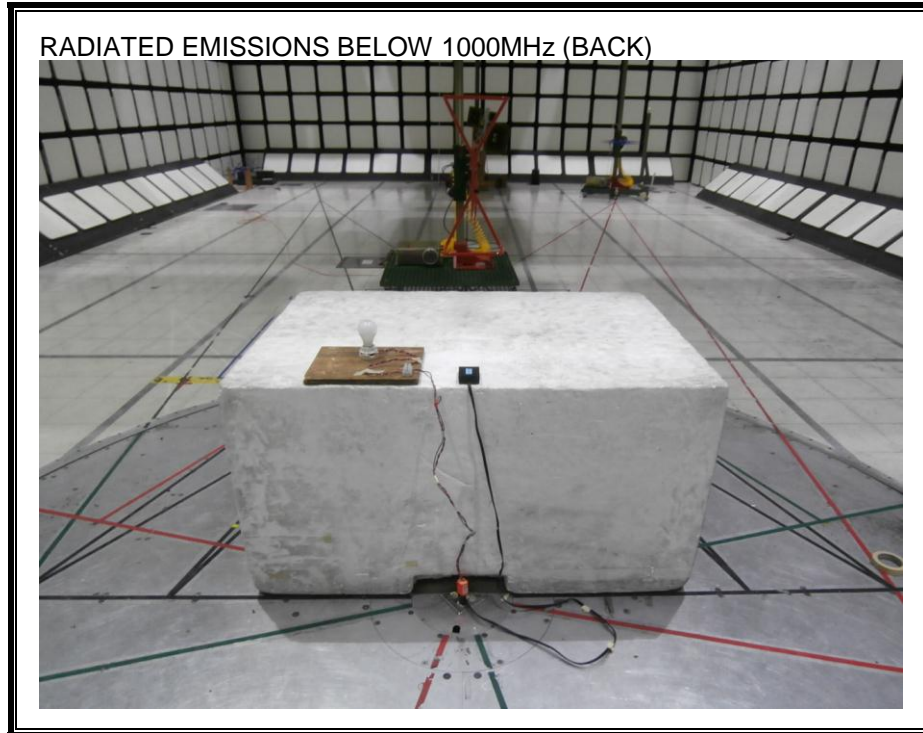
10. SETUP PHOTOS

ANTENNA PORT

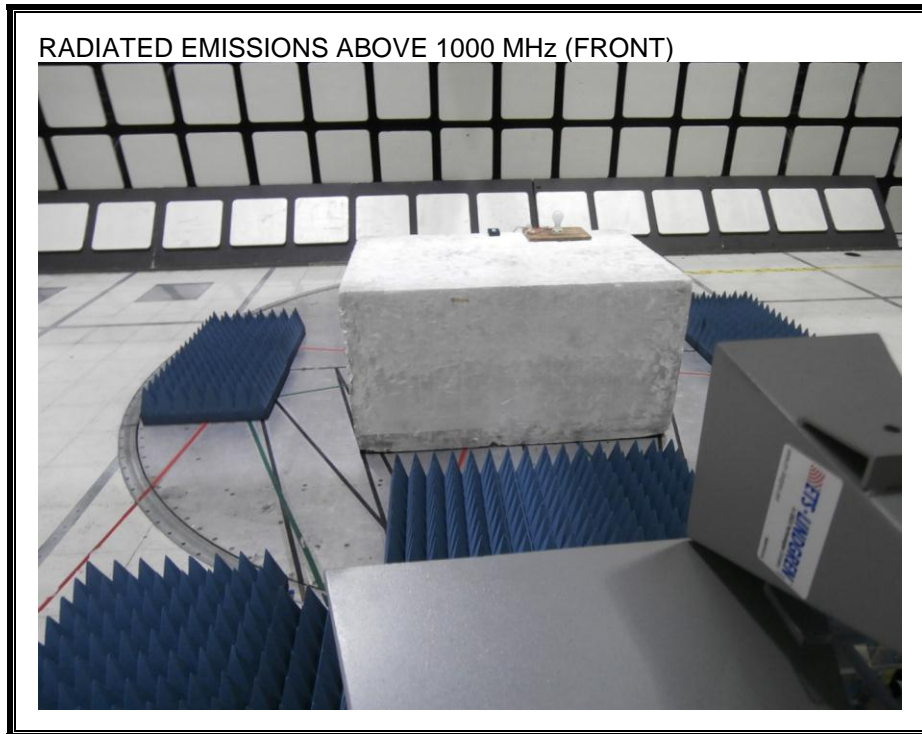


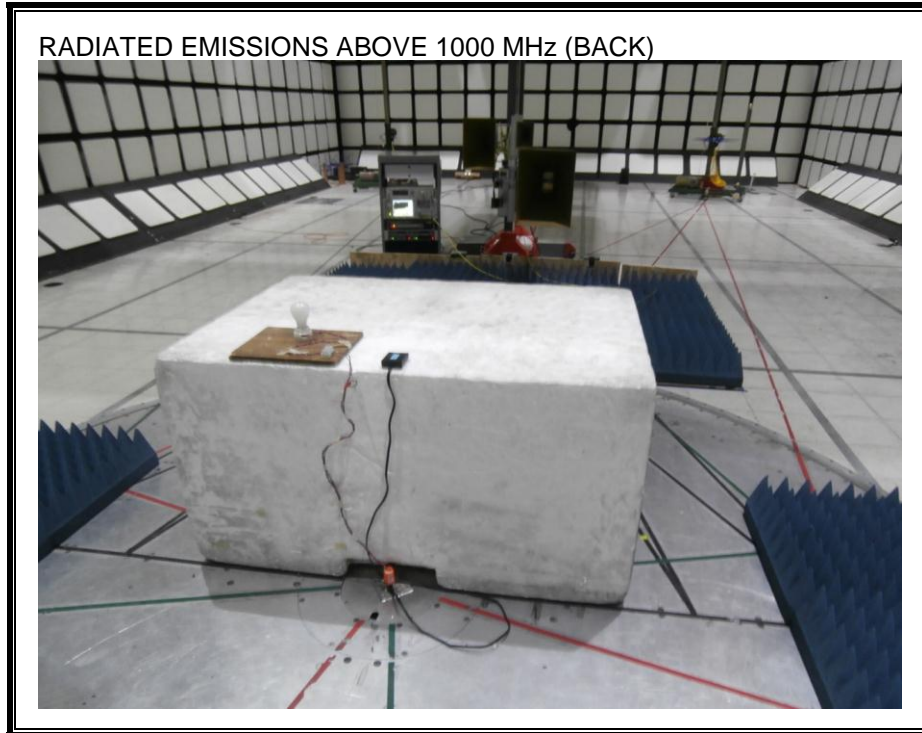
RADIATED EMISSION BELOW 1000 MHz



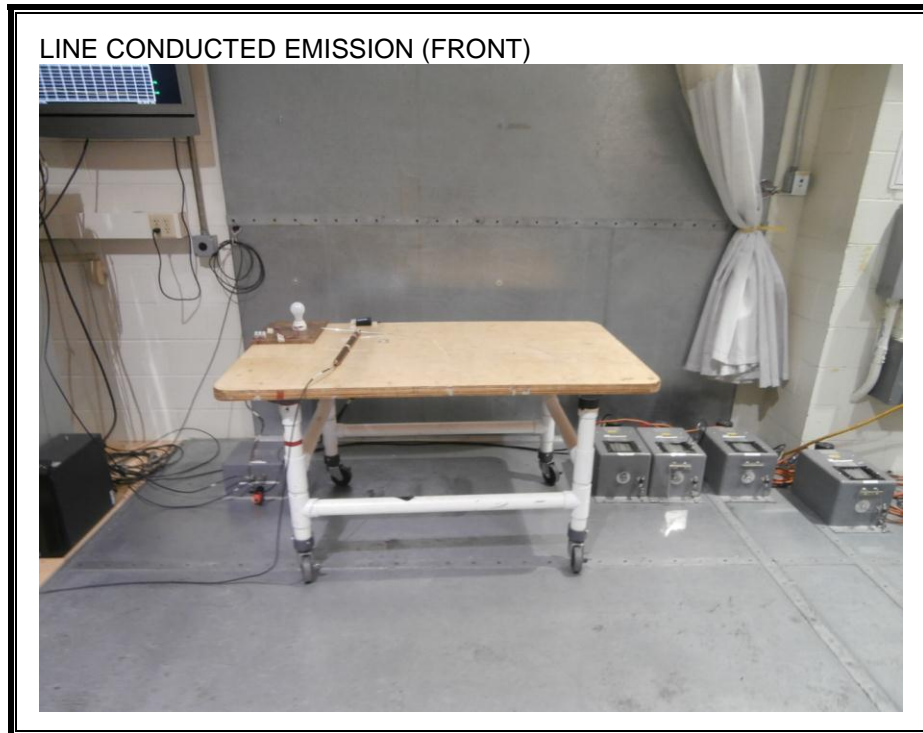


RADIATED EMISSION ABOVE 1000 MHz





AC MAINS LINE CONDUCTED EMISSION





END OF REPORT