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

CERTIFICATION TEST REPORT

FOR

EUT

MODEL NUMBER: LMJ-5T-DV-B

FCC ID: JPZ0105
IC: 2851A- JPZ0105

REPORT NUMBER: 10123132

ISSUE DATE: 2014-02-06

Prepared for
LUTRON ELECTRONICS INC.
7200 SUTER RD.
COOPERBURG PA, 18036, USA

Prepared by
UL LLC
1285 WALT WHITMAN RD.
MELVILLE, NY 11747, U.S.A.
TEL: (631) 271-6200
FAX: (877) 854-3577

NVLAP LAB CODE 100255-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	2014-02-06	Initial Issue	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: Relay Control

MODEL: LMJ-5T-DV-B

SERIAL NUMBER: Non-serialized production unit.

DATE TESTED: 2014-01-07 through 2014-02-05

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:

Michael Antola
WiSE Lead Engineer
UL LLC

Tested By:

Bob DeLisi
WiSE Principal Engineer
UL LLC

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:

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

Note: Data may show BOMS Factor for combined Gain/Loss above 1GHz and GL for combined Gain/Loss below 1GHz.

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 transceiver used for lighting applications and dimming control of LED drivers. The transceiver operates between 431MHz and 437MHz.

The LMJ-5PWM-DV-B is also represented by this report. It is identical in construction to the model tested with some filter caps removed that change the PWM signal created by these products into a 0-10V signal. These changes will not affect the devices RF performance

Receive mode testing of this device was covered under UL Project 10049837.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral wire antenna.

5.3. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was LMJ1.27.

The test utility software used during testing was 0to10434FCC81.

5.4. WORST-CASE CONFIGURATION AND MODE

Testing was conducted on the high and low channels for radiated and conducted tests. For antenna port tests, testing was tested on a signal channel. The worst case orientation was the Y-axis.

5.5. MODIFICATIONS

The devices programmed output power was reduced to ensure the 3rd harmonic met the requirements.

5.6. DESCRIPTION OF TEST SETUP

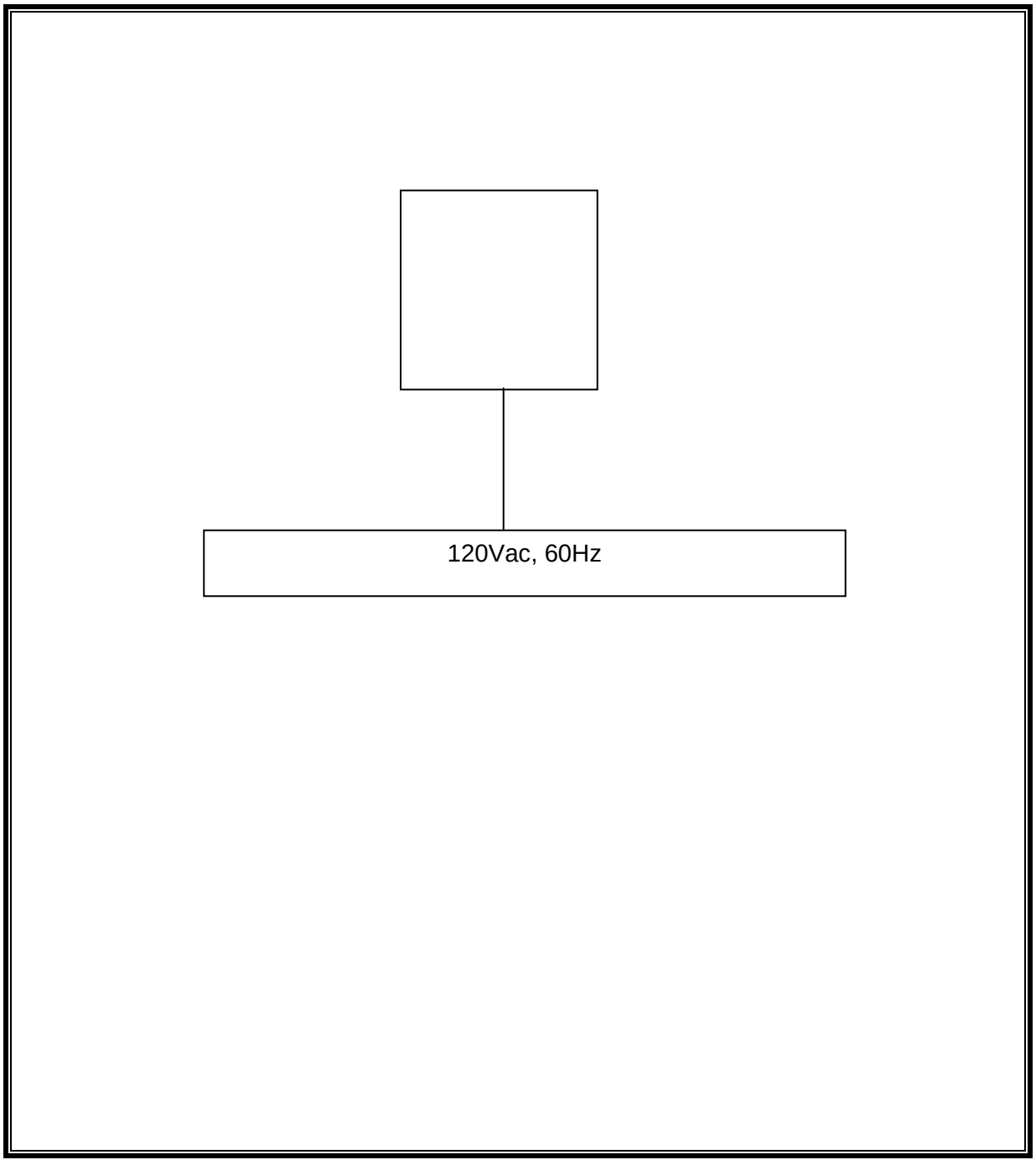
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identica Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	Hardware	Unshielded	<3m	None

TEST SETUP

The EUT was setup as a stand alone device.

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
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESCI 7	75141	2013-01-30	2014-01-31
Bicon Antenna	Schaffner	VBA6106A	54	2013-04-03	2014-04-03
Log-P Antenna	Schaffner	UPA6109	44067	2013-07-09	2014-07-09
Switch Driver	HP	11713A	ME7A-627	NA	NA
System Controller	Sunol Sciences	SC99V	44396	NA	NA
Camera Controller	Panasonic	WV-CU254	44395	NA	NA
RF Switch Box	UL	1	44398	NA	NA
Measurement Software	UL	Version 9.5	44740	NA	NA
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-22-12	2014-12-22
Multimeter	Fluke	83V	43443	2013-01-28	2014-01-31
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72823	2013-01-30	2014-01-31
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	NA	NA
Gain Controller	HP	11713A	50251	NA	NA
RF Switch / Preamp Fixture	UL	BOMS1	50249	NA	NA
System Controller	UL	BOMS2	50252	NA	NA
Measurement Software	UL	Version 9.5	44740	NA	NA
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-22-12	2014-12-22
Multimeter	Fluke	87V	79648	2013-01-28	2014-01-31

* - 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.

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.

** - Number in parentheses denotes antenna beam width.

Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2013-01-29	2014-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2013-02-01	2014-02-28
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	2012-03-08	2014-03-08
Multimeter	Fluke	87V	44547	2013-01-28	2014-01-31

Bench Tests					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
RF Room 1					
Spectrum Analyzer	Agilent	E4446A	72823	2013-01-29	2014-01-31
Dipole Antenna	EMCO	3121C	3359	2014-01-10	2015-01-10
Multimeter	Fluke	87V	44547	2013-01-28	2014-01-31

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 C63.4

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 10 KHz. 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:

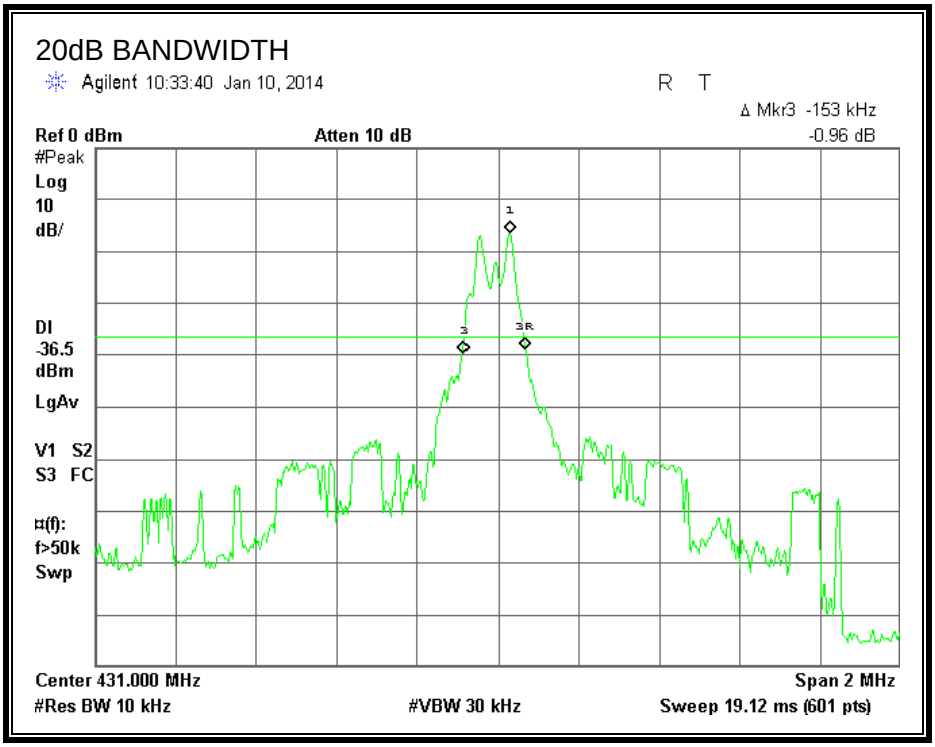
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431	153	1077.5	-924.5

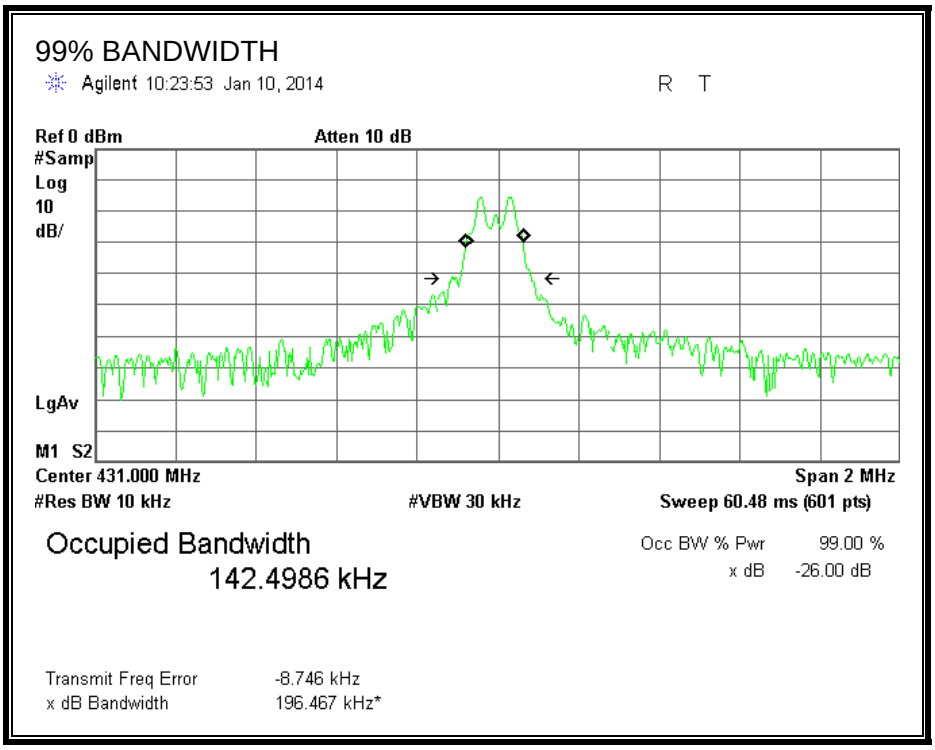
99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431	142.5	1077.5	-935

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

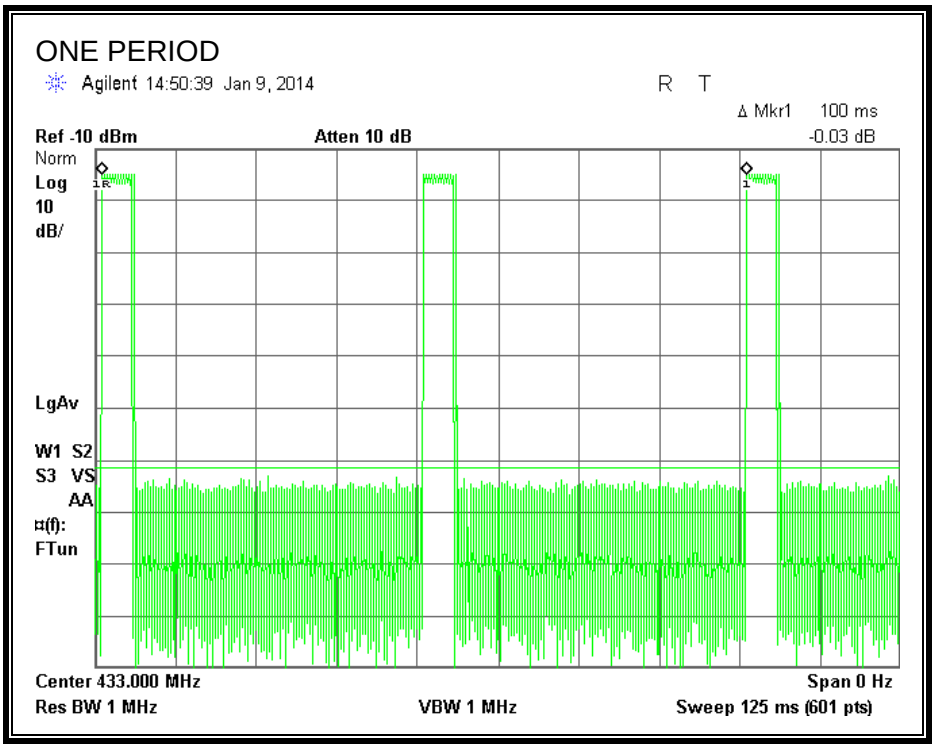
Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is
(# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

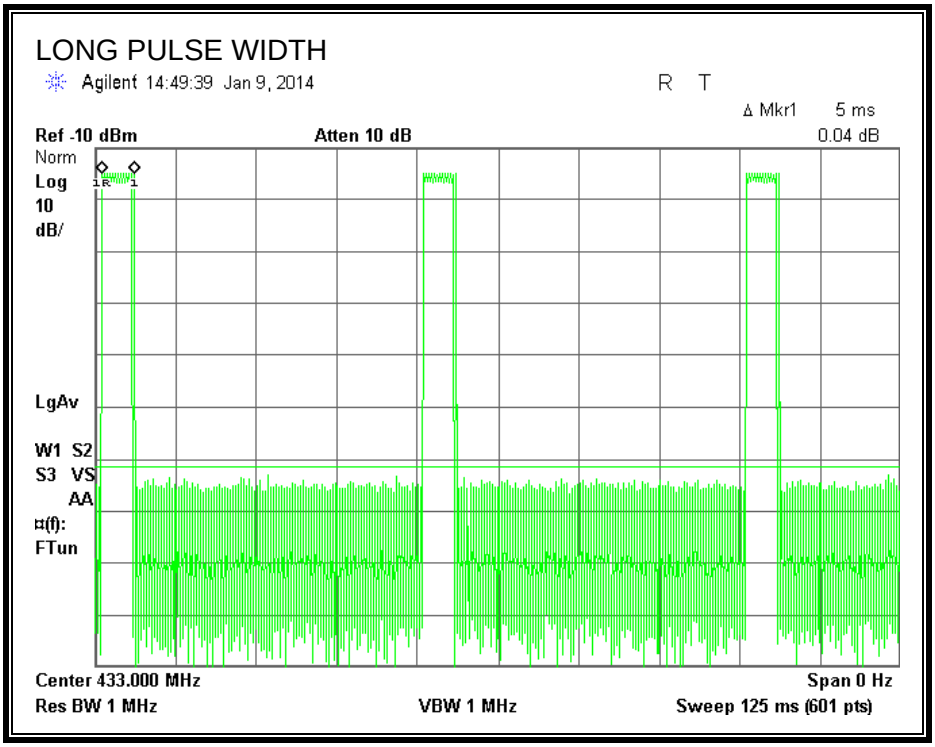
No non-compliance noted:

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	5	1	5.00	1	0.100	-20.00

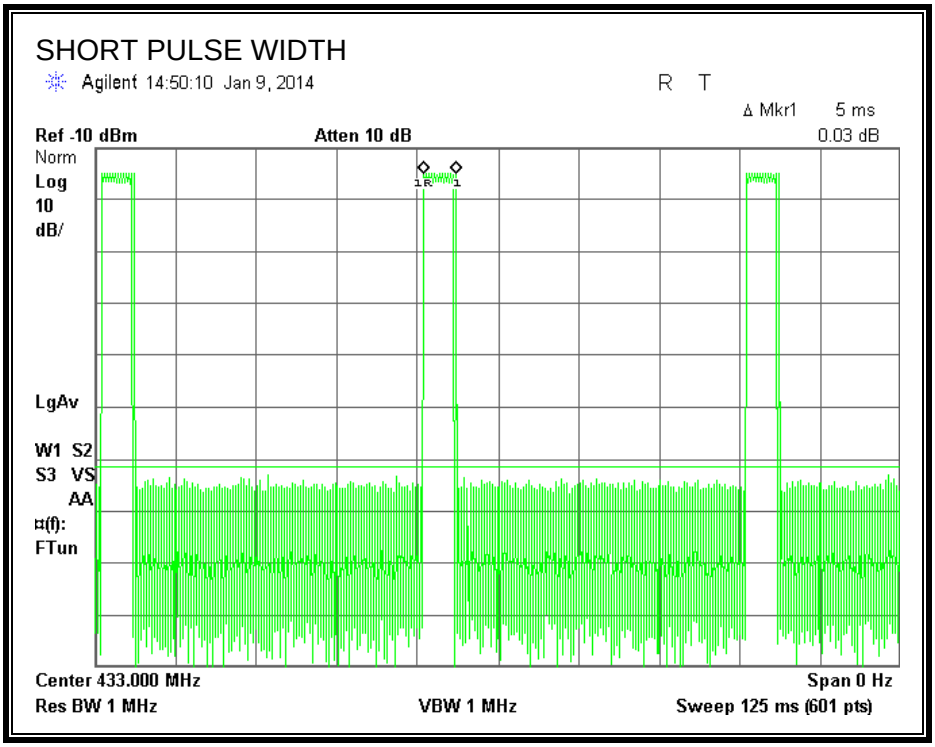
ONE PERIOD



LONG PULSE WIDTH



SHORT PULSE WIDTH



7.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)

IC A1.1.1 (b)

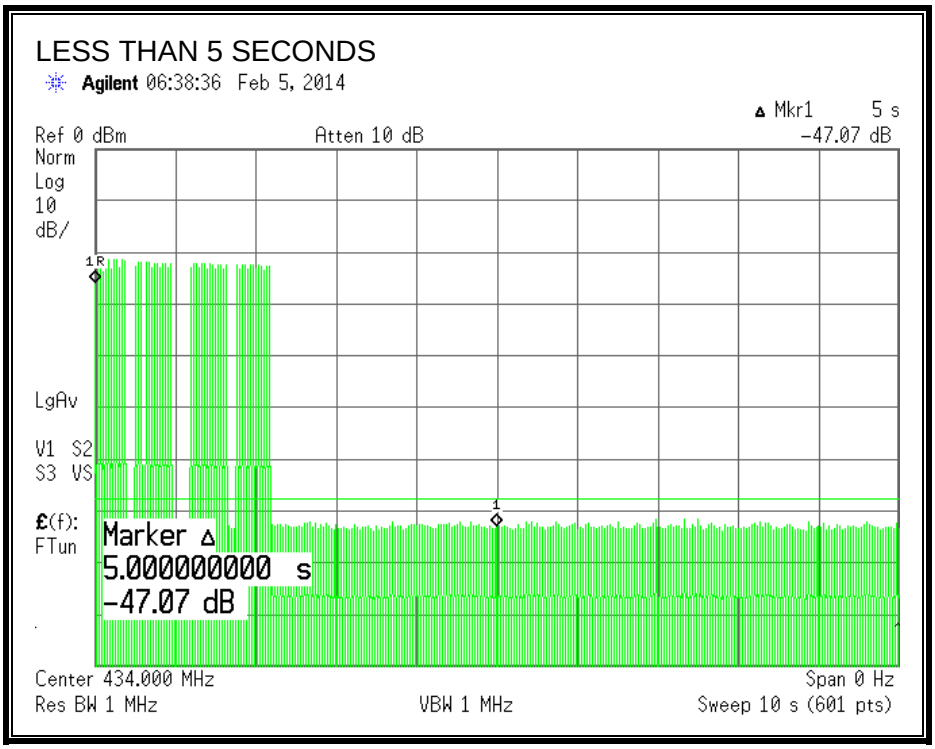
A transmitter activated automatically shall cease transmission within 5 seconds after activation.

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:



7.4. 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 C63.4. 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.

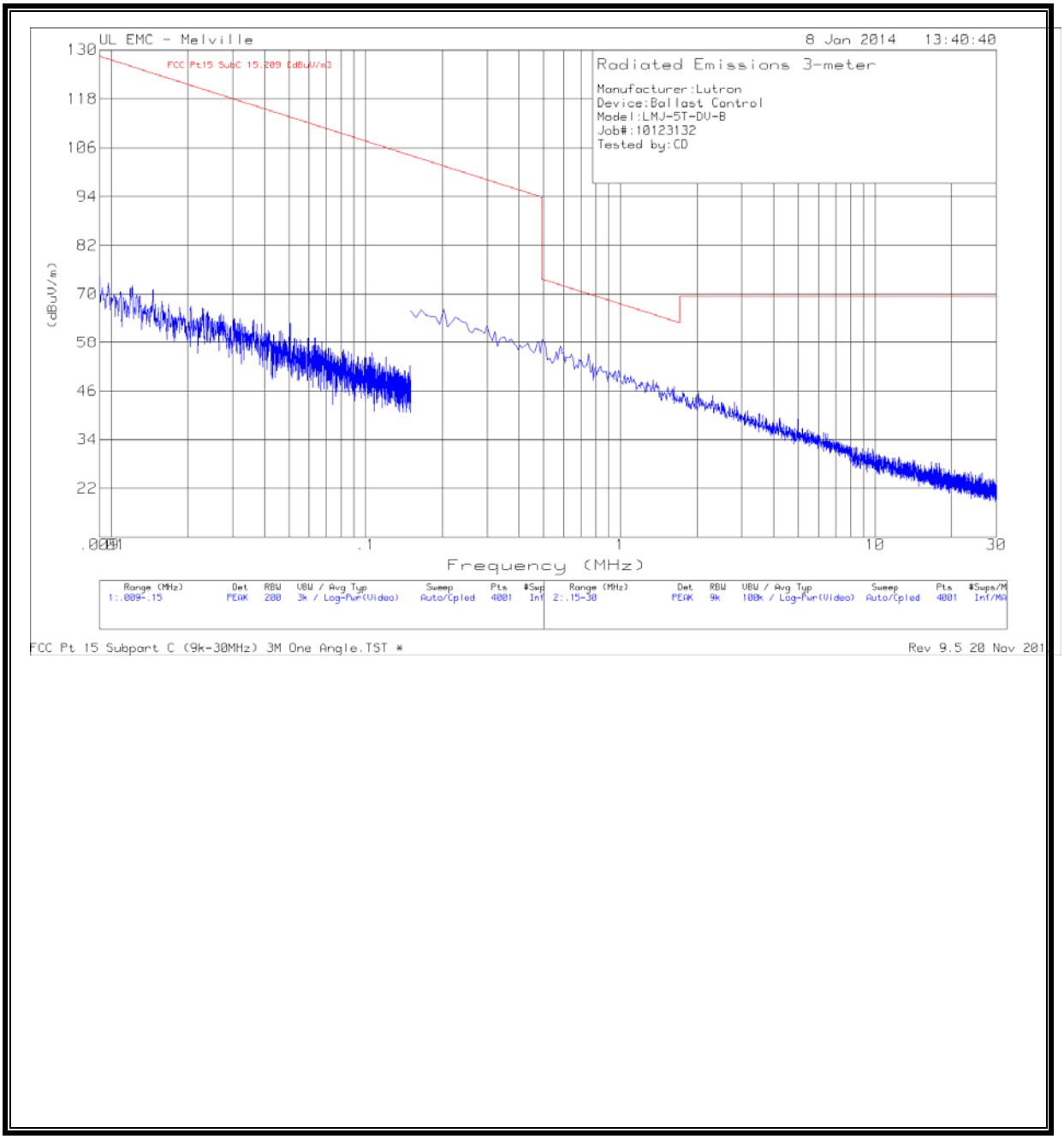
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

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:

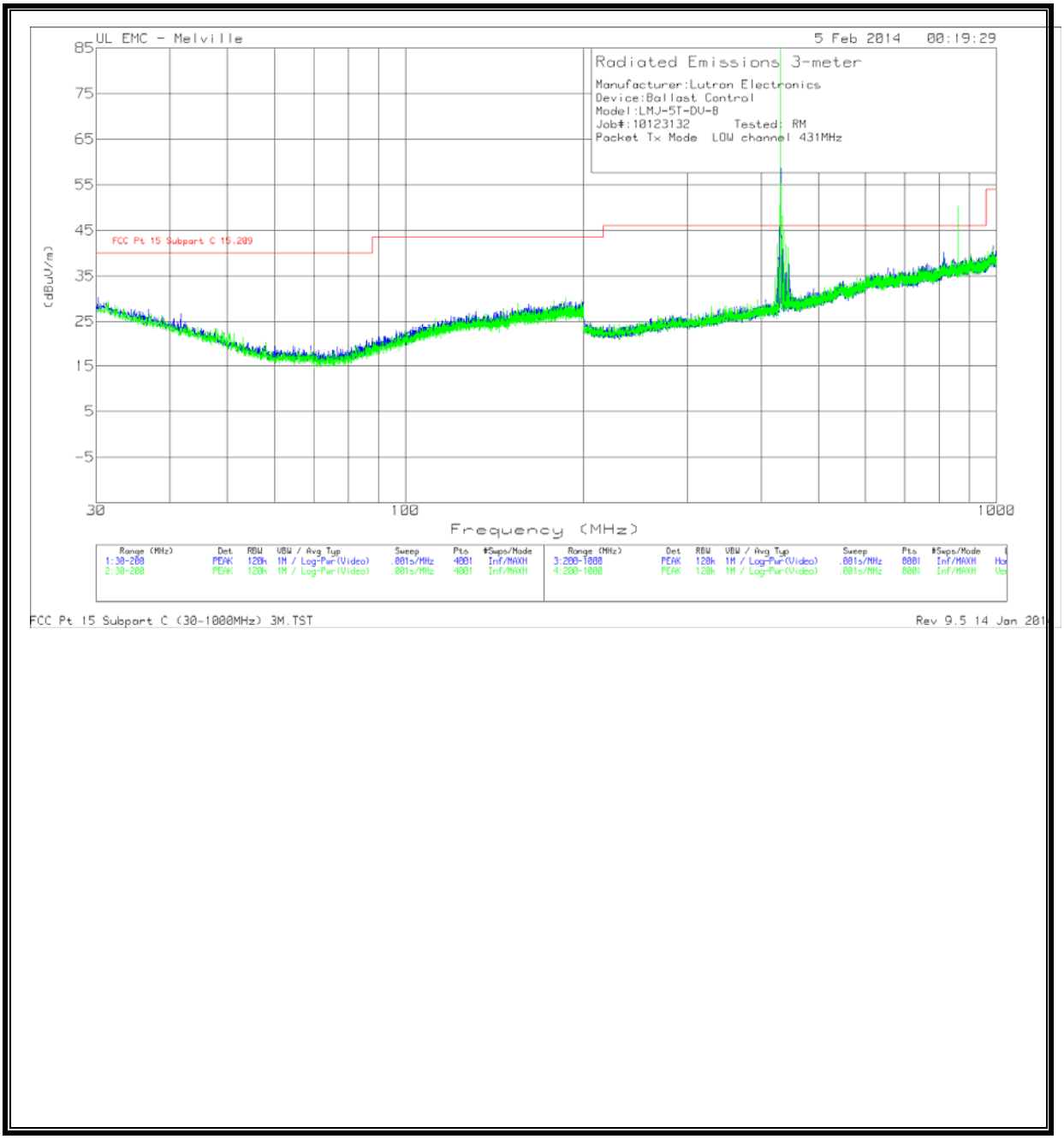
TX SPURIOUS EMISSION (9kHz – 30 MHz)



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)
.012067	42.05	PK	28.7	.2	70.95	125.95	-55	0-360	101
.01457	43.68	PK	27.3	.2	71.18	124.32	-53.14	0-360	101
.050489	43.78	PK	18.8	.3	62.88	113.53	-50.65	0-360	101
.20224	49.84	PK	16.2	.3	66.34	101.48	-35.14	0-360	101
.49328	42.22	PK	16.2	.3	58.72	73.74	-15.02	0-360	101
.747	38.67	PK	16.2	.3	55.17	70.14	-14.97	0-360	101

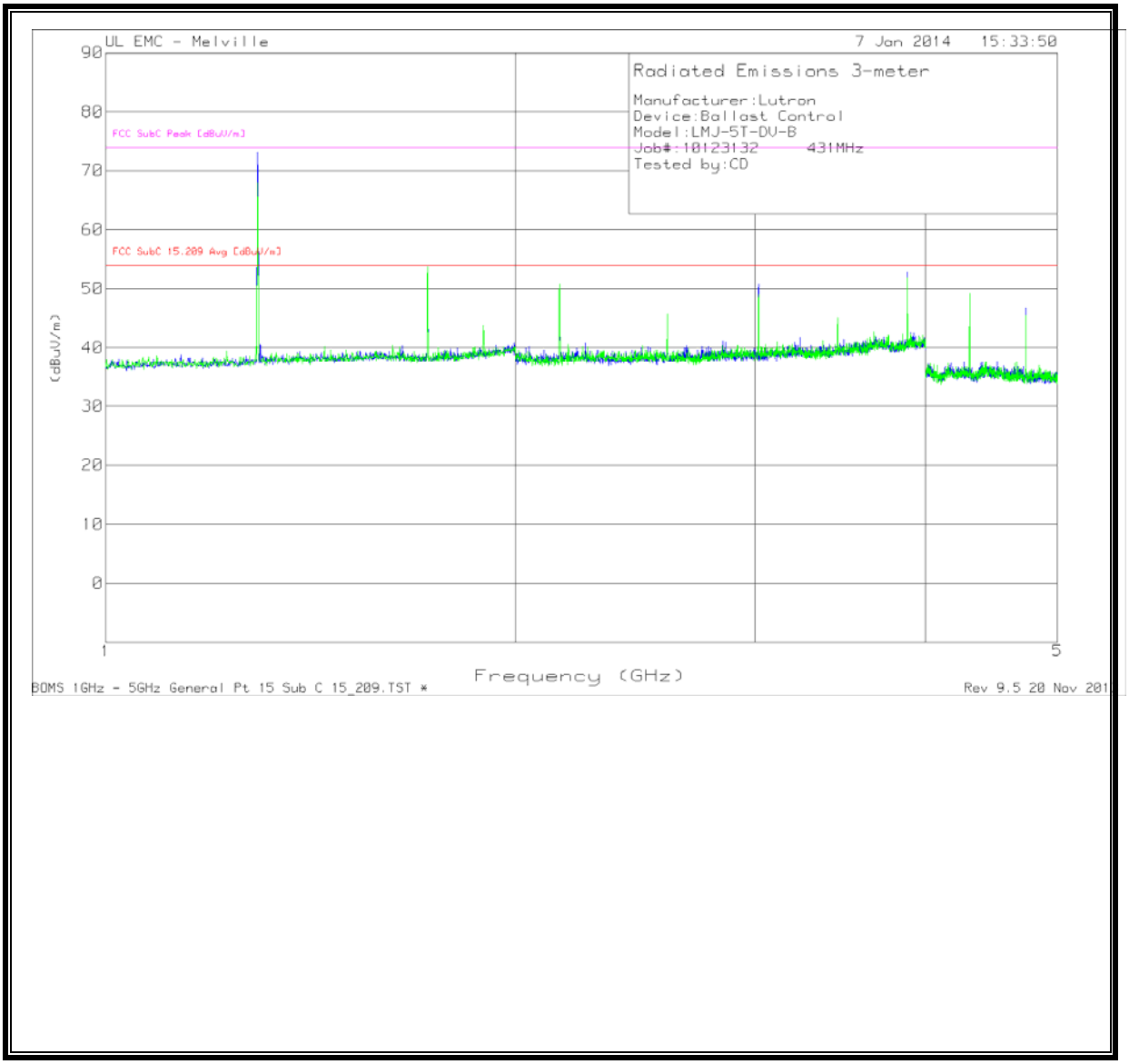
PK - Peak detector

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



Frequency (MHz)	Meter Reading (dBuV)	Det	AF-67 [dB/m]	GL-3M [dB]	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC Pt 15 Subpart C 15.209	Margin (dB)	FCC Pt 15 Subpart C 15.231	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
431.0313	71.11	PK	16.1	1.4	88.61	20	68.61	-	-	80.7	-12.09	100.7	-12.09	294	249	H
431.0349	73.39	PK	16.1	1.4	90.89	20	70.89	-	-	80.7	-9.81	100.7	-9.81	90	150	V
861.999	34.68	PK	21.9	2.2	58.78	20	38.78	-	-	60.7	-21.92	80.7	-21.92	141	199	V
861.9992	32.13	PK	21.9	2.2	56.23	20	36.23	-	-	60.7	-24.47	80.7	-24.47	141	199	H
431.9995	18.97	QP	16.2	1.5	36.67	-	-	46	-9.33	-	-	-	-	245	217	H
431.9995	19.03	QP	16.2	1.5	36.73	-	-	46	-9.27	-	-	-	-	65	290	V
430.0009	14.99	QP	16	1.4	32.39	-	-	46	-13.61	-	-	-	-	190	318	V
430.0017	21.01	QP	16	1.4	38.41	-	-	46	-7.59	-	-	-	-	148	313	H
428.2995	12.26	QP	15.9	1.5	29.66	-	-	46	-16.34	-	-	-	-	181	110	H
434.7999	5.4	QP	16.4	1.4	23.2	-	-	46	-22.8	-	-	-	-	0	131	H
427.9	15.26	QP	15.9	1.5	32.66	-	-	46	-13.34	-	-	-	-	32	101	V
434.5122	13.35	QP	16.4	1.4	31.15	-	-	46	-14.85	-	-	-	-	283	124	V

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz – Low Channel



Frequency (GHz)	Meter Reading (dBuV)	Det	AF-51442 [dB/m]	BOMS Factor (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.293	86.96	PK	20.4	-44.17	63.19	-20	43.19	54	-10.81	74	-10.81	178	146	H
1.293	85.26	PK	20.4	-44.17	61.49	-20	41.49	54	-12.51	74	-12.51	135	128	V
1.724	67.35	PK	20.8	-43.61	44.54	-20	24.54	54	-29.46	74	-29.46	336	267	H
1.724	73.1	PK	20.8	-43.59	50.31	-20	30.31	54	-23.69	74	-23.69	355	317	V

PK - Peak detector

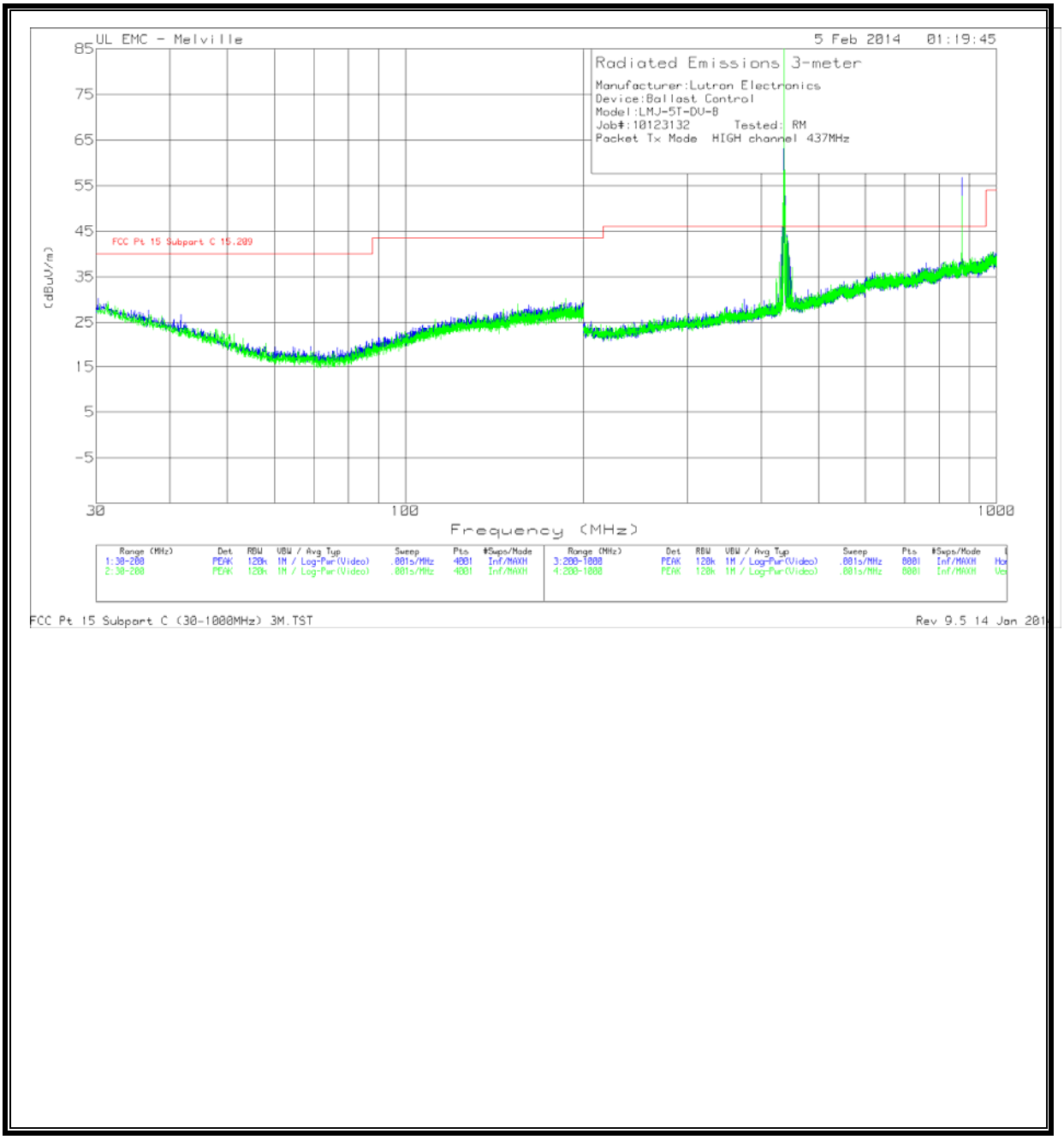
Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48107 [dB/m]	BOMS Factor (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.155	84.46	PK	21.4	-43.13	62.73	-20	42.73	54	-11.27	74	-11.27	319	304	V
2.155	78.83	PK	21.4	-43.13	57.1	-20	37.1	54	-16.9	74	-16.9	329	377	H
2.586	74.36	PK	21.3	-42.48	53.18	-20	33.18	54	-20.82	74	-20.82	7	161	H
2.586	79.55	PK	21.3	-42.48	58.37	-20	38.37	54	-15.63	74	-15.63	205	127	V
3.017	79.61	PK	21.5	-41.62	59.49	-20	39.49	54	-14.51	74	-14.51	174	136	V
3.017	78.05	PK	21.5	-41.62	57.93	-20	37.93	54	-16.07	74	-16.07	11	365	H
3.448	71.66	PK	22.1	-41.31	52.45	-20	32.45	54	-21.55	74	-21.55	0	326	H
3.448	73.24	PK	22.1	-41.31	54.03	-20	34.03	54	-19.97	74	-19.97	354	374	V
3.879	73.81	PK	22.6	-41.54	54.87	-20	34.87	54	-19.13	74	-19.13	51	323	V
3.879	72.92	PK	22.6	-41.54	53.98	-20	33.98	54	-20.02	74	-20.02	319	330	H

PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48106 [dB/m]	BOMS Factor (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4.31	73.18	PK	27.7	-51.26	49.62	-20	29.62	54	-24.38	74	-24.38	297	313	H
4.31	73.54	PK	27.7	-51.26	49.98	-20	29.98	54	-24.02	74	-24.02	256	297	V
4.741	79.02	PK	27.2	-51.86	54.36	-20	34.36	54	-19.64	74	-19.64	234	240	V
4.741	76.54	PK	27.2	-51.86	51.88	-20	31.88	54	-22.12	74	-22.12	186	326	H

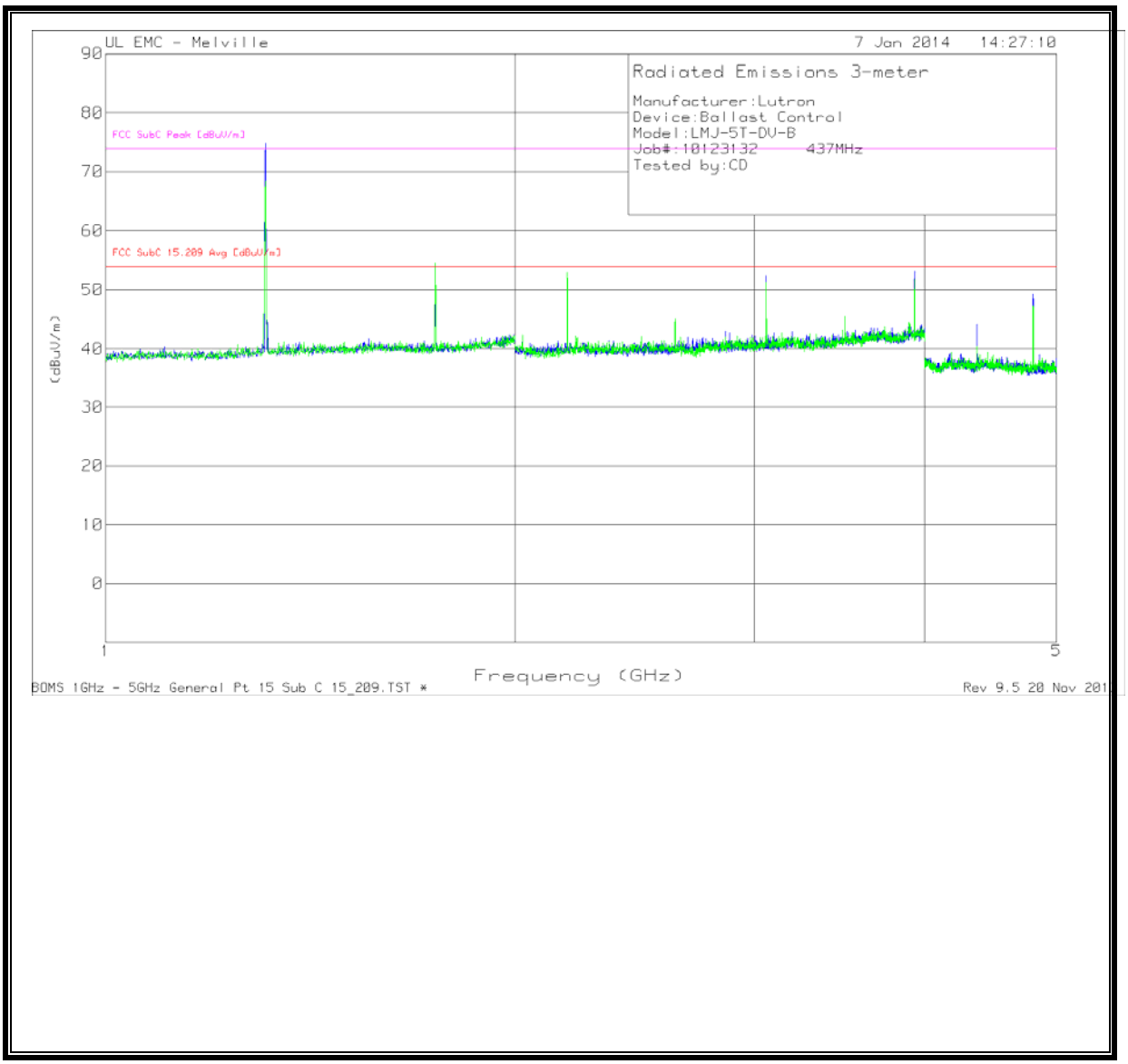
PK - Peak detector

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



Frequency (MHz)	Meter Reading (dBuV)	Det	AF-67 [dB/m]	GL-3M [dB]	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC Pt 15 Subpart C 15.209	Margin (dB)	FCC Pt 15 Subpart C 15.231	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
437.0308	74.12	PK	16.5	1.5	92.12	20	72.12	-	-	80.9	-8.78	100.9	-8.78	296	222	H
437.0333	74.35	PK	16.5	1.5	92.35	20	72.35	-	-	80.9	-8.55	100.9	-8.55	130	165	V
873.9992	28.35	PK	22.6	2.1	53.05	20	33.05	-	-	60.7	-27.65	80.7	-27.65	132	102	H
874.0001	33.7	PK	22.6	2.1	58.4	20	38.4	-	-	60.7	-22.3	80.7	-22.3	63	115	V
439.4005	18.66	QP	16.6	1.4	36.66	-	-	46	-9.34	-	-	-	-	59	132	V
438.2	16.97	QP	16.5	1.5	34.97	-	-	46	-11.03	-	-	-	-	82	241	H
439.1317	12.23	QP	16.6	1.4	30.23	-	-	46	-15.77	-	-	-	-	207	108	H

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz – High Channel



Frequency (GHz)	Meter Reading (dBuV)	Det	AF-51442 [dB/m]	BOMS Factor (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.311	86.63	PK	20.5	-44.28	62.85	-20	42.85	54	-11.15	74	-11.15	139	290	V
1.311	90.36	PK	20.5	-44.28	66.58	-20	46.58	54	-7.42	74	-7.42	197	131	H
1.748	75.64	PK	20.8	-43.77	52.67	-20	32.67	54	-21.33	74	-21.33	204	191	H
1.748	74.09	PK	20.8	-43.77	51.12	-20	31.12	54	-22.88	74	-22.88	204	191	V

PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48107 [dB/m]	BOMS Factor (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.185	72.21	PK	21.5	-43.1	50.61	-20	30.61	54	-23.39	74	-23.39	115	182	H
2.185	79.7	PK	21.5	-43.1	58.1	-20	38.1	54	-15.9	74	-15.9	115	182	V
2.622	72.92	PK	21.4	-42.18	52.14	-20	32.14	54	-21.86	74	-21.86	289	105	H
2.622	71.67	PK	21.4	-42.18	50.89	-20	30.89	54	-23.11	74	-23.11	289	105	V
3.059	69.84	PK	21.6	-41.62	49.82	-20	29.82	54	-24.18	74	-24.18	239	318	H
3.059	67.69	PK	21.6	-41.62	47.67	-20	27.67	54	-26.33	74	-26.33	239	318	V
3.932	75.47	PK	22.7	-41.32	56.85	-20	36.85	54	-17.15	74	-17.15	293	334	H
3.932	69.8	PK	22.7	-41.32	51.18	-20	31.18	54	-22.82	74	-22.82	293	334	V

PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF-48106 [dB/m]	BOMS Factor (dB)	Corrected Reading (dBuV/m)	DCF (dB)	Corrected Average (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4.369	67.86	PK	27.6	-51.54	43.92	-20	23.92	54	-30.08	74	-30.08	122	147	H
4.369	67.49	PK	27.6	-51.54	43.55	-20	23.55	54	-30.45	74	-30.45	122	147	V
4.807	76.42	PK	27.1	-52.2	51.32	-20	31.32	54	-22.68	74	-22.68	337	329	H
4.807	67.43	PK	27.1	-52.2	42.33	-20	22.33	54	-31.67	74	-31.67	337	329	V

PK - Peak detector

8. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207 (a)
IC RSS-GEN, Section 7.2.2

Frequency of emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50
* Decreases with the logarithm of the frequency.		

TEST PROCEDURE

ANSI C63.4

RESULTS

No non-compliance noted:

6 WORST EMISSIONS 431MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Class B QPK Limit (dBuV)	Margin (dB)	Class B Avg Limit (dBuV)	Margin (dB)
.15341	37.65	PK	10	47.65	65.81	-18.16	55.81	-8.16
.35782	28.92	PK	10	38.92	58.78	-19.86	48.78	-9.86
.50601	24.55	PK	10	34.55	56	-21.45	46	-11.45
.57585	22.61	PK	10	32.61	56	-23.39	46	-13.39
.63206	20.62	PK	10	30.62	56	-25.38	46	-15.38
.71383	19.53	PK	10	29.53	56	-26.47	46	-16.47

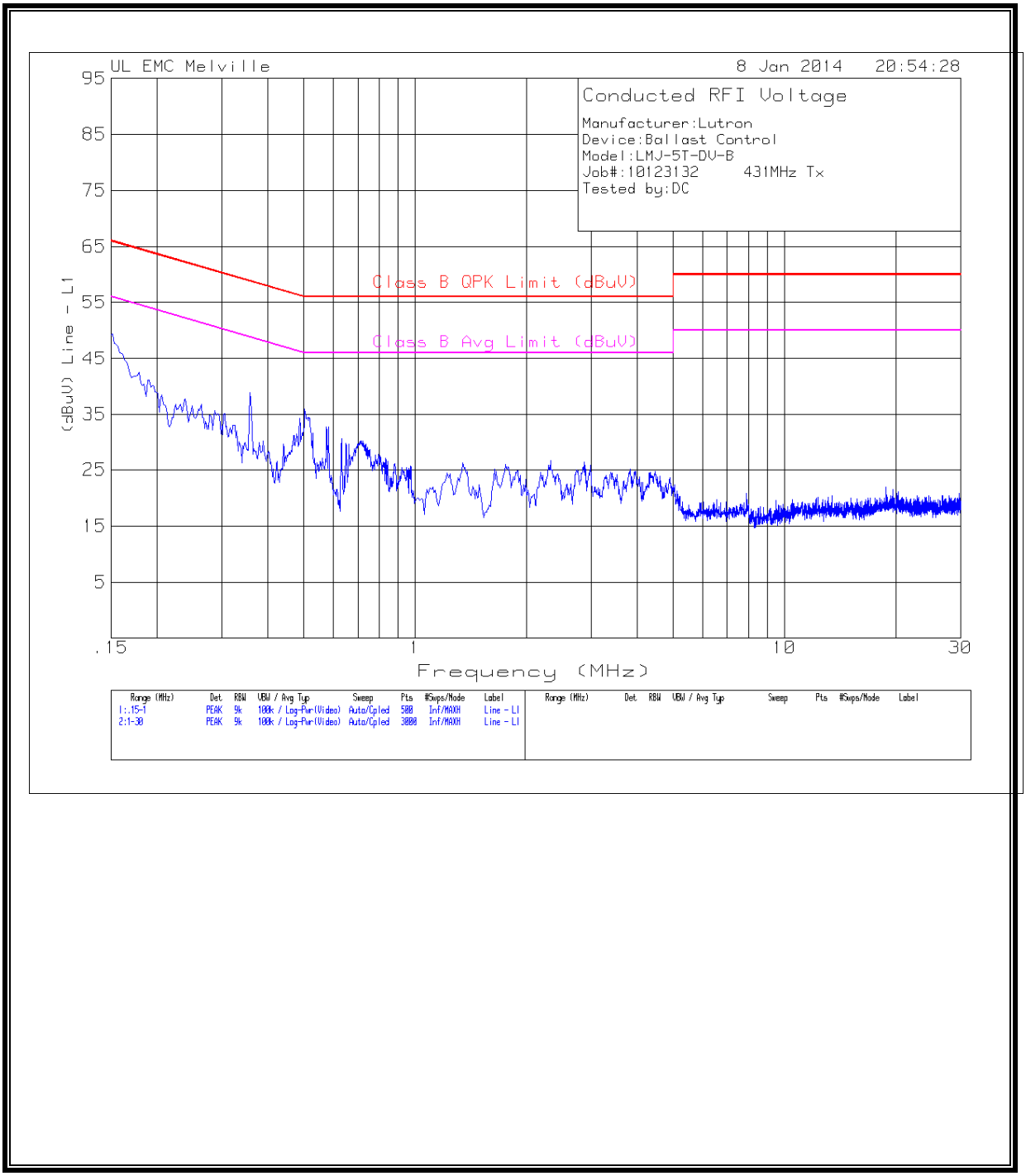
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 2 G/L (dB)	Corrected Reading (dBuV)	Class B QPK Limit (dBuV)	Margin (dB)	Class B Avg Limit (dBuV)	Margin (dB)
.15681	39.09	PK	10.1	49.19	65.63	-16.44	55.63	-6.44
.23687	29.12	PK	10	39.12	62.21	-23.09	52.21	-13.09
.26413	26.88	PK	10	36.88	61.3	-24.42	51.3	-14.42
.51112	19.9	PK	10.1	30	56	-26	46	-16
.70872	15.72	PK	10.1	25.82	56	-30.18	46	-20.18
.97615	12.58	PK	10.1	22.68	56	-33.32	46	-23.32

6 WORST EMISSIONS 437MHz

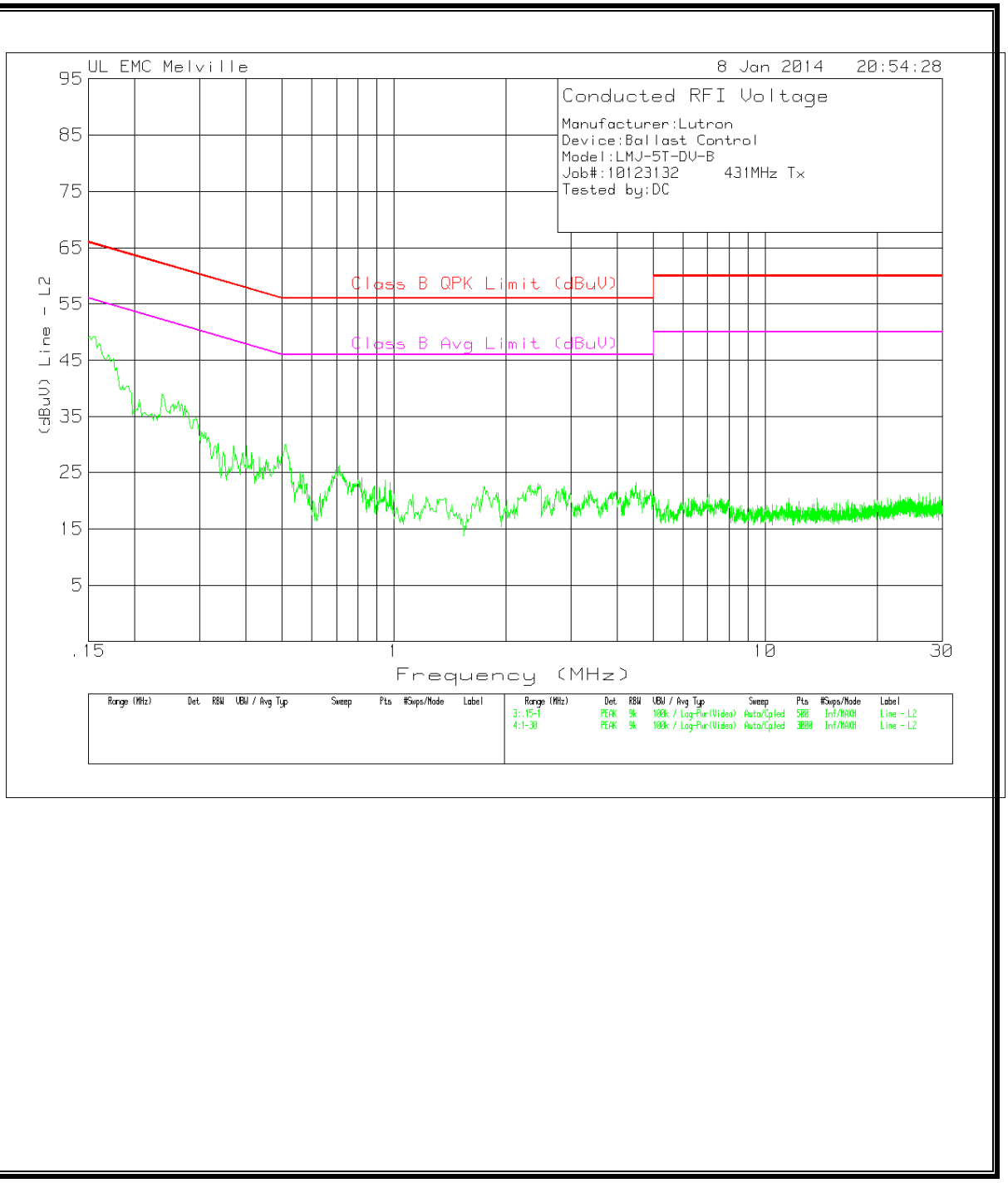
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Class B QPK Limit (dBuV)	Margin (dB)	Class B Avg Limit (dBuV)	Margin (dB)
.15681	37.61	PK	10	47.61	65.63	-18.02	55.63	-8.02
.18066	33.69	PK	10	43.69	64.46	-20.77	54.46	-10.77
.20451	29.23	PK	10	39.23	63.43	-24.2	53.43	-14.2
.22495	27.28	PK	10	37.28	62.63	-25.35	52.63	-15.35
.50942	20.43	PK	10	30.43	56	-25.57	46	-15.57
.71553	15.61	PK	10	25.61	56	-30.39	46	-20.39

Frequency (MHz)	Meter Reading (dBuV)	Det	Line 2 G/L (dB)	Corrected Reading (dBuV)	Class B QPK Limit (dBuV)	Margin (dB)	Class B Avg Limit (dBuV)	Margin (dB)
.15511	38.69	PK	10.1	48.79	65.72	-16.93	55.72	-6.93
.17555	33.26	PK	10	43.26	64.69	-21.43	54.69	-11.43
.23687	26.6	PK	10	36.6	62.21	-25.61	52.21	-15.61
.28116	27.28	PK	10	37.28	60.78	-23.5	50.78	-13.5
.50942	18.93	PK	10.1	29.03	56	-26.97	46	-16.97
.70531	16.06	PK	10.1	26.16	56	-29.84	46	-19.84

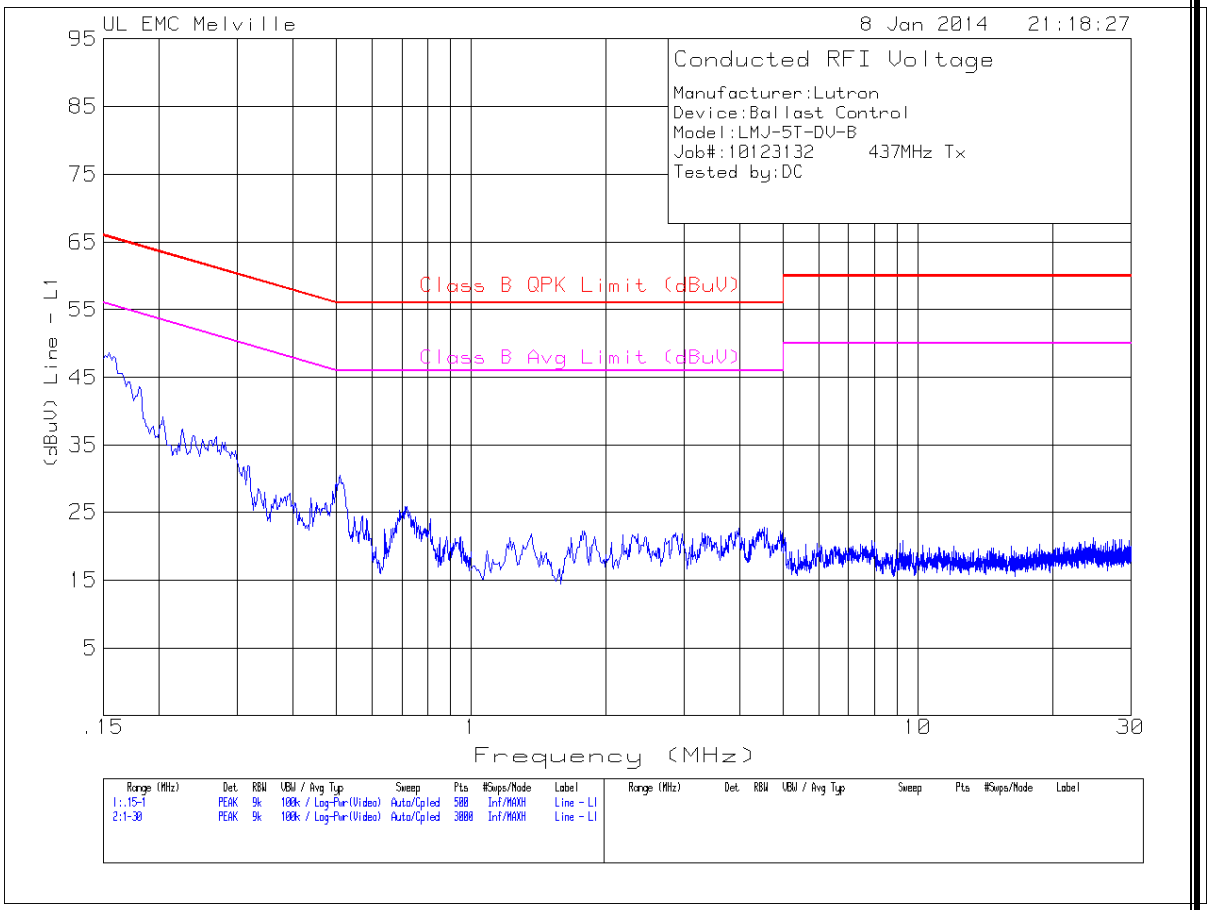
LINE 1 RESULTS 431MHz



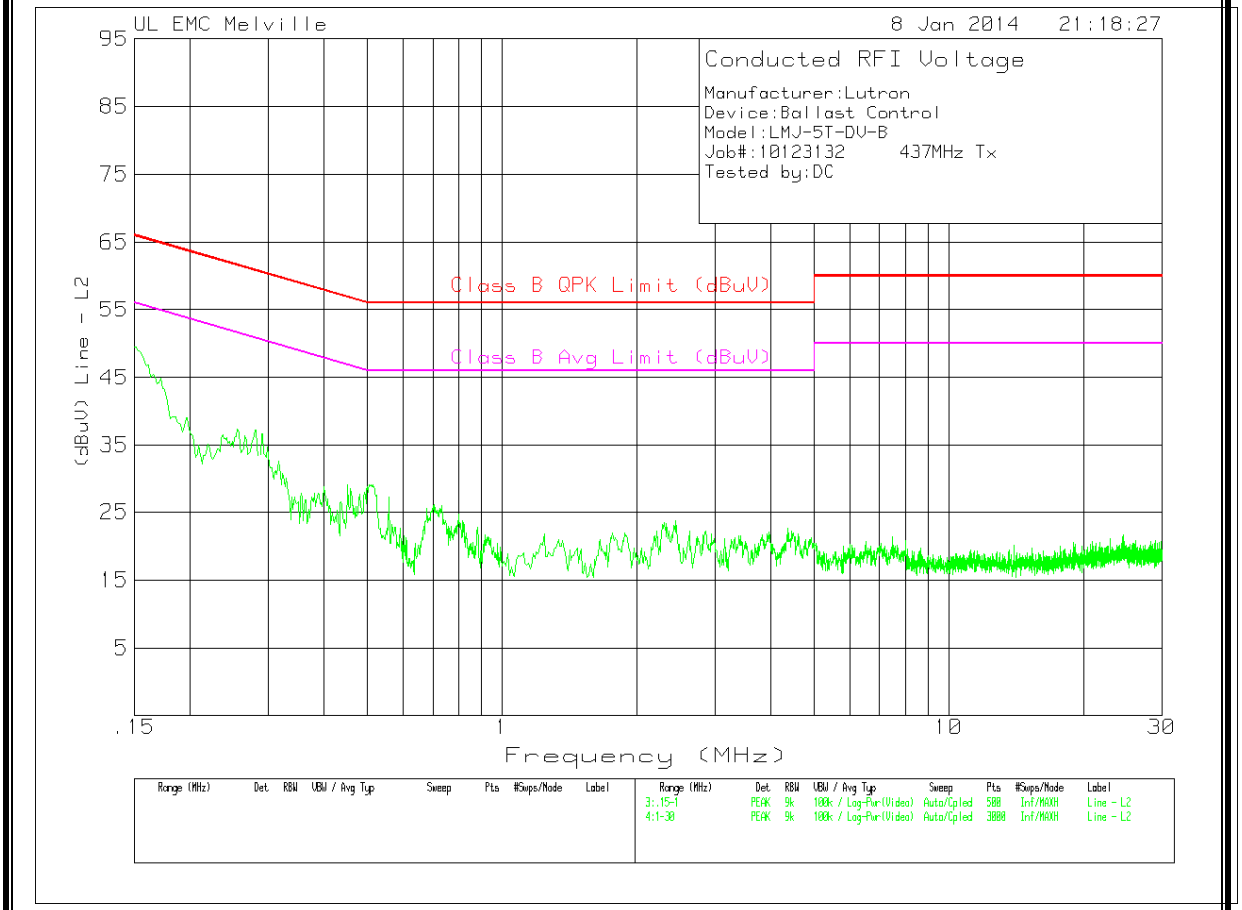
LINE 2 RESULTS 431MHz



LINE 1 RESULTS 437MHz



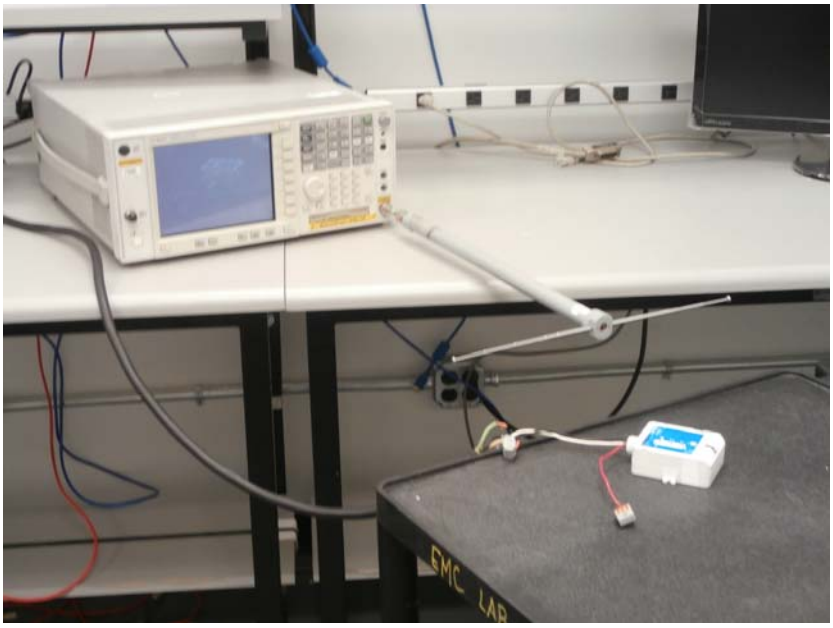
LINE 2 RESULTS 437MHz



9. SETUP PHOTOS

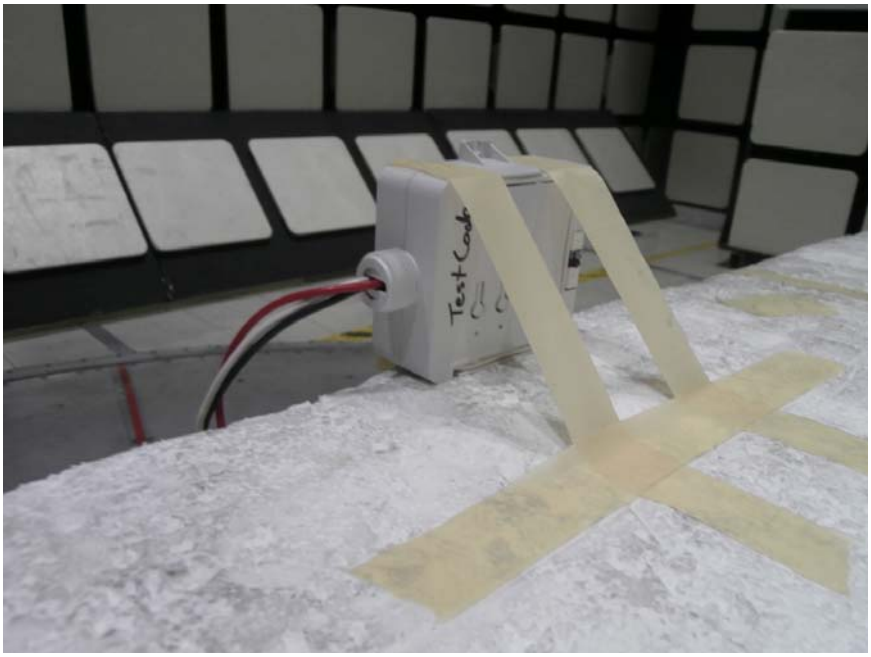
ANTENNA PORT

ANTENNA PORT



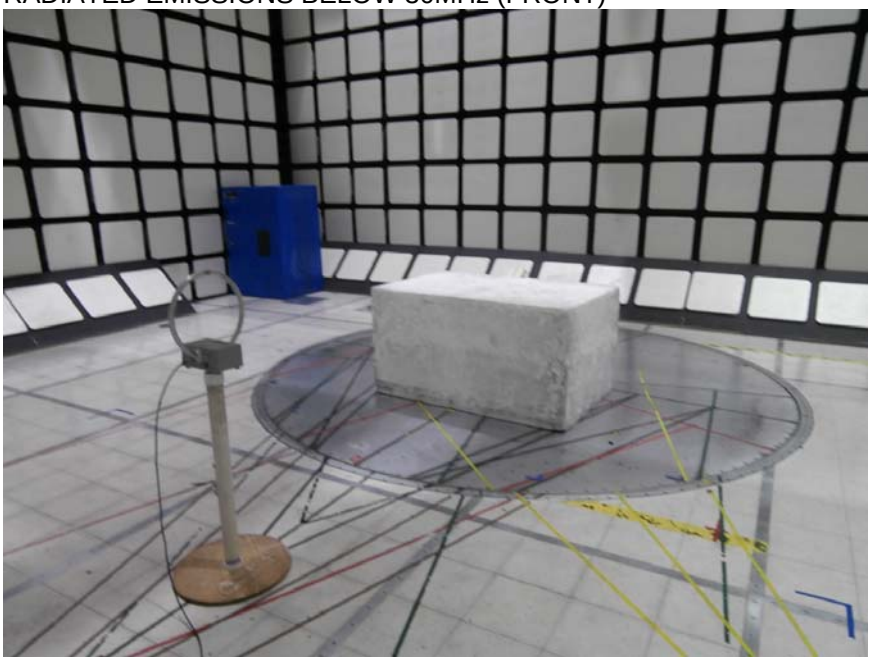
RADIATED EMISSION FOR PORTABLE CONFIGURATION – WORST CASE ORIENTATION

RADIATED EMISSION FOR PORTABLE CONFIGURATION – Y ORIENTATION

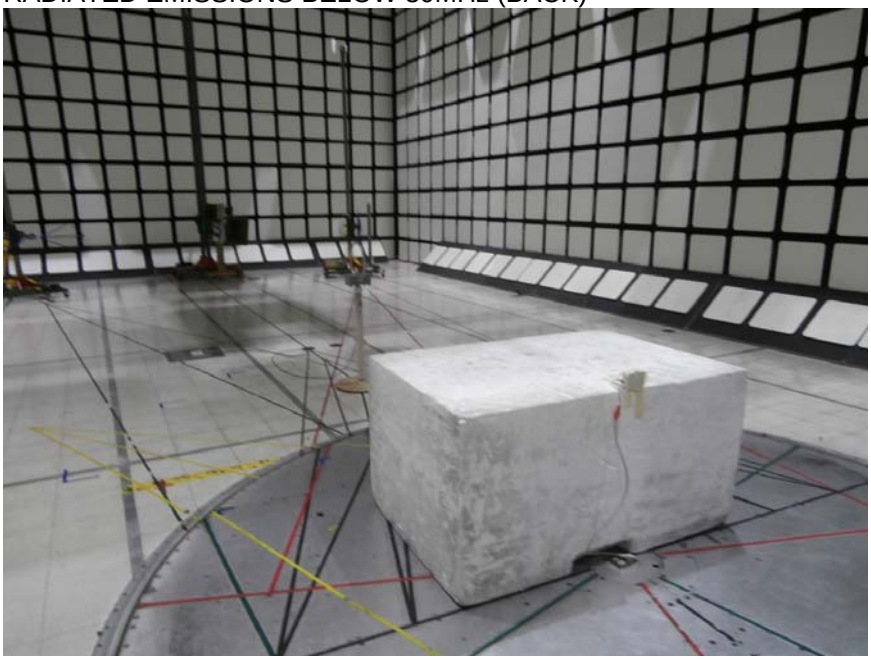


RADIATED EMISSION BELOW 30 MHz

RADIATED EMISSIONS BELOW 30MHz (FRONT)

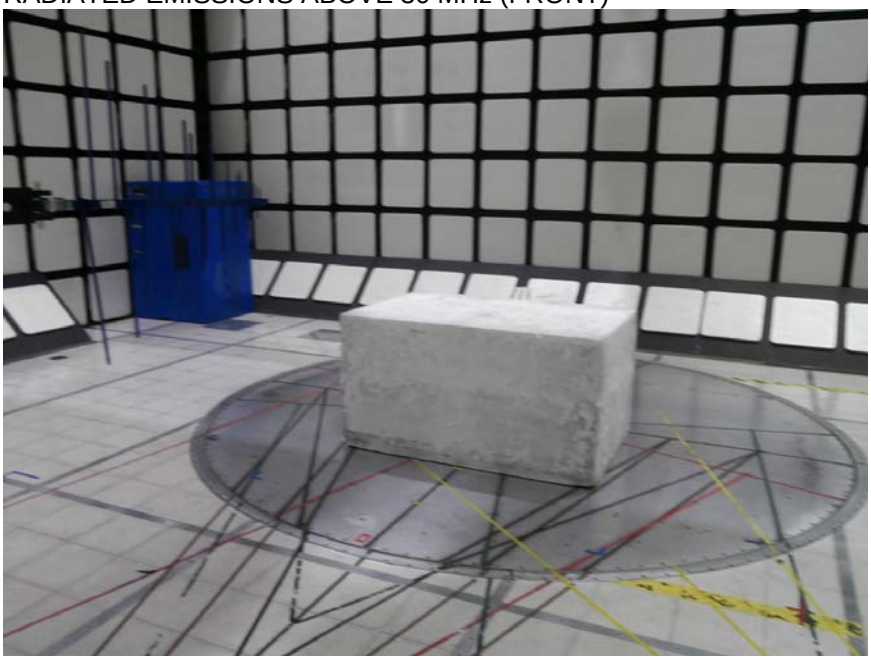


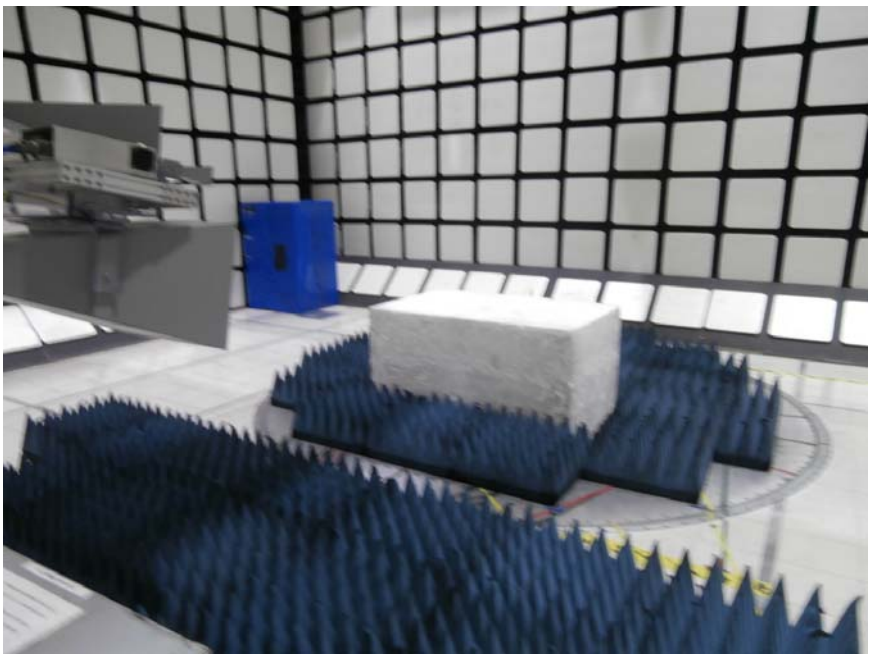
RADIATED EMISSIONS BELOW 30MHz (BACK)



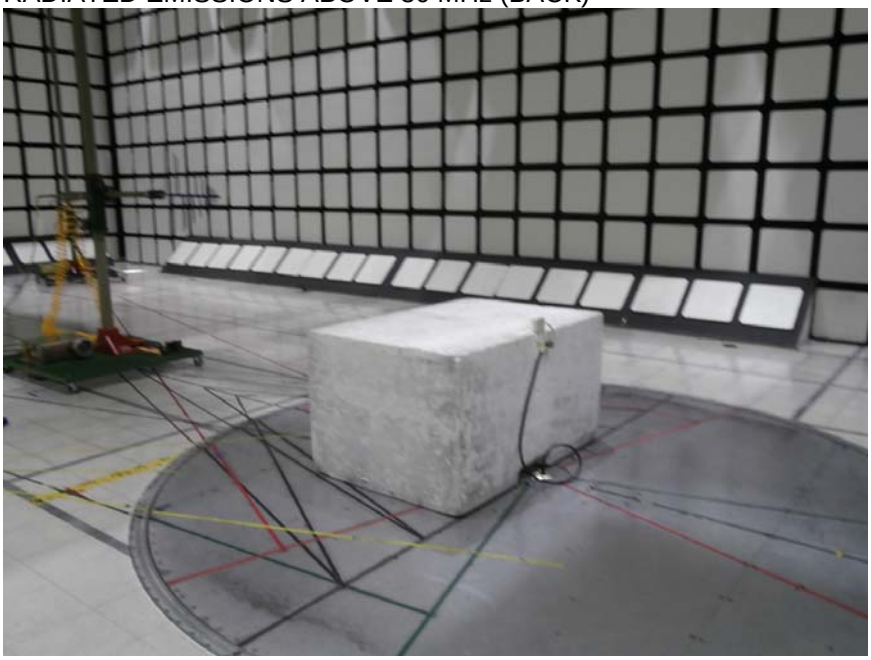
RADIATED EMISSION ABOVE 30 MHz

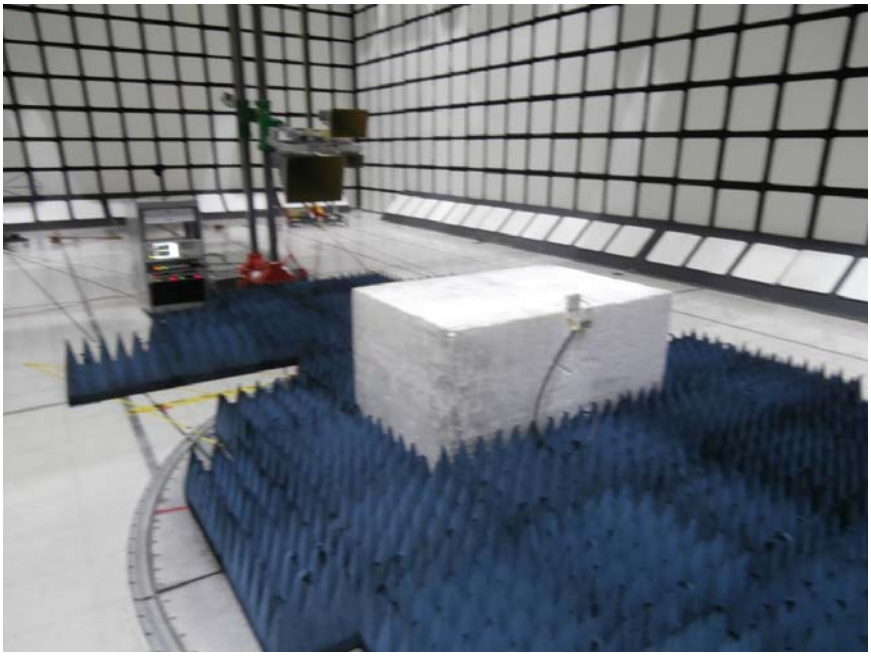
RADIATED EMISSIONS ABOVE 30 MHz (FRONT)





RADIATED EMISSIONS ABOVE 30 MHz (BACK)





AC MAINS LINE CONDUCTED EMISSION

LINE CONDUCTED EMISSION (FRONT)

LINE CONDUCTED EMISSION (BACK)

END OF REPORT