



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

CERTIFICATION TEST REPORT

FOR

THERMOSTAT

MODEL NUMBER: LR-HWLHVAC

**FCC ID: JPZ0084
IC: 2851A- JPZ0084**

REPORT NUMBER: 1001394167

ISSUE DATE: 2011-08-11

Prepared for
**LUTRON ELECTRONICS INC
7200 SUTTER ROAD
COOPERBURG
PA 18036, USA**

Prepared by
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NVLAP LAB CODE 100255-0

Revision History

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

COMPANY NAME: LUTRON ELECTRONICS INC
7200 SUTTER ROAD
COOPERBURG, PA 18036, USA

EUT DESCRIPTION: Thermostat

MODEL: LR-HWLV-HVAC

SERIAL NUMBER: NA

DATE TESTED: 2011-08-08 to 2011-08-11

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

Underwriters Laboratories Inc. conducted the measurements of 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 Underwriters Laboratories Inc. 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 Underwriters Laboratories Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories 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 By:

Tested By:



Joseph Danisi
Lead Engineering Associate
UL

Bob DeLisi
Sr. Staff Engineer
UL

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3:2010, and RSS-210 Issue 8:2010.

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:

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

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 thermostat with wireless transmission intended for home HVAC use.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna.

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was code supplied by Lutron Electronics Inc.

5.4. WORST-CASE CONFIGURATION AND MODE

Testing was conducted at the lowest and highest channel and only has one configuration.

5.5. MODIFICATIONS

The software code was changed to lower the output power of the fundamental. The setting was changed from 46 to 49 in the code. This setting is necessary for compliance in production.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

No Support Equipment required.

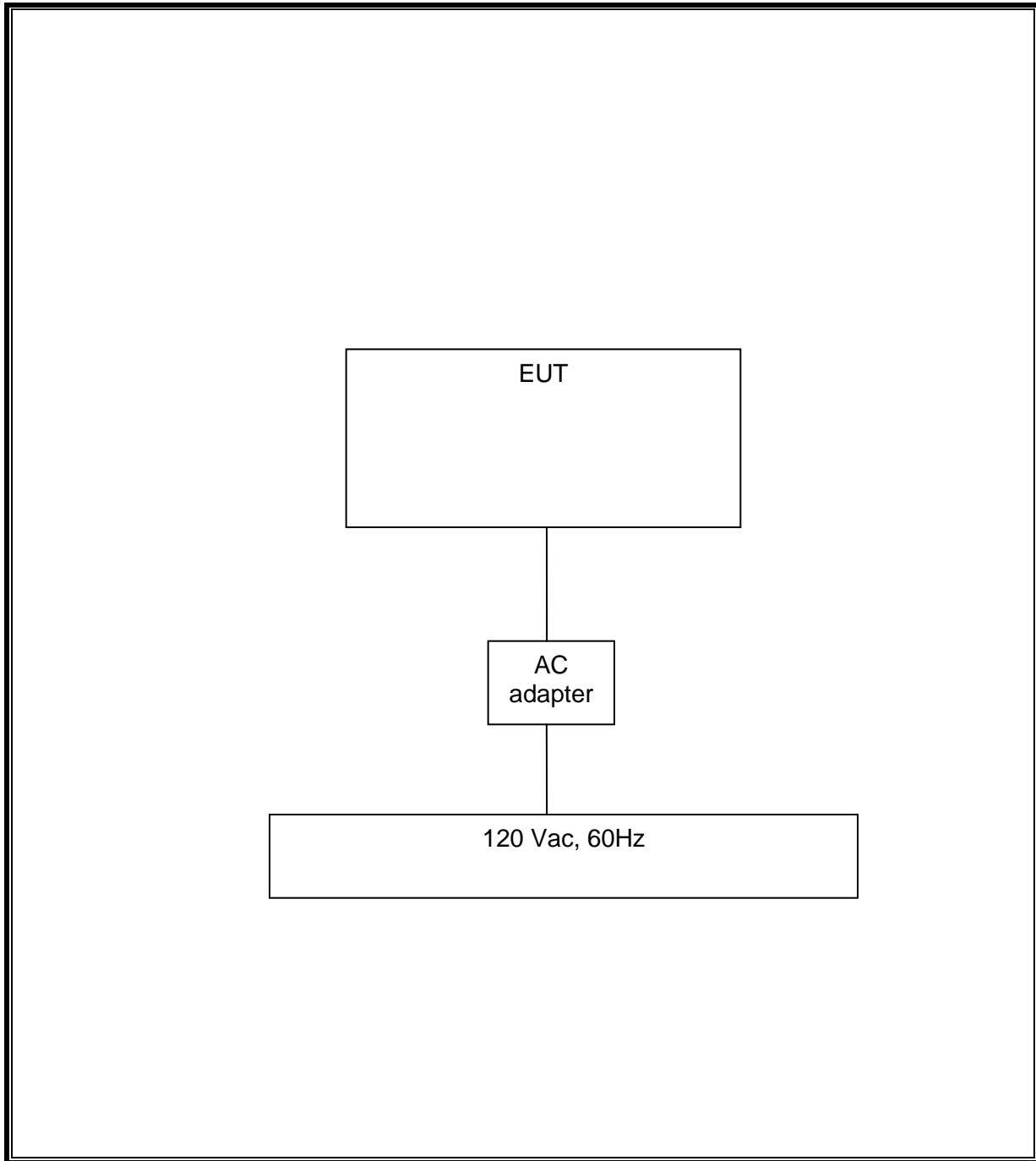
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identic Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC	Unshielded	1.8m	None

TEST SETUP

The EUT is a stand-alone device. Test software exercised the radio.

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 - 10 Meter Chamber

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2011-03-01	2012-03-01
Bicon Antenna	Schaffner	VBA6106A	54	2011-04-05	2012-04-05
Log-P Antenna	Schaffner	UPA6109	44067	2011-04-29	2012-04-29
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	4268	2010-12-07	2012-12-07
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72823	2011-07-26	2012-07-26
Horn Antenna (1-2 GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	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	2010-12-07	2012-12-07
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29
<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>					

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2011-01-27	2012-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2011-02-04	2012-02-28
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	2010-03-08	2012-03-08
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29

Occupied Bandwidth / Pulse Train / Cease Operation

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2011-01-27	2012-01-31
Dipole Antenna	EMCO	3121C	3359	2010-12-08	2012-12-08
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2010-03-08	2012-03-08
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29

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 100 KHz. The VBW is set to 300 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:

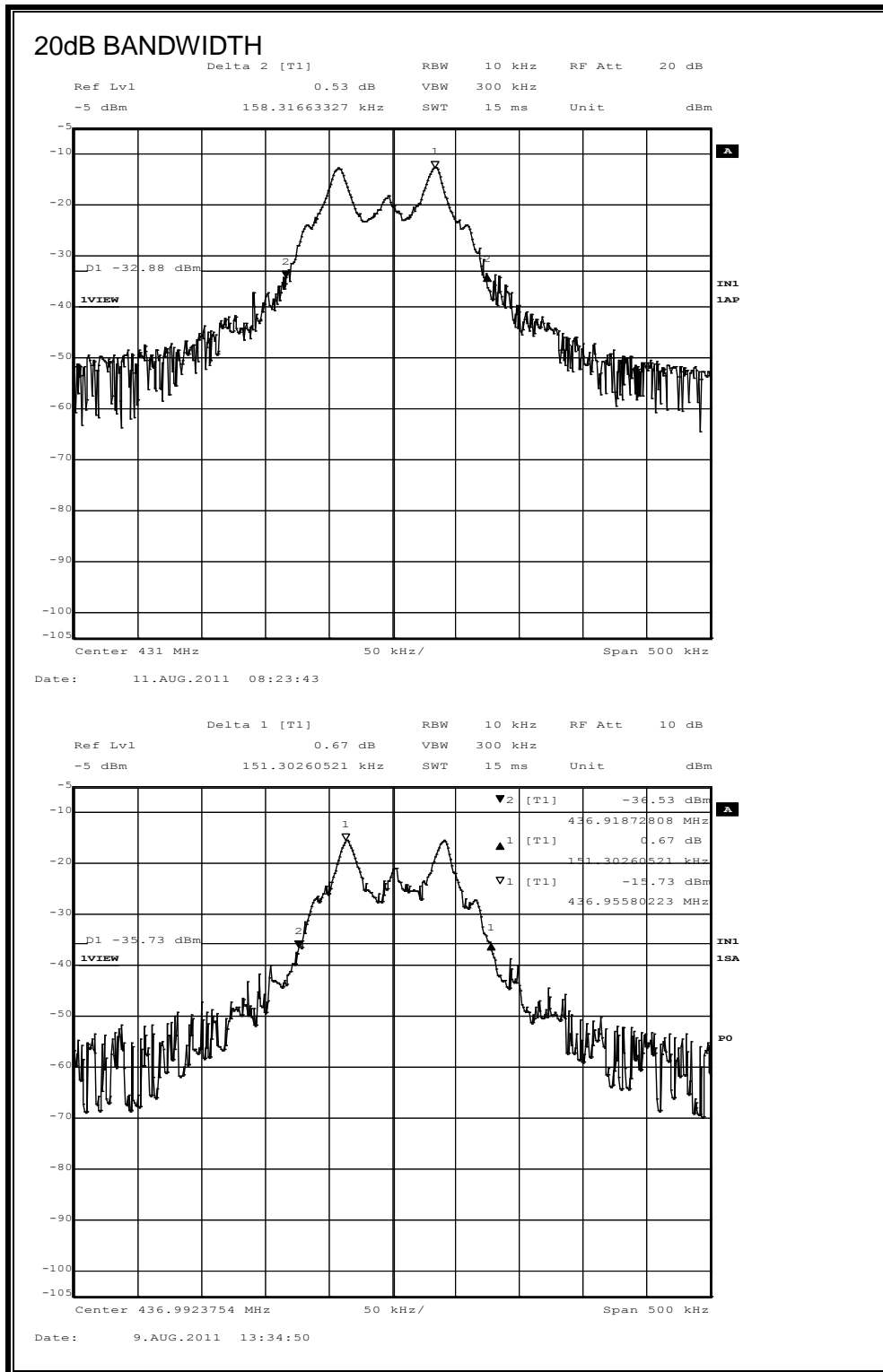
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431	158.3	1077.5	-919.2
437	151.3	1092.5	-941.2

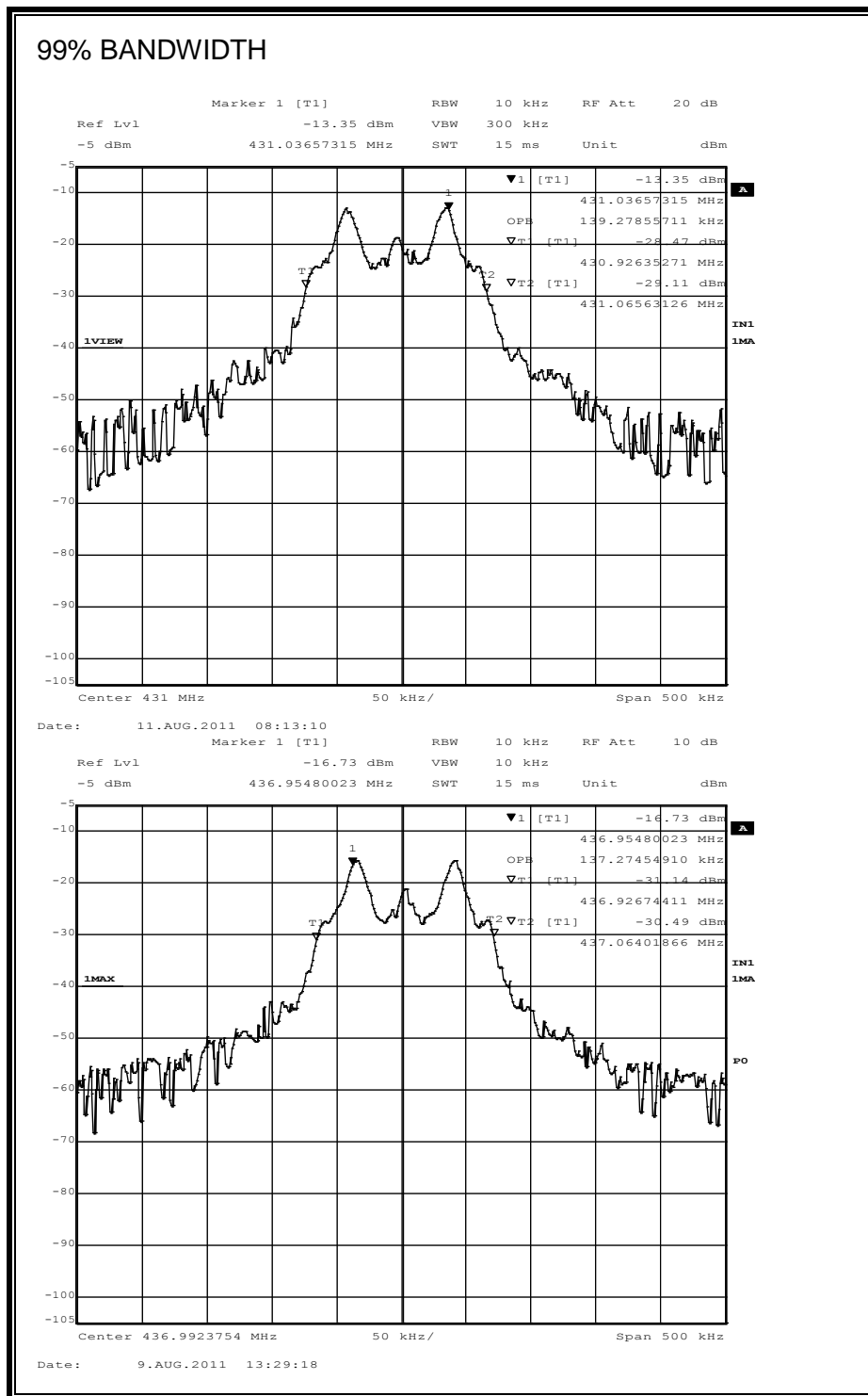
99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431	139.3	1077.5	-938.2
437	137.3	1092.5	-955.2

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 100 kHz and the VBW is set to 100 kHz. 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

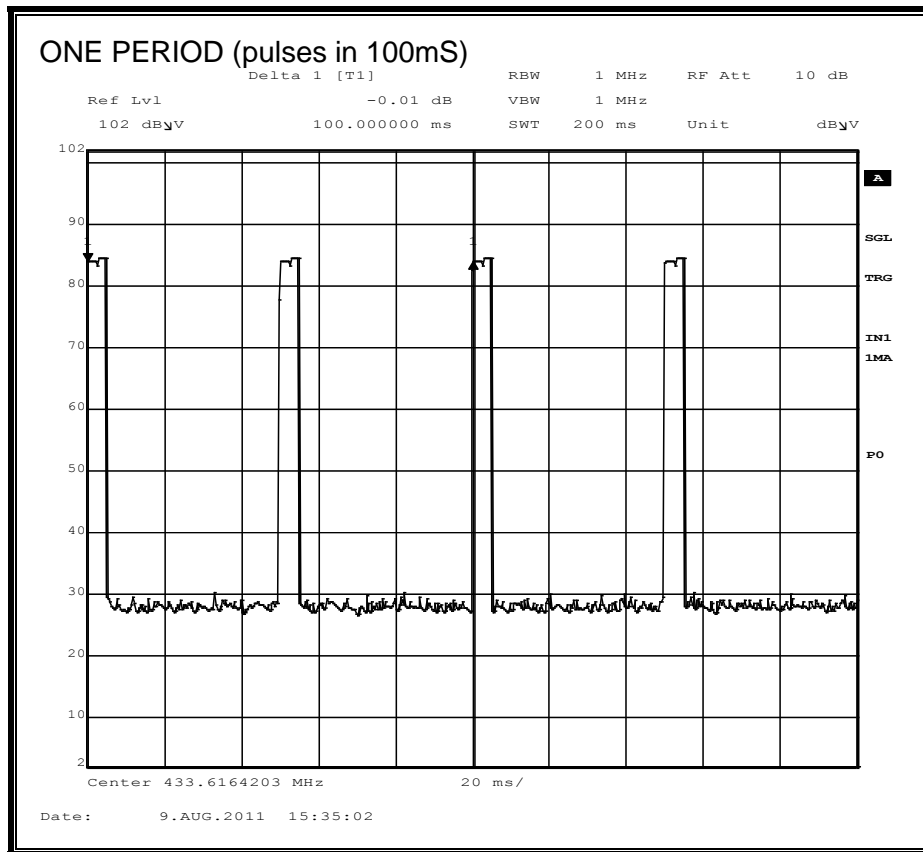
Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is (# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

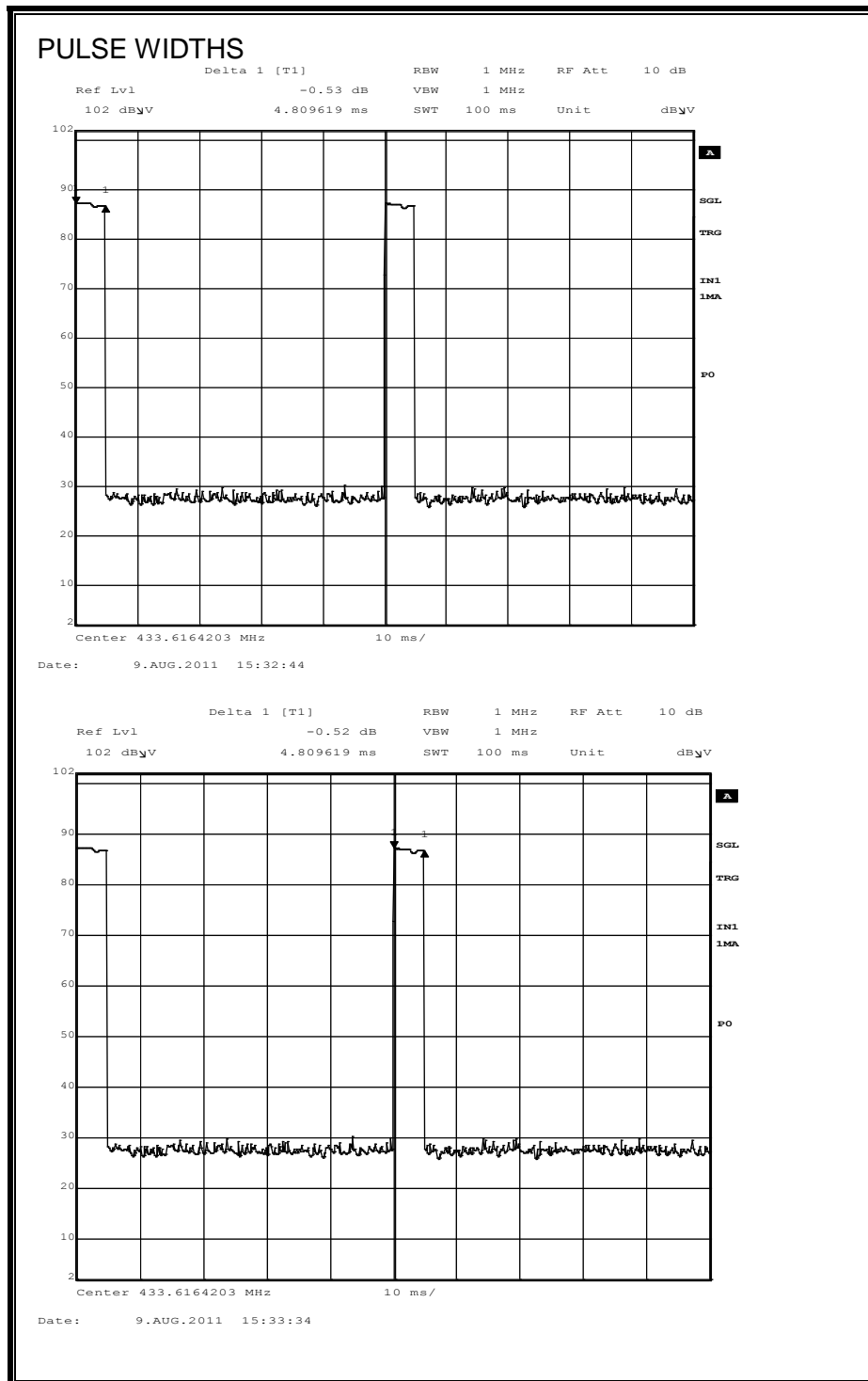
No non-compliance noted:

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	4.81	2	0.00	0	0.096	-20.34

ONE PERIOD



PULSE WIDTHS



7.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)

IC A1.1.1 (b)

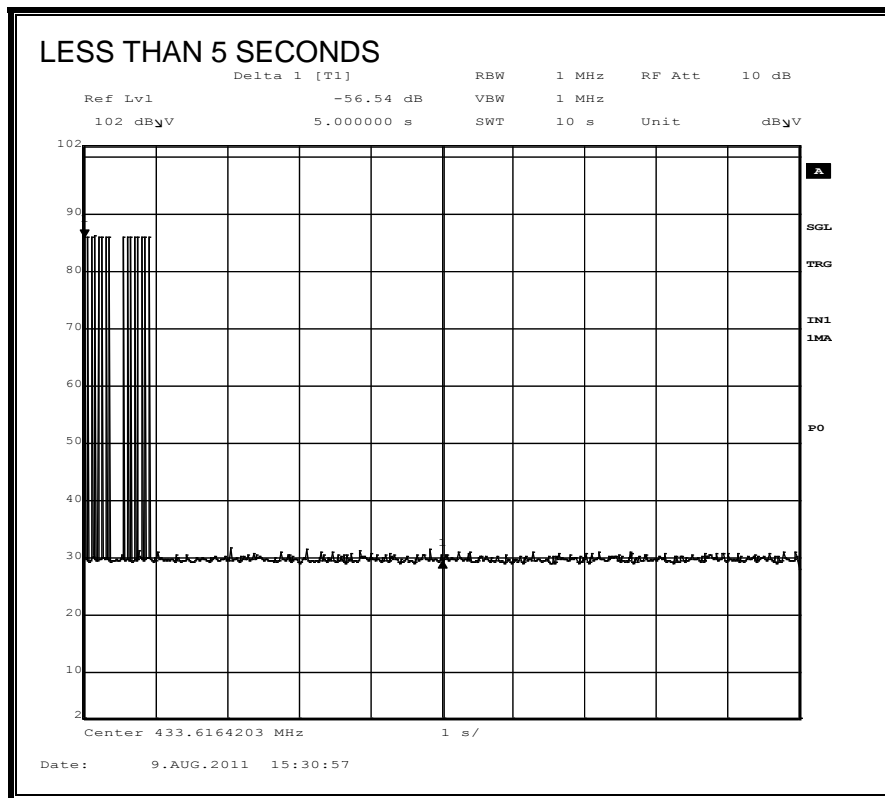
A transmitter activated automatically shall cease transmission within 5 seconds after activation.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 100 kHz and the VBW is set to 100 kHz. 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 3,7501	125 to 3751
174 - 260	3,750	375
260 - 470	3,750 to 12,5001	375 to 1,2501
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)
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.

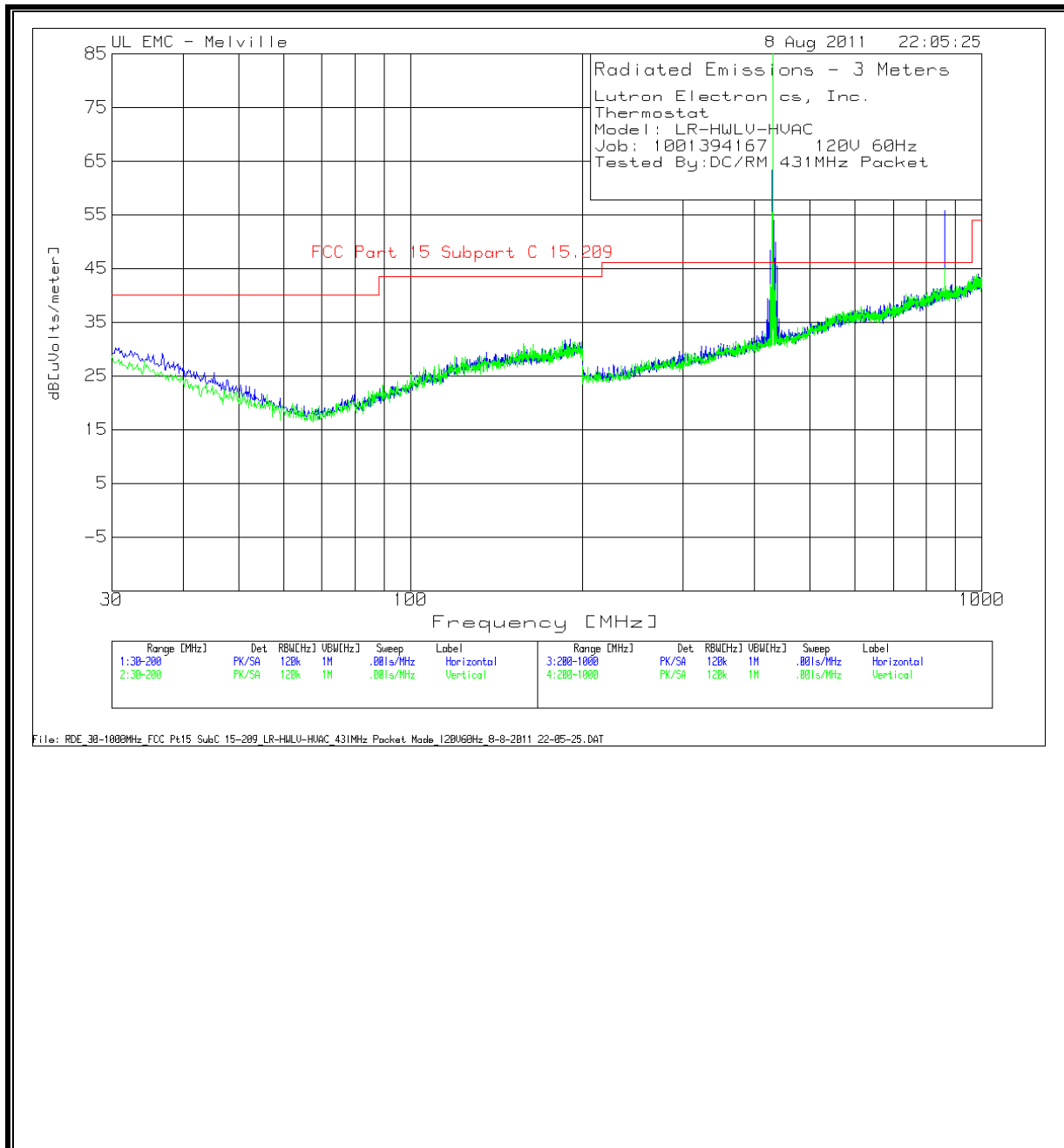
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

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.

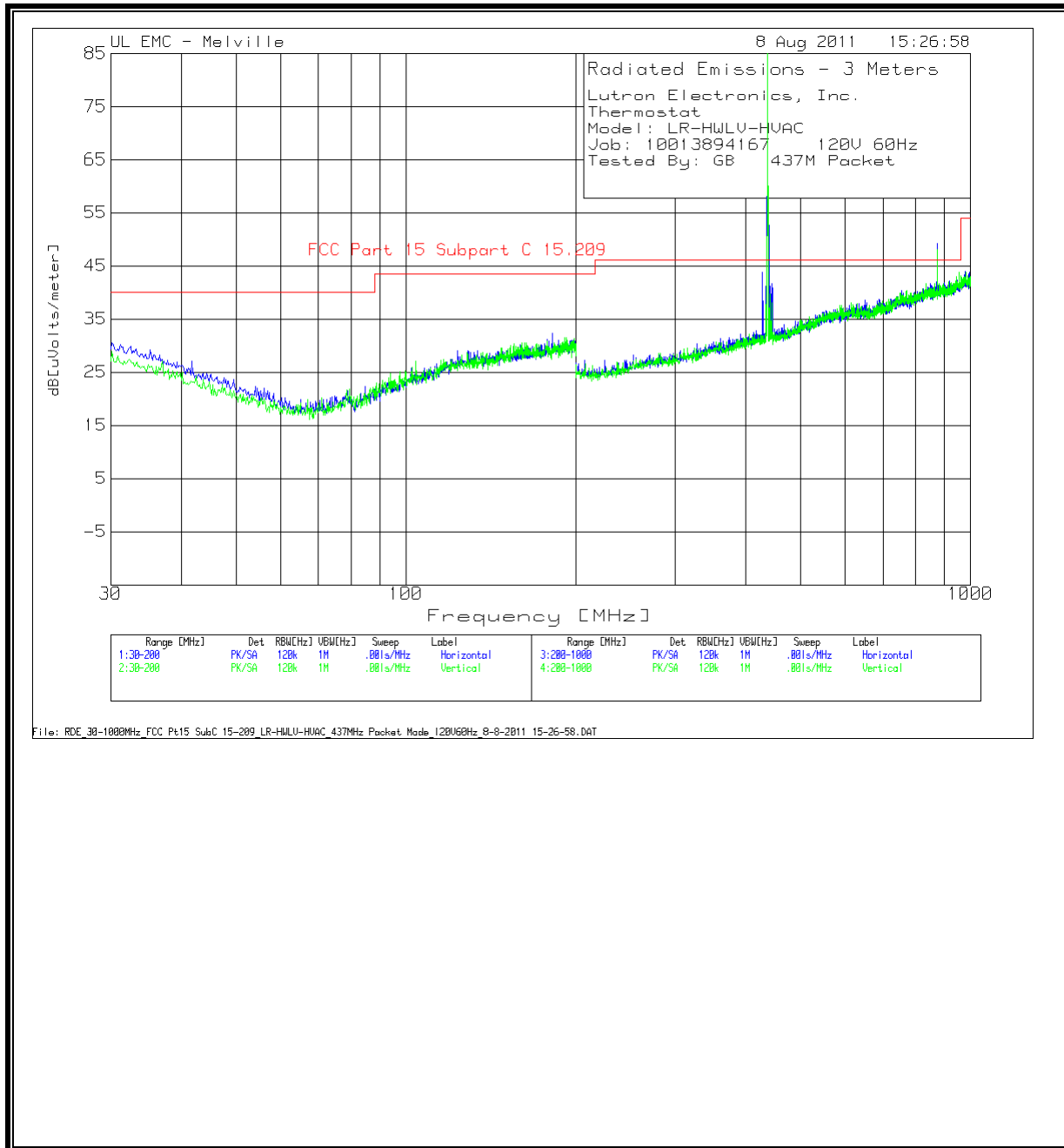
RESULTS

No non-compliance noted:

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

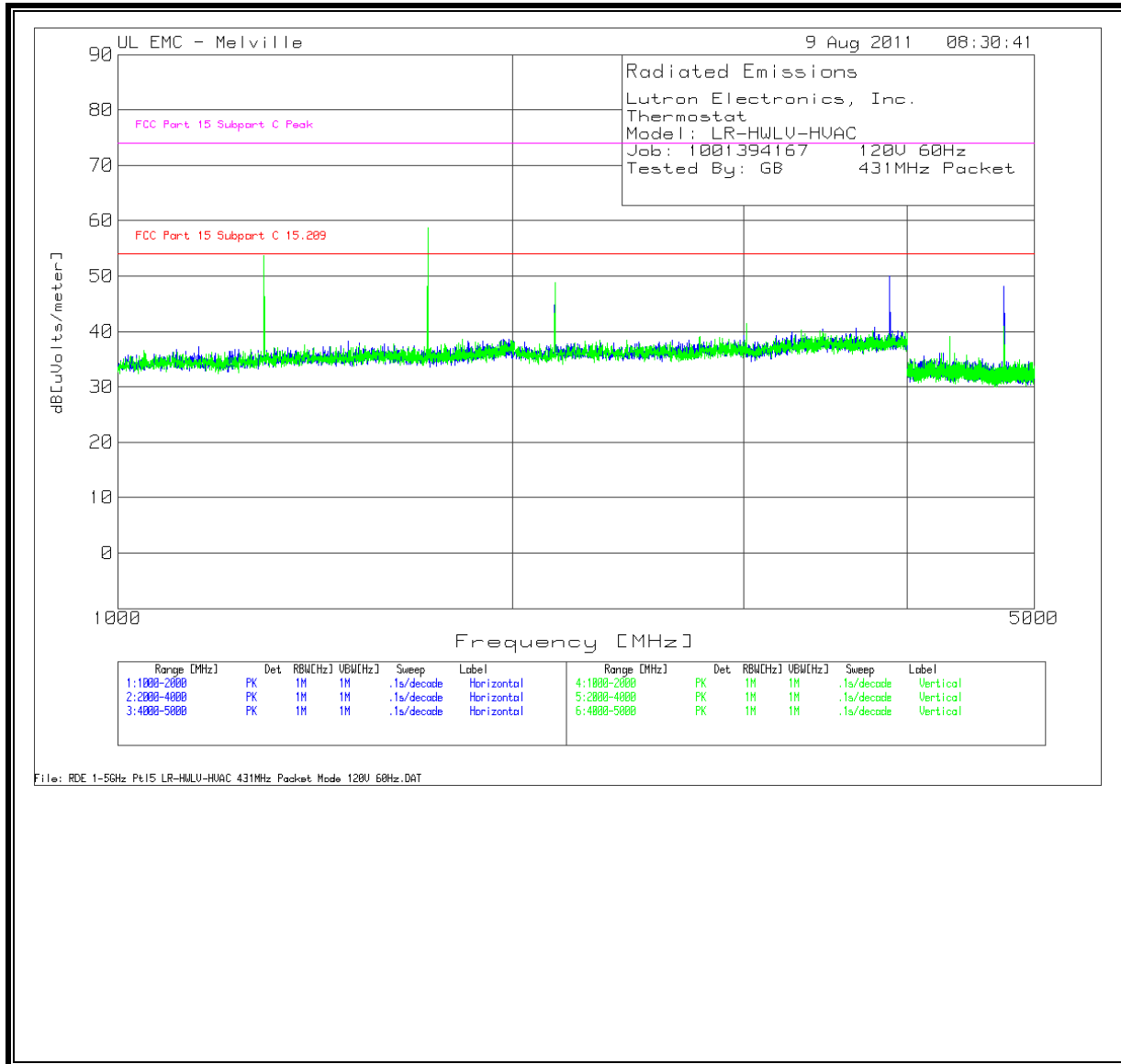


Thermostat																
Model: LR-HWLHVAC																
Job: 1001394167 120V 60Hz																
Tested By:DC/RM 431MHz Packet																
Horizontal 200 - 1000MHz																
Test	Meter	Detector	LogP 3M Horz 44067 02May1 2 [dB]	3MLoc 30- 1000MH z 02Feb12 [dB]	dB[uVolts /meter]	DCF	Corrected Level	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C 15.231	Margin	Azimuth [Degs]	Height [cm]	Polarity		
426.51	7.78	QP	16.9	2.3	26.98	-	-	46	-19.02	-	-	46	273	Horz		
428.9906	18.11	QP	17	2.3	37.41	-	-	46	-8.59	-	-	15	195	Horz		
429.715	17.63	QP	17	2.3	36.93	-	-	46	-9.07	-	-	12	202	Horz		
432.925	20.21	QP	17.1	2.3	39.61	-	-	46	-6.39	-	-	16	209	Horz		
433.72	17.58	QP	17.1	2.3	36.98	-	-	46	-9.02	-	-	13	185	Horz		
434.92	14.32	QP	17.1	2.3	33.72	-	-	46	-12.28	-	-	14	176	Horz		
438.12	8.35	QP	17.2	2.3	27.85	-	-	46	-18.15	-	-	17	179	Horz		
861.9165	35.11	PK	22.9	3.4	61.41	20.3	41.11	-	-	60.7	-19.59	223	158	Horz		
430.9447	78.39	PK	17	2.3	97.69	20.3	77.39	-	-	80.7	-3.31	7	186	Horz		
Vertical 200 - 1000MHz																
426.51	7.72	QP	16.5	2.3	26.52	-	-	46	-19.48	-	-	330	125	Vert		
427.71	8.62	QP	16.5	2.3	27.42	-	-	46	-18.58	-	-	341	128	Vert		
432.12	17.77	QP	16.5	2.3	36.57	-	-	46	-9.43	-	-	329	149	Vert		
435.32	8.52	QP	16.6	2.3	27.42	-	-	46	-18.58	-	-	333	121	Vert		
430.9447	74.7	PK	16.5	2.3	93.5	20.3	73.2	-	-	80.7	-7.5	327	150	Vert		
861.9157	30.75	PK	23	3.4	57.15	20.3	36.85	-	-	60.7	-23.85	284	120	Vert		
PK - Peak detector (Maximized)																
QP - Quasi-Peak detector																
LnAv - Linear Average detector																
LgAv - Log Average detector																
Av - Average detector																
CAV - CISPR Average detector																
RMS - RMS detection																
CRMS - CISPR RMS detection																

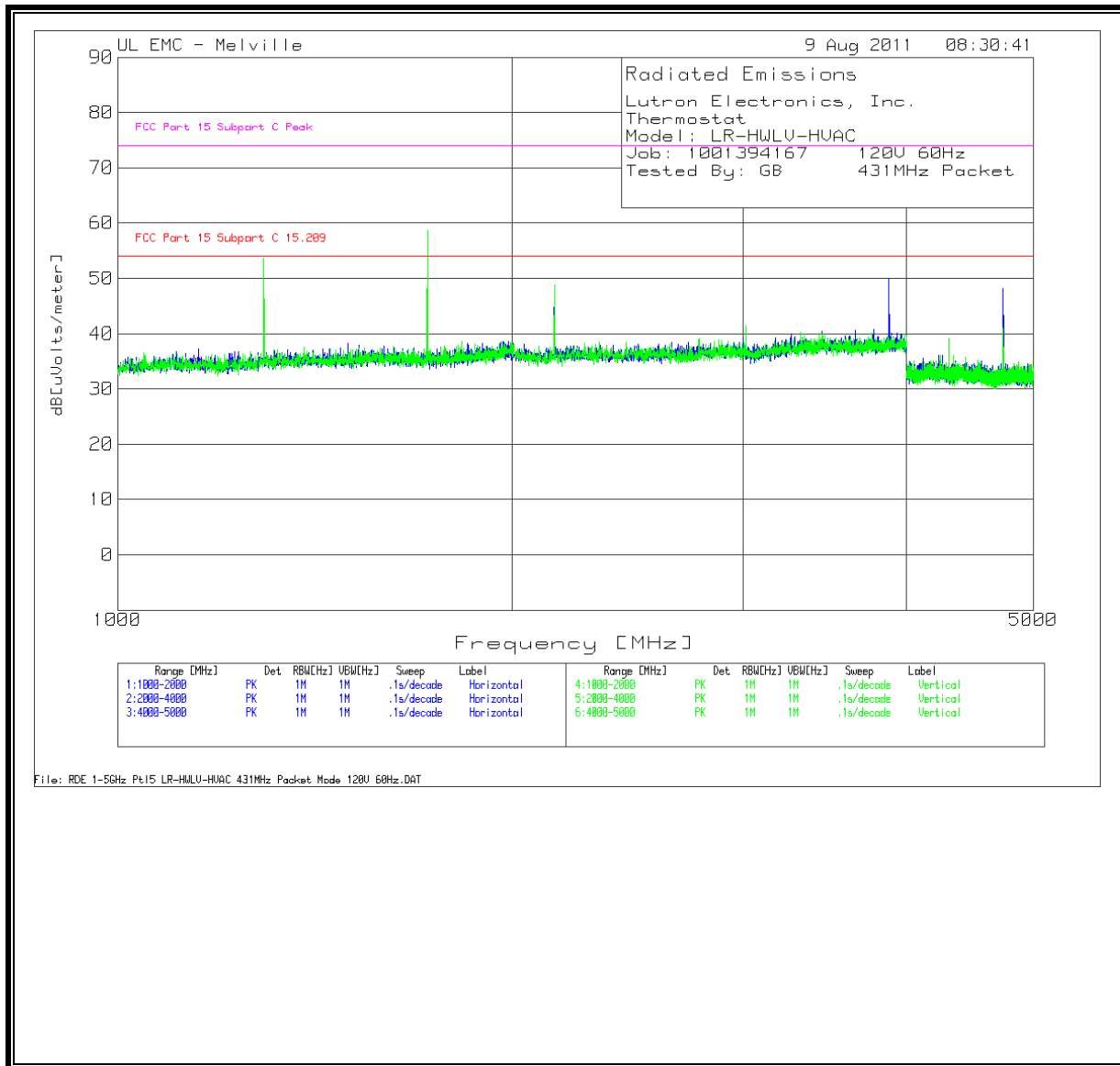


Lutron Electronics, Inc.														
Thermostat														
Model: LR-HWLV-HVAC														
Job: 10013894167 120V 60Hz														
Tested By: GB 437M Packet														
Horizontal 200 - 1000MHz														
Test	Meter	Detector	LogP 3M Horz 44067 02May1	3MLoc 30- 1000MH z 02Feb12	dB[uVolts /meter]	DCF	Corrected Level	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15.231	Margin	Azimuth [Degs]	Height [cm]	Polarity
426.9719	7.96	QP	16.9	2.3	27.16	-	-	46	-18.84	-	-	44	260	Horz
435.7	21.21	QP	17.1	2.3	40.61	-	-	46	-5.39	-	-	17	201	Horz
434.9	10.67	QP	17.1	2.3	30.07	-	-	46	-15.93	-	-	234	155	Horz
438.92	21.17	QP	17.2	2.3	40.67	-	-	46	-5.33	-	-	20	190	Horz
440.12	15.58	QP	17.2	2.3	35.08	-	-	46	-10.92	-	-	15	186	Horz
443.32	9.34	QP	17.1	2.4	28.84	-	-	46	-17.16	-	-	17	190	Horz
444.52	8.13	QP	17.1	2.4	27.63	-	-	46	-18.37	-	-	189	228	Horz
874.0719	30.08	PK	23.3	3.4	56.78	20.3	36.48	-	-	60.9	-24.42	158	164	Horz
917.96	8.84	QP	23.3	3.5	35.64	-	-	46	-10.36	-	-	101	311	Horz
946.77	8.84	QP	23.8	3.6	36.24	-	-	46	-9.76	-	-	335	306	Horz
436.9459	75.95	PK	17.1	2.3	95.35	20.3	75.05	-	-	80.9	-5.85	162	184	Horz
Vertical 200 - 1000MHz														
433.7	7.36	QP	16.6	2.3	26.26	-	-	46	-19.74	-	-	218	388	Vert
433.7	7.36	QP	16.6	2.3	26.26	-	-	46	-19.74	-	-	218	388	Vert
441.2689	7.48	QP	16.7	2.4	26.58	-	-	46	-19.42	-	-	71	304	Vert
442.1	7.42	QP	16.7	2.4	26.52	-	-	46	-19.48	-	-	61	299	Vert
444.5	7.36	QP	16.8	2.4	26.56	-	-	46	-19.44	-	-	114	285	Vert
873.9908	23.54	PK	23.3	3.4	50.24	20.3	29.94	-	-	60.9	-30.96	287	121	Vert
943.5549	8.99	QP	23.9	3.6	36.49	-	-	46	-9.51	-	-	182	373	Vert
958.2487	8.89	QP	24.2	3.6	36.69	-	-	46	-9.31	-	-	248	140	Vert
436.9459	75.07	PK	16.6	2.3	93.97	20.3	73.67	-	-	80.9	-7.23	313	162	Vert
PK - Peak detector (Maximized)														
QP - Quasi-Peak detector														
LnAv - Linear Average detector														
LgAv - Log Average detector														
Av - Average detector														
CAV - CISPR Average detector														
RMS - RMS detection														
CRMS - CISPR RMS detection														

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz



Lutron Electronics, Inc.														
Thermostat														
Model: LR-HWLV-HVAC														
Job: 1001394167 120V 60Hz														
Tested By: GB 431MHz Packet														
Horizontal 1000 - 2000MHz														
Test Frequency	Meter Reading	Detector	51442 1-2GHz [dB]	BOMS Factor [dB]	dB[uVolts /meter]	DCF	Corrected level	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1293.055	87.09	PK	20.5	-44.41	63.18	20.3	42.88	54	-11.12	74	-10.82	193	144	Horz
1723.82	73.95	PK	20.8	-44.14	50.61	20.3	30.31	54	-23.69	74	-23.39	142	352	Horz
Horizontal 2000 - 4000MHz														
2154.86	69.98	PK	21.4	-43.39	47.99	20.3	27.69	54	-26.31	74	-26.01	66	377	Horz
3023.94	59.12	PK	21.5	-41.85	38.77	20.3	18.47	54	-35.53	74	-35.23	31	188	Horz
3879.235	73.89	PK	22.6	-41.92	54.57	20.3	34.27	54	-19.73	74	-19.43	151	361	Horz
Horizontal 4000 - 5000MHz														
4310.06	70.41	PK	27.7	-51.73	46.38	20.3	26.08	54	-27.92	74	-27.62	185	213	Horz
4740.465	76.85	PK	27.2	-52.59	51.46	20.3	31.16	54	-22.84	74	-22.54	72	109	Horz
Vertical 1000 - 2000MHz														
1292.855	83.28	PK	20.4	-44.42	59.26	20.3	38.96	54	-15.04	74	-14.74	152	322	Vert
1723.845	85.17	PK	20.8	-44.14	61.83	20.3	41.53	54	-12.47	74	-12.17	180	162	Vert
Vertical 2000 - 4000MHz														
2155.105	74.25	PK	21	-43.38	51.87	20.3	31.57	54	-22.43	74	-22.13	189	134	Vert
3017.265	63.69	PK	21.7	-41.97	43.42	20.3	23.12	54	-30.88	74	-30.58	172	138	Vert
3871	59.77	PK	22.6	-41.8	40.57	20.3	20.27	54	-33.73	74	-33.43	38	334	Vert
Vertical 4000 - 5000MHz														
4309.99	70.62	PK	27.8	-51.73	46.69	20.3	26.39	54	-27.61	74	-27.31	165	379	Vert
4740.725	77.59	PK	27.1	-52.59	52.1	20.3	31.8	54	-22.2	74	-21.9	197	240	Vert
PK - Peak detector (Maximized)														
QP - Quasi-Peak detector														
LnAv - Linear Average detector														
LgAv - Log Average detector														
Av - Average detector														
CAV - CISPR Average detector														
RMS - RMS detection														
CRMS - CISPR RMS detection														



Lutron Electronics, Inc.														
Thermostat														
Model: LR-HWLV-HVAC														
Job: 1001394167 120V 60Hz														
Tested By: GB 437MHz Packet														
Horizontal 1000 - 2000MHz														
Test Frequency	Meter Reading	Detector	51442 1-2GHz [dB]	BOMS Factor [dB]	dB[uVolts /meter]	DCF	Corrected level	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1310.835	85.91	PK	20.5	-44.35	62.06	20.3	41.76	54	-12.24	74	-11.94	207	233	Horz
1747.83	73.71	PK	20.8	-44.14	50.37	20.3	30.07	54	-23.93	74	-23.63	129	342	Horz
Horizontal 2000 - 4000MHz														
2184.915	70.68	PK	21.5	-43.19	48.99	20.3	28.69	54	-25.31	74	-25.01	54	354	Horz
3932.815	73.28	PK	22.7	-41.7	54.28	20.3	33.98	54	-20.02	74	-19.72	164	298	Horz
Horizontal 4000 - 5000MHz														
4370.485	68.74	PK	27.6	-51.66	44.68	20.3	24.38	54	-29.62	74	-29.32	179	354	Horz
4807.31	77.52	PK	27.1	-52.55	52.07	20.3	31.77	54	-22.23	74	-21.93	150	359	Horz
Vertical 1000 - 2000MHz														
1310.95	83.77	PK	20.5	-44.35	59.92	20.3	39.62	54	-14.38	74	-14.08	169	211	Vert
1747.81	81.08	PK	20.8	-44.14	57.74	20.3	37.44	54	-16.56	74	-16.26	181	233	Vert
Vertical 2000 - 4000MHz														
2193.355	59.65	PK	21.3	-43.23	37.72	20.3	17.42	54	-36.58	74	-36.28	152	222	Vert
3933	66.23	PK	22.7	-41.7	47.23	20.3	26.93	54	-27.07	74	-26.77	115	110	Vert
Vertical 4000 - 5000MHz														
4370.33	72.18	PK	27.7	-51.66	48.22	20.3	27.92	54	-26.08	74	-25.78	102	397	Vert
4807.375	75.48	PK	27.3	-52.55	50.23	20.3	29.93	54	-24.07	74	-23.77	77	385	Vert
PK - Peak detector (Maximized)														
QP - Quasi-Peak detector														
LnAv - Linear Average detector														
LgAv - Log Average detector														
Av - Average detector														
CAV - CISPR Average detector														
RMS - RMS detection														
CRMS - CISPR RMS detection														

9. 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

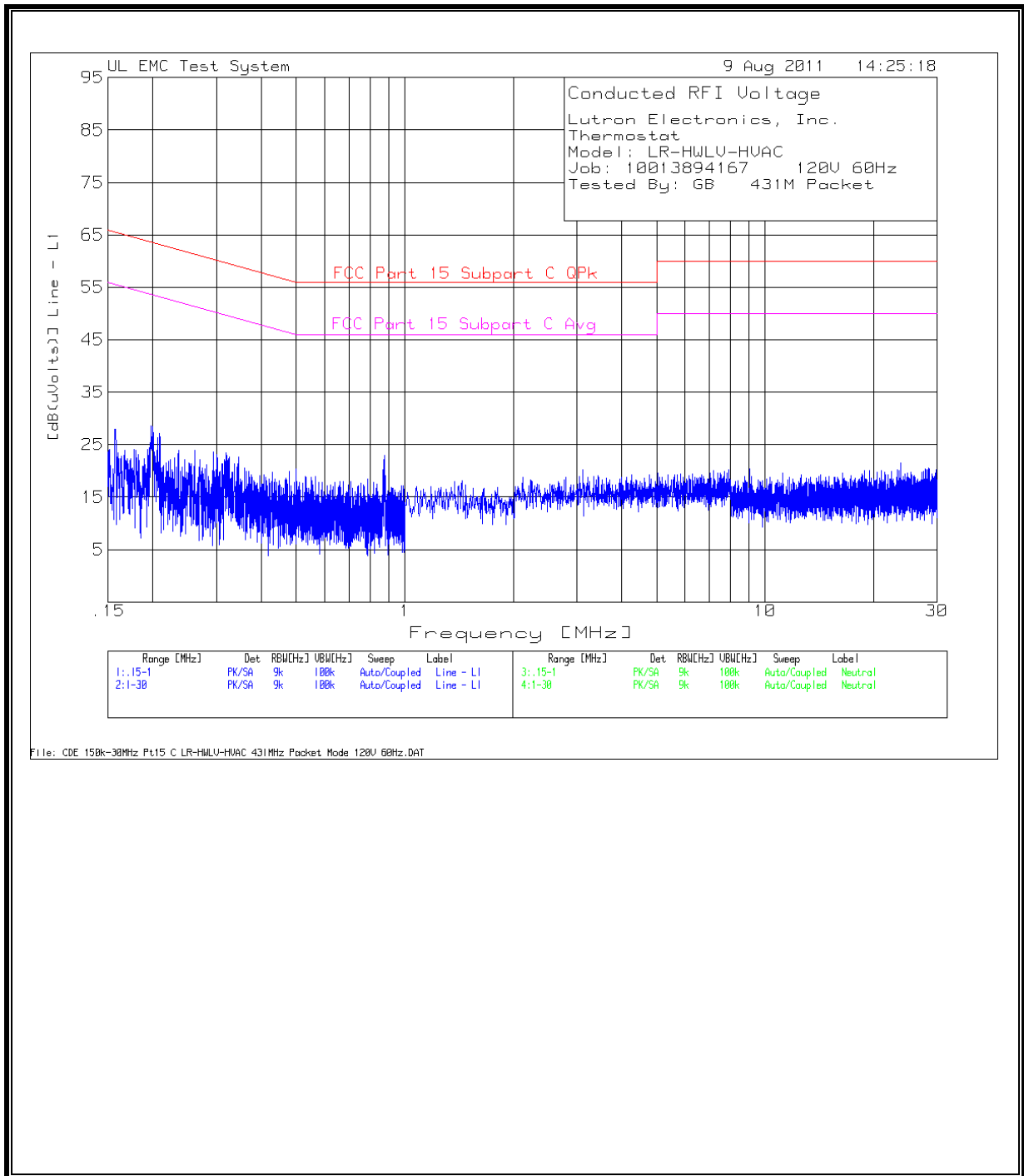
RESULTS

No non-compliance noted:

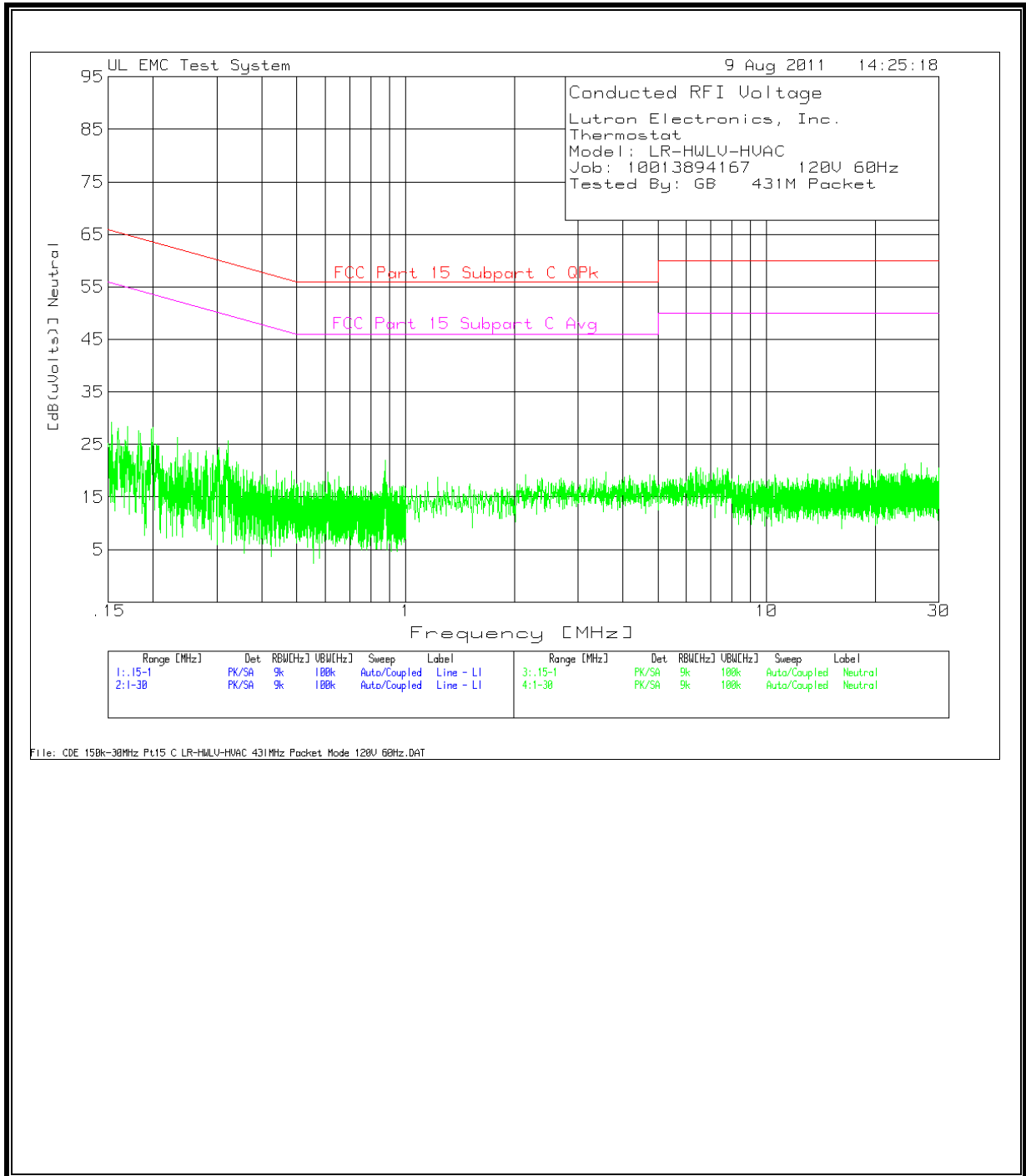
6 WORST EMISSIONS – 431MHz

Lutron Electronics, Inc.									
Thermostat									
Model: LR-HWLV-HVAC									
Job: 10013894167 120V 60Hz									
Tested By: GB 431M Packet									
Line - L1 .15 - 1MHz									
Test	Meter	Detector	5A636 with TI and Sw Line 1	FCC Part 15 Subpart	FCC Part 15 Subpart	C QPk	Margin	C Avg	Margin
Frequency	Reading		[dB]	[dB(uVolts)]					
0.15697	16.52	PK	11.5	28.02	65.6	-37.58	55.6	-27.58	
0.17925	12.58	PK	11.3	23.88	64.5	-40.62	54.5	-30.62	
0.19744	17.51	PK	11.1	28.61	63.7	-35.09	53.7	-25.09	
0.20866	16.11	PK	11.1	27.21	63.3	-36.09	53.3	-26.09	
0.87077	9.84	PK	10.4	20.24	56	-35.76	46	-25.76	
Line - L1 1 - 30MHz									
3.12323	9.86	PK	10.4	20.26	56	-35.74	46	-25.74	
Neutral .15 - 1MHz									
0.1534	17.66	PK	11.6	29.26	65.8	-36.54	55.8	-26.54	
0.16972	17.09	PK	11.4	28.49	65	-36.51	55	-26.51	
0.1818	16.3	PK	11.3	27.6	64.4	-36.8	54.4	-26.8	
0.19965	17.24	PK	11.1	28.34	63.6	-35.26	53.6	-25.26	
0.23315	15.45	PK	10.9	26.35	62.3	-35.95	52.3	-25.95	
Neutral 1 - 30MHz									
6.37187	10.25	PK	10.5	20.75	60	-39.25	50	-29.25	
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

LINE 1 RESULTS

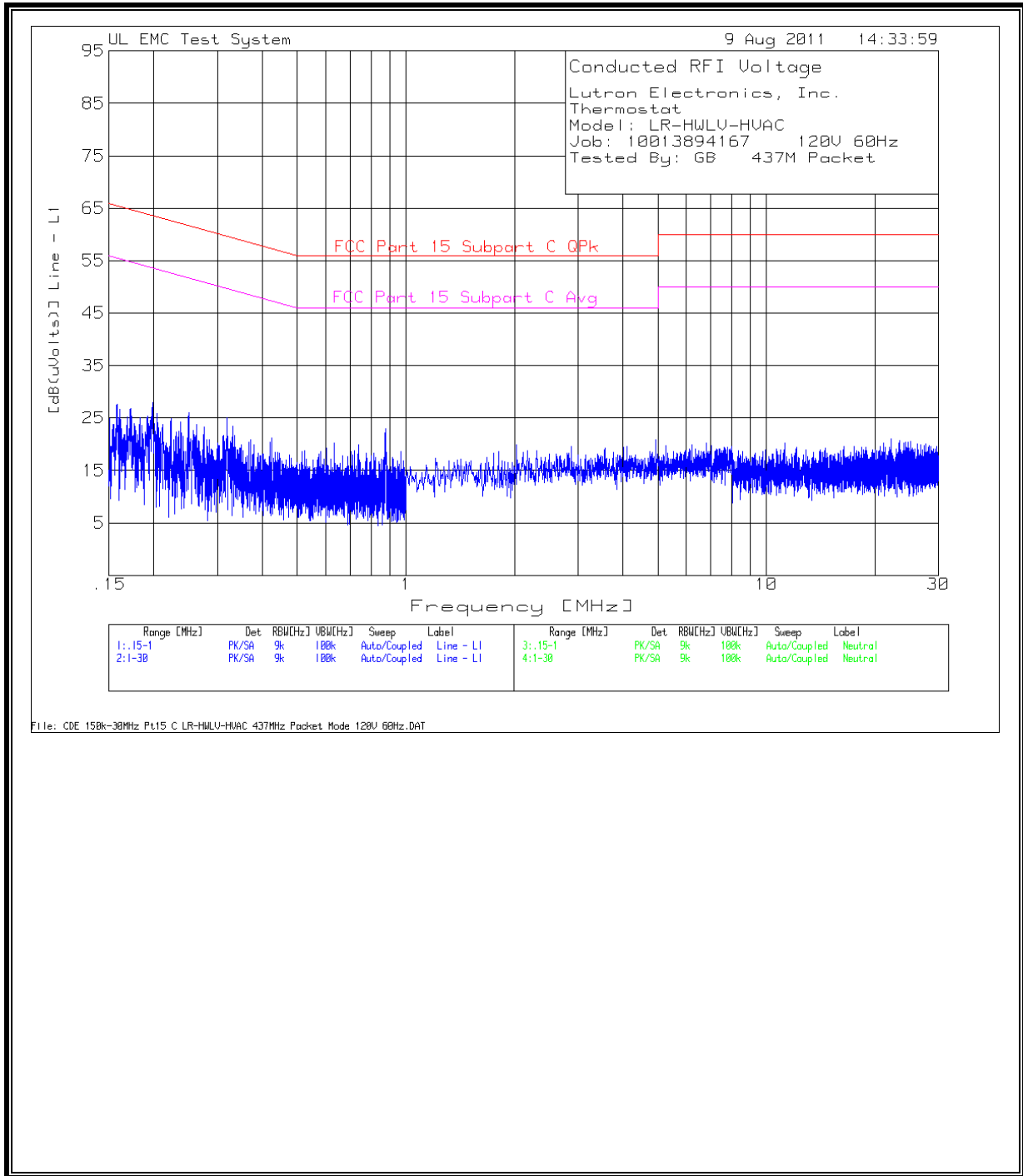


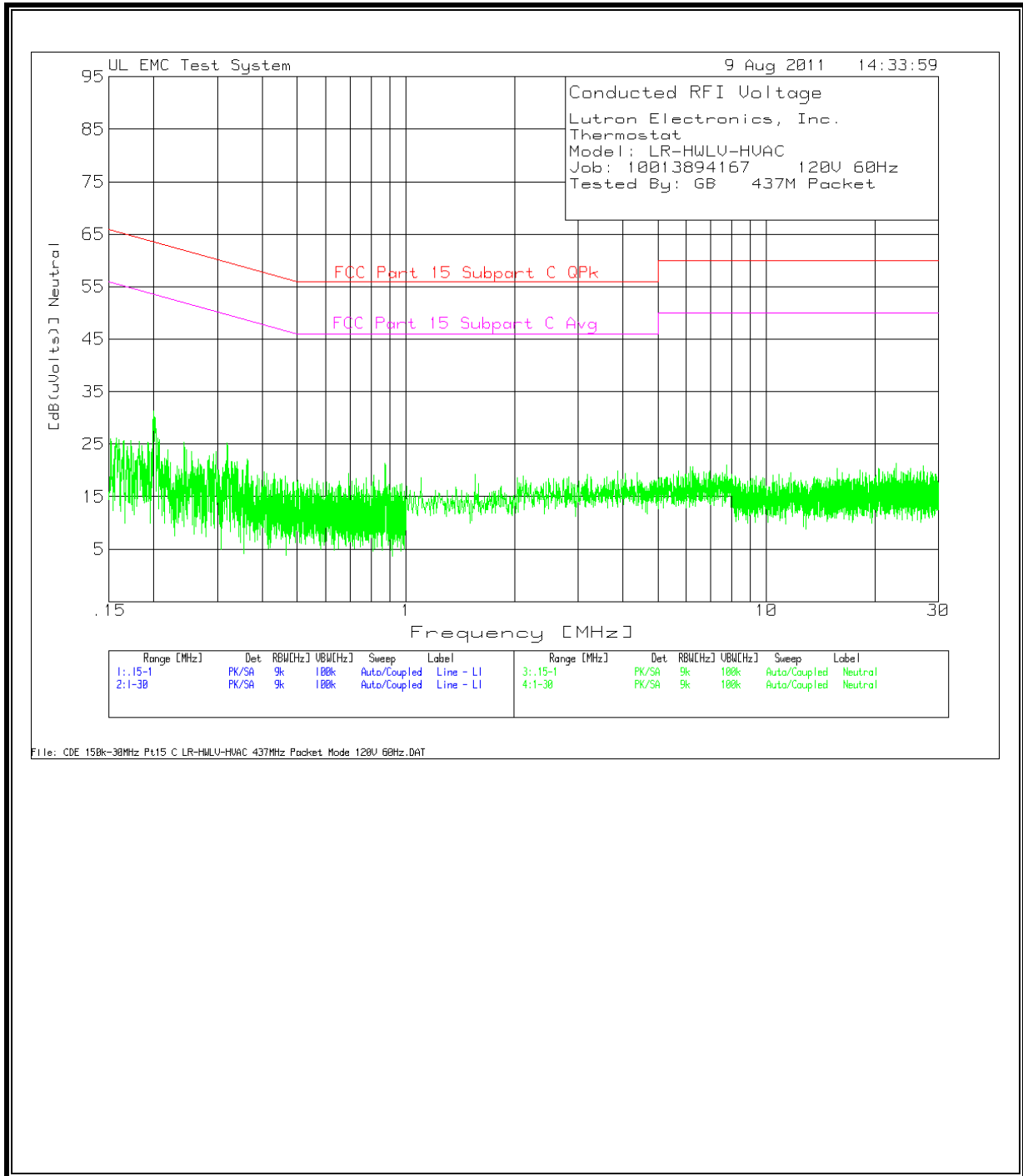
LINE 2 RESULTS



6 WORST EMISSIONS – 437MHz

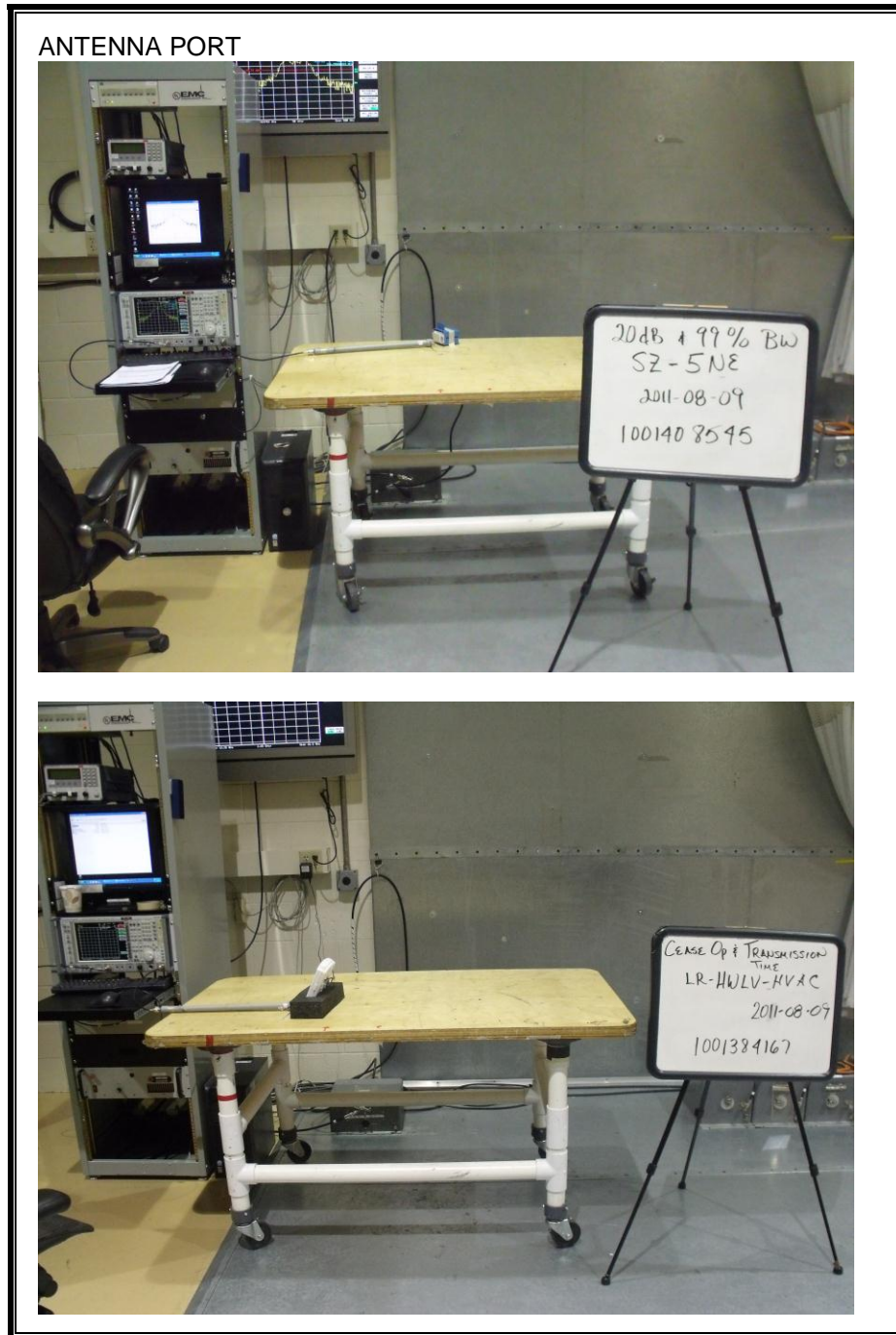
Lutron Electronics, Inc.								
Thermostat								
Model: LR-HWLV-HVAC								
Job: 10013894167 120V 60Hz								
Tested By: GB 437M Packet								
Line - L1 .15 - 1MHz								
Test	Meter		5A636 with TI and Sw Line 1		FCC Part 15 Subpart		FCC Part 15 Subpart	
Frequency	Reading	Detector	[dB]	[dB(uVolts)]	C QPk	Margin	C Avg	Margin
0.15782	16.08	PK	11.5	27.58	65.6	-38.02	55.6	-28.02
0.1721	15.59	PK	11.3	26.89	64.9	-38.01	54.9	-28.01
0.19846	16.89	PK	11.1	27.99	63.7	-35.71	53.7	-25.71
0.24964	15.19	PK	10.9	26.09	61.8	-35.71	51.8	-25.71
0.8786	12.6	PK	10.4	23	56	-33	46	-23
Line - L1 1 - 30MHz								
4.93319	10.5	PK	10.4	20.9	56	-35.1	46	-25.1
Neutral .15 - 1MHz								
0.16479	14.36	PK	11.4	25.76	65.2	-39.44	55.2	-29.44
0.18231	14.2	PK	11.3	25.5	64.4	-38.9	54.4	-28.9
0.19914	20.29	PK	11.1	31.39	63.6	-32.21	53.6	-22.21
0.24284	14.41	PK	10.9	25.31	62	-36.69	52	-26.69
0.31935	14.52	PK	10.7	25.22	59.7	-34.48	49.7	-24.48
Neutral 1 - 30MHz								
6.26165	10.16	PK	10.5	20.66	60	-39.34	50	-29.34
PK - Peak detector								
QP - Quasi-Peak detector								
LnAv - Linear Average detector								
LgAv - Log Average detector								
Av - Average detector								
CAV - CISPR Average detector								
RMS - RMS detection								
CRMS - CISPR RMS detection								



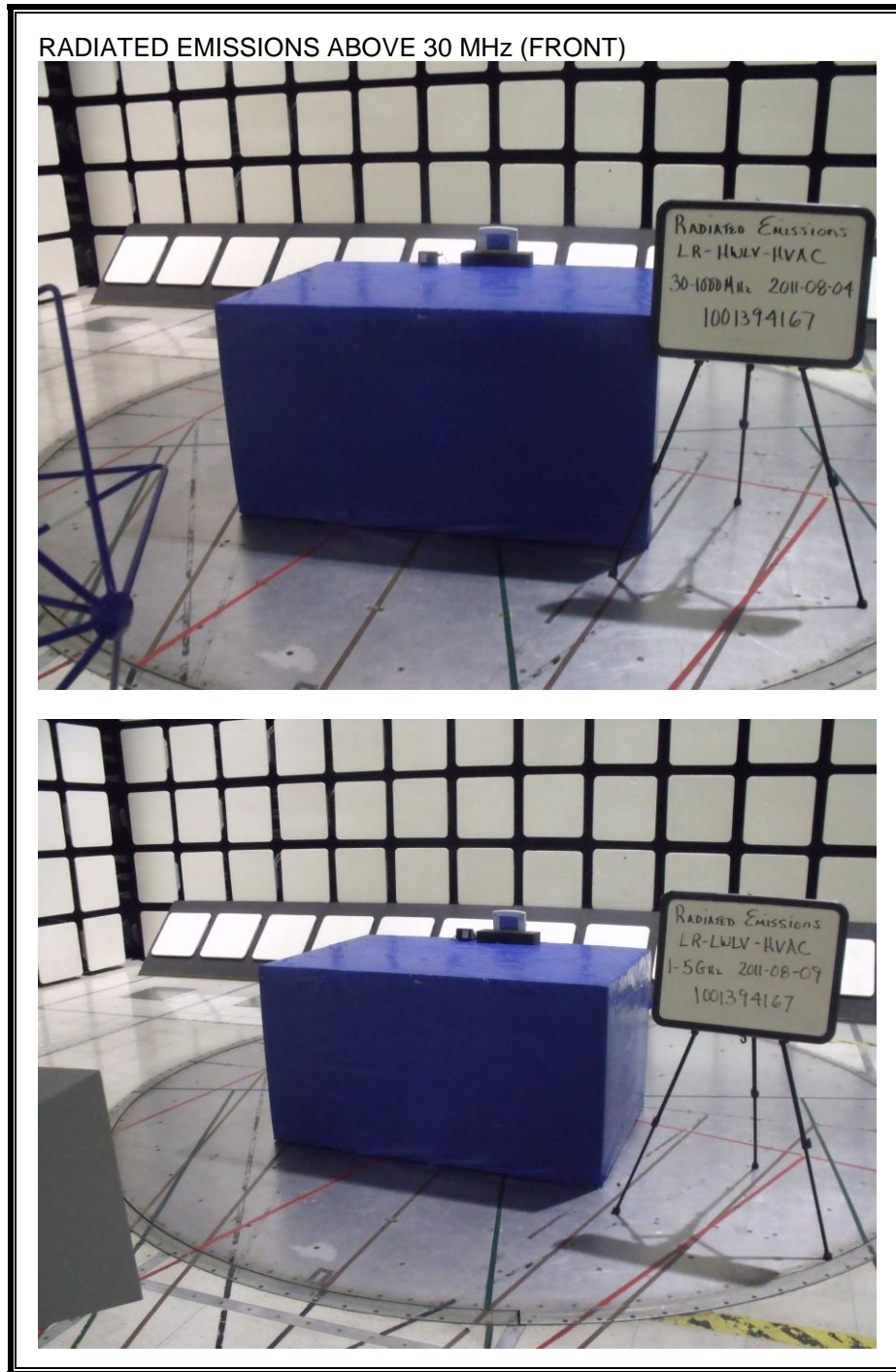


10. SETUP PHOTOS

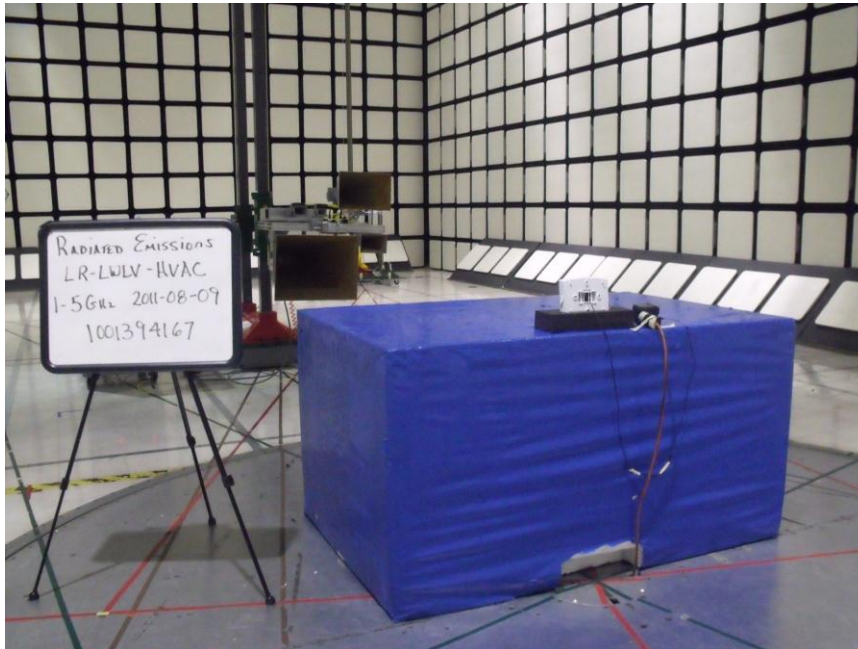
ANTENNA PORT



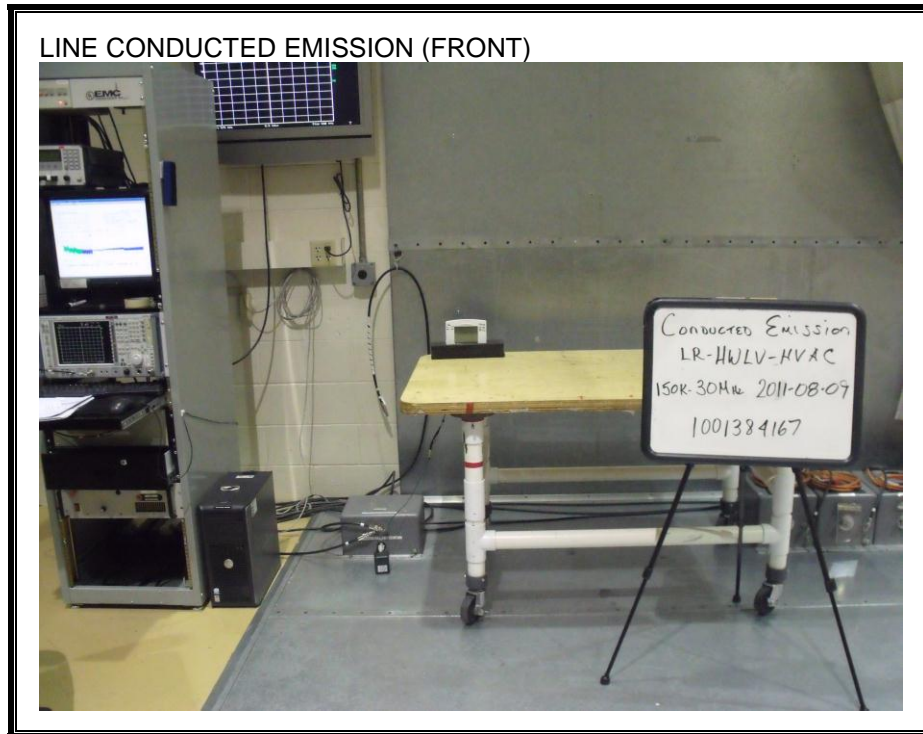
RADIATED EMISSION ABOVE 30 MHz

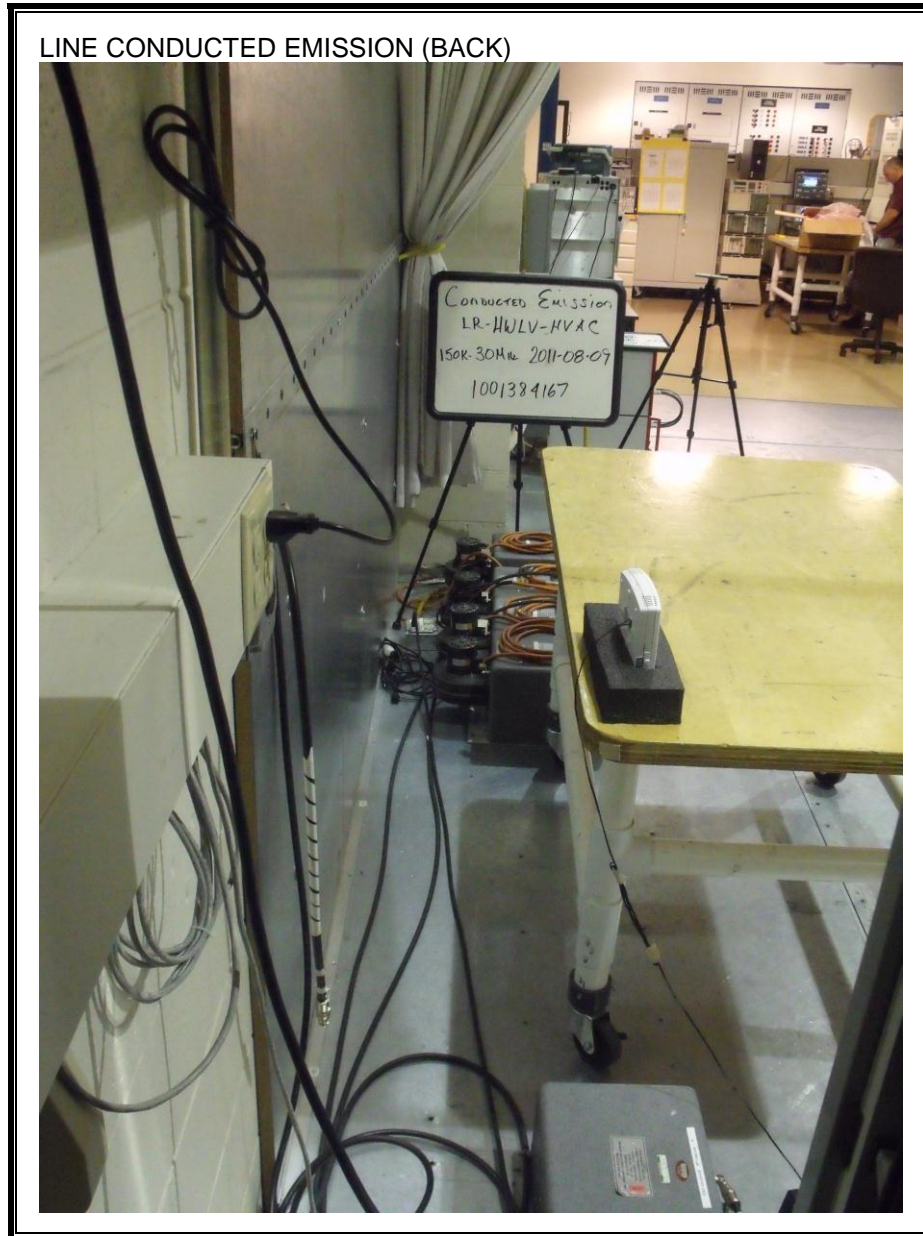


RADIATED EMISSIONS ABOVE 30 MHz (BACK)



AC MAINS LINE CONDUCTED EMISSION





END OF REPORT