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Job Number:	1001188273
Project Number:	09CA60255
File Number:	MC15896
Date:	January 7, 2010
Model:	LRF2-DCRB
FCC ID:	JPZ0068
IC Number:	2851A-JPZ0068

Electromagnetic Compatibility Test Report

For

LUTRON ELECTRONICS INC

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1285 Walt Whitman Rd.
Melville, NY 11747

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Tel: (631) 271-6200 Fax: (631) 439-6095

Job Number: 1001188273 File Number: MC15896 Page 2 of 51
Model Number: LRF2-DCRB
Client Name: LUTRON ELECTRONICS INC
FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Test Report Details

Tests Performed By: **Underwriters Laboratories Inc.**
1285 Walt Whitman Rd.
Melville, NY 11747

Tests Performed For: **LUTRON ELECTRONICS INC**
7200 SUTTER ROAD
COOPERBURG, PA 18036

Applicant Contact: **BOB SPEHALSKI**
Contact Signature*:

Title: **Engineering Manager**
Phone: **(610) 282-7424**
E-mail: **RSPEHALSKI@LUTRON.COM**

Test Report Date: **January 7, 2010**

Product Type: **Daylight Sensor**

Product standards **FCC Part 15, Subpart C, 15.231**

Model Number: **LRF2-DCRB**

Sample Serial Number: **Non-serialized production unit**

EUT Category: **Periodic Low Power Transmitter**

Testing Start Date: **16 December 2009**

Date Testing Complete: **17 December 2009**

Overall Results: Compliant

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the US government.

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*Signature required for products covered by FCC Declaration of Conformity or Verification in accordance with record retention requirements in FCC Rules 2.955(x) or 2.1057(x).

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Client Name: LUTRON ELECTRONICS INC
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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None	Original	-	-

1.0 G E N E R A L - Product Description

1.1 Equipment Description

The LRF2-DCRB is a battery operated daylight sensor that transmits data to a wireless receiver.

Per FCC Part 2.1093 (C) this device is not required to undergo testing for radio-frequency radiation exposure.

Antenna description: Permanently attached to the RF circuit board and the transmit antenna type is a PCB trace antenna.

1.2 Equipment Marking Plate

Not Available

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1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Daylight Sensor	LUTRON ELECTRONICS INC	LRF2-DCRB	None
Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test)				

1.3.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	Batt	N	N	None
Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical I/O = Signal Input or Output Port (Not Involved in Process Control) Batt = Battery TP = Telecommunication Ports					

1.3.3 EUT Internal Operating Frequencies:

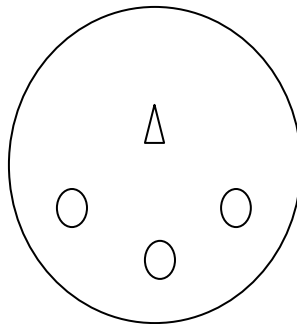
Frequency (MHz)	Description
1	Bus
1	Clock out
1	SPI
8	Clock
32	Crystal
431 – 437	Fundamental Transmit frequency range (6 channels 350kHz apart). User selected single channel device.

1.3.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	3	-	-	DC	-	3V Li-ion battery
1	3	-	-	DC	-	3V Li-ion battery

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



1.5 EUT Configurations

Mode #	Description
1	Stand Alone

1.6 EUT Operation Modes

Mode #	Description
1	Constant transmitting with modulation at 431MHz
2	Constant transmitting with modulation at 437MHz
3	Normal (periodic) transmissions at 431MHz
4	Normal (periodic) transmissions at 437MHz
5	Standby Mode (sleep mode)
6	Normal (periodic) transmissions at 433MHz

Note: all testing was conducted with fresh batteries.

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart C, 15.231	Code of Federal Regulations, Part 15, Radio Frequency Devices	2009
FCC Part 15, Subpart B	Code of Federal Regulations, Part 15, Radio Frequency Devices	2009
RSS-GEN, Issue 2	General Requirements and Information for the Certification of Radiocommunication Equipment	2007
RSS-210, Issue 7	Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment	2007
ICES-003, Issue 4	Digital Apparatus	2004

2.4 Results Summary

This product is considered Periodic Transmitter

Requirement – Test	Result (Compliant / Non-Compliant)
Fundamental Radiated Emissions	Compliant
Spurious Radiated Emissions	Compliant
Occupied Bandwidth – 20dB	Compliant
Occupied Bandwidth – 99% Power	Compliant
Pulse Train - Averaging Factor	Compliant
Cease Operation	Compliant
Radiated Emissions - Unintentional	Compliant

Note: for Radiated Emissions the EUT is positioned in the worst case orientation.

Test Engineer:



Bob DeLisi (Ext.22452)
Senior Staff Engineer
International EMC Services
Conformity Assessment Services-

Reviewer:



Joe Danisi(Ext.23055)
Lead Engineering Associate
International EMC Services
Conformity Assessment Services

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

----- North America -----

Code of Federal Regulations Title 47	Part 15, Subpart B and C, Radio Frequency Devices
Industry Canada	RSS-GEN, RSS-210 and ICES-003

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150
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4.1 Test Conditions and Results – OCCUPIED BANDWIDTH

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	FCC Part 15 Subpart C,15.231, RSS-210, RSS-GEN
Occupied Bandwidth Limits	
0.25% of Fo	

Table 1 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	3
1	1	4
Supplementary information: None		

Table 2 Occupied Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth (MHz)	Occupied Bandwidth Requirements	
	dBc	%
10kHz	-20	99
Supplementary information: None		

Table 3 Occupied Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Dipole Antenna	EMCO	3121C	3359
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268

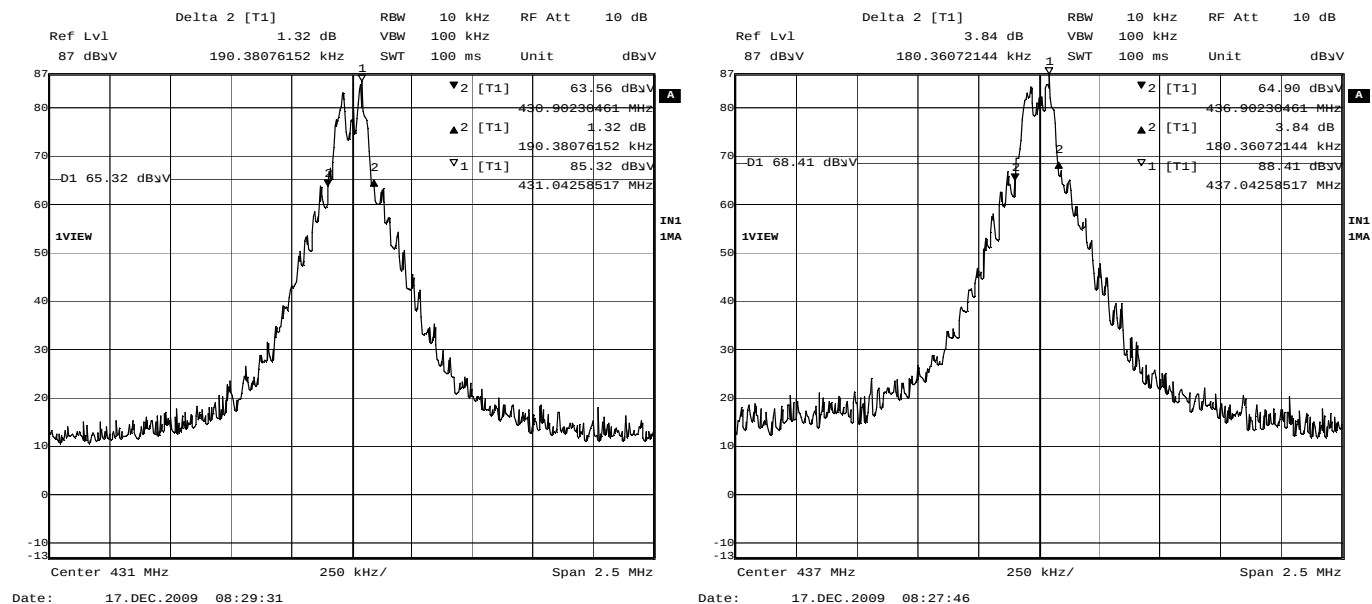
Figure 1 Test Setup for Occupied Bandwidth



Table 4 Occupied Bandwidth

Frequency (MHz)	20dB OBW	99% OBW	Limit (MHz)	Result
431	190.4kHz	205.4kHz	1.08	Pass
437	180.4kHz	215.4kHz	1.09	Pass

Figure 2 Occupied Bandwidth Graph – 20dB



4.2 Test Conditions and Results – CEASE OPERATION

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart C,15.231
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

Table 5 Cease Operation Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	6
Supplementary information: None		

Table 6 Cease Operation Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Dipole Antenna	EMCO	3121C	3359
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268

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Client Name: LUTRON ELECTRONICS INC

FCC ID:JPZ0068

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Figure 4 Test Setup for Cease Operation



4.3 Test Conditions and Results – PULSE TRAIN

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.		
Basic Standard		FCC Part 15 Subpart A, 15.35	
Pulse Train Limits			
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.			

Table 7 Pulse Train Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	6
Supplementary information: None		

Table 8 Pulse Train Calculation

Pulse Width (mS)	Total Transmission time or 100ms which ever is lesser	Average Correction Factor (dB) $20 \log \left(\frac{PulseWidth}{TotalTransmissionTime} \right)$
10	100	-20.0

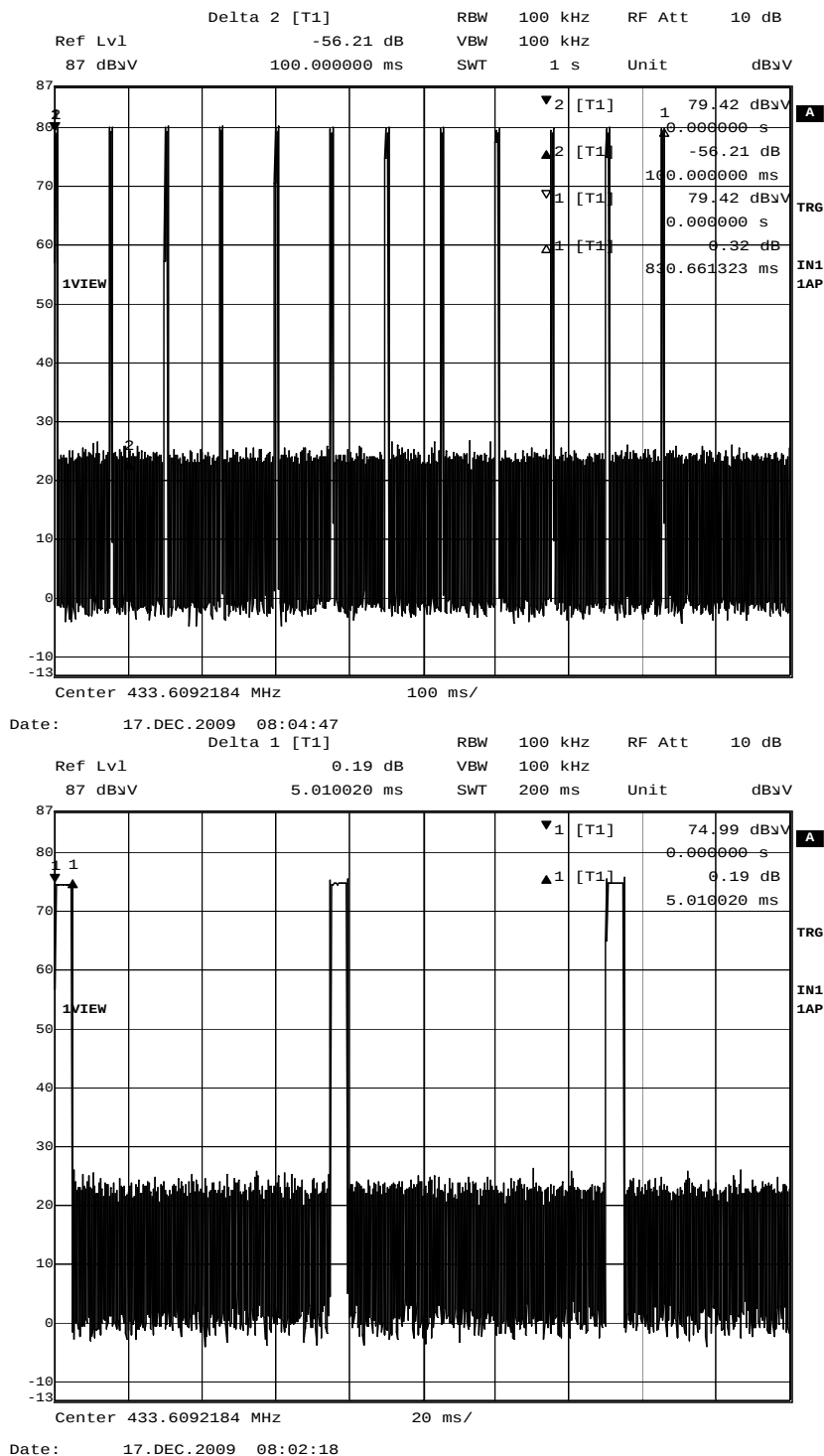
Table 9 Pulse Train Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Dipole Antenna	EMCO	3121C	3359
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268

Figure 6 Test Setup for Pulse Train



Figure 7 Pulse Train Graph



4.4 Test Conditions and Results – INTENTIONAL RADIATED EMISSIONS

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.10. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.		
Basic Standard		C63.10	
UL LPG		80-EM-S0029	
	Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range	0.009 MHz – 5GHz	(3 meter measurement distance)	
Limits			
Frequency (MHz)	Limit (dBμV/m)		
	Quasi-Peak	Average	
	General Emissions	Fundamental	Spurious
0.009 – 0.490	128.5 – 93.8	-	-
0.490 – 1.705	73.8 – 63	-	-
1.705 – 30	69.5	-	-
30 – 88	40	-	-
88 – 216	43.5	-	-
216-960	46	-	-
1000-10000	54	-	-
Fundamental - 431	-	80.7	-
Fundamental - 437	-	80.9	-
Spurious of 431	-	-	60.7
Spurious of 437	-	-	60.9
Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits.			
For the range 9kHz to 30MHz, only one channel is tested since the transmitter does not operate in that range.			
A new battery was used prior to each test run in each frequency range.			

Table 10 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
1	1	2
Supplementary information: None		

Table 11 Radiated Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
60Hz-30MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Active Loop Antenna	EMCO	6507	ME5A-288
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Multimeter	Fluke	87V	44547
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Bicon Antenna	Schaffner	VBA6106A	43441
Log-P Antenna	Schaffner	UPA6109	44067
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Multimeter	Fluke	87V	44547
Above 1GHz (Band Optimized System)			
Spectrum Analyzer	Agilent	E7405A	19695
Horn Antenna (1-2 GHz)	ETS	3161-01	51442
Horn Antenna (2-4 GHz)	ETS	3161-02	48107
Horn Antenna (4-8 GHz)	ETS	3161-03	48106
Signal Path Controller	HP	11713A	50250
Gain Controller	HP	11713A	50251

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Client Name: LUTRON ELECTRONICS INC
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Test Equipment Used			
Description	Manufacturer	Model	Identifier
RF Switch / Preamp Fixture	UL	BOMS1	50249
System Controller	UL	BOMS2	50252
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Multimeter	Fluke	87V	44547

Figure 8 Test setup for Radiated Emissions

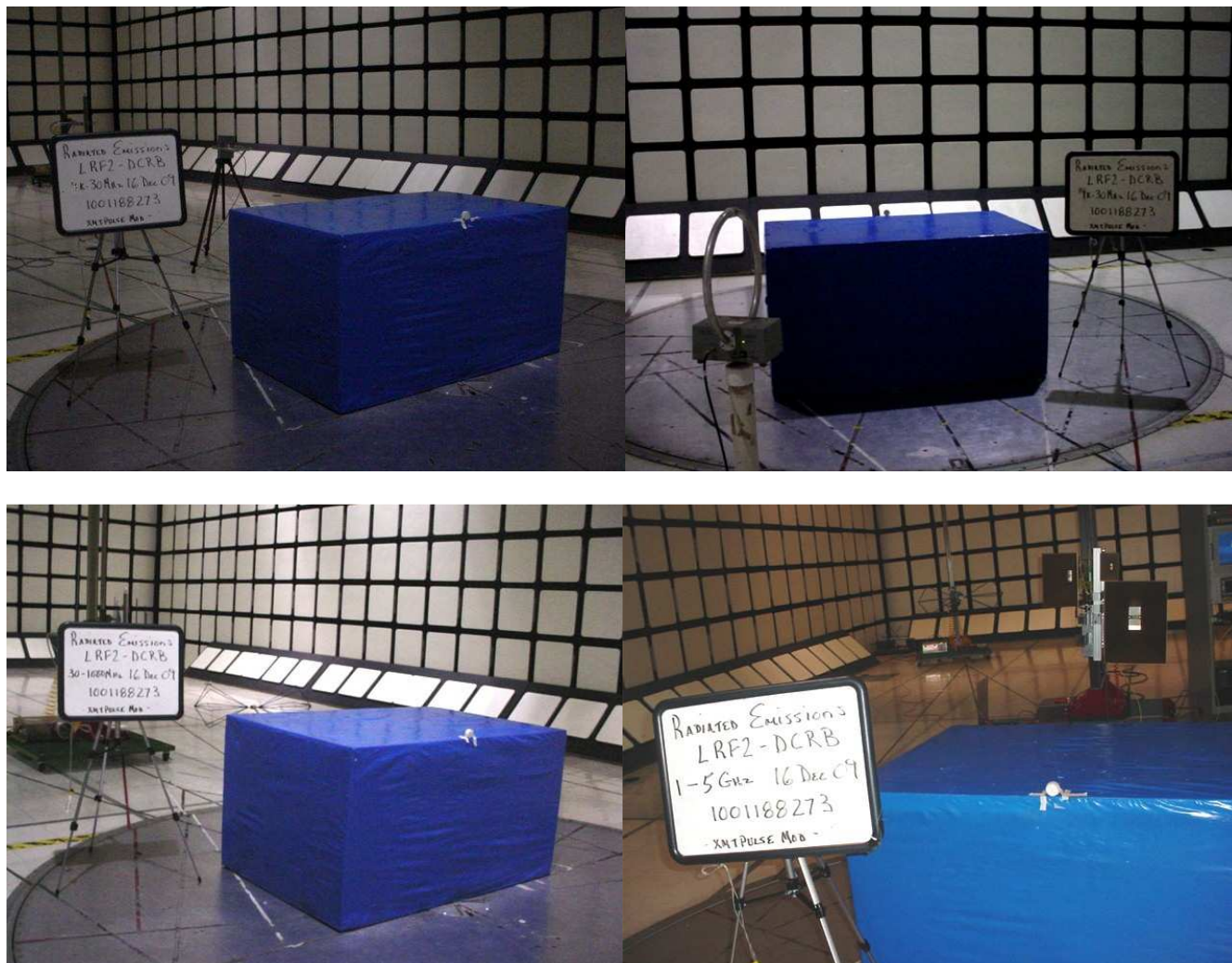
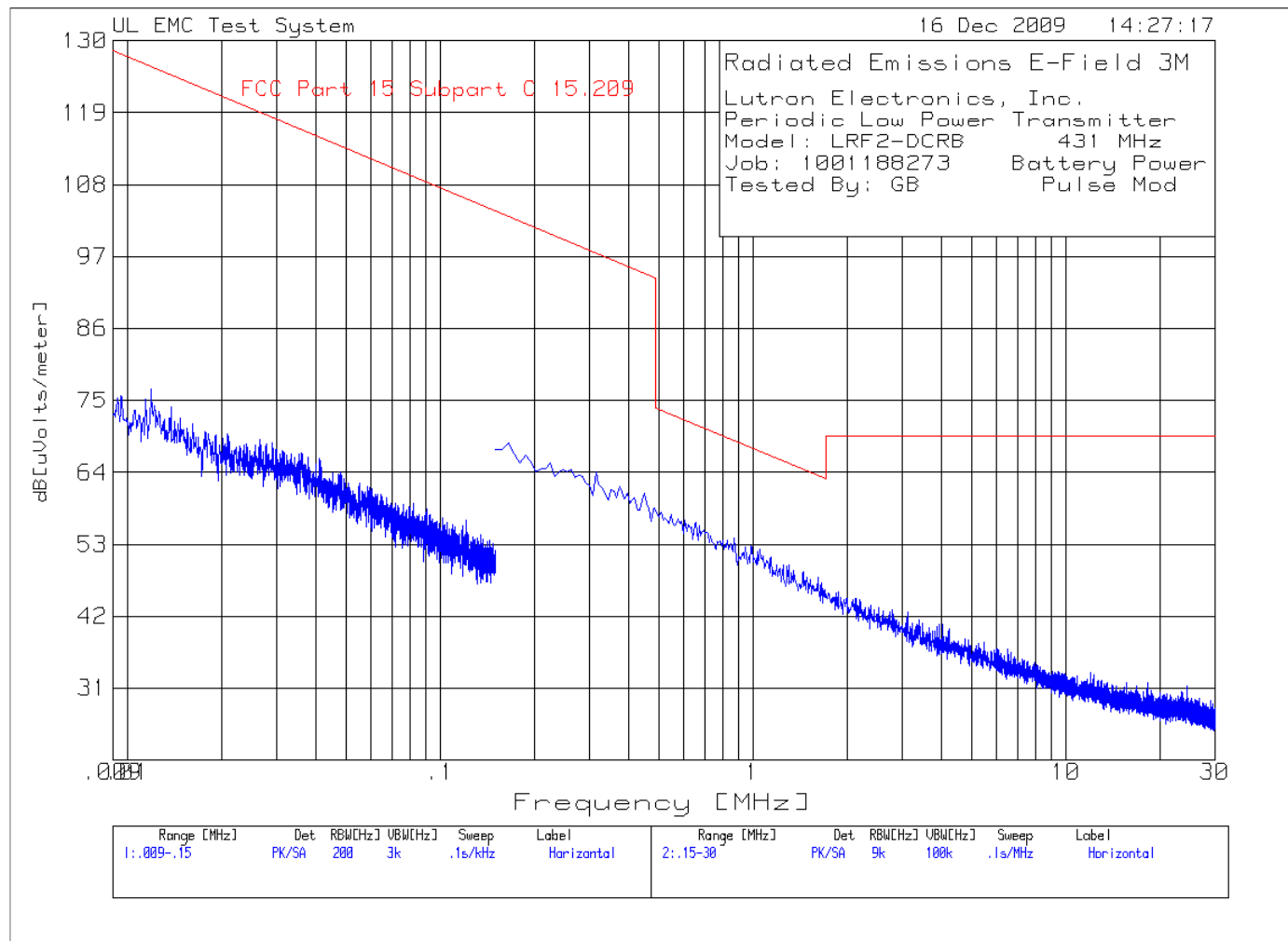


Figure 9 Radiated Emissions Graph



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 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Table 12 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 431 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal .009 - .15MHz -----											
1	.01193	46.51 pk	.2	30.1	76.81	126.1	-	-	-	-	-
	Azimuth:353			Margin [dB]		-49.29	-	-	-	-	-
2	.0138	44.83 pk	0	29.1	73.93	124.8	-	-	-	-	-
	Azimuth:7			Margin [dB]		-50.87	-	-	-	-	-
3	.02909	44.29 pk	0	24.2	68.49	118.3	-	-	-	-	-
	Azimuth:231			Margin [dB]		-49.81	-	-	-	-	-
4	.04122	43.89 pk	0	22.2	66.09	115.3	-	-	-	-	-
	Azimuth:353			Margin [dB]		-49.21	-	-	-	-	-
Horizontal .15 - 30MHz -----											
5	.18732	49.27 pk	0	17.3	66.57	102.1	-	-	-	-	-
	Azimuth:241			Margin [dB]		-35.53	-	-	-	-	-
6	.32168	45 pk	0	17.1	62.1	97.5	-	-	-	-	-
	Azimuth:355			Margin [dB]		-35.4	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

PK - Peak detector

QP - Quasi-Peak detector

av - Linear average detector

avlg - Log average detection.

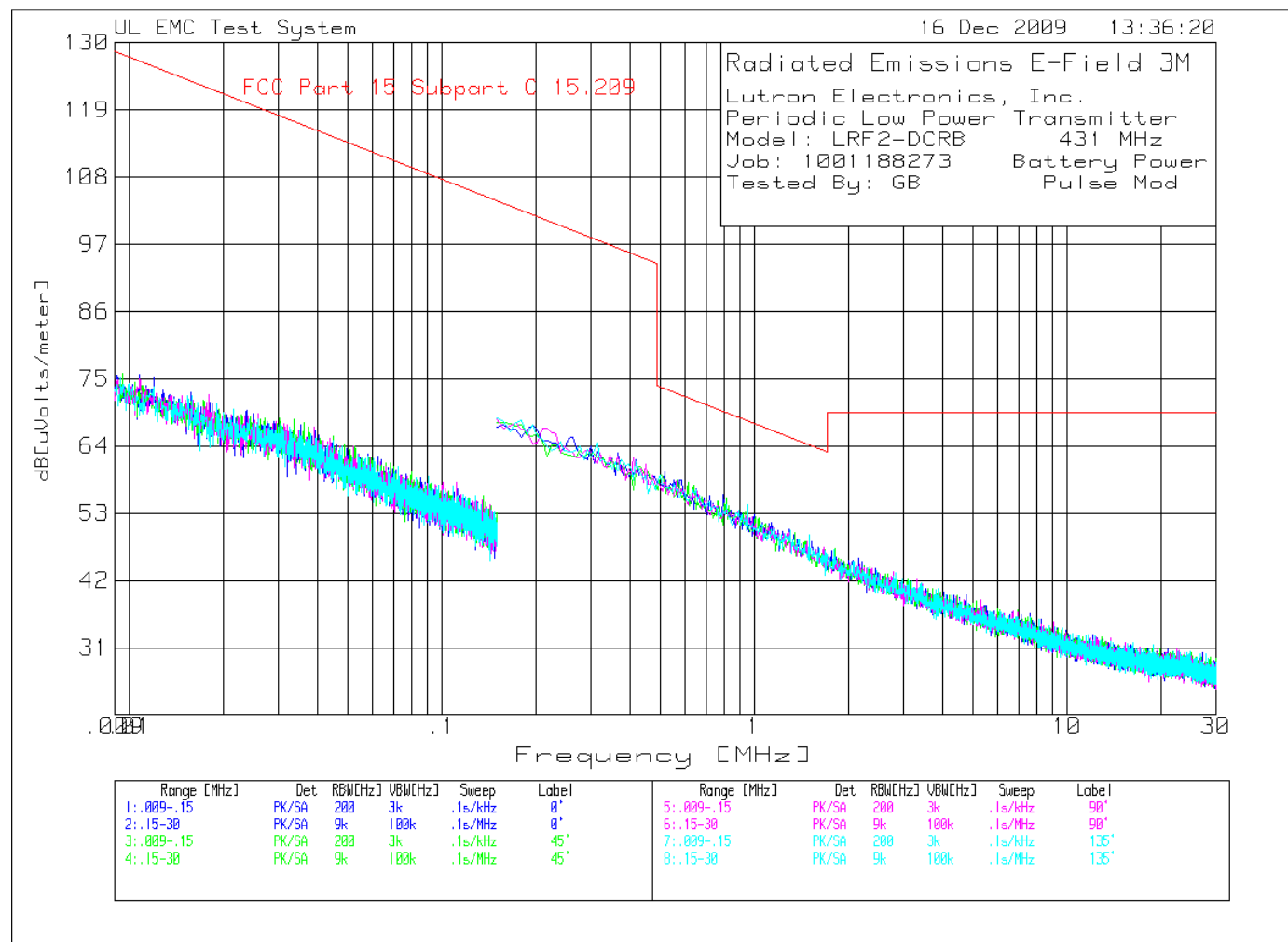
AV - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

Figure 10 Radiated Emissions Graph - Vertical Polarity



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 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Table 13 Radiated Emissions Data Points - Vertical Polarity

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 431 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6

0°	.009 - .15MHz	-----									
1	.01081	45.18 pk	-.2	30.7	75.68	126.9	-	-	-	-	-
	Azimuth:303	Height:100	Horz	Margin [dB]		-51.22	-	-	-	-	-
2	.01199	44.89 pk	.2	30	75.09	126	-	-	-	-	-
	Azimuth:7	Height:100	Horz	Margin [dB]		-50.91	-	-	-	-	-

0°	.15 - 30MHz	-----									
5	.19479	50.14 pk	0	17.3	67.44	101.8	-	-	-	-	-
	Azimuth:258	Height:100	Horz	Margin [dB]		-34.36	-	-	-	-	-
6	.41872	44.48 pk	0	17.3	61.78	95.2	-	-	-	-	-
	Azimuth:315	Height:100	Horz	Margin [dB]		-33.42	-	-	-	-	-

90°	.009 - .15MHz	-----									
3	.01797	45.59 pk	0	26.8	72.39	122.5	-	-	-	-	-
	Azimuth:276	Height:140	Horz	Margin [dB]		-50.11	-	-	-	-	-
4	.03907	44.55 pk	0	22.5	67.05	115.8	-	-	-	-	-
	Azimuth:357	Height:140	Horz	Margin [dB]		-48.75	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

PK - Peak detector

QP - Quasi-Peak detector

av - Linear average detector

avlg - Average log detector

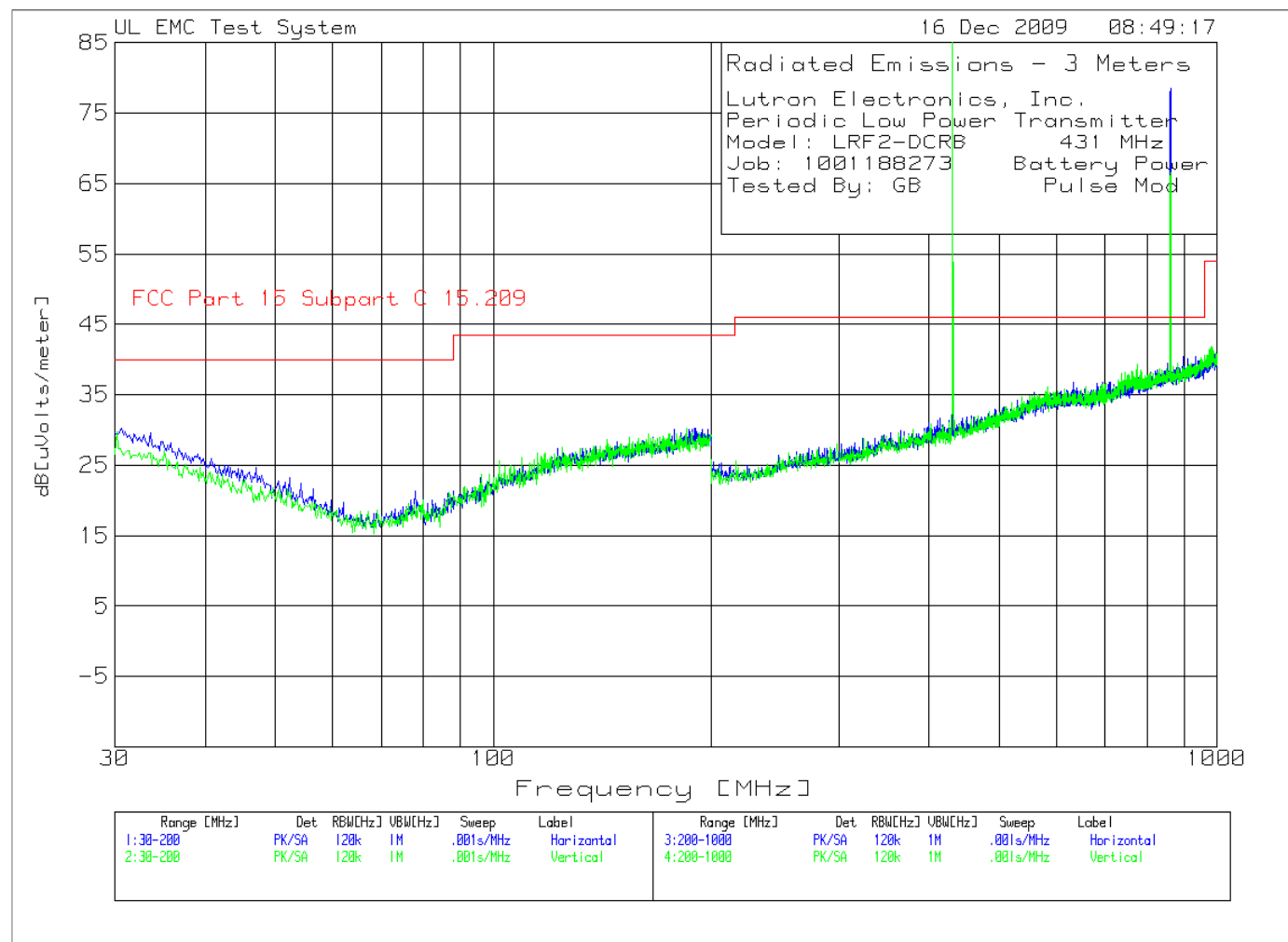
AV - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

Figure 11 Radiated Emissions Graph



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 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Table 14 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 431 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 200 - 1000MHz -----											
1	430.9155	65.29 pk	1.3	16.7	83.29	-	80.7	-	-	-	-
	Azimuth:137	Height:400	Horz	Margin [dB]		-	2.59	-	-	-	-
4	861.931	52.79 pk	1.7	23.1	77.59	-	60.7	-	-	-	-
	Azimuth:14	Height:100	Horz	Margin [dB]		-	16.89	-	-	-	-
5	414.5073	13.74 pk	1.3	16.6	31.64	46	-	-	-	-	-
	Azimuth:286	Height:100	Horz	Margin [dB]		-14.36	-	-	-	-	-
Vertical 200 - 1000MHz -----											
2	430.9155	75.32 pk	1.3	16.4	93.02	-	80.7	-	-	-	-
	Azimuth:24	Height:100	Vert	Margin [dB]		-	12.32	-	-	-	-
3	862.3312	41.87 pk	1.7	23	66.57	-	60.7	-	-	-	-
	Azimuth:169	Height:300	Vert	Margin [dB]		-	5.87	-	-	-	-
6	981.991	15.01 pk	1.9	25	41.91	54	-	-	-	-	-
	Azimuth:54	Height:100	Vert	Margin [dB]		-12.09	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Log average detection.

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Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 431 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

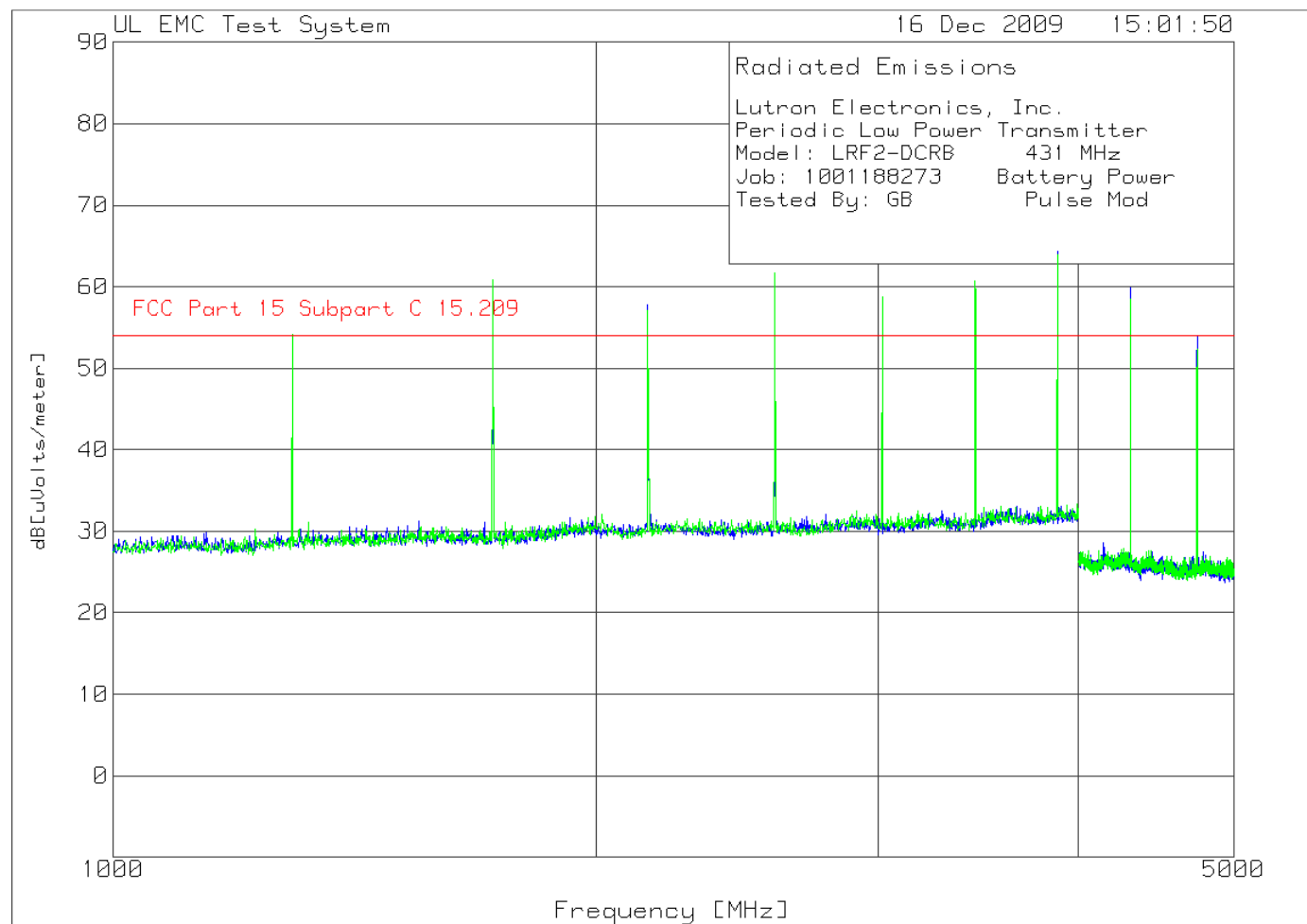
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
=====									
Horizontal 200 - 1000MHz									
431	70 PK	1.3	16.7	68*	-	80.7	-	-	-
Azimuth: 342	Height:374	Horz		Margin [dB]:	-	-12.7	-	-	-
862.1	53.13 PK	1.7	23.1	57.93*	-	60.7	-	-	-
Azimuth: 138	Height:160	Horz		Margin [dB]:	-	-2.77	-	-	-
Vertical 200 - 1000MHz									
431	76.66 PK	1.3	16.4	74.36*	-	80.7	-	-	-
Azimuth: 286	Height:134	Vert		Margin [dB]:	-	-6.34	-	-	-
861.9	46.52 PK	1.7	23	51.22*	-	60.7	-	-	-
Azimuth: 204	Height:157	Vert		Margin [dB]:	-	-9.48	-	-	-

***Duty Cycle correction factor of 20.0 applied (see section 4.3 of report for calculation)**

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector (maximized)
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Average log detector
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection
 CRMS - CISPR RMS detection

Figure 12 Radiated Emissions Graph



Job Number: 1001188273 File Number: MC15896 Page 33 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Table 15 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 431 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 1000 - 2000MHz -----											
1	1293.383	78.11 pk	-45.59	20.5	53.02	54	-	-	-	-	-
		Height:149	Horz	Margin [dB]		-.98	-	-	-	-	-
2	1725.343	80.72 pk	-45.07	20.8	56.45	54	-	-	-	-	-
		Height:149	Horz	Margin [dB]		2.45	-	-	-	-	-
Horizontal 2000 - 4000MHz -----											
5	2154.806	80.3 pk	-43.92	21.4	57.78	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		3.78	-	-	-	-	-
6	2586.767	82.97 pk	-43.55	21.3	60.72	54	-	-	-	-	-
		Height:149	Horz	Margin [dB]		6.72	-	-	-	-	-
7	3018.727	71 pk	-42.88	21.5	49.62	54	-	-	-	-	-
		Height:149	Horz	Margin [dB]		-4.38	-	-	-	-	-
8	3448.19	77.84 pk	-42.83	22.1	57.11	54	-	-	-	-	-
		Height:200	Horz	Margin [dB]		3.11	-	-	-	-	-
14	3880.15	84.58 pk	-42.9	22.6	64.28	54	-	-	-	-	-
		Height:200	Horz	Margin [dB]		10.28	-	-	-	-	-
Horizontal 4000 - 5000MHz -----											
15	4309.484	85.52 pk	-53.3	27.7	59.92	54	-	-	-	-	-
		Height:150	Horz	Margin [dB]		5.92	-	-	-	-	-
16	4741.265	81.28 pk	-54.49	27.2	53.99	54	-	-	-	-	-
		Height:150	Horz	Margin [dB]		-.01	-	-	-	-	-
Vertical 1000 - 2000MHz -----											
3	1293.383	79.21 pk	-45.59	20.5	54.12	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		.12	-	-	-	-	-
4	1725.343	85.07 pk	-45.07	20.8	60.8	54	-	-	-	-	-
		Height:149	Vert	Margin [dB]		6.8	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

PK - Peak detector

QP - Quasi-Peak detector

av - Linear average detector

avlg - Average log detector

AV - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

Job Number: 1001188273 File Number: MC15896 Page 34 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
=====											
Vertical 2000 - 4000MHz -----											
9	2154.806	79.96 pk	-43.92	21	57.04	54	-	-	-	-	-
		Height:199 Vert		Margin [dB]		3.04	-	-	-	-	-
10	2586.767	83.73 pk	-43.55	21.5	61.68	54	-	-	-	-	-
		Height:150 Vert		Margin [dB]		7.68	-	-	-	-	-
11	3018.727	79.88 pk	-42.88	21.7	58.7	54	-	-	-	-	-
		Height:199 Vert		Margin [dB]		4.7	-	-	-	-	-
12	3448.19	81.37 pk	-42.83	22.2	60.74	54	-	-	-	-	-
		Height:100 Vert		Margin [dB]		6.74	-	-	-	-	-
13	3880.15	84.22 pk	-42.9	22.6	63.92	54	-	-	-	-	-
		Height:100 Vert		Margin [dB]		9.92	-	-	-	-	-
Vertical 4000 - 5000MHz -----											
17	4309.484	83.93 pk	-53.3	27.8	58.43	54	-	-	-	-	-
		Height:150 Vert		Margin [dB]		4.43	-	-	-	-	-
18	4741.265	79.72 pk	-54.49	27.1	52.33	54	-	-	-	-	-
		Height:100 Vert		Margin [dB]		-1.67	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

PK - Peak detector

QP - Quasi-Peak detector

av - Linear average detector

avlg - Average log detector

AV - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

Job Number: 1001188273 File Number: MC15896 Page 35 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 431 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
=====										
Horizontal 1000 - 2000MHz										
1724.15	76.44 PK	-45.12	20.8	52.12	-	60.7	-	-	-	-
Azimuth: 20	Height:275	Horz	Margin	[dB]:	-	-8.58	-	-	-	-
1293	73.7 PK	-45.6	20.5	48.6	-	60.7	-	-	-	-
Azimuth: 220	Height:229	Horz	Margin	[dB]:	-	-12.1	-	-	-	-
Horizontal 2000 - 4000MHz										
2155.2	81.48 PK	-43.91	21.4	58.97	-	60.7	-	-	-	-
Azimuth: 173	Height:364	Horz	Margin	[dB]:	-	-1.73	-	-	-	-
3879.345	84.97 PK	-42.91	22.6	44.66*	54	-	-	-	-	-
Azimuth: 29	Height:335	Horz	Margin	[dB]:	-9.34	-	-	-	-	-
3447.95	79.64 PK	-42.83	22.1	58.91	-	60.7	-	-	-	-
Azimuth: 47	Height:340	Horz	Margin	[dB]:	-	-1.79	-	-	-	-
3017.36	70.29 PK	-42.92	21.5	48.87	-	60.7	-	-	-	-
Azimuth: 309	Height:356	Horz	Margin	[dB]:	-	-11.83	-	-	-	-
2586	85.28 PK	-43.55	21.3	43.03*	-	60.7	-	-	-	-
Azimuth: 156	Height:306	Horz	Margin	[dB]:	-	-17.67	-	-	-	-

*Duty Cycle correction factor of 20.0 applied (see section 4.3 of report for calculation)

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector (maximized)
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Average log detector
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection
 CRMS - CISPR RMS detection

Job Number: 1001188273 File Number: MC15896 Page 36 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

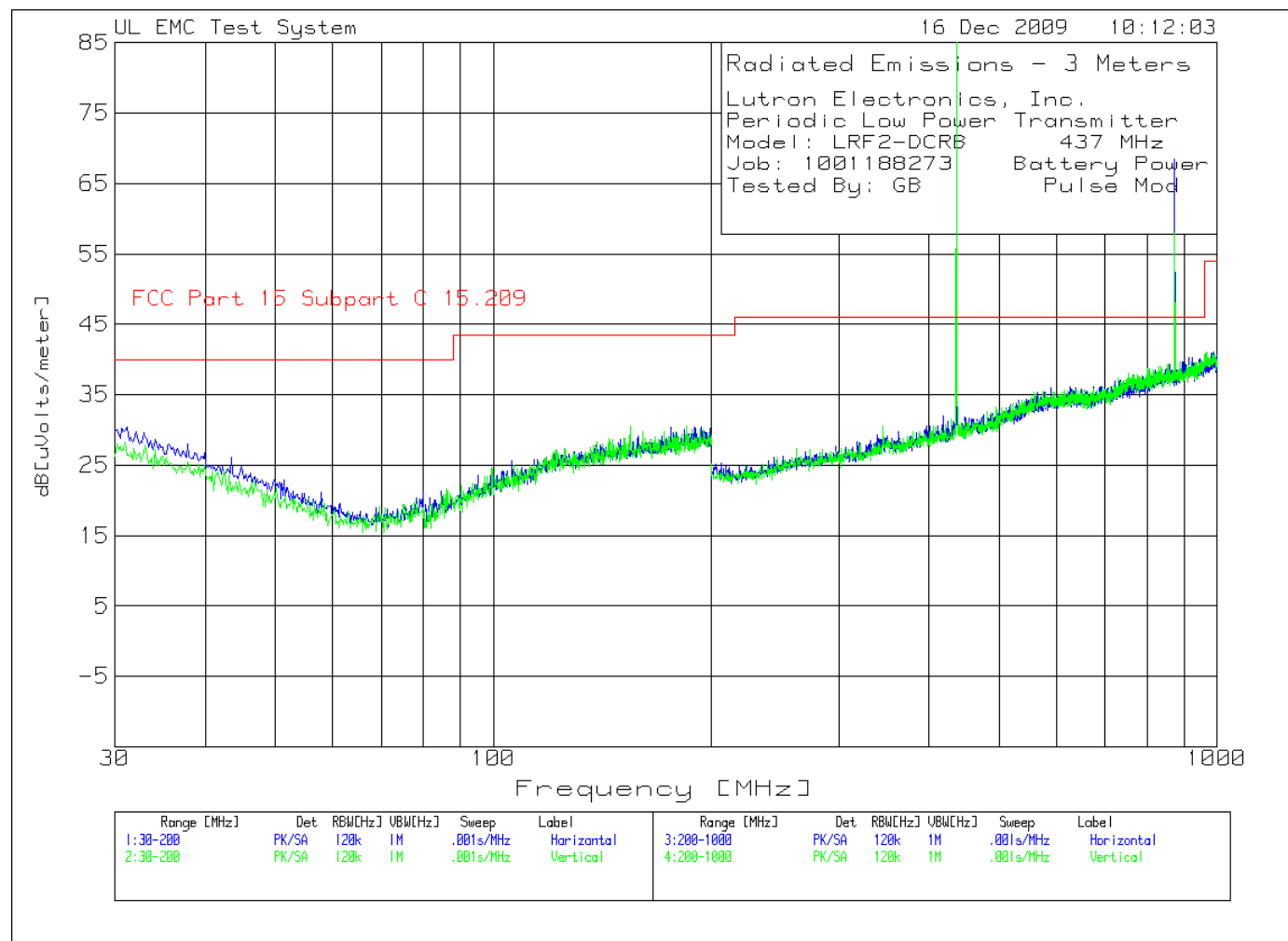
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
=====										
Horizontal 4000 - 5000MHz										
4309.635	86.23 PK	-53.31	27.7	40.62*	54	-	-	-	-	-
Azimuth: 57	Height:325	Horz	Margin [dB]:		-13.38	-	-	-	-	-
4741	82.46 PK	-54.49	27.2	35.17*	54	-	-	-	-	-
Azimuth: 30	Height:394	Horz	Margin [dB]:		-18.83	-	-	-	-	-
Vertical 1000 - 2000MHz										
1293	81.22 PK	-45.6	20.5	56.12	-	60.7	-	-	-	-
Azimuth: 155	Height:216	Vert	Margin [dB]:		-	-4.58	-	-	-	-
1724.115	85.4 PK	-45.12	20.8	41.08*	-	60.7	-	-	-	-
Azimuth: 187	Height:156	Vert	Margin [dB]:		-	-19.62	-	-	-	-
Vertical 2000 - 4000MHz										
2155.005	80.6 PK	-43.91	21	57.69	-	60.7	-	-	-	-
Azimuth: 163	Height:295	Vert	Margin [dB]:		-	-3.01	-	-	-	-
2586.245	79.5 PK	-43.55	21.5	57.45	-	60.7	-	-	-	-
Azimuth: 82	Height:297	Vert	Margin [dB]:		-	-3.25	-	-	-	-
3016.92	77.5 PK	-42.91	21.7	56.29	-	60.7	-	-	-	-
Azimuth: 144	Height:205	Vert	Margin [dB]:		-	-4.41	-	-	-	-
3447.97	85.54 PK	-42.83	22.2	44.91*	-	60.7	-	-	-	-
Azimuth: 346	Height:282	Vert	Margin [dB]:		-	-15.79	-	-	-	-
3879	83.6 PK	-42.92	22.6	43.28*	54	-	-	-	-	-
Azimuth: 199	Height:261	Vert	Margin [dB]:		-10.72	-	-	-	-	-
Vertical 4000 - 5000MHz										
4309.61	86.31 PK	-53.31	27.8	40.8*	54	-	-	-	-	-
Azimuth: 19	Height:317	Vert	Margin [dB]:		-13.2	-	-	-	-	-
4741	73.45 PK	-54.49	27.1	46.06	54	-	-	-	-	-
Azimuth: 167	Height:389	Vert	Margin [dB]:		-7.94	-	-	-	-	-

*Duty Cycle correction factor of 20.0 applied (see section 4.3 of report for calculation)

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector (maximized)
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Average log detector
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection
 CRMS - CISPR RMS detection

Figure 13 Radiated Emissions Graph



Job Number: 1001188273 File Number: MC15896 Page 38 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Table 16 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 437 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 200 - 1000MHz -----											
1	436.9185	72.04 pk	1.3	17	90.34	-	80.9	-	-	-	-
	Azimuth:359	Height:400	Horz	Margin [dB]		-	9.44	-	-	-	-
2	873.937	43.72 pk	1.7	23	68.42	-	60.9	-	-	-	-
	Azimuth:95	Height:300	Horz	Margin [dB]		-	7.52	-	-	-	-
6	926.7634	14.19 pk	1.9	23.4	39.49	46	-	-	-	-	-
	Azimuth:359	Height:200	Horz	Margin [dB]		-6.51	-	-	-	-	-
Vertical 200 - 1000MHz -----											
3	436.9185	77.34 pk	1.3	16.5	95.14	-	80.9	-	-	-	-
	Azimuth:61	Height:100	Vert	Margin [dB]		-	14.24	-	-	-	-
4	874.3372	33.02 pk	1.7	23.2	57.92	-	60.9	-	-	-	-
	Azimuth:18	Height:200	Vert	Margin [dB]		-	-2.98	-	-	-	-
5	345.6728	13.97 pk	1.2	15.4	30.57	46	-	-	-	-	-
	Azimuth:166	Height:300	Vert	Margin [dB]		-15.43	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Log average detection.
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection
 CRMS - CISPR RMS detection

Job Number: 1001188273 File Number: MC15896 Page 39 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 437 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

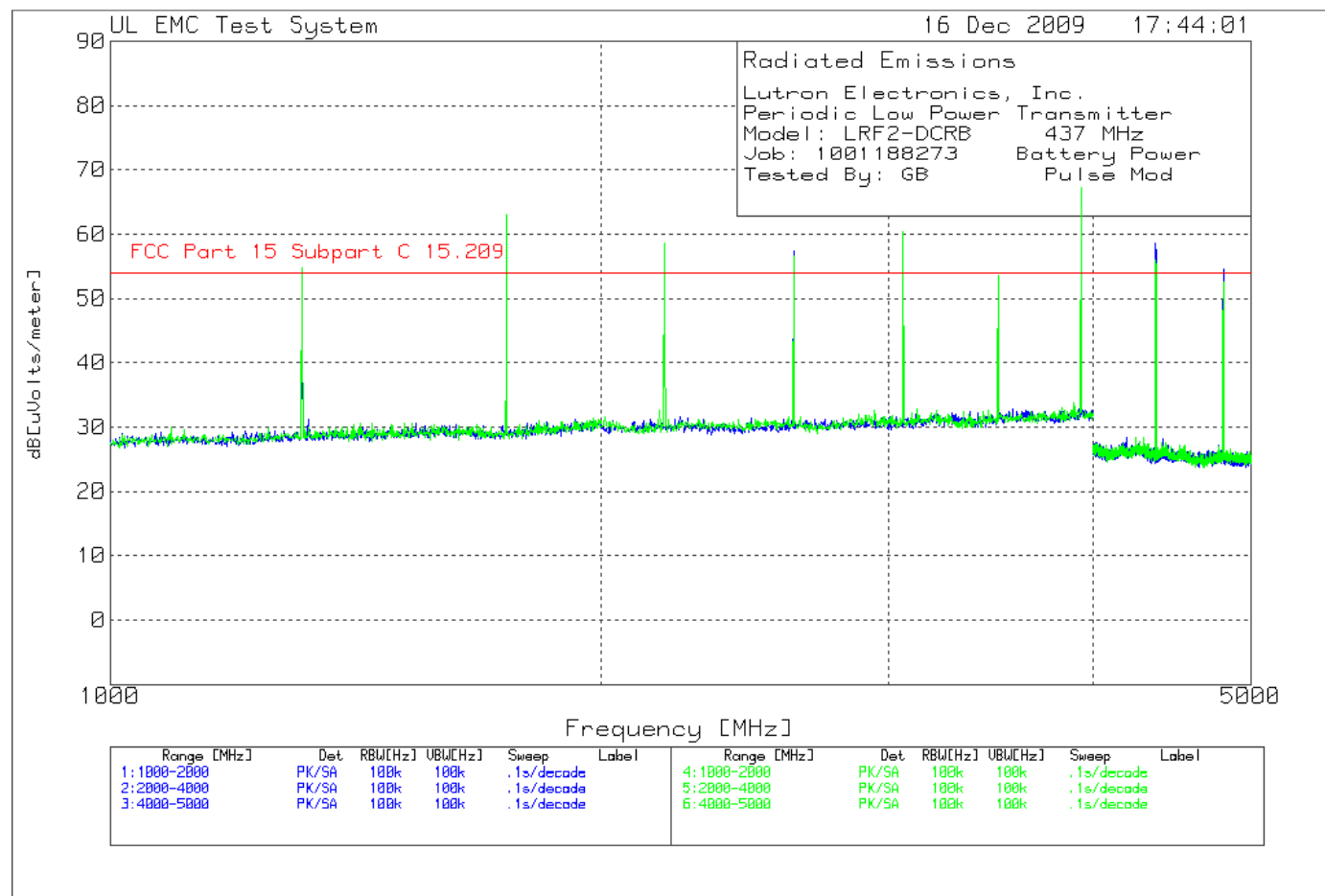
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
Horizontal 200 - 1000MHz									
437	72.21 PK	1.3	17	70.51*	-	80.9	-	-	-
Azimuth: 342	Height:373	Horz		Margin [dB]:	-	-10.39	-	-	-
874.1	34.87 PK	1.7	23	39.57*	-	60.9	-	-	-
Azimuth: 12	Height:112	Horz		Margin [dB]:	-	-21.33	-	-	-
Vertical 200 - 1000MHz									
436.9529	78.99 PK	1.3	16.5	76.79*	-	80.9	-	-	-
Azimuth: 268	Height:134	Vert		Margin [dB]:	-	-8.22	-	-	-
874.0648	40.07 PK	1.7	23.2	44.97*	-	60.9	-	-	-
Azimuth: 214	Height:140	Vert		Margin [dB]:	-	-15.93	-	-	-

*Duty Cycle correction factor of 20.0 applied (see section 4.3 of report for calculation)

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector (maximized)
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Average log detector
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection
 CRMS - CISPR RMS detection

Figure 14 Radiated Emissions Graph



Job Number: 1001188273 File Number: MC15896 Page 41 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Table 17 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 437 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 1000 - 2000MHz -----											
1	1310.861	75.46 pk	-45.73	20.5	50.23	54	-	-	-	-	-
		Height:150	Horz	Margin [dB]		-3.77	-	-	-	-	-
2	1749.064	81.95 pk	-45.01	20.8	57.74	54	-	-	-	-	-
		Height:150	Horz	Margin [dB]		3.74	-	-	-	-	-
Horizontal 2000 - 4000MHz -----											
3	2184.769	79.39 pk	-44.02	21.5	56.87	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		2.87	-	-	-	-	-
4	2621.723	79.45 pk	-43.42	21.4	57.43	54	-	-	-	-	-
		Height:199	Horz	Margin [dB]		3.43	-	-	-	-	-
5	3061.174	74.42 pk	-42.93	21.6	53.09	54	-	-	-	-	-
		Height:199	Horz	Margin [dB]		- .91	-	-	-	-	-
6	3498.127	69.42 pk	-42.85	22.2	48.77	54	-	-	-	-	-
		Height:199	Horz	Margin [dB]		-5.23	-	-	-	-	-
7	3935.081	86.21 pk	-42.8	22.7	66.11	54	-	-	-	-	-
		Height:199	Horz	Margin [dB]		12.11	-	-	-	-	-
Horizontal 4000 - 5000MHz -----											
8	4370.216	84.76 pk	-53.68	27.6	58.68	54	-	-	-	-	-
		Height:200	Horz	Margin [dB]		4.68	-	-	-	-	-
9	4806.988	81.73 pk	-54.34	27.1	54.49	54	-	-	-	-	-
		Height:150	Horz	Margin [dB]		.49	-	-	-	-	-
Vertical 1000 - 2000MHz -----											
10	1310.861	79.99 pk	-45.73	20.5	54.76	54	-	-	-	-	-
		Height:200	Vert	Margin [dB]		.76	-	-	-	-	-
11	1749.064	87.17 pk	-45.01	20.8	62.96	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		8.96	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

PK - Peak detector

QP - Quasi-Peak detector

av - Linear average detector

avlg - Average log detector

AV - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

Job Number: 1001188273 File Number: MC15896 Page 42 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
=====											
Vertical 2000 - 4000MHz -----											
12	2184.769	81.35 pk	-44.02	21.2	58.53	54	-	-	-	-	-
		Height:199 Vert		Margin [dB]		4.53	-	-	-	-	-
13	2621.723	78.62 pk	-43.42	21.4	56.6	54	-	-	-	-	-
		Height:199 Vert		Margin [dB]		2.6	-	-	-	-	-
14	3061.174	81.49 pk	-42.93	21.8	60.36	54	-	-	-	-	-
		Height:199 Vert		Margin [dB]		6.36	-	-	-	-	-
15	3498.127	73.93 pk	-42.85	22.4	53.48	54	-	-	-	-	-
		Height:199 Vert		Margin [dB]		- .52	-	-	-	-	-
16	3932.584	87.42 pk	-42.76	22.7	67.36	54	-	-	-	-	-
		Height:199 Vert		Margin [dB]		13.36	-	-	-	-	-
Vertical 4000 - 5000MHz -----											
17	4370.216	81.87 pk	-53.68	27.7	55.89	54	-	-	-	-	-
		Height:149 Vert		Margin [dB]		1.89	-	-	-	-	-
18	4806.988	79.58 pk	-54.34	27.3	52.54	54	-	-	-	-	-
		Height:200 Vert		Margin [dB]		-1.46	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

PK - Peak detector

QP - Quasi-Peak detector

av - Linear average detector

avlg - Average log detector

AV - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

Job Number: 1001188273 File Number: MC15896 Page 43 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB 437 MHz
 Job: 1001188273 Battery Power
 Tested By: GB Pulse Mod

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
=====										
Horizontal 1000 - 2000MHz										
1310.8825	76.37 PK	-45.73	20.5	51.14	54	-	-	-	-	-
Azimuth: 360 Height:145 Horz					Margin [dB]: -2.86	-	-	-	-	-
1748.155	83.05 PK	-45.04	20.8	58.81	-	60.9	-	-	-	-
Azimuth: 6 Height:248 Horz					Margin [dB]: -	-2.09	-	-	-	-
Horizontal 2000 - 4000MHz										
2184.8125	80.22 PK	-44.02	21.5	57.7	-	60.9	-	-	-	-
Azimuth: 162 Height:344 Horz					Margin [dB]: -	-3.2	-	-	-	-
2622.233	80.79 PK	-43.43	21.4	58.76	-	60.9	-	-	-	-
Azimuth: 359 Height:372 Horz					Margin [dB]: -	-2.14	-	-	-	-
3058.728	74.94 PK	-42.95	21.6	53.59	-	60.9	-	-	-	-
Azimuth: 237 Height:267 Horz					Margin [dB]: -	-7.31	-	-	-	-
3495.93	78.66 PK	-42.86	22.2	58	-	60.9	-	-	-	-
Azimuth: 52 Height:344 Horz					Margin [dB]: -	-2.9	-	-	-	-
3496.317	77.65 PK	-42.85	22.2	57	-	60.9	-	-	-	-
Azimuth: 45 Height:182 Horz					Margin [dB]: -	-2.9	-	-	-	-
3933.353	87.61 PK	-42.77	22.7	47.54*	54	-	-	-	-	-
Azimuth: 32 Height:276 Horz					Margin [dB]: -6.46	-	-	-	-	-
Horizontal 4000 - 5000MHz										
4370.395	83.7 PK	-53.68	27.6	37.62*	54	-	-	-	-	-
Azimuth: 360 Height:235 Horz					Margin [dB]: -16.38	-	-	-	-	-
4806.575	80.56 PK	-54.33	27.1	53.33	54	-	-	-	-	-
Azimuth: 349 Height:251 Horz					Margin [dB]: -.67	-	-	-	-	-

*Duty Cycle correction factor of 20.0 applied (see section 4.3 of report for calculation)

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector (maximized)
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Average log detector
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection

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 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

CRMS - CISPR RMS detection

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]	[dB]						
=====										
Vertical 1000 - 2000MHz										
1311.1225	79.98 PK	-45.74	20.5	34.74*	54	-	-	-	-	-
Azimuth: 165 Height:228 Vert					Margin [dB]:	-19.26	-	-	-	-
1747.848	86.99 PK	-45.07	20.8	42.72*	-	60.9	-	-	-	-
Azimuth: 207 Height:236 Vert					Margin [dB]:	-	-18.18	-	-	-
Vertical 2000 - 4000MHz										
2184.8025	80.97 PK	-44.02	21.2	58.15	-	60.9	-	-	-	-
Azimuth: 324 Height:248 Vert					Margin [dB]:	-	-2.75	-	-	-
2622.235	79 PK	-43.43	21.4	56.97	-	60.9	-	-	-	-
Azimuth: 346 Height:233 Vert					Margin [dB]:	-	-3.93	-	-	-
3059.273	83.49 PK	-42.95	21.8	42.34*	-	60.9	-	-	-	-
Azimuth: 342 Height:359 Vert					Margin [dB]:	-	-18.56	-	-	-
3495.6955	78.01 PK	-42.87	22.4	57.54	-	60.9	-	-	-	-
Azimuth: 360 Height:221 Vert					Margin [dB]:	-	-3.36	-	-	-
Vertical 4000 - 5000MHz										
4370.385	85.37 PK	-53.68	27.7	39.39*	54	-	-	-	-	-
Azimuth: 352 Height:175 Vert					Margin [dB]:	-	-	-	-	-
4806.575	82.07 PK	-54.33	27.3	35.04*	54	-	-	-	-	-
Azimuth: 352 Height:289 Vert					Margin [dB]:	-	-	-	-	-

*Duty Cycle correction factor of 20.0 applied (see section 4.3 of report for calculation)

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Average log detector
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection
 CRMS - CISPR RMS detection

Job Number: 1001188273 File Number: MC15896 Page 45 of 51
 Model Number: LRF2-DCRB
 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

4.5 Test Conditions and Results – UNINTENTIONAL RADIATED EMISSIONS

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Basic Standard	FCC Part 15, Subpart B 15.109 / CISPR 22	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	(10 meter measurement distance)
Limits - Class B		
Frequency (MHz)	Limit (dBμV/m)	
	Quasi-Peak	Average
30-230	30	NA
230-1000	37	NA
Supplementary information: None		

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 Client Name: LUTRON ELECTRONICS INC
 FCC ID:JPZ0068 IC Number:2851A-JPZ0068

Table 18 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	5
Supplementary information: None		

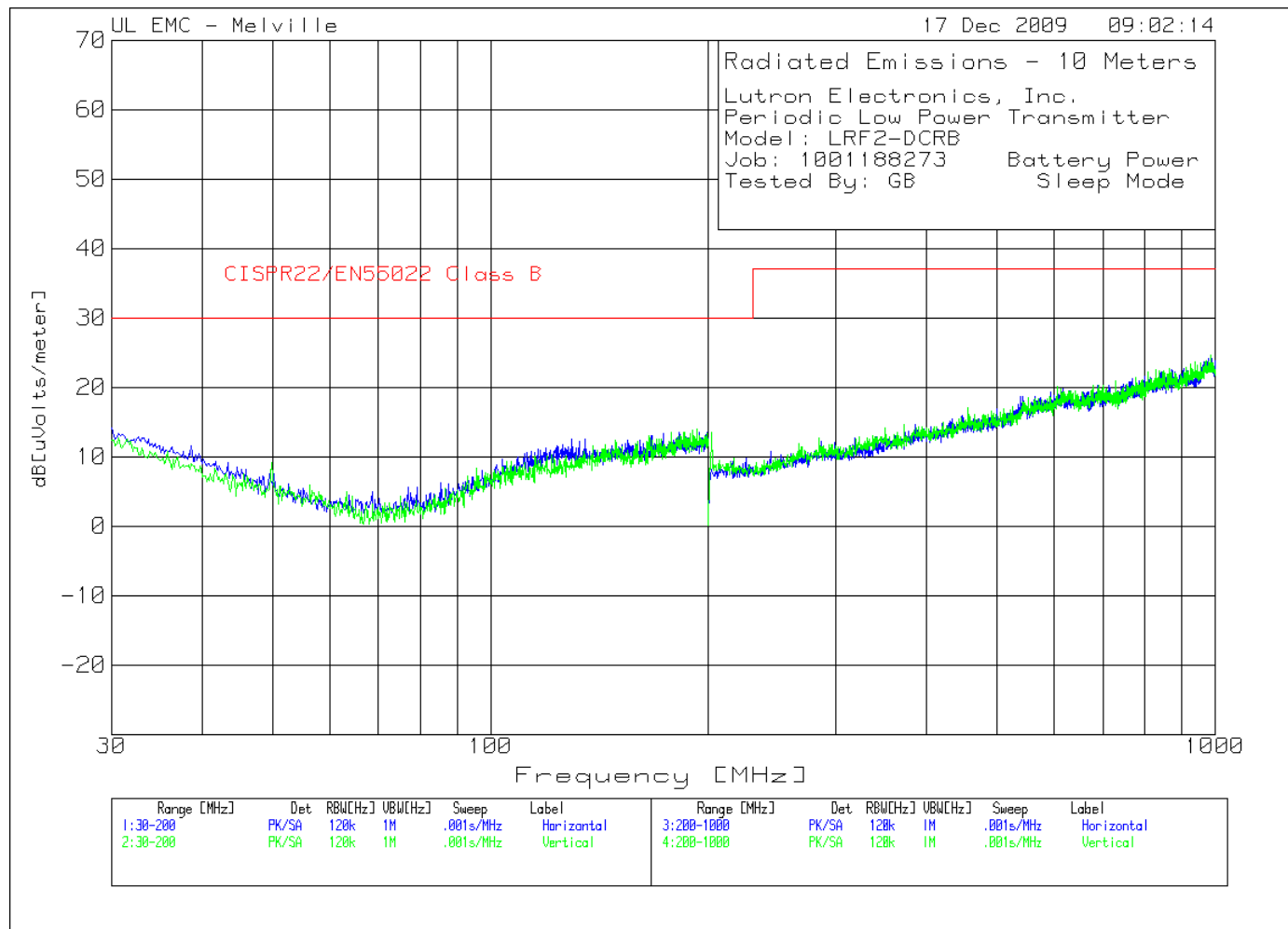
Table 19 Radiated Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Log-P Antenna	Schaffner	UPA6109	44068
Bicon Antenna	Schaffner	VBA6106A	54
Bias Tee	Miteq	AM-1523-7687	44392
Bias Tee	Miteq	AM-1523-7687	44393
Preamp	Miteq	AM-3A-000110-7687	44391
Preamp	Miteq	AM-3A-000110-7687	44394
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268

Figure 15 Test setup for Radiated Emissions



Figure 16 Radiated Emissions Graph



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 Client Name: LUTRON ELECTRONICS INC
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Table 20 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Periodic Low Power Transmitter
 Model: LRF2-DCRB
 Job: 1001188273 Battery Power
 Tested By: GB Sleep Mode

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
=====											
Horizontal 30 - 200MHz -----											
1	38.6787	33.12 pk	-36	14.4	11.52	30	-	-	-	-	-
	Azimuth:93	Height:100	Horz	Margin [dB]		-18.48	-	-	-	-	-
2	129.5496	34.27 pk	-35.6	13.9	12.57	30	-	-	-	-	-
	Azimuth:320	Height:250	Horz	Margin [dB]		-17.43	-	-	-	-	-
3	137.2072	32.2 pk	-35.5	14.1	10.8	30	-	-	-	-	-
	Azimuth:283	Height:250	Horz	Margin [dB]		-19.2	-	-	-	-	-
Vertical 30 - 200MHz -----											
4	49.9099	35.44 pk	-35.9	9.6	9.14	30	-	-	-	-	-
	Azimuth:17	Height:101	Vert	Margin [dB]		-20.86	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
5	538.1691	31.7 pk	-32.1	19.1	18.7	37	-	-	-	-	-
	Azimuth:352	Height:199	Horz	Margin [dB]		-18.3	-	-	-	-	-
Vertical 200 - 1000MHz -----											
6	827.914	31.94 pk	-31.7	22.3	22.54	37	-	-	-	-	-
	Azimuth:18	Height:300	Vert	Margin [dB]		-14.46	-	-	-	-	-

LIMIT 1: CISPR22/EN55022 Class B
 LIMIT 2: NONE
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

PK - Peak detector
 QP - Quasi-Peak detector
 av - Linear average detector
 avlg - Average log detector
 AV - Average detector
 CAV - CISPR Average detector
 RMS - RMS detection
 CRMS - CISPR RMS detection

Appendix A

Accreditations and Authorizations



NVLAP Lab code: 100255-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see <http://ts.nist.gov/ts/htdocs/210/214/scopes/1002550.htm>



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91040).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-83400, and C-81879 and (Conducted Emissions - Telecommunications Ports) T-1582 and T-1583.



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6

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