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| | |
|-----------------|-------------------|
| Job Number: | 1001149944 |
| Project Number: | 09CA43210 |
| File Number: | MC15896 |
| Date: | 26 September 2009 |
| Revision Date: | 16 October 2009 |
| Model: | RR-VCRX |
| FCC ID: | JPZ0064 |
| IC Number: | 2851A-JPZ0064 |

Electromagnetic Compatibility Test Report

For

LUTRON ELECTRONICS INC

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

Job Number: 1001149948 File Number: MC15896 Page 2 of 67
Model Number: RR-VCRX
Client Name: LUTRON ELECTRONICS INC
FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

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**

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Test Report Date: **26 September 2009**
Test Report Revision Date: **16 October 2009**

Product Type: **Wireless Lighting Controller**

Product standards **FCC Part 15, Subpart B and Subpart C paragraph 15.231**

Model Number: **RR-VCRX**

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

EUT Category: **Periodic Low Power Transceiver**

Testing Start Date: **08 September 2009**

Date Testing Complete: **10 September 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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Report Revision History

| Revision Date | Description | Revised By | Revision Reviewed By |
|-----------------|------------------------------|------------|----------------------|
| None | Original | - | - |
| 16 October 2009 | Updated 431MHz 20dB OBW plot | B. DeLisi | J. Danisi |

1.0 GENERAL - Product Description

1.1 Equipment Description

The RR-VCRX interacts with a lighting control system using the 434MHz transceiver, causing action based on contact closures or inputs from a car visor transmitter. The car visor transmitter (different FCC ID) transmits at 390MHz and the visor control receiver receives that signal and either causes a contact closure output or transmits at 434MHz to the lighting control system.

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

Antenna description: It is a permanently attached to the RF circuit board and the transmit antenna type is dipole.

Note: throughout this report, where the model is noted as VCRX, it is the same as the report model RR-VCRX.

1.2 Equipment Marking Plate

Not Available

Job Number: 1001149948 File Number: MC15896 Page 5 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

| Use | Product Type | Manufacturer | Model | Comments |
|---|-----------------------|------------------------|---------|----------|
| EUT | Low Power Transceiver | LUTRON ELECTRONICS INC | RR-VCRX | 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 | AC | Y | N | None |
| 1 | Contact Closures | I/O | Y | 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) TP = Telecommunication Ports | | | | | |

1.3.3 EUT Internal Operating Frequencies:

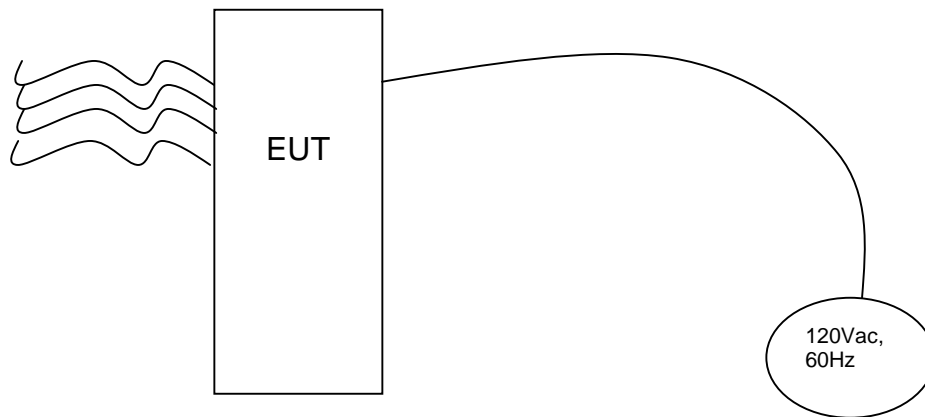
| Frequency (MHz) | Description |
|-----------------|-----------------------------|
| 431 – 437 | Fundamental frequency range |
| 32 | Crystal |
| 2 | SPI data rate |
| 4 | SPI date rate |
| 8 | Bus rate |
| 11.853 | Crystal |
| 10.7 | AM Transceiver IF |
| 0.285 | RF Transceiver IF |
| 16 | Crystal |

1.3.4 Power Interface:

| Mode # /Rated | Voltage (V) | Current (A) | Power (W) | Frequency (DC/AC-Hz) | Phases (#) | Comments |
|---------------|-------------|-------------|-----------|----------------------|------------|----------|
| Rated | 120 | - | - | AC – 60Hz | 1 | None |
| 1 | 120 | - | - | AC – 60Hz | 1 | None |

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



1.5 EUT Configurations

| Mode # | Description |
|--------|---|
| 1 | Stand Alone with 1-meter copper wire connected to contact closures. |

1.6 EUT Operation Modes

| Mode # | Description |
|--------|---|
| 1 | Continuous Transmission with modulation tuned to 431MHz |
| 2 | Continuous Transmission with modulation tuned to 437MHz |
| 3 | Normal transmission with modulation tuned to 431MHz |
| 2 | Normal transmission with modulation tuned to 437MHz |
| 5 | Receive mode tuned to 390MHz |

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 Licence-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 a periodic transmitter with a Class B receiver.

| Requirement – Test | Result (Compliant / Non-Compliant)* |
|------------------------------------|-------------------------------------|
| Conducted Emissions - Mains | Compliant |
| Fundamental Radiated Emissions | Compliant |
| Spurious Radiated Emissions | Compliant |
| Occupied Bandwidth | Compliant |
| Pulse Train - Averaging Factor | Compliant |
| Cease Operation | Compliant |
| Radiated Emissions - Unintentional | Compliant |

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 |
|-------------------------|------------|----------------------|---------|---------------------------|-----------|

4.1 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS

| | | |
|--|---|-------------------|
| Test Description | Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN. | |
| Basic Standard | FCC Part 15, Subpart B, 15.107 and Subpart C, 15.207 | |
| UL LPG | 80-EM-S0026 | |
| | Frequency range on each side of line | Measurement Point |
| Fully configured sample scanned over the following frequency range | 150kHz to 30MHz | Mains |
| Limits – Class B and 15.207 | | |
| Frequency (MHz) | Limit (dBµV) | |
| | Quasi-Peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| Supplementary information: None | | |

Table 1 Conducted Emissions EUT Configuration Settings

| Power Interface Mode # | EUT Configurations Mode # | EUT Operation Mode # |
|---------------------------------|---------------------------|----------------------|
| 1 | 1 | 1 |
| 1 | 1 | 2 |
| 1 | 1 | 5 |
| Supplementary information: None | | |

Table 2 Conducted Emissions Test Equipment

| Test Equipment Used | | | |
|------------------------------|-----------------|-------------|------------|
| Description | Manufacturer | Model | Identifier |
| Conducted Emissions – GP 1 | | | |
| EMI Receiver | Rohde & Schwarz | ESIB26 | ME5B-081 |
| LISN | EMCO | 3825/2R | ME5-790 |
| Switch Driver | HP | 11713A | 44397 |
| RF Switch Box | UL | 4 | 44404 |
| Measurement Software | UL | Version 9.3 | 44736 |
| Temp/Humidity/Pressure Meter | Cole Parmer | 99760-00 | 43734 |

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Model Number: RR-VCRX
Client Name: LUTRON ELECTRONICS INC
FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

| Test Equipment Used | | | |
|---------------------|--------------|-------|------------|
| Description | Manufacturer | Model | Identifier |
| Multimeter | Fluke | 83III | 444459 |

Figure 1 Test Setup for Conducted Emissions



Figure 2 Conducted Emissions Graph

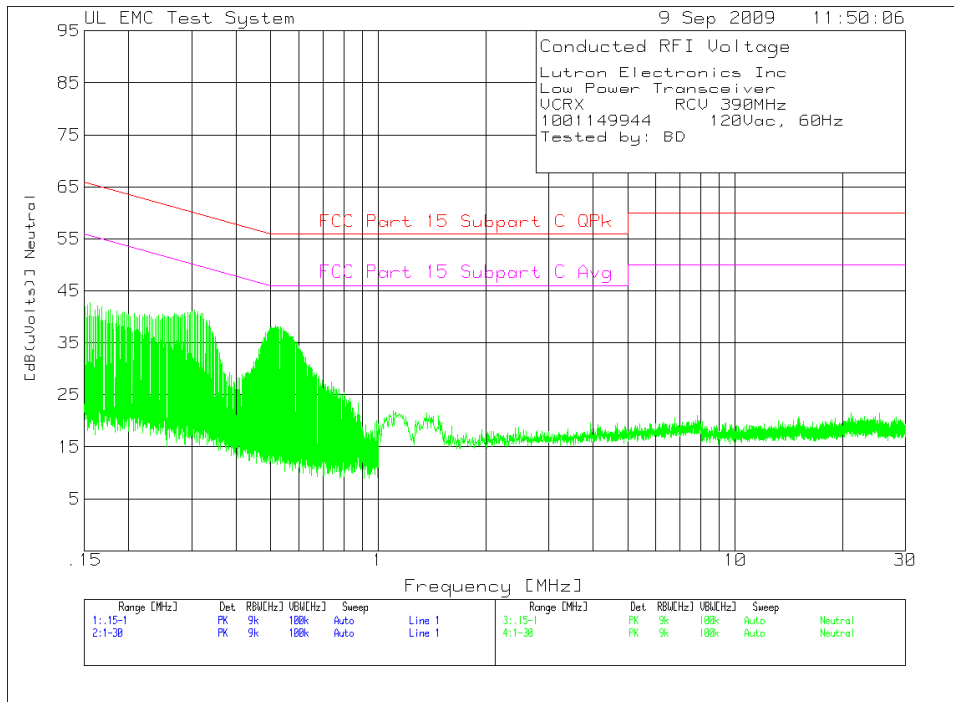
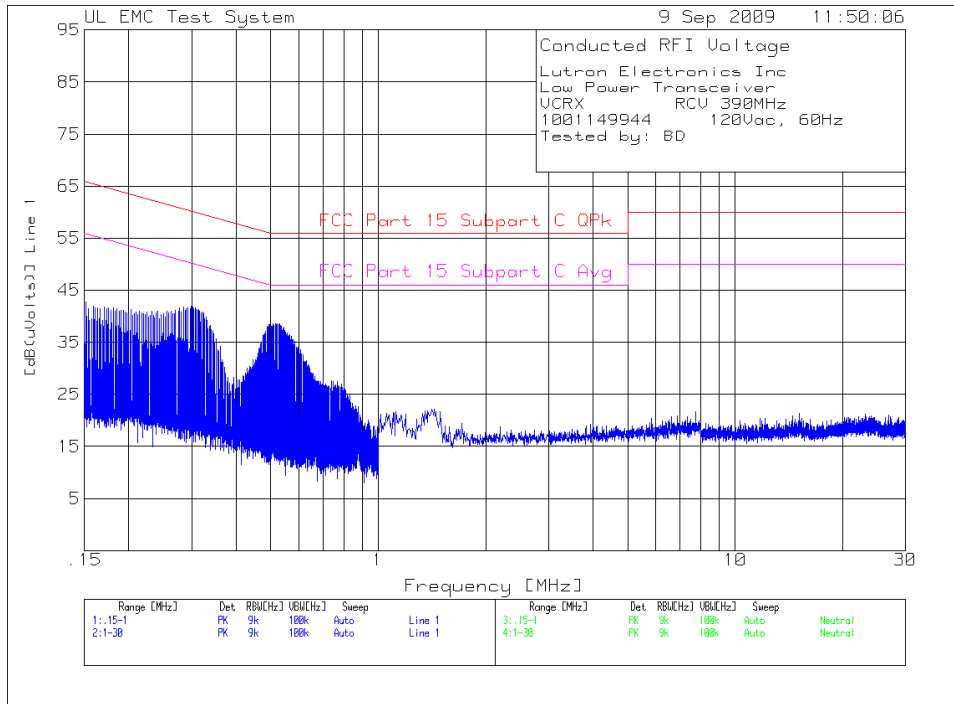


Table 3 Conducted Emissions Data Points

Lutron Electronics Inc
 Low Power Transceiver
 RR-VCRX RCV 390MHz
 1001149944 120Vac, 60Hz
 Tested by: BD

| No. | Test Frequency [MHz] | Meter Reading [dB(uV)] | Gain/Loss Factor [dB] | Transducer Factor [dB] | Level [dB(uVolts)] | Limit:1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------|----------------------|------------------------|-----------------------|------------------------|--------------------|---------|--------|---|---|---|---|
| ----- | | | | | | | | | | | |
| Line 1 .15 - 1MHz ----- | | | | | | | | | | | |
| 1 | .15884 | 29.93 pk | 12 | 0 | 41.93 | 65.5 | 55.5 | - | - | - | - |
| | | | | Margin [dB] | | -23.57 | -13.57 | - | - | - | - |
| 2 | .20237 | 29.81 pk | 11.5 | 0 | 41.31 | 63.5 | 53.5 | - | - | - | - |
| | | | | Margin [dB] | | -22.19 | -12.19 | - | - | - | - |
| 3 | .30643 | 30.69 pk | 10.9 | 0 | 41.59 | 60.1 | 50.1 | - | - | - | - |
| | | | | Margin [dB] | | -18.51 | -8.51 | - | - | - | - |
| 4 | .51404 | 28.03 pk | 10.6 | 0 | 38.63 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -17.37 | -7.37 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Line 1 1 - 30MHz ----- | | | | | | | | | | | |
| 5 | 1.12182 | 11.31 pk | 10.4 | 0 | 21.71 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -34.29 | -24.29 | - | - | - | - |
| 6 | 1.41188 | 11.8 pk | 10.4 | 0 | 22.2 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -33.8 | -23.8 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Neutral .15 - 1MHz ----- | | | | | | | | | | | |
| 7 | .15578 | 30.64 pk | 12.1 | 0 | 42.74 | 65.7 | 55.7 | - | - | - | - |
| | | | | Margin [dB] | | -22.96 | -12.96 | - | - | - | - |
| 8 | .20662 | 29.33 pk | 11.4 | 0 | 40.73 | 63.3 | 53.3 | - | - | - | - |
| | | | | Margin [dB] | | -22.57 | -12.57 | - | - | - | - |
| 9 | .31238 | 30.02 pk | 10.9 | 0 | 40.92 | 59.9 | 49.9 | - | - | - | - |
| | | | | Margin [dB] | | -18.98 | -8.98 | - | - | - | - |
| 10 | .50707 | 27.4 pk | 10.6 | 0 | 38 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -18 | -8 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Neutral 1 - 30MHz ----- | | | | | | | | | | | |
| 11 | 1.10442 | 11.63 pk | 10.4 | 0 | 22.03 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -33.97 | -23.97 | - | - | - | - |
| 12 | 1.36547 | 11.14 pk | 10.4 | 0 | 21.54 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -34.46 | -24.46 | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - average detector
 avlg - average log detection
 ave - average detection
 cav - CISPR average detection

Figure 3 Conducted Emissions Graph

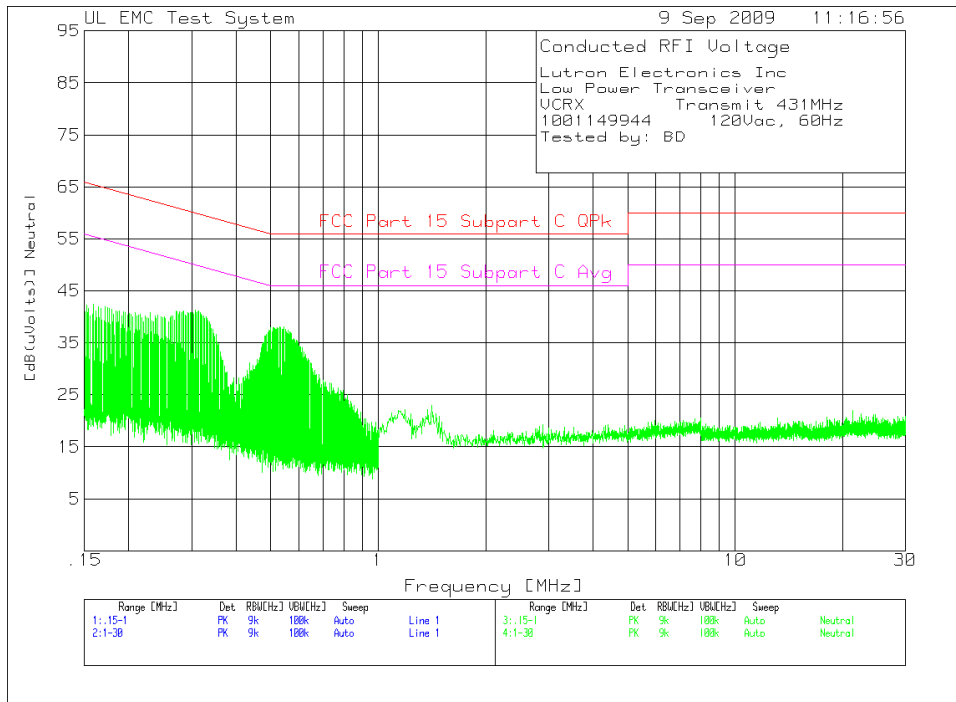
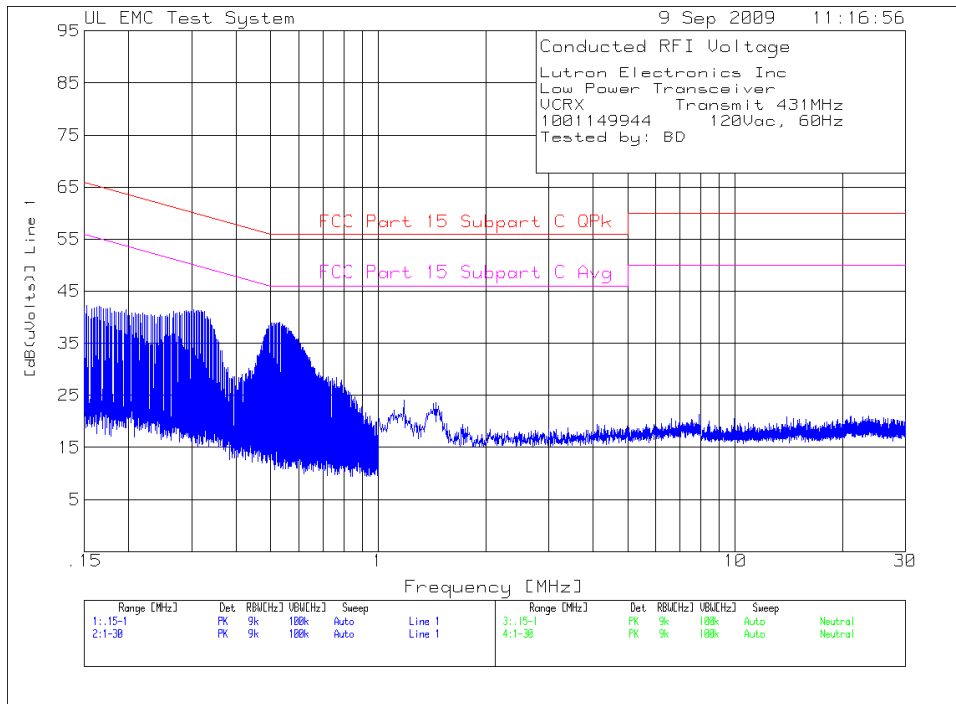


Table 4 Conducted Emissions Data Points

Lutron Electronics Inc
 Low Power Transceiver
 RR-VCRX Transmit 431MHz
 1001149944 120Vac, 60Hz
 Tested by: BD

| No. | Test Frequency [MHz] | Meter Reading [dB(uV)] | Gain/Loss Factor [dB] | Transducer Factor [dB] | Level [dB(uVolts)] | Limit:1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------|----------------------|------------------------|-----------------------|------------------------|--------------------|---------|--------|---|---|---|---|
| ----- | | | | | | | | | | | |
| Line 1 .15 - 1MHz ----- | | | | | | | | | | | |
| 1 | .16479 | 30.22 pk | 11.9 | 0 | 42.12 | 65.2 | 55.2 | - | - | - | - |
| | | | | Margin [dB] | | -23.08 | -13.08 | - | - | - | - |
| 2 | .19132 | 29.48 pk | 11.6 | 0 | 41.08 | 64 | 54 | - | - | - | - |
| | | | | Margin [dB] | | -22.92 | -12.92 | - | - | - | - |
| 3 | .2357 | 29.14 pk | 11.2 | 0 | 40.34 | 62.2 | 52.2 | - | - | - | - |
| | | | | Margin [dB] | | -21.86 | -11.86 | - | - | - | - |
| 4 | .31085 | 30.36 pk | 10.9 | 0 | 41.26 | 59.9 | 49.9 | - | - | - | - |
| | | | | Margin [dB] | | -18.64 | -8.64 | - | - | - | - |
| 5 | .51812 | 28.33 pk | 10.5 | 0 | 38.83 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -17.17 | -7.17 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Line 1 1 - 30MHz ----- | | | | | | | | | | | |
| 6 | 1.44669 | 13.13 pk | 10.4 | 0 | 23.53 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -32.47 | -22.47 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Neutral .15 - 1MHz ----- | | | | | | | | | | | |
| 7 | .16428 | 29.9 pk | 12 | 0 | 41.9 | 65.2 | 55.2 | - | - | - | - |
| | | | | Margin [dB] | | -23.3 | -13.3 | - | - | - | - |
| 8 | .18843 | 29.56 pk | 11.6 | 0 | 41.16 | 64.1 | 54.1 | - | - | - | - |
| | | | | Margin [dB] | | -22.94 | -12.94 | - | - | - | - |
| 9 | .23655 | 28.92 pk | 11.2 | 0 | 40.12 | 62.2 | 52.2 | - | - | - | - |
| | | | | Margin [dB] | | -22.08 | -12.08 | - | - | - | - |
| 10 | .31425 | 30.2 pk | 10.9 | 0 | 41.1 | 59.9 | 49.9 | - | - | - | - |
| | | | | Margin [dB] | | -18.8 | -8.8 | - | - | - | - |
| 11 | .52084 | 27.33 pk | 10.6 | 0 | 37.93 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -18.07 | -8.07 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Neutral 1 - 30MHz ----- | | | | | | | | | | | |
| 12 | 1.41188 | 12.58 pk | 10.4 | 0 | 22.98 | 56 | 46 | - | - | - | - |
| | | | | Margin [dB] | | -33.02 | -23.02 | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - average detector
 avlg - average log detection
 ave - average detection
 cav - CISPR average detection

Figure 4 Conducted Emissions Graph

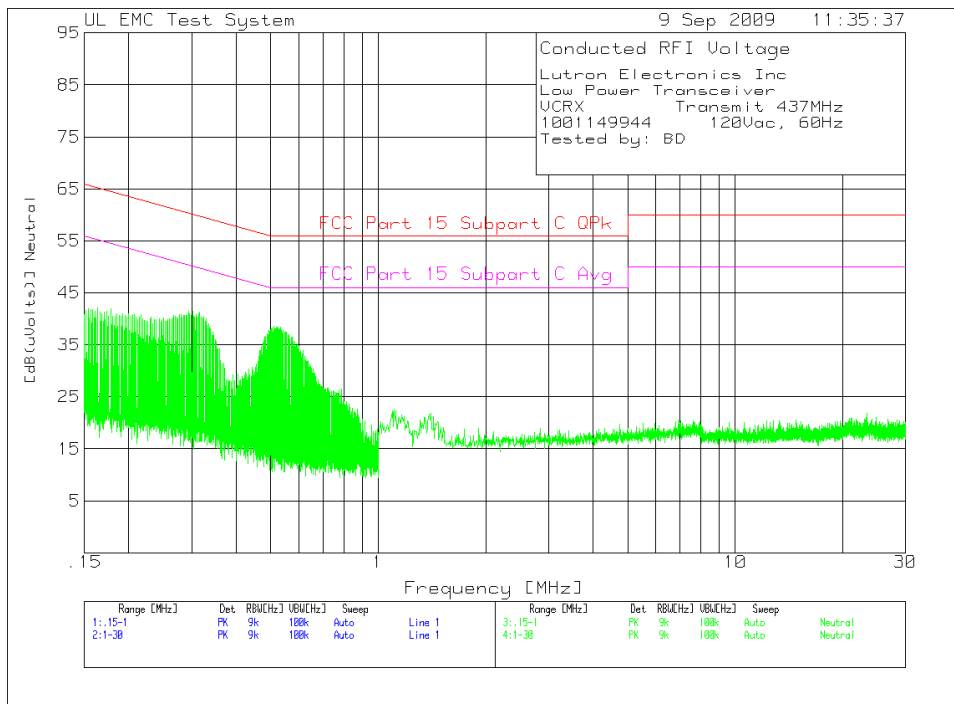
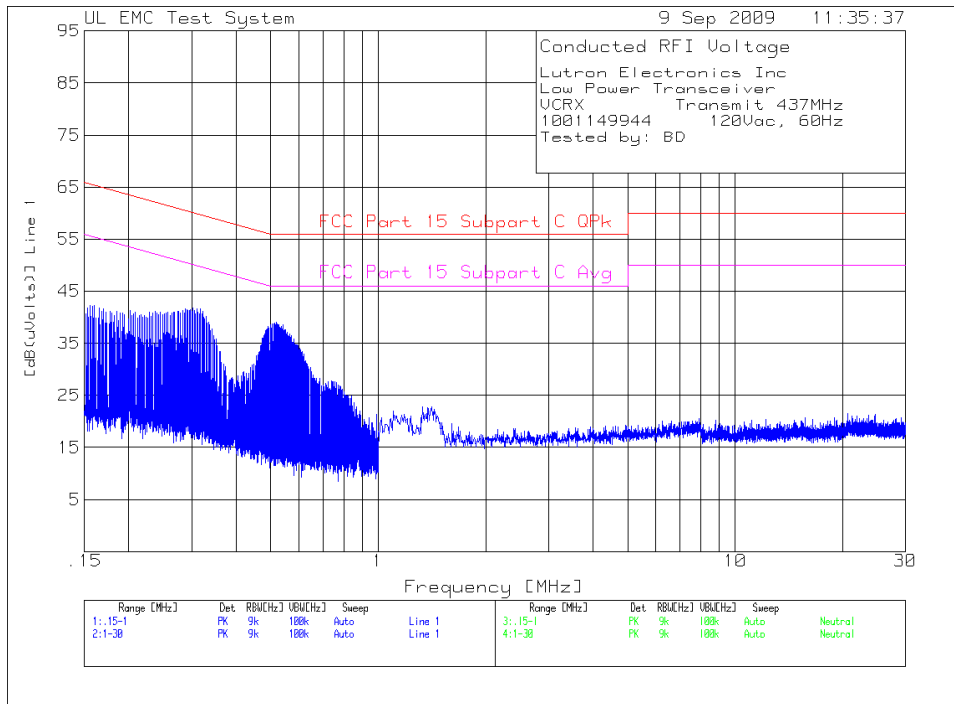


Table 5 Conducted Emissions Data Points

Lutron Electronics Inc
 Low Power Transceiver
 RR-VCRX Transmit 437MHz
 1001149944 120Vac, 60Hz
 Tested by: BD

| No. | Test Frequency [MHz] | Meter Reading [dB(uV)] | Gain/Loss Factor [dB] | Transducer Factor [dB] | Level [dB(uVolts)] | Limit:1 | 2 | 3 | 4 | 5 | 6 |
|--------------------|----------------------|------------------------|-----------------------|------------------------|--------------------|---------|--------|---|---|---|---|
| ----- | | | | | | | | | | | |
| Line 1 .15 - 1MHz | | | | | | | | | | | |
| 1 | .15544 | 30.2 pk | 12.1 | 0 | 42.3 | 65.7 | 55.7 | - | - | - | - |
| | | | | | Margin [dB] | -23.4 | -13.4 | - | - | - | - |
| 2 | .22822 | 29.72 pk | 11.2 | 0 | 40.92 | 62.5 | 52.5 | - | - | - | - |
| | | | | | Margin [dB] | -21.58 | -11.58 | - | - | - | - |
| 3 | .31017 | 30.71 pk | 10.9 | 0 | 41.61 | 60 | 50 | - | - | - | - |
| | | | | | Margin [dB] | -18.39 | -8.39 | - | - | - | - |
| 4 | .51761 | 28.56 pk | 10.5 | 0 | 39.06 | 56 | 46 | - | - | - | - |
| | | | | | Margin [dB] | -16.94 | -6.94 | - | - | - | - |
| 5 | .76552 | 16.92 pk | 10.5 | 0 | 27.42 | 56 | 46 | - | - | - | - |
| | | | | | Margin [dB] | -28.58 | -18.58 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Line 1 1 - 30MHz | | | | | | | | | | | |
| 6 | 1.41188 | 12.46 pk | 10.4 | 0 | 22.86 | 56 | 46 | - | - | - | - |
| | | | | | Margin [dB] | -33.14 | -23.14 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Neutral .15 - 1MHz | | | | | | | | | | | |
| 7 | .15612 | 29.72 pk | 12.1 | 0 | 41.82 | 65.7 | 55.7 | - | - | - | - |
| | | | | | Margin [dB] | -23.88 | -13.88 | - | - | - | - |
| 8 | .21665 | 29.52 pk | 11.3 | 0 | 40.82 | 62.9 | 52.9 | - | - | - | - |
| | | | | | Margin [dB] | -22.08 | -12.08 | - | - | - | - |
| 9 | .31595 | 30.34 pk | 10.9 | 0 | 41.24 | 59.8 | 49.8 | - | - | - | - |
| | | | | | Margin [dB] | -18.56 | -8.56 | - | - | - | - |
| 10 | .50979 | 27.92 pk | 10.6 | 0 | 38.52 | 56 | 46 | - | - | - | - |
| | | | | | Margin [dB] | -17.48 | -7.48 | - | - | - | - |
| 11 | .76059 | 15.38 pk | 10.5 | 0 | 25.88 | 56 | 46 | - | - | - | - |
| | | | | | Margin [dB] | -30.12 | -20.12 | - | - | - | - |
| ----- | | | | | | | | | | | |
| Neutral 1 - 30MHz | | | | | | | | | | | |
| 12 | 1.40608 | 11.46 pk | 10.4 | 0 | 21.86 | 56 | 46 | - | - | - | - |
| | | | | | Margin [dB] | -34.14 | -24.14 | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - average detector
 avlg - average log detection
 ave - average detection
 cav - CISPR average detection

4.2 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 |
| Occupied Bandwidth Limits | |
| 0.25% of Fo | |

Table 6 Occupied Bandwidth Configuration Settings

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

Table 7 Occupied Bandwidth Spectrum Analyzer Settings

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

Table 8 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 | 43734 |
| Multimeter | Fluke | 87III | ME5B-218 |

Figure 5 Test Setup for Occupied Bandwidth



Figure 6 Occupied Bandwidth Graph

| Frequency (MHz) | -20dB OBW | 99% Power OBW | Limit (MHz) |
|-----------------|-----------|---------------|-------------|
| 431 | 156.3kHz | 176.3kHz | 1.08 |
| 437 | 156.3kHz | 148.3kHz | 1.08 |

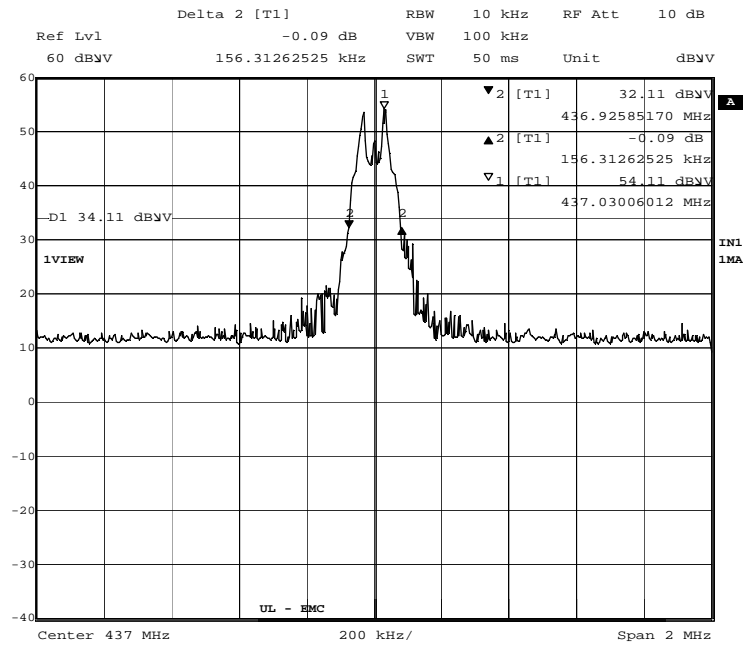
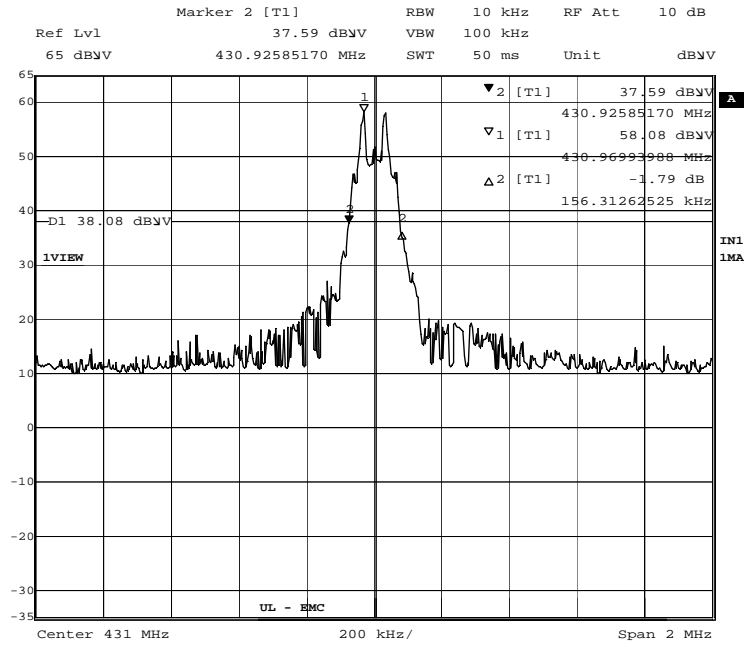
Job Number:
 Model Number:
 Client Name:
 FCC ID:

1001149948
 RR-VCRX
 LUTRON ELECTRONICS INC
 JPZ0064

File Number: MC15896

Page 22 of 67

IC Number: 2851A-JPZ0064



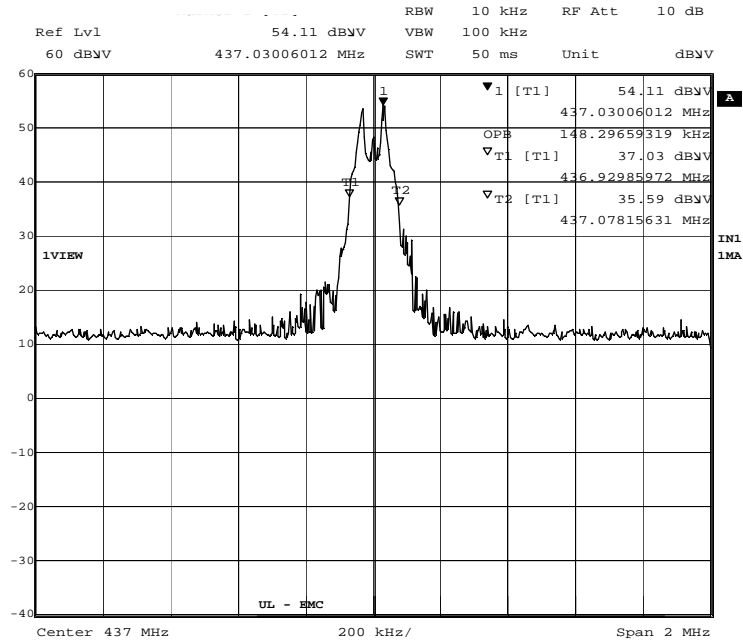
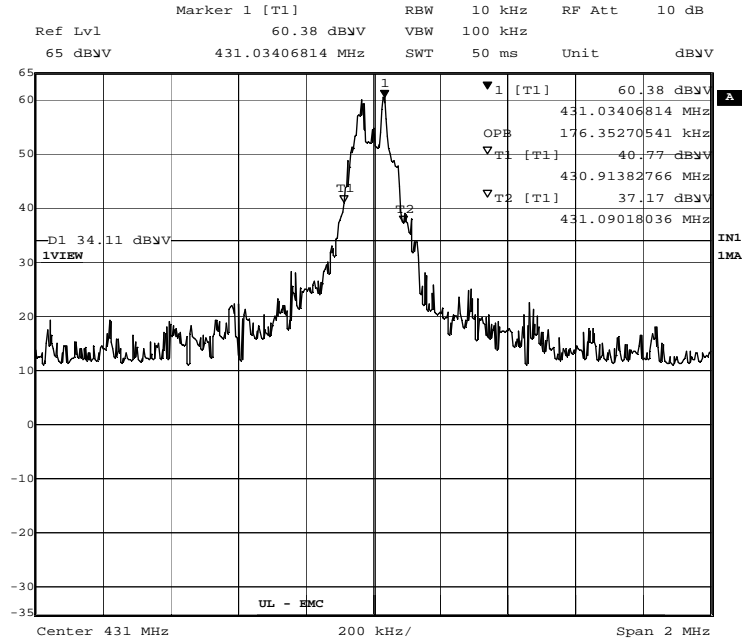
Job Number:
Model Number:
Client Name:
FCC ID:

1001149948
RR-VCRX
LUTRON ELECTRONICS INC
JPZ0064

File Number: MC15896

Page 23 of 67

IC Number: 2851A-JPZ0064



4.3 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 9 Cease Operation Configuration Settings

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

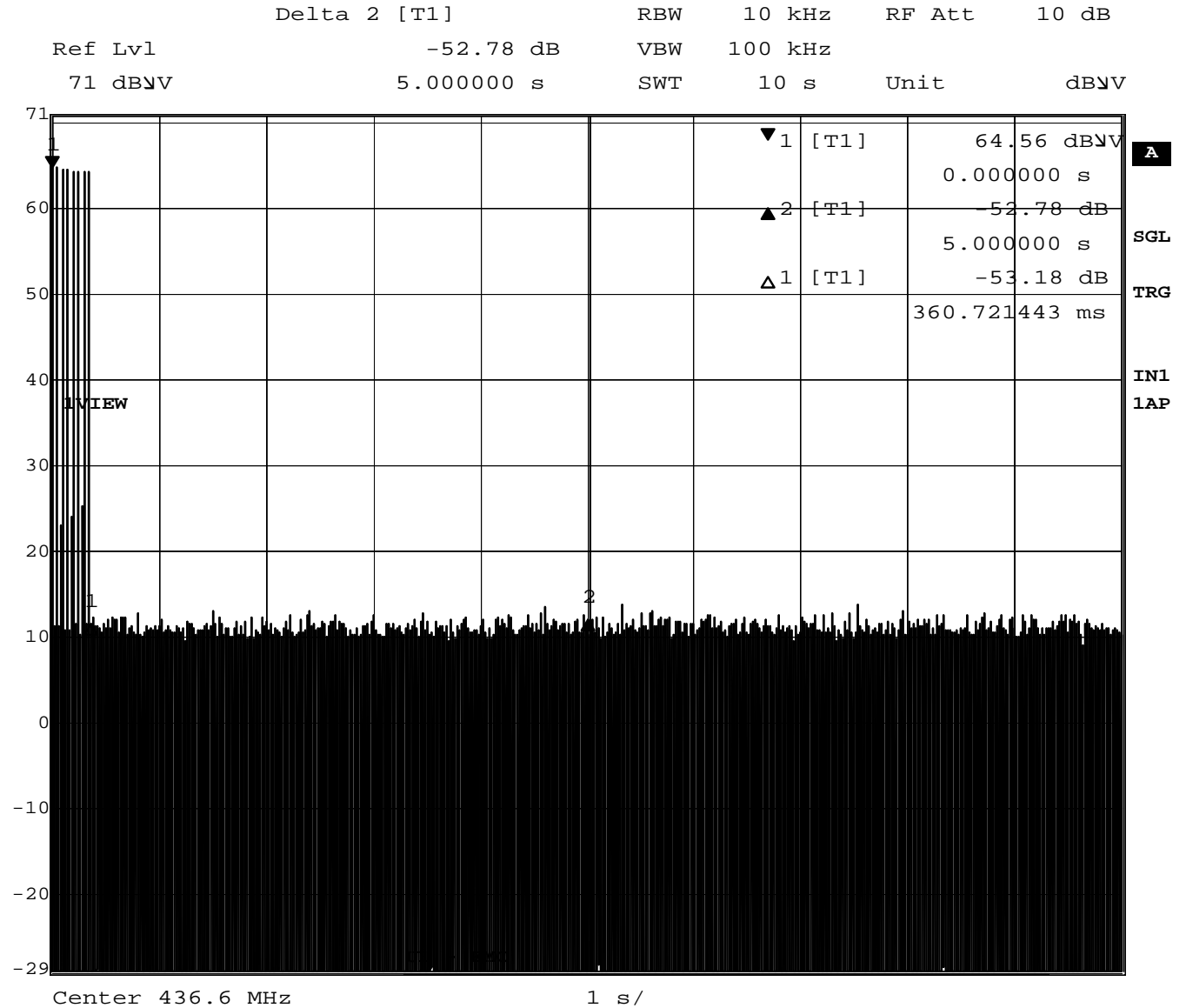
Table 10 Cease Operation Test Equipment

| 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 | 43734 |
| Multimeter | Fluke | 87III | ME5B-218 |

Figure 7 Test Setup for Cease Operation



Figure 8 Cease Operation Graph



Date: 9.SEP.2009 09:55:17

4.4 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 11 Pulse Train Configuration Settings

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

Table 12 Pulse Train Calculation

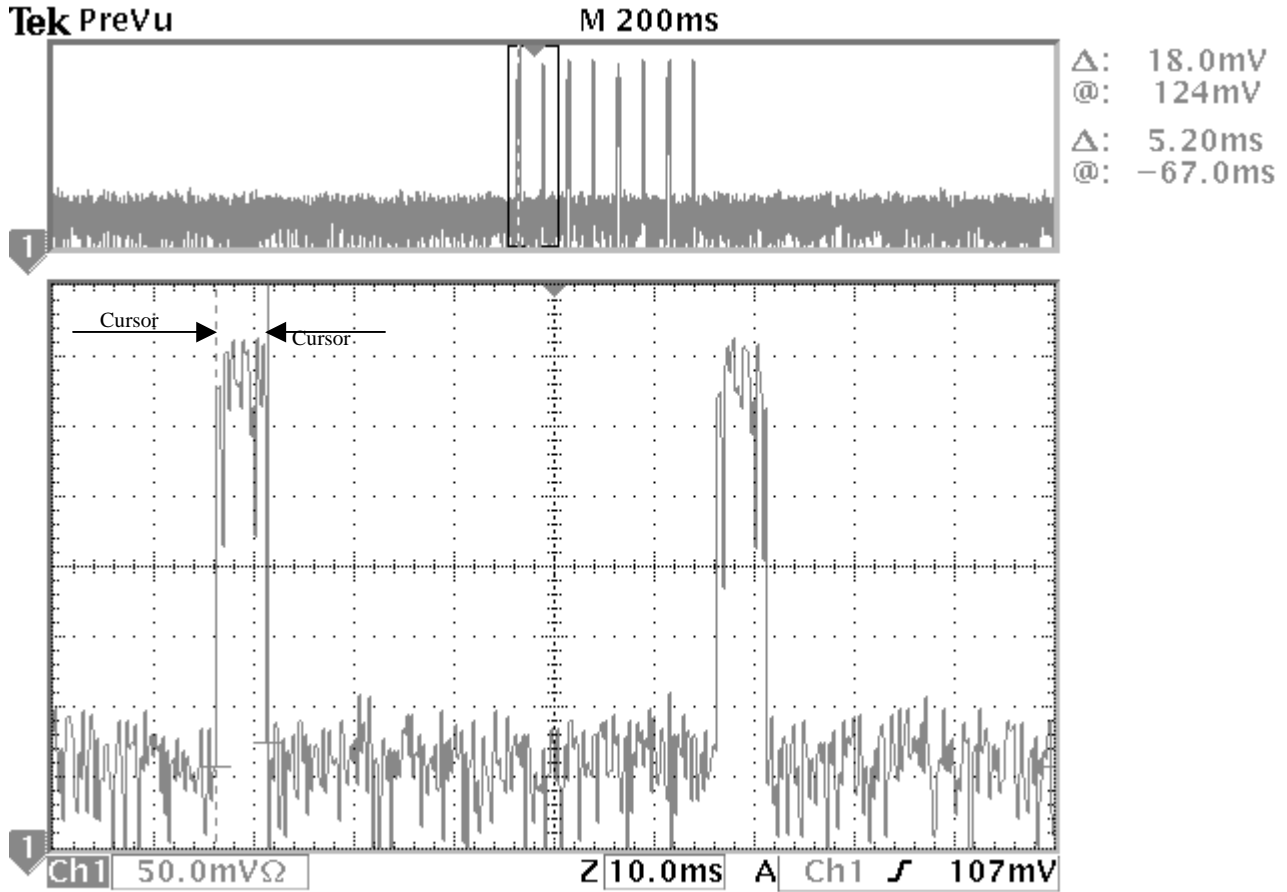
| Pulse Width (mS) | Total Transmission time or 100ms which ever is lesser | Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$ |
|------------------|---|---|
| 10.4 | 100 | -19.7 |

Table 13 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 | 43734 |
| Multimeter | Fluke | 87III | ME5B-218 |

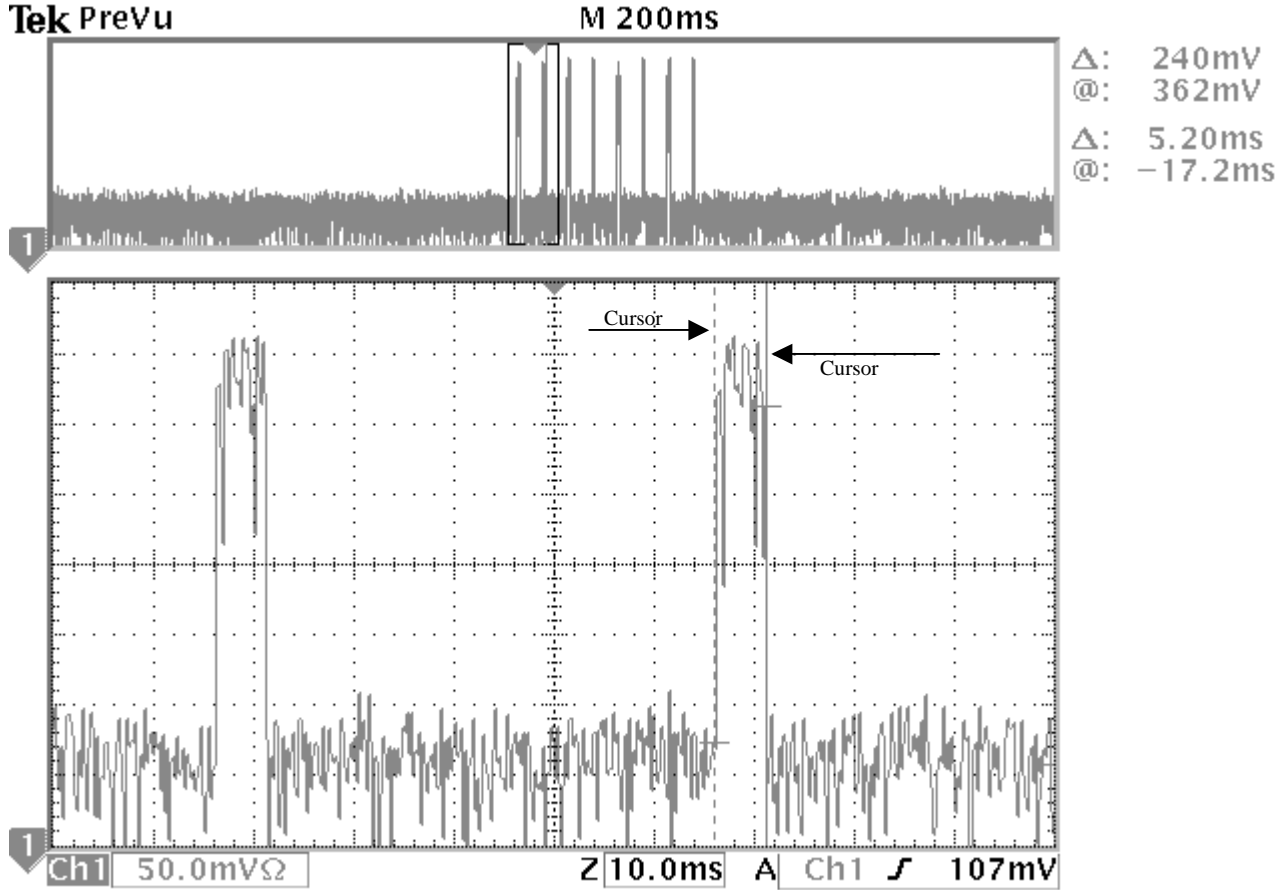
Figure 9 Test Setup for Pulse Train





8 Sep 2009
10:45:44

Width of 1st pulse in 100mS



8 Sep 2009
10:46:12

Width of 2nd pulse in 100mS

4.5 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 C63.4. 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 | FCC Part 15 Subpart C 15.209 and 15.231 | | |
| UL LPG | 80-EM-S0029 | | |
| | Frequency range | Measurement Point | |
| Fully configured sample scanned over the following frequency range | 9kHz – 1GHz | (3 meter measurement distance) | |
| Fully configured sample scanned over the following frequency range | 1GHz – 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. | | | |

Table 14 Radiated Emissions EUT Configuration Settings

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

Table 15 Radiated Emissions Test Equipment

| Test Equipment Used | | | |
|------------------------------------|-----------------|-------------|------------|
| Description | Manufacturer | Model | Identifier |
| 9kHz-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 | 83V | 43443 |
| 30-1000MHz | | | |
| EMI Receiver | Rohde & Schwarz | ESIB40 | 34968 |
| Bicon Antenna | Schaffner | VBA6106A | 54 |
| 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 | 83V | 43443 |
| 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 |

Job Number: 1001149948 File Number: MC15896 Page 34 of 67
Model Number: RR-VCRX
Client Name: LUTRON ELECTRONICS INC
FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

| 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 | 83V | 43443 |

Figure 11 Test setup for Radiated Emissions

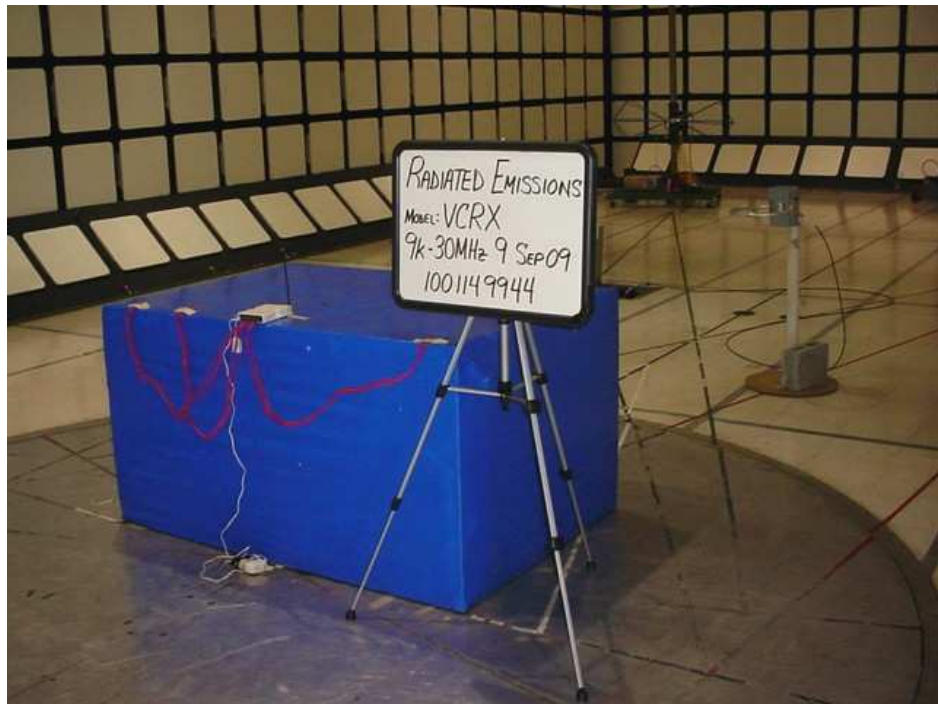
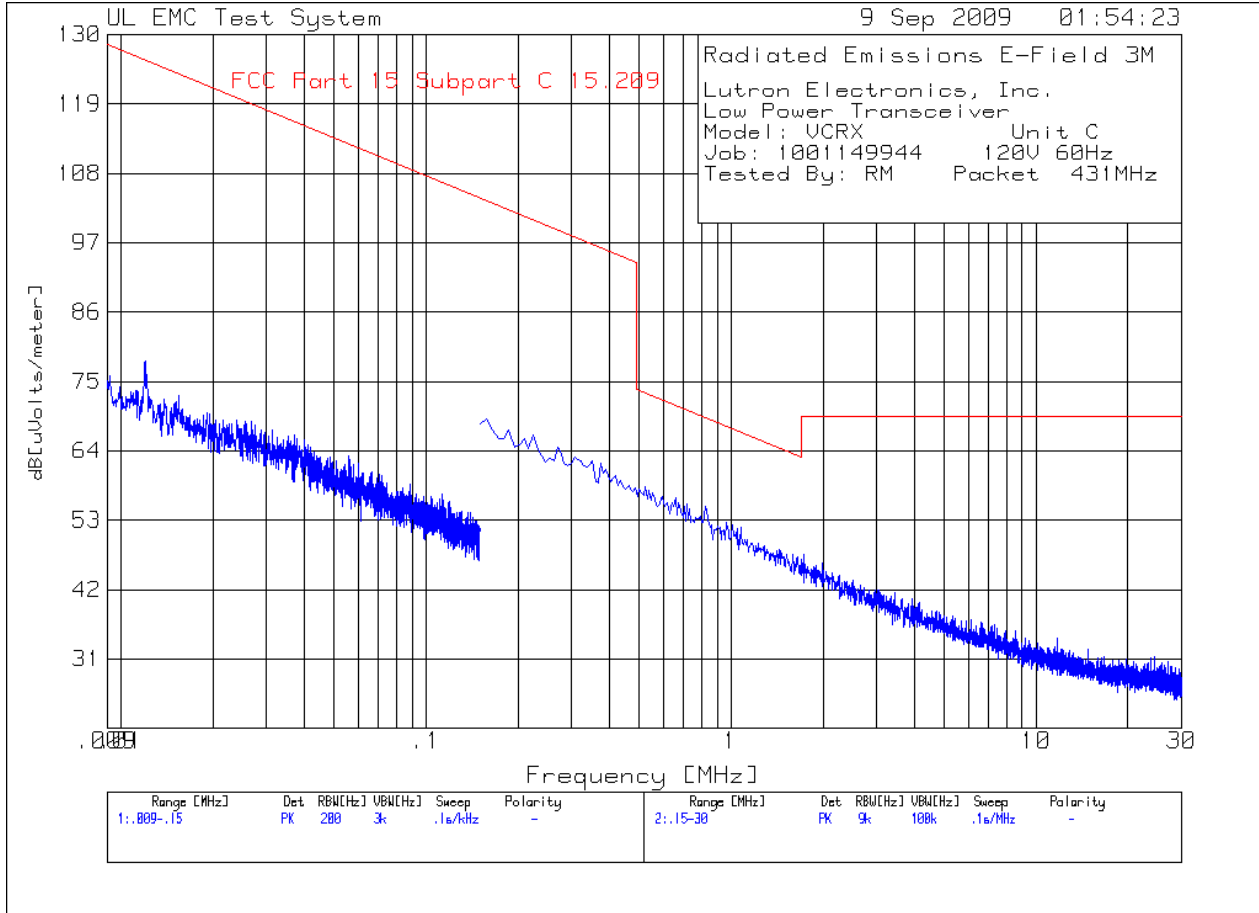








Figure 12 Radiated Emissions Graph (Horizontal)



Job Number: 1001149948 File Number: MC15896 Page 40 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

Table 16 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: RM Packet 431MHz

| 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 |
|-----------------------------|----------------------|------------------------|-----------------------|------------------------|------------------------|---------|---|---|---|---|---|
| ----- | | | | | | | | | | | |
| Range 1 .009 - .15MHz ----- | | | | | | | | | | | |
| 1 | .01205 | 48.02 pk | .2 | 30 | 78.22 | 126 | - | - | - | - | - |
| | Azimuth:302 | | | Margin [dB] | | -47.78 | - | - | - | - | - |
| 2 | .056 | 42.96 pk | 0 | 20.2 | 63.16 | 112.6 | - | - | - | - | - |
| | Azimuth:358 | | | Margin [dB] | | -49.44 | - | - | - | - | - |
| 3 | .08906 | 40.19 pk | 0 | 18.5 | 58.69 | 108.6 | - | - | - | - | - |
| | Azimuth:77 | | | Margin [dB] | | -49.91 | - | - | - | - | - |
| ----- | | | | | | | | | | | |
| Range 2 .15 - 30MHz ----- | | | | | | | | | | | |
| 4 | .22464 | 49.29 pk | 0 | 17.2 | 66.49 | 100.6 | - | - | - | - | - |
| | Azimuth:307 | | | Margin [dB] | | -34.11 | - | - | - | - | - |
| 5 | .82179 | 38.46 pk | 0 | 16.7 | 55.16 | 69.3 | - | - | - | - | - |
| | Azimuth:215 | | | Margin [dB] | | -14.14 | - | - | - | - | - |
| 6 | 11.71977 | 16.57 pk | .2 | 17.5 | 34.27 | 69.5 | - | - | - | - | - |
| | Azimuth:256 | | | Margin [dB] | | -35.23 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - Average detector

Figure 13 Radiated Emissions Graph (Vertical)

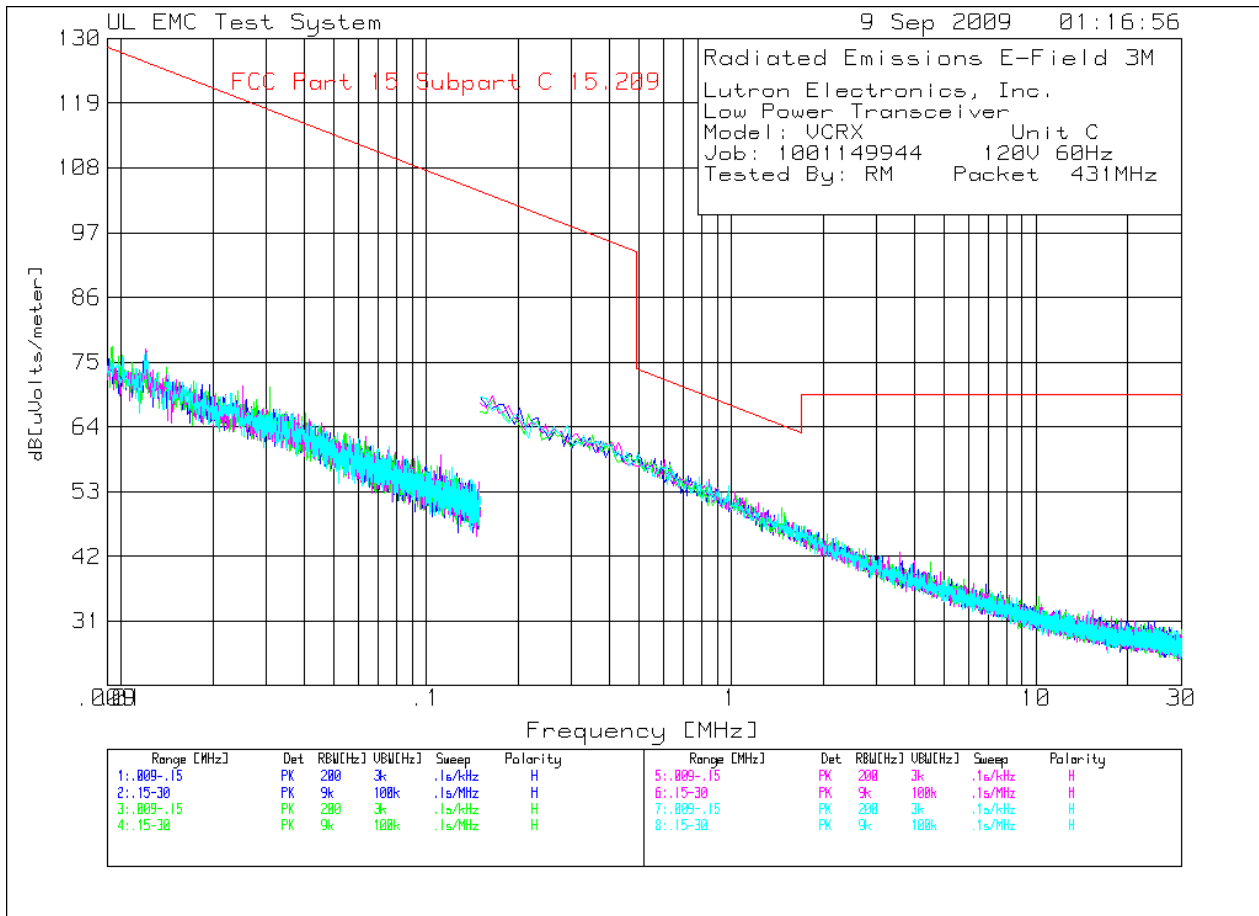


Table 17 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: RM Packet 431MHz

| 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 | .01222 | 46.15 pk | .1 | 29.9 | 76.15 | 125.8 | - | - | - | - | - |
| | Azimuth:301 | Height:101 | Horz | Margin [dB] | | -49.65 | - | - | - | - | - |
| 2 | .01955 | 45.47 pk | -.1 | 25.9 | 71.27 | 121.8 | - | - | - | - | - |
| | Azimuth:301 | Height:101 | Horz | Margin [dB] | | -50.53 | - | - | - | - | - |
| ----- | | | | | | | | | | | |
| 0° .15 - 30MHz | | | | | | | | | | | |
| 3 | .5904 | 41.01 pk | 0 | 17.1 | 58.11 | 72.2 | - | - | - | - | - |
| | Azimuth:184 | Height:101 | Horz | Margin [dB] | | -14.09 | - | - | - | - | - |
| 4 | 3.6284 | 24.34 pk | .1 | 16.8 | 41.24 | 69.5 | - | - | - | - | - |
| | Azimuth:2 | Height:101 | Horz | Margin [dB] | | -28.26 | - | - | - | - | - |
| ----- | | | | | | | | | | | |
| 45° .009 - .15MHz | | | | | | | | | | | |
| 5 | .00934 | 45.33 pk | .6 | 31.8 | 77.73 | 128.2 | - | - | - | - | - |
| | Azimuth:6 | Height:120 | Horz | Margin [dB] | | -50.47 | - | - | - | - | - |
| 6 | .03072 | 46.88 pk | 0 | 23.9 | 70.78 | 117.8 | - | - | - | - | - |
| | Azimuth:358 | Height:120 | Horz | Margin [dB] | | -47.02 | - | - | - | - | - |
| ----- | | | | | | | | | | | |
| 45° .15 - 30MHz | | | | | | | | | | | |
| 7 | 1.47119 | 33.35 pk | .1 | 16.7 | 50.15 | 64.3 | - | - | - | - | - |
| | Azimuth:54 | Height:120 | Horz | Margin [dB] | | -14.15 | - | - | - | - | - |
| 8 | 10.21197 | 17.61 pk | .2 | 17.4 | 35.21 | 69.5 | - | - | - | - | - |
| | Azimuth:102 | Height:120 | Horz | Margin [dB] | | -34.29 | - | - | - | - | - |
| ----- | | | | | | | | | | | |
| 90° .009 - .15MHz | | | | | | | | | | | |
| 9 | .0121 | 47.07 pk | .1 | 30 | 77.17 | 125.9 | - | - | - | - | - |
| | Azimuth:227 | Height:140 | Horz | Margin [dB] | | -48.73 | - | - | - | - | - |
| 10 | .02508 | 46.18 pk | 0 | 24.8 | 70.98 | 119.6 | - | - | - | - | - |
| | Azimuth:2 | Height:140 | Horz | Margin [dB] | | -48.62 | - | - | - | - | - |
| ----- | | | | | | | | | | | |
| 90° .15 - 30MHz | | | | | | | | | | | |
| 11 | .84419 | 38.33 pk | 0 | 16.8 | 55.13 | 69.1 | - | - | - | - | - |
| | Azimuth:154 | Height:140 | Horz | Margin [dB] | | -13.97 | - | - | - | - | - |
| 12 | 3.56868 | 25.84 pk | .1 | 16.8 | 42.74 | 69.5 | - | - | - | - | - |
| | Azimuth:245 | Height:140 | Horz | Margin [dB] | | -26.76 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 1001149948 File Number: MC15896 Page 43 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: RM Packet 431MHz

| 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 |
|-------|----------------------|------------------------|-----------------------|------------------------|------------------------|---------|---|---|---|---|---|
| ----- | | | | | | | | | | | |
| 135° | .009 - .15MHz | ----- | | | | | | | | | |
| 13 | .01222 | 46.65 pk | .1 | 29.9 | 76.65 | 125.8 | - | - | - | - | - |
| | Azimuth:358 | Height:160 | Horz | Margin [dB] | | -49.15 | - | - | - | - | - |
| 14 | .07564 | 41.96 pk | 0 | 18.8 | 60.76 | 110 | - | - | - | - | - |
| | Azimuth:209 | Height:160 | Horz | Margin [dB] | | -49.24 | - | - | - | - | - |
| 135° | .15 - 30MHz | ----- | | | | | | | | | |
| 15 | .97855 | 37.34 pk | 0 | 16.7 | 54.04 | 67.8 | - | - | - | - | - |
| | Azimuth:355 | Height:160 | Horz | Margin [dB] | | -13.76 | - | - | - | - | - |
| 16 | 14.75776 | 14.81 pk | .2 | 17.6 | 32.61 | 69.5 | - | - | - | - | - |
| | Azimuth:359 | Height:160 | Horz | Margin [dB] | | -36.89 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Figure 14 Radiated Emissions Graph (30-1000MHz, 431 MHz)

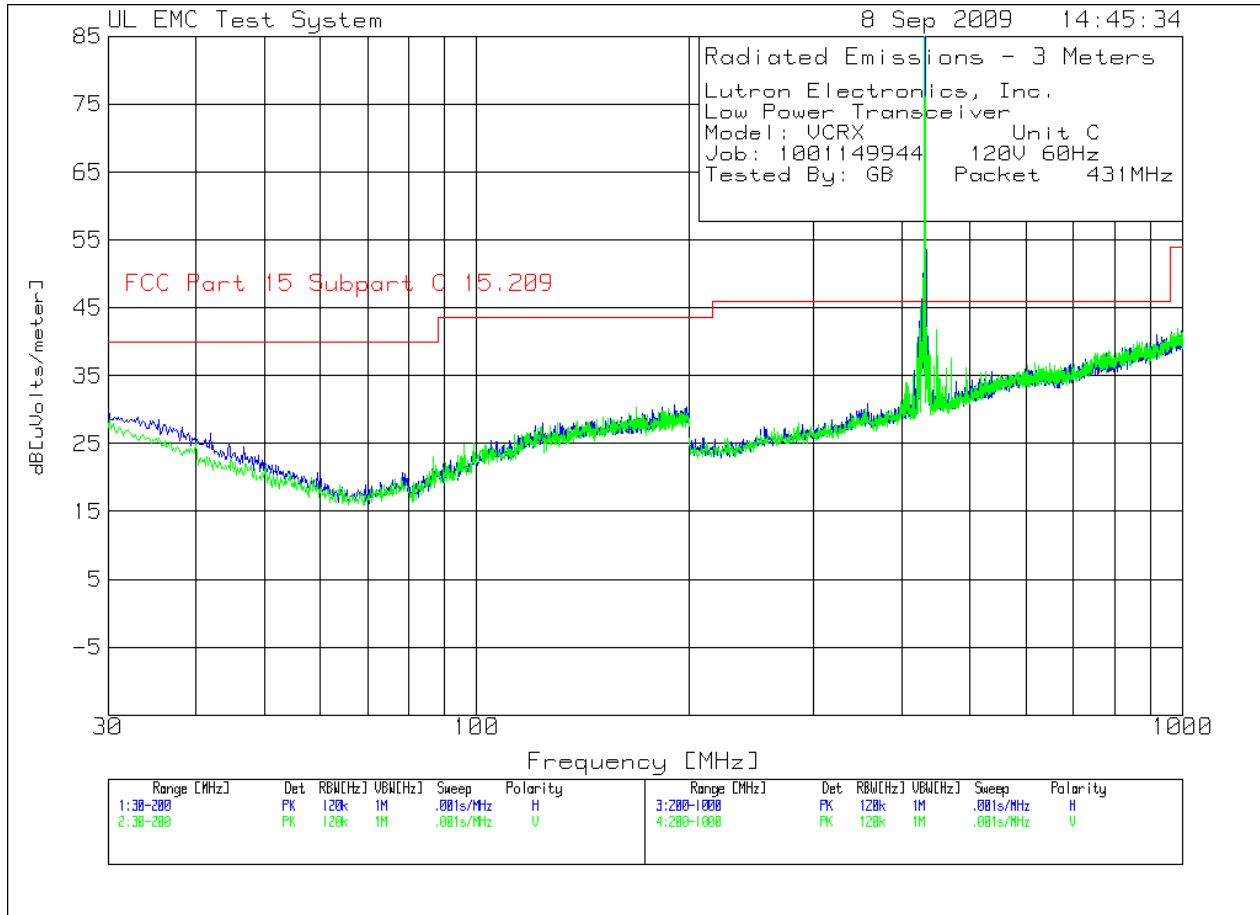


Table 18 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: GB Packet 431MHz

| 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 200 - 1000MHz ----- | | | | | | | | | | | |
| 1 | 430.9155 | 76.23 pk | 1.3 | 16.7 | 94.23 | 46 | - | - | - | - | - |
| | Azimuth:296 | Height:100 | Horz | Margin [dB] | 48.23 | - | - | - | - | - | - |
| 3 | 422.1111 | 22.82 pk | 1.3 | 16.6 | 40.72 | 46 | - | - | - | - | - |
| | Azimuth:85 | Height:200 | Horz | Margin [dB] | -5.28 | - | - | - | - | - | - |
| 4 | 424.5123 | 26.51 pk | 1.3 | 16.6 | 44.41 | 46 | - | - | - | - | - |
| | Azimuth:85 | Height:100 | Horz | Margin [dB] | -1.59 | - | - | - | - | - | - |
| 5 | 425.7129 | 25.06 pk | 1.3 | 16.6 | 42.96 | 46 | - | - | - | - | - |
| | Azimuth:343 | Height:100 | Horz | Margin [dB] | -3.04 | - | - | - | - | - | - |
| 6 | 427.3137 | 20.03 pk | 1.3 | 16.6 | 37.93 | 46 | - | - | - | - | - |
| | Azimuth:296 | Height:100 | Horz | Margin [dB] | -8.07 | - | - | - | - | - | - |
| 7 | 428.5143 | 18.19 pk | 1.3 | 16.7 | 36.19 | 46 | - | - | - | - | - |
| | Azimuth:296 | Height:100 | Horz | Margin [dB] | -9.81 | - | - | - | - | - | - |
| 8 | 429.3147 | 37.95 pk | 1.3 | 16.7 | 55.95 | 46 | - | - | - | - | - |
| | Azimuth:296 | Height:100 | Horz | Margin [dB] | 9.95 | - | - | - | - | - | - |
| 9 | 432.1161 | 36.59 pk | 1.3 | 16.8 | 54.69 | 46 | - | - | - | - | - |
| | Azimuth:43 | Height:200 | Horz | Margin [dB] | 8.69 | - | - | - | - | - | - |
| 10 | 432.9165 | 35.42 pk | 1.3 | 16.8 | 53.52 | 46 | - | - | - | - | - |
| | Azimuth:343 | Height:100 | Horz | Margin [dB] | 7.52 | - | - | - | - | - | - |
| 11 | 435.7179 | 22.66 pk | 1.3 | 16.9 | 40.86 | 46 | - | - | - | - | - |
| | Azimuth:296 | Height:100 | Horz | Margin [dB] | -5.14 | - | - | - | - | - | - |
| Vertical 200 - 1000MHz ----- | | | | | | | | | | | |
| 2 | 430.9155 | 72.94 pk | 1.3 | 16.4 | 90.64 | 46 | - | - | - | - | - |
| | Azimuth:85 | Height:100 | Vert | Margin [dB] | 44.64 | - | - | - | - | - | - |
| 12 | 424.1121 | 23.55 pk | 1.3 | 16.4 | 41.25 | 46 | - | - | - | - | - |
| | Azimuth:295 | Height:200 | Vert | Margin [dB] | -4.75 | - | - | - | - | - | - |
| 13 | 424.9125 | 27.58 pk | 1.3 | 16.4 | 45.28 | 46 | - | - | - | - | - |
| | Azimuth:253 | Height:200 | Vert | Margin [dB] | -.72 | - | - | - | - | - | - |
| 14 | 427.7139 | 26.98 pk | 1.3 | 16.4 | 44.68 | 46 | - | - | - | - | - |
| | Azimuth:337 | Height:100 | Vert | Margin [dB] | -1.32 | - | - | - | - | - | - |
| 15 | 428.5143 | 26.53 pk | 1.3 | 16.4 | 44.23 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:300 | Vert | Margin [dB] | -1.77 | - | - | - | - | - | - |
| 16 | 429.3147 | 38.68 pk | 1.3 | 16.4 | 56.38 | 46 | - | - | - | - | - |
| | Azimuth:343 | Height:200 | Vert | Margin [dB] | 10.38 | - | - | - | - | - | - |
| 17 | 433.3167 | 15.21 pk | 1.3 | 16.5 | 33.01 | 46 | - | - | - | - | - |
| | Azimuth:253 | Height:300 | Vert | Margin [dB] | -12.99 | - | - | - | - | - | - |
| 18 | 447.3237 | 23.72 pk | 1.3 | 16.7 | 41.72 | 46 | - | - | - | - | - |
| | Azimuth:17 | Height:100 | Vert | Margin [dB] | -4.28 | - | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection

Job Number: 1001149948 File Number: MC15896 Page 46 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: GB Packet 431MHz

| 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 200 - 1000MHz | | | | | | | | | | |
| 424.5 | 11.08 qp | 1.3 | 16.6 | 28.98 | 46 | - | - | - | - | - |
| Azimuth: 217 Height:103 Horz | | | | | Margin [dB]: | -17.02 | - | - | - | - |
| 422.1 | 12.39 qp | 1.3 | 16.6 | 30.29 | 46 | - | - | - | - | - |
| Azimuth: 209 Height:100 Horz | | | | | Margin [dB]: | -15.71 | - | - | - | - |
| 425.7 | 14.15 qp | 1.3 | 16.6 | 32.05 | 46 | - | - | - | - | - |
| Azimuth: 210 Height:103 Horz | | | | | Margin [dB]: | -13.95 | - | - | - | - |
| 429.3 | 19.35 qp | 1.3 | 16.7 | 37.35 | 46 | - | - | - | - | - |
| Azimuth: 200 Height:100 Horz | | | | | Margin [dB]: | -8.65 | - | - | - | - |
| 432.1 | 22.49 qp | 1.3 | 16.8 | 40.59 | 46 | - | - | - | - | - |
| Azimuth: 205 Height:104 Horz | | | | | Margin [dB]: | -5.41 | - | - | - | - |
| 431 | 74.2 pk | 1.3 | 16.4 | 72.2* | - | 80.7 | - | - | - | - |
| Azimuth: 205 Height:225 Horz | | | | | Margin [dB]: | -8.5 | - | - | - | - |
| 432.9 | 18.67 qp | 1.3 | 16.8 | 36.77 | 46 | - | - | - | - | - |
| Azimuth: 203 Height:104 Horz | | | | | Margin [dB]: | -9.23 | - | - | - | - |
| 435.7 | 16.56 qp | 1.3 | 16.9 | 34.76 | 46 | - | - | - | - | - |
| Azimuth: 316 Height:100 Horz | | | | | Margin [dB]: | -11.24 | - | - | - | - |
| Vertical 200 - 1000MHz | | | | | | | | | | |
| 431 | 81.25 pk | 1.3 | 16.4 | 79.25* | - | 80.7 | - | - | - | - |
| Azimuth: 168 Height:124 Vert | | | | | Margin [dB]: | -1.45 | - | - | - | - |
| 424.9 | 16.69 qp | 1.3 | 16.4 | 34.39 | 46 | - | - | - | - | - |
| Azimuth: 68 Height:100 Vert | | | | | Margin [dB]: | -11.61 | - | - | - | - |
| 427.7 | 22.82 qp | 1.3 | 16.4 | 40.52 | 46 | - | - | - | - | - |
| Azimuth: 182 Height:115 Vert | | | | | Margin [dB]: | -5.48 | - | - | - | - |
| 428.5 | 22.71 qp | 1.3 | 16.4 | 40.41 | 46 | - | - | - | - | - |
| Azimuth: 165 Height:134 Vert | | | | | Margin [dB]: | -5.59 | - | - | - | - |
| 429.3 | 25.5 qp | 1.3 | 16.4 | 43.2 | 46 | - | - | - | - | - |
| Azimuth: 174 Height:126 Vert | | | | | Margin [dB]: | -2.8 | - | - | - | - |
| 447.23 | 17.1 qp | 1.3 | 16.7 | 35.1 | 46 | - | - | - | - | - |
| Azimuth: 140 Height:100 Vert | | | | | Margin [dB]: | -10.9 | - | - | - | - |
| 424.11 | 21.21 qp | 1.3 | 16.4 | 38.91 | 46 | - | - | - | - | - |
| Azimuth: 175 Height:121 Vert | | | | | Margin [dB]: | -7.09 | - | - | - | - |

***Duty Cycle correction factor of 19.7 applied (see section 4.4 of report for calculation)**

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: FCC Part 15 Subpart C 15.231

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

avlg - Average log detector

ave - Average detector

Figure 15 Radiated Emissions Graph

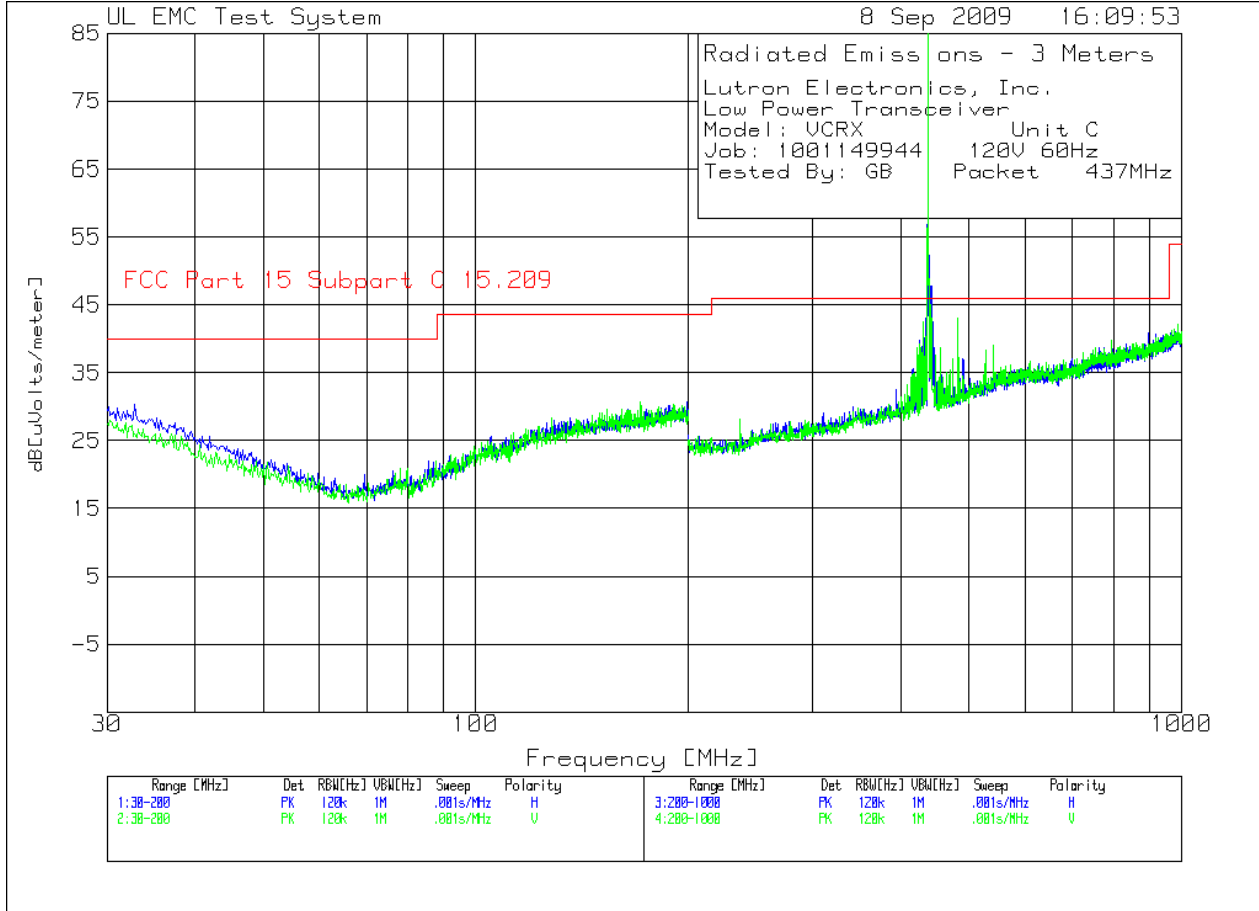


Table 19 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: GB Packet 437MHz

| 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 | 32.8929 | 12.66 pk | .4 | 17.3 | 30.36 | 40 | - | - | - | - | - |
| | Azimuth:217 | Height:300 | Horz | Margin [dB] | | -9.64 | - | - | - | - | - |
| 2 | 135.6757 | 13.44 pk | .7 | 14.2 | 28.34 | 43.5 | - | - | - | - | - |
| | Azimuth:1 | Height:400 | Horz | Margin [dB] | | -15.16 | - | - | - | - | - |
| Vertical 30 - 200MHz ----- | | | | | | | | | | | |
| 3 | 171.0711 | 14.34 pk | .8 | 15.6 | 30.74 | 43.5 | - | - | - | - | - |
| | Azimuth:290 | Height:100 | Vert | Margin [dB] | | -12.76 | - | - | - | - | - |
| Horizontal 200 - 1000MHz ----- | | | | | | | | | | | |
| 4 | 425.3127 | 21.84 pk | 1.3 | 16.6 | 39.74 | 46 | - | - | - | - | - |
| | Azimuth:17 | Height:100 | Horz | Margin [dB] | | -6.26 | - | - | - | - | - |
| 5 | 426.5133 | 19.77 pk | 1.3 | 16.6 | 37.67 | 46 | - | - | - | - | - |
| | Azimuth:128 | Height:200 | Horz | Margin [dB] | | -8.33 | - | - | - | - | - |
| 6 | 428.9145 | 20.82 pk | 1.3 | 16.7 | 38.82 | 46 | - | - | - | - | - |
| | Azimuth:343 | Height:100 | Horz | Margin [dB] | | -7.18 | - | - | - | - | - |
| 7 | 432.1161 | 22.1 pk | 1.3 | 16.8 | 40.2 | 46 | - | - | - | - | - |
| | Azimuth:2 | Height:100 | Horz | Margin [dB] | | -5.8 | - | - | - | - | - |
| 8 | 433.3167 | 25.01 pk | 1.3 | 16.8 | 43.11 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:100 | Horz | Margin [dB] | | -2.89 | - | - | - | - | - |
| 9 | 434.9175 | 26.59 pk | 1.3 | 16.9 | 44.79 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:200 | Horz | Margin [dB] | | -1.21 | - | - | - | - | - |
| 10 | 435.7179 | 36.93 pk | 1.3 | 16.9 | 55.13 | 46 | - | - | - | - | - |
| | Azimuth:295 | Height:100 | Horz | Margin [dB] | | 9.13 | - | - | - | - | - |
| 11 | 436.9185 | 71.34 pk | 1.3 | 17 | 89.64 | 46 | - | - | - | - | - |
| | Azimuth:295 | Height:200 | Horz | Margin [dB] | | 43.64 | - | - | - | - | - |
| 12 | 438.9195 | 33.93 pk | 1.3 | 17.1 | 52.33 | 46 | - | - | - | - | - |
| | Azimuth:295 | Height:100 | Horz | Margin [dB] | | 6.33 | - | - | - | - | - |
| 13 | 440.1201 | 27.11 pk | 1.3 | 17.1 | 45.51 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:100 | Horz | Margin [dB] | | -.49 | - | - | - | - | - |
| 14 | 441.3207 | 29.44 pk | 1.3 | 17.1 | 47.84 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:200 | Horz | Margin [dB] | | 1.84 | - | - | - | - | - |
| 15 | 442.1211 | 29.4 pk | 1.3 | 17.1 | 47.8 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:200 | Horz | Margin [dB] | | 1.8 | - | - | - | - | - |
| 16 | 443.3217 | 23.14 pk | 1.3 | 17.2 | 41.64 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:100 | Horz | Margin [dB] | | -4.36 | - | - | - | - | - |
| 17 | 444.1221 | 23.96 pk | 1.3 | 17.2 | 42.46 | 46 | - | - | - | - | - |
| | Azimuth:44 | Height:200 | Horz | Margin [dB] | | -3.54 | - | - | - | - | - |
| 18 | 445.7229 | 20.13 pk | 1.3 | 17.2 | 38.63 | 46 | - | - | - | - | - |
| | Azimuth:14 | Height:200 | Horz | Margin [dB] | | -7.37 | - | - | - | - | - |
| 19 | 489.7449 | 17.45 pk | 1.5 | 18.1 | 37.05 | 46 | - | - | - | - | - |
| | Azimuth:86 | Height:200 | Horz | Margin [dB] | | -8.95 | - | - | - | - | - |
| 20 | 897.5488 | 15.78 pk | 1.9 | 23.2 | 40.88 | 46 | - | - | - | - | - |
| | Azimuth:296 | Height:300 | Horz | Margin [dB] | | -5.12 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector

Job Number: 1001149948 File Number: MC15896 Page 49 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

avlg - Average log detector
 ave - Average detector
 Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: GB Packet 437MHz

| 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 200 - 1000MHz ----- | | | | | | | | | | | |
| 21 | 421.3107 | 21.02 pk | 1.3 | 16.3 | 38.62 | 46 | - | - | - | - | - |
| | Azimuth:254 | Height:100 | Vert | Margin [dB] | | -7.38 | - | - | - | - | - |
| 22 | 422.9115 | 19.86 pk | 1.3 | 16.4 | 37.56 | 46 | - | - | - | - | - |
| | Azimuth:17 | Height:200 | Vert | Margin [dB] | | -8.44 | - | - | - | - | - |
| 23 | 424.9125 | 21.45 pk | 1.3 | 16.4 | 39.15 | 46 | - | - | - | - | - |
| | Azimuth:343 | Height:100 | Vert | Margin [dB] | | -6.85 | - | - | - | - | - |
| 24 | 427.3137 | 21.03 pk | 1.3 | 16.4 | 38.73 | 46 | - | - | - | - | - |
| | Azimuth:337 | Height:200 | Vert | Margin [dB] | | -7.27 | - | - | - | - | - |
| 25 | 429.3147 | 24.88 pk | 1.3 | 16.4 | 42.58 | 46 | - | - | - | - | - |
| | Azimuth:86 | Height:100 | Vert | Margin [dB] | | -3.42 | - | - | - | - | - |
| 26 | 434.5173 | 29.93 pk | 1.3 | 16.5 | 47.73 | 46 | - | - | - | - | - |
| | Azimuth:170 | Height:200 | Vert | Margin [dB] | | 1.73 | - | - | - | - | - |
| 27 | 436.9185 | 72.48 pk | 1.3 | 16.5 | 90.28 | 46 | - | - | - | - | - |
| | Azimuth:43 | Height:100 | Vert | Margin [dB] | | 44.28 | - | - | - | - | - |
| 28 | 438.5193 | 24.25 pk | 1.3 | 16.6 | 42.15 | 46 | - | - | - | - | - |
| | Azimuth:86 | Height:400 | Vert | Margin [dB] | | -3.85 | - | - | - | - | - |
| 29 | 439.3197 | 30.87 pk | 1.3 | 16.6 | 48.77 | 46 | - | - | - | - | - |
| | Azimuth:86 | Height:200 | Vert | Margin [dB] | | 2.77 | - | - | - | - | - |
| 30 | 440.1201 | 27.05 pk | 1.3 | 16.6 | 44.95 | 46 | - | - | - | - | - |
| | Azimuth:86 | Height:100 | Vert | Margin [dB] | | -1.05 | - | - | - | - | - |
| 31 | 441.7209 | 25.15 pk | 1.3 | 16.6 | 43.05 | 46 | - | - | - | - | - |
| | Azimuth:86 | Height:200 | Vert | Margin [dB] | | -2.95 | - | - | - | - | - |
| 32 | 442.9215 | 24.01 pk | 1.3 | 16.7 | 42.01 | 46 | - | - | - | - | - |
| | Azimuth:43 | Height:200 | Vert | Margin [dB] | | -3.99 | - | - | - | - | - |
| 33 | 447.3237 | 19.52 pk | 1.3 | 16.7 | 37.52 | 46 | - | - | - | - | - |
| | Azimuth:170 | Height:200 | Vert | Margin [dB] | | -8.48 | - | - | - | - | - |
| 34 | 454.5273 | 20.4 pk | 1.3 | 16.9 | 38.6 | 46 | - | - | - | - | - |
| | Azimuth:343 | Height:100 | Vert | Margin [dB] | | -7.4 | - | - | - | - | - |
| 35 | 474.1371 | 18.25 pk | 1.4 | 17.4 | 37.05 | 46 | - | - | - | - | - |
| | Azimuth:43 | Height:100 | Vert | Margin [dB] | | -8.95 | - | - | - | - | - |
| 36 | 482.1411 | 23.84 pk | 1.5 | 17.7 | 43.04 | 46 | - | - | - | - | - |
| | Azimuth:17 | Height:100 | Vert | Margin [dB] | | -2.96 | - | - | - | - | - |
| 37 | 526.9635 | 18.16 pk | 1.4 | 18.7 | 38.26 | 46 | - | - | - | - | - |
| | Azimuth:170 | Height:100 | Vert | Margin [dB] | | -7.74 | - | - | - | - | - |
| 38 | 540.9705 | 18.31 pk | 1.4 | 19.4 | 39.11 | 46 | - | - | - | - | - |
| | Azimuth:212 | Height:200 | Vert | Margin [dB] | | -6.89 | - | - | - | - | - |
| 39 | 793.8969 | 15.62 pk | 1.7 | 22.4 | 39.72 | 46 | - | - | - | - | - |
| | Azimuth:17 | Height:300 | Vert | Margin [dB] | | -6.28 | - | - | - | - | - |
| 40 | 953.5768 | 14.65 pk | 1.9 | 24.2 | 40.75 | 46 | - | - | - | - | - |
| | Azimuth:34 | Height:300 | Vert | Margin [dB] | | -5.25 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 1001149948 File Number: MC15896 Page 50 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: GB Packet 437MHz

| 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 200 - 1000MHz | | | | | | | | | | |
| 436.9671 | 76.21 pk | 1.3 | 17 | 74.81* | - | 80.9 | - | - | - | - |
| Azimuth: 99 | | Height:100 | Horz | Margin [dB]: | - | -6.09 | - | - | - | - |
| 432.0032 | 26.94 qp | 1.3 | 16.8 | 45.04 | 46 | - | - | - | - | - |
| Azimuth: 221 | | Height:100 | Horz | Margin [dB]: | -.96 | - | - | - | - | - |
| 433.948 | 21.48 qp | 1.3 | 16.9 | 39.68 | 46 | - | - | - | - | - |
| Azimuth: 213 | | Height:100 | Horz | Margin [dB]: | -6.32 | - | - | - | - | - |
| 435.0022 | 21.62 qp | 1.3 | 16.9 | 39.82 | 46 | - | - | - | - | - |
| Azimuth: 210 | | Height:100 | Horz | Margin [dB]: | -6.18 | - | - | - | - | - |
| 435.9705 | 21.98 qp | 1.3 | 16.9 | 40.18 | 46 | - | - | - | - | - |
| Azimuth: 205 | | Height:104 | Horz | Margin [dB]: | -5.82 | - | - | - | - | - |
| 438.903 | 22.62 qp | 1.3 | 17.1 | 41.02 | 46 | - | - | - | - | - |
| Azimuth: 112 | | Height:100 | Horz | Margin [dB]: | -4.98 | - | - | - | - | - |
| 441.9417 | 26.67 qp | 1.3 | 17.1 | 45.07 | 46 | - | - | - | - | - |
| Azimuth: 321 | | Height:105 | Horz | Margin [dB]: | -.93 | - | - | - | - | - |
| 441.0535 | 16.43 qp | 1.3 | 17.1 | 34.83 | 46 | - | - | - | - | - |
| Azimuth: 312 | | Height:100 | Horz | Margin [dB]: | -11.17 | - | - | - | - | - |
| 442.9933 | 17.18 qp | 1.3 | 17.2 | 35.68 | 46 | - | - | - | - | - |
| Azimuth: 315 | | Height:100 | Horz | Margin [dB]: | -10.32 | - | - | - | - | - |
| 444.1221 | 12.25 qp | 1.3 | 17.2 | 30.75 | 46 | - | - | - | - | - |
| Azimuth: 315 | | Height:104 | Horz | Margin [dB]: | -15.25 | - | - | - | - | - |
| 897.5488 | 9.15 qp | 1.9 | 23.2 | 34.25 | 46 | - | - | - | - | - |
| Azimuth: 0 | | Height:119 | Horz | Margin [dB]: | -11.75 | - | - | - | - | - |
| Vertical 200 - 1000MHz | | | | | | | | | | |
| 437.0302 | 80.51 pk | 1.3 | 16.5 | 78.61* | - | 80.9 | - | - | - | - |
| Azimuth: 162 | | Height:117 | Vert | Margin [dB]: | - | -2.29 | - | - | - | - |

***Duty Cycle correction factor of 19.7 applied (see section 4.4 of report for calculation)**

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 1001149948 File Number: MC15896 Page 51 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: GB Packet 437MHz

| 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 |
|----------------------|------------------------|-----------------------|------------------------|------------------------|---------|---|---|---|---|---|
| 430.9082 | 23.32 qp | 1.3 | 16.4 | 41.02 | 46 | - | - | - | - | - |
| Azimuth: 167 | | Height:128 | Vert | Margin [dB]: | -4.98 | - | - | - | - | - |
| 429.3147 | 16.43 qp | 1.3 | 16.4 | 34.13 | 46 | - | - | - | - | - |
| Azimuth: 169 | | Height:131 | Vert | Margin [dB]: | -11.87 | - | - | - | - | - |
| 433.9348 | 26.08 qp | 1.3 | 16.5 | 43.88 | 46 | - | - | - | - | - |
| Azimuth: 158 | | Height:129 | Vert | Margin [dB]: | -2.12 | - | - | - | - | - |
| 434.9889 | 26.71 qp | 1.3 | 16.5 | 44.51 | 46 | - | - | - | - | - |
| Azimuth: 160 | | Height:119 | Vert | Margin [dB]: | -1.49 | - | - | - | - | - |
| 438.9092 | 26.65 qp | 1.3 | 16.6 | 44.55 | 46 | - | - | - | - | - |
| Azimuth: 172 | | Height:120 | Vert | Margin [dB]: | -1.45 | - | - | - | - | - |
| 439.1046 | 26.39 qp | 1.3 | 16.6 | 44.29 | 46 | - | - | - | - | - |
| Azimuth: 174 | | Height:120 | Vert | Margin [dB]: | -1.71 | - | - | - | - | - |
| 439.3197 | 21.42 qp | 1.3 | 16.6 | 39.32 | 46 | - | - | - | - | - |
| Azimuth: 176 | | Height:117 | Vert | Margin [dB]: | -6.68 | - | - | - | - | - |
| 442.9785 | 21.59 qp | 1.3 | 16.7 | 39.59 | 46 | - | - | - | - | - |
| Azimuth: 164 | | Height:113 | Vert | Margin [dB]: | -6.41 | - | - | - | - | - |
| 481.9402 | 25.77 qp | 1.5 | 17.7 | 44.97 | 46 | - | - | - | - | - |
| Azimuth: 173 | | Height:128 | Vert | Margin [dB]: | -1.03 | - | - | - | - | - |
| 953.5768 | 9.2 qp | 1.9 | 24.2 | 35.3 | 46 | - | - | - | - | - |
| Azimuth: 328 | | Height:198 | Vert | Margin [dB]: | -10.7 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Figure 16 Radiated Emissions Graph

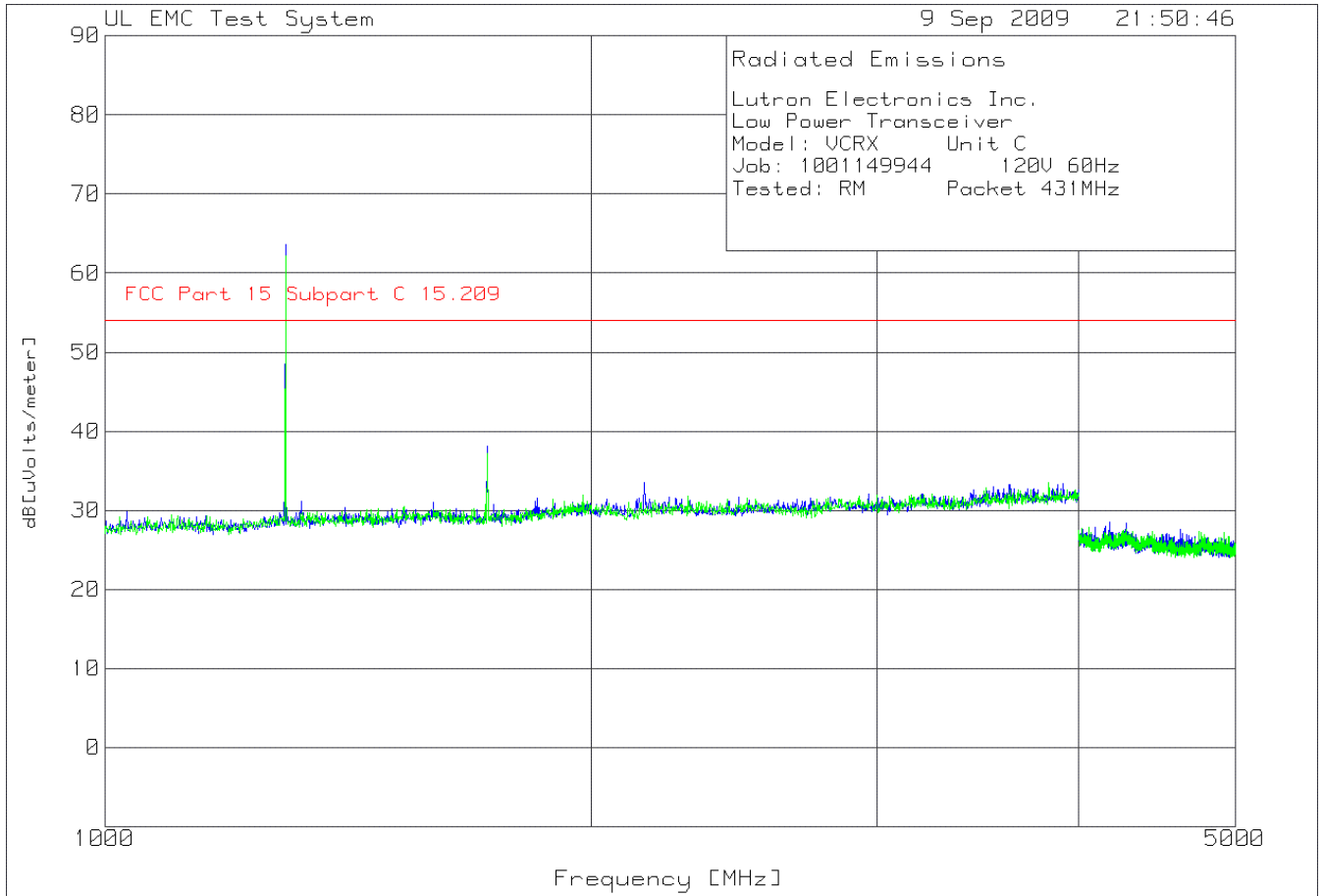


Table 20 Radiated Emissions Data Points

Lutron Electronics Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested: RM Packet 431MHz

| 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 1000 - 2000MHz ----- | | | | | | | | | | | |
| 1 | 1293.383 | 88.67 pk | -45.59 | 20.5 | 63.58 | 54 | - | - | - | - | - |
| | | Height:150 Horz | | Margin [dB] | | 9.58 | - | - | - | - | - |
| 2 | 1724.095 | 62.45 pk | -45.12 | 20.8 | 38.13 | 54 | - | - | - | - | - |
| | | Height:100 Horz | | Margin [dB] | | -15.87 | - | - | - | - | - |
| Horizontal 2000 - 4000MHz ----- | | | | | | | | | | | |
| 3 | 2154.806 | 56 pk | -43.92 | 21.4 | 33.48 | 54 | - | - | - | - | - |
| | | Height:199 Horz | | Margin [dB] | | -20.52 | - | - | - | - | - |
| 4 | 3627.965 | 53.58 pk | -42.73 | 22.4 | 33.25 | 54 | - | - | - | - | - |
| | | Height:100 Horz | | Margin [dB] | | -20.75 | - | - | - | - | - |
| Horizontal 4000 - 5000MHz ----- | | | | | | | | | | | |
| 5 | 4183.86 | 54.49 pk | -53.83 | 27.9 | 28.56 | 54 | - | - | - | - | - |
| | | Height:200 Horz | | Margin [dB] | | -25.44 | - | - | - | - | - |
| Vertical 1000 - 2000MHz ----- | | | | | | | | | | | |
| 6 | 1293.383 | 87.27 pk | -45.59 | 20.5 | 62.18 | 54 | - | - | - | - | - |
| | | Height:150 Vert | | Margin [dB] | | 8.18 | - | - | - | - | - |
| 7 | 1724.095 | 61.52 pk | -45.12 | 20.8 | 37.2 | 54 | - | - | - | - | - |
| | | Height:100 Vert | | Margin [dB] | | -16.8 | - | - | - | - | - |
| Vertical 4000 - 5000MHz ----- | | | | | | | | | | | |
| 8 | 4764.559 | 53.35 pk | -54.4 | 27.2 | 26.15 | 54 | - | - | - | - | - |
| | | Height:200 Vert | | Margin [dB] | | -27.85 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

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: 1001149948 File Number: MC15896 Page 54 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

Lutron Electronics Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested: RM Packet 431MHz

| 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 | | | | | | | | | | |
| 1293.0875 | 89.16 PK | -45.6 | 20.5 | 44.36* | - | 60.7 | - | - | - | - |
| Azimuth: 215 Height:155 | | Horz | Margin [dB]: | | - | -16.34 | - | - | - | - |
| 1722.885 | 64.13 PK | -45.16 | 20.8 | 39.77 | 54 | - | - | - | - | - |
| Azimuth: 0 Height:175 | | Horz | Margin [dB]: | | -14.23 | - | - | - | - | - |
| Vertical 1000 - 2000MHz | | | | | | | | | | |
| 1293.09 | 87.62 PK | -45.6 | 20.5 | 42.82* | - | 60.7 | - | - | - | - |
| Azimuth: 203 Height:112 | | Vert | Margin [dB]: | | - | -17.88 | - | - | - | - |
| 1722.8775 | 63.88 PK | -45.16 | 20.8 | 39.52 | 54 | - | - | - | - | - |
| Azimuth: 64 Height:101 | | Vert | Margin [dB]: | | -14.48 | - | - | - | - | - |
| 2155.155 | 58.62 PK | -43.91 | 21.4 | 36.11 | 54 | - | - | - | - | - |
| Azimuth: 243 Height:117 | | Horz | Margin [dB]: | | -17.89 | - | - | - | - | - |

***Duty Cycle correction factor of 19.7 applied (see section 4.4 of report for calculation)**

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231

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 17 Radiated Emissions Graph

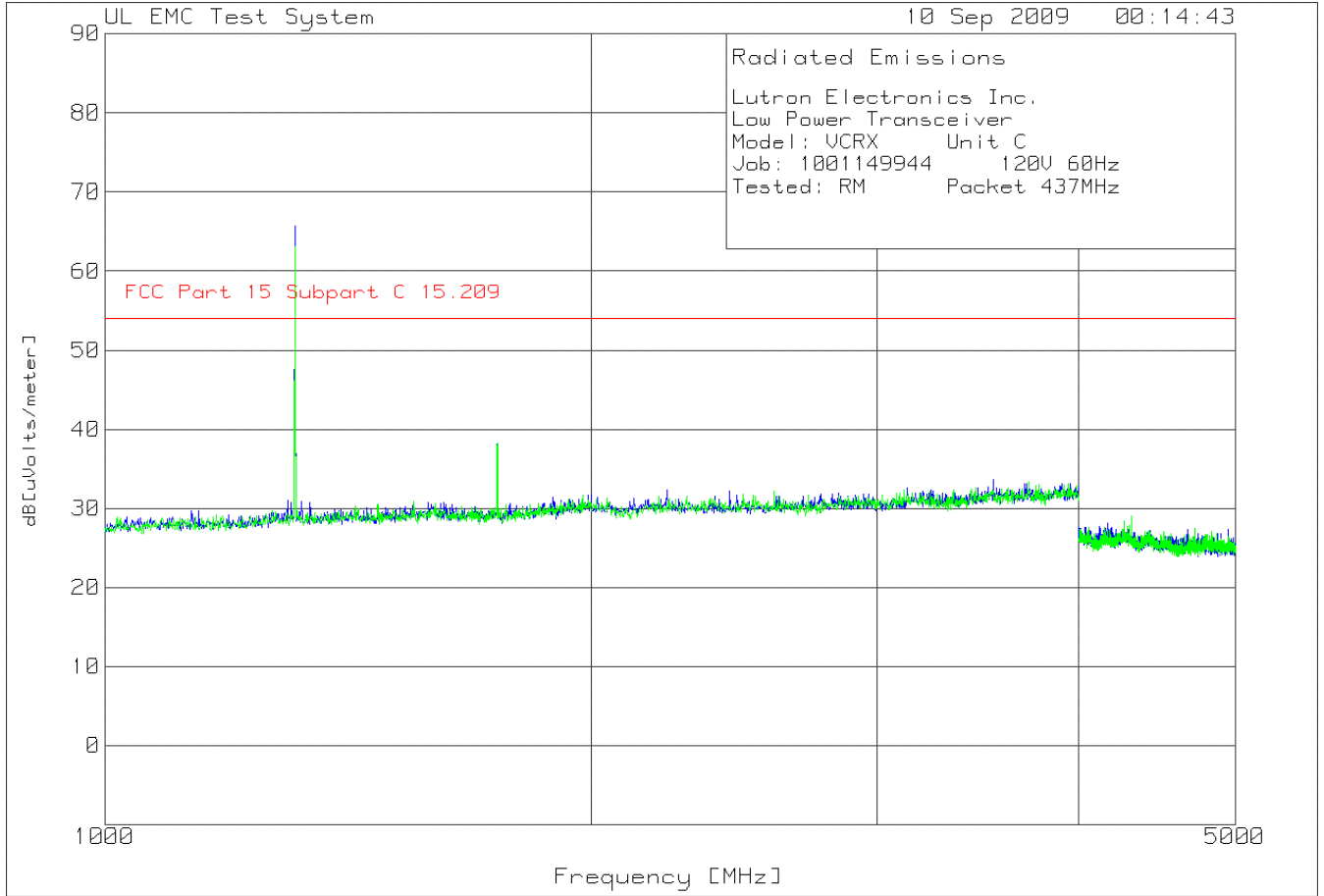


Table 21 Radiated Emissions Data Points

Lutron Electronics Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested: RM Packet 437MHz

| 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 1000 - 2000MHz ----- | | | | | | | | | | | |
| 1 | 1310.861 | 91 pk | -45.73 | 20.5 | 65.77 | 54 | - | - | - | - | - |
| | | Height:150 Horz | | Margin [dB] | | 11.77 | - | - | - | - | - |
| 2 | 1747.815 | 62.45 pk | -45.07 | 20.8 | 38.18 | 54 | - | - | - | - | - |
| | | Height:101 Horz | | Margin [dB] | | -15.82 | - | - | - | - | - |
| Horizontal 2000 - 4000MHz ----- | | | | | | | | | | | |
| 3 | 2434.457 | 54.68 pk | -43.67 | 21.2 | 32.21 | 54 | - | - | - | - | - |
| | | Height:200 Horz | | Margin [dB] | | -21.79 | - | - | - | - | - |
| 4 | 3540.574 | 54.33 pk | -42.94 | 22.3 | 33.69 | 54 | - | - | - | - | - |
| | | Height:200 Horz | | Margin [dB] | | -20.31 | - | - | - | - | - |
| Horizontal 4000 - 5000MHz ----- | | | | | | | | | | | |
| 5 | 4951.747 | 54.5 pk | -54.42 | 27.3 | 27.38 | 54 | - | - | - | - | - |
| | | Height:200 Horz | | Margin [dB] | | -26.62 | - | - | - | - | - |
| Vertical 1000 - 2000MHz ----- | | | | | | | | | | | |
| 6 | 1310.861 | 88.35 pk | -45.73 | 20.5 | 63.12 | 54 | - | - | - | - | - |
| | | Height:149 Vert | | Margin [dB] | | 9.12 | - | - | - | - | - |
| 7 | 1749.064 | 62.47 pk | -45.01 | 20.8 | 38.26 | 54 | - | - | - | - | - |
| | | Height:100 Vert | | Margin [dB] | | -15.74 | - | - | - | - | - |
| Vertical 2000 - 4000MHz ----- | | | | | | | | | | | |
| 8 | 2594.257 | 54.09 pk | -43.36 | 21.5 | 32.23 | 54 | - | - | - | - | - |
| | | Height:100 Vert | | Margin [dB] | | -21.77 | - | - | - | - | - |
| Vertical 4000 - 5000MHz ----- | | | | | | | | | | | |
| 9 | 4311.148 | 54.55 pk | -53.32 | 27.8 | 29.03 | 54 | - | - | - | - | - |
| | | Height:149 Vert | | Margin [dB] | | -24.97 | - | - | - | - | - |
| 10 | 4831.115 | 54.26 pk | -54.57 | 27.4 | 27.09 | 54 | - | - | - | - | - |
| | | Height:100 Vert | | Margin [dB] | | -26.91 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart C 15.209

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: 1001149948 File Number: MC15896 Page 57 of 67
 Model Number: RR-VCRX
 Client Name: LUTRON ELECTRONICS INC
 FCC ID: JPZ0064 IC Number: 2851A-JPZ0064

Lutron Electronics Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested: RM Packet 437MHz

| 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 | | | | | | | | | | |
| 1310.89 | 91.43 PK | -45.73 | 20.5 | 46.5* | - | 60.9 | - | - | - | - |
| Azimuth: 197 | | Height:168 | | Horz | | Margin [dB]: | | -14.4 | - | - |
| 1746.8775 | 63.67 PK | -45.12 | 20.8 | 39.35 | 54 | - | - | - | - | - |
| Azimuth: 11 | | Height:166 | | Horz | | Margin [dB]: | | -14.65 | - | - |
| Vertical 1000 - 2000MHz | | | | | | | | | | |
| 1311.0925 | 87.11 PK | -45.74 | 20.5 | 42.17* | - | 60.9 | - | - | - | - |
| Azimuth: 214 | | Height:118 | | Vert | | Margin [dB]: | | -18.73 | - | - |
| 1746.8825 | 63.18 PK | -45.12 | 20.8 | 38.86 | 54 | - | - | - | - | - |
| Azimuth: 291 | | Height:149 | | Vert | | Margin [dB]: | | -15.14 | - | - |

***Duty Cycle correction factor of 19.7 applied (see section 4.4 of report for calculation)**

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231

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

4.6 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. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter for measurements below 1GHz and 3-meter for above 1GHz.. 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 C, 15.231 | |
| UL LPG | 80-EM-S0029 | |
| | Frequency range | Measurement Point |
| Fully configured sample scanned over the following frequency range | 30MHz – 1GHz | (10 meter measurement distance) |
| Fully configured sample scanned over the following frequency range | 1GHz – 2GHz | (3 meter measurement distance) |
| Limits - Class B | | |
| Frequency (MHz) | Limit (dBµV/m) | |
| | Quasi-Peak | Average |
| 30-230 | 30 | NA |
| 230-1000 | 37 | NA |
| 1000 - 2000 | NA | 54 |
| Supplementary information: Below 1GHz CISPR 22 Limits applied. | | |

Table 22 Radiated Emissions EUT Configuration Settings

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

Table 23 Radiated Emissions Test Equipment

| Test Equipment Used | | | |
|---|-----------------|-------------|------------|
| Description | Manufacturer | Model | Identifier |
| 30-1000MHz | | | |
| EMI Receiver | Rohde & Schwarz | ESIB40 | 34968 |
| Bicon Antenna | Schaffner | VBA6106A | 54 |
| 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 | 83III | ME5B-305 |
| Above 1GHz (Band Optimized System) | | | |
| Spectrum Analyzer | Agilent | E7405A | 19695 |
| Horn Antenna (1-2 GHz) | ETS | 3161-01 | 51442 |
| Signal Path Controller | HP | 11713A | 50250 |
| Gain Controller | HP | 11713A | 50251 |
| 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 |
| Multimeter | Fluke | 83III | ME5B-305 |

Figure 18 Test setup for Radiated Emissions

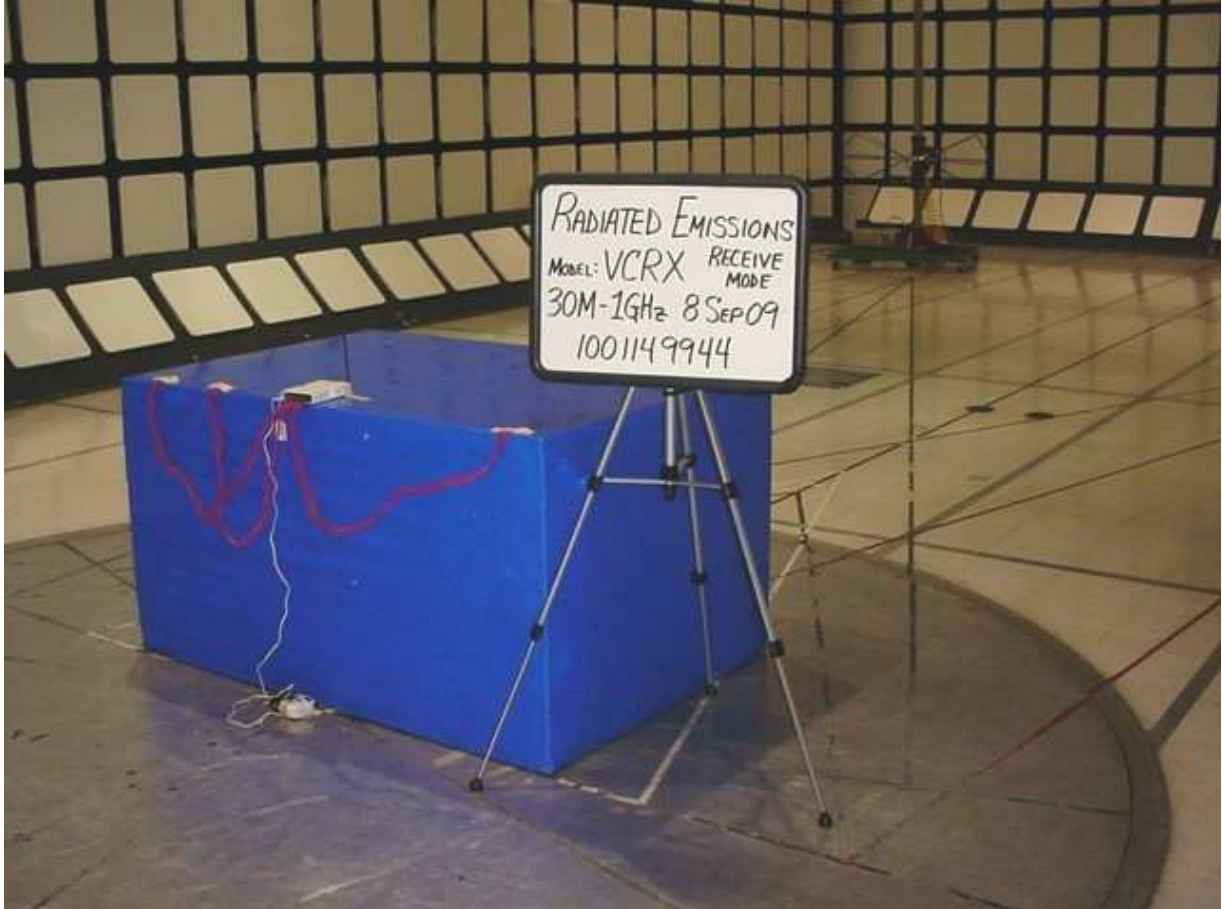




Figure 19 Radiated Emissions Graph

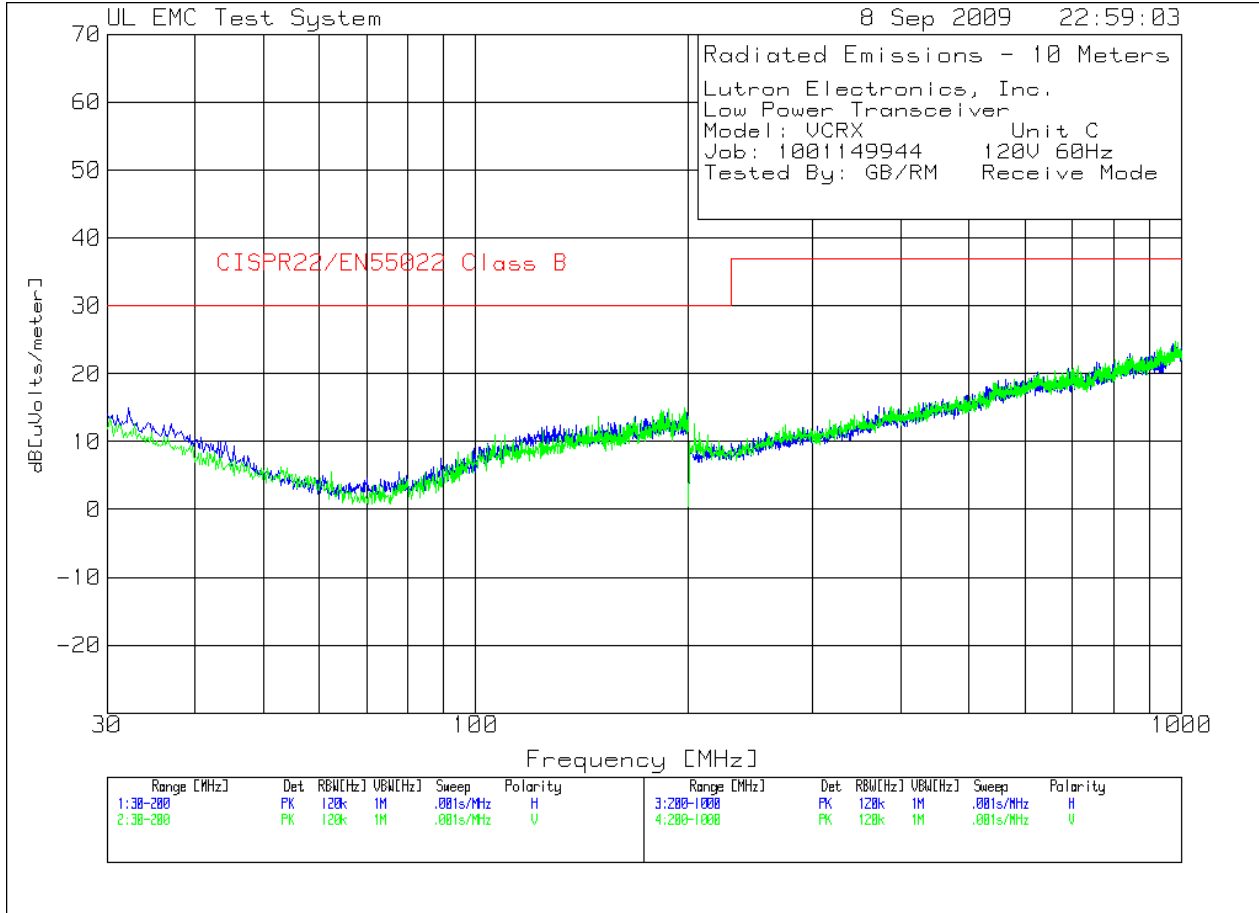


Table 24 Radiated Emissions Data Points

Lutron Electronics, Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested By: GB/RM Receive 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 | 32.2122 | 34.02 pk | -36 | 16.9 | 14.92 | 30 | - | - | - | - | - |
| | Azimuth:279 | Height:400 | Horz | Margin [dB] | | -15.08 | - | - | - | - | - |
| 2 | 129.039 | 33.83 pk | -35.5 | 13.9 | 12.23 | 30 | - | - | - | - | - |
| | Azimuth:158 | Height:400 | Horz | Margin [dB] | | -17.77 | - | - | - | - | - |
| Vertical 30 - 200MHz ----- | | | | | | | | | | | |
| 3 | 187.0671 | 33.74 pk | -35.2 | 16.2 | 14.74 | 30 | - | - | - | - | - |
| | Azimuth:358 | Height:100 | Vert | Margin [dB] | | -15.26 | - | - | - | - | - |
| Horizontal 200 - 1000MHz ----- | | | | | | | | | | | |
| 4 | 371.6858 | 33.07 pk | -33.1 | 15.1 | 15.07 | 37 | - | - | - | - | - |
| | Azimuth:44 | Height:200 | Horz | Margin [dB] | | -21.93 | - | - | - | - | - |
| 5 | 843.1216 | 31.92 pk | -31.7 | 22.7 | 22.92 | 37 | - | - | - | - | - |
| | Azimuth:179 | Height:400 | Horz | Margin [dB] | | -14.08 | - | - | - | - | - |
| Vertical 200 - 1000MHz ----- | | | | | | | | | | | |
| 6 | 978.3892 | 31.65 pk | -31.1 | 24.2 | 24.75 | 37 | - | - | - | - | - |
| | Azimuth:135 | Height:200 | Vert | Margin [dB] | | -12.25 | - | - | - | - | - |

LIMIT 1: CISPR22/EN55022 Class B

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Figure 20 Radiated Emissions Graph

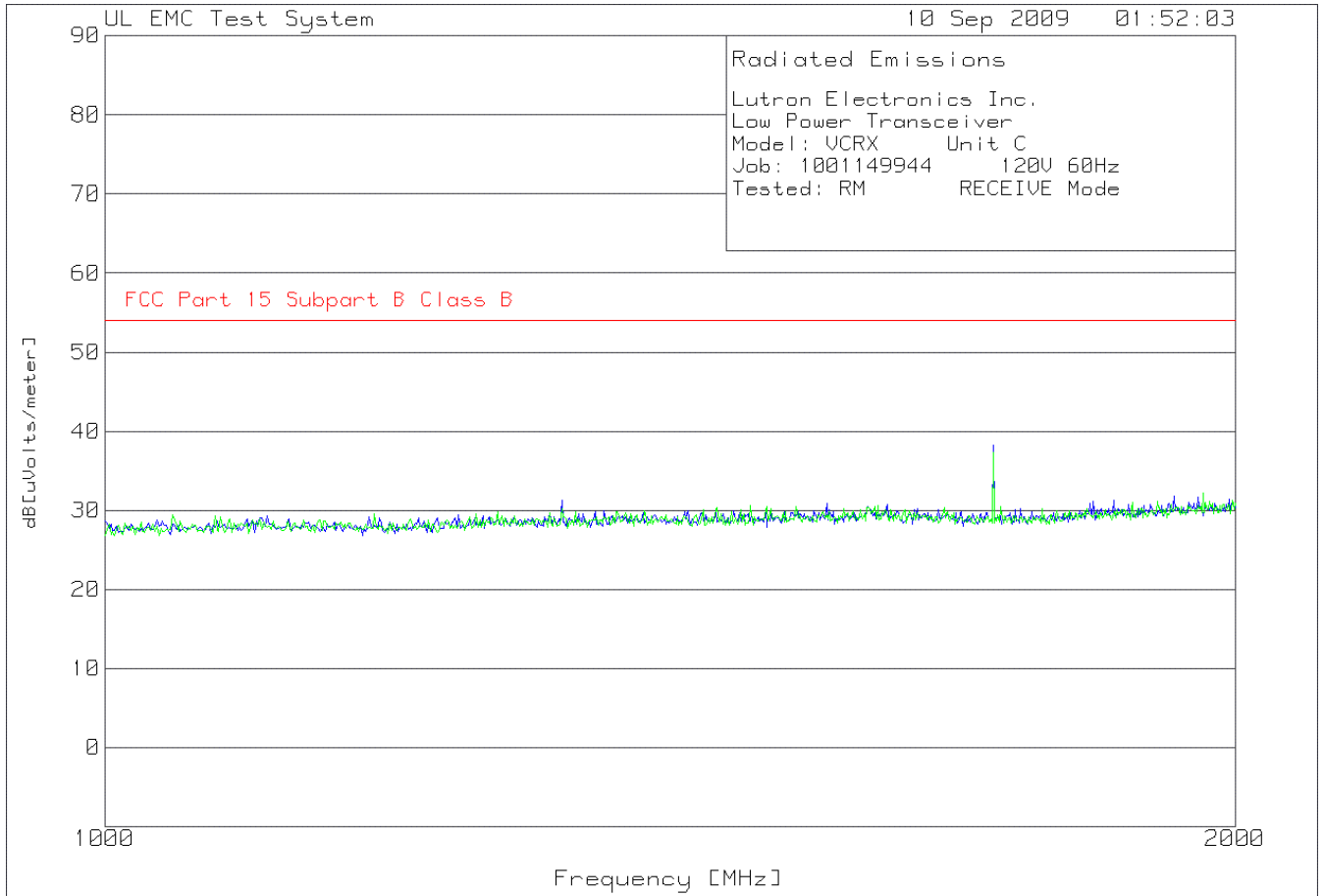


Table 25 Radiated Emissions Data Points

Lutron Electronics Inc.
 Low Power Transceiver
 Model: RR-VCRX Unit C
 Job: 1001149944 120V 60Hz
 Tested: RM RECEIVE Mode

| 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 | 1104.869 | 55.1 pk | -45.78 | 20 | 29.32 | 54 | - | - | - | - | - |
| | | Height:150 Horz | | Margin [dB] | | -24.68 | - | - | - | - | - |
| 2 | 1323.346 | 56.45 pk | -45.61 | 20.5 | 31.34 | 54 | - | - | - | - | - |
| | | Height:100 Horz | | Margin [dB] | | -22.66 | - | - | - | - | - |
| 3 | 1556.804 | 55.24 pk | -45.4 | 21 | 30.84 | 54 | - | - | - | - | - |
| | | Height:200 Horz | | Margin [dB] | | -23.16 | - | - | - | - | - |
| 4 | 1724.095 | 62.58 pk | -45.12 | 20.8 | 38.26 | 54 | - | - | - | - | - |
| | | Height:100 Horz | | Margin [dB] | | -15.74 | - | - | - | - | - |
| Vertical 1000 - 2000MHz ----- | | | | | | | | | | | |
| 5 | 1724.095 | 61.61 pk | -45.12 | 20.8 | 37.29 | 54 | - | - | - | - | - |
| | | Height:100 Vert | | Margin [dB] | | -16.71 | - | - | - | - | - |
| 6 | 1961.298 | 54.97 pk | -44.74 | 22 | 32.23 | 54 | - | - | - | - | - |
| | | Height:149 Vert | | Margin [dB] | | -21.77 | - | - | - | - | - |

LIMIT 1: FCC Part 15 Subpart B Class B

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

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.

Job Number: 1001149948 File Number: MC15896 Page 67 of 67
Model Number: RR-VCRX
Client Name: LUTRON ELECTRONICS INC
FCC ID: JPZ0064 IC Number: 2851A-JPZ0064



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