

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

CERTIFICATION TEST REPORT

FOR

EUT

MODEL NUMBER: LRF2-SSW

FCC ID: JPZ0090 IC: 2851A-JPZ0090

REPORT NUMBER: 1001550724

ISSUE DATE: 2012-10-02

Prepared for LUTRON ELECTRONICS CO INC 7200 SUTER RD COOPERSBURG , PA 18036 USA

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

 \mathbb{N}^{5}

NVLAP LAB CODE 100255-0

Revision History

Rev.	lssue Date	Revisions	Revised By
	2012- 10-02	Initial Issue	B. DeLisi

UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 2 of 31

TABLE OF CONTENTS

1.	ATT	ESTATION OF TEST RESULTS
2.	TES	ST METHODOLOGY
3.	FAC	CILITIES AND ACCREDITATION
4.	CAL	IBRATION AND UNCERTAINTY
4	4.1.	MEASURING INSTRUMENT CALIBRATION
4	4.2.	SAMPLE CALCULATION
4	4.3.	MEASUREMENT UNCERTAINTY
5.	EQI	JIPMENT UNDER TEST
ł	5.1.	DESCRIPTION OF EUT
ł	5.2.	DESCRIPTION OF AVAILABLE ANTENNAS
ł	5.3.	SOFTWARE AND FIRMWARE
ł	5.4.	WORST-CASE CONFIGURATION AND MODE 6
ł	5.5.	MODIFICATIONS
ł	5.6.	DESCRIPTION OF TEST SETUP 6
6.	AN	FENNA PORT TEST RESULTS
e	5.1.	20 dB AND 99% BW 8
e	6.2.	DUTY CYCLE
e	6.3.	TRANSMISSION TIME
7.	RA	DIATED EMISSION TEST RESULTS17
-	7.1.	TX RADIATED SPURIOUS EMISSION
8.	SET	UP PHOTOS

Page 3 of 31

1. ATTESTATION OF TEST RESULTS

DATE TESTED:	2012-09-24 through 2012-09-25
SERIAL NUMBER:	Non-Serialized production unit
MODEL:	LRF2-SSW
EUT DESCRIPTION:	Radio Shadow Sensor
COMPANY NAME:	Lutron Electronics Inc. 7200 Suter Rd Coopersburg , PA 18036 USA

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

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation, as described by the referenced documents. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL By:

Tested By:

Joseph Danisi WiSE Project Lead UL LLC Bob DeLisi WiSE Principle Engineer UL LLC

Page 4 of 31

2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a light sensor intended for lighting applications.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna.

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was as follows: FCC test code rev. 0794346 FCC "As-Is" code rev. 0794347

5.4. WORST-CASE CONFIGURATION AND MODE

Testing was conducted at the low and high channels and tested in the worst case orientation determined from preliminary testing. The X-axis was considered the worst case orientation.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Not Applicable.

I/O CABLES

Not Applicable.

TEST SETUP

The EUT is a stand-alone device.

Page 6 of 31

SETUP DIAGRAM FOR TESTS



Page 7 of 31

6. ANTENNA PORT TEST RESULTS

6.1. 20 dB AND 99% BW

<u>LIMITS</u>

FCC §15.231 (c)

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

IC A1.1.3

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

TEST PROCEDURE

ANSI C63.4

The transmitter output is connected to the spectrum analyzer.

20dB Bandwidth: The RBW is set to 10 KHz. The VBW is set to 100 KHz. The sweep time is coupled. Bandwidth is determined at the points 20 dB down from the modulated carrier.

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

Page 8 of 31

RESULTS

No non-compliance noted:

20dB Bandwidth

Frequency	20dB Bandwidth	Limit	Margin		
(MHz)	(kHz)	(kHz)	(kHz)		
434.03	153	1085.075	-932.075		

99% Bandwidth

Frequency	99% Bandwidth	Limit	Margin		
(MHz)	(kHz)	(kHz)	(kHz)		
434.03	138.1	1085.075	-946.975		

UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 9 of 31

20dB BANDWIDTH



Page 10 of 31

99% BANDWIDTH



UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 11 of 31

6.2. DUTY CYCLE

<u>LIMITS</u>

FCC §15.35 (c)

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

TEST PROCEDURE

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

CALCULATION

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

<u>RESULTS</u>

No non-compliance noted:

One	Long Pulse	# of	Short	# of	Duty	20*Log
Period	Period Width		Width	Short	Cycle	Duty Cycle
						<i></i>
(ms)	(ms)	Pulses	(ms)	Pulses		(dB)

ONE PERIOD



Page 13 of 31

LONG PULSE WIDTH



Page 14 of 31

SHORT PULSE WIDTH



UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 15 of 31

6.3. TRANSMISSION TIME

<u>LIMITS</u>

FCC §15.231 (a) (2)

IC A1.1.1 (b)

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

TEST PROCEDURE

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

RESULTS

No non-compliance noted:



Page 16 of 31

7. RADIATED EMISSION TEST RESULTS

7.1. TX RADIATED SPURIOUS EMISSION

<u>LIMITS</u>

FCC §15.231 (b) IC A1.1.2 In addition to the pr

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

Fundamental Frequency (MHz)	Field Strength of Fundamental Frequency (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)			
40.66 - 40.70	2,250	225			
70 - 130	1,250	125			
130 - 174	1,250 to 3,7501	125 to 3751			
174 - 260	3,750	375			
260 - 470	3,750 to 12,5001	375 to 1,2501			
Above 470	12,500	1,250			

1 Linear interpolation

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

MHz	MHz	MHz	GHz		
$\begin{array}{c} 0.090 - 0.110 \\ {}^{1}0.495 - 0.505 \\ 2.1735 - 2.1905 \\ 4.125 - 4.128 \\ 4.17725 - 4.17775 \\ 4.20725 - 4.20775 \\ 6.215 - 6.248 \end{array}$	16.42 - 16.423 16.69475 - 16.69525 16.80425 - 16.80475 25.5 - 25.67 37.5 - 38.25 73 - 74.6	399.9 - 410 608 - 614 960 - 1240 1300 - 1427 1435 - 1626.5 1645.5 - 1646.5	4.5 - 5.15 5.35 - 5.46 7.25 - 7.75 8.025 - 8.5 9.0 - 9.2 9.3 - 9.5		
$\begin{array}{c} 6.215 - 6.218\\ 6.26775 - 6.26825\\ 6.31175 - 6.31225\\ 8.291 - 8.294\\ 8.362 - 8.366\\ 8.37625 - 8.38675\\ 8.41425 - 8.41475\\ 12.29 - 12.293\\ 12.51975 - 12.52025\\ 12.57675 - 12.57725\\ 13.36 - 13.41\end{array}$	14.8 - 75.2 108 - 121.94 123 - 138 149.9 - 150.05 156.52475 - 156.52525 156.7 - 156.9 162.0125 - 167.17 167.72 - 173.2 240 - 285 322 - 335.4	1718.8 - 1722.2 2200 - 2300 2310 - 2390 2483.5 - 2500 2655 - 2900 3260 - 3267 3332 - 3339 3345.8 - 3358 3600 - 4400	$10.6 - 12.7$ $13.25 - 13.4$ $14.47 - 14.5$ $15.35 - 16.2$ $17.7 - 21.4$ $22.01 - 23.12$ $23.6 - 24.0$ $31.2 - 31.8$ $36.43 - 36.5$ $\binom{2}{}$		

Page 17 of 31

UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC. 1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz. 2 Above 38.6

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

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency	Field Strength	Measurement Distance	
(MHz)	(microvolts/meter)	(meters)	
30 88 88 216 216 960 Above 960	100 ** 150 ** 200 ** 500	3 3 3	

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 72 MHz, 76 88 MHz, 174 216 MHz or 470 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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

Page 18 of 31

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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

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

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

RESULTS

No non-compliance noted:

UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 19 of 31

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



Page 20 of 31 UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Manufactu	rordutron													
Ivianu ractu		<u> </u>												
Device:Rac	dio Shadow	Sensor												
Model: LRF	-2-SSW													
Job#:10015	550724													
Tested by:	BD Lo	w Channe												
							Corrected	FCC Part 15		FCC Part				
							Value	Subpart C		15				
Test	Meter		AF-44067	GL-3M	dB(uVolts		dB(uVolts	15.209/		Subpart C		Azimuth	Height	
Frequency	Reading	Detector	[dB]	[dB]	/meter)	DCF (dB)	/meter)	15.231	Margin	Peak	Margin	[Degs]	[cm]	Polarity
Horizontal	200 - 1000	ИНz												
431.0195	66.82	РК	16.3	2.3	85.42	-20	65.42	80.9	-15.48	100.9	-15.48	227	389	Horz
861.9158	38.12	РК	22.4	3.4	63.92	-20	43.92	60.9	-16.98	80.9	-16.98	25	228	Horz
978.3892	13.93	РК	24.7	3.7	42.33	-	-	54	-11.67	-	-	2	200	Horz
Vertical 20	0 - 1000MH	Z												
431.0183	73.32	РК	16.3	2.3	91.92	-20	71.92	80.9	-8.98	100.9	-8.98	142	143	Vert
861.9126	43.64	РК	22.4	3.4	69.44	-20	49.44	60.9	-11.46	80.9	-11.46	291	143	Vert
981.5908	14.26	РК	24.7	3.7	42.66	-	-	54	-11.34	-	-	298	200	Vert
PK - Peak c	detector (N	laximized)												
QP - Quasi	-Peak dete	ctor												
LnAv - Line	ear Average	detector												
LgAv - Log	Average de	tector												
Av - Avera	ge detecto	r												
CAV - CISP	R Average	detector												
RMS - RMS	detection													
CRMS - CIS	PR RMS de	tection												

Page 21 of 31

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz – Low Channel



UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 22 of 31

REPORT NO: 1001550724 FCC ID: JPZ0090

Device fuely show show show show show show show show	Manufactu	rer:Lutron													
Model-LICP-SSW Iow Come	Device:Radio Shadow Sensor														
Johe Book Johe Company Johe Company <td>Model: LRF</td> <td>2-SSW</td> <td></td>	Model: LRF	2-SSW													
	Job#:10015	50724													
Number	Tested by:	BD Lo	w Channe	1											
Test Meter AF-5144 Pactor BOMS BOMS BUVOIS BOMS BUVOIS Corrected Value CCP at 15.209 PC Pat Margin Core at C Peak Margin Margin CPC Pat C Peak Margin Margin CPC Pat C Peak Margin Margin CPC Pat C Peak Margin Margin CPak Margin Margin Corrected Margin Margin Margin Corrected Margin Corrected Margin Corrected Margin Corrected Margin Corrected Margin Corrected Margin Corrected Margin Corrected Margin Margin Corrected Margin Margin Corrected Margin Margin Corrected Margin Margin															
Horizontal 2000-2000MHz Control Control <thcontrol< th=""> Control <t< td=""><td>Test Frequency</td><td>Meter Reading</td><td>Detector</td><td>AF-51442 [dB]</td><td>BOMS Factor [dB]</td><td>dB(uVolts/ meter)</td><td>DCF (dB)</td><td>Corrected Value dB(uVolts/ meter)</td><td>FCC Part 15 Subpart C 15.209</td><td>Margin</td><td>FCC Part 15 Subpart C Peak</td><td>Margin</td><td>Azimuth [Degs]</td><td>Height [cm]</td><td>Polarity</td></t<></thcontrol<>	Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB(uVolts/ meter)	DCF (dB)	Corrected Value dB(uVolts/ meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1292.8641 79.99 PK 20.5 -44.68 55.81 -20 35.81 54 -18.19 74 -18.19 331 220 301 Prz 1724.7 7.44.5 PK 20.8 -44.28 50.97 -20 30.97 54 -14.25 74 -14.25 327 3391 1280 Horz 1255.107 82.34 PK 21.4 -43.99 59.75 -20 39.75 54 -14.25 74 -13.25 327 3398 Horz 2366.694 72.65 PK 21.3 -42.26 54.76 -20 39.46 54 -14.25 74 -13.24 224 324 324 324 324 324 324 324 324 334 162 379 Horz 3879 3138 81.24 PK 22.6 -42.53 61.31 -20 43.35 54 -10.35 74 -10.35 287 386 Horz 4309 322 87.75 PK 27.7 -51.8 63.65 -20 43.65 54 -13.56 74 -13.52 287 386 Horz 1253.010 84	Horizontal	1000 - 2000	MHz												
17.2.7 7.4.4.5 PK 20.8 -44.28 50.97 -20 30.97 54 -23.03 74 -23.03 331 280 Horz Horizontal 2000 - 4000MHz Image: Construct on the second on the seco	1292.8641	. 79.99	РК	20.5	-44.68	55.81	-20	35.81	54	-18.19	74	-18.19	136	363	Horz
Horizontal 2000 - 4000 MHz Line Line <thline< th=""> Line <thline< th=""> <thli< td=""><td>1724.7</td><td>74.45</td><td>РК</td><td>20.8</td><td>-44.28</td><td>50.97</td><td>-20</td><td>30.97</td><td>54</td><td>-23.03</td><td>74</td><td>-23.03</td><td>331</td><td>280</td><td>Horz</td></thli<></thline<></thline<>	1724.7	74.45	РК	20.8	-44.28	50.97	-20	30.97	54	-23.03	74	-23.03	331	280	Horz
Horizontal 2000 - 4000MHz L Image: Control of the															
2155.107 82.34 PK 21.4 -43.29 59.75 -20 39.75 54 -14.25 74 -14.25 327 398 Horz 3016.694 72.65 PK 21.3 -43.29 50.66 -20 30.66 54 -13.24 74 -19.24 324 357 Horz 347.976 80.34 PK 22.1 -42.83 56.46 -20 39.46 54 -12.69 74 -19.24 324 357 Horz 347.976 80.34 PK 22.1 -42.83 61.31 -20 41.31 54 -14.54 74 -14.54 288 337 Horz 347.976 80.34 PK 22.6 -42.53 61.31 -20 41.36 54 -12.69 74 -10.35 74 -10.35 74 -10.35 74 -10.35 74 -10.35 74 -10.35 74 -10.35 74 -10.35 74 -13.64 166 372 Horz 474.11 85.9 PK 27.7 -51.8 66.63 -20 40.18 54 -13.62 74 -13.63 26 <td>Horizontal</td> <td>2000 - 4000</td> <td>MHz</td> <td></td>	Horizontal	2000 - 4000	MHz												
2586.083 72.65 PK 21.3 -43.29 50.66 -20 30.66 54 -23.34 74 -23.34 162 379 Horz 3016.6944 75.89 PK 21.5 -42.63 54.76 -20 33.76 54 -19.24 74 -19.24 228 337 Horz 3879.3138 81.24 PK 22.6 -42.53 61.31 -20 31.46 54 -14.54 74 -14.54 28 337 Horz 3879.3138 81.24 PK 22.6 -42.53 61.31 -20 41.31 54 -14.54 74 -14.54 288 337 Horz 3879.3138 81.24 PK 22.6 -42.53 61.36 -20 40.36 54 -13.64 74 -10.35 287 386 Horz 474.11 85.69 PK 27.7 -51.8 63.65 -20 40.18 54 -13.86 74 -13.64 126 127 127 -21.52 -20 40.18 54 -13.82 74 -13.55 36 221 Vert 1233.0166 84.36 PK 20.5	2155.107	82.34	РК	21.4	-43.99	59.75	-20	39.75	54	-14.25	74	-14.25	327	398	Horz
3016.6944 75.89 PK 21.5 -42.63 54.76 -20 34.76 54 -14.54 74 -14.54 224 337 Horz 3479.318 81.24 PK 22.1 -42.98 59.46 -20 39.46 54 -14.54 74 -14.54 228 337 Horz 3879.318 81.24 PK 22.6 -42.58 61.31 -20 41.31 54 -12.69 74 -14.54 228 337 Horz 3409.9232 87.75 PK 27.7 -51.8 63.65 -20 43.65 54 -10.35 74 -10.35 287 386 Horz 4309.9232 87.75 PK 27.7 -51.8 63.65 -20 40.36 54 -10.35 74 -13.64 166 372 Horz Vertical 1000 - 2000MHz - <td< td=""><td>2586.083</td><td>72.65</td><td>РК</td><td>21.3</td><td>-43.29</td><td>50.66</td><td>-20</td><td>30.66</td><td>54</td><td>-23.34</td><td>74</td><td>-23.34</td><td>162</td><td>379</td><td>Horz</td></td<>	2586.083	72.65	РК	21.3	-43.29	50.66	-20	30.66	54	-23.34	74	-23.34	162	379	Horz
347976 80.34 PK 22.1 -42.98 59.46 -20 39.46 54 -14.54 74 -14.54 298 337 Horz 3879.3138 81.24 PK 22.6 -42.53 61.31 -20 41.31 54 -12.69 74 -12.69 174 340 Horz 4309.9232 87.75 PK 27.7 -51.8 63.65 -20 43.65 54 -10.35 74 -13.64 66 372 Horz 4741.1 85.69 PK 27.2 -52.53 60.36 -20 40.36 54 -13.64 74 -13.82 74	3016.6944	75.89	РК	21.5	-42.63	54.76	-20	34.76	54	-19.24	74	-19.24	324	357	Horz
3879.3138 81.24 PK 22.6 -42.53 61.31 -20 41.31 54 -12.69 74 -12.69 174 340 Horz 4309.9232 87.75 PK 27.7 -51.8 63.65 -20 43.65 54 -10.35 74 -10.35 287 386 Horz 4741.1 85.69 PK 27.2 -52.53 60.36 -20 40.36 54 -13.64 74 -13.64 166 372 Horz Vertical 1000-2000MHz	3447.976	80.34	РК	22.1	-42.98	59.46	-20	39.46	54	-14.54	74	-14.54	298	337	Horz
Horizontal 4000-5000/H/z Kork K	3879.3138	8 81.24	РК	22.6	-42.53	61.31	-20	41.31	54	-12.69	74	-12.69	174	340	Horz
Horizontal 4000- 5000 MHz image image <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>															
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Horizontal	4000 - 5000	MHz												
4741.1 85.69 PK 27.2 -52.53 60.36 -20 40.36 54 -13.64 74 -13.64 166 372 Horz 1293.0166 84.36 PK 20.5 -44.68 60.18 -20 40.18 54 -13.82 74 -13.82 12 214 Vert 1293.0166 84.36 PK 20.5 -44.68 60.18 -20 40.45 54 -13.82 74 -13.82 12 214 Vert 1293.0166 84.36 PK 20.8 -44.29 60.45 -20 40.45 54 -13.85 74 -13.82 12 214 Vert 1723.8244 83.94 PK 20.8 -44.29 66.23 -20 40.45 54 -13.55 74 -13.82 74 14.83 74 18.13 0 299 Vert 2155.017 88.82 PK 21.4 -43.99 66.23 -20 35.87 54 -14.18 74 -14.813 0 299 Vert 3447.976 78.69 PK 22.1 -42.98 57.81 -20 35.87 54 -16.19	4309.9232	87.75	РК	27.7	-51.8	63.65	-20	43.65	54	-10.35	74	-10.35	287	386	Horz
Vertical 1000 - 2000MHz Image: Marked M	4741.1	. 85.69	РК	27.2	-52.53	60.36	-20	40.36	54	-13.64	74	-13.64	166	372	Horz
Vertical 1000 - 2000MHz Image: Marrier															
1293.0166 84.36 PK 20.5 -44.68 60.18 -20 40.18 54 -13.82 74 -13.82 12 214 Vert 1723.8244 83.94 PK 20.8 -44.29 60.45 -20 40.45 54 -13.55 74 -13.85 36 223 Vert Vertical 2000 - 4000MHz	Vertical 10	00 - 2000MI	Hz												
1723.8244 83.94 PK 20.8 -44.29 60.45 -20 40.45 54 -13.55 74 -13.55 36 223 Vert Vertical 2000 - 4000MHz <td>1293.0166</td> <td>84.36</td> <td>РК</td> <td>20.5</td> <td>-44.68</td> <td>60.18</td> <td>-20</td> <td>40.18</td> <td>54</td> <td>-13.82</td> <td>74</td> <td>-13.82</td> <td>12</td> <td>214</td> <td>Vert</td>	1293.0166	84.36	РК	20.5	-44.68	60.18	-20	40.18	54	-13.82	74	-13.82	12	214	Vert
Vertical 2000 - 4000MHz Chan and an analysis Constraints C	1723.8244	83.94	РК	20.8	-44.29	60.45	-20	40.45	54	-13.55	74	-13.55	36	223	Vert
Vertical 2000- 4000 MHz Image: Marrie Marri Marrie Marrie Marrie Marrie Marrie Marrie Ma															
2155.107 88.82 PK 21.4 -43.99 66.23 -20 46.23 54 -7.77 74 -7.77 79 303 Vert 2586.083 74.51 PK 21.3 -43.29 52.52 -20 32.52 54 -21.48 74 -21.48 243 374 Vert 3016.6944 77 PK 21.5 -42.63 55.87 -20 33.87 54 -18.13 74 -18.13 0 299 Vert 347.976 78.69 PK 22.1 -42.98 57.81 -20 37.81 54 -16.19 74 -16.19 75 359 Vert 3879.3138 79.93 PK 22.6 -42.53 60 -20 40 54 -14 74 -14 247 349 Vert 3879.3138 79.93 PK 22.6 -42.53 60 -20 40 54 -9.25 74 -9.25 241 386 Vert 4309.9232 88.85 PK 27.7 -51.8 <td< td=""><td>Vertical 20</td><td>00 - 4000MI</td><td>Hz</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Vertical 20	00 - 4000MI	Hz												
2586.083 74.51 PK 21.3 -43.29 52.52 -20 32.52 54 -21.48 74 -21.48 243 374 Vert 3016.6944 77 PK 21.5 -42.63 55.87 -20 35.87 54 -18.13 74 -18.13 0 299 Vert 3447.976 78.69 PK 22.1 -42.98 57.81 -20 37.81 54 -16.19 74 -16.19 75 359 Vert 3879.3138 79.93 PK 22.6 -42.53 60 -20 40 54 -14 74 -14 247 394 Vert Vertical 4000 - 5000MHz -<	2155.107	88.82	РК	21.4	-43.99	66.23	-20	46.23	54	-7.77	74	-7.77	79	303	Vert
3016.6944 77 PK 21.5 -42.63 55.87 -20 35.87 54 -18.13 74 -18.13 0 299 Vert 3447.976 78.69 PK 22.1 -42.98 57.81 -20 37.81 54 -16.19 74 -16.19 75 359 Vert 3879.3138 79.93 PK 22.6 -42.53 60 -20 40 54 -14 74 -14 247 394 Vert Vertical 4000 - 5000MHz Image: Company of the state of the	2586.083	74.51	РК	21.3	-43.29	52.52	-20	32.52	54	-21.48	74	-21.48	243	374	Vert
3447.976 78.69 PK 22.1 -42.98 57.81 -20 37.81 54 -16.19 74 -16.19 75 359 Vert 3879.3138 79.93 PK 22.6 -42.53 60 -20 40 54 -14 74 -14 247 394 Vert 4309.9232 88.85 PK 27.7 -51.8 64.75 -20 44.75 54 -9.25 74 -9.25 241 386 Vert 4741.1 89.16 PK 27.2 -52.53 63.83 -20 43.83 54 -10.17 74 -10.17 125 360 Vert 4741.1 89.16 PK 27.2 -52.53 63.83 -20 43.83 54 -10.17 74 -10.17 125 360 Vert PK - Peak detector (Maximized) Image: Additioned in the image: Additioned in	3016.6944	77	РК	21.5	-42.63	55.87	-20	35.87	54	-18.13	74	-18.13	0	299	Vert
3879.3138 79.93 PK 22.6 -42.53 60 -20 40 54 -14 74 -14 247 394 Vert Vertical 4000 - 5000MHz Image: Constraint of the second	3447.976	78.69	РК	22.1	-42.98	57.81	-20	37.81	54	-16.19	74	-16.19	75	359	Vert
Vertical $4000 - 5000$ MHz Image: Marked	3879.3138	79.93	РК	22.6	-42.53	60	-20	40	54	-14	74	-14	247	394	Vert
Vertical 4000 - 5000MHz Image: mark of the															
4309.9232 88.85 PK 27.7 -51.8 64.75 -20 44.75 54 -9.25 74 -9.25 241 386 Vert 4741.1 89.16 PK 27.2 -52.53 63.83 -20 43.83 54 -10.17 74 -10.17 125 360 Vert A	Vertical 40	00 - 5000MI	Hz												
4741.1 89.16 PK 27.2 -52.53 63.83 -20 43.83 54 -10.17 74 -10.17 125 360 Vert A	4309.9232	88.85	РК	27.7	-51.8	64.75	-20	44.75	54	-9.25	74	-9.25	241	386	Vert
Image: Sector (Maximized) Image:	4741.1	. 89.16	РК	27.2	-52.53	63.83	-20	43.83	54	-10.17	74	-10.17	125	360	Vert
PK - Peak detector (Maximized) QP - Quasi-Peak detector LnAv - Linear Average detector LqAv - Log Average detector Av - Average detector Av - Average detector CAV - CISPR Average detector RMS - RMS detection															
PK - Peak detector (Maximized) QP - Quasi-Peak detector LnAv - Linear Average detector LnAv - Linear Average detector CAV - Log Average detector Av - Average detector CAV - CISPR Average detector RMS - RMS detection															
PK - Peak detector (Maximized) Image: Constraint of the symbol of th															
QP - Quasi-Peak detector InAv - Linear Average detector Image: Comparison of the comparison of	PK - Peak d	etector (M	aximized)												
InAv - Linear Average detector Image: Average detector Image: Average detector IgAv - Log Average detector Image: Average detector Image: Average detector CAV - CISPR Average detector Image: Average detector Image: Average detector RMS - RMS detection Image: Average detector Image: Average detector CRMS - CISPR RMS detection Image: Average detector Image: Average detector	OP - Quasi-	Peak dete	ctor												
LgAv - Log Average detector LgAv - Log Average detector CAV - CISPR Average detector RMS - RMS detection CRMS - CISPR RMS de	InAv - Line	ar Average	detector												
Av - Average detector Image: Constraint of the second of	LgAy - Log	Average de	tector												
CAV - CISPR Average detector RMS - RMS detection CRMS - CISPR RMS detection CRMS - CISPR RMS detection	Av - Avera	ge detecto	r												
RMS - RMS detection Image: Constraint of the second seco	CAV - CISP	R Average	detector												
CRMS - CISPR RMS detection	RMS - RMS	detection													
	CRMS - CISPR RMS detection														

Page 23 of 31 UL LLC. FORM NO: CCSUP4701D 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

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



UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 24 of 31

												-		
Manufactu	rer:Lutron													
Device:Rad	io Shadow	Sensor												
Model: LRF	2-SSW													
Job#:10015	50724													
Tested by:	3D Hi	gh Channe	el											
Test	Meter		AF-44067	GL-3M	dB(uVolts/		Corrected Value dB(uVolts/	FCC Part 15 Subpart C 15.209 /		FCC Part 15 Subpart C		Azimuth	Height	
Frequency	Reading	Detector	[dB]	[dB]	meter)	DCF (dB)	meter)	15.231	Margin	Peak	Margin	[Degs]	[cm]	Polarity
Horizontal	200 - 1000	ИНz												
436.948	69.49	РК	16.6	2.3	88.39	-20	68.39	80.9	-12.51	100.9	-12.51	230	145	Horz
873.9447	29.27	РК	22.5	3.4	55.17	-20	35.17	60.9	-25.73	80.9	-25.73	198	234	Horz
977.5888	14.96	РК	24.7	3.7	43.36	-	-	54	-10.64	-		18	200	Horz
Vertical 200	0 - 1000MH	z												
436.9498	74.89	РК	16.6	2.3	93.79	-20	73.79	80.9	-7.11	100.9	-7.11	325	158	Vert
873.9527	33.27	РК	22.5	3.4	59.17	-20	39.17	60.9	-21.73	80.9	-21.73	108	143	Vert
381.2906	17.73	РК	14.9	2.1	. 34.73	-	-	46	-11.27	-		179	400	Vert
PK - Peak d	etector (M	laximized)												
QP - Quasi-	Peak dete	ctor												
LnAv - Line	ar Average	detector												
LgAv - Log A	Average de	tector												
Av - Avera	ge detecto	r												
CAV - CISP	R Average	detector												
RMS - RMS	detection													
CRMS - CISE	PR RMS de	tection												

Page 25 of 31

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz - High Channel



UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.

Page 26 of 31

REPORT NO: 1001550724 FCC ID: JPZ0090

Manufactu	rer:Lutron													
Device Rad	lio Shadow	Sensor												
Model: IRE	2_SS\N/	3611301												
lob#-10015	50724													
Tostod by:	50724 DD Ц;	gh Channe	1											
Testeu by.		gir Chaime												
Test	Meter	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB(uVolts/	DCE (dB)	Corrected Value dB(uVolts/ meter)	FCC Part 15 Subpart C 15 209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth	Height	Polarity
Horizontal	1000 - 2000	MH7	[00]	[00]	metery		metery	15.205	ivia Bill	reak	THUI BITT	[0683]	[em]	rolarity
1310 9944	1000 2000	PK	20.5	-44 7	51 51	-20	31 51	54	-22 49	74	-22 49	333	336	Horz
17/8 1/57	7 80.8	DK	20.5	_// 19	57.01	_20	37.01	54	-16 58	74	-16 58	212	393	Horz
1740.1437	00.0	FN	20.0	-44.10	5 57.42	20	57.42	J4	-10.56	/4	-10.56	512	505	11012
Vertical 10	00 - 2000MI	H7												
1310,9944	82.73	PK	20.5	-44.7	58.53	-20	38.53	54	-15.47	74	-15.47	31	352	Vert
1748 1457	7 86.3	PK	20.8	-44 18	62 92	-20	42 92	54	-11.08	74	-11.08	200	162	Vert
1/40.1457	00.5	T K	20.0		02.52		-12.52	54	11.00		11.00	200	102	vere
Horizontal	2000 - 4000	MHz												
2184.8164	82.46	PK	21.5	-43.8	60.16	-20	40.16	54	-13.84	74	-13.84	325	392	Horz
2622.2383	3 75.48	PK	21.4	-43.28	53.6	-20	33.6	54	-20.4	74	-20.4	126	372	Horz
3059.1222	2 73.6	PK	21.6	-42.71	52.49	-20	32.49	54	-21.51	74	-21.51	326	305	Horz
3495.8146	5 76.16	PK	22.2	-42.52	55.84	-20	35.84	54	-18.16	74	-18.16	97	187	Horz
3933.2928	81.19	PK	22.7	-42.58	61.31	-20	41.31	54	-12.69	74	-12.69	0	374	Horz
Horizontal	2000 - 4000	MHz												
2184.8164	86.49	РК	21.5	-43.8	64.19	-20	44.19	54	-9.81	74	-9.81	278	180	Vert
2622.2383	8 75.51	РК	21.4	-43.28	53.63	-20	33.63	54	-20.37	74	-20.37	95	357	Vert
3059.1222	2 74.7	РК	21.6	-42.71	53.59	-20	33.59	54	-20.41	74	-20.41	17	362	Vert
3495.8146	5 78.71	РК	22.2	-42.52	58.39	-20	38.39	54	-15.61	74	-15.61	183	367	Vert
3933.2928	80.73	РК	22.7	-42.58	60.85	-20	40.85	54	-13.15	74	-13.15	48	322	Vert
Horizontal	4000 - 5000	MHz												
4369.7355	83.32	PK	27.6	-51.94	58.98	-20	38.98	54	-15.02	74	-15.02	355	303	Horz
4806.5902	84.23	РК	27.1	-52.62	58.71	-20	38.71	54	-15.29	74	-15.29	316	371	Horz
Horizontal	4000 - 5000	MHz												
4369.7355	86.05	РК	27.6	-51.94	61.71	-20	41.71	54	-12.29	74	-12.29	222	302	Vert
4806.5902	90.16	РК	27.1	-52.62	64.64	-20	44.64	54	-9.36	74	-9.36	75	307	Vert
PK - Peak d	etector (M	aximized)												
QP - Quasi-	Peak dete	ctor												
LnAv - Line	ar Average	detector												
LgAv - Log A	Average de	tector												
Av - Avera	ge detecto	r												
CAV - CISP	R Average	detector												
RMS - RMS	detection													
CRMS - CISI	PR RMS det	tection												

Page 27 of 31

8. SETUP PHOTOS

ANTENNA PORT



Page 28 of 31

RADIATED EMISSION FOR PORTABLE CONFIGURATION – X ORIENTATION



Page 29 of 31

RADIATED EMISSION FOR PORTABLE CONFIGURATION – Y ORIENTATION



Page 30 of 31

RADIATED EMISSION ABOVE 30 MHz



END OF REPORT

Page 31 of 31

UL LLC. 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of UL LLC.