



**FCC CFR47 PART 15 SUBPART C  
ISED CANADA RSS-210 ISSUE 9**

**CERTIFICATION TEST REPORT**

**FOR**

**SIGNAL REPEATER**

**Model: Radio RA2  
PMN: L-REPPRO  
HVIN: NHR1**

**FCC ID: JPZ0117  
IC: 2851A-JPZ0117**

**REPORT NUMBER: R11854880-E1 V4**

**ISSUE DATE: 2017-08-31**

**Prepared for  
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### Revision History

Ver.	Issue Date	Revisions	Revised By
1	2017-08-15	Initial Issue	Brian Kiewra
2	2017-08-21	Corrected RSS-GEN reference in Section 9. Removed Transmission Time Section, this would be covered by associated transmitters compliant to 15.231(a).	Brian Kiewra
3	2017-08-30	Added low channel and high channel data. Added PMN (Product Marketing Name) and HVIN (Hardware Version Identification Number).	Jeff Moser
4	2017-08-31	Editorial revisions and added Low/High Channel for OBW tests.	Jeff Moser

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Lutron Electronics Co. Inc.  
7200 Suter Road  
Coopersburg, PA, 18036-1249 USA

**EUT DESCRIPTION:** Signal Repeater

**MODEL:** Radio RA2 (PMN: L-REPPRO, HVIN: NHR1)

**SERIAL NUMBER:** 0250002B

**DATE TESTED:** 2017-07-25 to 2017-08-31

APPLICABLE STANDARDS		TEST RESULTS
STANDARD		
FCC PART 15 SUBPART C		Pass
ISED CANADA RSS-210 Issue 9		Pass
ISED CANADA RSS-GEN Issue 4		Pass

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested 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 herein. 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, or any agency of the U.S. Government.

Approved & Released  
For UL LLC By:



Jeffrey Moser  
Operations Leader  
UL – Consumer Technology Division

Prepared By:



Brian Kiewra  
Project Engineer  
UL – Consumer Technology Division

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-210 Issue 9.

## 3. FACILITIES

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA.

12 Laboratory Dr., RTP, NC 27709
<input type="checkbox"/> Chamber A
<input type="checkbox"/> Chamber C
2800 Suite B Perimeter Park Dr., Morrisville, NC 27560
<input checked="" type="checkbox"/> Chamber NORTH
<input type="checkbox"/> Chamber SOUTH

The onsite chambers are covered under Industry Canada company address code 2180C with site numbers 2180C-1 through 2180C-4, respectively.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

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

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

### 4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY	Required by standard
Occupied Channel Bandwidth	2.00%	±5 %
RF output power, conducted	1.3 dB	±1.5 dB
Power Spectral Density, conducted	2.47 dB	±3 dB
Unwanted Emissions, conducted	2.94 dB	±3 dB
All emissions, radiated	5.36 dB	±6 dB
Temperature	2.26 °C	±3 °C
Supply voltages	2.40%	±3 %
Time	3.39%	±5 %

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a signal repeater in an integrated lighting control system intended for transmitting and receiving command signals to trigger system events and to update control indicator status. The EUT operates over the 431-437 MHz band.

### 5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a helical antenna.

### 5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 0797251, 0.02, App image 0790000 Rev 250.14.

The EUT driver software installed during testing was RAIL 1.6.0.

The test utility software used during testing was 0790000 rev 250.15 +6dBm Tx power

### 5.4. WORST-CASE CONFIGURATION AND MODE

Three orientations of the EUT were investigated for the worst-case emissions at its fundamental operating frequency. The worst-case orientation was with the unit lying flat on the test table.

### 5.5. MODIFICATIONS

The power was reduced for compliance. The sample used for final testing was marked as S/N 00B010A9.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Power Supply	Lutron	T-5DC-USB-WH	NA	NA

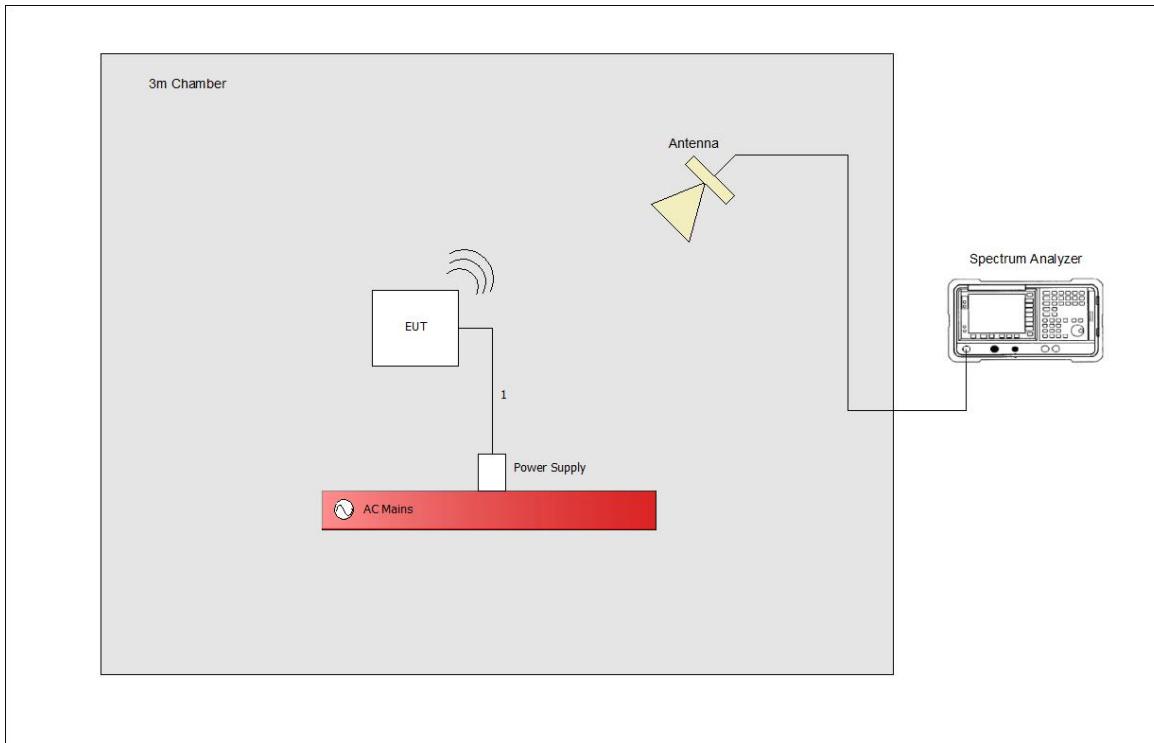
### I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	μUSB	USB	<3m	DC Power

### TEST SETUP

The EUT is setup as a standalone device.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)  
Includes Occupied Bandwidth testing.

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	<b>0.009-30MHz</b>	(Loop Ant.)			
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2016-12-28	2017-12-31
	<b>30-1000 MHz</b>				
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2017-06-15	2018-06-15
	<b>1-18 GHz</b>				
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2017-04-05	2018-04-05
	<b>Gain-Loss Chains</b>				
N-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2016-10-04	2017-10-04
N-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2017-06-11	2018-06-11
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2016-08-28, 2017-08-18	2017-08-28, 2018-08-18
	<b>Receiver &amp; Software</b>				
SA0027	Spectrum Analyzer	Agilent	N9030A	2017-03-16	2018-03-16
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	<b>Additional Equipment used</b>				
s/n 161024690	Environmental Meter	Fisher Scientific	15-077-963	2016-12-21	2018-12-21
HPF009	1GHz High-Pass Filter	Micro-Tronics	HPM17672	2017-03-20	2018-03-20
ATA174	10dB Pad	Mini-Circuits	BW-N10W5	2017-03-20	2018-03-20

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL076	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3476-240	2017-06-12	2018-06-12
s/n 160938893	Environmental Meter	Fisher Scientific	14-650-118	2016-11-02	2018-11-02
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2016-08-24, 2017-08-22	2017-08-24, 2018-08-22
PRE0101521 (75141)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2016-08-23, 2017-08-23	2017-08-23, 2018-08-23
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2017-06-12	2018-06-12
PS214	AC Power Source	Elgar	CW2501M (s/n 1523A02396)	NA	NA
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	<b>Miscellaneous (if needed)</b>				
CDECABLE001	ANSI C63.4 1m extension cable.	UL	Per Annex B of ANSI C63.4	2017-07-03	2018-07-03

## 7. ANTENNA PORT TEST RESULTS

### 7.1. 20 dB AND 99% BW

#### LIMITS

##### FCC §15.231 (c)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. 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.

##### RSS-210 A.1.3

For the purpose of Section A1.1, the 99% Bandwidth shall be less than or equal to 0.25% of the centre frequency for devices operating between 70 and 900MHz. For devices operating above 900 MHz, the emission shall be less or equal to 0.5% of the centre frequency.

#### TEST PROCEDURE

##### ANSI C63.10

The transmitter output is connected to the spectrum analyzer.

20dB Bandwidth: The RBW is set to 1% to 5% of the OBW. The VBW is set to 3 times the RBW. 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 5% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

## **RESULTS**

No non-compliance noted.

20dB Bandwidth

<b>Frequency (MHz)</b>	<b>20dB Bandwidth (kHz)</b>	<b>Limit (kHz)</b>	<b>Margin (kHz)</b>
431.5	139.5	1078.75	-939.25
436.6	139.2	1091.5	-952.3

99% Bandwidth

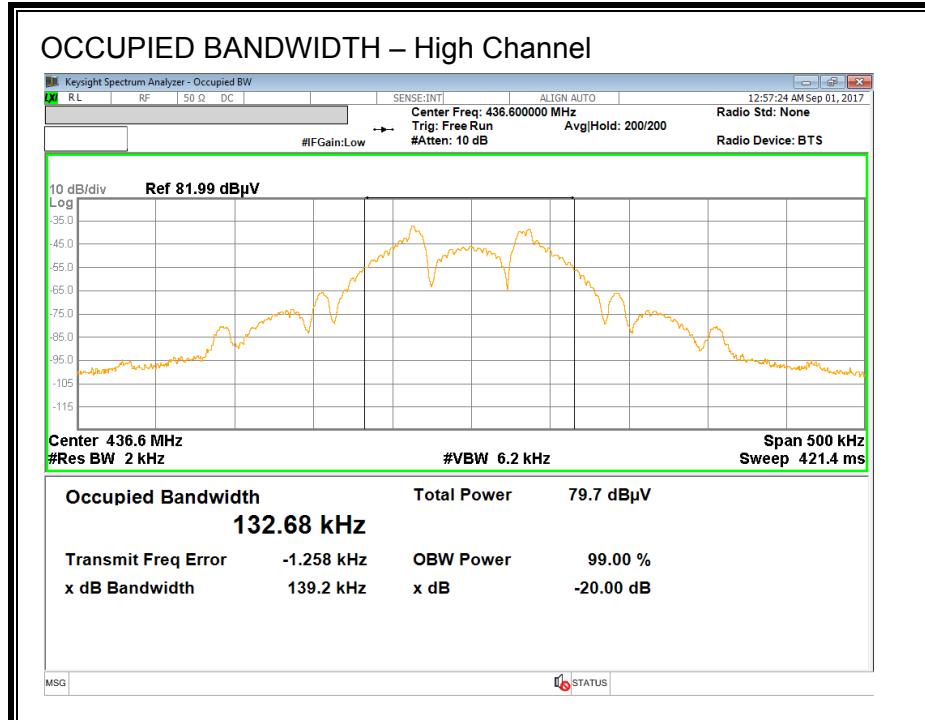
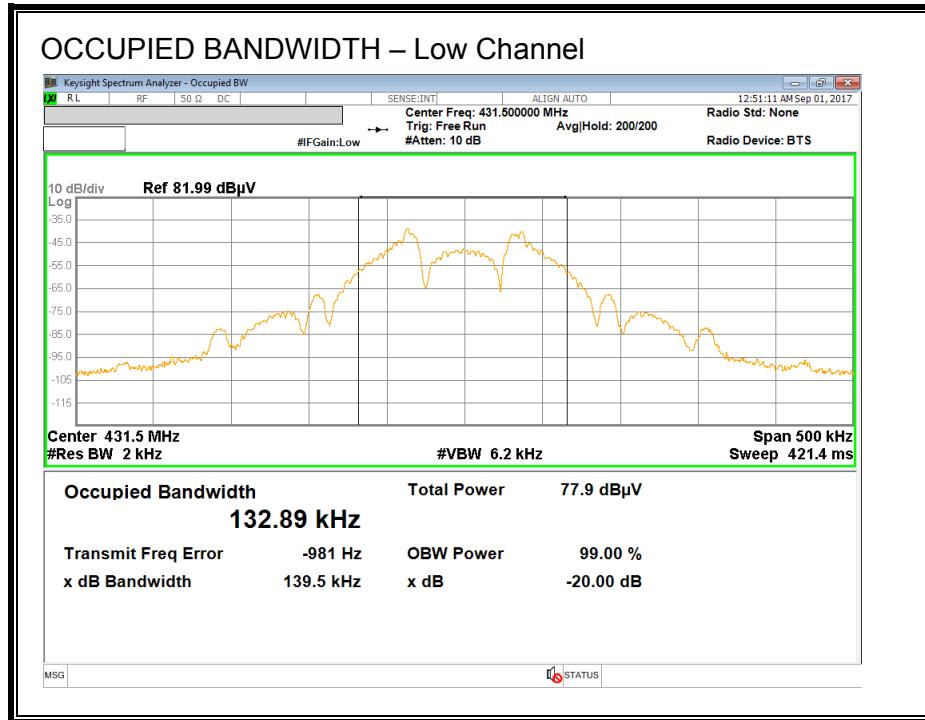
<b>Frequency (MHz)</b>	<b>99% Bandwidth (kHz)</b>	<b>Limit (kHz)</b>	<b>Margin (kHz)</b>
431.5	132.89	1078.75	-945.86
436.6	132.68	1091.5	-958.82

## **Test Information**

Tester: Mark Nolting

Date: 2017-08-31

**20dB AND 99% BANDWIDTH**



## 7.2. DUTY CYCLE

### LIMITS

#### FCC §15.35 (c)

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

### TEST PROCEDURE

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

### CALCULATION

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

### RESULTS

Lutron has declared a worst-case duty cycle of 10%.

## 8. RADIATED EMISSION TEST RESULTS

### 8.1. TX RADIATED SPURIOUS EMISSION

#### LIMITS

FCC §15.231 (b)

IC A1.2

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

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

<sup>1</sup> Linear interpolation

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

2 Above 38.6

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

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

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

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

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

## **TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz measurements and 1.5 meters above the ground plane for above 1 GHz measurements. The antenna to EUT distance is 3 meters.

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

For peak measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz. For average measurements, the resolution and video bandwidths are set as described in ANSI 63.10:2013 for the applicable average measurement. For this test program, Average measurements were performed using a Peak detector and duty cycle correction by  $20\log(x)$  where 'x' is the duty cycle of 10%.

The spectrum from 9 kHz to 5 GHz is investigated with the transmitter on.

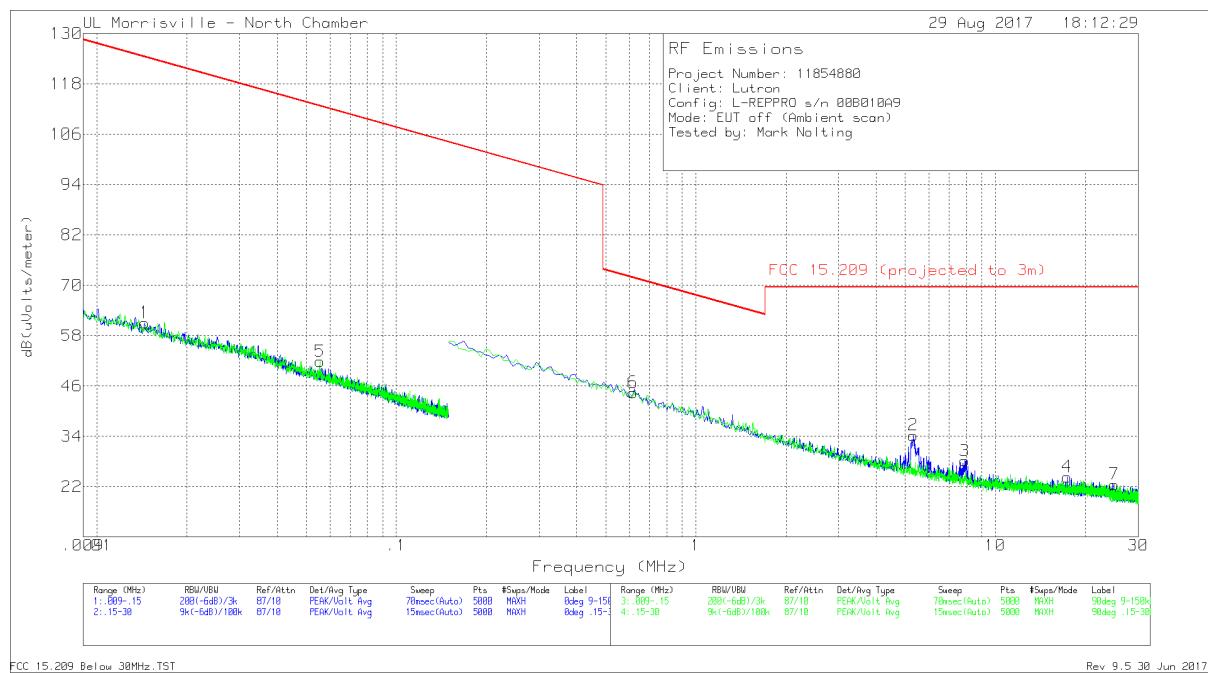
The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

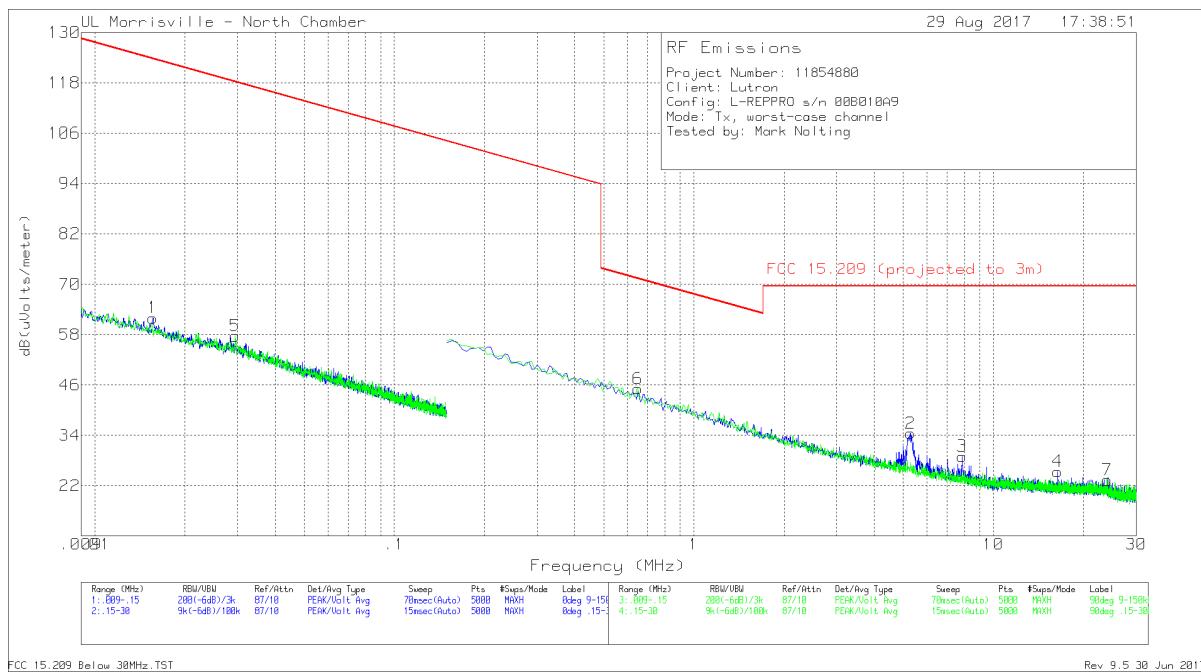
## RESULTS

### TX SPURIOUS EMISSIONS (0.009-30MHz)

**Note:** All measurements were made at a test distance of 3 m. The limits in the plots and tabular data are the FCC/IC limits extrapolated from the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to the measurement distance to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were  $40 \times \log$  (specification distance / test distance) per FCC 15.31 (f) (2).

Although these tests were performed at a test site other than an open area test site, adequate comparison measurements were confirmed against an open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.





Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	CBI (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 (projected to 3m)	Margin (dB)	Azimuth (Degs)
The following emissions are with the loop antenna at 0-degrees. (Face on.)									
1	.01564	46	Pk	15.9	.1	62	123.72	-61.72	0-360
2	5.28506	23.09	Pk	11	.4	34.49	69.54	-35.05	0-360
3	7.85259	17.8	Pk	10.7	.5	29	69.54	-40.54	0-360
4	16.39709	14.5	Pk	10.2	.7	25.4	69.54	-44.14	0-360
The following emissions are with the loop antenna at 90-degrees. (Face off.)									
5	.02944	44.08	Pk	13.5	.1	57.68	118.23	-60.55	0-360
6	.65156	34.32	Pk	10.7	.1	45.12	71.32	-26.2	0-360
7	0.24034	13.35	Pk	9.2	.8	23.35	69.54	-46.19	0-360

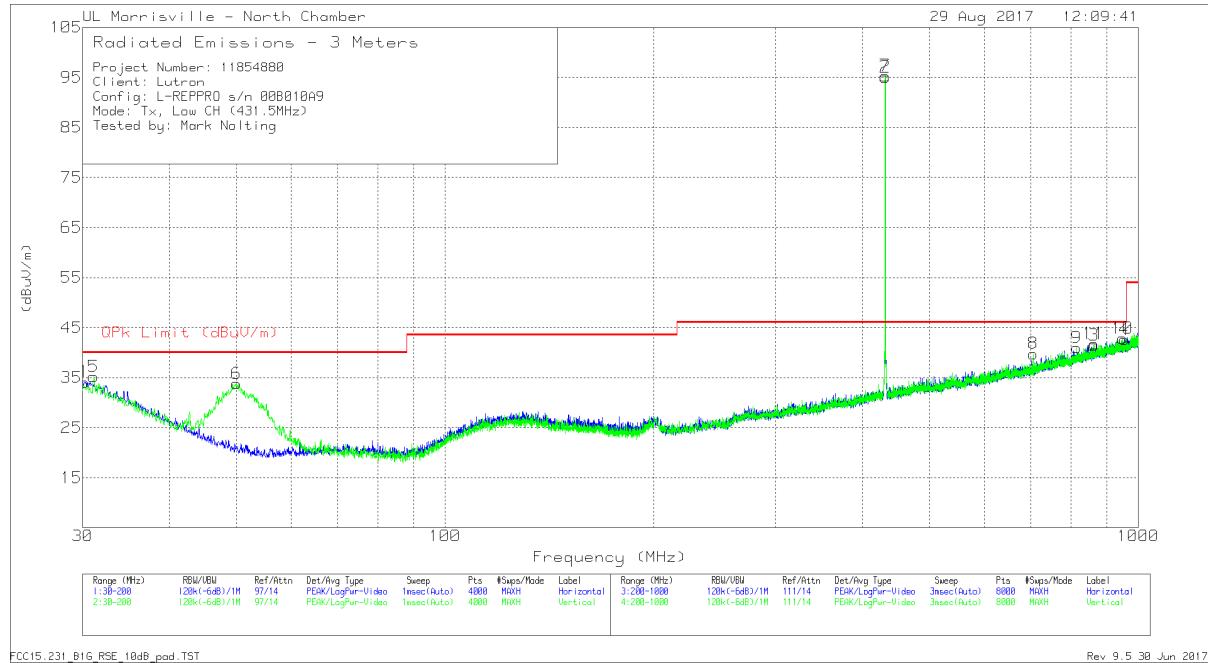
Pk - Peak detector

FCC 15.209 Below 30MHz.TST

Rev 9.5 30 Jun 2017

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

**LOW CHANNEL**

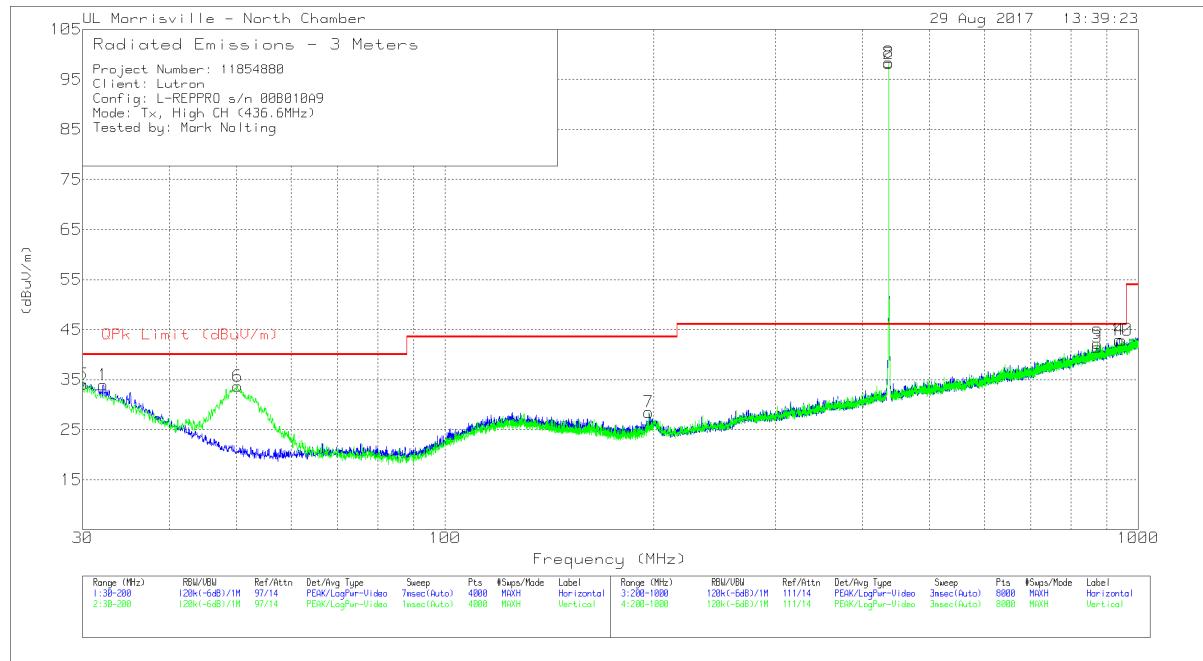


Marker	Freq. (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Amp/Cbl (dB)	Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Pk Limit (dBuV/m) *Qp Limit	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.205	25.25	Qp	26.1	-31.7	9.9	0	29.55	*40	-10.45	-	-	279	398	H
2	431.537	93.27	Pk	21	-28.7	9.9	0	95.47	100.75	-5.28	-	-	102	231	H
	431.537	93.27	Pk	21	-28.7	9.9	-20	75.47	-	-	80.75	-5.28	102	231	H
3	863.0728	32.4	Pk	26.6	-26.8	9.9	0	42.1	80.75	-38.65	-	-	107	227	H
	863.0728	32.4	Pk	26.6	-26.8	9.9	-20	22.1	-	-	60.75	-38.65	107	227	H
4	954.9981	24.19	Qp	27.7	-25.8	9.9	0	35.99	*46.02	-10.03	-	-	96	101	H
5	31.1053	25.26	Qp	25.4	-31.7	9.9	0	28.86	*40	-11.14	-	-	258	101	V
6	49.9802	42.74	Pk	12.7	-31.5	9.9	0	33.84	*40	-6.16	-	-	0-360	102	V
7	431.5397	93.14	Pk	21	-28.7	9.9	0	95.34	100.75	-5.41	-	-	88	226	V
	431.5301	93.11	Pk	21	-28.7	9.9	-20	75.34	-	-	80.75	-5.41	88	226	V
8	705.7657	24.75	Qp	24.7	-27.9	9.9	0	31.45	*46.02	-14.57	-	-	50	201	V
9	815.08	24.58	Qp	26.4	-27.2	9.9	0	33.68	*46.02	-12.34	-	-	50	201	V
11	863.0732	32.8	Pk	26.6	-26.8	9.9	0	42.5	80.75	-38.25	-	-	332	100	V
	863.0862	32.08	Pk	26.6	-26.8	9.9	-20	22.5	-	-	60.75	-38.25	332	100	V
10	948.3973	24.19	Qp	27.5	-25.8	9.9	0	35.79	*46.02	-10.23	-	-	174	398	V

Pk - Peak detector

Qp - Quasi-Peak detector

## HIGH CHANNEL

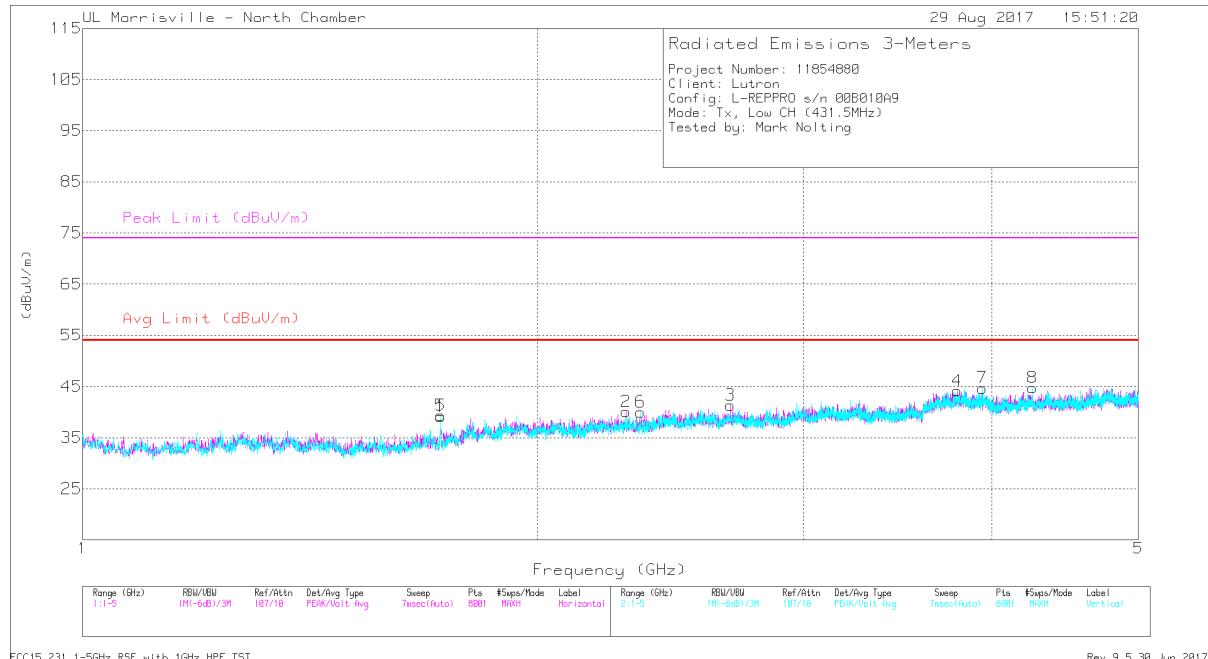


Marker	Freq. (MHz)	Meter Reading (dBuV)	Det	AT0074	Amp/Cbl (dB/m)	Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Pk Limit (dBuV/m) *Qp Limit	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.1256	25.24	Qp	24.6	-31.7	9.9	0	28.04	*40	-11.96	-	-	160	100	H
2	436.6383	96.13	Pk	20.9	-28.7	9.9	0	98.23	100.91	-2.68	-	-	110	229	H
	436.6383	96.13	Pk	20.9	-28.7	9.9	-20	78.23	-	-	80.91	-2.68	110	229	H
3	873.1174	33.85	Pk	26.7	-26.6	9.9	0	43.85	80.91	-37.06	-	-	103	233	H
	873.1174	33.85	Pk	26.7	-26.6	9.9	-20	23.85	-	-	60.91	-37.06	103	233	H
4	939.0961	24.31	Qp	27.3	-25.9	9.9	0	35.61	*46.02	-10.41	-	-	0-360	299	H
5	30.1413	25.22	Qp	26.2	-31.8	9.9	0	29.52	*40	-10.48	-	-	109	100	V
6	50.1927	42.67	Pk	12.6	-31.5	9.9	0	33.67	*40	-6.33	-	-	0-360	102	V
7	196.5581	31.69	Pk	17	-30.1	9.9	0	28.49	*43.52	-15.03	-	-	0-360	102	V
8	436.6354	96.24	Pk	20.9	-28.7	9.9	0	98.34	100.91	-2.57	-	-	96	212	V
	436.6354	96.24	Pk	20.9	-28.7	9.9	-20	78.34	-	-	80.91	-2.57	96	212	V
9	873.1191	34.13	Pk	26.7	-26.6	9.9	0	44.13	80.91	-36.78	-	-	83	204	V
	873.1191	34.13	Pk	26.7	-26.6	9.9	-20	24.13	-	-	60.91	-36.78	83	204	V
10	946.9971	24.23	Qp	27.5	-25.8	9.9	0	35.83	*46.02	-10.19	-	-	262	201	V

Pk - Peak detector

Qp - Quasi-Peak detector

**HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz**  
**LOW CHANNEL**

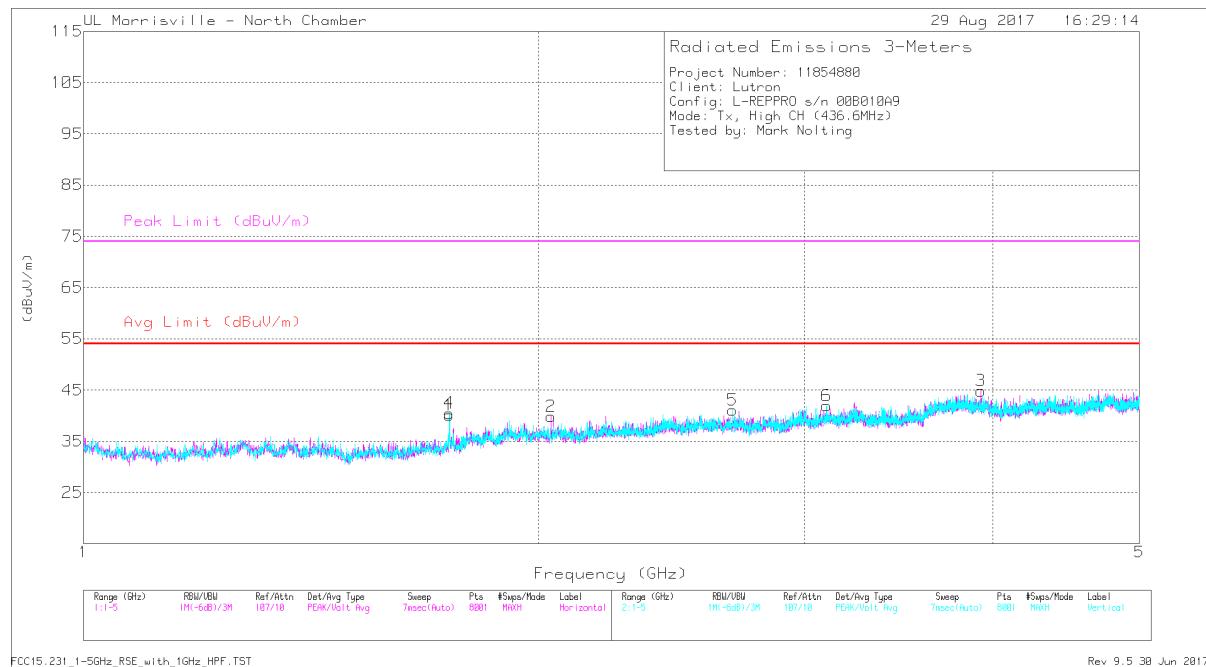


Marker	Freq. (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Amp/Cbl (dB)	HPF009 (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.726	47.2	Pk	29.2	-35.3	.5	0	41.6	-	-	80.75	-39.15	161	253	H
	1.726	47.2	Pk	29.2	-35.3	.5	-20	21.6	60.75	-39.15	-	-	161	253	H
2	* 2.29	42.47	Pk	31.5	-34.2	.3	0	40.07	54	-13.93	74	-33.93	0-360	103	H
3	* 2.684	42.17	Pk	32.4	-33.6	.4	0	41.37	54	-12.63	74	-32.63	0-360	399	H
4	* 3.793	42.53	Pk	33.5	-32.4	.5	0	44.13	54	-9.87	74	-29.87	0-360	399	H
5	1.726	47.24	Pk	29.2	-35.3	.5	0	41.64	-	-	80.75	-39.11	76	390	V
	1.726	47.24	Pk	29.2	-35.3	.5	-20	21.64	60.75	-39.11	-	-	76	390	V
6	* 2.34	42.12	Pk	31.6	-34.1	.4	0	40.02	54	-13.98	74	-33.98	0-360	302	V
7	* 3.941	43.41	Pk	33.4	-32.5	.4	0	44.71	54	-9.29	74	-29.29	0-360	400	V
8	* 4.257	42.94	Pk	33.5	-32.1	.4	0	44.74	54	-9.26	74	-29.26	0-360	102	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

## HIGH CHANNEL



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Amp/Cbl (dB)	HPF009 (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.746	47.97	Pk	29.5	-35.2	.5	0	42.77	-	-	80.91	-38.14	349	252	H
	1.746	47.97	Pk	29.5	-35.2	.5	-20	22.77	60.91	-38.14	-	-	349	252	H
2	2.039	42.82	Pk	31.4	-34.7	.3	0	39.82	54	-14.18	74	-34.18	0-360	399	H
3	* 3.929	43.44	Pk	33.4	-32.5	.5	0	44.84	54	-9.16	74	-29.16	0-360	399	H
4	1.747	48.21	Pk	29.5	-35.2	.5	0	43.01	-	-	80.91	-37.90	75	394	V
	1.747	48.21	Pk	29.5	-35.2	.5	-20	23.01	60.91	-37.90	-	-	75	394	V
5	* 2.69	41.77	Pk	32.4	-33.5	.4	0	41.07	54	-12.93	74	-32.93	0-360	400	V
6	3.104	41.8	Pk	32.8	-33.2	.5	0	41.9	54	-12.1	74	-32.1	0-360	102	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

## 9. AC MAINS LINE CONDUCTED EMISSIONS

### LIMITS

§15.207 (a)  
IC RSS-GEN, Section 8.8

Frequency of emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

\* Decreases with the logarithm of the frequency.

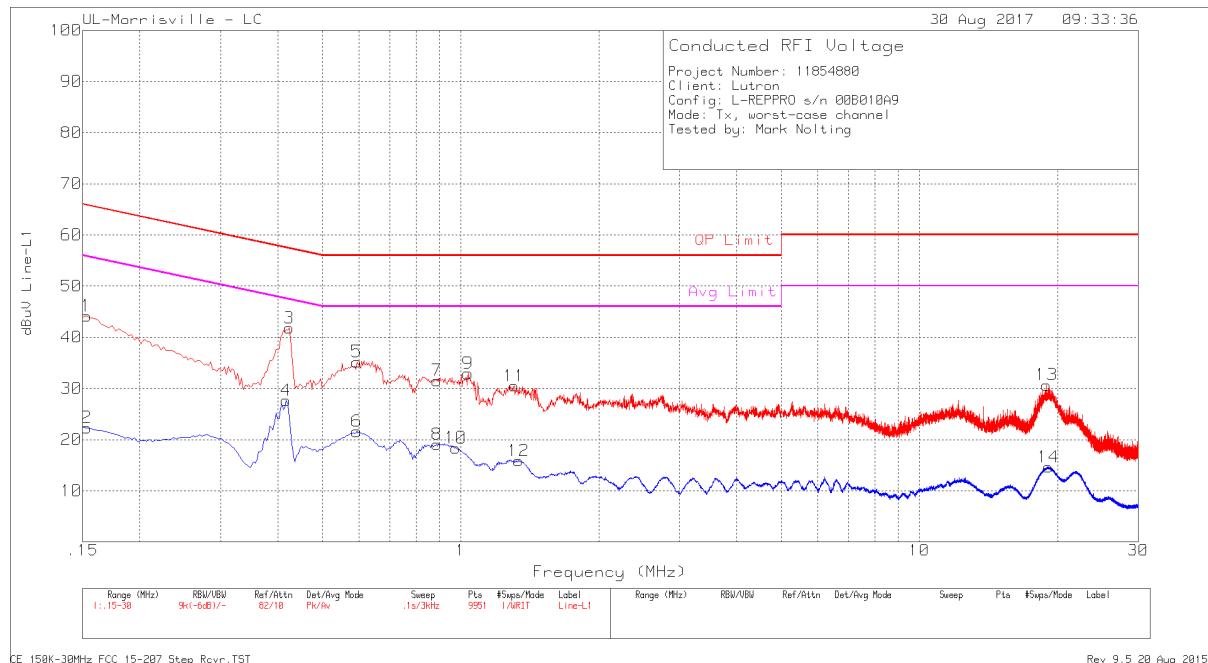
### TEST PROCEDURE

ANSI C63.10

### RESULTS

No non-compliance noted.

**LINE 1 RESULTS**

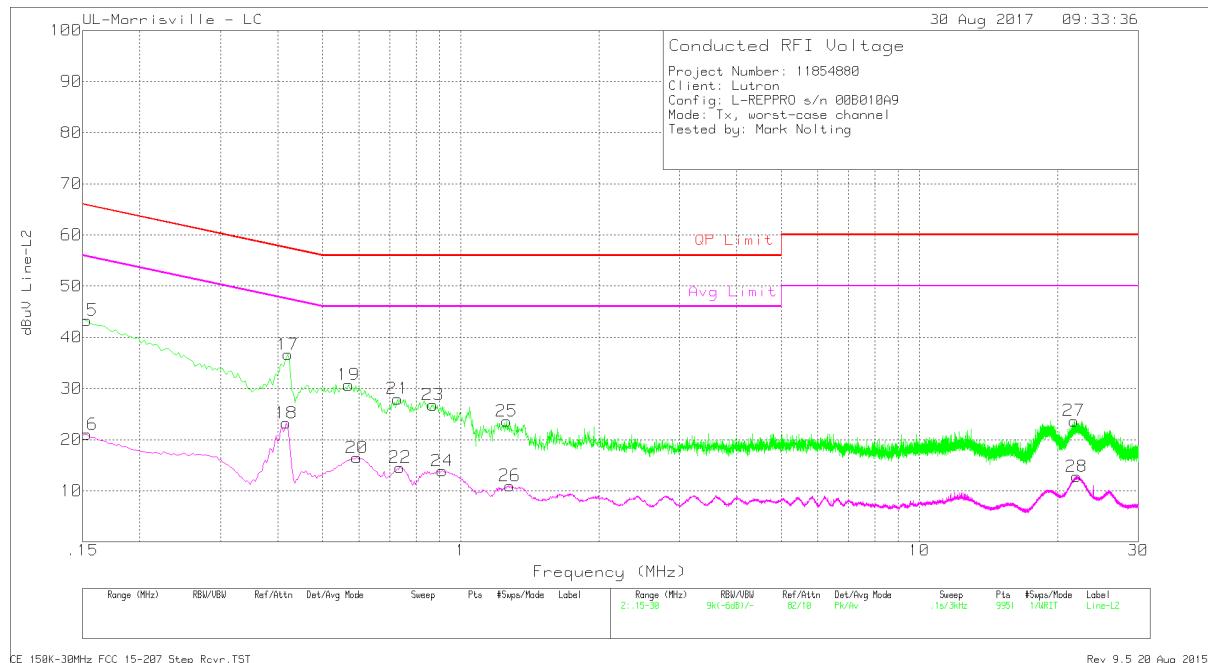


Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit	Margin (dB)	Avg Limit	Margin (dB)	
1	.153	33.99	Pk	.2	10	44.19	65.84	-21.65	-	-	
2	.153	12.13	Av	.2	10	22.33	-	-	55.84	-33.51	
3	.423	31.79	Pk	.1	9.9	41.79	57.39	-15.6	-	-	
4	.417	17.6	Av	.1	10	27.7	-	-	47.51	-19.81	
5	.594	25.32	Pk	0	9.9	35.22	56	-20.78	-	-	
6	.594	11.71	Av	0	9.9	21.61	-	-	46	-24.39	
7	.888	21.65	Pk	0	9.9	31.55	56	-24.45	-	-	
8	.888	9.18	Av	0	9.9	19.08	-	-	46	-26.92	
9	1.038	23.01	Pk	0	9.9	32.91	56	-23.09	-	-	
10	.975	8.49	Av	0	9.9	18.39	-	-	46	-27.61	
11	1.308	20.48	Pk	0	10	30.48	56	-25.52	-	-	
12	1.338	5.9	Av	0	10	15.9	-	-	46	-30.1	
13	18.942	20.29	Pk	.2	10.2	30.69	60	-29.31	-	-	
14	19.098	4.28	Av	.2	10.2	14.68	-	-	50	-35.32	

Pk - Peak detector

Av - Average detection

## LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit	Margin (dB)	Avg Limit	Margin (dB)
15	.153	33.12	Pk	.2	10	43.32	65.84	-22.52	-	-
16	.153	10.8	Av	.2	10	21	-	-	55.84	-34.84
17	.42	26.62	Pk	.1	9.9	36.62	57.45	-20.83	-	-
18	.417	13.14	Av	.1	10	23.24	-	-	47.51	-24.27
19	.57	20.8	Pk	0	9.9	30.7	56	-25.3	-	-
20	.594	6.56	Av	0	9.9	16.46	-	-	46	-29.54
21	.729	18.09	Pk	0	9.9	27.99	56	-28.01	-	-
22	.738	4.66	Av	0	9.9	14.56	-	-	46	-31.44
23	.87	16.87	Pk	0	9.9	26.77	56	-29.23	-	-
24	.912	3.98	Av	0	9.9	13.88	-	-	46	-32.12
25	1.26	13.65	Pk	0	10	23.65	56	-32.35	-	-
26	1.2795	1	Av	0	10	11	-	-	46	-35
27	21.714	13.28	Pk	.2	10.2	23.68	60	-36.32	-	-
28	22.011	2.41	Av	.2	10.2	12.81	-	-	50	-37.19

Pk - Peak detector

Av - Average detection