



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

CERTIFICATION TEST REPORT

FOR

DIMMER MODULE

MODEL NUMBER: RMJS-ECO32-SZ

**FCC ID: JPZ0118
IC: 2851A-JPZ0118**

REPORT NUMBER: R12388606-E1

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**Prepared for
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Revision History

<u>Ver.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
1	2018-09-11	Initial Issue	Brian T. Kiewra
1	2018-09-12	Revised procedural writeup in Section 8 to clarify frequency range scanned and detector used.	Brian T. Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Lutron Electronics Co., Inc.
7200 Suter Rd.
Coopersburg, PA 18036, USA

EUT DESCRIPTION: Dimmer Module

MODEL: RMJS-ECO32-SZ

SERIAL NUMBER: 02052C83

DATE TESTED: 2018-07-30 to 2018-09-10

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Complies
ISED CANADA RSS-210 Issue 9	Complies
ISED CANADA RSS-GEN Issue 5	Complies

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.

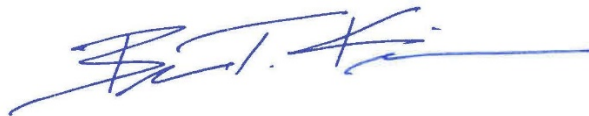
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this 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:



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Operations Leader
UL – Consumer Technology Division

Prepared By:



Brian T. Kiewra
Project Engineer
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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 5, and RSS-210 Issue 9.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Perimeter Park Drive, Suite B, Morrisville, NC 27560.

12 Laboratory Dr., RTP, NC 27709, USA
<input type="checkbox"/> Chamber A
<input type="checkbox"/> Chamber C

2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560, USA
<input checked="" type="checkbox"/> Chamber NORTH
<input type="checkbox"/> Chamber SOUTH

The onsite chambers (A, C, North and South) are covered under Industry Canada company address code 2180C with site numbers 2180C -1 through 2180C-4, respectively.

UL LLC is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <https://www.nist.gov/nvlap>.

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
Occupied Channel Bandwidth	2.00%
Unwanted Emissions, conducted	3.05 dB
All emissions, radiated	5.36 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a dimmer module with 431.5 – 436.6MHz transmitter.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a mono-pole antenna, with a maximum gain of -0.55 dBi.

5.3. SOFTWARE AND FIRMWARE

Firmware used for testing software: 0797866 Revision 6.00
Firmware installed on the EUT: 0798001 Revision 6.03.

5.4. WORST-CASE CONFIGURATION AND MODE

Three orientations, X, Y, and Z, of the EUT were investigated for the worst-case emissions at its fundamental operating frequency. The worst-case orientation was determined to be X. Therefore all radiated testing performed in the X orientation. AC Mains emissions was performed with the EUT transmitting on worst-case channel determined by fundamental field strength.

Cable placement used as instructed by manufacturer per installation guide.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
None				

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	Quick Connect	Single conductor	>1m	AC Mains
2	Control	1	Quick Connect	Single conductor	<1m	Control leads

TEST SETUP

The EUT is setup as a standalone device.

SETUP DIAGRAM FOR TESTS

Refer to Document R12388606-EP1 for Setup diagram.

6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Conducted Room 1					
T177 (PRE0079253)	Spectrum Analyzer	Agilent Technologies	E4446A	2018-04-12	2019-04-12
SN 161024885	Environmental Meter	Fisher Scientific	15-077-963	2016-12-23	2018-12-23

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz (Loop Ant.)					
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2018-01-02	2019-01-02
30-1000 MHz					
AT0073	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2018-08-06	2019-08-06
AT0075	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2017-09-05	2018-09-30
1 - 4.5 GHz					
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2018-04-30	2019-04-30
Gain-Loss Chains					
N-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2017-09-15	2018-09-15
N-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2018-05-20	2019-05-20
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2018-03-23	2019-03-23
Receiver & Software					
SA0027	Spectrum Analyzer	Agilent	N9030A	2018-04-04	2019-04-04
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
s/n 161024690	Environmental Meter	Fisher Scientific	15-077-963	2016-12-21	2018-12-21

7. ANTENNA PORT TEST RESULTS

7.1. 20 dB AND 99% BW

LIMITS

FCC §15.231 (c)

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

RSS-210 A1.3

The 99% bandwidth of momentarily operated devices shall be less or equal to 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99% bandwidth shall be less or equal to 0.5% of the center frequency.

TEST PROCEDURE

99% BW: Per RSS-Gen, Section 6.6

The transmitter output is coupled to the spectrum analyzer via an antenna connected to the spectrum analyzer.

The RBW is set to 1% to 5% of the 99 % bandwidth. The VBW is set to approximately 3 times the RBW. The sweep time is coupled. The detection mode is set to peak and the trace mode to max hold as allowed by the RSS-Gen standard for devices that do not transmit continuously. The spectrum analyzer's internal 99% bandwidth function is utilized.

20dB BW: Per ANSI C63.10, Section 6.9.3

The transmitter output is coupled to the spectrum analyzer via an antenna connected to the spectrum analyzer.

The RBW is set to 1% to 5% of the 20dB bandwidth. The VBW is set to approximately 3 times the RBW. The sweep time is coupled. The detection mode is set to peak and the trace mode to max hold. The spectrum analyzer's internal 20dB bandwidth function is utilized.

RESULTS

No non-compliance noted:

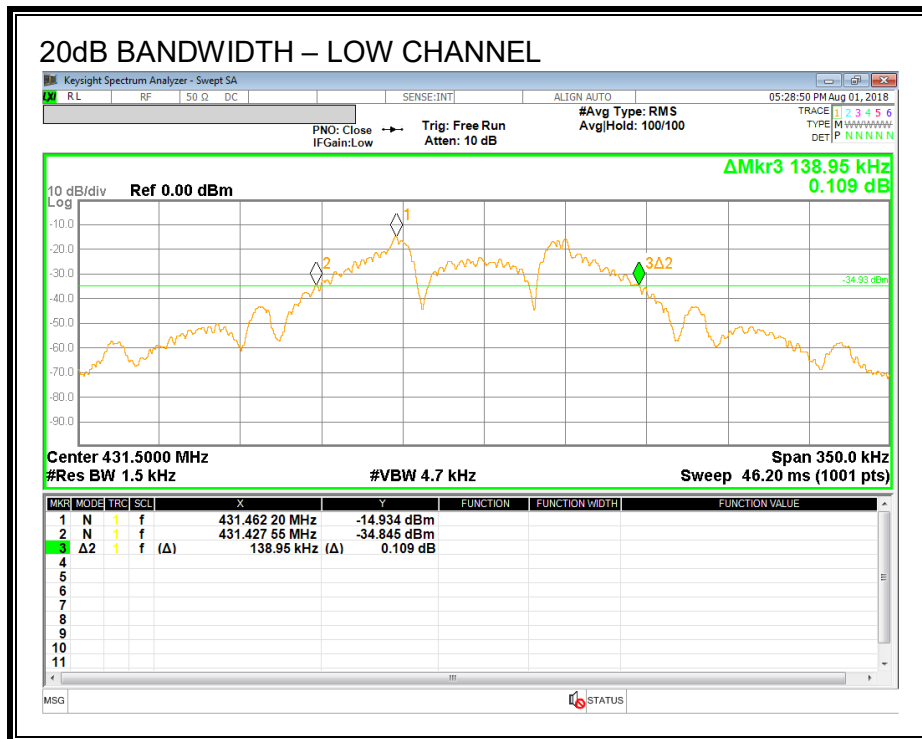
20dB Bandwidth

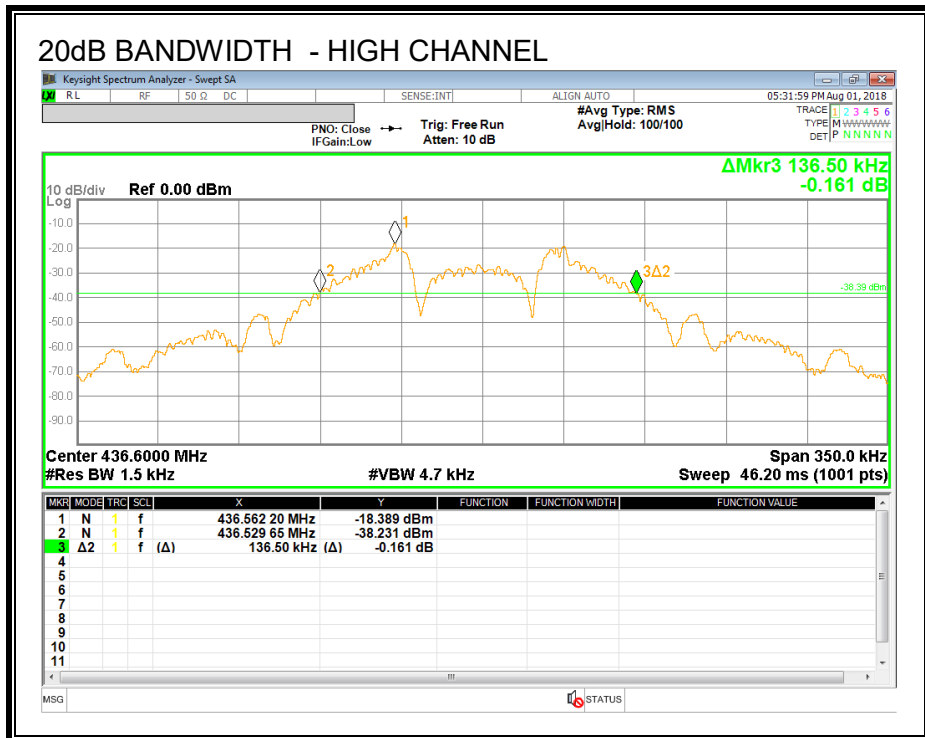
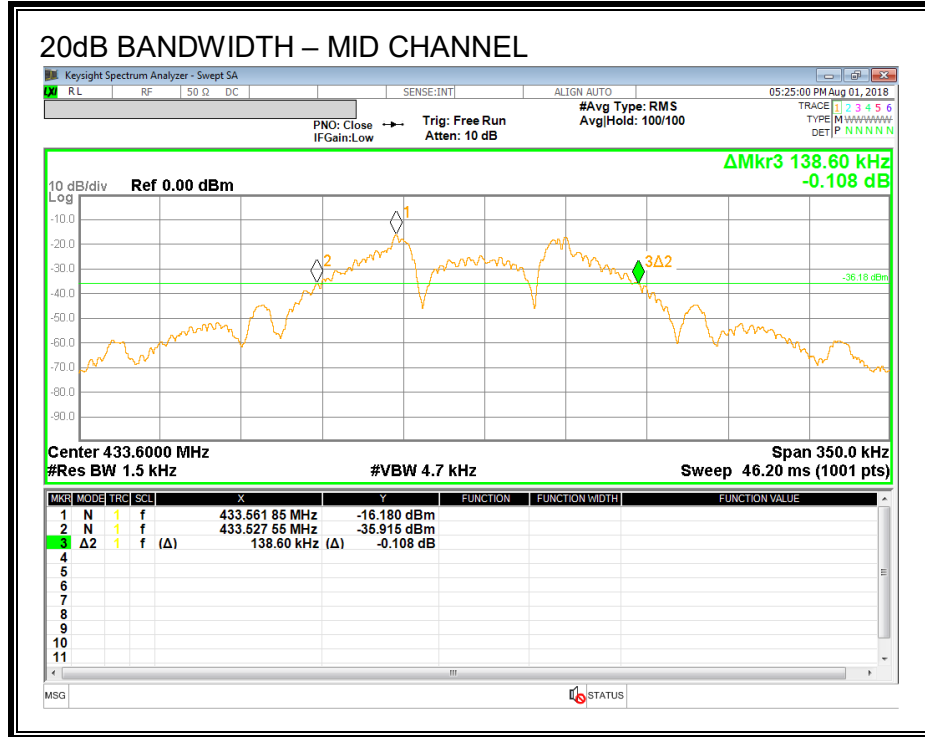
Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431.5	138.95	1078.75	-939.8
433.6	138.6	1084	-945.4
436.6	136.5	1091.5	-955

99% Bandwidth

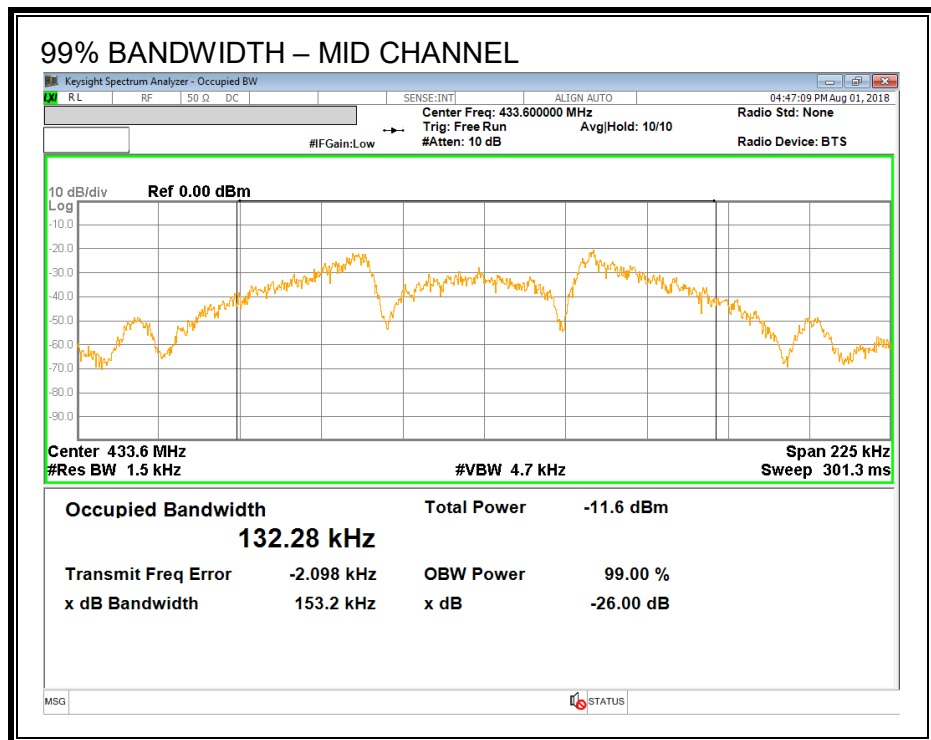
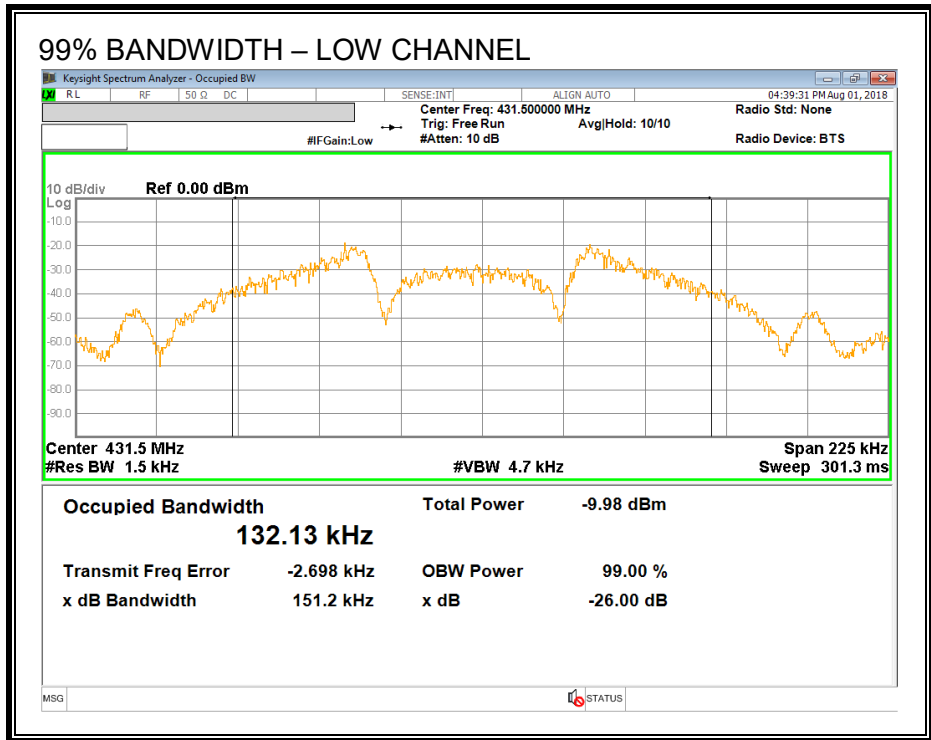
Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431.5	132.13	1078.75	-946.62
433.6	132.28	1084	-951.72
436.6	132.78	1091.5	-958.72

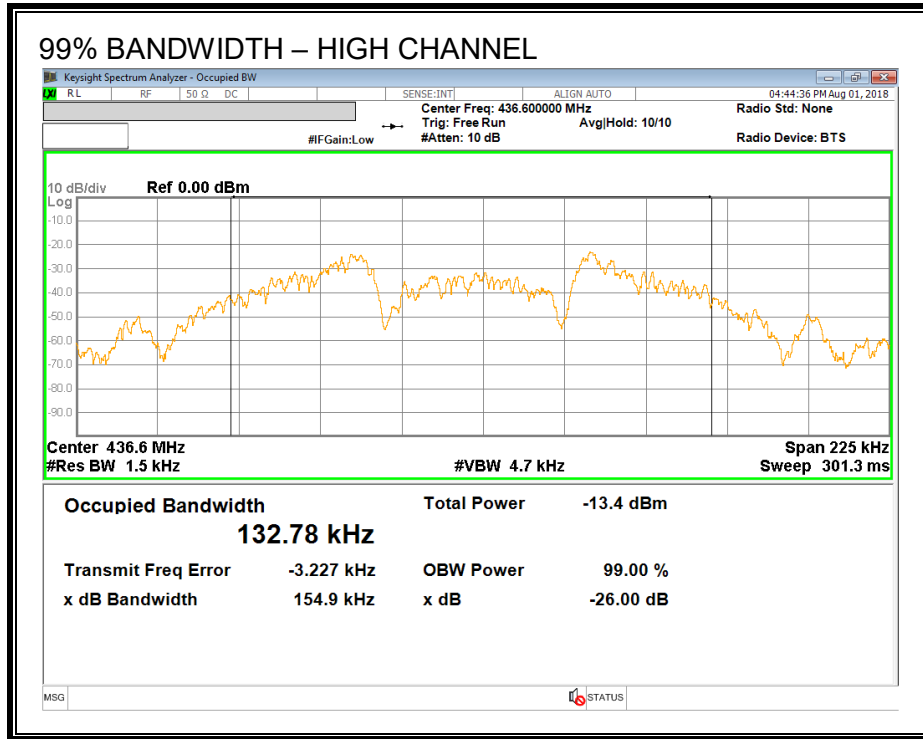
20dB BANDWIDTH





99% BANDWIDTH





7.2. DUTY CYCLE

LIMITS

FCC §15.35 (c)

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

TEST PROCEDURE

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

CALCULATION

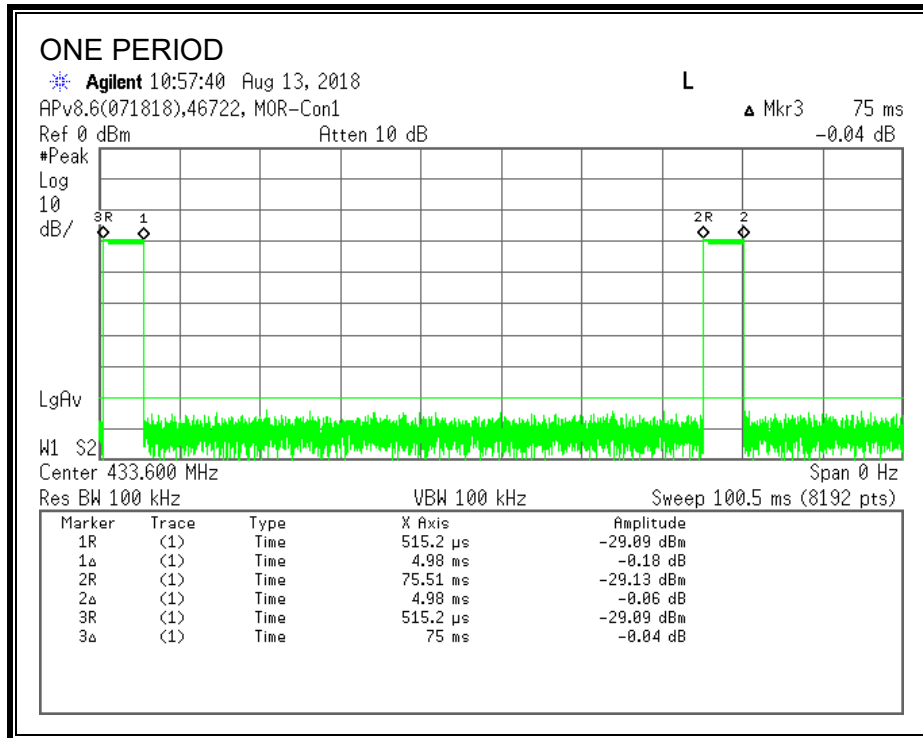
Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is (# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

No non-compliance noted:

One Period (ms)	Pulse Width (ms)	# of Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	4.98	2	0.0996	-20.03

ONE PERIOD



7.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)
ISED RSS-210 A1.1

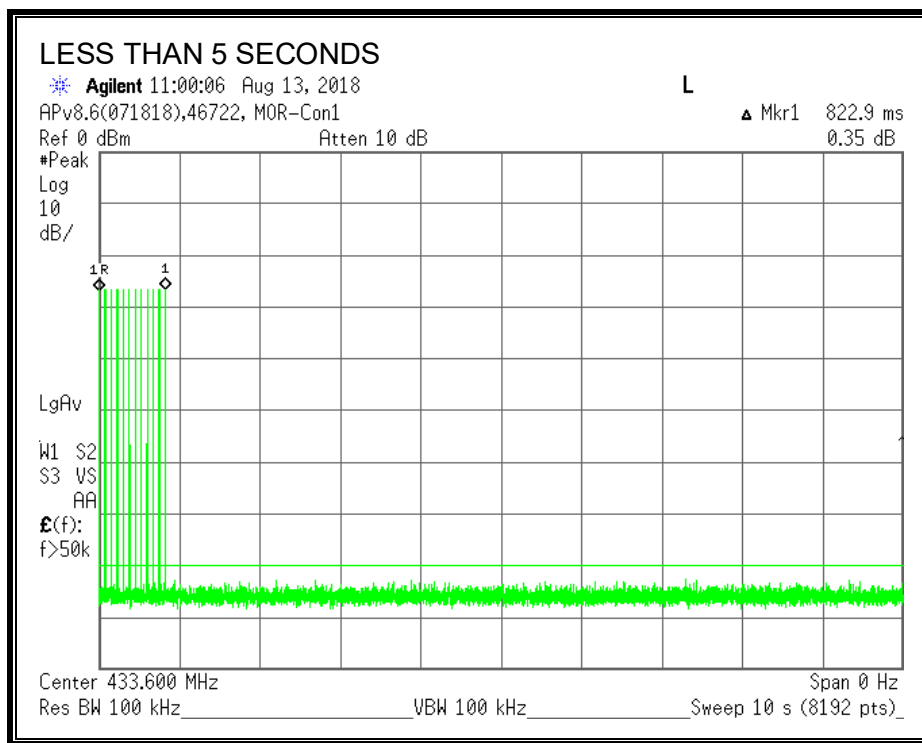
A transmitter activated automatically shall cease transmission within 5 seconds after activation.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is set to 10 seconds and the span is set to 0 Hz.

RESULTS

No non-compliance noted:



8. RADIATED EMISSION TEST RESULTS

8.1. TX RADIATED SPURIOUS EMISSION

LIMITS

FCC §15.231 (b)
 IC A1.2

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 ¹	125 to 375 ¹
174 - 260	3,750	375
260 - 470	3,750 to 12,500 ¹	375 to 1,250 ¹
Above 470	12,500	1,250

¹ Linear interpolation

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 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	(²)
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 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 9.96%.

For peak measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz.

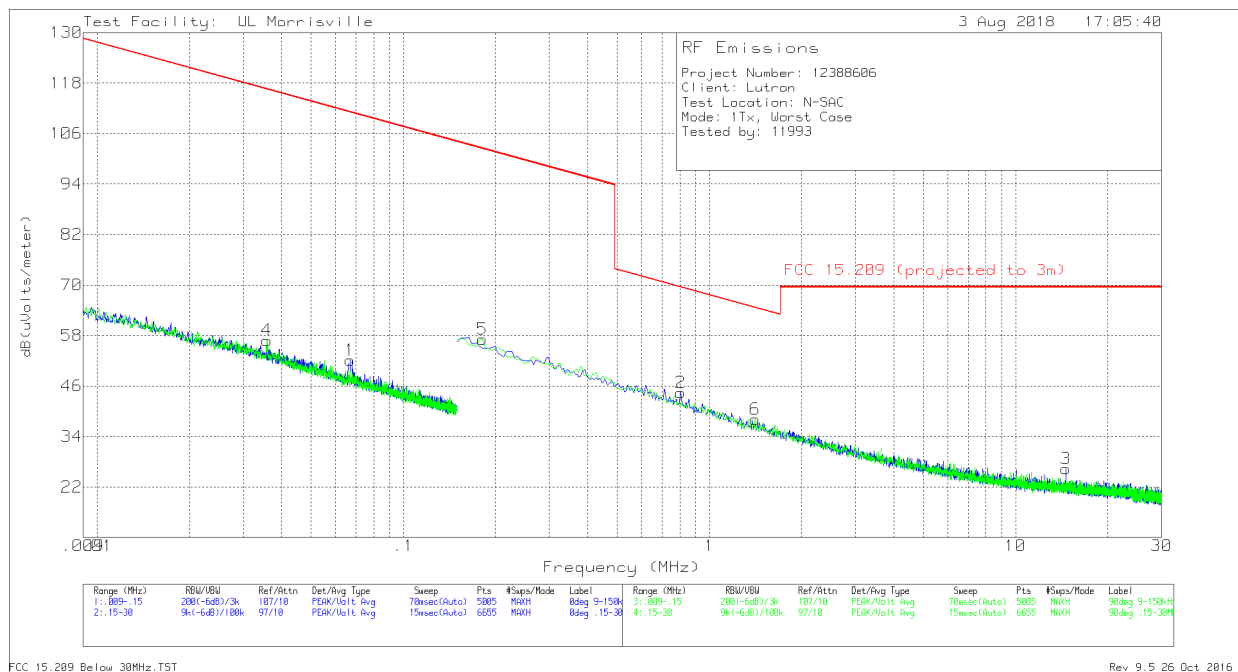
The spectrum from 9 kHz to 4.5 GHz is investigated with the transmitter on.

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.

TX SPURIOUS EMISSIONS (0.009-30MHz WORST-CASE)

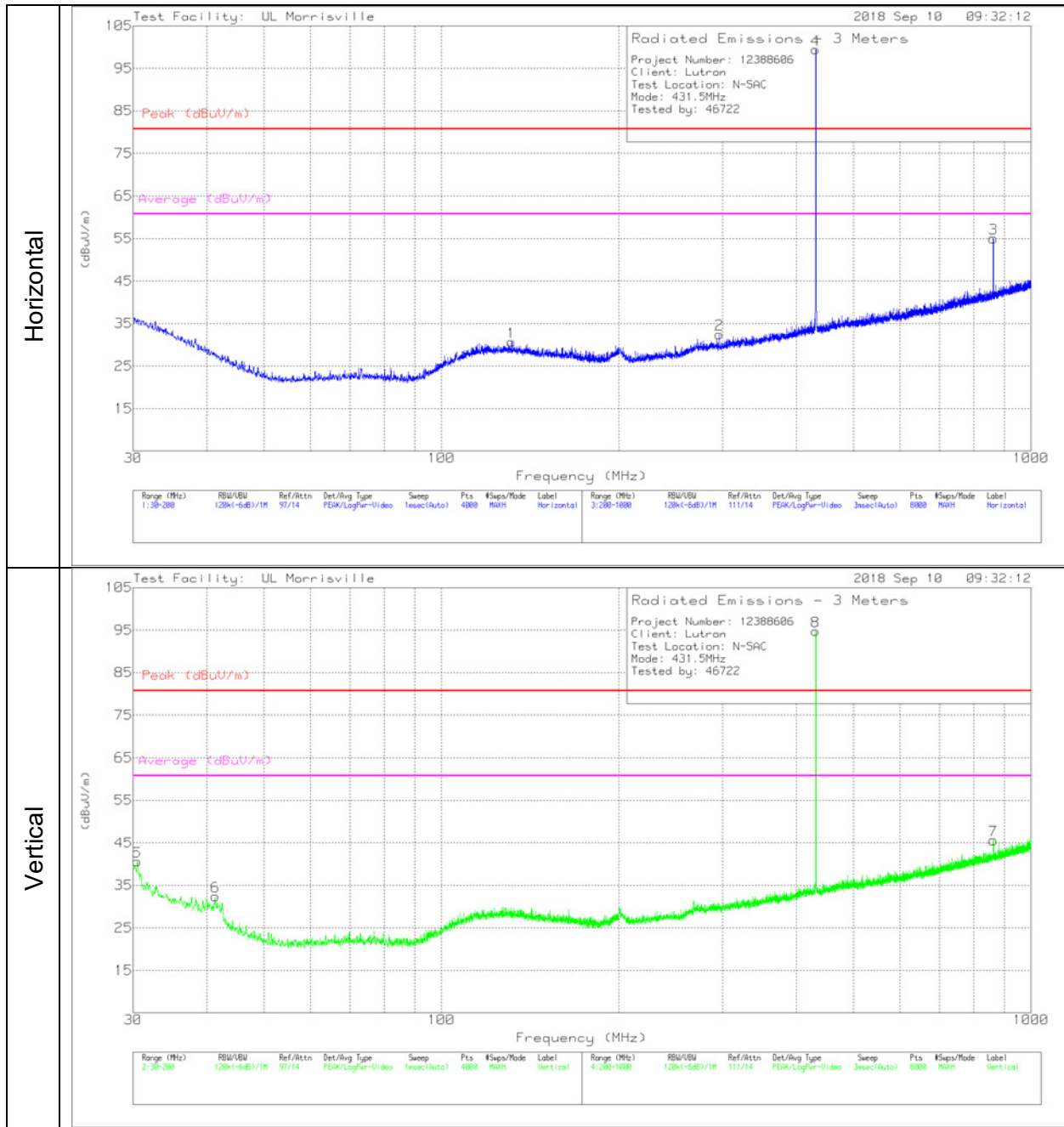
Note: All measurements were made at a test distance of 3 m. The limits in the plots and tabular data are the FCC/IC limits extrapolated from the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to the measurement distance to clearly show the relative levels of fundamental 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*Log (specification distance / test distance).

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.



The above plots demonstrate there were no EUT-related emissions of interest relative to the FCC 15.209 limit below 30MHz.

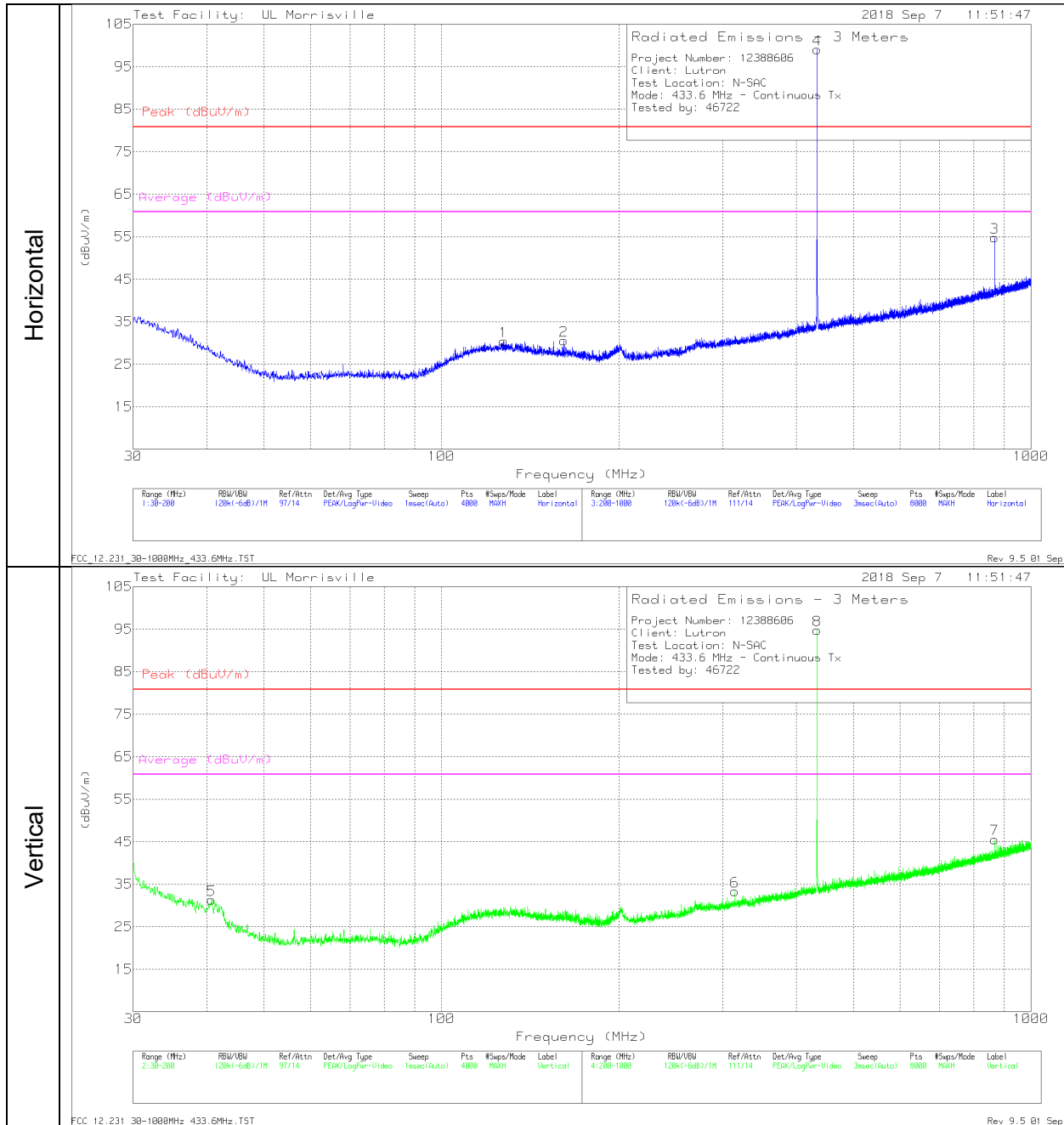
FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz)
LOW CHANNEL (431.5MHz)



Marker No.	Freq (MHz)	Meter Reading [dBuV]	Detector	Antenna Factor [dB/m]	Gain/Loss [dB]	Pad (dB)	Peak Field Strength [dBuV/m]	FCC 15.231 (b) Peak Limit ¹ [dBuV/m]	Margin [dB]	DCCF (dB)	Average Field Strength ² [dBuV/m]	FCC 15.231 Average Limit [dBuV/m]	Margin [dB]	Antenna Polarity	In FCC Restricted Band*?	In NCC Restricted Band**?
4 (FUND)	431.4608	95.87	Pk	22.90	-28.60	9.90	100.07	100.75	-0.68	-20.03	80.04	80.75	-0.71	H	N	N
3 (HARM)	862.9131	44.28	Pk	28.40	-26.80	10.00	55.88	80.75	-24.87	-20.03	35.85	60.75	-24.90	H	N	N
8 (FUND)	431.4599	90.62	Pk	22.90	-28.60	9.90	94.82	100.75	-5.93	-20.03	74.79	80.75	-5.96	V	N	N
7 (HARM)	863.0662	38.52	Pk	28.40	-26.80	10.00	50.12	80.75	-30.63	-20.03	30.09	60.75	-30.66	V	N	N
PK = Peak, QP = Quasi-Peak																
Note 1: Limit is QP Limit if frequency within a restricted band.																
Note 2: Average Field Strength computed as follows for the above fundamental and harmonics: PK + DCCF																
1	131.338	24.99	Qp	20.10	-30.70	9.90	24.29	43.50	-19.21	-	-	-	-	H	Y	Y
2	296.158	24.73	Qp	19.90	-29.50	9.90	25.03	-	-	-	-	-	-	H	N	N
5	30.546	28.19	Qp	27.50	-31.70	9.90	33.89	-	-	-	-	-	-	V	N	N
6	41.403	27.83	Qp	19.50	-31.60	9.90	25.63	-	-	-	-	-	-	V	N	N
PK = Peak, Qp = Quasi-Peak																
Note 1: Limit is QP Limit if frequency within a restricted band.																

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band

MID CHANNEL (433.6MHz)



Marker No.	Freq (MHz)	Meter Reading [dBuV]	Detector	Antenna Factor [dB/m]	Gain/Loss [dB]	Pad (dB)	Peak Field Strength [dBuV/m]	FCC 15.231 (b) Peak Limit ¹ [dBuV/m]	Margin [dB]	DCCF (dB)	Average Field Strength ² [dBuV/m]	FCC 15.231 Average Limit [dBuV/m]	Margin [dB]	Antenna Polarity	In FCC Restricted Band*?	In NCC Restricted Band**?
4 (FUND)	433.5610	95.36	Pk	22.90	-28.70	9.90	99.46	100.81	-1.355	-20.03	79.43	80.81	-1.38	H	N	N
3 (HARM)	867.1186	43.67	Pk	28.40	-26.70	10.00	55.37	80.81	-25.445	-20.03	35.34	60.81	-25.47	H	N	N
8 (FUND)	433.5616	90.49	Pk	22.90	-28.70	9.90	94.59	100.81	-6.225	-20.03	74.56	80.81	-6.25	V	N	N
7 (HARM)	867.2773	38.30	Pk	28.40	-26.70	10.00	50.00	80.81	-30.815	-20.03	29.97	60.81	-30.84	V	N	N

PK = Peak, QP = Quasi-Peak

Note 1: Limit is QP Limit if frequency within a restricted band.

Note 2: Average Field Strength computed as follows for the above fundamental and harmonics: PK + DCCF

Note: The following frequencies were not harmonics of the EUT's fundamental frequency .

1	127.607	24.87	Qp	20.10	-30.60	9.90	24.3	43.50	-19.23	-	-	-	-	H	Y	Y
2	161.187	30.79	Pk	18.70	-30.40	9.90	29.0	80.81	-51.82	-	-	60.81	-31.82	H	N	N
5	41.622	35.05	Pk	19.30	-31.60	9.90	32.7	80.81	-48.16	-	-	60.81	-28.16	V	N	N
6	314.835	30.86	Pk	20.50	-29.30	9.90	32.0	80.81	-48.85	-	-	60.81	-28.85	V	N	N

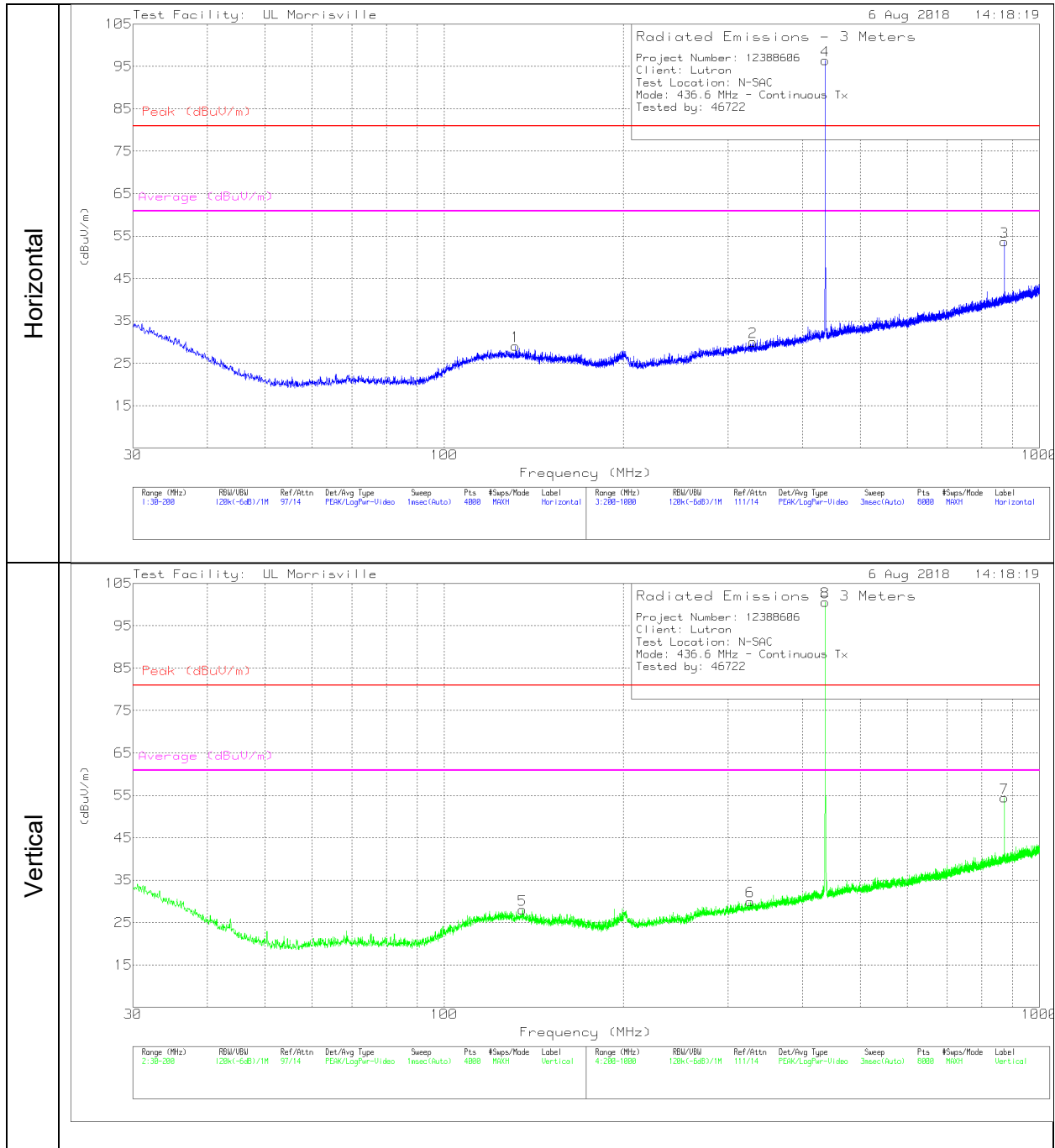
PK = Peak, Qp = Quasi-Peak

Note 1: Limit is QP Limit if frequency within a restricted band.

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

HIGH CHANNEL (436.6MHz)



Marker No.	Freq (MHz)	Meter Reading [dBuV]	Detector	Antenna Factor [dB/m]	Gain/Loss [dB]	Pad (dB)	Peak Field Strength [dBuV/m]	FCC 15.231 (b) Peak Limit ¹ [dBuV/m]	Margin [dB]	DCCF (dB)	Average Field Strength ² [dBuV/m]	FCC 15.231 Average Limit [dBuV/m]	Margin [dB]	Antenna Polarity	In FCC Restricted Band*?	In NCC Restricted Band**?
4 (FUND)	436.5609	93.87	Pk	22.90	-28.70	9.90	97.97	100.91	-2.943	-20.03	77.94	80.91	-2.97	H	N	N
3 (HARM)	873.1238	41.39	Qp	28.50	-26.60	10.00	53.29	46.02	7.270	-	-	-	-	H	N	Y
3 (HARM)	873.1238	42.88	Pk	28.50	-26.60	10.00	54.78	80.91	-26.130	-20.03	34.75	60.91	-26.16	H	N	
8 (FUND)	436.5619	87.83	Pk	22.90	-28.70	9.90	91.93	100.91	-8.983	-20.03	71.90	80.91	-9.01	V	N	N
7 (HARM)	873.1000	34.65	Qp	28.50	-26.60	10.00	46.55	46.02	0.530	-	-	-	-	V	N	Y
7 (HARM)	873.1000	37.69	Pk	28.50	-26.60	10.00	49.59	80.91	-31.320	-20.03	29.56	60.91	-31.35	V	N	

PK = Peak, QP = Quasi-Peak

Note 1: Limit is QP Limit if frequency within a restricted band.

Note 2: Average Field Strength computed as follows for the above fundamental and harmonics: PK + DCCF

Note: The following frequencies were not harmonics of the EUT's fundamental frequency .																
1	121.594	24.97	Qp	20.10	-30.70	9.90	24.3	43.50	-19.23	-	-	-	-	H	Y	Y
2	199.652	24.85	Qp	19.40	-30.20	9.90	24.0	80.91	-56.96	-	-	60.91	-36.96	H	N	N
5	30.458	29.29	Qp	27.60	-31.70	9.90	35.1	80.91	-45.82	-	-	60.91	-25.82	H	N	N
6	40.749	27.99	Qp	20.00	-31.60	9.90	26.3	80.91	-54.62	-	-	60.91	-34.62	H	N	N

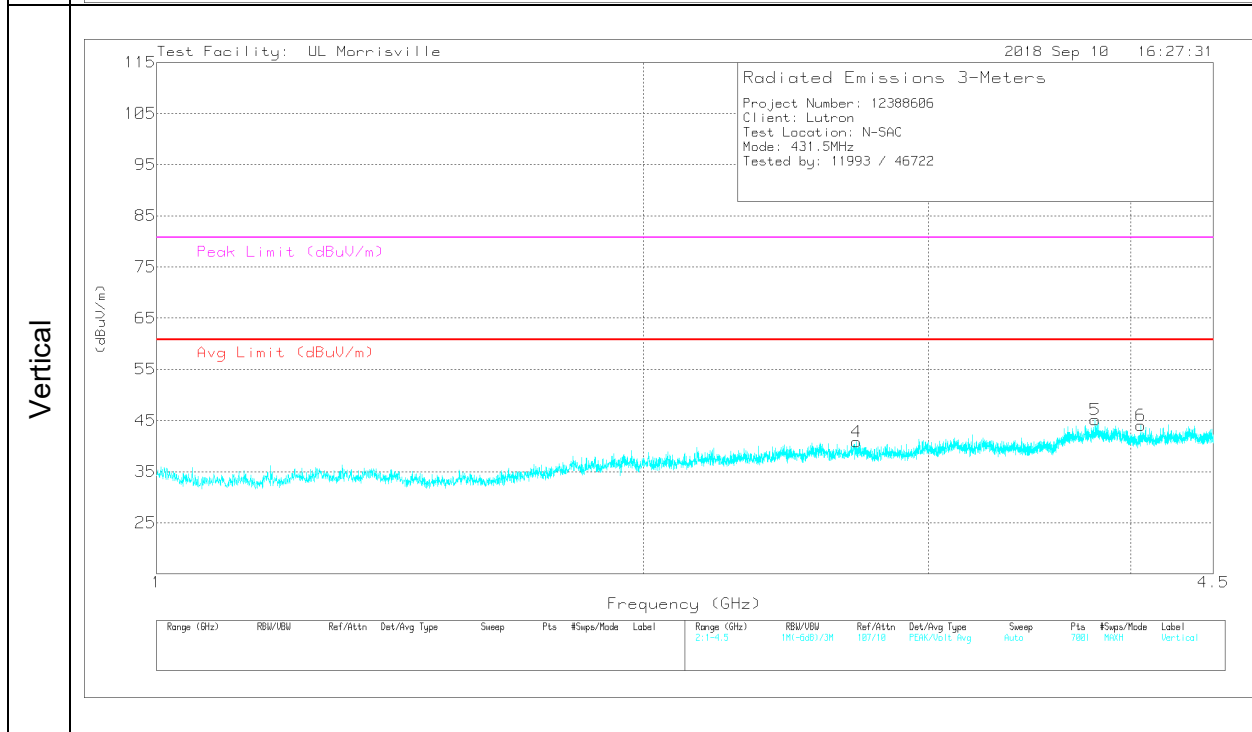
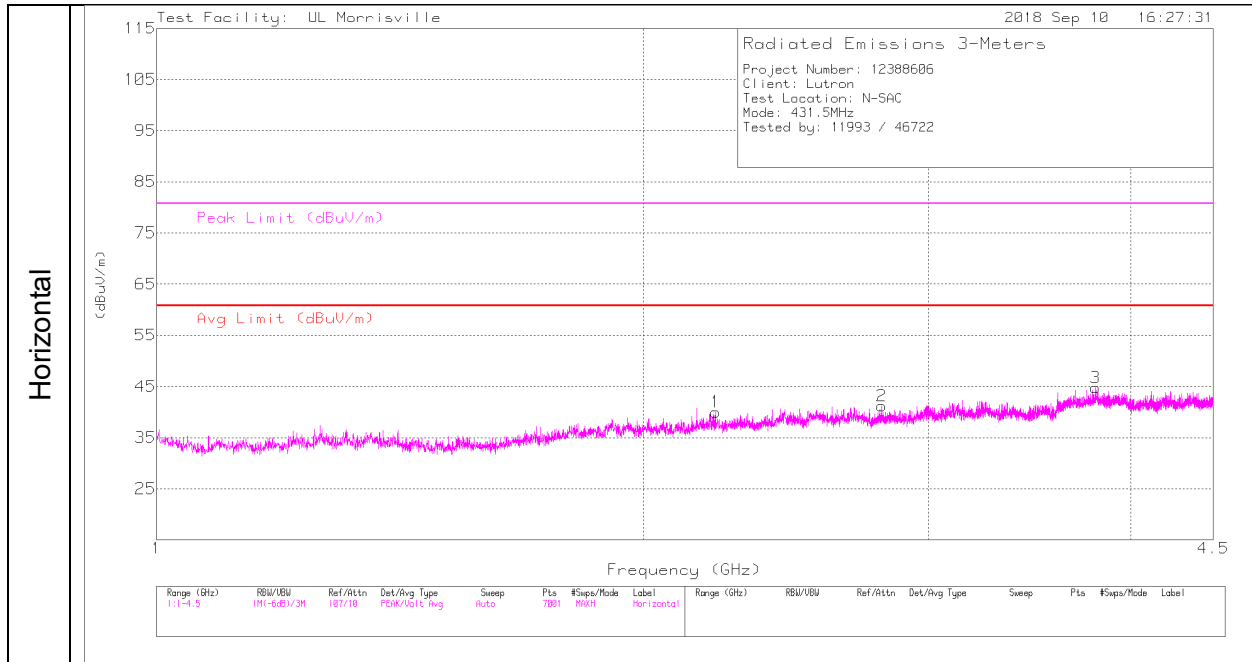
PK = Peak, Qp = Quasi-Peak

Note 1: Limit is QP Limit if frequency within a restricted band.

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

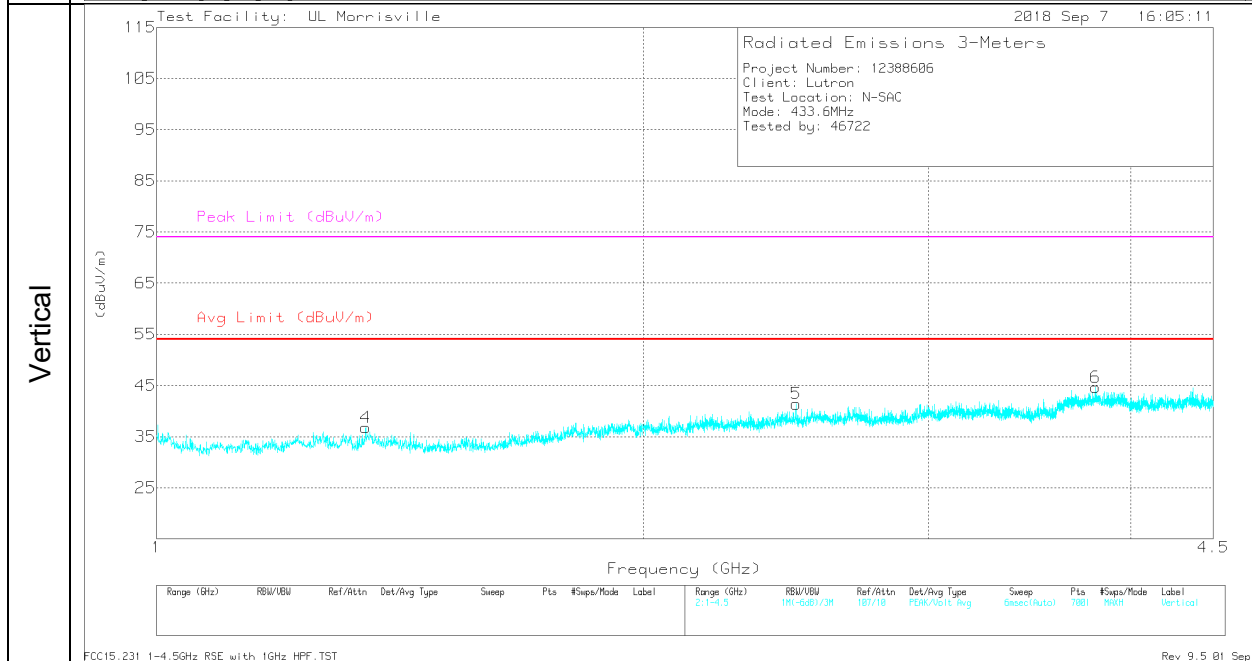
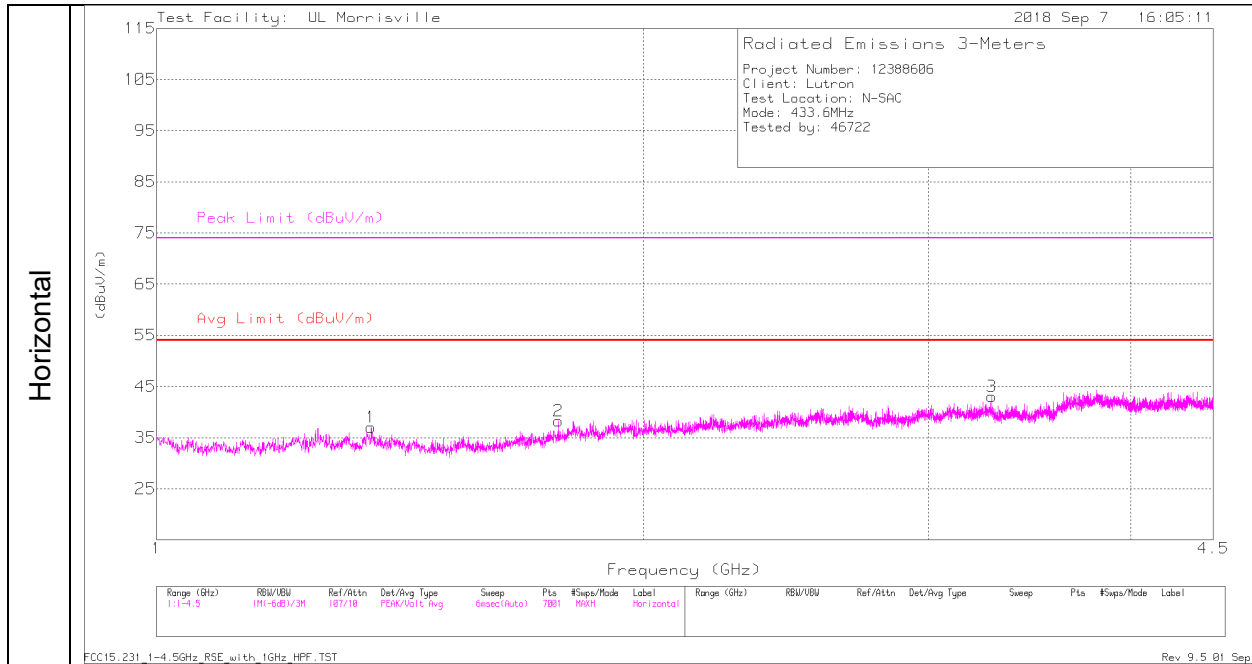
HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz
LOW CHANNEL (431.5MHz)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.217	34.78	Av	31.7	-35	.3	31.78	60.75	-28.97	-	-	203	240	H
	* ** 2.217	41.33	Pk	31.7	-35	.3	38.33	-	-	80.75	-42.42	203	240	H
2	* ** 2.807	33.87	Av	32.2	-34.2	.5	32.37	60.75	-28.38	-	-	289	396	H
	* ** 2.807	40.89	Pk	32.2	-34.2	.5	39.39	-	-	80.75	-41.36	289	396	H
3	* ** 3.808	35.48	Av	33.5	-33.2	.6	36.38	60.75	-24.37	-	-	360	377	H
	* ** 3.808	43.18	Pk	33.5	-33.2	.6	44.08	-	-	80.75	-36.67	360	377	H
4	* ** 2.709	34.41	Av	32.4	-34.2	.4	33.01	60.75	-27.74	-	-	84	302	V
	* ** 2.709	41.29	Pk	32.4	-34.2	.4	39.89	-	-	80.75	-40.86	84	302	V
5	* ** 3.803	36.4	Av	33.5	-33.2	.6	37.3	60.75	-23.45	-	-	135	156	V
	* ** 3.803	43.17	Pk	33.5	-33.2	.6	44.07	-	-	80.75	-36.68	135	156	V
6	* ** 4.06	34.55	Av	33.5	-33.3	.5	35.25	60.75	-25.5	-	-	313	390	V
	* ** 4.06	41.76	Pk	33.5	-33.3	.5	42.46	-	-	80.75	-38.29	313	390	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 Av - Average detection

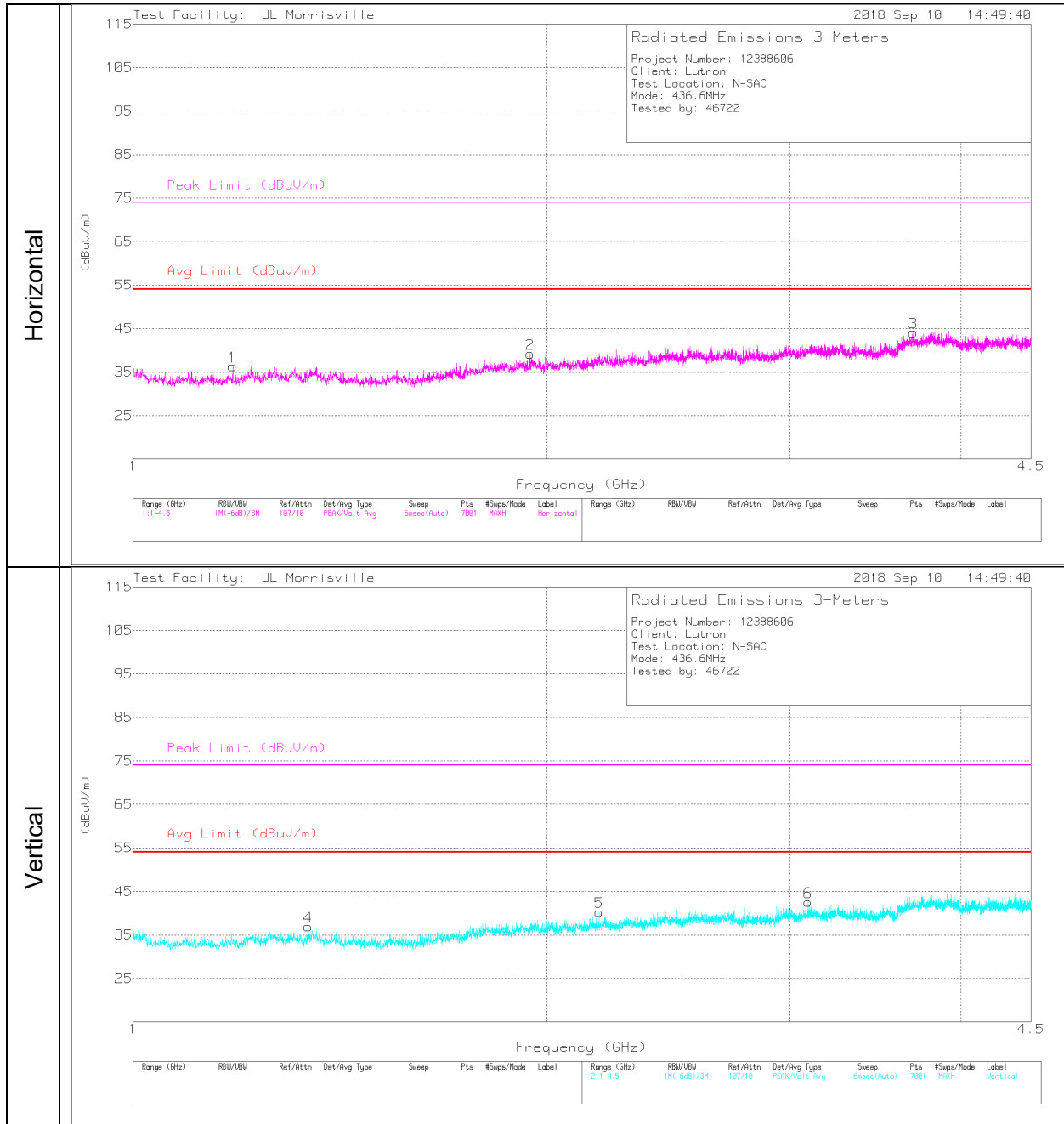
MID CHANNEL (433.6MHz)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 AF (dB/m)	Amp/Cbl/Fitr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.359	44.79	Pk	29.3	-36.8	.5	37.79	-	-	74	-36.21	150	274	H
	* 1.359	37.28	Av	29.3	-36.8	.5	30.28	54	-23.72	-	-	150	274	H
2	1.772	43.86	Pk	29.8	-35.9	.5	38.26	-	-	-	-	0-360	299	H
3	3.283	43.22	Pk	32.9	-33.6	.5	43.02	-	-	-	-	0-360	199	H
4	* ** 1.346	44.2	Pk	29.3	-36.8	.5	37.2	-	-	74	-36.8	5	127	V
	* ** 1.346	36.84	Av	29.3	-36.8	.5	29.84	54	-24.16	-	-	5	127	V
5	* ** 2.486	43.55	Pk	32.4	-34.6	.4	41.75	-	-	74	-32.25	272	122	V
	* ** 2.486	36.15	Av	32.4	-34.6	.4	34.35	54	-19.65	-	-	272	122	V
6	* 3.806	45.1	Pk	33.5	-33.2	.6	46	-	-	74	-28	124	312	V
	* 3.806	37.37	Av	33.5	-33.2	.6	38.27	54	-15.73	-	-	124	312	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 Av - Average detection

HIGHCHANNEL (436.6MHz)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 AF (dB/m)	Amp/Cbl/Fitr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.181	44.66	Pk	28.2	-37.1	.6	36.36	-	-	74	-37.64	230	293	H
	* 1.181	37.56	Av	28.2	-37.1	.6	29.26	54	-24.74	-	-	230	293	H
2	1.945	43.09	Pk	31.1	-35.4	.4	39.19	-	-	-	-	0-360	299	H
3	*** 3.692	44.42	Pk	33.2	-33.2	.5	44.92	-	-	74	-29.08	42	371	H
	*** 3.692	36.99	Av	33.2	-33.2	.5	37.49	54	-16.51	-	-	42	371	H
4	*** 1.342	44.37	Pk	29.3	-36.8	.4	37.27	-	-	74	-36.73	308	240	V
	*** 1.342	36.91	Av	29.3	-36.8	.4	29.81	54	-24.19	-	-	308	240	V
5	2.183	43.48	Pk	31.5	-35.1	.4	40.28	-	-	-	-	0-360	302	V
6	3.097	42.99	Pk	32.9	-33.8	.5	42.59	-	-	-	-	0-360	302	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

Av - Average detection

9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207 (a)
IC RSS-GEN, Section 8.8

Frequency of emission (MHz)	Conducted Limit (dB μ 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.

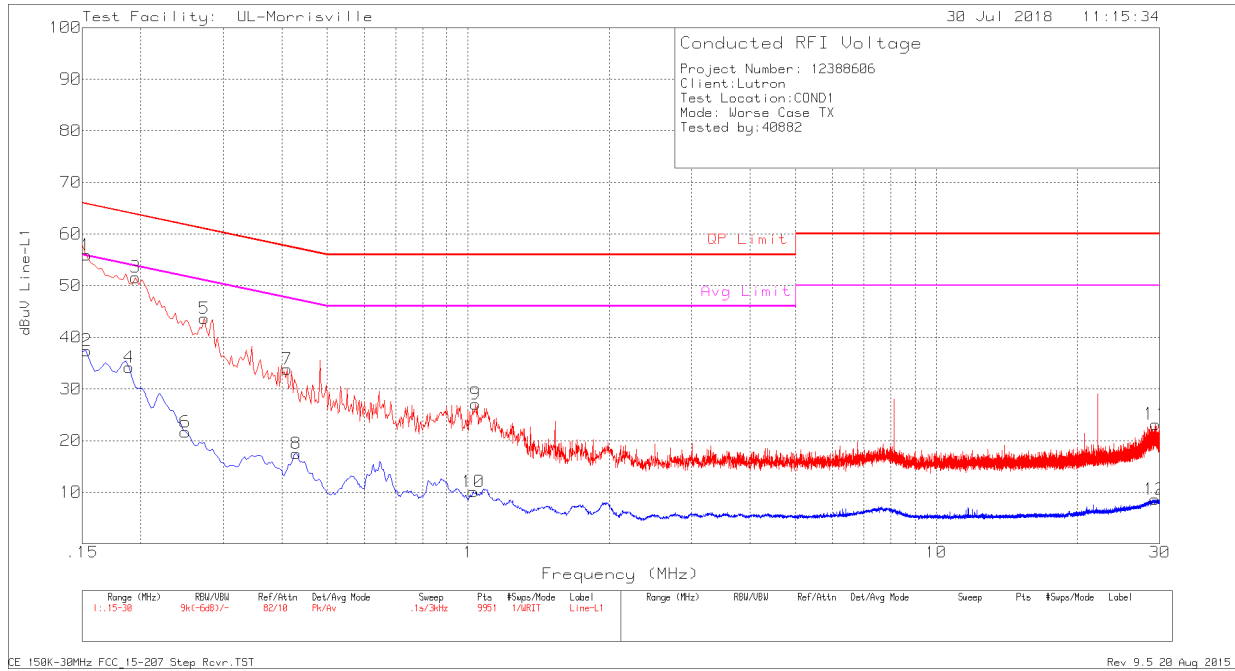
TEST PROCEDURE

ANSI C63.10

RESULTS

No non-compliance noted:

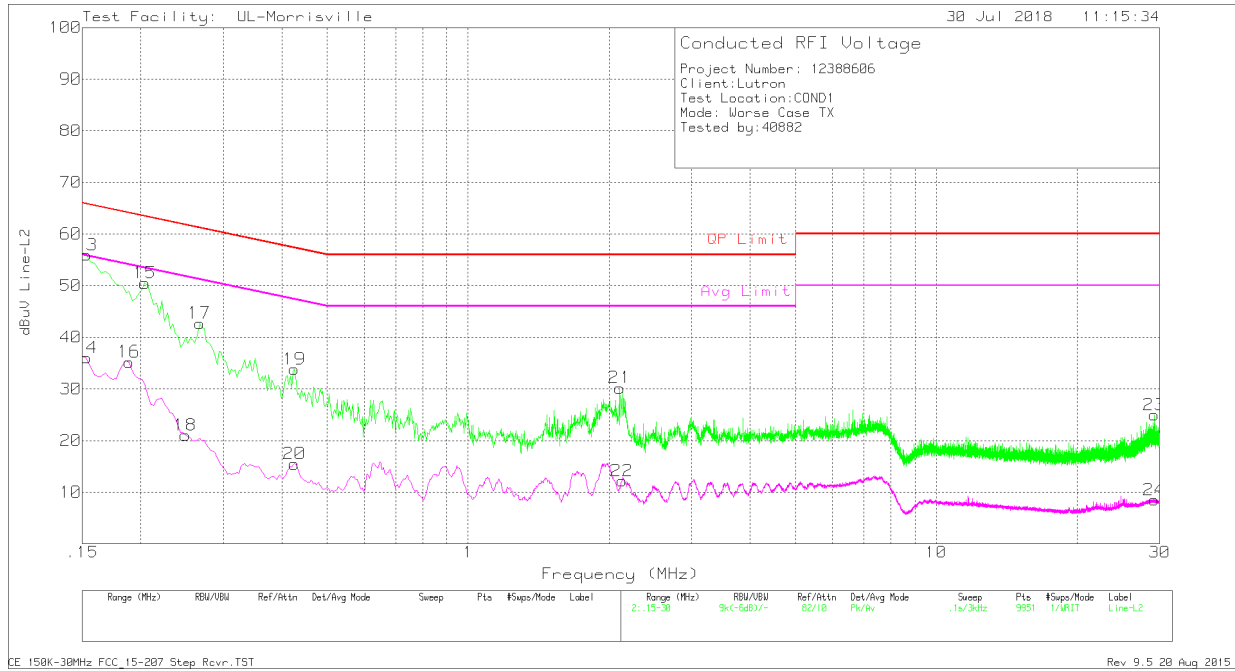
LINE 1 RESULTS



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	45.76	Pk	.2	10	55.96	65.84	-9.88	-	-
2	.153	27.23	Av	.2	10	37.43	-	-	55.84	-18.41
3	.195	41.39	Pk	.2	10	51.59	63.82	-12.23	-	-
4	.189	23.98	Av	.2	10	34.18	-	-	54.08	-19.9
5	.273	33.52	Pk	.1	10	43.62	61.03	-17.41	-	-
6	.249	11.53	Av	.1	10	21.63	-	-	51.79	-30.16
7	.411	23.7	Pk	.1	10	33.8	57.63	-23.83	-	-
8	.429	7.38	Av	.1	10	17.48	-	-	47.27	-29.79
9	1.038	17.12	Pk	0	10	27.12	56	-28.88	-	-
10	1.026	.11	Av	0	10	10.11	-	-	46	-35.89
11	29.364	12.18	Pk	.3	10.7	23.18	60	-36.82	-	-
12	29.31	-2.35	Av	.3	10.7	8.65	-	-	50	-41.35

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)
13	.153	45.71	Pk	.2	10	55.91	65.84	-9.93	-	-
14	.153	25.85	Av	.2	10	36.05	-	-	55.84	-19.79
15	.204	40.39	Pk	.1	10	50.49	63.45	-12.96	-	-
16	.189	25.03	Av	.2	10	35.23	-	-	54.08	-18.85
17	.267	32.63	Pk	.1	10	42.73	61.21	-18.48	-	-
18	.249	10.96	Av	.1	10	21.06	-	-	51.79	-30.73
19	.426	23.69	Pk	.1	10	33.79	57.33	-23.54	-	-
20	.426	5.36	Av	.1	10	15.46	-	-	47.33	-31.87
21	2.109	20.1	Pk	0	10.1	30.2	56	-25.8	-	-
22	2.13	2.11	Av	0	10.1	12.21	-	-	46	-33.79
23	29.205	13.96	Pk	.3	10.7	24.96	60	-35.04	-	-
24	29.205	-2.47	Av	.3	10.7	8.53	-	-	50	-41.47

Pk - Peak detector
 Av - Average detection

10. SETUP PHOTOS

Refer to Document R12388606-EP1 for Setup photos.

END OF REPORT