



**BEC INCORPORATED**

**CERTIFICATION APPLICATION TEST REPORT**

**TEST STANDARDS:**

**FCC Part 15 Subpart C, ISED RSS-Gen, ISED RSS-247  
DTS Intentional Radiator**

**Lutron Model XXX-MWCL  
LED Lighting Controller with BLE Radio**

**FCC ID: JPZ0155  
ISED ID: 2851A-JPZ0155**

**REPORT BEC-2328-02**

**TEST DATES: 07/16/2024 – 08/01/2024**

**CUSTOMER:**

**Lutron Electronics Company Incorporated  
7200 Suter Road  
Coopersburg, PA 18036**

**PREPARED BY:**

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## Revision History

Revision #	Description of Changes	Date of Changes	Date Released
0	Test Report Initial Release	N/A	08/15/2024
1	Added Antenna Conducted Test Cable to Appendix A	09/12/2024	09/12/2024
2	Edited the Appendix A to reflect the current correct Calibration Date and Due Date for Cable BEC-962	9/27/2024	09/27/2024
3	Corrected the RSS-247 from Issue 2 to Issue 3	9/30/2024	09/30/2024



## 1.0 Administrative Information

### 1.1 Project Details

<b>Project Number</b>	BEC-2328	
<b>EUT Manufacturer</b>	Lutron Electronics	
<b>EUT Model Number</b>	RRL-MWCL	
<b>EUT Description</b>	LED Lighting Controller with BLE Radio	
<b>EUT Sample Types</b>	Antenna Conducted Test Sample	Radiated Emissions Test Sample
<b>EUT Sample Numbers</b>	2328-01	2328-02
<b>EUT Serial Numbers</b>	02F257C5	02F257C4
<b>Power Supply Manufacturer</b>	Lutron Electronics	
<b>Power Supply Model Number</b>	LU-PH3-A	
<b>Power Supply Serial Number</b>	04 184827 07320 6 MC 1660	
<b>Power Supply Sample Number</b>	2328-03	
<b>FCC ID</b>	JPZ0155	
<b>ISED ID</b>	2851A-JPZ0155	
<b>Frequency of Operation</b>	2400 – 2480 MHz	
<b>Frequencies Tested (1 Mbps)</b>	Low (2402 MHz), Middle (2440 MHz), High (2480 MHz)	
<b>Antenna Gain</b>	+ 4.0 dBi / + 1.85 dBd	
<b>Antenna Type</b>	Planar Inverted-F PCB Trace Antenna (PIFA)	
<b>Modulation</b>	GFSK	
<b>FCC Classification</b>	Digital Transmission System (DTS)	
<b>Date Samples Received</b>	07/02/2024	
<b>EUT Firmware Version</b>	2.005.004	
<b>Sample Types</b>	Production Units Suitable for Test	
<b>Applicable FCC Rules</b>	FCC Rules Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System	
<b>Applicable ISED Rules</b>	RSS-Gen: General Requirements for Compliance of Radio Apparatus & RSS-247: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices	



## 1.2 Preface

This report documents product testing conducted to verify compliance of the specified EUT with applicable standards and requirements as identified herein. EUT, test instrument configurations, test procedures, and recorded data are generally described in this report. The reader is referred to the applicable test standards for detailed procedures. The following table summarizes the test results obtained during this evaluation.

## 1.3 Laboratory and Customer Information

<b>Test Laboratory Location</b>	BEC Incorporated 970 East High Street Pottstown, PA 19464
<b>BEC Test Personnel</b>	JR Fanella / Steve Fanella
<b>BEC Laboratory Number FCC Registration</b>	US1118
<b>BEC Laboratory Number ISED Registration</b>	7342A-1
<b>Test Performed For</b>	Lutron Electronics Company Incorporated 7200 Suter Road Coopersburg, PA 18036
<b>Customer Technical Contacts</b>	Keith Kennedy
<b>Customer Reference Number</b>	PO # 5332239



## 1.4 Measurement Uncertainty

Measurement	Measurement Distance	Frequency Range	Measurement Limit	Expanded Uncertainty
Radiated Disturbance	3 Meter	30 MHz – 1 GHz	Class B	4.63
Conducted Disturbance AC Mains	N/A	150 kHz – 30 MHz	Class A or B	2.69

No adjustments to measured data presented in this report are required because all values of uncertainty are less than the CISPR 16-4-2:2018 recommendations. These uncertainties have a coverage factor of  $k = 2$ , which yields approximately a 95% level of confidence for the near-normal distribution typical of most measurement results.

FCC Registered Test Site Number: US1118  
 ISED Registered Test Site Number: 7342A-1

Test Measurement	ETSI TR 100 028 and CISPR 16-4-2 Limits	BEC Value
Radio Frequency	$\pm 0.5$ ppm	$\pm 0.027$ ppm
RF Power, Conducted	$\pm 1.5$ dB	$\pm 1.45$ dB
Conducted Spurious Emission of Transmitter, Valid up to 6 GHz	$\pm 3$ dB	$\pm 0.9$ dB
Radiated Emission of Transmitter, Valid up to 6 GHz	$\pm 5.2$ dB	$\pm 4.87$ dB
Radiated Emission of Receiver, Valid up to 6 GHz	$\pm 5.2$ dB	$\pm 4.87$ dB
Radiated Emission of Transmitter, Valid up to 18 GHz	$\pm 5.5$ dB	$\pm 4.90$ dB
Radiated Emission of Receiver, Valid up to 18 GHz	$\pm 5.5$ dB	$\pm 4.90$ dB
Occupied Bandwidth	$\pm 5$ %	$\pm 2$ %
Temperature	$\pm 2.5$ °C	$\pm 0.5$ °C
Humidity	$\pm 10$ %	$\pm 2.5$ %

These uncertainties have a coverage factor of  $k = 1.96$  or  $k = 2$ , (which provide confidence levels of respectively 95 % and 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Principles for the calculation of measurement uncertainty are contained in ETSI TR 100 028 [i.3], in particular in annex D of ETSI TR 100 028-2 [i.3].



## 1.5 Test Result Summary Table

The Lutron Model RRL-MWCL LED Lighting Controller was tested and found to be compliant to the sections of the FCC Part 15 Subpart C and ISED standards listed below:

Report Section	FCC Part 15, Subpart C	RSS-Gen	RSS-247	Test Description	Result
<a href="#">4.1</a>	15.203	Annex A 10(g)		Antenna Requirement	<b>PASS</b>
<a href="#">4.2</a>	15.204	8.3		External RF power amplifiers and antenna modifications	<b>PASS</b>
<a href="#">4.3</a>	ANSI C63.10, Section 11.6			Duty Cycle	<b>Measured</b>
<a href="#">4.4</a>	15.247(d)		5.5	DTS Emissions in non-restricted frequency Bands 30 MHz to 25 GHz Conducted Spurious Emission	<b>PASS</b>
<a href="#">4.5</a>	15.205, 15.209 15.35(b)	8.1, 8.9, 8.10	3.3	DTS Emissions in restricted frequency Bands 30 MHz to 25 GHz Radiated Spurious Emission	<b>PASS</b>
<a href="#">4.6</a>	15.247(a)(2)		5.2 (a)	6 dB Occupied Bandwidth	<b>PASS</b>
<a href="#">4.7</a>	2.1049(h)	6.7		99% Occupied Bandwidth	<b>PASS</b>
<a href="#">4.8</a>	15.247(b)(3)		5.4 (d)	Maximum Conducted Output Power and EIRP	<b>PASS</b>
<a href="#">4.9</a>	15.247(e)		5.2 (b)	Antenna Port, Power Spectral Density	<b>PASS</b>
<a href="#">4.10</a>	15.247(d)		5.5	Band Edge Measurement	<b>PASS</b>
<a href="#">4.11</a>	15.207	8.8		AC Mains Conducted Emissions	<b>PASS</b>

Note: This report is for the Lutron Model XXX-MWCL which represents either the Model RRL-MWCL or Model HWL-MWCL. The Lutron model RRL-MWCL that was tested also covers the model HWL-MWCL. The only differences between the models are that they are marked differently for marketing purposes. They are identical in construction.





## **1.6 Condition of Received Sample**

An evaluation of the EUT was conducted in order to verify test subject identity and condition and to ensure suitability for testing. No evidence of physical damage was noted. The test item condition was deemed acceptable for the performance of the requested test services.

## **1.7 Climatic Environment**

The following were the general environmental conditions inside the laboratory during testing:

Temperature:  $22^{\circ}\text{C} \pm 5^{\circ}\text{C}$

Humidity:  $50\% \pm 20\%$

Barometric Pressure:  $1010 - 1050\text{ mb} \pm 20\%$

## **1.8 Test Equipment**

All test equipment is checked to manufacturer's specifications and, when applicable, have current N.I.S.T. traceable, ISO 9002 conforming certificates of calibration. Test equipment used for the tests described herein is listed in Appendix A.



## **2.0 Equipment Under Test**

Unless otherwise noted in the individual test results sections, testing was performed on the EUT as follows.

### **2.1 EUT Description**

The Lutron Model RRL-MWCL is a LED Lighting Controller. The controller is powered by a Lutron Model LU-PH3-A AC to DC power supply. This report is for the Lutron Model XXX-MWCL which represents either the Model RRL-MWCL or Model HWL-MWCL. The only differences between the models are that they are marked differently for marketing purposes. They are identical in construction.

### **2.2 Product Category**

FCC Part 15, Subpart C (Section 15.247), ISED RSS-Gen, ISED RSS-247

### **2.3 Product Classification**

Intentional Radiator Testing Requirements, DTS Operation within the band of 2400 – 2483.5 MHz.

### **2.4 Test Configuration**

The Lutron Model RRL-MWCL LED Lighting Controller was powered at 24 V DC by a Lutron Model LU-PH3-A AC to DC power supply with an input voltage of 120 VAC / 60 Hz. The Lutron Model RRL-MWCL LED Lighting Controller Sample # 2328-01 with Sample # 2328-03 Supply was tested for all antenna conducted measurements. The Lutron Model RRL-MWCL LED Lighting Controller Sample # 2328-02 with Sample # 2328-03 Supply was tested for all conducted emission tests. The Lutron Model RRL-MWCL LED Lighting Controller Sample # 2328-02 with Sample # 2328-03 Supply was tested for all radiated emissions tests. The radio test software allowed the tester to choose the BLE transmissions of low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for the 1 Mbps Data Rate. The transmission was tested in maximum output power with the choice of transmitting with GFSK Modulation or without Modulation.

### **2.5 Test Configuration Rationale**

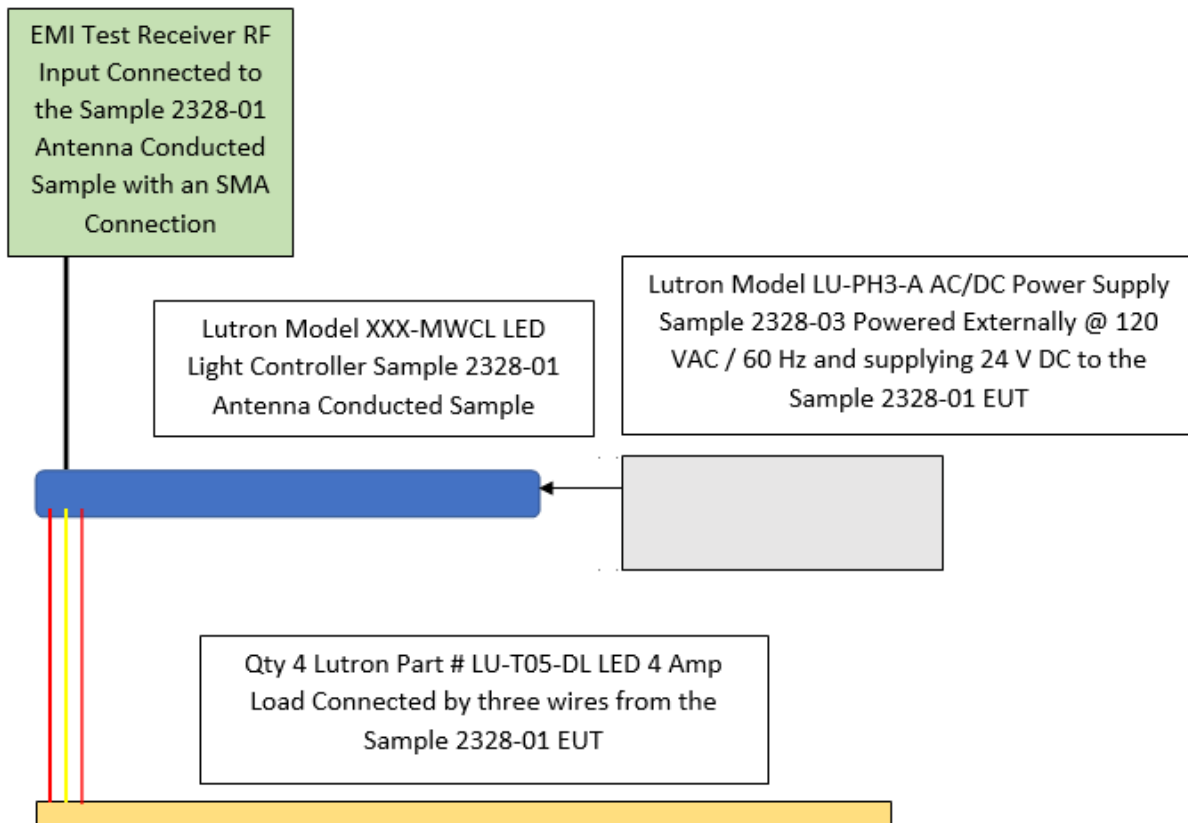
The modified radio of the Lutron Model RRL-MWCL LED Lighting Controller allows direct access to the output of the radio without a transmission antenna. The unmodified unit is factory produced with modified software for EMI test purposes.



## 2.6 Test Configuration Diagrams

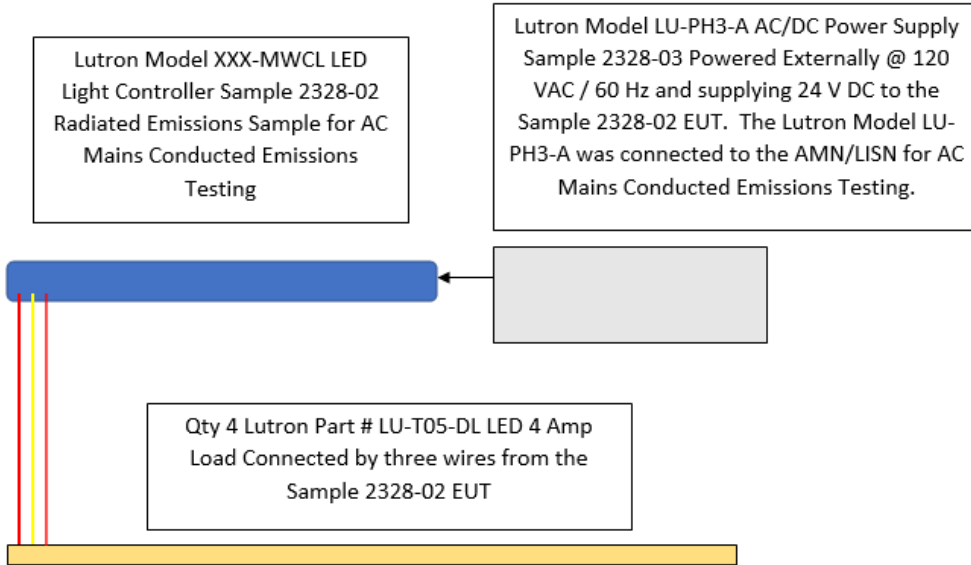
Block diagrams of the EUT configuration showing interconnection cables are illustrated below. The drawing shows the physical hardware layout used for the tests along with I/O cables and AC power distribution.

Antenna Conducted Test Configuration (modified with SMA connector in place of antenna)

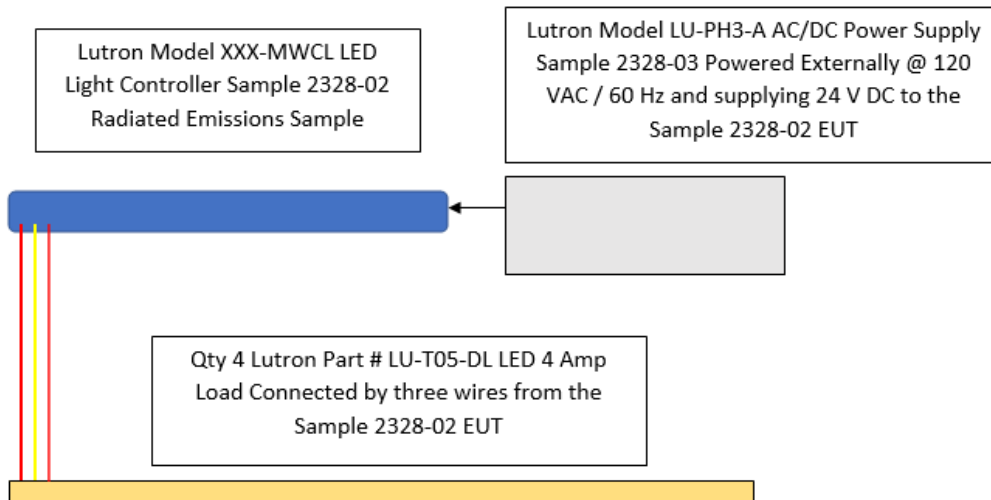




### Conducted Emission AC Mains Test Configuration (un-modified EUT)



### Radiated Emission Test Configuration (un-modified EUT)





## 2.7 EUT Information, Interconnection Cabling and Support Equipment

### EUT Hardware

Description	Manufacturer	Model	Serial Number	Sample Number
LED Lighting Controller Antenna Conducted Sample	Lutron Electronics	RRL-MWCL	02F257C5	2328-01
LED Lighting Controller Radiated Emissions Sample	Lutron Electronics	RRL-MWCL	02F257C4	2328-02
AC/DC Power Supply	Lutron Electronics	LU-PH3-A	04 184827 07320 6 MC 1660	2328-03

### Interconnection Cable List

Manufacturer	Model	Type	Shielding	Length	Description
Unknown	Unknown	Unknown	None	20 cm	Power Control Red Wire From RRL-MWCL to the LED Light Strip
Unknown	Unknown	Unknown	None	20 cm	Power Control Yellow Wire From RRL-MWCL to the LED Light Strip
Unknown	Unknown	Unknown	None	20 cm	Power Control Red/White Wire From RRL-MWCL to the LED Light Strip
Unknown	Unknown	Unknown	None	20 cm	Power Control Red and Black Wires From LU-PH3-A Supply to the Lutron RRL-MWCL Lighting Controller

### Support Equipment

Description	Manufacturer	Model	Serial Number
Qty 4-120 Piece LED Strip Light	Lutron Electronics	2835-192D-24V- YWDG-IP20	No Serial Number
Laptop Computer- Programming the EUT Radio Transmitter Software	Dell	Inspiron 15-3567	E4B4B16C-F475-4A3F- 9795-A06C5CB4AB43



## 2.8 Test Signals and Test Modulation

By design this product does not have an external Modulation input connector, therefore, normal operating modulation was used for all testing reported herein. The only test where modulation was not active was during testing of the Maximum Peak Power Output FCC Section 15.247(b) (3) (Section 4.6 of this report) to ensure that the un-modulated carrier was not higher than the modulated carrier.

The control unit in this product is a digital frequency transmitter. The EUT transmits to a discrete frequency on a specific channel. The Lutron Model RRL-MWCL LED Lighting Controller has 40 Channels available for 1 Mbps. The Channels and frequencies that can be transmitted by the EUT are as follows:

BLE Channels	Frequency (MHz)		BLE Channels	Frequency (MHz)
37	2402		17	2440
0	2404		18	2442
1	2406		19	2444
2	2408		20	2446
3	2410		21	2448
4	2412		22	2450
5	2414		23	2452
6	2416		24	2454
7	2418		25	2456
8	2420		26	2458
9	2422		27	2460
10	2424		28	2462
38	2426		29	2464
11	2428		30	2466
12	2430		31	2468
13	2432		32	2470
14	2434		33	2472
15	2436		34	2474
16	2438		35	2476
			36	2478
Low- 1 Mbps	2402 MHz		39	2480
Middle	2440 MHz			
High	2480 MHz			

For the required testing, the EUT was configured to transmit at low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT operates with a 1.1 MHz Operational Channel Bandwidth. The EUT has the option to be programmed to operate with maximum output power with GFSK modulation or with Constant Wave (CW) signal.



## **2.9 Antenna Gain**

The antenna gain was documented by Lutron at + 4.0 dBi or + 1.85 dBd.

## **2.10 Grounding**

The EUT ground is provide by the Lutron Model LU-PH3-A AC/DC Power Supply.

## **2.11 EUT Modifications**

An SMA connector was added to replace the antenna on the PCB of the Lutron Model RRL-MWCL LED Lighting Controller Antenna Conducted Test Sample 2328-01. No other modifications were done on any of the other samples.



## **3.0 Applicable Requirements, Methods, and Procedures**

### **3.1 Applicable Requirements**

The results of the measurement of the radio disturbance characteristics of the EUT described herein may be applied and where appropriate, provide a presumption of compliance to one or more of the following requirements or to other requirements at the discretion of the customer, regulatory agencies, or other entities.

#### **3.1.1 FCC Requirements**

Code of Federal Regulations: Title 47 – Telecommunication  
Chapter I - Federal Communications Commission  
Sub-chapter A – General  
Part 15 – Radio Frequency Devices  
Subpart C - Intentional Radiators  
15.247 Operation within the bands 902-928 MHz,  
2400-2483.5 MHz, and 5725-5850 MHz.

#### **3.1.2 Innovation, Science and Economic Development Canada (ISED)**

RSS-Gen Issue 5 March 2019 Amendment 1: General Requirements for Compliance of Radio Apparatus

RSS-247 Issue 3 August 2023: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

#### **3.1.3 Basic Test Methods and Test Procedures**

KDB Document 558074 D01 15.247 Meas Guidance v05r02, Guidance for Performing Compliance Measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under Section 15.247 of the FCC Rules.

ANSI C63.10-2020, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

#### **3.1.4 Deviations or Exclusions from the Requirements**

No deviations or exclusions were made.





## 4.0 Test Results

### 4.1 Antenna Requirement (47 CFR 15.203)(RSS-GEN ANNEX A (10)(g))

The antenna used by the Lutron Model RRL-MWCL LED Lighting Controller is a Planar Inverted-F PCB Trace Antenna (PIFA). There are no detachable parts of the antenna. The antenna is not replaceable, nor changeable, and therefore complies with the requirements of this section.

### 4.2 External RF power amps/antenna modifications (47 CFR 15.204)(RSS-GEN 8.3)

There are no RF power amplifier kits available to be used with the Lutron Model RRL-MWCL LED Lighting Controller. There are no detachable parts of the antenna. The antenna is not replaceable, nor changeable, and therefore complies with the requirements of this section.

### 4.3 Duty Cycle of the DTS Fundamental Transmission

The duty cycle of the DTS transmission shall be greater than or equal to 98%. This ensures that the various emissions measured for this certification test will be made with the transmitter fully active. Duty cycles less than 98% can be used and a duty cycle correction factor can be calculated to reduce the peak level of the emission for radiated emission tests. The procedure of ANSI C63.10, Section 11.6 can be used to evaluate the duty cycle of this device.

#### Spectrum Analyzer Settings

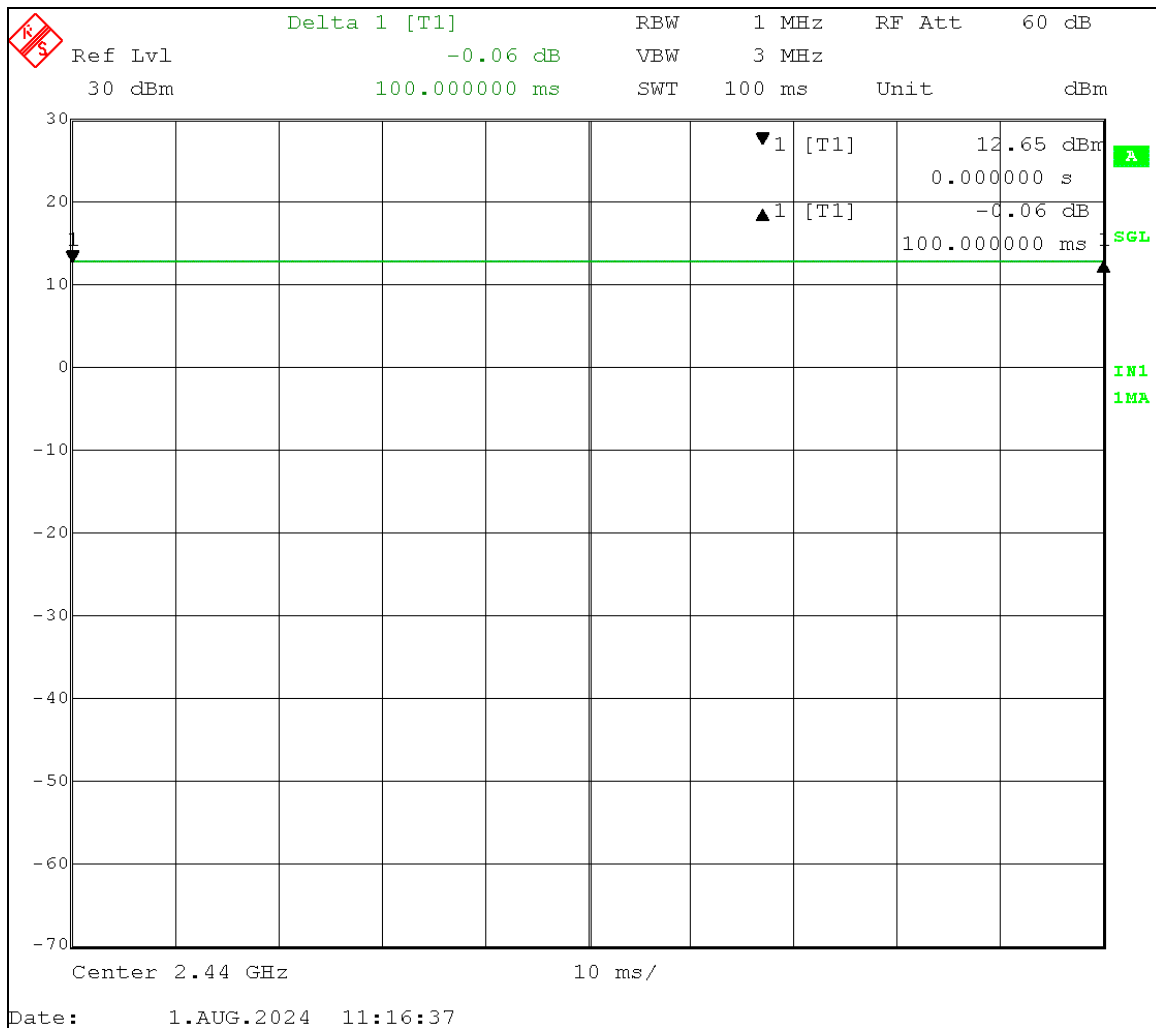
OBW	1.1	MHz
RBW	1	MHz
VBW	3	MHz
Span	Zero	MHz
Sweep Time	100	us
Attenuation	60	dB
Reference Level	30	dBm



### 4.3.1 Duty Cycle Measurement Results (08/01/2024)

BEC Incorporated tested the duty cycle of the BLE Radio from the Lutron Model RRL-MWCL LED Lighting Controller. Transmission was set to maximum output at middle channel of 2440 MHz with GFSK modulation at 1 Mbps using the radio control test software. The Duty Cycle of the transmitter was measured to be 100% and no duty cycle correction factor was required to be calculated.

#### BLE Transmission at 2440 MHz using 1 Mbps Data Rate





## 4.4 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands (FCC Section 15.247(d), RSS-247 Sec.5)

### 4.4.1 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands Test Procedure

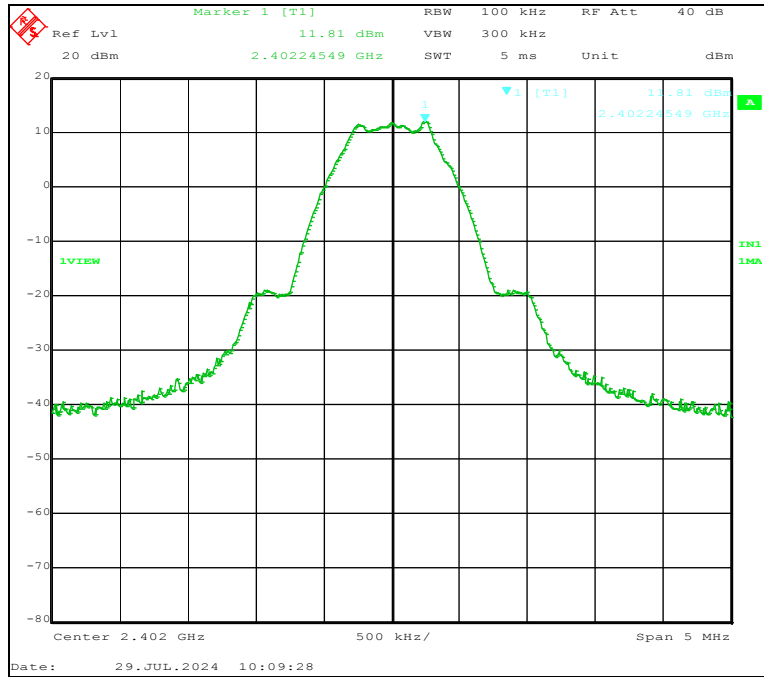
Measurements of the emissions in non-restricted frequency bands were made at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The procedure for the test is ANSI C63.10, Section 11.11. The frequency spectrum from 30 MHz to 25 GHz was divided into three bands: 30 - 1000 MHz, 1 – 10 GHz and 10 – 25 GHz. Each of the three fundamental test frequencies was measured for the reference value to determine the -20 dBc value.

#### Spectrum Analyzer Settings

Emission Level: BLE Radio, GFSK modulation			
Spectrum Analyzer Settings			ANSI C63.10 requirement
Span	Varies	-	Encompass spectrum divided into bands
RBW	100 kHz		47 CFR Part 15.247 (d)
VBW	300 kHz		$\geq 3 \times \text{RBW}$
Sweep	Varies		Auto



#### 4.4.2 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands Reference Measurement Channel 37, 1 Mbps (07/29/2024)

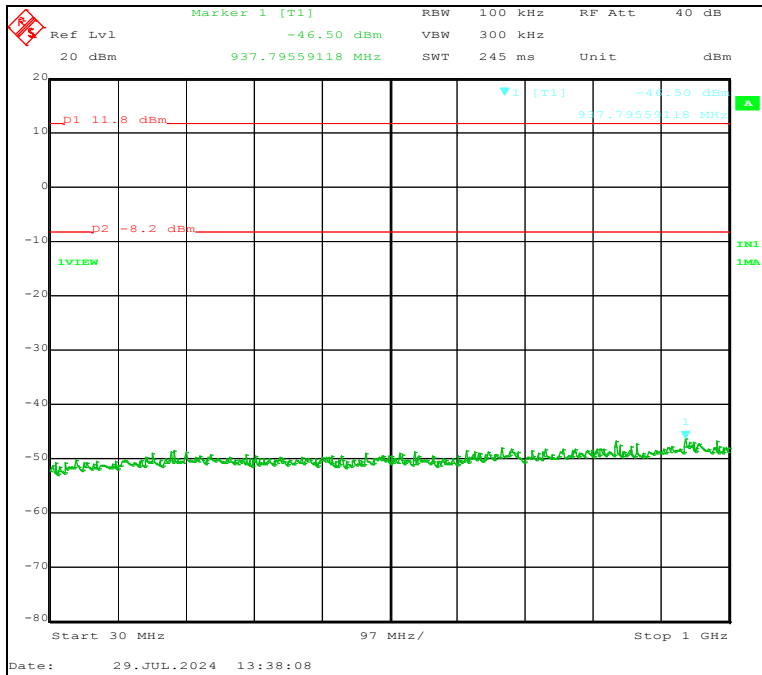


The peak level of 11.8 dBm is the maximum peak output of the Lutron Model RRL-MWCL LED Lighting Controller. The conducted spurious emissions from the antenna port must be 20 dB down from this peak. The resultant limit is therefore -8.2 dBm and is displayed on the plots below.

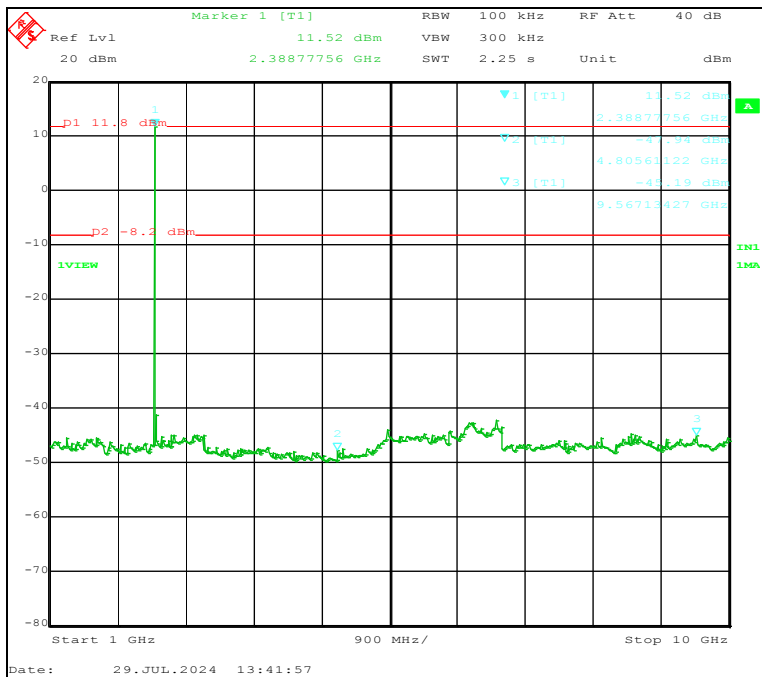


### 4.4.3 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands Channel 37, 1 Mbps Test Results (07/29/2024)

30 MHz – 1000 MHz

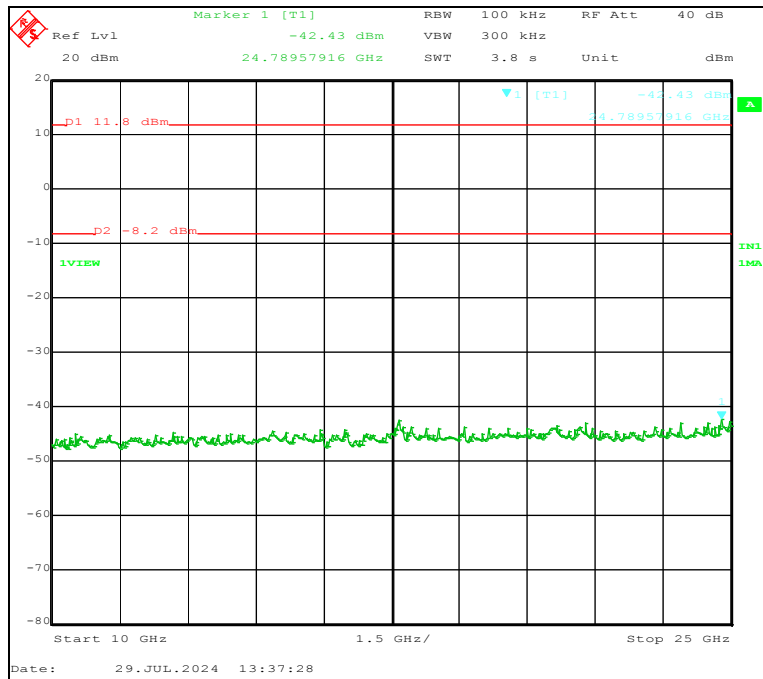


1 GHz – 10 GHz





### 10 GHz – 25 GHz

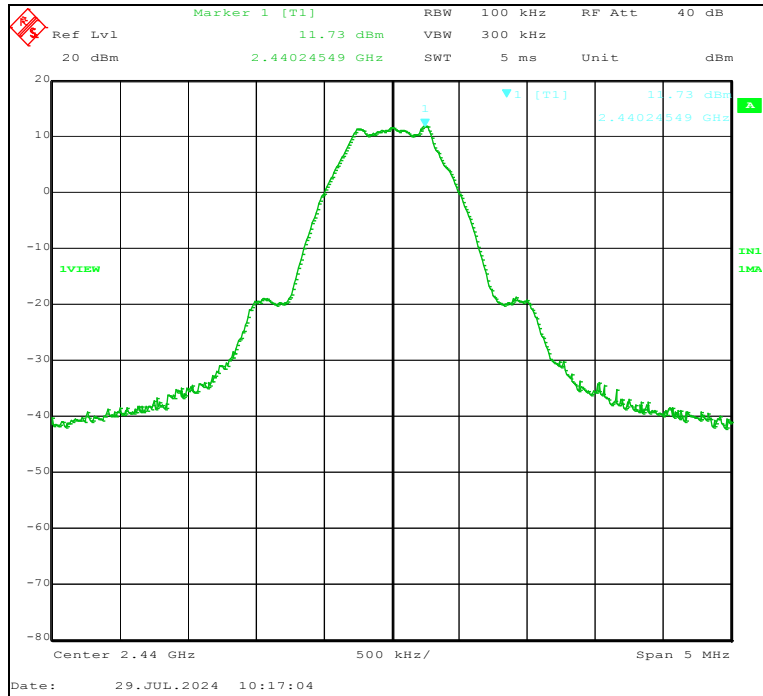


### Test Results of Highest Emissions: Channel 37, 1 Mbps (Frequency 2402 MHz)

Channel Frequency	Frequency	Peak	20 dB below Max Peak Reference	Margin	Result
MHz	MHz	dBm	dBc	dB	
2402	4805.611	-47.94	-8.20	-39.74	Pass
	9567.134	-45.19	-8.20	-36.99	Pass
	24789.579	-42.43	-8.20	-34.23	Pass



#### 4.4.4 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands Reference Measurement Channel 17, 1 Mbps (07/29/2024)

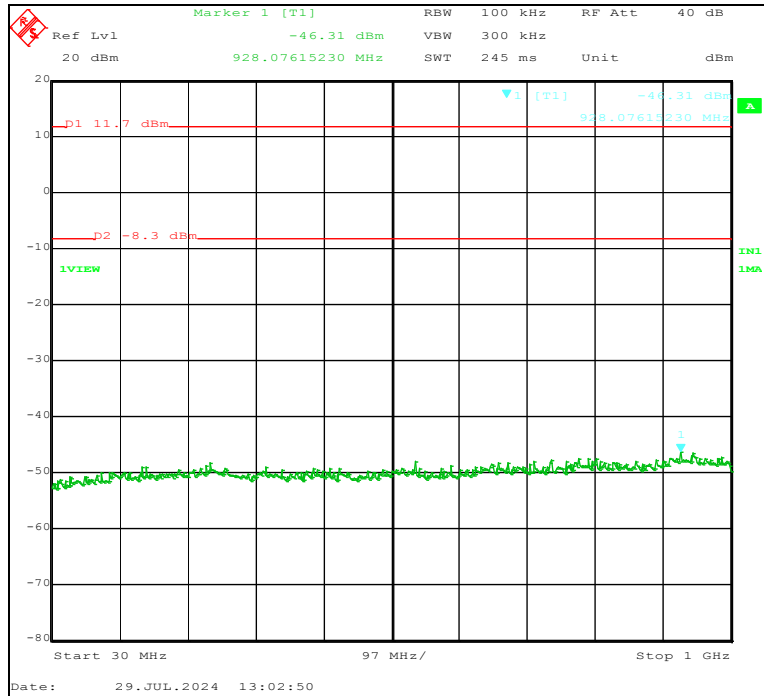


The peak level of 11.7 dBm is the maximum peak output of the Lutron Model RRL-MWCL LED Lighting Controller. The conducted spurious emissions from the antenna port must be 20 dB down from this peak. The resultant limit is therefore -8.3 dBm and is displayed on the plots below.

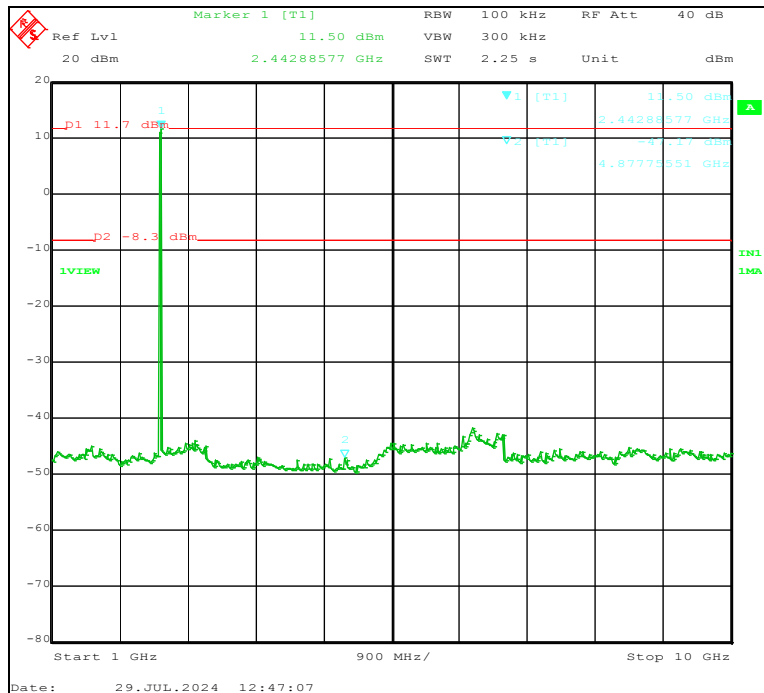


### 4.4.5 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands Channel 17, 1 Mbps Test Results (07/29/2024)

30 MHz – 1000 MHz



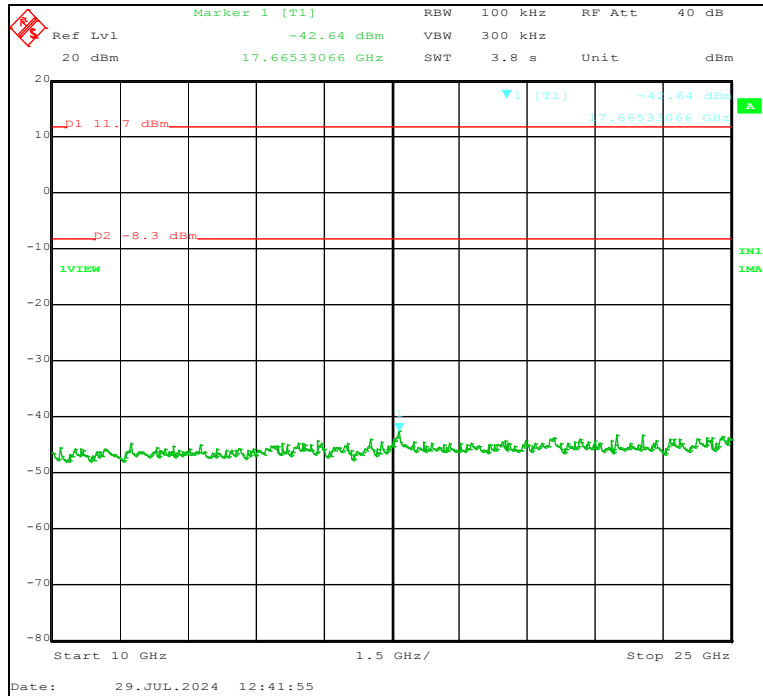
1 GHz – 10 GHz







### 10 GHz – 25 GHz

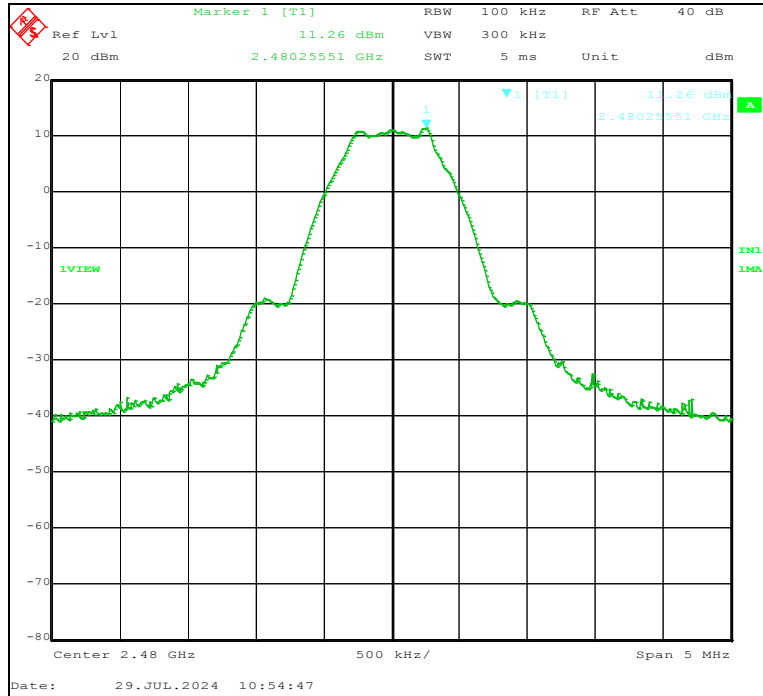


### Test Results Table Highest Emissions: Channel 17, 1 Mbps (2440 MHz)

Channel Frequency	Frequency	Peak	20 dB below Max Peak Reference	Margin	Result
MHz	MHz	dBm	dBc	dB	
2440	4877.756	-47.17	-8.30	-38.87	Pass
	17665.331	-42.64	-8.30	-34.34	Pass



#### 4.4.6 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands Reference Measurement Channel 39, 1 Mbps (07/29/2024)

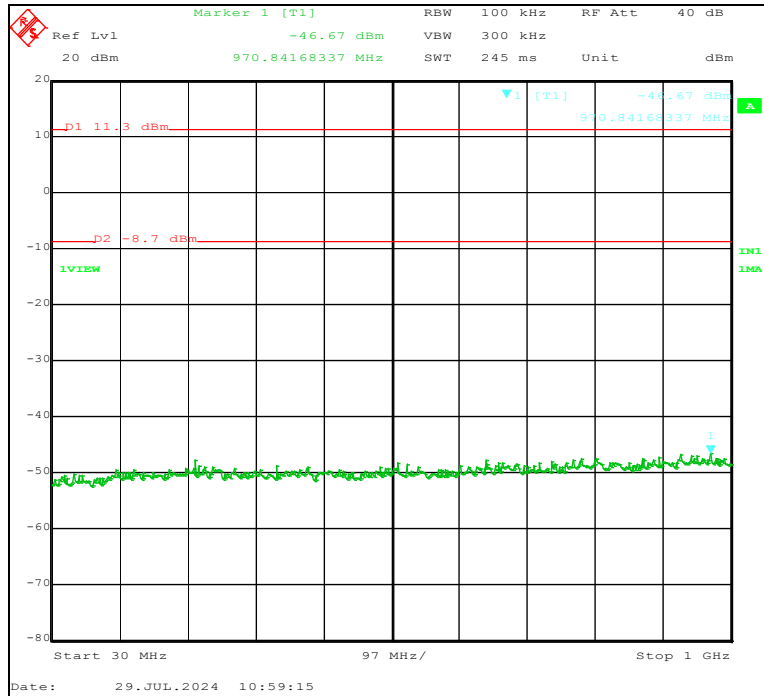


The peak level of 11.3 dBm is the maximum peak output of the Lutron Model RRL-MWCL LED Lighting Controller. The conducted spurious emissions from the antenna port must be 20 dB down from this peak. The resultant limit is therefore -8.7 dBm and is displayed on the plots below.

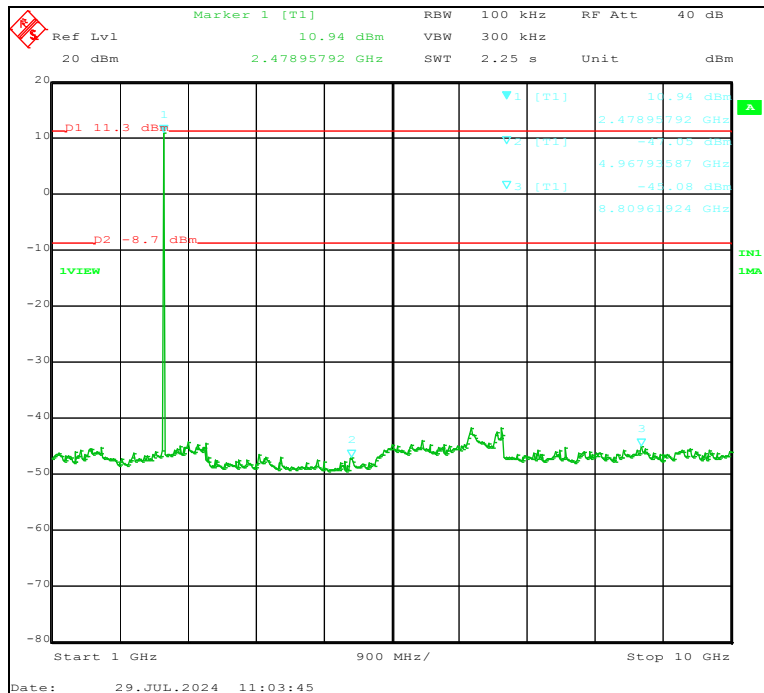


### 4.4.7 DTS Antenna Conducted Spurious Emissions in Non-restricted Frequency Bands Channel 39, 1 Mbps Test Results (07/29/2024)

30 MHz – 1000 MHz

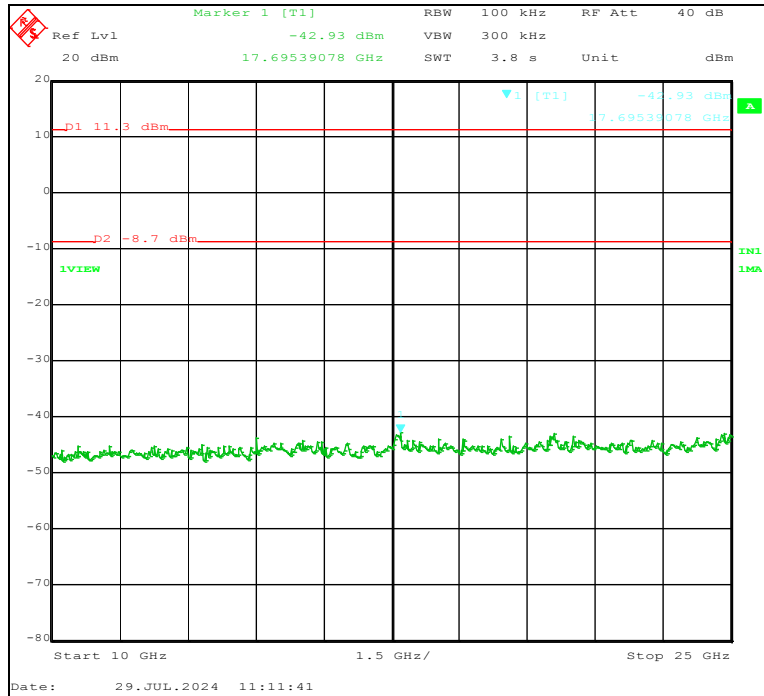


1 GHz – 10 GHz





### 10 GHz – 25 GHz



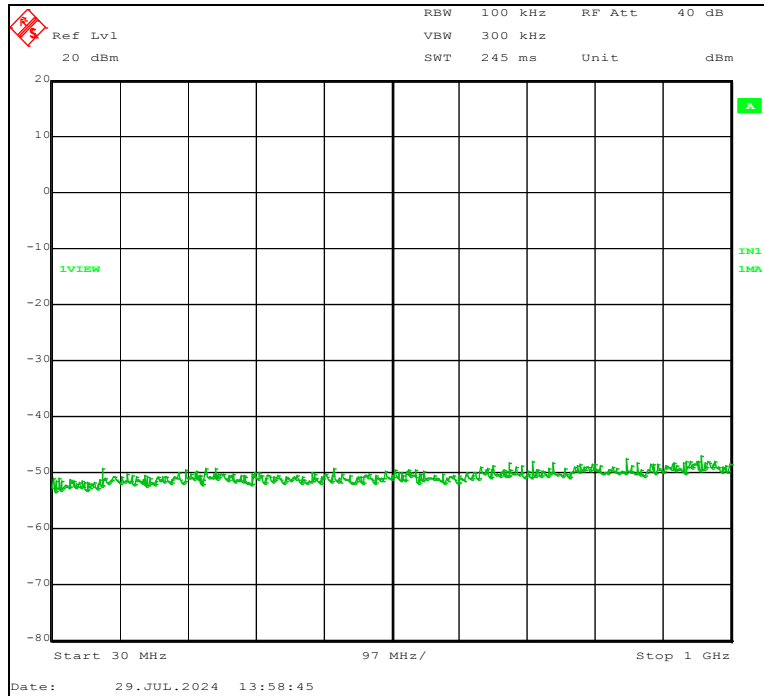
### Test Results of Highest Emissions: Channel 39, 1 Mbps (Frequency 2480 MHz)

Channel Frequency	Frequency	Peak	20 dB below Max Peak Reference	Margin	Result
MHz	MHz	dBm	dBc	dB	
2480	4967.936	-47.05	-8.70	-38.35	Pass
	8089.620	-45.08	-8.70	-36.38	Pass
	17695.391	-42.93	-8.70	-34.23	Pass

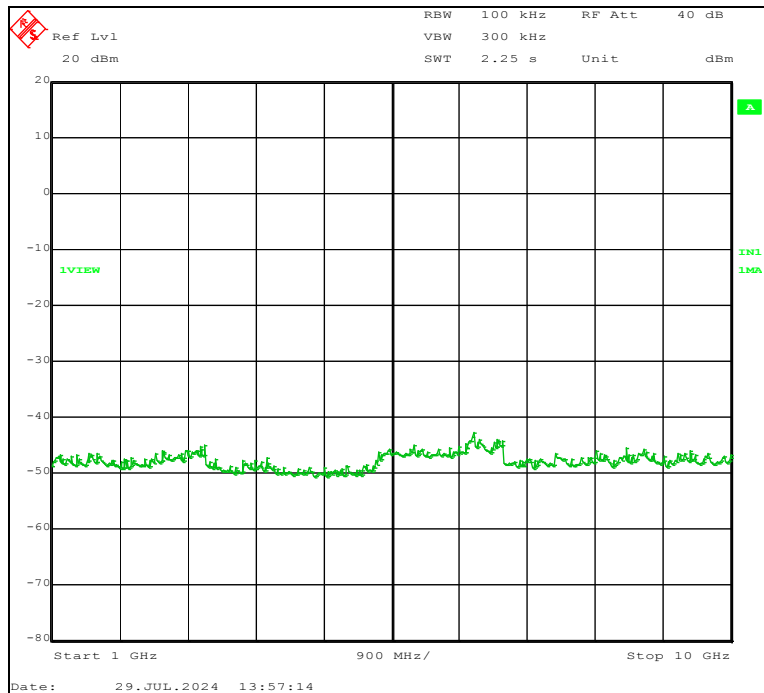


### 4.4.8 DTS Conducted Spurious Emissions in Non-restricted Frequency Bands Rx Mode Test Results (07/29/2024)

30 MHz – 1000 MHz

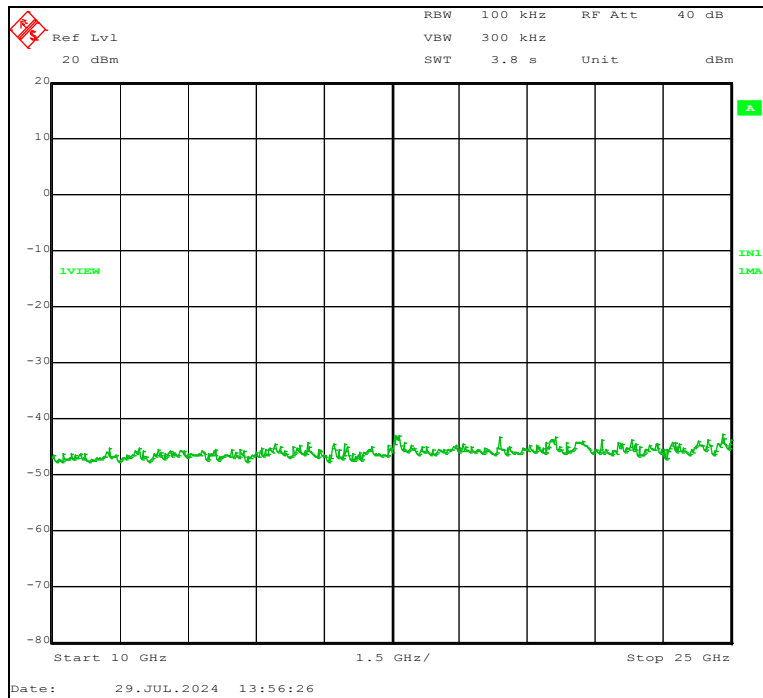


1 GHz – 10 GHz





### 10 GHz – 25 GHz



**Test Results:** The Antenna Conducted Spurious Emissions of the Lutron Model RRL-MWCL LED Lighting Controller, at Low, Middle and High Frequencies, are below the carrier 20 dBc limit and therefore compliant with the limits specified in FCC Section 15.247(d).



## **4.5 DTS Radiated Spurious Emissions in Non-restricted and Restricted Frequency Bands, 30 MHz – 25 GHz (47 CFR 15.205 & 15.209)(RSS-GEN 8.9 & 8.10)**

The emissions from the Lutron Model RRL-MWCL LED Lighting Controller, which fall in the restricted bands of operation and unrestricted bands of operation, detailed in this section, comply with the limits of 15.209. The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The EUT was also tested in the Rx Mode.

Measurement of the signals was performed with the EUT on a turntable and a variable height antenna mast at 3 meters distance. The signals residing in restricted bands of operation are indicated in the tables below.

### **4.5.1 Non-Restricted and Restricted Bands Test Facility**

#### **OATS**

The Open Area Test Site (OATS) is an all-weather facility with a wooden enclosure that contains a ground level 4-foot diameter turntable capable of rotating equipment 360 degrees. The enclosure is free of reflective metallic objects and extraneous electromagnetic signals. This non-metallic enclosure and the 3 meter and 10 meter test range existing outside the enclosure rest upon a protective insulating material, which in turn covers a flat, metal, continuous ground plane.

Instrumentation for remote control of the antenna mast, turntable, and other equipment are controlled by personnel indoors. The EUT and support peripherals required for EUT operation were placed on a table 80 cm high for tabletop equipment or directly on the turntable surface for floor standing equipment. The test site complies with the requirements of ANSI C63.4 and ANSI C63.10.

#### **SR#1**

The Semi-Anechoic Shielded Room (SR#1) is a ferrite and absorber lined chamber which houses a 5-foot diameter turntable capable of rotating equipment 360 degrees and antenna mast for Horizontal and Vertical polarity measurements. The enclosure is free of reflective metallic objects and extraneous electromagnetic signals. The 3 meter shielded enclosure has a raised computer floor with metal tile bottoms providing a continuous ground plane.

Instrumentation for remote control of the antenna mast, turntable, and other equipment are controlled by personnel outside the chamber. The EUT and support peripherals required for EUT operation were placed on a table 80 cm high for tabletop equipment or directly on the turntable surface for floor standing equipment.

The chamber complies with the requirements of ANSI C63.4 and ANSI C63.10.



## 4.5.2 Non-restricted and Restricted Bands Radiated Spurious Emissions Test Procedure

### Radiated Emissions 30 MHz – 40 GHz

The EMI receiver was set to quasi-peak mode for frequencies from 30 MHz to 1 GHz and the appropriate CISPR bandwidths were employed. The receiver was set to average mode for frequencies above 1 GHz with the appropriate CISPR bandwidths were employed.

Three orthogonal positions of the EUT were evaluated for maximum emissions. The position of the EUT, with the base of the trap placed on the horizontal surface of the 80-cm table, was determined to be the axis that produced the highest emissions.

Significant emissions found during the preliminary scans were maximized by rotating the turntable and varying the antenna height. Both horizontal and vertical antenna polarities were also investigated for suspect emissions. The signals are maximized and measured using the in house generated RADE or off the shelf TILE software. The support equipment and test item(s) were powered off in turn to determine the source of the emissions where appropriate.

Field strengths were calculated as follows:

Field Strength (dB $\mu$ V/m) = Meter Reading (dB $\mu$ V) + Antenna Factor (dB/m) + Cable Loss (dB) – Amplifier Gain (dB)

During the testing process, it was determined that the Y-axis was the worst-case orientation for the EUT. Therefore, all the tests were carried out with the EUT positioned in the Y-axis. The following tables are the highest emissions recorded and summarized. Restricted band signals are marked with an asterisk. Other spurious emissions are shown to demonstrate compliance of the EUT to 15.209 limits.

The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The EUT was also tested in the Rx Mode.





### 4.5.3 DTS Radiated Spurious Emissions in Non-restricted and Restricted Bands of Operation, 30 MHz – 1000 MHz Test Results (07/22/2024)

#### Low Channel 37 (2402 MHz) GFSK 1 Mbps

CONFIGURATION TESTED		EUT Orientation (Y Axis) Tx at Low Channel of 2402 MHz at 1 Mbps and Max Output Power (+13 dBm)									
Frequency	Corrected		Antenna Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC Part15.205/209 RSS-GEN/247				Result
	Peak Level	QP Level					Peak Limit	Peak Margin	QP Limit	QP Margin	
MHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
64.082	16.08	15.68	H	116	230	-12.88	60.00	-43.92	40.00	-24.32	Pass
* 127.085	22.93	22.00	H	131	100	-6.46	63.52	-40.59	43.52	-21.52	Pass
* 245.07	16.48	14.64	H	145	130	-7.37	66.02	-49.54	46.02	-31.38	Pass
300.150	15.82	14.28	H	230	136	-5.09	66.02	-50.20	46.02	-31.74	Pass
940.504	25.68	24.22	H	034	230	4.50	66.02	-40.34	46.02	-21.80	Pass
32.602	28.96	27.94	V	214	116	-1.75	60.00	-31.04	40.00	-12.06	Pass
35.973	27.55	26.65	V	109	109	-4.20	60.00	-32.45	40.00	-13.35	Pass
66.325	26.77	25.93	V	070	101	-12.72	60.00	-33.23	40.00	-14.07	Pass
79.832	26.72	25.08	V	001	120	-12.95	60.00	-33.28	40.00	-14.92	Pass
105.654	26.23	24.45	V	357	150	-8.41	63.52	-37.29	43.52	-19.07	Pass
635.041	18.87	20.14	V	147	152	0.24	66.02	-47.15	46.02	-25.88	Pass
954.872	24.52	24.49	V	142	209	4.65	66.02	-41.50	46.02	-21.53	Pass

\* Restricted Band Signal

#### Middle Channel 17 (2440 MHz) GFSK 1 Mbps

CONFIGURATION TESTED		EUT Orientation (Y Axis) Tx at Mid Channel of 2440 MHz at 1 Mbps and Max Output Power (+13 dBm)									
Frequency	Corrected		Antenna Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC Part15.205/209 RSS-GEN/247				Result
	Peak Level	QP Level					Peak Limit	Peak Margin	QP Limit	QP Margin	
MHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
31.102	20.68	19.08	H	006	209	-0.92	60.00	-39.32	40.00	-20.92	Pass
* 125.9	21.42	19.10	H	097	250	-6.46	63.52	-42.10	43.52	-24.42	Pass
372.556	18.68	15.99	H	128	255	-4.21	66.02	-47.34	46.02	-30.03	Pass
791.860	25.35	23.32	H	211	177	2.74	66.02	-40.67	46.02	-22.70	Pass
918.585	25.78	24.72	H	149	189	4.26	66.02	-40.24	46.02	-21.30	Pass
35.970	28.56	27.51	V	205	105	-4.19	60.00	-31.44	40.00	-12.49	Pass
41.594	27.33	23.27	V	191	103	-8.18	60.00	-32.67	40.00	-16.73	Pass
68.583	28.06	26.47	V	068	104	-12.62	60.00	-31.94	40.00	-13.53	Pass
80.948	28.65	27.20	V	000	114	-12.96	60.00	-31.35	40.00	-12.80	Pass
105.651	24.66	24.38	V	355	163	-8.41	63.52	-38.86	43.52	-19.14	Pass
* 169.764	16.13	13.08	V	097	136	-7.71	63.52	-47.39	43.52	-30.44	Pass
488.371	19.98	19.02	V	118	240	-1.80	66.02	-46.04	46.02	-27.00	Pass
742.605	24.84	22.83	V	041	131	1.74	66.02	-41.18	46.02	-23.19	Pass
954.458	27.38	24.96	V	079	218	4.66	66.02	-38.64	46.02	-21.06	Pass

\* Restricted Band Signal



## High Channel 39 (2480.0 MHz) GFSK 1 Mbps

CONFIGURATION TESTED		EUT Orientation (Y Axis) Tx at High Channel of 2480 MHz at 1 Mbps and Max Output Power (+13 dBm)									
Frequency	Corrected		Antenna Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC Part15.205/209 RSS-GEN/247				Result
	Peak Level	QP Level					Peak Limit	Peak Margin	QP Limit	QP Margin	
MHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
33.742	19.70	17.65	H	242	137	-2.61	60.00	-40.30	40.00	-22.35	Pass
* 124.792	21.23	19.65	H	133	104	-6.47	63.52	-42.29	43.52	-23.87	Pass
473.817	20.41	18.77	H	240	130	-2.08	66.02	-45.61	46.02	-27.25	Pass
805.852	25.77	23.80	H	185	152	3.03	66.02	-40.25	46.02	-22.22	Pass
* 973.888	28.50	25.16	H	343	177	4.74	73.98	-45.48	53.98	-28.82	Pass
32.592	28.91	27.16	V	246	105	-1.75	60.00	-31.09	40.00	-12.84	Pass
68.593	27.24	25.93	V	008	115	-12.62	60.00	-32.76	40.00	-14.07	Pass
80.963	27.94	25.10	V	001	156	-12.96	60.00	-32.06	40.00	-14.90	Pass
* 115.798	23.73	22.12	V	001	146	-6.85	63.52	-39.79	43.52	-21.40	Pass
472.402	21.50	18.69	V	057	136	-2.15	66.02	-44.52	46.02	-27.33	Pass
796.692	25.40	23.72	V	208	109	2.93	66.02	-40.62	46.02	-22.30	Pass
956.405	26.04	25.04	V	098	240	4.66	66.02	-39.98	46.02	-20.98	Pass

\* Restricted Band Signal

## Receive Mode

CONFIGURATION TESTED		EUT Orientation (Y Axis) EUT in Rx Mode									
Frequency	Corrected		Antenna Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC Part15.205/209 RSS-GEN/247				Result
	Peak Level	QP Level					Peak Limit	Peak Margin	QP Limit	QP Margin	
MHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
31.468	22.20	18.93	H	200	136	-1.13	60.00	-37.80	40.00	-21.07	Pass
* 124.752	20.56	18.71	H	096	255	-6.47	63.52	-42.96	43.52	-24.81	Pass
318.186	15.46	14.72	H	262	203	-4.83	66.02	-50.56	46.02	-31.30	Pass
595.383	22.68	20.38	H	143	156	-0.41	66.02	-43.34	46.02	-25.64	Pass
680.886	21.84	21.28	H	339	151	0.69	66.02	-44.18	46.02	-24.74	Pass
823.675	25.55	23.54	H	297	255	3.12	66.02	-40.47	46.02	-22.48	Pass
917.307	26.92	24.86	H	143	220	4.28	66.02	-39.10	46.02	-21.16	Pass
34.815	29.22	26.24	V	271	136	-3.32	60.00	-30.78	40.00	-13.76	Pass
67.425	27.43	25.96	V	023	101	-12.64	60.00	-32.57	40.00	-14.04	Pass
82.040	27.50	26.34	V	325	121	-13.04	60.00	-32.50	40.00	-13.66	Pass
107.864	25.22	23.64	V	359	135	-7.94	63.52	-38.30	43.52	-19.88	Pass
524.931	20.71	19.67	V	064	136	-1.42	66.02	-45.31	46.02	-26.35	Pass
737.512	25.11	22.83	V	219	240	1.61	66.02	-40.91	46.02	-23.19	Pass
810.674	24.80	23.90	V	266	203	3.13	66.02	-41.22	46.02	-22.12	Pass
956.883	26.29	25.07	V	327	203	4.66	66.02	-39.73	46.02	-20.95	Pass

\* Restricted Band Signal

**Test Results:** The Lutron Model RRL-MWCL LED Lighting Controller, operating in DTS mode and receive mode, comply with the requirements of 47 CFR Part 15.205 and RSS-Gen Section 8.10 for restricted bands of operation with a margin of 12.06 dB.



#### 4.5.4 DTS Radiated Spurious Emissions in Non-Restricted and Restricted Bands of Operation, 1 GHz – 18 GHz Test Results (07/16/2024 and 07/17/2024)

##### Low Channel 39 (2402 MHz) GFSK 1 Mbps

CONFIGURATION TESTED		EUT Orientation (Y Axis) Tx at Low Channel of 2402 MHz at 1 Mbps and Max Output Power (+13 dBm)									
Frequency	Peak Corrected	Average Corrected	Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC 15.205/209: RSS-GEN/RSS-247 Average Limit	FCC 15.205/209: RSS-GEN/RSS-247 Average Margin	FCC 15.205/209: RSS-GEN/RSS-247 Peak Limit	FCC 15.205/209: RSS-GEN/RSS-247 Peak Margin	Results
GHz	dBuV/m	dBuV/m		degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 4.85597	36.84	26.30	H	348	238.30	1.84	53.98	-27.68	73.98	-37.139	PASS
* 12.0088	54.89	46.46	H	359	222.00	7.75	53.98	-7.52	73.98	-19.091	PASS
14.4057	54.85	45.18	H	018	243.40	12.24	53.98	-8.80	73.98	-19.127	PASS
* 4.80389	37.83	28.96	V	010	101.00	1.65	53.98	-25.02	73.98	-36.147	PASS
7.1885	41.58	31.72	V	226	103.00	4.05	53.98	-22.26	73.98	-32.396	PASS
* 12.0064	47.11	37.20	V	243	176.00	7.75	53.98	-16.78	73.98	-26.869	PASS
* Restricted Band Signal											

##### Middle Channel 17 (2440 MHz) GFSK 1 Mbps

CONFIGURATION TESTED		EUT Orientation (Y Axis) Tx at Mid Channel of 2440 MHz at 1 Mbps and Max Output Power (+13 dBm)									
Frequency	Peak Corrected	Average Corrected	Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC 15.205/209: RSS-GEN/RSS-247 Average Limit	FCC 15.205/209: RSS-GEN/RSS-247 Average Margin	FCC 15.205/209: RSS-GEN/RSS-247 Peak Limit	FCC 15.205/209: RSS-GEN/RSS-247 Peak Margin	Results
GHz	dBuV/m	dBuV/m		degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 4.87163	34.27	25.74	H	266	243.30	1.87	53.98	-28.24	73.98	-39.711	PASS
* 12.2118	46.28	37.67	H	004	236.40	7.81	53.98	-16.31	73.98	-27.696	PASS
* 14.6146	55.45	45.04	H	095	100.10	12.38	53.98	-8.94	73.98	-18.526	PASS
* 7.31918	46.88	36.88	V	326	232.00	4.74	53.98	-17.10	73.98	-27.101	PASS
* 12.2551	47.41	37.72	V	178	224.00	7.79	53.98	-16.26	73.98	-26.569	PASS
* Restricted Band Signal											



## High Channel 39 (2480 MHz) GFSK 1 Mbps

CONFIGURATION TESTED		EUT Orientation (Y Axis) Tx at High Channel of 2480 MHz at 1 Mbps and Max Output Power (+13 dBm)									
Frequency	Peak Corrected	Average Corrected	Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC 15.205/209: RSS-GEN/RSS-247 Average Limit	FCC 15.205/209: RSS-GEN/RSS-247 Average Margin	FCC 15.205/209: RSS-GEN/RSS-247 Peak Limit	FCC 15.205/209: RSS-GEN/RSS-247 Peak Margin	Results
GHz	dBuV/m	dBuV/m		degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
9.9228	46.58	35.95	H	111	176.40	6.31	53.98	-18.03	73.98	-27.397	PASS
* 12.4148	47.99	37.38	H	038	129.70	7.69	53.98	-16.60	73.98	-25.988	PASS
14.8904	53.48	44.12	H	027	168.70	11.15	53.98	-9.86	73.98	-20.502	PASS
* 4.96044	38.46	29.85	V	022	133.00	1.83	53.98	-24.13	73.98	-35.518	PASS
* 12.3957	46.30	37.31	V	140	194.00	7.64	53.98	-16.67	73.98	-27.676	PASS
14.4546	55.02	44.37	V	152	224.00	12.21	53.98	-9.61	73.98	-18.957	PASS
* Restricted Band Signal											

## Receive Mode

CONFIGURATION TESTED		EUT Orientation (Y Axis) EUT in Receive Mode									
Frequency	Peak Corrected	Average Corrected	Polarity	Turntable Angle	Antenna Height	Correction Factor	FCC 15.205/209: RSS-GEN/RSS-247 Average Limit	FCC 15.205/209: RSS-GEN/RSS-247 Average Margin	FCC 15.205/209: RSS-GEN/RSS-247 Peak Limit	FCC 15.205/209: RSS-GEN/RSS-247 Peak Margin	Results
GHz	dBuV/m	dBuV/m		degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 7.68816	42.28	33.66	H	037	101.00	4.63	53.98	-20.32	73.98	-31.705	PASS
13.0271	51.22	40.79	H	008	170.20	9.10	53.98	-13.19	73.98	-22.756	PASS
* 15.8115	50.46	40.59	H	023	227.80	8.09	53.98	-13.39	73.98	-23.516	PASS
6.5801	40.73	31.14	V	314	211.00	3.11	53.98	-22.84	73.98	-33.246	PASS
* 8.07512	44.69	34.83	V	215	170.00	5.29	53.98	-19.15	73.98	-29.286	PASS
15.1036	53.70	43.37	V	181	104.00	10.33	53.98	-10.61	73.98	-20.275	PASS
* Restricted Band Signal											

**Test Results:** The Lutron Model RRL-MWCL LED Lighting Controller, operating in DTS and receive modes, comply with the requirements of 47 CFR Part 15.205 and RSS-Gen Section 8.10 with a margin of 7.52 dB.



#### **4.5.5 DTS Radiated Spurious Emissions in Non-Restricted and Restricted Bands of Operation, 18 GHz – 25 GHz Test Results (07/22/2024)**

Measurements were made in the frequency range of 18 GHz to 25 GHz for the Lutron Model RRL-MWCL LED Lighting Controller. The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The EUT was also tested in the Rx Mode. There were no significant signals found when testing the EUT in this frequency range. Test results for all configurations tested are available upon request.



## 4.6 DTS 6 dB Occupied Bandwidth (FCC Section 15.247(a)(2) RSS-247 5.2(a))

### 4.6.1 DTS 6 dB Occupied Bandwidth – Test Procedure

The minimum DTS (6 dB) bandwidth, specified in FCC Section 15.247(a) (2) was measured using a Spectrum Analyzer with 100 kHz resolution bandwidth and 300 kHz video bandwidth. The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The test procedure of ANSI C63.10, Section 11.8, Option 1, was used.

Spectrum Analyzer Settings:

SA Settings			ANSI C63.10 Requirement
Span	5 MHz		2 to 5 times OBW
RBW	100 kHz		1 - 5 % of OBW (min 100 kHz)
VBW	300 kHz		≈3 times RBW
Sweep Time	5 ms		Auto
OBW	1.1 MHz (1 Mbps)	Ref Level & Attenuation	20 dBm & 40 dB Attenuation

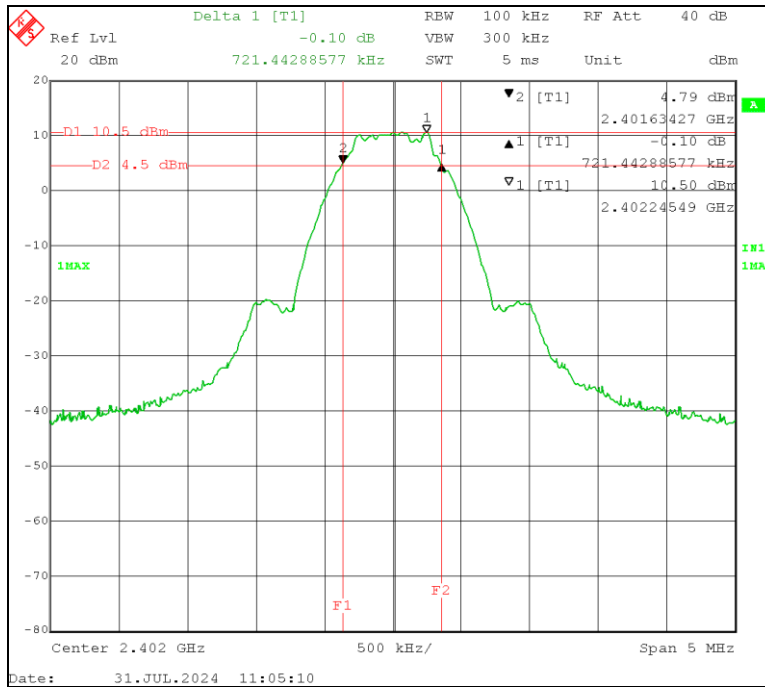
### 4.6.2 DTS 6 dB Occupied Bandwidth Test Results (07/31/2024)

Tx Channel With GFSK Modulation and 1 Mbps Data Rate	Frequency	Measured 6 dB BW	47 CFR 15.247(a)(2) & RSS-247 5.2 Minimum Limit	Margin	Result
	MHz	kHz	kHz	kHz	
37	2402.0	721.44	500.00	221.44	PASS
17	2440.0	731.46	500.00	231.46	PASS
39	2480.0	721.44	500.00	221.44	PASS

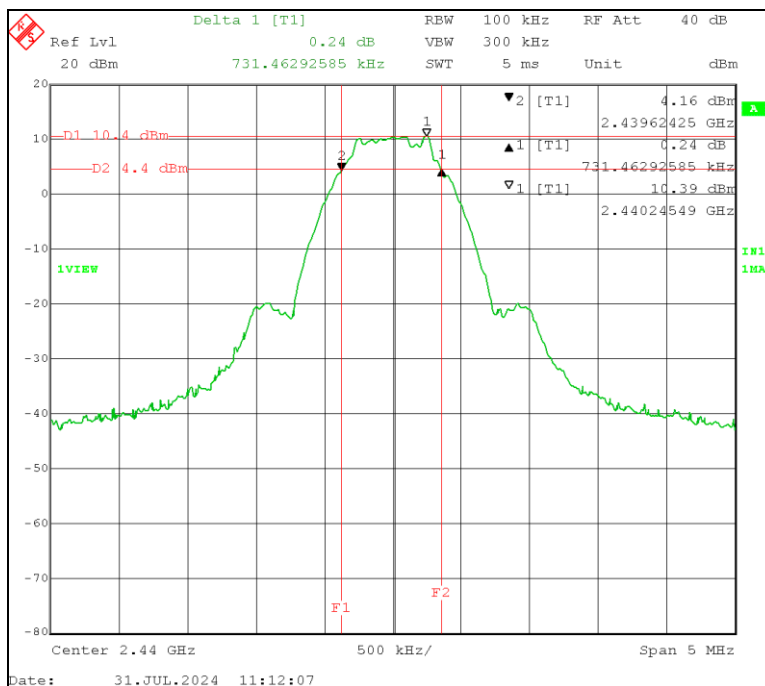


### 4.6.3 DTS 6 dB Occupied Bandwidth Analyzer Screen Captures

#### Channel 39: 2402 MHz GFSK 1 Mbps

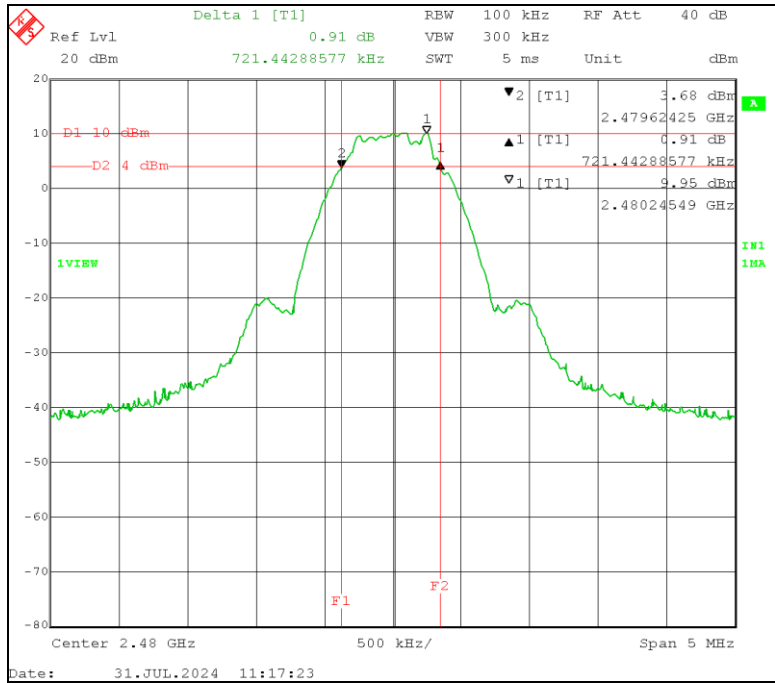


#### Channel 17: 2440 MHz GFSK 1 Mbps





### Channel 39: 2480 MHz GFSK 1 Mbps



**Test Results:** The DTS 6 dB Occupied Bandwidth measurements for the Lutron Model RRL-MWCL LED Lighting Controller were measured and are compliant to FCC and ISED requirements.





## 4.7 DTS 99% Occupied Bandwidth RSS-Gen 6.7

### 4.7.1 DTS 99% Occupied Bandwidth – Test Procedure

The 99% Occupied Bandwidth measurement per RSS-Gen Section 6.7 was measured using a Spectrum Analyzer with 100 kHz resolution bandwidth and 300 kHz video bandwidth. The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The test procedure of ANSI C63.10, Section 6.9.3 was used.

Spectrum Analyzer Settings:

RBW	100	kHz
VBW	300	kHz
Span	5 and 10	MHz
Sweep Time (Auto)	5	ms
Attenuation	40	dB
Reference Level	20	dBm

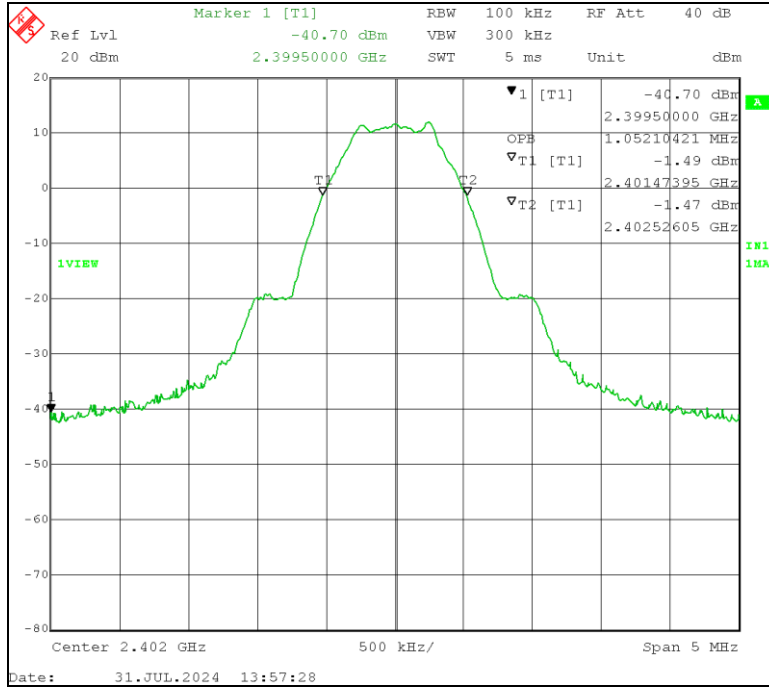
### 4.7.2 DTS 99% Occupied Bandwidth Test Results (07/31/2024)

Channel @ 1 Mbps Data Rate	Frequency (MHz)	99% Occupied BW (MHz)
37	2402.0	1.052
17	2440.0	1.072
39	2480.0	1.052

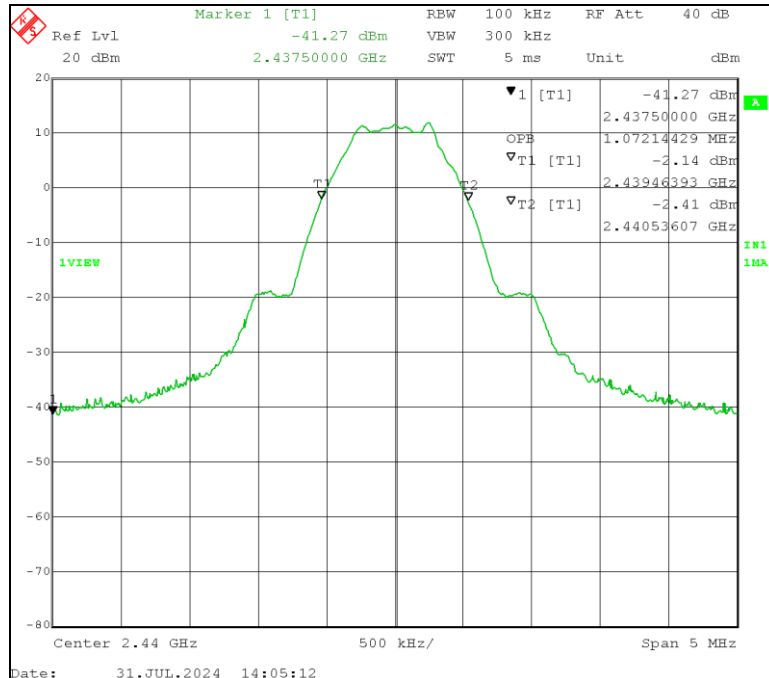


### 4.7.3 DTS 99% Occupied Bandwidth Analyzer Screen Captures

#### Channel 37: 2402 MHz GFSK 1 Mbps

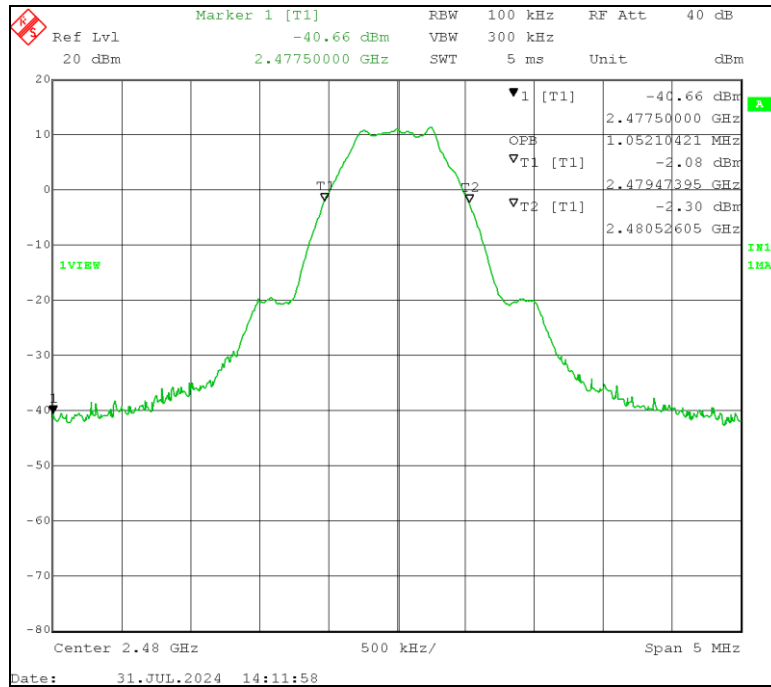


#### Channel 17: 2440 MHz GFSK 1 Mbps





### Channel 39: 2480 MHz GFSK 1 Mbps



**Test Results:** The DTS 99% Occupied Bandwidth measurements for the Lutron Model RRL-MWCL LED Lighting Controller were measured for RSS-Gen Section 6.7 requirement.



## 4.8 Maximum Conducted Output Power and EIRP (FCC Part 15.247(b)(3), RSS-247 Section 5.4(d))

### 4.8.1 Maximum Conducted Output Power Test Procedure

A conducted power measurement of the output frequency was measured according to ANSI C63.10, Section 11.9.1.1. Spectrum Analyzer Resolution Bandwidth and Frequency Span were based upon the Operating Bandwidth (OBW) measured in the previous section. The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation and without modulation.

Spectrum Analyzer Settings:

Measurement Analyzer Settings	
Span	10 MHz
RBW	3 MHz
VBW	10 MHz
Sweep Time (Auto)	5 ms

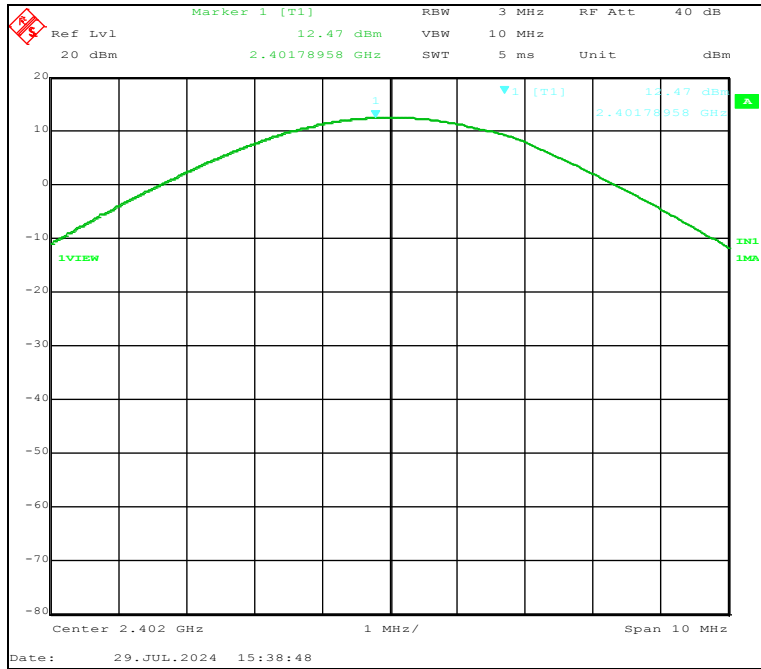
### 4.8.2 Maximum Conducted Output Power Test Results (07/29/2024)

BLE Tx Channel	Modulation	Frequency (MHz)	Measured Peak Level (dBm)	Cable # 962 Loss (dB)	Corrected Peak Level		Limit		Margin	
					dBm	Watts	dBm	Watts	dBm	Watts
37	None	2402.0	12.47	0.377	12.85	0.019	30.00	1.000	-17.15	-0.981
17		2440.0	12.35	0.375	12.73	0.019	30.00	1.000	-17.28	-0.981
39		2480.0	11.98	0.377	12.36	0.017	30.00	1.000	-17.64	-0.983
37	1 Mbps with GFSK	2402.0	12.60	0.377	12.98	0.020	30.00	1.000	-17.02	-0.980
17		2440.0	12.35	0.375	12.73	0.019	30.00	1.000	-17.28	-0.981
39		2480.0	11.98	0.377	12.36	0.017	30.00	1.000	-17.64	-0.983

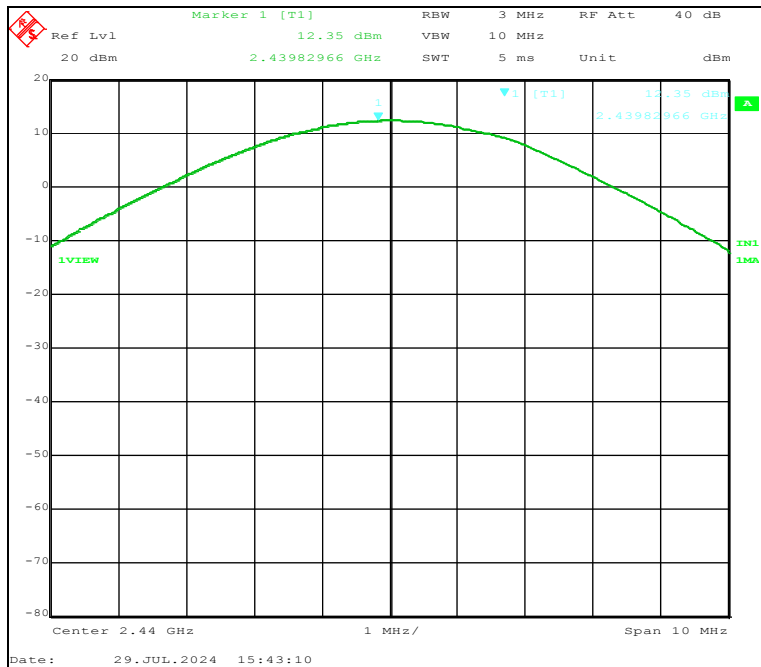


### 4.8.3 Maximum Conducted Output Power Analyzer Screen Captures

#### Channel 37: 2402 MHz No Modulation

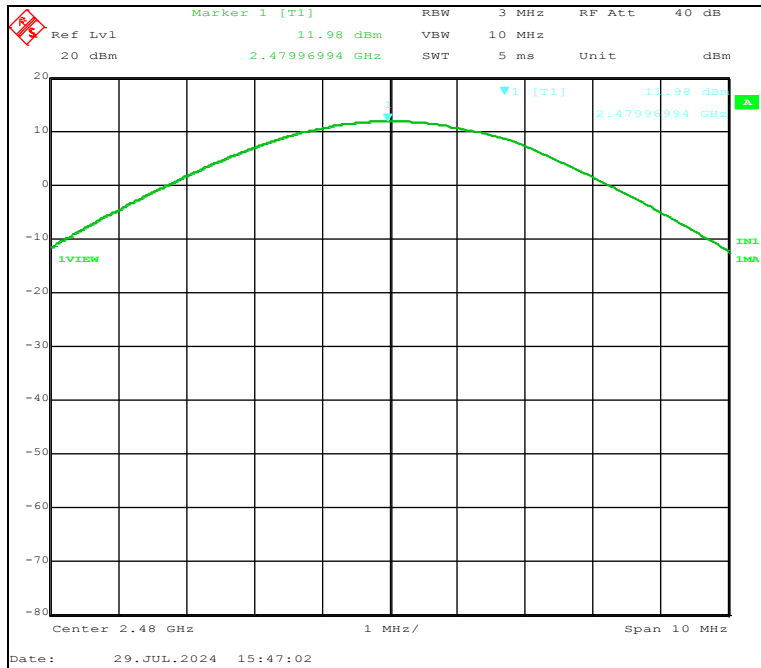


#### Channel 17: 2440 MHz No Modulation

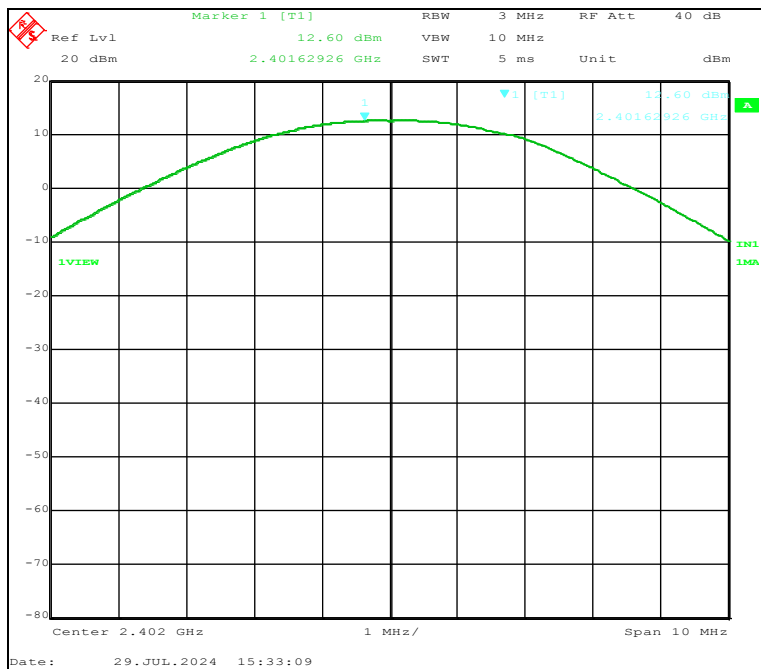




### Channel 39: 2480 MHz No Modulation

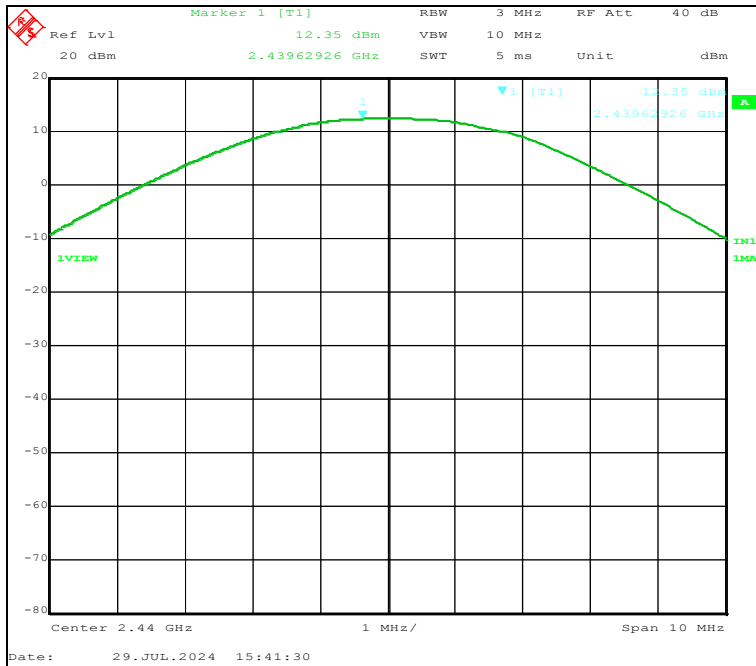


### Channel 37: 2402 MHz GFSK Modulation 1 Mbps

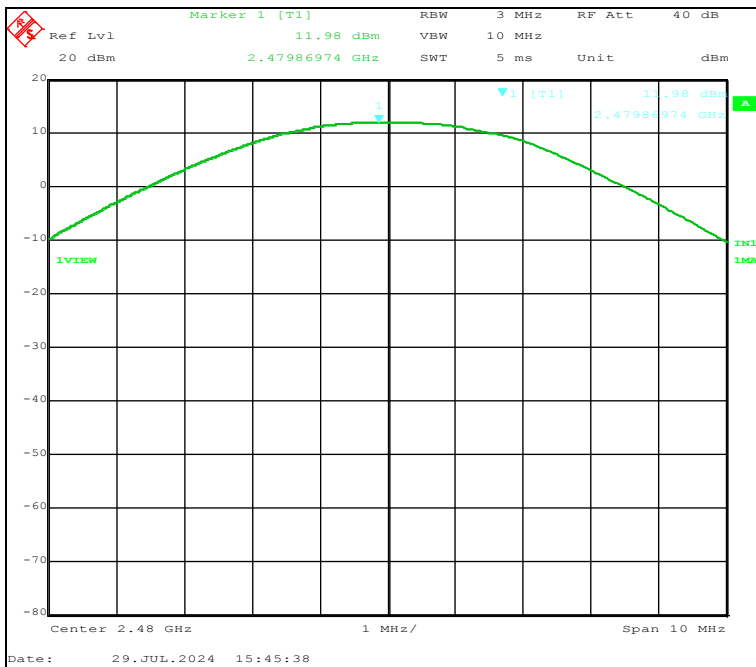




### Channel 17: 2440 MHz GFSK Modulation 1 Mbps



### Channel 39: 2480 MHz GFSK Modulation 1 Mbps



**Test Results:** The Maximum Conducted Output Power peak measurements for the Lutron Model RRL-MWCL LED Lighting Controller, with and without modulation, are compliant with the limits specified in FCC Section 15.247(b)(3).



#### 4.8.4 EIRP Calculation RSS-247 (07/29/2024)

The gain of the antenna used in the Lutron Model RRL-MWCL LED Lighting Controller is + 4.0 dBi. Applying the antenna gain to the maximum peak transmitter output produces the following values of EIRP.

Channel	Modulation	Frequency (MHz)	Corrected Measured Level		Antenna Gain		EIRP				Result
			dBm	Watts	Isotropic (dBi)	Numeric	Total		Limit	Margin	
							dBm	Watts			
37	None	2402.0	12.85	0.0193	4.00	2.512	16.85	0.048	4.00	-3.952	Pass
17		2440.0	12.73	0.0187			16.73	0.047		-3.953	Pass
39		2480.0	12.36	0.0172			16.36	0.043		-3.957	Pass
37	1 Mbps with GFSK	2402.0	12.98	0.0198			16.98	0.050		-3.950	Pass
17		2440.0	12.73	0.0187			16.73	0.047		-3.953	Pass
39		2480.0	12.36	0.0172			16.36	0.043		-3.957	Pass

**Test Results:** The results in the above table show compliance to the ISED requirements for EIRP limits of RSS-247.





## 4.9 Power Spectral Density (FCC Section 15.247(e), RSS-247 Section 5.2(b))

### 4.9.1 Power Spectral Density Test Procedure

A conducted power measurement of the output frequency was measured using a peak detector for the Lutron Model RRL-MWCL LED Lighting Controller BLE transmitter. The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The test procedure of ANSI C63.10, Section 11.10.2 (PKPSD) was used.

Spectrum Analyzer Settings:

Measurement Analyzer Settings		
RBW (Between 3 kHz and 100 kHz)	3	kHz
VBW (3 X RBW)	10	kHz
Span (>1.5 X the DTS Bandwidth)	3 MHz for 1 Mbps	MHz
Sweep (Auto)	0.84	sec
Attenuation	30	dB
Ref Level	10	dBm

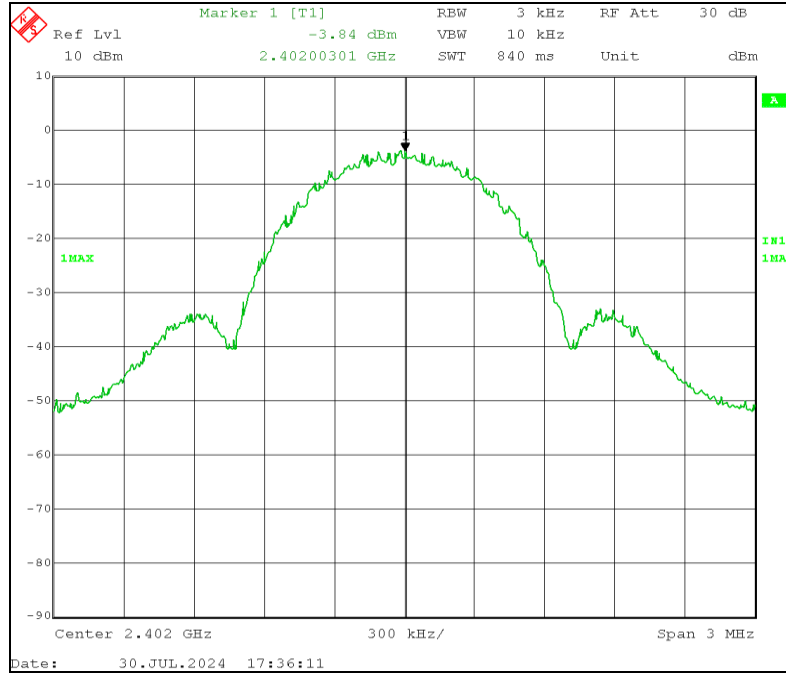
### 4.9.2 Power Spectral Density Test Results (07/30/2024)

Channel	Modulation Information	Frequency (MHz)	Measured Level	Cable #BEC-962 Correction Factor	Corrected Level	Limit	Margin
			dBm	dB	dBm	dBm	dBm
37	1 Mbps Data Rate with GFSK Modulation	2402.0	-3.84	0.377	-3.46	8.00	-11.46
17		2440.0	-3.97	0.375	-3.60	8.00	-11.60
39		2480.0	-4.29	0.377	-3.91	8.00	-11.91

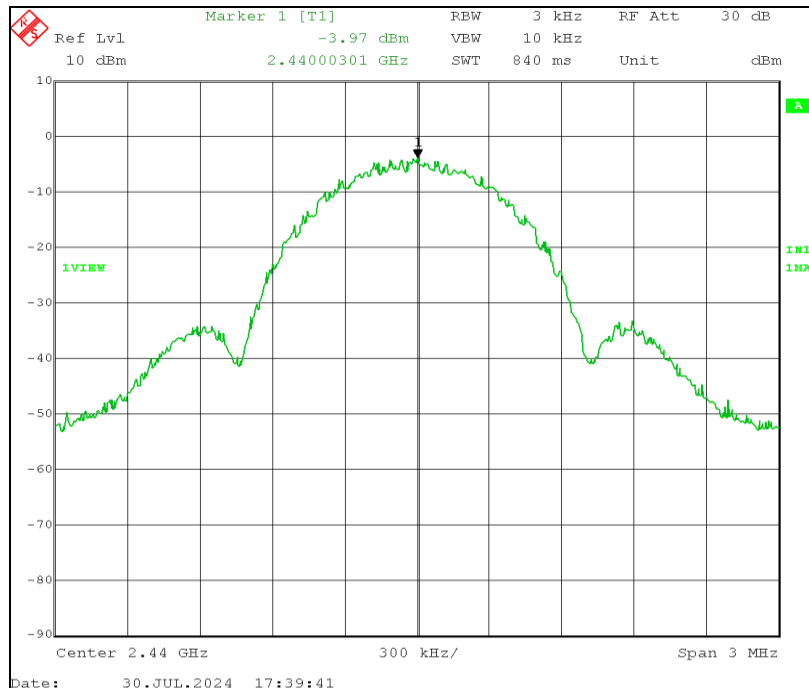


### 4.9.3 Power Spectral Density Analyzer Screen Captures

#### Channel 39, 2402 MHz, GFSK Modulation 1 Mbps

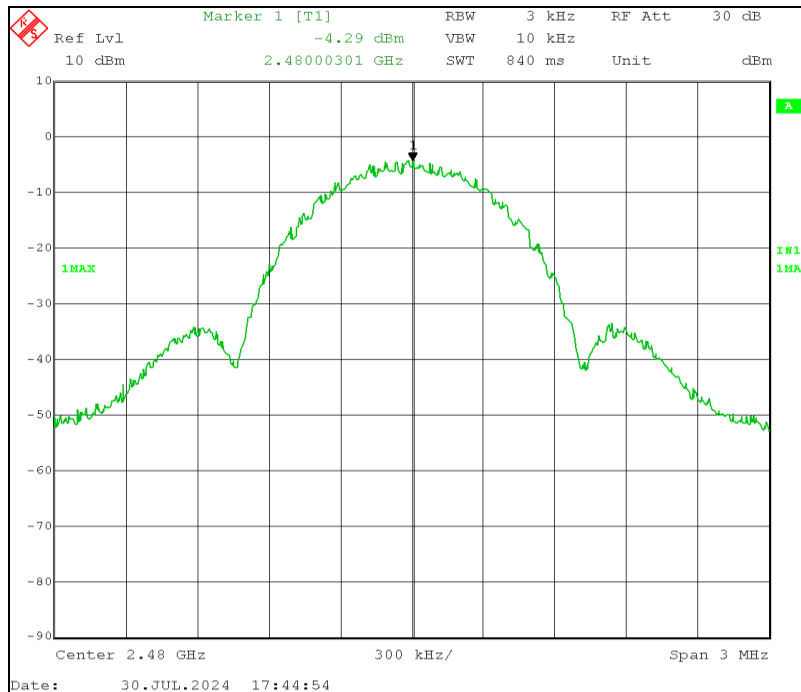


#### Channel 17, 2440 MHz, GFSK Modulation 1 Mbps





### Channel 37, 2480 MHz, GFSK Modulation 1 Mbps



**Test Results:** The Power Spectral Density measurements of the Lutron Model RRL-MWCL LED Lighting Controller are compliant with the limits specified in FCC Section 15.247(e) and RSS-247.



## 4.10 Band Edge Measurement (FCC Part 15.247(d), RSS-247 5.5)

### 4.10.1 Band Edge Measurement Test Procedure

Band edge measurements were recorded on the EUT while operating with a modulated carrier. The Lutron Model RRL-MWCL LED Lighting Controller was tested at the low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps. The EUT was set to transmit a signal at maximum output power (setting of 13) with GFSK modulation. The Authorized Band Edge measurements were made using the Relative Method of Section 6.10.4 of ANSI C63.10. The Spectrum Analyzer Screens below show emissions between the modulated carrier, at low and high frequencies and the lower and upper band edges.

Spectrum Analyzer Settings:

Measurement Analyzer Settings	
RBW	100 kHz
VBW	300 kHz
Sweep	5.5 ms Low Tx and 7.0 ms High Tx

	Lower Edge	Upper Edge
Authorized Band:	2400 MHz	2483.5 MHz
Nearest Restricted Bands:	2310-2390 MHz	2483.5-2500 MHz

### 4.10.2 Band Edge Measurement Test Results (07/30/2024)

Test Mode	Frequency (MHz)	Peak Transmit Measurement	Band Edge Measurement			Result
			Peak Level @ Lower Band 2.4 GHz Lower Band & Peak Level @ 2.4835 GHz Higher Band	Limit (dB) 20 dB Below the Tx Peak Amplitude (-20 dBc)	Margin	
Tx at Maximum Output Power 1 Mbps Data Rate	2402.0	9.87	-44.20	-10.13	-34.07	PASS
Tx at Maximum Output Power 1 Mbps Data Rate	2480.0	9.13	-48.72	-10.87	-37.85	PASS





## 4.11 Conducted Emissions

### 4.11.1 Conducted Emissions AC Power Port Test Procedure

#### AC Power Line

Conducted emissions at the power line input of the EUT were measured with an EMI receiver set to the appropriate detector and CISPR bandwidth, which was connected to the RF output of a 50  $\Omega$ , 50  $\mu$ H Line Impedance Stabilization Network (LISN) installed in each power line. Measurements were made over the frequency range of 150 kHz to 30 MHz while the EUT was operating as described in the EUT section of this report. The significant amplitudes of emissions measured on the AC power lines of the EUT were recorded as follows:

$$\text{Emission (dB}\mu\text{V)} = \text{Meter Reading (dB}\mu\text{v)} + \text{Cable Loss (dB)} + \text{LISN Factor (dB)} + \text{Limiter Loss (dB)}$$

The Lutron RRL-MWCL Sample 2259-01 was powered by the Phihong Model PPL36U-240 Sample 2259-05 at 120 Vac / 60 Hz. Transmission frequencies at low Channel 37 (2402 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 1 Mbps and at the low Channel 0 (2404 MHz), middle Channel 17 (2440 MHz) and high Channel 39 (2480 MHz) for 2 Mbps were tested. The EUT was set to transmit a signal at maximum output power with GFSK modulation and also tested while operating in the Receive Mode (Rx).

<b>Fundamental Frequencies</b>	Tx Low Channel at 2402 MHz for the 1 Mbps Data Rate and 2404 MHz for the 2 Mbps Data Rate, Tx Middle Channel at 2440 MHz and Tx High Channel at 2480 MHz	Receive Mode (Rx)
<b>Test Standards / Limits</b>	47 CFR 15.207 and RSS-Gen, 8.8	
<b>EUT Type</b>	Radiated Sample transmitting in Constant Stream Mode	Radiated Sample in Receive Mode
<b>Manufacturer</b>	Phihong	
<b>Model</b>	PPL36U-240	
<b>Sample Number</b>	2259-05	
<b>EUT Power</b>	120 Vac / 60 Hz	
<b>Test Date</b>	07/15/2024 and 07/16/2024	
<b>Temperature / Humidity</b>	24°C / 54% RH, 25°C / 54% RH	
<b>Test Configuration</b>	Lutron Model RRL-MWCL Sample 2328-02 was powered by the Lutron Model LU-PH3-A AC/DC Power Supply Sample 2328-03. EUT was configured to be either in a transmit mode or the receive mode during testing.	



### 4.11.2 Conducted Emissions AC Power Port Test Results (07/15/2024 and 07/16/2024)

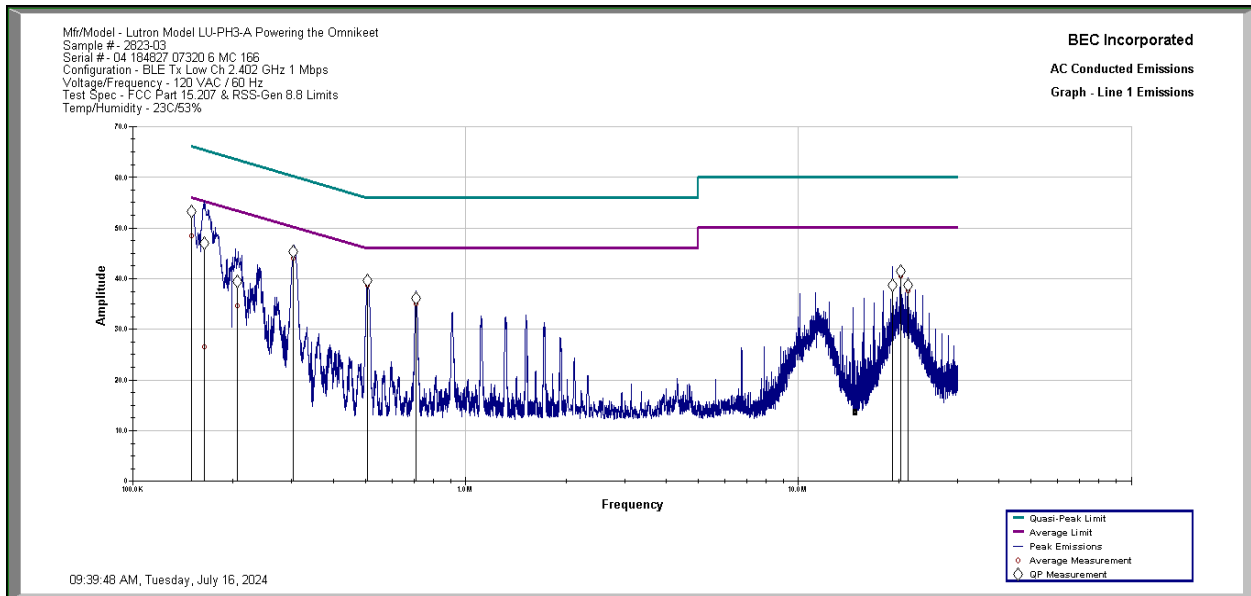
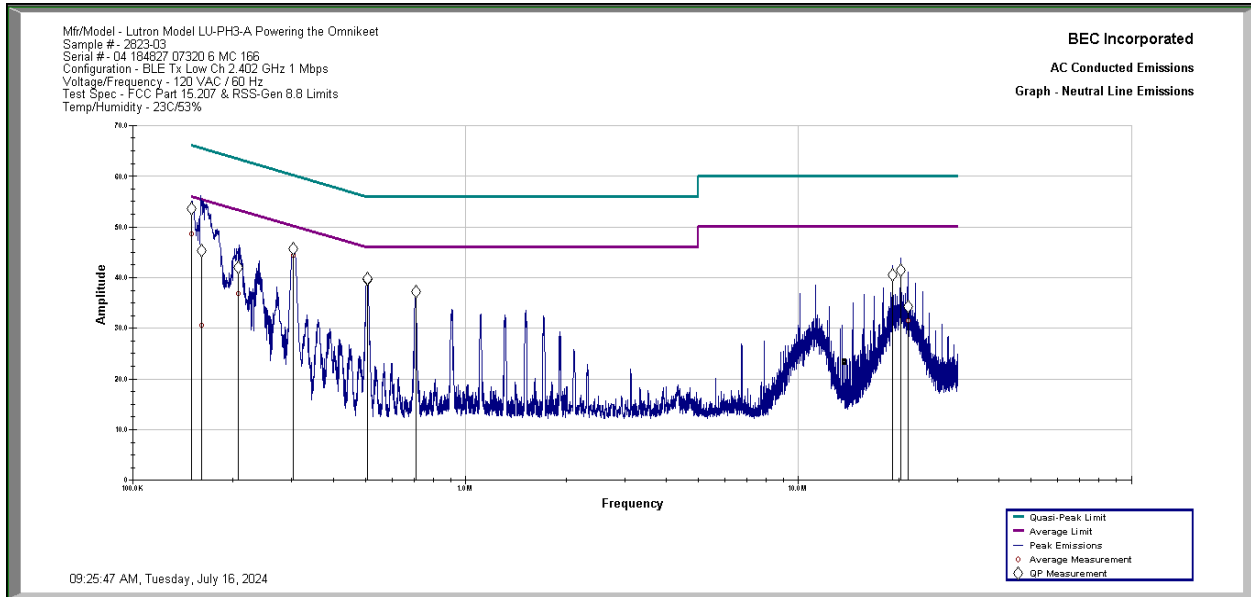
Results Tables Tx @ Low Channel, 2402 MHz GFSK with 1 Mbps Data Rate

BEC Incorporated Neutral Line Conducted Emissions 09:21:05 AM, Tuesday, July 16, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
150.055 KHz	48.56	56.00	-7.44	53.61	66.00	-12.39	10.120
160.313 KHz	30.55	55.71	-25.16	45.33	65.71	-20.38	10.120
207.321 KHz	36.87	54.36	-17.49	42.02	64.36	-22.34	10.119
302.183 KHz	44.44	51.65	-7.21	45.63	61.65	-16.02	10.110
504.656 KHz	39.12	46.00	-6.88	39.64	56.00	-16.36	10.120
506.016 KHz	39.13	46.00	-6.87	39.81	56.00	-16.19	10.121
707.390 KHz	36.82	46.00	-9.18	37.18	56.00	-18.82	10.131
19.108 MHz	40.07	50.00	-9.93	40.50	60.00	-19.50	10.511
20.231 MHz	40.87	50.00	-9.13	41.37	60.00	-18.63	10.522
21.360 MHz	31.51	50.00	-18.49	34.22	60.00	-25.78	10.527
<b>Mfr/Model - Lutron Model LU-PH3-A Powering the Omnikeet</b>							
<b>Sample # - 2823-03</b>							
<b>Serial # - 04 184827 07320 6 MC 166</b>							
<b>Configuration - BLE Tx Low Ch 2.402 GHz 1 Mbps</b>							
<b>Voltage/Frequency - 120 VAC / 60 Hz</b>							
<b>Test Spec - FCC Part 15.207 &amp; RSS-Gen 8.8 Limits</b>							
<b>Temp/Humidity - 23C/53%</b>							

BEC Incorporated Line 1 Conducted Emissions 09:35:11 AM, Tuesday, July 16, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
150.047 KHz	48.39	56.00	-7.61	53.28	66.00	-12.72	10.140
164.312 KHz	26.57	55.59	-29.02	47.03	65.59	-18.56	10.140
205.325 KHz	34.69	54.42	-19.73	39.46	64.42	-24.96	10.130
302.669 KHz	44.05	51.64	-7.59	45.28	61.64	-16.36	10.130
505.884 KHz	38.69	46.00	-7.31	39.51	56.00	-16.49	10.132
506.204 KHz	38.87	46.00	-7.13	39.51	56.00	-16.49	10.132
707.120 KHz	35.05	46.00	-10.95	36.05	56.00	-19.95	10.151
19.108 MHz	38.72	50.00	-11.28	38.74	60.00	-21.26	10.470
20.235 MHz	40.58	50.00	-9.42	41.41	60.00	-18.59	10.470
21.361 MHz	37.60	50.00	-12.40	38.65	60.00	-21.35	10.467
<b>Mfr/Model - Lutron Model LU-PH3-A Powering the Omnikeet</b>							
<b>Sample # - 2823-03</b>							
<b>Serial # - 04 184827 07320 6 MC 166</b>							
<b>Configuration - BLE Tx Low Ch 2.402 GHz 1 Mbps</b>							
<b>Voltage/Frequency - 120 VAC / 60 Hz</b>							
<b>Test Spec - FCC Part 15.207 &amp; RSS-Gen 8.8 Limits</b>							
<b>Temp/Humidity - 23C/53%</b>							



# Graphs Tx @ Low Channel, 2402 MHz GFSK with 1 Mbps Data Rate, Neutral & Phase Lines







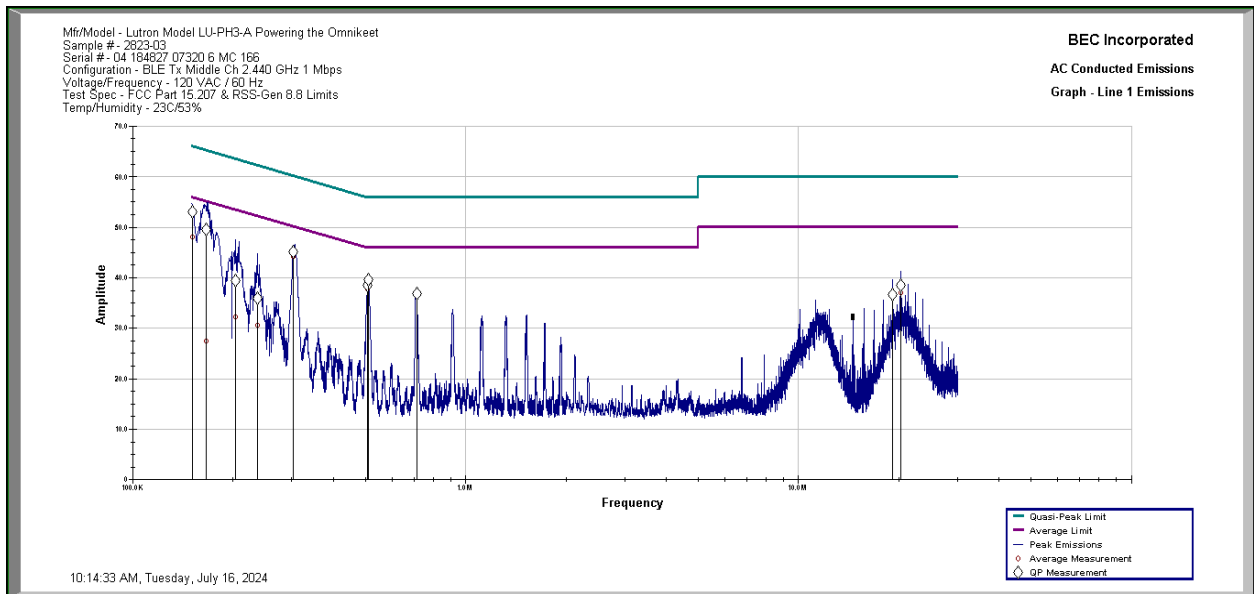
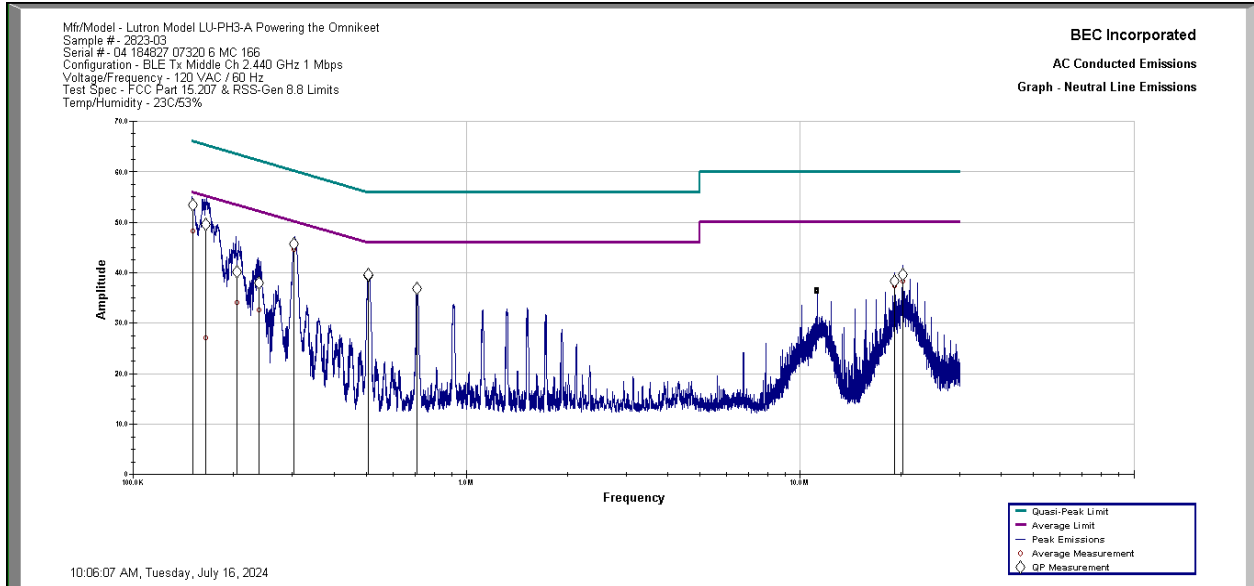
Results Tables Tx @ Middle Channel, 2440 MHz GFSK with 1 Mbps Data Rate

BEC Incorporated Neutral Line Conducted Emissions 10:01:28 AM, Tuesday, July 16, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
150.767 KHz	48.22	55.98	-7.75	53.36	65.98	-12.62	10.120
164.943 KHz	27.13	55.57	-28.45	49.57	65.57	-16.00	10.120
204.767 KHz	34.14	54.44	-20.30	40.20	64.44	-24.24	10.119
238.284 KHz	32.50	53.48	-20.98	38.00	63.48	-25.48	10.112
303.859 KHz	44.61	51.60	-6.99	45.64	61.60	-15.96	10.110
506.697 KHz	38.87	46.00	-7.13	39.40	56.00	-16.60	10.121
507.177 KHz	38.97	46.00	-7.03	39.63	56.00	-16.37	10.121
709.710 KHz	36.53	46.00	-9.47	36.90	56.00	-19.10	10.131
19.108 MHz	37.47	50.00	-12.53	38.27	60.00	-21.73	10.511
20.233 MHz	38.26	50.00	-11.74	39.53	60.00	-20.47	10.522
Mfr/Model - Lutron Model LU-PH3-A Powering the Omniket							
Sample # - 2823-03							
Serial # - 04 184827 07320 6 MC 166							
Configuration - BLE Tx Middle Ch 2.440 GHz 1 Mbps							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - FCC Part 15.207 & RSS-Gen 8.8 Limits							
Temp/Humidity - 23C/53%							

BEC Incorporated Line 1 Conducted Emissions 10:09:51 AM, Tuesday, July 16, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
150.814 KHz	48.04	55.98	-7.94	53.09	65.98	-12.89	10.140
166.330 KHz	27.40	55.53	-28.13	49.60	65.53	-15.93	10.140
203.726 KHz	32.24	54.46	-22.23	39.43	64.46	-25.03	10.130
235.985 KHz	30.57	53.54	-22.97	35.87	63.54	-27.67	10.130
303.550 KHz	44.20	51.61	-7.41	45.19	61.61	-16.42	10.130
506.092 KHz	37.82	46.00	-8.18	38.54	56.00	-17.46	10.132
508.183 KHz	38.82	46.00	-7.18	39.54	56.00	-16.46	10.132
711.270 KHz	36.56	46.00	-9.44	36.80	56.00	-19.20	10.151
19.113 MHz	36.70	50.00	-13.30	36.71	60.00	-23.29	10.470
20.237 MHz	36.98	50.00	-13.02	38.54	60.00	-21.46	10.470
Mfr/Model - Lutron Model LU-PH3-A Powering the Omniket							
Sample # - 2823-03							
Serial # - 04 184827 07320 6 MC 166							
Configuration - BLE Tx Middle Ch 2.440 GHz 1 Mbps							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - FCC Part 15.207 & RSS-Gen 8.8 Limits							
Temp/Humidity - 23C/53%							



# Graphs Tx @ Middle Channel, 2440 MHz FSK with 1 Mbps Data Rate, Neutral & Phase Lines





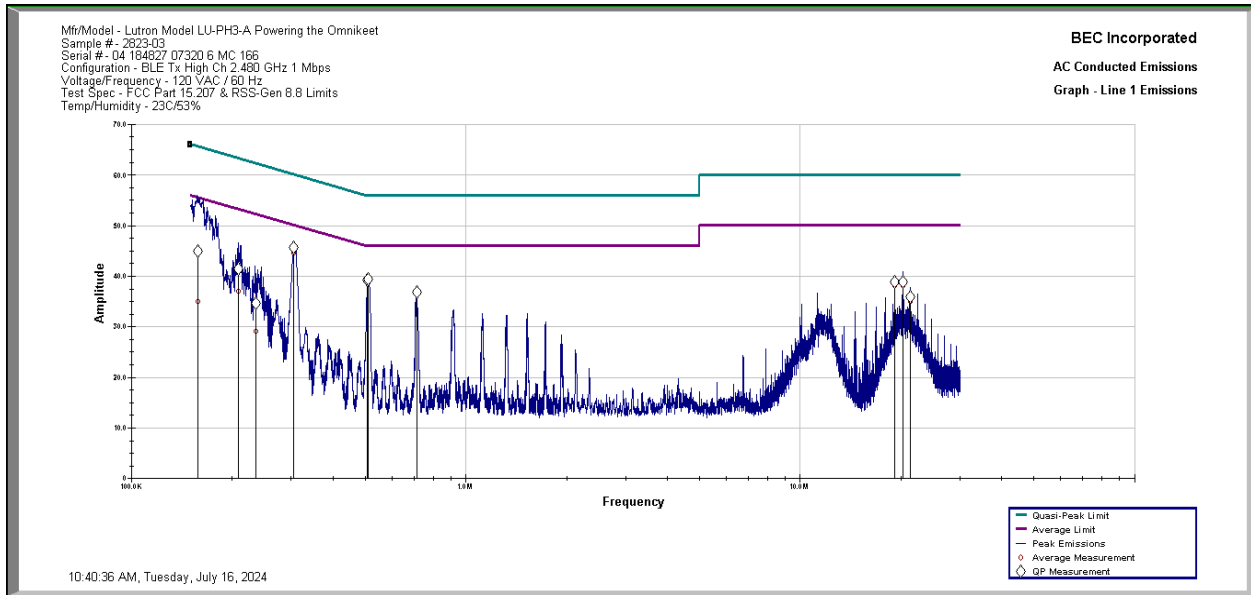
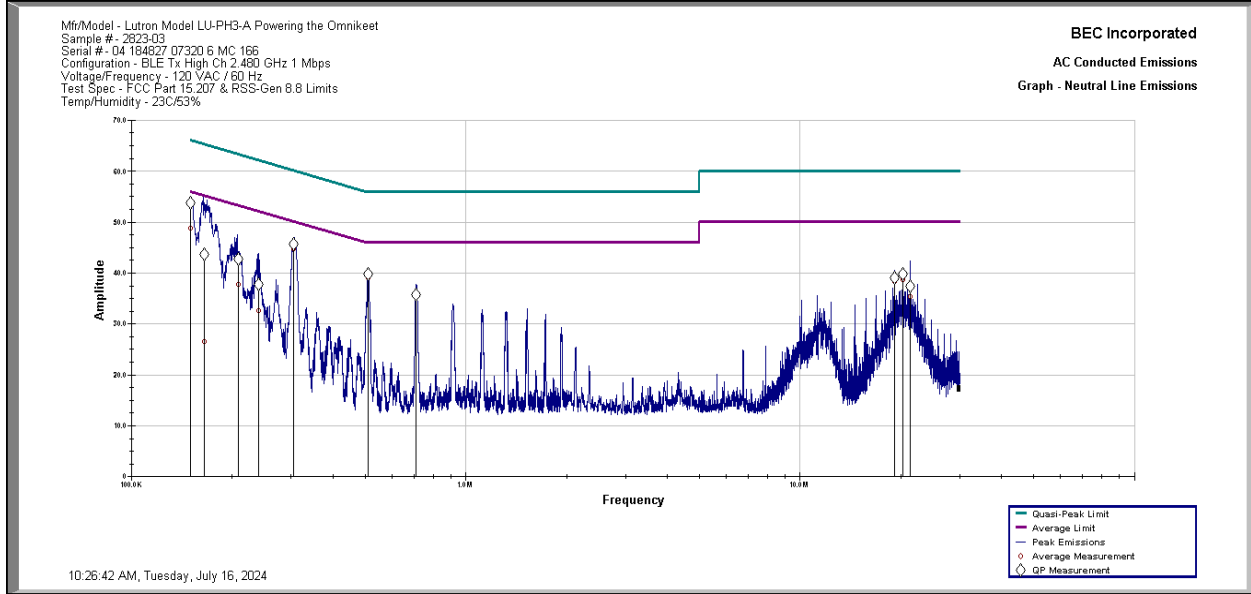
Results Tables Tx @ High Channel, 2480 MHz GFSK with 1 Mbps Data Rate

BEC Incorporated							
Neutral Line Conducted Emissions							
10:21:58 AM, Tuesday, July 16, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
150.073 KHz	48.75	56.00	-7.25	53.68	66.00	-12.32	10.120
165.168 KHz	26.56	55.57	-29.01	43.69	65.57	-21.88	10.120
208.703 KHz	37.81	54.32	-16.51	42.72	64.32	-21.60	10.118
239.361 KHz	32.60	53.45	-20.84	37.83	63.45	-25.61	10.112
304.882 KHz	44.81	51.57	-6.76	45.73	61.57	-15.84	10.110
508.992 KHz	39.12	46.00	-6.88	39.77	56.00	-16.23	10.121
709.370 KHz	35.72	46.00	-10.28	35.69	56.00	-20.31	10.131
19.112 MHz	38.34	50.00	-11.66	39.09	60.00	-20.91	10.511
20.236 MHz	38.64	50.00	-11.36	39.70	60.00	-20.30	10.522
21.361 MHz	35.31	50.00	-14.69	37.42	60.00	-22.58	10.527
<b>Mfr/Model - Lutron Model LU-PH3-A Powering the Omniket</b>							
Sample # - 2823-03							
Serial # - 04 184827 07320 6 MC 166							
Configuration - BLE Tx High Ch 2.480 GHz 1 Mbps							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - FCC Part 15.207 & RSS-Gen 8.8 Limits							
Temp/Humidity - 23C/53%							

BEC Incorporated							
Line 1 Conducted Emissions							
10:36:06 AM, Tuesday, July 16, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
157.696 KHz	35.00	55.78	-20.78	44.84	65.78	-20.94	10.140
208.006 KHz	37.04	54.34	-17.30	41.44	64.34	-22.90	10.130
235.420 KHz	29.16	53.56	-24.40	34.66	63.56	-28.90	10.130
304.660 KHz	44.58	51.58	-7.00	45.63	61.58	-15.95	10.130
507.454 KHz	38.68	46.00	-7.32	39.23	56.00	-16.77	10.132
509.091 KHz	38.73	46.00	-7.27	39.45	56.00	-16.55	10.133
711.560 KHz	36.53	46.00	-9.47	36.81	56.00	-19.19	10.151
19.112 MHz	38.07	50.00	-11.93	38.84	60.00	-21.16	10.470
20.236 MHz	38.18	50.00	-11.82	38.86	60.00	-21.14	10.470
21.364 MHz	34.95	50.00	-15.05	35.83	60.00	-24.17	10.467
<b>Mfr/Model - Lutron Model LU-PH3-A Powering the Omniket</b>							
Sample # - 2823-03							
Serial # - 04 184827 07320 6 MC 166							
Configuration - BLE Tx High Ch 2.480 GHz 1 Mbps							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - FCC Part 15.207 & RSS-Gen 8.8 Limits							
Temp/Humidity - 23C/53%							



# Graphs Tx @ High Channel, 2480 MHz FSK with 1 Mbps Data Rate, Neutral & Phase Lines





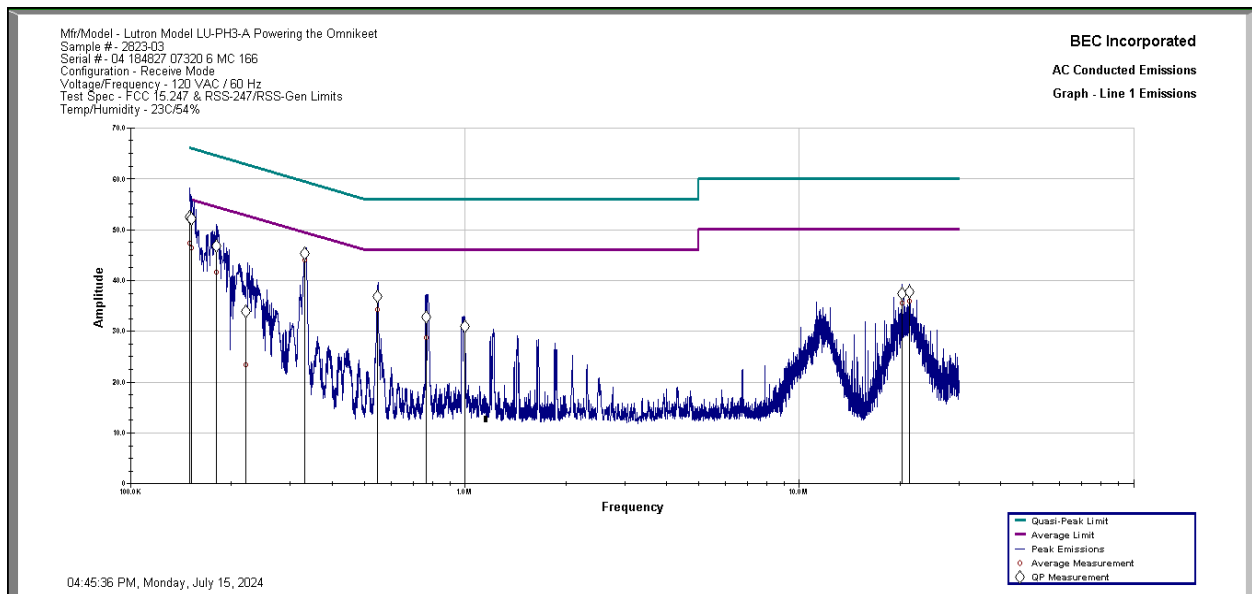
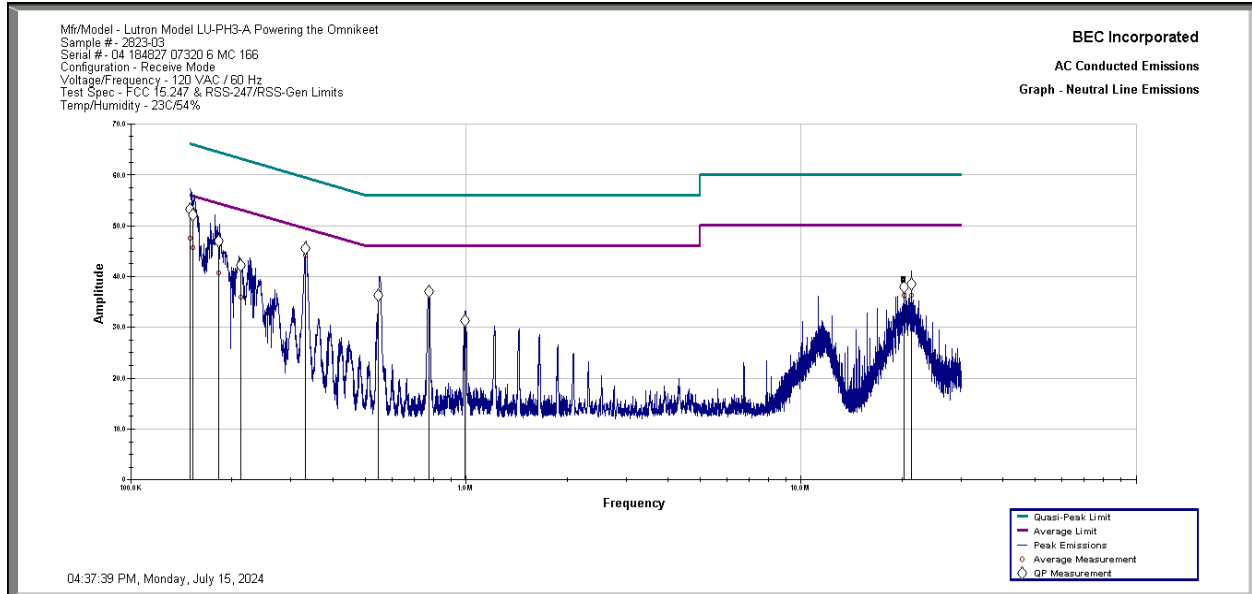
## Results Tables Rx Mode

BEC Incorporated							
Neutral Line Conducted Emissions							
04:32:56 PM, Monday, July 15, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
150.027 KHz	47.43	56.00	-8.56	53.25	66.00	-12.75	10.120
152.788 KHz	45.74	55.92	-10.18	52.05	65.92	-13.87	10.120
182.220 KHz	40.77	55.08	-14.31	46.98	65.08	-18.10	10.120
211.859 KHz	35.97	54.23	-18.27	42.14	64.23	-22.09	10.118
331.722 KHz	44.26	50.81	-6.54	45.50	60.81	-15.31	10.110
547.802 KHz	35.71	46.00	-10.29	36.17	56.00	-19.83	10.125
772.930 KHz	36.81	46.00	-9.19	37.03	56.00	-18.97	10.137
992.010 KHz	30.74	46.00	-15.26	31.37	56.00	-24.63	10.140
20.235 MHz	36.35	50.00	-13.65	38.00	60.00	-22.00	10.522
21.357 MHz	36.31	50.00	-13.69	38.43	60.00	-21.57	10.527
<b>Mfr/Model - Lutron Model LU-PH3-A Powering the Omniket</b>							
Sample # - 2823-03							
Serial # - 04 184827 07320 6 MC 166							
Configuration - Receive Mode							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - FCC 15.247 & RSS-247/RSS-Gen Limits							
Temp/Humidity - 23C/54%							

BEC Incorporated							
Line 1 Conducted Emissions							
04:40:52 PM, Monday, July 15, 2024							
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
150.094 KHz	47.26	56.00	-8.73	52.44	66.00	-13.56	10.140
151.965 KHz	46.47	55.94	-9.47	52.16	65.94	-13.78	10.140
179.692 KHz	41.58	55.15	-13.57	46.72	65.15	-18.43	10.130
220.996 KHz	23.47	53.97	-30.50	33.93	63.97	-30.04	10.130
331.733 KHz	43.96	50.81	-6.85	45.33	60.81	-15.48	10.130
545.994 KHz	34.17	46.00	-11.83	36.80	56.00	-19.20	10.144
763.060 KHz	28.66	46.00	-17.34	32.81	56.00	-23.19	10.156
995.430 KHz	30.97	46.00	-15.03	30.86	56.00	-25.14	10.160
20.235 MHz	35.62	50.00	-14.38	37.36	60.00	-22.64	10.470
21.355 MHz	35.99	50.00	-14.01	37.79	60.00	-22.21	10.467
<b>Mfr/Model - Lutron Model LU-PH3-A Powering the Omniket</b>							
Sample # - 2823-03							
Serial # - 04 184827 07320 6 MC 166							
Configuration - Receive Mode							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - FCC 15.247 & RSS-247/RSS-Gen Limits							
Temp/Humidity - 23C/54%							



## Graphs Rx Mode Neutral and Phase Lines



**Results:** The Lutron Model RRL-MWCL Sample 2328-02 powered by the Lutron Model LU-PH3-A Sample 2328-03 complies with the requirements of FCC Part 15.207 and RSS-Gen Section 8.8. The closest passing margin is 6.54 dB with the EUT in RX Mode.



## Appendix A – Test Equipment

Equipment	Manufacturer	Model #	Serial #	BEC #	Calibration Date	Calibration Cycle	Calibration Due Date
EMI Receiver (20 Hz – 26.5 GHz)	Rohde & Schwarz	ESIB 26	836119/006	1010	12/09/22	3 Years	12/09/25
Antenna (30 MHz - 6 GHz)	Sunol Sciences	JB6	A022108	712	06/27/24	3 Years	06/27/27
9kHz-3GHz EMC Analyzer	Agilent	E7402A	US39440162	883	06/21/21	5 Years	06/21/26
Antenna (30 MHz - 6 GHz)	Sunol Sciences	JB6	A020714	882	05/16/24	3 Years	05/16/27
Amplifier (.09 – 1300 MHz)	Hewlett Packard	8447F	3313A06658	807	01/13/21	5 Years	01/13/26
EMC Analyzer (9 kHz - 26.5 GHz)	Hewlett Packard	8593EM	3710A00214	1026	03/23/20	5 Years	03/23/25
Amplifier System (0.5 – 50 GHz)	Hewlett Packard	83015A 83017A	3123A00360 & 3332A00219	1027	06/16/21	5 Years	06/16/26
Double Ridged Horn Antenna (1 - 18 GHz)	EMCO	3115	9705-5225	1028	11/24/21	3 Years	11/21/24
Antenna (18 - 26.5 GHz)	Hewlett Packard	84125- 80008	N/A	1056	01/18/22	3 Years	01/18/25
OATS Site (30 MHz – 1 GHz)	BEC	N/A	N/A	705	10/06/23	1 Year	10/06/24
Temp/Humidity Meter	Control Company	4096	151872672	780	07/21/22	3 Years	07/21/25

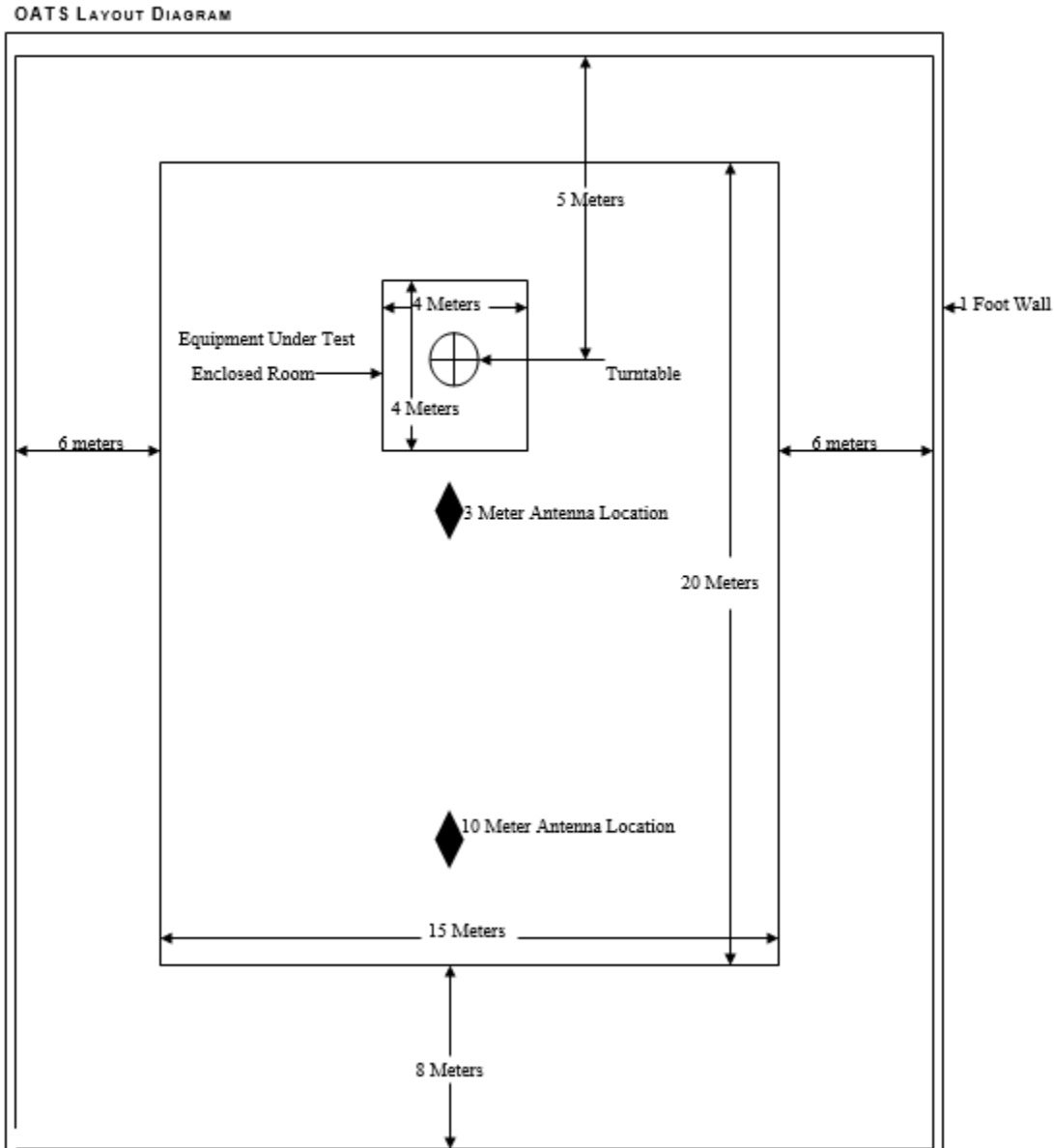


3.5GHz High Pass Filter	Hewlett Packard	84300-80038	005	779	08/04/22	3 Years	08/04/25
EMI Receiver (9 kHz - 6.5 GHz)	Hewlett Packard	8546A	3325A00158	761	03/15/23	3 Years	03/15/26
Four Line V-LISN	TESEQ	NNB 52	253551	950	12/08/22	3 Years	12/08/25
Software (Tile Instrument Control System)	Quantum Change/EMC Systems	Version 3	N/A	N/A	No Cal. Required	No Cal. Required	No Cal. Required
Radiated Emissions Test Software	BEC	RADE	2.2	N/A	No Cal. Required	No Cal. Required	No Cal. Required
Screen Room	ETS Lindgren	26W-2/2-0	6065	880	No Cal. Required	No Cal. Required	No Cal. Required
SMA RF Cable-Antenna Conducted Test Setup	Suhner	04272	None	962	07/14/23	3 Years	07/14/26





## Appendix B – Open Area Test Site Layout Diagram





## Appendix C – Emissions Shielded Room Layout Diagram

### SITE DESCRIPTION

The chamber is a 3 Meter semi-anechoic chamber with the ferrite absorbers on all walls and ceiling and is re-categorized as a Fully anechoic chamber when absorbers are added in between the test area and measurement antenna. The turn-table and mast are controlled externally by the ETS Lindgren 2090 Controller. The metal computer floor provides the ground plane for the site. Inside room dimensions are 22' Long by 13' Wide by 11'5" High. Outside room dimensions are 22'8" Long by 14' Wide by 12'9" High.

