BEC INCORPORATED

CLASS II PERMISSIVE CHANGE TEST REPORT

TEST STANDARDS:
FCC Part 15 Subpart C, IC RSS-Gen, IC RSS-247
DTS Intentional Radiator

EUT:
Legrand Model WNAL24 and WZ3AL24 adorne Wireless Smart Switch
Legrand Model WNAL64 and WZ3AL64 adorne Wireless Smart Dimmer

FCC ID: 2AU5D-ASWDM
ISED ID: 25764-ASWDM

REPORT#: BEC-2272-07

TEST DATES: 08/30/2023 – 09/19/2023

CUSTOMER:
Pass & Seymour/Legrand
50 Boyd Avenue
Syracuse, NY 13209

PREPARED BY: _____
JR Fanella**,** Test Engineer

REVIEWED and APPROVED BY: _____
Steve Fanella**,** Quality Manager

ACCREDITED
Testing Cert #2957.01

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Notice to Customer

This report and any recommendations it contain represent the result of BEC's testing and assessment on behalf of your company. Testing has been conducted according to accepted engineering standards and practices. This report reflects testing and assessment of product samples provided by your company and may not reflect the characteristics of other samples, especially those produced at different times. This report and its findings and recommendations, if implemented, should not be construed as an assurance or implied warranty for the continuing electromagnetic compatibility (EMC) of the product. **BEC shall not be liable for incidental or consequential damages, even if advised of the possibility thereof.**

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The BEC Decision Rule: Measurement Uncertainty is not applied to any testing measurements or test results provided to the customer by BEC Incorporated at this time.

Revision History

Revision #	Description of Changes	Date of Changes	Date Released
0	Test Report Initial Release	N/A	10/19/2023
1	Clarified Model Numbers on Page 5. Added the statement on Page 43 that we scanned the models from 30 MHz to 1000 MHz for spurious emissions.	12/13/2023	12/13/2023

1.0 Administrative Information

1.1 Project General Information

Project Number	BEC-2272		
Manufacturer	Legrand		
Models	WNAL24, WZ3AL24, WNAL64 and WZ3AL64		
Descriptions	Legrand Model adorne Wireless Smart Switch with Netatmo and adorne Wireless Smart Dimmer with Netatmo		
EUT Models	WNAL64	WNAL64	WNAL24
EUT Test Types	SMA connector at antenna port and radio test software	Standard antenna and radio test software	Standard antenna and radio test software
EUT Serial Numbers	None	None	None
EUT Samples	2272-04	2272-05	2272-07
FCC ID	2AU5D-ASWDM		
ISED ID	25764- ASWDM		
Zigbee Radio Chip Manufacturer	Atmel		
Zigbee Radio Chip Model	SAMR21E		
Radio Type	Zigbee		
Frequency of Operation	2405 – 2480 MHz		
Modulation Type	O-QPSK		
Antenna Gain	+ 3.3 dBi		
FCC Classification	Digital Transmission System (DTS)		
Samples Received	08/30/2023		
Condition Received	Suitable for test		
Sample Type	Production units		
Firmware Version	TestRadio_WNRL23.bin		
Applicable FCC Rules	FCC Rules Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System		
Applicable ISED Rules	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

Test Laboratory Location	BEC Incorporated 970 East High Street Pottstown, PA 19464
Test Personnel	Steve Fanella / JR Fanella
BEC Laboratory Number FCC Registration	US1118
BEC Laboratory Number ISED Registration	7342A-1
Test Performed For	Pass & Seymour/Legrand 50 Boyd Avenue Syracuse, NY 13209
Customer Technical Contacts	Fred Duffy
Customer Reference Number	PO # SP319415-802

1.4 Measurement Uncertainty

Measurement	Measurement Distance	Range	Measurement Limit	Expanded Uncertainty
Radiated Disturbance Open Area Test Site	3 Meter	30 MHz – 1 GHz	Class A or B	4.63
Conducted Disturbance AC Mains	N/A	150 kHz – 30 MHz	Class A or B	2.69
Radio Frequency	N/A	1 MHz – 26.5 GHz	N/A	±0.027 ppm
RF power, conducted	N/A	1 MHz – 26.5 GHz	N/A	±1.45 dB
Conducted spurious emission of transmitter, valid up to 6 GHz	N/A	150 kHz – 26.5 GHz	N/A	±0.9 dB
Occupied Bandwidth	N/A	1 MHz – 26.5 GHz	N/A	±2 %
Temperature	N/A	15 – 35° C	N/A	±0.5 °C
Humidity	N/A	20 – 95 %	N/A	±2.5%

No adjustments to measured data presented in this report are required because all values of uncertainty are less that 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.

1.5 Test Result Summary Table

The Legrand Model WNAL24 and WNAL64 were tested and found to be compliant to the sections of the FCC Part 15 Subpart C and RSS-Gen RSS-247 standards listed below. The testing reflects specific testing to show compliance for a Class II Permissive Change:

Report Section	FCC Part 15, Subpart C	RSS-Gen	RSS-247	Test Description	Result
	15.203(b)	Annex A 10(g)		Antenna Requirement	Previously Reported
	15.204	8.3		External RF power amplifiers and antenna modifications	Previously Reported
4.1	15.207	7.2		Conducted Limits (AC Power) 150 kHz – 30 MHz	**PASS**
4.2	15.205(a) 15.209	8.9, 8.10	3.3	Radiated Emissions in Non-Restricted and Restricted Frequency Band 1 GHz – 18 GHz	**PASS**
	15.247(a)(2)		5.2 (a)	6 dB Occupied Bandwidth	Previously Reported
		6.7		99% Occupied Bandwidth	Previously Reported
4.3	15.247(b)(3)		5.4 (d)	Maximum Conducted (Peak) Power Output and EIRP	**PASS**
	15.247(d)		5.5	Antenna Conducted Emissions in Restricted Frequency Bands 30 MHz – 25 GHz	Previously Reported
	15.247(e)		5.2 (b)	DTS maximum power spectral density level in the fundamental emission	Previously Reported
	15.247(d)		5.5	DTS band-edge emission measurements	Previously Reported

Previously Reported Results: The EUT was previously tested with results are documented in report BEC-2150-01.

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

Unless noted elsewhere in this report, the following were the ambient conditions in the laboratory during testing:

Temperature: 22 ° ± 5 °
Humidity: 50% ± 20%
Barometric Pressure: 1000mb ± 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

Legrand Model WNALX4 Family Product Description-

The Legrand Model WNALX4 is a family of wireless switches and dimmers with Netatmo. The Legrand Model WNALX4 devices serve as an endpoint receiver for a nearby gateway device in an IOT network for smart lighting/electrical device control.

The WNAL24/WZ3AL24 is a wireless switch from the adorne collection, manufactured by Legrand. The WNAL24/WZ3AL24 switch uses AC voltage to power a Zigbee radio that operates at 2.4 GHz controlled by the Netatmo Smart Lighting System. The WNAL24/WZ3AL24 wireless smart switch with Netatmo serves as an endpoint receiver for a nearby gateway device in an IOT network for smart lighting/electrical device control

The WNAL64/WZ3AL64 is a wireless dimmer from the adorne collection, manufactured by Legrand. The WNAL64/WZ3AL64 dimmer uses AC voltage to power a Zigbee radio that operates at 2.4 GHz controlled by the Netatmo Smart Lighting System. The WNAL64/WZ3AL64 wireless smart dimmer with Netatmo serves as an endpoint receiver for a nearby gateway device in an IOT network for smart lighting/electrical device control

The WZ3ALXX products are the exact same device, parts and firmware as the WNALXX items. The only difference in the part numbers relate to specific marketing channels which can be handled by using different part numbers.

2.2 Product Category

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

2.3 Product Classification

47 CFR Part 15, Subpart C, Section 15.247 “DTS Operation within the band of 900 – 928 MHz, 2400 – 2483.5 MHz, and 5725 – 5850 MHz.”

2.4 Test Configuration

Samples of the Legrand Model WNALX3 adorne Wireless Smart Switch and Smart Dimmer with Zigbee, were tested at the Low Channel 11 at 2405 MHz, Middle Channel 18 at 2440 MHz and High Channel 26 at 2480 MHz. The Legrand Models WNAL24 and WNAL64 models with Zigbee radio samples contained control software that can utilize the O-QPSK modulation used in normal operation. The control software also allowed the tester to select an un-modulated transmit signal for the radio of the unit under test or to place the radio in a receive mode. The highest amplitude was determined to be when the radio transmitted with modulation.

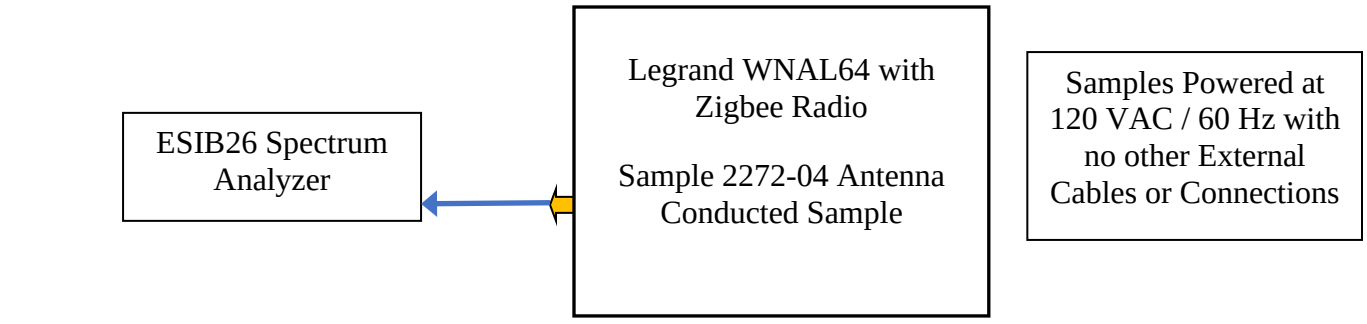
2.5 Test Configuration Rationale

Samples of the Legrand Models WNAL24 and WNAL64 with Zigbee radio, were powered externally at 120 VAC / 60 Hz and were supplied with software which controlled the operation of the Zigbee radio in a manner consistent with normal use.

2.6 Test Configuration Diagrams – Zigbee Radio

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. Diagrams show the Conducted Measurement configuration connection and Radiated Measurement configuration connection when testing the Zigbee Radio.

2.6.1 Zigbee Configuration – Conducted Measurement



BEC-926, 1 Meter SMA Cable Connecting the SMA Connection from the Zigbee Radio Output to the Input of the Rohde and Schwarz ESIB26 Measurement Analyzer

SMA Adapter Connected from the Zigbee Radio for connection to the SMA Cable

2.6.2 Zigbee Configuration – Radiated Measurement

Legrand WNAL24 2272-07 and WNAL64 2272-05 Radiated Emissions Test Samples	Samples Powered at 120 VAC / 60 Hz with no other External Cables or Connections

2.7 EUT Information, Interconnection Cabling and Support Equipment

EUT Hardware

Description	Manufacturer	Model	Serial Number	Sample Number
radiant 4-Button Scene Controller - Radiated Test Sample	Legrand	WNAL24	None	2272-07
radiant 4-Button Scene Controller - Antenna Conducted Test Sample	Legrand	WNAL64	None	2272-04
radiant 4-Button Scene Controller - Radiated Test Sample				2272-05

Interconnection Cable List (Conducted Measurement Test Setup)

Manufacturer	Model	Type	Shielding	Length	Description
Suhner	S04272B	High Frequency RF Cable 1 to 40 GHz	Double Braid	1 Meter	Measurement Cable from the Antenna SMA Connector to the R&S ESIB26 Receiver. Asset # BEC-962

2.8 Test Signals and Test Modulation

By design this product does not have an external modulation input connector, therefore, normal internally generated modulation was used. When evaluating the type of signal that would generate the highest output amplitude there was no difference between the un-modulated carrier and the modulated carrier. The testing was performed using modulated signals.

2.8.1 Zigbee Radio - Test Signals and Modulation

The EUT transmits to a discrete frequency on a specific channel. The Legrand WNAL24 and WNAL64 with Zigbee radio have 16 Channels available. The 16 Channels and frequencies that can be transmitted by the EUT are as follows:

Zigbee Channel	Frequency (MHz)	Zigbee Channel	Frequency (MHz)
11	2405	19	2445
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	25	2475
18	2440	26	2480

For the required testing, the EUT was configured to transmit at low Channel 11 (2405 MHz), middle Channel 18 (2440 MHz) and high Channel 26 (2480 MHz). The Zigbee radio utilizes one modulation, O-QPSK.

2.9 Grounding

There was no ground connection to the EUT during test. This presents the worst-case scenario of an ungrounded device; either by failing to attach ground at installation or breakage of ground wire.

2.10 EUT Modifications

With the exception for the attachment of an SMA connector directly to the antenna output on the main board of the Legrand Model WNAL24 and Model WNAL64, no modifications were made to the test 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

3.1.2 Industry Canada Requirements

RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus

RSS-247 Issue 2: 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

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

ANSI C63.10-2013, American National Standard for Compliance Testing of Unlicensed Wireless Devices.

3.2 Deviations or Exclusions from the Requirements

No deviations or exclusions were made.

4.0 Test Results

4.1 Conducted Emissions AC Power Port (47 CFR 15.207)(RSS-Gen 7.2)

The Legrand Models WNAL24 and WNAL64 with Zigbee radio were powered externally at 120 VAC / 60 Hz and therefore require the Conducted Emissions AC Power Port testing.

4.1.1 Conducted Emissions 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 Ω, 50 µH 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:

Emission (dBµV) = Meter Reading (dBµv) + Cable Loss (dB) + LISN Factor (dB) + Limiter Loss (dB)

Note: An EMI receiver set to peak mode was used to measure and record the spectrum for expediency. To determine compliance, the peak detector sweep is graphed against the appropriate average limit. This type of measurement is valid because the peak reading will always be greater than or equal to the average or quasi-peak reading. Peak emissions that are greater than or equal to 1 dB below the average limit are remeasured using either a manually tuned receiver with the detector function set to quasi-peak and then to average, or a receiver under remote control with quasi-peak and average detector functions.

4.1.2 Conducted Emissions Test Information

The following information is related to the testing performed for AC Conducted Emissions in the frequency range of 150 kHz to 30 MHz.

Frequency Range	150 kHz to 30 MHz
Test Standards	FCC Part 15.207 and RSS-Gen 7.2
Class Limits	Class B Device
BEC Test Area	Screen Room 1
Manufacturer	Legrand
Model	WNAL24
Serial Number	No Serial Number
Sample Number	2272-07
Manufacturer	Legrand
Model	WNAL64
Serial Number	No Serial Number
Sample Number	2272-05
Sample Type	Radiated Emissions Sample Types
Test Configuration	During testing of the Transmitter, the EUT was tested at Maximum Output Power with typical modulation. The Transmitter Low Channel, Middle Channel and High Channel were tested along with the Transmitter in Rx Mode.
Port Tested	AC Mains Port of the EUT
EUT Power	120 VAC / 60 Hz
Test Date	09/05/2023
Temperature	24°C
Humidity	51 %
Test Date	09/19/2023
Temperature	23°C
Humidity	55 %

4.1.3 Conducted Emissions 150 kHz to 30 MHz FCC 15.207 and RSS-Gen 7.2 Limits Test Results Legrand Model WNAL24

The following graphs and tables show the conducted emissions recorded on the AC Power Port of the EUT displayed against the FCC Part 15.207 and RSS-Gen 7.2 Limits. EUT was powered at 120 Vac / 60 Hz.

EUT Transmitting at 2.405 GHz Low Channel Tables

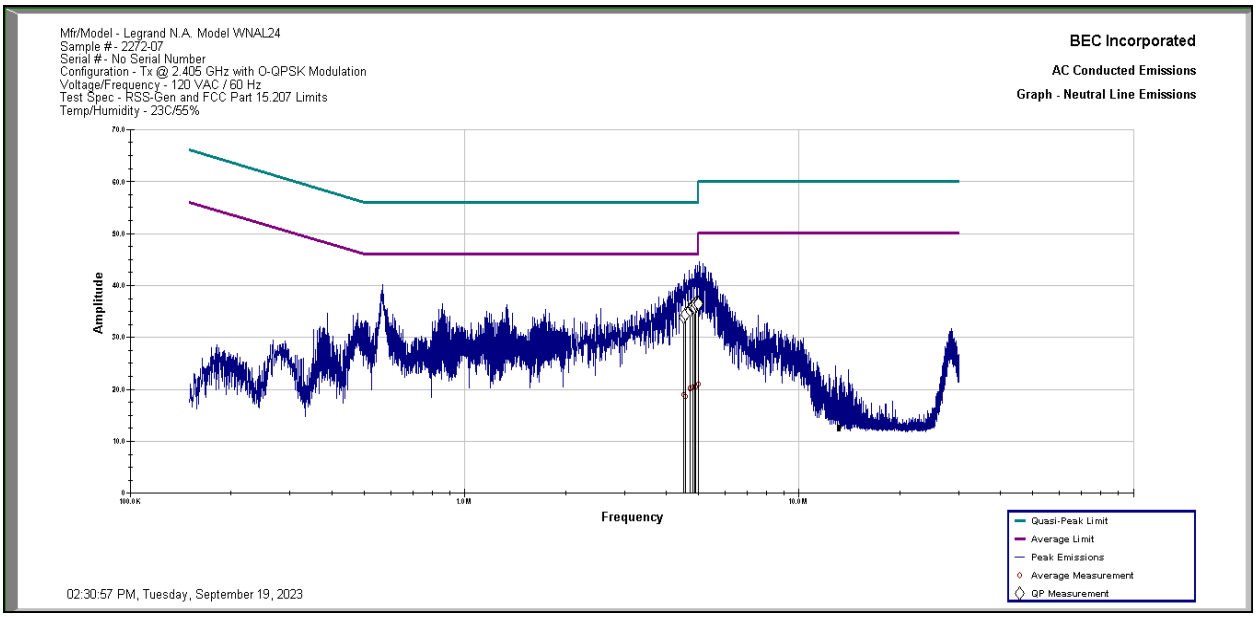
BEC Incorporated
Neutral Line Conducted Emissions
02:30:57 PM, Tuesday, September 19, 2023

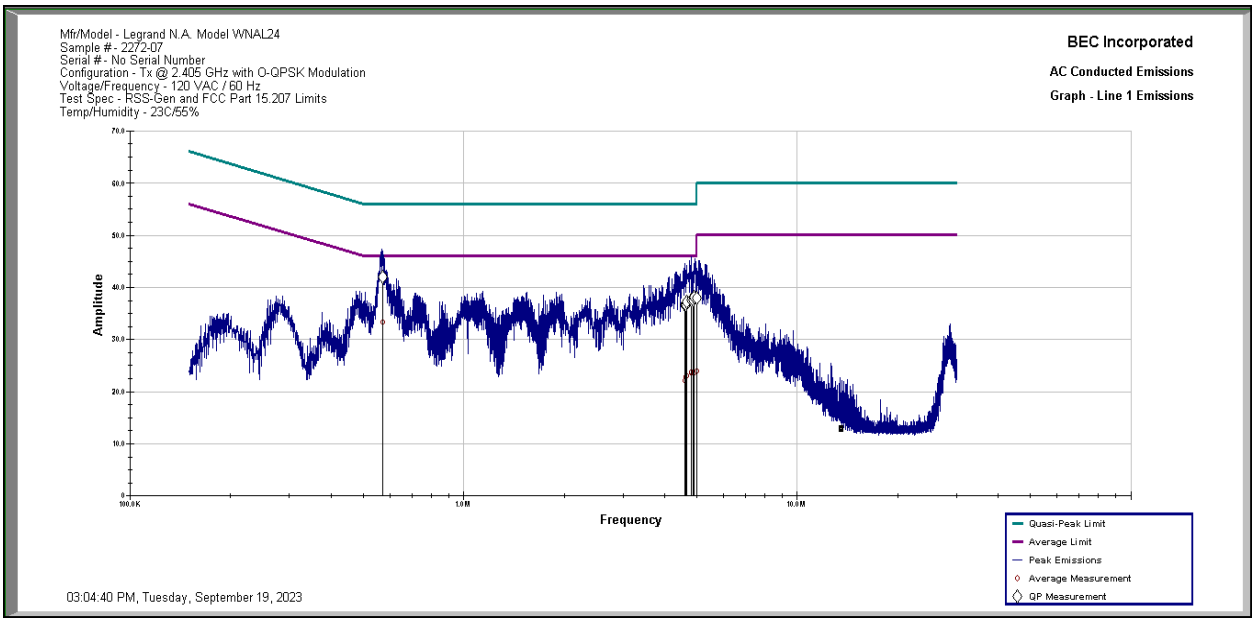
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
4.523 MHz	19.04	46.00	-26.96	33.95	56.00	-22.05	10.27
4.558 MHz	18.64	46.00	-27.36	34.39	56.00	-21.61	10.27
4.704 MHz	20.14	46.00	-25.86	35.34	56.00	-20.66	10.27
4.721 MHz	20.25	46.00	-25.75	35.19	56.00	-20.81	10.27
4.810 MHz	20.39	46.00	-25.61	35.75	56.00	-20.25	10.28
4.811 MHz	20.45	46.00	-25.55	35.87	56.00	-20.13	10.28
4.869 MHz	20.38	46.00	-25.62	35.65	56.00	-20.35	10.28
4.904 MHz	20.54	46.00	-25.46	36.55	56.00	-19.45	10.28
4.980 MHz	21.05	46.00	-24.95	36.68	56.00	-19.32	10.28
4.987 MHz	21.02	46.00	-24.98	36.42	56.00	-19.58	10.28
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - Tx @ 2.405 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

BEC Incorporated
Line 1 Conducted Emissions
03:04:40 PM, Tuesday, September 19, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
571.124 KHz	33.39	46.00	-12.61	42.07	56.00	-13.93	10.15
4.591 MHz	22.18	46.00	-23.82	36.62	56.00	-19.38	10.29
4.637 MHz	22.82	46.00	-23.18	36.61	56.00	-19.39	10.29
4.672 MHz	22.97	46.00	-23.03	37.18	56.00	-18.82	10.29
4.798 MHz	23.50	46.00	-22.50	37.57	56.00	-18.43	10.30
4.800 MHz	23.70	46.00	-22.30	37.63	56.00	-18.37	10.30
4.878 MHz	23.63	46.00	-22.37	37.54	56.00	-18.46	10.30
4.901 MHz	23.59	46.00	-22.41	38.04	56.00	-17.96	10.30
4.981 MHz	23.98	46.00	-22.02	37.85	56.00	-18.15	10.30
5.005 MHz	23.98	50.00	-26.02	37.96	60.00	-22.04	10.30
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - Tx @ 2.405 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

EUT Transmitting at 2.405 GHz Low Channel Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL24 Sample 2272-07 in Tx Mode Low Channel at 2.405 GHz are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 12.61 dB.

EUT Transmitting at 2.440 GHz Middle Channel Tables

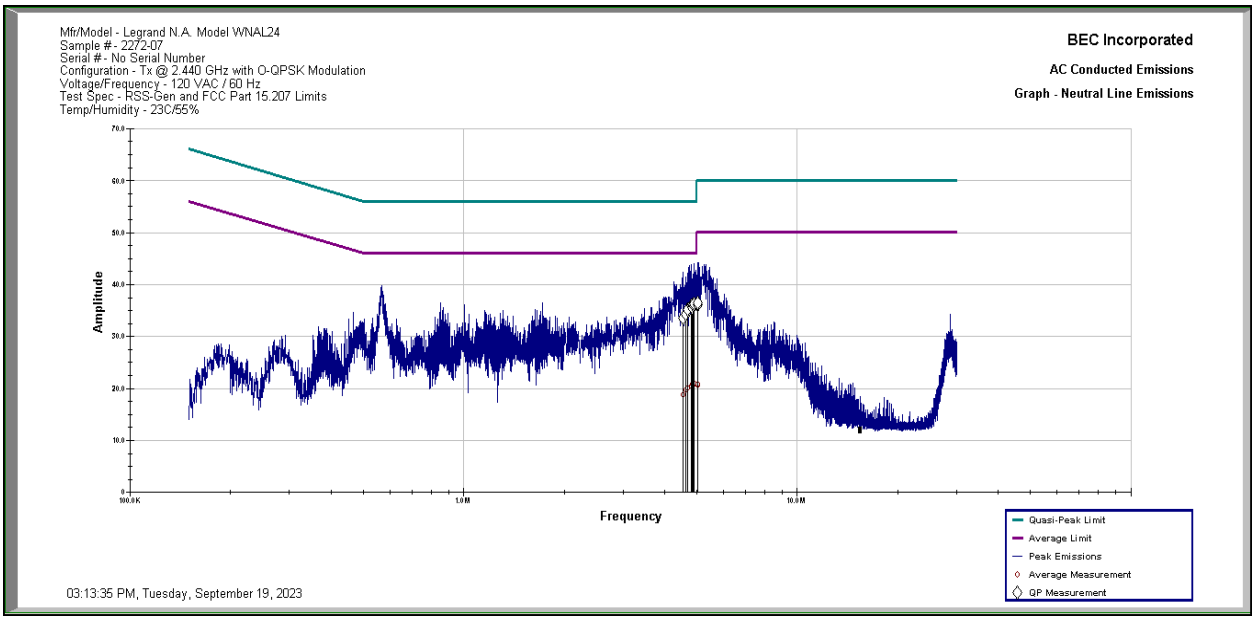
BEC Incorporated
Neutral Line Conducted Emissions
03:13:35 PM, Tuesday, September 19, 2023

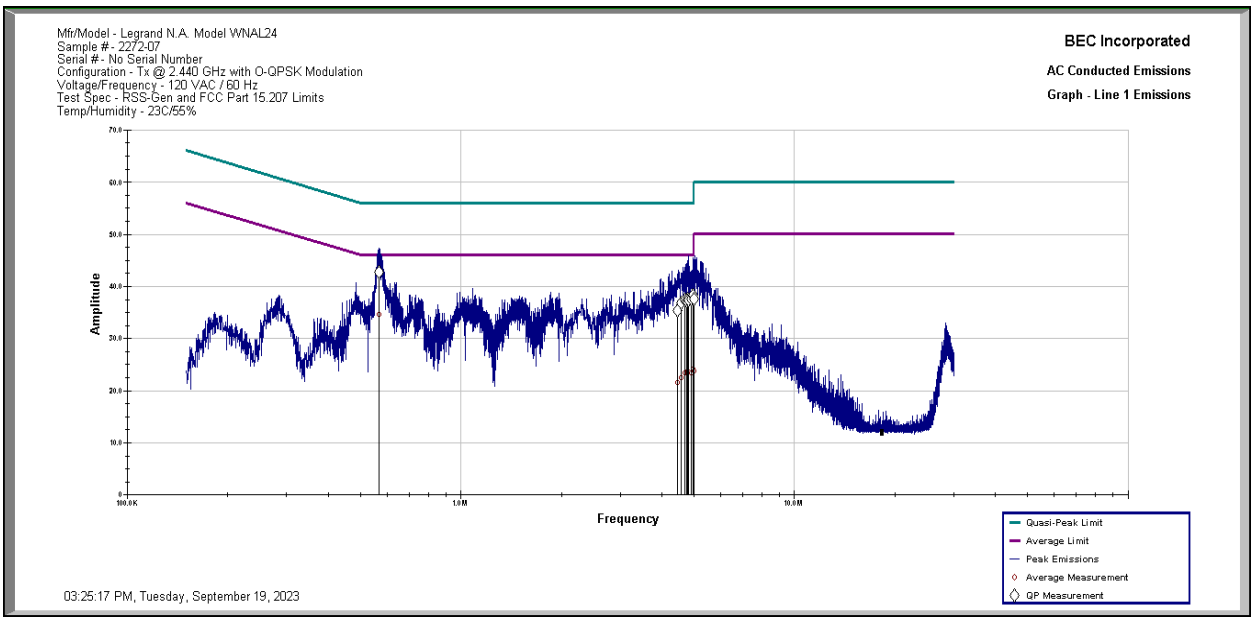
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
4.550 MHz	18.81	46.00	-27.19	33.58	56.00	-22.42	10.27
4.627 MHz	19.68	46.00	-26.32	34.19	56.00	-21.81	10.27
4.696 MHz	20.04	46.00	-25.96	35.21	56.00	-20.79	10.27
4.795 MHz	20.39	46.00	-25.61	35.87	56.00	-20.13	10.28
4.823 MHz	20.83	46.00	-25.17	35.56	56.00	-20.44	10.28
4.863 MHz	20.71	46.00	-25.29	36.02	56.00	-19.98	10.28
4.880 MHz	20.89	46.00	-25.11	36.14	56.00	-19.86	10.28
4.897 MHz	20.99	46.00	-25.01	36.36	56.00	-19.64	10.28
5.027 MHz	20.59	50.00	-29.41	36.12	60.00	-23.88	10.28
5.028 MHz	20.77	50.00	-29.23	36.52	60.00	-23.48	10.28
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - Tx @ 2.440 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

BEC Incorporated
Line 1 Conducted Emissions
03:25:17 PM, Tuesday, September 19, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
566.228 KHz	34.62	46.00	-11.38	42.79	56.00	-13.21	10.15
4.446 MHz	21.48	46.00	-24.52	35.31	56.00	-20.69	10.29
4.576 MHz	22.50	46.00	-23.50	36.76	56.00	-19.24	10.29
4.696 MHz	23.43	46.00	-22.57	37.36	56.00	-18.64	10.29
4.747 MHz	23.59	46.00	-22.41	37.22	56.00	-18.78	10.29
4.786 MHz	23.56	46.00	-22.44	37.52	56.00	-18.48	10.30
4.796 MHz	23.64	46.00	-22.36	37.44	56.00	-18.56	10.30
4.901 MHz	23.43	46.00	-22.57	37.59	56.00	-18.41	10.30
4.965 MHz	24.20	46.00	-21.80	38.31	56.00	-17.69	10.30
4.992 MHz	23.75	46.00	-22.25	37.64	56.00	-18.36	10.30
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - Tx @ 2.440 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

EUT Transmitting at 2.440 GHz Middle Channel Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL24 Sample 2272-07 in Tx Mode Middle Channel at 2.440 GHz are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 11.38 dB.

EUT Transmitting at 2.480 GHz High Channel Tables

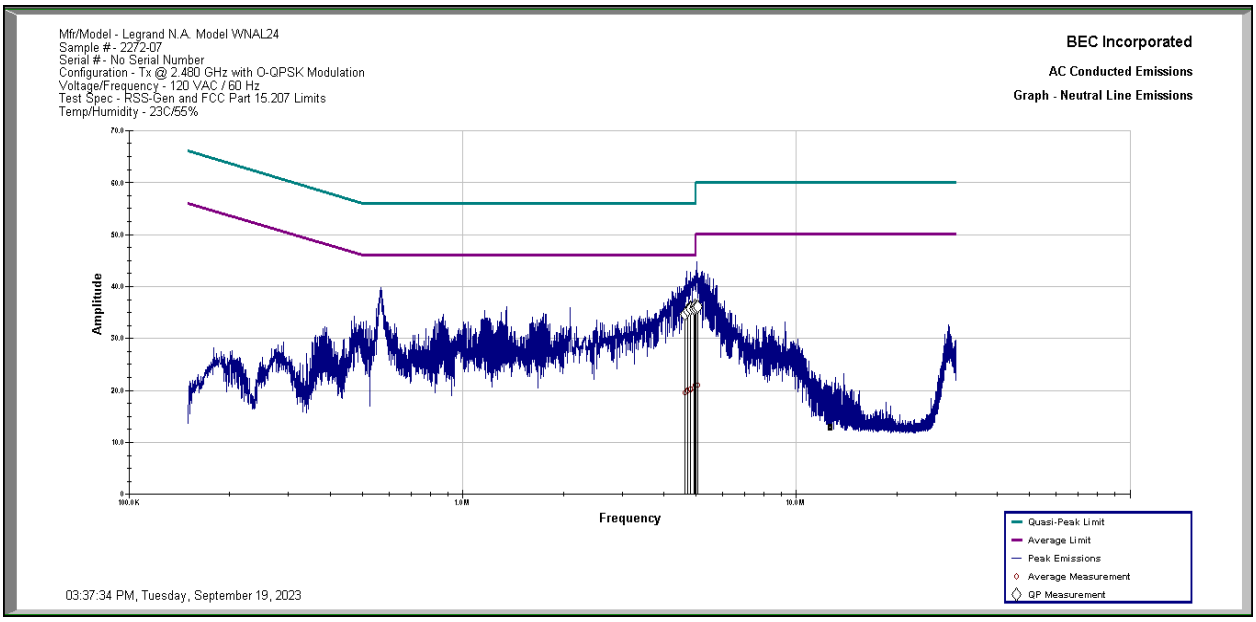
BEC Incorporated
Neutral Line Conducted Emissions
03:37:34 PM, Tuesday, September 19, 2023

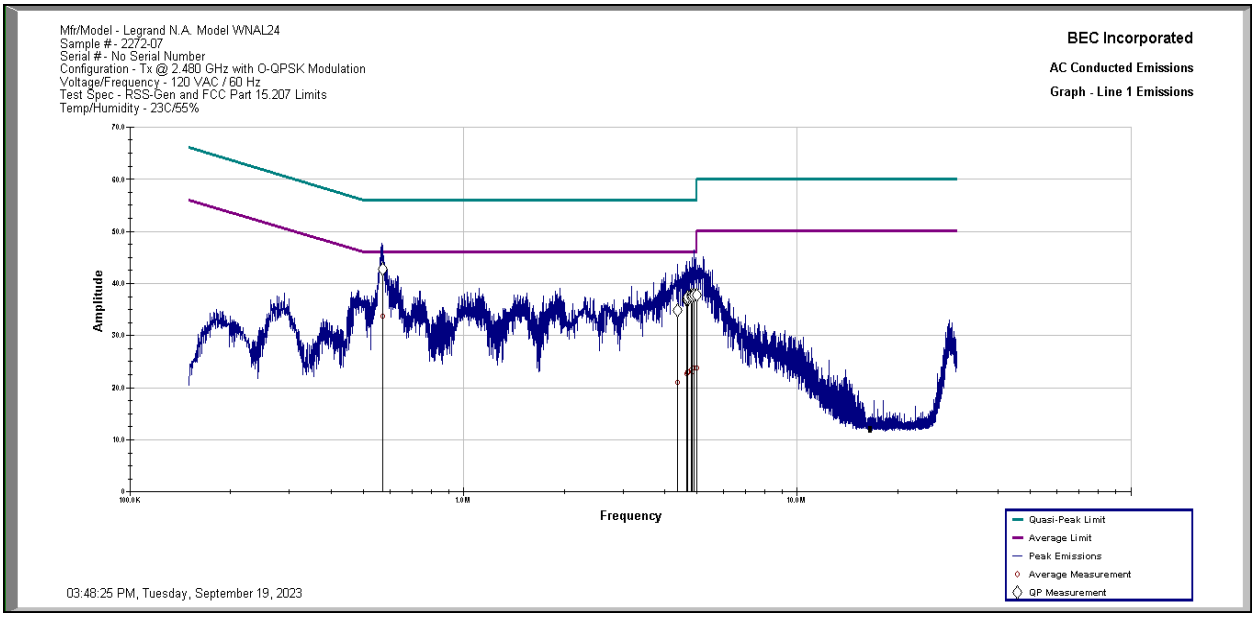
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
4.615 MHz	19.44	46.00	-26.56	34.61	56.00	-21.39	10.27
4.704 MHz	20.04	46.00	-25.96	35.31	56.00	-20.69	10.27
4.714 MHz	19.90	46.00	-26.10	35.40	56.00	-20.60	10.27
4.806 MHz	20.07	46.00	-25.93	35.99	56.00	-20.01	10.28
4.819 MHz	20.19	46.00	-25.81	35.82	56.00	-20.18	10.28
4.928 MHz	20.46	46.00	-25.54	35.79	56.00	-20.21	10.28
4.931 MHz	20.39	46.00	-25.61	35.79	56.00	-20.21	10.28
4.977 MHz	20.95	46.00	-25.05	36.29	56.00	-19.71	10.28
4.978 MHz	21.00	46.00	-25.00	35.96	56.00	-20.04	10.28
5.054 MHz	20.99	50.00	-29.01	36.04	60.00	-23.96	10.28
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - Tx @ 2.480 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

BEC Incorporated
Line 1 Conducted Emissions
03:48:25 PM, Tuesday, September 19, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
570.579 KHz	33.80	46.00	-12.20	42.64	56.00	-13.36	10.15
4.367 MHz	21.04	46.00	-24.96	34.86	56.00	-21.14	10.29
4.654 MHz	22.62	46.00	-23.38	36.82	56.00	-19.18	10.29
4.682 MHz	22.87	46.00	-23.13	36.86	56.00	-19.14	10.29
4.693 MHz	23.09	46.00	-22.91	37.36	56.00	-18.64	10.29
4.800 MHz	23.29	46.00	-22.71	37.70	56.00	-18.30	10.30
4.808 MHz	23.43	46.00	-22.57	37.46	56.00	-18.54	10.30
4.845 MHz	23.12	46.00	-22.88	37.49	56.00	-18.51	10.30
4.904 MHz	23.69	46.00	-22.31	37.69	56.00	-18.31	10.30
5.001 MHz	23.79	50.00	-26.21	37.79	60.00	-22.21	10.30
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - Tx @ 2.480 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

EUT Transmitting at 2.480 GHz High Channel Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL24 Sample 2272-07 in Tx Mode High Channel at 2.480 GHz are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 12.2 dB.

EUT Configured in Rx Mode Tables

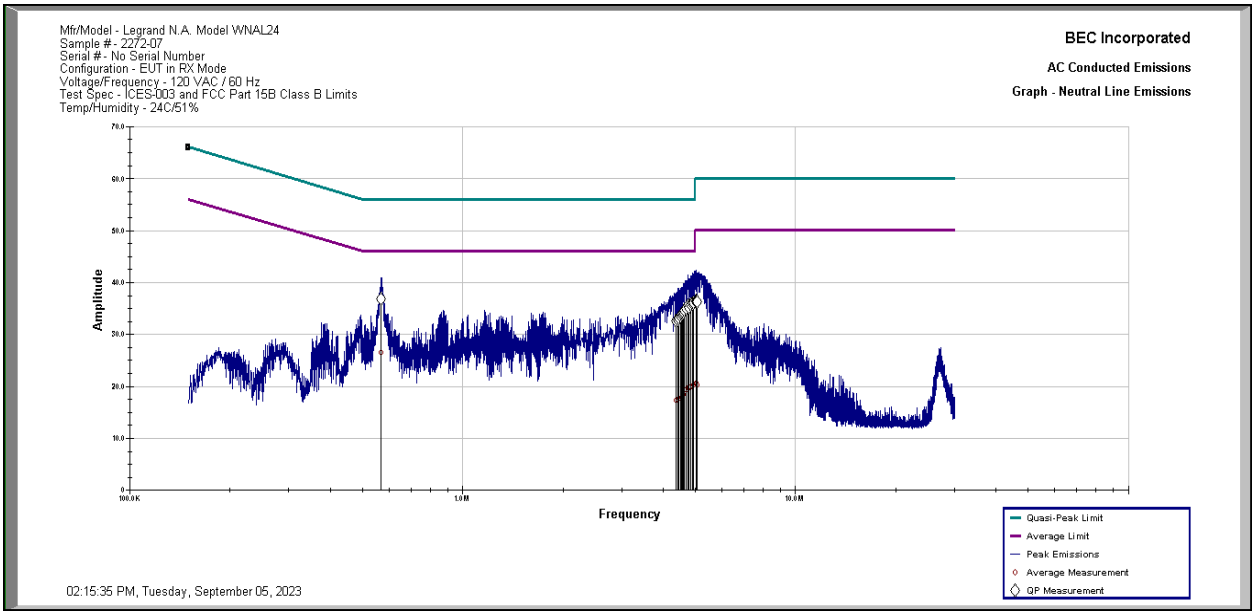
BEC Incorporated
Neutral Line Conducted Emissions
02:15:35 PM, Tuesday, September 05, 2023

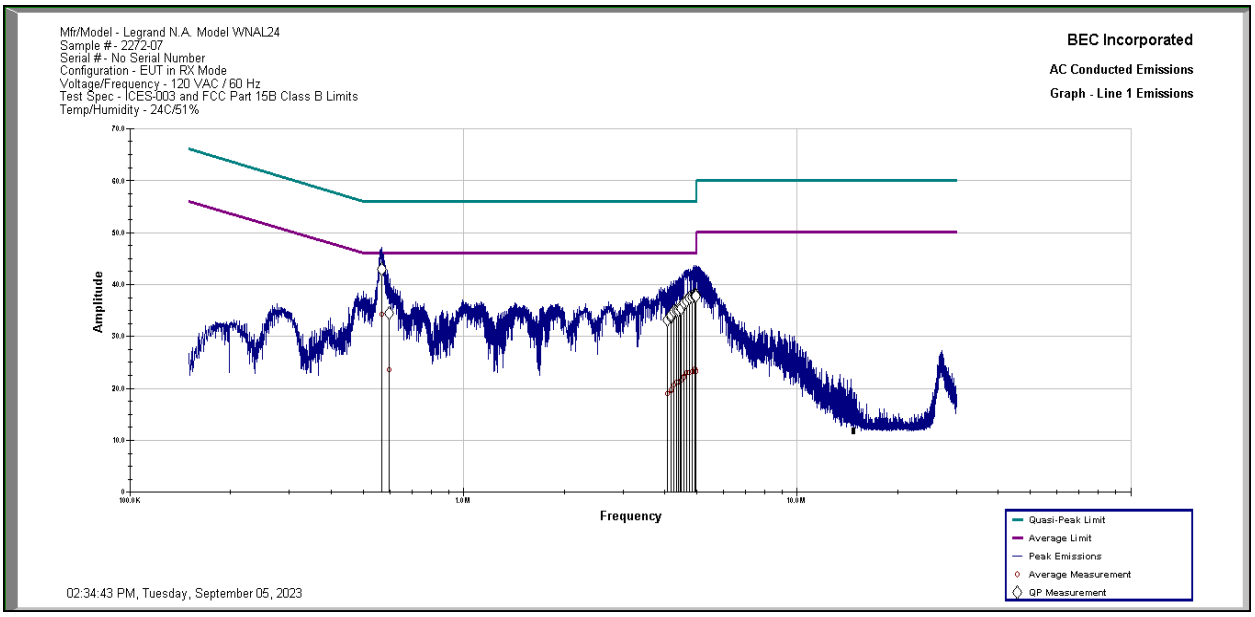
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
569.232 KHz	26.47	46.00	-19.53	36.80	56.00	-19.20	10.13
4.376 MHz	17.27	46.00	-28.73	32.57	56.00	-23.43	10.27
4.424 MHz	17.47	46.00	-28.53	32.88	56.00	-23.12	10.27
4.460 MHz	17.60	46.00	-28.40	33.14	56.00	-22.86	10.27
4.514 MHz	17.77	46.00	-28.23	33.47	56.00	-22.53	10.27
4.530 MHz	17.96	46.00	-28.04	33.88	56.00	-22.12	10.27
4.559 MHz	18.41	46.00	-27.59	33.98	56.00	-22.02	10.27
4.565 MHz	18.41	46.00	-27.59	34.13	56.00	-21.87	10.27
4.597 MHz	18.45	46.00	-27.55	34.16	56.00	-21.84	10.27
4.627 MHz	18.99	46.00	-27.01	34.59	56.00	-21.41	10.27
4.698 MHz	19.42	46.00	-26.58	34.94	56.00	-21.06	10.27
4.758 MHz	19.68	46.00	-26.32	35.53	56.00	-20.47	10.28
4.784 MHz	19.65	46.00	-26.35	35.17	56.00	-20.83	10.28
4.788 MHz	19.67	46.00	-26.33	35.22	56.00	-20.78	10.28
4.823 MHz	19.92	46.00	-26.08	35.73	56.00	-20.27	10.28
4.901 MHz	20.13	46.00	-25.87	35.94	56.00	-20.06	10.28
4.940 MHz	20.26	46.00	-25.74	36.07	56.00	-19.93	10.28
5.011 MHz	20.69	50.00	-29.31	36.39	60.00	-23.61	10.28
5.039 MHz	20.53	50.00	-29.47	36.29	60.00	-23.71	10.28
5.062 MHz	20.27	50.00	-29.73	36.29	60.00	-23.71	10.28
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - EUT in RX Mode							
Voltage/Frequency - 120 VAC / 60 Hz							

BEC Incorporated
Line 1 Conducted Emissions
02:34:43 PM, Tuesday, September 05, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
569.098 KHz	34.19	46.00	-11.81	42.93	56.00	-13.07	10.15
597.645 KHz	23.58	46.00	-22.42	34.51	56.00	-21.49	10.15
4.076 MHz	18.98	46.00	-27.02	33.09	56.00	-22.91	10.28
4.175 MHz	19.52	46.00	-26.48	33.67	56.00	-22.33	10.28
4.184 MHz	19.66	46.00	-26.34	33.99	56.00	-22.01	10.28
4.275 MHz	20.62	46.00	-25.38	34.79	56.00	-21.21	10.29
4.355 MHz	21.26	46.00	-24.74	34.91	56.00	-21.09	10.29
4.395 MHz	21.26	46.00	-24.74	35.06	56.00	-20.94	10.29
4.469 MHz	21.30	46.00	-24.70	35.57	56.00	-20.43	10.29
4.487 MHz	21.47	46.00	-24.53	35.43	56.00	-20.57	10.29
4.558 MHz	22.25	46.00	-23.75	36.38	56.00	-19.62	10.29
4.575 MHz	22.20	46.00	-23.80	36.55	56.00	-19.45	10.29
4.648 MHz	23.00	46.00	-23.00	36.85	56.00	-19.15	10.29
4.755 MHz	23.02	46.00	-22.98	37.39	56.00	-18.61	10.30
4.830 MHz	23.22	46.00	-22.78	37.53	56.00	-18.47	10.30
4.850 MHz	23.21	46.00	-22.79	37.51	56.00	-18.49	10.30
4.933 MHz	23.77	46.00	-22.23	37.79	56.00	-18.21	10.30
4.935 MHz	23.24	46.00	-22.76	37.84	56.00	-18.16	10.30
4.963 MHz	23.38	46.00	-22.62	37.84	56.00	-18.16	10.30
4.969 MHz	23.26	46.00	-22.74	37.69	56.00	-18.31	10.30
Mfr/Model - Legrand N.A. Model WNAL24							
Sample # - 2272-07							
Serial # - No Serial Number							
Configuration - EUT in RX Mode							
Voltage/Frequency - 120 VAC / 60 Hz							

EUT Configured in Rx Mode Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL24 Sample 2272-07 in Rx Mode are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 11.81 dB.

4.1.4 Conducted Emissions 150 kHz to 30 MHz FCC 15.207 and RSS-Gen 7.2 Limits Test Results Legrand Model WNAL64

The following graphs and tables show the conducted emissions recorded on the AC Power Port of the EUT displayed against the FCC Part 15.207 and RSS-Gen 7.2 Limits. EUT was powered at 120 Vac / 60 Hz.

EUT Transmitting at 2.405 GHz Low Channel Tables

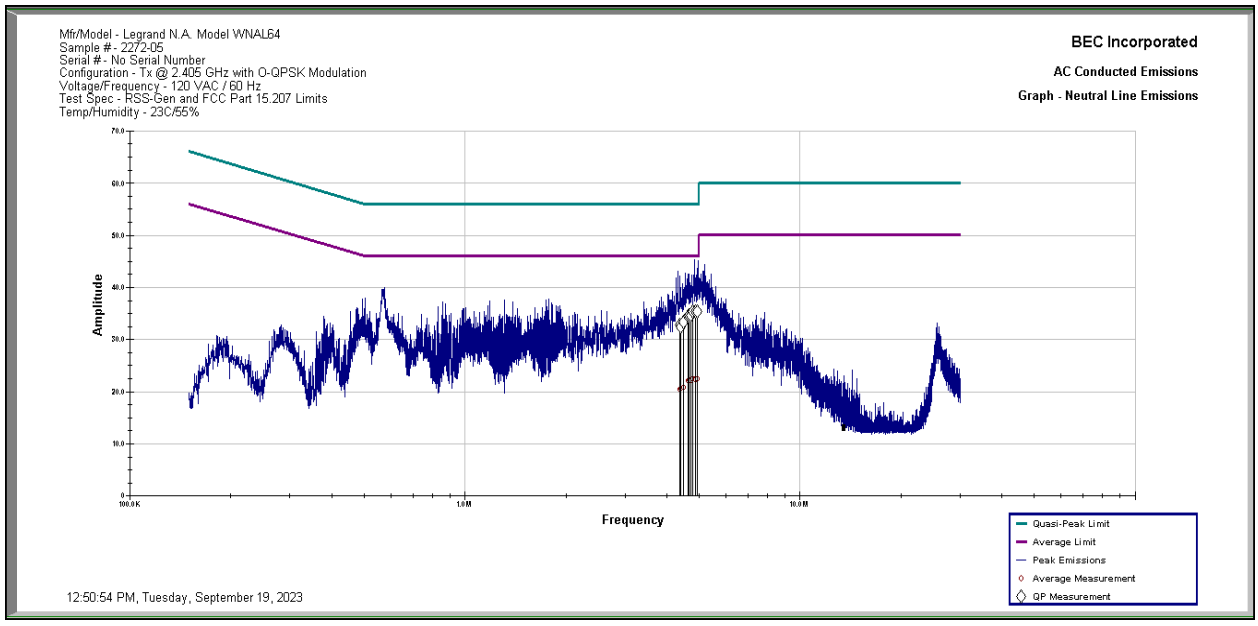
BEC Incorporated
Neutral Line Conducted Emissions
12:46:51 PM, Tuesday, September 19, 2023

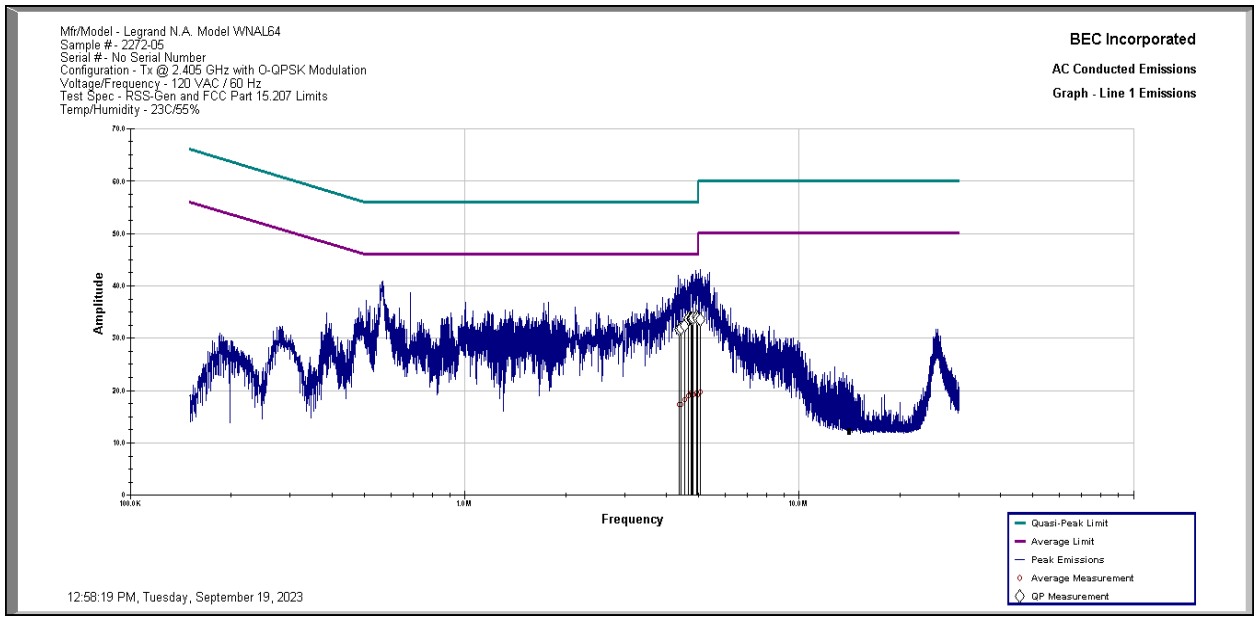
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
4.369 MHz	20.52	46.00	-25.48	32.82	56.00	-23.18	10.27
4.409 MHz	20.62	46.00	-25.38	32.42	56.00	-23.58	10.27
4.496 MHz	20.76	46.00	-25.24	33.26	56.00	-22.74	10.27
4.641 MHz	22.03	46.00	-23.97	34.46	56.00	-21.54	10.27
4.670 MHz	22.21	46.00	-23.79	34.53	56.00	-21.47	10.27
4.705 MHz	22.12	46.00	-23.88	34.61	56.00	-21.39	10.27
4.776 MHz	22.50	46.00	-23.50	35.28	56.00	-20.72	10.28
4.865 MHz	22.41	46.00	-23.59	35.45	56.00	-20.55	10.28
4.875 MHz	22.28	46.00	-23.72	35.31	56.00	-20.69	10.28
4.930 MHz	22.51	46.00	-23.49	35.45	56.00	-20.55	10.28
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - Tx @ 2.405 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

BEC Incorporated
Line 1 Conducted Emissions
12:54:20 PM, Tuesday, September 19, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
4.369 MHz	17.32	46.00	-28.68	31.74	56.00	-24.26	10.29
4.422 MHz	17.29	46.00	-28.71	31.87	56.00	-24.13	10.29
4.553 MHz	18.16	46.00	-27.84	32.46	56.00	-23.54	10.29
4.667 MHz	19.00	46.00	-27.00	33.68	56.00	-22.32	10.29
4.736 MHz	19.44	46.00	-26.56	33.73	56.00	-22.27	10.29
4.777 MHz	19.35	46.00	-26.65	33.67	56.00	-22.33	10.30
4.817 MHz	19.19	46.00	-26.81	33.85	56.00	-22.15	10.30
4.939 MHz	19.59	46.00	-26.41	34.04	56.00	-21.96	10.30
4.970 MHz	19.13	46.00	-26.87	33.78	56.00	-22.22	10.30
5.050 MHz	19.79	50.00	-30.21	33.56	60.00	-26.44	10.30
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - Tx @ 2.405 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

EUT Transmitting at 2.405 GHz Low Channel Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL64 Sample 2272-05 in Tx Mode Low Channel at 2.405 GHz are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 20.55 dB.

EUT Transmitting at 2.440 GHz Middle Channel Tables

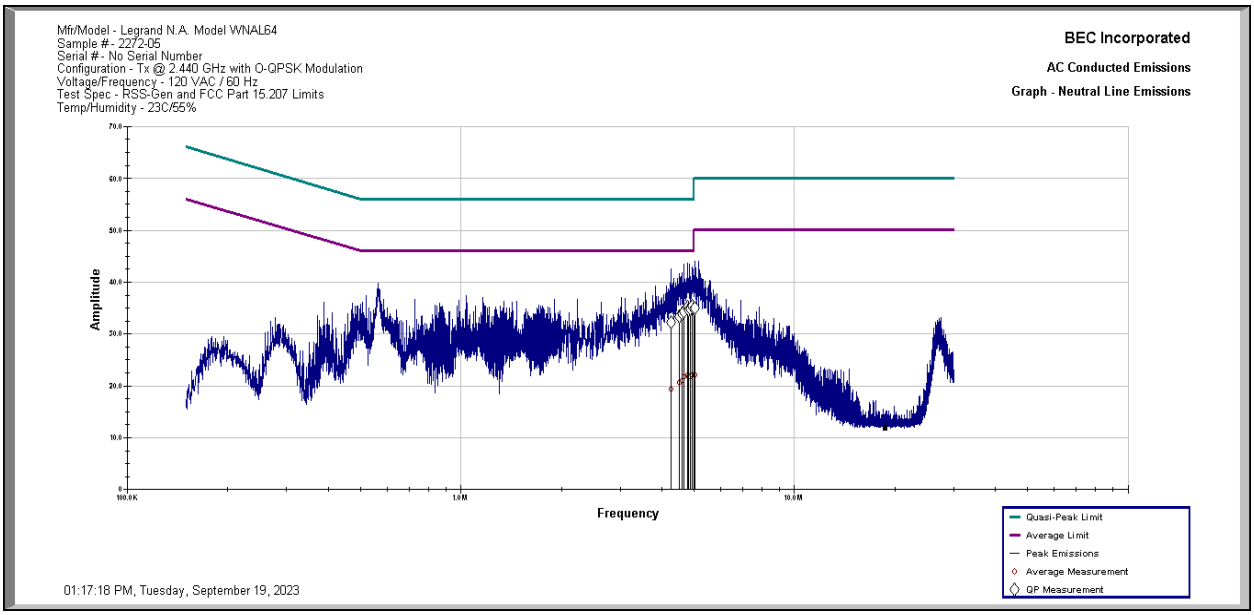
BEC Incorporated
Neutral Line Conducted Emissions
01:17:18 PM, Tuesday, September 19, 2023

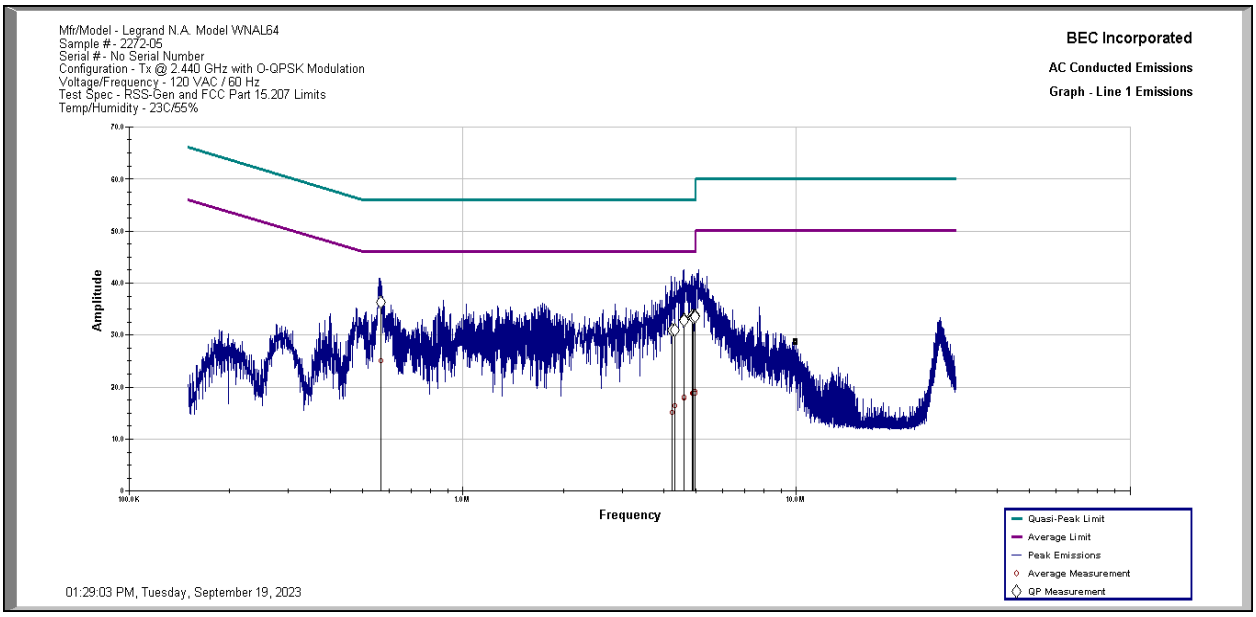
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
4.275 MHz	19.38	46.00	-26.62	32.20	56.00	-23.80	10.27
4.516 MHz	20.60	46.00	-25.40	33.28	56.00	-22.72	10.27
4.586 MHz	21.09	46.00	-24.91	33.95	56.00	-22.05	10.27
4.669 MHz	21.76	46.00	-24.24	34.29	56.00	-21.71	10.27
4.771 MHz	22.11	46.00	-23.89	35.15	56.00	-20.85	10.28
4.815 MHz	21.69	46.00	-24.31	34.58	56.00	-21.42	10.28
4.880 MHz	21.78	46.00	-24.22	34.81	56.00	-21.19	10.28
4.938 MHz	22.13	46.00	-23.87	35.41	56.00	-20.59	10.28
4.996 MHz	22.11	46.00	-23.89	34.87	56.00	-21.13	10.28
5.030 MHz	22.14	50.00	-27.86	35.01	60.00	-24.99	10.28
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - Tx @ 2.440 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

BEC Incorporated
Line 1 Conducted Emissions
01:29:03 PM, Tuesday, September 19, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
565.844 KHz	25.05	46.00	-20.95	36.33	56.00	-19.67	10.15
4.225 MHz	15.19	46.00	-30.81	30.85	56.00	-25.15	10.28
4.320 MHz	16.39	46.00	-29.61	31.03	56.00	-24.97	10.29
4.587 MHz	17.83	46.00	-28.17	32.90	56.00	-23.10	10.29
4.606 MHz	18.08	46.00	-27.92	32.82	56.00	-23.18	10.29
4.876 MHz	18.79	46.00	-27.21	33.70	56.00	-22.30	10.30
4.885 MHz	18.75	46.00	-27.25	33.31	56.00	-22.69	10.30
4.950 MHz	19.07	46.00	-26.93	33.67	56.00	-22.33	10.30
4.956 MHz	19.18	46.00	-26.82	33.72	56.00	-22.28	10.30
4.975 MHz	18.76	46.00	-27.24	33.46	56.00	-22.54	10.30
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - Tx @ 2.440 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

EUT Transmitting at 2.440 GHz Middle Channel Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL64 Sample 2272-05 in Tx Mode Middle Channel at 2.440 GHz are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 19.67 dB.

EUT Transmitting at 2.480 GHz High Channel Tables

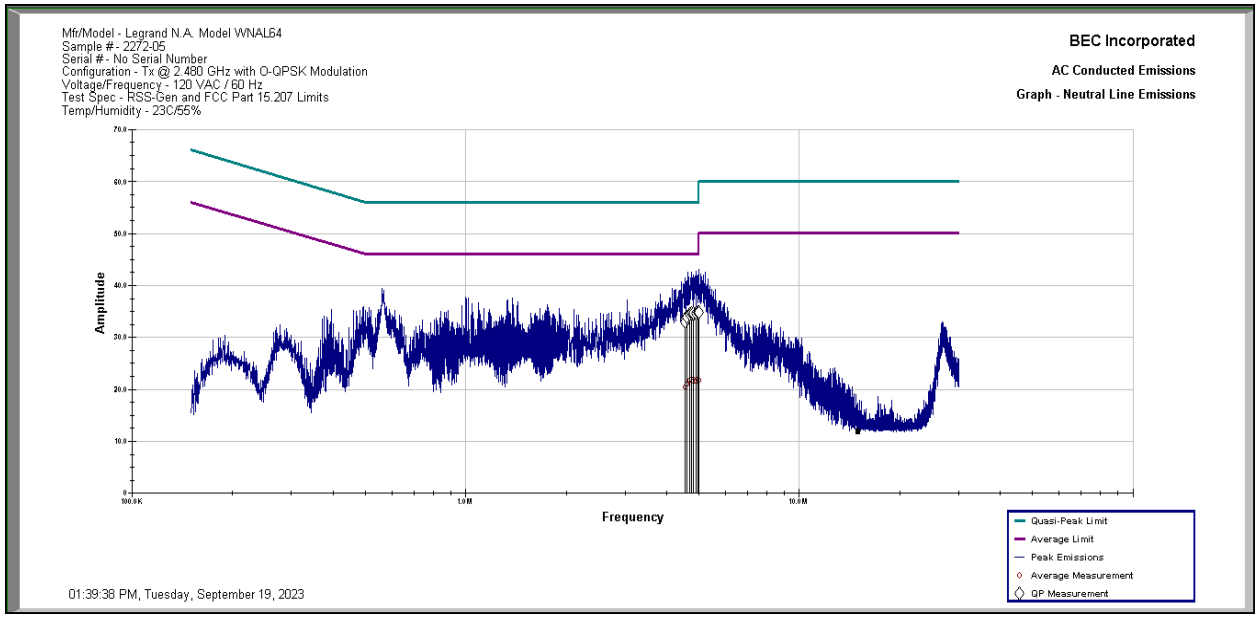
BEC Incorporated
Neutral Line Conducted Emissions
01:39:38 PM, Tuesday, September 19, 2023

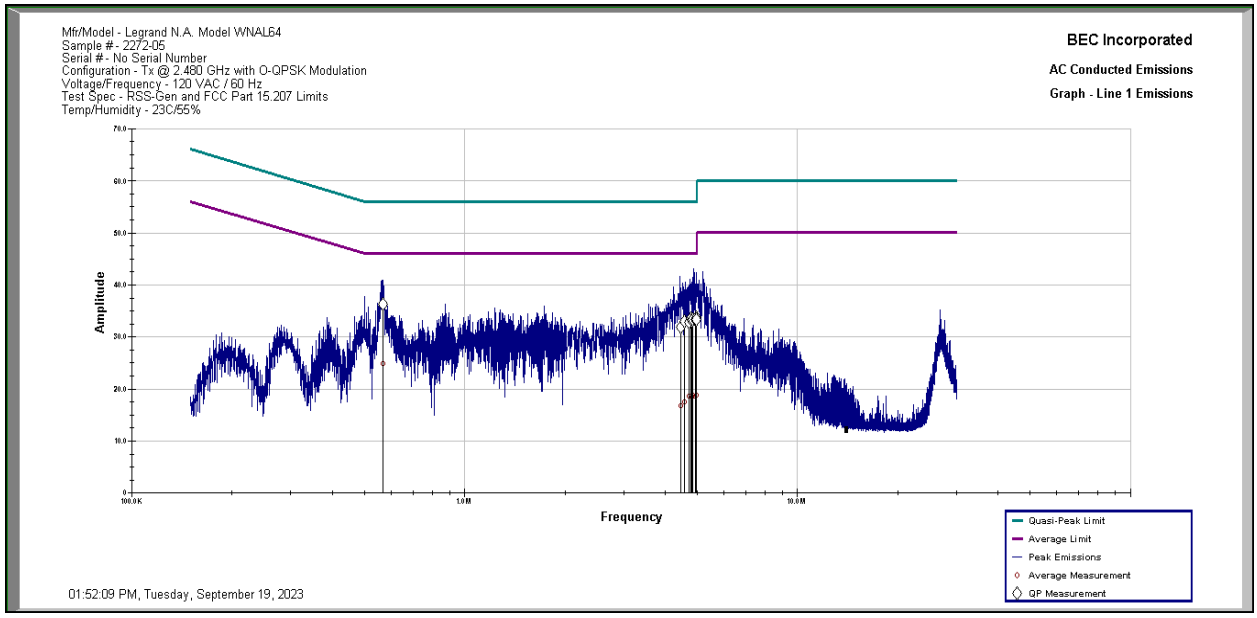
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
4.543 MHz	20.47	46.00	-25.53	33.42	56.00	-22.58	10.27
4.549 MHz	20.49	46.00	-25.51	32.89	56.00	-23.11	10.27
4.594 MHz	20.93	46.00	-25.07	33.91	56.00	-22.09	10.27
4.697 MHz	21.81	46.00	-24.19	34.45	56.00	-21.55	10.27
4.736 MHz	21.85	46.00	-24.15	34.63	56.00	-21.37	10.27
4.794 MHz	21.92	46.00	-24.08	34.44	56.00	-21.56	10.28
4.821 MHz	21.62	46.00	-24.38	34.67	56.00	-21.33	10.28
4.883 MHz	21.54	46.00	-24.46	34.57	56.00	-21.43	10.28
4.963 MHz	21.94	46.00	-24.06	34.86	56.00	-21.14	10.28
4.983 MHz	21.68	46.00	-24.32	34.82	56.00	-21.18	10.28
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - Tx @ 2.480 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

BEC Incorporated
Line 1 Conducted Emissions
01:52:09 PM, Tuesday, September 19, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
566.867 KHz	24.78	46.00	-21.22	36.19	56.00	-19.81	10.15
4.450 MHz	16.80	46.00	-29.20	31.83	56.00	-24.17	10.29
4.579 MHz	17.55	46.00	-28.45	33.02	56.00	-22.98	10.29
4.702 MHz	18.53	46.00	-27.47	32.85	56.00	-23.15	10.29
4.772 MHz	18.59	46.00	-27.41	33.51	56.00	-22.49	10.30
4.809 MHz	18.49	46.00	-27.51	33.10	56.00	-22.90	10.30
4.840 MHz	18.81	46.00	-27.19	33.27	56.00	-22.73	10.30
4.918 MHz	18.60	46.00	-27.40	33.35	56.00	-22.65	10.30
4.945 MHz	18.72	46.00	-27.28	33.60	56.00	-22.40	10.30
4.959 MHz	18.77	46.00	-27.23	33.39	56.00	-22.61	10.30
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - Tx @ 2.480 GHz with O-QPSK Modulation							
Voltage/Frequency - 120 VAC / 60 Hz							
Test Spec - RSS-Gen and FCC Part 15.207 Limits							
Temp/Humidity - 23C/55%							

EUT Transmitting at 2.480 GHz High Channel Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL64 Sample 2272-05 in Tx Mode High Channel at 2.480 GHz are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 19.81 dB.

EUT Configured in Rx Mode Tables

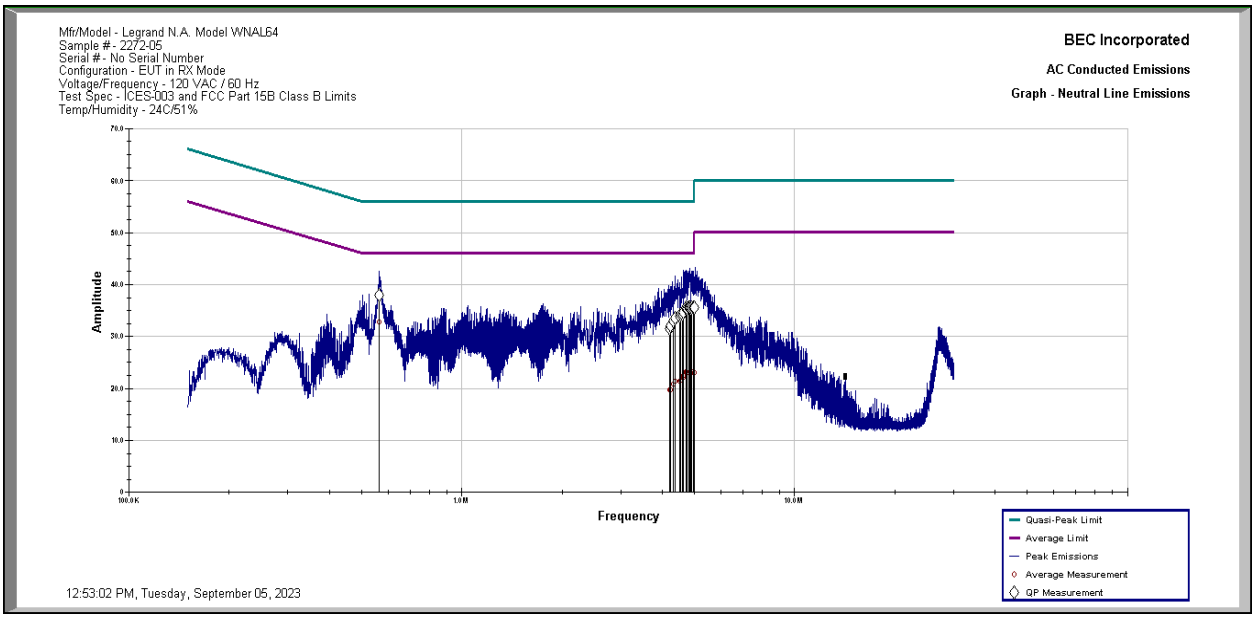
BEC Incorporated
Neutral Line Conducted Emissions
12:53:02 PM, Tuesday, September 05, 2023

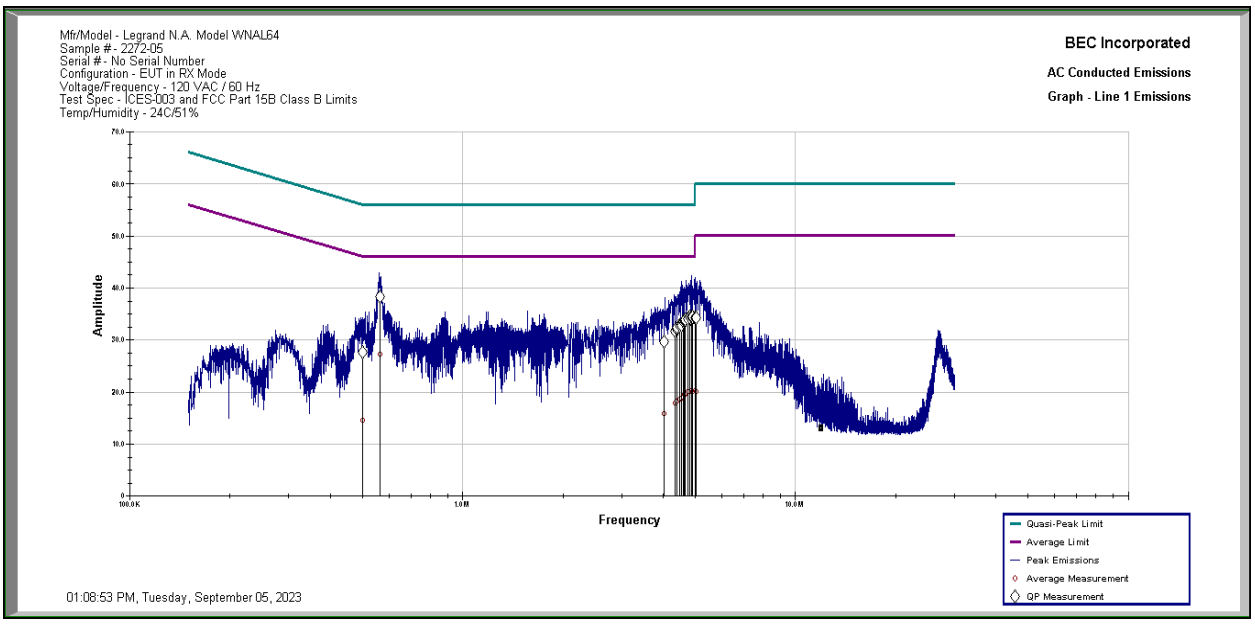
	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
563.583 KHz	32.81	46.00	-13.19	37.92	56.00	-18.08	10.13
4.214 MHz	19.70	46.00	-26.30	31.53	56.00	-24.47	10.26
4.227 MHz	19.74	46.00	-26.26	31.96	56.00	-24.04	10.26
4.307 MHz	20.77	46.00	-25.23	32.98	56.00	-23.02	10.27
4.384 MHz	21.30	46.00	-24.70	33.43	56.00	-22.57	10.27
4.514 MHz	21.40	46.00	-24.60	33.85	56.00	-22.15	10.27
4.530 MHz	21.61	46.00	-24.39	34.22	56.00	-21.78	10.27
4.598 MHz	22.14	46.00	-23.86	34.17	56.00	-21.83	10.27
4.614 MHz	22.16	46.00	-23.84	34.56	56.00	-21.44	10.27
4.631 MHz	22.48	46.00	-23.52	34.67	56.00	-21.33	10.27
4.725 MHz	23.22	46.00	-22.78	35.38	56.00	-20.62	10.27
4.730 MHz	23.08	46.00	-22.92	35.51	56.00	-20.49	10.27
4.745 MHz	22.96	46.00	-23.04	35.30	56.00	-20.70	10.27
4.811 MHz	23.13	46.00	-22.87	35.55	56.00	-20.45	10.28
4.823 MHz	23.14	46.00	-22.86	35.59	56.00	-20.41	10.28
4.870 MHz	23.11	46.00	-22.89	35.43	56.00	-20.57	10.28
4.914 MHz	22.94	46.00	-23.06	35.55	56.00	-20.45	10.28
4.973 MHz	23.24	46.00	-22.76	35.57	56.00	-20.43	10.28
4.978 MHz	23.09	46.00	-22.91	35.60	56.00	-20.40	10.28
5.005 MHz	22.99	50.00	-27.01	35.58	60.00	-24.42	10.28
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - EUT in RX Mode							
Voltage/Frequency - 120 VAC / 60 Hz							

BEC Incorporated
Line 1 Conducted Emissions
01:08:53 PM, Tuesday, September 05, 2023

	1	2	3	4	5	6	7
Frequency	AVG	AVG	AVG	QP	QP	QP	Corr
MHz	dBuV	Limit	Margin	dBuV	Limit	Margin	Factor
500.765 KHz	14.65	46.00	-31.35	27.66	56.00	-28.34	10.13
563.704 KHz	27.25	46.00	-18.75	38.34	56.00	-17.66	10.15
4.034 MHz	15.89	46.00	-30.11	29.70	56.00	-26.30	10.28
4.330 MHz	17.81	46.00	-28.19	31.71	56.00	-24.29	10.29
4.399 MHz	18.24	46.00	-27.76	32.08	56.00	-23.92	10.29
4.402 MHz	18.33	46.00	-27.67	32.48	56.00	-23.52	10.29
4.493 MHz	18.53	46.00	-27.47	32.72	56.00	-23.28	10.29
4.530 MHz	18.78	46.00	-27.22	33.04	56.00	-22.96	10.29
4.542 MHz	18.77	46.00	-27.23	32.84	56.00	-23.16	10.29
4.585 MHz	19.05	46.00	-26.95	33.44	56.00	-22.56	10.29
4.641 MHz	19.51	46.00	-26.49	33.67	56.00	-22.33	10.29
4.649 MHz	19.61	46.00	-26.39	33.62	56.00	-22.38	10.29
4.667 MHz	19.78	46.00	-26.22	33.82	56.00	-22.18	10.29
4.736 MHz	20.03	46.00	-25.97	33.99	56.00	-22.01	10.29
4.804 MHz	20.16	46.00	-25.84	34.51	56.00	-21.49	10.30
4.865 MHz	20.00	46.00	-26.00	33.90	56.00	-22.10	10.30
4.870 MHz	20.32	46.00	-25.68	34.36	56.00	-21.64	10.30
4.900 MHz	20.12	46.00	-25.88	34.34	56.00	-21.66	10.30
4.983 MHz	20.22	46.00	-25.78	34.17	56.00	-21.83	10.30
5.026 MHz	20.14	50.00	-29.86	34.21	60.00	-25.79	10.30
Mfr/Model - Legrand N.A. Model WNAL64							
Sample # - 2272-05							
Serial # - No Serial Number							
Configuration - EUT in RX Mode							
Voltage/Frequency - 120 VAC / 60 Hz							

EUT Configured in Rx Mode Graphs





Results: All conducted emissions measured on the AC Power Port of the Legrand Model WNAL64 Sample 2272-05 in Rx Mode are below the limit specified by FCC Part 15.207 and RSS-Gen 7.2 Limits by a margin of 13.19 dB.

4.2 Emissions in Non-Restricted and Restricted Frequency Bands 1 GHz - 25 GHz (47 CFR 15.205, 15.209)(RSS-GEN 8.9, 8.10)

The emissions from the Legrand Model WNRCB46 with Zigbee Radio, which fall in the restricted bands of operation, detailed in this section, comply with the limits of 15.209. The Legrand Model WNRCB46 was tested at three frequencies: Low (2.405 GHz), Middle (2.440 GHz) and High (2.480 GHz). The modulation was O-QPSK.

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 designated in the tables in the results section.

Frequency Range	1 GHz to 18 GHz
Test Standards	FCC Part 15.205 and 15.209 and RSS-Gen 8.9 and 8.10
Limits	FCC Part 15.205 and 15.209 and RSS-Gen 8.9 and 8.10 Limits
Manufacturer	Legrand
Model	WNAL24
Serial Number	No Serial Number
Sample Number	2272-07
Manufacturer	Legrand
Model	WNAL64
Serial Number	No Serial Number
Sample Number	2272-05
Sample Type	Radiated Emissions Sample Type
Test Configuration	During testing of the Transmitter, the EUT was tested at Maximum Output Power with typical modulation. The Transmitter Low Channel, Middle Channel and High Channel were tested along with the Transmitter in Rx Mode.
Port Tested	Enclosure Port of the EUT
EUT Power	120 VAC / 60 Hz
Test Date	09/18/2023
Temperature	24°C
Humidity	55 %
Test Date	09/19/2023
Temperature	23°C
Humidity	55 %

4.2.1 Radiated Spurious Emissions 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 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 attenuation measurements specified in ANSI C63.4.

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. This 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.

4.2.2 Emissions in Non-Restricted and Restricted Frequency Bands 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**s** were evaluated for maximum emissions. The position of the EUTs placed in an upright position horizontal with buttons facing the measurement antenna on the horizontal surface of the 80-cm table was determined to be the axis that produced the highest emissions for the Legrand Model WNAL24 and Model WNAL64.

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 (dBµV/m) = Meter Reading (dBµV) + Antenna Factor (dB/m) + Cable Loss (dB) – Amplifier Gain (dB)

The Legrand Model WNAL24 and Model WNAL64 were tested in the 30 MHz to 1000 MHz frequency range and 1 to 18 GHz frequency range with the radio transmitting at low, middle and high frequencies and while in receive mode (non-transmission). The Zigbee radio was tested with O-QPSK modulated transmission signals at maximum output.

The following tables are the highest emissions recorded and summarized. The use of the 15.209 limit table for restricted band emissions is not required but ensures compliance to 15.205 and 15.209. The signals in the tables that fall into the restricted bands, described in 15.205, are marked with an asterisk.

Spectrum Analyzer Settings

RBW		1 MHz
VBW		3 MHz
Sweep		Auto
Reference Level		80 dBuV
Attenuation		10 dB
Detectors		Peak and Average
Frequency Range		1 GHz to 18 GHz

4.2.3 Emissions in Frequency Bands 1 - 18 GHz WNAL24 with Zigbee Radio Test Results (09/19/2023)

Radiated emissions scans, 1 – 18 GHz, were made for the EUT configured for the low, middle and high transmission frequencies and in Rx mode. The Transmit Frequencies were measured with O-QPSK Modulation at maximum output. Peak and Average levels shown in the table are corrected values.

Legrand Model WNAL24 With Zigbee Radio, Low Channel 11, 2.405 GHz, Modulated

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 4.82149	37.94	27.69	V	083	204	1.72	53.98	-26.29	73.98	-36.04	PASS
* 4.86974	38.14	28.21	H	201	139	1.87	53.98	-25.77	73.98	-35.84	PASS
6.0959	39.34	29.27	V	167	153	3.43	53.98	-24.71	73.98	-34.64	PASS
7.2187	42.71	33.11	H	338	155	4.22	53.98	-20.87	73.98	-31.27	PASS
7.2363	44.10	33.21	V	070	129	4.32	53.98	-20.77	73.98	-29.88	PASS
8.6673	46.75	35.95	V	251	183	6.32	53.98	-18.03	73.98	-27.23	PASS
9.2861	45.56	36.03	V	360	100	6.53	53.98	-17.95	73.98	-28.42	PASS
9.6181	45.22	35.87	H	045	164	6.30	53.98	-18.11	73.98	-28.76	PASS
9.6207	45.26	35.35	V	057	170	6.29	53.98	-18.63	73.98	-28.72	PASS
10.3558	46.01	36.00	H	244	167	5.96	53.98	-17.98	73.98	-27.97	PASS
* 11.9007	46.91	37.87	H	182	136	7.84	53.98	-16.11	73.98	-27.07	PASS
* 12.0271	49.76	40.04	H	359	199	7.74	53.98	-13.94	73.98	-24.23	PASS
* 12.0396	48.88	37.99	V	144	116	7.73	53.98	-15.99	73.98	-25.10	PASS

*Restricted Band Signal

Legrand Model WNAL24 With Zigbee Radio, Middle Channel 18, 2.440 GHz, Modulated

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
3.5893	34.36	24.8	V	112	236	-1.25	53.98	-29.179	73.98	-39.617	PASS
* 3.74031	36.73	26.76	H	88	130.2	-0.08	53.98	-27.221	73.98	-37.254	PASS
* 4.87139	38.42	28.42	H	15	186.1	1.87	53.98	-25.559	73.98	-35.561	PASS
* 4.87893	40.08	31.25	V	327	108	1.88	53.98	-22.73	73.98	-33.897	PASS
* 7.31805	44.61	33.95	H	1	228.1	4.74	53.98	-20.026	73.98	-29.374	PASS
* 7.33576	42.93	33.09	V	252	119	4.78	53.98	-20.891	73.98	-31.053	PASS
* 8.15803	45.06	35.56	V	214	100	5.35	53.98	-18.416	73.98	-28.923	PASS
9.7751	45.36	35.66	V	236	125	6.13	53.98	-18.319	73.98	-28.624	PASS
9.7779	46.9	35.52	H	167	134.6	6.12	53.98	-18.456	73.98	-27.081	PASS
* 11.339	47.84	37.67	H	1	135.2	6.55	53.98	-16.31	73.98	-26.143	PASS
* 11.5425	47.93	37.54	V	88	144	7.06	53.98	-16.442	73.98	-26.055	PASS
* 12.1997	48.58	38.84	H	306	214.8	7.82	53.98	-15.137	73.98	-25.402	PASS
* 12.208	48.12	38.35	V	297	209	7.81	53.98	-15.628	73.98	-25.855	PASS

*Restricted Band Signal

Legrand Model WNAL24 With Zigbee Radio, High Channel 26, 2.480 GHz, Modulated

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 4.17155	35.26	25.33	H	360	109	0.34	53.98	-28.652	73.98	-38.717	PASS
* 4.95907	41.43	33.13	V	360	248	1.83	53.98	-20.854	73.98	-32.549	PASS
* 4.96473	36.32	26.86	H	341	198.5	1.83	53.98	-27.118	73.98	-37.655	PASS
* 7.43548	43.41	33.63	V	137	179	4.75	53.98	-20.35	73.98	-30.567	PASS
* 7.43932	44.15	33.75	H	168	183.2	4.75	53.98	-20.234	73.98	-29.826	PASS
8.0165	46.23	35.72	V	172	110	5.17	53.98	-18.26	73.98	-27.745	PASS
* 8.25139	46.27	35.98	H	251	152.5	5.47	53.98	-17.997	73.98	-27.714	PASS
9.9086	45.99	36.3	H	270	104.6	6.31	53.98	-17.677	73.98	-27.995	PASS
9.9552	46.39	36.26	V	203	197	6.33	53.98	-17.721	73.98	-27.593	PASS
* 12.4117	48.79	38.11	V	32	119	7.68	53.98	-15.867	73.98	-25.189	PASS
* 12.4272	47.82	37.96	H	360	146.9	7.73	53.98	-16.02	73.98	-26.155	PASS
12.8876	50.1	41.16	V	323	249	8.51	53.98	-12.818	73.98	-23.878	PASS

*Restricted Band Signal

Legrand Model WNAL24 With Zigbee Radio, Rx Mode

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
8.0235	45.7	35.7	H	208	129.8	5.19	53.98	-18.276	73.98	-28.276	PASS
* 8.23826	47.27	36.12	V	262	156	5.46	53.98	-17.862	73.98	-26.707	PASS
10.0230	47.38	36.55	H	314	237.5	6.33	53.98	-17.435	73.98	-26.605	PASS
10.1577	45.35	36.53	V	57	200	6.32	53.98	-17.449	73.98	-28.632	PASS
* 11.1138	47.39	37.48	V	22	229	6.41	53.98	-16.497	73.98	-26.587	PASS
* 12.3372	46.94	38.17	V	251	199	7.7	53.98	-15.807	73.98	-27.044	PASS
13.0102	51	41.74	H	38	105.2	9.05	53.98	-12.24	73.98	-22.983	PASS

*Restricted Band Signal

Test Results: The Legrand Model WNAL24 With Zigbee Radio complies with the requirements of 47 CFR Part 15.205, 15.209 and RSS-Gen Section 8.10 for non-restricted and restricted bands of operation between 1 – 18 GHz with an Average Margin of 12.24 dB.

4.2.4 Emissions in Frequency Bands 1 - 18 GHz WNAL64 with Zigbee Radio Test Results (09/18/2023)

Radiated emissions scans, 1 – 18 GHz, were made for the EUT configured for the low, middle and high transmission frequencies and in Rx mode. The Transmit Frequencies were measured with O-QPSK Modulation at maximum output. Peak and Average levels shown in the table are corrected values.

Legrand Model WNAL64 With Zigbee Radio, Low Channel 11, 2.405 GHz, Modulated

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 4.811	43.52	32.72	H	061	242	1.68	53.98	-21.26	73.98	-30.46	PASS
* 4.81085	40.52	30.61	V	005	101	1.68	53.98	-23.37	73.98	-33.46	PASS
5.9437	39.74	28.80	V	157	148	3.25	53.98	-25.18	73.98	-34.24	PASS
5.9677	39.90	29.46	H	095	155	3.31	53.98	-24.52	73.98	-34.08	PASS
7.2079	43.22	33.20	H	095	170	4.16	53.98	-20.78	73.98	-30.76	PASS
7.2146	43.49	33.14	V	271	193	4.20	53.98	-20.84	73.98	-30.49	PASS
9.6167	45.79	36.05	H	129	101	6.30	53.98	-17.93	73.98	-28.19	PASS
9.6471	46.36	35.95	V	161	101	6.24	53.98	-18.03	73.98	-27.62	PASS
* 12.0201	49.03	38.50	H	145	228	7.74	53.98	-15.48	73.98	-24.95	PASS
* 12.0318	49.49	38.44	V	137	126	7.73	53.98	-15.54	73.98	-24.49	PASS

*Restricted Band Signal

Legrand Model WNAL64 With Zigbee Radio, Middle Channel 18, 2.440 GHz, Modulated

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 4.5048	36.09	26.71	V	066	213	0.75	53.98	-27.27	73.98	-37.89	PASS
* 4.86715	38.44	28.03	V	188	130	1.86	53.98	-25.95	73.98	-35.54	PASS
* 4.88083	42.64	32.51	H	009	229	1.89	53.98	-21.47	73.98	-31.34	PASS
6.6564	42.34	32.63	V	120	245	3.42	53.98	-21.35	73.98	-31.64	PASS
* 7.31559	44.82	33.73	V	037	243	4.73	53.98	-20.25	73.98	-29.16	PASS
* 7.32675	42.34	33.71	H	324	221	4.76	53.98	-20.27	73.98	-31.64	PASS
9.7539	45.12	36.01	V	262	195	6.18	53.98	-17.98	73.98	-28.86	PASS
9.7585	45.96	36.09	H	214	101	6.17	53.98	-17.89	73.98	-28.02	PASS
* 12.172	48.40	38.52	V	181	129	7.78	53.98	-15.46	73.98	-25.58	PASS
* 12.2869	47.60	38.44	H	098	106	7.74	53.98	-15.54	73.98	-26.38	PASS

*Restricted Band Signal

Legrand Model WNAL64 With Zigbee Radio, High Channel 26, 2.480 GHz, Modulated

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
* 4.11354	36.43	25.84	H	156	196	0.28	53.98	-28.14	73.98	-37.55	PASS
* 4.96107	39.02	29.64	V	035	102	1.83	53.98	-24.34	73.98	-34.96	PASS
5.8857	38.83	28.25	V	326	150	3.03	53.98	-25.73	73.98	-35.15	PASS
* 7.41173	45.15	33.66	H	256	153	4.75	53.98	-20.32	73.98	-28.83	PASS
* 7.41575	44.88	33.55	V	359	116	4.75	53.98	-20.43	73.98	-29.10	PASS
9.9267	46.32	36.29	H	052	101	6.31	53.98	-17.69	73.98	-27.66	PASS
9.9321	45.49	36.39	V	246	160	6.32	53.98	-17.59	73.98	-28.49	PASS
* 12.419	48.44	38.32	H	175	197	7.71	53.98	-15.66	73.98	-25.54	PASS
* 12.4685	49.93	38.48	V	332	146	7.88	53.98	-15.50	73.98	-24.05	PASS

*Restricted Band Signal

Legrand Model WNAL64 With Zigbee Radio, Rx Mode

Frequency	Peak Measured	Average Measured	Antenna Polarity	Turntable Angle	Antenna Height	Correction Factors	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	Result
GHz	dBuV/m	dBuV/m	H/V	degrees	cm	dB	dBuV/m	dB	dBuV/m	dB	
4.4760	37.23	26.90	H	223	200	0.69	53.98	-27.09	73.98	-36.75	PASS
5.2960	37.94	28.48	V	349	205	2.84	53.98	-25.51	73.98	-36.05	PASS
5.9675	39.27	29.36	V	034	226	3.31	53.98	-24.62	73.98	-34.71	PASS
5.9940	37.66	29.06	H	322	136	3.35	53.98	-24.92	73.98	-36.32	PASS
* 8.44213	46.10	36.33	V	189	181	5.86	53.98	-17.65	73.98	-27.88	PASS
10.5168	46.01	35.86	V	213	119	6.03	53.98	-18.12	73.98	-27.97	PASS
* 11.1325	47.37	37.69	H	144	105	6.43	53.98	-16.29	73.98	-26.61	PASS

*Restricted Band Signal

Test Results: The Legrand Model WNAL64 With Zigbee Radio complies with the requirements of 47 CFR Part 15.205, 15.209 and RSS-Gen Section 8.10 for non-restricted and restricted bands of operation between 1 – 18 GHz with an Average Margin of 15.46 dB.

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

4.3.1 Maximum Output Power Conducted Test Procedure

A conducted power measurement of the output frequency of the Zigbee radio was measured according to the guidance of KDB 550874 D01, Section 8.3.1.2. The modulated, transmitter output signal is wide-band and noise-like. Further guidance from the KDB document identified ANSI C63.10, Section 11.9.2.2.2., (Method AVGSA-1), as the measurement procedure. Spectrum analyzer parameters are listed for the Zigbee radio maximum conducted (peak) output power. The un-modulated carrier was also measured for comparison.

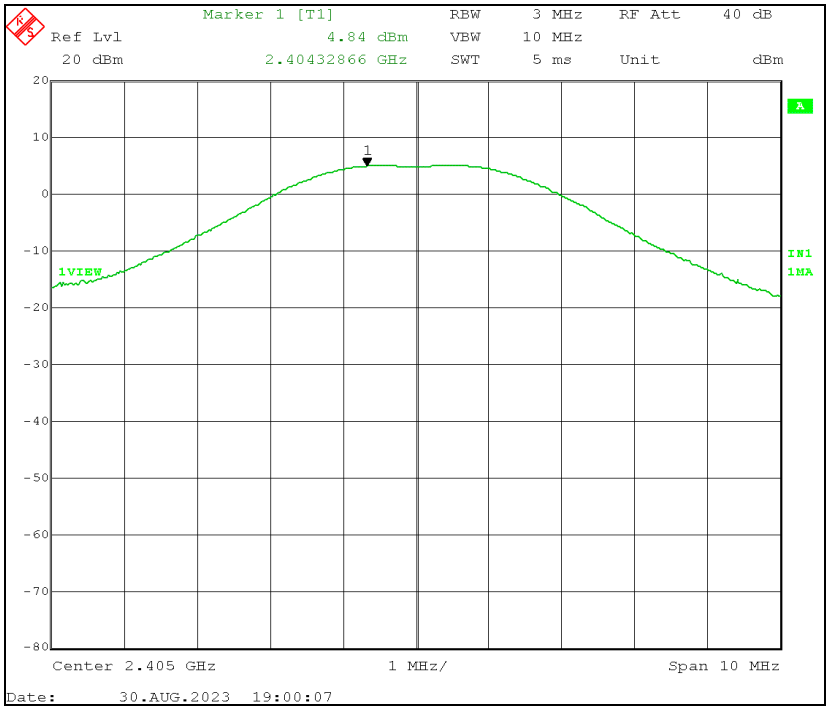
Spectrum Analyzer Settings for Zigbee Radio Measurements for Maximum Output Power and EIRP.

Zigbee Radio, O-QPSK modulation			
Spectrum Analyzer Settings			ANSI C63.10 requirement
Span	10	MHz	≥ 3 X RBW
RBW	3	MHz	RBW ≥ DTS BW
VBW	10	MHz	≥ 3 X RBW
Sweep	5	ms	Auto

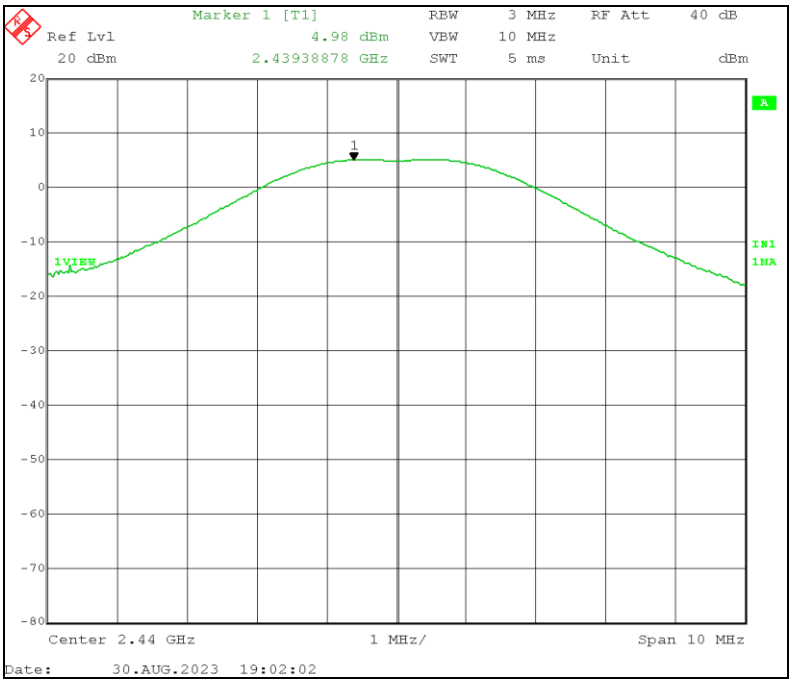
The spectrum analyzer utilized RMS Detection, averaged 100 traces, for measurement.

4.3.1.1 Maximum Output Power Conducted Legrand WNAL64 with Zigbee Radio O-QPSK Modulation Test Results (08/30/2023)

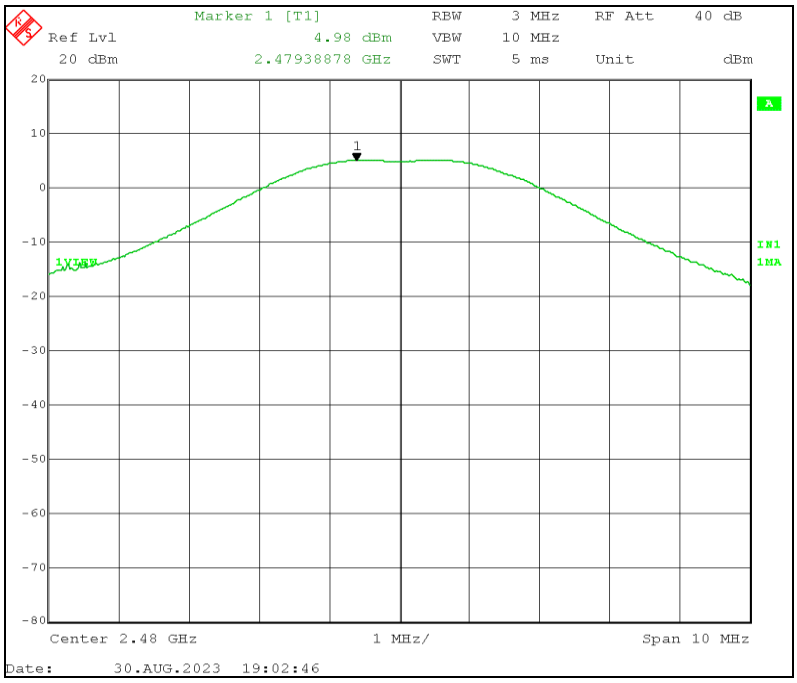
Legrand Model WNAL64 with Zigbee Radio Low Channel 11, 2.405 GHz, O-QPSK Modulation



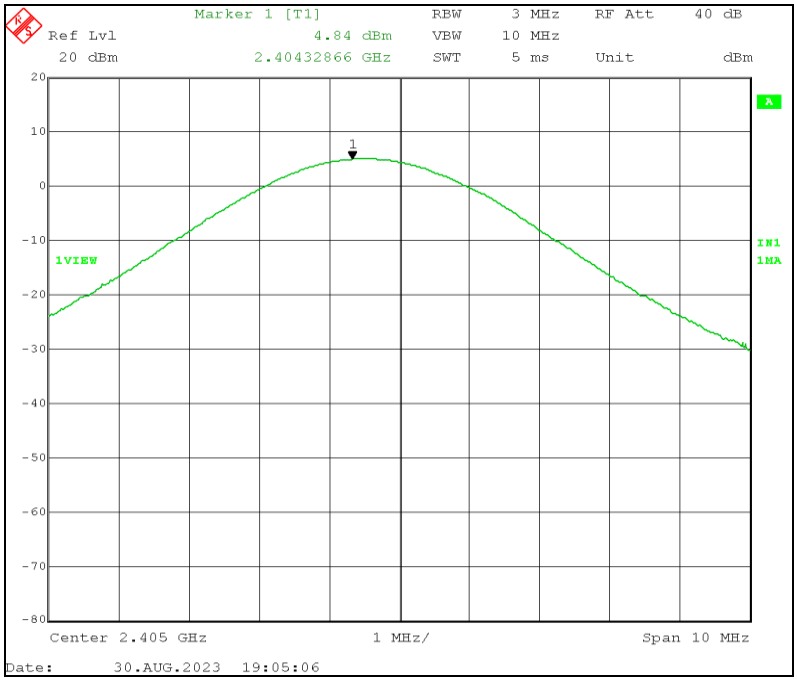
Legrand Model WNAL64 with Zigbee Radio Middle Channel 18, 2.440 GHz, O-QPSK Modulation



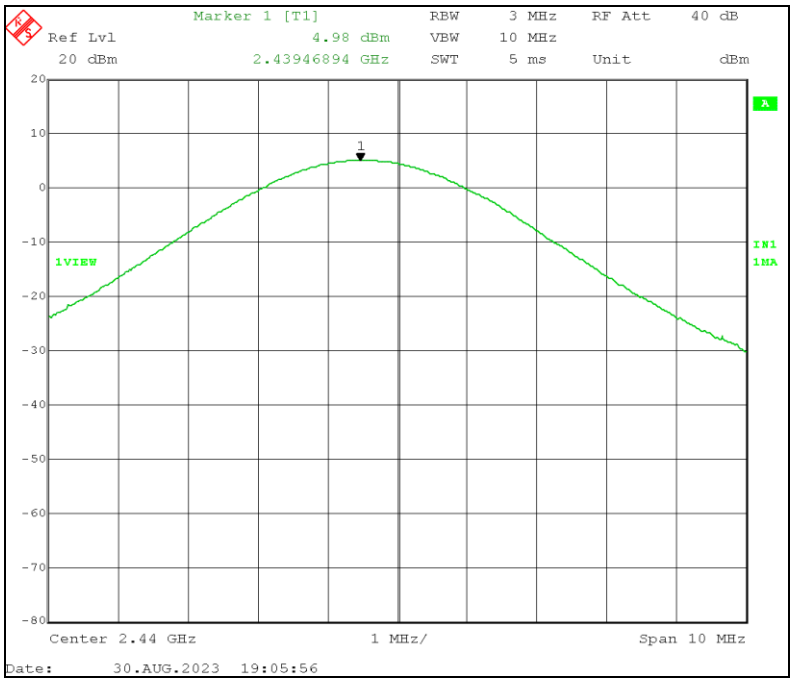
Legrand Model WNAL64 with Zigbee Radio High Channel 26, 2.480 GHz, O-QPSK Modulation



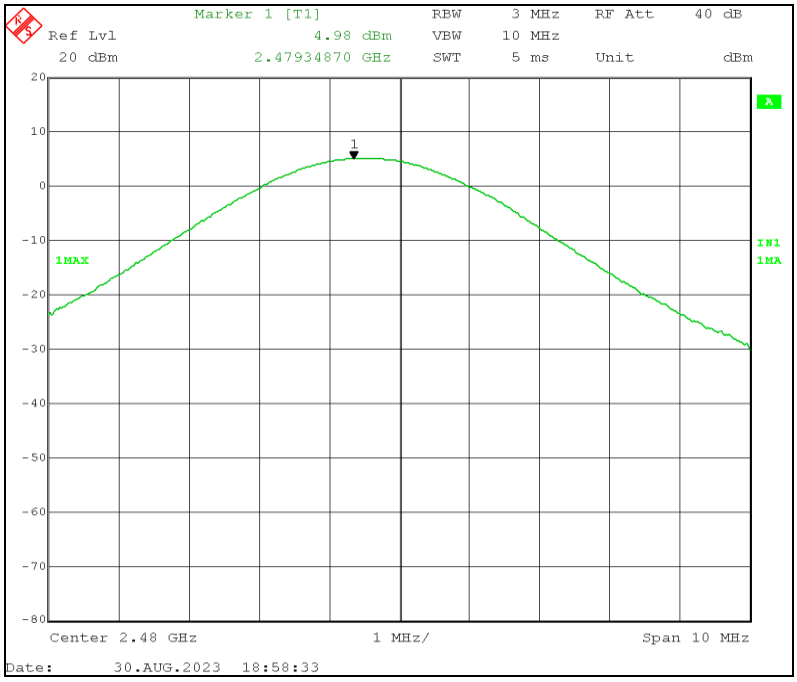
Legrand Model WNAL64 with Zigbee Radio Low Channel 11, 2.405 GHz, No modulation



Legrand Model WNAL64 with Zigbee Radio Middle Channel 18, 2.440 GHz, No modulation



Legrand Model WNAL64 with Zigbee Radio High Channel 26, 2.480 GHz, No modulation



Maximum Conducted Output Power Measurement Summary Tables

EUT Tested	Legrand WNAL64 Adorne Zigbee Radio EUT-Conducted EUT
Sample #	2272-04
Test Configuration	EUT Tested With O-QPSK Modulation and Without Modulation (CW)

Channel	Modulation	Frequency (GHz)	Measured Level	Cable # 962	Total		Limit		Margin		Result
					dBm	Watts	dBm	Watts	dBm	Watts	
11	O-QPSK	2405.0	4.84	0.47	5.31	0.0034	30.00	1.000	-24.69	-0.997	Pass
18		2440.0	4.98	0.47	5.45	0.0035	30.00	1.000	-24.55	-0.996	Pass
26		2480.0	4.98	0.47	5.45	0.0035	30.00	1.000	-24.55	-0.996	Pass

Channel	Modulation	Frequency (GHz)	Measured Level	Cable # 962	Total		Limit		Margin		Result
					dBm	Watts	dBm	Watts	dBm	Watts	
11	None	2405.0	4.84	0.47	5.31	0.0034	30.00	1.000	-24.69	-0.997	Pass
18		2440.0	4.98	0.47	5.45	0.0035	30.00	1.000	-24.55	-0.996	Pass
26		2480.0	4.98	0.47	5.45	0.0035	30.00	1.000	-24.55	-0.996	Pass

Test Results: The Maximum Output Power Conducted measurements for the Legrand Model WNAL64 with Zigbee Radio, modulated with O-QPSK and un-modulated, are compliant to the requirements of 47 CFR Part 15.247(b)(3) and ISED, RSS-247 Section 5.4(d).

4.3.2 EIRP Level WNAL64 with Zigbee Radio Test Results (08/30/2023)

The Innovation, Science and Economic Development Canada (ISED), RSS-247 requires the calculation of the Effective Isotropic Radiated Power (EIRP) for the Legrand Model WNRCB46 Zigbee Radio. Below is the tabular data, using measured power levels from the previous section in which measurements were made for the EUT configured for the low, middle and high transmission frequencies. The Transmit Frequencies were measured with O-QPSK Modulation at maximum output. The un-modulated carrier at maximum output was also measured for comparison.

4.3.2.1 EIRP Level WNAL64 with Zigbee Radio Test Results

Antenna Gain of Legrand WNAL24 & WNAL64 is + 3.3 dBi.

Channel	Modulation	Frequency (GHz)	Transmitter Output Total		Antenna Gain		EIRP				Result
							Total		Limit	Margin	
			dBm	Watts	Isotropic	Numeric	dBm	Watts	Watts	Watts	
11	O-QPSK	2405.0	5.31	0.0034	3.30	2.138	8.61	0.0073	4.00	-3.9927	Pass
18		2440.0	5.45	0.0035	3.30	2.138	8.75	0.0075	4.00	-3.9925	Pass
26		2480.0	5.45	0.0035	3.30	2.138	8.75	0.0075	4.00	-3.9925	Pass

Channel	Modulation	Frequency (GHz)	Transmitter Output Total		Antenna Gain		EIRP				Result
							Total		Limit	Margin	
			dBm	Watts	Isotropic	Numeric	dBm	Watts	Watts	Watts	
11	None	2405.0	5.31	0.0034	3.30	2.138	8.61	0.0073	4.00	-3.9927	Pass
18		2440.0	5.45	0.0035	3.30	2.138	8.75	0.0075	4.00	-3.9925	Pass
26		2480.0	5.45	0.0035	3.30	2.138	8.75	0.0075	4.00	-3.9925	Pass

Test Results: The Effective Isotropic Radiated Power measurements for the Legrand Model WNAL64 with Zigbee Radio, modulated with O-QPSK and un-modulated, are compliant to the requirements of ISED, RSS-247 Section 5.4(d).

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	06/21/21	3 Years	06/21/24
OATS Site (30 MHz – 1 GHz)	BEC	N/A	N/A	705	10/07/22	1 Year	10/07/23
EMC Analyzer (9 kHz - 3 GHz)	Agilent	E7402A	US39440162	883	06/21/21	3 Years	06/21/24
Antenna (30 MHz - 6 GHz)	Sunol Sciences	JB6	A020714	882	05/24/21	3 Years	05/24/24
Amplifier (.09 – 1300 MHz)	Hewlett Packard	8447F	3313A06658	807	01/13/21	3 Years	01/13/24
EMC Analyzer (9 kHz - 1.8 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	3 Years	06/16/24
Double Ridged Horn Antenna (1 - 18 GHz)	EMCO	3115	9705-5225	1028	11/24/21	3 Years	11/21/24
Intentional Radiator Testing High Frequency RF Test Cable	Suhner	S04272B	N/A	962	07/16/23	3 Years	07/16/26
Temp/Humidity Meter	Control Company	4096	221672460	780	07/21/22	3 Years	07/21/25
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