

ITRON, INC.

TEST REPORT

SCOPE OF WORK

RADIO TESTING – WIFI MODULE INTEGRATED INTO THE POLE MOUNT ROUTER MAJOR REFRESH (PMR-MR)

REPORT NUMBER

106368701ATL-007

ISSUE DATE

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REVISED DATE

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DOCUMENT CONTROL NUMBER

Non-Specific Radio Report Shell Rev. January 2025

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RADIO TEST REPORT**Report Number:** 106368701ATL-007**Project Number:** G106368701**Report Issue Date:** 13 January 2026**Model/HVIN:** LWB5PLUS**FCC ID:** SK9LWB5PLUS**IC:** 864G-LWB5PLUS

Standards: 47 CFR Part 15 Subpart C, 15.247
RSS-247, Issue 4
ANSI C63.10-2020+Cor.1-2023
RSS-GEN, Issue 5

Test Location

Intertek
1950 Evergreen Blvd., Suite 100
Duluth, GA 30096 USA
FCC Designation: US1046
CAB Designator: US0128

Client

Itron, Inc.
313 North Hwy 11
West Union, SC 29696-2706 USA

Report prepared by



Jeremy Pickens / Senior Staff Engineer

Report reviewed by



Uri Spector / Sr. EMC Staff Engineer

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1 Introduction and Conclusion

The tests indicated in Section 2 were performed on the product constructed as described in Section 4. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test Description	Test Specification		Result
		FCC	ISED	
NA	Occupied and DTS Bandwidth	15.247(a)(2)	RSS-247 S5.2(a) RSS-GEN S6.7	NS ¹
NA	Peak Output Power	15.247(b)(3)	RSS-247 S5.4(d)	NS ¹
NA	Power Spectral Density	15.247(e)	RSS-247 S5.2(b)	NS ¹
NA	Conducted Spurious Emissions / Band Edge	15.247(d)	RSS-247 S5.5	NS ¹
5	Emissions in Restricted Frequency Bands	15.247(d) 15.205(a), 15.209(a)	RSS-GEN S8.9-8.10	Compliant
6	AC Mains Conducted Emissions	15.207	RSS-GEN S8.8	Compliant
NA	Antenna Requirement	15.203	RSS-GEN S6.8	Compliant ²

1) Not in the Scope of this evaluation. Antenna port conducted data is being reused from the original certification (FCC ID: SQG-LWB5PLUS).

2) The module is professionally installed in the Socket Based Router

3 Client Information

This evaluation was performed at the request of:

Client: Itron Inc.
313 North Hwy 11
West Union, SC 29696-2706 USA

Contact: Guangxin Wang

Email: guangxin.wang@itron.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: Itron Inc.
313 North Hwy 11
West Union, SC 29696-2706 USA

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Pole Mount Router Major Refresh	Itron, Inc.	PMR-MR	370500362
WLAN Radio	Ezurio LLC	LWB5PLUS	Not Labeled

Receive Date:	20 October 2025
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)

The OpenWay Riva Pole Mount Router is a device that provides mesh network communications for either RFLAN or OpenWay Riva or in Dual Mesh mode. The equipment provides routing and backhauls support for utility metering data by bridging proprietary mesh networks operating in the ISM band to public cellular LTE networks.

Certification Purpose

This test report is a Class II Permissive Change on the WiFi module to support the integration and co-location of multiple radios within the PMR-MR host device.

Radio/Receiver Characteristics	
Frequency Range / Number of Channels	2412 – 2462MHz
Data Rate / Modulation Type(s)	802.11b: 1 – 11Mbps 802.11g: 6-54Mbps 802.11n: MCS0 – MCS7
Channel Separation:	5MHz
Maximum Conducted Output Power:	290mW
Equipment Type	Portable – 20cm Separation Distance
Antenna Type and Gain	MSE-0183-006, PCTEL MMSO2300PTRASM-REL, 0dBi Peak

Software

No.	Description of EUT Software
1	The equipment runs a set of data collection and routing applications operating on a custom Linux kernel

4.1 Justification

All testing performed in this report was for the WiFi radio only. The original Laird/Ezurio module (FCC ID: SQG-LWB5PLUS / IC: 3147A-LWB5PLUS) supported 2.4GHz WLAN (20/40MHz Bandwidths), Bluetooth, and 5GHz UNII operations. For this Class II Permissive Change application, only the 2.4GHz WLAN 20MHz Bandwidth will be active. No hardware changes have been made, so the antenna port conducted measurements from the original application still apply and only radiated spurious emissions measurements were performed.

For radiated spurious emission measurements the DUT was placed on a non-conductive platform 0.8m or 1.5m off the ground plane depending on the frequency range. The EUT was tested at low, mid, and high channels while in a constant modulated transmit mode. The worst-case data rates were evaluated for each modulation: 802.11b, 1Mbps / 802.11g, 6Mbps, and 802.11n, MCS0.

All modulations transmitted at a greater than 98% duty cycle.

The system was also fully evaluated for intermodulation products due to simultaneous transmissions with the co-located radios and found to be compliant.

4.2 Modifications Required for Compliance

No modifications were made during compliance testing in order to bring the product into compliance.

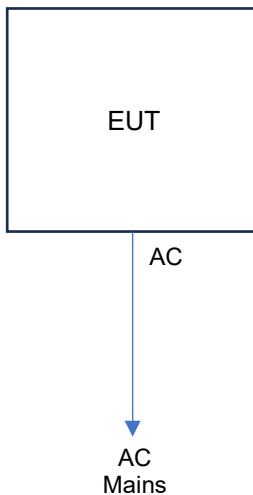
4.3 Additions, Deviations and Exclusions from Standards

No additions, deviations or exclusion have been made from standard.

4.4 Method

Configuration as required by ANSI C63.10.

4.5 EUT Block Diagram – Radiated Measurements



5 Radiated Spurious Emissions / Restricted Frequency Bands

5.1 Method

Tests were performed in accordance with ANSI C63.10. The EUT was tested at a height of 0.8m for measurements below 1GHz and at 1.5 meters for measurements above 1GHz.

TEST SITE: 10 Meter Chamber

10 Meter Semi-Anechoic Chamber The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. It is a 10-meter semi-anechoic chamber manufactured by Panashield. Embedded in the floor is a 3-meter diameter turntable.

Sample Calculation

The field strength was calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength in dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$\begin{aligned}FS &= 32 \text{ dB}\mu\text{V/m} \\RA &= 52.0 \text{ dB}\mu\text{V} \\CF &= 1.6 \text{ dB} \\AF &= 7.4 \text{ dB/m} \\AG &= 29.0 \text{ dB}\end{aligned}$$

To convert from dB μ V to μ V or mV the following was used

$$\begin{aligned}UF &= 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V} \\NF &= \text{Net Reading in dB}\mu\text{V}\end{aligned}$$

Example

$$\begin{aligned}FS &= RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0 \text{ dB}\mu\text{V/m} \\UF &= 10^{(32 \text{ dB}\mu\text{V/m} / 20)} = 39.8 \mu\text{V/m}\end{aligned}$$

5.2 Test Equipment

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
200074	Preamplifier, 10 MHz to 2000 MHz	Mini-Circuits	ZKL-2	D011105	01/24/2025	01/24/2026
200080	Preamplifier, 18-40GHz, 29 dB Gain	Miteq	JS41800400-30-5P-S	818197	10/22/2025	10/22/2026
200162	EMI Receiver (20Hz-40GHz)	Rohde & Schwarz	ESU 40	100314	10/07/2025	10/07/2026
211262	Controller - Turntable and Mast	Sunol	SC99V	SC99V-1	VBV	VBV
211264	Mast - Antenna	Sunol	TWR95	NNN2	VBV	VBV
211386	Antenna, BiLog, 20-2000MHz	Chase	CBL6112B	2622	06/30/2025	06/30/2026
212166	Temperature/Pressure/Humidity Sensor	Extech	SD700	110392	04/02/2025	04/02/2026
213023	Antenna, Horn, 18-40 GHz	EMCO	3116	9310-2222	02/19/2025	02/19/2026
213058A	Antenna, Horn, <18 GHz	A.H. Systems	SAS-200/571	246	04/03/2025	04/03/2026
213365	PreAmplifier 100Hz-30MHz	Com-Power	PAL-010	181492	06/18/2025	06/18/2026
213451	Omni -directional Comb Generator	Com-Power	CGO-520	281266	VBV	VBV
213453	Preamplifier 500MHz-18GHz	Com-Power	PAM-118A	18040030	10/20/2025	10/20/2026
213463	Band reject Filter 0-2.7GHz	Micro Tronics	HPM50117	G008	06/18/2025	06/18/2026
E403	RF Coax Cable, 18-40 GHz, 2.9mm, 9"	Megaphase	TM40 K1K1 9	E403	10/27/2025	10/27/2026
E404	RF Coax Cable, 18-40 GHz, 2.9mm, 2m	Megaphase	TM40 K1K1 80	E404	10/22/2025	10/22/2026
E405	RF Coax Cable, 18-40 GHz, 2.9mm, 2m	Megaphase	TM40 K1K1 80	E405	10/22/2025	10/22/2026
MM5	RF Coax Cable 9kHz-18GHz	Maury Microwave	UC-N-MM-118	163203	04/01/2025	04/01/2026
MM8	RF Coax Cable 9kHz-18GHz	Maury Microwave	UC-N-MM-267	1635289	06/18/2025	06/18/2026
MM36	RF Coax Cable 9kHz-18GHz	Maury Microwave	UC-N-MM-36	16 32 10	06/18/2025	06/18/2026
MP10	RF Coax Cable 9kHz-18GHz	Fairview Microwave	FMCA1282-394	MP10	06/18/2025	06/18/2026
MP12	RF Coax Cable 9kHz-18GHz	Fairview Microwave	SCE180060505-700CM	MP12	01/23/2025	01/23/2026
MP14	RF Coax Cable 9kHz-18GHz	Megaphase	EC29-N1N1-276-H	20938802	09/19/2025	09/19/2026

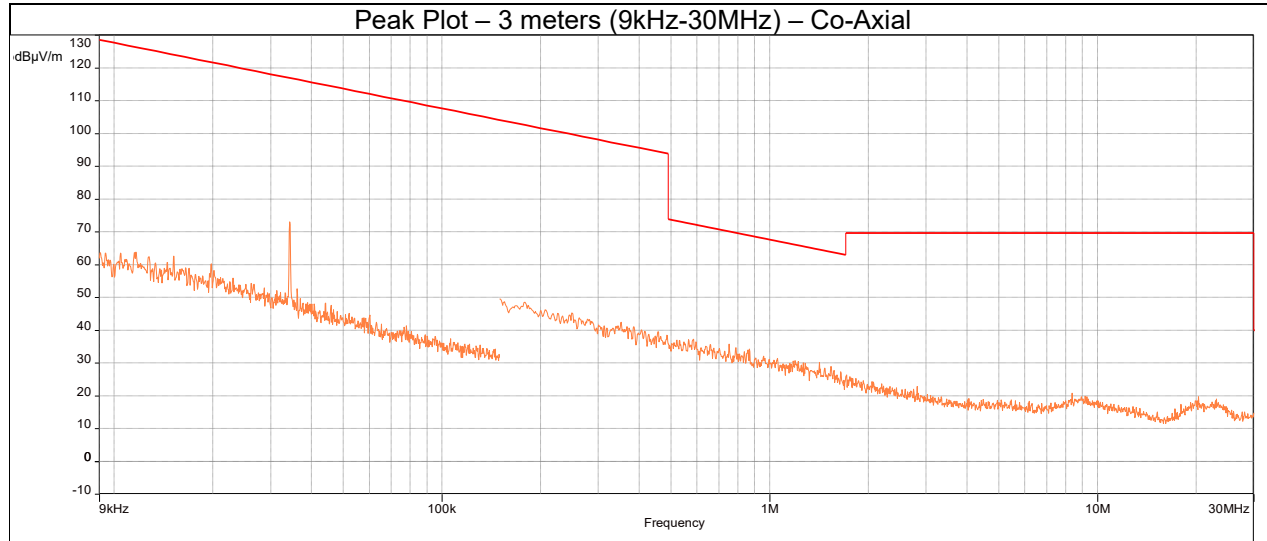
Software Utilized

Name	Manufacturer	Version
BAT EMC	NEXIO	3.19.1.18

5.3 Results

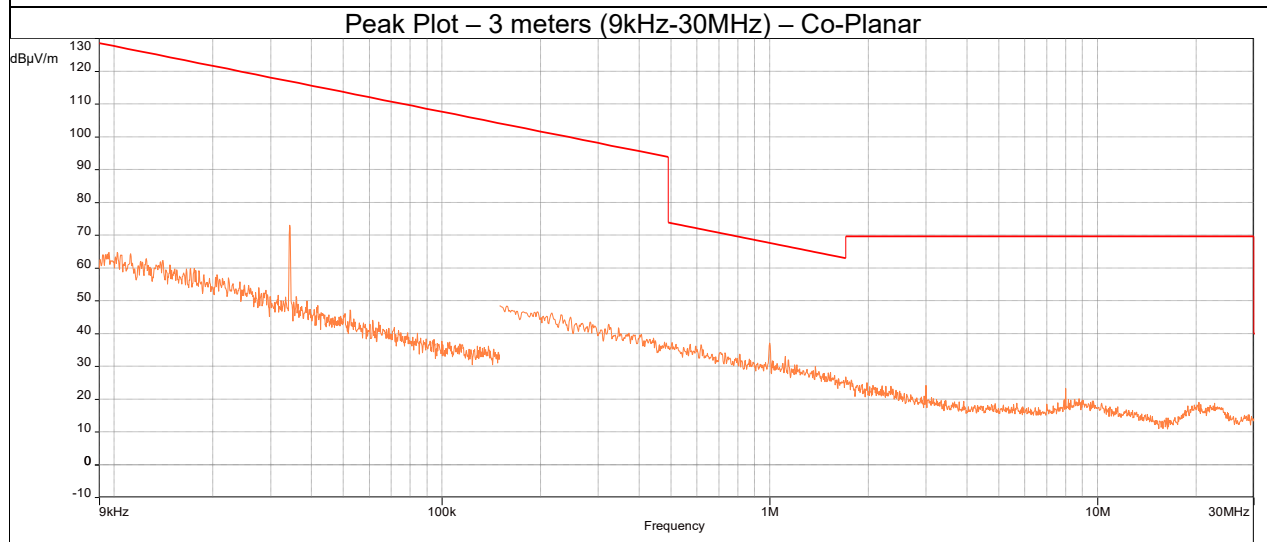
The sample tested was found to Comply.

5.4 Plots/Data



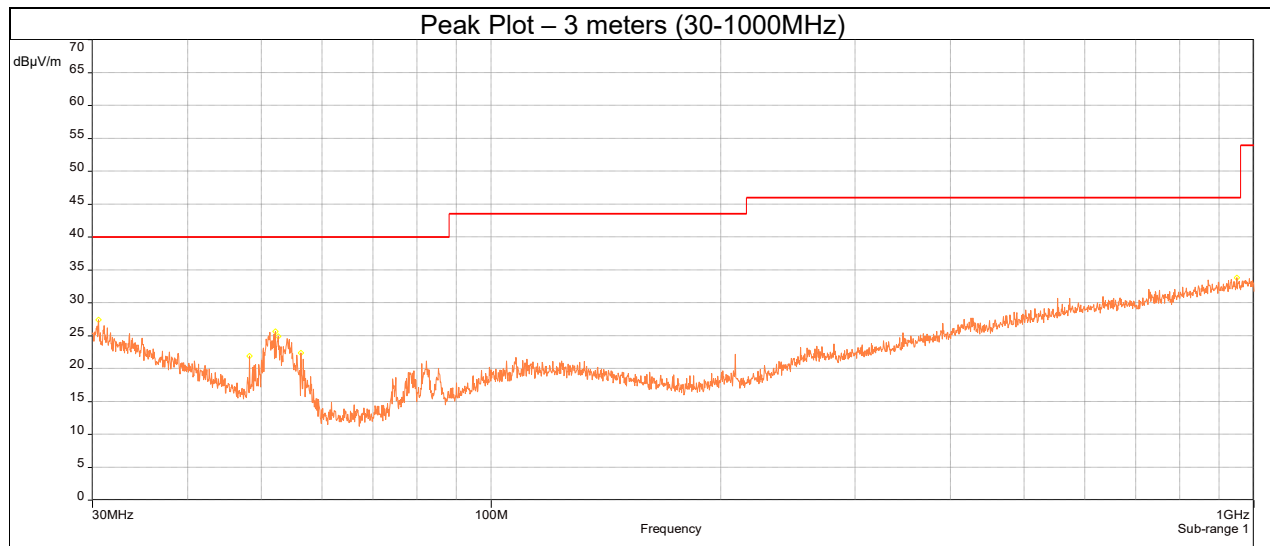
FCC Part 15 Transmitters/FCC 15.209

Note: There was no discernible difference among channels in this frequency range – worst-case power/PSD data presented (802.11b, 1Mbps, 2437MHz)



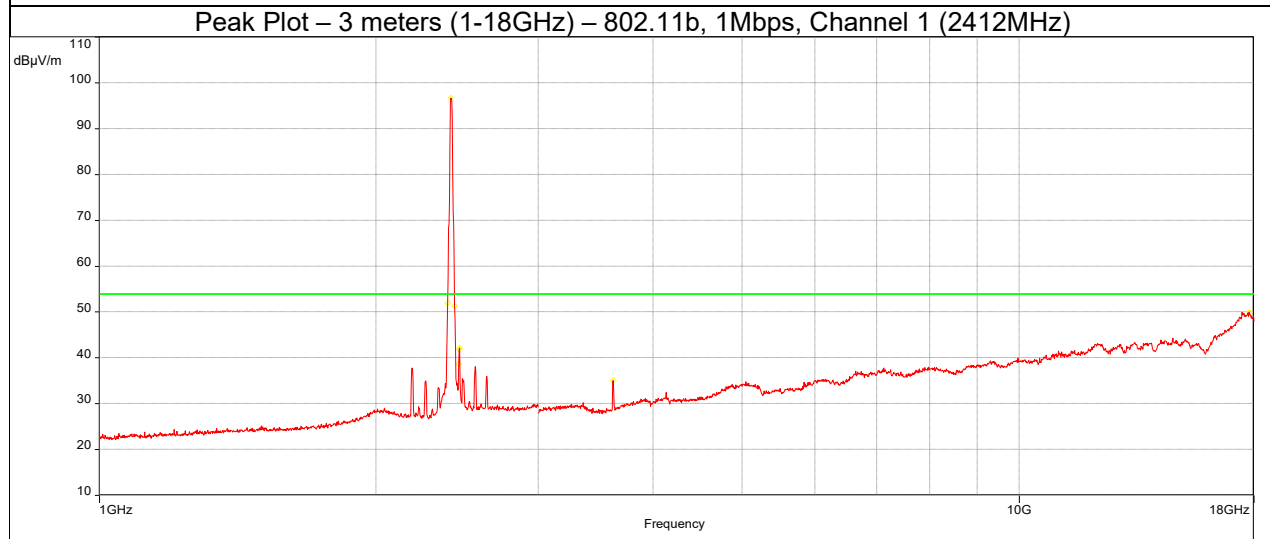
FCC Part 15 Transmitters/FCC 15.209

Note: There was no discernible difference among channels in this frequency range – worst-case power/PSD data presented (802.11b, 1Mbps, 2437MHz)



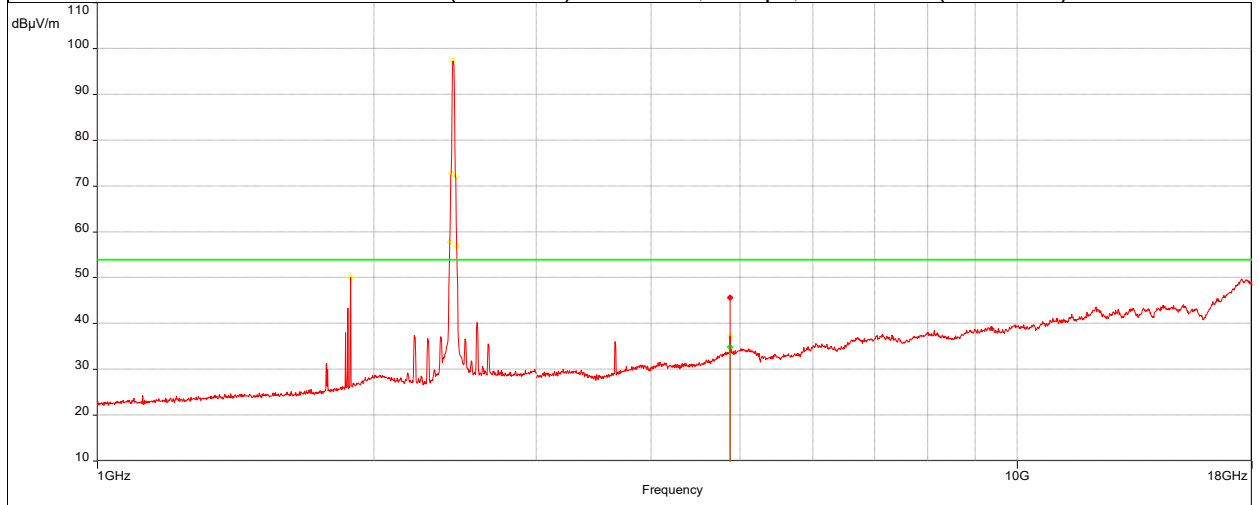
FCC Part 15 Transmitters/FCC 15.209

Note: There was no discernible difference among channels and modulations in this frequency range – no detected emissions were associated with the radio and, therefore, not subject to the 15.209 limits. – worst-case power/PSD data presented (802.11b, 1Mbps, 2437MHz)



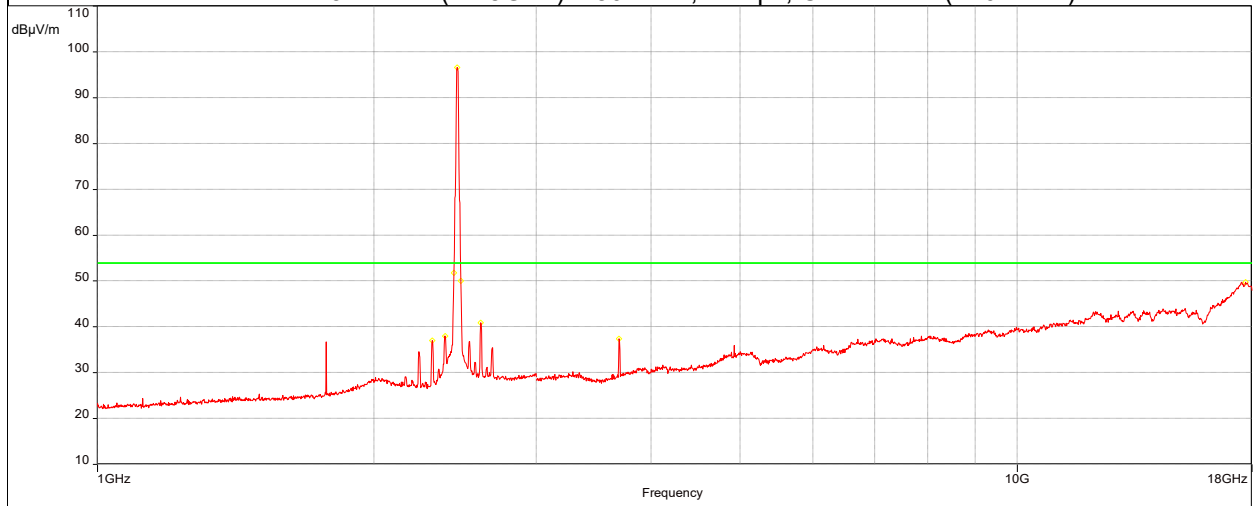
FCC Part 15 Transmitters/FCC 15.209

Peak Plot – 3 meters (1-18GHz) – 802.11b, 1Mbps, Channel 6 (2437MHz)

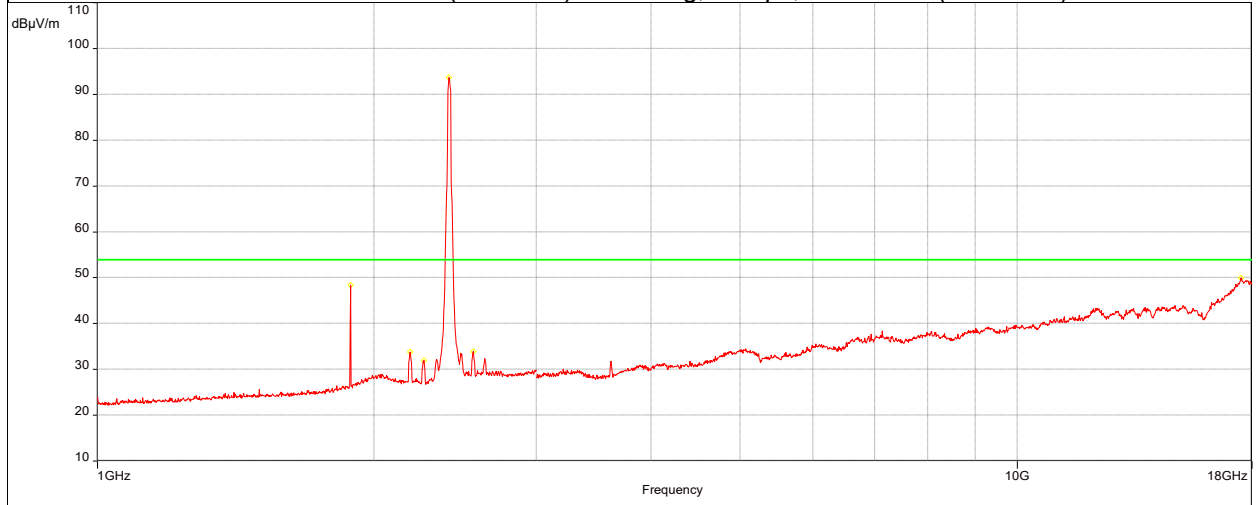


Note: Emissions around 1880MHz were in a cellular band and not associated with the 2.4GHz radio.

Peak Plot – 3 meters (1-18GHz) – 802.11b, 1Mbps, Channel 11 (2462MHz)



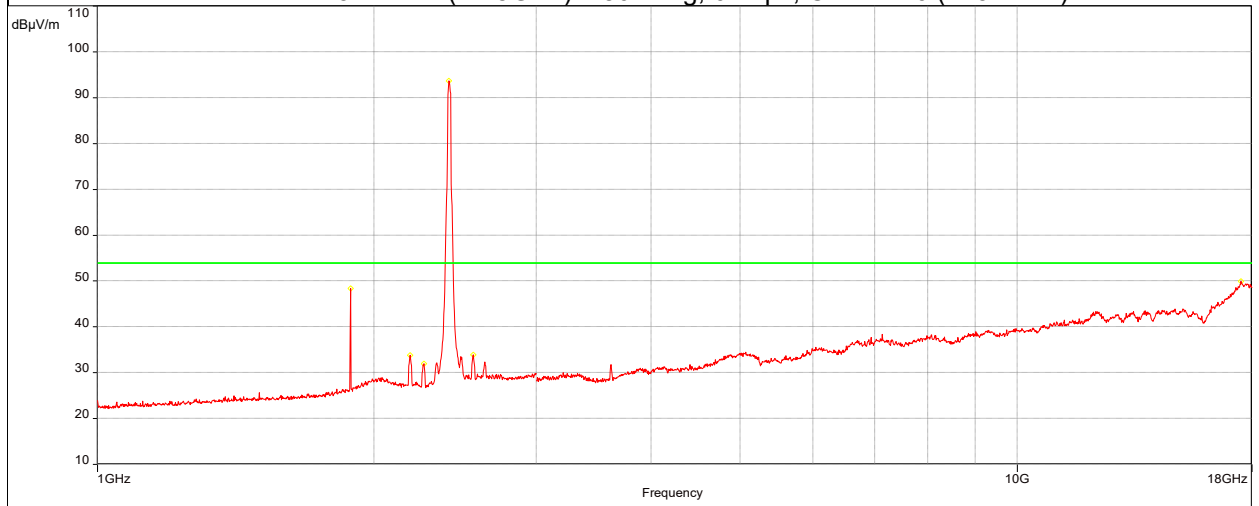
Peak Plot – 3 meters (1-18GHz) – 802.11g, 6Mbps, Channel 1 (2412MHz)



FCC Part 15 Transmitters/FCC 15.209

Note: Emissions around 1880MHz were in a cellular band and not associated with the 2.4GHz radio.

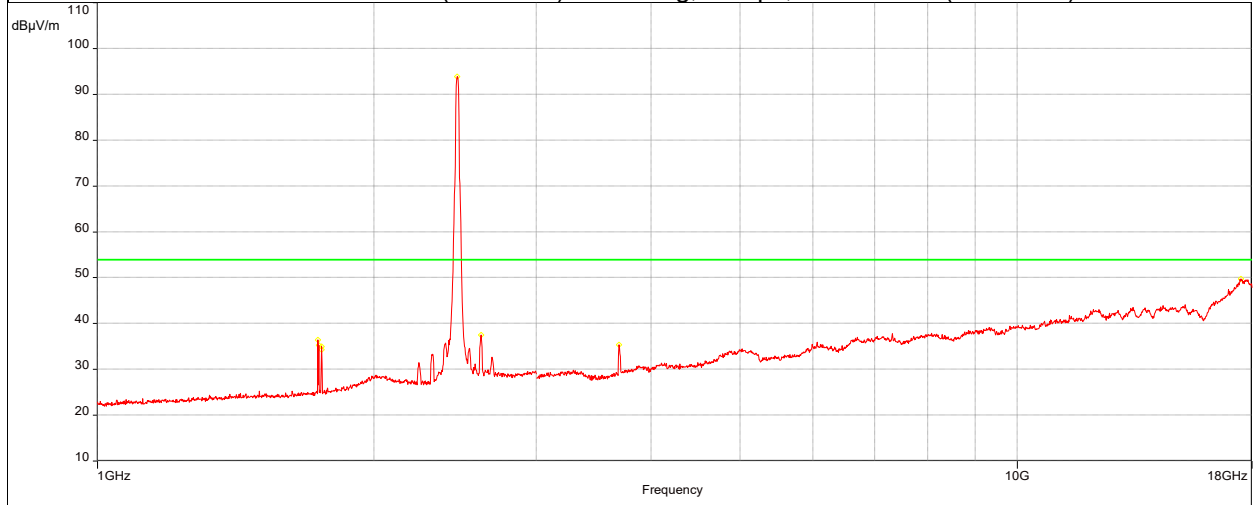
Peak Plot – 3 meters (1-18GHz) – 802.11g, 6Mbps, Channel 6 (2437MHz)



FCC Part 15 Transmitters/FCC 15.209

Note: Emissions around 1880MHz were in a cellular band and not associated with the 2.4GHz radio.

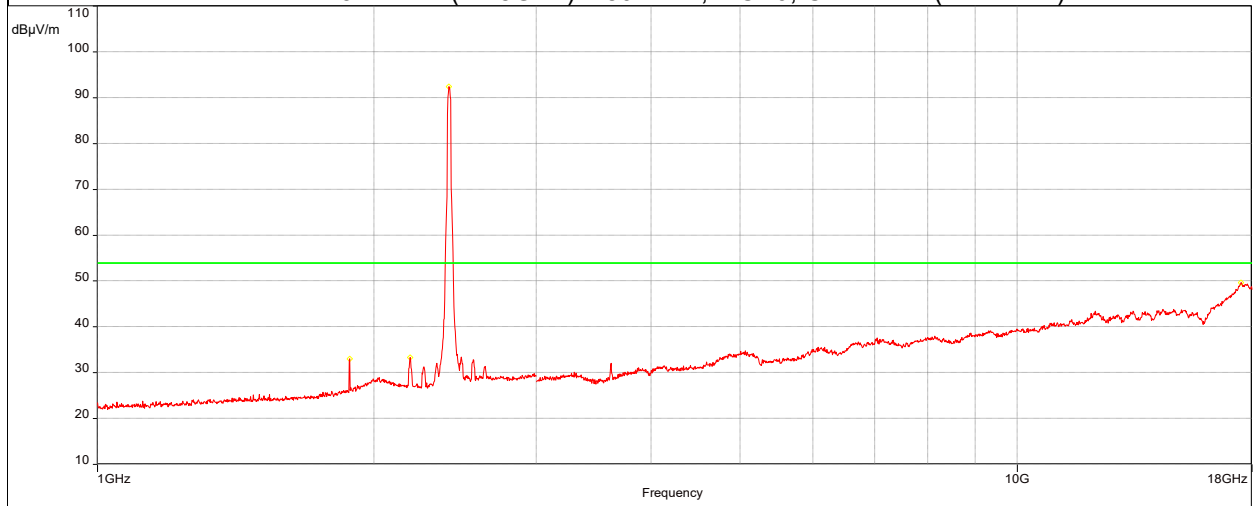
Peak Plot – 3 meters (1-18GHz) – 802.11g, 6Mbps, Channel 11 (2462MHz)



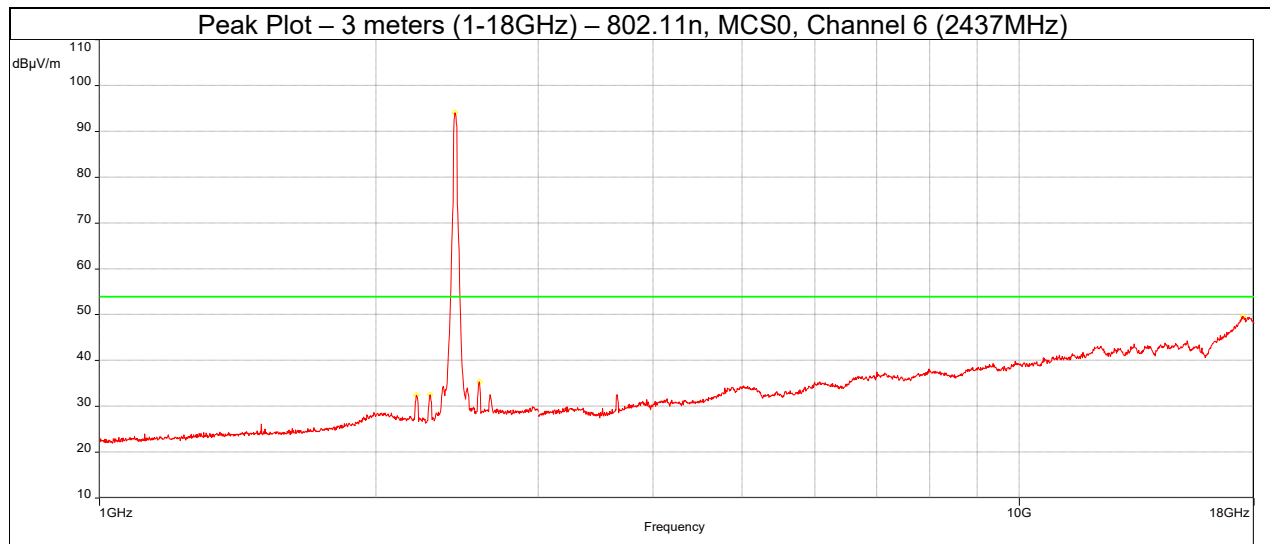
FCC Part 15 Transmitters/FCC 15.209

Note: Emissions around 1880MHz were in a cellular band and not associated with the 2.4GHz radio.

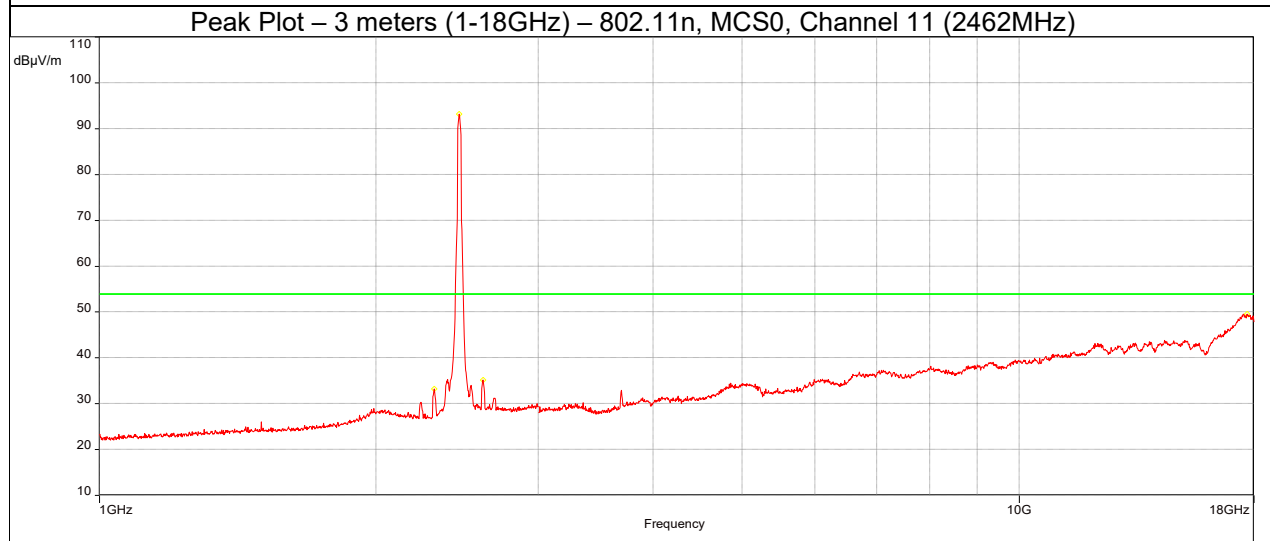
Peak Plot – 3 meters (1-18GHz) – 802.11n, MCS0, Channel 1 (2412MHz)



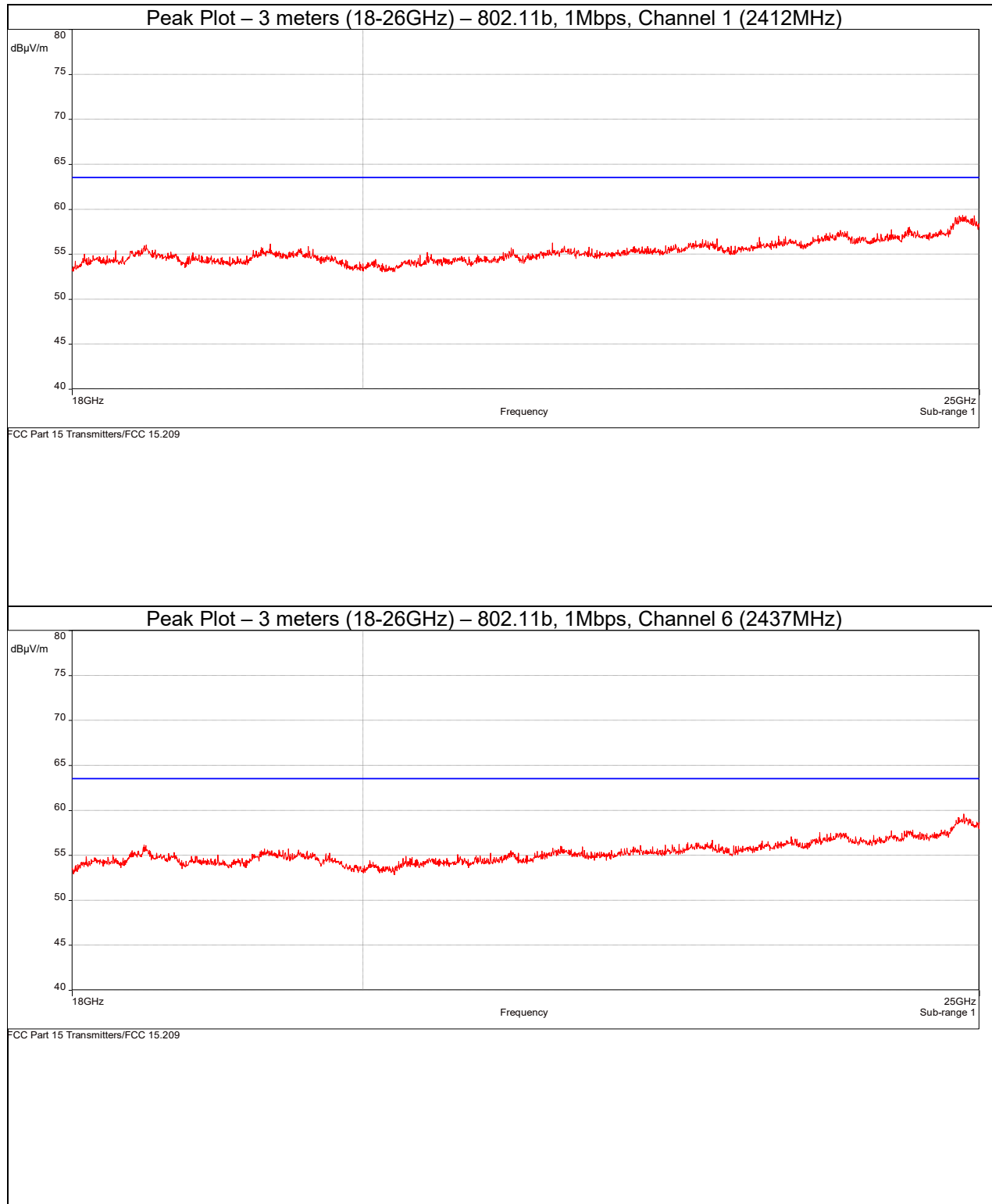
FCC Part 15 Transmitters/FCC 15.209

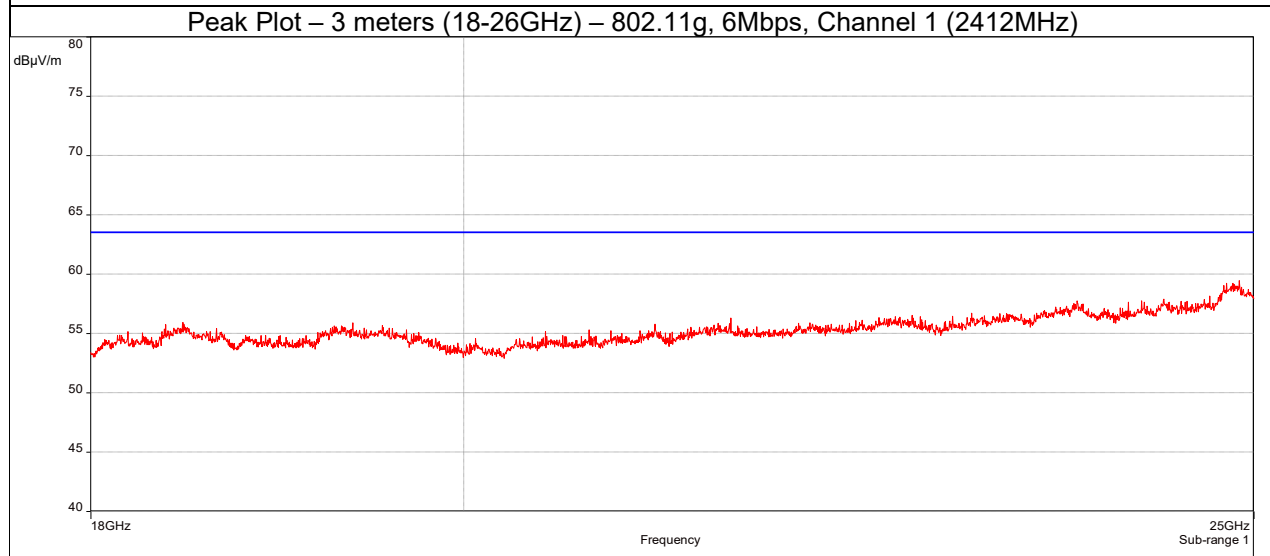
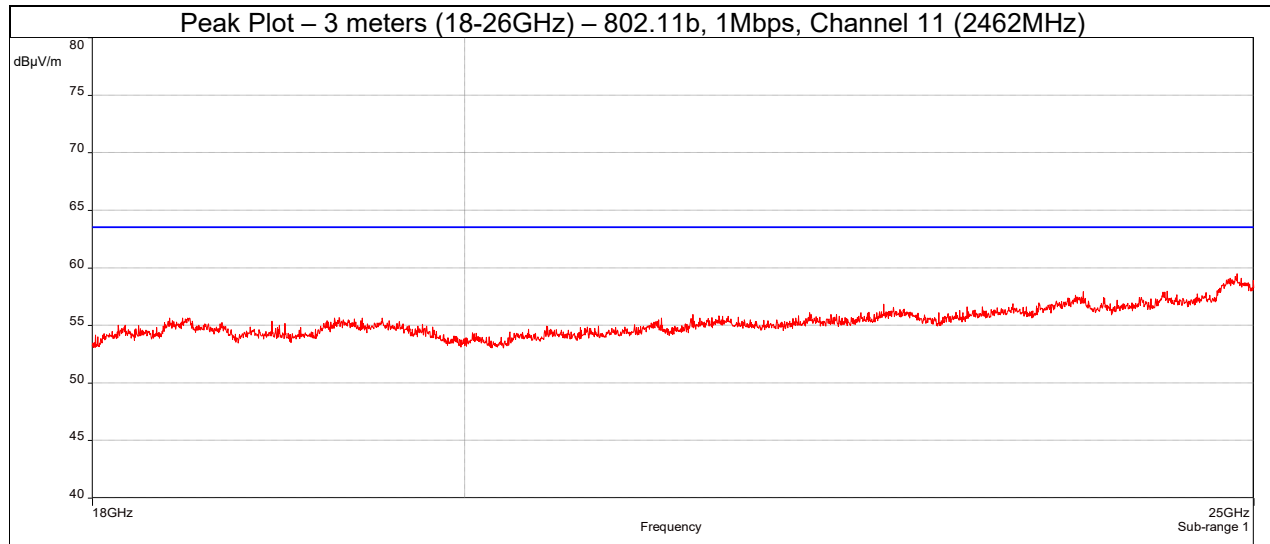


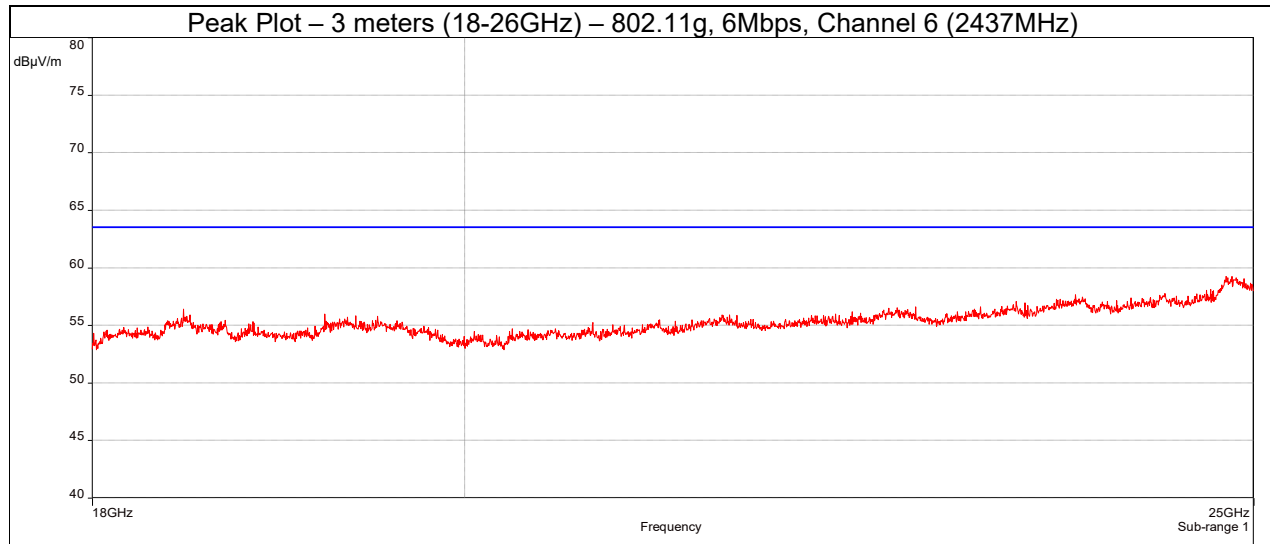
FCC Part 15 Transmitters/FCC 15.209



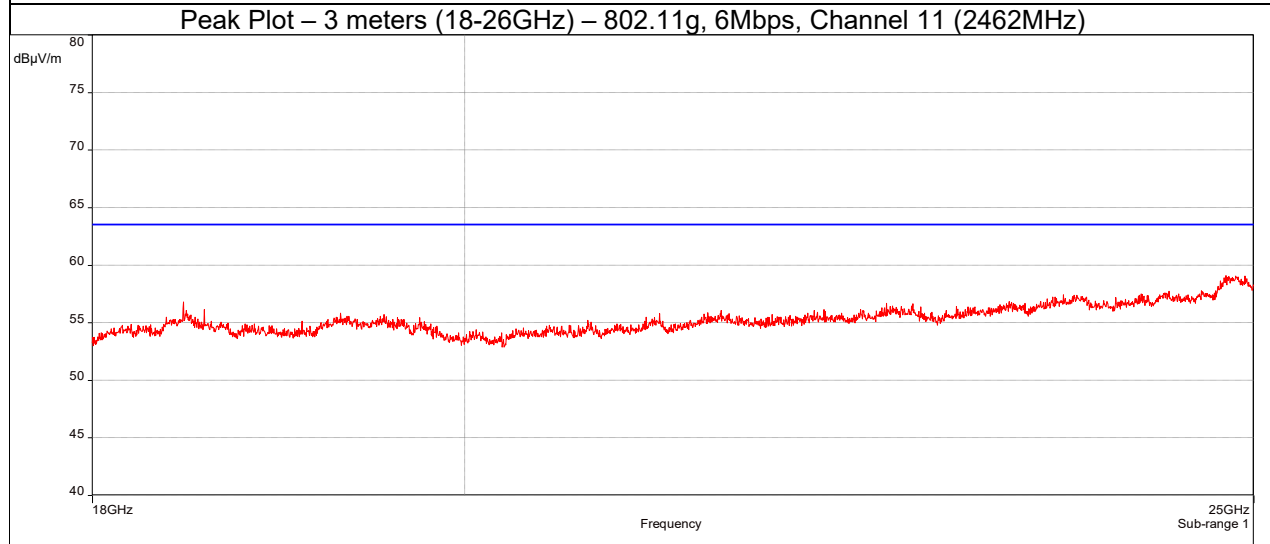
FCC Part 15 Transmitters/FCC 15.209



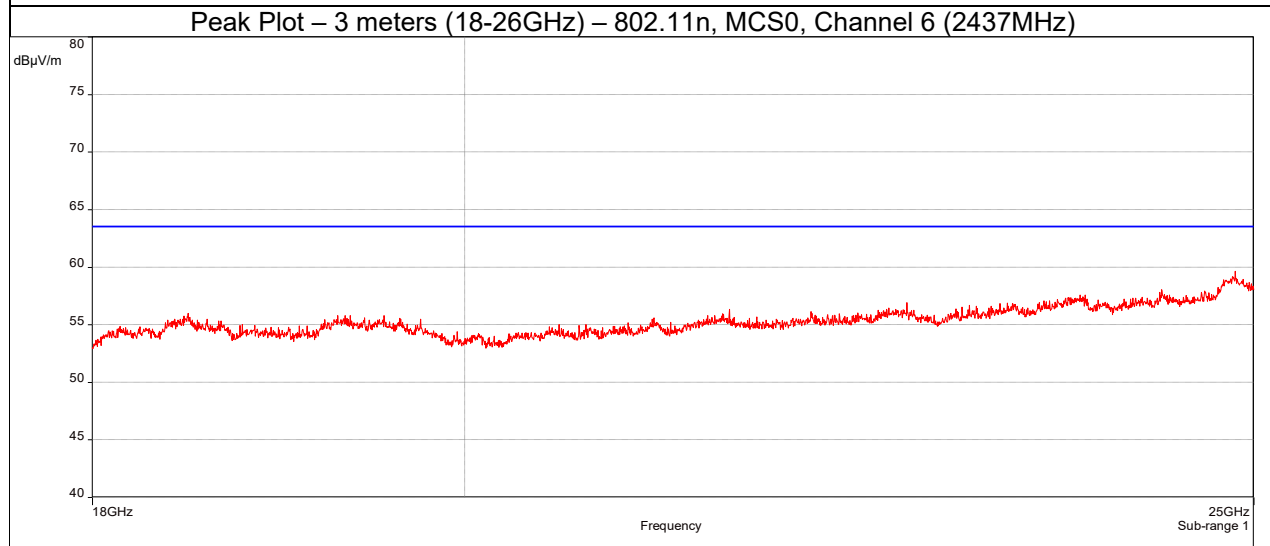
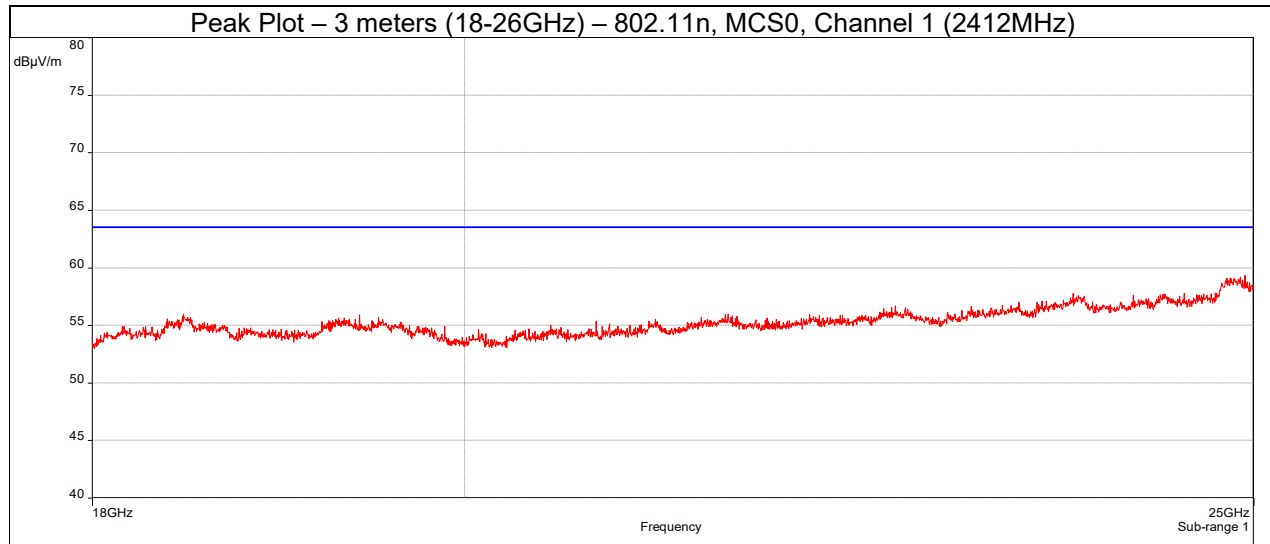


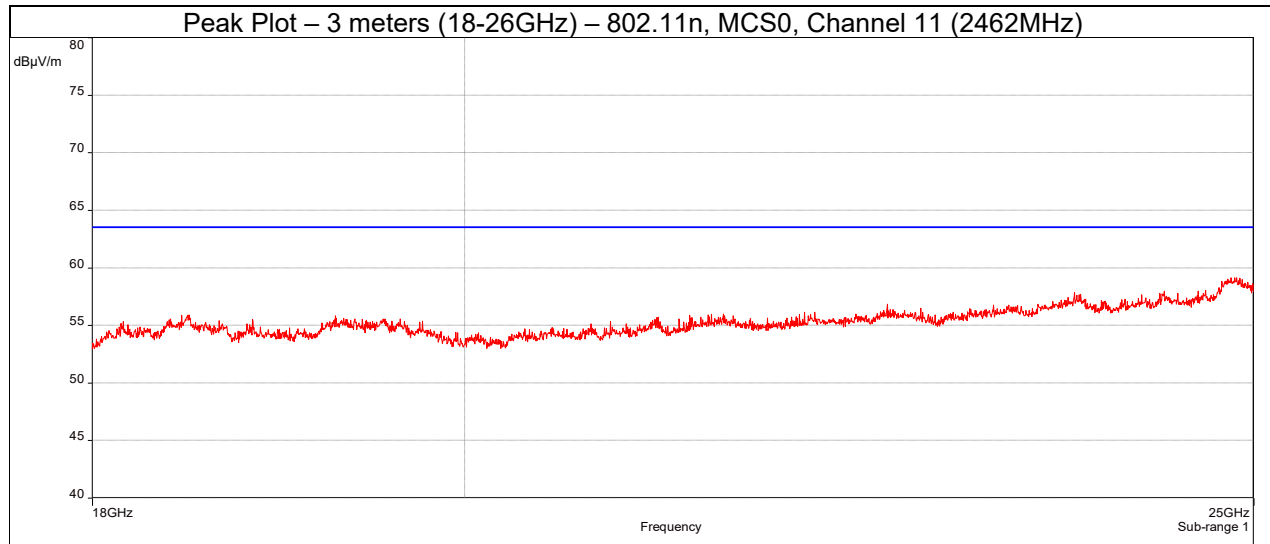


FCC Part 15 Transmitters/FCC 15.209



FCC Part 15 Transmitters/FCC 15.209





Tabular Data – Spurious Emissions

Peak

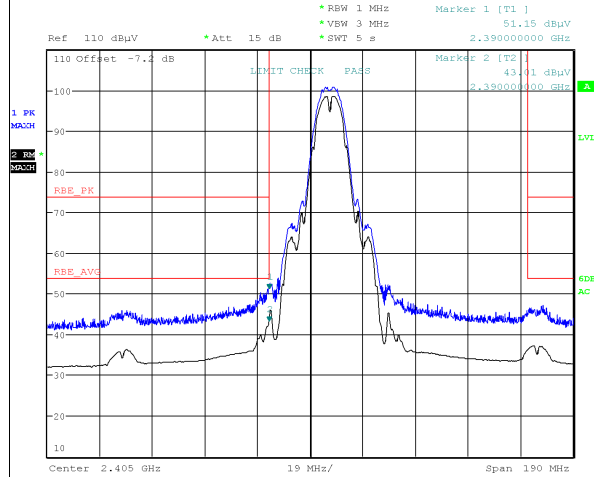
Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Azimuth (°)	Height (m)	Polarity	RBW (MHz)	Correction (dB)
802.11b, Channel 6								
4873.950	45.64	74	-28.36	228	1.24	Vertical	1	-4.65

Average

Frequency (MHz)	AVG Level (dBμV/m)	AVG Limit (dBμV/m)	AVG Margin (dB)	Azimuth (°)	Height (m)	Polarity	RBW (MHz)	Correction (dB)
802.11b, Channel 6								
4873.950	34.87	54	-19.13	228	1.24	Vertical	1	-4.65

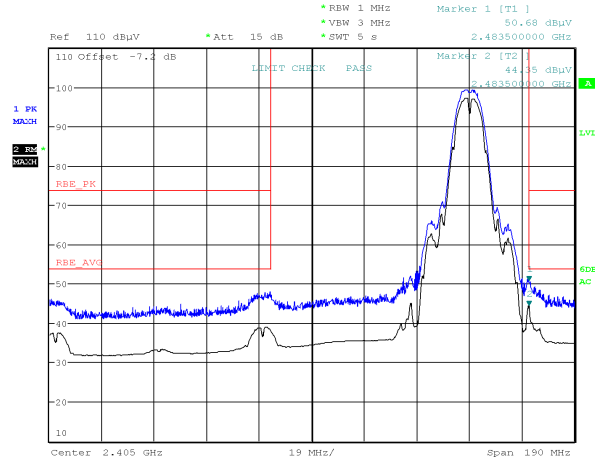
Restricted Band Edges

Low Channel (802.11b, 1Mbps, Channel 1)



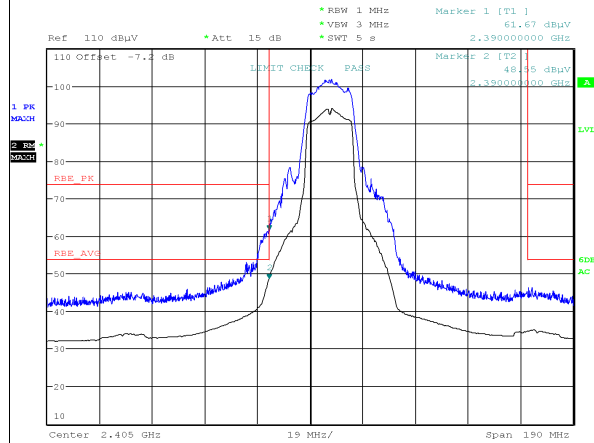
Date: 23.OCT.2025 15:00:45

High Channel (802.11b, 1Mbps, Channel 11)



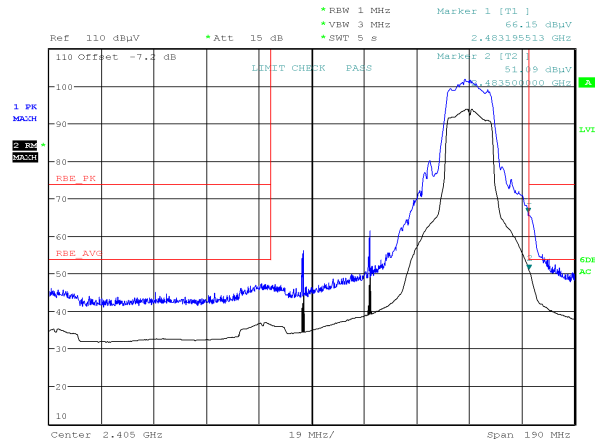
Date: 23.OCT.2025 14:59:04

Low Channel (802.11g, 6Mbps, Channel 1)



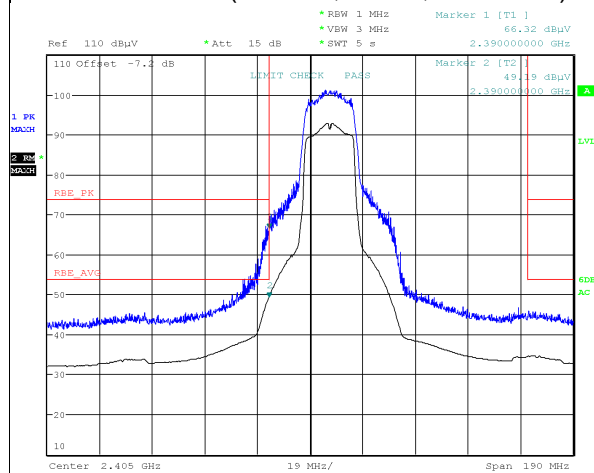
Date: 23.OCT.2025 15:02:34

High Channel (802.11g, 6Mbps, Channel 11)



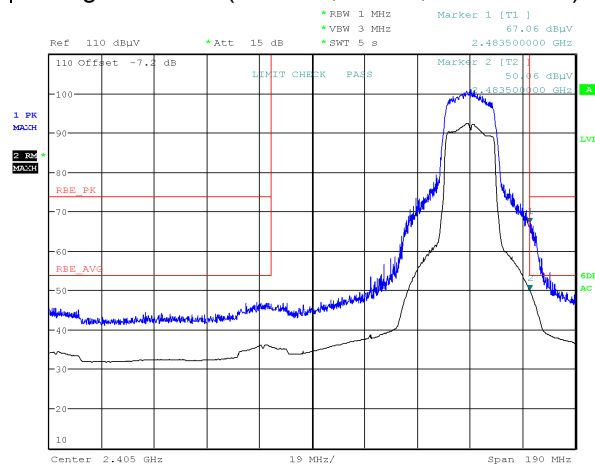
Date: 23.OCT.2025 14:54:51

Low Channel (802.11n, MCS0, Channel 1)



Date: 23.OCT.2025 15:04:02

High Channel (802.11n, MCS0, Channel 11)



Date: 23.OCT.2025 14:57:47

Tabular Data – Band Edges

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	RBW (MHz)	Correction (dB/m)
802.11b LCH					
2390.000	51.15	74	-22.85	1	-7.2
802.11b HCH					
2483.500	50.68	74	-23.32	1	-7.2
802.11g LCH					
2390.000	61.67	74	-12.33	1	-7.2
802.11g HCH					
2483.500	66.15	74	-7.85	1	-7.2
802.11n LCH					
2390.000	66.32	74	-7.68	1	-7.2
802.11n HCH					
2483.500	67.06	74	-6.94	1	-7.2
Frequency (MHz)	AVG Level (dBμV/m)	AVG Limit (dBμV/m)	Margin (dB)	RBW (MHz)	Correction (dB/m)
802.11b LCH					
2390.000	43.01	54	-10.99	1	-7.2
802.11b HCH					
2483.500	44.35	54	-9.65	1	-7.2
802.11g LCH					
2390.000	48.55	54	-5.45	1	-7.2
802.11g HCH					
2483.500	51.09	54	-2.91	1	-7.2
802.11n LCH					
2390.000	49.19	54	-4.81	1	-7.2
802.11n HCH					
2483.500	50.06	54	-3.94	1	-7.2

Test Personnel: Jeremy Pickens 
Supervising/Reviewing
Engineer:
(Where Applicable) _____
Product Standard: ANSI C63.10
Input Voltage: 240Vac, 60Hz
Pretest Verification w/
Ambient Signals or
BB Source: BB

Test Date: 22-23 October 2025Limit Applied: 15.209Ambient Temperature: 20.3 – 22.1°CRelative Humidity: 41.0 – 43.8%Atmospheric Pressure: 98.1 – 98.3kPa

Deviations, Additions, or Exclusions: None

6 AC Conducted Emissions

6.1 Method

Tests were performed in accordance with ANSI C63.10.

TEST SITE: EMC Lab

The EMC Lab has two Semi-anechoic Chambers (One 10-meter and one compact) and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Sample Calculations

The following calculations were used to determine the net line-conducted measurements:

$$NF = RF + LF + CF + AF$$

Where NF = Net Reading in dB μ V

RF = Reading from receiver in dB μ V

LF = LISN or ISN Correction Factor in dB

CF = Cable Correction Factor in dB

AF = Attenuator Loss Factor in dB

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 \text{ dB}\mu\text{V}$$

$$UF = 10^{(49.1 \text{ dB}\mu\text{V} / 20)} = 285.1 \mu\text{V/m}$$

6.2 Test Equipment

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
200162	EMI Receiver (20Hz-40GHz)	Rohde & Schwarz	ESU 40	100314	10/07/2025	10/07/2026
212166	Temperature/Pressure/Humidity Sensor	Extech	SD700	110392	04/02/2025	04/02/2026
213498	Two-Line V-Network	Rohde & Schwarz	ENV216	3560-6550-16	10/15/2025	10/15/2026
MM8	RF Coax Cable 9kHz-18GHz	Maury Microwave	UC-N-MM-267	1635289	06/18/2025	06/18/2026

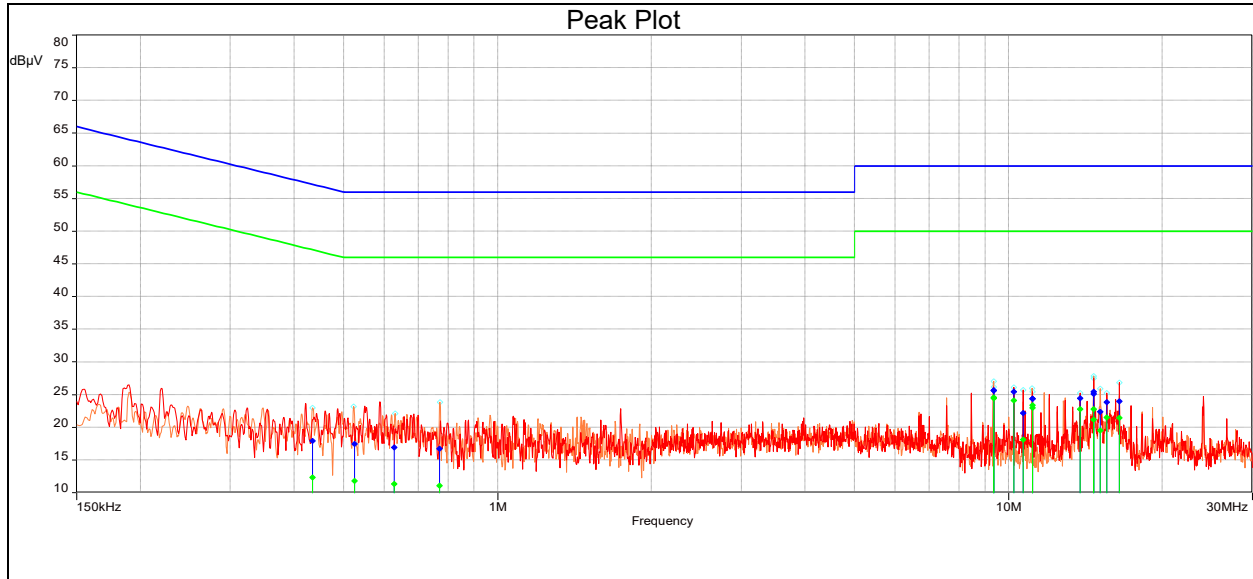
Software Utilized

Name	Manufacturer	Version
EMC BAT	Nexio	3.19.1.18

6.3 Results

The sample tested was found to Comply.

6.4 Plots/Data



Tabular Data

Frequency (MHz)	AVG Level (dBμV)	QP Level (dBμV)	Limit AVG (dBμV)	Limit QP (dBμV)	AVG Margin (dB)	QP Margin (QP)	Line	Correction (dB)
9.343	24.44	25.61	50.0	60.0	-25.6	-34.4	Phase 1	9.9
10.233	24.11	25.43	50.0	60.0	-25.9	-34.6	Phase 1	10.0
10.678	18.1	22.17	50.0	60.0	-31.9	-37.8	Phase 1	10.0
11.125	23	24.39	50.0	60.0	-27.0	-35.6	Phase 1	10.0
13.794	22.81	24.42	50.0	60.0	-27.2	-35.6	Phase 1	10.0
14.680	21.21	25.48	50.0	60.0	-28.8	-34.5	Phase 1	10.0
15.575	21.52	23.86	50.0	60.0	-28.5	-36.1	Phase 1	10.0
16.464	21.47	24.01	50.0	60.0	-28.5	-36.0	Phase 1	10.0
0.435	12.31	17.95	47.2	57.2	-34.9	-39.2	Phase 2	9.8
0.524	11.8	17.43	46.0	56.0	-34.2	-38.6	Phase 2	9.8
0.627	11.35	16.92	46.0	56.0	-34.7	-39.1	Phase 2	9.8
0.769	11.07	16.71	46.0	56.0	-34.9	-39.3	Phase 2	9.8
9.345	24.56	25.63	50.0	60.0	-25.4	-34.4	Phase 2	10.0
11.124	23.39	24.39	50.0	60.0	-26.6	-35.6	Phase 2	10.0
14.684	22.76	25.09	50.0	60.0	-27.2	-34.9	Phase 2	10.1
15.120	19.55	22.4	50.0	60.0	-30.5	-37.6	Phase 2	10.1

Test Personnel: Jeremy Pickens
 Supervising/Reviewing Engineer:
 (Where Applicable)
 Product Standard: ANSI C63.4
 Input Voltage: 240Vac, 60Hz
 Pretest Verification w/ Ambient Signals or BB Source: BB

Test Date: 23 October 2024

Limit Applied: 15.207 / RSS-Gen S8.8

Ambient Temperature: 21.1°C

Relative Humidity: 42.4%

Atmospheric Pressure: 98.3kPa

Deviations, Additions, or Exclusions: None

7 Measurement Uncertainty

Parameter	Expanded Uncertainty for Normal k factor equal to 2
Radio Frequency	0.07
Total RF Power (Conducted)	0.65
Power Density (Conducted)	0.65
RF Spurious (Conducted)	1.8 dB
Radiated Emissions (9kHz-30MHz)	4.7 dB
Radiated Emissions (30MHz-1GHz)	4.1 dB
Radiated Emissions (1GHz-18GHz)	4.5dB
Radiated Emissions (18GHz-40GHz)	4.7 dB
AC Line Conducted Emissions	2.8 dB
Temperature	0.7°
Humidity	3.9%

8 Revision History

Revision Level	Date	Prepared By	Reviewed By	Notes
0	13 January 2026	JOP	US	Original Issue