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CERTIFICATION TEST REPORT

Manufacturer:	**Runwise, Inc.** **104 West 27th Street, Floor 3** **New York, New York 10001 USA**
Applicant:	**Same as Above**
Product Name:	**Gen2 Wireless Network Module**
Product Description:	Serial UART to RF network interface, 2.4 GHz Bluetooth Radio
Operating Voltage/Freq. of EUT During Testing:	Module is DC powered at 3.3VDC nominal
Model:	**V4.0**
FCC ID:	**2AQX2-G2RWHPMOD**
Testing Commenced:	2024-01-10
Testing Ended:	2024-01-17
Summary of Test Results:	**In Compliance** The EUT complies with the EMC requirements when manufactured identically as the unit tested in this report, including any required modifications and/or manufacturer's statement. Any changes to the design or build of this unit subsequent to this testing may deem it non-compliant.

Standards:

- **FCC Part 15 Subpart C, Section 15.249**
- **FCC Part 15 Subpart C, Section 15.215(c) – Additional provisions to the general radiated emission limitations**
- **FCC Part 15 Subpart A, Section 15.31(e) – Measurement Standards**
- **FCC15.207 - Conducted Limits**

Evaluation Conducted by:

Julius Chiller, Senior Wireless Project Engineer

Report Reviewed by:

Ken Littell, Vice President of Operations

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1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD**.**

1.2 Measurement Procedure:

All measurements were performed according to ANSI C63.10 and recommended FCC procedure of measurement under Section 15.249. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used, and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data and are expressed with a 95% confidence factor using a coverage factor of k=2. The Uncertainty for a laboratory is referred to as *U*lab. For Radiated and Conducted Emissions, the Expanded Uncertainty is compared to the *U*cispr values to determine if a specific margin is required to deem compliance.

*U*lab

Measurement Range	Combined Uncertainty	Expanded Uncertainty
Radiated Emissions <1 GHz @ 3m	2.54dB	5.07dB
Radiated Emissions <1 GHz @ 10m	2.55 dB	5.09dB
Radiated Emissions 1 GHz to 2.7 GHz	1.81 dB	3.62dB
Radiated Emissions 2.7 GHz to 18 GHz	1.55 dB	3.10dB
AC Power Line Conducted Emissions, 150kHz to 30 MHz	1.38 dB	2.76dB
AC Power Line Conducted Emissions, 9kHz to 150kHz	1.66 dB	3.32dB

*U*cispr

Measurement Range	Expanded Uncertainty
Radiated Emissions <1 GHz @ 3m	5.2dB
Radiated Emissions <1 GHz @ 10m	5.2dB
Radiated Emissions 1 GHz to 2.7 GHz	Under Consideration
Radiated Emissions 2.7 GHz to 18 GHz	Under Consideration
AC Power Line Conducted Emissions, 150kHz to 30 MHz	3.6dB
AC Power Line Conducted Emissions, 9kHz to 150kHz	4.0dB

If *U*lab is less than or equal to *U*cispr, then:
- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If *U*lab is greater than *U*cispr in table 1, then:
- compliance is deemed to occur if no measured disturbance, increased by (*U*lab – *U*cispr), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by (*U*lab – *U*cispr), exceeds the disturbance limit.

Note: Only measurements listed in the tables above that relate to tests included in this Test Report are applicable.

1.4 Document History:

Document Number	Description	Issue Date	Approved By
F2P30751A-C2A-02E	First Issue	2024-02-05	K. Littell

2 SUMMARY OF TEST RESULTS

Test Name	Standard(s)	Results
99% Occupied Bandwidth	CFR 47 Part 15.215(c)	Complies
-20dB Occupied Bandwidth	CFR 47 Part 15.215(c)	Complies
Field Strength of Emissions	CFR 47 Part 15.249(a)(d)	Complies
Variation of the Input Power	CFR 47 Part 15.31(e)	Complies
Conducted Emissions	CFR 47 Part 15.207(a)	Complies

Modifications Made to the Equipment
None

Power Setting
8

3 TABLE OF MEASURED RESULTS

Test			Low Channel 2402 MHz	Mid Channel 2440 MHz	High Channel 2480 MHz
Average Field Strength of Fundamental	Modulation: 1Mbps		79.9 dBµV/m / 9.8 mV/m	78.7 dBµV/m / 8.6 mV/m	78.0 dBµV/m / 7.9 mV/m
Average Field Strength of Fundamental	Modulation: 2Mbps		76.2 dBµV/m / 6.4 mV/m	74.2 dBµV/m / 5.1 mV/m	73.9 dBµV/m / 5.0 mV/m
Average Limit for Fundamental			50 millivolts/meter / 93.97 dBµV/m	50 millivolts/meter / 93.97 dBµV/m	50 millivolts/meter / 93.97 dBµV/m
-20dB Occupied Bandwidth	1Mbps		1.192 MHz	1.158 MHz	1.186 MHz
	2Mbps		2.364 MHz	2.349 MHz	2.328 MHz
99% Occupied Bandwidth	1Mbps		1.052 MHz	1.043 MHz	1.052 MHz
	2Mbps		2.057 MHz	2.045 MHz	2.089 MHz
Voltage Variations	Modulation: 1Mbps	-15%	79.3 dBuV/m	--	77.9 dBuV/m
		+15%	80.0 dBuV/m	--	78.0 dBuV/m
	Modulation: 2Mbps	-15%	76.1 dBuV/m	--	73.6 dBuV/m
		+15%	76.6 dBuV/m	--	74.1 dBuV/m

To meet the requirements of 15.31 the maximum voltage used is the manufacturer's specified limit. The minimum voltage of 2.7VDC is 0.1VDC above turn off.

4 ENGINEERING STATEMENT

This report has been prepared on behalf of Runwise, Inc. to provide documentation for the testing described herein. This equipment has been tested and found to comply with part 15.249 of the FCC Rules using ANSI C63.10 standard. The test results found in this test report relate only to the items tested.

5 EUT INFORMATION AND DATA

5.1 Equipment Under Test:

Product: Gen2 Wireless Network Module - 2.4 GHz Bluetooth Radio
Model: V4.0
Serial No.: 412
Firmware: V4.0
Hardware: V1.0.3
FCC ID: 2AQX2-G2RWHPMOD

5.2 Trade Name:

Runwise, Inc.

5.3 Power Supply:

Module is DC powered at 3.3VDC nominal

5.4 Applicable Rules:

CFR 47, Part 15.249, subpart C

5.5 Antenna:

Integral Chip Antenna

5.6 Accessories:

Device	Manufacturer	Model Number	Serial Number
Test Fixture	Texas Instruments	CC1350	Rev1.3.0
Accessory Software Version:		FW Rev:1.0	

5.7 Test Item Condition:

The equipment to be tested was received in good condition.

5.8 Testing Algorithm:

EUT was set to transmit a continuous modulated signal in the 2.4 GHz BLE band. Measurements were taken on low (2402 MHz), mid (2440 MHz) and high (2480 MHz) channels using 1Mbps and 2Mbps modulations.

6 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	Albatross Projects	B83117-DF435-T261	US140023	2024-11-15
Receiver	CL151	Rohde & Schwarz	ESU40	100319	2025-04-09
Low Loss Cable Set	CL315 / CL318	Fairview Microwave	FMC0202914-240 / FMC0202914-72	None Spec.	2025-04-09, 2025-04-10
Low Loss Cable Set	CL315 / CL317 / CL319	Fairview Microwave	FMC0202914-240 / FMC0202914-72 / FMC0202914-12	None Spec	2025-04-09, 2025-04-10
Horn Antenna	CL098	Emco	3115	9809-5580	2024-01-19
Horn Antenna 18-26.5 GHz	CL114	A.H. Systems, Inc.	SAS-572	237	2024-01-19
Preamplifier	CL284	A.H. Systems, Inc.	PAM-1001	131	2025-04-10
Active 18” Loop Antenna	CL163-Loop	A.H. Systems, Inc.	EHA-52B	100	2024-12-14
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	2024-09-25
Pre-Amplifier	CL153	Agilent	83006-69007	MY57280115	2024-11-14
Software:	Tile Version 3.4.B.3		Software Verified: 2024-01-11 to 2024-01-17		
Software:	EMC 32, Version 8.53.0		Software Verified: 2024-01-11 to 2024-01-17		
Temp/Hum. Recorder	CL293	Thermpro	TP50	1	2025-05-31
Spectrum Analyzer	0141	Hewlett Packard	8591E	3520A04145	2025-04-09
Transient Limiter	0202	Hewlett Packard	11974A	3107A00729	2025-04-09
LISN	CL184	Com-Power	LI-125A	191213	2026-11-02
LISN	CL185	Com-Power	LI-125A	191214	2026-11-02
Temp/Hum Rec	CL294	Thermpro	TP50	2	2026-04-27

7 FCC PART 15.215(e), OCCUPIED BANDWIDTH

7.1 Requirements:

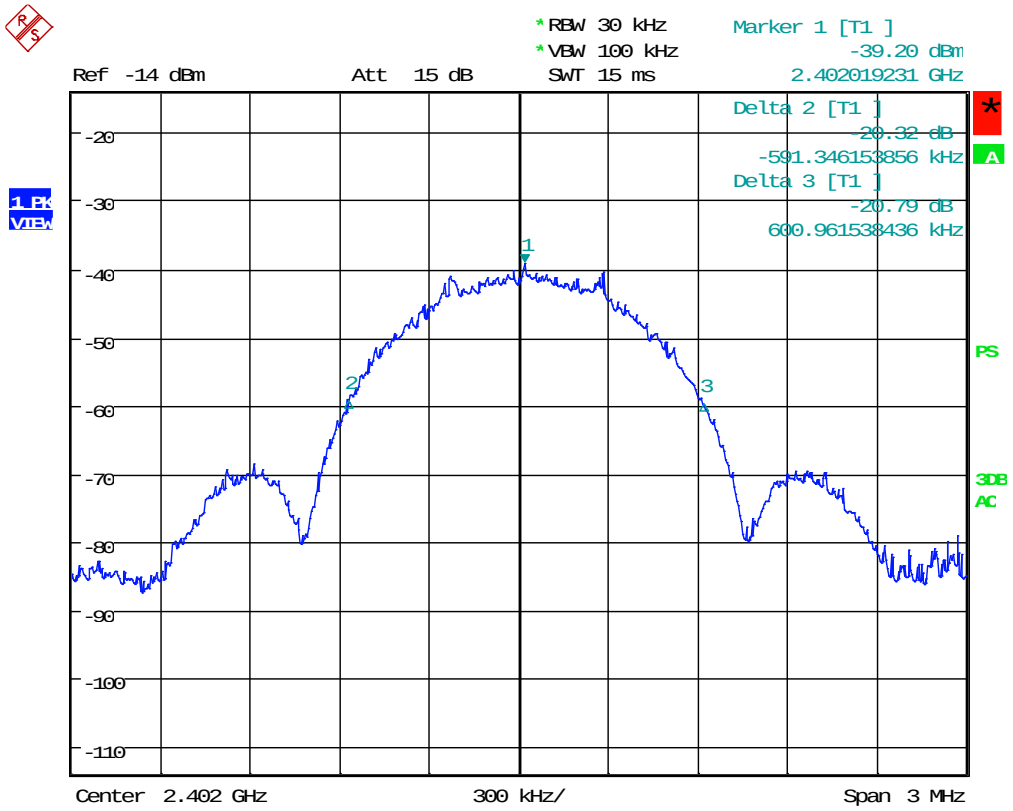
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the -20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

Bandwidth measurements were made at the low (2.402 GHz), mid (2.440 GHz) and upper (2.480 GHz) frequencies. The bandwidth was measured using the marker delta method.

7.2 Occupied Bandwidth Test Data

Test Date(s):	2024-01-10	Test Engineer(s):	J. Chiller
Standards:	CFR 47 Part 15.215(c)	Air Temperature:	20.8ºC
		Relative Humidity:	39%

1Mbps: -20dB, Low Channel



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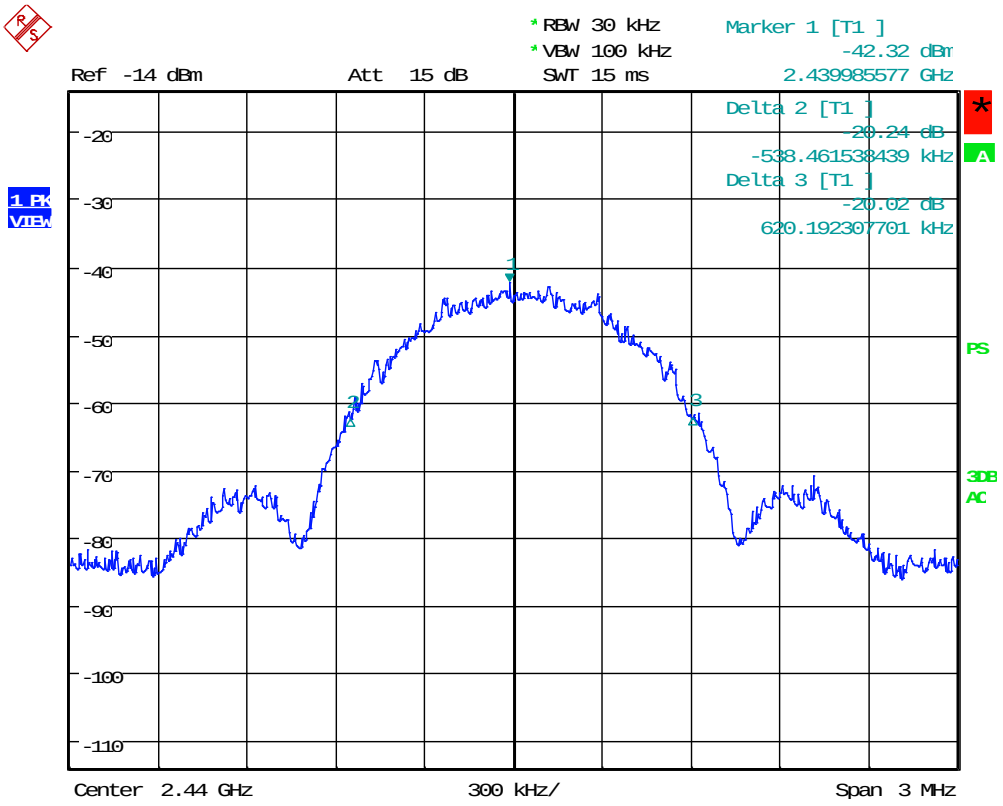
1Mbps: -20dB, Mid Channel



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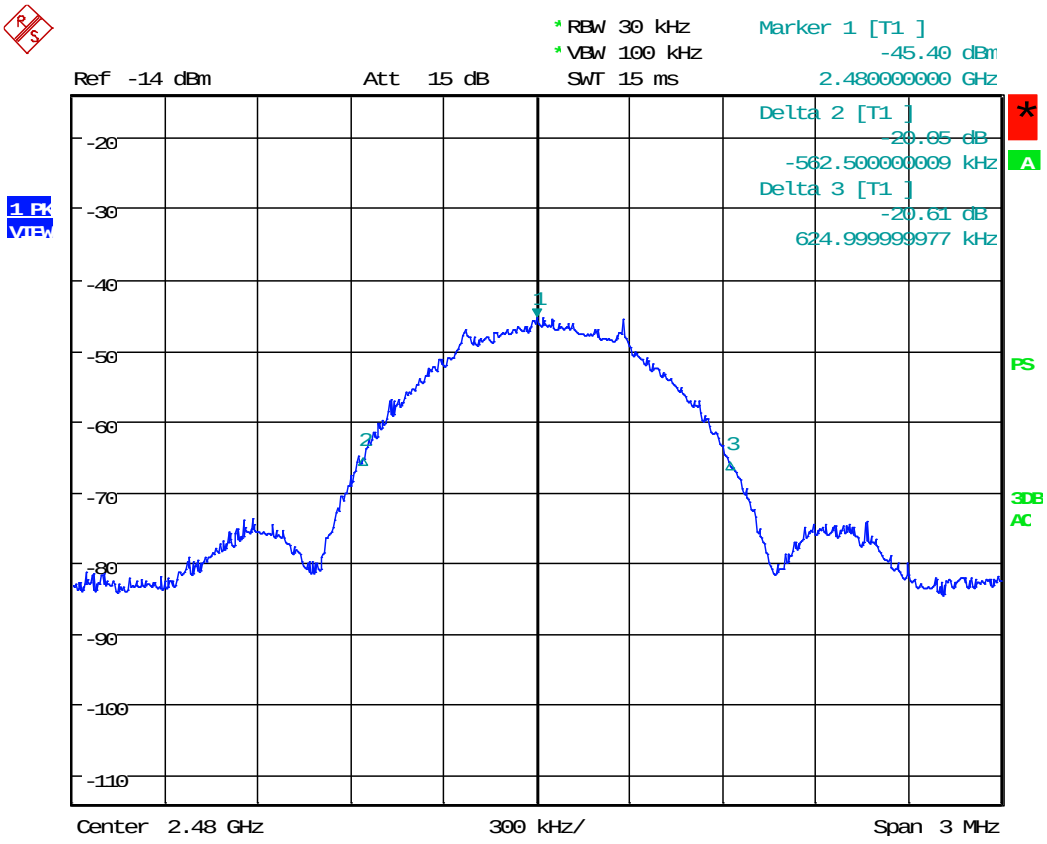
1Mbps: -20dB, High Channel



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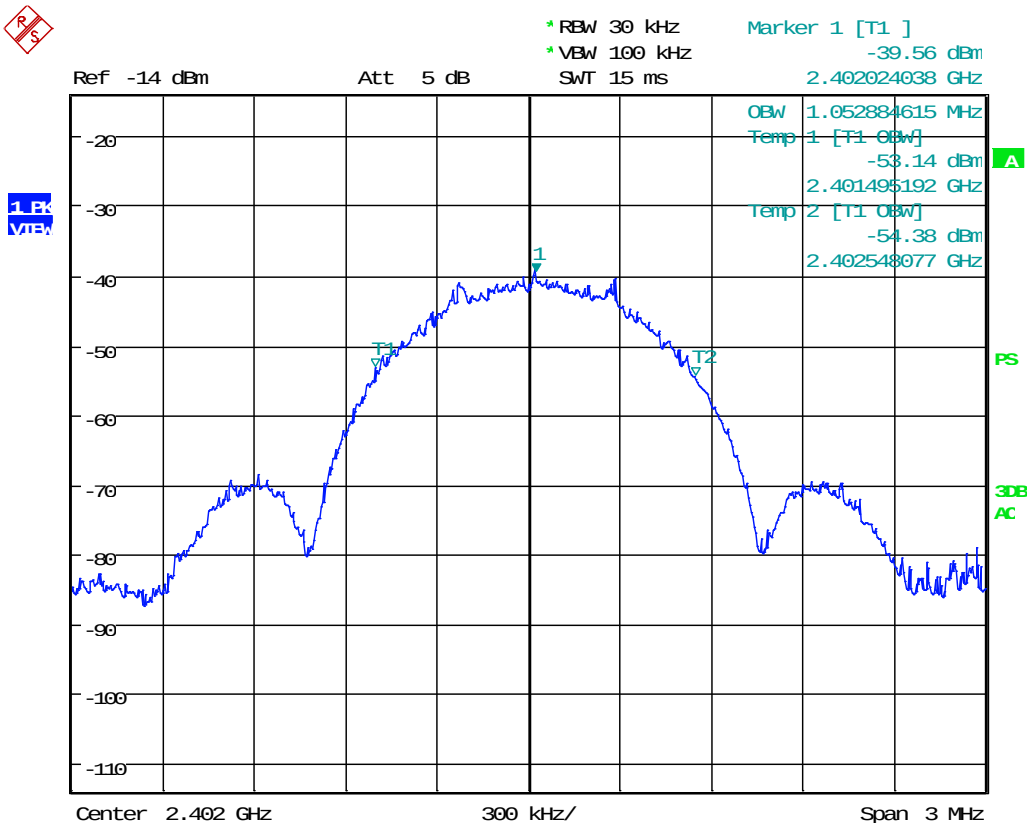
1Mbps: 99%, Low Channel



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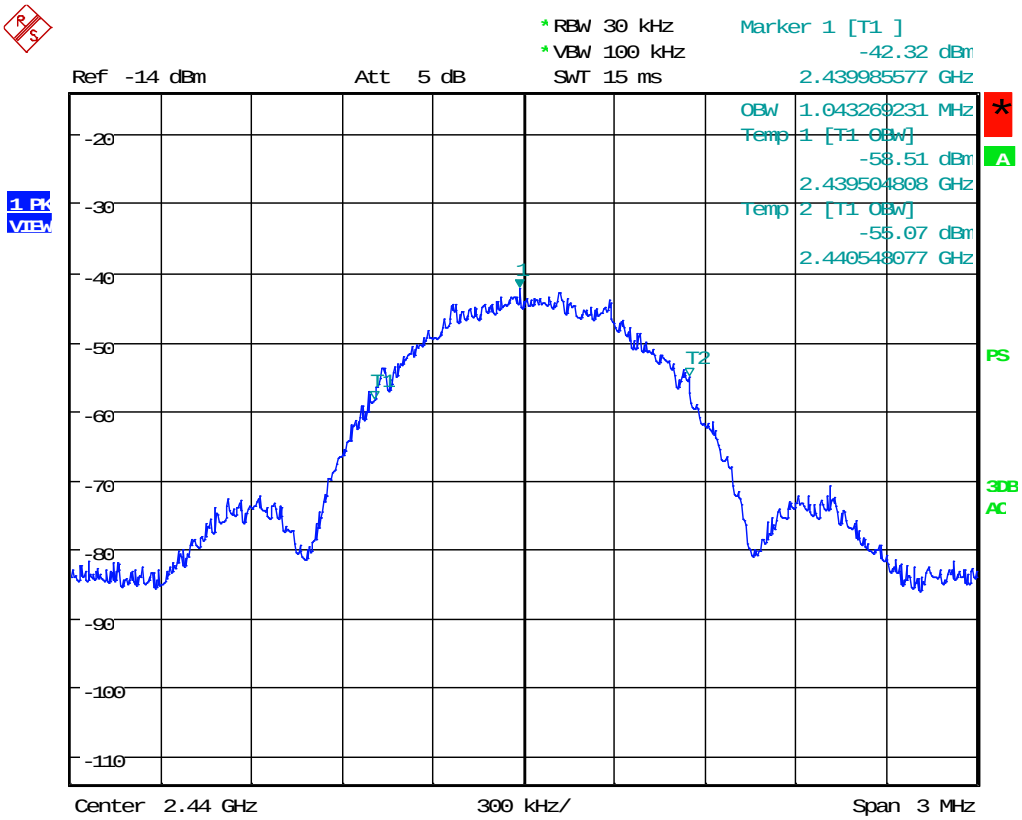
1Mbps: 99%, Mid Channel



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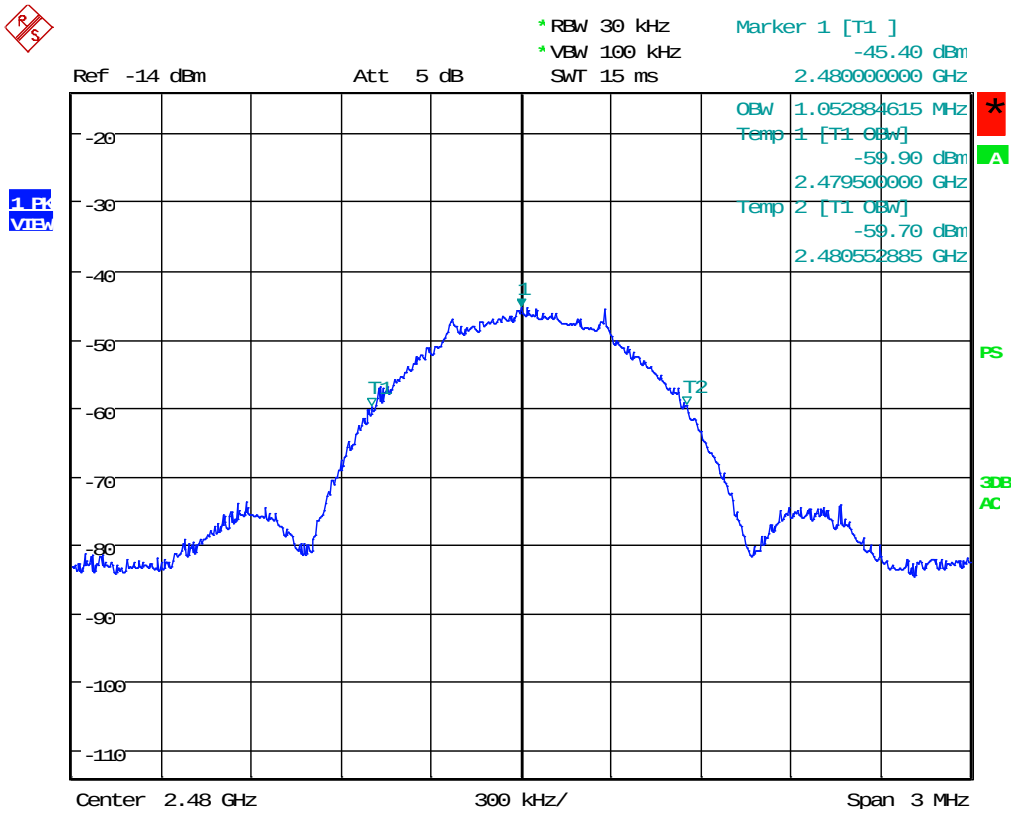
1Mbps: 99%, High Channel



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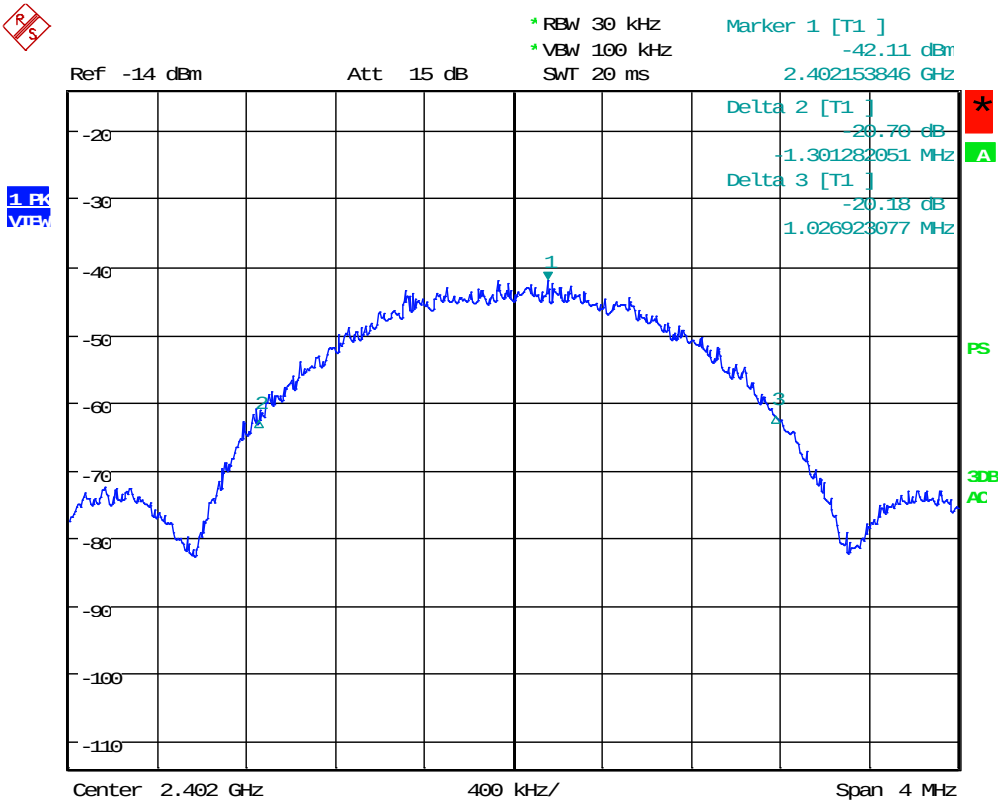
2Mbps: -20dB, Low Channel



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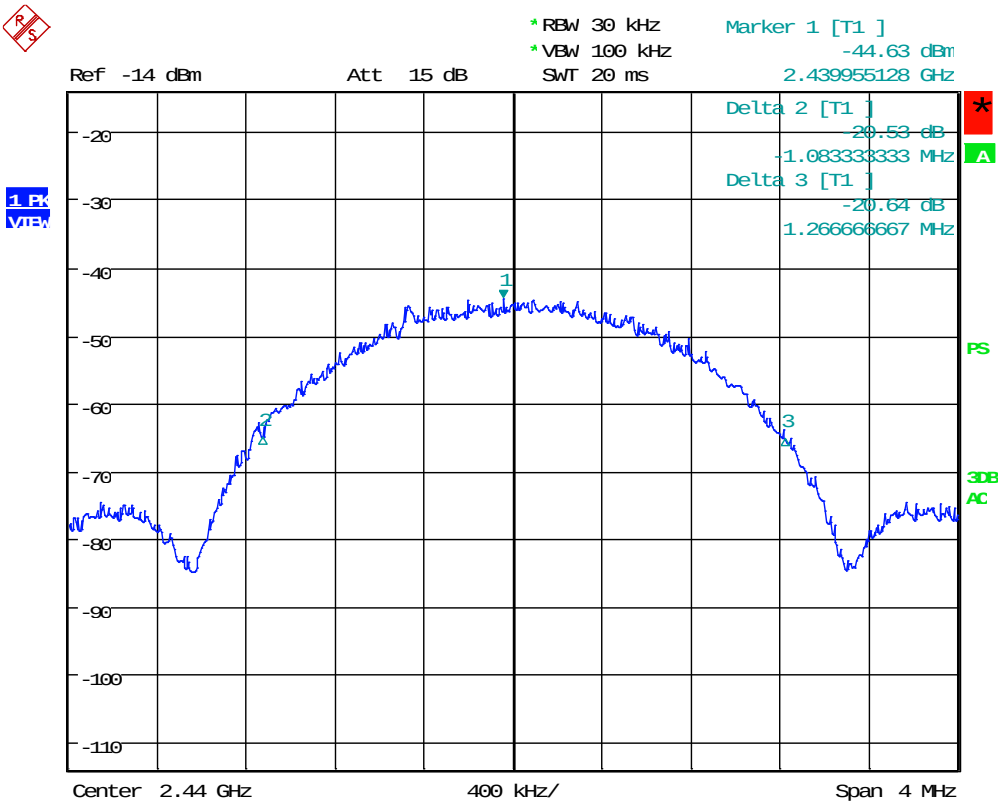
2Mbps: -20dB, Mid Channel



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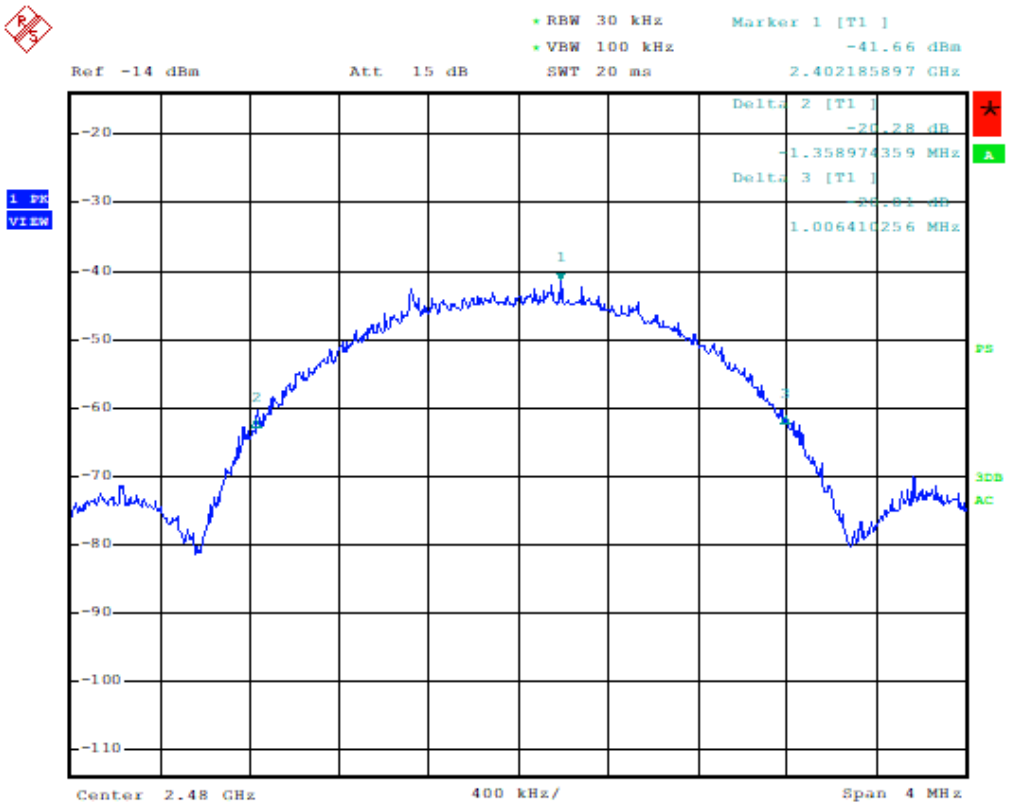
2Mbps: -20dB, High Channel



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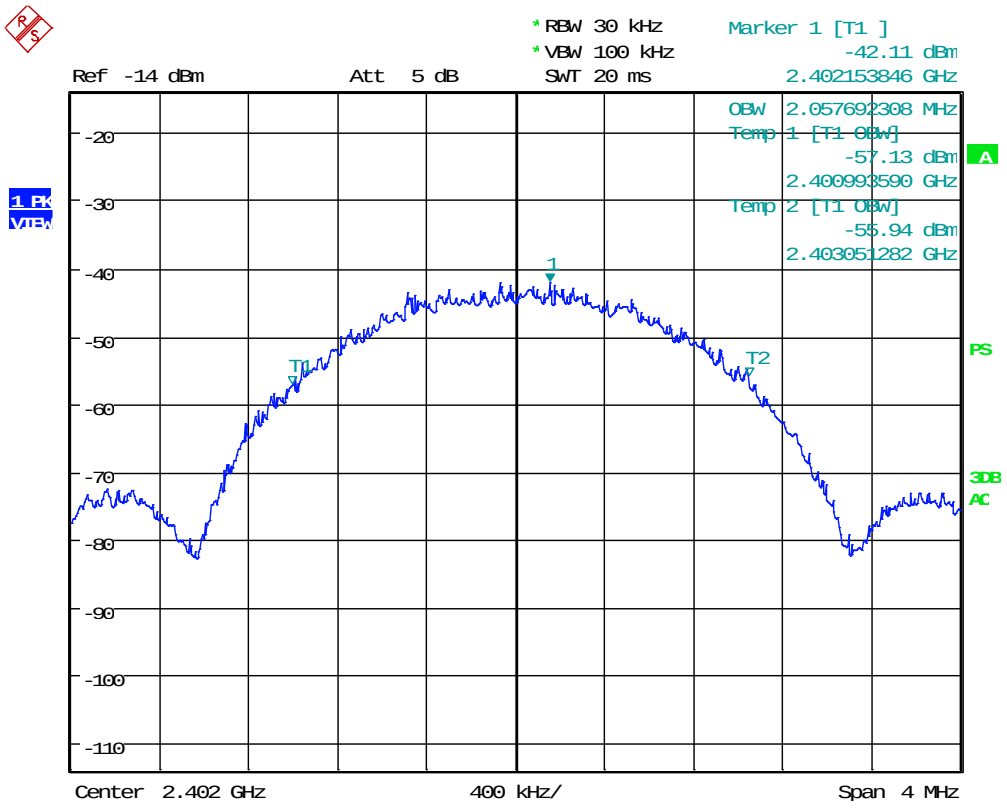
2Mbps: 99%, Low Channel



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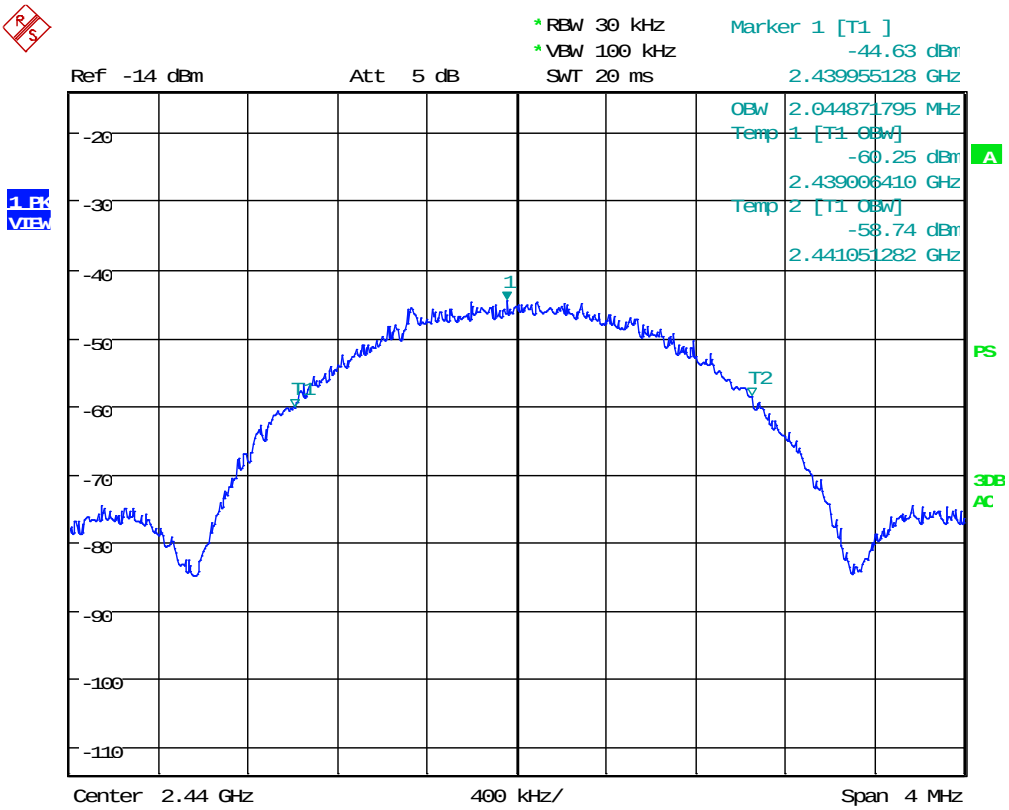
2Mbps: 99%, Mid Channel



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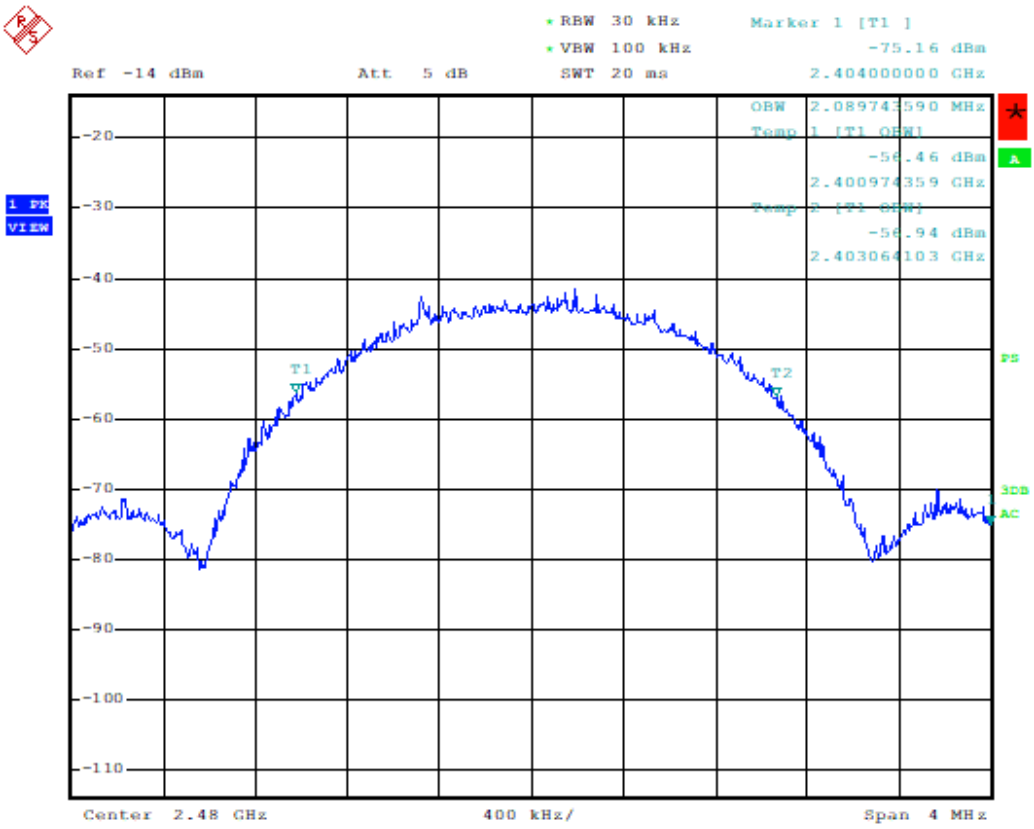
2Mbps: 99%, High Channel



Date: 10.JAN.2024 09:26:25

8 FIELD STRENGTH OF EMISSIONS FROM INTENTIONAL RADIATORS

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

NOTE: During the pre-scan evaluation, the EUT was rotated in all possible directions to find the maximum emissions. The orthogonal position that showed the highest emissions was used. The antenna was raised between 1 and 4 meters and the EUT turntable was rotated 360 degrees to maximize the emissions.

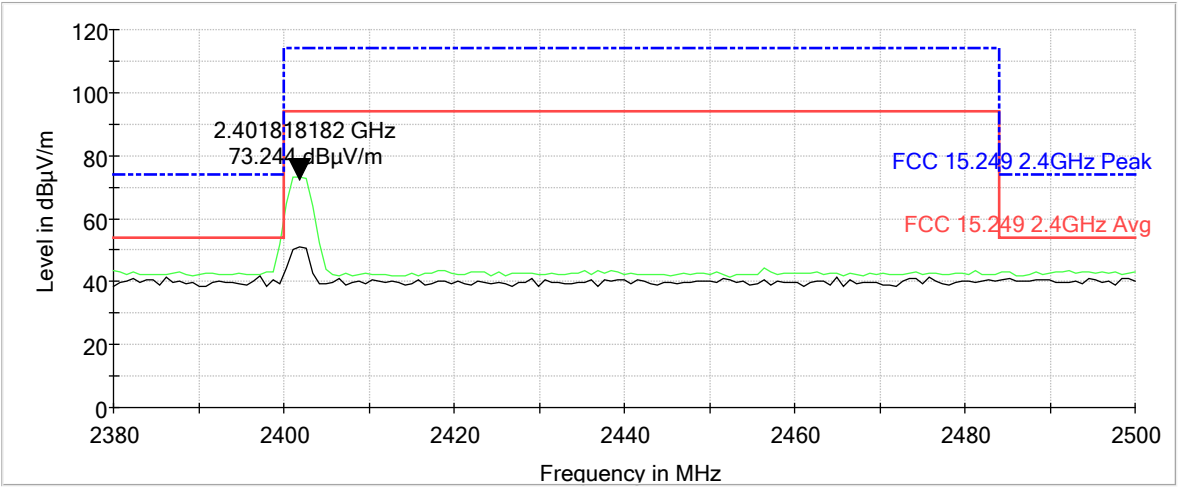
Note: Plots below are peak, max-hold pre-scan data included only to determine which frequencies to investigate and measure. The blue limit line is the Peak limit line which emissions on the graph do not exceed, and the table of FINAL measurements on pages 28 and 31 show compliance.

Power setting of 8 in the client's software was used.

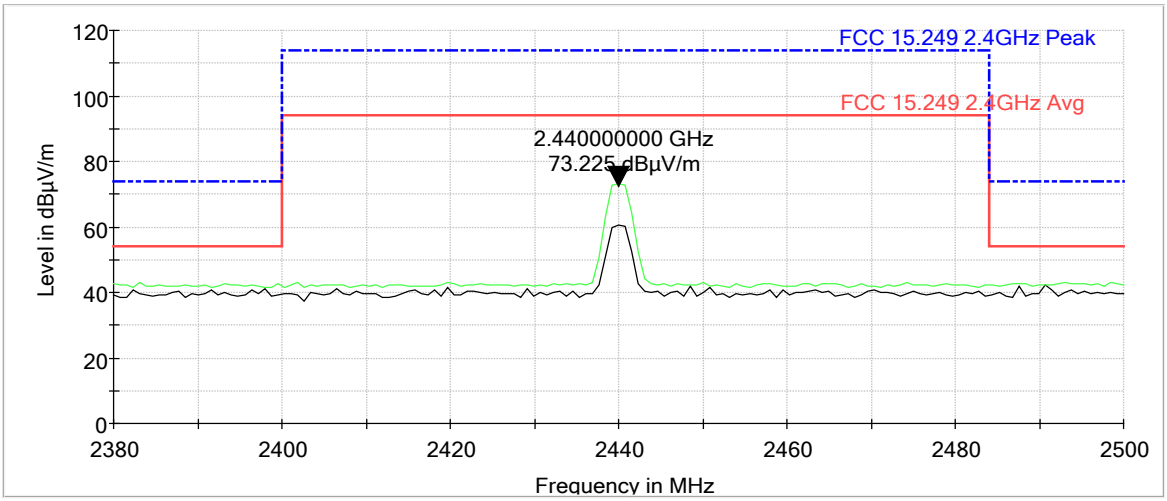
8.1 Test Data - Field Strength of Emissions from Intentional Radiators

Test Date(s):	2024-01-17	**Test Engineer(s):**	J. Chiller
Standards:	CFR 47 Part 15.249(a)	**Air Temperature:**	21.3ºC
		Relative Humidity:	38%

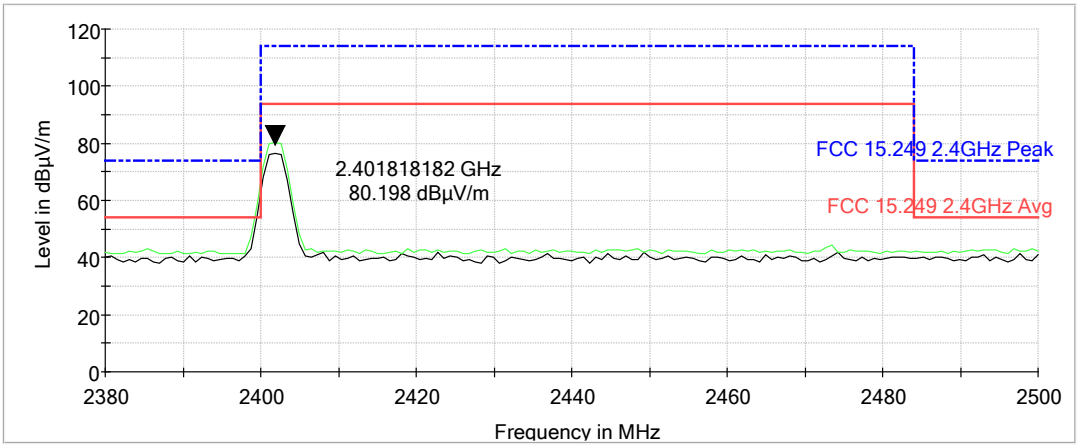
1Mbps: Low Band Edge - Vertical



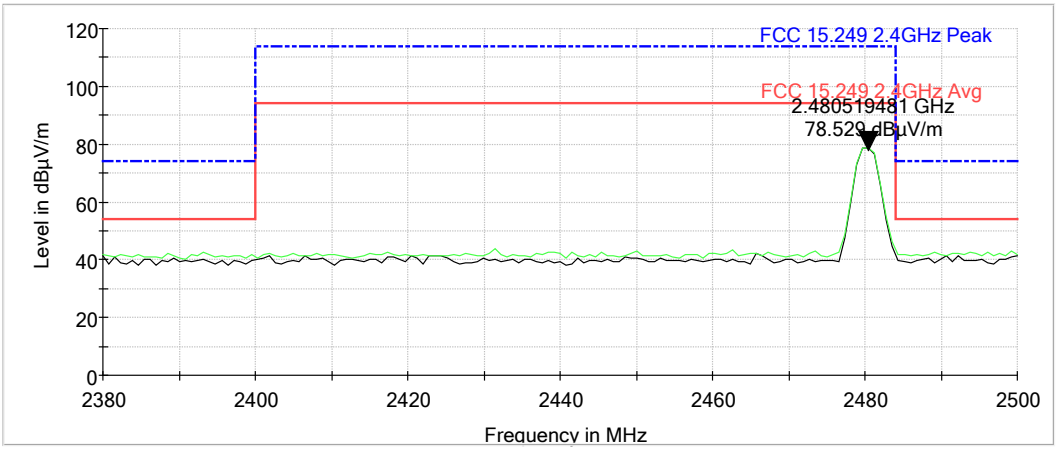
1Mbps: Mid Channel - Vertical



1Mbps: Lower Band Edge - Horizontal

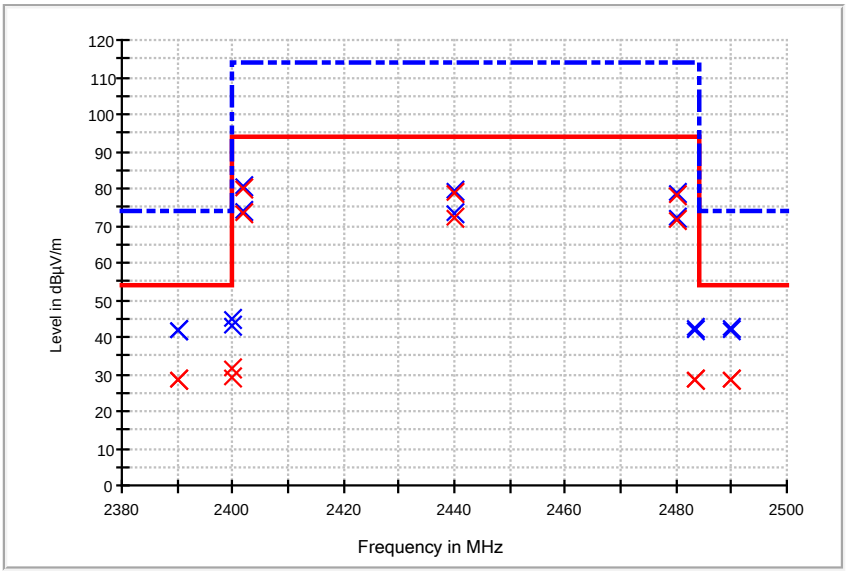


1Mbps: Upper Band Edge - Horizontal



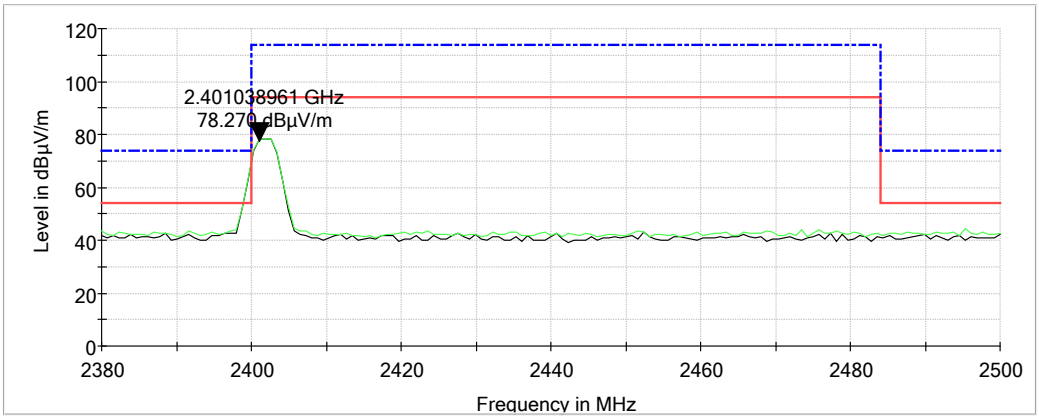
1Mbps: Band Edge and Field Strength of the Fundamentals

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)*	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2390.000000	41.5	28.3	1000.0	1000.000	160.0	H	143.0	6.9	25.7	54.0
2390.000000	41.9	28.3	1000.0	1000.000	150.0	V	0.0	6.9	25.7	54.0
2400.000000	45.1	31.5	1000.0	1000.000	160.0	H	143.0	6.9	22.5	54.0
2400.000000	42.9	28.9	1000.0	1000.000	150.0	V	0.0	6.9	25.1	54.0
2402.000000	74.2	73.2	1000.0	1000.000	176.0	V	227.0	6.9	20.8	94.0
2402.000000	80.9	79.9	1000.0	1000.000	160.0	H	143.0	6.9	14.1	94.0
2440.000000	79.7	78.7	1000.0	1000.000	180.0	H	155.0	6.9	15.3	94.0
2440.000000	73.1	72.2	1000.0	1000.000	207.0	V	233.0	6.9	21.8	94.0
2480.000000	72.2	71.3	1000.0	1000.000	150.0	V	232.0	6.9	22.7	94.0
2480.000000	78.9	78.0	1000.0	1000.000	150.0	H	150.0	6.9	16.0	94.0
2483.500000	41.6	28.4	1000.0	1000.000	150.0	V	232.0	6.9	25.6	54.0
2483.500000	42.2	28.6	1000.0	1000.000	150.0	H	150.0	6.9	25.4	54.0
2490.000000	41.7	28.7	1000.0	1000.000	150.0	V	232.0	7.0	25.3	54.0
2490.000000	42.6	28.8	1000.0	1000.000	150.0	H	150.0	7.0	25.2	54.0

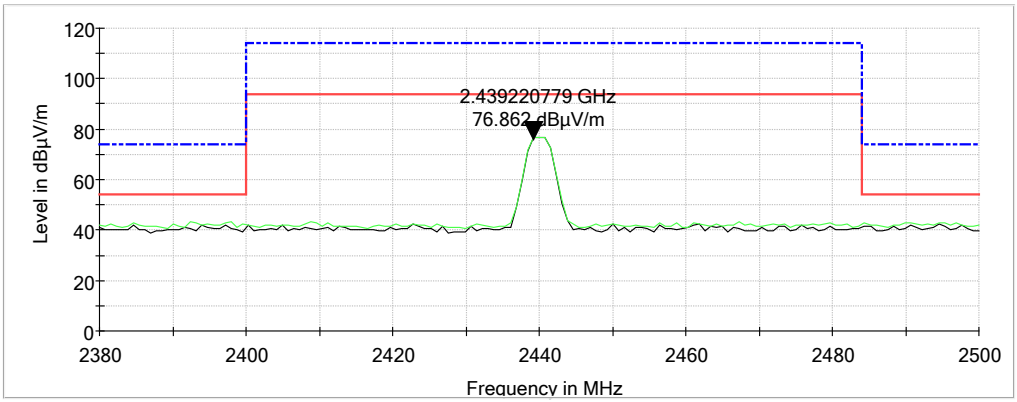


**Different cable sets were used for 1Mbps and 2Mbps testing.*

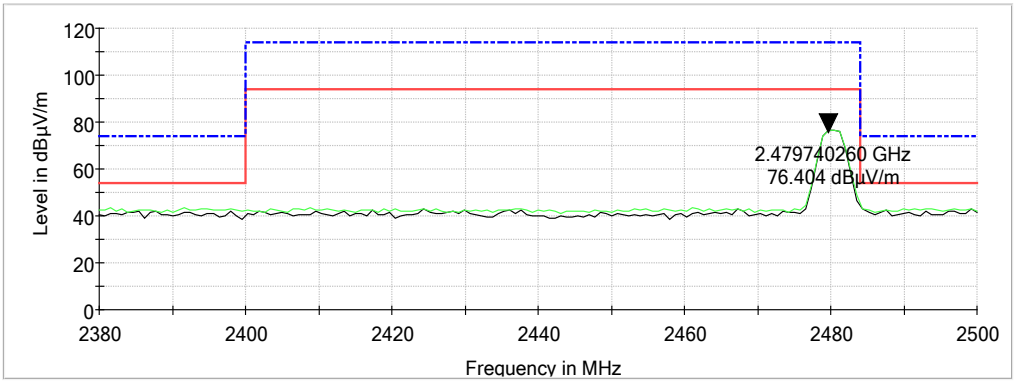
2Mbps: Low Band Edge - Vertical



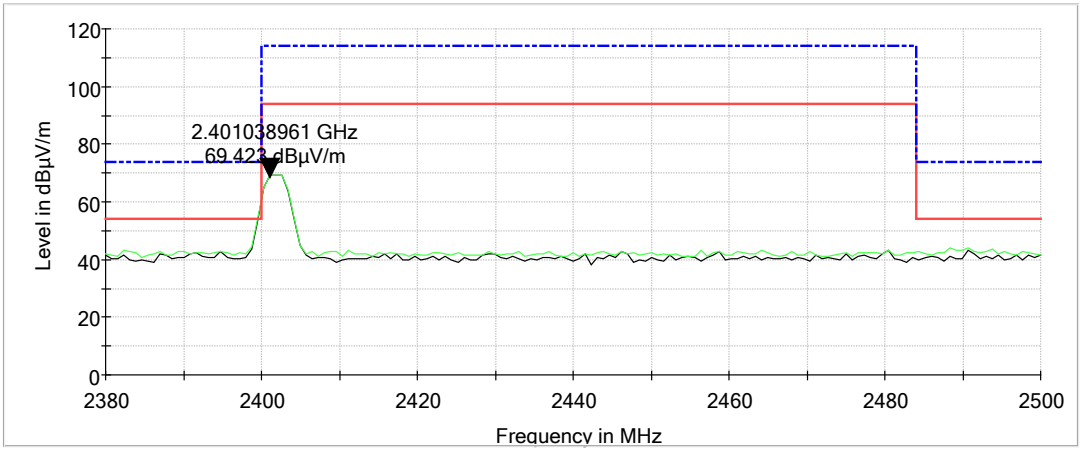
2Mbps: Middle - Vertical



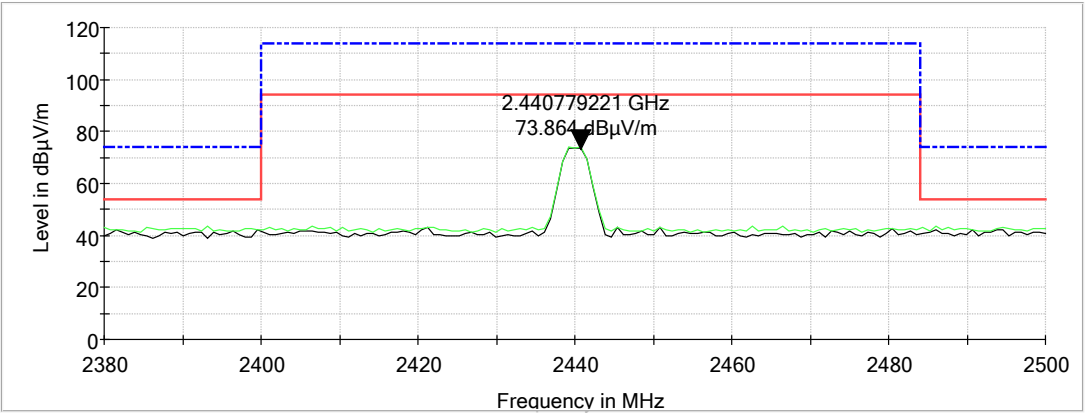
2Mbps: Upper Band Edge - Vertical



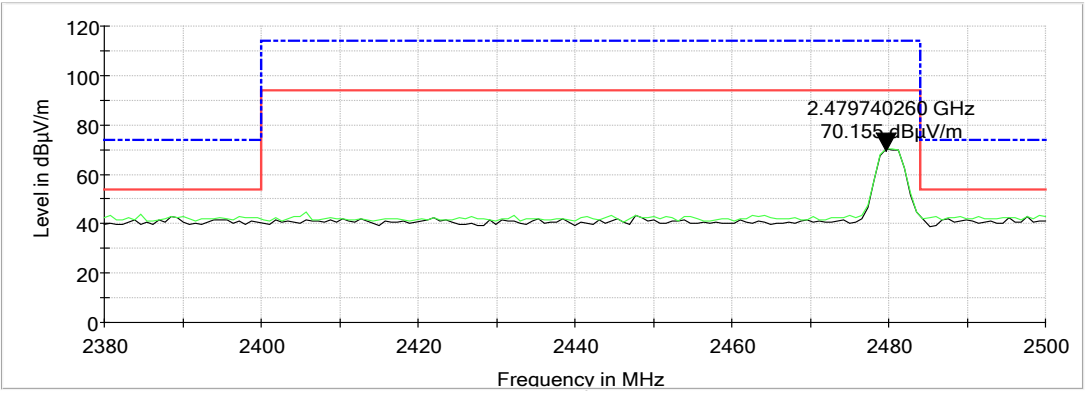
2Mbps: Low Band Edge - Horizontal



2Mbps: Middle - Horizontal

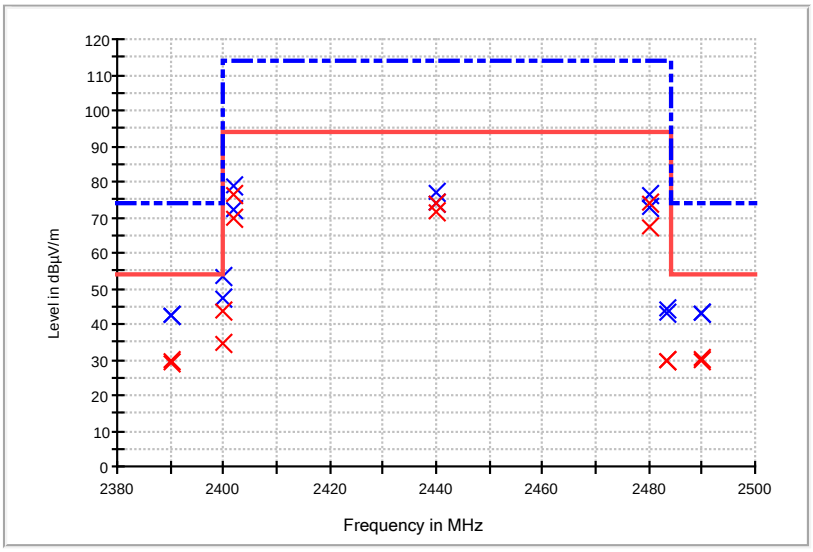


2Mbps: Upper Band Edge - Horizontal



2Mbps: Band Edge and Field Strength of the Fundamentals

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)*	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2390.000000	42.2	29.2	1000.0	1000.000	150.0	V	333.0	8.2	14.8	54.0
2390.000000	42.5	29.5	1000.0	1000.000	210.0	H	232.0	8.2	14.5	54.0
2400.000000	47.0	34.7	1000.0	1000.000	210.0	H	232.0	8.2	59.3	54.0
2400.000000	53.5	43.6	1000.0	1000.000	150.0	V	333.0	8.2	50.4	54.0
2402.000000	78.5	76.2	1000.0	1000.000	150.0	V	333.0	8.2	17.8	94.0
2402.000000	72.2	69.5	1000.0	1000.000	210.0	H	232.0	8.2	24.5	94.0
2440.000000	76.7	74.2	1000.0	1000.000	150.0	V	182.0	8.2	19.8	94.0
2440.000000	74.1	71.7	1000.0	1000.000	150.0	H	221.0	8.2	22.3	94.0
2480.000000	72.7	67.3	1000.0	1000.000	150.0	H	108.0	8.3	26.7	94.0
2480.000000	76.2	73.9	1000.0	1000.000	160.0	V	214.0	8.3	20.1	94.0
2483.500000	43.1	29.5	1000.0	1000.000	150.0	H	108.0	8.3	24.5	54.0
2483.500000	44.5	30.0	1000.0	1000.000	160.0	V	214.0	8.3	24.0	54.0
2490.000000	43.3	29.8	1000.0	1000.000	150.0	H	108.0	8.4	24.2	54.0
2490.000000	42.9	30.1	1000.0	1000.000	160.0	V	214.0	8.4	23.9	54.0



**Different cable sets were used for 1Mbps and 2Mbps testing.*

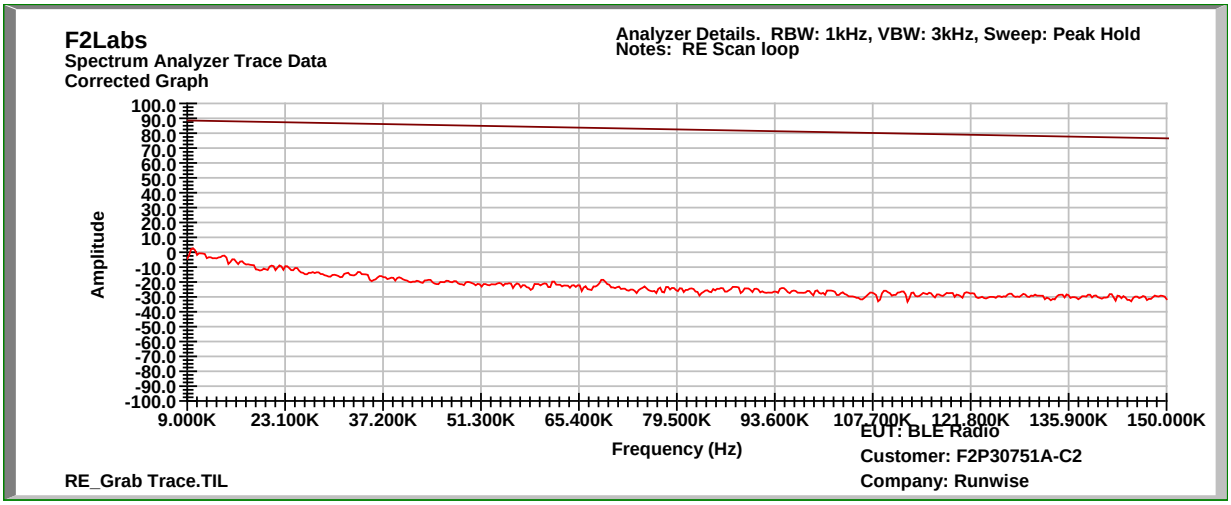
8.2 Test Data – Spurious Emissions

Notes: Plots are peak, max hold pre-scan data included only to determine what frequencies to investigate and measure. During the pre-scan evaluation, the EUT was rotated in all possible directions to find the maximum emissions. The orthogonal position that showed the highest emissions was used. At some frequencies, no emissions from the EUT were measurable over the ambient noise floor. The readings did not change with EUT on and EUT off.

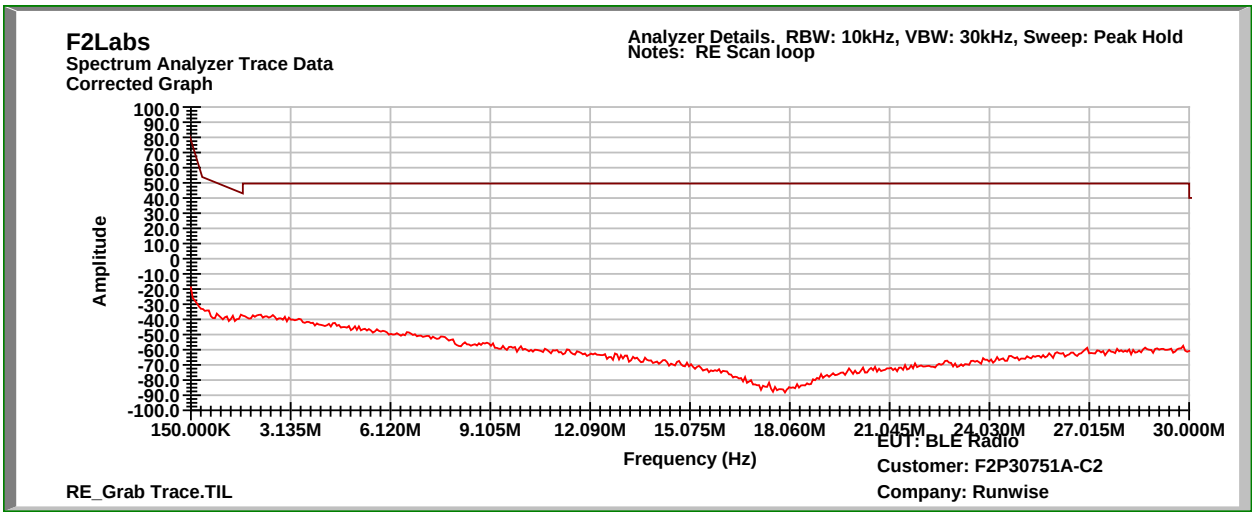
At least 6 of the highest frequencies were measured per ANSI 63.4 in a 3-meter anechoic chamber. Frequencies below 1 GHz were measured using a quasi-peak detector. The antenna was raised between 1 and 4 meters and the EUT turntable was rotated 360 degrees to maximize the emissions. Some of the frequencies did not change with the EUT on or off. At those frequencies, the test distance was shortened to 1 meter and still no emissions from the EUT were visible or over the ambient or limit. Frequencies were scanned from 9kHz to 26 GHz and the highest emissions are listed below.

Test Date(s):	2024-01-10	Test Engineer(s):	J. Chiller
Standards:	CFR 47 Part 15.249(d) / Part 15.209	Air Temperature:	21.3ºC
		Relative Humidity:	37%

Characterization Scan, 9 kHz to 150 kHz



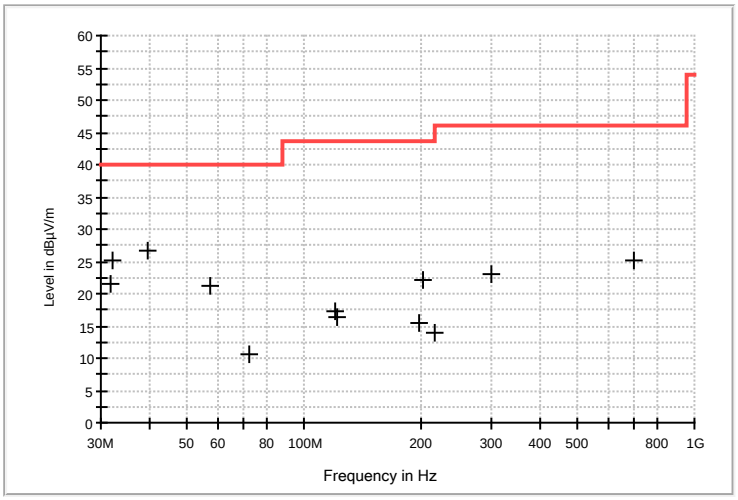
Characterization Scan, 150 kHz to 30 MHz



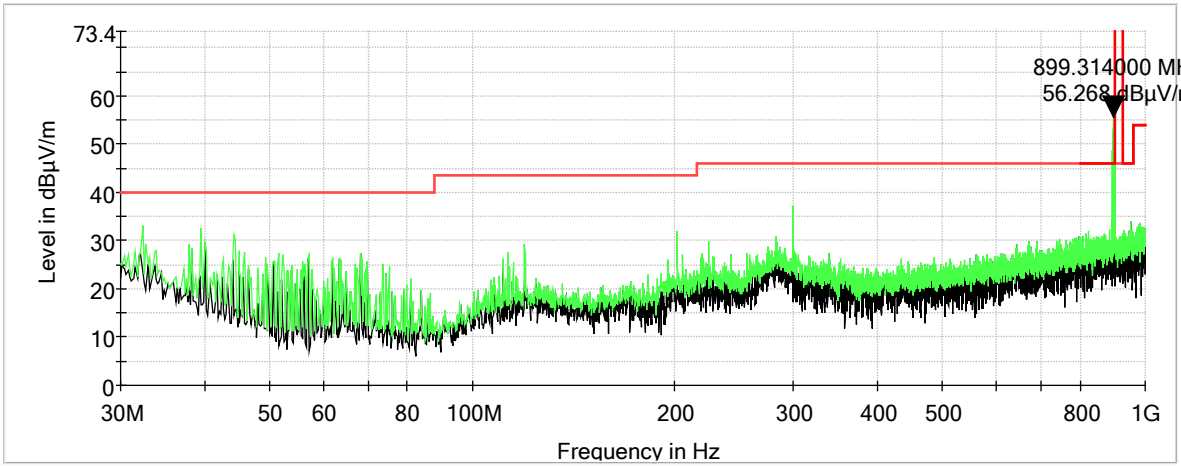
1Mbps: 30 MHz to 1000 MHz

**Note: Chart below includes data from all three channels.
No difference between 2Mbps and 1Mbps setting.**

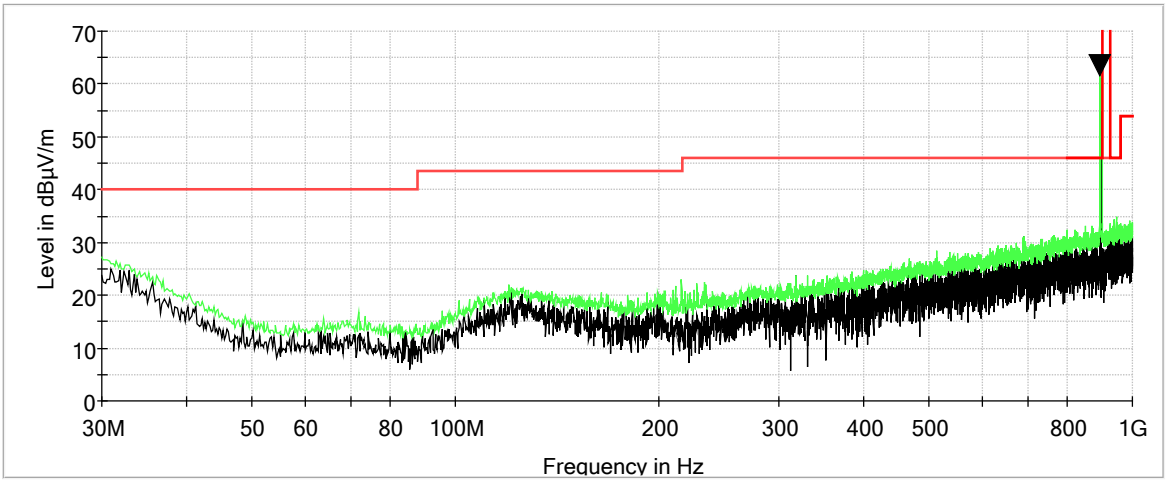
Frequency (MHz)	Ant. Pol.	Antenna Height (cm)	Azimuth (degrees)	Reading (dBµV)	Corr. Factors (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
31.940000	H	100.00	0.00	42.1	-20.5	21.60	40.0	-18.4
32.330000	V	100.00	0.00	46.0	-20.8	25.20	40.0	-14.8
39.510000	V	100.00	0.00	52.8	-26.2	26.60	40.0	-13.4
57.160000	V	100.00	0.00	53.9	-32.6	21.30	40.0	-18.7
71.900000	H	100.00	0.00	42.0	-31.5	10.50	40.0	-29.5
119.630000	V	100.00	0.00	43.2	-25.8	17.40	43.5	-26.1
120.790000	H	100.00	0.00	42.1	-25.7	16.40	43.5	-27.1
197.030000	H	100.00	0.00	42.0	-26.5	15.50	43.5	-28.0
201.500000	V	100.00	0.00	48.5	-26.4	22.10	43.5	-21.4
215.660000	H	100.00	0.00	42.0	-28.0	14.00	43.5	-29.5
299.660000	V	100.00	0.00	48.2	-25.1	23.10	46.0	-22.9
695.610000	H	100.00	0.00	43.0	-17.8	25.20	46.0	-20.8



30 MHz to 1000 MHz, Vertical

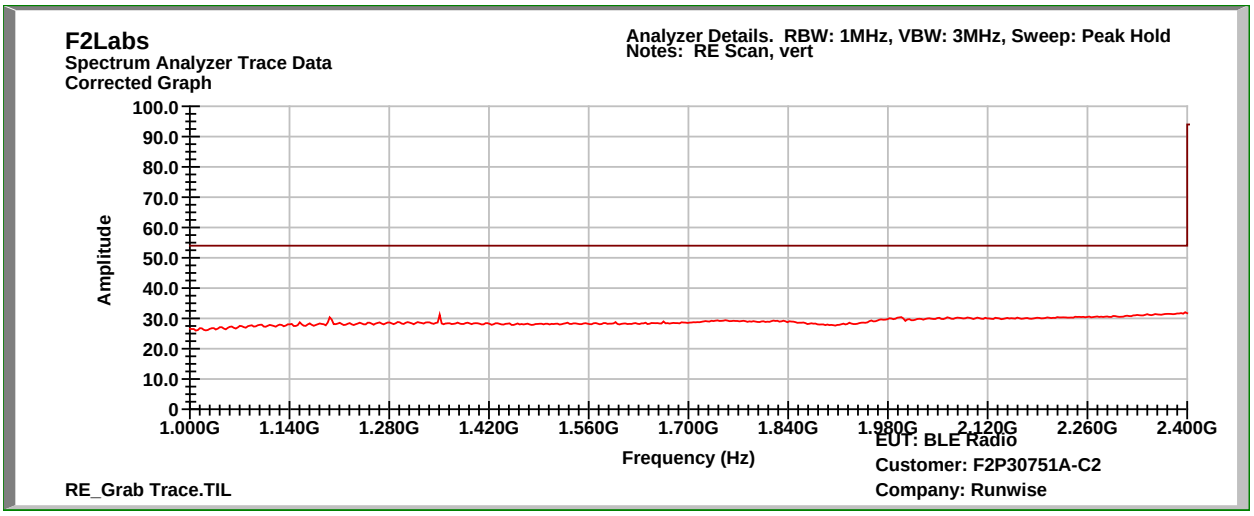


30 MHz to 1000 MHz, Horizontal

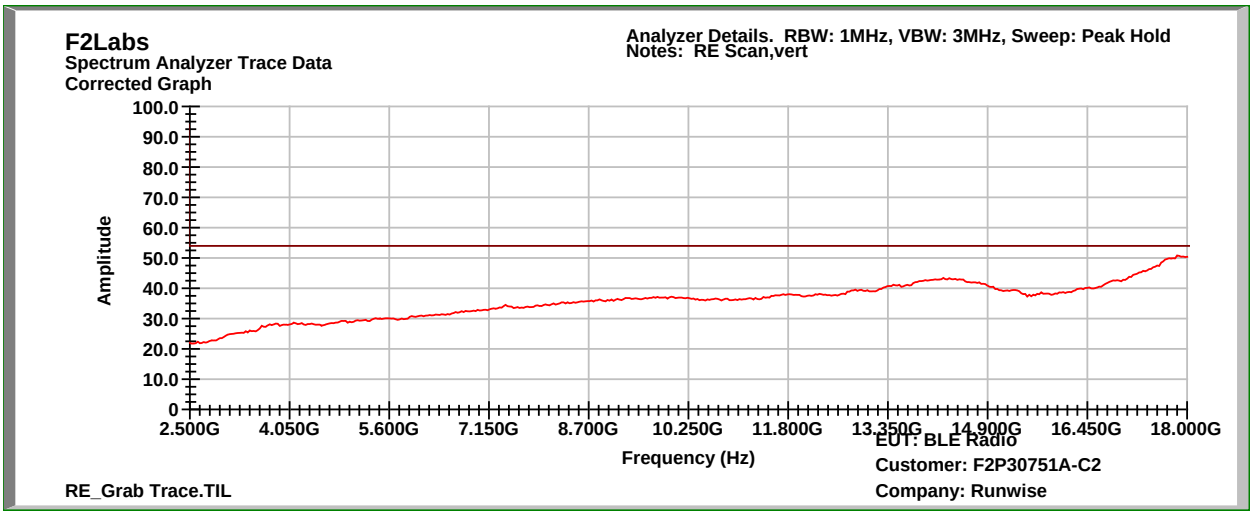


Note: The 900 MHz emission is a separate transmitter, refer to F2 Labs Report F2P30751A-R1-01E.

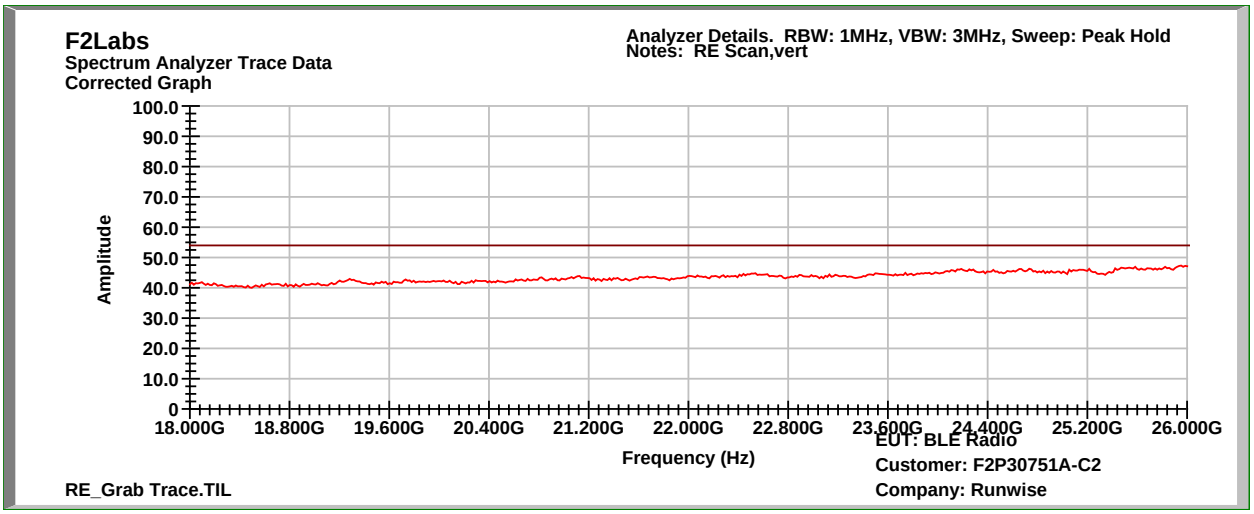
1Mbps: 1 GHz to 2.4 GHz, Vertical



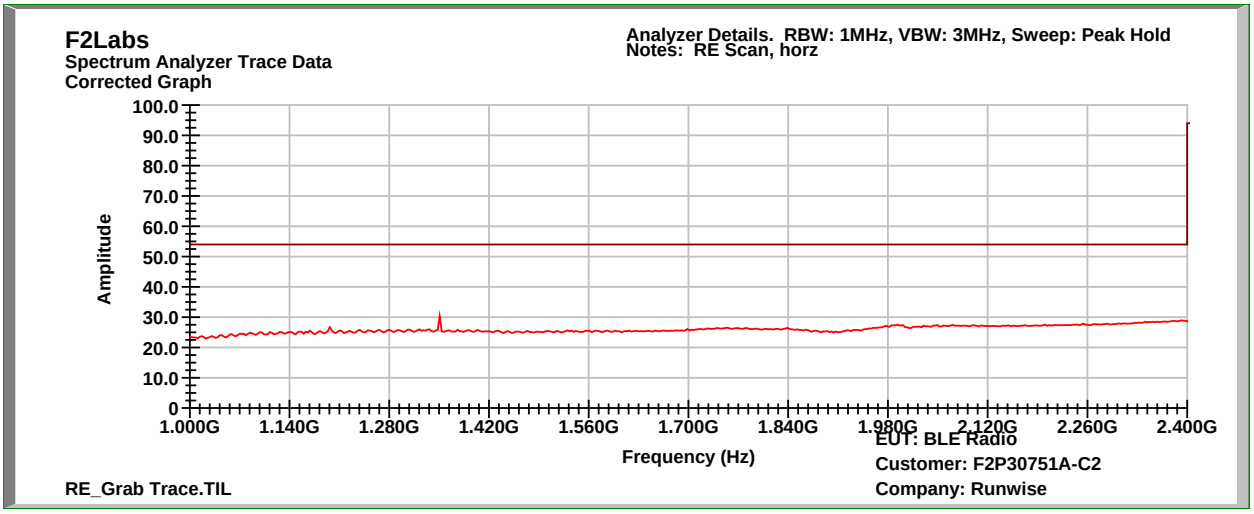
1Mbps: 2.5 GHz to 18 GHz, Vertical



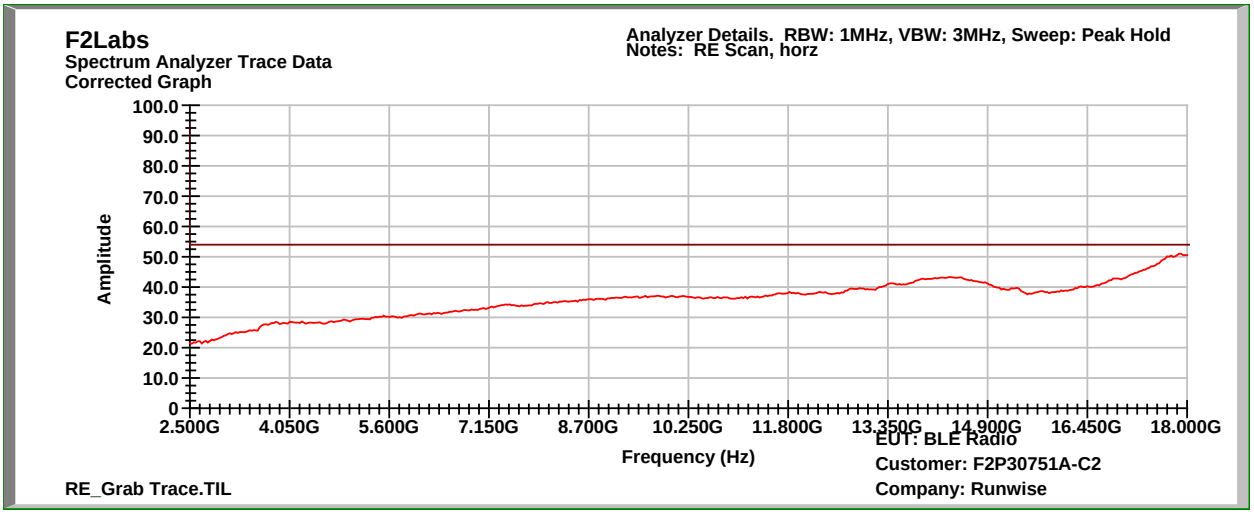
1Mbps: 18 GHz to 26 GHz, Vertical



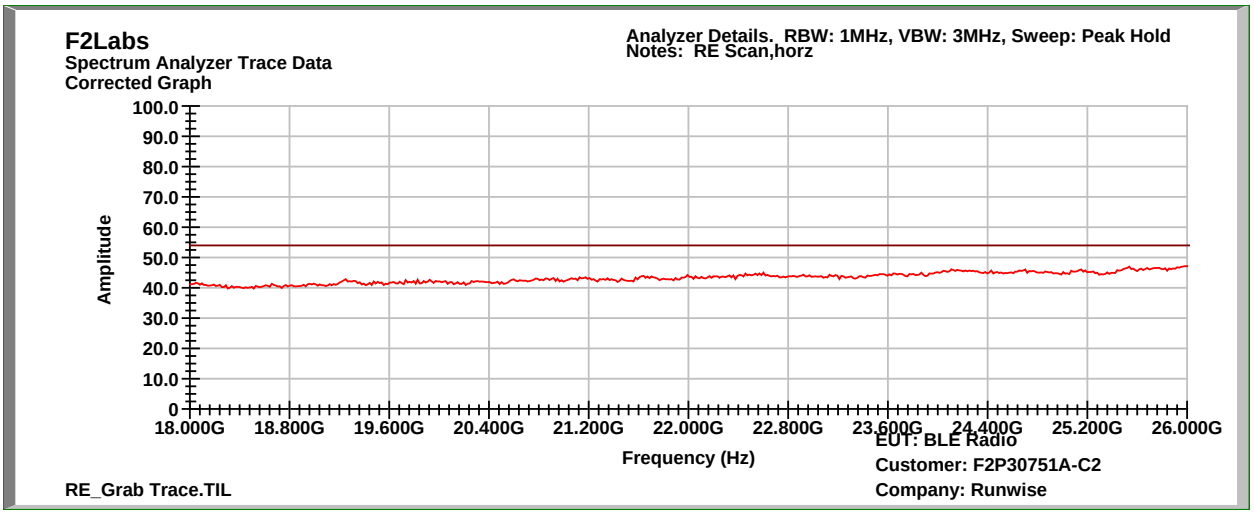
1Mbps: 1 GHz to 2.4 GHz, Horizontal



1Mbps: 2.5 GHz to 18 GHz, Horizontal



1Mbps: 18 GHz to 26 GHz, Horizontal



9 VOLTAGE VARIATIONS

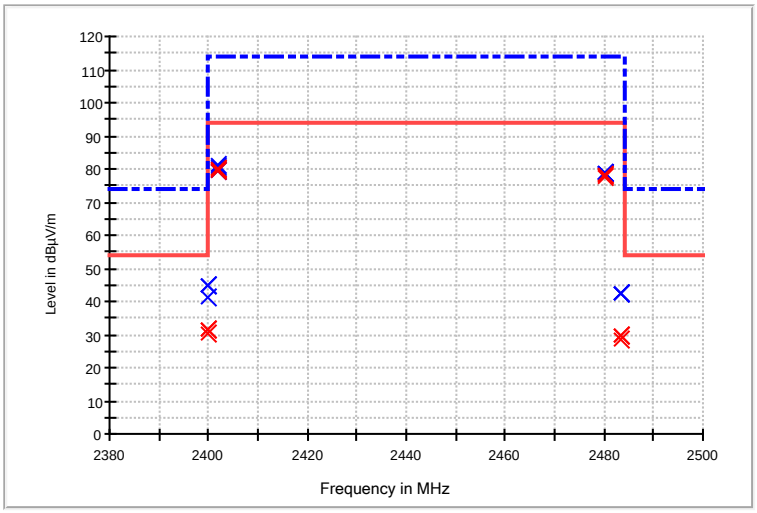
For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery. A nominal voltage of 120VAC was used and then 100VAC and 138VAC were used as the 85% and 115% variations.

RESULTS: The results showed that the fundamental frequency did not move outside the frequency band and the field strength did not increase above the limit during the variations.

Test Date:	2024-01-17	Test Engineer:	J. Chiller
Rule:	RSS GEN Part 6.11	Air Temperature:	21.0º C
Test Results:	Pass	Relative Humidity:	38%

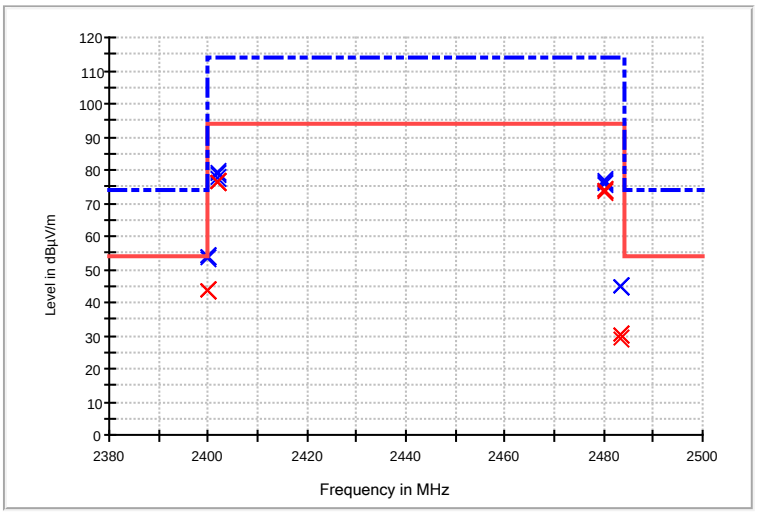
1Mbps

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2400.000000	41.3	30.6	1000.0	1000.000	160.0	H	143.0	6.9	23.4	54.0	nominal
2400.000000	45.0	31.6	1000.0	1000.000	160.0	H	143.0	6.9	22.4	54.0	3.8VDC
2400.000000	45.1	31.5	1000.0	1000.000	160.0	H	143.0	6.9	22.5	54.0	2.7VDC
2402.000000	81.0	80.0	1000.0	1000.000	160.0	H	143.0	6.9	14.0	94.0	nominal
2402.000000	79.2	79.3	1000.0	1000.000	160.0	H	143.0	6.9	14.7	94.0	3.8VDC
2402.000000	80.9	79.9	1000.0	1000.000	160.0	H	143.0	6.9	14.1	94.0	2.7VDC
2480.000000	79.0	78.1	1000.0	1000.000	150.0	H	150.0	6.9	15.9	94.0	nominal
2480.000000	78.5	78.0	1000.0	1000.000	150.0	H	150.0	6.9	16.2	94.0	3.8VDC
2480.000000	78.9	77.8	1000.0	1000.000	150.0	H	150.0	6.9	16.0	94.0	2.7VDC
2483.500000	42.1	29.7	1000.0	1000.000	150.0	H	150.0	6.9	24.3	54.0	nominal
2483.500000	42.7	29.7	1000.0	1000.000	150.0	H	150.0	6.9	24.3	54.0	3.8VDC
2483.500000	42.2	28.6	1000.0	1000.000	150.0	H	150.0	6.9	25.4	54.0	2.7VDC



2Mbps

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2400.000000	53.7	43.8	1000.0	1000.000	160.0	V	333.0	6.9	10.2	54.0	nominal
2400.000000	54.1	43.8	1000.0	1000.000	160.0	V	333.0	6.9	10.2	54.0	3.8VDC
2400.000000	53.2	43.5	1000.0	1000.000	160.0	V	333.0	6.9	10.5	54.0	2.7VDC
2402.000000	78.7	76.5	1000.0	1000.000	160.0	V	333.0	6.9	17.5	94.0	nominal
2402.000000	79.1	76.6	1000.0	1000.000	160.0	V	333.0	6.9	17.4	94.0	3.8VDC
2402.000000	77.8	76.1	1000.0	1000.000	160.0	V	333.0	6.9	17.9	94.0	2.7VDC
2480.000000	76.5	74.1	1000.0	1000.000	150.0	V	214.0	6.9	19.9	94.0	nominal
2480.000000	76.8	74.1	1000.0	1000.000	150.0	V	214.0	6.9	19.9	94.0	3.8VDC
2480.000000	76.0	73.6	1000.0	1000.000	150.0	V	214.0	6.9	20.4	94.0	2.7VDC
2483.500000	44.7	30.5	1000.0	1000.000	150.0	V	214.0	6.9	23.5	54.0	nominal
2483.500000	44.7	30.5	1000.0	1000.000	150.0	V	214.0	6.9	23.5	54.0	3.8VDC
2483.500000	44.6	29.2	1000.0	1000.000	150.0	V	214.0	6.9	24.8	54.0	2.7VDC



10 CONDUCTED EMISSIONS

10.1 Requirements

In accordance with FCC CFR 47 Part 15.207(a), “Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

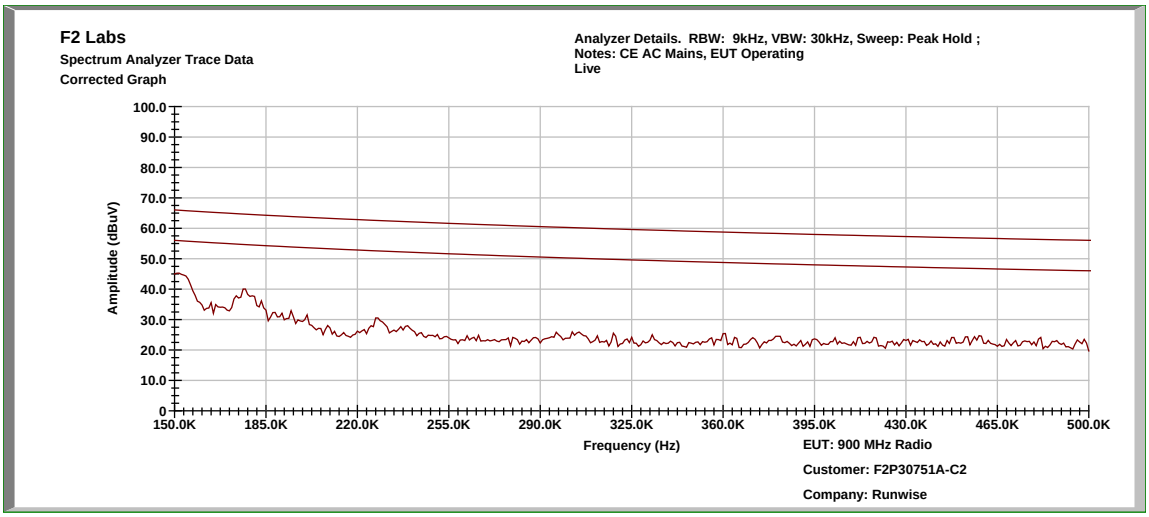
10.2 Procedure

The EUT was placed on a 1.0 x 1.5 meter non-conductive table, 0.8 meter above a horizontal ground plane and 0.4 meter from a vertical ground plane. Power was provided to the EUT through a LISN bonded to a 3 x 2 meter ground plane. The LISN and peripherals were supplied power through a filtered AC power source. The output of the LISN was connected to the input of the receiver via a transient limiter, and emissions in the range 150 kHz to 30 MHz were measured. The measurements were recorded using the quasi-peak and average detectors as directed by the standard, and the resolution bandwidth during testing was 9 kHz. The raw measurements were corrected to allow for attenuation from the LISN, transient limiter and cables.

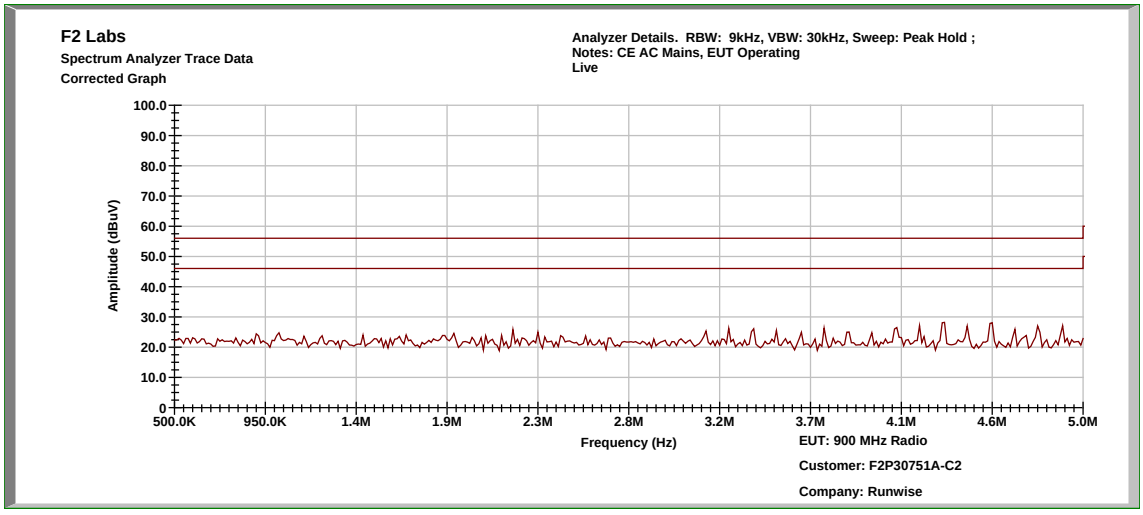
10.3 Conducted Emissions Test Data

Test Date(s):	2024-01-11	Test Engineer:	J. Chiller
Rule:	15.207	Air Temperature:	21.3º C
Test Results:	Complies	Relative Humidity:	41%

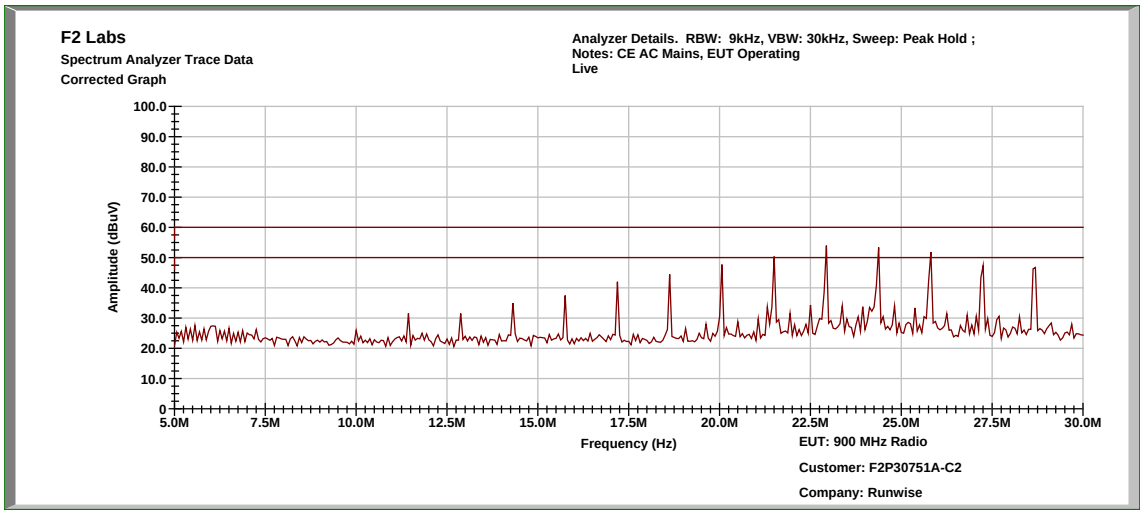
Conducted Test – Live: 0.15 MHz to 0.5 MHz



Conducted Test – Live: 0.5 MHz to 5.0 MHz

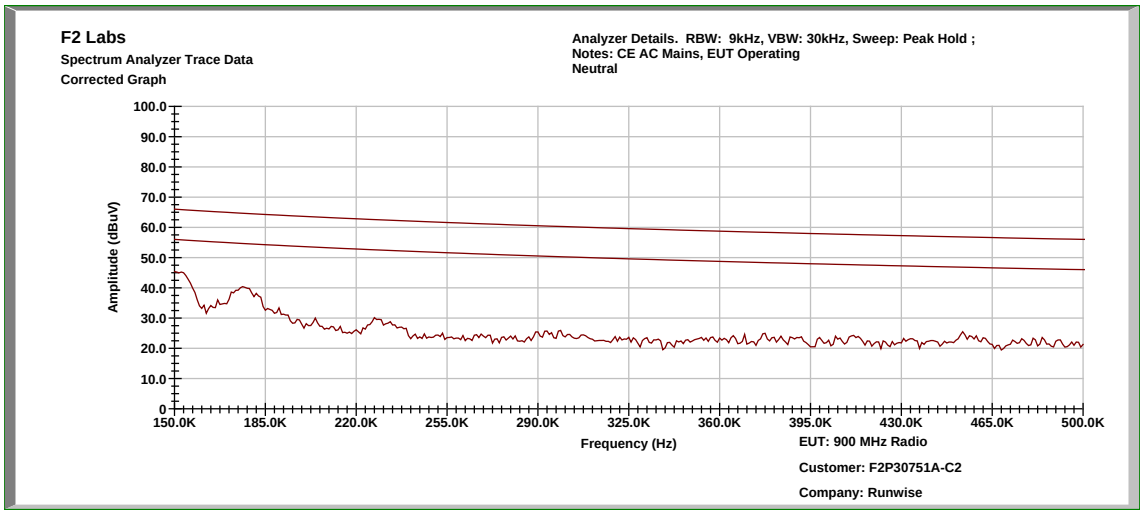


Conducted Test – Live: 5.0 MHz to 30.0 MHz

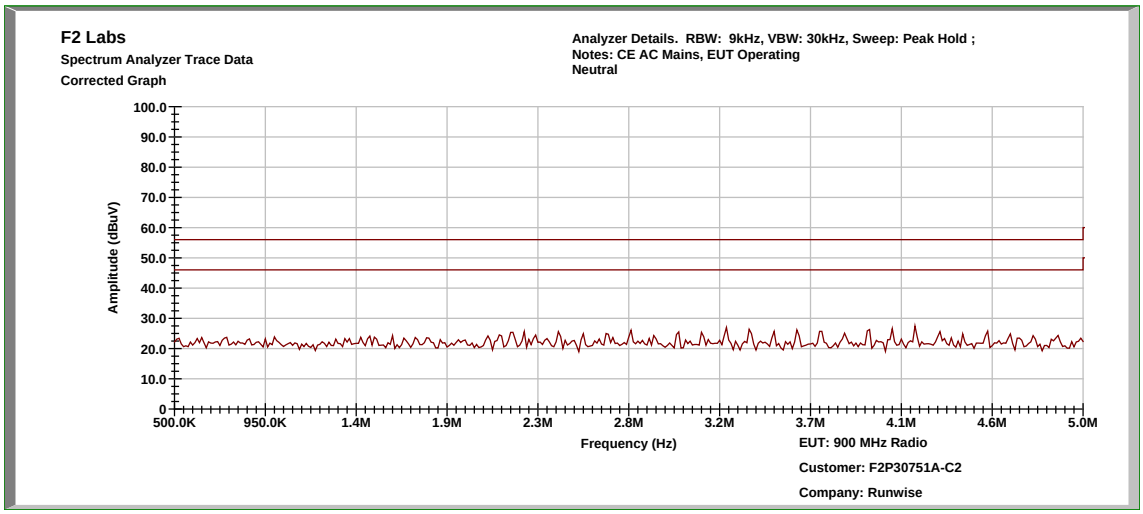


Top Discrete Measurements								
No.	**Conductor**	**Frequency (MHz)**	**Detector**	**Level (dBµV)**	**Adjustment (dB)**	**Results (dBµV)**	**Limit (dBµV)**	**Margin (dB)**
1	Line 1	20.06	Quasi-Peak	35.51	10.896	46.41	60.0	-13.6
			Average	33.86	10.896	44.76	50.0	-5.2
2	Line 1	21.5	Quasi-Peak	37.18	11.025	48.21	60.0	-11.8
			Average	34.71	11.025	45.74	50.0	-4.3
3	Line 1	22.9	Quasi-Peak	40.8	11.092	51.89	60.0	-8.1
			Average	37.78	11.092	48.87	50.0	-1.1
4	Line 1	24.3	Quasi-Peak	40.69	11.125	51.82	60.0	-8.2
			Average	37.56	11.125	48.69	50.0	-1.3
5	Line 1	25.8	Quasi-Peak	38.05	11.286	49.34	60.0	-10.7
			Average	34.51	11.286	45.80	50.0	-4.2

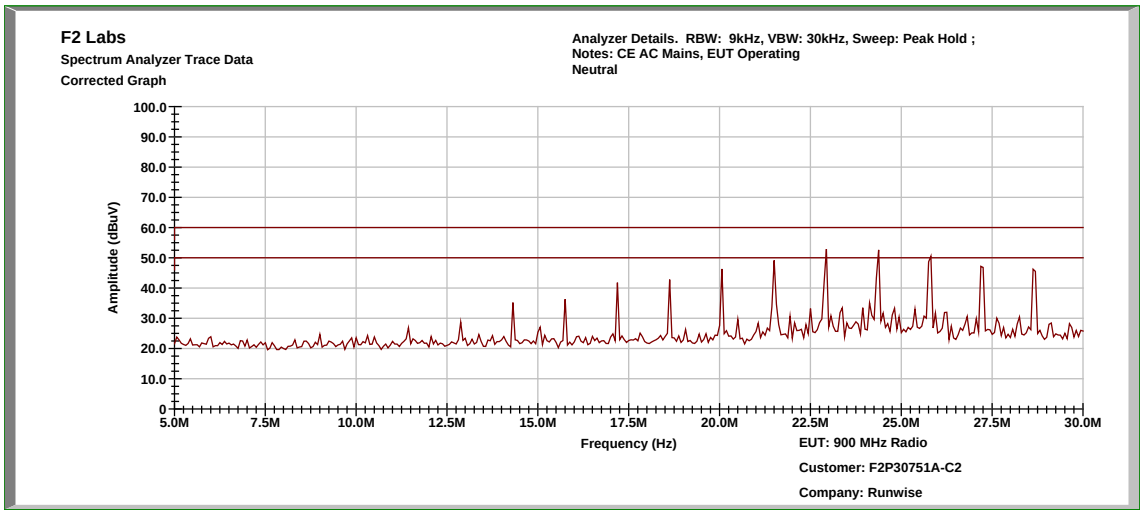
Conducted Test – Neutral: 0.15 MHz to 0.5 MHz



Conducted Test – Neutral: 0.5 MHz to 5.0 MHz



Conducted Test – Neutral: 5.0 MHz to 30.0 MHz



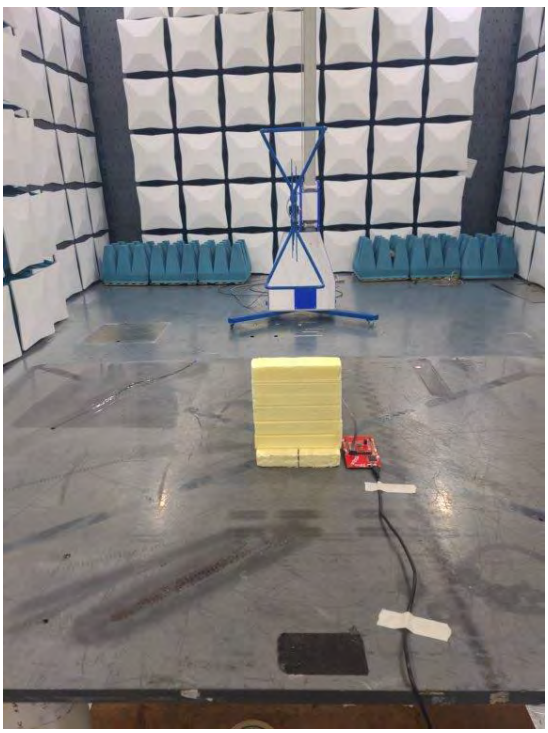
Top Discrete Measurements								
No.	Conductor	Frequency (MHz)	Detector	Level (dBµV)	Adjustment (dB)	Results (dBµV)	Limit (dBµV)	Margin (dB)
1	Neutral	21.5	Quasi-Peak	36.57	10.983	47.55	60.00	-12.4
			Average	33.49	10.983	44.47	50.00	-5.5
2	Neutral	22.93	Quasi-Peak	40.30	11.042	51.34	60.00	-8.7
			Average	36.88	11.042	47.92	50.00	-2.1
3	Neutral	24.37	Quasi-Peak	40.05	11.161	51.21	60.00	-8.8
			Average	37.02	11.161	48.18	50.00	-1.8
4	Neutral	25.81	Quasi-Peak	38.01	11.196	49.21	60.00	-10.8
			Average	35.58	11.196	46.78	50.00	-3.2

11 PHOTOGRAPH(S) - TEST SETUPS

Radio Setup

Radiated Spurious Emissions: 0.009 MHz to 30 MHz

Radiated Spurious Emissions: 30 MHz to 1000 MHz



Radiated Spurious Emissions: Greater Than 1 GHz

Conducted Emissions