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# Otodata TEST REPORT

**SCOPE OF WORK**

EMC TESTING – TM5040 TANK MONITOR

**REPORT NUMBER**

105820250LEX-001

**ISSUE DATE**

7/15/2024

**PAGES**

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**DOCUMENT CONTROL NUMBER**

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**EMC TEST REPORT**  
(FULL COMPLIANCE)

**Report Number:** 105820250LEX-001

**Project Number:** G105820250

**Report Issue Date:** 7/15/2024

**Model(s) Tested:** TM5040 Tank Monitor

**Standards:** FCC Title 47 CFR Part 15.247  
RSS-247 Issue 3  
RSS-GEN Issue 5

Tested by:  
Intertek Testing Services NA, Inc.  
731 Enterprise Dr.  
Lexington, KY 40510  
USA

Client:  
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## 1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. 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 full name	Result
6	Occupied/DTS Bandwidth (ANSI C63.10 (2020) §6.9.3 and §11.8)	Pass
7	Fundamental Emission Output Power (ANSI C63.10 (2020) §11.9)	Pass
8	Maximum Power Spectral Density (ANSI C63.10 (2020) §11.10)	Pass
9	Conducted Spurious Emissions (ANSI C63.10 (2020) §11.11)	Pass
10	Radiated Spurious Emissions ANSI C63.10 (2020) §6.3 §6.5 and §6.6	Pass
11	Antenna Requirement (FCC Part 15.203, RSS-Gen Issue 5 § 6.8)	Pass



### 3 Client Information

This product was tested at the request of the following:

Client Information	
<b>Client Name:</b>	Otodata
<b>Address:</b>	1180 De Louvain Street West Montreal, QC H4N 1G5 Canada
<b>Contact:</b>	Julien Renaud
<b>Telephone:</b>	514-673-0244
<b>Email:</b>	jrenaud@otodata.ca
Manufacturer Information	
<b>Manufacturer Name:</b>	Otodata
<b>Manufacturer Address:</b>	1180 De Louvain Street West Montreal, QC H4N 1G5 Canada



#### 4 Description of Equipment under Test and Variant Models

Equipment Under Test	
Product Name	TM5040 Tank Monitor
Model Number	TM5040 C024-2R1
Serial Number	MPH23IS02002456
Receive Date	6/4/2024
Test Start Date	6/7/2024
Test End Date	6/26/2024
Device Received Condition	Good
Test Sample Type	Production
Transmit Band	2402MHz – 2480MHz Bluetooth
Nominal DTS Bandwidth	BLE 1Mbps:1MHz BLE 2Mbps: 2MHz
Antenna Type	Dedicated Antenna
Antenna Gain <sup>1</sup>	3.16 dBi
Rated Voltage	Battery, 3.6VDC
Description of Equipment Under Test (provided by client)	
<p>The MT4ADS is a remote tank level monitoring device. It is intended to be powered by a non-rechargeable lithium battery pack for a predicted average lifetime of at least 10 years</p> <p>The unit uses a BLE (Bluetooth Low Energy) microcontroller which manages all wireless communications. BLE advertising is also used to allow infield testing and diagnostics as well as enabling possible firmware upgrade. A 3.16dBi PCB (Printed Circuit Board) antenna over a ground plane is used as main BLE antenna.</p> <p>The device reads the tank level sensor every few minutes. When a significant level change is detected, the microcontroller (MCU) activates the BLE transceiver to advertise the tank's level. If there is no level change after 24 hours, the unit performs a daily report using the same procedure on the cellular module.</p>	

##### 4.1 Variant Models:

There were no variant models covered under this evaluation.

<sup>1</sup> This information was provided by the client and may affect compliance. Intertek does not make any claim of compliance for values other than those shown.



## 5 System Setup and Method

### 5.1 Method:

Configuration as required by ANSI C63.10 (2020)

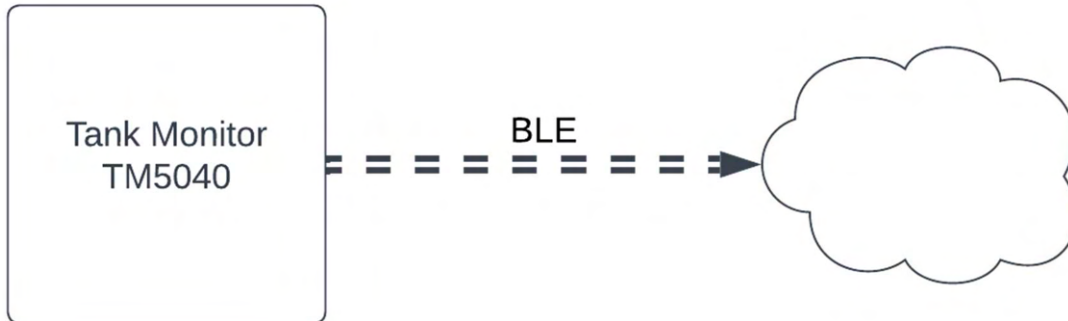
No.	Descriptions of EUT Exercising
1	The EUT was powered on.
2	The EUT was powered on and configured to transmit a low, mid, or high BLE channel.

Cables					
QTY	Description	Length (m)	Shielding	Ferrites	Termination
-	-	-	-	-	-

Support Equipment (Accessories)		
Description	Manufacturer	Model Number
-	-	-



**5.2 EUT Block Diagram:**







## **6 Occupied/DTS Bandwidth**

### **6.1 Test Method:**

Tests are performed in accordance with ANSI C63.10 §6.9.3 and §11.8.

### **6.2 Test Limits:**

Title 47 CFR 15.247(a)

- (1) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

RSS-247 §5.2

- a. The minimum 6 dB bandwidth shall be 500 kHz.

RSS-GEN §6.7

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.



### 6.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
Spectrum Analyzer	101472	Rohde & Schwarz	FSW26	12/19/2023	12/19/2024

### 6.4 Test Software Used:

Description	Manufacturer	Version
RSCCommander	Rohde & Schwarz	2.4.2 64 bit (2023)

### 6.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Conducted Measurement	2.89

No measurement correction based on measurement uncertainty is performed.

### 6.6 Test Conditions

Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Seth Parker	NA	6/24/2024	23.9 °C	48.7 %	982.0 mbar

### 6.7 Test Results:

The sample tested was found to Comply. The 6dB bandwidth was at least 500 kHz.

### 6.8 Test Data:

#### 6.8.1 BLE, 1 Mbps

Frequency (MHz)	6dB Bandwidth (kHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (kHz)
2402	668.30	1.05	1.006	500
2440	671.30	1.02	1.003	500
2480	668.30	1.020	1.003	500

#### 6.8.2 BLE, 2Mbps

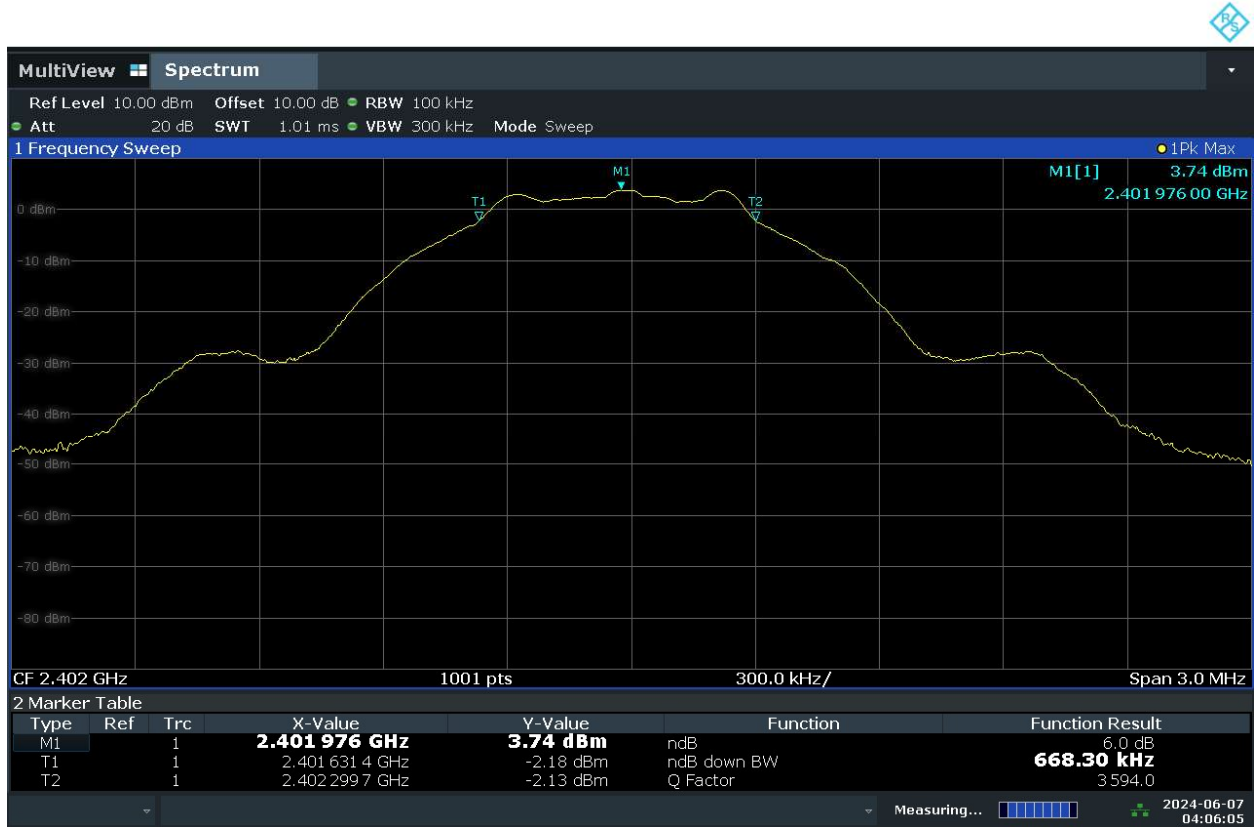
Frequency (MHz)	6dB Bandwidth (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (kHz)
2402	1.14	1.77	2.040	500
2440	1.14	1.76	2.020	500
2480	1.14	1.76	2.028	500



### 6.9 Test Plots: Occupied Channel Bandwidth (6dB Bandwidth)

#### 6.9.1 BLE, 1Mbps

##### 6.9.1.1 Low Channel



04:06:06 AM 06/07/2024



### 6.9.1.2 Mid Channel



04:08:11 AM 06/07/2024



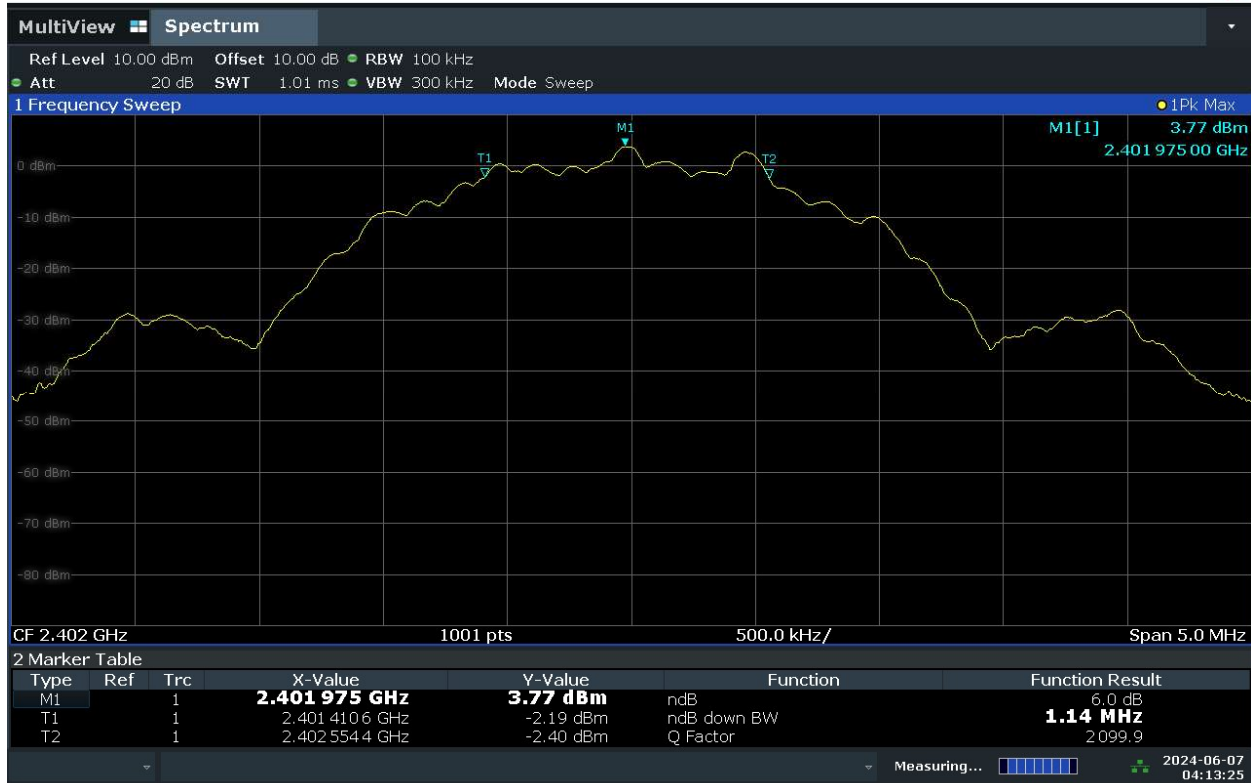
### 6.9.1.3 High Channel



04:09:29 AM 06/07/2024



### 6.9.2 BLE, 2Mbps 6.9.2.1 Low Channel



04:13:26 AM 06/07/2024



### 6.9.2.2 Mid Channel



04:12:46 AM 06/07/2024



### 6.9.2.3 High Channel



04:11:57 AM 06/07/2024

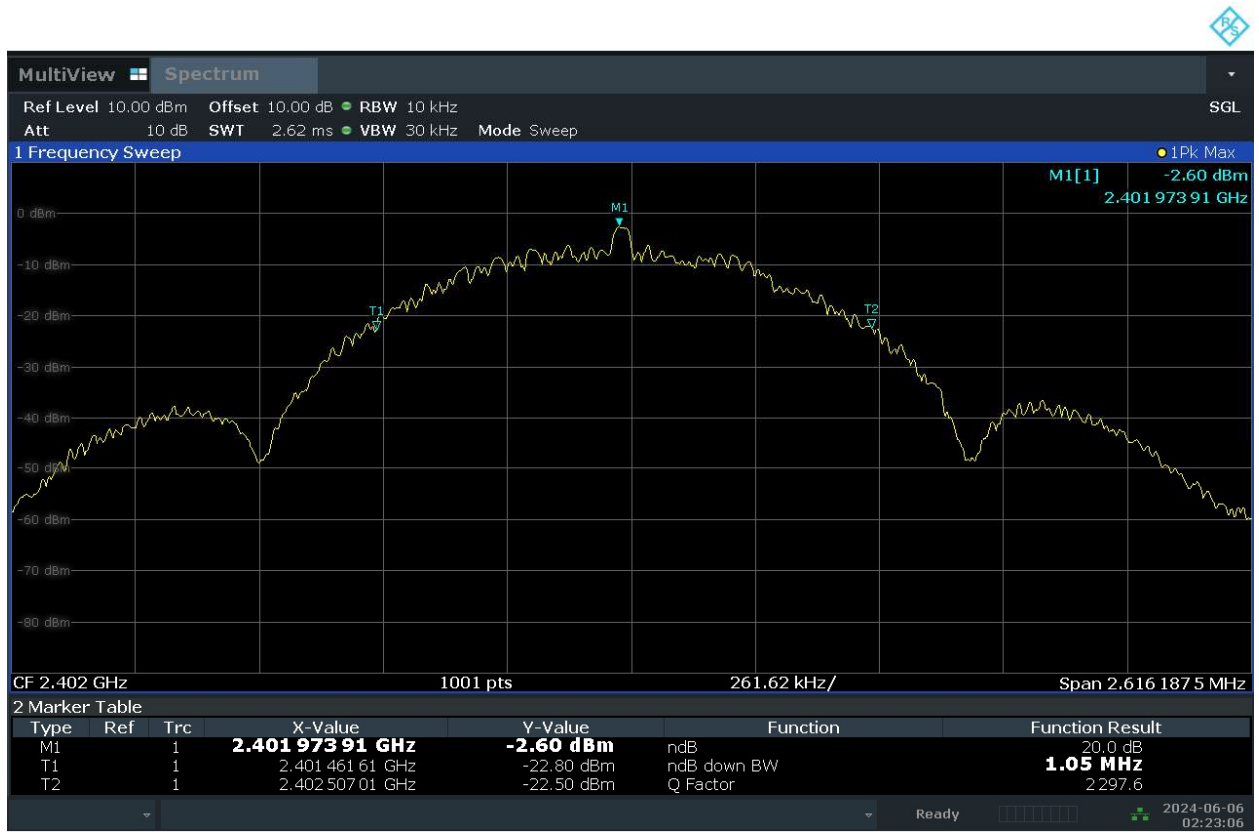




### 6.10 Test Plots: Occupied Channel Bandwidth (20dB Bandwidth)

#### 6.10.1 BLE, 1Mbps

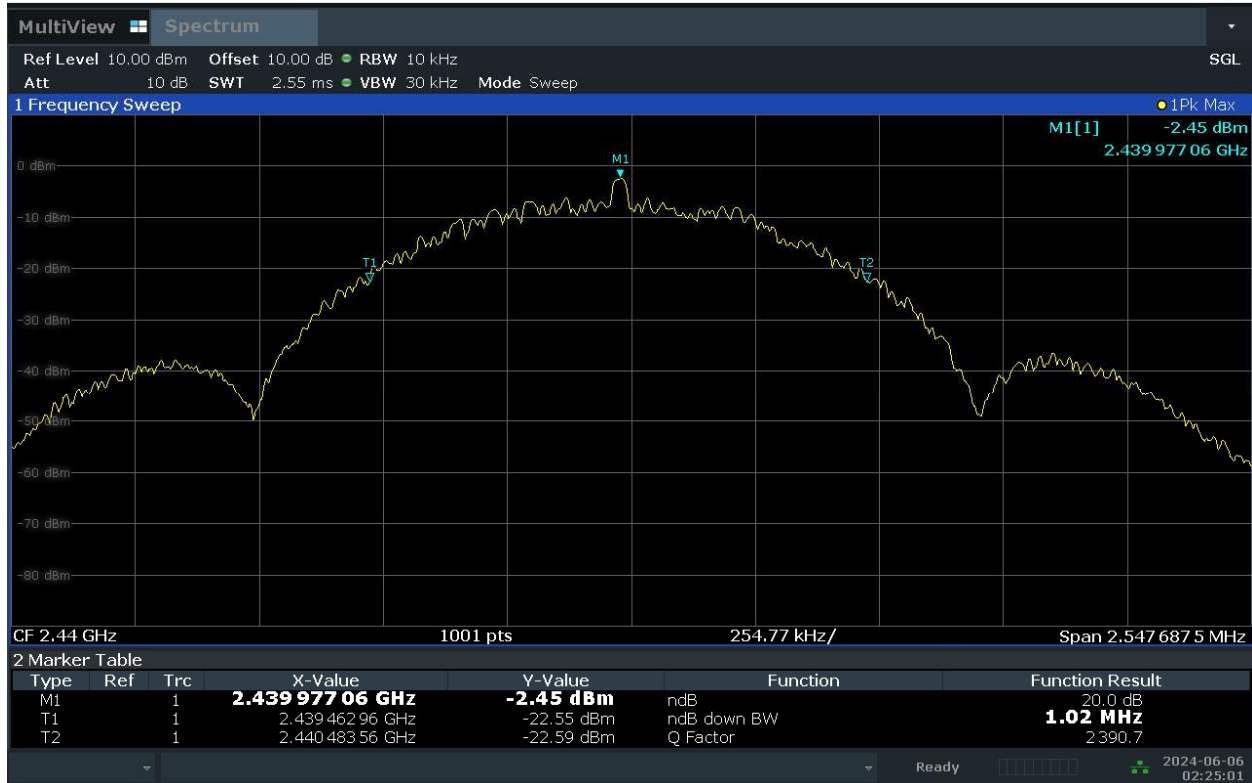
##### 6.10.1.1 Low Channel



02:23:07 AM 06/06/2024



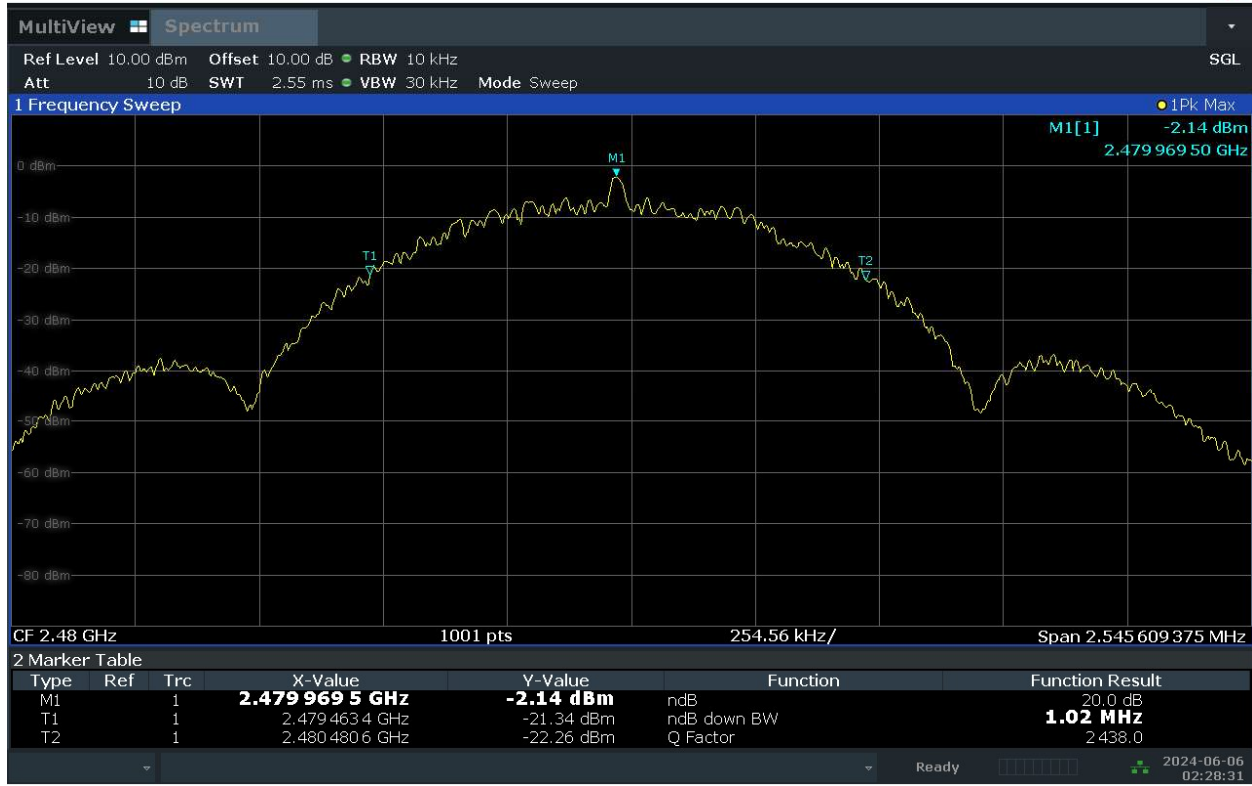
### 6.10.1.2 Mid Channel



02:25:02 AM 06/06/2024



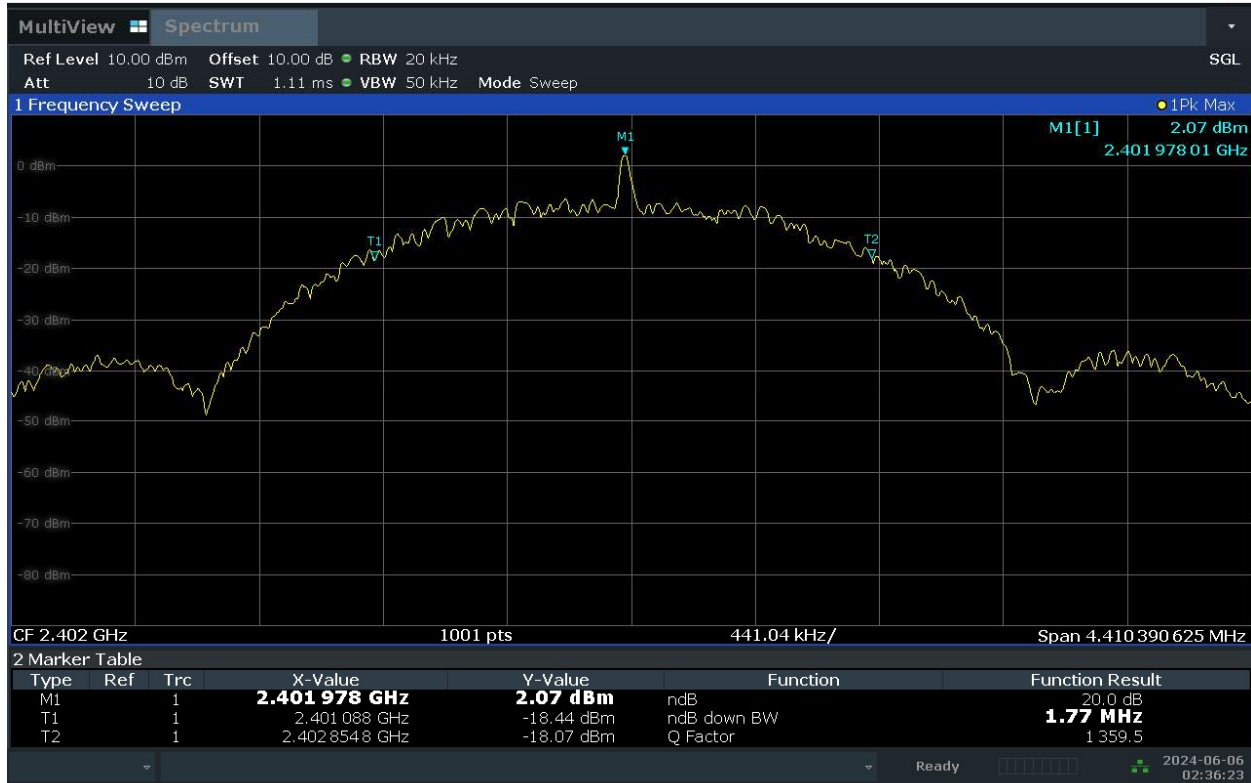
### 6.10.1.3 High Channel



02:28:32 AM 06/06/2024



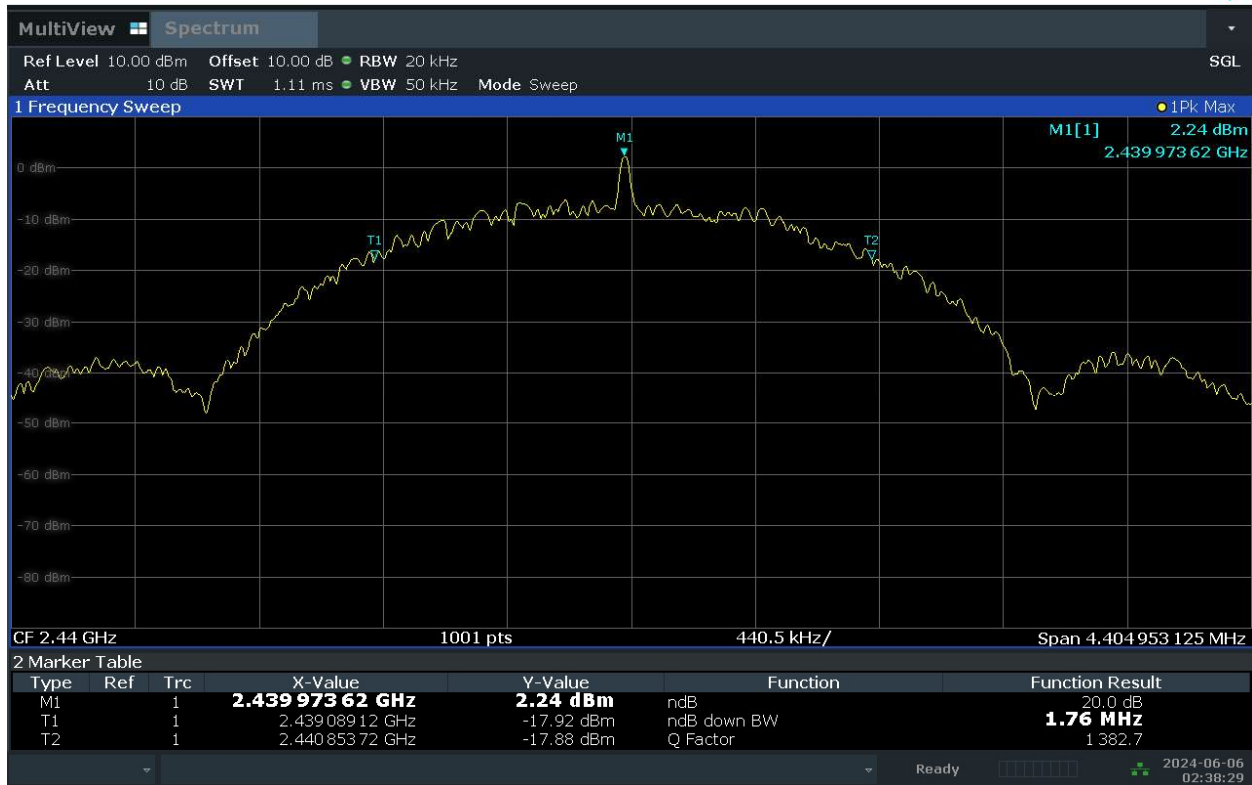
### 6.10.2 BLE, 2Mbps 6.10.2.1 Low Channel



02:36:23 AM 06/06/2024



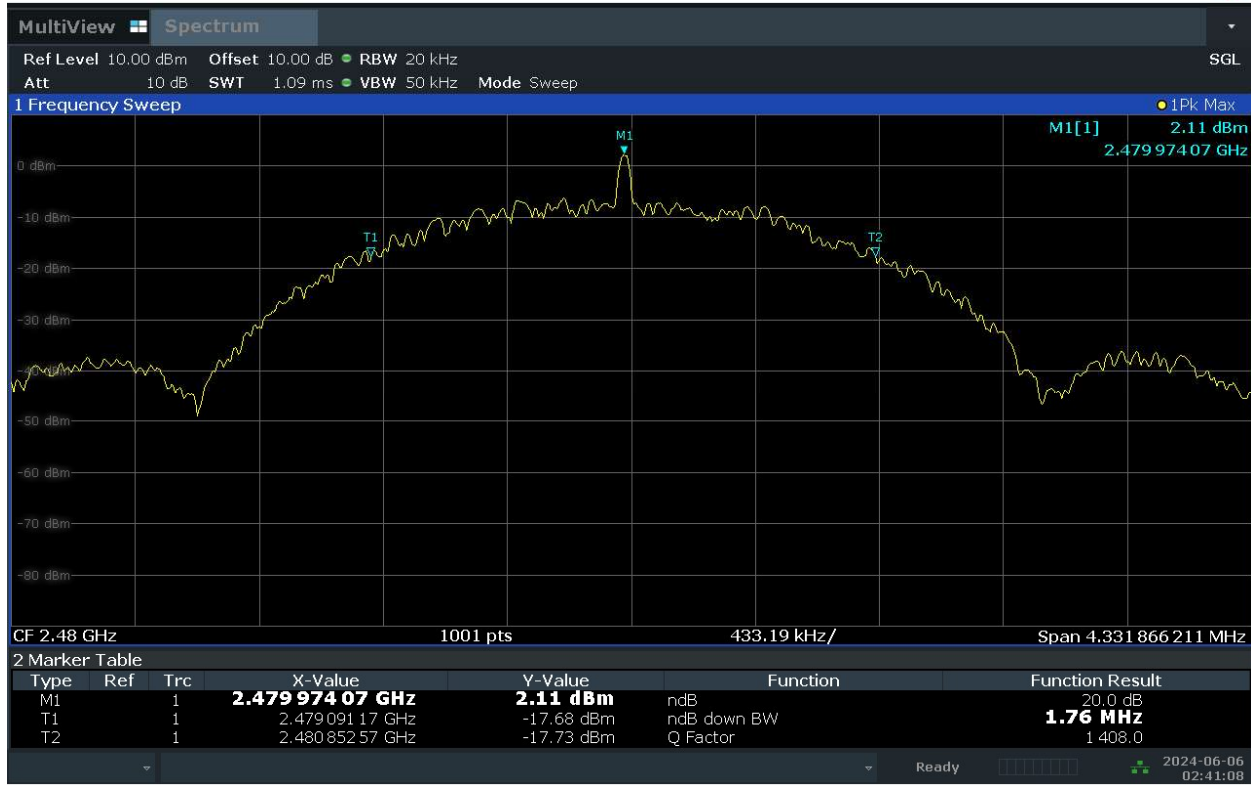
### 6.10.2.2 Mid Channel



02:38:30 AM 06/06/2024



### 6.10.2.3 High Channel



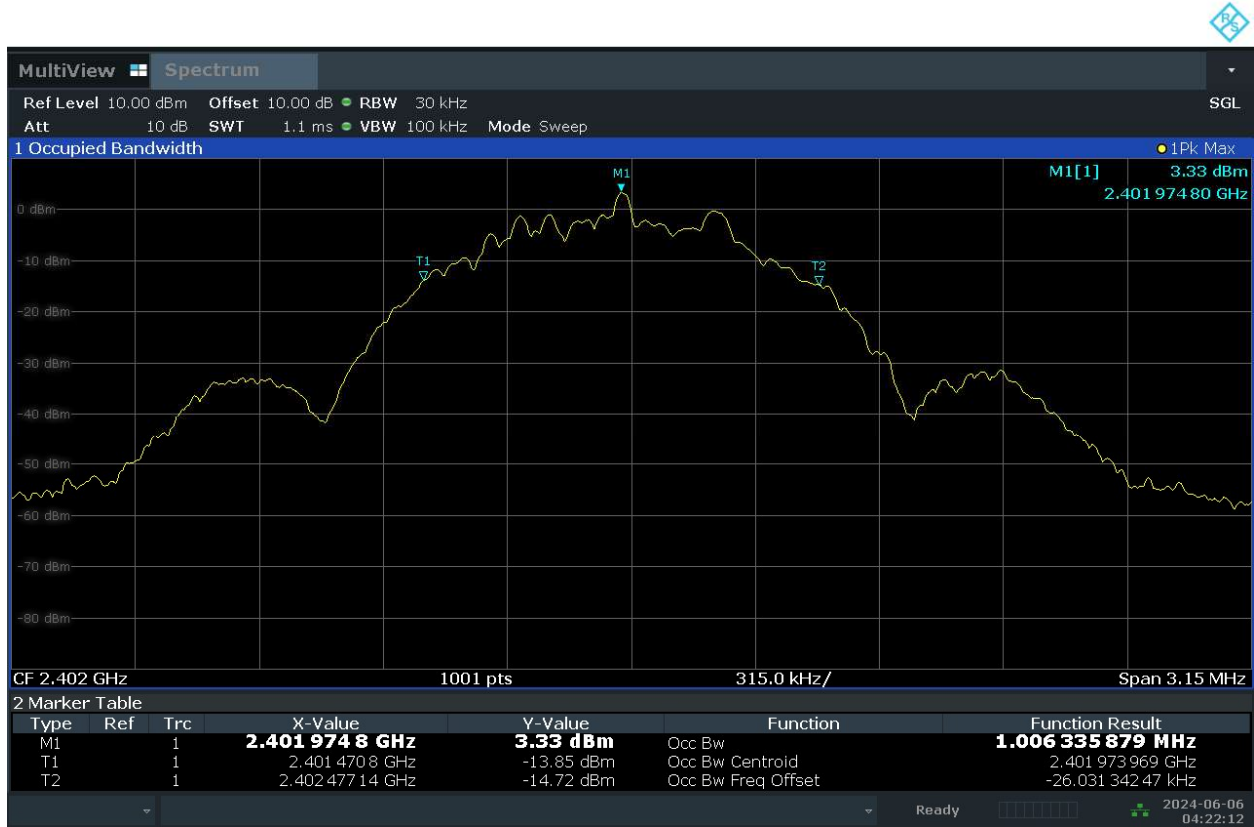
02:41:09 AM 06/06/2024



### 6.11 Test Plots: Occupied Channel Bandwidth (99% Bandwidth)

#### 6.11.1 BLE, 1Mbps

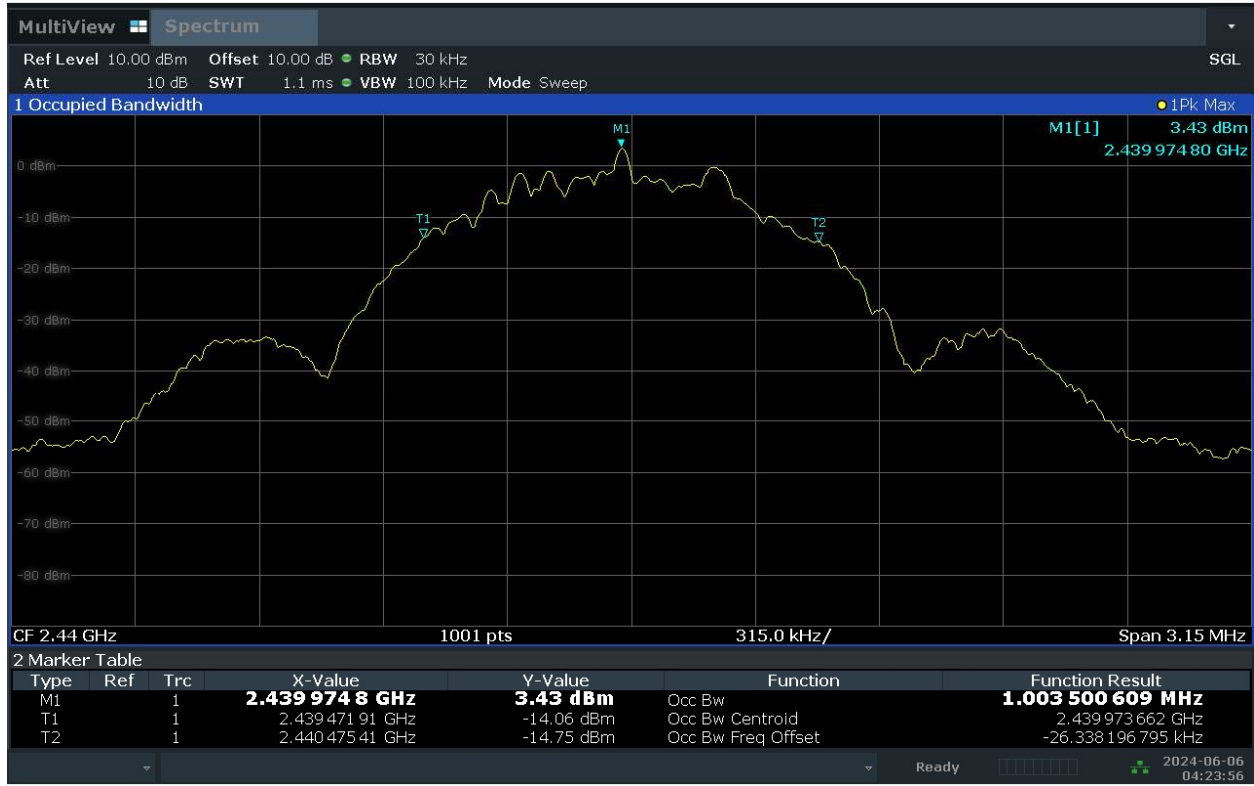
##### 6.11.1.1 Low Channel



04:22:12 AM 06/06/2024



### 6.11.1.2 Mid Channel

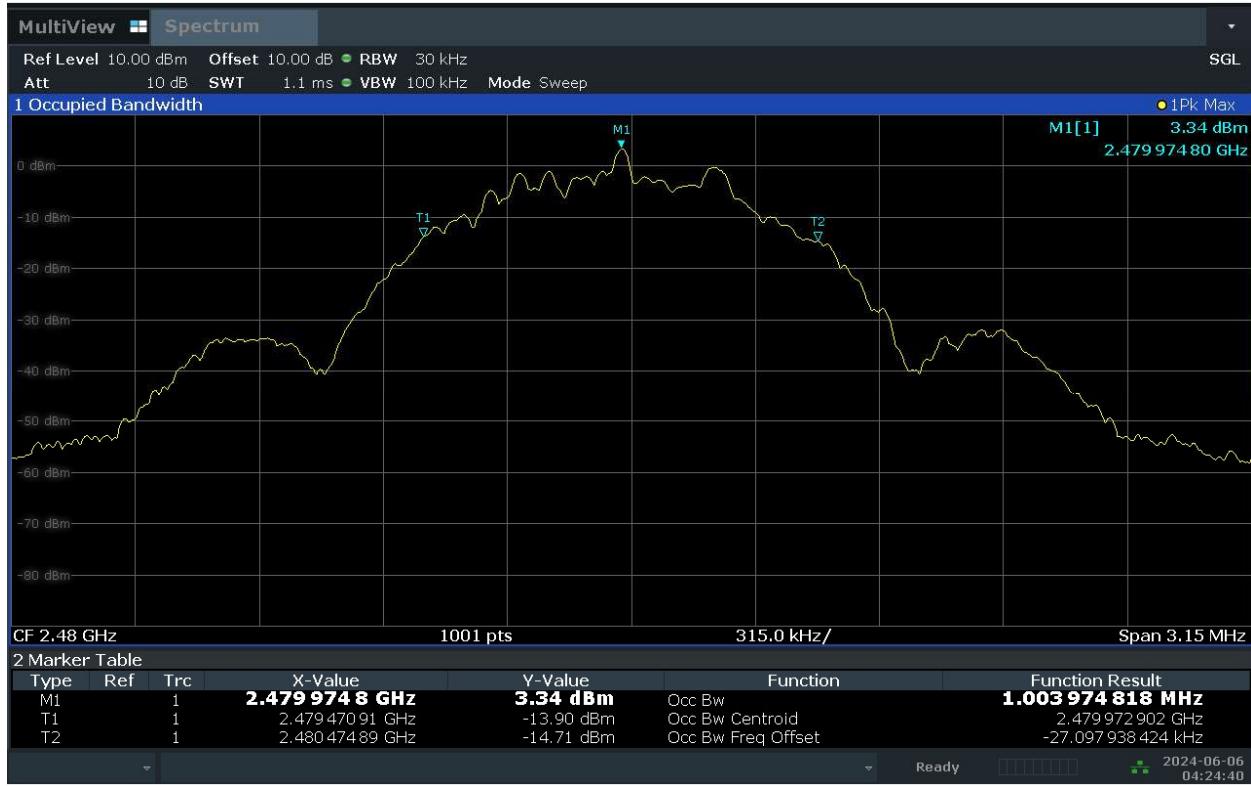


04:23:57 AM 06/06/2024





### 6.11.1.3 High Channel



04:24:41 AM 06/06/2024



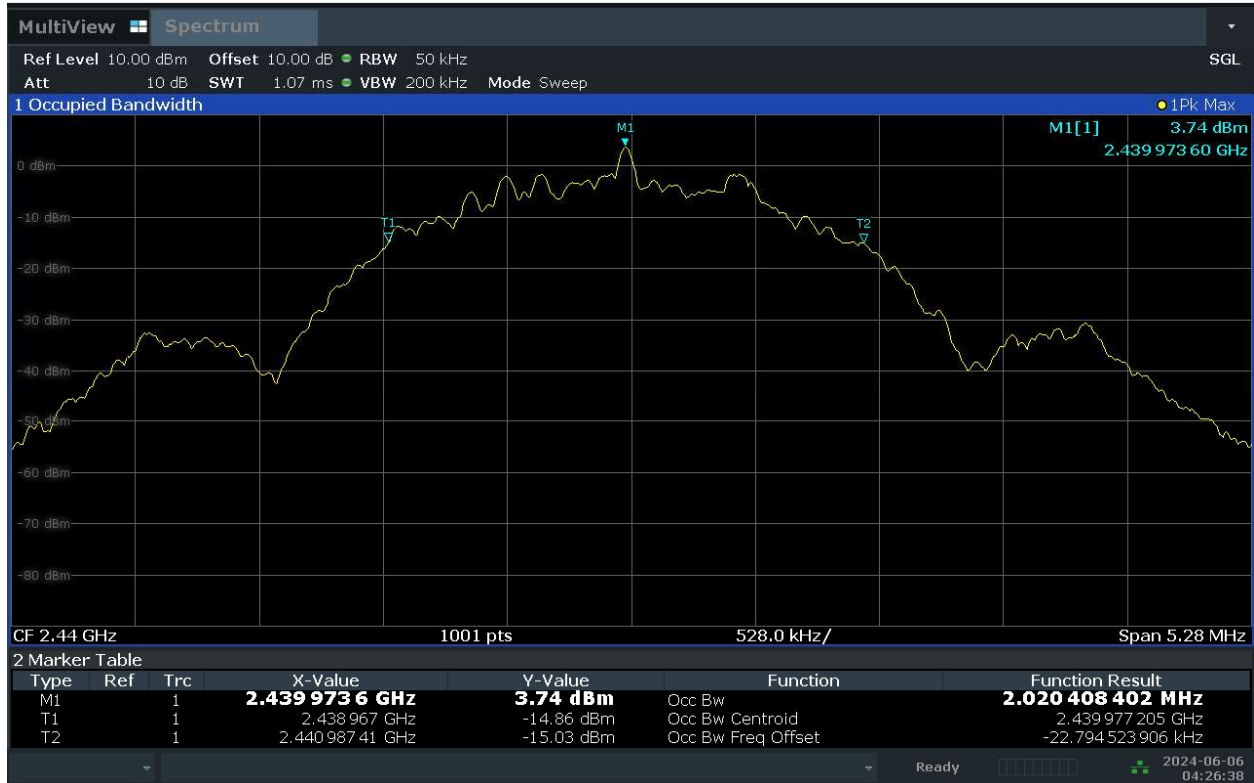
### 6.11.2 BLE, 2Mbps 6.11.2.1 Low Channel



04:26:05 AM 06/06/2024



### 6.11.2.2 Mid Channel



04:26:38 AM 06/06/2024



### 6.11.2.3 High Channel



04:27:08 AM 06/06/2024



## 7 Fundamental Emissions Output Power

### 7.1 Test Method:

Tests are performed in accordance with ANSI C63.10 §11.9.

### 7.2 Test Limits:

47 CFR 15.247(b)

- (2) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

RSS-247 §5.4

- d. For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).



### 7.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
Spectrum Analyzer	101472	Rohde & Schwarz	FSW26	12/19/2023	12/19/2024

### 7.4 Test Software Used:

Description	Manufacturer	Version
RSCCommander	Rohde & Schwarz	2.4.2 64 bit (2023)

### 7.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Conducted Measurement	2.89

No measurement correction based on measurement uncertainty is performed.

### 7.6 Test Conditions

Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Seth Parker	NA	6/24/2024	23.9 °C	48.7 %	982.0 mbar

### 7.7 Test Results:

The sample tested was found to Comply. The conducted output power was less than 1 W. The EIRP was less than 4 W.

**7.8 Test Data:****7.8.1 BLE, 1 Mbps**

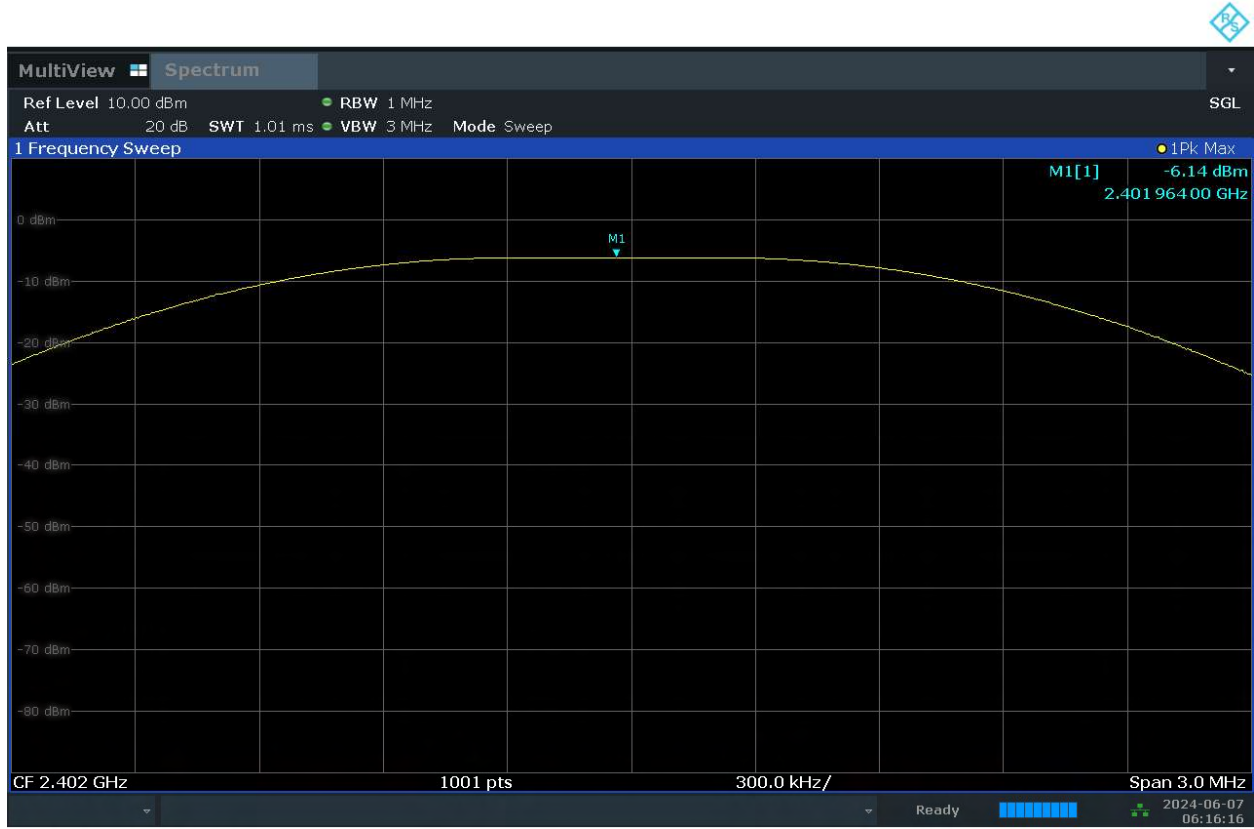
Frequency (MHz)	Measured (dBm)	Attenuation (dB)	Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Output Power Limit (W)	EIRP Limit (W)
2402	-6.14	10	3.86	2.432	3.16	7.02	.005	1	4
2440	-6.14	10	3.86	2.432	3.16	7.02	.005	1	4
2480	-6.19	10	3.81	2.404	3.16	6.97	.005	1	4

**7.8.2 BLE, 2 Mbps**

Frequency (MHz)	Measured (dBm)	Attenuation (dB)	Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Output Power Limit (W)	EIRP Limit (W)
2402	-6.14	10	3.86	2.432	3.16	7.02	.005	1	4
2440	-6.14	10	3.86	2.432	3.16	7.02	.005	1	4
2480	-6.20	10	3.80	2.398	3.16	6.96	.005	1	4



**7.9 Test Plots: Output Power**  
**7.9.1 BLE, 1Mbps**  
**7.9.1.1 Low Channel**

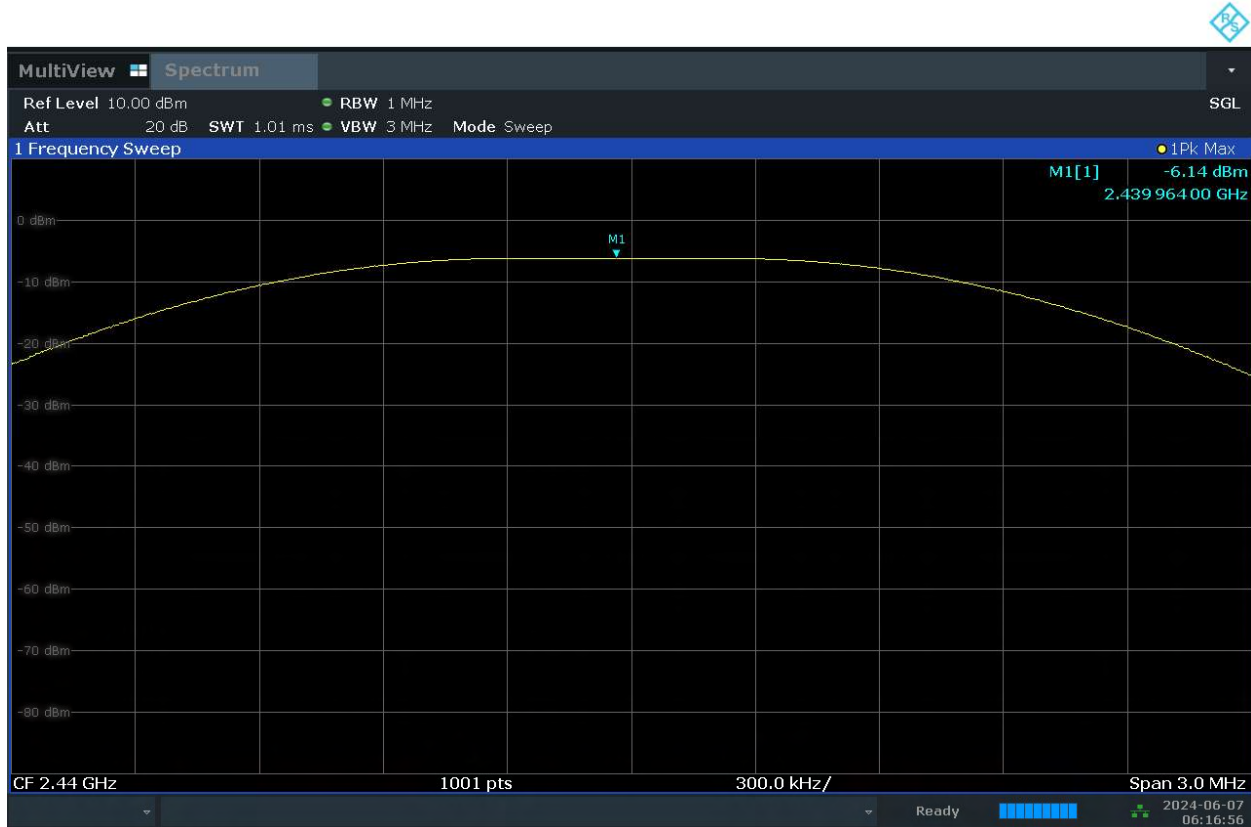


06:16:17 AM 06/07/2024





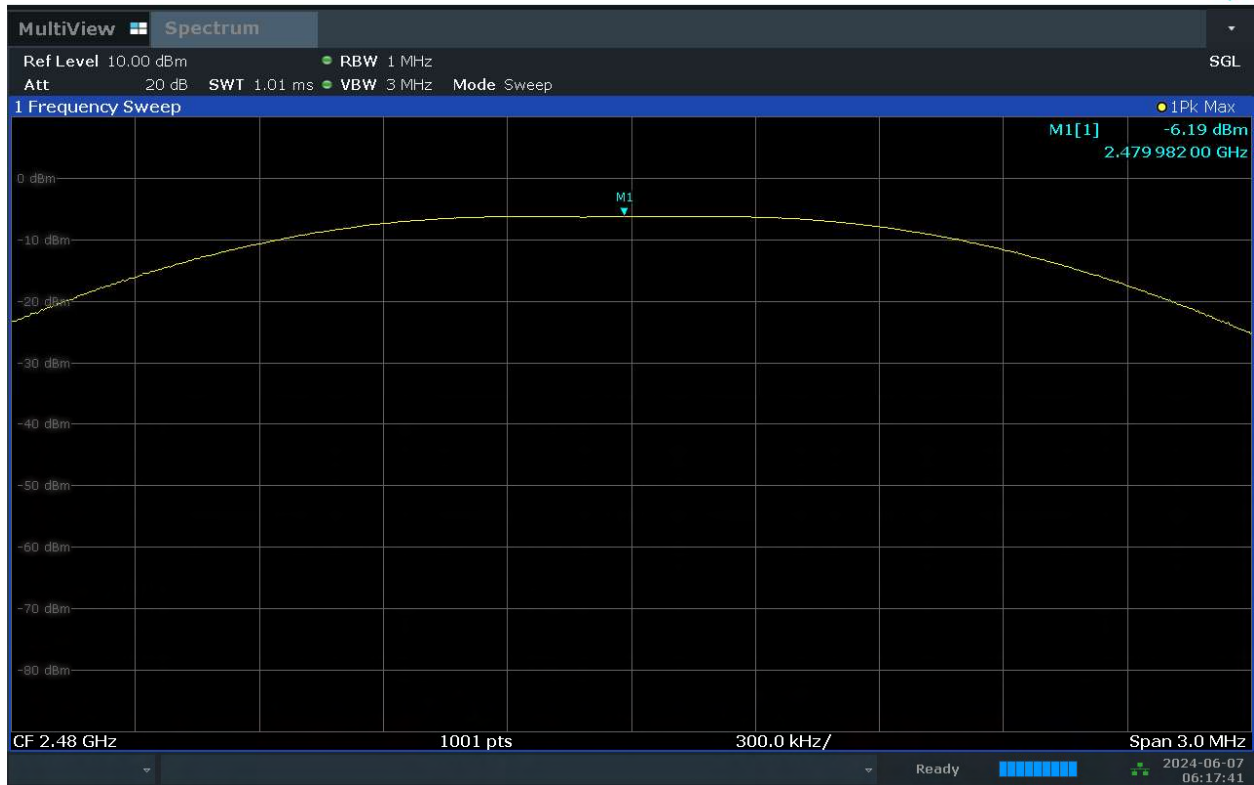
### 7.9.1.2 Mid Channel



06:16:57 AM 06/07/2024



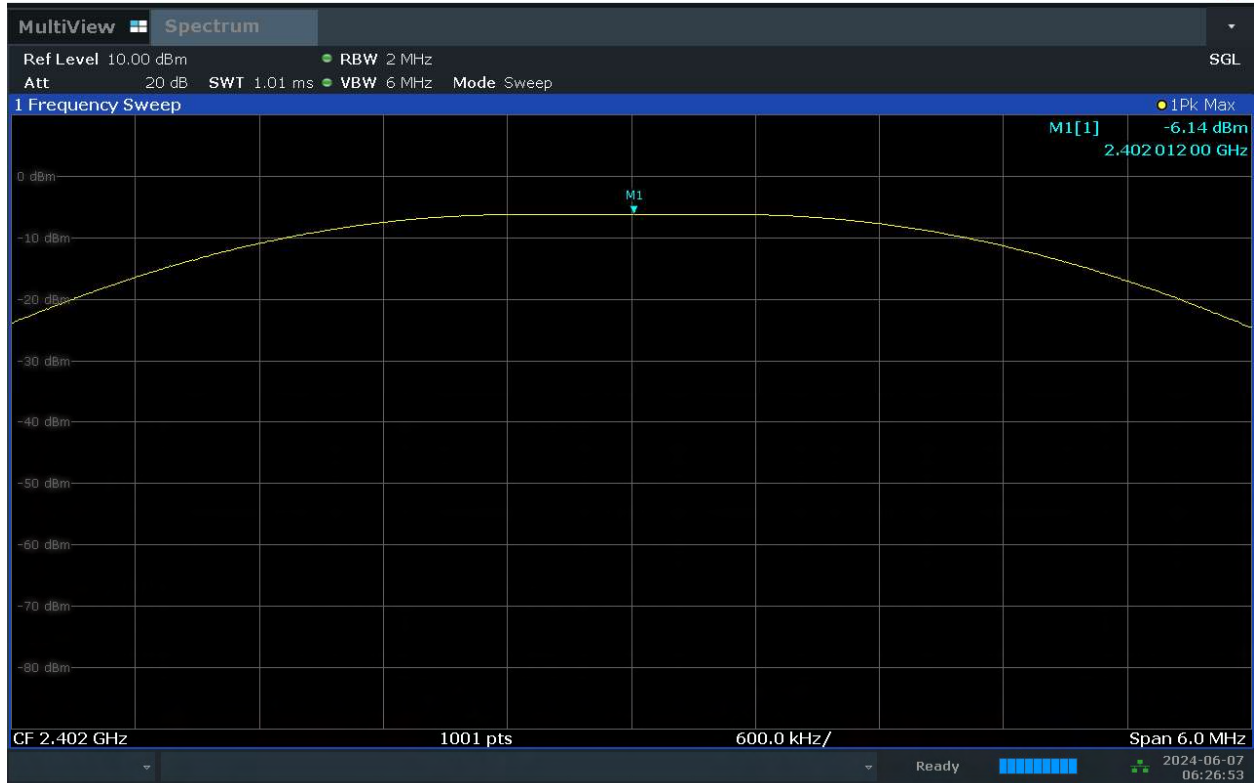
### 7.9.1.3 High Channel



06:17:42 AM 06/07/2024



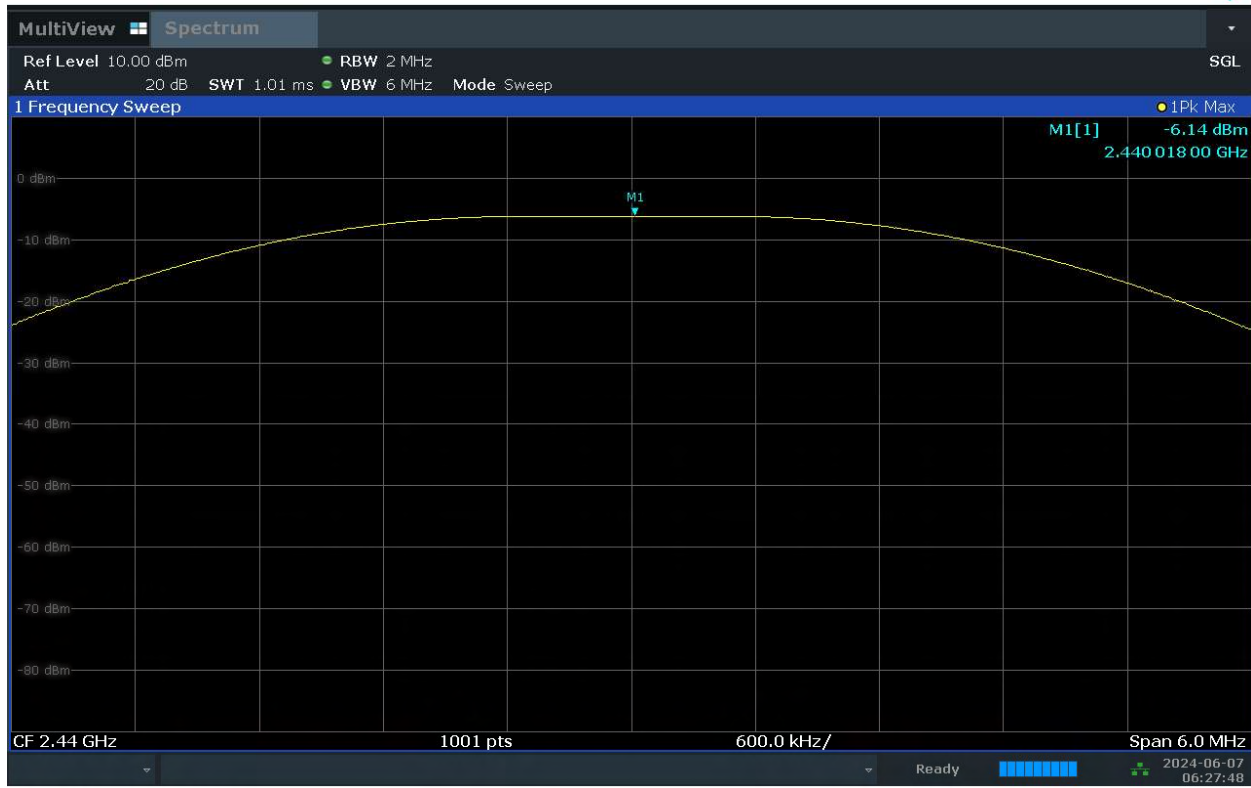
7.9.2 BLE, 2Mbps  
7.9.2.1 Low Channel



06:26:53 AM 06/07/2024



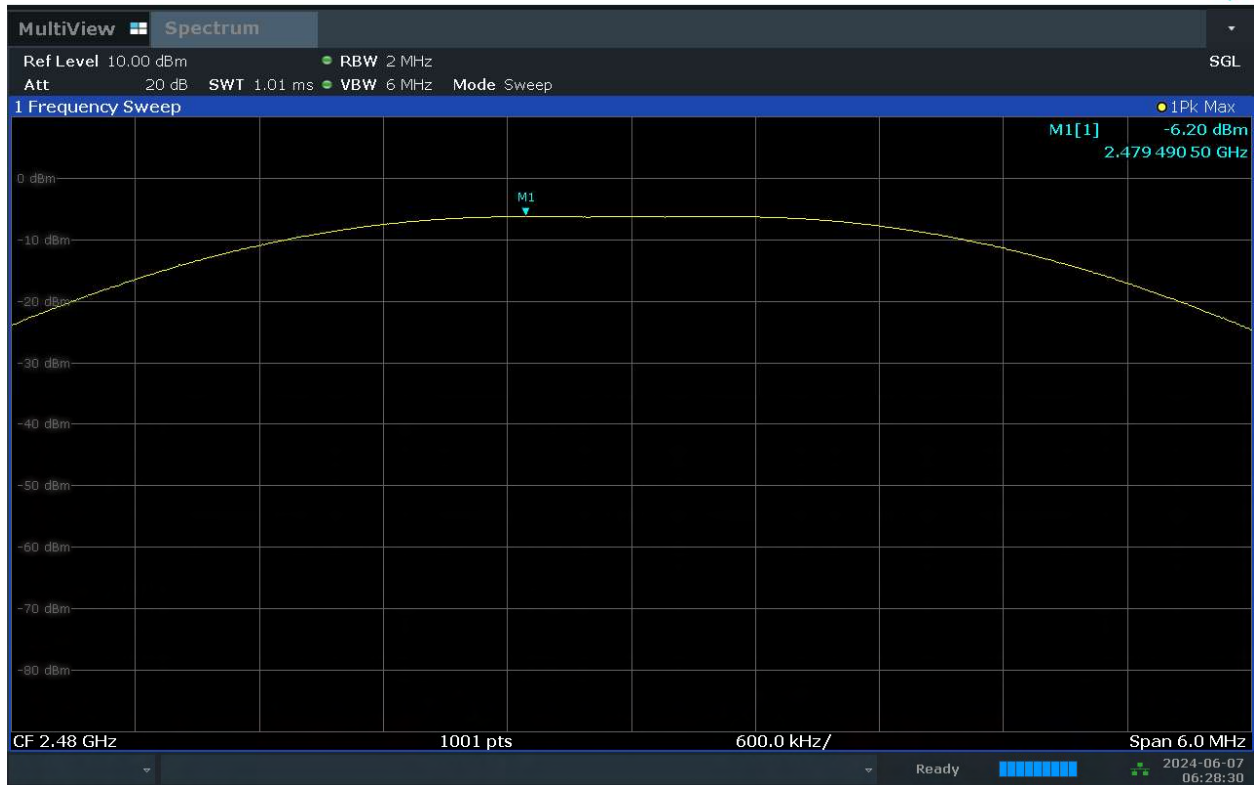
### 7.9.2.2 Mid Channel



06:27:49 AM 06/07/2024



### 7.9.2.3 High Channel



06:28:31 AM 06/07/2024



## 8 Maximum Power Spectral Density (PSD)

### 8.1 Test Method:

Tests are performed in accordance with ANSI C63.10 §11.10.

### 8.2 Test Limits:

47 CFR 15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

RSS-247 §5.2

- b. The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).



### 8.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
Spectrum Analyzer	101472	Rohde & Schwarz	FSW26	12/19/2023	12/19/2024

### 8.4 Test Software Used:

Description	Manufacturer	Version
RSCCommander	Rohde & Schwarz	2.4.2 64 bit (2023)

### 8.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Conducted Measurement	2.89

No measurement correction based on measurement uncertainty is performed.

### 8.6 Test Conditions

Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Seth Parker	NA	6/24/2024	23.9 °C	48.7 %	982.0 mbar

### 8.7 Test Results:

The sample tested was found to Comply. The power spectral density was less than 8 dBm/3kHz.

### 8.8 Test Data:

#### 8.8.1 BLE, 1 Mbps

Frequency (MHz)	Conducted PSD (dBm/3kHz)	Antenna Gain (dBi)	PSD EIRP (dBm/3kHz)	Limit (dBm/3kHz)
2402	3.74	3.16	6.9	8
2440	3.75	3.16	6.91	8
2480	3.71	3.16	6.87	8

#### 8.8.2 BLE, 2 Mbps

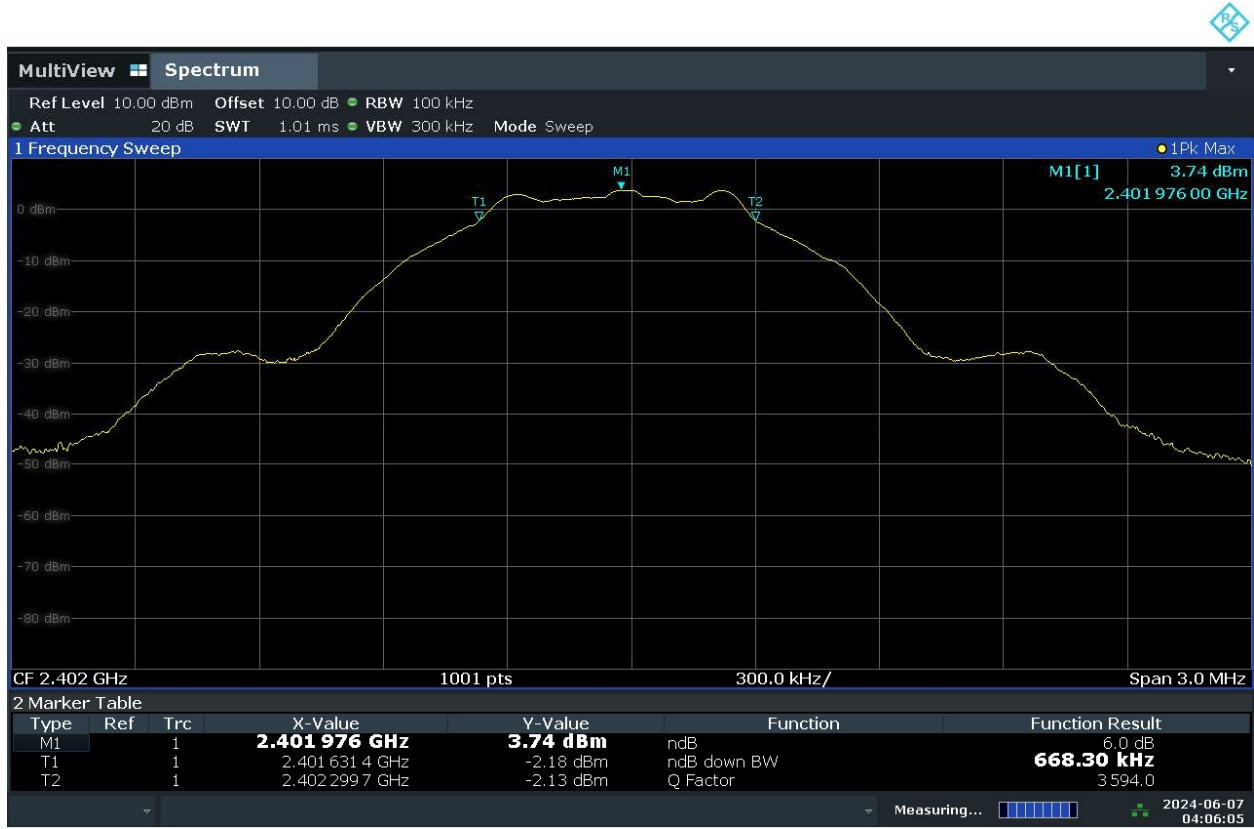
Frequency (MHz)	Conducted PSD (dBm/3kHz)	Antenna Gain (dBi)	PSD EIRP (dBm/3kHz)	Limit (dBm/3kHz)
2402	3.77	3.16	6.93	8
2440	3.78	3.16	6.94	8
2480	3.73	3.16	6.89	8



### 8.9 Test Plots: Power Spectral Density

#### 8.9.1 BLE, 1Mbps

##### 8.9.1.1 Low Channel



04:06:06 AM 06/07/2024





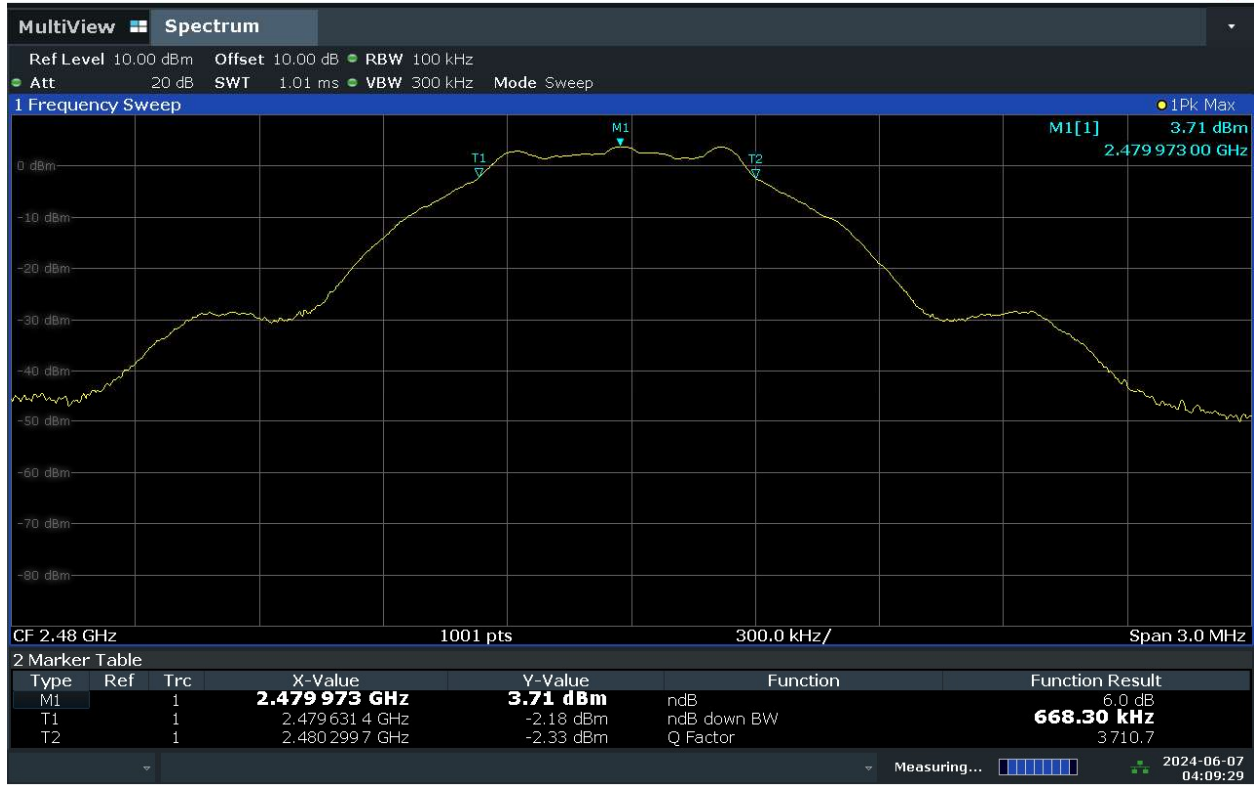
### 8.9.1.2 Mid Channel



04:08:11 AM 06/07/2024



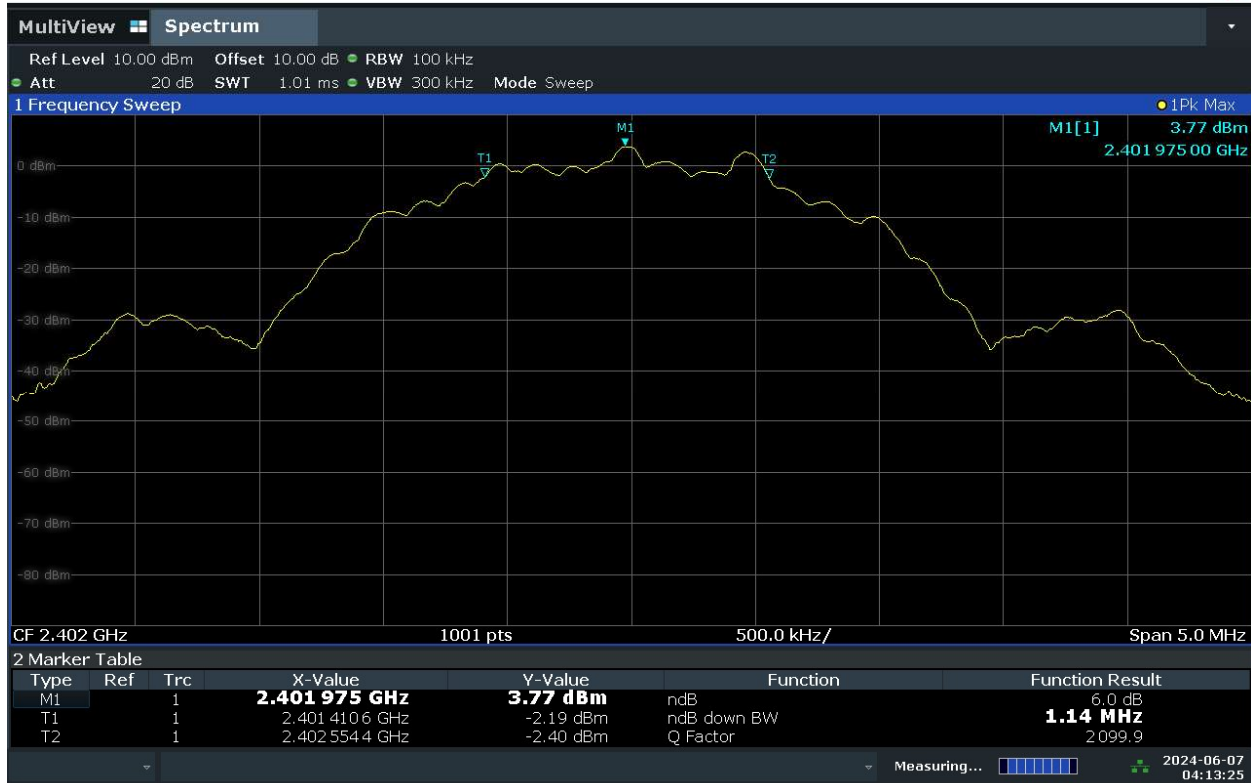
### 8.9.1.3 High Channe



04:09:29 AM 06/07/2024



### 8.9.2 BLE, 2Mbps 8.9.2.1 Low Channel



04:13:26 AM 06/07/2024



### 8.9.2.2 Mid Channel



04:12:46 AM 06/07/2024



### 8.9.2.3 High Channel



04:11:57 AM 06/07/2024



## 9 Conducted Spurious Emissions

### 9.1 Test Method:

Tests are performed in accordance with ANSI C63.10 §11.11.

### 9.2 Test Limits:

47 CFR 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

RSS-247 §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under [section 5.4\(d\)](#), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.



### 9.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
Spectrum Analyzer	101472	Rohde & Schwarz	FSW26	12/19/2023	12/19/2024

### 9.4 Test Software Used:

Description	Manufacturer	Version
RSCCommander	Rohde & Schwarz	2.4.2 64 bit (2023)

### 9.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Conducted Measurement	2.89

No measurement correction based on measurement uncertainty is performed.

### 9.6 Test Conditions

Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Seth Parker	NA	6/24/2024	23.9 °C	48.7 %	982.0 mbar

### 9.7 Test Results:

The sample tested was found to Comply.

**9.8 Test Data:****9.8.1 BLE, 1 Mbps**

Frequency (MHz)	Reference Level Max PSD (dBm)	Highest 3 Unwanted Emissions Level (dBm)	Margin (dB)	Limit (dB)
2402	3.92	> 80	> 80	20
2440	3.92	> 80	> 80	20
2480	3.92	> 80	> 80	20

**9.8.2 BLE, 2 Mbps**

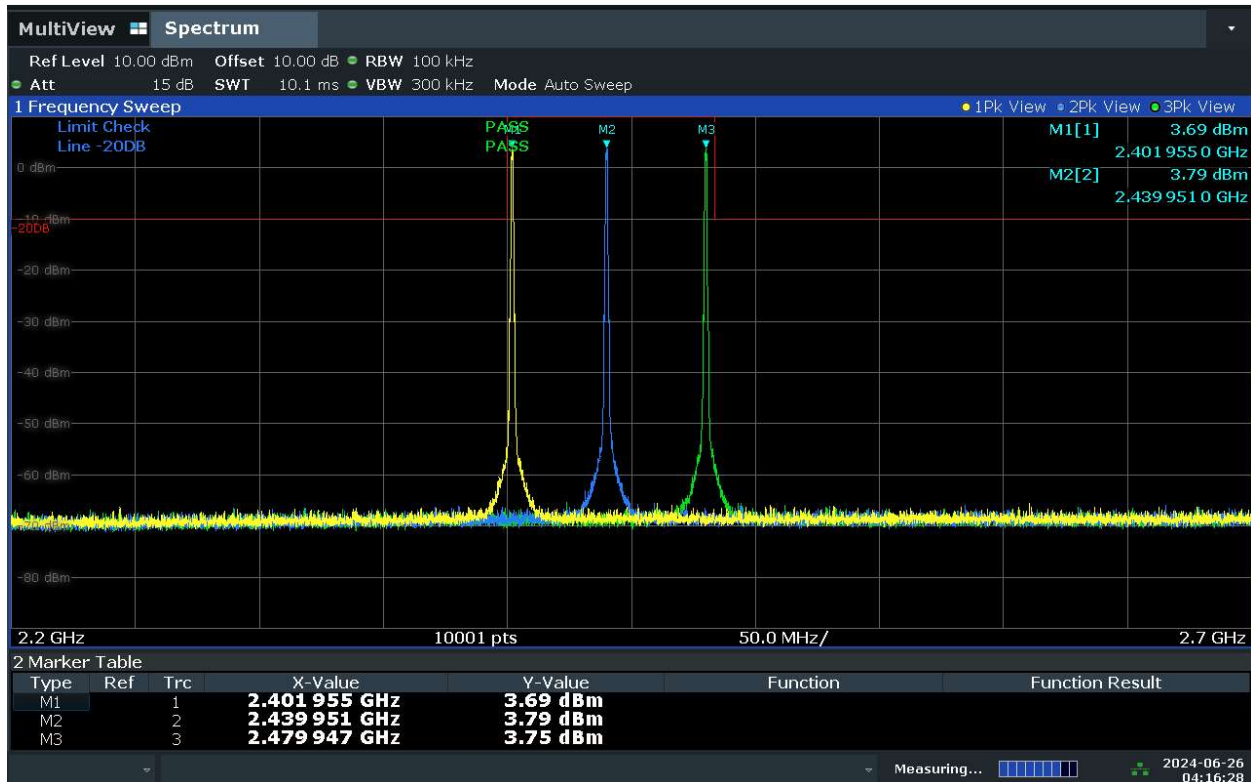
Frequency (MHz)	Reference Level Max PSD (dBm)	Highest 3 Unwanted Emissions Level (dBm)	Margin (dB)	Limit (dB)
2402	3.90	> 80	> 80	20
2440	3.90	> 80	> 80	20
2480	3.90	> 80	> 80	20





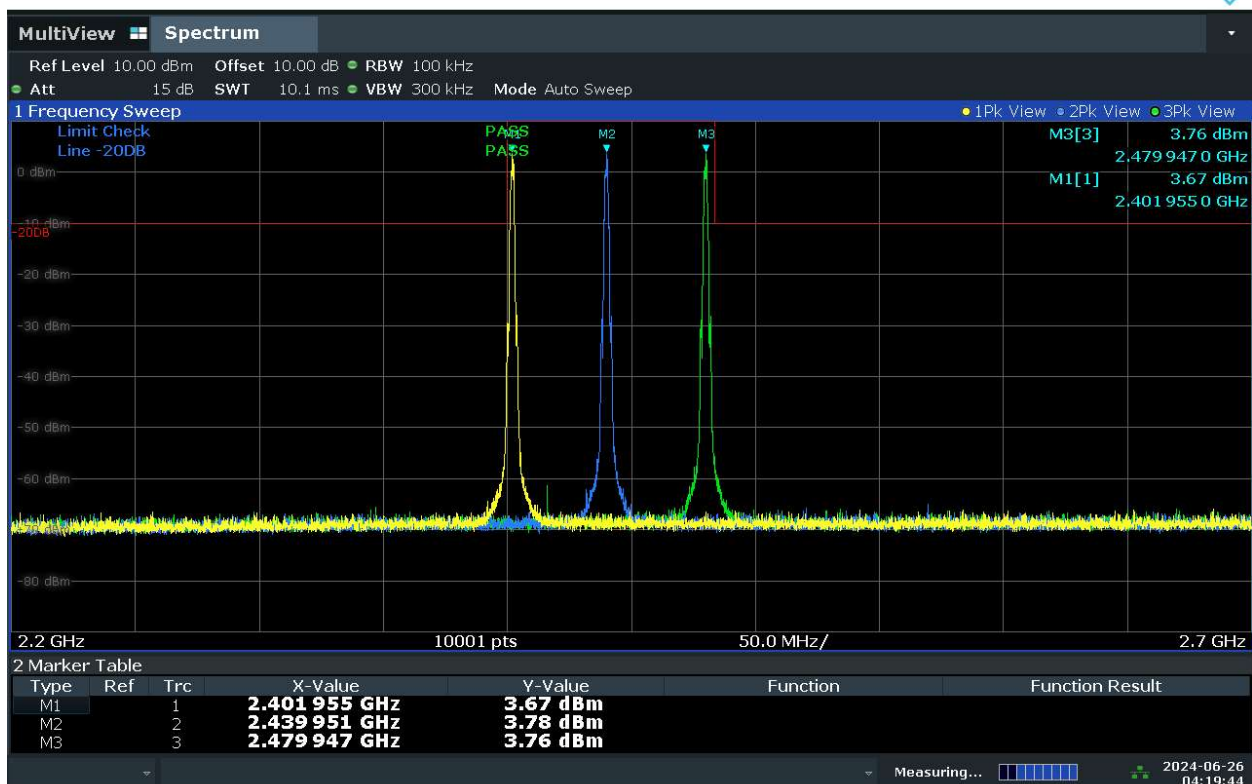
### 9.9 Test Plots: Emissions in Non-Restrictive Bands

#### 9.9.1 BLE, 1Mbps





### 9.9.2 BLE, 2Mbps





## 10 Radiated Spurious Emissions

### 10.1 Test Method:

Tests are performed in accordance with ANSI C63.10 §6.3 §6.5 and §6.6.

### 10.2 Test Limits:

47 CFR 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

RSS-247 §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

**10.3 Test Equipment Used:**

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8258	Rohde & Schwarz	ESW44	9/19/2023	9/19/2024
Horn Antenna (18-40GHz)	3779	ETS	3116c	8/23/2023	8/23/2024
Horn Antenna (1-18GHz)	4001	ETS	3117	3/4/2024	3/4/2025
Bilog Antenna	7085	SunAR	JB6	3/18/2024	3/18/2025
Magnetic Loop Antenna	2366	ETS	6502	8/28/2023	8/28/2024
System Controller	3957	Sunol Sciences	SC99V	Verify at Time of Use	Verify at Time of Use
Preamplifier (1-18GHz)	3918	Rohde & Schwarz	TS-PR18	1/12/2024	1/12/2025
1-18GHz Signal Path with Preamplifier	3074, 3918, 2588, 2593, 8188, 8185			1/12/2024	1/12/2025
30M-1G 3m Signal Path without Preamplifier	3339, 2592, 8188, 8185			1/12/2024	1/12/2025
1-18GHz Signal Path without Preamplifier	3074, 2588, 2593, 8188, 8185			1/12/2024	1/12/2025
18-40GHz Signal Path with Preamplifier	7020, 3921, 7021			1/12/2024	1/12/2025

**10.4 Measurement Uncertainty**

Measurement	Frequency Range	Expanded Uncertainty (k=2)
Radiated Emissions, 10m	30-1000 MHz	3.9dB
Radiated Emissions, 3m	30-1000 MHz	4.0dB
Radiated Emissions, 3m	1-6 GHz	4.7dB
Radiated Emissions, 3m	6-15 GHz	4.7dB
Radiated Emissions, 3m	15-18 GHz	4.7dB
Radiated Emissions, 3m	18-40 GHz	4.7dB

No measurement correction based on measurement uncertainty is performed.

**10.5 Test Software Used:**

Description	Manufacturer	Version
EMC32	Rohde & Schwarz	10.60.20

**10.6 Test Results:**

The sample tested was found to Comply. The device was investigated in three orthogonal axes.

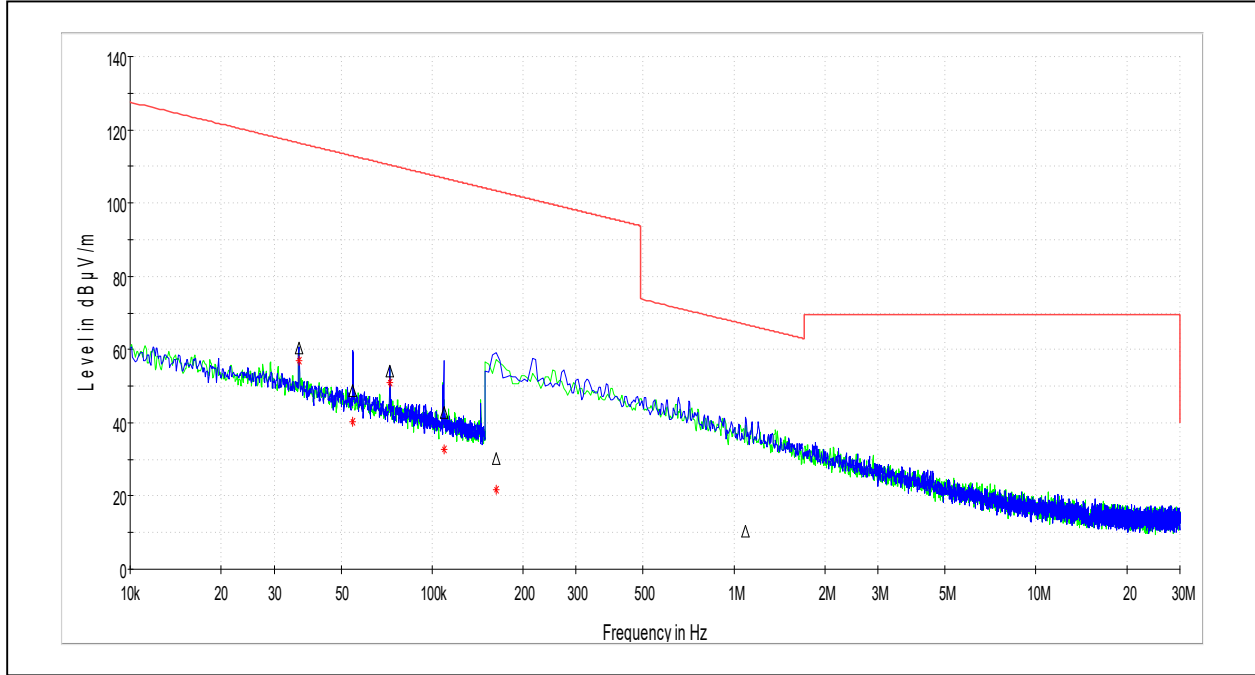


10.7 Test Data: Radiated Spurious Emissions, General

10.7.1 Frequency Range 9kHz – 30MHz

10.7.1.1 Mid Channel<sup>1</sup>

BLE, 1 Mbps



Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.036	57.04	116.42	59.38	100.0	H	7.0	14.0
0.055	40.33	112.83	72.50	100.0	V	218.0	12.8
0.072	50.81	110.40	59.59	100.0	H	0.0	12.4
0.110	32.68	106.81	74.13	100.0	V	259.0	12.2
0.163	21.65	103.35	81.69	100.0	V	207.0	12.1
1.094	-2.78	66.85	69.62	100.0	V	33.0	12.0

Test Personnel: Seth Parker  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
 FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

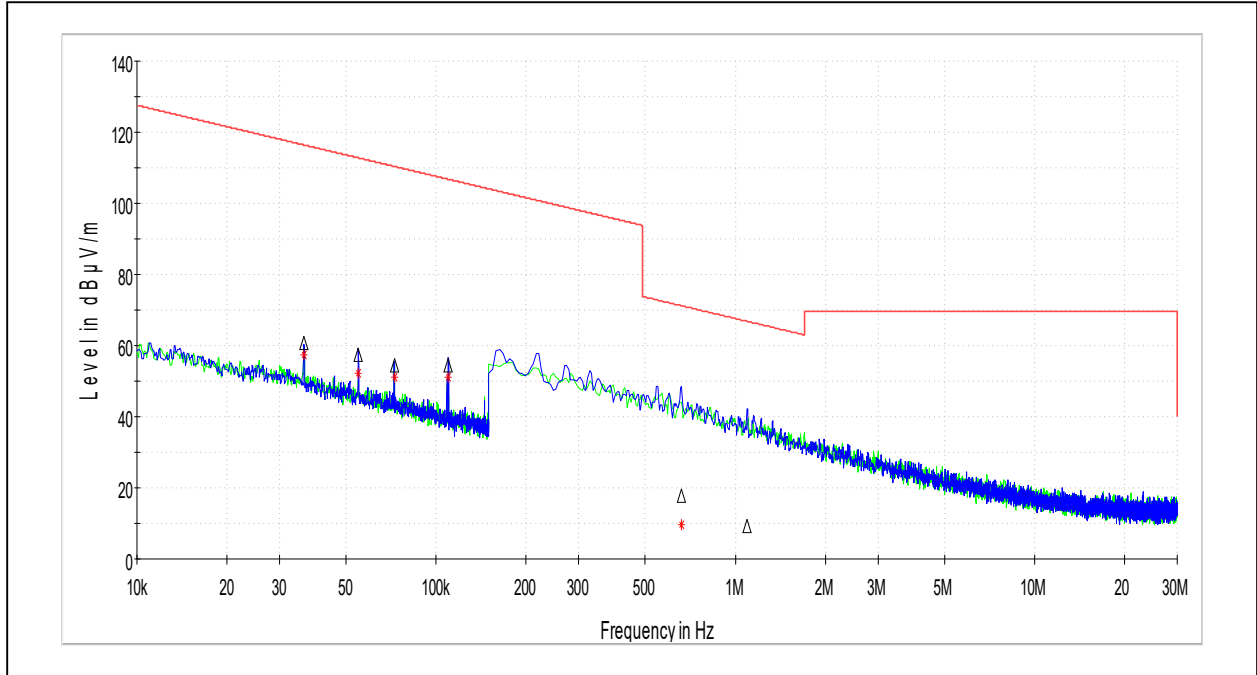
Test Date: 6/24/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 23.9 °C  
 Relative Humidity: 48.7 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None

<sup>1</sup> Testing represents the worst case of low, middle, and high channels.



**BLE, 2Mbps**



Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.036	57.32	116.42	59.10	100.0	H	34.0	14.0
0.055	52.08	112.80	60.72	100.0	V	15.0	12.8
0.073	50.99	110.39	59.39	100.0	H	0.0	12.4
0.110	51.07	106.78	55.71	100.0	V	36.0	12.2
0.659	9.69	71.23	61.54	100.0	V	111.0	11.9
1.094	-3.72	66.85	70.57	100.0	V	265.0	12.0

Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: NA  
 (Where Applicable) FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

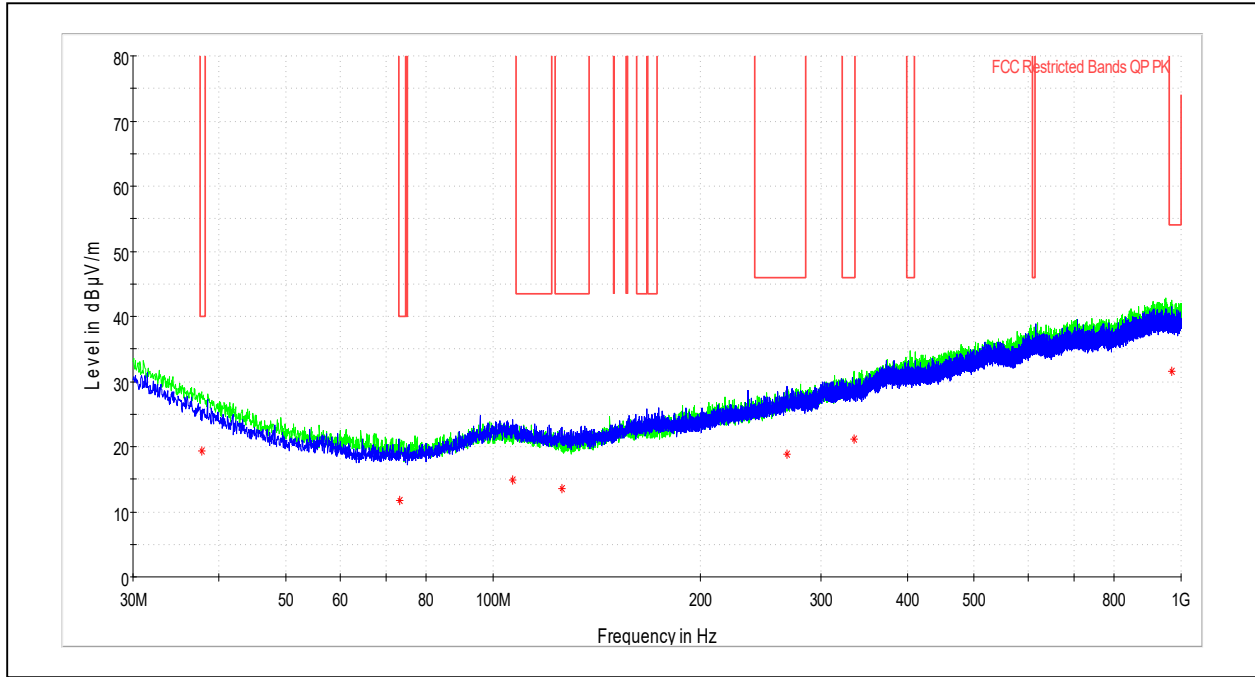
Deviations, Additions, or Exclusions: None



### 10.7.2 Frequency Range 30MHz – 1GHz

#### 10.7.2.1 High Channel<sup>1</sup>

BLE, 1 Mbps



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.760	19.37	40.00	20.63	269.0	H	101.0	20.6
73.219	11.69	40.00	28.31	311.0	H	-6.0	13.5
106.899	14.80	1000.00	985.20	206.0	V	242.0	16.6
125.922	13.54	43.52	29.98	400.0	V	142.0	15.6
267.327	18.88	46.02	27.14	100.0	V	0.0	20.6
334.903	21.11	46.02	24.91	400.0	H	99.0	22.8
968.367	31.65	53.98	22.33	298.0	H	348.0	33.2

Test Personnel: Seth Parker  
 Supervising/Reviewing Engineer: NA  
 (Where Applicable) FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

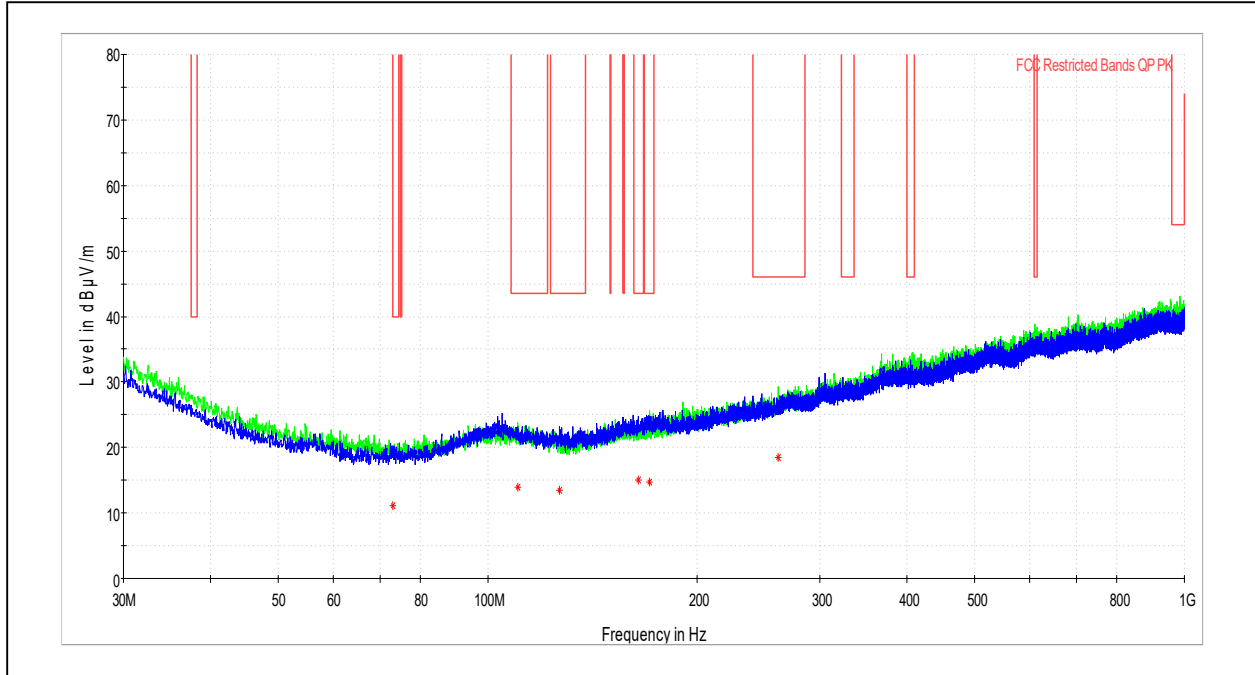
Test Date: 6/24/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 23.9 °C  
 Relative Humidity: 48.7 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None

<sup>1</sup> Testing represents the worst case of low, middle, and high channels.



**BLE, 2Mbps**



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
73.003	11.05	40.00	28.95	206.0	V	214.0	12.8
110.348	13.88	43.52	29.65	230.0	H	203.0	15.7
126.731	13.52	43.52	30.01	327.0	V	140.0	15.6
164.507	14.97	43.52	28.55	292.0	V	139.0	17.2
170.866	14.66	43.52	28.86	97.0	H	158.0	16.6
261.237	18.43	46.02	27.59	254.0	H	204.0	20.4

Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: NA  
 (Where Applicable) FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None

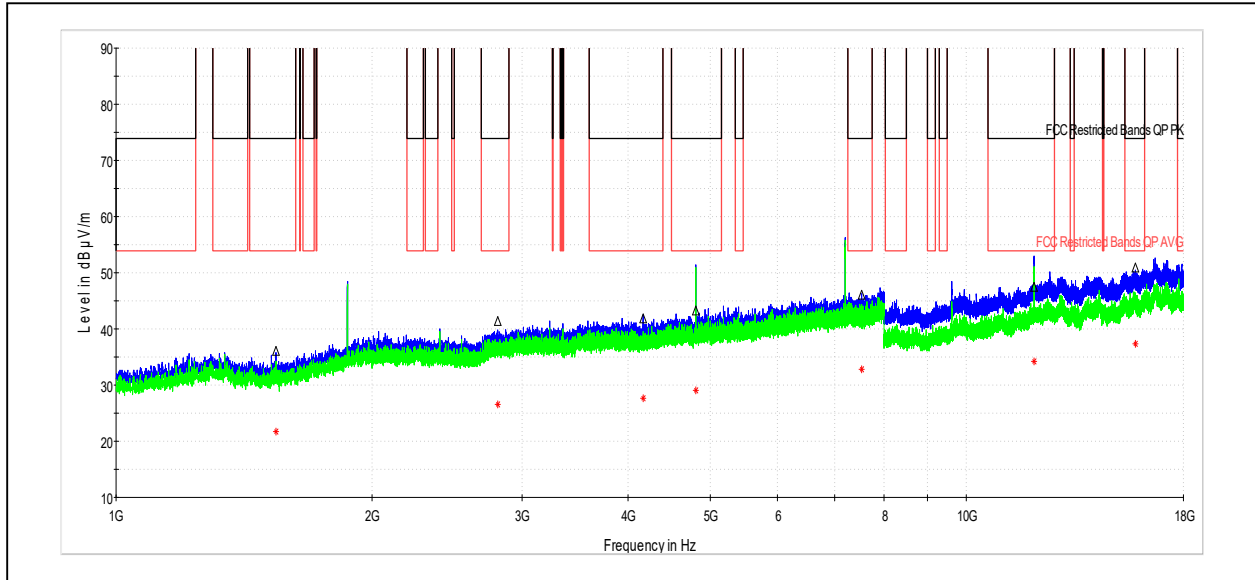




### 10.7.3 Frequency Range 1GHz – 18GHz

#### 10.7.3.1 Low Channel

##### BLE, 1 Mbps



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1542.111	36.10	73.98	37.88	100.0	V	92.0	0.1
2808.722	41.34	73.98	32.64	410.0	H	104.0	6.0
4164.389	41.90	73.98	32.08	100.0	H	294.0	8.6
4804.500	43.34	73.98	30.64	410.0	V	204.0	9.8
7525.167	46.02	73.98	27.96	410.0	H	79.0	13.6
12011.250	47.45	73.98	26.53	100.0	V	243.0	20.1
15815.000	50.88	73.98	23.10	410.0	H	345.0	23.8

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1542.111	21.71	53.98	32.27	100.0	V	92.0	0.1
2808.722	26.61	53.98	27.37	410.0	H	104.0	6.0
4164.389	27.71	53.98	26.27	100.0	H	294.0	8.6
4804.500	29.02	53.98	24.96	410.0	V	204.0	9.8
7525.167	32.80	53.98	21.18	410.0	H	79.0	13.6
12011.250	34.17	53.98	19.81	100.0	V	243.0	20.1
15815.000	37.30	53.98	16.68	410.0	H	345.0	23.8

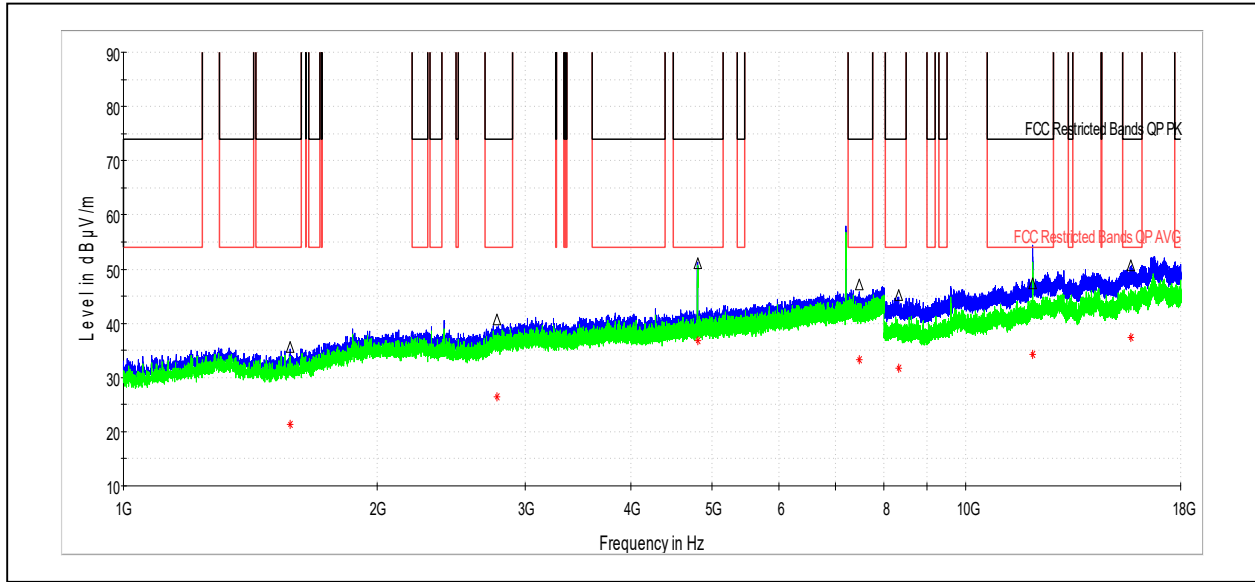
Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
 FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



**BLE, 2Mbps**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1577.111	35.53	73.98	38.45	100.0	H	202.0	-0.1
2775.278	40.75	73.98	33.23	410.0	V	300.0	5.8
4803.333	51.11	73.98	22.87	179.0	V	348.0	9.8
7476.556	47.22	73.98	26.76	410.0	V	340.0	13.6
8330.625	45.24	73.98	28.74	410.0	V	96.0	14.8
12007.500	47.31	73.98	26.67	213.0	V	179.0	20.1
15721.875	50.73	73.98	23.25	410.0	V	96.0	23.6

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1577.111	21.29	53.98	32.69	100.0	H	202.0	-0.1
2775.278	26.47	53.98	27.51	410.0	V	300.0	5.8
4803.333	36.81	53.98	17.17	179.0	V	348.0	9.8
7476.556	33.18	53.98	20.80	410.0	V	340.0	13.6
8330.625	31.74	53.98	22.24	410.0	V	96.0	14.8
12007.500	34.18	53.98	19.80	213.0	V	179.0	20.1
15721.875	37.48	53.98	16.50	410.0	V	96.0	23.6

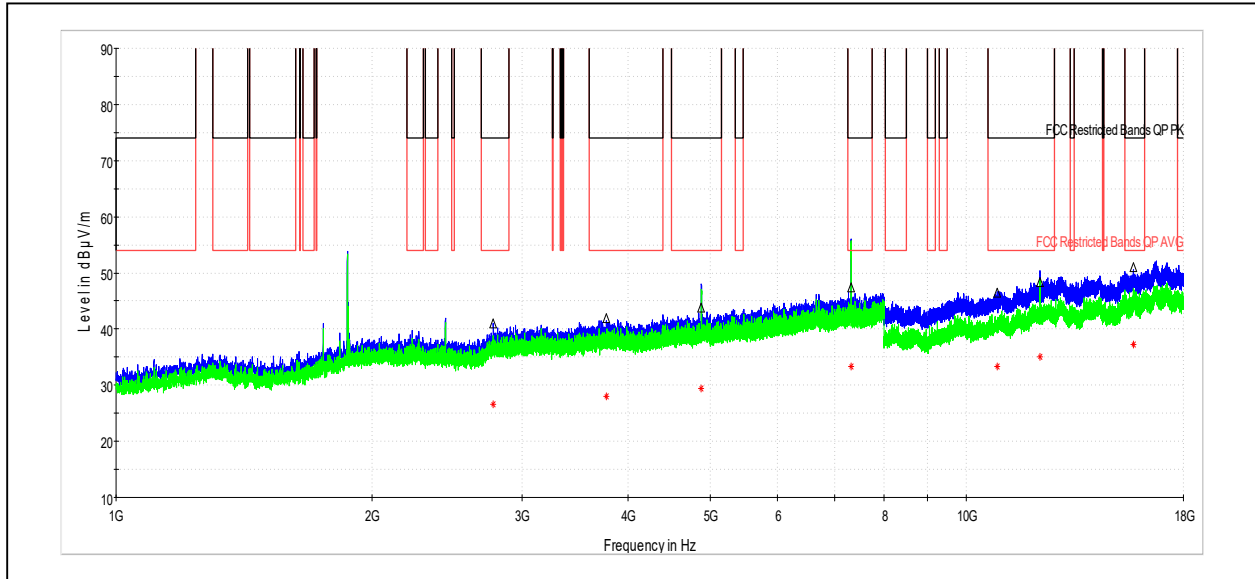
Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: NA  
 (Where Applicable) FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



**10.7.3.2 Middle Channel  
 BLE, 1 Mbps**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2778.000	40.93	73.98	33.05	410.0	H	70.0	6.0
3769.278	41.96	73.98	32.02	100.0	V	104.0	8.2
4879.556	43.80	73.98	30.18	410.0	H	141.0	9.7
7321.000	47.49	73.98	26.49	410.0	H	0.0	13.5
10879.375	46.45	73.98	27.53	410.0	V	329.0	19.0
12201.250	48.28	73.98	25.70	410.0	H	196.0	20.4
15720.000	51.07	73.98	22.91	100.0	H	308.0	23.5

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2778.000	26.55	53.98	27.43	410.0	H	70.0	6.0
3769.278	27.94	53.98	26.04	100.0	V	104.0	8.2
4879.556	29.34	53.98	24.64	410.0	H	141.0	9.7
7321.000	33.38	53.98	20.60	410.0	H	0.0	13.5
10879.375	33.34	53.98	20.64	410.0	V	329.0	19.0
12201.250	35.03	53.98	18.95	410.0	H	196.0	20.4
15720.000	37.20	53.98	16.78	100.0	H	308.0	23.5

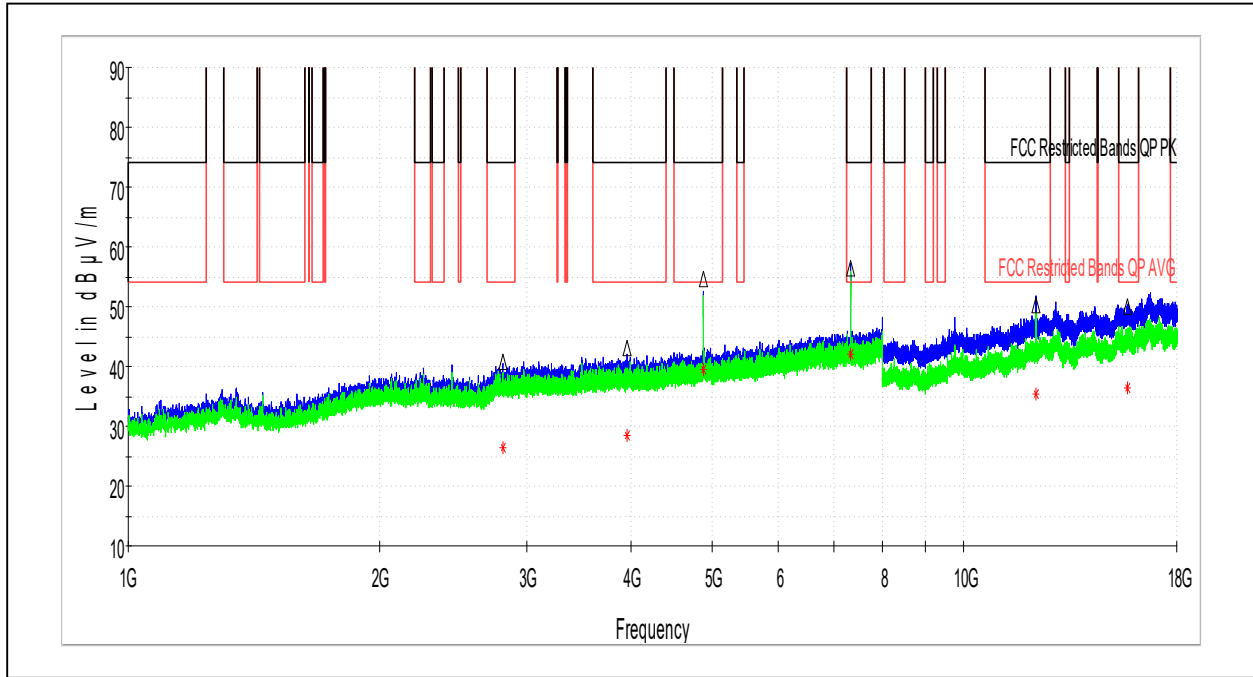
Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: NA  
 (Where Applicable) FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



**BLE, 2Mbps**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2806.389	40.79	73.98	33.19	410.0	V	331.0	5.9
3952.833	43.01	73.98	30.97	100.0	H	0.0	8.5
4881.111	54.51	73.98	19.47	177.0	V	289.0	9.8
7318.667	56.53	73.98	17.45	216.0	V	140.0	13.5
12200.000	50.25	73.98	23.73	330.0	H	128.0	20.4
15703.750	50.12	73.98	23.86	117.0	H	332.0	23.4

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2806.389	26.39	53.98	27.59	410.0	V	331.0	5.9
3952.833	28.56	53.98	25.42	100.0	H	0.0	8.5
4881.111	39.37	53.98	14.61	177.0	V	289.0	9.8
7318.667	42.08	53.98	11.90	216.0	V	140.0	13.5
12200.000	35.41	53.98	18.57	330.0	H	128.0	20.4
15703.750	36.40	53.98	17.58	117.0	H	332.0	23.4

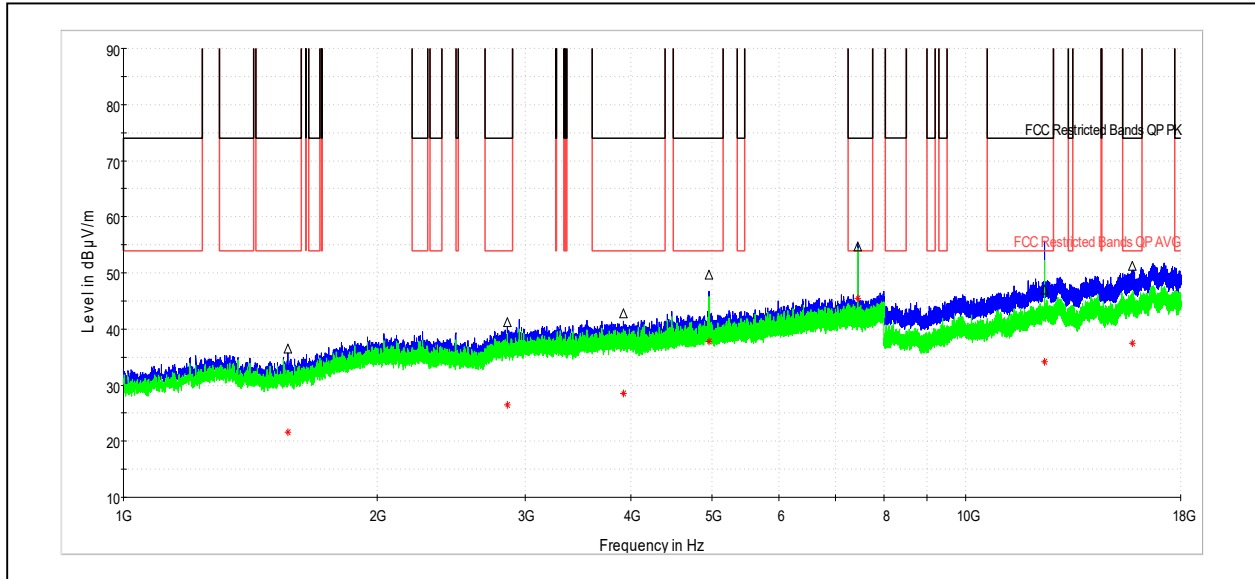
Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



**10.7.3.3 High Channel  
 BLE, 1 Mbps**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1568.167	36.46	73.98	37.52	100.0	V	11.0	0.2
2854.222	41.17	73.98	32.81	410.0	H	0.0	6.0
3921.333	42.82	73.98	31.16	100.0	V	281.0	8.4
4960.444	49.62	73.98	24.36	244.0	H	292.0	9.8
7440.389	54.74	73.98	19.24	353.0	H	334.0	13.5
12398.750	47.02	73.98	26.96	322.0	V	175.0	20.7
15763.125	51.32	73.98	22.66	100.0	V	84.0	23.7

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1568.167	21.58	53.98	32.40	100.0	V	11.0	0.2
2854.222	26.47	53.98	27.51	410.0	H	0.0	6.0
3921.333	28.53	53.98	25.45	100.0	V	281.0	8.4
4960.444	37.73	53.98	16.25	244.0	H	292.0	9.8
7440.389	45.50	53.98	8.48	353.0	H	334.0	13.5
12398.750	34.11	53.98	19.87	322.0	V	175.0	20.7
15763.125	37.51	53.98	16.47	100.0	V	84.0	23.7

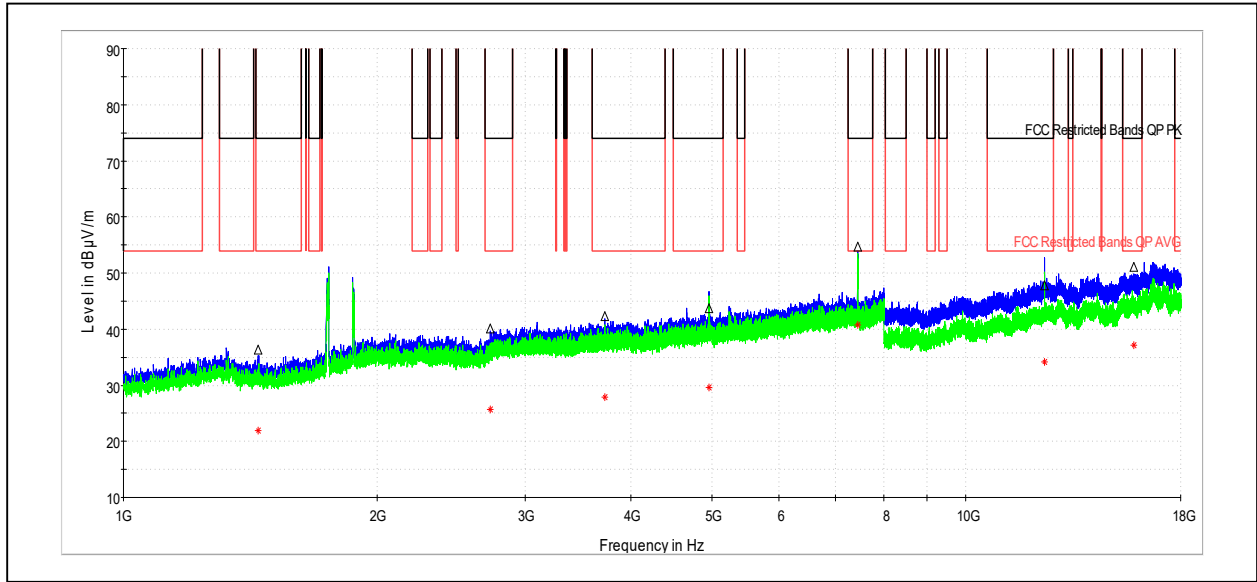
Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



**BLE, 2Mbps**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1444.500	36.28	73.98	37.70	410.0	H	251.0	0.0
2728.222	40.12	73.98	33.86	100.0	V	0.0	5.8
3730.000	42.29	73.98	31.69	410.0	V	60.0	8.0
4960.833	43.74	73.98	30.24	410.0	V	117.0	9.8
7438.833	54.64	73.98	19.34	356.0	H	336.0	13.5
12397.500	47.78	73.98	26.20	410.0	V	269.0	20.7
15830.625	51.16	73.98	22.82	100.0	V	0.0	23.9

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1444.500	21.85	53.98	32.13	410.0	H	251.0	0.0
2728.222	25.62	53.98	28.36	100.0	V	0.0	5.8
3730.000	27.92	53.98	26.06	410.0	V	60.0	8.0
4960.833	29.53	53.98	24.45	410.0	V	117.0	9.8
7438.833	40.72	53.98	13.26	356.0	H	336.0	13.5
12397.500	34.15	53.98	19.83	410.0	V	269.0	20.7
15830.625	37.15	53.98	16.83	100.0	V	0.0	23.9

Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: NA  
 (Where Applicable) FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

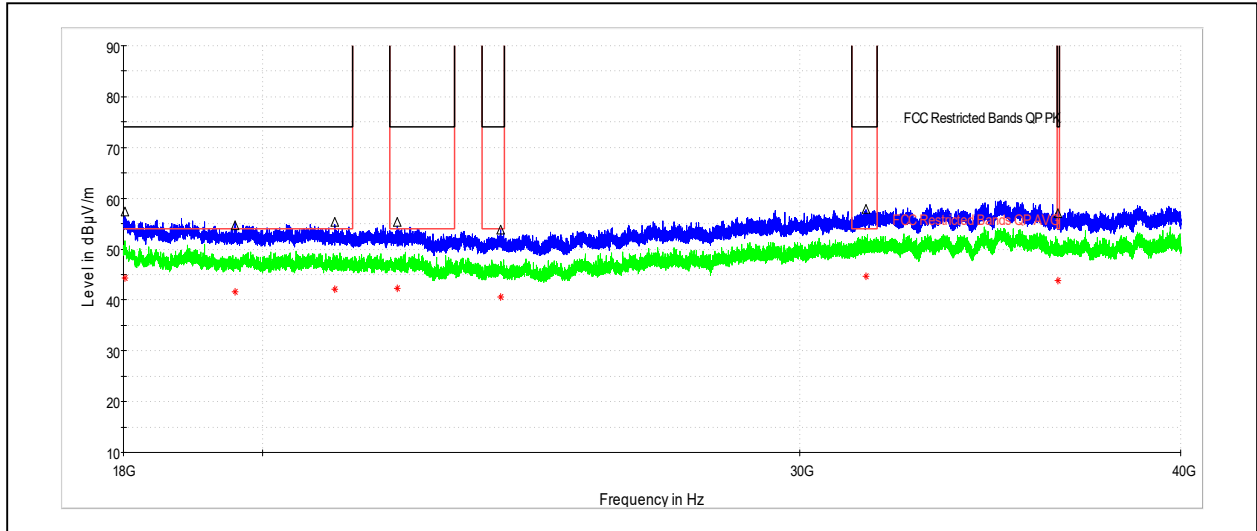
Deviations, Additions, or Exclusions: None



**10.7.4 Frequency Range 18GHz – 40GHz**

**10.7.4.1 Middle Channel<sup>1</sup>**

**BLE, 1 Mbps**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18020.000	57.40	73.98	16.58	410.0	V	0.0	29.1
19579.000	54.59	73.98	19.39	410.0	V	0.0	24.4
21120.000	55.41	73.98	18.57	410.0	V	0.0	19.3
22131.000	55.36	73.98	18.62	410.0	V	0.0	16.1
23932.000	53.77	73.98	20.21	410.0	V	0.0	13.8
31538.000	57.92	73.98	16.06	410.0	V	301.0	22.6
36465.000	56.99	73.98	16.99	100.0	H	0.0	23.5

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18020.000	44.31	53.98	9.67	410.0	V	0.0	29.1
19579.000	41.54	53.98	12.44	410.0	V	0.0	24.4
21120.000	42.05	53.98	11.93	410.0	V	0.0	19.3
22131.000	42.26	53.98	11.72	410.0	V	0.0	16.1
23932.000	40.53	53.98	13.45	410.0	V	0.0	13.8
31538.000	44.58	53.98	9.40	410.0	V	301.0	22.6
36465.000	43.80	53.98	10.18	100.0	H	0.0	23.5

Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: NA  
 (Where Applicable) FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

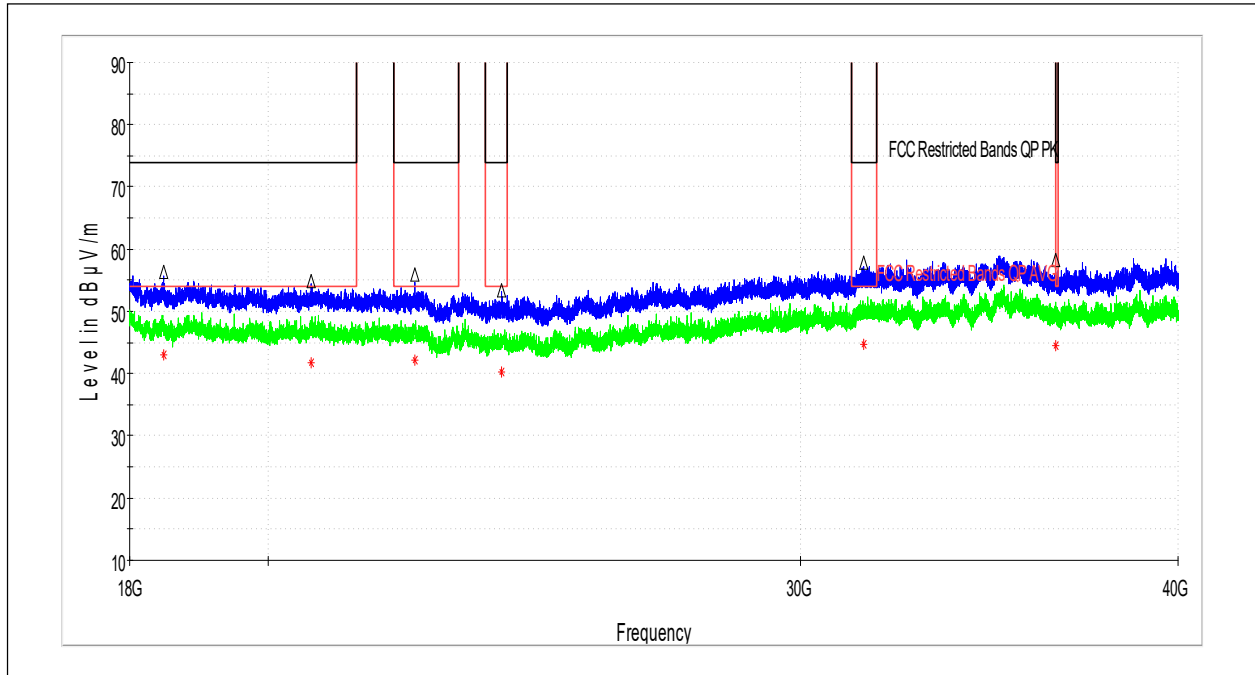
Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None

<sup>1</sup> The “worst-case” scenario between the low, middle, and high channels



**BLE, 2Mbps**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18467.000	56.35	73.98	17.63	410.0	V	0.0	27.7
20663.000	54.92	73.98	19.06	100.0	H	0.0	20.6
22364.000	55.90	73.98	18.08	410.0	H	347.0	15.5
23891.000	53.35	73.98	20.63	410.0	V	0.0	13.8
31488.000	57.80	73.98	16.18	410.0	H	0.0	22.7
36436.000	58.18	73.98	15.80	410.0	V	0.0	23.5

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18467.000	43.09	53.98	10.89	410.0	V	0.0	27.7
20663.000	41.65	53.98	12.33	100.0	H	0.0	20.6
22364.000	42.26	53.98	11.72	410.0	H	347.0	15.5
23891.000	40.23	53.98	13.75	410.0	V	0.0	13.8
31488.000	44.72	53.98	9.26	410.0	H	0.0	22.7
36436.000	44.58	53.98	9.40	410.0	V	0.0	23.5

Test Personnel: Jeremiah Andrade  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
 FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/10/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 27.5 °C  
 Relative Humidity: 41.3 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None

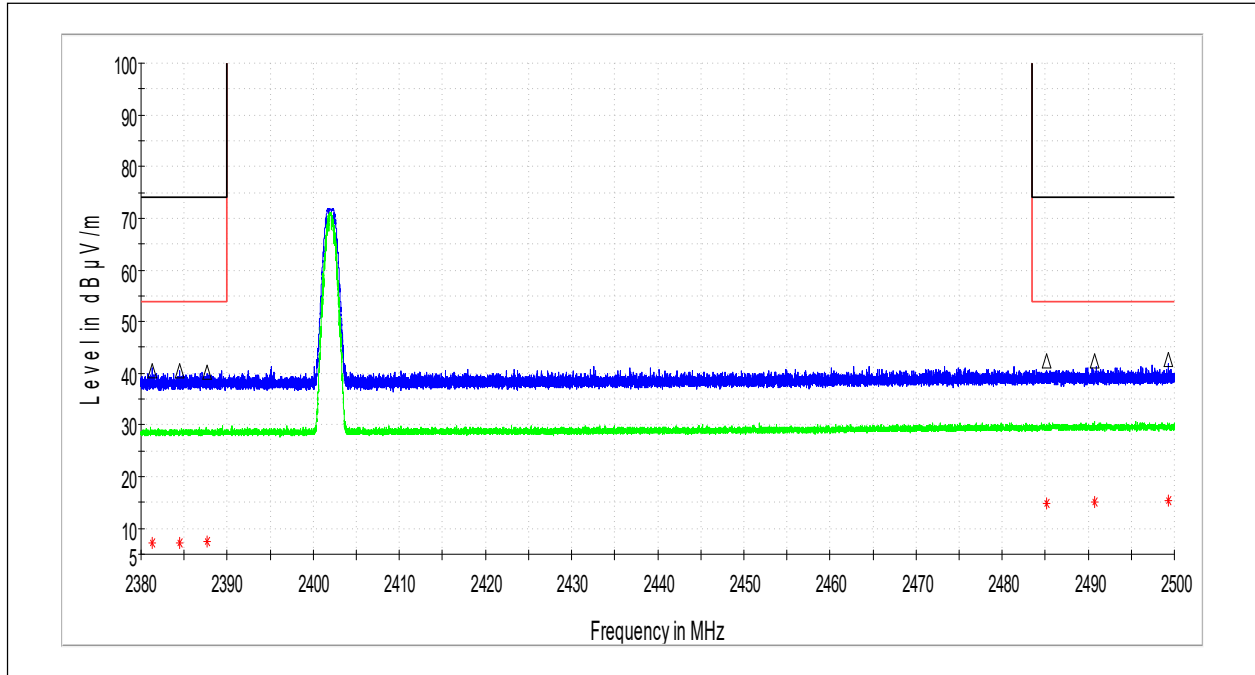




**10.8 Test Data: Radiated Emissions, Band Edge**

**10.8.1 BLE, 1Mbps**

**10.8.1.1 Low Channel Band Edge**



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2381.333	40.62	73.98	33.36	100.0	V	258.0	38.2
2384.513	40.42	73.98	33.56	167.0	V	214.0	38.3
2387.640	40.29	73.98	33.69	100.0	H	175.0	38.3
2485.160	42.46	73.98	31.52	153.0	V	0.0	38.9
2490.693	42.49	73.98	31.49	321.0	V	259.0	38.9
2499.260	42.67	73.98	31.31	306.0	V	112.0	38.9

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2381.333	7.06	53.98	46.92	100.0	V	258.0	38.2
2384.513	7.29	53.98	46.69	167.0	V	214.0	38.3
2387.640	7.47	53.98	46.51	100.0	H	175.0	38.3
2485.160	14.95	53.98	39.03	153.0	V	0.0	38.9
2490.693	15.09	53.98	38.89	321.0	V	259.0	38.9
2499.260	15.40	53.98	38.58	306.0	V	112.0	38.9

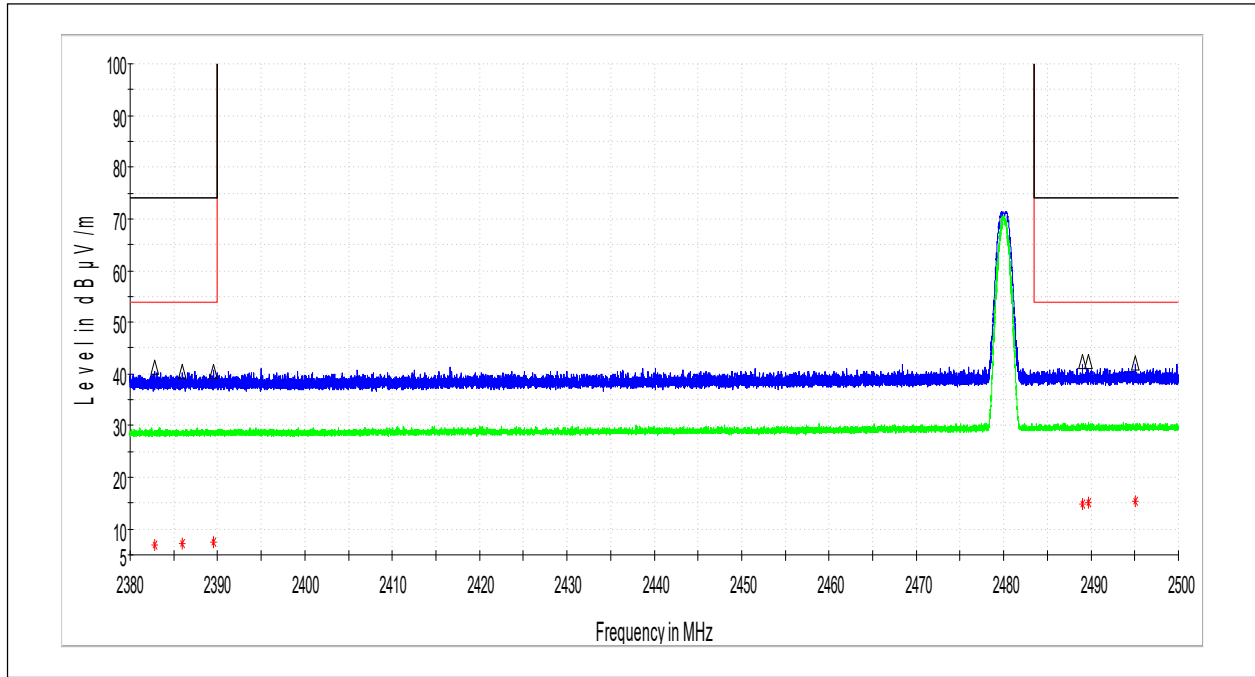
Test Personnel: Seth Parker  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
 FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/24/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 23.9 °C  
 Relative Humidity: 48.7 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



**10.8.1.2 High Channel Band Edge**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2382.827	41.27	73.98	32.71	175.0	V	128.0	38.2
2385.987	40.44	73.98	33.54	258.0	H	92.0	38.3
2389.580	40.58	73.98	33.40	373.0	V	154.0	38.3
2488.993	42.36	73.98	31.62	410.0	H	332.0	38.9
2489.673	42.45	73.98	31.53	247.0	H	70.0	38.9
2495.100	42.07	73.98	31.91	339.0	V	154.0	38.9

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2382.827	7.02	53.98	46.96	175.0	V	128.0	38.2
2385.987	7.28	53.98	46.70	258.0	H	92.0	38.3
2389.580	7.44	53.98	46.54	373.0	V	154.0	38.3
2488.993	14.96	53.98	39.02	410.0	H	332.0	38.9
2489.673	15.02	53.98	38.96	247.0	H	70.0	38.9
2495.100	15.25	53.98	38.73	339.0	V	154.0	38.9

Test Personnel: Seth Parker  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
 FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

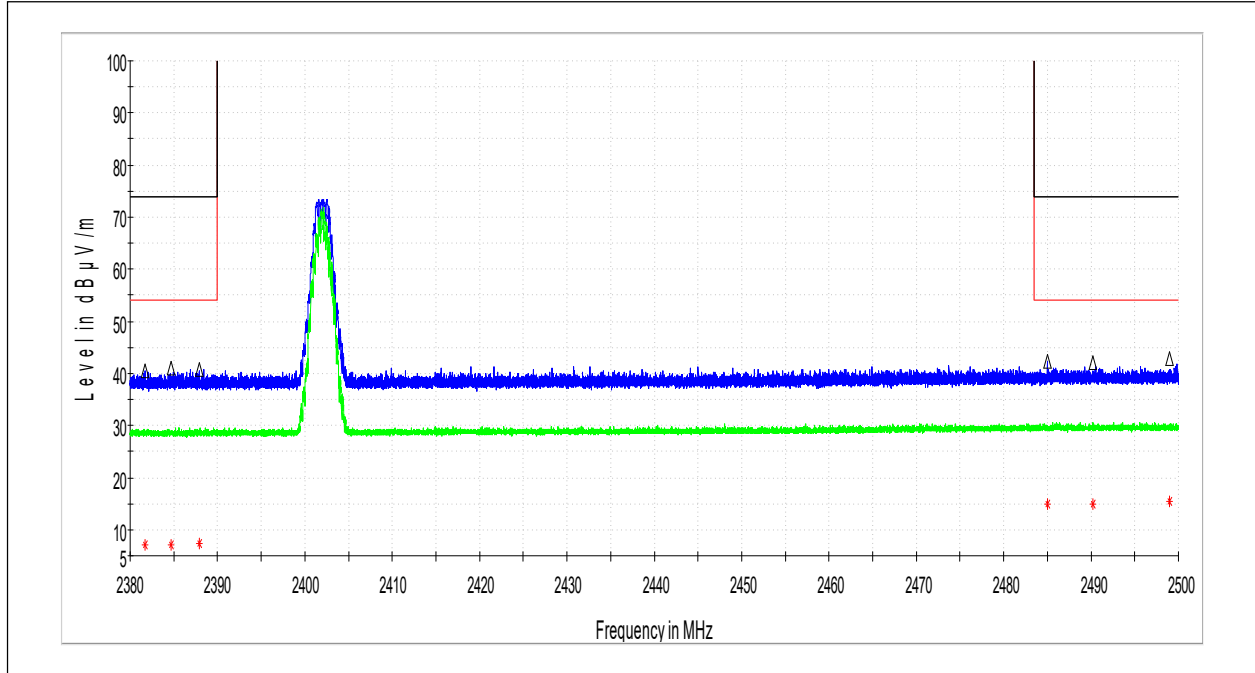
Test Date: 6/24/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 23.9 °C  
 Relative Humidity: 48.7 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



10.8.2 BLE, 2Mbps

10.8.2.1 Low Channel Band Edge



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2381.673	40.58	73.98	33.40	176.0	V	0.0	38.2
2384.667	41.09	73.98	32.89	235.0	H	275.0	38.3
2387.887	40.85	73.98	33.13	154.0	V	209.0	38.3
2484.973	42.41	73.98	31.57	189.0	V	332.0	38.9
2490.213	41.97	73.98	32.01	385.0	H	293.0	38.9
2498.993	42.92	73.98	31.06	186.0	V	348.0	38.9

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2381.673	6.99	53.98	46.99	176.0	V	0.0	38.2
2384.667	7.12	53.98	46.86	235.0	H	275.0	38.3
2387.887	7.33	53.98	46.65	154.0	V	209.0	38.3
2484.973	14.87	53.98	39.11	189.0	V	332.0	38.9
2490.213	15.02	53.98	38.96	385.0	H	293.0	38.9
2498.993	15.31	53.98	38.67	186.0	V	348.0	38.9

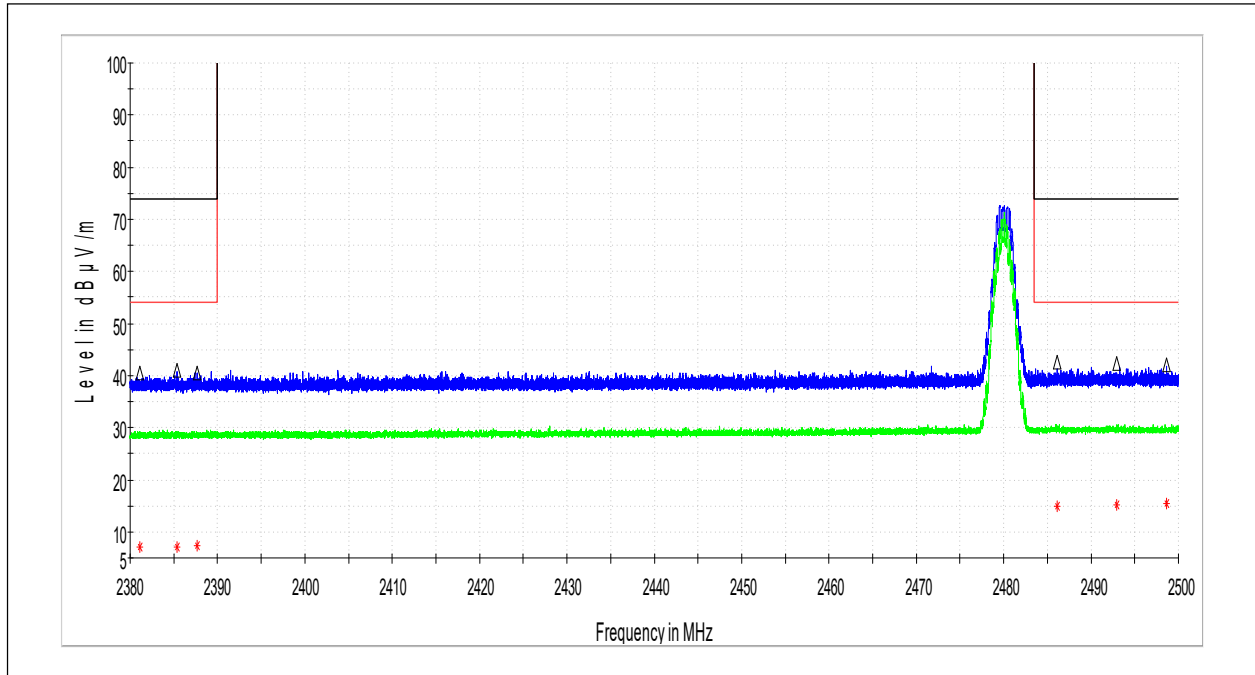
Test Personnel: Seth Parker  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
 FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/24/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 23.9 °C  
 Relative Humidity: 48.7 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



**10.8.2.2 High Channel Band Edge**



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2381.080	40.53	73.98	33.45	283.0	H	0.0	38.3
2385.393	41.11	73.98	32.87	339.0	V	0.0	38.3
2387.647	40.62	73.98	33.36	209.0	H	0.0	38.3
2486.153	42.54	73.98	31.44	363.0	H	1.0	38.9
2492.893	42.43	73.98	31.55	188.0	H	249.0	38.9
2498.627	42.14	73.98	31.84	153.0	V	315.0	38.9

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2381.080	6.97	53.98	47.01	283.0	H	0.0	38.3
2385.393	7.06	53.98	46.92	339.0	V	0.0	38.3
2387.647	7.24	53.98	46.74	209.0	H	0.0	38.3
2486.153	14.89	53.98	39.09	363.0	H	1.0	38.9
2492.893	15.19	53.98	38.79	188.0	H	249.0	38.9
2498.627	15.33	53.98	38.65	153.0	V	315.0	38.9

Test Personnel: Seth Parker  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) NA  
 FCC 15.247  
 Product Standard: RSS-247  
 Input Voltage: Battery

Test Date: 6/24/2024  
 Limit Applied: See Section 10.2  
 Ambient Temperature: 23.9 °C  
 Relative Humidity: 48.7 %  
 Atmospheric Pressure: 982.0 mbar

Deviations, Additions, or Exclusions: None



## 11 Antenna Requirement

### 11.1 Test Limits

#### FCC Part 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

#### RSS-Gen Issue 5 § 6.8:

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

*This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.*

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

### 11.2 Test Results

The device was found to be **compliant**. The device has an internal, permanently affixed antenna.



**12 Revision History**

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	7/15/2024	105820250LEX-001	<i>SP</i>	<i>MC</i>	Original Issue