

Report No.: SEWM2212000294RG01

Rev.: 01

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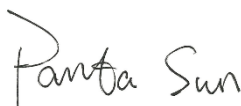
# TEST REPORT

**Application No.:** SEWM2212000294RG  
**Applicant:** Sony Corporation  
**Address of Applicant:** 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan  
**Manufacturer:** Sony Corporation  
**Address of Manufacturer:** 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan  
**EUT Description:** BT Sensor  
**Trade Mark:** SONY  
**FCC ID:** PY7-35141E  
**Standards:** FCC 47 CFR Part 2, Subpart J  
FCC 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2022/11/24  
**Date of Test:** 2022/12/08 to 2022/12/09  
**Date of Issue:** 2022/12/09

<b>Test Result :</b>	<b>PASS *</b>
----------------------	---------------

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Panta Sun  
Wireless Laboratory Manager



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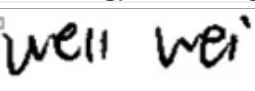
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## 1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022/12/09		Original

Prepared By	
	(Ives Cheng) / Test Engineer
Checked By	
	(Well Wei) / Reviewer



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## 2 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result
Antenna Requirement	15.203/15.247(b)	--	Clause 4.1	PASS
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013 Section 6.2	Clause 4.2	N/A
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013 Section 11.9.2.3	Clause 4.4	PASS
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013 Section 11.8 Option 2 / 6.9.3	Clause 4.5	PASS
Power Spectral Density	15.247 (e)	ANSI C63.10 2013 Section 11.10.2	Clause 4.6	PASS
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013 Section 11.11	Clause 4.7	PASS
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013 Section 11.11	Clause 4.8	PASS
Radiated Spurious Emissions	15.205/15.209	ANSI C63.10 2013 Section 11.12	Clause 4.9	PASS
Restricted bands around fundamental frequency (Radiated Emission)	15.205/15.209	ANSI C63.10 2013 Section 11.12	Clause 4.10	PASS
Remark: For the Result, the "N/A" denotes "not applicable".				



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### 3 General Information

#### 3.1 Details of Client

Applicant:	Sony Corporation
Address of Applicant:	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer:	Sony Corporation
Address of Manufacturer:	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan

#### 3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Ives Cheng, King-p Li

#### 3.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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### 3.4 General Description of EUT

EUT Description:	BT Sensor	
Trade Mark:	SONY	
Hardware Version:	A	
Software Version:	0.25	
SN:	RF Conducted	SMSBBCARL4R00142
	RSE	SMSBBCARL4R0003A
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 2 MHz, where: -fc = “Operating Frequency” in MHz, -N = “Channel Number” with the range from 0 to 39.	
Bluetooth version:	Bluetooth V5.0	
Modulation Type:	GFSK	
Number of Channel:	40	
Rates Type*:	<input checked="" type="checkbox"/> Provided by client	
	1M PHY	2M PHY
Antenna Type:	PIFA Antenna	
Antenna Gain:	1.09dBi	
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
RF Cable:	0.8dB	
Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion. Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.		

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

Remark:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel(CH0)	2402MHz
The Middle channel(CH19)	2440MHz
The Highest channel(CH39)	2480MHz



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### 3.5 Test Environment

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	3.3-4.2
Remark: NV: Normal Voltage NT: Normal Temperature		

### 3.6 Description of Support Units

The EUT has been tested as an independent unit.



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## 4 Test results and Measurement Data

### 4.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203 /247(b)
<p>15.203 requirement: 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, 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.</p> <p>15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> <p>The antenna is PIFA Antenna on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.09dBi.</p> <p><i>Note:</i> <i>The antenna gain are derived from the gain information report provided by the manufacturer.</i></p> <p><i>Remark:</i> <i>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</i></p>	



## 4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013 Section 6.2		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range(MHz)	Limit (dBuV)	
		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.			
Test Procedure:	<ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li> <li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.</li> <li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li> <li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</li> </ol>		



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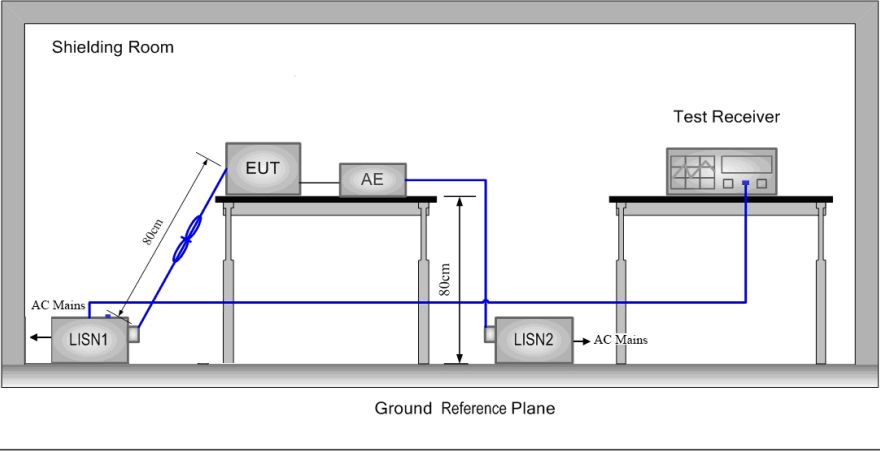
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Test Setup:	
Test Mode:	Transmitting with GFSK modulation. Charge +Transmitting mode.
Instruments Used:	Refer to section 6 for details.
Test Results:	N/A Remark:The function Bluetooth Low Energy (BLE) of this device PY7-35141E is disabled by the software during charging. Therefore, this device PY7-35141E does not need to be tested AC Power Line Conducted Emission (15.207) for FCC certificate.

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## 4.3 Duty Cycle

The detailed test data see: **Appendix**



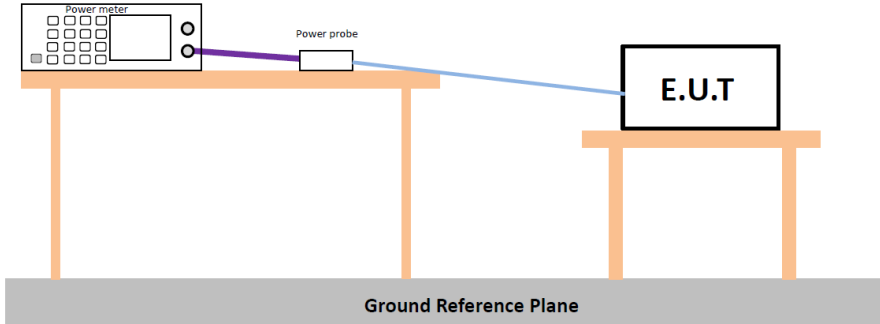
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## 4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2013 Section11.9.1.3&11.9.2.3.1
Test Setup:	
Test Instruments:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	30dBm
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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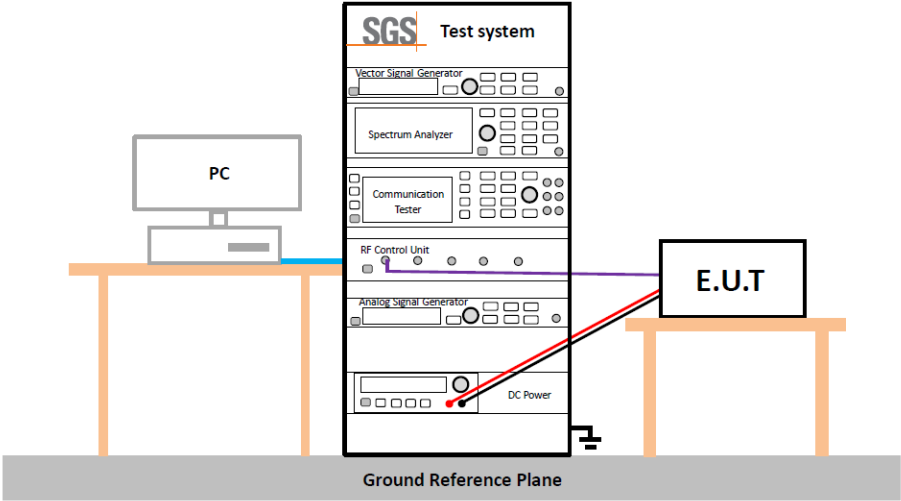
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#### 4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

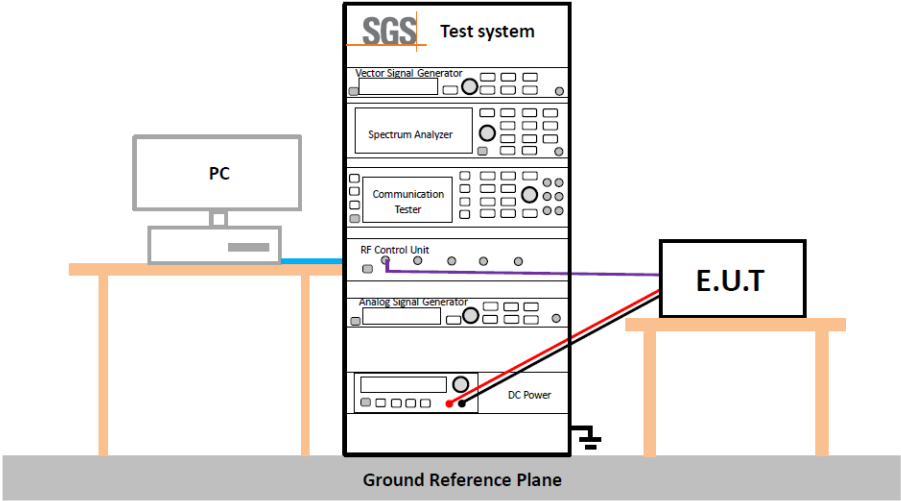
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8 Option 2 / 6.9.3
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	$\geq 500$ kHz
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	

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## 4.6 Power Spectral Density

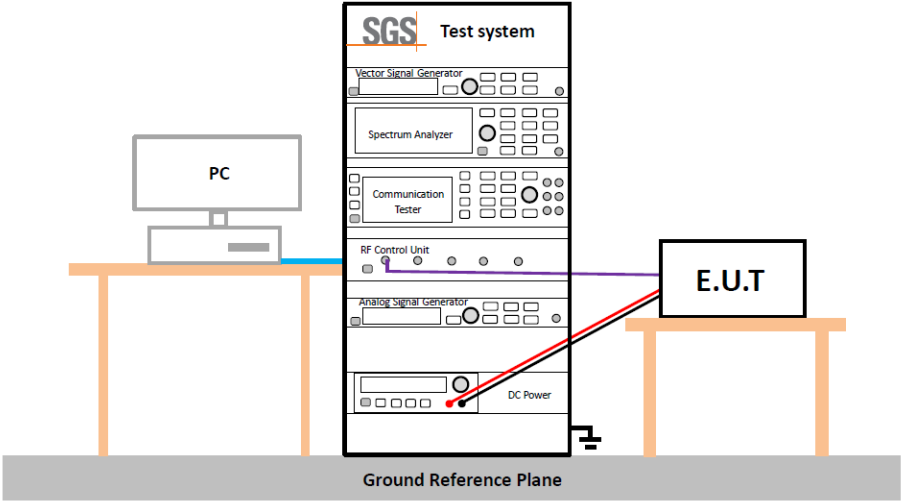
Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
Test Setup:	
Test Instruments:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	≤8.00dBm/3kHz
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	

## 4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	

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## 4.8 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	

## 4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Test Frequency:	9kHz ~ 25GHz				
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					

### Test Setup:

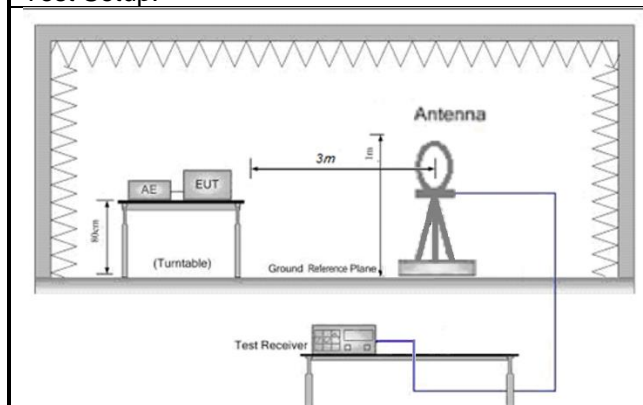


Figure 1. Below 30MHz

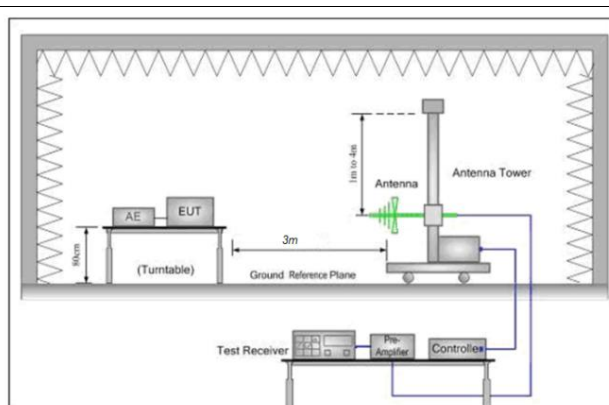


Figure 2. 30MHz to 1GHz

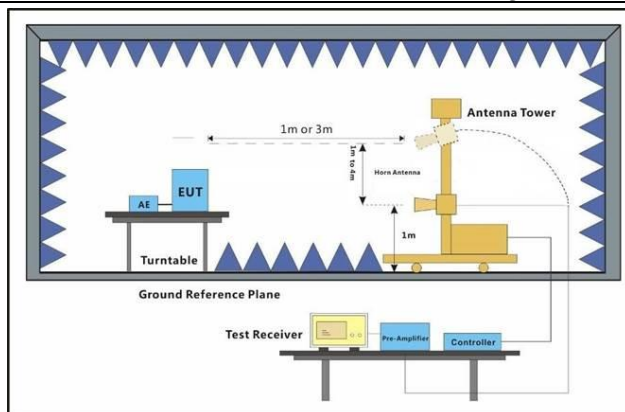


Figure 3. Above 1 GHz

<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements &gt;18GHz).</li> <li>The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>Test the EUT in the lowest channel, the middle channel, the Highest channel.</li> <li>The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> <li>The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported</li> <li>The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.</li> <li>At a measurement distance of 1 meter the limit line was increased by <math>20 \cdot \log(3/1) = 9.54 \text{ dB}</math>.</li> </ol>
<p>Test Configuration:</p>	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>RBW = 120 kHz</li> <li>VBW = 300 kHz</li> <li>Detector = Peak</li> <li>Trace mode = max hold</li> </ul>

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	<p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW ≥ 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW ≥ [3 *RBW]</li> <li>• Detector = RMS (power averaging), if span / (# of points in sweep) ≤ (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.</li> <li>• Sweep time = auto</li> <li>• Perform a trace average of at least 100 traces.</li> </ul>
Exploratory Test Mode:	Transmitting with GFSK modulation. Charge + Transmitting mode.
Final Test Mode:	Transmitting with GFSK modulation. Pretest the EUT at Charge + Transmitting mode, For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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### 4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

#### Test Setup:

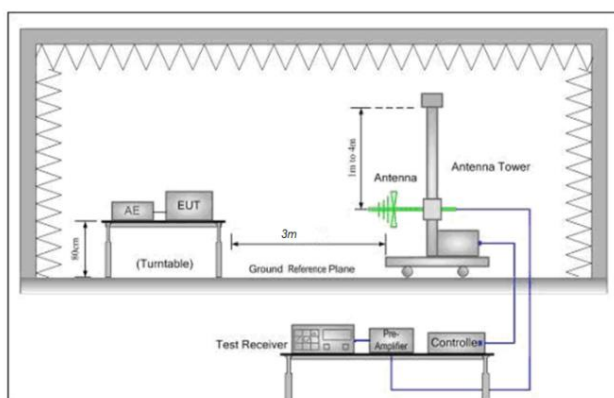


Figure 1. 30MHz to 1GHz

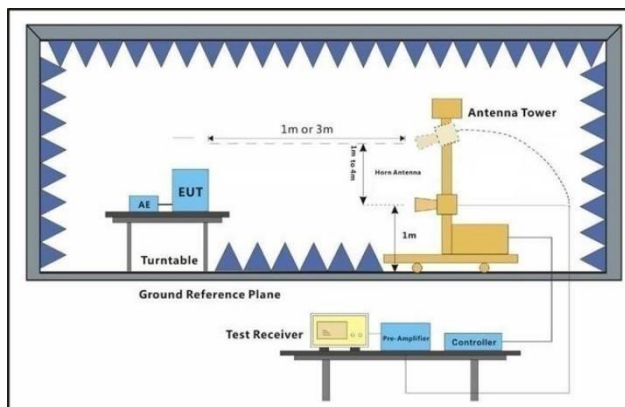


Figure 2. Above 1 GHz

#### Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- Place a marker at the end of the restricted band closest to the transmit

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	<p>frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</p> <p>h. Test the EUT in the lowest channel , the Highest channel</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW ≥ 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW ≥ [3 *RBW]</li> <li>• Detector = RMS (power averaging), if span / (# of points in sweep) ≤ (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.</li> <li>• Sweep time = auto</li> <li>• Perform a trace average of at least 100 traces.</li> </ul>
Exploratory Test Mode:	<p>Transmitting with GFSK modulation.</p> <p>Charge + Transmitting mode.</p>
Final Test Mode:	<p>Transmitting with GFSK modulation.</p> <p>Pretest the EUT at Charge + Transmitting mode.</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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## 5 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	$\pm 0.54\text{dB}$
2	RF power density, conducted	$\pm 1.03\text{dB}$
3	Spurious emissions, conducted	$\pm 0.54\text{dB}$
4	Radio Frequency	$\pm 1.0\%$
5	Duty Cycle	$\pm 0.37\%$
6	Occupied Bandwidth	$\pm 1.0\%$
7	Conduction Emission	$\pm 2.90\text{dB}$ (150kHz to 30MHz)
8	Radiated Emission	$\pm 3.13\text{dB}$ (9k -30MHz)
		$\pm 4.80\text{dB}$ (30M -1GHz)
		$\pm 4.80\text{dB}$ (1GHz to 18GHz)
		$\pm 4.80\text{dB}$ (Above 18GHz)

**Remark:**

The  $U_{\text{lab}}$  (lab Uncertainty) is less than  $U_{\text{CISPR/ETSI}}$  (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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## 6 Equipment List

RF Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSV3030	SUWI-01-02-02	2022/05/17	2023/05/16
Measurement Software	Tonscend	JS1120-3 Test System V3.1.55	SUWI-02-09-09	NCR	NCR
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2022/02/15	2023/02/14
Power meter	Anritsu	ML2495A	SUWI-01-31-01	2022/11/23	2023/11/22
Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	2022/11/23	2023/11/22
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-01	2022/02/15	2023/02/14

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	SUWI-04-03-01	2021/05/08	2024/05/07
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-01	2022/02/16	2023/02/15
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-02	2022/02/16	2023/02/15
Measurement Software	Tonscend	JS32-CE V4.0.0.2	SUWI-02-09-05	NCR	NCR
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/16	2023/02/15
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2022/02/16	2023/02/15



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RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date (yyyy/mm/dd)	Cal Due Date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-05	2022/11/23	2023/11/22
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2022/02/15	2023/02/14
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9163	SUWI-01-11-01	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/05/14	2023/05/13
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2022/02/19	2023/02/18
Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
Measurement Software	Tonscend	JS32-RE V4.0.0.0	SUWI-02-09-04	NCR	NCR



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## 7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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# Appendix



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## DTS Bandwidth Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.67	2401.66	2402.32	$\geq 0.5$	PASS
		2440	0.66	2439.66	2440.32	$\geq 0.5$	PASS
		2480	0.67	2479.66	2480.33	$\geq 0.5$	PASS
BLE_2M	Ant1	2402	1.13	2401.44	2402.57	$\geq 0.5$	PASS
		2440	1.12	2439.44	2440.56	$\geq 0.5$	PASS
		2480	1.13	2479.44	2480.56	$\geq 0.5$	PASS



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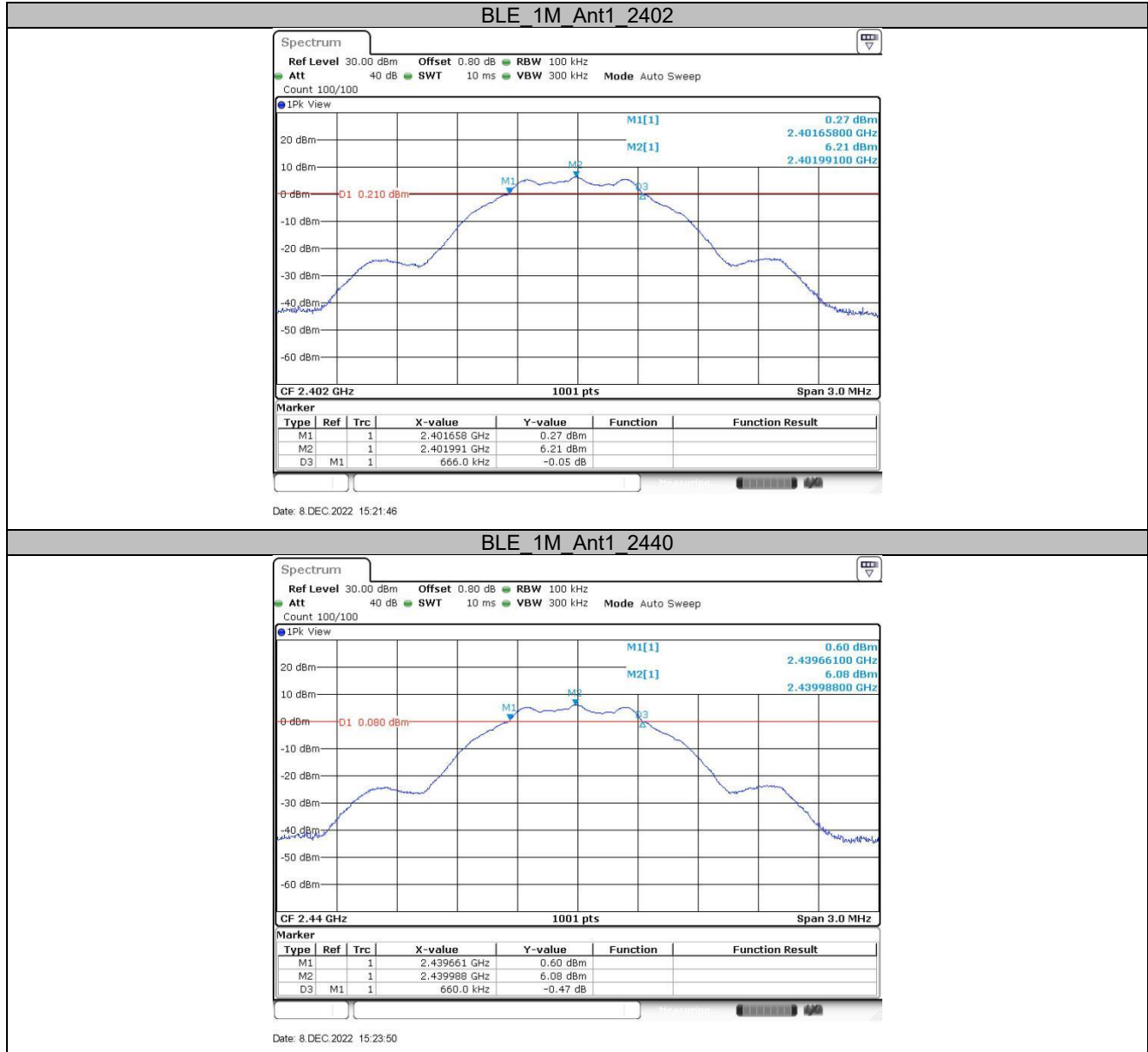
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### Test Graphs



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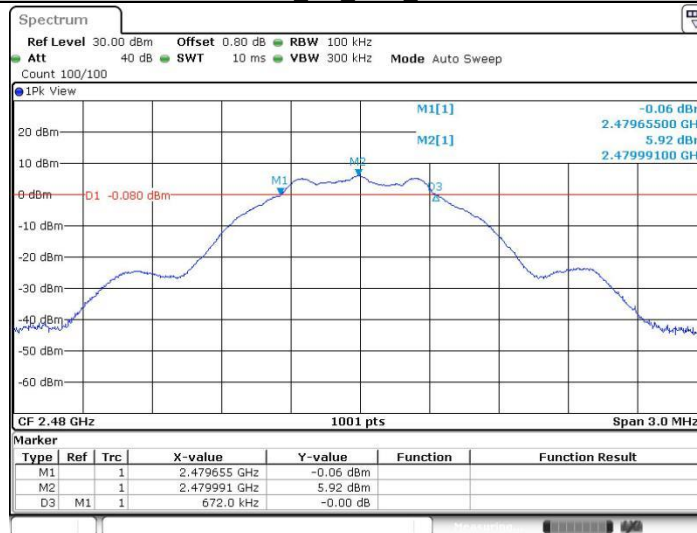
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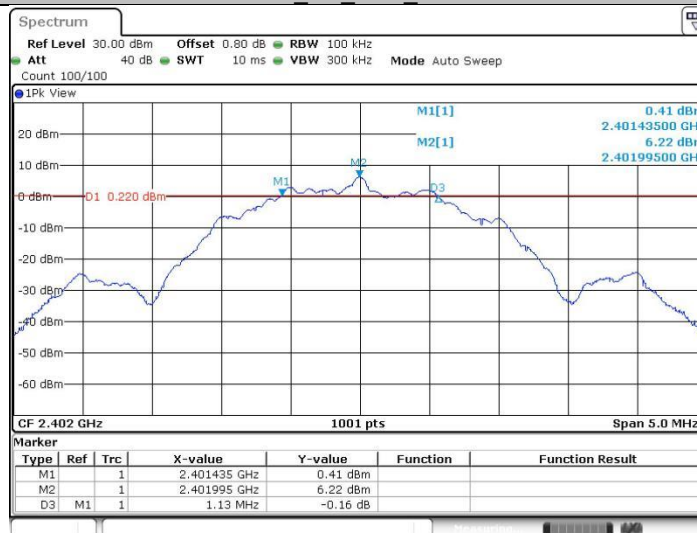
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### BLE\_1M\_Ant1\_2480



Date: 8 DEC 2022 15:26:12

### BLE\_2M\_Ant1\_2402



Date: 8 DEC 2022 15:28:34



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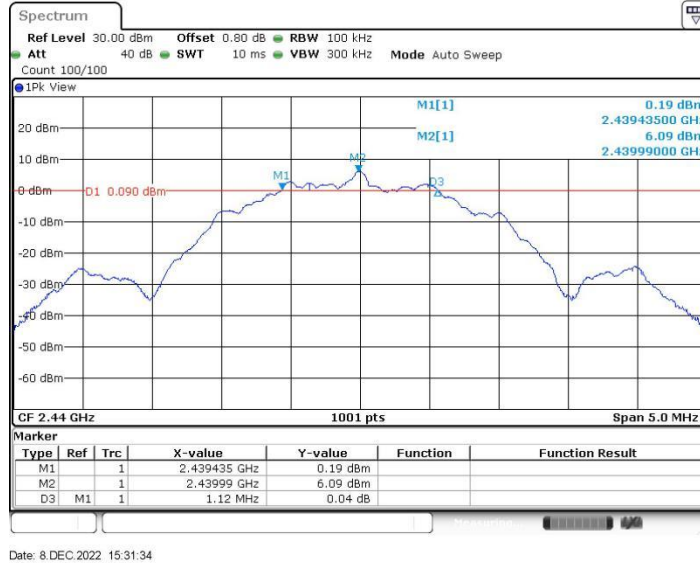
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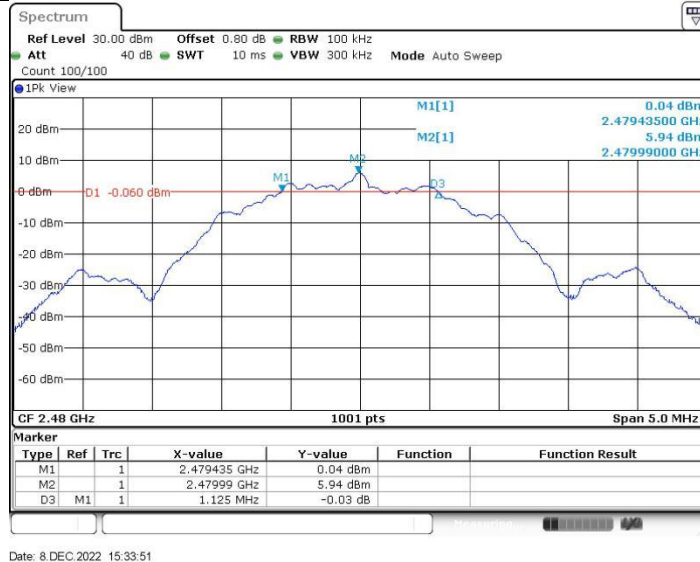
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### BLE\_2M\_Ant1\_2440



### BLE\_2M\_Ant1\_2480



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## Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.037	2401.4815	2402.5185	---	---
		2440	1.043	2439.4785	2440.5215	---	---
		2480	1.043	2479.4785	2480.5215	---	---
BLE_2M	Ant1	2402	2.103	2400.9510	2403.0539	---	---
		2440	2.103	2438.9510	2441.0539	---	---
		2480	2.103	2478.9510	2481.0539	---	---



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### Test Graphs



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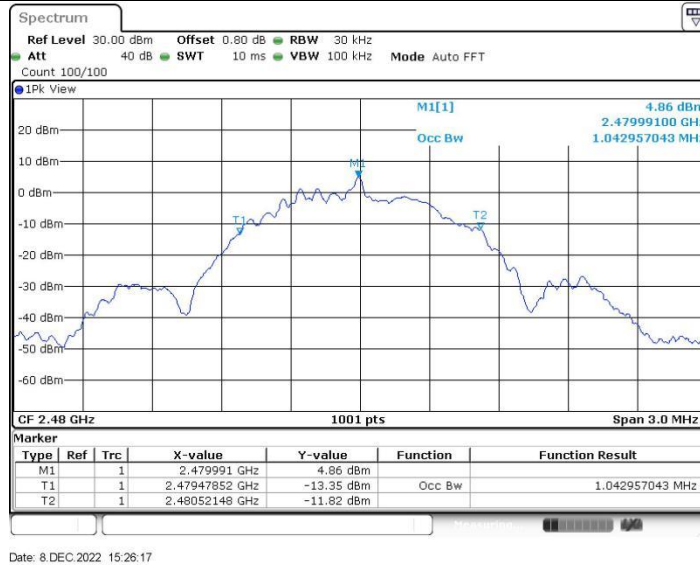
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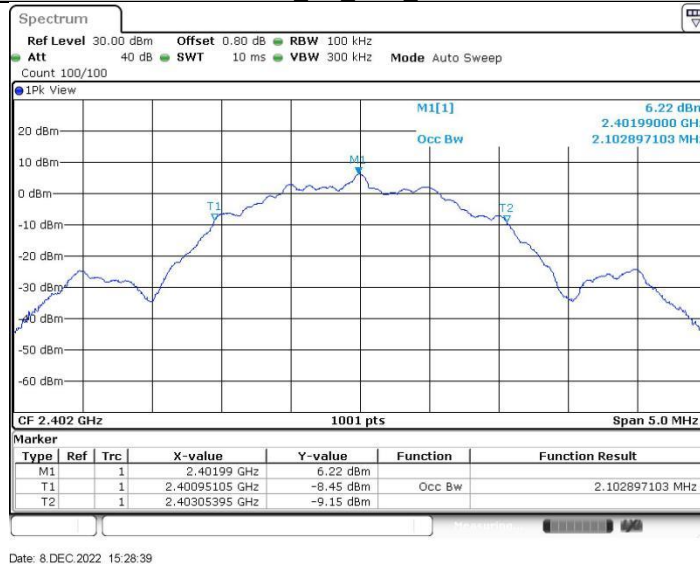
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### BLE\_2M\_Ant1\_2402



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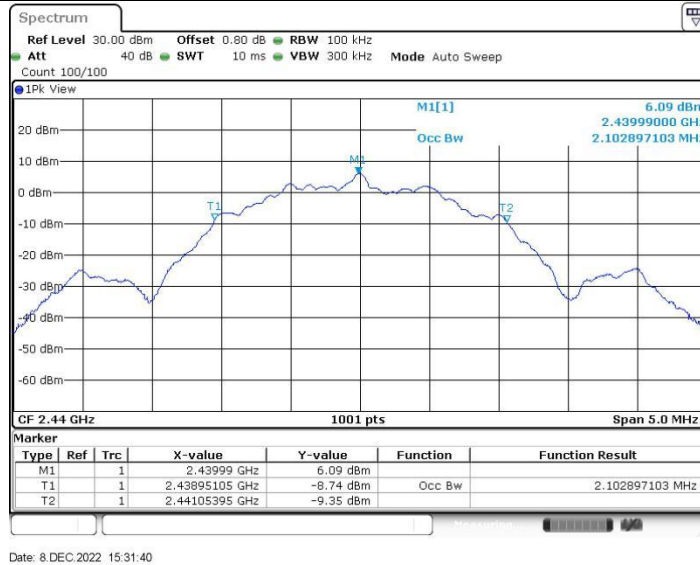
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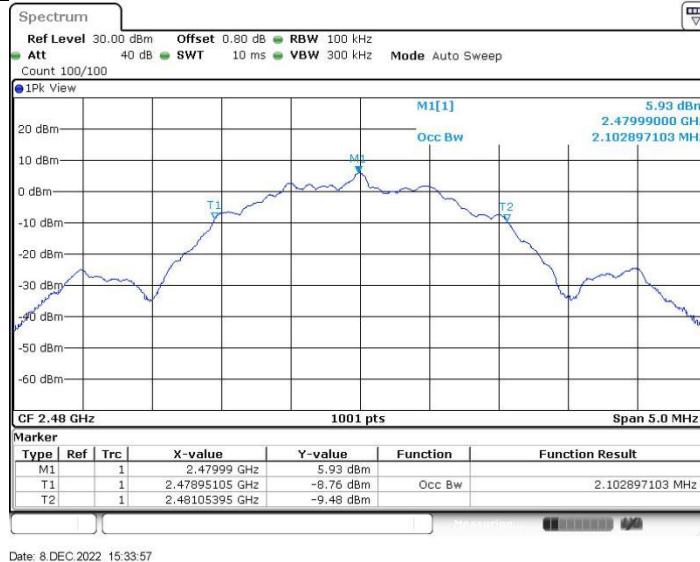
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## Maximum conducted output power Test Result

TestMode	Antenna	Channel	Result[dBm]	Averaged Power [dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	6.32	5.82	≤30	PASS
		2440	6.18	5.83	≤30	PASS
		2480	6.04	5.55	≤30	PASS
BLE_2M	Ant1	2402	6.32	5.85	≤30	PASS
		2440	6.19	5.74	≤30	PASS
		2480	6.04	5.61	≤30	PASS

Remark:

- 1) The Duty Cycle Factor is compensated when testing Average power.



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## Maximum power spectral density

### Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-9.06	≤8.00	PASS
		2440	-9.22	≤8.00	PASS
		2480	-9.24	≤8.00	PASS
BLE_2M	Ant1	2402	-9.90	≤8.00	PASS
		2440	-10.03	≤8.00	PASS
		2480	-10.13	≤8.00	PASS



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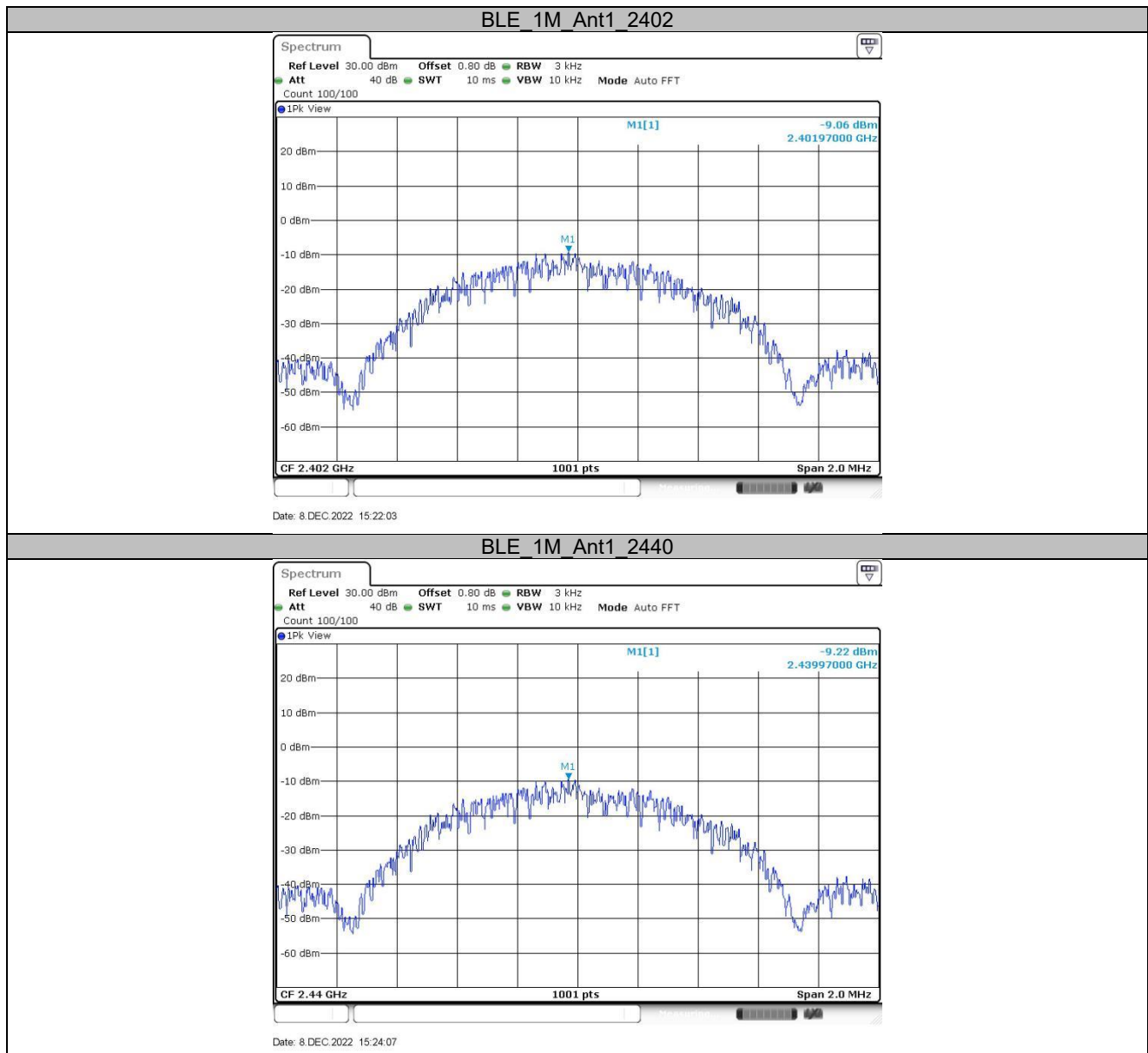
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### Test Graphs



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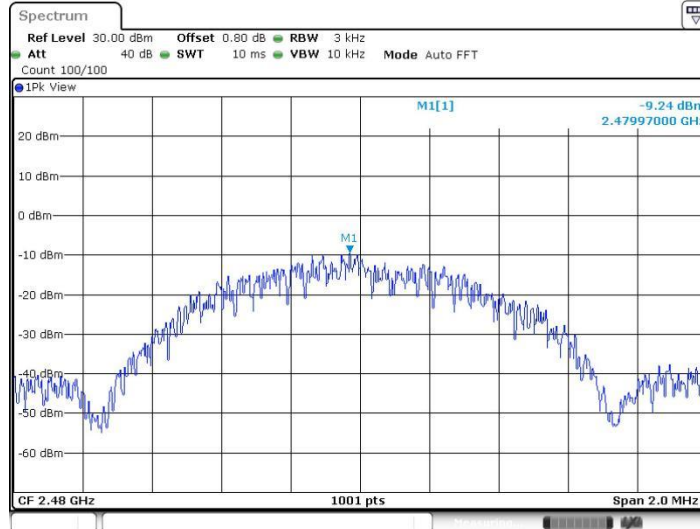
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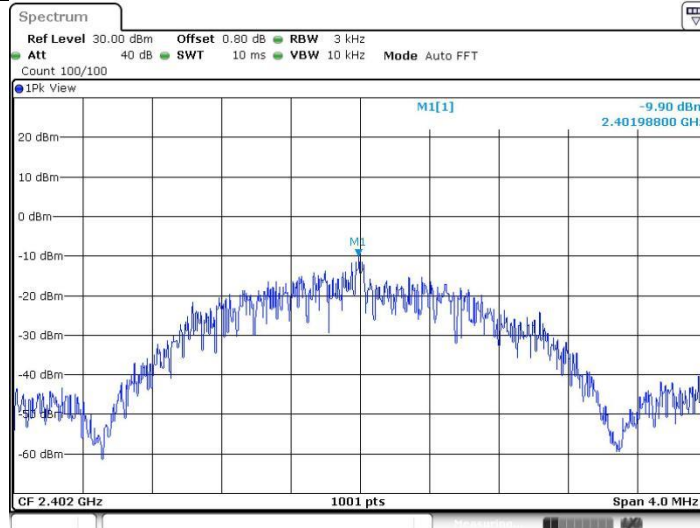
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### BLE\_1M\_Ant1\_2480



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### BLE\_2M\_Ant1\_2402



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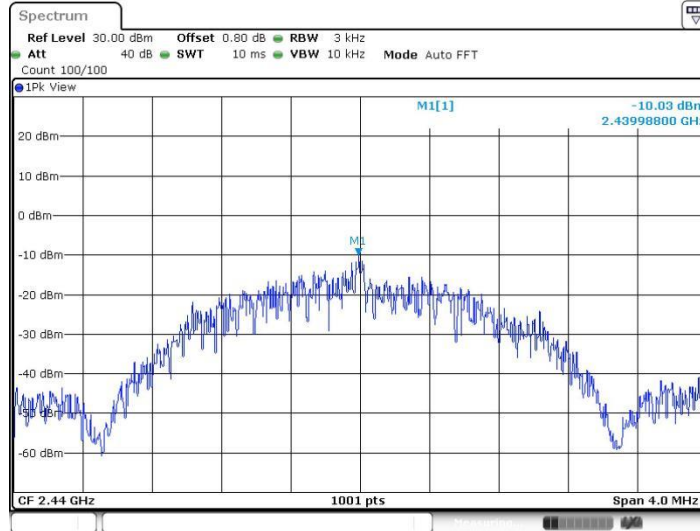
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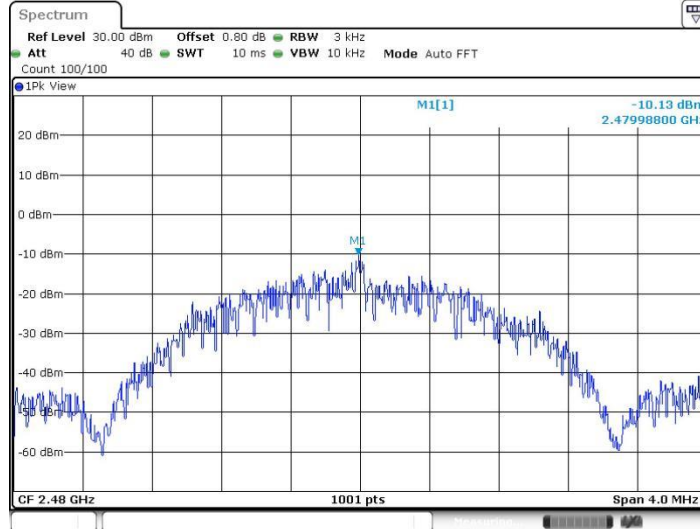
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### BLE\_2M\_Ant1\_2440



Date: 8 DEC 2022 15:31:51

### BLE\_2M\_Ant1\_2480



Date: 8 DEC 2022 15:34:08



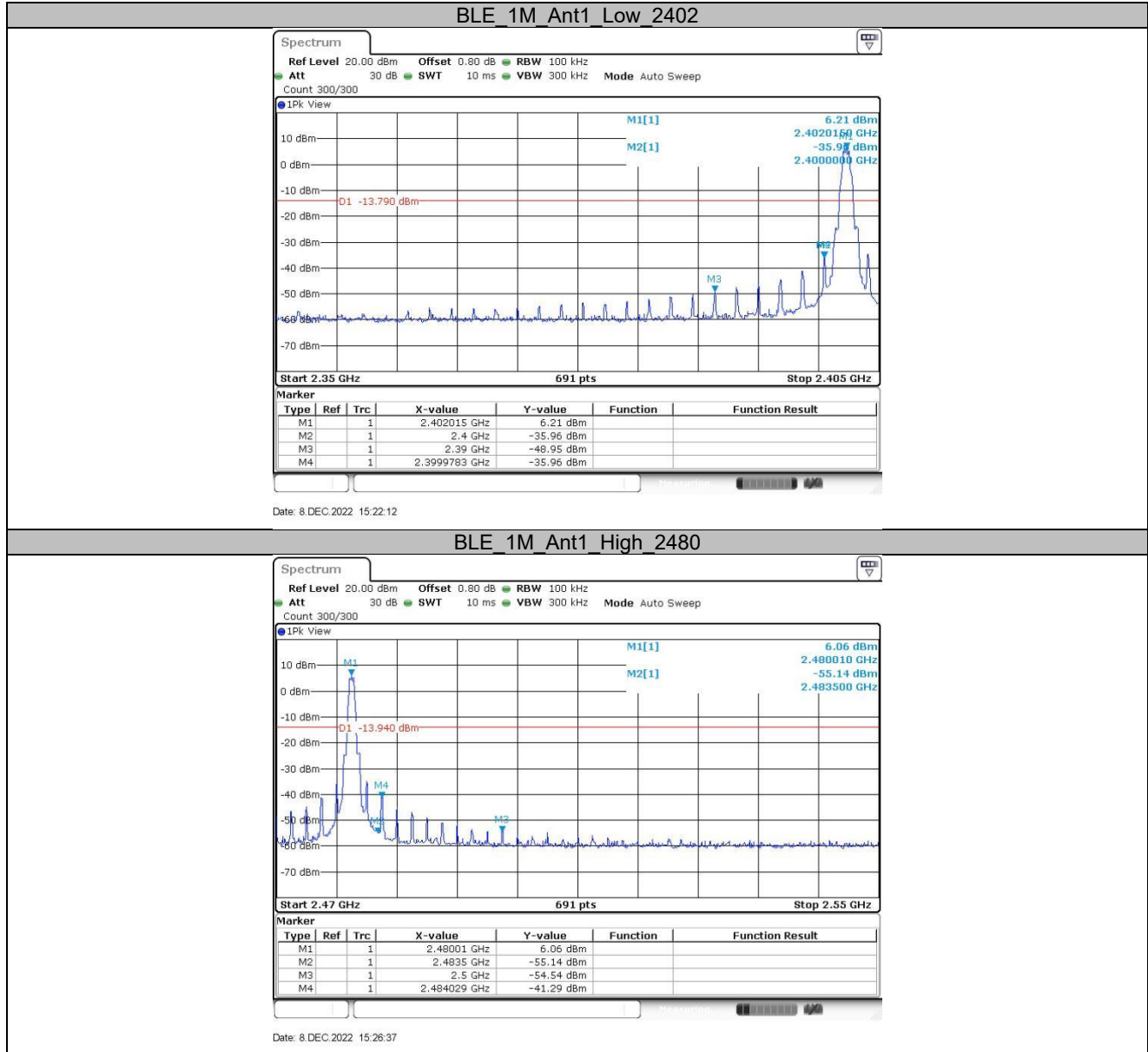
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### Band edge measurements

### Test Graphs

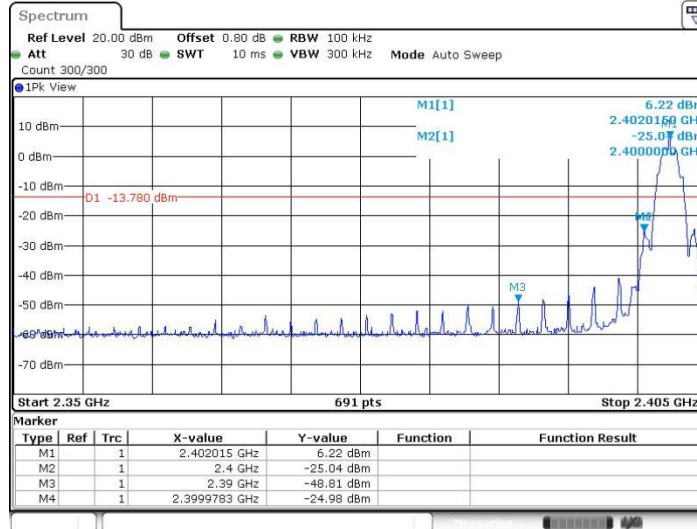


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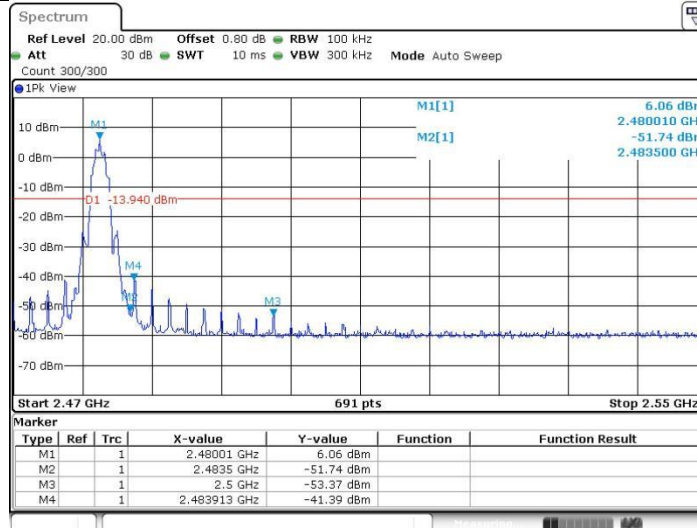
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### BLE 2M Ant1 Low 2402



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### BLE 2M Ant1 High 2480



Date: 8 DEC 2022 15:34:17



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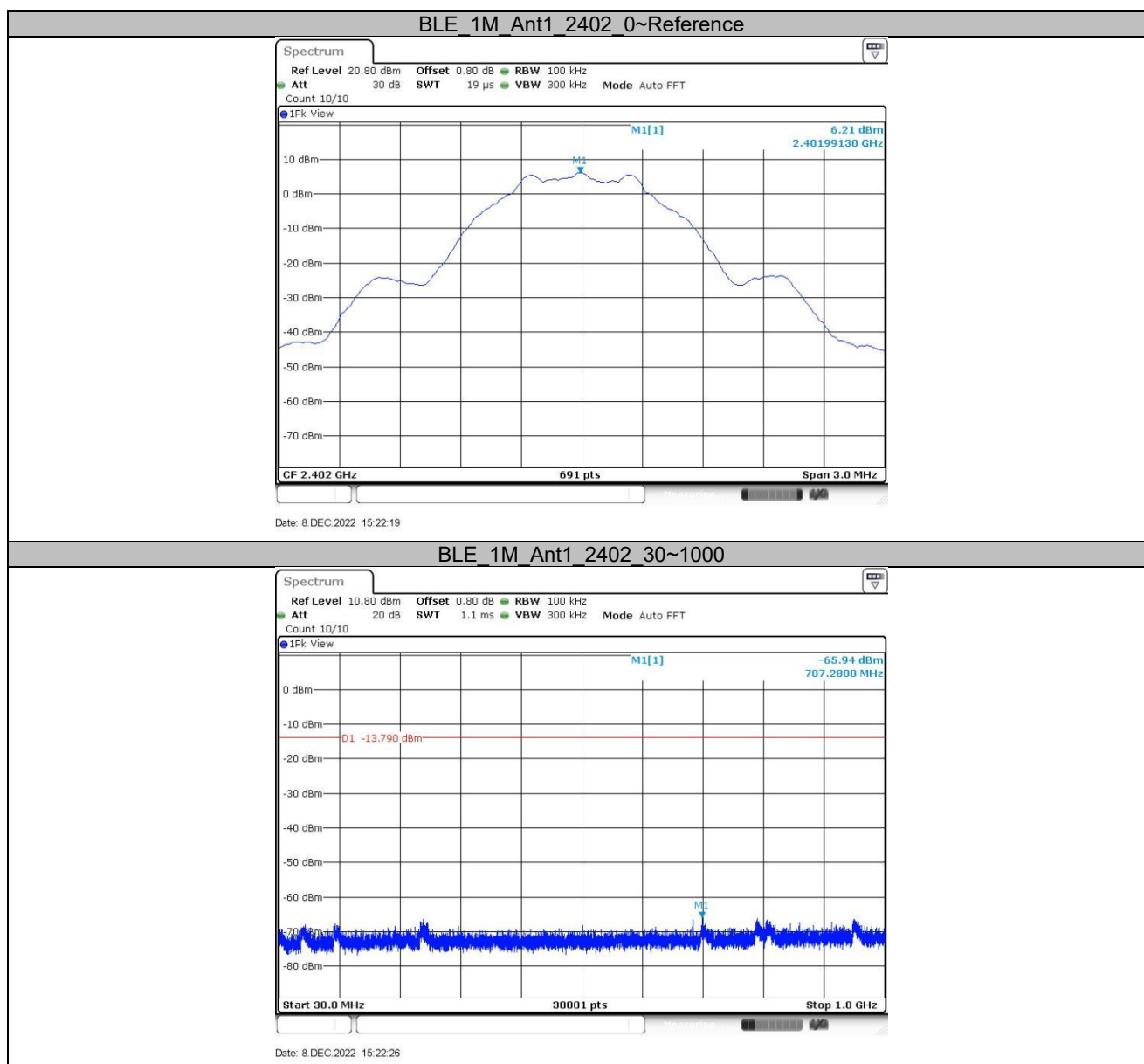
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### Conducted Spurious Emission Test Graphs



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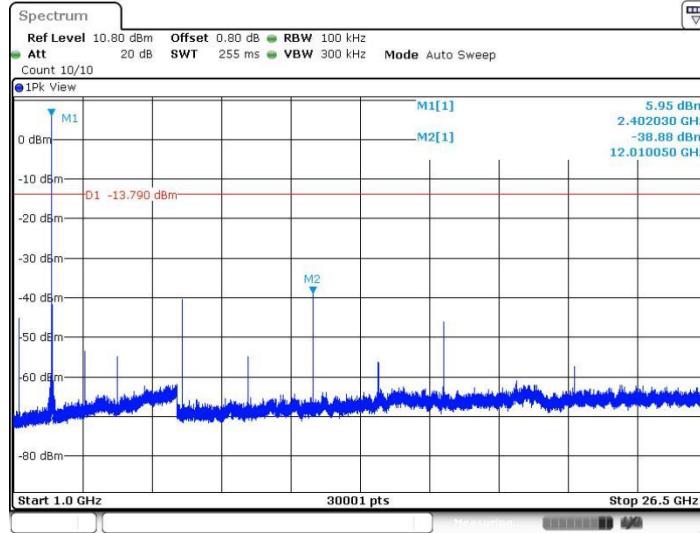
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### BLE 1M Ant1 2402 1000~26500



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### BLE 1M Ant1 2440 0~Reference



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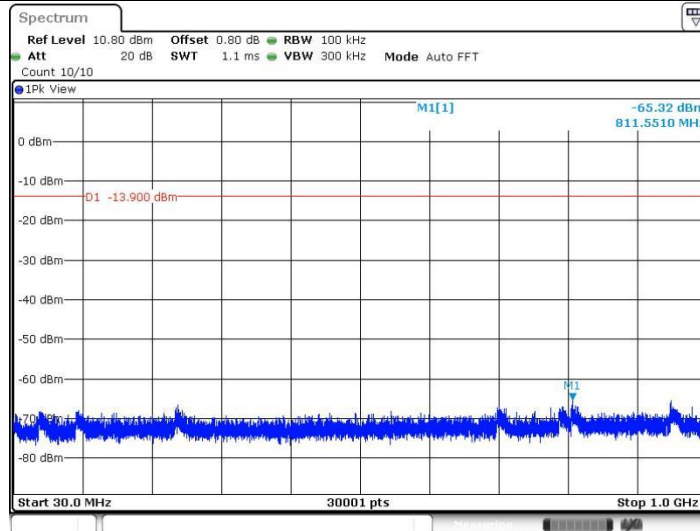
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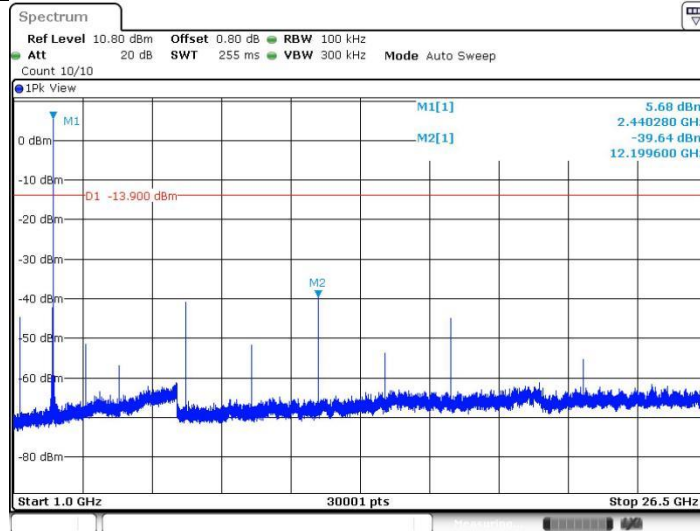
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BLE\_1M\_Ant1\_2440\_30~1000



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BLE\_1M\_Ant1\_2440\_1000~26500



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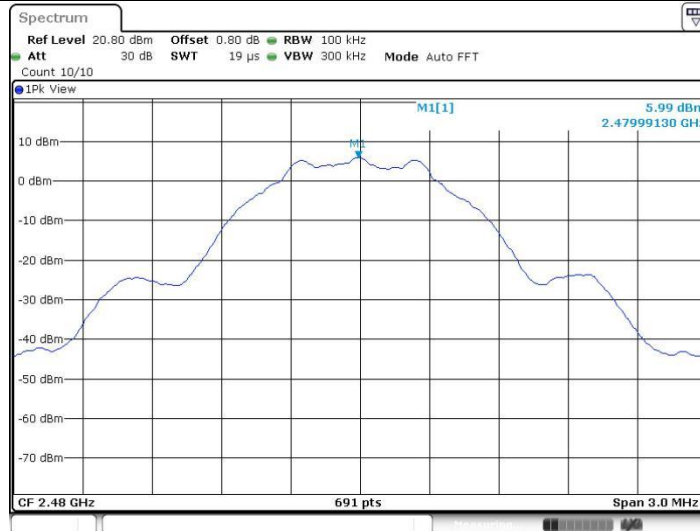
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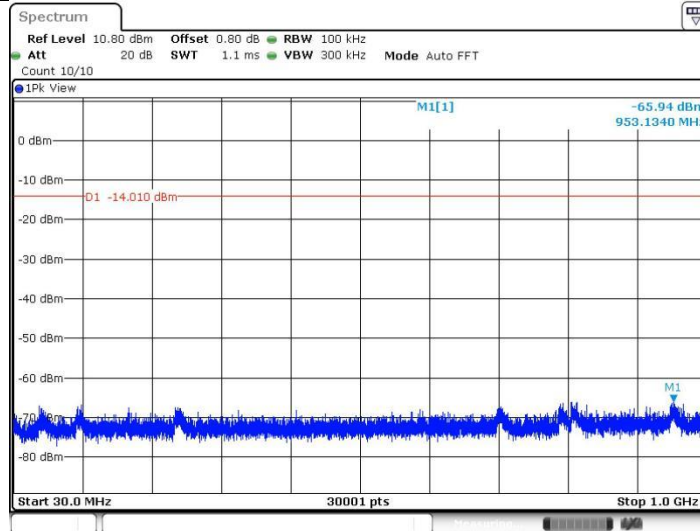
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### BLE 1M Ant1 2480 0~Reference



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### BLE 1M Ant1 2480 30~1000



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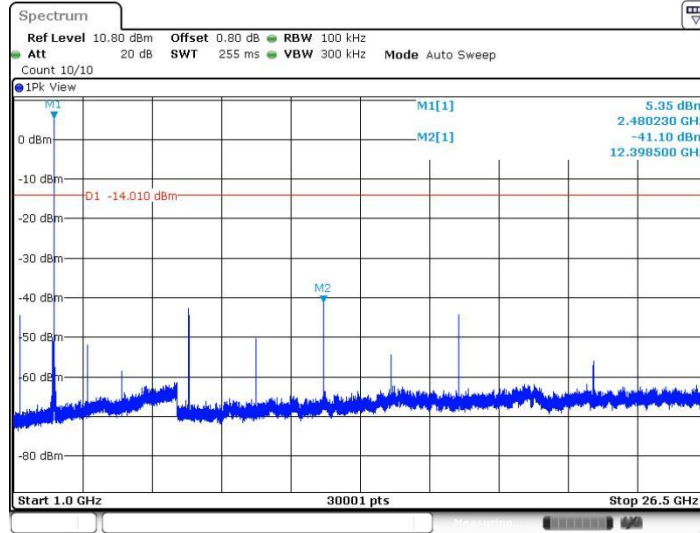
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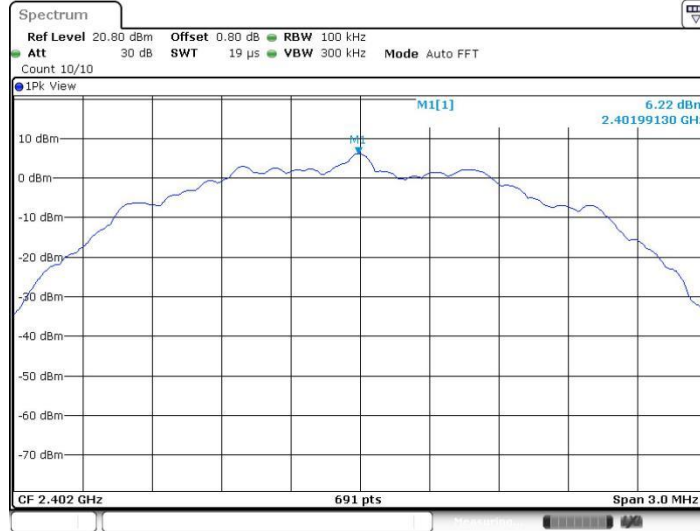
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### BLE 1M Ant1 2480 1000~26500



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### BLE 2M Ant1 2402 0~Reference



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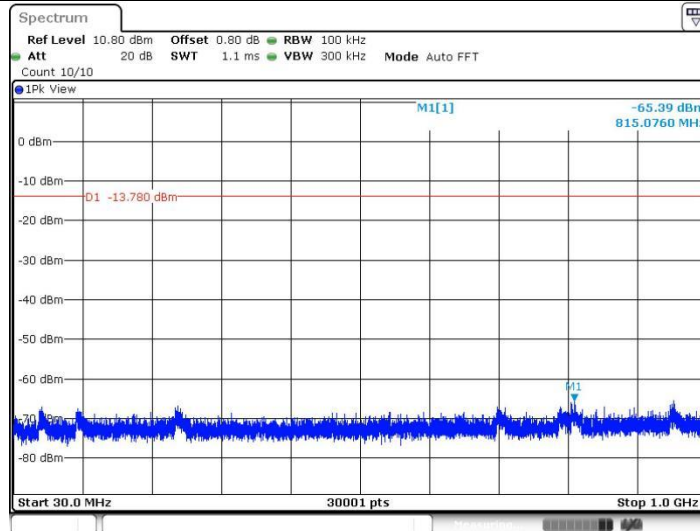
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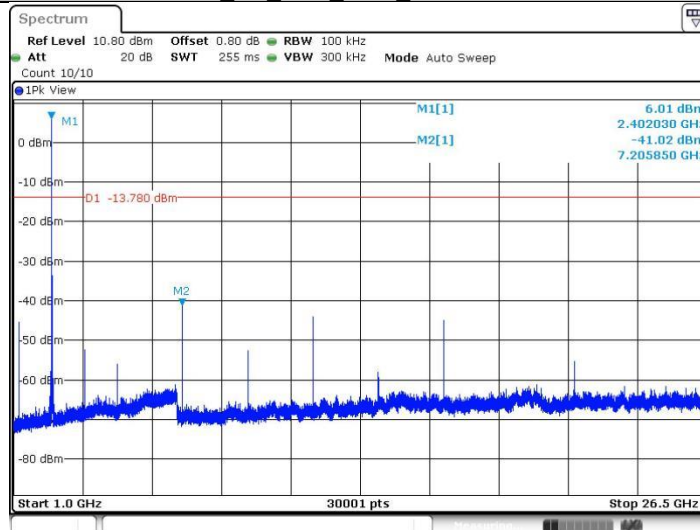
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### BLE 2M Ant1 2402 30~1000



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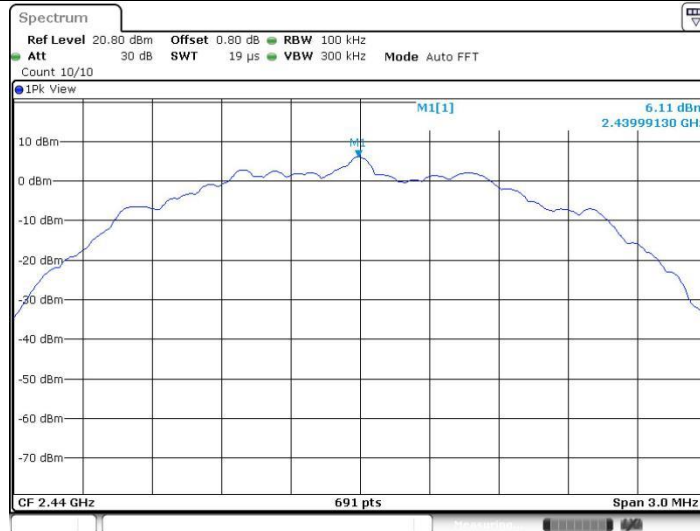
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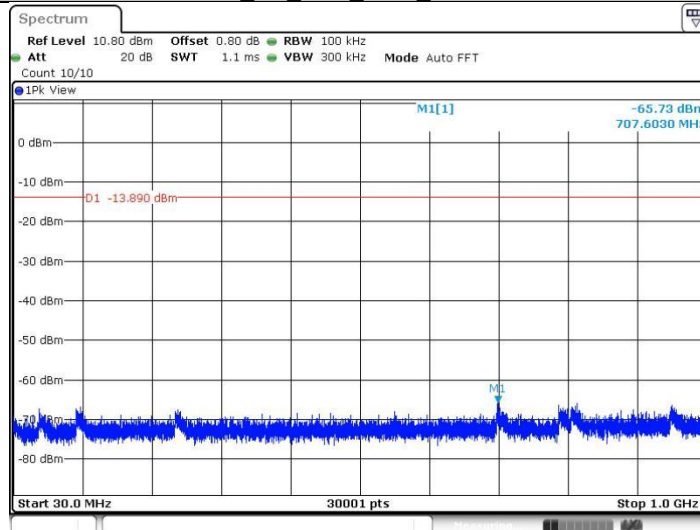
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### BLE 2M Ant1 2440 0~Reference



Date: 8 DEC 2022 15:31:58

### BLE 2M Ant1 2440 30~1000



Date: 8 DEC 2022 15:32:05



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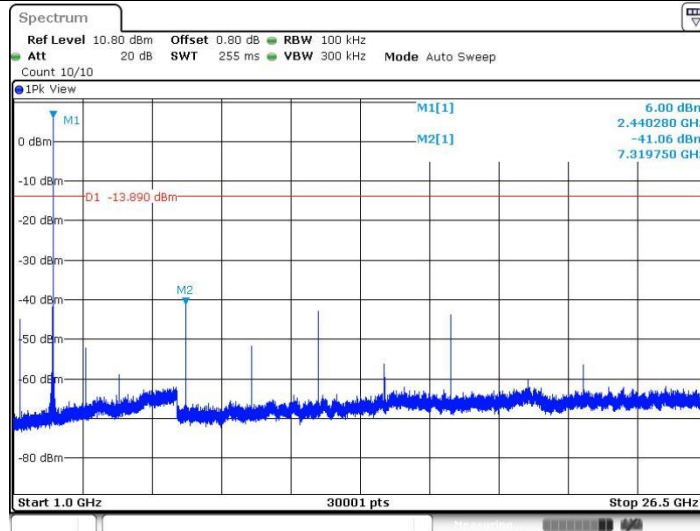
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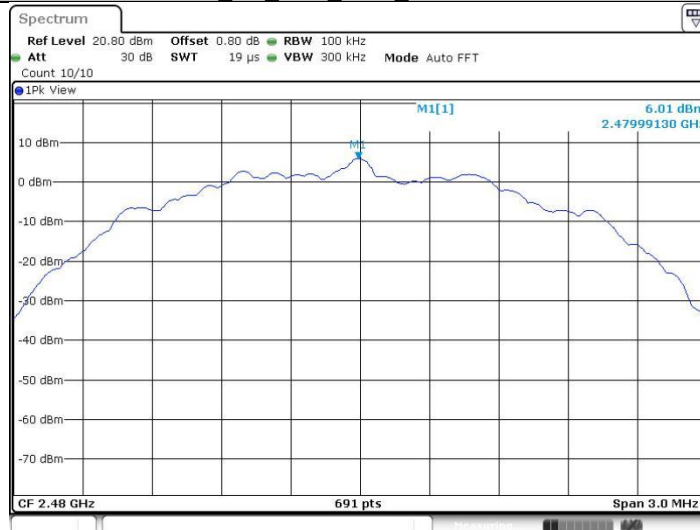
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### BLE 2M Ant1 2440 1000~26500



Date: 8 DEC 2022 15:32:42

### BLE 2M Ant1 2480 0~Reference



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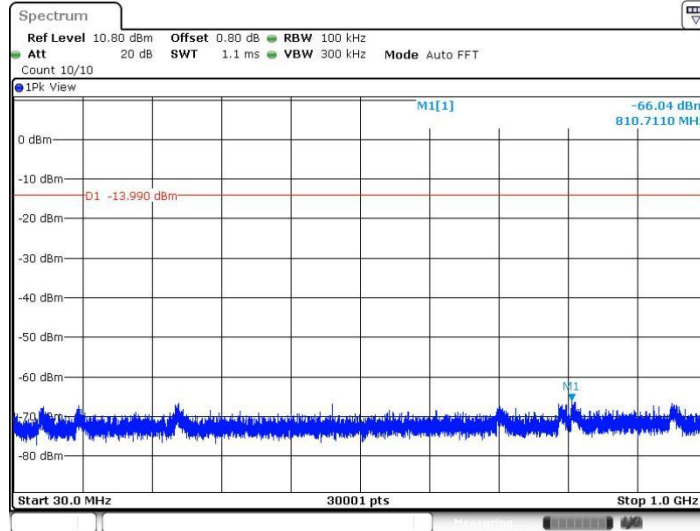
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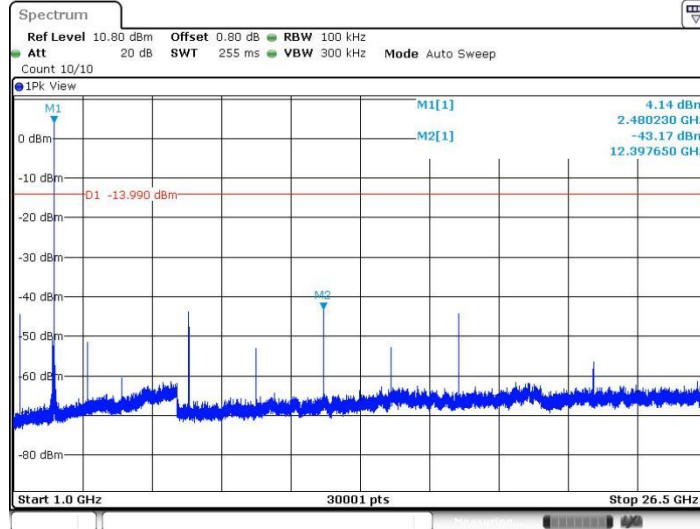
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### BLE 2M Ant1 2480 30~1000



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### BLE 2M Ant1 2480 1000~26500



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## Duty Cycle Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Cycle Factor
BLE_1M	Ant1	2402	0.41	0.62	66.13	1.80
		2440	0.41	0.62	66.13	1.80
		2480	0.40	0.61	65.57	1.83
BLE_2M	Ant1	2402	0.22	0.62	35.48	4.50
		2440	0.23	0.62	37.10	4.31
		2480	0.23	0.62	37.10	4.31



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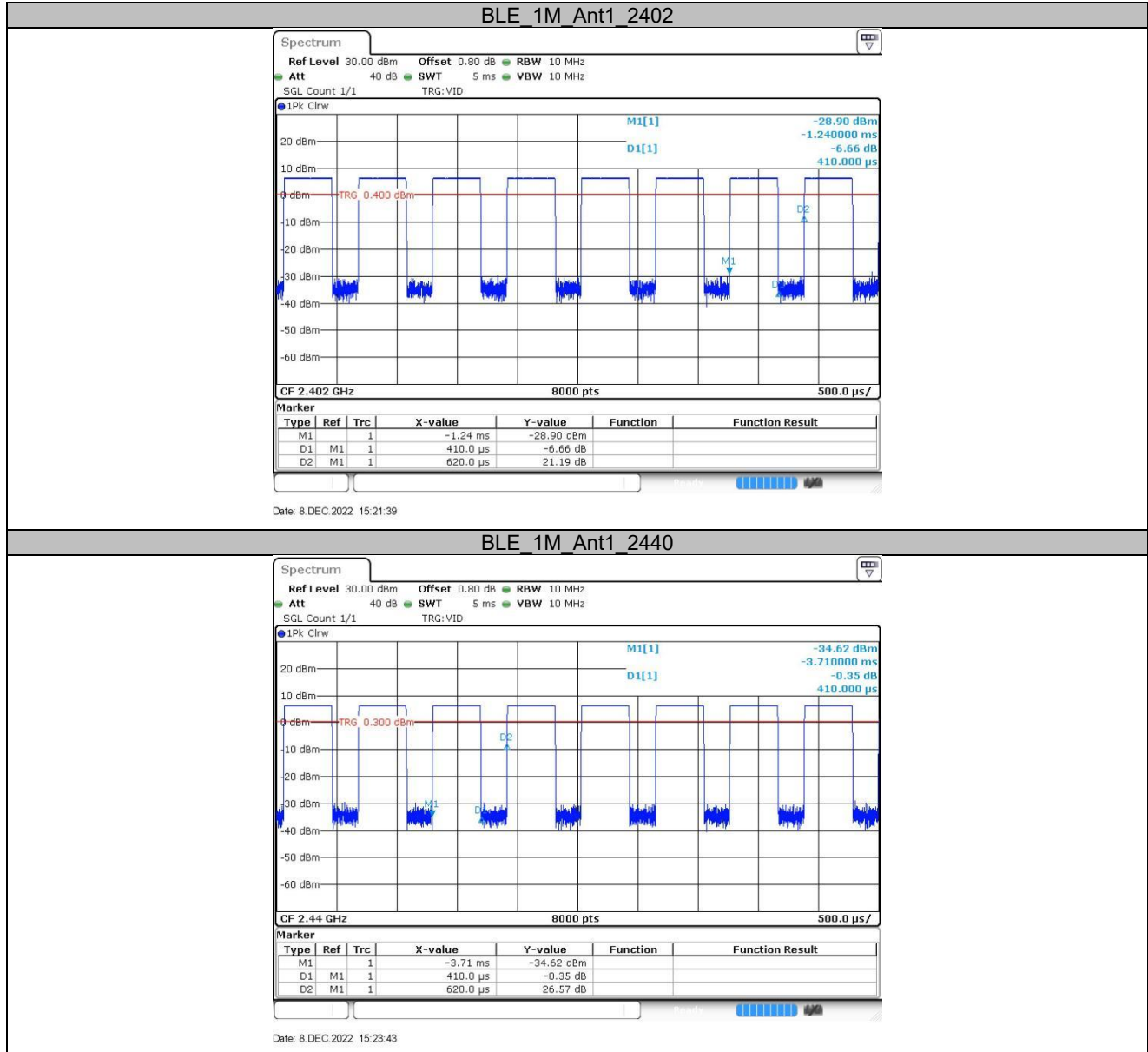
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### Test Graphs



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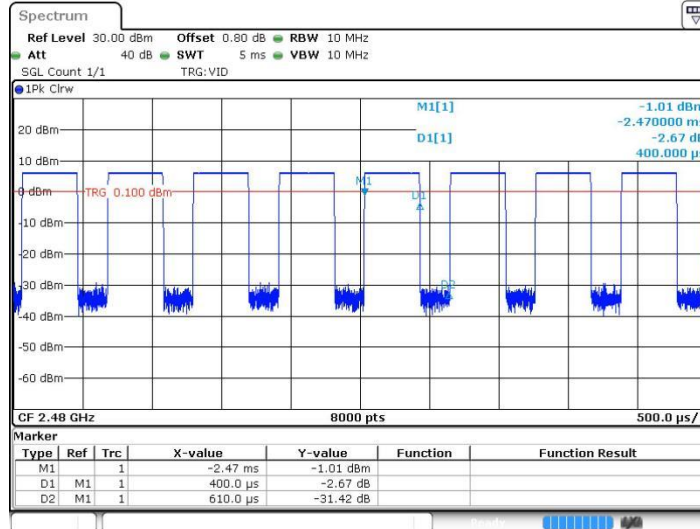
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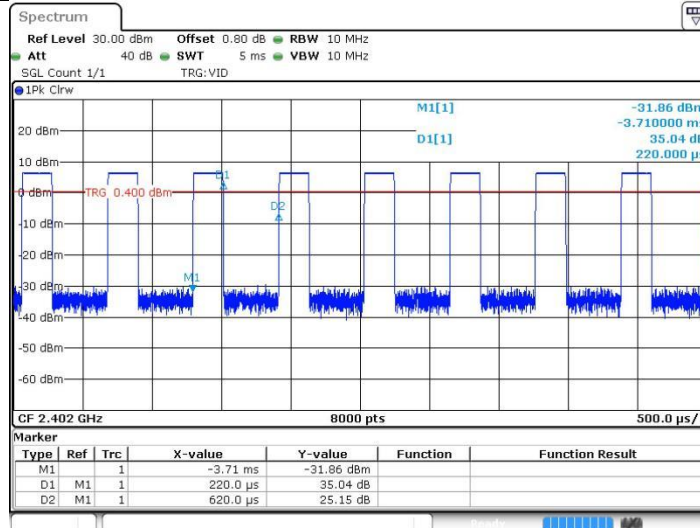
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### BLE\_1M\_Ant1\_2480



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### BLE\_2M\_Ant1\_2402



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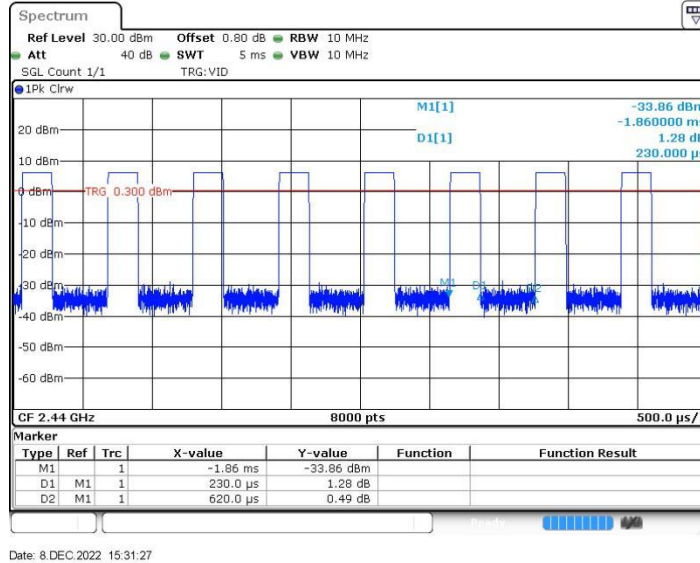
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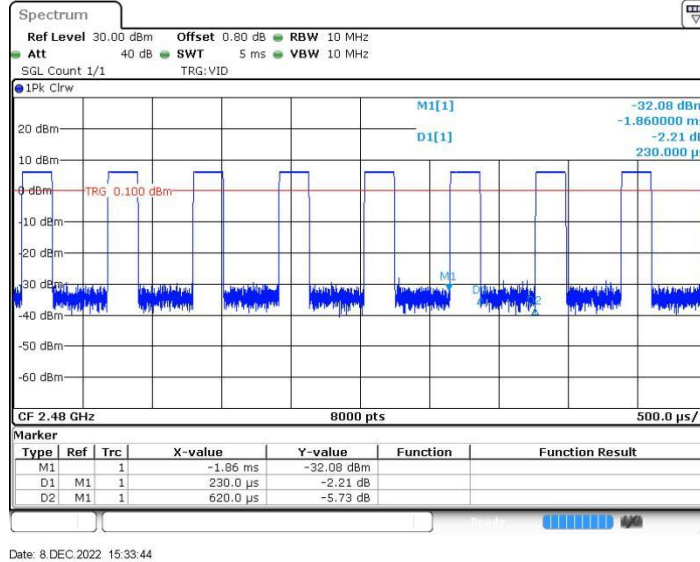
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### BLE\_2M\_Ant1\_2440



### BLE\_2M\_Ant1\_2480



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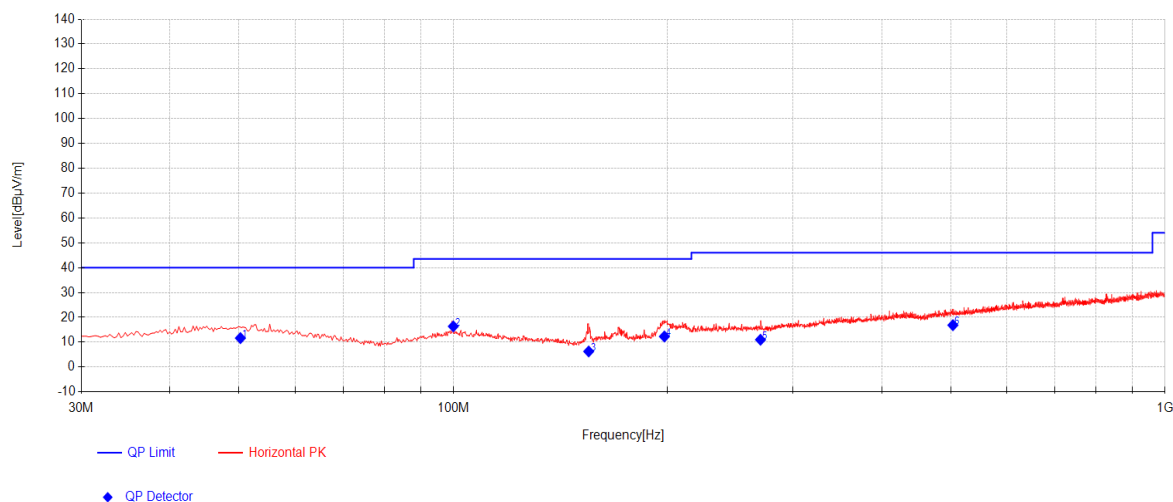
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## Radiated Spurious Emissions

### Radiated emission below 1GHz

**Worst case Mode: BLE 1M\_Channel 39**

#### Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	50.2207	25.90	-28.01	13.77	11.66	40.00	28.34	102	211	Horizontal
2	100.0011	32.95	-27.36	10.78	16.37	43.50	27.13	142	229	Horizontal
3	154.9649	26.00	-27.15	7.44	6.29	43.50	37.21	255	54	Horizontal
4	197.9564	28.93	-27.04	10.41	12.30	43.50	31.20	263	318	Horizontal
5	270.1324	25.09	-26.42	12.32	10.99	46.00	35.01	221	326	Horizontal
6	503.4367	24.65	-24.68	16.89	16.86	46.00	29.14	142	244	Horizontal



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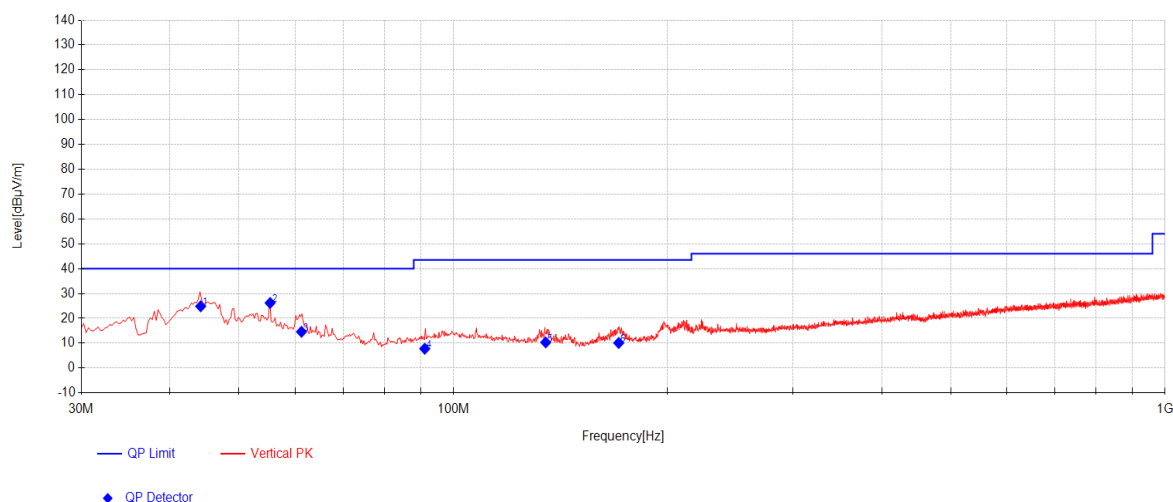
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## Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.1724	40.00	-28.05	12.91	24.86	40.00	15.14	106	11	Vertical
2	55.2891	41.46	-27.81	12.55	26.20	40.00	13.80	120	346	Vertical
3	61.1920	31.19	-27.64	11.05	14.60	40.00	25.40	118	356	Vertical
4	91.1912	25.72	-27.63	9.68	7.77	43.50	35.73	100	311	Vertical
5	134.8387	29.60	-27.15	7.88	10.33	43.50	33.17	111	0	Vertical
6	170.7623	28.64	-26.51	7.97	10.10	43.50	33.40	110	359	Vertical

## Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  
Value = Reading(dBμV) + AF(dB/m) + Factor(dB):  
AF = Antenna Factor(dB/m)  
Factor = Cable Factor(dB) - Preamplifier gain(dB)  
Margin = Limit(dBμV/m) – Value(dBμV/m)
- All channels have been tested, but only the worst case data displayed in this report.



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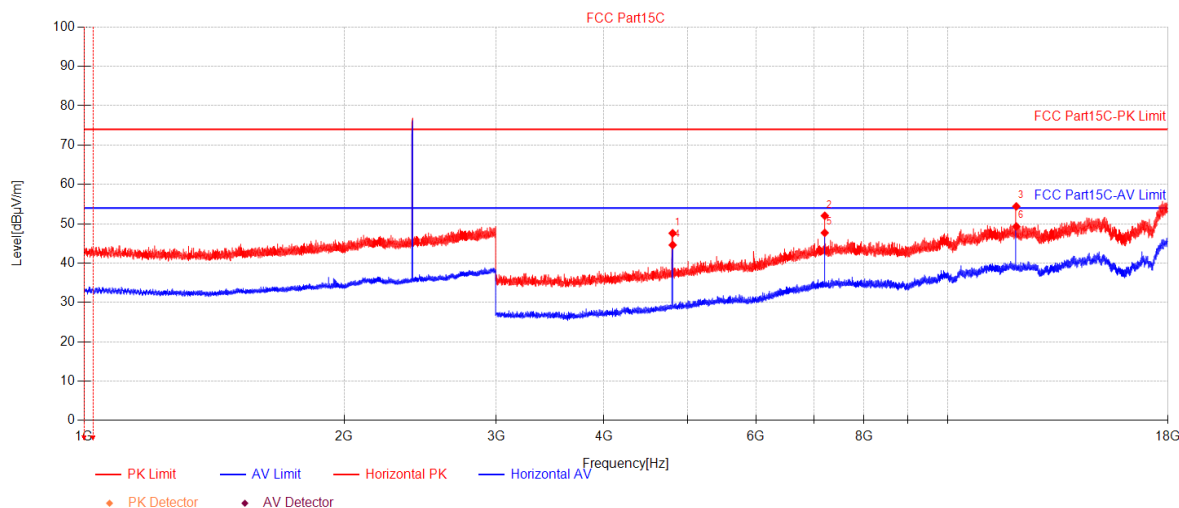
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### Transmitter emission Above 1GHz

#### BLE\_1M 2402\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4803.75	63.77	30.93	-47.11	47.59	74.00	26.41	163	180	Horizontal
2	7206.75	61.35	36.05	-45.37	52.03	74.00	21.97	254	307	Horizontal
3	12009.75	53.20	39.80	-38.59	54.41	74.00	19.59	175	24	Horizontal
4	4803.75	60.78	30.93	-47.11	44.60	54.00	9.40	263	0	Horizontal
5	7206	57.01	36.05	-45.37	47.69	54.00	6.31	265	157	Horizontal
6	12009.75	48.10	39.80	-38.59	49.31	54.00	4.69	284	1	Horizontal



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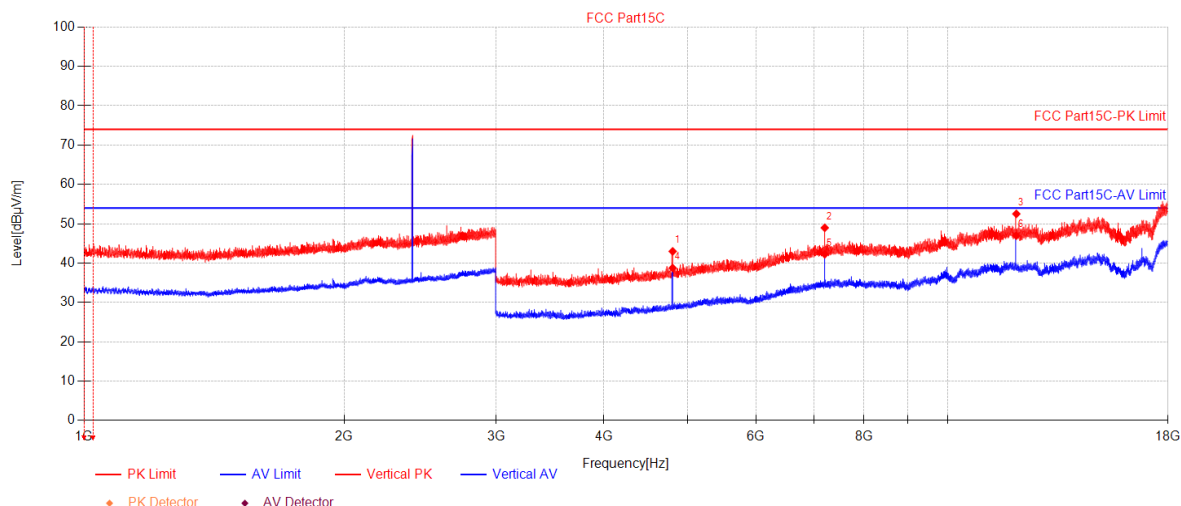
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### BLE\_1M 2402\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4803.75	59.16	30.93	-47.11	42.98	74.00	31.02	142	5	Vertical
2	7206	58.30	36.05	-45.37	48.98	74.00	25.02	263	182	Vertical
3	12011.25	51.30	39.80	-38.59	52.51	74.00	21.49	265	332	Vertical
4	4803.75	54.93	30.93	-47.11	38.75	54.00	15.25	241	5	Vertical
5	7206.75	51.56	36.05	-45.37	42.24	54.00	11.76	175	357	Vertical
6	12009	45.77	39.80	-38.59	46.98	54.00	7.02	264	5	Vertical



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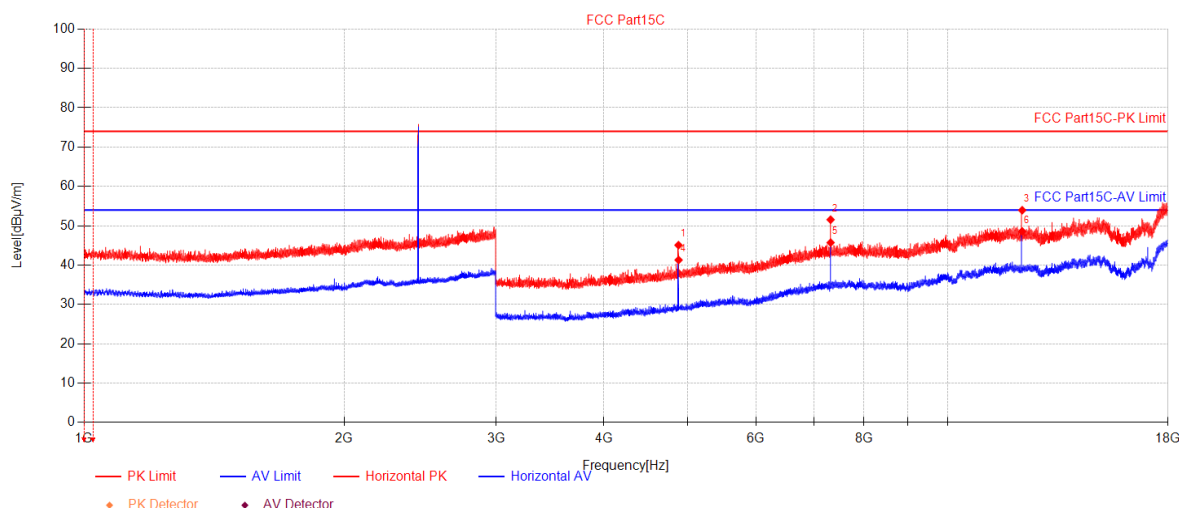
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### BLE\_1M 2440\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4878.75	60.98	31.11	-47.02	45.07	74.00	28.93	241	77	Horizontal
2	7319.25	60.79	36.18	-45.42	51.55	74.00	22.45	175	255	Horizontal
3	12201	53.12	39.78	-38.95	53.95	74.00	20.05	288	153	Horizontal
4	4880.25	57.20	31.11	-47.01	41.30	54.00	12.70	142	0	Horizontal
5	7320	54.94	36.18	-45.41	45.71	54.00	8.29	286	307	Horizontal
6	12198.75	47.76	39.78	-38.96	48.58	54.00	5.42	265	280	Horizontal



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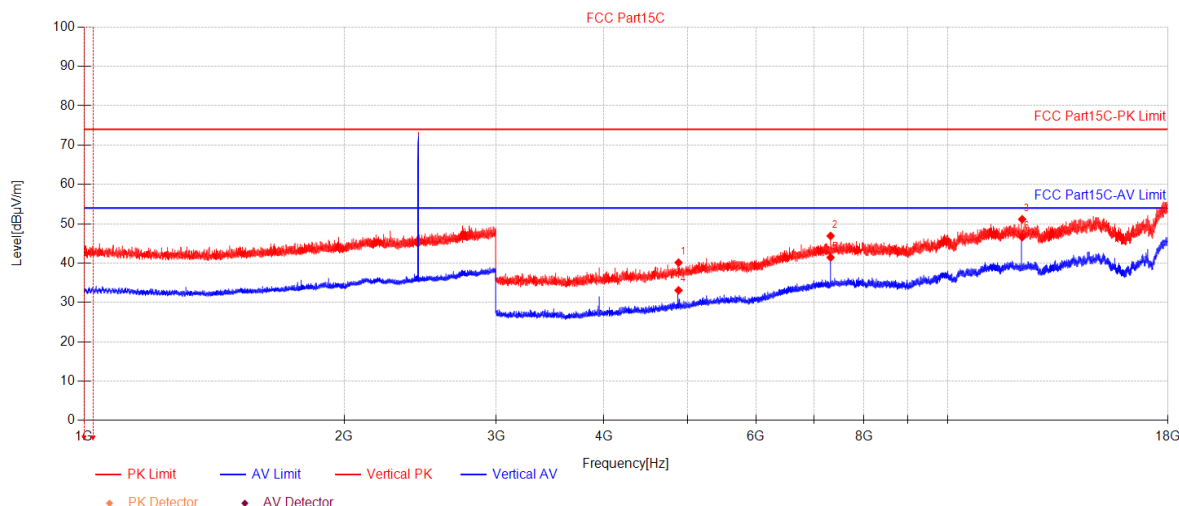
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### BLE\_1M 2440\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4879.5	56.04	31.11	-47.01	40.14	74.00	33.86	288	280	Vertical
2	7319.25	56.15	36.18	-45.42	46.91	74.00	27.09	241	8	Vertical
3	12200.25	50.32	39.78	-38.96	51.14	74.00	22.86	177	0	Vertical
4	4879.5	48.98	31.11	-47.01	33.08	54.00	20.92	285	101	Vertical
5	7319.25	50.67	36.18	-45.42	41.43	54.00	12.57	265	333	Vertical
6	12200.25	45.79	39.78	-38.96	46.61	54.00	7.39	174	50	Vertical



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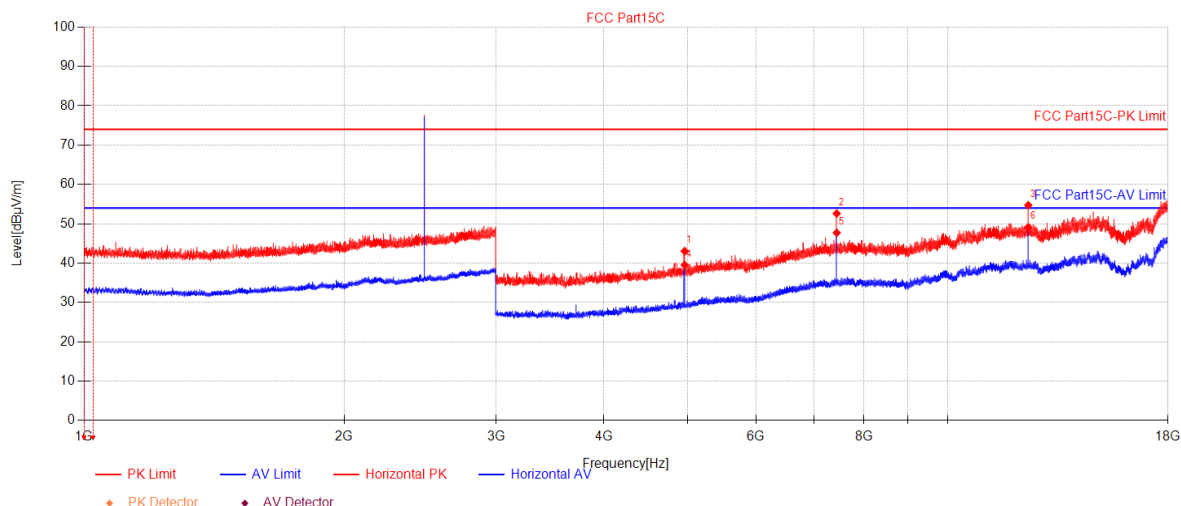
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### BLE\_1M 2480\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4959.75	58.86	31.30	-47.11	43.05	74.00	30.95	142	357	Horizontal
2	7439.25	61.35	36.33	-45.08	52.60	74.00	21.40	275	0	Horizontal
3	12399	53.27	39.76	-38.32	54.71	74.00	19.29	263	128	Horizontal
4	4959.75	55.34	31.30	-47.11	39.53	54.00	14.47	268	52	Horizontal
5	7440	56.46	36.33	-45.08	47.71	54.00	6.29	241	182	Horizontal
6	12399	47.64	39.76	-38.32	49.08	54.00	4.92	177	102	Horizontal



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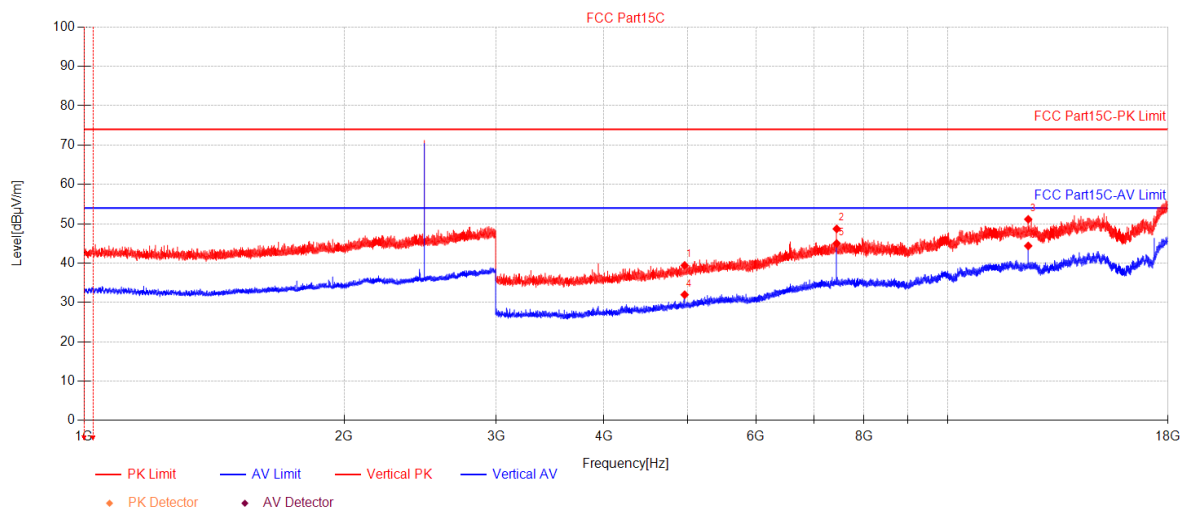
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### BLE\_1M 2480\_Channel



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4959.75	55.23	31.30	-47.11	39.42	74.00	34.58	175	57	Vertical
2	7439.25	57.45	36.33	-45.08	48.70	74.00	25.30	268	1	Vertical
3	12399	49.69	39.76	-38.32	51.13	74.00	22.87	241	256	Vertical
4	4959.75	47.77	31.30	-47.11	31.96	54.00	22.04	175	8	Vertical
5	7439.25	53.74	36.33	-45.08	44.99	54.00	9.01	288	108	Vertical
6	12399	42.93	39.76	-38.32	44.37	54.00	9.63	284	206	Vertical



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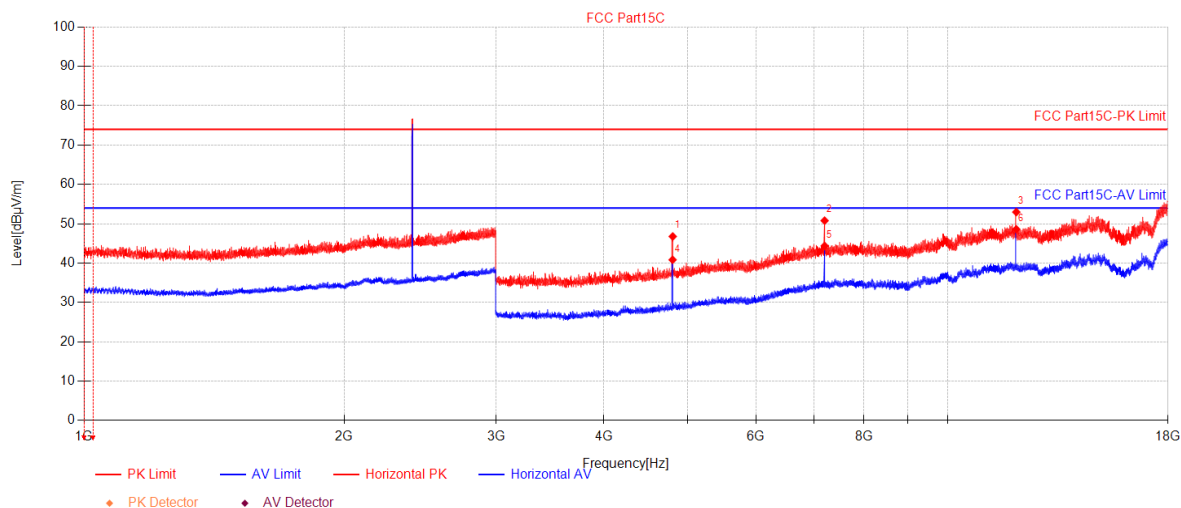
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### BLE\_2M 2402\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4804.5	62.94	30.93	-47.10	46.77	74.00	27.23	126	327	Horizontal
2	7203.75	60.12	36.04	-45.37	50.79	74.00	23.21	265	349	Horizontal
3	12009.75	51.77	39.80	-38.59	52.98	74.00	21.02	241	327	Horizontal
4	4803	57.02	30.93	-47.11	40.84	54.00	13.16	175	360	Horizontal
5	7204.5	53.68	36.05	-45.37	44.36	54.00	9.64	284	51	Horizontal
6	12009.75	47.39	39.80	-38.59	48.60	54.00	5.40	122	130	Horizontal



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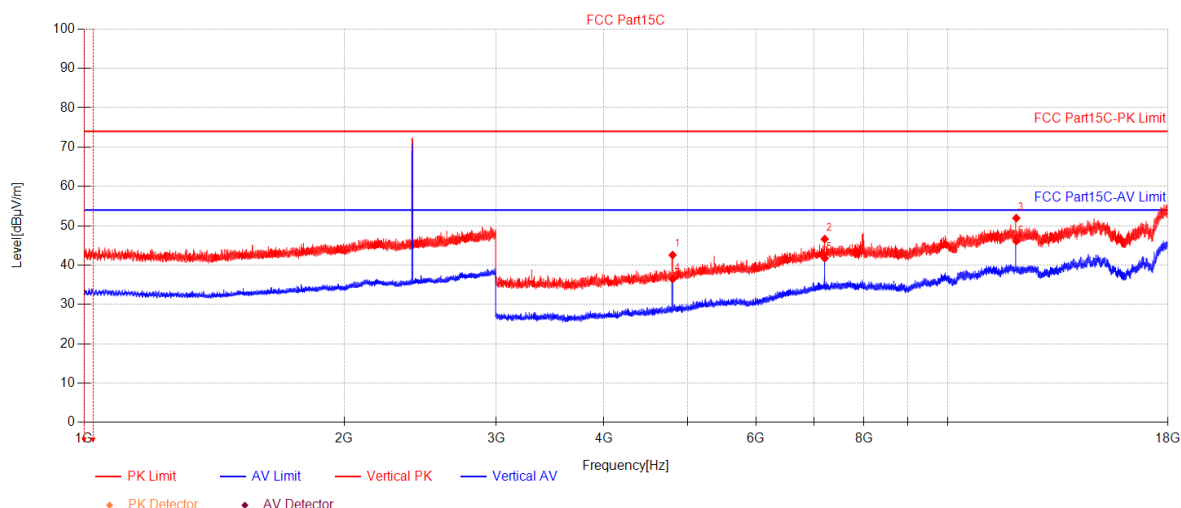
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### BLE\_2M 2402\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4803	58.74	30.93	-47.11	42.56	74.00	31.44	185	129	Vertical
2	7204.5	55.94	36.05	-45.37	46.62	74.00	27.38	263	230	Vertical
3	12009.75	50.73	39.80	-38.59	51.94	74.00	22.06	265	334	Vertical
4	4803	52.63	30.93	-47.11	36.45	54.00	17.55	296	156	Vertical
5	7204.5	51.07	36.05	-45.37	41.75	54.00	12.25	241	359	Vertical
6	12009.75	44.90	39.80	-38.59	46.11	54.00	7.89	105	3	Vertical



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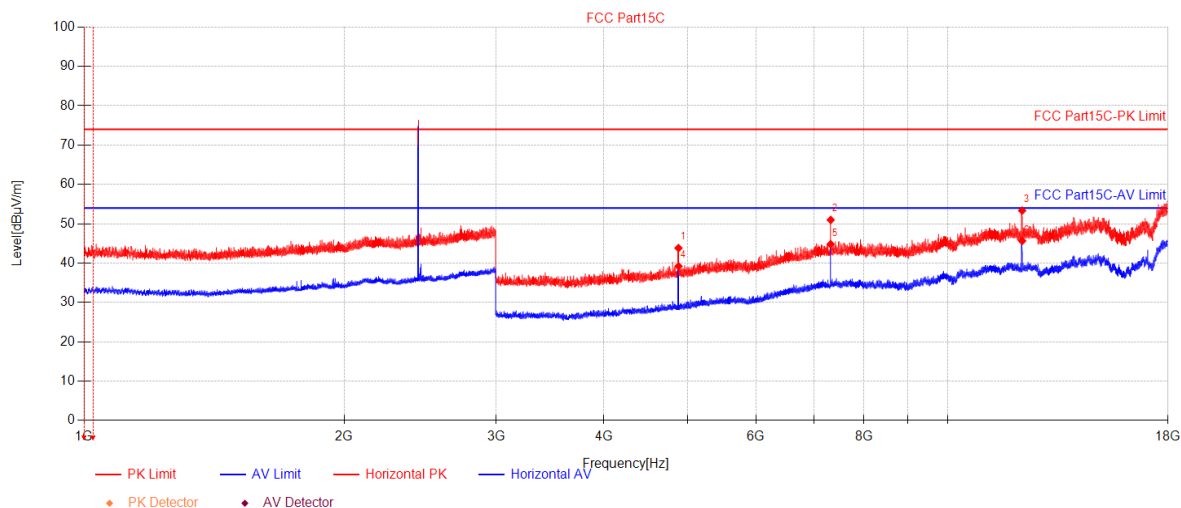
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### BLE\_2M 2440\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4878.75	59.73	31.11	-47.02	43.82	74.00	30.18	185	3	Horizontal
2	7321.5	60.20	36.19	-45.41	50.98	74.00	23.02	263	180	Horizontal
3	12198	52.53	39.78	-38.96	53.35	74.00	20.65	265	352	Horizontal
4	4879.5	55.11	31.11	-47.01	39.21	54.00	14.79	298	131	Horizontal
5	7320	54.04	36.18	-45.41	44.81	54.00	9.19	176	180	Horizontal
6	12198	44.83	39.78	-38.96	45.65	54.00	8.35	177	354	Horizontal



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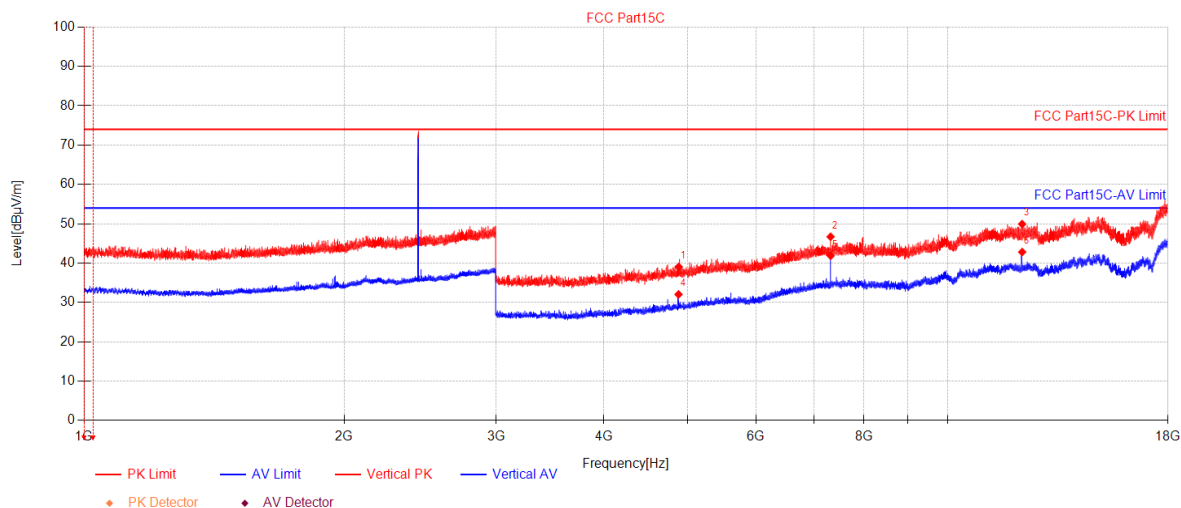
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### BLE\_2M 2440\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4882.5	54.93	31.12	-47.01	39.04	74.00	34.96	182	28	Vertical
2	7319.25	55.94	36.18	-45.42	46.70	74.00	27.30	263	353	Vertical
3	12198	49.10	39.78	-38.96	49.92	74.00	24.08	268	3	Vertical
4	4879.5	47.94	31.11	-47.01	32.04	54.00	21.96	241	3	Vertical
5	7320	51.10	36.18	-45.41	41.87	54.00	12.13	178	278	Vertical
6	12200.25	42.00	39.78	-38.96	42.82	54.00	11.18	269	300	Vertical



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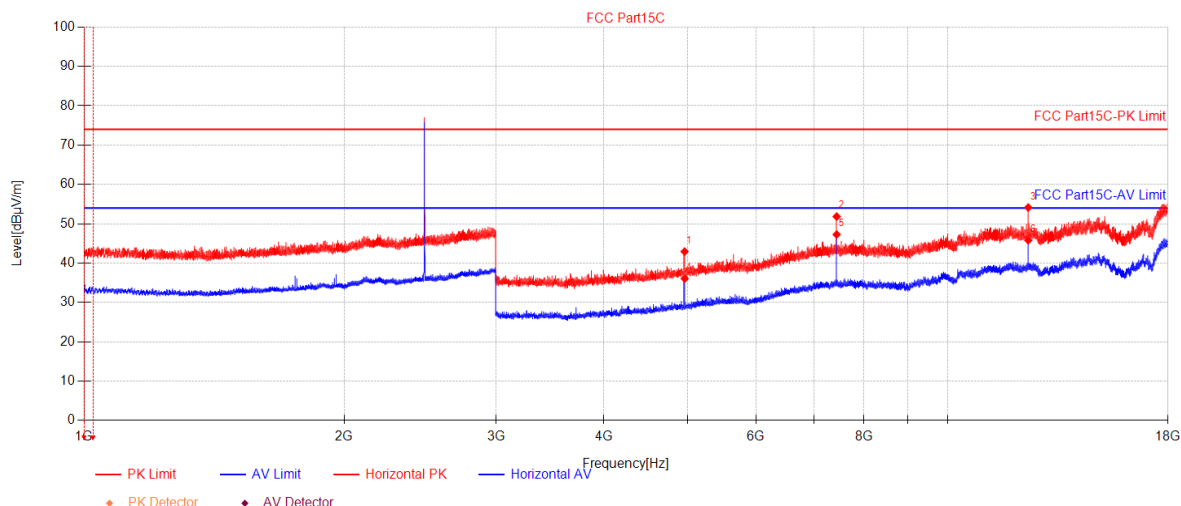
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### BLE\_2M 2480\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4959	58.76	31.30	-47.11	42.95	74.00	31.05	185	284	Horizontal
2	7438.5	60.57	36.33	-45.08	51.82	74.00	22.18	263	181	Horizontal
3	12397.5	52.68	39.76	-38.31	54.13	74.00	19.87	265	206	Horizontal
4	4960.5	51.87	31.31	-47.11	36.07	54.00	17.93	241	54	Horizontal
5	7438.5	56.02	36.33	-45.08	47.27	54.00	6.73	175	256	Horizontal
6	12399.75	44.35	39.76	-38.32	45.79	54.00	8.21	296	360	Horizontal



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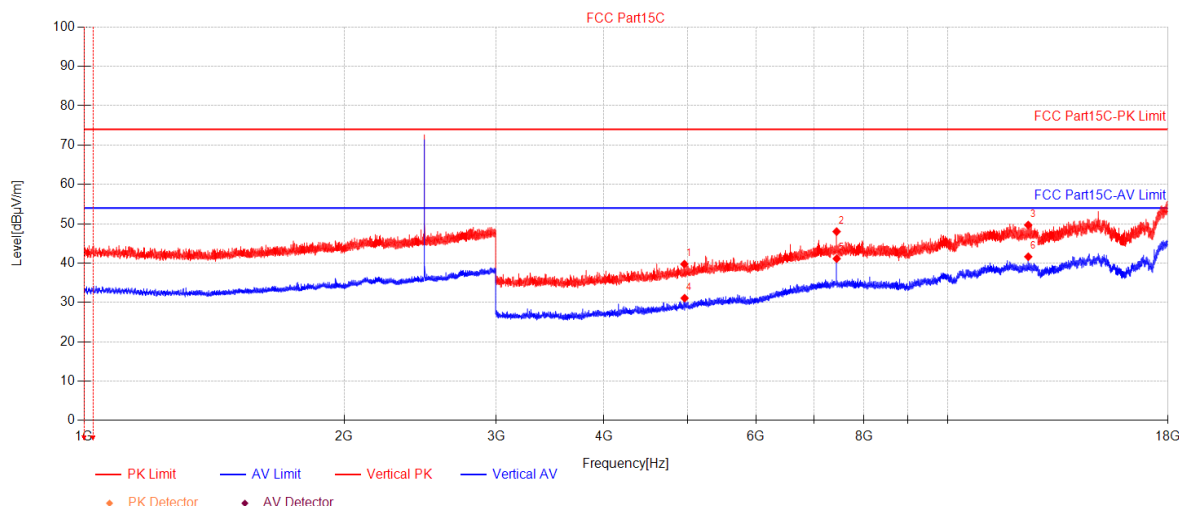
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### BLE\_2M 2480\_Channel



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4956	55.55	31.29	-47.10	39.74	74.00	34.26	142	242	Vertical
2	7437.75	56.76	36.33	-45.08	48.01	74.00	25.99	265	44	Vertical
3	12397.5	48.22	39.76	-38.31	49.67	74.00	24.33	284	179	Vertical
4	4959	46.91	31.30	-47.11	31.10	54.00	22.90	177	3	Vertical
5	7439.25	49.88	36.33	-45.08	41.13	54.00	12.87	152	353	Vertical
6	12399.75	40.18	39.76	-38.32	41.62	54.00	12.38	263	168	Vertical

#### Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  

$$\text{Level} = \text{Reading}(\text{dB}\mu\text{V}) + \text{AF}(\text{dB}/\text{m}) + \text{Factor}(\text{dB})$$

$$\text{AF} = \text{Antenna Factor}(\text{dB}/\text{m})$$

$$\text{Factor} = \text{Cable Factor}(\text{dB}) - \text{Preamplifier gain}(\text{dB})$$

$$\text{Margin} = \text{Limit}(\text{dB}\mu\text{V}/\text{m}) - \text{Level}(\text{dB}\mu\text{V}/\text{m})$$
- All channels have been tested, but only the worst case data displayed in this report.
- The Duty Cycle Factor is compensated when testing.



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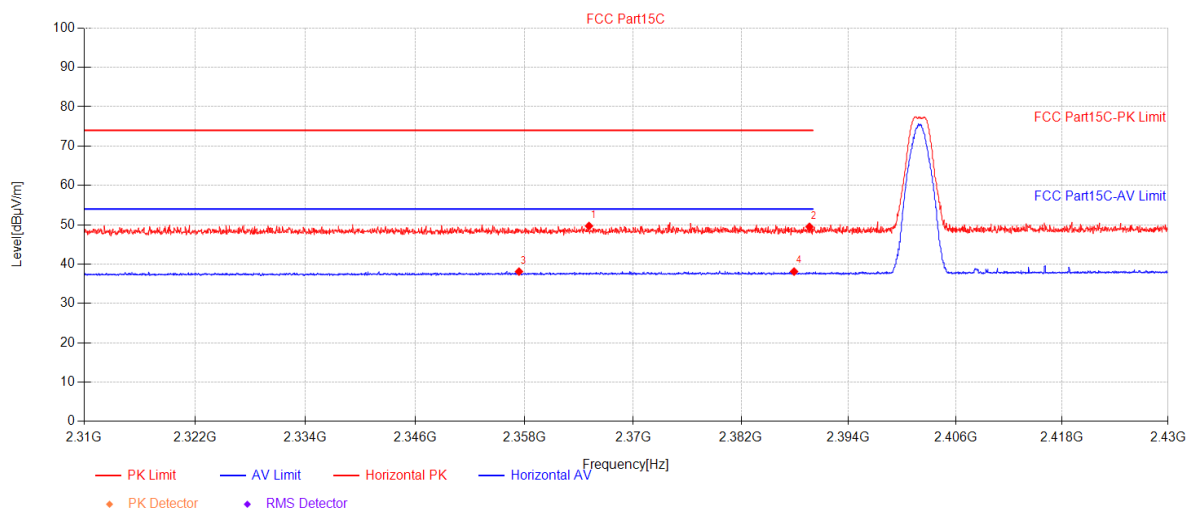
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### Restricted bands around fundamental frequency

#### BLE 1M 2402



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2365.1384	48.36	27.08	-25.75	49.69	74.00	24.31	126	49	Horizontal
2	2389.6265	48.05	27.14	-25.70	49.49	74.00	24.51	126	49	Horizontal
3	2357.4158	36.80	27.06	-25.77	38.09	54.00	15.91	126	49	Horizontal
4	2387.906	36.68	27.13	-25.71	38.10	54.00	15.90	126	49	Horizontal



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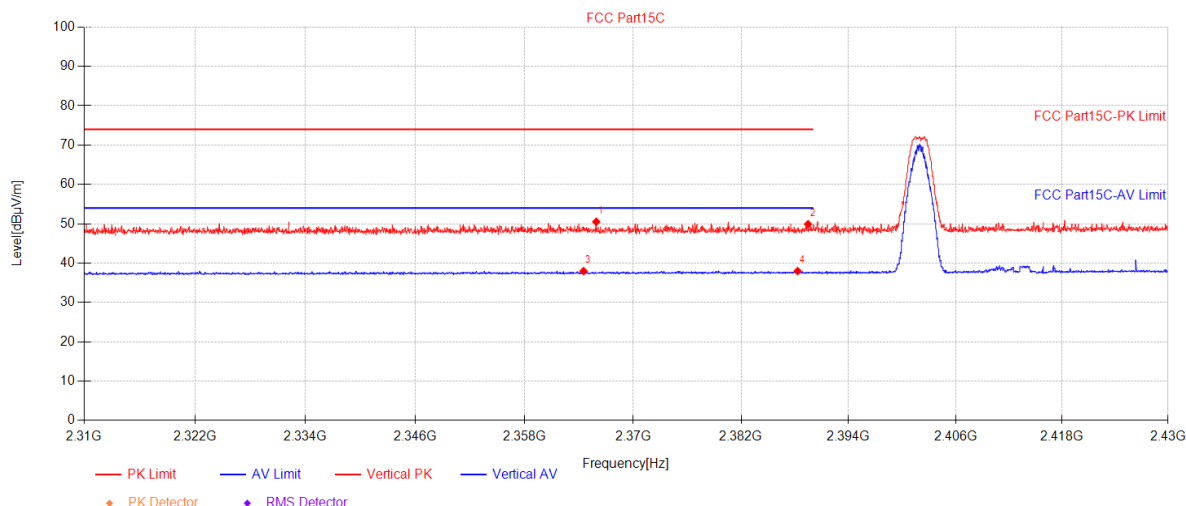
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Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2365.9386	49.18	27.08	-25.75	50.51	74.00	23.49	321	145	Vertical
2	2389.4665	48.48	27.13	-25.70	49.91	74.00	24.09	321	145	Vertical
3	2364.5382	36.65	27.07	-25.75	37.97	54.00	16.03	321	145	Vertical
4	2388.3061	36.55	27.13	-25.70	37.98	54.00	16.02	321	145	Vertical



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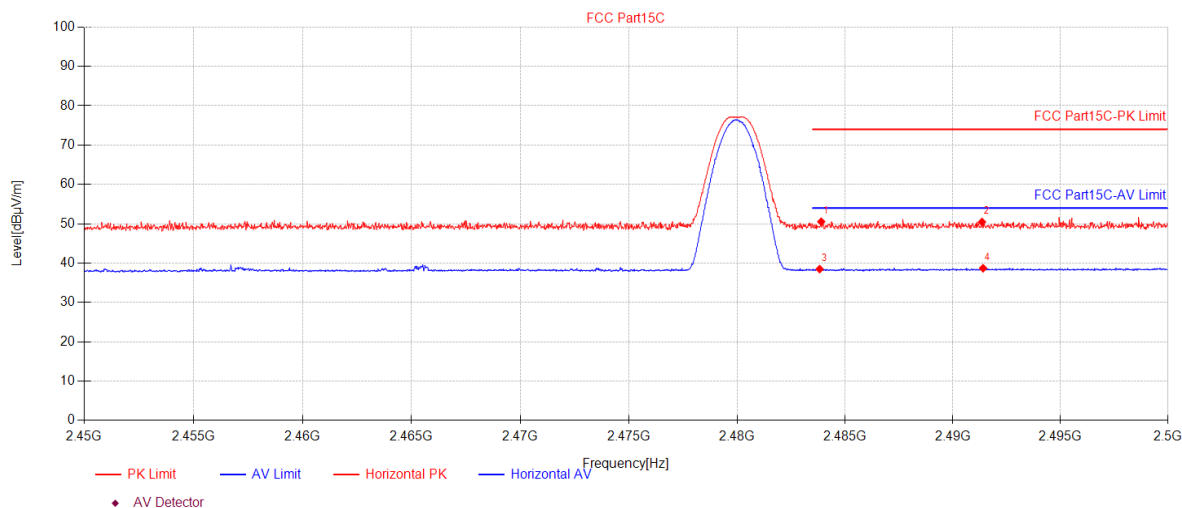
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### BLE 1M 2480



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.8919	48.31	27.36	-25.14	50.53	74.00	23.47	144	51	Horizontal
2	2491.3457	48.18	27.38	-25.10	50.46	74.00	23.54	144	51	Horizontal
3	2483.8169	36.26	27.36	-25.14	38.48	54.00	15.52	144	51	Horizontal
4	2491.3957	36.41	27.38	-25.10	38.69	54.00	15.31	144	51	Horizontal



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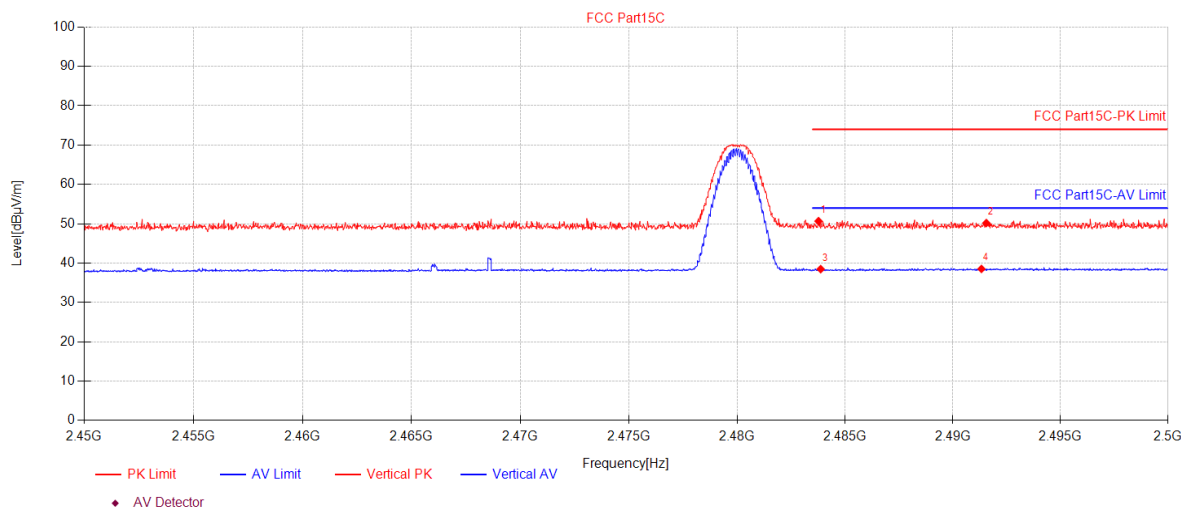
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### BLE 1M 2480



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.7669	48.44	27.36	-25.14	50.66	74.00	23.34	332	161	Vertical
2	2491.5458	47.89	27.38	-25.09	50.18	74.00	23.82	332	161	Vertical
3	2483.8669	36.25	27.36	-25.14	38.47	54.00	15.53	332	161	Vertical
4	2491.3207	36.25	27.38	-25.10	38.53	54.00	15.47	332	161	Vertical



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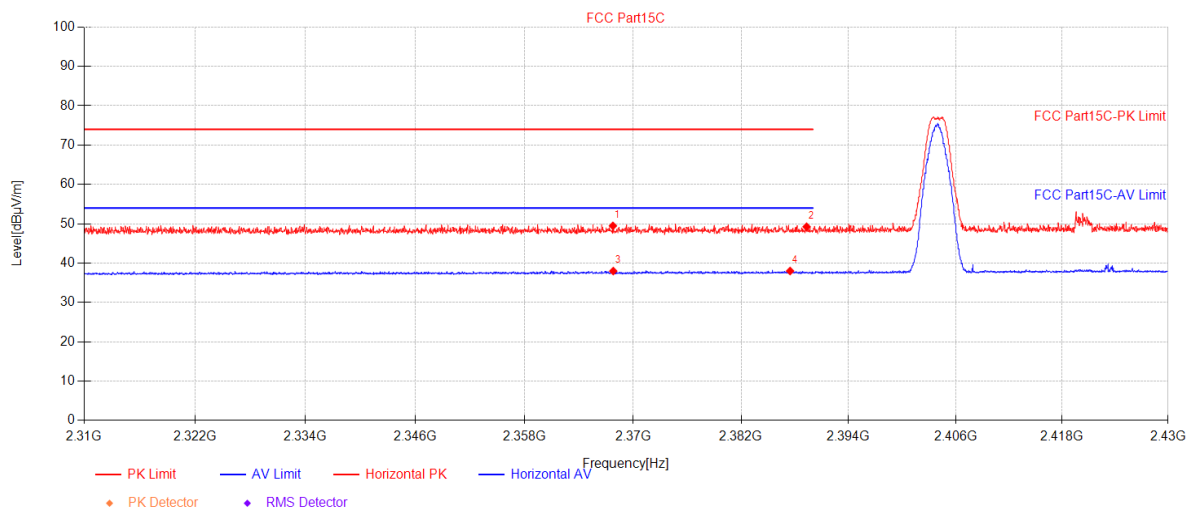
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### BLE 2M 2402



Data List										
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1	2367.7793	48.14	27.08	-25.75	49.47	74.00	24.53	166	45	Horizontal
2	2389.3064	47.81	27.13	-25.70	49.24	74.00	24.76	166	45	Horizontal
3	2367.8193	36.65	27.08	-25.75	37.98	54.00	16.02	166	45	Horizontal
4	2387.4658	36.57	27.13	-25.71	37.99	54.00	16.01	166	45	Horizontal



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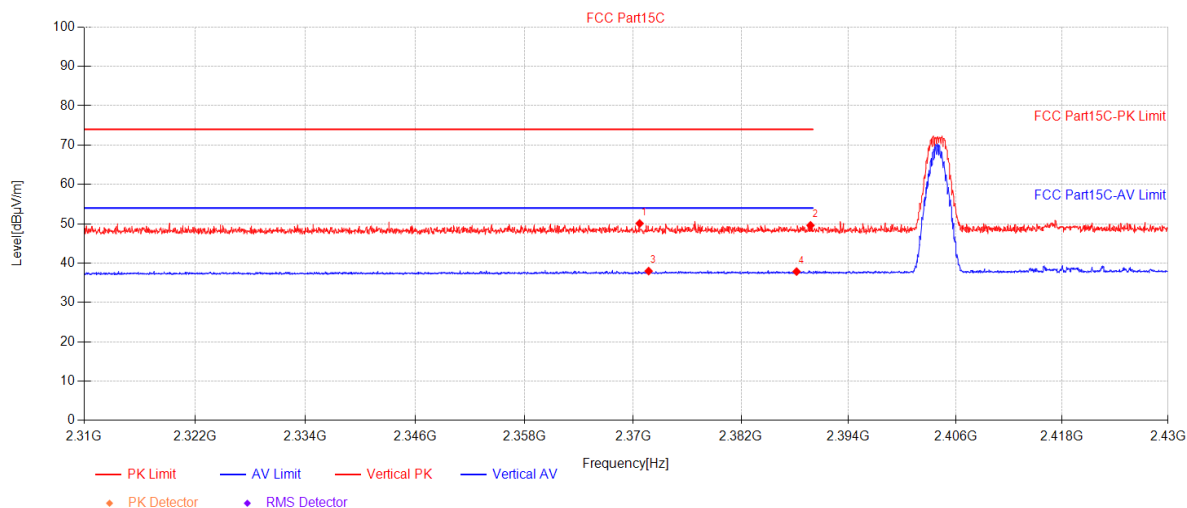
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## BLE 2M 2402



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2370.7402	48.73	27.09	-25.74	50.08	74.00	23.92	332	126	Vertical
2	2389.7466	48.15	27.14	-25.70	49.59	74.00	24.41	332	126	Vertical
3	2371.7406	36.62	27.09	-25.74	37.97	54.00	16.03	332	126	Vertical
4	2388.1861	36.42	27.13	-25.70	37.85	54.00	16.15	332	126	Vertical



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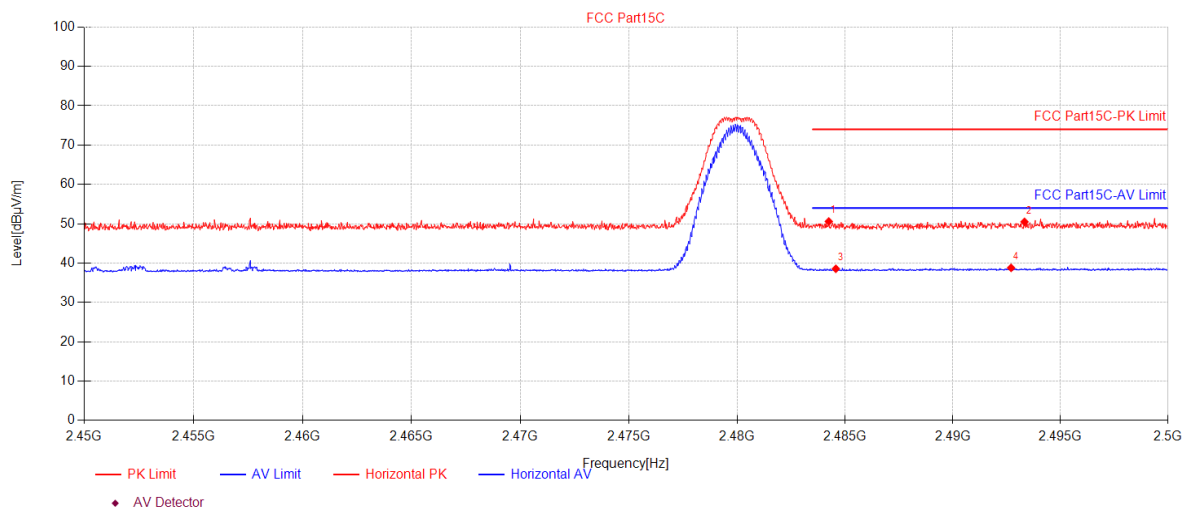
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### BLE 2M 2480



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2484.2421	48.36	27.36	-25.14	50.58	74.00	23.42	142	57	Horizontal
2	2493.3217	48.19	27.38	-25.08	50.49	74.00	23.51	142	57	Horizontal
3	2484.5673	36.34	27.36	-25.14	38.56	54.00	15.44	142	57	Horizontal
4	2492.6963	36.50	27.38	-25.09	38.79	54.00	15.21	142	57	Horizontal



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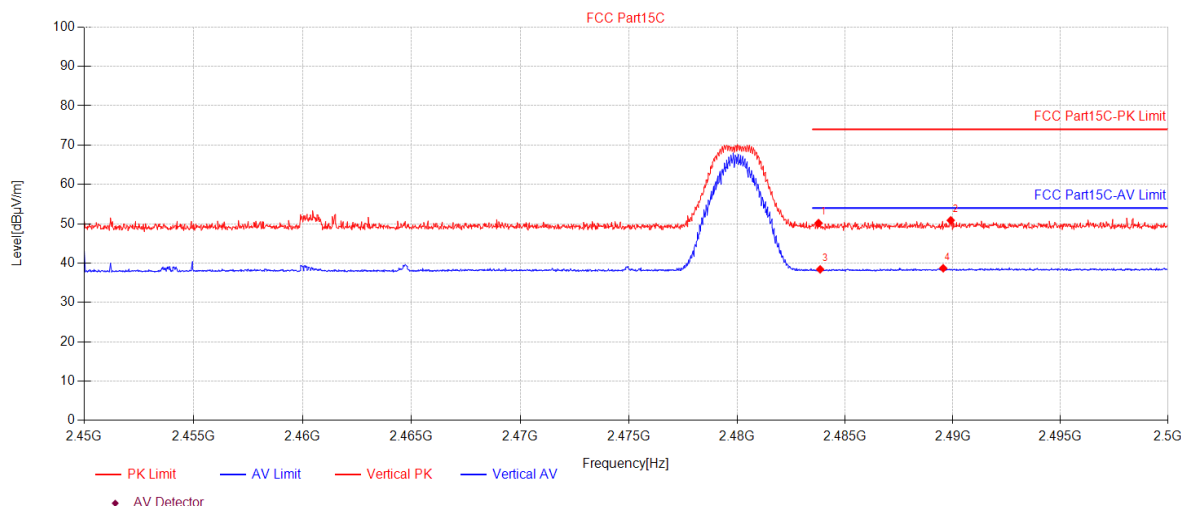
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### BLE 2M 2480



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.7669	47.95	27.36	-25.14	50.17	74.00	23.83	362	142	Vertical
2	2489.8949	48.59	27.38	-25.10	50.87	74.00	23.13	362	142	Vertical
3	2483.8419	36.18	27.36	-25.14	38.40	54.00	15.60	362	142	Vertical
4	2489.5448	36.43	27.37	-25.11	38.69	54.00	15.31	362	142	Vertical

#### Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  

$$\text{Level} = \text{Reading}(\text{dB}\mu\text{V}) + \text{AF}(\text{dB}/\text{m}) + \text{Factor}(\text{dB})$$

$$\text{AF} = \text{Antenna Factor}(\text{dB}/\text{m})$$

$$\text{Factor} = \text{Cable Factor}(\text{dB}) - \text{Preamplifier gain}(\text{dB})$$

$$\text{Margin} = \text{Limit}(\text{dB}\mu\text{V}/\text{m}) - \text{Level}(\text{dB}\mu\text{V}/\text{m})$$
- The Duty Cycle Factor is compensated when testing.

---End of Report---



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