


 Report No.: ZEWM2310001500RG04  
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## TEST REPORT

**Application No.:** ZEWM2310001500RG  
**Applicant:** vivo Mobile Communication Co., Ltd.  
**Address of Applicant:** No.1, vivo Road, Chang'an, Dongguan,Guangdong,China  
**Manufacturer:** vivo Mobile Communication Co., Ltd.  
**Address of Manufacturer:** No.1, vivo Road, Chang'an, Dongguan,Guangdong,China  
**EUT Description:** Mobile Phone  
**Model No.:** V2322  
**Trade Mark:** vivo  
**FCC ID:** 2AUCY-V2322  
**Standards:** FCC 47 CFR Part 2, Subpart J  
 FCC 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2023/04/21 (for original report ZEWM2303000343RG04)  
 2023/10/13 (for new report ZEWM2310001500RG04)  
**Date of Test:** 2023/04/21 to 2023/05/18 (for original report ZEWM2303000343RG04)  
 2023/10/16 to 2023/10/17 (for new report ZEWM2310001500RG04)  
**Date of Issue:** 2023/10/24

<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:

 Keny Xu  
 Laboratory Manager

 SGS-CSTC Standards Technical Services Co., Ltd.  
 Shenzhen Branch Wireless Laboratory

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## 1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/10/24		Original

Prepared By	 _____ (Jack Huang) / Test Engineer
Checked By	 _____ (Flora Wang) / Reviewer



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Shenzhen Branch, Inspection & Testing Services

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## 2 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result	Test Lab*
Antenna Requirement	15.203/15.247(b)	--	Clause 4.1	PASS	--
AC Power Line Conducted Emission	15.207	ANSI C63.10-2020 Section 6.2	Clause 4.2	PASS	B
Duty cycle	--	ANSI C63.10-2020 Section 11.6	Clause 4.3	For Report Purpose	A
Conducted Output Power	15.247 (b)(3)	ANSI C63.10-2020 Section 11.9.1.2	Clause 4.4	PASS	A
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10-2020 Section 11.8 Option 2 / 6.9.3	Clause 4.5	PASS	A
Power Spectral Density	15.247 (e)	ANSI C63.10-2020 Section 11.10.2	Clause 4.6	PASS	A
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10-2020 Section 11.11	Clause 4.7	PASS	A
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10-2020 Section 11.11	Clause 4.8	PASS	A
Radiated Spurious Emissions	15.205/15.209	ANSI C63.10-2020 Section 11.12	Clause 4.9	PASS	B
Restricted bands around fundamental frequency (Radiated Emission)	15.205/15.209	ANSI C63.10-2020 Section 11.12	Clause 4.10	PASS	B

\*Remark:  
 Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch  
 Lab B SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.



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Remark for report ZEWM2310001500RG04 issue on 2023/10/24:

This test report (Report No.: ZEWM2310001500RG04 issue on 2023/10/24) is based on the original test report (Report No.: ZEWM2303000343RG04 issue on 2023/05/19) .

According to the declaration from the applicant, the models in this report and models in original report were identical, only difference as below:

1. Remove NFC by hardware and software.
2. Remove macro camera.
3. Back cover change from glass to plastic.
4. Add a new charger.
5. Software version change to PD2280UF\_EX\_A\_13.0.9.3.W30.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report the AC Power Line Conducted Emission were tested, Radiated Spurious emissions and Restricted bands around fundamental frequency were performed based on the worst case of the original report with report number ZEWM2303000343RG04 issue on 2023/05/19 and other test data in this report are based on the previous report with report number ZEWM2303000343RG04 issue on 2023/05/19.

Summary of the Spot check:

Radiated spurious emission and Restricted bands around fundamental frequency(Radiated Emission) test against the variant model based on the worst-case condition from the original model was performed in this filing and the verification test results similar to the original FCC ID. All tests meet FCC technical limits. Detail sport check test result can be found in the variant model report.

Test Item		Original FCC ID: 2AUCY-V2247	Variant FCC ID: 2AUCY-V2322	Limit	*Difference (%)<=25%	Limit margin>50%
		(dBμV/m)	(dBμV/m)			
Radiated Spurious emissions	Peak	53.05	52.09	74	10%	-
	Average	35.38	39.6	54	63%	<48
Restricted bands around fundamental frequency(Radiated Emission)	Peak	55.25	57.52	74	30%	<68
	Average	35.38	39.6	54	63%	<48

\*Difference: converted the data into linear unit to calculate difference.



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## 3 General Information

### 3.1 Details of Client

Applicant:	vivo Mobile Communication Co., Ltd.
Address of Applicant:	No.1, vivo Road, Chang'an, Dongguan,Guangdong,China
Manufacturer:	vivo Mobile Communication Co., Ltd.
Address of Manufacturer:	No.1, vivo Road, Chang'an, Dongguan,Guangdong,China

### 3.2 Test Location

<b>Lab A:</b>	
Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China
Post code:	518057
Test engineer:	Jerry Zeng
<b>Lab B:</b>	
Company:	SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.
Address:	1/F, Unit D, Building 1, Kanghong Orange Science Park, No.137, Keyuan 3rd Road, Fengdong New Town, Xi' an, Shaanxi China
Post code:	710086
Test engineer:	Jacky Xue



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### 3.3 Test Facility

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

#### Lab A:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

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

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

- **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch has been recognized as an accredited testing laboratory.

Designation Number: CN1336.

Test Firm Registration Number: 787754

#### Lab B:

- **A2LA (Certificate No. 4854.01)**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

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

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095.

IC#: 25613.

- **FCC –Designation Number: CN1337**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN1337.

Test Firm Registration Number: 917410



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### 3.4 General Description of EUT

EUT Description:	Mobile Phone	
Model No.:	V2322	
Trade Mark:	vivo	
Hardware Version:	MP_0.1	
Software Version:	PD2280UF_EX_A_13.0.9.3.W30	
Power Supply:	Lithium Battery (3.89V)	
IMEI:	RF Conducted	IMEI1:863548060194275 IMEI2:863548060194267
	RSE & AC power line	860849079999453
Operation Frequency:	2400MHz~2483.5MHz $f_c = 2402 \text{ MHz} + N * 2 \text{ MHz}$ , where: - $f_c$ = "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	
Antenna Type:	PIFA Antenna	
Antenna Gain:	-3.3dBi(Ant22)	
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
RF Cable:	2000MHz ~ 3000MHz(1.1dB)	
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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	96~101 kPa Selected Values During Tests	
Relative Humidity	40-60 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~25	3.89
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 and no consideration of replacement.          The best case gain of the antenna is -3.3dBi.*</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>	



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## 4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10-2020 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 <math>50\Omega/50\mu\text{H} + 5\Omega</math> 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 C63.10-2020 on conducted measurement.</li> </ol>		





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<p>Test Setup:</p>	
<p>Test Mode:</p>	<p>Transmitting with GFSK modulation. Charge +Transmitting mode. Only the worst case is recorded in the report.</p>
<p>Instruments Used:</p>	<p>Refer to section 6 for details.</p>
<p>Test Results:</p>	<p>Pass</p>



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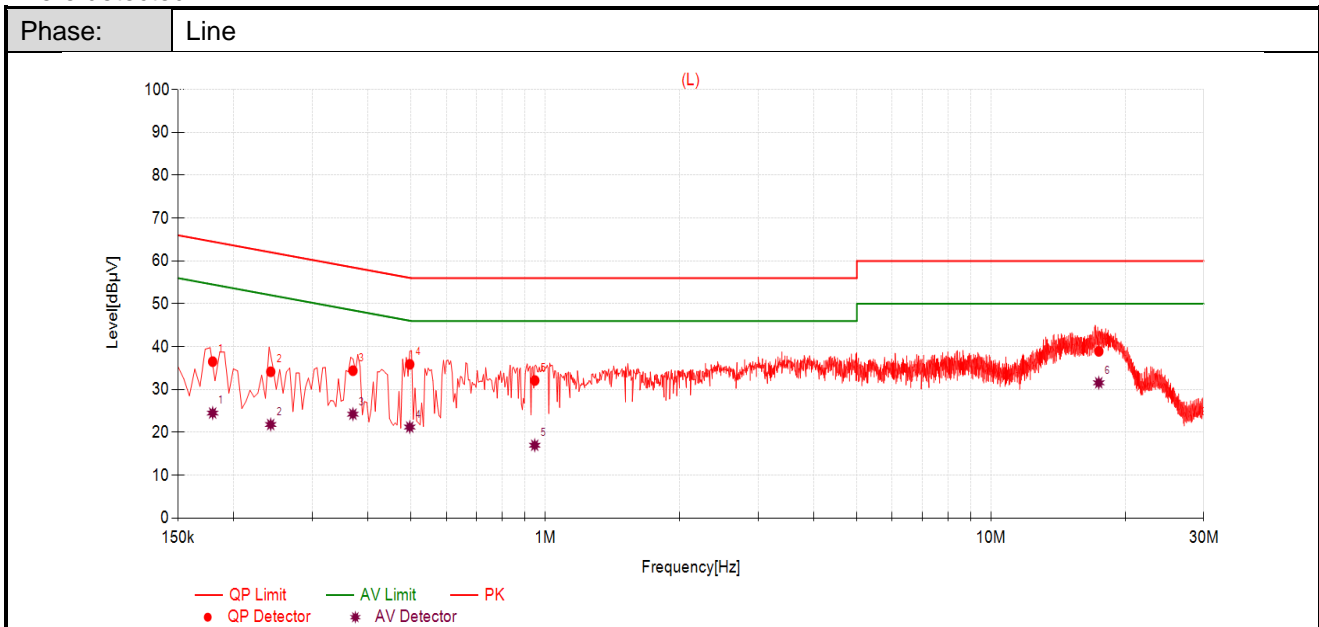
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## Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



## Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1793	9.85	26.67	36.52	64.52	28.00	14.67	24.52	54.52	30.00	PASS
2	0.2420	9.87	24.29	34.16	62.03	27.87	11.97	21.84	52.03	30.19	PASS
3	0.3701	9.86	24.55	34.41	58.50	24.09	14.40	24.26	48.50	24.24	PASS
4	0.4964	9.89	26.00	35.89	56.06	20.17	11.36	21.25	46.06	24.81	PASS
5	0.9468	9.86	22.26	32.12	56.00	23.88	7.14	17.00	46.00	29.00	PASS
6	17.4484	10.24	28.68	38.92	60.00	21.08	21.34	31.58	50.00	18.42	PASS

## Remark:

- The following Quasi-Peak and Average measurements were performed on the EUT:
- Value = Reading[dBµV] + Factor(Lin factor[dB] + cable loss[dB]).
- Margin = Limit[dBµV] – Value[dBµV]



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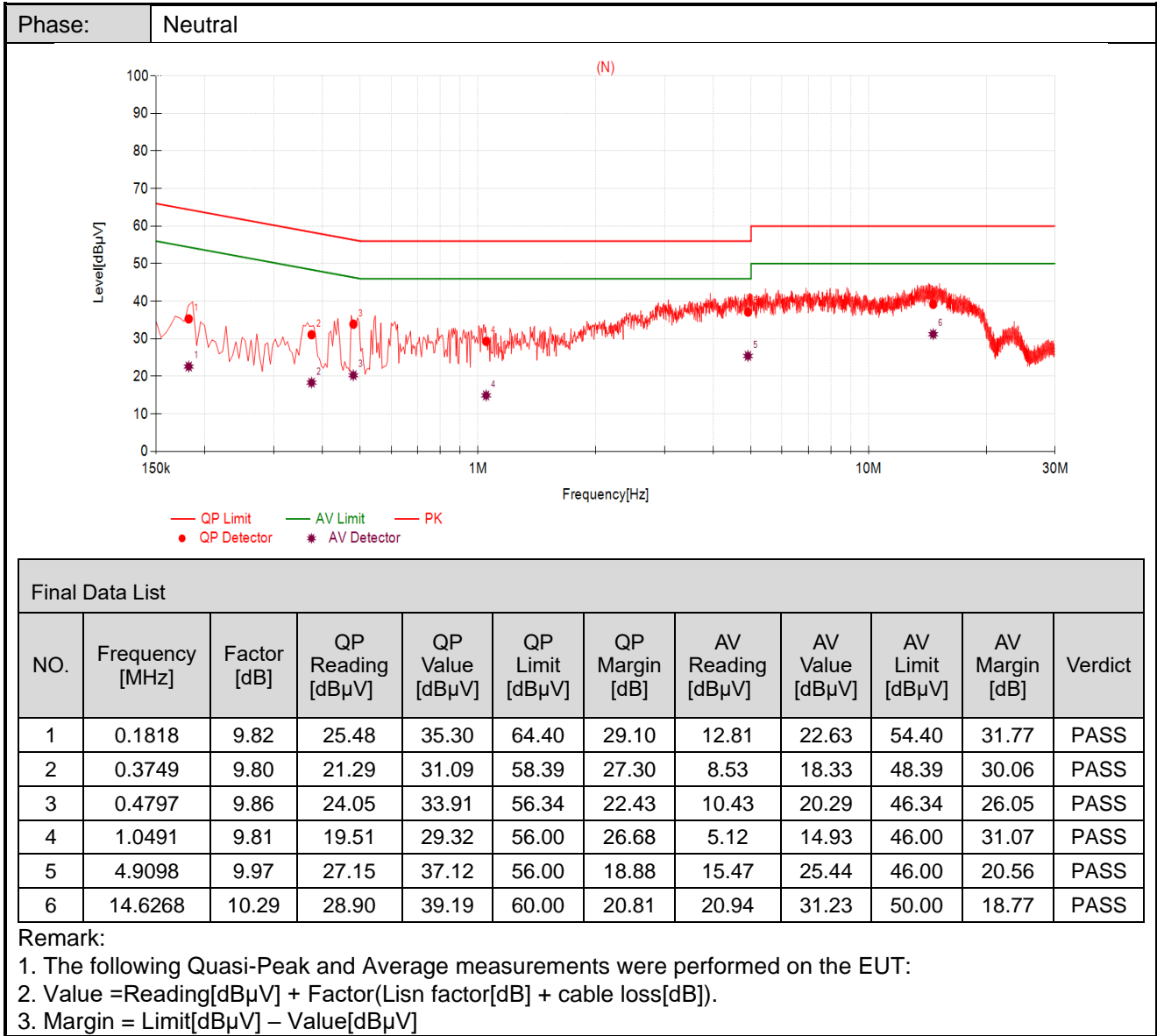
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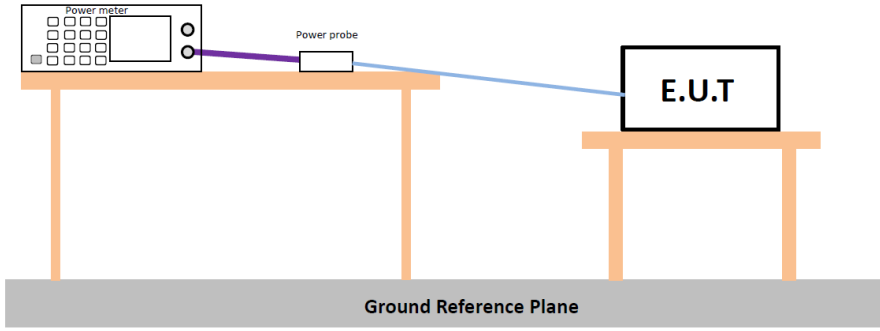
### 4.3 Duty Cycle

Test Requirement:	ANSI C63.10-2020 Section 11.6
Test Method:	ANSI C63.10-2020 Section 11.6
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	No restriction limits
Test Results:	For Report Purpose
The detailed test data see: <b>Appendix</b>	





#### 4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10-2020 Section 11.9.1.2
Test Setup:	 <p>* Test with power meter (Detector function: Peak)</p>
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>	





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

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10-2020 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:	≥ 500 kHz for DTS Bandwidth
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 C63.10-2020 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>	



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#### 4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020 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>	





**4.8 RF Conducted Spurious Emissions**

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020 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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## 4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10-2020 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:

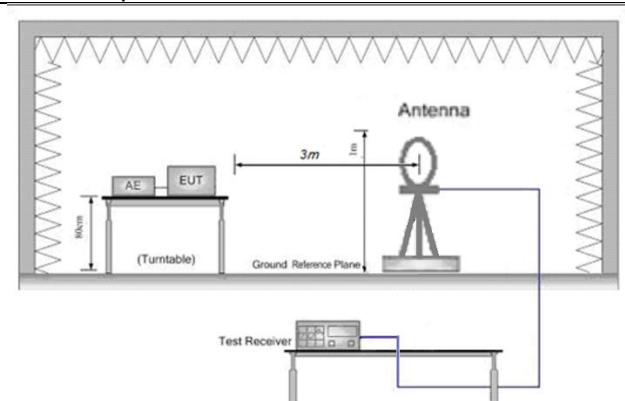


Figure 1. Below 30MHz

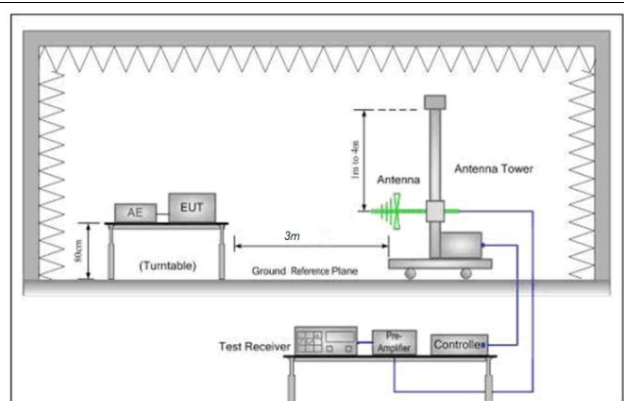


Figure 2. 30MHz to 1GHz



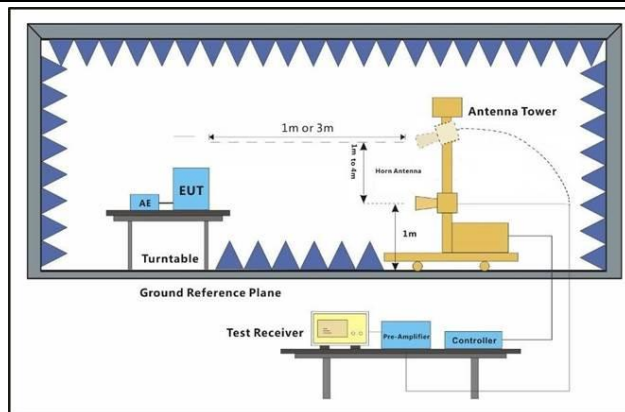


Figure 3. Above 1 GHz

<b>Test Procedure:</b>	<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 \text{LOG}(3/1) = 9.54 \text{ dB}</math>.</li> </ol>
<b>Test Configuration:</b>	<b>Measurements below 30MHz</b> <ul style="list-style-type: none"> <li>• RBW = 10 kHz</li> <li>• VBW = 30 kHz</li> <li>• Detector = Peak &amp; Average &amp; Quasi-peak</li> </ul>







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	<ul style="list-style-type: none"> <li>• Trace mode = max hold</li> </ul> <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Quasi-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 = 10 Hz, when duty cycle is no less than 98 percent.</li> <li>• VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</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 all channels, but 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 C63.10-2020 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:

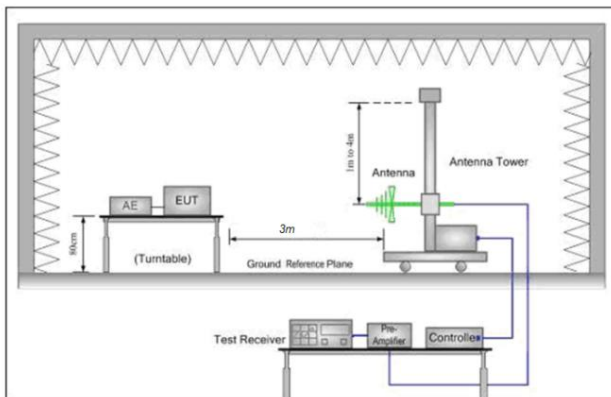


Figure 1. 30MHz to 1GHz

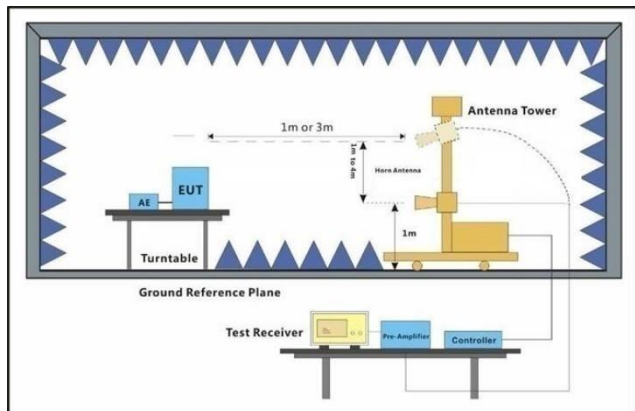


Figure 2. Above 1 GHz

#### 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.





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	<p>g. Place a marker at the end of the restricted band closest to the transmit 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 = Quasi-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 = 10 Hz, when duty cycle is no less than 98 percent.</li> <li>• VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</li> </ul>
Exploratory Test Mode:	<p>Transmitting with GFSK modulation. Charge + Transmitting mode.</p>
Final Test Mode:	<p>Transmitting with GFSK modulation. Pretest the EUT at Charge + Transmitting mode. 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)

Lab A		
No.	Item	Measurement Uncertainty
1	Radio Frequency	± 9.84Hz
2	Duty cycle	± 0.185%
3	Occupied Bandwidth	± 0.20%
4	RF conducted power	± 0.42dB
5	RF power density	± 1.97dB
6	Conducted Spurious emissions	± 0.42dB

**Remark:**

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{CISPR/ETSI}$  (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.

Lab B		
No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.6dB (9kHz to 30MHz)
		± 4.9dB (30MHz to 1GHz)
		± 4.9dB (1GHz to 6GHz)
		± 4.7dB (6GHz to 18GHz)
		± 5.26dB (Above 18GHz)

**Remark:**

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{CISPR/ETSI}$  (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

Lab A					
RF Test System (for report ZEWM2303000343RG04)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Spectrum Analyzer	Keysight	N9020A	SZ-WRG-M-002	2022/11/18	2023/11/17
Signal Generator	Keysight	N5181A	SZ-WRG-M-005	2022/11/18	2023/11/17
DC power supply	Tonscend	TS0806-4ADC	SZ-WRG-A-007	NCR	NCR
RF Control Unit	Tonscend	JS0806-2	SZ-WRG-M-008	2022/11/18	2023/11/17
Radio Communication Tester	Rohde & Schwarz	CMW270	SZ-WRG-M-009	2023/02/16	2024/02/15
Radio Communication Tester	Rohde & Schwarz	CMW-Z800A	SZ-WRG-M-010	NCR	NCR
Signal Generator	Rohde & Schwarz	SMM100A	SZ-WRG-M-011	2023/02/22	2024/02/21
Test Software	Tonscend	JS1120 V3.2.22	N/A	NCR	NCR
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	SZ-WRG-M-077	2022/07/06	2023/07/05
Spectrum Analyzer	Rohde & Schwarz	FSV	SZ-WRG-M-012	2023/02/16	2024/02/15

Lab B					
CE Test System (for report ZEWM2303000343RG04)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	XAW04-03-01	N/A	N/A
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2022/09/08	2023/09/07
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2022/06/30	2023/06/29
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2022/09/18	2023/09/17
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-07-01	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-02	2022/06/30	2023/06/29



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Lab B					
RSE Test System (for report ZEWM2303000343RG04)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal. Due date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2021/09/09	2024/09/08
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2023/02/16	2024/02/15
Spectrum Analyzer	ROHDE &SCHWARZ	FSV3044	XAW01-13-05	2022/05/24	2023/05/23
Test receiver	ROHDE &SCHWARZ	ESR	XAW01-08-01	2022/09/08	2023/09/07
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2022/07/28	2024/07/27
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2022/07/28	2024/07/27
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2022/07/23	2024/07/22
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP9K3G32	XAW01-41-01	2022/05/24	2023/05/23
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2022/09/14	2023/09/13
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2022/09/14	2023/09/13
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2022/09/14	2023/09/13
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2022/09/18	2023/09/17
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-05-01	NCR	NCR
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2022/05/26	2023/05/25



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Lab B CE Test System (for report ZEWM2310001500RG04)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	XAW04-03-01	N/A	N/A
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2023/08/30	2024/08/29
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2023/06/30	2024/06/29
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2023/08/30	2024/08/29
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-07-01	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-02	2023/06/30	2024/06/29



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Lab B RSE Test System (for report ZEWM2310001500RG04)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal. Due date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2021/09/09	2024/09/08
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2023/02/16	2024/02/15
Spectrum Analyzer	ROHDE&SCHWARZ	FSV3044	XAW01-13-05	2023/05/15	2024/05/14
Test receiver	ROHDE &SCHWARZ	ESR	XAW01-08-01	2023/08/30	2024/08/29
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2022/07/28	2024/07/27
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2022/07/28	2024/07/27
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2022/07/23	2024/07/22
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP9K3G32	XAW01-41-01	2023/05/15	2024/05/14
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2023/08/30	2024/08/29
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2023/08/30	2024/08/29
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2023/08/30	2024/08/29
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2023/09/04	2024/09/03
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-05-01	NCR	NCR
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2022/05/26	2024/05/25



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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	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant22	2402	0.68	2401.66	2402.34	≥0.5	PASS
		2440	0.68	2439.66	2440.34	≥0.5	PASS
		2480	0.68	2479.65	2480.34	≥0.5	PASS



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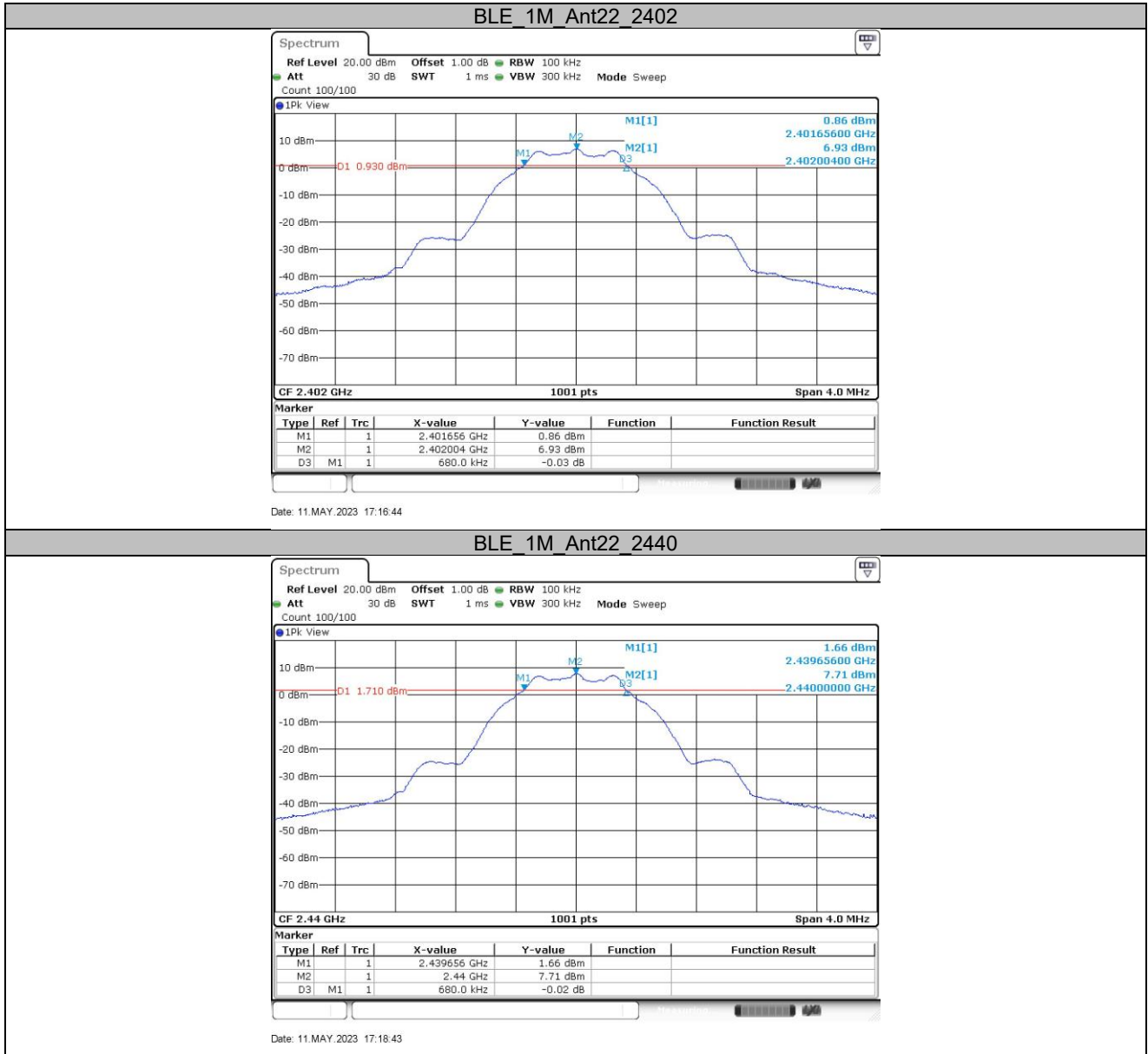
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## Test Graphs



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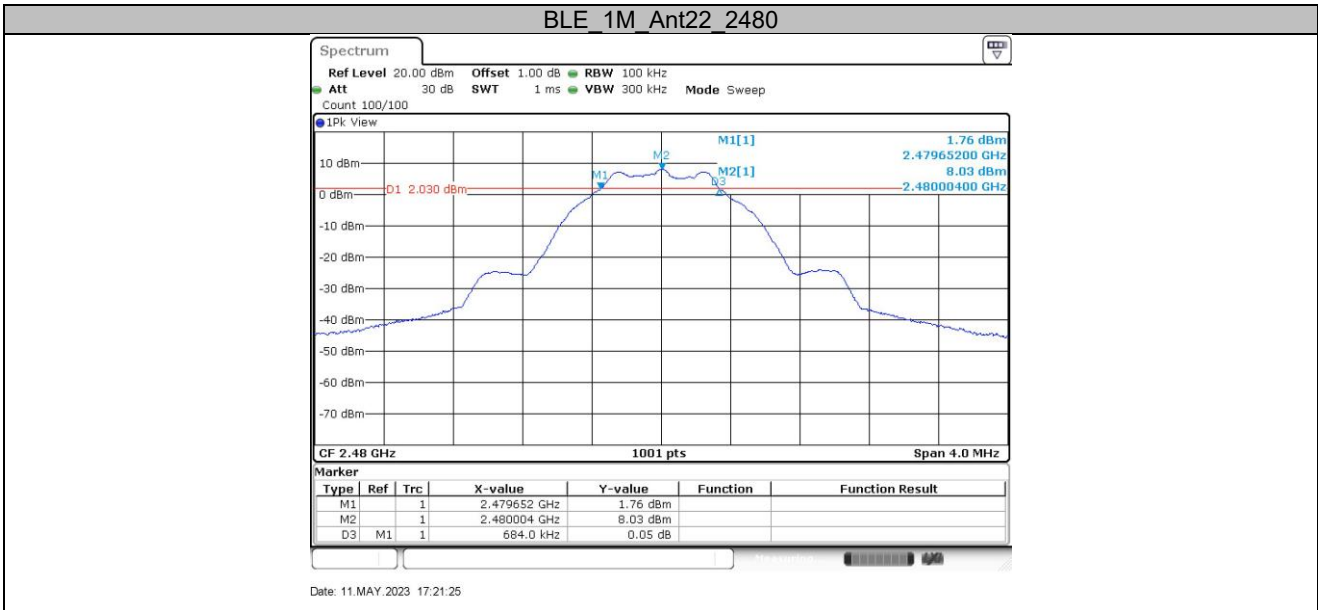
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## Occupied Channel Bandwidth Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
BLE_1M	Ant22	2402	1.035	2401.4885	2402.5235	For Report Purpose
		2440	1.035	2439.4885	2440.5235	
		2480	1.031	2479.4885	2480.5195	


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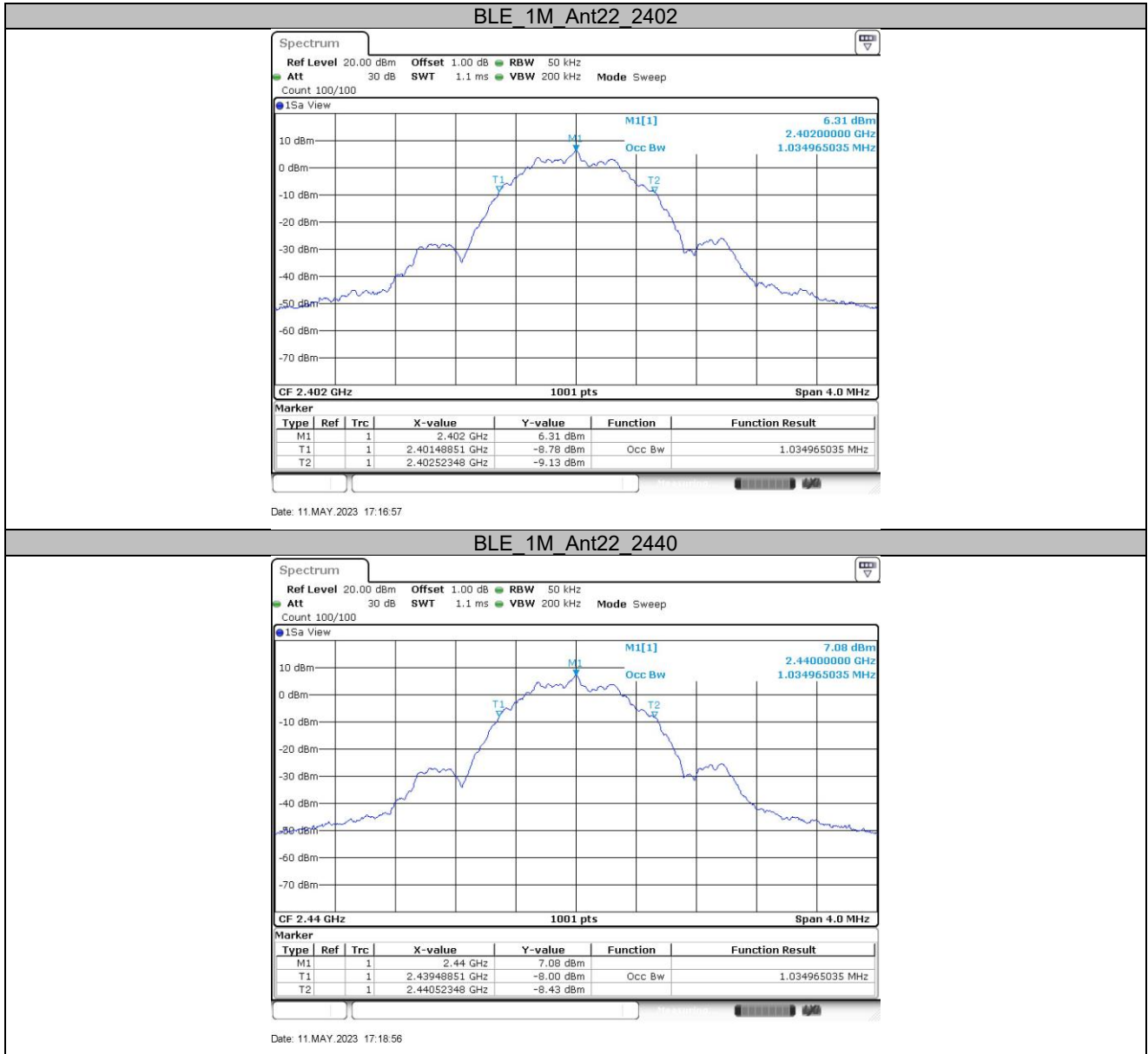
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**Test Graphs**



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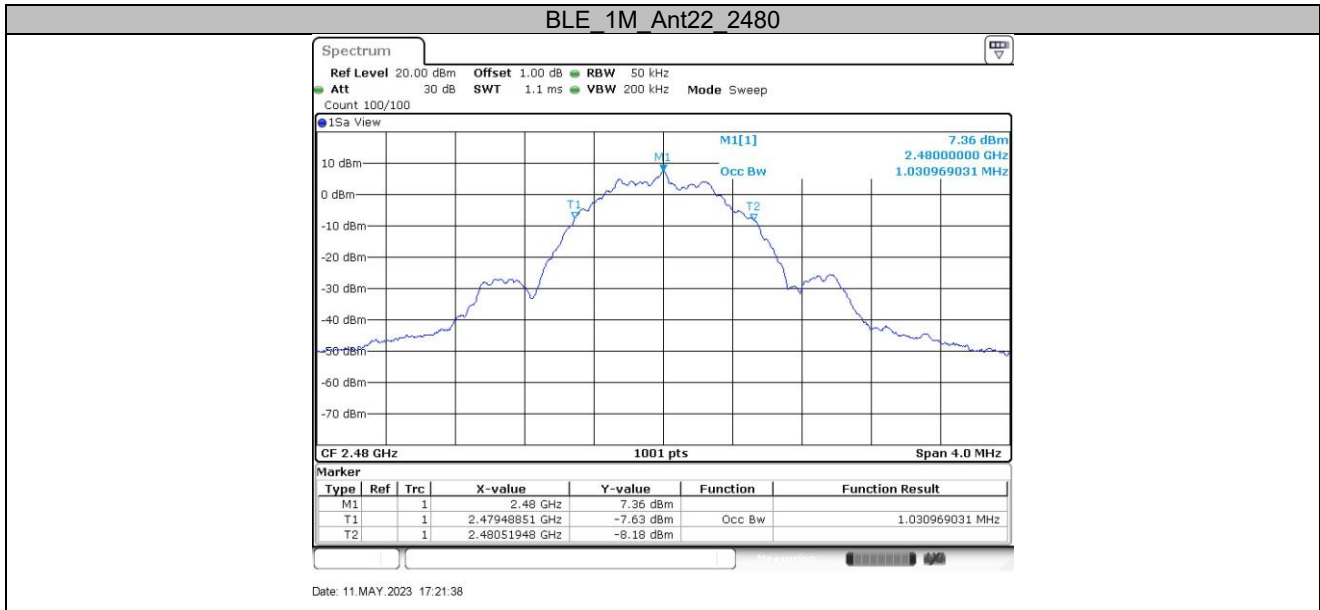
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## Maximum conducted output power Test Result Peak

TestMode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant22	2402	7.33	≤30	PASS
		2440	8.09	≤30	PASS
		2480	8.37	≤30	PASS



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## Maximum power spectral density Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant22	2402	-7.63	≤8.00	PASS
		2440	-6.85	≤8.00	PASS
		2480	-6.56	≤8.00	PASS



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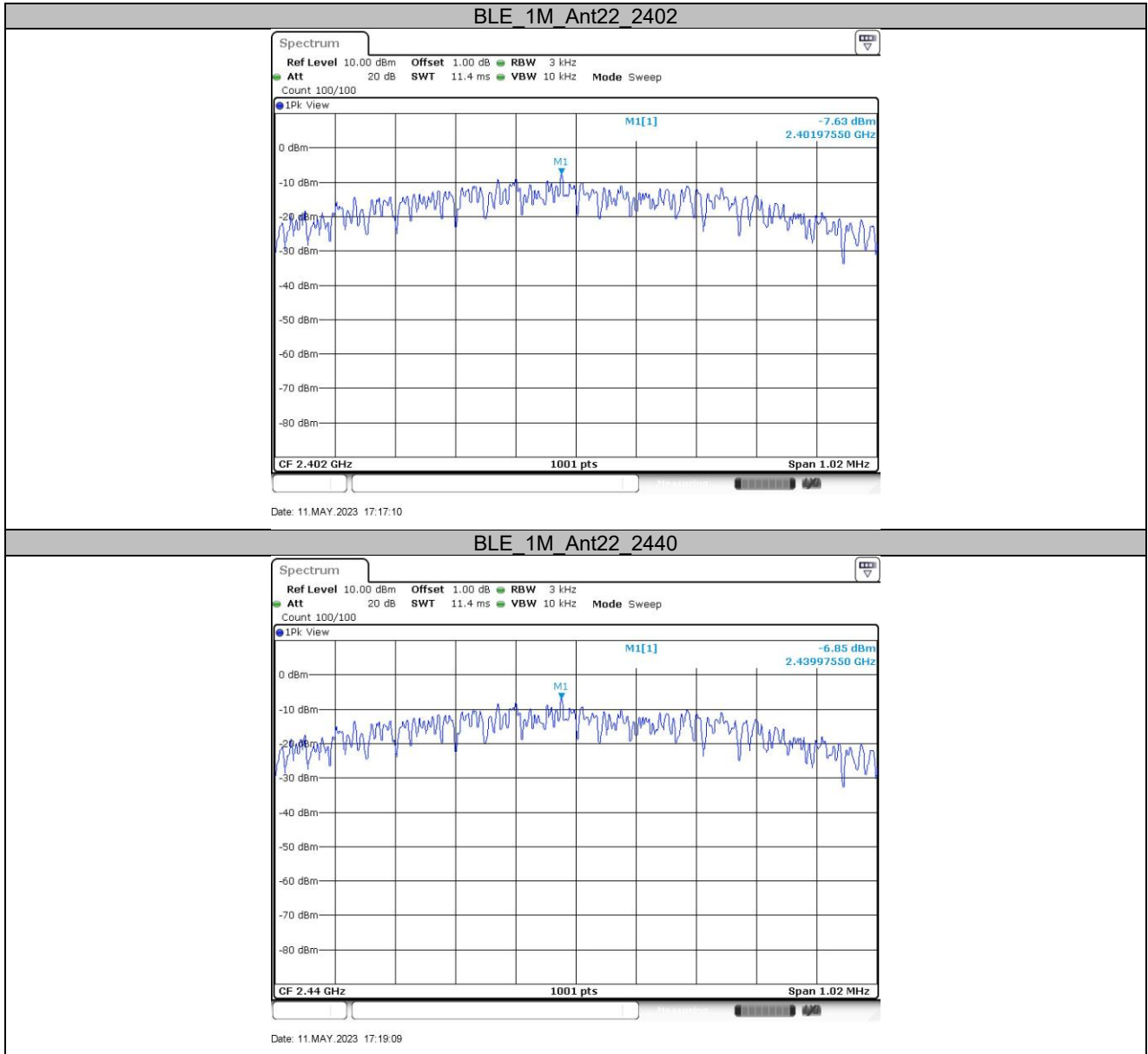
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**Test Graphs**



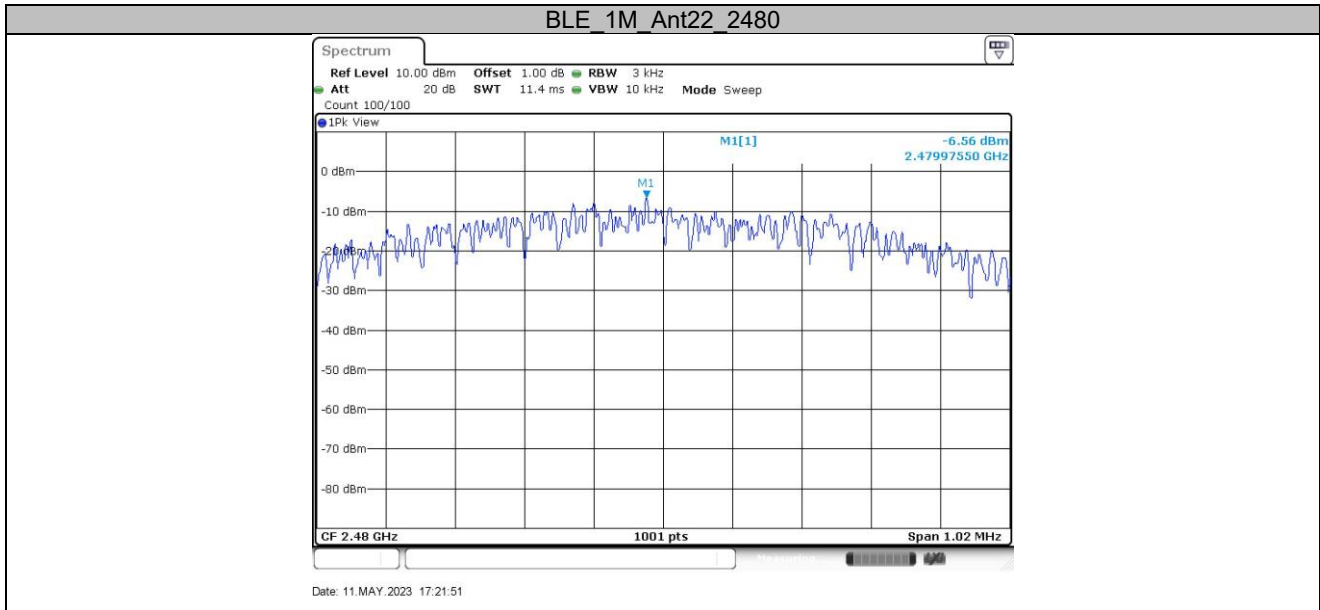
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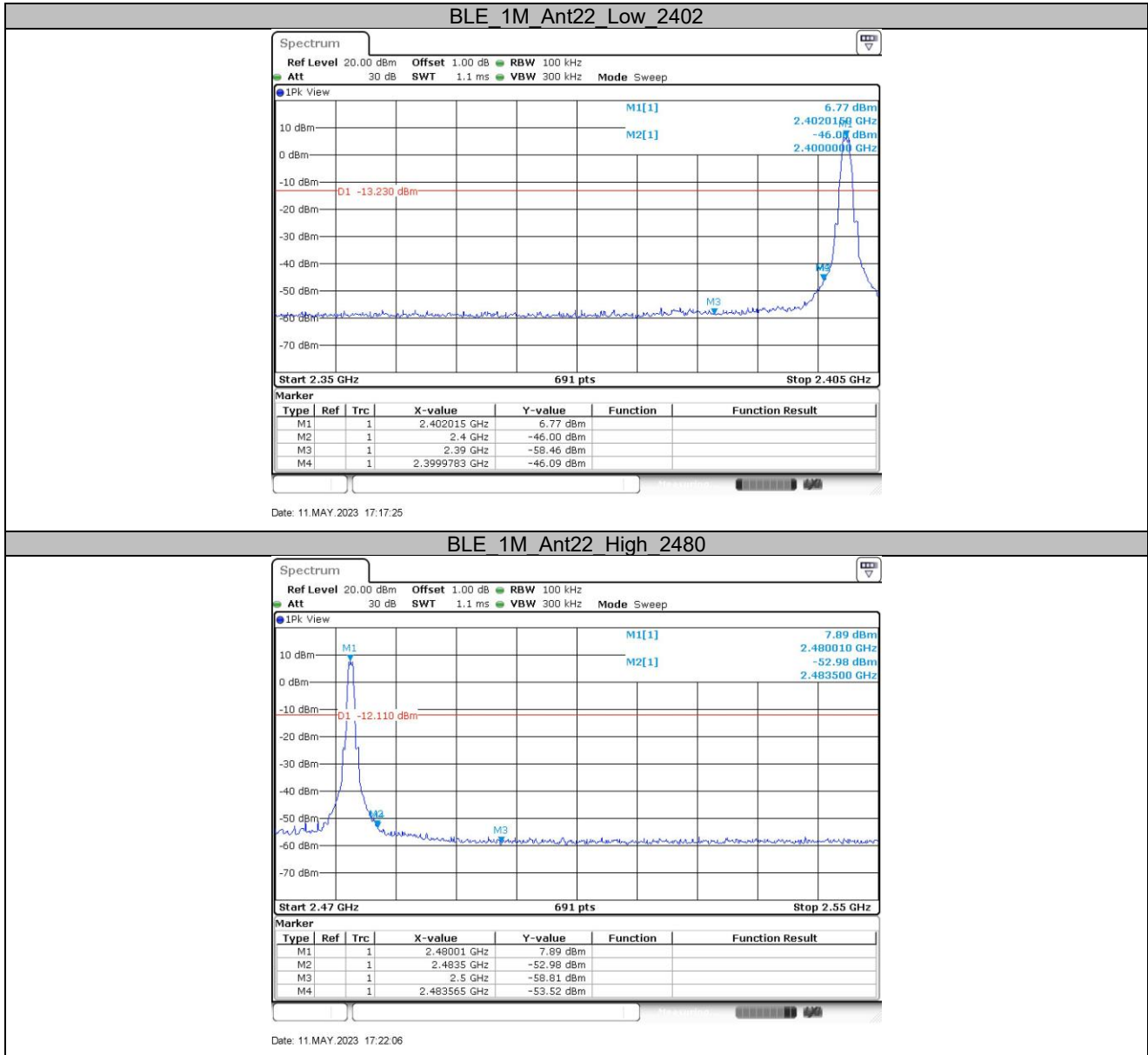




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## Band edge measurements Test Graphs



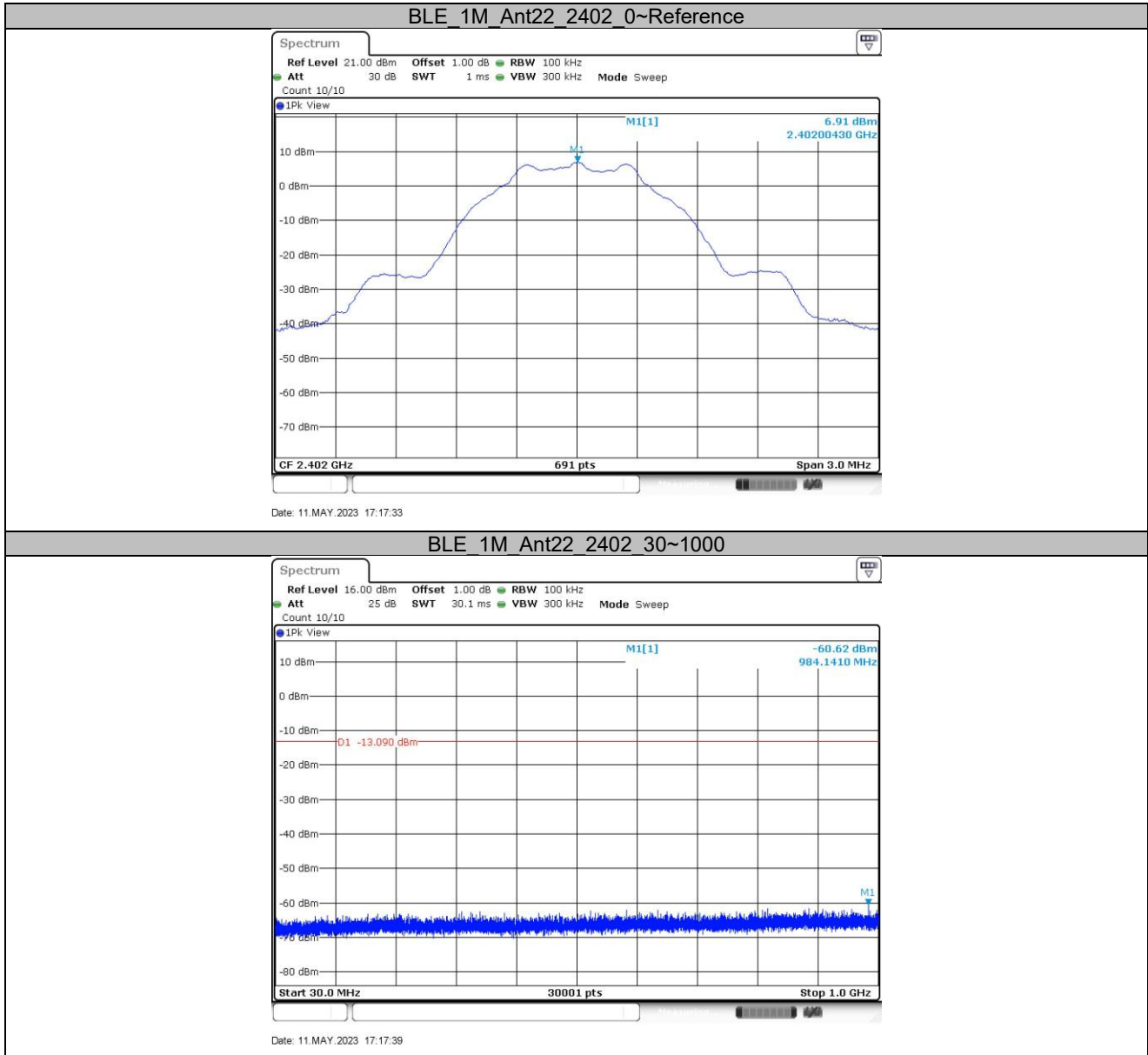
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**Conducted Spurious Emission  
 Test Graphs**



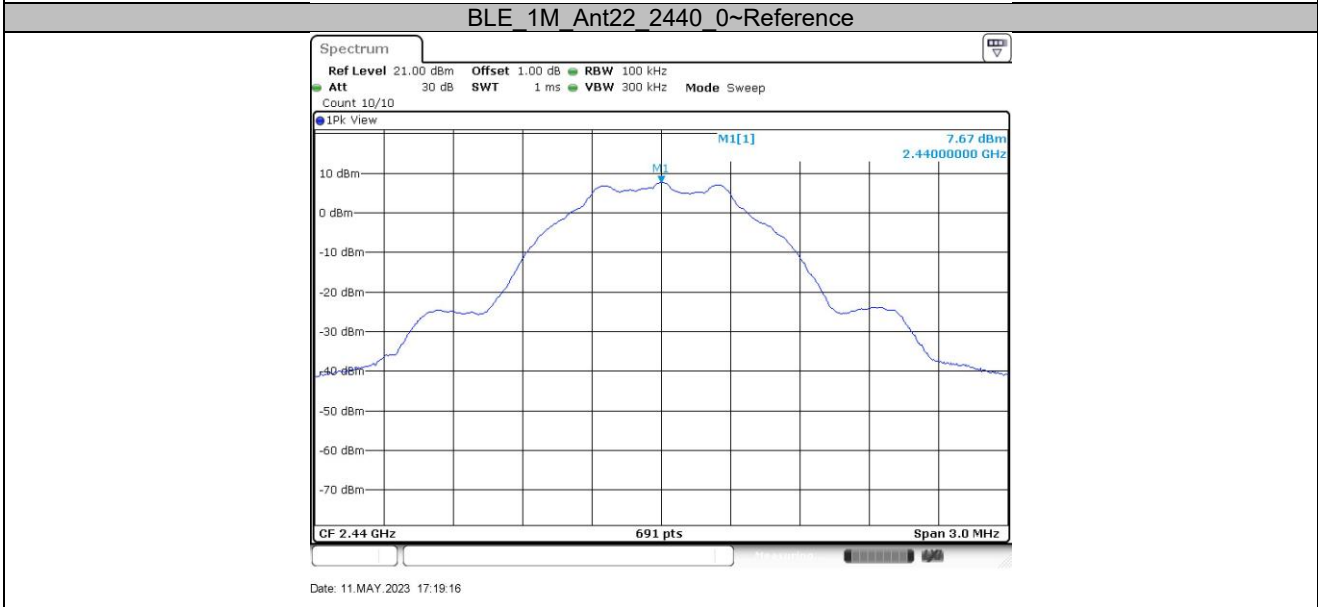
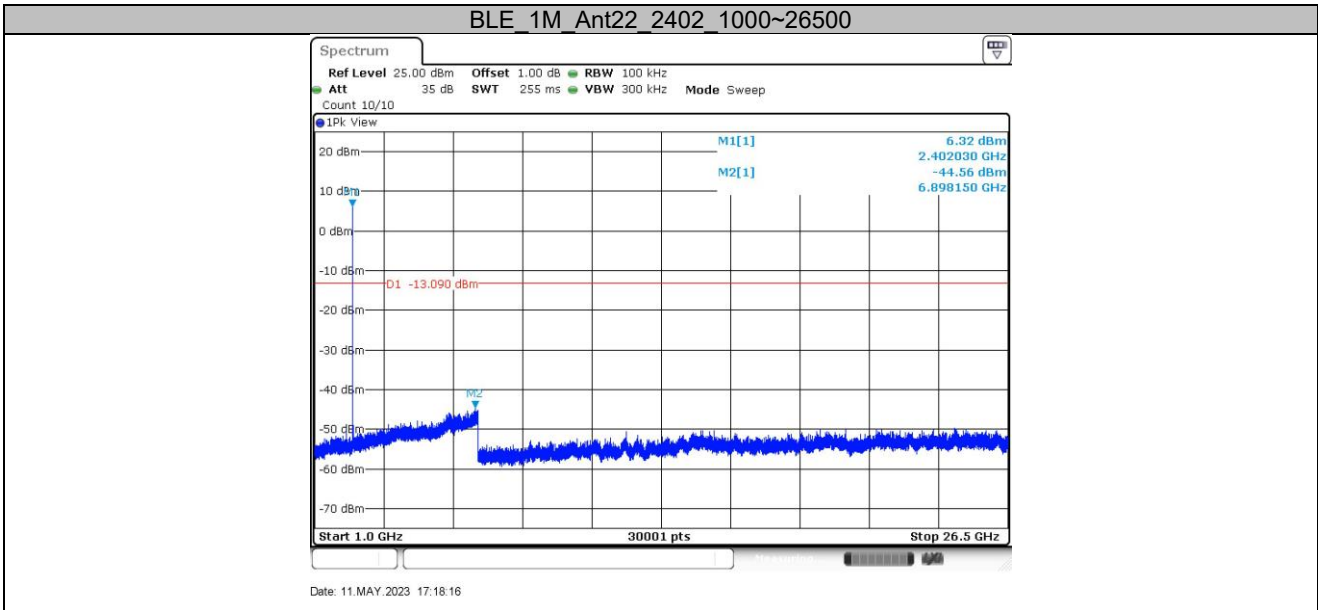
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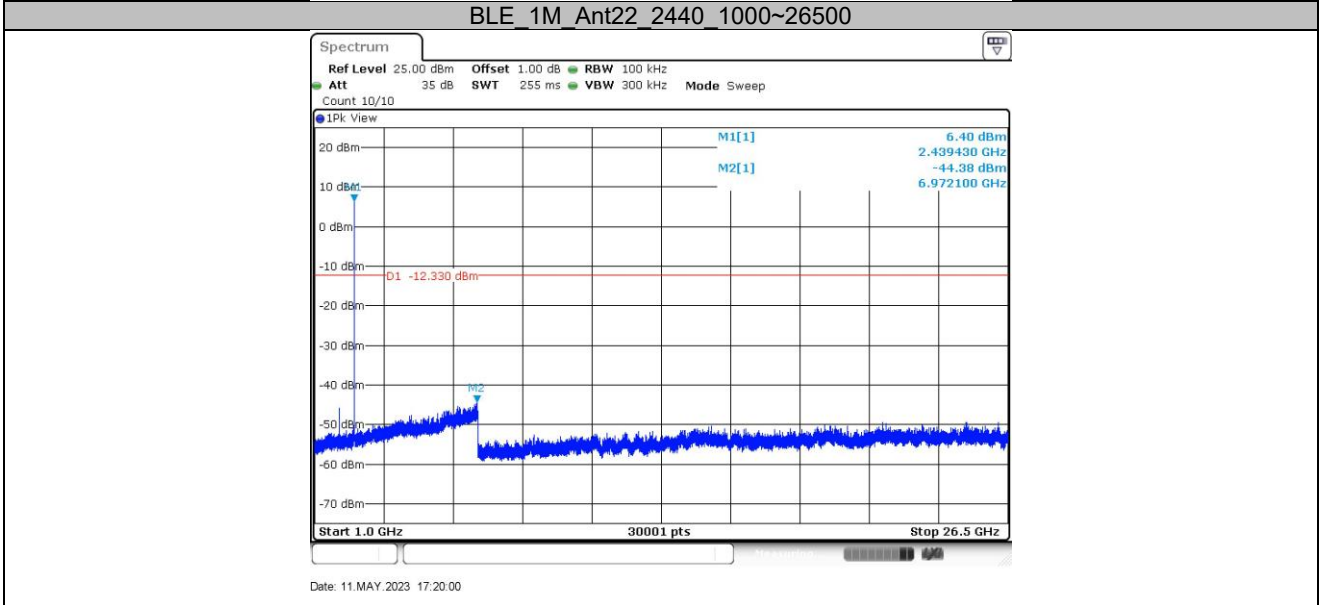
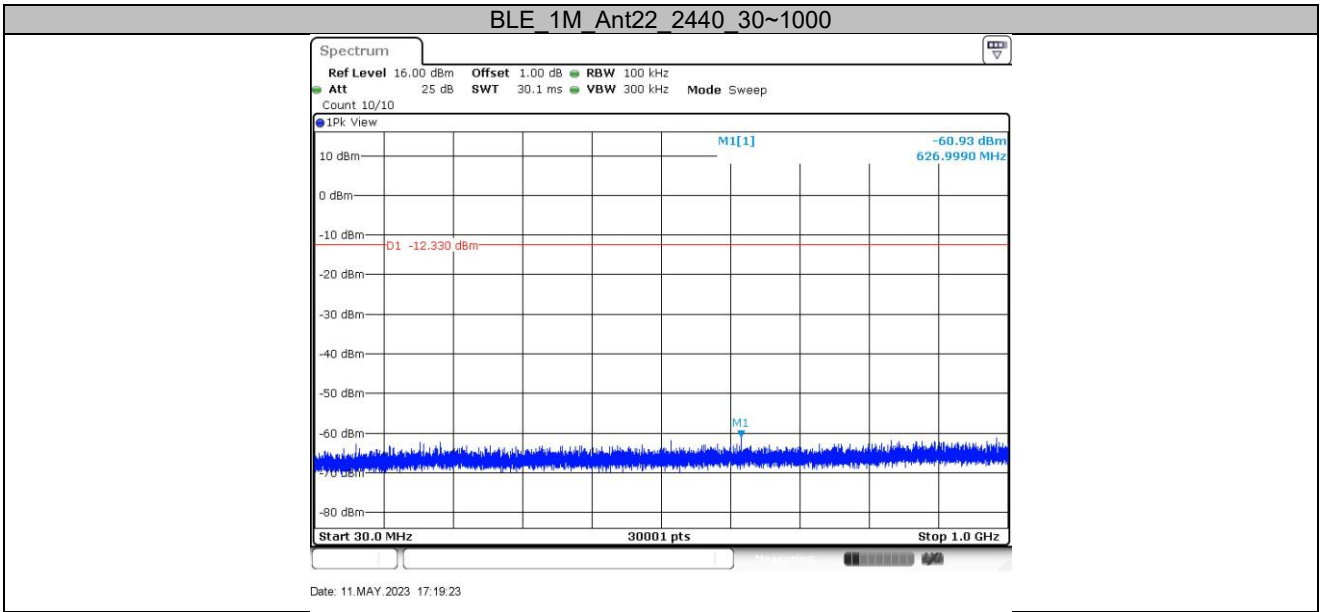
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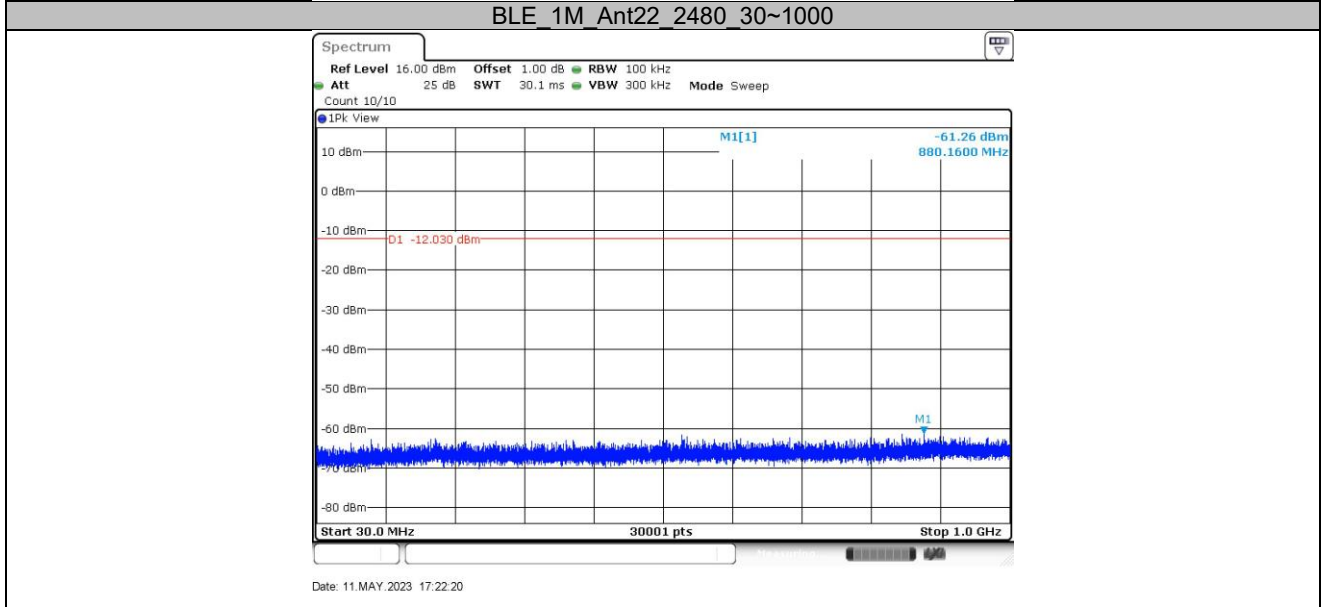
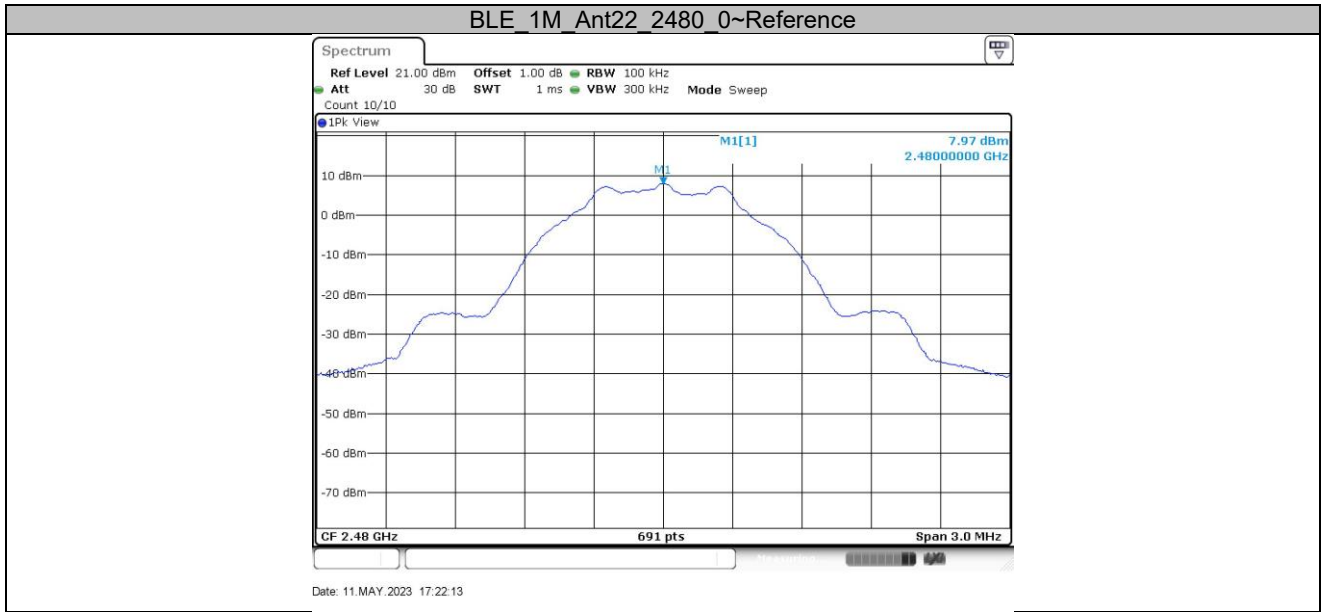
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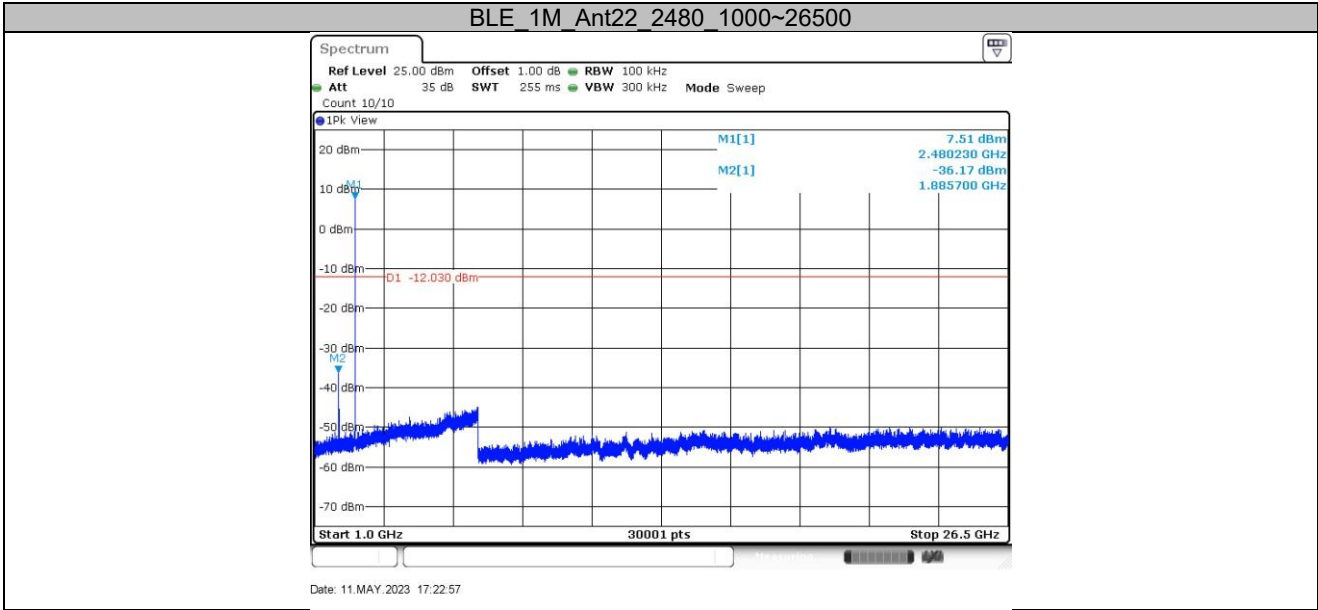
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## Duty Cycle Test Result

TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	Ant22	2402	0.39	0.62	62.90	2.01

Note:

Radiated Emission Average VBW = 1 / T

TestMode	T[ms]	Period[ms]	Duty Cycle[%]	1/T[kHz]	VBW Setting
BLE_1M	0.39	0.62	62.90	2.52780	2.7KHz



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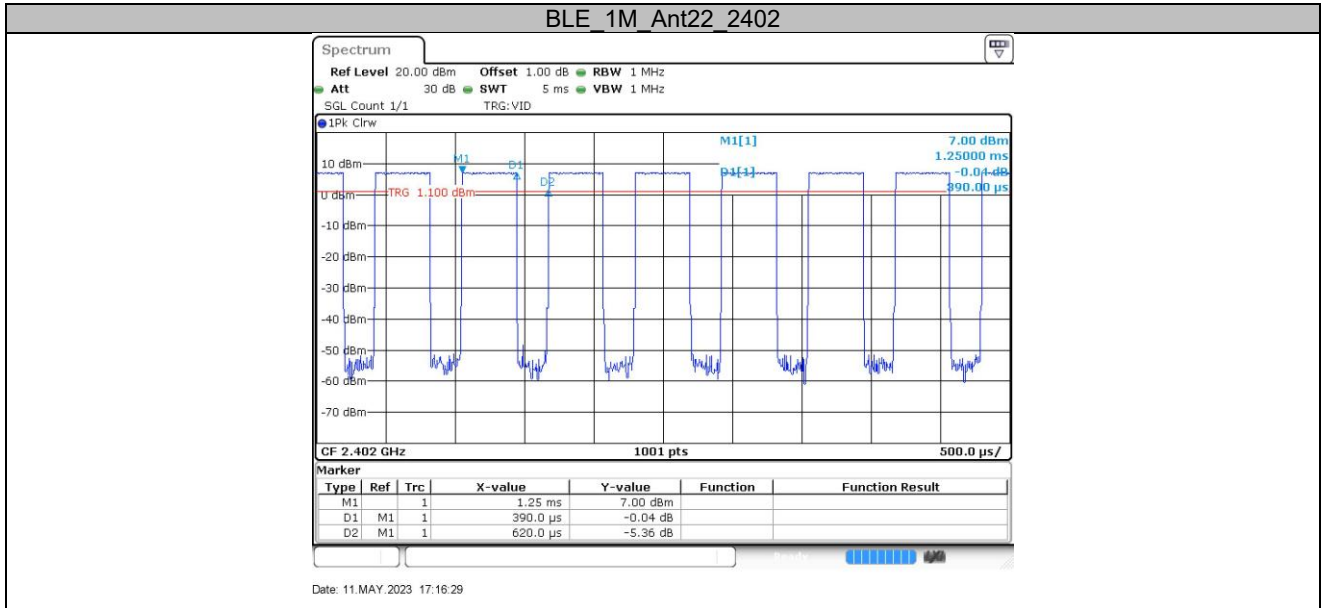
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**Test Graphs**



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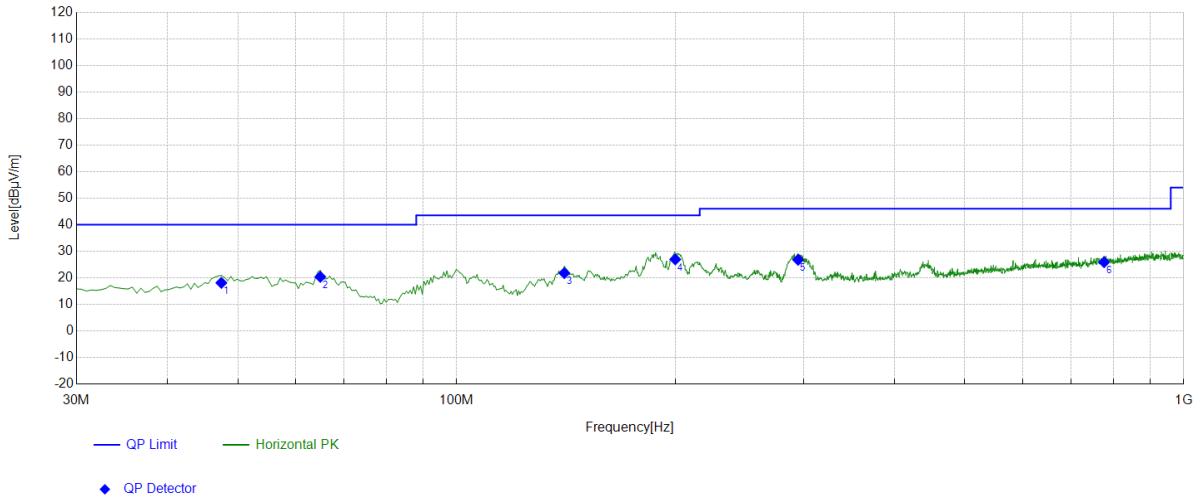
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**Radiated Spurious Emissions**  
**Radiated emission below 1GHz**  
**Worst case Mode: BLE\_1M CH39**

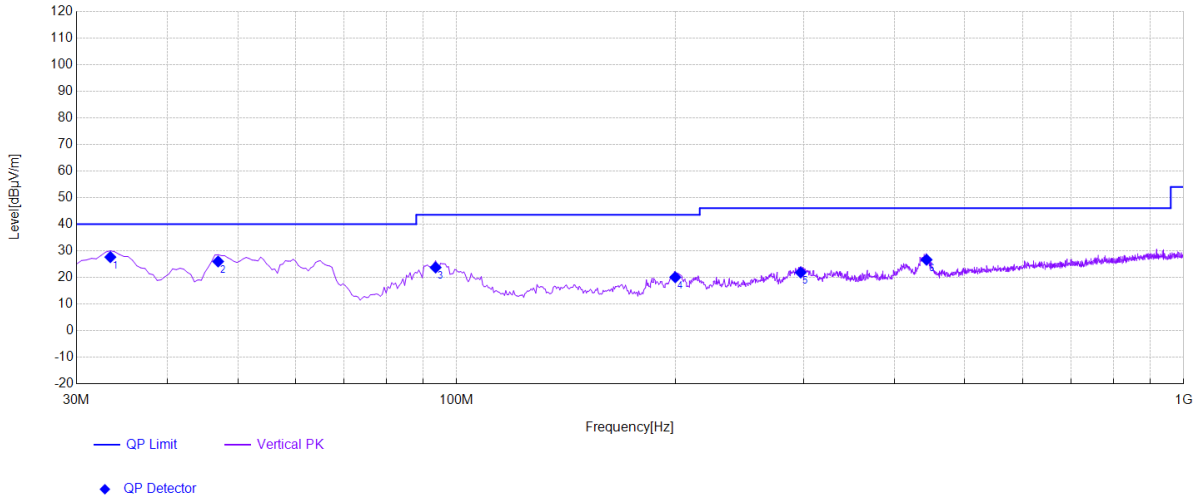


Final Data List										
NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading[dBµV]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	47.4687	14.07	-27.77	31.83	18.13	40.00	21.87	151	120	Horizontal
2	64.9375	12.10	-27.66	35.94	20.38	40.00	19.62	135	153	Horizontal
3	140.6353	7.84	-26.45	40.4	21.79	43.50	21.71	262	49	Horizontal
4	199.8349	11.40	-26.32	41.88	26.96	43.50	16.54	243	249	Horizontal
5	294.9425	13.40	-25.77	39.18	26.81	46.00	19.19	259	46	Horizontal
6	777.2736	20.53	-23.80	29.17	25.90	46.00	20.10	354	165	Horizontal



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Final Data List										
NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading[dBµV]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	33.3967	11.30	-28.00	44.33	27.63	40.00	12.37	189	5	Vertical
2	46.9835	14.30	-27.78	39.45	25.97	40.00	14.03	136	20	Vertical
3	93.5668	10.81	-27.44	40.35	23.72	43.50	19.78	253	86	Vertical
4	199.8349	11.40	-26.32	34.98	20.06	43.50	23.44	363	35	Vertical
5	297.3687	13.31	-25.83	34.37	21.85	46.00	24.15	245	317	Vertical
6	442.9415	16.14	-25.24	35.74	26.64	46.00	19.36	155	242	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.

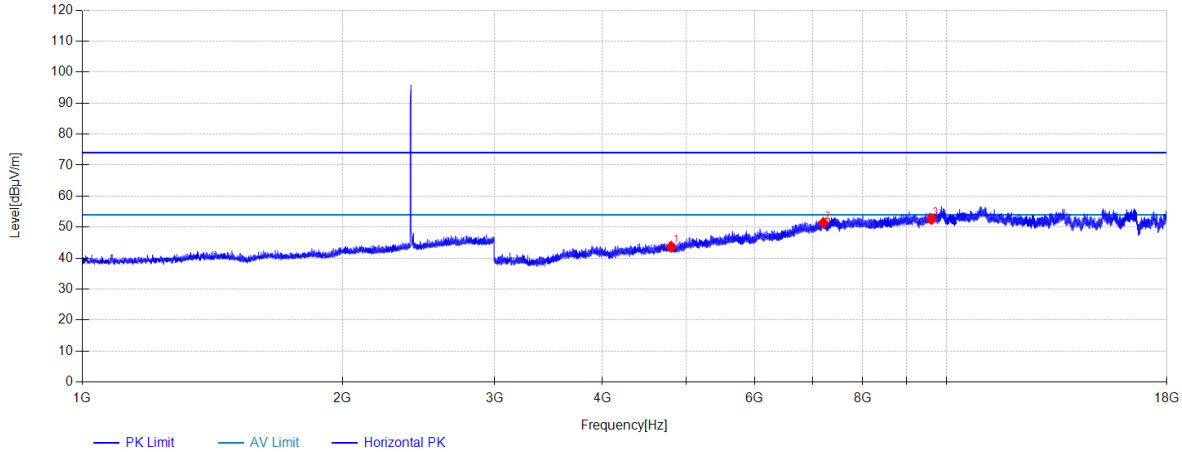


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**Transmitter emission Above 1GHz**  
**BLE 1M\_Channel 0**



Final 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	55.83	30.78	-42.95	43.66	74.00	30.34	242	306	Horizontal
2	7206	53.55	36.56	-38.71	51.40	74.00	22.60	187	38	Horizontal
3	9608	50.43	37.85	-35.70	52.58	74.00	21.42	214	273	Horizontal

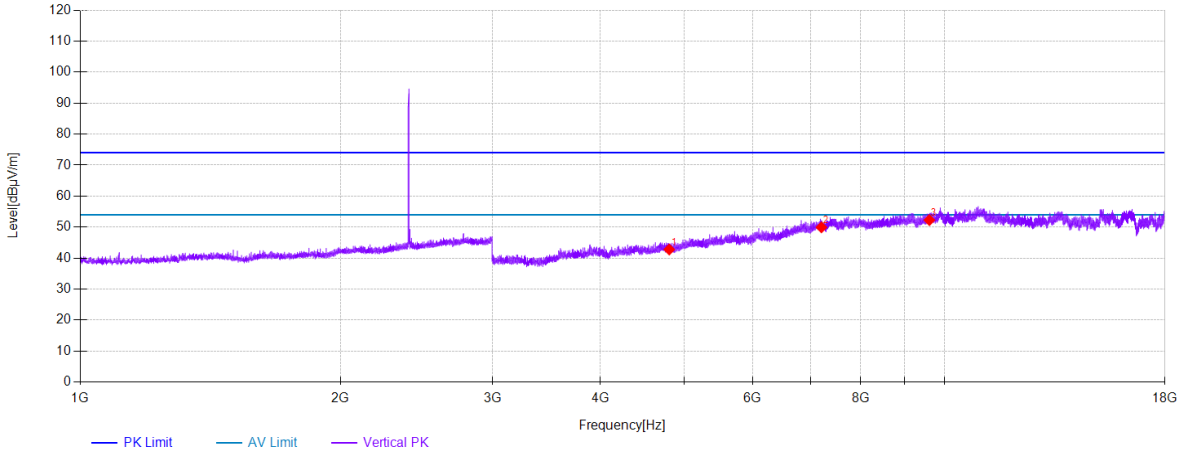


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**BLE 1M\_Channel 0**



Final 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	54.95	30.78	-42.95	42.78	74.00	31.22	370	209	Vertical
2	7206	52.08	36.56	-38.71	49.93	74.00	24.07	241	284	Vertical
3	9608	50.12	37.85	-35.70	52.27	74.00	21.73	333	209	Vertical

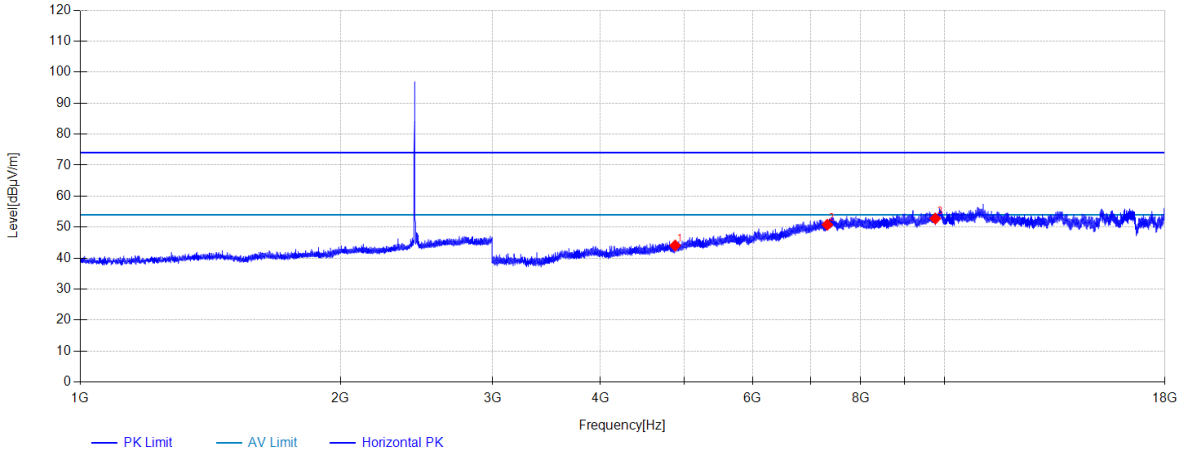


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**BLE 1M\_Channel 19**



Final 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	4880	56.19	30.78	-42.89	44.08	74.00	29.92	125	135	Horizontal
2	7320	53.10	36.44	-38.76	50.78	74.00	23.22	196	231	Horizontal
3	9760	50.40	38.34	-35.97	52.77	74.00	21.23	222	82	Horizontal

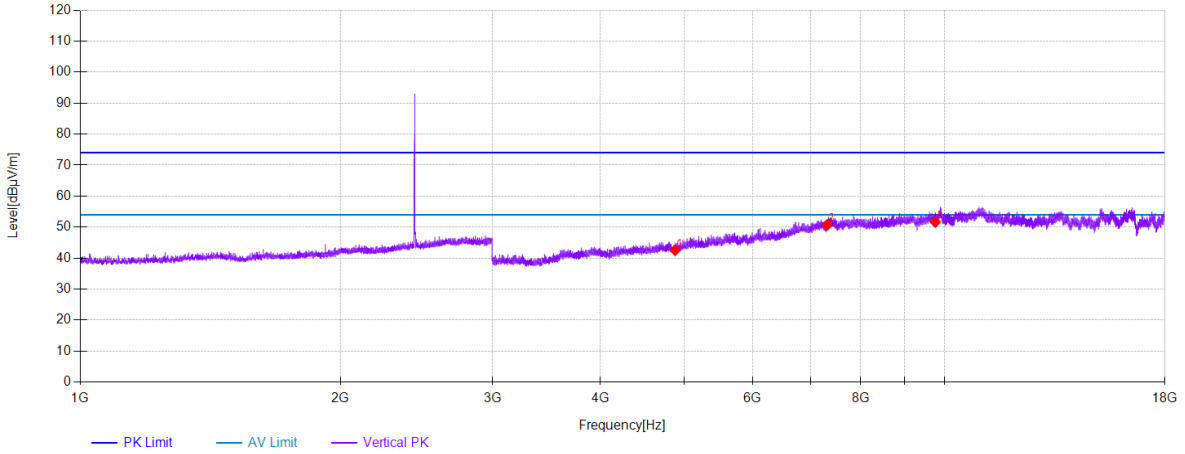


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**BLE 1M\_Channel 19**



Final 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	4880	54.67	30.78	-42.89	42.56	74.00	31.44	352	222	Vertical
2	7320	53.05	36.44	-38.76	50.73	74.00	23.27	261	222	Vertical
3	9760	49.28	38.34	-35.97	51.65	74.00	22.35	228	348	Vertical

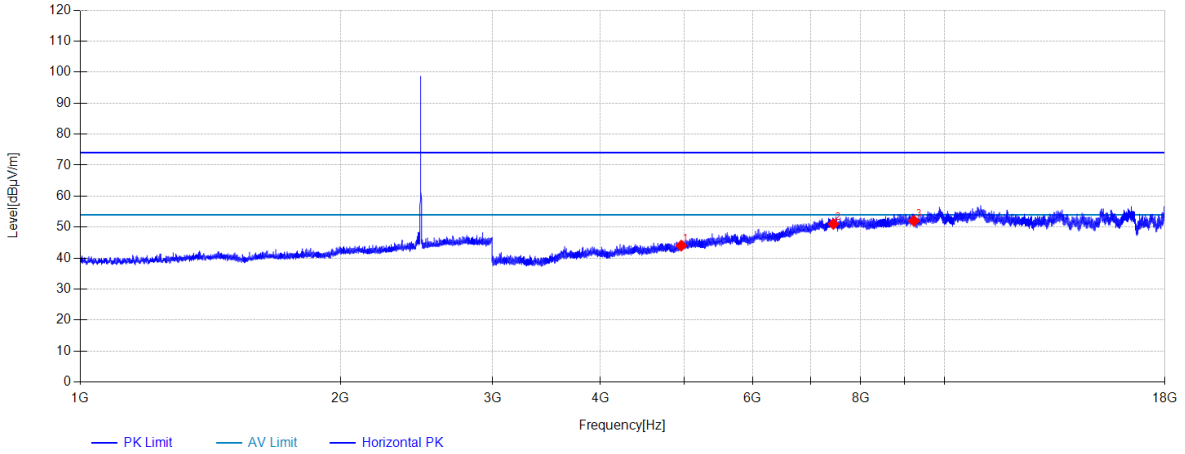


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**BLE 1M\_Channel 39**



Final 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	4960	55.77	31.04	-42.78	44.03	74.00	29.97	144	39	Horizontal
2	7440	52.52	36.78	-38.28	51.02	74.00	22.98	204	16	Horizontal
3	9220	50.59	37.50	-36.04	52.05	74.00	21.95	178	16	Horizontal



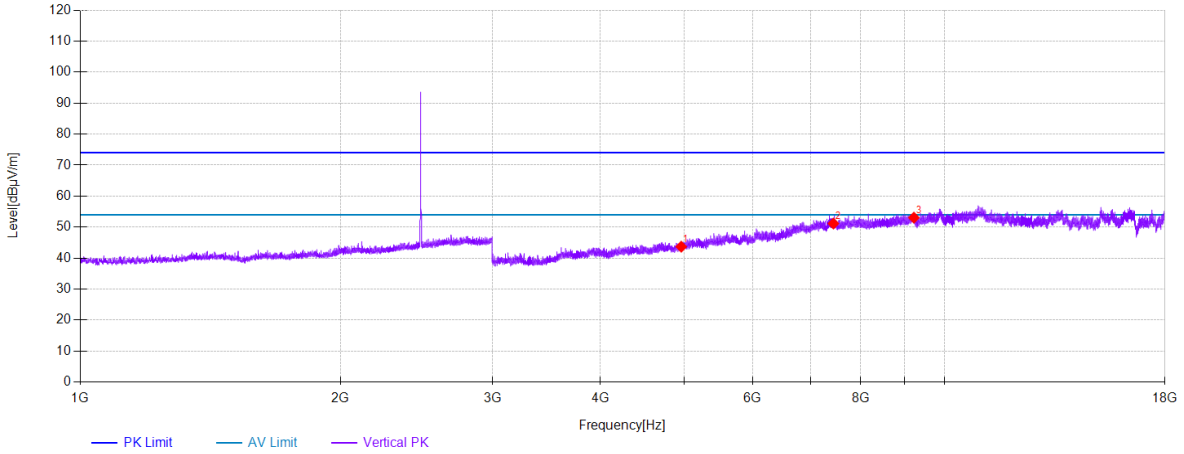
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**BLE 1M\_Channel 39**



Final 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	4960	55.43	31.04	-42.78	43.69	74.00	30.31	278	188	Vertical
2	7440	52.66	36.78	-38.28	51.16	74.00	22.84	367	0	Vertical
3	9220	51.59	37.50	-36.04	53.05	74.00	20.95	145	284	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:  
 Level = Reading(dBµV) + AF(dB/m) + Factor(dB)  
 AF = Antenna Factor(dB/m)  
 Factor = Cable Factor(dB) - Preamplifier gain(dB)  
 Margin = Limit(dBµV/m) – Level(dBµV/m)
- All channels have been tested, but only the worst case data displayed in this report.
- Both peak and average measured complies with the limit line, so test result is “PASS”.



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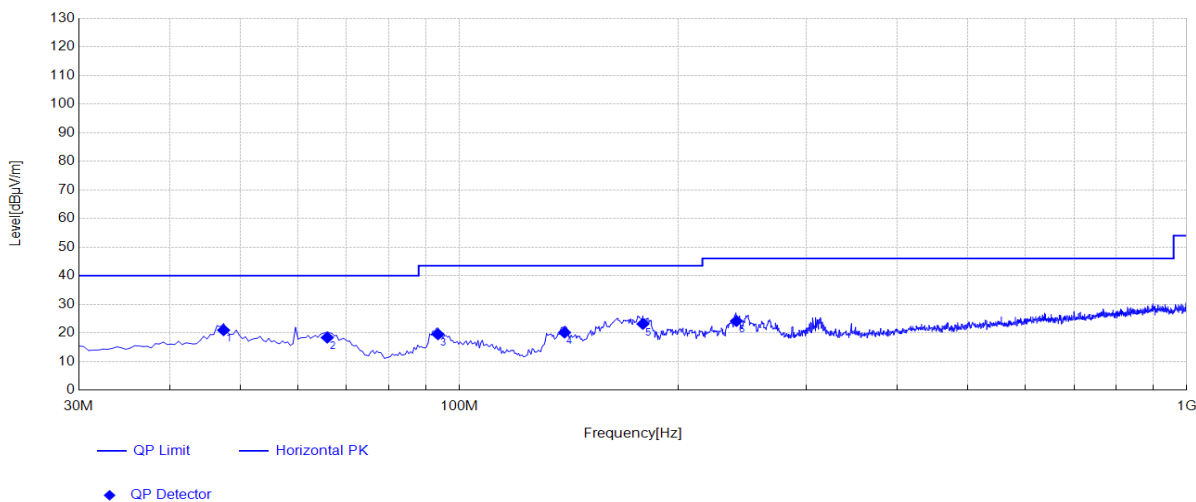
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**Shenzhen Branch**

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**Test on the worst case:**  
**Radiated emission below 1GHz**  
**Worst case Mode: BLE 1M\_Channel 39**



Final Data List								
NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading[dBµV]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	47.4687	14.07	-27.77	34.65	20.95	40.00	19.05	Horizontal
2	65.908	11.92	-27.60	34.05	18.37	40.00	21.63	Horizontal
3	93.5668	10.81	-27.44	36.14	19.51	43.50	23.99	Horizontal
4	139.6648	7.77	-26.44	38.8	20.13	43.50	23.37	Horizontal
5	178.9695	9.01	-26.46	40.59	23.14	43.50	20.36	Horizontal
6	240.5953	12.50	-26.29	37.93	24.14	46.00	21.86	Horizontal

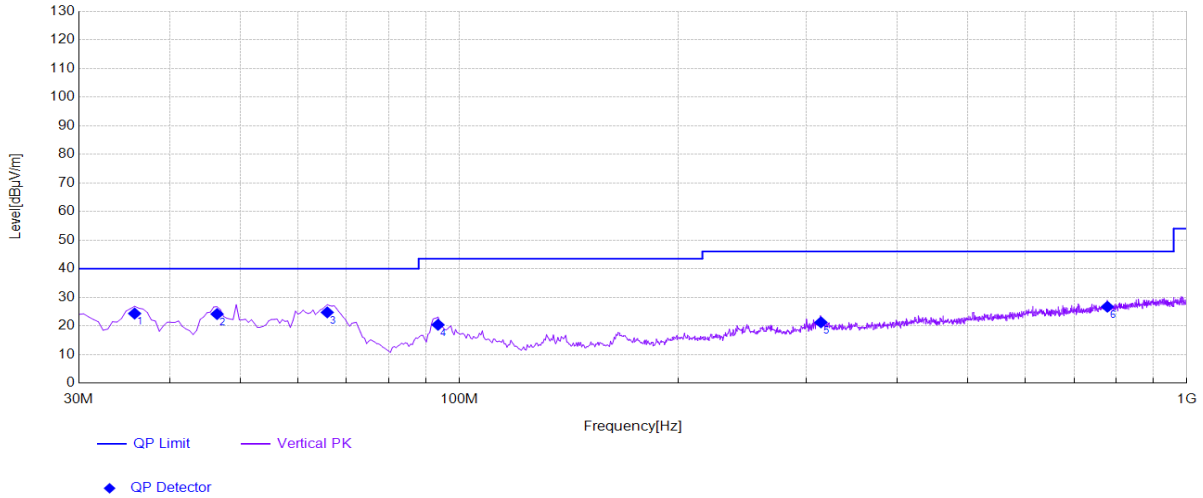


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Final Data List								
NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading[dBµV]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	35.8229	11.73	-27.99	40.58	24.32	40.00	15.68	Vertical
2	46.4982	14.20	-27.79	37.74	24.15	40.00	15.85	Vertical
3	65.908	11.92	-27.60	40.41	24.73	40.00	15.27	Vertical
4	93.5668	10.81	-27.44	37.03	20.40	43.50	23.10	Vertical
5	314.3522	13.37	-25.97	33.85	21.25	46.00	24.75	Vertical
6	778.2441	20.62	-23.79	29.86	26.69	46.00	19.31	Vertical

**Remark:**

1) 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)

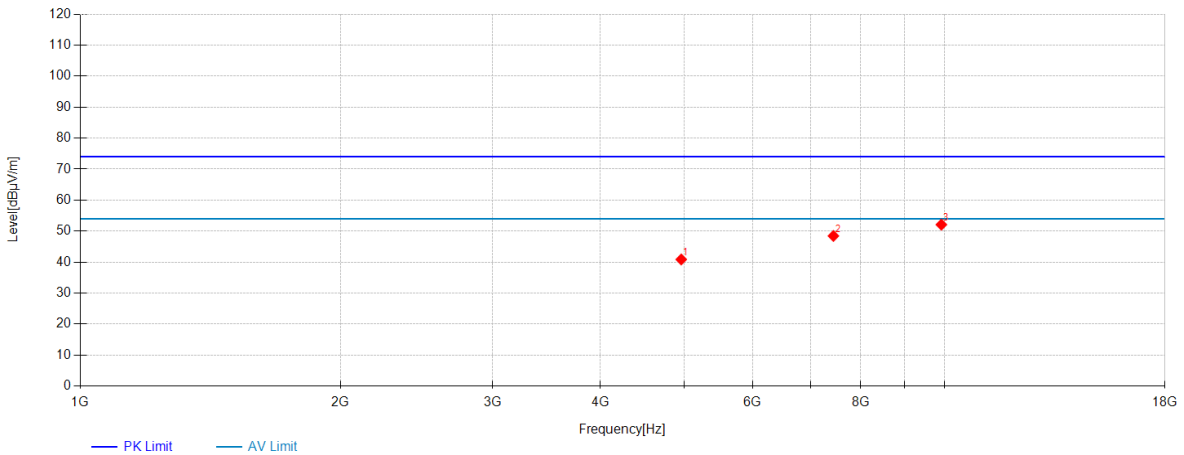


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**Transmitter emission Above 1GHz**  
**BLE 1M\_Channel 39**



Final Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4960	52.61	31.04	-42.78	40.87	74.00	33.13	Horizontal
2	7440	49.95	36.78	-38.28	48.45	74.00	25.55	Horizontal
3	9920	48.96	38.62	-35.49	52.09	74.00	21.91	Horizontal

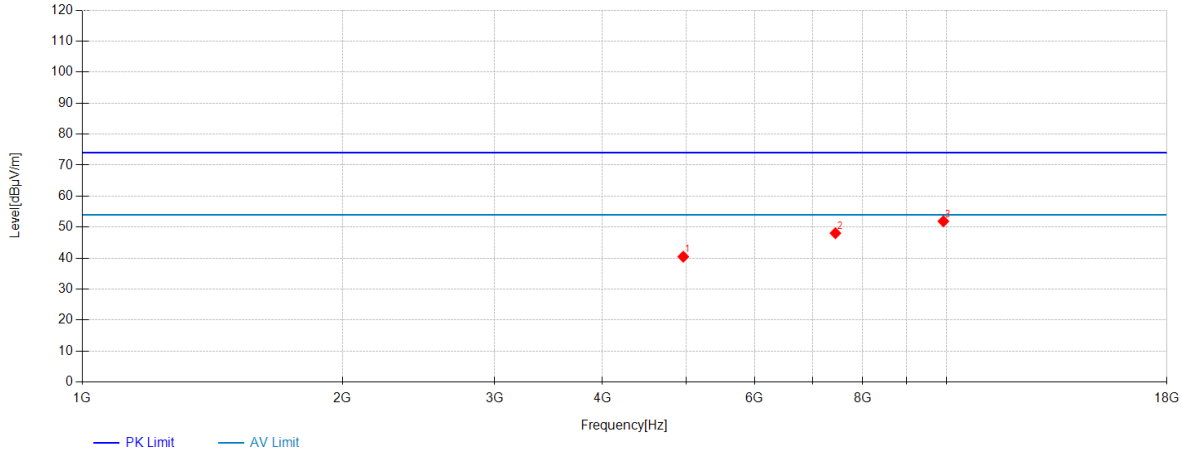


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**BLE 1M\_Channel 39**



Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4960	52.20	31.04	-42.78	40.46	74.00	33.54	Vertical
2	7440	49.54	36.78	-38.28	48.04	74.00	25.96	Vertical
3	9920	48.77	38.62	-35.49	51.90	74.00	22.10	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:  
 Level = Reading(dBµV) + AF(dB/m) + Factor(dB):  
 AF = Antenna Factor(dB/m)  
 Factor = Cable Factor(dB) - Preamplifier gain(dB)  
 Margin = Limit(dBµV/m) – Level(dBµV/m)
- Both peak and average measured complies with the limit line, so test result is "PASS".



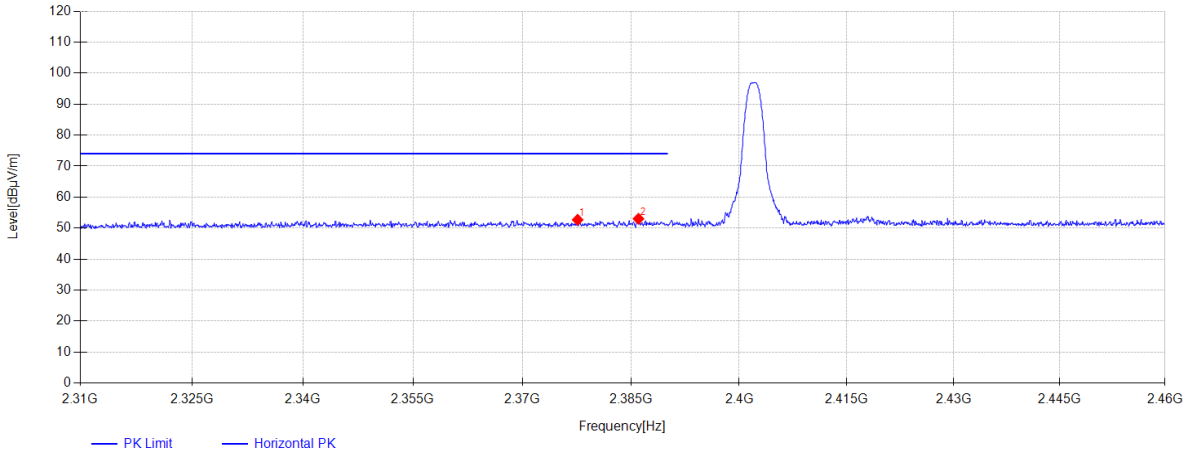
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**Restricted bands around fundamental frequency**  
**BLE 1M\_Channel 0**



Final 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	2377.6088	48.24	27.49	-23.04	52.69	74.00	21.31	199	210	Horizontal
2	2386.013	48.57	27.46	-23.02	53.01	74.00	20.99	199	210	Horizontal



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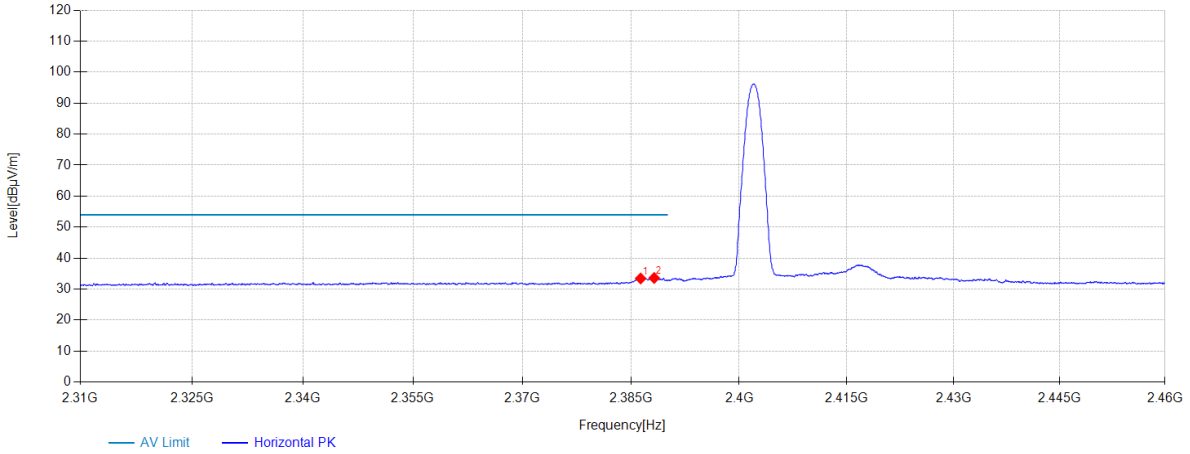
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**BLE 1M\_Channel 0**



Final 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	2386.3132	29.00	27.45	-23.02	33.43	54.00	20.57	199	210	Horizontal
2	2388.1891	29.17	27.45	-23.02	33.60	54.00	20.40	199	210	Horizontal



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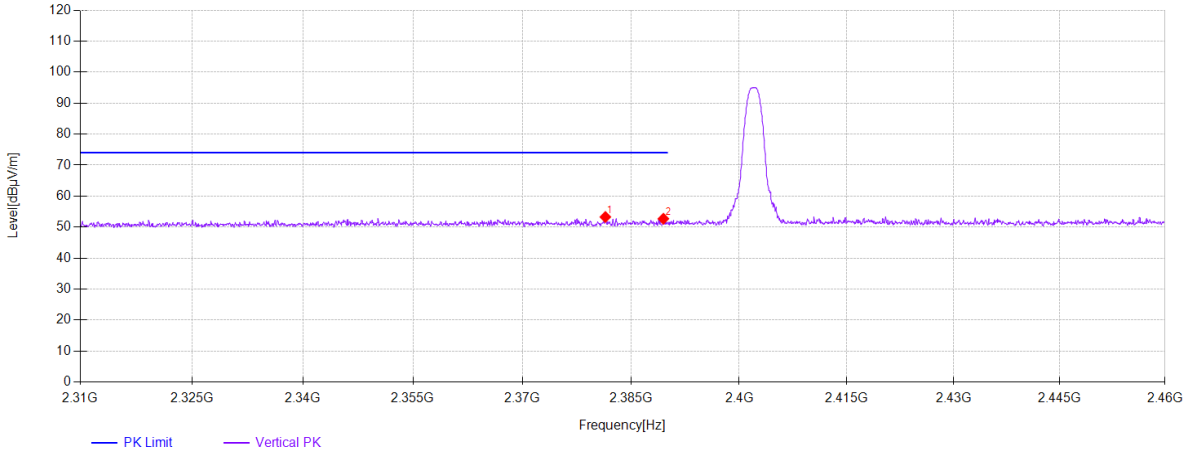
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**BLE 1M\_Channel 0**



Final 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	2381.4357	48.83	27.47	-23.03	53.27	74.00	20.73	367	150	Vertical
2	2389.4647	48.28	27.44	-23.02	52.70	74.00	21.30	367	150	Vertical

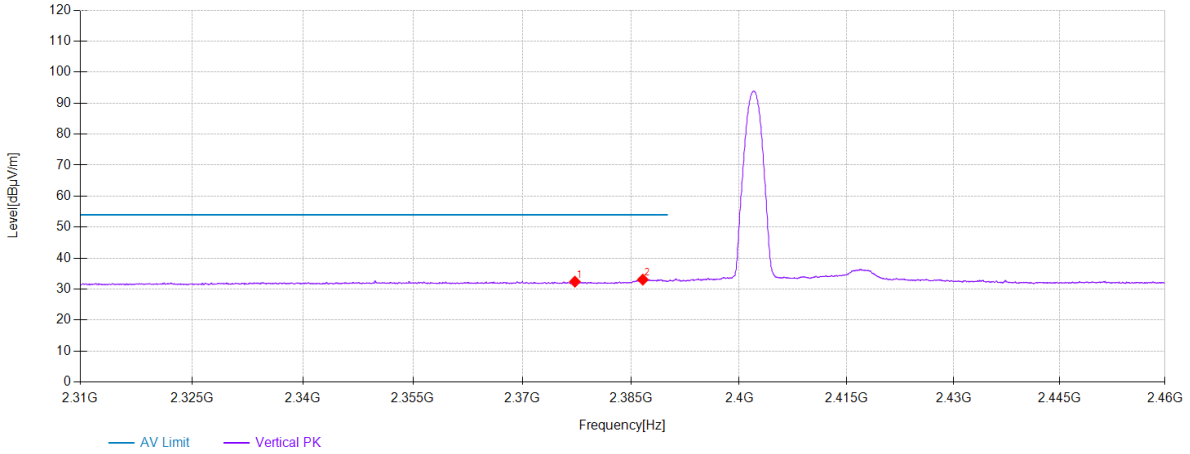


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**BLE 1M\_Channel 0**



Final 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	2377.2336	27.96	27.49	-23.04	32.41	54.00	21.59	367	150	Vertical
2	2386.6133	28.64	27.45	-23.02	33.07	54.00	20.93	367	150	Vertical



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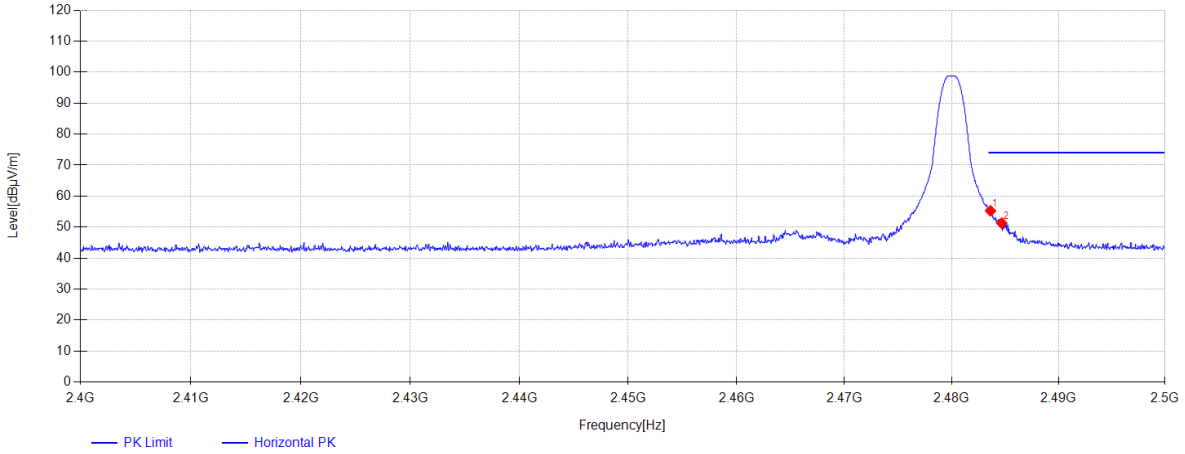
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**BLE 1M\_Channel 39**



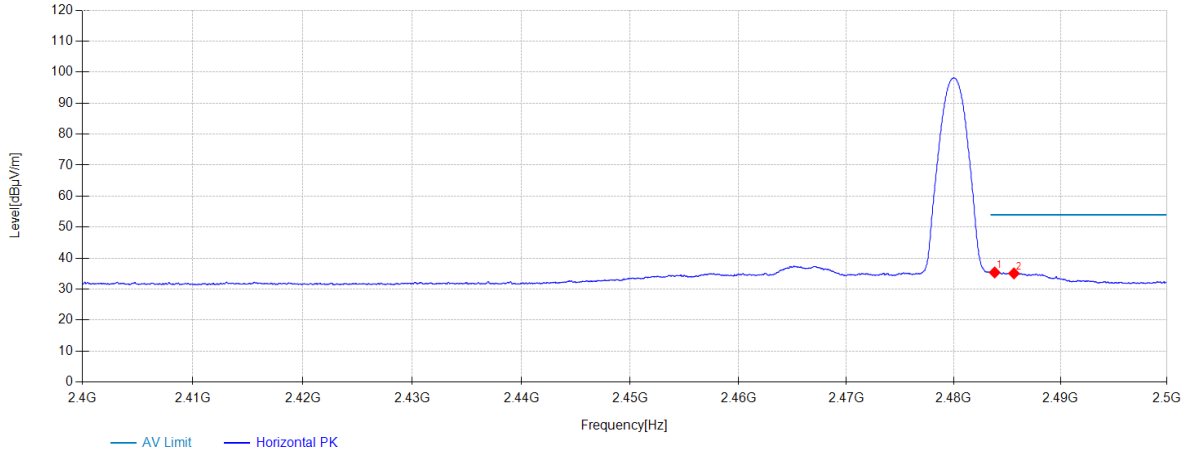
Final Data List										
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.6418	50.64	27.73	-23.12	55.25	74.00	18.75	141	46	Horizontal
2	2484.6923	46.67	27.74	-23.12	51.29	74.00	22.71	141	46	Horizontal



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**BLE 1M\_Channel 39**


Final 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	2483.8419	30.76	27.74	-23.12	35.38	54.00	18.62	141	46	Horizontal
2	2485.6428	30.46	27.74	-23.12	35.08	54.00	18.92	141	46	Horizontal


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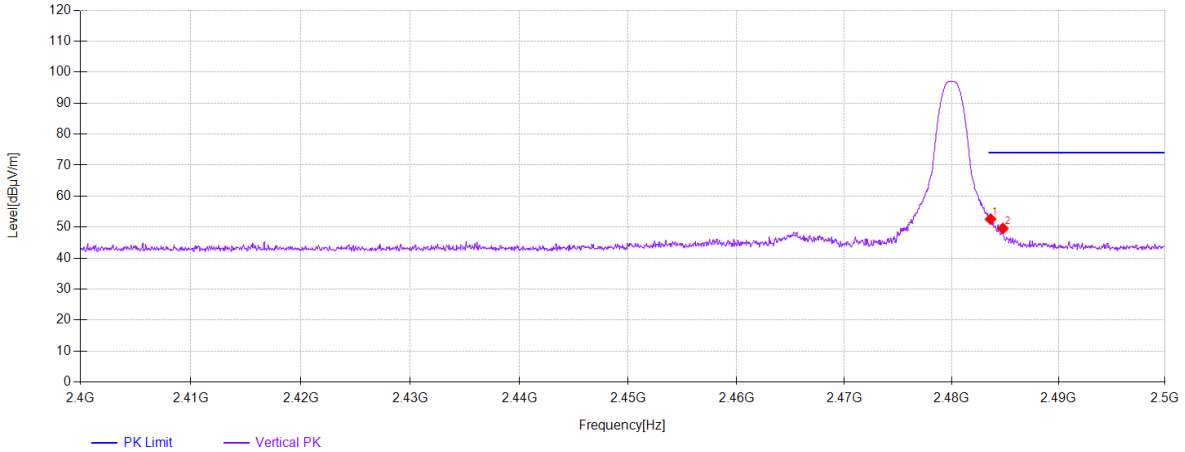
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**BLE 1M\_Channel 39**



Final 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	2483.6418	47.98	27.73	-23.12	52.59	74.00	21.41	388	168	Vertical
2	2484.7924	44.96	27.74	-23.12	49.58	74.00	24.42	388	168	Vertical

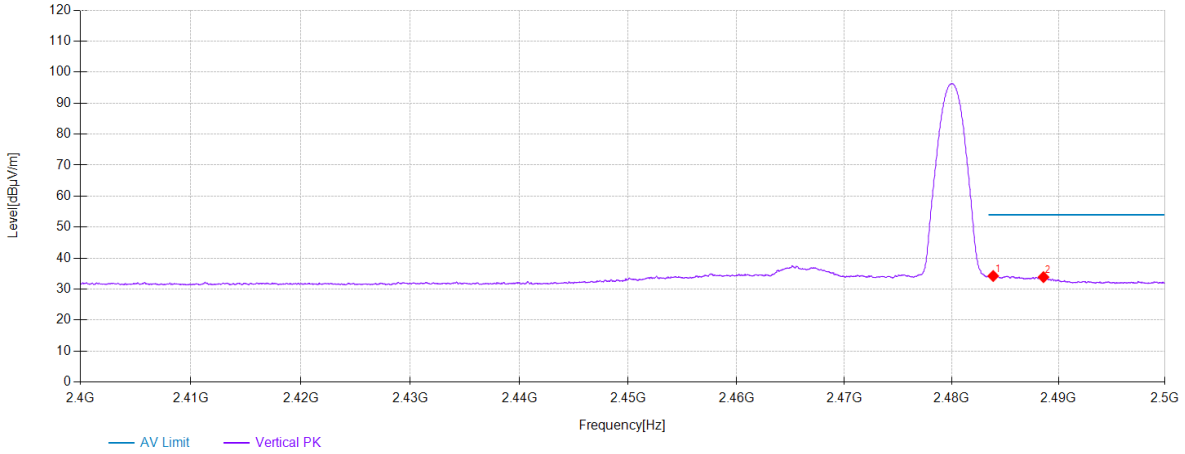


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**BLE 1M\_Channel 39**



Final 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	29.62	27.74	-23.12	34.24	54.00	19.76	388	168	Vertical
2	2488.5943	29.25	27.75	-23.12	33.88	54.00	20.12	388	168	Vertical

**Remark:**

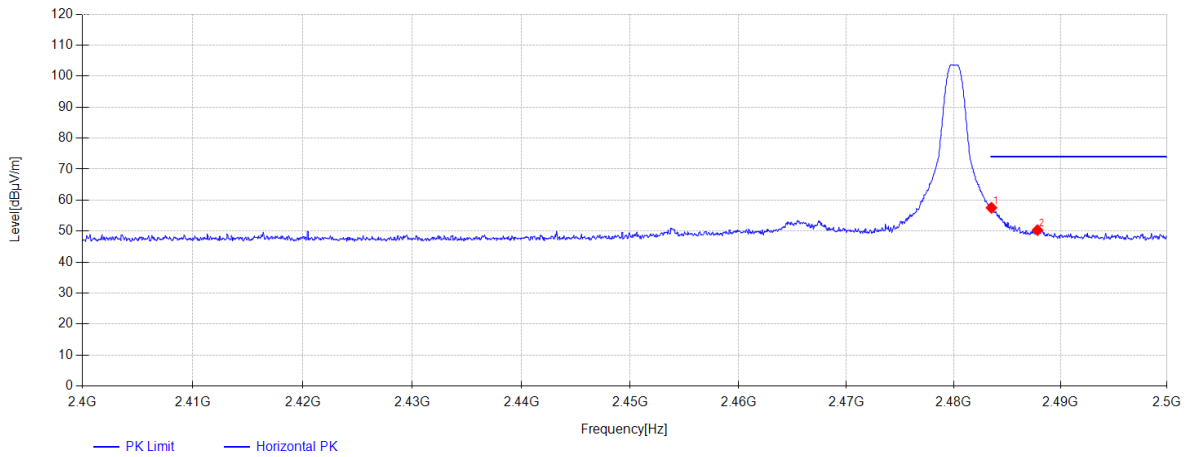
- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  
 Level = Reading(dBµV) + AF(dB/m) + Factor(dB):  
 AF = Antenna Factor(dB/m)  
 Factor = Cable Factor(dB) - Preamplifier gain(dB)  
 Margin = Limit(dBµV/m) – Level(dBµV/m)
- Both peak and average measured complies with the limit line, so test result is “PASS”.



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**Test on the worst case:**  
**BLE 1M\_Channel 39**


Final Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.5418	47.98	27.73	-18.19	57.52	74.00	16.48	Horizontal
2	2487.8439	40.74	27.75	-18.17	50.32	74.00	23.68	Horizontal


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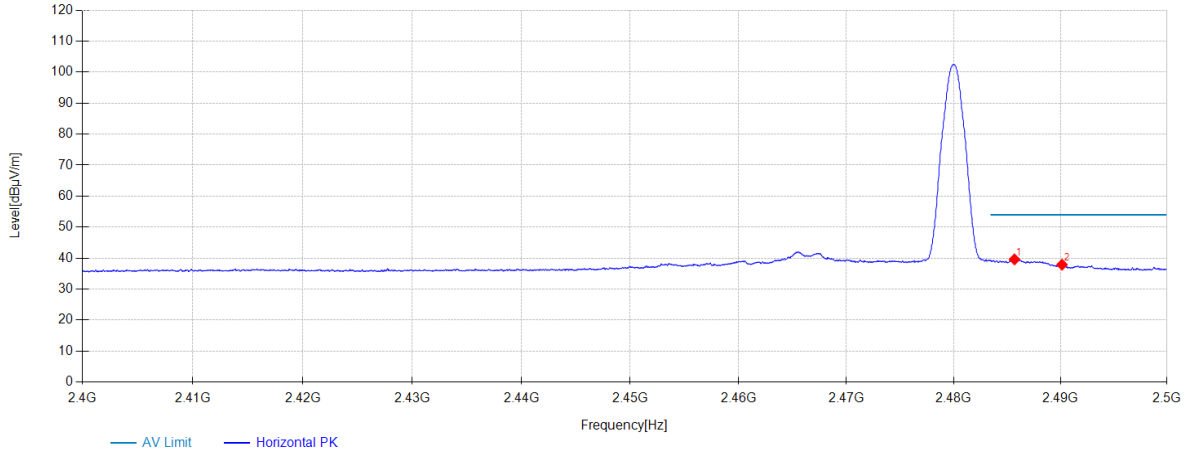
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**BLE 1M\_Channel 39**

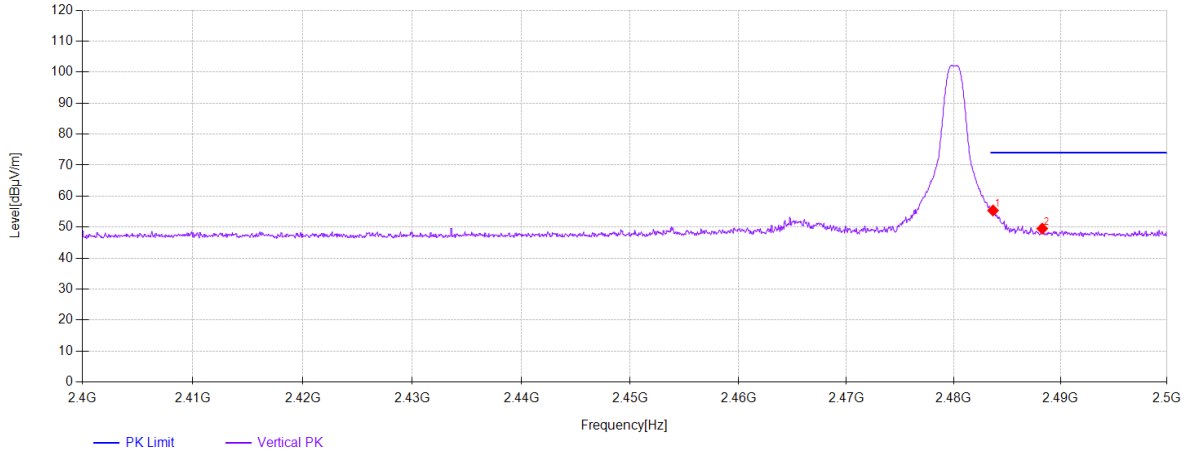


Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2485.6928	30.04	27.74	-18.18	39.60	54.00	14.40	Horizontal
2	2490.1451	28.29	27.76	-18.16	37.89	54.00	16.11	Horizontal



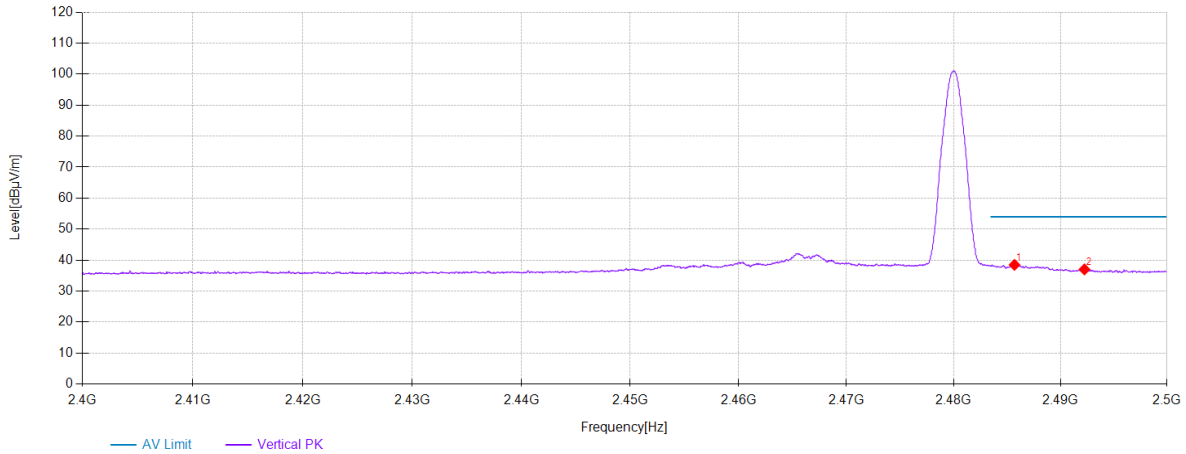
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**BLE 1M\_Channel 39**


Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.6918	45.83	27.73	-18.19	55.37	74.00	18.63	Vertical
2	2488.2941	39.95	27.75	-18.17	49.53	74.00	24.47	Vertical




**BLE 1M\_Channel 39**


Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2485.6928	28.92	27.74	-18.18	38.48	54.00	15.52	Vertical
2	2492.2461	27.43	27.77	-18.19	37.01	54.00	16.99	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:  

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

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

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

$$\text{Margin} = \text{Limit}(\text{dB}\mu\text{V}/\text{m}) - \text{Level}(\text{dB}\mu\text{V}/\text{m})$$
- Both peak and average measured complies with the limit line, so test result is "PASS".

---End of Report---

