



Shenzhen Huaxin Information Technology Service Co., Ltd

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# TEST REPORT



Report No. ....: HX250801R002

FCC ID.....: 2BQVP-ZPHD-0320

Applicant.....: Dongguan Zhiping Interactive Technology Co., LTD

Address.....: Room 301, Building 5, No.30, Lianxing Road, Wulian Village, Fenggang Town, Dongguan City, Guangdong Province, China

Manufacturer.....: Dongguan Zhiping Interactive Technology Co., LTD

Address.....: Room 301, Building 5, No.30, Lianxing Road, Wulian Village, Fenggang Town, Dongguan City, Guangdong Province, China

Product Name.....: Mobile smart screen

Trade Mark.....: /

Model/Type reference.....: ZPHD-0320

Listed Model(s) .....: /

Standard.....: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of receipt of test sample....: Jul. 10, 2025

Date of testing.....: Jul. 11, 2025 ~ Aug. 04, 2025

Date of issue.....: Aug. 05, 2025

Result.....: PASS

Compiled by:

(Printed name + signature) Terry Su

Approved by:

(Printed name + signature) Michael Wu



Testing Laboratory Name.....: Shenzhen Huaxin Information Technology Service Co., Ltd

Address.....: 101, R & D Building, No.3 guansheng 4th Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China

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## 1. TEST SUMMARY

### 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

[RSS 247 Issue 3](#): Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSS) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

[RSS-Gen Issue 5](#): General Requirements for Compliance of Radio Apparatus.

### 1.2. Report version

Revised No.	Date of issue	Description
01	Aug. 05, 2025	Original



### 1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS 247 Issue 3				
Test Item	Standard Section		Result	Test Engineer
	FCC	IC		
Antenna Requirement	15.203& 15.247(b)(4)	/	Pass	Sain Liao
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Ann Lu
Conducted Band Edge and Spurious Emissions	15.247(d)	RSS 247 5.5	Pass	Sain Liao
Radiated Emissions Restricted Band and Radiated Spurious Emissions	15.205&15.209& 15.247(d)	RSS 247 5.5	Pass	Sain Liao
6dB Bandwidth	15.247(a)(2)	RSS 247 5.2 (a)	Pass	Sain Liao
Peak Output Power	15.247(b)(3)	RSS 247 5.4 (d)	Pass	Sain Liao
Power Spectral Density	15.247(e)	RSS 247 5.2 (b)	Pass	Sain Liao
Transmitter Radiated Spurious	15.209&15.247(d)	RSS 247 5.5& RSS-Gen 8.9	Pass	Sain Liao

Note: "N/A" is not applicable.

The measurement uncertainty is not included in the test result.



## 1.4. Test Facility

### Shenzhen Huaxin Information Technology Service Co., Ltd

Address: 101, R & D Building, No.3 guansheng 4th Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China

### Laboratory accreditation

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

#### A2LA-Lab Cert. No.: 6855.01

Shenzhen Huaxin Information Technology Service Co., Ltd EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### Industry Canada (Company Number: 31786, CAB Identifier: CN0147)

Shenzhen Huaxin Information Technology Service Co., Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 31786.

#### FCC (Registration No.: 932271, Designation Number CN1344)

Shenzhen Huaxin Information Technology Service Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC)Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration NO.: 932271.

## 1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huaxin Information Technology Service Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for Shenzhen Huaxin Information Technology Service Co., Ltd



Test Items	Measurement Uncertainty	Notes
DTS Bandwidth	±3.70%	(1)
Maximum Conducted Output Power	±0.60dB	(1)
Maximum Power Spectral Density Level	±0.46dB	(1)
Band-edge Compliance	±4.40dB	(1)
Conducted Spurious Emissions	±1.40dB	(1)
Conducted Emissions 9kHz~30MHz	±3.10dB	(1)
Radiated Emissions 9kHz~30MHz	±3.62dB	(1)
Radiated Emissions 30~1000MHz	±4.63dB	(1)
Radiated Emissions 1~18GHz	±4.40dB	(1)
Radiated Emissions 18~40GHz	±4.40dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa



## 2. GENERAL INFORMATION

### 2.1. Client Information

Applicant:	Dongguan Zhiping Interactive Technology Co., LTD
Address:	Room 301, Building 5, No.30, Lianxing Road, Wulian Village, Fenggang Town, Dongguan City, Guangdong Province, China
Manufacturer:	Dongguan Zhiping Interactive Technology Co., LTD
Address:	Room 301, Building 5, No.30, Lianxing Road, Wulian Village, Fenggang Town, Dongguan City, Guangdong Province, China

### 2.2. General Description of EUT

Product Name:	Mobile smart screen
Trade Mark:	/
Model/Type reference:	ZPHD-0320
Listed Model(s):	/
Power supply:	12V=6A from AC/DC Adapter 14.8Vdc from 12000mAh Lithium Battery
Adapter Model:	J652-1206000UX Input: 100-240V~ 50/60Hz 1.7A Output: 12V=6A
Hardware version:	/
Software version:	/
<b>BT V4.1/ BLE</b>	
Modulation:	GFSK
Data rate:	1Mbps, 2Mbps
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	FPC Antenna
Antenna gain:	3.54dBi Max



## 2.3. Accessory Equipment information

<b>Equipment Information</b>			
Name	Model	S/N	Manufacturer
/	/	/	/
<b>Cable Information</b>			
Name	Shielded Type	Ferrite Core	Length
DC In Cable	Without	Without	1.5M
<b>Test Software Information</b>			
Name	Versions	/	/
Engineering mode	/	/	/



## 2.4. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT BLE, 40 channels are provided to the EUT. Channels 00/19/39 were selected for testing.

Operation Frequency List:

Channel	Frequency (MHz)
<b>00</b>	<b>2402</b>
01	2404
:	:
18	2438
<b>19</b>	<b>2440</b>
20	2442
:	:
38	2478
<b>39</b>	<b>2480</b>

Note: The display in grey were the channel selected for testing.

Test mode

For RF test items:
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.



## 2.5. Measurement Instruments List

RF Test System - SRD					
Item	Test Equipment	Manufacturer	Model No.	Versions/ Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY51280803	Apr. 08, 2026
2	Wideband Radio Communication Tester	R&S	CMW500	157763	Apr. 08, 2026
3	MXG Vector Signal Generator	Agilent	N5182A	101795	Apr. 08, 2026
4	EXG Analog Signal Generator	Agilent	N5181A	MY47421151	Apr. 08, 2026
5	RF Sensor Unit	Techy	TR1029-2	20220428P009	Apr. 08, 2026
6	High and low temperature test chamber	Asprey	LX-225L	2020091401	Apr. 08, 2026
7	SRD Test Software	TACHOY	RTS	V1.0.0	/
8	2G/3G/4G Test Software	TST	TST-PASS	V2.0	/

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Versions/ Serial No.	Calibrated until
1	EMI spectrum receiver	R&S	ESR7	102543	Apr. 08, 2026
2	9*6*6 anechoic chamber	Mao Rui	9*6*6	/	Apr. 08, 2026
3	Spectrum analyzer	R&S	FSV40-N	101795	Apr. 09, 2026
4	Preamplifier	Agilent	8449B	3008A00551	Apr. 09, 2026
5	Preamplifier	HP	8447D	1616A02061	Apr. 08, 2026
6	Horn Antenna	A. H. System, Inc	SAS-571	915	Apr. 18, 2026
7	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	01318	Apr. 18, 2026
8	6dB Fixed Attenuator	SKET	AP_DC01G-2W-N-6dB	SK2021012803	Apr. 08, 2026
9	Test Software	SKET	EMC-I	V1.4.0.1	/
10	Wideband Radio Communication Tester	R&S	CMW500	157763	Apr. 08, 2026

Conducted emission					
Item	Test Equipment	Manufacturer	Model No.	Versions/ Serial No.	Calibrated until
1	LISN	R&S	ENV216	101291	Apr. 09, 2026
2	LISN	R&S	ESH3-Z5	894981/024	Apr. 09, 2026
3	EMI Test Receiver	R&S	ESR7	102543	Apr. 08, 2026
5	Test Software	SKET	EMC-I	V1.4.0.1	/
6	Wideband Radio Communication Tester	R&S	CMW500	157763	Apr. 08, 2026

Note: 1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.

### 3. TEST ITEM AND RESULTS

#### 3.1. Conducted Emission

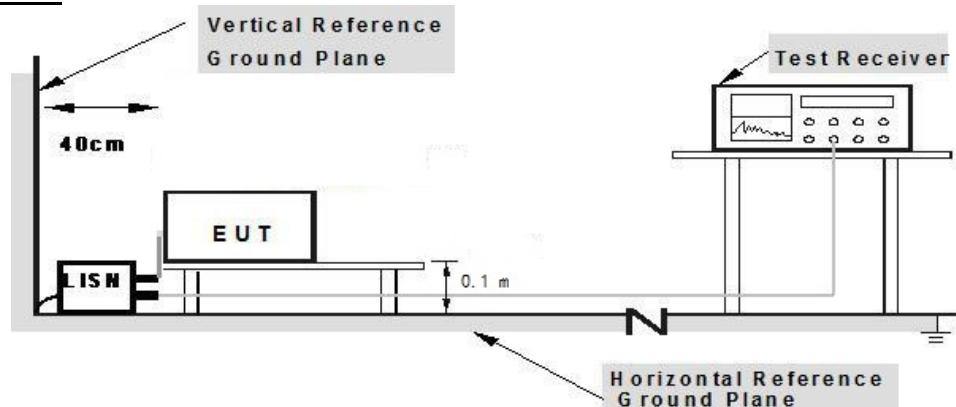
##### Limit

##### FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS - Gen 8.8

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 Configuration



**Note:** 1. Support units were connected to second LISN.  
2. Both of LISNs (AMH) are 80 cm from EUT and at least 80 cm from other units and other metal planes

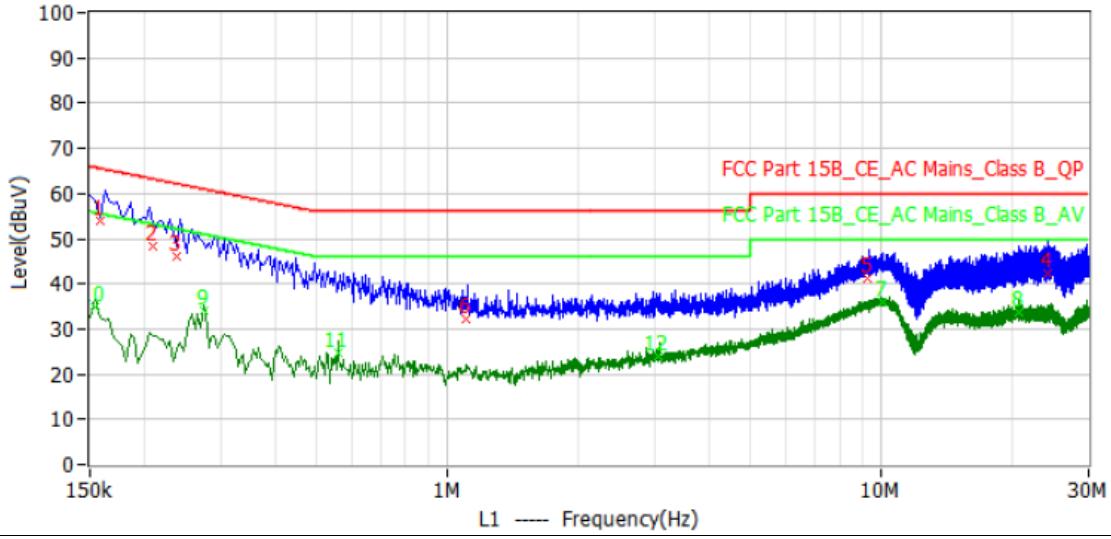
##### Test Procedure

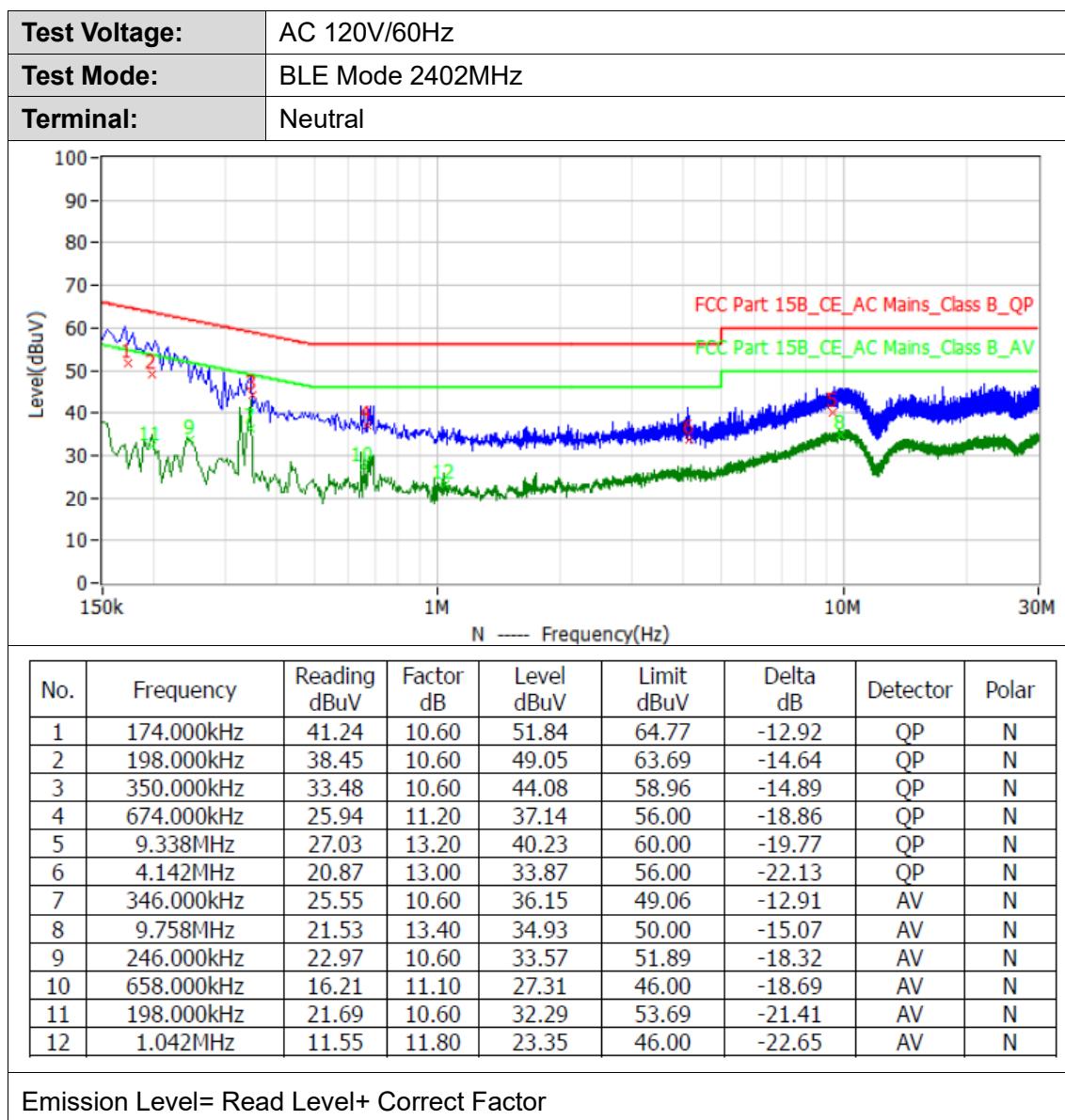
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, Raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

**Test Mode:**

Please refer to the clause 2.4.

**Test Results**

<b>Test Voltage:</b>	AC 120V/60Hz																																																																																																																												
<b>Test Mode:</b>	BLE Mode 2402MHz																																																																																																																												
<b>Terminal:</b>	Line																																																																																																																												
																																																																																																																													
<table border="1"><thead><tr><th>No.</th><th>Frequency</th><th>Reading dBuV</th><th>Factor dB</th><th>Level dBuV</th><th>Limit dBuV</th><th>Delta dB</th><th>Detector</th><th>Polar</th></tr></thead><tbody><tr><td>1</td><td>158.000kHz</td><td>43.48</td><td>10.40</td><td>53.88</td><td>65.57</td><td>-11.69</td><td>QP</td><td>L1</td></tr><tr><td>2</td><td>210.000kHz</td><td>37.92</td><td>10.40</td><td>48.32</td><td>63.21</td><td>-14.89</td><td>QP</td><td>L1</td></tr><tr><td>3</td><td>238.000kHz</td><td>35.55</td><td>10.40</td><td>45.95</td><td>62.17</td><td>-16.22</td><td>QP</td><td>L1</td></tr><tr><td>4</td><td>24.174MHz</td><td>28.68</td><td>13.60</td><td>42.28</td><td>60.00</td><td>-17.72</td><td>QP</td><td>L1</td></tr><tr><td>5</td><td>9.306MHz</td><td>28.01</td><td>13.10</td><td>41.11</td><td>60.00</td><td>-18.89</td><td>QP</td><td>L1</td></tr><tr><td>6</td><td>1.098MHz</td><td>20.54</td><td>11.70</td><td>32.24</td><td>56.00</td><td>-23.76</td><td>QP</td><td>L1</td></tr><tr><td>7</td><td>10.074MHz</td><td>22.79</td><td>13.30</td><td>36.09</td><td>50.00</td><td>-13.91</td><td>AV</td><td>L1</td></tr><tr><td>8</td><td>20.674MHz</td><td>19.99</td><td>13.60</td><td>33.59</td><td>50.00</td><td>-16.41</td><td>AV</td><td>L1</td></tr><tr><td>9</td><td>274.000kHz</td><td>23.44</td><td>10.60</td><td>34.04</td><td>51.00</td><td>-16.95</td><td>AV</td><td>L1</td></tr><tr><td>10</td><td>154.000kHz</td><td>24.41</td><td>10.40</td><td>34.81</td><td>55.78</td><td>-20.98</td><td>AV</td><td>L1</td></tr><tr><td>11</td><td>558.000kHz</td><td>13.84</td><td>10.90</td><td>24.74</td><td>46.00</td><td>-21.26</td><td>AV</td><td>L1</td></tr><tr><td>12</td><td>3.062MHz</td><td>11.23</td><td>12.90</td><td>24.13</td><td>46.00</td><td>-21.87</td><td>AV</td><td>L1</td></tr></tbody></table>									No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector	Polar	1	158.000kHz	43.48	10.40	53.88	65.57	-11.69	QP	L1	2	210.000kHz	37.92	10.40	48.32	63.21	-14.89	QP	L1	3	238.000kHz	35.55	10.40	45.95	62.17	-16.22	QP	L1	4	24.174MHz	28.68	13.60	42.28	60.00	-17.72	QP	L1	5	9.306MHz	28.01	13.10	41.11	60.00	-18.89	QP	L1	6	1.098MHz	20.54	11.70	32.24	56.00	-23.76	QP	L1	7	10.074MHz	22.79	13.30	36.09	50.00	-13.91	AV	L1	8	20.674MHz	19.99	13.60	33.59	50.00	-16.41	AV	L1	9	274.000kHz	23.44	10.60	34.04	51.00	-16.95	AV	L1	10	154.000kHz	24.41	10.40	34.81	55.78	-20.98	AV	L1	11	558.000kHz	13.84	10.90	24.74	46.00	-21.26	AV	L1	12	3.062MHz	11.23	12.90	24.13	46.00	-21.87	AV	L1
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Emission Level= Read Level+ Correct Factor																																																																																																																													



### 3.2. Radiated Emission

#### Limit

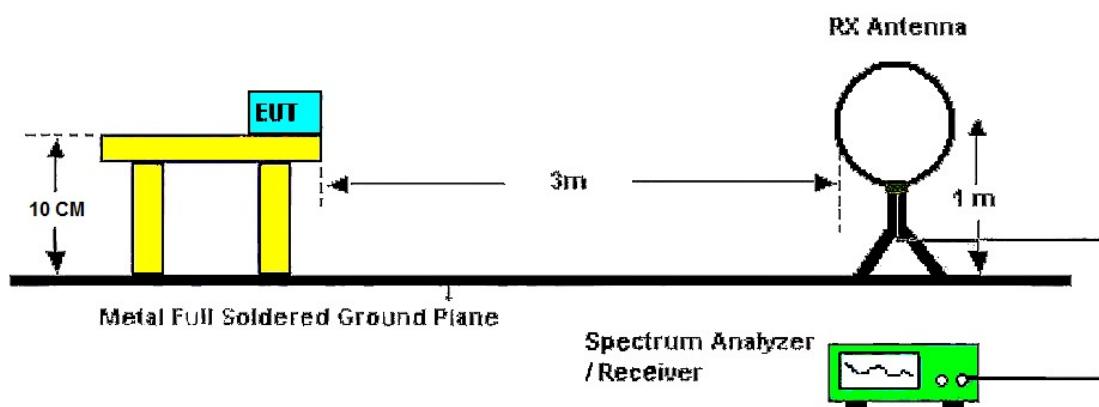
#### FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS – Gen 8.9

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 GHz	54.00	Average
	74.00	Peak

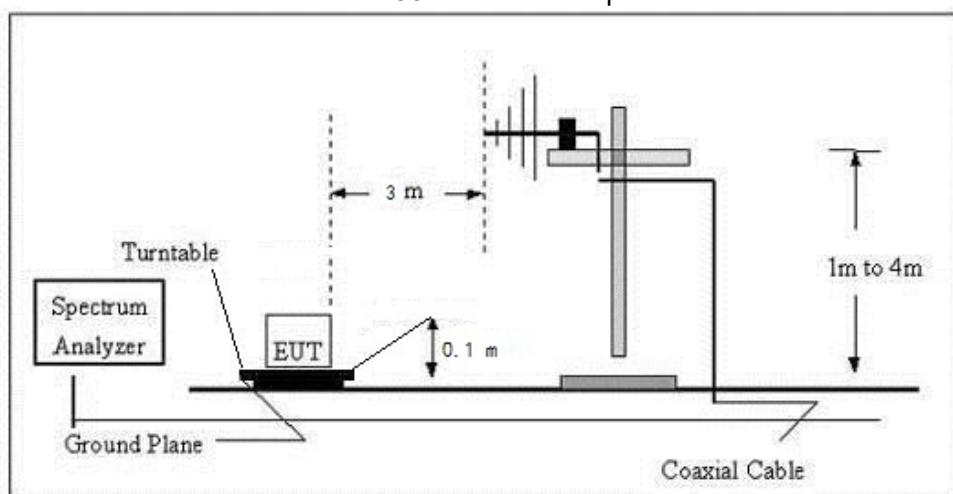
#### Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

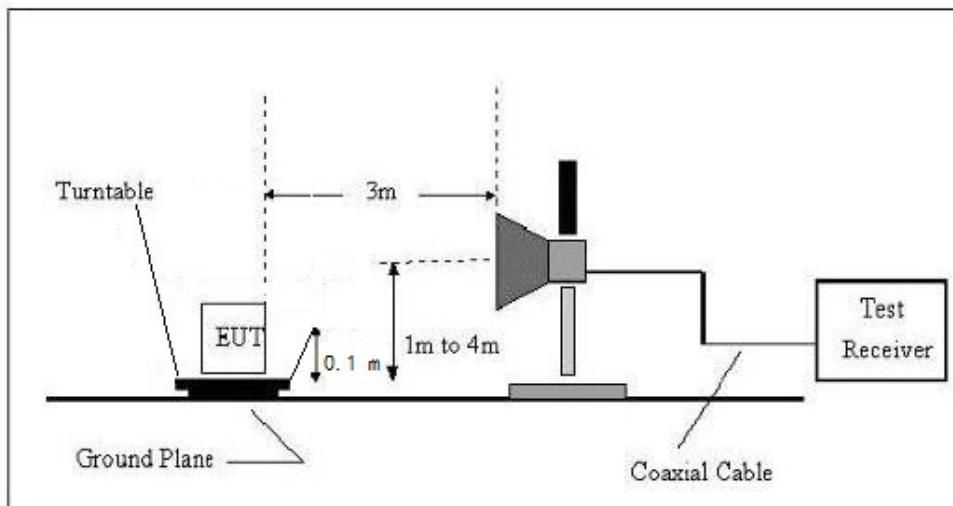
#### Test Configuration



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

### **Test Procedure**

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 30 MHz:  
9kHz – 150kHz, RBW=200Hz, VBW $\geq$ RBW, Sweep=auto, Detector function=peak, Trace=max hold;  
150kHz – 30MHz, RBW=9kHz, VBW $\geq$ RBW, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (3) 30 MHz - 1 GHz:  
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- (3) From 1 GHz to 10<sup>th</sup> harmonic:  
RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
RBW=1MHz, VBW $\geq$ 1/T Peak detector for Average value.

Note 1: For the 1/T& Duty Cycle please refer to clause 3.8 Duty Cycle.

### **Test Mode**

Please refer to the clause 2.4.

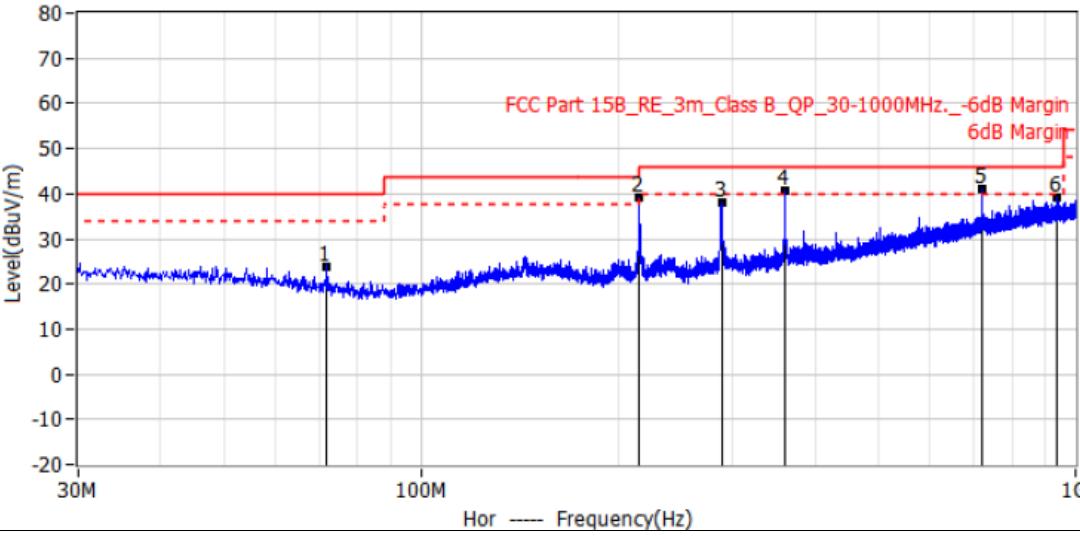
### **Test Result**

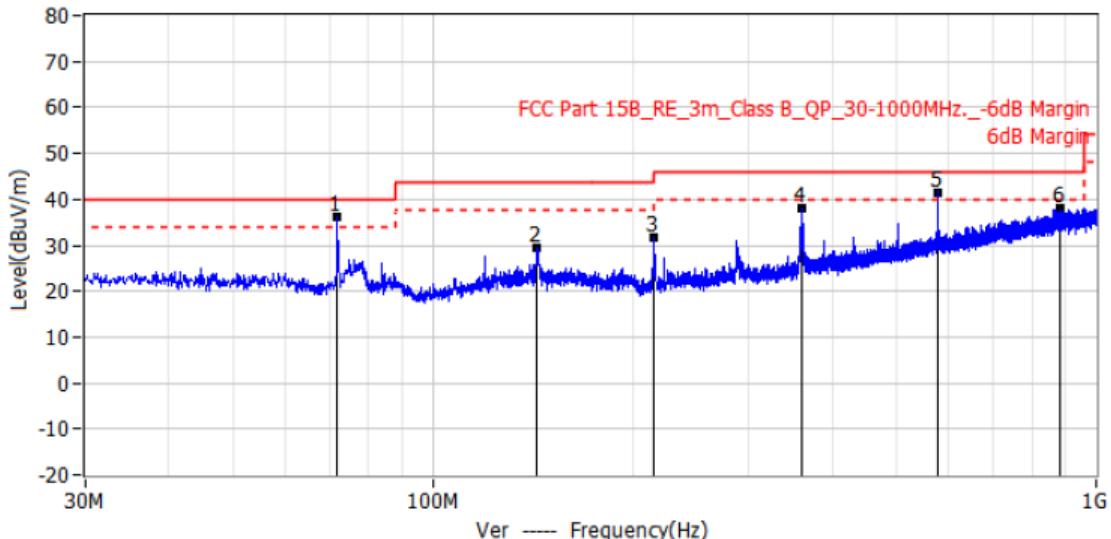
#### **9 KHz~30 MHz**

From 9 kHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

## 30MHz-1GHz

Ant. Pol.	Horizontal																																																																						
Test Mode:	BLE 1Mbps Mode 2402MHz																																																																						
Remark:	Only worse case is reported																																																																						
																																																																							
<table border="1"><thead><tr><th>No.</th><th>Frequency</th><th>Reading dBuV</th><th>Factor dB/m</th><th>Level dBuV/m</th><th>Limit dBuV/m</th><th>Delta dB</th><th>Detector</th><th>Polar</th></tr></thead><tbody><tr><td>1*</td><td>71.953MHz</td><td>11.5</td><td>12.5</td><td>24.0</td><td>40.0</td><td>-16.0</td><td>QP</td><td>Hor</td></tr><tr><td>2*</td><td>215.876MHz</td><td>25.9</td><td>13.3</td><td>39.2</td><td>43.5</td><td>-4.3</td><td>QP</td><td>Hor</td></tr><tr><td>3*</td><td>287.899MHz</td><td>22.5</td><td>15.6</td><td>38.1</td><td>46.0</td><td>-7.9</td><td>QP</td><td>Hor</td></tr><tr><td>4*</td><td>359.921MHz</td><td>23.2</td><td>17.4</td><td>40.6</td><td>46.0</td><td>-5.4</td><td>QP</td><td>Hor</td></tr><tr><td>5*</td><td>719.791MHz</td><td>16.6</td><td>24.6</td><td>41.2</td><td>46.0</td><td>-4.8</td><td>QP</td><td>Hor</td></tr><tr><td>6*</td><td>935.738MHz</td><td>11.9</td><td>27.2</td><td>39.1</td><td>46.0</td><td>-6.9</td><td>QP</td><td>Hor</td></tr></tbody></table>									No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar	1*	71.953MHz	11.5	12.5	24.0	40.0	-16.0	QP	Hor	2*	215.876MHz	25.9	13.3	39.2	43.5	-4.3	QP	Hor	3*	287.899MHz	22.5	15.6	38.1	46.0	-7.9	QP	Hor	4*	359.921MHz	23.2	17.4	40.6	46.0	-5.4	QP	Hor	5*	719.791MHz	16.6	24.6	41.2	46.0	-4.8	QP	Hor	6*	935.738MHz	11.9	27.2	39.1	46.0	-6.9	QP	Hor
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar																																																															
1*	71.953MHz	11.5	12.5	24.0	40.0	-16.0	QP	Hor																																																															
2*	215.876MHz	25.9	13.3	39.2	43.5	-4.3	QP	Hor																																																															
3*	287.899MHz	22.5	15.6	38.1	46.0	-7.9	QP	Hor																																																															
4*	359.921MHz	23.2	17.4	40.6	46.0	-5.4	QP	Hor																																																															
5*	719.791MHz	16.6	24.6	41.2	46.0	-4.8	QP	Hor																																																															
6*	935.738MHz	11.9	27.2	39.1	46.0	-6.9	QP	Hor																																																															
<p>Remarks:</p> <p>1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor</p> <p>2. Margin value = Level -Limit value</p>																																																																							

<b>Ant. Pol.</b>	Vertical																																																																						
<b>Test Mode:</b>	BLE 1Mbps Mode 2402MHz																																																																						
<b>Remark:</b>	Only worse case is reported																																																																						
 <p>FCC Part 15B RE 3m Class B QP 30-1000MHz. -6dB Margin 6dB Margin</p>																																																																							
<table border="1"><thead><tr><th>No.</th><th>Frequency</th><th>Reading dBuV</th><th>Factor dB/m</th><th>Level dBuV/m</th><th>Limit dBuV/m</th><th>Delta dB</th><th>Detector</th><th>Polar</th></tr></thead><tbody><tr><td>1*</td><td>71.953MHz</td><td>23.6</td><td>12.5</td><td>36.1</td><td>40.0</td><td>-3.9</td><td>QP</td><td>Ver</td></tr><tr><td>2*</td><td>143.854MHz</td><td>13.6</td><td>16.0</td><td>29.6</td><td>43.5</td><td>-13.9</td><td>QP</td><td>Ver</td></tr><tr><td>3*</td><td>215.876MHz</td><td>18.5</td><td>13.3</td><td>31.8</td><td>43.5</td><td>-11.7</td><td>QP</td><td>Ver</td></tr><tr><td>4*</td><td>359.800MHz</td><td>20.5</td><td>17.4</td><td>37.9</td><td>46.0</td><td>-8.1</td><td>QP</td><td>Ver</td></tr><tr><td>5*</td><td>575.868MHz</td><td>19.5</td><td>22.1</td><td>41.6</td><td>46.0</td><td>-4.4</td><td>QP</td><td>Ver</td></tr><tr><td>6*</td><td>882.145MHz</td><td>11.2</td><td>26.7</td><td>37.9</td><td>46.0</td><td>-8.1</td><td>QP</td><td>Ver</td></tr></tbody></table>									No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar	1*	71.953MHz	23.6	12.5	36.1	40.0	-3.9	QP	Ver	2*	143.854MHz	13.6	16.0	29.6	43.5	-13.9	QP	Ver	3*	215.876MHz	18.5	13.3	31.8	43.5	-11.7	QP	Ver	4*	359.800MHz	20.5	17.4	37.9	46.0	-8.1	QP	Ver	5*	575.868MHz	19.5	22.1	41.6	46.0	-4.4	QP	Ver	6*	882.145MHz	11.2	26.7	37.9	46.0	-8.1	QP	Ver
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar																																																															
1*	71.953MHz	23.6	12.5	36.1	40.0	-3.9	QP	Ver																																																															
2*	143.854MHz	13.6	16.0	29.6	43.5	-13.9	QP	Ver																																																															
3*	215.876MHz	18.5	13.3	31.8	43.5	-11.7	QP	Ver																																																															
4*	359.800MHz	20.5	17.4	37.9	46.0	-8.1	QP	Ver																																																															
5*	575.868MHz	19.5	22.1	41.6	46.0	-4.4	QP	Ver																																																															
6*	882.145MHz	11.2	26.7	37.9	46.0	-8.1	QP	Ver																																																															
<p>Remarks:</p> <p>1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor</p> <p>2. Margin value = Level -Limit value</p>																																																																							

**Above 1GHz**

BLE 1Mbps Mode 2402MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
4804	49.26	3.7	52.96	74	-21.04	Horizontal	Peak
4804	44.25	3.7	47.95	74	-26.05	Vertical	Peak
4804	36.44	3.7	40.14	54	-13.86	Horizontal	Average
4804	31.96	3.7	35.66	54	-18.34	Vertical	Average

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value
3. No report for the emission which more than 10 dB below the prescribed limit

BLE 1Mbps Mode 2440MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
4880	48.56	4.0	52.56	74	-21.44	Horizontal	Peak
4880	44.14	4.0	48.14	74	-25.86	Vertical	Peak
4880	37.51	4.0	41.51	54	-12.49	Horizontal	Average
4880	32.88	4.0	36.88	54	-17.12	Vertical	Average

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value
3. No report for the emission which more than 10 dB below the prescribed limit

BLE 1Mbps Mode 2480MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
4960	49.75	4.3	54.05	74	-19.95	Horizontal	Peak
4960	45.11	4.3	49.41	74	-24.59	Vertical	Peak
4960	38.69	4.3	42.99	54	-11.01	Horizontal	Average
4960	32.15	4.3	36.45	54	-17.55	Vertical	Average

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value
3. No report for the emission which more than 10 dB below the prescribed limit

BLE 2Mbps Mode 2402MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
4804	48.51	3.7	52.21	74	-21.79	Horizontal	Peak
4804	44.66	3.7	48.36	74	-25.64	Vertical	Peak
4804	38.75	3.7	42.45	54	-11.55	Horizontal	Average
4804	32.45	3.7	36.15	54	-17.85	Vertical	Average

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value
3. No report for the emission which more than 10 dB below the prescribed limit



BLE 2Mbps Mode 2440MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
4880	49.62	4.0	53.62	74	-20.38	Horizontal	Peak
4880	45.25	4.0	49.25	74	-24.75	Vertical	Peak
4880	38.47	4.0	42.47	54	-11.53	Horizontal	Average
4880	32.63	4.0	36.63	54	-17.37	Vertical	Average

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value
3. No report for the emission which more than 10 dB below the prescribed limit

BLE 2Mbps Mode 2480MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
4960	48.63	4.3	52.93	74	-21.07	Horizontal	Peak
4960	45.26	4.3	49.56	74	-24.44	Vertical	Peak
4960	37.69	4.3	41.99	54	-12.01	Horizontal	Average
4960	32.44	4.3	36.74	54	-17.26	Vertical	Average

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value
3. No report for the emission which more than 10 dB below the prescribed limit

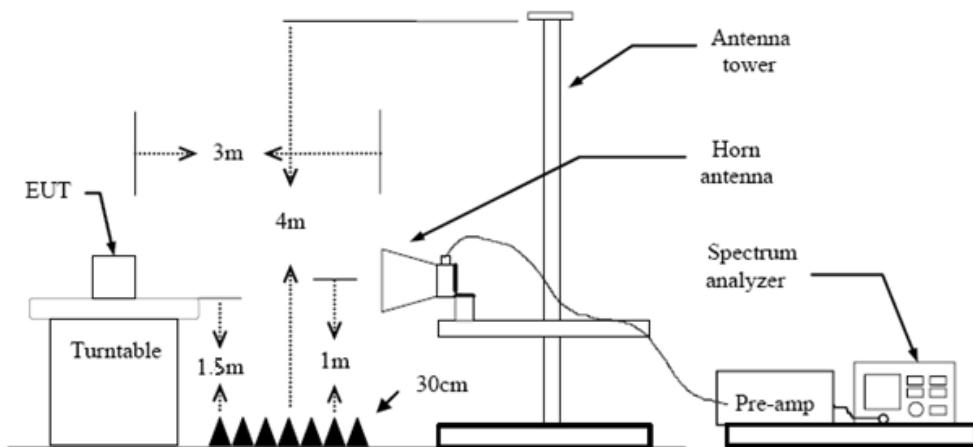
### 3.3. Radiated Emissions Restricted Band

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS 247 5.5:

Restricted Frequency Band (MHz)	(dBuV/m)(at 3m)	
	Peak	Average
2310 ~ 2390	74	54
2483.5 ~ 2500	74	54

#### Test Configuration



#### Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:  
RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

#### Test Mode

Please refer to the clause 2.4.

**Test Results**

BLE 1Mbps Mode 2402MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
2310	47.58	-3.4	44.18	74	-29.82	Horizontal	Peak
2310	43.56	-3.4	40.16	74	-33.84	Vertical	Peak
2390	48.15	-3.1	45.05	74	-28.95	Horizontal	Peak
2390	42.26	-3.1	39.16	74	-34.84	Vertical	Peak
2310	38.15	-3.4	34.75	54	-19.25	Horizontal	Average
2310	33.26	-3.4	29.86	54	-24.14	Vertical	Average
2390	37.58	-3.1	34.48	54	-19.52	Horizontal	Average
2390	33.15	-3.1	30.05	54	-23.95	Vertical	Average

Remarks:  
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor  
2. Margin value = Level -Limit value

BLE 1Mbps Mode 2480MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
2483.5	47.25	-2.8	44.45	74	-29.55	Horizontal	Peak
2483.5	44.25	-2.8	41.45	74	-32.55	Vertical	Peak
2500	48.62	-2.7	45.92	74	-28.08	Horizontal	Peak
2500	44.36	-2.7	41.66	74	-32.34	Vertical	Peak
2483.5	37.18	-2.8	34.38	54	-19.62	Horizontal	Average
2483.5	32.26	-2.8	29.46	54	-24.54	Vertical	Average
2500	37.61	-2.7	34.91	54	-19.09	Horizontal	Average
2500	33.45	-2.7	30.75	54	-23.25	Vertical	Average

Remarks:  
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor  
2. Margin value = Level -Limit value

BLE 2Mbps Mode 2402MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
2310	48.12	-3.4	44.72	74	-29.28	Horizontal	Peak
2310	44.26	-3.4	40.86	74	-33.14	Vertical	Peak
2390	47.15	-3.1	44.05	74	-29.95	Horizontal	Peak
2390	43.62	-3.1	40.52	74	-33.48	Vertical	Peak
2310	39.15	-3.4	35.75	54	-18.25	Horizontal	Average
2310	34.25	-3.4	30.85	54	-23.15	Vertical	Average
2390	38.41	-3.1	35.31	54	-18.69	Horizontal	Average
2390	34.15	-3.1	31.05	54	-22.95	Vertical	Average

Remarks:  
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor  
2. Margin value = Level -Limit value



BLE 2Mbps Mode 2480MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
2483.5	48.56	-2.8	45.76	74	-28.24	Horizontal	Peak
2483.5	43.26	-2.8	40.46	74	-33.54	Vertical	Peak
2500	48.12	-2.7	45.42	74	-28.58	Horizontal	Peak
2500	43.51	-2.7	40.81	74	-33.19	Vertical	Peak
2483.5	38.62	-2.8	35.82	54	-18.18	Horizontal	Average
2483.5	33.44	-2.8	30.64	54	-23.36	Vertical	Average
2500	38.41	-2.7	35.71	54	-18.29	Horizontal	Average
2500	34.16	-2.7	31.46	54	-22.54	Vertical	Average

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2. Margin value = Level -Limit value

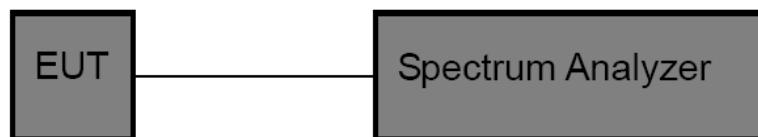


### 3.4. Band edge and Spurious Emissions (Conducted)

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): 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 Configuration



#### Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:  
RBW = 100 kHz, VBW  $\geq$  RBW, scan up through 10<sup>th</sup> harmonic.  
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

#### Test Mode

Please refer to the clause 2.4.

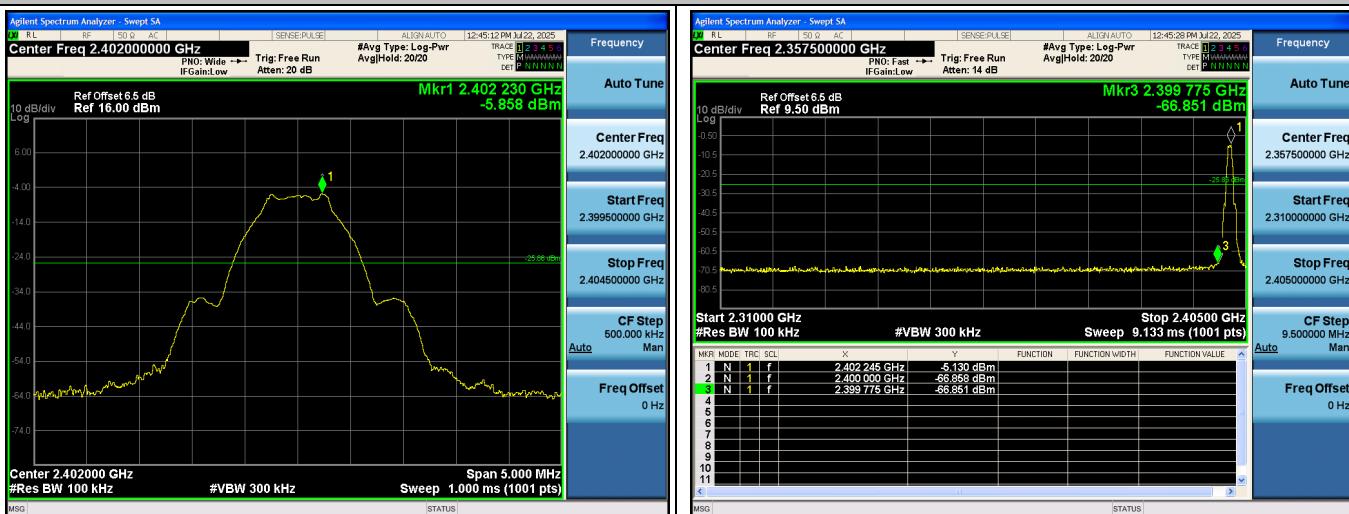
#### Test Results

##### (1) Band edge Conducted Test

Test Mode	Frequency[MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE 1Mbps	2402	-5.858	-66.851	-25.858	PASS
	2480	-2.762	-67.712	-22.762	PASS
BLE 2Mbps	2402	-5.739	-36.844	-25.739	PASS
	2480	-3.206	-60.356	-23.206	PASS



## BLE\_1Mbps\_Low\_2402



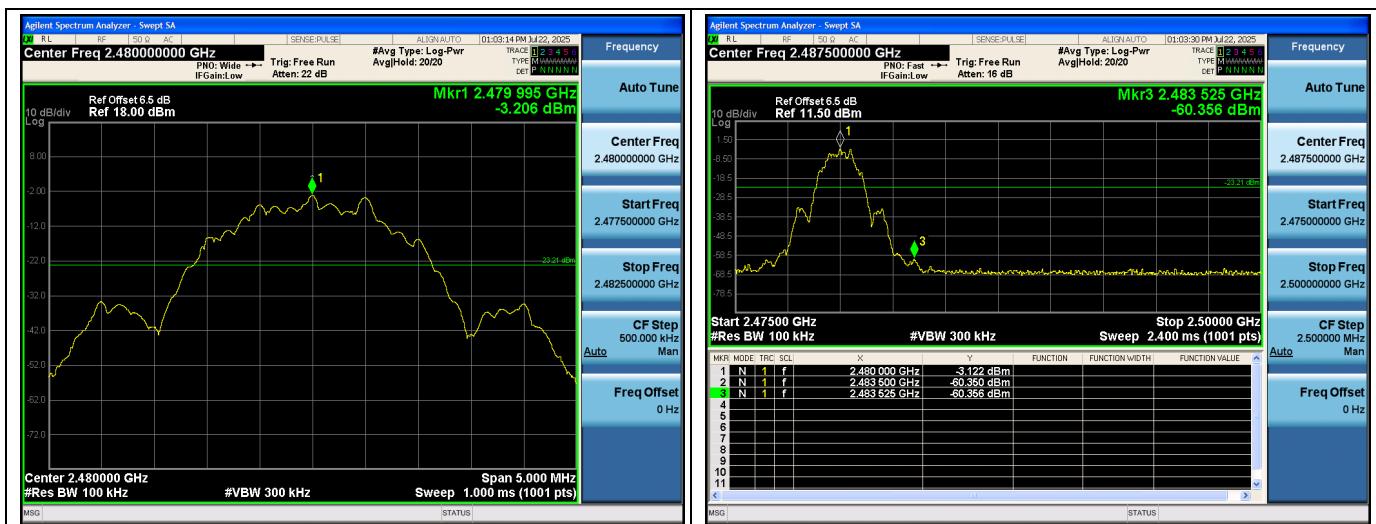
## BLE\_1Mbps\_High\_2480



## BLE\_2Mbpsbps\_Low\_2402



## BLE\_2Mbpsbps\_High\_2480

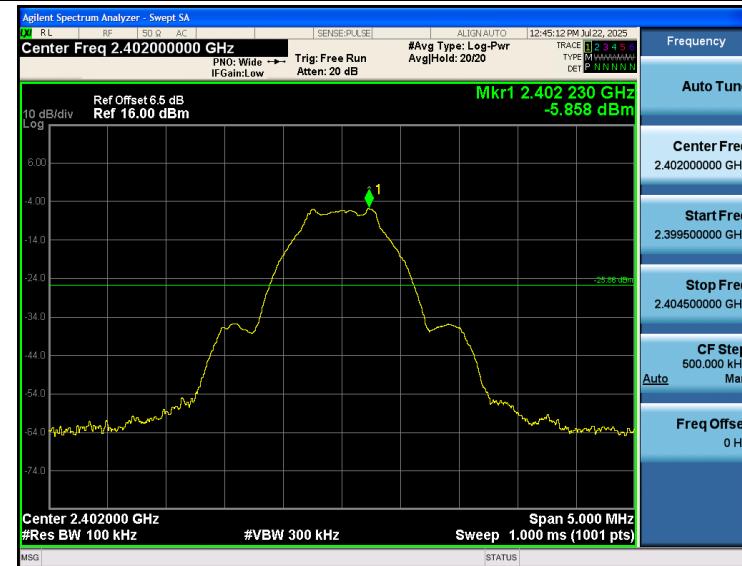


**(2) Conducted Spurious Emissions Test**

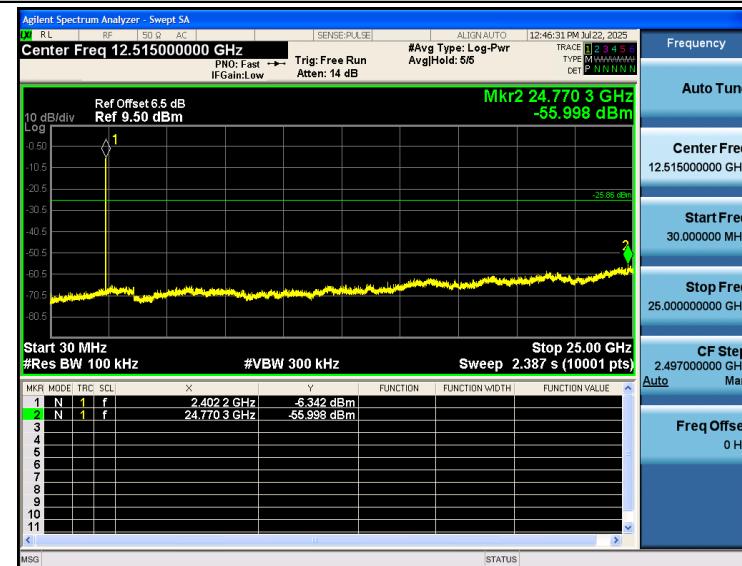
Test Mode	Frequency [MHz]	Ref Level [dBm]	Spurious level[dBm]	Limit[dBm]	Verdict
BLE 1Mbps	2402	-5.858	-55.998	-25.858	PASS
	2440	-3.017	-54.394	-23.017	PASS
	2480	-2.762	-58.773	-22.762	PASS
BLE 2Mbps	2402	-5.739	-55.856	-25.739	PASS
	2440	-3.622	-54.032	-23.622	PASS
	2480	-3.206	-54.181	-23.206	PASS



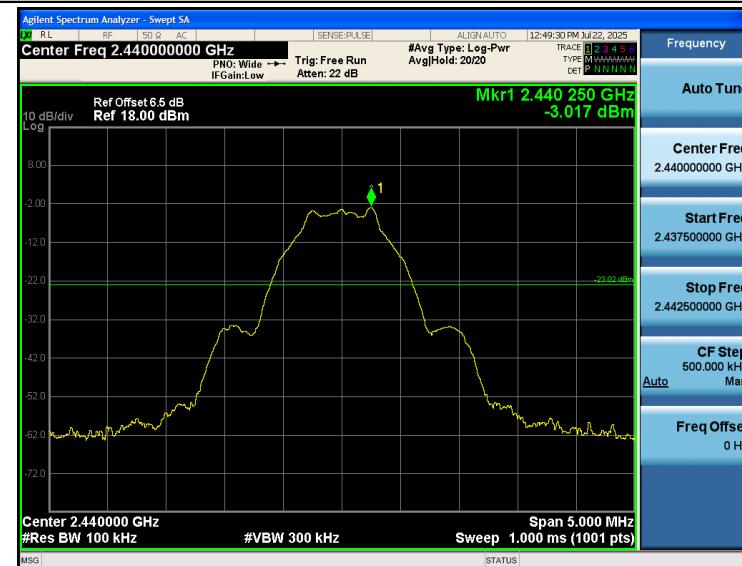
## BLE\_1Mbps\_2402\_Reference



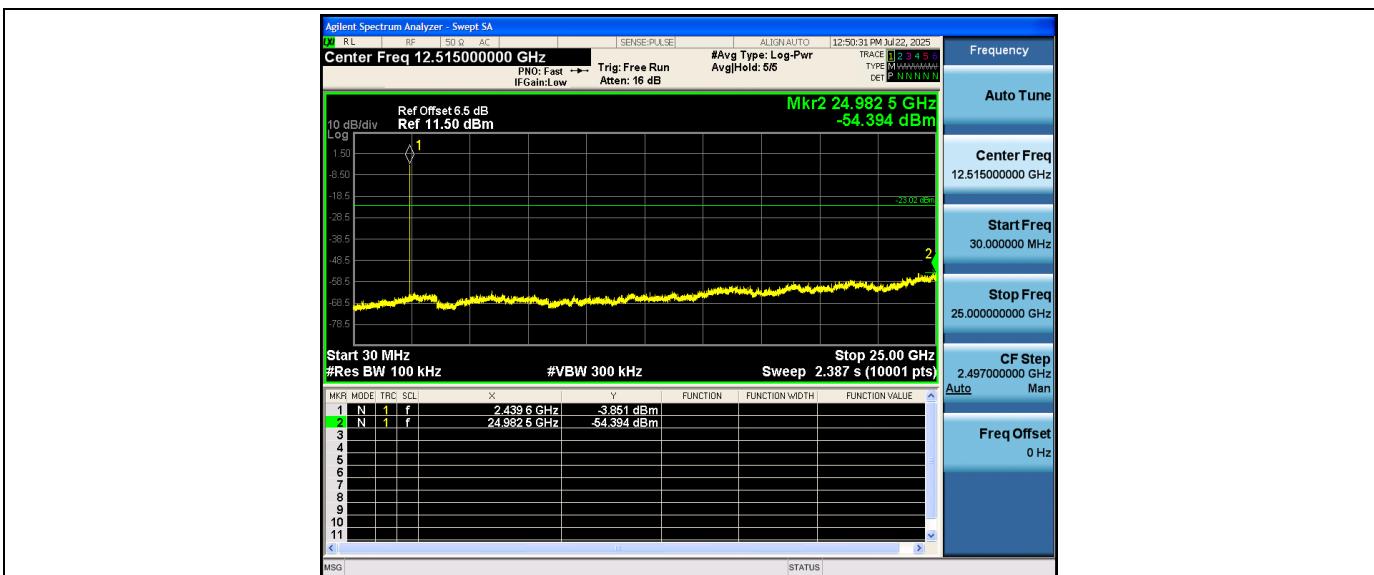
## BLE\_1Mbps\_2402\_30~25000



## BLE\_1Mbps\_2440\_Reference



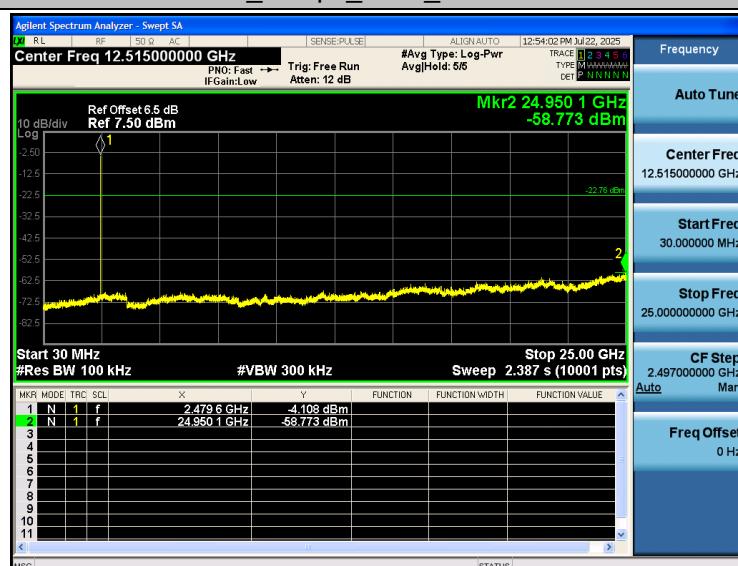
## BLE\_1Mbps\_2440\_30~25000



## BLE\_1Mbps\_2480\_0~Reference

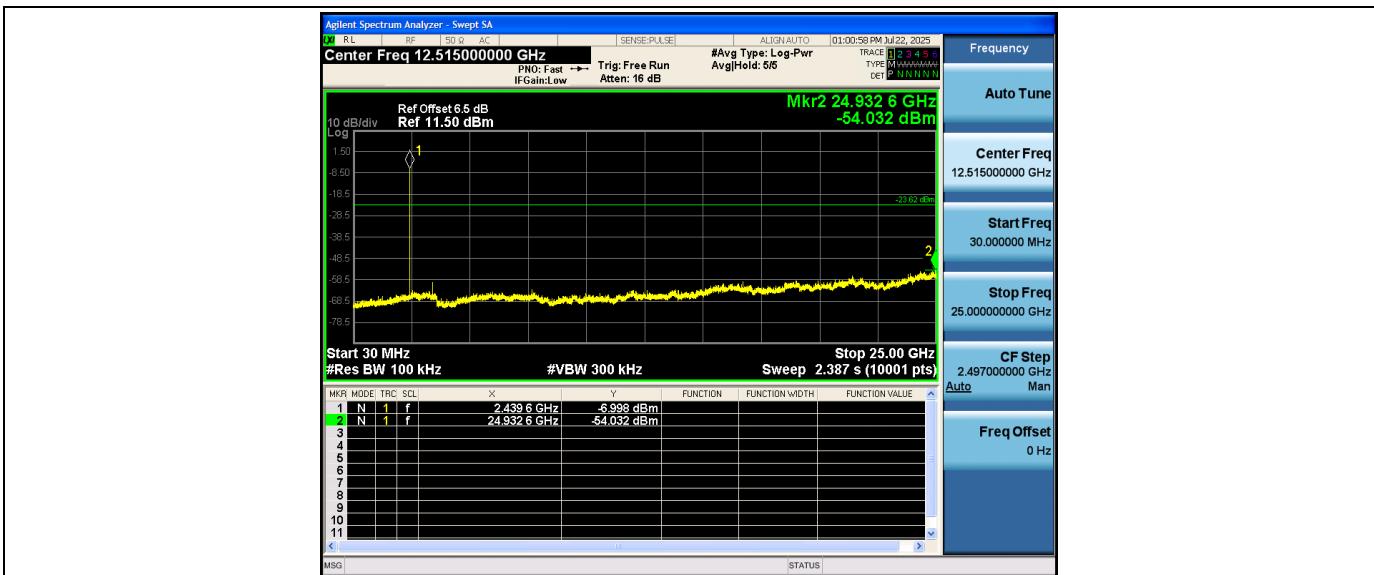


## BLE\_1Mbps\_2480\_30~25000



## BLE\_2Mbps\_2402\_0~Reference

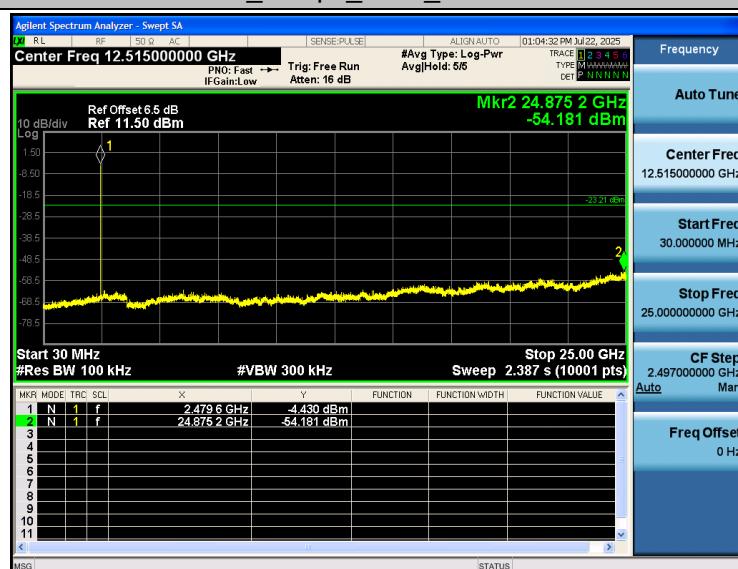




## BLE\_2Mbps\_2480\_0~Reference



## BLE\_2Mbps\_2480\_30~25000





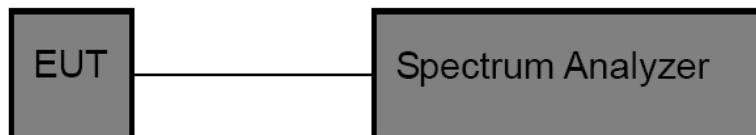
### 3.5. DTS Bandwidth

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. DTS Spectrum Setting:
  - (1) Set RBW = 100 kHz.
  - (2) Set the video bandwidth (VBW)  $\geq 3$  RBW.
  - (3) Detector = Peak.
  - (4) Trace mode = Max hold.
  - (5) Sweep = Auto couple.OCB Spectrum Setting:
  - (1) Set RBW = 1% ~ 5% occupied bandwidth.
  - (2) Set the video bandwidth (VBW)  $\geq 3$  RBW.
  - (3) Detector = Peak.
  - (4) Trace mode = Max hold.
  - (5) Sweep = Auto couple.

#### Test Mode

Please refer to the clause 2.4.

#### Test Results

Test Mode	Frequency[MHz]	DTS BW[kHz]	Limit[kHz]	Verdict
BLE 1Mbps	2402	665.01	>500	PASS
	2440	669.11	>500	PASS
	2480	670.53	>500	PASS
BLE 2Mbps	2402	1156.31	>500	PASS
	2440	1169.55	>500	PASS
	2480	1164.54	>500	PASS



## BLE\_1Mbps\_2402



## BLE\_1Mbps\_2440



## BLE\_1Mbps\_2480



## BLE\_2Mbps\_2402





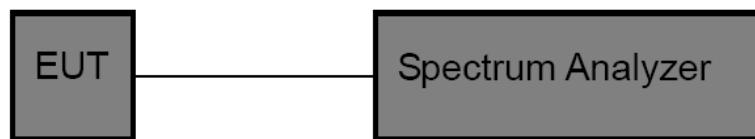
### 3.6. Peak Output Power

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4 d:

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:  
Peak Detector:  $RBW \geq DTS$  Bandwidth,  $VBW \geq 3 \times RBW$ .  
Sweep time=Auto.  
Detector= Peak.  
Trace mode= Maxhold.  
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

#### Test Mode

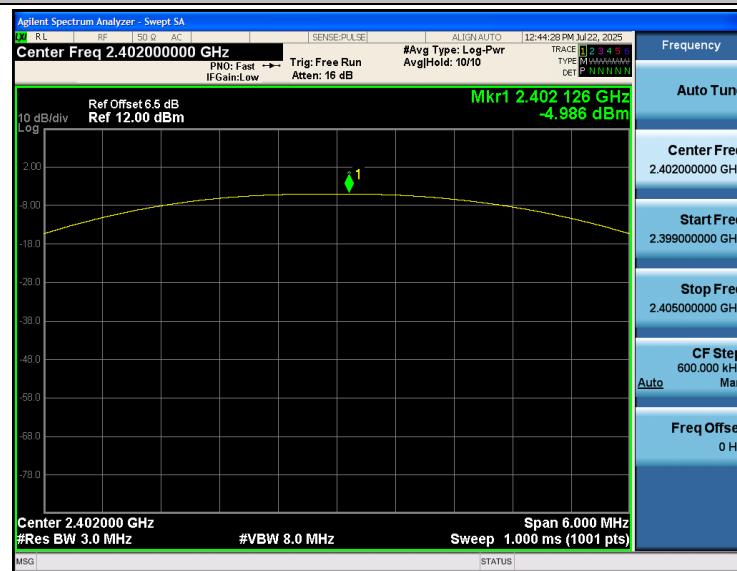
Please refer to the clause 2.4.

#### Test Result

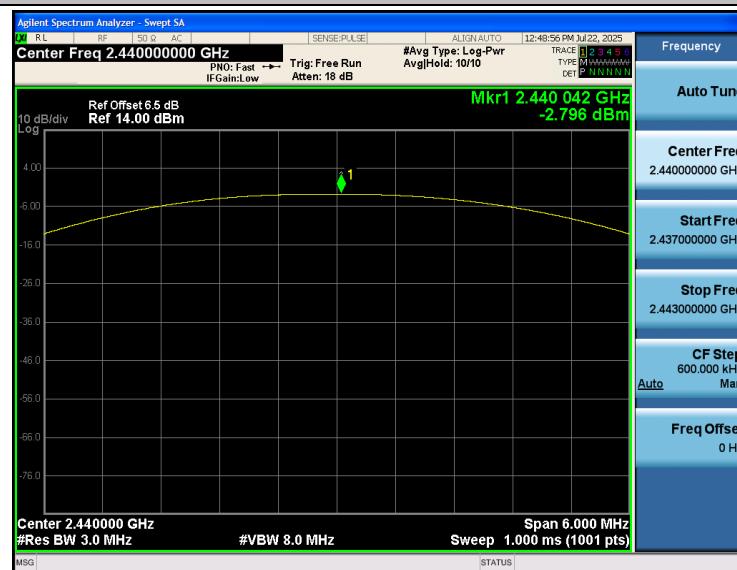
Test Mode	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
BLE 1Mbps	2402	-4.986	<=30	PASS
	2440	-2.796	<=30	PASS
	2480	-2.517	<=30	PASS
BLE 2Mbps	2402	-4.955	<=30	PASS
	2440	-2.742	<=30	PASS
	2480	<b>-2.436</b>	<=30	PASS



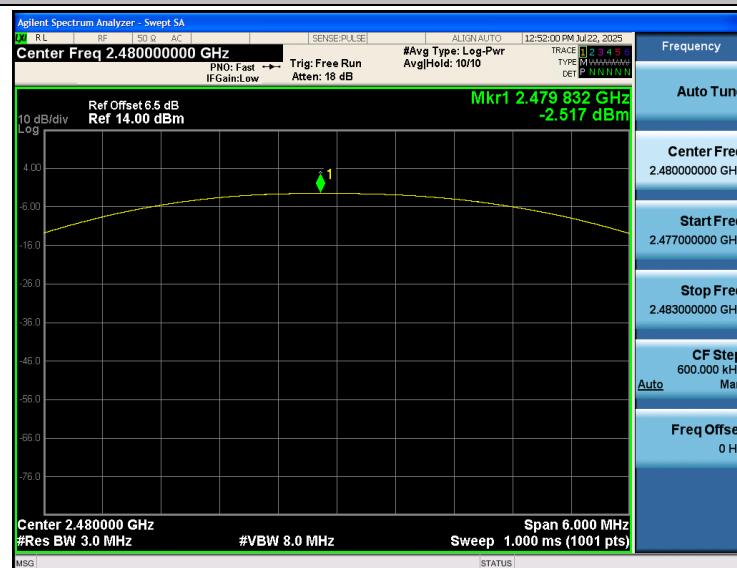
## BLE\_1Mbps\_2402



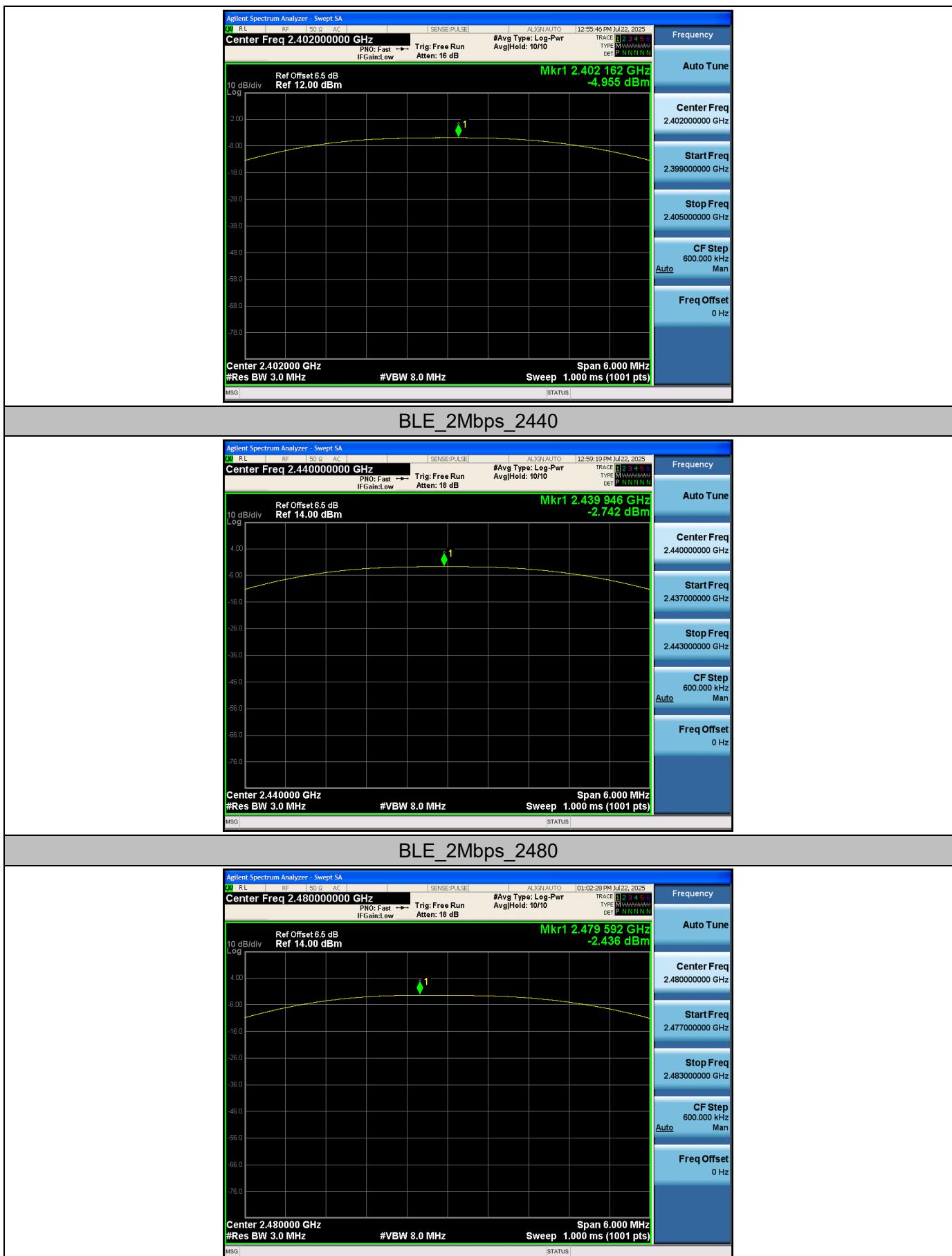
## BLE\_1Mbps\_2440



## BLE\_1Mbps\_2480



## BLE\_2Mbps\_2402





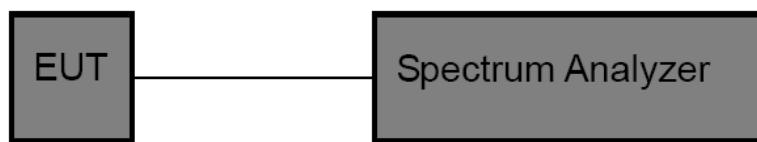
### 3.7. Power Spectral Density

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:  
Set analyzer center frequency to DTS channel center frequency.  
Set the span to 1.5 times the DTS bandwidth.  
Set the RBW to: 3 kHz  
Set the VBW to: 10 kHz  
Detector: peak  
Sweep time: auto  
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

#### Test Mode

Please refer to the clause 2.4.

#### Test Result

Test Mode	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE 1Mbps	2402	-21.29	<=8	PASS
	2440	-19.00	<=8	PASS
	2480	-18.72	<=8	PASS
BLE 2Mbps	2402	-23.87	<=8	PASS
	2440	-21.51	<=8	PASS
	2480	-21.90	<=8	PASS



## BLE\_1Mbps\_2402



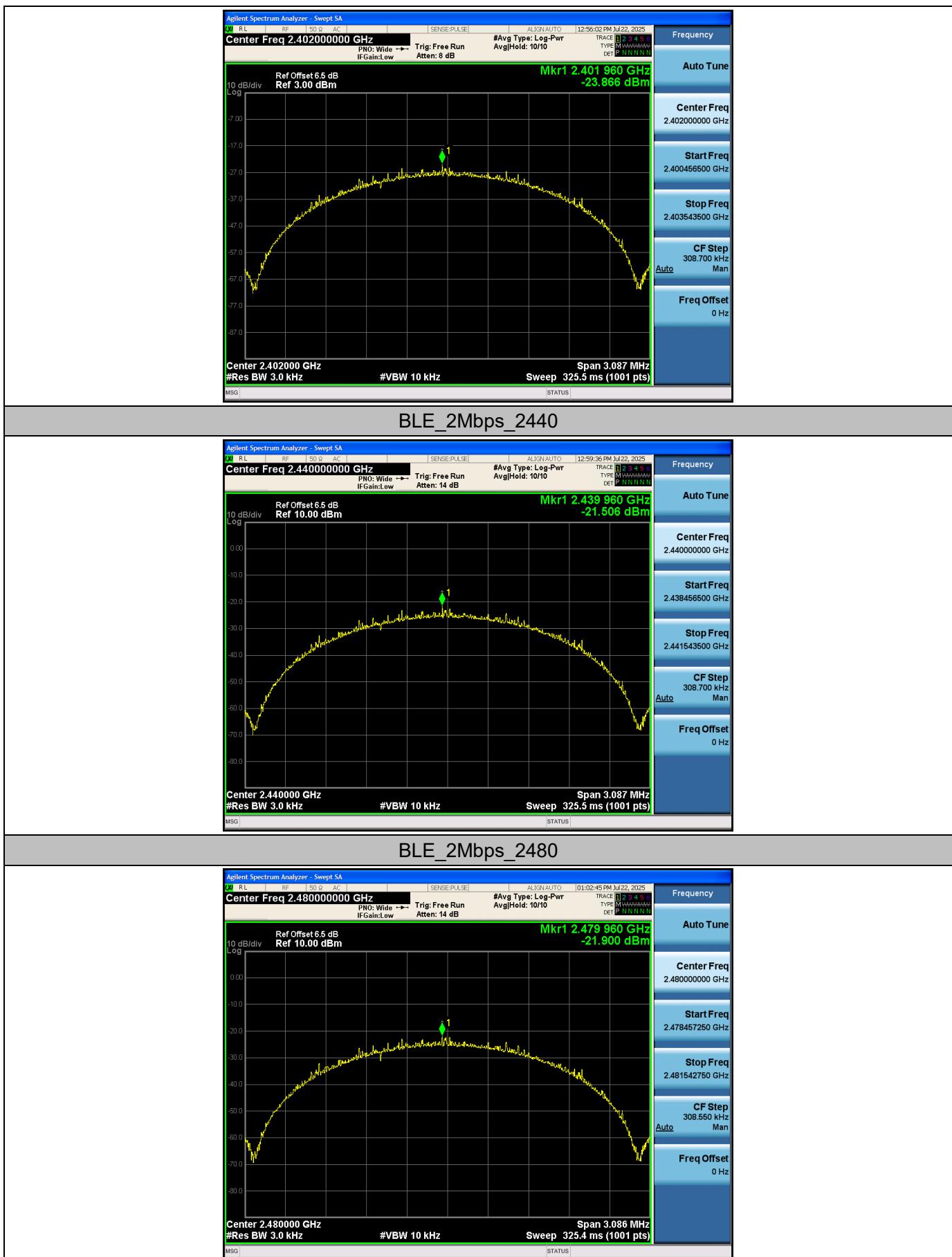
## BLE\_1Mbps\_2440



## BLE\_1Mbps\_2480



## BLE\_2Mbps\_2402



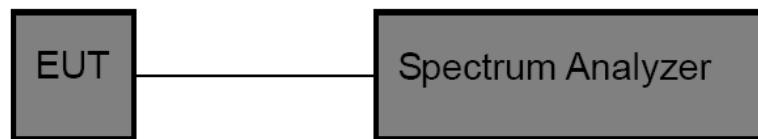


### 3.8. Duty Cycle

#### Limit

None, for report purposes only.

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:  
Set analyzer center frequency to test channel center frequency.  
Set the span to 0Hz  
Set the RBW to 8MHz  
Set the VBW to 8MHz  
Detector: Peak  
Sweep time: Auto  
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

#### Test Mode

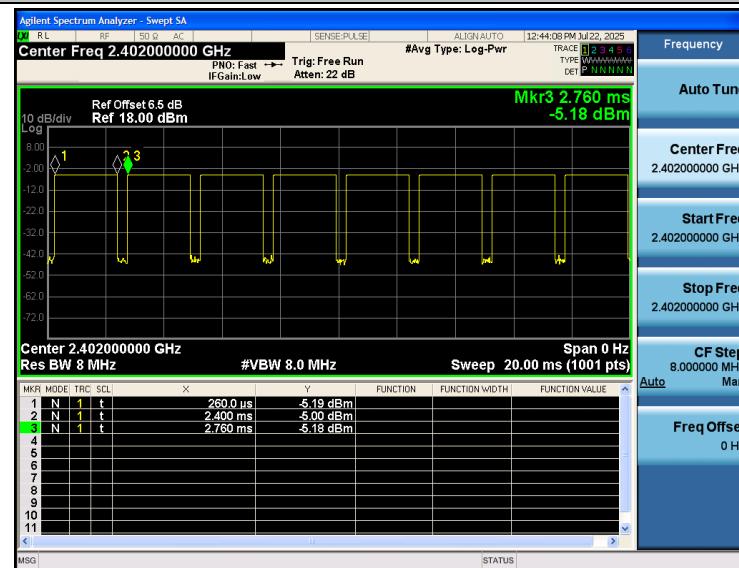
Please refer to the clause 2.4.

#### Test Result

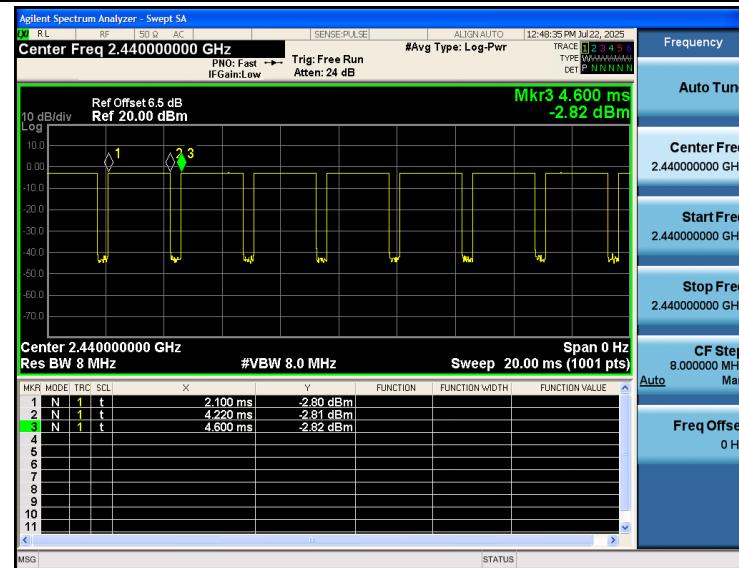
Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
BLE 1Mbps	2402	2.14	2.50	85.60	0.47	1
	2440	2.12	2.50	84.80	0.47	1
	2480	2.14	2.50	85.60	0.47	1
BLE 2Mbps	2402	1.08	1.88	57.45	0.93	1
	2440	1.06	1.86	56.99	0.94	1
	2480	1.08	1.88	57.45	0.93	1



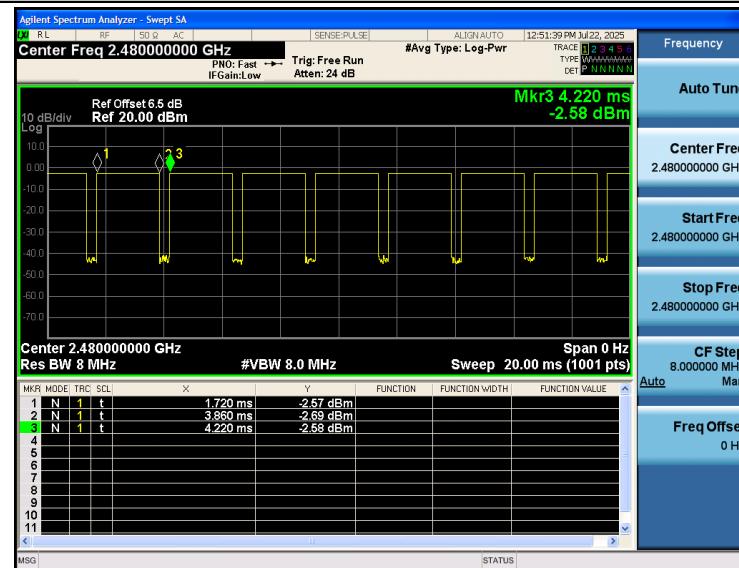
## BLE\_1Mbps\_2402



## BLE\_1Mbps\_2440



## BLE\_1Mbps\_2480



## BLE\_2Mbps\_2402





### 3.9. Antenna requirement

#### Requirement

##### **FCC CFR Title 47 Part 15 Subpart C Section 15.203:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of 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.

##### **FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):**

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

#### Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

\*\*\*\*\*THE END\*\*\*\*\*