

# RF MEASUREMENT REPORT

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**FCC ID:** 2AHXJ-ULTRASENSOR  
**Applicant:** Mopeka Products, LLC  
**Product:** LEVEL SENSOR  
**Model No.:** M1015  
**Brand Name:** MOPEKA  
**FCC Classification:** Digital Transmission System (DTS)  
**FCC Rule Part(s):** Part 15 Subpart C (Section 15.247)  
**Result:** Complies  
**Test Date:** 2022-04-21 ~ 2022-04-26

**Reviewed By:**

\_\_\_\_\_  
Jame Yuan

**Approved By:**

\_\_\_\_\_  
Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

**Revision History**

Report No.	Version	Description	Issue Date	Note
2204RSU025-U1	Rev. 01	Initial Report	2022-05-25	Valid

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#### 1.4. Product Information

Product Name	LEVEL SENSOR
Model No.	M1015
EUT Identification No.	20220419Sample#04 (Conducted) 20220418Sample#06 (Radiated)
Bluetooth Specification	BLE only, v4.0
Integrated Wireless Module	Product Name: IOT Module Model: nRF9160 FCC ID: 2ANPO00NRF9160
Working Voltage	2*AA battery
Remark: 1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer. 2. Bluetooth and LTE can't transmit simultaneously.	

#### 1.5. Radio Specification

Bluetooth Frequency	2402 ~ 2480MHz
Channel Number	40
Type of modulation	GFSK
Data Rate	1Mbps
Antenna Type	Onboard PCB
Antenna Gain	2.254 dBi

Note: For other features of this EUT, test report will be issued separately.

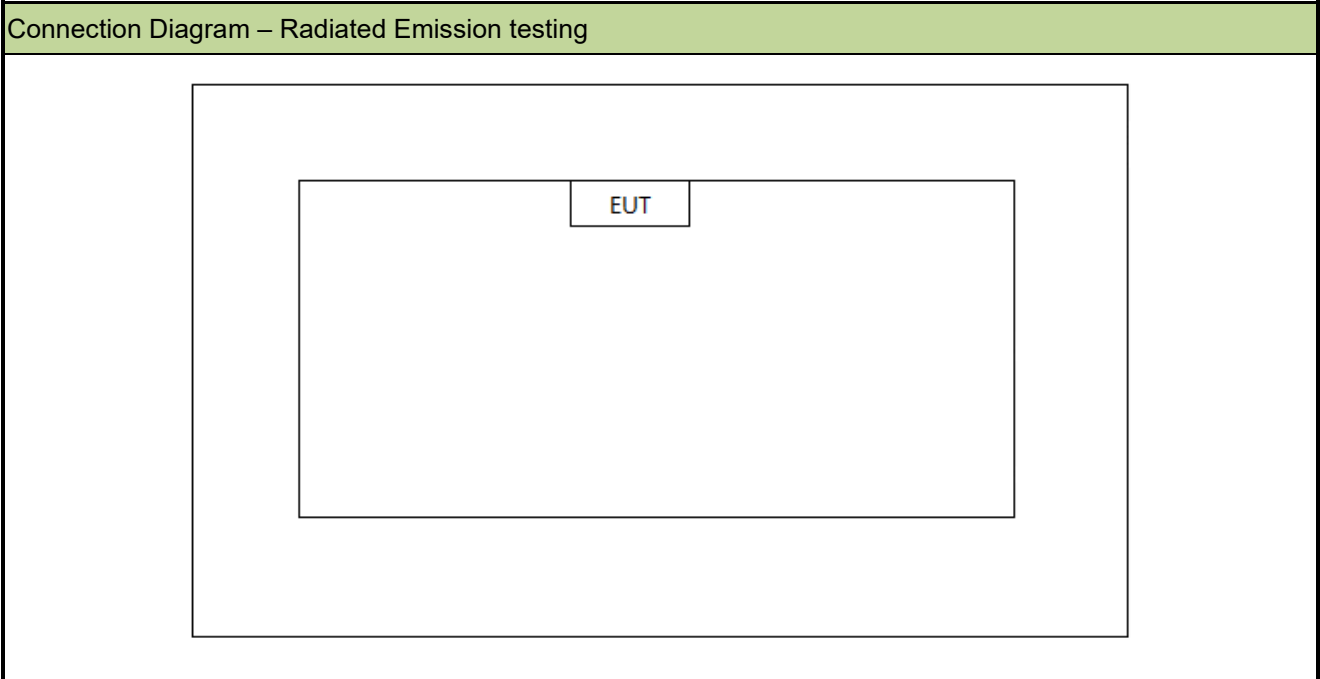
**1.6. Working Frequencies**

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	--	--	--	--

## 2. Test Configuration

### 2.1. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing.



### 2.2. Test Software

The test utility software used during testing was “nRF Connect”, and the version was 4.22.3

### 2.3. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.247
- KDB 558074 D01v05r02
- ANSI C63.10-2013

### 2.4. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~75%RH



### 3. Antenna Requirements

#### **Excerpt from §15.203 of the FCC Rules/Regulations:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

#### **Conclusion:**

The unit complies with the requirement of §15.203.

#### 4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2023-04-06	WZ-SR5
Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2022-06-28	WZ-SR5
Shielding Room	HUAMING	WZ-SR5	MRTSUE06442	/	/	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2022-06-24	WZ-SR5
USB Power Sensor	Agilent	U2021XA	MRTSUE06030	1 year	2022-10-10	WZ-SR5
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2022-05-24	WZ-AC2
EMI Test Receiver	Agilent	N9038A	MRTSUE06125	1 year	2022-06-24	WZ-AC2
Thermohygrometer	Mingle	ETH529	MRTSUE06170	1 year	2022-12-01	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2022-10-21	WZ-AC2
Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2022-11-12	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2023-04-21	WZ-AC2
Thermohygrometer	testo	Testo 608-H1	MRTSUE11038	1 year	2022-11-11	WZ-AC2

Software	Version	Function
EMI V3	V3.0.0	EMI Test Software
Controller_MF 7802	V 1.02	RE Antenna & turntable

## 5. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

<b>AC Conducted Emission Measurement</b>
Measurement Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
<b>Radiated Disturbance</b>
Measurement Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
<b>Spurious Emissions, Conducted</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 0.78dB
<b>Output Power</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 1.13dB
<b>Power Spectrum Density</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 1.15dB
<b>Occupied Bandwidth</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 0.28%

## 6. Test Result

### 6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.247(a)(2)	6dB Bandwidth	Conducted	Pass
15.247(b)(3)	Output Power		Pass
15.247(e)	Power Spectral Density		Pass
15.247(d)	Band Edge / Out-of-Band Emissions		Pass
15.205 15.209	General Field Strength (Restricted Bands and Radiated Emission)	Radiated	Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	N/A

**Remark:**

- The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
- "N/A" means not applicable.

## 6.2. 6dB Bandwidth Measurement

### 6.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

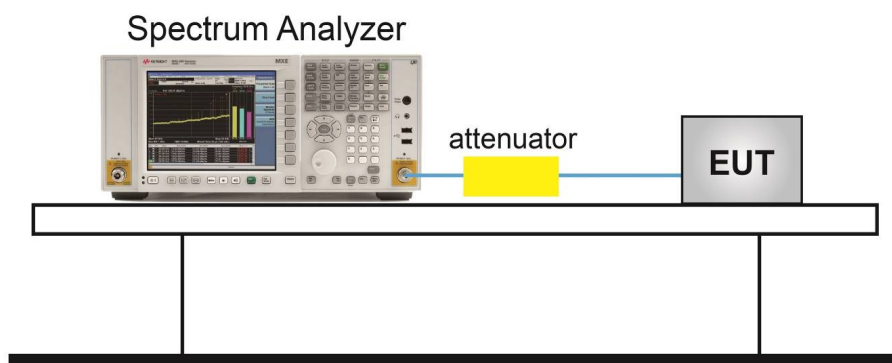
### 6.2.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.8

### 6.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to  $X = 6$ . The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize

### 6.2.4. Test Setup



### 6.2.5. Test Result

Refer to Appendix A.2.

### **6.3. Output Power Measurement**

#### **6.3.1. Test Limit**

The maximum output power shall be less 1 Watt (30dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. 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 FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **6.3.2. Test Procedure**

ANSI C63.10 - 2013 - Section 11.9.1.3

ANSI C63.10 - 2013 - Section 11.9.2.3.2

#### **6.3.3. Test Setting**

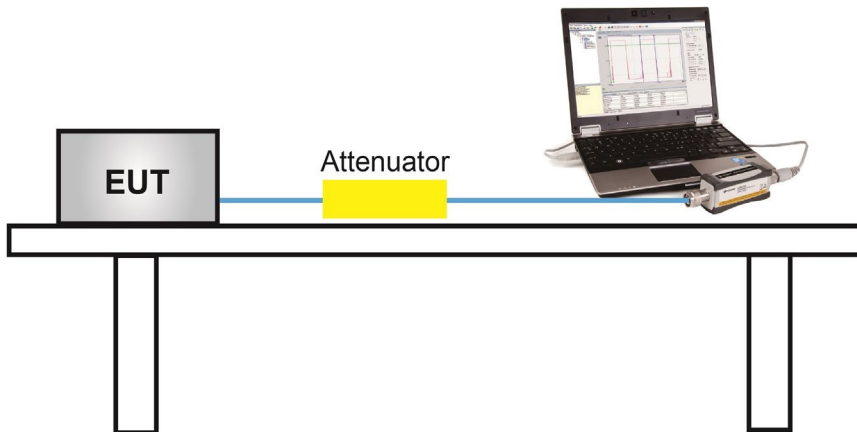
##### **PKPM1 Peak power meter method**

The maximum peak conducted output power was measured using a broadband peak RF power meter. The power meter had a video bandwidth that was greater than or equal to the DTS bandwidth and used a fast-responding diode detector.

##### **Average Power Measurement**

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

### 6.3.4. Test Setup



### 6.3.5. Test Result

Refer to Appendix A.3.

## 6.4. Power Spectral Density Measurement

### 6.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

The same method of determining the conducted output power shall be used to determine the power spectral density.

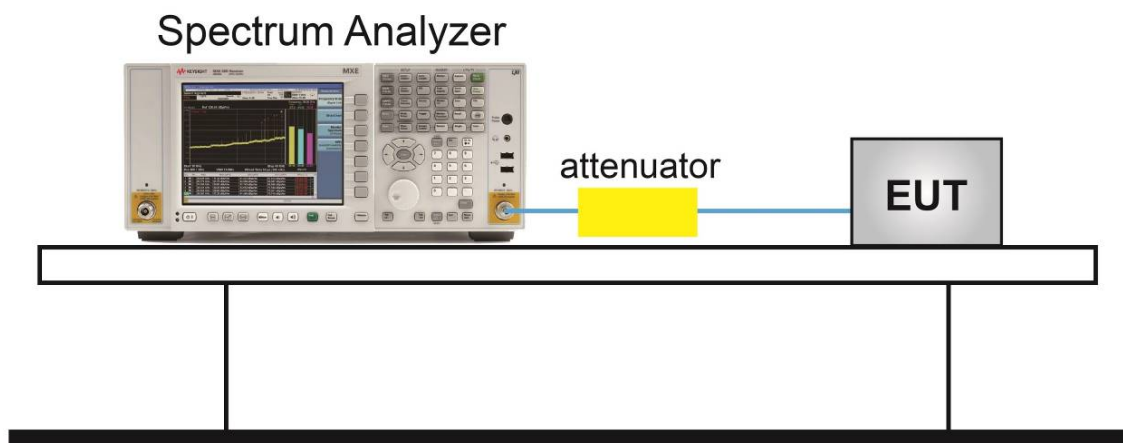
### 6.4.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.10.2

### 6.4.3. Test Setting

1. Set instrument center frequency to DTS channel center frequency.
2. Set span to at least 1.5 times the DTS bandwidth.
3. RBW = 3 kHz.
4. VBW  $\geq 3 \times$  RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.

### 6.4.4. Test Setup



### 6.4.5. Test Result

Refer to Appendix A.4.



## **6.5. Conducted Band Edge and Out-of-Band Emissions Measurement**

### **6.5.1. Test Limit**

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

### **6.5.2. Test Procedure**

ANSI C63.10-2013 - Section 11.11

### **6.5.3. Test Setting**

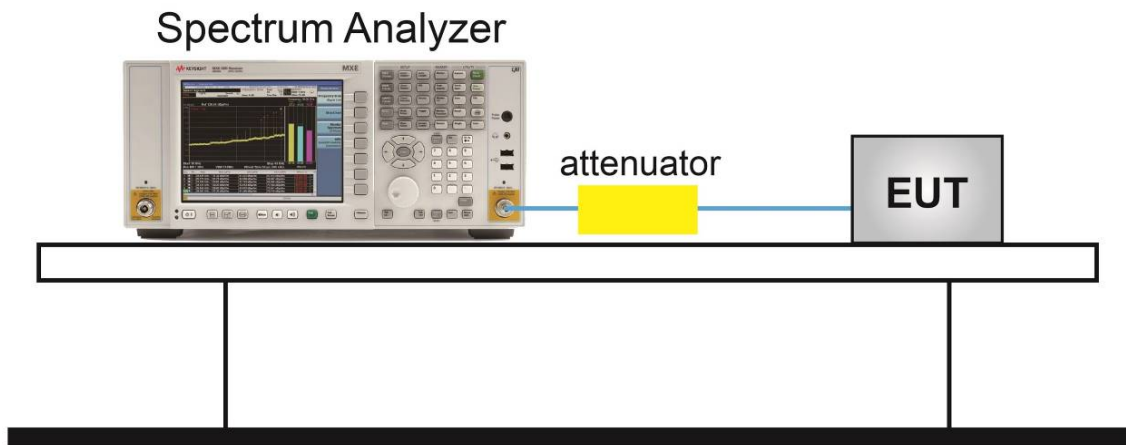
#### **Reference level measurement**

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to  $\geq 1.5$  times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW = 3 x RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

#### **Emission level measurement**

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

#### 6.5.4. Test Setup



#### 6.5.5. Test Result

Refer to Appendix A.5.

## 6.6. Radiated Spurious Emission Measurement

### 6.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

### 6.6.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.11 & 11.12

ANSI C63.10 - 2013 - Section 6.3 (General Requirements)

ANSI C63.10 - 2013 - Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 - 2013 - Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 - 2013 - Section 6.6 (Standard test method above 1GHz)

### 6.6.3. Test Setting

**Table 1 - RBW as a function of frequency**

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

#### **Quasi-Peak Measurements below 1GHz**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. VBW  $\geq 3 \times$  RBW
5. Detector = CISPR quasi-peak
6. Sweep time = auto couple
7. Trace was allowed to stabilize

#### **Peak Measurements above 1GHz**

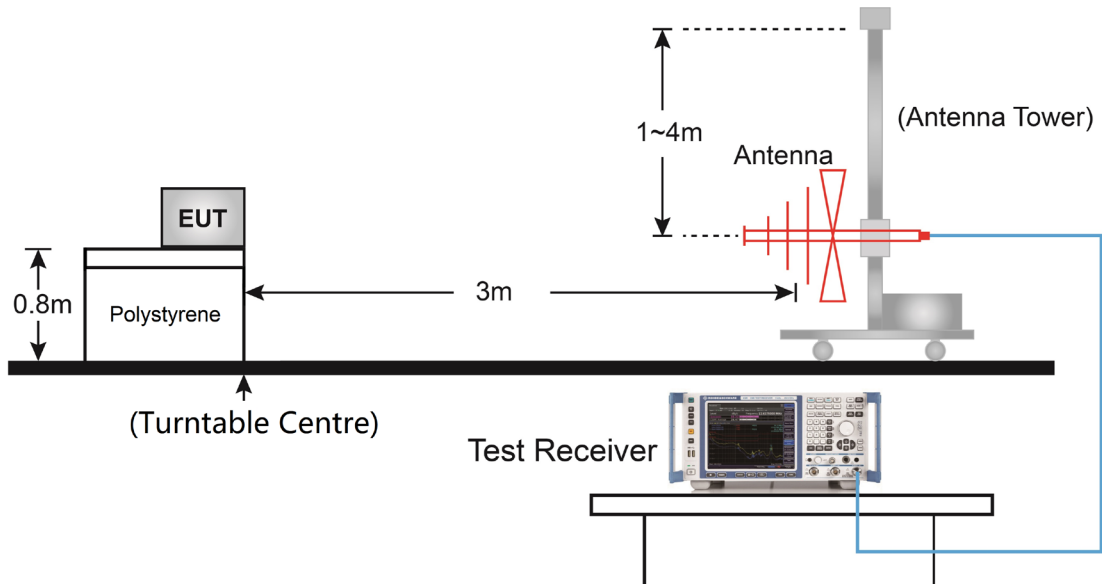
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

**Average Measurements above 1GHz (Method VB)**

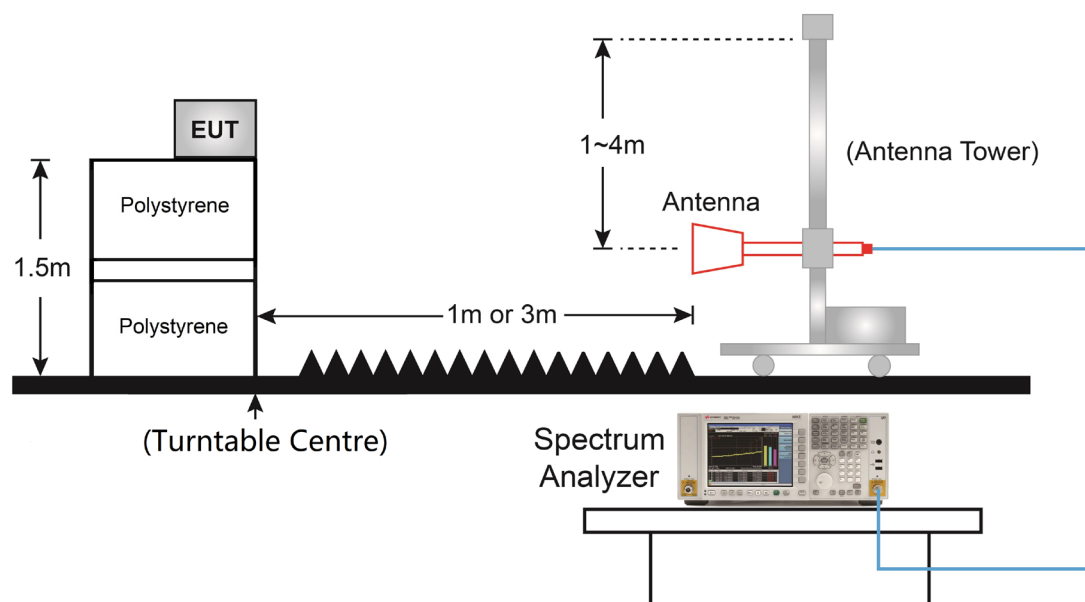
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle  $\geq 98\%$ , set VBW = 10 Hz.  
If the EUT duty cycle is  $< 98\%$ , set VBW  $\geq 1/T$ . T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 6.6.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



### 6.6.5. Test Result

Refer to Appendix A.6.

## 6.7. Radiated Restricted Band Edge Measurement

### 6.7.1. Test Limit

#### For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

<b>FCC Part 15 Subpart C Paragraph 15.209</b>		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

#### 6.7.2. Test Procedure

ANSI C63.10-2013 Section 6.3 & 6.6 & 11.13



### 6.7.3. Test Setting

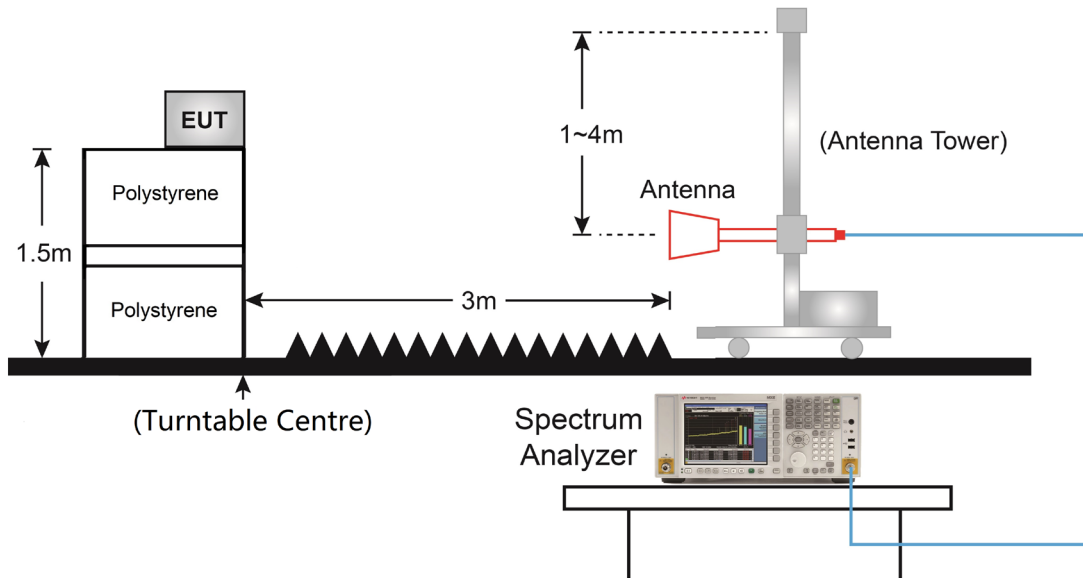
#### **Peak Field Strength Measurements**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

#### **Average Field Strength Measurements**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW  $\geq 1/T$
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

### 6.7.4. Test Setup



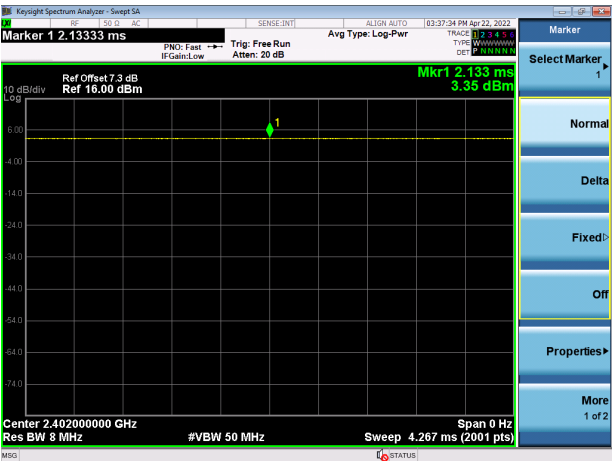
### 6.7.5. Test Result

Refer to Appendix A.7.

## Appendix A - Test Result

### A.1 Duty Cycle Test Result

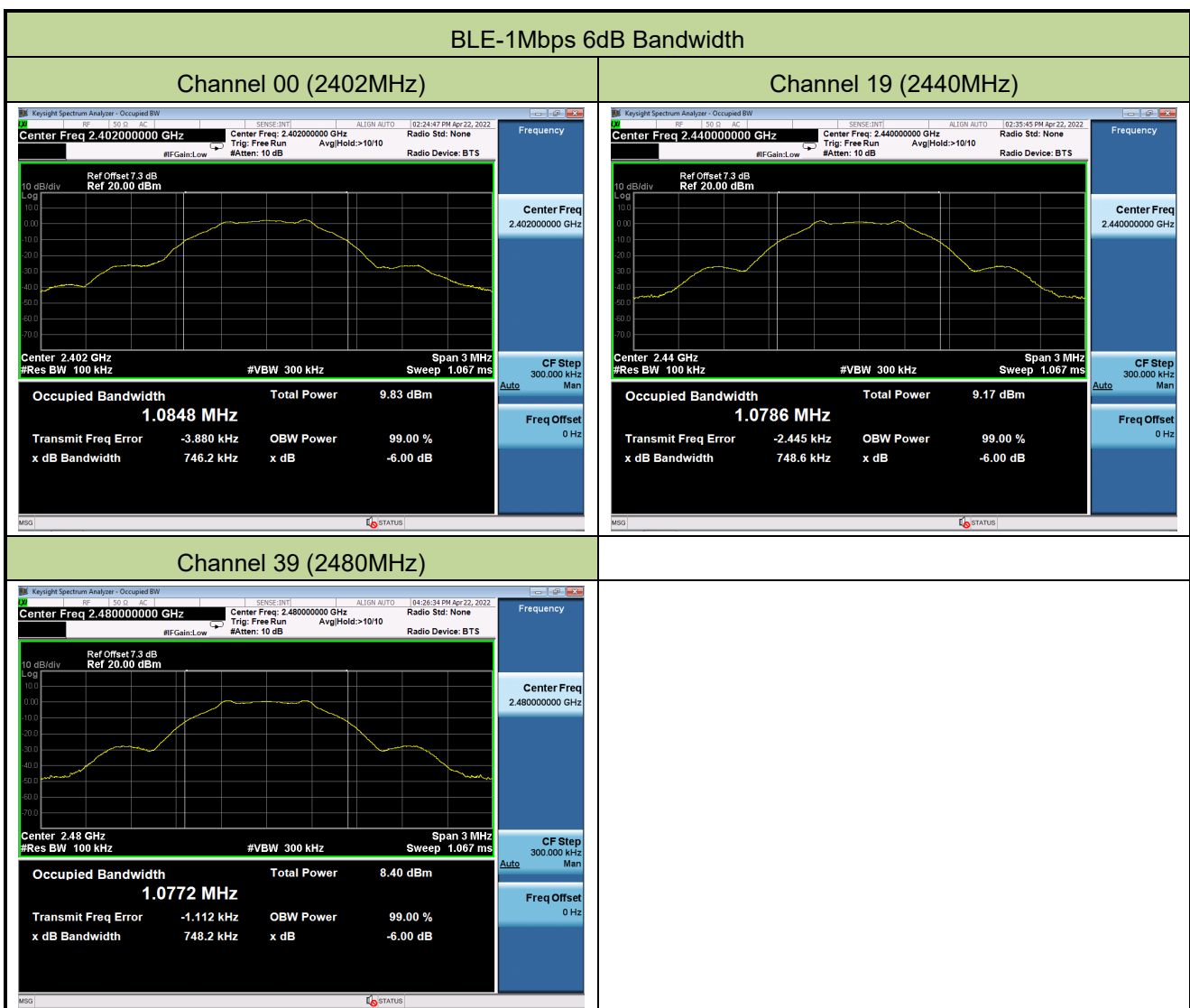
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2022/04/22		

Test Mode	Duty Cycle
BLE-1Mbps	100%
Duty Cycle (T = Transmission Duration)	
BLE-1Mbps	
 <p>The screenshot shows a Keysight Spectrum Analyzer interface. The main display is a log-scale plot of power spectral density (PSD) versus frequency. The center frequency is 2.402000000 GHz, and the span is 0 Hz. A single signal is visible at 2.402 GHz. A marker is placed on the signal, showing a duration of 2.133 ms and a power level of 3.35 dBm. The reference level is 16.00 dBm. The plot shows a narrow peak at the center frequency, indicating a narrowband signal.</p>	

**A.2 6dB Bandwidth Test Result**

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2022-04-22		

Test Mode	Data Rate	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
BLE	1Mbps	00	2402	0.7462	≥ 0.5
BLE	1Mbps	19	2440	0.7486	≥ 0.5
BLE	1Mbps	39	2480	0.7482	≥ 0.5



### A.3 Output Power Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2022-04-21		

#### Test Result of Peak Output Power

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	00	2402	2.99	≤ 30.00	Pass
BLE	1Mbps	19	2440	2.35	≤ 30.00	Pass
BLE	1Mbps	39	2480	1.62	≤ 30.00	Pass

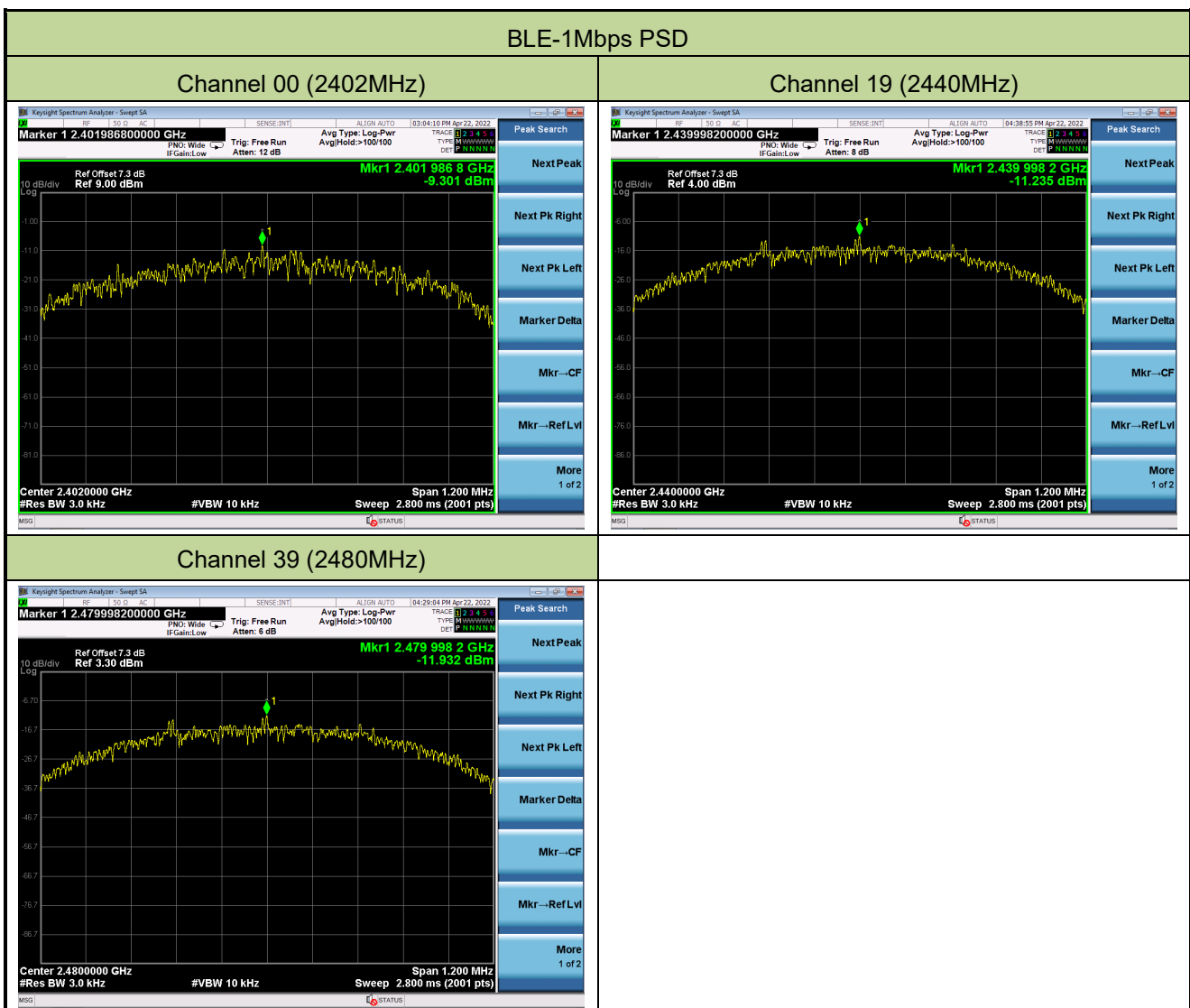
#### Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	00	2402	2.82	≤ 30.00	Pass
BLE	1Mbps	19	2440	2.15	≤ 30.00	Pass
BLE	1Mbps	39	2480	1.38	≤ 30.00	Pass

**A.4 Power Spectral Density Test Result**

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2022-04-22		

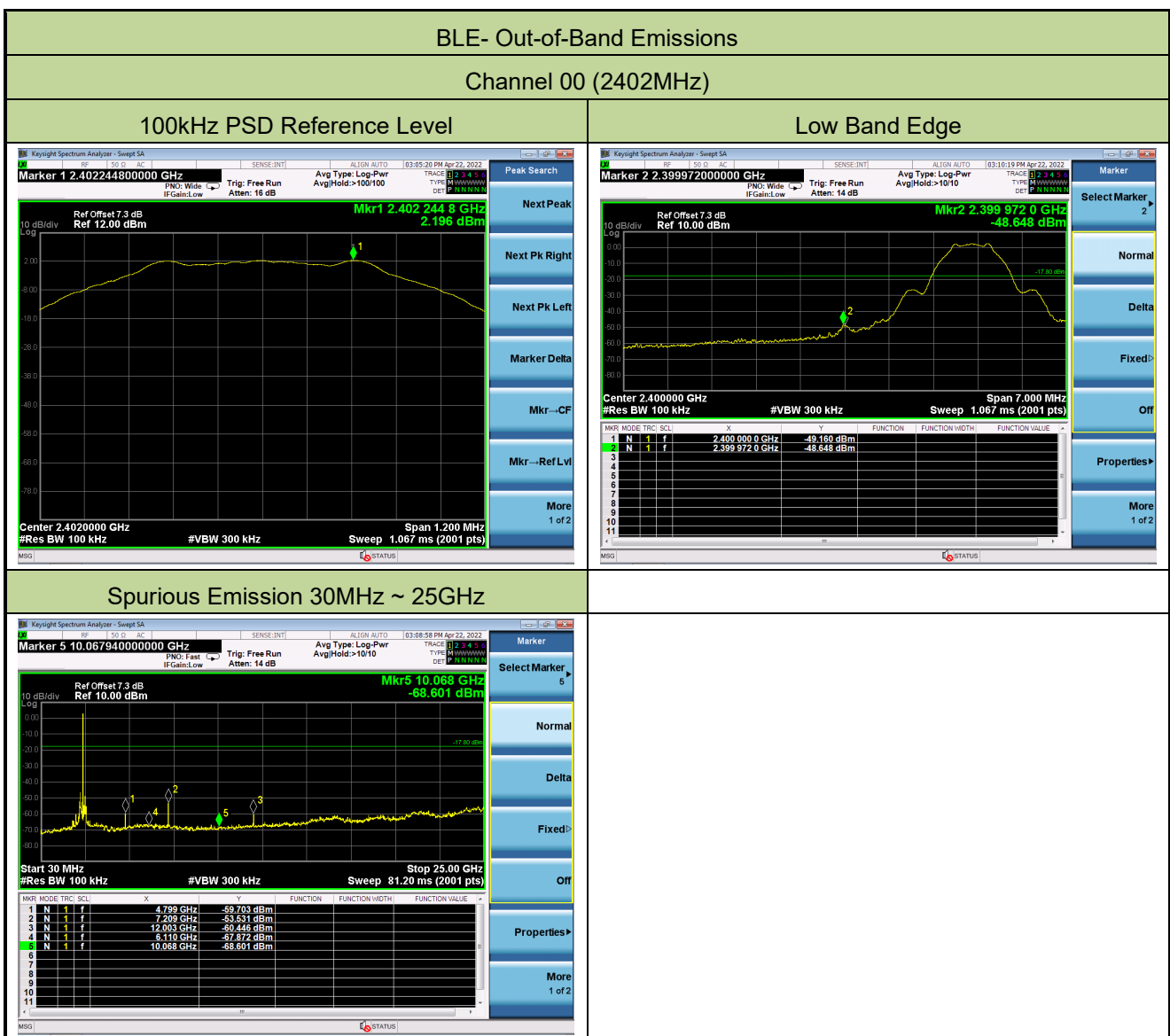
Test Mode	Data Rate	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1Mbps	00	2402	-9.30	≤ 8.00	Pass
BLE	1Mbps	19	2440	-11.24	≤ 8.00	Pass
BLE	1Mbps	39	2480	-11.93	≤ 8.00	Pass



**A.5 Conducted Band Edge and Out-of-Band Emissions Test Result**

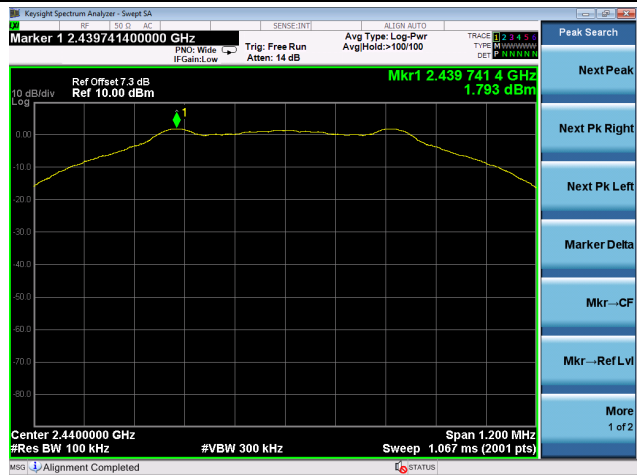
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2022-04-22		

Test Mode	Data Rate / Mbps	Channel No.	Frequency (MHz)	Limit (dBc)	Result
BLE	1	00	2402	20	Pass
BLE	1	19	2440	20	Pass
BLE	1	39	2480	20	Pass

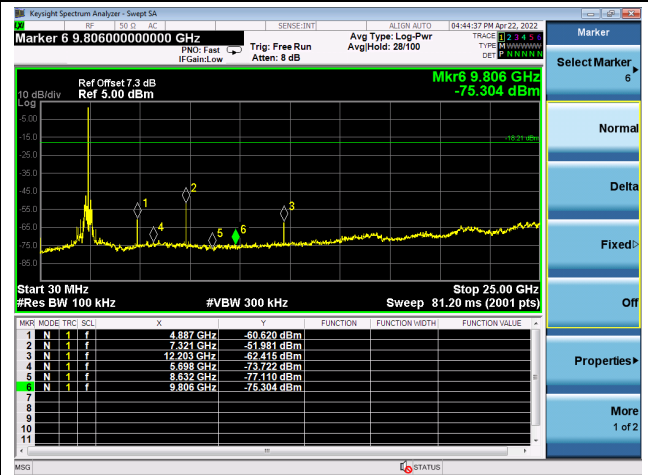


### Channel 19 (2440MHz)

#### 100kHz PSD Reference Level

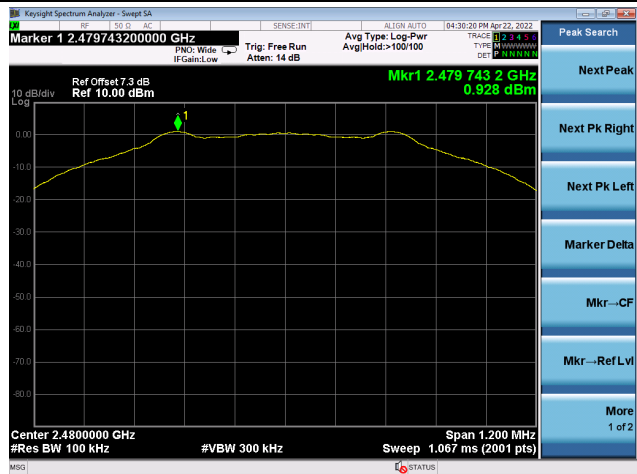


#### Spurious Emission 30MHz ~ 25GHz

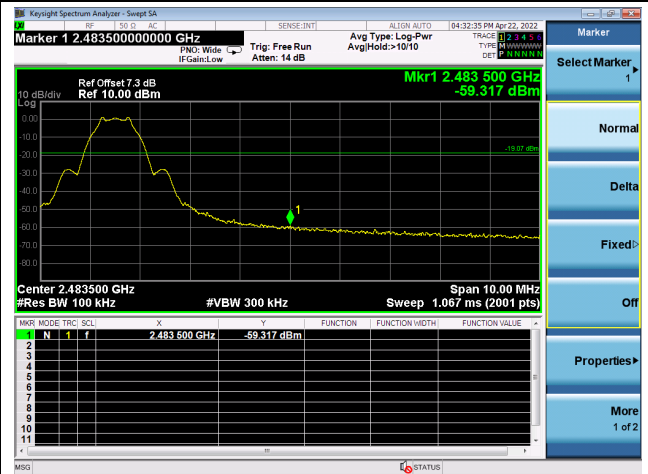


### Channel 39 (2480MHz)

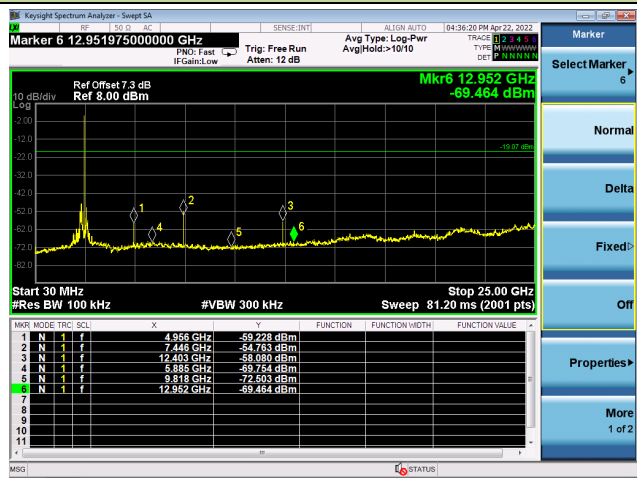
#### 100kHz PSD Reference Level



#### High Band Edge



#### Spurious Emission 30MHz ~ 25GHz





**A.6 Radiated Spurious Emission Test Result**

Test Site	WZ-AC2	Test Engineer	Bob Zhang
Test Date	2022-04-26	Test Mode:	BLE-1Mbps
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

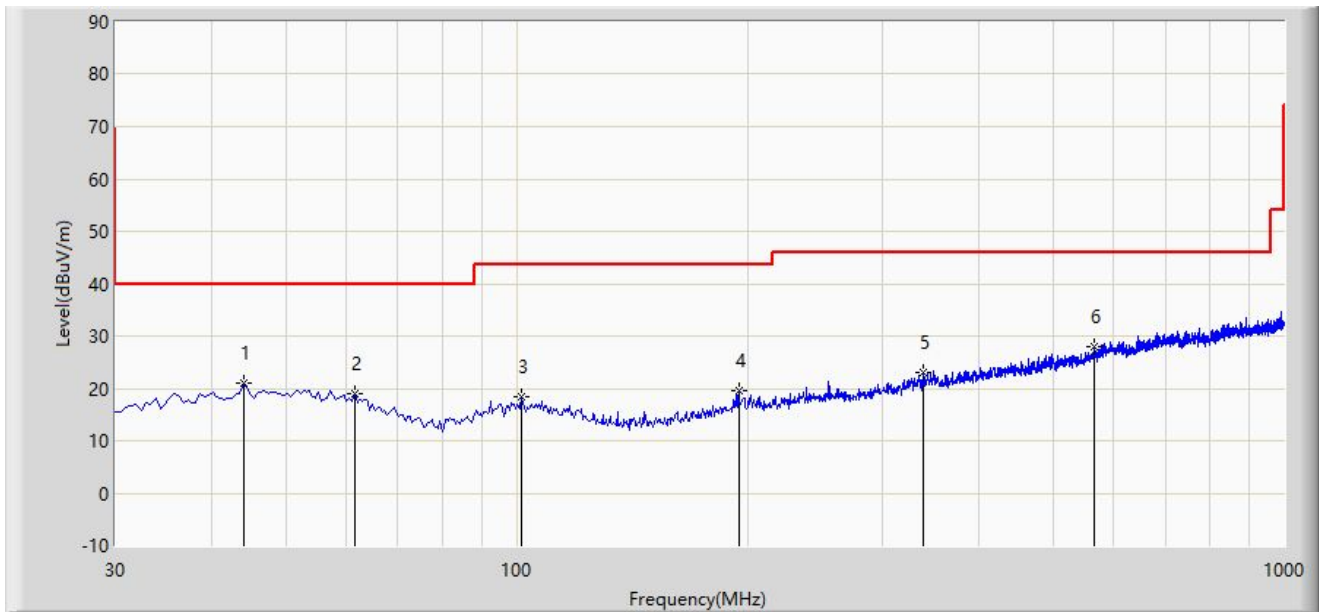
Test Channel	Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB/m)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
00	3966.5	36.6	0.5	37.1	74.0	-36.9	Peak	Horizontal
	4808.0	43.1	4.5	47.6	74.0	-26.4	Peak	Horizontal
	8259.0	31.6	11.9	43.5	74.0	-30.5	Peak	Horizontal
	3975.0	36.7	0.5	37.2	74.0	-36.8	Peak	Vertical
	4799.5	39.5	4.6	44.1	74.0	-29.9	Peak	Vertical
	12007.5	35.4	17.6	53.0	74.0	-21.0	Peak	Vertical
	12007.5	30.2	17.6	47.8	54.0	-6.2	Average	Vertical
19	4170.5	35.7	1.5	37.2	74.0	-36.8	Peak	Horizontal
	4884.5	43.4	3.9	47.3	74.0	-26.7	Peak	Horizontal
	7324.0	40.6	11.6	52.2	74.0	-21.8	Peak	Horizontal
	4876.0	41.7	4.0	45.7	74.0	-28.3	Peak	Vertical
	7315.5	40.3	11.6	51.9	74.0	-22.1	Peak	Vertical
	12203.0	36.0	18.3	54.3	74.0	-19.7	Peak	Vertical
	12203.0	30.3	18.3	48.6	54.0	-5.4	Average	Vertical
39	4961.0	44.0	3.9	47.9	74.0	-26.1	Peak	Horizontal
	7443.0	41.3	12.0	53.3	74.0	-20.7	Peak	Horizontal
	7443.0	35.0	12.0	47.0	54.0	-7.0	Average	Horizontal
	8208.0	32.0	11.9	43.9	74.0	-30.1	Peak	Horizontal
	4961.0	43.9	3.9	47.8	74.0	-26.2	Peak	Vertical
	7443.0	43.3	12.0	55.3	74.0	-18.7	Peak	Vertical
	7443.0	37.8	12.0	49.8	54.0	-4.2	Average	Vertical
	12398.5	34.9	17.5	52.4	74.0	-21.6	Peak	Vertical

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

**The Result of Radiated Emission below 1GHz:**

Site: WZ-AC2	Test Date: 2022-04-25
Limit: FCC_Part15.209_RSE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_VULB9162_0.03-7GHz	Polarity: Horizontal
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			44.065	21.103	0.589	-18.897	40.000	20.515	PK
2			61.525	19.089	0.032	-20.911	40.000	19.058	PK
3			101.295	18.299	-0.399	-25.201	43.500	18.698	PK
4			194.900	19.424	0.641	-24.076	43.500	18.783	PK
5			339.430	23.120	0.644	-22.880	46.000	22.475	PK
6		*	564.470	28.101	1.818	-17.899	46.000	26.284	PK

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

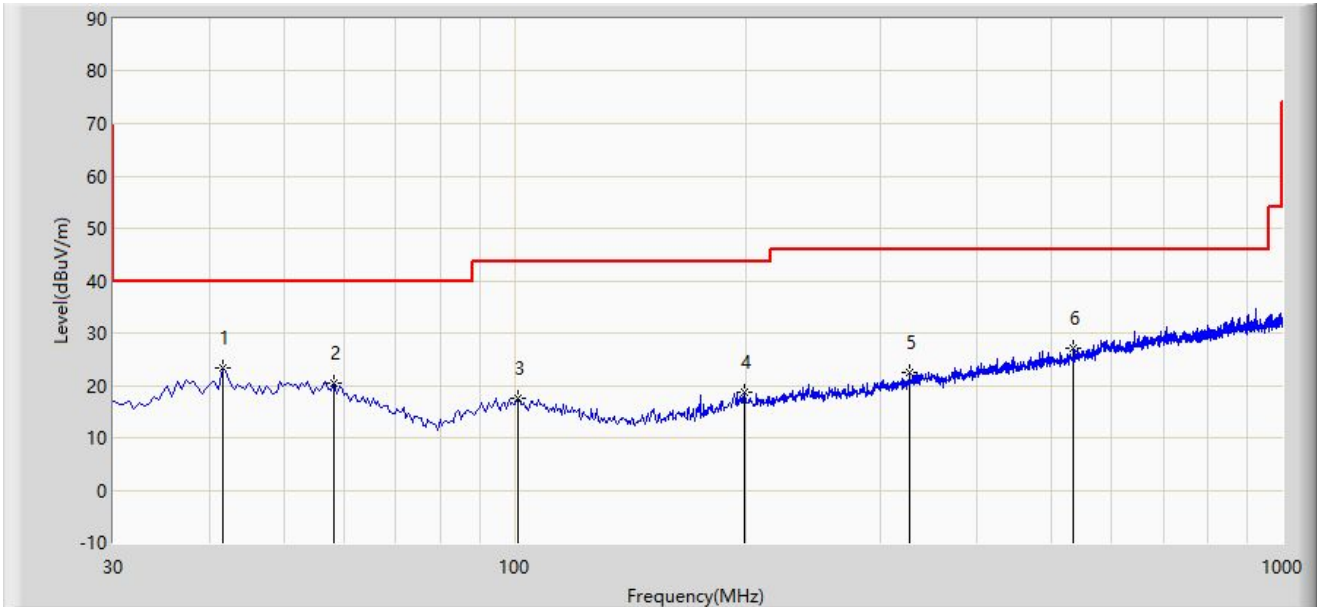
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: QP measurement was not performed when peak measure level was lower than the QP limit.

Note 3: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

Site: WZ-AC2	Test Date: 2022-04-25
Limit: FCC_Part15.209_RSE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_VULB9162_0.03-7GHz	Polarity: Vertical
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		*	41.640	23.422	3.526	-16.578	40.000	19.896	PK
2			58.130	20.336	0.450	-19.664	40.000	19.886	PK
3			100.810	17.643	-1.059	-25.857	43.500	18.702	PK
4			199.265	18.774	-0.213	-24.726	43.500	18.987	PK
5			326.820	22.363	0.472	-23.637	46.000	21.891	PK
6			534.400	27.131	1.459	-18.869	46.000	25.673	PK

Note 1: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

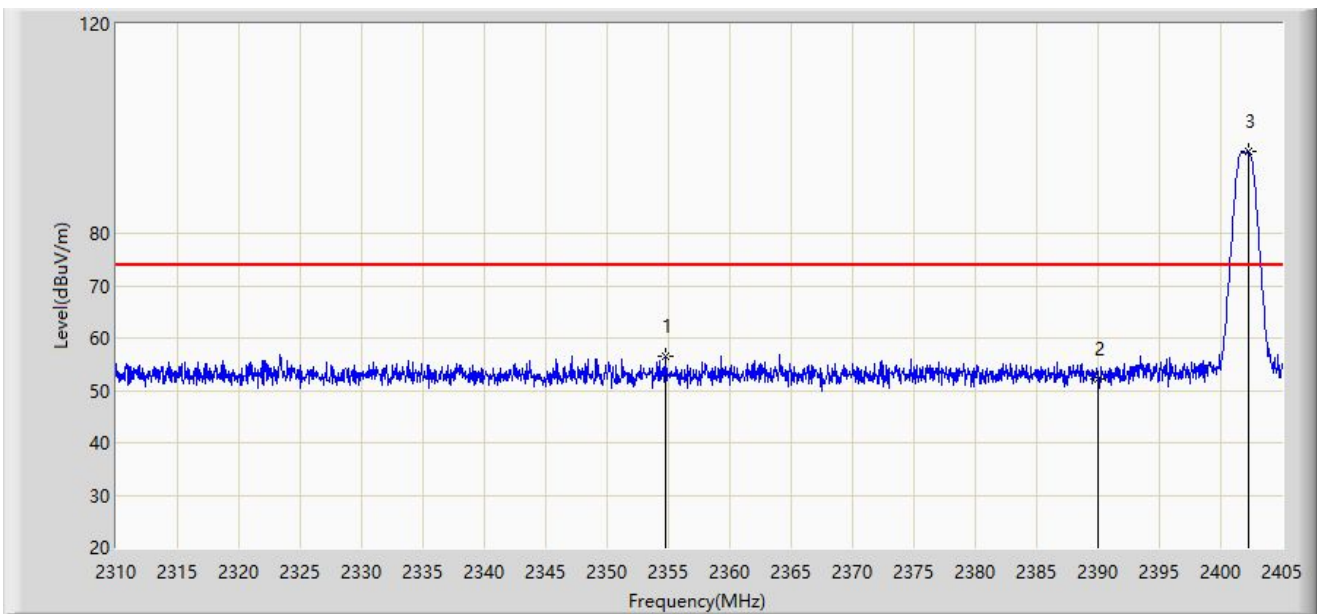
Note 2: QP measurement was not performed when peak measure level was lower than the QP limit.

Note 3: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

**A.7 Radiated Restricted Band Edge Test Result**

Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2402MHz	

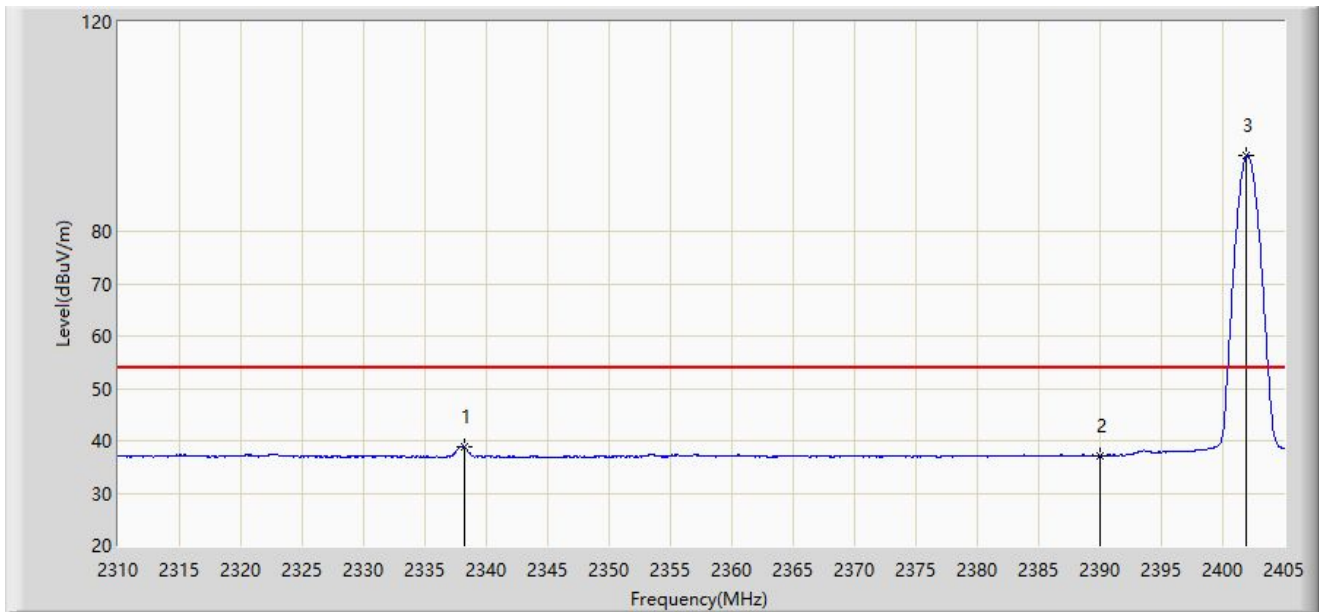


No	Flag	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1			2354.792	56.509	24.999	-17.491	74.000	31.511	PK
2			2390.000	52.073	20.640	-21.927	74.000	31.433	PK
3		*	2402.245	95.599	64.216	N/A	N/A	31.383	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2402MHz	

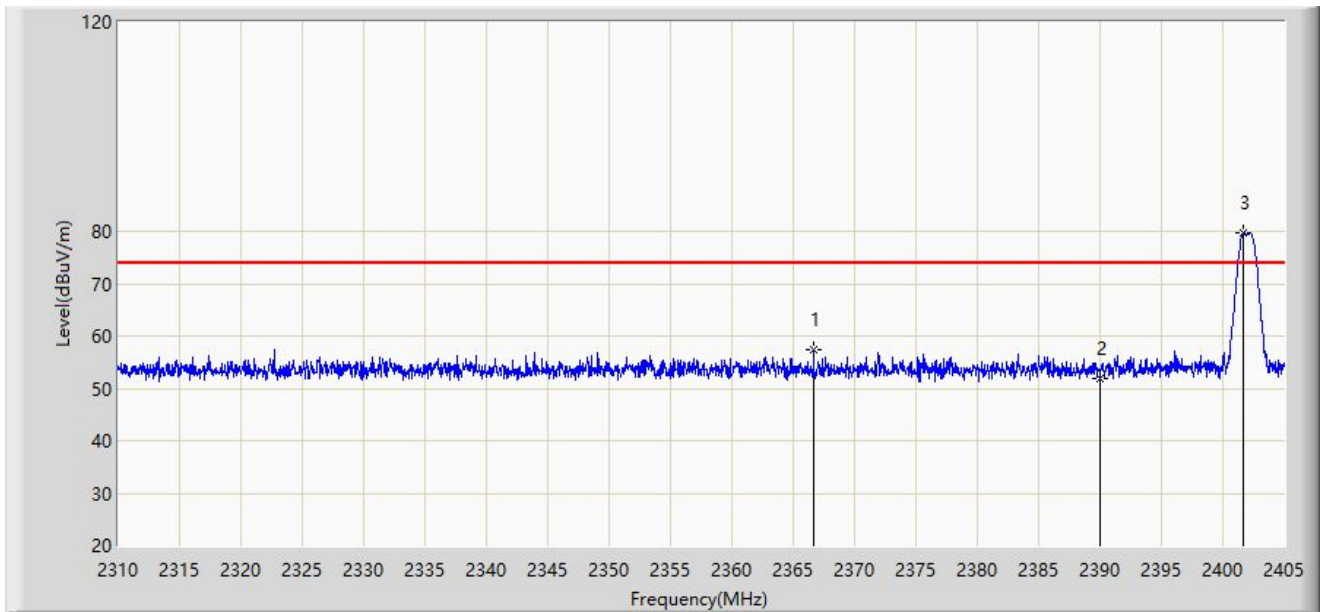


No	Flag	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1			2338.167	38.830	7.279	-15.170	54.000	31.551	AV
2			2390.000	37.077	5.644	-16.923	54.000	31.433	AV
3		*	2401.960	94.455	63.071	N/A	N/A	31.384	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2402MHz	

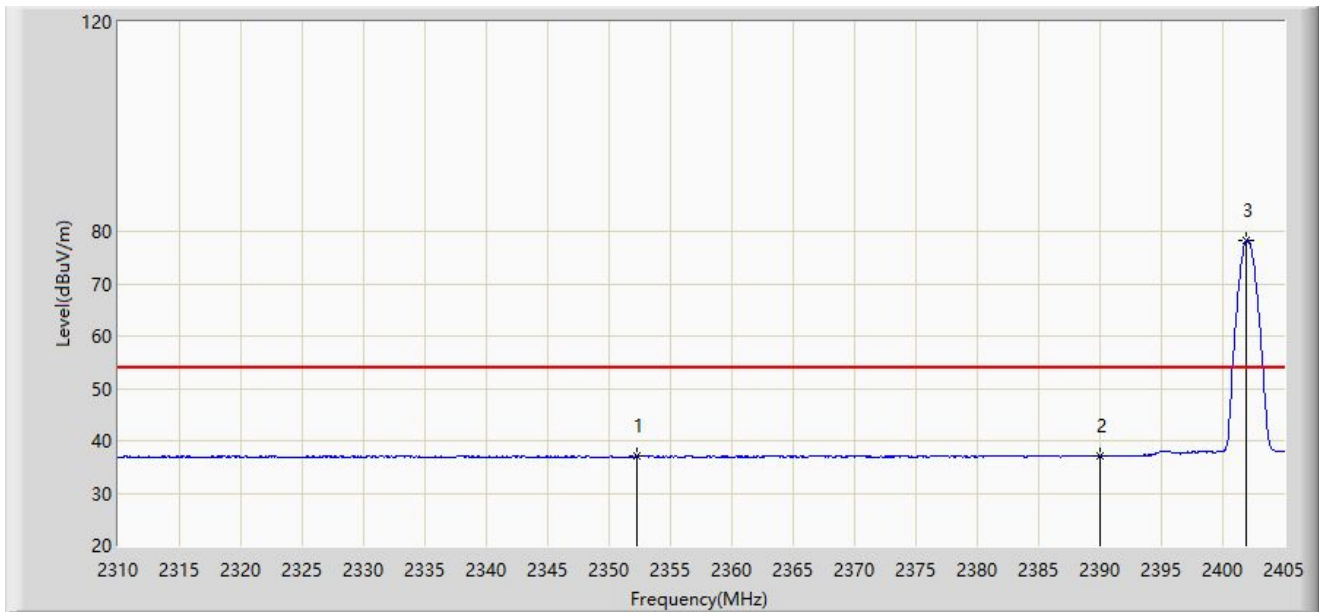


No	Flag	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1			2366.667	57.441	25.928	-16.559	74.000	31.512	PK
2			2390.000	51.978	20.545	-22.022	74.000	31.433	PK
3		*	2401.722	79.688	48.303	N/A	N/A	31.385	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2402MHz	

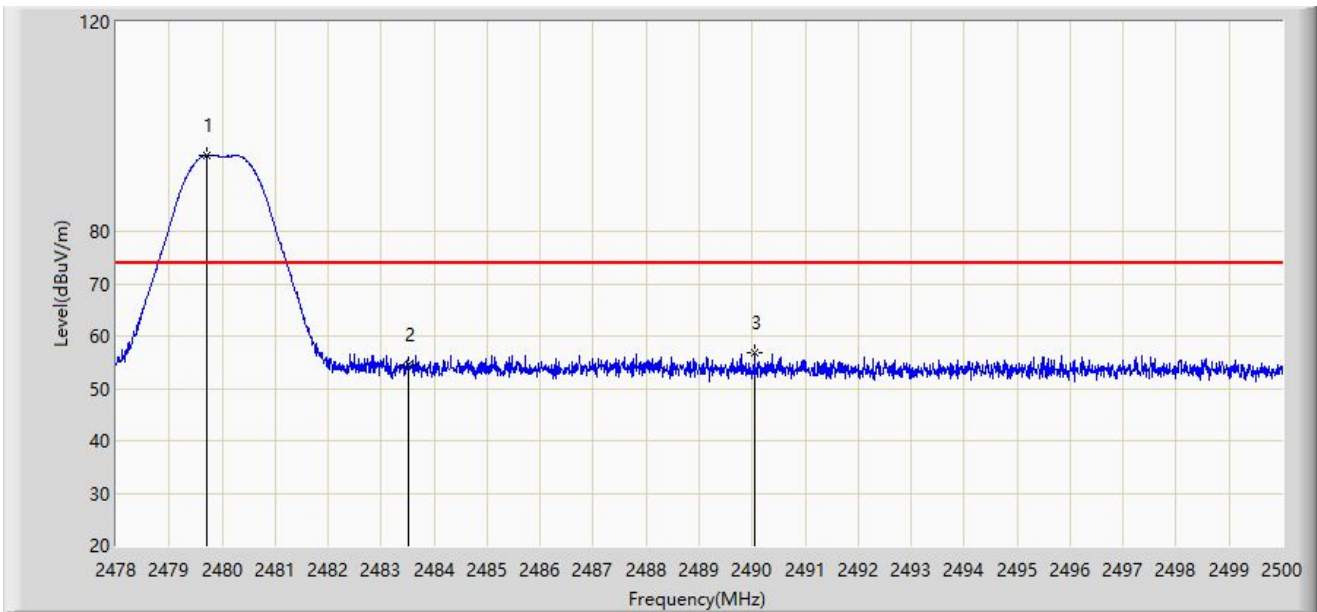


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1			2352.275	36.967	5.457	-17.033	54.000	31.510	AV
2			2390.000	37.204	5.771	-16.796	54.000	31.433	AV
3		*	2401.960	78.306	46.922	N/A	N/A	31.384	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2480MHz	



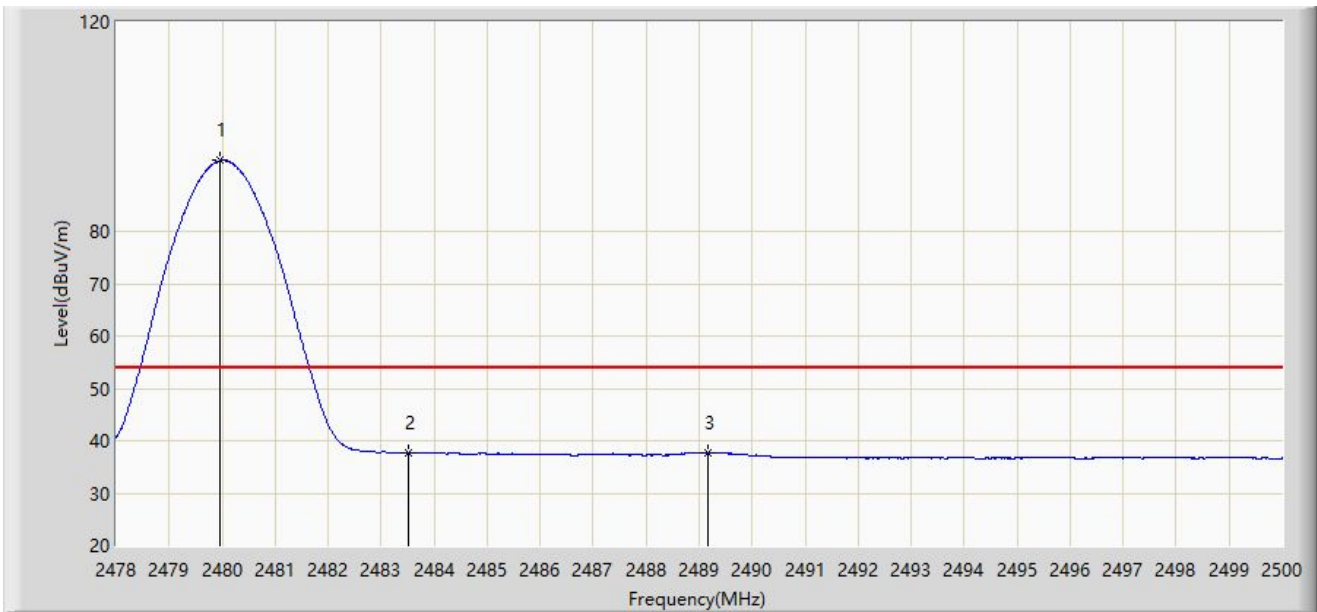
No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2479.705	94.549	63.241	N/A	N/A	31.308	PK
2			2483.500	54.502	23.187	-19.498	74.000	31.315	PK
3			2490.045	56.887	25.561	-17.113	74.000	31.326	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).



Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2480MHz	

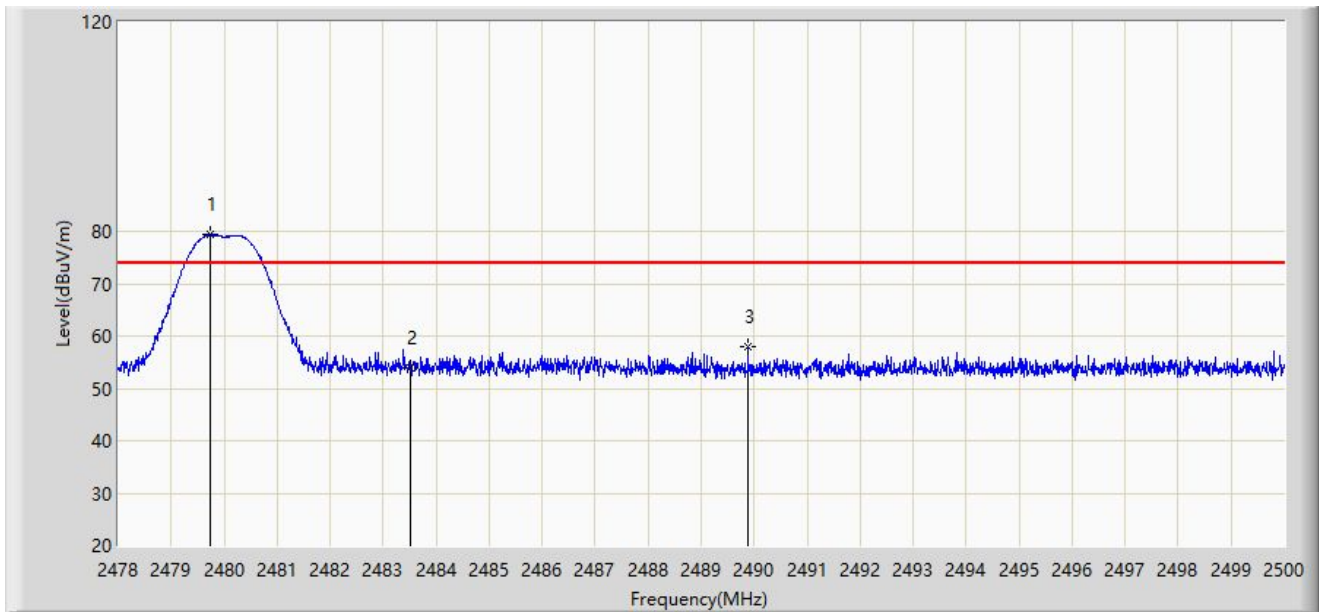


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1		*	2479.969	93.483	62.175	N/A	N/A	31.308	AV
2			2483.500	37.647	6.332	-16.353	54.000	31.315	AV
3			2489.176	37.641	6.316	-16.359	54.000	31.325	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2480MHz	

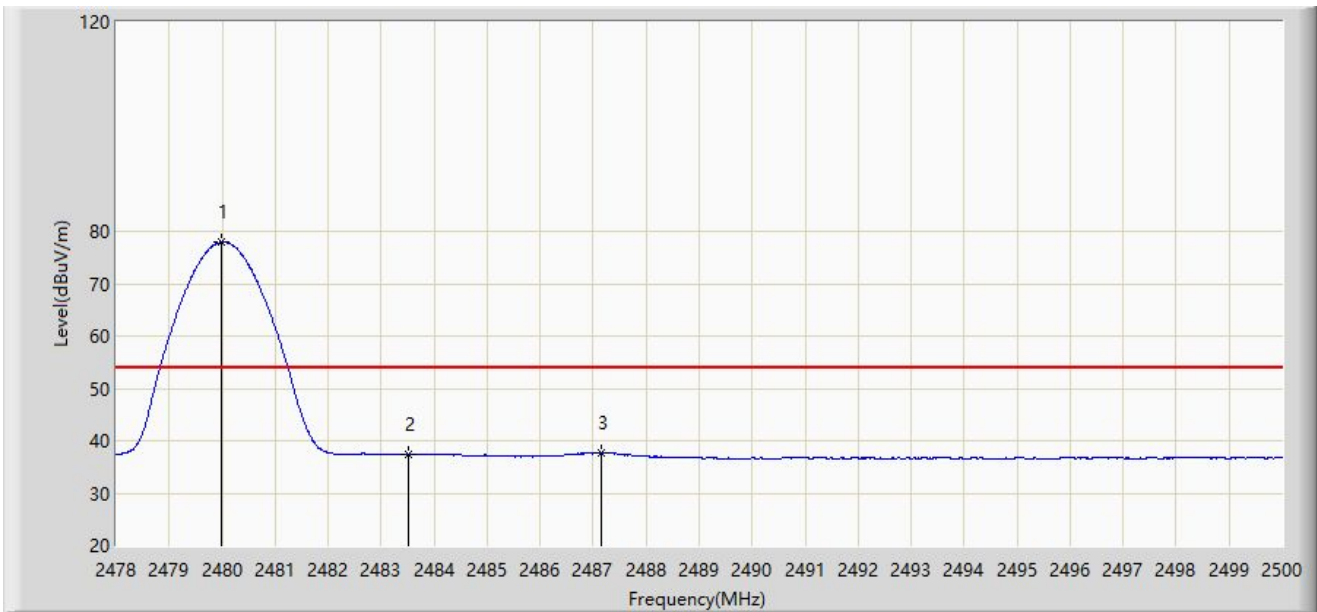


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1		*	2479.749	79.389	48.081	N/A	N/A	31.308	PK
2			2483.500	54.052	22.737	-19.948	74.000	31.315	PK
3			2489.880	58.053	26.727	-15.947	74.000	31.326	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC2	Test Date: 2022-04-24
Limit: FCC_Part 15.209_RE(3m)	Engineer: Hyde Yu
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: M1015	Power: By 2*AA Battery
Test Mode: Transmit by BLE-1Mbps at Channel 2480MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		*	2479.991	77.883	46.575	N/A	N/A	31.308	AV
2			2483.500	37.389	6.074	-16.611	54.000	31.315	AV
3			2487.163	37.712	6.391	-16.288	54.000	31.321	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

## **Appendix A - Test Setup Photograph**

Refer to “ 2204RSU025-UT” file.

## Appendix B - EUT Photograph

Refer to “ 2204RSU025-UE” file.

\_\_\_\_\_ The End \_\_\_\_\_