



## MEASUREMENT REPORT

### FCC PART 15.247 / RSS-247 Bluetooth LE

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**FCC ID:** 2ACQELR8X  
**IC:** 27195-LR8X  
**Applicant:** Flowline, Inc.  
**Product:** LR Radar Level Instrument  
**Model No.:** LR80, LR81, LR83, LR85  
**Brand Name:** ECHOBEAM  
**FCC Classification:** Digital Transmission System (DTS)  
**FCC Rule Part(s):** Part 15 Subpart C (Section 15.247)  
**ISED Rule Part(s):** RSS-247 Issue 3, RSS-GEN Issue 5  
**Test Procedure(s):** ANSI C63.10-2013  
**Received Date:** February 2, 2021  
**Test Date:** February 23 ~ March 12, 2021

**Reviewed By:**

\_\_\_\_\_  
Vincent Yu

**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    |
|---------------|---------|------------------------------------|------------|---------|
| 2312RSU058-U2 | V01     | Initial Report                     | 2023-12-22 | Invalid |
| 2312RSU058-U2 | V02     | Standard Upgrade <sup>Note 2</sup> | 2024-01-17 | Valid   |

Note 1: This report is based on the original report (Report No.: 2102RSU015-U2) with product model adjusted. According to the manufacturer's statement, no changes have been made to the product. The original test model, LR84, was simply folded into the LR85 for marketing purposes and the manufacturer eliminated the marketing/sale of LR82, LR84 and LR86. All test data in this report are copied from the original report.

Note 2: Upgrade the test standard RSS-247 version from issue 2 to issue 3. After evaluation, the version upgrade does not affect the original test results in this report.

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## 1. GENERAL INFORMATION

### 1.1. Applicant

Flowline, Inc.

10500 Humbolt St., Los Alamitos, California 90720, United States

### 1.2. Manufacturer

Flowline, Inc.

10500 Humbolt St., Los Alamitos, California 90720, United States

### 1.3. Testing Facility

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | <b>Test Site – MRT Suzhou Laboratory</b><br><b>Laboratory Location (Suzhou - Wuzhong)</b><br>D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China<br><b>Laboratory Location (Suzhou - SIP)</b><br>4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China<br><b>Laboratory Accreditations</b><br>A2LA: 3628.01 CNAS: L10551<br>FCC: CN1166 ISED: CN0001<br>VCCI: <input type="checkbox"/> R-20025 <input type="checkbox"/> G-20034 <input type="checkbox"/> C-20020 <input type="checkbox"/> T-20020<br><input type="checkbox"/> R-20141 <input type="checkbox"/> G-20134 <input type="checkbox"/> C-20103 <input type="checkbox"/> T-20104 |
| <input checked="" type="checkbox"/> | <b>Test Site – MRT Shenzhen Laboratory</b><br><b>Laboratory Location (Shenzhen)</b><br>1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China<br><b>Laboratory Accreditations</b><br>A2LA: 3628.02 CNAS: L10551<br>FCC: CN1284 ISED: CN0105                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <input type="checkbox"/>            | <b>Test Site – MRT Taiwan Laboratory</b><br><b>Laboratory Location (Taiwan)</b><br>No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)<br><b>Laboratory Accreditations</b><br>TAF: 3261<br>FCC: 291082, TW3261 ISED: TW3261                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## 2. PRODUCT INFORMATION

### 2.1. Feature of Equipment under Test

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Product Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | LR Radar Level Instrument |
| Model No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LR80, LR81, LR83, LR85    |
| Brand Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ECHOBEAM                  |
| Sample ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LR84PARCM                 |
| Hardware Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H01                       |
| Software Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | R01                       |
| Operating Temp.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -40 ~ 80°C                |
| Process Temp. at the antenna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -40 ~ 120°C               |
| Normal Supply Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 24VDC                     |
| <p>Remark: The EUT is made up of electronic part, housing part, process connection part, installation accessories part and antenna. All electronic parts including RF circuit are same within these models, and differences of other parts such as Shell Material, Installation method and power supply method etc. can not affect RF performance of the product. Only the differences of antennas can affect the RF performance and we selected the largest antenna gain for all RF testing. For detailed differences between models, please refer to the declaration letter of model differences.</p> |                           |

### 2.2. Product Specification Subjective to this report

|                         |                 |
|-------------------------|-----------------|
| Bluetooth Specification | v4.0 (BLE Only) |
| Frequency Range         | 2402 ~ 2480MHz  |
| Channel Space           | 2MHz            |
| Channel Number          | 40              |
| Data Rate               | 1Mbps           |
| Modulation              | GFSK            |
| Antenna Type            | PCB Antenna     |
| Antenna Gain            | 0dBi            |

Note 1: Above antenna information is provided by applicant.

Note 2: For other features of this EUT, test report will be issued separately.

### 2.3. Working Frequencies for this report

| 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  | --      | --        | --      | --        |

### 2.4. Test Mode

|           |                         |
|-----------|-------------------------|
| Test Mode | Mode 1: Transmit by BLE |
|-----------|-------------------------|

### 2.5. Test Environment Condition

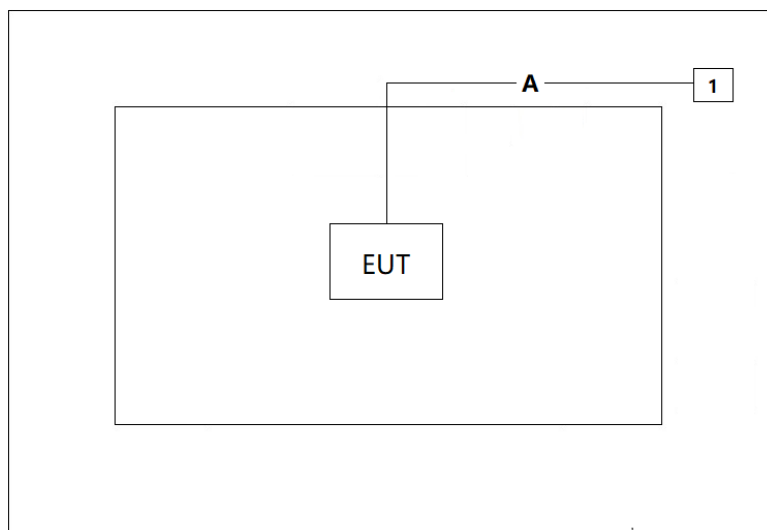
|                     |               |
|---------------------|---------------|
| Ambient Temperature | 15°C ~ 35°C   |
| Relative Humidity   | 20%RH ~ 75%RH |

### 2.6. Test Software

The test utility software used during testing was “sscom.exe”, and the version was v5.13.1.

## 2.7. Test Configuration

Connection Diagram for Radiated Emissions Measurement



| Cable Type |           | Signal Cable Description |
|------------|-----------|--------------------------|
| A          | USB Cable | Non-Shielding, > 1 m     |

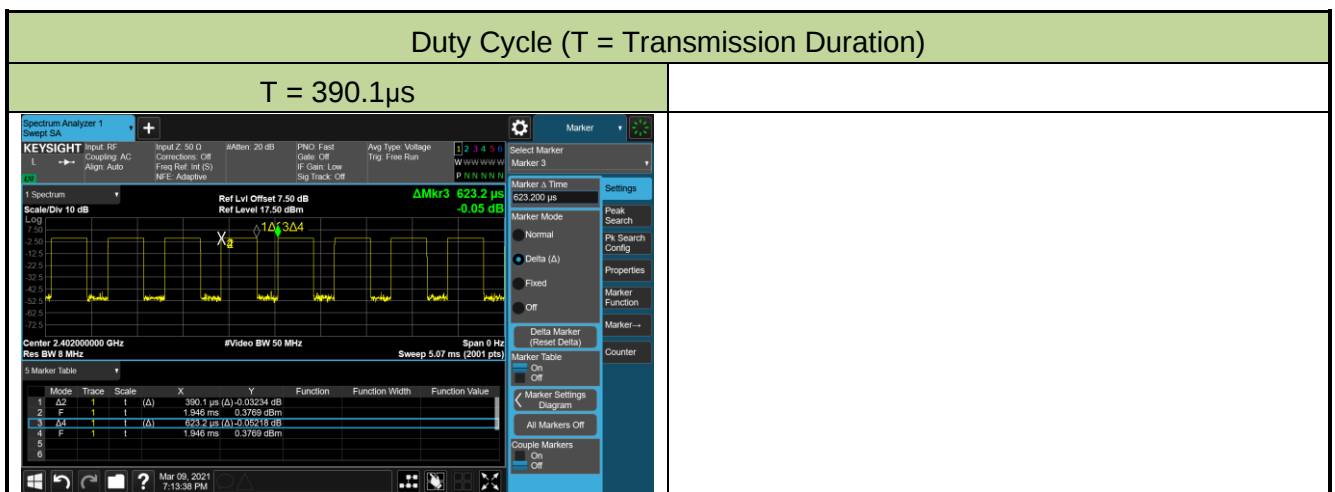
## 2.8. Test System Details

| Product |          | Manufacturer | Model No. |
|---------|----------|--------------|-----------|
| 1       | Notebook | DELL         | P61F      |

## 2.9. Duty Cycle

The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than  $50/T$ , where  $T$  is the minimum transmission duration, and the number of sweep points across  $T$  was greater than 100. The duty cycles are as follows:

| Test Mode | Duty Cycle |
|-----------|------------|
| BLE       | 62.60%     |



### 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 device unit complies with the requirement of §15.203.

#### 4. TEST EQUIPMENT CALIBRATION DATE

##### Conducted Emissions (WZ-SR2)

| Instrument         | Manufacturer | Type No. | Asset No.   | Cali. Interval | Cali. Due Date |
|--------------------|--------------|----------|-------------|----------------|----------------|
| EMI Test Receiver  | R&S          | ESR3     | MRTSUE06185 | 1 year         | 2022/01/12     |
| Two-Line V-Network | R&S          | ENV 216  | MRTSUE06002 | 1 year         | 2021/06/11     |
| Two-Line V-Network | R&S          | ENV 216  | MRTSUE06003 | 1 year         | 2021/06/11     |
| Thermal Hygrometer | testo        | 608-H1   | MRTSUE06404 | 1 year         | 2021/07/26     |

##### Radiated Emissions (WZ-AC1)

| Instrument                 | Manufacturer | Type No.    | Asset No.   | Cali. Interval | Cali. Due Date |
|----------------------------|--------------|-------------|-------------|----------------|----------------|
| EMI Test Receiver          | R&S          | ESR7        | MRTSUE06001 | 1 year         | 2022/01/04     |
| PXA Signal Analyzer        | Keysight     | N9030B      | MRTSUE06395 | 1 year         | 2021/08/30     |
| Loop Antenna               | Schwarzbeck  | FMZB 1519   | MRTSUE06025 | 1 year         | 2021/11/08     |
| Bilog Period Antenna       | Schwarzbeck  | VULB 9168   | MRTSUE06172 | 1 year         | 2021/04/03     |
| Horn Antenna               | Schwarzbeck  | BBHA 9120D  | MRTSUE06023 | 1 year         | 2021/09/27     |
| Horn Antenna               | Schwarzbeck  | BBHA9170    | MRTSUE06597 | 1 year         | 2021/12/14     |
| Microwave System Amplifier | Agilent      | 83017A      | MRTSUE06076 | 1 year         | 2021/11/14     |
| Preamplifier               | Schwarzbeck  | BBV 9721    | MRTSUE06121 | 1 year         | 2021/06/11     |
| Thermal Hygrometer         | testo        | 608-H1      | MRTSUE06403 | 1 year         | 2021/07/26     |
| Anechoic Chamber           | TDK          | Chamber-AC1 | MRTSUE06212 | 1 year         | 2021/04/30     |

##### Radiated Emission (WZ-AC2)

| Instrument                     | Manufacturer | Type No.    | Asset No.   | Cali. Interval | Cali. Due Date |
|--------------------------------|--------------|-------------|-------------|----------------|----------------|
| MXE EMI Receiver               | Keysight     | N9038A      | MRTSUE06125 | 1 year         | 2021/07/02     |
| Loop Antenna                   | Schwarzbeck  | FMZB 1519   | MRTSUE06025 | 1 year         | 2021/11/08     |
| Bilog Period Antenna           | Schwarzbeck  | VULB 9162   | MRTSUE06022 | 1 year         | 2021/05/26     |
| Broad-Band Horn Antenna        | Schwarzbeck  | BBHA 9120D  | MRTSUE06171 | 1 year         | 2021/10/25     |
| Horn Antenna                   | Schwarzbeck  | BBHA9170    | MRTSUE06597 | 1 year         | 2021/12/14     |
| Broadband Coaxial Preamplifier | Schwarzbeck  | BBV 9718    | MRTSUE06176 | 1 year         | 2021/11/14     |
| Preamplifier                   | Schwarzbeck  | BBV 9721    | MRTSUE06121 | 1 year         | 2021/06/11     |
| Thermal Hygrometer             | Minggao      | ETH529      | MRTSUE06170 | 1 year         | 2021/12/08     |
| Anechoic Chamber               | RIKEN        | Chamber-AC2 | MRTSUE06213 | 1 year         | 2021/04/30     |

## Conducted Test Equipment (WZ-TR3)

| Instrument                             | Manufacturer | Type No.    | Asset No.   | Cali. Interval | Cali. Due Date |
|----------------------------------------|--------------|-------------|-------------|----------------|----------------|
| EXA Signal Analyzer                    | Agilent      | N9020A      | MRTSUE06106 | 1 year         | 2021/04/14     |
| EXA Signal Analyzer                    | Keysight     | N9010B      | MRTSUE06607 | 1 year         | 2022/01/06     |
| Signal Analyzer                        | R&S          | FSV40       | MRTSUE06218 | 1 year         | 2021/04/14     |
| Power Meter                            | Agilent      | U2021XA     | MRTSUE06030 | 1 year         | 2021/10/22     |
| USB wideband power sensor              | Keysight     | U2021XA     | MRTSUE06446 | 1 year         | 2021/06/11     |
| USB wideband power sensor              | Keysight     | U2021XA     | MRTSUE06447 | 1 year         | 2021/06/11     |
| Bluetooth Test Set                     | Anritsu      | MT8852B-042 | MRTSUE06389 | 1 year         | 2021/06/11     |
| Audio Analyzer                         | Agilent      | U8903B      | MRTSUE06143 | 1 year         | 2021/06/11     |
| Modulation Analyzer                    | HP           | HP8901A     | MRTSUE06098 | 1 year         | 2021/09/26     |
| Wideband Radio<br>Communication Tester | R&S          | CMW 500     | MRTSUE06243 | 1 year         | 2021/10/20     |
| DC Power Supply                        | GWINSTEK     | DPS-3303C   | MRTSUE06064 | N/A            | N/A            |
| Temperature & Humidity<br>Chamber      | BAOYT        | BYH-150CL   | MRTSUE06051 | 1 year         | 2021/10/22     |
| Thermal Hygrometer                     | testo        | 608-H1      | MRTSUE06401 | 1 year         | 2021/07/26     |

| Software     | Version | Function          |
|--------------|---------|-------------------|
| EMI Software | V3      | EMI Test Software |

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

## 6. TEST RESULT

### 6.1. Summary

| FCC Part Section(s) | RSS Section(s)   | Test Description                                                | Test Limit                                                                     | Test Condition | Test Result | Reference         |
|---------------------|------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------|----------------|-------------|-------------------|
| 15.247(a)(2)        | RSS-247 [5.2]    | 6dB Bandwidth                                                   | $\geq 500\text{kHz}$                                                           | Conducted      | Pass        | Section 6.2       |
| N/A                 | RSS-Gen [6.7]    | 99% Bandwidth                                                   | N/A                                                                            |                | Pass        |                   |
| 15.247(b)(3)        | RSS-247 [5.4(d)] | Output Power                                                    | $\leq 1\text{Watt}$ & $\text{EIRP} \leq 4\text{Watt}$                          |                | Pass        | Section 6.3       |
| 15.247(e)           | RSS-247 [5.2]    | Power Spectral Density                                          | $\leq 8\text{dBm} / 3\text{kHz}$                                               |                | Pass        | Section 6.4       |
| 15.247(d)           | RSS-247 [5.5]    | Band Edge / Out-of-Band Emissions                               | $\leq 20\text{dBc}$ (Peak)                                                     |                | Pass        | Section 6.5       |
| 15.205<br>15.209    | RSS-247 [5.5]    | General Field Strength (Restricted Bands and Radiated Emission) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | Radiated       | Pass        | Section 6.6 & 6.7 |
| 15.207              | RSS-Gen [8.8]    | AC Conducted Emissions 150kHz - 30MHz                           | < FCC 15.207 limits                                                            | Line Conducted | N/A         | Section 6.8       |

#### Notes:

- 1) All modes of operation and data rates were investigated. 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.
- 2) 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.

## **6.2. Occupied Bandwidth Measurement**

### **6.2.1. Test Limit**

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

### **6.2.2. Test Procedure used**

ANSI C63.10-2013 - Section 11.8 (6dB bandwidth)

ANSI C63.10-2013 - Section 6.9.3 (99% bandwidth)

### **6.2.3. Test Setting**

#### **For 6dB bandwidth**

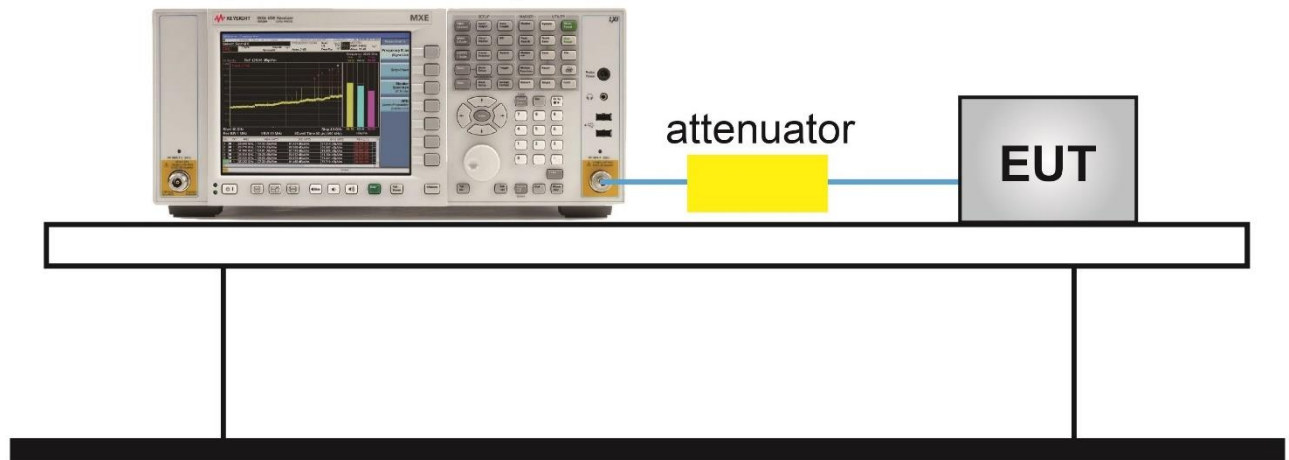
1. Set RBW = 100 kHz
2. VBW  $\geq 3 \times$  RBW
3. Detector = Peak
4. Trace mode = Max hold
5. Sweep = Auto couple
6. Allow the trace to stabilize
7. Use the X dB bandwidth mode with X set to 6 dB

#### **For 99% bandwidth**

1. Span = 1.5 times to 5 times the OBW
2. Set RBW = 1% to 5% the OBW
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

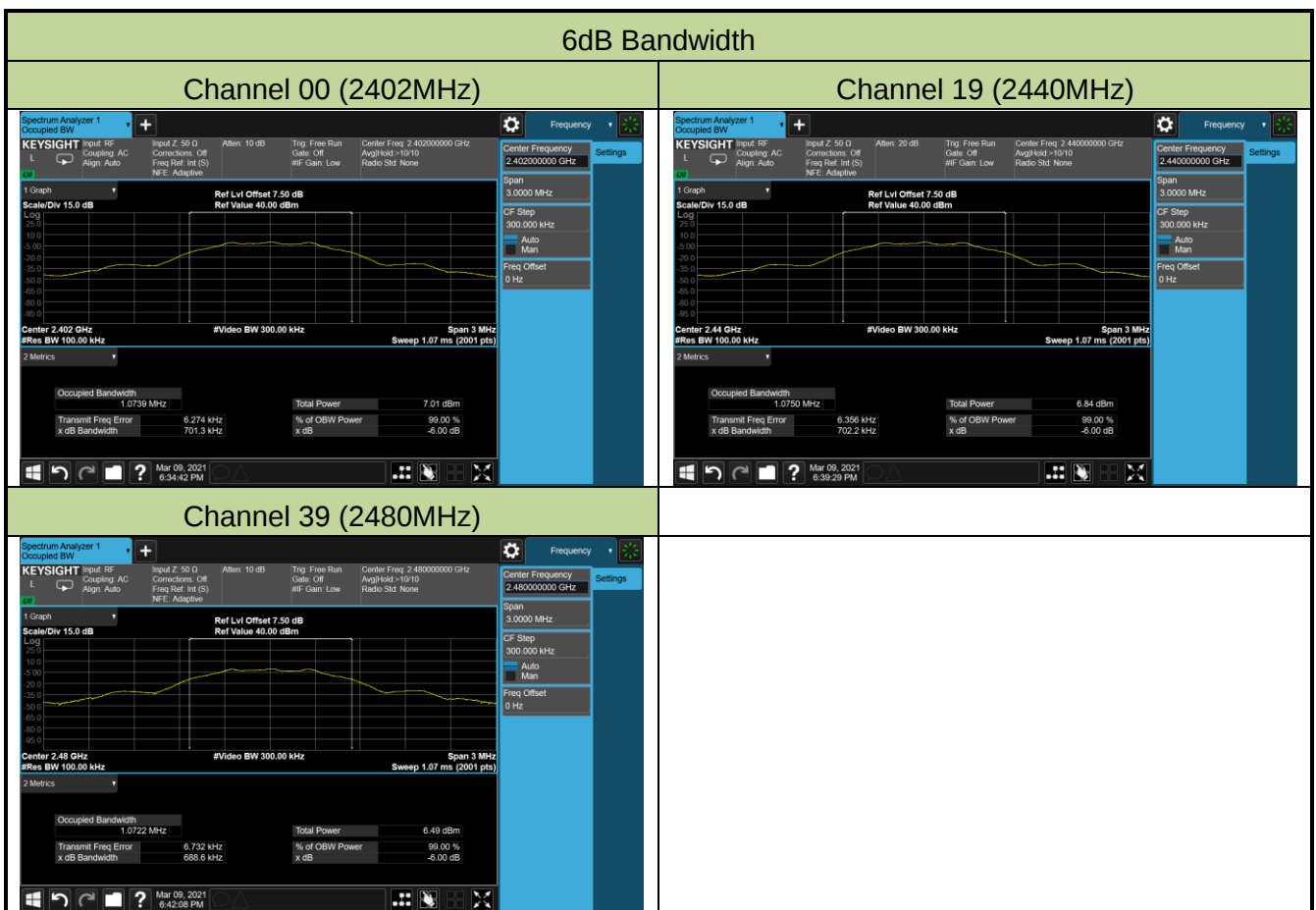
### Spectrum Analyzer



### 6.2.5. Test Result

|           |                       |               |            |
|-----------|-----------------------|---------------|------------|
| Test Site | WZ-TR3                | Test Engineer | Bruce Wang |
| Test Date | 2021/03/09~2021/03/12 |               |            |

| Test Mode | Data Rate (Mbps) | Channel No. | Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | 99% Bandwidth (MHz) | Result |
|-----------|------------------|-------------|-----------------|---------------------|-------------|---------------------|--------|
| BLE       | 1                | 00          | 2402            | 0.701               | $\geq 0.5$  | 1.054               | Pass   |
| BLE       | 1                | 19          | 2440            | 0.702               | $\geq 0.5$  | 1.052               | Pass   |
| BLE       | 1                | 39          | 2480            | 0.689               | $\geq 0.5$  | 1.052               | Pass   |

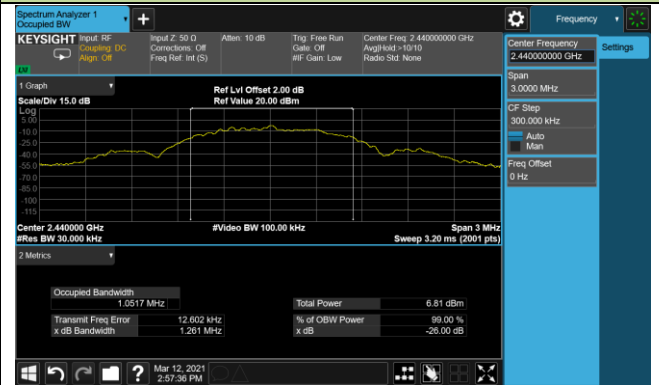


## 99% Bandwidth

### Channel 00 (2402MHz)



### Channel 19 (2440MHz)



### Channel 39 (2480MHz)



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

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

The maximum out power shall be less 1 Watt (30dBm) and the EIRP shall not exceed 4 Watt (36.02dBm).

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

ANSI C63.10-2013 Section 11.9.1.3

ANSI C63.10-2013 Section 11.9.2.3.2

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

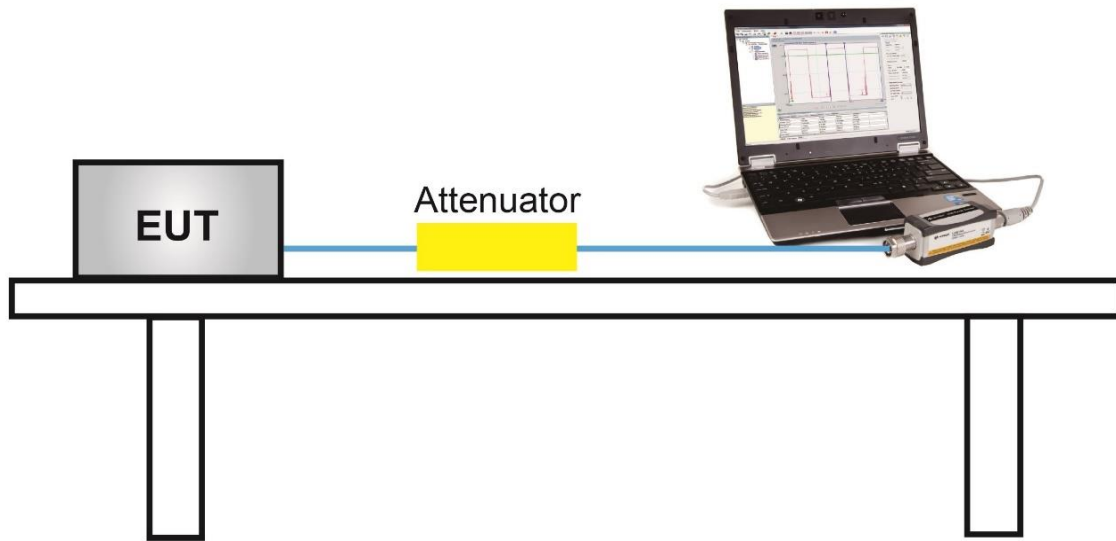
##### **PKPM1 Peak-reading power meter method**

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

##### **Method AVGPM-G (Measurement using a gated RF average-reading power meter)**

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

### 6.3.4. Test Setup



### 6.3.5. Test Result of Output Power

|           |            |               |         |
|-----------|------------|---------------|---------|
| Test Site | WZ-TR3     | Test Engineer | Yuri Li |
| Test Date | 2021/03/09 |               |         |

### Test Result of Peak Output Power

| Test Mode | Data Rate (Mbps) | Channel No. | Frequency (MHz) | Peak Power (dBm) | Limit (dBm) | Max EIRP (dBm) | EIRP Limit (dBm) | Result |
|-----------|------------------|-------------|-----------------|------------------|-------------|----------------|------------------|--------|
| BLE       | 1                | 00          | 2402            | 1.95             | ≤ 30.00     | 1.95           | ≤ 36.02          | Pass   |
| BLE       | 1                | 19          | 2440            | 1.89             | ≤ 30.00     | 1.89           | ≤ 36.02          | Pass   |
| BLE       | 1                | 39          | 2480            | 1.67             | ≤ 30.00     | 1.67           | ≤ 36.02          | Pass   |

Note: Max EIRP (dBm) = Peak Power (dBm) + Antenna Gain (dBi), Antenna Gain = 0 dBi.

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

| Test Mode | Data Rate (Mbps) | Channel No. | Frequency (MHz) | Average Power (dBm) | Limit (dBm) | Max EIRP (dBm) | EIRP Limit (dBm) | Result |
|-----------|------------------|-------------|-----------------|---------------------|-------------|----------------|------------------|--------|
| BLE       | 1                | 00          | 2402            | 0.10                | ≤ 30.00     | 0.10           | ≤ 36.02          | Pass   |
| BLE       | 1                | 19          | 2440            | -0.22               | ≤ 30.00     | -0.22          | ≤ 36.02          | Pass   |
| BLE       | 1                | 39          | 2480            | -0.46               | ≤ 30.00     | -0.46          | ≤ 36.02          | Pass   |

Note: Max EIRP (dBm) = Average Power (dBm) + Antenna Gain (dBi), Antenna Gain = 0 dBi.

## 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.

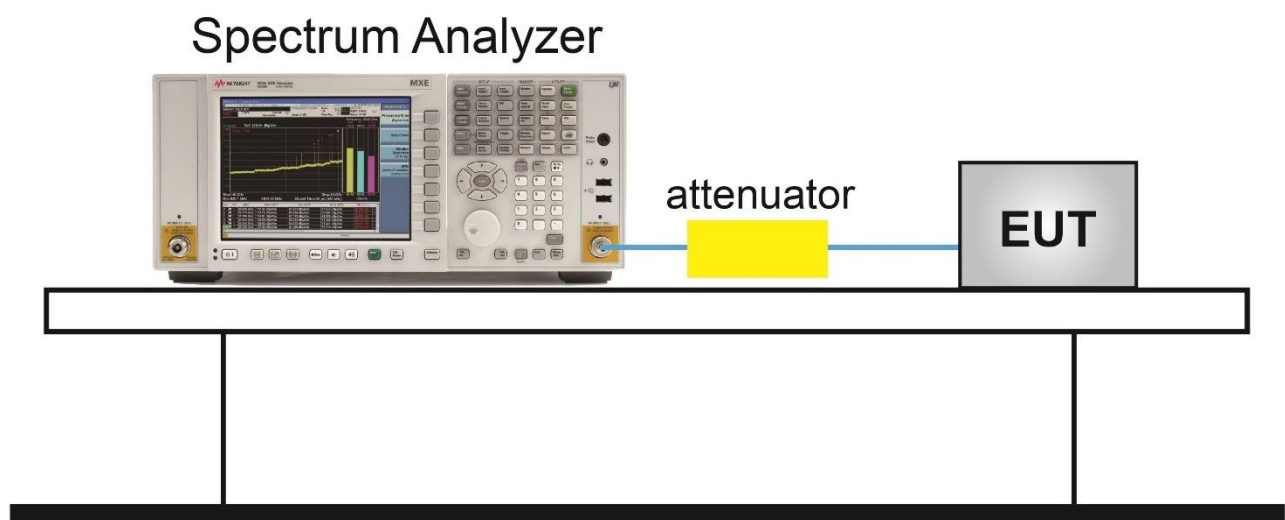
### 6.4.2. Test Procedure Used

ANSI C63.10-2013 Section 11.10.2

### 6.4.3. Test Setting

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3kHz
4. VBW = 10kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

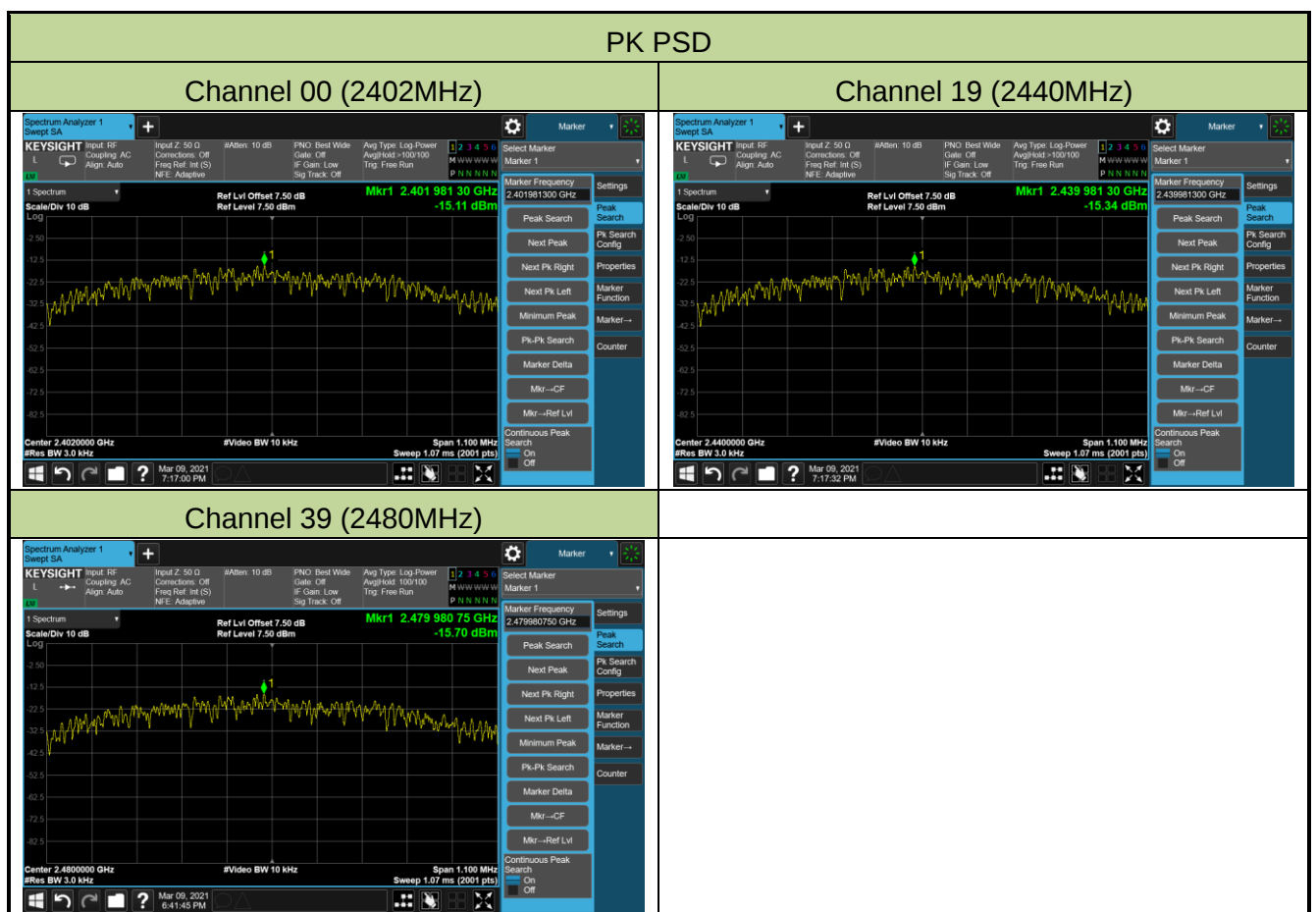
### 6.4.4. Test Setup



### 6.4.5. Test Result

|           |            |               |         |
|-----------|------------|---------------|---------|
| Test Site | WZ-TR3     | Test Engineer | Yuri Li |
| Test Date | 2021/03/09 |               |         |

| Test Mode | Data Rate (Mbps) | Channel No. | Frequency (MHz) | PSD Result (dBm / 3kHz) | Limit (dBm / 3kHz) | Result |
|-----------|------------------|-------------|-----------------|-------------------------|--------------------|--------|
| BLE       | 1                | 00          | 2402            | -15.11                  | ≤ 8.00             | Pass   |
| BLE       | 1                | 19          | 2440            | -15.34                  | ≤ 8.00             | Pass   |
| BLE       | 1                | 39          | 2480            | -15.70                  | ≤ 8.00             | Pass   |



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

### **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 100kHz bandwidth per the PSD procedure.

### **6.5.2. Test Procedure Used**

ANSI C63.10-2013 Section 11.11

### **6.5.3. Test Setting**

#### **Reference level measurement**

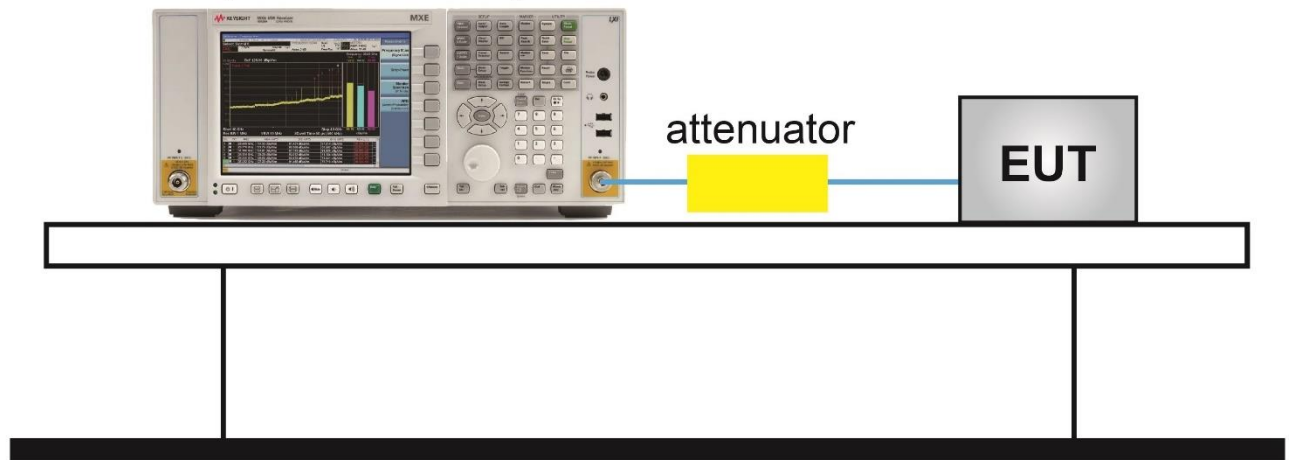
1. Set instrument center frequency to DTS channel center frequency
2. Set the span to  $\geq 1.5$  times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW  $\geq 3 \times$  RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

#### **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

### Spectrum Analyzer

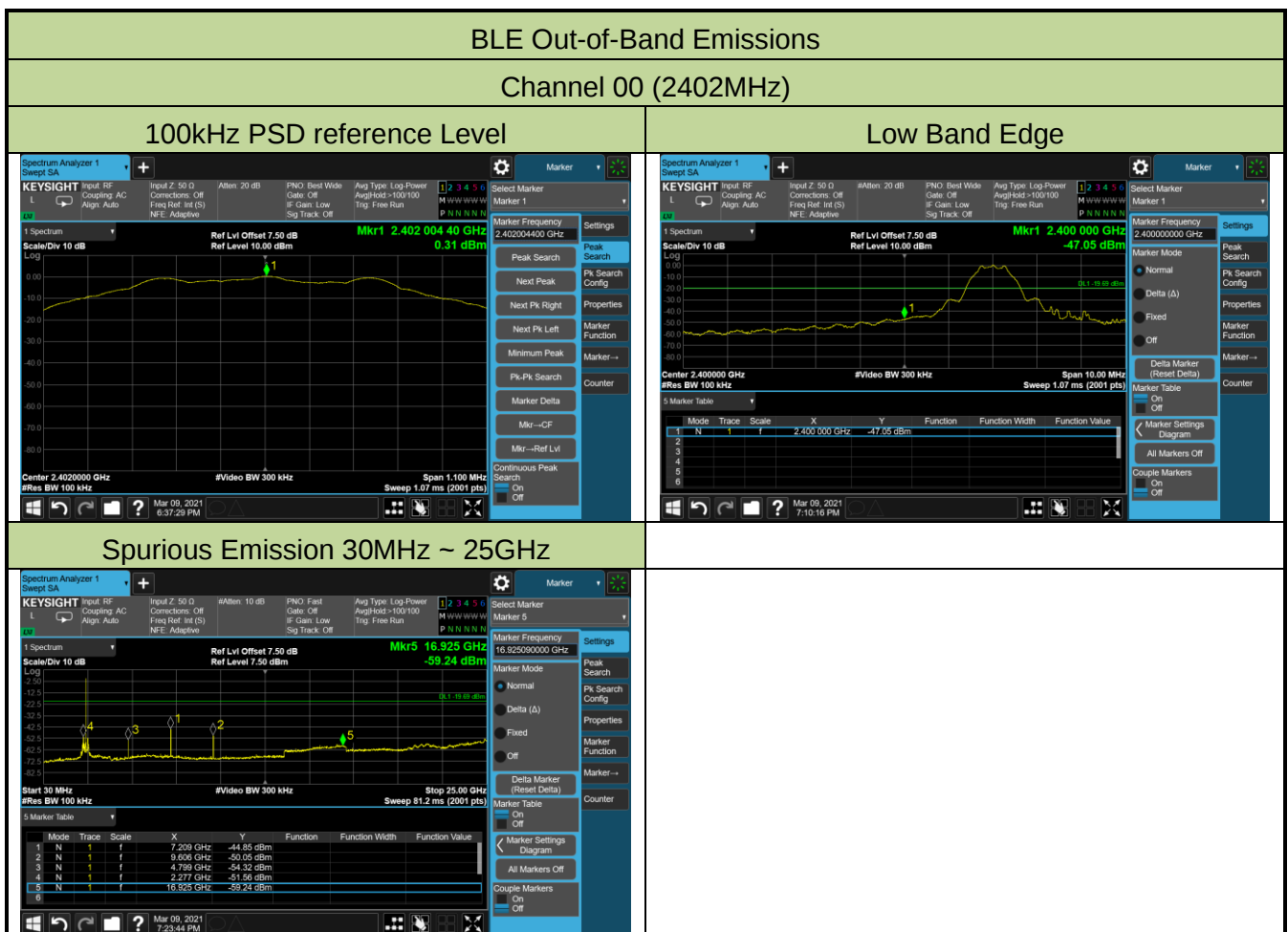


### 6.5.5. Test Result

|           |            |               |            |
|-----------|------------|---------------|------------|
| Test Site | WZ-TR3     | Test Engineer | Bruce Wang |
| Test Date | 2021/03/09 |               |            |

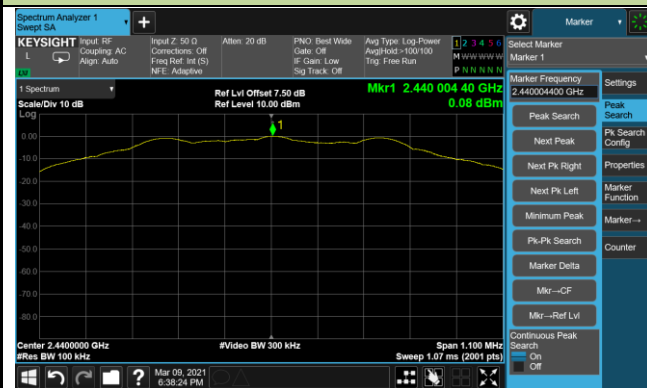
| Test Mode | Data Rate (Mbps) | Channel No. | Frequency (MHz) | Limit (dBm) | Result |
|-----------|------------------|-------------|-----------------|-------------|--------|
| BLE       | 1                | 00          | 2402            | -19.69      | Pass   |
| BLE       | 1                | 19          | 2440            | -19.92      | Pass   |
| BLE       | 1                | 39          | 2480            | -20.02      | Pass   |

Note: The limit is 20dB below the fundamental emission level.

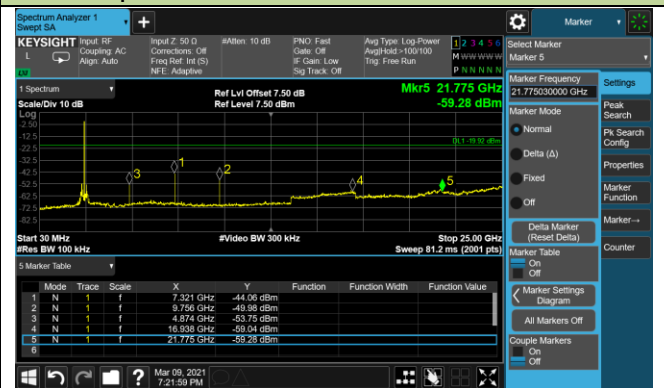


## Channel 19 (2440MHz)

## 100kHz PSD reference Level

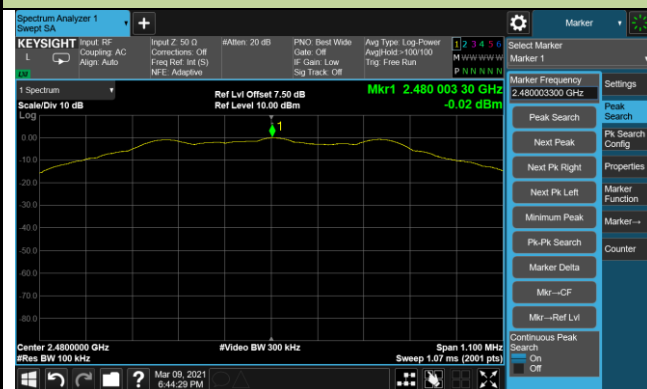


## Spurious Emission 30MHz ~ 25GHz



## Channel 39 (2480MHz)

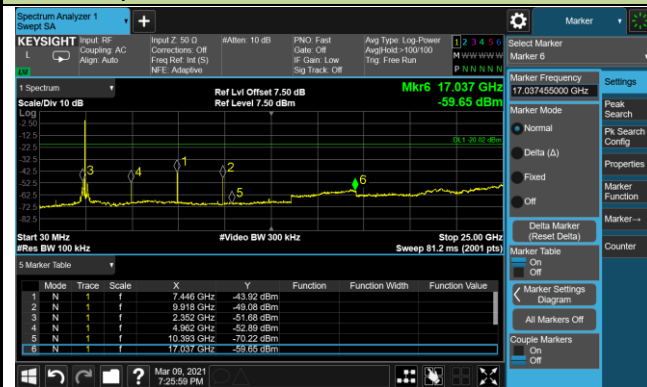
## 100kHz PSD reference Level



## High Band Edge



## Spurious Emission 30MHz ~ 25GHz



## 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 [ $\mu\text{V/m}$ ] | 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                          |

All out of band emissions appearing in a restricted band as specified in Section 8.10 of the RSS-Gen must not exceed the limits shown in Table per Section 8.9.

| RSS-Gen Section 8.9 |                                    |                                                       |                       |
|---------------------|------------------------------------|-------------------------------------------------------|-----------------------|
| Frequency (MHz)     | Field Strength ( $\mu\text{V/m}$ ) | Magnetic Field Strength (H-Field) ( $\mu\text{A/m}$ ) | Measured Distance (m) |
| 0.009 - 0.490       | --                                 | 6.37/F (F in kHz)                                     | 300                   |
| 0.490 - 1.705       | --                                 | 6.37/F (F in kHz)                                     | 30                    |
| 1.705 - 30          | --                                 | 0.08                                                  | 30                    |
| 30 - 88             | 100                                | --                                                    | 3                     |
| 88 - 216            | 150                                | --                                                    | 3                     |
| 216 - 960           | 200                                | --                                                    | 3                     |
| Above 960           | 500                                | --                                                    | 3                     |

### 6.6.2.Test Procedure Used

ANSI C63.10-2013 Section 6.3

ANSI C63.10-2013 Section 6.4

ANSI C63.10-2013 Section 6.5

ANSI C63.10-2013 Section 6.6

### 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. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. 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

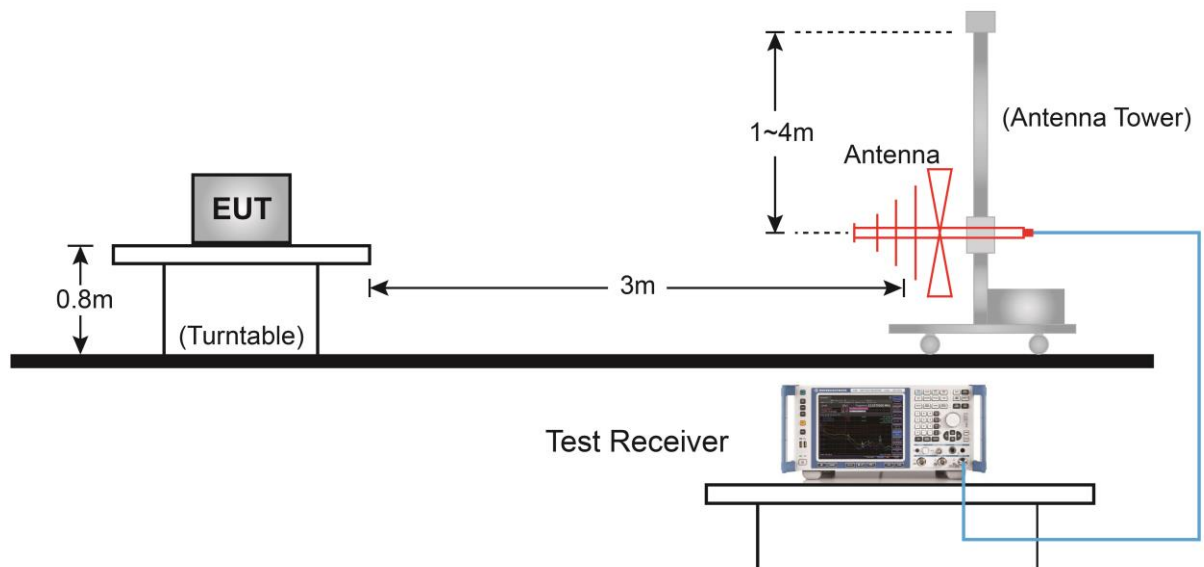
6. Trace mode = max hold
7. Trace was allowed to stabilize

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

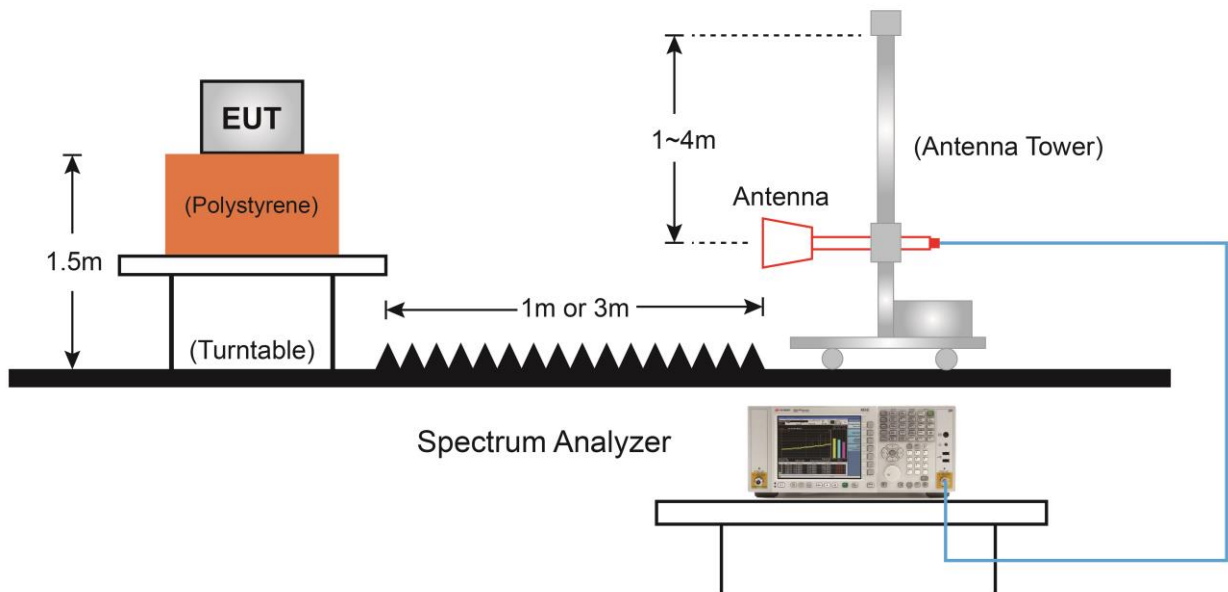
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle  $\geq 98\%$ , set VBW = 10 Hz.  
If the EUT duty cycle is  $< 98\%$ , set VBW  $\geq 1/T$ . T is the minimum transmission duration.
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

|           |                                                                                                                                                                                   |               |            |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------|
| Test Site | WZ-AC1                                                                                                                                                                            | Test Engineer | Tommy Tang |
| Test Date | 2021/03/04                                                                                                                                                                        | Test Channel  | 00         |
| Test Mode | BLE                                                                                                                                                                               |               |            |
| Remark    | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. |               |            |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|------|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
|      | 4808.0          | 46.4                 | 5.7         | 52.1                   | 74.0           | -21.9       | Peak     | Horizontal   |
|      | 8097.5          | 37.1                 | 11.2        | 48.3                   | 74.0           | -25.7       | Peak     | Horizontal   |
|      | 10987.5         | 36.6                 | 15.7        | 52.3                   | 74.0           | -21.7       | Peak     | Horizontal   |
|      | 4799.5          | 43.4                 | 5.6         | 49.0                   | 74.0           | -25.0       | Peak     | Vertical     |
|      | 8233.5          | 38.8                 | 11.0        | 49.8                   | 74.0           | -24.2       | Peak     | Vertical     |
|      | 10996.0         | 37.0                 | 15.7        | 52.7                   | 74.0           | -21.3       | Peak     | Vertical     |

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

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

|           |                                                                                                                                                                                   |               |            |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------|
| Test Site | WZ-AC1                                                                                                                                                                            | Test Engineer | Tommy Tang |
| Test Date | 2021/03/04                                                                                                                                                                        | Test Channel  | 19         |
| Test Mode | BLE                                                                                                                                                                               |               |            |
| Remark:   | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. |               |            |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|------|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
|      | 4876.0          | 44.8                 | 5.2         | 50.0                   | 74.0           | -24.0       | Peak     | Horizontal   |
|      | 7324.0          | 47.3                 | 10.1        | 57.4                   | 74.0           | -16.6       | Peak     | Horizontal   |
|      | 7324.0          | 43.0                 | 10.1        | 53.1                   | 54.0           | -0.9        | Average  | Horizontal   |
|      | 11004.5         | 35.8                 | 15.6        | 51.4                   | 74.0           | -22.6       | Peak     | Horizontal   |
|      | 4986.5          | 42.3                 | 5.8         | 48.1                   | 74.0           | -25.9       | Peak     | Vertical     |
|      | 7315.5          | 42.5                 | 10.1        | 52.6                   | 74.0           | -21.4       | Peak     | Vertical     |
|      | 11081.0         | 36.1                 | 15.5        | 51.6                   | 74.0           | -22.4       | Peak     | Vertical     |

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

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

|           |                                                                                                                                                                                   |               |            |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------|
| Test Site | WZ-AC1                                                                                                                                                                            | Test Engineer | Tommy Tang |
| Test Date | 2021/03/04                                                                                                                                                                        | Test Channel  | 39         |
| Test Mode | BLE                                                                                                                                                                               |               |            |
| Remark:   | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. |               |            |

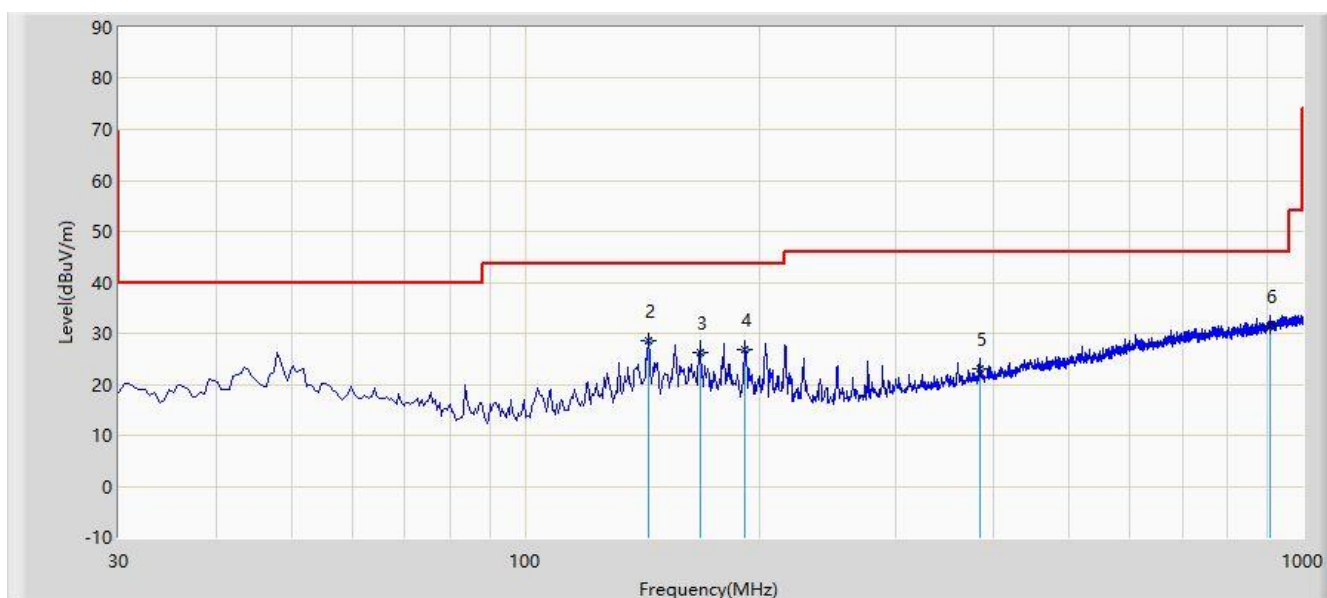
| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|------|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
|      | 4961.0          | 42.3                 | 5.5         | 47.8                   | 74.0           | -26.2       | Peak     | Horizontal   |
|      | 7443.0          | 46.6                 | 10.1        | 56.7                   | 74.0           | -17.3       | Peak     | Horizontal   |
|      | 7443.0          | 41.5                 | 10.1        | 51.6                   | 54.0           | -2.4        | Average  | Horizontal   |
|      | 11038.5         | 36.4                 | 15.4        | 51.8                   | 74.0           | -22.2       | Peak     | Horizontal   |
|      | 4986.5          | 41.3                 | 5.8         | 47.1                   | 74.0           | -26.9       | Peak     | Vertical     |
|      | 7443.0          | 41.7                 | 10.1        | 51.8                   | 74.0           | -22.2       | Peak     | Vertical     |
|      | 11574.0         | 36.0                 | 15.1        | 51.1                   | 74.0           | -22.9       | Peak     | Vertical     |

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

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

### The worst case of Radiated Emission below 1GHz:

|                                               |                       |
|-----------------------------------------------|-----------------------|
| Site: WZ-AC1                                  | Test Date: 2021/03/09 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang  |
| Probe: WZ-AC1_VULB 9168 _30-1000MHz           | Polarity: Horizontal  |
| EUT: LR Radar Level Instrument                | Power: 24VDC          |
| Test Mode: Transmit by BLE at channel 2440MHz |                       |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 7.950           | 23.003                 | 6.500                | -46.497     | 69.500         | 16.503      | QP   |
| 2  |      |      | 143.970         | 28.448                 | 10.500               | -15.052     | 43.500         | 17.948      | QP   |
| 3  |      |      | 167.740         | 26.223                 | 8.500                | -17.277     | 43.500         | 17.723      | QP   |
| 4  |      |      | 191.990         | 26.674                 | 11.200               | -16.826     | 43.500         | 15.474      | QP   |
| 5  |      |      | 384.050         | 22.972                 | 2.150                | -23.028     | 46.000         | 20.822      | QP   |
| 6  |      | *    | 906.880         | 31.556                 | 1.500                | -14.444     | 46.000         | 30.056      | QP   |

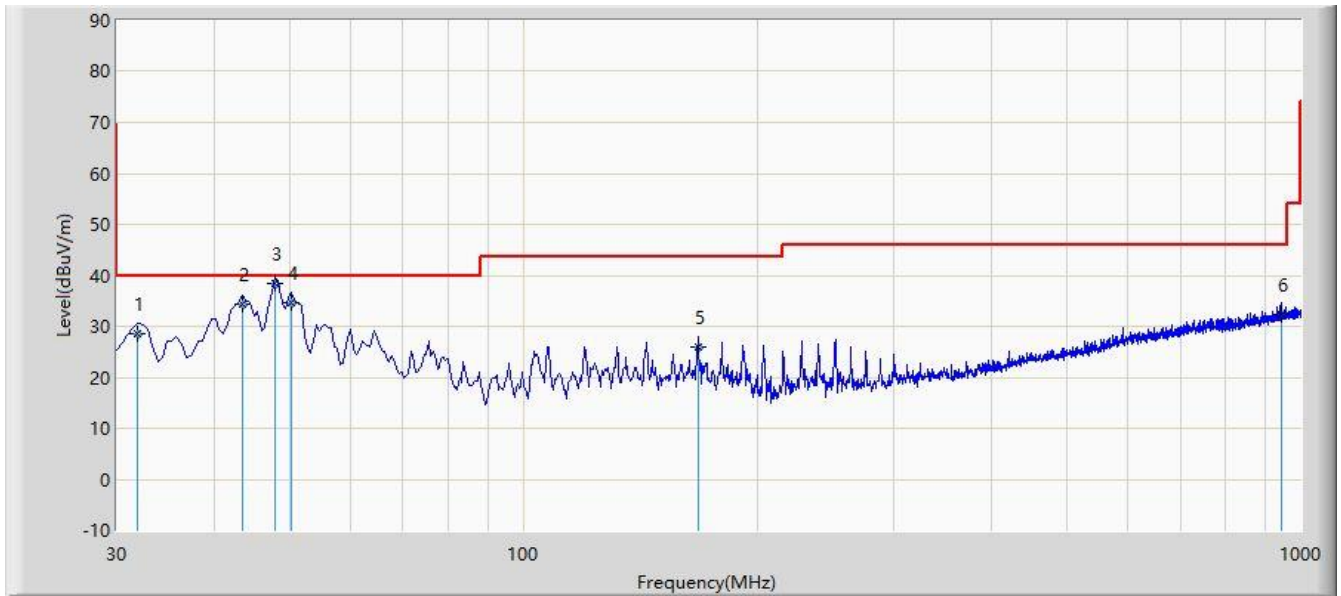
Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

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

Note 2: 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-AC1                                  | Test Date: 2021/03/09 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang  |
| Probe: WZ-AC1_VULB 9168 _30-1000MHz           | Polarity: Vertical    |
| EUT: LR Radar Level Instrument                | Power: 24VDC          |
| Test Mode: Transmit by BLE at channel 2440MHz |                       |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 31.940          | 28.644                 | 12.050               | -11.356     | 40.000         | 16.594      | QP   |
| 2  |      |      | 43.580          | 34.299                 | 16.500               | -5.701      | 40.000         | 17.799      | QP   |
| 3  |      | *    | 47.945          | 38.511                 | 20.500               | -1.489      | 40.000         | 18.012      | QP   |
| 4  |      |      | 50.370          | 34.608                 | 16.500               | -5.392      | 40.000         | 18.108      | QP   |
| 5  |      |      | 167.740         | 25.873                 | 8.150                | -17.627     | 43.500         | 17.723      | QP   |
| 6  |      |      | 943.740         | 32.217                 | 1.580                | -13.783     | 46.000         | 30.637      | QP   |

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

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

Note 2: 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.

## 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<br>(MHz)         | Frequency<br>(MHz)    | Frequency<br>(MHz) | Frequency<br>(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.

| FCC Part 15 Subpart C Paragraph 15.209 |                          |                               |
|----------------------------------------|--------------------------|-------------------------------|
| Frequency<br>[MHz]                     | Field Strength<br>[μV/m] | Measured Distance<br>[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                             |

### **For RSS-Gen Section 8.10 Requirement**

Radiated emissions which fall in the restricted bands, as defined in Section 8.10 of RSS-Gen, must also comply with the radiated emission limits specified in Section 8.9.

| Frequency<br>(MHz)  | Frequency<br>(MHz)    | Frequency<br>(GHz) |
|---------------------|-----------------------|--------------------|
| 0.090 - 0.110       | 149.9 - 150.05        | 9.0 - 9.2          |
| 0.495 - 0.505       | 156.52475 - 156.52525 | 9.3 - 9.5          |
| 2.1735 - 2.1905     | 156.7 - 156.9         | 10.6 - 12.7        |
| 3.020 - 3.026       | 162.0125 - 167.17     | 13.25 - 13.4       |
| 4.125 - 4.128       | 167.72 - 173.2        | 14.47 - 14.5       |
| 4.17725 - 4.17775   | 240 - 285             | 15.35 - 16.2       |
| 4.20725 - 4.20775   | 322 - 335.4           | 17.7 - 21.4        |
| 5.677 - 5.683       | 399.9 - 410           | 22.01 - 23.12      |
| 6.215 - 6.218       | 608 - 614             | 23.6 - 24.0        |
| 6.26775 - 6.26825   | 960 - 1427            | 31.2 - 31.8        |
| 6.31175 - 6.31225   | 1435 - 1626.5         | 36.43 - 36.5       |
| 8.291 - 8.294       | 1645.5 - 1646.5       | Above 38.6         |
| 8.362 - 8.366       | 1660 - 1710           | --                 |
| 8.37625 - 8.38675   | 1718.8 -1722.2        |                    |
| 8.41425 - 8.41475   | 2200 - 2300           |                    |
| 12.29 - 12.293      | 2310 -2390            |                    |
| 12.51975 - 12.52025 | 2483.5 -2500          |                    |
| 12.57675 - 12.57725 | 2655 - 2900           |                    |
| 13.36 -13.41        | 3260 - 3267           |                    |
| 16.42 - 16.423      | 3332 -3339            |                    |
| 16.69475 - 16.69525 | 3345.8 - 3358         |                    |
| 16.80425 - 16.80475 | 3500 - 4400           |                    |
| 25.5 - 25.67        | 4500 - 5150           |                    |
| 37.5 - 38.25        | 5350 - 5460           |                    |
| 73 - 74.6           | 7250 - 7750           |                    |
| 74.8 - 75.2         | 8025 - 8500           |                    |
| 108 - 138           |                       |                    |

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR and in Section 8.10 of the RSS-Gen must not exceed the limits shown in Table.

| RSS-Gen Section 8.9 |                                       |                                                             |                          |
|---------------------|---------------------------------------|-------------------------------------------------------------|--------------------------|
| Frequency<br>(MHz)  | Field Strength<br>( $\mu\text{V/m}$ ) | Magnetic Field Strength<br>(H-Field)<br>( $\mu\text{A/m}$ ) | Measured Distance<br>(m) |
| 0.009 - 0.490       | --                                    | 6.37/F (F in kHz)                                           | 300                      |
| 0.490 - 1.705       | --                                    | 6.37/F (F in kHz)                                           | 30                       |
| 1.705 - 30          | --                                    | 0.08                                                        | 30                       |
| 30 - 88             | 100                                   | --                                                          | 3                        |
| 88 - 216            | 150                                   | --                                                          | 3                        |
| 216 - 960           | 200                                   | --                                                          | 3                        |
| Above 960           | 500                                   | --                                                          | 3                        |

### 6.7.2.Test Procedure Used

ANSI C63.10-2013 Section 6.3

ANSI C63.10-2013 Section 6.6

ANSI C63.10-2013 Section 6.10

### 6.7.3.Test Setting

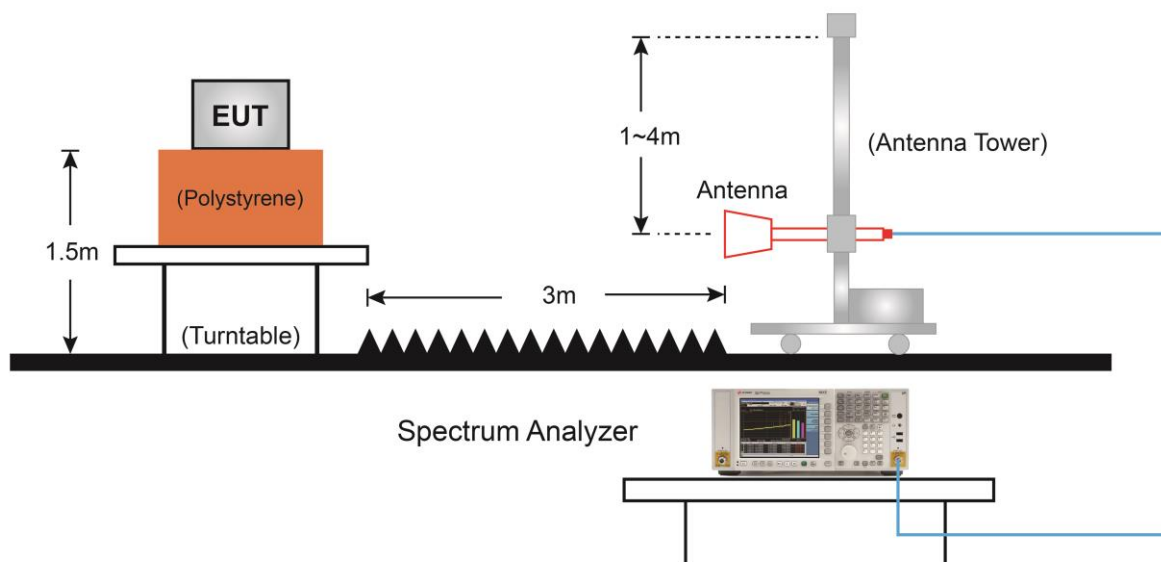
#### Peak Field Strength Measurements

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**

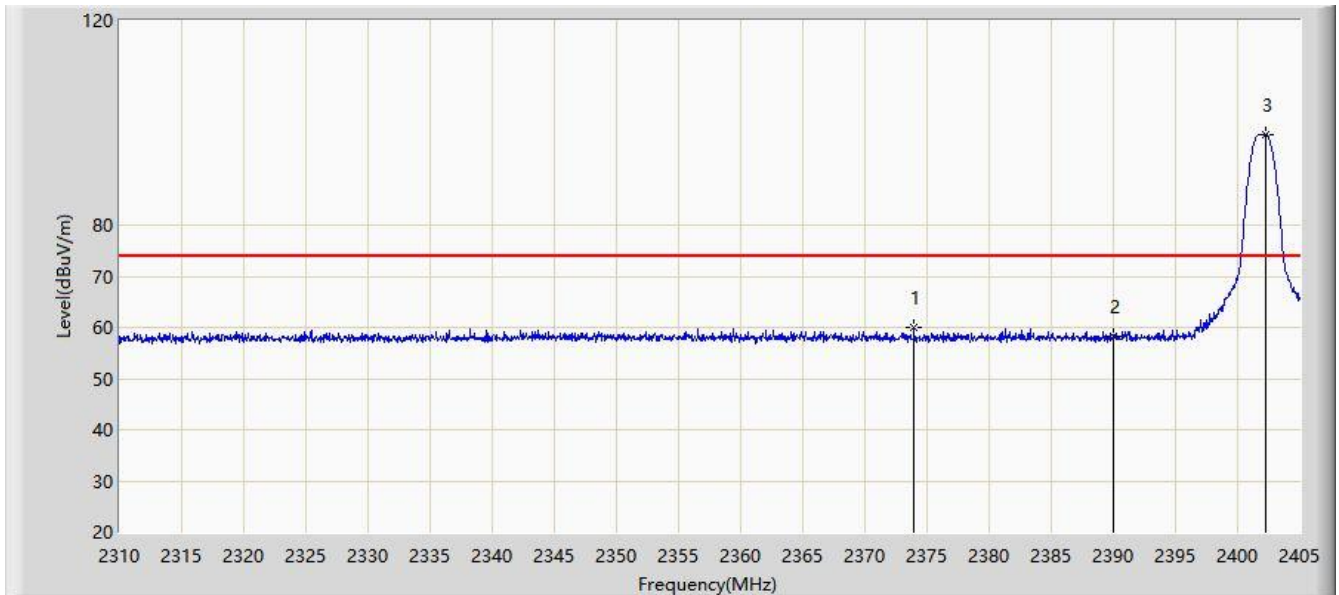
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW  $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB 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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:15 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Horizontal          |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2402MHz |                               |

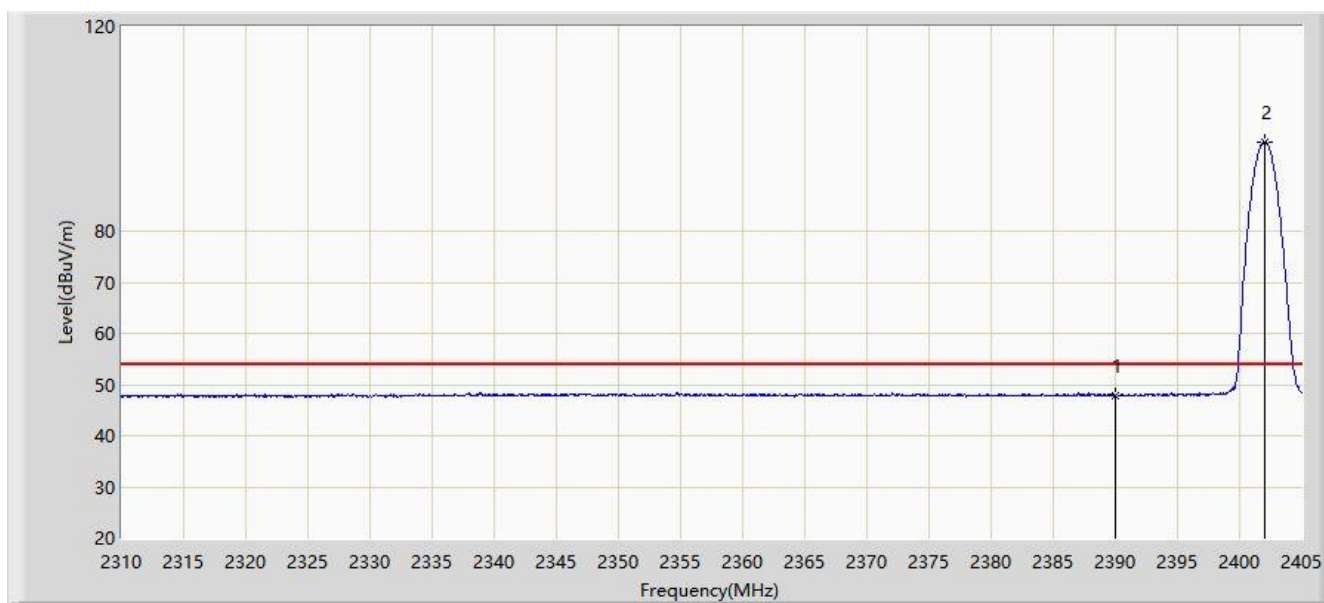


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBμV/m) | Reading Level (dBμV) | Margin (dB) | Limit (dBμV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2373.935        | 59.950                 | 27.426               | -14.050     | 74.000         | 32.524      | PK   |
| 2  |      |      | 2390.000        | 58.321                 | 25.788               | -15.679     | 74.000         | 32.533      | PK   |
| 3  |      | *    | 2402.245        | 97.801                 | 65.262               | N/A         | N/A            | 32.539      | PK   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:16 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Horizontal          |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2402MHz |                               |

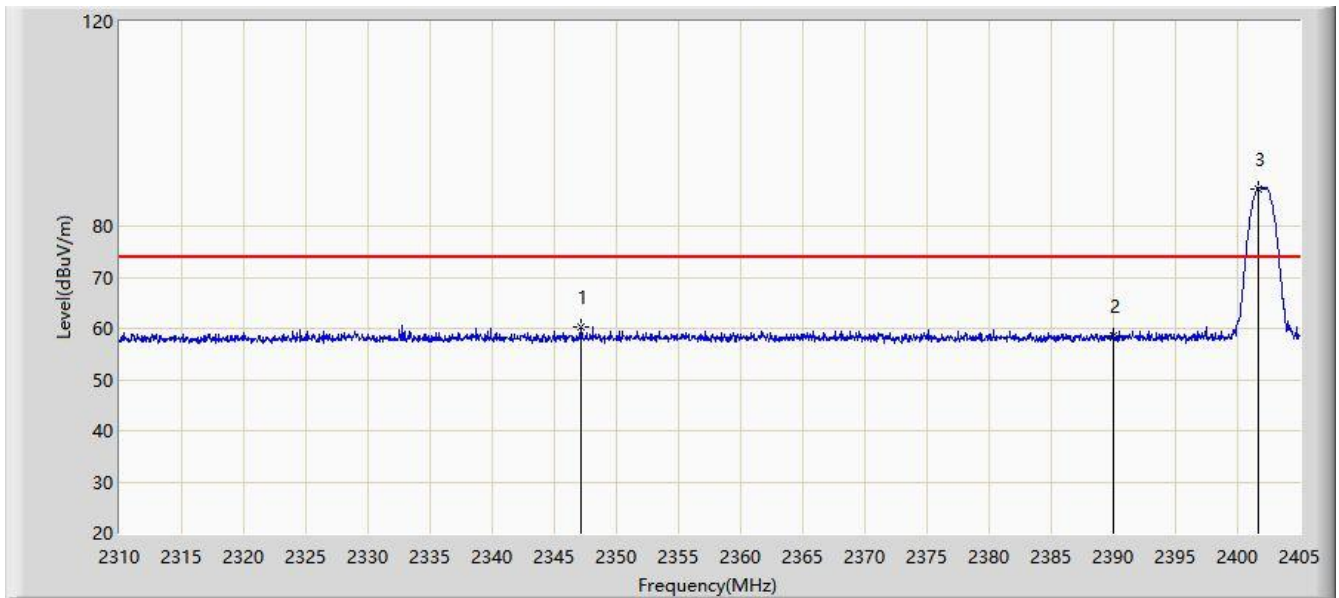


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2390.000        | 47.860                 | 15.327               | -6.140      | 54.000         | 32.533      | AV   |
| 2  |      | *    | 2402.008        | 97.503                 | 64.963               | N/A         | N/A            | 32.540      | AV   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:18 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Vertical            |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2402MHz |                               |

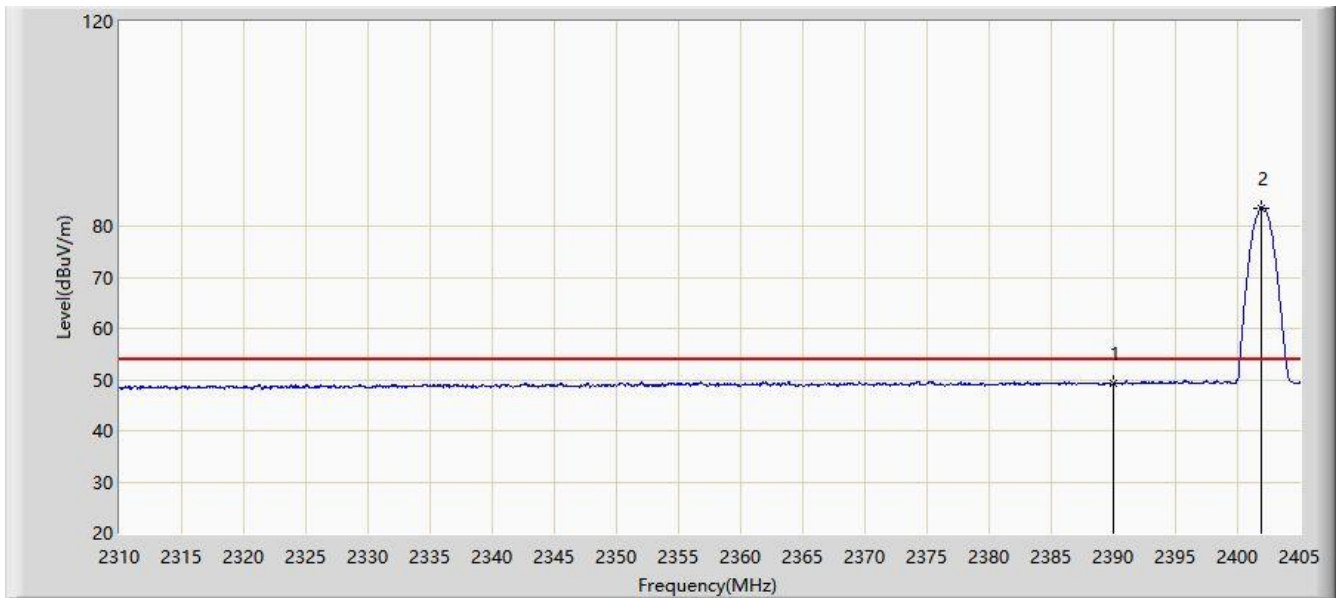


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2347.192        | 60.305                 | 27.632               | -13.695     | 74.000         | 32.674      | PK   |
| 2  |      |      | 2390.000        | 58.548                 | 26.015               | -15.452     | 74.000         | 32.533      | PK   |
| 3  |      | *    | 2401.627        | 87.338                 | 54.796               | N/A         | N/A            | 32.542      | PK   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/24 - 02:48 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Vertical            |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2402MHz |                               |

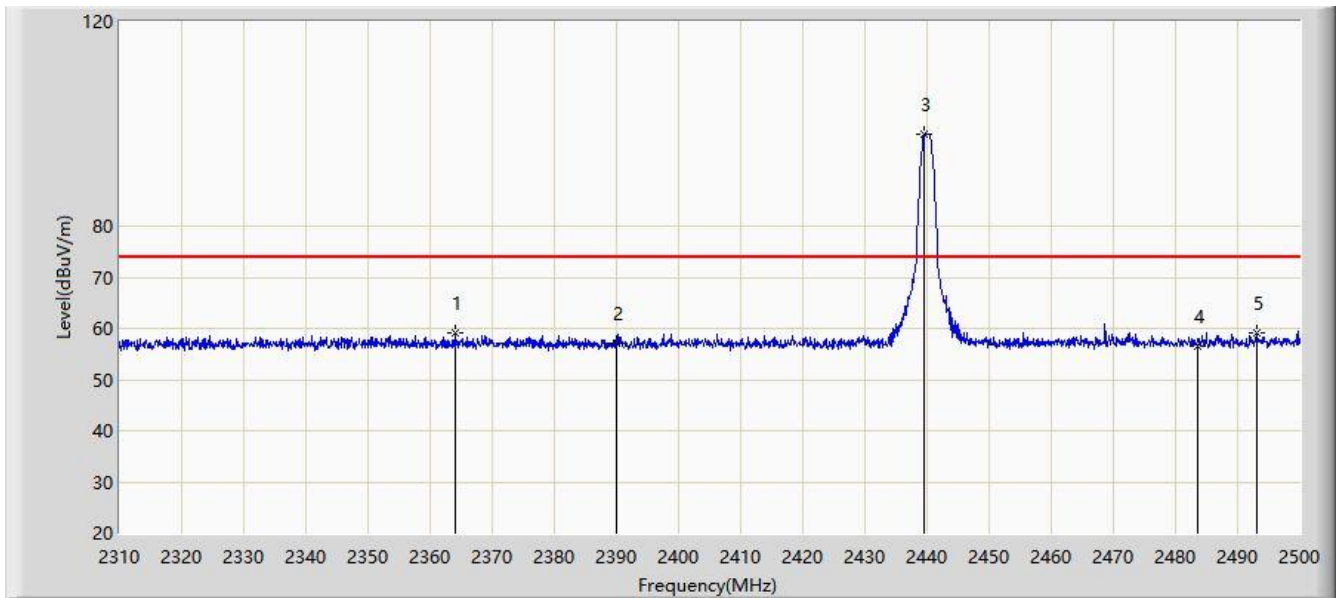


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2390.000        | 49.307                 | 16.774               | -4.693      | 54.000         | 32.533      | AV   |
| 2  |      | *    | 2401.865        | 83.584                 | 51.043               | N/A         | N/A            | 32.541      | AV   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:21 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Horizontal          |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2440MHz |                               |

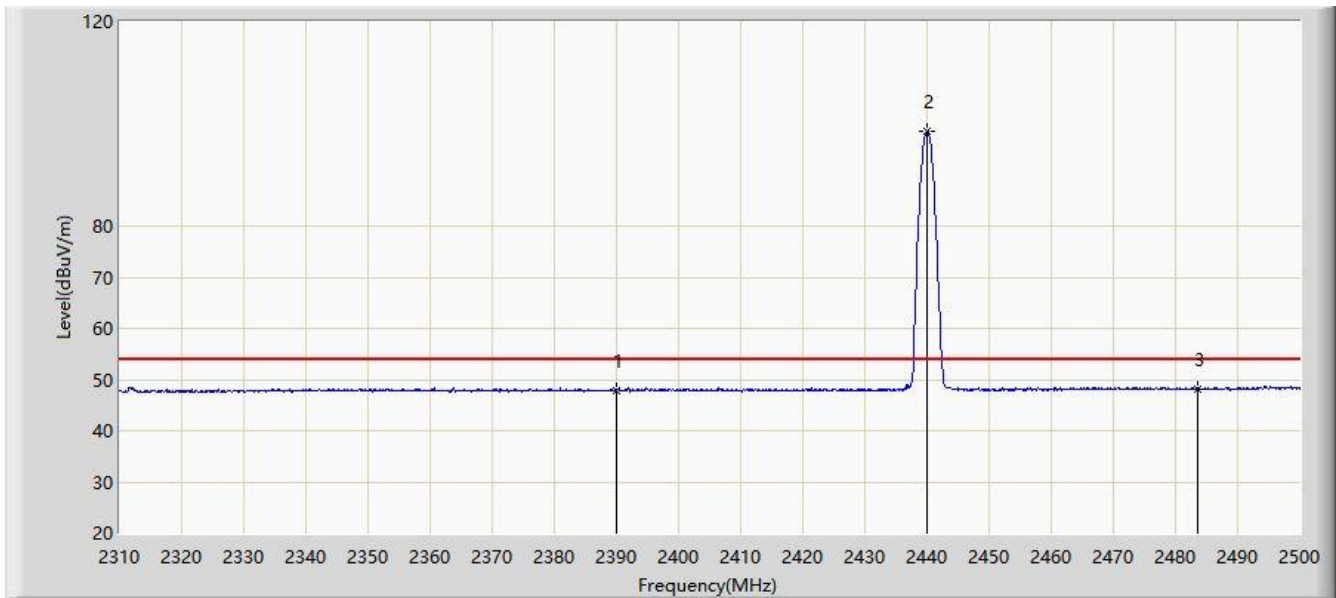


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBμV/m) | Reading Level (dBμV) | Margin (dB) | Limit (dBμV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2364.055        | 59.100                 | 26.516               | -14.900     | 74.000         | 32.584      | PK   |
| 2  |      |      | 2390.000        | 57.150                 | 24.617               | -16.850     | 74.000         | 32.533      | PK   |
| 3  |      | *    | 2439.580        | 97.848                 | 65.370               | N/A         | N/A            | 32.478      | PK   |
| 4  |      |      | 2483.500        | 56.384                 | 23.955               | -17.616     | 74.000         | 32.429      | PK   |
| 5  |      |      | 2493.065        | 58.995                 | 26.574               | -15.005     | 74.000         | 32.421      | PK   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:24 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Horizontal          |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2440MHz |                               |

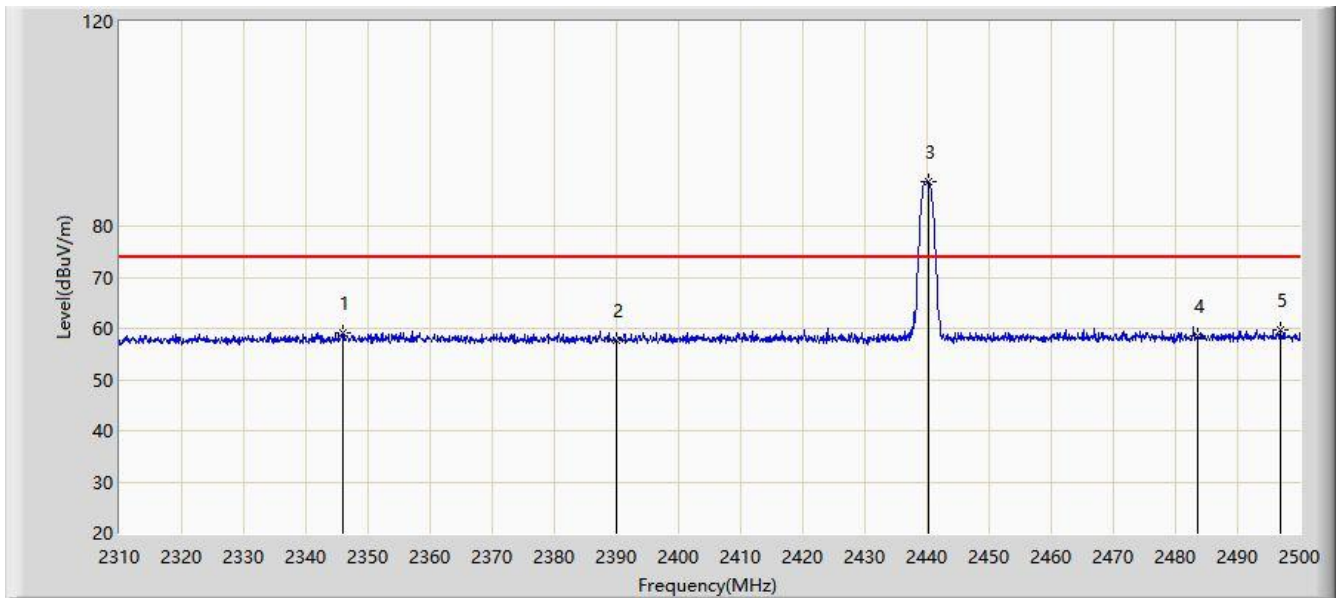


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2390.000        | 47.932                 | 15.399               | -6.068      | 54.000         | 32.533      | AV   |
| 2  |      | *    | 2439.960        | 98.537                 | 66.059               | N/A         | N/A            | 32.478      | AV   |
| 3  |      |      | 2483.500        | 48.042                 | 15.613               | -5.958      | 54.000         | 32.429      | AV   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:26 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Vertical            |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2440MHz |                               |

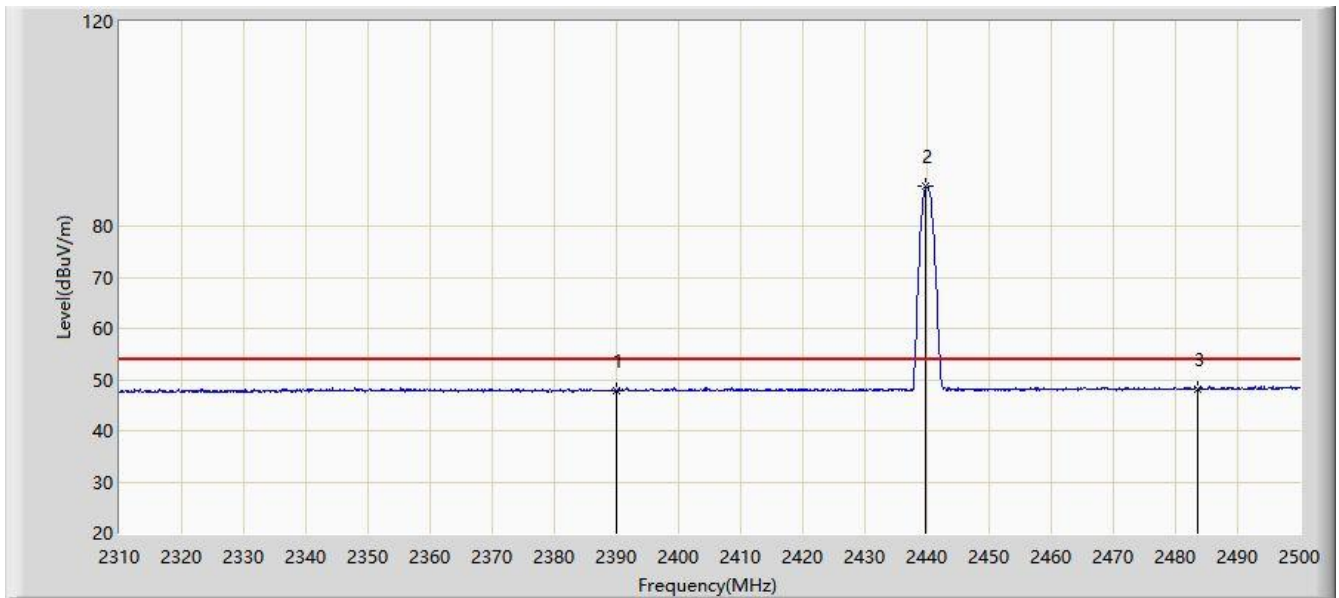


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBμV/m) | Reading Level (dBμV) | Margin (dB) | Limit (dBμV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2346.005        | 59.069                 | 26.389               | -14.931     | 74.000         | 32.679      | PK   |
| 2  |      |      | 2390.000        | 57.617                 | 25.084               | -16.383     | 74.000         | 32.533      | PK   |
| 3  |      | *    | 2440.245        | 88.823                 | 56.346               | N/A         | N/A            | 32.478      | PK   |
| 4  |      |      | 2483.500        | 58.443                 | 26.014               | -15.557     | 74.000         | 32.429      | PK   |
| 5  |      |      | 2496.960        | 59.647                 | 27.215               | -14.353     | 74.000         | 32.432      | PK   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:27 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Vertical            |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2440MHz |                               |

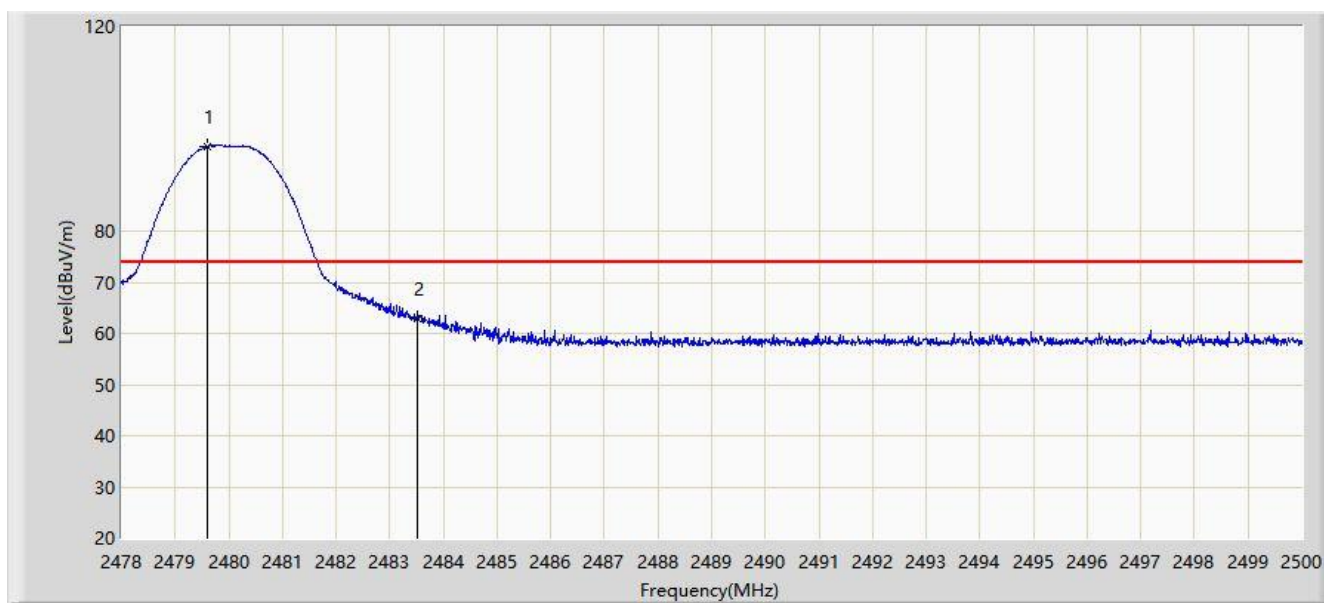


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      |      | 2390.000        | 47.884                 | 15.351               | -6.116      | 54.000         | 32.533      | AV   |
| 2  |      | *    | 2439.865        | 87.960                 | 55.482               | N/A         | N/A            | 32.478      | AV   |
| 3  |      |      | 2483.500        | 48.081                 | 15.652               | -5.919      | 54.000         | 32.429      | AV   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:30 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Horizontal          |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2480MHz |                               |

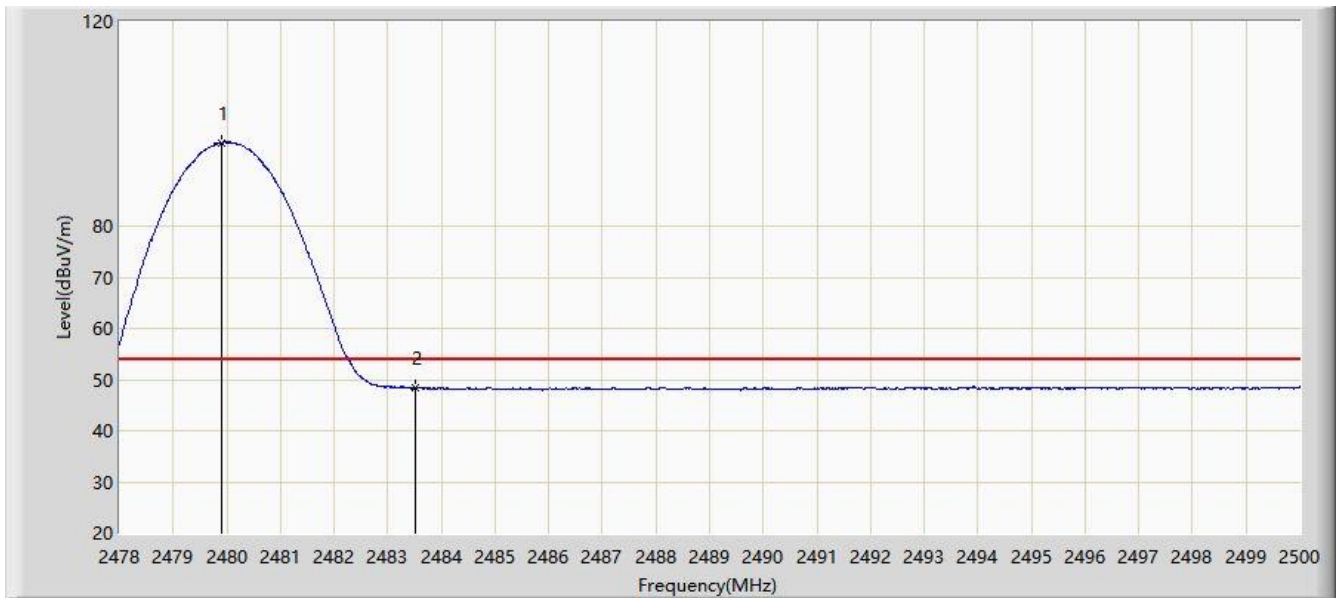


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      | *    | 2479.595        | 96.556                 | 64.104               | N/A         | N/A            | 32.452      | PK   |
| 2  |      |      | 2483.500        | 62.771                 | 30.342               | -11.229     | 74.000         | 32.429      | PK   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:32 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Horizontal          |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2480MHz |                               |

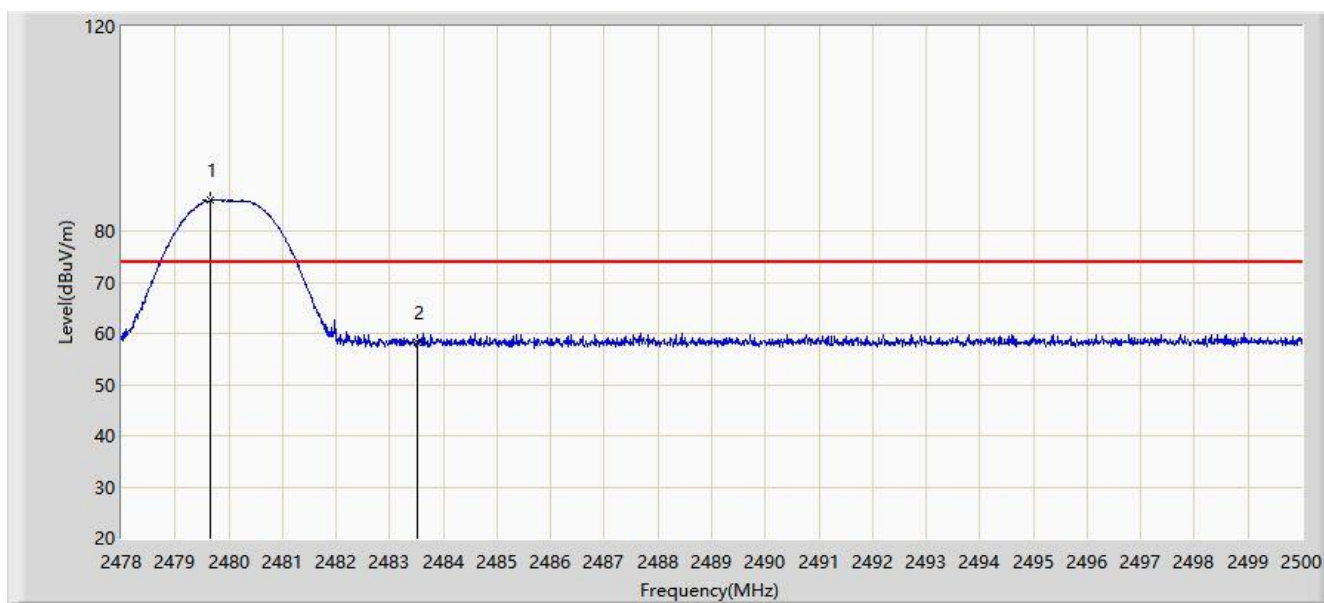


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBμV/m) | Reading Level (dBμV) | Margin (dB) | Limit (dBμV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      | *    | 2479.892        | 96.244                 | 63.794               | N/A         | N/A            | 32.450      | AV   |
| 2  |      |      | 2483.500        | 48.410                 | 15.981               | -5.590      | 54.000         | 32.429      | AV   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:34 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Vertical            |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2480MHz |                               |

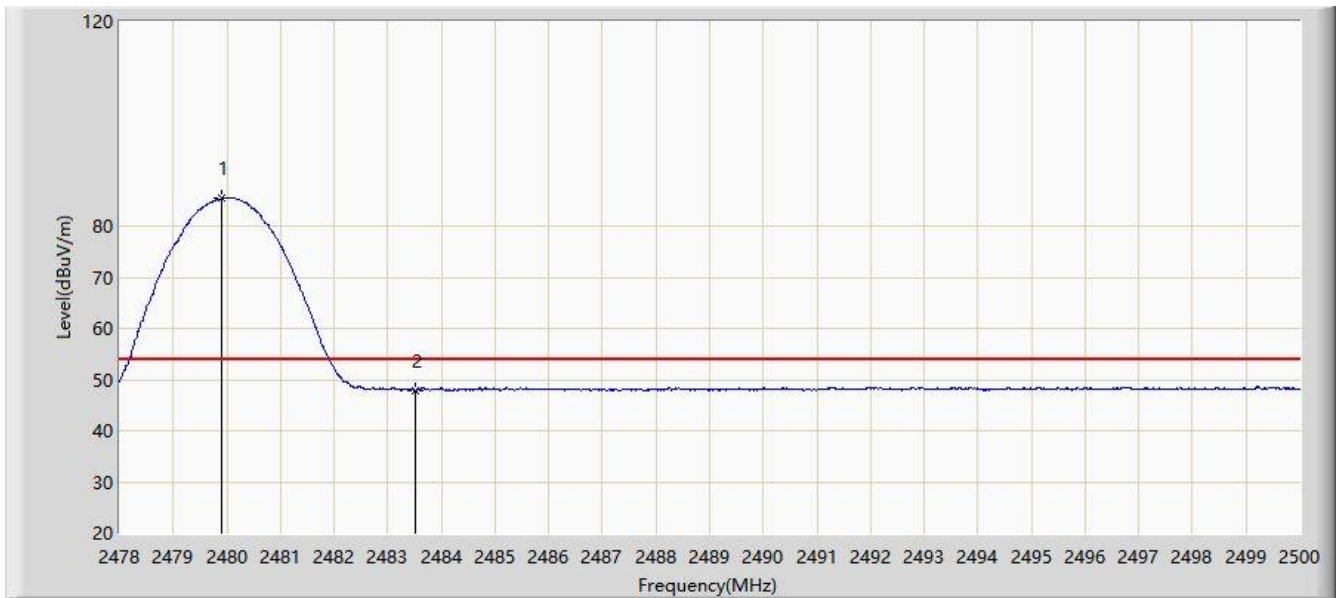


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Margin (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      | *    | 2479.650        | 86.075                 | 53.623               | N/A         | N/A            | 32.452      | PK   |
| 2  |      |      | 2483.500        | 58.289                 | 25.860               | -15.711     | 74.000         | 32.429      | PK   |

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

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

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| Site: WZ-AC1                                  | Test Date: 2021/02/23 - 00:35 |
| Limit: FCC_Part15.209_RE(3m)                  | Engineer: Tommy Tang          |
| Probe: WZ-AC1_BBHA9120D_1-18GHz               | Polarity: Vertical            |
| EUT: LR Radar Level Instrument                | Power: By DC Power            |
| Test Mode: Transmit by BLE at Channel 2480MHz |                               |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBμV/m) | Reading Level (dBμV) | Margin (dB) | Limit (dBμV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-------------|----------------|-------------|------|
| 1  |      | *    | 2479.903        | 85.375                 | 52.925               | N/A         | N/A            | 32.450      | AV   |
| 2  |      |      | 2483.500        | 47.901                 | 15.472               | -6.099      | 54.000         | 32.429      | AV   |

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

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

## 6.8. AC Conducted Emissions Measurement

### 6.8.1. Test Limit

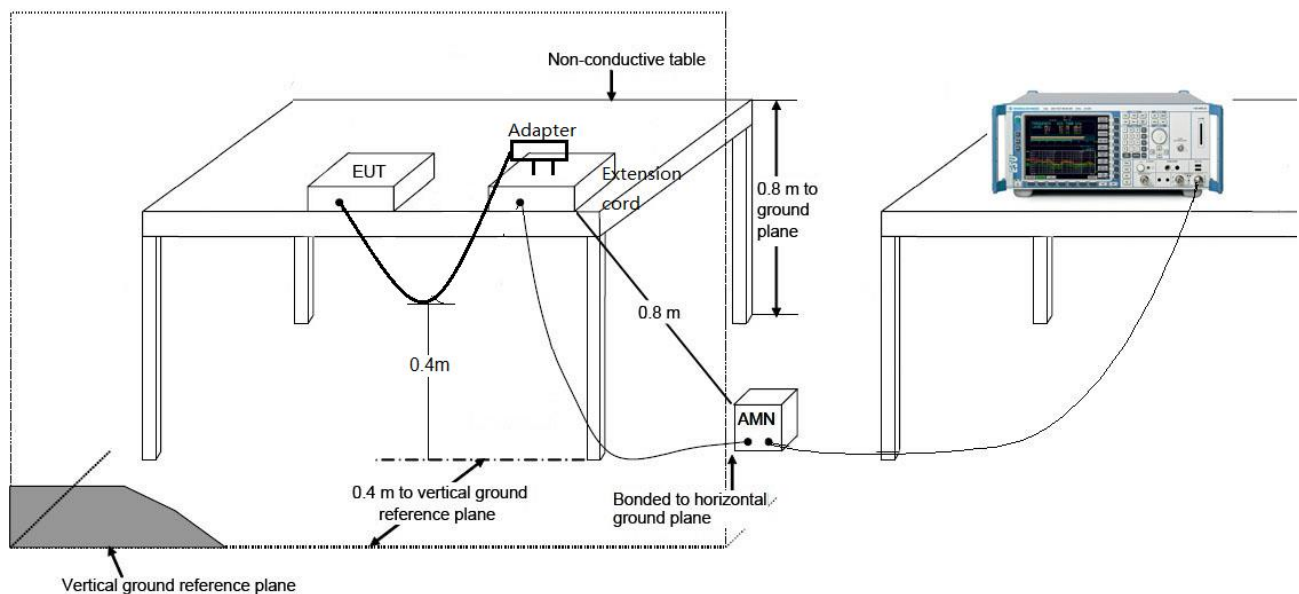
FCC Part 15 Subpart C Paragraph 15.207 Limits & RSS-Gen Issue 5 Section 8.8 Limits

| Frequency (MHz) | QP (dB $\mu$ V) | AV (dB $\mu$ V) |
|-----------------|-----------------|-----------------|
| 0.15 - 0.50     | 66 - 56         | 56 - 46         |
| 0.50 - 5.0      | 56              | 46              |
| 5.0 - 30        | 60              | 50              |

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

### 6.8.2. Test Setup



### 6.8.3. Test Result

The EUT is powered by DC power supply, so this item is not applicable.

## **7. CONCLUSION**

The data collected relate only the item(s) tested and show that the device is in compliance with Part 15.247 of the FCC Rules and RSS-247 Section 5 of the ISED Rules.

---

The End

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

Refer to “2312RSU058-UT” file.

## **Appendix B - EUT Photograph**

Refer to “2312RSU058-UE” file.