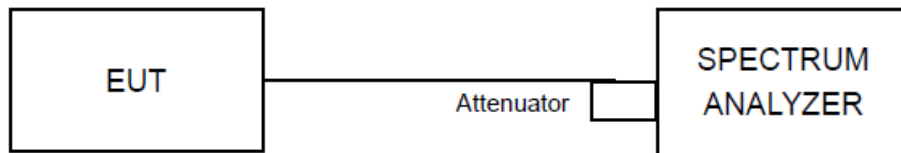


## 4.5 Conducted Band Edges Measurement

### 4.5.1 Limit

Below 20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

### 4.5.2 Test Setup



### 4.5.3 Test Procedures

The EUT was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance” (clause 11.0) for compliance to FCC 47CFR 15.247 requirements.

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = No faster than coupled (auto) time.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

#### MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep = No faster than coupled (auto) time.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

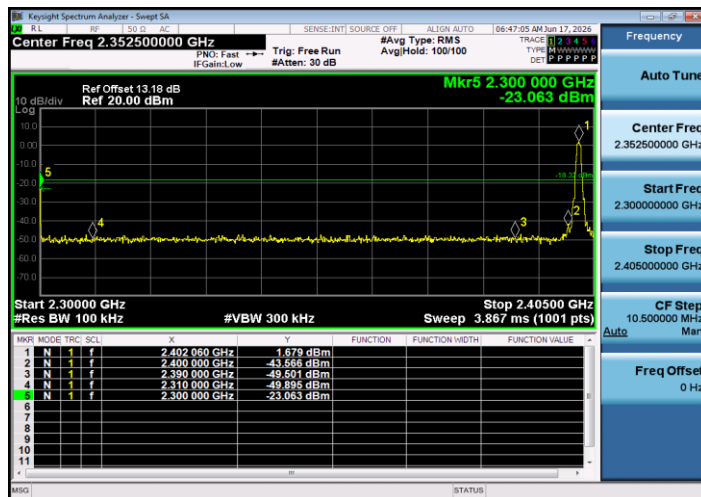
### 4.5.4 Deviation of Test Standard

No deviation.

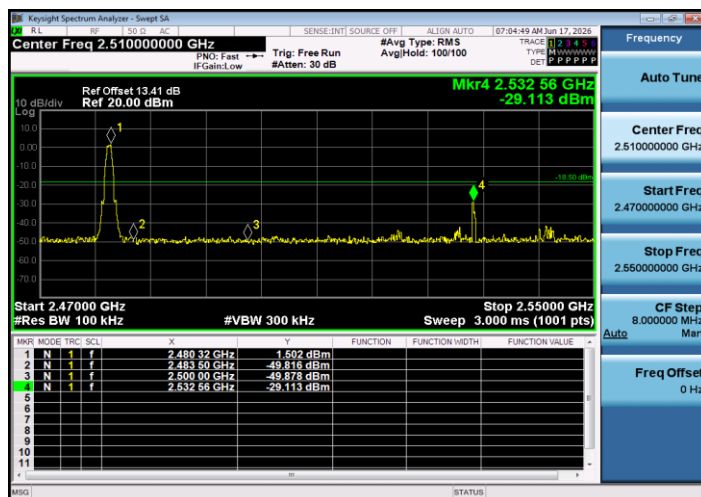
#### 4.5.5 Test Results

| Test Mode | Antenna | ChName | Channel [MHz] | RefLevel [dBm] | Max. Spurious Level [dBm] | Limit [dBm] | Verdict |
|-----------|---------|--------|---------------|----------------|---------------------------|-------------|---------|
| BLE_1M    | Ant1    | Low    | 2402          | 1.68           | -23.06                    | ≤-18.32     | PASS    |
|           |         | High   | 2480          | 1.50           | -29.11                    | ≤-18.5      | PASS    |
| BLE_2M    | Ant1    | Low    | 2402          | -0.51          | -22.94                    | ≤-20.51     | PASS    |
|           |         | High   | 2480          | 0.84           | -40.75                    | ≤-19.16     | PASS    |

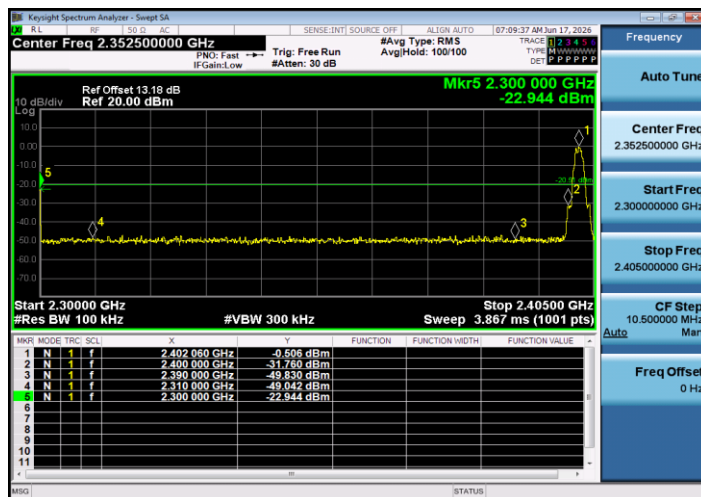
### BLE\_1M\_Ant1\_Low\_2402



### BLE\_1M\_Ant1\_High\_2480



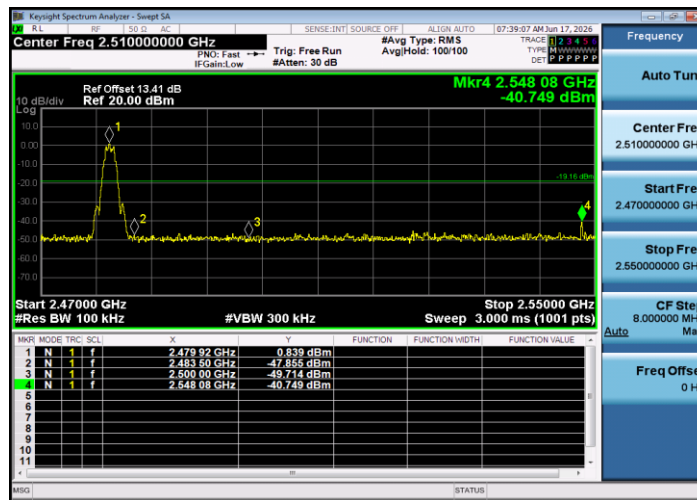
### BLE\_2M\_Ant1\_Low\_2402





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VERITAS

## BLE\_2M\_Ant1\_High\_2480

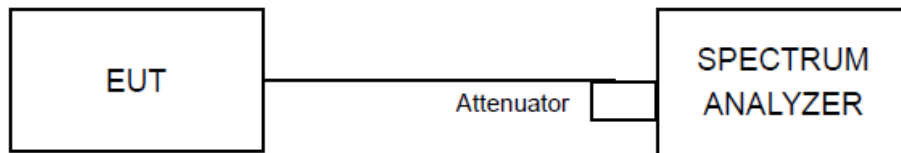


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limit

Below 20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

### 4.6.2 Test Setup



### 4.6.3 Test Procedures

The EUT was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance” (clause 11.0) for compliance to FCC 47CFR 15.247 requirements.

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = No faster than coupled (auto) time.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

#### MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep = No faster than coupled (auto) time.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

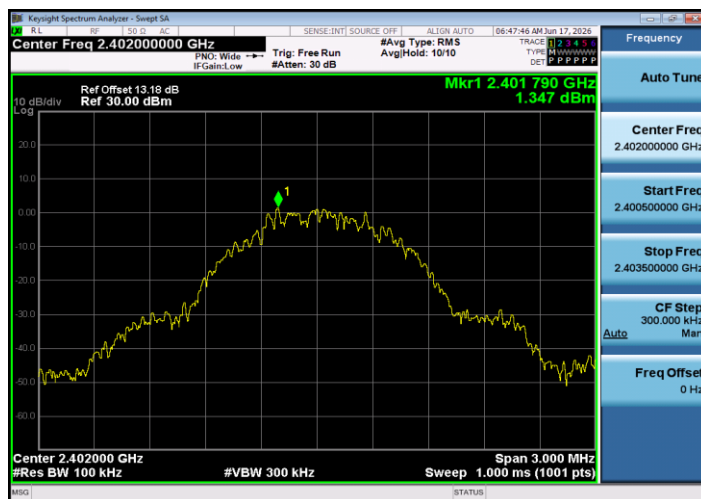
### 4.6.4 Deviation of Test Standard

No deviation.

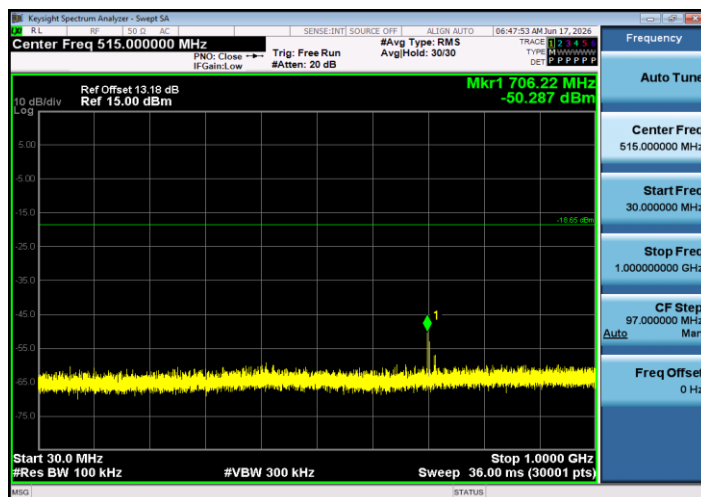
#### 4.6.5 Test Results

| Test Mode | Antenna | Channel [MHz] | FreqRange [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|-----------|---------|---------------|-----------------|----------------|--------------|-------------|---------|
| BLE_1M    | Ant1    | 2402          | Reference       | 1.35           | 1.35         | ---         | PASS    |
|           |         |               | 30~1000         | 1.35           | -50.29       | ≤-18.65     | PASS    |
|           |         |               | 1000~26500      | 1.35           | -23.54       | ≤-18.65     | PASS    |
|           |         | 2440          | Reference       | 0.74           | 0.74         | ---         | PASS    |
|           |         |               | 30~1000         | 0.74           | -52.72       | ≤-19.26     | PASS    |
|           |         |               | 1000~26500      | 0.74           | -23.32       | ≤-19.26     | PASS    |
|           |         | 2480          | Reference       | 1.21           | 1.21         | ---         | PASS    |
|           |         |               | 30~1000         | 1.21           | -58.17       | ≤-18.79     | PASS    |
|           |         |               | 1000~26500      | 1.21           | -23.28       | ≤-18.79     | PASS    |
| BLE_2M    | Ant1    | 2402          | Reference       | -0.64          | -0.64        | ---         | PASS    |
|           |         |               | 30~1000         | -0.64          | -34.76       | ≤-20.64     | PASS    |
|           |         |               | 1000~26500      | -0.64          | -23.48       | ≤-20.64     | PASS    |
|           |         | 2440          | Reference       | -0.71          | -0.71        | ---         | PASS    |
|           |         |               | 30~1000         | -0.71          | -55.12       | ≤-20.71     | PASS    |
|           |         |               | 1000~26500      | -0.71          | -23.23       | ≤-20.71     | PASS    |
|           |         | 2480          | Reference       | -1.37          | -1.37        | ---         | PASS    |
|           |         |               | 30~1000         | -1.37          | -58.71       | ≤-21.37     | PASS    |
|           |         |               | 1000~26500      | -1.37          | -23.23       | ≤-21.37     | PASS    |

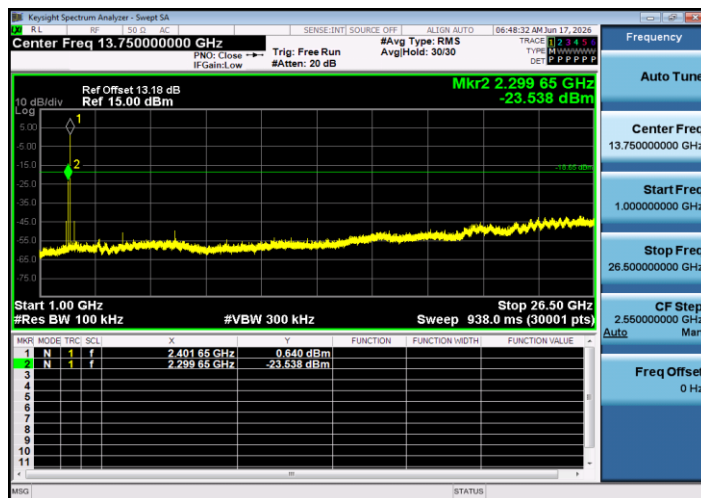
### BLE\_1M\_Ant1\_2402\_0~Reference



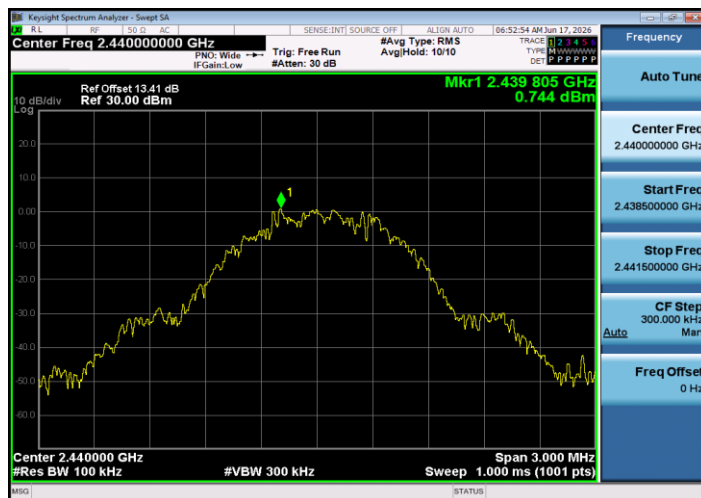
### BLE\_1M\_Ant1\_2402\_30~1000



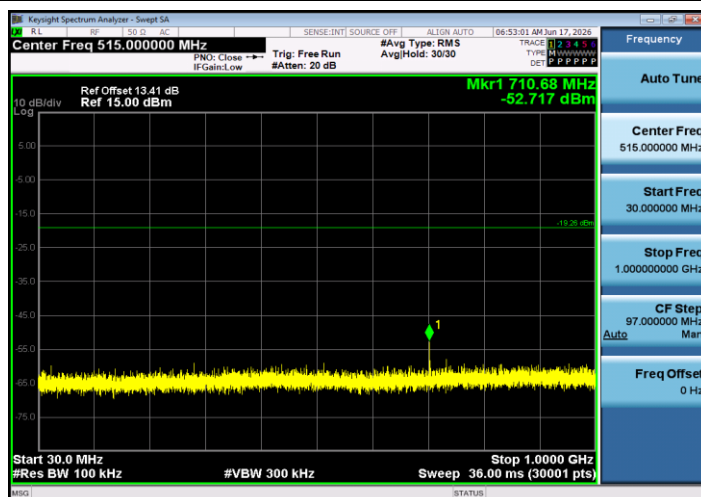
### BLE\_1M\_Ant1\_2402\_1000~26500



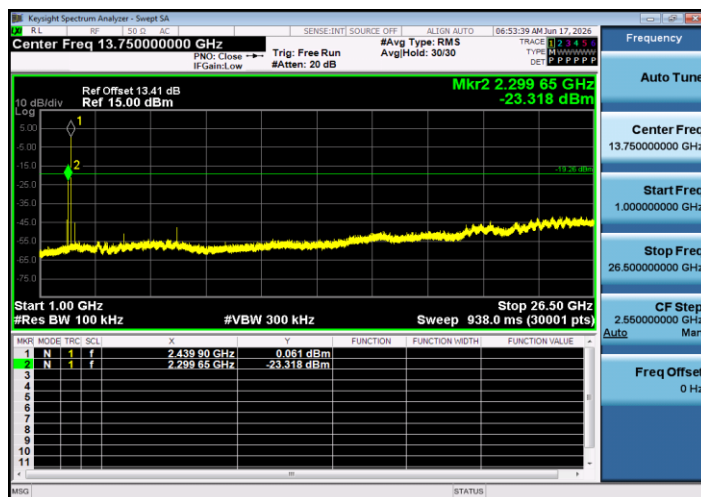
### BLE\_1M\_Ant1\_2440\_0~Reference



### BLE\_1M\_Ant1\_2440\_30~1000



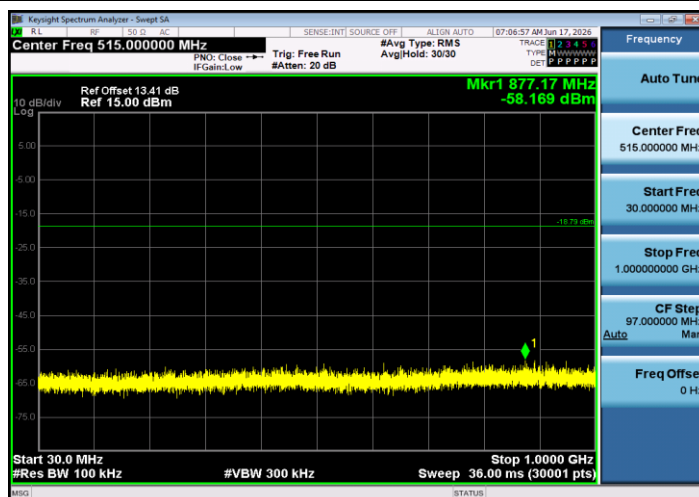
### BLE\_1M\_Ant1\_2440\_1000~26500



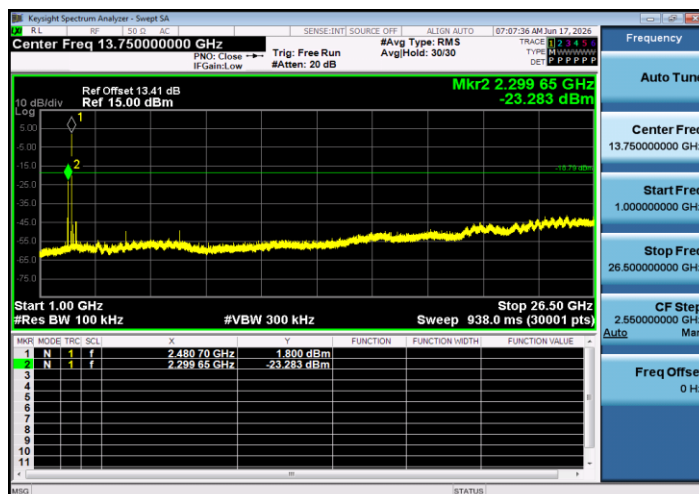
### BLE\_1M\_Ant1\_2480\_0~Reference



### BLE\_1M\_Ant1\_2480\_30~1000



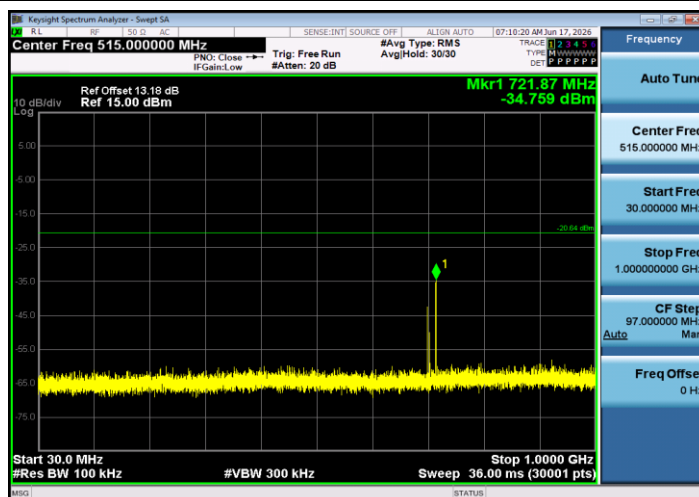
### BLE\_1M\_Ant1\_2480\_1000~26500



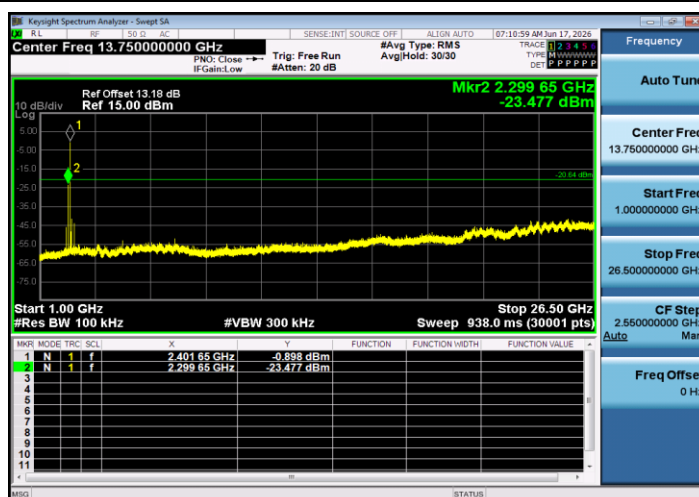
### BLE\_2M\_Ant1\_2402\_0~Reference



### BLE\_2M\_Ant1\_2402\_30~1000



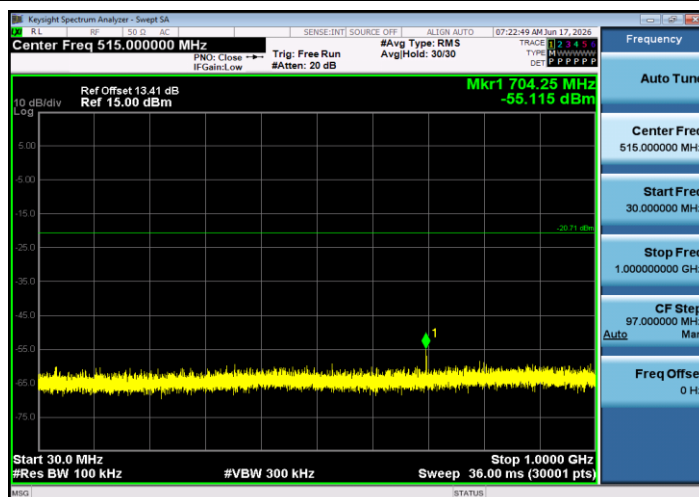
### BLE\_2M\_Ant1\_2402\_1000~26500



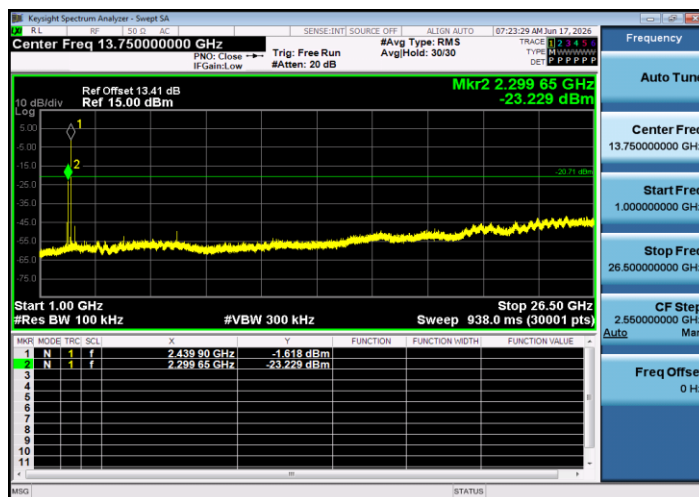
### BLE\_2M\_Ant1\_2440\_0~Reference



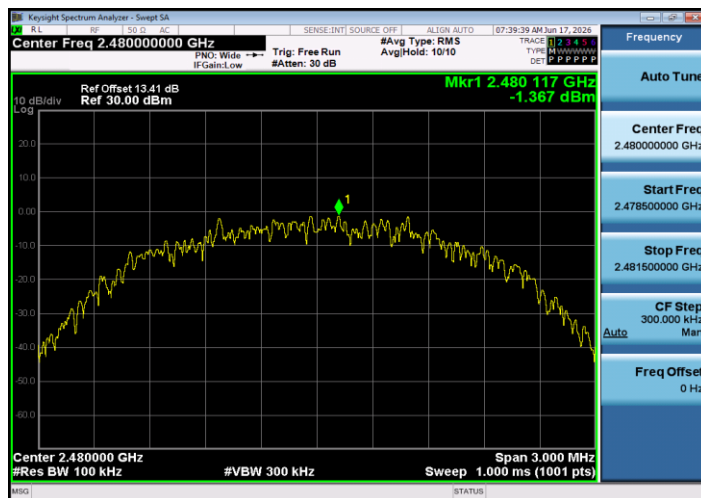
### BLE\_2M\_Ant1\_2440\_30~1000



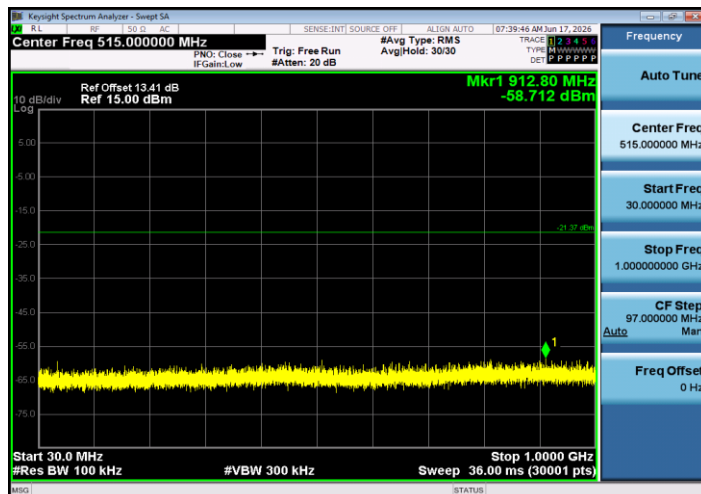
### BLE\_2M\_Ant1\_2440\_1000~26500



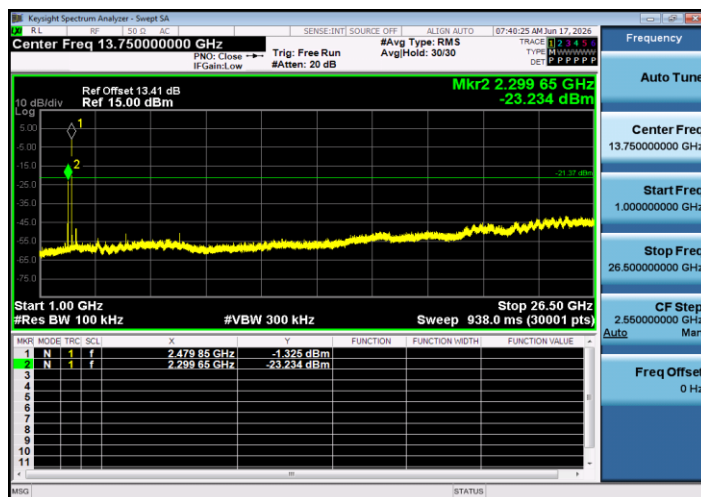
### BLE\_2M\_Ant1\_2480\_0~Reference



### BLE\_2M\_Ant1\_2480\_30~1000



### BLE\_2M\_Ant1\_2480\_1000~26500





#### 4.7 Emissions in restricted frequency bands

##### 4.7.1 Test Limit

##### For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part1 5, 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         |
| 1 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 - 156.525 | 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        | (2)                |
| 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>[uV/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                             |

#### 4.7.2 Test Procedure Reference

ANSI C63.10 Section 6.3 (General Requirements)

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

#### 4.7.3 Test Procedures

##### Peak Field Strength Measurements

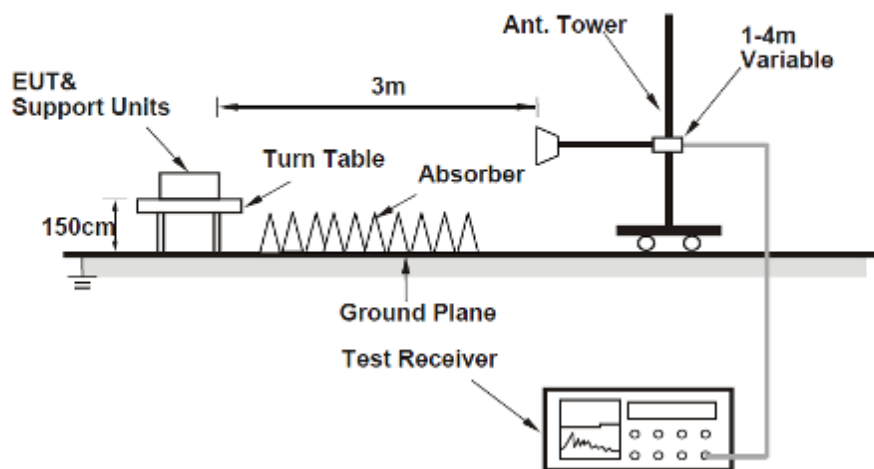
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### **Average 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.
3. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

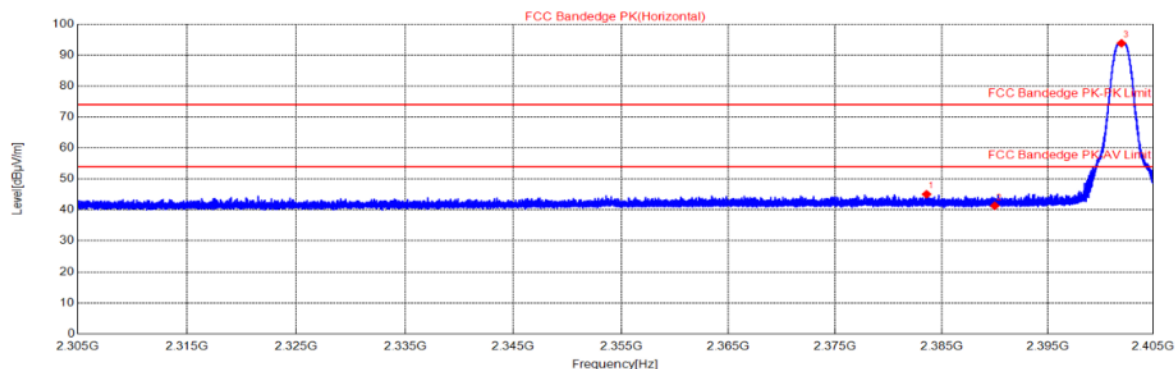
#### **4.7.4 Test Setup**

**For Radiated emission above 1GHz**



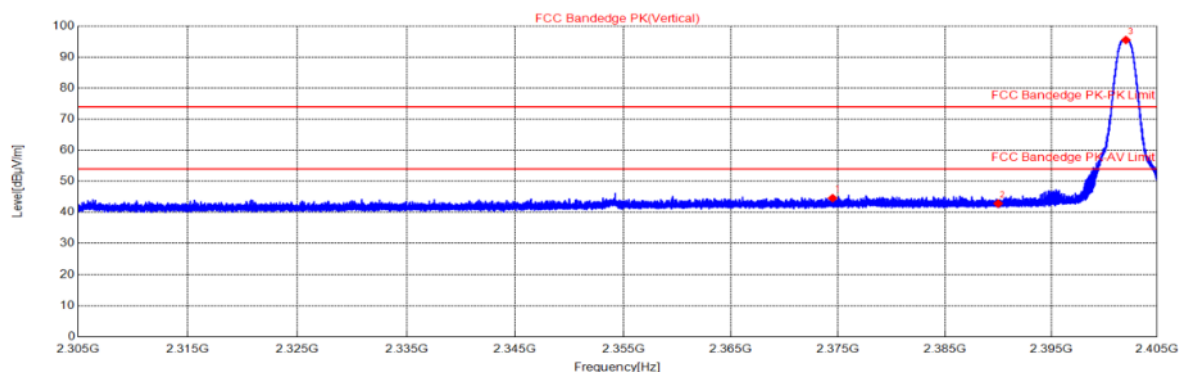
#### 4.7.5 Test Results

BLE\_1M\_2402\_Ant1/ Horizontal



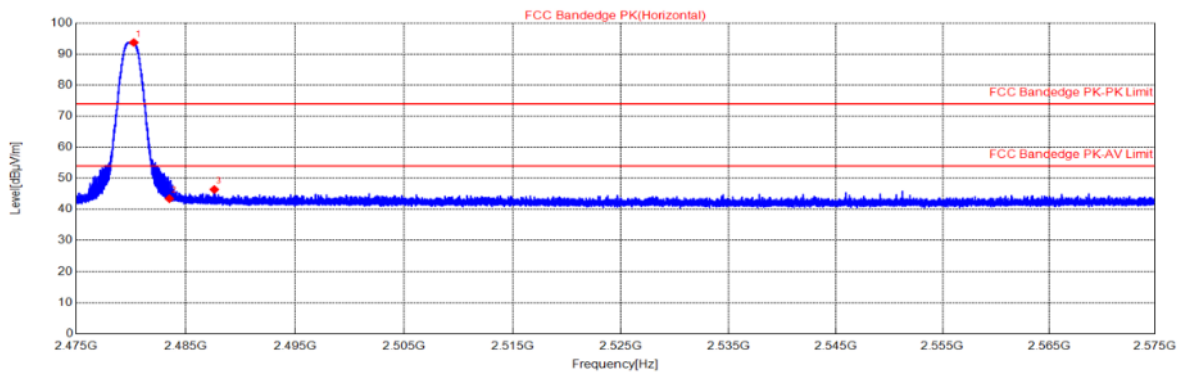
| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|------------|
| 1   | 2383.58     | 55.41            | -10.34      | 45.07          | 74.00          | 28.93       | PK       | 155         | 145       | Horizontal |
| 2   | 2390.00     | 51.65            | -10.32      | 41.33          | 74.00          | 32.67       | PK       | 155         | 52        | Horizontal |
| 3   | 2401.99     | 104.15           | -10.31      | 93.84          | 74.00          | -19.84      | PK       | 155         | 75        | Horizontal |

BLE\_1M\_2402\_Ant1/ Vertical



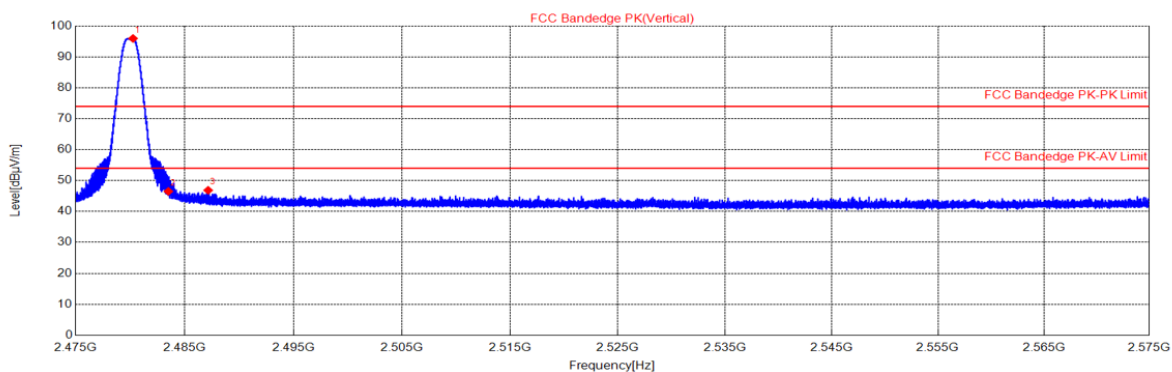
| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|----------|
| 1   | 2374.49     | 54.94            | -10.35      | 44.59          | 74.00          | 29.41       | PK       | 155         | 57        | Vertical |
| 2   | 2390.00     | 53.18            | -10.32      | 42.86          | 74.00          | 31.14       | PK       | 155         | 151       | Vertical |
| 3   | 2402.05     | 105.83           | -10.31      | 95.52          | 74.00          | -21.52      | PK       | 155         | 57        | Vertical |

**BLE\_1M\_2480\_Ant1/ Horizontal-PK**



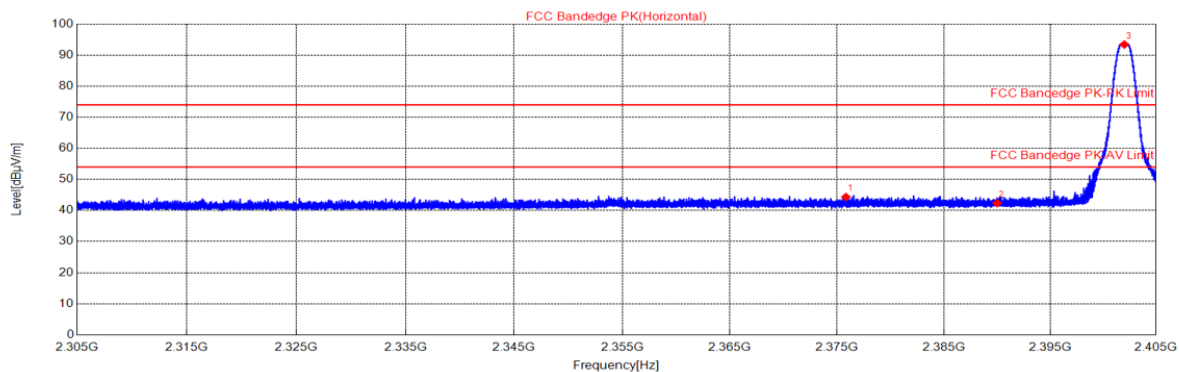
| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|------------|
| 1   | 2480.26     | 104.35           | -10.60      | 93.75          | 74.00          | -19.75      | PK       | 155         | 245       | Horizontal |
| 2   | 2483.50     | 54.07            | -10.61      | 43.46          | 74.00          | 30.54       | PK       | 155         | 315       | Horizontal |
| 3   | 2487.60     | 57.03            | -10.62      | 46.41          | 74.00          | 27.59       | PK       | 155         | 76        | Horizontal |

**BLE\_1M\_2480\_Ant1/ Vertical-PK**



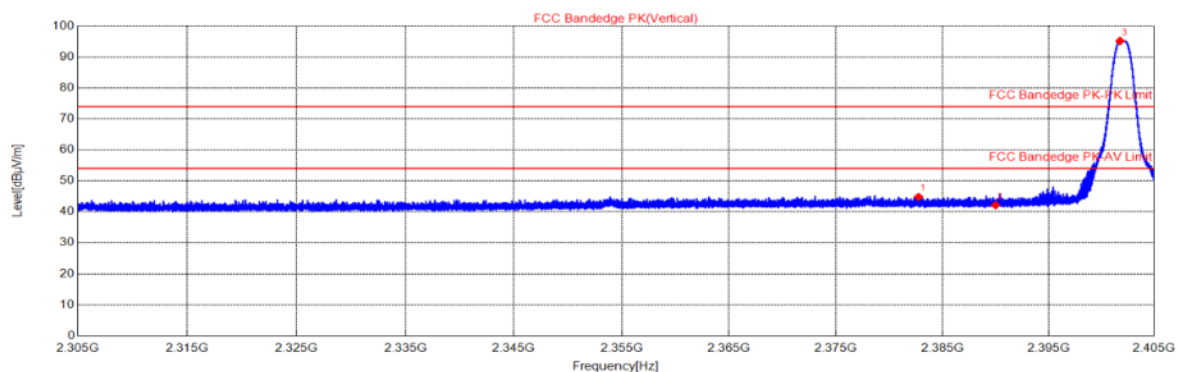
| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|----------|
| 1   | 2480.26     | 106.59           | -10.60      | 95.99          | 74.00          | -21.99      | PK       | 155         | 11        | Vertical |
| 2   | 2483.50     | 57.13            | -10.61      | 46.52          | 74.00          | 27.48       | PK       | 155         | 132       | Vertical |
| 3   | 2487.15     | 57.48            | -10.62      | 46.86          | 74.00          | 27.14       | PK       | 155         | 46        | Vertical |

### BLE\_2M\_2402\_Ant1/ Horizontal



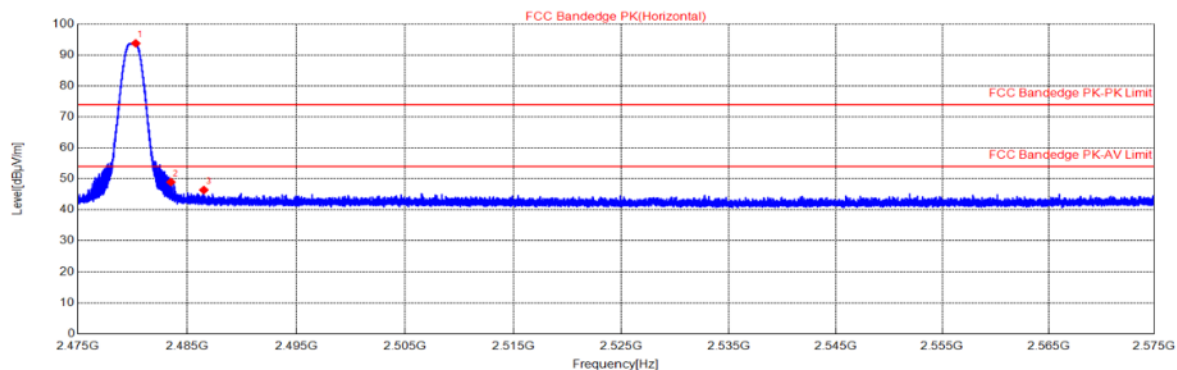
| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|------------|
| 1   | 2375.82     | 54.70            | -10.35      | 44.35          | 74.00          | 29.65       | PK       | 155         | 324       | Horizontal |
| 2   | 2390.00     | 52.69            | -10.32      | 42.37          | 74.00          | 31.63       | PK       | 155         | 190       | Horizontal |
| 3   | 2402.00     | 103.75           | -10.31      | 93.44          | 74.00          | -19.44      | PK       | 155         | 74        | Horizontal |

### BLE\_2M\_2402\_Ant1/ Vertical



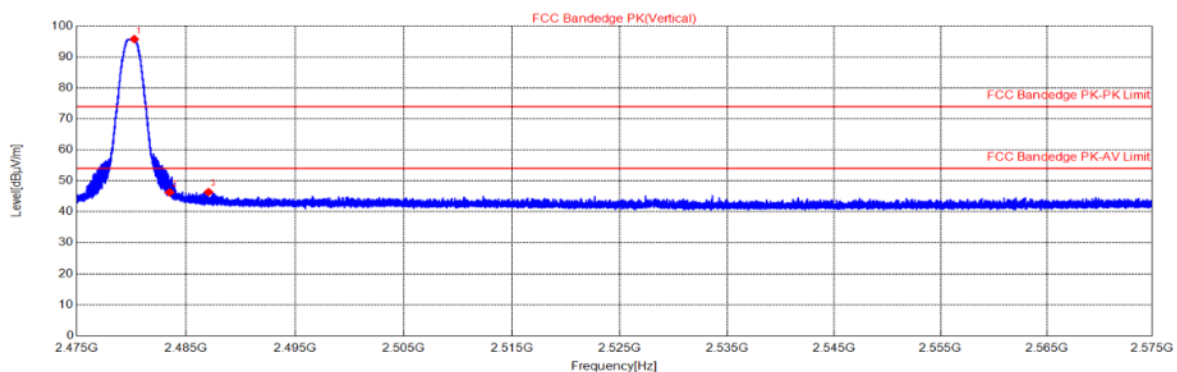
| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|----------|
| 1   | 2382.75     | 55.16            | -10.34      | 44.82          | 74.00          | 29.18       | PK       | 155         | 360       | Vertical |
| 2   | 2390.00     | 52.48            | -10.32      | 42.16          | 74.00          | 31.84       | PK       | 155         | 322       | Vertical |
| 3   | 2401.76     | 105.51           | -10.31      | 95.20          | 74.00          | -21.20      | PK       | 155         | 149       | Vertical |

**BLE\_2M\_2480\_Ant1/ Horizontal-PK**



| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|------------|
| 1   | 2480.29     | 104.37           | -10.60      | 93.77          | 74.00          | -19.77      | PK       | 155         | 248       | Horizontal |
| 2   | 2483.50     | 59.60            | -10.61      | 48.99          | 74.00          | 25.01       | PK       | 155         | 87        | Horizontal |
| 3   | 2486.51     | 57.03            | -10.62      | 46.41          | 74.00          | 27.59       | PK       | 155         | 64        | Horizontal |

**BLE\_2M\_2480\_Ant1/ Vertical-PK**



| NO. | Freq. [MHz] | Reading [dBμV/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle [°] | Polarity |
|-----|-------------|------------------|-------------|----------------|----------------|-------------|----------|-------------|-----------|----------|
| 1   | 2480.27     | 106.39           | -10.60      | 95.79          | 74.00          | -21.79      | PK       | 155         | 5         | Vertical |
| 2   | 2483.50     | 56.91            | -10.61      | 46.30          | 74.00          | 27.70       | PK       | 155         | 0         | Vertical |
| 3   | 2487.06     | 57.01            | -10.62      | 46.39          | 74.00          | 27.61       | PK       | 155         | 10        | Vertical |

## 4.8 Radiated Emission Measurement

### 4.8.1 Limits

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

| Frequencies<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009 ~ 0.490        | 2400/F (kHz)                         | 300                              |
| 0.490 ~ 1.705        | 24000/F (kHz)                        | 30                               |
| 1.705 ~ 30.0         | 30                                   | 30                               |
| 30 ~ 88              | 100                                  | 3                                |
| 88 ~ 216             | 150                                  | 3                                |
| 216 ~ 960            | 200                                  | 3                                |
| Above 960            | 500                                  | 3                                |

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

### 4.8.2 Test Procedures

#### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degree to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotate table was turned from 0 degree to 360 degree to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

**Note:**

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

#### **For Radiated emission above 30MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

#### **Note:**

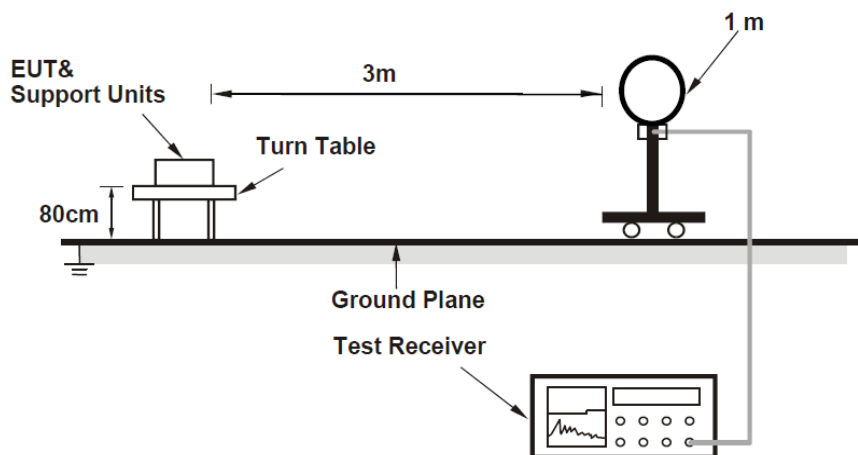
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for RMS Average (Duty cycle < 98 %) for Peak detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle  $\geq$  98 %) for Average detection (AV) at frequency above 1 GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

#### **4.8.3 Deviation from Test Standard**

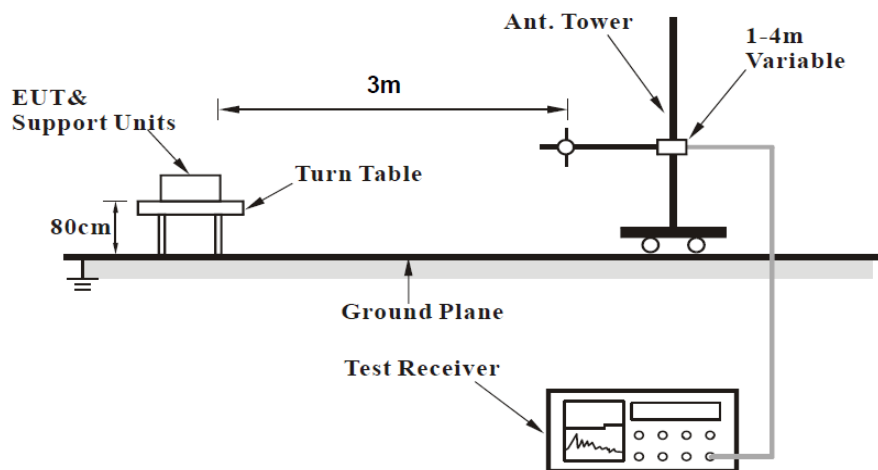
No deviation.

#### 4.8.4 Test Setup

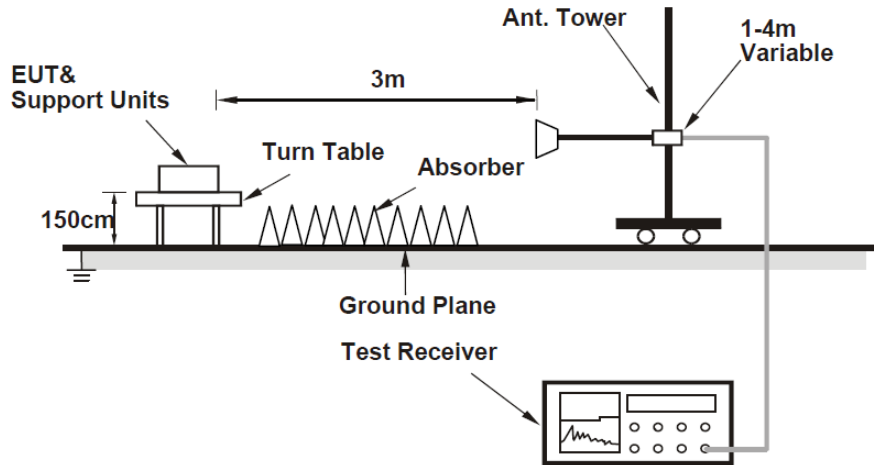
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



**For Radiated emission above 1GHz**



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### **4.8.5 EUT Operating Conditions**

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

#### **4.8.6 Test Results**

##### **Radiated Emissions Range 9kHz~30MHz**

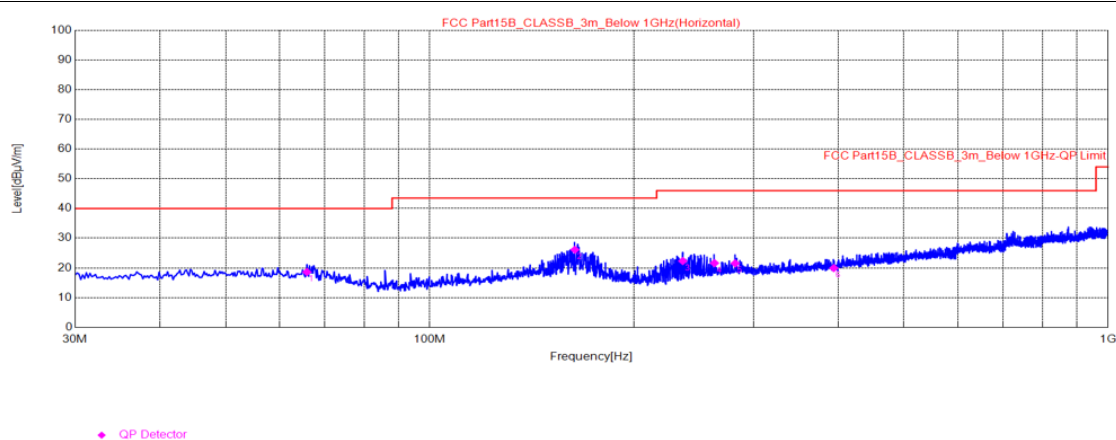
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

## Radiated Emissions Range 30MHz~1GHz

Below is the worst test data

|                 |              |                   |                 |
|-----------------|--------------|-------------------|-----------------|
| Channel         | BLE_2402     | Detector Function | Quasi-Peak (QP) |
| Frequency Range | 30MHz ~ 1GHz | Antenna Polarity  | Horizontal      |
| Test mode       | Working mode |                   |                 |

Test Plot:



### Final Data List

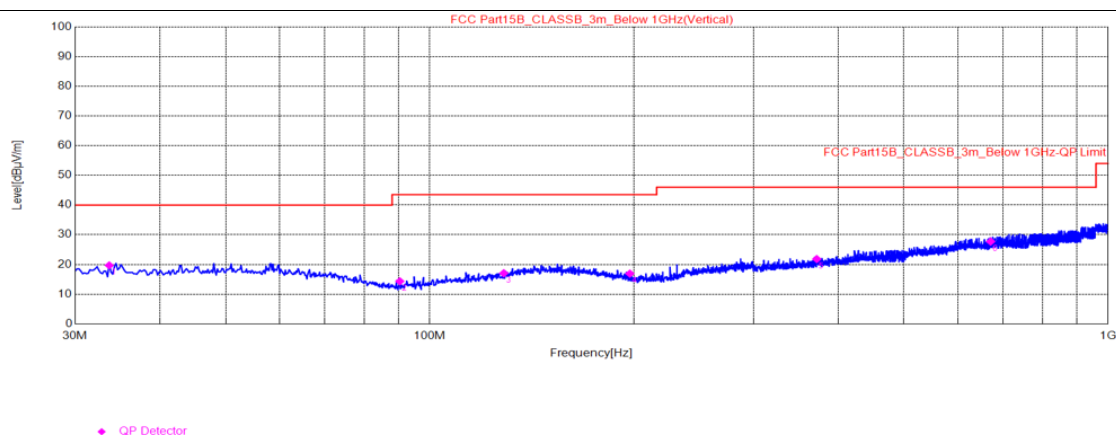
| NO. | Freq.[MHz] | Reading [dBμV] | Factor [dB] | Value [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle[°] | Polarity   |
|-----|------------|----------------|-------------|----------------|----------------|-------------|----------|-------------|----------|------------|
| 1   | 65.89      | 30.25          | -11.65      | 18.60          | 40.00          | 21.40       | QP       | 126         | 292      | Horizontal |
| 2   | 163.67     | 36.5           | -10.40      | 26.10          | 43.50          | 17.40       | QP       | 134         | 273      | Horizontal |
| 3   | 236.03     | 33.73          | -11.43      | 22.30          | 46.00          | 23.70       | QP       | 120         | 108      | Horizontal |
| 4   | 262.80     | 31.71          | -10.11      | 21.60          | 46.00          | 24.40       | QP       | 158         | 120      | Horizontal |
| 5   | 282.01     | 30.82          | -9.31       | 21.51          | 46.00          | 24.49       | QP       | 169         | 94       | Horizontal |
| 6   | 394.14     | 26.99          | -7.06       | 19.93          | 46.00          | 26.07       | QP       | 170         | 23       | Horizontal |

### REMARKS:

- Emission Level(dBuV/m) = Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

|                        |              |                          |                 |
|------------------------|--------------|--------------------------|-----------------|
| <b>Channel</b>         | BLE_2402     | <b>Detector Function</b> | Quasi-Peak (QP) |
| <b>Frequency Range</b> | 30MHz ~ 1GHz | <b>Antenna Polarity</b>  | Vertical        |
| <b>Test mode</b>       | Working mode |                          |                 |

Test Plot:



#### Final Data List

| NO. | Freq.[MHz] | Reading [dBμV] | Factor [dB] | Value [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Height [cm] | Angle[°] | Polarity |
|-----|------------|----------------|-------------|----------------|----------------|-------------|----------|-------------|----------|----------|
| 1   | 33.69      | 31.64          | -11.97      | 19.67          | 40.00          | 20.33       | QP       | 110         | 127      | Vertical |
| 2   | 90.33      | 30.05          | -15.73      | 14.32          | 43.50          | 29.18       | QP       | 152         | 55       | Vertical |
| 3   | 128.55     | 29.14          | -12.11      | 17.03          | 43.50          | 26.47       | QP       | 104         | 286      | Vertical |
| 4   | 197.23     | 29.75          | -12.84      | 16.91          | 43.50          | 26.59       | QP       | 169         | 303      | Vertical |
| 5   | 372.02     | 29.14          | -7.33       | 21.81          | 46.00          | 24.19       | QP       | 134         | 102      | Vertical |
| 6   | 671.17     | 29.35          | -1.65       | 27.70          | 46.00          | 18.30       | QP       | 165         | 309      | Vertical |

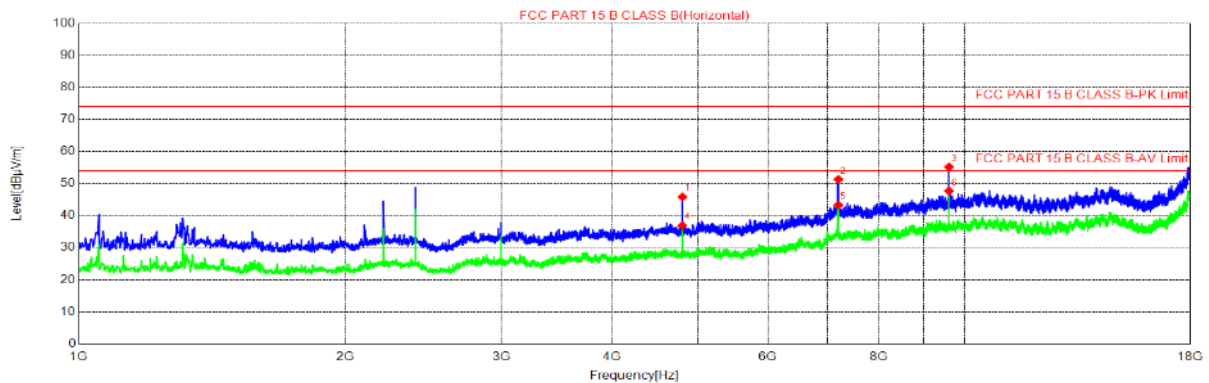
#### REMARKS:

- Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

## Radiated Emission Range 1GHz~10th Harmonic

Below is the worst test data

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE1M_2402_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

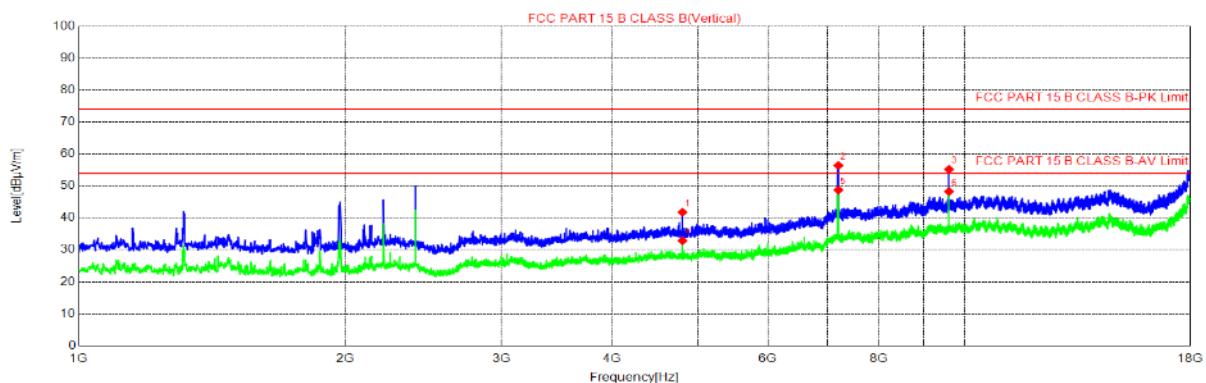


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4804.60         | 45.82                   | 74.00          | 28.18       | -2.95                    | H                | PK       |
| 2                       | 7206.70         | 51.32                   | 74.00          | 22.68       | 4.07                     | H                | PK       |
| 3                       | 9608.80         | 55.18                   | 74.00          | 18.82       | 9.95                     | H                | PK       |
| 4                       | 4802.90         | 36.88                   | 54.00          | 17.12       | -2.95                    | H                | AV       |
| 5                       | 7206.70         | 43.30                   | 54.00          | 10.70       | 4.07                     | H                | AV       |
| 6                       | 9608.80         | 47.70                   | 54.00          | 6.30        | 9.95                     | H                | AV       |

### REMARKS:

1. Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE1M_2402_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

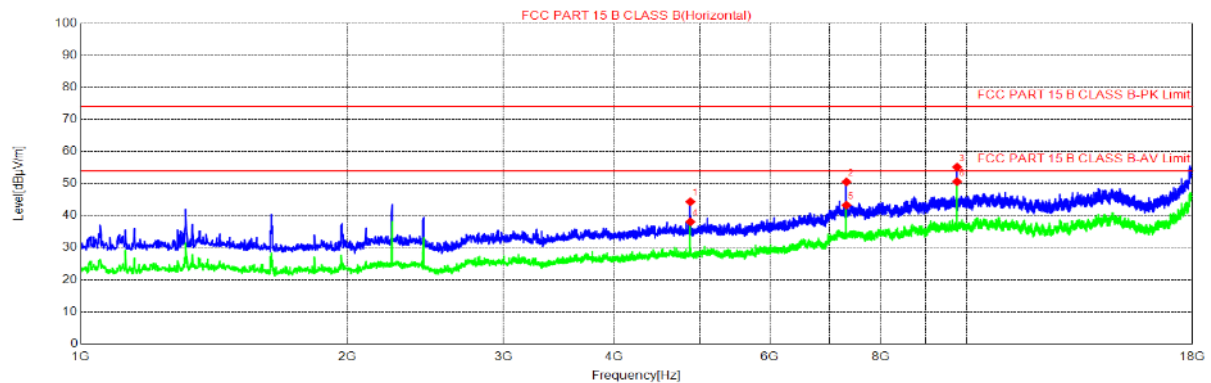


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4804.60         | 41.77                   | 74.00          | 32.23       | -2.95                    | V                | PK       |
| 2                       | 7206.70         | 56.41                   | 74.00          | 17.59       | 4.07                     | V                | PK       |
| 3                       | 9608.80         | 55.21                   | 74.00          | 18.79       | 9.95                     | V                | PK       |
| 4                       | 4804.60         | 32.85                   | 54.00          | 21.15       | -2.95                    | V                | AV       |
| 5                       | 7206.70         | 48.73                   | 54.00          | 5.27        | 4.07                     | V                | AV       |
| 6                       | 9608.80         | 48.27                   | 54.00          | 5.73        | 9.95                     | V                | AV       |

#### REMARKS:

- Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

|                        |                 |                          |              |
|------------------------|-----------------|--------------------------|--------------|
| <b>Channel</b>         | BLE1M_2440_Ant1 | <b>Detector Function</b> | Peak (PK)    |
| <b>Frequency Range</b> | 1GHz ~ 25GHz    |                          | Average (AV) |

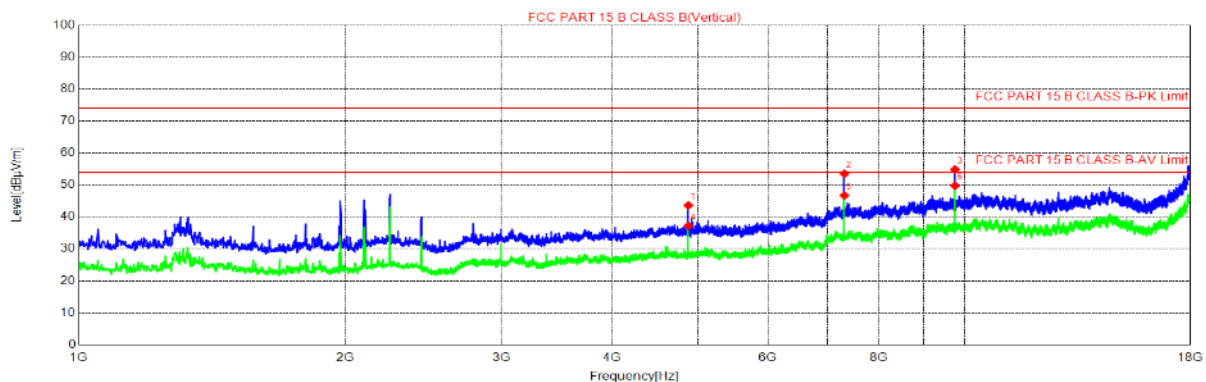


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4879.40         | 44.32                   | 74.00          | 29.68       | -2.74                    | H                | PK       |
| 2                       | 7320.60         | 50.51                   | 74.00          | 23.49       | 3.55                     | H                | PK       |
| 3                       | 9760.10         | 55.14                   | 74.00          | 18.86       | 9.21                     | H                | PK       |
| 4                       | 4879.40         | 38.06                   | 54.00          | 15.94       | -2.74                    | H                | AV       |
| 5                       | 7320.60         | 43.26                   | 54.00          | 10.74       | 3.55                     | H                | AV       |
| 6                       | 9760.10         | 50.59                   | 54.00          | 3.41        | 9.21                     | H                | AV       |

#### REMARKS:

- Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE1M_2440_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

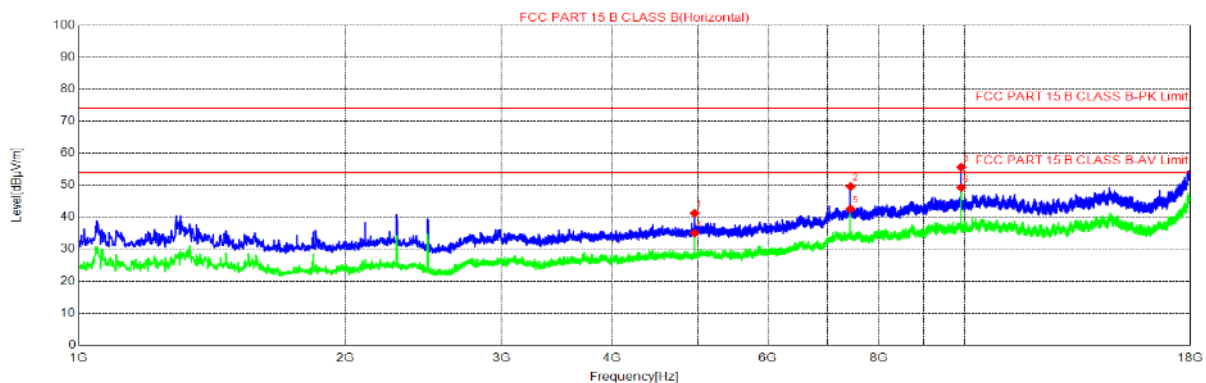


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4879.40         | 43.61                   | 74.00          | 30.39       | -2.74                    | V                | PK       |
| 2                       | 7320.60         | 53.52                   | 74.00          | 20.48       | 3.55                     | V                | PK       |
| 3                       | 9760.10         | 54.84                   | 74.00          | 19.16       | 9.21                     | V                | PK       |
| 4                       | 4879.40         | 37.23                   | 54.00          | 16.77       | -2.74                    | V                | AV       |
| 5                       | 7320.60         | 46.72                   | 54.00          | 7.28        | 3.55                     | V                | AV       |
| 6                       | 9760.10         | 49.78                   | 54.00          | 4.22        | 9.21                     | V                | AV       |

#### REMARKS:

1. Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission Level

|                        |                 |                          |              |
|------------------------|-----------------|--------------------------|--------------|
| <b>Channel</b>         | BLE1M_2480_Ant1 | <b>Detector Function</b> | Peak (PK)    |
| <b>Frequency Range</b> | 1GHz ~ 25GHz    |                          | Average (AV) |

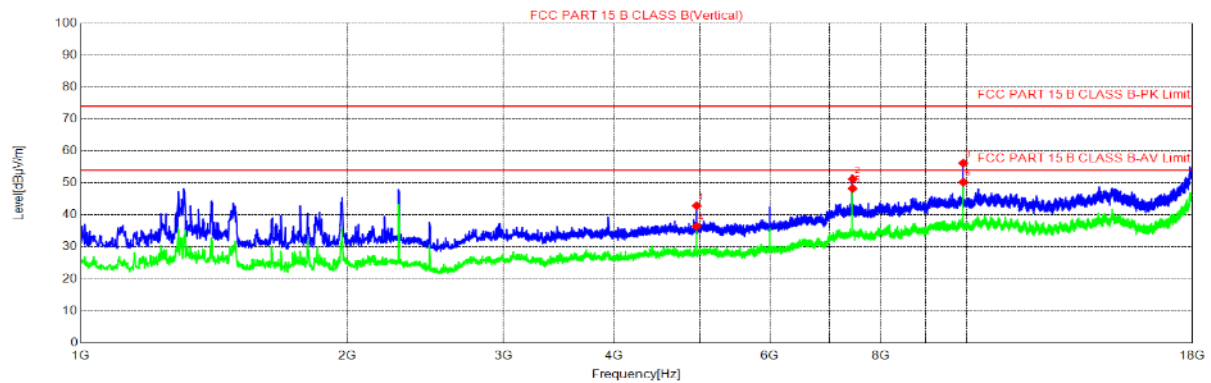


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4959.30         | 41.21                   | 74.00          | 32.79       | -2.52                    | H                | PK       |
| 2                       | 7439.60         | 49.60                   | 74.00          | 24.40       | 4.14                     | H                | PK       |
| 3                       | 9919.90         | 55.64                   | 74.00          | 18.36       | 9.12                     | H                | PK       |
| 4                       | 4959.30         | 35.01                   | 54.00          | 18.99       | -2.52                    | H                | AV       |
| 5                       | 7439.60         | 42.58                   | 54.00          | 11.42       | 4.14                     | H                | AV       |
| 6                       | 9919.90         | 49.27                   | 54.00          | 4.73        | 9.12                     | H                | AV       |

#### REMARKS:

- Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE1M_2480_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

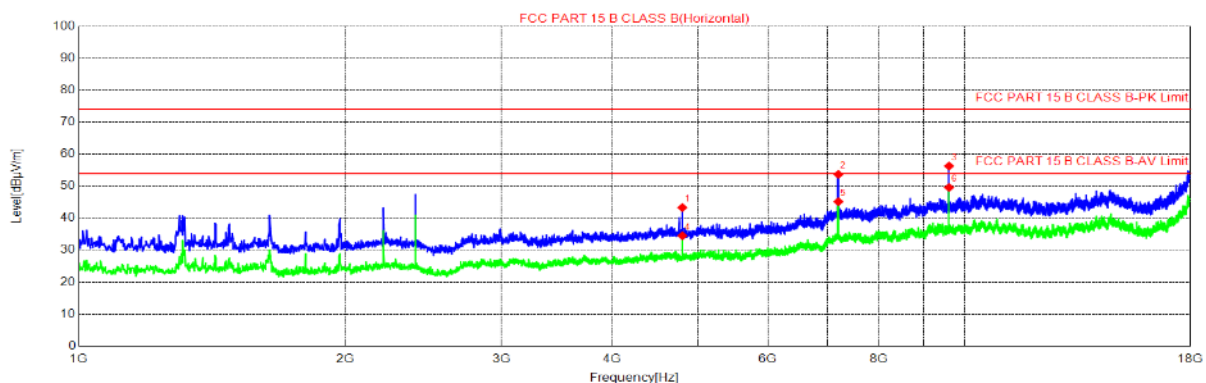


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4959.30         | 42.88                   | 74.00          | 31.12       | -2.52                    | V                | PK       |
| 2                       | 7441.30         | 51.26                   | 74.00          | 22.74       | 4.14                     | V                | PK       |
| 3                       | 9919.90         | 56.23                   | 74.00          | 17.77       | 9.12                     | V                | PK       |
| 4                       | 4959.30         | 36.49                   | 54.00          | 17.51       | -2.52                    | V                | AV       |
| 5                       | 7439.60         | 48.28                   | 54.00          | 5.72        | 4.14                     | V                | AV       |
| 6                       | 9919.90         | 50.27                   | 54.00          | 3.73        | 9.12                     | V                | AV       |

#### REMARKS:

- Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE2M_2402_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

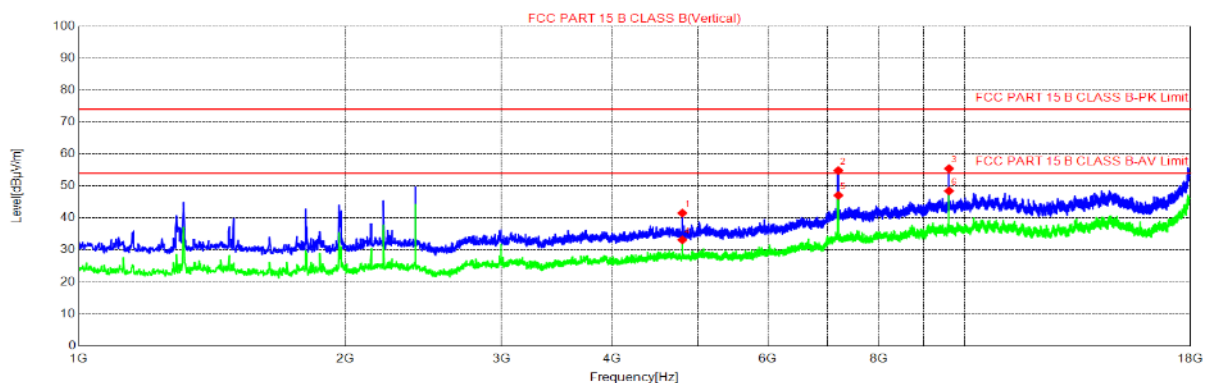


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4802.90         | 43.29                   | 74.00          | 30.71       | -2.95                    | H                | PK       |
| 2                       | 7206.70         | 53.68                   | 74.00          | 20.32       | 4.07                     | H                | PK       |
| 3                       | 9608.80         | 56.29                   | 74.00          | 17.71       | 9.95                     | H                | PK       |
| 4                       | 4802.90         | 34.49                   | 54.00          | 19.51       | -2.95                    | H                | AV       |
| 5                       | 7206.70         | 45.15                   | 54.00          | 8.85        | 4.07                     | H                | AV       |
| 6                       | 9608.80         | 49.59                   | 54.00          | 4.41        | 9.95                     | H                | AV       |

#### REMARKS:

- Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE2M_2402_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

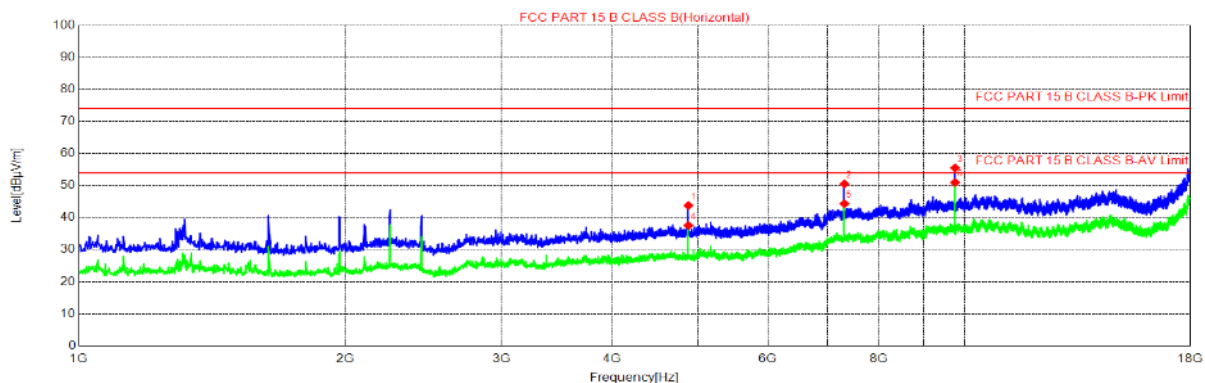


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4802.90         | 41.54                   | 74.00          | 32.46       | -2.95                    | V                | PK       |
| 2                       | 7205.00         | 54.86                   | 74.00          | 19.14       | 4.07                     | V                | PK       |
| 3                       | 9608.80         | 55.47                   | 74.00          | 18.53       | 9.95                     | V                | PK       |
| 4                       | 4802.90         | 33.16                   | 54.00          | 20.84       | -2.95                    | V                | AV       |
| 5                       | 7206.70         | 47.08                   | 54.00          | 6.92        | 4.07                     | V                | AV       |
| 6                       | 9608.80         | 48.47                   | 54.00          | 5.53        | 9.95                     | V                | AV       |

#### REMARKS:

- Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE2M_2440_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

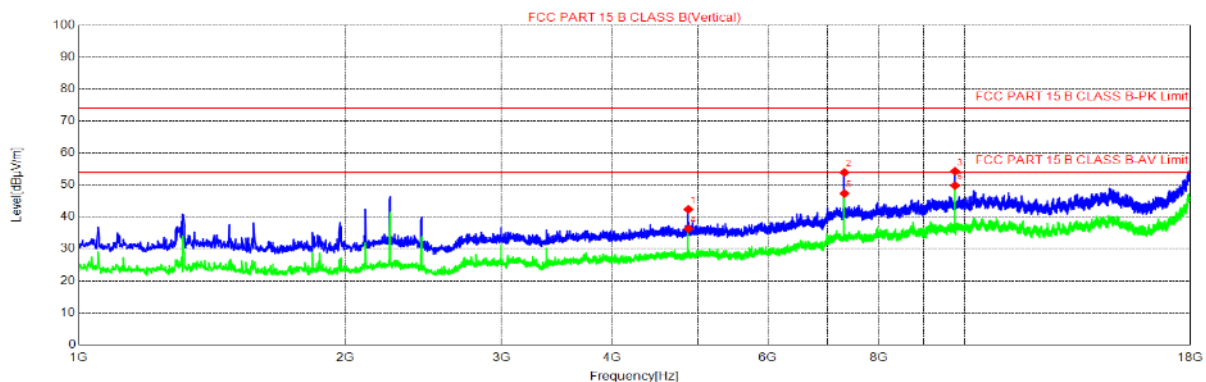


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4879.40         | 43.78                   | 74.00          | 30.22       | -2.74                    | H                | PK       |
| 2                       | 7320.60         | 50.52                   | 74.00          | 23.48       | 3.55                     | H                | PK       |
| 3                       | 9760.10         | 55.51                   | 74.00          | 18.49       | 9.21                     | H                | PK       |
| 4                       | 4879.40         | 37.55                   | 54.00          | 16.45       | -2.74                    | H                | AV       |
| 5                       | 7320.60         | 44.34                   | 54.00          | 9.66        | 3.55                     | H                | AV       |
| 6                       | 9760.10         | 50.97                   | 54.00          | 3.03        | 9.21                     | H                | AV       |

#### REMARKS:

1. Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE2M_2440_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

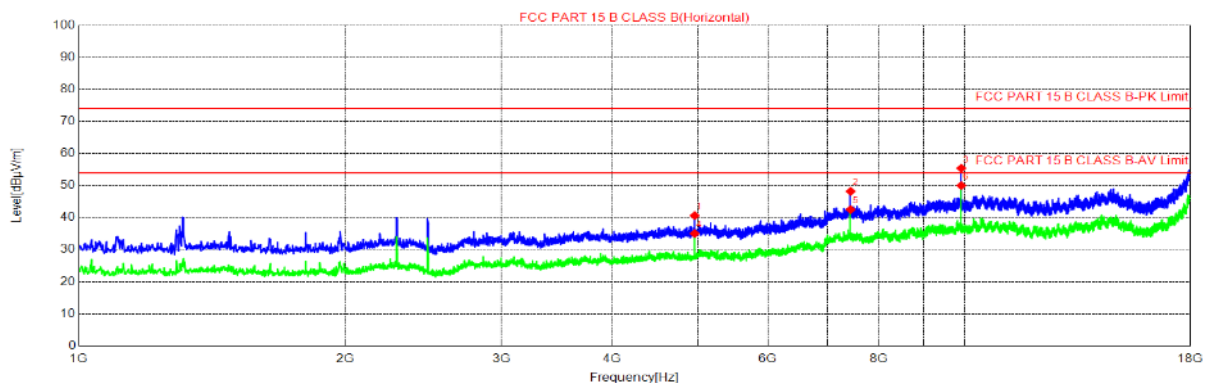


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4879.40         | 42.36                   | 74.00          | 31.64       | -2.74                    | V                | PK       |
| 2                       | 7320.60         | 53.90                   | 74.00          | 20.10       | 3.55                     | V                | PK       |
| 3                       | 9760.10         | 54.28                   | 74.00          | 19.72       | 9.21                     | V                | PK       |
| 4                       | 4879.40         | 36.28                   | 54.00          | 17.72       | -2.74                    | V                | AV       |
| 5                       | 7320.60         | 47.32                   | 54.00          | 6.68        | 3.55                     | V                | AV       |
| 6                       | 9760.10         | 49.82                   | 54.00          | 4.18        | 9.21                     | V                | AV       |

#### REMARKS:

1. Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE2M_2480_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |

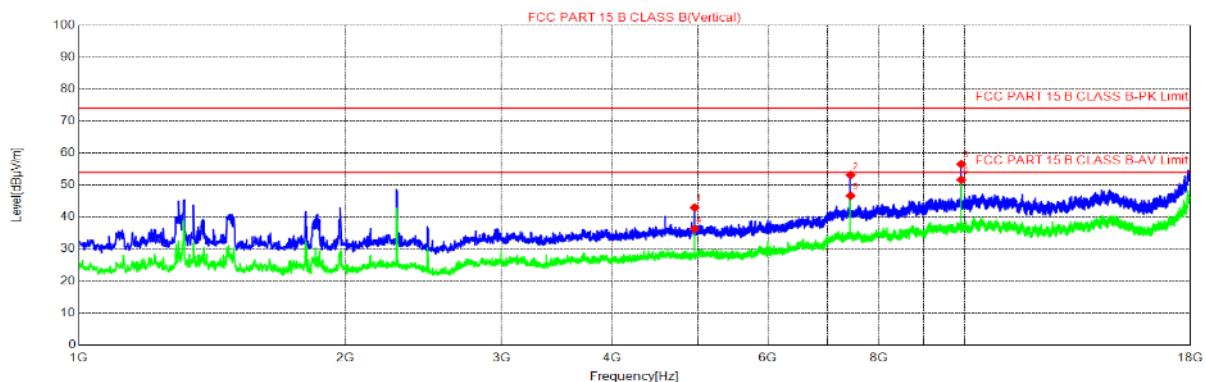


| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4959.30         | 40.62                   | 74.00          | 33.38       | -2.52                    | H                | PK       |
| 2                       | 7439.60         | 48.19                   | 74.00          | 25.81       | 4.14                     | H                | PK       |
| 3                       | 9919.90         | 55.41                   | 74.00          | 18.59       | 9.12                     | H                | PK       |
| 4                       | 4959.30         | 35.02                   | 54.00          | 18.98       | -2.52                    | H                | AV       |
| 5                       | 7439.60         | 42.51                   | 54.00          | 11.49       | 4.14                     | H                | AV       |
| 6                       | 9919.90         | 50.00                   | 54.00          | 4.00        | 9.12                     | H                | AV       |

#### REMARKS:

1. Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission Level

|                 |                 |                   |              |
|-----------------|-----------------|-------------------|--------------|
| Channel         | BLE2M_2480_Ant1 | Detector Function | Peak (PK)    |
| Frequency Range | 1GHz ~ 25GHz    |                   | Average (AV) |



| Spurious Emission Level |                 |                         |                |             |                          |                  |          |
|-------------------------|-----------------|-------------------------|----------------|-------------|--------------------------|------------------|----------|
| No.                     | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Correction Factor (dB/m) | Antenna Polarity | Detector |
| 1                       | 4959.30         | 42.97                   | 74.00          | 31.03       | -2.52                    | V                | PK       |
| 2                       | 7439.60         | 53.15                   | 74.00          | 20.85       | 4.14                     | V                | PK       |
| 3                       | 9919.90         | 56.57                   | 74.00          | 17.43       | 9.12                     | V                | PK       |
| 4                       | 4959.30         | 36.30                   | 54.00          | 17.70       | -2.52                    | V                | AV       |
| 5                       | 7439.60         | 46.69                   | 54.00          | 7.31        | 4.14                     | V                | AV       |
| 6                       | 9919.90         | 51.67                   | 54.00          | 2.33        | 9.12                     | V                | AV       |

#### REMARKS:

1. Emission Level(dBuV/m) = Original Spectrum reading (dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission Level

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

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