

### 11.3. LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/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: All modes were tested For restricted band radiated emission,  
the test records reported below are the worst result compared to other modes.

### 11.4. TEST RESULT

#### RADIATED EMISSION BELOW 30MHZ

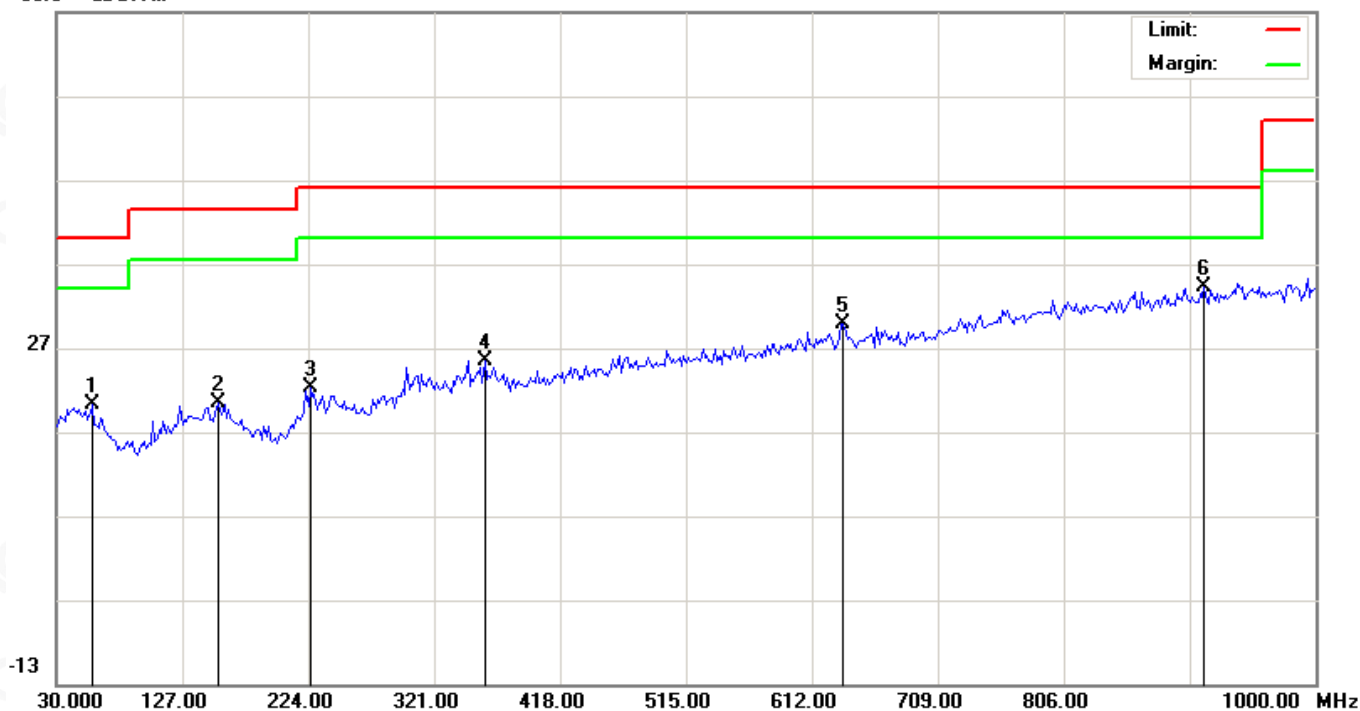
No emission found between lowest internal used/generated frequencies to 30MHz.



### RADIATED EMISSION BELOW 1GHZ

|             |                  |                   |                |
|-------------|------------------|-------------------|----------------|
| EUT         | Bluetooth Module | Model Name        | FSC-BT836B     |
| Temperature | 25° C            | Relative Humidity | 55.4%          |
| Pressure    | 960hPa           | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 1           | Antenna           | Horizontal     |

66.9 dBuV/m

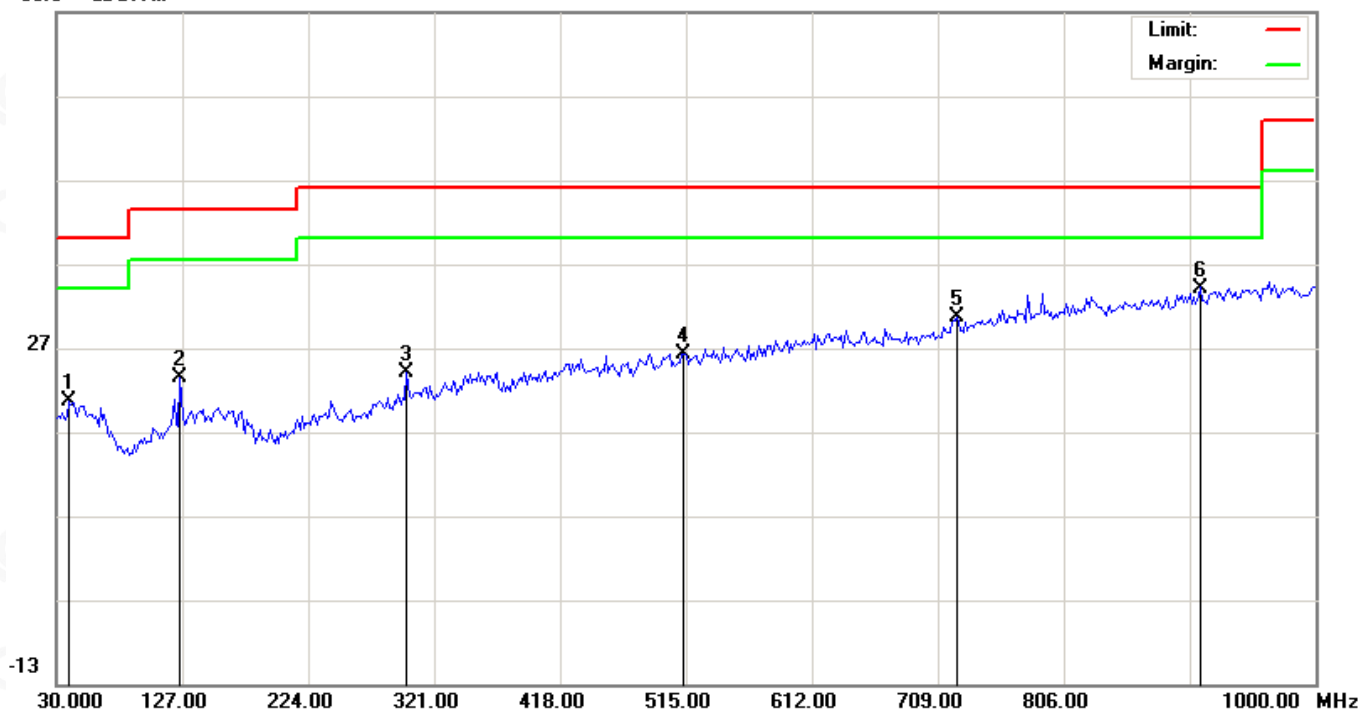


| No. | Mk | Freq.    | Reading     | Factor      | Measurement   | Limit         | Over      | Detector |
|-----|----|----------|-------------|-------------|---------------|---------------|-----------|----------|
|     |    | MHz      | <u>dBuV</u> | <u>dB/m</u> | <u>dBuV/m</u> | <u>dBuV/m</u> | <u>dB</u> |          |
| 1   |    | 57.4833  | 1.12        | 19.09       | 20.21         | 40.00         | -19.79    | peak     |
| 2   |    | 154.4832 | 1.12        | 19.20       | 20.32         | 43.50         | -23.18    | peak     |
| 3   |    | 225.6167 | 4.58        | 17.64       | 22.22         | 46.00         | -23.78    | peak     |
| 4   |    | 359.8000 | 3.79        | 21.57       | 25.36         | 46.00         | -20.64    | peak     |
| 5   |    | 636.2500 | 2.45        | 27.38       | 29.83         | 46.00         | -16.17    | peak     |
| 6   | *  | 914.3167 | 2.30        | 31.82       | 34.12         | 46.00         | -11.88    | peak     |

**RESULT: PASS**


|             |                  |                   |                |
|-------------|------------------|-------------------|----------------|
| EUT         | Bluetooth Module | Model Name        | FSC-BT836B     |
| Temperature | 25° C            | Relative Humidity | 55.4%          |
| Pressure    | 960hPa           | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 1           | Antenna           | Vertical       |

66.9 dBuV/m



| No. | Mk | Freq.<br>MHz | Reading<br>dBuV | Factor<br>dB/m | Measurement<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector |
|-----|----|--------------|-----------------|----------------|-----------------------|-----------------|------------|----------|
| 1   |    | 39.7000      | 0.68            | 19.98          | 20.66                 | 40.00           | -19.34     | peak     |
| 2   |    | 125.3833     | 5.07            | 18.31          | 23.38                 | 43.50           | -20.12     | peak     |
| 3   |    | 299.9833     | 4.59            | 19.47          | 24.06                 | 46.00           | -21.94     | peak     |
| 4   |    | 513.3832     | 1.00            | 25.25          | 26.25                 | 46.00           | -19.75     | peak     |
| 5   |    | 723.5500     | 1.92            | 28.68          | 30.60                 | 46.00           | -15.40     | peak     |
| 6   | *  | 911.0833     | 2.30            | 31.80          | 34.10                 | 46.00           | -11.90     | peak     |

## RESULT: PASS

### Note:

- Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
- All test modes had been tested. The mode 1 is the worst case and recorded in the report.



### RADIATED EMISSION ABOVE 1GHZ

|                    |                  |                          |                |
|--------------------|------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Module | <b>Model Name</b>        | FSC-BT836B     |
| <b>Temperature</b> | 25° C            | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa           | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 1           | <b>Antenna</b>           | Horizontal     |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4804.000           | 43.56                   | 0.08           | 43.64                      | 74                 | -30.36         | peak       |
| 4804.000           | 35.18                   | 0.08           | 35.26                      | 54                 | -18.74         | AVG        |
| 7206.000           | 38.92                   | 2.21           | 41.13                      | 74                 | -32.87         | peak       |
| 7206.000           | 32.43                   | 2.21           | 34.64                      | 54                 | -19.36         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                  |                          |                |
|--------------------|------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Module | <b>Model Name</b>        | FSC-BT836B     |
| <b>Temperature</b> | 25° C            | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa           | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 1           | <b>Antenna</b>           | Vertical       |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4804.000           | 42.59                   | 0.08           | 42.67                      | 74                 | -31.33         | peak       |
| 4804.000           | 34.33                   | 0.08           | 34.41                      | 54                 | -19.59         | AVG        |
| 7206.000           | 38.42                   | 2.21           | 40.63                      | 74                 | -33.37         | peak       |
| 7206.000           | 30.46                   | 2.21           | 32.67                      | 54                 | -21.33         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



|                    |                  |                          |                |
|--------------------|------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Module | <b>Model Name</b>        | FSC-BT836B     |
| <b>Temperature</b> | 25° C            | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa           | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 2           | <b>Antenna</b>           | Horizontal     |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4880.000           | 44.59                   | 0.14           | 44.73                      | 74                 | -29.27         | peak       |
| 4880.000           | 36.28                   | 0.14           | 36.42                      | 54                 | -17.58         | AVG        |
| 7320.000           | 40.13                   | 2.36           | 42.49                      | 74                 | -31.51         | peak       |
| 7320.000           | 32.56                   | 2.36           | 34.92                      | 54                 | -19.08         | AVG        |
|                    |                         |                |                            |                    |                |            |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                  |                          |                |
|--------------------|------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Module | <b>Model Name</b>        | FSC-BT836B     |
| <b>Temperature</b> | 25° C            | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa           | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 2           | <b>Antenna</b>           | Vertical       |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4880.000           | 43.89                   | 0.14           | 44.03                      | 74                 | -29.97         | peak       |
| 4880.000           | 36.82                   | 0.14           | 36.96                      | 54                 | -17.04         | AVG        |
| 7320.000           | 39.13                   | 2.36           | 41.49                      | 74                 | -32.51         | peak       |
| 7320.000           | 30.22                   | 2.36           | 32.58                      | 54                 | -21.42         | AVG        |
|                    |                         |                |                            |                    |                |            |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



|                    |                  |                          |                |
|--------------------|------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Module | <b>Model Name</b>        | FSC-BT836B     |
| <b>Temperature</b> | 25° C            | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa           | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 3           | <b>Antenna</b>           | Horizontal     |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4960.000           | 43.29                   | 0.22           | 43.51                      | 74                 | -30.49         | peak       |
| 4960.000           | 36.12                   | 0.22           | 36.34                      | 54                 | -17.66         | AVG        |
| 7440.000           | 38.12                   | 2.64           | 40.76                      | 74                 | -33.24         | peak       |
| 7440.000           | 30.79                   | 2.64           | 33.43                      | 54                 | -20.57         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                  |                          |                |
|--------------------|------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Module | <b>Model Name</b>        | FSC-BT836B     |
| <b>Temperature</b> | 25° C            | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa           | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 3           | <b>Antenna</b>           | Vertical       |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4960.000           | 42.58                   | 0.22           | 42.8                       | 74                 | -31.2          | peak       |
| 4960.000           | 34.56                   | 0.22           | 34.78                      | 54                 | -19.22         | AVG        |
| 7440.000           | 39.14                   | 2.64           | 41.78                      | 74                 | -32.22         | peak       |
| 7440.000           | 31.27                   | 2.64           | 33.91                      | 54                 | -20.09         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

**RESULT: PASS**

**Note:**

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

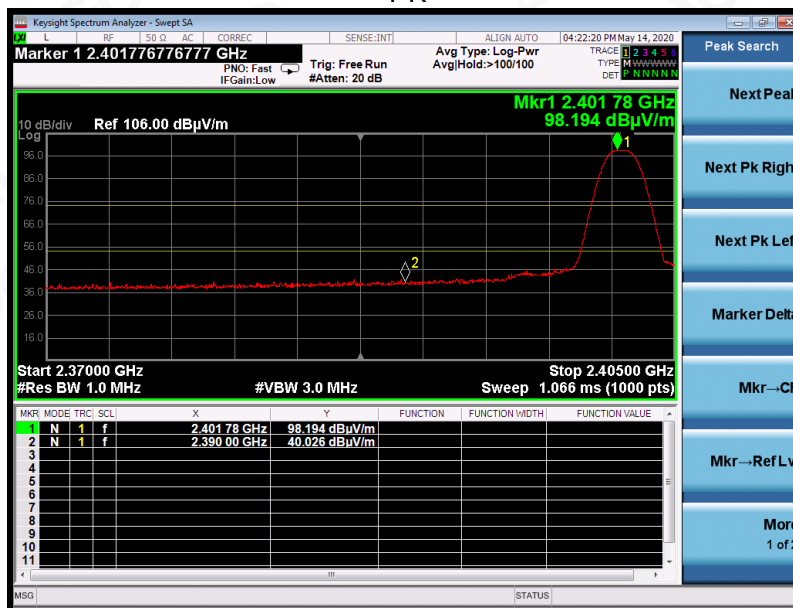
The "Factor" value can be calculated automatically by software of measurement system.



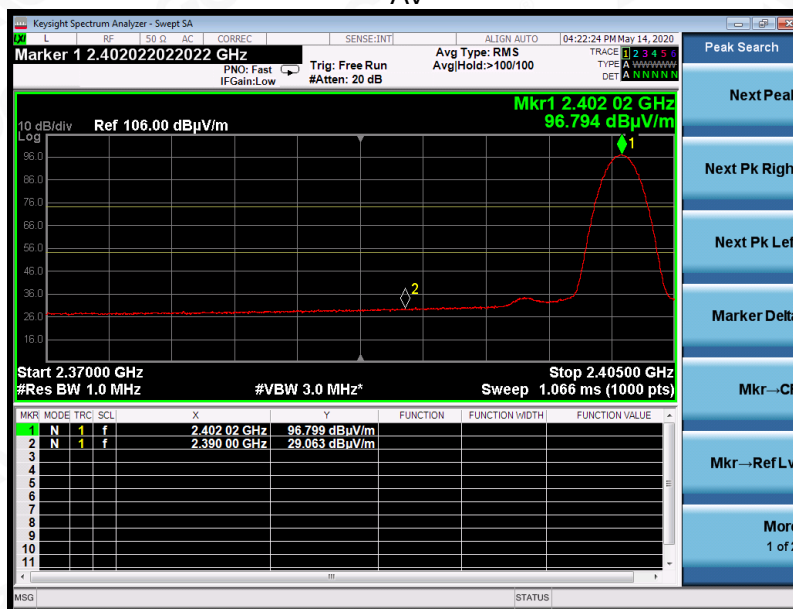
### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

|             |                  |                   |                |
|-------------|------------------|-------------------|----------------|
| EUT         | Bluetooth Module | Model Name        | FSC-BT836B     |
| Temperature | 25° C            | Relative Humidity | 55.4%          |
| Pressure    | 960hPa           | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 1           | Antenna           | Horizontal     |

PK



AV

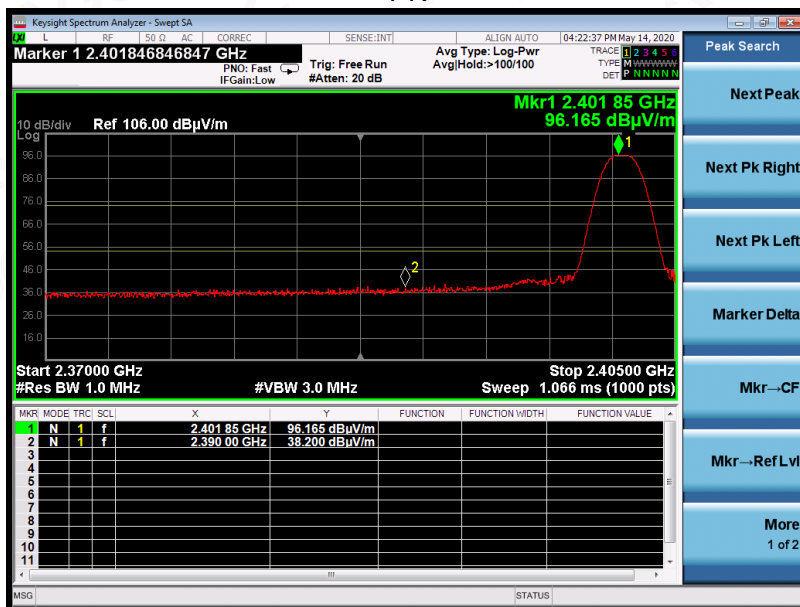


RESULT: PASS

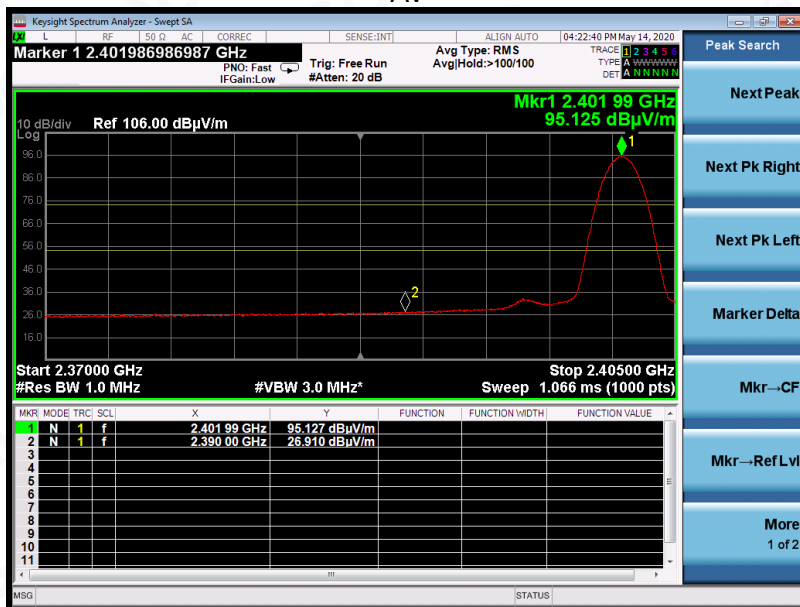


|             |                  |                   |                |
|-------------|------------------|-------------------|----------------|
| EUT         | Bluetooth Module | Model Name        | FSC-BT836B     |
| Temperature | 25° C            | Relative Humidity | 55.4%          |
| Pressure    | 960hPa           | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 1           | Antenna           | Vertical       |

PK



AV



RESULT: PASS

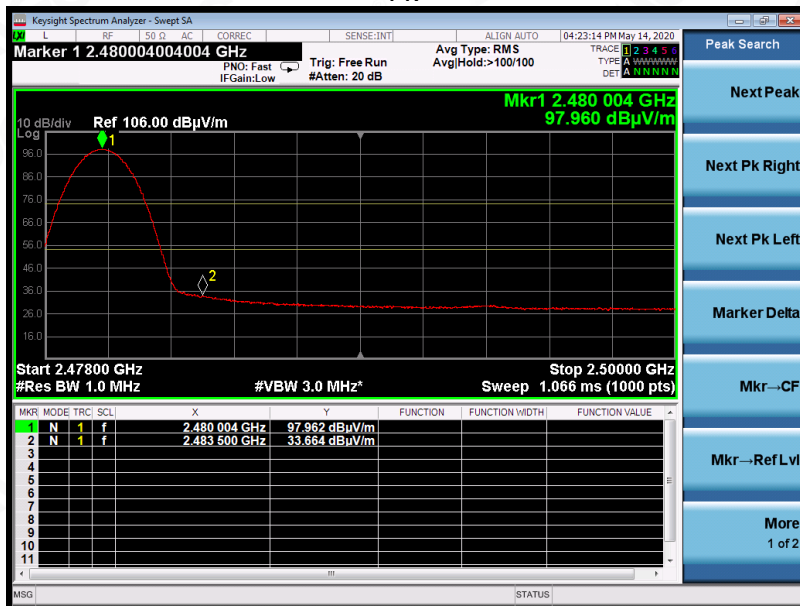


|             |                  |                   |                |
|-------------|------------------|-------------------|----------------|
| EUT         | Bluetooth Module | Model Name        | FSC-BT836B     |
| Temperature | 25° C            | Relative Humidity | 55.4%          |
| Pressure    | 960hPa           | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 3           | Antenna           | Horizontal     |

PK



AV

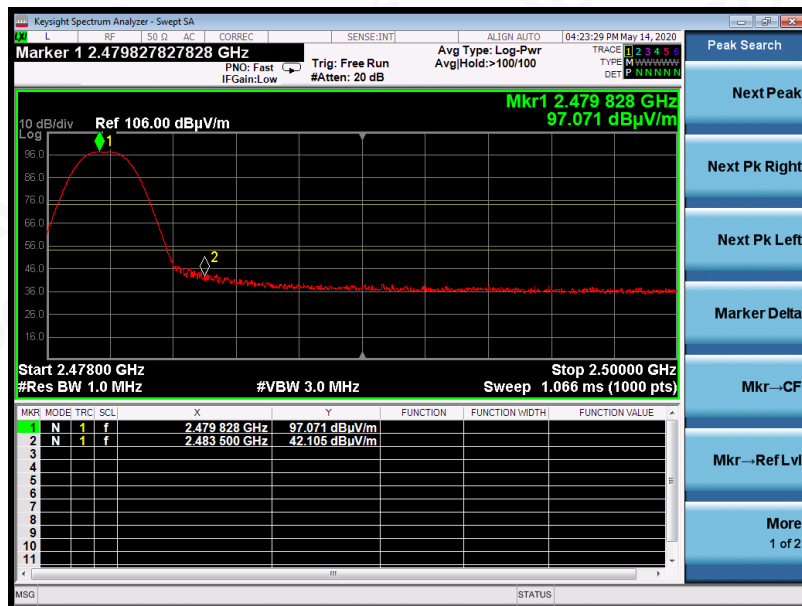


RESULT: PASS

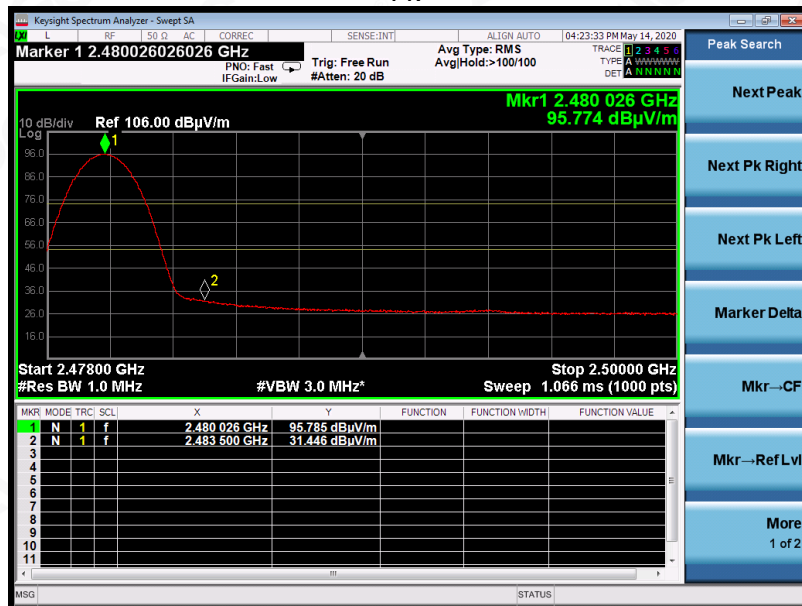


|             |                  |                   |                |
|-------------|------------------|-------------------|----------------|
| EUT         | Bluetooth Module | Model Name        | FSC-BT836B     |
| Temperature | 25° C            | Relative Humidity | 55.4%          |
| Pressure    | 960hPa           | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 3           | Antenna           | Vertical       |

PK



AV



## RESULT: PASS

**Note:** The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.



## 14. FCC LINE CONDUCTED EMISSION TEST

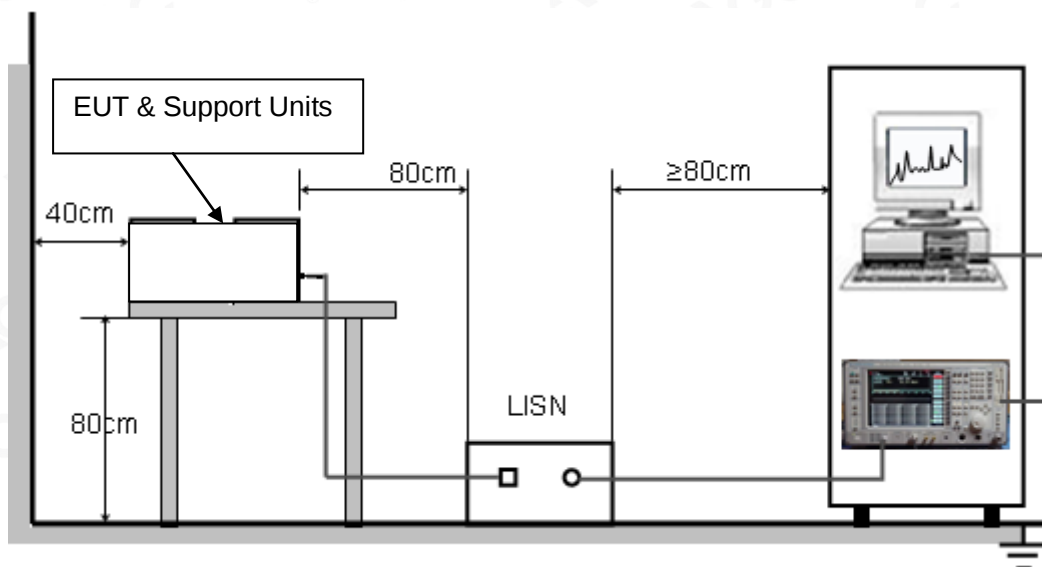
### 14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

| Frequency     | Maximum RF Line Voltage |                |
|---------------|-------------------------|----------------|
|               | Q.P.( dBuV)             | Average( dBuV) |
| 150kHz~500kHz | 66-56                   | 56-46          |
| 500kHz~5MHz   | 56                      | 46             |
| 5MHz~30MHz    | 60                      | 50             |

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



#### 14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 3.3V power from control board and PC which received AC120V/60Hz power from a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

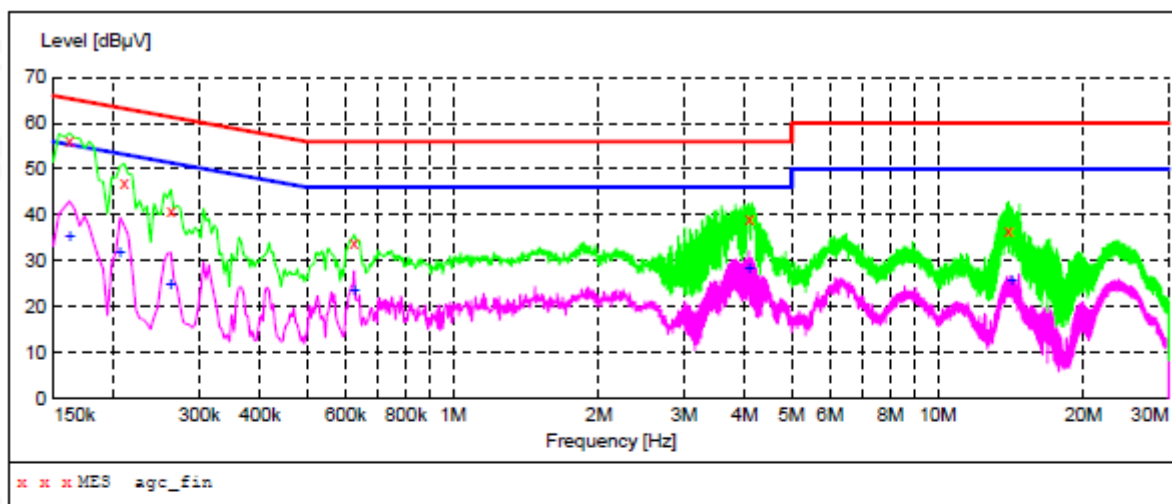
#### 14.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.



# 14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



## MEASUREMENT RESULT: "agc\_fin"

2020/5/15 1:44

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.162000         | 56.40         | 11.3         | 65            | 9.0          | QP       | L1   | GND |
| 0.210000         | 46.90         | 11.3         | 63            | 16.3         | QP       | L1   | GND |
| 0.262000         | 41.10         | 11.3         | 61            | 20.3         | QP       | L1   | GND |
| 0.626000         | 34.00         | 11.3         | 56            | 22.0         | QP       | L1   | GND |
| 4.086000         | 39.20         | 11.4         | 56            | 16.8         | QP       | L1   | GND |
| 14.010000        | 36.40         | 11.9         | 60            | 23.6         | QP       | L1   | GND |

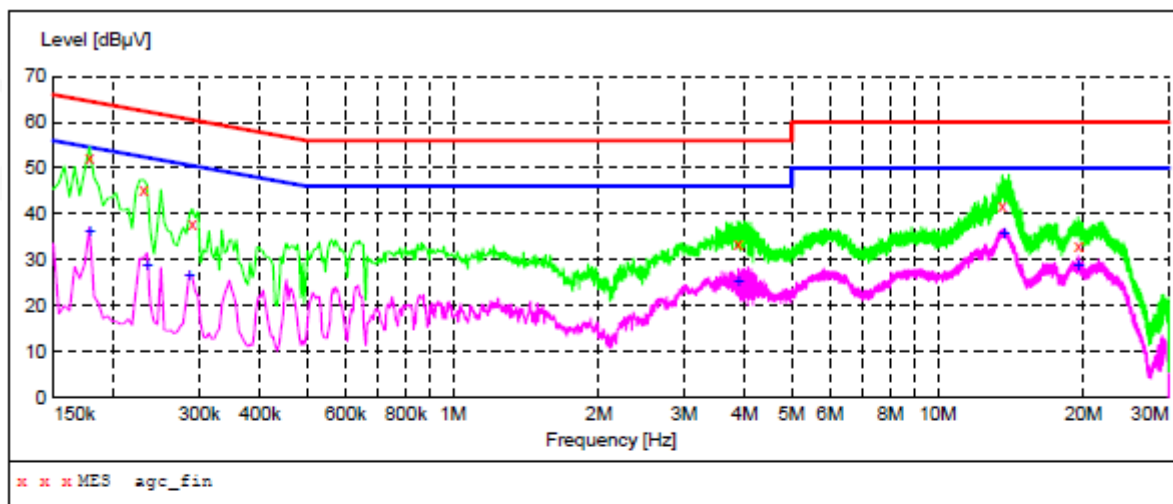
## MEASUREMENT RESULT: "agc\_fin2"

2020/5/15 1:45

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.162000         | 35.20         | 11.3         | 55            | 20.2         | AV       | L1   | GND |
| 0.206000         | 31.60         | 11.3         | 53            | 21.8         | AV       | L1   | GND |
| 0.262000         | 24.90         | 11.3         | 51            | 26.5         | AV       | L1   | GND |
| 0.626000         | 23.20         | 11.3         | 46            | 22.8         | AV       | L1   | GND |
| 4.086000         | 28.00         | 11.4         | 46            | 18.0         | AV       | L1   | GND |
| 14.194000        | 25.40         | 11.9         | 50            | 24.6         | AV       | L1   | GND |



### Line Conducted Emission Test Line 2-N



#### MEASUREMENT RESULT: "agc\_fin"

2020/5/15 1:48

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.178000         | 52.10         | 11.3         | 65            | 12.5         | QP       | N    | GND |
| 0.230000         | 45.10         | 11.3         | 62            | 17.3         | QP       | N    | GND |
| 0.290000         | 38.00         | 11.3         | 61            | 22.5         | QP       | N    | GND |
| 3.866000         | 33.60         | 11.4         | 56            | 22.4         | QP       | N    | GND |
| 13.610000        | 41.80         | 11.9         | 60            | 18.2         | QP       | N    | GND |
| 19.490000        | 33.20         | 12.3         | 60            | 26.8         | QP       | N    | GND |

#### MEASUREMENT RESULT: "agc\_fin2"

2020/5/15 1:48

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.178000         | 36.00         | 11.3         | 55            | 18.6         | AV       | N    | GND |
| 0.234000         | 28.50         | 11.3         | 52            | 23.8         | AV       | N    | GND |
| 0.286000         | 26.40         | 11.3         | 51            | 24.2         | AV       | N    | GND |
| 3.882000         | 25.30         | 11.4         | 46            | 20.7         | AV       | N    | GND |
| 13.722000        | 35.50         | 11.9         | 50            | 14.5         | AV       | N    | GND |
| 19.490000        | 28.50         | 12.3         | 50            | 21.5         | AV       | N    | GND |

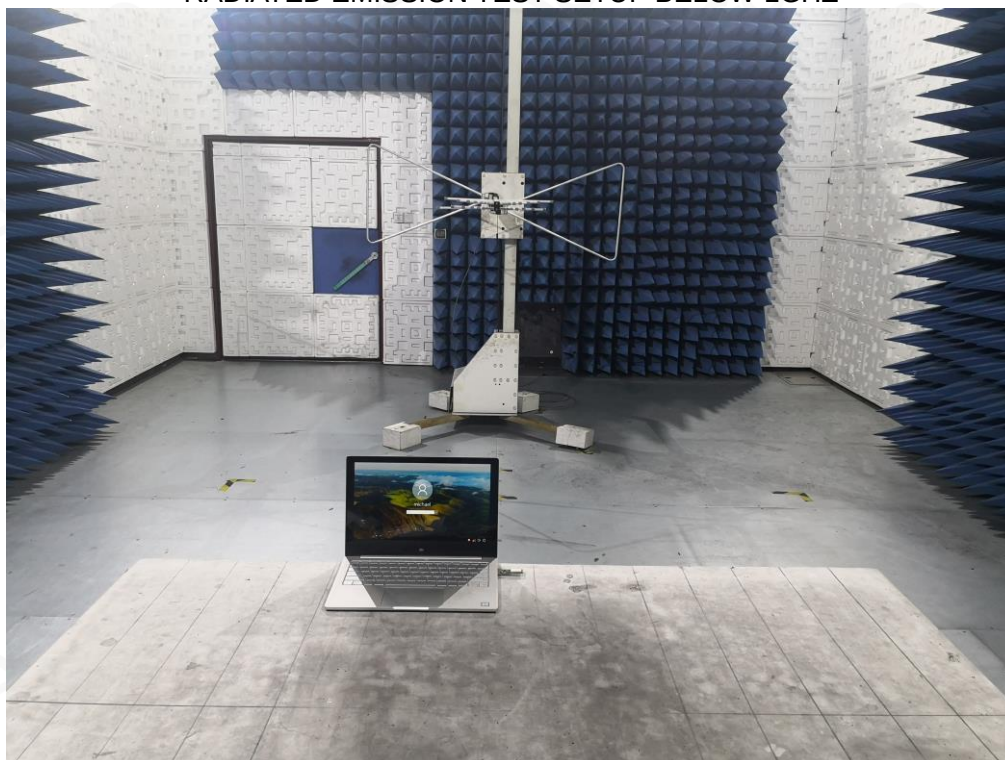
#### RESULT: PASS

Note: All the test modes had been tested, the mode 1 was the worst case. Only the data of the worst case would be record in this test report.



## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### RADIATED EMISSION TEST SETUP BELOW 1GHZ



### RADIATED EMISSION TEST SETUP ABOVE 1GHZ

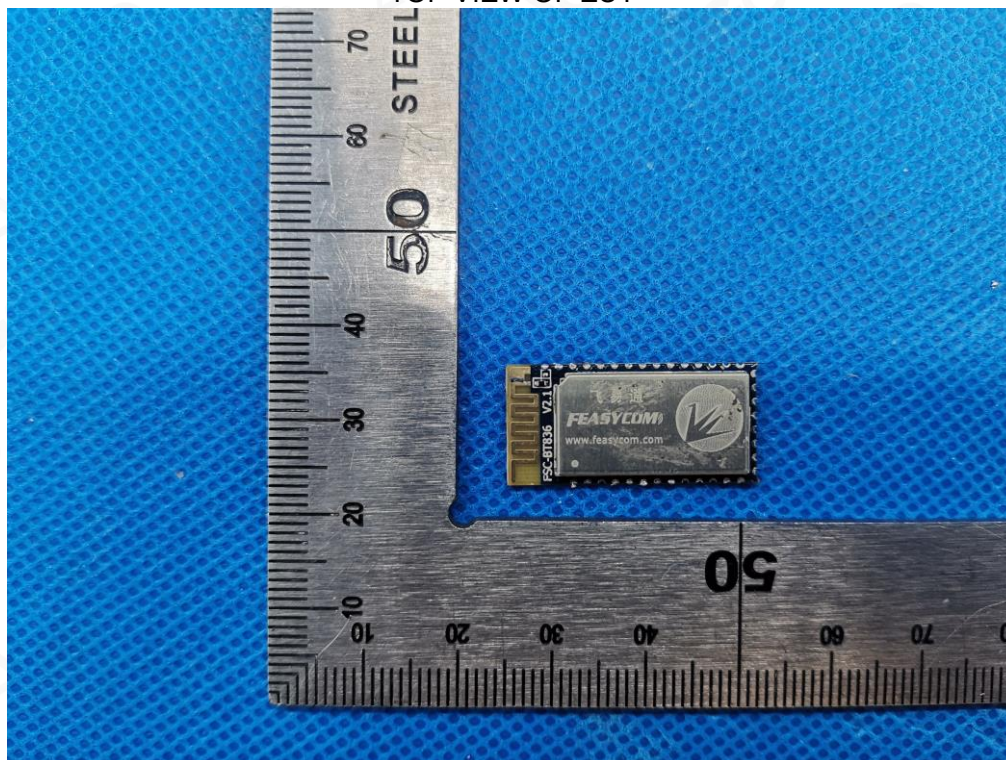


CONDUCTED EMISSION TEST SETUP

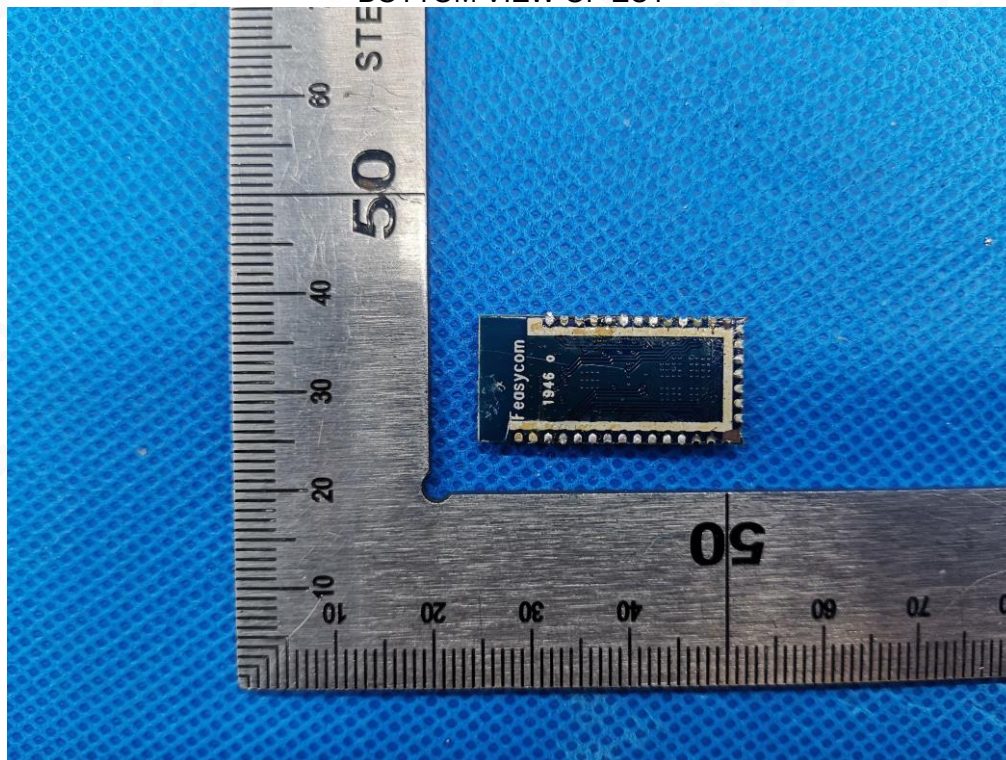


## APPENDIX B: PHOTOGRAPHS OF EUT

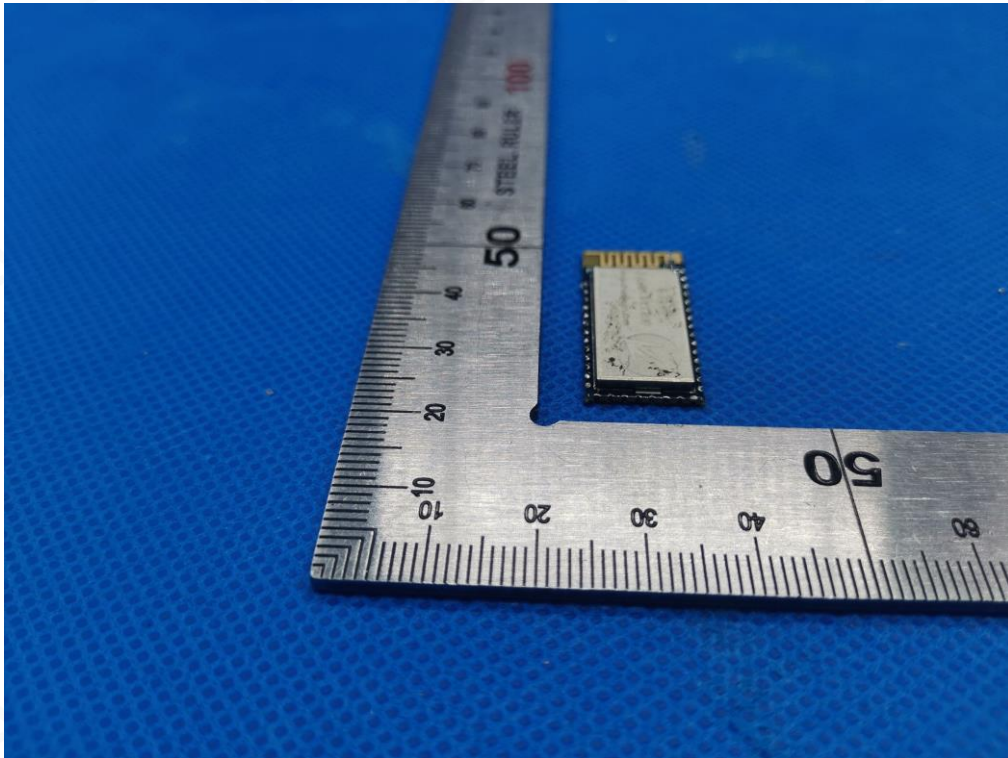
TOP VIEW OF EUT



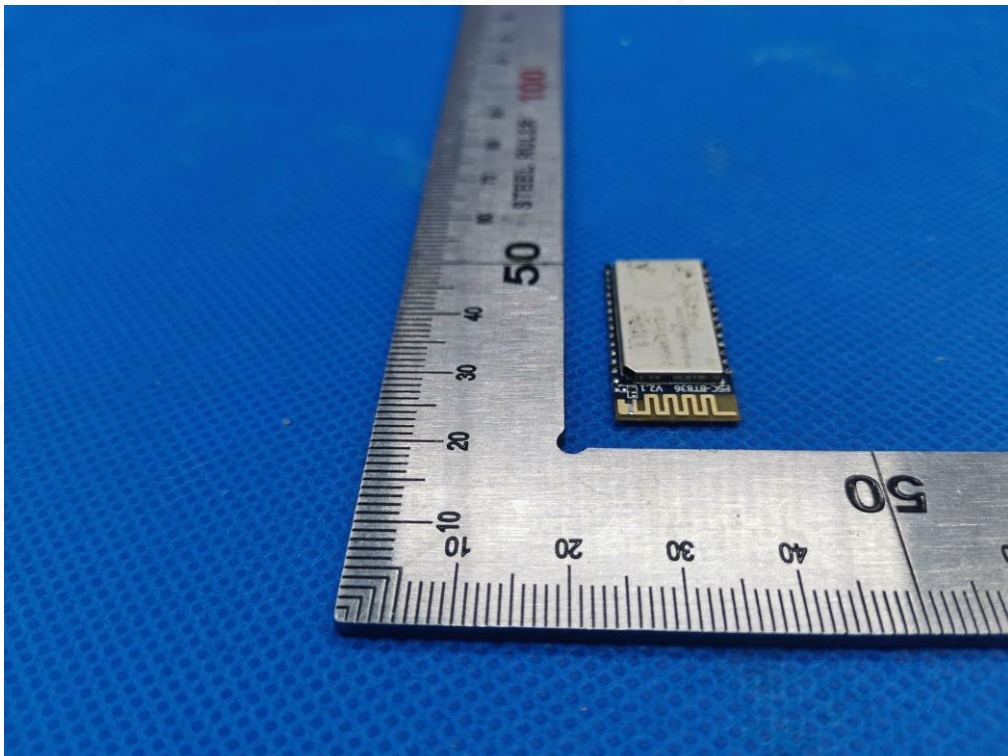
BOTTOM VIEW OF EUT



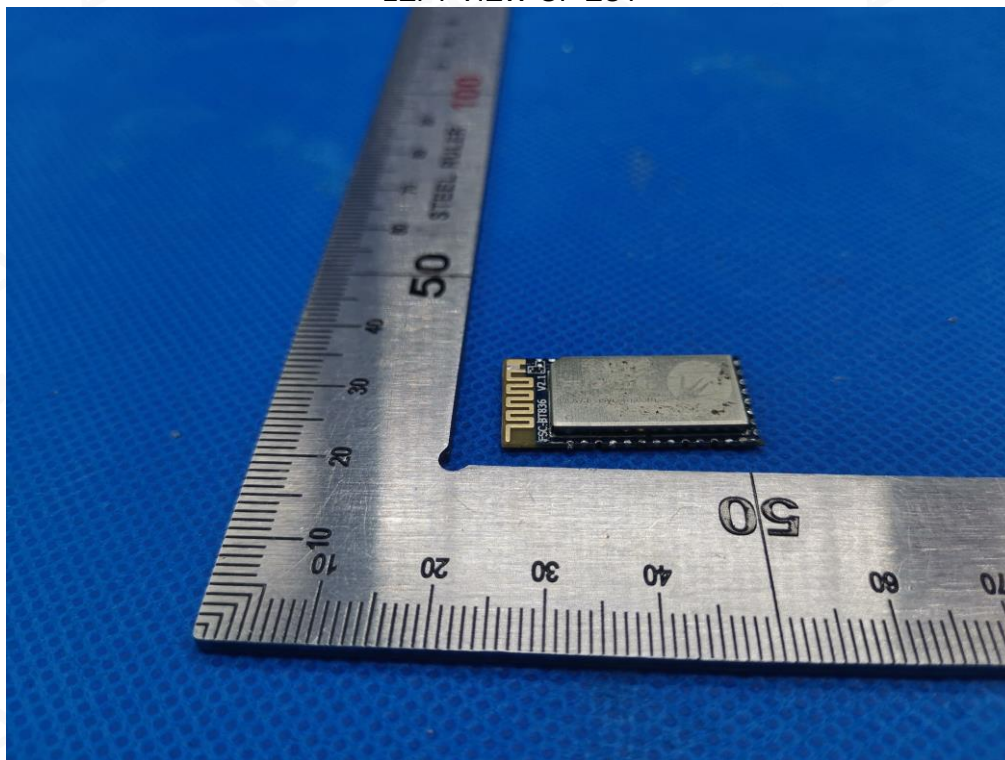
FRONT VIEW OF EUT



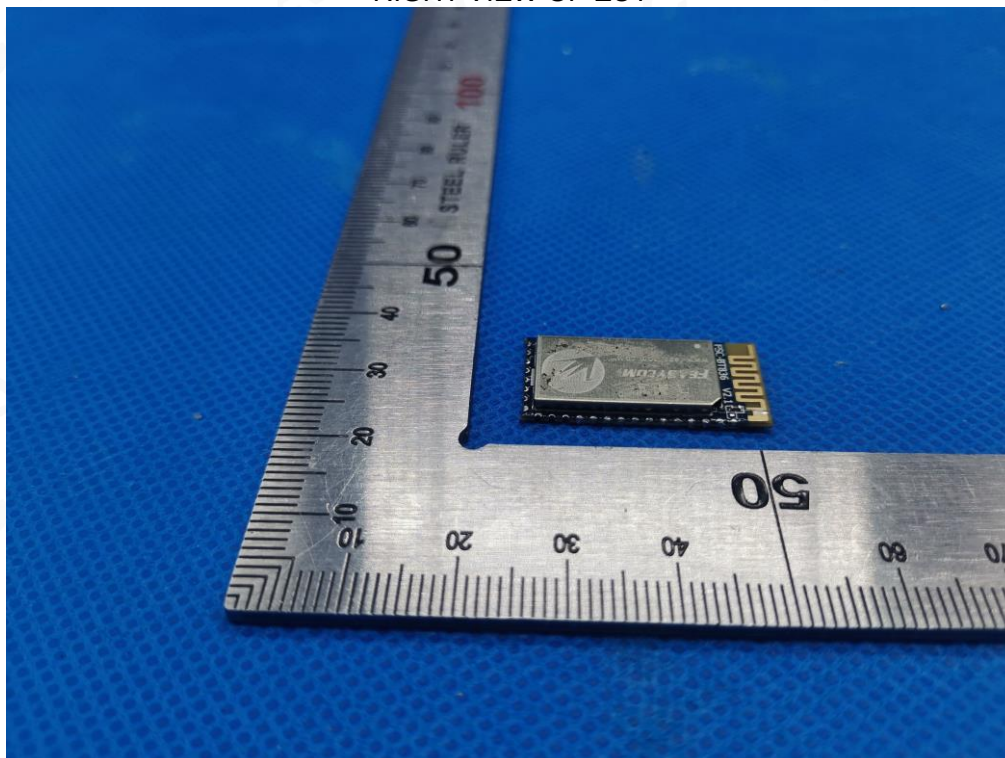
BACK VIEW OF EUT



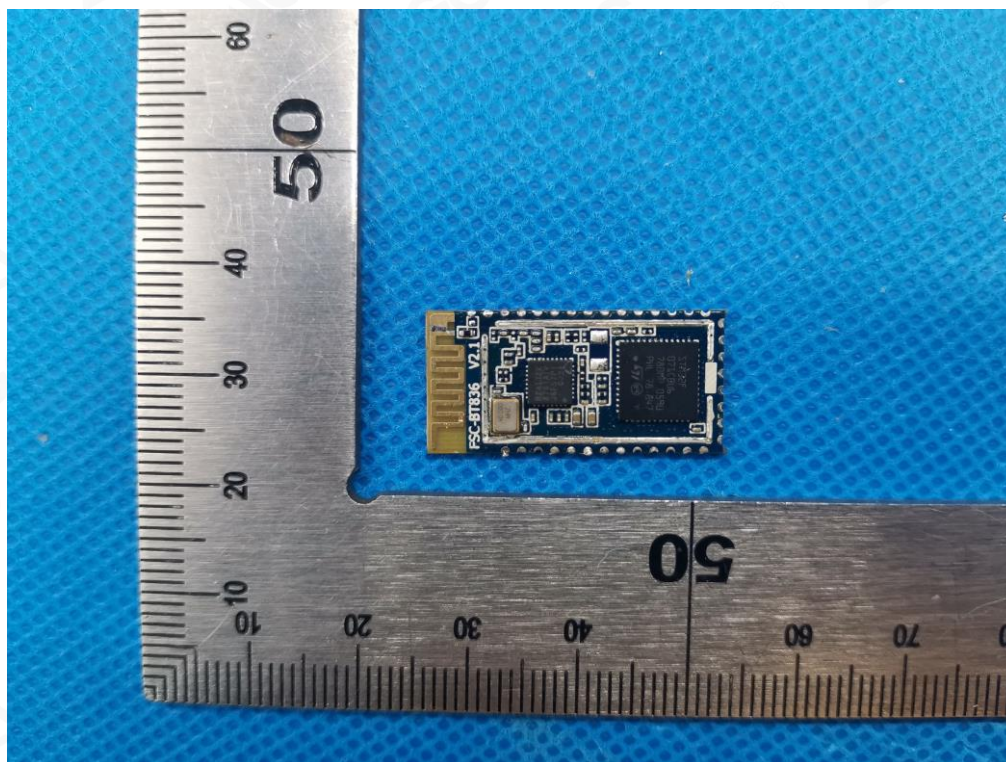
LEFT VIEW OF EUT



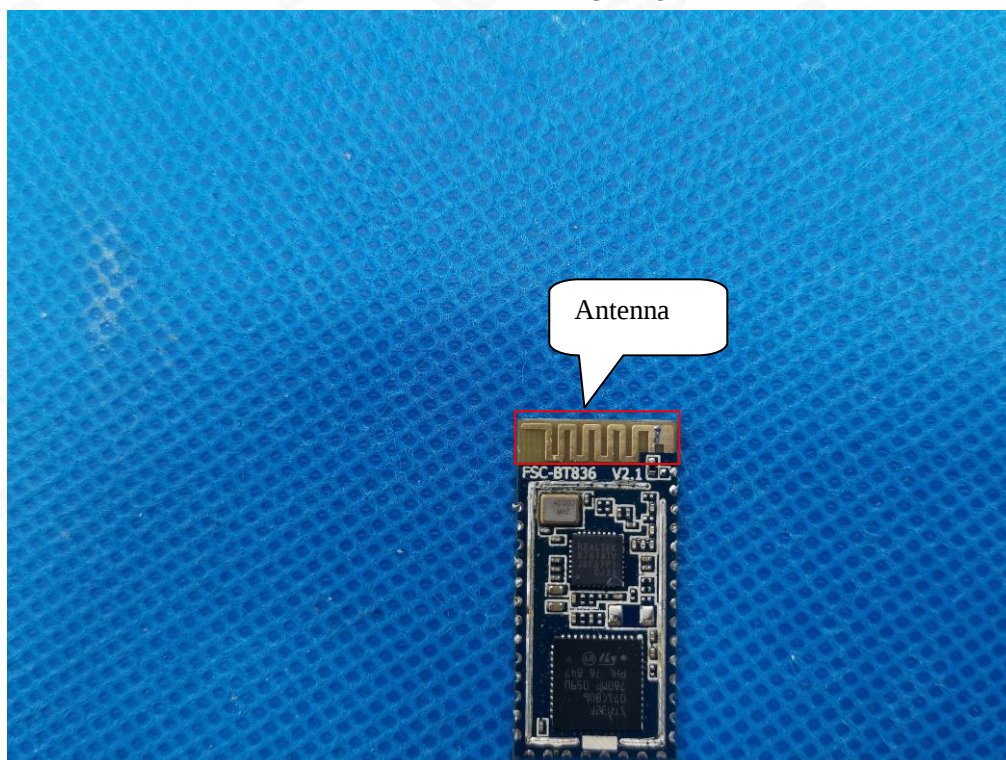
RIGHT VIEW OF EUT



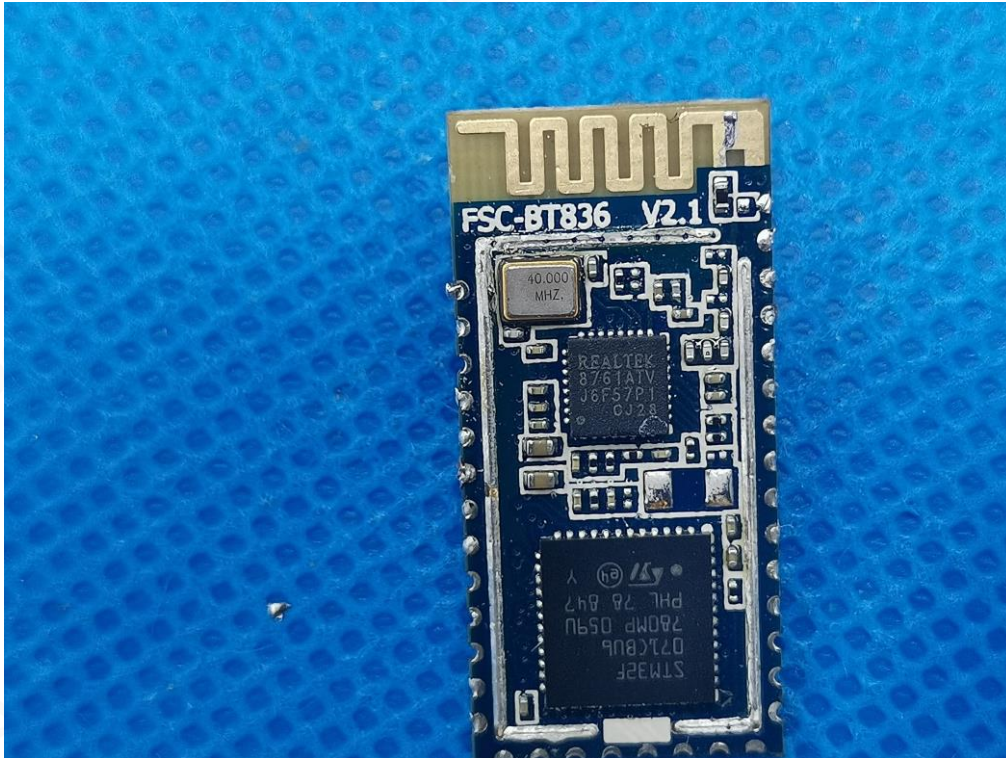
INTERNAL VIEW-1 OF EUT



INTERNAL VIEW-2 OF EUT



INTERNAL VIEW-3 OF EUT



----END OF REPORT----