

# TEST REPORT

**Product Name** : Cordless Mouse  
**Brand Mark** : TECKNET/TeckNet  
**Model No.** : EWM01002  
**FCC ID** : 2AK8Q-EWM01002  
**Report Number** : BLA-EMC-202203-A10402  
**Date of Sample Receipt** : 2022/3/25  
**Date of Test** : 2022/3/25 to 2022/4/15  
**Date of Issue** : 2022/4/15  
**Test Standard** : 47 CFR Part 15, Subpart C 15.249  
**Test Result** : Pass

Prepared for:

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**201, 111-3, Huangjinshan District, Bantian Community, Bantian Street,**  
**Longgang District, Shenzhen, China**

Prepared by:

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Date:

2022/4/15



**REPORT REVISE RECORD**

| <b>Version No.</b> | <b>Date</b> | <b>Description</b> |
|--------------------|-------------|--------------------|
| 00                 | 2022/4/15   | Original           |

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## 1 TEST SUMMARY

| Test item  | Test Requirement                 | Test Method                            | Class/Severity  | Result |
|--|----------------------------------|--|---|--------|
| Radiated Emissions                                   | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)     | Pass   |
| Restricted Band Around Fundamental Frequency         | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209 | Pass   |
| Field Strength of the Fundamental Signal (15.249(a)) | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.5&6.6     | 47 CFR Part 15, Subpart C 15.249(a)                   | Pass   |
| 20dB Bandwidth                                       | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.9         | 47 CFR Part 15, Subpart C 15.215                      | Pass   |
| Antenna Requirement                                  | 47 CFR Part 15, Subpart C 15.249 | N/A                                    | 47 CFR Part 15, Subpart C 15.203                      | Pass   |

## 2 GENERAL INFORMATION

|                       |  |
|-----------------------|--|
| <b>Applicant</b>      | Shenzhen Unichain Technology Co., Ltd  |
| <b>Address</b>        | 201, 111-3, Huangjinshan District, Bantian Community, Bantian Street, Longgang District, Shenzhen, China |
| <b>Manufacturer</b>   | Shenzhen Unichain Technology Co., Ltd  |
| <b>Address</b>        | 201, 111-3, Huangjinshan District, Bantian Community, Bantian Street, Longgang District, Shenzhen, China |
| <b>Factory</b>        | Shenzhen Unichain Technology Co., Ltd  |
| <b>Address</b>        | 201, 111-3, Huangjinshan District, Bantian Community, Bantian Street, Longgang District, Shenzhen, China |
| <b>Product Name</b>   | Cordless Mouse   |
| <b>Test Model No.</b> | EWM01002   |

## 3 GENERAL DESCRIPTION OF E.U.T.

|                         |                                 |
|-------------------------|---------------------------------|
| <b>Hardware Version</b> | N/A                             |
| <b>Software Version</b> | N/A                             |
| Channel Spacing:        | 2MHz                            |
| Frequency Band :        | 2.4GHz ISM band                 |
| Frequency Range:        | 2402MHz~2480MHz                 |
| Modulation Type:        | GFSK                            |
| Number of Channels:     | 40 (declared by the client)     |
| Antenna Type:           | PCB ANT                         |
| Antenna Gain:           | 5dBi(Provided by the applicant) |
| Power Supply:           | DC3V                            |

#### 4 TEST ENVIRONMENT

| Environment | Temperature | Voltage |
|-------------|-------------|---------|
| normal      | 25°C        | DC3V    |

#### 5 TEST MODE

| TEST MODE                                    | TEST MODE DESCRIPTION             |
|--|-----------------------------------|
| TX   | Keep the EUT in transmitting mode |
| Remark: new battery is used during all test. |                                   |

#### 6 MEASUREMENT UNCERTAINTY

| Parameter                                      | Expanded Uncertainty (Confidence of 95%) |
|--|--|
| Radiated Emission(9kHz-30MHz)                  | ±4.34dB                                  |
| Radiated Emission(30Mz-1000MHz)                | ±4.24dB                                  |
| Radiated Emission(1GHz-18GHz)                  | ±4.68dB                                  |
| AC Power Line Conducted Emission(150kHz-30MHz) | ±3.45dB                                  |

## 7 DESCRIPTION OF SUPPORT UNIT

| Device Type | Manufacturer | Model Name | Serial No. | Remark |
|-------------|--------------|------------|------------|--------|
| PC          | HASEE        | K610D      | N/A        | N/A    |

## 8 LABORATORY LOCATION

All tests were performed at:  
BlueAsia of Technical Services(Shenzhen) Co., Ltd.  
Building C, No. 107, Shihuan Road, Shiyuan Sub-District, Baoan District, Shenzhen, Guangdong Province,  
China  
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673  
No tests were sub-contracted.



## 9 TEST INSTRUMENTS LIST

| Test Equipment Of Radiated Emissions |              |              |                  |            |           |
|--------------------------------------|--------------|--------------|------------------|------------|-----------|
| Equipment                            | Manufacturer | Model        | S/N              | Cal.Date   | Cal.Due   |
| Chamber                              | SKET         | 966          | N/A              | 10/11/2020 | 9/11/2023 |
| Spectrum                             | R&S          | FSP40        | 100817           | 24/9/2021  | 23/9/2022 |
| Receiver                             | R&S          | ESR7         | 101199           | 24/9/2021  | 23/9/2022 |
| broadband Antenna                    | Schwarzbeck  | VULB9168     | 00836<br>P:00227 | 26/9/2020  | 25/9/2022 |
| Horn Antenna                         | Schwarzbeck  | 9120D        | 01892<br>P:00331 | 26/9/2020  | 25/9/2022 |
| Amplifier                            | SKET         | LNPA-0118-45 | N/A              | 24/9/2021  | 23/9/2022 |
| EMI software                         | EZ           | EZ-EMC       | N/A              | N/A        | N/A       |
| Loop antenna                         | SCHNARZBECK  | FMZB1519B    | 00102            | 26/9/2020  | 25/9/2022 |

| Test Equipment Of Restricted Band Around Fundamental Frequency |              |              |                  |            |           |
|--|--------------|--------------|------------------|------------|-----------|
| Equipment  | Manufacturer | Model        | S/N              | Cal.Date   | Cal.Due   |
| Chamber  | SKET         | 966          | N/A              | 10/11/2020 | 9/11/2023 |
| Spectrum   | R&S          | FSP40        | 100817           | 24/9/2021  | 23/9/2022 |
| Receiver   | R&S          | ESR7         | 101199           | 24/9/2021  | 23/9/2022 |
| broadband Antenna  | Schwarzbeck  | VULB9168     | 00836<br>P:00227 | 26/9/2020  | 25/9/2022 |
| Horn Antenna   | Schwarzbeck  | 9120D        | 01892<br>P:00331 | 26/9/2020  | 25/9/2022 |
| Amplifier  | SKET         | LNPA-0118-45 | N/A              | 24/9/2021  | 23/9/2022 |
| EMI software   | EZ           | EZ-EMC       | N/A              | N/A        | N/A       |
| Loop antenna   | SCHNARZBECK  | FMZB1519B    | 00102            | 26/9/2020  | 25/9/2022 |

**Test Equipment Of Field Strength of the Fundamental Signal (15.249(a))**

| Equipment         | Manufacturer | Model        | S/N              | Cal.Date   | Cal.Due   |
|-------------------|--------------|--------------|------------------|------------|-----------|
| Chamber           | SKET         | 966          | N/A              | 10/11/2020 | 9/11/2023 |
| Spectrum          | R&S          | FSP40        | 100817           | 24/9/2021  | 23/9/2022 |
| Receiver          | R&S          | ESR7         | 101199           | 24/9/2021  | 23/9/2022 |
| broadband Antenna | Schwarzbeck  | VULB9168     | 00836<br>P:00227 | 26/9/2020  | 25/9/2022 |
| Horn Antenna      | Schwarzbeck  | 9120D        | 01892<br>P:00331 | 26/9/2020  | 25/9/2022 |
| Amplifier         | SKET         | LNPA-0118-45 | N/A              | 24/9/2021  | 23/9/2022 |
| EMI software      | EZ           | EZ-EMC       | N/A              | N/A        | N/A       |
| Loop antenna      | SCHNARZBECK  | FMZB1519B    | 00102            | 26/9/2020  | 25/9/2022 |

**Test Equipment Of 20dB Bandwidth**

| Equipment    | Manufacturer | Model   | S/N           | Cal.Date   | Cal.Due    |
|--------------|--------------|---------|---------------|------------|------------|
| Shield room  | SKET         | 833     | N/A           | 25/11/2020 | 24/11/2023 |
| Receiver     | R&S          | ESPI3   | 101082        | 24/9/2021  | 23/9/2022  |
| LISN         | R&S          | ENV216  | 3560.6550.15  | 24/9/2021  | 23/9/2022  |
| LISN         | AT           | AT166-2 | AKK1806000003 | 26/9/2021  | 25/9/2022  |
| EMI software | EZ           | EZ-EMC  | N/A           | N/A        | N/A        |

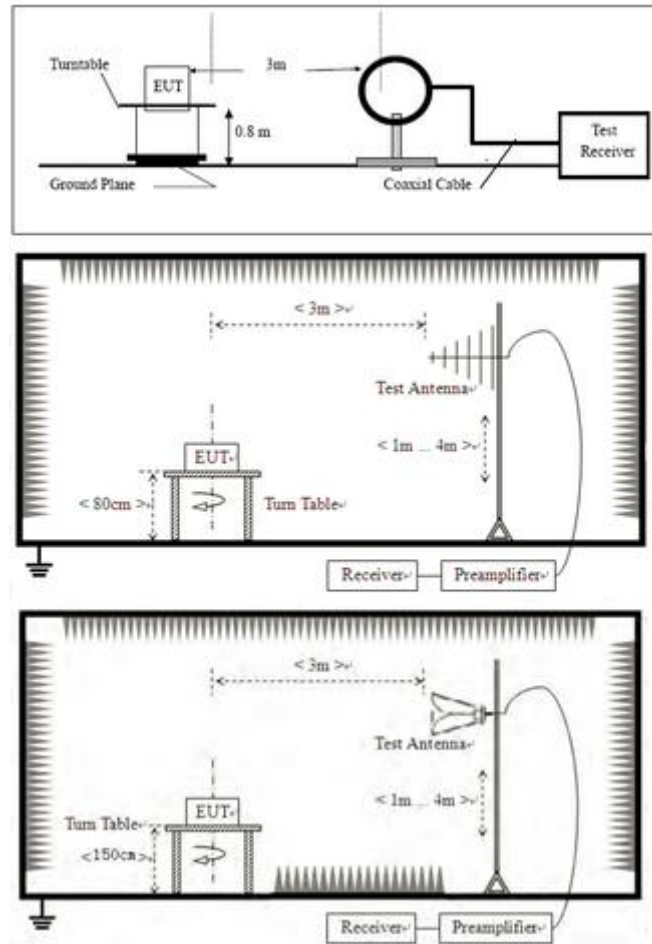
## 10 RADIATED EMISSIONS

|                               |  |
|-------------------------------|--|
| <b>Test Standard</b>          | 47 CFR Part 15, Subpart C 15.249       |
| <b>Test Method</b>            | ANSI C63.10 (2013) Section 6.4&6.5&6.6 |
| <b>Test Mode (Pre-Scan)</b>   | TX                                     |
| <b>Test Mode (Final Test)</b> | TX                                     |
| <b>Tester</b>                 | Jozu                                   |
| <b>Temperature</b>            | 25°C                                   |
| <b>Humidity</b>               | 60%                                    |

### 10.1 LIMITS

| Frequency(MHz) | Field strength<br>(microvolts/meter) | Limit<br>(dBuV/m) | Detector | Measurement 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                                  | 40.0              | QP       | 3                                |
| 88-216         | 150                                  | 43.5              | QP       | 3                                |
| 216-960        | 200                                  | 46.0              | QP       | 3                                |
| 960-1000       | 500                                  | 54.0              | QP       | 3                                |
| Above 1000     | 500                                  | 54.0              | AV       | 3                                |

## 10.2 BLOCK DIAGRAM OF TEST SETUP



## 10.3 PROCEDURE

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark:

1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

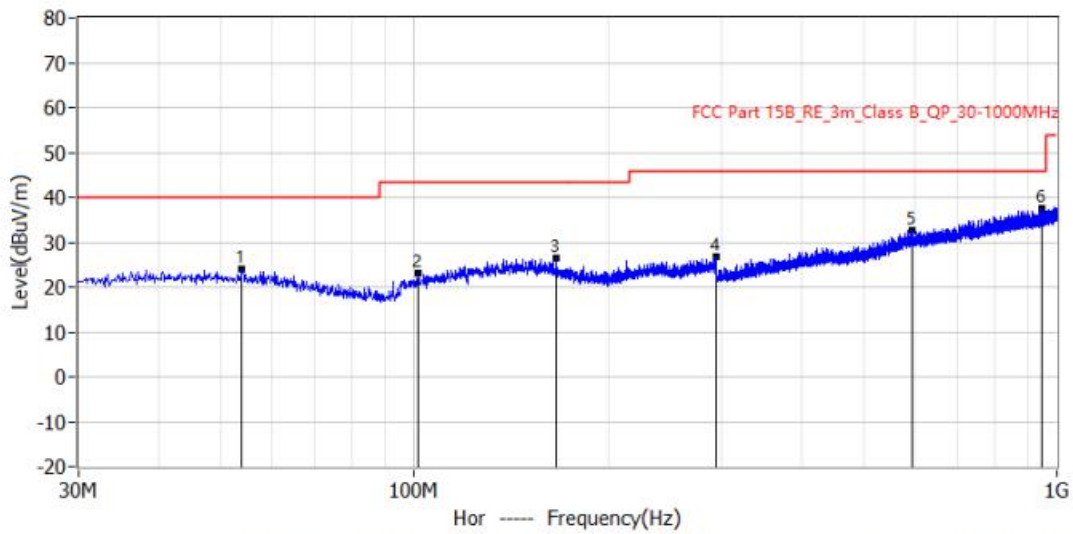
3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.

4) For frequencies above 1GHz, the field strength limits are based on average limits. 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. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

### 10.4 TEST DATA

[TestMode: TX Below 1G]; [Polarity: Horizontal]

|                                      |                                |
|--------------------------------------|--------------------------------|
| Test Lab: BlueAsia EMC Lab ( RE #1 ) | Project: BLA-EMC-202203-A104   |
| EUT: Cordless Mouse                  | Test Engineer: York            |
| M/N: EWM01002                        | Temperature:                   |
| S/N:                                 | Humidity:                      |
| Test Mode: TX mode                   | Test Voltage:                  |
| Note:                                | Test Data: 2022-04-06 16:25:48 |

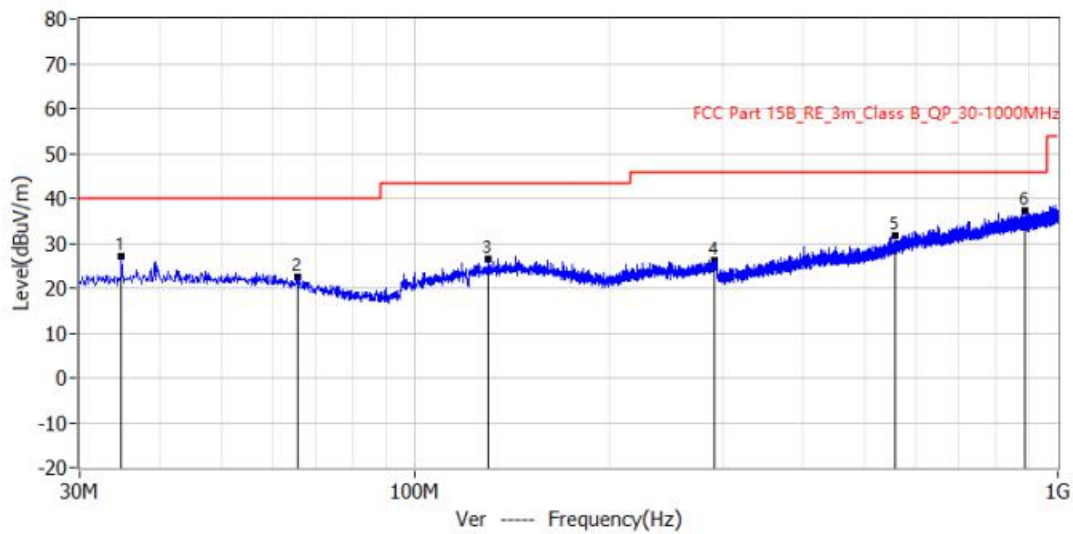


| No. | Frequency  | Limit dBuV/m | Level dBuV/m | Delta dB | Reading dBuV | Factor dB/m | Detector | Polar | Height cm | Angle deg |
|-----|------------|--------------|--------------|----------|--------------|-------------|----------|-------|-----------|-----------|
| 1*  | 53.886MHz  | 40.0         | 24.0         | -16.0    | 0.3          | 23.7        | QP       | Hor   | 100.0     | 115.0     |
| 2*  | 101.295MHz | 43.5         | 23.1         | -20.4    | 2.3          | 20.8        | QP       | Hor   | 100.0     | 158.0     |
| 3*  | 166.043MHz | 43.5         | 26.4         | -17.1    | 3.6          | 22.8        | QP       | Hor   | 100.0     | 0.0       |
| 4*  | 294.689MHz | 46.0         | 26.7         | -19.3    | 2.8          | 23.9        | QP       | Hor   | 100.0     | 164.0     |
| 5*  | 595.025MHz | 46.0         | 32.6         | -13.4    | 1.5          | 31.1        | QP       | Hor   | 100.0     | 0.0       |
| 6*  | 947.256MHz | 46.0         | 37.4         | -8.6     | 1.9          | 35.5        | QP       | Hor   | 100.0     | 302.0     |

**Test Result: Pass**

[TestMode: TX Below 1G]; [Polarity: Vertical]

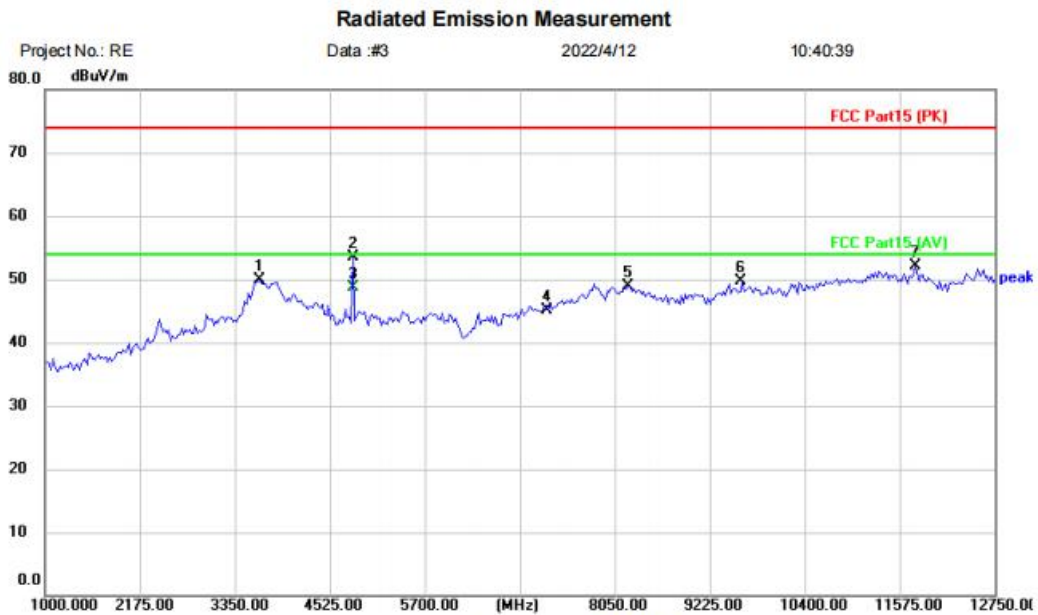
|                                    |                                |
|------------------------------------|--------------------------------|
| Test Lab: BlueAsia EMC Lab (RE #1) | Project: BLA-EMC-202203-A104   |
| EUT: Cordless Mouse                | Test Engineer: York            |
| M/N: EWM01002                      | Temperature:                   |
| S/N:                               | Humidity:                      |
| Test Mode: TX mode                 | Test Voltage:                  |
| Note:                              | Test Data: 2022-04-06 16:27:48 |



| No. | Frequency  | Limit dBuV/m | Level dBuV/m | Delta dB | Reading dBuV | Factor dB/m | Detector | Polar | Height cm | Angle deg |
|-----|------------|--------------|--------------|----------|--------------|-------------|----------|-------|-----------|-----------|
| 1*  | 34.850MHz  | 40.0         | 27.1         | -12.9    | 3.5          | 23.6        | QP       | Ver   | 100.0     | 218.0     |
| 2*  | 65.405MHz  | 40.0         | 22.4         | -17.6    | 0.0          | 22.4        | QP       | Ver   | 100.0     | 195.0     |
| 3*  | 129.789MHz | 43.5         | 26.6         | -16.9    | 3.4          | 23.2        | QP       | Ver   | 100.0     | 0.0       |
| 4*  | 292.385MHz | 46.0         | 26.2         | -19.8    | 2.3          | 23.9        | QP       | Ver   | 100.0     | 143.0     |
| 5*  | 558.771MHz | 46.0         | 31.7         | -14.3    | 1.6          | 30.1        | QP       | Ver   | 100.0     | 230.0     |
| 6*  | 886.874MHz | 46.0         | 37.2         | -8.8     | 2.3          | 34.9        | QP       | Ver   | 100.0     | 48.0      |

**Test Result: Pass**

[TestMode: TX low channel]; [Polarity: Vertical]



Site:      Polarization: **Vertical**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power: M      Humidity: %RH  
 EUT: Cordless Mouse  
 M/N: EWM01002  
 Mode: TX-L  
 Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 3655.500     | 42.05                    | 7.76                      | 49.81                      | 74.00           | -24.19     | peak     |         |
| 2   |     | 4807.000     | 49.80                    | 3.71                      | 53.51                      | 74.00           | -20.49     | peak     |         |
| 3   | *   | 4807.000     | 45.00                    | 3.71                      | 48.71                      | 54.00           | -5.29      | AVG      |         |
| 4   |     | 7206.000     | 39.23                    | 5.96                      | 45.19                      | 74.00           | -28.81     | peak     |         |
| 5   |     | 8214.500     | 40.77                    | 8.21                      | 48.98                      | 74.00           | -25.02     | peak     |         |
| 6   |     | 9608.000     | 40.48                    | 9.29                      | 49.77                      | 74.00           | -24.23     | peak     |         |
| 7   |     | 11763.000    | 40.50                    | 11.63                     | 52.13                      | 74.00           | -21.87     | peak     |         |

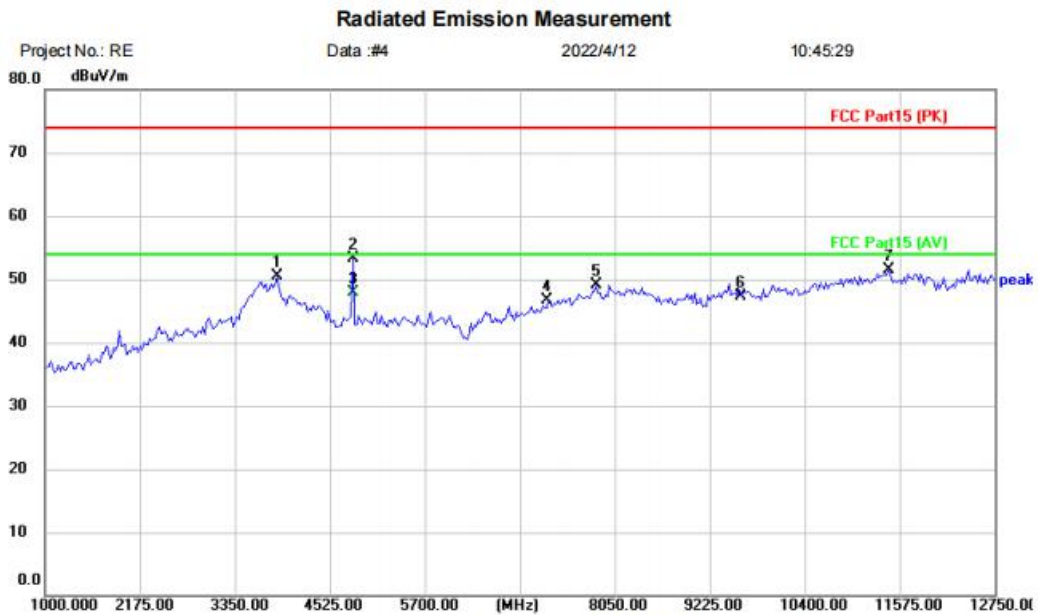
\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**



[TestMode: TX low channel]; [Polarity: Horizontal]



Site:      Polarization: **Horizontal**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power: M      Humidity: %RH  
 EUT: Cordless Mouse  
 M/N: EWM01002  
 Mode: TX-L  
 Note:

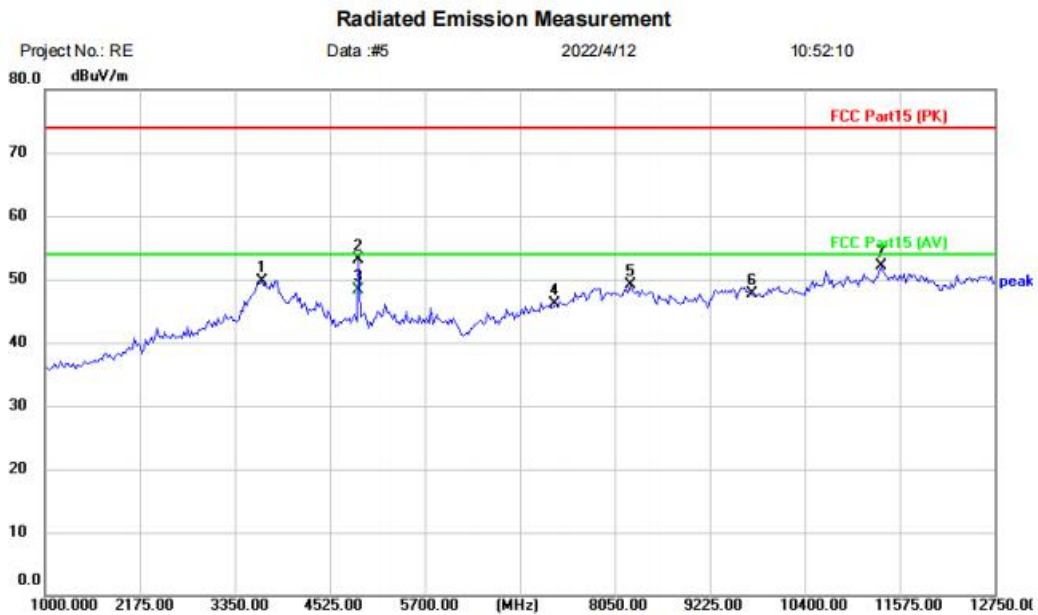
| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 3867.000     | 43.74                    | 6.82                      | 50.56                      | 74.00           | -23.44     | peak     |         |
| 2   |     | 4807.000     | 49.57                    | 3.71                      | 53.28                      | 74.00           | -20.72     | peak     |         |
| 3   | *   | 4807.000     | 44.16                    | 3.71                      | 47.87                      | 54.00           | -6.13      | AVG      |         |
| 4   |     | 7206.000     | 40.66                    | 5.96                      | 46.62                      | 74.00           | -27.38     | peak     |         |
| 5   |     | 7815.000     | 41.35                    | 7.72                      | 49.07                      | 74.00           | -24.93     | peak     |         |
| 6   |     | 9608.000     | 38.08                    | 9.29                      | 47.37                      | 74.00           | -26.63     | peak     |         |
| 7   |     | 11434.000    | 39.79                    | 11.81                     | 51.60                      | 74.00           | -22.40     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Horizontal]



Site:      Polarization: **Horizontal**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power: M      Humidity: %RH  
 EUT: Cordless Mouse  
 M/N: EWM01002  
 Mode: TX-M  
 Note:

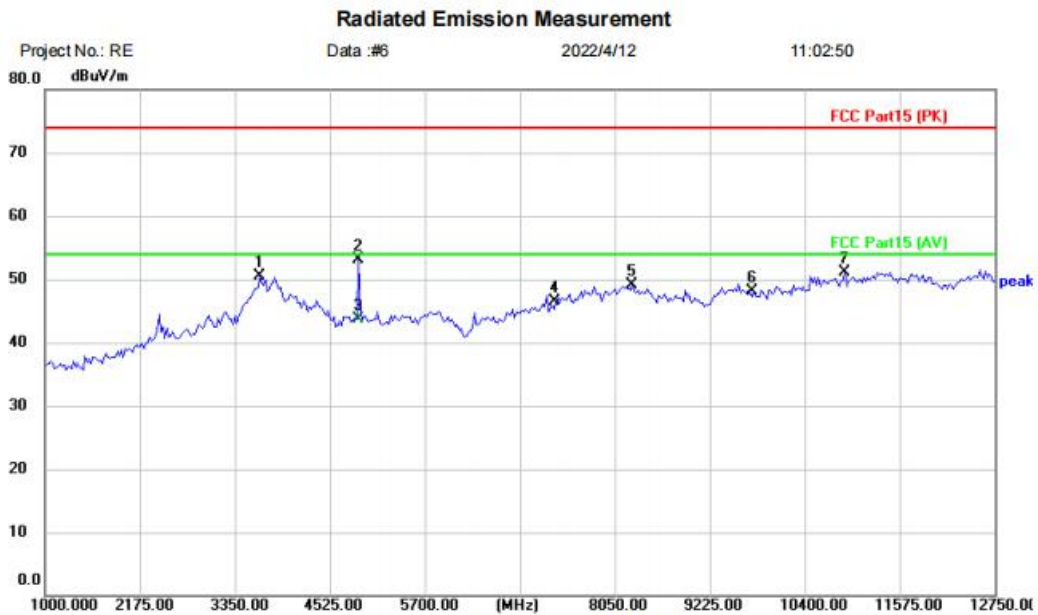
| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 3679.000     | 41.97                    | 7.73                      | 49.70                      | 74.00           | -24.30     | peak     |         |
| 2   |     | 4877.500     | 49.74                    | 3.37                      | 53.11                      | 74.00           | -20.89     | peak     |         |
| 3   | *   | 4877.500     | 45.00                    | 3.37                      | 48.37                      | 54.00           | -5.63      | AVG      |         |
| 4   |     | 7320.000     | 39.75                    | 6.41                      | 46.16                      | 74.00           | -27.84     | peak     |         |
| 5   |     | 8238.000     | 40.80                    | 8.22                      | 49.02                      | 74.00           | -24.98     | peak     |         |
| 6   |     | 9760.000     | 38.08                    | 9.62                      | 47.70                      | 74.00           | -26.30     | peak     |         |
| 7   |     | 11340.000    | 40.23                    | 11.85                     | 52.08                      | 74.00           | -21.92     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Vertical]



Site:      Polarization: **Vertical**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power: M      Humidity: %RH  
 EUT: Cordless Mouse  
 M/N: EWM01002  
 Mode: TX-M  
 Note:

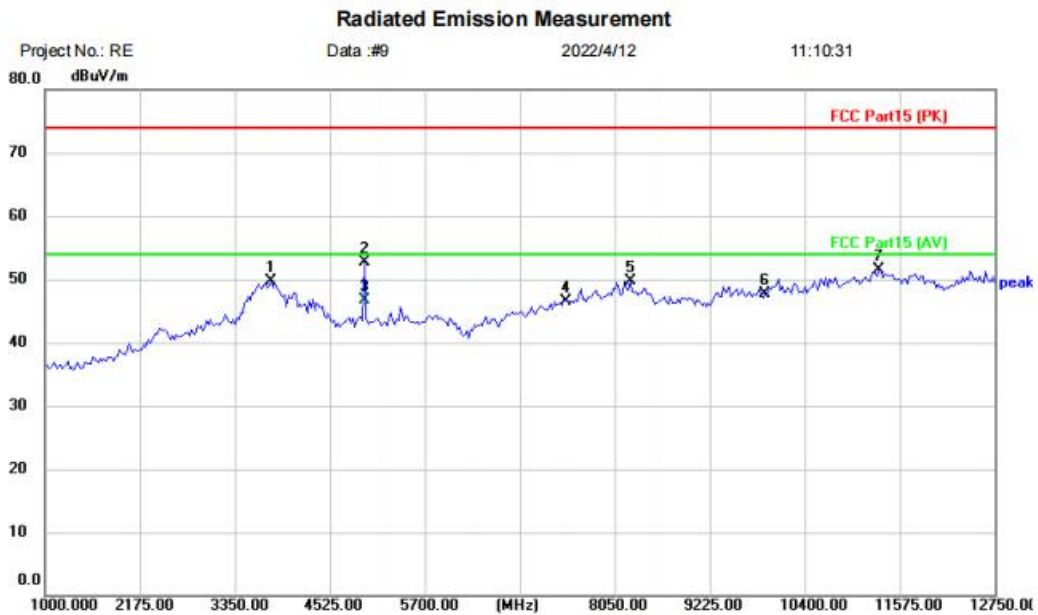
| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 3655.500     | 42.68                    | 7.76                      | 50.44                      | 74.00           | -23.56     | peak     |         |
| 2   |     | 4877.500     | 49.65                    | 3.37                      | 53.02                      | 74.00           | -20.98     | peak     |         |
| 3   | *   | 4877.500     | 40.37                    | 3.37                      | 43.74                      | 54.00           | -10.26     | AVG      |         |
| 4   |     | 7320.000     | 40.14                    | 6.41                      | 46.55                      | 74.00           | -27.45     | peak     |         |
| 5   |     | 8261.500     | 40.78                    | 8.23                      | 49.01                      | 74.00           | -24.99     | peak     |         |
| 6   |     | 9760.000     | 38.44                    | 9.62                      | 48.06                      | 74.00           | -25.94     | peak     |         |
| 7   |     | 10893.500    | 39.18                    | 11.87                     | 51.05                      | 74.00           | -22.95     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Horizontal]



Site:      Polarization: **Horizontal**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power: M      Humidity: %RH  
 EUT: Cordless Mouse  
 M/N: EWM01002  
 Mode: TX-H  
 Note:

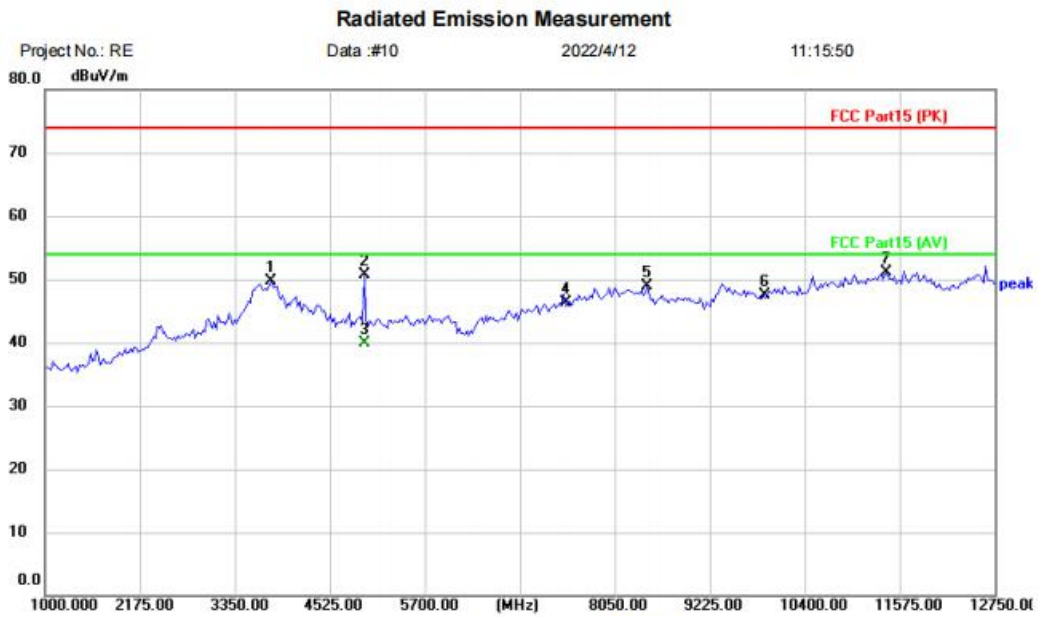
| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 3796.500     | 42.06                    | 7.65                      | 49.71                      | 74.00           | -24.29     | peak     |         |
| 2   |     | 4948.000     | 48.98                    | 3.65                      | 52.63                      | 74.00           | -21.37     | peak     |         |
| 3   | *   | 4948.000     | 43.10                    | 3.65                      | 46.75                      | 54.00           | -7.25      | AVG      |         |
| 4   |     | 7440.000     | 39.55                    | 6.86                      | 46.41                      | 74.00           | -27.59     | peak     |         |
| 5   |     | 8238.000     | 41.46                    | 8.22                      | 49.68                      | 74.00           | -24.32     | peak     |         |
| 6   |     | 9920.000     | 37.49                    | 10.16                     | 47.65                      | 74.00           | -26.35     | peak     |         |
| 7   |     | 11316.500    | 39.63                    | 11.88                     | 51.51                      | 74.00           | -22.49     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Vertical]



Site:      Polarization: **Vertical**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power: M      Humidity: %RH  
 EUT: Cordless Mouse  
 M/N: EWM01002  
 Mode: TX-H  
 Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 3796.500     | 42.05                    | 7.65                      | 49.70                      | 74.00           | -24.30     | peak     |         |
| 2   |     | 4948.000     | 47.10                    | 3.65                      | 50.75                      | 74.00           | -23.25     | peak     |         |
| 3   | *   | 4948.000     | 36.23                    | 3.65                      | 39.88                      | 54.00           | -14.12     | AVG      |         |
| 4   |     | 7440.000     | 39.43                    | 6.86                      | 46.29                      | 74.00           | -27.71     | peak     |         |
| 5   |     | 8449.500     | 40.79                    | 8.20                      | 48.99                      | 74.00           | -25.01     | peak     |         |
| 6   |     | 9920.000     | 37.36                    | 10.16                     | 47.52                      | 74.00           | -26.48     | peak     |         |
| 7   |     | 11410.500    | 39.28                    | 11.78                     | 51.06                      | 74.00           | -22.94     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

## 11 RESTRICTED BAND AROUND FUNDAMENTAL FREQUENCY

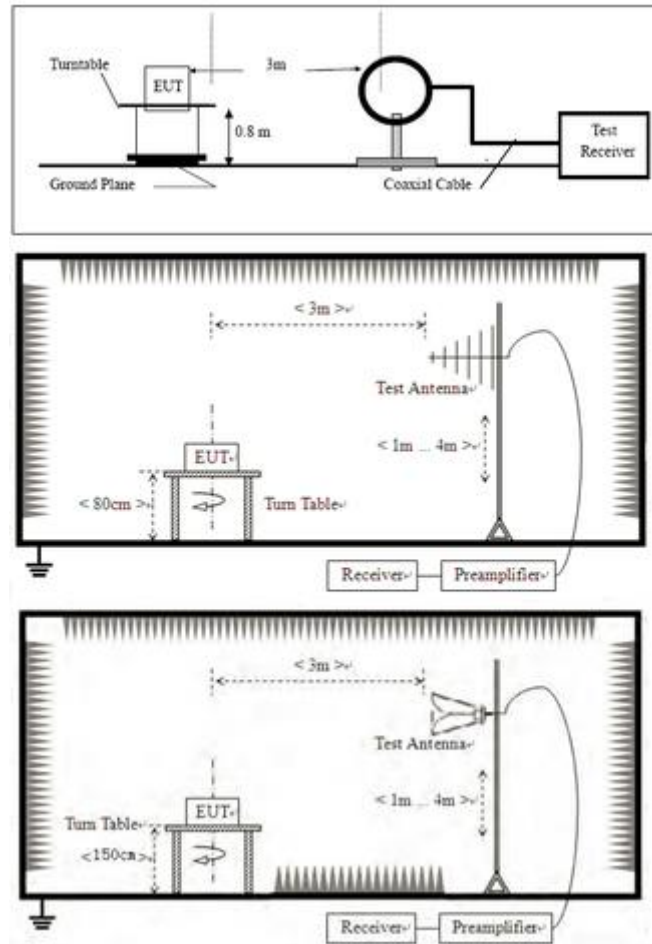
|                               |  |
|-------------------------------|--|
| <b>Test Standard</b>          | 47 CFR Part 15, Subpart C 15.249       |
| <b>Test Method</b>            | ANSI C63.10 (2013) Section 6.4&6.5&6.6 |
| <b>Test Mode (Pre-Scan)</b>   | TX                                     |
| <b>Test Mode (Final Test)</b> | TX                                     |
| <b>Tester</b>                 | Jozu                                   |
| <b>Temperature</b>            | 25°C                                   |
| <b>Humidity</b>               | 60%                                    |

### 11.1 LIMITS

| Frequency     | Limit (dBuV/m @3m) | Remark           |
|---------------|--------------------|------------------|
| 30MHz-88MHz   | 40.0               | Quasi-peak Value |
| 88MHz-216MHz  | 43.5               | Quasi-peak Value |
| 216MHz-960MHz | 46.0               | Quasi-peak Value |
| 960MHz-1GHz   | 54.0               | Quasi-peak Value |
| Above 1GHz    | 54.0               | Average Value    |
| Above 1GHz    | 74.0               | Peak Value       |

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

## 11.2 BLOCK DIAGRAM OF TEST SETUP



## 11.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

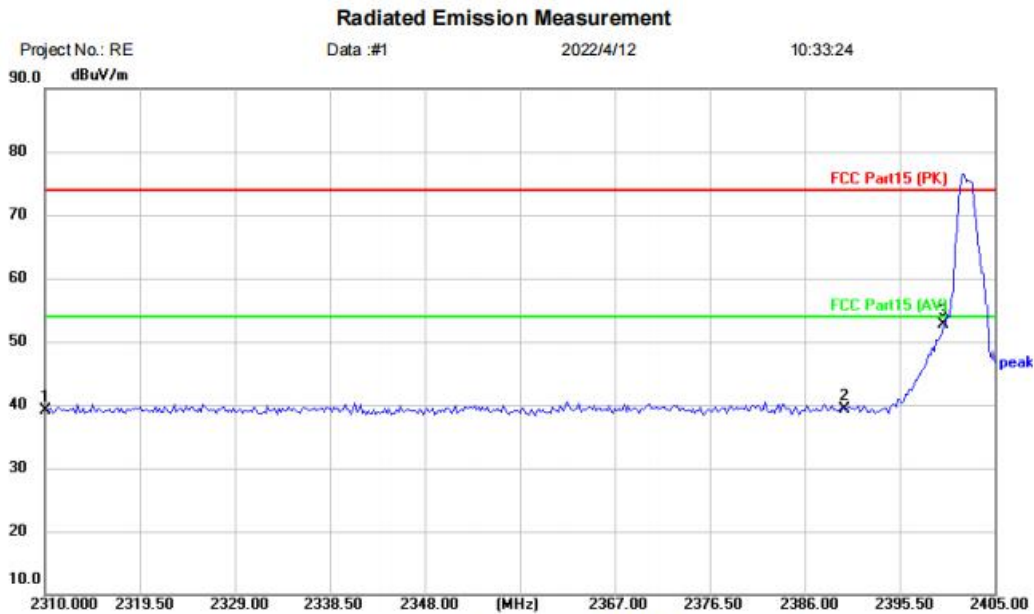
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
  - i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
  - j. Repeat above procedures until all frequencies measured was complete.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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### 11.4 TEST DATA

[TestMode: TX low channel]; [Polarity: Vertical]



Site:      Polarization: **Vertical**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
 EUT: Cordless Mouse  
 M/N: EWM01002  
 Mode: TX-L  
 Note:

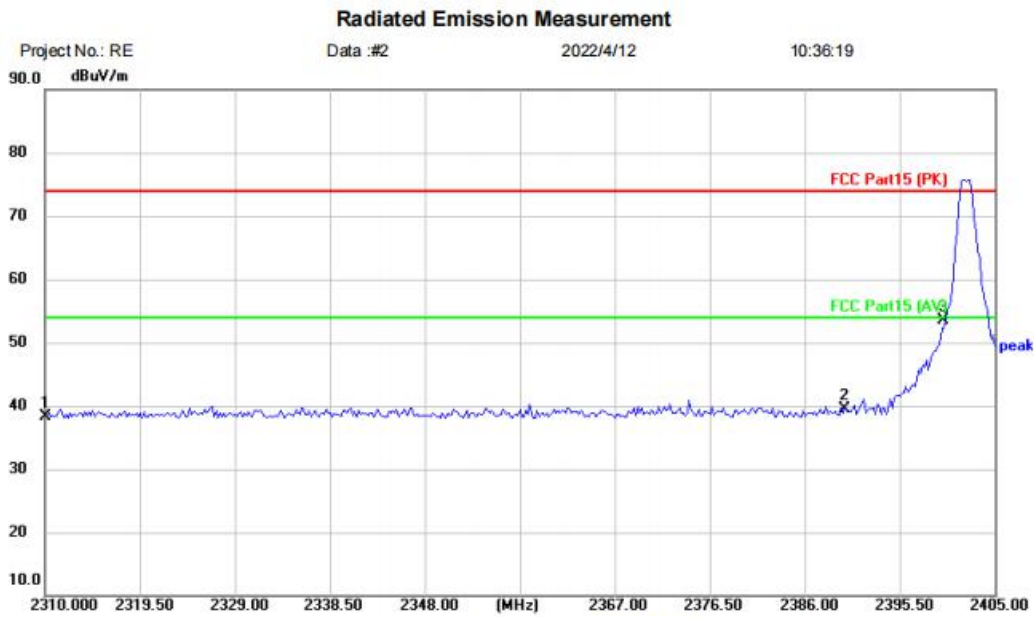
| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 2310.000     | 43.13                    | -3.93                     | 39.20                      | 74.00           | -34.80     | peak     |         |
| 2   |     | 2390.000     | 42.89                    | -3.58                     | 39.31                      | 74.00           | -34.69     | peak     |         |
| 3   | *   | 2400.000     | 56.26                    | -3.54                     | 52.72                      | 74.00           | -21.28     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX low channel]; [Polarity: Horizontal]



|                        |                                 |                  |
|------------------------|---------------------------------|------------------|
| Site                   | Polarization: <b>Horizontal</b> | Temperature: (C) |
| Limit: FCC Part15 (PK) | Power:                          | Humidity: %RH    |
| EUT: Cordless Mouse    |                                 |                  |
| M/N: EWM01002          |                                 |                  |
| Mode: TX-L             |                                 |                  |
| Note:                  |                                 |                  |

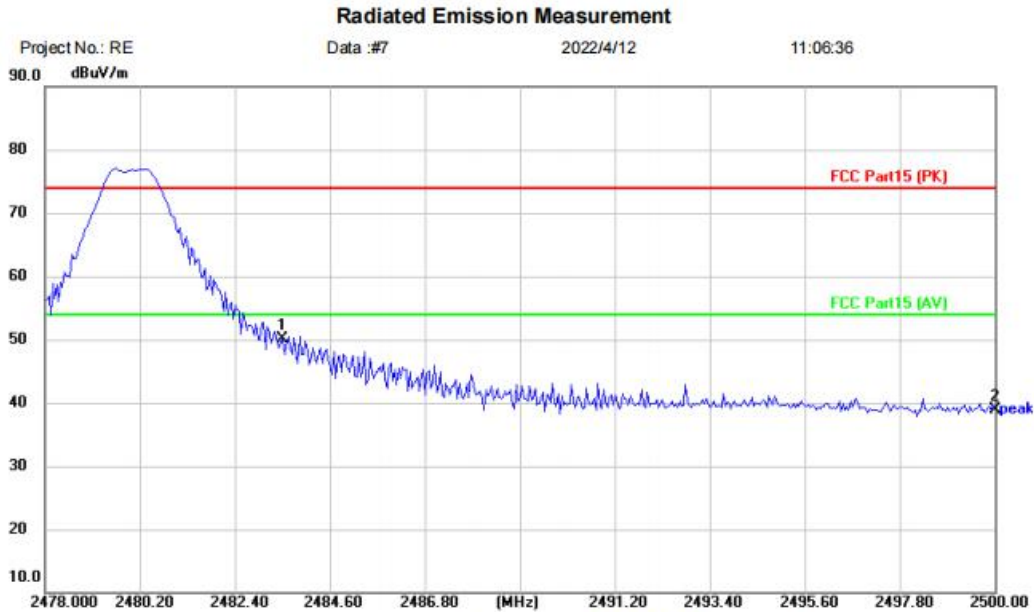
| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Detector | Comment |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     |          |         |
| 1   |     | 2310.000 | 42.26         | -3.93          | 38.33       | 74.00  | -35.67 | peak     |         |
| 2   |     | 2390.000 | 43.12         | -3.58          | 39.54       | 74.00  | -34.46 | peak     |         |
| 3   | *   | 2400.000 | 57.05         | -3.54          | 53.51       | 74.00  | -20.49 | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Horizontal]



|                        |                                 |                  |
|------------------------|---------------------------------|------------------|
| Site                   | Polarization: <b>Horizontal</b> | Temperature: (C) |
| Limit: FCC Part15 (PK) | Power:                          | Humidity: %RH    |
| EUT: Cordless Mouse    |                                 |                  |
| M/N: EWM01002          |                                 |                  |
| Mode: TX-H             |                                 |                  |
| Note:                  |                                 |                  |

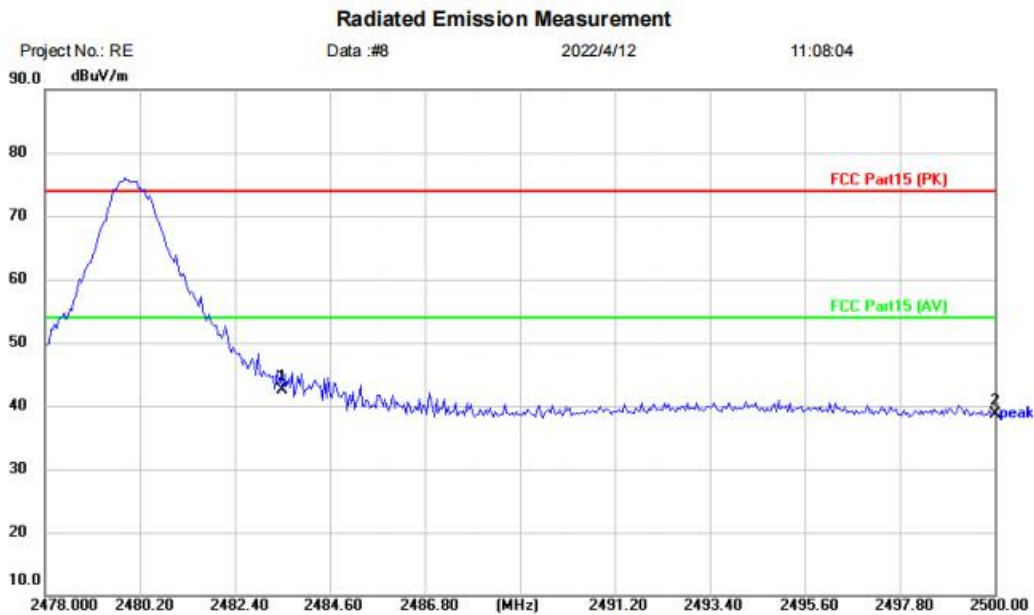
| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Detector | Comment |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     |          |         |
| 1   | *   | 2483.500 | 53.24         | -3.14          | 50.10       | 74.00  | -23.90 | peak     |         |
| 2   |     | 2500.000 | 42.02         | -3.08          | 38.94       | 74.00  | -35.06 | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Vertical]



|                        |                               |                  |
|------------------------|-------------------------------|------------------|
| Site                   | Polarization: <b>Vertical</b> | Temperature: (C) |
| Limit: FCC Part15 (PK) | Power:                        | Humidity: %RH    |
| EUT: Cordless Mouse    |                               |                  |
| M/N: EWM01002          |                               |                  |
| Mode: TX-H             |                               |                  |
| Note:                  |                               |                  |

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   | *   | 2483.500     | 45.65                    | -3.14                     | 42.51                      | 74.00           | -31.49     | peak     |         |
| 2   |     | 2500.000     | 41.81                    | -3.08                     | 38.73                      | 74.00           | -35.27     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

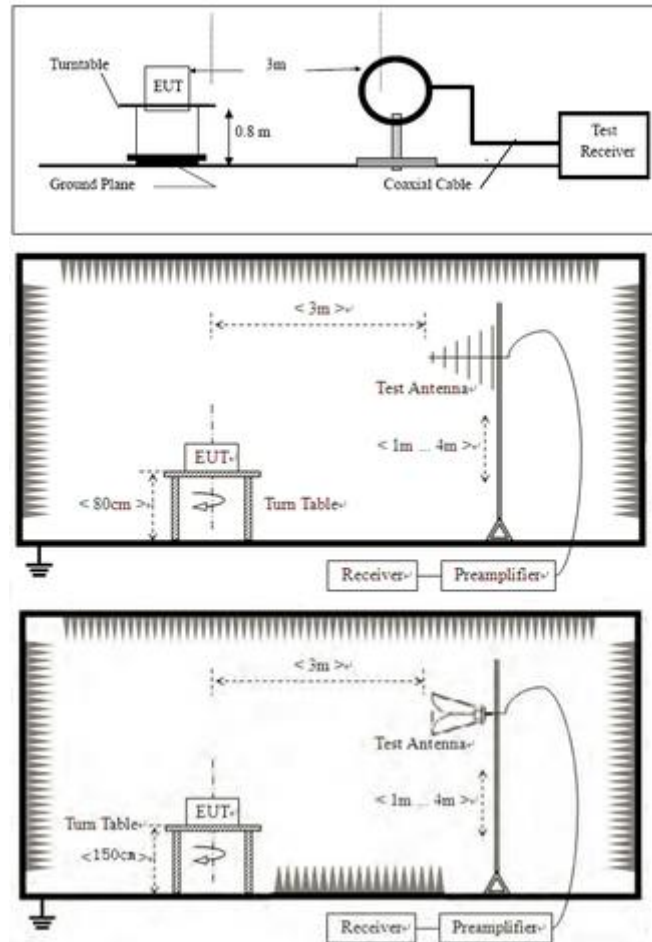
## 12 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.249(A))

|                               |                                    |
|-------------------------------|------------------------------------|
| <b>Test Standard</b>          | 47 CFR Part 15, Subpart C 15.249   |
| <b>Test Method</b>            | ANSI C63.10 (2013) Section 6.5&6.6 |
| <b>Test Mode (Pre-Scan)</b>   | TX                                 |
| <b>Test Mode (Final Test)</b> | TX                                 |
| <b>Tester</b>                 | Jozu                               |
| <b>Temperature</b>            | 25°C                               |
| <b>Humidity</b>               | 60%                                |

### 12.1 LIMITS

| Frequency         | Limit (dB $\mu$ V/m @3m) | Remark        |
|-------------------|--------------------------|---------------|
| 2400MHz-2483.5MHz | 94.0                     | Average Value |
|                   | 114.0                    | Peak Value    |

## 12.2 BLOCK DIAGRAM OF TEST SETUP



## 12.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
  - i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
  - j. Repeat above procedures until all frequencies measured was complete.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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### 12.4 TEST DATA

Peak value:

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Over Limit (dB) | Antenna Polaxis |
|-----------------|----------------------|---------------------|----------------------|----------------------|-----------------|-----------------|
| 2402            | 77.94                | -3.54               | 74.40                | 114.00               | -36.06          | H               |
| 2402            | 75.02                | -3.54               | 71.48                | 114.00               | -38.98          | V               |
| 2440            | 82.35                | -3.34               | 79.01                | 114.00               | -31.65          | H               |
| 2440            | 76.67                | -3.34               | 73.33                | 114.00               | -37.33          | V               |
| 2480            | 79.53                | -3.17               | 76.36                | 114.00               | -34.47          | H               |
| 2480            | 77.52                | -3.17               | 74.35                | 114.00               | -36.48          | V               |

Average value:

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Over Limit (dB) | Antenna Polaxis |
|-----------------|----------------------|---------------------|----------------------|----------------------|-----------------|-----------------|
| 2402            | 76.43                | -3.54               | 72.89                | 94.00                | -17.57          | H               |
| 2402            | 72.9                 | -3.54               | 69.36                | 94.00                | -21.1           | V               |
| 2440            | 77.47                | -3.34               | 74.13                | 94.00                | -16.53          | H               |
| 2440            | 73.64                | -3.34               | 70.30                | 94.00                | -20.36          | V               |
| 2480            | 77.74                | -3.17               | 74.57                | 94.00                | -16.26          | H               |
| 2480            | 75.85                | -3.17               | 72.68                | 94.00                | -18.15          | V               |

NOTE: RBW 3MHz VBW 10MHz · PK detector is for PK value ,RMS detector is for AV value.



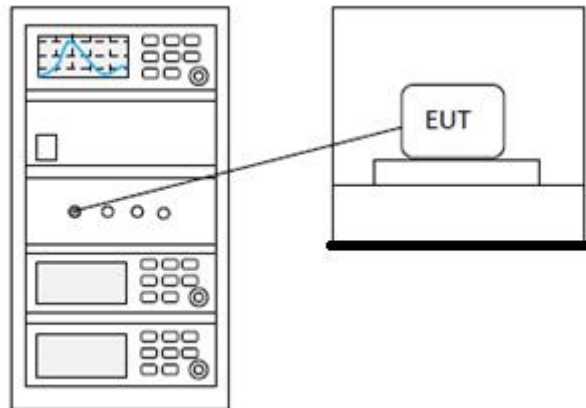
### 13 20DB BANDWIDTH

|                        |                                  |
|------------------------|----------------------------------|
| Test Standard          | 47 CFR Part 15, Subpart C 15.249 |
| Test Method            | ANSI C63.10 (2013) Section 6.9   |
| Test Mode (Pre-Scan)   | TX                               |
| Test Mode (Final Test) | TX                               |
| Tester                 | Jozu                             |
| Temperature            | 25°C                             |
| Humidity               | 60%                              |

#### 13.1 LIMITS

|        |     |
|--------|-----|
| Limit: | N/A |
|--------|-----|

#### 13.2 BLOCK DIAGRAM OF TEST SETUP



#### 13.3 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

## 14 ANTENNA REQUIREMENT

|               |                                  |
|---------------|----------------------------------|
| Test Standard | 47 CFR Part 15, Subpart C 15.249 |
| Test Method   | N/A                              |

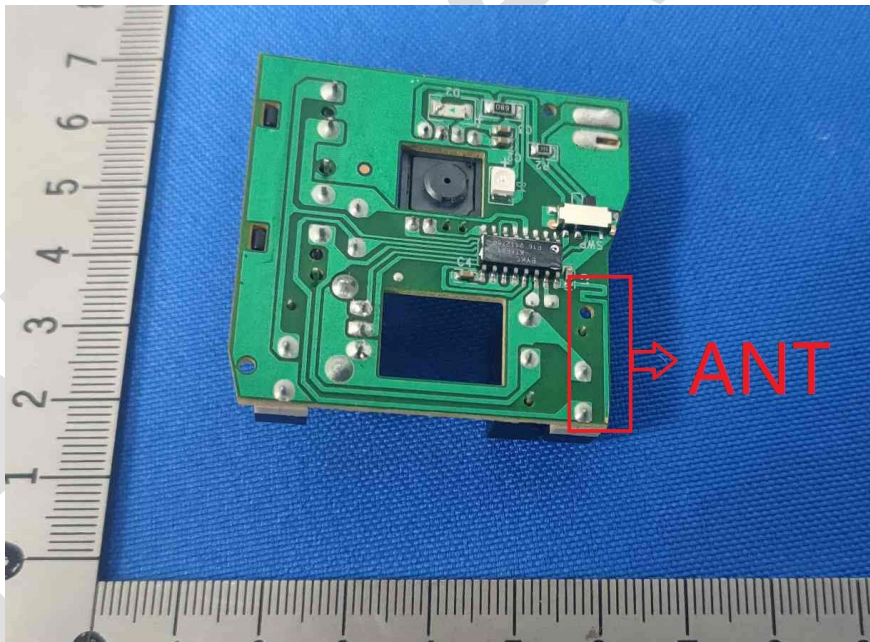
### 14.1 CONCLUSION

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

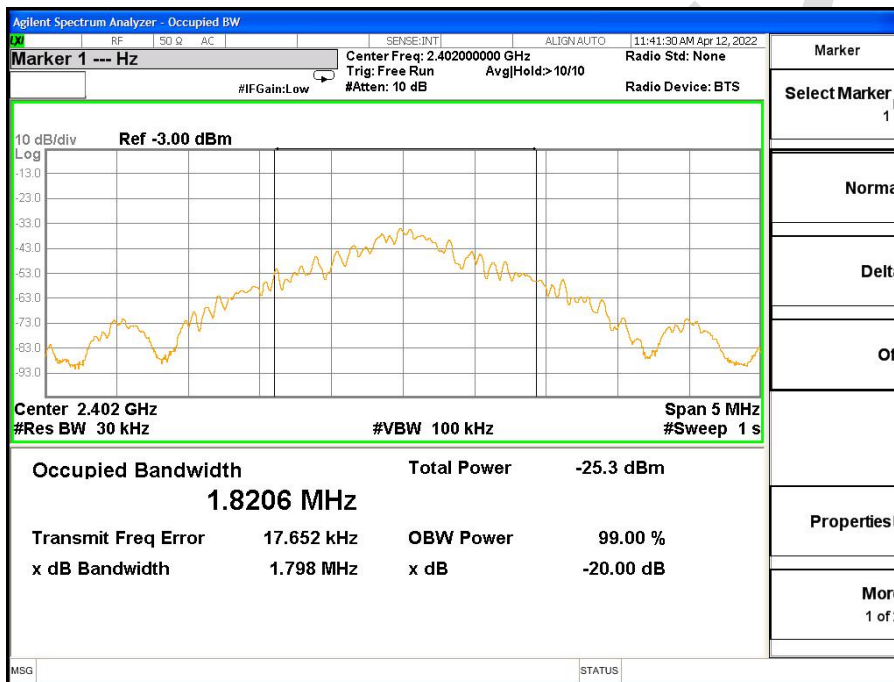


## 15 APPENDIX

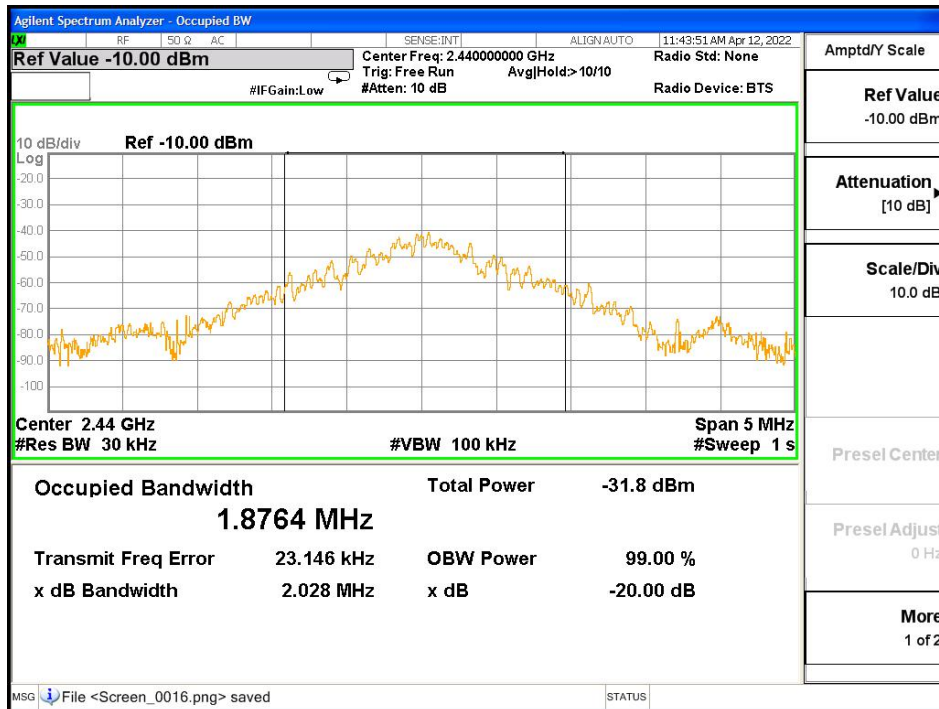
### -20dB Bandwidth

| Condition | Mode | Frequency (MHz) | Antenna | -20 dB Bandwidth (MHz) | Limit -20 dB Bandwidth (MHz) | Verdict |
|-----------|------|-----------------|---------|------------------------|------------------------------|---------|
| NVNT      | GFSK | 2402            | Ant1    | 1.798                  | 0.5                          | Pass    |
| NVNT      | GFSK | 2440            | Ant1    | 2.028                  | 0.5                          | Pass    |
| NVNT      | GFSK | 2480            | Ant1    | 2.093                  | 0.5                          | Pass    |

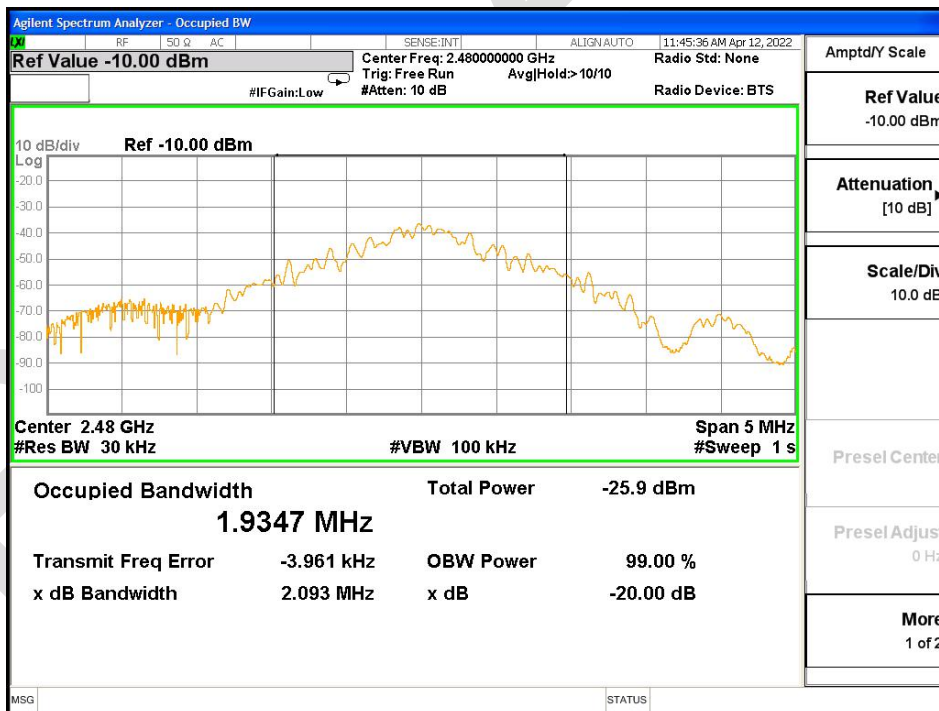
-20dB Bandwidth NVNT GFSK 2402MHz Ant1



-20dB Bandwidth NVNT GFSK 2440MHz Ant1

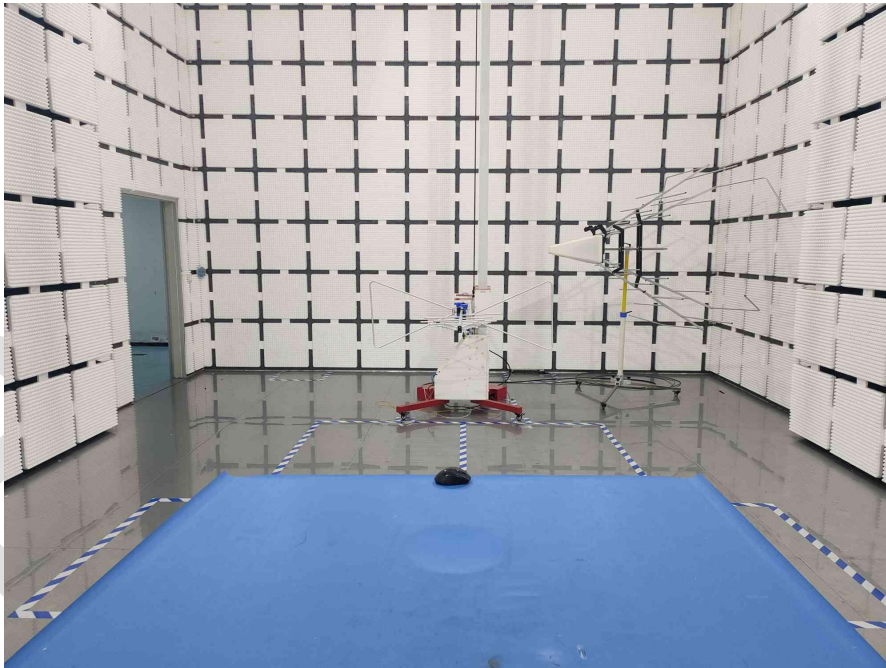


-20dB Bandwidth NVNT GFSK 2480MHz Ant1



## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### Radiated Emissions



**APPENDIX B: PHOTOGRAPHS OF EUT**

Reference to the test report No. BLA-EMC-202203-A10401

**----END OF REPORT----**

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