

# FCC TEST REPORT

Client Name : Shenzhen Najia Electronic Co., Ltd  
Address : 1107, No.6-18 Xinhe Avenue, Xinqiao Comm Xinqiao  
Street, Bao'an District Shenzhen, Guangdong CHINA  
518000  
Product Name : Hamster Wireless Mouse  
Date : Nov. 17, 2021



**Shenzhen Anbotech Compliance Laboratory Limited**

\* Approved \*



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# TEST REPORT

Applicant : Shenzhen Najia Electronic Co., Ltd  
Manufacturer : Shenzhen Najia Electronic Co., Ltd  
Product Name : Hamster Wireless Mouse  
Model No. : 02MOMO, Smart 1 Wireless Mouse  
Trade Mark : N.A.  
Rating(s) : Input: DC 1.5V, 20 mA (by "AA" battery)

**Test Standard(s) : FCC Part15 Subpart C, Paragraph 15.249**

**Test Method(s) : ANSI C63.10: 2013**

The device described above is tested by Shenzhen Anbotech Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotech Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotech Compliance Laboratory Limited.

Date of Receipt

Jun. 08, 2021

Date of Test

Jun. 08 ~ 18, 2021

Prepared by

*Ella Liang*

(Ella Liang)

Approved & Authorized Signer

*Kingkong Jin*

(Kingkong Jin)

# 1. General Information

## 1.1. Client Information

|              |   |                                                                                                              |
|--------------|---|--------------------------------------------------------------------------------------------------------------|
| Applicant    | : | Shenzhen Najia Electronic Co., Ltd                                                                           |
| Address      | : | 1107, No.6-18 Xinhe Avenue, Xinqiao Comm Xinqiao Street, Bao'an District<br>Shenzhen, Guangdong CHINA 518000 |
| Manufacturer | : | Shenzhen Najia Electronic Co., Ltd                                                                           |
| Address      | : | 1107, No.6-18 Xinhe Avenue, Xinqiao Comm Xinqiao Street, Bao'an District<br>Shenzhen, Guangdong CHINA 518000 |
| Factory      | : | Shenzhen Najia Electronic Co., Ltd                                                                           |
| Address      | : | 1107, No.6-18 Xinhe Avenue, Xinqiao Comm Xinqiao Street, Bao'an District<br>Shenzhen, Guangdong CHINA 518000 |

## 1.2. Description of Device (EUT)

|                                                                                                                                                                       |   |                                                                                                                                                  |                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Product Name                                                                                                                                                          | : | Hamster Wireless Mouse                                                                                                                           |                              |
| Model No.                                                                                                                                                             | : | 02MOMO, Smart 1 Wireless Mouse<br>(Note: All samples are the same except the model number and appearance, so we prepare “02MOMO” for test only.) |                              |
| Trade Mark                                                                                                                                                            | : | N.A.                                                                                                                                             |                              |
| Test Power Supply                                                                                                                                                     | : | DC 1.5V                                                                                                                                          |                              |
| Test Sample No.                                                                                                                                                       | : | 1-2-1(Normal Sample), 1-2-2(Engineering Sample)                                                                                                  |                              |
| Product Description                                                                                                                                                   | : | Operation Frequency:                                                                                                                             | 2408~2474MHz                 |
|                                                                                                                                                                       |   | Number of Channel:                                                                                                                               | 34 Channels                  |
|                                                                                                                                                                       |   | Modulation Type:                                                                                                                                 | FSK                          |
|                                                                                                                                                                       |   | Antenna Type:                                                                                                                                    | PCB Antenna                  |
|                                                                                                                                                                       |   | Antenna Gain(Peak):                                                                                                                              | 1 dBi (Provided by customer) |
| <b>Remark:</b> 1) For a more detailed features description, please refer to the manufacturer’s specifications or the User’s Manual. 2) This report is for SRD module. |   |                                                                                                                                                  |                              |

### 1.3. Auxiliary Equipment Used During Test

|     |  |
|-----|--|
| N/A |  |
|-----|--|

### 1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|--------------|-------------|
| Mode 1       | CH0         |
| Mode 2       | CH17        |
| Mode 3       | CH33        |

| For Conducted Emission |             |
|------------------------|-------------|
| Final Test Mode        | Description |
| Mode 1                 | CH0         |
| Mode 2                 | CH17        |
| Mode 3                 | CH33        |

| For Radiated Emission |             |
|-----------------------|-------------|
| Final Test Mode       | Description |
| Mode 1                | CH0         |
| Mode 2                | CH17        |
| Mode 3                | CH33        |

**Note:**

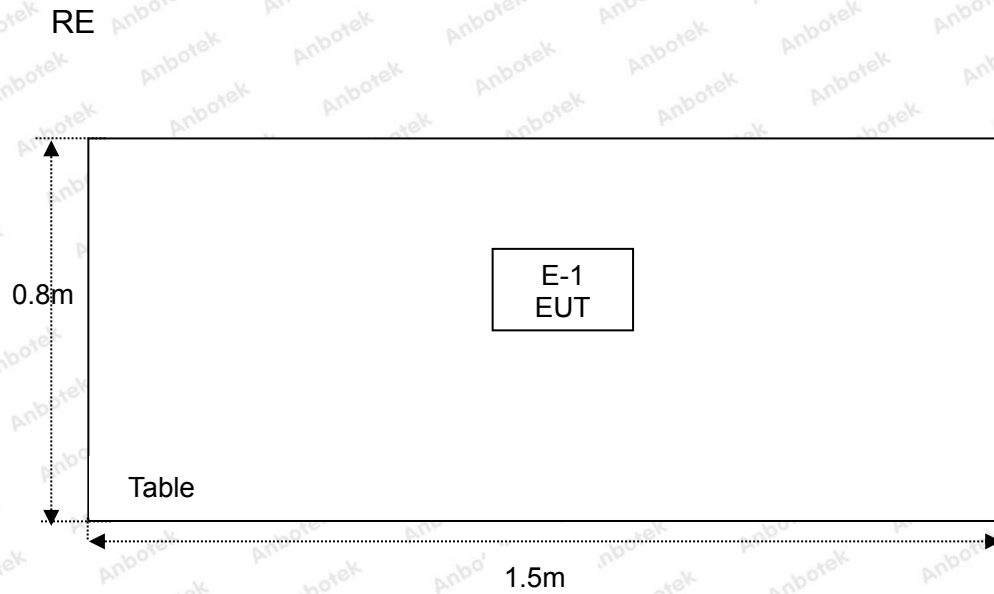
1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.

**1.5. List of Channels**

| Channel | Freq.<br>(MHz) | Channel | Freq.<br>(MHz) | Channel | Freq.<br>(MHz) | Channel | Freq.<br>(MHz) | Channel | Freq.<br>(MHz) |
|---------|----------------|---------|----------------|---------|----------------|---------|----------------|---------|----------------|
| 0       | 2408           | 1       | 2410           | 2       | 2412           | 3       | 2414           | 4       | 2416           |
| 5       | 2418           | 6       | 2420           | 7       | 2422           | 8       | 2424           | 9       | 2426           |
| 10      | 2428           | 11      | 2430           | 12      | 2432           | 13      | 2434           | 14      | 2436           |
| 15      | 2438           | 16      | 2440           | 17      | 2442           | 18      | 2444           | 19      | 2446           |
| 20      | 2448           | 21      | 2450           | 22      | 2452           | 23      | 2454           | 24      | 2456           |
| 25      | 2458           | 26      | 2460           | 27      | 2462           | 28      | 2464           | 29      | 2466           |
| 30      | 2468           | 31      | 2470           | 32      | 2472           | 33      | 2474           | /       | /              |



## 1.6. Description of Test Setup



## 1.7. Test Equipment List

| Item | Equipment                                   | Manufacturer               | Model No.        | Serial No.    | Last Cal.     | Cal. Interval |
|------|---------------------------------------------|----------------------------|------------------|---------------|---------------|---------------|
| 1.   | L.I.S.N.<br>Artificial Mains<br>Network     | Rohde & Schwarz            | ENV216           | 100055        | Oct. 26, 2020 | 1 Year        |
| 2.   | EMI Test Receiver                           | Rohde & Schwarz            | ESCI             | 100627        | Oct. 26, 2020 | 1 Year        |
| 3.   | EMI Test Receiver                           | Rohde & Schwarz            | ESR26            | 101481        | Oct. 26, 2020 | 1 Year        |
| 4.   | RF Switching Unit                           | Compliance<br>Direction    | RSU-M2           | 38303         | Oct. 26, 2020 | 1 Year        |
| 5.   | MAX Spectrum<br>Analysis                    | Agilent                    | N9020A           | MY51170037    | Oct. 26, 2020 | 1 Year        |
| 6.   | Preamplifier                                | SKET Electronic            | BK1G18G30<br>D   | KD17503       | Oct. 26, 2020 | 1 Year        |
| 7.   | Double Ridged Horn<br>Antenna               | Instruments<br>corporation | GTH-0118         | 351600        | Nov. 02, 2020 | 2 Year        |
| 8.   | Bilog Broadband<br>Antenna                  | Schwarzbeck                | VULB9163         | VULB 9163-289 | Nov. 02, 2020 | 2 Year        |
| 9.   | Loop Antenna                                | Schwarzbeck                | FMZB1519B        | 00053         | Nov. 02, 2020 | 2 Year        |
| 10.  | Horn Antenna                                | A-INFO                     | LB-180400-<br>KF | J211060628    | Nov. 02, 2020 | 2 Year        |
| 11.  | Pre-amplifier                               | SONOMA                     | 310N             | 186860        | Oct. 26, 2020 | 1 Year        |
| 12.  | EMI Test Software<br>EZ-EMC                 | SHURPLE                    | N/A              | N/A           | N/A           | N/A           |
| 13.  | RF Test Control<br>System                   | YIHENG                     | YH3000           | 2017430       | Oct. 26, 2020 | 1 Year        |
| 14.  | Power Sensor                                | DAER                       | RPR3006W         | 15I00041SN045 | Oct. 26, 2020 | 1 Year        |
| 15.  | Power Sensor                                | DAER                       | RPR3006W         | 15I00041SN046 | Oct. 26, 2020 | 1 Year        |
| 16.  | MXA Spectrum<br>Analysis                    | Agilent                    | N9020A           | MY51170037    | Oct. 26, 2020 | 1 Year        |
| 17.  | MXG RF Vector<br>Signal Generator           | Agilent                    | N5182A           | MY48180656    | Oct. 26, 2020 | 1 Year        |
| 18.  | Signal Generator                            | Agilent                    | E4421B           | MY41000743    | Oct. 26, 2020 | 1 Year        |
| 19.  | DC Power Supply                             | IVYTECH                    | IV3605           | 1804D360510   | Oct. 26, 2020 | 1 Year        |
| 20.  | Constant<br>Temperature<br>Humidity Chamber | ZHONGJIAN                  | ZJ-KHWS80<br>B   | N/A           | Oct. 26, 2020 | 1 Year        |



### 1.8. Measurement Uncertainty

|                        |   |                          |
|------------------------|---|--------------------------|
| Radiation Uncertainty  | : | Ur = 3.9 dB (Horizontal) |
|                        |   | Ur = 3.8 dB (Vertical)   |
| Conduction Uncertainty | : | Uc = 3.4 dB              |

### 1.9. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### FCC-Registration No.: 184111

Shenzhen Anbotech Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

#### ISED-Registration No.: 8058A

Shenzhen Anbotech Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

#### Test Location

Shenzhen Anbotech Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102



## 2. Summary of Test Results

| Standard Section                                            | Test Item           | Result |
|-------------------------------------------------------------|---------------------|--------|
| 15.203                                                      | Antenna Requirement | PASS   |
| 15.207                                                      | Conducted Emission  | N/A    |
| 15.249                                                      | Radiated Emission   | PASS   |
| 15.215(c)                                                   | 20dB Bandwidth      | PASS   |
| 15.249(c)                                                   | Band Edge           | PASS   |
| <b>Remark:</b> "N/A" is an abbreviation for Not Applicable. |                     |        |



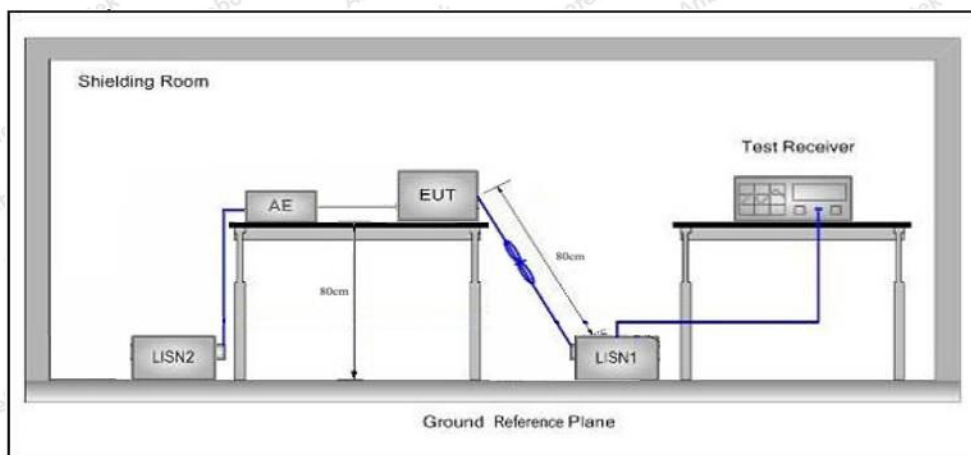
### 3. Conducted Emission Test

#### 3.1. Test Standard and Limit

| Test Standard | FCC Part15 Section 15.207 |                                |               |
|---------------|---------------------------|--------------------------------|---------------|
| Test Limit    | Frequency                 | Maximum RF Line Voltage (dBuV) |               |
|               |                           | Quasi-peak Level               | Average Level |
|               | 150kHz~500kHz             | 66 ~ 56 *                      | 56 ~ 46 *     |
|               | 500kHz~5MHz               | 56                             | 46            |
|               | 5MHz~30MHz                | 60                             | 50            |

**Remark:** (1) \*Decreasing linearly with logarithm of the frequency.  
(2) The lower limit shall apply at the transition frequency.

#### 3.2. Test Setup



#### 3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

#### 3.4. Test Data

Not applicable for equipment operated with DC power supply.

## 4. Radiated Emission and Band Edge

### 4.1. Test Standard and Limit

| Test Standard | FCC Part15 C Section 15.209 and 15.205 |                                  |                |            |                          |
|---------------|----------------------------------------|----------------------------------|----------------|------------|--------------------------|
| Test Limit    | Frequency (MHz)                        | Field strength (microvolt/meter) | Limit (dBuV/m) | Remark     | Measurement distance (m) |
|               | 0.009MHz~0.490MHz                      | 2400/F(kHz)                      | -              | -          | 300                      |
|               | 0.490MHz-1.705MHz                      | 24000/F(kHz)                     | -              | -          | 30                       |
|               | 1.705MHz-30MHz                         | 30                               | -              | -          | 30                       |
|               | 30MHz~88MHz                            | 100                              | 40.0           | Quasi-peak | 3                        |
|               | 88MHz~216MHz                           | 150                              | 43.5           | Quasi-peak | 3                        |
|               | 216MHz~960MHz                          | 200                              | 46.0           | Quasi-peak | 3                        |
|               | 960MHz~1000MHz                         | 500                              | 54.0           | Quasi-peak | 3                        |
|               | Above 1000MHz                          | 500                              | 54.0           | Average    | 3                        |
|               |                                        | -                                | 74.0           | Peak       | 3                        |

**Remark:**

(1)The lower limit shall apply at the transition frequency.

(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

| Test Standard | FCC Part15 C Section 15.249 |                                                    |                                                |                |         |                          |
|---------------|-----------------------------|----------------------------------------------------|------------------------------------------------|----------------|---------|--------------------------|
| Test Limit    | Frequency (MHz)             | Field Strength of fundamental ((millivolts /meter) | Field Strength of Harmonics (microvolts/meter) | Limit (dBuV/m) | Remark  | Measurement distance (m) |
|               | 2400~2483.5                 | 50                                                 | -                                              | 114.0          | Peak    | 3                        |
|               | 2400~2483.5                 | 50                                                 | -                                              | 94.0           | Average | 3                        |
|               | 2400~2483.5                 | -                                                  | 500                                            | 74.0           | Peak    | 3                        |
|               | 2400~2483.5                 | -                                                  | 500                                            | 54.0           | Average | 3                        |

**Remark:**

(1) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

## 4.2. Test Setup

Figure 1. Below 30MHz

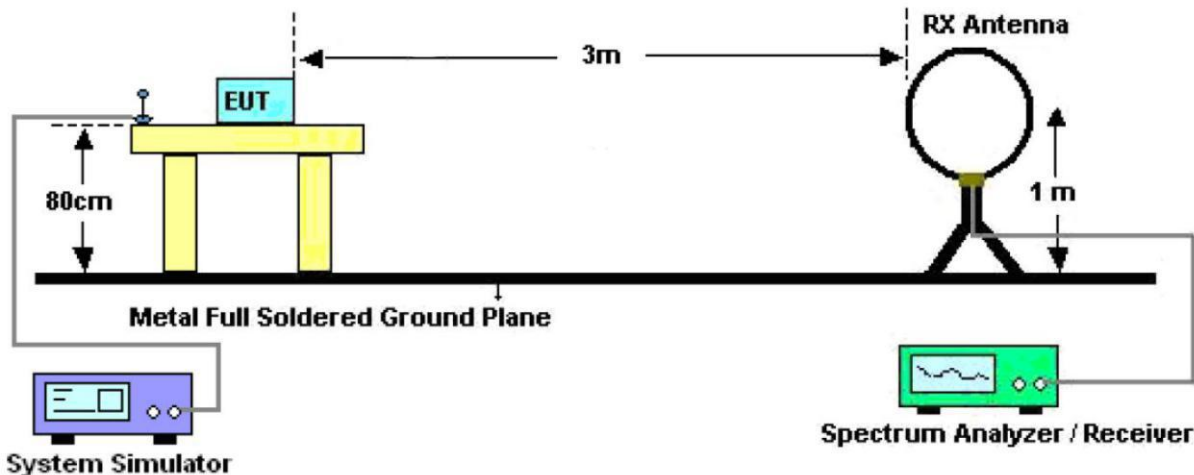


Figure 2. 30MHz to 1GHz

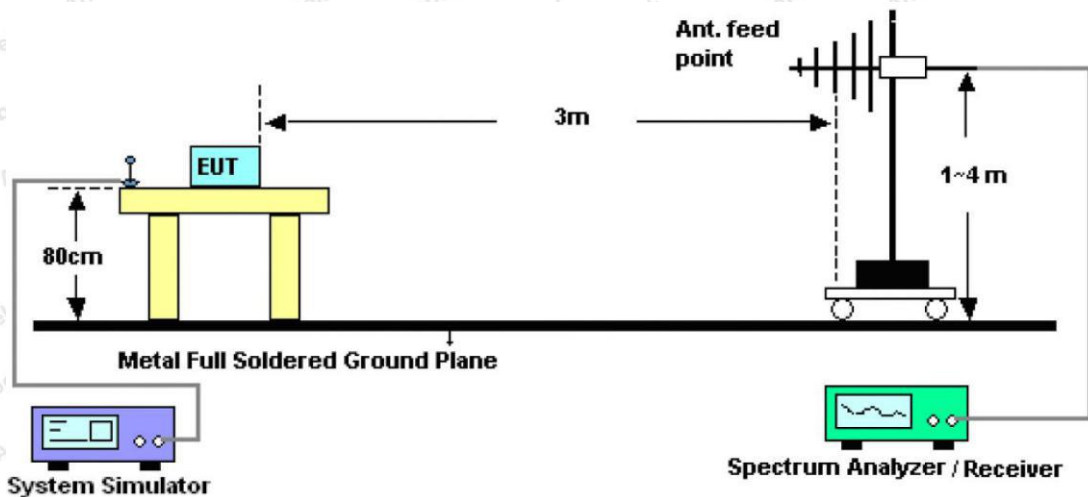
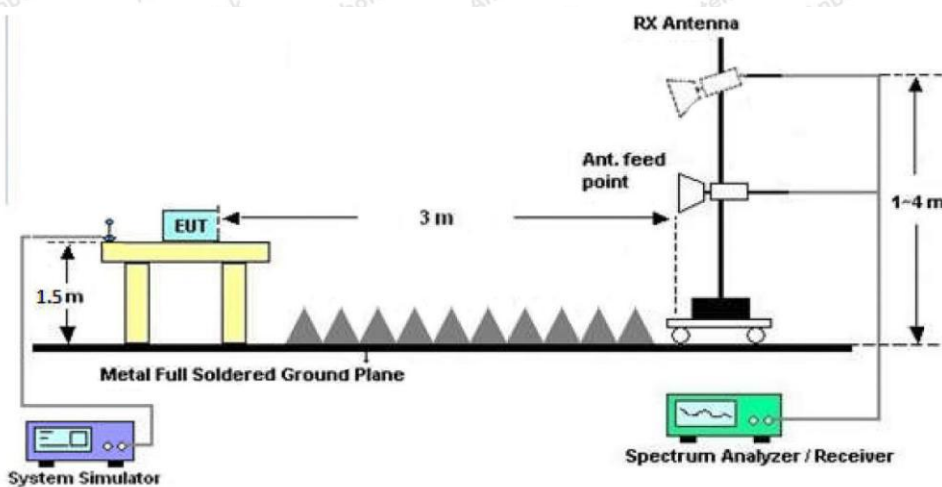


Figure 3. Above 1 GHz



### 4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9\*6\*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz,Set the spectrum analyzer as:

RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.

RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

### 4.4. Test Data

#### PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all the modes, only the worst case is recorded in the report.

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**Test Results (30~1000MHz)**

Test Mode: CH0  
Power Source: DC 1.5V  
Polarization: Vertical  
Temp.(°C)/Hum.(%RH): 24.3°C/46%RH



| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|----------------|---------------|-----------------|----------------|-----------------|----------|-------------|--------------|--------|
| 1   | 71.8320     | 34.55          | -18.49        | 16.06           | 40.00          | -23.94          | QP       | 100         | 0            |        |
| 2   | 144.3348    | 35.23          | -20.00        | 15.23           | 43.50          | -28.27          | QP       | 100         | 360          |        |
| 3   | 216.7828    | 34.16          | -16.55        | 17.61           | 46.00          | -28.39          | QP       | 100         | 0            |        |
| 4   | 289.0021    | 34.03          | -13.82        | 20.21           | 46.00          | -25.79          | QP       | 100         | 360          |        |
| 5   | 400.4319    | 40.04          | -11.27        | 28.77           | 46.00          | -17.23          | QP       | 100         | 0            |        |
| 6   | 801.7863    | 34.58          | -4.13         | 30.45           | 46.00          | -15.55          | QP       | 100         | 360          |        |



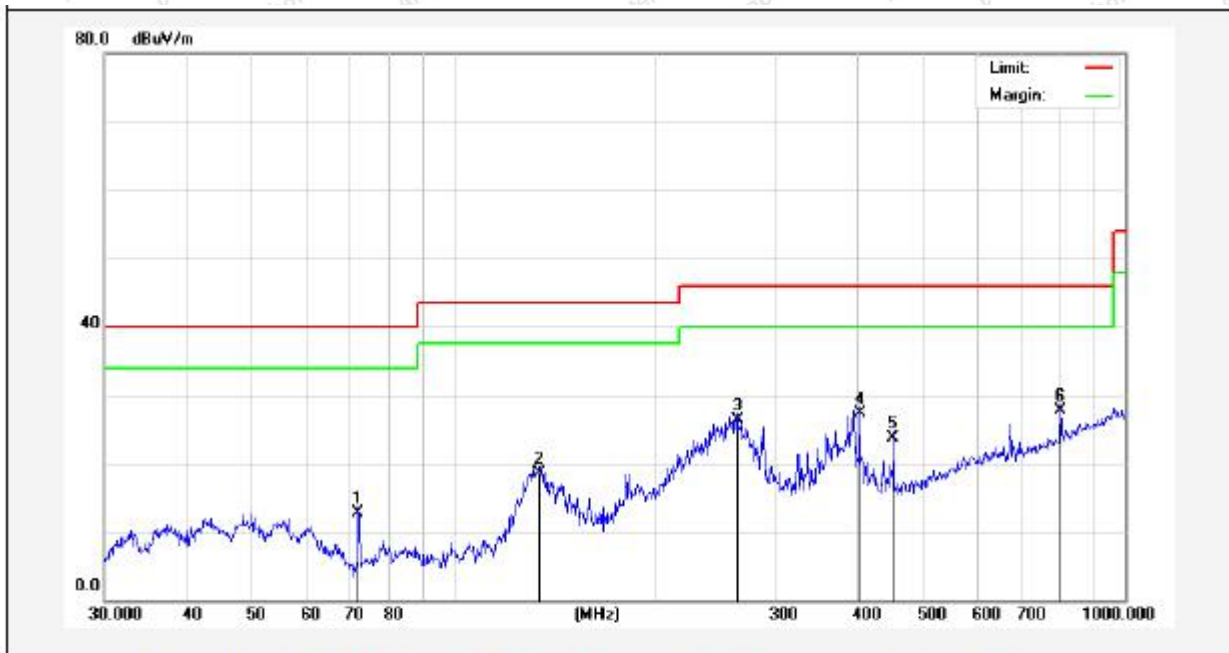
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**Test Results (30~1000MHz)**

Test Mode: CH0  
Power Source: DC 1.5V  
Polarization: Horizontal  
Temp.(°C)/Hum.(%RH): 24.3°C/46%RH



| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|----------------|---------------|-----------------|----------------|-----------------|----------|-------------|--------------|--------|
| 1   | 71.8320     | 33.35          | -20.71        | 12.64           | 40.00          | -27.36          | QP       | 100         | 0            |        |
| 2   | 133.6188    | 39.16          | -20.62        | 18.54           | 43.50          | -24.96          | QP       | 100         | 360          |        |
| 3   | 263.8190    | 43.88          | -17.58        | 26.30           | 46.00          | -19.70          | QP       | 100         | 0            |        |
| 4   | 401.8385    | 40.22          | -12.95        | 27.27           | 46.00          | -18.73          | QP       | 100         | 360          |        |
| 5   | 451.1350    | 35.74          | -12.01        | 23.73           | 46.00          | -22.27          | QP       | 100         | 0            |        |
| 6   | 801.7863    | 31.74          | -4.13         | 27.61           | 46.00          | -18.39          | QP       | 100         | 360          |        |



## Test Results (1GHz-25GHz)

| Test Mode: Low channel |                   |                       |                 |                          |                |                |                 |      |          |
|------------------------|-------------------|-----------------------|-----------------|--------------------------|----------------|----------------|-----------------|------|----------|
| Frequency (MHz)        | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. | Detector |
| 2408.0000              | 94.50             | 31.12                 | 2.18            | 35.33                    | 92.47          | 114.00         | -21.53          | V    | Peak     |
| 2408.0000              | 86.00             | 31.12                 | 2.18            | 35.33                    | 83.97          | 94.00          | -10.03          | V    | AVG      |
| 4816.0000              | 48.66             | 34.01                 | 2.58            | 34.65                    | 50.60          | 74.00          | -23.40          | V    | Peak     |
| 4816.0000              | 41.05             | 34.01                 | 2.58            | 34.65                    | 42.99          | 54.00          | -11.01          | V    | AVG      |
| 7224.0000              | 45.26             | 36.16                 | 2.97            | 35.07                    | 49.32          | 74.00          | -24.68          | V    | Peak     |
| 7224.0000              | 35.40             | 36.16                 | 2.97            | 35.07                    | 39.46          | 54.00          | -14.54          | V    | AVG      |
| 9632.0000              | *                 |                       |                 |                          |                |                |                 |      |          |
| 12040.0000             | *                 |                       |                 |                          |                |                |                 |      |          |
| 14448.0000             | *                 |                       |                 |                          |                |                |                 |      |          |
| 16856.0000             | *                 |                       |                 |                          |                |                |                 |      |          |
| 2408.0000              | 93.03             | 31.12                 | 2.18            | 35.33                    | 91.00          | 114.00         | -23.00          | H    | Peak     |
| 2408.0000              | 82.99             | 31.12                 | 2.18            | 35.33                    | 80.96          | 94.00          | -13.04          | H    | AVG      |
| 4816.0000              | 49.31             | 34.01                 | 2.58            | 34.65                    | 51.25          | 74.00          | -22.75          | H    | Peak     |
| 4816.0000              | 39.50             | 34.01                 | 2.58            | 34.65                    | 41.44          | 54.00          | -12.56          | H    | AVG      |
| 7224.0000              | 48.31             | 36.16                 | 2.97            | 35.07                    | 52.37          | 74.00          | -21.63          | H    | Peak     |
| 7224.0000              | 36.73             | 36.16                 | 2.97            | 35.07                    | 40.79          | 54.00          | -13.21          | H    | AVG      |
| 9632.0000              | *                 |                       |                 |                          |                |                |                 |      |          |
| 12040.0000             | *                 |                       |                 |                          |                |                |                 |      |          |
| 14448.0000             | *                 |                       |                 |                          |                |                |                 |      |          |
| 16856.0000             | *                 |                       |                 |                          |                |                |                 |      |          |

## Note:

1. Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “\*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.



| Test Mode: Middle channel |                   |                       |                 |                    |                |                |                 |      |          |
|---------------------------|-------------------|-----------------------|-----------------|--------------------|----------------|----------------|-----------------|------|----------|
| Frequency (MHz)           | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. | Detector |
| 2442.0000                 | 96.67             | 31.12                 | 2.20            | 34.51              | 95.48          | 114.00         | -18.52          | V    | Peak     |
| 2442.0000                 | 85.00             | 31.22                 | 2.20            | 34.51              | 83.91          | 94.00          | -10.09          | V    | AVG      |
| 4884.0000                 | 48.86             | 34.98                 | 2.49            | 34.14              | 52.19          | 74.00          | -21.81          | V    | Peak     |
| 4884.0000                 | 41.82             | 34.98                 | 2.49            | 34.14              | 45.15          | 54.00          | -8.85           | V    | AVG      |
| 7326.0000                 | 47.14             | 36.01                 | 3.01            | 34.56              | 51.60          | 74.00          | -22.40          | V    | Peak     |
| 7326.0000                 | 35.83             | 36.01                 | 3.01            | 34.56              | 40.29          | 54.00          | -13.71          | V    | AVG      |
| 9768.0000                 | *                 |                       |                 |                    |                |                |                 |      |          |
| 12210.0000                | *                 |                       |                 |                    |                |                |                 |      |          |
| 14652.0000                | *                 |                       |                 |                    |                |                |                 |      |          |
| 17094.0000                | *                 |                       |                 |                    |                |                |                 |      |          |
| 2442.0000                 | 95.81             | 31.12                 | 2.20            | 34.51              | 94.62          | 114.00         | -19.38          | H    | Peak     |
| 2442.0000                 | 82.26             | 31.12                 | 2.20            | 34.51              | 81.07          | 94.00          | -12.93          | H    | AVG      |
| 4884.0000                 | 47.90             | 34.98                 | 2.49            | 34.14              | 51.23          | 74.00          | -22.77          | H    | Peak     |
| 4884.0000                 | 38.14             | 34.98                 | 2.49            | 34.14              | 41.47          | 54.00          | -12.53          | H    | AVG      |
| 7326.0000                 | 47.46             | 36.01                 | 3.01            | 34.56              | 51.92          | 74.00          | -22.08          | H    | Peak     |
| 7326.0000                 | 38.41             | 36.01                 | 3.01            | 34.56              | 42.87          | 54.00          | -11.13          | H    | AVG      |
| 9768.0000                 | *                 |                       |                 |                    |                |                |                 |      |          |
| 12210.0000                | *                 |                       |                 |                    |                |                |                 |      |          |
| 14652.0000                | *                 |                       |                 |                    |                |                |                 |      |          |
| 17094.0000                | *                 |                       |                 |                    |                |                |                 |      |          |

**Note:**

1. Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. "\*" means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.



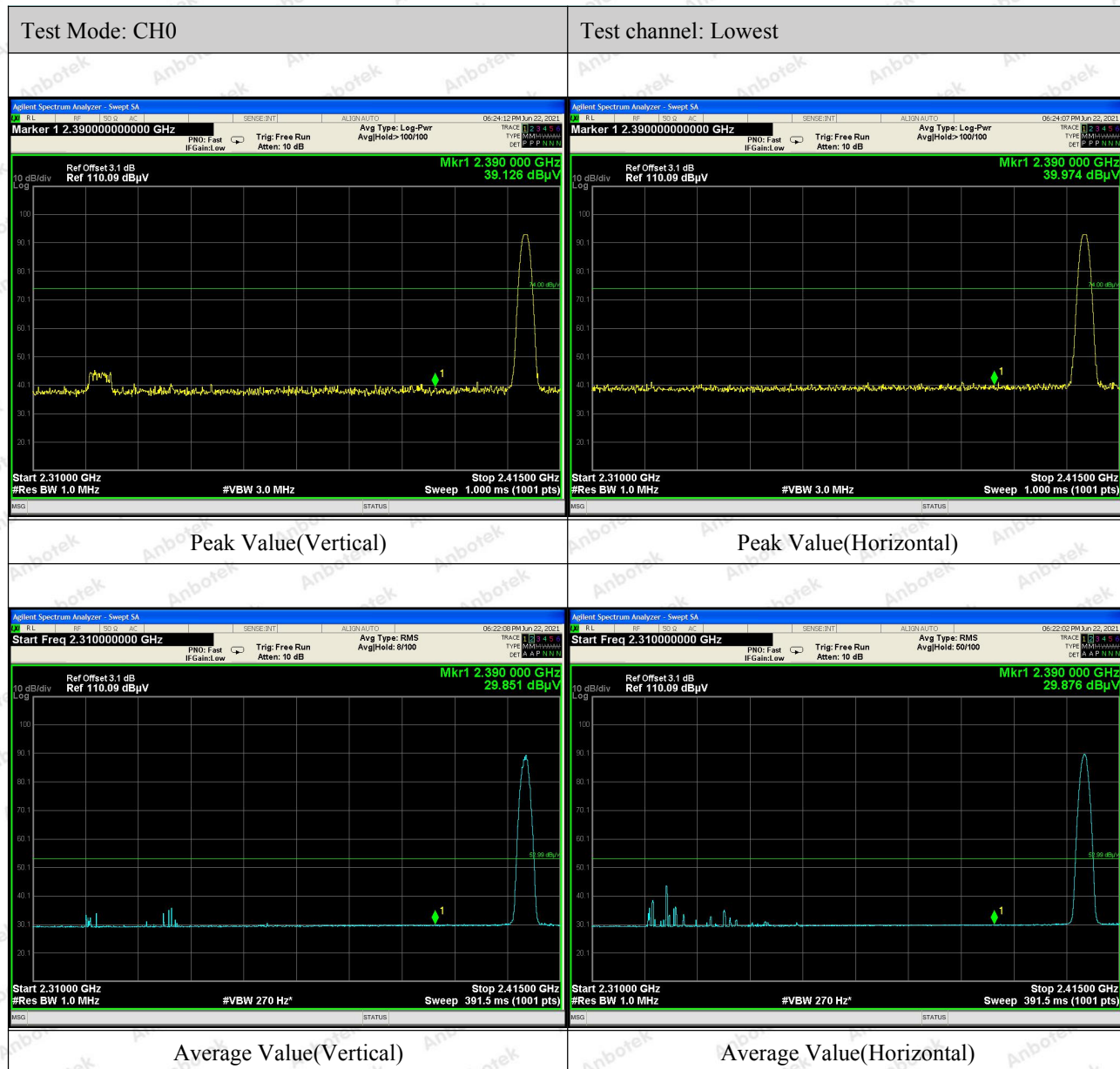
| Test Mode: High channel |                   |                       |                 |                    |                |                |                 |      |          |
|-------------------------|-------------------|-----------------------|-----------------|--------------------|----------------|----------------|-----------------|------|----------|
| Frequency (MHz)         | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. | Detector |
| 2474.0000               | 95.10             | 31.65                 | 2.23            | 36.07              | 92.91          | 114.00         | -21.09          | V    | Peak     |
| 2474.0000               | 84.31             | 31.65                 | 2.23            | 36.07              | 82.12          | 94.00          | -11.88          | V    | AVG      |
| 4948.0000               | 50.45             | 35.06                 | 2.60            | 34.93              | 53.18          | 74.00          | -20.82          | V    | Peak     |
| 4948.0000               | 39.37             | 35.06                 | 2.60            | 34.93              | 42.10          | 54.00          | -11.90          | V    | AVG      |
| 7422.0000               | 47.57             | 36.19                 | 3.12            | 35.11              | 51.77          | 74.00          | -22.23          | V    | Peak     |
| 7422.0000               | 35.18             | 36.19                 | 3.12            | 35.11              | 39.38          | 54.00          | -14.62          | V    | AVG      |
| 9896.0000               | *                 |                       |                 |                    |                |                |                 |      |          |
| 12370.0000              | *                 |                       |                 |                    |                |                |                 |      |          |
| 14844.0000              | *                 |                       |                 |                    |                |                |                 |      |          |
| 17318.0000              | *                 |                       |                 |                    |                |                |                 |      |          |
| 2474.0000               | 96.58             | 31.65                 | 2.23            | 36.07              | 94.39          | 114.00         | -19.61          | H    | Peak     |
| 2474.0000               | 82.60             | 31.65                 | 2.23            | 36.07              | 80.41          | 94.00          | -13.59          | H    | AVG      |
| 4948.0000               | 50.61             | 35.06                 | 2.60            | 34.93              | 53.34          | 74.00          | -20.66          | H    | Peak     |
| 4948.0000               | 38.61             | 35.06                 | 2.60            | 34.93              | 41.34          | 54.00          | -12.66          | H    | AVG      |
| 7422.0000               | 47.94             | 36.19                 | 3.12            | 35.11              | 52.14          | 74.00          | -21.86          | H    | Peak     |
| 7422.0000               | 37.76             | 36.19                 | 3.12            | 35.11              | 41.96          | 54.00          | -12.04          | H    | AVG      |
| 9896.0000               | *                 |                       |                 |                    |                |                |                 |      |          |
| 12370.0000              | *                 |                       |                 |                    |                |                |                 |      |          |
| 14844.0000              | *                 |                       |                 |                    |                |                |                 |      |          |
| 17318.0000              | *                 |                       |                 |                    |                |                |                 |      |          |

**Note:**

1. Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. "\*" means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

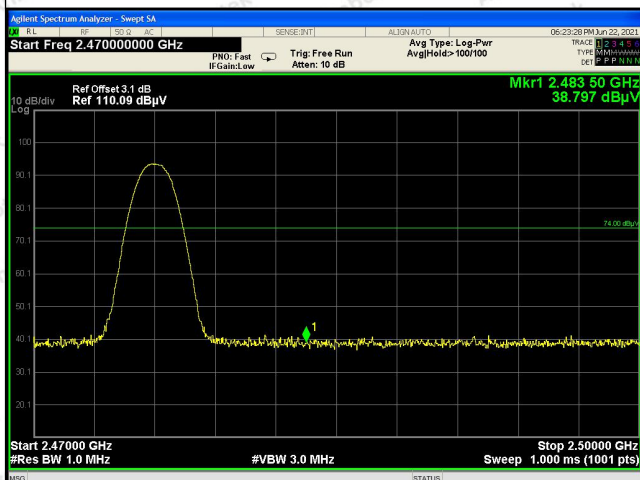


## Radiated Band Edge:

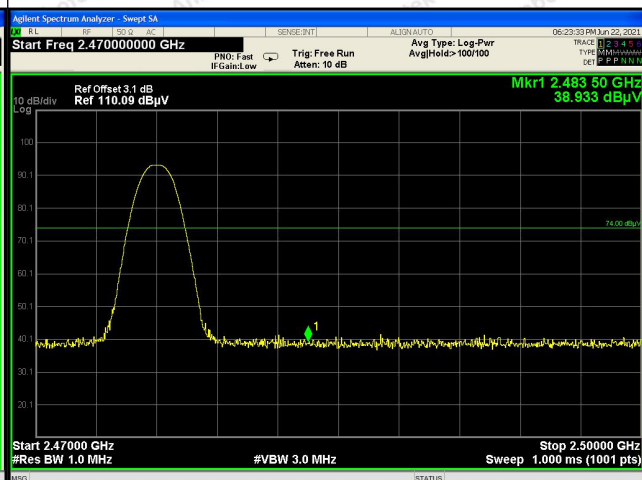


Test Mode: CH33

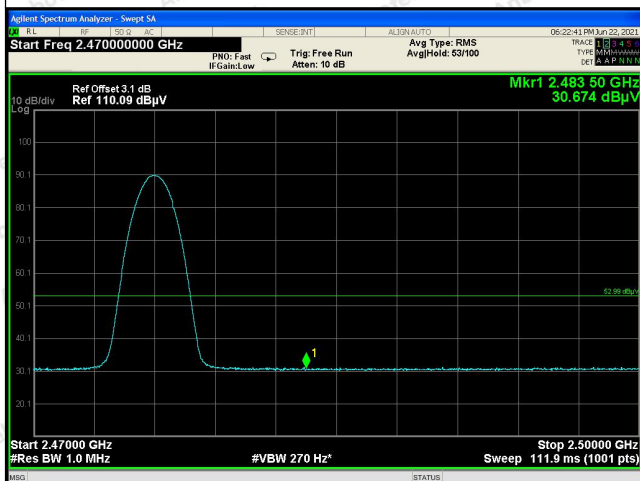
Test channel: Highest



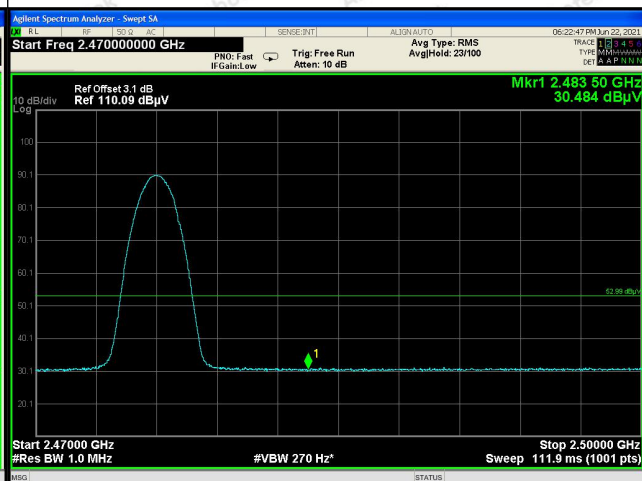
Peak Value(Vertical)



Peak Value(Horizontal)



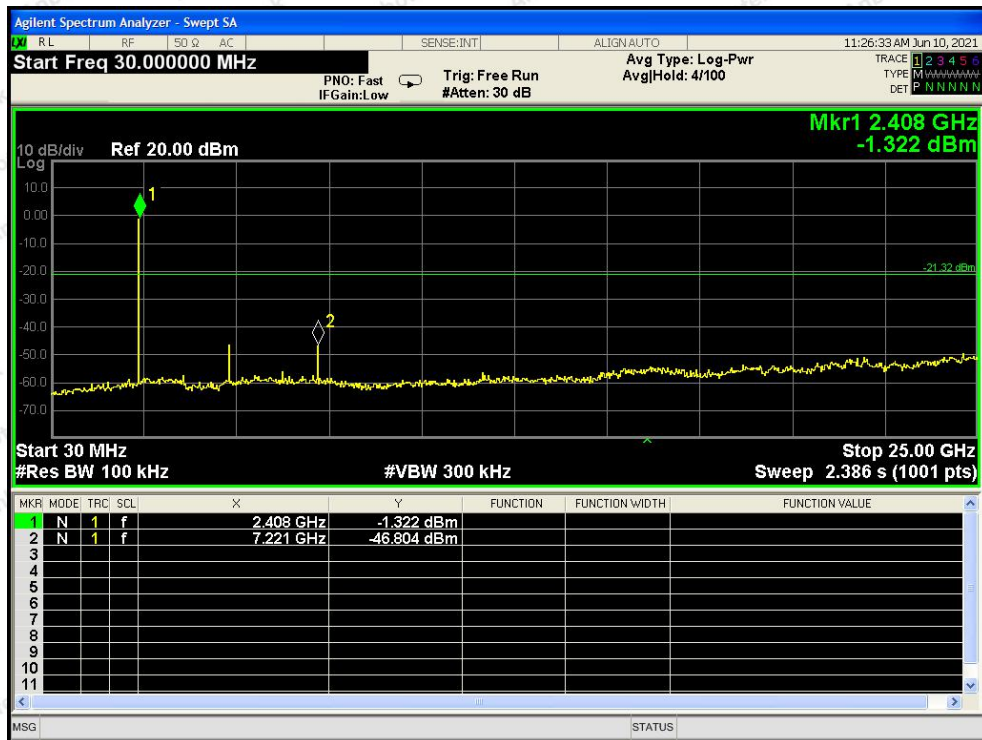
Average Value(Vertical)



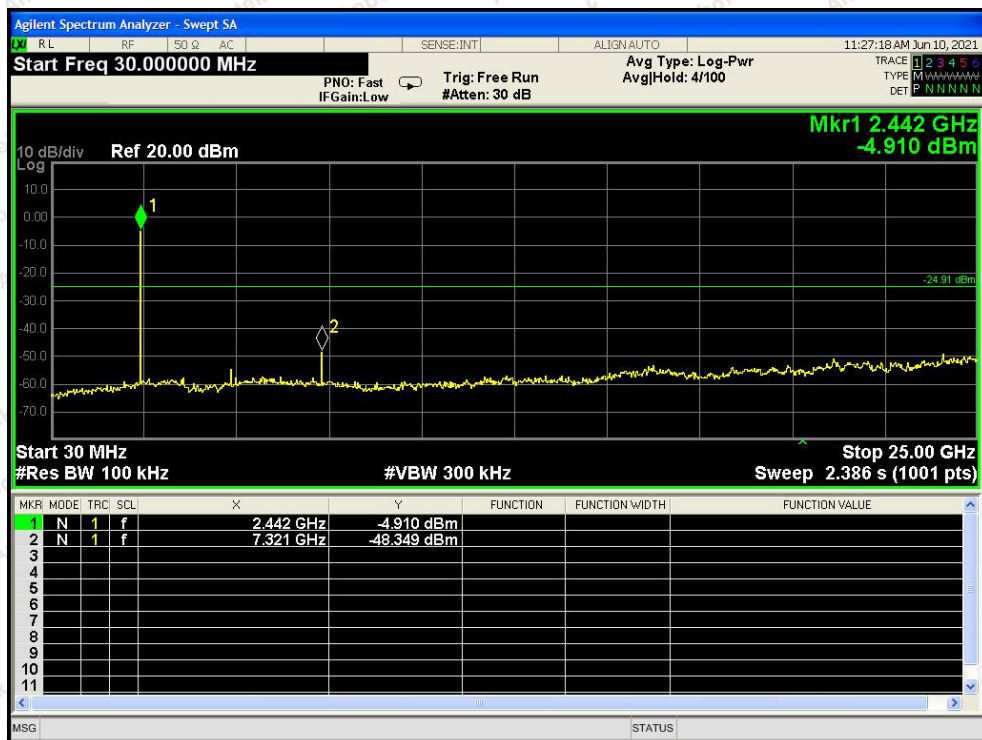
Average Value(Horizontal)



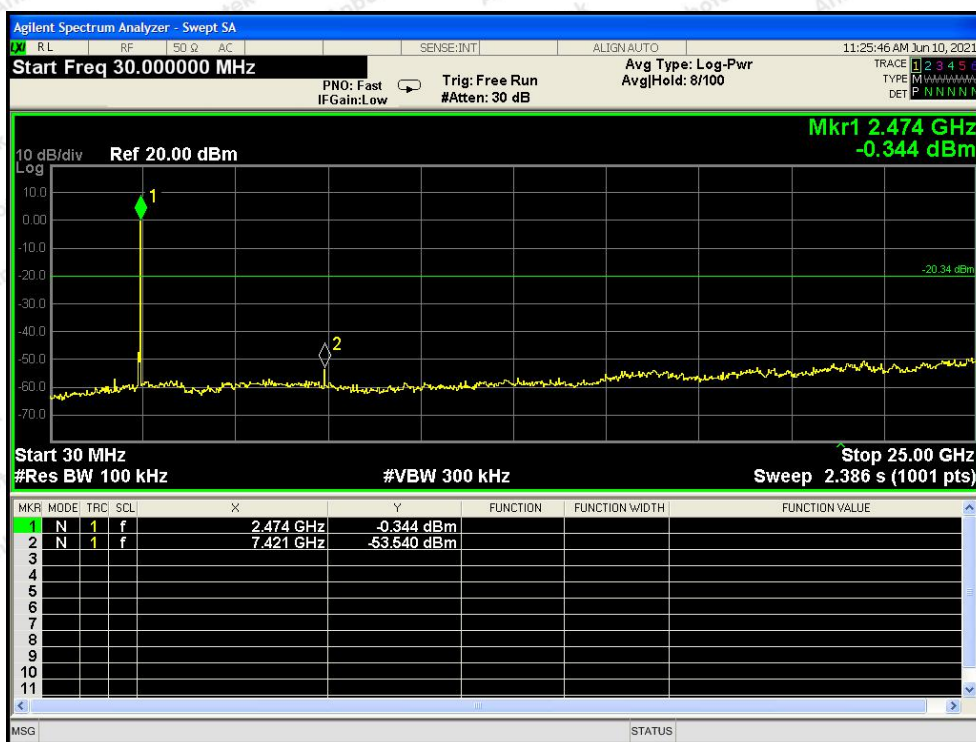
## Conducted Emission Method



CH: Low



CH: Middle



CH: High

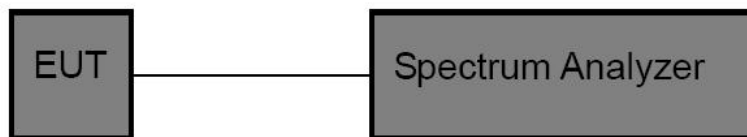


## 5. 20dB Bandwidth Test

### 5.1. Test Standard and Limit

|               |                             |
|---------------|-----------------------------|
| Test Standard | FCC Part15 C Section 15.249 |
|---------------|-----------------------------|

### 5.2. Test Setup



### 5.3. Test Procedure

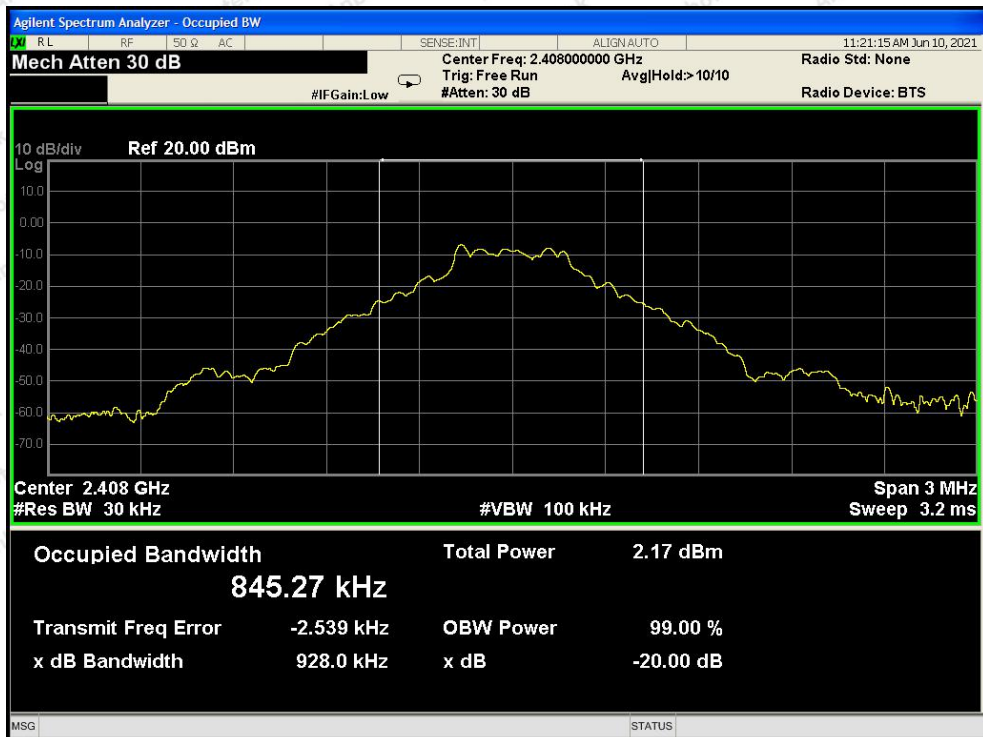
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:  
RBW = 30kHz, VBW $\geq$ 3\*RBW =100kHz,  
Detector= Average  
Trace mode= Max hold.  
Sweep- auto couple.
4. Mark the peak frequency and -20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

### 5.4. Test Data

|              |   |                |
|--------------|---|----------------|
| Test Item    | : | 20dB Bandwidth |
| Test Voltage | : | DC 1.5V        |
| Test Result  | : | PASS           |

|             |   |        |
|-------------|---|--------|
| Test Mode   | : | Mode 1 |
| Temperature | : | 22.4℃  |
| Humidity    | : | 55%RH  |

| Frequency (MHz) | Bandwidth (kHz) | Result |
|-----------------|-----------------|--------|
| 2408            | 928             | PASS   |
| 2442            | 933.6           | PASS   |
| 2474            | 935.9           | PASS   |



Test Mode: Low



Test Mode: Middle

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400-003-0500

www.anbotek.com



Test Mode: High



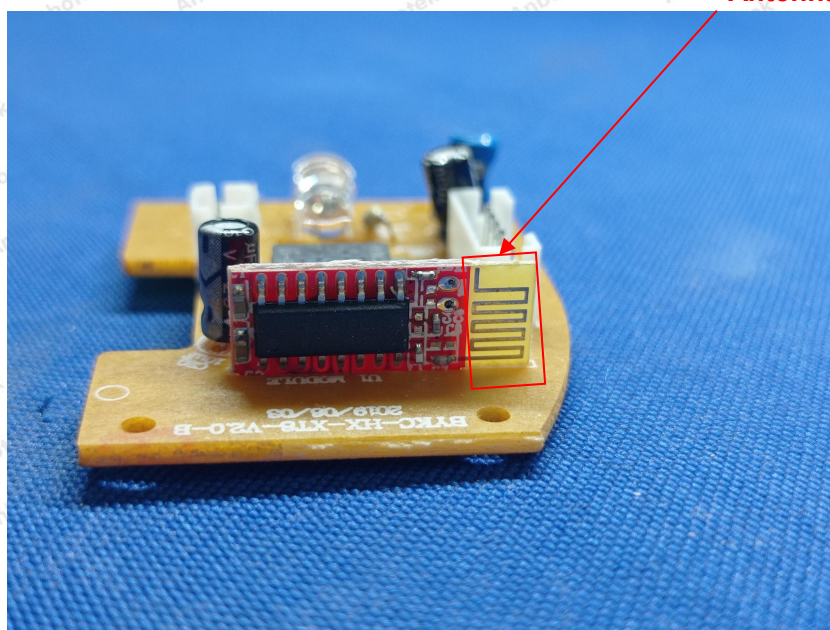
## 6. Antenna Requirement

### 6.1. Test Standard and Requirement

| Test Standard | FCC Part15 Section 15.203                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Requirement   | 1) 15.203 requirement:<br>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 a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. |

### 6.2. Antenna Connected Construction

The antenna is a PCB Antenna which permanently attached, and the best case gain of the antenna is 1 dBi. It complies with the standard requirement.



Antenna



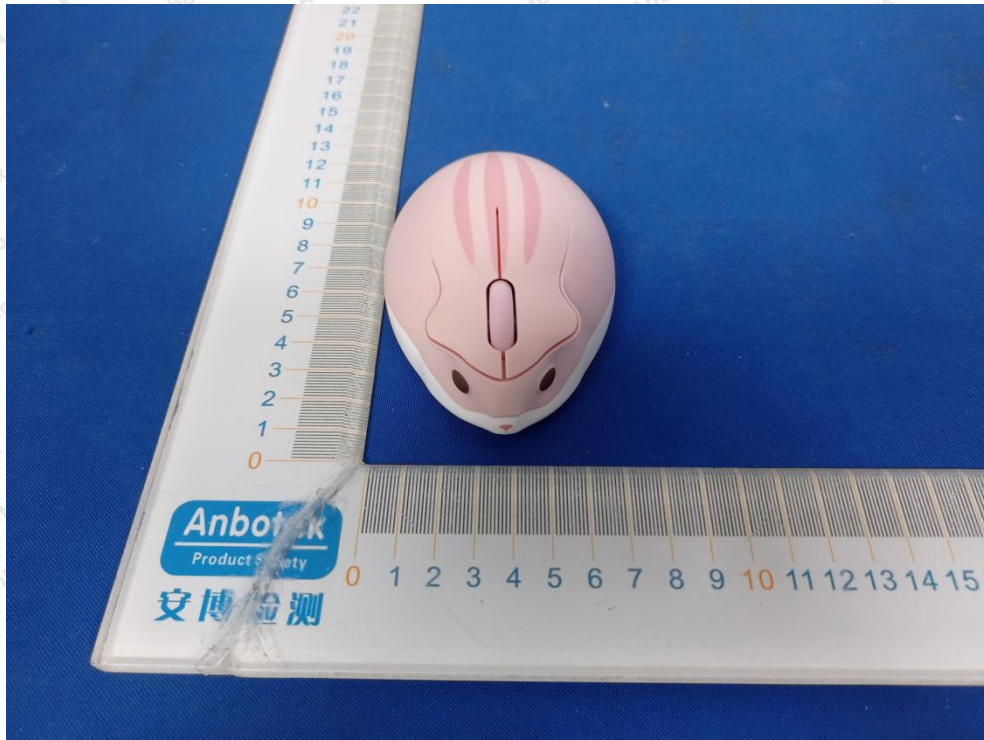
## APPENDIX I -- TEST SETUP PHOTOGRAPH

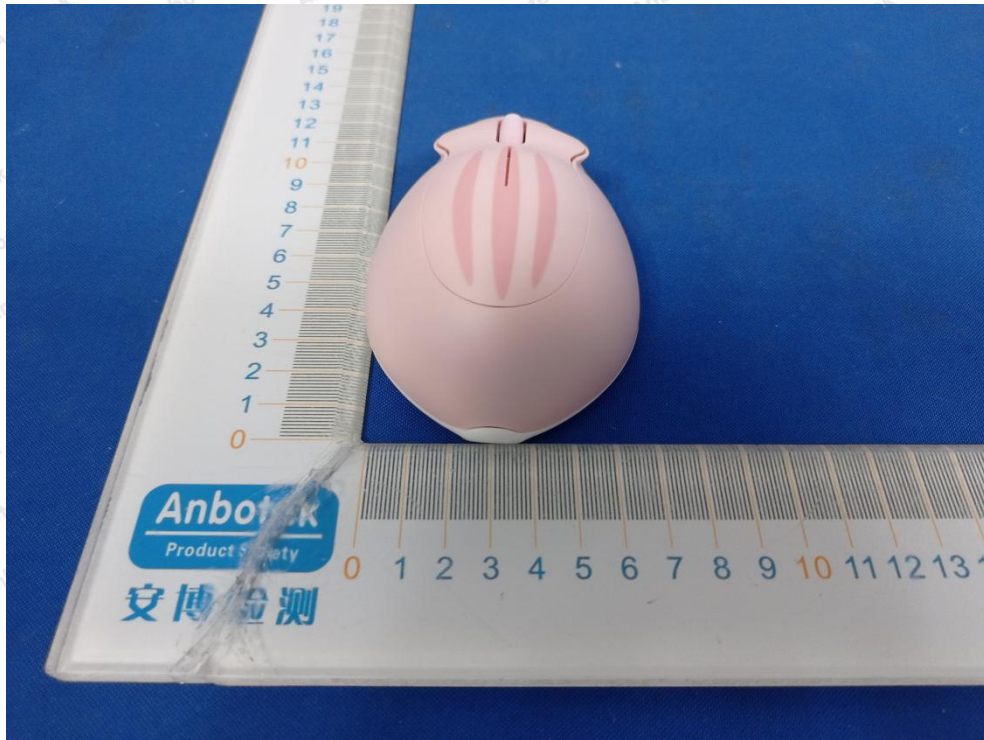
Photo of Radiation Emission Test



**APPENDIX II -- EXTERNAL PHOTOGRAPH**





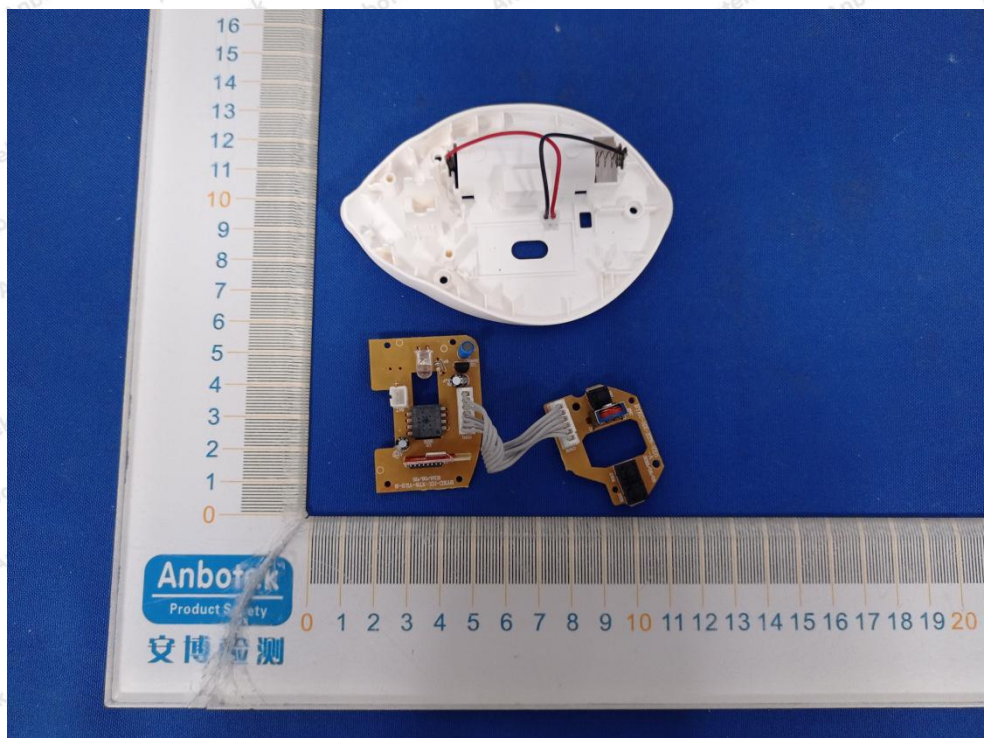
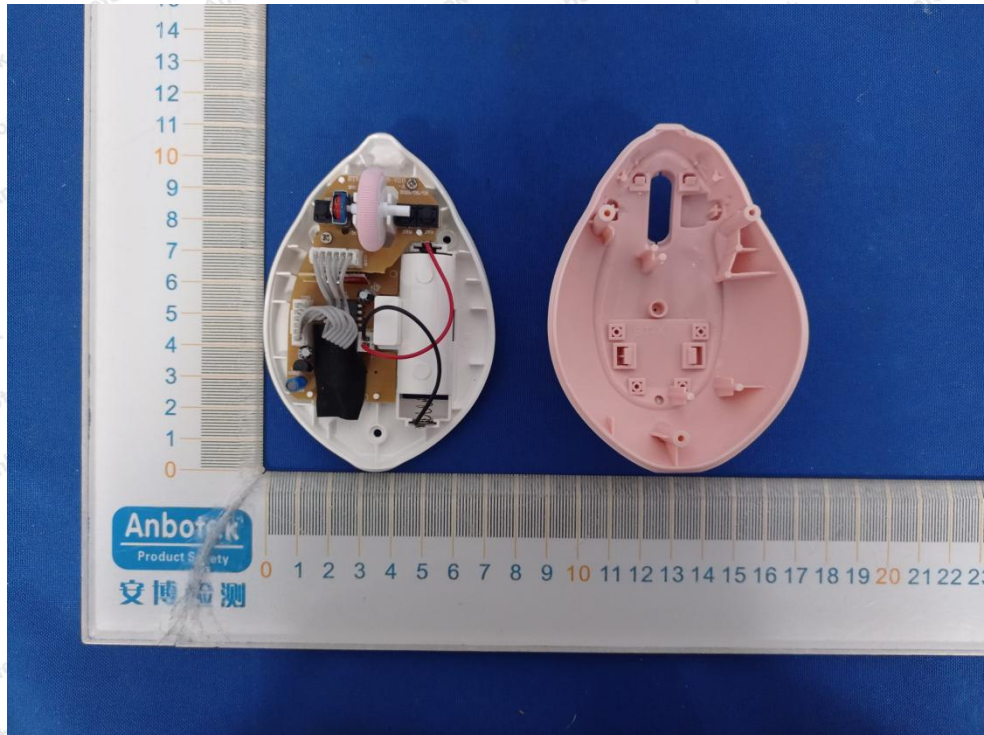


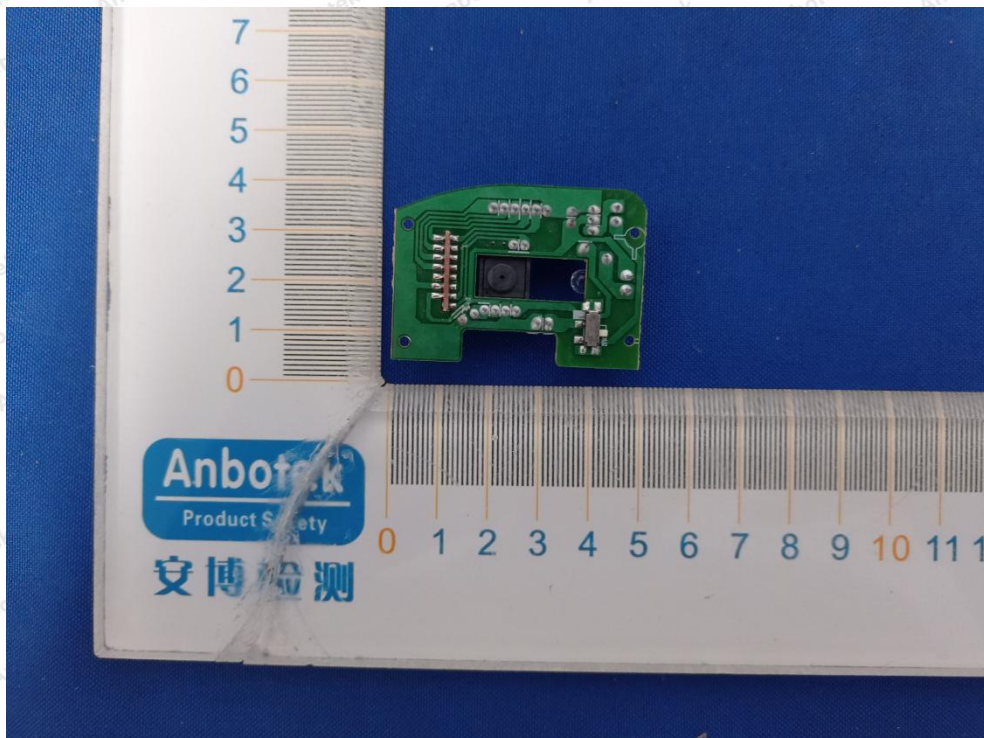
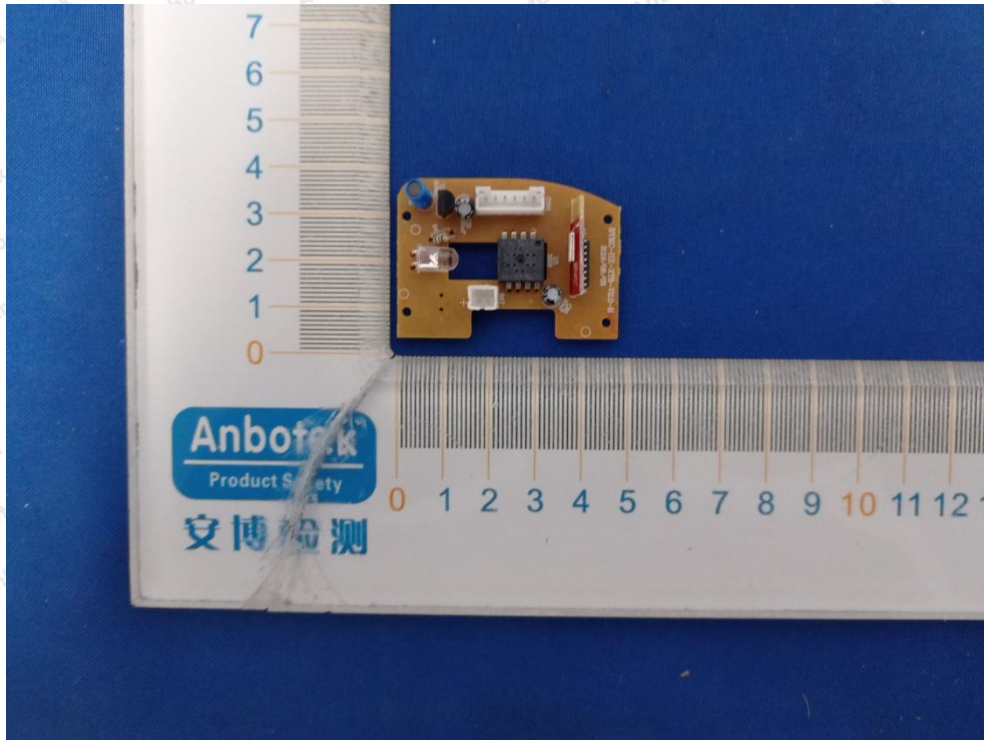




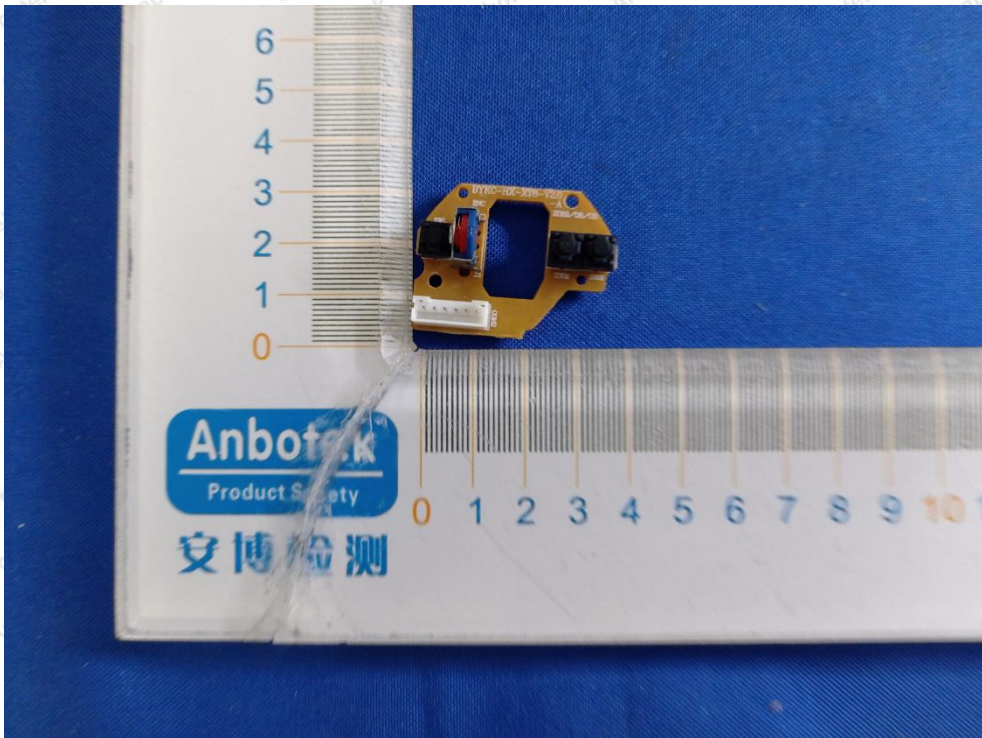
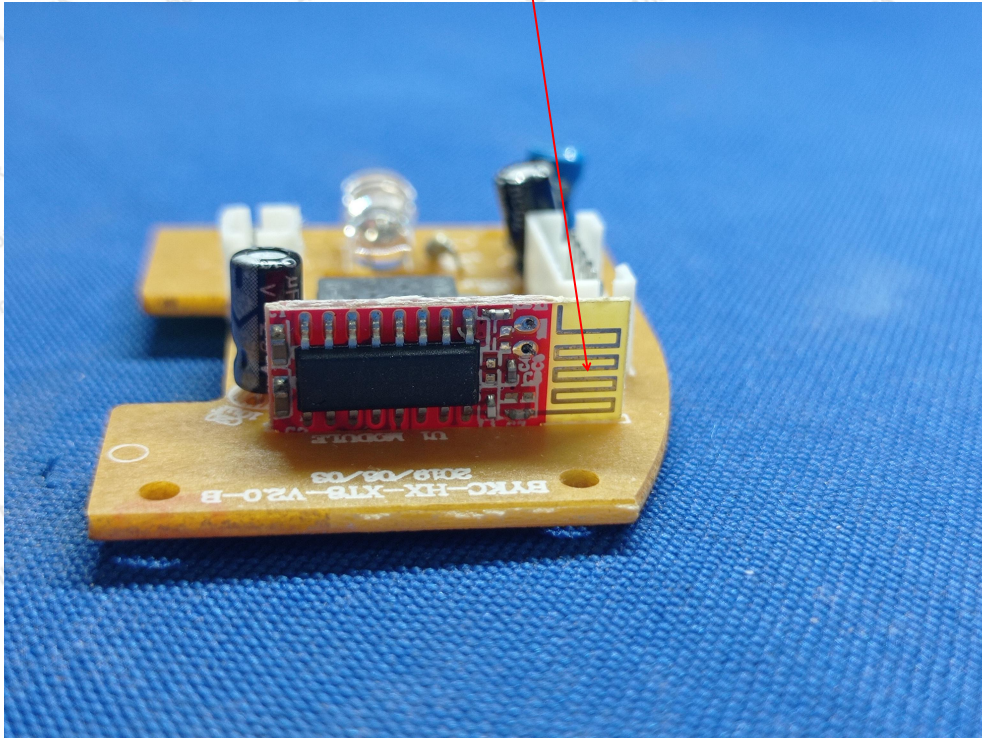


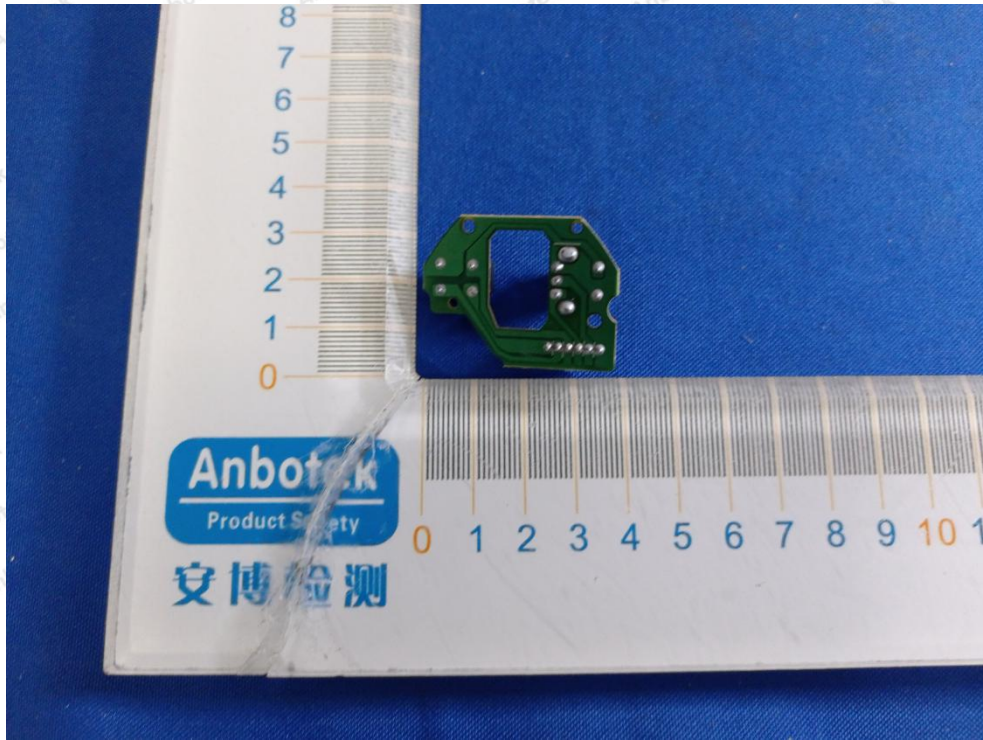
## APPENDIX III -- INTERNAL PHOTOGRAPH





ANT





----- End of Report -----

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