

# Test Report

**Product:** Wireless mouse

**Trade Mark:** /

**Model Number:** PC309A-1

**FCC ID:** 2A3JH-PC309A-1

**Prepared for**

Dongguan Yuzhenrong Trading Co., Ltd.  
Room 204, No.74, Humen Xinlian 9th Street, Humen Village, Humen Town,  
Dongguan City, Guangdong, China

**Prepared by**

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## TEST RESULT CERTIFICATION

**Applicant's Name**..... : Dongguan Yuzhenrong Trading Co., Ltd.  
**Address** ..... : Room 204, No.74, Humen Xinlian 9th Street, Humen  
Village, Humen Town, Dongguan City, Guangdong, China  
**Manufacturer's Name** ..... : Dongguan Yuzhenrong Trading Co., Ltd.  
**Address** ..... : Room 204, No.74, Humen Xinlian 9th Street, Humen  
Village, Humen Town, Dongguan City, Guangdong, China

### Product description

**Product name** ..... : Wireless mouse  
**Model Number** ..... : PC309A-1  
**Standards** ..... : FCC Part 15.249  
**Test procedure**..... : IEEE/ANSI C63.10-2020

This device described above has been tested by Shenzhen HongBiao Certification& Testing Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

### Date of Test

**Date (s) of performance of tests**..... : November 13, 2023 ~ November 24, 2023  
**Test Result**..... : **Pass**

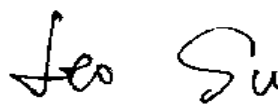
**Testing Engineer** :

  
( Z o e S u )

**Technical Manager** :

  
( G a r y L u )

**Authorized Signatory** :

  
( L e o S u )

[illegible]

# 1 General Description

## 1.1 Description of EUT

|                            |                       |
|----------------------------|-----------------------|
| Product name:              | Wireless mouse        |
| Model name:                | PC309A-1              |
| Series Model:              | /                     |
| Different of series model: | N/A                   |
| Operation frequency:       | 2408 - 2474 MHz       |
| Modulation type:           | GFSK                  |
| Bit Rate of transmitter:   | 2 Mbps                |
| Antenna type:              | PCB Antenna           |
| Antenna gain:              | -0.61dBi              |
| Hardware version:          | MA385N                |
| Software version:          | V1.0                  |
| Power supply:              | DC 1.5V by AA battery |

## 1.2 Test Mode

| Test Mode | Channel | Frequency (MHz) |
|-----------|---------|-----------------|
| 1         | Low     | 2408            |
| 2         | Middle  | 2440            |
| 3         | High    | 2474            |

## 1.3 Operation Channel list

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 01          | 2408            | 10          | 2426            | 19          | 2444            | 28          | 2462            |
| 02          | 2410            | 11          | 2428            | 20          | 2446            | 29          | 2464            |
| 03          | 2412            | 12          | 2430            | 21          | 2448            | 30          | 2466            |
| 04          | 2414            | 13          | 2432            | 22          | 2450            | 31          | 2468            |
| 05          | 2416            | 14          | 2434            | 23          | 2452            | 32          | 2470            |
| 06          | 2418            | 15          | 2436            | 24          | 2454            | 33          | 2472            |
| 07          | 2420            | 16          | 2438            | 25          | 2456            | 34          | 2474            |
| 08          | 2422            | 17          | 2440            | 26          | 2458            | -           | -               |
| 09          | 2424            | 18          | 2442            | 27          | 2460            | -           | -               |

## 1.4 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.5 Ancillary Equipment

| Equipment | Model | S/N | Manufacturer |
|-----------|-------|-----|--------------|
| -         | -     | -   | -            |

| Equipment | Length (cm) | Shielded/Unshielded | With/Without Ferrite |
|-----------|-------------|---------------------|----------------------|
| -         | -           | -                   | -                    |

## 2 Summary of Test Result

| No. | Standard Section  | Test Item                        | Result | Remark |
|-----|-------------------|----------------------------------|--------|--------|
| 1   | FCC Part15.203    | Antenna Requirement              | Pass   |        |
| 2   | FCC Part15.207    | AC power line conducted emission | N/A    |        |
| 3   | FCC Part15.249(d) | Radiated spurious emission       | Pass   |        |
| 4   | FCC Part 15.215   | 20dB and 99% Bandwidth           | Pass   |        |

### 3 Test Facilities and Accreditations

#### 3.1 Test Laboratory

|                       |                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site             | Shenzhen HongBiao Certification& Testing Co., Ltd                                                                                                 |
| Test Site Location    | Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China |
| Telephone:            | (86-755) 2998 9321                                                                                                                                |
| Fax:                  | (86-755) 2998 5110                                                                                                                                |
| FCC Registration No.: | CN1341                                                                                                                                            |
| A2LA Certificate No.: | 6765.01                                                                                                                                           |

#### 3.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

|                    |              |
|--------------------|--------------|
| Temperature:       | 15°C~35°C    |
| Relative Humidity: | 20%~75%      |
| Air Pressure:      | 98kPa~101kPa |

#### 3.3 Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| Measurement Frequency Range      | U, (dB)            | Note |
|----------------------------------|--------------------|------|
| RF frequency                     | $2 \times 10^{-5}$ |      |
| RF power, conducted              | $\pm 0.57$ dB      |      |
| Conducted emission(150kHz~30MHz) | $\pm 2.5$ dB       |      |
| Radiated emission(30MHz~1GHz)    | $\pm 4.2$ dB       |      |
| Radiated emission (above 1GHz)   | $\pm 4.7$ dB       |      |
| Temperature                      | $\pm 1$ degree     |      |
| Humidity                         | $\pm 5$ %          |      |

#### 3.4 Test Software

| Software name         | Manufacturer | Model    | Version  |
|-----------------------|--------------|----------|----------|
| EMI Measurement       | Farad        | EZ-EMC   | V1.1.4.2 |
| Conducted test system | MWRF-test    | MTS 8310 | V2.0.0   |

## 4 List of Test Equipment

| Radiation emission  |               |                                          |              |             |              |                  |            |
|---------------------|---------------|------------------------------------------|--------------|-------------|--------------|------------------|------------|
| Item                | Equipment No. | Equipment name                           | Manufacturer | Model       | Serial No.   | Calibration date | Due date   |
| 1                   | HB-E001       | Horn Antenna                             | Schwarzbeck  | BBHA 9120D  | 02592        | 2022-04-02       | 2024-04-01 |
| 2                   | HB-E002       | Biconical log-periodic composite antenna | Schwarzbeck  | VULB 9168   | 01340        | 2022-04-06       | 2024-04-05 |
| 3                   | HB-E003       | SHF-EHF Horn                             | Schwarzbeck  | BBHA 91270  | 01193        | 2022-04-02       | 2024-04-01 |
| 4                   | HB-E004       | Preamplifier                             | Noyetec      | LAN-0910    | NYCM1420101  | 2023-05-11       | 2024-05-10 |
| 5                   | HB-E005       | Preamplifier                             | Noyetec      | LAN-0118    | NYCM1420102  | 2023-05-12       | 2024-05-11 |
| 6                   | HB-E006       | Preamplifier                             | Noyetec      | LAN-1840    | NYCM1420103  | 2023-06-11       | 2024-06-10 |
| 7                   | HB-E007       | EMI TEST RECEIVER                        | R&S          | ESR7        | 102520       | 2023-05-12       | 2024-05-11 |
| 8                   | HB-E009       | POSITINAL COTROLLE R                     | Noyetec      | N/A         | N/A          | /                | /          |
| 9                   | HB-E013       | RF switch                                | Noyetec      | NY-RF4      | NY0CM1420204 | /                | /          |
| 10                  | HB-E066       | Illuminance Tester                       | TASI         | TA8121      | N/A          | 2023-05-11       | 2024-05-10 |
| 11                  | HB-E075       | Active loop antenna                      | Schwarzbeck  | FMZB 1519B  | 1519B-245    | 2022-07-24       | 2024-07-23 |
| Conduction emission |               |                                          |              |             |              |                  |            |
| Item                | Equipment No. | Equipment name                           | Manufacturer | Model       | Serial No.   | Calibration date | Due date   |
| 1                   | HB-E014       | 4 Path V-LISN                            | Schwarzbeck  | NNLK 8121   | 00770        | 2023-05-12       | 2024-05-11 |
| 2                   | HB-E015       | Pulse Limiter                            | Schwarzbeck  | VTSD 9561-F | 00949        | 2023-05-12       | 2024-05-11 |
| 3                   | HB-E016       | ZN23201                                  | Noyetec      | ZN23201     | N/A          | 2023-05-11       | 2024-05-10 |
| 4                   | HB-E059       | Attenuator                               | Xianghua     | TS2-6-1     | 220215166    | 2023-05-12       | 2024-05-11 |
| 5                   | HB-E069       | EMI TEST RECEIVER                        | R&S          | ESCI        | N/A          | 2023-05-12       | 2024-05-11 |
| RF                  |               |                                          |              |             |              |                  |            |
| Item                | Equipment No. | Equipment name                           | Manufacturer | Model       | Serial No.   | Calibration date | Due date   |
| 1                   | HB-E041       | MXG AnaioG Signal Generator              | Agilent      | N5181A      | MY47070421   | 2023-05-11       | 2024-05-10 |
| 2                   | HB-E042       | WIDEBAND RADIO COMMUNICA                 | R&S          | CMW500      | 132108       | 2023-05-11       | 2024-05-10 |

|   |         | TION TESTER                              |         |                |            |            |            |
|---|---------|------------------------------------------|---------|----------------|------------|------------|------------|
| 3 | HB-E043 | MXG Anaio<br>Signal<br>Generator         | Agilent | N5182A         | US46240335 | 2023-05-11 | 2024-05-10 |
| 4 | HB-E044 | Signal&<br>spectrum<br>Analyzer          | R&S     | FSV3044        | 101264     | 2023-05-11 | 2024-05-10 |
| 5 | HB-E045 | RF Control<br>Box                        | Noyetec | NY100-R<br>FCB | N/A        | /          | /          |
| 6 | HB-E058 | Thermometer<br>Clock Humidity<br>Monitor | N/A     | HTC-1          | N/A        | /          | /          |
| 7 | HB-E077 | PXA Signal<br>Analyzer                   | Agilent | N9030A         | N/A        | 2023-05-11 | 2024-05-10 |

Note: the calibration interval of the above test instruments is 12&24 months and the calibrations are traceable to international system unit (SI).

## **5 Test Item And Results**

### **5.1 Antenna Requirement**

#### **5.1.1 Standard Requirement**

15.203 requirement: For intentional device, according to 15.203: 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

#### **5.1.2 Test Result**

The antenna is an PCB antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is -0.61dBi.

## 5.2 Conducted Emission

### 5.2.1 Limits

| Limits – Class B |              |           |
|------------------|--------------|-----------|
| Frequency (MHz)  | Limit (dBμV) |           |
|                  | Quasi-Peak   | Average   |
| 0.15 to 0.5      | 66 to 56*    | 56 to 46* |
| 0.5 to 5         | 56           | 46        |
| 5 to 30          | 60           | 50        |

Note:

- the tighter limit applies at the band edges.
- the limit of "\*" marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### 5.2.2 Test Procedures

#### a) EUT Operating Conditions

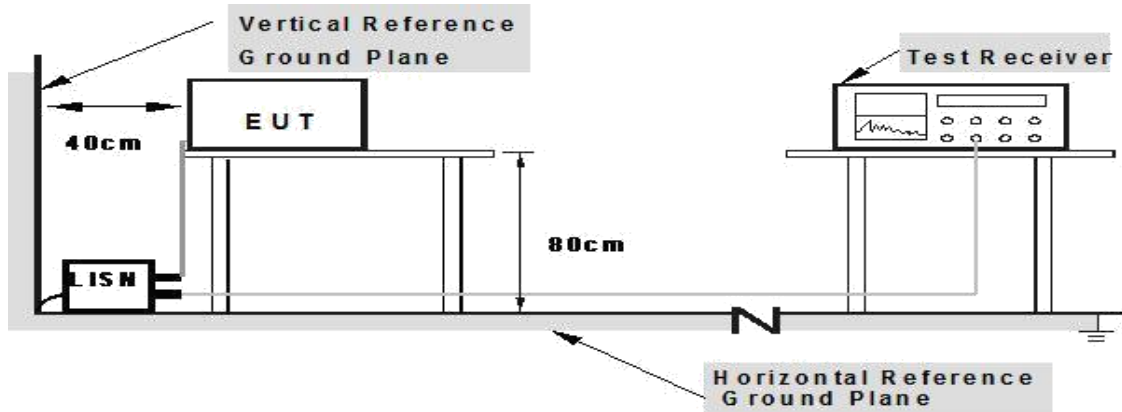
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

#### b) The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item – photographs of the test setup.

### 5.2.3 Test Setup



### 5.2.4 Test Result

Because the product power is supply through DC 1.5V by AA battery, so not applicable.

### 5.3 Radiated Emission

#### 5.3.1 Limits

Emissions 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 §15.209, whichever is the lesser attenuation.

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

| Receiver Parameter     | Setting                          |
|------------------------|----------------------------------|
| Attenuation            | Auto                             |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP    |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP    |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

FCC PART 15.249(a);

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Frequency (MHz) | Field Strength of Fundamental (mV/m) | Field Strength of Harmonics (μV/m) |
|-----------------|--------------------------------------|------------------------------------|
| 902-928         | 50                                   | 500                                |
| 2400-2483.5     | 50                                   | 500                                |
| 5725-5875       | 50                                   | 500                                |

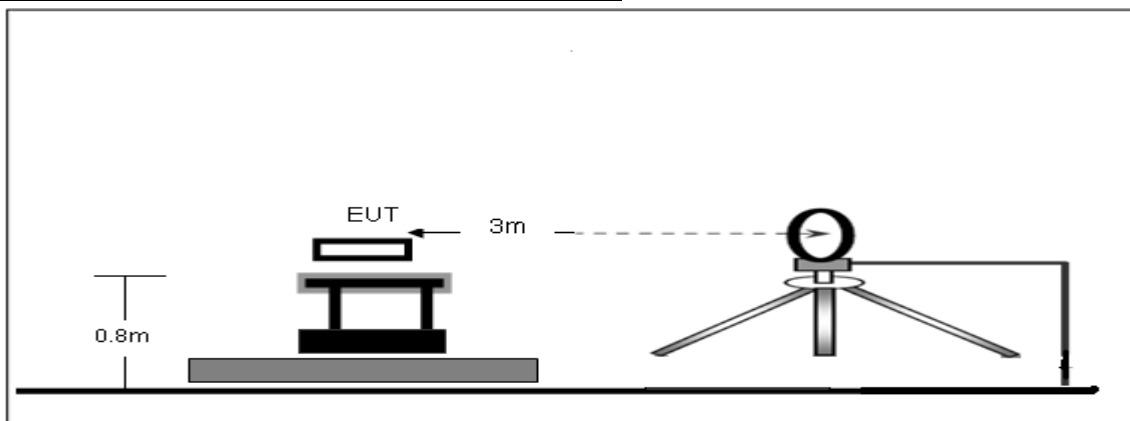
#### 5.3.2 Test Procedures

- The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.
- EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- Use the following spectrum analyser settings:

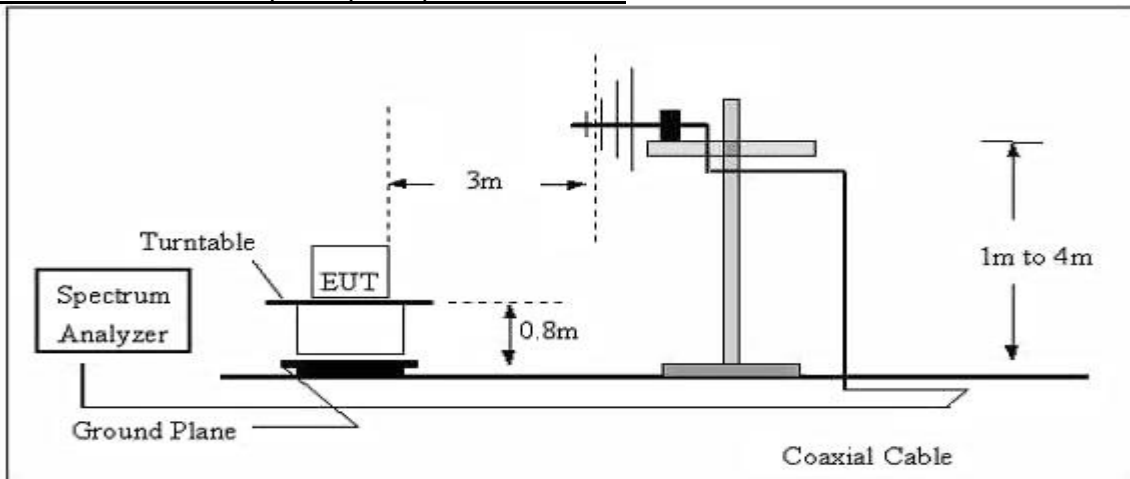
1. Span = wide enough to fully capture the emission being measured
  2. RBW = 1 MHz for  $f \geq 1\text{GHz}$ , 100 kHz for  $f < 1\text{GHz}$
  3. VBW  $\geq$  RBW, Sweep = auto
  4. Detector function = peak
  5. Trace = max hold
- d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- e) The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.
- f) For the actual test configuration, please refer to the related item – EUT test photos.

### 5.3.3 Test Setup

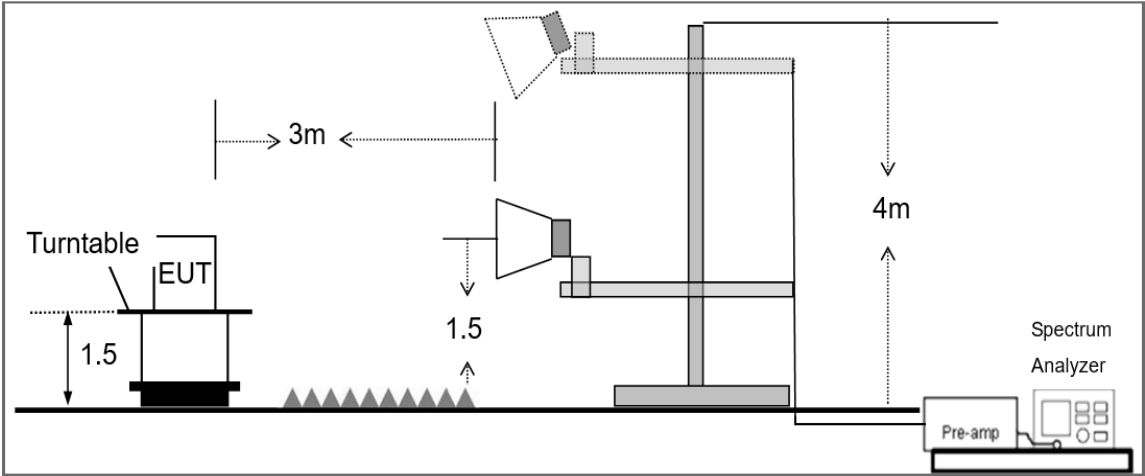
#### Radiated Emission Test-Up Frequency Below 30MHz



#### Radiated Emission Test-Up Frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



**5.3.4 Test Result**

Below 30MHz

|            |                |               |                      |
|------------|----------------|---------------|----------------------|
| EUT:       | Wireless mouse | Model Name:   | PC309A-1             |
| Pressure:  | 1010 hPa       | Test Voltage: | DC 1.5V from battery |
| Test Mode: | TX             | Polarization: | --                   |

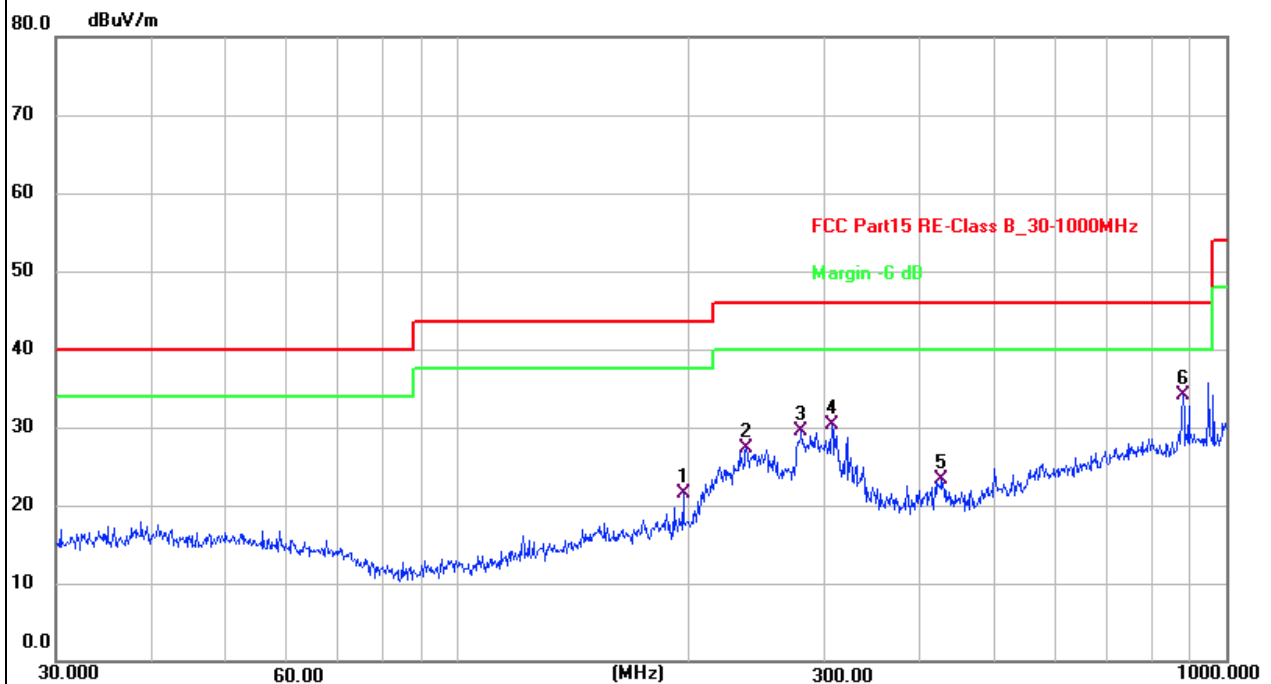
| Freq. | Reading  | Limit    | Margin | State |
|-------|----------|----------|--------|-------|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB)   | P/F   |
| --    | --       | --       | --     | Pass  |
| --    | --       | --       | --     | Pass  |

Note:

1. For 9kHz-30MHz, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor =  $40 \log (\text{specific distance}/\text{test distance})(\text{dB})$ ;
3. Limit line = specific limits (dBuV) + distance extrapolation factor.

Frequency range (30MHz – 1GHz)

|               |                      |             |            |
|---------------|----------------------|-------------|------------|
| EUT:          | Wireless mouse       | Model Name: | PC309A-1   |
| Test Mode:    | TX                   | Phase :     | Horizontal |
| Test Voltage: | DC 1.5V from battery |             |            |

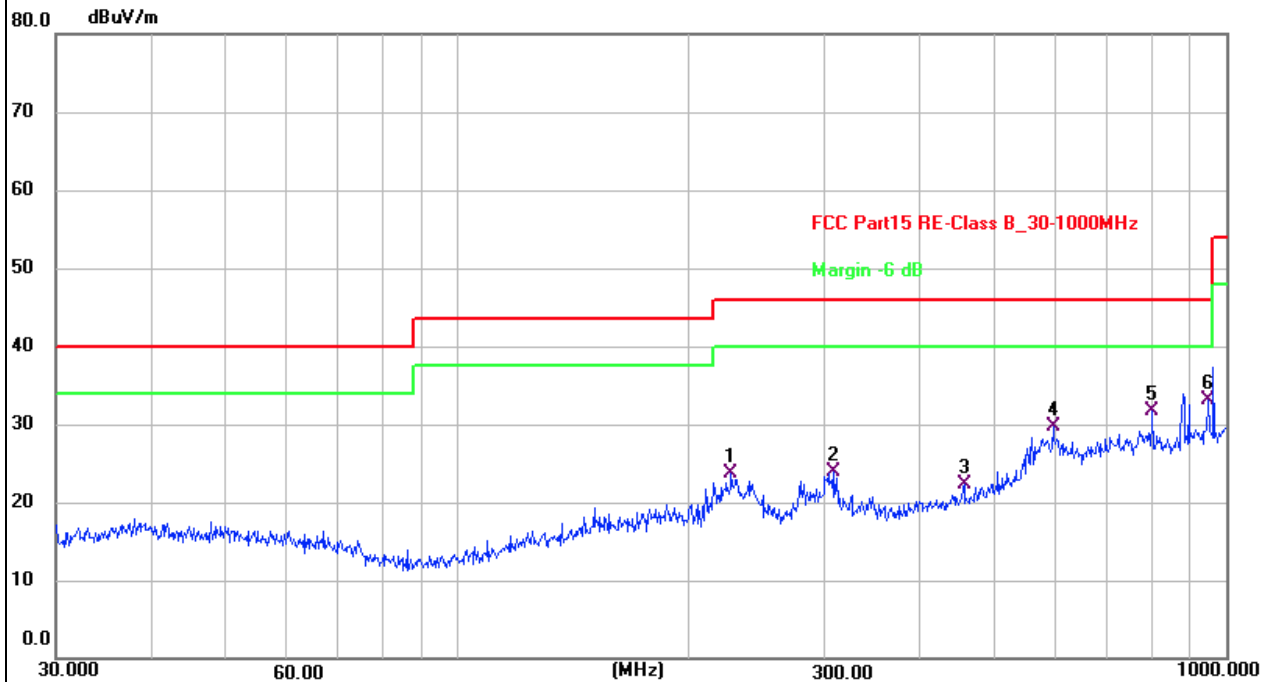


| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 196.5098        | 33.70          | -12.11        | 21.59          | 43.50          | -21.91      | QP       | 100         | 330            | P   |        |
| 2   | 237.4760        | 37.34          | -10.13        | 27.21          | 46.00          | -18.79      | QP       | 100         | 289            | P   |        |
| 3   | 280.0237        | 38.43          | -8.84         | 29.59          | 46.00          | -16.41      | QP       | 100         | 299            | P   |        |
| 4   | 306.7537        | 38.48          | -8.27         | 30.21          | 46.00          | -15.79      | QP       | 100         | 299            | P   |        |
| 5   | 426.5210        | 28.97          | -5.57         | 23.40          | 46.00          | -22.60      | QP       | 100         | 43             | P   |        |
| 6 * | 878.3214        | 31.11          | 3.01          | 34.12          | 46.00          | -11.88      | QP       | 100         | 54             | P   |        |

Remarks:

1. Mesurement Level = Reading level + Correct Factor, Margin = Mesurement Level – Limit.
- 2.The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3.All test modes were pre-tested, but we only recorded the worst case in this report.

|               |                      |             |          |
|---------------|----------------------|-------------|----------|
| EUT:          | Wireless mouse       | Model Name: | PC309A-1 |
| Test Mode:    | TX                   | Phase :     | Vertical |
| Test Voltage: | DC 1.5V from battery |             |          |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 226.8936        | 34.59          | -10.84        | 23.75          | 46.00          | -22.25      | QP       | 100         | 113            | P   |        |
| 2   | 308.9125        | 32.12          | -8.25         | 23.87          | 46.00          | -22.13      | QP       | 100         | 1              | P   |        |
| 3   | 455.9058        | 27.20          | -4.86         | 22.34          | 46.00          | -23.66      | QP       | 100         | 348            | P   |        |
| 4   | 595.1327        | 30.86          | -1.20         | 29.66          | 46.00          | -16.34      | QP       | 100         | 164            | P   |        |
| 5   | 801.7863        | 29.23          | 2.46          | 31.69          | 46.00          | -14.31      | QP       | 100         | 194            | P   |        |
| 6 * | 948.7610        | 29.95          | 3.24          | 33.19          | 46.00          | -12.81      | QP       | 100         | 348            | P   |        |

**Remarks:**

1. Mesurement Level = Reading level + Correct Factor, Margin = Mesurement Level – Limit.
- 2.The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3.All test modes were pre-tested, but we only recorded the worst case in this report.

### 5.3.5 Band edge—Field strength of fundamental

| Frequency | Ant. Polarization | Emission level | Limits       | Detector | Result |
|-----------|-------------------|----------------|--------------|----------|--------|
| (MHz)     | H / V             | dB $\mu$ V/m   | dB $\mu$ V/m |          |        |
| 2408      | H                 | 88.00          | 114          | PK       | PASS   |
| 2408      | H                 | 76.66          | 94           | AV       | PASS   |
| 2408      | V                 | 79.59          | 114          | PK       | PASS   |
| 2408      | V                 | 70.41          | 94           | AV       | PASS   |

| Frequency | Ant. Polarization | Emission level | Limits       | Detector | Result |
|-----------|-------------------|----------------|--------------|----------|--------|
| (MHz)     | H / V             | dB $\mu$ V/m   | dB $\mu$ V/m |          |        |
| 2440      | H                 | 91.21          | 114          | PK       | PASS   |
| 2440      | H                 | 78.23          | 94           | AV       | PASS   |
| 2440      | V                 | 83.56          | 114          | PK       | PASS   |
| 2440      | V                 | 74.67          | 94           | AV       | PASS   |

| Frequency | Ant. Polarization | Emission level | Limits       | Detector | Result |
|-----------|-------------------|----------------|--------------|----------|--------|
| (MHz)     | H / V             | dB $\mu$ V/m   | dB $\mu$ V/m |          |        |
| 2474      | H                 | 89.35          | 114          | PK       | PASS   |
| 2474      | H                 | 81.02          | 94           | AV       | PASS   |
| 2474      | V                 | 78.65          | 114          | PK       | PASS   |
| 2474      | V                 | 70.77          | 94           | AV       | PASS   |

1GHz-25GHz

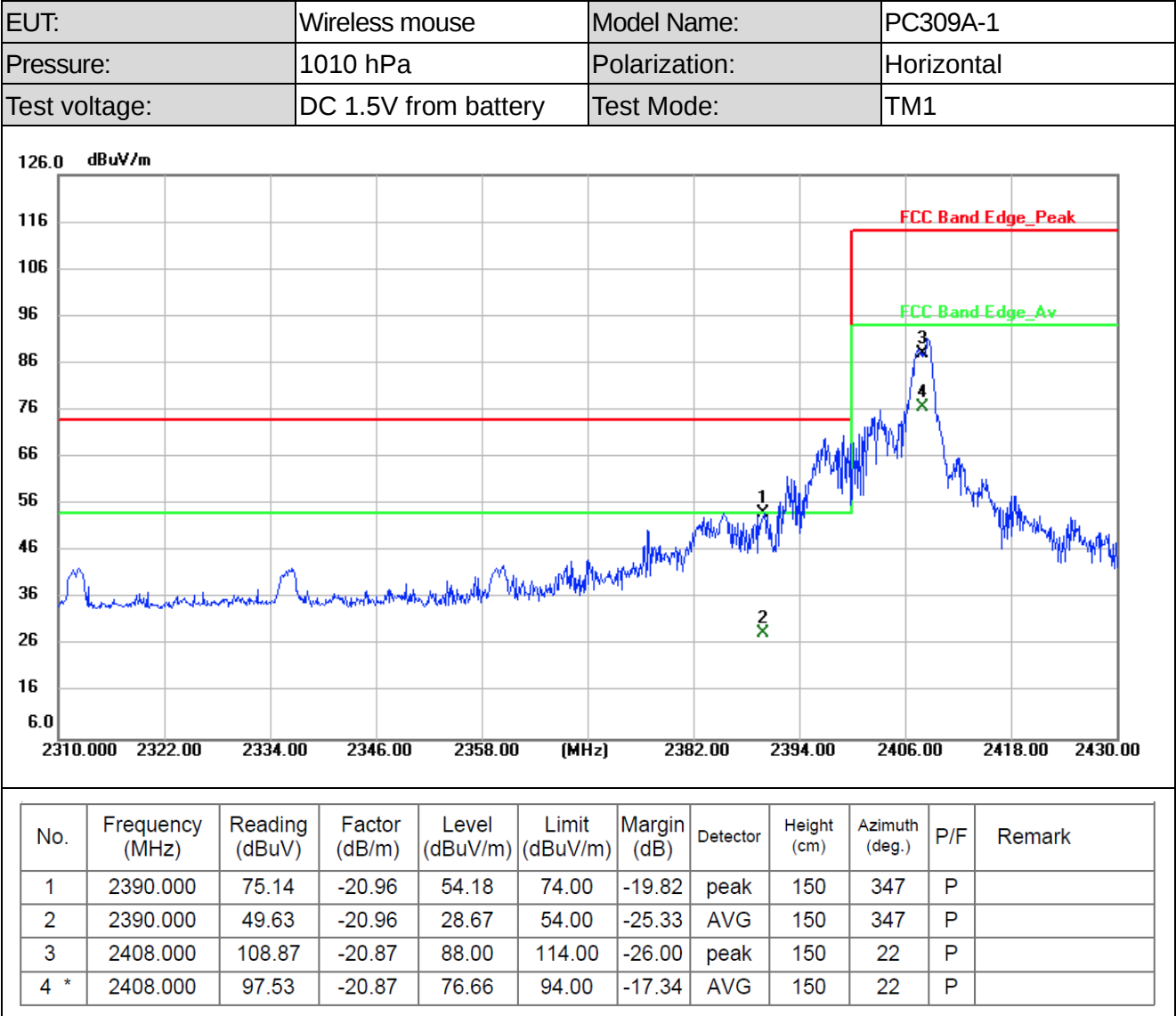
| Frequency                                | Read Level | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits   | Margin | Remark | Comment    |
|------------------------------------------|------------|------------|----------------|---------------|----------------|----------|--------|--------|------------|
| (MHz)                                    | (dBμV)     | (dB)       | dB/m           | (dB)          | (dBμV/m)       | (dBμV/m) | (dB)   |        |            |
| Low Channel (2408 MHz)(GFSK)--Above 1G   |            |            |                |               |                |          |        |        |            |
| 4816                                     | 65.40      | 5.21       | 35.59          | 44.30         | 61.90          | 74.00    | -12.10 | Pk     | Vertical   |
| 4816                                     | 49.76      | 5.21       | 35.59          | 44.30         | 46.26          | 54.00    | -7.74  | AV     | Vertical   |
| 7224                                     | 59.00      | 6.48       | 36.27          | 44.60         | 57.15          | 74.00    | -16.85 | Pk     | Vertical   |
| 7224                                     | 44.40      | 6.48       | 36.27          | 44.60         | 42.55          | 54.00    | -11.45 | AV     | Vertical   |
| 4816                                     | 64.69      | 5.21       | 35.55          | 44.30         | 61.15          | 74.00    | -12.85 | Pk     | Horizontal |
| 4816                                     | 50.23      | 5.21       | 35.55          | 44.30         | 46.69          | 54.00    | -7.31  | AV     | Horizontal |
| 7224                                     | 60.38      | 6.48       | 36.27          | 44.52         | 58.61          | 74.00    | -15.39 | Pk     | Horizontal |
| 7224                                     | 44.45      | 6.48       | 36.27          | 44.52         | 42.68          | 54.00    | -11.32 | AV     | Horizontal |
| Mid Channel (2440 MHz)(GFSK)--Above 1G   |            |            |                |               |                |          |        |        |            |
| 4880                                     | 64.82      | 5.21       | 35.66          | 44.20         | 61.49          | 74.00    | -12.51 | Pk     | Vertical   |
| 4880                                     | 49.59      | 5.21       | 35.66          | 44.20         | 46.26          | 54.00    | -7.74  | AV     | Vertical   |
| 7320                                     | 60.88      | 7.10       | 36.50          | 44.43         | 60.05          | 74.00    | -13.95 | Pk     | Vertical   |
| 7320                                     | 44.56      | 7.10       | 36.50          | 44.43         | 43.73          | 54.00    | -10.27 | AV     | Vertical   |
| 4880                                     | 65.50      | 5.21       | 35.66          | 44.20         | 62.17          | 74.00    | -11.83 | Pk     | Horizontal |
| 4880                                     | 49.32      | 5.21       | 35.66          | 44.20         | 45.99          | 54.00    | -8.01  | AV     | Horizontal |
| 7320                                     | 60.83      | 7.10       | 36.50          | 44.43         | 60.00          | 74.00    | -14.00 | Pk     | Horizontal |
| 7320                                     | 44.12      | 7.10       | 36.50          | 44.43         | 43.29          | 54.00    | -10.71 | AV     | Horizontal |
| High Channel (2474 MHz)(GFSK)-- Above 1G |            |            |                |               |                |          |        |        |            |
| 4948                                     | 65.88      | 5.21       | 35.52          | 44.21         | 62.40          | 74.00    | -11.60 | Pk     | Vertical   |
| 4948                                     | 51.43      | 5.21       | 35.52          | 44.21         | 47.95          | 54.00    | -6.05  | AV     | Vertical   |
| 7422                                     | 58.35      | 7.10       | 36.53          | 44.60         | 57.38          | 74.00    | -16.62 | Pk     | Vertical   |
| 7422                                     | 44.44      | 7.10       | 36.53          | 44.60         | 43.47          | 54.00    | -10.53 | AV     | Vertical   |
| 4948                                     | 65.05      | 5.21       | 35.52          | 44.21         | 61.57          | 74.00    | -12.43 | Pk     | Horizontal |
| 4948                                     | 49.12      | 5.21       | 35.52          | 44.21         | 45.64          | 54.00    | -8.36  | AV     | Horizontal |
| 7422                                     | 59.25      | 7.10       | 36.53          | 44.60         | 58.28          | 74.00    | -15.72 | Pk     | Horizontal |
| 7422                                     | 45.33      | 7.10       | 36.53          | 44.60         | 44.36          | 54.00    | -9.64  | AV     | Horizontal |

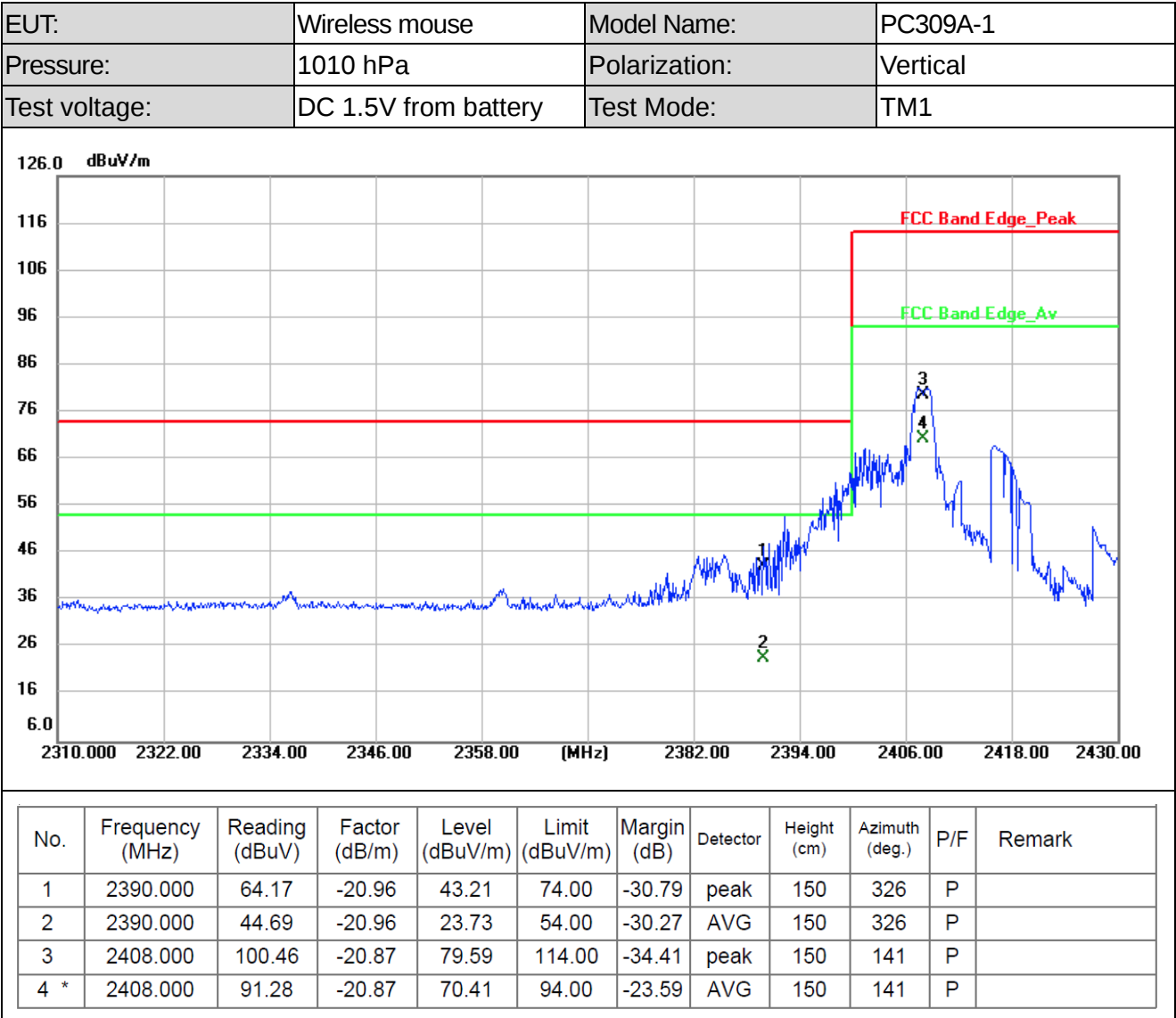
Note:

1. All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
2. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor.

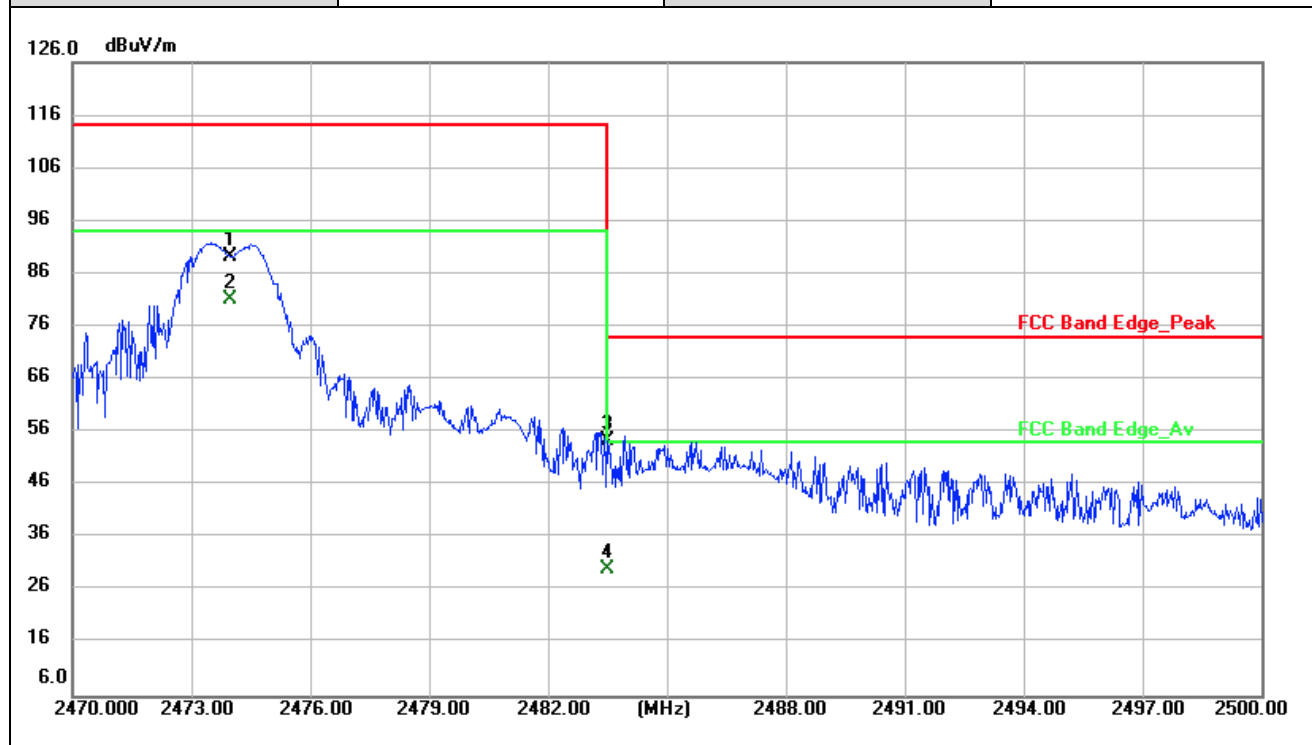
5.3.6 Band edge-radiated

All the modulation modes have been tested, and the worst result was report as below:



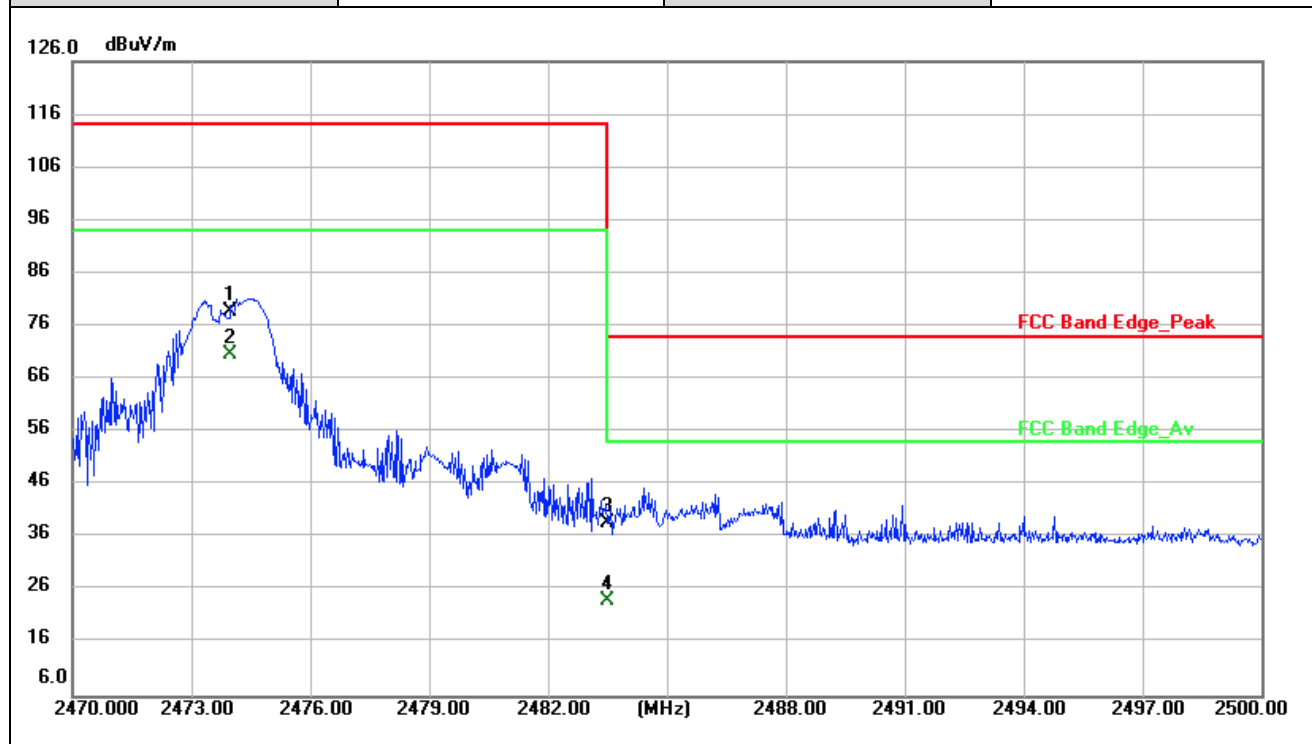


|               |                      |               |            |
|---------------|----------------------|---------------|------------|
| EUT:          | Wireless mouse       | Model Name:   | PC309A-1   |
| Pressure:     | 1010 hPa             | Polarization: | Horizontal |
| Test voltage: | DC 1.5V from battery | Test Mode:    | TM3        |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 2474.000        | 109.90         | -20.55        | 89.35          | 114.00         | -24.65      | peak     | 150         | 33             | P   |        |
| 2 * | 2474.000        | 101.57         | -20.55        | 81.02          | 94.00          | -12.98      | AVG      | 150         | 33             | P   |        |
| 3   | 2483.500        | 75.05          | -20.51        | 54.54          | 74.00          | -19.46      | peak     | 150         | 13             | P   |        |
| 4   | 2483.500        | 50.71          | -20.51        | 30.20          | 54.00          | -23.80      | AVG      | 150         | 12             | P   |        |

|               |                      |               |          |
|---------------|----------------------|---------------|----------|
| EUT:          | Wireless mouse       | Model Name:   | PC309A-1 |
| Pressure:     | 1010 hPa             | Polarization: | Vertical |
| Test voltage: | DC 1.5V from battery | Test Mode:    | TM3      |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 2474.000        | 99.20          | -20.55        | 78.65          | 114.00         | -35.35      | peak     | 150         | 99             | P   |        |
| 2 * | 2474.000        | 91.32          | -20.55        | 70.77          | 94.00          | -23.23      | AVG      | 150         | 99             | P   |        |
| 3   | 2483.500        | 59.28          | -20.51        | 38.77          | 74.00          | -35.23      | peak     | 150         | 284            | P   |        |
| 4   | 2483.500        | 44.66          | -20.51        | 24.15          | 54.00          | -29.85      | AVG      | 150         | 284            | P   |        |

Note:

1. All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
2. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor.
3. All other emissions more than 20dB below the limit.

## 5.4 20dB and 99% Bandwidth

### 5.4.1 Limit

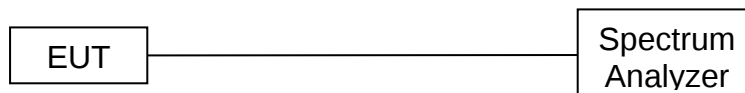
FCC §15.215(c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 5.4.2 Test Procedure

1. Use the following spectrum analyzer settings:
2. For 20 dB bandwidth
3. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
4. RBW  $\geq 1\%$  of the 20 dB bandwidth
5. VBW  $\geq$  RBW
6. Sweep = auto
7. Detector function = peak
8. Trace = max hold
9. The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth and 99% occupied bandwidth of the emission

### 5.4.3 Test Setup

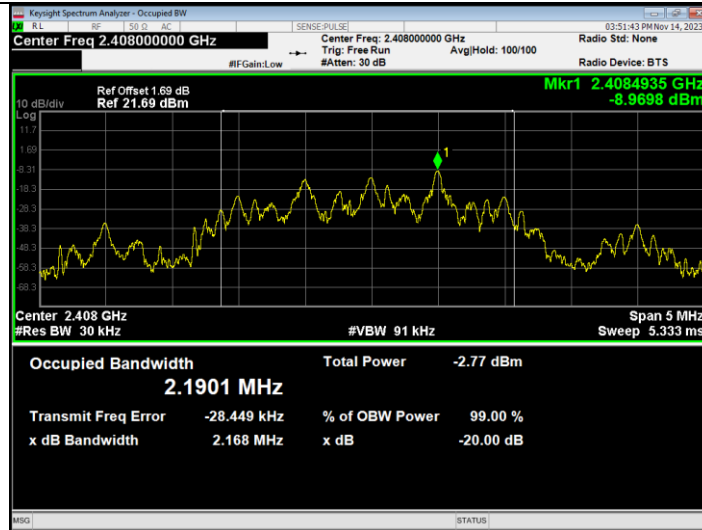


### 5.4.4 Test Results

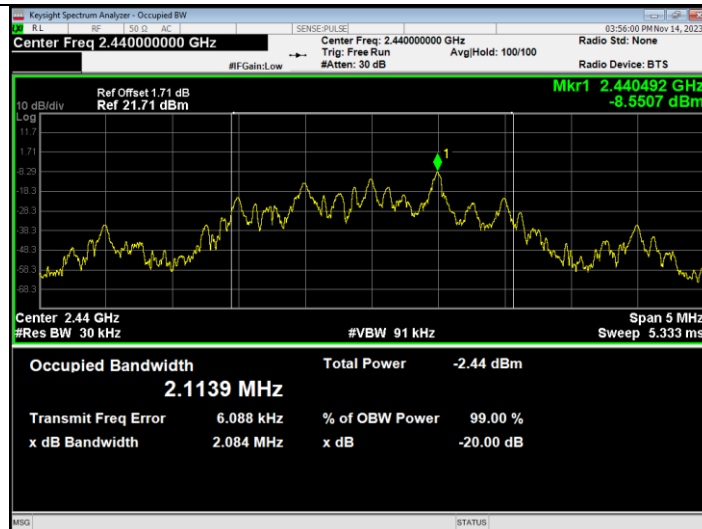
| Frequency (MHz) | 20dB bandwidth (MHz) | 99% Bandwidth (MHz) |
|-----------------|----------------------|---------------------|
| 2408            | 2.168                | 2.1901              |
| 2440            | 2.084                | 2.1139              |
| 2474            | 2.099                | 2.1288              |

Test plots

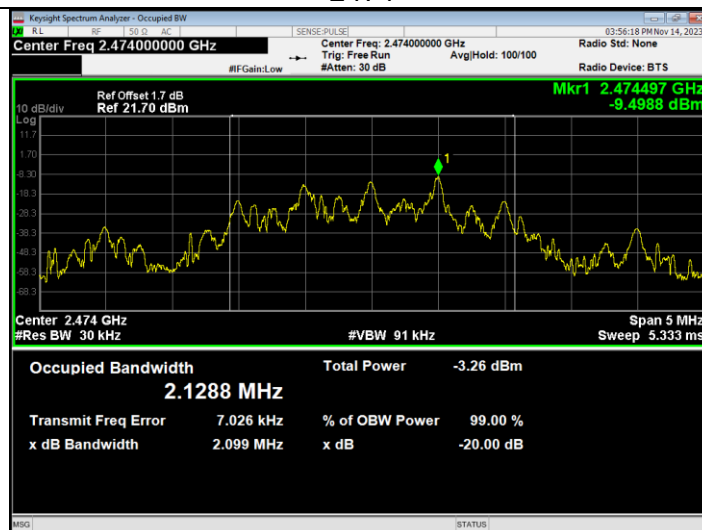
2408



2440



2474



## **6 Photographs of the Test Setup**

Reference to the appendix Test Setup Photos for details.

## **7 Photographs of the EUT**

Reference to the appendix External Photos and Internal Photos for details.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***