

### FCC REPORT

**Applicant:** Shenzhen Rapoo Technology Co., Ltd

**Address of Applicant:** 22, Jinxiu Road East, Pingshan District, Shenzhen, China

**Manufacturer/Factory:** Shenzhen Rapoo Technology Co., Ltd

**Address of Manufacturer/Factory:** 22, Jinxiu Road East, Pingshan District, Shenzhen, China

**Equipment Under Test (EUT)**

Product Name: Mouse

Model No.: GXT 161

Trade Mark: TRUST RAPOO

**FCC ID:** PP2-GXT161

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.249

**Date of sample receipt:** April 19, 2018

**Date of Test:** April 20-May 18, 2018

**Date of report issued:** May 18, 2018

**Test Result :** PASS \*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Lo

Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## 2 Version

| Version No. | Date         | Description |
|-------------|--------------|-------------|
| 00          | May 18, 2018 | Original    |
|             |              |             |
|             |              |             |
|             |              |             |
|             |              |             |

Prepared By:

*Tiger Chen*

Date:

May 18, 2018

Project Engineer

Check By:

*Andy Wu*

Date:

May 18, 2018

Reviewer

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## 4 Test Summary

| Test Item                                | Section in CFR 47     | Result |
|------------------------------------------|-----------------------|--------|
| Antenna requirement                      | 15.203                | Pass   |
| AC Power Line Conducted Emission         | 15.207                | Pass   |
| Field strength of the fundamental signal | 15.249 (a)            | Pass   |
| Spurious emissions                       | 15.249 (a) (d)/15.209 | Pass   |
| Band edge                                | 15.249 (d)/15.205     | Pass   |
| 20dB Occupied Bandwidth                  | 15.215 (c)            | Pass   |

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not applicable.

Remark: Test according to ANSI C63.10 2013 and ANSI C63.4: 2014.

### 4.1 Measurement Uncertainty

| Test Item                        | Frequency Range | Measurement Uncertainty | Notes |
|----------------------------------|-----------------|-------------------------|-------|
| Radiated Emission                | 9kHz ~ 30MHz    | $\pm 4.34\text{dB}$     | (1)   |
| Radiated Emission                | 30MHz ~ 1000MHz | $\pm 4.24\text{dB}$     | (1)   |
| Radiated Emission                | 1GHz ~ 26.5GHz  | $\pm 4.68\text{dB}$     | (1)   |
| AC Power Line Conducted Emission | 0.15MHz ~ 30MHz | $\pm 3.45\text{dB}$     | (1)   |

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

## 5 General Information

### 5.1 General Description of EUT

|                      |                              |
|----------------------|------------------------------|
| Product Name:        | Mouse                        |
| Model No.:           | GXT 161                      |
| Serial No.:          | 18030300037                  |
| Test sample(s) ID:   | GTS201804000176-1            |
| Sample(s) Status     | Engineer sample              |
| Hardware Version:    | 1.0                          |
| Software Version:    | 1.0                          |
| Operation Frequency: | 2408MHz~2474MHz              |
| Channel numbers:     | 34                           |
| Channel separation:  | 2MHz                         |
| Modulation type:     | FSK                          |
| Antenna Type:        | Integral antenna             |
| Antenna gain:        | 0 dBi (declare by Applicant) |
| Power supply:        | DC3.7V rechargeable battery  |

| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1                                   | 2408MHz   | 10      | 2426MHz   | 19      | 2444MHz   | 28      | 2462MHz   |
| 2                                   | 2410MHz   | 11      | 2428MHz   | 20      | 2446MHz   | 29      | 2464MHz   |
| 3                                   | 2412MHz   | 12      | 2430MHz   | 21      | 2448MHz   | 30      | 2466MHz   |
| 4                                   | 2414MHz   | 13      | 2432MHz   | 22      | 2450MHz   | 31      | 2468MHz   |
| 5                                   | 2416MHz   | 14      | 2434MHz   | 23      | 2452MHz   | 32      | 2470MHz   |
| 6                                   | 2418MHz   | 15      | 2436MHz   | 24      | 2454MHz   | 33      | 2472MHz   |
| 7                                   | 2420MHz   | 16      | 2438MHz   | 25      | 2456MHz   | 34      | 2474MHz   |
| 8                                   | 2422MHz   | 17      | 2440MHz   | 26      | 2458MHz   |         |           |
| 9                                   | 2424MHz   | 18      | 2442MHz   | 27      | 2460MHz   |         |           |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel             | Frequency |
|---------------------|-----------|
| The lowest channel  | 2408MHz   |
| The middle channel  | 2440MHz   |
| The Highest channel | 2474MHz   |

## 5.2 Test mode

|                                                                                                                                                                                                                                              |                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Transmitting mode                                                                                                                                                                                                                            | Keep the EUT in continuously transmitting mode |
| <i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i> |                                                |

### Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

| Axis                   | X     | Y     | Z     |
|------------------------|-------|-------|-------|
| Field Strength(dBuV/m) | 75.50 | 76.45 | 74.25 |

## 5.3 Description of Support Units

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

## 5.4 Test Facility

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

- **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 381383, January 08, 2018.

- **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

## 5.5 Test Location

|                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All tests were performed at:                                                                                                                                                                                                                     |
| Global United Technology Services Co., Ltd.<br>Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102<br>Tel: 0755-27798480<br>Fax: 0755-27798960 |

## 5.6 Other Information Requested by the Customer

|       |
|-------|
| None. |
|-------|

## 5.7 Additional instructions

Software (Used for test) from client

|           |                                               |
|-----------|-----------------------------------------------|
| Mode      | Special test SW was built-in by manufacturer. |
| Power set | Default                                       |

## 6 Test Instruments list

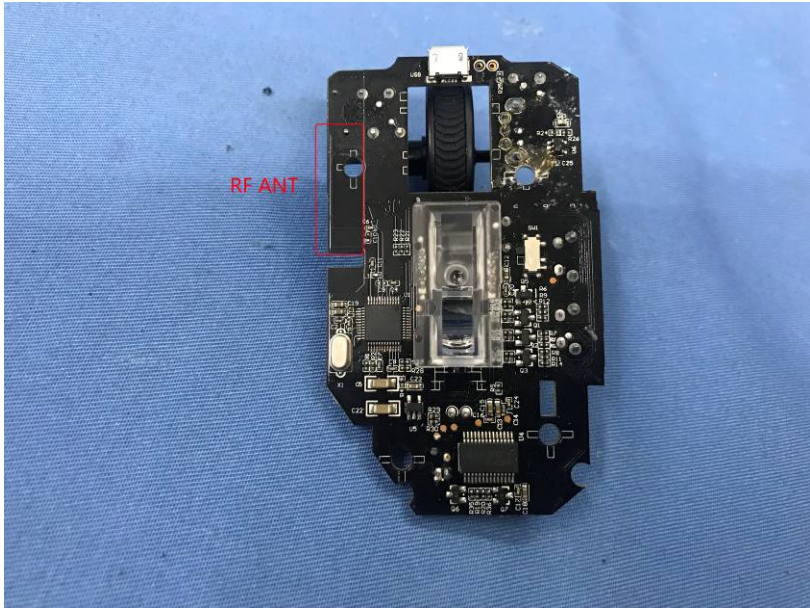
| Radiated Emission: |                               |                                |                             |               |                     |                         |
|--------------------|-------------------------------|--------------------------------|-----------------------------|---------------|---------------------|-------------------------|
| Item               | Test Equipment                | Manufacturer                   | Model No.                   | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                  | 3m Semi- Anechoic Chamber     | ZhongYu Electron               | 9.2(L)*6.2(W)* 6.4(H)       | GTS250        | July 03 2015        | July 02 2020            |
| 2                  | Control Room                  | ZhongYu Electron               | 6.2(L)*2.5(W)* 2.4(H)       | GTS251        | N/A                 | N/A                     |
| 3                  | Spectrum Analyzer             | Agilent                        | E4440A                      | GTS533        | June. 28 2017       | June. 27 2018           |
| 4                  | EMI Test Receiver             | Rohde & Schwarz                | ESU26                       | GTS203        | June. 28 2017       | June. 27 2018           |
| 5                  | BiConiLog Antenna             | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163                    | GTS214        | June. 28 2017       | June. 27 2018           |
| 6                  | Double -ridged waveguide horn | SCHWARZBECK<br>MESS-ELEKTRONIK | 9120D-829                   | GTS208        | June. 28 2017       | June. 27 2018           |
| 7                  | Horn Antenna                  | ETS-LINDGREN                   | 3160                        | GTS217        | June. 28 2017       | June. 27 2018           |
| 8                  | EMI Test Software             | AUDIX                          | E3                          | N/A           | N/A                 | N/A                     |
| 9                  | Coaxial Cable                 | GTS                            | N/A                         | GTS213        | June. 28 2017       | June. 27 2018           |
| 10                 | Coaxial Cable                 | GTS                            | N/A                         | GTS211        | June. 28 2017       | June. 27 2018           |
| 11                 | Coaxial cable                 | GTS                            | N/A                         | GTS210        | June. 28 2017       | June. 27 2018           |
| 12                 | Coaxial Cable                 | GTS                            | N/A                         | GTS212        | June. 28 2017       | June. 27 2018           |
| 13                 | Amplifier(100kHz-3GHz)        | HP                             | 8347A                       | GTS204        | June. 28 2017       | June. 27 2018           |
| 14                 | Amplifier(2GHz-20GHz)         | HP                             | 8349B                       | GTS206        | June. 28 2017       | June. 27 2018           |
| 15                 | Amplifier (18-26GHz)          | Rohde & Schwarz                | AFS33-18002<br>650-30-8P-44 | GTS218        | June. 28 2017       | June. 27 2018           |
| 16                 | Band filter                   | Amindeon                       | 82346                       | GTS219        | June. 28 2017       | June. 27 2018           |
| 17                 | Power Meter                   | Anritsu                        | ML2495A                     | GTS540        | June. 28 2017       | June. 27 2018           |
| 18                 | Power Sensor                  | Anritsu                        | MA2411B                     | GTS541        | June. 28 2017       | June. 27 2018           |
| 19                 | Loop Antenna                  | ZHINAN                         | ZN30900A                    | GTS534        | June 28 2017        | June 27 2018            |

| Conducted Emission |                          |                     |                      |               |                     |                         |
|--------------------|--------------------------|---------------------|----------------------|---------------|---------------------|-------------------------|
| Item               | Test Equipment           | Manufacturer        | Model No.            | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                  | Shielding Room           | ZhongYu Electron    | 7.3(L)x3.1(W)x2.9(H) | GTS252        | May.16 2014         | May.15 2019             |
| 2                  | EMI Test Receiver        | R&S                 | ESCI 7               | GTS552        | June.28 2017        | June.27 2018            |
| 3                  | Coaxial Switch           | ANRITSU CORP        | MP59B                | GTS225        | June.28 2017        | June.27 2018            |
| 4                  | Artificial Mains Network | SCHWARZBECK<br>MESS | NSLK8127             | GTS226        | June.28 2017        | June.27 2018            |
| 5                  | Coaxial Cable            | GTS                 | N/A                  | GTS227        | N/A                 | N/A                     |
| 6                  | EMI Test Software        | AUDIX               | E3                   | N/A           | N/A                 | N/A                     |
| 7                  | Thermo meter             | KTJ                 | TA328                | GTS233        | June.28 2017        | June.27 2018            |

| General used equipment: |                |              |           |               |                     |                         |
|-------------------------|----------------|--------------|-----------|---------------|---------------------|-------------------------|
| Item                    | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                       | Barometer      | ChangChun    | DYM3      | GTS257        | June 28 2017        | June 27 2018            |

## 7 Test results and Measurement Data

### 7.1 Antenna requirement

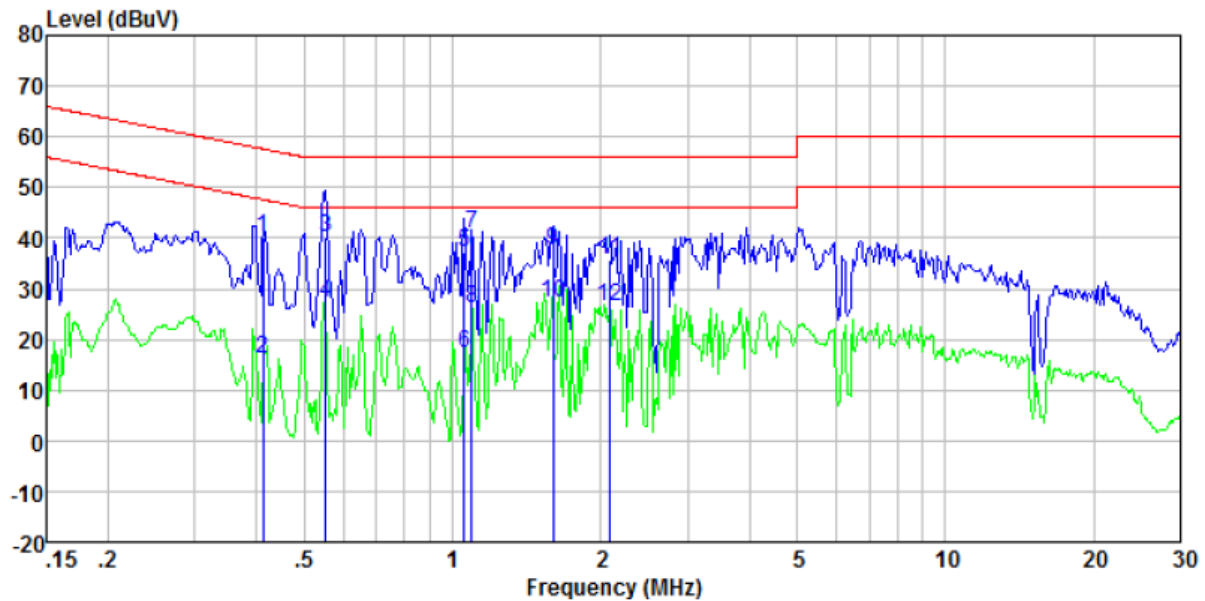
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Standard requirement:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FCC Part15 C Section 15.203 |
| <b>15.203 requirement:</b><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. |                             |
| <b>EUT Antenna:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |
| <p><i>The antenna is ntegral antenna, the best case gain of the antenna is 0dBi</i></p>                                                                                                                                                                                                                                                                                                       |                             |

## 7.2 Conducted Emissions

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                               |       |              |     |           |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------|-----|-----------|-----------|
| Test Requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FCC Part15 B Section 15.107                                                                                                                                                                                                                                                                                                                                                                   |       |              |     |           |           |
| Test Method:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ANSI C63.4:2014                                                                                                                                                                                                                                                                                                                                                                               |       |              |     |           |           |
| Test Frequency Range:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 150kHz to 30MHz                                                                                                                                                                                                                                                                                                                                                                               |       |              |     |           |           |
| Class / Severity:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Class B                                                                                                                                                                                                                                                                                                                                                                                       |       |              |     |           |           |
| Receiver setup:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | RBW=9kHz, VBW=30kHz                                                                                                                                                                                                                                                                                                                                                                           |       |              |     |           |           |
| Limit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Frequency range (MHz)                                                                                                                                                                                                                                                                                                                                                                         |       | Limit (dBμV) |     |           |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                               |       | Quasi-peak   |     | Average   |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.15-0.5                                                                                                                                                                                                                                                                                                                                                                                      |       | 66 to 56*    |     | 56 to 46* |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.5-5                                                                                                                                                                                                                                                                                                                                                                                         |       | 56           |     | 46        |           |
| Test setup:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <div><div>Reference Plane</div><div><div>LISN</div><div>AUX Equipment</div><div>E.U.T</div><div>Test table/Insulation plane</div></div><div><div>LISN</div><div>Filter</div><div>AC power</div><div>EMI Receiver</div></div><div>40cm</div><div>80cm</div></div> <div>Remark:<br/>E.U.T: Equipment Under Test<br/>LISN: Line Impedance Stabilization Network<br/>Test table height=0.8m</div> |       |              |     |           |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Test procedure                                                                                                                                                                                                                                                                                                                                                                                |       |              |     |           |           |
| <div><div>1.</div><div>The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment.</div></div> <div><div>2.</div><div>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs).</div></div> <div><div>3.</div><div>Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.</div></div> |                                                                                                                                                                                                                                                                                                                                                                                               |       |              |     |           |           |
| Test environment:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Temp.:                                                                                                                                                                                                                                                                                                                                                                                        | 25 °C | Humid.:      | 52% | Press.:   | 1 012mbar |
| Test Instruments:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Refer to section 6 for details                                                                                                                                                                                                                                                                                                                                                                |       |              |     |           |           |
| Test mode:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Refer to section 5.2 for details                                                                                                                                                                                                                                                                                                                                                              |       |              |     |           |           |
| Test results:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Pass                                                                                                                                                                                                                                                                                                                                                                                          |       |              |     |           |           |

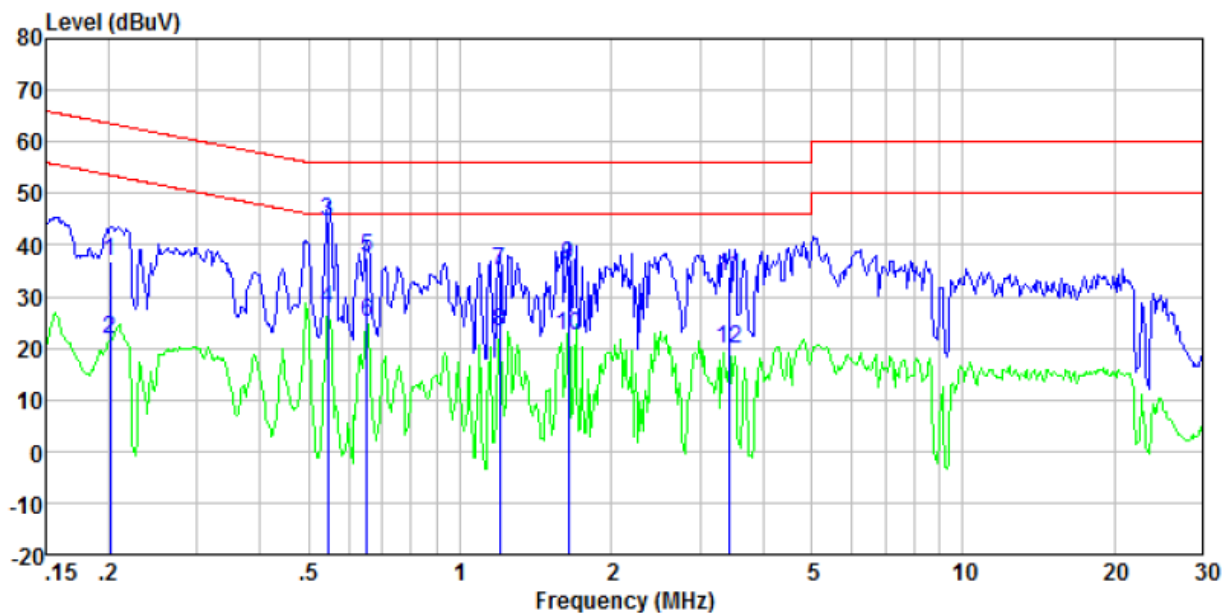
## Measurement Data

|            |                   |                 |      |
|------------|-------------------|-----------------|------|
| Test mode: | Transmitting mode | Phase Polarity: | Line |
|------------|-------------------|-----------------|------|



| Freq<br>MHz | Reading<br>level<br>dBuV | LIISN/ISN<br>factor<br>dB | Cable<br>loss<br>dB | level<br>dBuV | Limit<br>level<br>dBuV | Over<br>limit<br>dB | Remark  |
|-------------|--------------------------|---------------------------|---------------------|---------------|------------------------|---------------------|---------|
| 0.413       | 39.71                    | 0.39                      | 0.11                | 40.21         | 57.59                  | -17.38              | QP      |
| 0.413       | 15.67                    | 0.39                      | 0.11                | 16.17         | 47.59                  | -31.42              | Average |
| 0.552       | 39.73                    | 0.31                      | 0.11                | 40.15         | 56.00                  | -15.85              | QP      |
| 0.552       | 26.82                    | 0.31                      | 0.11                | 27.24         | 46.00                  | -18.76              | Average |
| 1.054       | 36.90                    | 0.21                      | 0.13                | 37.24         | 56.00                  | -18.76              | QP      |
| 1.054       | 17.10                    | 0.21                      | 0.13                | 17.44         | 46.00                  | -28.56              | Average |
| 1.094       | 40.52                    | 0.21                      | 0.13                | 40.86         | 56.00                  | -15.14              | QP      |
| 1.094       | 25.64                    | 0.21                      | 0.13                | 25.98         | 46.00                  | -20.02              | Average |
| 1.602       | 37.06                    | 0.20                      | 0.14                | 37.40         | 56.00                  | -18.60              | QP      |
| 1.602       | 26.72                    | 0.20                      | 0.14                | 27.06         | 46.00                  | -18.94              | Average |
| 2.088       | 35.29                    | 0.20                      | 0.15                | 35.64         | 56.00                  | -20.36              | QP      |
| 2.088       | 26.23                    | 0.20                      | 0.15                | 26.58         | 46.00                  | -19.42              | Average |

|            |                   |                 |         |
|------------|-------------------|-----------------|---------|
| Test mode: | Transmitting mode | Phase Polarity: | Neutral |
|------------|-------------------|-----------------|---------|

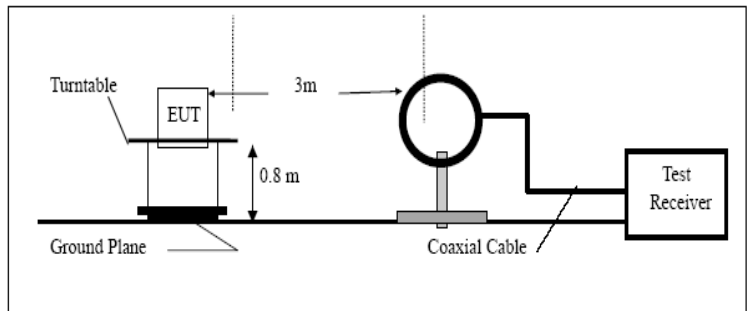


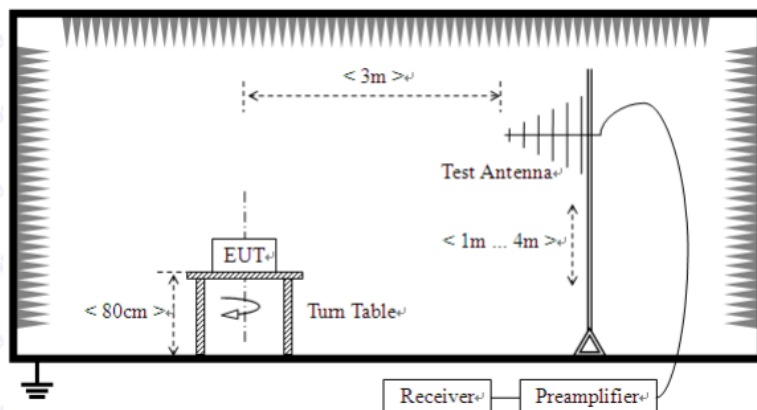
| Freq<br>MHz | Reading<br>level<br>dBuV | LISN/ISN<br>factor<br>dB | Cable<br>loss<br>dB | level<br>dBuV | Limit<br>level<br>dBuV | Over<br>limit<br>dB | Remark  |
|-------------|--------------------------|--------------------------|---------------------|---------------|------------------------|---------------------|---------|
| 0.202       | 36.32                    | 0.43                     | 0.13                | 36.88         | 63.54                  | -26.66              | QP      |
| 0.202       | 21.17                    | 0.43                     | 0.13                | 21.73         | 53.54                  | -31.81              | Average |
| 0.546       | 44.23                    | 0.34                     | 0.11                | 44.68         | 56.00                  | -11.32              | QP      |
| 0.546       | 27.13                    | 0.34                     | 0.11                | 27.58         | 46.00                  | -18.42              | Average |
| 0.654       | 37.19                    | 0.29                     | 0.13                | 37.61         | 56.00                  | -18.39              | QP      |
| 0.654       | 24.53                    | 0.29                     | 0.13                | 24.95         | 46.00                  | -21.05              | Average |
| 1.197       | 34.62                    | 0.24                     | 0.13                | 34.99         | 56.00                  | -21.01              | QP      |
| 1.197       | 22.93                    | 0.24                     | 0.13                | 23.30         | 46.00                  | -22.70              | Average |
| 1.645       | 35.81                    | 0.21                     | 0.14                | 36.16         | 56.00                  | -19.84              | QP      |
| 1.645       | 22.17                    | 0.21                     | 0.14                | 22.52         | 46.00                  | -23.48              | Average |
| 3.436       | 33.47                    | 0.21                     | 0.15                | 33.83         | 56.00                  | -22.17              | QP      |
| 3.436       | 19.42                    | 0.21                     | 0.15                | 19.78         | 46.00                  | -26.22              | Average |

## Notes:

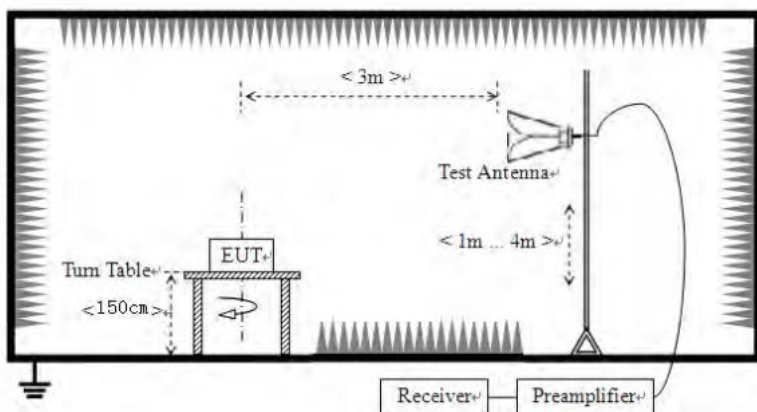
- The following Quasi-Peak and Average measurements were performed on the EUT:
- Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

## 7.3 Radiated Emission Method

|                                                         |                                                                                                                                                                                                                                                                |                    |         |                      |            |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------|----------------------|------------|
| Test Requirement:                                       | FCC Part15 C Section 15.209                                                                                                                                                                                                                                    |                    |         |                      |            |
| Test Method:                                            | ANSI C63.10:2013                                                                                                                                                                                                                                               |                    |         |                      |            |
| Test Frequency Range:                                   | 9kHz to 25GHz                                                                                                                                                                                                                                                  |                    |         |                      |            |
| Test site:                                              | Measurement Distance: 3m                                                                                                                                                                                                                                       |                    |         |                      |            |
| Receiver setup:                                         | Frequency                                                                                                                                                                                                                                                      | Detector           | RBW     | VBW                  | Value      |
|                                                         | 9KHz-150KHz                                                                                                                                                                                                                                                    | Quasi-peak         | 200Hz   | 600Hz                | Quasi-peak |
|                                                         | 150KHz-30MHz                                                                                                                                                                                                                                                   | Quasi-peak         | 9KHz    | 30KHz                | Quasi-peak |
|                                                         | 30MHz-1GHz                                                                                                                                                                                                                                                     | Quasi-peak         | 100KHz  | 300KHz               | Quasi-peak |
|                                                         | Above 1GHz                                                                                                                                                                                                                                                     | Peak               | 1MHz    | 3MHz                 | Peak       |
|                                                         |                                                                                                                                                                                                                                                                | Peak               | 1MHz    | 10Hz                 | Average    |
| Limit:<br>(Field strength of the<br>fundamental signal) | Frequency                                                                                                                                                                                                                                                      | Limit (dBuV/m @3m) |         | Remark               |            |
|                                                         | 2400MHz-2483.5MHz                                                                                                                                                                                                                                              | 94.00              |         | Average Value        |            |
|                                                         |                                                                                                                                                                                                                                                                | 114.00             |         | Peak Value           |            |
| Limit:<br>(Spurious Emissions)                          | Frequency                                                                                                                                                                                                                                                      | Limit (uV/m)       | Value   | Measurement Distance |            |
|                                                         | 0.009MHz-0.490MHz                                                                                                                                                                                                                                              | 2400/F(KHz)        | QP      | 300m                 |            |
|                                                         | 0.490MHz-1.705MHz                                                                                                                                                                                                                                              | 24000/F(KHz)       | QP      | 300m                 |            |
|                                                         | 1.705MHz-30MHz                                                                                                                                                                                                                                                 | 30                 | QP      | 30m                  |            |
|                                                         | 30MHz-88MHz                                                                                                                                                                                                                                                    | 100                | QP      | 3m                   |            |
|                                                         | 88MHz-216MHz                                                                                                                                                                                                                                                   | 150                | QP      |                      |            |
|                                                         | 216MHz-960MHz                                                                                                                                                                                                                                                  | 200                | QP      |                      |            |
|                                                         | 960MHz-1GHz                                                                                                                                                                                                                                                    | 500                | QP      |                      |            |
|                                                         | Above 1GHz                                                                                                                                                                                                                                                     | 500                | Average |                      |            |
|                                                         |                                                                                                                                                                                                                                                                | 5000               | Peak    |                      |            |
| Limit:<br>(band edge)                                   | 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 Section 15.209, whichever is the lesser attenuation. |                    |         |                      |            |
| Test setup:                                             | Below 30MHz                                                                                                                                                                                                                                                    |                    |         |                      |            |
|                                                         |                                                                                                                                                                            |                    |         |                      |            |
|                                                         | Below 1GHz                                                                                                                                                                                                                                                     |                    |         |                      |            |



Above 1GHz



Measurement data:

## 7.3.1 Field Strength of The Fundamental Signal

### Peak value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|----------------|---------------------|-----------------|--------------|
| 2408.00         | 79.07             | 27.43                 | 5.40            | 36.87                    | 75.03          | 114.00              | -38.97          | Vertical     |
| 2408.00         | 78.94             | 27.43                 | 5.40            | 36.87                    | 74.90          | 114.00              | -39.10          | Horizontal   |
| 2440.00         | 80.08             | 27.53                 | 5.43            | 36.89                    | 76.15          | 114.00              | -37.85          | Vertical     |
| 2440.00         | 78.66             | 27.53                 | 5.43            | 36.89                    | 74.73          | 114.00              | -39.27          | Horizontal   |
| 2474.00         | 80.29             | 27.62                 | 5.46            | 36.92                    | 76.45          | 114.00              | -37.55          | Vertical     |
| 2474.00         | 79.11             | 27.62                 | 5.46            | 36.92                    | 75.27          | 114.00              | -38.73          | Horizontal   |

### Average value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|----------------|---------------------|-----------------|--------------|
| 2408.00         | 58.48             | 27.43                 | 5.40            | 36.87                    | 54.44          | 94.00               | -39.56          | Vertical     |
| 2408.00         | 57.86             | 27.43                 | 5.40            | 36.87                    | 53.82          | 94.00               | -40.18          | Horizontal   |
| 2440.00         | 58.94             | 27.53                 | 5.43            | 36.89                    | 55.01          | 94.00               | -38.99          | Vertical     |
| 2440.00         | 57.39             | 27.53                 | 5.43            | 36.89                    | 53.46          | 94.00               | -40.54          | Horizontal   |
| 2474.00         | 59.72             | 27.62                 | 5.46            | 36.92                    | 55.88          | 94.00               | -38.12          | Vertical     |
| 2474.00         | 57.67             | 27.62                 | 5.46            | 36.92                    | 53.83          | 94.00               | -40.17          | Horizontal   |

Remark: RBW 3MHz VBW 3MHz peak detector is for PK Value, RMS detector is for AV value

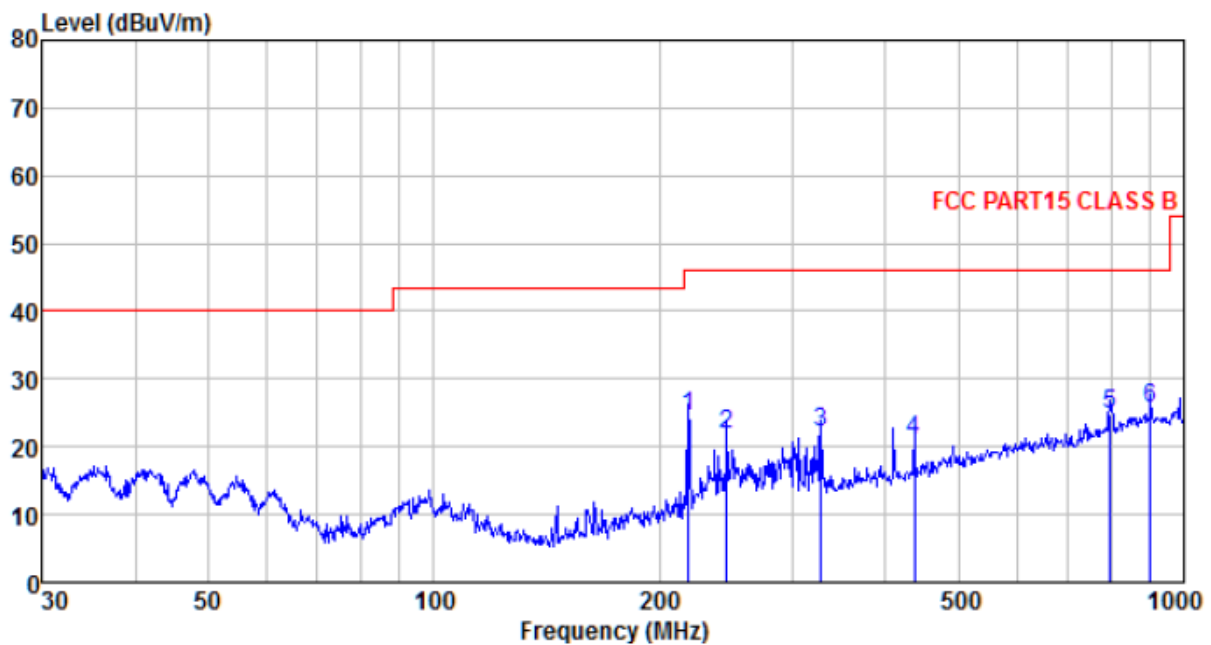
## 7.3.2 Spurious emissions

### ■ 9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

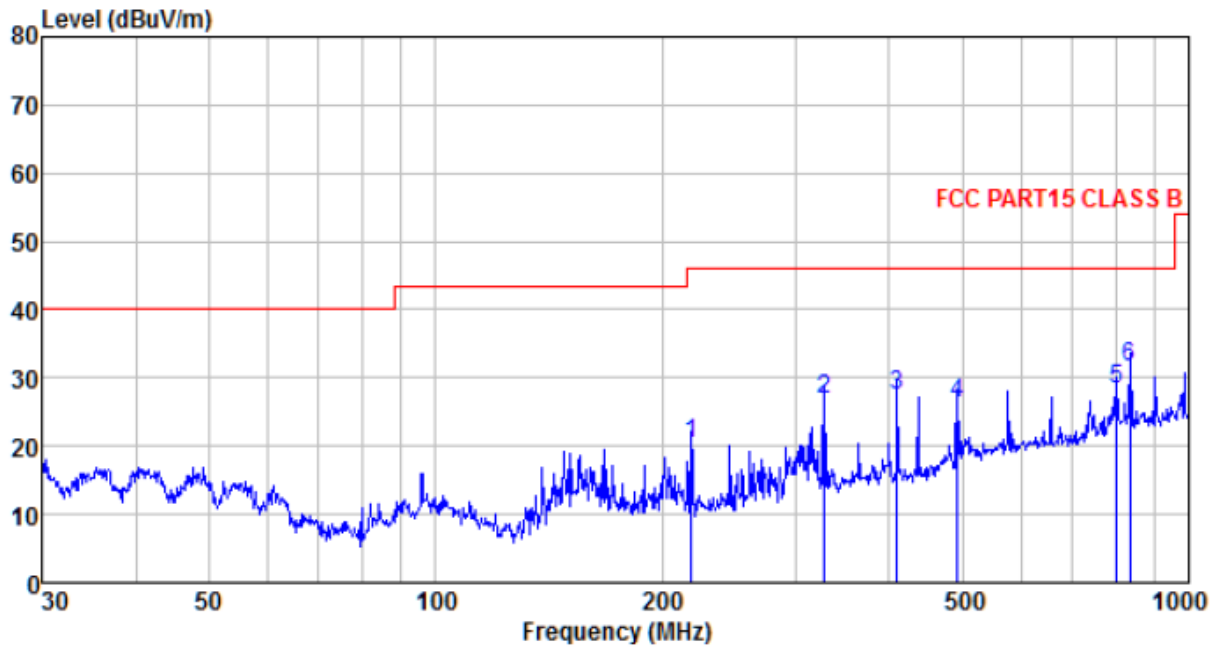
### ■ 30 MHz -1GHz

Horizontal:



| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamp<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------|---------------|--------------------------|---------------------|--------|
| 218.309     | 48.68                    | 11.09                     | 1.95                | 37.35                  | 24.37         | 46.00                    | -21.63              | QP     |
| 245.951     | 44.94                    | 12.04                     | 2.10                | 37.38                  | 21.70         | 46.00                    | -24.30              | QP     |
| 327.887     | 42.85                    | 14.12                     | 2.51                | 37.45                  | 22.03         | 46.00                    | -23.97              | QP     |
| 437.120     | 39.43                    | 16.12                     | 3.03                | 37.52                  | 21.06         | 46.00                    | -24.94              | QP     |
| 796.183     | 36.66                    | 21.34                     | 4.45                | 37.62                  | 24.83         | 46.00                    | -21.17              | QP     |
| 903.309     | 36.11                    | 22.30                     | 4.87                | 37.60                  | 25.68         | 46.00                    | -20.32              | QP     |

**Vertical:**

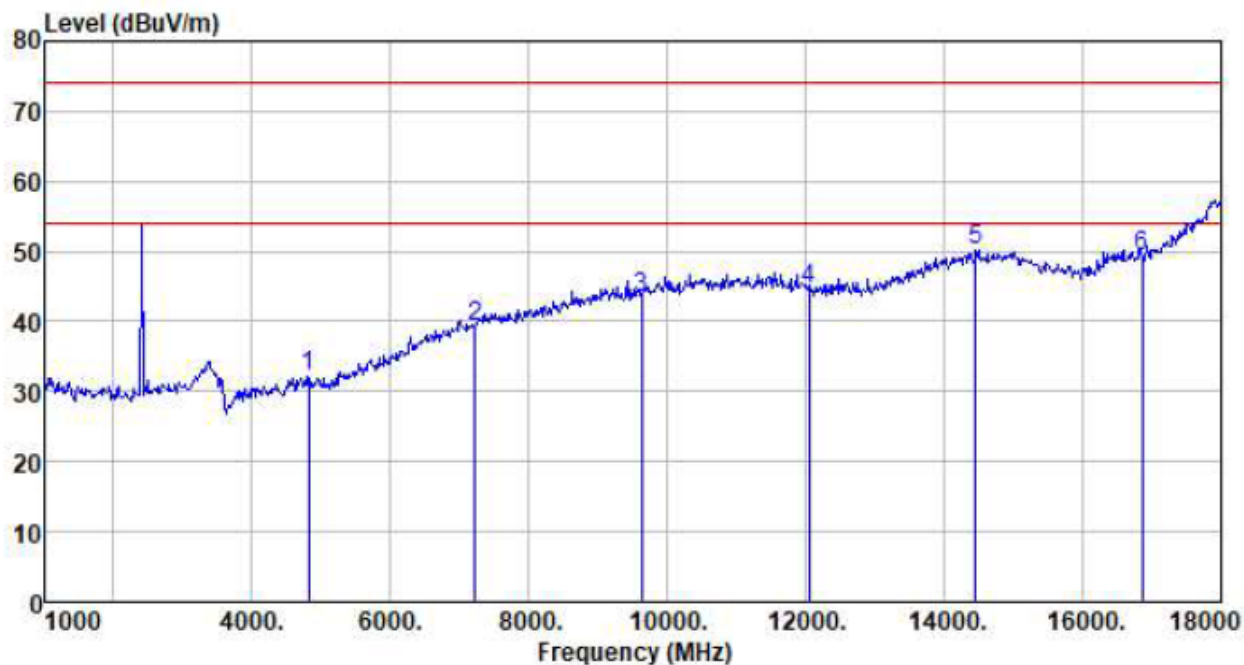


| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamp<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------|---------------|--------------------------|---------------------|--------|
| 218.309     | 44.53                    | 11.09                     | 1.95                | 37.35                  | 20.22         | 46.00                    | -25.78              | QP     |
| 327.887     | 47.73                    | 14.12                     | 2.51                | 37.45                  | 26.91         | 46.00                    | -19.09              | QP     |
| 410.383     | 46.64                    | 15.54                     | 2.91                | 37.52                  | 27.57         | 46.00                    | -18.43              | QP     |
| 492.469     | 43.36                    | 17.18                     | 3.27                | 37.51                  | 26.30         | 46.00                    | -19.70              | QP     |
| 801.786     | 39.97                    | 21.40                     | 4.46                | 37.62                  | 28.21         | 46.00                    | -17.79              | QP     |
| 836.244     | 42.79                    | 21.75                     | 4.60                | 37.61                  | 31.53         | 46.00                    | -14.47              | QP     |

■ Above 1GHz

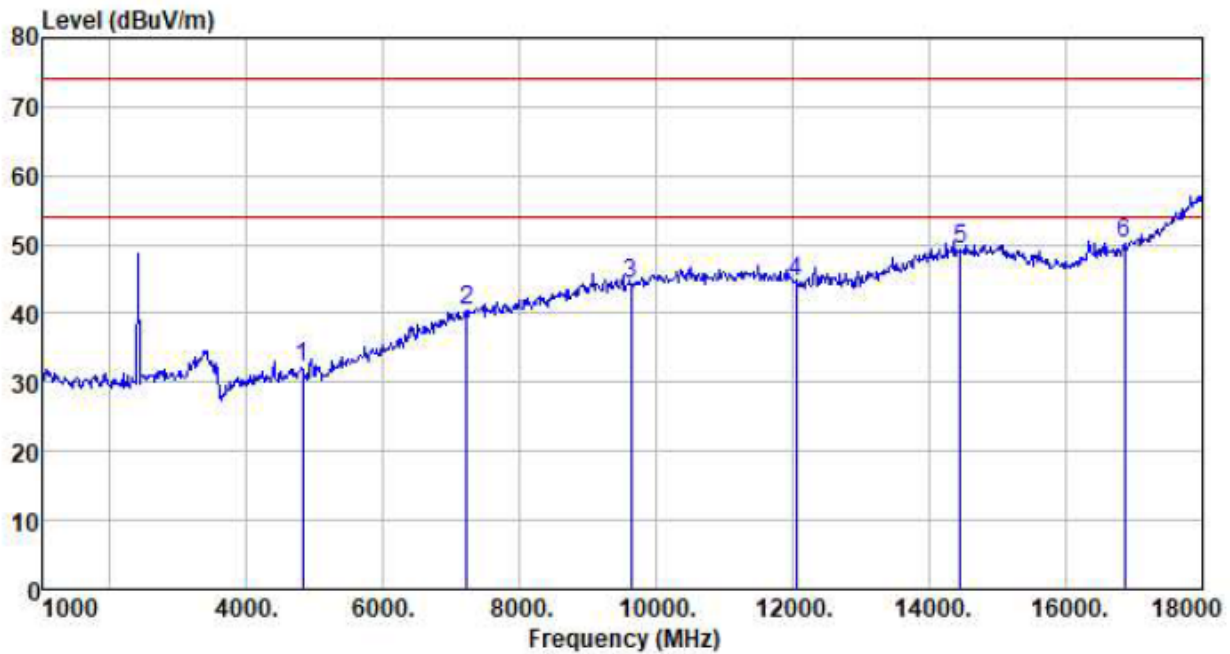
|               |                |
|---------------|----------------|
| Test channel: | Lowest channel |
|---------------|----------------|

Horizontal:



| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamplifier<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------------|---------------|--------------------------|---------------------|--------|
| 4816.000    | 30.00                    | 31.22                     | 8.61                | 37.73                        | 32.10         | 74.00                    | -41.90              | Peak   |
| 7224.000    | 27.04                    | 36.20                     | 11.66               | 35.63                        | 39.27         | 74.00                    | -34.73              | Peak   |
| 9632.000    | 26.31                    | 37.97                     | 14.16               | 34.95                        | 43.49         | 74.00                    | -30.51              | Peak   |
| 12040.000   | 27.14                    | 38.51                     | 15.05               | 36.22                        | 44.48         | 74.00                    | -29.52              | Peak   |
| 14448.000   | 27.63                    | 41.49                     | 17.17               | 36.06                        | 50.23         | 74.00                    | -23.77              | Peak   |
| 16856.000   | 27.08                    | 39.58                     | 18.82               | 36.17                        | 49.31         | 74.00                    | -24.69              | Peak   |

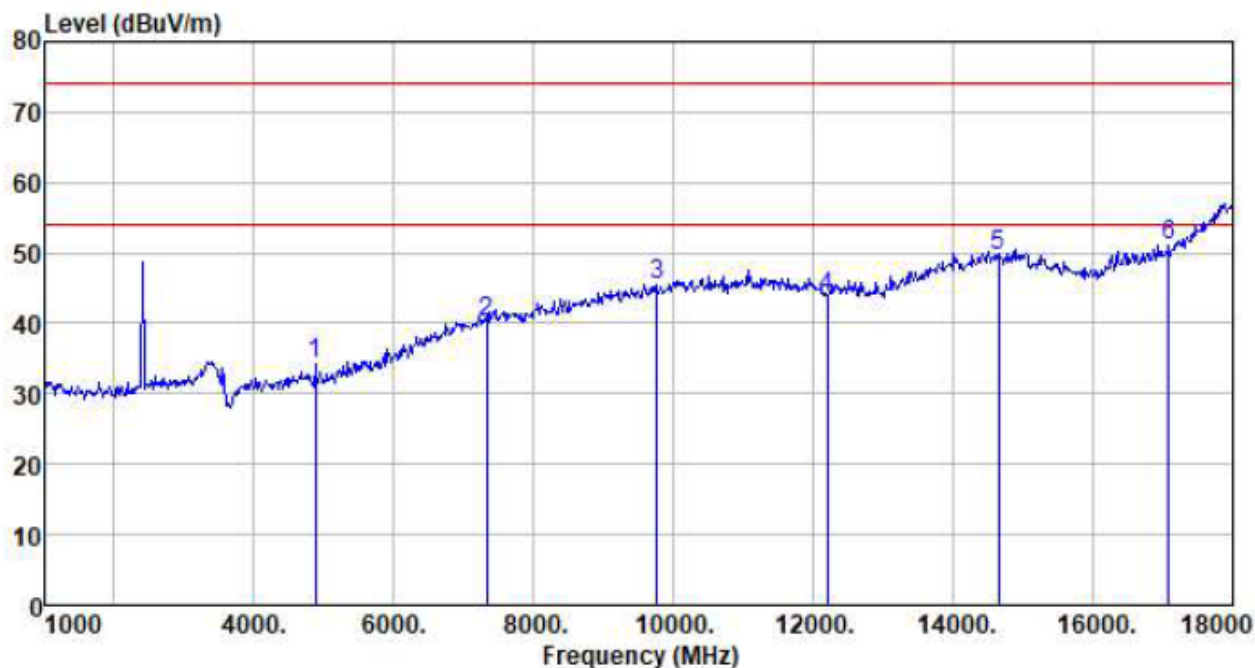
**Vertical:**



| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamp<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------|---------------|--------------------------|---------------------|--------|
| 4816.000    | 30.09                    | 31.22                     | 8.61                | 37.73                  | 32.19         | 74.00                    | -41.81              | Peak   |
| 7224.000    | 28.19                    | 36.20                     | 11.66               | 35.63                  | 40.42         | 74.00                    | -33.58              | Peak   |
| 9632.000    | 27.17                    | 37.97                     | 14.16               | 34.95                  | 44.35         | 74.00                    | -29.65              | Peak   |
| 12040.000   | 27.21                    | 38.51                     | 15.05               | 36.22                  | 44.55         | 74.00                    | -29.45              | Peak   |
| 14448.000   | 26.83                    | 41.49                     | 17.17               | 36.06                  | 49.43         | 74.00                    | -24.57              | Peak   |
| 16856.000   | 27.89                    | 39.58                     | 18.82               | 36.17                  | 50.12         | 74.00                    | -23.88              | Peak   |

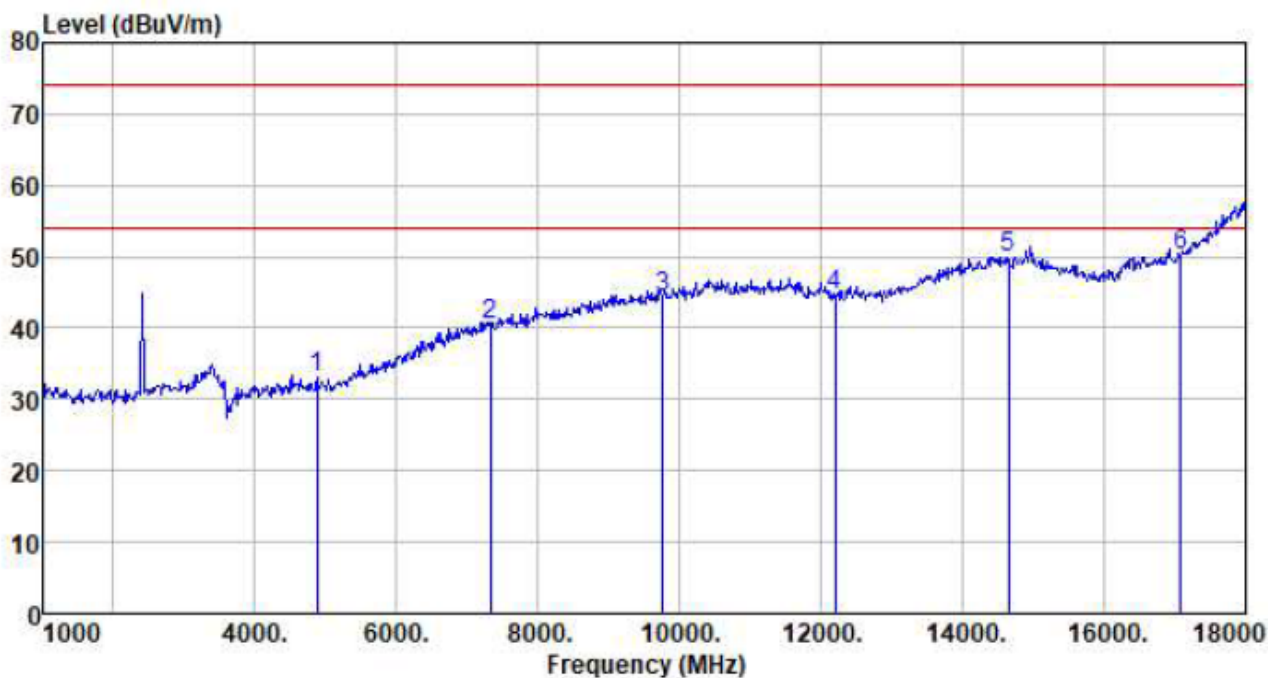
|               |                |
|---------------|----------------|
| Test channel: | Middle channel |
|---------------|----------------|

Horizontal:



| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamp<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------|---------------|--------------------------|---------------------|--------|
| 4880.000    | 32.09                    | 31.31                     | 8.66                | 37.75                  | 34.31         | 74.00                    | -39.69              | Peak   |
| 7320.000    | 27.73                    | 36.43                     | 11.72               | 35.60                  | 40.28         | 74.00                    | -33.72              | Peak   |
| 9760.000    | 28.18                    | 38.10                     | 14.25               | 35.03                  | 45.50         | 74.00                    | -28.50              | Peak   |
| 12200.000   | 26.28                    | 38.57                     | 15.14               | 36.31                  | 43.68         | 74.00                    | -30.32              | Peak   |
| 14640.000   | 26.95                    | 41.10                     | 17.28               | 35.77                  | 49.56         | 74.00                    | -24.44              | Peak   |
| 17080.000   | 28.04                    | 40.22                     | 18.99               | 36.29                  | 50.96         | 74.00                    | -23.04              | Peak   |

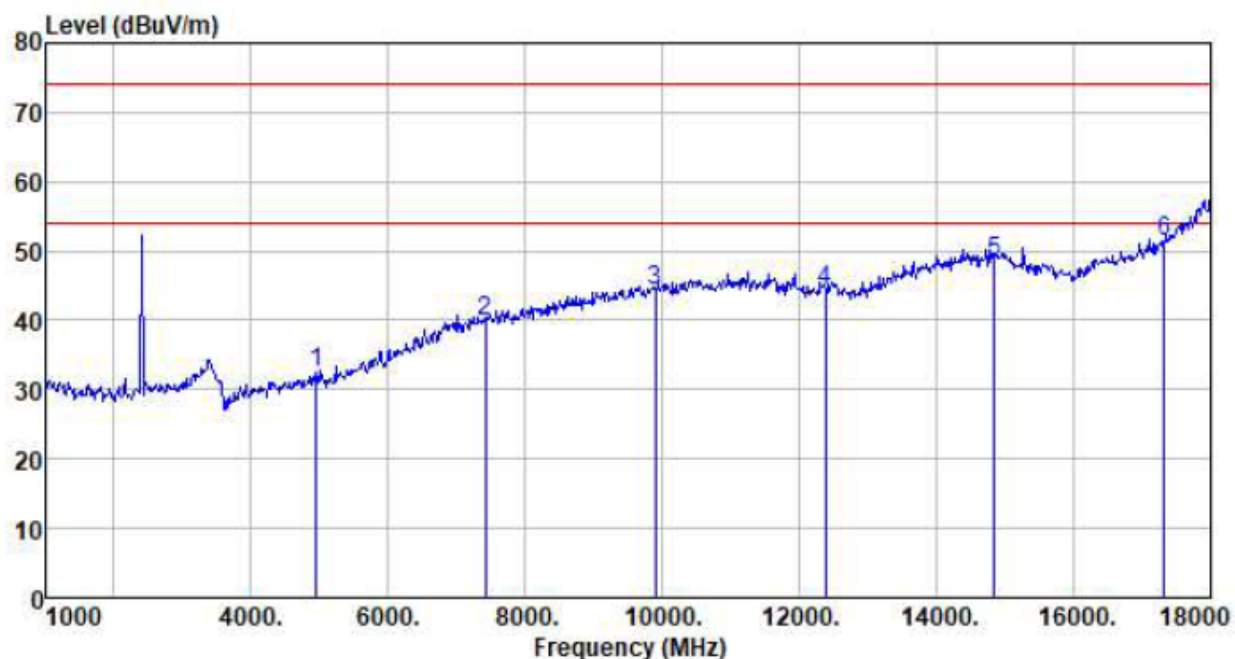
Vertical:



| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamp<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------|---------------|--------------------------|---------------------|--------|
| 4880.000    | 30.87                    | 31.31                     | 8.66                | 37.75                  | 33.09         | 74.00                    | -40.91              | Peak   |
| 7320.000    | 27.75                    | 36.43                     | 11.72               | 35.60                  | 40.30         | 74.00                    | -33.70              | Peak   |
| 9760.000    | 26.98                    | 38.10                     | 14.25               | 35.03                  | 44.30         | 74.00                    | -29.70              | Peak   |
| 12200.000   | 27.31                    | 38.57                     | 15.14               | 36.31                  | 44.71         | 74.00                    | -29.29              | Peak   |
| 14640.000   | 27.26                    | 41.10                     | 17.28               | 35.77                  | 49.87         | 74.00                    | -24.13              | Peak   |
| 17080.000   | 27.15                    | 40.22                     | 18.99               | 36.29                  | 50.07         | 74.00                    | -23.93              | Peak   |

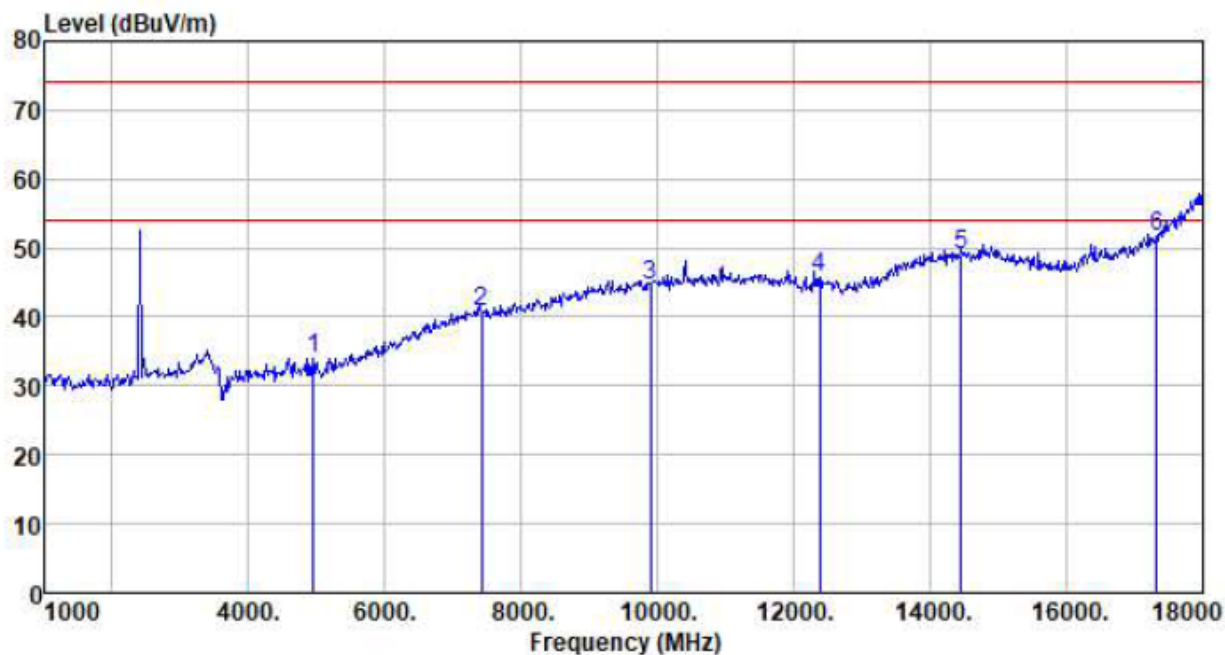
|               |                 |
|---------------|-----------------|
| Test channel: | Highest channel |
|---------------|-----------------|

Horizontal:



| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamp<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------|---------------|--------------------------|---------------------|--------|
| 4948.000    | 30.08                    | 31.41                     | 8.71                | 37.78                  | 32.42         | 74.00                    | -41.58              | Peak   |
| 7422.000    | 26.94                    | 36.62                     | 11.77               | 35.57                  | 39.76         | 74.00                    | -34.24              | Peak   |
| 9896.000    | 26.73                    | 38.27                     | 14.35               | 35.12                  | 44.23         | 74.00                    | -29.77              | Peak   |
| 12370.000   | 26.86                    | 38.64                     | 15.25               | 36.42                  | 44.33         | 74.00                    | -29.67              | Peak   |
| 14844.000   | 25.99                    | 40.70                     | 17.37               | 35.53                  | 48.53         | 74.00                    | -25.47              | Peak   |
| 17318.000   | 27.27                    | 41.52                     | 18.98               | 36.26                  | 51.51         | 74.00                    | -22.49              | Peak   |

**Vertical:**



| Freq<br>MHz | Reading<br>level<br>dBuV | Antenna<br>factor<br>dB/m | Cable<br>loss<br>dB | Preamp<br>factor<br>dB | level<br>dBuV | Limit<br>level<br>dBuV/m | Over<br>limit<br>dB | Remark |
|-------------|--------------------------|---------------------------|---------------------|------------------------|---------------|--------------------------|---------------------|--------|
| 4948.000    | 31.75                    | 31.41                     | 8.71                | 37.78                  | 34.09         | 74.00                    | -39.91              | Peak   |
| 7422.000    | 27.90                    | 36.62                     | 11.77               | 35.57                  | 40.72         | 74.00                    | -33.28              | Peak   |
| 9896.000    | 27.02                    | 38.27                     | 14.35               | 35.12                  | 44.52         | 74.00                    | -29.48              | Peak   |
| 12370.000   | 28.36                    | 38.64                     | 15.25               | 36.42                  | 45.83         | 74.00                    | -28.17              | Peak   |
| 14448.000   | 26.53                    | 41.49                     | 17.17               | 36.06                  | 49.13         | 74.00                    | -24.87              | Peak   |
| 17318.000   | 27.41                    | 41.52                     | 18.98               | 36.26                  | 51.65         | 74.00                    | -22.35              | Peak   |

**Remark:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

### 7.3.3 Bandedge emissions

All of the restriction bands were tested, and only the data of worst case was exhibited.

|               |                |
|---------------|----------------|
| Test channel: | Lowest channel |
|---------------|----------------|

#### Peak value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|----------------|---------------------|-----------------|--------------|
| 2390.00         | 34.79             | 27.14                 | 5.30            | 36.79                    | 30.44          | 74.00               | -43.56          | Horizontal   |
| 2400.00         | 34.13             | 27.37                 | 5.38            | 36.85                    | 30.03          | 74.00               | -43.97          | Horizontal   |
| 2390.00         | 33.68             | 27.14                 | 5.30            | 36.79                    | 29.33          | 74.00               | -44.67          | Vertical     |
| 2400.00         | 34.27             | 27.37                 | 5.38            | 36.85                    | 30.17          | 74.00               | -43.83          | Vertical     |

#### Average value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|----------------|---------------------|-----------------|--------------|
| 2390.00         | 23.65             | 27.14                 | 5.30            | 36.79                    | 19.30          | 54.00               | -34.70          | Horizontal   |
| 2400.00         | 23.81             | 27.37                 | 5.38            | 36.85                    | 19.71          | 54.00               | -34.29          | Horizontal   |
| 2390.00         | 22.78             | 27.14                 | 5.30            | 36.79                    | 18.43          | 54.00               | -35.57          | Vertical     |
| 2400.00         | 23.07             | 27.37                 | 5.38            | 36.85                    | 18.97          | 54.00               | -35.03          | Vertical     |

|               |                 |
|---------------|-----------------|
| Test channel: | Highest channel |
|---------------|-----------------|

#### Peak value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|----------------|---------------------|-----------------|--------------|
| 2483.50         | 34.09             | 27.66                 | 5.47            | 36.93                    | 30.29          | 74.00               | -43.71          | Horizontal   |
| 2500.00         | 34.59             | 27.70                 | 5.49            | 36.94                    | 30.84          | 74.00               | -43.16          | Horizontal   |
| 2483.50         | 33.77             | 27.66                 | 5.47            | 36.93                    | 29.97          | 74.00               | -44.03          | Vertical     |
| 2500.00         | 34.24             | 27.70                 | 5.49            | 36.94                    | 30.49          | 74.00               | -43.51          | Vertical     |

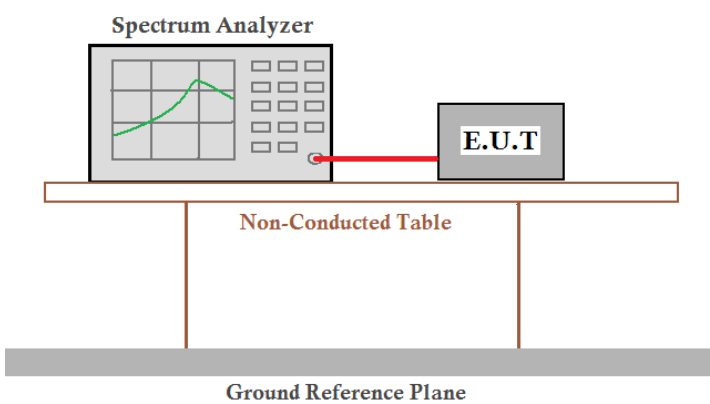
#### Average value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|----------------|---------------------|-----------------|--------------|
| 2483.50         | 23.17             | 27.66                 | 5.47            | 36.93                    | 19.37          | 54.00               | -34.63          | Horizontal   |
| 2500.00         | 23.63             | 27.70                 | 5.49            | 36.94                    | 19.88          | 54.00               | -34.12          | Horizontal   |
| 2483.50         | 22.43             | 27.66                 | 5.47            | 36.93                    | 18.63          | 54.00               | -35.37          | Vertical     |
| 2500.00         | 23.08             | 27.70                 | 5.49            | 36.94                    | 19.33          | 54.00               | -34.67          | Vertical     |

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

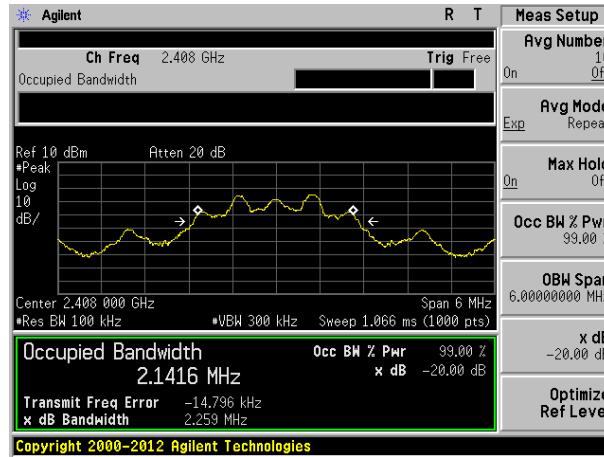
## 7.4 20dB Occupy Bandwidth

|                   |                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC Part15 C Section 15.249/15.215                                                                                                                                                                                                                                                                                                                         |
| Test Method:      | ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                           |
| Limit:            | Operation Frequency range 2400MHz~2483.5MHz                                                                                                                                                                                                                                                                                                                |
| Test setup:       |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p> |
| Test Instruments: | Refer to section 6.0 for details                                                                                                                                                                                                                                                                                                                           |
| Test mode:        | Refer to section 5.2 for details                                                                                                                                                                                                                                                                                                                           |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                       |

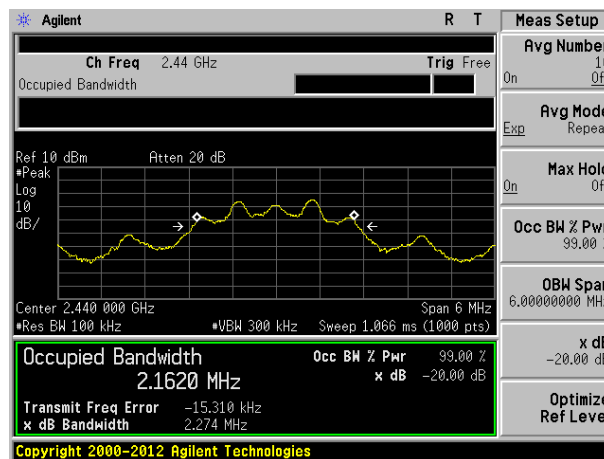
### Measurement Data

| Test channel | 20dB bandwidth(MHz) | Result |
|--------------|---------------------|--------|
| Lowest       | 2.259               | Pass   |
| Middle       | 2.274               | Pass   |
| Highest      | 2.263               | Pass   |

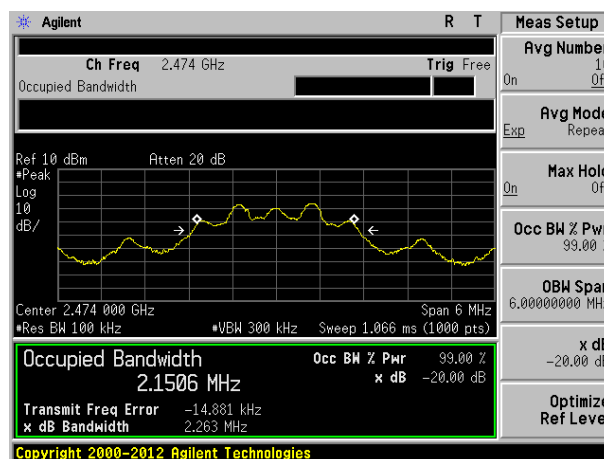
Test plot as follows:



Lowest channel



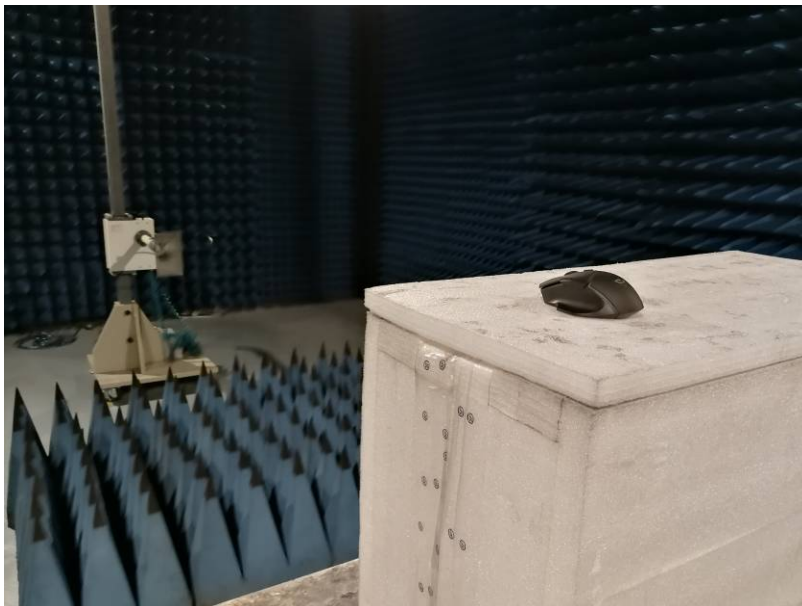
Middle channel



Highest channel

## 8 Test Setup Photo

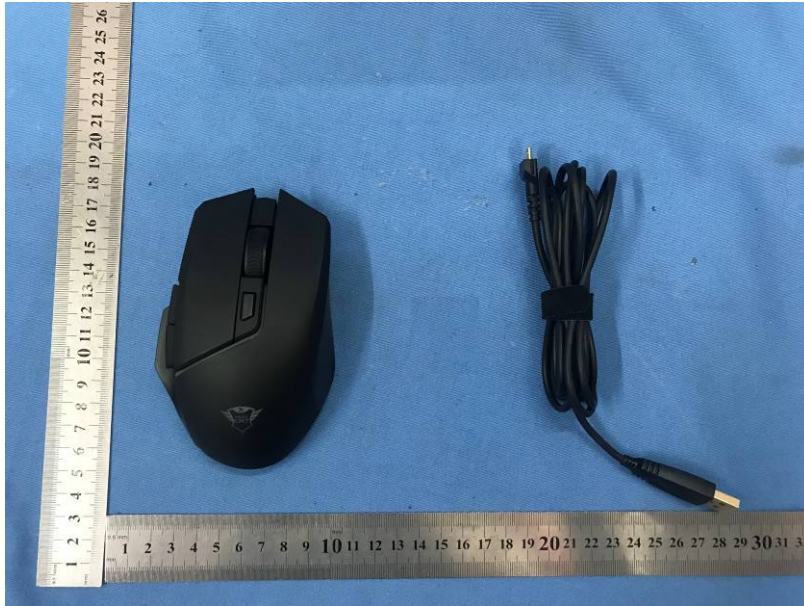
Radiated Emission



## Conducted Emission

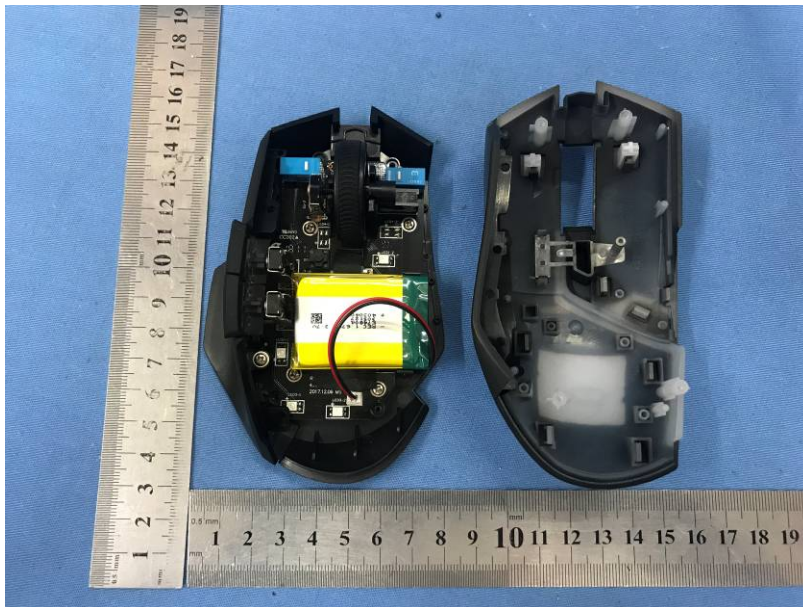


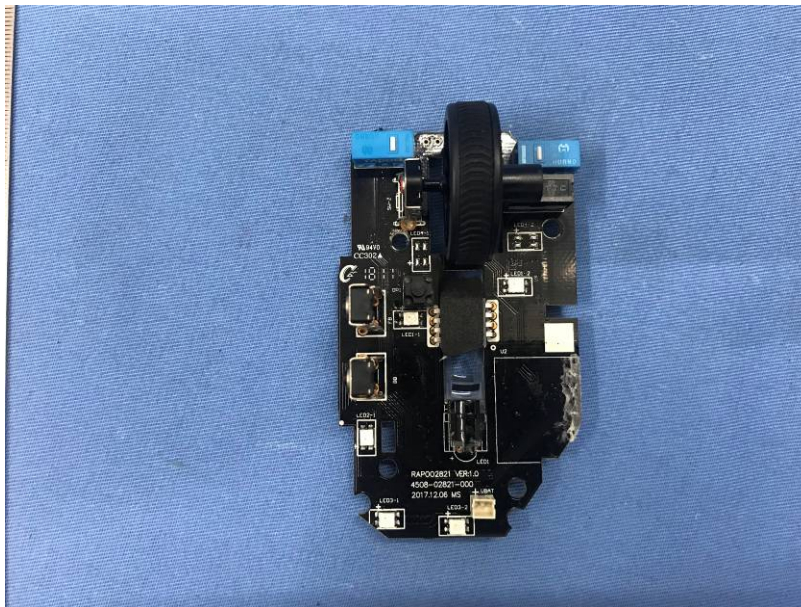
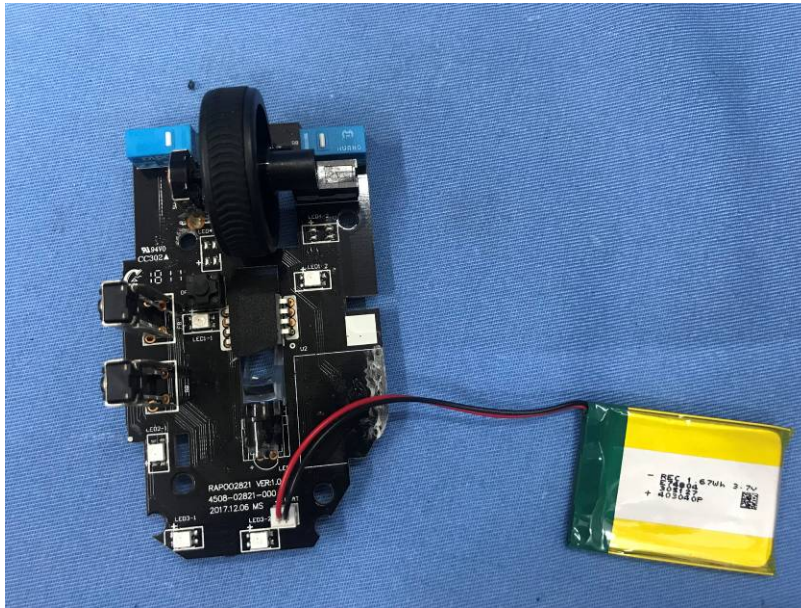
## 9 EUT Constructional Details

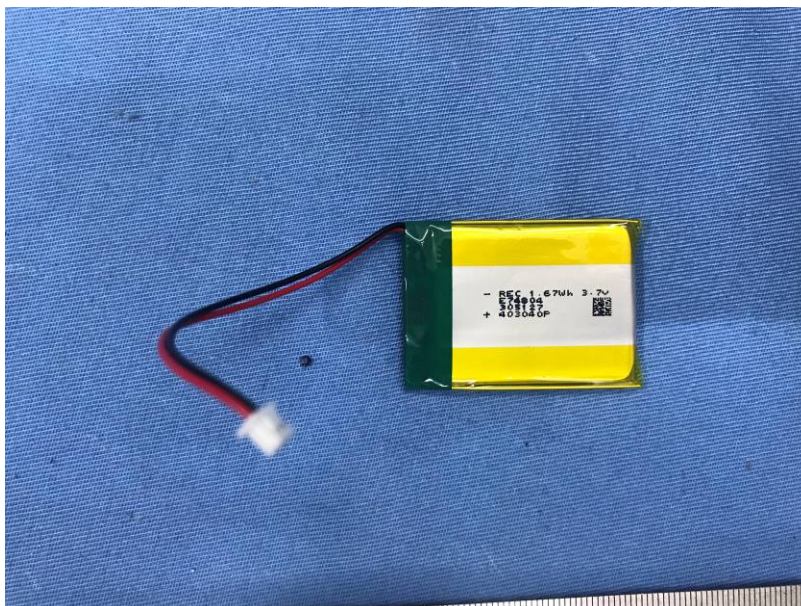
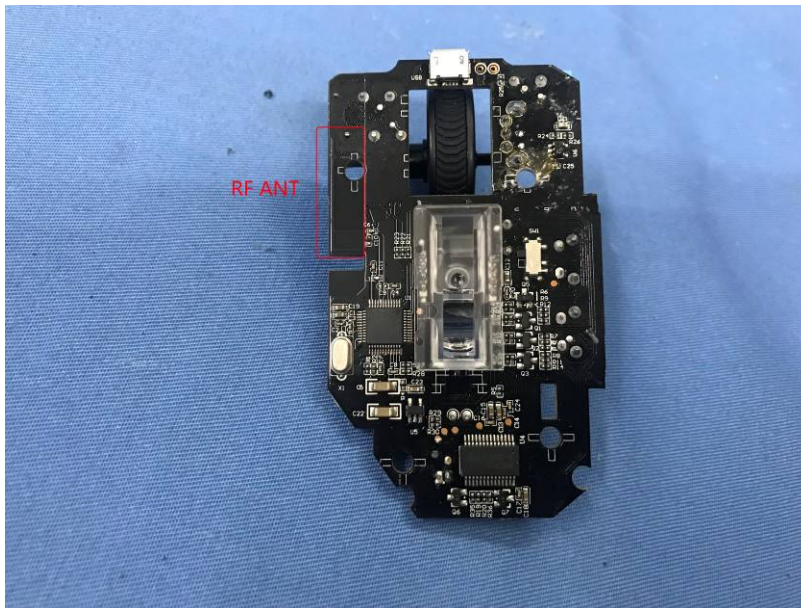












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