

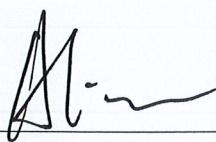
# RADIO TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant/Manufacturer : DONGGUAN TOGRAN ELECTRONICS TECHNOLOGY CO.,LTD.  
Address : 262 shidan Rd.,3rd industrial Area, Juzhou,Shijie Town, Dongguan city China  
Factory : DONGGUAN TOGRAN ELECTRONICS TECHNOLOGY CO.,LTD.  
Address : 262 shidan Rd.,3rd industrial Area, Juzhou,Shijie Town, Dongguan city China  
E.U.T. : Wireless Optical Mouse  
Brand Name : N/A  
Model No. : TM175G  
FCC ID : 2AGLG-TM175  
Measurement Standard : FCC PART 15.249: 2016  
Date of Receiver : May 09, 2017  
Date of Test : May 10, 2017 to June 09, 2017  
Date of Report : June 09, 2017

This Test Report is Issued Under the Authority of :

Prepared by



Alina Guo / Engineer

Approved & Authorized Signer



Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

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## Revision History of This Test Report

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test

This device is a wireless mouse, it's powered by 2\*1.5V come from AA battery. For more details features, please refer to User's Manual.

Product Name : Wireless Optical Mouse

Model Name : TM175G

Model Difference : None  
Description

Power Supply : 2\*1.5V From AA battery

Test Voltage : 2\*1.5V From AA battery

### Technical Specification:

#### 2.4G Function:

Frequency Range : 2408~2474MHz

Modulation Type : GFSK

Number of Channel : 34

Channel Space : 2MHz

Antenna Type : PCB

Antenna Gain : -5.35dBi (Declaration by manufacturer)

Hardware version : A0

Software version : A0

### Channel List:

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

**Note:** The Lowest, middle, and the Highest frequency of channel were selected to perform the test. The frequency selected see below:

The Lowest frequency: 2408MHz

The middle frequency: 2440MHz

The Highest frequency: 2474MHz

## 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AGLG-TM175 filing to comply with Section 15.249 of the FCC Part 15 (2016), Subpart C Rule.

## 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters.

## 1.4 Equipment Modifications

Not available for this EUT intended for grant.

## 1.5 Support Device

None

## 1.6 Test Facility and Location

Listed by CNAS, August 14, 2015

The certificate is valid until August 13, 2018

The Laboratory has been assessed and proved to be in compliance with CNAS/CL01

The Certificate Registration Number is L5795.

Listed by FCC, July 03, 2014

The Certificate Registration Number is 665078.

Listed by Industry Canada, June 18, 2014

The Certificate Registration Number is 46405-9743.

Dongguan NTC Co., Ltd.

(Full Name: Dongguan Nore Testing Center Co., Ltd.)

Building D, Gaosheng Science and Technology Park, Hongtu Road,

Nancheng District, Dongguan City, Guangdong, China

(Full Name: Building D, Gaosheng Science & Technology Park,

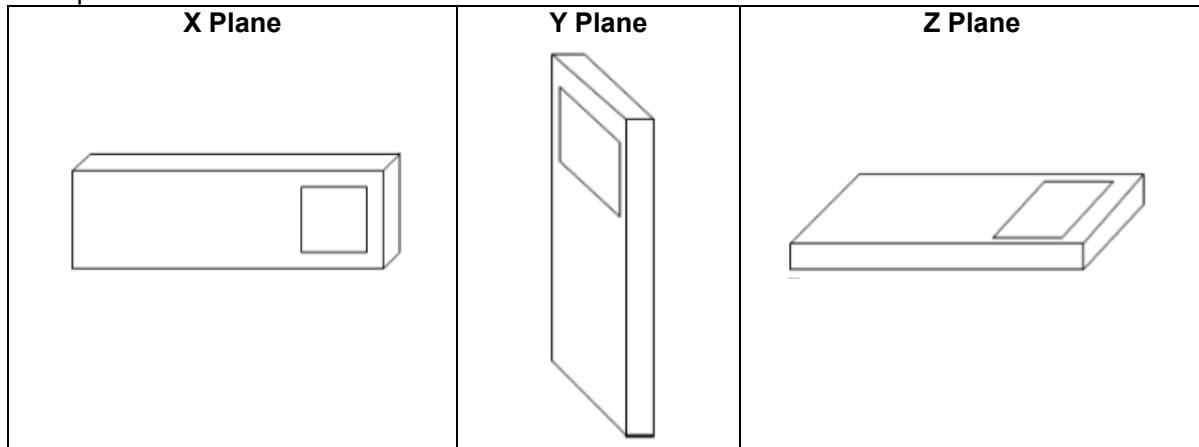
Zhouxi Longxi Road, Nancheng District, Dongguan, Guangdong, China.

## 1.7 Summary of Test Results

| FCC Rules          | Description Of Test         | Uncertainty               | Result        |
|--------------------|-----------------------------|---------------------------|---------------|
| §15.207(a)         | AC Power Conducted Emission | ±1.06dB                   | No Applicable |
| §15.249(a)/ 15.209 | Radiated Emissions          | ±3.70dB                   | Compliant     |
| §15.249(d)/ 15.205 | Band Edge                   | ±1.70dB                   | Compliant     |
| §15.215(c)         | 20dB Bandwidth              | ±1.42 x10 <sup>-4</sup> % | Compliant     |
| §15.203            | Antenna Requirement         | ±0.60dB                   | Compliant     |

Note: 1. The EUT has been tested as an independent unit. And Continual transmitting in maximum power (The new battery be used during test)  
2. Due to this EUT is powered by battery only, the AC Power Conducted Emission is not applicable.  
3. The EUT powered by battery and operating multiple positions, so the EUT shall be performed two or three orthogonal planes. The worst plane is Z.

Example:



---

## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 Special Accessories

Not available for this EUT intended for grant.

### 2.3 Description of test modes

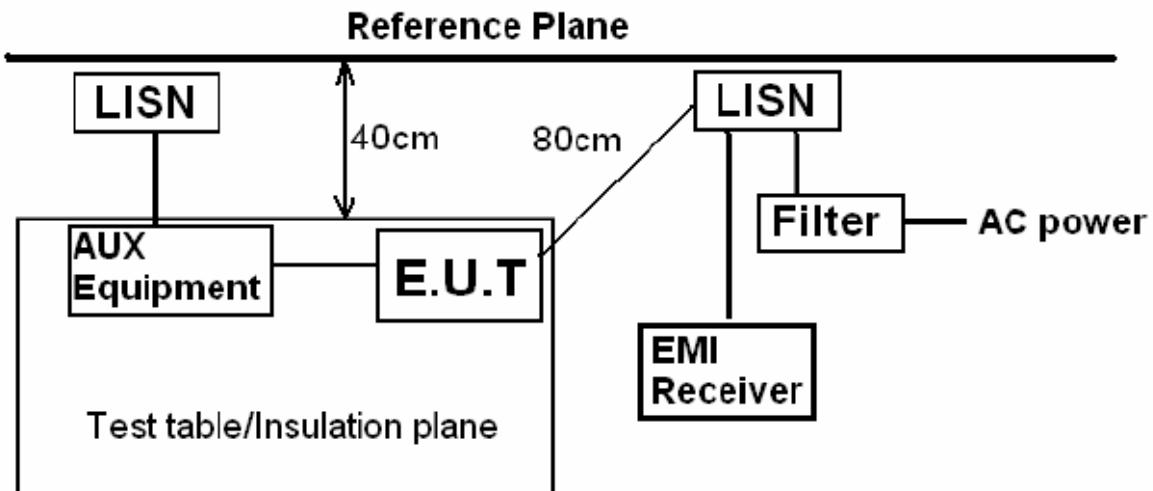
The EUT has been tested under operating condition. The Lowest, middle and highest frequencies were chosen for testing.

### 2.4 EUT Exercise

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

### 3. Conducted Emissions Test

#### 3.1 Test SET-UP (Block Diagram of Configuration)



#### 3.2 Test Condition

**Test Requirement:** FCC Part 15.207

**Frequency Range:** 150KHz ~ 30MHz

**Detector:** RBW 9KHz, VBW 30KHz

**Operation Mode:** TX

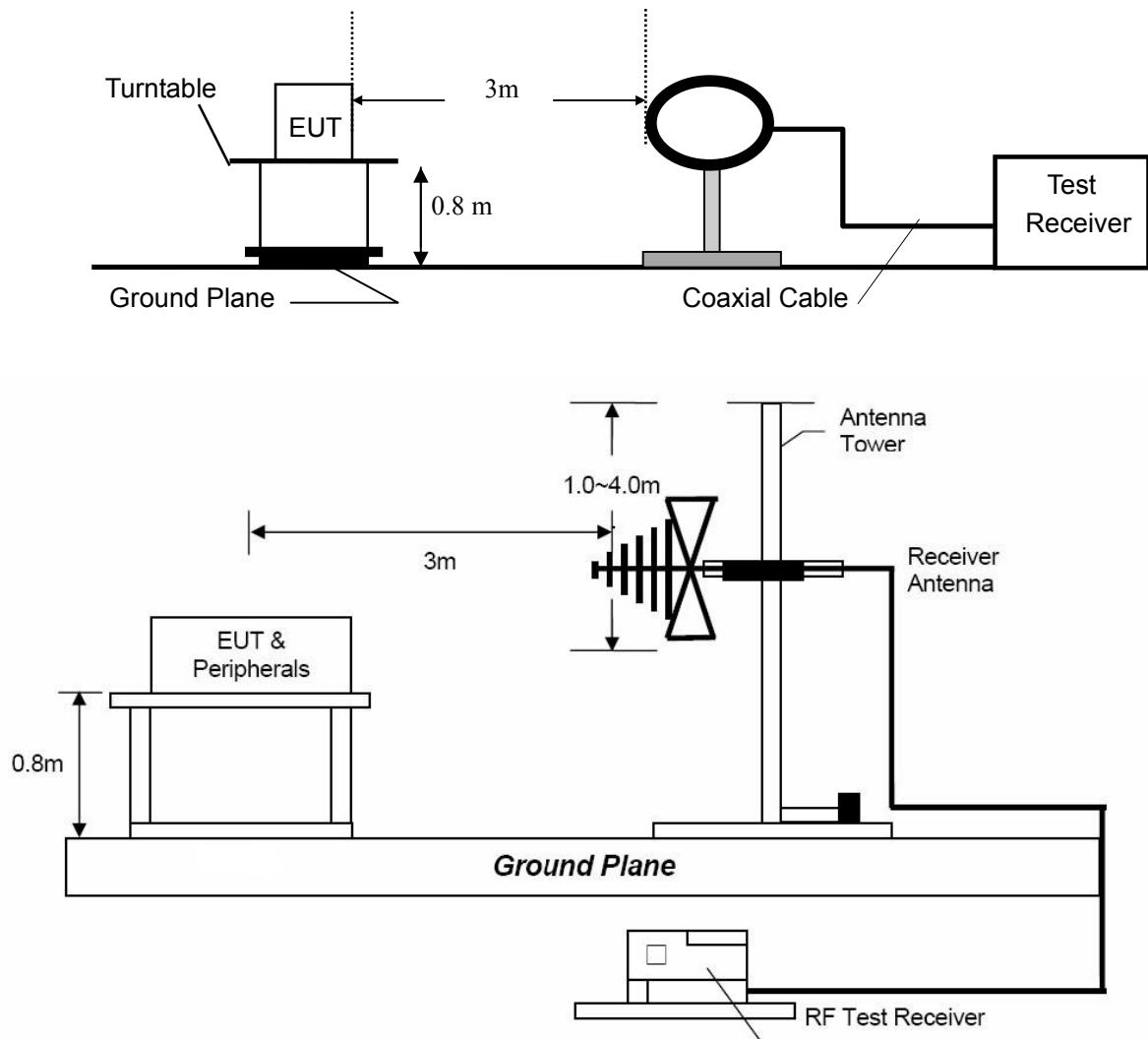
#### 3.3 Measurement Results

**No Applicable.**

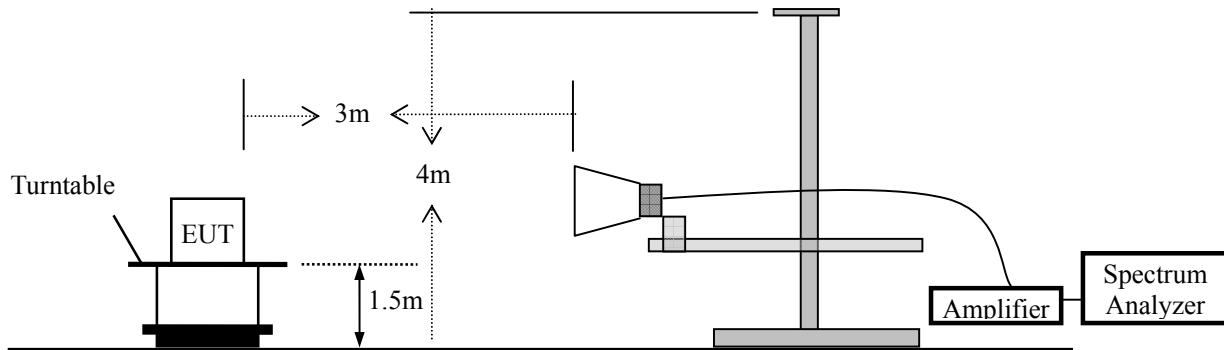
## 4. Radiated Emission Test

### 4.1 Test SET-UP (Block Diagram of Configuration)

#### 4.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



#### 4.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



#### 4.2 Measurement Procedure

- a. Below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- b. For the radiated emission test above 1GHz:  
The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

| Frequency Band (MHz) | Level   | Resolution Bandwidth | Video Bandwidth |
|----------------------|---------|----------------------|-----------------|
| 30 to 1000           | QP      | 120 kHz              | 300 kHz         |
| Above 1000           | Peak    | 1 MHz                | 3 MHz           |
|                      | Average | 1 MHz                | 10 Hz           |

#### 4.3 Limit

| Frequency range MHz | Distance Meters | Field Strengths Limit (15.209)          |                                       |
|---------------------|-----------------|---|---------------------------------------|
|                     |                 | μV/m                                    |                                       |
| 0.009 ~ 0.490       | 300             | 2400/F(kHz)                             |                                       |
| 0.490 ~ 1.705       | 30              | 24000/F(kHz)                            |                                       |
| 1.705 ~ 30          | 30              | 30                                      |                                       |
| 30 ~ 88             | 3               | 100                                     |                                       |
| 88 ~ 216            | 3               | 150                                     |                                       |
| 216 ~ 960           | 3               | 200                                     |                                       |
| Above 960           | 3               | 500                                     |                                       |
| Frequency range MHz | Distance Meters | Field Strengths Limit (15.249)          |                                       |
|                     |                 | mV/m<br>(Field strength of fundamental) | μV/m<br>(Field strength of Harmonics) |
| 902 ~ 928           | 3               | 50                                      | 500                                   |
| 2400 ~ 2483.5       | 3               | 50                                      | 500                                   |
| 5725 ~ 5875         | 3               | 50                                      | 500                                   |
| 24000 ~ 2425000     | 3               | 250                                     | 2500                                  |

Remark : (1) Emission level (dB) $\mu$ V = 20 log Emission level  $\mu$ V/m

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
- (4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

#### 4.4 Measurement Results

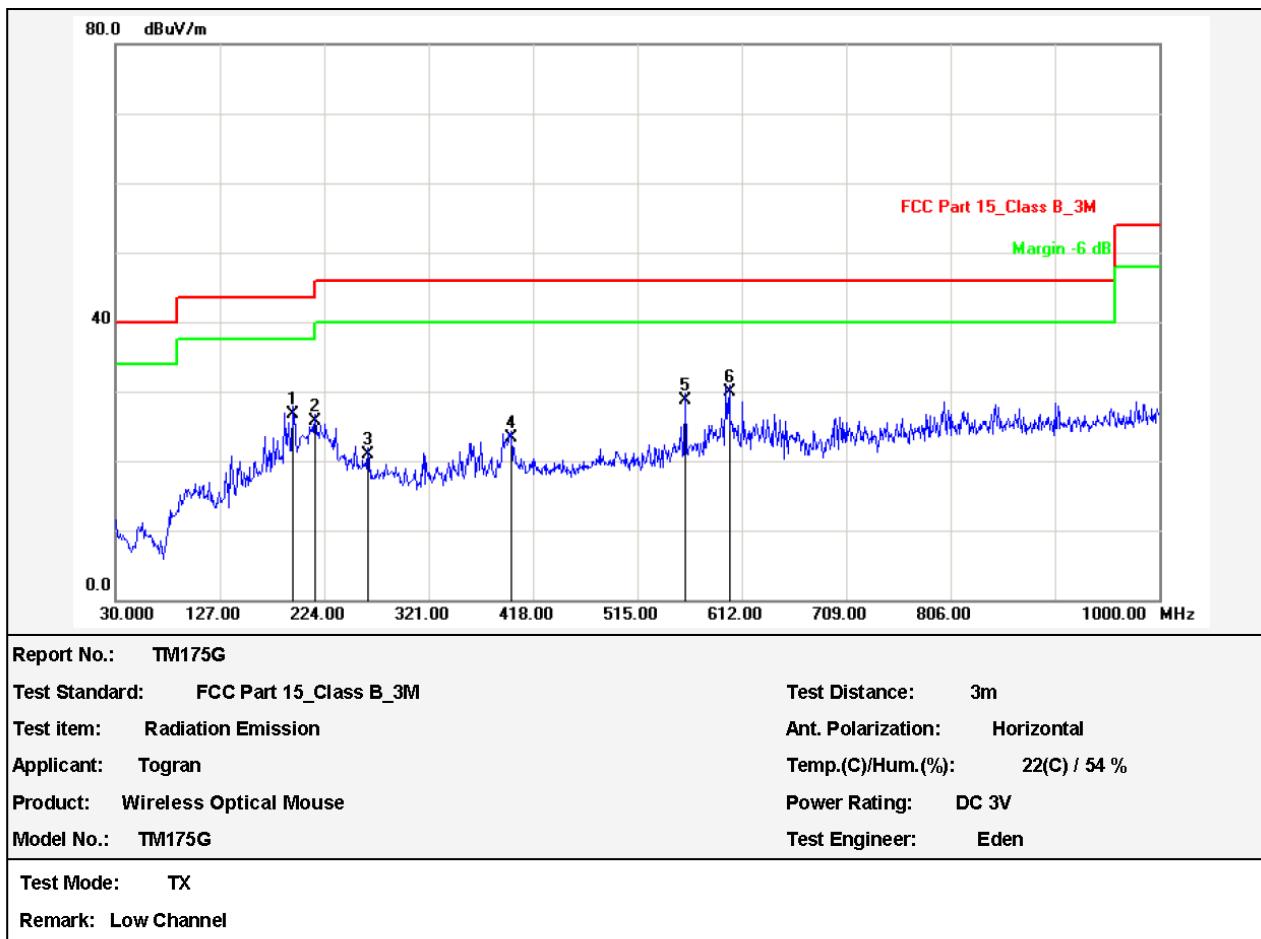
Please refer to following the test plots of the worst case: Low channel.



Dongguan NTC Co., Ltd.  
 Tel: +86-769-22022444 Fax: +86-769-22022799  
 Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Radiation

Test Time: 2017-5-25 15:46:17



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 194.9000        | -13.42        | 40.22          | 26.80          | 43.50          | -16.70      | QP       |             |                | P   |        |
| 2   | 215.2700        | -13.11        | 38.81          | 25.70          | 43.50          | -17.80      | QP       |             |                | P   |        |
| 3   | 264.7400        | -11.31        | 32.21          | 20.90          | 46.00          | -25.10      | QP       |             |                | P   |        |
| 4   | 397.6298        | -9.13         | 32.43          | 23.30          | 46.00          | -22.70      | QP       |             |                | P   |        |
| 5   | 559.6200        | -6.23         | 35.03          | 28.80          | 46.00          | -17.20      | QP       |             |                | P   |        |
| 6   | 600.3600        | -5.00         | 34.90          | 29.90          | 46.00          | -16.10      | QP       |             |                | P   |        |

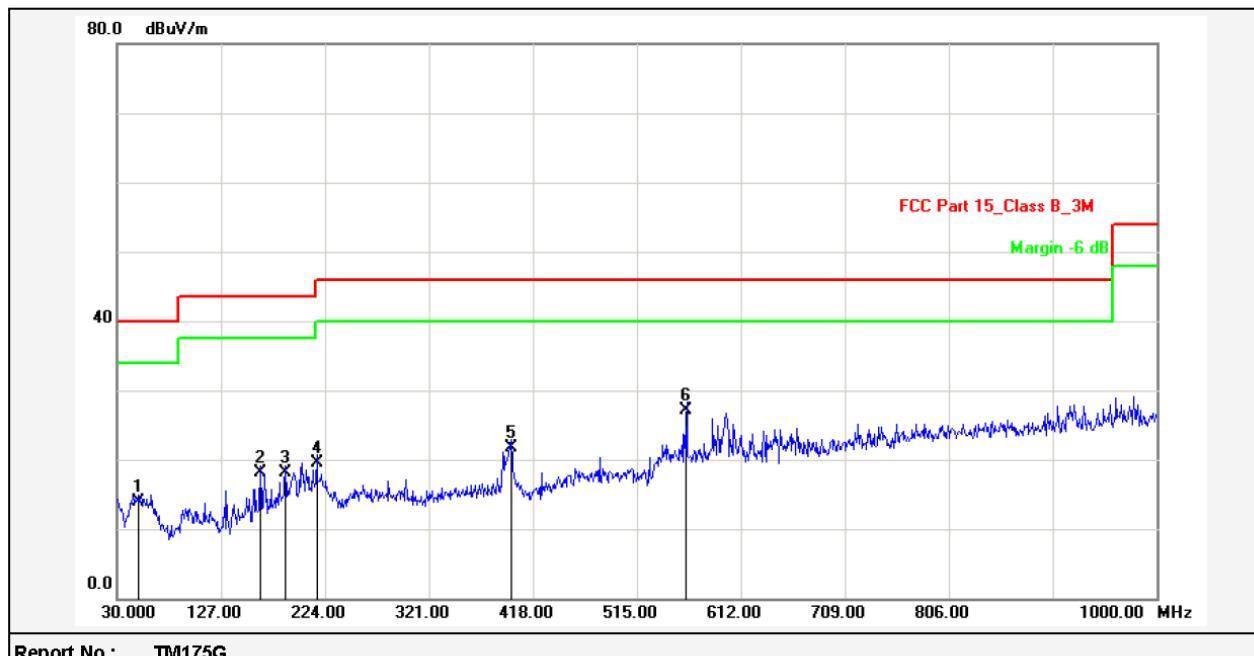
Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.



Dongguan NTC Co., Ltd.  
 Tel: +86-769-22022444 Fax: +86-769-22022799  
 Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Radiation

Test Time: 2017-5-25 15:39:00



Report No.: TM175G

Test Standard: FCC Part 15\_Class B\_3M

Test Distance: 3m

Test item: Radiation Emission

Ant. Polarization: Vertical

Applicant: Togran

Temp.(C)/Hum.(%): 22(C) / 54 %

Product: Wireless Optical Mouse

Power Rating: DC 3V

Model No.: TM175G

Test Engineer: Eden

Test Mode: TX

Remark: Low Channel

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 50.3699         | -13.41        | 27.31          | 13.90          | 40.00          | -26.10      | QP       |             |                | P   |        |
| 2   | 163.8600        | -18.02        | 36.12          | 18.10          | 43.50          | -25.40      | QP       |             |                | P   |        |
| 3   | 187.1399        | -16.72        | 34.92          | 18.20          | 43.50          | -25.30      | QP       |             |                | P   |        |
| 4   | 216.2400        | -16.08        | 35.68          | 19.60          | 46.00          | -26.40      | QP       |             |                | P   |        |
| 5   | 397.6298        | -11.13        | 32.93          | 21.80          | 46.00          | -24.20      | QP       |             |                | P   |        |
| 6   | 561.5596        | -8.16         | 35.36          | 27.20          | 46.00          | -18.80      | QP       |             |                | P   |        |

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

Frequency Range: 1-25GHz  
 Test Result: PASS  
 Measured Distance: 3m  
 Test By: Sance

Test Date : May 25, 2017  
 Temperature : 21 °C  
 Humidity : 55 %

| Freq.<br>(MHz)                        | Ant.Pol.<br>(H/V) | Reading<br>Level(dBuV) |       | Factor<br>(dB/m) | Emission Level<br>(dBuV) |       | Limit 3m<br>(dBuV/m) |       | Margin<br>(dB) |        |
|---------------------------------------|-------------------|------------------------|-------|------------------|--------------------------|-------|----------------------|-------|----------------|--------|
|                                       |                   | PK                     | AV    |                  | PK                       | AV    | PK                   | AV    | PK             | AV     |
| <b>Operation Mode: TX Mode (Low)</b>  |                   |                        |       |                  |                          |       |                      |       |                |        |
| 2408                                  | V                 | 87.24                  | 85.28 | 0.15             | 87.39                    | 85.43 | 114.00               | 94.00 | -26.61         | -8.57  |
| 4816                                  | V                 | 49.28                  | 36.90 | 6.36             | 55.64                    | 43.26 | 74.00                | 54.00 | -18.36         | -10.74 |
| 7224                                  | V                 | 49.25                  | 36.76 | 10.46            | 59.71                    | 47.22 | 74.00                | 54.00 | -14.29         | -6.78  |
| ---                                   |                   |                        |       |                  |                          |       |                      |       |                |        |
| 2408                                  | H                 | 92.73                  | 90.60 | 0.15             | 92.88                    | 90.75 | 114.00               | 94.00 | -21.12         | -3.25  |
| 4816                                  | H                 | 49.46                  | 38.39 | 6.36             | 55.82                    | 44.75 | 74.00                | 54.00 | -18.18         | -9.25  |
| 7224                                  | H                 | 49.29                  | 37.04 | 10.46            | 59.75                    | 47.50 | 74.00                | 54.00 | -14.25         | -6.50  |
| ---                                   |                   |                        |       |                  |                          |       |                      |       |                |        |
| <b>Operation Mode: TX Mode (Mid)</b>  |                   |                        |       |                  |                          |       |                      |       |                |        |
| 2440                                  | V                 | 92.50                  | 90.08 | 0.23             | 92.73                    | 90.31 | 114.00               | 94.00 | -21.27         | -3.69  |
| 4880                                  | V                 | 49.57                  | 38.02 | 6.60             | 56.17                    | 44.62 | 74.00                | 54.00 | -17.83         | -9.38  |
| 7320                                  | V                 | 48.41                  | 36.99 | 10.55            | 58.96                    | 47.54 | 74.00                | 54.00 | -15.04         | -6.46  |
| ---                                   |                   |                        |       |                  |                          |       |                      |       |                |        |
| 2440                                  | H                 | 82.61                  | 79.40 | 0.23             | 82.84                    | 79.63 | 114.00               | 94.00 | -31.16         | -14.37 |
| 4880                                  | H                 | 53.35                  | 36.67 | 6.60             | 59.95                    | 43.27 | 74.00                | 54.00 | -14.05         | -10.73 |
| 7320                                  | H                 | 48.92                  | 37.84 | 10.55            | 59.47                    | 48.39 | 74.00                | 54.00 | -14.53         | -5.61  |
| ---                                   |                   |                        |       |                  |                          |       |                      |       |                |        |
| <b>Operation Mode: TX Mode (High)</b> |                   |                        |       |                  |                          |       |                      |       |                |        |
| 2474                                  | V                 | 81.27                  | 79.07 | 0.33             | 81.60                    | 79.40 | 114.00               | 94.00 | -32.40         | -14.60 |
| 4948                                  | V                 | 47.41                  | 35.26 | 6.85             | 54.26                    | 42.11 | 74.00                | 54.00 | -19.74         | -11.89 |
| 7422                                  | V                 | 53.84                  | 38.99 | 10.59            | 64.43                    | 49.58 | 74.00                | 54.00 | -9.57          | -4.42  |
| ---                                   |                   |                        |       |                  |                          |       |                      |       |                |        |
| 2474                                  | H                 | 91.15                  | 89.48 | 0.33             | 91.48                    | 89.81 | 114.00               | 94.00 | -22.52         | -4.19  |
| 4948                                  | H                 | 54.04                  | 42.14 | 6.85             | 60.89                    | 48.99 | 74.00                | 54.00 | -13.11         | -5.01  |
| 7422                                  | H                 | 45.19                  | 38.14 | 10.59            | 55.78                    | 48.73 | 74.00                | 54.00 | -18.22         | -5.27  |
| ---                                   |                   |                        |       |                  |                          |       |                      |       |                |        |

**Note:**

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level + Factor
- (3) Factor= Antenna Gain + Cable Loss – Amplifier Gain
- (4) Data of measurement within this frequency range shown “---” in the table  
 above means the reading of emissions are attenuated more than 10dB below the permissible limits.
- (5) Measurement uncertainty : ±3.7dB.
- (6) Horn antenna used for the emission over 1000MHz.

## 5. 20dB Bandwidth

### 5.1 Measurement Procedure

The 20dB bandwidth of the emission was contained within the frequency band designated which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered, FCC Rule 15.215(c):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

### 5.2 Test SET-UP (Block Diagram of Configuration)



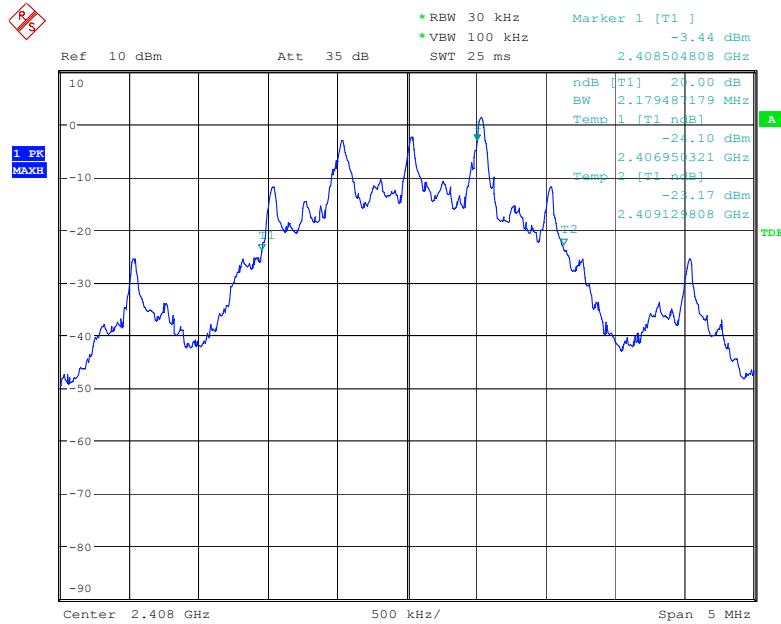
### 5.3 Measurement Results

Refer to attached data chart.

|                    |       |               |              |
|--------------------|-------|---------------|--------------|
| RBW:               | 30KHz | VBW:          | 100KHz       |
| Spectrum Detector: | PK    | Temperature : | 22 °C        |
| Test By:           | Sance | Humidity :    | 54 %         |
| Test Result:       | PASS  | Test Date :   | May 15, 2017 |

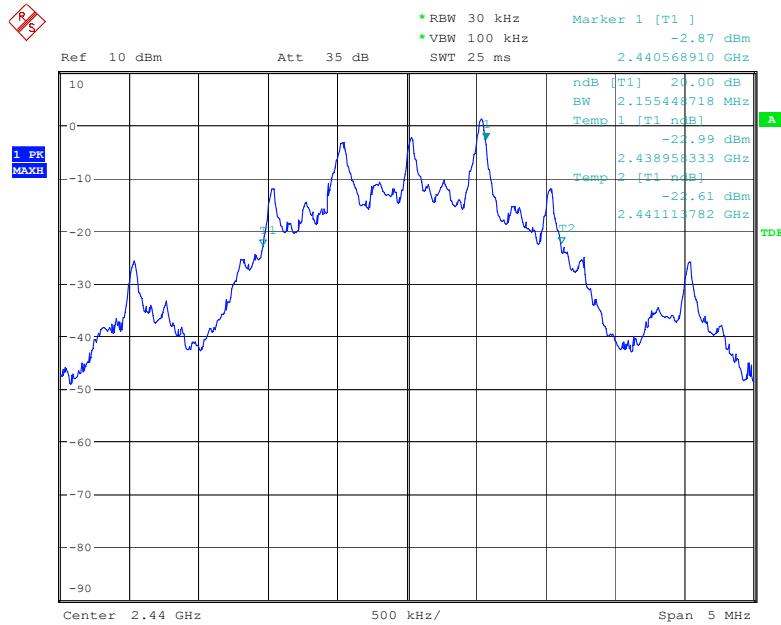
| Channel frequency (MHz) | 20dB Down BW(kHz) |
|-------------------------|-------------------|
| 2408                    | 2179              |
| 2440                    | 2155              |
| 2474                    | 2163              |

### Lowest Channel



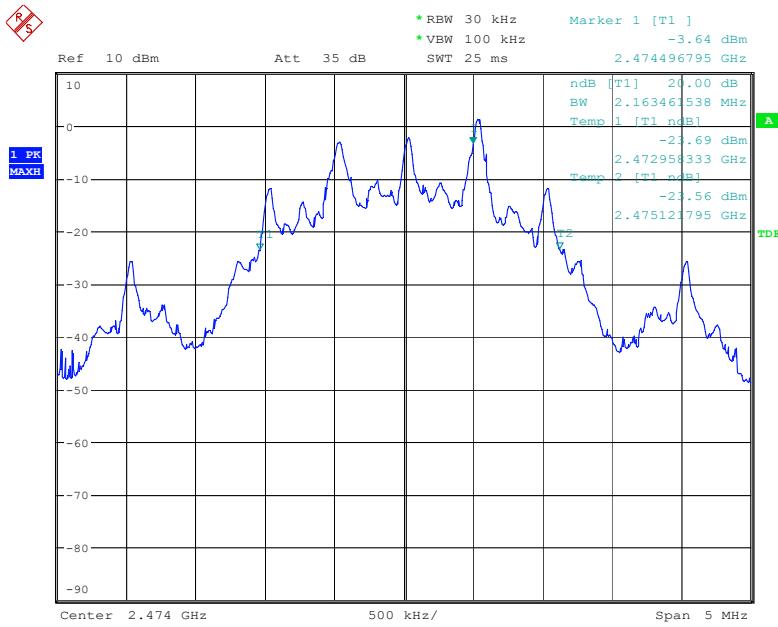
Date: 15.MAY.2017 13:51:55

### Middle Channel



Date: 15.MAY.2017 13:57:02

## Highest Channel



Date: 15.MAY.2017 13:58:21

## 6. Band Edge

### 6.1 Measurement Procedure

Same as Radiated Emission Test.

### 6.2 Limit

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.

### 6.3 Measurement Results

|                    |         |             |              |
|--------------------|---------|-------------|--------------|
| Operation Mode:    | TX Mode | Test Date : | May 25, 2017 |
| Temperature :      | 21 °C   | Humidity :  | 55 %         |
| Test Result:       | PASS    | Test By:    | Sance        |
| Measured Distance: | 3m      |             |              |

| Freq.<br>(MHz) | Ant.Pol.<br>(H/V) | Reading<br>Level(dBuV) |       | Factor<br>(dB/m) | Emission Level<br>(dBuV) |       | Limit 3m<br>(dBuV/m) |       | Margin<br>(dB) |       |
|----------------|-------------------|------------------------|-------|------------------|--------------------------|-------|----------------------|-------|----------------|-------|
|                |                   | PK                     | AV    |                  | PK                       | AV    | PK                   | AV    | PK             | AV    |
| 2390.000       | H                 | 53.74                  | 44.17 | 0.09             | 53.83                    | 44.26 | 74.00                | 54.00 | -20.17         | -9.74 |
| 2390.000       | V                 | 53.63                  | 44.20 | 0.09             | 53.72                    | 44.29 | 74.00                | 54.00 | -20.28         | -9.71 |
| 2483.500       | H                 | 55.04                  | 45.72 | 0.35             | 55.39                    | 46.07 | 74.00                | 54.00 | -18.61         | -7.93 |
| 2483.500       | V                 | 54.97                  | 45.38 | 0.35             | 55.32                    | 45.73 | 74.00                | 54.00 | -18.68         | -8.27 |

**Note:** (1) Emission Level= Reading Level + Factor  
(2) Factor= Antenna Gain + Cable Loss – Amplifier Gain  
(3) Horn antenna used for the emission over 1000MHz.

## 7. Antenna requirement

### 7.1 Measurement Procedure

According to of FCC part 15C section 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. 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.

Systems operating in the 2400-2483.5MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### 7.2 Measurement Results

The antenna is PCB antenna and no consideration of replacement, and the best case gain of the antenna is -5.35dBi. So, the antenna is consider meet the requirement.

## 8. Test Equipment List

| Description                    | Manufacturer    | Model Number | Serial Number | Characteristics | Calibration Date | Calibration Due Date |
|--------------------------------|-----------------|--------------|---------------|-----------------|------------------|----------------------|
| Test Receiver                  | Rohde & Schwarz | ESCI7        | 100837        | 9KHz~7GHz       | Nov. 23, 2016    | Nov. 22, 2017        |
| Antenna                        | Schwarzbeck     | VULB9162     | 9162-010      | 30MHz~7GHz      | Nov. 26, 2016    | Nov. 25, 2017        |
| Positioning Controller         | UC              | UC 3000      | N/A           | 0~360°, 1-4m    | N/A              | N/A                  |
| Color Monitor                  | SUNSPO          | SP-140A      | N/A           | N/A             | N/A              | N/A                  |
| Single Phase Power Line Filter | SAEMC           | PF201A-32    | 110210        | 32A             | N/A              | N/A                  |
| 3 Phase Power Line Filter      | SAEMC           | PF401A-200   | 110318        | 200A            | N/A              | N/A                  |
| DC Power Filter                | SAEMC           | PF301A-200   | 110245        | 200A            | N/A              | N/A                  |
| Cable                          | Huber+Suhner    | CBL2-NN-1M   | 22390001      | 9KHz~7GHz       | Nov. 06, 2016    | Nov. 05, 2017        |
| Cable                          | Huber+Suhner    | CIL02        | N/A           | 9KHz~7GHz       | Nov. 06, 2016    | Nov. 05, 2017        |
| RF Cable                       | Huber+Suhner    | SF-104       | MY16559/4     | 9KHz~25GHz      | Mar. 06, 2017    | Mar. 05, 2018        |
| Power Amplifier                | HP              | HP 8447D     | 1145A00203    | 100KHz~1.3GHz   | Nov. 06, 2016    | Nov. 05, 2017        |
| Horn Antenna                   | Schwarzbeck     | BBHA9170     | 9170-372      | 15GHz~26.5GHz   | Oct.22, 2016     | Oct.21, 2017         |
| Horn Antenna                   | Com-Power       | AH-118       | 071078        | 1GHz~18GHz      | Nov. 04, 2016    | Nov. 03, 2017        |
| Loop antenna                   | Daze            | ZA30900A     | 0708          | 9KHz~30MHz      | Oct.09, 2016     | Oct.08, 2017         |
| Spectrum Analyzer              | Rohde & Schwarz | FSU26        | 200409/026    | 20Hz~26.5GHz    | Aug. 31, 2016    | Aug. 30, 2017        |
| Pre-Amplifier                  | Agilent         | 8449B        | 3008A02964    | 1GHz~26.5GHz    | Nov. 02, 2016    | Nov. 01, 2017        |
| L.I.S.N.                       | Rohde & Schwarz | ENV 216      | 101317        | 9KHz~30MHz      | Nov. 06, 2016    | Nov. 07, 2017        |
| Temporary antenna connector    | TESCOM          | SS402        | N/A           | 9KHz-25GHz      | N/A              | N/A                  |

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.