

# FCC Test Report

|              |              |
|--------------|--------------|
| Product Name | Gaming Mouse |
| Model No     | P705         |
| FCC ID.      | XW3DKMSP705  |

|           |  |
|-----------|--|
| Applicant | Dongguan Siliten Electronics CO.,LTD                       |
| Address   | Sijia Yewu Industrial estate, Shijie Town, Dongguan, China |

|                 |                     |
|-----------------|---------------------|
| Date of Receipt | Sep. 16, 2019       |
| Issue Date      | Nov. 01, 2019       |
| Report No.      | 1990207R-RFUSP23V00 |
| Report Version  | V1.0                |



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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# Test Report

Issue Date: Nov. 01, 2019

Report No.: 1990207R-RFUSP23V00



|                     |   |
|---------------------|---|
| Product Name        | Gaming Mouse  |
| Applicant           | Dongguan Siliten Electronics CO.,LTD                                      |
| Address             | Sijia Yewu Industrial estate, Shijie Town, Dongguan, China                |
| Manufacturer        | Dongguan Siliten Electronics CO.,LTD                                      |
| Model No.           | P705  |
| EUT Rated Voltage   | DC 3.7V (Power by battery)  |
| EUT Test Voltage    | DC 3.7V (Power by battery)  |
| Trade Name          | ASUS  |
| Applicable Standard | FCC CFR Title 47 Part 15 Subpart C<br>ANSI C63.4: 2014, ANSI C63.10: 2013 |
| Test Result         | Complied  |

Documented By : Genie Chang  
( Senior Adm. Specialist / Genie Chang )

Tested By : Jason Tuan  
( Engineer / Jason Tuan )

Approved By : Vincent Lin  
( Director / Vincent Lin )

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**Attachment 1: EUT Test Photographs**

**Attachment 2: EUT Detailed Photographs**

## 1. GENERAL INFORMATION

### 1.1. EUT Description

|                     |                                   |
|---------------------|-----------------------------------|
| Product Name        | Gaming Mouse                      |
| Trade Name          | ASUS                              |
| Model No.           | P705                              |
| FCC ID.             | XW3DKMSP705                       |
| Frequency Range     | 2403-2480MHz                      |
| Number of Channels  | 78CH                              |
| Channel Separation  | 1MHz                              |
| Type of Modulation  | GFSK                              |
| Antenna Type        | Printed on PCB                    |
| Antenna Gain        | Refer to the table "Antenna List" |
| Channel Control     | Auto                              |
| USB to Type C Cable | Shielded, 1.85m                   |

#### Antenna List

| No. | Manufacturer | Part No. | Antenna Type   | Peak Gain            |
|-----|--------------|----------|----------------|----------------------|
| 1   | ASUS         | P705     | Printed on PCB | -2.76dBi for 2.4 GHz |

Note: The antenna of EUT conforms to FCC 15.203.

## Center Frequency of Each Channel:

| Channel     | Frequency | Channel     | Frequency | Channel     | Frequency | Channel     | Frequency |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| Channel 01: | 2403 MHz  | Channel 21: | 2423 MHz  | Channel 41: | 2443 MHz  | Channel 61: | 2463 MHz  |
| Channel 02: | 2404 MHz  | Channel 22: | 2424 MHz  | Channel 42: | 2444 MHz  | Channel 62: | 2464 MHz  |
| Channel 03: | 2405 MHz  | Channel 23: | 2425 MHz  | Channel 43: | 2445 MHz  | Channel 63: | 2465 MHz  |
| Channel 04: | 2406 MHz  | Channel 24: | 2426 MHz  | Channel 44: | 2446 MHz  | Channel 64: | 2466 MHz  |
| Channel 05: | 2407 MHz  | Channel 25: | 2427 MHz  | Channel 45: | 2447 MHz  | Channel 65: | 2467 MHz  |
| Channel 06: | 2408 MHz  | Channel 26: | 2428 MHz  | Channel 46: | 2448 MHz  | Channel 66: | 2468 MHz  |
| Channel 07: | 2409 MHz  | Channel 27: | 2429 MHz  | Channel 47: | 2449 MHz  | Channel 67: | 2469 MHz  |
| Channel 08: | 2410 MHz  | Channel 28: | 2430 MHz  | Channel 48: | 2450 MHz  | Channel 68: | 2470 MHz  |
| Channel 09: | 2411 MHz  | Channel 29: | 2431 MHz  | Channel 49: | 2451 MHz  | Channel 69: | 2471 MHz  |
| Channel 10: | 2412 MHz  | Channel 30: | 2432 MHz  | Channel 50: | 2452 MHz  | Channel 70: | 2472 MHz  |
| Channel 11: | 2413 MHz  | Channel 31: | 2433 MHz  | Channel 51: | 2453 MHz  | Channel 71: | 2473 MHz  |
| Channel 12: | 2414 MHz  | Channel 32: | 2434 MHz  | Channel 52: | 2454 MHz  | Channel 72: | 2474 MHz  |
| Channel 13: | 2415 MHz  | Channel 33: | 2435 MHz  | Channel 53: | 2455 MHz  | Channel 73: | 2475 MHz  |
| Channel 14: | 2416 MHz  | Channel 34: | 2436 MHz  | Channel 54: | 2456 MHz  | Channel 74: | 2476 MHz  |
| Channel 15: | 2417 MHz  | Channel 35: | 2437 MHz  | Channel 55: | 2457 MHz  | Channel 75: | 2477 MHz  |
| Channel 16: | 2418 MHz  | Channel 36: | 2438 MHz  | Channel 56: | 2458 MHz  | Channel 76: | 2478 MHz  |
| Channel 17: | 2419 MHz  | Channel 37: | 2439 MHz  | Channel 57: | 2459 MHz  | Channel 77: | 2479 MHz  |
| Channel 18: | 2420 MHz  | Channel 38: | 2440 MHz  | Channel 58: | 2460 MHz  | Channel 78: | 2480 MHz  |
| Channel 19: | 2421 MHz  | Channel 39: | 2441 MHz  | Channel 59: | 2461 MHz  |             |           |
| Channel 20: | 2422 MHz  | Channel 40: | 2442 MHz  | Channel 60: | 2462 MHz  |             |           |

## Note:

1. The EUT is a Gaming Mouse with a built-in Bluetooth V4.2 and 2.4GHz GFSK transceiver , this report for 2.4GHz GFSK.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample for the purpose of demonstrating compliance of 2.4GHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices

|            |                  |
|------------|------------------|
| Test Mode: | Mode 1: Transmit |
|------------|------------------|

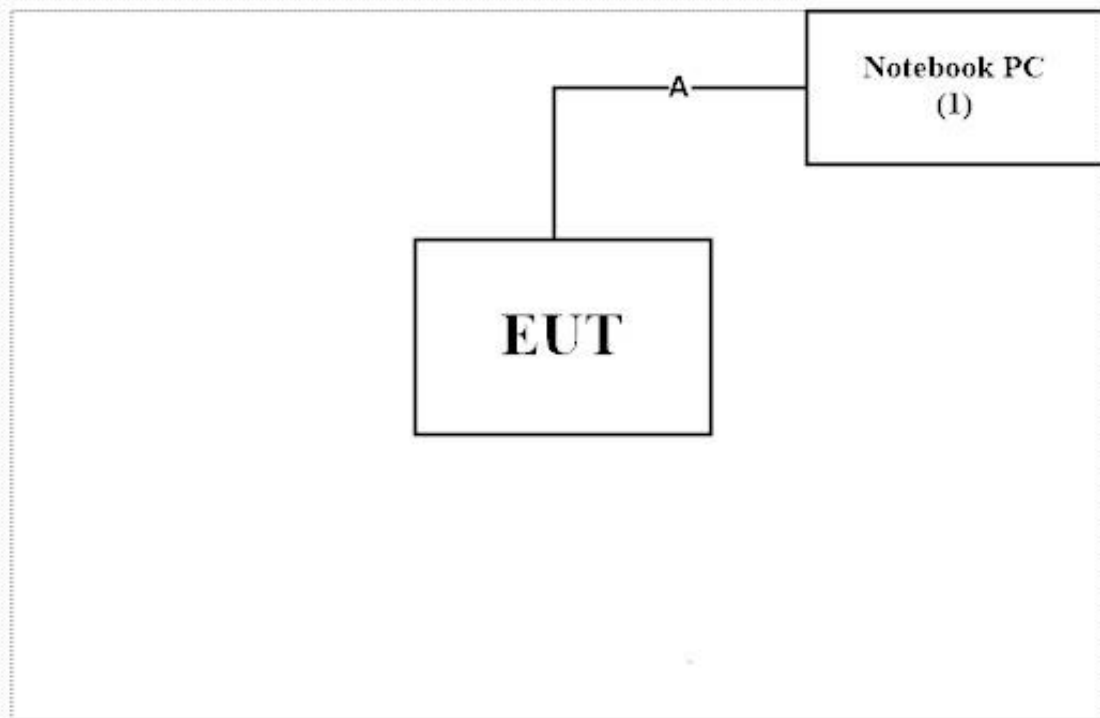
### 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

| Product         | Manufacturer | Model No.     | Serial No. | Power Cord         |
|-----------------|--------------|---------------|------------|--------------------|
| 1   Notebook PC | DELL         | Latitude 5580 | GDZN7H2    | Non-shielded, 0.8m |

| Signal Cable Type       | Signal cable Description |
|-------------------------|--------------------------|
| A   USB to Type C Cable | Shielded, 1.85m          |

### 1.4. Configuration of Tested System



### 1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Cmd” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

## 1.6. Test Facility

Ambient conditions in the laboratory:

| Items                      | Required (IEC 68-1) | Actual   |
|----------------------------|---------------------|----------|
| Temperature (°C)           | 15-35               | 20-35    |
| Humidity (%RH)             | 25-75               | 50-65    |
| Barometric pressure (mbar) | 860-1060            | 950-1000 |

**USA : FCC Registration Number: TW3023**

**Canada : IC Registration Number: 4075A**

Site Description: Accredited by TAF  
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd  
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,  
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Phone number: 886-2-8601-3788

Fax number: 886-2-8601-3789

Email address: [info.tw@dekra.com](mailto:info.tw@dekra.com)

Website: <http://www.dekra.com.tw>



## 1.7. List of Test Equipment

### Conducted measurements /CB3/SR8

|   | Equipment             | Manufacturer | Model No. | Serial No.   | Cali. Date | Due. Date  |
|---|-----------------------|--------------|-----------|--------------|------------|------------|
|   | Temperature Chamber   | WIT GROUP    | TH-1S-B   | EQ-201-00146 | 2019/02/26 | 2020/02/25 |
| X | Spectrum Analyzer     | Agilent      | N9010A    | MY53470892   | 2019/09/25 | 2020/09/24 |
| X | Peak Power Analyzer   | Keysight     | 8990B     | MY51000410   | 2019/07/30 | 2020/07/29 |
| X | Wideband Power Sensor | Keysight     | N1923A    | MY56080003   | 2019/07/30 | 2020/07/29 |
| X | Wideband Power Sensor | Keysight     | N1923A    | MY56080004   | 2019/07/30 | 2020/07/29 |
| X | EMI Test Receiver     | R&S          | ESCS 30   | 100369       | 2018/11/19 | 2019/11/18 |
| X | LISN                  | R&S          | ENV216    | 101105       | 2019/04/10 | 2020/04/09 |
| X | LISN                  | R&S          | ESH3-Z5   | 836679/014   | 2019/04/10 | 2020/04/09 |
| X | Coaxial Cable         | DEKRA        | RG 400    | LC018-RG     | 2019/06/21 | 2020/06/20 |

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version :DEKRA Conduction Test SystemV9.0.5.

**For Radiated measurements /Site3/CB8**

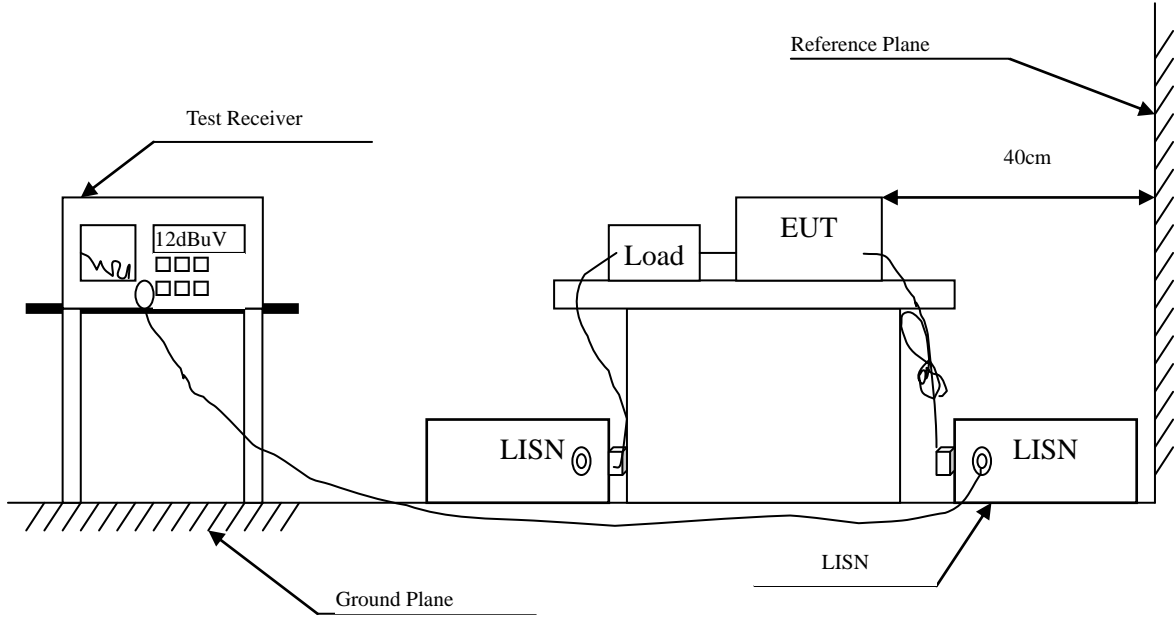
|   | Equipment         | Manufacturer    | Model No.   | Serial No.            | Cali. Date | Due. Date  |
|---|-------------------|-----------------|-------------|-----------------------|------------|------------|
| X | Spectrum Analyzer | R&S             | FSP40       | 100170                | 2019/03/11 | 2020/03/10 |
| X | Loop Antenna      | Teseq           | HLA6121     | 37133                 | 2019/10/15 | 2021/10/14 |
| X | Bilog Antenna     | Schaffner Chase | CBL6112B    | 2794                  | 2019/06/23 | 2020/06/22 |
| X | Coaxial Cable     | DEKRA           | L1907-001C  | 280280.F141.1<br>000D | 2019/07/10 | 2020/07/09 |
| X | Amplifier         | EMCI            | EMC001330   | 980254                | 2019/08/22 | 2020/08/21 |
| X | Horn Antenna      | ETS-LINDGREN    | 3117        | 00228113              | 2019/05/02 | 2020/05/01 |
| X | Coaxial Cable     | DEKRA           | L1907-002C  | 280280.F141.1<br>000D | 2019/07/10 | 2020/07/09 |
| X | Amplifier         | EMCI            | EMC05820SE  | 980362                | 2019/06/26 | 2020/06/25 |
| X | Amplifier         | EMCI            | EMC051845SE | SN980632              | 2019/08/08 | 2020/08/07 |
|   | Horn Antenna      | Com-Power       | AH-1840     | 101101                | 2018/10/19 | 2019/10/18 |
|   | Amplifier + Cable | EMCI            | EMC184045SE | 980369                | 2019/04/16 | 2020/04/15 |
|   | Bilog Antenna     | Schaffner Chase | CBL6112B    | 2916                  | 2019/06/23 | 2020/06/22 |
|   | Coaxial Cable     | DEKRA           | L1907-003C  | 00100A1B3A<br>120M    | 2019/07/10 | 2020/07/09 |
|   | Amplifier         | EMCI            | EMC001330   | 980255                | 2019/06/28 | 2020/06/27 |
| X | Filter            | MICRO-TRONICS   | BRM50702    | G270                  | 2019/08/08 | 2020/08/07 |
|   | Filter            | MICRO-TRONICS   | BRM50716    | G196                  | 2019/08/08 | 2020/08/07 |

## Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version :Quietek EMI System V2.1.134.

## 2. Conducted Emission

### 2.1. Test Setup



## 2.2. Limits

| <b>FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit</b> |        |       |
|--|--------|-------|
| Frequency<br>MHz   | Limits |       |
|  | QP     | AVG   |
| 0.15 - 0.50  | 66-56  | 56-46 |
| 0.50-5.0   | 56     | 46    |
| 5.0 - 30   | 60     | 50    |

## 2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. 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.)

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.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

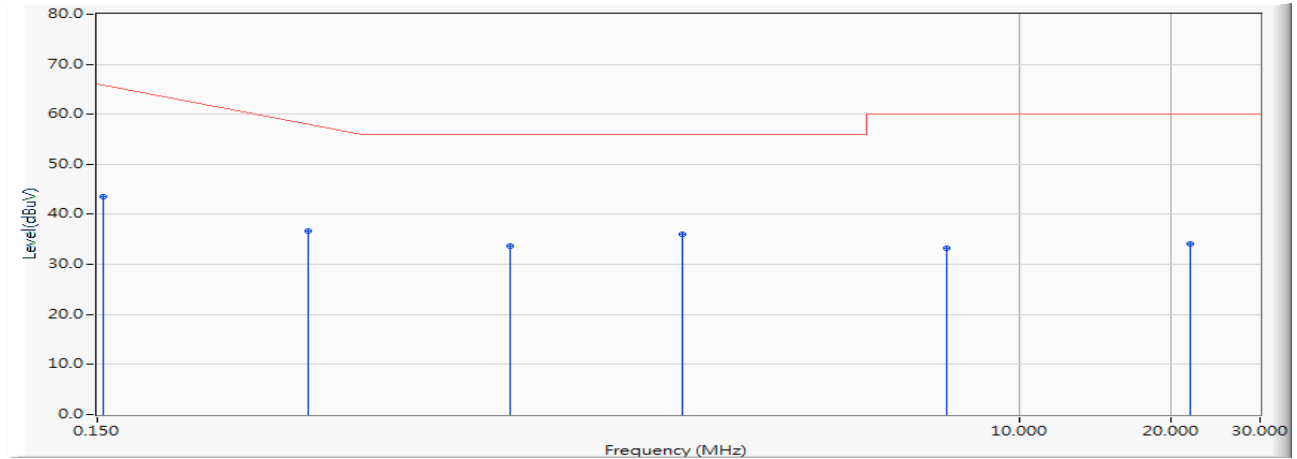
## 2.4. Uncertainty

± 2.26 dB

## 2.5. Test Result of Conducted Emission

Product : Gaming Mouse  
 Test Item : Conducted Emission Test  
 Power Line : Line (+)  
 Test Date : 2019/10/15  
 Test Mode : Mode 1: Transmit (2440MHz)

Line 1



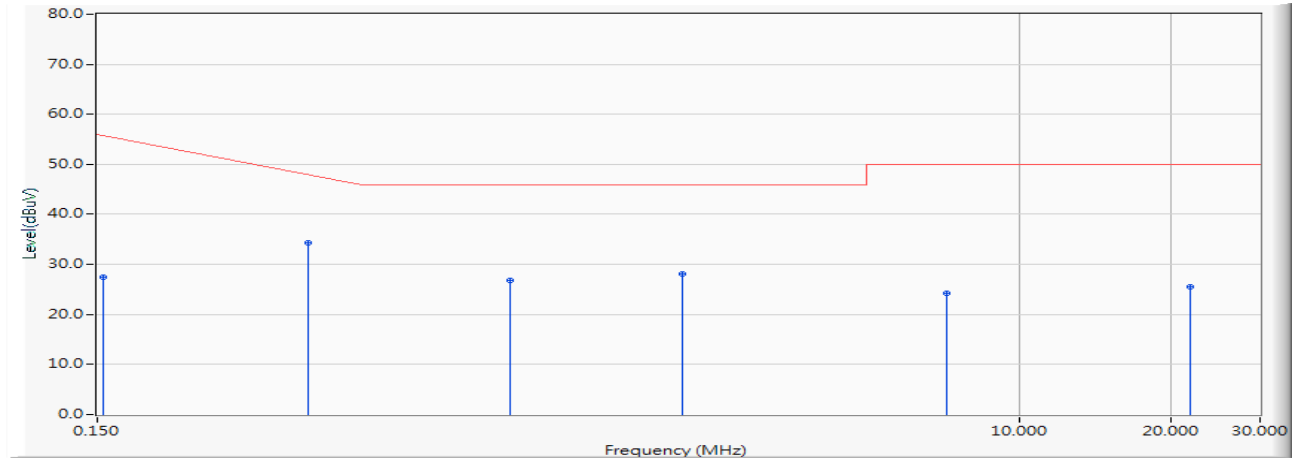
|   |   | Frequency<br>(MHz) | Correct Factor<br>(dB) | Reading Level<br>(dBuV) | Measure Level<br>(dBuV) | Margin<br>(dB) | Limit<br>(dBuV) | Detector<br>Type |
|---|---|--------------------|------------------------|-------------------------|-------------------------|----------------|-----------------|------------------|
| 1 |   | 0.154              | 9.668                  | 33.860                  | 43.528                  | -22.358        | 65.886          | QUASIPeAK        |
| 2 |   | 0.392              | 9.681                  | 27.000                  | 36.681                  | -22.405        | 59.086          | QUASIPeAK        |
| 3 |   | 0.986              | 9.713                  | 23.920                  | 33.633                  | -22.367        | 56.000          | QUASIPeAK        |
| 4 | * | 2.162              | 9.787                  | 26.240                  | 36.027                  | -19.973        | 56.000          | QUASIPeAK        |
| 5 |   | 7.205              | 9.944                  | 23.380                  | 33.324                  | -26.676        | 60.000          | QUASIPeAK        |
| 6 |   | 21.771             | 10.188                 | 23.980                  | 34.168                  | -25.832        | 60.000          | QUASIPeAK        |

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ \* “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Gaming Mouse  
 Test Item : Conducted Emission Test  
 Power Line : Line (+)  
 Test Date : 2019/10/15  
 Test Mode : Mode 1: Transmit (2440MHz)

Line 1



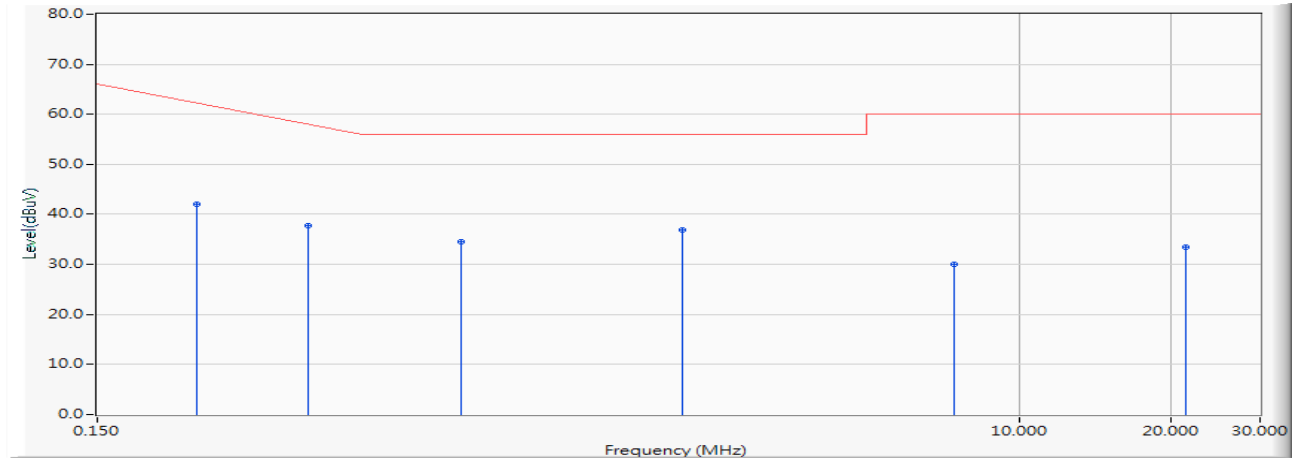
|   |   | <b>Frequency (MHz)</b> | <b>Correct Factor (dB)</b> | <b>Reading Level (dBuV)</b> | <b>Measure Level (dBuV)</b> | <b>Margin (dB)</b> | <b>Limit (dBuV)</b> | <b>Detector Type</b> |
|---|---|------------------------|----------------------------|-----------------------------|-----------------------------|--------------------|---------------------|----------------------|
| 1 |   | 0.154                  | 9.668                      | 17.820                      | 27.488                      | -28.398            | 55.886              | AVERAGE              |
| 2 |   | 0.392                  | 9.681                      | 24.700                      | 34.381                      | -14.705            | 49.086              | AVERAGE              |
| 3 |   | 0.986                  | 9.713                      | 17.050                      | 26.763                      | -19.237            | 46.000              | AVERAGE              |
| 4 | * | 2.162                  | 9.787                      | 18.350                      | 28.137                      | -17.863            | 46.000              | AVERAGE              |
| 5 |   | 7.205                  | 9.944                      | 14.250                      | 24.194                      | -25.806            | 50.000              | AVERAGE              |
| 6 |   | 21.771                 | 10.188                     | 15.410                      | 25.598                      | -24.402            | 50.000              | AVERAGE              |

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ \* “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Gaming Mouse  
 Test Item : Conducted Emission Test  
 Power Line : Line (-)  
 Test Date : 2019/10/15  
 Test Mode : Mode 1: Transmit (2440MHz)

Line2



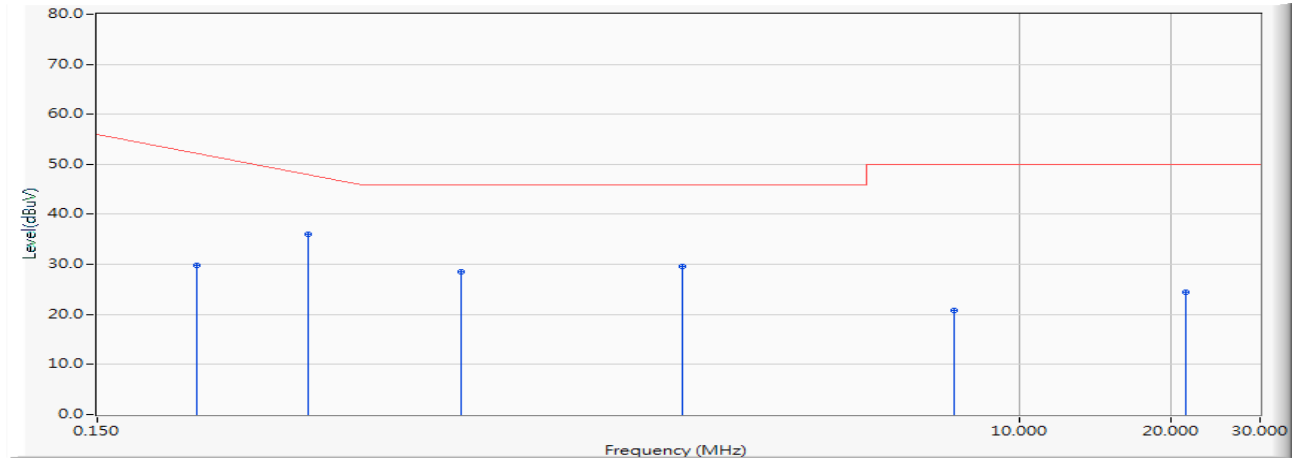
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|-----------------|---------------------|----------------------|----------------------|-------------|--------------|---------------|
| 1 |   | 0.236           | 9.702               | 32.340               | 42.042               | -21.501     | 63.543       | QUASIPeAK     |
| 2 |   | 0.392           | 9.711               | 28.100               | 37.811               | -21.275     | 59.086       | QUASIPeAK     |
| 3 |   | 0.787           | 9.742               | 24.740               | 34.482               | -21.518     | 56.000       | QUASIPeAK     |
| 4 | * | 2.158           | 9.827               | 26.960               | 36.787               | -19.213     | 56.000       | QUASIPeAK     |
| 5 |   | 7.439           | 10.009              | 20.120               | 30.129               | -29.871     | 60.000       | QUASIPeAK     |
| 6 |   | 21.388          | 10.384              | 23.020               | 33.404               | -26.596     | 60.000       | QUASIPeAK     |

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ \* “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Gaming Mouse  
 Test Item : Conducted Emission Test  
 Power Line : Line (-)  
 Test Date : 2019/10/15  
 Test Mode : Mode 1: Transmit (2440MHz)

Line2



|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|-----------------|---------------------|----------------------|----------------------|-------------|--------------|---------------|
| 1 |   | 0.236           | 9.702               | 20.130               | 29.832               | -23.711     | 53.543       | AVERAGE       |
| 2 |   | 0.392           | 9.711               | 26.220               | 35.931               | -13.155     | 49.086       | AVERAGE       |
| 3 |   | 0.787           | 9.742               | 18.850               | 28.592               | -17.408     | 46.000       | AVERAGE       |
| 4 | * | 2.158           | 9.827               | 19.840               | 29.667               | -16.333     | 46.000       | AVERAGE       |
| 5 |   | 7.439           | 10.009              | 10.880               | 20.889               | -29.111     | 50.000       | AVERAGE       |
| 6 |   | 21.388          | 10.384              | 14.110               | 24.494               | -25.506     | 50.000       | AVERAGE       |

Note:

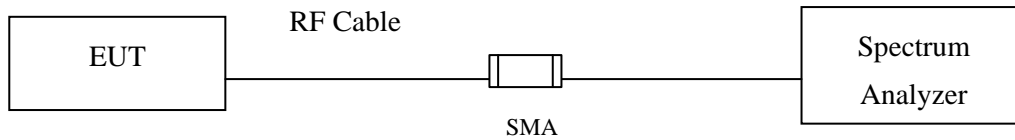
1. All Reading Levels are Quasi-Peak and average value.
2. “ \* “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



### 3. Peak Power Output

#### 3.1. Test Setup

Conducted Measurement



#### 3.2. Limits

The maximum peak power shall be less 1 Watt.

#### 3.3. Test Procedure

The EUT was tested according to C63.10:2013 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using C63.10:2013 Section 11.9.1.3 PKPM1 Peak power meter method.

#### 3.4. Uncertainty

$\pm 1.19$  dB

### 3.5. Test Result of Peak Power Output

Product : Gaming Mouse  
Test Item : Peak Power Output Data  
Test Site : No.3 OATS  
Test Date : 2019/10/22  
Test Mode : Mode 1: Transmit

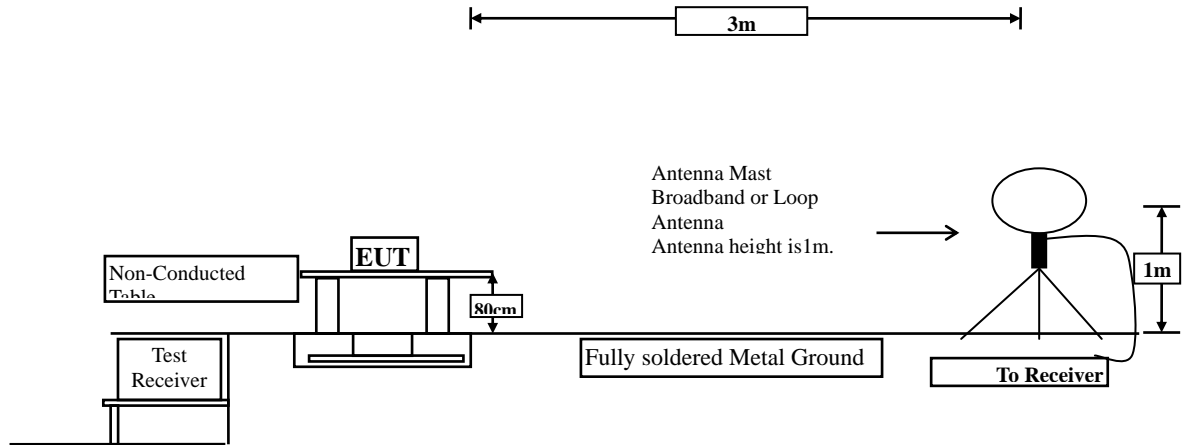
| Channel No. | Frequency (MHz) | Average Power (dBm) | Peak Power (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|---------------------|------------------|----------------------|--------|
| 01          | 2403            | -0.24               | -0.19            | <30dBm               | Pass   |
| 38          | 2440            | -0.68               | -0.61            | <30dBm               | Pass   |
| 78          | 2480            | -1.30               | -1.16            | <30dBm               | Pass   |

Note: Peak Power Output Value =Reading value on peak power meter + cable loss

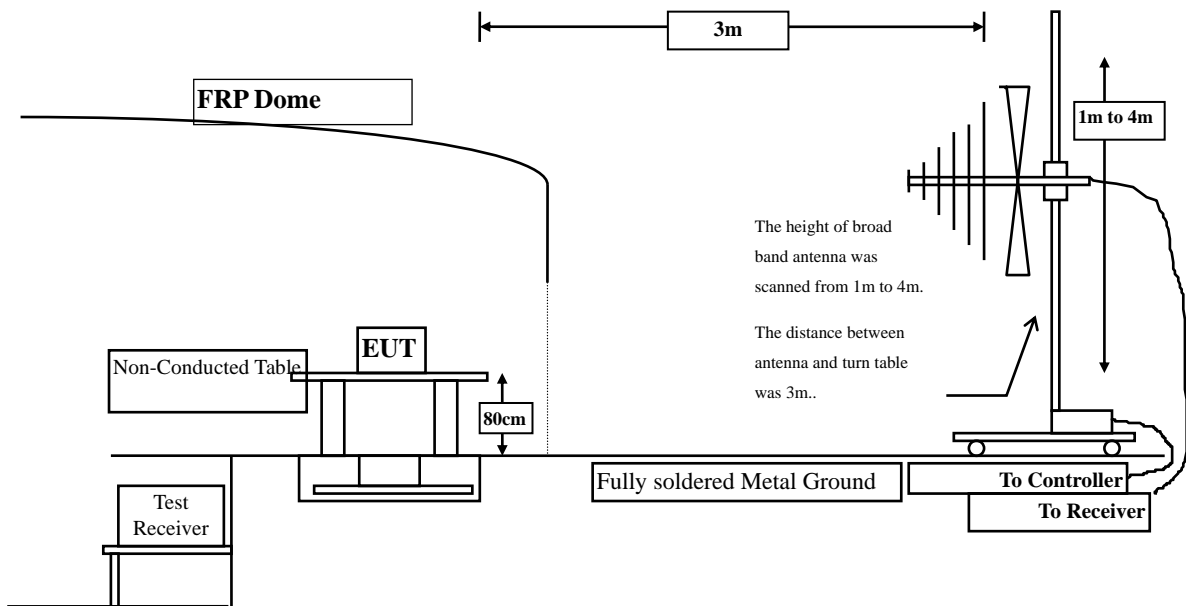
#### 4. Radiated Emission

##### 4.1. Test Setup

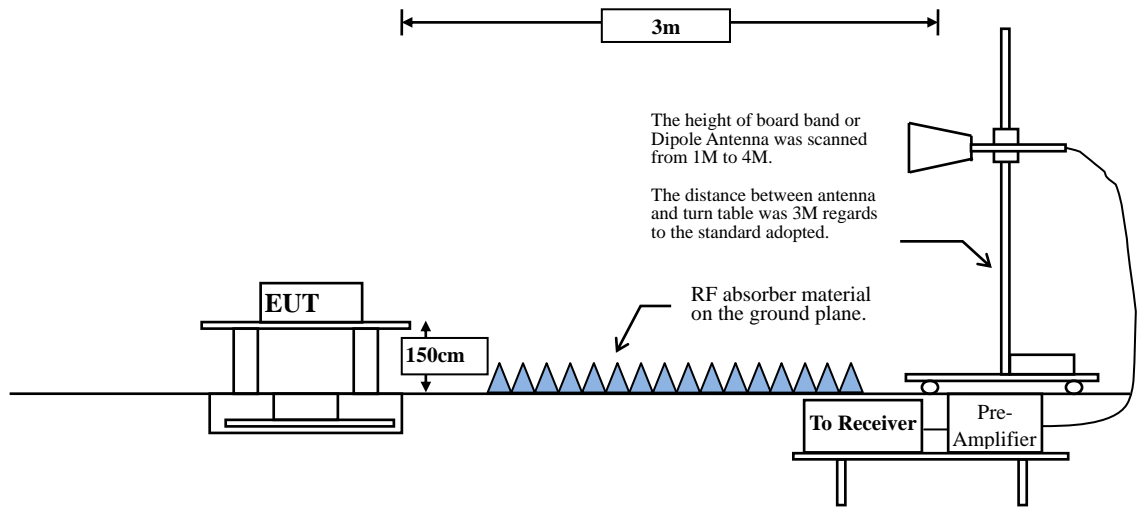
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

| FCC Part 15 Subpart C Paragraph 15.209(a) Limits |          |           |
|--|----------|-----------|
| Frequency MHz                                    | uV/m @3m | dBuV/m@3m |
| 30-88  | 100      | 40        |
| 88-216   | 150      | 43.5      |
| 216-960  | 200      | 46        |
| Above 960  | 500      | 54        |

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

### 4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to C63.10:2013 Section 11.12.1 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna. The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

### RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure

RBW = as specified in Table 1.

VBW  $\geq 3 \times$  RBW.

**Table 1 —RBW as a function of frequency**

| Frequency   | RBW         |
|-------------|-------------|
| 9-150 kHz   | 200-300 Hz  |
| 0.15-30 MHz | 9-10 kHz    |
| 30-1000 MHz | 100-120 kHz |
| > 1000 MHz  | 1 MHz       |

According to C63.10 Section 11.12.2.5 Average measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle  $\geq 98 \%$

VBW  $\geq 1/T$ , when duty cycle  $< 98 \%$

( T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

| 2.4GHz band | Duty Cycle (%) | T (ms) | 1/T (Hz) | VBW (Hz) |
|-------------|----------------|--------|----------|----------|
| GFSK        | 100            | --     | --       | 10       |

Note: Duty Cycle Refer to Section 9.

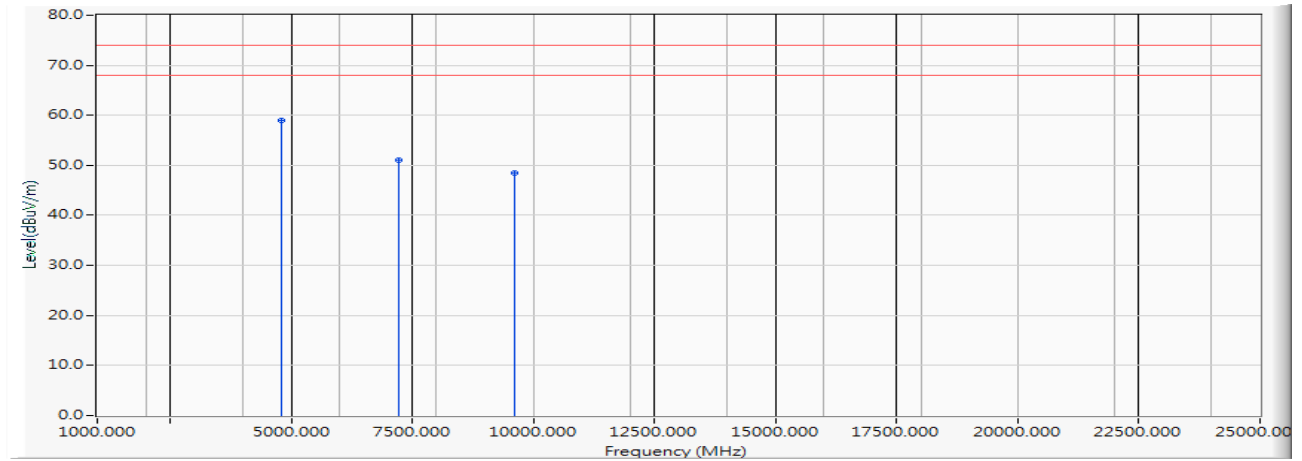
### 4.4. Uncertainty

$\pm 4.08$  dB above 1GHz

$\pm 4.22$  dB below 1GHz

#### 4.5. Test Result of Radiated Emission

Product : Gaming Mouse  
 Test Item : Harmonic Radiated Emission Data  
 Test Date : 2019/10/21  
 Test Mode : Mode 1: Transmit (2403MHz)

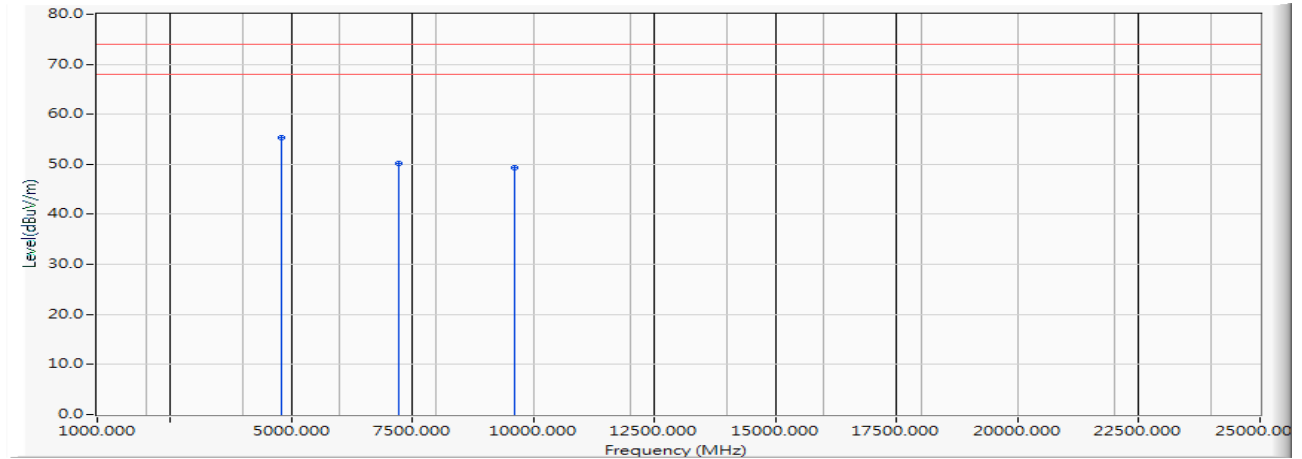


| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBµV | Measurement<br>Level<br>dBµV/m | Margin<br>dB | Peak<br>Limit<br>dBµV/m | Average<br>Limit<br>dBµV/m |
|-------------------|-------------------------|--------------------------|--------------------------------|--------------|-------------------------|----------------------------|
| <b>Horizontal</b> |                         |                          |                                |              |                         |                            |
| Peak Detector     |                         |                          |                                |              |                         |                            |
| 4806.000          | 4.623                   | 54.320                   | 58.943                         | -15.057      | 74.000                  | 54.00                      |
| 7209.000          | 11.700                  | 39.390                   | 51.090                         | -22.910      | 74.000                  | 54.00                      |
| 9612.000          | 11.906                  | 36.610                   | 48.516                         | -25.484      | 74.000                  | 54.00                      |
| Average Detector  |                         |                          |                                |              |                         |                            |
| 4806.000          | 4.623                   | 44.050                   | 48.673                         | -25.327      | 74.000                  | 54.00                      |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Gaming Mouse  
 Test Item : Harmonic Radiated Emission Data  
 Test Date : 2019/10/21  
 Test Mode : Mode 1: Transmit (2403MHz)



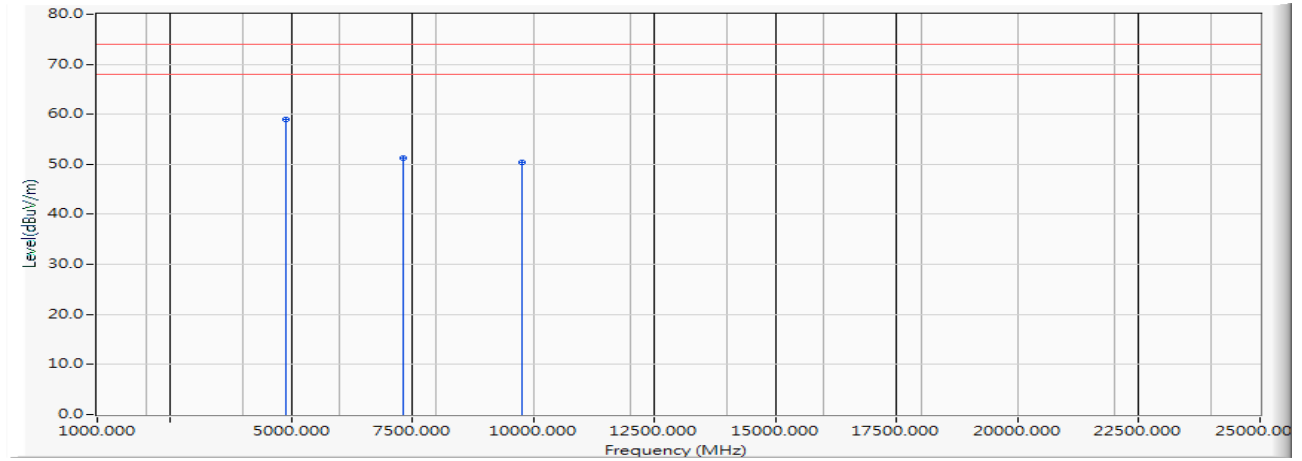
| Frequency<br>MHz | Correct<br>Factor<br>dB | Reading<br>Level<br>dBµV | Measurement<br>Level<br>dBµV/m | Margin<br>dB | Peak<br>Limit<br>dBµV/m | Average<br>Limit<br>dBµV/m |
|------------------|-------------------------|--------------------------|--------------------------------|--------------|-------------------------|----------------------------|
| <b>Vertical</b>  |                         |                          |                                |              |                         |                            |
| Peak Detector    |                         |                          |                                |              |                         |                            |
| 4806.000         | 4.623                   | 50.680                   | 55.303                         | -18.697      | 74.000                  | 54.00                      |
| 7209.000         | 11.700                  | 38.480                   | 50.180                         | -23.820      | 74.000                  | 54.00                      |
| 9612.000         | 11.906                  | 37.360                   | 49.266                         | -24.734      | 74.000                  | 54.00                      |
| Average Detector |                         |                          |                                |              |                         |                            |
| 4806.000         | 4.623                   | 39.900                   | 44.523                         | -9.477       | 74.000                  | 54.00                      |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : Gaming Mouse  
 Test Item : Harmonic Radiated Emission Data  
 Test Date : 2019/10/21  
 Test Mode : Mode 1: Transmit (2440MHz)

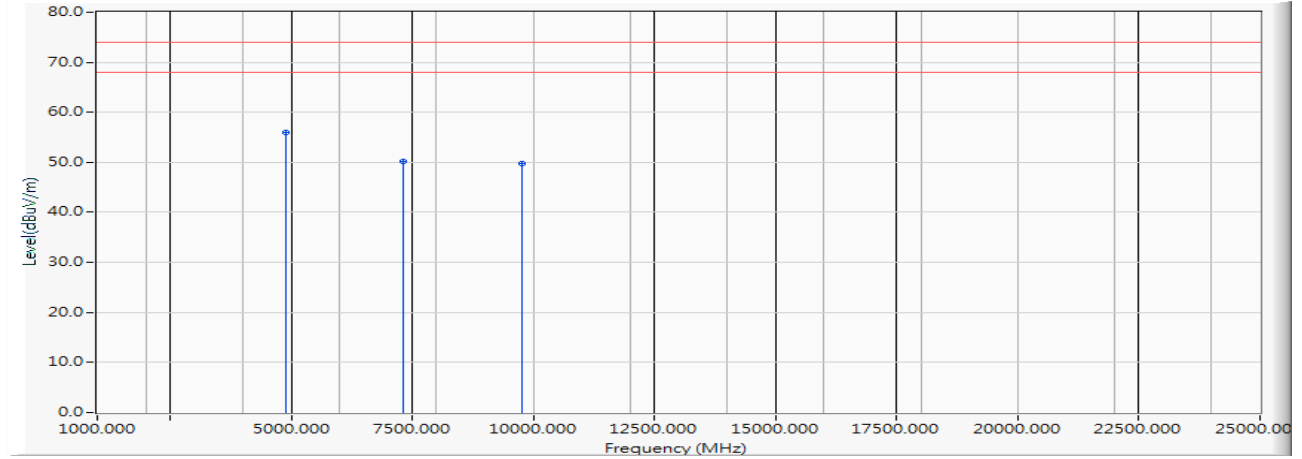


| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBµV | Measurement<br>Level<br>dBµV/m | Margin<br>dB | Peak<br>Limit<br>dBµV/m | Average<br>Limit<br>dBµV/m |
|-------------------|-------------------------|--------------------------|--------------------------------|--------------|-------------------------|----------------------------|
| <b>Horizontal</b> |                         |                          |                                |              |                         |                            |
| Peak Detector     |                         |                          |                                |              |                         |                            |
| 4880.000          | 5.302                   | 53.730                   | 59.032                         | -14.968      | 74.000                  | 54.00                      |
| 7320.000          | 11.795                  | 39.390                   | 51.185                         | -22.815      | 74.000                  | 54.00                      |
| 9760.000          | 11.929                  | 38.410                   | 50.340                         | -23.660      | 74.000                  | 54.00                      |
| Average Detector  |                         |                          |                                |              |                         |                            |
| 4880.000          | 5.302                   | 43.130                   | 48.432                         | -5.568       | 74.000                  | 54.00                      |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Gaming Mouse  
 Test Item : Harmonic Radiated Emission Data  
 Test Date : 2019/10/21  
 Test Mode : Mode 1: Transmit (2440MHz)

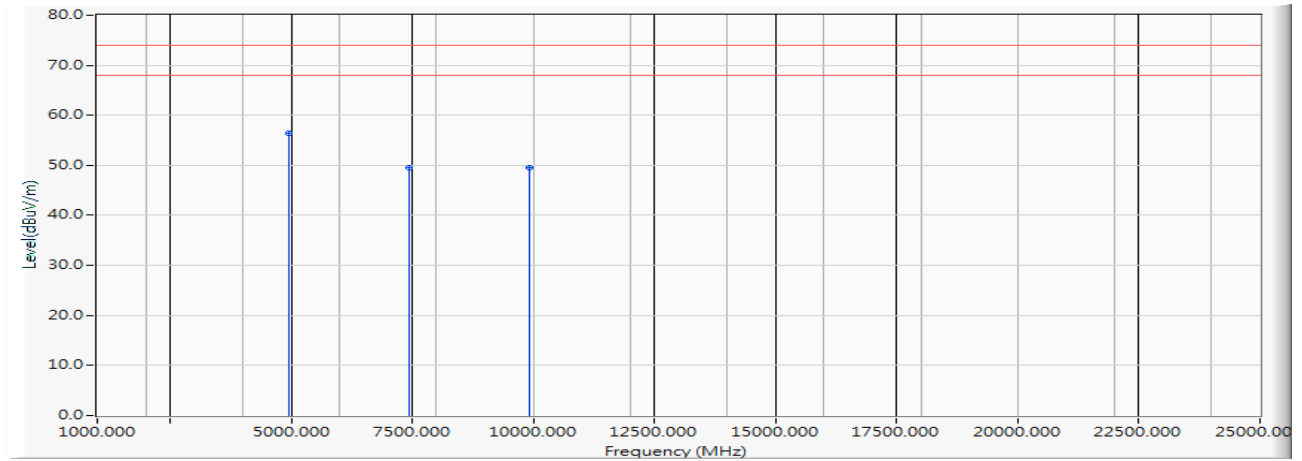


| Frequency<br>MHz | Correct<br>Factor<br>dB | Reading<br>Level<br>dBµV | Measurement<br>Level<br>dBµV/m | Margin<br>dB | Peak<br>Limit<br>dBµV/m | Average<br>Limit<br>dBµV/m |
|------------------|-------------------------|--------------------------|--------------------------------|--------------|-------------------------|----------------------------|
| <b>Vertical</b>  |                         |                          |                                |              |                         |                            |
| Peak Detector    |                         |                          |                                |              |                         |                            |
| 4880.000         | 5.302                   | 50.700                   | 56.002                         | -17.998      | 74.000                  | 54.00                      |
| 7320.000         | 11.795                  | 38.320                   | 50.115                         | -23.885      | 74.000                  | 54.00                      |
| 9760.000         | 11.929                  | 37.930                   | 49.860                         | -24.140      | 74.000                  | 54.00                      |
| Average Detector |                         |                          |                                |              |                         |                            |
| 4880.000         | 5.302                   | 39.800                   | 45.102                         | -8.898       | 74.000                  | 54.00                      |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Gaming Mouse  
 Test Item : Harmonic Radiated Emission Data  
 Test Date : 2019/10/21  
 Test Mode : Mode 1: Transmit (2480MHz)

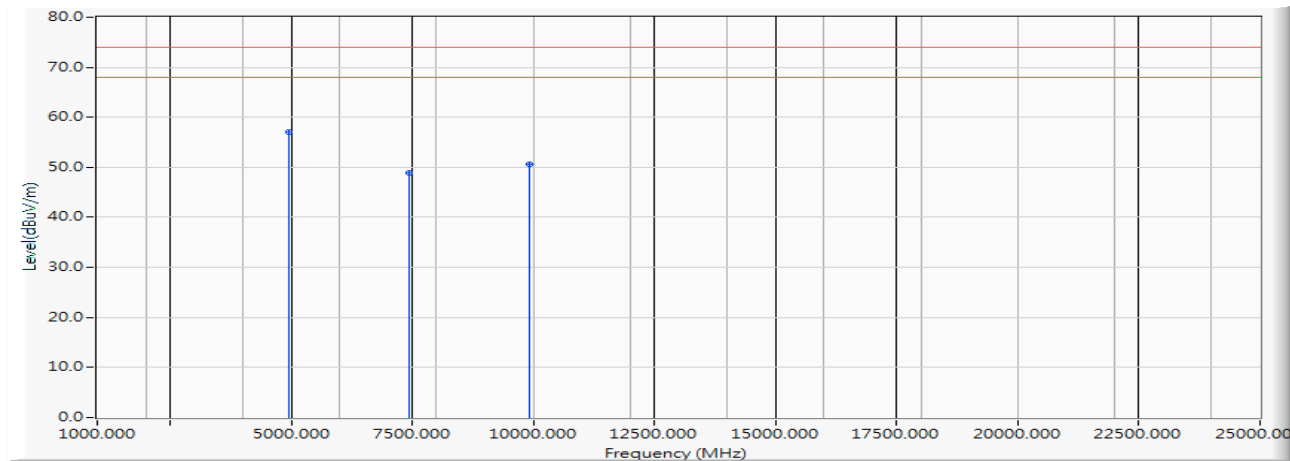


| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBµV | Measurement<br>Level<br>dBµV/m | Margin<br>dB | Peak<br>Limit<br>dBµV/m | Average<br>Limit<br>dBµV/m |
|-------------------|-------------------------|--------------------------|--------------------------------|--------------|-------------------------|----------------------------|
| <b>Horizontal</b> |                         |                          |                                |              |                         |                            |
| Peak Detector     |                         |                          |                                |              |                         |                            |
| 4960.000          | 6.035                   | 50.360                   | 56.395                         | -17.605      | 74.000                  | 54.00                      |
| 7440.000          | 10.977                  | 38.570                   | 49.547                         | -24.453      | 74.000                  | 54.00                      |
| 9920.000          | 12.758                  | 36.880                   | 49.637                         | -24.363      | 74.000                  | 54.00                      |
| Average Detector  |                         |                          |                                |              |                         |                            |
| 4960.000          | 40.422                  | 38.380                   | 44.415                         | -9.585       | 74.000                  | 54.00                      |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Gaming Mouse  
 Test Item : Harmonic Radiated Emission Data  
 Test Date : 2019/10/21  
 Test Mode : Mode 1: Transmit (2480MHz)



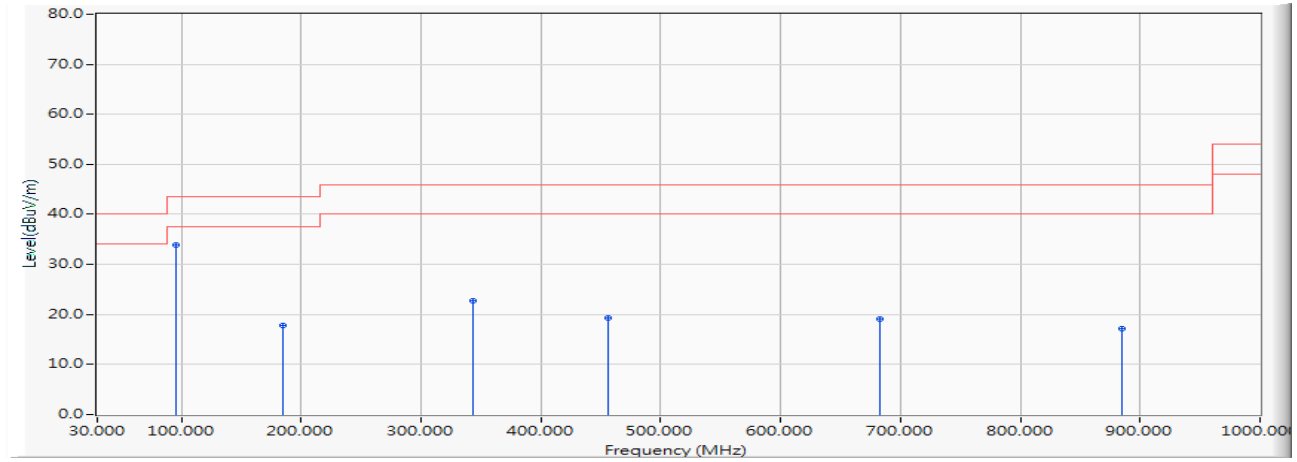
| Frequency<br>MHz | Correct<br>Factor<br>dB | Reading<br>Level<br>dBµV | Measurement<br>Level<br>dBµV/m | Margin<br>dB | Peak<br>Limit<br>dBµV/m | Average<br>Limit<br>dBµV/m |
|------------------|-------------------------|--------------------------|--------------------------------|--------------|-------------------------|----------------------------|
| <b>Vertical</b>  |                         |                          |                                |              |                         |                            |
| Peak Detector    |                         |                          |                                |              |                         |                            |
| 4960.000         | 6.035                   | 51.060                   | 57.095                         | -16.905      | 74.000                  | 54.00                      |
| 7440.000         | 10.977                  | 38.000                   | 48.977                         | -25.023      | 74.000                  | 54.00                      |
| 9920.000         | 12.758                  | 37.890                   | 50.647                         | -23.353      | 74.000                  | 54.00                      |
| Average Detector |                         |                          |                                |              |                         |                            |
| 4960.000         | 6.035                   | 39.370                   | 45.405                         | -8.595       | 74.000                  | 54.00                      |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Gaming Mouse  
 Test Item : General Radiated Emission Data  
 Test Date : 2019/10/28  
 Test Mode : Mode 1: Transmit (2440MHz)

**Horizontal**



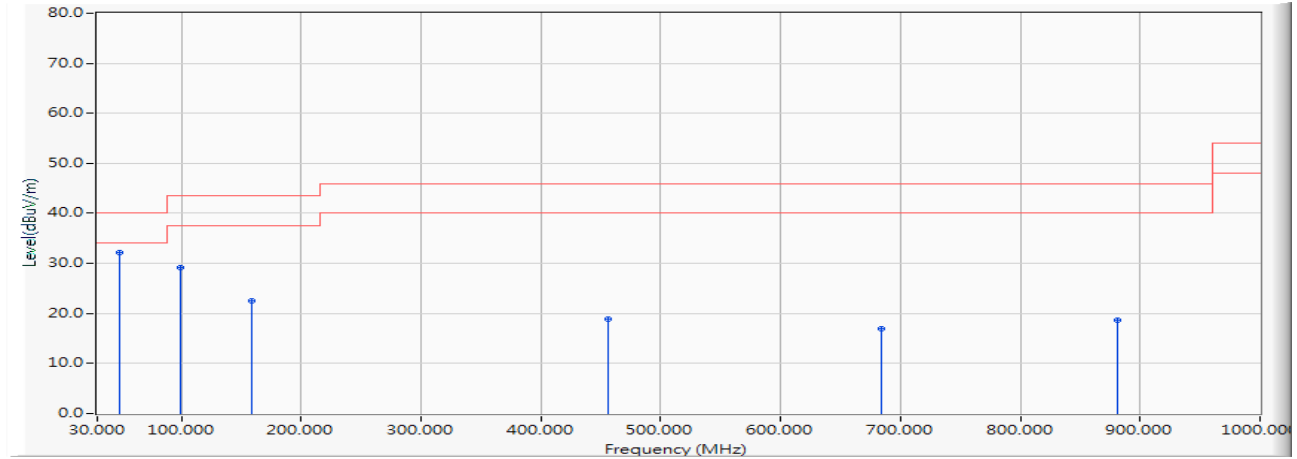
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 | * | 96.072          | -16.250             | 50.143               | 33.893                 | -9.607      | 43.500         | QUASIPeAK     |
| 2 |   | 184.638         | -17.739             | 35.617               | 17.878                 | -25.622     | 43.500         | QUASIPeAK     |
| 3 |   | 343.493         | -11.381             | 34.218               | 22.837                 | -23.163     | 46.000         | QUASIPeAK     |
| 4 |   | 455.957         | -8.349              | 27.630               | 19.281                 | -26.719     | 46.000         | QUASIPeAK     |
| 5 |   | 682.290         | -7.779              | 26.768               | 18.989                 | -27.011     | 46.000         | QUASIPeAK     |
| 6 |   | 884.725         | -6.554              | 23.747               | 17.193                 | -28.807     | 46.000         | QUASIPeAK     |

**Note:**

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Gaming Mouse  
 Test Item : General Radiated Emission Data  
 Test Date : 2019/10/28  
 Test Mode : Mode 1: Transmit (2440MHz)

**Vertical**



|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 | * | 48.275          | -16.986             | 49.070               | 32.084                 | -7.916      | 40.000         | QUASIPEAK     |
| 2 |   | 98.884          | -15.868             | 44.970               | 29.102                 | -14.398     | 43.500         | QUASIPEAK     |
| 3 |   | 159.333         | -18.561             | 41.171               | 22.609                 | -20.891     | 43.500         | QUASIPEAK     |
| 4 |   | 455.957         | -8.349              | 27.322               | 18.973                 | -27.027     | 46.000         | QUASIPEAK     |
| 5 |   | 683.696         | -7.898              | 24.746               | 16.848                 | -29.152     | 46.000         | QUASIPEAK     |
| 6 |   | 880.507         | -6.256              | 24.842               | 18.586                 | -27.414     | 46.000         | QUASIPEAK     |

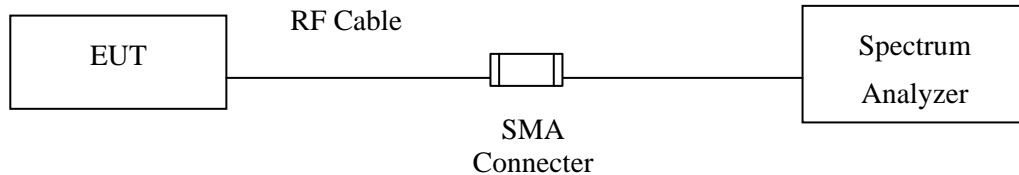
**Note:**

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

## 5. RF antenna conducted test

### 5.1. Test Setup

#### RF antenna Conducted Measurement:



### 5.2. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 5.3. Test Procedure

The EUT was tested according to C63.10:2013 Section 11.11 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

### 5.4. Uncertainty

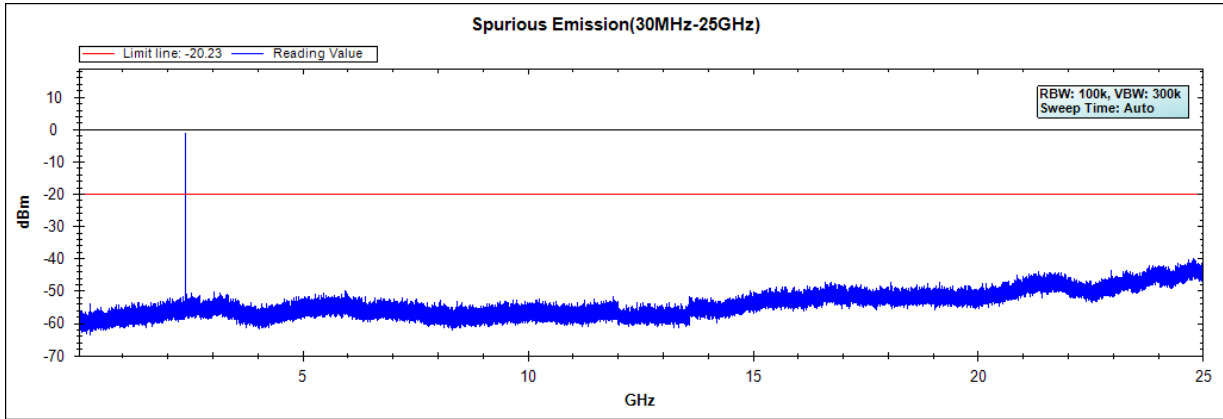
The measurement uncertainty

Conducted is defined as  $\pm 1.20\text{dB}$

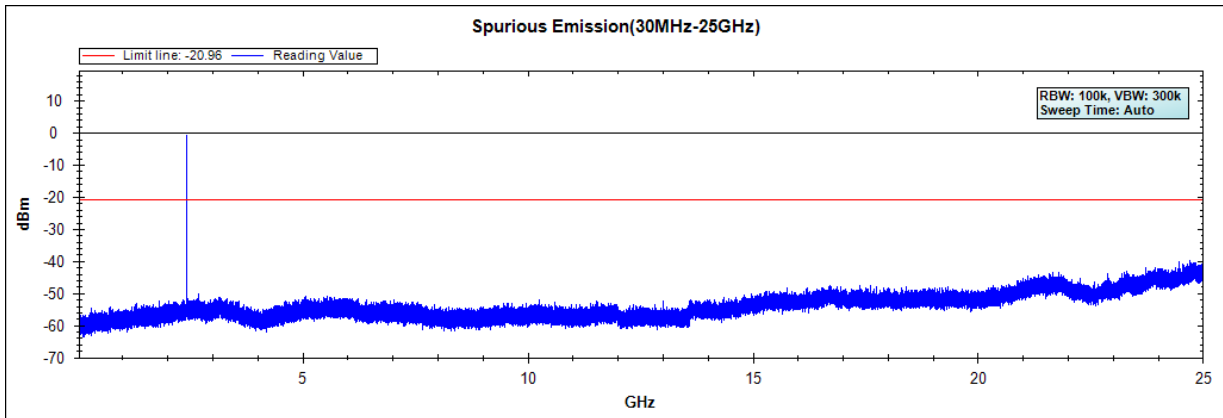
### 5.5. Test Result of RF antenna conducted test

Product : Gaming Mouse  
Test Item : RF antenna conducted test  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmit

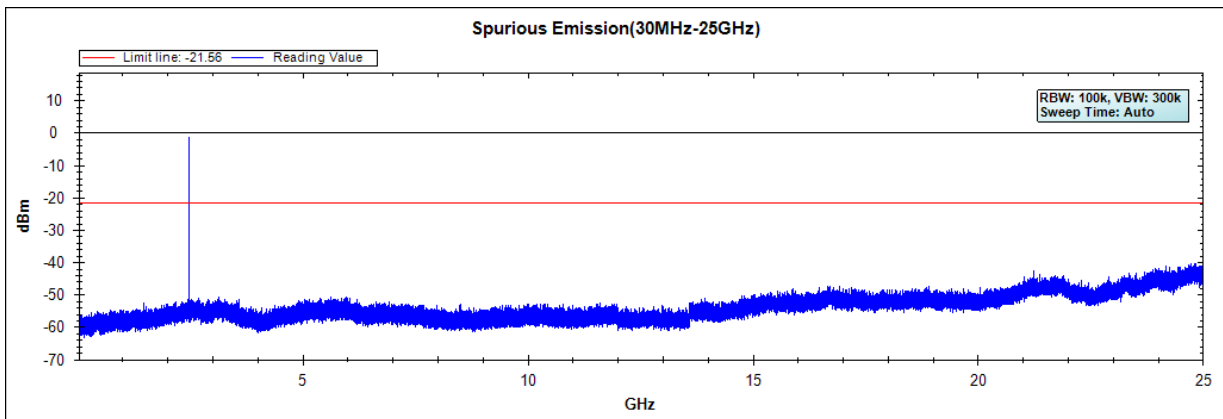
**(2403MHz) 30M-25GHz**



**(2440MHz) 30M-25GHz**



**(2480MHz) 30M-25GHz**

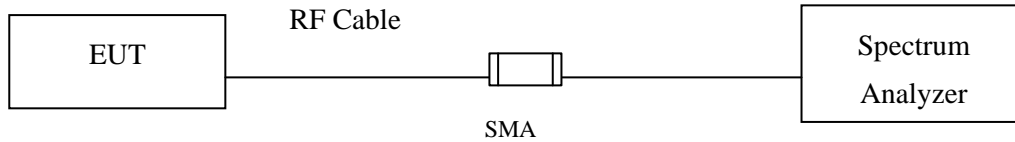




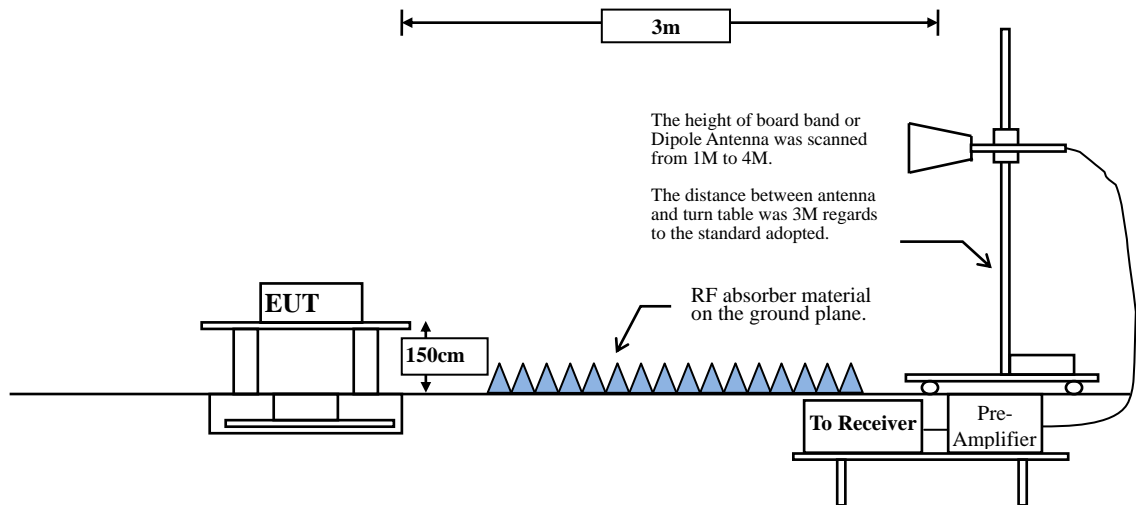
## 6. Band Edge

### 6.1. Test Setup

#### RF Conducted Measurement



#### RF Radiated Measurement:



### 6.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

### 6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to ANSI C63.10, 2013 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

#### RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure

RBW = as specified in Table 1.

VBW  $\geq 3 \times$  RBW.

**Table 1 —RBW as a function of frequency**

| Frequency   | RBW         |
|-------------|-------------|
| 9-150 kHz   | 200-300 Hz  |
| 0.15-30 MHz | 9-10 kHz    |
| 30-1000 MHz | 100-120 kHz |
| > 1000 MHz  | 1 MHz       |

According to C63.10 Section 11.12.2.5 Average measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle  $\geq 98 \%$

VBW  $\geq 1/T$ , when duty cycle  $< 98 \%$

( T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

| 2.4GHz band | Duty Cycle (%) | T (ms) | 1/T (Hz) | VBW (Hz) |
|-------------|----------------|--------|----------|----------|
| GFSK        | 100            | --     | --       | 10       |

Note: Duty Cycle Refer to Section 9.

### 6.4. Uncertainty

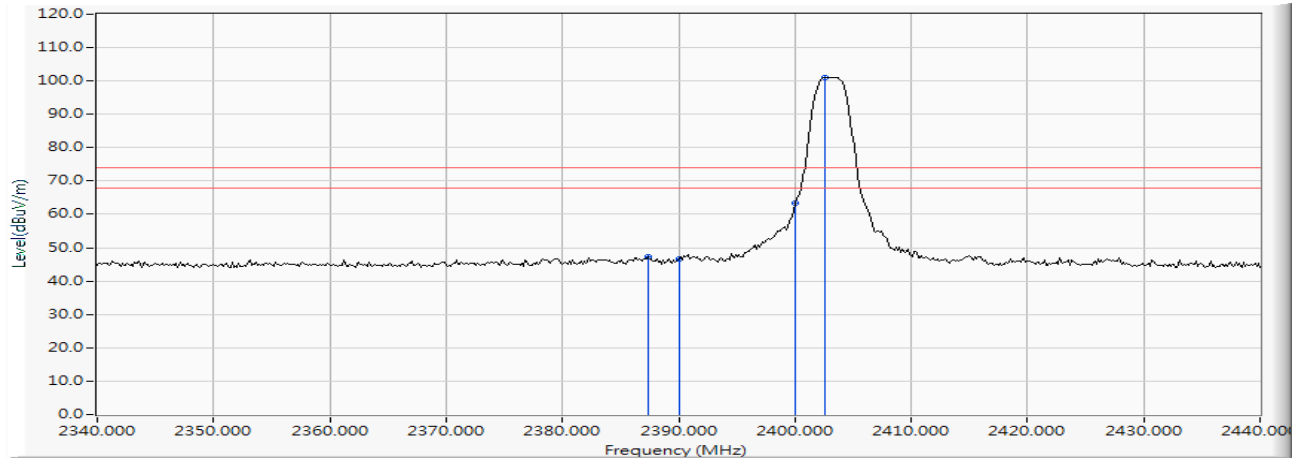
$\pm 4.08$  dB above 1GHz

$\pm 4.22$  dB below 1GHz

### 6.5. Test Result of Band Edge

Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2403MHz)

#### Horizontal



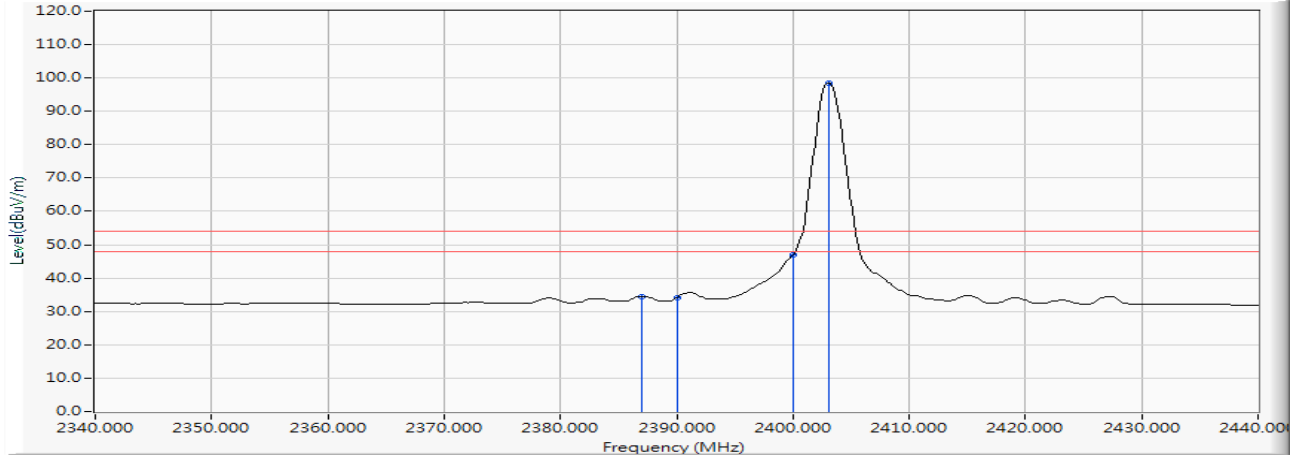
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 |   | 2387.391        | -1.534              | 48.727               | 47.193                 | -26.807     | 74.000         | PEAK          |
| 2 |   | 2390.000        | -1.550              | 48.103               | 46.553                 | -27.447     | 74.000         | PEAK          |
| 3 |   | 2400.000        | -1.612              | 64.849               | 63.237                 | --          | --             | PEAK          |
| 4 | * | 2402.609        | -1.627              | 102.636              | 101.008                | --          | --             | PEAK          |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2403MHz)

**Horizontal**



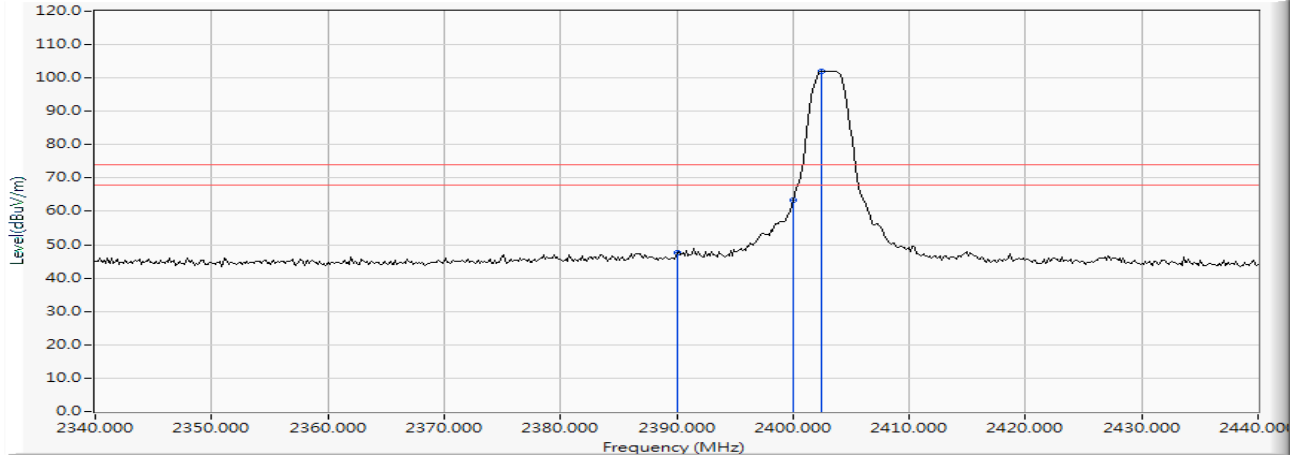
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 |   | 2386.957        | -1.531              | 35.997               | 34.465                 | -19.535     | 54.000         | AVERAGE       |
| 2 |   | 2390.000        | -1.550              | 35.673               | 34.123                 | -19.877     | 54.000         | AVERAGE       |
| 3 |   | 2400.000        | -1.612              | 48.433               | 46.821                 | --          | --             | AVERAGE       |
| 4 | * | 2403.043        | -1.630              | 100.056              | 98.426                 | --          | --             | AVERAGE       |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2403MHz)

**Vertical**



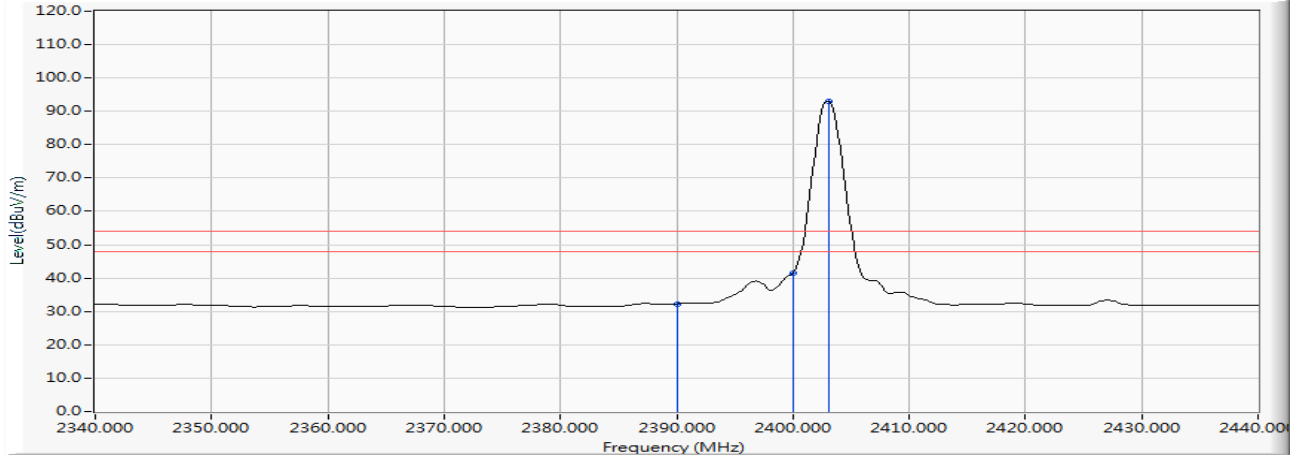
|   |   | <b>Frequency<br/>(MHz)</b> | <b>Correct Factor<br/>(dB)</b> | <b>Reading Level<br/>(dBuV)</b> | <b>Measure Level<br/>(dBuV/m)</b> | <b>Margin<br/>(dB)</b> | <b>Limit<br/>(dBuV/m)</b> | <b>Detector<br/>Type</b> |
|---|---|----------------------------|--------------------------------|---------------------------------|-----------------------------------|------------------------|---------------------------|--------------------------|
| 1 |   | 2390.000                   | -1.550                         | 49.162                          | 47.612                            | -26.388                | 74.000                    | PEAK                     |
| 2 |   | 2400.000                   | -1.612                         | 64.967                          | 63.355                            | --                     | --                        | PEAK                     |
| 3 | * | 2402.464                   | -1.627                         | 103.758                         | 102.131                           | --                     | --                        | PEAK                     |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2403MHz)

**Vertical**



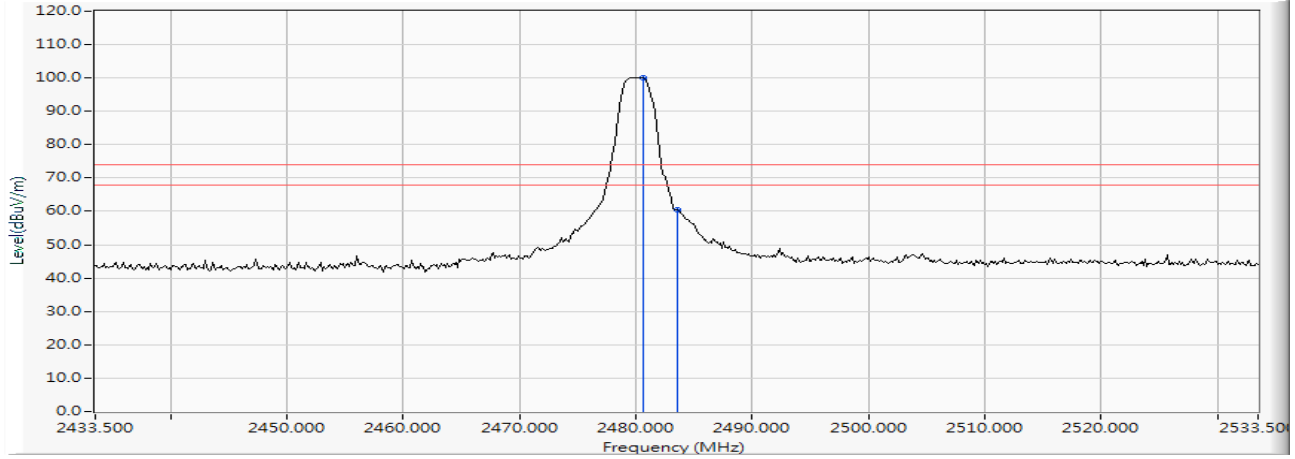
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 |   | 2386.522        | -1.528              | 36.355               | 34.826                 | -19.174     | 54.000         | AVERAGE       |
| 2 |   | 2390.000        | -1.550              | 36.159               | 34.609                 | -19.391     | 54.000         | AVERAGE       |
| 3 |   | 2400.000        | -1.612              | 49.386               | 47.774                 | --          | --             | AVERAGE       |
| 4 | * | 2403.043        | -1.630              | 101.147              | 99.517                 | --          | --             | AVERAGE       |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2480MHz)

**Horizontal**



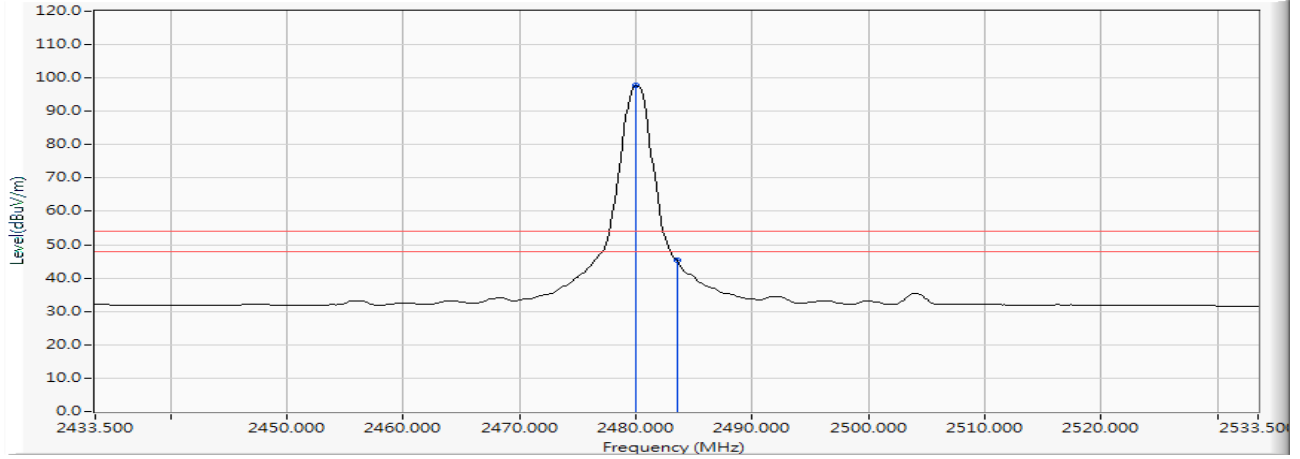
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 | * | 2480.601        | -2.109              | 102.087              | 99.978                 | --          | --             | PEAK          |
| 2 |   | 2483.500        | -2.127              | 62.663               | 60.536                 | -13.464     | 74.000         | PEAK          |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2480MHz)

**Horizontal**



|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 | * | 2480.022        | -2.105              | 99.804               | 97.699                 | --          | --             | AVERAGE       |
| 2 |   | 2483.500        | -2.127              | 47.366               | 45.239                 | -8.761      | 54.000         | AVERAGE       |

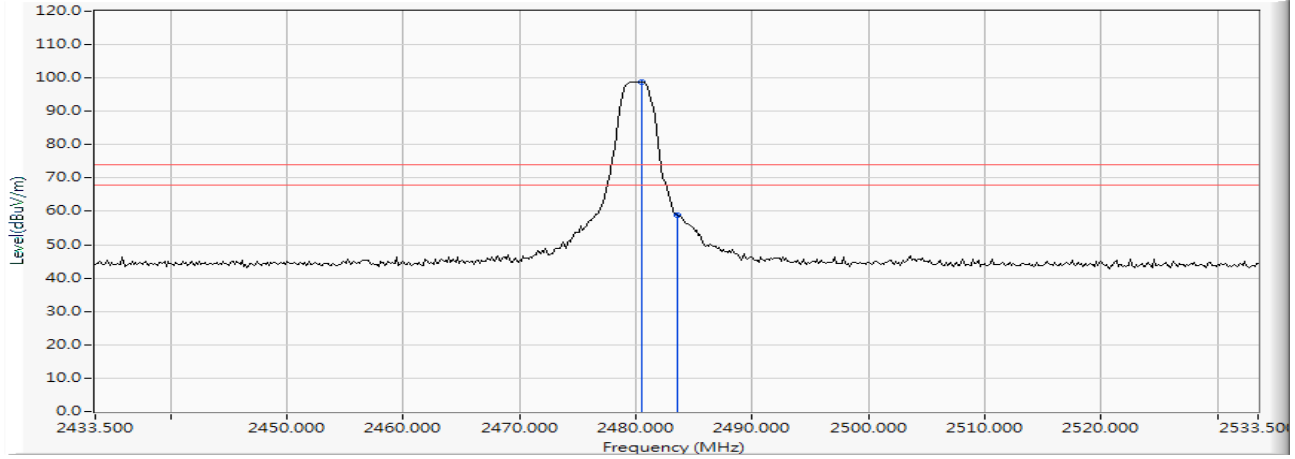
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.



Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2480MHz)

**Vertical**



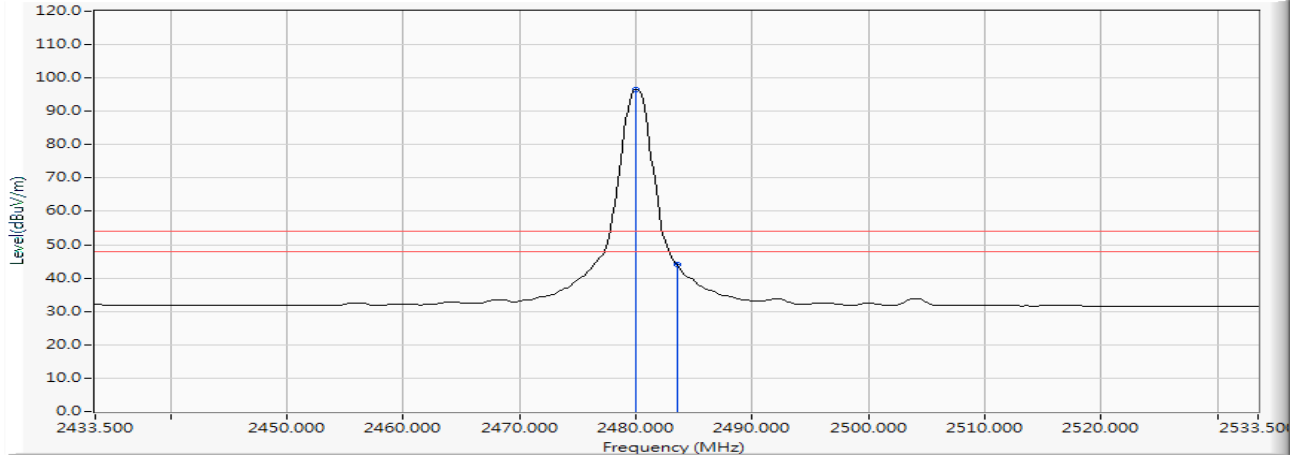
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 | * | 2480.457        | -2.108              | 100.977              | 98.869                 | --          | --             | PEAK          |
| 2 |   | 2483.500        | -2.127              | 61.091               | 58.964                 | -15.036     | 74.000         | PEAK          |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Gaming Mouse  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2480MHz)

**Vertical**



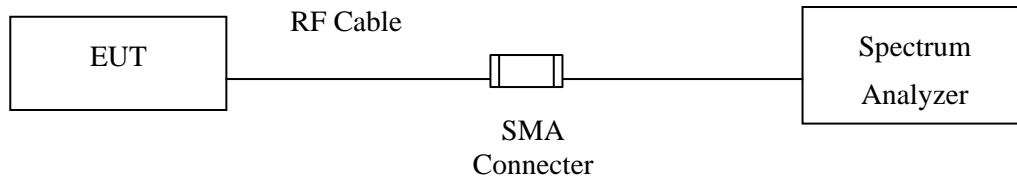
|   |   | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|-----------------|---------------------|----------------------|------------------------|-------------|----------------|---------------|
| 1 | * | 2480.022        | -2.105              | 98.716               | 96.611                 | --          | --             | AVERAGE       |
| 2 |   | 2483.500        | -2.127              | 46.304               | 44.177                 | -9.823      | 54.000         | AVERAGE       |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

## 7. 6dB Bandwidth

### 7.1. Test Setup



### 7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

### 7.3. Test Procedure

The EUT was setup according to ANSI C63.4, 2014; tested according to ANSI C63.10 Section 11.8 for compliance to FCC 47CFR 15.247 requirements.

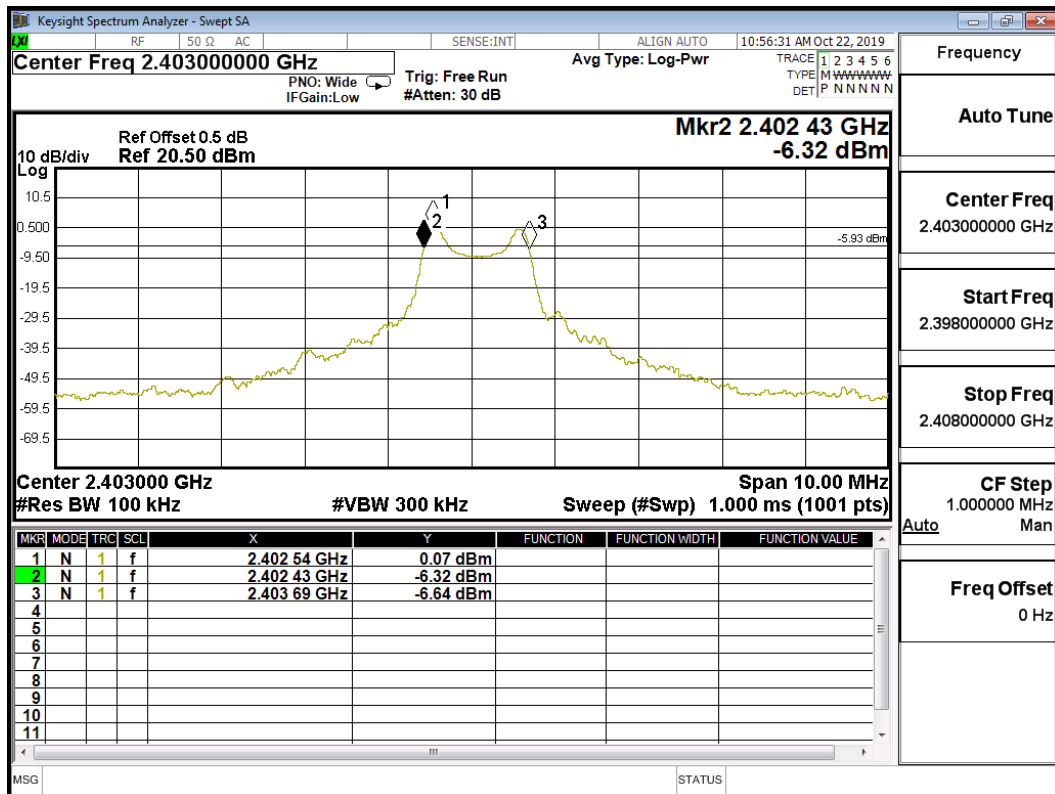
### 7.4. Uncertainty

$\pm 283\text{Hz}$

### 7.5. Test Result of 6dB Bandwidth

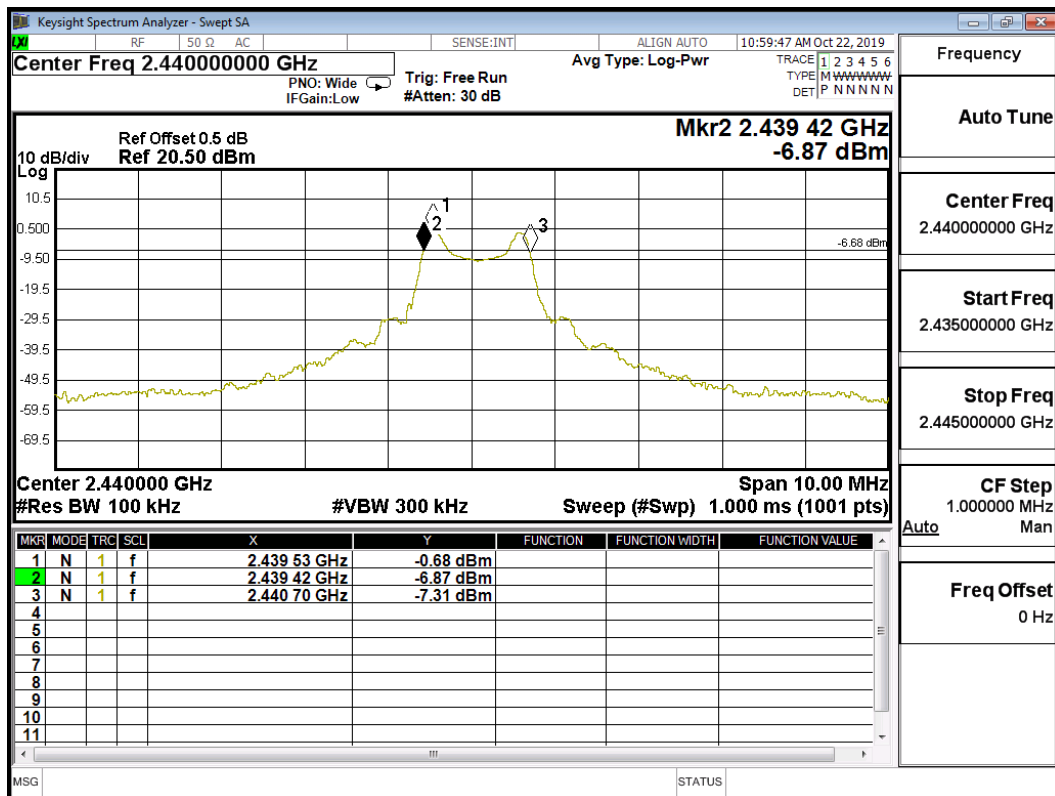
Product : Gaming Mouse  
 Test Item : 6dB Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2403MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 01          | 2403.00         | 1260                    | >500                 | Pass   |



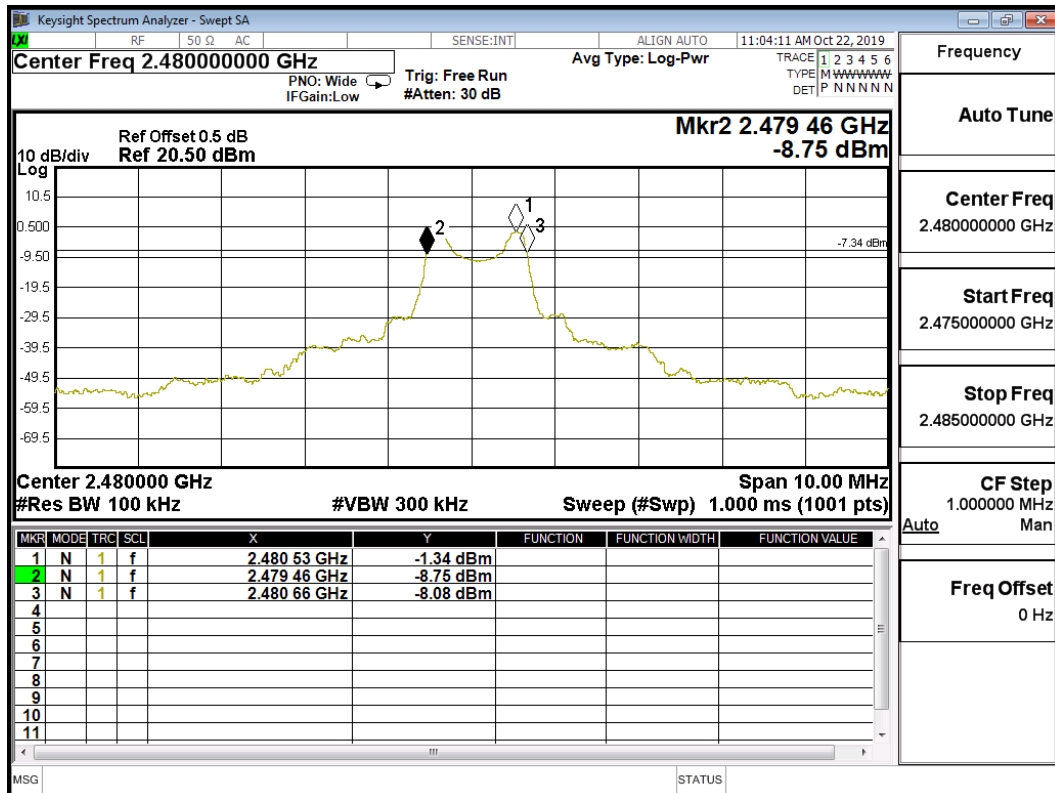
Product : Gaming Mouse  
 Test Item : 6dB Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2440MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 38          | 2440.00         | 1280                    | >500                 | Pass   |



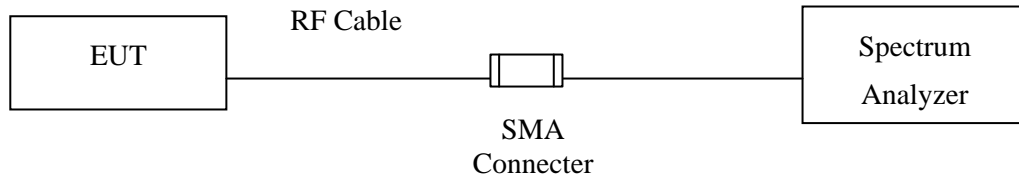
Product : Gaming Mouse  
 Test Item : 6dB Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2480MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 78          | 2480.00         | 1200                    | >500                 | Pass   |



## 8. Power Density

### 8.1. Test Setup



### 8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

### 8.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The maximum power spectral density using C63.10 Section 11.10.2 Method PKPSD (peak PSD).

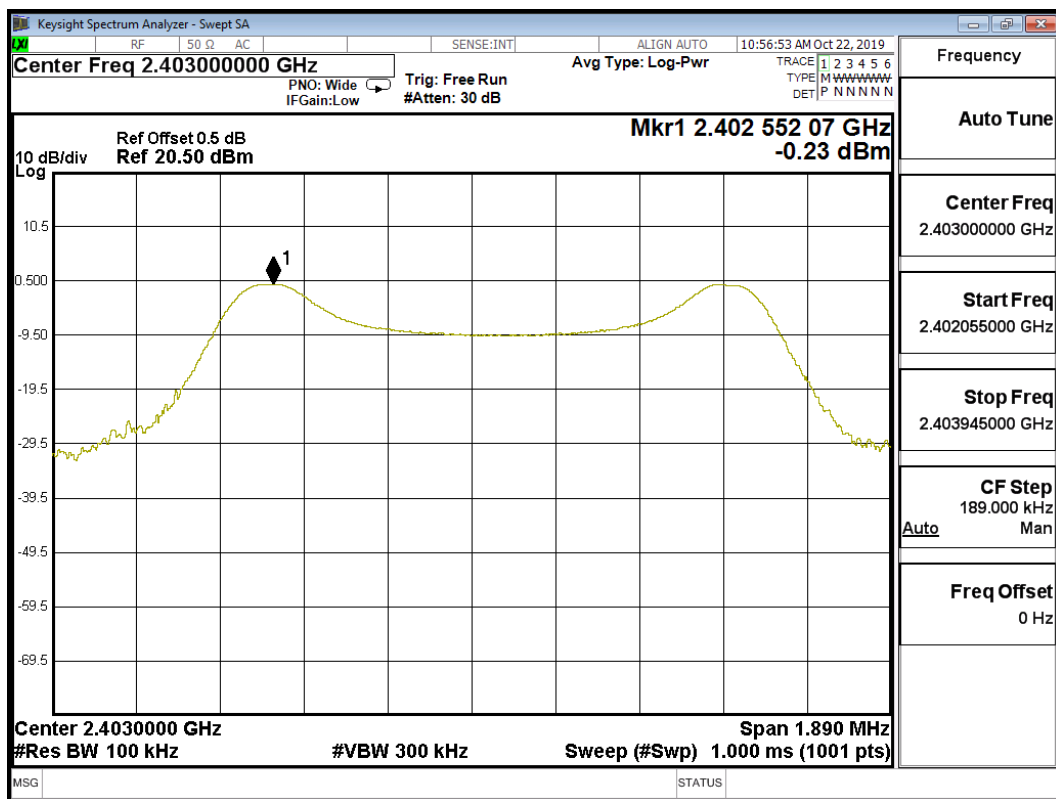
### 8.4. Uncertainty

$\pm 1.20$  dB

### 8.5. Test Result of Power Density

Product : Gaming Mouse  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit(2403MHz)

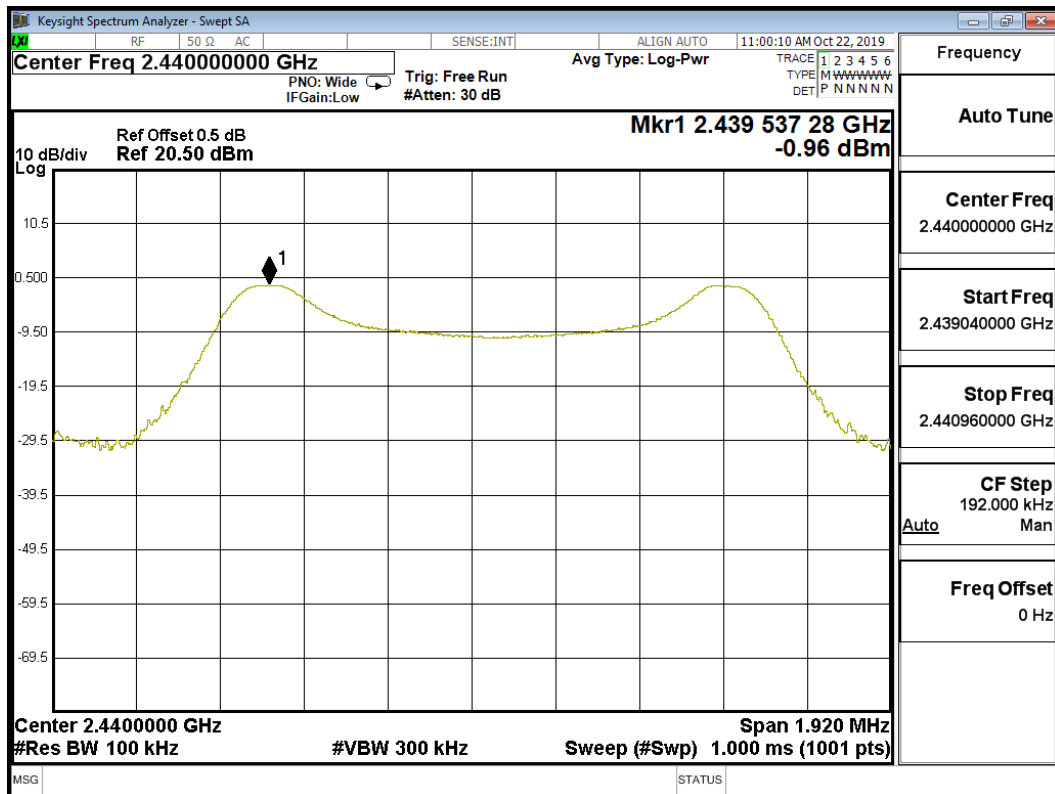
| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 01          | 2403.00         | -0.23               | ≤ 8dBm      | Pass   |





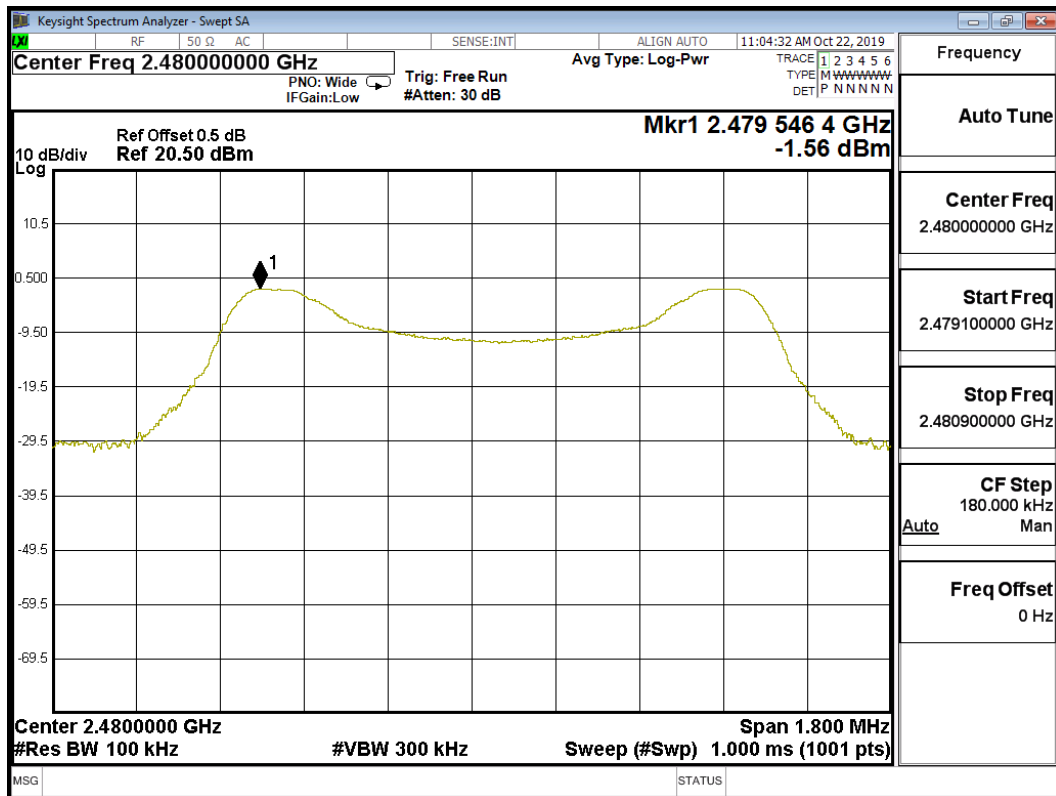
Product : Gaming Mouse  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit (2440MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 38          | 2440            | -0.96                   | ≤ 8dBm               | Pass   |



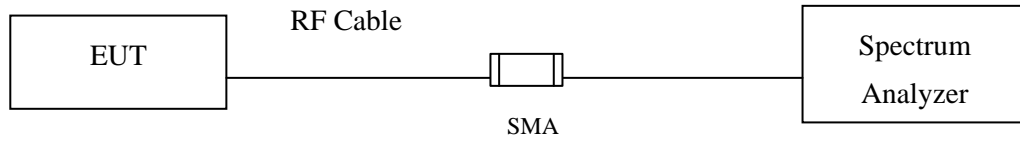
Product : Gaming Mouse  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2480MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 78          | 2480.00         | -1.56                   | ≤ 8dBm               | Pass   |



## 9. Duty Cycle

### 9.1. Test Setup



### 9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to ANSI C63.10 2013 for compliance to FCC 47CFR 15.247 requirements.

### 9.3. Uncertainty

$\pm 2.31\text{msec}$

### 9.4. Test Result of Duty Cycle

Product : Gaming Mouse  
 Test Item : Duty Cycle  
 Test Mode : Mode 1: Transmit

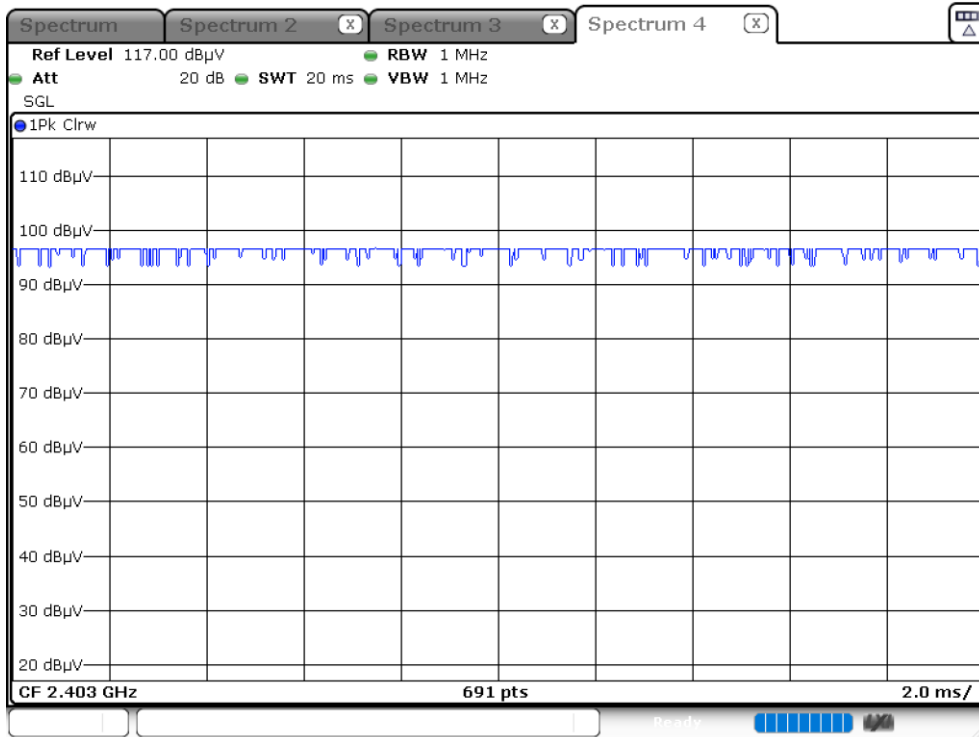
Duty Cycle Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

$$\text{Duty Factor} = 10 \text{ Log} (1/\text{Duty Cycle})$$

Results:

| 2.4GHz band | Ton (ms) | Ton + Toff (ms) | Duty Cycle (%) | Duty Factor (dB) |
|-------------|----------|-----------------|----------------|------------------|
| GFSK        | --       | --              | 100            | --               |



Date: 21.OCT.2019 11:39:07

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**10. EMI Reduction Method During Compliance Testing**

No modification was made during testing.