



# FCC Radio TEST Report

## FCC ID: EMJMM51T00

**Issued Date** : May. 08, 2009  
**Project No.** : 0904C204  
**Equipment** : 5 BTN Wireless Optical Mouse with tilt wheel  
**Model Name.** : M51T00  
**Applicant** : Primax Electronics Ltd.  
**Address** : No. 669, Ruey Kuang Road, Neihu 114 Taipei, Taiwan.  
R.O.C.  
**Manufacturer** : Dongguan Primax Electronic & Telecommunication  
Products Ltd.  
**Address** : Liu Wu District, Shek Kit Town, Dong Guan City,  
Guang Dong Province, P.R. China

**Tested by:**  
Neutron Engineering Inc. EMC Laboratory

**Date of Test:**  
Apr. 30, 2009 ~ May. 06, 2009

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### **Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.



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## 1. CERTIFICATION

Equipment : 5 BTN Wireless Optical Mouse with tilt wheel  
Trade Name : Ingram Micro; V7  
Model Name. : M51T00  
Applicant : Primax Electronics Ltd.  
Factory : Dongguan Primax Electronic & Telecommunication Products Ltd.  
Address : Liu Wu District, Shek Kit Town, Dong Guan City, Guang Dong Province, P.R. China  
Date of Test : Apr. 30, 2009 ~ May. 06, 2009  
Test Item : ENGINEERING SAMPLE  
Standards : FCC Part15, Subpart C(15.227) / ANSI C63.4 : 2003/  
RSS-310:Issue 2(2007-06)

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-0904C204) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| <b>Applied Standard: 47 CFR FCC Part 15 Subpart C(15.227)/RSS-310:Issue 2(2007-06)</b> |                  |                                         |          |         |
|----------------------------------------------------------------------------------------|------------------|-----------------------------------------|----------|---------|
| Standard Section                                                                       | Standard Section | Test Item                               | Judgment | Remark  |
| RSS Gen<br>7.2.2                                                                       | 15.207           | Conducted Emission                      | -        | Note(1) |
| 3.8<br>Table(2)/(3)                                                                    | 15.227(a)        | Field Strength of Fundamental Emissions | PASS     |         |
| RSS Gen<br>4.6                                                                         | 15.215(c)        | 20dB Spectrum Bandwidth                 | PASS     |         |
| 3.8/3.4.2                                                                              | 15.227(b)        | Radiated Emissions                      | PASS     |         |
| 3.8<br>Table(2)/(3)                                                                    | 15.227(b)        | Band Edge Emissions                     | PASS     |         |
| RSS Gen<br>7.1.4                                                                       | 15.203           | Antenna Requirements                    | PASS     |         |

**NOTE:**

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) The EUT used new battery.



**2.1 TEST FACILITY**

The test facilities used to collect the test data in this report is **C01/OS02** at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

Neutron's test firm number is 95335

**2.2 MEASUREMENT UNCERTAINTY**

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

**A. Conducted Measurement :**

| Test Site | Method | Measurement Frequency Range | U , (dB) | NOTE |
|-----------|--------|-----------------------------|----------|------|
| C01       | ANSI   | 150 KHz ~ 30MHz             | 1.94     |      |

**B. Radiated Measurement :**

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U , (dB) | NOTE |
|-----------|--------|-----------------------------|------------|----------|------|
| OS01      | ANSI   | 30MHz ~ 200MHz              | V          | 3.82     |      |
|           |        | 30MHz ~ 200MHz              | H          | 3.60     |      |
|           |        | 200MHz ~ 1,000MHz           | V          | 3.86     |      |
|           |        | 200MHz ~ 1,000MHz           | H          | 3.94     |      |
| OS02      | ANSI   | 30MHz ~ 200MHz              | V          | 2.48     |      |
|           |        | 30MHz ~ 200MHz              | H          | 2.16     |      |
|           |        | 200MHz ~ 1,000MHz           | V          | 2.50     |      |
|           |        | 200MHz ~ 1,000MHz           | H          | 2.66     |      |



**3. GENERAL INFORMATION**

**3.1 GENERAL DESCRIPTION OF EUT**

|                                                                                                                                                                                                                    |                                                           |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------|
| Equipment                                                                                                                                                                                                          | 5 BTN Wireless Optical Mouse with tilt wheel              |                       |
| Trade Name                                                                                                                                                                                                         | Ingram Micro; V7                                          |                       |
| Model Name.                                                                                                                                                                                                        | M51T00                                                    |                       |
| OEM Brand/Model No.                                                                                                                                                                                                | N/A                                                       |                       |
| Model Difference                                                                                                                                                                                                   | N/A                                                       |                       |
| Product Description                                                                                                                                                                                                | The EUT is a 5 BTN Wireless Optical Mouse with tilt wheel |                       |
|                                                                                                                                                                                                                    | Operation Frequency:                                      | 27.045 MHz            |
|                                                                                                                                                                                                                    | Modulation Type:                                          | FSK                   |
|                                                                                                                                                                                                                    | Number Of Channel                                         | 1 CH                  |
|                                                                                                                                                                                                                    | Antenna Designation:                                      | Integral Loop antenna |
|                                                                                                                                                                                                                    | Max. Field strength                                       | 50.84 dBuV/m          |
| Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. |                                                           |                       |
| Power Source                                                                                                                                                                                                       | DC Voltage supplied from 1*AA size Battery(Mouse)         |                       |
| Power Rating                                                                                                                                                                                                       | DC 1.5Vdc (Mouse)                                         |                       |
| Connecting I/O Port(s)                                                                                                                                                                                             | Please refer to the User's Manual                         |                       |
| Products Covered                                                                                                                                                                                                   | N/A                                                       |                       |
| EUT Modification(s)                                                                                                                                                                                                | N/A                                                       |                       |

**Note:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.





**3.2 DESCRIPTION OF TEST MODES**

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

| Pretest Mode | Description        |
|--------------|--------------------|
| Mode 1       | TX CH 01-27.045MHz |

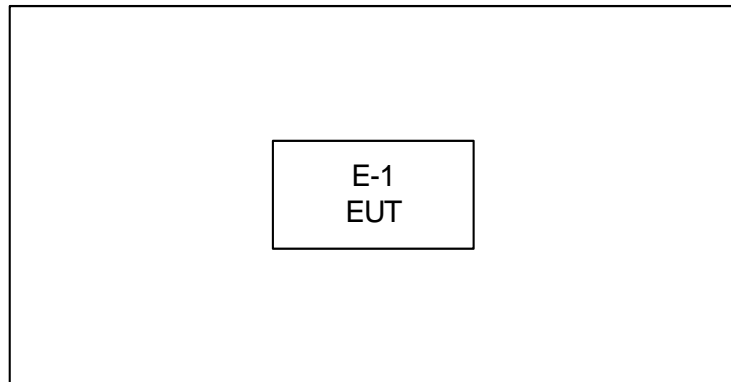
| For Conducted Test |                                                        |
|--------------------|--------------------------------------------------------|
| Final Test Mode    | Description                                            |
|                    | N/A - denotes test is not applican in this test report |

| For Radiated Test |                    |
|-------------------|--------------------|
| Final Test Mode   | Description        |
| Mode 1            | TX CH 01-27.045MHz |

- 1) The EUT used the new battery



3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED





**3.1 DESCRIPTION OF SUPPORT UNITS**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment                                    | Mfr/Brand    | Model/Type No. | FCC ID     | Series No. | Note |
|------|----------------------------------------------|--------------|----------------|------------|------------|------|
| E-1  | 5 BTN Wireless Optical Mouse with tilt wheel | Ingram Micro | M51T00         | EMJMM51T00 | N/A        | EUT  |
|      |                                              |              |                |            |            |      |
|      |                                              |              |                |            |            |      |
|      |                                              |              |                |            |            |      |
|      |                                              |              |                |            |            |      |
|      |                                              |              |                |            |            |      |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

**Note:**

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



**4. EMC EMISSION TEST**

**4.1. FIELD STRENGTH OF FUNDAMENTAL EMISSIONS MEASUREMENT**

**4.1.1. LIMIT**

The field strength of emissions within these bands specified at a distance of 3 meters shall comply with the following table.

| Frequency Band    | Fundamental Emissions Limit (dBuV/m) at 3m |
|-------------------|--------------------------------------------|
| 26.96 ~ 27.28 MHz | 80 (Average)                               |
| 26.96 ~ 27.28 MHz | 100 (Peak)                                 |

**4.1.2. MEASURING INSTRUMENTS AND SETTING**

| Item | Kind of Equipment       | Manufacturer     | Type No.        | Serial No. | Calibrated until |
|------|-------------------------|------------------|-----------------|------------|------------------|
| 1    | Log-Bicon Antenna       | Schwarzbeck      | VULB 9160       | 3058       | Nov. 26, 2009    |
| 2    | Test Cable              | N/A              | 10M_OS02        | N/A        | Nov. 26, 2009    |
| 3    | Test Cable              | N/A              | OS02-1/-2/-3    | N/A        | Nov. 26, 2009    |
| 4    | Pre-Amplifier           | Anritsu          | MH648A          | M09961     | Nov. 26, 2009    |
| 5    | EMI Test Receiver       | R&S              | ESCI            | 100082     | Jan. 29, 2010    |
| 6    | Antenna Mast            | Chance Most      | CMTB-1.5        | N/A        | N/A              |
| 7    | Turn Table              | Chance Most      | CMTB-1.5        | N/A        | N/A              |
| 8    | Spectrum Analyzer       | R&S              | FSP_40          | 100129     | Jan. 06, 2010    |
| 9    | Horn Antenna            | Schwarzbeck      | BBHA9120D       | 9120D-325  | Oct. 23, 2009    |
| 10   | Horn Antenna            | Schwarzbeck      | BBHA9170        | 9170187    | Oct. 24, 2009    |
| 11   | Microwave Pre_amplifier | Agilent          | 8449B           | 3008A01714 | Mar. 08, 2010    |
| 12   | Microflex Cable         | United Microwave | 57793           | 1m         | Mar. 08, 2010    |
| 13   | Microflex Cable         | United Microwave | A30A30-500<br>6 | 10M        | Jul. 06, 2009    |

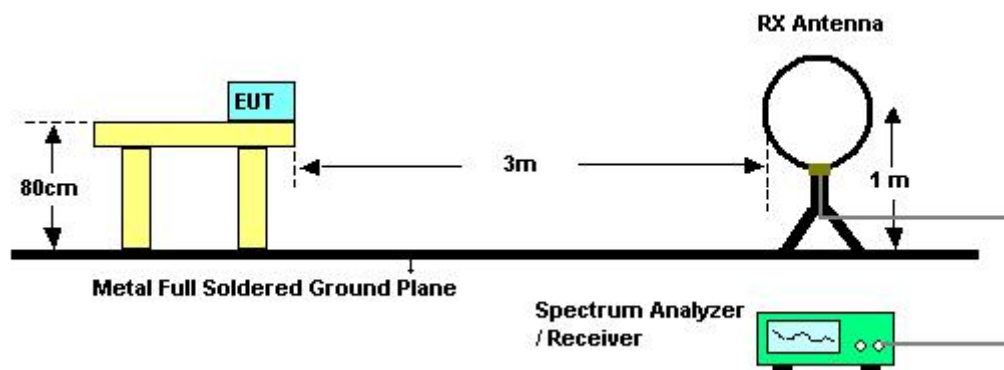
Please refer to section 5 in this report. The following table is the setting of the receiver.

| Receiver Parameter | Setting               |
|--------------------|-----------------------|
| Attenuation        | Auto                  |
| Center Frequency   | Fundamental Frequency |
| RB                 | 9 kHz                 |
| Detector           | Peak / Average        |

#### 4.1.3. TEST PROCEDURES

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
4. For Fundamental emissions, use the receiver to measure peak and average reading.
5. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

#### 4.1.4. TEST SETUP LAYOUT



#### 4.1.5. TEST DEVIATION

There is no deviation with the original standard.

#### 4.1.6. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.



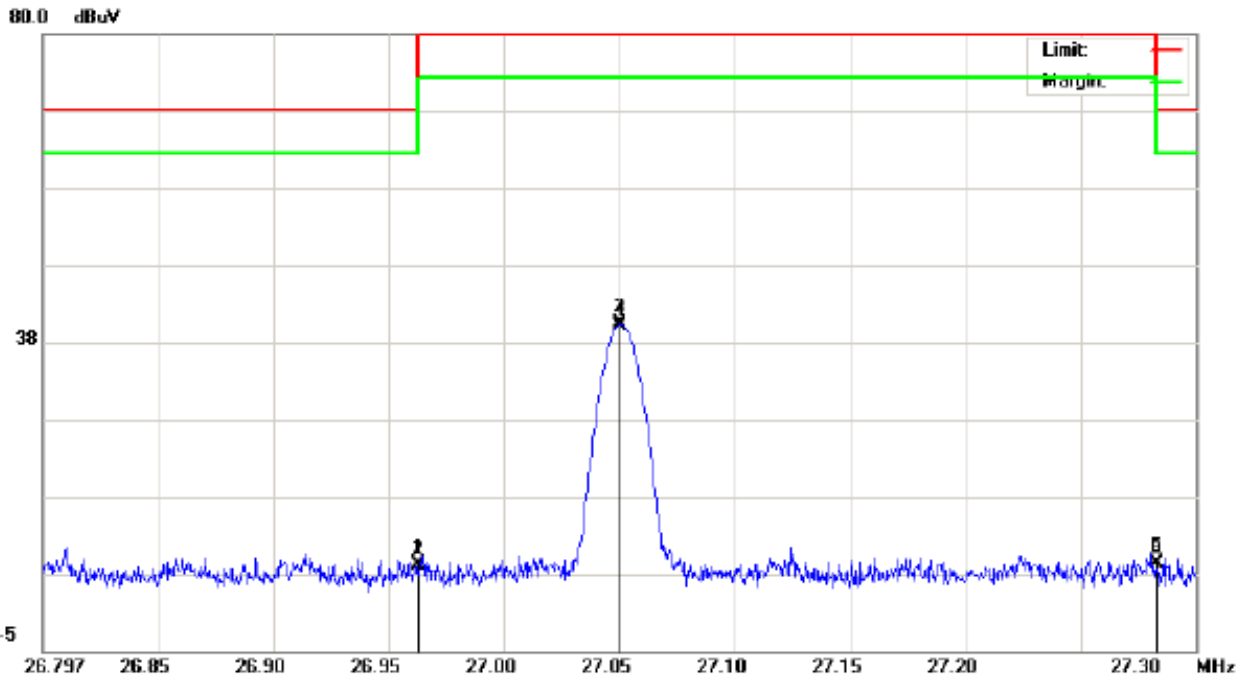
**4.1.7. TEST RESULT OF FIELD STRENGTH OF FUNDAMENTAL EMISSIONS**

|               |                                              |                     |         |
|---------------|----------------------------------------------|---------------------|---------|
| EUT :         | 5 BTN Wireless Optical Mouse with tilt wheel | Model Name :        | M51T00  |
| Temperature : | 26 °C                                        | Relative Humidity : | 60%     |
| Pressure :    | 1010hPa                                      | Test Voltage :      | DC 1.5V |
| Test Mode :   | TX CH01-27.045MHz                            |                     |         |

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) |
|-------------|----------|--------------------|----------------------|-----------------------|---------------------|-------------|
| 26.96       | V        | 15.63              | -8.55                | 6.78                  | 69.50               | - 62.72     |
| 27.05       | V        | 49.14              | -8.89                | 40.25                 | 100.00              | - 59.75     |
| 27.05       | V        | 48.71              | -8.89                | 39.82                 | 80.00               | - 40.18     |
| 27.28       | V        | 15.97              | -8.99                | 6.98                  | 69.50               | - 62.52     |

**Remark :**

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



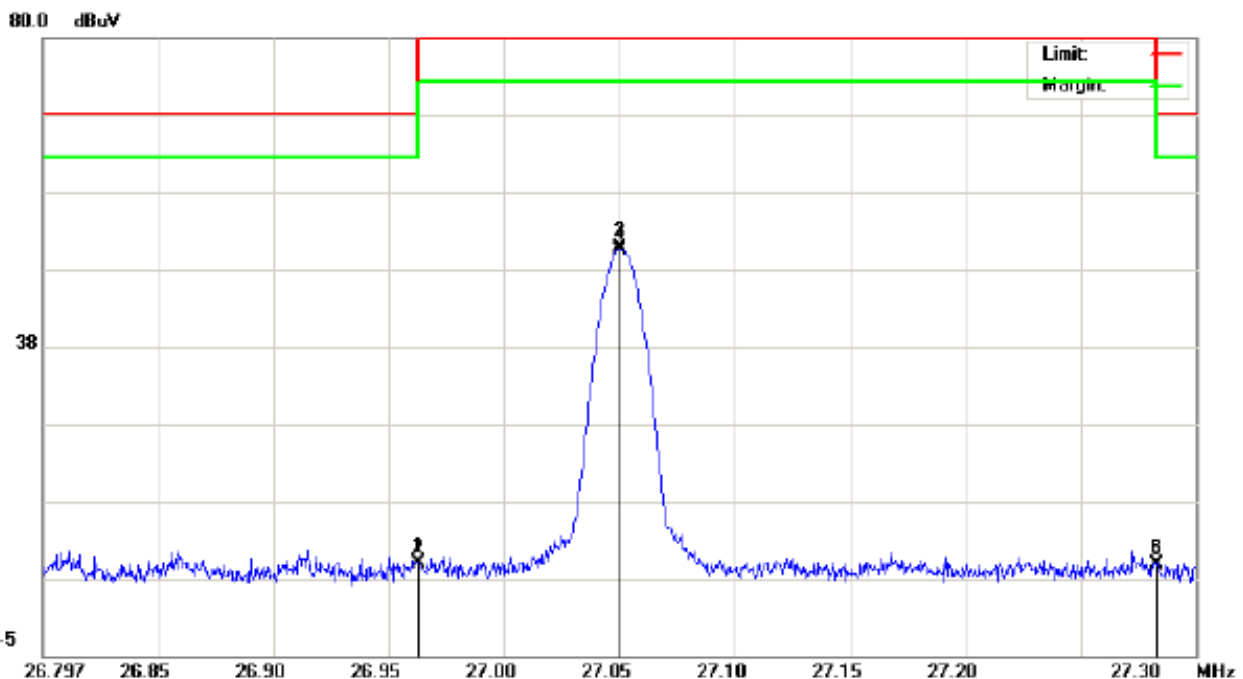


|               |                                              |                     |         |
|---------------|----------------------------------------------|---------------------|---------|
| EUT :         | 5 BTN Wireless Optical Mouse with tilt wheel | Model Name :        | M51T00  |
| Temperature : | 26 °C                                        | Relative Humidity : | 60%     |
| Pressure :    | 1010 hPa                                     | Test Power :        | DC 1.5V |
| Test Mode :   | TX Mode 27.045MHz                            |                     |         |

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) | Note |
|-------------|----------|--------------------|----------------------|-----------------------|---------------------|-------------|------|
| 26.96       | H        | 16.54              | -8.85                | 7.69                  | 69.50               | - 61.81     | E/QP |
| 27.05       | H        | 60.10              | -8.89                | 51.21                 | 100.00              | - 48.79     | F/PK |
| 27.05       | H        | 59.73              | -8.89                | 50.84                 | 80.00               | - 29.16     | F/AV |
| 27.28       | H        | 16.38              | -8.99                | 7.39                  | 69.50               | - 62.11     | E/QP |

**Remark :**

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



## 4.2. 20dBc SPECTRUM BANDWIDTH MEASUREMENT

### 4.2.1.LIMIT

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (26.96 ~ 27.28 MHz).

### 4.2.2 MEASURING INSTRUMENTS AND SETTING

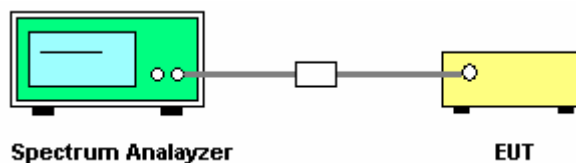
Please refer to section 5 in this report. The following table is the setting of the Spectrum Analyzer.

| Spectrum Parameters | Setting          |
|---------------------|------------------|
| Attenuation         | Auto             |
| Span Frequency      | > 20dB Bandwidth |
| RB                  | 1 kHz            |
| VB                  | 1 kHz            |
| Detector            | Peak             |
| Trace               | Max Hold         |
| Sweep Time          | Auto             |

### 4.2.3.TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 1 kHz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

### 4.2.4.TEST SETUP LAYOUT



### 4.2.5.TEST DEVIATION

There is no deviation with the original standard.

### 4.2.6. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.





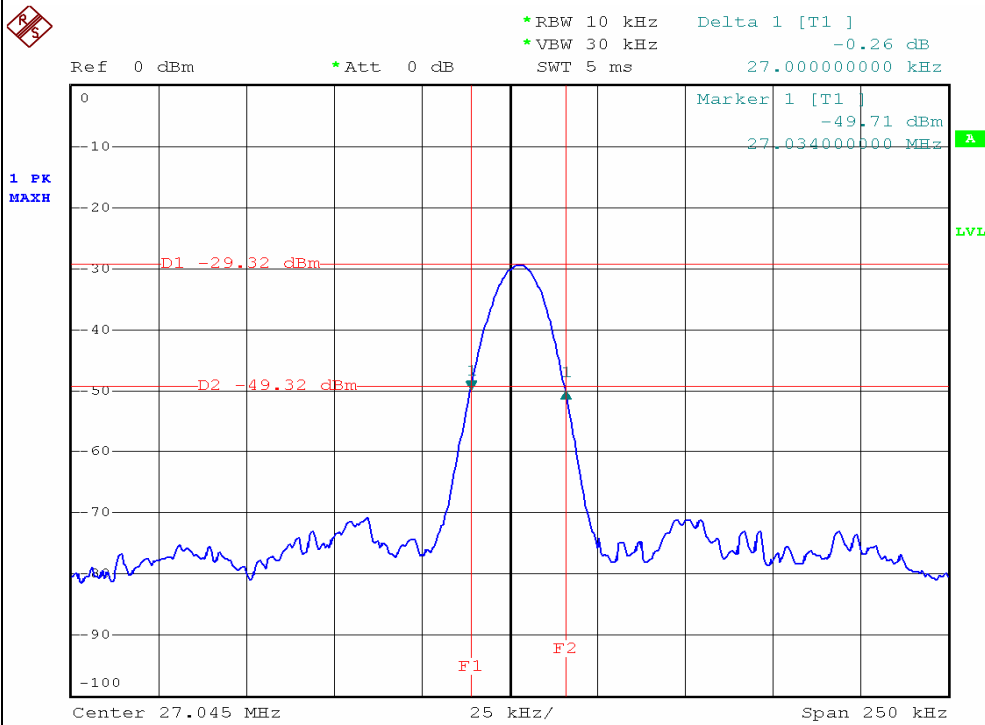
4.2.7. TEST RESULT OF 20dB SPECTRUM BANDWIDTH.

|               |                                              |                     |         |
|---------------|----------------------------------------------|---------------------|---------|
| EUT :         | 5 BTN Wireless Optical Mouse with tilt wheel | Model Name :        | M51T00  |
| Temperature : | 26 °C                                        | Relative Humidity : | 60%     |
| Pressure :    | 1010 hPa                                     | Test Power :        | DC 1.5V |
| Test Mode :   | TX CH 01-27.045MHz                           |                     |         |

| Frequency  | 20dB BW (kHz) | 99% OBW (KHz) | Frequency range (MHz)<br>$f_L > 26.96\text{MHz}$ | Frequency range (MHz)<br>$f_H < 27.28\text{MHz}$ | Test Result |
|------------|---------------|---------------|--------------------------------------------------|--------------------------------------------------|-------------|
| 27.045 MHz | 27.00         | 22.75         | PASS                                             | PASS                                             | Complies    |

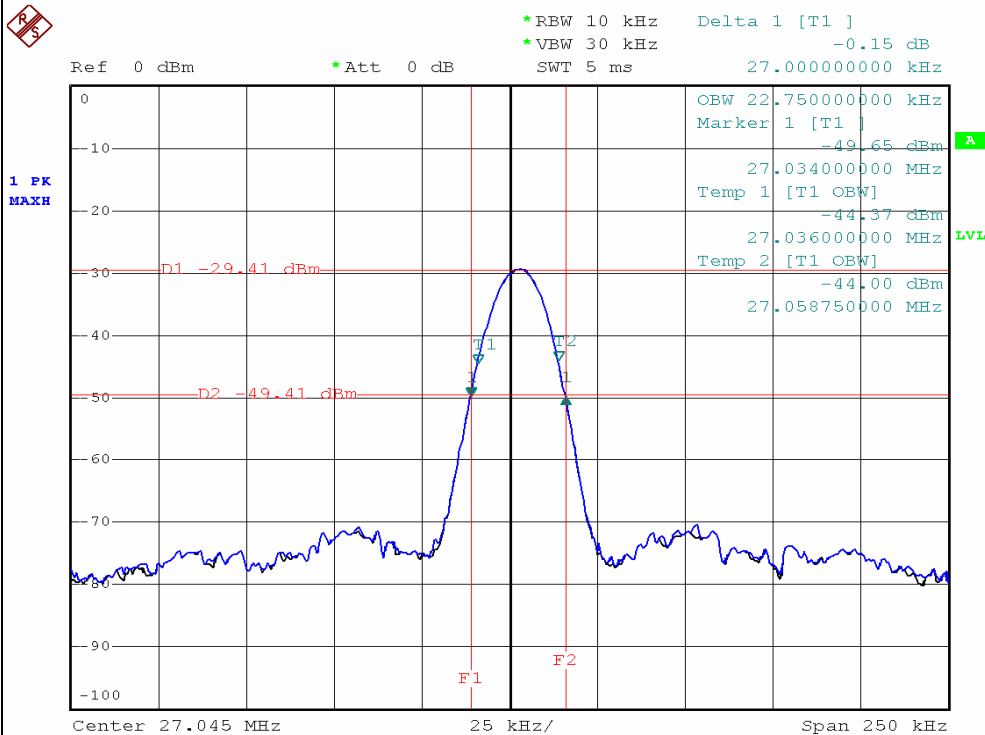


20 dBc Bandwidth Plot on 27.045 MHz



Date: 4.MAY.2009 13:51:54

99%OBW Plot on 27.045 MHz



Date: 4.MAY.2009 13:50:30



**4.3. RADIATED EMISSIONS MEASUREMENT**

**4.3.1. LIMIT**

The field strength of any emissions which appear outside of 26.96 ~ 27.28 MHz band shall not exceed the general radiated emissions limits in Section 15.209(a)

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

**4.3.2. MEASURING INSTRUMENTS AND SETTING**

| <b>Item</b> | <b>Kind of Equipment</b> | <b>Manufacturer</b> | <b>Type No.</b> | <b>Serial No.</b> | <b>Calibrated until</b> |
|-------------|--------------------------|---------------------|-----------------|-------------------|-------------------------|
| 1           | Log-Bicon Antenna        | Schwarzbeck         | VULB 9160       | 3058              | Nov. 27, 2008           |
| 2           | Test Cable               | N/A                 | 10M_OS02        | N/A               | Nov. 27, 2008           |
| 3           | Test Cable               | N/A                 | OS02-1/-2/-3    | N/A               | Nov. 27, 2008           |
| 4           | Pre-Amplifier            | Anritsu             | MH648A          | M09961            | Nov. 27, 2008           |
| 5           | EMI Test Receiver        | R&S                 | ESCI            | 100082            | Jan. 29, 2010           |
| 6           | Antenna Mast             | Chance Most         | CMTB-1.5        | N/A               | N/A                     |
| 7           | Turn Table               | Chance Most         | CMTB-1.5        | N/A               | N/A                     |
| 8           | Spectrum Analyzer        | R&S                 | FSP_40          | 100129            | Jan. 06, 2010           |
| 9           | Horn Antenna             | Schwarzbeck         | BBHA9120D       | 9120D-325         | Oct. 24, 2008           |
| 10          | Horn Antenna             | Schwarzbeck         | BBHA9170        | 9170187           | Oct. 25, 2008           |
| 11          | Microwave Pre_amplifier  | Agilent             | 8449B           | 3008A01714        | Mar. 08, 2010           |
| 12          | Microflex Cable          | United Microwave    | 57793           | 1m                | Mar. 08, 2010           |
| 13          | Microflex Cable          | United Microwave    | A30A30-500<br>6 | 10M               | Jul. 06, 2009           |

Please refer to section 5 in this report. The following table is the setting of receiver.

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

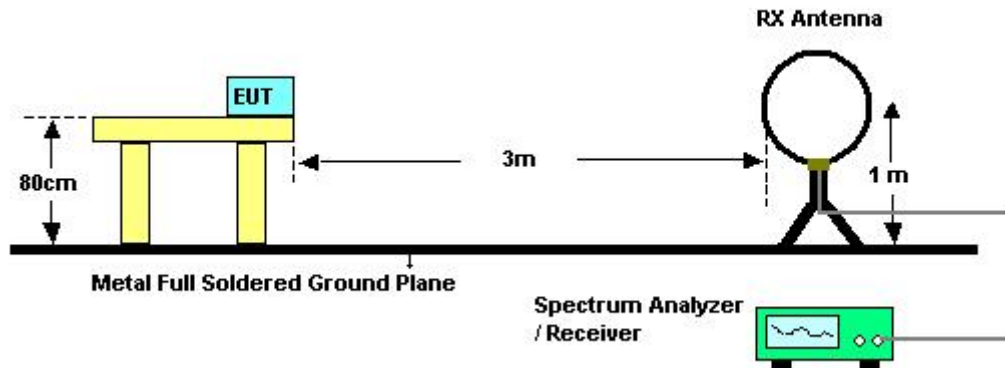


#### 4.3.3. TEST PROCEDURES

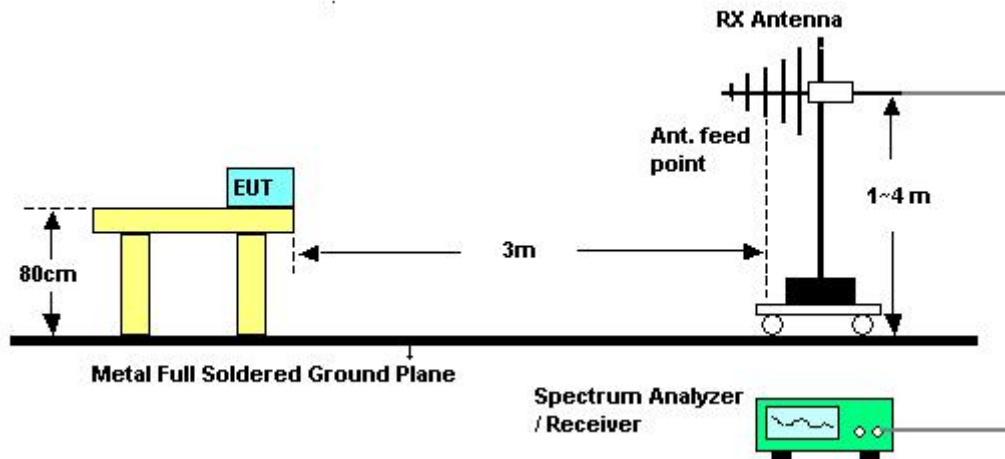
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

**4.3.4. TEST SETUP LAYOUT**

For radiated emissions below 30MHz



For radiated emissions above 30MHz



**4.3.5. TEST DEVIATION**

There is no deviation with the original standard.

**4.3.6. EUT OPERATION DURING TEST**

The EUT was programmed to be in continuously transmitting mode.



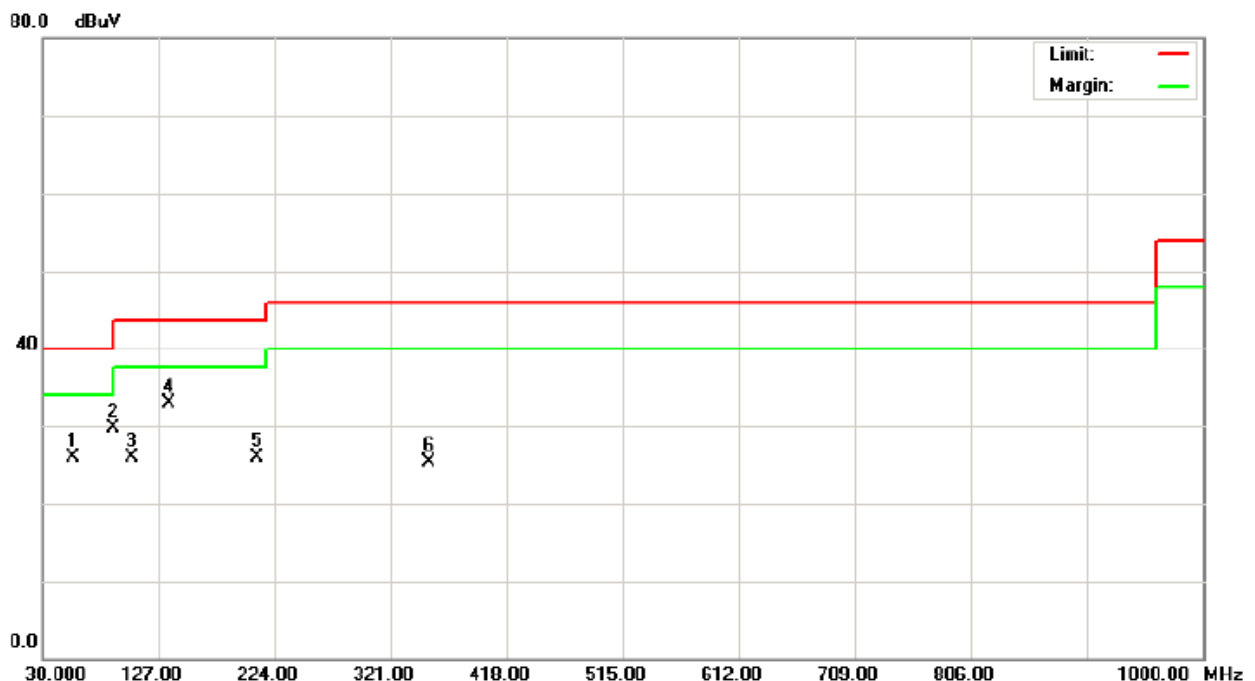
4.3.7. TEST RESULTS (30MHz~1GHz)

|               |                                              |                     |         |
|---------------|----------------------------------------------|---------------------|---------|
| EUT :         | 5 BTN Wireless Optical Mouse with tilt wheel | Model Name :        | M51T00  |
| Temperature : | 26 °C                                        | Relative Humidity : | 60%     |
| Pressure :    | 1010 hPa                                     | Test Power :        | DC 1.5V |
| Test Mode :   | TX Mode 27.045MHz                            |                     |         |

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) | Note |
|-------------|----------|--------------------|----------------------|-----------------------|---------------------|-------------|------|
| 54.49       | V        | 46.03              | -20.16               | 25.87                 | 40.00               | - 14.13     |      |
| 87.76       | V        | 54.58              | -24.81               | 29.77                 | 40.00               | - 10.23     |      |
| 103.88      | V        | 48.15              | -22.29               | 25.86                 | 43.50               | - 17.64     |      |
| 134.55      | V        | 2.46               | -19.49               | 32.97                 | 43.50               | - 10.53     |      |
| 209.00      | V        | 48.10              | -22.29               | 25.81                 | 43.50               | - 17.69     |      |
| 352.30      | V        | 42.16              | -16.79               | 25.37                 | 46.00               | - 20.63     |      |

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



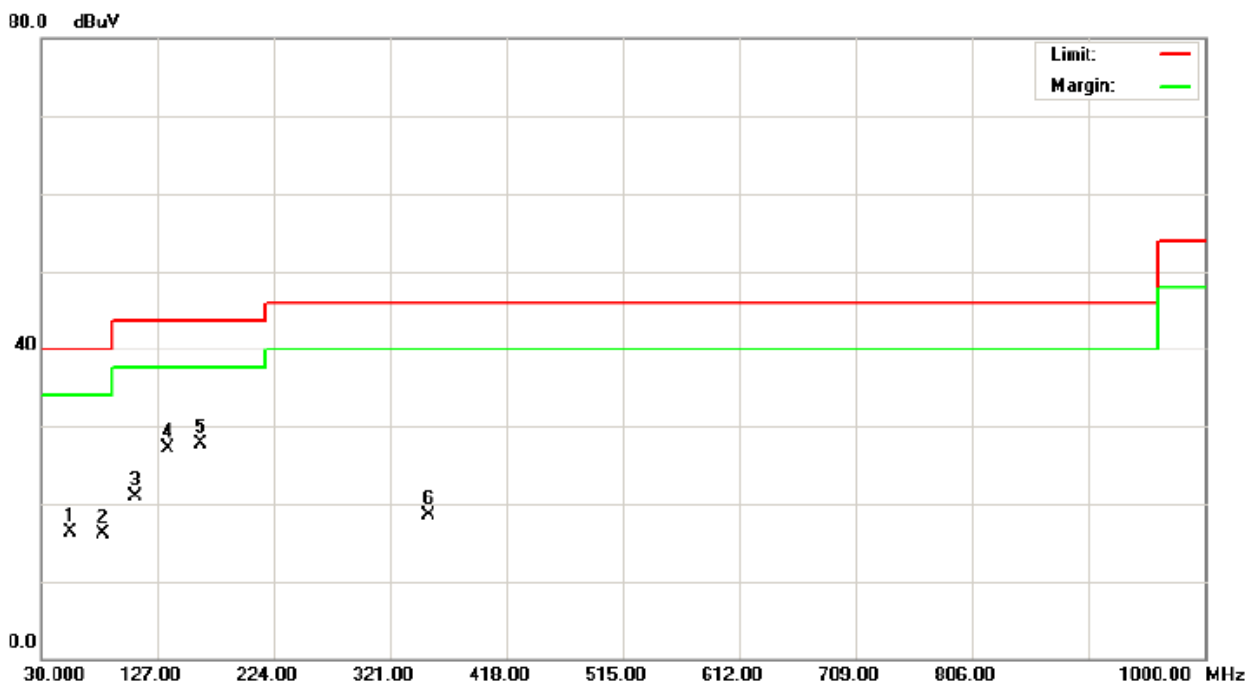


|               |                                              |                     |         |
|---------------|----------------------------------------------|---------------------|---------|
| EUT :         | 5 BTN Wireless Optical Mouse with tilt wheel | Model Name :        | M51T00  |
| Temperature : | 26 °C                                        | Relative Humidity : | 60%     |
| Pressure :    | 1010 hPa                                     | Test Power :        | DC 1.5V |
| Test Mode :   | TX Mode 27.045MHz                            |                     |         |

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) | Note |
|-------------|----------|--------------------|----------------------|-----------------------|---------------------|-------------|------|
| 54.13       | H        | 36.47              | -20.16               | 16.31                 | 40.00               | - 23.69     |      |
| 81.14       | H        | 40.16              | -23.97               | 16.19                 | 40.00               | - 23.81     |      |
| 107.96      | H        | 42.11              | -21.13               | 20.98                 | 43.50               | - 22.52     |      |
| 134.76      | H        | 46.56              | -19.49               | 27.07                 | 43.50               | - 16.43     |      |
| 162.34      | H        | 46.60              | -18.97               | 27.63                 | 43.50               | - 15.87     |      |
| 352.04      | H        | 35.25              | -16.79               | 18.46                 | 46.00               | - 27.54     |      |

**Remark :**

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦





#### 4.4. BAND EDGE EMISSION MEASUREMENT

##### 4.4.1. LIMIT

Band edge emissions outside of the frequency bands shown in below table.

| <b>Outside Frequency Band Edge</b> | <b>Limit (dBUV/m) at 3m</b> |
|------------------------------------|-----------------------------|
| Low band edge                      | 69.54 (QP)                  |
| High band edge                     | 69.54 (QP)                  |

##### 4.4.2. MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of the receiver.

| <b>Receiver Parameter</b> | <b>Setting</b>        |
|---------------------------|-----------------------|
| Attenuation               | Auto                  |
| Center Frequency          | Fundamental Frequency |
| RB                        | 9 KHz                 |
| Detector                  | QP or Peak            |

##### 4.4.3. TEST PROCEDURES

The test procedure is the same as section 4.2.3, only the frequency range investigated is limited to 2MHz around bandedges.

##### 4.4.4. TEST SETUP LAYOUT

This test setup layout is the same as that shown in section 4.2.4.

##### 4.4.5. TEST DEVIATION

There is no deviation with the original standard.

##### 4.4.6. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.





**4.4.7. TEST RESULT OF BAND EDGE AND FUNDAMENTAL EMISSIONS**

|               |                                              |                     |         |
|---------------|----------------------------------------------|---------------------|---------|
| EUT :         | 5 BTN Wireless Optical Mouse with tilt wheel | Model Name :        | M51T00  |
| Temperature : | 26 °C                                        | Relative Humidity : | 60%     |
| Pressure :    | 1010 hPa                                     | Test Power :        | DC 1.5V |
| Test Mode :   | TX Mode 27.045MHz                            |                     |         |

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) | Note |
|-------------|----------|--------------------|----------------------|-----------------------|---------------------|-------------|------|
| 26.96       | V        | 15.63              | -8.55                | 6.78                  | 69.50               | - 62.72     | E/QP |
| 27.28       | V        | 15.97              | -8.99                | 6.98                  | 69.50               | - 62.52     | E/QP |

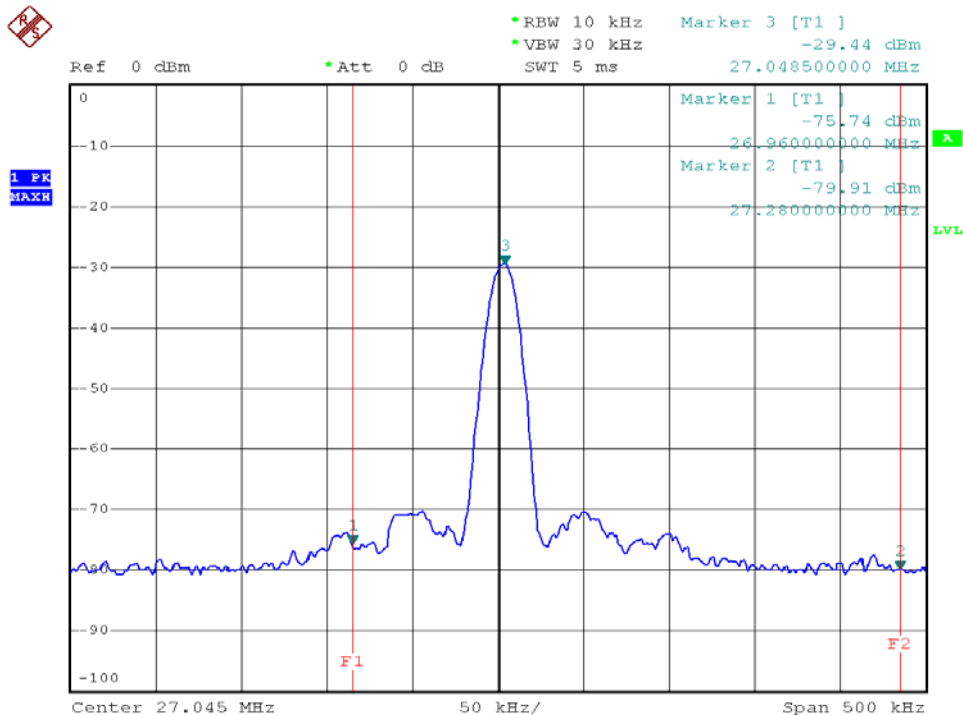
| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) | Note |
|-------------|----------|--------------------|----------------------|-----------------------|---------------------|-------------|------|
| 26.96       | H        | 16.54              | -8.85                | 7.69                  | 69.50               | - 61.81     | E/QP |
| 27.28       | H        | 16.38              | -8.99                | 7.39                  | 69.50               | - 62.11     | E/QP |

Note:

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

**Low /High Band Edge Plot on 27.045 MHz**



Date: 4.MAY.2009 13:55:15



#### 4.5. ANTENNA REQUIREMENTS

##### 4.5.1. LIMITS

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable.

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 shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

##### 4.5.2. ANTENNA CONNECTOR CONSTRUCTION

Please refer to section 3.3 in this test report, all antenna connectors comply with the requirements.



**5. EUT TEST PHOTO**

**Radiated Measurement Photos**

