



**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

FCC ID: EMJ202R70

**RF WIRELESS MOUSE**

**MODEL NO: RO07**

**REPORT NO: RF00002**

**DEC. 11, 2000**

*Prepared for*

**PRIMAX ELECTRONICS LTD.**

**No. 669, Ruen Kuang Road,**

**Neihu Taipei, Taiwan R.O.C.**

*Prepared by*

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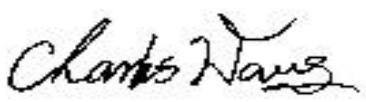
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**1. VERIFICATION OF COMPLIANCE**

COMPANY NAME : PRIMAX ELECTRONICS LTD.  
No. 669, Ruen Kuang Road, Neihu Taipei, Taiwan R.O.C.  
CONTACT PERSON : Raymond Liang  
TELEPHONE NO : 02-22993279 ext 377  
EUT DESCRIPTION : RF WIRELESS MOUSE  
MODEM NAME : RO07  
DATE OF MEASUREMENT: Dec. 05, 2000

| LIMITES APPLY TO: FCC PART 15 SECTION 15.227                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| TECHNICAL LIMITS                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MEASUREMENT RESULT |
| Radiated Emission/ 15.205 & 15.209                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PASS               |
| AC Line Conducted Emission/15.207                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PASS               |
| Emission in operating band/15.227                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PASS               |
| <p>The above equipment was tested by C&amp;C Laboratory Co. Ltd. for compliance with the requirements set forth in CFR 47 PART 15, SUBPART C. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requires.</p> <p></p> <p>Charles Wang/ Technical Director<br/>C&amp;C Laboratory Co. Ltd.</p> |                    |

## 2. DESCRIPTION OF EQUIPMENT UNDER MEASUREMENT (EUT)

RO07 is a wireless mouse product which allow its users to connect it to the USB port of PC through its receiver unit and wireless controlled by host mouse unit (Transmitter) to form a typical application as a traditional mouse

| Transmitter Technical Data |                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------|
| Actual Operating Frequency | 26.985 MHz to 27.26 MHz                                                                               |
| Transmit Power             | 0.75dBm                                                                                               |
| Modulation scheme          | FSK                                                                                                   |
| Power consumption          | Maximum -----25mA<br>Standby -----0.80mA<br>Sleep -----0.02mA<br>(wake-up by clicking mouse key only) |
| Channel                    | 6 channel with 4 bit security ID for mouse                                                            |
| Antenna type               | Antenna match at 27 MHz, integrated inside housing                                                    |
| Operation range            | 1.5m (minimum)                                                                                        |
| DC voltage                 | 3V(2*AAA Alkaline battery for mouse)                                                                  |

| Receiver Technical Data    |                                              |
|----------------------------|----------------------------------------------|
| PC interface type          | From USB interface                           |
| DC voltage                 | From PC                                      |
| Antenna type               | Wired-loop antenna integrated inside housing |
| Receiver power consumption | 60 mA                                        |
| Receiver dynamic range     | 0 dBm ~ 90 dBm                               |

## 3. ANTENNA CONNECTION

The RF wireless mouse equipped with an integrated antenna fixed permanently in transmitting unit, user can't changeable.

#### 4. CHANNEL USAGE

The operating frequency used is 27.05908 MHz, it is subject to the requirement of FCC CFR 47 i 15.227.

#### 5. THEORY OF OPERATION

The unit is working at 27.05908 MHz as a carrier to send communication signal to PC through a receiver which is sold together with the transmitter (Mouse host unit).

#### 6. EUT SETUP FOR MEASUREMENT PURPOSE

The EUT (transmitter) was setup as a minimum test configuration as like testing to regular ITE product as per requirement described in ANSI C63.4-1992. The function of EUT was checked and stay in working status under the tests.

#### 7. MEASUREMENT LOCATION

All emissions tests were performed at:

C&C Laboratory Co. Ltd.

No.15, 14 Lin, Chin Twu Chi, Lu Chu Hsiang, Taoyuan, Taiwan R.O.C.

C&C has site descriptions on file with the FCC for 10 and 3 meter site configurations. C&C is a A2LA accredited facility.

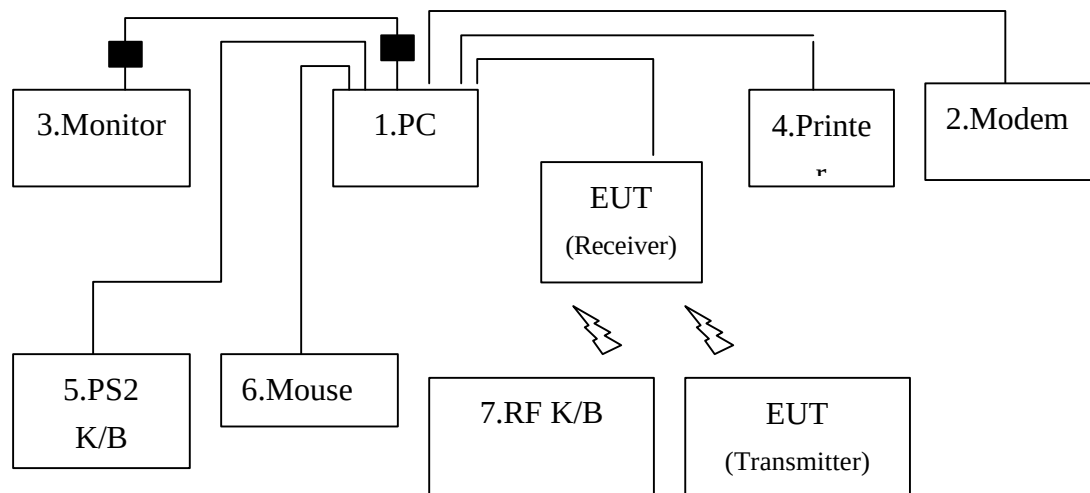
Radiated emissions from the EUT were performed at site 4, one of our 3/10 meters sites.

Conducted emissions – NA (Because the EUT was powered with Battery)

#### 8. SUPPORT EQUIPMENT

| No. | Equipment | Model # | Serial #      | FCC ID     | Trade Name           | Data Cable     | Power Cord       |
|-----|-----------|---------|---------------|------------|----------------------|----------------|------------------|
| 1.  | PC        | D84XX   | SG93000552    | FCC DoC    | HP                   | Shielded, 1.8m | Unshielded, 1.8m |
| 2.  | Modem     | 2400    | 94-364-176276 | DK467GSM24 | Computer Peripherals | Shielded, 1.8m | Unshielded, 1.8m |
| 3.  | Monitor   | D2835   | KR74011499    | A3LCGE750  | HP                   | Shielded, 1.8m | Unshielded, 1.8m |
| 4.  | Printer   | 2225C   | 3137S01428    | DSI6XU2225 | HP                   | Shielded, 1.8m | Unshielded, 1.8m |
| 5.  | Keyboard  | 2225C   | 3137S01428    | DSI6XU2225 | HP                   | Shielded, 1.8m | N/A              |
| 6.  | Mouse     | M-S34   | LZC81065474   | DZL211029  | HP                   | Shielded, 1.8m | N/A              |
| 7.  | Keyboard  | SK-8808 | N/A           | GYUR93SK   | IBM                  | N/A            | N/A              |

## 9. MEASUREMENT CONFIGURATION(SIGNAL PATH ONLY)



## 10. MEASUREMENT PROCEDURES AND MEASUREMENT RESULTS

### ➤ Radiated Emissions (General Requirements)

Measurement Requirement: 15.205, 15.209

Measurement facility used for Radiated Emissions

| Open Area Test Site # 4 |             |              |               |            |            |
|-------------------------|-------------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE          | MFR         | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL. DUE   |
| Spectrum Analyzer       | ADVANTEST   | R3132        | 91700456      | 02/15/2000 | 02/14/2001 |
| EMI Test Receiver       | R&S         | ESCS30       | 847793/012    | 11/10/2000 | 11/09/2001 |
| Precision Dipole        | R&S         | HZ-12        | 846932/0004   | 07/14/2000 | 07/13/2001 |
| Precision Dipole        | R&S         | HZ-13        | 846556/0008   | 07/14/2000 | 07/13/2001 |
| Bilog Antenna           | CHASE       | CBL 6112B    | 2462          | 01/16/2001 | 01/15/2002 |
| Turn Table              | Chance most | N/A          | N/A           | N.C.R      | N.C.R      |
| Antenna Tower           | Chance most | N/A          | N/A           | N.C.R      | N.C.R      |
| Controller              | Chance most | N/A          | N/A           | N.C.R      | N.C.R      |
| RF Switch               | ANRITSU     | MP59B        | M51067        | N.C.R      | N.C.R      |
| Site NSA                | C&C Lab.    | N/A          | N/A           | 11/24/2000 | 11/23/2001 |

**Measurement Results (1/2):**

Measured by: Eric Lin

Detector Function: Quasi-Peak

Temperature: 22 °C

(The chart below shows the highest readings taken from the final data)

Polar: Vertical – 3 m

Measurement Results: Passed

Humidity: 68 % RH

| Freq.<br>(MHz) | Raw<br>Data<br>(dBuV/m) | Corr.<br>Factor<br>(dB) | Emiss.<br>Level<br>( dBuV/m ) | Limits<br>( ) | Margin<br>(dB) |
|----------------|-------------------------|-------------------------|-------------------------------|---------------|----------------|
| 168.03         | 25.5                    | 10.9                    | 36.4                          | 43.5          | -7.1           |
| 216.04         | 25.4                    | 11.0                    | 36.4                          | 46.0          | -9.6           |
| 336.08         | 24.8                    | 16.0                    | 40.8                          | 46.0          | -5.2           |
| 360.04         | 20.8                    | 16.9                    | 37.7                          | 46.0          | -8.3           |
| 384.06         | 24.9                    | 18.5                    | 43.4                          | 46.0          | -2.6           |
| 408.08         | 20.6                    | 19.6                    | 40.2                          | 46.0          | -5.8           |

**Measurement Results (2/2):**

Measured by: Eric Lin

Polar: Horizontal – 3 m

Detector Function: Quasi-Peak

Measurement Results: Passed

Temperature: 26 °C

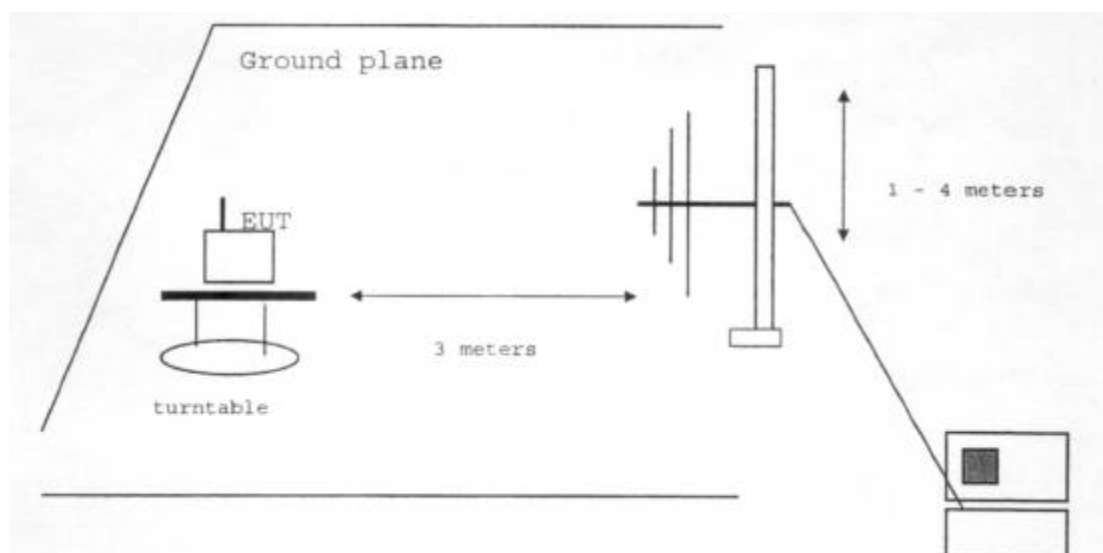
Humidity: 68 % RH

(The chart below shows the highest readings taken from the final data)

| Freq.<br>(MHz) | Raw<br>Data<br>(dBuV/m) | Corr.<br>Factor<br>(dB) | Emiss.<br>Level<br>( dBuV/m ) | Limits | Margin<br>(dB) |
|----------------|-------------------------|-------------------------|-------------------------------|--------|----------------|
| 168.03         | 26.1                    | 10.9                    | 37.0                          | 43.5   | -6.5           |
| 288.05         | 19.0                    | 15.0                    | 34.0                          | 46.0   | -12.0          |
| 360.06         | 24.8                    | 16.9                    | 41.7                          | 46.0   | -4.3           |
| 396.06         | 18.9                    | 19.3                    | 38.2                          | 46.0   | -7.8           |
| 470.30         | 22.2                    | 19.6                    | 41.8                          | 46.0   | -4.2           |
| 480.05         | 17.9                    | 19.7                    | 37.6                          | 46.0   | -8.4           |

### Measurement Procedures

1. The EUT was placed on a metal free table on the outdoor ground plane. The search antenna was placed 3 meter from the EUT. Measurement distance is chosen so that the noise floor of the measurement system is at least 6dB below the specification limits.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.
3. Once maximum direction was determined, the searching antenna was raised and lowered in both vertical and horizontal polarization. The maximum readings so obtained are recorded in the data listed below.
4. General measurement set up drawing.

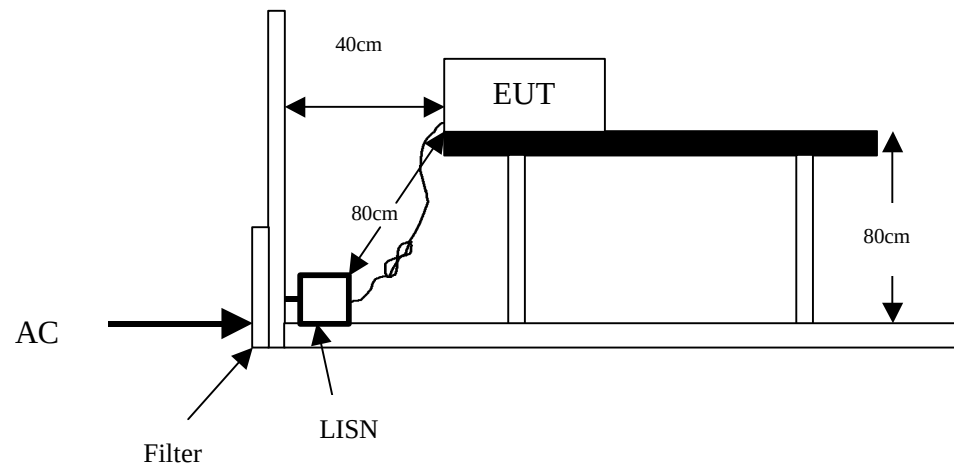


➤ *AC Line Conducted Emissions***Measurement facility used for Conducted Emissions**

| <b>Conducted Emission Test Site # 4</b> |            |                         |                          |                      |                     |
|-----------------------------------------|------------|-------------------------|--------------------------|----------------------|---------------------|
| <b>EQUIPMENT<br/>TYPE</b>               | <b>MFR</b> | <b>MODEL<br/>NUMBER</b> | <b>SERIAL<br/>NUMBER</b> | <b>LAST<br/>CAL.</b> | <b>CAL.<br/>DUE</b> |
| EMI Test Receiver                       | R&S        | ESHS10                  | 843743/015               | 12/10/1999           | 12/09/2000          |
| LISN                                    | EMCO       | 3825/2                  | 9003/1382                | 01/10/2000           | 01/09/2001          |
| LISN                                    | EMCO       | 3825/2                  | 9003-1628                | 07/12/2000           | 07/11/2001          |

**Measurement Procedure**

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a normal hopping mode.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.
3. General measurement set up drawing.



**Measurement Results:** N/A (Since the EUT is Powered with battery Test to 15.207 is not required.)

**THE EMISSION LEVEL IN OPERATING BAND**

As per the requirement of FCC ; 15.227, any emission within this band shall not exceed (100uV/m, 80dBuV/m) at 3 meters.

The measurement procedure and setup are same as radiated emission measurement. The test result as listed at next page.

**Measurement facility used for the emission level in operating band**

| OATS #4           |       |              |               |            |            |
|-------------------|-------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE    | * MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL. DUE   |
| EMI Test Receiver | R&S   | ESHS10       | 843743/015    | 12/10/1999 | 12/09/2000 |
| Loop Antenna      | EMCO  | 6502         | 2356          | 04/20/2000 | 04/19/2001 |

**Measurement Results:**

Measured by: Bob Lin

Polar: Vertical – 3 m

Detector Function: Average/Peak

Measurement Results: Passed

Temperature: 26 °C

Humidity: 70 % RH

(The chart below shows the highest readings taken from the final data)

| Freq.<br>(MHz) | Raw<br>Data<br>(dBuV/m) | Corr.<br>Factor<br>(dB) | Emiss.<br>Level<br>( dBuV/m ) | Limits | Margin     |
|----------------|-------------------------|-------------------------|-------------------------------|--------|------------|
| 27.05908       | 38.3                    | 10.1                    | 48.4                          | 80.0   | -11.6 (Av) |
| 27.05908       | 41.7                    | 10.1                    | 51.8                          | 100.0  | -28.2 (Pk) |

**Measurement Results:**

Measured by: Bob Lin

Polar: Horizontal – 3 m

Detector Function: Average/Peak

Measurement Results: Passed

Temperature: 26 °C

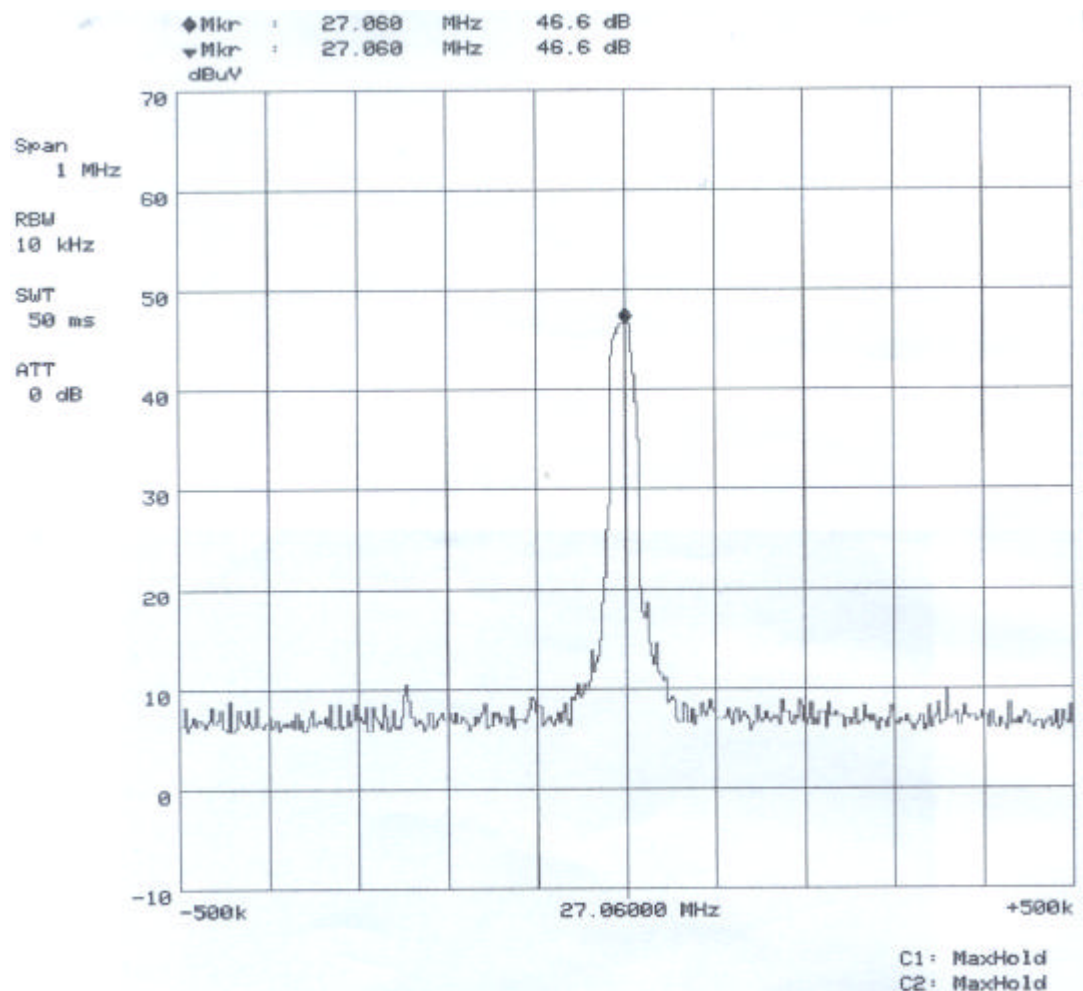
Humidity: 70 % RH

(The chart below shows the highest readings taken from the final data)

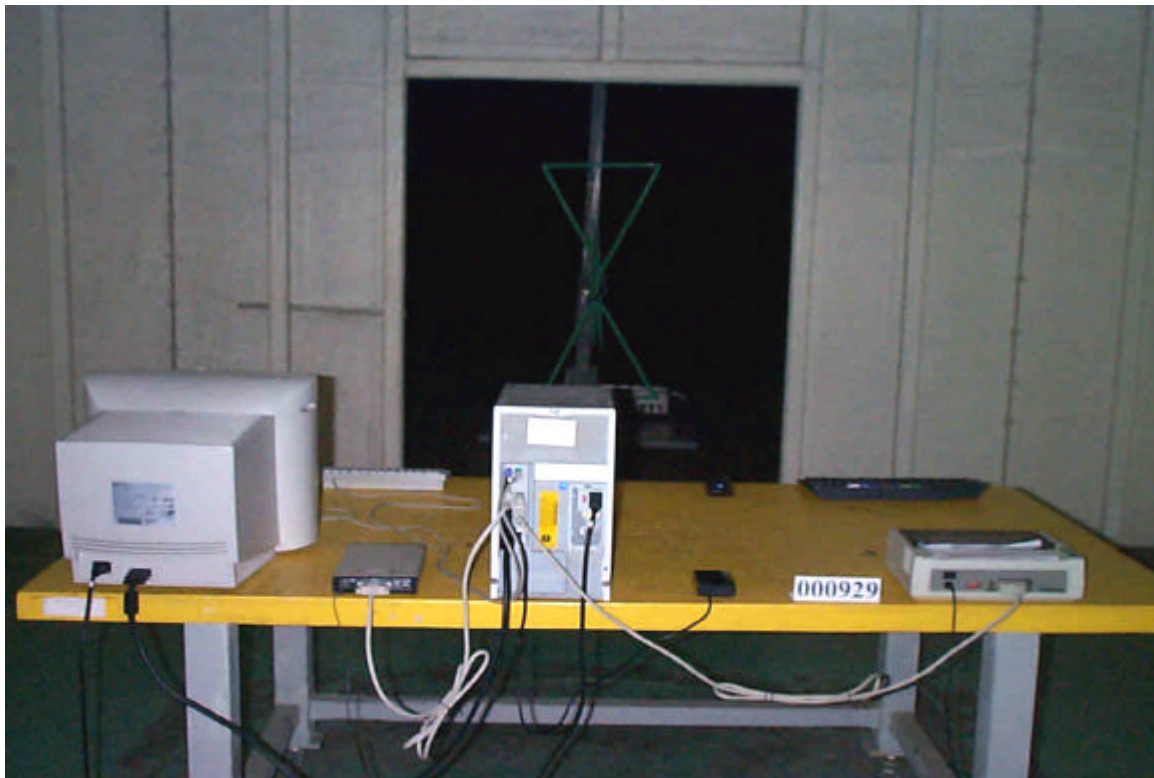
| Freq.<br>(MHz) | Raw<br>Data<br>(dBuV/m) | Corr.<br>Factor<br>(dB) | Emiss.<br>Level<br>( dBuV/m ) | Limits | Margin    |
|----------------|-------------------------|-------------------------|-------------------------------|--------|-----------|
| 27.058         | 38.3                    | 10.1                    | 48.4                          | 80.0   | 47.0 (Av) |
| 27.058         | 41.7                    | 10.1                    | 51.8                          | 100.0  | 50.1 (Pk) |

➤ **OPERATING RANGE VERIFICATION**

The stipulated operating range of FCC §15.227 is 26.96 to 27.28 MHz. The band edge requirement meets the requirement from the spectrum plot shown below.



## 11. RADIATED EMISSION MEASUREMENT SETUP PHOTO



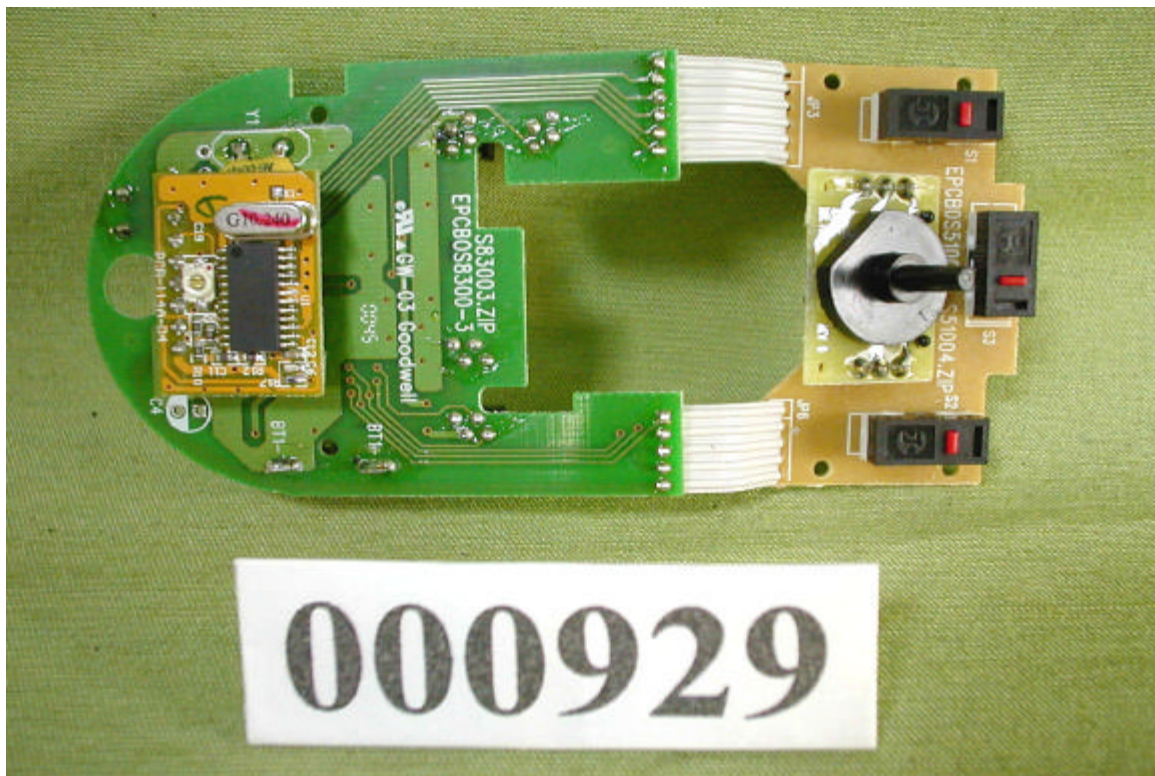
## **12. AC LINE CONDUCTED EMISSION MEASUREMENT SETUP PHOTO**

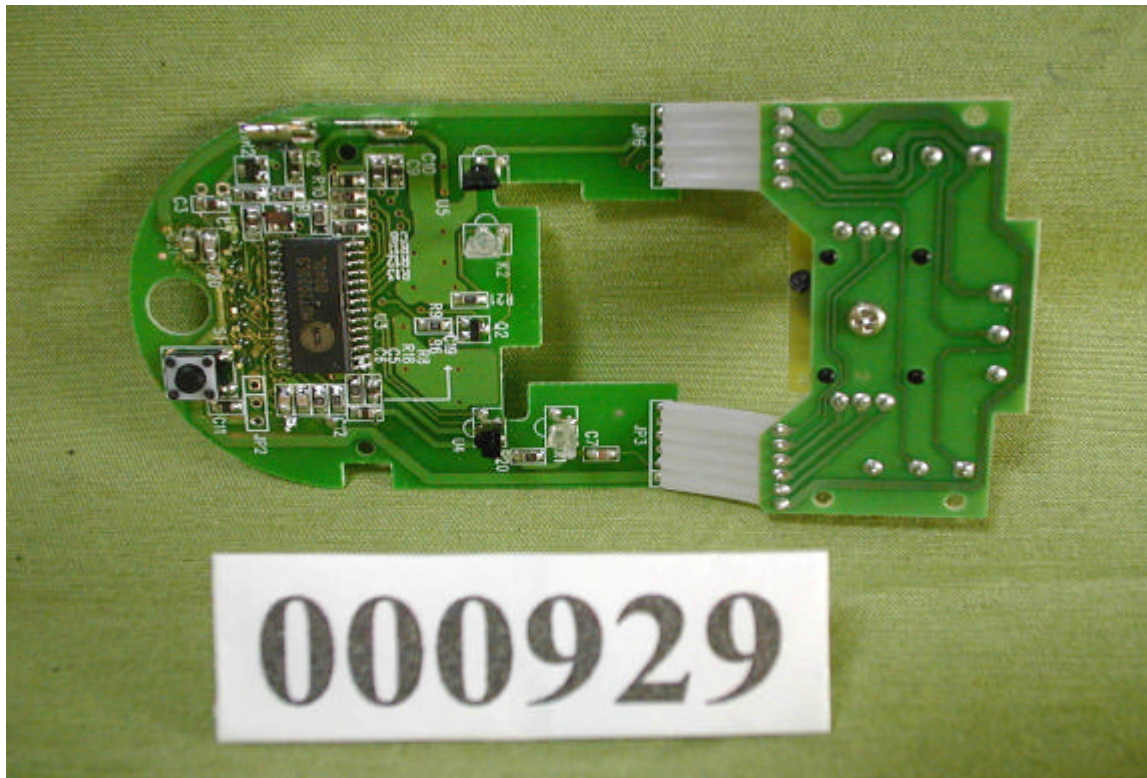
N/A

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INTERNAL







**EXTERNAL**

