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

OF

Wireless Mouse

FCC ID: THNJM_LW850K

MODEL No.: JM-R851K

BRAND NAME: N/A

REPORT NO: SQE05100016

ISSUE DATE: October 23, 2005

Prepared for

SHENZHEN JEEJA ELECTRON INDUSTRIAL CO., LTD
4 JINLONG ROAD, LUOGANG INDUSTRIAL AREA, BUJI TOWN
SHENZHEN, CHINA

Prepared by

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO., LTD

d.b.a.

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO., LTD
HUATONGWEI BUILDING, KEJI RD. 12 S., HIGH-TECH PARK,
NANSHAN DISTRICT, SHENZHEN,
GUANGDONG , P.R.CHINA

TEL: 86-755-26748099
FAX: 86-755-26748089

VERIFICATION OF COMPLIANCE

Applicant:	Shenzhen Jeeja Electron Industrial Co., Ltd 4 Jinlong Road, Luogang Industrial Area, Buji Town, Shenzhen, China
Manufacturer	Shenzhen Jeeja Electron Industrial Co., Ltd 4 Jinlong Road, Luogang Industrial Area, Buji Town, Shenzhen, China
Product Description:	Wireless mouse
Brand Name:	N/A
Model Number:	JM-R851K
Serial Number:	N/A
File Number:	SQE05100016
Date of Test:	October 20, 2005 ~ October 23, 2005

We hereby certify that:

The above equipment was tested by SHENZHEN HUA TONG WEI INTERNATIONAL INSPECTION CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.227.

The test results of this report relate only to the tested sample identified in this report.

Approved By

Jimmy Li / Q.A. Manager
SHENZHEN HUA TONG WEI
INTERNATIONAL INSPECTION CO., LTD

Reviewed By

Jimmy Zhang / Test Engineer
SHENZHEN HUA TONG WEI
INTERNATIONAL INSPECTION CO., LTD

Table of Contents

1. GENERAL INFORMATION 4

1.1 PRODUCT DESCRIPTION 4
1.2 RELATED SUBMITTAL(S) / GRANT (S) 4
1.3 TEST METHODOLOGY 4
1.4 TEST FACILITY 4

2. System Test Configuration 5

2.1 EUT CONFIGURATION 5
2.2 EUT EXERCISE 5
2.3 TEST PROCEDURE 5
2.4 LIMITATION 5
2.5 CONFIGURATION OF TESTED SYSTEM 7

3. Summary Of Test Results 9

4. Description of test modes 9

5. Conducted Emissions Test (Not applicable in this report) 10

5.1 MEASUREMENT PROCEDURE: 10
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 10
5.3 MEASUREMENT EQUIPMENT USED: 10
5.4 MEASUREMENT RESULT: 10
5.5 CONDUCTED MEASUREMENT PHOTOS: 10

6. RADIATED EMISSION TEST 11

6.1 MEASUREMENT PROCEDURE 11
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 12
6.3 MEASUREMENT EQUIPMENT USED: 13
6.4 FIELD STRENGTH CALCULATION 13
6.5 MEASUREMENT RESULT 14
6.6 MEASUREMENT RESULT 15

7. OCCUPIED BANDWIDTH 16

7.1 MEASUREMENT PROCEDURE 16
7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 16
7.3 MEASUREMENT EQUIPMENT USED: 16
7.4 MEASUREMENT RESULTS: 16

APPENDIX 1
PHOTOGRAPHS OF SET UP 18

APPENDIX 2
PHOTOGRAPHS OF EUT 20

1. GENERAL INFORMATION

1.1 Product Description

The EUT is an short range, lower power, wireless mouse designed as an "Input Device". It is designed by way of utilizing the FSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

A). Operation Frequency: 27.045 MHz
B). Modulation: FSK
C). Antenna Designation: Non-User Replaceable (Integrated)
D). Power Supply: DC 3V by battery.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: THNJM_LW850K filing to comply with Section 15.227 of the FCC Part 15, Subpart C Rules. The composite system (receiver) is compliance with Subpart B is authorized under a verification procedure.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The fully anechoic chamber test site and conducted measurement facility used to collect the radiated data is located on the address of SHENZHEN HUA TONG WEI INTERNATIONAL INSPECTION CO., LTD Huatongwei Building, Keji Rd. 12 S., High-tech Park, Nanshan District, Shenzhen, Guangdong, P.R.China

The fully anechoic chamber Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and CISPR 22/EN 55022 requirements.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. System Test Configuration

2.1 EUT Configuration

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

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the TX frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 Limitation

(1) Conducted Emission (Not applicable in this report)

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	**Average**
0.15 to 0.50	**66 to 56**	**56 to 46**
0.50 to 5	**56**	**46**
5 to 30	**60**	**50**

Note
1.The lower limit shall apply at the transition frequencies
2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

(2) Radiated Emission

a. The field strength of any emission within this band (section 15.227 frequency between 26.96MHz –27.28MHz) shall not exceed 10000 micro volts/meter at 3 meters. (80dBμV at 3m) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.
b. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209(Intentional Radiators general limit).as below.

Frequency (MHz)	Field strength μV/m	Distance(m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance o meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ15.205, then the general radiated emission limits in ξ 15.209 apply.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	Wireless Mouse	N/A	JM-R851K	THNJM_LW850K	N/A	***EUT***

3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§ 15.207	Conducted Emission	N/A
§ 15.227	Radiated Emission	Compliant
§ 15.227	26 dB Bandwidth	Compliant

4. Description of test modes

1. The EUT (Wireless mouse) has been tested under normal operating condition.
2. The EUT stays in continuous transmitting mode during test.

5. Conducted Emissions Test (Not applicable in this report)

5.1 Measurement Procedure:

N/A

5.2 Test SET-UP (Block Diagram of Configuration)

N/A

5.3 Measurement Equipment Used:

Conducted Emission Test Site # 3					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS30	100038	2004/11	2005/11
ARTIFICIAL MAINS	ROHDE & SCHWARZ	ESH2-Z5	100028	2004/11	2005/11
PULSE LIMITER	ROHDE & SCHWARZ	ESHSZ2	100044	2004/11	2005/11
EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	N/A	N/A

5.4 Measurement Result:

N/A

5.5 Conducted Measurement Photos:

N/A

6. Radiated Emission Test

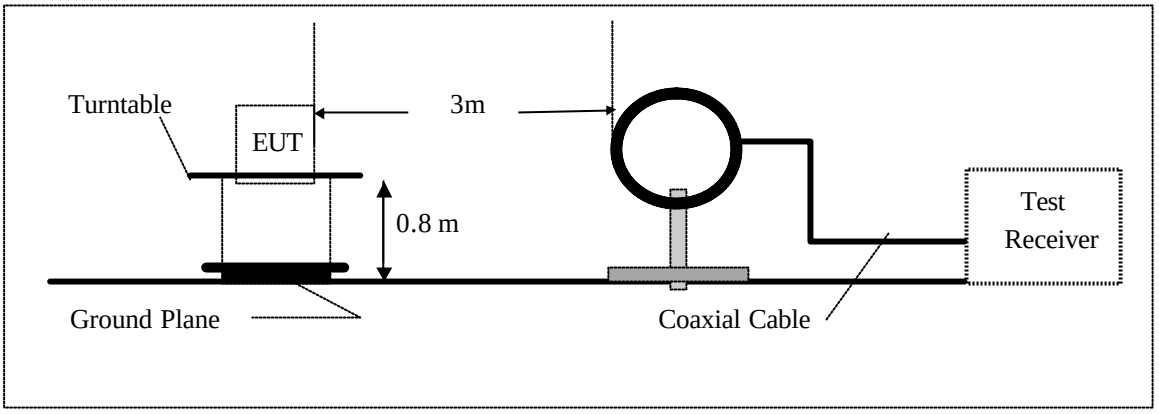
6.1 Measurement Procedure

1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on at least ten highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

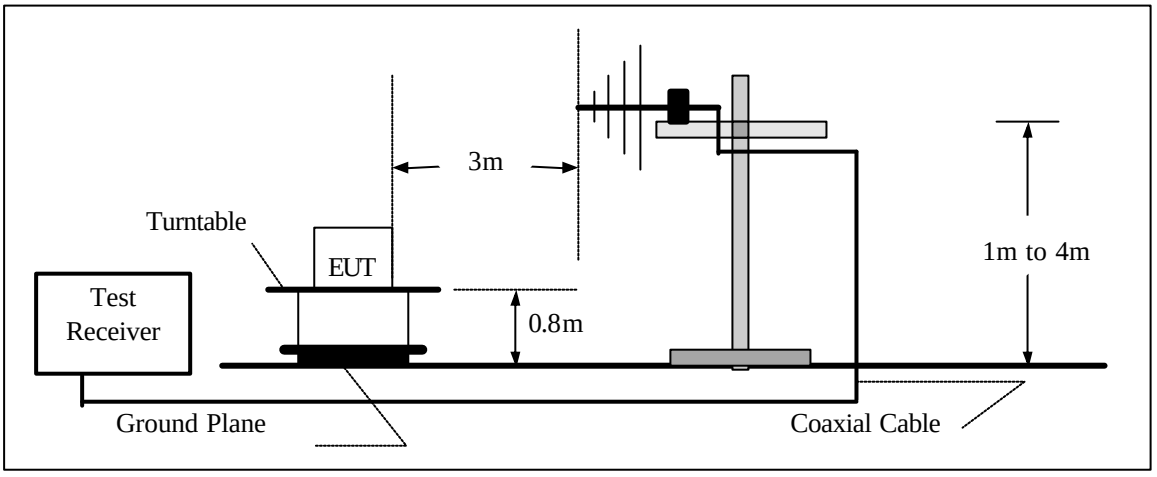
Note:
The EUT (Wireless mouse) has been set to work as normal during test.

6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



6.3 Measurement Equipment Used:

3/5 Anechoic ChamberRadiation Test Site # 4					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2004/11	2005/11
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2004/11	2005/11
RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	N/A	N/A
TURNTABLE	ETS	2088	2149	N/A	N/A
ANTENNA MAST	ETS	2075	2346	N/A	N/A
EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	NA	N/A	N/A

6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

6.5 Measurement Result

Operation Mode:	Transmitting Mode	Test Date :	October 23, 2005
Fundamental Frequency:	27.045 MHz	Test By:	Jimmy Zhang
Temperature :	22 ℃	Pol:	Vertical
Humidity :	54 %		

Judgement : Passed by -17.32 dB at 54.293 MHz Ant.Pol. Ver.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
27.045	V	Peak	42.69	21.20	63.89	80.00	-16.11	F
54.090	V	Peak	14.38	8.30	22.68	40.00	-17.32	H
135.225	V	Peak	11.27	10.14	21.41	43.50	-22.09	H
Others			-					

Remark :

(1) Measuring frequencies from 25 MHz to the 1GHz。

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) Datum of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of EMI Test Receiver between 25MHz to 1GHz was 120KHz.

6.6 Measurement Result

Operation Mode: Transmitting Mode
Fundamental Frequency: 27.045 MHz
Temperature : 22℃
Humidity: 54 %
Test Date : October 23, 2005
Test By: Jimmy
Pol: Horizontal

Judgement: Passed by -20 dB at All Fre. MHz Ant.Pol. Hor.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
27.045	H	Peak	32.33	21.20	53.53	80.00	-26.47	F

Others -

Remark：

(1) Measuring frequencies from 25 MHz to the 1GHz.
(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) Datum of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(5) The IF bandwidth of EMI Test Receiver between 25MHz to 1GHz was 120KHz.

7. Occupied Bandwidth

7.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 1 KHz, Span =100 KHz.
4. Set SPA Max hold. Mark peak, -26dB.

7.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

7.3 Measurement Equipment Used:

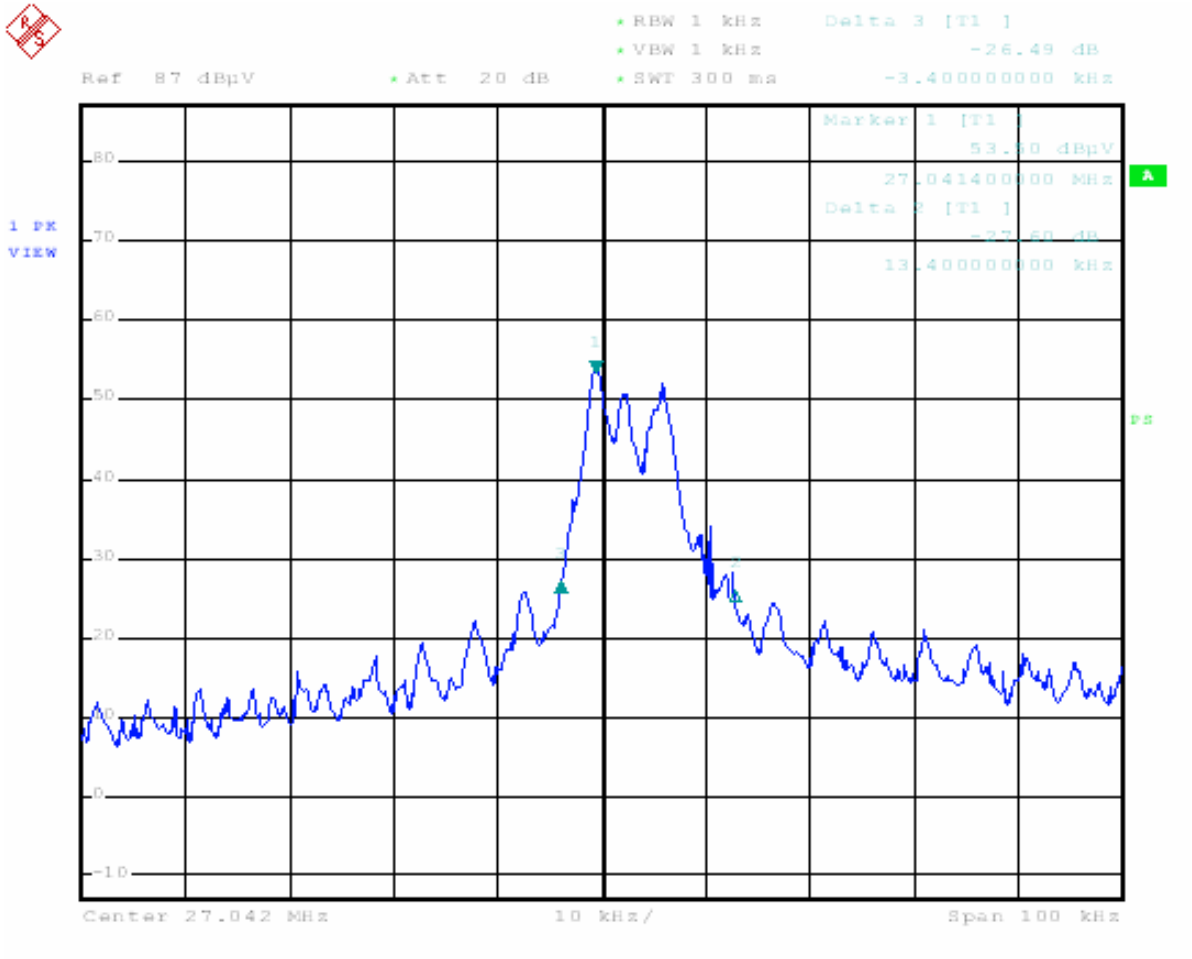
Same as 4.2 Radiated Emission Measurement.

7.4 Measurement Results:

26dB bandwidth = 16.8 KHz

Refer to attached data chart.

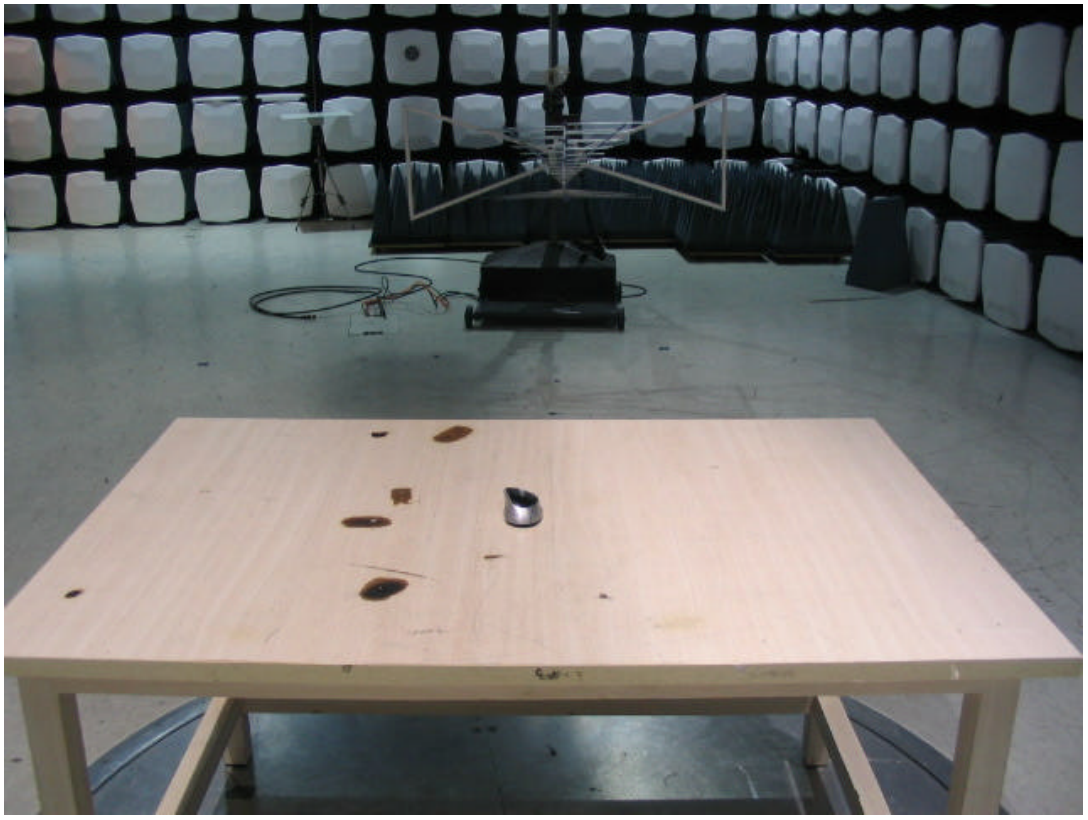
26dB Bandwidth Test Data :



APPENDIX 1

PHOTOGRAPHS OF SET UP

Radiated Emission Setup Photos



APPENDIX 2

PHOTOGRAPHS OF EUT

Top View of TX

Bottom View of TX

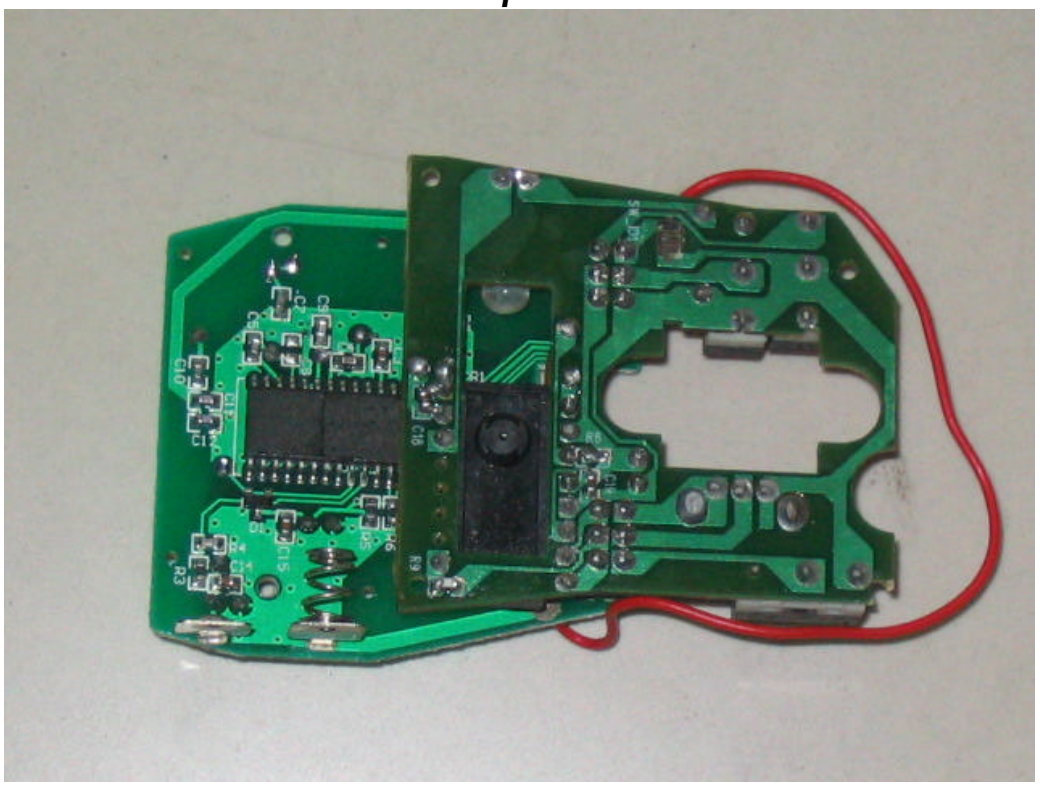
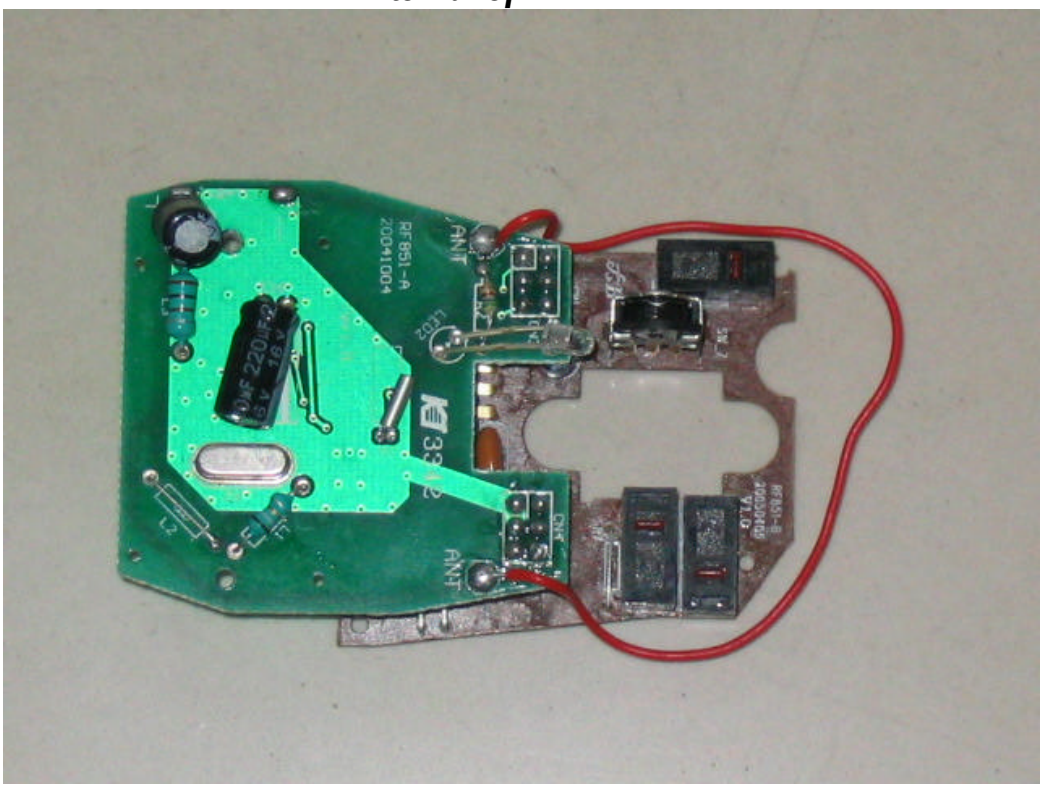
Front View of TX

Back View of TX

Left View of TX

Right View of TX

Internal of TX– 1



Internal of TX– 2