PEP Testing Laboratory
12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

NVLAP LAB CODE: 200097-0

FCC ID TEST REPORT

According to

FCC Part 15 Subpart C, Intentional Radiators

EUT Type **Mi ni RF Optical Mouse**

Transmitter (TX) **1) Model No.: RF-81M**
2) FCC ID: PY9OM85M

Applicant Name: **ELELUX INTERNATIONAL LTD.**

Address **See the General Information for details.**

Test Date : APR. 11, 2004 Issued Date : APR. 19, 2004

Test Engineer : JASON KUNG NVLAP Signature : Peter Kao
Peter Kao / Director

- The test report shall not be reproduced except in full, without the written approval of the "PEP"
- The report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States government.
- This report is applicable only for EUT Model which described in page 4 .
- The testing result in this report are traceable to national or international standard .

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Table of Contents

1. General Information

Measurement of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC Part 2 and 15.

Applicant Name/Address: **ELELUX INTERNATIONAL LTD.**
3F., NO. 103, CHOW TZE STREET, NEI-HU DISTRICT 114, TAIPEI, TAIWAN, R. O. C.

Contact Person: **WINSTON WU / G.M**

Phone No.: **886-2-26272291** **Fax No.:** **886-2-26596726**

Manufacturer Name/Address: **ANDAH ELECTRONICS (SHEN ZHEN) CO., LTD. CHONG QING ROAD, TONG FUYU INDUSTRIAL PARK, FU YONG TOWN, SHEN ZHEN (518103), GUANG DONG, CHINA**

- ✧ Regulation: FCC Part 2 and 15
- ✧ Limitation: Part 15, Section 15.227, 15.207 and 15.209
- ✧ Test Procedure: ANSI C63.4-1992
- ✧ Place of Test: PEP Testing Laboratory
  12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
  Taipei Hsien, Taiwan, R. O. C.
  TEL : 886-2-26922097 FAX : 886-2-26956236

2. Product Information

a.	**EUT Type:**	**Mi ni RF Optical Mouse**
b.	**Transmitter Model:**	**RF-81M**
c.	**TX FCC ID:**	**PY9OM85M**
d.	**TX Channel No.：**	**One**
e.	**TX Working Freq. :**	**27.045 MHz**
f.	**TX Modulation：**	**FSK**
g.	**TX Crystal / Osc.：**	**76.8 KHz, 18.432 MHz, 27.042MHz**
h.	**TX Port(s) ：**	**N/A**
i.	**TX Transmitting Power：**	**DC 3V (1.5V × 2)**
j	**TX Power Supply：**	**Battery(Type AAA)**
j.	**TX Case：**	**ABS**

k. EUT Condition : ☐ **Prototype** ☑ **Engineering** ☐ **Production**

l. EUT Received Date : **APR. 11, 2004**

3. EUT Description and Test Methods

(A) The EUT is Mi ni RF Optical Mouse, FCC ID: PY9OM85M, model RF-81M. The EUT that comes with a scroll wheel and two buttons is optical wireless mouse. DC 3V from two batteries (size AAA, DC 1.5V) is required to operate EUT. The radio frequency of EUT is 27.045MHz. For more detail information about the EUT, please refer to the user's manual.

(B) Test Method: According to the major function designed, the EUT placement on test table was arranged alone to proceed with test. The test was carried out on EUT operational condition of Tx-On mode: continuous transmission state. The worst-case test result of each test mode was recorded and provided in this report.

(C) At the frequencies where the peak values of the emission exceeded the quasi-peak limit, the emissions were also measured with the quasi-peak detectors. The average detector also measured the emission either (A) quasi-peak values were under quasi-peak limit but exceeded average limit, or (B) peak values were under quasi-peak limit but exceeded average limit.

4. Modification(s):

N/A

5. Test Software Used

N/A

6. Support Equipment Used

N/A

7. Description of Conducted Emissions Test

7.1 Conducted Emissions

A 1m x1.5m wooden table 80 cm high is placed 40cm away from the vertical wall. Two AMN are bonded to the grounding plane. The EUT is powered from the designated AMN and the support equipment is powered from another designated AMN. Powers to the AMN are filtered by a high-current high insertion loss power line filters. All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2". All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the AMN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.

The spectrum was scanned from 150kHz to 30 MHz with1.5 sec sweep time. The frequency producing the maximum level was re-examined using Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode. The bandwidth of the receiver was set to 10kHz. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission.

7.2 Conducted Emissions Limits

Frequency	Maximum RF Line Voltage dB(uV)			
	Class A		Class B	
MHz	QUASI-PEAK	AVERAGE	QUASI-PEAK	AVERAGE
0.15 - 0.50	79	66	66-56	56-46
0.50 - 5.0	73	60	56	46
5.0 - 30	73	60	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

8. Description of Radiated Emissions Test

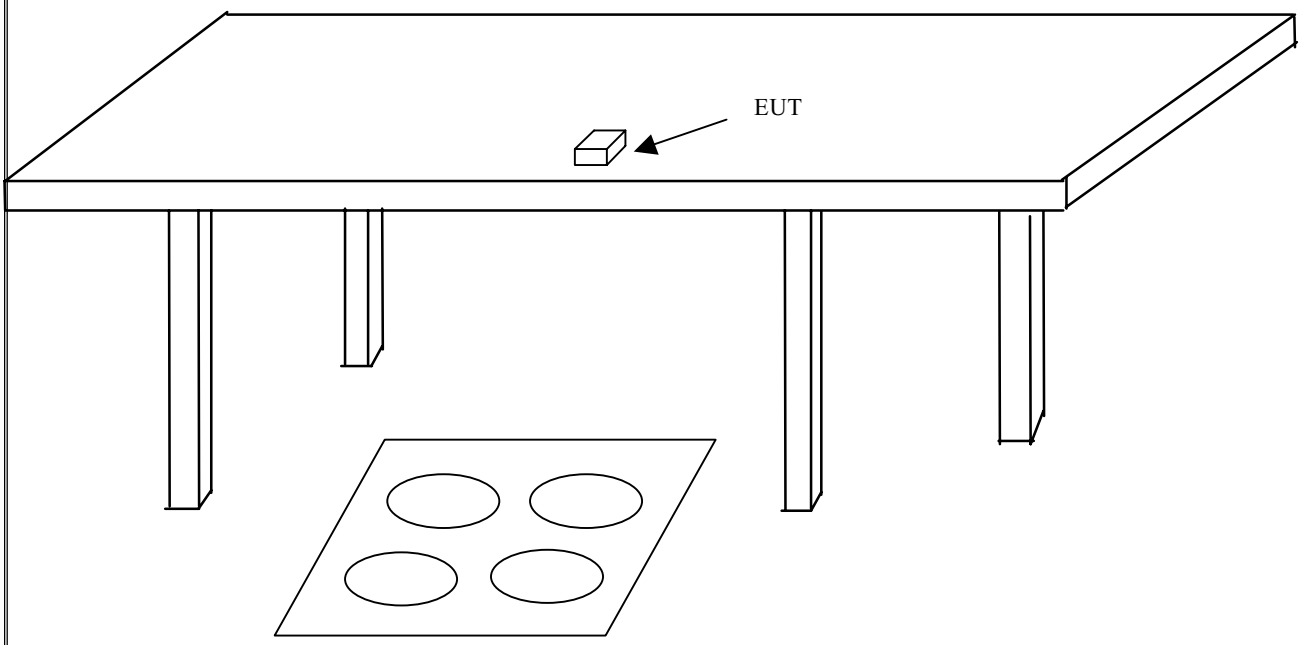
8.1 Radiated Emissions

Preliminary measurements were made indoors chamber at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using logbicon antenna. Above 1GHz, linearly polarized double ridge horn antenna was used.

Final measurements were made outdoors at 3-meter test range using logbicon antenna and horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz.

The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet , if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in radiated emission test photo.

8.2 Test Configuration



8.3 Radiated Emission Limits

Limits for radiated disturbance of
Class B ITE or Intentional Radiator
At a measuring distance of 3 m

Frequency MHz	Field Strength dB(μV/m) or uV/m	
30 to 88	40	100
88 to 216	43.5	150
216 to 960	46	200
Above 960	56	500

NOTES
1 The lower limit shall apply at the transition frequency.
2 Additional provisions may be required for cases where interference occurs.

9. Conducted Emissions Test Setup Photos

N/A

10. Conducted Emissions Test Data

The EUT is supplied by DC power source from batteries. The conducted powerline test is not applicable to EUT.

11. Radiated Emissions Test Setup Photos

< FRONT VIEW >

< REAR VIEW >

12. Radiated Emissions Test Data

Model No. : RF-81M
Frequency range : 30MHz to 1GHz Detector : Quasi-Peak Value
Frequency range : above 1GHz Detector : Quasi-Peak/Average Value
Temperature : 28° C Humidity : 54 %
Memo : TX ON MODE

Antenna polarization : HORIZONTAL ; Test distance : 3m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
27.045	55.19	-24.81	80.00	52.84	2.35	0.62	20.00	150.0	4.0
135.207	35.25	- 8.25	43.50	45.36	8.46	1.14	19.71	139.0	4.0
162.287	33.36	-10.14	43.50	42.10	9.57	1.30	19.61	217.0	4.0
189.291	38.47	- 5.03	43.50	46.39	10.19	1.39	19.50	97.0	4.0
216.381	28.88	-17.12	46.00	35.60	11.15	1.50	19.37	285.0	4.0
351.584	31.25	-14.75	46.00	33.06	15.43	2.05	19.29	312.0	3.5
405.674	34.95	-11.05	46.00	36.13	16.32	2.13	19.63	154.0	3.5

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

Model No. : RF-81M
Frequency range : 30MHz to 1GHz **Detector : Quasi-Peak Value**
Frequency range : above 1GHz **Detector : Quasi-Peak/Average Value**
Temperature : 28° C **Humidity : 54 %**
Memo : TX ON MODE

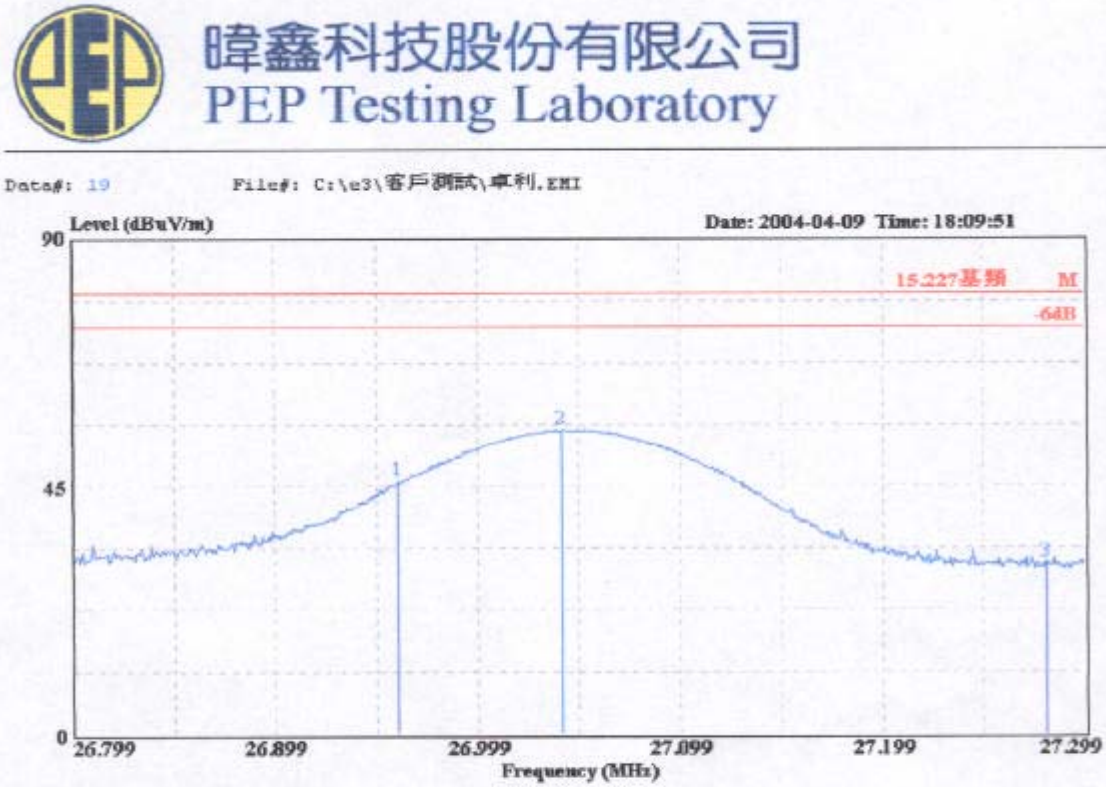
Antenna polarization : VERTICAL ; Test distance : 3m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
27.045	55.26	-24.74	80.00	52.91	2.35	0.62	20.00	155.0	4.0
135.209	32.96	-10.54	43.50	43.07	8.46	1.14	19.71	216.0	1.0
243.389	38.39	- 7.61	46.00	44.00	12.31	1.57	19.49	172.0	1.0
351.584	40.73	- 5.27	46.00	42.54	15.43	2.05	19.29	309.0	1.5
405.690	39.12	- 6.88	46.00	40.30	16.32	2.13	19.63	254.0	1.5
459.780	37.86	- 8.14	46.00	37.91	17.26	2.35	19.66	123.0	1.5
622.050	36.21	- 9.79	46.00	31.91	21.08	2.62	19.40	85.0	1.5

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

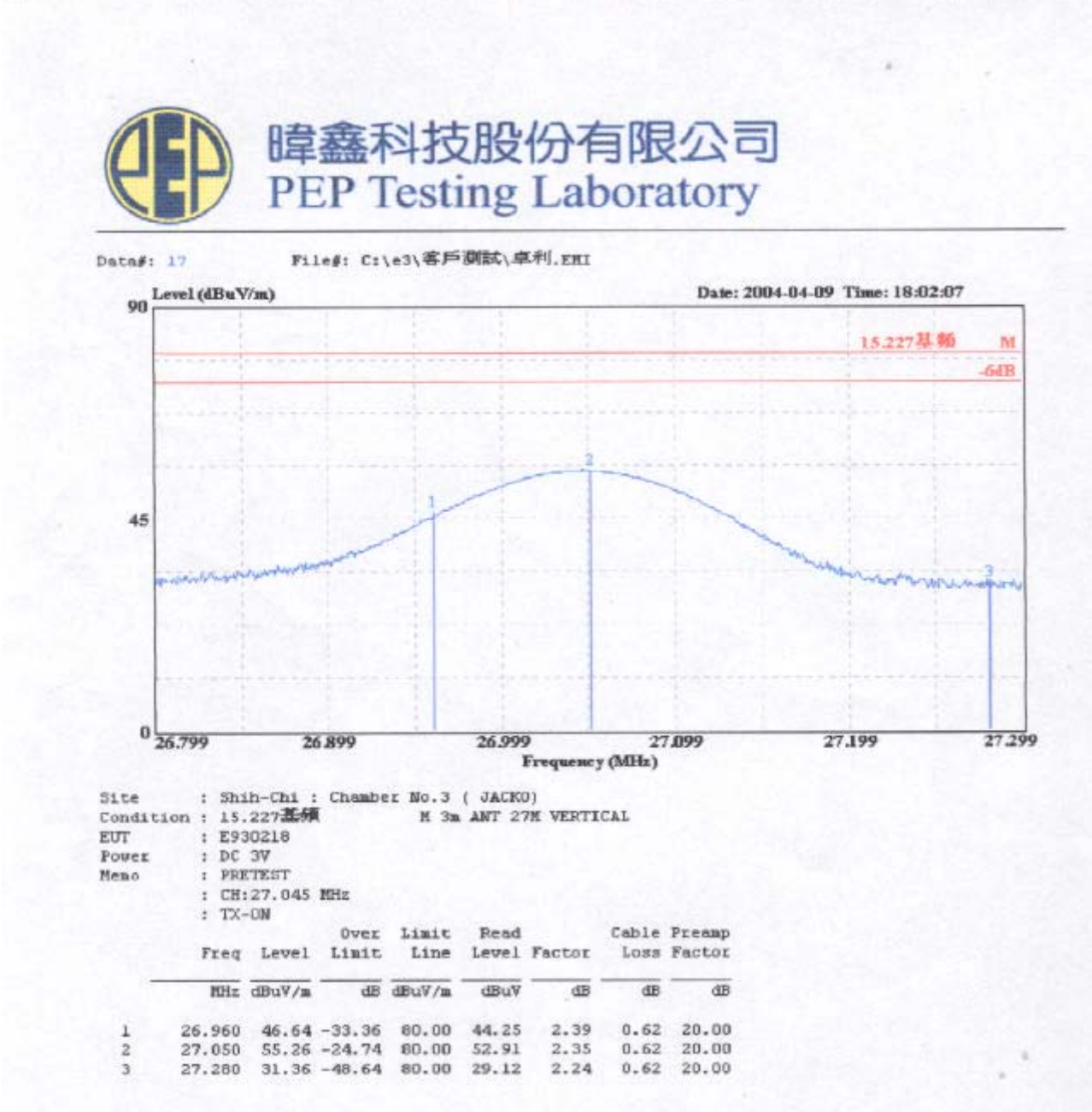
13. Occupied Bandwidth Plot Data



Site : Shih-Chi : Chamber No.3 (JACK0)
Condition : 15.227基頻 M 3m ANT 27M HORIZONTAL
EUT : E930218
Power : DC 3V
Memo : PRETEST
: CH:27.045 MHz
: TX-ON

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Cable Loss	Preamp Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB
1	26.960	46.24	-33.76	80.00	43.85	2.39	0.62	20.00
2	27.040	55.19	-24.81	80.00	52.84	2.35	0.62	20.00
3	27.280	30.98	-49.02	80.00	26.74	2.24	0.62	20.00

RBW = 120 KHz
VBW = 300 KHz



Site : Shih-Chi : Chamber No.3 (JACKU)
Condition : 15.227基頻 M 3m ANT 27M VERTICAL
EUT : E930218
Power : DC 3V
Memo : PRETEST
: CH:27.045 MHz
: TX-ON

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Cable Loss	Preamp Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB
1	26.960	46.64	-33.36	80.00	44.25	2.39	0.62	20.00
2	27.050	55.26	-24.74	80.00	52.91	2.35	0.62	20.00
3	27.280	31.36	-48.64	80.00	29.12	2.24	0.62	20.00

RBW = 120 KHz
VBW = 300 KHz

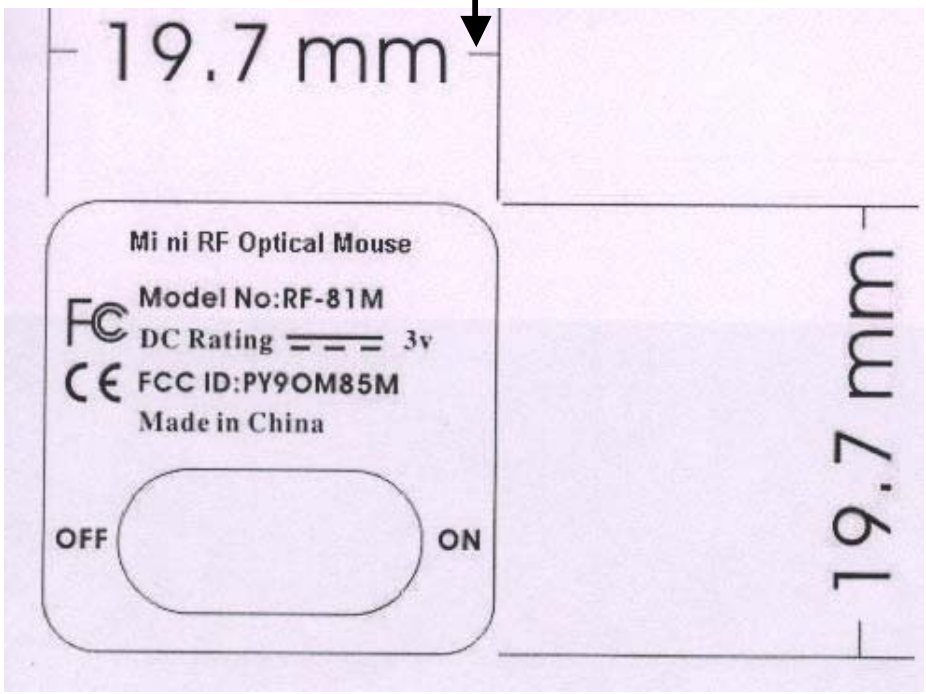
14. List of Measured Instruments

Test Mode	Instrument	Model No.	Serial No.	Next Cal. Date	Cal. Interval
Radiation (OP No.1)	R & S Receiver	ESVS30	863342/012	May 22, 2004	1Year
	Schaffner Pre-amplifier	CPA9232	1028	May 20, 2004	1Year
	COM-Power Horn Ant.	AH-118 (1GHz~18GHz)	10095	May 21, 2005	2Year
	Schwarzbeck Precision Dipole Ant	VHAP (30MHz~1GHz)	970 + 971 953 + 954	June 26, 2006	3Year
	R &S Signal Generator	SMY01	841104/037	Apr. 29, 2005	2Year
	RF Cable	No. 1	N/A	May 11, 2004	1Year
	EMCO Antenna	3142B (26MHz~2GHz)	9904-1370	Aug. 24, 2004	1Year
Chamber **(No. 3)**	Spectrum Analyzer	FSP 3GHz	833387/010	Aug. 30, 2004	1Year
	Pre-Amplifier	CPA-9232	1027	Feb. 24, 2005	1Year
	Antenna	VULB9160	3074	July 24, 2004	1Year
	Signal Generator	SMY02	829846/0358	Jan. 29, 2005	2Year
	RF Cable	NO.3	N/A	Feb. 19, 2005	1Year
	HORN ANTENNA	AH-118	10095	July 24, 2004	1Year

15. FCC ID Label Sample

The sample label shown below shall be permanently affixed at a conspicuous location on the device, instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practicable, only the trade name, model number, and the FCC logo must be displayed on the device per Section §15.19 (b)(2).

EUT Label



16. Information To The User

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver .
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected .
- Consult the dealer or an experienced radio / TV technician for help .

17. EUT External Photos

PHOTO. 1. EUT (TX) FRONT VIEW

PHOTO. 2. EUT (TX) REAR VIEW

18. EUT Internal Photos

PHOTO. 3. EUT (TX) INSIDE VIEW

PHOTO. 4. EUT (TX) INSIDE VIEW

PHOTO. 5. **EUT (TX) COMPONENT SIDE VIEW**

PHOTO. 6. **EUT (TX) SOLDERING SIDE VIEW**