FCC TEST REPORT

REPORT NO.: RF90050903
MODEL NO.: 1410 U/P
RECEIVED: May 9, 2001
TESTED: May 30 ~ June 1, 2001

APPLICANT: Chic Technology Corporation

ADDRESS: 16F, No.150, Chien-I Road, Chung Ho, Taipei, Taiwan,R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.

0528

Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT :	RF Wireless Optical Mouse (Transmitter part)
BRAND NAME :	Chic
MODEL NO :	1410 U/P
APPLICANT :	Chic Technology Corporation
STANDARDS :	47 CFR Part 15, Subpart C, ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from May 30, 2001 to June 1, 2001. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

TESTED BY: Gary Chang (Gary Chang) , **DATE:** June 8, 2001

CHECKED BY: Demi Chen (Demi Chen) , **DATE:** June 8, 2001

APPROVED BY: (Harris W. Lai) , **DATE:** June 8, 2001

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
STANDARD PARAGRAPH	**TEST TYPE**	**RESULT**	**REMARK**
15.107	Conducted Emission Test	N/A	Minimum passing margin is –6.21dBuV at 0.50100MHz
15.227	Radiated Emission Test	PASS	Minimum passing margin is –2.8dBuV at 54.65MHz

NOTE: The receiver part to communicate with the EUT has been verified to comply with FCC Part 15, Subpart B, Class B (DoC). The test report can be provided upon request.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	RF Wireless Optical Mouse (Transmitter part)
MODEL NO.	1410 U/P
POWER SUPPLY	3VDC from battery (1.5V x 2) for transmitter 6VDC from adapter for charged mode of transmitter
MODULATION TYPE	FSK
FREQUENCY RANGE	NA
CARRIER FREQUENCY OF EACH CHANNEL	27.045MHz, 27.095MHz
BANDWIDTH OF EACH CHANNEL	NA
NUMBER OF CHANNEL	2
ANTENNA TYPE	Printed Antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT is the transmitter part of a RF Wireless Optical Mouse. It is designed to support re-chargeable batteries use.
2. There were two kinds of power supply as below for EUT.
   Mode 2 was chosen for final test as it has worse emission.

Mode	1	2
Power Supply	Battery	Power Adapter

The power adapter below was used for the test and it can be kept working while the batteries in EUT are charged.

Model Name :	RGD-3506003
Input Power :	120V 60Hz
Output Power :	6VDC 200mA

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

3.2 DESCRIPTION OF TEST MODES

Two channels are provided in this EUT.

Channel	Frequency	Channel	Frequency
1	27.045 MHz		
2	27.145 MHz		

NOTE: The channel 1, worst case one, was chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is the transmitter part of a RF Wireless Optical Mouse. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C

ANSI C63.4-1992

All tests have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

NA

4 TEST PROCEDURE AND RESULT

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.45 – 30	48	-	48	-

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 6, 2001
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 9, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 28, 2001
ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 3, 2001
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 9, 2001
Software	Cond-V2e	NA	NA
RF cable (JYEBAO)	RG-58A/U	Cable-C02.01	July 9, 2001
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

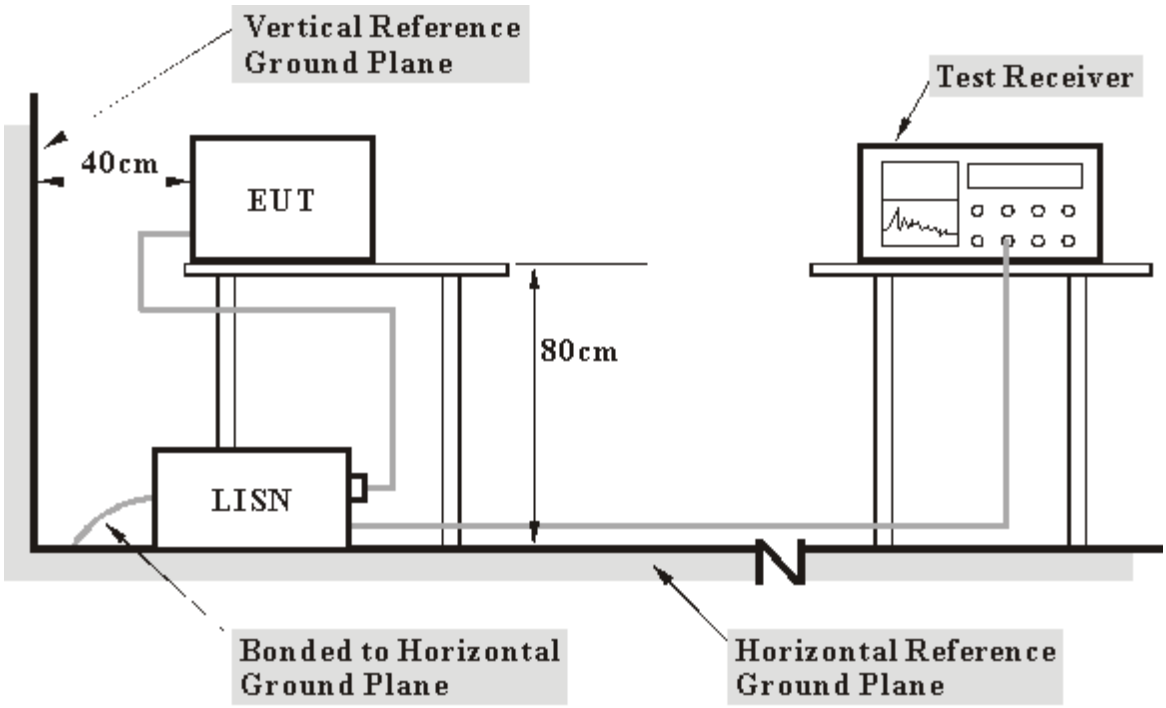
4.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported.

4.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item in this test report - Photographs of the Test Configuration.

4.1.5 EUT OPERATING CONDITION

The EUT was set to enable EUT under transmission condition continuously at specific channel frequency.

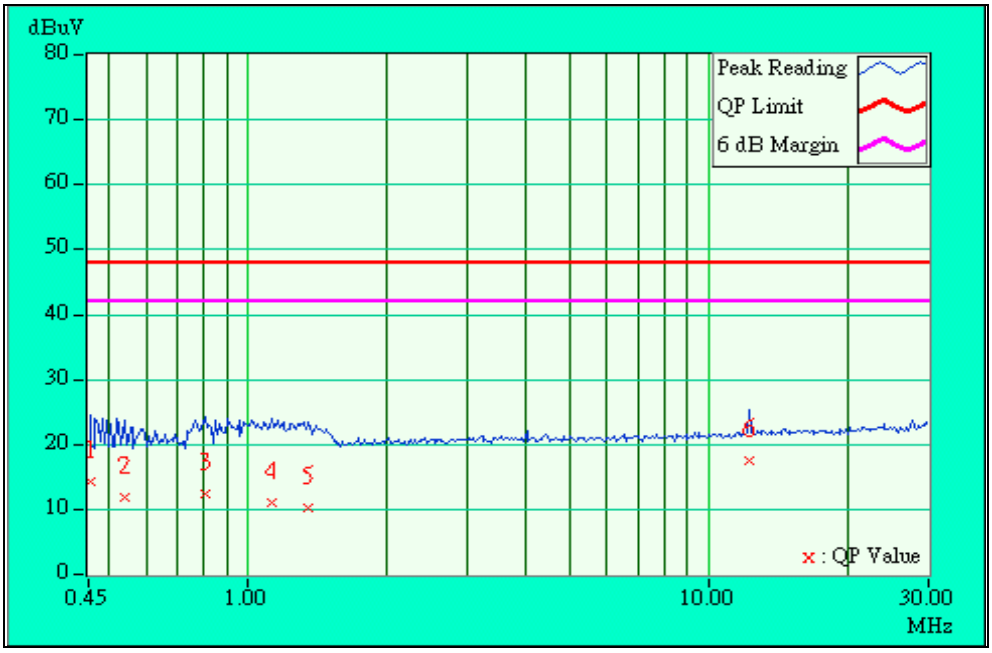
4.1.6 TEST RESULT

EUT	RF Wireless Optical Mouse (Transmitter part)	**MODEL**	1410 U/P
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.45300	0.20	14.28	---	14.48	---	48.00	---	-33.52	---
2	0.53700	0.20	11.80	---	12.00	---	48.00	---	-36.00	---
3	0.81000	0.20	12.45	---	12.65	---	48.00	---	-35.35	---
4	1.12500	0.20	11.09	---	11.29	---	48.00	---	-36.71	---
5	1.34700	0.20	10.21	---	10.41	---	48.00	---	-37.59	---
6	12.25400	0.84	17.41	---	18.25	---	48.00	---	-29.75	---

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

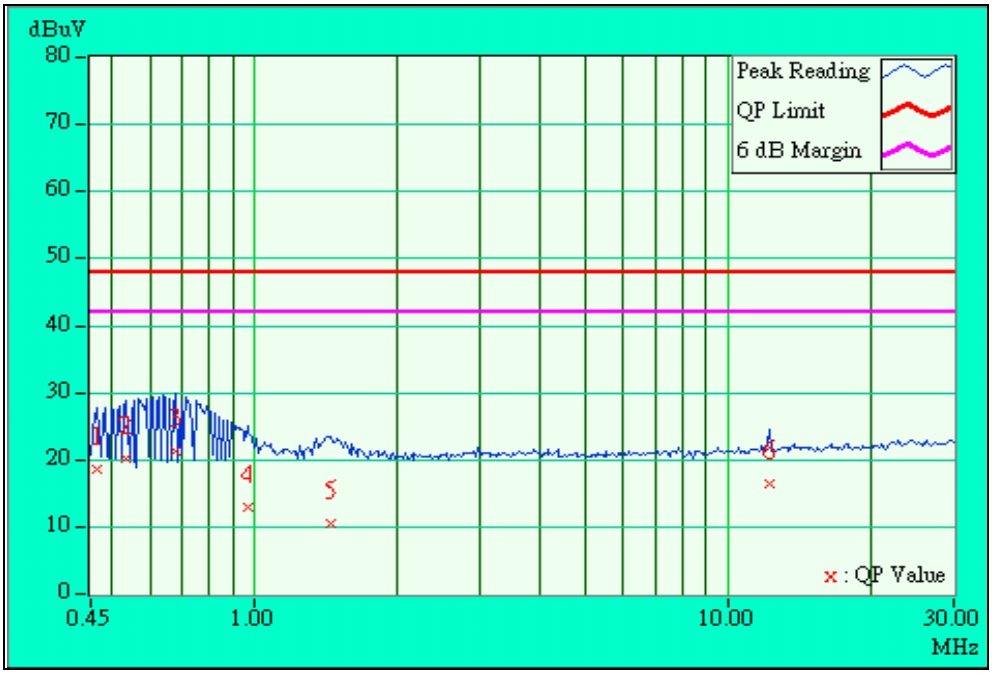


EUT	RF Wireless Optical Mouse (Transmitter part)	**MODEL**	1410 U/P
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.46200	0.20	18.51	---	18.71	---	48.00	---	-29.29	---
2	0.53400	0.20	20.07	---	20.27	---	48.00	---	-27.73	---
3	0.68100	0.20	21.15	---	21.35	---	48.00	---	-26.65	---
4	0.96300	0.20	12.90	---	13.10	---	48.00	---	-34.90	---
5	1.44600	0.20	10.55	---	10.75	---	48.00	---	-37.25	---
6	12.25400	0.74	16.31	---	17.05	---	48.00	---	-30.95	---

NOTE:

6. QP. and AV. are abbreviations of quasi-peak and average individually.
7. "-": NA
8. The emission levels of other frequencies were very low against the limit.
9. Margin value = Emission level - Limit value
10. Emission Level = Reading Value + Correction Factor.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.227 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m)	
26.96-27.28	Peak	Average
	100	80

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Other Frequencies (MHz)	Field Strength of Fundamental	
	uV/meter	dBuV/meter
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8590L	3544A01176	April 18, 2001
HP Preamplifier	8447D	2944A08485	April 26, 2001
* HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 4, 2001
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 4, 2001
Open Field Test Site	Site 5	ADT-R05	July 28, 2001
Site Registration No.	FCC: 90422 VCCI : R-1039 Canada IC: IC 3789-5		

NOTE:

1. "*" = These equipments are used for the final measurement.
2. The preamplifiers are not used while R&S receiver is doing the measurements.
3. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
4. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.2.3 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

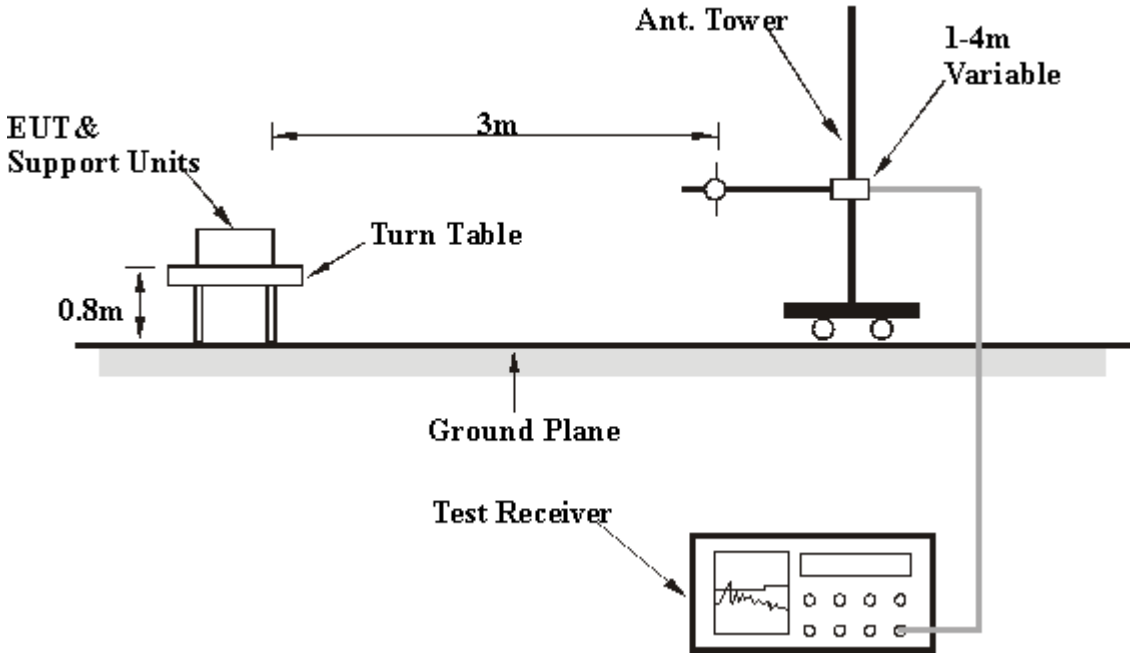
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 TEST SETUP



For the actual test configuration, please refer to the related item in this test report - Photographs of the Test Configuration.

4.2.5 EUT OPERATING CONDITION

Same as 4.1.5

4.2.6 TEST RESULT

EUT	RF Wireless Optical Mouse (Transmitter Part)	**MODEL**	1410 U/P
MODE	Channel 1	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak / Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*27.09	40.5 PK	100.00	-59.50	1.00H	18	58.68	6.80	2.03	27.00	18.18
2	*27.09	34.1 AV	80.00	-45.90	1.00H	18	25.30	6.80	2.03	0.00	-8.83
3	54.68	24.9 QP	40.00	-15.10	1.00H	346	16.80	6.02	2.08	0.00	-8.11
4	108.50	28.7 QP	43.50	-14.80	1.00H	141	15.60	10.80	2.31	0.00	-13.12
5	135.68	31.6 QP	43.50	-11.90	1.00H	90	18.20	10.84	2.55	0.00	-13.39
6	189.42	28.4 QP	43.50	-15.10	1.00H	42	17.20	8.51	2.73	0.00	-11.25
7	216.45	28.1 QP	46.00	-17.90	1.00H	38	15.80	9.43	2.82	0.00	-12.26
8	325.68	31.2 QP	46.00	-14.80	2.18H	29	14.80	13.20	3.24	0.00	-16.44

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. " * " : Fundamental frequency

EUT	RF Wireless Optical Mouse (Transmitter Part)	**MODEL**	1410 U/P
MODE	Channel 1	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	110Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak / Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Gary Chang	

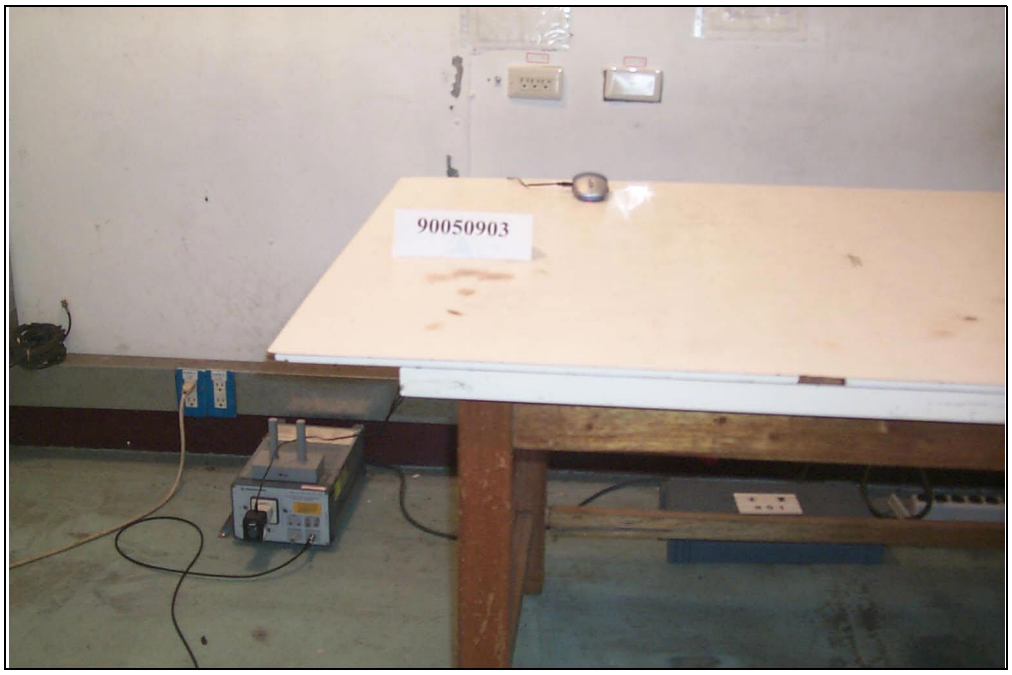
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*27.00	42.4 PK	100.00	-57.60	1.00V	352	60.58	6.80	2.03	27.00	18.17
2	*27.15	35.8 AV	80.00	-44.20	1.00V	352	27.00	6.80	2.03	0.00	-8.83
3	54.65	37.2 QP	40.00	-2.80	1.20V	204	29.10	6.02	2.08	0.00	-8.11
4	108.35	34.1 QP	43.50	-9.40	1.20V	204	21.00	10.80	2.31	0.00	-13.12
5	135.56	29.1 QP	43.50	-14.40	1.00V	28	15.70	10.84	2.55	0.00	-13.39
6	189.74	27.0 QP	43.50	-16.50	1.00V	97	15.80	8.51	2.73	0.00	-11.25
7	216.45	25.8 QP	46.00	-20.20	1.00V	149	13.50	9.43	2.82	0.00	-12.25
8	540.65	30.2 QP	46.00	-15.80	1.00V	154	9.50	17.07	3.67	0.00	-20.74

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. " * " : Fundamental frequency

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUATED EMISSION TEST



RADIATED EMISSION TEST

6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
R.O.C.	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

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Lin Kou Safety Lab:
Tel: 886-2-26093195
Fax: 886-2-26093184

Lin Kou RF&Telecom Lab:
Tel: 886-3-3270910
Fax: 886-3-3270892

Email: service@mail.adt.com.tw
Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.