FCC TEST REPORT

CATEGORY	:	Portable
PRODUCT NAME	:	Wireless Optical Mouse
FCC ID.	:	IOWRMO378UP
FILING TYPE	:	Certification
BRAND NAME	:	Chic
MODEL NAME	:	RMO378; 97990
APPLICANT	:	**Chic Technology Corp.** 16F, No. 150, Chien-1 Road, 235 Chung Ho City, Taipei Hsien, Taiwan, R.O.C.
MANUFACTURER	:	**Chic Technology Corp.** Xiwang Industrial Park, Tian Tang Wei, Feng Gang, Dongguan, Guangdong, China.
ISSUED BY	:	**SPORTON INTERNATIONAL INC.** 6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

Statements:

The test result in this report refers exclusively to the presented test model / sample.
Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

Certificate or Test Report could not be used by the applicant to claim the product endorsement by NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.

Lab Code: 200079-0

Table of Contents

History of this test report

Original Report Issue Date: Sep. 22, 2005

Report No.: FR590805

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

with

47 CFR FCC Part 15 Subpart C (Section 15.227)

PRODUCT NAME	:	Wireless Optical Mouse
BRAND NAME	:	Chic
MODEL NAME	:	RMO378; 97990
APPLICANT	:	**Chic Technology Corp.** 16F, No. 150, Chien-1 Road, 235 Chung Ho City, Taipei Hsien, Taiwan, R.O.C.
MANUFACTURER	:	**Chic Technology Corp.** Xiwang Industrial Park, Tian Tang Wei, Feng Gang, Dongguan, Guangdong, China.

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 - 2003 and all test are performed according to 47 CFR FCC Part 15. Testing was carried out on Sep. 19, 2005 at SPORTON International Inc. LAB.

Wayne Hsu / Supervisor
Sporton International Inc.

1. General Description of Equipment under Test

1.1. Applicant

Chic Technology Corp.
16F, No. 150, Chien-1 Road, 235 Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

1.2. Manufacturer

Chic Technology Corp.
Xiwang Industrial Park, Tian Tang Wei, Feng Gang, Dongguan, Guangdong, China.

1.3. Basic Description of Equipment under Test

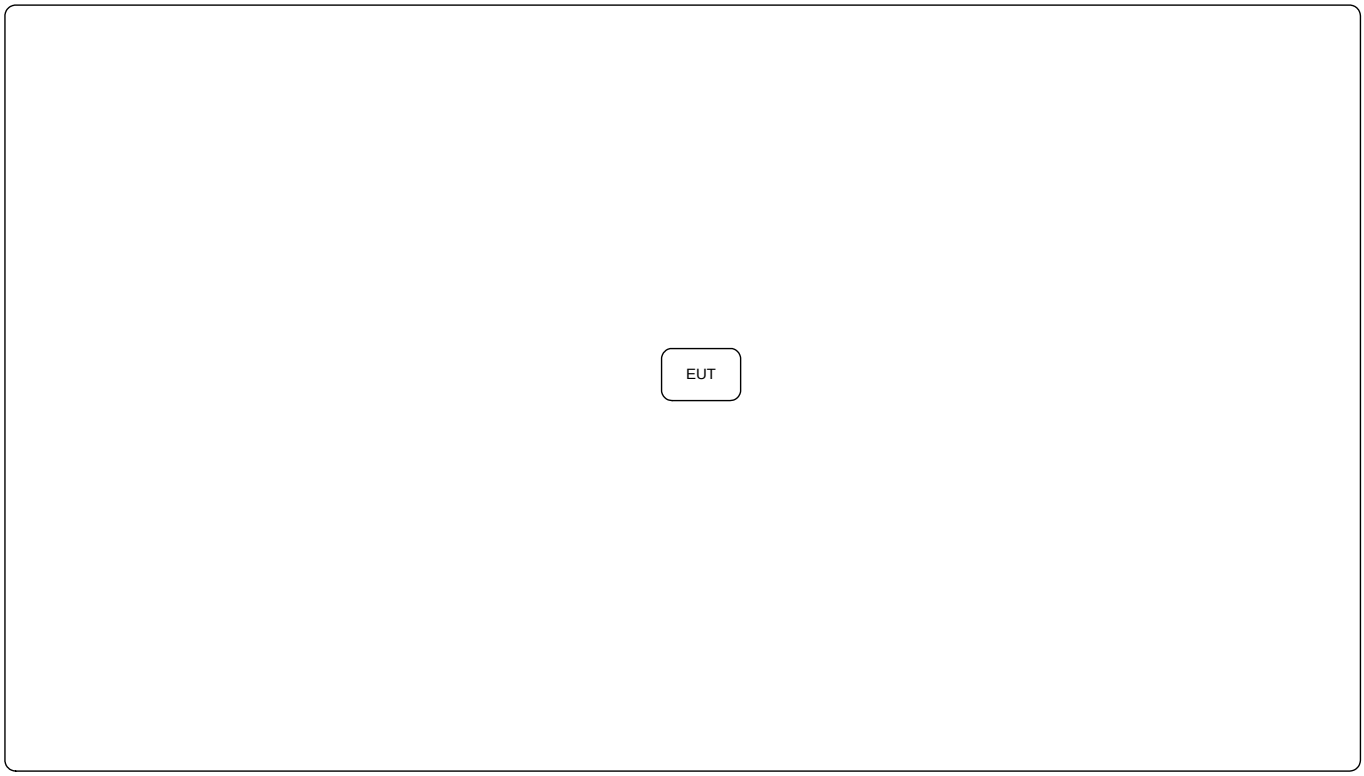
This product is a wireless optical mouse with FSK modulation solution. The radio technical data has been listed on section " Features of Equipment under Test ". This report is for the transmitter part only.

1.4. Features of Equipment under Test

Items	Description
Type of Modulation	FSK
Number of Channels	1
Channel Width	50KHz
Carrier Frequency	27MHz
Antenna Type / Gain	Integrated Antenna / 1dBi
Testing Duty Cycle	100.00%
Power Rating (DC/AC, Voltage)	3V dc from Battery
Temperature Range (Operating)	0 ~ 40 ℃

2. Test Configuration of the Equipment under Test

2.1. Connection Diagram of Test System



2.2. The Test Mode Description

1. The used peripherals as well as the configuration fulfill the requirements of ANSI C63.4:2003. The configuration is operated in a manner which tends to maximize its emission characteristics in a typical application.
2. 3 meters measurement distance was used in this test.

2.3. Description of Test Supporting Units

The EUT was tested alone.

3. General Information of Test

3.1. Test Facility

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
: TEL 886-3-327-3456
: FAX 886-3-318-0055

Test Site No : 03CH03-HY

3.2. Test Conditions

Normal Voltage : 3V dc from Battery
Normal Temperature : 20℃

3.3. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.
ANSI C63.4-2003
47 CFR Part 15 Subpart C (Section 15.227)

3.4. Frequency Range Investigated

Radiated emission test: from 30 MHz to 10th carrier harmonic.

3.5. Test Distance

The test distance of radiated emission (30MHz~1GHz) test from antenna to EUT is 3 M.

3.6. Test Software

During testing, there is no supporting test software.

4. List of Measurements

4.1. Summary of the Test Results

Applied Standard: 47CFR FCC Part 15 Subpart C			
Paragraph	**FCC Section**	**Description of Test**	**Result**
5.1	15.227(a)	Maximum Field Strength of Fundamental	Pass
5.2	15.207	AC Power Line Conducted Emission	NA
5.3	15.227(b)	Spurious Radiated Emission	Pass
5.4	15.203	Antenna Requirement	Pass

5. Test Result

5.1. Test of Maximum Carrier Field Strength

Applicable Standard

47 CFR FCC Part 15 Subpart C, section 15.227 (a): The field strength of any emissions within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emissions limit in this paragraph is based on measurement instrumentation employing an average detector.

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

Measuring Instruments

Refer to section 6 in this report.

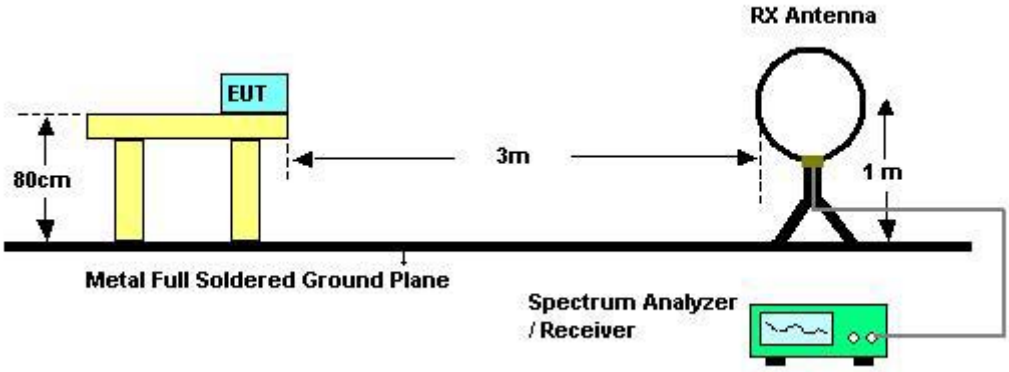
Major Test Instruments Setting

Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	10 KHz
Detector	Peak / Average

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. Set the test-receiver system to Peak and Average Detect Function with specified bandwidth under Maximum Hold Mode.
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.

Test Setup Layout

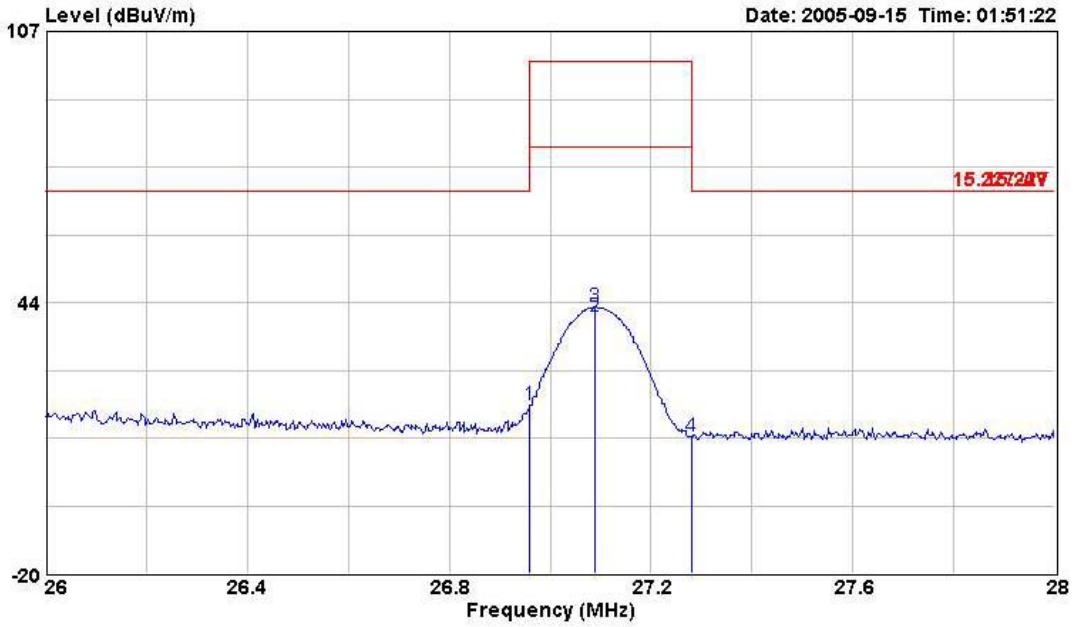


Test Deviation

The measurement uncertainty is 2.54dB. Test methods have no deviation with original standard.

Test Result

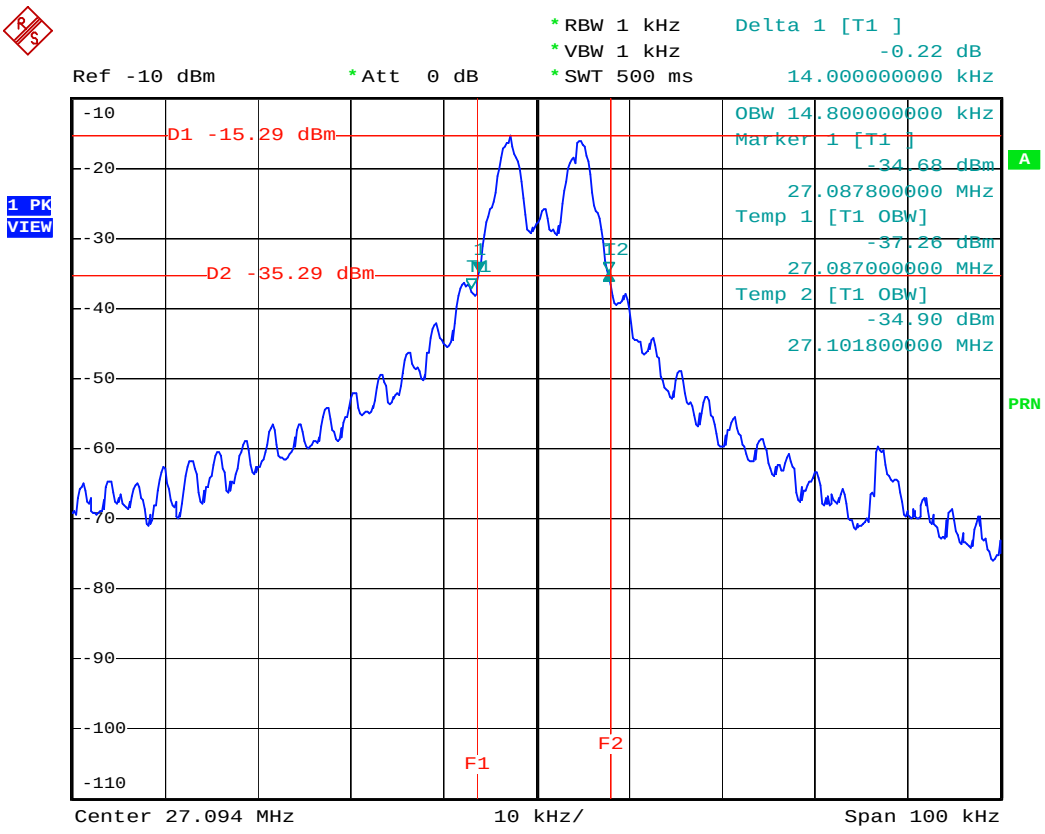
- Temperature: 28°C
- Relative Humidity: 58%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu



	Freq	Level	Over Limit	Read Level	Limit Line	Cable Loss	Antenna Factor	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB		cm	deg
1	26.960	19.43	-50.11	33.90	69.54	0.52	15.17	30.17	Peak	---	---
2 @	27.090	40.24	-39.76	54.83	80.00	0.52	15.05	30.17	Average	---	---
3	27.090	42.44	-57.56	57.03	100.00	0.52	15.05	30.17	Peak	---	---
4	27.280	12.15	-57.39	26.86	69.54	0.52	14.93	30.17	Peak	---	---

Bandwidth Test Result

- Temperature: 26°C
- Relative Humidity: 54%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Sam Lee



Frequency (MHz)	20dB Bandwidth (kHz)	99% Occupied BW (kHz)	Fequency range MHz (20dB Down) fL > 26.96 MHz	Fequency range MHz (20dB Down) fH < 27.28 MHz
27.0450	14.0000	14.80	27.0878	27.1018

Note:
Correct Factor = Antenna Factor + Cable Loss - Preamp Factor.
Read Level = Level of Receiver or Spectrum.
Level = Read Level + Correct Factor.

5.2. Test of AC Power Line Conducted Emission

Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

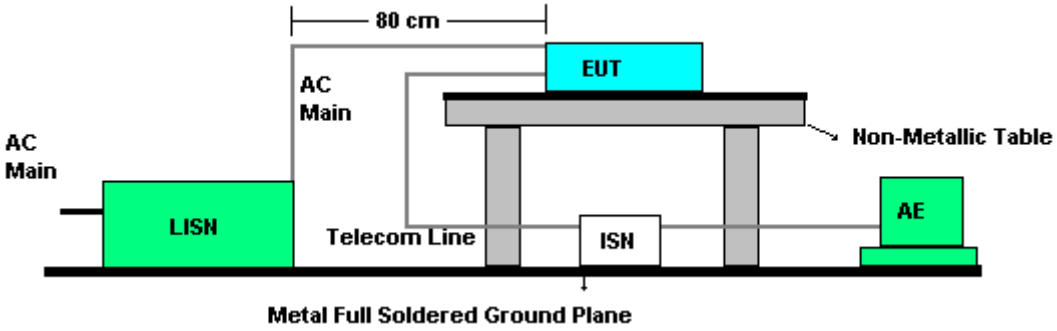
Description of Major Test Instruments Setting

- Test Receiver : R&S ESCS 30
  Attenuation : 10 dB
  Start Frequency : 0.15 MHz
  Stop Frequency : 30 MHz
  IF Bandwidth : 9 KHz

Test Procedures

1. Configure the EUT according to ANSI C63.4-2003.
2. The EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN)
4. All the support units are connected to the other LISNs. The LISN should provides 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
7. The measurement has to be done between each power line and ground at the power terminal for each RF channel. Only one RF channel has to be investigated since this test is independent with the RF channel selection.

Test Setup Layout



Test Result of Conducted Emission

The transmitter is battery powered; there is no need to do this testing.

5.3. Test of Spurious Radiated Emission

Please reference to test report Appendix B.

5.4. Antenna Requirements

Standard Applicable

Section 15.203: 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 a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connected Construction

There is no connector for integrated antenna.

Test Criteria

All test results complied with the requirements of section 15.203.

6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	Spectrum analyzer	R&S	FSP40	100116	9kHz ~ 40GHx	Jan. 28, 2005	Conducted (TH01-HY)
2	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Jun. 16, 2005	Radiation (03CH03-HY)
3	Spectrum Analyzer	R&S	FSP40	100019	9KHZ~40GHz	Jul. 21, 2005	Radiation (03CH03-HY)
4	Amplifier	SCHAFFNER	CPA9231A	18667	9KHz ~ 2GHz	Jan. 10, 2005	Radiation (03CH03-HY)
5	Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	May 31, 2005	Radiation (03CH03-HY)
6	Amplifier	MITEQ	AMF-6F-260400	923364	26.5GHz ~ 40GHz	Jan. 05, 2004*	Radiation (03CH03-HY)
7	Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz ~ 30MHz	May 24, 2004*	Radiation (03CH03-HY)
8	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz ~ 200MHz	Jul. 22, 2005	Radiation (03CH03-HY)
9	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz ~ 1GHz	Jul. 22, 2005	Radiation (03CH03-HY)
10	Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 22, 2005	Radiation (03CH03-HY)
11	Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jun. 09, 2004*	Radiation (03CH03-HY)
12	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	Feb. 22, 2005	Radiation (03CH03-HY)
13	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec.01, 2004	Radiation (03CH03-HY)
14	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
15	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year.
※ * Calibration Interval of instruments listed above is two year.

7. Company Profile

SPORTON Lab. was established in 1986 with one shielded room: the first private EMI test facility, offering local manufacturers an alternative EMI test familial apart from ERSO. In 1988, one 3M and 10M/3M open area test site were setup and also obtained official accreditation from FCC, VCCI and NEMKO. In 1993, a Safety laboratory was founded and obtained accreditation from UL of USA, CSA of Canada and TUV (Rhineland & PS) of Germany. In 1995, one EMC lab, including EMI and EMS test facilities was setup. In 1997, SPORTON Group has provided financial expense to relocate the headquarter to Orient Scientific Park in Taipei Hsien to offer more comprehensive, more qualified and better service to local suppliers and manufactures. In 1999, Safety Group and Component Group were setup. In 2001, SPORTON has established 3M/10M chamber in Hwa Ya Technology Park.

7.1. Certificate of Accreditation

Taiwan	BSMI, CNLA, DGT
USA	FCC, NVLAP, UL
EU	Nemko, TUV
Japan	VCCI
Canada	Industry Canada

7.2. Test Location

SHIJR	ADD：	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL：	02-2696-2468
	FAX：	02-2696-2255
HWA YA	ADD：	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL：	03-327-3456
	FAX：	03-318-0055
LINKOU	ADD：	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL：	02-2601-1640
	FAX：	02-2601-1695
DUNGHU	ADD：	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL：	02-2631-4739
	FAX：	02-2631-9740
JUNGHE	ADD：	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL：	02-8227-2020
	FAX：	02-8227-2626
NEIHU	ADD：	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL：	02-2794-8886
	FAX：	02-2794-9777

8. Certificate of NVLAP Accreditation

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC 17025:1999
ISO 9002:1994

Certificate of Accreditation

SPORTON INTERNATIONAL, INC.
TAIPEI HSIEN 221
TAIWAN

is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria set forth in NIST Handbook 150:2001, all requirements of ISO/IEC 17025:1999, and relevant requirements of ISO 9002:1994. Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

December 31, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP Lab Code: 200079-0

NVLAP-01C (06-01)

Appendix B. Attachment of Report for additional measurement data

EQUIPMENT: Wireless Optical Mouse
TRADE NAME : Chic
MODEL NO. : RMO378; 97990
FCC ID: IOWRMO378UP
APPLICANT: Chic Technology Corp.
16F, No. 150, Chien-1 Road, 235 Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

The test result shown in the test report is the same with that of the original one in test report no. **FR590805**, except the printed antenna with 1dBi and shielding. The difference between the original and the report is the test result of Radiation Emission.

Different layout has been changed into the project. Radiation Emissions below 1 GHz test have been modified.

This attachment should be filed together with original test report **FR590805** for reference.

Wayne Hsu / Supervisor
Sporton International Inc.

Sporton International Inc.
6F, No. 106, Sec. 1, Hsin Tai Wu Rd.,
Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. Test of Spurious Radiated Emission

1.1 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).

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
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

1.2 Measuring Instruments and Setting

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

Receiver Parameter	Setting
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

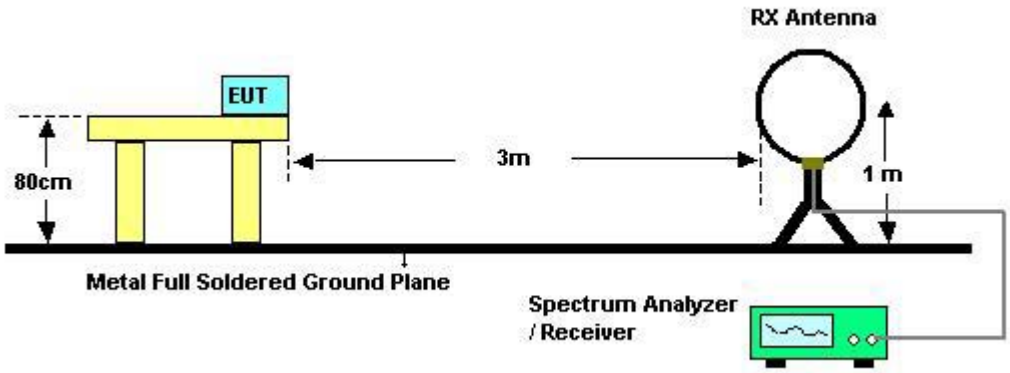
1.3 Test Procedures

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 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.

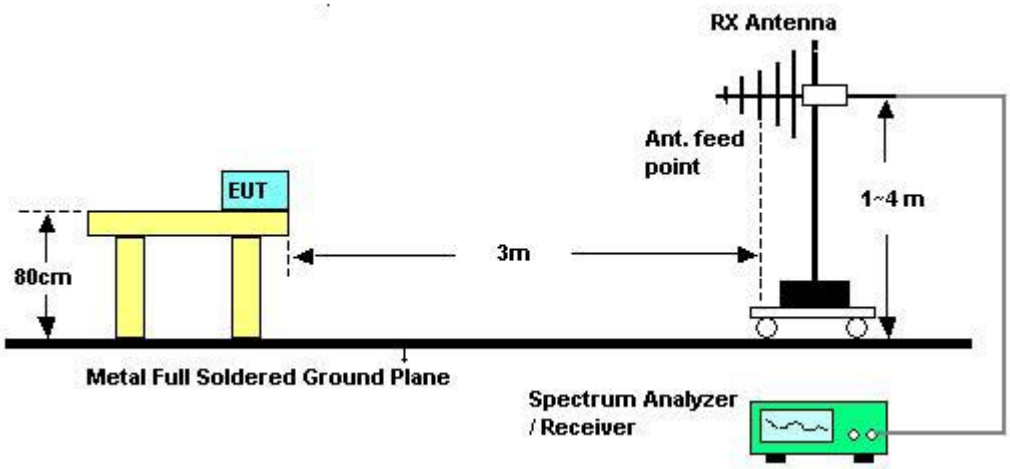
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

1.4 Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



1.5 Test Deviation

There are no deviations with the original standard.

1.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

1.7 Results of Radiated Emissions (9kHz~30MHz)

Temperature	27℃	Humidity	63%
Test Engineer	Ted Chiu	Configurations	Channel 1

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

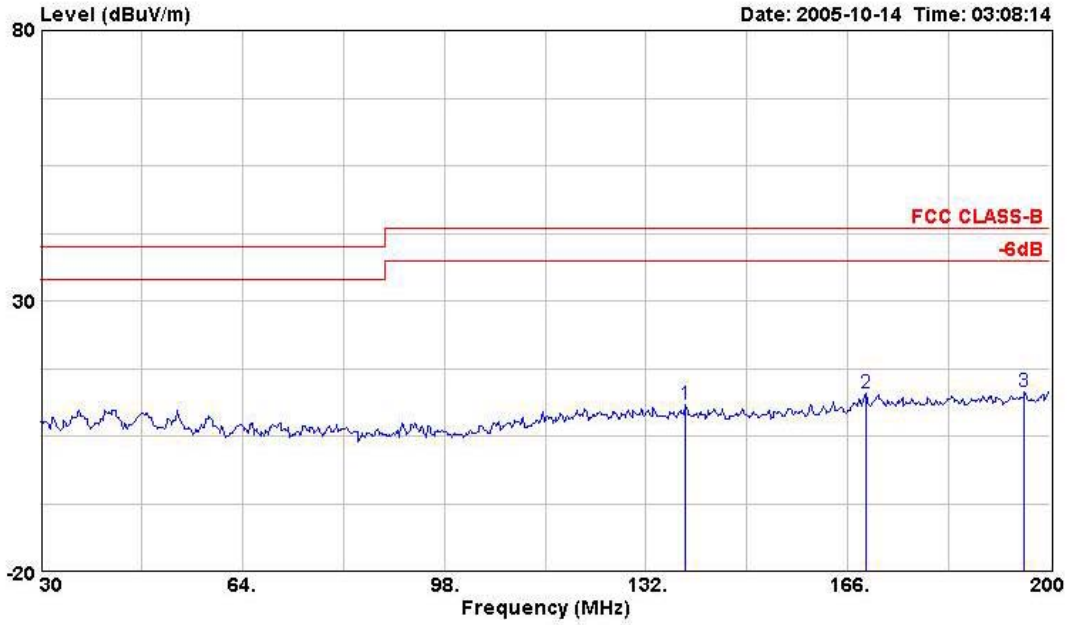
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

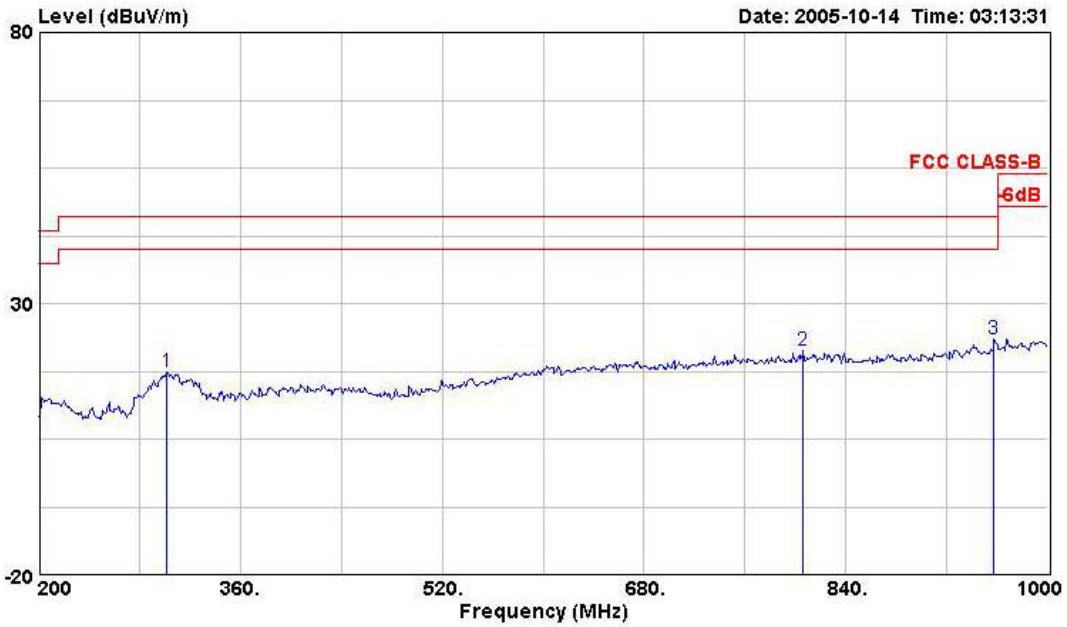
1.8 Test Results for emission below 1GHz

- Temperature: 27°C
- Relative Humidity: 63%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal

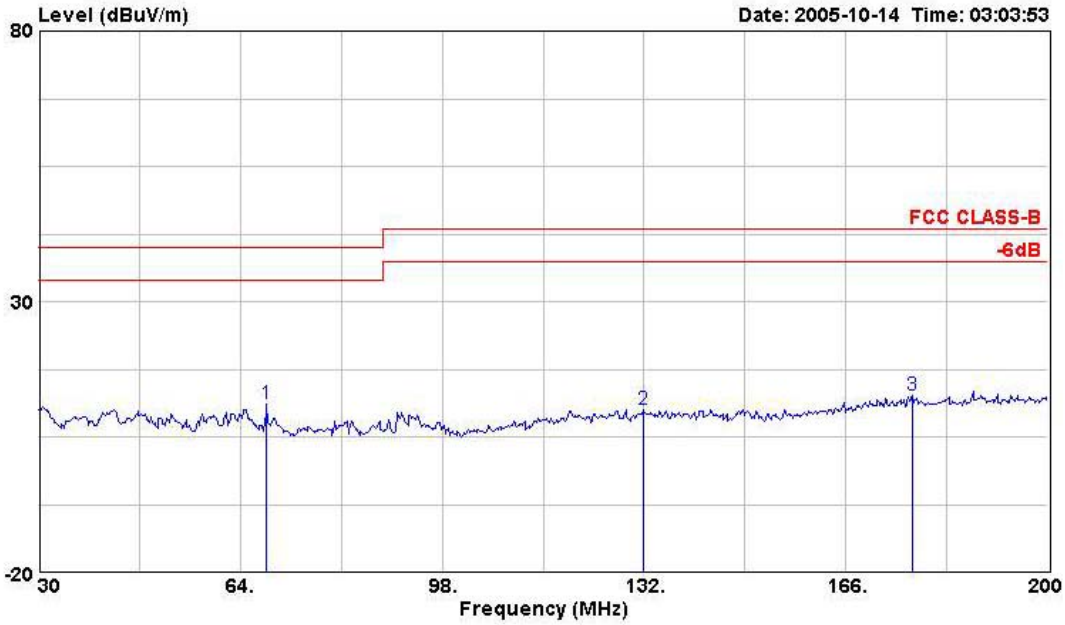


	Freq	Level	Over Limit	Read Level	Limit Line	Cable Loss	Antenna Factor	Preamp Factor	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB		deg	cm
1	138.630	10.70	-32.80	27.73	43.50	1.18	12.56	30.77	Peak	---	---
2	169.060	12.85	-30.65	27.95	43.50	1.28	13.57	29.95	Peak	---	---
3	195.750	13.18	-30.32	27.07	43.50	1.30	15.46	30.65	Peak	---	---

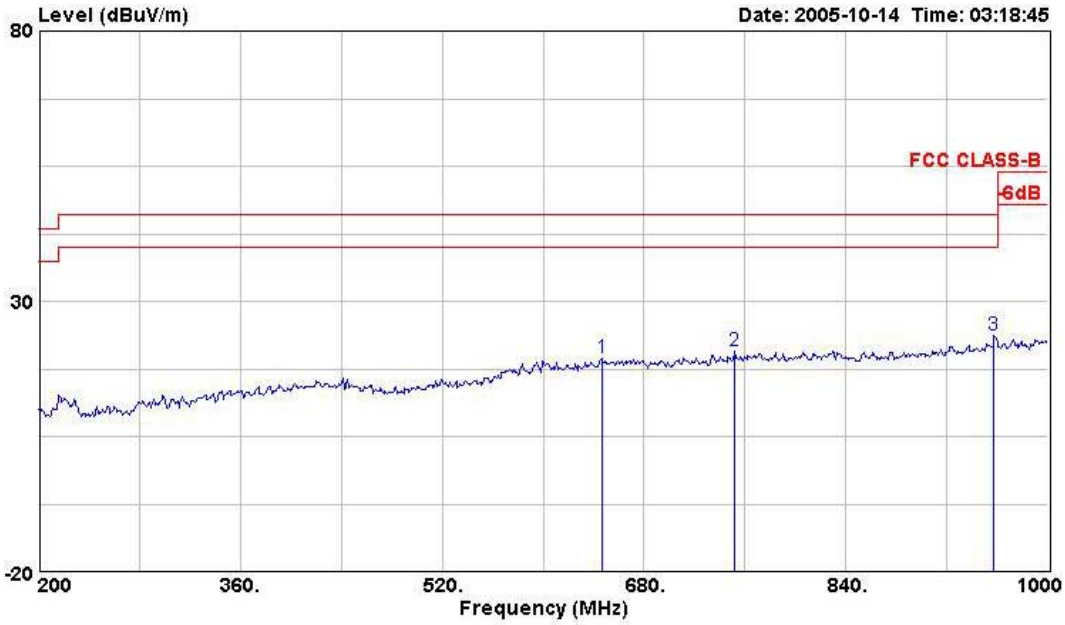


	Freq	Level	Over Limit	Read Level	Limit Line	Cable Loss	Antenna Factor	Preamp Factor	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB		deg	cm
1 @	301.600	17.33	-28.67	32.39	46.00	1.67	13.85	30.58	Peak	---	---
2 @	806.400	21.43	-24.57	27.39	46.00	2.81	21.89	30.65	Peak	---	---
3 @	957.600	23.43	-22.57	26.76	46.00	3.01	22.96	29.30	Peak	---	---

(B) Polarization: Vertical



	Freq	Level	Over Limit	Read Level	Limit Line	Cable Loss	Antenna Factor	Preamp Factor	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB		deg	cm
1 @	68.420	10.98	-29.02	30.54	40.00	0.82	9.91	30.29	Peak	---	---
2	131.830	10.07	-33.43	27.25	43.50	1.15	12.38	30.71	Peak	---	---
3	177.220	12.65	-30.85	27.16	43.50	1.27	14.20	29.98	Peak	---	---



	Freq	Level	Over Limit	Read Level	Limit Line	Cable Loss	Antenna Factor	Preamp Factor	Remark	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB		deg	cm
1 @	646.400	19.40	-26.60	26.91	46.00	2.48	20.54	30.54	Peak	---	---
2 @	752.000	20.81	-25.19	27.13	46.00	2.79	21.33	30.44	Peak	---	---
3 @	957.600	23.82	-22.18	27.15	46.00	3.01	22.96	29.30	Peak	---	---

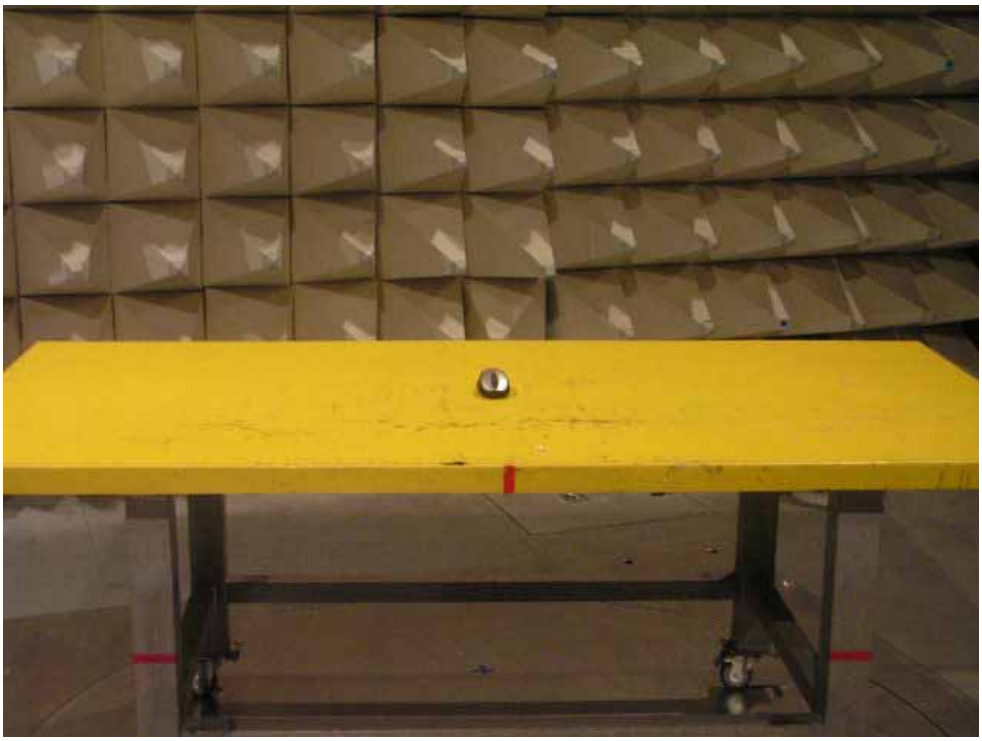
Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

1.9 Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW