Report No.	C3115953
Specifications Test Method	FCC Part 15, Class B ANSI C63.4 1992
Applicant address	16F, No. 150, Chen I Road, 235 Chung Ho City, Taipei Hsien, Taiwan, R.O.C.
Applicant	Chic Technology Corp.
Items tested Model No.	Wireless Mouse CHIC 1490UP, Typhoon 40151 (Sample#C31952, Tx)
Results Date	**Compliance** (As detailed within this report) 12/26/2001 (month / day / year) (Sample received) 01/04/2002 (month / day / year) (Test)
Prepared by	Project Engineer
Authorized by	General Manager (Frank Tsai)
Issue date	*January 17, 2002* (month / day / year)
Modifications	**None**
Tested by	Training Research Co., Ltd.
Office at	2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan
Chamber at	2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan

Conditions of issue :

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(2) ***This report must not be used by the client to claim product endorsement by NVLAP or any agency of U.S. Government.***

★ ***NVLAP LAB CODE: 200174-0***

★ ***FCC ID: IOW1490UP***

Contents

Chapter 1 Introduction

Description of EUT

Product Name	**:**	Wireless Optical Mouse
Model No.	**:**	CHIC 1490UP, Typhoon 40151
FCC ID	**:**	IOW1490UP
Frequency Range	**:**	26.96 – 27.28 MHz
Operating Frequency	**:**	27.045 – 27.095 MHz 27.095MHz (channel 1) / 27.045 MHz (channel 2)
Power Type	**:**	Powered by two UM-4, Size AAA, batteries

Test method

All measurements contained in this report were performed according to the techniques described in Measurement procedure ANSI C63.4 – 1992.

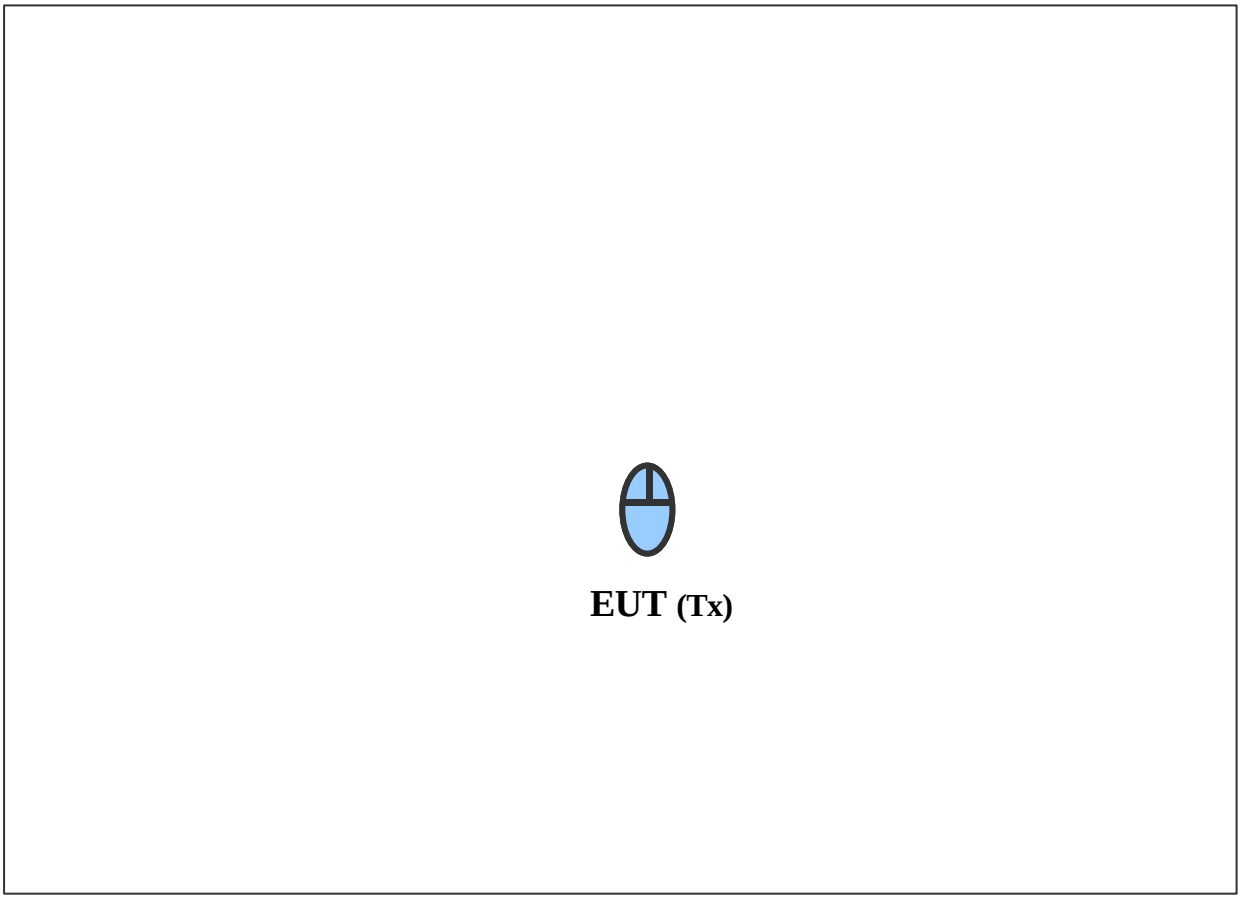
Pretest was found that the emission of operating mode is worse than standby mode. So, The final test is made at the operating mode (charging and transmitted).

While testing, the EUT set in Ch1 (27.095MHz) and continuously transmitting and charging mode, which transmitted the maximum emission.

The test placement as the photographs showed is the worst case emission placed. (If the emission is close to the ambient, the resolution BW and view resolution will be reduced and the data will be recorded by detection of maximum hold peak mode.)

The testing configuration of test setup is showing in the next page.

Configuration of test setup (Power by batteries)



Connections of EUT

Power by Batteries:

*Put AAA size, UM-4 * 2, batteries into the battery cell of Tx, powers the subject device. The EUT does not be connected with any product.

List of Support Equipment

None

Chapter 2 Conducted Emission Test

Test Condition and Setup

All the equipment is placed and setup according to the ANSI C63.4 – 1992.

The EUT is assembled on a wooden table, which is 80 cm high, is placed 40 cm from the back-wall, which is a vertical conducting plane. One LISN is for EUT, the other LISN is for support equipment. They are all placed on the conductive ground. The EUT's LISN connect a line switch box for selecting L1 or L2, then connect to a preamplifier and spectrum.

The spectrum scans from 450KHz to 30MHz. Conducted emission levels are detected at maximum peak mode. But if the maximum peak mode failed, it will be measured by CISPR's quasi-peak detection mode.

While testing, there is the worst-emission plot printed at peak detection mode, and there are more than 6 highest emissions relative to limit recorded. The plot is kept as the original data, not included in test report.

List of test Instrument

				Calibration Date	
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	06/29/01	06/29/02
RF Filter Section	85460A	H P	3448A00217	06/29/01	06/29/02
LISN (EUT)	LISN-01	TRC	9912-03,04	12/08/01	12/08/02
LISN (Support E.)	LISN-01	TRC	9912-05	01/04/02	01/04/03
Switch/Control Unit (< 30MHz)	3488A	HP	N/A	11/20/01	11/20/02
Auto Switch Box (< 30MHz)	ASB-01	TRC	9904-01	11/20/01	11/20/02

The level of confidence of 95%, the uncertainty of measurement of conducted emission is ± 2.4 dB.

Test Result: N/A (Not Applicable)

Chapter 3 Radiated Emission Test

Test Condition and Setup (Harmonic and Spurious Emission)

Pretest: Prior to the final test ,the EUT is placed in an anechoic chamber, and scan from 27MHz to 1GHz. The devices rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit. This is done to ensure the radiation exactly emits form the EUT.

Final test: Final radiation measurements is made on a **3 – meter** anechoic chamber.. The EUT's maximum emission of radiation is placed on a nonconductive table, which is 0.8m height, the top surface is 1.0 x 1.5 meter. All placement is according to ANSI C63.4 - 1992.

The spectrum is examined from 27MHz to 1000MHz measured by HP spectrum.

The whole range Antenna is used to measure frequency from 27 MHz to 1GHz. The final test is used the spectrum analyzer.

Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency. The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meters to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization.

Appropriated preamplifier, which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading. The spectrum analyzer's 6dB bandwidth is set to 120 kHz, and the EUT is measured at quasi-peak mode.

If the emission is close to the frequency band of ambient, the tester will recheck the data and the corrected data will be written in the test data sheet. If the emission is just within the ambient, the data from shield room will be taken as the final data.

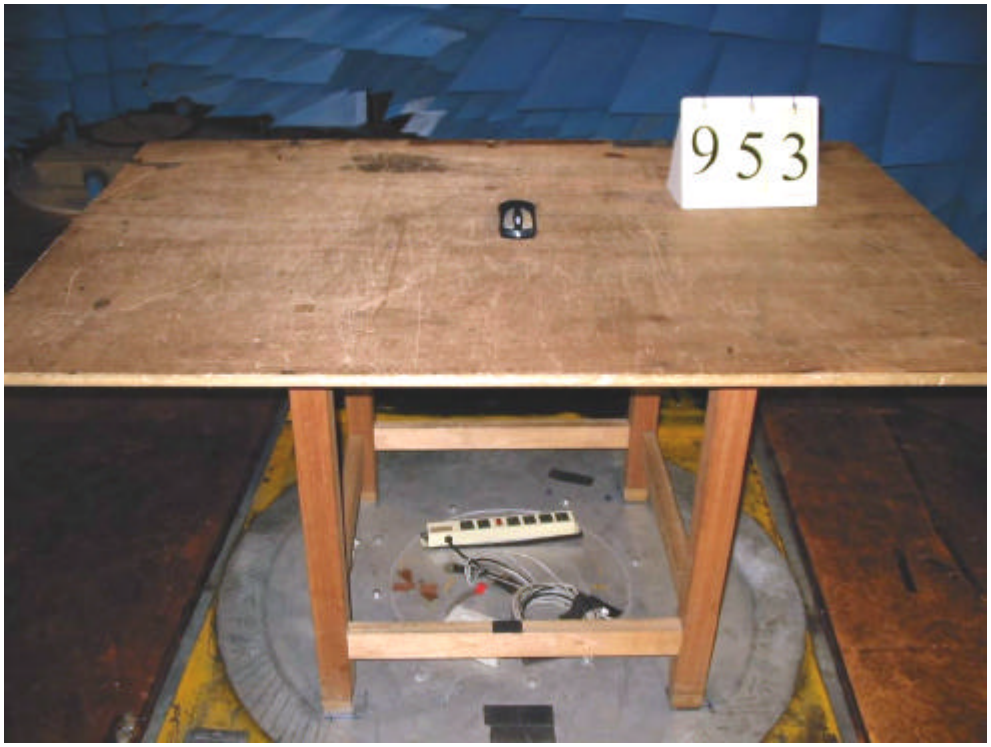
List of test Instrument

				Calibration Date	
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	06/29/01	06/29/02
RF Filter Section	85460A	H P	3448A00217	06/29/01	06/29/02
Bi-log Antenna	CBL6141A	Schaffner	4206	03/09/01	03/09/02
Switch/Control Unit (> 30MHz)	3488A	HP	N/A	11/20/01	11/20/02
Auto Switch Box (> 30MHz)	ASB-01	TRC	9904-01	11/20/01	11/20/02
Spectrum Analyzer	8564E	HP	US36433002	08/01/01	08/01/02
Microwave Preamplifier	83051A	HP	3232A00347	08/01/01	08/01/02
Horn Antenna	3115	EMCO	9704 – 5178	08/01/01	08/01/02
Anechoic Chamber (cable calibrated together)				05/20/01	05/20/02

The level of confidence of 95% , the uncertainty of measurement of radiated emission is ± 4.96 dB .

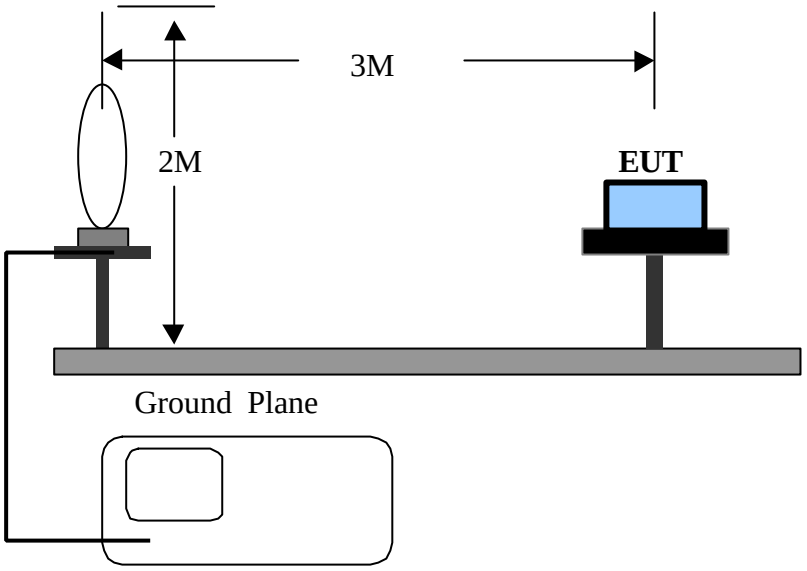
Test Result : Pass (Appendix A)

Radiated Test Placement: (Photographs)



Peak Power Measurement of Fundamental Frequency

Test Setup



HP 8546A Spectrum Analyzer

(Below 30MHz: RBW=10KHz & VBW=10KHz, Detector mode: Average.)

Test Procedure

a. Set the Loop ANT. height 1m. ,Vertical, and rotate the ANT to find the azimuth of the highest emission and record the reading.

b. Keep the ANT. azimuth and turn the EUT 360 degree and record the highest emission.

c. Raise the ANT to 2 meters and repeat set a and b.

d. Change the ANT Horizontal and repeat a to c.

e. Record the most highest reading in test report.

List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	06/29/01	06/29/02
RF Filter Section	85460A	H P	3448A00217	06/29/01	06/29/02
Active Loop Antenna	6502	EMCO	2777	07/20/01	07/20/02

Test Result : Pass (Appendix B)

Appendix A

Harmonic and Spurious Emission Test Result: (Horizontal)

Test Conditions:

Testing room : Temperature : 26 ° C Humidity : 73 % RH

Testing site : Temperature : 31 ° C Humidity : 75 % RH

Frequency	**Reading Amplitude**	**Ant. Height**	**Table**	**Correction Factors**	**Corrected Amplitude**	**Class B Limit**	**Margin**
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
67.597	1.61	1.00	0	-9.61	11.22	40.00	-28.78
81.129	5.35	3.94	60	-10.23	15.58	40.00	-24.42
189.346	1.72	1.00	46	-12.72	14.44	43.50	-29.06
243.379	11.38	1.00	52	-15.26	26.64	46.00	-19.36
270.416	15.15	1.00	39	-15.51	30.66	46.00	-15.34
513.791	3.88	1.00	42	-21.16	25.04	46.00	-20.96

Note:

1.Margin = Amplitude – limit, *if margin is minus means under limit.*

2.Corrected Amplitude = Reading Amplitude – Correction Factors

3.Correction factor = Antenna factor + (Cable Loss – Amplitude gain)

Harmonic and Spurious Emission Test Result: (Vertical)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
135.221	4.53	1.00	83	-14.02	18.55	43.50	-24.95
189.292	1.19	1.00	14	-12.76	13.95	43.50	-29.55
216.334	3.97	1.00	69	-14.80	18.77	46.00	-27.23
243.360	8.93	2.43	119	-15.23	23.83	46.00	-22.17
270.418	10.51	1.00	98	-15.94	26.45	46.00	-19.55
513.814	0.67	1.00	115	-22.15	22.82	46.00	-23.18

Appendix B

Fundamental Emission Test Result: (CH 1)

Frequency: 27.095 MHz					
Antenna Polarity	**Reading Amplitude**	**Correction Factors**	**Corrected Amplitude**	**Limit**	**Margin**
	dBμV	dB	dBμV/m	dBμV/m	dB
Horizontal	30.84	12.00	42.84	80.00	-37.16
Horizontal > Vertical					

Fundamental Emission Test Result: (CH 2)

Frequency: 27.045 MHz					
Antenna Polarity	**Reading Amplitude**	**Correction Factors**	**Corrected Amplitude**	**Limit**	**Margin**
	dBμV	dB	dBμV/m	dBμV/m	dB
Horizontal	30.37	12.00	42.37	80.00	-37.63
Horizontal > Vertical					

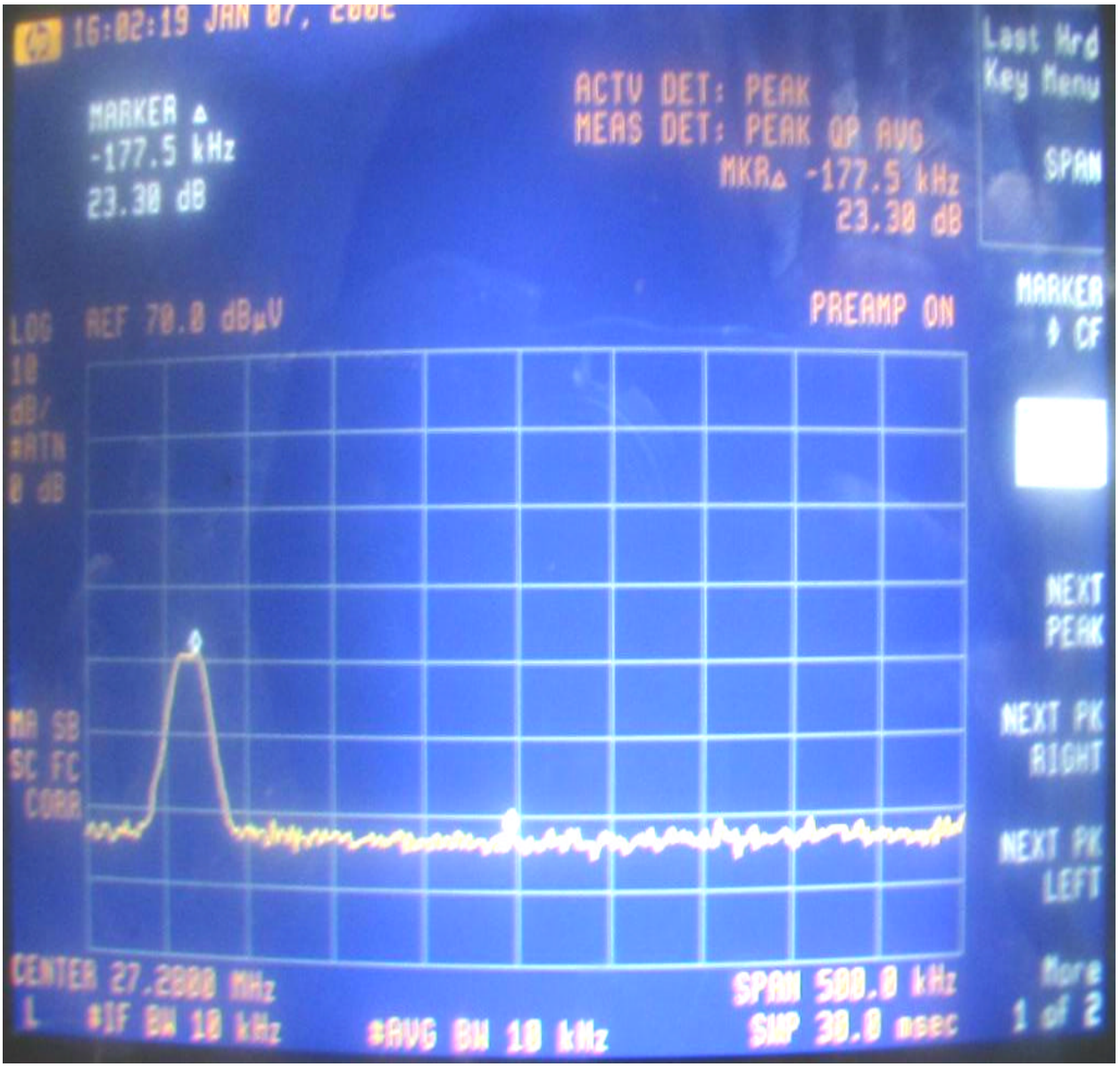
Note:

1. Correction Factors = Antenna factors + Cable loss - Amplifier
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Margin = Corrected Amplitude - Limited

Appendix C

Band Edge of Measurement: (Frequency Band: 26.96 ~ 27.28)

Channel 1 (27.095MHz)



Channel 2 (27.045MHz)