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Report No.	C3115035		
FCC ID	IOW2100UP		
Specifications	FCC Part 15, Class B		
Test Method	ANSI C63.4 1992		
Applicant	Chic Technology Corp.		
Applicant	16F, No. 150, Chien-I Road, 235	6 Chung Ho City,	
address	Taipei Hsien, Taiwan, R.O.C.		
Product name	Office Wireless Optical Mouse	-	
Items tested	Wireless Optical Mouse		
Model No.	CHIC 2100UP (Sample # C3174	(8)	
Frequency Range	26.96MHz to 27.28MHz		
Results	Compliance (As detailed within	this report)	
Date	11/27/2002 (month / day / year)(Sample received)	
	12/19/2002 (month / day / year)(Tested)	
Prepared by	ting	Project Engineer	
Authorized by	Fank TEST	General Manager (Frank Tsai)	
Issue date	February 14, 2002	(month / day / year)	
Modifications	None	;	

Tested by Office at Open site at

Conditions of issue :

 This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.

Training Research Co., Ltd. (Accredited by NVLAP)

No. 15, Lane 530, Pa-Lian RD., Sec. 1, Hsichih City, Taipei Hsien, Taiwan, R.O.C.

1F, No. 255, Nan Yang Street, Hsichih, Taipei Hsien 221, Taiwan

- The test data in this test report are following the procedures in accordance with the terms of accreditation.
- This test report and measurements made by TRC are traceable to the NIST only Conducted and Radiated Method (TRC is accredited by NVLAP, code No.: 200174-0).
- The device has been tested is fully complied with the requirements the Directive FCC Part 15.

Report No.: C3115035

Training Research Co., Ltd., TEL: 886-2-26461146, Fax: 886-2-26461778

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Chapter 1 Introduction

Description of EUT:

EUT	:	Wireless Optical Mouse and Receiver
Model No.	:	CHIC 2100UP
Product name	:	Office Wireless Optical Mouse
Frequency Range	:	26.96 – 27.28 MHz
Power Type	:	Transmitter: Powered by two 1.5VDC AA batteries

*This EUT has two channels (each with 256 IDs):

1. 27.0450 MHz 2. 27.0950 MHz

Test method:

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

During the measurement, there are two channel and six modes tested: "Normal Operating Channel 1 by PS/2 Interface", "Normal Operating Channel 2 by PS/2 Interface", "Normal Operating Channel 1 by USB Interface", "Normal Operating Channel 2 by USB Interface", "Charging by Adaptor" and "Charging by USB" modes. The radiation pretest was found out the testing mode: "Normal Operating Channel 1 by USB Interface" was the worst case and we only recorded worse cases in this report.

While testing, the EUT was made to transmit continuously and adjusted at a position, 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.

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Configuration of Test Setup(Test mode: "Normal Operating")



EUT:

*Put two AA size, 1.5V battery into the battery cell of EUT, powers the subject device. The EUT does not be connected with any product.

*Power jack --- with nothing.



Configuration of Test Setup (Test mode: "Charging by USB")

Connections:

<u>PC:</u>

- *Serial Port --- via a 110cm shielded RS-232 cable to an external modem.
- *Monitor Port --- a monitor with 1.5m length data cable.
- *Keyboard port --- a keyboard with 1.5m length data cable.
- *Mouse port --- with nothing.
- *USB port A --- a USB joystick with 1.5m long, shielded, no ferrite bead data cable.
- *USB port B --- to EUT(Tx).
- (Each port on PC is connected with suitable device)

$\underline{EUT(Tx)}$:

- *Put two AA size, 1.5V battery into the battery cell of EUT, powers the subject device. Put the EUT(Tx) on the EUT(Rx) to charge.
- *Power jack --- with a 1.0m length USB cable to the USB port B of PC.



Configuration of Test Setup (Test mode: "Charging by Adaptor")

Connections:

EUT(Tx):

*Put two AA size, 1.5V battery into the battery cell of EUT, powers the subject device. Put the EUT(Tx) on the EUT(Rx) to charge.

*Power jack --- with nothing.

EUT(Rx):

*USB Jack --- with a 142cm long shielded USB cable that terminated.

*Power Jack --- via a 1.86m long power cable with a adapter to the power source.

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List of Support Equipment

Conducted (Radiated) test:

PC	:	HP Brio 85xx 6/350					
Model No.	:	D6928A					
Serial No.	:	SG91801443					
FCC ID	:	Doc Approved					
Power type	:	100 ~ 230VAC / 50 ~ 60Hz, 5A, Switching					
Power cord	:	Non-shielded, 2.33m long, Plastic, No ferrite core					
Monitor	:	HP pavilion mx70					
Model No.	:	P1283A					
Serial No.	:	THTBR00257					
FCC ID	:	DOC Approved					
Power type	:	100 ~ 240V AC 15A 50/60Hz					
Power cord	:	Shielded, 1.83m long, No ferrite core					
Data cable	:	Shielded, 1.46m (1.80m) long, with two ferrite cores (no ferrite core)					
Printer	:	HP					
Printer Model No.	: :	HP C2642A					
Printer Model No. Serial No.	•	HP C2642A SG69A196GV					
Printer Model No. Serial No. FCC ID	: : :	HP C2642A SG69A196GV B94C2642X					
Printer Model No. Serial No. FCC ID Power type	• • • •	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz					
Printer Model No. Serial No. FCC ID Power type Power cord	: : : :	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core					
Printer Model No. Serial No. FCC ID Power type Power cord Data cable	: : : : :	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core Shielded, 1.84m long, no ferrite core					
Printer Model No. Serial No. FCC ID Power type Power cord Data cable Modem	: : : : :	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core Shielded, 1.84m long, no ferrite core					
Printer Model No. Serial No. FCC ID Power type Power cord Data cable Modem Model No.	: : : : :	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core Shielded, 1.84m long, no ferrite core					
Printer Model No. Serial No. FCC ID Power type Power cord Data cable Modem Model No. FCC ID	: : : : : :	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core Shielded, 1.84m long, no ferrite core ACEEX DM-1414V IFAXDM1414					
Printer Model No. Serial No. FCC ID Power type Power cord Data cable Moden Model No. FCC ID Power type	: : : : : : : :	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core Shielded, 1.84m long, no ferrite core ACEEX DM-1414V IFAXDM1414 120VAC, 60Hz/ 9VAC, 1A					
Printer Model No. Serial No. FCC ID Power type Power cord Data cable Model No. FCC ID Power type Power cord	: : : : : : : : : :	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core Shielded, 1.84m long, no ferrite core ACEEX DM-1414V IFAXDM1414 120VAC, 60Hz/ 9VAC, 1A Non-shielded, 1.9m long, no ferrite cord					
Printer Model No. Serial No. FCC ID Power type Power cord Data cable Model No. FCC ID Power type Power cord Data cable	• • • • • • •	HP C2642A SG69A196GV B94C2642X 230 VAC, 50Hz Non-shielded, 2m long, no ferrite core Shielded, 1.84m long, no ferrite core ACEEX DM-1414V IFAXDM1414 120VAC, 60Hz/ 9VAC, 1A Non-shielded, 1.9m long, no ferrite cord RS232, Shielded, 1.2m long, no ferrite core					

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Keyboard	:	Logitech SK-720C
Model No.	:	Y-SA2
Serial No.	:	SCC04514357
FCC ID	:	GYUR49SK
Power type	:	By PC
Data cable	:	Shielded, 1.73m long, with ferrite core
USB Joystick	κ:	Rockfire
Model No.	:	QF-337uv
Serial No.	:	10600545
FCC ID	:	CE Approval
Power type	:	Powered by PC
Power cable	:	Shielded, 1.8m long, No ferrite bead data cable
USB Mouse	:	Logitech Wheel Mouse
Model No.	:	M-BJ-58
Serial No.	:	LN20901985
FCC ID	:	Doc Approved
Power type	:	By PC
Power cord	:	Non-shielded, 1.88m long, No ferrite core
Mouse	:	HP
Model No.	:	M-S34
Serial No.	:	LZB90714106
FCC ID	:	DZL211029
Power type	:	By PC
Power cord	:	Non-shielded, 1.88m long, No ferrite core
Receiver	:	Chic Technology Corp.
Model No.	:	C191
Serial No.	:	N/A
FCC ID	:	Doc Approved
Power type	:	Operating by PC;
		Charging by adaptor: Input: 120VAC 60Hz, Output: 6VDC
Data cable	:	Shielded, 1.42m long, with a ferrite bead core

300mA

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 that is 80 cm high, is placed 40 cm from the back-wall that 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 measured from 150KHz to 30MHz. Conducted emission levels are detected at max. peak mode. But if the max. peak mode failed or over average limit, it will be measured by QP and average detection mode using the Receiver.

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.

				<u>Calibratio</u>	n Date
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Receiver	SCR3102	SCHAFFNER	012	03/29/02	03/28/03
LISN (EUT)	3825/2	EMCO	9411-2284	06/17/02	06/16/03
LISN (Support E.)	3825/2	EMCO	9210-2007	05/31/02	05/31/03
Preamplifier	EQ3-006	TRC		05/15/02	05/15/03
Line switch box	EQ3-007	TRC		05/15/02	05/15/03

List of test Instrument :

The level of confidence of 95% , the uncertainty of measurement of conducted emission is \pm 2.02 dB .

Test Result: Pass (Appendix A)



Conducted Test Placement: (Photographs)(Test mode: Charging by USB)

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Conducted Test Placement: (Photographs)(Test mode: Charging by Adaptor)



Chapter 3 Peak Power Measurement (Frequency Band: 26.96 ~ 27.28)

Test Setup:

1. Test Setup:



2. Test Procedure:

- a. The EUT was setup in the anechoic chamber as shown above.
- b. The loop antenna was located upon its plane vertical, 3-meter distance from the EUT. The center of the loop is 1-meter above the ground plane.
- c. In order to find the maximum radiation, the EUT was rotated 360°. The measuring antenna was rotated about its axis at each azimuth about the EUT.

List of test Instrument :

				Calibration Date		
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time	
Receiver	SCR3102	SCHAFFNER	012	03/29/02	03/28/03	
Control Box	TWR95-4	TRC	C9001-2	12/01/02	12/01/03	
Antenna	6502	EMCO	9206-2777	06/10/02	06/09/03	
Open test side (An	tenna, Amplify	v, cable calibrated to	ogether)	05/15/02	05/15/03	

The level of confidence of 95%, the uncertainty of measurement of radiated emission is \pm 3.44 dB. <u>**Test Result : Appendix A**</u>

Chapter 4 Radiated Emission Test

Test Condition and Setup:

Pretest : Prior to the final test the EUT is placed in an anechoic chamber, and scan from 30MHz 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 open-field test site. 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 emissions was examined from 30 MHz to 1000 MHz measured by receiver.

The whole range Antenna is used to measure frequency from 30 MHz to 1 GHz. The final test is used the receiver.

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	
Receiver	SCR3102	SCHAFFNER	012	03/29/02	03/28/03	
Control Box	TWR95-4	TRC	C9001-2	12/01/02	12/01/03	
Antenna	CBL6141A	SCHAFFNER	4188	11/29/02	11/28/03	
Open test side (An	tenna, Amplify	, cable calibrated to	ogether)	05/15/02	05/15/03	

The level of confidence of 95% , the uncertainty of measurement of radiated emission is \pm 3.44 dB .

Test Result : Pass (Appendix A)

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Radiated Test Placement: (Photographs)



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Appendix A

Conducted Emission Test Result: (Test mode: Charging by Adaptor)

Testing room :

Temperature : 23° C Humidity : 71 % RH

	READ	DING AMPLI	TUDE	LIN	ЛIT	
Frequency (KHz)	Peak (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Margin (dB)
202.00	20.10	***.**	***.**	64.51	54.51	-34.42
208.00	21.27	***.**	*** **	64.34	54.34	-33.07
349.00	23.94	***.**	*** **	60.31	50.31	-26.38

Line 2

	READING AMPLITUDE L			LIN	AIT -	
Frequency (KHz)	Peak (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Margin (dB)
216.00	21.55	***.**	***.**	64.11	54.11	-32.56
349.00	23.36	***.**	***.**	60.31	50.31	-26.95

*The reading amplitudes of this mode are all under limit MORE THAN 20 dB

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Conducted Emission Test Result: (Test mode: Charging by USB)

Testi	ing room :	Temperatur	re : 23° C	Humidity	: 81 % RH		
-	<u>Line 1</u>						
		READING AMPLITUDE			LIN		
	Frequency (KHz)	Peak (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Margin (dB)
	150.00	41.35	***.**	***.**	66.00	56.00	-14.65
	175.00	35.86	***.**	***.**	65.29	55.29	-19.43
	208.00	39.48	***.**	***.**	64.34	54.34	-14.86
	575.00	27.21	***.**	***.**	56.00	46.00	-18.79
	650.00	32.50	***.**	***.**	56.00	46.00	-13.50
	675.00	30.75	***.**	***.**	56.00	46.00	-15.25
	701.00	31.60	***.**	***.**	56.00	46.00	-14.40
	729.00	30.90	***.**	***.**	56.00	46.00	-15.10
	749.00	29.28	***.**	***.**	56.00	46.00	-16.72
	851.00	26.31	***.**	***.**	56.00	46.00	-19.69

Line 2

	READ	DING AMPLI	TUDE	LIN	1IT	
Frequency (KHz)	Peak (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Quasi-Peak (dB m V)	Average (dB m V)	Margin (dB)
152.00	46.58	***.**	*** **	65.94	55.94	-9.36
173.00	42.96	***.**	*** **	65.34	55.34	-12.39
200.00	40.80	***.**	*** **	64.57	54.57	-13.77
205.00	40.93	***.**	*** **	64.43	54.43	-13.50
549.00	32.79	***.**	*** **	56.00	46.00	-13.21
601.00	33.39	***.**	***.**	56.00	46.00	-12.61
650.00	32.07	***.**	***.**	56.00	46.00	-13.93
675.00	34.52	***.**	***.**	56.00	46.00	-11.48
701.00	37.16	***.**	*** **	56.00	46.00	-8.84
729.00	35.04	***.**	***.**	56.00	46.00	-10.96

*The reading amplitudes are all under limit.

Appendix B

Peak Power Test Result: (Horizontal)(Test mode: Normal Operating)

Frequency	Frequency Amplitude		Corrected Amplitude	Limit	Margin
MHz	dBµV/m	dB	dBµV/m	dBµV/m	dB
27.0970	59.60	-8.30	51.30	80.00	-28.70

Radiated Emission Test Result: (Horizontal) (Test mode: Normal)

Test Conditions:

Testing	site : Te	mperatur	re : 28 ° (C Humidi	ity : 73 % RF	ł	
Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBµV/m	m	degree	dB	$dB\mu V/m$	$dB\mu V/m$	dB
54.1990	31.23	2.50	193	-6.25	24.98	40.00	-15.02
81.2960	35.37	2.50	88	-9.88	25.49	40.00	-14.51
108.3955	32.70	1.01	96	-6.34	26.36	43.52	-17.16
135.4950	28.77	1.01	122	-4.40	24.37	43.52	-19.15
161.9225	23.43	1.01	357	-5.58	17.85	43.52	-25.67

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)

(For example : 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)

Frequency	Reading Amplitude	Correction Factors	Corrected Amplitude	Limit	Margin
MHz	dBµV/m	dB/m	dBµV	dBµV/m	dB
27.1020	47.20	-8.30	38.90	80.00	-41.10

Peak Power Test Result: (Vertical) (Test mode: Normal Operating)

Radiated Emission Test Result: (Vertical) (Test mode: Normal)

Test Conditions:

Testing	site : Te	mperatu	re : 28 ° (C Humidi	ity : 73 % RF	ł	
Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBµV/m	m	degree	dB	$dB\mu V/m$	dBµV/m	dB
54.2990	24.91	1.00	343	-6.29	18.62	40.00	-21.38
81.2860	26.97	1.00	1	-9.88	17.09	40.00	-22.91
108.3950	24.71	1.00	314	-6.34	18.37	43.52	-25.15
135.4900	25.72	1.00	216	-4.40	21.32	43.52	-22.20
161.9215	24.16	1.00	34	-5.58	18.58	43.52	-24.94

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)

(For example : 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)

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Appendix C

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

Lower channel



26.96MHz << Class B Limit.

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Upper channel:



27.28 MHz >> Class B Limit.