FCC TEST REPORT

REPORT NO.: RF90021305
MODEL NO.: 1210 U/P
RECEIVED: February 13, 2001
TESTED: February 21, 2001

APPLICANT: CHIC TECHNOLOGY CORPORATION

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

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 13-1, Lane 19, Wen Shan 3rd St., Kweishan,
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Accredited Laboratory

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1 CERTIFICATION

PRODUCT :	Wireless Mouse
BRAND NAME :	Chic
MODEL NO :	1210 U/P
APPLICANT :	Chic Technology Corporation
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.227) , ANSI C63.4-1992
SITE REGISTERATION NO :	90422 (FCC) IC 3789-5 (Canada IC)

We, **Advance Data Technology Corporation**, hereby certify that one sample (M-RN67) of the designation has been tested in our facility on February 19, 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 : Steven Lu , Date: Feb, 21, 2001
Steven Lu

Prepared by : Demi Chen , Date: Feb. 21, 2001
Demi Chen

Approved by : Alan Lane , Date: Feb. 21, 2001
Dr. Alan Lane, Manager

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 REQUIREMENTS**	**RESULT**	**REMARK**
15.107	AC Power Conducted Emissions Spec.: 48 dBuV	N/A	N/A
15.227	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Minimum passing margin is –3.5dBuV at 51.65 MHz

NOTE:

The receiver portion of the EUT has been tested in ADT. The test result has been verified to comply with FCC Part 15, Subpart B, Class B – Computing Devices (FCC DoC). The engineering test report can be provided upon FCC requests.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Mouse
MODEL NO.	1210 U/P
POWER SUPPLY	3VDC (1.5V x 2 batteries)
DATA CABLE	NA
I/O PORTS	NA
MODULATION TYPE	FSK
FREQUENCY RANGE	27.045MHz ~ 27.095MHz
NUMBER OF CHANNEL	2
ANTENNA TYPE	Printed Antenna
ASSOCIATED DEVICES	NA
DESCRIPTION OF MODELS	

3.2 DESCRIPTION OF TEST MODES

Two channels are provided in this EUT.

Channel	Frequency	Channel	Frequency
1	27.045 MHz	7	
2	27.095 MHz	8	
3		9	
4		10	
5		11	
6			

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless Keyboard, according to the specifications of the manufacturers, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.227)

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

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PERSONAL COMPUTER	COMPAQ	PRESARIO 5716	1L9ACQV3S450	FCCDoC APPROVED
2	MODEM	ACEEX	1414	980020503	IFAXDM1414
3	19"COLOR MONITOR	HP	D2842A	KR93473116	BEJCB910
4	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
5	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110114	F4ZDA-104G

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
4	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
5	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST PROCEDURES AND RESULTS

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
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTES: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
(3) 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 6, 2001
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 9, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	835154/007	Apr. 26, 2001
EMCO-L.I.S.N.	3825/2	9204-1964	July 9, 2001
Shielded Room	Site 2	ADT-C02	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 PROCEDURES

a. Place the EUT at 0.4 meter away from the conduction wall of the shielded room.

b. Connect the EUT to the power mains through a Line Impedance Stabilization Network (LISN).

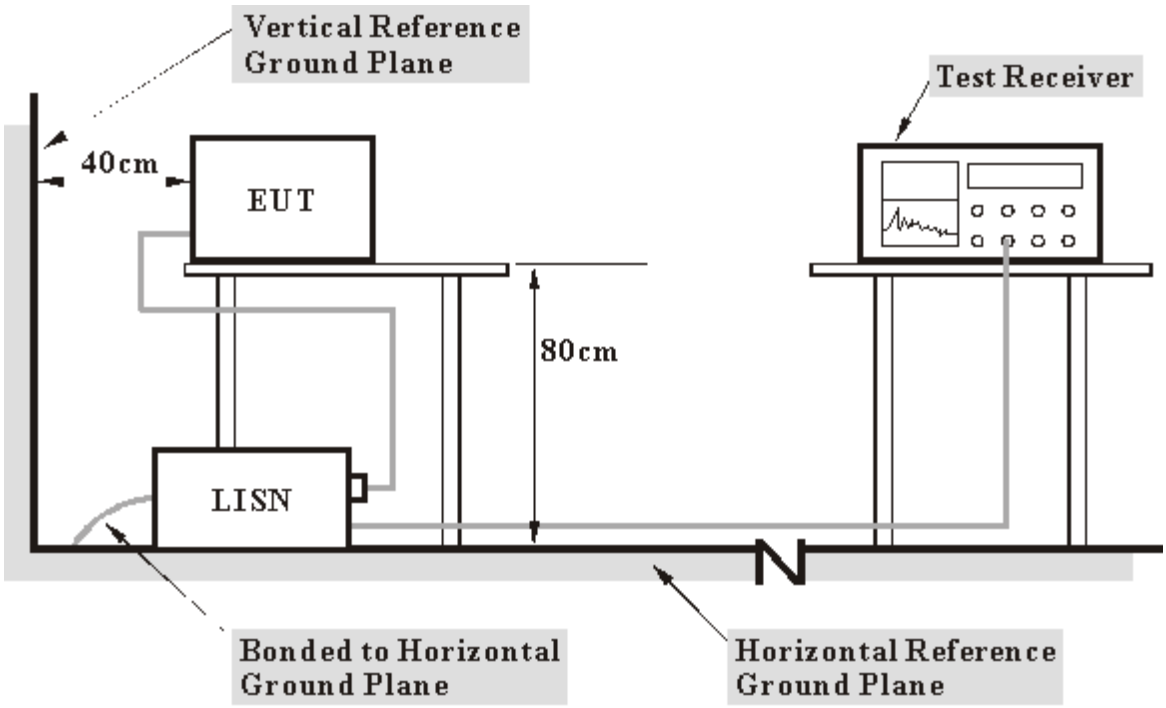
c. Connect the other support units to the other LISN too.

d. Make sure the 50Ω/ 50μH coupling impedance is provided to the measurement instrument by the LISNs.

e. Measure the maximum conducted interference on both lines of the power mains connects to the EUT, within frequency range 450KHz ~ 30MHz.

f. The emission level under limit by 10dB is not needed to 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 TEST RESULTS

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to paragraph 15.207(a), measurements to demonstrate compliance with the conducted limited are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

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 (dBµV/meter)	
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	
	µV/meter	dBµV/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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8590L	3544A01176	Apr. 18, 2001
HP Preamplifier	8447D	2944A08485	Apr. 27, 2001
HP Preamplifier	8347A	3307A01088	Sep. 04, 2001
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 3, 2001
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	N/A
CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
SCHWARZBECK Horn Antenna	BBHA9120-D	D130	Jul. 9, 2001
SCHWARZBECK Horn Antenna	BBHA9170	123	Jan. 30, 2001
EMCO Turn Table	1060	1115	N/A
SHOSHIN Tower	AP-4701	A6Y005	N/A
Open Field Test Site	Site 5	ADT-R05	Aug. 08, 2001

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.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.

b. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.

c. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.

d. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.

e. Rotate the turn table and stop at the angle where the measurement device has maximum reading

f. Shift the interference-receiving antenna again to detect the maximum emission of the local peak

g. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.

h. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.

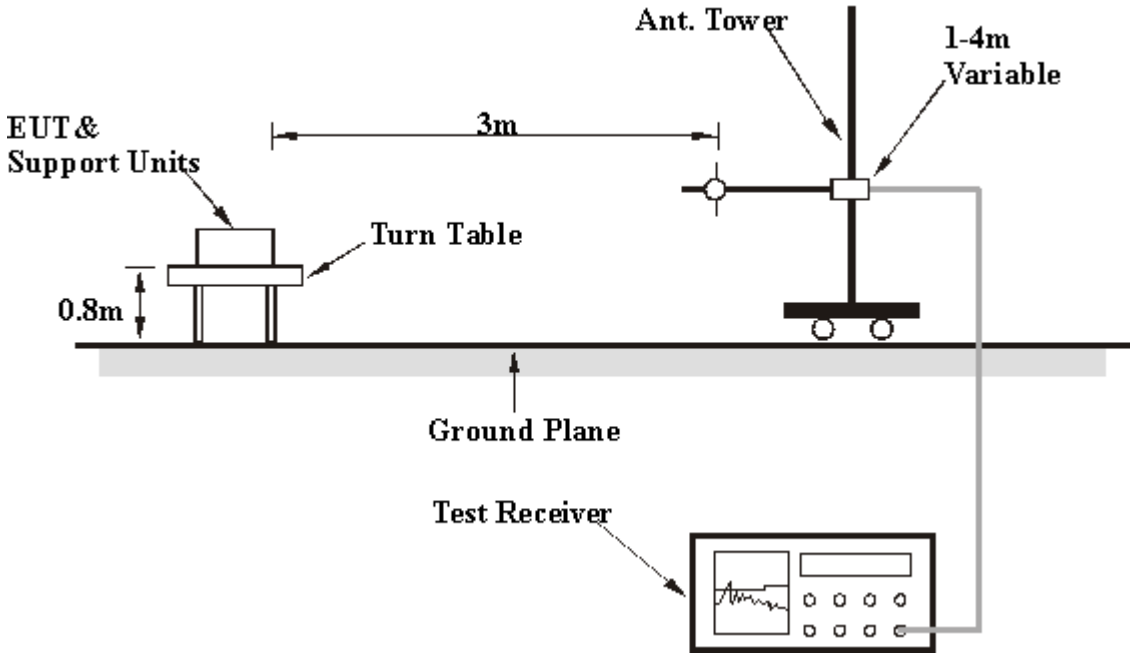
i. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

Note:1. The frequency range of verification is either from 30 MHz to 1GHz or from 30 MHz up to 10 times carrier frequency of EUT (whichever is the highest frequency range).

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for frequency below 1GHz.

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for 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 TEST RESULTS

EUT	Wireless Mouse	**Model**	1210 U/P
Mode	Channel 2	**Detector Function**	Quasi-Peak
Frequency Range	30-1000 MHz	**Test Distance**	3M
Environmental Conditions	24℃, 70%RH	**Tested By**	Steven Lu

ANTENNA POLARITY: Vertical		**Detector Function :**				**6dB Bandwidth : 120 kHz.**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
*27.09	7.89	56.01	-	63.9	-	100	80	-36.1	-	105	188

ANTENNA POLARITY: Horizontal		**Detector Function :**				**6dB Bandwidth : 120 kHz.**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
*27.09	7.89	57.31	-	65.2	-	100	80	-34.8	-	121	266

NOTES: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. The limit value is defined as per 15.227
*6. " * " : Fundamental frequency*

EUT	Wireless Mouse	**Model**	1210 U/P
Mode	Channel 2	**Detector Function**	Quasi-Peak
Frequency Range	30-1000 MHz	**Test Distance**	3M
Environmental Conditions	24℃, 70%RH	**Tested By**	Steven Lu

ANTENNA POLARITY: HORIZONTAL							
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
54.22	18.89	15.41	34.3	40.0	-5.7	111	272
81.01	18.43	9.87	28.3	40.0	-11.7	100	287
108.01	13.88	7.72	21.6	43.5	-21.9	107	63
135.30	13.56	2.84	16.4	43.5	-27.1	126	304
162.03	15.29	7.81	23.1	43.5	-20.4	127	46
189.20	15.76	11.74	27.5	43.5	-16.0	137	297

ANTENNA POLARITY: VERTICAL							
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
51.65	18.89	17.61	36.5	40.0	-3.5	100	230
81.29	18.43	8.37	26.8	40.0	-13.2	158	234
108.01	13.88	20.12	34.0	43.5	-9.5	100	325
135.01	13.56	16.64	30.2	43.5	-13.3	134	252
162.00	15.29	10.31	25.6	46.0	-17.9	162	81

NOTES:(1) Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
(2) Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
(3) The other emission levels were very low against the limit.
(4) Margin value = Emission level - Limit value

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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 by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
New Zealand	RFS
Norway	NEMKO, DNV
U.K.	INCHCAPE
R.O.C.	BSMI

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.

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