FCC TEST REPORT

REPORT NO.: RF920712R01
MODEL NO.: MWP2038
OEM MODEL NO.: PAWM30
RECEIVED: July 12, 2003
TESTED: July 17 ～18, 2003

APPLICANT: DEXIN Corporation

ADDRESS: 14F-8, No 258,Lian Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan, R.O.C

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chia Pau Tsuen, Linkou Hsiang, Taipei, Taiwan, R.O.C.

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0528
ILAC MRA

Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT :	Wireless Mouse
BRAND NAME :	DEXIN
OEM BRAND NAME :	TARGUS
MODEL NO :	MWP2038
OEM MODEL NO :	PAWM30
TEST ITEM:	Engineering Sample
APPLICANT :	DEXIN Corporation
STANDARDS :	47 CFR Part 15, Subpart C(15.227) ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility on July 17 ～18, 2003. 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.

PREPARED BY: Wendy Liao , **DATE:** Aug. 01, 2003

Wendy Liao

APPROVED BY: for **DATE:** Aug. 01, 2003

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 TYPE**	**RESULT**	**REMARK**
15.207	Conducted Emission Test	PASS	Minimum passing margin is –14.60dBuV at 0.170 MHz
15.227	Radiated Emission Test	PASS	Minimum passing margin is –4.60dBuV/m at 270.36MHz

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	Wireless Mouse
MODEL NO.	MWP2038
OEM MODEL NO.	PAWM30
POWER SUPPLY	3.6VDC from battery
MODULATION TYPE	FSK
CARRIER FREQUENCY OF EACH CHANNEL	26.985MHz/27.015MHz/27.045MHz/27.075MHz 27.105MHz/27.135MHz/27.165MHz/27.195MHz 27.225MHz/27.255MHz
BANDWIDTH OF EACH CHANNEL	30KHz
NUMBER OF CHANNEL	10
ANTENNA TYPE	Integral antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT is the transmitter part of a Wireless Mouse.
2. For more detailed features description of the EUT, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

Ten channels were provided in this EUT.

Channel	Frequency	Channel	Frequency
1	26.985 MHz	6	27.135 MHz
2	27.015 MHz	7	27.165 MHz
3	27.045 MHz	8	27.195 MHz
4	27.075 MHz	9	27.225 MHz
5	27.105 MHz	10	27.255 MHz

Note 1: Channel 3, the worst one, was chosen for final test.

Note 2: The EUT was tested with the following two modes. The mode 1 was tested with Tx only, mode 2 was tested with charger function which powered by host equipment via a USB cable.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 15, Subpart C (15.227)

ANSI C63.4-1992

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	Notebook	Compaq	N800C	470048-515	DoC
2	Printer	EPSON	LQ-300+	DCGY017096	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

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

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 50

NOTE: 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	ESCS30	834115/016	Mar. 04, 2004
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ESH2-Z5	892107/003	Jul. 8, 2004
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Nov. 29, 2003
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Nov. 29, 2003
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	Jun. 17, 2004
Software	Cond-V2M3	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C03.01	May. 23, 2004
Terminator (For EMCO LISN)	NA	E1-01-300	Feb. 23, 2004
Terminator (For EMCO LISN)	NA	E1-01-301	Feb. 23, 2004

NOTE: 1.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. "*": These equipment are used for conducted telecom port test only (if tested).
3. The test was performed in ADT Shielded Room No. 3.
4. The VCCI Site Registration No. is C-274.

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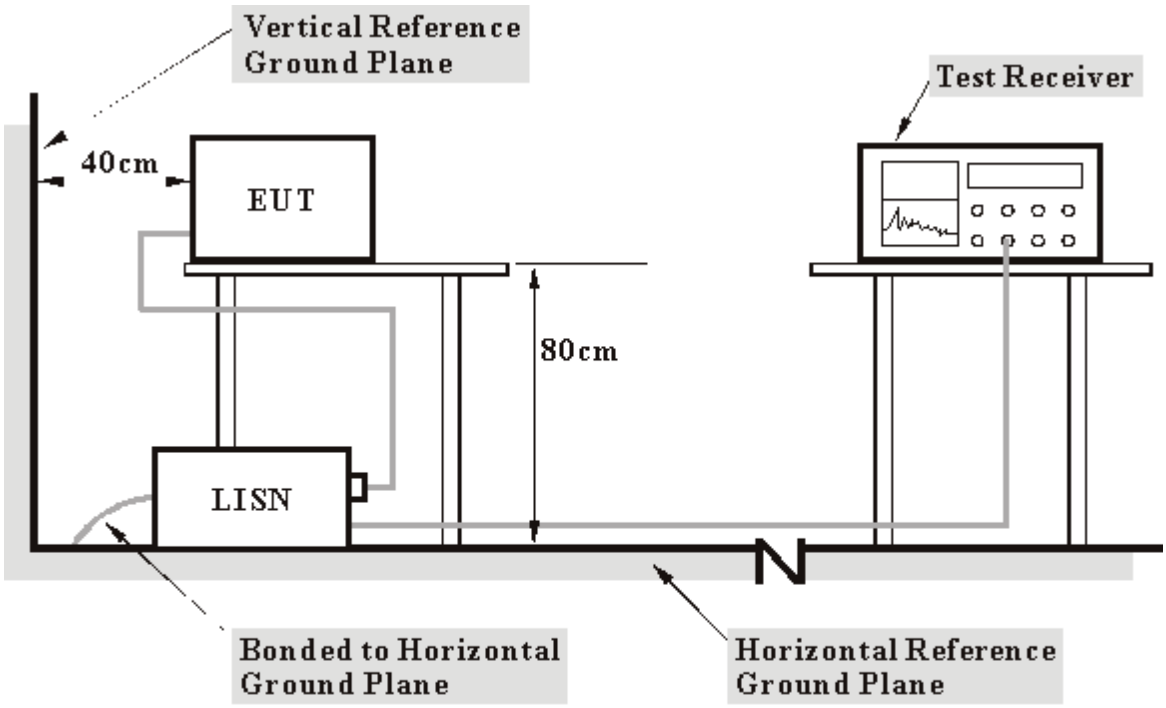
4.1.3 TEST PROCEDURES

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 – Photographs of the Test Configuration.

4.1.5 EUT OPERATING CONDITIONS

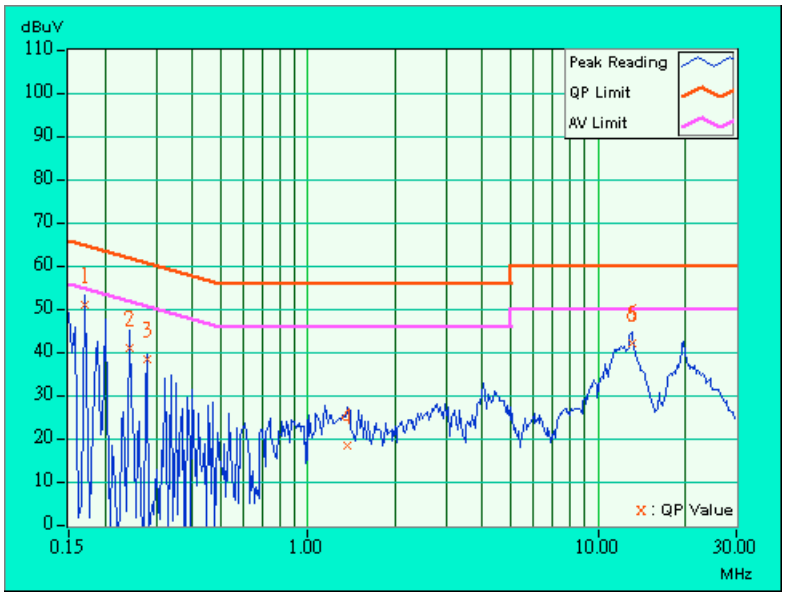
a. Connected the EUT to a computer system placed on a testing table.
b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The computer system sent "H" messages to its screen.
d. The computer system sent “H” messages to modem.
e. The computer system sent "H" messages to printer, and the printer prints them on paper.

4.1.6 TEST RESULTS

EUT	Wireless Mouse	**MODEL**	MWP2038
MODE	Mode 2	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 991 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.10	50.28	-	50.38	-	64.98	54.98	-14.60	-
2	0.244	0.12	40.22	-	40.34	-	61.97	51.97	-21.63	-
3	0.279	0.14	37.74	-	37.88	-	60.85	50.85	-22.97	-
4	1.363	0.34	17.76	-	18.10	-	56.00	46.00	-37.90	-
5	13.059	0.92	41.37	-	42.29	-	60.00	50.00	-17.71	-
6	13.059	0.92	41.25	-	42.17	-	60.00	50.00	-17.83	-

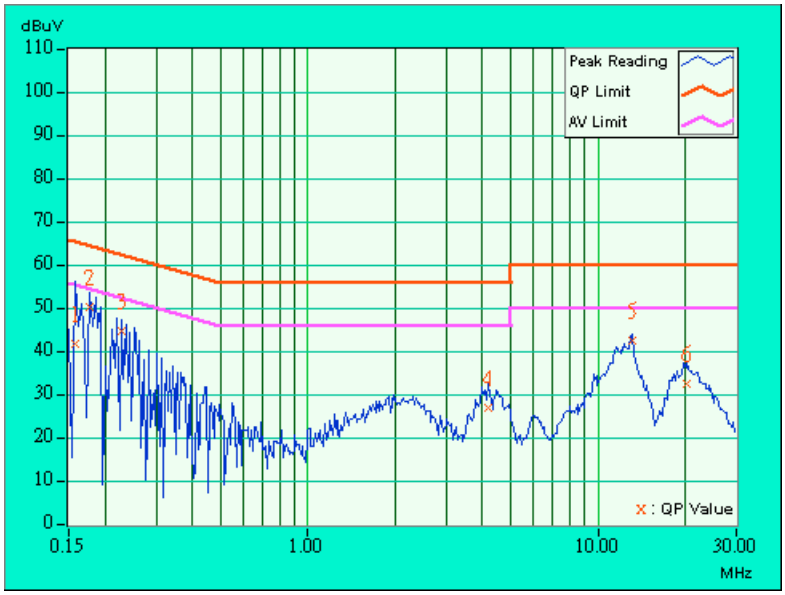
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless Mouse	**MODEL**	MWP2038
MODE	Mode 2	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 991 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	41.15	-	41.25	-	65.58	55.58	-24.33	-
2	0.177	0.10	49.64	-	49.74	-	64.61	54.61	-14.87	-
3	0.228	0.11	44.01	-	44.12	-	62.52	52.52	-18.39	-
4	4.203	0.41	26.36	-	26.77	-	56.00	46.00	-29.23	-
5	13.059	0.60	41.96	-	42.56	-	60.00	50.00	-17.44	-
6	20.203	0.70	31.95	-	32.65	-	60.00	50.00	-27.35	-

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



5 TEST PROCEDURE AND RESULT

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 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.

5.1.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	Jun. 10, 2004
Spectrum Analyzer	8593E	3926A04191	Mar. 24, 2004
* HP Preamplifier	8447D	2944A08485	May. 01, 2004
HP Preamplifier	8449B	3008A01201	Dec. 01, 2003
HP Preamplifier	8449B	3008A01292	Aug. 07, 2003
*Test Receiver	ESI7	838496/016	Feb. 23, 2004
SCHAFFNER Tunable Dipole Antenna SCHWARZBECK Tunable Dipole Antenna	VHBA 9123 UHA 9105	459 977	Nov. 22, 2003
* ANTENNA (Large Biconical)	VHBA9123	449	Dec. 22, 2003
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 02, 2003
SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jun 30, 2004
EMCO Horn Antenna	3115	9312-4192	Mar. 23 2004
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	ADT_Radiated_V5.09	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 05. 2004
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jan. 05. 2004

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

2. "*" = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. 5.
5. The VCCI Site Registration No. is R-1039.

5.2.3 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.

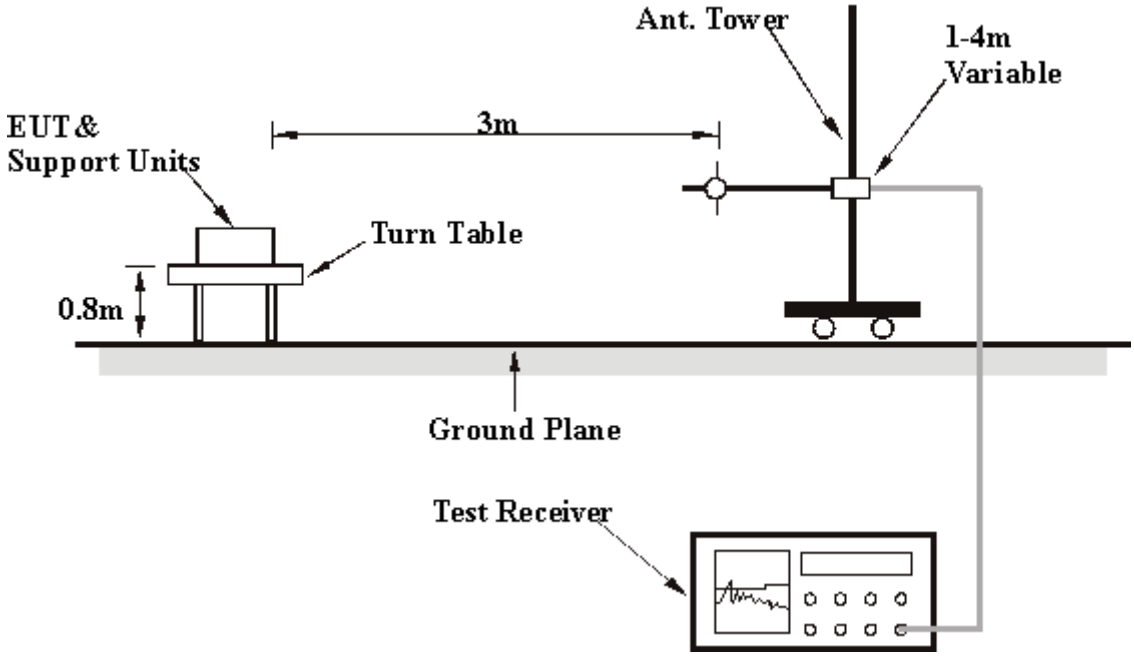
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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.

5.2.4 TEST SETUP



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

5.1.5 EUT OPERATING CONDITION

Same as 4.1.5

5.1.6 TEST RESULT

EUT	Wireless Mouse	**MODEL**	MWP2038
FREQUENCY RANGE	Below 1000MHz	**MODE**	Mode 1
INPUT POWER	3.6VDC	**DETECTOR FUNCTION**	Peak / Quasi-Peak / Average
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 991 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)	Correction Factor (dB/m)
1	*27.04	26.1 AV	80.00	-53.90	2.41 H	146	19.50	6.60
2	*27.04	38.0 PK	100.00	-62.00	2.42 H	146	31.40	6.60
3	243.42	28.4 QP	46.00	-17.60	1.15 H	180	13.40	15.00
4	270.37	35.3 QP	46.00	-10.70	1.42 H	59	18.90	16.40
5	540.70	28.3 QP	46.00	-17.70	1.53 H	213	7.20	21.10
6	648.95	30.4 QP	46.00	-15.60	1.67 H	127	7.60	22.80
7	702.74	31.8 QP	46.00	-14.20	1.22 H	172	8.80	23.10
8	757.11	30.3 QP	46.00	-15.70	1.33 H	107	6.00	24.30
9	811.19	32.1 QP	46.00	-13.90	1.12 H	230	7.20	24.90
10	919.34	30.1 QP	46.00	-15.90	1.30 H	49	5.10	25.00

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)	Correction Factor (dB/m)
1	*27.04	37.6 AV	80.00	-42.40	1.00 V	268	31.00	6.60
2	*27.04	47.6 PK	100.00	-52.40	1.00 V	268	41.00	6.60
3	54.10	26.2 QP	40.00	-13.80	1.19 V	95	16.90	9.40
4	270.33	28.2 QP	46.00	-17.80	1.17 V	226	11.80	16.40
5	405.57	29.7 QP	46.00	-16.30	1.32 V	215	10.50	19.20
6	513.75	28.5 QP	46.00	-17.50	1.09 V	105	7.30	21.20
7	540.79	28.3 QP	46.00	-17.70	1.38 V	250	7.30	21.10
8	703.08	30.8 QP	46.00	-15.20	1.21 V	163	7.70	23.10

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. ”∗”= Fundamental frequency.

EUT	Wireless Mouse	MODEL	MWP2038
FREQUENCY RANGE	Below 1000MHz	MODE	Mode 2
INPUT POWER	3.6VDC	DETECTOR FUNCTION	Peak / Quasi-Peak / Average
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 991 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)	Correction Factor (dB/m)
1	*27.04	51.5 AV	80.00	-28.50	2.71 H	147	44.90	6.60
2	*27.04	60.3 PK	100.00	-39.70	2.72 H	147	53.70	6.60
3	216.38	31.6 QP	46.00	-14.40	1.36 H	55	19.10	12.50
4	243.24	35.0 QP	46.00	-11.00	1.31 H	65	20.00	15.00
5	270.36	41.4 QP	46.00	-4.60	1.29 H	146	25.00	16.40
6	513.91	30.6 QP	46.00	-15.40	1.21 H	287	9.40	21.20
7	649.14	33.3 QP	46.00	-12.70	1.22 H	64	10.50	22.80
8	676.24	33.1 QP	46.00	-12.90	1.68 H	353	10.20	22.90
9	703.29	36.5 QP	46.00	-9.50	1.34 H	120	13.50	23.10
10	757.40	33.3 QP	46.00	-12.70	1.14 H	213	9.10	24.30
11	865.58	33.2 QP	46.00	-12.80	1.28 H	24	8.10	25.10
12	919.34	37.0 QP	46.00	-9.00	1.02 H	155	12.00	25.00

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)	Correction Factor (dB/m)
1	*27.04	57.5 AV	80.00	-22.50	1.00 V	103	50.90	6.60
2	*27.04	67.5 PK	100.00	-32.50	1.00 V	103	60.90	6.60
3	54.08	28.6 QP	40.00	-11.40	1.32 V	34	19.20	9.40
4	270.36	32.4 QP	46.00	-13.60	1.15 V	74	16.00	16.40
5	513.72	32.0 QP	46.00	-14.00	1.57 V	85	10.80	21.20
6	567.80	29.1 QP	46.00	-16.90	1.17 V	84	7.50	21.60
7	594.70	36.1 QP	46.00	-9.90	1.04 V	227	13.60	22.50
8	648.90	36.7 QP	46.00	-9.30	1.18 V	94	13.90	22.80
9	676.23	34.0 QP	46.00	-12.00	1.54 V	62	11.10	22.90
10	757.40	31.6 QP	46.00	-14.40	1.12 V	30	7.30	24.30

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. ”*”= Fundamental frequency.

6 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST

7 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.
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The address and road map of all our labs can be found in our web site also.