



# FCC TEST REPORT

**REPORT NO.:** RF930429L05

**MODEL NO.:** MWP2090

**RECEIVED:** Apr. 29, 2004

**TESTED:** May 4, 2004

**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:** No. 19, Hwa Ya 2nd rd., Kueishan, Taoyuan, Taiwan, R.O.C.

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## 1 CERTIFICATION

**PRODUCT NAME :** OFFICE WIRELESS MOUSE  
**BRAND NO:** DEXIN  
**MODEL NO. :** MWP2090  
**APPLICANT :** DEXIN Corporation  
**TESTED:** May 4, 2004  
**TEST ITEM :** Engineering Sample  
**STANDARDS :** FCC Part 15, Subpart C(15.227)  
ANSI C63.4-2001

The above equipment has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY:** Wendy Liao , **DATE:** May 7, 2004  
Wendy Liao

**APPROVED BY:** Cody Chang , **DATE:** May 7, 2004  
Cody Chang / Supervisor

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	N/A	Power supply is 3Vdc from batteries
15.227	Radiated Emission Test	PASS	Minimum passing margin is -7.19dB at 269.10MHz

**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

<b>PRODUCT</b>	OFFICE WIRELESS MOUSE
<b>MODEL NO.</b>	MWP2090
<b>POWER SUPPLY</b>	3.0Vdc for Mouse from AA Battery x 2
<b>MODULATION TYPE</b>	FSK
<b>CARRIER FREQUENCY OF EACH CHANNEL</b>	27.045MHz, 27.145MHz
<b>BANDWIDTH OF EACH CHANNEL</b>	NA
<b>NUMBER OF CHANNEL</b>	2
<b>ANTENNA TYPE</b>	Internal copper trace antenna
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	NA
<b>ASSOCIATED DDVCES</b>	NA

**NOTE:**

1. The EUT is the transmitter part of a wireless mouse.
2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

Two channels were provided in this EUT.

CHENNEL	FREQUENCY
1	27.045MHz
2	27.145MHz

**Note:** Frequency of 27.045MHz, the worst case one, was chosen for the final test.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC Part 15, Subpart C (15.227)**

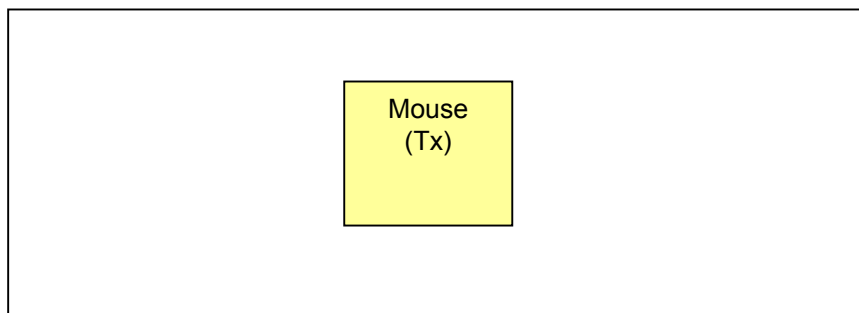
**ANSI C63.4-2001**

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

NA

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST



## 4 TEST PROCEDURE AND RESULT

### 4.1 CONDUCTED EMISSION MEASUREMENT

NA

### 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 (dBuV/m)	
	Peak	Average
26.96-27.28	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:

Frequencies (MHz)	Field strength (microvolts/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

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 INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Jan. 13, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 15, 2004
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170241	Feb. 23, 2005
Preamplifier Agilent	8449B	3008A01961	Jan. 22, 2005
Preamplifier Agilent	8447D	2944A10629	Jan. 14, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218182/4	Mar. 04, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218194/4	Mar. 04, 2005
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA

- 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. The test was performed in HwaYa Chamber 1.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-2.



#### 4.2.3 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.

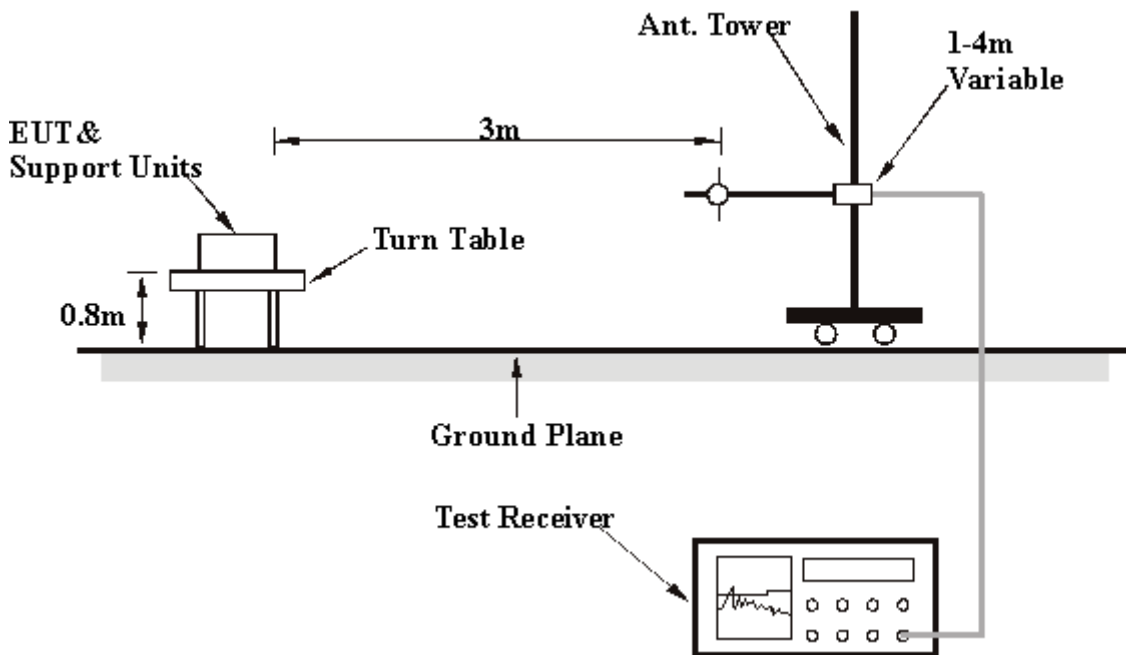
**NOTE:**

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 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



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

#### 4.2.6 EUT OPERATING CONDITION

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

## 4.2.7 TEST RESULTS

<b>EUT</b>	OFFICE WIRELESS MOUSE	<b>MODEL</b>	MWP2090
<b>FREQUENCY</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>INPUT POWER</b>	3Vdc	<b>DETECTOR FUNCTION</b>	Peak / Quasi-Peak / Average
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 60%RH, 991hPa	<b>TESTED BY:</b> Steven Lu	

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	44.88 PK	100.00	-55.12	2.25 H	186	31.28	13.60
1	*27.04	42.20 AV	80.00	-37.80	2.25 H	186	28.60	13.60
2	107.76	24.40 QP	43.50	-19.10	1.75 H	349	12.62	11.77
3	134.97	27.24 QP	43.50	-16.26	2.50 H	67	13.17	14.07
4	162.18	24.21 QP	43.50	-19.29	1.75 H	136	9.53	14.68
5	189.40	22.55 QP	43.50	-20.95	1.75 H	109	10.33	12.22
6	216.61	27.75 QP	46.00	-18.25	1.00 H	352	15.66	12.09
7	243.83	34.92 QP	46.00	-11.08	1.00 H	10	21.79	13.13
<b>8</b>	<b>269.10</b>	<b>38.81 QP</b>	<b>46.00</b>	<b>-7.19</b>	<b>1.00 H</b>	<b>331</b>	<b>25.07</b>	<b>13.73</b>
9	296.31	35.73 QP	46.00	-10.27	1.00 H	346	21.29	14.44
10	323.53	37.01 QP	46.00	-8.99	1.00 H	355	21.97	15.04
11	350.74	35.74 QP	46.00	-10.26	1.00 H	7	20.07	15.67
12	377.96	34.89 QP	46.00	-11.11	1.00 H	340	18.63	16.27
13	514.03	32.39 QP	46.00	-13.61	1.75 H	10	13.39	19.00
14	568.46	35.76 QP	46.00	-10.24	1.50 H	253	15.58	20.18
15	595.67	35.96 QP	46.00	-10.04	1.50 H	259	15.06	20.90
16	622.89	34.39 QP	46.00	-11.61	1.50 H	241	13.07	21.32
17	650.10	33.42 QP	46.00	-12.58	1.00 H	4	11.74	21.68

- 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.

<b>EUT</b>	OFFICE WIRELESS MOUSE	<b>MODEL</b>	MWP2090
<b>FREQUENCY</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>INPUT POWER</b>	3Vdc	<b>DETECTOR FUNCTION</b>	Peak / Quasi-Peak / Average
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 60%RH, 991hPa	<b>TESTED BY:</b> Steven Lu	

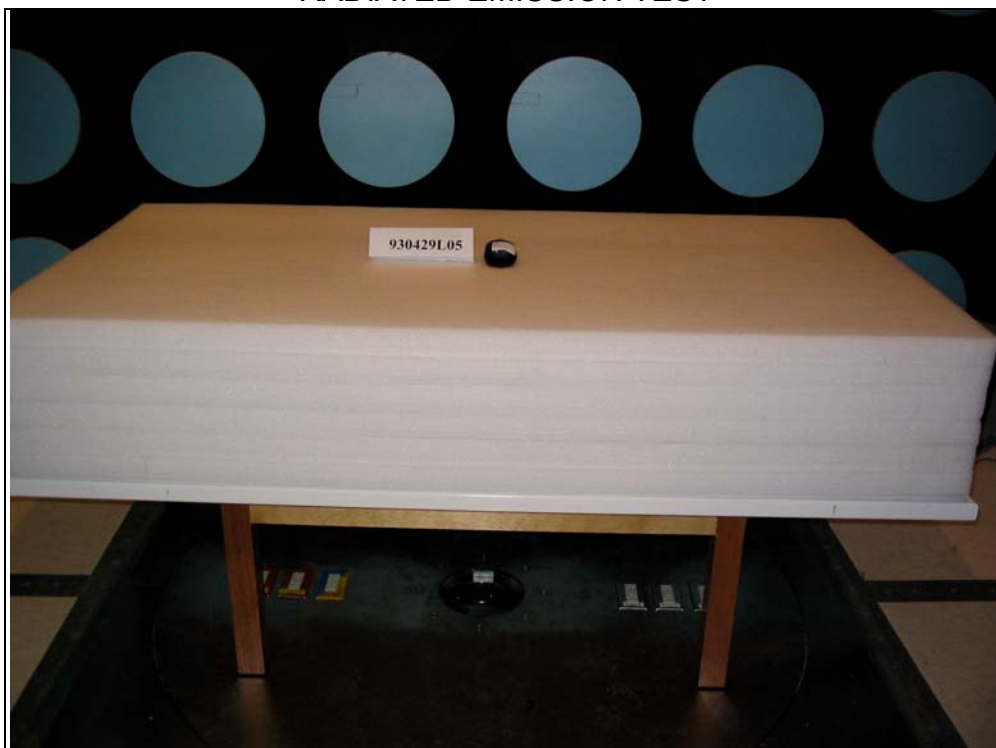
**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

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	*27.05	46.67 PK	100.00	-53.33	1.00 V	206	33.07	13.60
1	*27.04	44.23 AV	80.00	-35.77	1.00 V	206	30.63	13.60
2	53.33	23.14 QP	40.00	-16.86	1.00 V	145	8.77	14.37
3	84.43	21.04 QP	40.00	-18.96	1.00 V	91	10.97	10.07
4	113.59	23.95 QP	43.50	-19.55	1.00 V	226	11.57	12.37
5	243.83	18.76 QP	46.00	-27.24	2.00 V	241	5.63	13.13
6	269.10	24.78 QP	46.00	-21.22	1.00 V	325	11.05	13.73
7	296.31	22.04 QP	46.00	-23.96	1.25 V	295	7.60	14.44
8	350.74	25.72 QP	46.00	-20.28	1.25 V	289	10.06	15.67
9	377.96	27.22 QP	46.00	-18.78	1.25 V	277	10.95	16.27
10	405.17	24.35 QP	46.00	-21.65	1.25 V	253	7.47	16.89
11	432.38	23.13 QP	46.00	-22.87	1.50 V	70	5.52	17.60
12	568.46	27.85 QP	46.00	-18.15	1.00 V	22	7.68	20.18
13	595.67	27.26 QP	46.00	-18.74	1.75 V	136	6.36	20.90
14	622.89	27.61 QP	46.00	-18.39	1.50 V	292	6.29	21.32
15	650.10	28.46 QP	46.00	-17.54	1.50 V	283	6.78	21.68

- 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.

## 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, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

<b>USA</b>	FCC, NVLAP, UL
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA , CSA
<b>R.O.C.</b>	CNLA, BSMI, DGT
<b>Netherlands</b>	Telefication
<b>Singapore</b>	PSB , GOST-ASIA(MOU)
<b>Russia</b>	CERTIS(MOU)

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](http://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.

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