

# FCC TEST REPORT

**REPORT NO.:** RF960718L14  
**MODEL NO.:** MWP83-P1M  
**SERIES MODEL NO.:** (refer to item 3.1 for more details)  
**RECEIVED:** Jul. 18, 2007  
**TESTED:** Jul. 21 ~ Jul. 22, 2007  
**ISSUED:** Jul. 25, 2007

**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 ADDRESS:** No. 47, 14<sup>th</sup> Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

**TEST LOCATION:** No. 19, Hwa Ya 2<sup>nd</sup> Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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# 1 CERTIFICATION

**PRODUCT:** Cordless Mouse

**MODEL NO.:** MWP83-P1M

**SERIES MODEL NO.:** (refer to item 3.1 for more details)

**BRAND:** DEXIN

**APPLICANT:** DEXIN Corporation

**TESTED:** Jul. 21 ~ Jul. 22, 2007

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** **FCC Part 15, Subpart C (Section 15.227)**

ANSI C63.4-2003

The above equipment (model: MWP83-P1M) 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** : Rennie Wang , **DATE:** Jul. 25, 2007  
Rennie Wang / Senior Specialist

**TECHNICAL ACCEPTANCE** : Long Chen , **DATE:** Jul. 25, 2007  
Responsible for RF Long Chen / Senior Engineer

**APPROVED BY** : Gary Chang , **DATE:** Jul. 25, 2007  
Gary Chang / Assistant Manager

## 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	AC Power Conducted Emission	NA	Power supply is 3Vdc from batteries
15.227 15.209	Radiated Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is -15.10dB at 377.93MHz.

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Cordless Mouse
<b>MODEL NO.</b>	MWP83-P1M
<b>SERIES MODEL NO.:</b>	(refer to NOTE below for more details)
<b>FCC ID</b>	NIYMWP83-P1M
<b>POWER SUPPLY</b>	3Vdc form batteries (1.5Vdc x 2)
<b>MODULATION TYPE</b>	FSK
<b>CARRIER FREQUENCY OF EACH CHANNEL</b>	27.045MHz
<b>NUMBER OF CHANNEL</b>	1
<b>ANTENNA TYPE</b>	Loop antenna
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	NA
<b>ACCESSORY DEVICE</b>	NA

**NOTE:**

1. The following models were provided to this EUT.

MODEL	REMARK
MWP83-P1M	-
MWP103-P1M	Series Tx, only outward appearance and internal 4.5key PCB board different

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.

### 3.1 DESCRIPTION OF TEST MODES

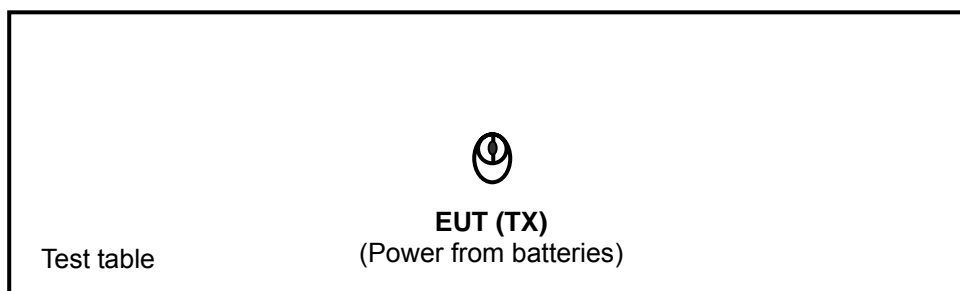
The EUT only has one channel.

CHANNEL	FREQUENCY (MHz)
1	27.045

The EUT had been pre-tested with following modes, and found the worst case at **Model MWP103-P1M**, therefore, only the data had been presented in the following sections.

MODE	MODEL
1	MWP83-P1M
2	MWP103-P1M

#### 3.1.1 CONFIGURATION OF SYSTEM UNDER TEST



### 3.1.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT configure mode	Applicable to		Description
	PLC	RE<1G	
-	NOTE	√	-

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery..

#### RADIATED EMISSION TEST (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations.
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
1	1	FSK

### 3.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. 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 C63.4-2003**

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

### 3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.

## 4 TEST PROCEDURE AND RESULT

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 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)	
	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.



#### 4.1.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 29, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 01, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 04, 2008
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-405	Dec. 18, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 16, 2008
Loop Antenna	HFH2-Z2	100070	Nov. 28, 2007
Preamplifier Agilent	8449B	3008A1960	Oct. 30, 2007
Preamplifier Agilent	8447D	2944A10631	Oct. 30, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	230128/4	Nov. 14, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	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 4.
  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 IC3789B-4.

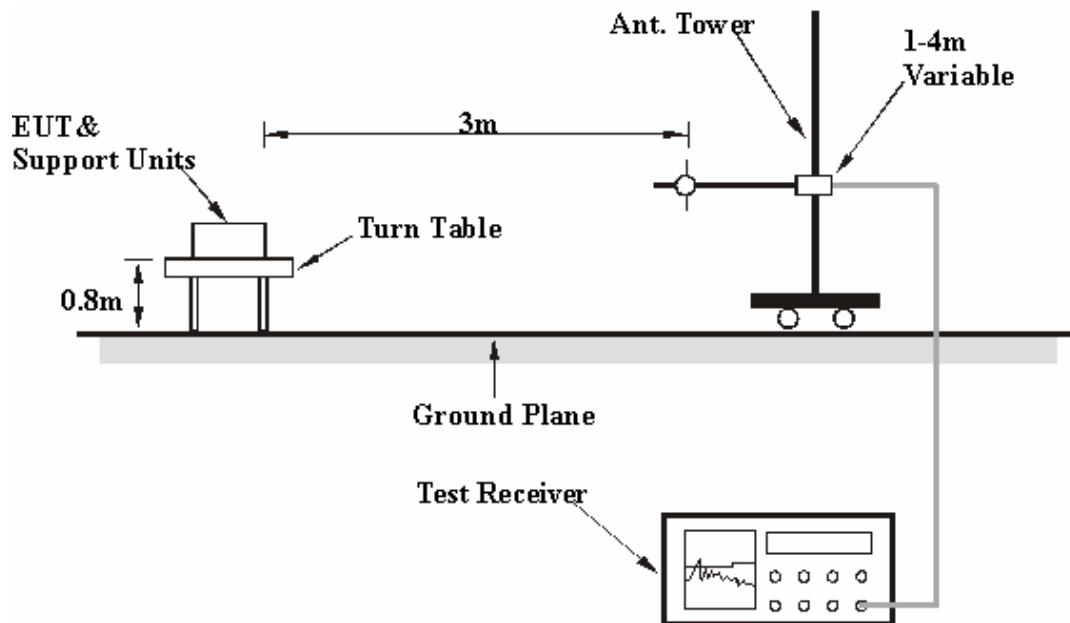
#### 4.1.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 peak, quasi-peak or average method as specified and then reported in a data sheet.

**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.

#### 4.1.4 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.5 EUT OPERATING CONDITION

- a. Placed the EUT on the testing table.
- b. Set the EUT under transmitting condition.

#### 4.1.6 TEST RESULTS

##### RADIATED WORST-CASE DATA

<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>FREQUENCY</b>	Below 1000 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68% RH, 982 hPa	<b>DETECTOR FUNCTION</b>	Peak / Average
<b>TESTED BY</b>	Morgan Chen		

TEST DISTANCE: 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	54.48 PK	100.00	-45.52	2.36	115	42.05	12.43
2	*27.05	54.29 AV	80.00	-25.71	2.36	115	41.86	12.43

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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. Loop Antenna was used for all frequency below 30MHz.

<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>FREQUENCY</b>	Below 1000 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68% RH, 982 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

<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	53.23	17.39 QP	40.00	-22.61	2.00 H	286	3.22	14.17
2	80.84	16.41 QP	40.00	-23.59	1.50 H	94	5.48	10.93
3	107.67	16.85 QP	43.50	-26.65	1.50 H	94	5.94	10.91
4	162.11	15.43 QP	43.50	-28.07	2.00 H	76	1.22	14.21
5	212.66	16.78 QP	43.50	-26.72	1.50 H	13	4.84	11.94
6	243.77	21.19 QP	46.00	-24.81	1.00 H	277	7.78	13.41
7	269.05	26.03 QP	46.00	-19.97	1.00 H	319	11.93	14.10
8	317.65	27.75 QP	46.00	-18.25	1.00 H	307	12.55	15.20
9	352.65	29.03 QP	46.00	-16.97	1.00 H	286	12.91	16.12
<b>10</b>	<b>377.93</b>	<b>30.90 QP</b>	<b>46.00</b>	<b>-15.10</b>	<b>1.00 H</b>	<b>271</b>	<b>14.13</b>	<b>16.77</b>
11	397.37	30.12 QP	46.00	-15.88	1.00 H	295	12.85	17.26
12	430.42	22.49 QP	46.00	-23.51	1.00 H	238	4.20	18.29
13	512.08	25.39 QP	46.00	-20.61	2.00 H	250	4.55	20.84
14	541.25	23.40 QP	46.00	-22.60	1.50 H	268	1.82	21.59
15	578.19	24.09 QP	46.00	-21.91	1.50 H	112	1.53	22.56

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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.

<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>FREQUENCY</b>	Below 1000 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68% RH, 982 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL 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	53.23	20.14 QP	40.00	-19.86	1.00 V	202	5.97	14.17
2	80.84	21.70 QP	40.00	-18.30	1.00 V	10	10.77	10.93
3	107.67	17.17 QP	43.50	-26.33	1.00 V	229	6.26	10.91
4	134.89	15.22 QP	43.50	-28.28	1.00 V	1	2.11	13.12
5	162.11	14.56 QP	43.50	-28.94	1.00 V	208	0.34	14.21
6	216.55	13.29 QP	46.00	-32.71	2.00 V	178	1.17	12.12
7	255.44	16.06 QP	46.00	-29.94	2.00 V	28	2.24	13.83
8	269.05	20.49 QP	46.00	-25.51	1.50 V	223	6.40	14.10
9	296.27	18.49 QP	46.00	-27.51	2.00 V	184	3.83	14.66
10	358.48	21.34 QP	46.00	-24.66	1.50 V	160	5.07	16.27
11	391.54	23.57 QP	46.00	-22.43	2.00 V	148	6.46	17.11
12	401.26	23.26 QP	46.00	-22.74	1.00 V	229	5.89	17.37
13	451.81	21.23 QP	46.00	-24.77	1.50 V	262	2.27	18.96
14	467.36	21.45 QP	46.00	-24.55	1.00 V	100	1.99	19.47
15	578.19	21.99 QP	46.00	-24.01	1.00 V	289	-0.57	22.56

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

## 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.

<b>USA</b>	FCC, UL, A2LA
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA , CSA
<b>R.O.C.</b>	TAF, BSMI, NCC
<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). If you have any comments, please feel free to contact us at the following:

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**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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



## **7 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.