

# FCC TEST REPORT

**REPORT NO.:** RF950705L14

**MODEL NO.:** 1083

**RECEIVED:** Jul. 05, 2006

**TESTED:** Jul. 06, 2006

**ISSUED:** Jul. 10, 2006

**APPLICANT:** Microsoft Corporation

**ADDRESS:** One Microsoft Way, Redmond, WA 98052-6399,  
U.S.A.

**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 :** Microsoft® Natural™ Wireless Laser Mouse 6000

**BRAND NAME :** Microsoft®

**MODEL NO. :** 1083

**APPLICANT :** Microsoft Corporation

**TESTED :** Jul. 06, 2006

**TEST SAMPLE :** ENGINEERING SAMPLE

**STANDARDS :** FCC Part 15, Subpart C (Section 15.227),  
ANSI C63.4-2003  
Canada RSS-310 Issue 1 (September 2005)

The above equipment (Model: 1083) have 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 :** Windy Chou , **DATE:** Jul. 10, 2006  
( Windy Chou )

**TECHNICAL ACCEPTANCE :** Long Chen , **DATE:** Jul. 10, 2006  
Responsible for RF ( Long Chen )

**APPROVED BY :** Gary Chang , **DATE:** Jul. 10, 2006  
( Gary 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	NA	Power supply is 1.5Vdc from batteries
15.227 15.209	Radiated Emission Test	PASS	Minimum passing margin is -15.80dB at 297.50MHz

### 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 (Horizontal)	3.56 dB
	30MHz ~ 200MHz (Vertical)	3.71 dB
	200MHz ~1000MHz (Horizontal)	3.73 dB
	200MHz ~1000MHz (Vertical)	3.71 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 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 D GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Microsoft® Natural™ Wireless Laser Mouse 6000
<b>MODEL NO.</b>	1083
<b>FCC ID</b>	C3K1083
<b>POWER SUPPLY</b>	1.5Vdc from batteries for transmitter
<b>MODULATION TYPE</b>	FSK
<b>CARRIER FREQUENCY OF EACH CHANNEL</b>	27.045 / 27.145
<b>CHANNEL SPACING</b>	100kHz
<b>NUMBER OF CHANNEL</b>	2
<b>ANTENNA TYPE</b>	PCB antenna
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	USB
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

1. This report only covered the EUT of Mouse (Model: 1083, FCC ID: C3K1083).

2. Pluto Configuration Information:

<b>Configuration #:</b>		<b>Comments: EV2 phase Mouse unit for formal report</b>			
<b>Manufacturer</b>	<b>Component type</b>	<b>Part no.</b>	<b>Revision no.</b>	<b>Description</b>	<b>BOM (if known)</b>
Microsoft	Mouse			Model: 1083	
ST	Optical Sensor	11300398000	B	CHIP IC Aviator ASIC TQFP-32L	11300398000
ST	Microcontroller	11300398000	B	CHIP IC Aviator ASIC TQFP-32L	11300398000
ULM	Laser	ULM850	NA	VCSEL (850nm)	10740114200
Microsoft	firmware			Bentley EV2 20060621-A	
	PCB	10230577200	08	SPCB, BENTLEY, TX, AVIAT, S2L, 101.1X90.8, OM05057U01	10230577201
KYE	PCB Assy	20000878200	04	PCBA, BENTLEY, TX	20000878200
	Case tooling				
Merrich	Bottom Case	15120605201	T1	Case, Bottom-Resin	15120605201
Merrich	Top Case	15102417201	T1	Case, Top (Top Skirt, including wheel surround)-Resin	15102417201

**Definition of configuration #:** The configuration number (#) is used for traceability to a particular BOM (Bill of Materials). It is an easy way to readily identify and convey the construction of a without having to include all of the details of a BOM on every test data sheet. If two sets of test data have test samples with the same configuration # then the construction details of those test samples can readily be determined (as long as the configuration # correctly corresponds to a BOM) and that these two test samples have been constructed identically.

**Detailed information on the configuration of the tested samples is required in order to track performance changes across various revisions of the hardware and to document that the samples tested are representative of the final configuration that will be manufactured in production.**

**Any prototype or pre-production components must be clearly identified in the configuration table.**

3. There are three samples provided to this EUT

Sample	Tx
1	BTX-EV2-041
2	BTX-EV2-040
3	BTX-EV2-162

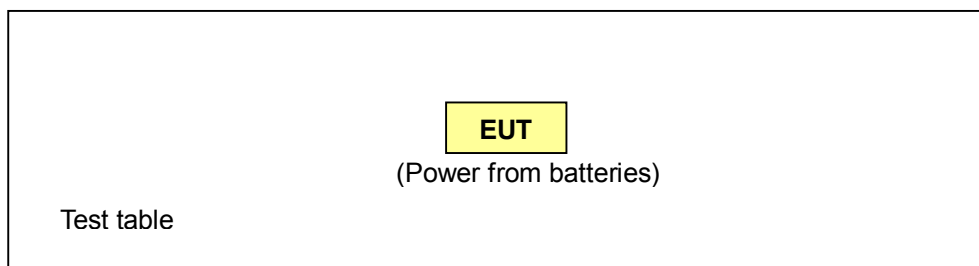
4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

Two channels were provided to this EUT.

CHANNEL	FREQUENCY
1	27.045
2	27.145

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT configure mode	Applicable to		Description
	PLC	RE<1G	
A	-	√	Sample 1
B	-	√	Sample 2
C	-	√	Sample 3

Where PLC: Power Line Conducted Emission

RE<1G RE: Radiated Emission below 1GHz

#### **Radiated Emission Test (Below 1 GHz):**

Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	Available Channel	Tested Channel	Modulation Type
A	1-2	1, 2	FSK
B	1-2	1, 2	FSK
C	1-2	1, 2	FSK

### 3.3 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**

**Canada RSS-310 Issue 1 (September 2005)**

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

NA

## 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	ESI7	100033	May. 22, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Dec. 05, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2007
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 08, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 19, 2007
Preamplifier Agilent	8447D	2944A10633	Nov. 04, 2006
Preamplifier Agilent	8449B	3008A01964	Oct. 30, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214377/4	Dec. 13, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219272/4	Dec. 13, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA
Loop Antenna	HFH2-Z2	100070	Nov. 28, 2007

- 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 2.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The VCCI Site Registration No. is R-237.
  5. The IC Site Registration No. is IC4924-3.

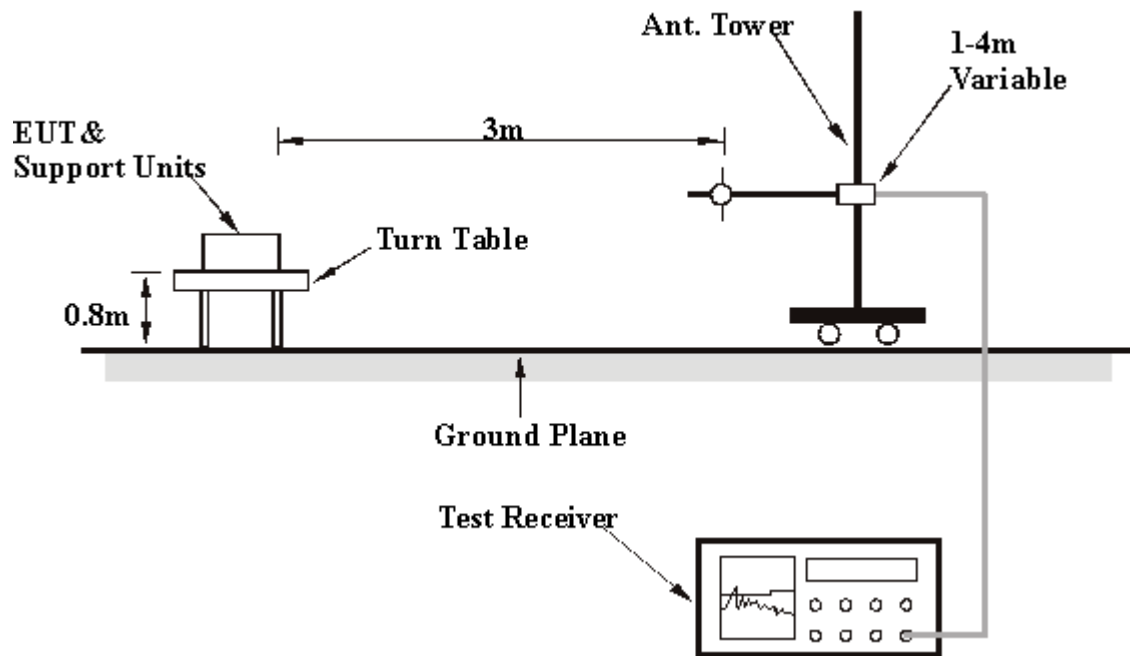
### 4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 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.
2. Emission of fundamental frequency is worst case between horizontal and vertical polarity

#### 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 EUT OPERATING CONDITION

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

## 4.2.6 TEST RESULTS

### Radiated Worst-Case Data

<b>CHANNEL</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	A	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 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	*27.04	49.33 PK	100	-50.67	2.03	135	36.00	13.33
2	*27.04	43.22 AV	80	-36.78	2.03	135	29.89	13.33

- 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>CHANNEL</b>	27.145MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	A	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 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	*27.14	49.92 PK	100	-50.08	1.80	169	36.59	13.33
2	*27.14	43.89 AV	80	-36.11	1.80	169	30.56	13.33

- 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>CHANNEL</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	B	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 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	*27.04	49.58 PK	100	-50.42	1.98	165	36.25	13.33
2	*27.04	43.62 AV	80	-36.38	1.98	165	30.29	13.33

- 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>CHANNEL</b>	27.145MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	B	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 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	*27.14	49.89 PK	100	-50.11	1.88	165	36.56	13.33
2	*27.14	43.75 AV	80	-36.25	1.88	165	30.42	13.33

- 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>CHANNEL</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	C	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 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	*27.04	49.14 PK	100	-50.86	1.99	129	35.81	13.33
2	*27.04	43.09 AV	80	-36.91	1.99	129	29.76	13.33

- 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>CHANNEL</b>	27.145MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	C	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 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	*27.14	49.85 PK	100	-50.15	1.80	173	36.52	13.33
2	*27.14	43.84 AV	80	-36.16	1.80	173	30.51	13.33

- 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>CHANNEL</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	A	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

**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	216.36	27.70 QP	46.00	-18.30	1.50 H	292	15.71	11.99
2	243.41	27.70 QP	46.00	-18.30	1.75 H	229	14.50	13.20
3	297.50	28.28 QP	46.00	-17.72	1.25 H	7	13.20	15.08
4	324.50	28.33 QP	46.00	-17.67	1.00 H	130	12.54	15.79
5	351.60	27.54 QP	46.00	-18.46	1.00 H	118	11.03	16.51
6	513.90	27.39 QP	46.00	-18.61	2.00 H	280	6.97	20.42

**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	216.36	28.93 QP	46.00	-17.07	1.25 V	262	16.94	11.99
2	243.41	29.61 QP	46.00	-16.39	1.25 V	322	16.41	13.20
3	297.50	29.79 QP	46.00	-16.21	1.00 V	103	14.71	15.08
4	324.50	29.79 QP	46.00	-16.21	1.00 V	265	14.00	15.79
5	351.60	27.25 QP	46.00	-18.75	1.00 V	142	10.74	16.51
6	513.90	28.20 QP	46.00	-17.80	1.00 V	100	7.78	20.42

- 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>CHANNEL</b>	27.145MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	A	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

**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	217.16	27.70 QP	46.00	-18.30	1.50 H	292	15.67	12.03
2	244.30	27.70 QP	46.00	-18.30	1.75 H	229	14.46	13.24
3	298.60	28.28 QP	46.00	-17.72	1.25 H	7	13.17	15.11
4	325.74	28.33 QP	46.00	-17.67	1.00 H	130	12.51	15.82
5	352.90	27.54 QP	46.00	-18.46	1.00 H	118	11.00	16.54
6	515.76	27.39 QP	46.00	-18.61	2.00 H	280	6.94	20.45

**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	217.16	28.93 QP	46.00	-17.07	1.25 V	262	16.90	12.03
2	244.30	29.61 QP	46.00	-16.39	1.25 V	322	16.37	13.24
3	298.60	29.79 QP	46.00	-16.21	1.00 V	103	14.68	15.11
4	325.74	29.79 QP	46.00	-16.21	1.00 V	265	13.97	15.82
5	352.90	27.25 QP	46.00	-18.75	1.00 V	142	10.71	16.54
6	515.76	28.20 QP	46.00	-17.80	1.00 V	100	7.75	20.45

- 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>CHANNEL</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	B	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

**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	216.36	27.89 QP	46.00	-18.11	1.25 H	239	15.90	11.99
2	243.41	28.80 QP	46.00	-17.20	1.50 H	212	15.60	13.20
3	297.50	28.39 QP	46.00	-17.61	1.25 H	7	13.31	15.08
4	324.50	28.93 QP	46.00	-17.07	1.00 H	133	13.14	15.79
5	351.60	27.94 QP	46.00	-18.06	1.25 H	158	11.43	16.51
6	513.90	28.60 QP	46.00	-17.40	1.00 H	259	8.18	20.42

**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	216.36	28.99 QP	46.00	-17.01	1.25 V	162	17.00	11.99
2	243.41	29.91 QP	46.00	-16.09	1.25 V	360	16.71	13.20
<b>3</b>	<b>297.50</b>	<b>30.20 QP</b>	<b>46.00</b>	<b>-15.80</b>	<b>1.50 V</b>	<b>360</b>	<b>15.12</b>	<b>15.08</b>
4	324.50	30.00 QP	46.00	-16.00	1.00 V	169	14.21	15.79
5	351.60	28.20 QP	46.00	-17.80	1.00 V	156	11.69	16.51
6	513.90	28.90 QP	46.00	-17.10	1.00 V	133	8.48	20.42

- 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>CHANNEL</b>	27.145MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	B	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

**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	217.16	26.70 QP	46.00	-19.30	1.00 H	43	14.67	12.03
2	244.30	27.31 QP	46.00	-18.69	1.00 H	13	14.07	13.24
3	298.60	27.21 QP	46.00	-18.79	1.00 H	358	12.10	15.11
4	325.74	26.54 QP	46.00	-19.46	1.00 H	169	10.72	15.82
5	352.90	26.51 QP	46.00	-19.49	1.00 H	169	9.97	16.54
6	515.76	27.05 QP	46.00	-18.95	1.00 H	220	6.60	20.45

**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	217.16	28.99 QP	46.00	-17.01	1.50 V	360	16.96	12.03
2	244.30	29.65 QP	46.00	-16.35	1.25 V	352	16.41	13.24
3	298.60	29.99 QP	46.00	-16.01	1.50 V	111	14.88	15.11
4	325.74	29.96 QP	46.00	-16.04	1.00 V	295	14.14	15.82
5	352.90	27.89 QP	46.00	-18.11	1.00 V	182	11.35	16.54
6	515.76	28.80 QP	46.00	-17.20	1.00 V	120	8.35	20.45

- 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>CHANNEL</b>	27.045MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	C	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

**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	216.36	22.82 QP	46.00	-23.18	1.50 H	202	10.83	11.99
2	243.41	25.42 QP	46.00	-20.58	1.00 H	193	12.22	13.20
3	297.50	27.86 QP	46.00	-18.14	1.00 H	286	12.78	15.08
4	324.50	28.35 QP	46.00	-17.65	1.50 H	184	12.56	15.79
5	351.60	24.88 QP	46.00	-21.12	1.00 H	337	8.37	16.51
6	513.90	26.88 QP	46.00	-19.12	1.50 H	73	6.46	20.42

**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	216.36	27.24 QP	46.00	-18.76	1.25 V	277	15.25	11.99
2	243.41	27.54 QP	46.00	-18.46	1.25 V	304	14.34	13.20
3	297.50	27.24 QP	46.00	-18.76	1.00 V	346	12.16	15.08
4	324.50	28.58 QP	46.00	-17.42	1.00 V	7	12.79	15.79
5	351.60	27.84 QP	46.00	-18.16	1.00 V	91	11.33	16.51
6	513.90	27.65 QP	46.00	-18.35	1.25 V	340	7.23	20.42

- 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>CHANNEL</b>	27.145MHz	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>EUT CONFIGURE MODE</b>	C	<b>INPUT POWER</b>	3Vdc
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 68 % RH, 991 hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TESTED BY</b>	Morgan Chen		

**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	217.16	20.22 QP	46.00	-25.78	1.25 H	70	8.19	12.03
2	244.30	20.25 QP	46.00	-25.75	1.00 H	97	7.01	13.24
3	298.60	24.92 QP	46.00	-21.08	1.00 H	28	9.81	15.11
4	325.74	27.48 QP	46.00	-18.52	1.00 H	25	11.66	15.82
5	352.90	27.28 QP	46.00	-18.72	1.00 H	130	10.74	16.54
6	515.76	26.30 QP	46.00	-19.70	1.25 H	205	5.85	20.45

**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	217.16	23.02 QP	46.00	-22.98	1.25 V	52	10.99	12.03
2	244.30	23.78 QP	46.00	-22.22	1.00 V	76	10.54	13.24
3	298.60	23.56 QP	46.00	-22.44	1.25 V	49	8.45	15.11
4	325.74	29.49 QP	46.00	-16.51	1.25 V	31	13.67	15.82
5	352.90	23.22 QP	46.00	-22.78	1.25 V	58	6.68	16.54
6	515.76	27.36 QP	46.00	-18.64	1.00 V	46	6.91	20.45

- 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.



## 4 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>	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).  
If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**  
Tel: 886-2-26052180  
Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**  
Tel: 886-3-5935343  
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab:**  
Tel: 886-3-3183232  
Fax: 886-3-3185050

**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.





## **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.