



# FCC TEST REPORT

**REPORT NO. :** RF931227H03G

**MODEL NO. :** DTZ-2100X, DTZ-2100D

**RECEIVED :** Sep. 11, 2007

**TESTED :** Sep. 11 to 29, 2007 and May 22, 2008

**ISSUED :** May 30, 2008

**APPLICANT :** Coretronic Corp.

**ADDRESS :** No. 11, Li-Hsing Road, Science Park, Hsinchu,  
Taiwan 300, R.O.C.

**ISSUED BY :** Advance Data Technology Corporation

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

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TESTING CERT #2177-01

## Table of Contents

1	CERTIFICATION.....	3
2	SUMMARY OF TEST RESULTS.....	4
2.1	MEASUREMENT UNCERTAINTY .....	4
3	GENERAL INFORMATION .....	5
3.1	GENERAL DESCRIPTION OF EUT.....	5
3.2	DESCRIPTION OF TEST MODES.....	7
3.3	DESCRIPTION OF SUPPORT UNITS.....	8
3.4	CONFIGURATION OF SYSTEM UNDER TEST .....	8
4	EMISSION TEST.....	9
4.1	RADIATED EMISSION MEASUREMENT .....	9
4.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT.....	9
4.1.2	TEST INSTRUMENTS .....	10
4.1.3	TEST PROCEDURE .....	11
4.1.4	DEVIATION FROM TEST STANDARD .....	11
4.1.5	TEST SETUP .....	12
4.1.6	EUT OPERATING CONDITIONS.....	12
4.1.7	TEST RESULTS.....	13
4.1.8	TEST RESULTS (SPECTRUM BANDWIDTH).....	15
5	INFORMATION ON THE TESTING LABORATORIES .....	16
6	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	17



# 1 CERTIFICATION

**PRODUCT :** LCD tablet  
**BRAND NAME :** Wacom  
**MODEL NO. :** DTZ-2100X, DTZ-2100D  
**TESTED :** Sep. 11 to 14, 2007 and  
May 22, 2008(Only for Radiated Test)  
**TEST SAMPLE :** MASS-PRODUCTION  
**APPLICANT :** Coretronic Corp.  
**STANDARDS :** 47 CFR Part 15, Subpart C (Section 15.209),  
ANSI C63.4-2003

The above equipment (Model: DTZ-2100D) 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 :** Midoli Peng , **DATE:** May 30, 2008  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE :** Hank Chung , **DATE:** May 30, 2008  
Responsible for RF ( Hank Chung, Deputy Manager )

**APPROVED BY :** May Chen , **DATE:** May 30, 2008  
( May Chen, Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: 47 CFR Part 15, Subpart C</b>			
<b>Standard</b>	<b>Test Type</b>	<b>Result</b>	<b>Remarks</b>
47 CFR Part 15, Subpart C	Radiated Test	<b>PASS</b>	Meets Class B Limit Minimum passing margin is -4.01 dB at 0.667 MHz

Note : Power line conducted emission has been investigated and result is better than before and not reported here.

### 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:

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

<b>Measurement</b>	<b>Value</b>
Radiated emissions (30MHz ~ 200MHz)	3.69 dB
Radiated emissions (200MHz ~1GHz)	3.84 dB

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	LCD tablet
<b>MODEL NO.</b>	DTZ-2100X, DTZ-2100D
<b>FCC ID</b>	SUZDTZ2100D
<b>POWER SUPPLY</b>	Power Adapter, Class I
<b>FREQUENCY RANGE</b>	666.7KHz
<b>DATA CABLE</b>	Y type signal cable (shielded, 1.5m with 2 cores)
<b>POWER CORD</b>	AC Input cable (unshielded, 1.8m) DC output cable (unshielded, 1.8m with 1 core)
<b>ANTENNA TYPE</b>	Loop Antenna
<b>ASSOCIATED DEVICES</b>	Remote control pen

**Note:**

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.:RF931227H03E design is as the following:
  - ◆ There are 6 resistors (R38 · R39 · R95 · R96 · R101 and R102) have to change to 22Ω from 100Ω.
2. The EUT has different models names, which are identical to each other in all aspects except for the followings :

Brand	Model No.	Difference
Wacom	DTZ-2100X (X could be "0~9", "a~Z")	For marking requirement
	DTZ-2100D	

From the above models, model: **DTZ-2100D** was selected as representative model for the test and its data was recorded in this report.

3. The EUT must be supplied with a power adapter as following :

Brand	Model No.	Spec.
LI-SHIN	LSE0452B1280	AC Input : 100-240V~, 50/60Hz, 1A DC Output : 12V, 6.67A

4. The EUT must be assembled a LCD Panel as following :

Brand	Model No.
NEC	NL160120BC27-XX (X could be "0~9", "a~Z")

5. The EUT must be assembled an Inverter as following :

Brand	Model No.
TPCI	TI2106CO-06

6. The EUT must be assembled a Main Board as following :

Model No.
FLI5962H

7. The EUT was pre-tested under the following modes :

Mode	Resolution
<b>Mode A</b>	<b>1600 x 1200 / 60Hz with Digital</b>
Mode B	1280 x 1024 / 60Hz with Digital
Mode C	640 x 480 / 60Hz with Digital
Mode D	1600 x 1200 / 60Hz with Analog
Mode E	1280 x 1024 / 60Hz with Analog
Mode F	640 x 480 / 60Hz with Analog

From the above modes, the worst cases were found in **Mode A**. Therefore only the test data of the modes were recorded in this report individually.

8. For radiated emission test, pretest the Loop antenna was rotated about the X and Y axis during below 30MHz, the worst data was found in Y axis.
9. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

One channel is provided to this EUT.

Channel	Frequency
1	666.7KHz

The EUT was tested under the following test mode, and its data were recorded in this report:

Test Mode	Resolution
Mode 1	1600 x 1200 / 60Hz with Digital

### 3.3 DESCRIPTION OF SUPPORT UNITS

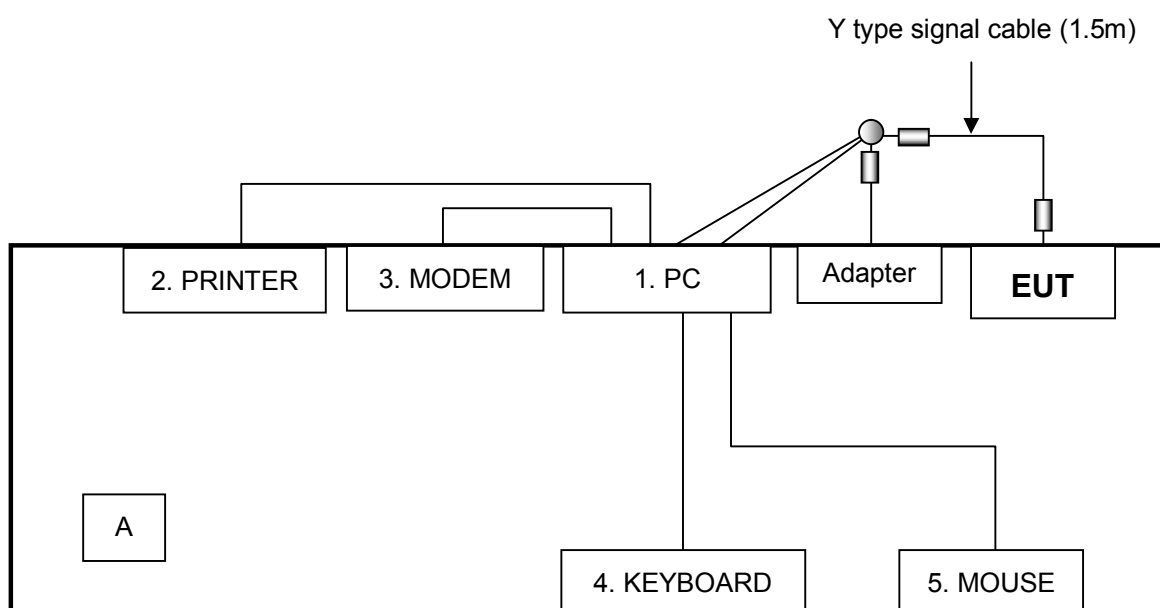
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	Dell	Precision 490	99G7N1S	NA
2	PRINTER	EPSON	LQ-300+	DCGY046020	DoC
3	MODEM	ACEEX	1414V/3	0401008252	IFAXDM1414
4	KEYBOARD	DELL	SK-8115	MY-OJ4635-71619-548-0464	DoC
5	MOUSE	DELL	MO56UO	513021776	DoC

No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
4	2.0 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
5	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.

Note: 1. The power cords of the above support units were unshielded (1.8m).

### 3.4 CONFIGURATION OF SYSTEM UNDER TEST



**NOTE:** 1. Item A is the remote control pen of the EUT.



## 4 EMISSION TEST

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

##### FOR FREQUENCY BELOW 30 MHz

FREQUENCY (MHz)	Field Strength		Measurement Distance (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

##### BETWEEN 30-1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30 – 88	90	39.1	100	40.0
88 – 216	150	43.5	150	43.5
216 – 960	210	46.4	200	46.0
960 – 1000	300	49.5	500	54.0

##### FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation 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
Test Receiver ROHDE & SCHWARZ	ESIB7	100186	Dec. 06, 2008
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Sep. 25, 2008
Spectrum Analyzer Agilent	FSP40	100025	Oct. 17, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Nov. 29, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-149	Nov. 29, 2008
Preamplifier Agilent	8447D	2944A10637	Dec. 05, 2008
Preamplifier Agilent	8447D	2944A10636	Dec. 05, 2008
RF signal cable Woken	8D-FB	Cable-Hych1-01	Oct. 13, 2008
RF signal cable Woken	8D-FB	Cable-Hych1-02	Oct. 13, 2008
Software ADT	ADT_Radiated_V7	NA	NA
Antenna Tower HD Deisel GmbH	MA240	11030	NA
Antenna Tower HD Deisel GmbH	MA240	12030	NA
Turn Table HD Deisel GmbH	DS430	50303	NA
Controller HD Deisel GmbH	HD2000	18303	NA
R&S Loop Antenna	HFH2-Z2	100070	Jan. 13, 2009

- 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 FCC Site Registration No. is 477732.
  4. The IC Site Registration No. is IC3789B-1.
  5. The VCCI Site Registration No. is R-1893.

### 4.1.3 TEST PROCEDURE

#### Above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

**NOTE:** 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for quasi-peak detection (QP) at frequency 30MHz to 1GHz.

#### Below 30MHz

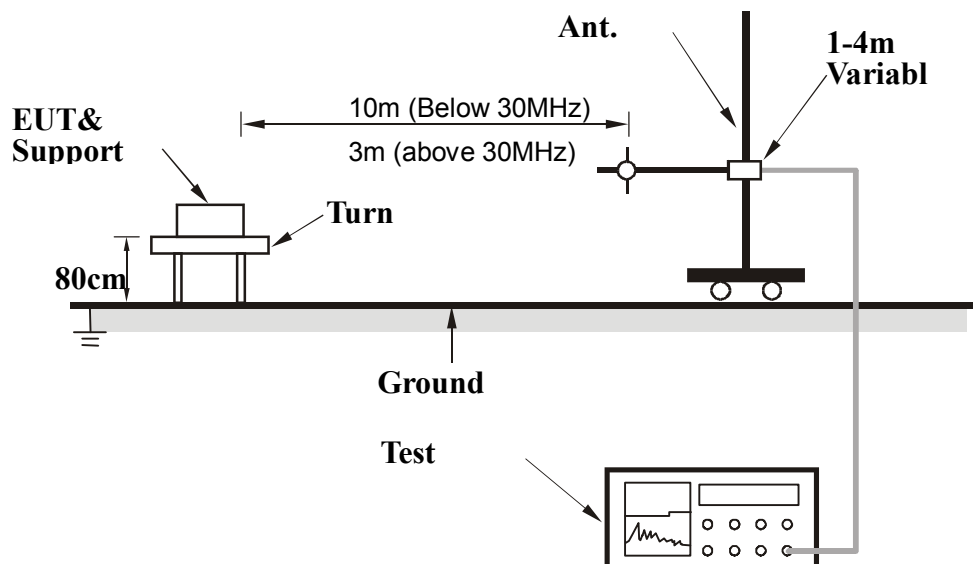
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of antenna tower.
- c. The antenna is a loop antenna, and its height is varied at 1.5 meters above the ground to determine the maximum value of the field strength.
- d. For each suspected emission, the EUT was arranged to its worst case 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

**NOTE:** 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz for quasi-peak detection (QP) at frequency below 30MHz.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



For the actual test configuration, please refer to the related Item - Photographs of the Test Configuration.

#### 4.1.6 EUT OPERATING CONDITIONS

1. Turn on the power of all equipment.
2. Enable touch screen function.
3. PC runs "EMCTEST.exe" sends "H" messages to LCD monitor (EUT).  
EUT scrolling "H" patterns on its screen.
4. PC sends "H" messages to modem.
5. PC sends "H" messages to printer, and the printer prints them on paper.
6. Repeat steps 2-5.



## 4.1.7 TEST RESULTS

<b>TEST MODE</b>	Mode 1	<b>FREQUENCY RANGE</b>	9 kHz ~ 30 MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak, 9kHz
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65 % RH, 981 hPa	<b>TESTED BY</b>	Whisky Lee

ANTENNA POLARITY & TEST DISTANCE: AT 10 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	0.667	46.20	50.21	-4.01	1.15	180	31.26	14.94

- 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. In the frequency range above 667kHz and below 30MHz no significant emissions are detected.

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (19.085dB per decade of distance)

Example:

$$\begin{aligned}
 24000/666.7\text{KHz} &= 36 \text{ uV/m} && 30\text{m} \\
 &= 31.12 \text{ dBuV/m} && 30\text{m} \\
 &= 31.12 + 20\log(30/10)^2 && 10\text{m} \\
 &= 50.21 \text{ dBuV/m}
 \end{aligned}$$



<b>TEST MODE</b>	Mode 1	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>INPUT POWER</b>	120Vac, 60Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Quasi-Peak, 120kHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 66%RH, 981 hPa	<b>TESTED BY</b>	Moris Lin

#### 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	127.01	28.34 QP	43.50	-15.16	3.00 H	121	26.63	1.71
2	190.12	36.46 QP	43.50	-7.04	3.00 H	310	35.81	0.65
3	342.60	35.43 QP	46.00	-10.57	2.10 H	223	27.26	8.17
4	647.99	37.69 QP	46.00	-8.31	1.58 H	236	21.32	16.37
5	765.30	39.42 QP	46.00	-6.58	1.00 H	80	23.59	15.83
6	890.99	39.48 QP	46.00	-6.52	1.00 H	60	20.99	18.49

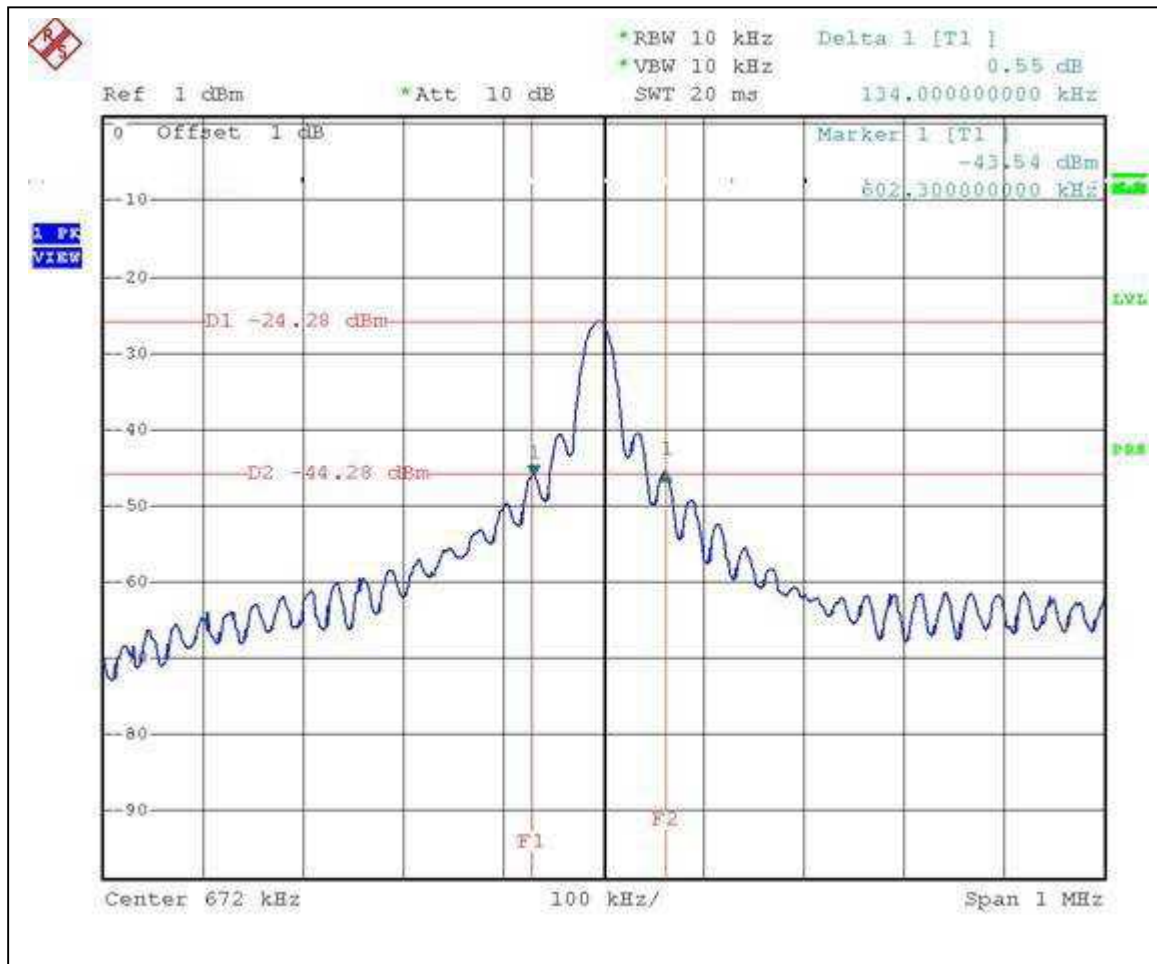
#### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

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	127.20	38.45 QP	43.50	-5.05	1.00 V	156	9.50	28.95
2	190.80	35.23 QP	43.50	-8.27	1.00 V	269	6.28	28.95
3	316.01	37.72 QP	46.00	-8.28	1.00 V	300	8.77	28.95
4	707.02	39.51 QP	46.00	-6.49	2.21 V	30	10.56	28.95
5	809.98	40.59 QP	46.00	-5.41	2.25 V	300	11.64	28.95
6	890.98	37.63 QP	46.00	-8.37	1.40 V	336	8.68	28.95

- 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.

### 4.1.8 TEST RESULTS (SPECTRUM BANDWIDTH)

666.7 KHz





## 5 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>	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:

**Lin Kou EMC Lab:**  
Tel: 886-2-26052180  
Fax: 886-2-26052943

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

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

**Email:** [service@adt.com.tw](mailto:service@adt.com.tw)  
**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.



## **6 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.