

FCC TEST REPORT

REPORT NO. : RF960601H08

- MODEL NO.: CTF-430
- RECEIVED: June 04, 2007
 - **TESTED :** June 11 to 13, 2007
 - **ISSUED :** June 14, 2007

APPLICANT : UNIVERSAL SCIENTIFIC INDUSTRIAL CO., LTD.

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- **ISSUED BY :** Advance Data Technology Corporation
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1 CERTIFICATION

PRODUCT :	WACOM Sparrow Tablet Product
MODEL NO. :	CTF-430
BRAND :	WACOM
TEST ITEM :	R&D SAMPLE
APPLICANT :	UNIVERSAL SCIENTIFIC INDUSTRIAL CO., LTD.
STANDARDS :	47 CFR Part 15, Subpart C
	ANSI C63.4-2003

The above equipment (Model: CTF-430) 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.

(Carol Liao, Specialist) (Carol Liao, Specialist) PREPARED BY : **TECHNICAL DATE:** June 14, 2007 ACCEPTANCE Responsible for RF (Hank Chung, Deputy Manager) **APPROVED BY** : **DATE:** June 14, 2007 (May Chen, Deputy Manager)



2 SUMMARY OF TEST RESULTS

APPLIED STANDARD: 47 CFR Part 15, Subpart C					
Standard	Test Type	Result	Remarks		
	Conducted Test		Meets Class B Limit		
			Minimum passing margin is		
47 CFR Part 15,			-10.08 dB at 0.931 MHz		
Subpart C	Radiated Test		Meets Class B Limit		
			Minimum passing margin is		
			–13.4 dB at 480.03 MHz		

The EUT has been tested according to the following specifications:

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:

Measurement	Value
Conducted emissions	2.41 dB
Radiated emissions (30MHz-1GHz)	3.98 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	WACOM Sparrow Tablet Product	
MODEL NO.	CTF-430	
FCC ID	IXMCTF-430	
POWER SUPPLY	DC 4.35-5.25V From the host equipment	
CARRIER FREQUENCY	600 KHz +/- 5 %	
DATA CABLE	USB Cable (Shielded, 1.5m)	
POWER CORD	NA	
ANTENNA TYPE	Loop Antenna	
INTERFACE	USB	
ASSOCIATED DEVICES	NA	

Note:

1. The EUT's information as following:

Active area(W \times D)	127.6 * 92.8 mm
Physical size(W \times D \times H)	197 * 195 * 10.2 mm
Cable length	1.5 m
Weigth	320+/-40g (Including cable)

2. Following Pen will be sold together with the EUT:

Product Name	Brand	Model No.
PEN	WACOM	FP-500

- 3. 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.
- 4. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



3.2 DESCRIPTION OF TEST MODES

The EUT was tested under the following test mode:

Test Mode	Description
Mode 1	with Pen



3.3 DESCRIPTION OF SUPPORT UNITS

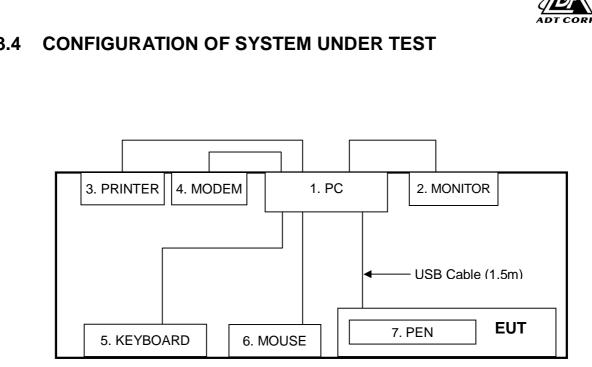
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	DELL	4600	CN-OG3023-42940- 3AS-00A5	DoC
2	MONITOR	Panasonic	BT-H1390Y	EM7250460	DoC
3	PRINTER	EPSON	LQ-300+	DCGY017097	DoC
4	MODEM	ACEEX	1414	0206026776	IFAXDM1414
5	KEYBOARD	DELL	SK-8110	MY-05N456-71619- 39U-1124	DoC
6	MOUSE	DELL	MO71KC	345011086	DoC
7	PEN	WACOM	FP-500	NA	NA

No.	Signal cable description
1	NA
2	1.6 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core
3	1.8 m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
4	1.6 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.6 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core.
6	1.6 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
7	NA

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

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3.4 CONFIGURATION OF SYSTEM UNDER TEST



4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTES: (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	ESCS 30	100287	Mar. 06, 2008
Line-Impedance Stabilization Network(for EUT)	ENV-216	100072	Oct. 20, 2007
Line-Impedance Stabilization Network(for Peripheral)	KNW-407	8-1395-12	Aug. 15, 2007
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 19, 2007
Terminator	50	1	Oct. 30, 2007
Software	ADT_Cond_V7.3.2	NA	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 ADT Shielded Room No. A.

3. The VCCI Con A Registration No. is C-817.



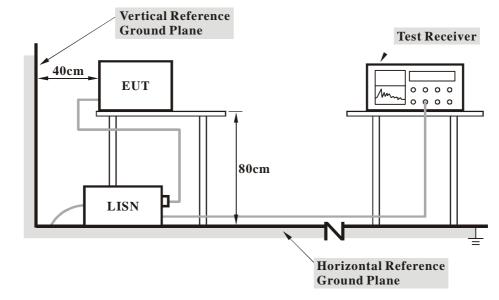
4.1.3 TEST PROCEDURE

- 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 20dB under the prescribed limits could not be reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80 cm from EUT and at 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.



4.1.6 EUT OPERATING CONDITIONS

- 1. Turn on the power of all equipment.
- 2. PC runs "CTE_EMI.exe" test program to enable all functions of EUT, and the pen (support unit 7) puts on the EUT steady.
- 3. PC sends "H" messages to monitor. Monitor 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.



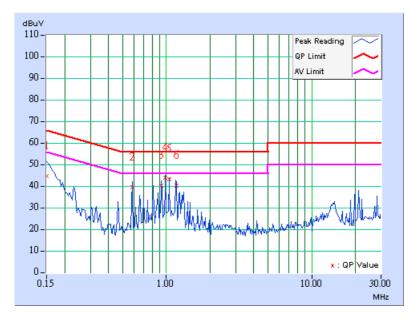
4.1.7 TEST RESULTS

TEST MODE	Mode 1	PHASE	Line (L)
INPUT POWER (SYSTEM)	120Vac, 60Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 60% RH, 960 hPa	TESTED BY : Max Tseng	

	Freq.	Corr.	Reading	g Value		sion vel	Lir	nit	Mar	gin
No		Factor	[dB ((uV)]	[dB	(uV)]	[dB	(uV)]	(dl	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	9.75	34.92	-	44.67	-	66.00	56.00	-21.33	-
2	0.584	9.83	29.65	-	39.48	-	56.00	46.00	-16.52	-
3	0.927	9.89	30.57	-	40.46	-	56.00	46.00	-15.54	-
4	0.986	9.90	34.07	-	43.97	-	56.00	46.00	-12.03	-
5	1.047	9.90	33.30	-	43.20	-	56.00	46.00	-12.80	-
6	1.170	9.90	30.39	-	40.29	-	56.00	46.00	-15.71	-

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.



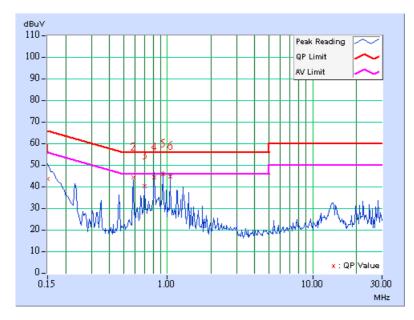


TEST MODE	Mode 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60% RH, 960 hPa	TESTED BY : Max Tseng	

	Freq.	Corr.	Reading	g Value	Emis Le	sion vel	Lir	nit	Mar	gin
No		Factor	[dB ((uV)]	[dB ((uV)]	[dB	(uV)]	(dl	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	9.75	33.92	-	43.67	-	66.00	56.00	-22.33	-
2	0.584	9.83	34.61	-	44.44	-	56.00	46.00	-11.56	-
3	0.697	9.85	30.45	-	40.30	-	56.00	46.00	-15.70	-
4	0.814	9.87	34.39	-	44.26	-	56.00	46.00	-11.74	-
5	0.931	9.89	36.03	-	45.92	-	56.00	46.00	-10.08	-
6	1.048	9.90	34.82	-	44.72	-	56.00	46.00	-11.28	-

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.





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FOR FREQUENCY BELOW 30 MHz

	Field S	Measurement Distance	
FREQUENCY (MHz)	uV/m	dBuV/m	(meters)
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)		
FREQUENCI (MHZ)	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 (dBu	ıV/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.



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 03, 2007
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB 9168	138	July 17, 2007
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 25, 2008
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 08, 2009
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 08, 2009
R&S Loop Antenna	HFH2-Z2	881058/15	Nov. 29, 2007
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N	STCCAB-30M-1	Jul. 15, 2007
· · · ·	Cable	GHz	
Software	ADT_Radiated_V 7.6.15.7	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Biconical and Periodic Antenna)and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.

The test was performed in ADT Open Site No. C.
The FCC Site Registration No. is 656396.
The VCCI Site Registration No. is R-1626.
The CANADA Site Registration No. is IC 4824A-3.
Loop antenna was used for all emissions below 30 MHz.



4.2.3 TEST PROCEDURE

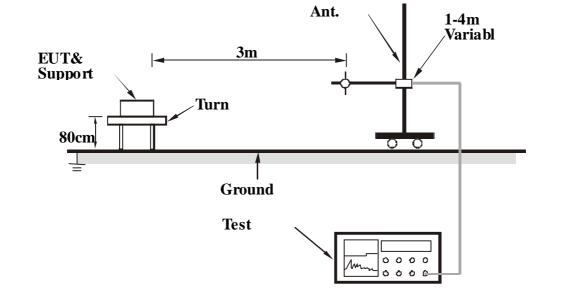
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10-meter open field site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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 polarization's 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 ratable 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.
- g. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the interference antenna and the detect function was set to Peak or Average.

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 - Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6



4.2.7 TEST RESULTS

TEST MODE	Mode 1	FREQUENCY RANGE	9 kHz ~ 30 MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	RB =VB=9kHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 61%RH, 960 hPa	TESTED BY	Moris Lin

	ANTENNA POLARITY & 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	0.60	47.70 QP	72.04	-24.34	1.50	334	46.80	0.90	
2	1.80	30.10 QP	69.54	-39.44	1.50	21	29.10	1.00	
3	3.00	28.40 QP	69.54	-41.14	1.50	288	27.30	1.10	
4	4.20	25.10 QP	69.54	-44.44	1.50	10	24.00	1.10	
5	5.40	25.00 QP	69.54	-44.54	1.50	118	23.90	1.20	
6	6.60	21.80 QP	69.54	-47.74	1.50	25	20.60	1.20	

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. Above limits have been translated by the formula

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 (40dB per decade of distance)

Example:

24000/600KHz	=40 uV/m	30m
	=32.04 dBuV/m	30m
	=32.04+20log(30/3) ²	3m
	=72.04 dBuV/m	



TEST MODE	Mode 1	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	28 deg. C, 61%RH, 960 hPa	TESTED BY	Moris Lin

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Emission	Limit (dBuV/m)	Margin (dB)	Antenna	Table	Raw	Correction
		Level			Height	Angle	Value	Factor
		(dBuV/m)			(m)	(Degree)	(dBuV)	(dB/m)
1	127.00	22.00 QP	43.50	-21.50	1.32 H	205	19.00	3.00
2	150.00	23.50 QP	43.50	-20.00	1.60 H	300	20.40	3.10
3	156.30	25.30 QP	43.50	-18.20	1.54 H	332	22.20	3.10
4	200.12	22.20 QP	43.50	-21.30	1.32 H	177	18.80	3.40
5	480.03	32.60 QP	46.00	-13.40	1.90 H	104	27.80	4.80
6	660.01	29.70 QP	46.00	-16.30	1.59 H	125	24.20	5.50
7	854.30	30.00 QP	46.00	-16.00	1.00 H	316	24.00	6.00

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Emission Level	Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle	Raw Value	Correction Factor
		(dBuV/m)			(m)	(Degree)	(dBuV)	(dB/m)
1	127.00	22.40 QP	43.50	-21.10	1.00 V	153	19.40	3.00
2	150.00	25.30 QP	43.50	-18.20	1.00 V	122	22.20	3.10
3	156.30	26.20 QP	43.50	-17.30	1.00 V	274	23.10	3.10
4	200.20	23.50 QP	43.50	-20.00	1.48 V	36	20.10	3.40
5	480.09	31.10 QP	46.00	-14.90	1.47 V	244	26.20	4.80
6	600.04	31.00 QP	46.00	-15.00	1.52 V	201	25.60	5.40
7	854.29	29.70 QP	46.00	-16.30	1.41 V	226	23.70	6.00

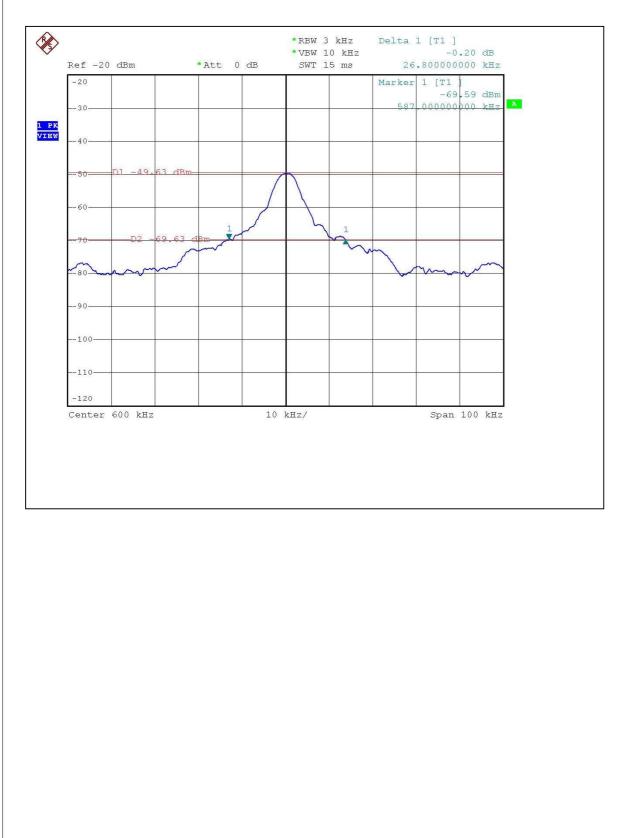
REMARKS:

- : 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.



4.2.8 TEST RESULTS (SPECTRUM BANDWIDTH)

600 KHz





5 APPENDIX - 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:

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	CNLA, BSMI, NCC
Netherlands	Telefication
Singapore	PSB, GOST-ASIA (MOU)
Russia	CERTIS (MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: <u>www.adt.com.tw/index.5/phtml</u>. If you have any comments, please feel free to contact us at the following:

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Email: <u>service@adt.com.tw</u> Web Site: <u>www.adt.com.tw</u>

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.