FCC TEST REPORT

REPORT NO.: RF970904A03B

MODEL NO.: DTF-720C, DTF-720CB, ID370

RECEIVED: Feb. 24, 2010

TESTED: March 16 ~ 17, 2010

ISSUED: March 19, 2010

APPLICANT: Wacom Co., Ltd.

ADDRESS: 2-510-1 Toyonodai, Kazo-shi, Saitama 349-1148, Japan

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien 244, Taiwan

Table of Contents

1 CERTIFICATION

PRODUCT:	LCD TABLET
MODEL NO.:	DTF-720C, DTF-720CB (**BRAND NAME:** WACOM) ID370 (**BRAND NAME:** Smart)
APPLICANT:	Wacom Co., Ltd.
TESTED:	March 16 ~ 17, 2010
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	FCC Part 15, Subpart C (Section 15.209), ANSI C63.4 -2003

The above equipment (model no.: DTF-720CB) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, 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 : Celia Chen , **DATE:** March 19, 2010
(Celia Chen / Senior Specialist)

TECHNICAL ACCEPTANCE : Jamison Chan , **DATE:** March 19, 2010
Responsible for RF
(Jamison Chan / Supervisor)

APPROVED BY : Ken Liu , **DATE:** March 19, 2010
(Ken Liu / 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	Conducted Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is –12.31 dB at 0.505MHz.
15.209	Radiated Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is –10.4 dB at 0.60MHz.

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:

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

MEASUREMENT	UNCERTAINTY
Conducted emissions	2.41 dB
Radiated emissions	3.86 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	LCD TABLET
MODEL NO.	DTF-720C, DTF-720CB, ID370
FCC ID	HV4DTF720C
POWER SUPPLY	12Vdc from adapter
CARRIER FREQUENCY OF EACH CHANNEL	600kHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	Integral antenna
ANTENNA CONNECTOR	N/A
DATA CABLE	Shielded D-Sub cable (1.8m) with two ferrite cores. Shielded USB cable (2.0m).
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Refer to note 4 as below

NOTE:

1. The EUT is a LCD TABLET, which is transceiver.
2. The EUT is the ideal tool to enhance user's presentations and documents. The pen (Brand: Wacom, model: FP-320 / FP-310) will be sold together with the EUT.

3. The EUT has several models, which are identical with each other except for their Panel features key and marketing different, as the following:

Brand Name	Model no.	Different		
WACOM	DTF-720C	Panel features key less		For marketing different
	DTF-720CB	Panel features key more		
Smart	ID370	Panel features key less / more		

During the test, the **model: DTF-720CB** was selected as the representative one and therefore only its test data was recorded in this report.

4. The EUT consumes power from a switching power adapter as the following:

Brand	Model No.	Rating
EDAC	EA10521C-120	AC I/P:100-240V, 1.8A, 50-60Hz DC O/P: 12V, 5A Non-shielded AC 3 Pin (1.8 m). Non-shielded DC cable (1.8 m) with one ferrite core.

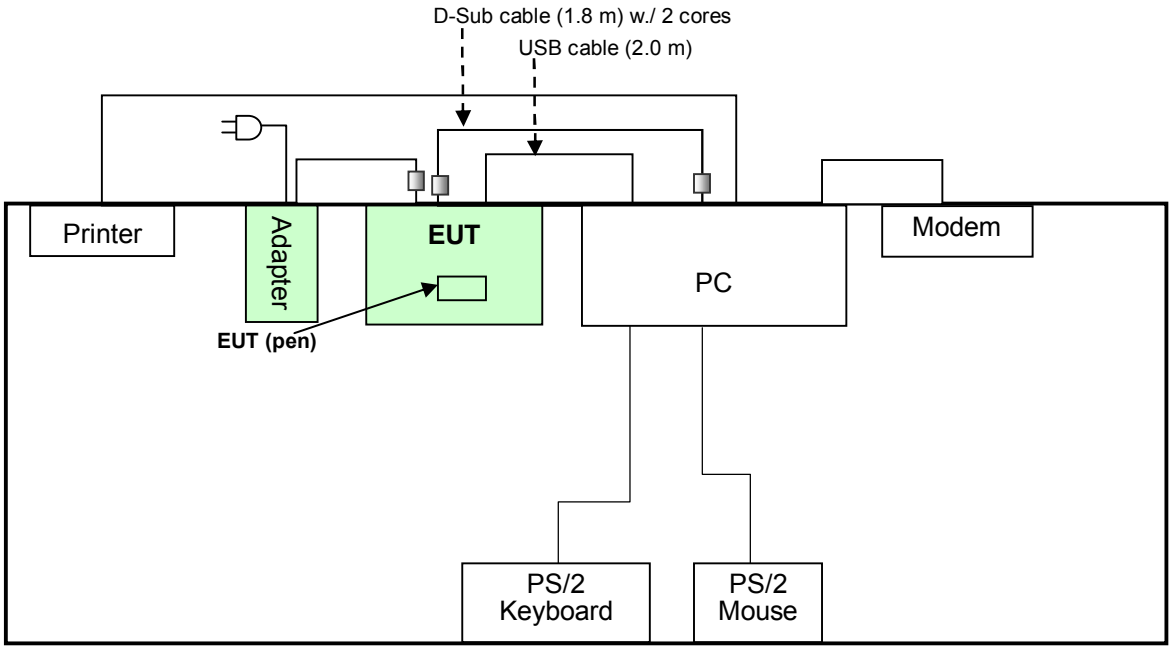
5. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

1 channels was provided to this EUT

Channel	Frequency (kHz)
1	600

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	
-	√	√	-

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

POWER LINE CONDUCTED EMISSION TEST:

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

AVAILABLE CHANNEL	TESTED CHANNEL
1	1

RADIATED EMISSION TEST (BELOW 1 GHZ):

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

AVAILABLE CHANNEL	TESTED CHANNEL
1	1

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	18deg. C, 78% RH, 1023hPa	120Vac, 60Hz	Chad Lee
RE<1G	14deg. C, 68% RH, 1023hPa	120Vac, 60Hz	Chad Lee

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. (15.209)
ANSI C63.4 -2003

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

NOTE: The product has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 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	HP	dx7300MT	SGH72102QS	FCC DoC Approved
2	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC Approved
3	MODEM	ACEEX	1414	980020538	IFAXDM1414
4	PS/2 KEYBOARD	HP	KB-0316	BC3520BGAUJ 05U	FCC DoC Approved
5	PS/2 MOUSE	BTC	M851	N/A	E5XMSM860

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	1.8m 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	1.8 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
5	1.5 m Non shielded wire, terminated with PS/2 connector via drain wire, w/o core.

NOTE: All power cords of the above support units are non-shielded (1.8m).

4 TEST PROCEDURE AND RESULT

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

NOTE:
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 DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100276	Dec. 15, 2009	Dec. 14, 2010
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Nov. 24, 2009	Nov. 23, 2010
LISN With Adapter (for EUT)	AD10	C10Ada-001	Nov. 24, 2009	Nov. 23, 2010
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Nov. 23, 2009	Nov. 22, 2010
Software	ADT_Cond_V7.3.7	NA	NA	NA
Software	ADT_ISN_V7.3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	Feb. 23, 2010	Feb. 22, 2011
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Feb. 23, 2010	Feb. 22, 2011

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 Shielded Room No. 10.
3. The VCCI Site Registration No. C-1852.

4.1.3 TEST PROCEDURES

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.

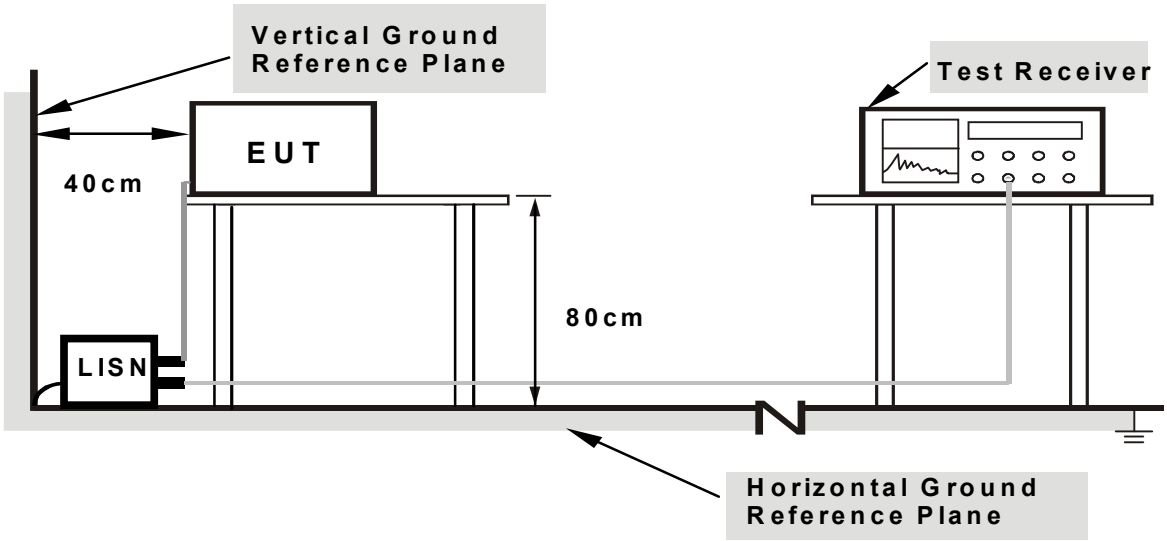
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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 80cm from EUT and at least 80cm 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

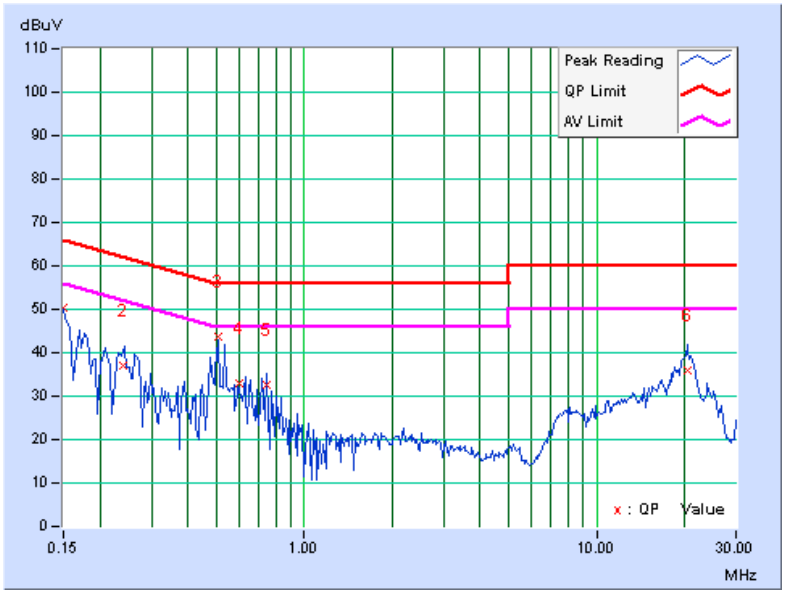
a. Turn on the power of all equipment.
b. The PC ran a test program (provided by manufacture) to enable EUT under transmitting condition at specific channel continuously.
c. PC sent messages to modem.
d. PC sent messages to printer and the printer printed them out.
e. Repeated c ~ e.

4.1.7 TEST RESULTS

PHASE	Line 1	6dB BANDWIDTH	9 kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.19	50.30	-	50.49	-	66.00	56.00	-15.51	-
2	0.239	0.21	36.73	-	36.94	-	62.14	52.14	-25.20	-
3	**0.505**	**0.30**	**43.39**	**-**	**43.69**	**-**	**56.00**	**46.00**	**-12.31**	**-**
4	0.600	0.30	32.66	-	32.96	-	56.00	46.00	-23.04	-
5	0.744	0.31	32.21	-	32.52	-	56.00	46.00	-23.48	-
6	20.387	1.27	34.49	-	35.76	-	60.00	50.00	-24.24	-

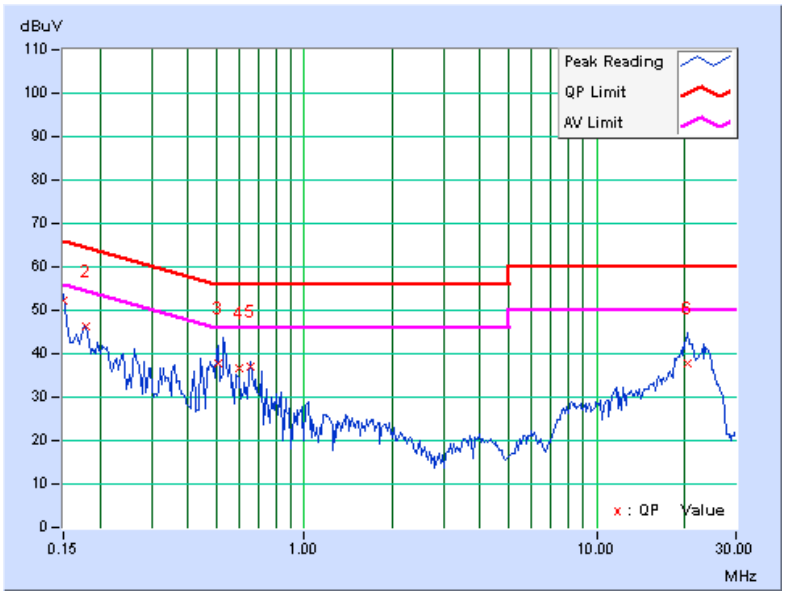
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9 kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.29	52.05	-	52.34	-	66.00	56.00	-13.66	-
2	0.179	0.28	46.02	-	46.30	-	64.55	54.55	-18.25	-
3	0.507	0.38	37.35	-	37.73	-	56.00	46.00	-18.27	-
4	0.600	0.38	36.28	-	36.66	-	56.00	46.00	-19.34	-
5	0.653	0.38	36.71	-	37.09	-	56.00	46.00	-18.91	-
6	20.488	1.05	36.85	-	37.90	-	60.00	50.00	-22.10	-

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 30MHz

FREQUENCY (MHz)	FIELD STRENGTH (dBuV/m)		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

FOR FREQUENCY BETWEEN 30-1000MHz

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
Above 960	300	49.5	500	54.0

FOR FREQUENCY ABOVE 1000MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (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 fieldstrengths specified above.

4.2.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	May 04, 2009	May 03, 2010
HP Preamplifier	8449B	3008A01924	Aug. 31, 2009	Aug. 30, 2010
HP Preamplifier	8449B	3008A01292	Aug. 10, 2009	Aug. 09, 2010
ROHDE & SCHWARZ TEST RECEIVER	ESU26	100005	Jun. 06, 2009	Jun. 05, 2010
Schwarzbeck Antenna	VULB 9168	137	Apr. 29, 2009	Apr. 28, 2010
Schwarzbeck Antenna	VHBA 9123	480	Apr. 21, 2009	Apr. 20, 2010
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V 7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF104-26.5	CABLE-CH6-17m -01	Aug. 20, 2009	Aug. 19, 2010
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010
Loop Antenna R & S	HFH2-Z2	100070	Feb. 03, 2010	Feb. 02, 2012

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

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 room. 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 height of antenna 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.

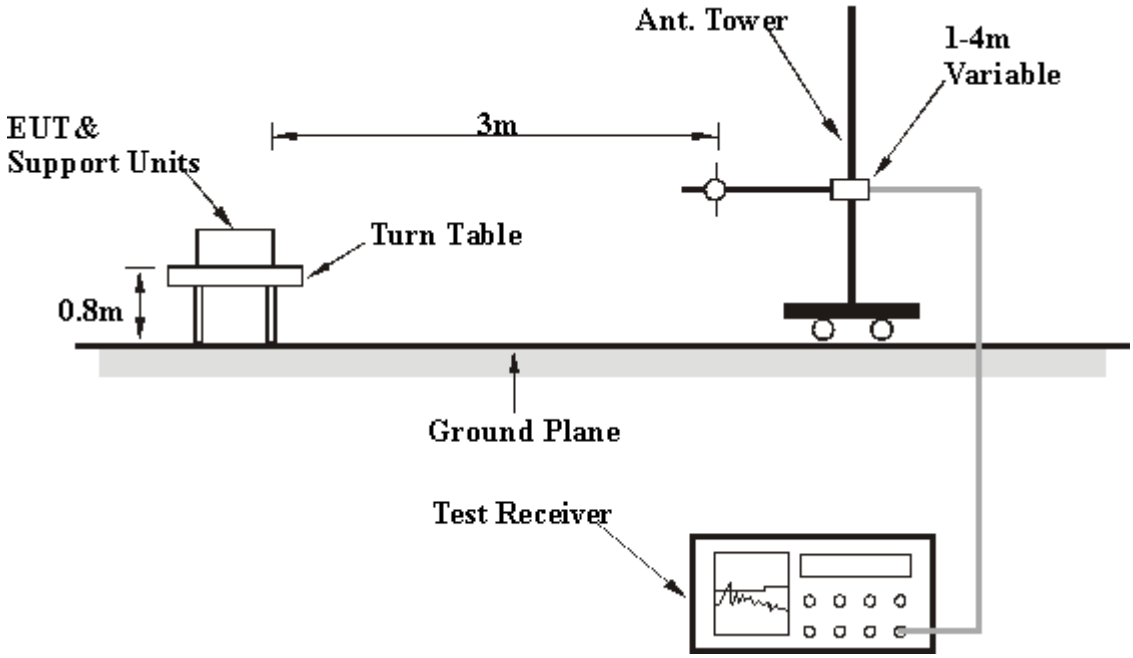
f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak method or average method as specified and then reported in data sheet.

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 in this test report - Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITION

Same as item 4.1.6.

4.2.7 TEST RESULT

FREQUENCY RANGE	9 kHz ~ 30 MHz	DETECTOR FUNCTION	Quasi-Peak

ANTENNA POLARITY & TEST DISTANCE: 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	**0.60**	**61.6 QP**	**72.0**	**-10.4**	**1.00**	**108**	**42.45**	**19.14**
2	1.20	35.7 QP	66.0	-30.3	1.00	152	16.39	19.29
3	1.80	38.1 QP	69.5	-31.4	1.00	11	18.61	19.49
4	2.40	34.7 QP	69.5	-34.8	1.00	29	15.14	19.55
5	3.00	34.0 QP	69.5	-35.5	1.00	182	14.49	19.54
6	3.60	34.1 QP	69.5	-35.4	1.00	71	14.51	19.54

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. Above limits have been translated by the formula
6. Loop antenna was used for all radiated emission below 30MHz.

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
	=32.0 dBuV/m	30m
	=32.0+20log(30/3)2	3m
	=72.0 dBuV/m	

FREQUENCY RANGE	30-1000MHz	DETECTOR FUNCTION	Quasi-Peak

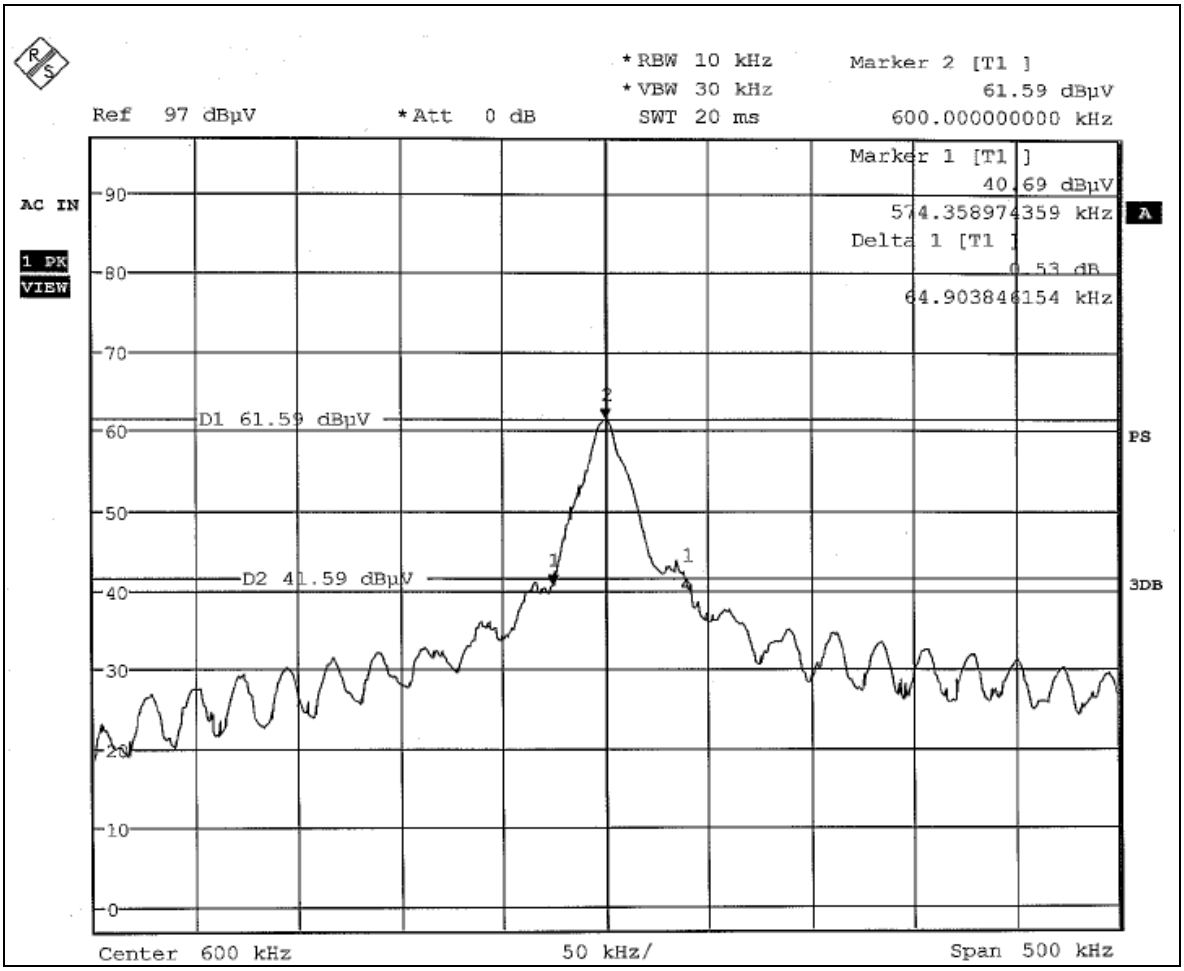
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	89.07	28.6 QP	43.5	-14.9	1.18 H	64	20.39	8.25
2	154.36	26.7 QP	43.5	-16.8	1.89 H	28	12.44	14.24
3	166.79	26.8 QP	43.5	-16.7	1.52 H	46	12.94	13.89
4	832.12	25.7 QP	46.0	-20.3	1.63 H	10	-1.46	27.12
5	919.17	25.3 QP	46.0	-20.7	1.42 H	337	-2.92	28.25
6	947.15	26.9 QP	46.0	-19.1	1.12 H	121	-1.64	28.56

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	322.24	30.6 QP	46.0	-15.4	1.02 V	181	14.60	16.00
2	331.57	32.4 QP	46.0	-13.6	1.15 V	184	16.19	16.24
3	365.77	33.3 QP	46.0	-12.7	1.68 V	190	16.18	17.15
4	530.54	31.0 QP	46.0	-15.0	1.42 V	217	9.26	21.77
5	616.04	30.6 QP	46.0	-15.4	1.84 V	229	7.16	23.48
6	972.02	38.9 QP	54.0	-15.1	1.13 V	148	10.04	28.84

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)

600kHz



5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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.
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

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.

---END---