FCC DoC TEST REPORT

REPORT NO.: FC960803A07

MODEL NO.: 5023H

RECEIVED: Aug. 3, 2007

TESTED: Aug. 7, 2007

ISSUED: Aug. 10, 2007

APPLICANT: BEHAVIOR TECH COMPUTER CORP.

ADDRESS: 20F-B, No.98, Sec. 1, Sintai 5th Rd., Sijhih City, Taipei County 22102, Taiwan (R.O.C.)

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C

Testing Laboratory
0528

ACCREDITED
No.: 2177-01

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1 CERTIFICATION

PRODUCT:	KEYBOARD
BRAND NAME:	BTC, EMPREX
MODEL NO:	5023H
TEST ITEM:	ENGINEERING SAMPLE
APPLICANT:	BEHAVIOR TECH COMPUTER CORP.
TESTED:	Aug. 7, 2007
STANDARDS:	FCC Part 15: 2007, Subpart B, Class B CISPR 22: 1997, Class B ICES-003: 2004, Class B ANSI C63.4-2003

The above equipment 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 : Vivian Chen , **DATE:** Aug. 10, 2007
(Vivian Chen / Specialist)

TECHNICAL ACCEPTANCE : Ken Liu , **DATE:** Aug. 10, 2007
Responsible for EMI
(Ken Liu / Deputy Manager)

APPROVED BY : Kenny Meng , **DATE:** Aug. 10, 2007
(Kenny Meng / Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Remarks
FCC Part 15: 2007 Subpart B, Class B CISPR 22: 1997, Class B ICES-003: 2004, Class B	Conducted Test	PASS	Meets Class B Limit Minimum passing margin is –20.06 dB at 0.201 MHz
	Radiated Test	PASS	Meets Class B Limit Minimum passing margin is –3.14 dB at 480.06 MHz

Note: The limit for radiated test was performed according to CISPR 22: 1997, which was specified in FCC PART 15 Subpart B 15.109(g). Also the limits of ICES-003: 2004 and CISPR 22: 1997 are same.

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	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.55 dB
Radiated emissions	30MHz ~ 1GHz	3.52 dB
	1GHz ~ 40GHz	2.89 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	KEYBOARD
MODEL NO.	5023H
FCC ID	E5XKB5023H
POWER SUPPLY	DC 5V (from PC)
DATA CABLE SUPPLIED	Shielded USB cable (0.8m)

NOTE:

1. The EUT is a keyboard with USB interface, and it has two USB ports.

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

3.2 DESCRIPTION OF SUPPORT UNITS

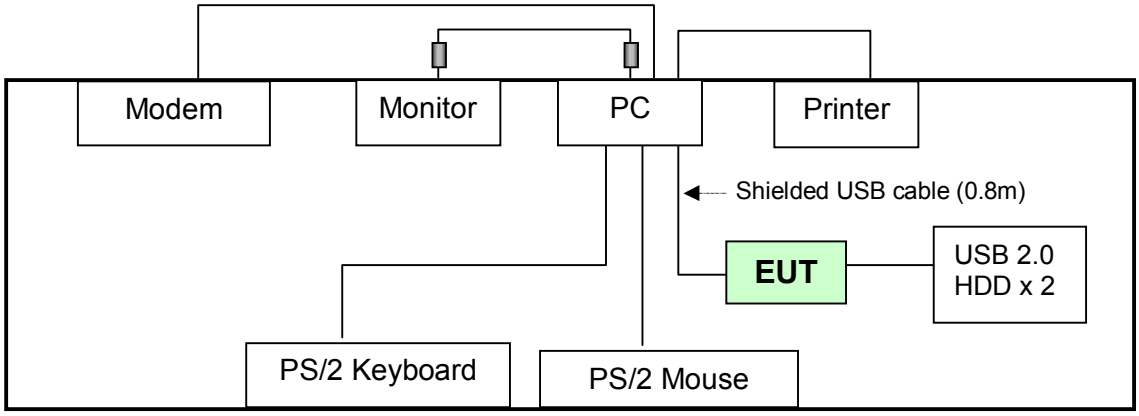
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PERSONAL COMPUTER	LEO	Persica 8620G	1A36I98A000209	FCC DoC Approved
2	MONITOR	ADI	CM100	020058T10200175	FCC DoC Approved
3	PRINTER	EPSON	LQ-300+	DCGY017089	FCC DoC Approved
4	MODEM	ACEEX	1414	980020540	IFAXDM1414
5	External USB 2.0 Hard Disk	Terasys	F12-UF	A0100223-5B90023	FCC DoC Approved
6	External USB 2.0 Hard Disk	Terasys	F12-UF	A0100223-5B90022	FCC DoC Approved
7	PS/2 KEYBOARD	BTC	5200T	F24800273	E5XKB5122WTH0110
8	PS/2 MOUSE	BTC	M851	N/A	E5XMSM860

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, with two cores
3	1.8m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.5 m shielded cable, terminated with USB connector, w/o core.
6	1.5 m shielded cable, terminated with USB connector, w/o core.
7	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
8	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).

Test Configuration



4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD:

FCC Part 15: 2007, Subpart B (Section: 15.107)

CISPR 22: 1997 (section 5)

ICES-003: 2004 (Class A: section 5.2)
(Class B: section 5.3)

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	ESCS30	834115/016	Jan. 09, 2008
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ESH3-Z5	894785/020	Jun. 27, 2008
LISN With Adapter (for EUT)	AD10	C03Ada-001	Jun. 27, 2008
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	Jun. 27, 2008
Software	ADT_Cond_V7.3.2	NA	NA
Software	ADT_ISN_V7.3.2	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C03.01	Jan. 09, 2008
LYNICS Terminator (For EMCO LISN)	NA	E1-01-300	Jan. 16, 2008
LYNICS Terminator (For EMCO LISN)	NA	E1-01-301	Jan. 16, 2008

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. 3.
3. The VCCI Site Registration No. C-274.

4.1.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4-2003 (section 7), CISPR 22 (section 9) and ICES-003: 2004 (section 4).

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.

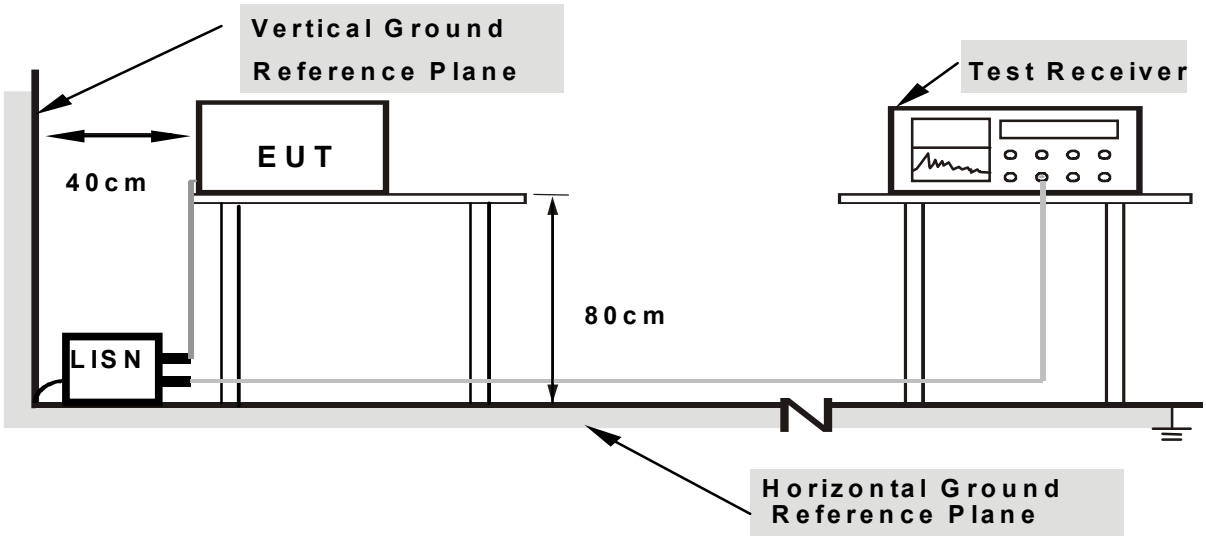
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels 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 80 cm from EUT and at least 80 cm from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

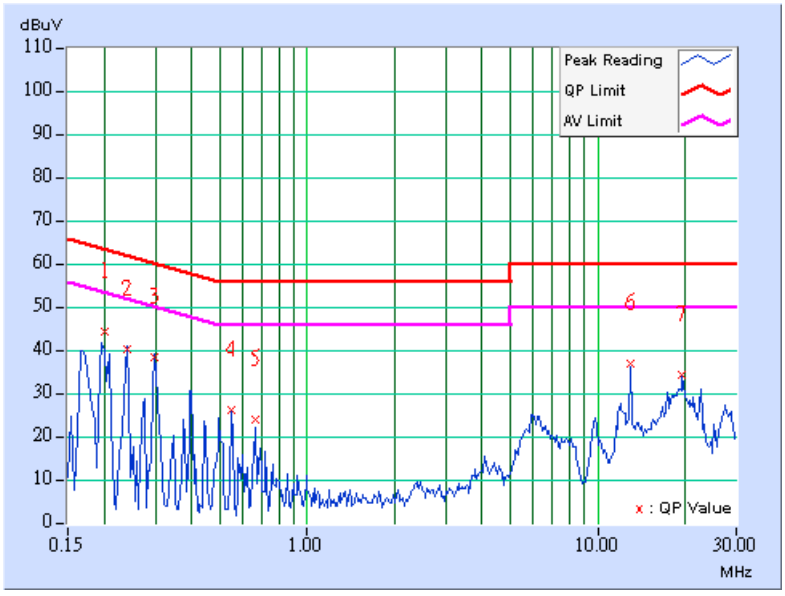
a. Turned on the power of all equipment.
b. PC ran a test program to enable all functions.
c. PC read and wrote messages from HDD.
d. PC read and wrote messages from ext. HDD via EUT.
e. PC sent "H" messages to monitor and monitor displayed "H" patterns on screen.
f. PC sent "H" messages to printer and printed them out.
g. PC sent messages to modem.
h. Repeated steps c-h.

4.1.7 TEST RESULTS

TEST MODE	Operating	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70 % RH, 993hPa	TESTED BY: Lake Cheng	

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	0.201	0.22	43.14	-	43.36	-	63.58	53.58	-20.22	-
2	0.240	0.22	39.27	-	39.49	-	62.10	52.10	-22.61	-
3	0.298	0.22	37.37	-	37.59	-	60.29	50.29	-22.70	-
4	0.548	0.22	24.97	-	25.19	-	56.00	46.00	-30.81	-
5	0.665	0.23	22.78	-	23.01	-	56.00	46.00	-32.99	-
6	13.004	0.87	35.74	-	36.61	-	60.00	50.00	-23.39	-
7	19.484	1.17	33.17	-	34.34	-	60.00	50.00	-25.66	-

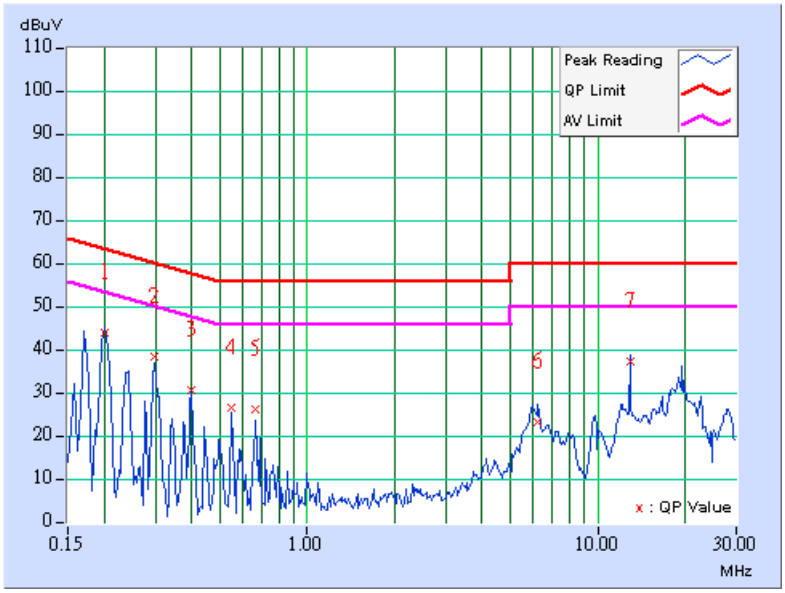
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST MODE	Operating	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70 % RH, 993hPa	**TESTED BY**: Lake Cheng	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.201**	**0.22**	**43.30**	**-**	**43.52**	**-**	**63.58**	**53.58**	**-20.06**	**-**
2	0.298	0.22	37.65	-	37.87	-	60.29	50.29	-22.42	-
3	0.400	0.22	30.09	-	30.31	-	57.85	47.85	-27.54	-
4	0.548	0.22	25.76	-	25.98	-	56.00	46.00	-30.02	-
5	0.666	0.23	25.35	-	25.58	-	56.00	46.00	-30.42	-
6	6.223	0.45	22.56	-	23.01	-	60.00	50.00	-36.99	-
7	13.004	0.77	36.75	-	37.52	-	60.00	50.00	-22.48	-

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

TEST STANDARD:
FCC Part 15: 2007, Subpart B (Section: 15.109)
CISPR 22: 1997 (section 6)
ICES-003: 2004 (Class A: Section 5.4)
(Class B: Section 5.5)

FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 – 230	40	30
230 - 1000	47	37

Note: The limit for radiated test was performed according to CISPR 22: 1997, which was specified in FCC PART 15B 15.109(g). Also the limits of ICES-003: 2004 and CISPR 22: 1997 are same.

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B 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.

FREQUENCY RANGE OF RADIATED MEASUREMENT
(For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

4.2.2 TEST INSTRUMENTS

<Frequency Range 30MHz-1GHz>

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ TEST RECEIVER	ESVS 10	840241/010	Sep. 03, 2007
Schaffner BILOG Antenna	CBL6111C	2728	May 31, 2008
CT Turn Table	TT100	CT-080	NA
CT Tower	AT100	CT-080	NA
Software	ADT_Radiated_V7.6.15	NA	NA
ANRITSU RF Switches	MP59B	6100259081	Sep. 17, 2007
WOKEN RF cable	8D	CABLE-ST3-01	Sep. 17, 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 ADT Open Site No. 3.
3. The VCCI Site Registration No. is R-269.

<Frequency Range 1GHz-40GHz>

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Agilent Spectrum	8564EC	4208A00659	Jun. 04, 2008
Agilent Preamplifier	8449B	3008A01201	Oct. 10, 2007
Agilent Preamplifier	8449B	3008A01638	Sep. 17, 2007
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	May 14, 2008
Schwarzbeck Horn Antenna	BBHA-9170	BBHA9170190	May 14, 2008
EMCO Horn Antenna	3115	00028257	Sep. 11, 2007
CT Turn Table	TT100	CT-080	NA
CT Tower	AT100	CT-080	NA
Software	ADT_Radiated_V7.6.15	NA	NA
SUHNER RF cable	SF106-18	PHACAB-1G-40GHz	Dec. 11, 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 ADT Open Site No. 3.
3. The VCCI Site Registration No. is R-269.

4.2.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4-2003 (section 8), CISPR 22 (section 10) and ICES-003: 2004 (section 4).

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. 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 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.
f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

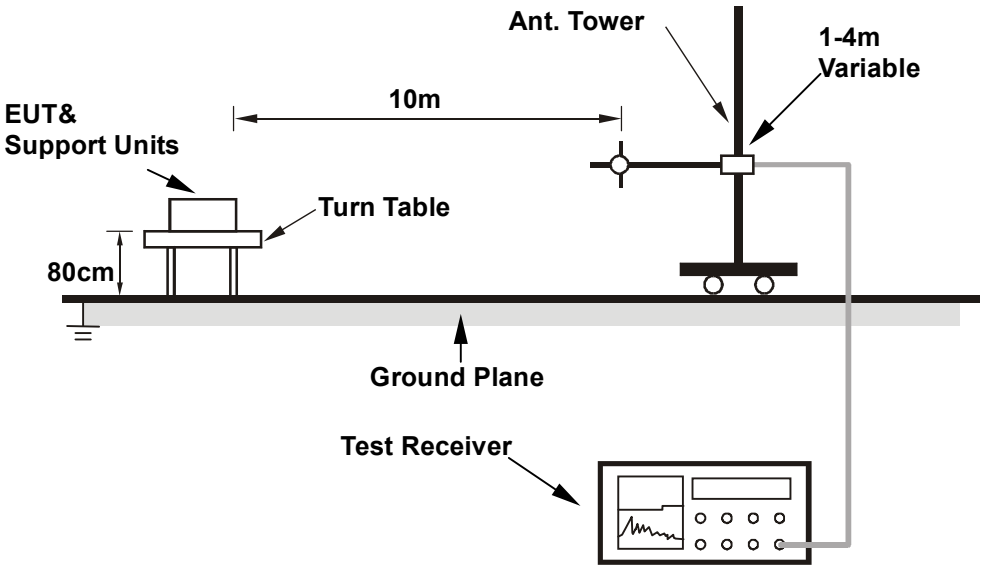
NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
3. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the interference-receiving antenna.

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

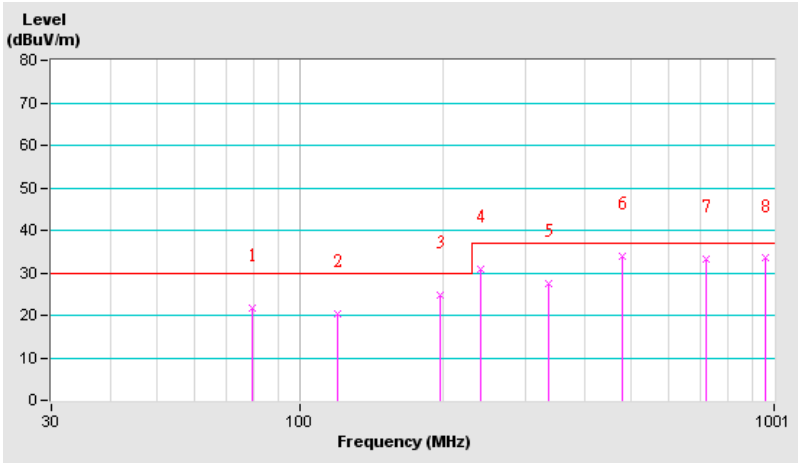
Same as item 4.1.6

4.2.7 TEST RESULTS

TEST MODE	Operating	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	30 deg. C, 74 % RH, 995 hPa	**TESTED BY**: Lake Cheng	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL 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	79.15	21.67 QP	30.00	-8.33	4.00 H	247	13.62	8.05
2	120.15	20.36 QP	30.00	-9.64	4.00 H	111	7.78	12.58
3	198.08	24.74 QP	30.00	-5.26	4.00 H	126	13.40	11.34
4	240.02	30.86 QP	37.00	-6.14	4.00 H	350	15.97	14.89
5	335.30	27.44 QP	37.00	-9.56	2.00 H	192	10.51	16.93
6	**480.06**	**33.86 QP**	**37.00**	**-3.14**	**1.99 H**	**127**	**11.66**	**22.20**
7	720.05	33.28 QP	37.00	-3.72	1.45 H	159	6.00	27.28
8	960.14	33.39 QP	37.00	-3.61	1.30 H	120	2.49	30.90

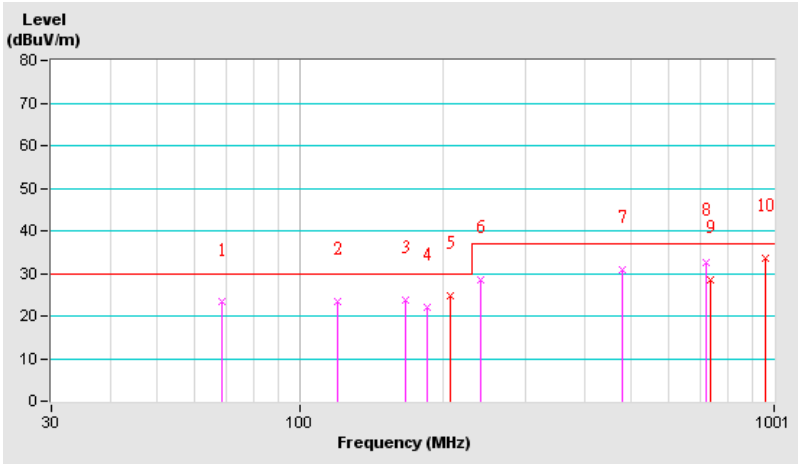
REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



TEST MODE	Operating	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & RESOLUTION BANDWIDTH**	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	30 deg. C, 74 % RH, 995 hPa	**TESTED BY**: Lake Cheng	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL 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	68.56	23.26 QP	30.00	-6.74	1.05 V	153	15.62	7.64
2	119.82	23.41 QP	30.00	-6.59	1.00 V	91	10.85	12.56
3	166.54	23.73 QP	30.00	-6.27	1.00 V	283	11.86	11.87
4	186.14	22.14 QP	30.00	-7.86	1.00 V	251	11.27	10.87
5	208.15	24.73 QP	30.00	-5.27	1.00 V	19	12.60	12.13
6	240.30	28.42 QP	37.00	-8.58	1.00 V	222	13.50	14.92
7	480.50	30.78 QP	37.00	-6.22	3.95 V	336	8.56	22.22
8	720.60	32.49 QP	37.00	-4.51	2.19 V	87	5.20	27.29
9	735.09	28.42 QP	37.00	-8.58	2.05 V	82	0.86	27.56
10	960.14	33.50 QP	37.00	-3.50	1.60 V	154	2.60	30.90

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 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.	TAF, 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: 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

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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.