



FCC DoC TEST REPORT

REPORT NO.: FD960323L10

MODEL NO.: E83XX (X=A-Z, 0-9 or blank)

RECEIVED: Mar. 26, 2007

TESTED: Mar. 28 ~ Apr. 10, 2007

ISSUED: Apr. 11, 2007

APPLICANT: Fujitsu Limited

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ISSUED BY: Advance Data Technology Corporation

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

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2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications.

Standard	Test Type	Result	Remarks
FCC Part 15:2006, Subpart B, Class B CISPR 22:1997, Class B ICES-003:2004, Class B	Conducted emission test	PASS	Meet the requirement of limit Minimum passing margin is -14.11 dB at 0.271 MHz
	Radiated emission test	PASS	Meet the requirement of limit Minimum passing margin is -3.02 dB at 212.80MHz

Note: The limit for radiated test for 30-1000 MHz 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:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz (Horizontal)	3.58 dB
	30MHz ~ 200MHz (Vertical)	3.73 dB
	200MHz ~1000MHz (Horizontal)	3.75 dB
	200MHz ~1000MHz (Vertical)	3.73 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 GENERAL DESCRIPTION OF EUT

PRODUCT	Notebook Computer
MODEL NO.	E83XX (X=A-Z, 0-9 or blank)
POWER SUPPLY	Refer to Note 2
DATA CABLE	NA
ACCESSORY DEVICE	Adapter

NOTE:

1. The models as below are identical to each other, except for their model designation due to marketing requirement.

Brand	Model
Fujitsu Limited	E83XX (X=A-Z, 0-9 or blank)

2. The EUT uses the following adapters:

Adapter 1	
Brand:	DELTA
Model:	ADP-80NB A
Input:	100-240Vac, 50-60Hz, 1.2A
Output:	19Vdc, 4.22A, 80W
Power line:	AC 1.8m non-shielded cable without core DC 1.2m non-shielded cable without core

Adapter 2	
Brand:	SANKEN
Model:	SEC100P2-19.0
Input:	100-240Vac, 50-60Hz, 1.2-0.6A
Output:	19Vdc, 4.22A, 80W
Power line:	AC 1.8m non-shielded cable without core DC 1.2m non-shielded cable without core

Adapter 3	
Brand:	SANKEN
Model:	SED110P2-19.0
Input:	100-240Vac, 50-60Hz, 1.35-0.6A
Output:	19Vdc, 5.27A, 100W
Power line:	AC 1.8m non-shielded cable without core DC 1.2m non-shielded cable without core

3. The EUT is a Notebook Computer was configured with the following key components:

Brand Name	Model No.	Specification
CPU		
Intel	Merom T7700	2.4GHz
	Merom T7500	2.2GHz
	Merom T7300	2.0GHz
	Merom T7100	1.8GHz



Brand Name	Model No.	Specification
LCD Panel		
CMO	N150X3-L0A	LCD 15" XGA Anti-glare 200nits
SHARP	LQ150X1LHS5	
Samsung	LTN150PF-L05	LCD 15" SXGA+ Anti-glare 200nits
CMO	N150P5-L02	
Memory		
Micron	MT4HTF6464HY-667E1	DDR2-667 SO-DIMM 512MB
	MT8HTF6464HDY-667D3	DDR2-667 SO-DIMM 512MB
	MT4HTF3264HY-667D3	DDR2-667 SO-DIMM 256MB
	MT16HTF12864HY-667D3	DDR2-667 SO-DIMM 1GB
	MH8TF12864HDY-667E1	DDR2-667 SO-DIMM 1GB
	MT16HTF25664HY-667A1	DDR2-667 SO-DIMM 2GB
Hynix	HYMP532S64BP6-Y5	DDR2-667 SO-DIMM 256MB
	HYMP564S64BP6-Y5	DDR2-667 SO-DIMM 512MB
Samsung	M470T3354EZ3-CE6	DDR2-667 SO-DIMM 256MB
	M470T6554EZ3-CE6	DDR2-667 SO-DIMM 512MB
	M470T2953CZ3-CE6	DDR2-667 SO-DIMM 1GB
HDD		
FUJITSU	MHW2040BH	40GB, 5400rpm
	MHW2060BH	60GB, 5400rpm
	MHW2080BH	80GB, 5400rpm
	MHW2100BH	100GB, 5400rpm
	MHW2120BH	120GB, 5400rpm
HGST	HTS541640J9SA00	40GB 7200rpm
	HTS541680J9SA00	80GB 7200rpm
	HTS541610J9SA00	100GB 5400rpm
	HST721010G9SA	100GB 7200rpm
	HTS541612J9SA00	120GB 7200rpm
ODD		
NEC	AD-7540A	DVD-ROM
PANASONIC	UJ-850U	Super-Multi
TEAC	DW-224E-R	Combo
	DV-28E-R	DVD-ROM
HLDS	GSA-T20N	Super-Multi



Brand Name	Model No.	Specification
Modem		
Agere	Delphi D40	--
Wireless LAN		
Intel	WN3945ABG XXX (X may be 0~9, A~Z or Blank)	--
	WN3945BG	--
	4965AG_ XXX (X may be 0~9, A~Z or Blank)	--
	4965AGN XXX (X may be 0~9, A~Z or Blank)	--
Atheros	AR5XB6X (X may be 0~9, A~Z or Blank)	--
Bluetooth		
TAIYO YUDEN	EYTF3CSFT	--
Inverter		
Minebea	IM4534 (CP274384-XX)	--
UMTS		
Sierra	MC8780	--
ST LCD		
itak	TAK-42636-F490021/R	--
Fingerprint		
Authen Tec	AES2501B	--
TPM		
FUJITSU	CP268940-X1	--
Battery (1st)		
FUJITSU (Sanyo)	CP293530-XX	--
FUJITSU (Panasonic)	CP279074-XX	--
Battery (2nd) for ODD bay		
FUJITSU	CP245377-XX	
Adapter		
DELTA	ADP-80NB A	80W/19V
SANKEN	SEC100P2-19.0	80W/19V
	SED110P2-19.0	100W/19V
Port Replicator		
Fujitsu Limited	FPCPR63**	DC 19Vdc, 5.27A

Brand Name	Model No.	Specification
Keyboard		
FUJITSU	CP270340-02	UK/Blank without touch stick
	CP270342-02	
Keyboard		
FUJITSU	CP270341-02	UK/Blank with touch stick
	CP270343-02	
Chipset		
Intel	--	North bridge:GM965
	--	South bridge:ICH8M

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

The EUT has been pre-tested under following test modes. The test mode 12 is for the final test of radiated emission and presented in the report.

	1	2	3	4	5	6	7	8	9	10	11	12
CPU	Intel / Merom T7300			Intel / Merom T7500			Intel / Merom T7100			Intel / Merom T7700		
LCD Panel	CMO / N150P5-L02			CMO / N150X3-L0A			Samsung / LTN150PF-L05			SHARP / LQ150X1LHS5		
Memory	Micron / 512MB *2 MT4HTF6464HY-667E1 MT8HTF6464HDY-667D3			Hynix DDR2-667 (256+512)	Samsung DDR2-667 (256+512)	Micron DDR2-667 2GB / Samsung DDR2-667 1GB	Micron DDR2-667 1GB *2	Micron / DDR2-667 256MB Samsung / DDR2-667 1GB				
HDD	FUJITSU 80GB 5400rpm			HGST 100GB 7200rpm	FUJITSU 100GB 5400rpm	FUJITSU 40GB 5400rpm	HGST 120GB 5400rpm	HGST 80GB 5400rpm	FUJITSU 60GB 5400rpm	HGST 100GB 5400rpm	HGST 40GB 5400rpm	FUJITSU 120GB 5400rpm
ODD	NEC / AD-7540A			PANASONIC UJ-850U	TEAC DW-224E-R	TEAC DW-224E-V	HLDS GSA-T20N			TEAC DV-28E-R		
MODEM	Agere / Delphi D40											
Wireless LAN	Atheros / AR5BXB6X (X may be 0-9, A-Z or Blank)			Intel / WN3945ABG XXX (X may be 0-9, a-z or Blank)	Intel / WN3945BG	Intel / 4965AG_XXX	Intel / WN3945ABG XXX (X may be 0-9, A-Z or Blank)	Intel / 4965AGN XXX (X may be 0-9, A-Z or Blank)	Atheros / AR5BXB6X (X may be 0-9, A-Z or Blank)			
Bluetooth	TAIYO / YUDEN EYTF3CSFT											
Inverter	Minebea / IM4534 (CP274384-XX)											
ST LCD	itak / TAK-42636-F490021/R											
Fingerprint	Authen / Tec AES2501B			NA			NA			Authen / Tec AES2501B		
TPM	FUJITSU / CP268940-X1											
UMTS	Sierra / MC8780											
Battery	FUJITSU / (Panasonic)			FUJITSU / (Sanyo)			FUJITSU / (Panasonic)					
Adapter	Sanken (100)	Delta	Sanken (110)	Delta								

For conducted test, the worst mode 12 (as above) with port replicator collocated with the three power adapters separately, and presented in the report as below.

Test Mode	Description	Remark
A	Configuration 12	Power adapter: ADP-80NB A
B	Configuration 12	Power adapter: SEC100P2-19.0
C	Configuration 12	Power adapter: SED110P2-19.0



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	24" LCD MONITOR	DELL	2407WFPb	CN-0FC255-46633-665-07US	FCC DoC Approved
2	20"LCD MONITOR	DELL	2001FP	CN-0C0647-46633-533-043L	NA
3	TV MONITOR	HACE	CT14A	35111411001753	VERIFICATION
4	MODEM	ACEEX	1414V/3	0401008273	IFAXDM1414
5	PRINTER	EPSON	LQ-300+	DCGY054105	FCC DoC Approved
6	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4860019	FCC DoC Approved
7	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4A60004	FCC DoC Approved
8	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4860018	FCC DoC Approved
9	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4A60010	FCC DoC Approved
10	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4990023	FCC DoC Approved
11	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4A50003	FCC DoC Approved
12	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4990026	FCC DoC Approved
13	FIREWIRE HARD DRIVE	Terasys	F12-UF	A0100222-4A60001	FCC DoC Approved
14	MOUSE	HP	M-S69	NA	INZ211443
15	MICROPHONE	Labtec	LVA7313	NA	NA
16	EARPHONE	PHILIPS	SBC HL125	NA	NA
17	NOTEBOOK	HP	NC6000	CNU4110Y3V	NA
18	TELEPHONE SWITCHBOARD	DLT	TC-104H	T3-020001	NA
19	WIRELESS AP	BUFFALO	WBR2-G54	34059544811631	FDI-04600142-0
20	BLUETOOTH EARPHONE	AboCom	BHC210	050600420	SI4-MBHC21

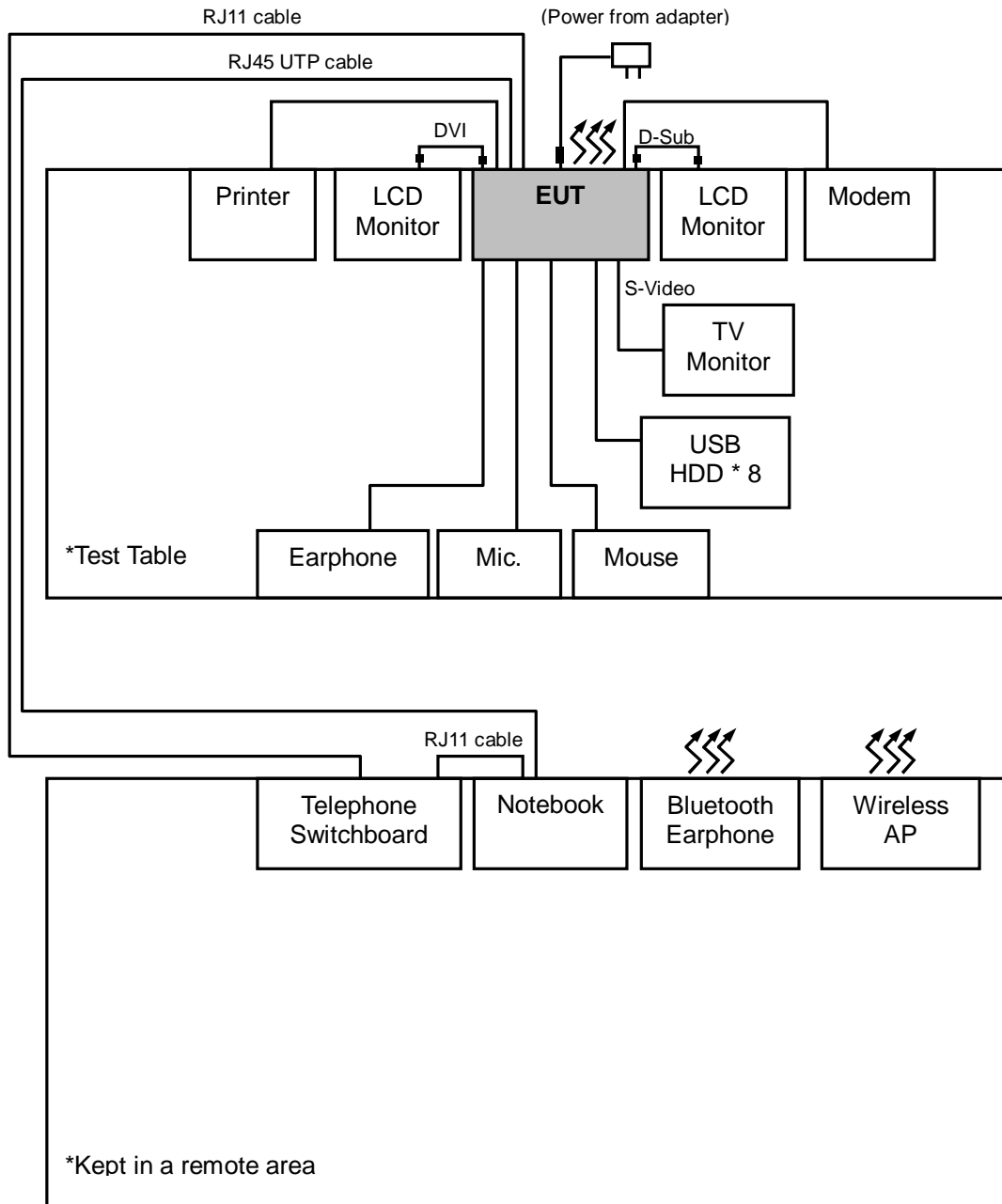


NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.2m shielded DVI cable with two cores
2	1.2m shielded D-Sub cable with two cores
3	1.8m shielded S-Video cable
4	1.2m shielded cable
5	1.2m shielded cable
6	1.2m shielded cable
7	1.2m shielded cable
8	1.2m shielded cable
9	1.2m shielded cable
10	1.2m shielded cable
11	1.5m shielded cable
12	1.5m shielded cable
13	1.5m shielded cable
14	1.2m shielded cable
15	1.2m non-shielded cable
16	1.2m non-shielded cable
17	10m shielded RJ45 UTP cable
18	10m shielded RJ11 cable
19	NA
20	NA

NOTE:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 17 ~ 20 acted as communication partners to transfer data.

3.4 CONFIGURATION OF SYSTEM UNDER TEST





4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD:

FCC Part 15:2006, 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
0.5-5	73	60	56	46
5-30	73	60	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 UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 25, 2007
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2008
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 08, 2008
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 16, 2008
Software ADT	ADT_Cond_V3	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 HwaYa Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.

4.1.3 TEST PROCEDURE

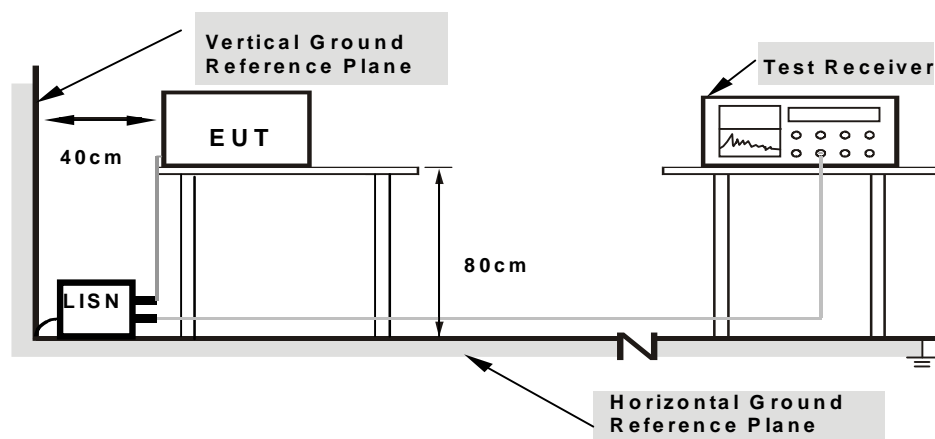
The basic test procedure was in accordance with ANSI C63.4:2003 (section 7), CISPR 22 (section 9) and ICES-003:2004 (section 4).

- 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) was not 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

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



4.1.6 EUT OPERATING CONDITIONS

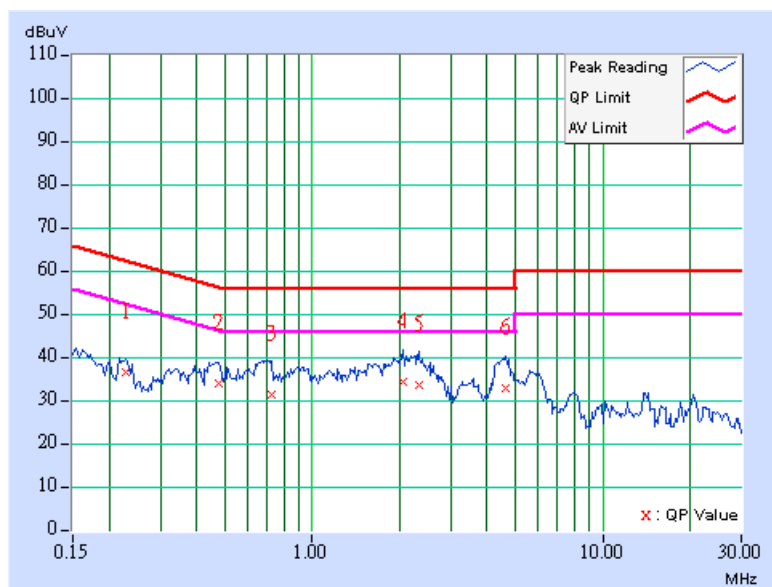
- a. The EUT ran a test program to enable all functions.
- b. The EUT communicated messages with the external HDDs.
- c. The EUT communicated messages with the workstation notebook.
- d. The EUT communicated messages with the workstation telephone switchboard.
- e. The EUT communicated messages with the workstation wireless AP.
- f. The EUT sent "H" messages to the monitors and the monitors displayed "H" patterns.
- g. The EUT sent audio signal to the earphone.
- h. Steps b ~ g were repeated.

4.1.7 TEST RESULTS (A)

INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa	PHASE	Line 1
TESTED BY	Ben Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.228	0.10	36.34	-	36.44	-	62.52	52.52	-26.08	-
2	0.474	0.10	33.79	-	33.89	-	56.44	46.44	-22.55	-
3	0.728	0.11	31.13	-	31.24	-	56.00	46.00	-24.76	-
4	2.051	0.22	34.09	-	34.31	-	56.00	46.00	-21.69	-
5	2.324	0.23	33.48	-	33.71	-	56.00	46.00	-22.29	-
6	4.605	0.29	32.75	-	33.04	-	56.00	46.00	-22.96	-

- 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.

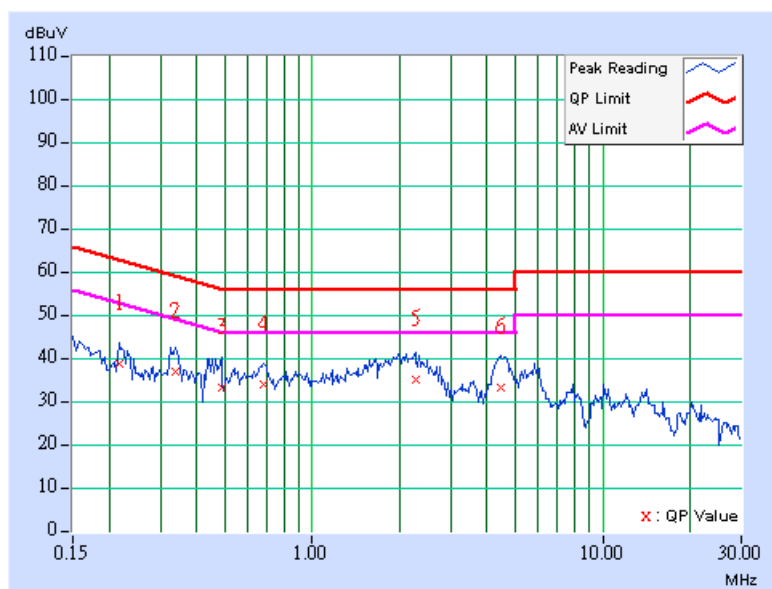




INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa	PHASE	Line 2
TESTED BY	Ben Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.216	0.10	38.50	-	38.60	-	62.96	52.96	-24.36	-
2	0.338	0.10	36.80	-	36.90	-	59.26	49.26	-22.36	-
3	0.486	0.12	33.03	-	33.15	-	56.24	46.24	-23.09	-
4	0.681	0.15	33.81	-	33.96	-	56.00	46.00	-22.04	-
5	2.266	0.23	34.85	-	35.08	-	56.00	46.00	-20.92	-
6	4.488	0.29	33.10	-	33.39	-	56.00	46.00	-22.61	-

- 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.

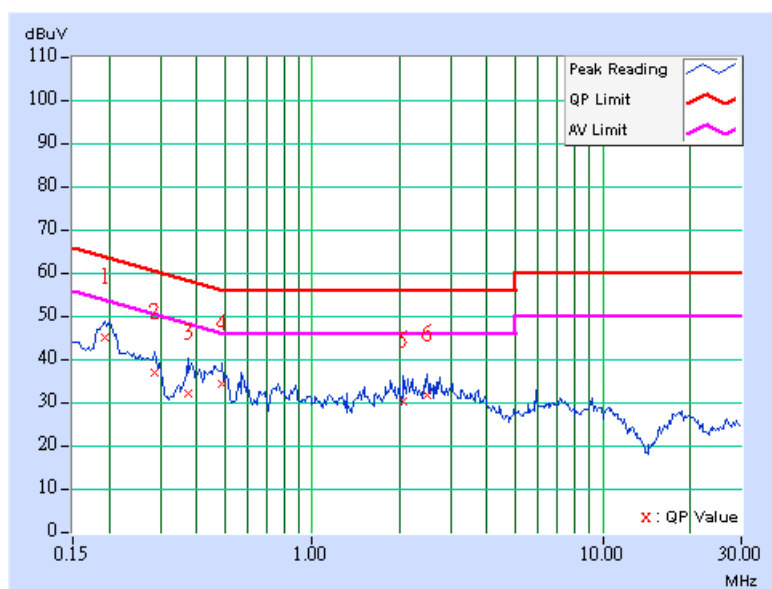


4.1.8 TEST RESULTS (B)

INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa	PHASE	Line 1
TESTED BY	Ben Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.10	44.84	-	44.94	-	63.91	53.91	-18.97	-
2	0.287	0.10	36.92	-	37.02	-	60.62	50.62	-23.60	-
3	0.373	0.10	31.89	-	31.99	-	58.44	48.44	-26.45	-
4	0.490	0.10	34.36	-	34.46	-	56.17	46.17	-21.71	-
5	2.066	0.22	30.32	-	30.54	-	56.00	46.00	-25.46	-
6	2.480	0.23	31.75	-	31.98	-	56.00	46.00	-24.02	-

- 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.

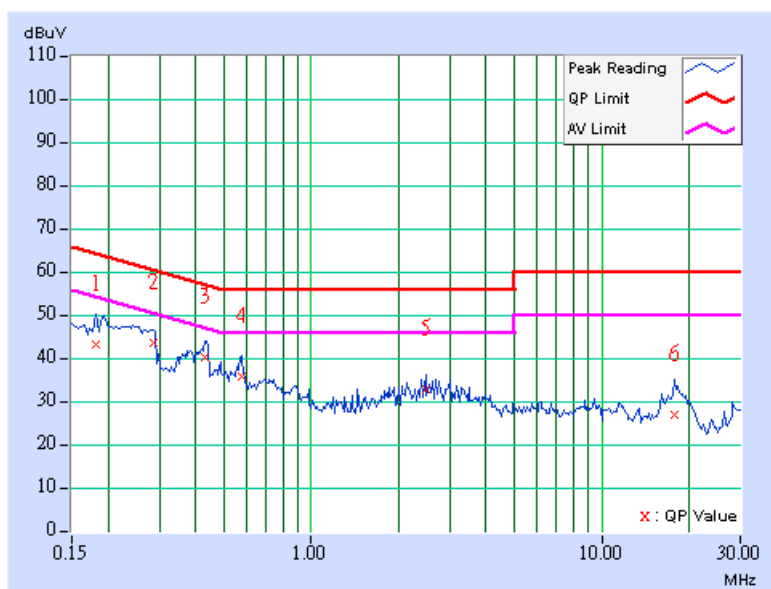




INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa	PHASE	Line 2
TESTED BY	Ben Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.181	0.10	42.74	-	42.84	-	64.43	54.43	-21.59	-
2	0.287	0.10	43.04	-	43.14	-	60.62	50.62	-17.48	-
3	0.431	0.11	39.81	-	39.92	-	57.23	47.23	-17.31	-
4	0.576	0.13	35.28	-	35.41	-	56.00	46.00	-20.59	-
5	2.480	0.23	32.48	-	32.71	-	56.00	46.00	-23.29	-
6	17.727	0.53	26.69	-	27.22	-	60.00	50.00	-32.78	-

- 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.

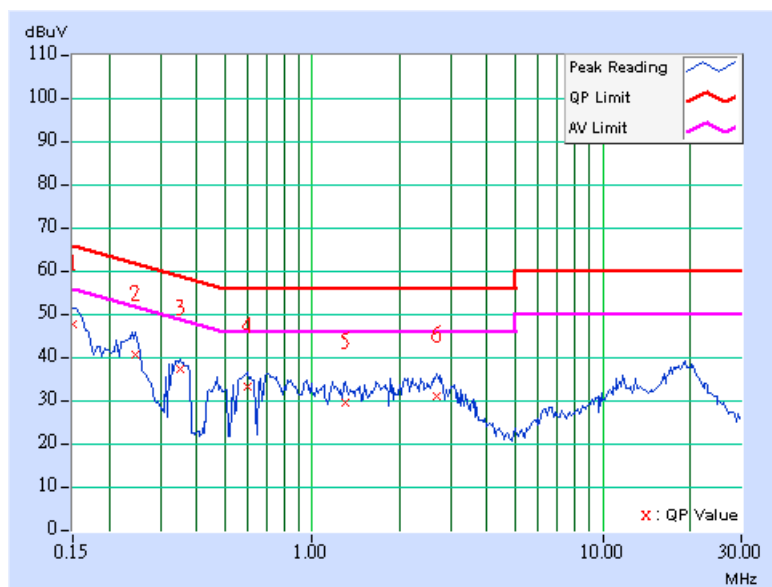


4.1.9 TEST RESULTS (C)

INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa	PHASE	Line 1
TESTED BY	Ben Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	47.58	-	47.68	-	66.00	56.00	-18.32	-
2	0.248	0.10	40.63	-	40.73	-	61.84	51.84	-21.11	-
3	0.349	0.10	37.18	-	37.28	-	58.98	48.98	-21.70	-
4	0.599	0.10	33.02	-	33.12	-	56.00	46.00	-22.88	-
5	1.309	0.14	29.37	-	29.51	-	56.00	46.00	-26.49	-
6	2.691	0.24	30.98	-	31.22	-	56.00	46.00	-24.78	-

- 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.

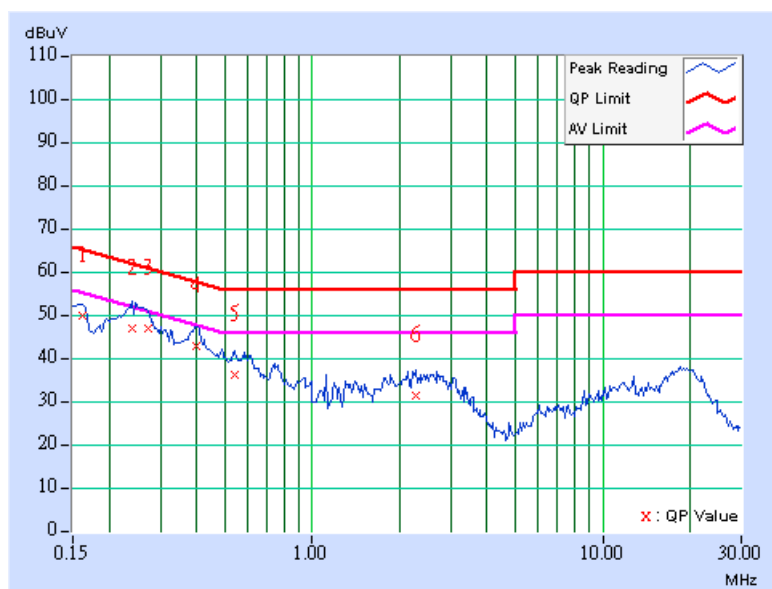




INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa	PHASE	Line 2
TESTED BY	Ben Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.10	49.73	-	49.83	-	65.38	55.38	-15.55	-
2	0.240	0.10	46.81	-	46.91	-	62.10	52.10	-15.19	-
3	0.271	0.10	46.87	-	46.97	-	61.08	51.08	-14.11	-
4	0.400	0.10	42.78	-	42.88	-	57.85	47.85	-14.97	-
5	0.541	0.13	36.20	-	36.33	-	56.00	46.00	-19.67	-
6	2.281	0.23	31.09	-	31.32	-	56.00	46.00	-24.68	-

- 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 15:2006, Subpart B (Section: 15.109)

CISPR 22:1997 (section 6)

ICES-003:2004 (Class A: section 5.4)

(Class B: section 5.5)

Frequency (MHz)	Class A (at 10m)	Class B (at 10m)
	Quasi-peak (dBuV/m)	Quasi-peak (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.

Frequency (MHz)	Class A (at 3m)		Class B (at 3m)	
	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	80	60	74	54

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
 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.

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

For frequency below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100186	Dec. 07, 2007
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Sep. 26, 2007
Spectrum Analyzer Agilent	8564EC	4208A00662	Dec. 25, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Nov. 28, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-149	Nov. 28, 2007
HORN Antenna EMCO	3115	5623	Jul. 19, 2007
Preamplifier Agilent	8447D	2944A10637	Dec. 10, 2007
Preamplifier Agilent	8447D	2944A10636	Dec. 10, 2007
Preamplifier Agilent	8449B	3008A01959	Dec. 17, 2007
RF signal cable Woken	8D-FB	Cable-Hych1-01	Oct. 15, 2007
RF signal cable Woken	8D-FB	Cable-Hych1-02	Oct. 15, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218186/4	Nov. 14, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 104	204850/4	Nov. 14, 2007
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

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



For frequency above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 17, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSEK 30	100049	Aug. 21, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Jan. 04, 2008
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-408	Jan. 18, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 16, 2008
Preamplifier Agilent	8449B	3008A01961	Oct. 15, 2007
Preamplifier Agilent	8447D	2944A10629	Oct. 16, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 106	25648/6	Dec. 19, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 104	251643/4	Dec. 11, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	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 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 IC Site Registration No. is IC3789B-2.



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, 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10, 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.
- 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.

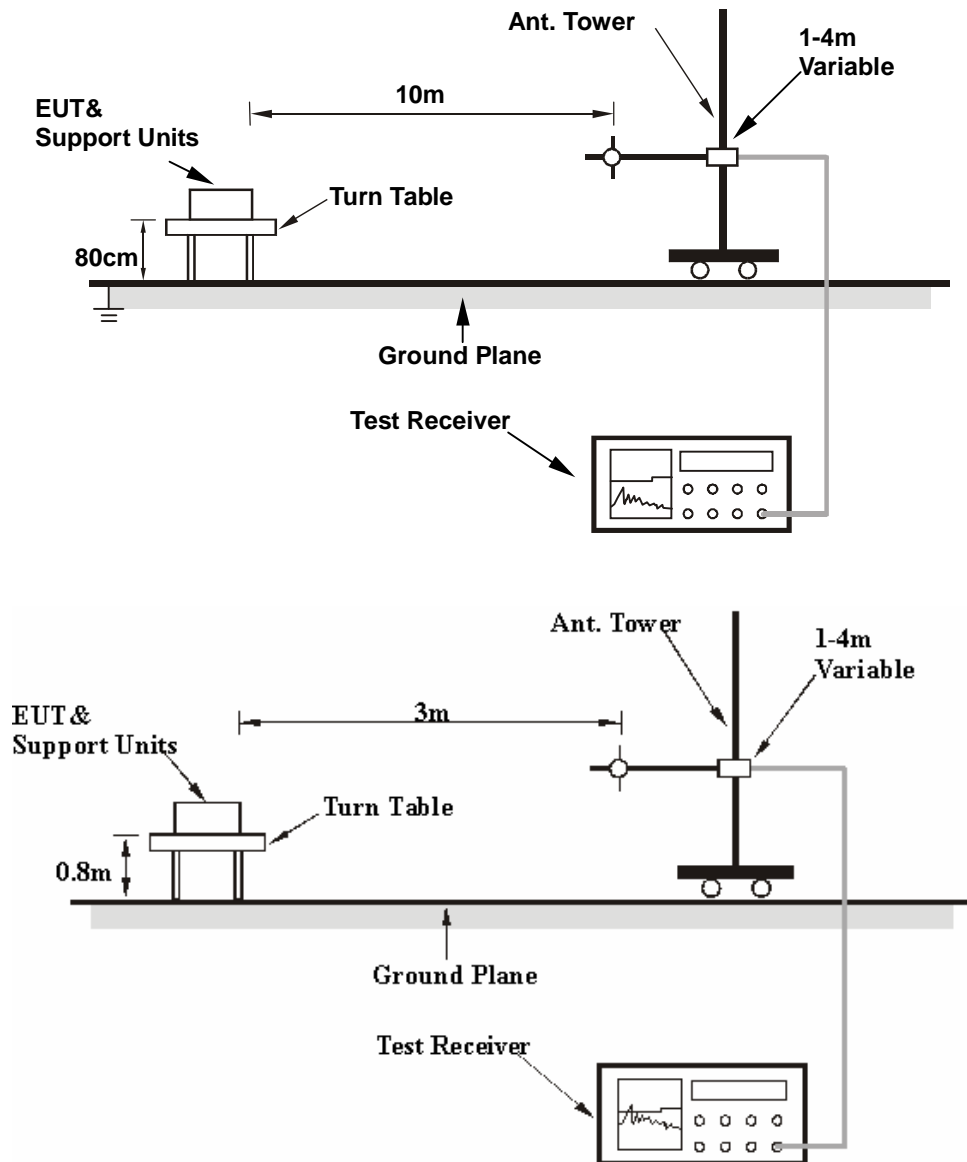
NOTE:

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

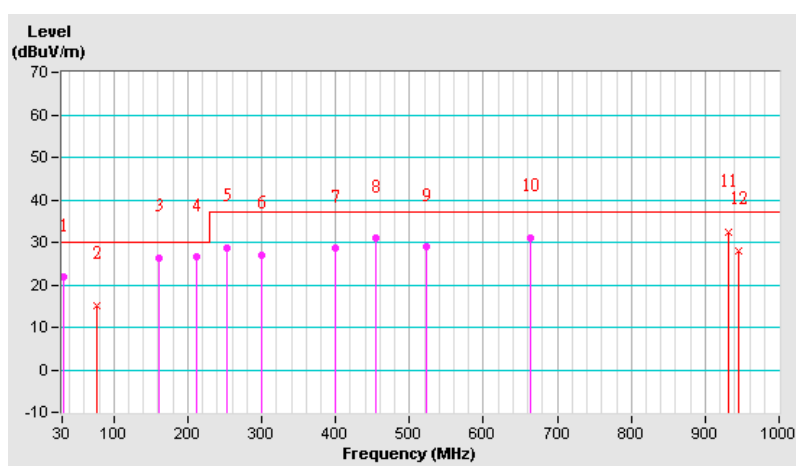
Same as 4.1.6.

4.2.7 TEST RESULTS

INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 56 RH, 991 hPa	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Daniel Lin		

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	31.94	21.75 QP	30.00	-8.25	3.50 H	15	7.29	14.46
2	76.61	15.02 QP	30.00	-14.98	3.50 H	190	4.11	10.91
3	160.24	26.27 QP	30.00	-3.73	4.00 H	34	12.61	13.66
4	212.73	26.50 QP	30.00	-3.50	2.50 H	343	14.71	11.79
5	253.55	28.77 QP	37.00	-8.23	3.00 H	142	15.85	12.92
6	300.20	26.99 QP	37.00	-10.01	2.50 H	280	10.57	16.41
7	399.34	28.48 QP	37.00	-8.52	2.50 H	148	9.82	18.65
8	453.77	30.88 QP	37.00	-6.12	2.50 H	15	11.25	19.63
9	523.75	28.83 QP	37.00	-8.17	1.50 H	196	7.06	21.77
10	663.71	31.04 QP	37.00	-5.96	2.00 H	359	6.02	25.02
11	932.04	32.27 QP	37.00	-4.73	1.00 H	35	2.33	29.94
12	945.72	28.13 QP	37.00	-8.87	1.00 H	35	-2.37	30.50

- 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.

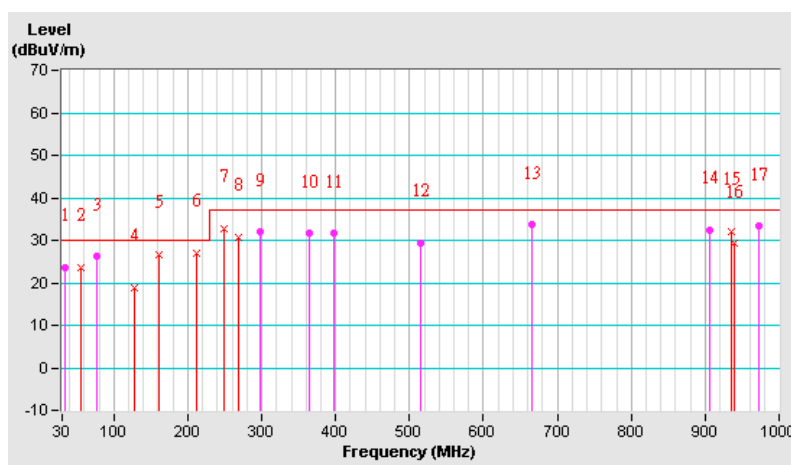




INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 56 RH, 991 hPa	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Daniel Lin		

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	33.89	23.68 QP	30.00	-6.32	4.00 V	2	8.95	14.73
2	55.30	23.58 QP	30.00	-6.42	3.00 V	314	9.01	14.57
3	76.65	26.11 QP	30.00	-3.89	1.50 V	157	14.46	11.65
4	127.67	18.90 QP	30.00	-11.10	1.00 V	294	6.28	12.62
5	160.83	26.54 QP	30.00	-3.46	2.00 V	146	12.39	14.15
6	212.80	26.98 QP	30.00	-3.02	1.00 V	109	14.54	12.44
7	250.00	32.74 QP	37.00	-4.26	1.00 V	166	19.52	13.22
8	269.20	30.65 QP	37.00	-6.35	1.00 V	156	15.42	15.23
9	298.26	31.89 QP	37.00	-5.11	1.00 V	157	15.15	16.74
10	364.35	31.56 QP	37.00	-5.44	4.00 V	166	13.04	18.52
11	397.39	31.55 QP	37.00	-5.45	4.00 V	143	12.03	19.52
12	515.97	29.48 QP	37.00	-7.52	3.00 V	185	7.06	22.42
13	665.65	33.58 QP	37.00	-3.42	4.00 V	327	7.75	25.83
14	906.69	32.32 QP	37.00	-4.68	2.00 V	344	1.82	30.49
15	936.03	32.10 QP	37.00	-4.90	2.00 V	347	0.47	31.63
16	939.75	29.22 QP	37.00	-7.78	2.50 V	342	-2.55	31.78
17	972.79	33.29 QP	37.00	-3.71	2.00 V	352	1.30	31.99

- 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.

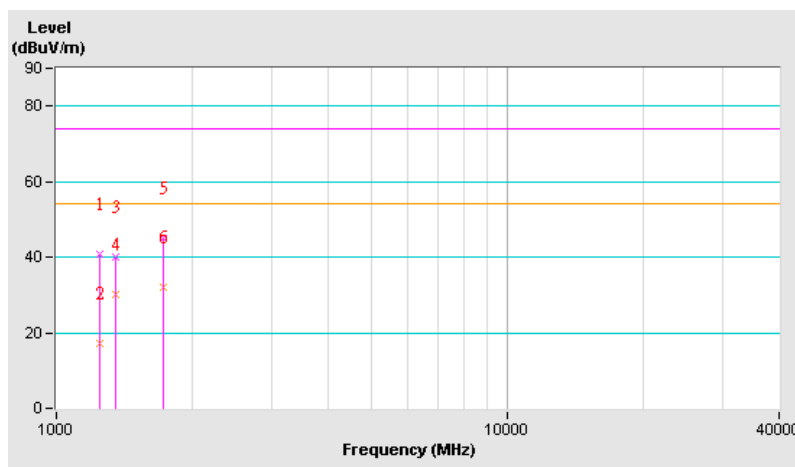




INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-40 GHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65 RH, 991 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Scott Yang		

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	1244.60	40.87 PK	74.00	-33.13	1.00 H	35	13.13	27.74
2	1244.60	17.27 AV	54.00	-36.73	1.00 H	35	-10.47	27.74
3	1349.90	39.93 PK	74.00	-34.07	2.00 H	208	11.85	28.08
4	1349.90	30.08 AV	54.00	-23.92	2.00 H	208	2.00	28.08
5	1729.50	45.14 PK	74.00	-28.86	1.00 H	349	15.87	29.27
6	1729.50	31.86 AV	54.00	-22.14	1.00 H	349	2.59	29.27

- 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.

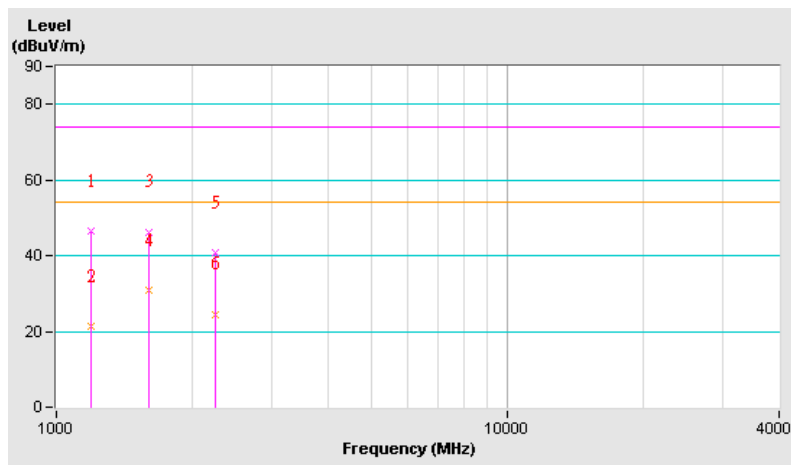




INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-40 GHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65 RH, 991 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Scott Yang		

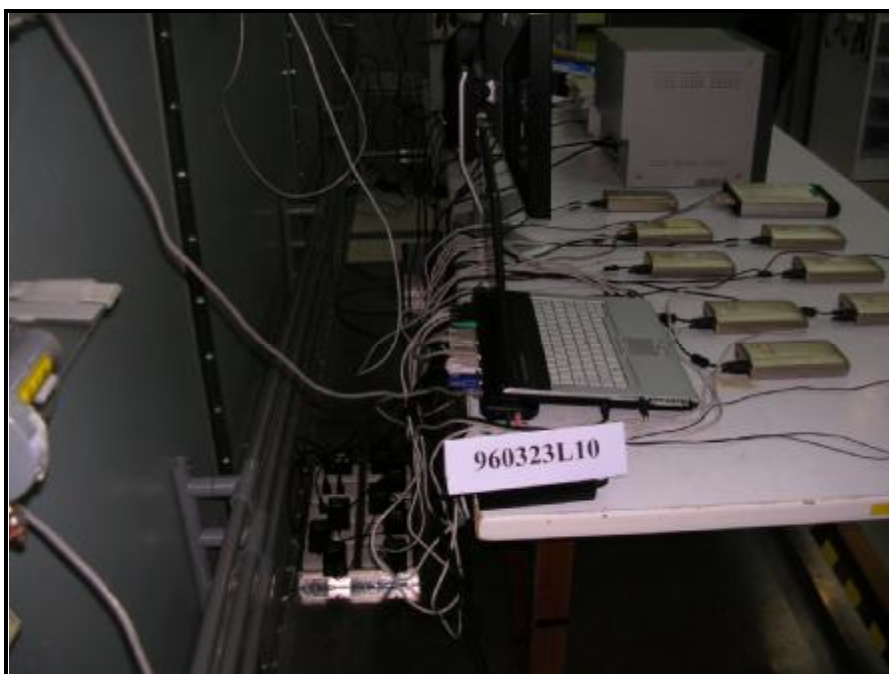
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1198.01	46.48 PK	74.00	-27.52	1.00 V	341	18.88	27.60
2	1198.01	21.18 AV	54.00	-32.82	1.00 V	341	-6.42	27.60
3	1597.90	46.30 PK	74.00	-27.70	1.00 V	149	17.45	28.85
4	1597.90	30.90 AV	54.00	-23.10	1.00 V	149	2.05	28.85
5	2243.70	40.63 PK	74.00	-33.37	1.50 V	224	9.62	31.01
6	2243.70	24.56 AV	54.00	-29.44	1.50 V	224	-6.45	31.01

- 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

Conducted Emission Test _ Test Mode A ~ C



Radiated Emission Test (10m) _ Test Mode 12



Radiated Emission Test (3m) _ Test Mode 12





6 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: 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.



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.