

FCC TEST REPORT

REPORT NO.: RF931118L02A

MODEL NO.: WAP54GP

RECEIVED: Dec. 04, 2006

TESTED: Dec. 06 ~ Dec. 08, 2006

ISSUED: Dec. 12, 2006

APPLICANT: Cisco-Linksys LLC

ADDRESS: 121 Theory Drive Irvine, CA 92617 (USA)

ISSUED BY: Advance Data Technology Corporation

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

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

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1. CERTIFICATION

PRODUCT : Wireless-G Access Point with POE

MODEL NO.: WAP54GP

BRAND: Linksys

APPLICANT : Cisco-Linksys LLC

TESTED: Dec. 06 ~ Dec. 08, 2006

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS : FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Jessie Wang, **DATE:** Dec. 12, 2006
Jessie Wang

TECHNICAL ACCEPTANCE : Long Chen, **DATE:** Dec. 12, 2006
Responsible for RF Long Chen

APPROVED BY : Gary Chang, **DATE:** Dec. 12, 2006
Gary Chang / Supervisor

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -6.42dB at 0.585MHz.
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.30dB at 54.10MHz.

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	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.46 dB
Radiated emissions	30MHz ~ 1000MHz	4.03 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	Wireless-G Access Point with POE
MODEL NO.	WAP54GP
FCC ID	Q87-WAP54GP
POWER SUPPLY	48Vdc from POE 12Vdc from AC adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11/ 5.5/ 2/ 1Mbps 802.11g: 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
MAXIMUM OUTPUT POWER	28.184mW
ANTENNA TYPE	Please refer to the note 3 as below
DATA CABLE	NA
I/O PORTS	RJ45

NOTE:

1. This report is issued as a supplementary report of ADT report no.: RF931118L02. This report shall be used combined together with its original report.
2. This report is prepared for FCC class II permissive change. The model in this report is identical to the original application one. The difference is:

◆ Adding one new adapter to this EUT. The detail as below:

BRAND	Linksys
MODEL	MT12-4120100-A1
INPUT	120Vac, 60Hz, 0.3A
OUTPUT	12Vdc, 1.0A
POWER LINE	DC 1.9 m non-shielded cable without core

3. There are 4 antenna combinations provided to this EUT. The information about those antennas:

Item	Ant. Type	Ant. Gain
1	Dipole Antenna	3dBi
2	Dipole Antenna	5dBi
3	Dipole Antenna	7dBi
4	Dipole Antenna	7dBi (with cradle)

4. The EUT complies with IEEE 802.11g standards and backwards compatible with IEEE 802.11b products.
5. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.
6. 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.

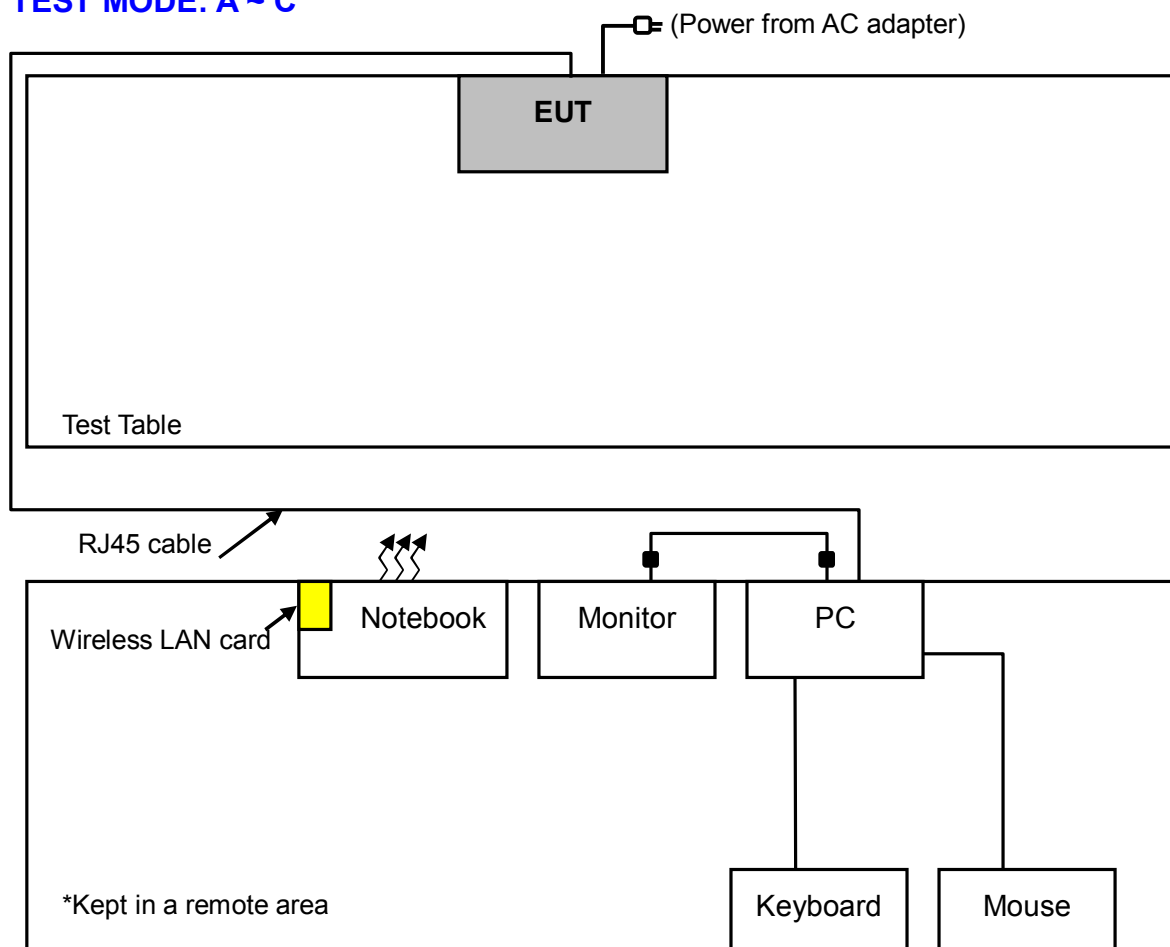
3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

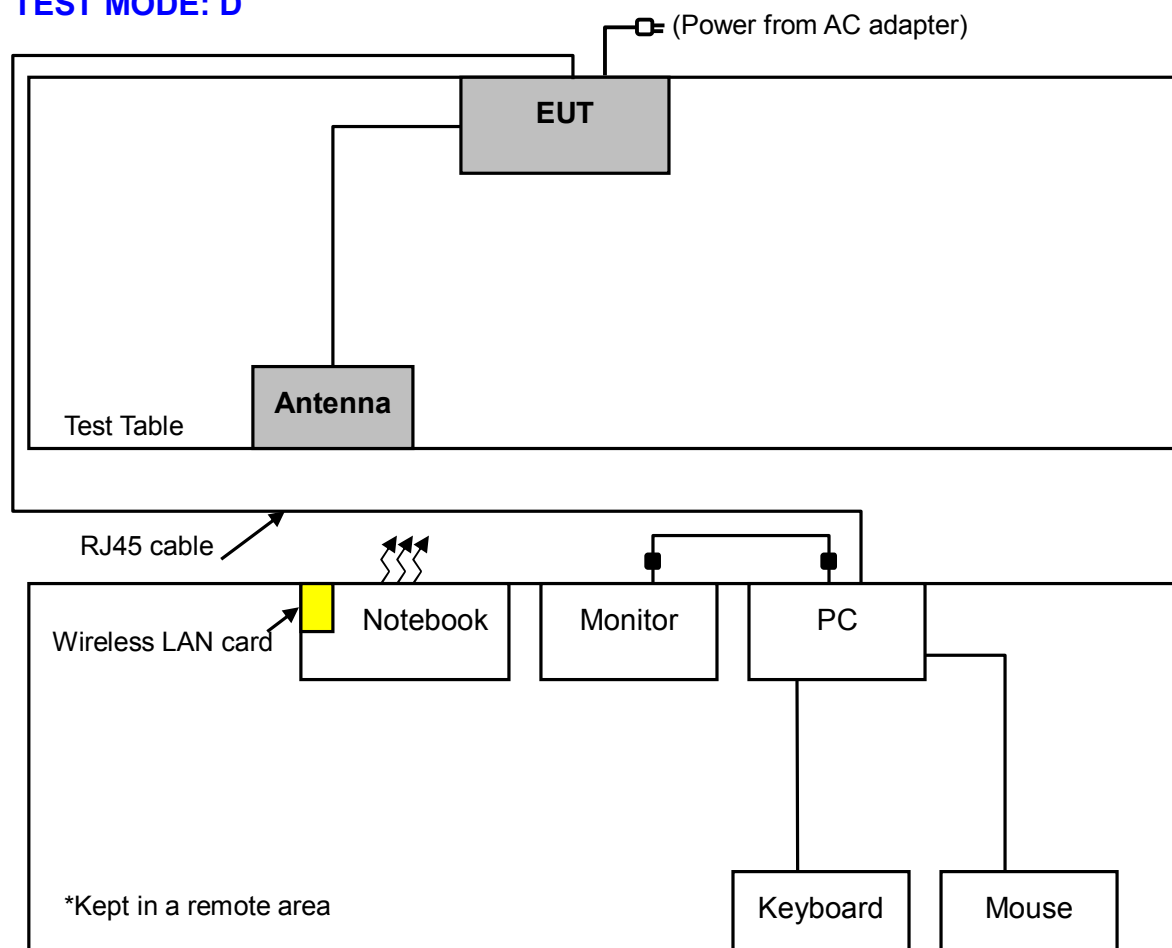
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

TEST MODE: A ~ C



TEST MODE: D



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO		DESCRIPTION
	PLC	RE < 1G	
A	Note	√	3dBi antenna
B	Note	√	5dBi antenna
C	√	√	7dBi antenna
D	Note	√	7dBi antenna with cradle

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

RE ≥ 1G: Radiated Emission above 1GHz

Note: Pre-scan shown antenna has no effect for PLC test and only worst case recorded in the report.

POWER LINE CONDUCTED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
C	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

RADIATED EMISSION TEST (BELOW 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	11	OFDM	BPSK	6
B	802.11g	1 to 11	11	OFDM	BPSK	6
C	802.11g	1 to 11	11	OFDM	BPSK	6
D	802.11g	1 to 11	11	OFDM	BPSK	6

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. (15.247)

ANSI C63.4-2003

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It 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	DTPC 27	21402951	FCC DoC Approved
2	COLOR MONITOR	ADI	CM100	026058T10200611 A	FCC DoC Approved
3	NOTEBOOK COMPUTER	DELL	PP05L	24729091408	FCC DoC Approved
4	PS/2 KEYBOARD	BTC	5200T	F24800239	E5XKB5122WTH0110
5	PS/2 MOUSE	LOGITECH	M-S43	LZE00703207	DZL211106
6	WIRELESS LAN CARD	INTEL	PRO/1000MT DESKTOP ADAPTER	0007E90FE3E6 123AD A78408-008	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core
3	NA
4	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
5	1.8 m foil shielded wire, terminated with PS/2 connector via drain wire, w/o core.
6	NA

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

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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 UNTIL
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	Jul. 20, 2007
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	May 31, 2007
LISN With Adapter (for EUT)	AD10	C02Ada-001	May 31, 2007
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	May 22, 2007
Software	ADT_Conc_V7.3.2	NA	NA
Software	ADT_ISN_V7.3.2	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C02.01	Mar. 13, 2007
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Jan. 16, 2007
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Jan. 16, 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 Shielded Room No. 2.
 3. The VCCI Site Registration No. C-240.

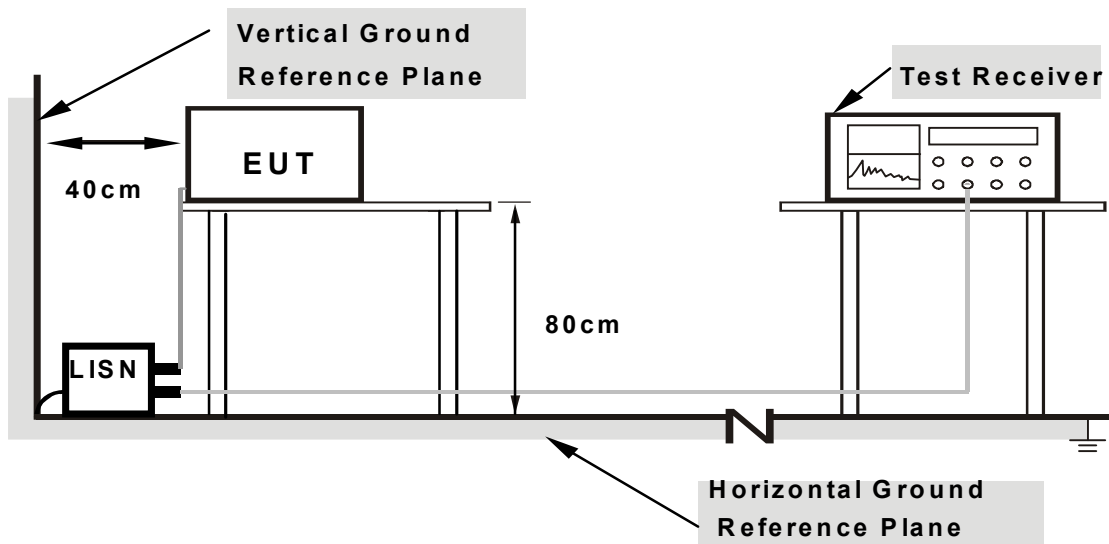
4.1.3 TEST PROCEDURES

- 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) was 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 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Connected the EUT to a notebook system via RJ45 cable and placed on a testing table.
- The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.

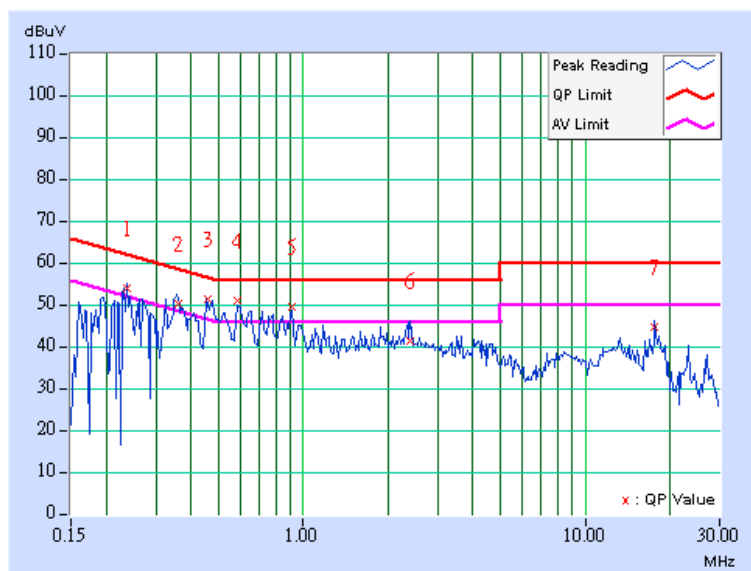
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 77%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	0.237	0.16	52.27	32.97	52.43	33.13	62.20	52.20	-9.78	-19.08
2	0.360	0.18	48.65	26.81	48.83	26.99	58.73	48.73	-9.90	-21.74
3	0.457	0.20	49.85	39.16	50.05	39.36	56.74	46.74	-6.69	-7.38
4	0.585	0.22	49.36	39.27	49.58	39.49	56.00	46.00	-6.42	-6.51
5	0.912	0.28	47.70	36.89	47.98	37.17	56.00	46.00	-8.02	-8.83
6	2.407	0.31	39.73	-	40.04	-	56.00	46.00	-15.96	-
7	17.693	1.77	43.23	-	45.00	-	60.00	50.00	-15.00	-

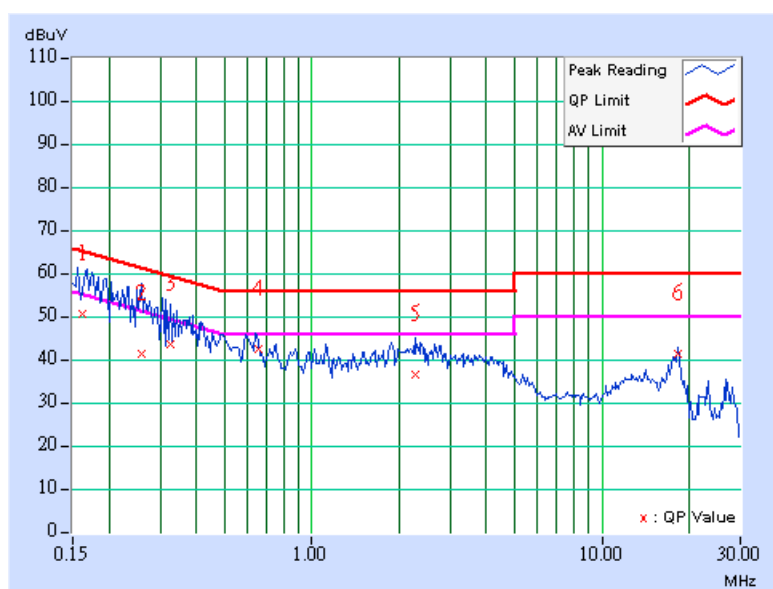
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 77%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	0.13	48.87	-	49.00	-	65.38	55.38	-16.38	-
2	0.258	0.16	39.83	-	39.99	-	61.49	51.49	-21.49	-
3	0.325	0.17	42.10	-	42.27	-	59.58	49.58	-17.31	-
4	0.652	0.19	40.90	-	41.09	-	56.00	46.00	-14.91	-
5	2.279	0.30	35.11	-	35.41	-	56.00	46.00	-20.59	-
6	18.242	1.69	39.87	-	41.56	-	60.00	50.00	-18.44	-

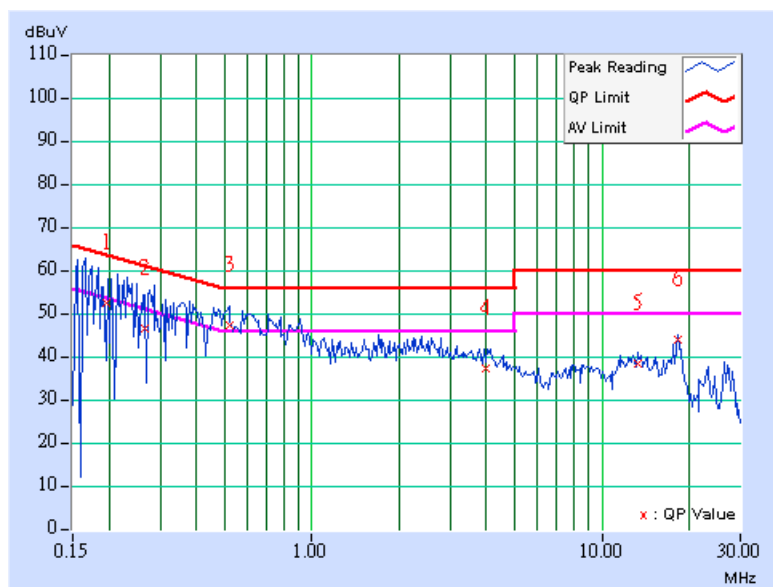
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 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 77%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	0.196	0.15	50.62	-	50.77	-	63.76	53.76	-12.99	-
2	0.265	0.16	44.80	-	44.96	-	61.29	51.29	-16.32	-
3	0.522	0.21	45.54	-	45.75	-	56.00	46.00	-10.25	-
4	3.970	0.39	35.58	-	35.97	-	56.00	46.00	-20.03	-
5	13.359	1.49	36.60	-	38.09	-	60.00	50.00	-21.91	-
6	18.304	1.79	42.34	-	44.13	-	60.00	50.00	-15.87	-

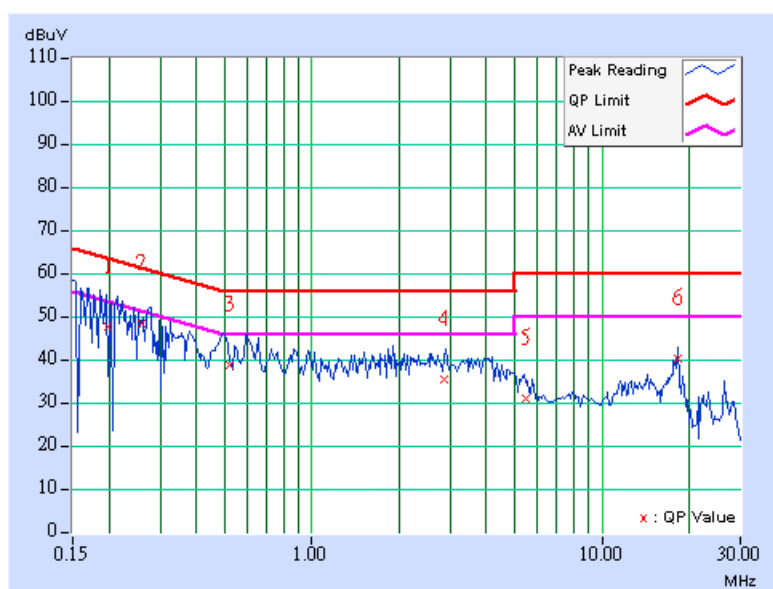
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 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 77%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	0.198	0.15	46.19	-	46.34	-	63.71	53.71	-17.38	-
2	0.258	0.16	46.91	-	47.07	-	61.51	51.51	-14.44	-
3	0.521	0.19	37.08	-	37.27	-	56.00	46.00	-18.73	-
4	2.863	0.33	33.88	-	34.21	-	56.00	46.00	-21.79	-
5	5.432	0.57	29.46	-	30.03	-	60.00	50.00	-29.97	-
6	18.243	1.69	38.67	-	40.36	-	60.00	50.00	-19.64	-

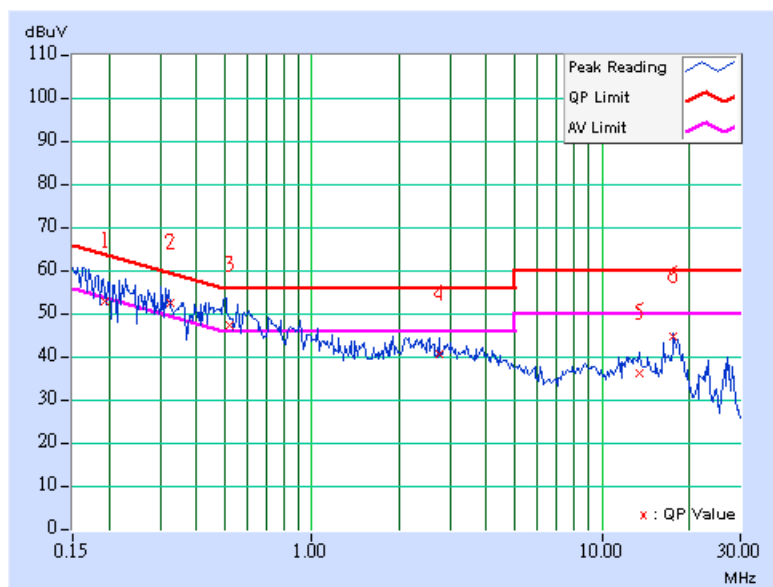
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 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 77%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	0.194	0.15	51.34	-	51.49	-	63.86	53.86	-12.37	-
2	0.325	0.17	50.86	41.23	51.03	41.40	59.59	49.59	-8.55	-8.18
3	0.521	0.21	45.58	-	45.79	-	56.00	46.00	-10.21	-
4	2.736	0.33	38.91	-	39.24	-	56.00	46.00	-16.76	-
5	13.412	1.49	34.60	-	36.09	-	60.00	50.00	-23.91	-
6	17.693	1.77	43.23	-	45.00	-	60.00	50.00	-15.00	-

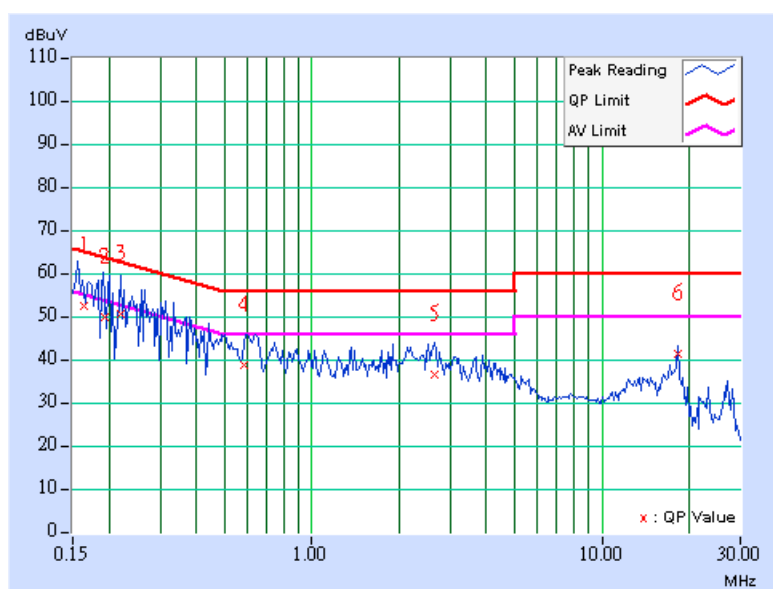
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 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 77%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	0.165	0.13	50.76	-	50.89	-	65.21	55.21	-14.32	-
2	0.192	0.15	48.30	-	48.45	-	63.93	53.93	-15.48	-
3	0.219	0.15	49.11	-	49.26	-	62.85	52.85	-13.59	-
4	0.582	0.19	37.06	-	37.25	-	56.00	46.00	-18.75	-
5	2.664	0.32	34.97	-	35.29	-	56.00	46.00	-20.71	-
6	18.243	1.69	39.79	-	41.48	-	60.00	50.00	-18.52	-

- 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

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400 / F(kHz)	300
0.490 ~ 1.705	24000 / F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Preamplifier	8449B	3008A01292	Aug. 06, 2007
HP Preamplifier	8449B	3008A01638	Sep. 17, 2007
SCHAFFNER TEST RECEIVER	SCR 3501	408	Dec. 28, 2006
CHASE BILOG Antenna	CBL6111D	21872	Aug. 01, 2007
EMCO Horn Antenna	3115	6714	Oct. 24, 2007
EMCO Horn Antenna	3115	9312-4192	Mar. 14, 2007
ADT. Turn Table	TT100	0505	NA
ADT. Tower	AT100	0505	NA
Software	ADT_Radiated_V7.5.14	NA	NA
ADT RF Switches BOX	EM-H-01-1	1002	Aug. 23, 2007
TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 23, 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 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 ADT Open Site No. 5.
4. The VCCI Site Registration No. R-1039.

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters open test area. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to 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 or average method as specified and then reported in a data sheet.

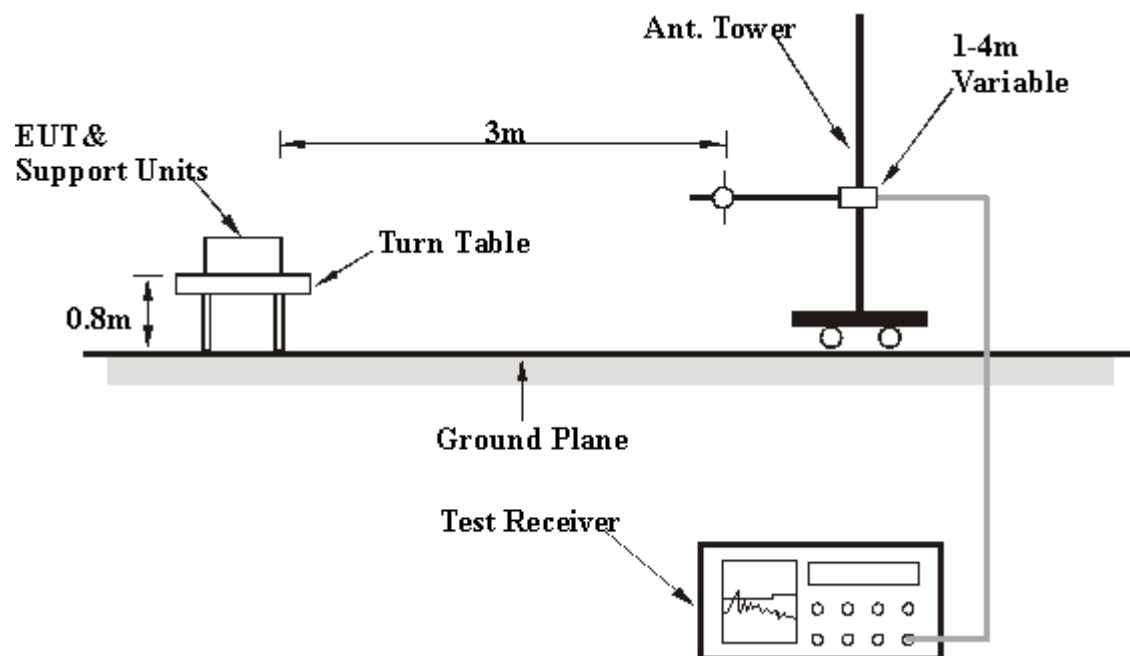
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	A
TESTED BY	Rober Tsai		

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	133.57	27.21 QP	43.50	-16.29	1.69 H	151	14.63	12.58
2	250.90	33.81 QP	46.00	-12.19	2.55 H	277	19.98	13.83
3	500.36	37.09 QP	46.00	-8.91	1.78 H	79	16.18	20.91
4	618.50	36.57 QP	46.00	-9.43	2.55 H	328	13.32	23.25
5	625.47	34.04 QP	46.00	-11.96	1.53 H	181	10.66	23.38
6	663.94	37.16 QP	46.00	-8.84	2.41 H	12	13.14	24.02
7	750.36	32.42 QP	46.00	-13.58	1.52 H	66	5.99	26.43
8	780.09	34.56 QP	46.00	-11.44	2.20 H	186	8.26	26.30
9	800.21	35.11 QP	46.00	-10.89	1.58 H	70	8.88	26.23
10	847.50	35.50 QP	46.00	-10.50	1.00 H	127	7.78	27.72
11	933.72	34.98 QP	46.00	-11.02	2.02 H	152	5.94	29.04

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	A
TESTED BY	Rober Tsai		

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	53.37	38.54 QP	40.00	-1.46	1.17 V	22	30.91	7.63
2	125.22	35.29 QP	43.50	-8.21	1.00 V	154	22.85	12.44
3	250.86	35.91 QP	46.00	-10.09	1.87 V	341	22.09	13.82
4	501.30	34.02 QP	46.00	-11.98	2.89 V	82	13.07	20.95
5	536.51	35.61 QP	46.00	-10.39	1.93 V	307	12.94	22.67
6	616.82	34.25 QP	46.00	-11.75	1.00 V	81	11.03	23.22
7	625.74	35.89 QP	46.00	-10.11	1.23 V	16	12.50	23.39
8	781.00	36.14 QP	46.00	-9.86	1.62 V	239	9.84	26.30
9	800.50	36.78 QP	46.00	-9.22	1.56 V	167	10.54	26.24
10	847.89	35.31 QP	46.00	-10.69	2.64 V	187	7.58	27.73
11	900.86	35.14 QP	46.00	-10.86	2.25 V	40	7.10	28.04
12	933.27	37.62 QP	46.00	-8.38	2.71 V	54	8.59	29.03

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	B
TESTED BY	Rober Tsai		

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	134.01	28.73 QP	43.50	-14.77	1.25 H	265	16.15	12.58
2	165.94	27.96 QP	43.50	-15.54	1.62 H	273	16.79	11.17
3	250.28	36.01 QP	46.00	-9.99	1.70 H	291	22.25	13.76
4	500.00	36.23 QP	46.00	-9.77	1.59 H	32	15.34	20.89
5	616.34	38.16 QP	46.00	-7.84	2.54 H	185	14.95	23.21
6	625.32	36.25 QP	46.00	-9.75	2.11 H	108	12.87	23.38
7	687.82	34.92 QP	46.00	-11.08	1.00 H	295	10.59	24.33
8	750.54	32.68 QP	46.00	-13.32	1.20 H	104	6.25	26.43
9	780.17	35.09 QP	46.00	-10.91	2.21 H	180	8.79	26.30
10	800.31	32.35 QP	46.00	-13.65	1.73 H	203	6.12	26.23
11	850.14	35.23 QP	46.00	-10.77	2.24 H	32	7.43	27.80
12	933.27	35.25 QP	46.00	-10.75	2.05 H	69	6.22	29.03

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	B
TESTED BY	Rober Tsai		

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	54.10	38.70 QP	40.00	-1.30	1.24 V	52	31.26	7.44
2	133.04	30.39 QP	43.50	-13.11	2.00 V	269	17.82	12.57
3	166.57	30.01 QP	43.50	-13.49	1.55 V	314	18.90	11.11
4	250.09	36.02 QP	46.00	-9.98	1.52 V	87	22.28	13.74
5	500.28	35.42 QP	46.00	-10.58	2.06 V	237	14.52	20.90
6	616.85	34.85 QP	46.00	-11.15	2.40 V	307	11.63	23.22
7	625.16	37.38 QP	46.00	-8.62	1.00 V	168	14.00	23.38
8	687.23	36.00 QP	46.00	-10.00	2.60 V	71	11.68	24.32
9	750.36	34.93 QP	46.00	-11.07	2.21 V	66	8.50	26.43
10	780.78	36.51 QP	46.00	-9.49	1.47 V	104	10.21	26.30
11	800.05	35.82 QP	46.00	-10.18	2.52 V	13	9.60	26.22
12	850.19	35.73 QP	46.00	-10.27	2.10 V	286	7.93	27.80
13	933.96	36.75 QP	46.00	-9.25	1.40 V	274	7.70	29.05

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	132.97	28.38 QP	43.50	-15.12	1.33 H	117	15.81	12.57
2	166.26	27.82 QP	43.50	-15.68	1.42 H	158	16.68	11.14
3	250.57	35.16 QP	46.00	-10.84	1.72 H	3	21.37	13.79
4	500.17	35.13 QP	46.00	-10.87	1.51 H	331	14.23	20.90
5	616.95	31.80 QP	46.00	-14.20	1.55 H	187	8.57	23.23
6	625.10	31.36 QP	46.00	-14.64	2.21 H	228	7.98	23.38
7	750.27	31.95 QP	46.00	-14.05	2.64 H	135	5.52	26.43
8	782.69	34.17 QP	46.00	-11.83	1.97 H	166	7.88	26.29
9	800.08	34.25 QP	46.00	-11.75	2.15 H	195	8.03	26.22
10	841.20	32.92 QP	46.00	-13.08	1.97 H	93	5.40	27.52
11	855.74	34.42 QP	46.00	-11.58	2.21 H	67	6.60	27.82
12	933.36	34.52 QP	46.00	-11.48	1.07 H	25	5.49	29.03

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	C
TESTED BY	Rober Tsai		

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	54.25	38.54 QP	40.00	-1.46	1.02 V	114	31.14	7.40
2	134.12	30.49 QP	43.50	-13.01	2.48 V	137	17.90	12.59
3	166.44	28.54 QP	43.50	-14.96	1.29 V	245	17.42	11.12
4	250.19	36.17 QP	46.00	-9.83	1.87 V	225	22.42	13.75
5	500.11	35.51 QP	46.00	-10.49	1.45 V	221	14.61	20.90
6	625.28	33.10 QP	46.00	-12.90	2.07 V	180	9.72	23.38
7	750.58	34.24 QP	46.00	-11.76	1.91 V	244	7.81	26.43
8	782.53	33.97 QP	46.00	-12.03	2.56 V	337	7.68	26.29
9	800.74	35.25 QP	46.00	-10.75	2.01 V	225	9.01	26.24
10	855.21	34.42 QP	46.00	-11.58	1.30 V	92	6.60	27.82
11	933.28	36.03 QP	46.00	-9.97	1.57 V	181	7.00	29.03

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	D
TESTED BY	Rober Tsai		

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	133.08	28.46 QP	43.50	-15.04	1.48 H	186	15.89	12.57
2	166.28	27.66 QP	43.50	-15.84	1.41 H	84	16.52	11.14
3	200.15	28.67 QP	43.50	-14.83	1.00 H	54	19.39	9.28
4	250.78	34.90 QP	46.00	-11.10	1.99 H	317	21.08	13.82
5	500.06	36.91 QP	46.00	-9.09	1.25 H	191	16.02	20.89
6	616.75	36.85 QP	46.00	-9.15	1.80 H	226	13.63	23.22
7	625.63	33.43 QP	46.00	-12.57	2.21 H	271	10.04	23.39
8	750.18	32.63 QP	46.00	-13.37	2.47 H	296	6.20	26.43
9	782.14	34.08 QP	46.00	-11.92	2.66 H	123	7.78	26.30
10	800.28	32.01 QP	46.00	-13.99	2.20 H	69	5.78	26.23
11	840.33	34.37 QP	46.00	-11.63	1.99 H	264	6.88	27.49
12	856.45	33.49 QP	46.00	-12.51	1.67 H	314	5.66	27.83
13	933.01	34.25 QP	46.00	-11.75	1.15 H	324	5.23	29.02

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa	TEST MODE	D
TESTED BY	Rober Tsai		

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	53.45	37.77 QP	40.00	-2.23	1.22 V	188	30.16	7.61
2	133.58	30.10 QP	43.50	-13.40	1.14 V	260	17.52	12.58
3	165.63	29.44 QP	43.50	-14.06	1.11 V	156	18.24	11.20
4	250.22	36.70 QP	46.00	-9.30	1.53 V	338	22.95	13.75
5	500.41	34.39 QP	46.00	-11.61	2.46 V	328	13.48	20.91
6	618.02	35.56 QP	46.00	-10.44	2.05 V	211	12.31	23.25
7	625.28	36.02 QP	46.00	-9.98	1.74 V	247	12.64	23.38
8	750.39	34.80 QP	46.00	-11.20	1.52 V	291	8.37	26.43
9	783.01	34.72 QP	46.00	-11.28	1.00 V	201	8.43	26.29
10	800.03	32.54 QP	46.00	-13.46	2.37 V	225	6.32	26.22
11	840.01	36.58 QP	46.00	-9.42	1.00 V	136	9.10	27.48
12	850.25	35.10 QP	46.00	-10.90	2.85 V	308	7.30	27.80
13	933.36	36.07 QP	46.00	-9.93	1.54 V	315	7.04	29.03

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.

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.