Supplemental “Dual Xmit” Test Report

REPORT NO.:	RF970909H06-01
MODEL NO.:	SPA525G
RECEIVED:	Sep. 09, 2008
TESTED:	Oct. 07 to 14, 2008
ISSUED:	Oct. 17, 2008

APPLICANT:	Cisco Systems Inc
ADDRESS:	170 W Tasman Dr, San Jose, CA95134, USA

ISSUED BY:	Advance Data Technology Corporation
LAB LOCATION:	No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien, Taiwan, R.O.C.

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1. CERTIFICATION

PRODUCT :	5-Line IP Phone
BRAND NAME :	cisco
MODEL NO. :	SPA525G
TESTED :	Oct. 07 to 14, 2008
APPLICANT :	Cisco Systems Inc
TEST SAMPLE :	R&D SAMPLE
STANDARDS :	47 CFR FCC Part 15, Subpart C
	ANSI C63.4-2003

PREPARED BY : Sunny Wen , **DATE:** *Oct. 17, 2008*
(Sunny Wen, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** *Oct. 17, 2008*
Responsible for RF
(Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** *Oct. 17, 2008*
(May Chen, Deputy Manager)

Note:

Per a request of the FCC, the 5-Line IP Phone was tested for conducted and radiated emissions in restricted bands while transmitting on both 2.4 GHz and bluetooth at simultaneously.

2. DUAL XMIT, CONDUCTED EMISSION MEASUREMENT

2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 11, 2008	Mar. 10, 2009
Line-Impedance Stabilization Network (for EUT)	KNW-407	8-1395-12	May 07, 2008	May 06, 2009
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 13, 2008	June 12, 2009
RF Cable (JYEBAO)	5DFB	COACAB-001	July 24, 2008	July 23, 2009
50 ohms Terminator	50	3	Nov. 16, 2007	Nov. 15, 2008
Software	ADT_Cond_V7.3.2	NA	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

2.3 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.

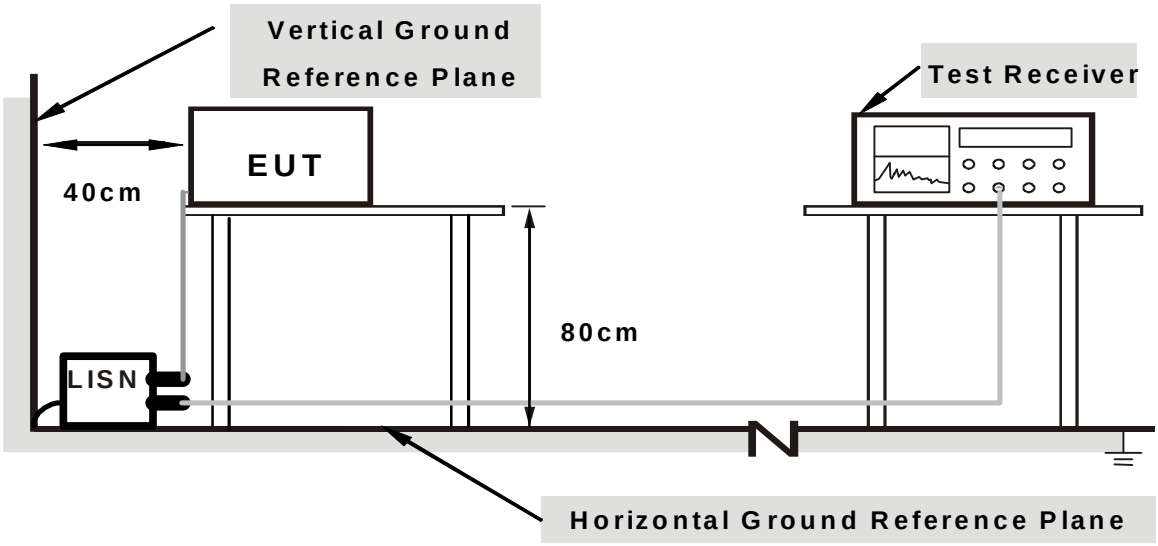
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

2.4 DEVIATION FROM TEST STANDARD

No deviation

2.5 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 related item – Photographs of the Test Configuration.

2.5 EUT OPERATING CONDITIONS

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

Note:

☒ 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.

Power Line Conducted Emission Test:

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
WLAN + Bluetooth	1 to 11	11	OFDM	BPSK	6
	0 to 78	78	FHSS	GPSK	-

Radiated Emission Test:

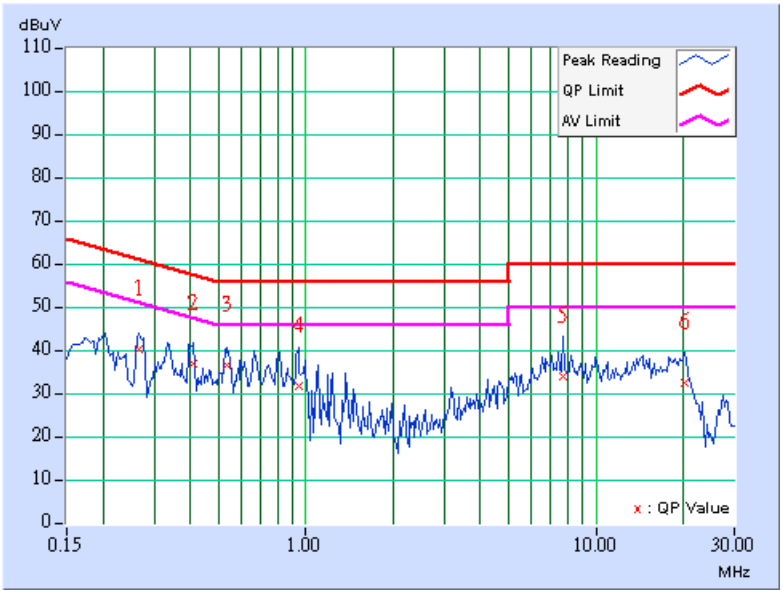
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
WLAN + Bluetooth	1 to 11	11	OFDM	BPSK	6
	0 to 78	0	FHSS	GPSK	-

2.7 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 959hPa	**PHASE**	Line (L)
TESTED BY	Rex Huang		

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	0.267	0.47	39.65	-	40.12	-	61.20	51.20	-21.09	-
2	0.412	0.40	36.17	-	36.57	-	57.61	47.61	-21.04	-
3	**0.533**	**0.42**	**36.02**	**-**	**36.44**	**-**	**56.00**	**46.00**	**-19.56**	**-**
4	0.943	0.46	31.24	-	31.70	-	56.00	46.00	-24.30	-
5	7.695	0.57	33.18	-	33.75	-	60.00	50.00	-26.25	-
6	20.223	0.76	31.93	-	32.69	-	60.00	50.00	-27.31	-

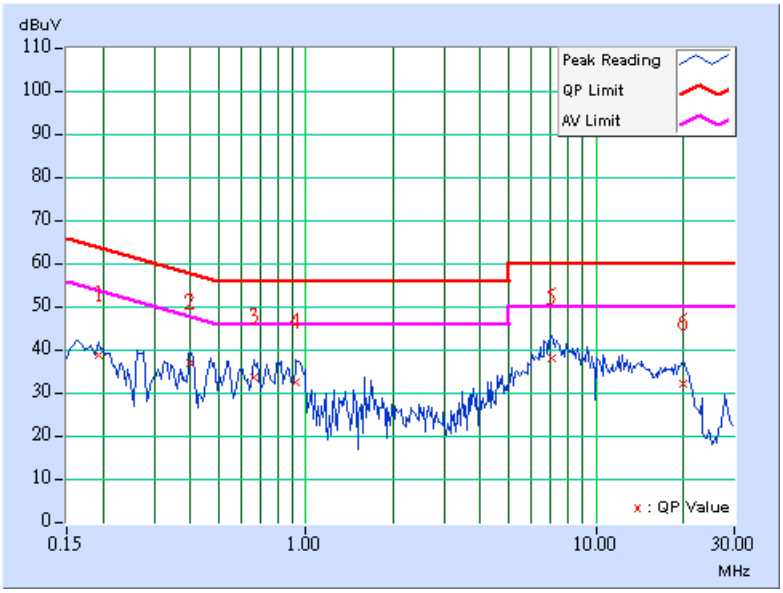
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 959hPa	**PHASE**	Neutral (N)
TESTED BY	Rex Huang		

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	0.193	0.27	38.31	-	38.58	-	63.91	53.91	-25.33	-
2	0.400	0.17	36.35	-	36.52	-	57.85	47.85	-21.33	-
3	0.662	0.20	33.03	-	33.23	-	56.00	46.00	-22.77	-
4	0.927	0.22	31.98	-	32.20	-	56.00	46.00	-23.80	-
5	7.043	0.35	37.52	-	37.87	-	60.00	50.00	-22.13	-
6	20.023	0.59	31.54	-	32.13	-	60.00	50.00	-27.87	-

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.



3. DUAL XMIT, RADIATED EMISSION MEASUREMENT

3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, 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.

3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 22, 2008	July 21, 2009
HP Pre_Amplifier	8449B	3008A01922	Sep. 25, 2008	Sep. 24, 2009
ROHDE & SCHWARZ Test Receiver	ESCS 30	841977/002	Nov. 13, 2007	Nov. 12, 2008
SCHAFFNER(CHASE) Broadband Antenna	CBL6112B	2798	April 30, 2008	April 29, 2009
Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 30, 2008	Sep. 29, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 28, 2008	Jan. 27, 2009
RF Switches	MP59B	6100175593	Aug. 11, 2008	Aug. 10, 2009
RF Cable	8DFB	STBCAB-30M-1GHz	Sep. 02, 2008	Sep. 01, 2009
Software	ADT_Radiated_V7.6.15.8	NA	NA	NA
CHANCE MOST Antenna Tower	AT-100	CM-A007	NA	NA
CHANCE MOST Turn Table	TC-008	CM-T007	NA	NA
CORCOM AC Filter	MRI2030	024/019	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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. B.
4. The VCCI Site Registration No. is R-847.
5. The FCC Site Registration No. is 92753.
6. The CANADA Site Registration No. is IC 3789C-2.

3.3 TEST PROCEDURES

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 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 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

g. The emissions up to 40 GHz were examined. Those emission falling within a restricted band were evaluated against the “restricted band emission limit” (54 dBμV / 74 dBμV).

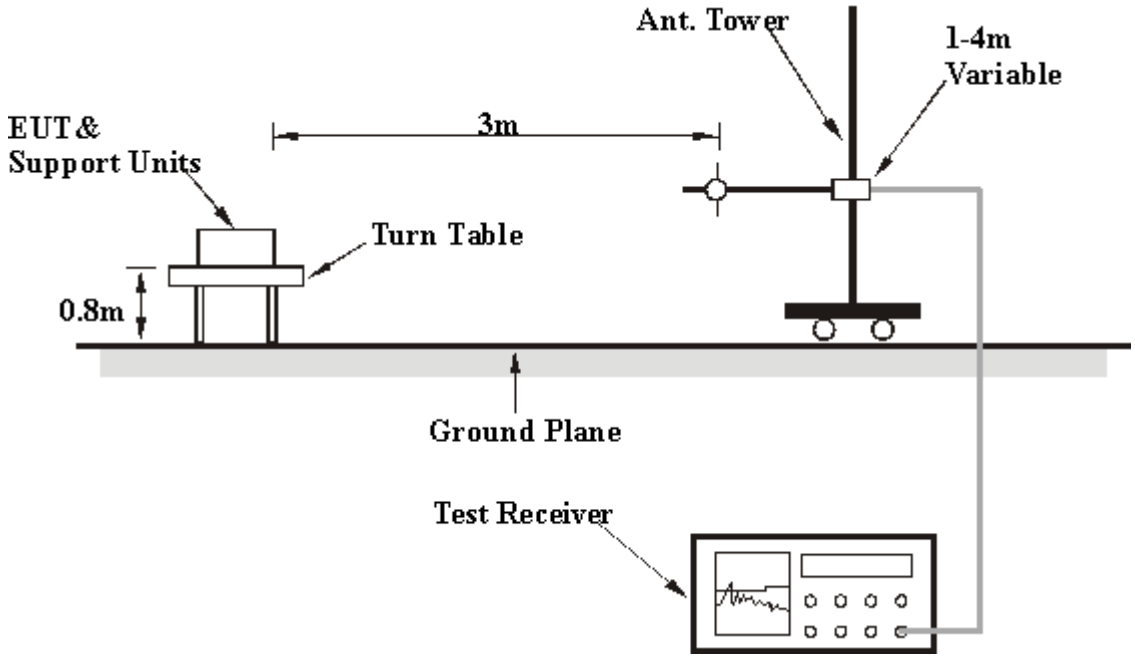
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

3.4 DEVIATION FROM TEST STANDARD

No deviation

3.5 TEST SETUP



3.6 EUT OPERATING CONDITIONS

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

3.7 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60Hz	**FREQUENCY RANGE**	30MHz~1000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 74%RH, 959 hPa	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
TESTED BY	Phoenix Huang		

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	71.12	32.29 QP	40.00	-7.71	2.94 H	144	18.78	13.51
2	111.58	27.75 QP	43.50	-15.75	1.63 H	263	14.68	13.07
3	200.00	28.35 QP	43.50	-15.15	1.37 H	257	14.56	13.79
4	250.00	41.30 QP	46.00	-4.70	1.00 H	245	24.97	16.33
5	300.00	34.12 QP	46.00	-11.88	1.00 H	307	16.27	17.85
6	375.00	38.61 QP	46.00	-7.39	1.07 H	20	17.56	21.05
7	500.00	38.31 QP	46.00	-7.69	1.58 H	21	14.29	24.02
8	725.00	36.33 QP	46.00	-9.67	1.14 H	254	7.15	29.18
9	800.00	36.50 QP	46.00	-9.50	1.00 H	51	5.07	31.43
10	825.00	35.01 QP	46.00	-10.99	1.00 H	325	3.35	31.66
11	875.00	34.56 QP	46.00	-11.44	1.00 H	265	2.39	32.17

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	**67.45**	**36.22 QP**	**40.00**	**-3.78**	**1.00 V**	**294**	**22.23**	**13.99**
2	120.00	35.74 QP	43.50	-7.76	1.00 V	314	21.26	14.48
3	125.00	31.46 QP	43.50	-12.04	1.00 V	62	16.68	14.78
4	137.51	35.15 QP	43.50	-8.35	1.00 V	264	19.61	15.54
5	200.00	32.33 QP	43.50	-11.17	1.00 V	187	18.54	13.79
6	250.00	34.29 QP	46.00	-11.71	1.00 V	140	17.96	16.33
7	375.00	36.99 QP	46.00	-9.01	1.00 V	20	15.94	21.05
8	500.00	33.47 QP	46.00	-12.53	1.00 V	122	9.45	24.02
9	700.00	31.09 QP	46.00	-14.91	1.37 V	305	2.65	28.44
10	825.00	35.42 QP	46.00	-10.58	1.23 V	5	3.76	31.66
11	875.00	37.08 QP	46.00	-8.92	1.00 V	71	4.91	32.17
12	975.00	41.12 QP	54.00	-12.88	1.00 V	126	7.45	33.67

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)

2. rrection 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)	120Vac, 60Hz	**FREQUENCY RANGE**	1000MHz~25000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 74%RH, 959 hPa	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
TESTED BY	Phoenix Huang		

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	1534.89	49.24 PK	74.00	-24.76	1.03 H	303	21.15	28.09
2	1534.89	46.22 AV	54.00	-7.78	1.03 H	303	18.13	28.09
3	4804.00	48.80 PK	74.00	-25.20	1.24 H	81	13.37	35.43
4	4804.00	18.80 AV	54.00	-35.20	1.24 H	81	-16.63	35.43
5	4924.00	50.73 PK	74.00	-23.27	1.17 H	157	15.10	35.63
6	4924.00	45.81 AV	54.00	-8.19	1.17 H	157	10.18	35.63
7	7206.00	50.67 PK	74.00	-23.33	1.56 H	83	8.89	41.78
8	7206.00	20.67 AV	54.00	-33.33	1.56 H	83	-21.11	41.78
9	7386.00	50.50 PK	74.00	-23.50	1.23 H	319	8.27	42.23
10	7386.00	38.10 AV	54.00	-15.90	1.23 H	319	-4.13	42.23

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	1534.85	46.71 PK	74.00	-27.29	1.02 V	20	18.62	28.09
2	1534.85	42.90 AV	54.00	-11.10	1.02 V	20	14.81	28.09
3	4804.00	48.82 PK	74.00	-25.18	1.25 V	18	13.39	35.43
4	4804.00	18.82 AV	54.00	-35.18	1.25 V	18	-16.61	35.43
5	4924.00	50.45 PK	74.00	-23.55	1.09 V	338	14.82	35.63
6	4924.00	45.32 AV	54.00	-8.68	1.09 V	338	9.69	35.63
7	7206.00	50.73 PK	74.00	-23.27	1.15 V	18	8.95	41.78
8	7206.00	20.73 AV	54.00	-33.27	1.15 V	18	-21.05	41.78
9	7386.00	51.85 PK	74.00	-22.15	1.41 V	26	9.62	42.23
10	7386.00	48.25 AV	54.00	-5.75	1.41 V	26	6.02	42.23

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)

2. rrection 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. 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
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	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:
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Fax: 886-2-26052943

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

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