



A D T

Supplemental “Transmit Simultaneously” Test Report

REPORT NO.: RF970909H06B-1
MODEL NO.: SPA525G, SPA525G2
RECEIVED: Apr. 06, 2010
TESTED: Apr. 22 to 23, 2010
ISSUED: Apr. 26, 2010

APPLICANT: Cisco Systems Inc

ADDRESS: 170 W Tasman Dr, San Jose, CA95134, USA

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

LAB LOCATION (1): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

LAB LOCATION (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

This test report consists of 15 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by any government agencies. The test results in the report only apply to the tested sample.



A D T

Table of Contents

1.	CERTIFICATION	3
2.	DUAL XMIT, CONDUCTED EMISSION MEASUREMENT	4
2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	4
2.2	TEST INSTRUMENTS	4
2.3	TEST PROCEDURES	5
2.4	DEVIATION FROM TEST STANDARD	5
2.5	TEST SETUP	5
2.5	EUT OPERATING CONDITIONS	6
2.6	TEST RESULTS	7
3.	DUAL XMIT, RADIATED EMISSION MEASUREMENT	9
3.1	LIMITS OF RADIATED EMISSION MEASUREMENT	9
3.2	TEST INSTRUMENTS	10
3.3	TEST PROCEDURES	11
3.4	DEVIATION FROM TEST STANDARD	11
3.5	TEST SETUP	12
3.6	EUT OPERATING CONDITIONS	12
3.7	TEST RESULTS	13
4.	INFORMATION ON THE TESTING LABORATORIES	15



A D T

1. CERTIFICATION

PRODUCT : 5-Line IP Phone
BRAND NAME : Cisco
MODEL NO. : SPA525G, SPA525G2
TESTED: Apr. 22 to 23, 2010
APPLICANT : Cisco Systems Inc
TEST SAMPLE : ENGINEERING SAMPLE
STANDARDS : FCC Part 15, Subpart C & E
 ANSI C63.4-2003

PREPARED BY : Sunny Wen , **DATE:** Apr. 26, 2010
 (Sunny Wen, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Apr. 26, 2010
 (Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Apr. 26, 2010
 (May Chen, Deputy Manager)

Note:

1. Per a request of the FCC, the access point radio was tested for radiated emissions in restricted bands while transmitting on both Bluetooth technology and WLAN technology at simultaneously.
2. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF970909H06-1 design is as the following information:
 - u Add one model name (Model: SPA525G2) and modify the chip filter of the Wi-Fi for the additional model name (Model: SPA525G2):

Brand	Model No.	Difference
Cisco	SPA525G	◆ The original model name.
	SPA525G2	◆ Additional model name. ◆ Modify the chip filter of the Wi-Fi



2. DUAL XMIT, CONDUCTED EMISSION MEASUREMENT

2.1 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.

2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2010	Mar. 08, 2011
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 23, 2009	Sep. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Oct. 26, 2009	Oct. 25, 2010
RF Cable (JYEBAO)	5DFB	COBCAB-001	Nov. 24, 2009	Nov. 23, 2010
50 ohms Terminator	50	3	Oct. 28, 2009	Oct. 27, 2010
Software	BV ADT_Cond_V7.3.7	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 Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.

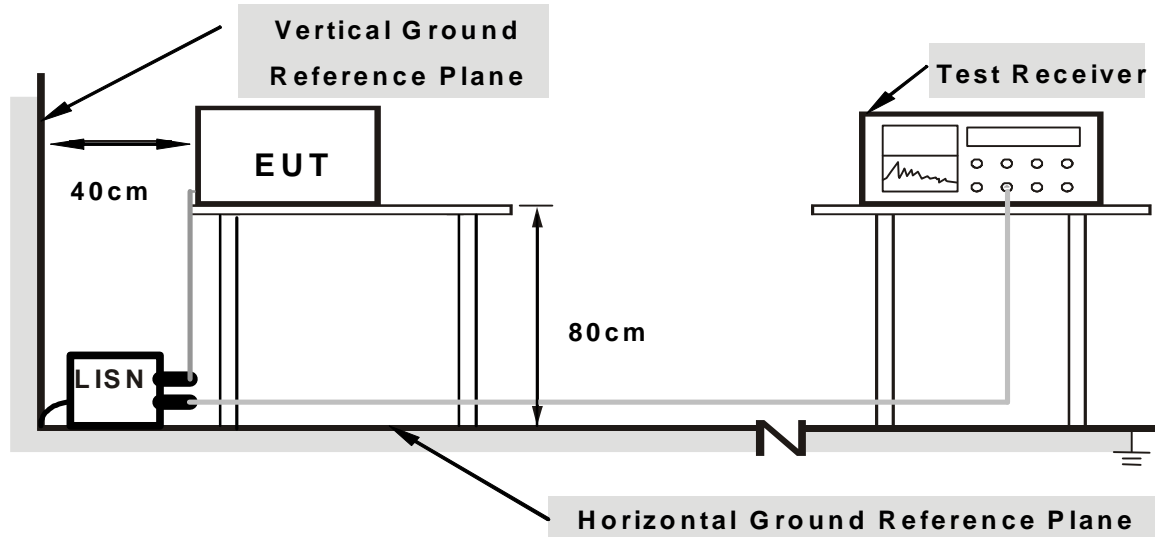
2.3 TEST PROCEDURES

- 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

- a. Placed the EUT on testing table.
- b. Prepared other computer systems (support units 1~2) to act as communication partners and placed them outside of testing area.
- c. The communication partners run test program “Marvell” to enable EUT under transmission/receiving 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.

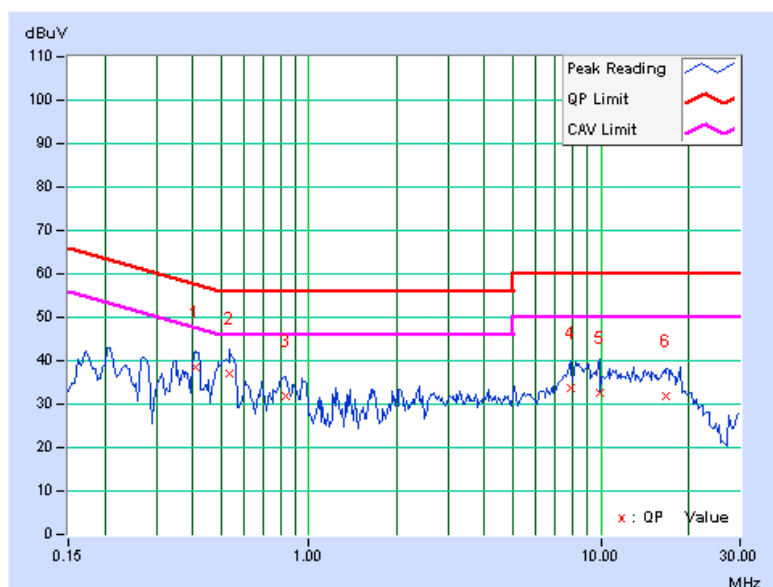
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
WLAN 802.11g + Bluetooth	1 to 11	11	OFDM	BPSK	6
	0 to 78	0	FHSS	GFSK	1

2.6 TEST RESULTS

TEST MODE	Dual transmission 11g, 2462MHz GFSK, 2402MHz	6dB BANDWIDTH	9 kHz
INPUT POWER	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	26deg. C, 63%RH, 1011hPa	TESTED BY	Timmy Hu

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	0.408	0.06	38.51	-	38.57	-	57.69
2	0.537	0.07	37.11	-	37.18	-	56.00	46.00	-18.82	-
3	0.834	0.08	31.87	-	31.95	-	56.00	46.00	-24.05	-
4	7.859	0.29	33.48	-	33.77	-	60.00	50.00	-26.23	-
5	9.922	0.35	32.11	-	32.46	-	60.00	50.00	-27.54	-
6	16.785	0.46	31.53	-	31.99	-	60.00	50.00	-28.01	-

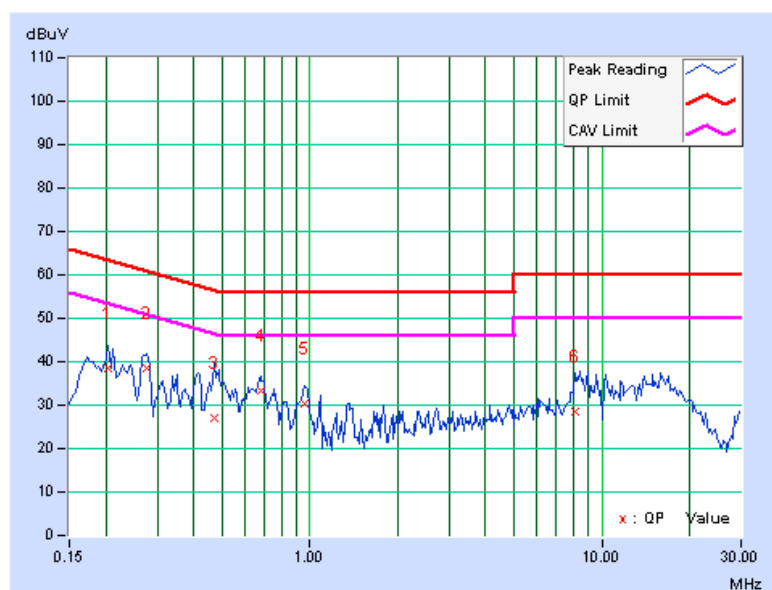
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



TEST MODE	Dual transmission 11g, 2462MHz GFSK, 2402MHz	6dB BANDWIDTH	9 kHz
INPUT POWER	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	26deg. C, 63%RH, 1011hPa	TESTED BY	Timmy Hu

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	0.205	0.06	38.47	-	38.53	-	63.42
2	0.275	0.06	38.36	-	38.42	-	60.97	50.97	-22.54	-
3	0.470	0.07	26.83	-	26.90	-	56.51	46.51	-29.60	-
4	0.677	0.08	33.22	-	33.30	-	56.00	46.00	-22.70	-
5	0.955	0.10	30.20	-	30.30	-	56.00	46.00	-25.70	-
6	8.129	0.31	28.34	-	28.65	-	60.00	50.00	-31.35	-

- 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.



A D T

3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010
Agilent PSA Spectrum Analyzer	E4446A	MY46180622	Apr. 24 , 2009	Apr. 23 , 2010
HP Pre_Amplifier	8449B	300801923	Nov. 02, 2009	Nov. 01, 2010
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Aug. 28, 2009	Aug. 27, 2010
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 29, 2009	Apr. 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 18, 2009	Dec. 17, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2010	Jan. 21, 2011
R&S Loop Antenna	HFH2-Z2	100070	Feb. 03, 2010	Feb. 02, 2012
RF Switches	EMH-011	1001	NA	NA
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 14, 2009	Aug. 13, 2010
RF Cable	8DFB	STCCAB-30M-1GHz	NA	NA
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

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 dB μ V / 74 dB μ V).

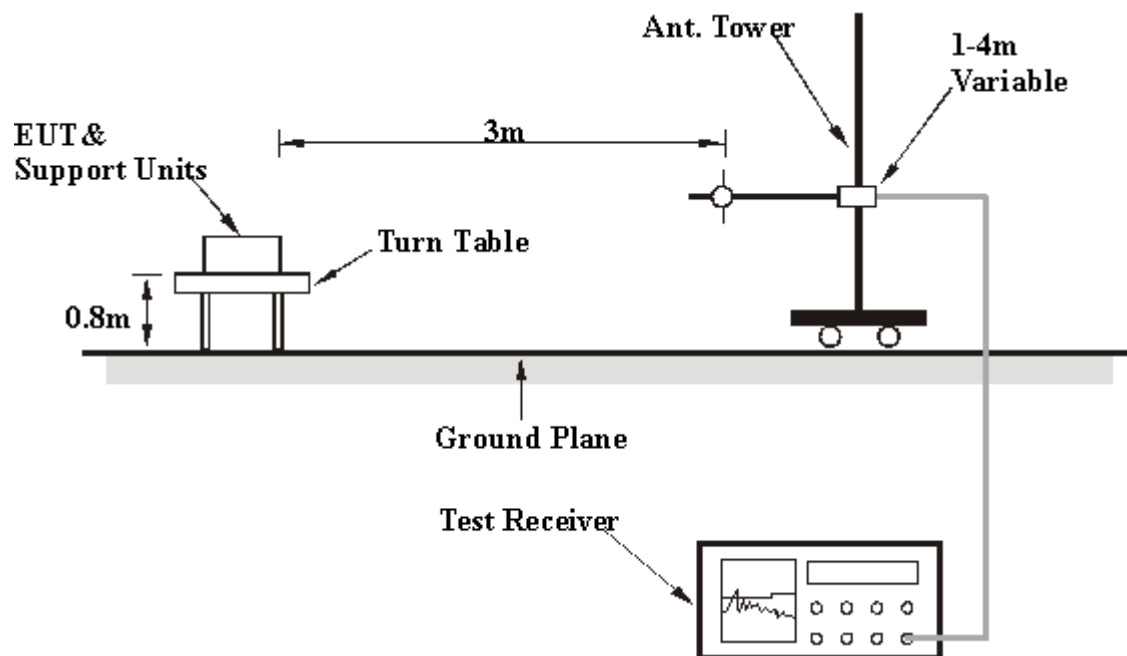
NOTE:

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

Same as the 2.5

Note:

The EUT was tested for out of band radiated emissions with the unit transmitting on WLAN 802.11g, 2462 MHz and Bluetooth GFSK 2402 MHz. These frequencies and power levels were chosen because these frequencies produced the worst case radiated emissions during the radiated emissions in restricted bands test performed previously. The unit was set to transmit at the same power level as was used in the initial radiated emissions tests and was transmitting at the same data rate. (Please refer to RF970909H06B test report)

The harmonic of the fundamental signals were recorded in this report.

There are two antennas provided to this EUT:

For WLAN : PIFA antenna with cable (Antenna Gain : 2.7dBi)

For Bluetooth : PIFA antenna with cable (Antenna Gain : 3.5dBi)



A D T

3.7 TEST RESULTS

TEST MODE	Dual transmission 11g, 2462MHz GFSK, 2402MHz	FREQUENCY RANGE	30MHz~1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH, 1011 hPa	TESTED BY	Wen Yu

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	32.63	34.14 QP	40.00	-5.86	1.52 H	280	21.08	13.06
2	122.87	24.89 QP	43.50	-18.61	1.43 H	150	12.29	12.60
3	270.28	23.87 QP	46.00	-22.13	1.00 H	7	9.28	14.59
4	480.00	32.07 QP	46.00	-13.93	1.84 H	83	11.33	20.74
5	663.20	33.70 QP	46.00	-12.30	1.26 H	150	9.27	24.43
6	840.10	36.90 QP	46.00	-9.10	1.00 H	291	9.63	27.27
7	960.10	36.05 QP	54.00	-17.95	1.02 H	165	7.24	28.81

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	44.10	25.63 QP	40.00	-14.37	1.12 V	167	11.10	14.53
2	375.10	25.90 QP	46.00	-20.10	1.00 V	193	8.05	17.85
3	480.10	33.73 QP	46.00	-12.27	1.00 V	108	12.99	20.74
4	575.00	28.36 QP	46.00	-17.64	1.00 V	90	5.43	22.93
5	719.90	32.86 QP	46.00	-13.14	1.20 V	83	7.53	25.33
6	800.01	36.58 QP	46.00	-9.42	1.00 V	126	10.02	26.56
7	960.01	30.76 QP	54.00	-23.24	1.00 V	32	1.95	28.81

- 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.



A D T

TEST MODE	Dual transmission 11g, 2462MHz GFSK, 2402MHz	FREQUENCY RANGE	1000MHz~17550MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH, 1011 hPa	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	4924.00	45.62 PK	74.00	-28.38	1.22 H	289	9.99	35.63
2	4924.00	32.54 AV	54.00	-21.46	1.22 H	289	-3.09	35.63
3	4960.00	48.48 PK	74.00	-25.52	1.30 H	36	12.79	35.69
4	4960.00	18.48 AV	54.00	-35.52	1.30 H	36	-17.21	35.69
5	7386.00	52.87 PK	74.00	-21.13	1.22 H	240	10.64	42.23
6	7386.00	40.27 AV	54.00	-13.73	1.22 H	240	-1.96	42.23
7	7440.00	51.86 PK	74.00	-22.14	1.21 H	205	9.49	42.37
8	7440.00	21.86 AV	54.00	-32.14	1.21 H	205	-20.51	42.37

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	4924.00	43.99 PK	74.00	-30.01	1.10 V	325	8.36	35.63
2	4924.00	32.24 AV	54.00	-21.76	1.10 V	325	-3.39	35.63
3	4960.00	48.70 PK	74.00	-25.30	1.10 V	332	13.01	35.69
4	4960.00	18.70 AV	54.00	-35.30	1.10 V	332	-16.99	35.69
5	7386.00	50.24 PK	74.00	-23.76	1.25 V	37	8.01	42.23
6	7386.00	38.64 AV	54.00	-15.36	1.25 V	37	-3.59	42.23
7	7440.00	51.10 PK	74.00	-22.90	1.11 V	257	8.73	42.37
8	7440.00	21.10 AV	54.00	-32.90	1.11 V	257	-21.27	42.37

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



4. INFORMATION ON THE TESTING LABORATORIES

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

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

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

Email: service@adt.com.tw

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

--- END ---