

CO-TRANSMISSION TEST REPORT

REPORT NO.: RF960612H07B

MODEL NO.: WRP400

RECEIVED: Nov. 14, 2008

TESTED: Nov. 24 to Dec. 02, 2008

ISSUED: Dec. 10, 2008

APPLICANT: Cisco-Linksys LLC

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

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

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

This test report consists of 26 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 endorsement by TAF or 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	SUMMARY OF TEST RESULTS	4
2.1	MEASUREMENT UNCERTAINTY	4
3	GENERAL INFORMATION	5
3.1	GENERAL DESCRIPTION OF EUT	5
3.2	DESCRIPTION OF TEST MODES	7
3.3	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:	8
3.4	GENERAL DESCRIPTION OF APPLIED STANDARDS	9
3.5	DESCRIPTION OF SUPPORT UNITS	10
3.6	CONFIGURATION OF SYSTEM UNDER TEST	11
4	TEST TYPES AND RESULTS	12
4.1	CONDUCTED EMISSION MEASUREMENT	12
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	12
4.1.2	TEST INSTRUMENTS	12
4.1.3	TEST PROCEDURES	13
4.1.4	TEST SETUP	13
4.1.5	EUT OPERATING CONDITIONS	14
4.1.6	TEST RESULTS	15
4.2	RADIATED EMISSION MEASUREMENT	19
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	19
4.2.2	TEST INSTRUMENTS	20
4.2.3	TEST PROCEDURES	21
4.2.4	TEST SETUP	22
4.2.5	EUT OPERATING CONDITIONS	22
4.2.6	TEST RESULTS	23
4.2.7	TEST RESULTS	24
5	INFORMATION ON THE TESTING LABORATORIES	25
6	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	26



A D T

1 CERTIFICATION

PRODUCT : Wireless-G Broadband Router with 2 Phone Ports
BRAND NAME : Linksys
MODEL NO. : WRP400
TESTED : Nov. 24 to Dec. 02, 2008
APPLICANT : Cisco-Linksys LLC
TEST SAMPLE : ENGINEERING SAMPLE
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003

The above equipment (Model: WRP400) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, 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 : Midoli Peng , **DATE:** Dec. 10, 2008
(Midoli Peng, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Dec. 10, 2008
Responsible for RF (Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Dec. 10, 2008
(May Chen, Deputy Manager)



A D T

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR 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 -11.39 dB at 20.258 MHz
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -0.72 dB at 69.72 MHz

This report is prepared for FCC class II permissive change. Only conducted emission and radiated emission presented in this test report.

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:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB



A D T

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless-G Broadband Router with 2 Phone Ports
MODEL NO.	WRP400
FCC ID	Q87-WRP400
POWER SUPPLY	DC 5V from power 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	2412 ~ 2462MHz
NUMBER OF CHANNEL	11
MAXIMUM OUTPUT POWER	802.11b: 138.038mW 802.11g: 131.826mW
ANTENNA TYPE	Dipole Antenna (Antenna gain : 2.0dBi)
DATA CABLE	NA
I/O PORT	Internet Port x 1, Phone Port x 2, Ethernet Port x 4, Power Port x 1, USB port x 1

NOTE:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF960612H07A design is as the following:

- ◆ Add three 3.5G CDMA Cards

Ø This product added one USB port before through FCC class I change, and the test data was recorded in another test report <RF960612H07A>.

2. The EUT could be applied with one 3.5G CDMA Card and following three different models could be chosen; therefore emission tests are added for simultaneously transmit between wireless LAN and 3.5G CDMA function. The emission tests have been performed at the worst channel of both WLAN and 3.5G CDMA, and recorded in the report.

Interface	Brand name	Model name	FCC ID
SPRINT NOVATEL WIRELESS OVATION U727.	Novatel	U727	PKRNVWMC727
SPRINT MOBILE BROADBAND USB Modem NOVATEL WIRELESS OVATION	Novatel	U720	PKRNVWMCD3000
SIERRA WIRELESS AIRCARD 595U	SIERRA	AirCard 595U	N7N-MC5725U

From the above 3.5G CDMA Cards, Model No.: U727 was selected for testing. Only one card can transmit on different interface for CDMA.

3. According to the note 2 description, The EUT was Pre-tested as the following test modes:

Test Mode	Description
Mode A	With 3.5G CDMA Cards - U727
Mode B	With 3.5G CDMA Cards - U720
Mode C	With 3.5G CDMA Cards - COMPASS 597

Mode A, the worse case one, was chosen for final test.

4. The EUT must be supplied with a power adapter and following different models could be chosen:

Adapter 1:	
Brand:	Linksys
Model No.:	AD5V/2.5A-SW
Input power :	100-240V 0.5A 50-60Hz
Output power :	5V, 2.5A Cable:1.8m/unshielded/without core
Adapter 2:	
Brand:	Linksys
Model No.:	PSM11R-050
Input power :	100-240V 0.3A 50-60Hz
Output power :	5V, 2A Cable:1.8m/unshielded/without core

For radiated emission test, The EUT was pre-tested with above adapters, the worse case was found in Adapter 1. Its test data was recorded in this report individually.

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



7. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

Eleven channels are provided for 802.11b, 802.11g:

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		

3.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to			Description
	PLC	RE<1G	RE≥1G	
-	√	√	√	Co-located (*Note 1)

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

Note1: Pre-Scan has been conducted to determine the worst case mode from antenna power.

Note2: The worst card was found in U727 (Channel Frequency: 1880MHz).

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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

Radiated Emission Test (Above 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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1



A D T

3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless-G Broadband Router with 2 Phone Ports. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C. (15.247)
ANSI C63.4 : 2003

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



3.5 DESCRIPTION OF SUPPORT UNITS

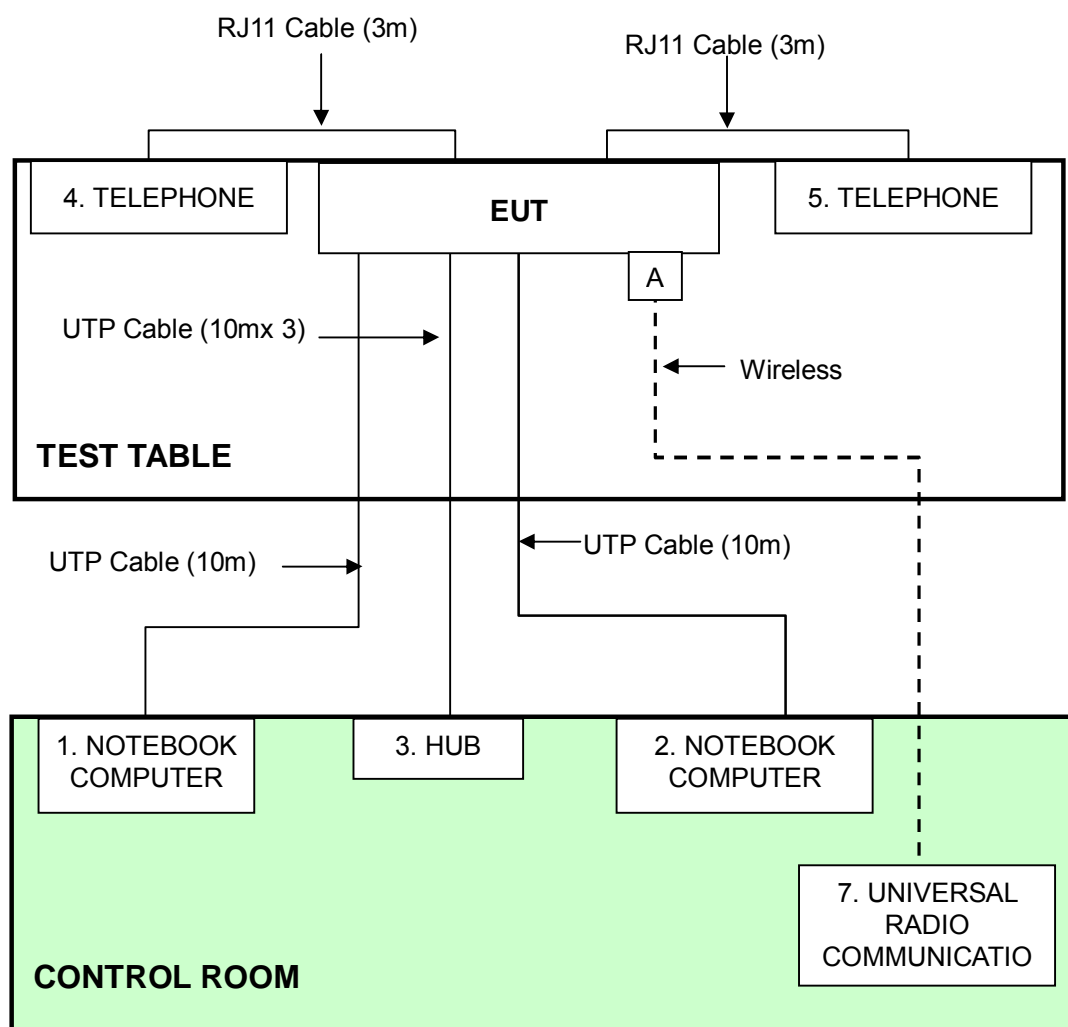
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70166-5CA-0448	PIW632500516610
2	NOTEBOOK COMPUTER	DELL	PP21L	CN-0GD366-70166-5B3-09ZX	QDS-BRCM1016
3	HUB	AVSYS	110H8	01-20E-000002	FCC DoC
4	TELEPHONE	ROMEO	TE-812	97280903	NA
5	TELEPHONE	ROMEO	TE-812	97280926	NA
6	3.5G CDMA Card	HUAWEI	U727	NA	PKRNVWMC727
7	UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU200	101095	NA

No.	Signal cable description
1	NA
2	NA
3	NA
4	NA
5	NA
6	NA
7	NA

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

3.6 CONFIGURATION OF SYSTEM UNDER TEST



NOTE: 1. Support units 1-3&7 were kept in the control room during the test.

2. Item A is 3.5G CDMA Card.

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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. All emanations from a class 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 DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	847124/029	Feb. 29, 2008	Feb. 28, 2009
Line-Impedance Stabilization Network(for EUT)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network(for Peripheral)	ESH3-Z5	848773/004	Nov. 05, 2008	Nov. 04, 2009
RF Cable (JYEBAO)	5DFB	COBCAB-001	July 24, 2008	July 23, 2009
50 ohms Terminator	50	3	Nov. 16, 2008	Nov. 15, 2009
Software	BV ADT_Conc_V7.3.6	NA	NA	NA

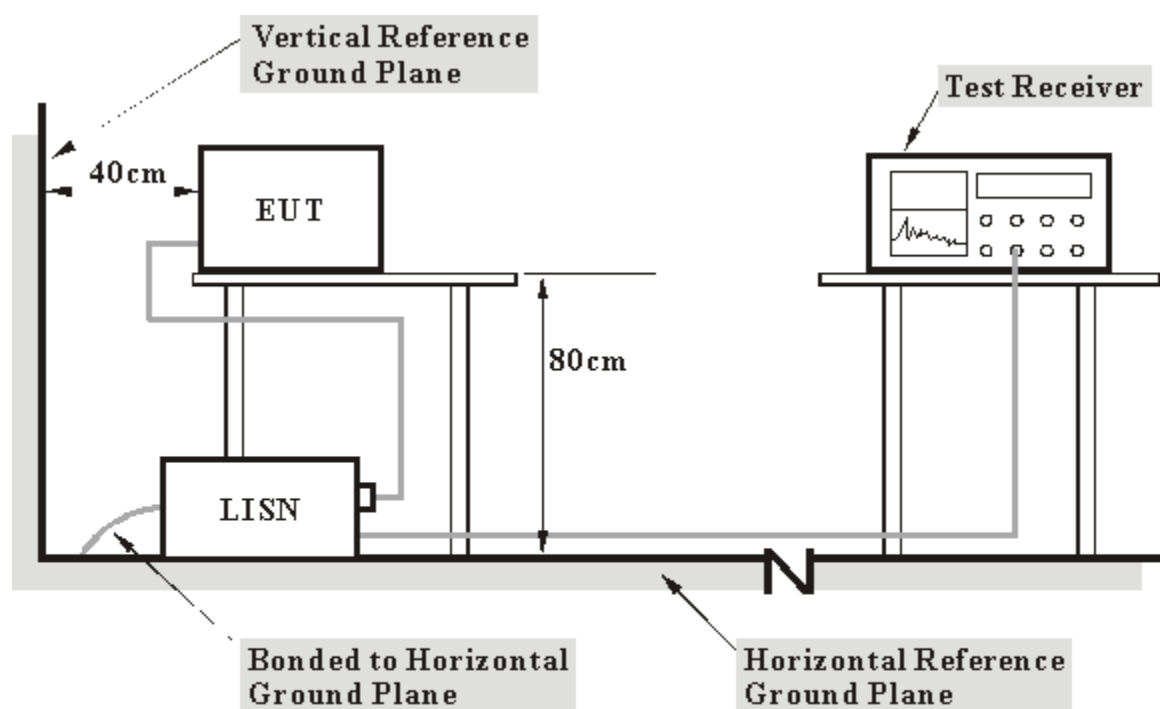
Note:

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. B.
- 3 The VCCI Con B Registration No. is C-2193.

4.1.3 TEST PROCEDURES

- The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST 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.
- Both lines of the power mains connected to the EUT/HOST were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 TEST SETUP



- Note:**
- Support units were connected to second LISN.
 - Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

4.1.5 EUT OPERATING CONDITIONS

- a. Placed the EUT on testing table.
- b. The 3.5G card link support unit 7 (UNIVERSAL RADIO COMMUNICATION TESTER) via wireless.
- c. Prepared other computer systems (support unit 1 ~ 2) to act as communication partners and placed them outside of testing area.
- d. The communication partners run test program "Ping.exe" to enable EUT(WLAN) under transmission/receiving condition continuously via UTP cable and wireless transmission.
- e. The support unit 4 and 5 (Telephone) keep in linking via EUT and internet.
- f. Repeat steps b-e.

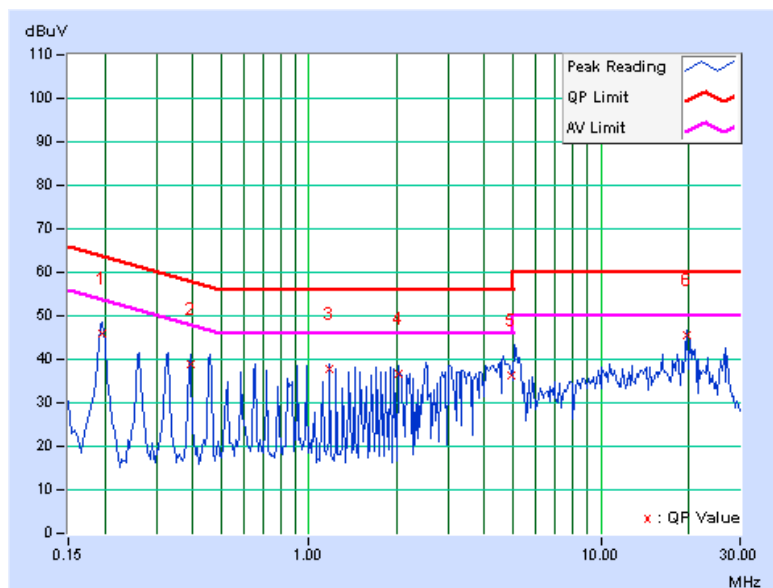
4.1.6 TEST RESULTS

With Adapter 1

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line (L)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH, 970hPa	TESTED BY	Phoenix Huang

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	9.70	36.14	-	45.84	-	63.74	53.74	-17.90	-
2	0.392	9.94	29.02	-	38.96	-	58.02	48.02	-19.06	-
3	1.176	9.68	28.03	-	37.71	-	56.00	46.00	-18.29	-
4	2.023	9.72	26.84	-	36.56	-	56.00	46.00	-19.44	-
5	4.963	9.77	26.46	-	36.23	-	56.00	46.00	-19.77	-
6	19.711	9.96	35.57	-	45.53	-	60.00	50.00	-14.47	-

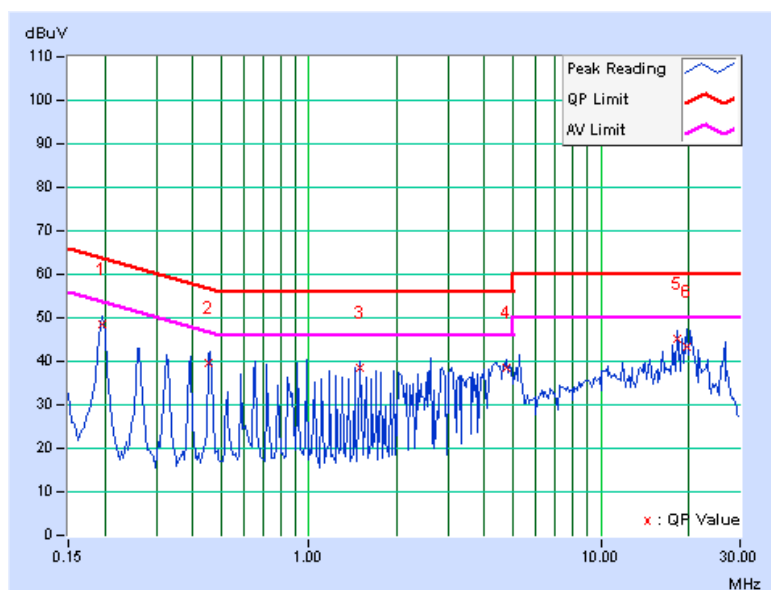
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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	Neutral (N)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH, 970hPa	TESTED BY	Phoenix Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	9.70	38.69	-	48.39	-	63.74	53.74	-15.35	-
2	0.455	9.92	29.78	-	39.70	-	56.79	46.79	-17.09	-
3	1.504	9.70	28.83	-	38.53	-	56.00	46.00	-17.47	-
4	4.773	9.78	28.84	-	38.62	-	56.00	46.00	-17.38	-
5	18.242	10.04	35.27	-	45.31	-	60.00	50.00	-14.69	-
6	19.711	10.08	33.14	-	43.22	-	60.00	50.00	-16.78	-

- 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.

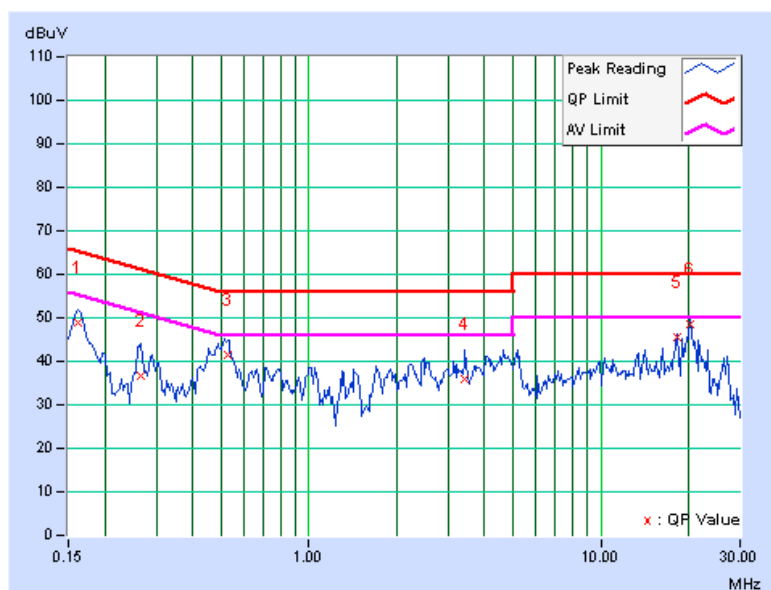


With Adapter 2

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line (L)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH, 970hPa	TESTED BY	Phoenix Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	9.68	39.10	-	48.78	-	65.38	55.38	-16.60	-
2	0.267	9.78	26.86	-	36.64	-	61.20	51.20	-24.56	-
3	0.525	9.89	31.62	-	41.51	-	56.00	46.00	-14.49	-
4	3.430	9.75	26.03	-	35.78	-	56.00	46.00	-20.22	-
5	18.242	9.94	35.55	-	45.49	-	60.00	50.00	-14.51	-
6	20.258	9.96	38.65	-	48.61	-	60.00	50.00	-11.39	-

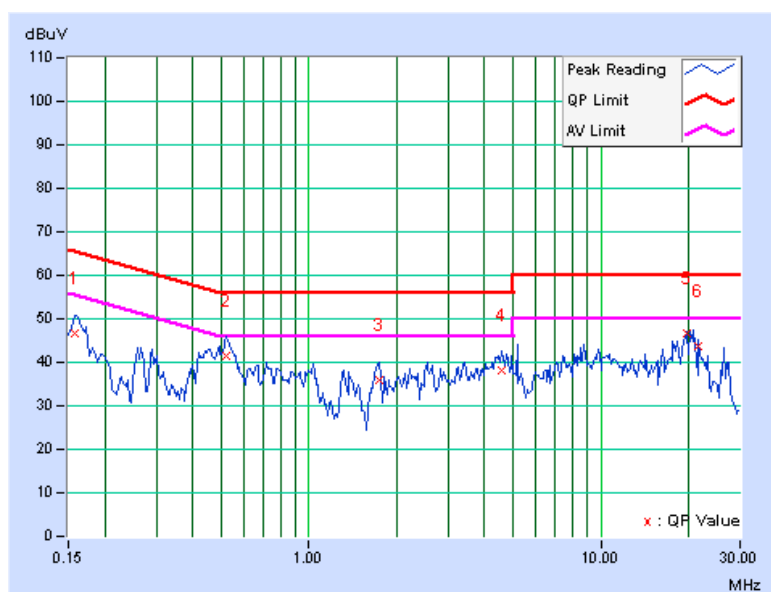
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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	Neutral (N)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH, 970hPa	TESTED BY	Phoenix Huang

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	0.158	9.67	36.82	-	46.49	-	65.58	55.58	-19.08	-
2	0.521	9.89	31.66	-	41.55	-	56.00	46.00	-14.45	-
3	1.734	9.71	26.39	-	36.10	-	56.00	46.00	-19.90	-
4	4.586	9.77	28.36	-	38.13	-	56.00	46.00	-17.87	-
5	19.709	10.08	36.68	-	46.76	-	60.00	50.00	-13.24	-
6	21.660	10.11	33.53	-	43.64	-	60.00	50.00	-16.36	-

- 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.



A D T

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 16, 2008	July 15, 2009
HP Pre_Amplifier	8449B	3008A01922	Sep. 25, 2008	Sep. 24, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	April 01, 2008	Mar. 31, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 30, 2008	April 29, 2009
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 17, 2007	Dec. 16, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 28, 2008	Jan. 27, 2009
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	SF102	22054-2	Dec. 07, 2008	Dec. 06, 2009
RF Cable	8DFB	STCCAB-30 M-1GHz	Oct. 07, 2008	Oct. 06, 2009
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: R3271A) 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.

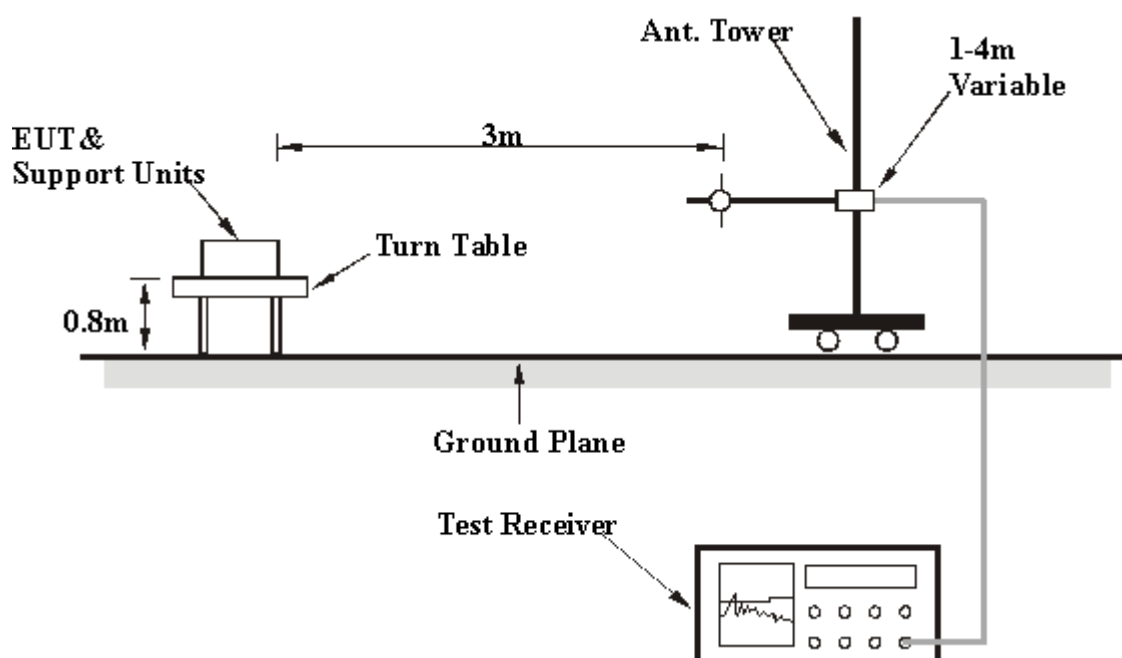
4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 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 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 and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 TEST SETUP



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

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5



A D T

4.2.6 TEST RESULTS

BELOW 1GHz WORST-CASE DATA : 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 970hPa	TESTED BY	Frank Liu

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	250.00	44.04 QP	46.00	-1.96	1.20 H	29	28.62	15.42
2	300.01	30.47 QP	46.00	-15.53	1.00 H	289	13.45	17.02
3	375.01	39.81 QP	46.00	-6.19	1.00 H	300	19.71	20.10
4	400.00	33.56 QP	46.00	-12.44	1.09 H	274	12.42	21.14
5	500.00	35.19 QP	46.00	-10.81	1.04 H	350	12.53	22.66
6	615.38	39.57 QP	46.00	-6.43	1.04 H	0	14.45	25.12
7	668.73	39.52 QP	46.00	-6.48	1.08 H	25	13.19	26.33
8	773.32	39.44 QP	46.00	-6.56	1.00 H	83	10.29	29.15
9	861.53	39.83 QP	46.00	-6.17	1.00 H	106	9.26	30.57
10	984.61	40.17 QP	54.00	-13.83	1.00 H	227	7.75	32.42
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	69.72	39.28 QP	40.00	-0.72	1.00 V	284	26.28	13.00
2	81.35	33.27 QP	40.00	-6.73	1.00 V	65	21.35	11.92
3	123.07	38.72 QP	43.50	-4.78	1.05 V	189	24.71	14.01
4	200.00	32.36 QP	43.50	-11.14	1.06 V	129	19.38	12.98
5	250.00	42.45 QP	46.00	-3.55	1.00 V	87	27.03	15.42
6	500.01	37.76 QP	46.00	-8.24	1.10 V	357	15.10	22.66
7	625.01	35.62 QP	46.00	-10.38	1.00 V	67	10.28	25.34
8	773.32	40.02 QP	46.00	-5.98	1.00 V	353	10.87	29.15
9	861.53	40.14 QP	46.00	-5.86	1.00 V	68	9.57	30.57

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

4.2.7 TEST RESULTS

Above 1GHz WORST-CASE DATA : 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 17.5GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 59%RH 970hPa	TESTED BY	Rex 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	46.94 PK	74.00	-27.06	1.21 H	318	11.31	35.63
2	4924.00	33.87 AV	54.00	-20.13	1.21 H	318	-1.76	35.63
3	7386.00	53.20 PK	74.00	-20.80	1.31 H	219	10.97	42.23
4	7386.00	40.14 AV	54.00	-13.86	1.31 H	219	-2.09	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	4924.00	50.10 PK	74.00	-23.90	1.42 V	247	14.47	35.63
2	4924.00	43.62 AV	54.00	-10.38	1.42 V	247	7.99	35.63
3	7386.00	59.12 PK	74.00	-14.88	1.32 V	314	16.89	42.23
4	7386.00	51.37 AV	54.00	-2.63	1.32 V	314	9.14	42.23

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

5 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 by the following approval agencies according to ISO/IEC 17025.

USA	FCC, UL, NVLAP
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:

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.



A D T

6 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.

---END---