

# CO-TRANSMISSION

## SUPPLEMENTARY TEST REPORT

**REPORT NO.:** RF990104H03-1  
WR6202-1U, WR6202, SMCWBR11S-3GN,  
**MODEL NO.:** SMCWBR11S-N, BG-100  
**RECEIVED:** Jan. 04, 2010  
**TESTED:** Jan. 14 to 26, 2010  
**ISSUED:** Mar. 03, 2010

**APPLICANT:** Accton Wireless Broadband Corp.

**ADDRESS:** 3F, No. 1 Creation Rd. III, Science-based  
Industrial Park Hsinchu 30077, Taiwan, R.O.C.

**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 29 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.





## 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 .....	8
3.3	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL: .....	9
3.4	GENERAL DESCRIPTION OF APPLIED STANDARDS .....	10
3.5	DESCRIPTION OF SUPPORT UNITS .....	11
3.6	CONFIGURATION OF SYSTEM UNDER TEST .....	12
4	TEST TYPES AND RESULTS .....	13
4.1	CONDUCTED EMISSION MEASUREMENT .....	13
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	13
4.1.2	TEST INSTRUMENTS .....	13
4.1.3	TEST PROCEDURES .....	14
4.1.4	DEVIATION FROM TEST STANDARD .....	14
4.1.5	TEST SETUP .....	14
4.1.6	EUT OPERATING CONDITIONS .....	15
4.1.7	TEST RESULTS - With adapter 1 .....	16
4.1.8	TEST RESULTS - With adapter 2 .....	18
4.1.9	TEST RESULTS - With adapter 3 .....	20
4.2	RADIATED EMISSION MEASUREMENT .....	22
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT .....	22
4.2.2	TEST INSTRUMENTS .....	23
4.2.3	TEST PROCEDURES .....	24
4.2.4	TEST SETUP .....	25
4.2.5	EUT OPERATING CONDITIONS .....	25
4.2.6	TEST RESULTS .....	26
4.2.7	TEST RESULTS .....	27
5	INFORMATION ON THE TESTING LABORATORIES .....	28
6	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....	29



A D T

## 1 CERTIFICATION

**PRODUCT :** 150Mbps Wireless-N Mini 3G Broadband Router,  
150Mbps Wireless-N Mini Broadband Router,  
Pareto Networks BG-100 Branch Services Gateway

**BRAND NAME :** AWB, SMC, Pareto

**MODEL NO. :** WR6202-1U, WR6202, SMCWBR11S-3GN,  
SMCWBR11S-N, BG-100

**TESTED :** Jan. 14 to 26, 2010

**APPLICANT :** Accton Wireless Broadband Corp.

**TEST SAMPLE :** R&D SAMPLE

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

The above equipment (Model: WR6202-1U) 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:** Mar. 03, 2010  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE :** Hank Chung , **DATE:** Mar. 03, 2010  
( Hank Chung, Deputy Manager )

**APPROVED BY :** May Chen , **DATE:** Mar. 03, 2010  
( May Chen, Deputy Manager )

### Revision Note:

Revision No.	Revised Date	Revised Pages	Comment
Rev.1.0	Mar. 03, 2010	7, 11	Modify the brand name of 3G card (Model: E169).

## 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 -3.36dB at 0.334MHz
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -6.35 dB at 499.99 MHz

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

Measurement	Value
Conducted emissions	2.45 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

<b>PRODUCT</b>	150Mbps Wireless-N Mini 3G Broadband Router, 150Mbps Wireless-N Mini Broadband Router, Pareto Networks BG-100 Branch Services Gateway
<b>MODEL NO.</b>	WR6202-1U, WR6202, SMCWBR11S-3GN, SMCWBR11S-N, BG-100
<b>FCC ID</b>	V8YFIU816202T00W
<b>POWER SUPPLY</b>	12V from power adapter
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps 802.11n (20MHz, 800ns GI): 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps 802.11n (40MHz, 800ns GI): 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps 802.11n (20MHz, 400ns GI): 72.2 / 65 / 57.8 / 43.3 / 28.9 / 21.7 / 14.4 / 7.2Mbps 802.11n (40MHz, 400ns GI): 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps
<b>FREQUENCY RANGE</b>	2412MHz ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
<b>MAXIMUM OUTPUT POWER</b>	802.11b: 199.5mW 802.11g: 281.8mW 802.11n (20MHz): 263.0mW 802.11n (40MHz): 195.0mW
<b>ANTENNA TYPE</b>	Please see note 2
<b>ANTENNA CONNECTOR</b>	Please see note 2
<b>DATA CABLE</b>	NA
<b>I/O PORT</b>	RJ-45 port x 2 (Ethernet (10,100Mbps)) USB port x 1 (Option) Antenna port x1
<b>ASSOCIATED DEVICES</b>	Adapter x1 Antenna x1

**NOTE:**

1. The EUT has three product / brand names and five model names, which are identical to each other in all aspects except for the followings:

Product name	Brand name	Model name	Different
150Mbps Wireless-N Mini 3G Broadband Router	AWB	WR6202-1U	with 3G USB Port
150Mbps Wireless-N Mini Broadband Router	AWB	WR6202	w/o 3G USB Port
150Mbps Wireless-N Mini 3G Broadband Router	SMC	SMCWBR11S-3GN	with 3G USB Port
150Mbps Wireless-N Mini Broadband Router	SMC	SMCWBR11S-N	w/o 3G USB Port
Pareto Networks BG-100 Branch Services Gateway	Pareto	BG-100	with 3G USB Port

From the above models, model: WR6202-1U was selected as representative model for the test and its data was recorded in this report.

2. There is one antenna provided to this EUT, please refer to the following table:

Brand No.	Model No.	Net Gain (dBi)	Cable Length(cm)	Antenna Type	Connector
E.S.G.T	E6601144081	2.35	7.5	Dipole	Reverse SMA

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

Adapter 1	
<b>Brand:</b>	APD
<b>Model No.:</b>	WA-12I12FU
<b>Input power :</b>	AC 100-240V, 0.5A Max., 50-60Hz Cable:1.5m / unshielded
<b>Output power :</b>	DC 12V, 1A
Adapter 2	
<b>Brand:</b>	APD
<b>Model No.:</b>	WA-12I12R
<b>Input power :</b>	AC 100-240V, 0.5A Max., 50-60Hz Cable:1.5m / unshielded
<b>Output power :</b>	DC 12V, 1A
Adapter 3	
<b>Brand:</b>	Sunny
<b>Model No.:</b>	SYS1381-1212-W2
<b>Input power :</b>	AC 100-240V, 0.5A Max., 50-60Hz Cable:1.9m / unshielded
<b>Output power :</b>	DC 12V, 1A

The EUT was pre-tested in chamber with above adapters, the radiated emission worst case was found in model: **WA-12I12R**. Therefore only the test data of the mode was recorded in this report.

4. The EUT could be applied with one 3G Card and following three different models could be chosen; therefore emission tests are added for simultaneously transmit between wireless LAN and 3G function. The emission tests have been performed at the worst channel of both WLAN and 3G, and recorded in other report. <only for test, not for sale>

Item	Product name	Brand name	Model name	FCC ID
1	HSDPA USB Stick	HUAWEI	E169	QISE169
2	HSDPA USB MODEM	ZTE	MF626	Q78-ZTEMF626
3	HSDPA USB MODEM	HUAWEI	E220	QISE220

The EUT was pre-tested in chamber with above 3G Cards, the worst case was found in model: E169. Therefore only the test data of the mode was recorded in this report.

5. The EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Level-set
<b>Mode B</b>	<b>Tower-set</b>

From the above modes, the radiated emission worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

6. The EUT incorporates a SISO function with 802.11b, 802.11g, 802.11n. Physically, the EUT provides one completed transmitter and receiver.
7. The EUT is 1 \* 1 spatial SISO without beam forming function. The antenna configuration is one transmitter antenna and one receiver antenna, as there is 1 Dipole antenna. There is one transmitter and one receiver.
8. The EUT complies with 802.11n standards and backwards compatible with 802.11b, 802.11g products.
9. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b and 802.11n technique devices to the network.
10. 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.

Rev.1.0 dated Mar. 03. 2010

### 3.2 DESCRIPTION OF TEST MODES

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		

Seven channels are provided for draft 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		



### 3.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to			Description
	PLC	RE<1G	RE≥1G	
A	√	-	-	Co-located mode with adapter 1
B	√	√	√	Co-located mode with adapter 2
C	√	-	-	Co-located mode with adapter 3

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

#### 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)	EUT configure mode
802.11g / 3G	1 to 11/ -	6 / 810	OFDM / WCDMA	BPSK / -	6 / -	A, B, C

#### 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)	EUT configure mode
802.11g / 3G	1 to 11/ -	6 / 810	OFDM / WCDMA	BPSK / -	6 / -	B

#### 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)	EUT configure mode
802.11g / 3G	1 to 11/ -	6 / 810	OFDM / WCDMA	BPSK / -	6 / -	B



A D T

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	15deg. C, 60%RH, 1024 hPa	120Vac, 60Hz	Kent Liu
RE<1G	17deg. C, 58%RH, 1024 hPa	120Vac, 60Hz	Eagle Chen
PLC	25deg. C, 60%RH, 1024 hPa	120Vac, 60Hz	Timmy Hu

**3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is an RF product. 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.

**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 47 CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



### 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.

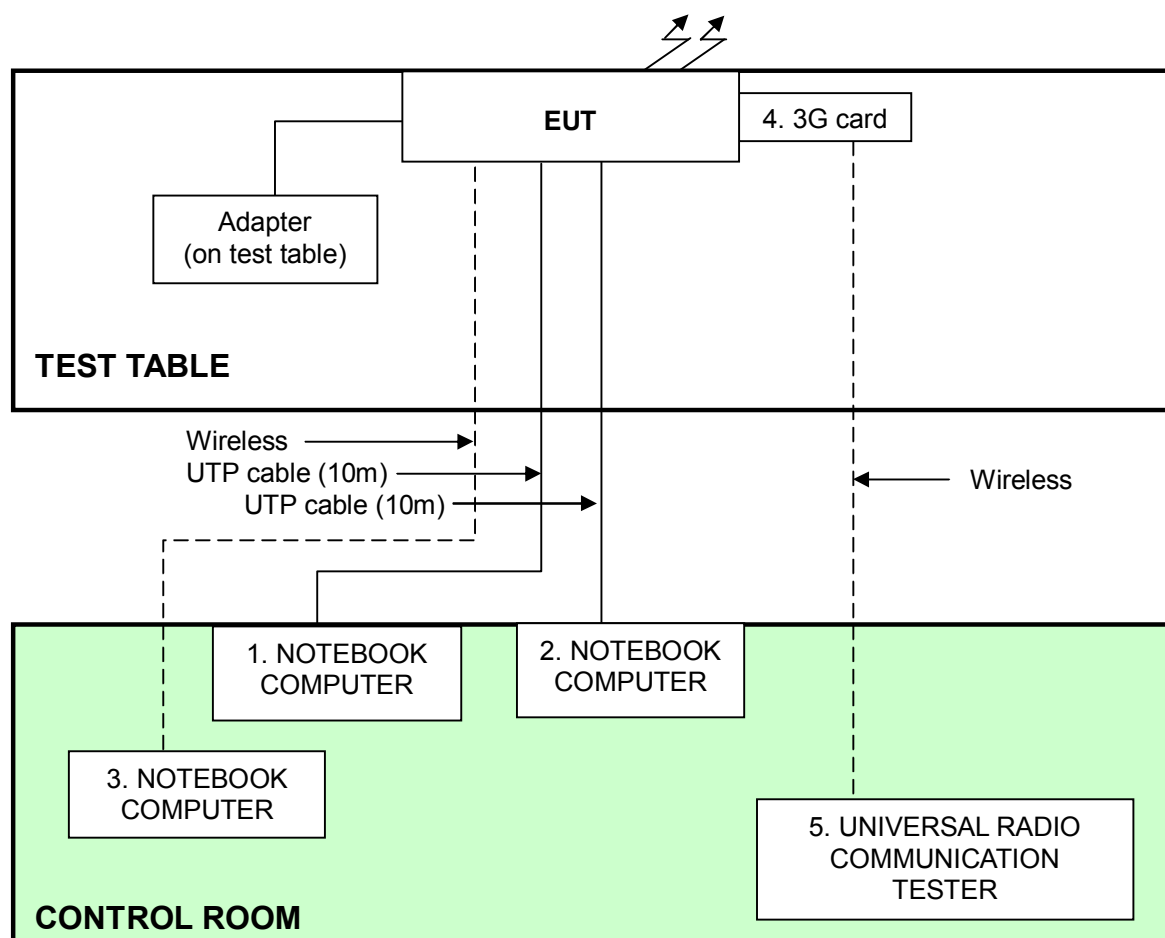
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-486 43-86L-4472	QDS-BRCM1019
2	NOTEBOOK COMPUTER	ASUS	M2400N	4ANP088103	FCC DoC
3	NOTEBOOK COMPUTER	DELL	PP21L	CN-0GD366-701 66-5B3-09ZX	QDS-BRCM1016
4	3G card	HUAWEI	E169	NA	QISE169
5	UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU200	104484	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable (Unshielded, 10m)
2	UTP cable (Unshielded, 10m)
3	NA
4	NA
5	NA

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

Rev.1.0 dated Mar. 03. 2010

### 3.6 CONFIGURATION OF SYSTEM UNDER TEST



## 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 $\mu$ 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 DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 05, 2009	Mar. 04, 2010
Line-Impedance Stabilization Network (for EUT)	KNW-407	8-1395-12	May 04, 2009	May 03, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 08, 2009	June 07, 2010
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec. 14, 2009	Dec. 13, 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. A.
3. The VCCI Con A Registration No. is C-817.

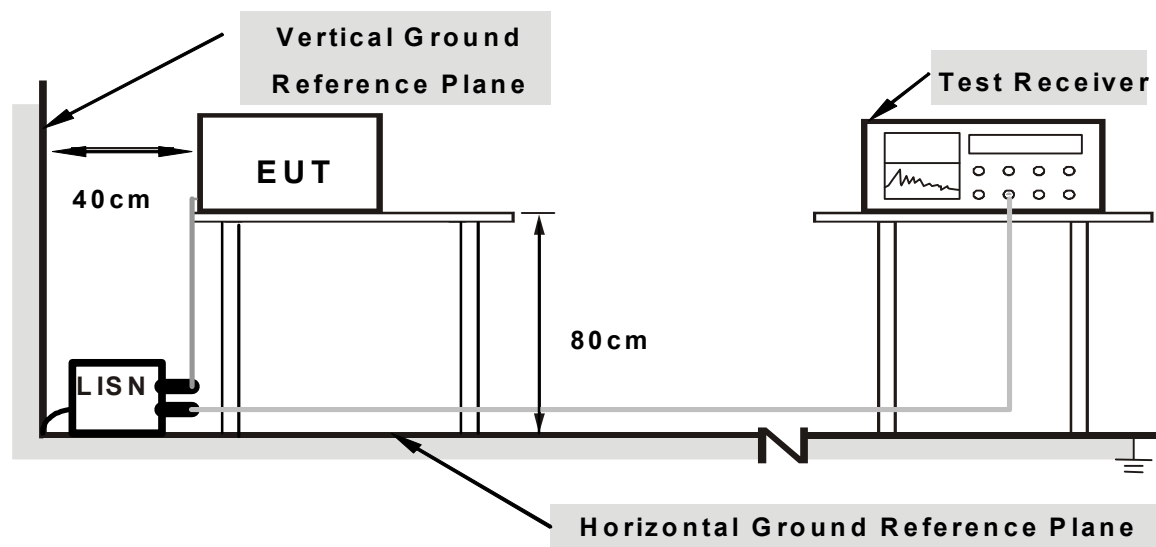
### 4.1.3 TEST PROCEDURES

- 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were 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 related item – Photographs of the Test Configuration.



#### 4.1.6 EUT OPERATING CONDITIONS

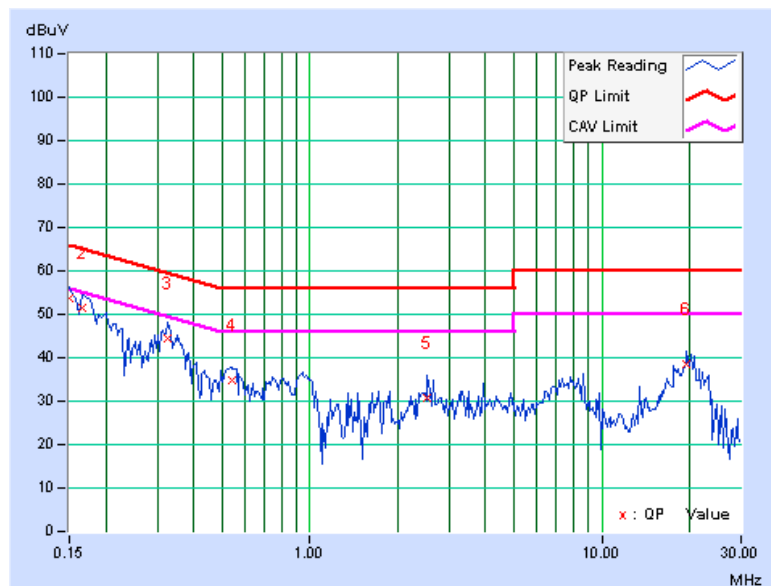
- a. Placed the EUT on testing table.
- b. The 3G card link support unit 5 (Universal Radio Communication Tester) via wireless.
- c. Prepared other computer systems (support units 1 ~ 3) to act as communication partners and placed them outside of testing area.
- d. The communication partners run test program "QA RT3052.exe" to enable EUT under transmission/receiving condition continuously via UTP cables.
- e. Repeat steps b-e.

#### 4.1.7 TEST RESULTS - With adapter 1

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
TEST MODE	Co-location made with adapter 1		

	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	0.150	0.04	53.73	-	53.77	-	66.00	56.00	-12.23	-
2	0.166	0.04	51.49	-	51.53	-	65.18	55.18	-13.65	-
3	0.326	0.05	44.41	-	44.46	-	59.56	49.56	-15.10	-
4	0.541	0.07	34.62	-	34.69	-	56.00	46.00	-21.31	-
5	2.523	0.14	30.71	-	30.85	-	56.00	46.00	-25.15	-
6	19.586	0.53	38.15	-	38.68	-	60.00	50.00	-21.32	-

- 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.

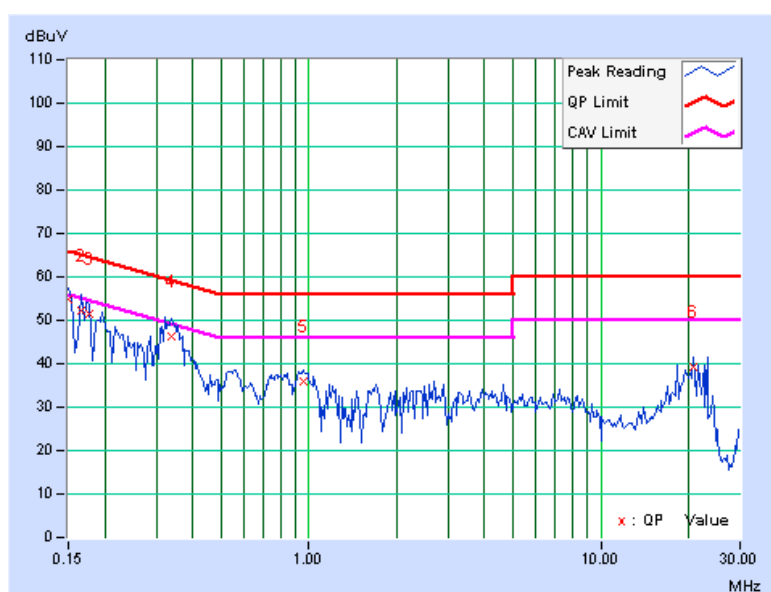




PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
TEST MODE	Co-location made with adapter 1		

	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	0.150	0.05	54.62	-	54.67	-	66.00	56.00	-11.33	-
2	0.166	0.05	52.16	-	52.21	-	65.18	55.18	-12.97	-
3	0.177	0.05	51.41	-	51.46	-	64.61	54.61	-13.15	-
4	0.338	0.06	46.28	-	46.34	-	59.26	49.26	-12.92	-
5	0.959	0.10	35.66	-	35.76	-	56.00	46.00	-20.24	-
6	20.809	0.59	38.52	-	39.11	-	60.00	50.00	-20.89	-

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

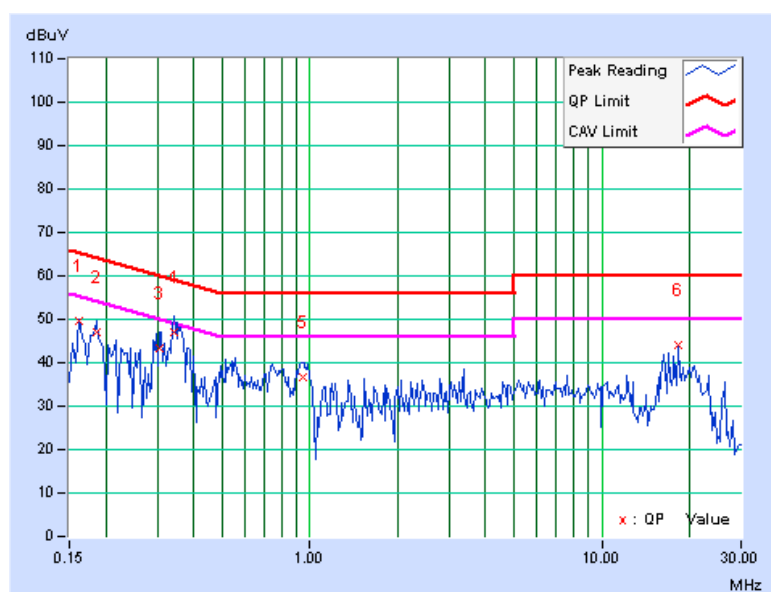


#### 4.1.8 TEST RESULTS - With adapter 2

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
TEST MODE	Co-location made with adapter 2		

	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	0.162	0.04	49.65	-	49.69	-	65.38	55.38	-15.69	-
2	0.185	0.04	46.87	-	46.91	-	64.25	54.25	-17.34	-
3	0.306	0.05	43.18	-	43.23	-	60.07	50.07	-16.84	-
4	0.341	0.05	46.81	-	46.86	-	59.17	49.17	-12.30	-
5	0.943	0.09	36.73	-	36.82	-	56.00	46.00	-19.18	-
6	18.242	0.51	43.69	-	44.20	-	60.00	50.00	-15.80	-

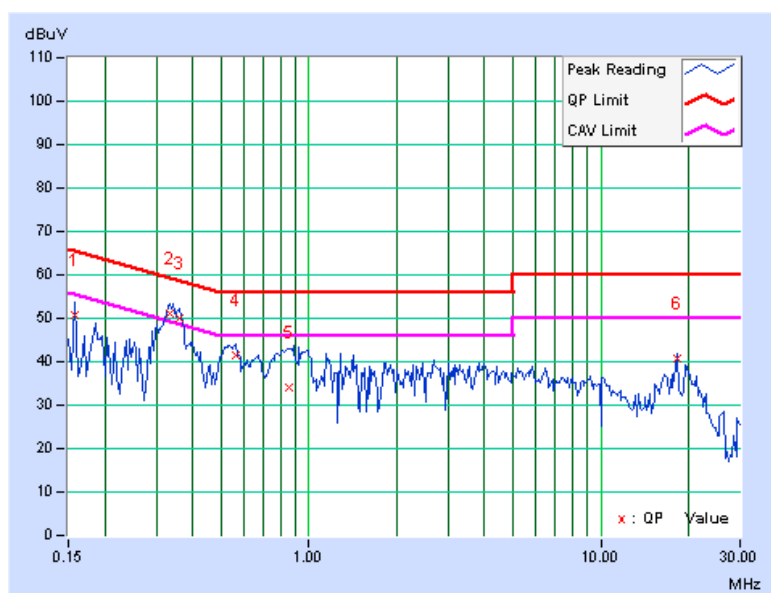
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
TEST MODE	Co-location made with adapter 2		

	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	0.158	0.05	50.57	-	50.62	-	65.58	55.58	-14.96	-
2	0.334	0.06	51.23	45.94	51.29	46.00	59.36	49.36	-8.07	-3.36
3	0.361	0.07	50.02	44.89	50.09	44.96	58.71	48.71	-8.62	-3.75
4	0.560	0.08	41.27	-	41.35	-	56.00	46.00	-14.65	-
5	0.853	0.09	33.98	-	34.07	-	56.00	46.00	-21.93	-
6	18.305	0.53	40.10	-	40.63	-	60.00	50.00	-19.37	-

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

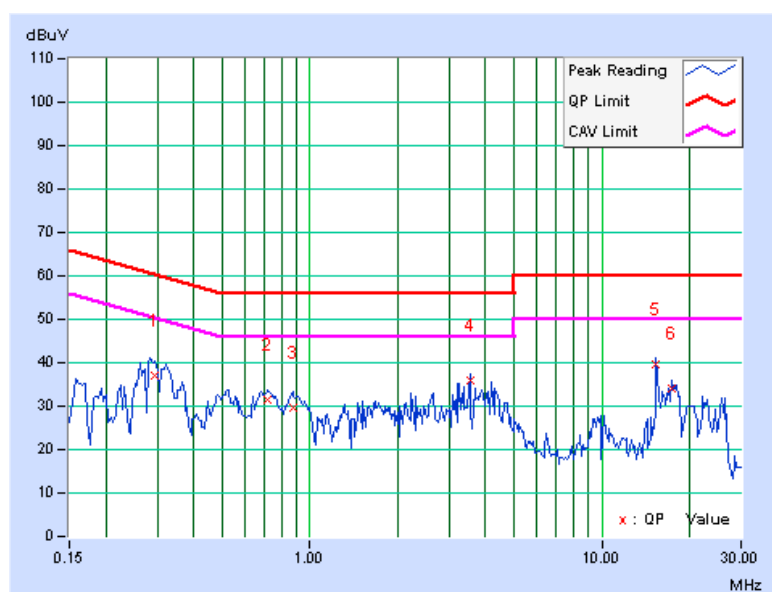


#### 4.1.9 TEST RESULTS - With adapter 3

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
TEST MODE	Co-location made with adapter 3		

	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	0.295	0.05	37.09	-	37.14	-	60.39	50.39	-23.25	-
2	0.716	0.08	31.37	-	31.45	-	56.00	46.00	-24.55	-
3	0.873	0.08	29.44	-	29.52	-	56.00	46.00	-26.48	-
4	3.552	0.18	35.69	-	35.87	-	56.00	46.00	-20.13	-
5	15.363	0.47	39.26	-	39.73	-	60.00	50.00	-20.27	-
6	17.387	0.50	33.65	-	34.15	-	60.00	50.00	-25.85	-

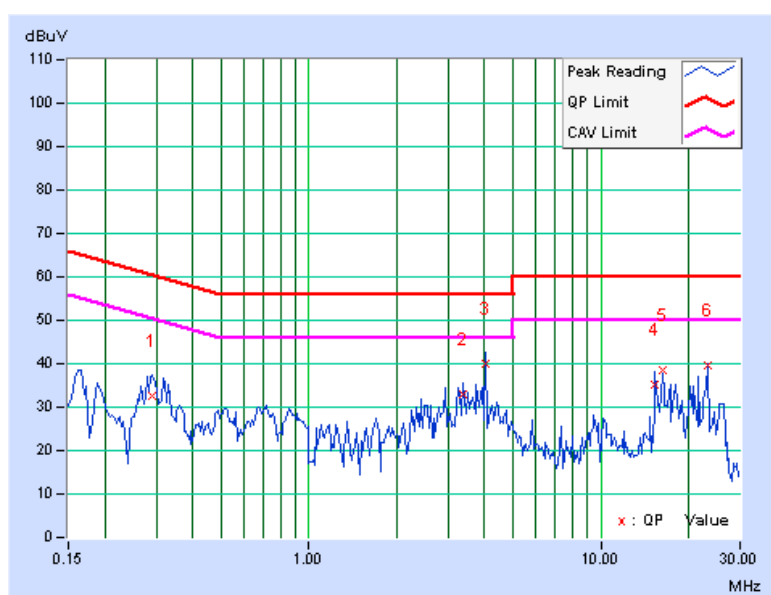
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
TEST MODE	Co-location made with adapter 3		

	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	0.291	0.06	32.64	-	32.70	-	60.51	50.51	-27.81	-
2	3.391	0.19	32.74	-	32.93	-	56.00	46.00	-23.07	-
3	4.019	0.22	39.86	-	40.08	-	56.00	46.00	-15.92	-
4	15.391	0.49	34.87	-	35.36	-	60.00	50.00	-24.64	-
5	16.227	0.50	37.85	-	38.35	-	60.00	50.00	-21.65	-
6	23.129	0.68	38.84	-	39.52	-	60.00	50.00	-20.48	-

- 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	U3751	170100022	Nov. 18, 2009	Nov. 17, 2010
ADVANTEST Spectrum Analyzer	U3772	160100280	Sep. 21, 2009	Sep. 20, 2010
HP Pre_Amplifier	8449B	3008A01922	Sep. 25, 2009	Sep. 24, 2010
ROHDE & SCHWARZ Test Receiver	ESCS 30	100027	May 05, 2009	May 04, 2010
SCHWARZBECK Broadband Antenna	VULB-9168	263	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D123	Sep. 21, 2009	Sep. 20, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2010	Jan. 21, 2011
RF Switches	EM-H-01-1	1009	Aug. 10, 2009	Aug. 09, 2010
RF Cable	8DFB	STACAB-30M-1GHz-091	Feb. 19, 2009	Feb. 18, 2010
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	TT100	ADT01	NA	NA
CORCOM AC Filter	MRI2030	107/108	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.

### 4.2.3 TEST PROCEDURES

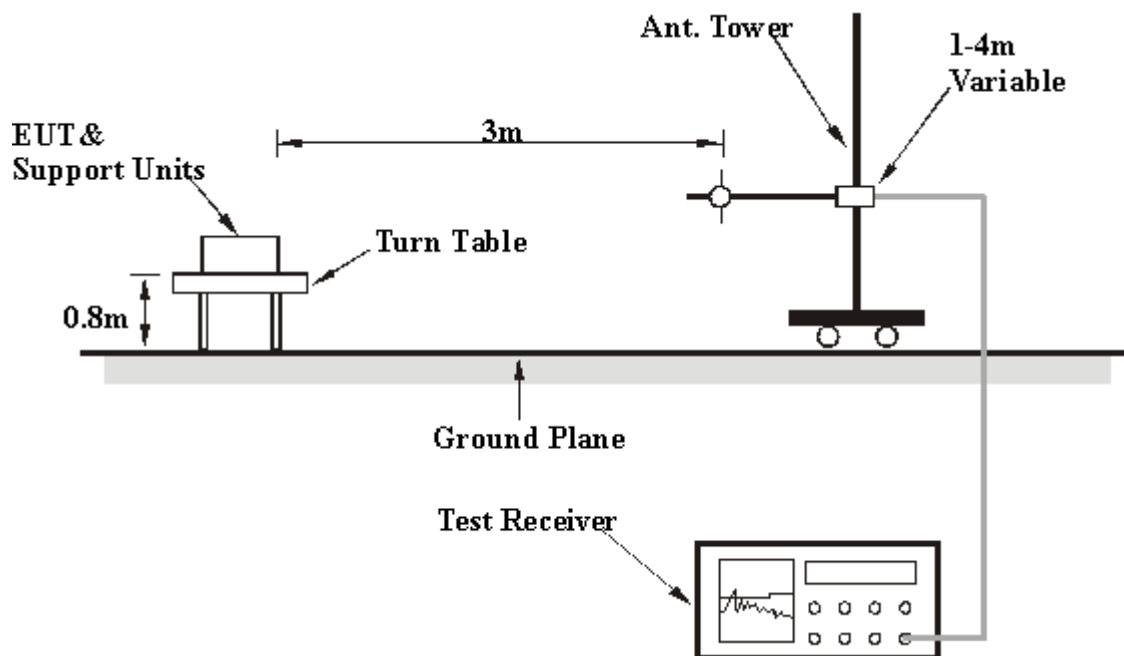
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on 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 4.1.6



A D T

## 4.2.6 TEST RESULTS

## BELOW 1GHz WORST-CASE DATA :

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	11g :Channel 6 / 3G :Channel 810	FREQUENCY RANGE	30-1000 MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 58%RH 1024hPa	TESTED BY	Eagle Chen

## ANTENNA POLARITY &amp; 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	125.00	33.11 QP	43.50	-10.39	4.00 H	337	20.57	12.54
2	250.00	36.65 QP	46.00	-9.35	3.17 H	47	22.65	14.00
3	375.00	35.52 QP	46.00	-10.48	2.20 H	347	18.14	17.38
4	499.99	39.65 QP	46.00	-6.35	1.76 H	31	19.29	20.36
5	639.99	39.60 QP	46.00	-6.40	1.41 H	33	17.64	21.96
6	853.32	37.94 QP	46.00	-8.06	1.00 H	33	13.65	24.29
7	1000.00	42.70 QP	54.00	-11.30	1.00 H	331	17.14	25.56

## ANTENNA POLARITY &amp; 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	125.00	32.05 QP	43.50	-11.45	1.00 V	43	19.51	12.54
2	250.00	37.32 QP	46.00	-8.68	1.00 V	330	23.32	14.00
3	375.00	33.43 QP	46.00	-12.57	2.12 V	348	16.05	17.38
4	500.00	37.45 QP	46.00	-8.55	1.53 V	65	17.09	20.36
5	750.01	34.57 QP	46.00	-11.43	2.24 V	349	11.50	23.07
6	875.01	35.71 QP	46.00	-10.29	2.21 V	50	11.15	24.56
7	1000.00	40.26 QP	54.00	-13.74	1.92 V	34	14.70	25.56

- 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 :

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	11g :Channel 6 / 3G :Channel 810	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 58%RH 1024hPa	TESTED BY	Eagle Chen

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	1634.00	39.15 PK	74.00	-34.85	1.05 H	154	10.96	28.19
2	1634.00	28.12 AV	54.00	-25.88	1.05 H	154	-0.07	28.19
3	4874.00	47.69 PK	74.00	-26.31	1.02 H	198	12.17	35.52
4	4874.00	36.41 AV	54.00	-17.59	1.02 H	198	0.89	35.52
5	7311.00	51.32 PK	74.00	-22.68	1.22 H	95	9.36	41.96
6	7311.00	40.98 AV	54.00	-13.02	1.22 H	95	-0.98	41.96
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	1634.00	37.80 PK	74.00	-36.20	1.04 V	254	9.61	28.19
2	1634.00	30.10 AV	54.00	-23.90	1.04 V	254	1.91	28.19
3	4874.00	45.89 PK	74.00	-28.11	1.33 V	247	10.37	35.52
4	4874.00	33.98 AV	54.00	-20.02	1.33 V	247	-1.54	35.52
5	7311.00	50.21 PK	74.00	-23.79	1.08 V	54	8.25	41.96
6	7311.00	39.66 AV	54.00	-14.34	1.08 V	54	-2.30	41.96

- 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 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](http://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](mailto:service@adt.com.tw)

**Web Site:** [www.adt.com.tw](http://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 ---