



# FCC TEST REPORT

**REPORT NO.:** RF980525L17B

**MODEL NO.:** SBG941 (refer to item 3.1 for more details)

**RECEIVED:** Nov. 09, 2009

**TESTED:** Nov. 11, 2009 ~ May 07, 2010

**ISSUED:** May 10, 2010

**APPLICANT:** Motorola, Inc.

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19044 United States

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

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou  
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**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei  
Shan Hsiang, Taoyuan Hsien 333, Taiwan,  
R.O.C.

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# 1. CERTIFICATION

**PRODUCT:** Wireless Cable Modem Gateway

**MODEL:** SBG941 (refer to item 3.1 for more details)

**BRAND:** Motorola

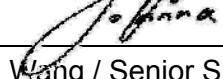
**APPLICANT:** Motorola, Inc.

**TESTED:** Nov. 11, 2009 ~ May 07, 2010

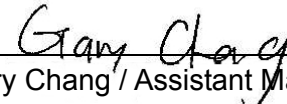
**TEST SAMPLE:** ENGINEERING SAMPLE

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

The above equipment (model: SBG941U DIAGNOSTIC) 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** :  , **DATE** : May 10, 2010  
Joanna Wang / Senior Specialist

**TECHNICAL ACCEPTANCE** :  , **DATE** : May 10, 2010  
Responsible for RF Long Chen / Senior Engineer

**APPROVED BY** :  , **DATE** : May 10, 2010  
Gary Chang / Assistant Manager

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -3.86dB at 0.185MHz.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.20dB at 933.31MHz.

### 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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.44dB
Radiated emissions	30MHz ~ 200MHz	3.34dB
	200MHz ~1000MHz	3.35dB
	1GHz ~ 18GHz	2.26dB
	18GHz ~ 40GHz	1.94dB

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

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Wireless Cable Modem Gateway
<b>MODEL NO.</b>	SBG941 (refer to NOTE for more details)
<b>FCC ID</b>	ACQSBG941
<b>POWER SUPPLY</b>	12Vdc from 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: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps
<b>FREQUENCY RANGE</b>	2412.0MHz ~ 2462.0MHz
<b>NUMBER OF CHANNEL</b>	11
<b>MAXIMUM OUTPUT POWER</b>	289.068mW
<b>ANTENNA TYPE</b>	Printed antenna with 1.88dBi gain (The top facing antenna) Printed antenna with 4.05dBi gain (The front facing antenna)
<b>DATA CABLE</b>	1.8m non-shielded RJ45 cable without core 1.4m non-shielded DIAG cable without core 1.9m shielded USB cable without core
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	Adapter

#### NOTE:

- This report is issued as a supplementary report to the original report no.: RF980525L17.
- This report is prepared for FCC class II permissive change. Differences compared with the original report are listed as below. Therefore, test items for conducted emission and radiated emission below 1GHz test had been re-tested. For radiated emission above 1GHz test, only re-tested CH1 of 802.11b mode (worst case mode of the original report).
  - ✧ Change second source for component.
  - ✧ Add two adapters.
  - ✧ Remove one adapter. (Brand: Bestek, Model: EA0121WAF)
- This report shall be combined together with its original report.
- The models as below are identical to each other except for their model designation and port due to marketing requirement.

MODEL NO.	DIAG PORT	USB PORT
SBG941	-	-
SBG941U	-	√
SBG941U DIAGNOSTIC	√	√

\*The model SBG941U DIAGNOSTIC was chosen for final test.

5. The front facing antenna with 4.05dBi gain was chosen for final test.
6. The EUT was operated with following adapters:

**<Original>**

<b>ADAPTER 1</b>	
<b>BRAND:</b>	LEADER ELECTRONICS INC.
<b>MODEL:</b>	MT20-21120-A00F
<b>INPUT:</b>	110-127Vac, 60Hz, 0.25A
<b>OUTPUT:</b>	12Vdc, 750mA
<b>POWER LINE:</b>	DC: 1.8m non-shielded cable without core

<b>ADAPTER 2</b>	
<b>BRAND:</b>	DELTA ELECTRONICS, INC.
<b>MODEL:</b>	EADP-12HB A
<b>INPUT:</b>	100-240Vac, 50-60Hz, 0.4A
<b>OUTPUT:</b>	12Vdc, 1A
<b>POWER LINE:</b>	AC: 1.9m non-shielded cable without core DC: 0.9m non-shielded cable without core

**<New >**

<b>ADAPTER 3</b>	
<b>BRAND:</b>	LEADER ELECTRONICS INC.
<b>MODEL:</b>	NU12-61120-300S
<b>INPUT:</b>	100-240Vac, 50/60Hz, 0.6A
<b>OUTPUT:</b>	12Vdc, 1A
<b>POWER LINE:</b>	AC: 1.9m non-shielded cable without core DC: 0.9m non-shielded cable without core

<b>ADAPTER 4</b>	
<b>BRAND:</b>	LEADER ELECTRONICS INC.
<b>MODEL:</b>	NU12-61120301S
<b>INPUT:</b>	100-240Vac, 50/60Hz, 0.6A
<b>OUTPUT:</b>	12Vdc, 0.75A
<b>POWER LINE:</b>	AC: 1.9m non-shielded cable without core DC: 1.8m non-shielded cable without core

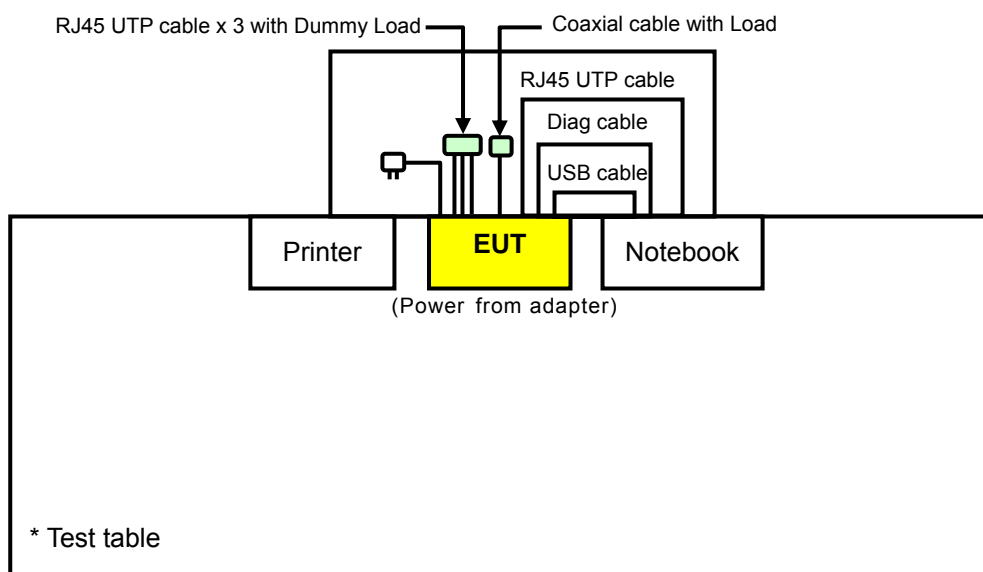
7. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions up to 54Mbps.
8. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT:

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

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE $\geq$ 1G	RE $<$ 1G	PLC	
A	√	√	√	Adapter: MT20-21120-A00F
B	-	√	√	Adapter: EADP-12HB A
C	-	√	√	Adapter: NU12-61120-300S
D	-	√	√	Adapter: NU12-61120301S

Where **PLC**: Power Line Conducted Emission      **RE $<$ 1G**: Radiated Emission below 1GHz  
**RE $\geq$ 1G**: Radiated Emission above 1GHz

**NOTE:** "-" means no effect.

#### 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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
A	802.11b	1 to 11	1	DSSS	DBPSK	1	Z

#### 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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

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

#### POWER LINE CONDUCTED EMISSION TEST:

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

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



**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	24deg. C, 65%RH, 1010 hPa	120Vac, 60Hz	Brad Wu
RE $<$ 1G	25deg. C, 65%RH, 1009 hPa	120Vac, 60Hz	Brad Wu
PLC	23deg. C, 62%RH, 1006 hPa	120Vac, 60Hz	Ariel Lin

**3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C (15.247)**

**ANSI C63.4-2003**

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

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

### 3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	D600	CN-0G5152-48643-49C-8226	FCC DoC Approved
2	PRINTER	EPSON	LQ-300+	DCGY054146	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8m braid shielded wire, DB25 connector, w/o core.

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

## 4. TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

**NOTE:**

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

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	100033	Jul. 06, 2009	Jul. 05, 2010
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100076	May 26, 2009	May 25, 2010
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 27, 2010	Apr. 26, 2011
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jul. 01, 2009	Jun. 30, 2010
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 25, 2009	Dec. 24, 2010
Preamplifier Agilent	8447D	2944A10633	Nov. 10, 2009	Nov. 09, 2010
Preamplifier Agilent	8449B	3008A01964	Nov. 09, 2009	Nov. 08, 2010
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 13, 2009	May 12, 2010
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 13, 2009	May 12, 2010
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 HwaYa Chamber 3.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 988962.
  5. The IC Site Registration No. is IC 7450F-3.

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

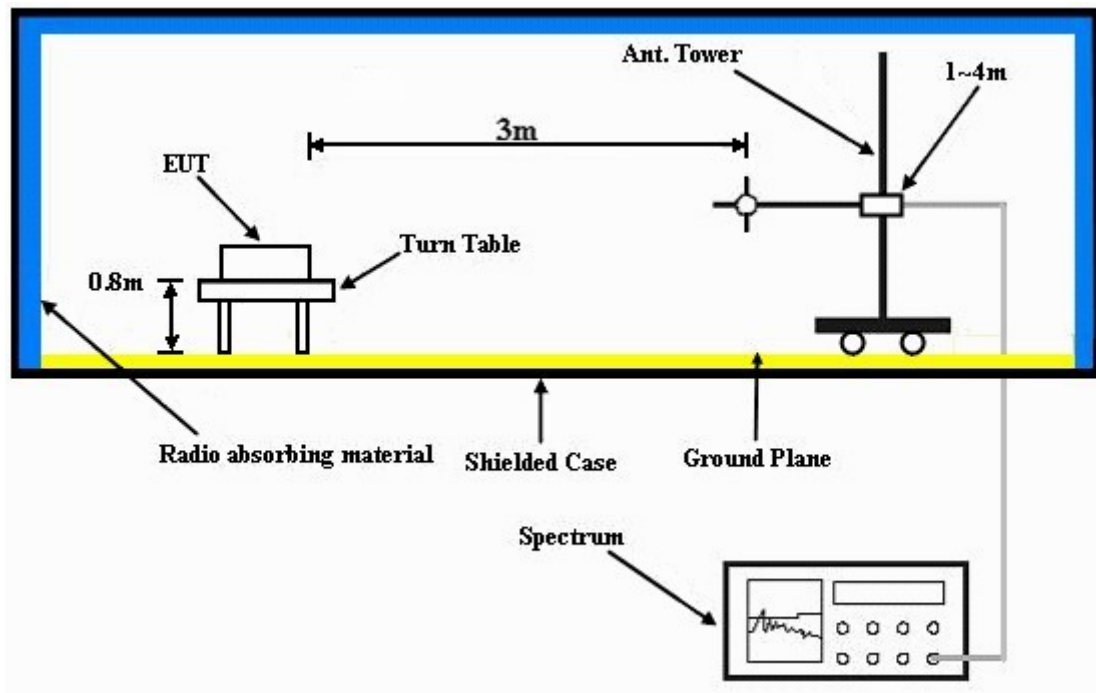
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.1.5 TEST SETUP



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

#### 4.1.6 EUT OPERATING CONDITIONS

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

#### 4.1.7 TEST RESULTS

##### ABOVE 1GHz WORST-CASE DATA : 802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH 1010hPa	TESTED BY	Brad Wu

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	2390.00	59.40 PK	74.00	-14.60	1.12 H	109	28.90	30.50
2	2390.00	51.00 AV	54.00	-3.00	1.12 H	109	20.50	30.50
3	*2412.00	112.80 PK			1.12 H	109	82.20	30.60
4	*2412.00	108.50 AV			1.12 H	109	77.90	30.60
5	4824.00	55.80 PK	74.00	-18.20	1.19 H	101	19.70	36.10
6	4824.00	51.90 AV	54.00	-2.10	1.19 H	101	15.80	36.10

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	2390.00	58.70 PK	74.00	-15.30	1.04 V	165	28.20	30.50
2	2390.00	50.40 AV	54.00	-3.60	1.04 V	165	19.90	30.50
3	*2412.00	111.70 PK			1.04 V	165	81.10	30.60
4	*2412.00	107.40 AV			1.04 V	165	76.80	30.60
5	4824.00	54.90 PK	74.00	-19.10	1.14 V	56	18.80	36.10
6	4824.00	51.00 AV	54.00	-3.00	1.14 V	56	14.90	36.10

- 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.
  5. “ \* “: Fundamental frequency.



**BELOW 1GHz WORST-CASE DATA : 802.11g**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1009hPa	TESTED BY	Brad Wu
TEST MODE	A		

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	212.66	33.30 QP	43.50	-10.20	1.00 H	148	21.90	11.40
2	399.31	34.60 QP	46.00	-11.40	1.00 H	307	16.50	18.10
3	500.42	36.40 QP	46.00	-9.60	1.50 H	337	15.90	20.50
4	624.85	37.40 QP	46.00	-8.60	1.00 H	37	14.30	23.10
5	751.23	36.80 QP	46.00	-9.20	1.00 H	121	11.20	25.60
6	799.84	36.20 QP	46.00	-9.80	1.00 H	163	10.10	26.10
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	57.12	35.40 QP	40.00	-4.60	1.00 V	85	22.40	13.00
2	249.60	36.00 QP	46.00	-10.00	1.00 V	331	22.10	13.90
3	500.42	41.70 QP	46.00	-4.30	1.00 V	13	21.20	20.50
4	624.85	34.10 QP	46.00	-11.90	1.00 V	10	11.00	23.10
5	751.23	38.20 QP	46.00	-7.80	1.00 V	322	12.60	25.60
6	875.67	37.70 QP	46.00	-8.30	1.00 V	10	10.20	27.50

- 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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1009hPa	TESTED BY	Brad Wu
TEST MODE	B		

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	249.60	37.60 QP	46.00	-8.40	1.00 H	10	23.70	13.90
2	374.04	37.00 QP	46.00	-9.00	1.00 H	61	20.00	17.00
3	399.31	35.40 QP	46.00	-10.60	1.00 H	199	17.30	18.10
4	624.85	35.90 QP	46.00	-10.10	1.00 H	292	12.80	23.10
5	751.23	40.70 QP	46.00	-5.30	1.00 H	112	15.10	25.60
6	933.99	40.80 QP	46.00	-5.20	1.50 H	289	12.40	28.40
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	99.89	36.40 QP	43.50	-7.10	1.00 V	19	24.80	11.60
2	249.60	34.50 QP	46.00	-11.50	1.00 V	151	20.60	13.90
3	500.42	37.80 QP	46.00	-8.20	1.00 V	358	17.30	20.50
4	624.85	36.20 QP	46.00	-9.80	1.50 V	7	13.10	23.10
5	751.23	39.80 QP	46.00	-6.20	1.50 V	28	14.20	25.60
6	933.31	44.60 QP	46.00	-1.40	1.09 V	265	16.20	28.40

- 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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1009hPa	TESTED BY	Brad Wu
TEST MODE	C		

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	156.28	31.20 QP	43.50	-12.30	2.00 H	331	16.90	14.30
2	249.60	33.40 QP	46.00	-12.60	1.00 H	43	19.50	13.90
3	399.31	37.40 QP	46.00	-8.60	1.00 H	322	19.30	18.10
4	500.42	39.00 QP	46.00	-7.00	2.00 H	286	18.50	20.50
5	751.23	39.80 QP	46.00	-6.20	1.00 H	307	14.20	25.60
6	933.99	36.20 QP	46.00	-9.80	1.50 H	322	7.80	28.40
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	156.28	37.20 QP	43.50	-6.30	1.00 V	10	22.90	14.30
2	399.31	37.70 QP	46.00	-8.30	1.00 V	10	19.60	18.10
3	500.42	40.50 QP	46.00	-5.50	1.00 V	346	20.00	20.50
4	751.23	39.40 QP	46.00	-6.60	1.00 V	10	13.80	25.60
5	858.17	41.20 QP	46.00	-4.80	2.00 V	79	14.10	27.10
6	933.31	44.80 QP	46.00	-1.20	1.02 V	267	16.40	28.40

- 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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1009hPa	TESTED BY	Brad Wu
TEST MODE	D		

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	160.17	38.90 QP	43.50	-4.60	1.50 H	109	24.50	14.40
2	193.22	38.40 QP	43.50	-5.10	1.00 H	10	27.50	10.90
3	533.47	35.90 QP	46.00	-10.10	1.50 H	304	14.70	21.20
4	751.23	41.60 QP	46.00	-4.40	1.00 H	298	16.00	25.60
5	799.84	38.30 QP	46.00	-7.70	1.00 H	202	12.20	26.10
6	933.99	40.20 QP	46.00	-5.80	1.50 H	154	11.80	28.40
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	160.17	37.80 QP	43.50	-5.70	1.00 V	58	23.40	14.40
2	399.31	33.70 QP	46.00	-12.30	1.00 V	10	15.60	18.10
3	500.42	39.60 QP	46.00	-6.40	1.00 V	346	19.10	20.50
4	751.23	39.30 QP	46.00	-6.70	1.00 V	10	13.70	25.60
5	873.72	40.10 QP	46.00	-5.90	1.50 V	10	12.70	27.40
6	933.99	43.50 QP	46.00	-2.50	1.00 V	262	15.10	28.40

- 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.

## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 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.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Dec. 16, 2009	Dec. 15, 2010
RF signal cable Woken	5D-FB	Cable-HYC01-01	Nov. 12, 2009	Nov. 11, 2010
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jun. 18, 2009	Jun. 17, 2010
LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jun. 03, 2009	Jun. 02, 2010
Software ADT	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 HwaYa Shielded Room 1.
  3. The VCCI Site Registration No. is C-2040.

#### 4.2.3 TEST PROCEDURES

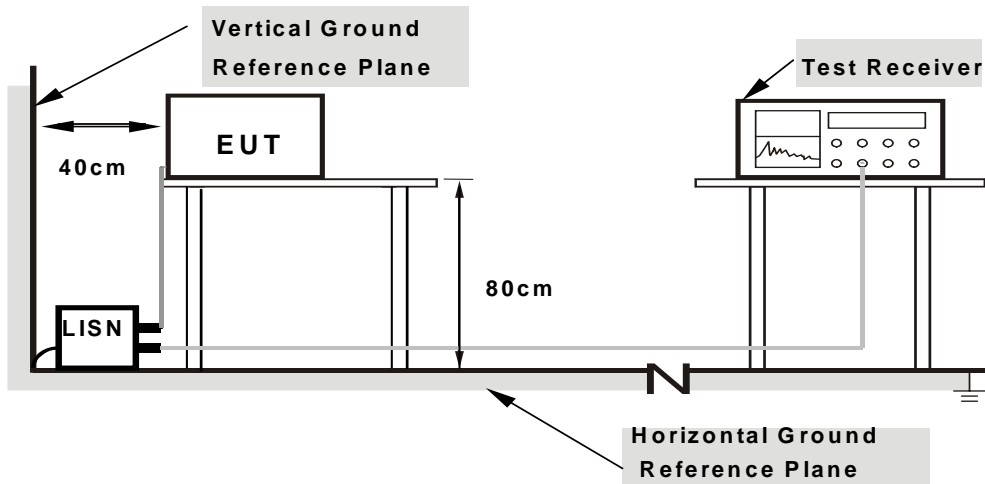
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 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 attached file (Test Setup Photo).

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

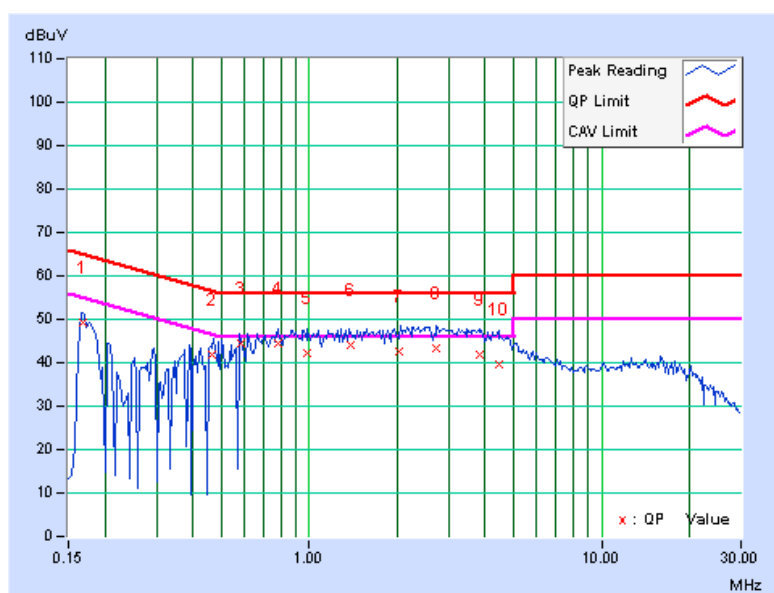
### 4.2.7 TEST RESULTS

#### CONDUCTED WORST-CASE DATA: 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.167	0.12	49.26	-	49.38	-	65.09	55.09	-15.71	-
2	0.463	0.14	41.65	-	41.79	-	56.64	46.64	-14.86	-
3	0.581	0.15	44.13	-	44.28	-	56.00	46.00	-11.72	-
4	0.787	0.16	44.34	-	44.50	-	56.00	46.00	-11.50	-
5	0.986	0.18	42.07	-	42.25	-	56.00	46.00	-13.75	-
6	1.388	0.21	43.75	-	43.96	-	56.00	46.00	-12.04	-
7	2.036	0.25	42.35	-	42.60	-	56.00	46.00	-13.40	-
8	2.734	0.29	42.99	-	43.28	-	56.00	46.00	-12.72	-
9	3.852	0.34	41.45	-	41.79	-	56.00	46.00	-14.21	-
10	4.457	0.37	39.34	-	39.71	-	56.00	46.00	-16.29	-

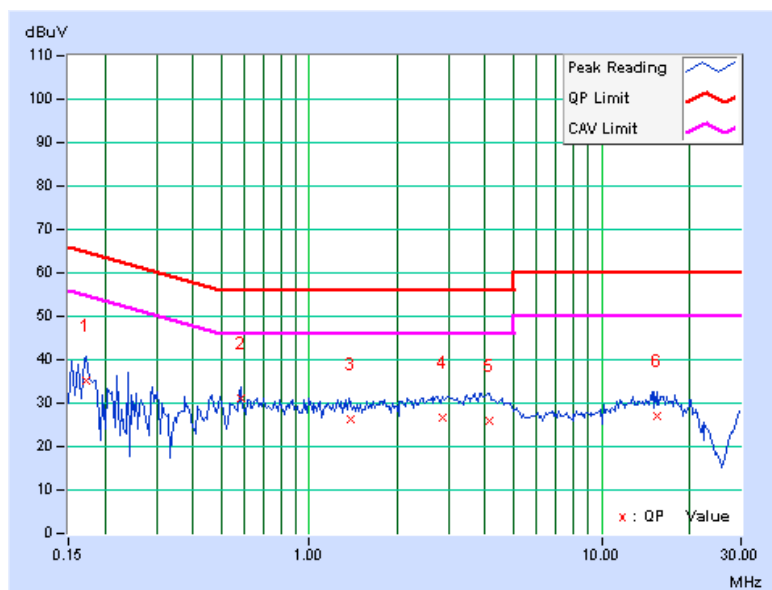
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>PHASE</b>	Line 2	<b>6dB BANDWIDTH</b>	9kHz
<b>TEST MODE</b>	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	34.98	-	35.08	-	64.79	54.79	-29.71	-
2	0.581	0.14	30.79	-	30.93	-	56.00	46.00	-25.07	-
3	1.390	0.20	25.92	-	26.12	-	56.00	46.00	-29.88	-
4	2.867	0.27	26.27	-	26.54	-	56.00	46.00	-29.46	-
5	4.111	0.32	25.71	-	26.03	-	56.00	46.00	-29.97	-
6	15.552	0.96	26.07	-	27.03	-	60.00	50.00	-32.97	-

- 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.

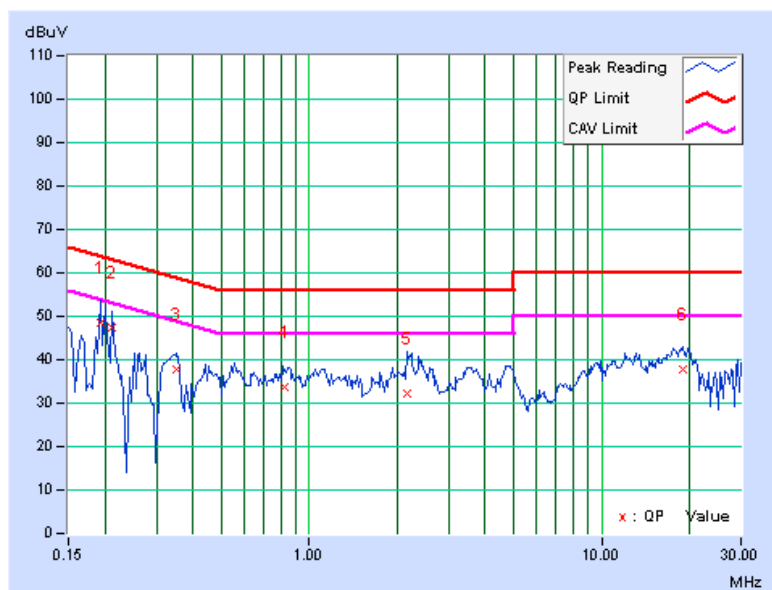




PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.11	48.53	-	48.64	-	63.91	53.91	-15.27	-
2	0.213	0.11	47.17	-	47.28	-	63.11	53.11	-15.83	-
3	0.353	0.13	37.51	-	37.64	-	58.89	48.89	-21.25	-
4	0.823	0.17	33.48	-	33.65	-	56.00	46.00	-22.35	-
5	2.172	0.26	31.86	-	32.12	-	56.00	46.00	-23.88	-
6	18.886	1.40	36.53	-	37.93	-	60.00	50.00	-22.07	-

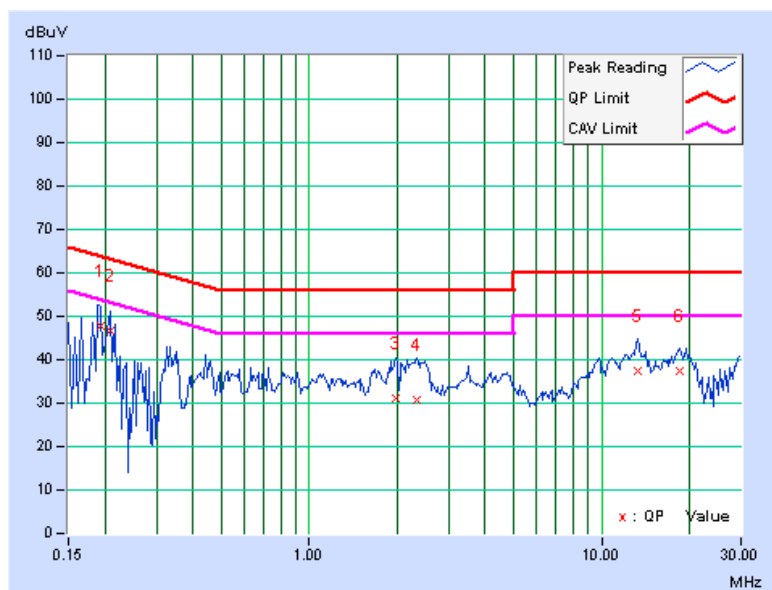
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>PHASE</b>	Line 2	<b>6dB BANDWIDTH</b>	9kHz
<b>TEST MODE</b>	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.10	47.67	-	47.77	-	63.91	53.91	-16.14	-
2	0.209	0.10	46.62	-	46.72	-	63.26	53.26	-16.54	-
3	1.975	0.24	30.80	-	31.04	-	56.00	46.00	-24.96	-
4	2.332	0.25	30.51	-	30.76	-	56.00	46.00	-25.24	-
5	13.349	0.80	36.56	-	37.36	-	60.00	50.00	-22.64	-
6	18.481	1.19	36.25	-	37.44	-	60.00	50.00	-22.56	-

- 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.



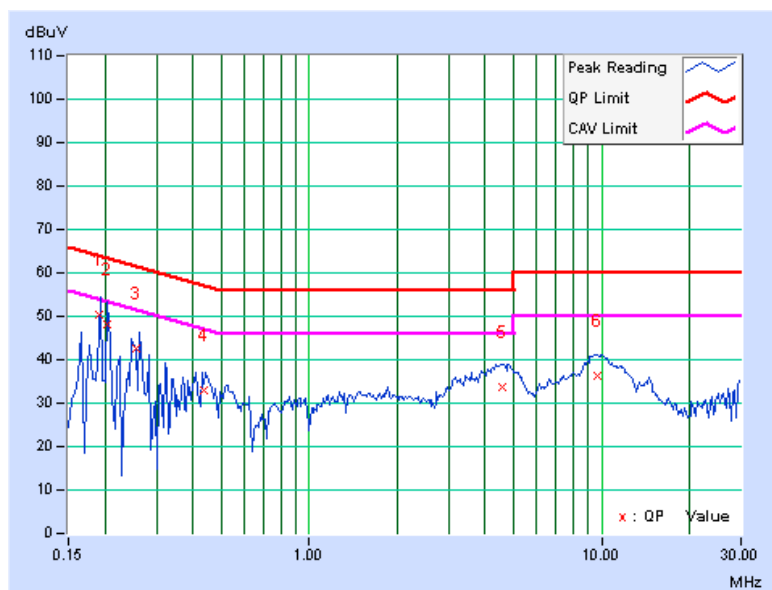


A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	C		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.190	0.11	50.21	-	50.32	-	64.02	54.02	-13.69	-
2	0.205	0.11	48.10	-	48.21	-	63.42	53.42	-15.21	-
3	0.254	0.12	42.42	-	42.54	-	61.62	51.62	-19.08	-
4	0.438	0.13	32.94	-	33.07	-	57.10	47.10	-24.03	-
5	4.549	0.38	33.15	-	33.53	-	56.00	46.00	-22.47	-
6	9.697	0.63	35.73	-	36.36	-	60.00	50.00	-23.64	-

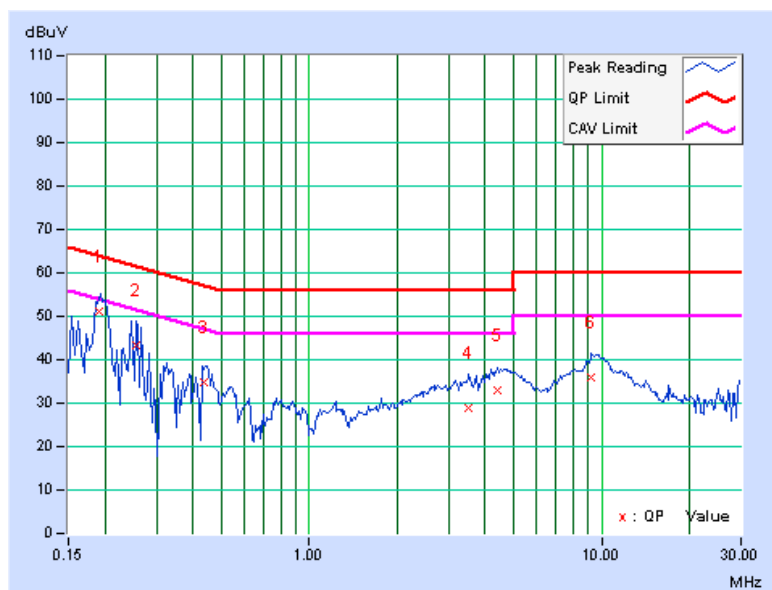
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>PHASE</b>	Line 2	<b>6dB BANDWIDTH</b>	9kHz
<b>TEST MODE</b>	C		

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	0.190	0.10	51.05	-	51.15	-	64.02	54.02	-12.87	-
2	0.255	0.11	43.19	-	43.30	-	61.58	51.58	-18.28	-
3	0.435	0.12	34.79	-	34.91	-	57.16	47.16	-22.24	-
4	3.520	0.30	28.63	-	28.93	-	56.00	46.00	-27.07	-
5	4.427	0.34	32.68	-	33.02	-	56.00	46.00	-22.98	-
6	9.262	0.53	35.39	-	35.92	-	60.00	50.00	-24.08	-

- 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.



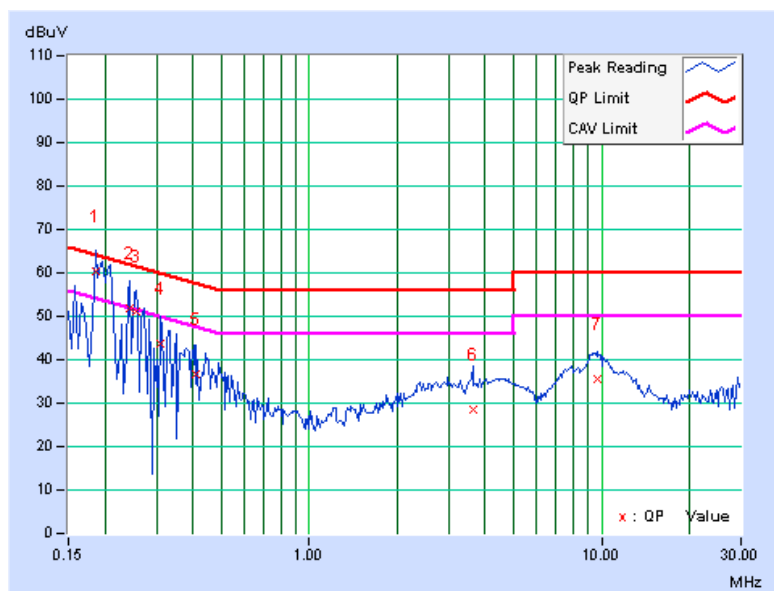


A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	D		

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.185	0.11	60.28	40.31	60.39	40.42	64.25	54.25	-3.86	-13.83
2	0.244	0.11	51.85	-	51.96	-	61.97	51.97	-10.00	-
3	0.255	0.12	50.94	-	51.06	-	61.58	51.58	-10.52	-
4	0.310	0.12	43.55	-	43.67	-	59.97	49.97	-16.30	-
5	0.412	0.13	36.58	-	36.71	-	57.61	47.61	-20.90	-
6	3.641	0.33	28.11	-	28.44	-	56.00	46.00	-27.56	-
7	9.703	0.63	34.91	-	35.54	-	60.00	50.00	-24.46	-

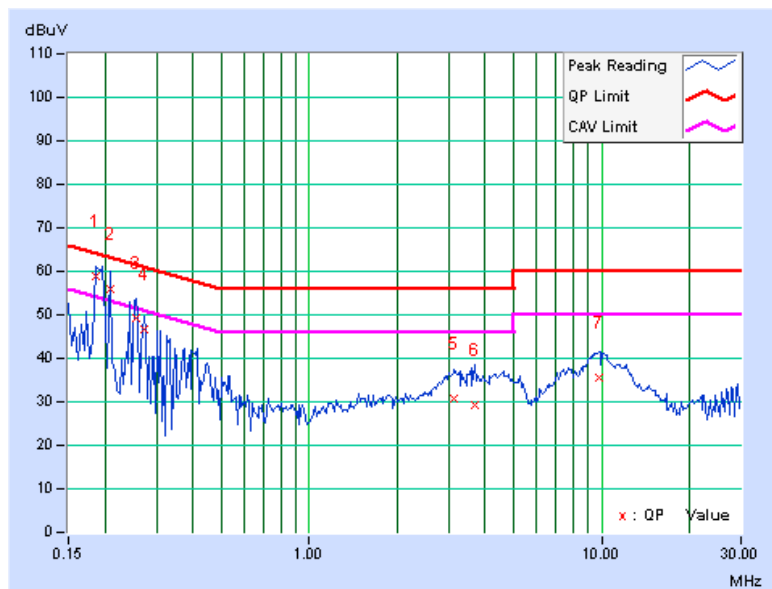
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>PHASE</b>	Line 2	<b>6dB BANDWIDTH</b>	9kHz
<b>TEST MODE</b>	D		

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	0.187	0.10	58.77	40.51	58.87	40.61	64.18	54.18	-5.31	-13.57
2	0.209	0.10	55.79	36.92	55.89	37.02	63.26	53.26	-7.37	-16.24
3	0.255	0.11	49.27	-	49.38	-	61.58	51.58	-12.20	-
4	0.271	0.11	46.49	-	46.60	-	61.08	51.08	-14.49	-
5	3.145	0.29	30.48	-	30.77	-	56.00	46.00	-25.23	-
6	3.664	0.31	28.99	-	29.30	-	56.00	46.00	-26.70	-
7	9.802	0.55	35.14	-	35.69	-	60.00	50.00	-24.31	-

- 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.



## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



## 6. 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: 886-2-26051924

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3185050

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

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



## **7. 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 ---**