



FCC TEST REPORT

REPORT NO.: RF980114L01D

MODEL NO.: SVG2501 (refer to item 3.1 for more details)

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APPLICANT: GENERAL INSTRUMENT OF TAIWAN, LTD.

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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 -6.30dB at 0.193MHz.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -2.40dB at 933.99MHz.

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

PRODUCT	Wireless Voice Gateway
MODEL NO.	SVG2501 (refer to NOTE for more details)
FCC ID	W5HSVG1501
POWER SUPPLY	14Vdc from adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	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
OPERATING FREQUENCY	2412.0MHz ~ 2462.0MHz
NUMBER OF CHANNEL	11
MAXIMUM OUTPUT POWER	228.034mW
ANTENNA TYPE	Printed antenna with 2dBi gain (The top facing antenna) Printed antenna with 4dBi gain (The front facing antenna)
DATA CABLE	1.8m non-shielded Internet cable without core 1.5m non-shielded Diag cable without core 2.0m shielded USB cable without core
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter, battery

NOTE:

- This report is issued as a supplementary report to the original BV ADT report no.: RF980114L01.
- 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 CH11 of 802.11b mode (worst case mode of the original report).
 - ✧ Change model name.
 - ✧ Change PCB layout due to adding battery function.
 - ✧ Move the C1081 / R1049 some mils to close U701.
 - ✧ Move the top facing antenna track 0.25" to close shield(S2).
- The following models are provided to this EUT.

MODEL NO.	DIAG PORT
SVG2501	-
SVG2501 DIAGNOSTIC	√

4. The EUT was powered by the following adapters and batteries:

ADAPTER 1	
BRAND:	LITEON
MODEL:	PA-1240-5M-ROHS
INPUT POWER:	100-240Vac, 2A, 50-60Hz
OUTPUT POWER:	14Vdc, 1.7A
POWER LINE:	1.8m non-shielded cable with one core

ADAPTER 2	
BRAND:	LEADER ELECTRONICS INC.
MODEL:	NU24-2140170-I3
INPUT POWER:	100-240Vac, 50-60Hz, 0.5A
OUTPUT POWER:	14Vdc, 1.7A
POWER LINE:	1.9m non-shielded cable with one core

LI-ION BATTERY 1	
BRAND:	MOTOROLA
MODEL:	553374-001-00
RATING:	7.2Vdc, 2200mAh

LI-ION BATTERY 2	
BRAND:	MOTOROLA
MODEL:	573901-001-00
RATING:	7.2Vdc, 2200mAh

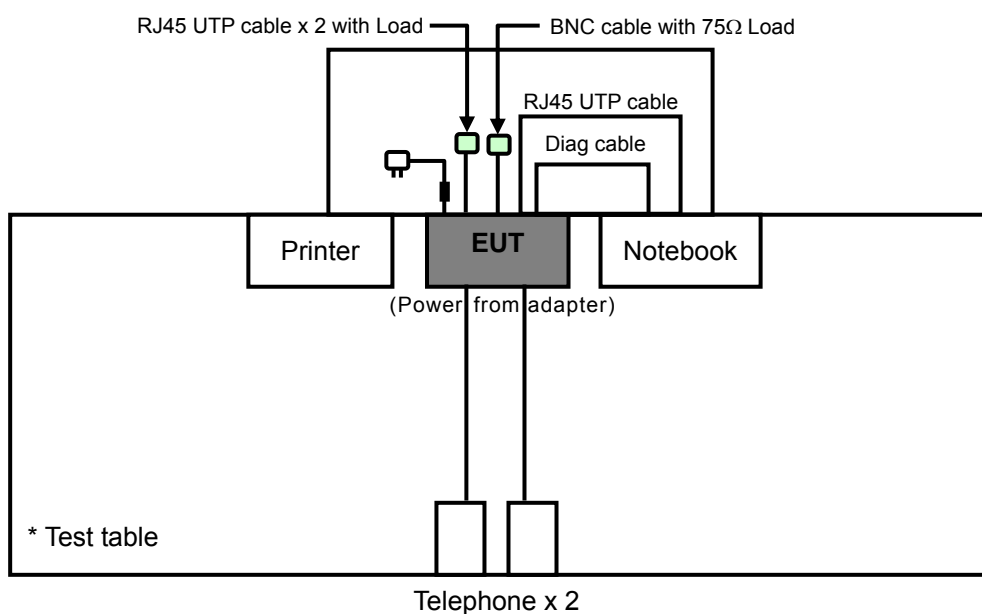
5. The front facing antenna with 4dBi gain was chosen for final test.
6. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions up to 54Mbps.
7. The above EUT information was declared by manufacturer 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	APCM	
A	√	√	√	√	Adapter 1 + Battery 1
B	-	√	√	-	Adapter 1 + Battery 2
C	-	√	√	-	Adapter 2 + Battery 1
D	-	√	√	-	Adapter 2 + Battery 2

Where **PLC**: Power Line Conducted Emission **RE<1G**: Radiated Emission below 1GHz
RE \geq 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement

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 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	802.11b	1 to 11	11	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.

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

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	26deg. C, 66%RH, 1009 hPa	120Vac, 60Hz	Brad Wu
RE $<$ 1G	25deg. C, 65%RH, 1009 hPa	120Vac, 60Hz	Brad Wu
PLC	20deg. C, 65%RH, 1006 hPa	120Vac, 60Hz	Eason Chen

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	N09-00319	QDS-BRCM1005-D
2	PRINTER	EPSON	LQ-300+	DCGY054146	FCC DoC Approved
3	TELEPHONE	WONDER	WD-303	5C17DA02743	NA
4	TELEPHONE	WONDER	WD-303	5C17DA09727	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.5m RJ45 UTP cable.
2	1.8m braid shielded wire, DB25 connector, w/o core.
3	1.8m non-shielded cable, RJ11 connector, w/o core.
4	1.8m non-shielded cable, RJ11 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	100269	Dec. 31, 2009	Dec. 30, 2010
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 27, 2010	Apr. 26, 2011
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Aug. 10, 2009	Aug. 09, 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 14, 2010	May 13, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 14, 2010	May 13, 2011
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.

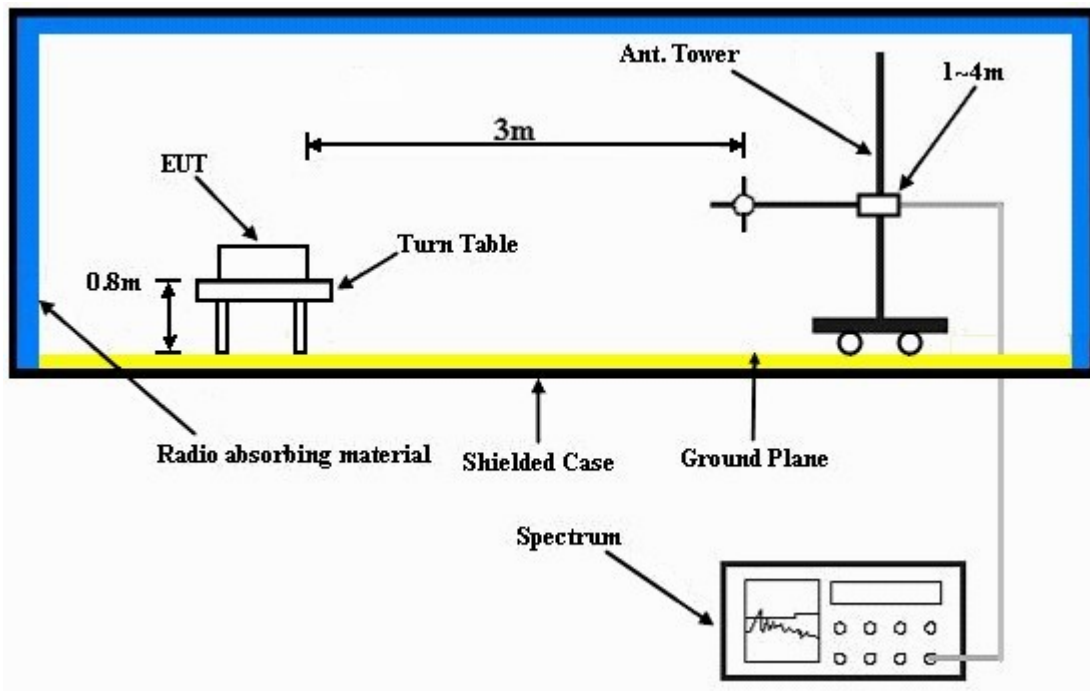
NOTE:

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

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



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4.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA : 802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH 1009 hPa	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	*2462.00	109.10 PK			1.23 H	242	78.40	30.70
2	*2462.00	105.90 AV			1.23 H	242	75.20	30.70
3	2483.50	61.10 PK	74.00	-12.90	1.23 H	242	30.30	30.80
4	2483.50	50.40 AV	54.00	-3.60	1.23 H	242	19.60	30.80
5	4924.00	52.50 PK	74.00	-21.50	1.20 H	226	16.20	36.30
6	4924.00	47.10 AV	54.00	-6.90	1.20 H	226	10.80	36.30
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	*2462.00	105.80 PK			1.00 V	152	75.10	30.70
2	*2462.00	102.00 AV			1.00 V	152	71.30	30.70
3	2483.50	59.50 PK	74.00	-14.50	1.00 V	152	28.70	30.80
4	2483.50	49.40 AV	54.00	-4.60	1.00 V	152	18.60	30.80
5	4924.00	52.40 PK	74.00	-21.60	1.06 V	280	16.10	36.30
6	4924.00	46.80 AV	54.00	-7.20	1.06 V	280	10.50	36.30

- 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 OFDM MODULATION

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 1009 hPa	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	131.00	39.8 QP	43.5	-3.7	2.00 H	76	27.50	12.30
2	249.60	41.8 QP	46.0	-4.2	1.00 H	85	27.90	13.90
3	399.31	38.7 QP	46.0	-7.3	1.00 H	220	20.60	18.10
4	607.35	41.5 QP	46.0	-4.5	1.00 H	10	18.80	22.70
5	751.23	40.3 QP	46.0	-5.7	1.00 H	10	14.70	25.60
6	933.99	39.0 QP	46.0	-7.0	2.00 H	199	10.60	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	59.06	35.8 QP	40.0	-4.2	1.50 V	100	22.90	12.90
2	134.89	36.0 QP	43.5	-7.5	1.00 V	334	23.40	12.60
3	263.21	37.0 QP	46.0	-9.0	1.50 V	352	23.20	13.80
4	500.42	38.1 QP	46.0	-7.9	1.00 V	121	17.60	20.50
5	862.06	40.0 QP	46.0	-6.0	1.00 V	124	12.80	27.20
6	933.99	42.1 QP	46.0	-3.9	1.00 V	277	13.70	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.



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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 1009 hPa	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	162.11	38.6 QP	43.5	-4.9	1.50 H	67	24.40	14.20
2	259.33	41.1 QP	46.0	-4.9	1.00 H	37	27.20	13.90
3	399.31	37.4 QP	46.0	-8.6	2.00 H	139	19.30	18.10
4	601.52	38.5 QP	46.0	-7.5	1.50 H	88	16.00	22.50
5	731.79	41.6 QP	46.0	-4.4	1.00 H	16	16.20	25.40
6	933.99	40.7 QP	46.0	-5.3	2.00 H	187	12.30	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	61.01	36.3 QP	40.0	-3.7	1.00 V	106	23.30	13.00
2	134.89	37.0 QP	43.5	-6.5	1.50 V	322	24.40	12.60
3	292.38	38.2 QP	46.0	-7.8	1.50 V	88	24.40	13.80
4	500.42	38.2 QP	46.0	-7.8	1.00 V	130	17.70	20.50
5	862.06	37.3 QP	46.0	-8.7	1.00 V	118	10.10	27.20
6	933.99	42.2 QP	46.0	-3.8	1.00 V	238	13.80	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.



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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 1009 hPa	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	162.11	39.3 QP	43.5	-4.2	1.50 H	88	25.10	14.20
2	249.60	43.3 QP	46.0	-2.7	1.00 H	295	29.40	13.90
3	399.31	41.9 QP	46.0	-4.1	1.00 H	220	23.80	18.10
4	500.42	39.4 QP	46.0	-6.6	1.50 H	253	18.90	20.50
5	595.69	38.0 QP	46.0	-8.0	1.00 H	79	15.60	22.40
6	751.23	39.3 QP	46.0	-6.7	1.50 H	22	13.70	25.60
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	64.90	35.7 QP	40.0	-4.3	1.00 V	127	22.60	13.10
2	249.60	37.8 QP	46.0	-8.2	1.00 V	340	23.90	13.90
3	399.31	36.8 QP	46.0	-9.2	1.50 V	328	18.70	18.10
4	500.42	40.7 QP	46.0	-5.3	1.00 V	289	20.20	20.50
5	751.23	38.3 QP	46.0	-7.7	1.50 V	340	12.70	25.60
6	933.99	43.6 QP	46.0	-2.4	1.00 V	238	15.20	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.



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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 1009 hPa	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	40.2 QP	43.5	-3.3	1.50 H	106	25.80	14.40
2	249.60	42.1 QP	46.0	-3.9	1.00 H	304	28.20	13.90
3	265.16	41.8 QP	46.0	-4.2	1.00 H	58	28.00	13.80
4	399.31	41.4 QP	46.0	-4.6	1.00 H	217	23.30	18.10
5	500.42	40.2 QP	46.0	-5.8	1.50 H	238	19.70	20.50
6	933.99	40.1 QP	46.0	-5.9	2.00 H	178	11.70	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	45.45	35.0 QP	40.0	-5.0	1.00 V	121	20.80	14.20
2	62.95	34.9 QP	40.0	-5.1	1.00 V	217	21.90	13.00
3	249.60	38.0 QP	46.0	-8.0	1.50 V	340	24.10	13.90
4	500.42	40.7 QP	46.0	-5.3	1.00 V	277	20.20	20.50
5	751.23	37.8 QP	46.0	-8.2	1.50 V	337	12.20	25.60
6	933.99	42.2 QP	46.0	-3.8	1.00 V	274	13.80	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 μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

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 SCHWARZBECK	NNBL 8226-2	8226-142	Jun. 12, 2010	Jun. 12, 2011
LISN ROHDE & SCHWARZ	ESH3-Z5	835239/001	Feb., 10, 2010	Feb. 09, 2011
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

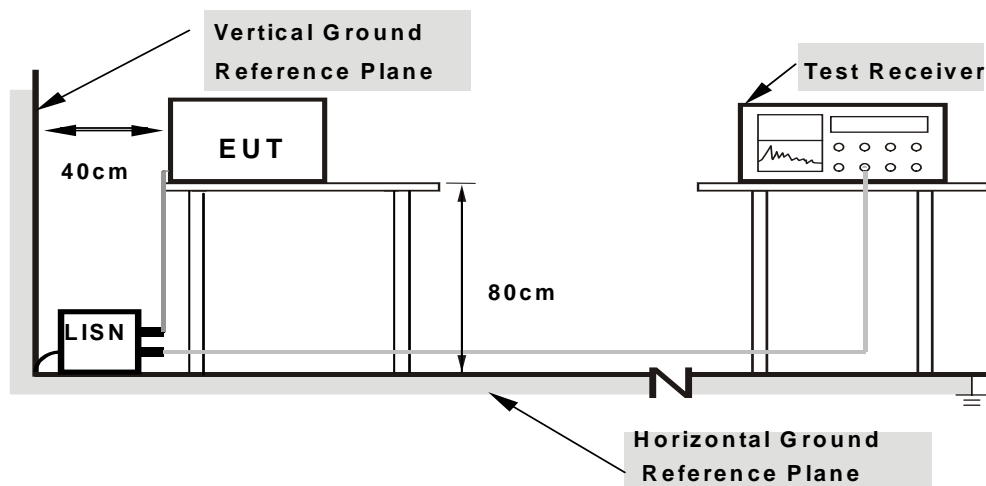
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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.

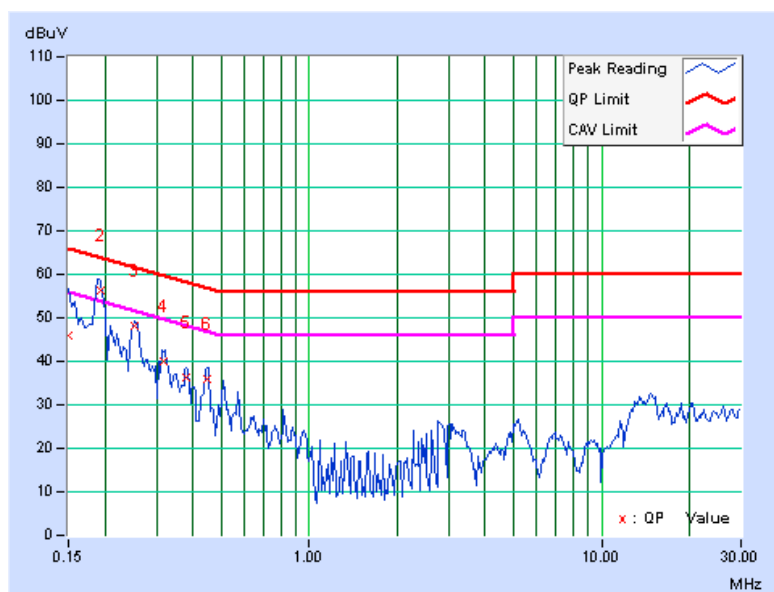
4.2.7 TEST RESULTS

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	0.150	0.12	45.67	-	45.79	-	66.00	56.00	-20.21	-
2	0.193	0.11	56.31	45.88	56.42	45.99	63.91	53.91	-7.49	-7.92
3	0.252	0.12	47.85	-	47.97	-	61.71	51.71	-13.74	-
4	0.318	0.12	39.80	-	39.92	-	59.76	49.76	-19.84	-
5	0.380	0.13	36.07	-	36.20	-	58.27	48.27	-22.07	-
6	0.447	0.13	35.68	-	35.81	-	56.93	46.93	-21.12	-

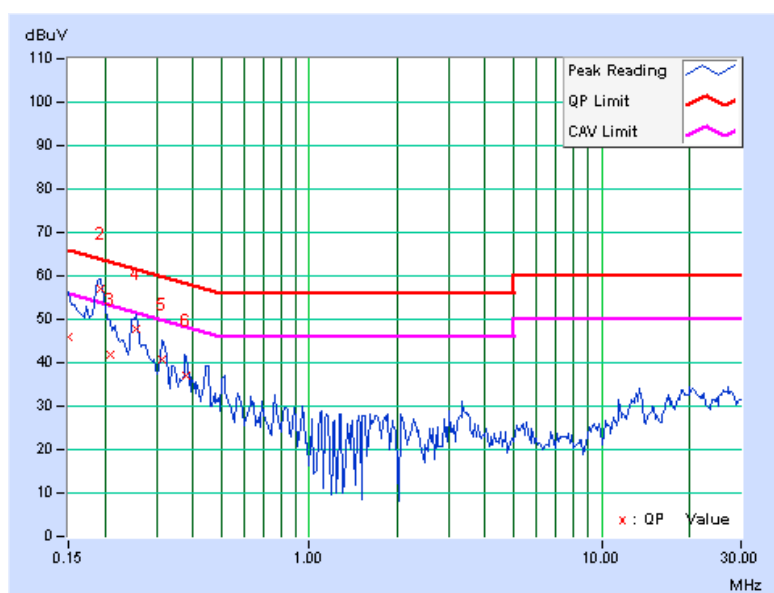
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.150	0.10	45.83	-	45.93	-	66.00	56.00	-20.07	-
2	0.193	0.10	56.91	47.51	57.01	47.61	63.91	53.91	-6.90	-6.30
3	0.209	0.10	41.72	-	41.82	-	63.26	53.26	-21.44	-
4	0.255	0.11	47.68	-	47.79	-	61.58	51.58	-13.79	-
5	0.314	0.11	40.55	-	40.66	-	59.86	49.86	-19.20	-
6	0.380	0.12	36.97	-	37.09	-	58.27	48.27	-21.18	-

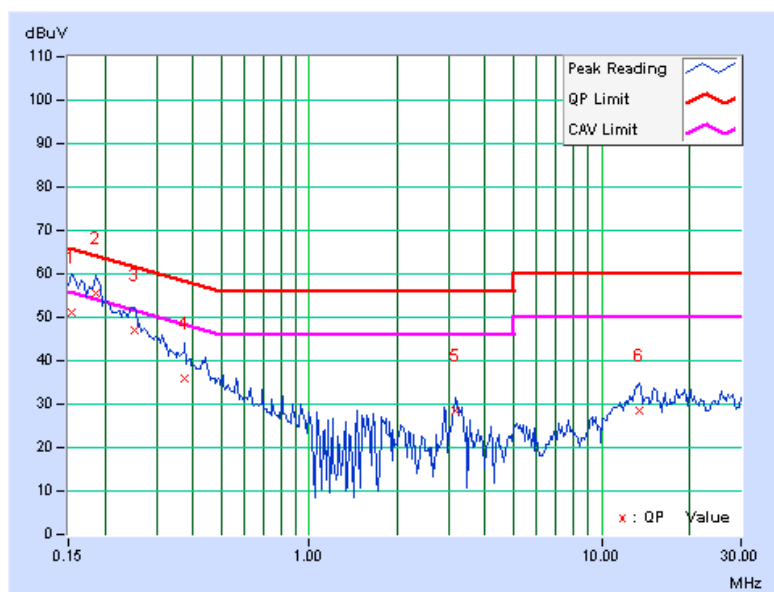
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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 [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.12	50.91	-	51.03	-	65.79	55.79	-14.76	-
2	0.186	0.11	55.46	41.36	55.57	41.47	64.19	54.19	-8.62	-12.72
3	0.252	0.12	46.87	-	46.99	-	61.71	51.71	-14.72	-
4	0.377	0.13	35.62	-	35.75	-	58.35	48.35	-22.61	-
5	3.160	0.31	28.34	-	28.65	-	56.00	46.00	-27.35	-
6	13.500	0.93	27.41	-	28.34	-	60.00	50.00	-31.66	-

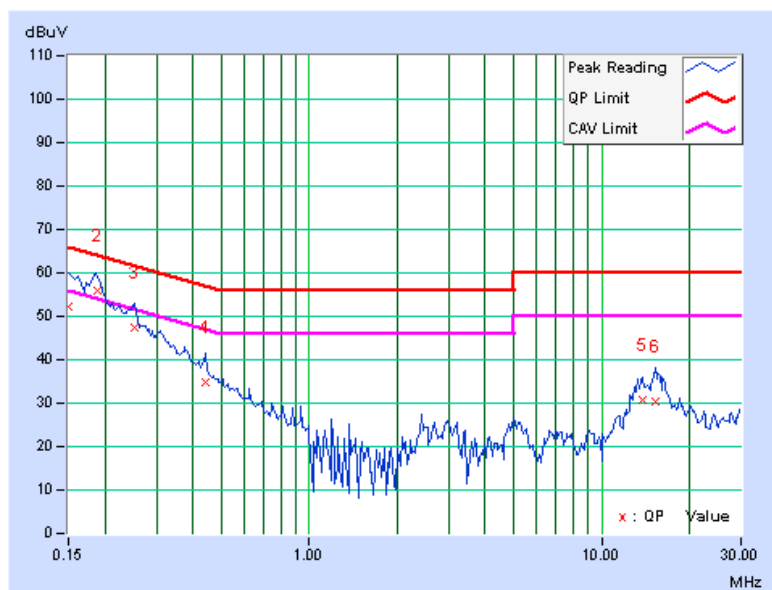
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.150	0.10	52.23	-	52.33	-	66.00	56.00	-13.67	-
2	0.189	0.10	55.93	41.44	56.03	41.54	64.07	54.07	-8.04	-12.53
3	0.252	0.11	47.20	-	47.31	-	61.71	51.71	-14.40	-
4	0.439	0.12	34.74	-	34.86	-	57.08	47.08	-22.22	-
5	13.738	0.83	29.77	-	30.60	-	60.00	50.00	-29.40	-
6	15.258	0.94	29.44	-	30.38	-	60.00	50.00	-29.62	-

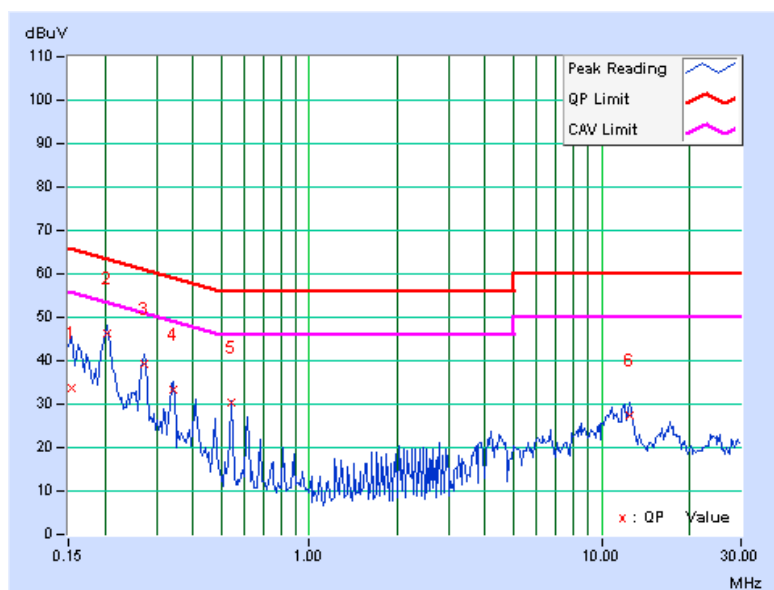
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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	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	0.154	0.12	33.62	-	33.74	-	65.79	55.79	-32.05	-
2	0.205	0.11	46.09	-	46.20	-	63.42	53.42	-17.22	-
3	0.271	0.12	39.22	-	39.34	-	61.08	51.08	-21.75	-
4	0.341	0.12	33.11	-	33.23	-	59.17	49.17	-25.93	-
5	0.545	0.14	30.13	-	30.27	-	56.00	46.00	-25.73	-
6	12.437	0.84	26.63	-	27.47	-	60.00	50.00	-32.53	-

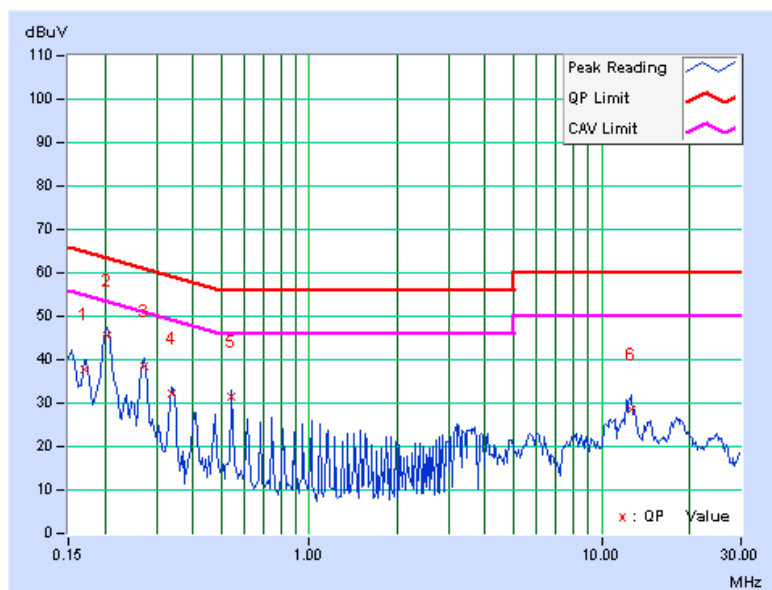
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	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	0.170	0.10	37.81	-	37.91	-	64.98	54.98	-27.07	-
2	0.205	0.10	45.60	-	45.70	-	63.42	53.42	-17.72	-
3	0.271	0.11	38.33	-	38.44	-	61.08	51.08	-22.65	-
4	0.338	0.11	32.16	-	32.27	-	59.26	49.26	-26.99	-
5	0.545	0.13	31.22	-	31.35	-	56.00	46.00	-24.65	-
6	12.645	0.75	27.77	-	28.52	-	60.00	50.00	-31.48	-

- 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.



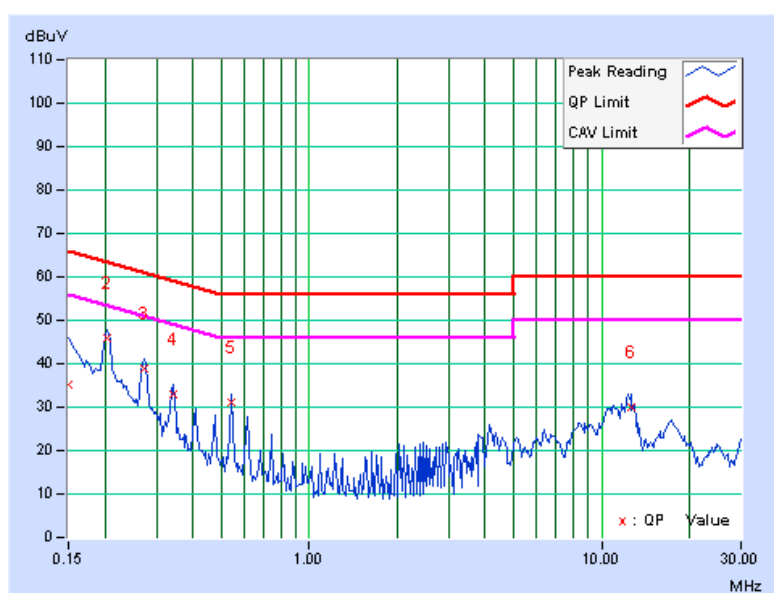


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PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	D		

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	0.150	0.12	35.23	-	35.35	-	66.00	56.00	-30.65	-
2	0.205	0.11	45.76	-	45.87	-	63.42	53.42	-17.55	-
3	0.271	0.12	38.88	-	39.00	-	61.08	51.08	-22.09	-
4	0.341	0.12	32.90	-	33.02	-	59.17	49.17	-26.14	-
5	0.545	0.14	31.11	-	31.25	-	56.00	46.00	-24.75	-
6	12.645	0.86	29.24	-	30.10	-	60.00	50.00	-29.90	-

- 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.



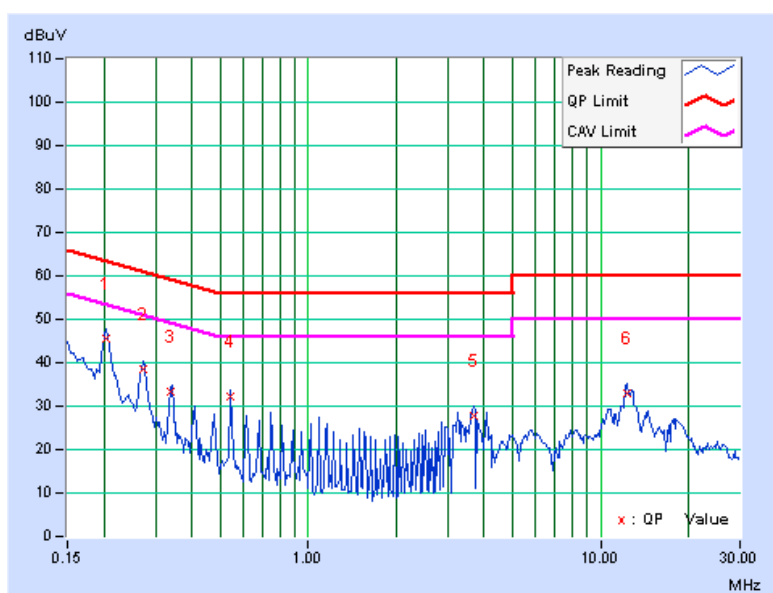


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PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	D		

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	0.205	0.10	45.54	-	45.64	-	63.42	53.42	-17.78	-
2	0.271	0.11	38.47	-	38.58	-	61.08	51.08	-22.51	-
3	0.340	0.11	33.07	-	33.18	-	59.20	49.20	-26.02	-
4	0.545	0.13	32.11	-	32.24	-	56.00	46.00	-23.76	-
5	3.672	0.31	27.40	-	27.71	-	56.00	46.00	-28.29	-
6	12.302	0.73	32.12	-	32.85	-	60.00	50.00	-27.15	-

- 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. 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

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 ---