

FCC TEST REPORT

REPORT NO.: RF111104C27

MODEL NO.: WCR-HP-G300 (refer to item 3.1 for more detail)

FCC ID: FDI-09101938-0

RECEIVED: Nov. 04, 2011

TESTED: Nov. 15 ~ Nov. 16, 2011

ISSUED: Nov. 21, 2011

APPLICANT: Buffalo Inc.

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

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New
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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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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	NA	Nov. 21, 2011

1. CERTIFICATION

PRODUCT: 802.11n/b/g Wireless Access Point Router

MODEL: WCR-HP-G300 (refer to item 3.1 for more detail)

BRAND: Buffalo

APPLICANT: Buffalo Inc.

TESTED: Nov. 15 ~ Nov. 16, 2011

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**

ANSI C63.4-2003

ANSI C63.10-2009

The above equipment (model: WCR-HP-G300) 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 : Ivonne Wu , **DATE** : Nov. 21, 2011
Ivonne Wu / Senior Specialist

APPROVED BY : Gary Chang , **DATE** : Nov. 21, 2011
Gary Chang / Technical Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -15.55dB at 0.162MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 1608.00MHz, 2390.00MHz, 1624.00MHz, 2483.50MHz and 4824.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connectors are R-SMA and UFL.

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	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

EUT	802.11n/b/g Wireless Access Point Router
MODEL NO.	WCR-HP-G300 (refer to note as below)
FCC ID	FDI-09101938-0
POWER SUPPLY	12Vdc
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 802.11n: up to 300Mbps
OPERATING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	279.3mW
ANTENNA TYPE	Refer to NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

- All models are listed as below.

BRAND	MODEL	REMARK
Buffalo	WCR-HP-G300	With 7dBi dipole antenna
	WCR-G300	With 5dBi dipole antenna

*The model: WCR-HP-G300 was chosen for the final test and presented in the test report.

- The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	2TX
802.11g	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

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3. The EUT uses following adapter.

ADAPTER	
BRAND:	DVE
MODEL:	DSA-12G-12 FUS 120120
INPUT:	100-240Vac, 50/60Hz, 0.3A
OUTPUT:	12Vdc, 1.0A
POWER LINE:	1.6m non-shielded cable w/o core

4. The following antennas were provided to the EUT.

ANTENNA	ANTENNA TYPE	ANTENNA GAIN	ANTENNA CONNECTOR	MANUFACTURER	ANTENNA MODEL	REMARK
Antenna 1	Dipole Antenna	5dBi	UFL	TSKY CO., LTD.	A8-A003-00062	-
Antenna 2					A8-A003-00060	
Antenna 3	Dipole Antenna	7dBi	R-SMA	WHA YU INDUSTRIAL CO., LTD.	C210-510573-A(SS R-12840)	Main Source
Antenna 4				TSKY CO., LTD.	A8-A003-00061	2 nd Source

*Antenna 3 was chosen for the final test and presented in the report.

5. The above EUT information is 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

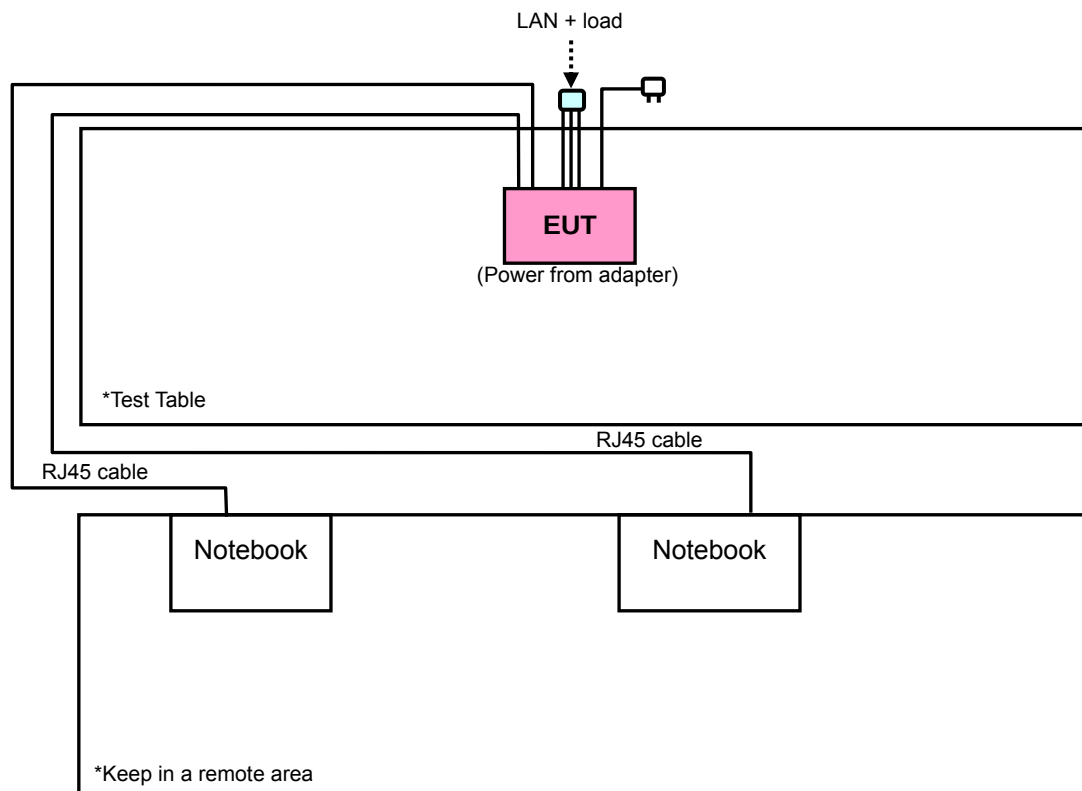
11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

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		

7 channels are provided for 802.11n (40MHz):

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

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 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-0G5152-48643-487-0068	NA
2	NOTEBOOK	DELL	D531	CN-0XM006-48643-81U-2610	QDS-BRCM1020

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 UTP cable without core
2	10m RJ45 UTP cable without core

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Items 1 ~ 2 acted as communication partners to transfer data.

3.2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

RADIATED EMISSION TEST (ABOVE 1GHz):

- ☒ 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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	15.0

RADIATED EMISSION TEST (BELOW 1GHz):

- ☒ 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)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0

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)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0

BANDEDGE MEASUREMENT:

- ☒ 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)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	15.0

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ 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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE _≥ 1G	25deg. C, 65%RH	120Vac, 60Hz	Antony Lee
RE _{<} 1G	25deg. C, 65%RH	120Vac, 60Hz	Antony Lee
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	25deg. C, 65%RH	120Vac, 60Hz	Antony Lee

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

ANSI C63.10-2009

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.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). Other emissions shall be at least 20dB below the highest level of the desired power:

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	838496/016	Dec. 27, 2010	Dec. 26, 2011
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 12, 2011	Apr. 11, 2012
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 06, 2011	Jan. 05, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8449B	3008A01961	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8447D	2944A10738	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250792/4	Aug. 19, 2011	Aug. 18, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283397/4	Aug. 19, 2011	Aug. 18, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 19, 2011	Aug. 18, 2012
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT.	TT100.	TT93021704	NA	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Aug. 04, 2011	Aug. 03, 2012
Power Sensor	MA2411B	0738171	Aug. 04, 2011	Aug. 03, 2012

- 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 4.
 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 460141.
 5. The IC Site Registration No. is IC7450F-4.

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. Height of receiving antenna 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.

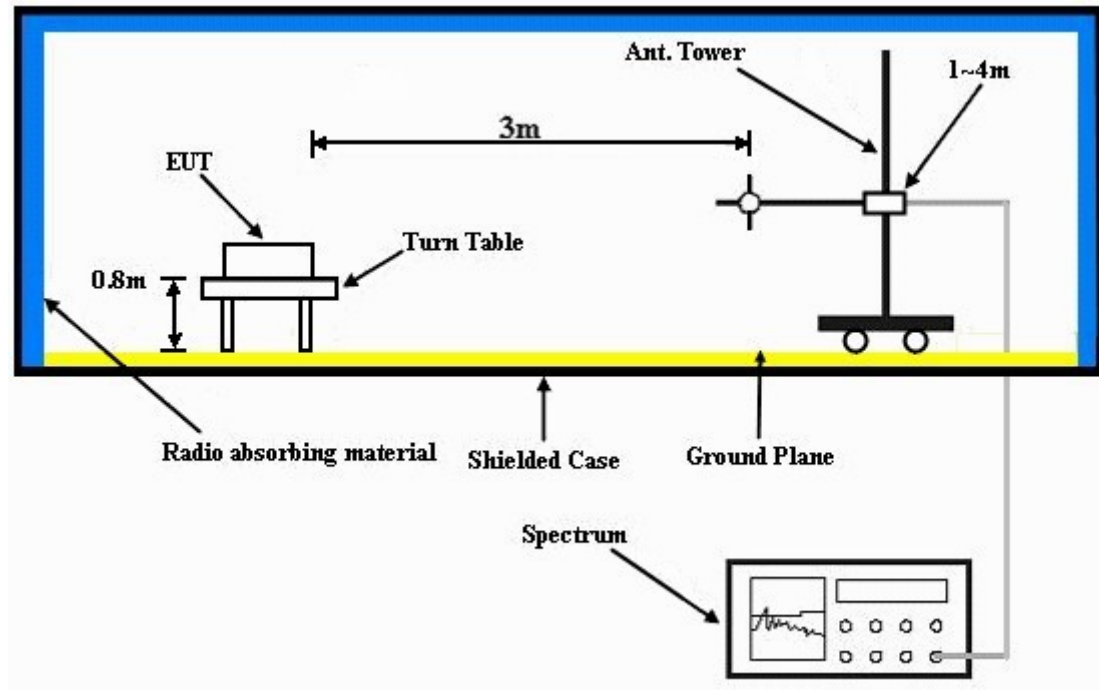
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz 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

- Placed the EUT on the testing table.
- Prepared two notebooks outside of testing area to act as communication partners.
- The communication partners connected with EUT via a RJ45 cable and run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the system in full functions

4.1.7 TEST RESULTS

802.11b

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

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	55.3 PK	74.0	-18.7	1.45 H	48	22.60	32.70
2	2390.00	44.5 AV	54.0	-9.5	1.45 H	48	11.80	32.70
3	*2412.00	93.5 PK			1.45 H	48	60.80	32.70
4	*2412.00	89.6 AV			1.45 H	48	56.90	32.70
5	4824.00	51.8 PK	74.0	-22.2	1.55 H	241	12.80	39.00
6	4824.00	47.1 AV	54.0	-6.9	1.55 H	241	8.10	39.00
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	56.9 PK	74.0	-17.1	1.02 V	229	24.20	32.70
2	2390.00	46.5 AV	54.0	-7.5	1.02 V	229	13.80	32.70
3	*2412.00	105.1 PK			1.00 V	228	72.40	32.70
4	*2412.00	102.3 AV			1.00 V	228	69.60	32.70
5	4824.00	56.9 PK	74.0	-17.1	1.00 V	103	17.90	39.00
6	4824.00	53.0 AV	54.0	-1.0	1.00 V	103	14.00	39.00

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	1624.00	56.2 PK	74.0	-17.8	1.05 H	129	26.10	30.10
2	1624.00	50.4 AV	54.0	-3.6	1.05 H	129	20.30	30.10
3	*2437.00	93.0 PK			1.00 H	155	60.20	32.80
4	*2437.00	88.4 AV			1.00 H	155	55.60	32.80
5	4874.00	52.6 PK	74.0	-21.4	1.05 H	237	13.50	39.10
6	4874.00	48.3 AV	54.0	-5.7	1.05 H	237	9.20	39.10
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	1624.00	60.2 PK	74.0	-13.8	1.00 V	69	30.10	30.10
2	1624.00	52.8 AV	54.0	-1.2	1.00 V	69	22.70	30.10
3	*2437.00	106.1 PK			1.02 V	349	73.30	32.80
4	*2437.00	101.2 AV			1.02 V	349	68.40	32.80
5	4874.00	55.7 PK	74.0	-18.3	1.00 V	155	16.60	39.10
6	4874.00	52.4 AV	54.0	-1.6	1.00 V	155	13.30	39.10

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	93.7 PK			1.00 H	156	60.80	32.90
2	*2462.00	89.5 AV			1.00 H	156	56.60	32.90
3	2483.50	56.4 PK	74.0	-17.6	1.00 H	156	23.40	33.00
4	2483.50	45.3 AV	54.0	-8.7	1.00 H	156	12.30	33.00
5	4924.00	50.5 PK	74.0	-23.5	1.02 H	6	11.30	39.20
6	4924.00	46.2 AV	54.0	-7.8	1.02 H	6	7.00	39.20
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	106.8 PK			1.00 V	149	73.90	32.90
2	*2462.00	101.9 AV			1.00 V	149	69.00	32.90
3	2483.50	58.0 PK	74.0	-16.0	1.00 V	148	25.00	33.00
4	2483.50	47.6 AV	54.0	-6.4	1.00 V	148	14.60	33.00
5	4924.00	54.5 PK	74.0	-19.5	1.00 V	155	15.30	39.20
6	4924.00	50.6 AV	54.0	-3.4	1.00 V	155	11.40	39.20

- 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.

802.11g

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

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	1608.00	57.4 PK	74.0	-16.6	1.00 H	23	27.30	30.10
2	1608.00	52.7 AV	54.0	-1.3	1.00 H	23	22.60	30.10
3	2390.00	56.6 PK	74.0	-17.4	1.00 H	136	23.90	32.70
4	2390.00	46.5 AV	54.0	-7.5	1.00 H	136	13.80	32.70
5	*2412.00	95.9 PK			1.00 H	136	63.20	32.70
6	*2412.00	85.3 AV			1.00 H	136	52.60	32.70
7	4824.00	62.5 PK	74.0	-11.5	1.00 H	79	23.50	39.00
8	4824.00	48.0 AV	54.0	-6.0	1.00 H	79	9.00	39.00
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	1608.00	58.2 PK	74.0	-15.8	1.00 V	279	28.10	30.10
2	1608.00	53.0 AV	54.0	-1.0	1.00 V	279	22.90	30.10
3	2390.00	57.9 PK	74.0	-16.1	1.00 V	228	25.20	32.70
4	2390.00	46.9 AV	54.0	-7.1	1.00 V	228	14.20	32.70
5	*2412.00	107.6 PK			1.00 V	228	74.90	32.70
6	*2412.00	98.3 AV			1.00 V	228	65.60	32.70
7	4824.00	65.9 PK	74.0	-8.1	1.00 V	80	26.90	39.00
8	4824.00	51.6 AV	54.0	-2.4	1.00 V	80	12.60	39.00

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	1624.00	56.9 PK	74.0	-17.1	1.00 H	57	26.80	30.10
2	1624.00	52.1 AV	54.0	-1.9	1.00 H	57	22.00	30.10
3	*2437.00	95.3 PK			1.00 H	139	62.50	32.80
4	*2437.00	85.4 AV			1.00 H	139	52.60	32.80
5	4874.00	62.6 PK	74.0	-11.4	1.00 H	59	23.50	39.10
6	4874.00	48.3 AV	54.0	-5.7	1.00 H	59	9.20	39.10
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	1624.00	57.6 PK	74.0	-16.4	1.00 V	281	27.50	30.10
2	1624.00	52.4 AV	54.0	-1.6	1.00 V	281	22.30	30.10
3	*2437.00	108.2 PK			1.00 V	231	75.40	32.80
4	*2437.00	97.8 AV			1.00 V	231	65.00	32.80
5	4874.00	66.3 PK	74.0	-7.7	1.00 V	75	27.20	39.10
6	4874.00	52.4 AV	54.0	-1.6	1.00 V	75	13.30	39.10

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	96.2 PK			1.00 H	133	63.30	32.90
2	*2462.00	85.4 AV			1.00 H	133	52.50	32.90
3	2483.50	56.6 PK	74.0	-17.4	1.00 H	133	23.60	33.00
4	2483.50	45.2 AV	54.0	-8.8	1.00 H	133	12.20	33.00
5	4924.00	63.5 PK	74.0	-10.5	1.00 H	85	24.30	39.20
6	4924.00	49.2 AV	54.0	-4.8	1.00 H	85	10.00	39.20
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	107.2 PK			1.00 V	247	74.30	32.90
2	*2462.00	97.2 AV			1.00 V	247	64.30	32.90
3	2483.50	59.5 PK	74.0	-14.5	1.00 V	247	26.50	33.00
4	2483.50	48.4 AV	54.0	-5.6	1.00 V	247	15.40	33.00
5	4924.00	63.6 PK	74.0	-10.4	1.45 V	231	24.40	39.20
6	4924.00	51.4 AV	54.0	-2.6	1.45 V	231	12.20	39.20

- 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.

802.11n (20MHz)

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

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	56.8 PK	74.0	-17.2	1.00 H	135	24.10	32.70
2	2390.00	46.9 AV	54.0	-7.1	1.00 H	135	14.20	32.70
3	*2412.00	96.2 PK			1.00 H	135	63.50	32.70
4	*2412.00	85.4 AV			1.00 H	135	52.70	32.70
5	4824.00	62.6 PK	74.0	-11.4	1.00 H	85	23.60	39.00
6	4824.00	48.2 AV	54.0	-5.8	1.00 H	85	9.20	39.00
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	1608.00	57.9 PK	74.0	-16.1	1.00 V	281	27.80	30.10
2	1608.00	52.8 AV	54.0	-1.2	1.00 V	281	22.70	30.10
3	2390.00	58.2 PK	74.0	-15.8	1.00 V	223	25.50	32.70
4	2390.00	47.2 AV	54.0	-6.8	1.00 V	223	14.50	32.70
5	*2412.00	108.2 PK			1.00 V	223	75.50	32.70
6	*2412.00	98.4 AV			1.00 V	223	65.70	32.70
7	4824.00	66.2 PK	74.0	-7.8	1.00 V	76	27.20	39.00
8	4824.00	51.8 AV	54.0	-2.2	1.00 V	76	12.80	39.00

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	1624.00	57.2 PK	74.0	-16.8	1.00 H	55	27.10	30.10
2	1624.00	52.3 AV	54.0	-1.7	1.00 H	55	22.20	30.10
3	*2437.00	95.6 PK			1.00 H	360	62.80	32.80
4	*2437.00	85.3 AV			1.00 H	360	52.50	32.80
5	4874.00	62.9 PK	74.0	-11.1	1.00 H	55	23.80	39.10
6	4874.00	48.6 AV	54.0	-5.4	1.00 H	55	9.50	39.10
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	1624.00	58.2 PK	74.0	-15.8	1.00 V	290	28.10	30.10
2	1624.00	52.3 AV	54.0	-1.7	1.00 V	290	22.20	30.10
3	*2437.00	107.5 PK			1.00 V	233	74.70	32.80
4	*2437.00	96.8 AV			1.00 V	233	64.00	32.80
5	4874.00	66.5 PK	74.0	-7.5	1.00 V	69	27.40	39.10
6	4874.00	52.4 AV	54.0	-1.6	1.00 V	69	13.30	39.10

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	96.2 PK			1.00 H	135	63.30	32.90
2	*2462.00	85.1 AV			1.00 H	135	52.20	32.90
3	2483.50	57.2 PK	74.0	-16.8	1.00 H	135	24.20	33.00
4	2483.50	46.3 AV	54.0	-7.7	1.00 H	135	13.30	33.00
5	4924.00	64.2 PK	74.0	-9.8	1.00 H	88	25.00	39.20
6	4924.00	50.1 AV	54.0	-3.9	1.00 H	88	10.90	39.20
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	108.2 PK			1.00 V	251	75.30	32.90
2	*2462.00	97.4 AV			1.00 V	251	64.50	32.90
3	2483.50	59.6 PK	74.0	-14.4	1.00 V	251	26.60	33.00
4	2483.50	48.7 AV	54.0	-5.3	1.00 V	251	15.70	33.00
5	4924.00	64.2 PK	74.0	-9.8	1.44 V	236	25.00	39.20
6	4924.00	51.8 AV	54.0	-2.2	1.44 V	236	12.60	39.20

- 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.

802.11n (40MHz)

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

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	58.6 PK	74.0	-15.4	1.00 H	131	25.90	32.70
2	2390.00	47.5 AV	54.0	-6.5	1.00 H	131	14.80	32.70
3	*2422.00	91.0 PK			1.00 H	131	58.20	32.80
4	*2422.00	81.2 AV			1.00 H	131	48.40	32.80
5	4844.00	50.2 PK	74.0	-23.8	1.00 H	23	11.20	39.00
6	4844.00	39.6 AV	54.0	-14.4	1.00 H	23	0.60	39.00
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	1614.00	65.7 PK	74.0	-8.3	1.00 V	253	35.60	30.10
2	1614.00	52.5 AV	54.0	-1.5	1.00 V	253	22.40	30.10
3	2390.00	65.4 PK	74.0	-8.6	1.00 V	203	32.70	32.70
4	2390.00	53.0 AV	54.0	-1.0	1.00 V	203	20.30	32.70
5	*2422.00	104.7 PK			1.00 V	185	71.90	32.80
6	*2422.00	95.7 AV			1.00 V	185	62.90	32.80
7	4844.00	53.2 PK	74.0	-20.8	1.00 V	216	14.20	39.00
8	4844.00	39.4 AV	54.0	-14.6	1.00 V	216	0.40	39.00

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	1624.00	64.8 PK	74.0	-9.2	1.00 H	15	34.70	30.10
2	1624.00	51.7 AV	54.0	-2.3	1.00 H	15	21.60	30.10
3	*2437.00	93.2 PK			1.00 H	136	60.40	32.80
4	*2437.00	83.4 AV			1.00 H	136	50.60	32.80
5	4874.00	50.9 PK	74.0	-23.1	1.00 H	56	11.80	39.10
6	4874.00	42.8 AV	54.0	-11.2	1.00 H	56	3.70	39.10
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	1624.00	65.5 PK	74.0	-8.5	1.00 V	255	35.40	30.10
2	1624.00	53.0 AV	54.0	-1.0	1.00 V	255	22.90	30.10
3	*2437.00	106.8 PK			1.00 V	193	74.00	32.80
4	*2437.00	97.3 AV			1.00 V	193	64.50	32.80
5	4874.00	53.5 PK	74.0	-20.5	1.00 V	220	14.40	39.10
6	4874.00	40.6 AV	54.0	-13.4	1.00 V	220	1.50	39.10

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	*2452.00	91.3 PK			1.00 H	360	58.40	32.90
2	*2452.00	81.4 AV			1.00 H	360	48.50	32.90
3	2483.50	58.6 PK	74.0	-15.4	1.00 H	360	25.60	33.00
4	2483.50	47.9 AV	54.0	-6.1	1.00 H	360	14.90	33.00
5	4904.00	50.5 PK	74.0	-23.5	1.00 H	24	11.30	39.20
6	4904.00	40.1 AV	54.0	-13.9	1.00 H	24	0.90	39.20
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	*2452.00	104.6 PK			1.00 V	188	71.70	32.90
2	*2452.00	94.3 AV			1.00 V	188	61.40	32.90
3	2483.50	65.2 PK	74.0	-8.8	1.00 V	189	32.20	33.00
4	2483.50	52.8 AV	54.0	-1.2	1.00 V	189	19.80	33.00
5	4904.00	54.2 PK	74.0	-19.8	1.00 V	211	15.00	39.20
6	4904.00	40.3 AV	54.0	-13.7	1.00 V	211	1.10	39.20

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	96.01	41.2 QP	43.5	-2.3	2.00 H	355	30.50	10.70
2	156.28	41.0 QP	43.5	-2.5	1.75 H	88	26.20	14.80
3	191.28	41.2 QP	43.5	-2.3	1.25 H	307	28.40	12.80
4	239.88	44.3 QP	46.0	-1.7	1.25 H	16	31.10	13.20
5	457.64	41.4 QP	46.0	-4.6	1.75 H	157	21.20	20.20
6	935.94	42.7 QP	46.0	-3.3	1.50 H	145	13.70	29.00
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	96.01	33.9 QP	43.5	-9.6	1.25 V	133	23.20	10.70
2	239.88	34.9 QP	46.0	-11.1	1.00 V	55	21.70	13.20
3	383.76	33.8 QP	46.0	-12.2	1.00 V	262	15.70	18.10
4	457.64	36.8 QP	46.0	-9.2	2.00 V	202	16.60	20.20
5	665.68	33.0 QP	46.0	-13.0	1.50 V	49	8.40	24.60
6	935.94	40.9 QP	46.0	-5.1	1.25 V	247	11.90	29.00

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 0.50MHz.
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	Nov. 30, 2010	Nov. 29, 2011
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 30, 2010	Dec. 29, 2011
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jul. 07, 2011	Jul. 06, 2012
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 06, 2011	Jan. 05, 2012
LISN ROHDE & SCHWARZ	ESH3-Z5	835239/001	Feb. 22, 2011	Feb. 21, 2012
V-LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jun. 30, 2011	Jun. 29, 2012
LISN ROHDE & SCHWARZ	ENV216	100072	Jun. 10, 2011	Jun. 09, 2012
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

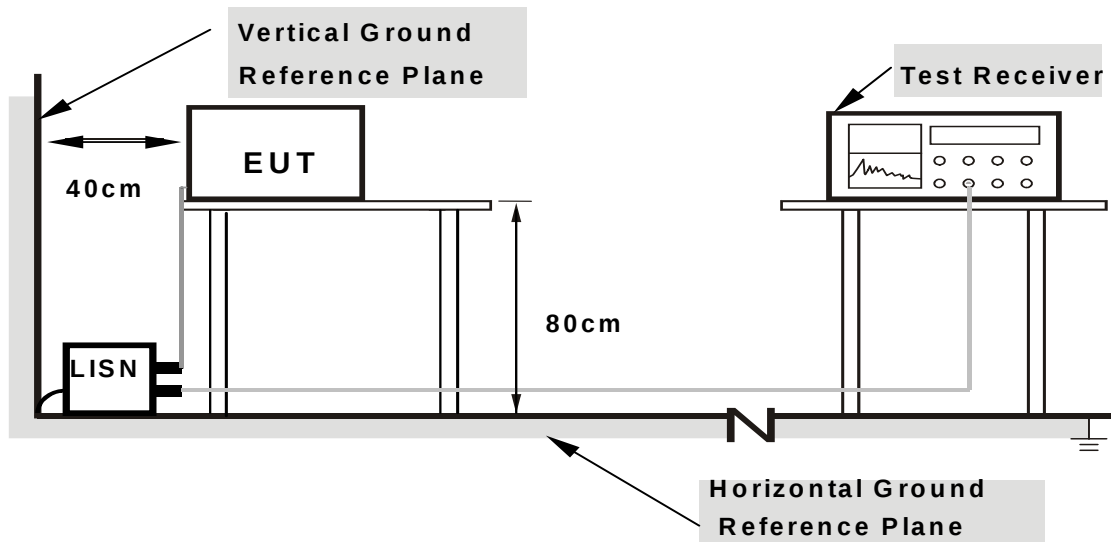
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

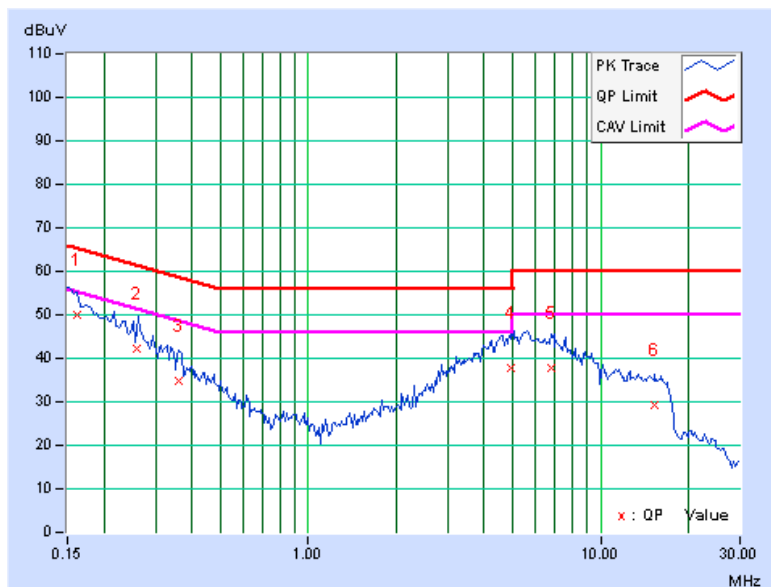
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.12	49.71	33.55	49.83	33.67	65.38	55.38	-15.55	-21.71
2	0.258	0.12	41.94	33.70	42.06	33.82	61.49	51.49	-19.43	-17.67
3	0.361	0.12	34.67	19.54	34.79	19.66	58.71	48.71	-23.92	-29.05
4	4.949	0.37	37.46	27.78	37.83	28.15	56.00	46.00	-18.17	-17.85
5	6.770	0.47	37.44	27.37	37.91	27.84	60.00	50.00	-22.09	-22.16
6	15.320	0.89	28.47	19.38	29.36	20.27	60.00	50.00	-30.64	-29.73

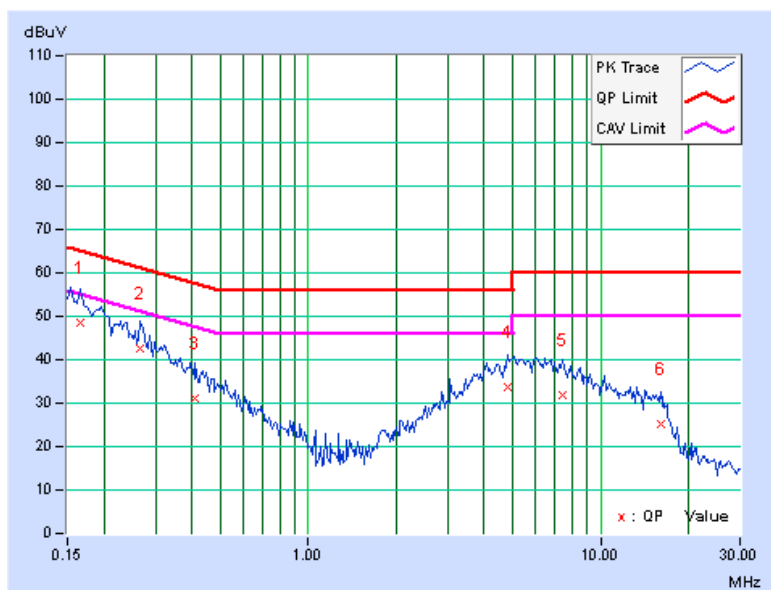
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.13	48.41	31.84	48.54	31.97	65.18	55.18	-16.64	-23.21
2	0.267	0.13	42.49	26.66	42.62	26.79	61.20	51.20	-18.58	-24.41
3	0.412	0.14	31.02	14.41	31.16	14.55	57.61	47.61	-26.45	-33.06
4	4.805	0.36	33.41	21.41	33.77	21.77	56.00	46.00	-22.23	-24.23
5	7.391	0.48	31.35	20.85	31.83	21.33	60.00	50.00	-28.17	-28.67
6	16.004	0.78	24.39	14.59	25.17	15.37	60.00	50.00	-34.83	-34.63

- 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.

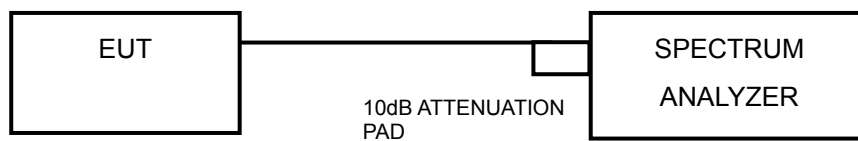


4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.3.4 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	12.24	12.21	0.5	PASS
6	2437	12.23	12.25	0.5	PASS
11	2462	12.23	12.23	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.06	16.07	0.5	PASS
6	2437	16.05	16.07	0.5	PASS
11	2462	15.89	16.03	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.25	16.45	0.5	PASS
6	2437	16.31	16.31	0.5	PASS
11	2462	16.34	16.32	0.5	PASS

802.11n (40MHz)

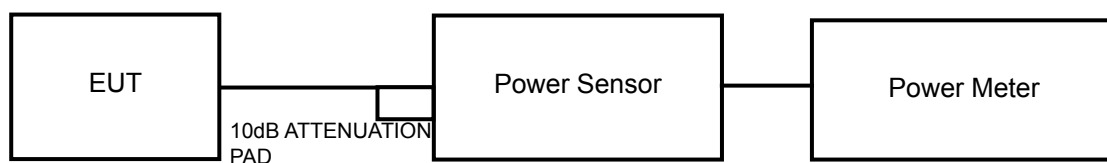
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2422	34.54	34.74	0.5	PASS
4	2437	34.47	34.48	0.5	PASS
7	2452	33.65	34.69	0.5	PASS

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz: 1 Watt (30dBm)

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

802.11b

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	13.00	13.10	40.370	16.06	25.99	PASS
6	2437	12.90	12.80	38.553	15.86	25.99	PASS
11	2462	12.90	12.50	37.281	15.71	25.99	PASS

802.11g

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.50	20.40	221.850	23.46	25.99	PASS
6	2437	21.50	21.40	279.292	24.46	25.99	PASS
11	2462	20.40	20.40	219.296	23.41	25.99	PASS

802.11n (20MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	19.70	19.90	191.049	22.81	25.99	PASS
6	2437	20.90	21.00	248.919	23.96	25.99	PASS
11	2462	20.10	20.30	209.481	23.21	25.99	PASS

802.11n (40MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2422	17.60	17.80	117.800	20.71	25.99	PASS
4	2437	20.10	20.30	209.481	23.21	25.99	PASS
7	2452	17.70	17.80	119.140	20.76	25.99	PASS

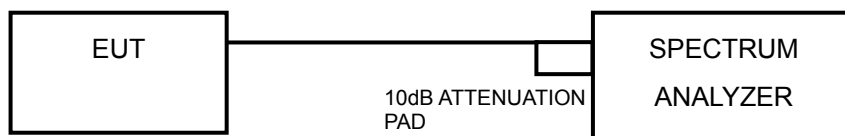
NOTE: Directional gain = 7dBi + 10log(2)=10.01dBi > 6dBi, so the conducted power limit shall be reduced to 30-(10.01-6)=25.99dBm

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-1.74	-16.97	3.01	-13.96	3.99	PASS
	6	2437	-1.67	-16.9	3.01	-13.89	3.99	PASS
	11	2462	-1.66	-16.89	3.01	-13.88	3.99	PASS
1	1	2412	-1.30	-16.53	3.01	-13.52	3.99	PASS
	6	2437	-1.70	-16.93	3.01	-13.92	3.99	PASS
	11	2462	-2.07	-17.3	3.01	-14.29	3.99	PASS

802.11g

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-3.12	-18.35	3.01	-15.34	3.99	PASS
	6	2437	-2.26	-17.49	3.01	-14.48	3.99	PASS
	11	2462	-3.09	-18.32	3.01	-15.31	3.99	PASS
1	1	2412	-3.82	-19.05	3.01	-16.04	3.99	PASS
	6	2437	-2.81	-18.04	3.01	-15.03	3.99	PASS
	11	2462	-3.91	-19.14	3.01	-16.13	3.99	PASS

802.11n (20MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-3.40	-18.63	3.01	-15.62	3.99	PASS
	6	2437	-2.14	-17.37	3.01	-14.36	3.99	PASS
	11	2462	-2.89	-18.12	3.01	-15.11	3.99	PASS
1	1	2412	-3.52	-18.75	3.01	-15.74	3.99	PASS
	6	2437	-2.31	-17.54	3.01	-14.53	3.99	PASS
	11	2462	-2.87	-18.1	3.01	-15.09	3.99	PASS

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2422	-8.43	-23.66	3.01	-20.65	3.99	PASS
	4	2437	-5.74	-20.97	3.01	-17.96	3.99	PASS
	7	2452	-8.15	-23.38	3.01	-20.37	3.99	PASS
1	1	2422	-8.48	-23.71	3.01	-20.70	3.99	PASS
	4	2437	-6.05	-21.28	3.01	-18.27	3.99	PASS
	7	2452	-8.50	-23.73	3.01	-20.72	3.99	PASS

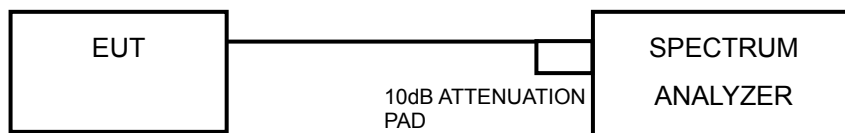
NOTE: Directional gain = 7dBi + 10log(2)=10.01dBi > 6dBi, so the conducted power limit shall be reduced to 8-(10.01-6)=3.99dBm

4.6 CONDUCTED EMISSION MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

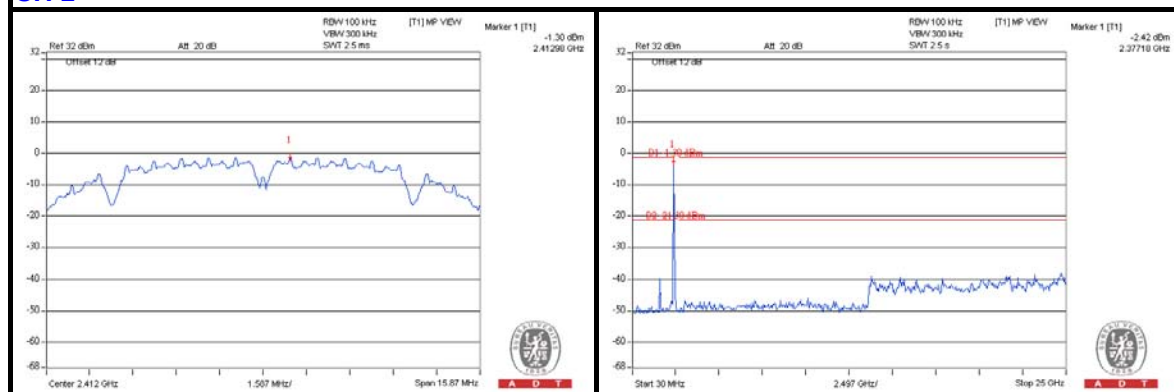
4.6.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

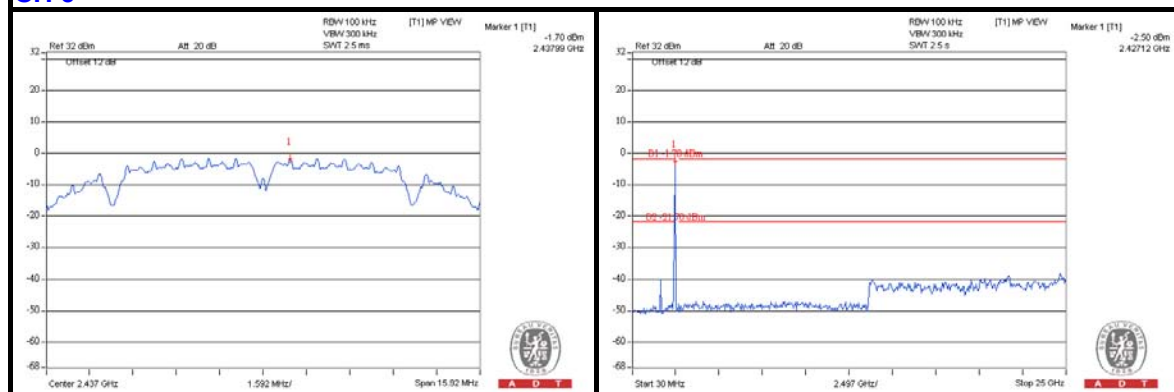
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b

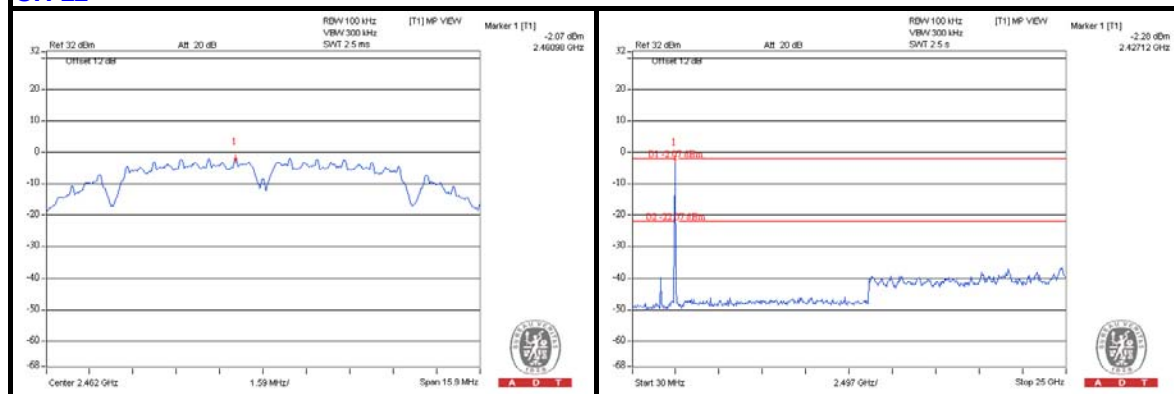
CH 1



CH 6

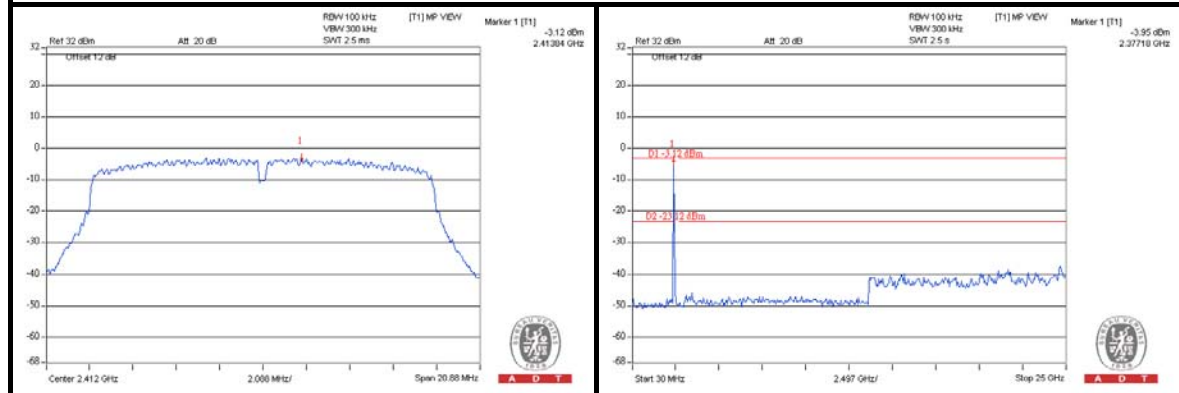


CH 11

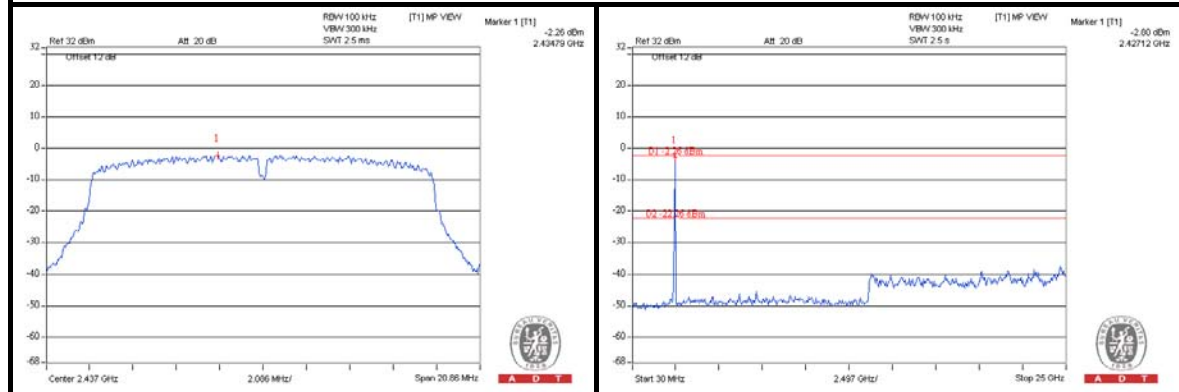


802.11g

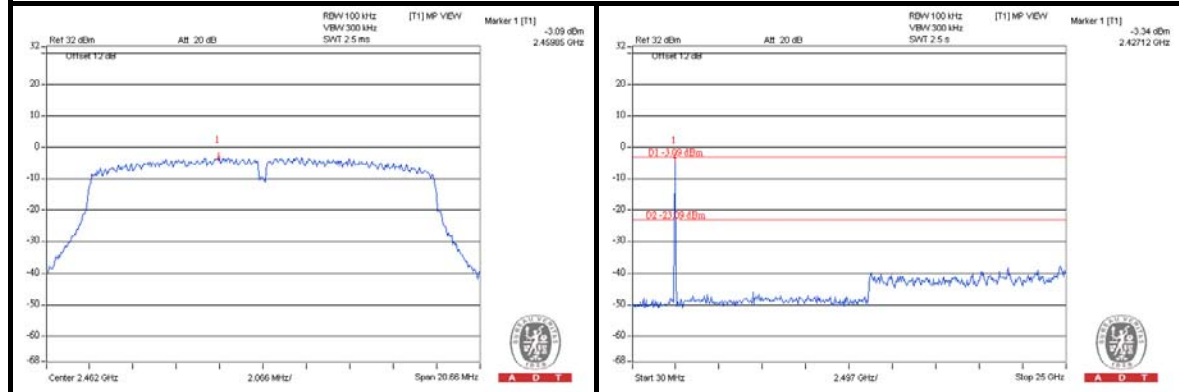
CH 1



CH 6

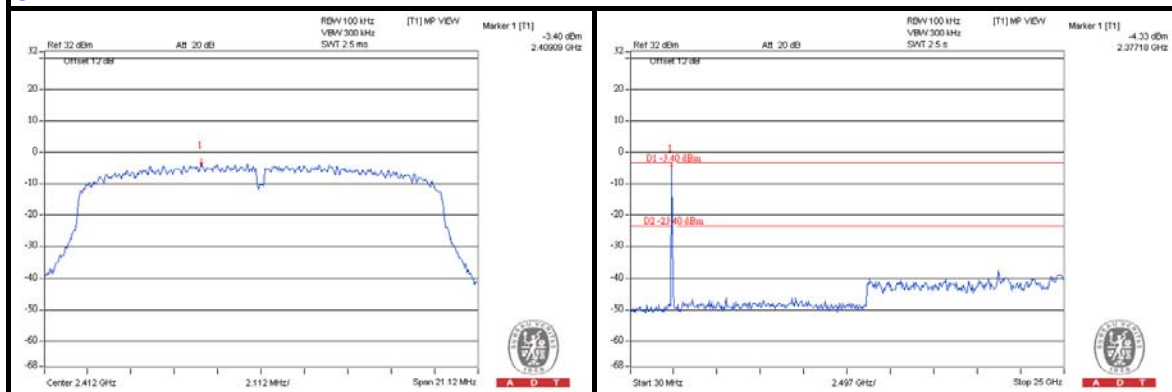


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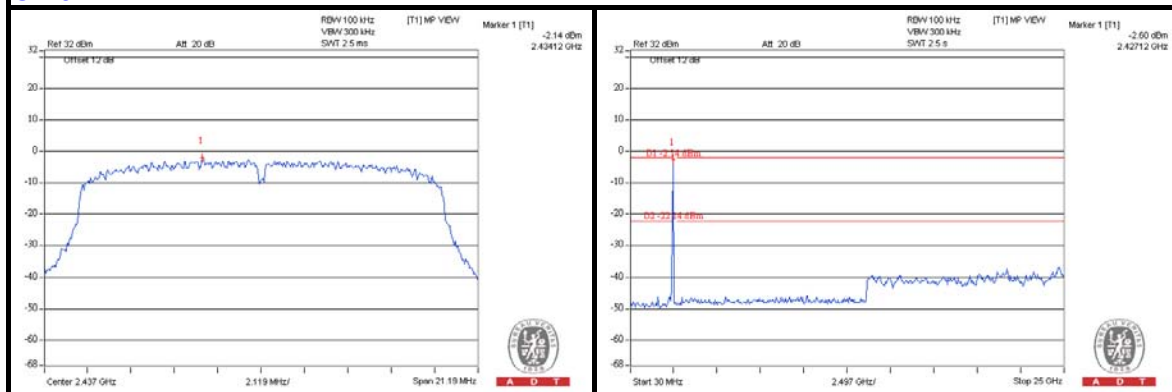


802.11n (20MHz)

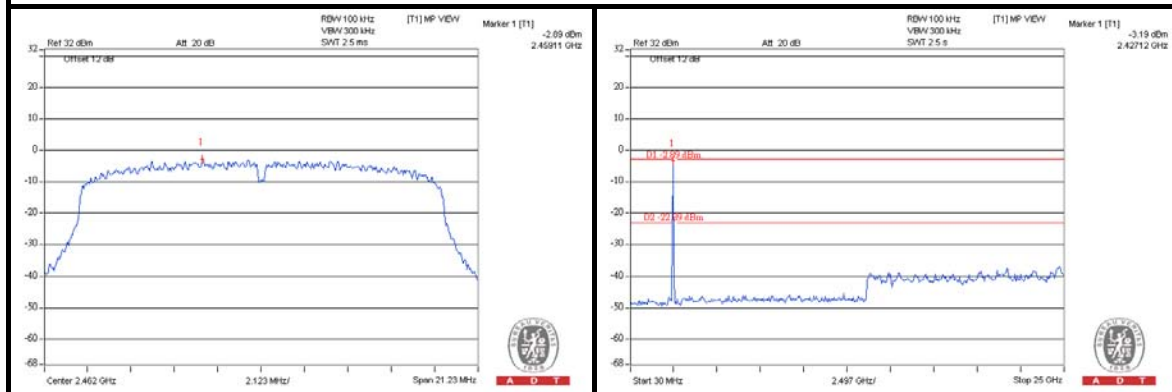
CH 1



CH 6

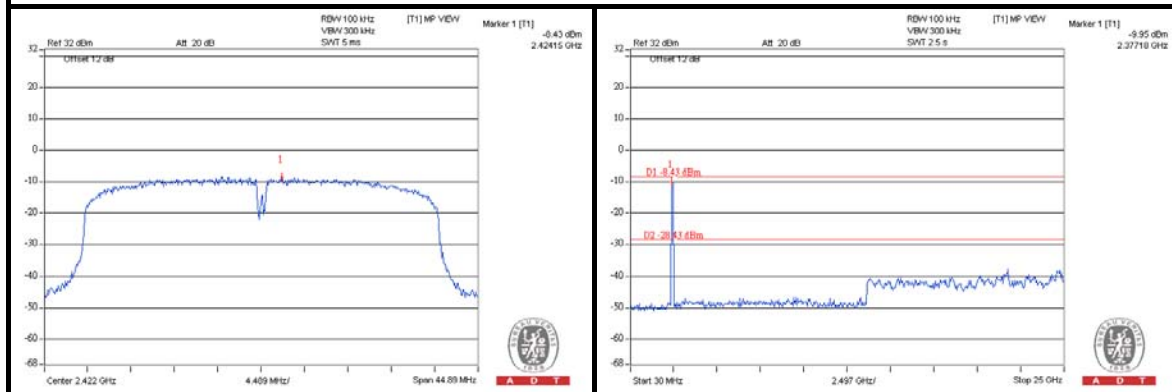


CH 11

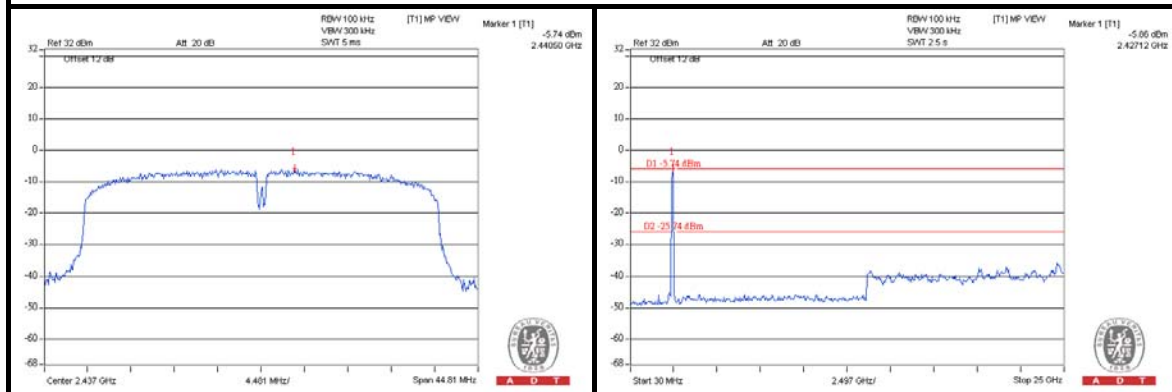


802.11n (40MHz)

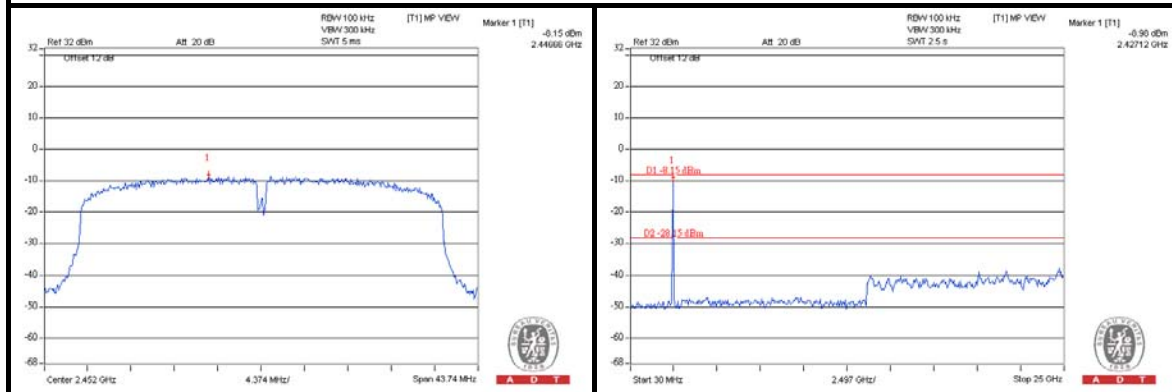
CH 1



CH 4



CH 7





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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 and authorization 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

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Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

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



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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---