FCC TEST REPORT (15.247)

REPORT NO.:	RF130226C01
MODEL NO.:	Cisco 860VAE-W
	(Refer to item 3.1 for more details)
FCC ID:	MXF-CISCO867VAE
RECEIVED:	Nov. 08, 2012
TESTED:	Nov. 08 ~ Dec. 07, 2012
ISSUED:	Mar. 04, 2013

APPLICANT:	Gemtek Technology Co., Ltd.
ADDRESS:	No.15-1, Zhonghua Rd, Hsinchu Industrial Park, Hsinchu County, Taiwan, R.O.C. 303

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 Taipei City, Taiwan, R.O.C.
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130226C01	Original release	Mar. 04, 2013

1. CERTIFICATION

PRODUCT:	XDSL Router
MODEL NO.:	Cisco 860VAE-W (Refer to item 3.1 for more details)
BRAND:	Cisco
APPLICANT:	Gemtek Technology Co., Ltd.
TESTED:	Nov. 08 ~ Dec. 07, 2012
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**
	ANSI C63.10-2009

The above equipment (model: Cisco867VAE-POE-W-A-K9, Cisco867VAE-W-A-K9) 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	: Pettie Chen / Senior Specialist	**DATE :**	Mar. 04, 2013
APPROVED BY	: Ken Liu / Senior Manager	**DATE :**	Mar. 04, 2013

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 -7.48dB at 14.48406MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2390.00MHz.
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 connector is I-PEX not a standard connector.

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	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 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	XDSL Router
MODEL NO.	Cisco 860VAE-W (Refer to NOTE for more details)
POWER SUPPLY	12Vdc (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 802.11n: up to 270.0Mbps
OPERATING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	383.765mW
ANTENNA TYPE	Antenna 1: PCBA antenna with 3.03dBi gain Antenna 2: PCBA antenna with 2.94dBi gain
ANTENNA CONNECTOR	I-PEX
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

1. The following models are provided to this EUT.

MODEL NO.	DESCRIPTION	
Cisco 860VAE-W	For marketing purpose	
Cisco867VAE-W-A-K9	SKU2	LAN: 2GE + 3FE WAN: 1GiE ADSL2+VDSL2: Over POTS DSL: Annex A
Cisco867VAE-POE-W-A-K9	SKU4	LAN: 2GE + 3FE WAN: 1GiE ADSL2+VDSL2: Over POTS DSL: Annex A Note: With 1 port PoE

2. The EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX / 2TX
802.11n (40MHz)	2TX

3. The EUT consumes power from the following adapters.

ADAPTER 1 (FOR MODEL: Cisco867VAE-W-A-K9)	
BRAND:	DELTA Electronics, INC.
MODEL:	EADP-30HB B
INPUT:	100-240Vac, 1A, 50-60Hz
OUTPUT:	12Vdc, 2.5A(2,5V)
POWER LINE:	DC 1.8m non-shielded cable with one core AC 1.2m non-shielded cable without core

ADAPTER 2 (FOR MODEL: Cisco867VAE-POE-W-A-K9)	
BRAND:	DELTA Electronics, INC.
MODEL:	EADP-60MB B
INPUT:	100-240Vac, 1.5A, 50-60Hz
OUTPUT:	12Vdc, 5A
POWER LINE:	DC 1.8m non-shielded cable without core AC 1.2m non-shielded cable without core

4. 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
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Model: Cisco867VAE-POE-W-A-K9
B	-	-	√	-	Model: Cisco867VAE-W-A-K9

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

NOTE 1:
The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane.**
NOTE 2: "-"means no effect.

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)	TX Function
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	1TX
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	1TX
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13.0	2TX
A	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	27.0	2TX

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)	TX Function
A	802.11n (20MHz)	1 to 11	6	OFDM	BPSK	13.0	2TX

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)	TX Function
A, B	802.11n (20MHz)	1 to 11	6	OFDM	BPSK	13.0	2TX

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)	TX Function
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0	1TX
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	1TX
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	13.0	2TX
A	802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	27.0	2TX

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)	TX Function
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	1TX
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	1TX
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13.0	2TX
A	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	27.0	2TX

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	26deg. C, 68%RH	120Vac, 60Hz	Cedric Wu
RE<1G	26deg. C, 68%RH	120Vac, 60Hz	Alan Wu
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jun Wu

3.3 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.

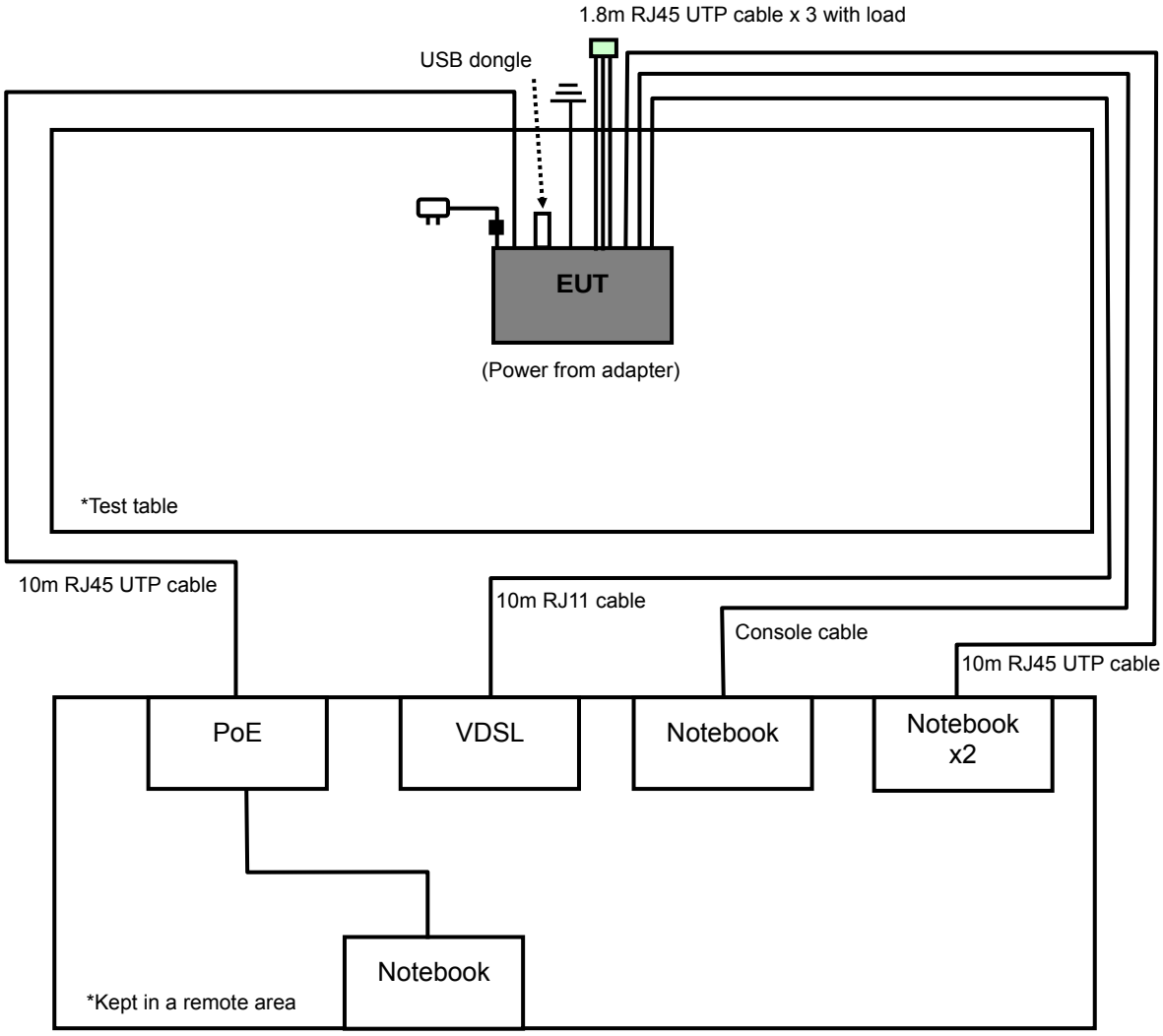
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5420	33MJMQ1	FCC Doc Approved
2	Notebook	DELL	E5420	BPQ8MQ1	FCC Doc Approved
3	Notebook	DELL	D531	CN-0XM006-4864 3-81U-2610	QDS-BRCM1020
4	Notebook	DELL	D531	CN-0XM006-4864 3-81U-2973	QDS-BRCM1020
5	VDSL	ZyXEL	IES-1000	S110Z23000505	FCC Doc Approved
6	PoE	Cisco	WET200	NA	NA
7	USB Dongle	Transcend	V85	538455 4481	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 cable
2	10m RJ45 cable
3	10m RJ45 cable
4	10m console cable
5	10m RJ11 cable
6	10m RJ45 cable
7	NA

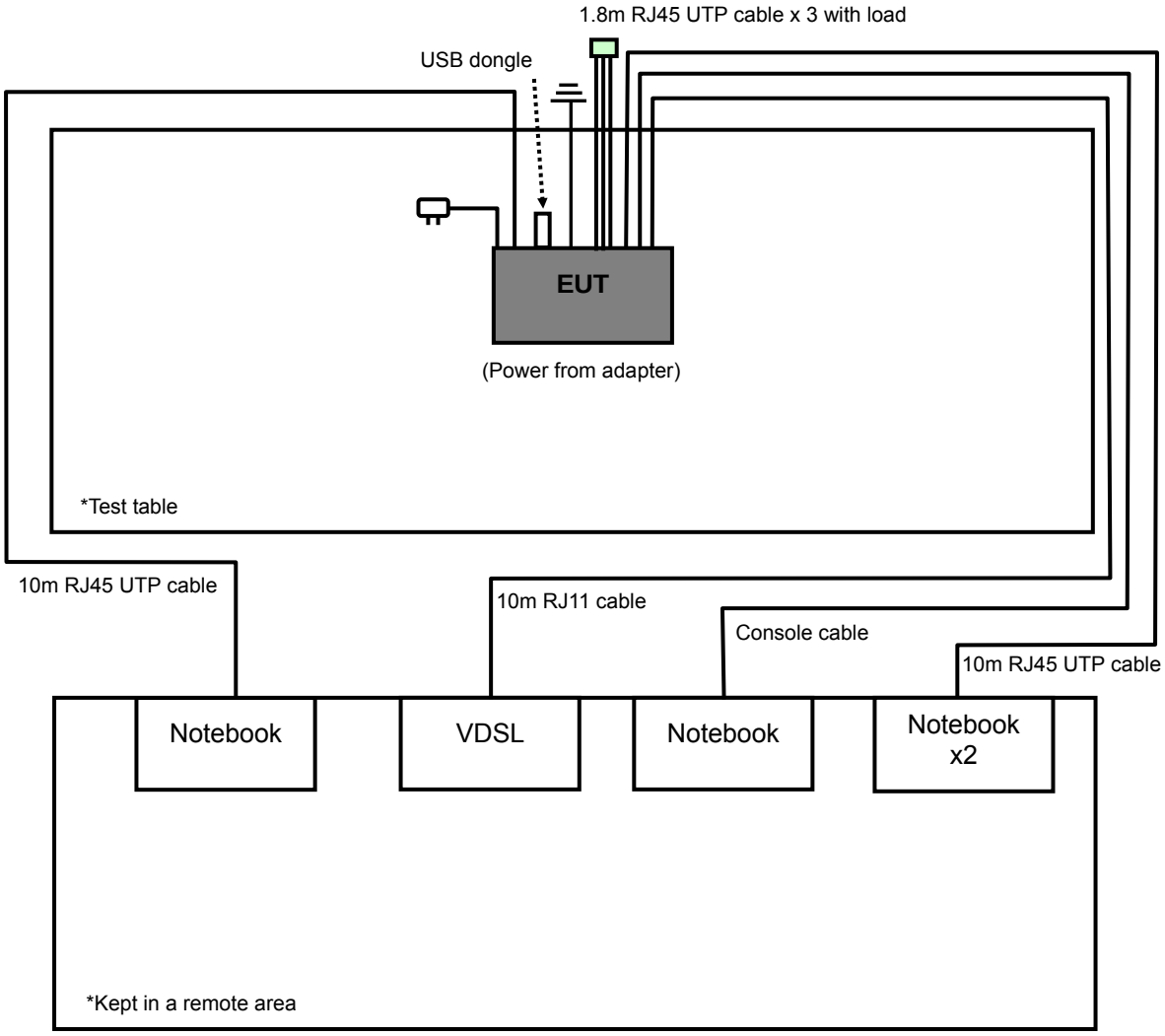
NOTE:
1. All power cords of the above support units are non shielded (1.8m).
2. Item 1-6 acted as communication partner to transfer data.
3. Item 6 was provided by client.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

Test Mode A



Test Mode B


1.8m RJ45 UTP cable x 3 with load
USB dongle
EUT
(Power from adapter)
*Test table
10m RJ45 UTP cable
10m RJ11 cable
Console cable
10m RJ45 UTP cable
Notebook
VDSL
Notebook
Notebook x2
*Kept in a remote area

3.4 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)
558074 D01 DTS Meas Guidance v02
662911 D01 Multiple Transmitter Output v01 r02
ANSI C63.10-2009

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

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. 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. 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	ESCI	100424	Aug. 21, 2012	Aug. 20, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Oct. 25, 2012	Oct. 24, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10738	Oct. 23, 2012	Oct. 22, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 28, 2012	Aug. 27, 2013
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	0842014	Apr. 28, 2012	Apr. 27, 2013
Power Sensor	MA2411B	0738404	Apr. 28, 2012	Apr. 27, 2013

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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 4.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 460141.
6. 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. 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.

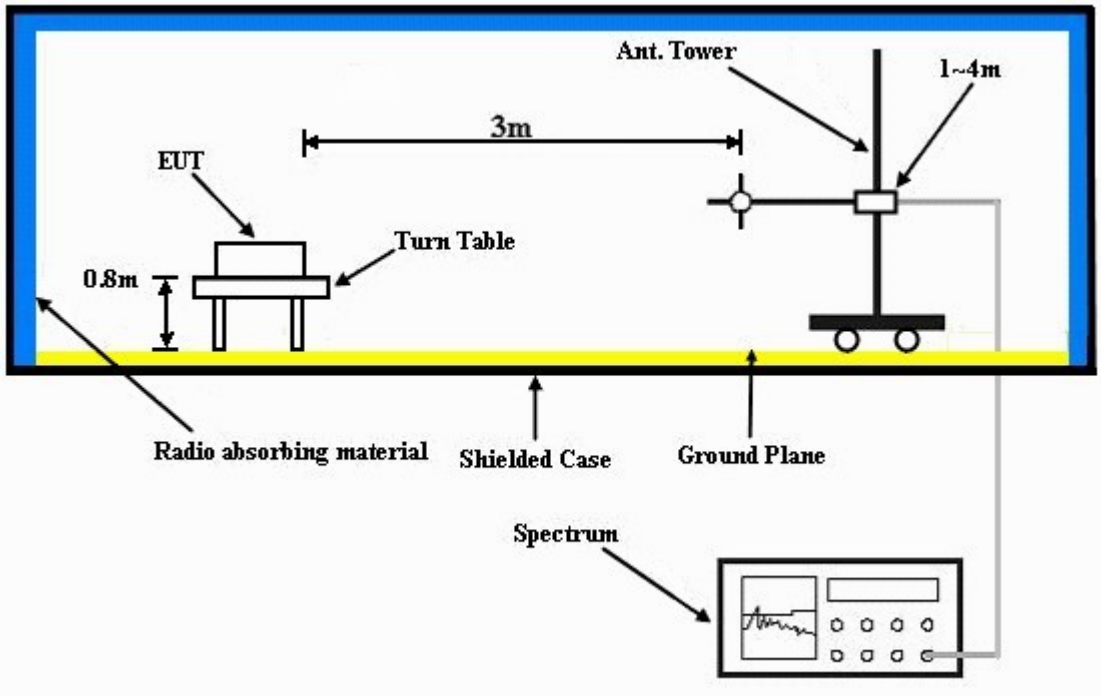
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz 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. Placed the EUT on the testing table.
b. Prepared notebooks and VDSL to act as communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ11 cable & console cable & RJ45 cables and run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 TEST RESULTS

ABOVE 1GHz DATA：

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	26deg. C, 68%RH	TESTED BY	Cedric 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	58.1 PK	74.0	-15.9	1.35 H	300	26.10	32.00
2	2390.00	45.5 AV	54.0	-8.5	1.35 H	300	13.50	32.00
3	*2412.00	102.8 PK			1.37 H	302	70.80	32.00
4	*2412.00	98.9 AV			1.37 H	302	66.90	32.00
5	4824.00	50.0 PK	74.0	-24.0	1.15 H	325	11.60	38.40
6	4824.00	47.2 AV	54.0	-6.8	1.15 H	325	8.80	38.40
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	2390.00	59.4 PK	74.0	-14.6	1.23 V	6	27.40	32.00
2	2390.00	46.9 AV	54.0	-7.1	1.23 V	6	14.90	32.00
3	*2412.00	109.6 PK			1.21 V	1	77.60	32.00
4	*2412.00	105.7 AV			1.21 V	1	73.70	32.00
5	4824.00	52.9 PK	74.0	-21.1	1.12 V	1	14.50	38.40
6	4824.00	48.0 AV	54.0	-6.0	1.12 V	1	9.60	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	1500.00	42.4 PK	74.0	-31.6	1.00 H	325	13.50	28.90
2	1500.00	36.9 AV	54.0	-17.1	1.00 H	325	8.00	28.90
3	*2437.00	102.6 PK			1.35 H	310	70.50	32.10
4	*2437.00	98.6 AV			1.35 H	310	66.50	32.10
5	4874.00	51.7 PK	74.0	-22.3	1.03 H	327	13.30	38.40
6	4874.00	47.1 AV	54.0	-6.9	1.03 H	327	8.70	38.40
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	1500.00	41.8 PK	74.0	-32.2	1.00 V	192	12.90	28.90
2	1500.00	34.7 AV	54.0	-19.3	1.00 V	192	5.80	28.90
3	*2437.00	109.8 PK			1.21 V	350	77.70	32.10
4	*2437.00	105.5 AV			1.21 V	350	73.40	32.10
5	4874.00	51.7 PK	74.0	-22.3	1.24 V	359	13.30	38.40
6	4874.00	47.6 AV	54.0	-6.4	1.24 V	359	9.20	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	102.2 PK			1.31 H	300	70.00	32.20
2	*2462.00	98.4 AV			1.31 H	300	66.20	32.20
3	2483.50	58.3 PK	74.0	-15.7	1.25 H	295	26.00	32.30
4	2483.50	47.0 AV	54.0	-7.0	1.25 H	295	14.70	32.30
5	4924.00	54.2 PK	74.0	-19.8	1.02 H	329	15.80	38.40
6	4924.00	51.1 AV	54.0	-2.9	1.02 H	329	12.70	38.40
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	*2462.00	109.5 PK			1.19 V	2	77.30	32.20
2	*2462.00	105.6 AV			1.19 V	2	73.40	32.20
3	2483.50	61.5 PK	74.0	-12.5	1.17 V	3	29.20	32.30
4	2483.50	51.5 AV	54.0	-2.5	1.17 V	3	19.20	32.30
5	4924.00	54.4 PK	74.0	-19.6	1.04 V	320	16.00	38.40
6	4924.00	51.4 AV	54.0	-2.6	1.04 V	320	13.00	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	58.9 PK	74.0	-15.1	1.30 H	297	26.90	32.00
2	2390.00	47.1 AV	54.0	-6.9	1.30 H	297	15.10	32.00
3	*2412.00	98.1 PK			1.37 H	306	66.10	32.00
4	*2412.00	85.7 AV			1.37 H	306	53.70	32.00
5	4824.00	44.7 PK	74.0	-29.3	1.00 H	325	6.30	38.40
6	4824.00	32.5 AV	54.0	-21.5	1.00 H	325	-5.90	38.40
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	2390.00	62.1 PK	74.0	-11.9	1.22 V	2	30.10	32.00
2	2390.00	48.7 AV	54.0	-5.3	1.22 V	2	16.70	32.00
3	*2412.00	105.5 PK			1.21 V	359	73.50	32.00
4	*2412.00	92.5 AV			1.21 V	359	60.50	32.00
5	4824.00	45.7 PK	74.0	-28.3	1.00 V	300	7.30	38.40
6	4824.00	32.8 AV	54.0	-21.2	1.00 V	300	-5.60	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	1500.00	42.1 PK	74.0	-31.9	1.00 H	275	13.20	28.90
2	1500.00	34.2 AV	54.0	-19.8	1.00 H	275	5.30	28.90
3	*2437.00	104.5 PK			1.36 H	303	72.40	32.10
4	*2437.00	91.9 AV			1.36 H	303	59.80	32.10
5	4874.00	51.0 PK	74.0	-23.0	1.04 H	327	12.60	38.40
6	4874.00	36.1 AV	54.0	-17.9	1.04 H	327	-2.30	38.40
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	1500.00	39.9 PK	74.0	-34.1	1.00 V	330	11.00	28.90
2	1500.00	32.8 AV	54.0	-21.2	1.00 V	330	3.90	28.90
3	*2437.00	111.1 PK			1.22 V	351	79.00	32.10
4	*2437.00	99.0 AV			1.22 V	351	66.90	32.10
5	4874.00	51.2 PK	74.0	-22.8	1.20 V	336	12.80	38.40
6	4874.00	36.6 AV	54.0	-17.4	1.20 V	336	-1.80	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	99.3 PK			1.33 H	300	67.10	32.20
2	*2462.00	86.1 AV			1.33 H	300	53.90	32.20
3	2483.50	58.2 PK	74.0	-15.8	1.39 H	301	25.90	32.30
4	2483.50	45.8 AV	54.0	-8.2	1.39 H	301	13.50	32.30
5	4924.00	44.8 PK	74.0	-29.2	1.00 H	341	6.40	38.40
6	4924.00	32.5 AV	54.0	-21.5	1.00 H	341	-5.90	38.40
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	*2462.00	104.8 PK			1.20 V	2	72.60	32.20
2	*2462.00	92.9 AV			1.20 V	2	60.70	32.20
3	2483.50	60.9 PK	74.0	-13.1	1.15 V	357	28.60	32.30
4	2483.50	48.3 AV	54.0	-5.7	1.15 V	357	16.00	32.30
5	4924.00	45.5 PK	74.0	-28.5	1.00 V	323	7.10	38.40
6	4924.00	32.7 AV	54.0	-21.3	1.00 V	323	-5.70	38.40

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.
5. " * ": Fundamental frequency.

802.11n (20MHz): 1TX

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	26deg. C, 67%RH	TESTED BY	Cedric 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	58.8 PK	74.0	-15.2	1.35 H	297	26.80	32.00
2	2390.00	46.5 AV	54.0	-7.5	1.35 H	297	14.50	32.00
3	*2412.00	98.1 PK			1.36 H	295	66.10	32.00
4	*2412.00	86.1 AV			1.36 H	295	54.10	32.00
5	4824.00	43.8 PK	74.0	-30.2	1.00 H	275	5.40	38.40
6	4824.00	30.8 AV	54.0	-23.2	1.00 H	275	-7.60	38.40
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	2390.00	64.2 PK	74.0	-9.8	1.21 V	351	32.20	32.00
2	2390.00	48.9 AV	54.0	-5.1	1.21 V	351	16.90	32.00
3	*2412.00	104.0 PK			1.21 V	359	72.00	32.00
4	*2412.00	91.8 AV			1.21 V	359	59.80	32.00
5	4824.00	44.4 PK	74.0	-29.6	1.00 V	10	6.00	38.40
6	4824.00	31.7 AV	54.0	-22.3	1.00 V	10	-6.70	38.40

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.
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	26deg. C, 67%RH	TESTED BY	Cedric 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	59.8 PK	74.0	-14.2	1.38 H	298	27.80	32.00
2	2390.00	47.6 AV	54.0	-6.4	1.38 H	298	15.60	32.00
3	*2437.00	104.3 PK			1.33 H	296	72.20	32.10
4	*2437.00	92.7 AV			1.33 H	296	60.60	32.10
5	4874.00	47.1 PK	74.0	-26.9	1.00 H	312	8.70	38.40
6	4874.00	34.0 AV	54.0	-20.0	1.00 H	312	-4.40	38.40
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	2390.00	64.0 PK	74.0	-10.0	1.15 V	9	32.00	32.00
2	2390.00	50.0 AV	54.0	-4.0	1.15 V	9	18.00	32.00
3	*2437.00	111.8 PK			1.19 V	1	79.70	32.10
4	*2437.00	99.4 AV			1.19 V	1	67.30	32.10
5	4874.00	48.3 PK	74.0	-25.7	1.11 V	1	9.90	38.40
6	4874.00	35.0 AV	54.0	-19.0	1.11 V	1	-3.40	38.40

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.
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	26deg. C, 67%RH	TESTED BY	Cedric 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	98.1 PK			1.31 H	297	65.90	32.20
2	*2462.00	86.2 AV			1.31 H	297	54.00	32.20
3	2483.50	58.7 PK	74.0	-15.3	1.34 H	298	26.40	32.30
4	2483.50	45.5 AV	54.0	-8.5	1.34 H	298	13.20	32.30
5	4924.00	43.1 PK	74.0	-30.9	1.00 H	343	4.70	38.40
6	4924.00	30.6 AV	54.0	-23.4	1.00 H	343	-7.80	38.40
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	*2462.00	105.1 PK			1.20 V	352	72.90	32.20
2	*2462.00	92.3 AV			1.20 V	352	60.10	32.20
3	2483.50	60.0 PK	74.0	-14.0	1.16 V	350	27.70	32.30
4	2483.50	47.6 AV	54.0	-6.4	1.16 V	350	15.30	32.30
5	4924.00	44.7 PK	74.0	-29.3	1.03 V	328	6.30	38.40
6	4924.00	31.5 AV	54.0	-22.5	1.03 V	328	-6.90	38.40

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.
5. " * ": Fundamental frequency.

802.11n (20MHz): 2TX

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	26deg. C, 68%RH	TESTED BY	Cedric 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	58.0 PK	74.0	-16.0	1.30 H	303	26.00	32.00
2	2390.00	46.8 AV	54.0	-7.2	1.30 H	303	14.80	32.00
3	*2412.00	97.1 PK			1.37 H	301	65.10	32.00
4	*2412.00	85.6 AV			1.37 H	301	53.60	32.00
5	4824.00	45.0 PK	74.0	-29.0	1.00 H	275	6.60	38.40
6	4824.00	32.3 AV	54.0	-21.7	1.00 H	275	-6.10	38.40
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	2390.00	61.8 PK	74.0	-12.2	1.24 V	6	29.80	32.00
2	2390.00	49.4 AV	54.0	-4.6	1.24 V	6	17.40	32.00
3	*2412.00	105.0 PK			1.22 V	1	73.00	32.00
4	*2412.00	92.0 AV			1.22 V	1	60.00	32.00
5	4824.00	45.9 PK	74.0	-28.1	1.00 V	10	7.50	38.40
6	4824.00	32.5 AV	54.0	-21.5	1.00 V	10	-5.90	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	1500.00	41.3 PK	74.0	-32.7	1.00 H	317	12.40	28.90
2	1500.00	34.5 AV	54.0	-19.5	1.00 H	317	5.60	28.90
3	*2437.00	104.9 PK			1.28 H	328	72.80	32.10
4	*2437.00	90.5 AV			1.28 H	328	58.40	32.10
5	4874.00	49.0 PK	74.0	-25.0	1.00 H	312	10.60	38.40
6	4874.00	36.0 AV	54.0	-18.0	1.00 H	312	-2.40	38.40
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	1500.00	39.8 PK	74.0	-34.2	1.00 V	328	10.90	28.90
2	1500.00	33.2 AV	54.0	-20.8	1.00 V	328	4.30	28.90
3	*2437.00	113.6 PK			1.20 V	18	81.50	32.10
4	*2437.00	98.7 AV			1.20 V	18	66.60	32.10
5	4874.00	49.4 PK	74.0	-24.6	1.11 V	1	11.00	38.40
6	4874.00	36.4 AV	54.0	-17.6	1.11 V	1	-2.00	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	94.8 PK			1.00 H	328	62.60	32.20
2	*2462.00	81.2 AV			1.00 H	328	49.00	32.20
3	2483.50	57.9 PK	74.0	-16.1	1.00 H	332	25.60	32.30
4	2483.50	45.5 AV	54.0	-8.5	1.00 H	332	13.20	32.30
5	4924.00	44.9 PK	74.0	-29.1	1.00 H	343	6.50	38.40
6	4924.00	31.9 AV	54.0	-22.1	1.00 H	343	-6.50	38.40
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	*2462.00	107.5 PK			1.20 V	359	75.30	32.20
2	*2462.00	93.7 AV			1.20 V	359	61.50	32.20
3	2483.50	62.9 PK	74.0	-11.1	1.16 V	3	30.60	32.30
4	2483.50	50.2 AV	54.0	-3.8	1.16 V	3	17.90	32.30
5	4924.00	45.2 PK	74.0	-28.8	1.03 V	328	6.80	38.40
6	4924.00	32.3 AV	54.0	-21.7	1.03 V	328	-6.10	38.40

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.
5. " * ": Fundamental frequency.

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH	TESTED BY	Cedric 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	58.7 PK	74.0	-15.3	1.30 H	302	26.70	32.00
2	2390.00	46.6 AV	54.0	-7.4	1.30 H	302	14.60	32.00
3	*2422.00	93.0 PK			1.36 H	308	60.90	32.10
4	*2422.00	83.0 AV			1.36 H	308	50.90	32.10
5	4844.00	46.1 PK	74.0	-27.9	1.00 H	265	7.70	38.40
6	4844.00	32.4 AV	54.0	-21.6	1.00 H	265	-6.00	38.40
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	2390.00	65.7 PK	74.0	-8.3	1.24 V	5	33.70	32.00
2	2390.00	52.3 AV	54.0	-1.7	1.24 V	5	20.30	32.00
3	*2422.00	102.8 PK			1.21 V	1	70.70	32.10
4	*2422.00	93.1 AV			1.21 V	1	61.00	32.10
5	4844.00	45.4 PK	74.0	-28.6	1.00 V	19	7.00	38.40
6	4844.00	32.6 AV	54.0	-21.4	1.00 V	19	-5.80	38.40

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.
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	26deg. C, 68%RH	TESTED BY	Cedric 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	59.4 PK	74.0	-14.6	1.31 H	302	27.40	32.00
2	2390.00	47.2 AV	54.0	-6.8	1.31 H	302	15.20	32.00
3	*2437.00	97.2 PK			1.34 H	306	65.10	32.10
4	*2437.00	86.2 AV			1.34 H	306	54.10	32.10
5	4874.00	45.4 PK	74.0	-28.6	1.00 H	261	7.00	38.40
6	4874.00	31.9 AV	54.0	-22.1	1.00 H	261	-6.50	38.40
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	2390.00	65.0 PK	74.0	-9.0	1.24 V	1	33.00	32.00
2	**2390.00**	**53.0 AV**	**54.0**	**-1.0**	**1.24 V**	**1**	**21.00**	**32.00**
3	*2437.00	105.8 PK			1.20 V	19	73.70	32.10
4	*2437.00	95.8 AV			1.20 V	19	63.70	32.10
5	4874.00	45.7 PK	74.0	-28.3	1.00 V	14	7.30	38.40
6	4874.00	32.3 AV	54.0	-21.7	1.00 V	14	-6.10	38.40

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.
5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH	TESTED BY	Cedric 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	*2452.00	92.4 PK			1.32 H	305	60.20	32.20
2	*2452.00	83.1 AV			1.32 H	305	50.90	32.20
3	2483.50	58.4 PK	74.0	-15.6	1.30 H	301	26.10	32.30
4	2483.50	46.7 AV	54.0	-7.3	1.30 H	301	14.40	32.30
5	4904.00	45.7 PK	74.0	-28.3	1.05 H	261	7.20	38.50
6	4904.00	33.2 AV	54.0	-20.8	1.05 H	261	-5.30	38.50
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	103.3 PK			1.20 V	359	71.10	32.20
2	*2452.00	92.9 AV			1.20 V	359	60.70	32.20
3	2483.50	67.1 PK	74.0	-6.9	1.16 V	2	34.80	32.30
4	2483.50	52.5 AV	54.0	-1.5	1.16 V	2	20.20	32.30
5	4904.00	46.2 PK	74.0	-27.8	1.00 V	26	7.70	38.50
6	4904.00	33.9 AV	54.0	-20.1	1.00 V	26	-4.60	38.50

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.
5. " * ": Fundamental frequency.

BELOW 1GHz WORST-CASE DATA：

802.11n (20MHz): 2TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH	TESTED BY	Alan 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	138.56	35.0 QP	43.5	-8.5	2.00 H	270	21.60	13.40
2	157.97	36.4 QP	43.5	-7.1	1.75 H	110	22.40	14.00
3	499.48	39.7 QP	46.0	-6.3	2.00 H	98	20.20	19.50
4	625.60	39.0 QP	46.0	-7.0	1.25 H	211	17.30	21.70
5	749.79	37.1 QP	46.0	-8.9	1.00 H	200	13.70	23.40
6	875.99	37.2 QP	46.0	-8.8	1.00 H	183	11.70	25.50
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	53.18	34.8 QP	40.0	-5.2	1.49 V	4	20.90	13.90
2	74.53	35.7 QP	40.0	-4.3	1.00 V	2	24.50	11.20
3	138.56	33.6 QP	43.5	-9.9	1.25 V	358	20.20	13.40
4	499.48	39.5 QP	46.0	-6.5	1.75 V	34	20.00	19.50
5	625.60	40.2 QP	46.0	-5.8	1.24 V	171	18.50	21.70
6	875.91	39.2 QP	46.0	-6.8	1.00 V	234	13.70	25.50

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.

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. 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

Tested Date: Nov. 09 ~ Dec. 07, 2012

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Nov. 09, 2012	Nov. 08, 2013
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 29, 2011	Dec. 28, 2012
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 30, 2011	Dec. 29, 2012
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 06, 2012	Jul. 05, 2013
Software ADT	BV ADT_Cond_ V7.3.7.3	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 2.

3. The VCCI Site Registration No. is C-2047.

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.

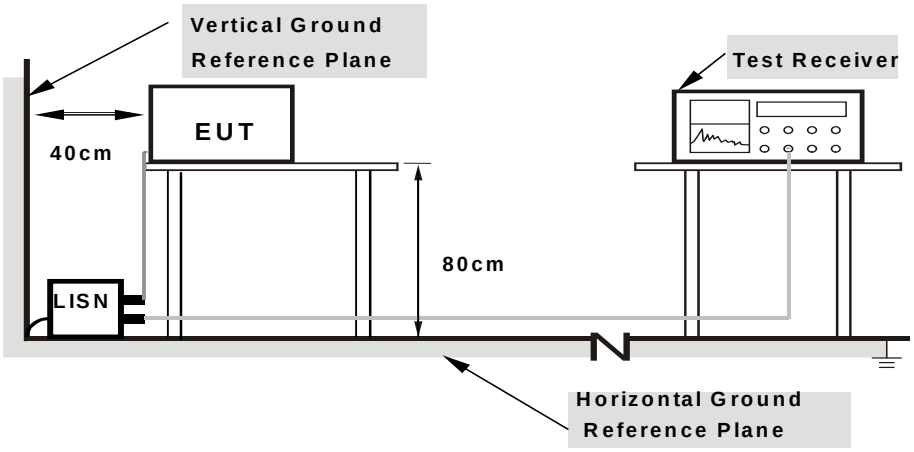
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

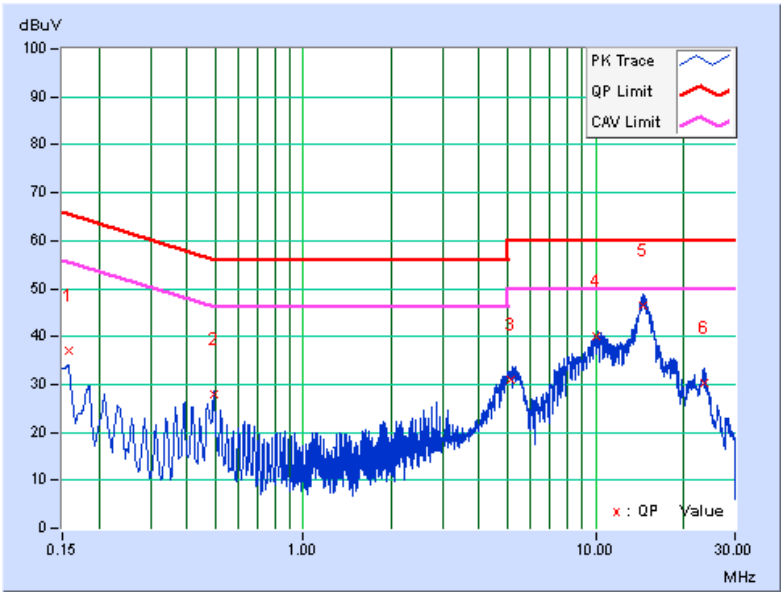
CONDUCTED WORST-CASE DATA：

802.11n (20MHz): 2TX

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15719	0.21	36.78	29.45	36.99	29.66	65.61	55.61	-28.62	-25.95
2	0.49324	0.25	27.59	25.10	27.84	25.35	56.11	46.11	-28.27	-20.76
3	5.11931	0.45	30.52	26.37	30.97	26.82	60.00	50.00	-29.03	-23.18
4	10.02334	0.52	39.67	35.63	40.19	36.15	60.00	50.00	-19.81	-13.85
5	14.45683	0.64	45.72	38.11	46.36	38.75	60.00	50.00	-13.64	-11.25
6	23.43796	0.79	29.57	22.44	30.36	23.23	60.00	50.00	-29.64	-26.77

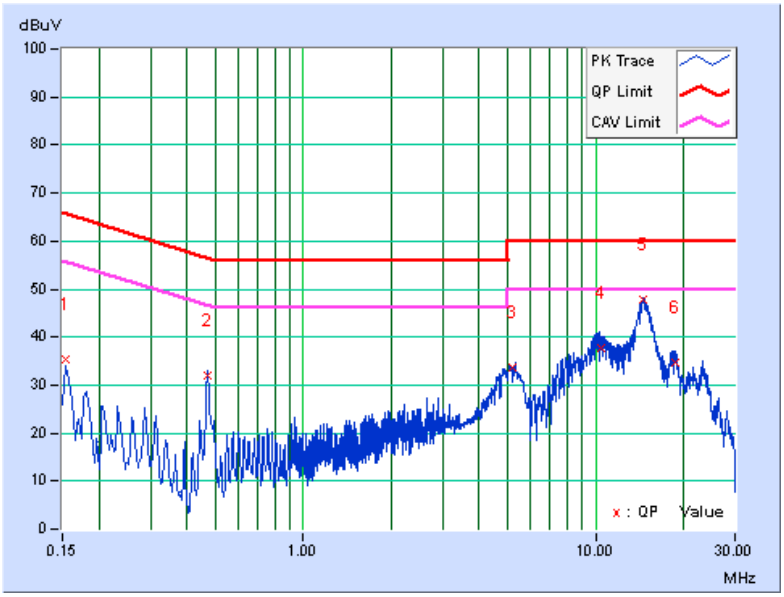
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.20	35.24	27.64	35.44	27.84	65.79	55.79	-30.34	-27.94
2	0.46792	0.23	31.67	28.87	31.90	29.10	56.55	46.55	-24.66	-17.46
3	5.16653	0.46	33.37	29.14	33.83	29.60	60.00	50.00	-26.17	-20.40
4	10.38638	0.62	37.21	30.39	37.83	31.01	60.00	50.00	-22.17	-18.99
5	**14.48406**	**0.73**	**46.96**	**41.79**	**47.69**	**42.52**	**60.00**	**50.00**	**-12.31**	**-7.48**
6	18.68340	0.84	33.77	24.50	34.61	25.34	60.00	50.00	-25.39	-24.66

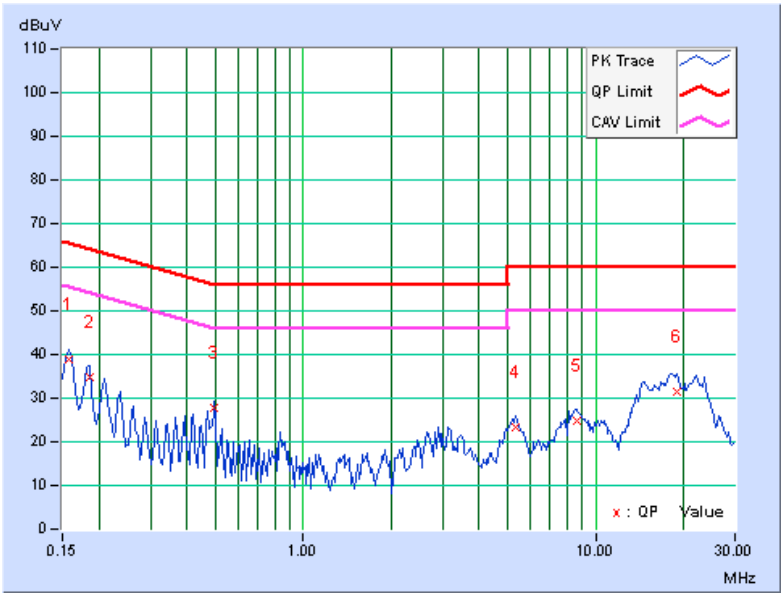
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.16	38.58	29.58	38.74	29.74	65.58	55.58	-26.84	-25.84
2	0.18516	0.17	34.81	27.36	34.98	27.53	64.25	54.25	-29.27	-26.72
3	0.49766	0.18	27.42	24.75	27.60	24.93	56.04	46.04	-28.43	-21.10
4	5.31250	0.40	22.92	18.57	23.32	18.97	60.00	50.00	-36.68	-31.03
5	8.60938	0.46	24.29	20.83	24.75	21.29	60.00	50.00	-35.25	-28.71
6	19.07813	0.70	30.82	23.81	31.52	24.51	60.00	50.00	-28.48	-25.49

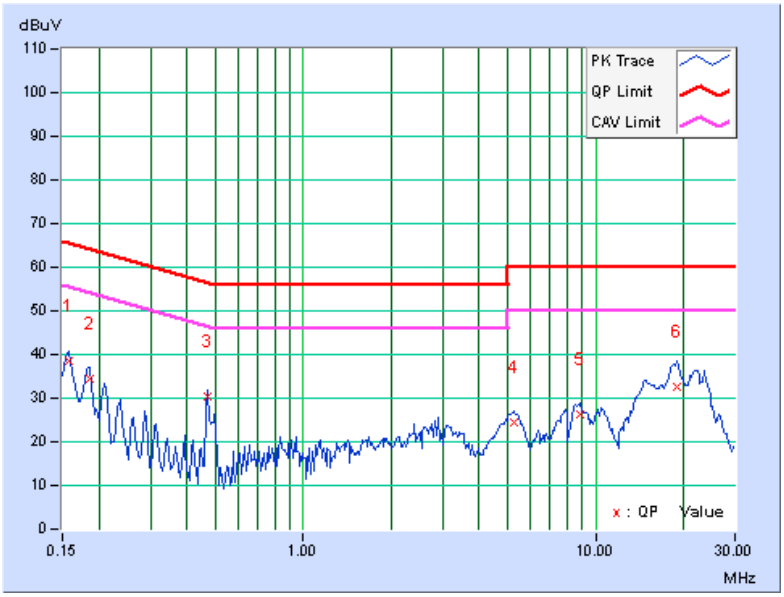
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.14	38.50	29.33	38.64	29.47	65.58	55.58	-26.94	-26.11
2	0.18516	0.15	34.20	24.91	34.35	25.06	64.25	54.25	-29.90	-29.19
3	0.47031	0.18	30.01	27.36	30.19	27.54	56.51	46.51	-26.31	-18.96
4	5.23438	0.44	23.96	19.77	24.40	20.21	60.00	50.00	-35.60	-29.79
5	8.84375	0.54	25.59	21.76	26.13	22.30	60.00	50.00	-33.87	-27.70
6	18.97656	0.79	31.73	20.92	32.52	21.71	60.00	50.00	-27.48	-28.29

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

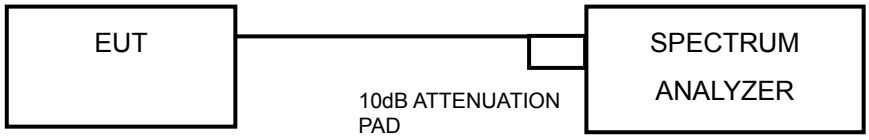


4.3 6dB BANDWIDTH MEASUREMENT

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

a. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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
1	2412	8.05	0.5	PASS
6	2437	8.11	0.5	PASS
11	2462	8.57	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.11	0.5	PASS
6	2437	14.87	0.5	PASS
11	2462	14.48	0.5	PASS

802.11n (20MHz): 1TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.10	0.5	PASS
6	2437	14.12	0.5	PASS
11	2462	14.46	0.5	PASS

802.11n (20MHz): 2TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	15.13	16.96	0.5	PASS
6	2437	15.19	15.09	0.5	PASS
11	2462	15.17	16.71	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.09	36.42	0.5	PASS
6	2437	36.12	36.40	0.5	PASS
9	2452	36.33	36.36	0.5	PASS

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

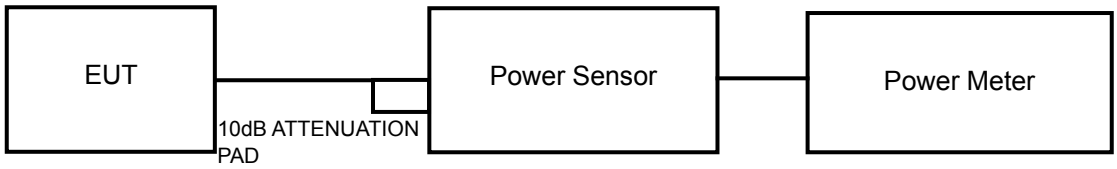
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

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 peak / average power sensor were used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. Record the peak 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

FOR PEAK POWER

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	129.420	21.12	30	PASS
6	2437	133.660	21.26	30	PASS
11	2462	127.057	21.04	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	101.158	20.05	30	PASS
6	2437	264.241	24.22	30	PASS
11	2462	85.114	19.30	30	PASS

802.11n (20MHz): 1TX

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	99.541	19.98	30	PASS
6	2437	263.027	24.20	30	PASS
11	2462	81.283	19.10	30	PASS

802.11n (20MHz): 2TX

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	18.35	17.89	129.909	21.14	30	PASS
6	2437	22.52	23.12	**383.765**	25.84	30	PASS
11	2462	19.00	18.37	148.140	21.71	30	PASS

802.11n (40MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	16.81	17.01	98.207	19.92	30	PASS
6	2437	20.31	20.33	215.294	23.33	30	PASS
9	2452	18.81	17.26	129.244	21.11	30	PASS

FOR AVERAGE POWER

802.11b

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	57.412	17.59
6	2437	59.704	17.76
11	2462	54.450	17.36

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	9.616	9.83
6	2437	46.132	16.64
11	2462	10.139	10.06

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	8.511	9.30
6	2437	42.658	16.30
11	2462	9.550	9.80

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	9.49	8.97	16.788	12.25
6	2437	14.75	14.76	59.841	17.77
11	2462	9.52	9.83	18.578	12.69

802.11n (40MHz)

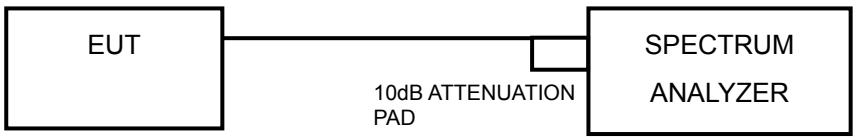
CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
3	2422	6.98	7.69	10.864	10.36
6	2437	10.54	10.75	23.227	13.66
9	2452	7.54	7.58	11.402	10.57

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

a. Set the RBW = 3 kHz, VBW =10 kHz, Detector = peak.
b. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
c. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

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

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-6.24	8	PASS
6	2437	-6.46	8	PASS
11	2462	-6.38	8	PASS

802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-16.61	8	PASS
6	2437	-9.17	8	PASS
11	2462	-16.01	8	PASS

802.11n (20MHz): 1TX

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-15.85	8	PASS
6	2437	-8.06	8	PASS
11	2462	-15.51	8	PASS

802.11n (20MHz): 2TX

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-17.08	3.01	-14.07	8	PASS
	6	2437	-11.53	3.01	-8.52	8	PASS
	11	2462	-17.06	3.01	-14.05	8	PASS
1	1	2412	-15.91	3.01	-12.90	8	PASS
	6	2437	-10.71	3.01	-7.70	8	PASS
	11	2462	-15.57	3.01	-12.56	8	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}$] = 6.00dBi = 6dBi, so the limit no need to reduced.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-22.65	3.01	-19.64	8	PASS
	6	2437	-18.40	3.01	-15.39	8	PASS
	9	2452	-21.89	3.01	-18.88	8	PASS
1	3	2422	-22.32	3.01	-19.31	8	PASS
	6	2437	-18.73	3.01	-15.72	8	PASS
	9	2452	-19.86	3.01	-16.85	8	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}$] = 6.00dBi = 6dBi, so the limit no need to reduced.

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION 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 ≥ 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 OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 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

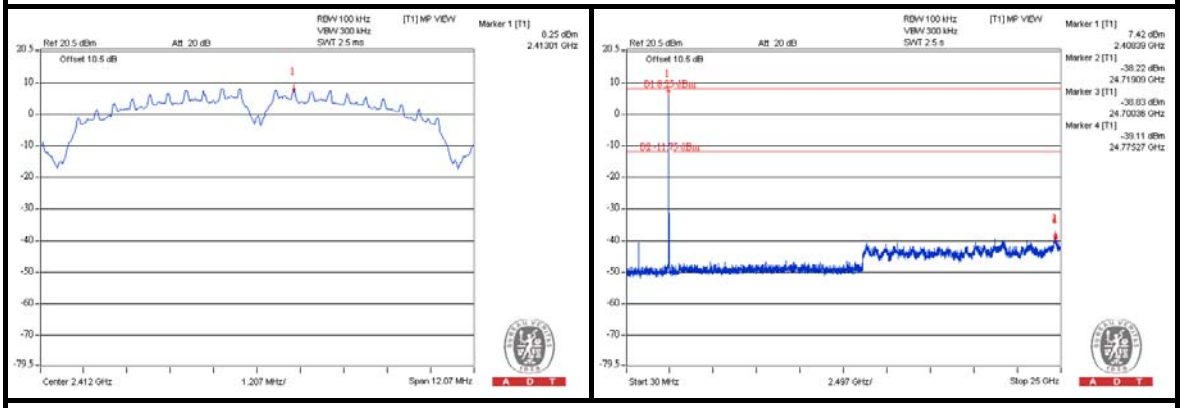
4.6.7 TEST RESULTS

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.

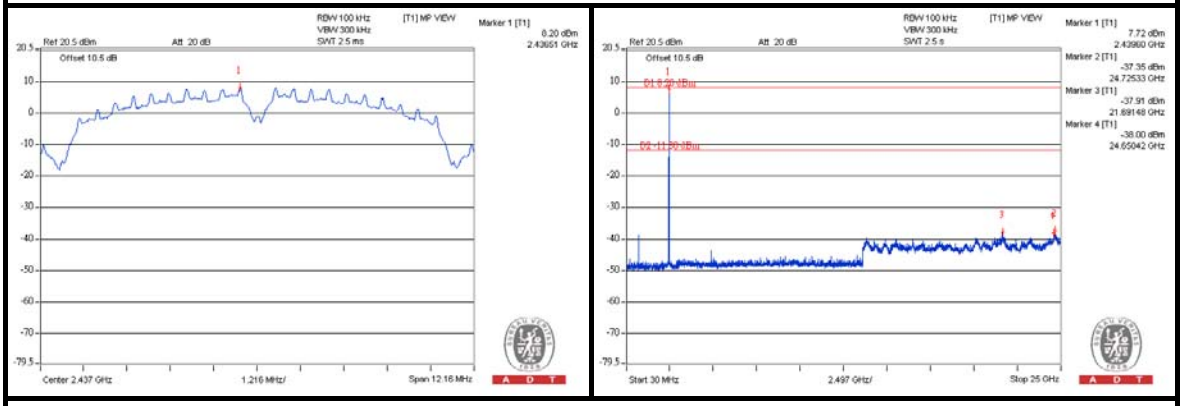
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

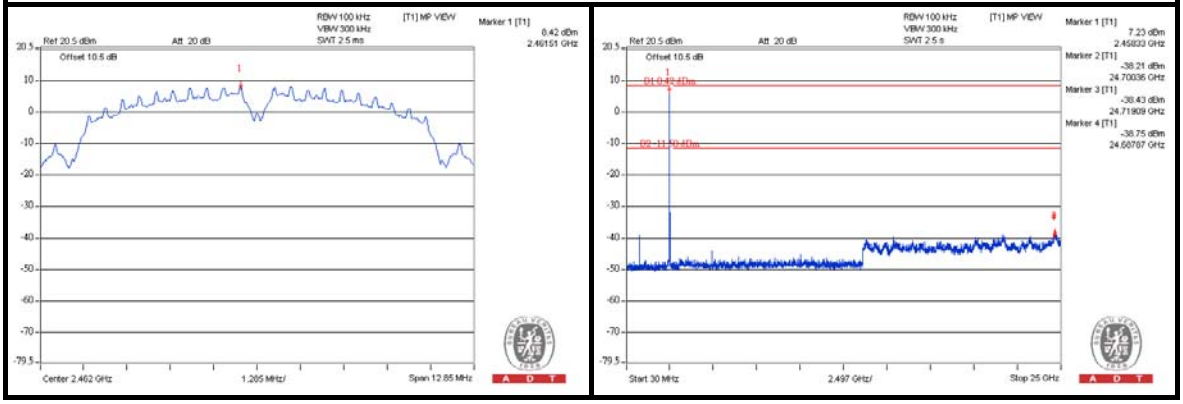
CH 1



CH 6

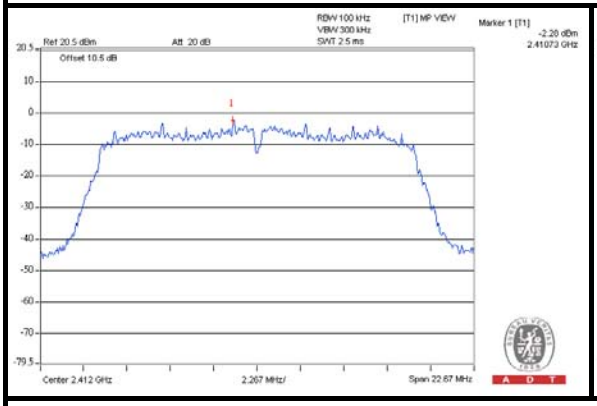


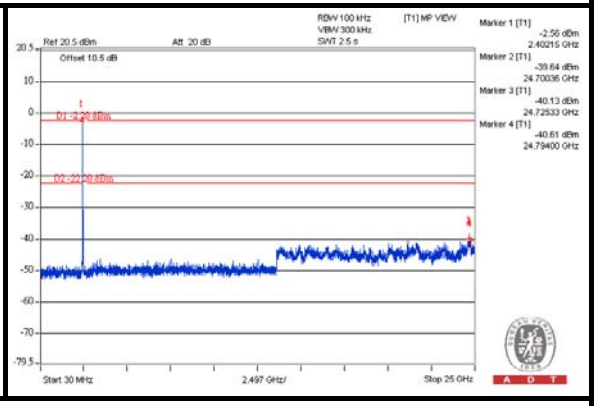
CH 11



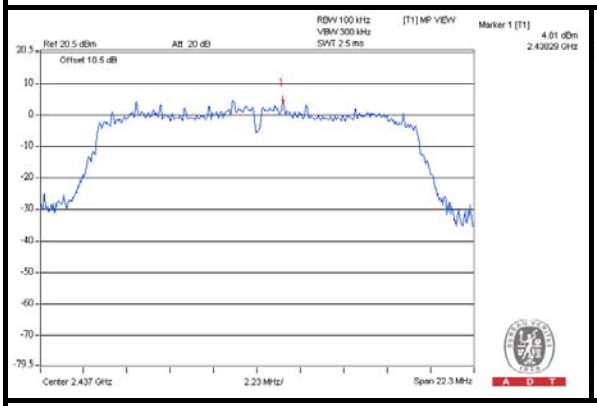
802.11g

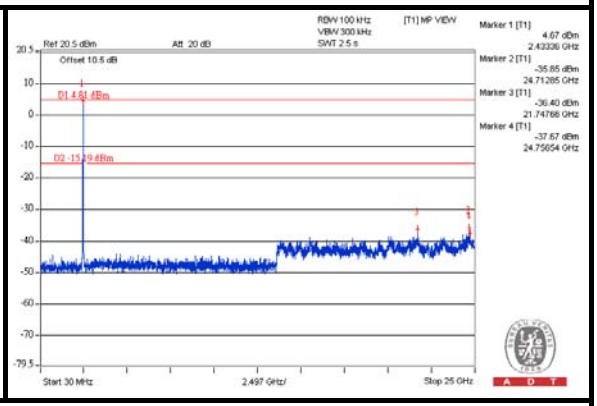
CH 1



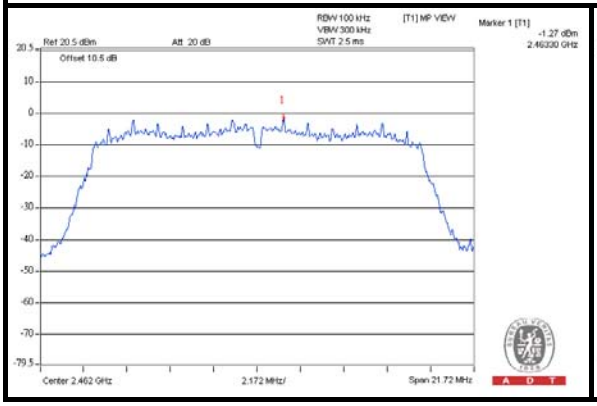


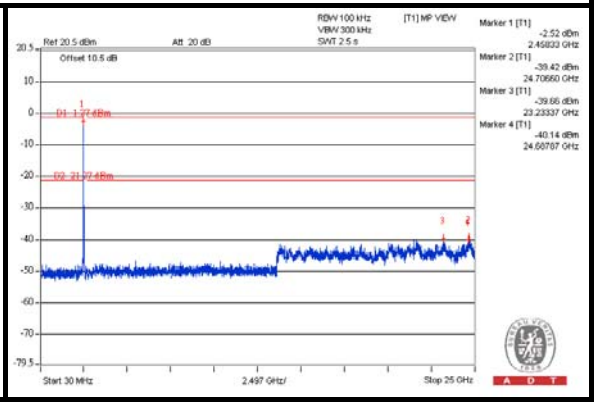
CH 6





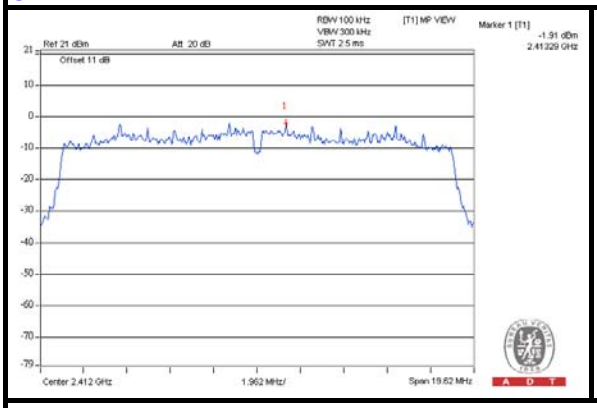
CH 11

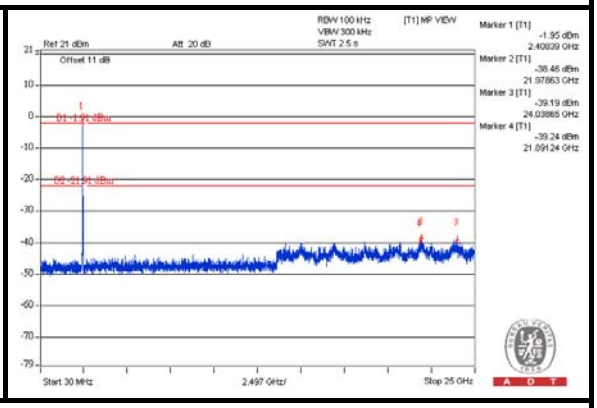




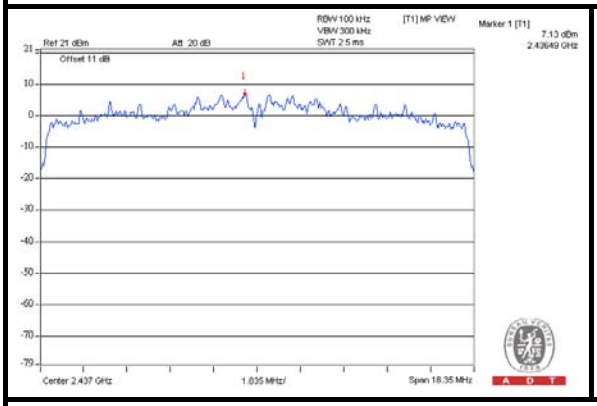
802.11n (20MHz): 1TX

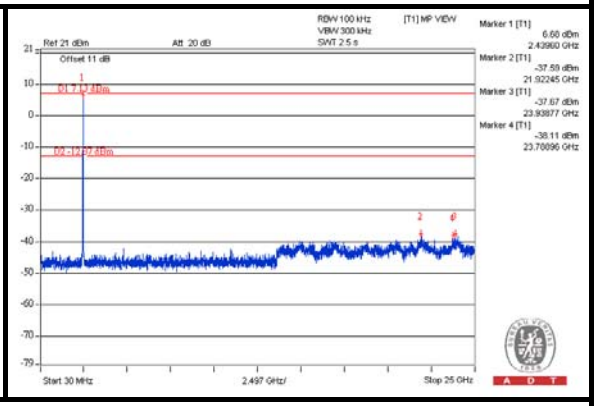
CH 1





CH 6





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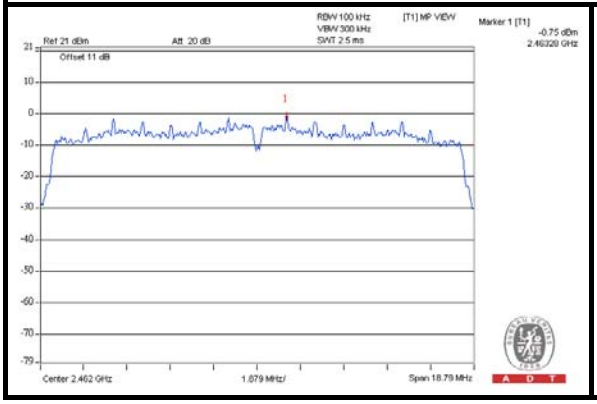
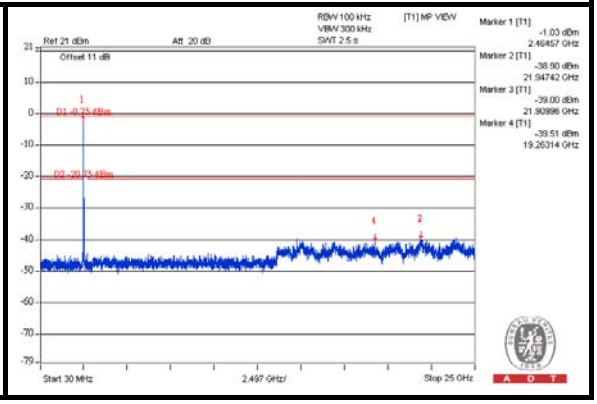
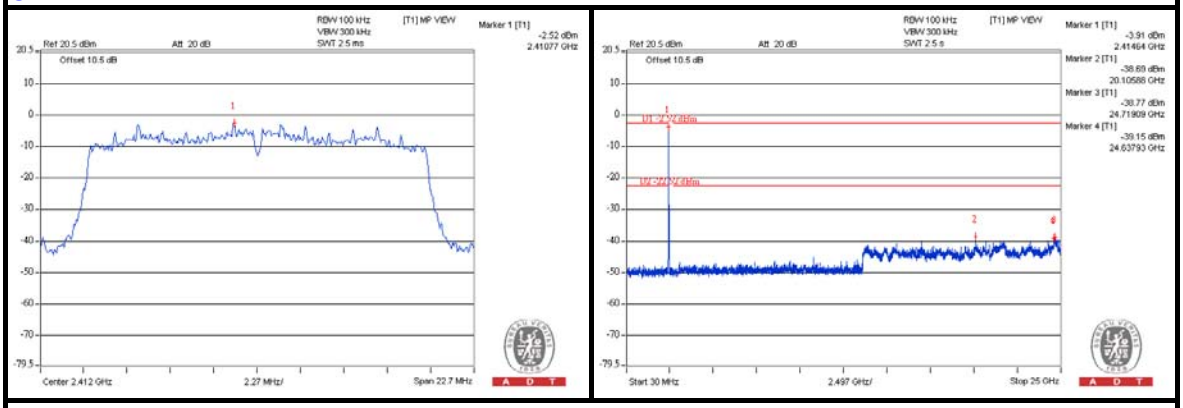




802.11n (20MHz): 2TX

CHAIN 0

CH 1



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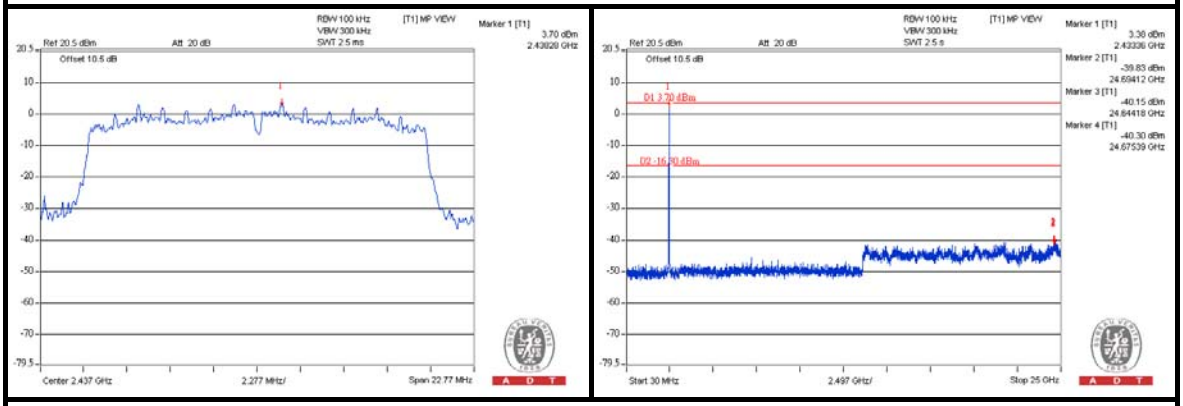

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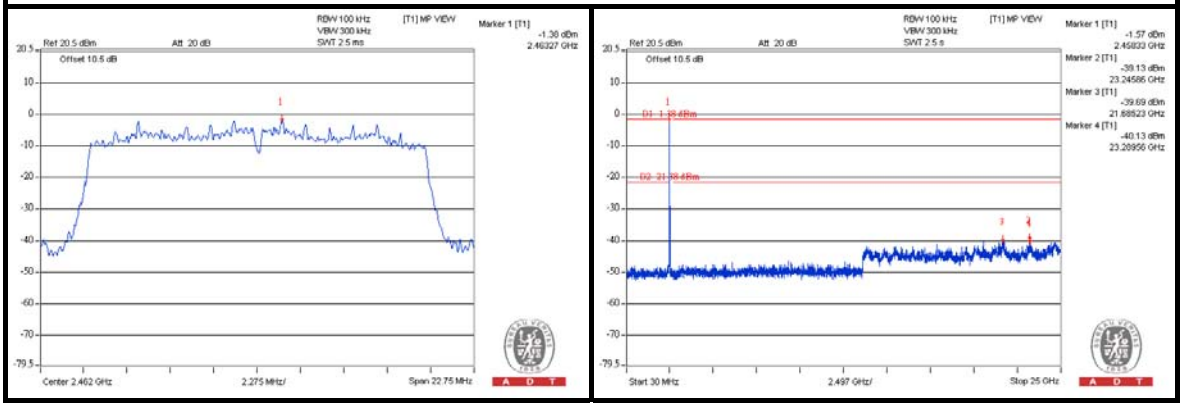
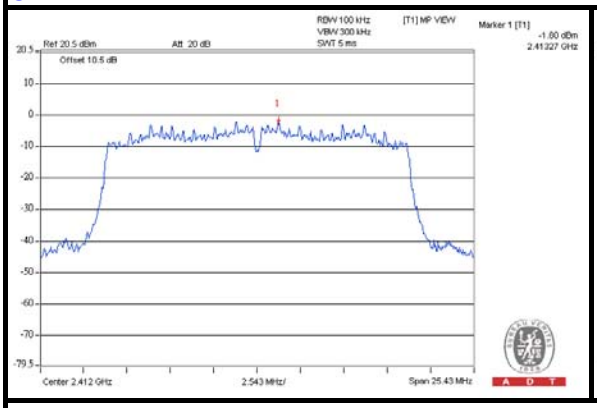
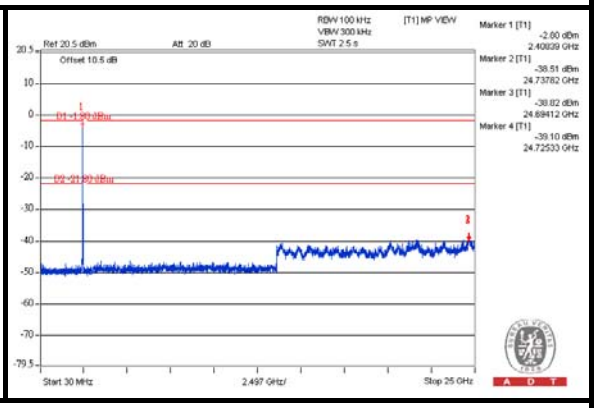


CHAIN 1

CH 1





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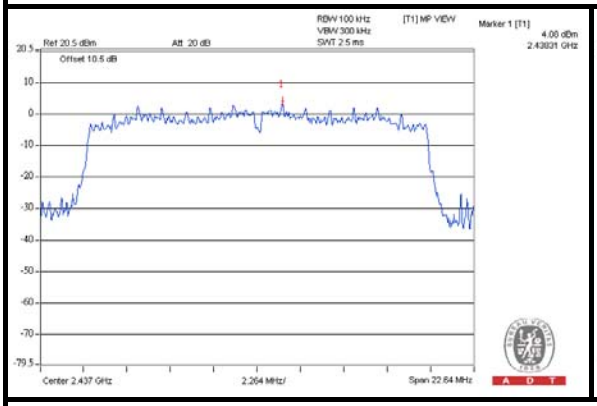

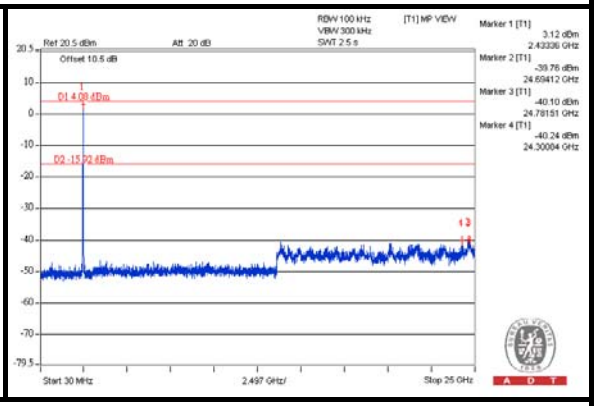

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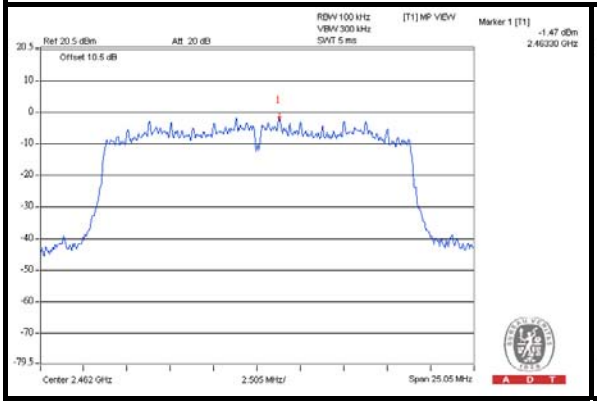
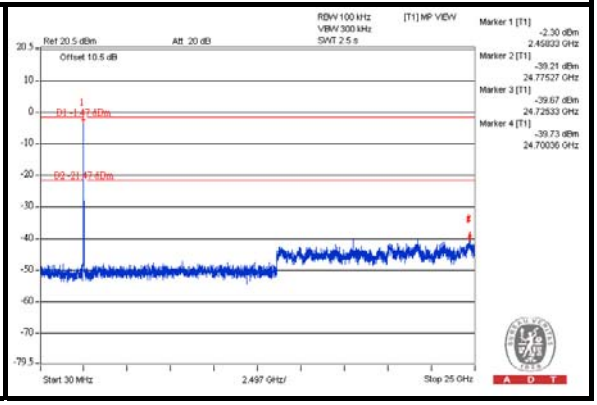
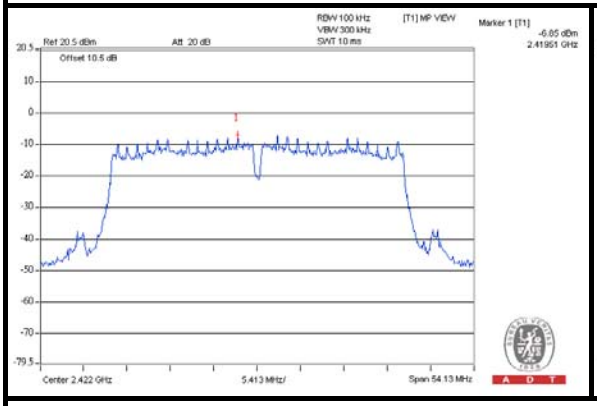


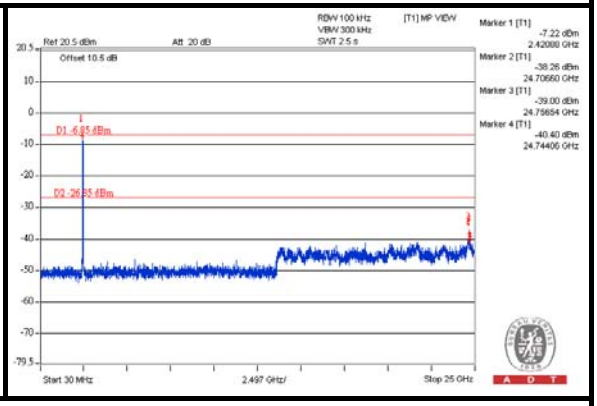


802.11n (40MHz)

CHAIN 0

CH 3





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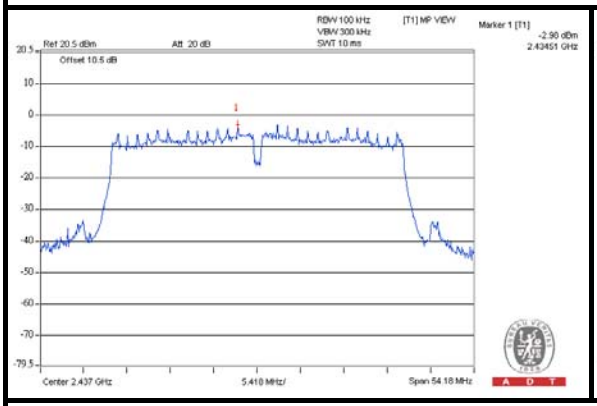
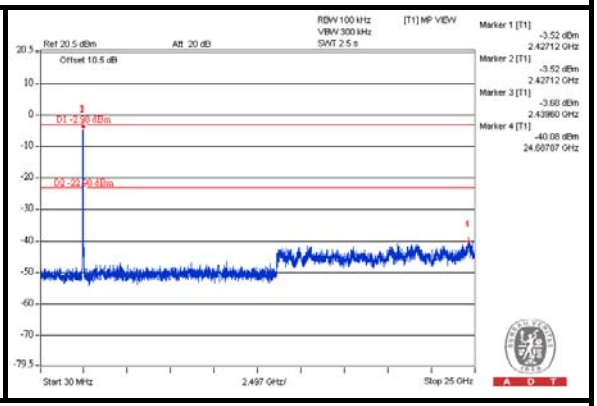
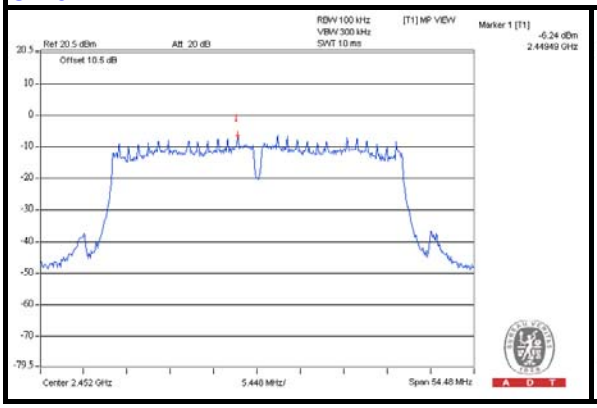
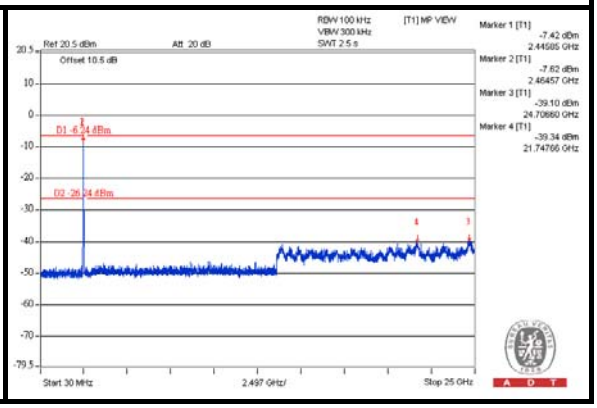




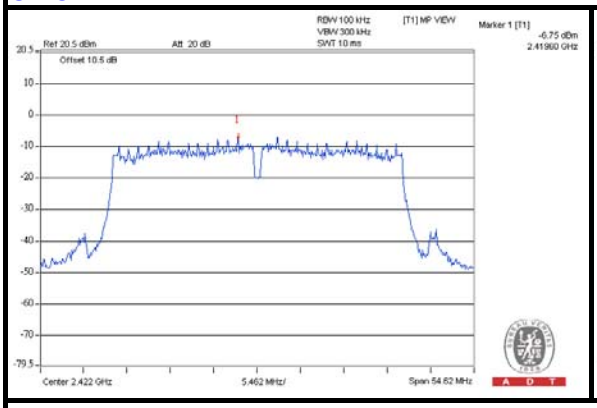
CH 9

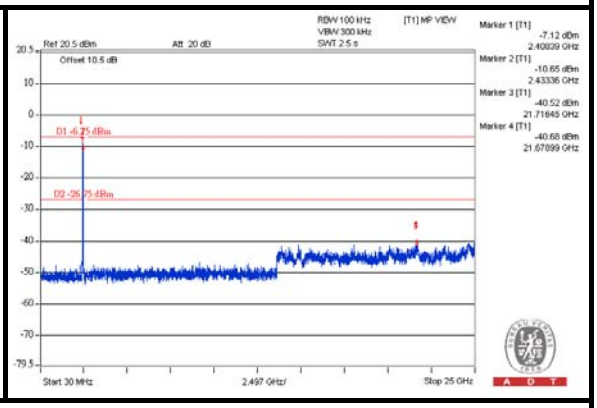




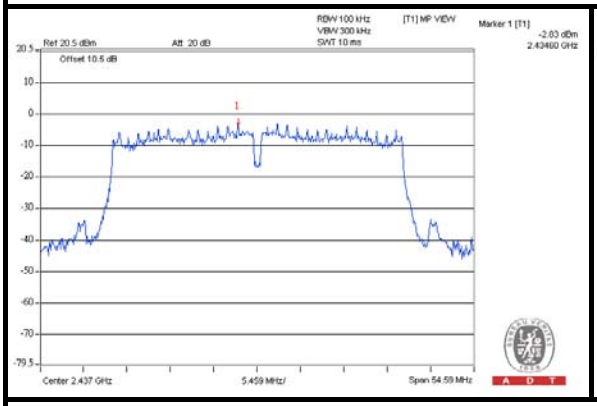
CHAIN 1

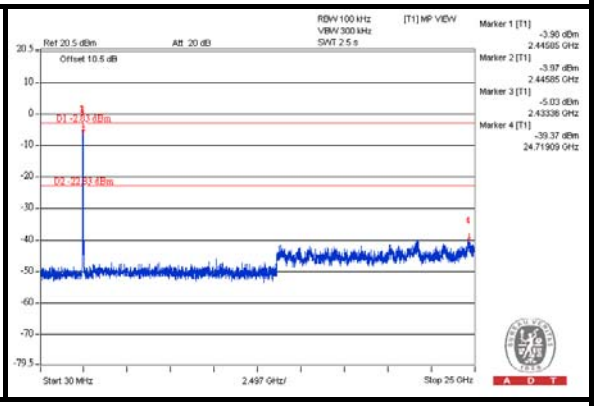
CH 3



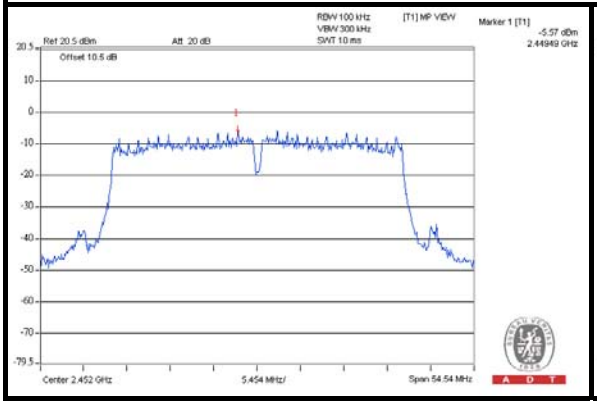


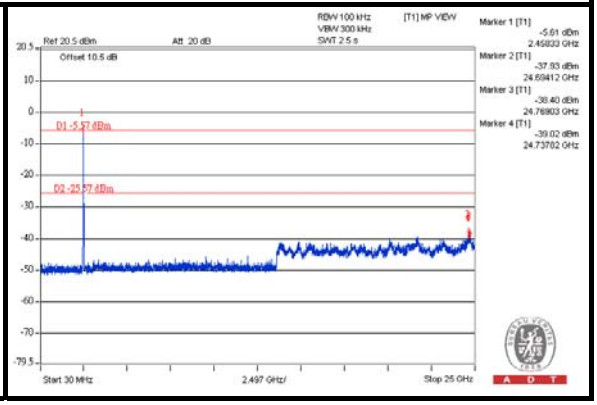
CH 6





CH 9





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.

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: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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 modifications were made to the EUT by the lab during the test.

---END---