FCC TEST REPORT (15.247)

REPORT NO.:	RF130905C19
MODEL NO.:	XR-3
FCC ID:	2AAUY-RACCOON
RECEIVED:	Sep. 05, 2013
TESTED:	Sep. 19 ~ Oct. 01, 2013
ISSUED:	Oct. 07, 2013

APPLICANT:	Xyne GmbH
ADDRESS:	Kaiserstrasse 201/203, Karlsruhe, Germany, 76133

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
RF130905C19	Original release	Oct. 07, 2013

1. CERTIFICATION

PRODUCT:	Wireless-N 300+300Mbps Ceiling Mount Dual Band Concurrent AP
MODEL NO.:	XR-3
BRAND:	XYNE
APPLICANT:	Xyne GmbH
TESTED:	Sep. 19 ~ Oct. 01, 2013
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

The above equipment (model: XR-3) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE :** Oct. 07, 2013
Polly Chien / Specialist

APPROVED BY : _____ , **DATE :** Oct. 07, 2013
Ken Liu / Senior 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 -11.91dB at 0.15781MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.8dB at 2483.50MHz & 5725.00MHz.
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 IPEX 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	Wireless-N 300+300Mbps Ceiling Mount Dual Band Concurrent AP
MODEL NO.	XR-3
POWER SUPPLY	12Vdc (Adapter) 48Vdc (PoE)
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 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
OPERATING FREQUENCY	**2.4GHz:** 2412 ~ 2462MHz **5.0GHz:** 5745 ~ 5825MHz
NUMBER OF CHANNEL	**2.4GHz:** 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) **5.0GHz:** 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	849.980mW for 2412 ~ 2462MHz 194.422mW for 5745 ~ 5825MHz
ANTENNA TYPE	PIFA antenna with 2dBi gain
ANTENNA CONNECTOR	IPEX
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

1. 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
802.11a	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

2. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	SUNNY COMPUTER TECHNOLOGY CO.,LTD.
MODEL:	SYS1357-2412
INPUT:	100-240Vac, 1.0A MAX, 50-60Hz
OUTPUT:	12Vdc, 2.0A
POWER LINE:	1.85m power cable without core attached on adapter

3. The EUT consumes power from the following POE and adapter (provided as a support unit only).

POE	
BRAND:	EnGenius
MODEL:	EPE-4818G
OUTPUT:	48Vdc, 0.42A

ADAPTER FOR POE	
BRAND:	MW
MODEL:	ES18E48-480
INPUT:	100-240Vac, 50-60Hz, 0.5A
OUTPUT:	48Vdc, 0.375A, 18W NAX
POWER LINE:	1.8m power cable with one core attached on adapter

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

FOR 2.4GHz:

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		

FOR 5.0GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from PoE

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 is a hexagon shape AP, therefore 7 modes is tested with 6 axis in Z plane and 1 axis in X plane. After the pretest, Z(4) for 802.11b and Z(3) for 802.11g, 802.11n (20MHz), 802.11n (40MHz) were found to be the worst case test modes
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)	AXIS
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Z(4)
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	Z(3)
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2	Z(3)
A	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0	Z(3)

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)	AXIS
A, B	802.11b	1 to 11	6	DSSS	DBPSK	1.0	Z(4)

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11b	1 to 11	6	DSSS	DBPSK	1.0

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)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	3 to 9	3, 9	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)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	24deg. C, 67%RH	120Vac, 60Hz	Brad Tung
RE<1G	24deg. C, 67%RH	120Vac, 60Hz 48Vdc	Brad Tung
PLC	24deg. C, 64%RH	120Vac, 60Hz 48Vdc	Match Tsui
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Chen

FOR 5.0GHz (5745 ~ 5825MHz):

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from PoE

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 is a hexagon shape AP, therefore 7 modes is tested with 6 axis in Z plane and 1 axis in X plane. After the pretest, Z(3) was found to be the worst case test mode
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)	AXIS
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0	Z(3)
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2	Z(3)
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0	Z(3)

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)	AXIS
A, B	802.11n (20MHz)	149 to 165	165	OFDM	BPSK	7.2	Z(3)

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11n (20MHz)	149 to 165	165	OFDM	BPSK	7.2

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)
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	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)
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE≥1G	24deg. C, 67%RH	120Vac, 60Hz	Brad Tung
RE<1G	24deg. C, 67%RH	120Vac, 60Hz 48Vdc	Brad Tung
PLC	24deg. C, 64%RH	120Vac, 60Hz 48Vdc	Match Tsui
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Chen

3.3 Duty cycle of test signal

2.4GHz:

Duty cycle of test signal is > 98 %, duty factor is not required.

802.11b: Duty cycle = 1

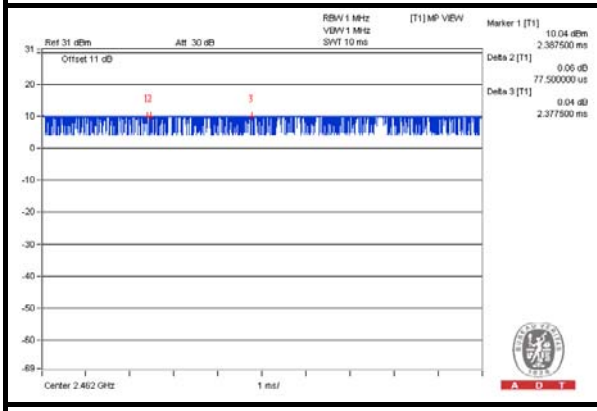
If duty cycle is < 98%, duty factor shall be considered.

802.11g: Duty cycle = 2.0175/2.075 = 0.972, Duty factor = 10 * log(1/0.972) = 0.12

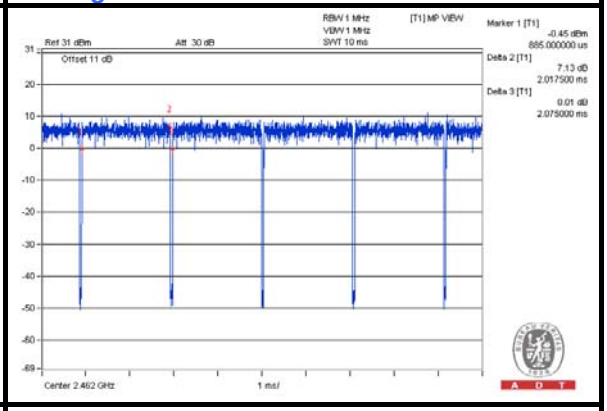
802.11n (20MHz): Duty cycle = 1.885/1.94 = 0.972, Duty factor = 10 * log(1/0.972) = 0.12

802.11n (40MHz): Duty cycle = 0.475/0.525 = 0.905, Duty factor = 10 * log(1/0.905) = 0.43

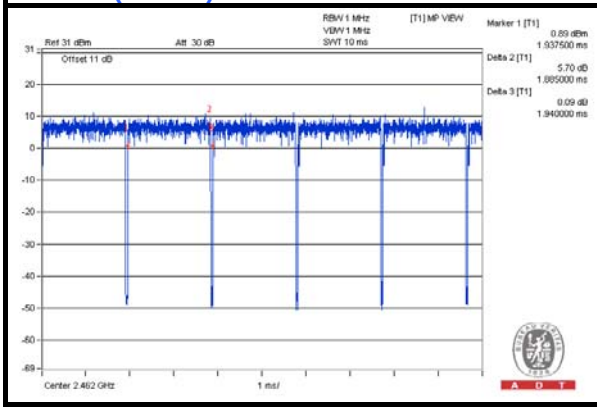
802.11b



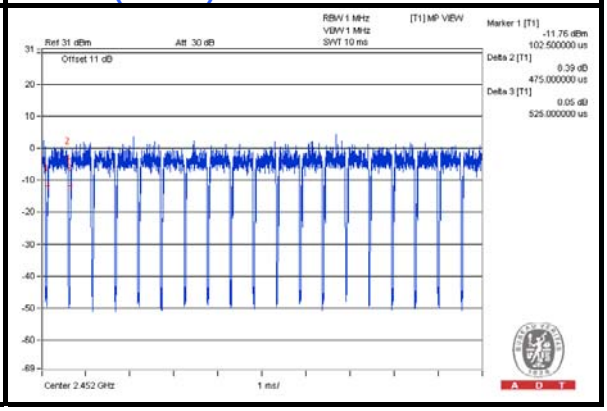
802.11g



802.11n (20MHz)



802.11n (40MHz)



5GHz:

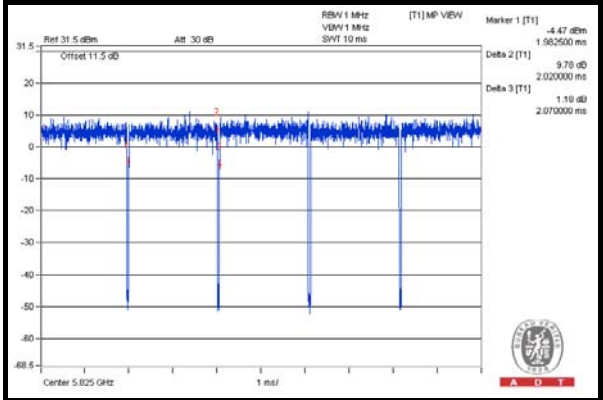
If duty cycle is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 2.02/2.07 = 0.976, Duty factor = 10 * log(1/0.976) = 0.11

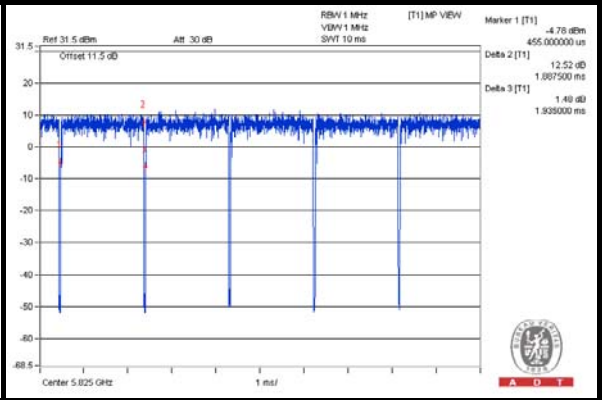
802.11n (20MHz): Duty cycle = 1.8875/1.935 = 0.975, Duty factor = 10 * log(1/0.975) = 0.11

802.11n (40MHz): Duty cycle = 0.485/0.520 = 0.933, Duty factor = 10 * log(1/0.933) = 0.30

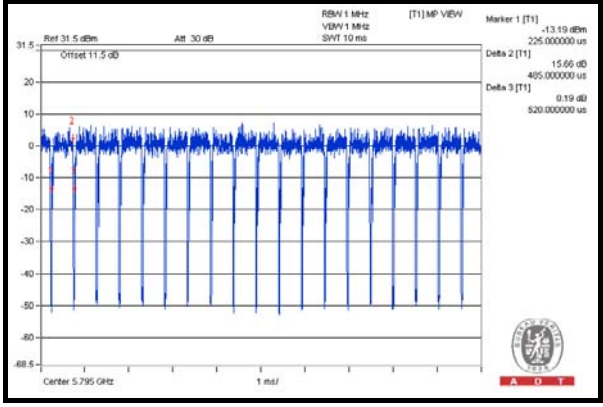
802.11a



802.11n (20MHz)



802.11n (40MHz)



3.4 DESCRIPTION OF SUPPORT UNITS

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

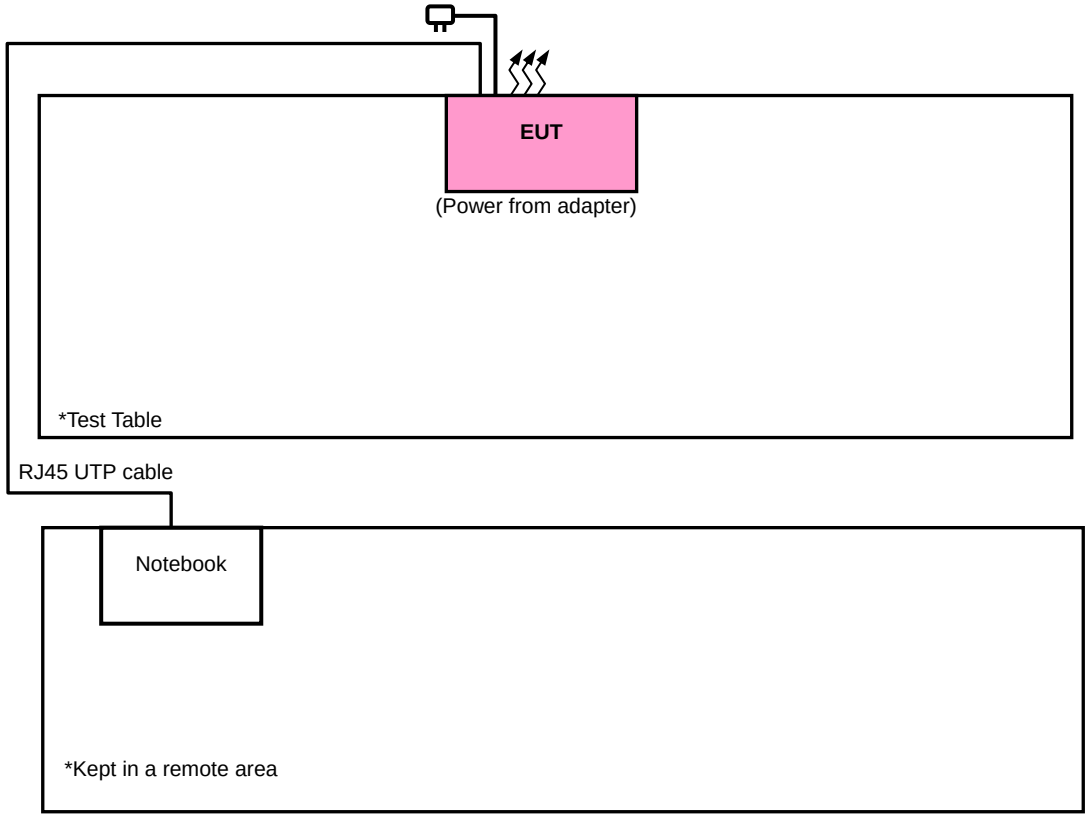
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	D531	CN-0XM006-48643-81U-2610	FCC DoC approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 UTP cable

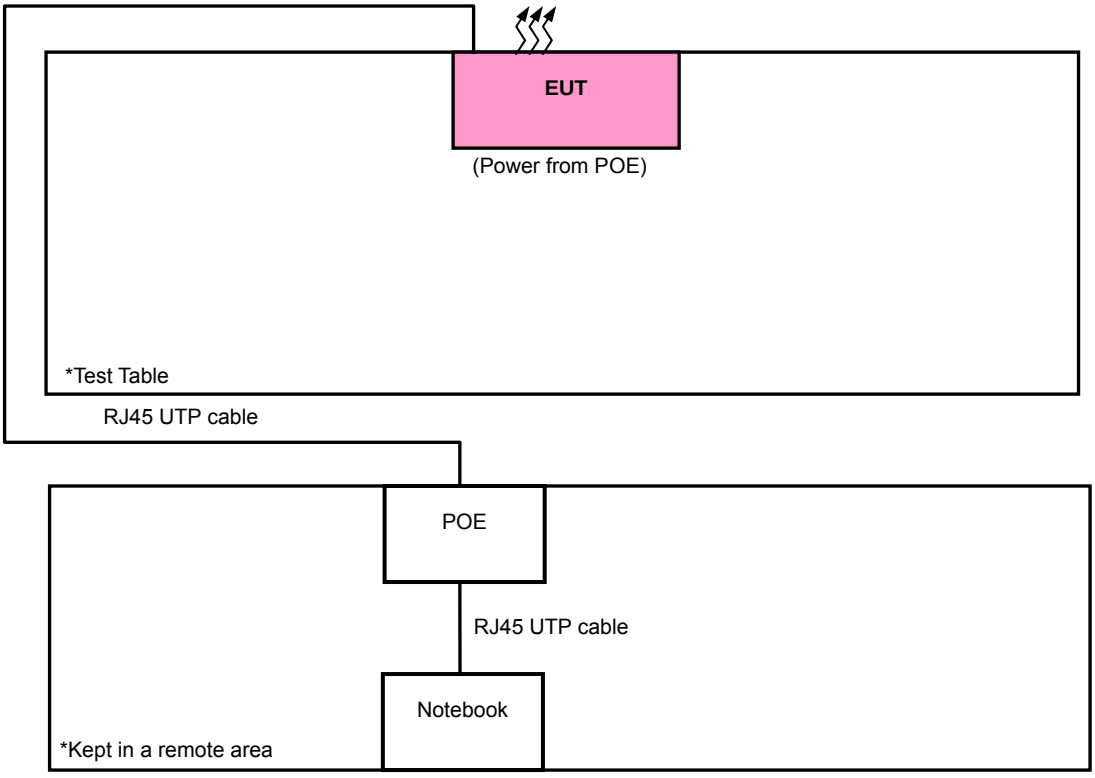
NOTE: All power cords of the above support units are non-shielded (1.8m).

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST

Test Mode A



Test Mode B



3.5 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 v03r01
662911 D01 Multiple Transmitter Output v02
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 (FOR 2.4GHz BAND)

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 30dB 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 30dB 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	Sep. 09, 2013	Sep. 08, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Oct. 25, 2012	Oct. 24, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Dec. 22, 2012	Dec. 21, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
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. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	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 BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 25, 2012	Oct. 24, 2013
High Speed Peak Power Meter	ML2495A	0824012	Sep. 12, 2013	Sep. 11, 2014
Power Sensor	MA2411B	0738171	Jul. 30, 2013	Jul. 29, 2014

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:

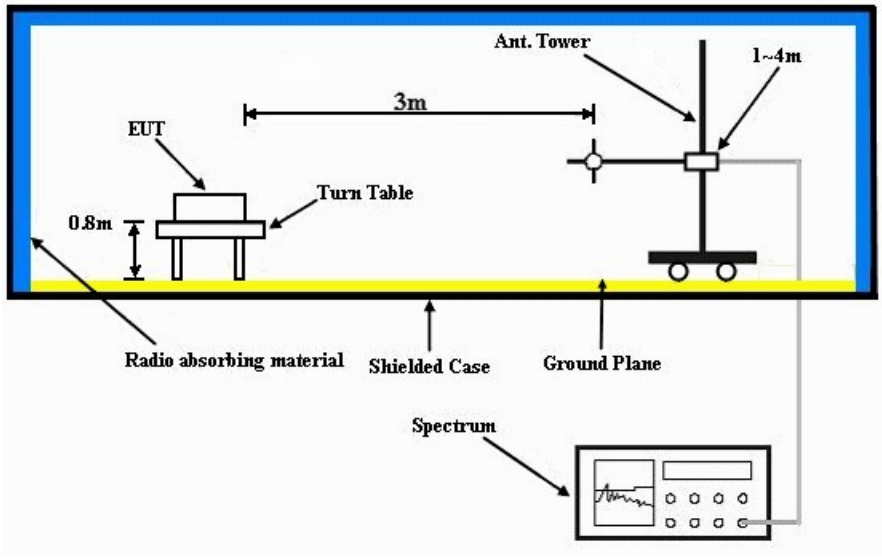
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz(Duty cycle < 98%) or 10Hz(Duty cycle > 98%) 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

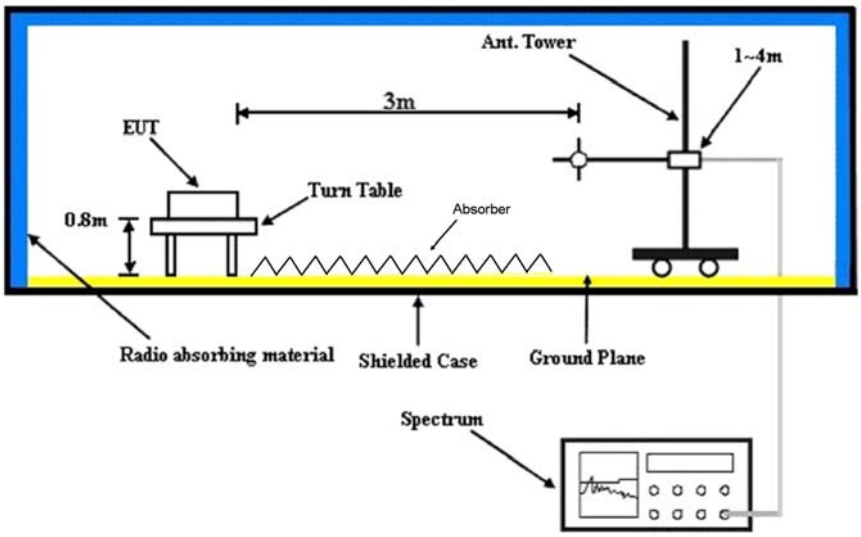
No deviation.

4.1.5 TEST SETUP

Frequency range 30MHz~1GHz



Frequency range above 1GHz



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 notebook to act as communication partner and placed it outside of testing area.
c. The communication partner 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.
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	72.9 PK	74.0	-1.1	1.16 H	301	41.00	31.90
2	2390.00	51.9 AV	54.0	-2.1	1.16 H	301	20.00	31.90
3	*2412.00	116.0 PK			1.16 H	301	84.00	32.00
4	*2412.00	112.1 AV			1.16 H	301	80.10	32.00
5	4824.00	47.9 PK	74.0	-26.1	1.00 H	134	43.10	4.80
6	4824.00	43.0 AV	54.0	-11.0	1.00 H	134	38.20	4.80
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	72.0 PK	74.0	-2.0	1.00 V	88	40.10	31.90
2	2390.00	51.0 AV	54.0	-3.0	1.00 V	88	19.10	31.90
3	*2412.00	111.0 PK			1.00 V	88	79.00	32.00
4	*2412.00	107.1 AV			1.00 V	88	75.10	32.00
5	4824.00	47.8 PK	74.0	-26.2	1.00 V	10	43.00	4.80
6	4824.00	42.7 AV	54.0	-11.3	1.00 V	10	37.90	4.80

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	73.0 PK	74.0	-1.0	1.10 H	301	41.10	31.90
2	2390.00	48.7 AV	54.0	-5.3	1.10 H	301	16.80	31.90
3	*2437.00	120.7 PK			1.10 H	301	88.70	32.00
4	*2437.00	117.2 AV			1.10 H	301	85.20	32.00
5	4874.00	51.9 PK	74.0	-22.1	1.00 H	125	46.90	5.00
6	4874.00	47.0 AV	54.0	-7.0	1.00 H	125	42.00	5.00
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	2353.00	65.0 PK	74.0	-9.0	1.10 V	57	33.20	31.80
2	2353.00	52.7 AV	54.0	-1.3	1.10 V	57	20.90	31.80
3	*2437.00	116.1 PK			1.00 V	84	84.10	32.00
4	*2437.00	112.3 AV			1.00 V	84	80.30	32.00
5	4874.00	51.7 PK	74.0	-22.3	1.00 V	19	46.70	5.00
6	4874.00	46.8 AV	54.0	-7.2	1.00 V	19	41.80	5.00

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	115.1 PK			1.10 H	300	82.90	32.20
2	*2462.00	111.7 AV			1.10 H	300	79.50	32.20
3	2483.50	73.0 PK	74.0	-1.0	1.10 H	300	40.70	32.30
4	2483.50	53.0 AV	54.0	-1.0	1.10 H	300	20.70	32.30
5	4924.00	47.6 PK	74.0	-26.4	1.00 H	125	42.60	5.00
6	4924.00	42.9 AV	54.0	-11.1	1.00 H	125	37.90	5.00
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	*2462.00	111.0 PK			1.00 V	96	78.80	32.20
2	*2462.00	107.1 AV			1.00 V	96	74.90	32.20
3	2483.50	71.0 PK	74.0	-3.0	1.00 V	96	38.70	32.30
4	2483.50	52.3 AV	54.0	-1.7	1.00 V	96	20.00	32.30
5	4924.00	47.3 PK	74.0	-26.7	1.00 V	13	42.30	5.00
6	4924.00	42.7 AV	54.0	-11.3	1.00 V	13	37.70	5.00

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	72.5 PK	74.0	-1.5	1.63 H	59	40.60	31.90
2	2390.00	51.9 AV	54.0	-2.1	1.63 H	59	20.00	31.90
3	*2412.00	110.1 PK			1.63 H	59	78.10	32.00
4	*2412.00	100.5 AV			1.63 H	59	68.50	32.00
5	4824.00	47.9 PK	74.0	-26.1	1.10 H	136	43.10	4.80
6	4824.00	35.0 AV	54.0	-19.0	1.10 H	136	30.20	4.80
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	69.9 PK	74.0	-4.1	1.40 V	250	38.00	31.90
2	2390.00	48.2 AV	54.0	-5.8	1.40 V	250	16.30	31.90
3	*2412.00	109.0 PK			1.40 V	250	77.00	32.00
4	*2412.00	99.3 AV			1.40 V	250	67.30	32.00
5	4824.00	48.0 PK	74.0	-26.0	1.00 V	133	43.20	4.80
6	4824.00	35.1 AV	54.0	-18.9	1.00 V	133	30.30	4.80

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	73.0 PK	74.0	-1.0	1.61 H	51	41.10	31.90
2	2390.00	50.9 AV	54.0	-3.1	1.61 H	51	19.00	31.90
3	*2437.00	120.2 PK			1.61 H	51	88.20	32.00
4	*2437.00	110.9 AV			1.61 H	51	78.90	32.00
5	4874.00	47.9 PK	74.0	-26.1	1.00 H	153	42.90	5.00
6	4874.00	35.0 AV	54.0	-19.0	1.00 H	153	30.00	5.00
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	*2437.00	119.0 PK			1.41 V	245	87.00	32.00
2	*2437.00	109.0 AV			1.41 V	245	77.00	32.00
3	4874.00	48.0 PK	74.0	-26.0	1.06 V	125	43.00	5.00
4	4874.00	35.2 AV	54.0	-18.8	1.06 V	125	30.20	5.00

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	114.2 PK			1.36 H	49	82.00	32.20
2	*2462.00	104.5 AV			1.36 H	49	72.30	32.20
3	2483.50	72.5 PK	74.0	-1.5	1.36 H	49	40.20	32.30
4	2483.50	52.0 AV	54.0	-2.0	1.36 H	49	19.70	32.30
5	4924.00	48.3 PK	74.0	-25.7	1.09 H	105	43.30	5.00
6	4924.00	35.5 AV	54.0	-18.5	1.09 H	105	30.50	5.00
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	*2462.00	113.0 PK			1.40 V	239	80.80	32.20
2	*2462.00	103.2 AV			1.40 V	239	71.00	32.20
3	2483.50	70.3 PK	74.0	-3.7	1.40 V	239	38.00	32.30
4	2483.50	50.1 AV	54.0	-3.9	1.40 V	239	17.80	32.30
5	4924.00	48.3 PK	74.0	-25.7	1.04 V	142	43.30	5.00
6	4924.00	35.5 AV	54.0	-18.5	1.04 V	142	30.50	5.00

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	72.0 PK	74.0	-2.0	1.33 H	31	40.10	31.90
2	2390.00	52.6 AV	54.0	-1.4	1.33 H	31	20.70	31.90
3	*2412.00	111.0 PK			1.33 H	52	79.00	32.00
4	*2412.00	101.3 AV			1.33 H	52	69.30	32.00
5	4824.00	47.2 PK	74.0	-26.8	1.08 H	13	42.40	4.80
6	4824.00	34.7 AV	54.0	-19.3	1.08 H	13	29.90	4.80
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	70.0 PK	74.0	-4.0	1.40 V	246	38.10	31.90
2	2390.00	50.1 AV	54.0	-3.9	1.40 V	246	18.20	31.90
3	*2412.00	109.0 PK			1.40 V	246	77.00	32.00
4	*2412.00	100.3 AV			1.40 V	246	68.30	32.00
5	4824.00	47.3 PK	74.0	-26.7	1.11 V	70	42.50	4.80
6	4824.00	34.8 AV	54.0	-19.2	1.11 V	70	30.00	4.80

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	2353.00	67.0 PK	74.0	-7.0	1.35 H	52	35.20	31.80
2	2353.00	52.8 AV	54.0	-1.2	1.35 H	52	21.00	31.80
3	2390.00	72.8 PK	74.0	-1.2	1.35 H	52	40.90	31.90
4	2390.00	51.1 AV	54.0	-2.9	1.35 H	52	19.20	31.90
5	*2437.00	119.8 PK			1.35 H	52	87.80	32.00
6	*2437.00	110.0 AV			1.35 H	52	78.00	32.00
7	4874.00	47.6 PK	74.0	-26.4	1.05 H	25	42.60	5.00
8	4874.00	35.0 AV	54.0	-19.0	1.05 H	25	30.00	5.00
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	71.6 PK	74.0	-2.4	1.42 V	242	39.70	31.90
2	2390.00	47.8 AV	54.0	-6.2	1.42 V	242	15.90	31.90
3	*2437.00	118.0 PK			1.42 V	242	86.00	32.00
4	*2437.00	108.6 AV			1.42 V	242	76.60	32.00
5	4874.00	47.4 PK	74.0	-26.6	1.12 V	60	42.40	5.00
6	4874.00	34.8 AV	54.0	-19.2	1.12 V	60	29.80	5.00

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	113.2 PK			1.36 H	31	81.00	32.20
2	*2462.00	102.4 AV			1.36 H	31	70.20	32.20
3	2483.50	71.2 PK	74.0	-2.8	1.36 H	31	38.90	32.30
4	**2483.50**	**53.2 AV**	**54.0**	**-0.8**	**1.36 H**	**31**	**20.90**	**32.30**
5	4924.00	47.4 PK	74.0	-26.6	1.09 H	62	42.40	5.00
6	4924.00	35.0 AV	54.0	-19.0	1.09 H	62	30.00	5.00
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	*2462.00	112.2 PK			1.44 V	227	80.00	32.20
2	*2462.00	101.2 AV			1.44 V	227	69.00	32.20
3	2483.50	69.1 PK	74.0	-4.9	1.44 V	227	36.80	32.30
4	2483.50	51.0 AV	54.0	-3.0	1.44 V	227	18.70	32.30
5	4924.00	47.5 PK	74.0	-26.5	1.07 V	53	42.50	5.00
6	4924.00	35.3 AV	54.0	-18.7	1.07 V	53	30.30	5.00

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	73.0 PK	74.0	-1.0	1.15 H	303	41.10	31.90
2	2390.00	53.0 AV	54.0	-1.0	1.15 H	303	21.10	31.90
3	*2422.00	104.4 PK			1.15 H	303	72.40	32.00
4	*2422.00	92.9 AV			1.15 H	303	60.90	32.00
5	4844.00	47.1 PK	74.0	-26.9	1.03 H	69	42.30	4.80
6	4844.00	34.8 AV	54.0	-19.2	1.03 H	69	30.00	4.80
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	70.0 PK	74.0	-4.0	1.06 V	300	38.10	31.90
2	2390.00	50.2 AV	54.0	-3.8	1.06 V	300	18.30	31.90
3	*2422.00	102.4 PK			1.06 V	300	70.40	32.00
4	*2422.00	90.7 AV			1.06 V	300	58.70	32.00
5	4844.00	47.2 PK	74.0	-26.8	1.17 V	154	42.40	4.80
6	4844.00	34.9 AV	54.0	-19.1	1.17 V	154	30.10	4.80

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	72.1 PK	74.0	-1.9	1.13 H	302	40.20	31.90
2	2390.00	52.5 AV	54.0	-1.5	1.13 H	302	20.60	31.90
3	*2437.00	107.8 PK			1.13 H	302	75.80	32.00
4	*2437.00	96.6 AV			1.13 H	302	64.60	32.00
5	4874.00	47.3 PK	74.0	-26.7	1.03 H	25	42.30	5.00
6	4874.00	34.8 AV	54.0	-19.2	1.03 H	25	29.80	5.00
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	68.4 PK	74.0	-5.6	1.08 V	313	36.50	31.90
2	2390.00	50.4 AV	54.0	-3.6	1.08 V	313	18.50	31.90
3	*2437.00	105.3 PK			1.08 V	313	73.30	32.00
4	*2437.00	93.4 AV			1.08 V	313	61.40	32.00
5	4874.00	47.1 PK	74.0	-26.9	1.15 V	160	42.10	5.00
6	4874.00	34.8 AV	54.0	-19.2	1.15 V	160	29.80	5.00

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) – Pre-Amplifier 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	106.1 PK			1.13 H	303	73.90	32.20
2	*2452.00	94.9 AV			1.13 H	303	62.70	32.20
3	2483.50	70.8 PK	74.0	-3.2	1.13 H	303	38.50	32.30
4	2483.50	52.2 AV	54.0	-1.8	1.13 H	303	19.90	32.30
5	4904.00	47.2 PK	74.0	-26.8	1.09 H	12	42.20	5.00
6	4904.00	34.9 AV	54.0	-19.1	1.09 H	12	29.90	5.00
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	*2452.00	104.0 PK			1.08 V	310	71.80	32.20
2	*2452.00	92.2 AV			1.08 V	310	60.00	32.20
3	2483.50	68.0 PK	74.0	-6.0	1.08 V	310	35.70	32.30
4	2483.50	51.0 AV	54.0	-3.0	1.08 V	310	18.70	32.30
5	4904.00	47.4 PK	74.0	-26.6	1.12 V	144	42.40	5.00
6	4904.00	35.0 AV	54.0	-19.0	1.12 V	144	30.00	5.00

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) – Pre-Amplifier 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：802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	208.42	20.2 QP	43.5	-23.3	1.50 H	259	36.80	-16.60
2	274.39	27.1 QP	46.0	-18.9	2.00 H	123	40.30	-13.20
3	375.29	20.3 QP	46.0	-25.7	1.00 H	53	31.60	-11.30
4	487.83	20.4 QP	46.0	-25.6	1.49 H	179	29.70	-9.30
5	625.60	27.6 QP	46.0	-18.4	1.25 H	12	33.90	-6.30
6	874.91	29.7 QP	46.0	-16.3	1.00 H	158	31.90	-2.20
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	35.72	15.4 QP	40.0	-24.6	1.25 V	213	30.10	-14.70
2	179.31	16.8 QP	43.5	-26.7	2.00 V	239	31.70	-14.90
3	274.39	23.1 QP	46.0	-22.9	1.49 V	75	36.30	-13.20
4	565.45	22.7 QP	46.0	-23.3	1.49 V	195	30.80	-8.10
5	625.60	28.2 QP	46.0	-17.8	1.00 V	277	34.50	-6.30
6	875.91	30.6 QP	46.0	-15.4	1.00 V	190	32.80	-2.20

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) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	161.85	20.4 QP	43.5	-23.1	2.00 H	80	34.00	-13.60
2	299.62	23.0 QP	46.0	-23.0	1.25 H	151	35.60	-12.60
3	489.77	25.8 QP	46.0	-20.2	1.00 H	174	35.10	-9.30
4	623.66	27.7 QP	46.0	-18.3	2.00 H	340	34.10	-6.40
5	720.68	24.0 QP	46.0	-22.0	1.25 H	36	28.90	-4.90
6	916.66	28.0 QP	46.0	-18.0	1.00 H	13	29.10	-1.10
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	132.74	22.3 QP	43.5	-21.2	1.25 V	276	37.50	-15.20
2	303.50	23.4 QP	46.0	-22.6	1.25 V	34	35.90	-12.50
3	450.97	23.3 QP	46.0	-22.7	1.00 V	19	33.00	-9.70
4	503.36	24.8 QP	46.0	-21.2	1.00 V	21	33.80	-9.00
5	687.70	23.8 QP	46.0	-22.2	2.00 V	3	29.40	-5.60
6	906.96	28.6 QP	46.0	-17.4	1.00 V	156	29.90	-1.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 16, 2012	Nov. 15, 2013
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 28, 2012	Dec. 27, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 04, 2013	Feb. 03, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 08, 2013	Jul. 07, 2014
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 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 TEST PROCEDURES

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

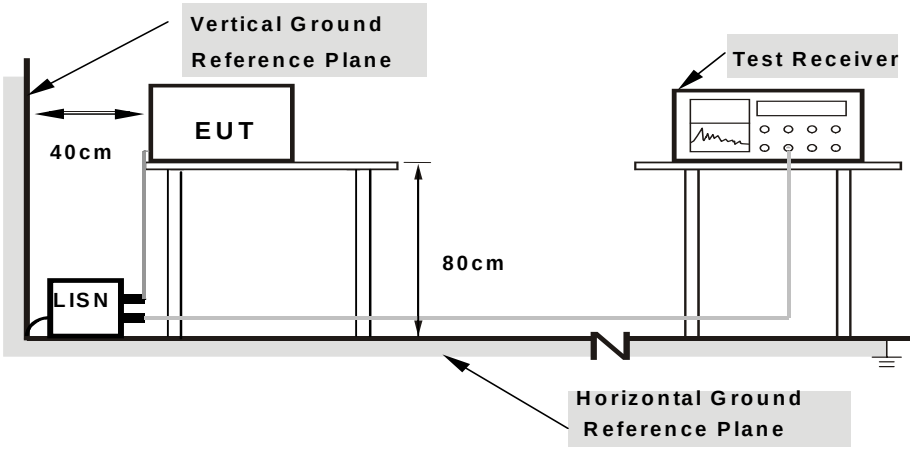
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80
from other units and other metal planes

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

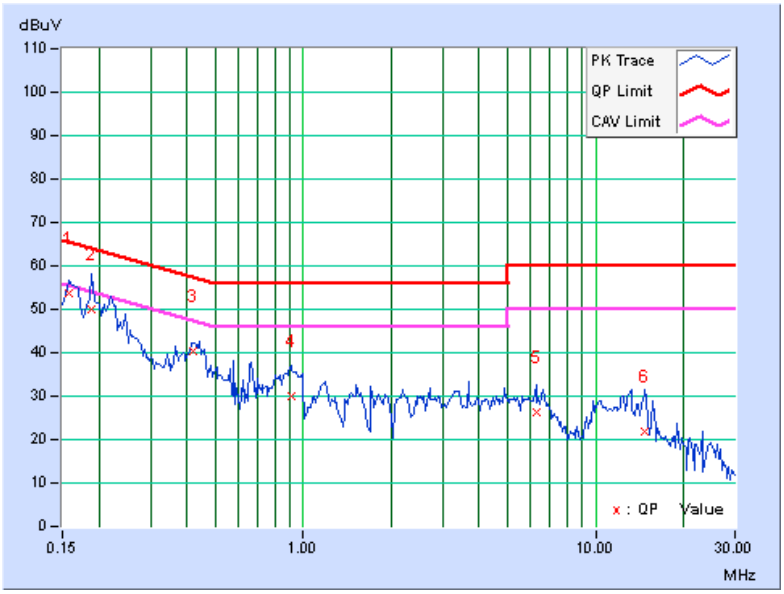
CONDUCTED WORST-CASE DATA：802.11b

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	**0.15781**	**0.16**	**53.51**	**36.89**	**53.67**	**37.05**	**65.58**	**55.58**	**-11.91**	**-18.53**
2	0.18906	0.16	49.96	35.20	50.12	35.36	64.08	54.08	-13.96	-18.72
3	0.41953	0.23	40.08	34.08	40.31	34.31	57.46	47.46	-17.15	-13.15
4	0.90781	0.25	29.77	22.48	30.02	22.73	56.00	46.00	-25.98	-23.27
5	6.27344	0.52	25.78	18.75	26.30	19.27	60.00	50.00	-33.70	-30.73
6	14.68359	0.95	20.78	11.09	21.73	12.04	60.00	50.00	-38.27	-37.96

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

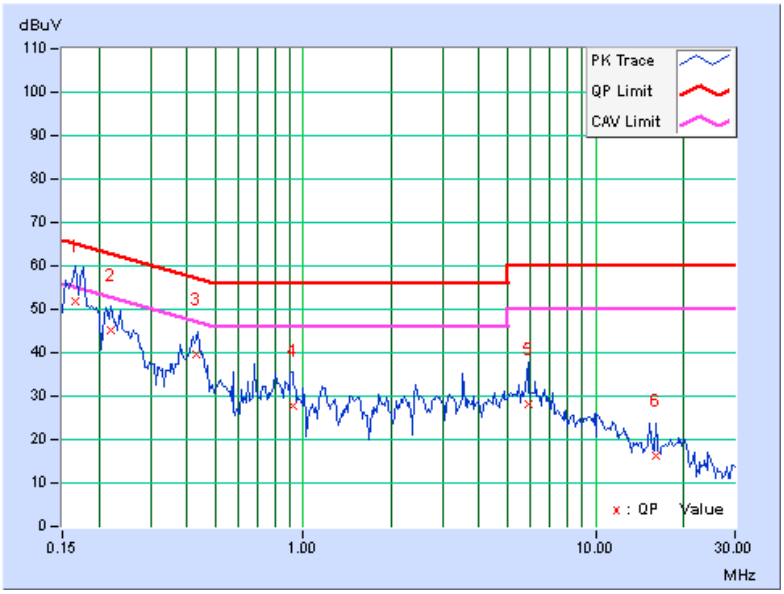


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.16562	0.17	51.86	37.56	52.03	37.73	65.18	55.18	-13.15	-17.45
2	0.22031	0.18	44.87	31.30	45.05	31.48	62.81	52.81	-17.76	-21.33
3	0.43007	0.24	39.45	32.05	39.69	32.29	57.25	47.25	-17.56	-14.96
4	0.91953	0.25	27.48	19.64	27.73	19.89	56.00	46.00	-28.27	-26.11
5	5.87891	0.45	27.66	21.60	28.11	22.05	60.00	50.00	-31.89	-27.95
6	16.02734	0.79	15.53	7.55	16.32	8.34	60.00	50.00	-43.68	-41.66

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

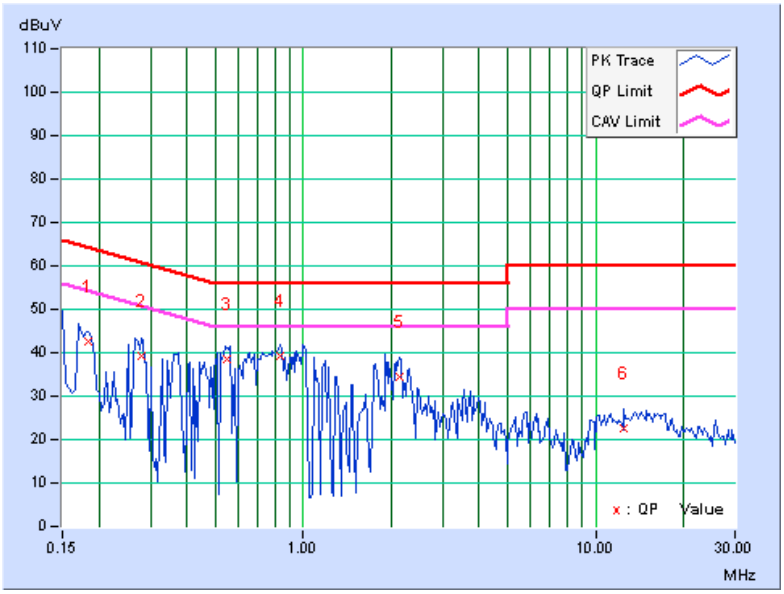


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.18351	0.16	42.47	38.02	42.63	38.18	64.33	54.33	-21.70	-16.15
2	0.27891	0.19	39.24	31.25	39.43	31.44	60.85	50.85	-21.42	-19.41
3	0.55089	0.24	38.32	31.17	38.56	31.41	56.00	46.00	-17.44	-14.59
4	0.83750	0.24	38.98	26.20	39.22	26.44	56.00	46.00	-16.78	-19.56
5	2.12782	0.30	34.28	23.10	34.58	23.40	56.00	46.00	-21.42	-22.60
6	12.54377	0.85	21.88	14.26	22.73	15.11	60.00	50.00	-37.27	-34.89

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

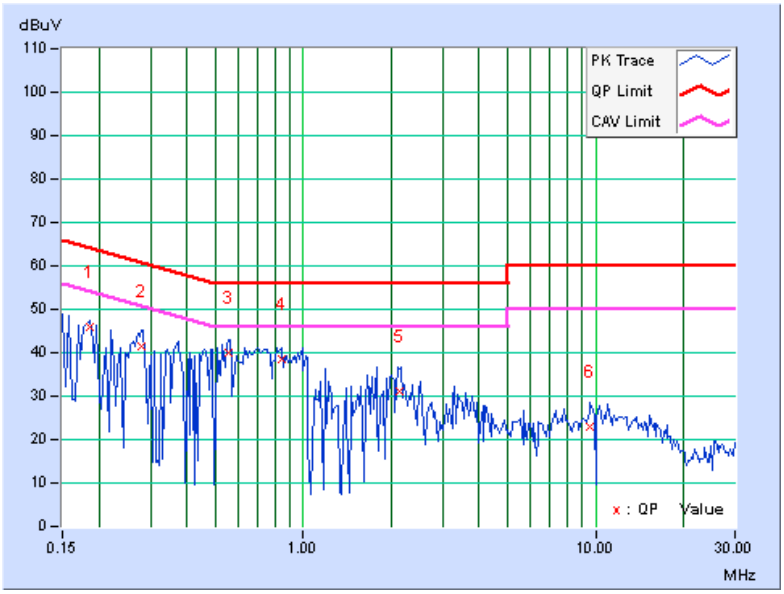


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.18516	0.17	45.60	40.44	45.77	40.61	64.25	54.25	-18.48	-13.64
2	0.27899	0.20	41.27	36.91	41.47	37.11	60.85	50.85	-19.38	-13.74
3	0.55625	0.24	39.60	32.32	39.84	32.56	56.00	46.00	-16.16	-13.44
4	0.84141	0.25	38.38	25.39	38.63	25.64	56.00	46.00	-17.37	-20.36
5	2.12947	0.29	30.95	21.34	31.24	21.63	56.00	46.00	-24.76	-24.37
6	9.60547	0.59	22.30	8.28	22.89	8.87	60.00	50.00	-37.11	-41.13

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

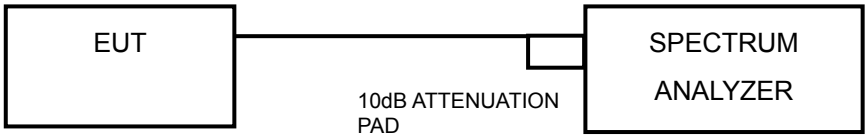


4.3 6dB BANDWIDTH MEASUREMENT

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) = 100kHz
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
		CHAIN 0	CHAIN 1		
1	2412	10.11	10.10	0.5	PASS
6	2437	10.13	10.11	0.5	PASS
11	2462	10.11	10.13	0.5	PASS

802.11g

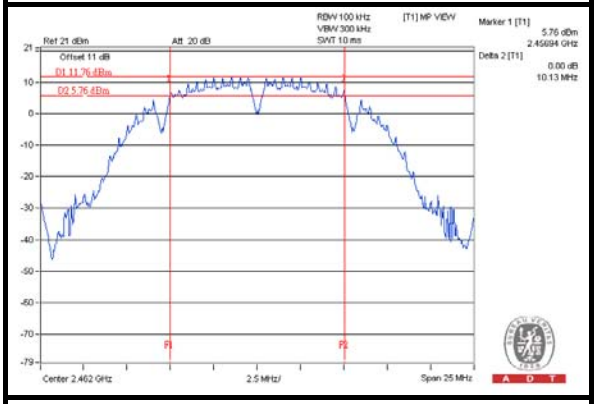
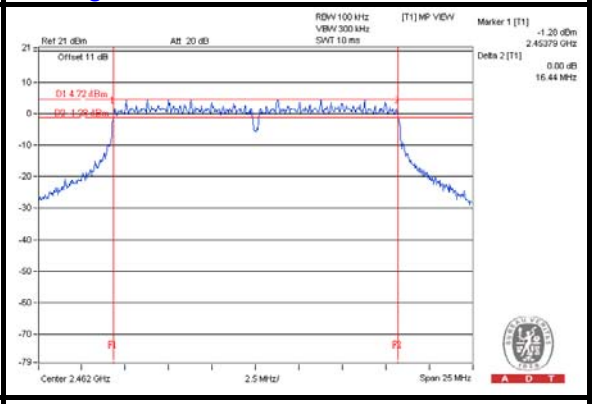
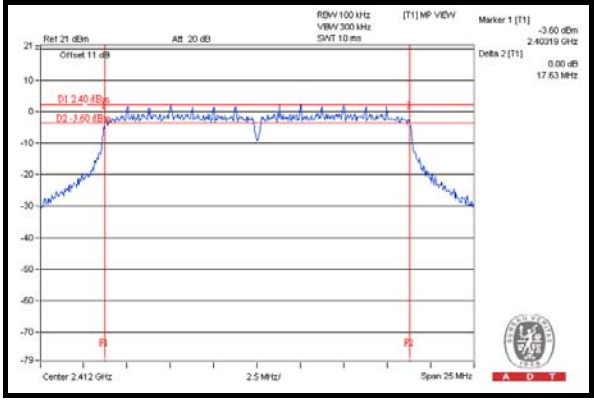
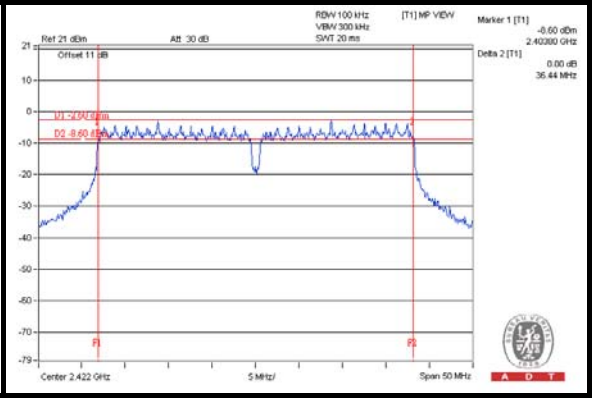
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.40	16.38	0.5	PASS
6	2437	16.38	16.39	0.5	PASS
11	2462	16.39	16.44	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.63	17.60	0.5	PASS
6	2437	16.97	17.57	0.5	PASS
11	2462	17.61	17.61	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.44	36.42	0.5	PASS
6	2437	36.35	36.28	0.5	PASS
9	2452	36.23	36.41	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b	802.11g
	
802.11n (20MHz)	802.11n (40MHz)
	

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

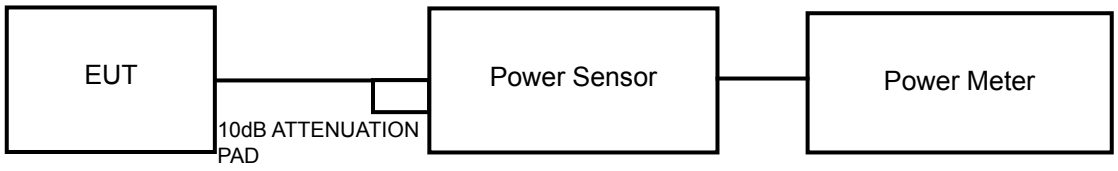
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v02 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

An average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average 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.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	19.57	20.38	199.717	23.00	30	PASS
6	2437	25.44	26.99	**849.980**	29.29	30	PASS
11	2462	20.68	21.44	256.266	24.09	30	PASS

802.11g

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	14.22	15.53	62.151	17.93	30	PASS
6	2437	24.11	24.99	573.132	27.58	30	PASS
11	2462	16.33	17.31	96.781	19.86	30	PASS

802.11n (20MHz)

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	14.43	15.54	63.543	18.03	30	PASS
6	2437	24.33	26.15	683.117	28.34	30	PASS
11	2462	16.93	15.21	82.506	19.16	30	PASS

802.11n (40MHz)

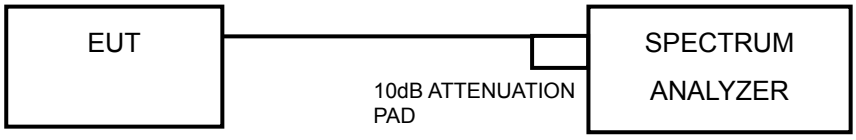
CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	10.99	11.38	26.300	14.20	30	PASS
6	2437	14.44	15.96	67.243	18.28	30	PASS
9	2452	13.24	14.52	49.400	16.94	30	PASS

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

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	-4.69	3.01	-1.68	8	PASS
	6	2437	-1.34	3.01	1.67	8	PASS
	11	2462	-6.47	3.01	-3.46	8	PASS
1	1	2412	-3.76	3.01	-0.75	8	PASS
	6	2437	2.73	3.01	5.74	8	PASS
	11	2462	-2.35	3.01	0.66	8	PASS

NOTE: Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, so the limit no need to reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O DUTY FACTOR (dBm/3kHz)	10 log (N=3) dB	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-12.10	3.01	0.12	-8.97	8	PASS
	6	2437	-4.47	3.01	0.12	-1.34	8	PASS
	11	2462	-11.09	3.01	0.12	-7.96	8	PASS
1	1	2412	-10.45	3.01	0.12	-7.32	8	PASS
	6	2437	-1.24	3.01	0.12	1.89	8	PASS
	11	2462	-9.22	3.01	0.12	-6.09	8	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD W/O DUTY FACTOR (dBm/3kHz)	10 log (N=3) dB	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-12.42	3.01	0.12	-9.29	8	PASS
	6	2437	-2.96	3.01	0.12	0.17	8	PASS
	11	2462	-10.35	3.01	0.12	-7.22	8	PASS
1	1	2412	-12.46	3.01	0.12	-9.33	8	PASS
	6	2437	-0.93	3.01	0.12	2.20	8	PASS
	11	2462	-10.77	3.01	0.12	-7.64	8	PASS

NOTE:

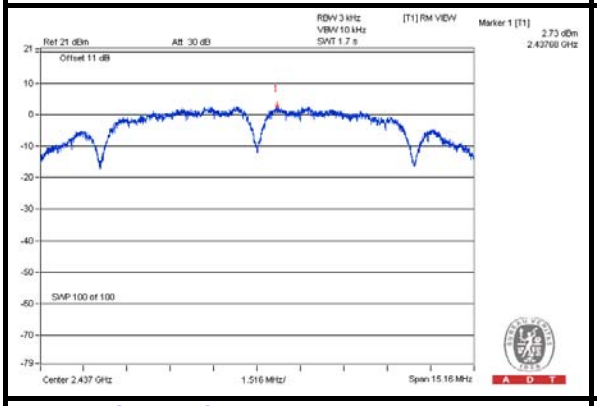
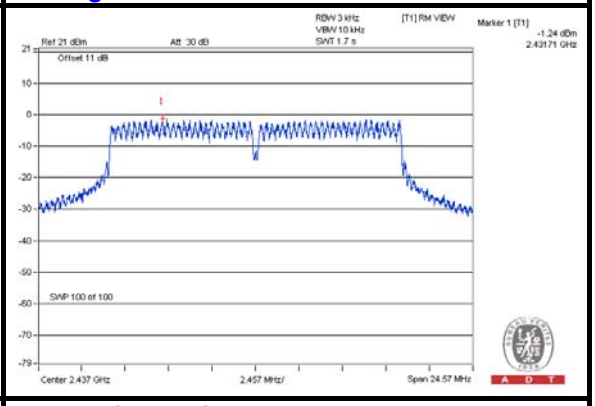
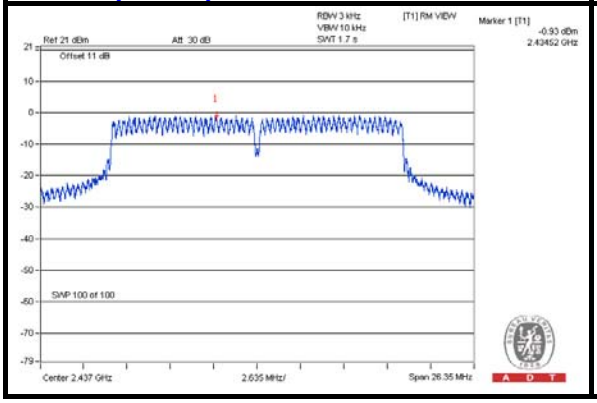
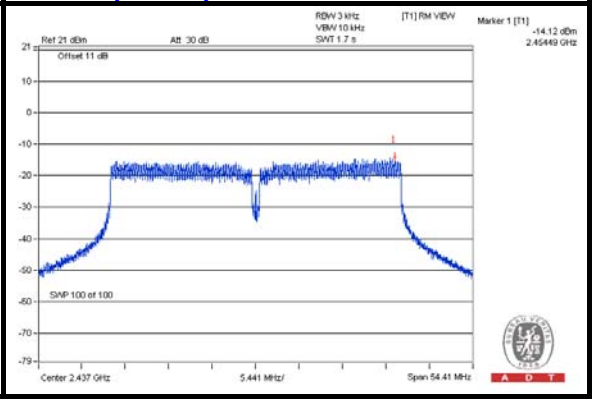
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD W/O DUTY FACTOR (dBm/3kHz)	10 log (N=3) dB	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-18.63	3.01	0.43	-15.19	8	PASS
	6	2437	-14.70	3.01	0.43	-11.26	8	PASS
	9	2452	-15.89	3.01	0.43	-12.45	8	PASS
1	3	2422	-18.76	3.01	0.43	-15.32	8	PASS
	6	2437	-14.12	3.01	0.43	-10.68	8	PASS
	9	2452	-16.45	3.01	0.43	-13.01	8	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11b	802.11g
	
802.11n (20MHz)	802.11n (40MHz)
	

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -30dB 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

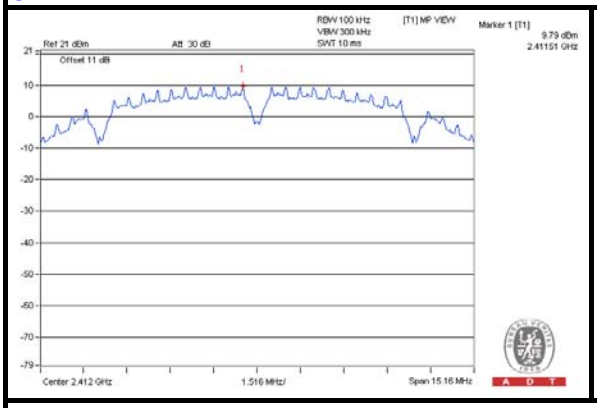
4.6.7 TEST RESULTS

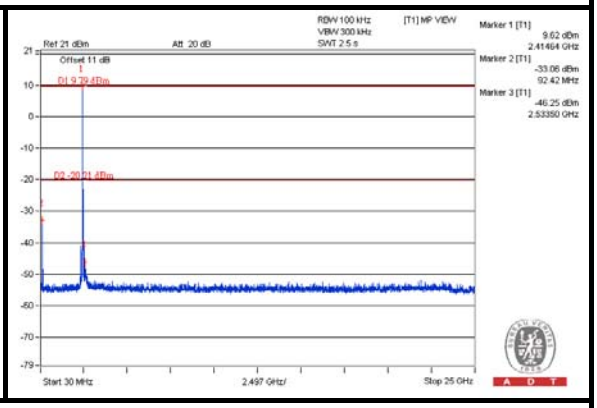
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

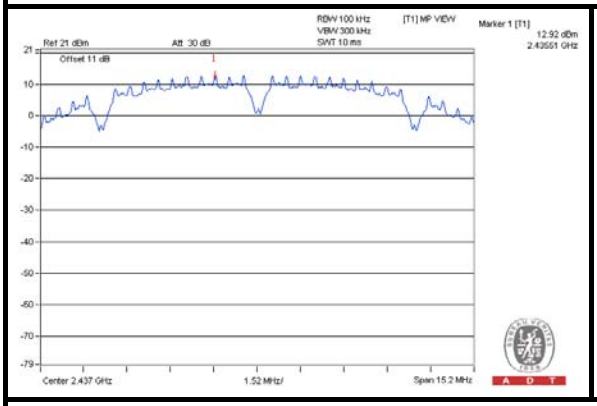
802.11b CHAIN 0

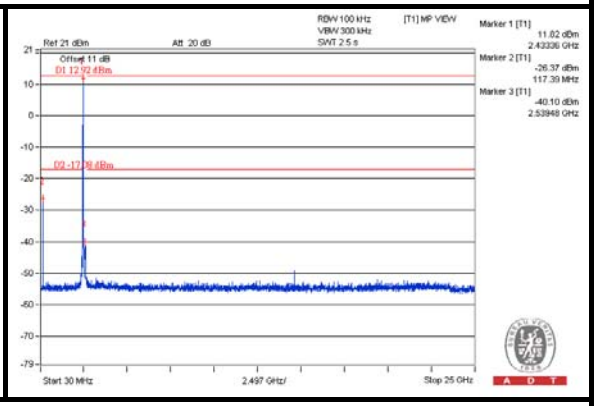
CH 1



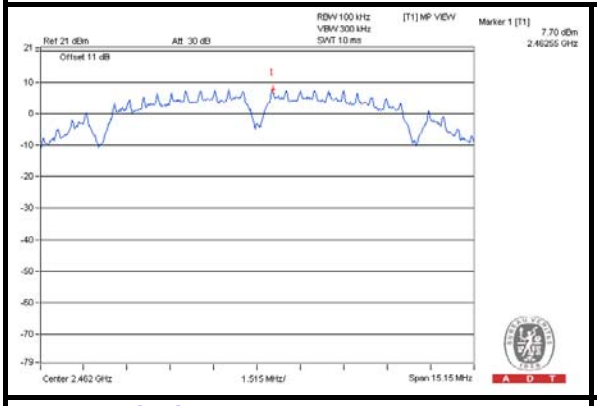


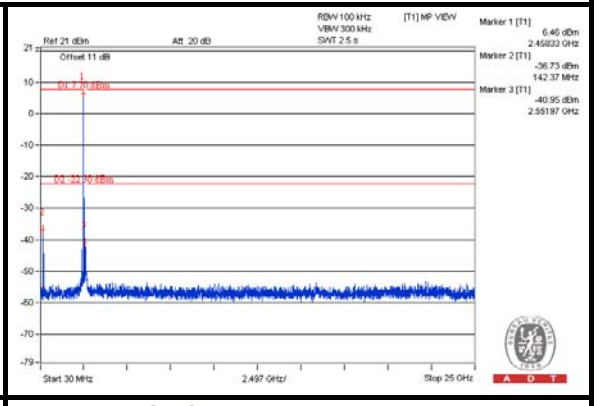
CH 6



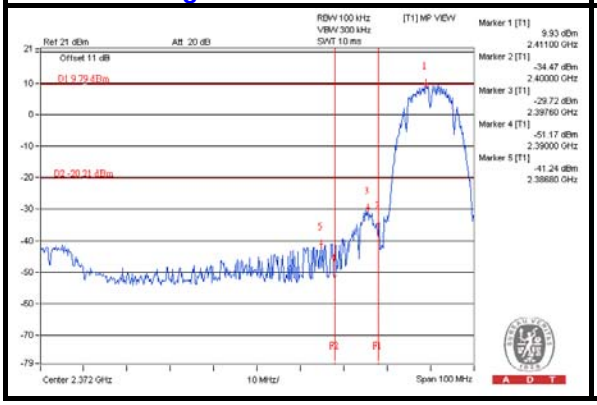


CH 11

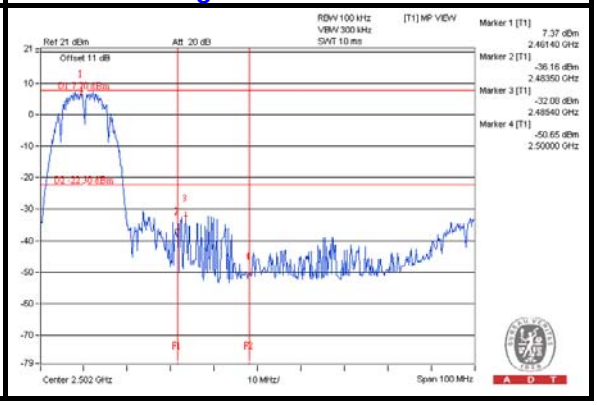




CH 1 Band edge

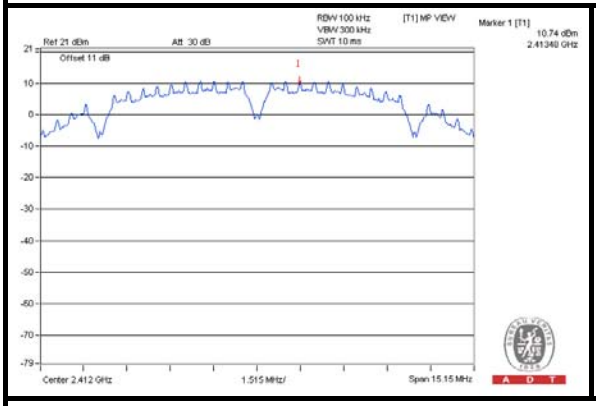


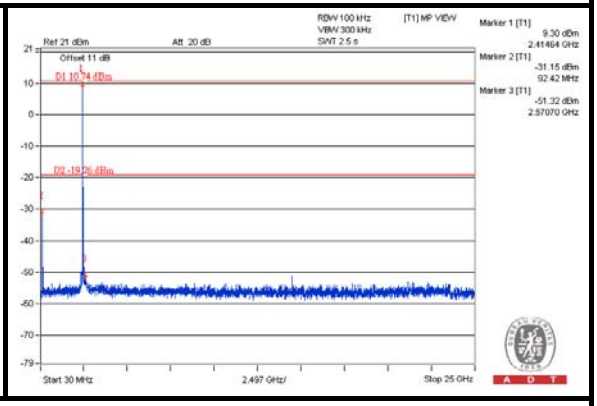
CH 11 Band edge



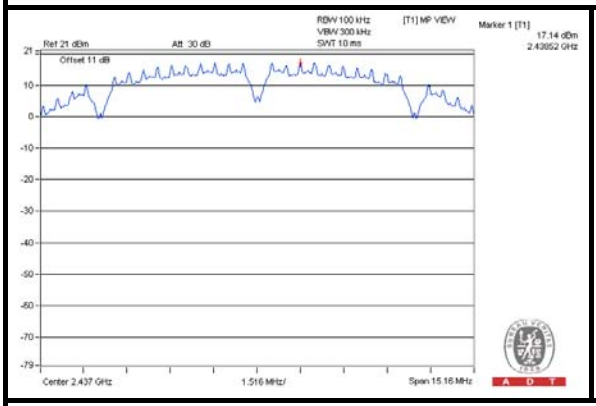
CHAIN 1

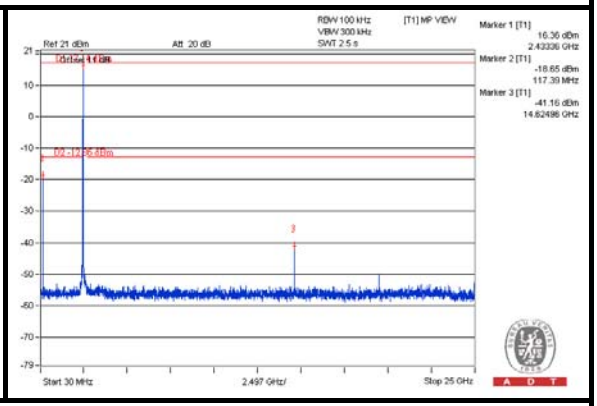
CH 1



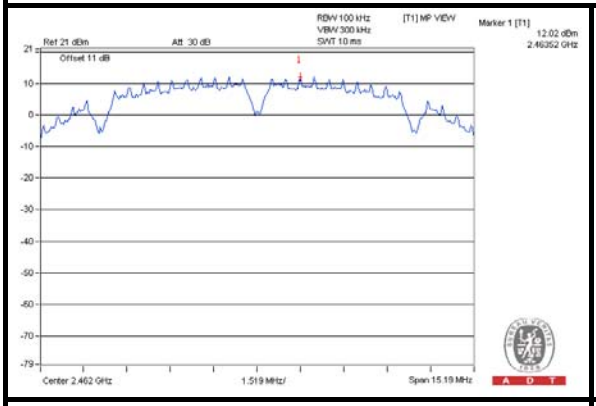


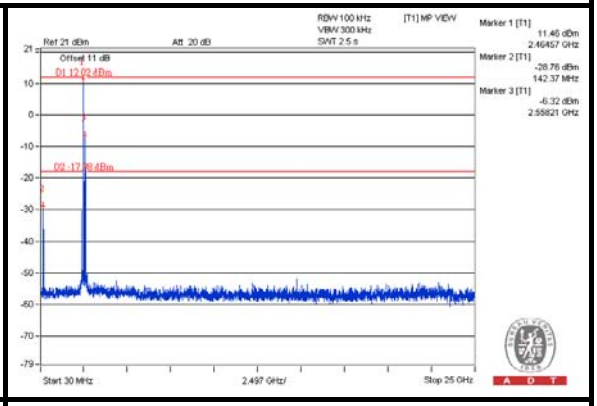
CH 6



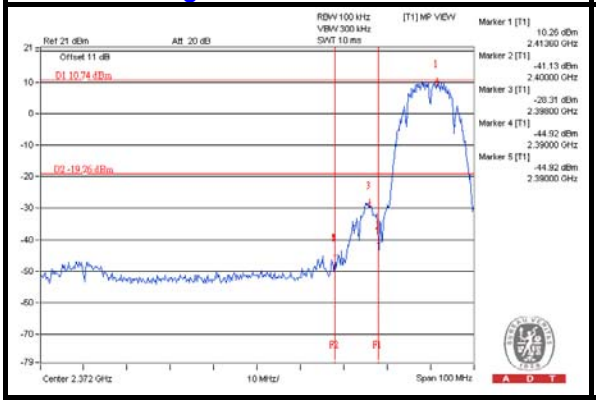


CH 11

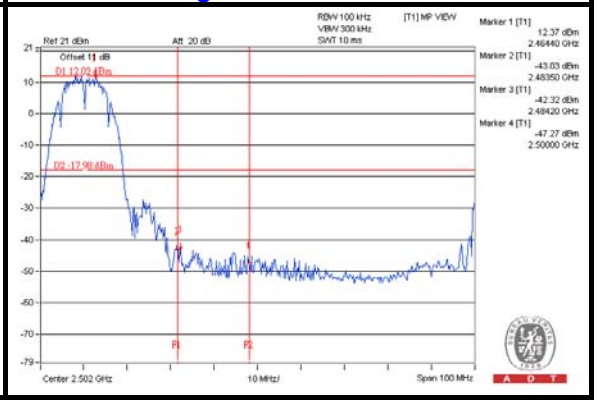




CH 1 Band edge

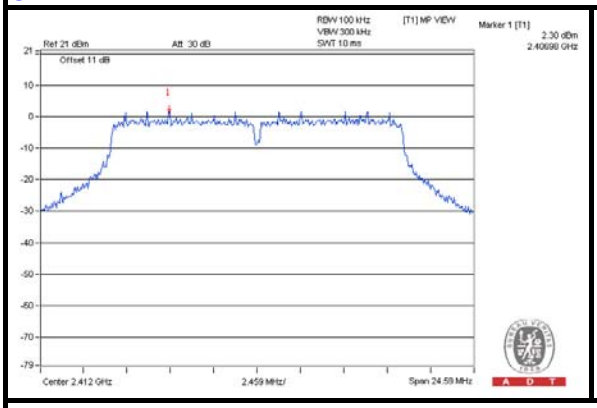


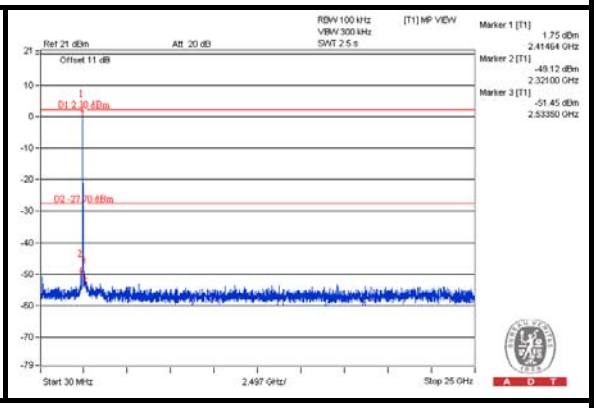
CH 11 Band edge



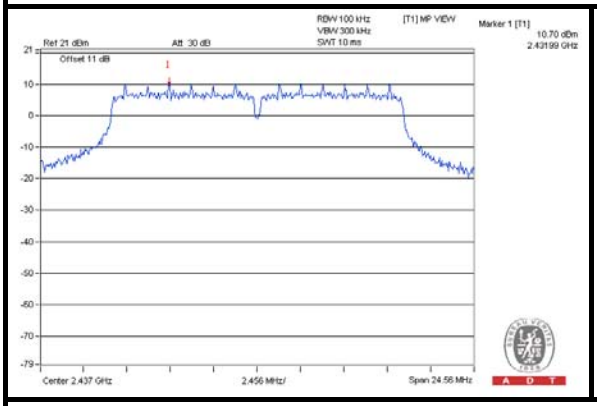
802.11g CHAIN 0

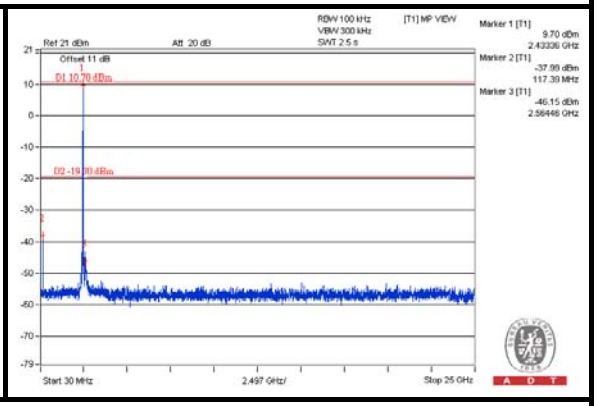
CH 1



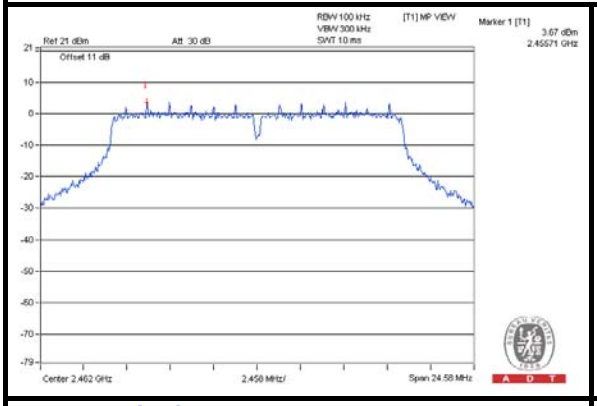


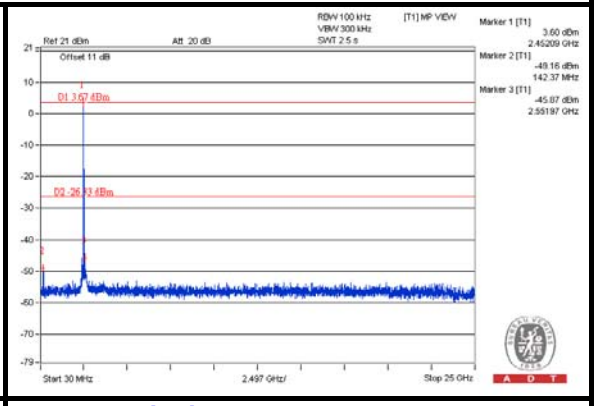
CH 6



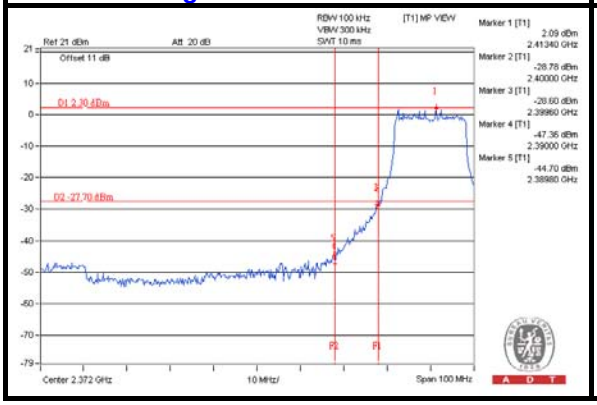


CH 11

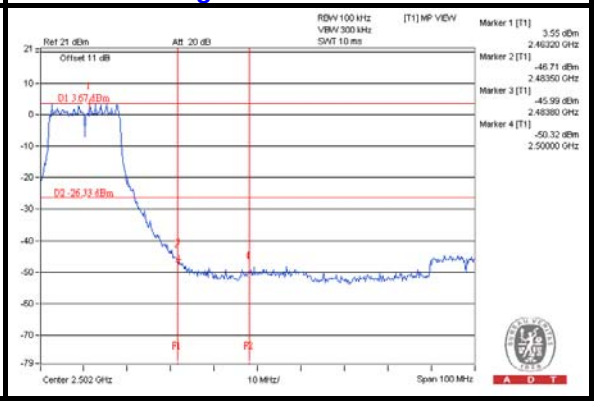




CH 1 Band edge

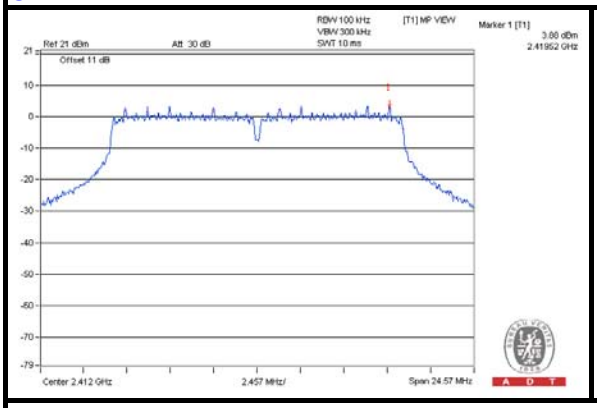


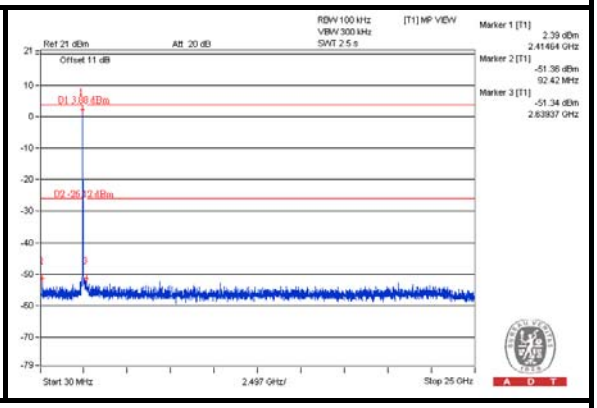
CH 11 Band edge



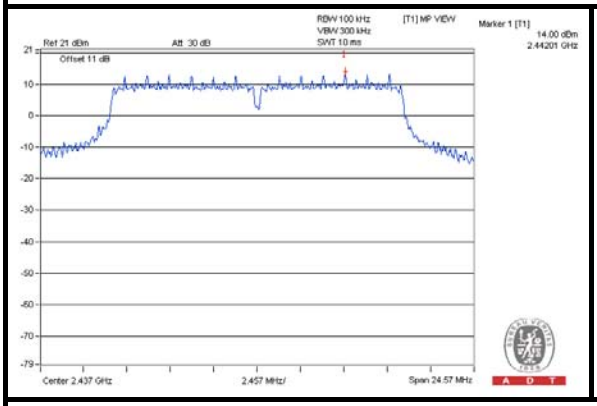
CHAIN 1

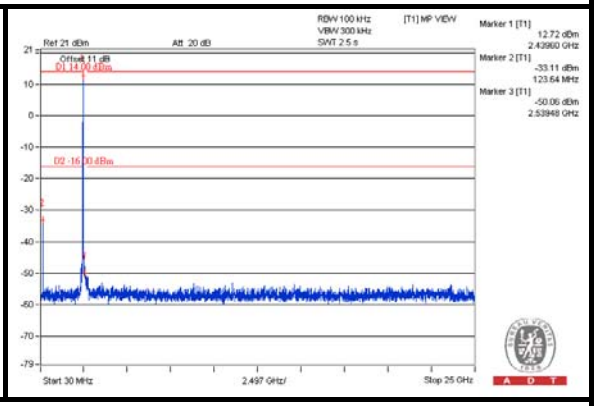
CH 1





CH 6





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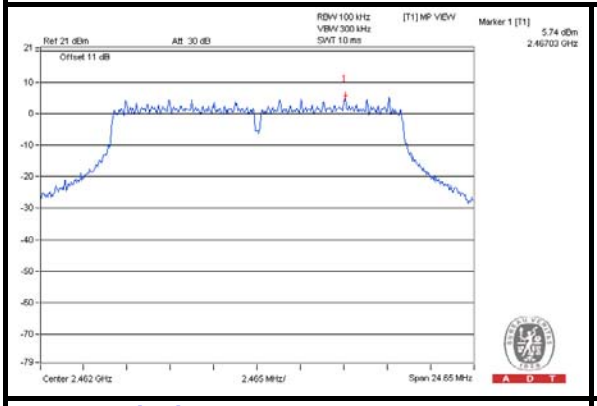
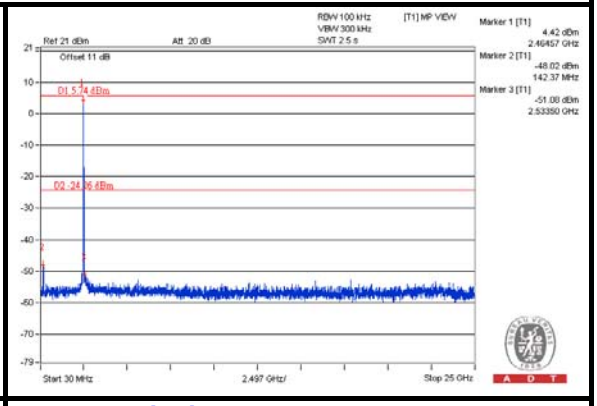
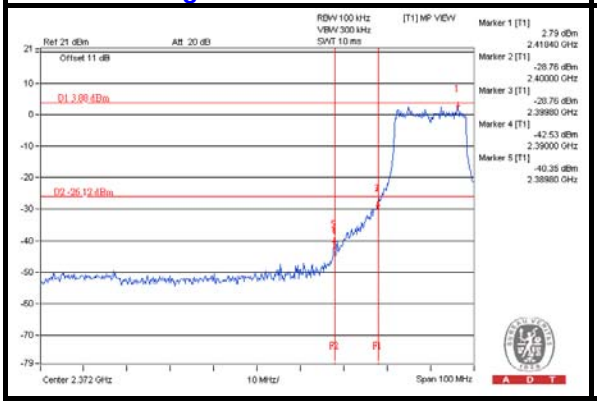
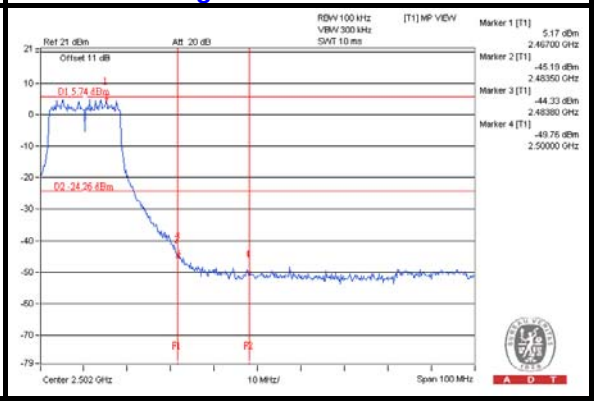




CH 1 Band edge

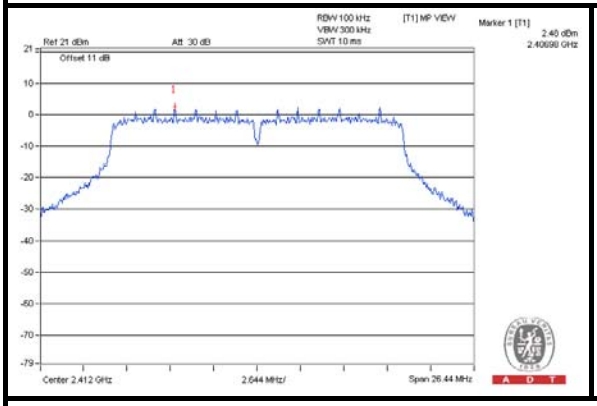


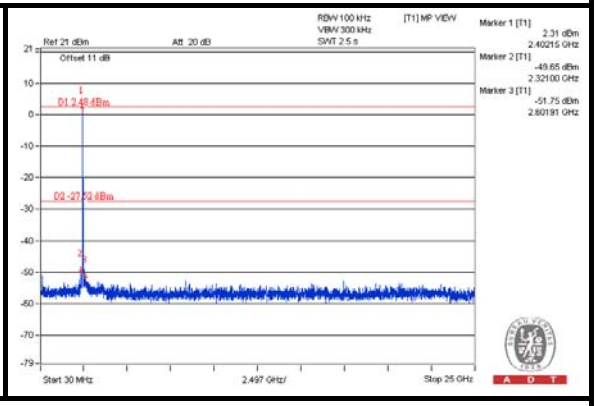
CH 11 Band edge



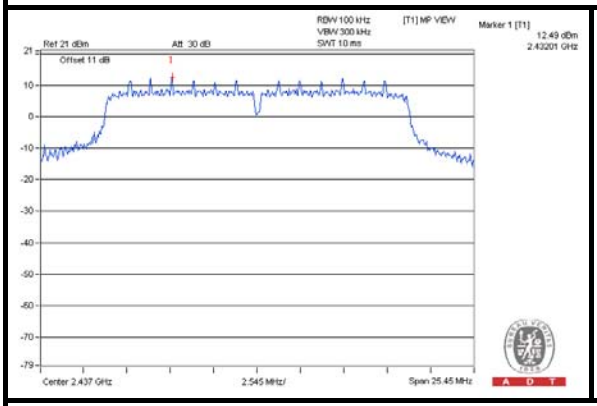
802.11n (20MHz) CHAIN 0

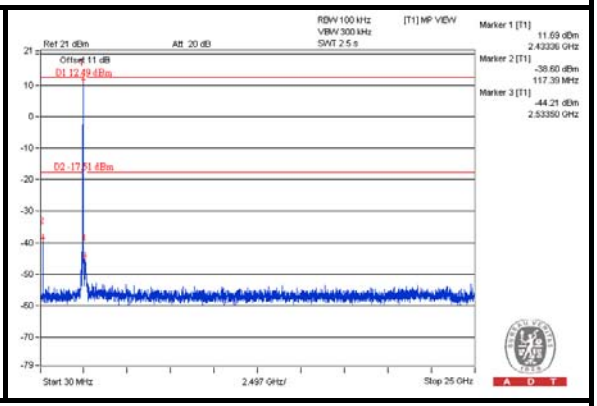
CH 1



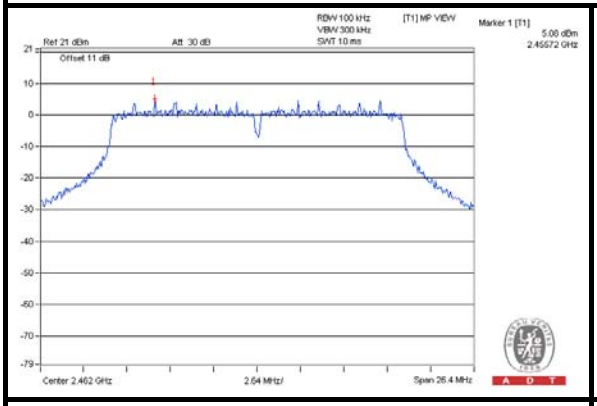


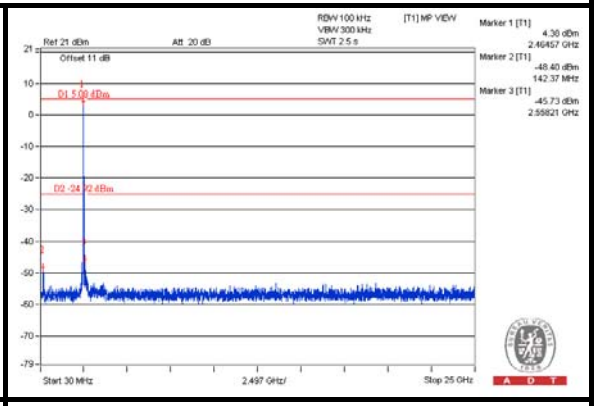
CH 6



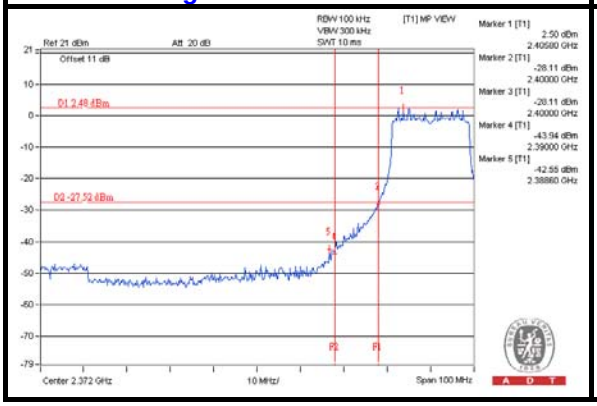


CH 11

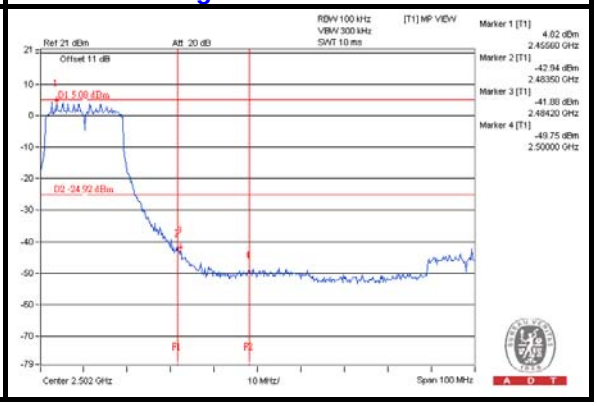




CH 1 Band edge

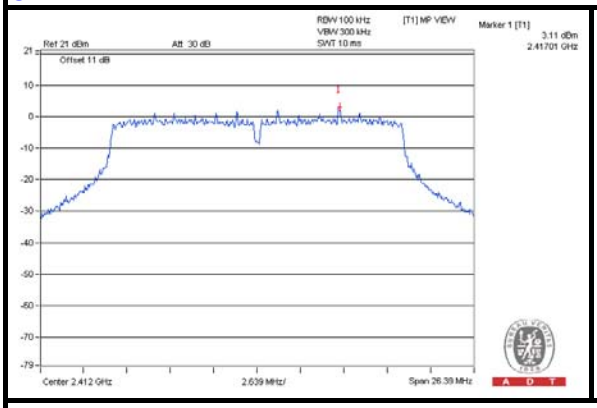


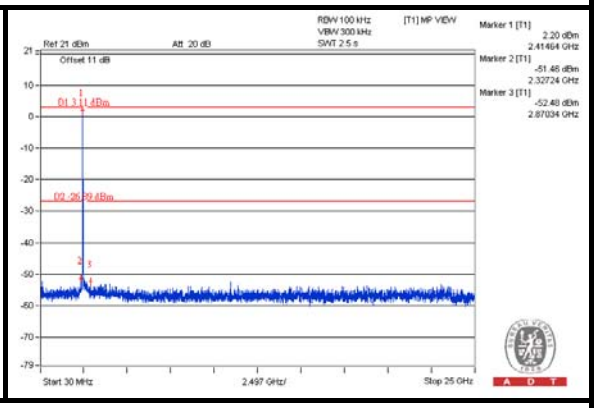
CH 11 Band edge



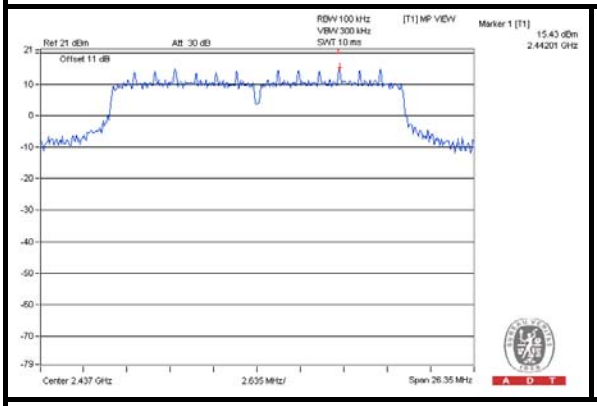
CHAIN 1

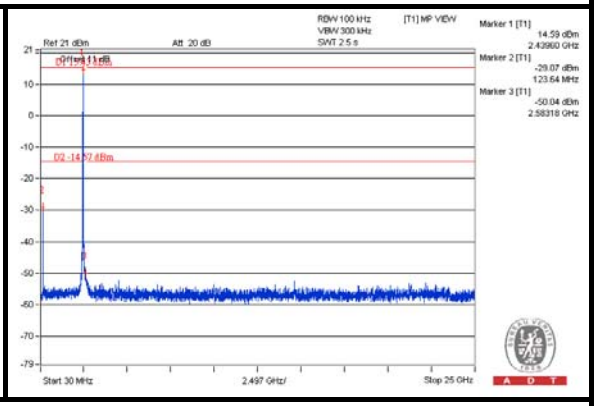
CH 1



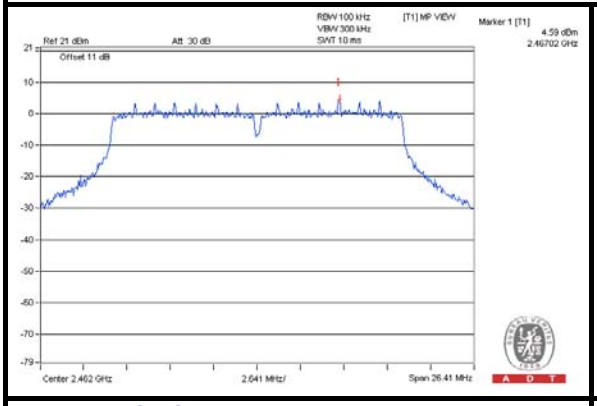


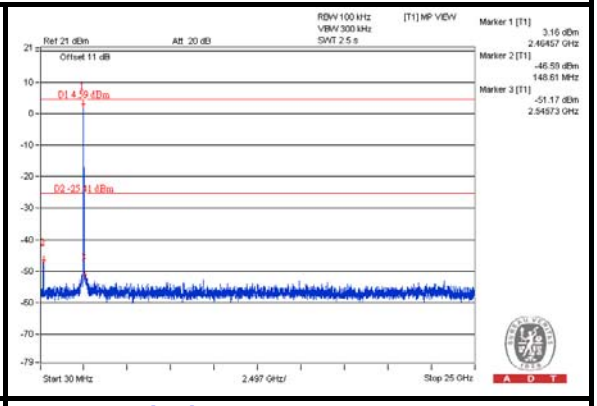
CH 6



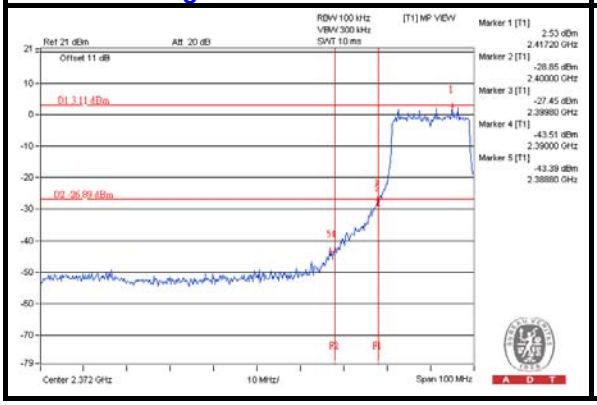


CH 11

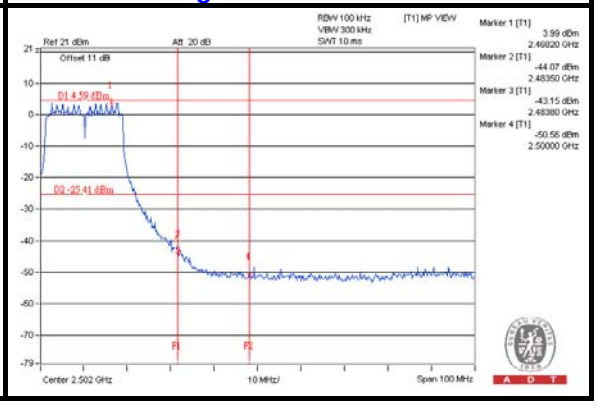




CH 1 Band edge

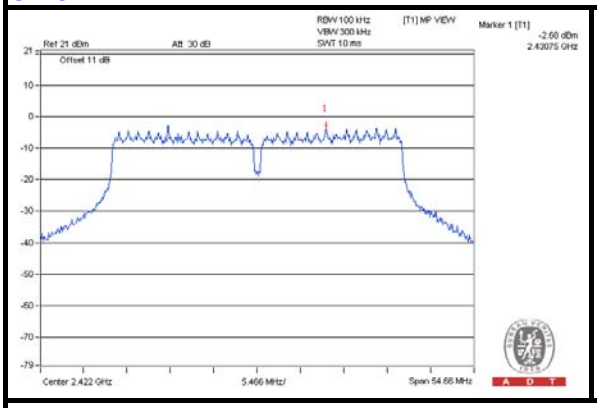


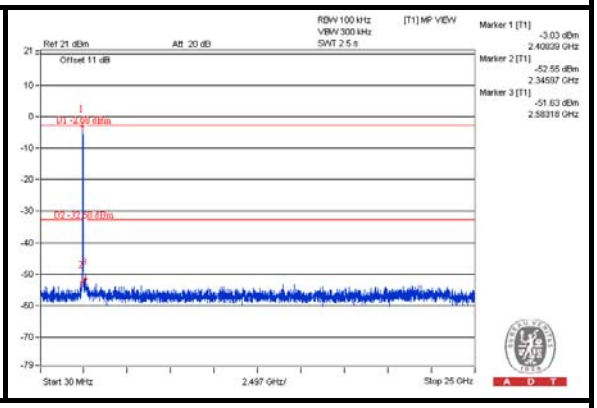
CH 11 Band edge



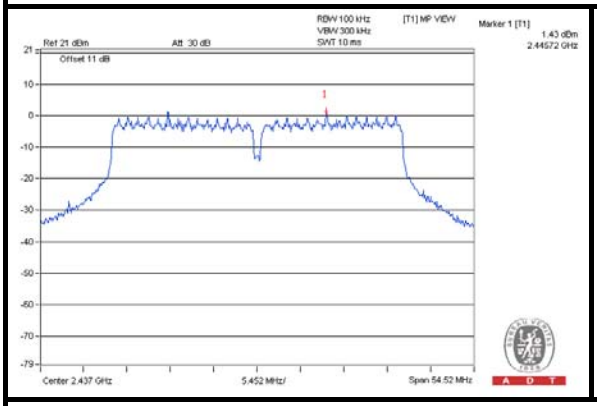
802.11n (40MHz) CHAIN 0

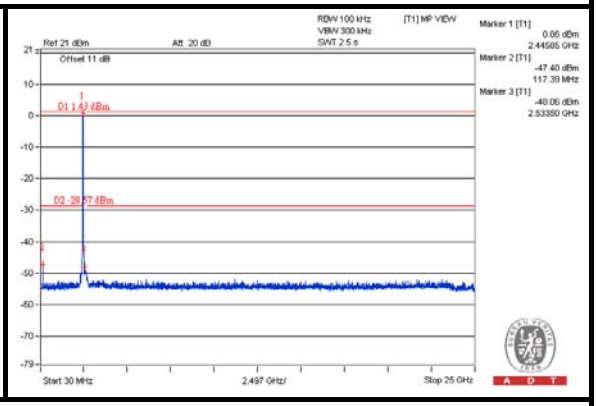
CH 3



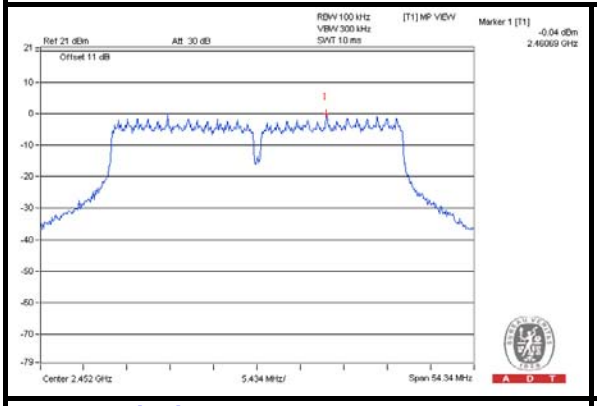


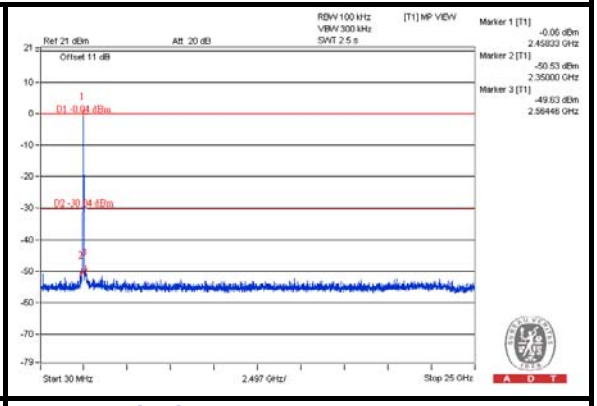
CH 6



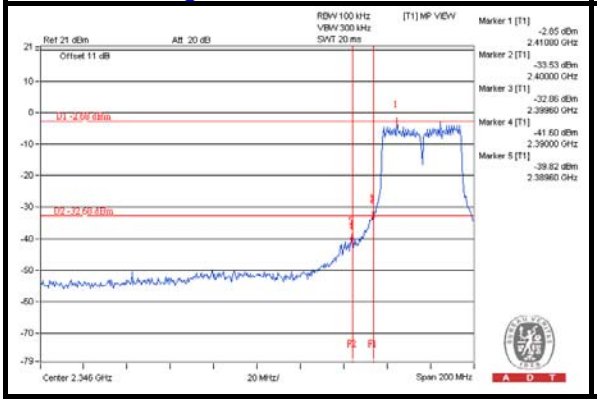


CH 9

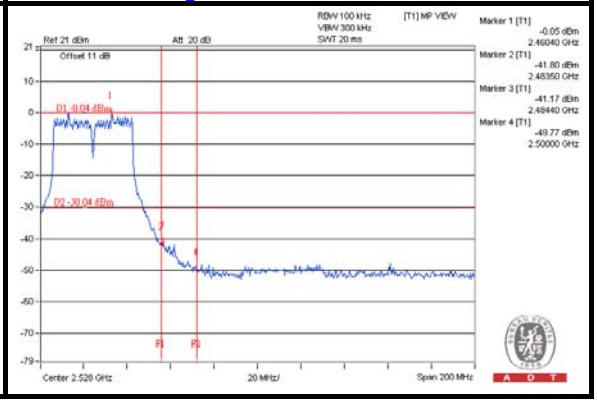




CH 3 Band edge

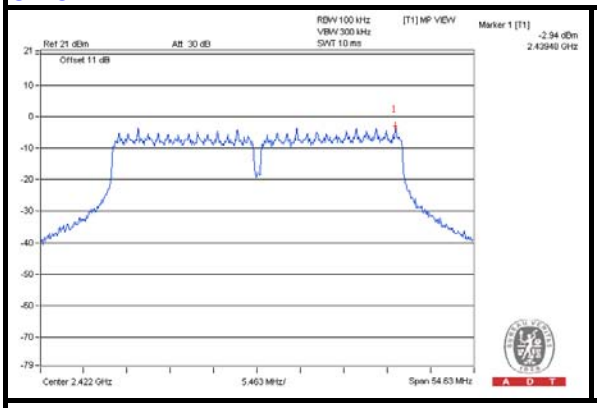


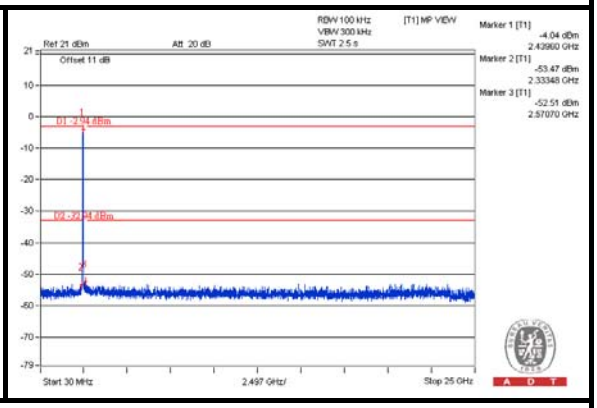
CH 9 Band edge



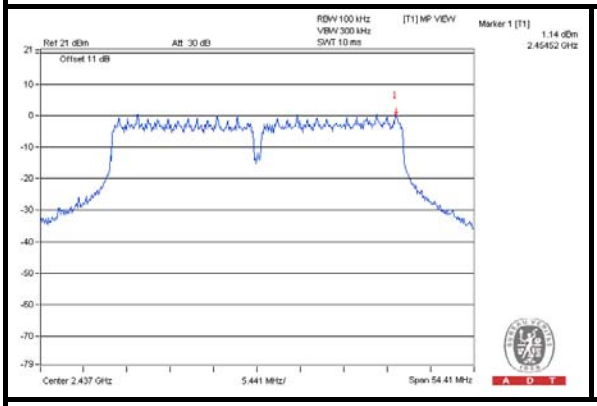
CHAIN 1

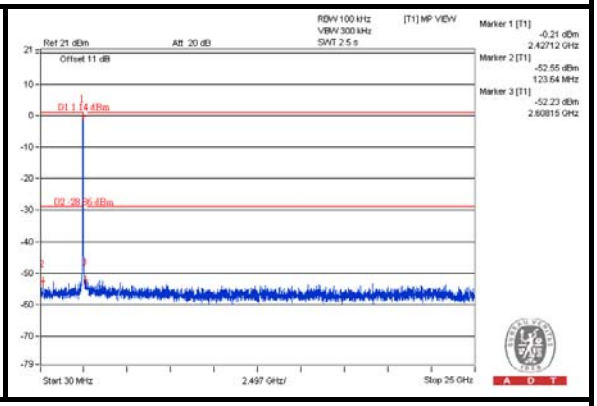
CH 3



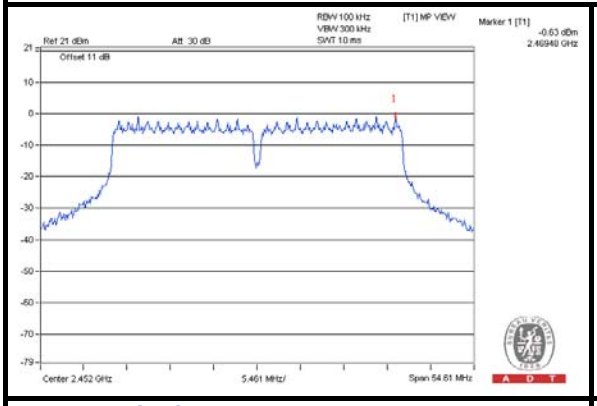


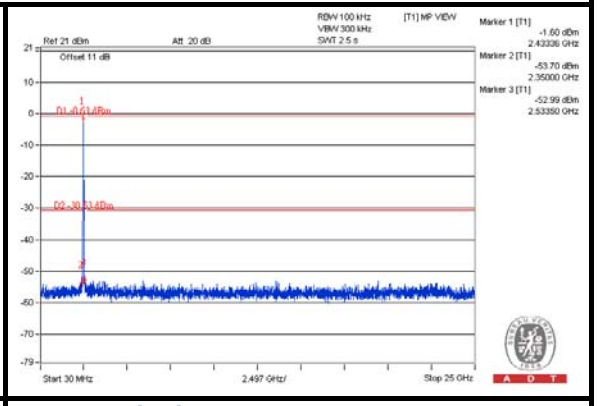
CH 6



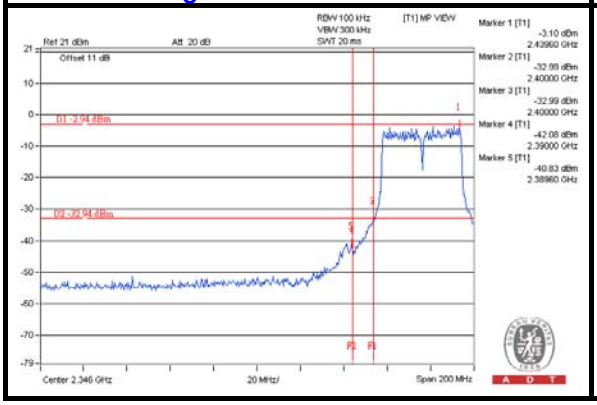


CH 9

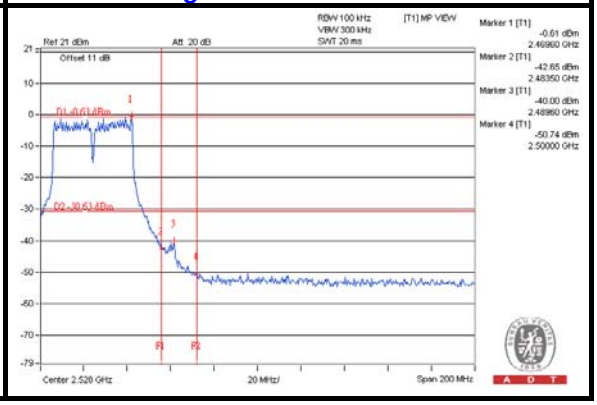




CH 3 Band edge



CH 9 Band edge



5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION 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 30dB 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 30dB under any condition of modulation.

5.1.2 TEST INSTRUMENTS

Same as item 4.1.2.

5.1.3 TEST PROCEDURES

Same as item 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as item 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.

5.1.7 TEST RESULTS

ABOVE 1GHz DATA：

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	64.0 PK	74.0	-10.0	1.30 H	124	58.50	5.50
2	5400.00	52.3 AV	54.0	-1.7	1.30 H	124	46.80	5.50
3	5455.00	62.7 PK	74.0	-11.3	1.30 H	122	57.10	5.60
4	5455.00	51.5 AV	54.0	-2.5	1.30 H	122	45.90	5.60
5	#5725.00	74.3 PK	86.4	-12.1	1.19 H	123	68.00	6.30
6	#5725.00	63.8 AV	75.9	-12.1	1.19 H	123	57.50	6.30
7	*5745.00	116.4 PK			1.20 H	121	76.20	40.20
8	*5745.00	105.9 AV			1.20 H	121	65.70	40.20
9	11490.00	68.0 PK	74.0	-6.0	1.00 H	203	49.90	18.10
10	11490.00	52.5 AV	54.0	-1.5	1.00 H	203	34.40	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	59.7 PK	74.0	-14.3	1.18 V	114	54.20	5.50
2	5400.00	47.1 AV	54.0	-6.9	1.18 V	114	41.60	5.50
3	5455.00	58.6 PK	74.0	-15.4	1.11 V	110	53.00	5.60
4	5455.00	46.8 AV	54.0	-7.2	1.11 V	110	41.20	5.60
5	#5725.00	70.7 PK	82.8	-12.1	1.19 V	130	64.40	6.30
6	#5725.00	60.6 AV	72.7	-12.1	1.19 V	130	54.30	6.30
7	*5745.00	112.8 PK			1.19 V	138	72.60	40.20
8	*5745.00	102.7 AV			1.19 V	138	62.50	40.20
9	11490.00	63.6 PK	74.0	-10.4	1.00 V	190	45.50	18.10
10	11490.00	49.4 AV	54.0	-4.6	1.00 V	190	31.30	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	62.8 PK	74.0	-11.2	1.29 H	125	57.30	5.50
2	5400.00	52.6 AV	54.0	-1.4	1.29 H	125	47.10	5.50
3	5455.00	60.8 PK	74.0	-13.2	1.22 H	126	55.20	5.60
4	5455.00	50.3 AV	54.0	-3.7	1.22 H	126	44.70	5.60
5	*5785.00	118.0 PK			1.44 H	118	77.70	40.30
6	*5785.00	107.7 AV			1.44 H	118	67.40	40.30
7	11570.00	67.7 PK	74.0	-6.3	1.04 H	203	49.50	18.20
8	11570.00	52.6 AV	54.0	-1.4	1.04 H	203	34.40	18.20
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	5400.00	60.0 PK	74.0	-14.0	1.14 V	131	54.50	5.50
2	5400.00	47.8 AV	54.0	-6.2	1.14 V	131	42.30	5.50
3	5455.00	58.8 PK	74.0	-15.2	1.14 V	131	53.20	5.60
4	5455.00	47.3 AV	54.0	-6.7	1.14 V	131	41.70	5.60
5	*5785.00	113.1 PK			1.18 V	138	72.80	40.30
6	*5785.00	103.2 AV			1.18 V	138	62.90	40.30
7	11570.00	64.4 PK	74.0	-9.6	1.00 V	195	46.20	18.20
8	11570.00	49.8 AV	54.0	-4.2	1.00 V	195	31.60	18.20

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	62.6 PK	74.0	-11.4	1.28 H	126	57.10	5.50
2	5400.00	51.4 AV	54.0	-2.6	1.28 H	126	45.90	5.50
3	5455.00	61.8 PK	74.0	-12.2	1.21 H	125	56.20	5.60
4	5455.00	50.4 AV	54.0	-3.6	1.21 H	125	44.80	5.60
5	*5825.00	116.7 PK			1.28 H	124	76.40	40.30
6	*5825.00	106.3 AV			1.28 H	124	66.00	40.30
7	#5850.00	68.1 PK	86.7	-18.6	1.28 H	129	61.50	6.60
8	#5850.00	58.2 AV	76.3	-18.1	1.28 H	129	51.60	6.60
9	11650.00	68.1 PK	74.0	-5.9	1.00 H	194	50.00	18.10
10	11650.00	52.7 AV	54.0	-1.3	1.00 H	194	34.60	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	59.8 PK	74.0	-14.2	1.11 V	134	54.30	5.50
2	5400.00	46.5 AV	54.0	-7.5	1.11 V	134	41.00	5.50
3	5455.00	57.9 PK	74.0	-16.1	1.11 V	134	52.30	5.60
4	5455.00	46.4 AV	54.0	-7.6	1.11 V	134	40.80	5.60
5	*5825.00	113.6 PK			1.16 V	138	73.30	40.30
6	*5825.00	103.3 AV			1.16 V	138	63.00	40.30
7	#5850.00	65.0 PK	83.6	-18.6	1.14 V	131	58.40	6.60
8	#5850.00	54.7 AV	73.3	-18.6	1.14 V	131	48.10	6.60
9	11570.00	63.9 PK	74.0	-10.1	1.00 V	193	45.70	18.20
10	11570.00	48.9 AV	54.0	-5.1	1.00 V	193	30.70	18.20

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	62.5 PK	74.0	-11.5	1.29 H	121	57.00	5.50
2	5400.00	52.3 AV	54.0	-1.7	1.29 H	121	46.80	5.50
3	5455.00	62.0 PK	74.0	-12.0	1.22 H	129	56.40	5.60
4	5455.00	50.9 AV	54.0	-3.1	1.22 H	129	45.30	5.60
5	#5725.00	75.8 PK	87.1	-11.3	1.40 H	123	69.50	6.30
6	#5725.00	65.9 AV	77.2	-11.3	1.40 H	123	59.60	6.30
7	*5745.00	117.1 PK			1.46 H	121	76.90	40.20
8	*5745.00	107.2 AV			1.46 H	121	67.00	40.20
9	11490.00	68.2 PK	74.0	-5.8	1.00 H	197	50.10	18.10
10	11490.00	52.6 AV	54.0	-1.4	1.00 H	197	34.50	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	60.7 PK	74.0	-13.3	1.12 V	119	55.20	5.50
2	5400.00	47.5 AV	54.0	-6.5	1.12 V	119	42.00	5.50
3	5455.00	59.0 PK	74.0	-15.0	1.12 V	119	53.40	5.60
4	5455.00	46.9 AV	54.0	-7.1	1.12 V	119	41.30	5.60
5	#5725.00	72.2 PK	83.5	-11.3	1.19 V	132	65.90	6.30
6	#5725.00	61.8 AV	73.1	-11.3	1.19 V	132	55.50	6.30
7	*5745.00	113.5 PK			1.18 V	137	73.30	40.20
8	*5745.00	103.1 AV			1.18 V	137	62.90	40.20
9	11490.00	64.0 PK	74.0	-10.0	1.00 V	197	45.90	18.10
10	11490.00	49.8 AV	54.0	-4.2	1.00 V	197	31.70	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	63.6 PK	74.0	-10.4	1.29 H	126	58.10	5.50
2	5400.00	52.8 AV	54.0	-1.2	1.29 H	126	47.30	5.50
3	5455.00	61.3 PK	74.0	-12.7	1.23 H	124	55.70	5.60
4	5455.00	50.5 AV	54.0	-3.5	1.23 H	124	44.90	5.60
5	*5785.00	116.3 PK			1.20 H	123	76.00	40.30
6	*5785.00	106.0 AV			1.20 H	123	65.70	40.30
7	11570.00	69.1 PK	74.0	-4.9	1.02 H	194	50.90	18.20
8	11570.00	53.0 AV	54.0	-1.0	1.02 H	194	34.80	18.20
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	5400.00	59.9 PK	74.0	-14.1	1.15 V	119	54.40	5.50
2	5400.00	47.0 AV	54.0	-7.0	1.15 V	119	41.50	5.50
3	5455.00	58.4 PK	74.0	-15.6	1.15 V	119	52.80	5.60
4	5455.00	46.5 AV	54.0	-7.5	1.15 V	119	40.90	5.60
5	*5785.00	113.3 PK			1.17 V	137	73.00	40.30
6	*5785.00	102.8 AV			1.17 V	137	62.50	40.30
7	11570.00	63.0 PK	74.0	-11.0	1.00 V	195	44.80	18.20
8	11570.00	49.3 AV	54.0	-4.7	1.00 V	195	31.10	18.20

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	60.1 PK	74.0	-13.9	1.27 H	121	54.60	5.50
2	5400.00	50.7 AV	54.0	-3.3	1.27 H	121	45.20	5.50
3	5455.00	60.5 PK	74.0	-13.5	1.25 H	123	54.90	5.60
4	5455.00	49.5 AV	54.0	-4.5	1.25 H	123	43.90	5.60
5	*5825.00	117.1 PK			1.43 H	115	76.80	40.30
6	*5825.00	107.0 AV			1.43 H	115	66.70	40.30
7	#5850.00	69.7 PK	87.1	-17.4	1.40 H	116	63.10	6.60
8	#5850.00	59.6 AV	77.0	-17.4	1.40 H	116	53.00	6.60
9	11650.00	68.2 PK	74.0	-5.8	1.00 H	197	50.10	18.10
10	11650.00	53.0 AV	54.0	-1.0	1.00 H	197	34.90	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	59.1 PK	74.0	-14.9	1.17 V	137	53.60	5.50
2	5400.00	45.7 AV	54.0	-8.3	1.17 V	137	40.20	5.50
3	5455.00	57.5 PK	74.0	-16.5	1.17 V	137	51.90	5.60
4	5455.00	45.4 AV	54.0	-8.6	1.17 V	137	39.80	5.60
5	*5825.00	113.1 PK			1.16 V	138	72.80	40.30
6	*5825.00	102.8 AV			1.16 V	138	62.50	40.30
7	#5850.00	65.7 PK	83.1	-17.4	1.10 V	137	59.10	6.60
8	#5850.00	55.4 AV	72.8	-17.4	1.10 V	137	48.80	6.60
9	11650.00	64.0 PK	74.0	-10.0	1.00 V	197	45.90	18.10
10	11650.00	50.0 AV	54.0	-4.0	1.00 V	197	31.90	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	63.5 PK	74.0	-10.5	1.30 H	125	58.00	5.50
2	5400.00	52.4 AV	54.0	-1.6	1.30 H	125	46.90	5.50
3	5455.00	61.8 PK	74.0	-12.2	1.25 H	129	56.20	5.60
4	5455.00	50.3 AV	54.0	-3.7	1.25 H	129	44.70	5.60
5	**#5725.00**	**83.8 PK**	**84.6**	**-0.8**	**1.48 H**	**120**	**77.50**	**6.30**
6	**#5725.00**	**71.5 AV**	**72.3**	**-0.8**	**1.48 H**	**120**	**65.20**	**6.30**
7	*5755.00	114.6 PK			1.45 H	117	74.40	40.20
8	*5755.00	102.3 AV			1.45 H	117	62.10	40.20
9	11510.00	67.4 PK	74.0	-6.6	1.00 H	194	49.30	18.10
10	11510.00	52.9 AV	54.0	-1.1	1.00 H	194	34.80	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	59.8 PK	74.0	-14.2	1.14 V	120	54.30	5.50
2	5400.00	46.6 AV	54.0	-7.4	1.14 V	120	41.10	5.50
3	5455.00	58.9 PK	74.0	-15.1	1.14 V	120	53.30	5.60
4	5455.00	46.3 AV	54.0	-7.7	1.14 V	120	40.70	5.60
5	**#5725.00**	**79.7 PK**	**80.5**	**-0.8**	**1.12 V**	**132**	**73.40**	**6.30**
6	**#5725.00**	**67.3 AV**	**68.1**	**-0.8**	**1.12 V**	**132**	**61.00**	**6.30**
7	*5755.00	110.5 PK			1.17 V	137	70.30	40.20
8	*5755.00	98.1 AV			1.17 V	137	57.90	40.20
9	11510.00	63.1 PK	74.0	-10.9	1.00 V	190	45.00	18.10
10	11510.00	49.1 AV	54.0	-4.9	1.00 V	190	31.00	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	63.3 PK	74.0	-10.7	1.29 H	127	57.80	5.50
2	5400.00	52.1 AV	54.0	-1.9	1.29 H	127	46.60	5.50
3	5455.00	62.5 PK	74.0	-11.5	1.27 H	126	56.90	5.60
4	5455.00	50.2 AV	54.0	-3.8	1.27 H	126	44.60	5.60
5	*5795.00	113.6 PK			1.24 H	114	73.30	40.30
6	*5795.00	101.3 AV			1.24 H	114	61.00	40.30
7	#5850.00	63.2 PK	83.6	-20.4	1.23 H	118	56.60	6.60
8	#5850.00	50.9 AV	71.3	-20.4	1.23 H	118	44.30	6.60
9	11590.00	67.7 PK	74.0	-6.3	1.00 H	195	49.60	18.10
10	11590.00	52.6 AV	54.0	-1.4	1.00 H	195	34.50	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung

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	5400.00	59.6 PK	74.0	-14.4	1.12 V	121	54.10	5.50
2	5400.00	46.3 AV	54.0	-7.7	1.12 V	121	40.80	5.50
3	5455.00	58.7 PK	74.0	-15.3	1.12 V	121	53.10	5.60
4	5455.00	46.2 AV	54.0	-7.8	1.12 V	121	40.60	5.60
5	*5795.00	110.0 PK			1.17 V	137	69.70	40.30
6	*5795.00	98.2 AV			1.17 V	137	57.90	40.30
7	#5850.00	59.6 PK	80.0	-20.4	1.11 V	132	53.00	6.60
8	#5850.00	47.8 AV	68.2	-20.4	1.11 V	132	41.20	6.60
9	11590.00	62.4 PK	74.0	-11.6	1.00 V	193	44.30	18.10
10	11590.00	48.8 AV	54.0	-5.2	1.00 V	193	30.70	18.10

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

BELOW 1GHz WORST-CASE DATA：802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	148.26	24.3 QP	43.5	-19.2	1.25 H	276	38.50	-14.20
2	179.31	25.0 QP	43.5	-18.5	2.00 H	281	39.90	-14.90
3	278.27	26.8 QP	46.0	-19.2	1.00 H	289	39.80	-13.00
4	375.29	21.9 QP	46.0	-24.1	1.50 H	238	33.20	-11.30
5	625.60	26.0 QP	46.0	-20.0	1.50 H	15	32.30	-6.30
6	798.30	25.7 QP	46.0	-20.3	1.00 H	223	28.90	-3.20
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	37.66	21.2 QP	40.0	-18.8	1.50 V	346	36.20	-15.00
2	173.49	21.6 QP	43.5	-21.9	1.00 V	214	36.20	-14.60
3	280.21	19.4 QP	46.0	-26.6	1.25 V	350	32.30	-12.90
4	499.48	22.3 QP	46.0	-23.7	1.00 V	12	31.30	-9.00
5	625.60	25.2 QP	46.0	-20.8	2.00 V	79	31.50	-6.30
6	875.91	30.8 QP	46.0	-15.2	2.00 V	172	33.00	-2.20

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) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Brad Tung
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	185.13	20.5 QP	43.5	-23.0	2.00 H	274	36.40	-15.90
2	260.81	24.4 QP	46.0	-21.6	1.25 H	234	38.40	-14.00
3	299.62	23.5 QP	46.0	-22.5	2.00 H	336	36.10	-12.60
4	365.59	19.0 QP	46.0	-27.0	1.00 H	178	30.40	-11.40
5	621.72	22.2 QP	46.0	-23.8	1.00 H	287	28.60	-6.40
6	870.09	26.7 QP	46.0	-19.3	1.00 H	320	28.90	-2.20
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	177.25	20.4 QP	43.5	-23.1	1.00 V	225	35.20	-14.80
2	250.24	24.2 QP	46.0	-21.8	1.50 V	53	38.70	-14.50
3	312.25	23.4 QP	46.0	-22.6	2.00 V	24	35.60	-12.20
4	366.05	20.0 QP	46.0	-26.0	1.00 V	1	31.40	-11.40
5	625.69	22.0 QP	46.0	-24.0	1.00 V	106	28.30	-6.30
6	875.43	26.0 QP	46.0	-20.0	1.00 V	31	28.20	-2.20

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) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

5.2 CONDUCTED EMISSION MEASUREMENT

5.2.1 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.

5.2.2 T EST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.

5.2.7 TEST RESULTS

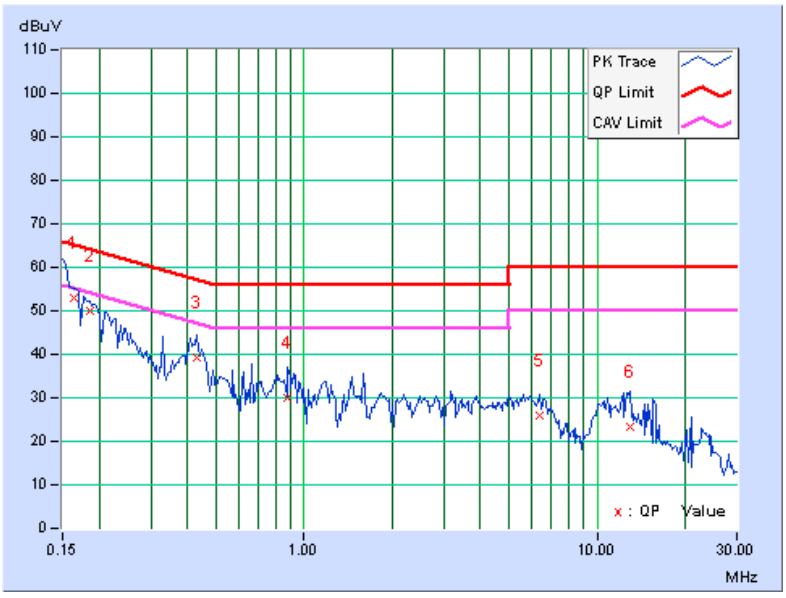
CONDUCTED WORST-CASE DATA：802.11n (20MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16408	0.16	52.78	38.78	52.94	38.94	65.25	55.25	-12.32	-16.32
2	0.18516	0.16	49.84	32.70	50.00	32.86	64.25	54.25	-14.25	-21.39
3	0.43125	0.23	39.13	31.06	39.36	31.29	57.23	47.23	-17.87	-15.94
4	0.88047	0.25	29.83	22.34	30.08	22.59	56.00	46.00	-25.92	-23.41
5	6.36328	0.53	25.46	18.56	25.99	19.09	60.00	50.00	-34.01	-30.91
6	12.95313	0.87	22.33	14.40	23.20	15.27	60.00	50.00	-36.80	-34.73

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

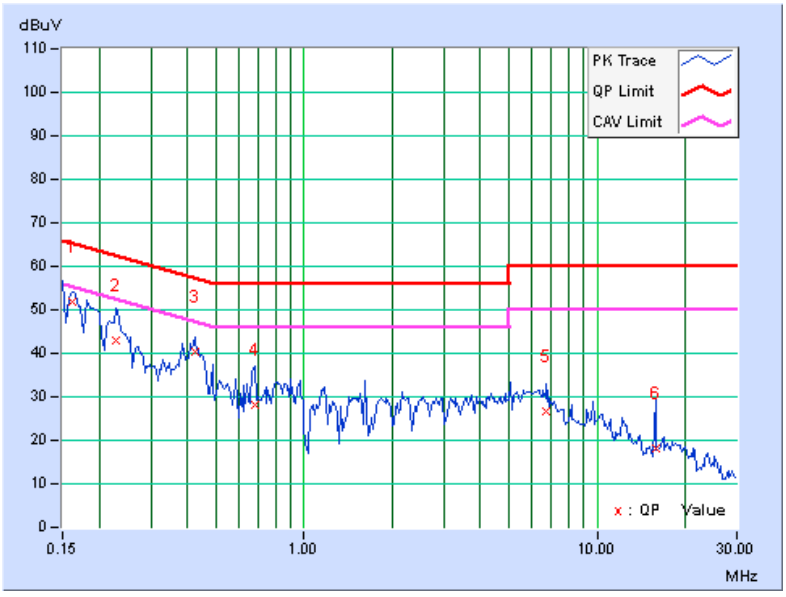


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.16172	0.17	51.80	37.05	51.97	37.22	65.38	55.38	-13.41	-18.16
2	0.22812	0.18	42.94	26.53	43.12	26.71	62.52	52.52	-19.40	-25.81
3	0.42344	0.24	40.11	33.45	40.35	33.69	57.38	47.38	-17.03	-13.69
4	0.67734	0.24	28.09	18.36	28.33	18.60	56.00	46.00	-27.67	-27.40
5	6.71875	0.48	26.06	19.40	26.54	19.88	60.00	50.00	-33.46	-30.12
6	15.85156	0.79	17.31	7.61	18.10	8.40	60.00	50.00	-41.90	-41.60

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

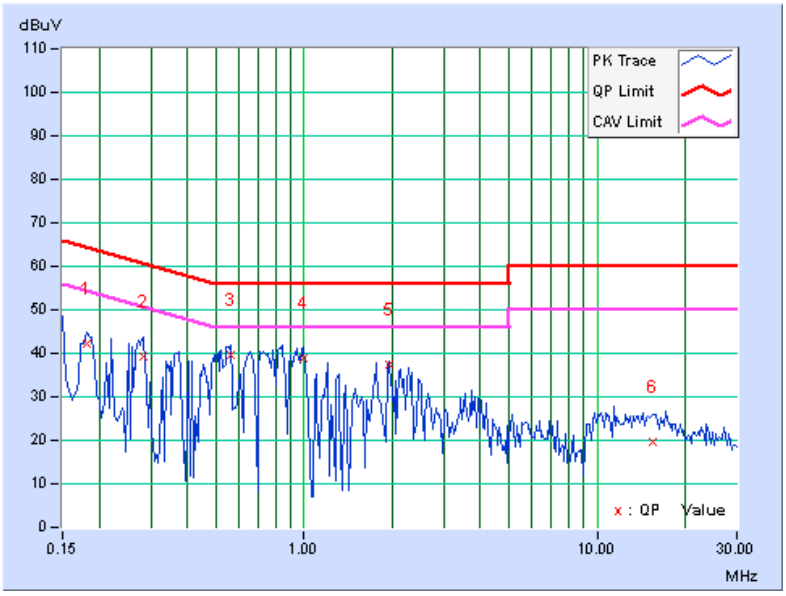


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.18125	0.16	41.90	36.65	42.06	36.81	64.43	54.43	-22.37	-17.62
2	0.28281	0.19	38.94	25.84	39.13	26.03	60.73	50.73	-21.60	-24.70
3	0.56016	0.24	39.56	28.04	39.80	28.28	56.00	46.00	-16.20	-17.72
4	1.00001	0.25	38.77	24.03	39.02	24.28	56.00	46.00	-16.98	-21.72
5	1.95703	0.29	37.20	19.88	37.49	20.17	56.00	46.00	-18.51	-25.83
6	15.51953	1.00	18.70	6.59	19.70	7.59	60.00	50.00	-40.30	-42.41

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

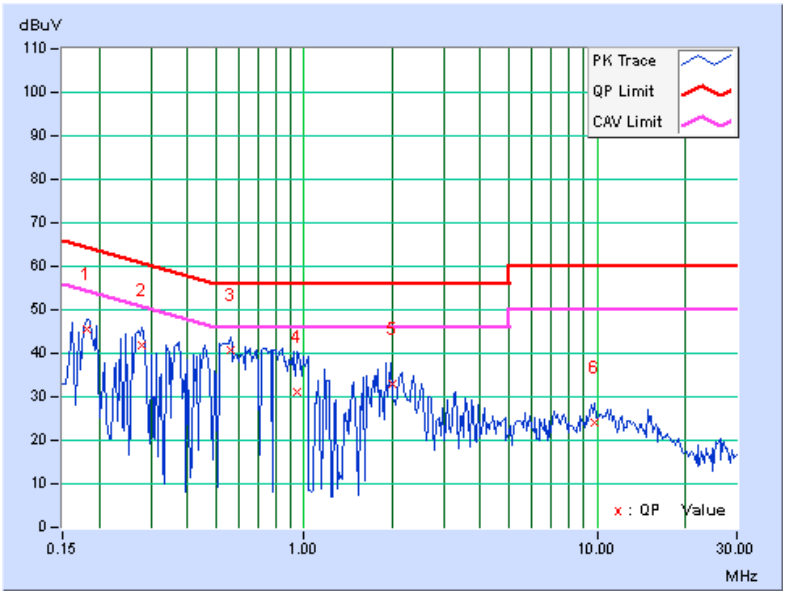


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.18125	0.17	45.29	38.36	45.46	38.53	64.43	54.43	-18.97	-15.90
2	0.27891	0.20	41.54	36.93	41.74	37.13	60.85	50.85	-19.11	-13.72
3	0.56016	0.24	40.60	30.71	40.84	30.95	56.00	46.00	-15.16	-15.05
4	0.94688	0.25	30.86	10.82	31.11	11.07	56.00	46.00	-24.89	-34.93
5	2.01115	0.28	32.78	19.54	33.06	19.82	56.00	46.00	-22.94	-26.18
6	9.84766	0.59	23.30	9.34	23.89	9.93	60.00	50.00	-36.11	-40.07

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



5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.

5.3.7 TEST RESULTS

802.11a

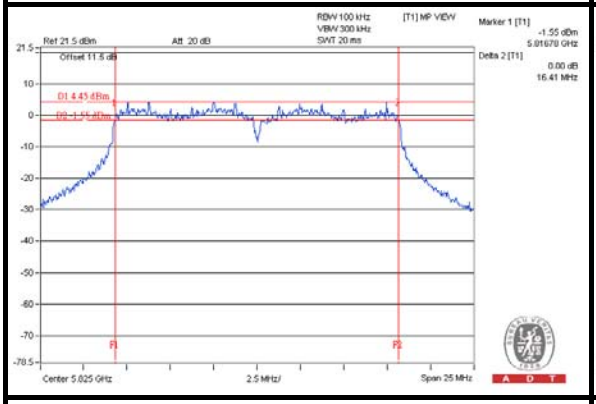
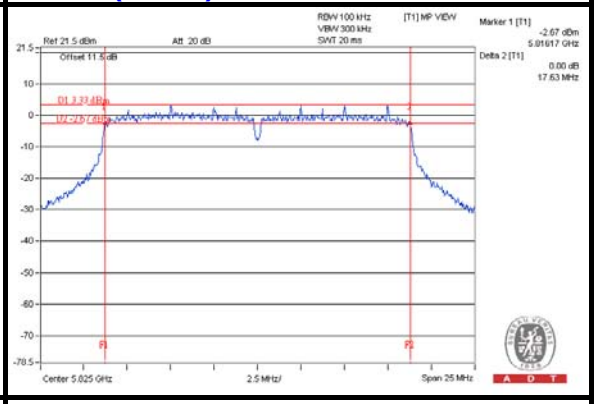
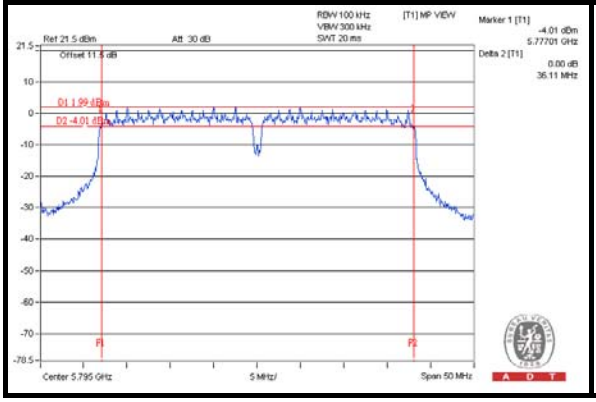
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.37	16.37	0.5	PASS
157	5785	15.13	16.38	0.5	PASS
165	5825	16.41	16.37	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	15.09	17.59	0.5	PASS
157	5785	15.09	17.60	0.5	PASS
165	5825	15.12	17.63	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.08	35.93	0.5	PASS
159	5795	35.81	36.11	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a	802.11n (20MHz)
	
802.11n (40MHz)	
	

5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

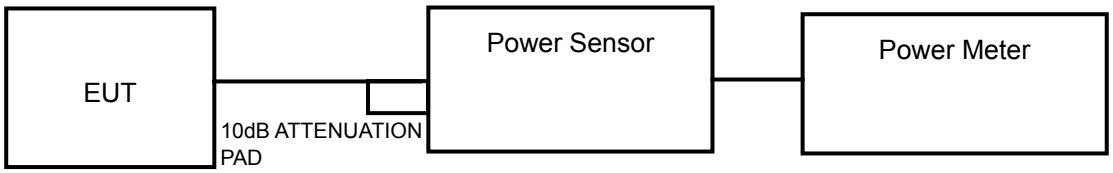
For systems using digital modulation in the 5725 –5850 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v02 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.

5.4.2 TEST SETUP



5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

Same as Item 4.4.4.

5.4.5 DEVIATION FROM TEST STANDARD

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

5.4.7 TEST RESULTS

802.11a

CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	18.38	17.07	119.798	20.78	30	PASS
157	5785	18.98	17.36	133.518	21.26	30	PASS
165	5825	18.29	17.68	126.067	21.01	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	19.17	17.91	144.406	21.60	30	PASS
157	5785	18.44	16.95	119.368	20.77	30	PASS
165	5825	19.13	18.04	145.526	21.63	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	20.19	19.54	**194.422**	22.89	30	PASS
159	5795	20.03	19.23	184.446	22.66	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP

Same as item 4.5.2.

5.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURE.

Same as item 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

5.5.7 TEST RESULTS

802.11a

TX chain	Channel	Freq. (MHz)	PSD W/O DUTY FACTOR (dBm/3kHz)	10 log (N=3) dB	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-8.85	3.01	0.11	-5.73	8	PASS
	157	5785	-8.26	3.01	0.11	-5.14	8	PASS
	165	5825	-9.42	3.01	0.11	-6.30	8	PASS
1	149	5745	-10.87	3.01	0.11	-7.75	8	PASS
	157	5785	-11.20	3.01	0.11	-8.08	8	PASS
	165	5825	-11.17	3.01	0.11	-8.05	8	PASS

NOTE: 1. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, so the limit no need to reduced.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

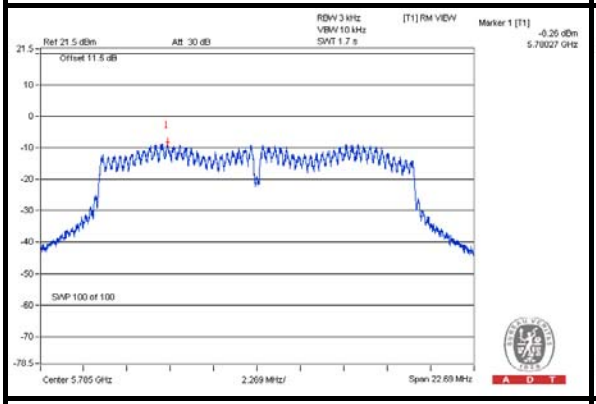
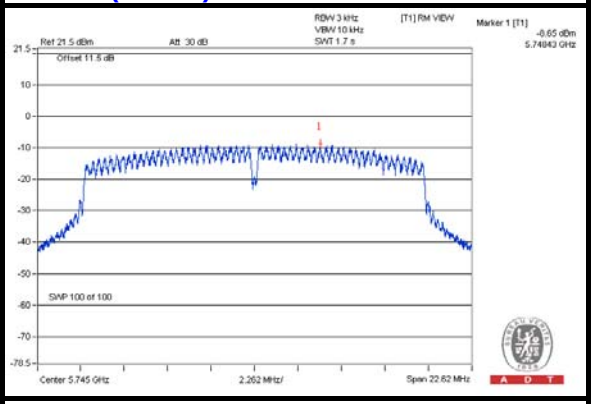
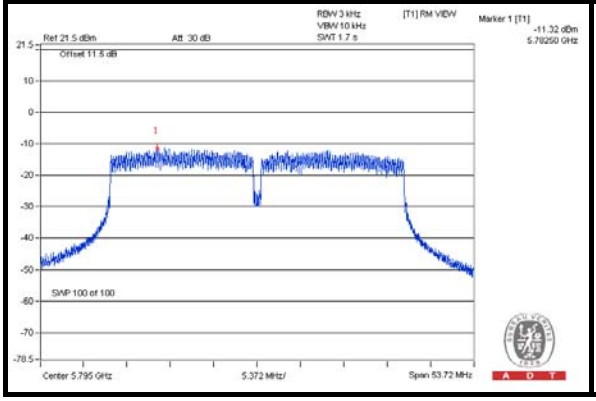
TX chain	Channel	Freq. (MHz)	PSD W/O DUTY FACTOR (dBm/3kHz)	10 log (N=3) dB	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-8.65	3.01	1.01	-5.53	8	PASS
	157	5785	-9.95	3.01	1.01	-6.83	8	PASS
	165	5825	-9.41	3.01	1.01	-6.29	8	PASS
1	149	5745	-10.62	3.01	1.01	-7.50	8	PASS
	157	5785	-11.90	3.01	1.01	-8.78	8	PASS
	165	5825	-11.45	3.01	1.01	-8.33	8	PASS

NOTE: 1. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, so the limit no need to reduced.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD W/O DUTY FACTOR (dBm/3kHz)	10 log (N=3) dB	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-11.65	3.01	0.30	-8.34	8	PASS
	159	5795	-11.32	3.01	0.30	-8.01	8	PASS
1	151	5755	-12.57	3.01	0.30	-9.26	8	PASS
	159	5795	-13.12	3.01	0.30	-9.81	8	PASS

NOTE: 1. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, so the limit no need to reduced.
2. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11a	**802.11n (20MHz)**
	
802.11n (40MHz)	
	

5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below –30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST SETUP

Same as Item 4.6.2

5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 TEST PROCEDURE

Same as Item 4.6.4

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

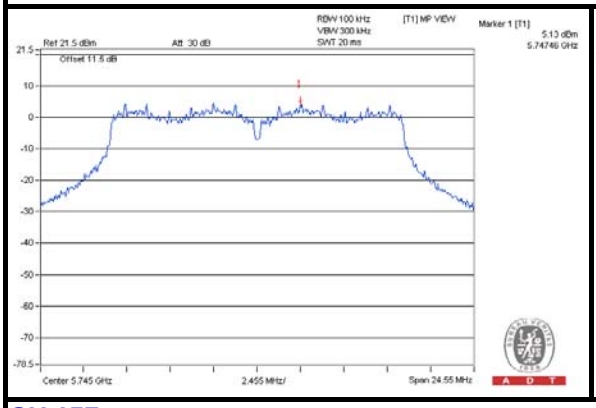
5.6.7 TEST RESULTS

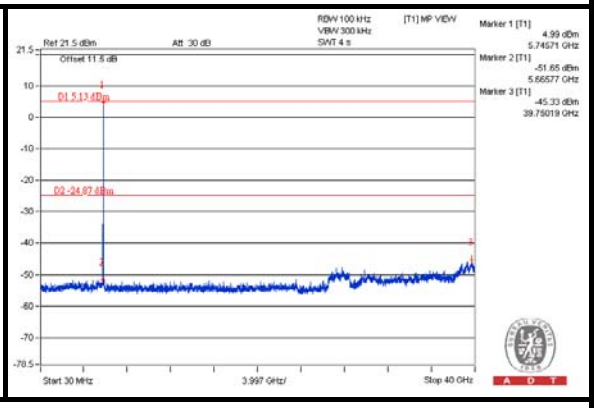
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

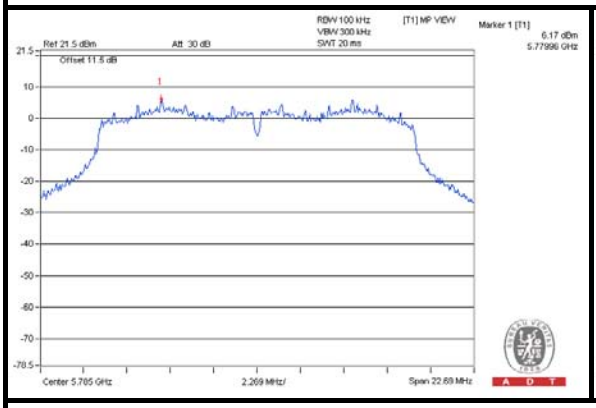
802.11a CHAIN 0

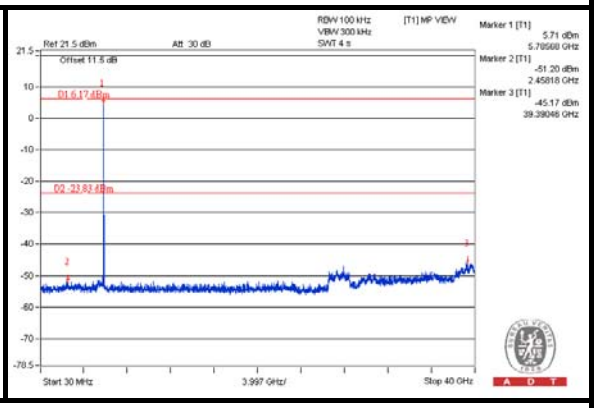
CH 149



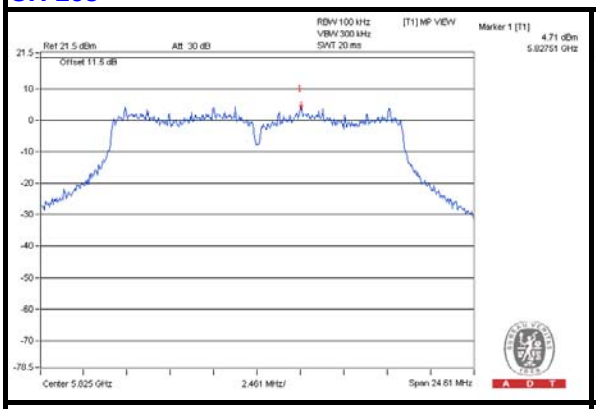


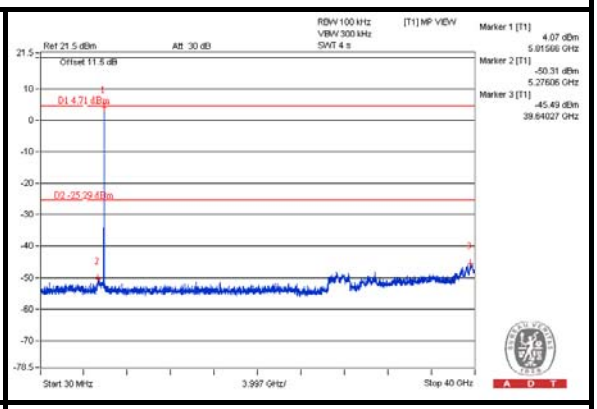
CH 157



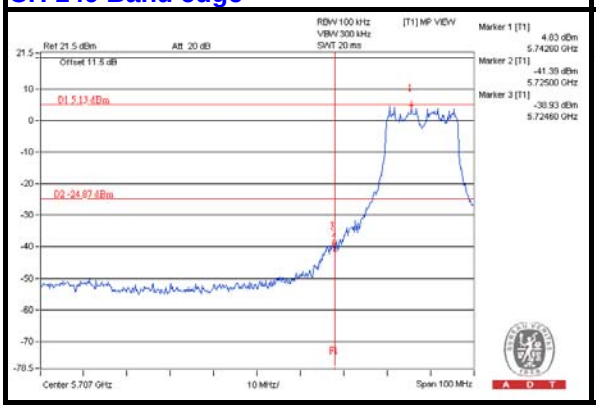


CH 165

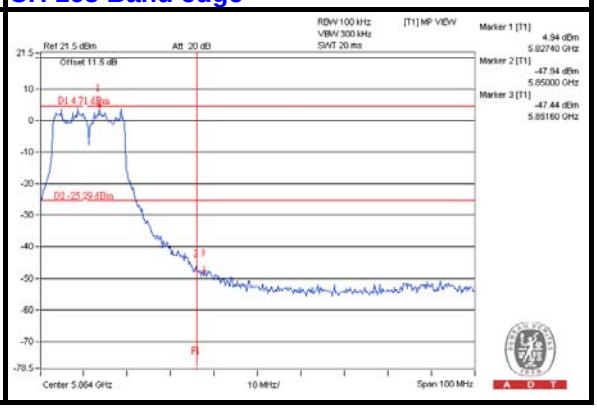




CH 149 Band edge

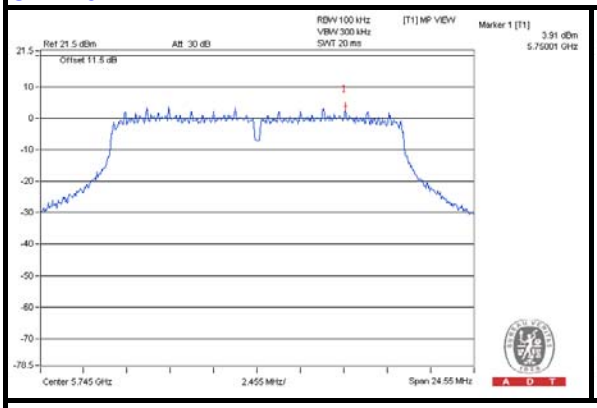


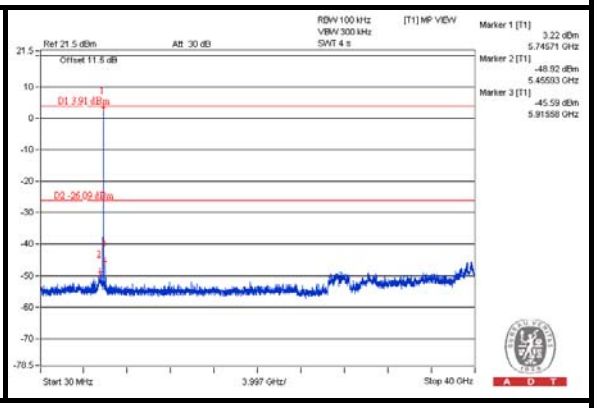
CH 165 Band edge



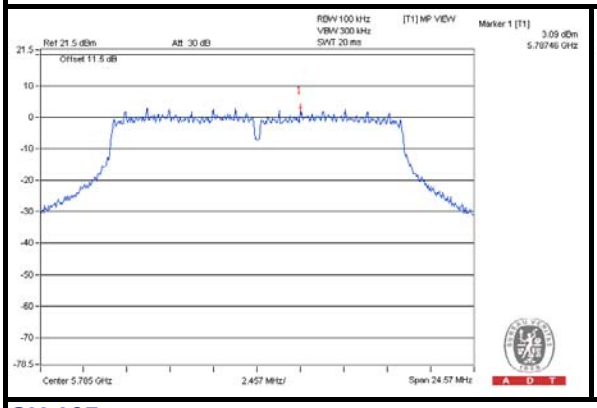
CHAIN 1

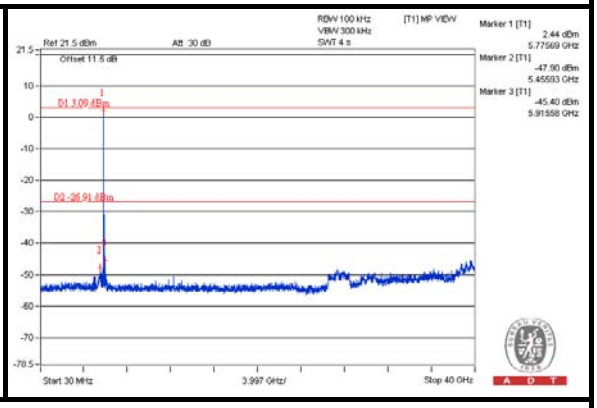
CH 149



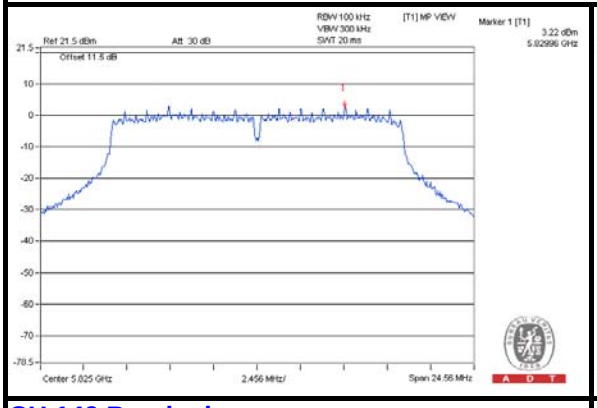


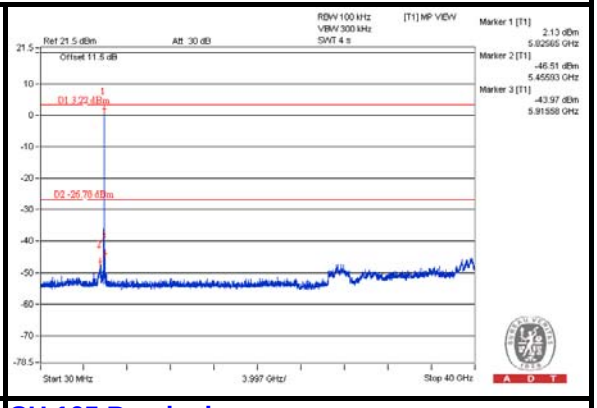
CH 157



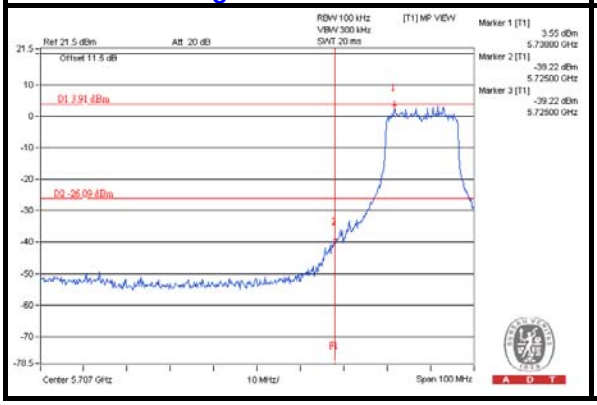


CH 165

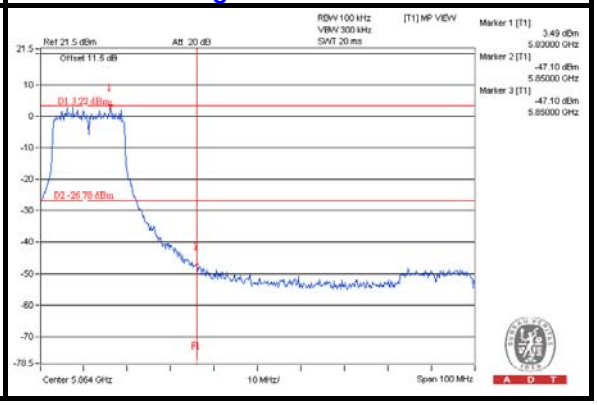




CH 149 Band edge

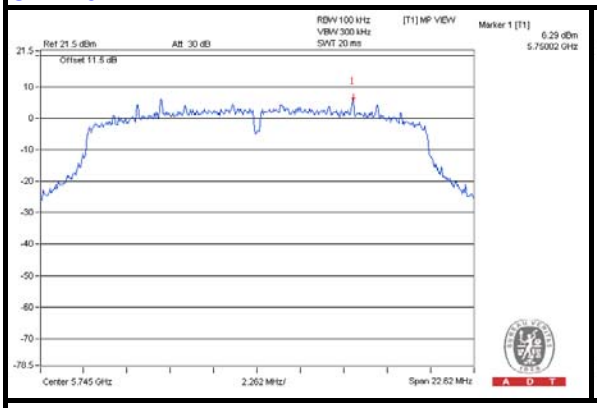


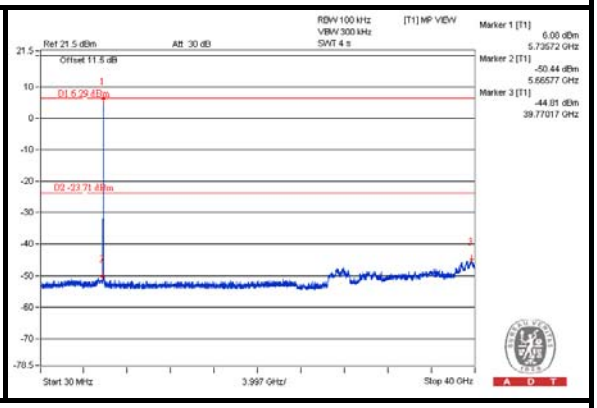
CH 165 Band edge



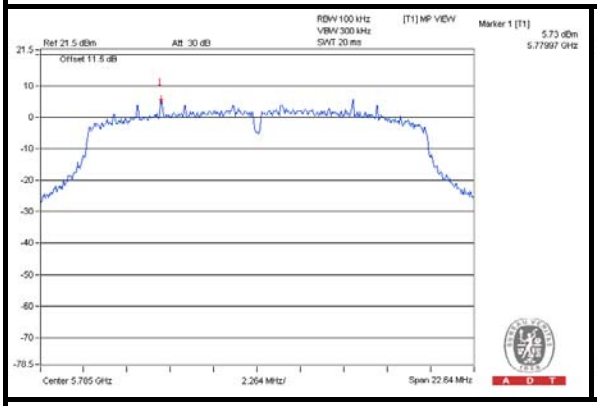
802.11n (20MHz) CHAIN 0

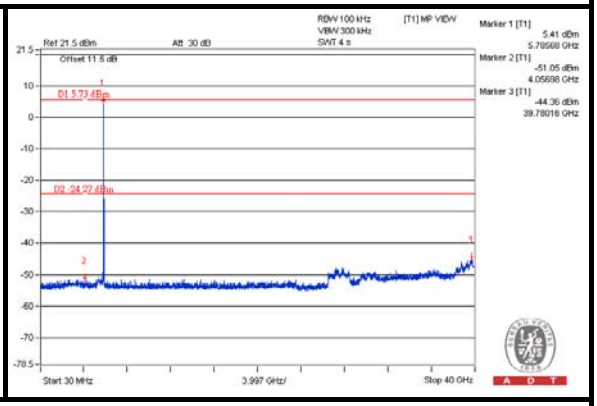
CH 149



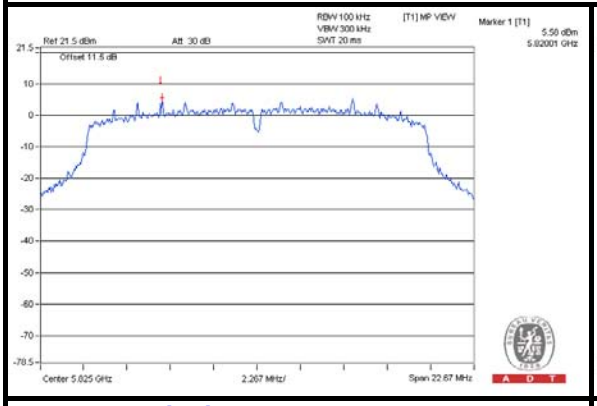


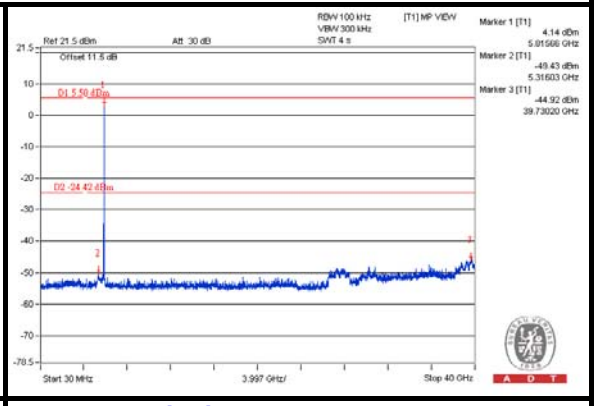
CH 157



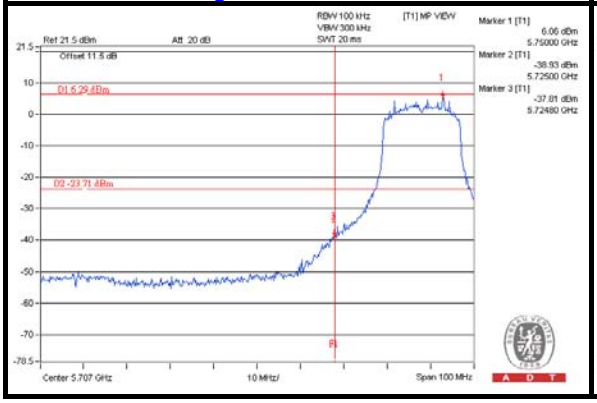


CH 165

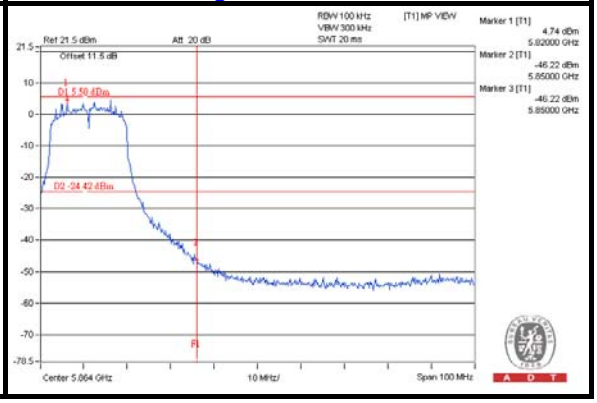




CH 149 Band edge

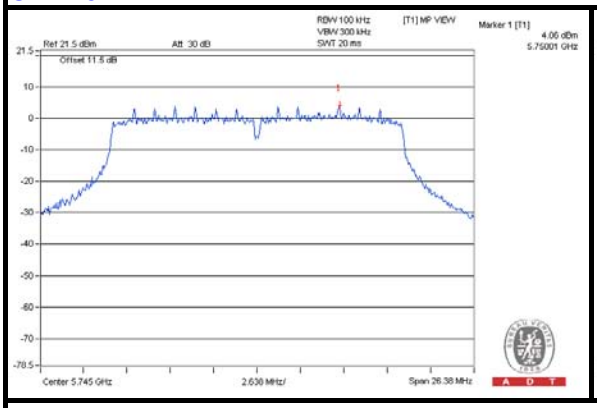


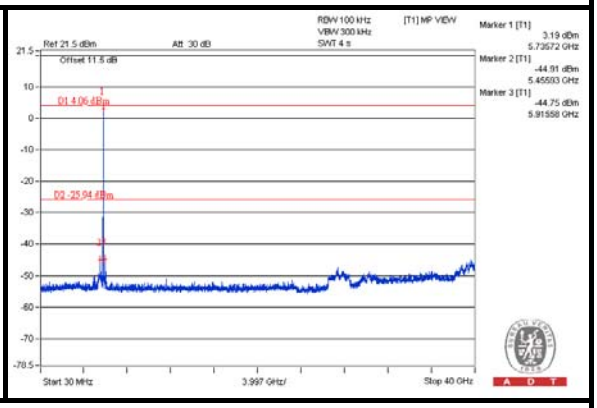
CH 165 Band edge



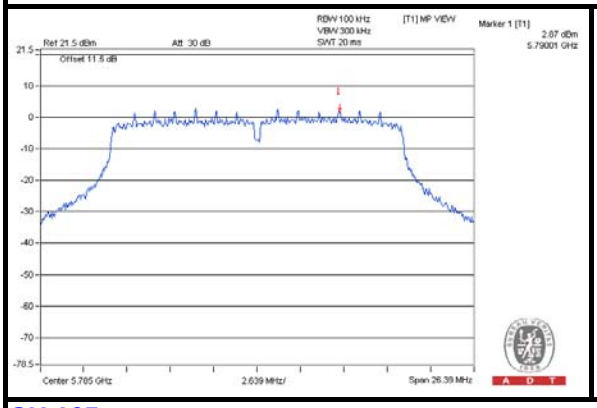
CHAIN 1

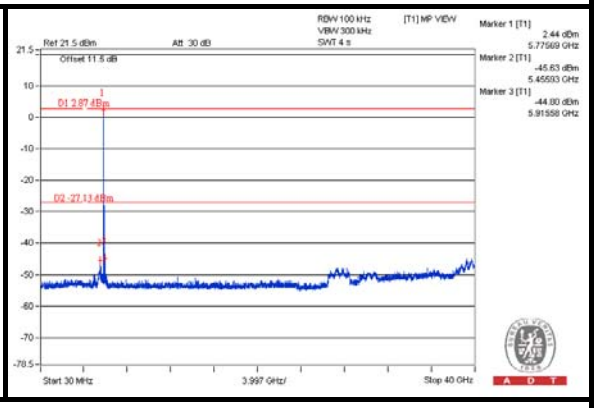
CH 149



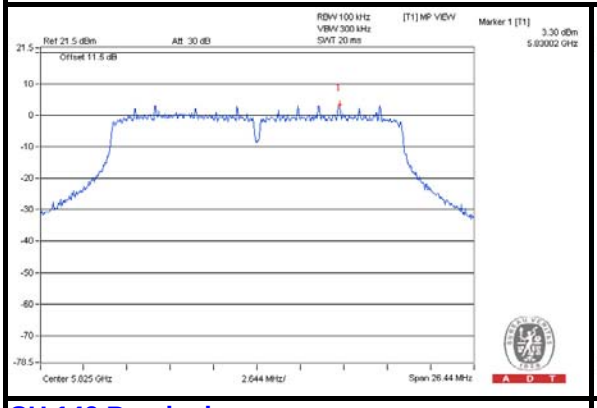


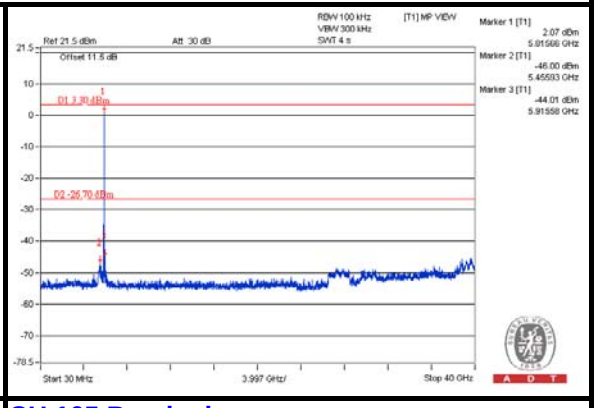
CH 157



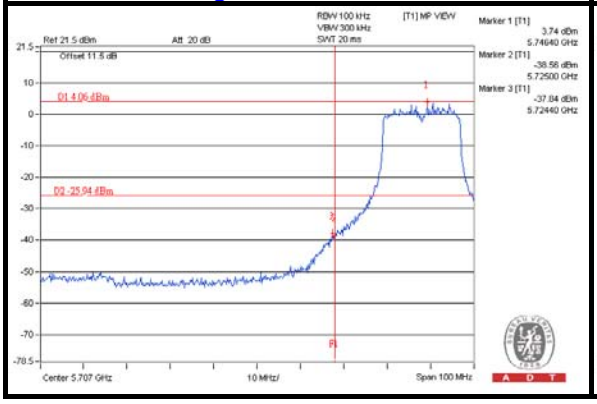


CH 165

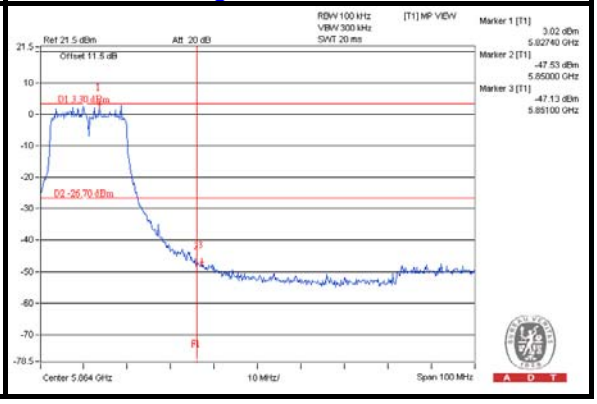




CH 149 Band edge

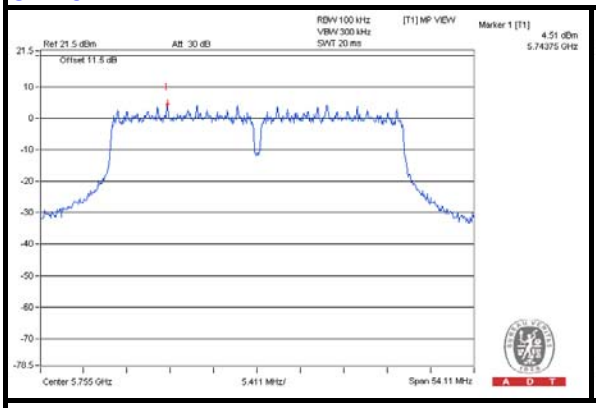


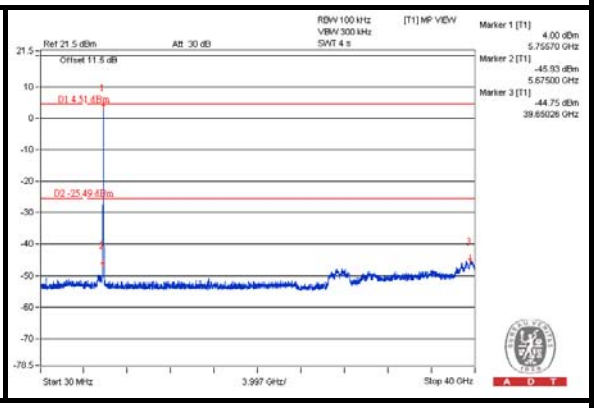
CH 165 Band edge



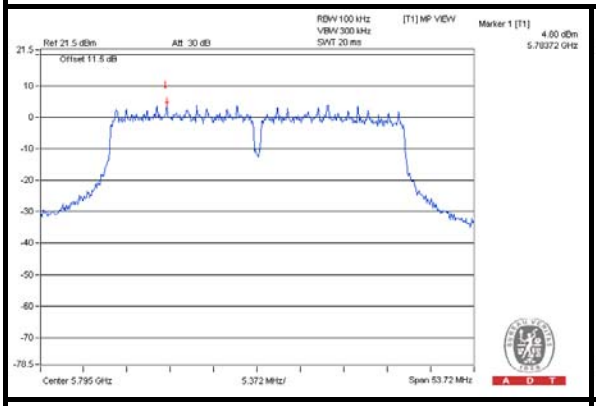
802.11n (40MHz) CHAIN 0

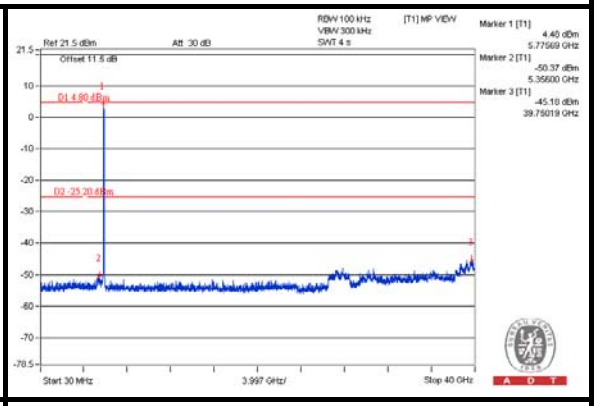
CH 151



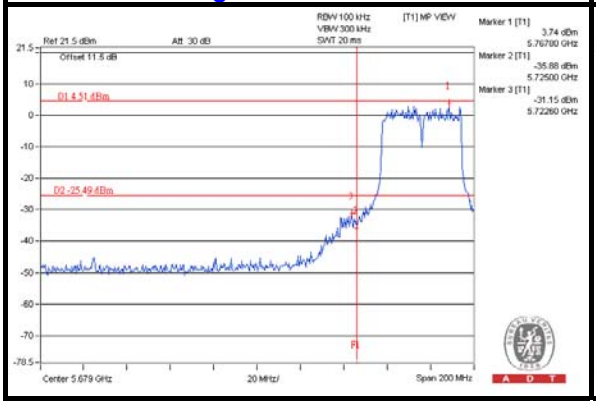


CH 159

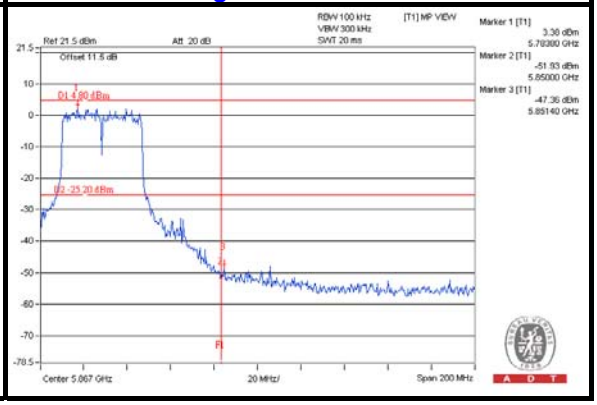




CH 151 Band edge

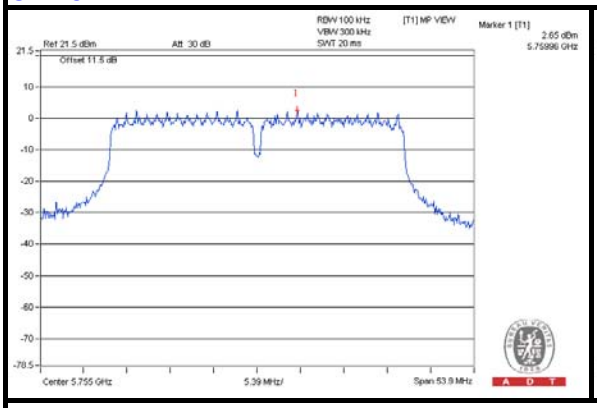


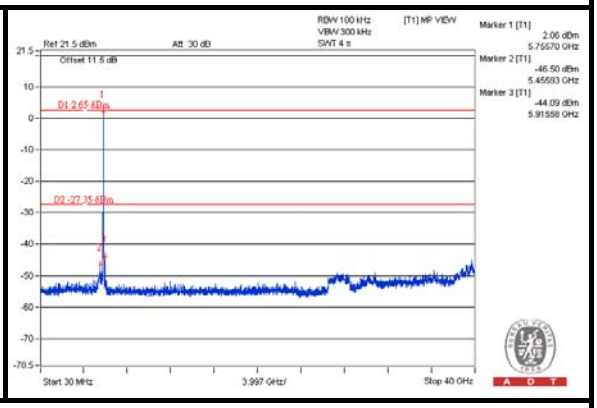
CH 159 Band edge



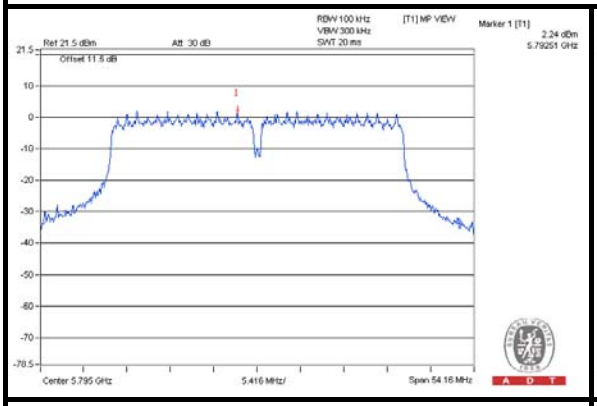
CHAIN 1

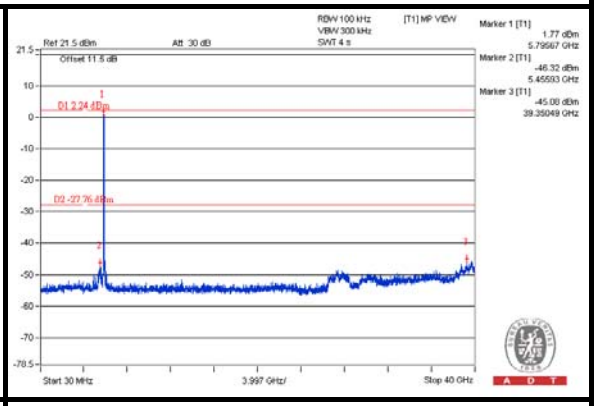
CH 151



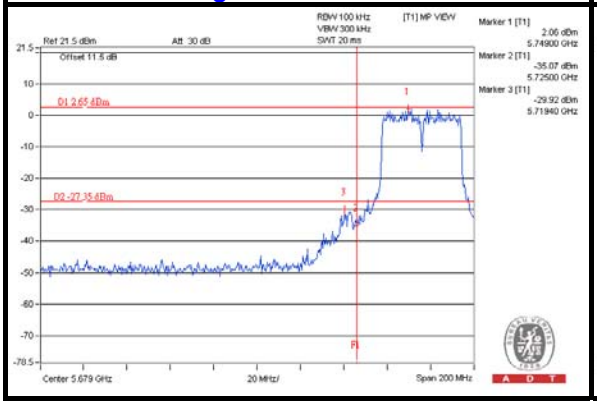


CH 159

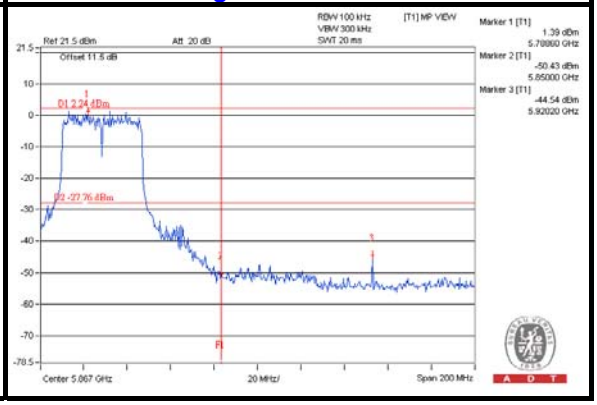




CH 151 Band edge



CH 159 Band edge



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. 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
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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.

8. 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---