FCC TEST REPORT (15.407)

REPORT NO.:	RF130813C26-1
MODEL NO.:	NVG599
FCC ID:	GZ5NVG599
RECEIVED:	Aug. 13, 2013
TESTED:	Aug. 19 ~ Nov. 14, 2013
ISSUED:	Nov. 19, 2013

APPLICANT:	ARRIS Group, Inc.
ADDRESS:	46653 Fremont Blvd., Fremont, CA, 94538, USA

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
RF130813C26-1	Original release	Nov. 19, 2013

1. CERTIFICATION

PRODUCT: DSL
MODEL: NVG599
BRAND: ARRIS
APPLICANT: ARRIS Group, Inc.
TESTED: Aug. 19 ~ Nov. 14, 2013
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.10-2009

The above equipment (model: NVG599) 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 :** Nov. 19, 2013
Pettie Chen / Senior Specialist

APPROVED BY : _____ **, DATE :** Nov. 19, 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 E (SECTION 15.407)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.77dB at 1.05321MHz.
15.407(b/1/2/3)(b)(6)	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 5000.00MHz.
15.407(a/1/2)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is UFL 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	3.34 dB
	200MHz ~1000MHz	3.35 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	DSL
MODEL NO.	NVG599
POWER SUPPLY	7.4Vdc (Battery) 12Vdc (Adapter)
MODULATION TYPE	256QAM, 64QAM, 16QAM, QPSK, BPSK
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps 802.11ac: up to 1300Mbps
OPERATING FREQUENCY	5180 ~ 5240MHz
NUMBER OF CHANNEL	4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz)
OUTPUT POWER	49.317mW
ANTENNA TYPE	PIFA antenna with 3.0dBi gain
ANTENNA CONNECTOR	UFL
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter, Battery

NOTE:

1. The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and three receivers.

MODULATION MODE	TX FUNCTION
802.11a	1TX
802.11n (20MHz)	1TX/3TX
802.11n (40MHz)	1TX/3TX
802.11ac (80MHz)	1TX/3TX

*For 5G Band: Chain 1 was chosen for the final tests.

2. The EUT consumes power from the following battery and adapters.

ADAPTER 1	
BRAND:	ARRIS
MODEL:	NBS42A120350M2
INPUT:	100-120Vac~50/60Hz, 1.0A
OUTPUT:	12Vdc / 3.5A
POWER LINE:	DC 2.2m non-shielded cable without core AC 0.8m non-shielded cable without core

ADAPTER 2	
BRAND:	LITEON
MODEL:	PB-1420-1M01
INPUT:	100-120Vac~60Hz, 1.0A
OUTPUT:	12Vdc / 3.5A
POWER LINE:	DC 1.85m non-shielded cable without core AC 0.8m non-shielded cable without core

Battery	
BRAND:	ARRIS
RATING:	7.4Vdc, 41.4Wh / 5600mAh

3. 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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190MHz	46	5230MHz

1 channel is provided for 802.11ac (80MHz):

CHANNEL	FREQUENCY
42	5210MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2

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

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX FUNCTION
A	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2	1TX/3TX
A	802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0	1TX/3TX
A	802.11ac (80MHz)	42	42	OFDM	BPSK	32.5	1TX/3TX

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX FUNCTION
A, B	802.11a	36 to 48	40	OFDM	BPSK	6.0	1TX

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX FUNCTION
A, B	802.11a	36 to 48	40	OFDM	BPSK	6.0	1TX

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX FUNCTION
A	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2	1TX/3TX
A	802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0	1TX/3TX
A	802.11ac (80MHz)	42	42	OFDM	BPSK	32.5	1TX/3TX

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Ted Chang
PLC	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
APCM	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui

3.3 DUTY CYCLE OF TEST SIGNAL

MODULATION TYPE: BPSK

802.11a, 802.11n (20MHz):

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

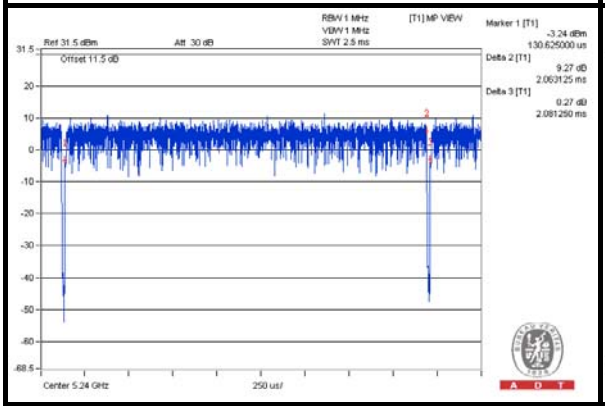
802.11n (40MHz), 802.11ac (80MHz):

Duty cycle of test signal is < 98%, duty factor shall be considered.

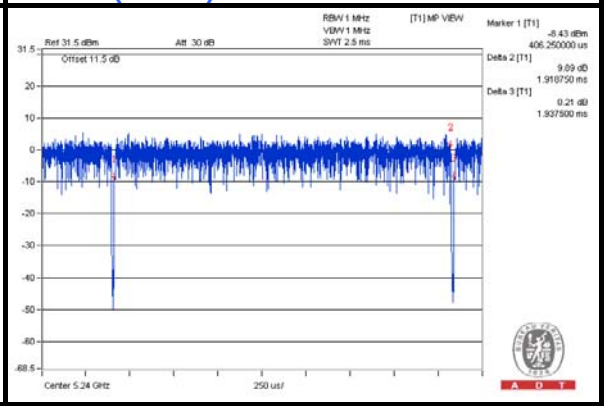
802.11n (40MHz): Duty cycle = 0.941/0.961 = 0.979, Duty factor = 10 * log(1/0.979) = 0.09

802.11ac (80MHz): Duty cycle = 0.462/0.491 = 0.941, Duty factor = 10 * log(1/0.941) = 0.26

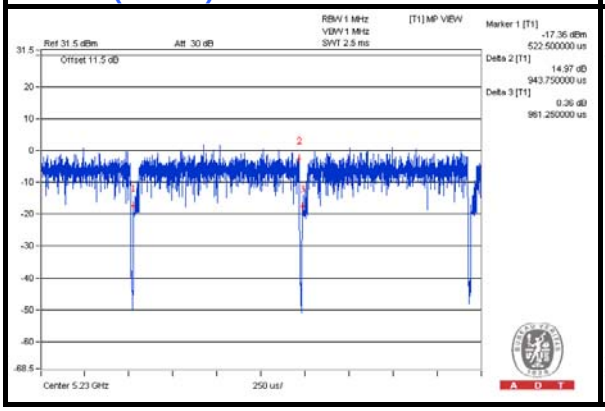
802.11a



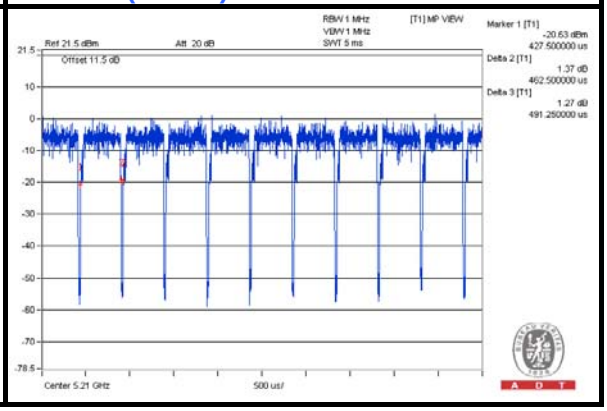
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



MODULATION TYPE: QPSK

802.11a, 802.11n (20MHz):

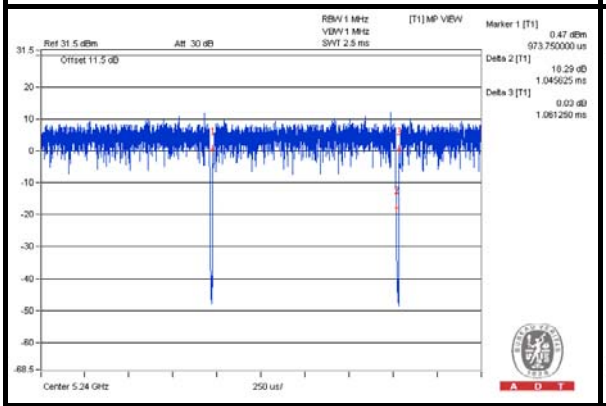
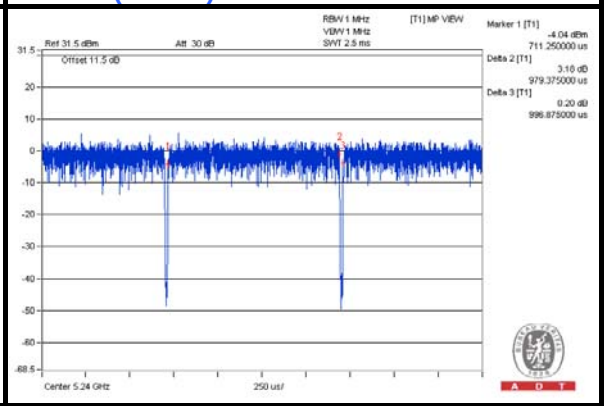
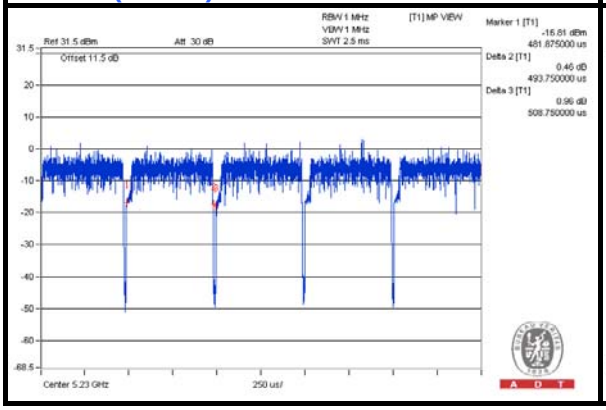
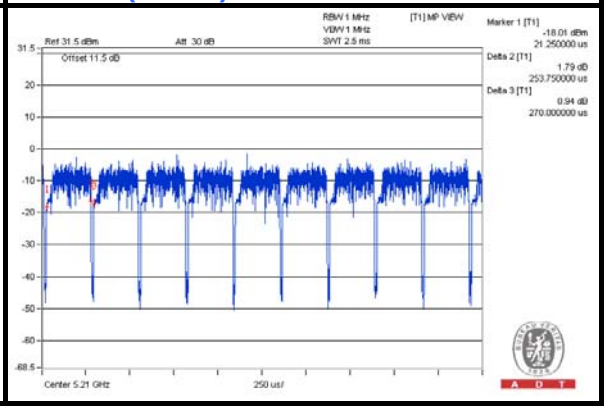
Duty cycle of test signal is > 98 %, duty factor is not required.

802.11n (40MHz), 802.11ac (80MHz):

Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11n (40MHz): Duty cycle = 0.494/0.509 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13

802.11ac (80MHz): Duty cycle = 0.254/0.27 = 0.941, Duty factor = 10 * log(1/0.941) = 0.27

802.11a	802.11n (20MHz)
	
802.11n (40MHz)	**802.11ac (80MHz)**
	

MODULATION TYPE: 16QAM

Duty cycle of test signal is < 98%, duty factor shall be considered.

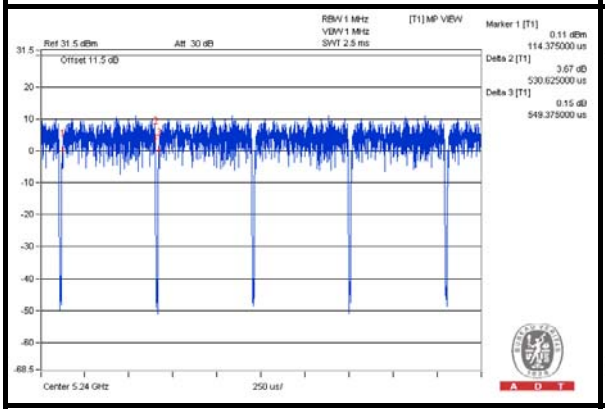
802.11a: Duty cycle = 0.531/0.549 = 0.967, Duty factor = 10 * log(1/0.967) = 0.14

802.11n (20MHz): Duty cycle = 0.507/0.526 = 0.964, Duty factor = 10 * log(1/0.964) = 0.16

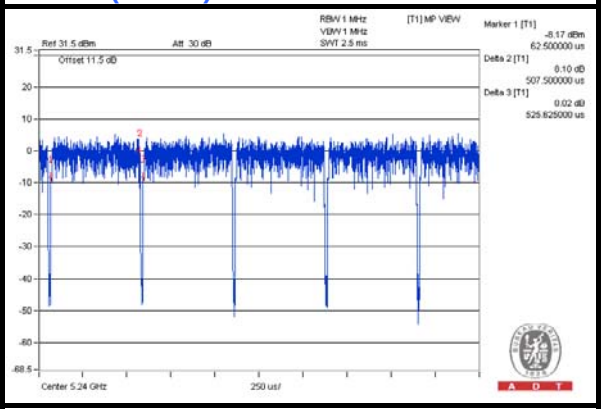
802.11n (40MHz): Duty cycle = 0.262/0.281 = 0.932, Duty factor = 10 * log(1/0.932) = 0.30

802.11ac (80MHz): Duty cycle = 0.148/0.165 = 0.897, Duty factor = 10 * log(1/0.897) = 0.47

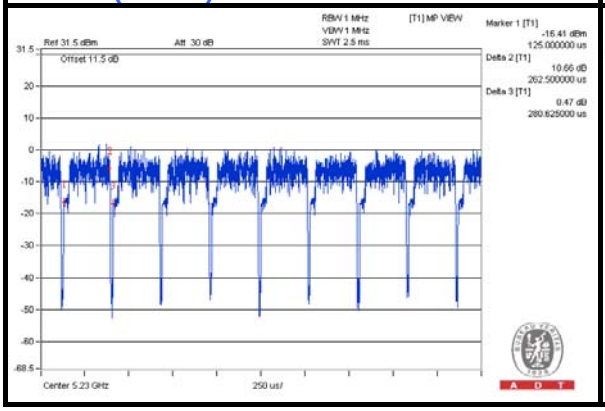
802.11a



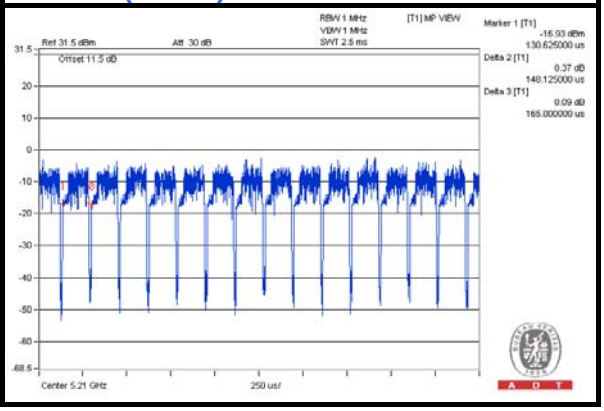
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



MODULATION TYPE: 64QAM

Duty cycle of test signal is < 98%, duty factor shall be considered.

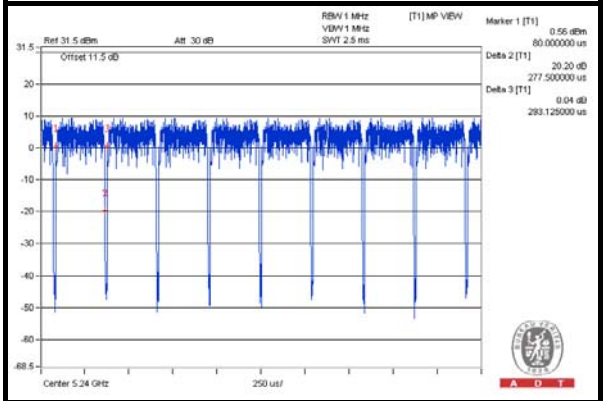
802.11a: Duty cycle = 0.277/0.293 = 0.945, Duty factor = 10 * log(1/0.945) = 0.24

802.11n (20MHz): Duty cycle = 0.271/0.289 = 0.938, Duty factor = 10 * log(1/0.938) = 0.28

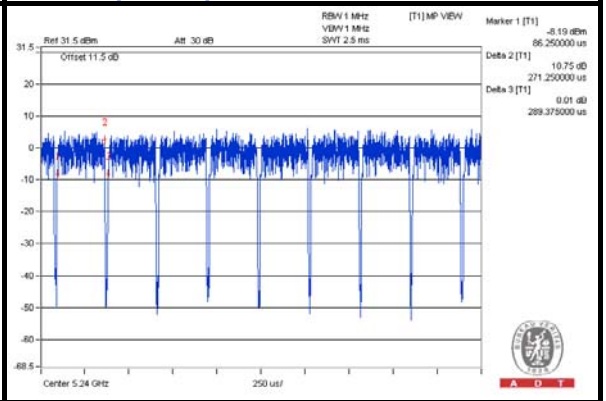
802.11n (40MHz): Duty cycle = 0.151/0.169 = 0.893, Duty factor = 10 * log(1/0.893) = 0.49

802.11ac (80MHz): Duty cycle = 0.096/0.114 = 0.842, Duty factor = 10 * log(1/0.842) = 0.75

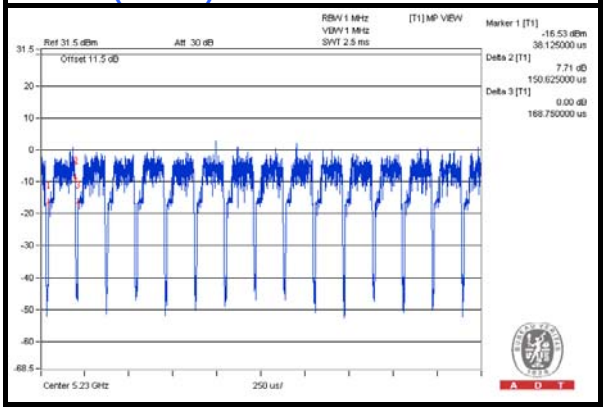
802.11a



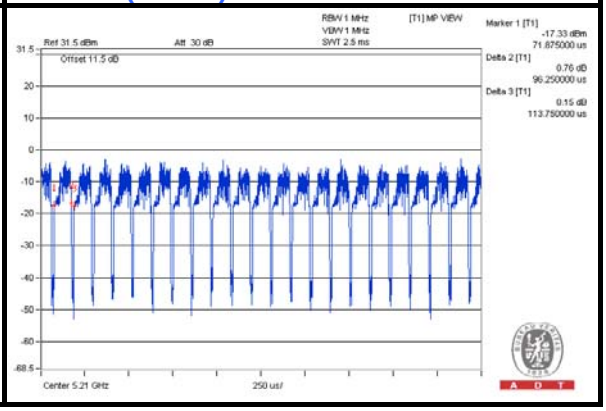
802.11n (20MHz)



802.11n (40MHz)



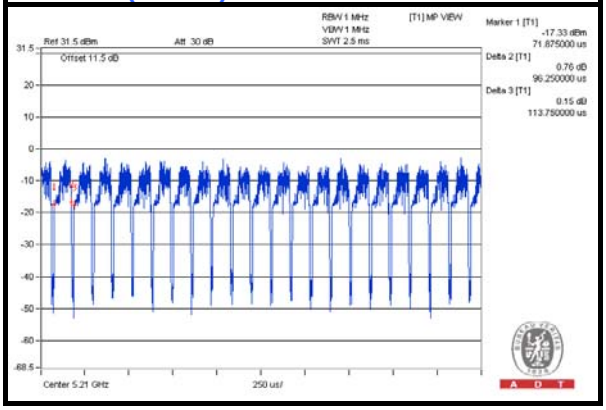
802.11ac (80MHz)



MODULATION TYPE: 256QAM

Duty cycle of test signal is < 98%, duty factor shall be considered.
802.11ac (80MHz): Duty cycle = 0.096/0.11 = 0.842, Duty factor = 10 * log(1/0.842) = 0.75

802.11ac (80MHz)



3.4 DESCRIPTION OF SUPPORT UNITS

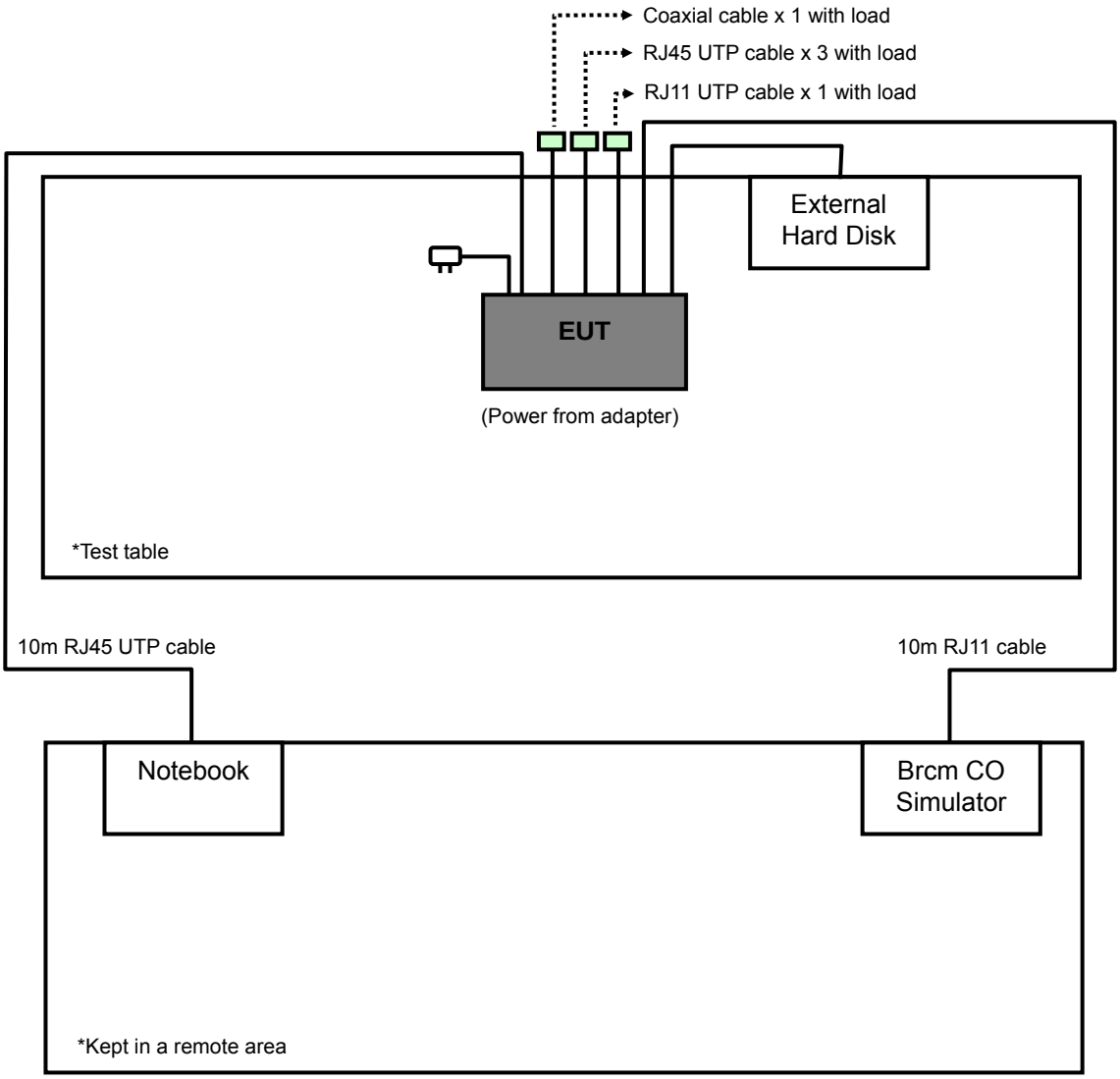
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	External Hard Disk	WD	WDBACY5000 ABL-01	WX41C12T2738	NA
2	Notebook	DELL	E5420	BPQ7MQ1	FCC DoC Approved
3	Brcm CO Simulator	Broadcom	BCM56026	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	0.5m USB cable
2	10m RJ45 (cat 5e) cable
3	10m RJ11 cable

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

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



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 E (15.407)
789033 D01 General UNII Test Procedures v01 r03
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

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:

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

NOTE:

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

4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
	FIELD STRENGTH AT 3m (dBμV/m)	
	PK	AV
	74	54
	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m)
√	PK	PK
	-27	68.3

NOTE: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts).

4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 25, 2012	Dec. 24, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jan. 31, 2013	Jan. 30, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Mar. 20, 2013	Mar. 19, 2014
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8447D	2944A10633	Oct. 07, 2013	Oct. 06, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Oct. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 23, 2013	Aug. 22, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/4	Aug. 23, 2013	Aug. 22, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2013	Oct. 17, 2014
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 10, 2013	Jun. 09, 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 test was performed in HwaYa Chamber 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.

4.1.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

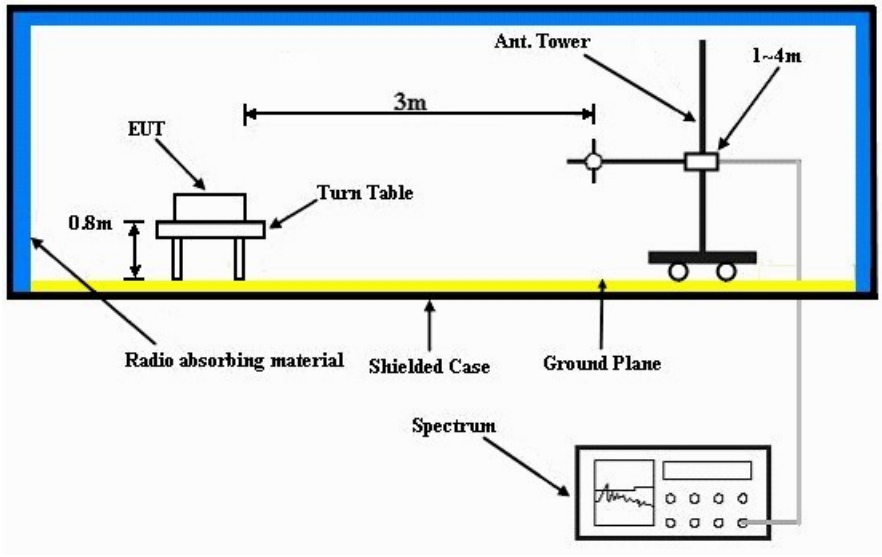
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution 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.

4.1.5 DEVIATION FROM TEST STANDARD

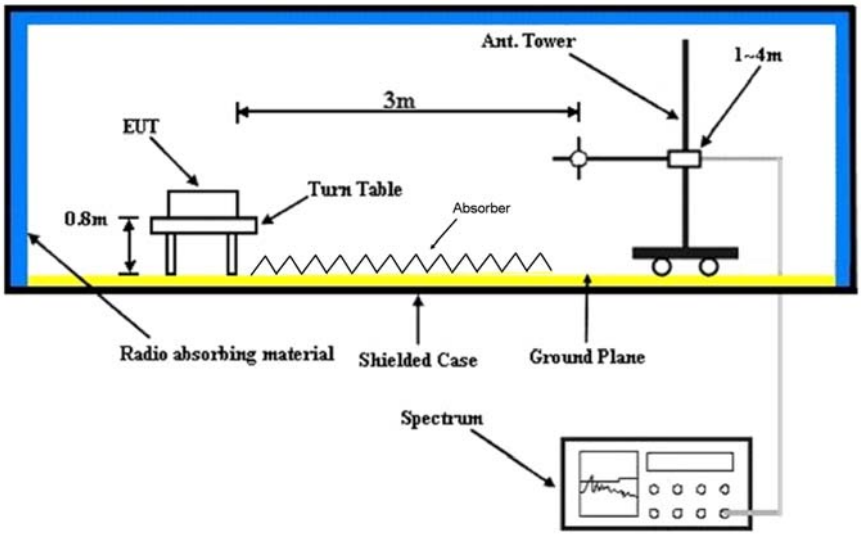
No deviation.

4.1.6 TEST SETUP

Frequency range 30MHz~1GHz



Frequency range above 1GHz



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

4.1.7 EUT OPERATING CONDITION

a. Placed the EUT on the testing table.
b. Prepared notebook and Brcm CO Simulator to act as communication partner and placed them outside of testing area.
c. The communication partners connected with EUT via a RJ45 or RJ11 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The notebook (communication partner) sent data to EUT by command "PING".
e. The EUT link with Brcm CO Simulator via DSL function.
f. The necessary accessories enabled the system in full functions.

4.1.8 TEST RESULTS

ABOVE 1GHz DATA：

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	49.7 PK	74.0	-24.3	1.56 H	263	44.40	5.30
2	5000.00	42.4 AV	54.0	-11.6	1.56 H	263	37.10	5.30
3	5100.00	56.6 PK	74.0	-17.4	1.36 H	260	51.50	5.10
4	5100.00	45.7 AV	54.0	-8.3	1.36 H	260	40.60	5.10
5	5150.00	54.2 PK	74.0	-19.8	1.49 H	266	49.10	5.10
6	5150.00	43.3 AV	54.0	-10.7	1.49 H	266	38.20	5.10
7	*5180.00	102.9 PK			1.49 H	266	65.20	37.70
8	*5180.00	93.1 AV			1.49 H	266	55.40	37.70
9	#6043.00	50.4 PK	68.3	-17.9	1.12 H	258	43.70	6.70
10	#6906.00	53.8 PK	68.3	-14.5	1.01 H	66	44.10	9.70
11	#10360.00	58.9 PK	68.3	-9.4	1.05 H	47	41.40	17.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	61.5 PK	74.0	-12.5	1.39 V	11	56.20	5.30
2	**5000.00**	**53.5 AV**	**54.0**	**-0.5**	**1.39 V**	**11**	**48.20**	**5.30**
3	5100.00	64.4 PK	74.0	-9.6	1.00 V	6	59.30	5.10
4	5100.00	51.8 AV	54.0	-2.2	1.00 V	6	46.70	5.10
5	5150.00	59.2 PK	74.0	-14.8	1.00 V	337	54.10	5.10
6	5150.00	40.4 AV	54.0	-13.6	1.00 V	337	35.30	5.10
7	*5180.00	112.0 PK			1.00 V	337	74.30	37.70
8	*5180.00	102.7 AV			1.00 V	337	65.00	37.70
9	#6043.00	55.0 PK	68.3	-13.3	1.00 V	72	48.30	6.70
10	#6906.00	58.5 PK	68.3	-9.8	1.00 V	343	48.80	9.70
11	#10360.00	59.9 PK	68.3	-8.4	1.00 V	350	42.40	17.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	50.7 PK	74.0	-23.3	1.32 H	262	45.40	5.30
2	5000.00	43.3 AV	54.0	-10.7	1.32 H	262	38.00	5.30
3	5120.00	52.6 PK	74.0	-21.4	1.26 H	259	47.50	5.10
4	5120.00	41.6 AV	54.0	-12.4	1.26 H	259	36.50	5.10
5	5150.00	55.8 PK	74.0	-18.2	1.46 H	264	50.70	5.10
6	5150.00	43.5 AV	54.0	-10.5	1.46 H	264	38.40	5.10
7	*5200.00	103.9 PK			1.46 H	264	66.10	37.80
8	*5200.00	93.0 AV			1.46 H	264	55.20	37.80
9	#6066.00	51.5 PK	68.3	-16.8	1.13 H	261	44.70	6.80
10	#6933.00	55.5 PK	68.3	-12.8	1.00 H	51	45.70	9.80
11	#10400.00	58.8 PK	68.3	-9.5	1.00 H	313	41.00	17.80
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	5000.00	60.5 PK	74.0	-13.5	1.14 V	12	55.20	5.30
2	5000.00	53.1 AV	54.0	-0.9	1.14 V	12	47.80	5.30
3	5120.00	52.4 PK	74.0	-21.6	1.00 V	5	47.30	5.10
4	5120.00	51.1 AV	54.0	-2.9	1.00 V	5	46.00	5.10
5	5150.00	56.7 PK	74.0	-17.3	1.00 V	338	51.60	5.10
6	5150.00	45.0 AV	54.0	-9.0	1.00 V	338	39.90	5.10
7	*5200.00	112.4 PK			1.00 V	338	74.60	37.80
8	*5200.00	102.9 AV			1.00 V	338	65.10	37.80
9	#6066.00	55.0 PK	68.3	-13.3	1.08 V	57	48.20	6.80
10	#6933.00	59.0 PK	68.3	-9.3	1.00 V	328	49.20	9.80
11	#10400.00	60.0 PK	68.3	-8.3	1.00 V	220	42.20	17.80

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.
6. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	49.3 PK	74.0	-24.7	1.30 H	260	44.00	5.30
2	5000.00	41.7 AV	54.0	-12.3	1.30 H	260	36.40	5.30
3	#5160.00	52.1 PK	68.3	-16.2	1.33 H	271	47.00	5.10
4	*5240.00	104.2 PK			1.33 H	264	66.30	37.90
5	*5240.00	94.4 AV			1.33 H	264	56.50	37.90
6	5350.00	45.4 PK	74.0	-28.6	1.33 H	264	40.00	5.40
7	5350.00	43.6 AV	54.0	-10.4	1.33 H	264	38.20	5.40
8	#5676.00	51.0 PK	68.3	-17.3	1.32 H	263	45.10	5.90
9	#6113.00	48.7 PK	68.3	-19.6	1.00 H	237	41.80	6.90
10	#6986.00	54.4 PK	68.3	-13.9	1.00 H	73	44.40	10.00
11	#10480.00	59.3 PK	68.3	-9.0	1.00 H	119	41.00	18.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	60.8 PK	74.0	-13.2	1.13 V	14	55.50	5.30
2	5000.00	53.3 AV	54.0	-0.7	1.13 V	14	48.00	5.30
3	#5160.00	61.8 PK	68.3	-6.5	1.00 V	3	56.70	5.10
4	*5240.00	112.5 PK			1.00 V	338	74.60	37.90
5	*5240.00	102.9 AV			1.00 V	338	65.00	37.90
6	5350.00	55.9 PK	74.0	-18.1	1.00 V	338	50.50	5.40
7	5350.00	45.2 AV	54.0	-8.8	1.00 V	338	39.80	5.40
8	#5676.00	62.7 PK	68.3	-5.6	1.00 V	340	56.80	5.90
9	#6113.00	51.9 PK	68.3	-16.4	1.00 V	351	45.00	6.90
10	#6986.00	59.0 PK	68.3	-9.3	1.00 V	76	49.00	10.00
11	#10480.00	60.4 PK	68.3	-7.9	1.00 V	105	42.10	18.30

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
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.

802.11n (20MHz)_1TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

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	#3200.00	54.5 PK	68.3	-13.8	1.02 H	152	54.50	0.00
2	5000.00	56.6 PK	74.0	-17.4	1.02 H	142	51.30	5.30
3	5000.00	44.8 AV	54.0	-9.2	1.02 H	142	39.50	5.30
4	5100.00	58.7 PK	74.0	-15.3	1.02 H	51	53.60	5.10
5	5100.00	47.7 AV	54.0	-6.3	1.02 H	51	42.60	5.10
6	5150.00	58.6 PK	74.0	-15.4	1.02 H	147	53.50	5.10
7	5150.00	46.6 AV	54.0	-7.4	1.02 H	147	41.50	5.10
8	*5180.00	104.1 PK			1.65 H	262	66.40	37.70
9	*5180.00	93.2 AV			1.65 H	262	55.50	37.70
10	#5612.00	57.3 PK	68.3	-11.0	1.02 H	24	51.50	5.80
11	#6043.00	58.3 PK	68.3	-10.0	1.11 H	320	51.60	6.70
12	#6906.00	60.3 PK	68.3	-8.0	1.02 H	325	50.60	9.70
13	#10360.00	58.7 PK	68.3	-9.6	1.02 H	189	41.20	17.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

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	#3200.00	57.0 PK	68.3	-11.3	1.41 V	123	57.00	0.00
2	5000.00	59.9 PK	74.0	-14.1	1.00 V	8	54.60	5.30
3	5000.00	53.1 AV	54.0	-0.9	1.00 V	8	47.80	5.30
4	5100.00	63.0 PK	74.0	-11.0	1.01 V	338	57.90	5.10
5	5100.00	51.2 AV	54.0	-2.8	1.01 V	338	46.10	5.10
6	5150.00	59.9 PK	74.0	-14.1	1.00 V	338	54.80	5.10
7	5150.00	46.4 AV	54.0	-7.6	1.00 V	338	41.30	5.10
8	*5180.00	113.9 PK			1.00 V	338	76.20	37.70
9	*5180.00	102.9 AV			1.00 V	338	65.20	37.70
10	#5612.00	62.7 PK	68.3	-5.6	1.02 V	347	56.90	5.80
11	#6043.00	60.9 PK	68.3	-7.4	1.00 V	75	54.20	6.70
12	#6906.00	64.4 PK	68.3	-3.9	1.01 V	325	54.70	9.70
13	#10360.00	61.0 PK	68.3	-7.3	1.00 V	214	43.50	17.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

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	5000.00	58.8 PK	74.0	-15.2	1.02 H	154	53.50	5.30
2	5000.00	48.8 AV	54.0	-5.2	1.02 H	154	43.50	5.30
3	5120.00	58.7 PK	74.0	-15.3	1.00 H	325	53.60	5.10
4	5120.00	47.7 AV	54.0	-6.3	1.00 H	325	42.60	5.10
5	*5200.00	101.8 PK			1.00 H	0	64.00	37.80
6	*5200.00	91.1 AV			1.00 H	0	53.30	37.80
7	#5280.00	59.3 PK	68.3	-9.0	1.75 H	136	54.00	5.30
8	#6066.00	54.8 PK	68.3	-13.5	1.54 H	193	48.00	6.80
9	#6933.00	58.5 PK	68.3	-9.8	1.08 H	88	48.70	9.80
10	#10400.00	59.1 PK	68.3	-9.2	1.21 H	152	41.30	17.80
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	5000.00	59.8 PK	74.0	-14.2	1.00 V	6	54.50	5.30
2	5000.00	53.1 AV	54.0	-0.9	1.00 V	6	47.80	5.30
3	5120.00	62.4 PK	74.0	-11.6	1.00 V	350	57.30	5.10
4	5120.00	51.0 AV	54.0	-3.0	1.00 V	350	45.90	5.10
5	*5200.00	113.7 PK			1.00 V	340	75.90	37.80
6	*5200.00	102.1 AV			1.00 V	340	64.30	37.80
7	#5280.00	63.0 PK	68.3	-5.3	1.00 V	320	57.70	5.30
8	#6066.00	60.6 PK	68.3	-7.7	1.20 V	78	53.80	6.80
9	#6933.00	64.5 PK	68.3	-3.8	1.00 V	325	54.70	9.80
10	#10400.00	61.3 PK	68.3	-7.0	1.02 V	154	43.50	17.80

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.
6. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

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	#5160.00	58.5 PK	68.3	-9.8	1.54 H	157	53.40	5.10
2	*5240.00	103.8 PK			1.46 H	254	65.90	37.90
3	*5240.00	93.0 AV			1.46 H	254	55.10	37.90
4	#5320.00	58.9 PK	68.3	-9.4	1.36 H	255	53.50	5.40
5	5350.00	56.9 PK	74.0	-17.1	1.22 H	196	51.50	5.40
6	5350.00	46.9 AV	54.0	-7.1	1.22 H	196	41.50	5.40
7	#5677.00	58.6 PK	68.3	-9.7	1.11 H	62	52.60	6.00
8	#6987.00	60.6 PK	68.3	-7.7	1.00 H	154	50.50	10.10
9	#10480.00	60.8 PK	68.3	-7.5	1.02 H	199	42.50	18.30
8	#10480.00	58.6 PK	68.3	-9.7	1.20 H	218	40.30	18.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5160.00	63.0 PK	68.3	-5.3	1.00 V	338	57.90	5.10
2	*5240.00	112.0 PK			1.22 V	340	74.10	37.90
3	*5240.00	101.8 AV			1.22 V	340	63.90	37.90
4	#5320.00	63.0 PK	68.3	-5.3	1.24 V	57	57.60	5.40
5	5350.00	59.7 PK	74.0	-14.3	1.02 V	355	54.30	5.40
6	5350.00	46.9 AV	54.0	-7.1	1.02 V	355	41.50	5.40
7	#5677.00	62.5 PK	68.3	-5.8	1.00 V	339	56.50	6.00
8	#6987.00	64.9 PK	68.3	-3.4	1.00 V	325	54.80	10.10
9	#10480.00	61.8 PK	68.3	-6.5	1.52 V	44	43.50	18.30

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
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.

802.11n (20MHz)_3TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	57.6 PK	74.0	-16.4	1.10 H	310	52.30	5.30
2	5000.00	48.5 AV	54.0	-5.5	1.10 H	310	43.20	5.30
3	5105.00	58.5 PK	74.0	-15.5	1.05 H	350	53.40	5.10
4	5105.00	47.4 AV	54.0	-6.6	1.05 H	350	42.30	5.10
5	5150.00	58.2 PK	74.0	-15.8	1.10 H	60	53.10	5.10
6	5150.00	44.5 AV	54.0	-9.5	1.10 H	60	39.40	5.10
7	*5180.00	106.0 PK			1.00 H	43	68.30	37.70
8	*5180.00	95.0 AV			1.00 H	43	57.30	37.70
9	#10360.00	58.8 PK	68.3	-9.5	1.14 H	52	41.30	17.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	59.3 PK	74.0	-14.7	1.00 V	295	54.00	5.30
2	5000.00	50.6 AV	54.0	-3.4	1.00 V	295	45.30	5.30
3	5105.00	60.1 PK	74.0	-13.9	1.00 V	359	55.00	5.10
4	5105.00	49.2 AV	54.0	-4.8	1.00 V	359	44.10	5.10
5	5150.00	57.8 PK	74.0	-16.2	1.12 V	7	52.70	5.10
6	5150.00	45.2 AV	54.0	-8.8	1.12 V	7	40.10	5.10
7	*5180.00	110.9 PK			1.00 V	342	73.20	37.70
8	*5180.00	99.3 AV			1.00 V	342	61.60	37.70
9	#10360.00	61.0 PK	68.3	-7.3	1.15 V	230	43.50	17.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5122.00	58.8 PK	74.0	-15.2	1.10 H	30	53.70	5.10
2	5122.00	46.3 AV	54.0	-7.7	1.10 H	30	41.20	5.10
3	*5200.00	106.4 PK			1.22 H	33	68.60	37.80
4	*5200.00	95.5 AV			1.22 H	33	57.70	37.80
5	#5633.00	59.5 PK	68.3	-8.8	1.10 H	350	53.70	5.80
6	#10400.00	59.4 PK	68.3	-8.9	1.23 H	55	41.60	17.80
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	5122.00	60.5 PK	74.0	-13.5	1.00 V	10	55.40	5.10
2	5122.00	48.9 AV	54.0	-5.1	1.00 V	10	43.80	5.10
3	*5200.00	111.1 PK			1.00 V	0	73.30	37.80
4	*5200.00	99.6 AV			1.00 V	0	61.80	37.80
5	#5633.00	61.4 PK	68.3	-6.9	1.00 V	357	55.60	5.80
6	#10400.00	61.3 PK	68.3	-7.0	1.25 V	302	43.50	17.80

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.
6. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	#3200.00	54.5 PK	68.3	-13.8	1.10 H	150	54.50	0.00
2	5000.00	57.6 PK	74.0	-16.4	1.30 H	30	52.30	5.30
3	5000.00	47.4 AV	54.0	-6.6	1.30 H	30	42.10	5.30
4	*5240.00	107.2 PK			1.34 H	42	69.30	37.90
5	*5240.00	96.7 AV			1.34 H	42	58.80	37.90
6	5350.00	58.1 PK	74.0	-15.9	1.40 H	46	52.70	5.40
7	5350.00	45.7 AV	54.0	-8.3	1.40 H	46	40.30	5.40
8	#10480.00	58.6 PK	68.3	-9.7	1.20 H	218	40.30	18.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#3200.00	56.7 PK	68.3	-11.6	1.02 V	139	56.70	0.00
2	5000.00	59.4 PK	74.0	-14.6	1.24 V	14	54.10	5.30
3	5000.00	49.3 AV	54.0	-4.7	1.24 V	14	44.00	5.30
4	*5240.00	112.8 PK			1.00 V	347	74.90	37.90
5	*5240.00	100.8 AV			1.00 V	347	62.90	37.90
6	5350.00	58.1 PK	74.0	-15.9	1.10 V	160	52.70	5.40
7	5350.00	46.1 AV	54.0	-7.9	1.10 V	160	40.70	5.40
8	#10480.00	62.0 PK	68.3	-6.3	1.23 V	207	43.70	18.30

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
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.

802.11n (40MHz)_1TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	59.0 PK	74.0	-15.0	1.02 H	54	53.70	5.30
2	5000.00	47.9 AV	54.0	-6.1	1.02 H	54	42.60	5.30
3	5110.00	58.8 PK	74.0	-15.2	1.58 H	187	53.70	5.10
4	5110.00	47.9 AV	54.0	-6.1	1.58 H	187	42.80	5.10
5	5150.00	59.5 PK	74.0	-14.5	1.02 H	66	54.40	5.10
6	5150.00	47.7 AV	54.0	-6.3	1.02 H	66	42.60	5.10
7	*5190.00	99.3 PK			1.00 H	360	61.50	37.80
8	*5190.00	88.5 AV			1.00 H	360	50.70	37.80
9	#5270.00	56.8 PK	68.3	-11.5	1.99 H	268	51.50	5.30
10	#5622.00	59.3 PK	68.3	-9.0	1.55 H	120	53.50	5.80
11	#6920.00	61.4 PK	68.3	-6.9	1.54 H	188	51.70	9.70
12	#10380.00	59.0 PK	68.3	-9.3	1.44 H	252	41.40	17.60

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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	59.6 PK	74.0	-14.4	1.51 V	125	54.30	5.30
2	5000.00	53.1 AV	54.0	-0.9	1.51 V	125	47.80	5.30
3	5110.00	61.1 PK	74.0	-12.9	1.00 V	339	56.00	5.10
4	5110.00	52.3 AV	54.0	-1.7	1.00 V	339	47.20	5.10
5	5150.00	71.8 PK	74.0	-2.2	1.00 V	337	66.70	5.10
6	5150.00	52.3 AV	54.0	-1.7	1.00 V	337	47.20	5.10
7	*5190.00	111.0 PK			1.00 V	338	73.20	37.80
8	*5190.00	99.8 AV			1.00 V	338	62.00	37.80
9	#5270.00	61.5 PK	68.3	-6.8	1.00 V	321	56.20	5.30
10	#5622.00	59.2 PK	68.3	-9.1	1.00 V	338	53.40	5.80
11	#6920.00	64.4 PK	68.3	-3.9	1.00 V	325	54.70	9.70
12	#10380.00	61.1 PK	68.3	-7.2	1.51 V	111	43.50	17.60

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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	58.9 PK	74.0	-15.1	1.06 H	44	53.60	5.30
2	5000.00	48.8 AV	54.0	-5.2	1.06 H	44	43.50	5.30
3	#5154.00	57.4 PK	68.3	-10.9	1.02 H	360	52.30	5.10
4	*5230.00	100.6 PK			1.22 H	254	62.70	37.90
5	*5230.00	90.2 AV			1.22 H	254	52.30	37.90
6	#5310.00	58.8 PK	68.3	-9.5	1.55 H	139	53.50	5.30
7	5350.00	58.8 PK	74.0	-15.2	1.00 H	125	53.40	5.40
8	5350.00	46.9 AV	54.0	-7.1	1.00 H	125	41.50	5.40
9	#5666.00	58.5 PK	68.3	-9.8	1.15 H	185	52.60	5.90
10	#6973.00	62.2 PK	68.3	-6.1	1.25 H	188	52.30	9.90
11	#10460.00	61.7 PK	68.3	-6.6	1.20 H	55	43.60	18.10
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	5000.00	60.3 PK	74.0	-13.7	1.02 V	32	55.00	5.30
2	5000.00	53.1 AV	54.0	-0.9	1.02 V	32	47.80	5.30
3	#5154.00	60.6 PK	68.3	-7.7	1.00 V	337	55.50	5.10
4	*5230.00	109.6 PK			1.00 V	320	71.70	37.90
5	*5230.00	99.3 AV			1.00 V	320	61.40	37.90
6	#5310.00	62.0 PK	68.3	-6.3	1.24 V	59	56.70	5.30
7	5350.00	60.0 PK	74.0	-14.0	1.00 V	320	54.60	5.40
8	5350.00	46.5 AV	54.0	-7.5	1.00 V	320	41.10	5.40
9	#5666.00	61.4 PK	68.3	-6.9	1.00 V	339	55.50	5.90
10	#6973.00	64.0 PK	68.3	-4.3	1.00 V	326	54.10	9.90
11	#10460.00	61.6 PK	68.3	-6.7	1.62 V	188	43.50	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 radiated frequency is out the restricted band.

802.11n (40MHz)_3TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	58.9 PK	74.0	-15.1	1.55 H	340	53.60	5.30
2	5000.00	50.5 AV	54.0	-3.5	1.55 H	340	45.20	5.30
3	5111.00	57.4 PK	74.0	-16.6	1.10 H	10	52.30	5.10
4	5111.00	45.2 AV	54.0	-8.8	1.10 H	10	40.10	5.10
5	5150.00	58.7 PK	74.0	-15.3	1.30 H	20	53.60	5.10
6	5150.00	45.2 AV	54.0	-8.8	1.30 H	20	40.10	5.10
7	*5190.00	103.8 PK			1.14 H	28	66.00	37.80
8	*5190.00	92.3 AV			1.14 H	28	54.50	37.80
9	#5270.00	56.9 PK	68.3	-11.4	1.25 H	340	51.60	5.30
10	#5272.00	56.6 PK	68.3	-11.7	1.20 H	30	51.30	5.30
11	#6920.00	60.9 PK	68.3	-7.4	1.20 H	340	51.20	9.70
12	#10380.00	57.9 PK	68.3	-10.4	1.23 H	307	40.30	17.60

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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	60.6 PK	74.0	-13.4	1.51 V	332	55.30	5.30
2	5000.00	52.4 AV	54.0	-1.6	1.51 V	332	47.10	5.30
3	5111.00	59.1 PK	74.0	-14.9	1.00 V	0	54.00	5.10
4	5111.00	46.9 AV	54.0	-7.1	1.00 V	0	41.80	5.10
5	5150.00	60.2 PK	74.0	-13.8	1.21 V	0	55.10	5.10
6	5150.00	47.5 AV	54.0	-6.5	1.21 V	0	42.40	5.10
7	*5190.00	109.9 PK			1.00 V	342	72.10	37.80
8	*5190.00	97.2 AV			1.00 V	342	59.40	37.80
9	#5270.00	58.8 PK	68.3	-9.5	1.19 V	326	53.50	5.30
10	#5272.00	58.6 PK	68.3	-9.7	1.15 V	0	53.30	5.30
11	#6920.00	63.0 PK	68.3	-5.3	1.16 V	331	53.30	9.70
12	#10380.00	61.3 PK	68.3	-7.0	1.25 V	63	43.70	17.60

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 radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	55.5 PK	74.0	-18.5	1.20 H	340	50.20	5.30
2	5000.00	47.8 AV	54.0	-6.2	1.20 H	340	42.50	5.30
3	*5230.00	104.9 PK			1.12 H	27	67.00	37.90
4	*5230.00	93.4 AV			1.12 H	27	55.50	37.90
5	#5307.00	57.6 PK	68.3	-10.7	1.10 H	20	52.30	5.30
6	5350.00	55.7 PK	74.0	-18.3	1.36 H	85	50.30	5.40
7	5350.00	45.0 AV	54.0	-9.0	1.36 H	85	39.60	5.40
8	#5665.00	58.5 PK	68.3	-9.8	1.14 H	360	52.60	5.90
9	#6973.00	62.5 PK	68.3	-5.8	1.10 H	90	52.60	9.90
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	5000.00	60.0 PK	74.0	-14.0	1.13 V	333	54.70	5.30
2	5000.00	52.5 AV	54.0	-1.5	1.13 V	333	47.20	5.30
3	*5230.00	109.7 PK			1.06 V	357	71.80	37.90
4	*5230.00	97.1 AV			1.06 V	357	59.20	37.90
5	#5307.00	59.8 PK	68.3	-8.5	1.05 V	0	54.50	5.30
6	5350.00	57.4 PK	74.0	-16.6	1.27 V	0	52.00	5.40
7	5350.00	46.2 AV	54.0	-7.8	1.27 V	0	40.80	5.40
8	#5665.00	61.8 PK	68.3	-6.5	1.00 V	196	55.90	5.90
9	#6973.00	63.9 PK	68.3	-4.4	1.00 V	87	54.00	9.90

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 radiated frequency is out the restricted band.

802.11ac (80MHz)_1TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 42	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5000.00	58.8 PK	74.0	-15.2	1.52 H	122	53.50	5.30
2	5000.00	47.8 AV	54.0	-6.2	1.52 H	122	42.50	5.30
3	5150.00	61.9 PK	74.0	-12.1	1.32 H	22	56.80	5.10
4	5150.00	47.6 AV	54.0	-6.4	1.32 H	22	42.50	5.10
5	*5210.00	95.7 PK			1.35 H	247	57.90	37.80
6	*5210.00	85.2 AV			1.35 H	247	47.40	37.80
7	#5788.00	59.6 PK	68.3	-8.7	1.10 H	115	53.50	6.10
8	#6947.00	62.1 PK	68.3	-6.2	1.02 H	228	52.20	9.90
9	#10420.00	59.2 PK	68.3	-9.1	1.02 H	241	41.30	17.90
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	5000.00	60.3 PK	74.0	-13.7	1.00 V	35	55.00	5.30
2	5000.00	53.1 AV	54.0	-0.9	1.00 V	35	47.80	5.30
3	5150.00	71.0 PK	74.0	-3.0	1.00 V	338	65.90	5.10
4	5150.00	53.1 AV	54.0	-0.9	1.00 V	338	48.00	5.10
5	*5210.00	106.6 PK			1.00 V	338	68.80	37.80
6	*5210.00	95.1 AV			1.00 V	338	57.30	37.80
7	#5788.00	63.9 PK	68.3	-4.4	1.00 V	326	57.80	6.10
8	#6947.00	64.7 PK	68.3	-3.6	1.00 V	325	54.80	9.90
9	#10420.00	61.4 PK	68.3	-6.9	1.54 V	188	43.50	17.90

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 radiated frequency is out the restricted band.

802.11ac (80MHz)_3TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 42	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	5150.00	58.8 PK	74.0	-15.2	1.00 H	45	53.70	5.10
2	5150.00	45.5 AV	54.0	-8.5	1.00 H	45	40.40	5.10
3	*5210.00	98.6 PK			1.00 H	47	60.80	37.80
4	*5210.00	88.7 AV			1.00 H	47	50.90	37.80
5	#5790.00	58.1 PK	68.3	-10.2	1.30 H	56	52.00	6.10
6	#6946.00	54.8 PK	68.3	-13.5	1.44 H	156	44.90	9.90
7	#10420.00	60.3 PK	68.3	-8.0	1.11 H	264	42.40	17.90
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	5150.00	65.8 PK	74.0	-8.2	1.00 V	349	60.70	5.10
2	5150.00	50.1 AV	54.0	-3.9	1.00 V	349	45.00	5.10
3	*5210.00	106.2 PK			1.00 V	349	68.40	37.80
4	*5210.00	95.6 AV			1.00 V	349	57.80	37.80
5	#5790.00	60.0 PK	68.3	-8.3	1.00 V	336	53.90	6.10
6	#6946.00	57.3 PK	68.3	-11.0	1.00 V	341	47.40	9.90
7	#10420.00	59.4 PK	68.3	-8.9	1.00 V	149	41.50	17.90

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 radiated frequency is out the restricted band.

BELOW 1GHz WORST-CASE DATA：802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang
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	49.30	34.9 QP	40.0	-5.1	1.24 H	155	49.30	-14.40
2	249.17	42.6 QP	46.0	-3.4	1.50 H	54	56.80	-14.20
3	375.29	38.2 QP	46.0	-7.8	1.00 H	131	49.00	-10.80
4	499.48	31.6 QP	46.0	-14.4	1.99 H	314	39.90	-8.30
5	641.13	34.9 QP	46.0	-11.1	1.00 H	5	40.10	-5.20
6	749.79	35.3 QP	46.0	-10.7	1.24 H	153	38.40	-3.10
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	70.65	34.4 QP	40.0	-5.6	1.24 V	268	50.00	-15.60
2	249.17	39.9 QP	46.0	-6.1	1.00 V	216	54.10	-14.20
3	375.29	31.0 QP	46.0	-15.0	1.99 V	51	41.80	-10.80
4	499.48	38.0 QP	46.0	-8.0	1.50 V	176	46.30	-8.30
5	625.60	34.3 QP	46.0	-11.7	1.00 V	6	39.70	-5.40
6	800.24	34.4 QP	46.0	-11.6	1.24 V	160	36.60	-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 40	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang
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	258.87	40.7 QP	46.0	-5.3	1.25 H	244	54.70	-14.00
2	319.02	36.3 QP	46.0	-9.7	1.00 H	300	48.30	-12.00
3	375.29	37.7 QP	46.0	-8.3	1.00 H	135	48.70	-11.00
4	625.60	35.6 QP	46.0	-10.4	1.50 H	229	41.30	-5.70
5	705.16	36.8 QP	46.0	-9.2	1.00 H	217	41.50	-4.70
6	802.18	35.4 QP	46.0	-10.6	1.50 H	192	38.00	-2.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	258.87	32.3 QP	46.0	-13.7	1.25 V	169	46.30	-14.00
2	375.29	37.4 QP	46.0	-8.6	1.00 V	184	48.40	-11.00
3	480.07	35.3 QP	46.0	-10.7	1.50 V	151	44.20	-8.90
4	625.60	34.1 QP	46.0	-11.9	1.00 V	187	39.80	-5.70
5	802.18	32.5 QP	46.0	-13.5	1.25 V	163	35.10	-2.60
6	961.29	37.9 QP	54.0	-16.1	1.50 V	11	37.70	0.20

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

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.

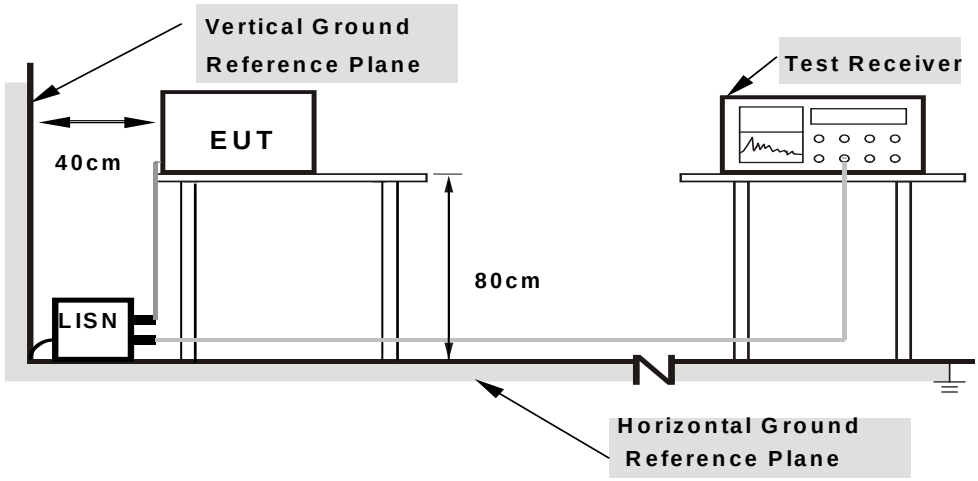
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

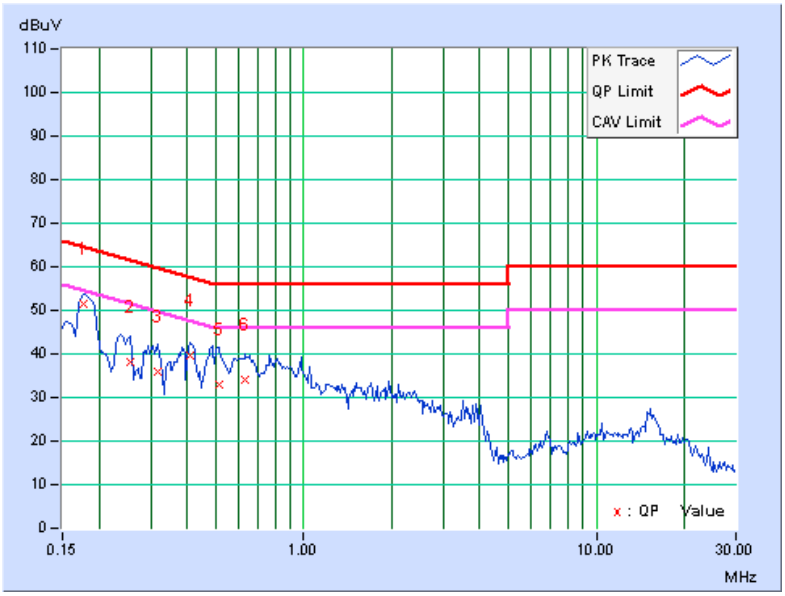
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA：802.11a

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	0.17734	0.16	51.46	39.80	51.62	39.96	64.61	54.61	-12.99	-14.65
2	0.25547	0.18	38.10	24.50	38.28	24.68	61.58	51.58	-23.30	-26.90
3	0.31797	0.20	35.80	16.09	36.00	16.29	59.76	49.76	-23.76	-33.47
4	0.41172	0.23	39.52	31.33	39.75	31.56	57.61	47.61	-17.86	-16.05
5	0.51328	0.23	32.69	20.54	32.92	20.77	56.00	46.00	-23.08	-25.23
6	0.63047	0.24	33.87	25.42	34.11	25.66	56.00	46.00	-21.89	-20.34

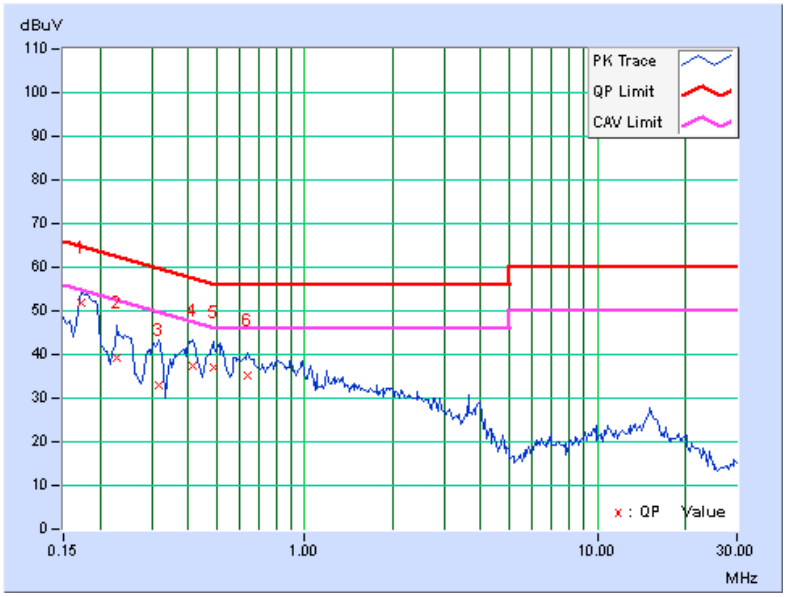
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading 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	0.17344	0.17	51.81	40.57	51.98	40.74	64.79	54.79	-12.82	-14.06
2	0.22812	0.18	39.06	25.70	39.24	25.88	62.52	52.52	-23.28	-26.64
3	0.31797	0.21	32.69	12.41	32.90	12.62	59.76	49.76	-26.86	-37.14
4	0.41563	0.24	37.18	29.13	37.42	29.37	57.54	47.54	-20.11	-18.16
5	0.48594	0.24	36.86	30.40	37.10	30.64	56.24	46.24	-19.14	-15.60
6	0.64219	0.24	35.05	27.05	35.29	27.29	56.00	46.00	-20.71	-18.71

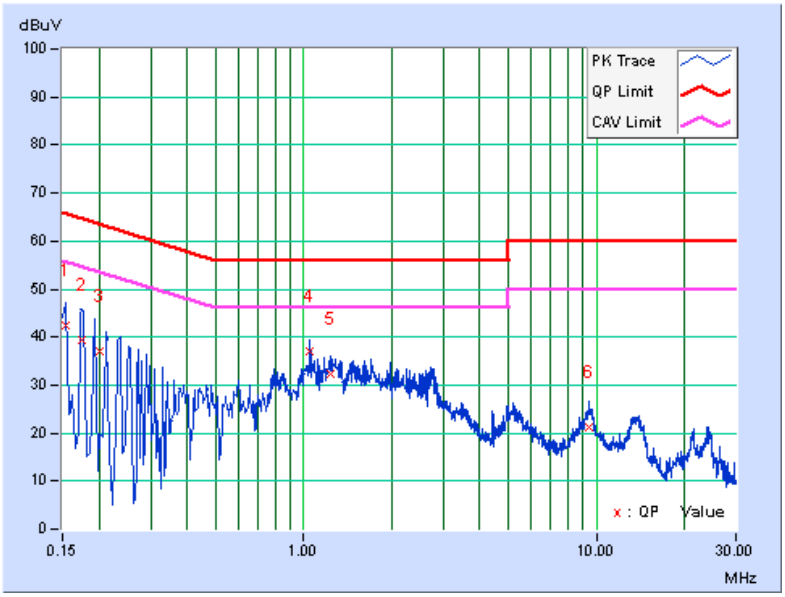
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading 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	0.15391	0.16	42.38	28.83	42.54	28.99	65.79	55.79	-23.25	-26.80
2	0.17374	0.16	39.14	11.33	39.30	11.49	64.78	54.78	-25.48	-43.29
3	0.20000	0.16	36.87	19.31	37.03	19.47	63.61	53.61	-26.58	-34.14
4	**1.05321**	**0.25**	**36.76**	**32.98**	**37.01**	**33.23**	**56.00**	**46.00**	**-18.99**	**-12.77**
5	1.22916	0.26	32.11	26.36	32.37	26.62	56.00	46.00	-23.63	-19.38
6	9.45189	0.69	20.45	14.69	21.14	15.38	60.00	50.00	-38.86	-34.62

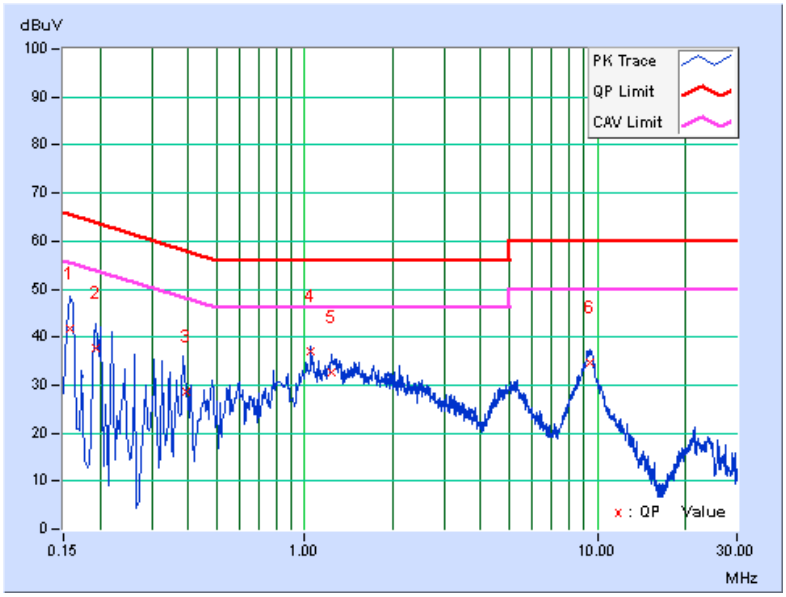
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading 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	0.15782	0.17	41.43	20.59	41.60	20.76	65.58	55.58	-23.98	-34.82
2	0.19305	0.17	37.45	23.37	37.62	23.54	63.90	53.90	-26.29	-30.37
3	0.39502	0.24	28.40	21.64	28.64	21.88	57.96	47.96	-29.32	-26.08
4	1.05069	0.25	36.79	32.85	37.04	33.10	56.00	46.00	-18.96	-12.90
5	1.22916	0.26	32.47	26.85	32.73	27.11	56.00	46.00	-23.27	-18.89
6	9.45189	0.58	34.07	28.82	34.65	29.40	60.00	50.00	-25.35	-20.60

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.



4.3 PEAK TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB

NOTE: Where B is the 26dB emission bandwidth in MHz.

Per KDB 662911 D01 Multiple Transmitter Output v02 Method of conducted output power measurement on IEEE 802.11 devices,

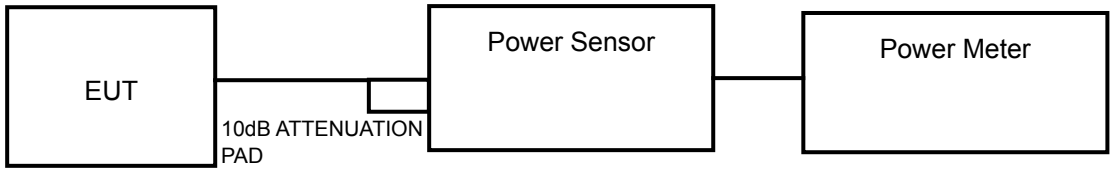
Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

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

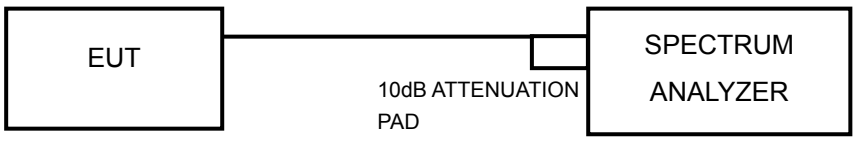
4.3.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT

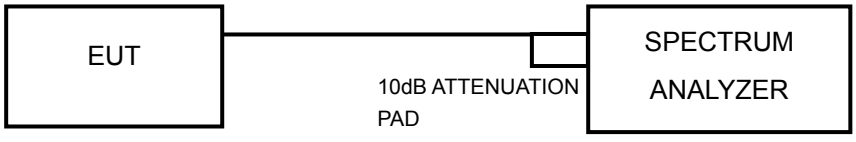
For 802.11a, 802.11n (20MHz), 802.11n (40MHz)



For 802.11ac (80MHz)



FOR 26dB BANDWIDTH



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.3.4 TEST PROCEDURE

FOR AVERAGE POWER MEASUREMENT
For 802.11a, 802.11n (20MHz), 802.11n (40MHz)

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.

For 802.11ac (80MHz)

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

1) Set the RBW = 1 MHz.
2) Set the VBW ≥ 3 RBW.
3) Set the span ≥ 1.5 x DTS bandwidth.
4) Detector = peak.
5) Sweep time = auto couple.
6) Trace mode = max hold.
7) Allow trace to fully stabilize.
8) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select peak detector). If the instrument does not have a band power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS bandwidth.

FOR 26dB BANDWIDTH

1) Set RBW = approximately 1% of the emission bandwidth.
2) Set the VBW > RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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 specific channel frequencies individually.

4.3.7 TEST RESULTS

POWER OUTPUT:

802.11a

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	40.644	16.09	17	PASS
40	5200	41.305	16.16	17	PASS
48	5240	40.179	16.04	17	PASS

NOTE:
1. 4dBm + 10log(20.64) = 17.15dBm > 17dBm.
2. 4dBm + 10log(20.61) = 17.14dBm > 17dBm.
3. 4dBm + 10log(20.62) = 17.14dBm > 17dBm.

802.11n (20MHz): 1TX

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	48.641	16.87	17	PASS
40	5200	**49.317**	16.93	17	PASS
48	5240	46.989	16.72	17	PASS

NOTE:
1. 4dBm + 10log(21.01) = 17.22dBm > 17dBm.
2. 4dBm + 10log(20.87) = 17.20dBm > 17dBm.
3. 4dBm + 10log(20.83) = 17.19dBm > 17dBm.

802.11n (20MHz): 3TX

CHAN.	FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	11.13	10.73	11.41	38.638	15.87	17	PASS
40	5200	11.34	10.80	11.64	40.225	16.04	17	PASS
48	5240	11.30	10.75	11.73	40.269	16.05	17	PASS

NOTE:
CHAIN 0
1. 4dBm + 10log(20.65) = 17.15dBm > 17dBm.
2. 4dBm + 10log(20.69) = 17.16dBm > 17dBm.
3. 4dBm + 10log(20.64) = 17.15dBm > 17dBm.

CHAIN 1
1. 4dBm + 10log(20.68) = 17.16dBm > 17dBm.
2. 4dBm + 10log(20.62) = 17.14dBm > 17dBm.
3. 4dBm + 10log(20.55) = 17.13dBm > 17dBm.

CHAIN 2
1. 4dBm + 10log(20.70) = 17.16dBm > 17dBm.
2. 4dBm + 10log(20.71) = 17.16dBm > 17dBm.
3. 4dBm + 10log(20.71) = 17.16dBm > 17dBm.

802.11n (40MHz): 1TX

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	47.315	16.75	17	PASS
46	5230	47.534	16.77	17	PASS

NOTE:
1. 4dBm + 10log(41.39) = 20.17dBm > 17dBm.
2. 4dBm + 10log(41.64) = 20.20dBm > 17dBm.

802.11n (40MHz): 3TX

CHAN.	FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
38	5190	11.78	10.84	11.66	41.855	16.22	17	PASS
46	5230	11.96	11.26	12.03	45.029	16.53	17	PASS

NOTE:
CHAIN 0
1. 4dBm + 10log(41.40) = 20.17dBm > 17dBm.
2. 4dBm + 10log(41.51) = 20.18dBm > 17dBm.

CHAIN 1
1. 4dBm + 10log(41.33) = 20.16dBm > 17dBm.
2. 4dBm + 10log(41.28) = 20.16dBm > 17dBm.

CHAIN 2
1. 4dBm + 10log(41.21) = 20.15dBm > 17dBm.
2. 4dBm + 10log(41.20) = 20.15dBm > 17dBm.

802.11ac (80MHz): 1TX

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
42	5210	38.726	15.88	17	PASS

NOTE:
1. 4dBm + 10log(83.38) = 23.21dBm > 17dBm.

802.11ac (80MHz): 3TX

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
42	5210	11.81	11.14	12.22	44.845	16.52	17	PASS

NOTE:
CHAIN 0
1. 4dBm + 10log(83.26) = 23.20dBm > 17dBm.

CHAIN 1
1. 4dBm + 10log(82.42) = 23.16dBm > 17dBm.

CHAIN 2
1. 4dBm + 10log(82.86) = 23.18dBm > 17dBm.

26dB BANDWIDTH:

802.11a

CHANNEL	FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	20.64	PASS
40	5200	20.61	PASS
48	5240	20.62	PASS

802.11n (20MHz): 1TX

CHANNEL	FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	21.01	PASS
40	5200	20.87	PASS
48	5240	20.83	PASS

802.11n (20MHz): 3TX

CHANNEL	FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
36	5180	20.65	20.68	20.70	PASS
40	5200	20.69	20.62	20.71	PASS
48	5240	20.64	20.55	20.71	PASS

802.11n (40MHz): 1TX

CHANNEL	FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
38	5190	41.39	PASS
46	5230	41.64	PASS

802.11n (40MHz): 3TX

CHANNEL	FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
38	5190	41.40	41.33	41.21	PASS
46	5230	41.51	41.28	41.20	PASS

802.11ac (80MHz): 1TX

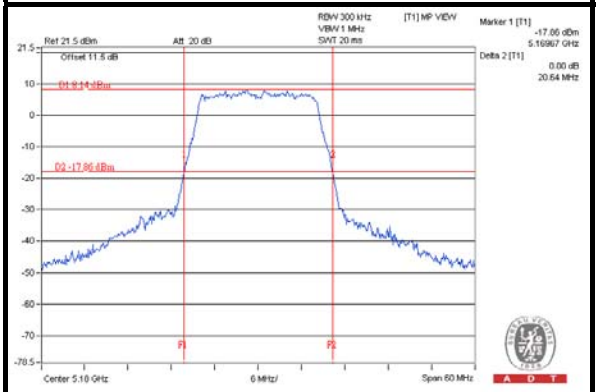
CHANNEL	FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
42	5210	83.38	PASS

802.11ac (80MHz): 3TX

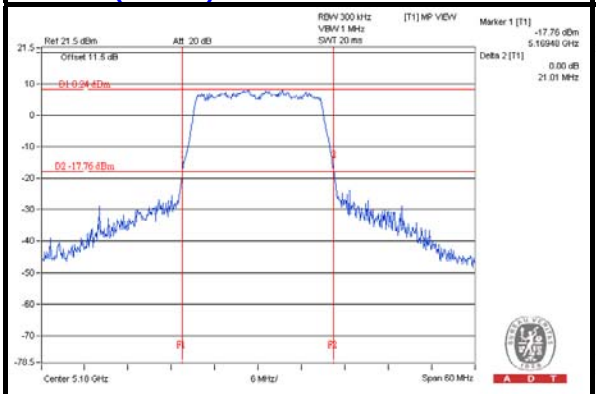
CHANNEL	FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
42	5210	83.26	82.42	82.86	PASS

SPECTRUM PLOT OF WORST VALUE

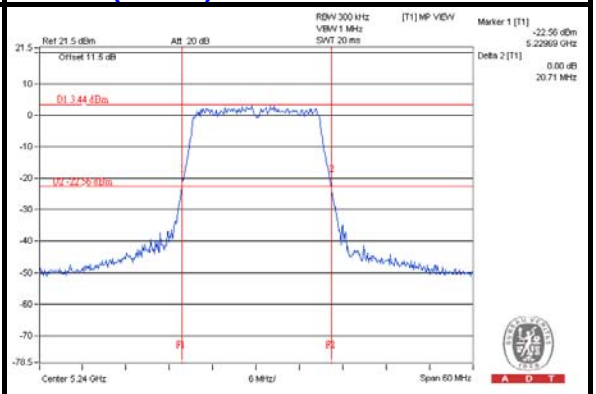
802.11a



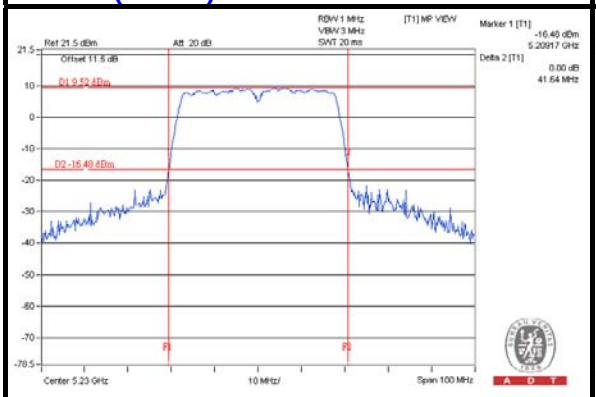
802.11n (20MHz): 1TX



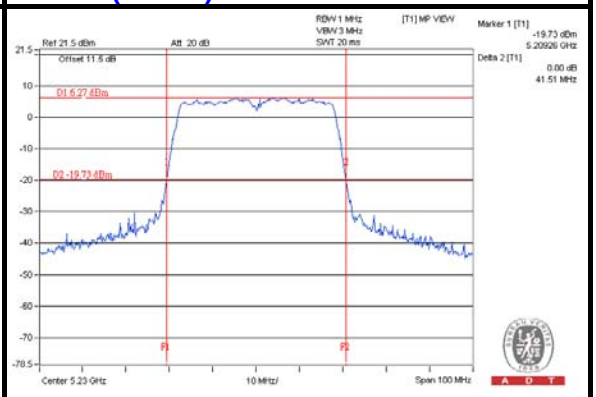
802.11n (20MHz): 3TX



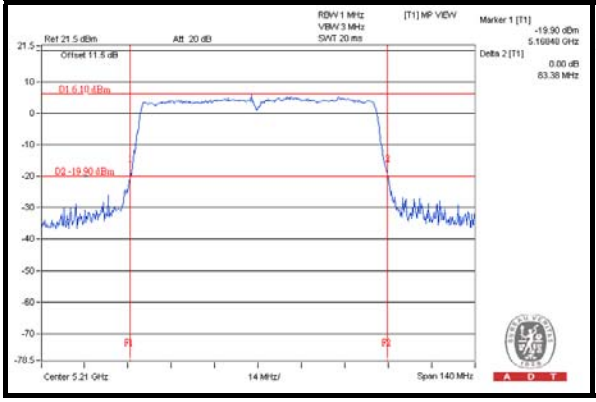
802.11n (40MHz): 1TX



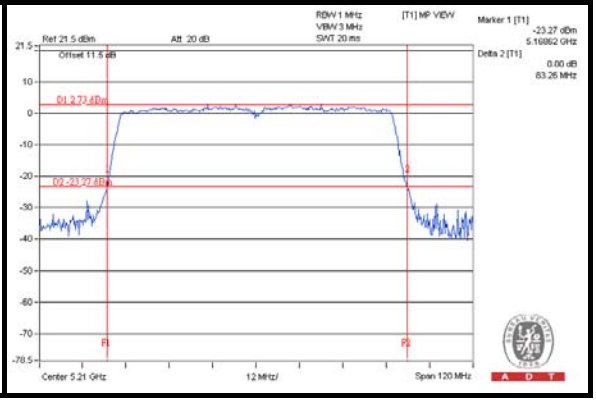
802.11n (40MHz): 3TX



802.11ac (80MHz): 1TX



802.11ac (80MHz): 3TX

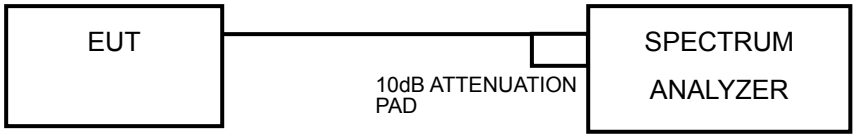


4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	4dBm

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.4.4 TEST PROCEDURES

802.11a, 802.11n (20MHz), 802.11n (40MHz):

Using method SA-1

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 30 KHz, Set VBW ≥ 1 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value

802.11ac (80MHz):

Using method SA-2

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 30 KHz, Set VBW ≥ 1 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value and add 10 log (1/duty cycle)

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6.

4.4.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	3.95	4	PASS
40	5200	3.84	4	PASS
48	5240	3.95	4	PASS

802.11n (20MHz): 1TX

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	3.46	4	PASS
40	5200	3.19	4	PASS
48	5240	3.39	4	PASS

802.11n (20MHz): 3TX

CHAN.	FREQ. (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
36	5180	-2.23	-2.90	-2.54	2.22	2.23	PASS
40	5200	-3.00	-2.72	-2.25	2.13	2.23	PASS
48	5240	-2.48	-2.93	-2.25	2.23	2.23	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 = 3dBi + 10log(3) = 7.77dBi > 6dBi , so the power density limit shall be reduced to 4-(7.77-6) = 2.23dBm.

802.11n (40MHz): 1TX

CHANNEL	FREQUENCY (MHZ)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
38	5190	-0.76	0.09	-0.67	4	PASS
46	5230	-0.29	0.09	-0.20	4	PASS

802.11n (40MHz): 3TX

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)			TOTAL PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2					
38	5190	-4.73	-6.77	-6.40	-1.10	0.09	-1.01	2.23	PASS
46	5230	-3.91	-5.02	-5.86	-0.09	0.09	0.00	2.23	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 = 3dBi + 10log(3) = 7.77dBi > 6dBi , so the power density limit shall be reduced to 4-(7.77-6) = 2.23dBm.

802.11ac (80MHz): 1TX

CHANNEL	FREQUENCY (MHZ)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
42	5210	-5.64	0.26	-5.38	4	PASS

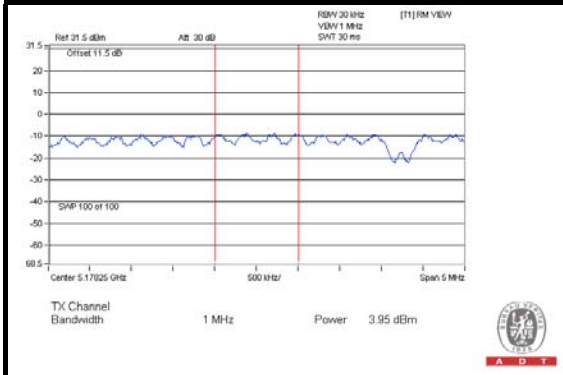
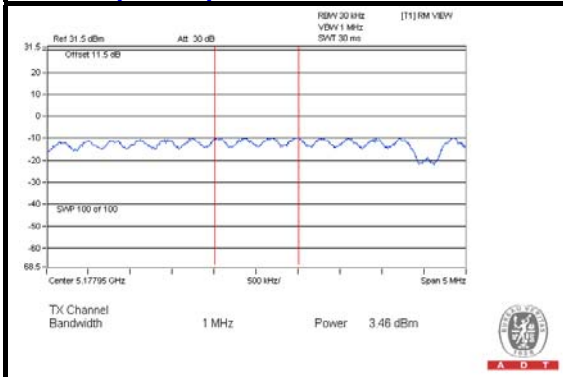
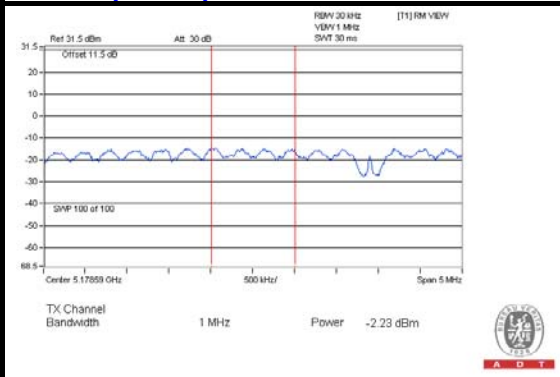
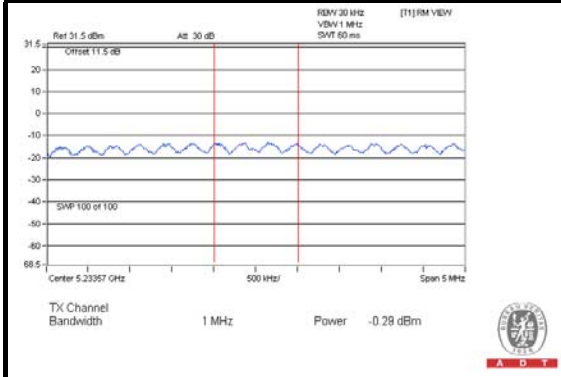
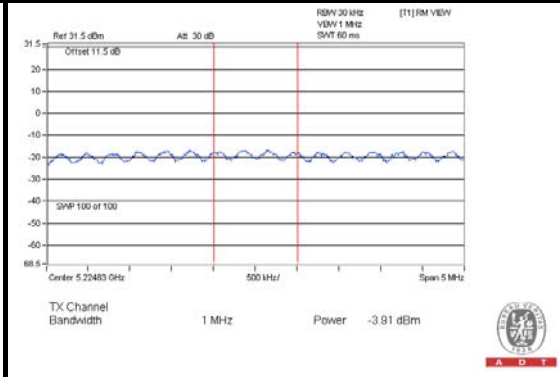
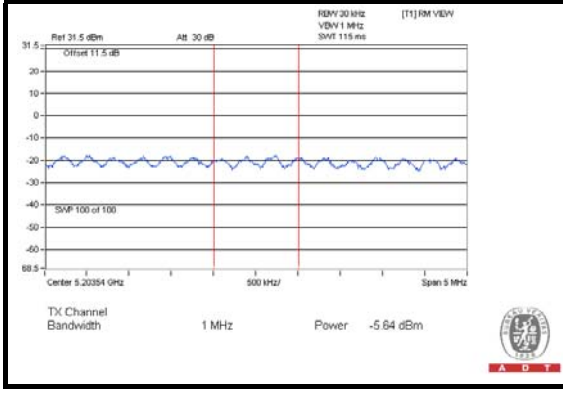
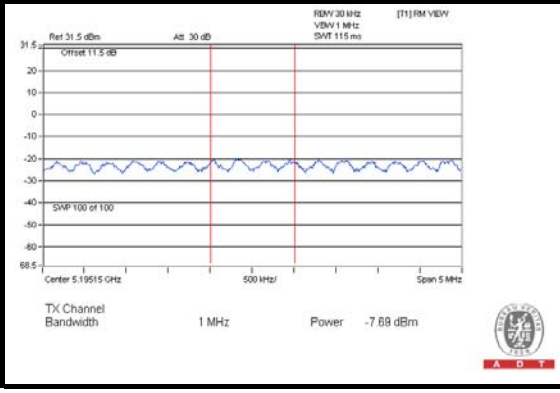
802.11ac (80MHz): 3TX

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)			TOTAL PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2					
42	5210	-8.02	-8.53	-7.69	-3.29	0.26	-3.03	2.23	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 = 3dBi + 10log(3) = 7.77dBi > 6dBi , so the power density limit shall be reduced to 4-(7.77-6) = 2.23dBm.

3. Refer to section 3.3 for duty cycle spectrum plot.

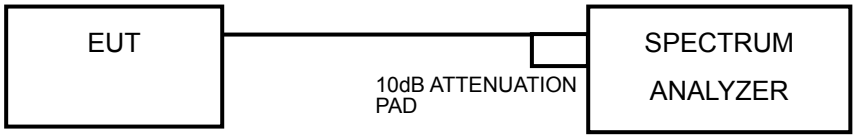
SPECTRUM PLOT OF WORST VALUE	
802.11a	
	
802.11n (20MHz): 1TX	**802.11n (20MHz): 3TX**
	
802.11n (40MHz): 1TX	**802.11n (40MHz): 3TX**
	
802.11ac (80MHz): 1TX	**802.11ac (80MHz): 3TX**
	

4.5 PEAK POWER EXCURSION MEASUREMENT

4.5.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Shall not exceed 13 dB

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.5.4 TEST PROCEDURE

1) Set RBW = 1 MHz, VBW ≥ 3 MHz, Detector = peak.
2) Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
3) Use the peak search function to find the peak of the spectrum.
4) Measure the PPSD.
5) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD. Find the worst channel and modulation mode as above test procedure, and follow KDB 789033 D01 General UNII Test Procedures v01r03 and repeat step 1 to 5 for final testing of each modulation mode on a single channel (all modulation types) in a single operating band to compliance with the peak excursion requirement.

4.5.5 DEVIATION FROM TEST STANDARD

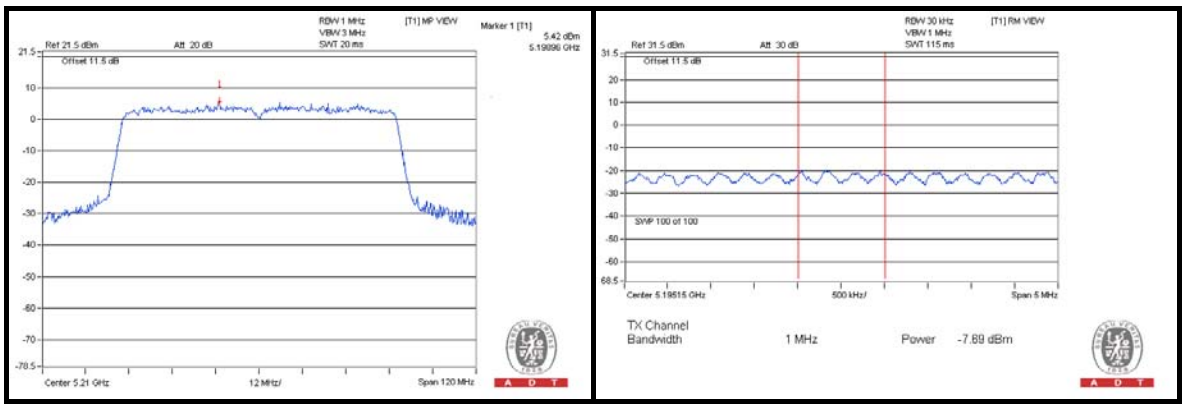
No deviation.

4.5.6 EUT OPERATING CONDITIONS

Same as 4.2.6

4.5.7 TEST RESULTS

MODULATION MODE	MODULATION TYPE	FREQ. (MHz)	PEAK VALUE (dBm)	PPSD WITHOUT DUTY FACTOR (dBm)	PPSD WITH DUTY FACTOR (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS /FAIL
802.11a	BPSK	5240	14.00	3.95	3.95	10.05	13	PASS
	QPSK		13.25	3.63	3.63	9.62	13	PASS
	16QAM		13.41	3.41	3.55	9.86	13	PASS
	64QAM		13.65	3.30	3.54	10.11	13	PASS
802.11n (20MHz): 1TX	BPSK	5240	14.17	3.39	3.39	10.78	13	PASS
802.11n (20MHz): 3TX	BPSK	5240	10.20	-2.25	-2.25	12.45	13	PASS
	QPSK		9.63	-2.12	-2.12	11.75	13	PASS
	16QAM		9.66	-1.98	-1.82	11.48	13	PASS
	64QAM		9.69	-2.00	-1.72	11.41	13	PASS
802.11n (40MHz): 1TX	BPSK	5230	10.08	-0.29	-0.20	10.28	13	PASS
802.11n (40MHz): 3TX	BPSK	5230	6.71	-3.91	-3.82	10.53	13	PASS
	QPSK		7.16	-4.49	-4.36	11.52	13	PASS
	16QAM		7.82	-4.62	-4.32	12.14	13	PASS
	64QAM		7.68	-4.82	-4.33	12.01	13	PASS
802.11ac (80MHz): 1TX	BPSK	5210	6.10	-5.64	-5.38	11.48	13	PASS
802.11ac (80MHz): 3TX	BPSK	5210	5.42	-7.69	-7.43	12.85	13	PASS
	QPSK		3.47	-8.72	-8.45	11.92	13	PASS
	16QAM		3.53	-8.53	-8.06	11.59	13	PASS
	64QAM		3.89	-8.37	-7.62	11.51	13	PASS
	256QAM		3.56	-8.21	-7.46	11.02	13	PASS

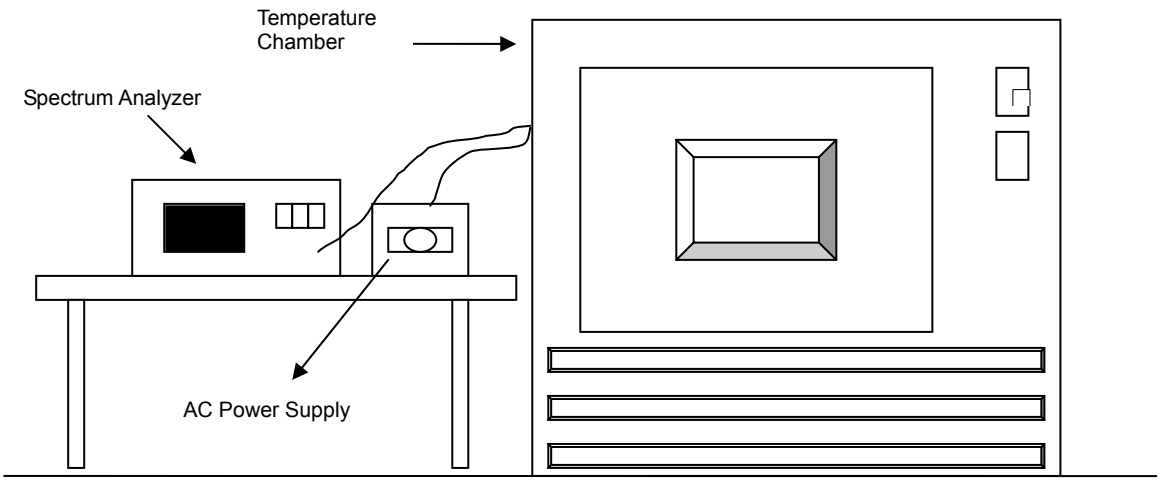


4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency of the carrier signal shall be maintained within band of operation

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.6.4 TEST PROCEDURE

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.

e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 TEST RESULTS

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5200MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5199.9957	-0.00008	5199.9974	-0.00005	5199.9970	-0.00006	5199.9981	-0.00004
40	120	5199.9816	-0.00035	5199.9790	-0.00040	5199.9836	-0.00032	5199.9770	-0.00044
30	120	5200.0288	0.00055	5200.0293	0.00056	5200.0208	0.00040	5200.0272	0.00052
20	120	5199.9930	-0.00013	5199.9964	-0.00007	5199.9953	-0.00009	5199.9885	-0.00022
10	120	5200.0031	0.00006	5200.0064	0.00012	5200.0050	0.00010	5200.0064	0.00012
0	120	5200.0070	0.00013	5200.0111	0.00021	5200.0071	0.00014	5200.0085	0.00016
-10	120	5199.9978	-0.00004	5199.9961	-0.00007	5200.0001	0.00000	5199.9969	-0.00006
-20	120	5200.0008	0.00002	5200.0082	0.00016	5200.0057	0.00011	5200.0082	0.00016

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5200MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5199.9924	-0.00015	5199.9967	-0.00006	5199.9953	-0.00009	5199.9894	-0.00020
	120	5199.9930	-0.00013	5199.9964	-0.00007	5199.9953	-0.00009	5199.9885	-0.00022
	102	5199.9924	-0.00015	5199.9962	-0.00007	5199.9944	-0.00011	5199.9879	-0.00023

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

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

7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

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