FCC TEST REPORT (15.407)

REPORT NO.:	RF140402C09-1
MODEL NO.:	CNUS0x (where "x" can be numerical 0-9 or alpha a-z)
FCC ID:	2AA9C900-00001
RECEIVED:	Apr. 02, 2014
TESTED:	Apr. 14, 2014 ~ Apr. 19, 2014
ISSUED:	Apr, 23, 2014

APPLICANT:	Morse Project Inc.
ADDRESS:	149 New Montgomery St., San Francisco, CA 94105

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
RF140402C09-1	Original release	Apr, 23, 2014

1. CERTIFICATION

PRODUCT:	Cone
MODEL NO.:	CNUS0x (where "x" can be numerical 0-9 or alpha a-z)
BRAND:	Aether
APPLICANT:	Morse Project Inc.
TESTED:	Apr. 14, 2014 ~ Apr. 19, 2014
TEST SAMPLE:	PRODUCTION UNIT
STANDARDS:	**FCC Part 15, Subpart E (Section 15.407)**
	ANSI C63.10-2009

The above equipment 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 : Gina Liu , **DATE :** Apr, 23, 2014

Gina Liu / Specialist

APPROVED BY : Sam chen , **DATE :** Apr, 23, 2014

Sam Chen / Senior Project Engineer

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 -31.71dB at 3.92969MHz.
15.407(b/1/2/3)(b)(6)	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.23dB at 5150MHz.
15.407(a/1/2)	Peak 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	No antenna connector is used.

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	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Cone
MODEL NO.	CNUS0x (where "x" can be numerical 0-9 or alpha a-z)
POWER SUPPLY	12Vdc (adapter) 7.2Vdc (Li-ion battery)
MODULATION TYPE	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 MCS7
OPERATING FREQUENCY	5180 ~ 5240MHz
NUMBER OF CHANNEL	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	13.24mW for 5180 ~ 5240MHz
ANTENNA TYPE	PIFA antenna with 1.7dBi gain (5180 ~ 5240MHz)
ANTENNA CONNECTOR	NA
DATA CABLE	Refer to Note as below
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Refer to Note as below

NOTE:

1. The EUT contains following accessory devices.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter 1	Chicony	ADUS0x (x can be 1-9)	I/P: 100-240Vac, 50/60Hz, 1A O/P: 12Vdc, 3A
Battery	Getac	NU1	7.2Vdc, 5200mAh
WLAN Chip	Marvell	8797	--

2. The following models are provided to this EUT.

MODEL	DESCRIPTION
CNUS0x (where "x" can be numerical 0-9 or alpha a-z)	For marketing purpose.

3. The EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
802.11a	1TX
802.11n (20MHz)	1TX, 2TX
802.11n (40MHz)	1TX, 2TX

4. The above EUT information is declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

WLAN 5180 ~ 5240MHz

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

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 **Z-plane.**

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
B	802.11n (20MHz)	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11n (20MHz)	5180-5240	36 to 48	36	OFDM	BPSK	MCS0

POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11n(20MHz)	5180-5240	36 to 48	36	OFDM	BPSK	MCS0

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 48	OFDM	BPSK	6.0
	802.11n (20MHz)		36 to 48	36, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
B	802.11n (20MHz)	5180-5240	36 to 48	36, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
B	802.11n (20MHz)	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0

Test CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu
PLC	25deg. C, 65%RH	120Vac, 60Hz	Peter Weng
APCM	25deg. C, 65%RH	120Vac, 60Hz	David Huang

3.3 DESCRIPTION OF SUPPORT UNITS

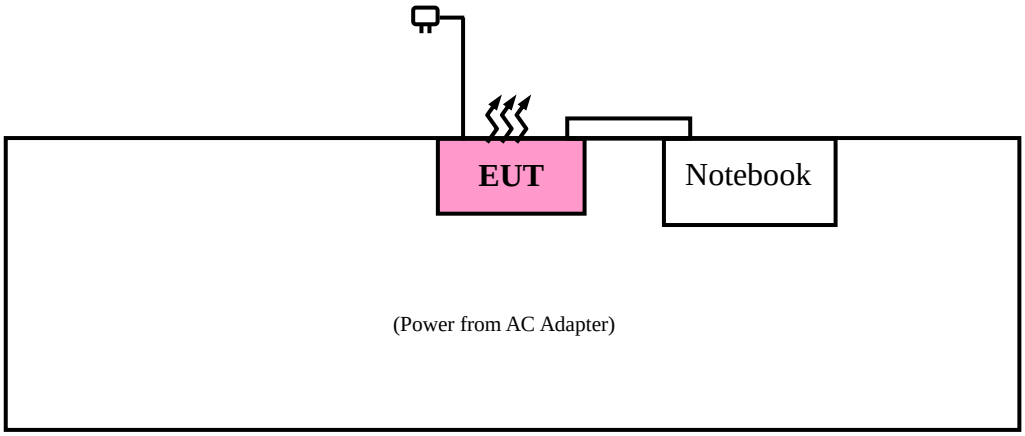
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	Inspiron 14R	7LRKKW1	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

NOTE: 1. All power cords of the above support units are non shielded (1.8m).

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



*Test Table

3.4 DUTY CYCLE TEST SIGNAL

MODE A

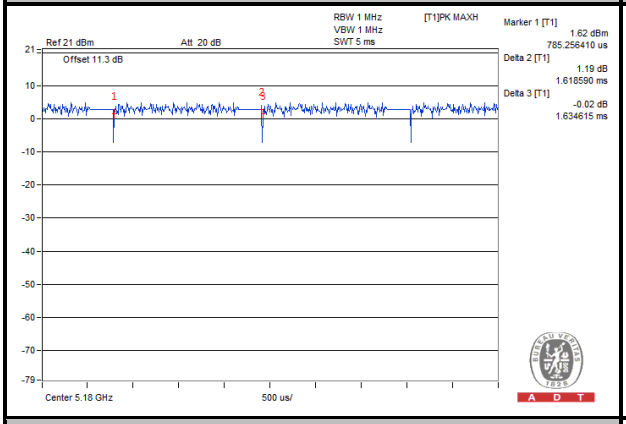
MODULATION TYPE: BPSK

802.11a: Duty cycle of test signal is > 98 %, duty factor is not required.

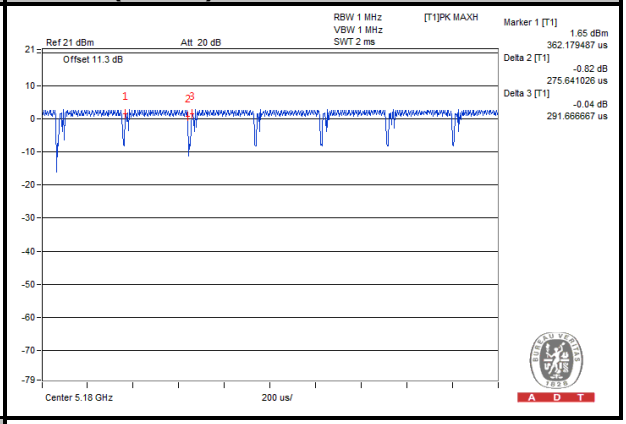
802.11n (20MHz): Duty cycle = 275.64/291.66 = 0.945, Duty factor = 10 * log(1/0.945) = 0.25

802.11n (40MHz): Duty cycle = 266.025/307.692 = 0.865, Duty factor = 10 * log(1/0.865) = 0.63

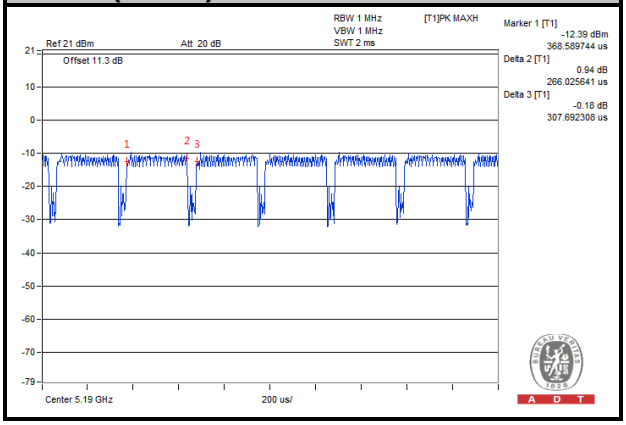
802.11a



802.11n (20MHz)



802.11n (40MHz)



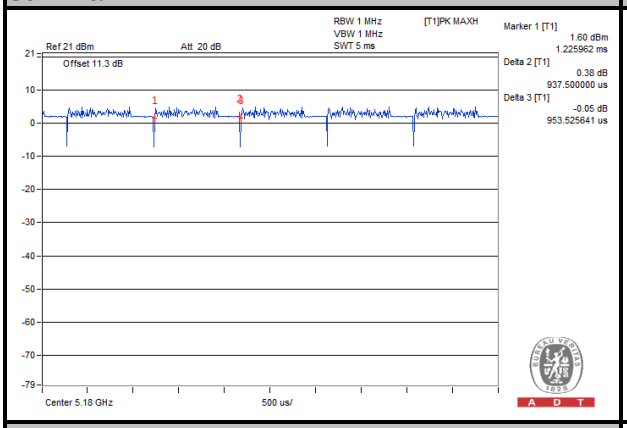
MODULATION TYPE: QPSK

802.11a: Duty cycle of test signal is > 98 %, duty factor is not required.

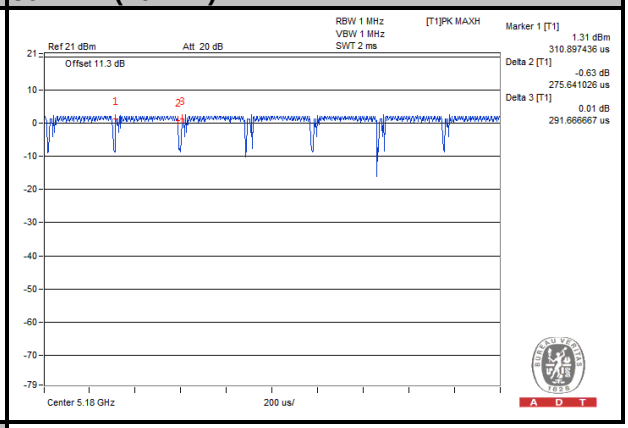
802.11n (20MHz): Duty cycle = 275.641/291.666 = 0.945, Duty factor = 10 * log(1/0.945) = 0.25

802.11n (40MHz): Duty cycle = 262.82/298.076 = 0.882, Duty factor = 10 * log(1/0.882) = 0.55

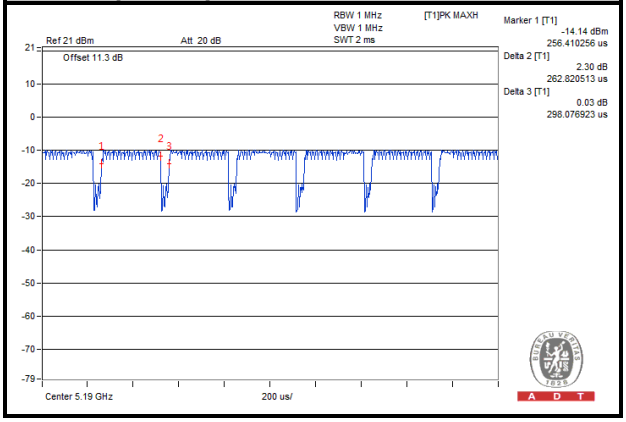
802.11a



802.11n (20MHz)



802.11n (40MHz)



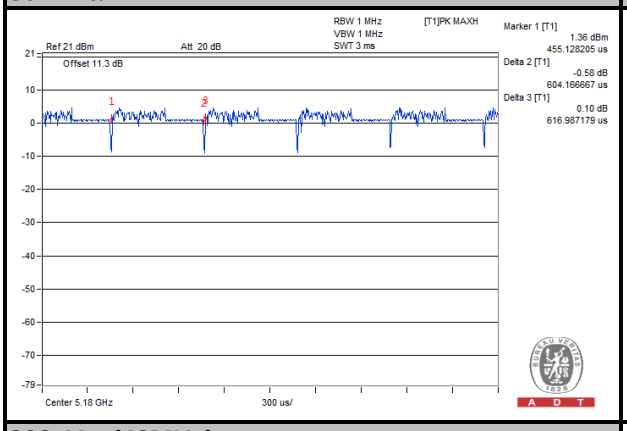
MODULATION TYPE: 16QAM

802.11a: Duty cycle = 604.166/616.987 = 0.979, Duty factor = 10 * log(1/0.979) = 0.09

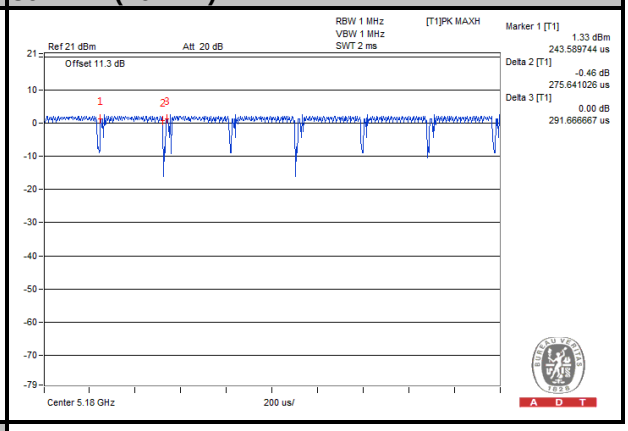
802.11n (20MHz): Duty cycle = 275.641/291.666 = 0.945, Duty factor = 10 * log(1/0.945) = 0.25

802.11n (40MHz): Duty cycle = 256/294 = 0.871, Duty factor = 10 * log(1/0.871) = 0.60

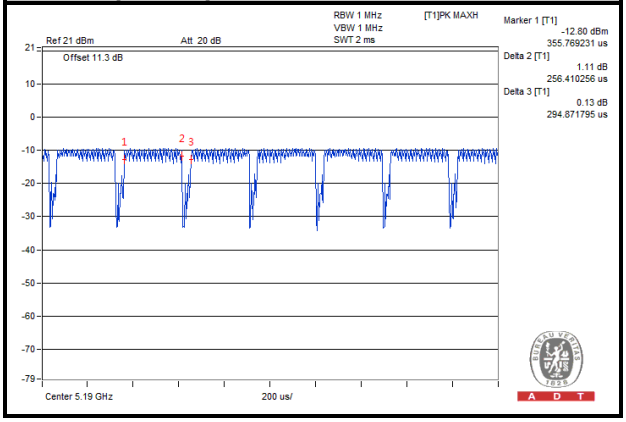
802.11a



802.11n (20MHz)



802.11n (40MHz)



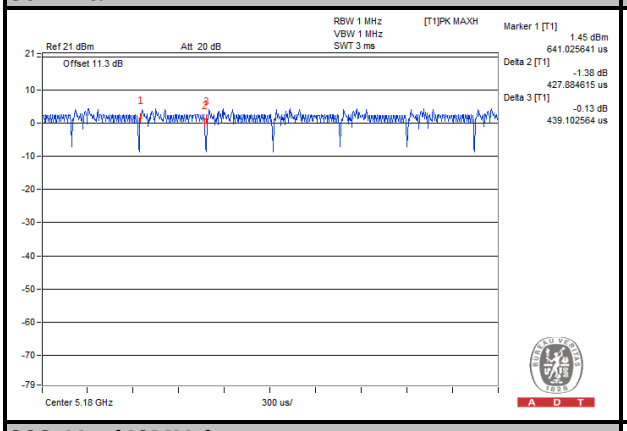
MODULATION TYPE: 64QAM

802.11a: Duty cycle = 427.884/439.102 = 0.974, Duty factor = 10 * log(1/0.974) = 0.11

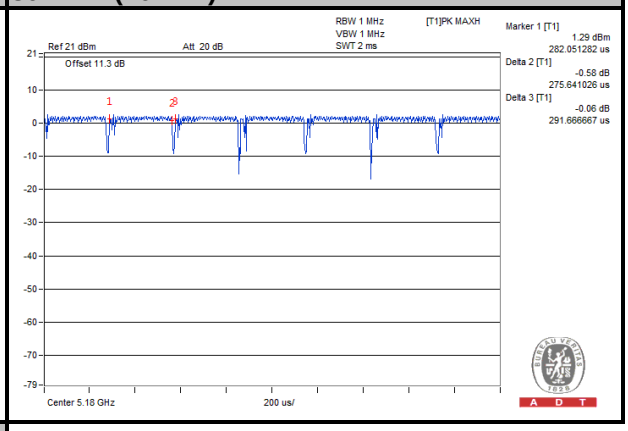
802.11n (20MHz): Duty cycle = 275.641/291.666 = 0.945, Duty factor = 10 * log(1/0.945) = 0.25

802.11n (40MHz): Duty cycle = 253.205/291.666 = 0.891, Duty factor = 10 * log(1/0.868) = 0.61

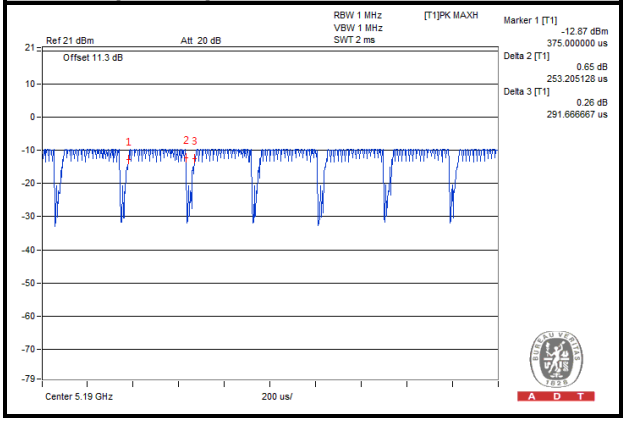
802.11a



802.11n (20MHz)



802.11n (40MHz)

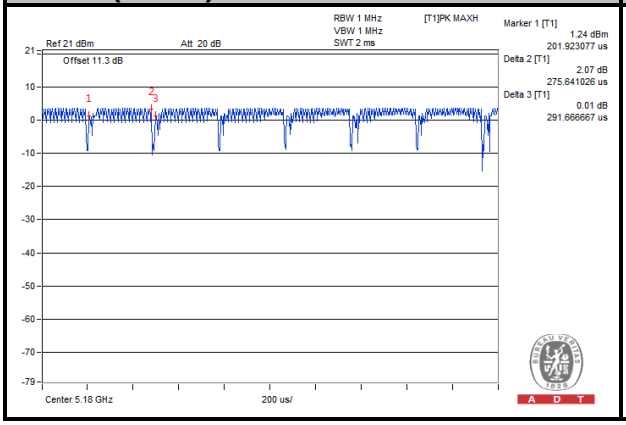
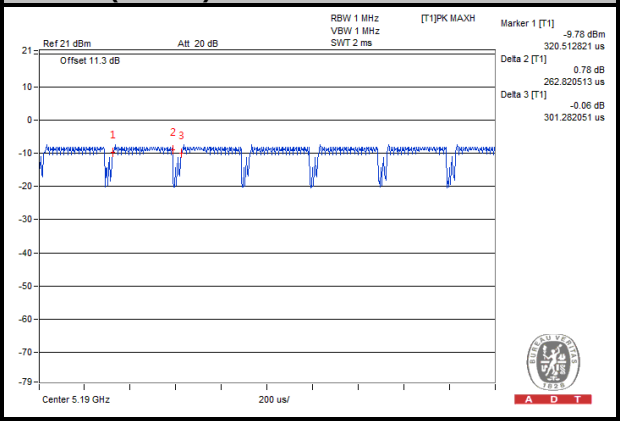


MODE B

MODULATION TYPE: BPSK

802.11n (20MHz): Duty cycle = 275.641/291.666 = 0.945, Duty factor = 10 * log(1/0.945) = 0.25

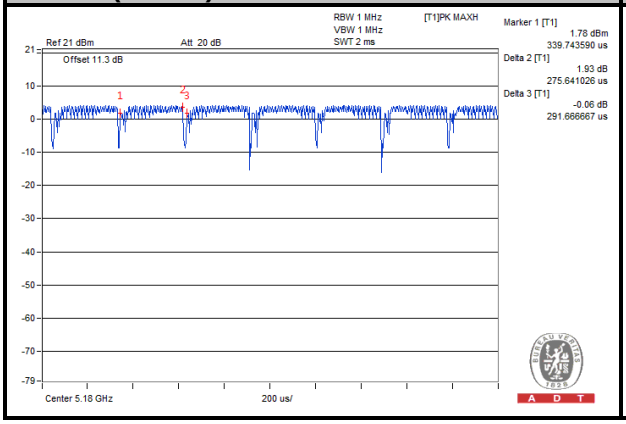
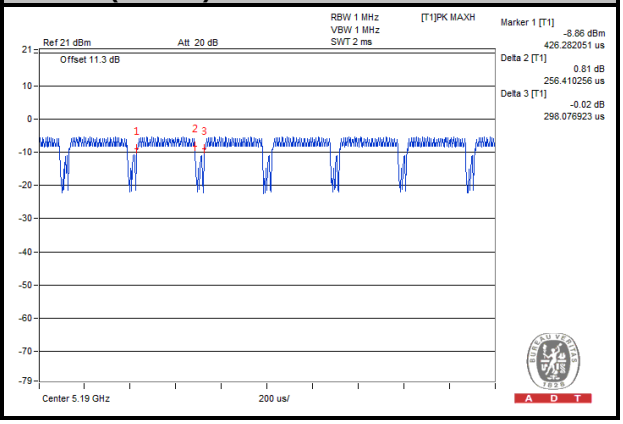
802.11n (40MHz): Duty cycle = 262.821/301.282 = 0.872, Duty factor = 10 * log(1/0.872) = 0.59

802.11n (20MHz)	802.11n (40MHz)
	

MODULATION TYPE: QPSK

802.11n (20MHz): Duty cycle = 275.641/291.666 = 0.945, Duty factor = 10 * log(1/0.945) = 0.25

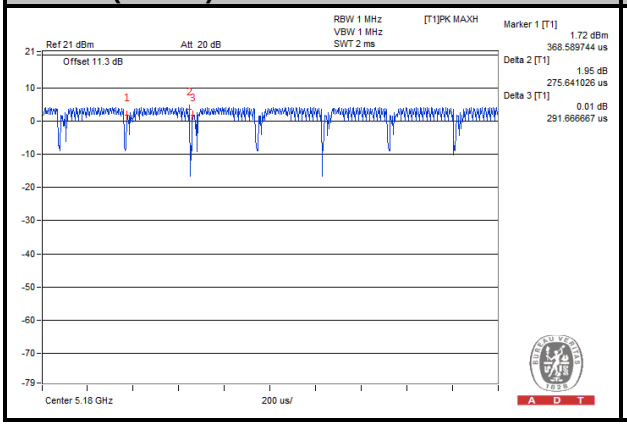
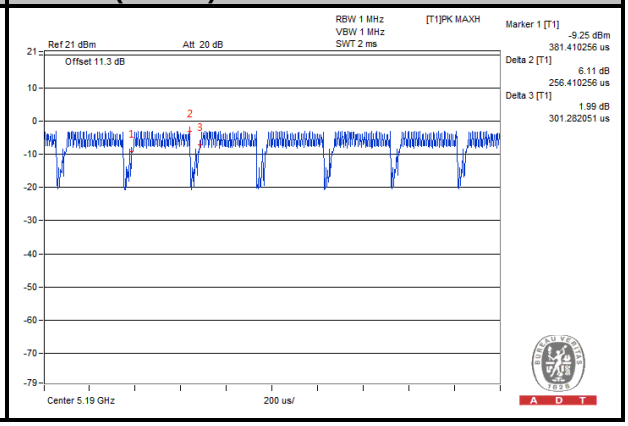
802.11n (40MHz): Duty cycle = 256.41/298.077 = 0.860, Duty factor = 10 * log(1/0.860) = 0.65

802.11n (20MHz)	802.11n (40MHz)
	

MODULATION TYPE: 16QAM

802.11n (20MHz): Duty cycle = 275.641/291.666 = 0.945, Duty factor = 10 * log(1/0.945) = 0.25

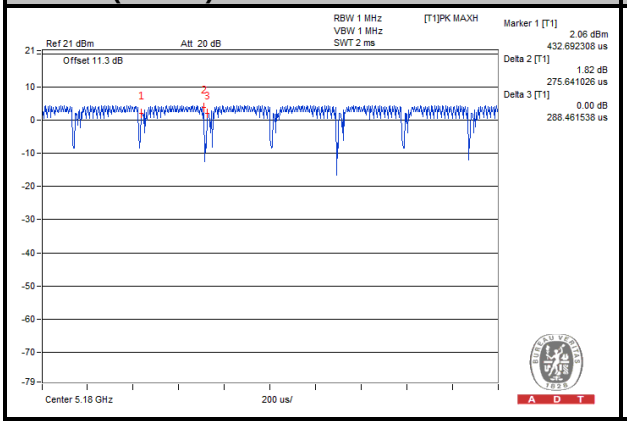
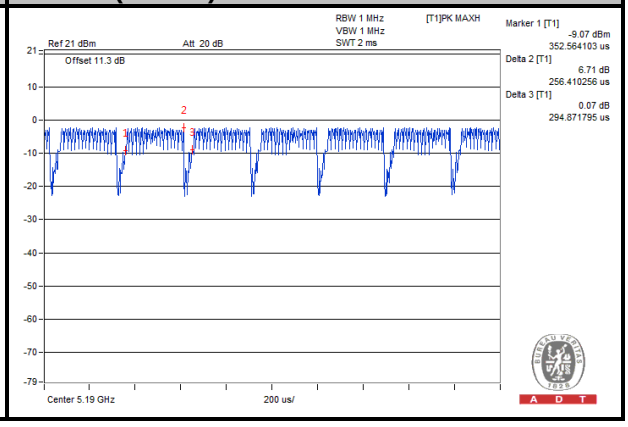
802.11n (40MHz): Duty cycle = 256.41/301.282 = 0.851, Duty factor = 10 * log(1/0.851) = 0.70

802.11n (20MHz)	802.11n (40MHz)
	

MODULATION TYPE: 64QAM

802.11n (20MHz): Duty cycle = 275.641/288.461 = 0.956, Duty factor = 10 * log(1/0.956) = 0.20

802.11n (40MHz): Duty cycle = 256/294 = 0.871, Duty factor = 10 * log(1/0.8714) = 0.60

802.11n (20MHz)	802.11n (40MHz)
	

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)
KDB 789033 D01 General UNII Test Procedures v01r03
662911 D01 Multiple Transmitter Output v02r01
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	ESCI	100744	Apr. 15, 2014	Apr. 14, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2013	Dec. 20, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 27. 2014	Feb. 26, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 19, 2013	Feb. 18, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Loop Antenna	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 2015
Preamplifier EMCI	EMC 012645	980115	Dec. 26, 2013	Dec. 25, 2014
Preamplifier EMCI	EMC 184045	980116	Jan. 13, 2014	Jan. 12, 2015
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2013	Dec. 26, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable Worken	RG-213	NA	Nov. 07, 2013	Nov. 06, 2014
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Power Meter	ML2495A	1232002	Aug. 23, 2013	Aug. 22, 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 10.
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 690701.
6. The IC Site Registration No. is IC 7450F-10.

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 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 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:

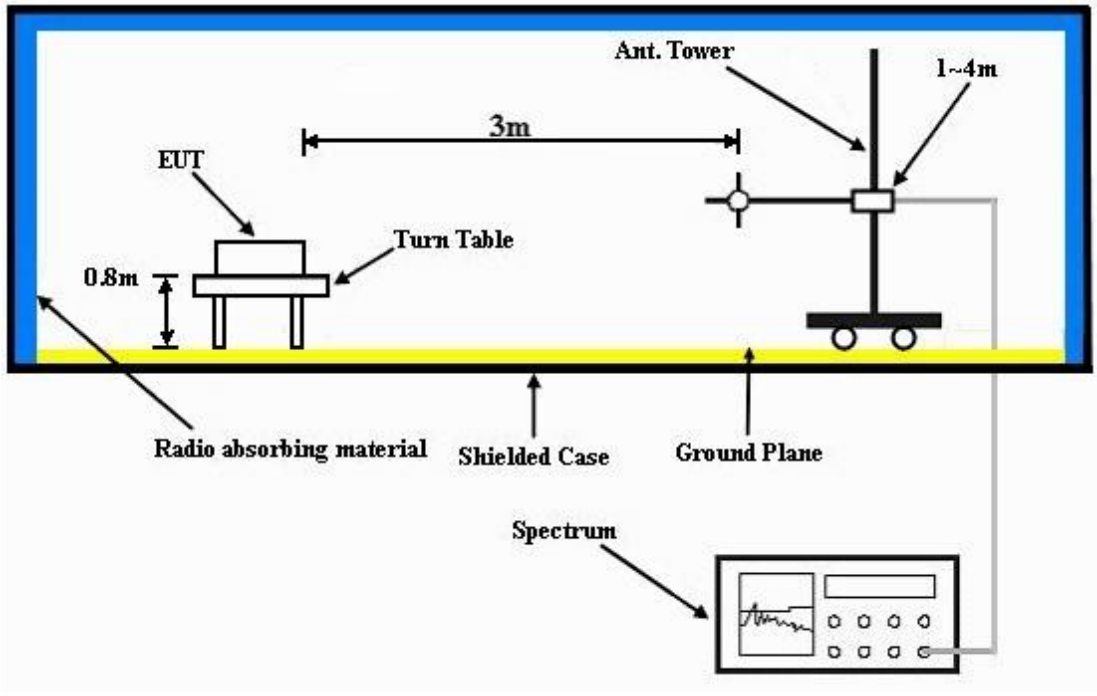
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency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

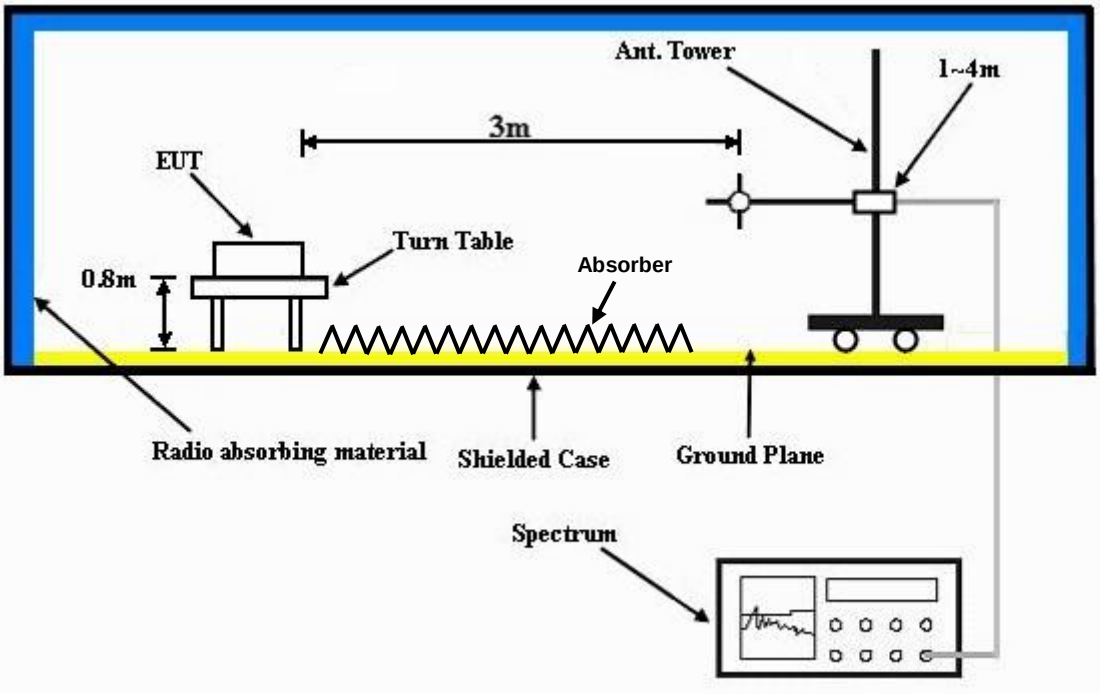
No deviation.

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 CONDITIONS

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.8 TEST RESULTS

MODE A

ABOVE 1GHz WORST-CASE DATA

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5140	44.77	36.51	54	-9.23	34.12	8.13	33.99	111	87	Average
5140	57.79	49.53	74	-16.21	34.12	8.13	33.99	111	87	Peak
5180	98.43	90.12			34.15	8.16	34	111	87	Average
5180	106.01	97.7			34.15	8.16	34	111	87	Peak
5350	46.08	37.45	54	-7.92	34.28	8.38	34.03	111	87	Average
5350	57.99	49.36	74	-16.01	34.28	8.38	34.03	111	87	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5136	43.8	35.55	54	-10.2	34.11	8.13	33.99	114	123	Average
5136	56.17	47.92	74	-17.83	34.11	8.13	33.99	114	123	Peak
5180	96.46	88.15			34.15	8.16	34	114	123	Average
5180	103.22	94.91			34.15	8.16	34	114	123	Peak
5404	45.18	36.46	54	-8.82	34.32	8.44	34.04	114	123	Average
5404	56.85	48.13	74	-17.15	34.32	8.44	34.04	114	123	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5180MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 44	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Kay Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5104	43.67	35.51	54	-10.33	34.08	8.07	33.99	111	87	Average
5104	56.5	48.34	74	-17.5	34.08	8.07	33.99	111	87	Peak
5220	98.55	90.16			34.17	8.22	34	111	87	Average
5220	106.35	97.96			34.17	8.22	34	111	87	Peak
5406	44.22	35.5	54	-9.78	34.32	8.44	34.04	111	87	Average
5406	57.46	48.74	74	-16.54	34.32	8.44	34.04	111	87	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5144	43.77	35.52	54	-10.23	34.12	8.13	34	114	123	Average
5144	57.76	49.51	74	-16.24	34.12	8.13	34	114	123	Peak
5220	95.96	87.57			34.17	8.22	34	114	123	Average
5220	103.73	95.34			34.17	8.22	34	114	123	Peak
5410	44.29	35.57	54	-9.71	34.32	8.44	34.04	114	123	Average
5410	58.54	49.82	74	-15.46	34.32	8.44	34.04	114	123	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5220MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5094	43.67	35.51	54	-10.33	34.08	8.07	33.99	111	89	Average
5094	57.39	49.23	74	-16.61	34.08	8.07	33.99	111	89	Peak
5240	99.28	90.84			34.19	8.26	34.01	111	89	Average
5240	106.66	98.22			34.19	8.26	34.01	111	89	Peak
5442	44.35	35.56	54	-9.65	34.35	8.48	34.04	111	89	Average
5442	57.71	48.92	74	-16.29	34.35	8.48	34.04	111	89	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5082	43.66	35.5	54	-10.34	34.07	8.07	33.98	123	123	Average
5082	56.5	48.34	74	-17.5	34.07	8.07	33.98	123	123	Peak
5240	96.55	88.11			34.19	8.26	34.01	123	123	Average
5240	104.54	96.1			34.19	8.26	34.01	123	123	Peak
5446	44.44	35.61	54	-9.56	34.36	8.51	34.04	123	123	Average
5446	57.87	49.04	74	-16.13	34.36	8.51	34.04	123	123	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5240MHz: Fundamental frequency.

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	46.82	38.57	54	-7.18	34.12	8.13	34	127	292	Average
5150	57.93	49.68	74	-16.07	34.12	8.13	34	127	292	Peak
5180	98.09	89.78			34.15	8.16	34	127	292	Average
5180	104.36	96.05			34.15	8.16	34	127	292	Peak
5436	44.35	35.56	54	-9.65	34.35	8.48	34.04	127	292	Average
5436	57.74	48.95	74	-16.26	34.35	8.48	34.04	127	292	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5084	43.66	35.5	54	-10.34	34.07	8.07	33.98	100	136	Average
5084	57.57	49.41	74	-16.43	34.07	8.07	33.98	100	136	Peak
5180	95.84	87.53			34.15	8.16	34	100	136	Average
5180	101.96	93.65			34.15	8.16	34	100	136	Peak
5454	45.28	36.46	54	-8.72	34.36	8.51	34.05	100	136	Average
5454	57.75	48.93	74	-16.25	34.36	8.51	34.05	100	136	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5180MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 44	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Kay Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5114	43.72	35.52	54	-10.28	34.09	8.1	33.99	127	289	Average
5114	56.42	48.22	74	-17.58	34.09	8.1	33.99	127	289	Peak
5220	97.9	89.51			34.17	8.22	34	127	289	Average
5220	103.59	95.2			34.17	8.22	34	127	289	Peak
5434	45.34	36.55	54	-8.66	34.35	8.48	34.04	127	289	Average
5434	58.31	49.52	74	-15.69	34.35	8.48	34.04	127	289	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5108	43.72	35.52	54	-10.28	34.09	8.1	33.99	126	68	Average
5108	57.12	48.92	74	-16.88	34.09	8.1	33.99	126	68	Peak
5220	95.37	86.98			34.17	8.22	34	126	68	Average
5220	101.82	93.43			34.17	8.22	34	126	68	Peak
5460	45.28	36.46	54	-8.72	34.36	8.51	34.05	126	68	Average
5460	56.99	48.17	74	-17.01	34.36	8.51	34.05	126	68	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5220MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5100	43.67	35.51	54	-10.33	34.08	8.07	33.99	127	290	Average
5100	56.96	48.8	74	-17.04	34.08	8.07	33.99	127	290	Peak
5240	97.57	89.13			34.19	8.26	34.01	127	290	Average
5240	104.24	95.8			34.19	8.26	34.01	127	290	Peak
5434	44.35	35.56	54	-9.65	34.35	8.48	34.04	127	290	Average
5434	58.94	50.15	74	-15.06	34.35	8.48	34.04	127	290	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5086	43.66	35.5	54	-10.34	34.07	8.07	33.98	125	68	Average
5086	56.81	48.65	74	-17.19	34.07	8.07	33.98	125	68	Peak
5240	94.9	86.46			34.19	8.26	34.01	125	68	Average
5240	101.12	92.68			34.19	8.26	34.01	125	68	Peak
5432	44.38	35.59	54	-9.62	34.35	8.48	34.04	125	68	Average
5432	57.75	48.96	74	-16.25	34.35	8.48	34.04	125	68	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5240MHz: Fundamental frequency.

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	53.77	45.52	54	-0.23	34.12	8.13	34	127	292	Average
5150	65.24	56.99	74	-8.76	34.12	8.13	34	127	292	Peak
5190	94.9	86.56			34.15	8.19	34	127	292	Average
5190	102.14	93.8			34.15	8.19	34	127	292	Peak
5374	44.23	35.57	54	-9.77	34.29	8.41	34.04	127	292	Average
5374	57.41	48.75	74	-16.59	34.29	8.41	34.04	127	292	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5148	47.93	39.68	54	-6.07	34.12	8.13	34	127	68	Average
5148	62.74	54.49	74	-11.26	34.12	8.13	34	127	68	Peak
5190	93.42	85.08			34.15	8.19	34	127	68	Average
5190	100.78	92.44			34.15	8.19	34	127	68	Peak
5446	44.39	35.56	54	-9.61	34.36	8.51	34.04	127	68	Average
5446	56.72	47.89	74	-17.28	34.36	8.51	34.04	127	68	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5190MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5102	44.66	36.5	54	-9.34	34.08	8.07	33.99	127	292	Average
5102	56.61	48.45	74	-17.39	34.08	8.07	33.99	127	292	Peak
5230	95.87	87.47			34.19	8.22	34.01	127	292	Average
5230	102.92	94.52			34.19	8.22	34.01	127	292	Peak
5460	44.39	35.57	54	-9.61	34.36	8.51	34.05	127	292	Average
5460	58.24	49.42	74	-15.76	34.36	8.51	34.05	127	292	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5092	43.67	35.5	54	-10.33	34.08	8.07	33.98	125	68	Average
5092	56.85	48.68	74	-17.15	34.08	8.07	33.98	125	68	Peak
5230	92.38	83.98			34.19	8.22	34.01	125	68	Average
5230	99.05	90.65			34.19	8.22	34.01	125	68	Peak
5446	45.02	36.19	54	-8.98	34.36	8.51	34.04	125	68	Average
5446	57.21	48.38	74	-16.79	34.36	8.51	34.04	125	68	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5230MHz: Fundamental frequency.

MODE B

ABOVE 1GHz WORST-CASE DATA

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5122	43.72	35.52	54	-10.28	34.09	8.1	33.99	134	260	Average
5122	57.05	48.85	74	-16.95	34.09	8.1	33.99	134	260	Peak
5180	97.44	89.13			34.15	8.16	34	134	260	Average
5180	103.48	95.17			34.15	8.16	34	134	260	Peak
5430	44.35	35.56	54	-9.65	34.35	8.48	34.04	134	260	Average
5430	58.66	49.87	74	-15.34	34.35	8.48	34.04	134	260	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5036	43.56	35.5	54	-10.44	34.03	8	33.97	114	106	Average
5036	56.8	48.74	74	-17.2	34.03	8	33.97	114	106	Peak
5180	94.87	86.56			34.15	8.16	34	114	106	Average
5180	101.61	93.3			34.15	8.16	34	114	106	Peak
5452	44.39	35.57	54	-9.61	34.36	8.51	34.05	114	106	Average
5452	57.11	48.29	74	-16.89	34.36	8.51	34.05	114	106	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5180MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 44	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Kay Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5072	43.63	35.51	54	-10.37	34.07	8.03	33.98	131	259	Average
5072	57.38	49.26	74	-16.62	34.07	8.03	33.98	131	259	Peak
5220	97.92	89.53			34.17	8.22	34	131	259	Average
5220	103.3	94.91			34.17	8.22	34	131	259	Peak
5422	44.33	35.56	54	-9.67	34.33	8.48	34.04	131	259	Average
5422	58.44	49.67	74	-15.56	34.33	8.48	34.04	131	259	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5148	43.77	35.52	54	-10.23	34.12	8.13	34	114	106	Average
5148	57.54	49.29	74	-16.46	34.12	8.13	34	114	106	Peak
5220	97.26	88.87			34.17	8.22	34	114	106	Average
5220	101.88	93.49			34.17	8.22	34	114	106	Peak
5448	44.39	35.56	54	-9.61	34.36	8.51	34.04	114	106	Average
5448	58	49.17	74	-16	34.36	8.51	34.04	114	106	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5220MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5126	43.73	35.51	54	-10.27	34.11	8.1	33.99	131	259	Average
5126	56.77	48.55	74	-17.23	34.11	8.1	33.99	131	259	Peak
5240	97.81	89.37			34.19	8.26	34.01	131	259	Average
5240	103.97	95.53			34.19	8.26	34.01	131	259	Peak
5448	44.42	35.59	54	-9.58	34.36	8.51	34.04	131	259	Average
5448	57.95	49.12	74	-16.05	34.36	8.51	34.04	131	259	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5030	43.56	35.5	54	-10.44	34.03	8	33.97	111	106	Average
5030	56.51	48.45	74	-17.49	34.03	8	33.97	111	106	Peak
5240	95.51	87.07			34.19	8.26	34.01	111	106	Average
5240	101.48	93.04			34.19	8.26	34.01	111	106	Peak
5366	45.19	36.55	54	-8.81	34.29	8.38	34.03	111	106	Average
5366	56.75	48.11	74	-17.25	34.29	8.38	34.03	111	106	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5240MHz: Fundamental frequency.

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	52.37	44.12	54	-1.63	34.12	8.13	34	126	88	Average
5150	60.97	52.72	74	-13.03	34.12	8.13	34	126	88	Peak
5190	95.86	87.52			34.15	8.19	34	134	78	Average
5190	102.16	93.82			34.15	8.19	34	134	78	Peak
5356	44.19	35.56	54	-9.81	34.28	8.38	34.03	134	78	Average
5356	57.51	48.88	74	-16.49	34.28	8.38	34.03	134	78	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5148	45.81	37.56	54	-8.19	34.12	8.13	34	100	105	Average
5148	58.35	50.1	74	-15.65	34.12	8.13	34	100	105	Peak
5190	93.86	85.52			34.15	8.19	34	100	105	Average
5190	100.13	91.79			34.15	8.19	34	100	105	Peak
5400	45.33	36.61	54	-8.67	34.32	8.44	34.04	100	105	Average
5400	56.77	48.05	74	-17.23	34.32	8.44	34.04	100	105	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5190MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5076	43.65	35.53	54	-10.35	34.07	8.03	33.98	134	78	Average
5076	56.61	48.49	74	-17.39	34.07	8.03	33.98	134	78	Peak
5230	95.98	87.58			34.19	8.22	34.01	134	78	Average
5230	102.41	94.01			34.19	8.22	34.01	134	78	Peak
5450	45.01	36.19	54	-8.99	34.36	8.51	34.05	134	78	Average
5450	58	49.18	74	-16	34.36	8.51	34.05	134	78	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5132	44.77	36.55	54	-9.23	34.11	8.1	33.99	100	105	Average
5132	57.55	49.33	74	-16.45	34.11	8.1	33.99	100	105	Peak
5230	93.98	85.58			34.19	8.22	34.01	100	105	Average
5230	99.6	91.2			34.19	8.22	34.01	100	105	Peak
5432	44.35	35.56	54	-9.65	34.35	8.48	34.04	100	105	Average
5432	57.05	48.26	74	-16.95	34.35	8.48	34.04	100	105	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5230MHz: Fundamental frequency.

MODE A

BELOW 1GHz WORST-CASE DATA:

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Kay Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
55.92	11.25	35.4	40	-28.75	7.18	0.9	32.23	155	145	Peak
109.65	18.44	39.99	43.5	-25.06	9.42	1.28	32.25	124	145	Peak
174.18	19.6	40.05	43.5	-23.9	10.18	1.61	32.24	102	175	Peak
341.3	28.29	42.21	46	-17.71	15.97	2.19	32.08	132	154	Peak
472.2	20.83	31.58	46	-25.17	18.81	2.56	32.12	166	214	Peak
542.9	22.92	31.92	46	-23.08	20.43	2.76	32.19	104	145	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
47.82	18.17	41.01	40	-21.83	8.48	0.9	32.22	159	214	Peak
111.54	20.01	41.71	43.5	-23.49	9.27	1.28	32.25	155	165	Peak
174.45	18.87	39.32	43.5	-24.63	10.18	1.61	32.24	145	175	Peak
352.5	23.01	36.5	46	-22.99	16.39	2.19	32.07	135	145	Peak
533.8	24.33	33.23	46	-21.67	20.57	2.7	32.17	102	145	Peak
690.6	24.98	30.84	46	-21.02	23.19	3.05	32.1	166	124	Peak

REMARKS: Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

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. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 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 2.
3. The VCCI Site Registration No. is C-2047.

4.2.3 TEST PROCEDURES

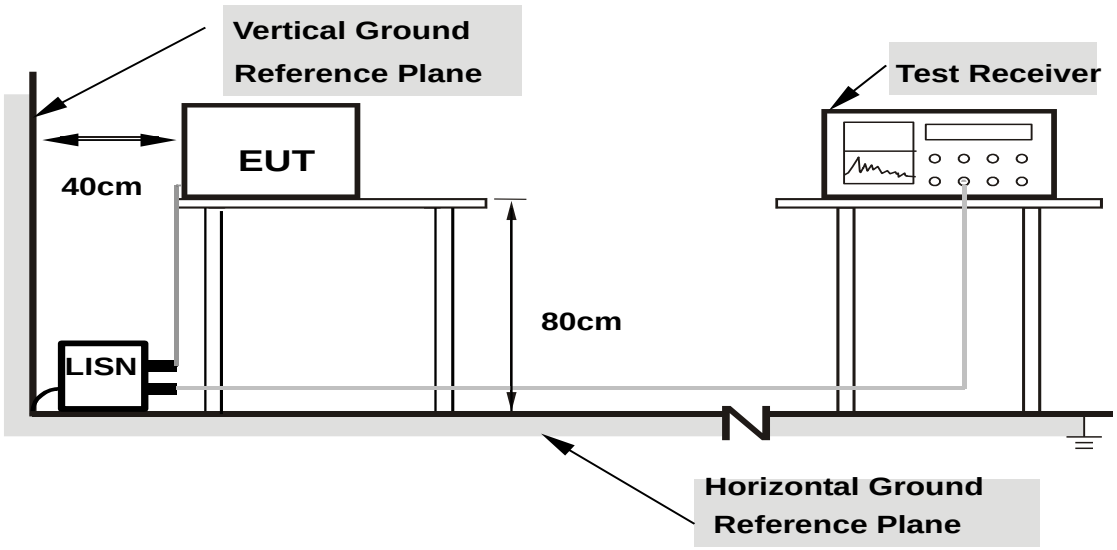
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



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

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

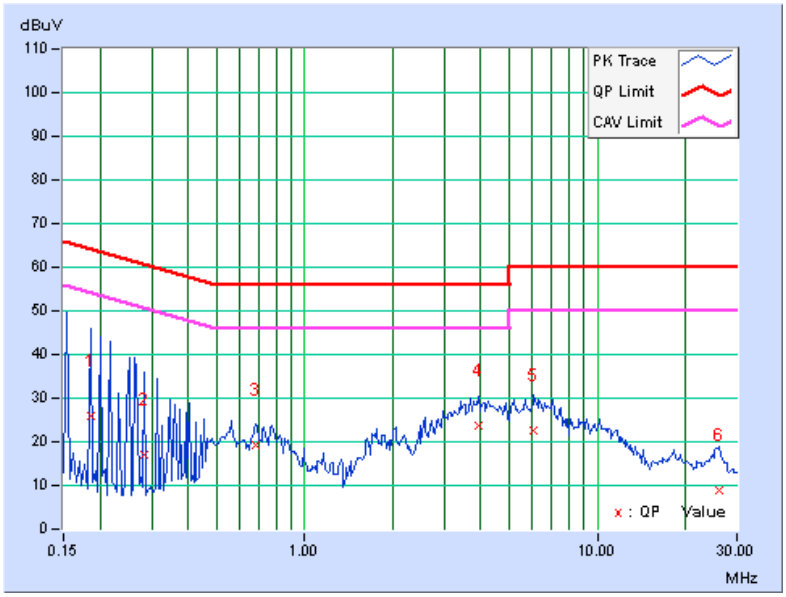
CONDUCTED WORST-CASE DATA：

PHASE	Line 1	6dB BANDWIDTH	9kHz

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	0.18516	0.28	25.70	-5.02	25.98	-4.74	64.25	54.25	-38.28	-59.00
2	0.28281	0.29	16.69	-6.59	16.98	-6.30	60.73	50.73	-43.75	-57.03
3	0.68125	0.32	18.95	1.79	19.27	2.11	56.00	46.00	-36.73	-43.89
4	3.92969	0.43	23.12	13.86	23.55	14.29	56.00	46.00	-32.45	-31.71
5	6.07031	0.45	22.14	14.33	22.59	14.78	60.00	50.00	-37.41	-35.22
6	26.08594	0.51	8.43	-4.67	8.94	-4.16	60.00	50.00	-51.06	-54.16

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

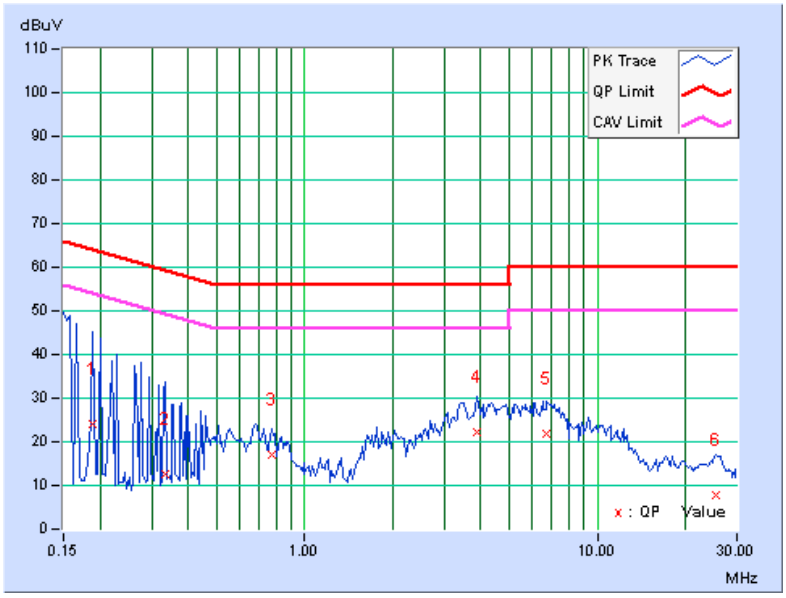


PHASE	Line 2	6dB BANDWIDTH	9kHz

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	0.18906	0.28	23.90	0.12	24.18	0.40	64.08	54.08	-39.90	-53.68
2	0.33359	0.29	12.14	-6.71	12.43	-6.42	59.36	49.36	-46.93	-55.78
3	0.77500	0.33	16.83	1.59	17.16	1.92	56.00	46.00	-38.84	-44.08
4	3.87109	0.44	21.89	13.38	22.33	13.82	56.00	46.00	-33.67	-32.18
5	6.73047	0.48	21.41	13.19	21.89	13.67	60.00	50.00	-38.11	-36.33
6	25.52734	0.55	7.32	-4.68	7.87	-4.13	60.00	50.00	-52.13	-54.13

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 PEAK TRANSMIT POWER MEASUREMENT

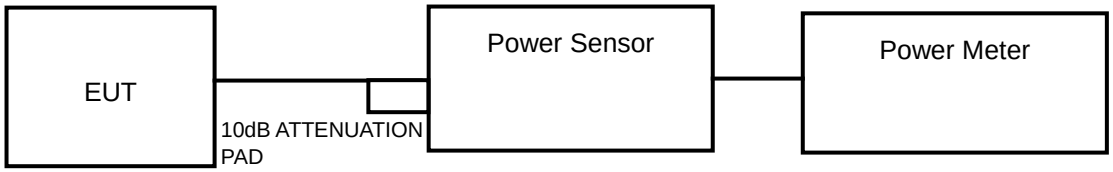
4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.250 ~ 5.350GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.470 ~ 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB

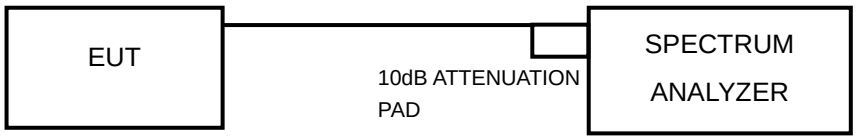
NOTE: Where B is the 26dB emission bandwidth in MHz.

4.3.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT



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

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 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

MODE A

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	12.88	11.10	17	PASS
44	5220	12.74	11.05	17	PASS
48	5240	12.82	11.08	17	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	13.06	11.16	17	PASS
44	5220	12.62	11.01	17	PASS
48	5240	12.42	10.94	17	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	11.80	10.72	17	PASS
46	5230	12.94	11.12	17	PASS

MODE B

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1				
36	5180	8.37	8.31	13.65	11.35	17	PASS
44	5220	8.15	8.08	12.96	11.13	17	PASS
48	5240	8.01	8.03	12.68	11.03	17	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1				
38	5190	8.40	8.33	13.73	11.38	17	PASS
46	5230	8.41	8.27	13.65	11.35	17	PASS

26dB BANDWIDTH

MODE A

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	20.14	PASS
44	5220	20.14	PASS
48	5240	20.16	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	22.25	PASS
44	5220	22.66	PASS
48	5240	22.65	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
38	5190	43.01	PASS
46	5230	43.74	PASS

MODE B

802.11n (20MHz)

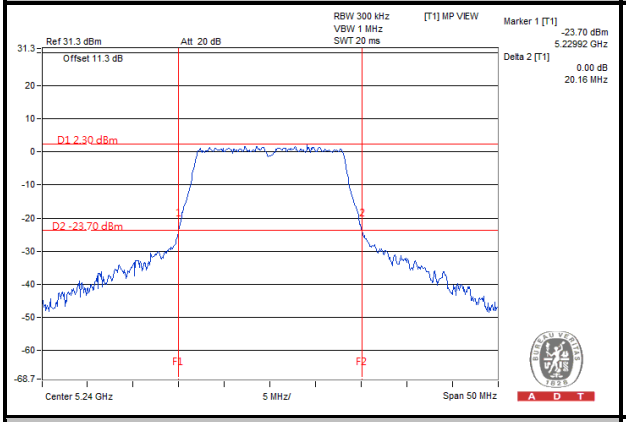
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
36	5180	22.33	21.90	PASS
44	5220	22.24	21.04	PASS
48	5240	22.26	21.79	PASS

802.11n (40MHz)

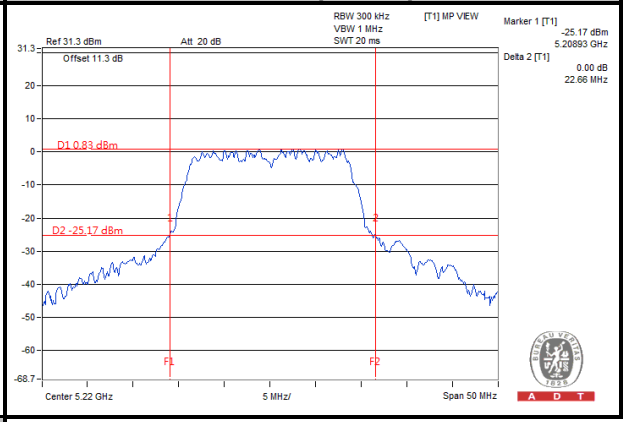
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
38	5190	42.63	44.31	PASS
46	5230	42.44	44.25	PASS

SPECTRUM PLOT OF WORST VALUE

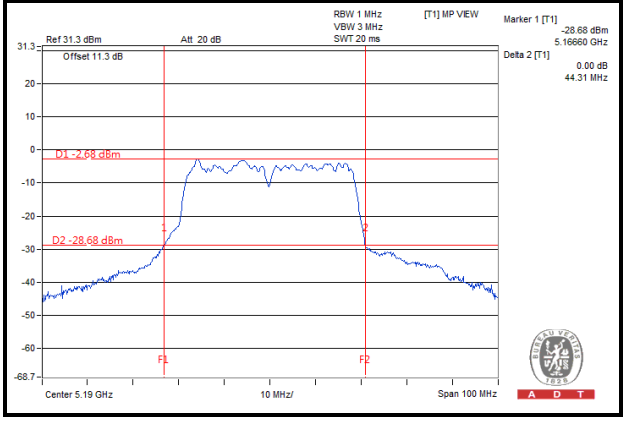
802.11a



802.11n (20MHz)



802.11n (40MHz)

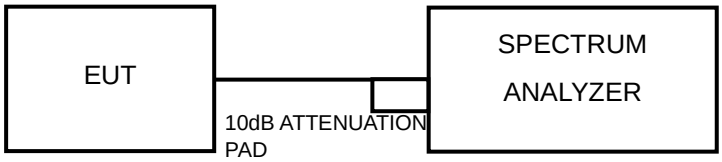


4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	4dBm
5.250 ~ 5.350GHz	11dBm
5.470 ~ 5.725GHz	11dBm

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-2 alternative

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3) Sweep time = 4second.
4) Perform a single sweep.
5) 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 Item 4.3.6.

4.4.7 TEST RESULTS

MODE A

802.11a

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	0.02	0	0.02	4	PASS
44	5220	-0.78	0	-0.78	4	PASS
48	5240	-0.75	0	-0.75	4	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	-0.08	0.25	0.17	4	PASS
44	5220	-0.27	0.25	-0.02	4	PASS
48	5240	-0.40	0.25	-0.15	4	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
38	5190	-4.88	0.63	-4.25	4	PASS
46	5230	-9.13	0.63	-8.50	4	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

MODE B

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)		TOTAL W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
		CHAIN0	CHAIN 1					
36	5180	-2.57	-8.16	-1.52	0.25	-1.27	4	PASS
44	5220	-3.62	-8.11	-2.30	0.25	-2.05	4	PASS
48	5240	-3.75	-7.44	-2.21	0.25	-1.96	4	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

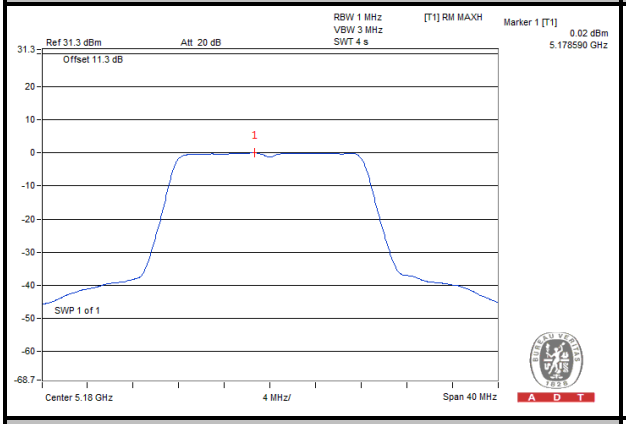
802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)		TOTAL W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
		CHAIN0	CHAIN 1					
38	5180	-6.12	-10.73	-4.83	0.59	-4.24	4	PASS
46	5220	-5.66	-10.31	-4.38	0.59	-3.79	4	PASS

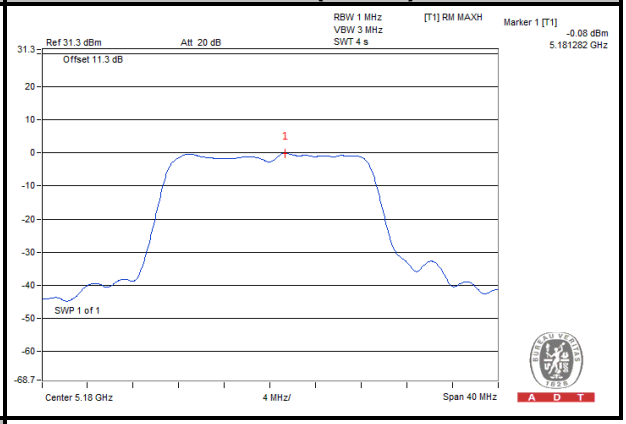
NOTE: Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

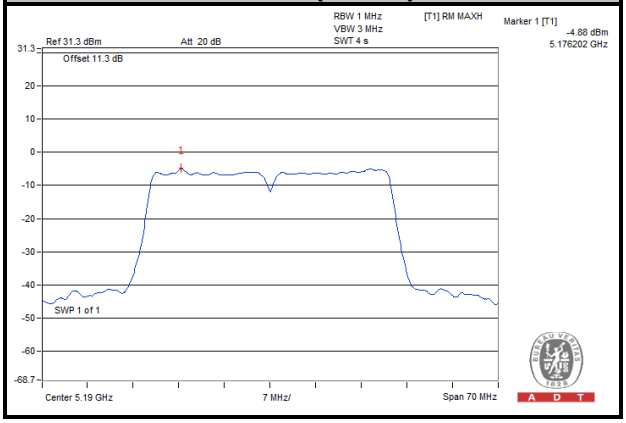
802.11a



802.11n (20MHz)



802.11n (40MHz)

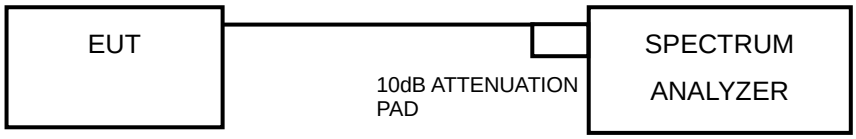


4.5 PEAK POWER EXCURSION MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY 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

a. Set the RBW = 1 kHz, VBW ≥ 3 MHz, Detector = peak.
b. Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
c. Use the peak search function to find the peak of the spectrum.
d. Measure the PPSD.
e. 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 CONDITION

Same as Item 4.3.6.

4.5.7 TEST RESULTS

MODE A

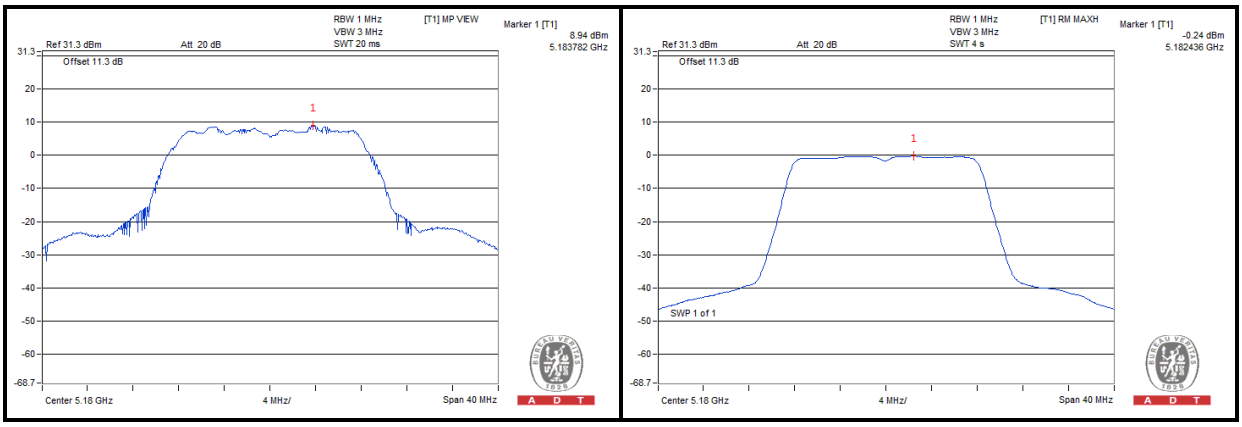
MODULATION MODE	MODULATION TYPE	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)	PPSD WITHOUT DUTY FACTOR (dBm)	PPSD WITH DUTY FACTOR (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS/FAIL
802.11a	BPSK	5180	8.10	0.02	0.02	8.08	13	PASS
	QPSK		8.94	-0.24	-0.24	9.18	13	PASS
	16QAM		9.00	-0.20	-0.11	9.11	13	PASS
	64QAM		8.43	0.55	0.66	7.77	13	PASS
802.11n (20MHz)	BPSK	5180	7.57	-0.08	0.17	7.40	13	PASS
	QPSK		7.61	-0.08	0.17	7.44	13	PASS
	16QAM		7.58	-0.09	0.16	7.42	13	PASS
	64QAM		7.63	-0.07	0.18	7.45	13	PASS
802.11n (40MHz)	BPSK	5190	3.57	-3.49	-2.86	6.43	13	PASS
	QPSK		3.67	-3.78	-3.23	6.90	13	PASS
	16QAM		4.78	-2.71	-2.11	6.89	13	PASS
	64QAM		4.86	-2.02	-1.41	6.27	13	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

MODE B

MODULATION MODE	MODULATION TYPE	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)		PPSD WITHOUT DUTY FACTOR (dBm)		PPSD WITH DUTY FACTOR (dBm)		PEAK EXCURSION (dB)		LIMIT (dB)	PASS/FAIL
			CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1		
802.11n (20MHz)	BPSK	5180	4.13	3.50	-2.57	-6.84	-2.32	-4.16	6.45	7.66	13	PASS
	QPSK		5.57	3.88	-1.83	-7.62	-1.58	-3.92	7.15	7.80	13	PASS
	16QAM		4.38	3.75	-3.12	-7.49	-2.87	-3.98	7.25	7.73	13	PASS
	64QAM		4.90	3.83	-2.55	-7.49	-2.35	-4.40	7.25	8.23	13	PASS
802.11n (40MHz)	BPSK	5190	1.43	-2.58	-6.12	-10.73	-5.53	-10.14	6.96	7.56	13	PASS
	QPSK		1.45	-2.98	-5.90	-10.64	-5.25	-9.99	6.70	7.01	13	PASS
	16QAM		3.52	-3.44	-4.25	-10.23	-3.55	-9.53	7.07	6.09	13	PASS
	64QAM		3.23	-1.90	-4.36	-9.10	-3.76	-8.50	6.99	6.60	13	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

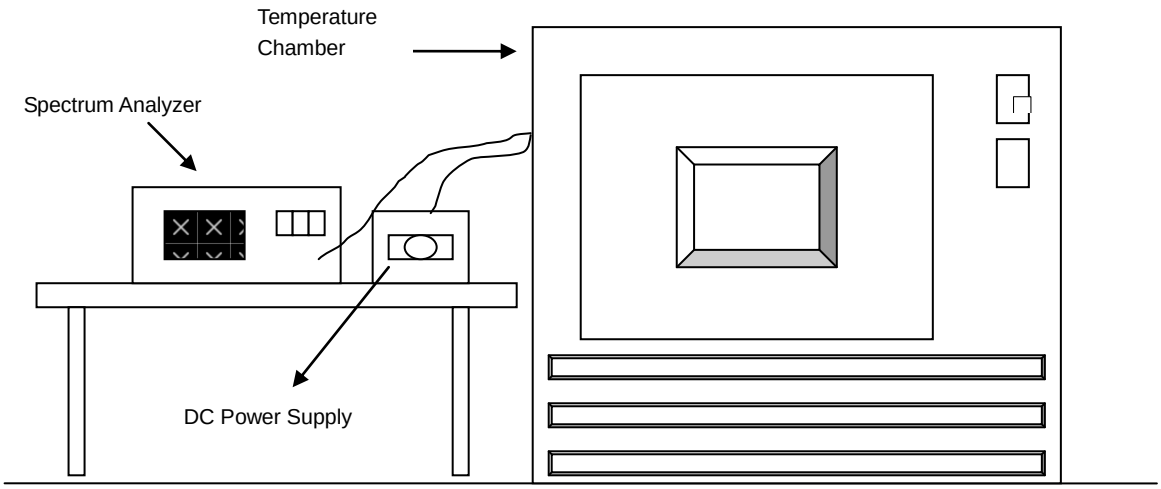

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MP VIEW
Marker 1 [T1]
8.94 dBm
5.183782 GHz
Ref 31.3 dBm
Att 20 dB
Offset 11.3 dB
Center 5.18 GHz
4 MHz/
Span 40 MHz
RBW 1 MHz
VBW 3 MHz
SWT 4 s
[T1] RM MAXH
Marker 1 [T1]
-0.24 dBm
5.182436 GHz
Ref 31.3 dBm
Att 20 dB
Offset 11.3 dB
SWP 1 of 1
Center 5.18 GHz
4 MHz/
Span 40 MHz

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. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
b. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
c. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

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: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
50	3.15	5179.992192	-1.507	5179.992156	-1.514	5179.991835	-1.576	5179.991684	-1.605
40	3.15	5179.991468	-1.647	5179.991481	-1.645	5179.991335	-1.673	5179.991610	-1.620
30	3.15	5179.992970	-1.357	5179.993281	-1.297	5179.993434	-1.268	5179.993386	-1.277
20	3.15	5179.993228	-1.307	5179.993282	-1.297	5179.993161	-1.320	5179.993664	-1.223
10	3.15	5179.995112	-0.944	5179.994894	-0.986	5179.994746	-1.014	5179.994892	-0.986
0	3.15	5179.993797	-1.197	5179.993946	-1.169	5179.994201	-1.119	5179.993891	-1.179
-10	3.15	5179.992261	-1.494	5179.992437	-1.460	5179.991971	-1.550	5179.991969	-1.550
-20	3.15	5179.992660	-1.417	5179.992247	-1.497	5179.992422	-1.463	5179.991870	-1.569

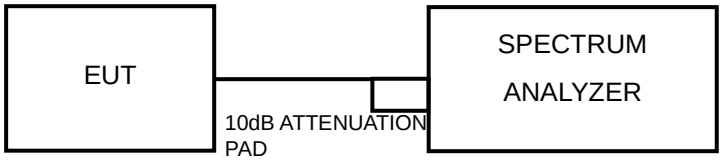
FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	1.53	5180.005086	0.982	5180.005204	1.005	5180.005409	1.044	5180.005649	1.091
	3.15	5180.005946	1.148	5180.005825	1.125	5180.005346	1.032	5180.005882	1.136
	3.62	5180.007055	1.362	5180.006809	1.314	5180.007115	1.374	5180.007072	1.365

4.7 20dBc BANDWIDTH MEASUREMENT

4.7.1 LIMITS OF 20dBc BANDWIDTH MEASUREMENT

20dBc point shall not overlap in 5150~5700MHz.

4.7.2 TEST SETUP



4.7.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.7.4 TEST PROCEDURES

789033 D01 General UNII Test Procedures v01r03

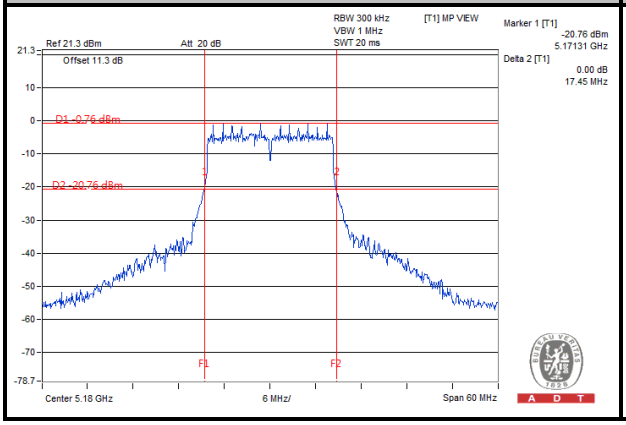
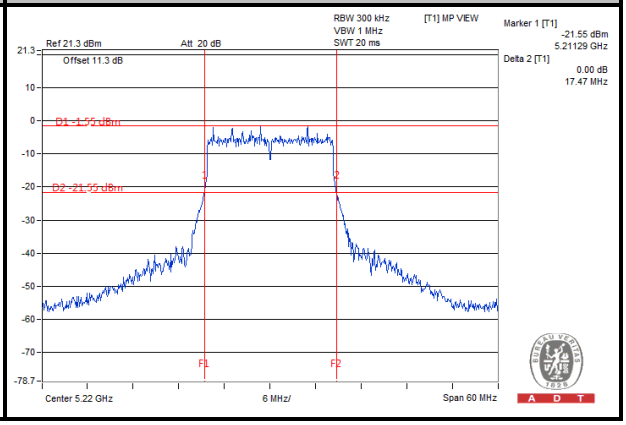
Emission bandwidth

1) Set RBW = approximately 1% of the emission bandwidth.
2) Set the VBW > RBW.
3) Detector = Peak
4) Trace mode = max hold.
5) Measurement the maximum width of the emission that is 20dB down from the peak of the emission. Compare this with RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

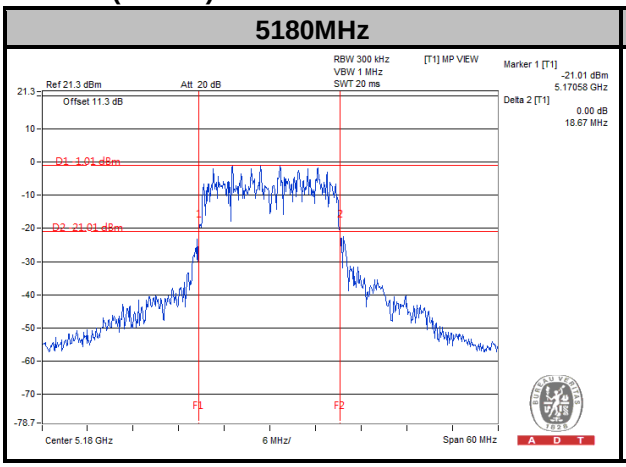
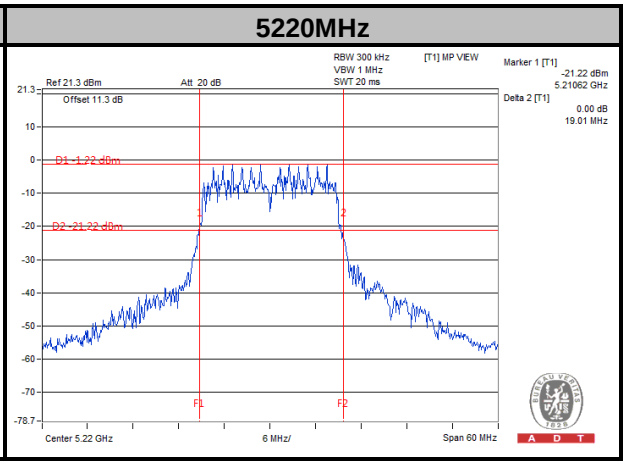
4.7.5 TEST RESULTS

MODE A

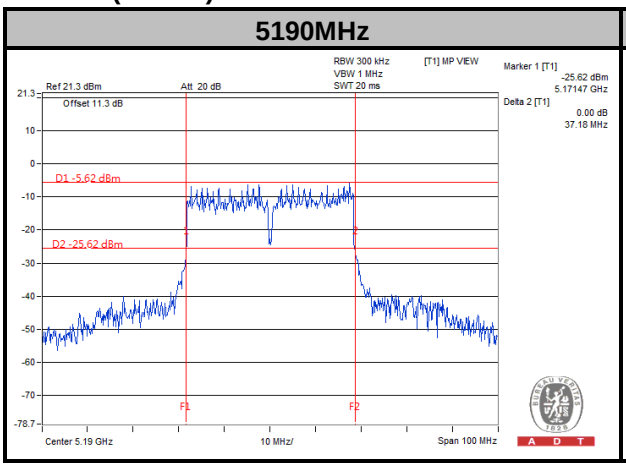
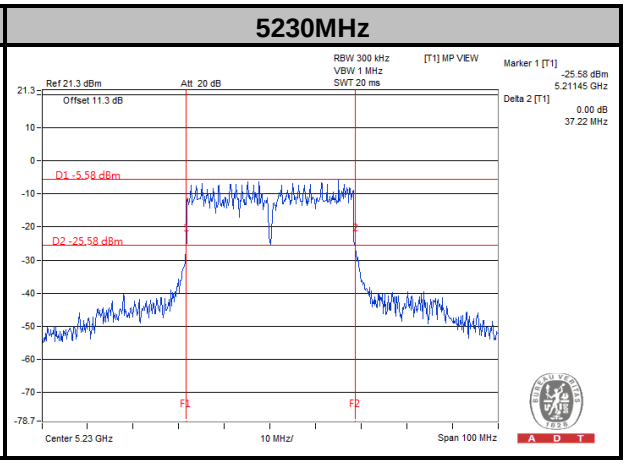
802.11a

5180MHz	5220MHz
	

802.11n (20MHz)

5180MHz	5220MHz
	

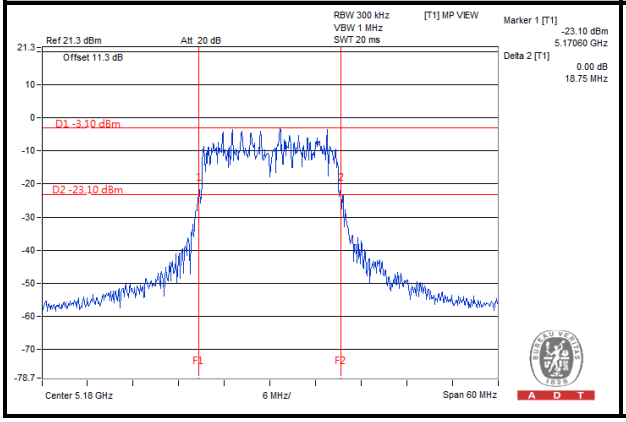
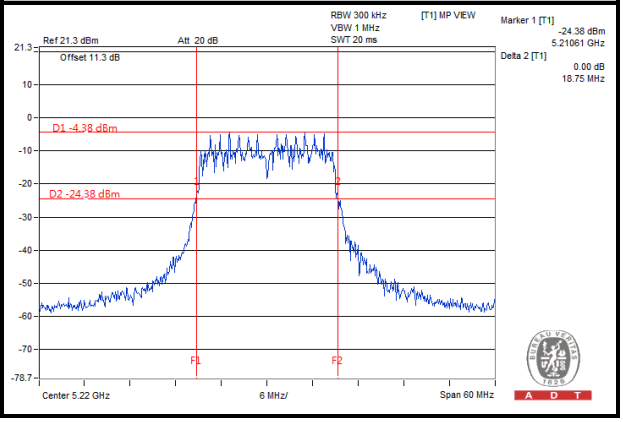
802.11n (40MHz)

5190MHz	5230MHz
	

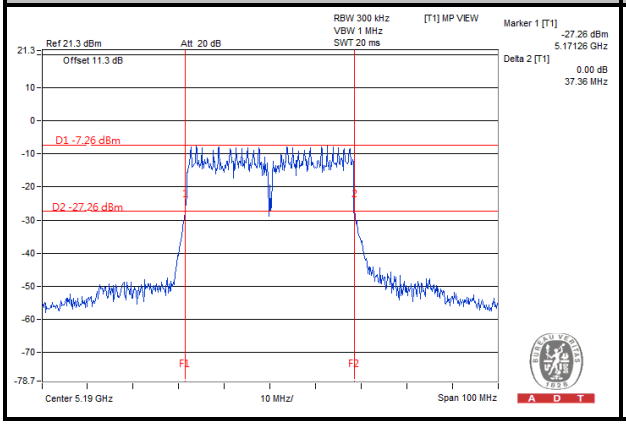
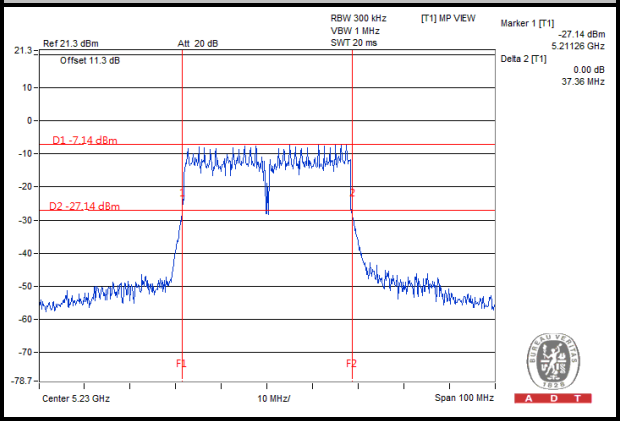
MODE B

CHAIN 0

802.11n (20MHz)

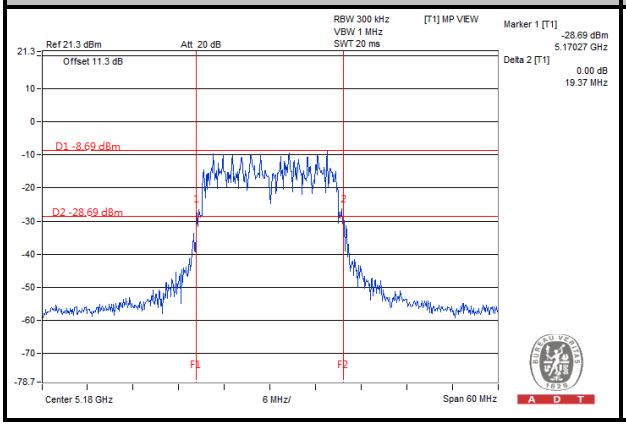
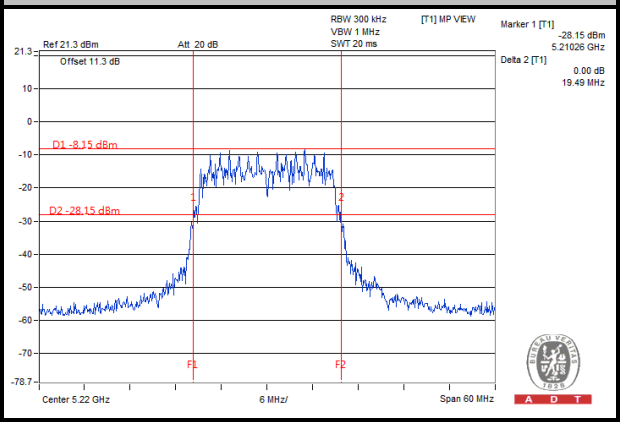
5180MHz	5220MHz
	

802.11n (40MHz)

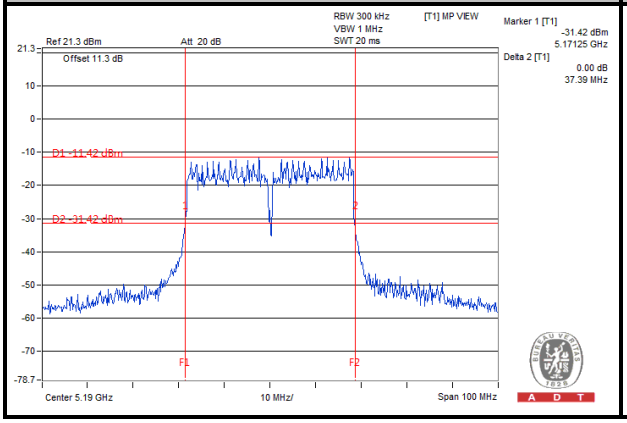
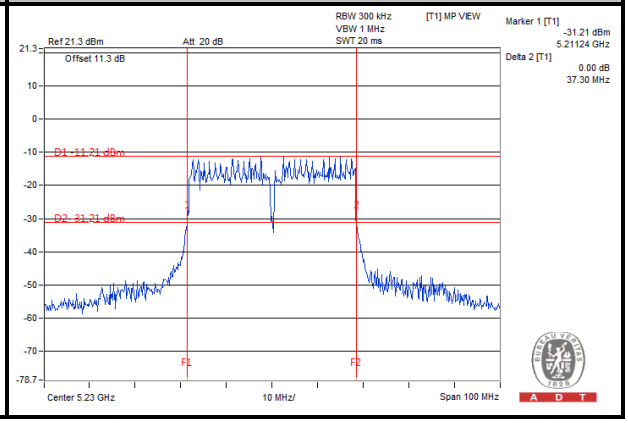
5190MHz	5230MHz
	

CHAIN 1

802.11n (20MHz)

5180MHz	5220MHz
	

802.11n (40MHz)

5190MHz	5230MHz
	

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.
If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

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

No any modifications are made to the EUT by the lab during the test.

---END---