FCC TEST REPORT (15.407)

REPORT NO.:	RF131113C05-1
MODEL NO.:	JWX6082
FCC ID:	W23-JWX6082
RECEIVED:	Nov. 13, 2013
TESTED:	Jan. 13, 2014 ~ Aug. 21, 2014
ISSUED:	Sep. 02, 2014

APPLICANT:	jjPlus Corporation
ADDRESS:	13F.-3, No 120, Qiaohe Rd. Zhonghe Dist., New Taipei City 23584 Taiwan (R.O.C.)

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
RF131113C05-1	Original release	Sep. 02, 2014

1. CERTIFICATION

PRODUCT:	802.11a/b/g/n 3T3R Mini-PCI Express Module
MODEL NO.:	JWX6082
BRAND:	jjPlus
APPLICANT:	jjPlus Corporation
TESTED:	Jan. 13, 2014 ~ Aug. 21, 2014
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart E (Section 15.407)**
	ANSI C63.10-2009

The above equipment (model: JWX6082) 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 : Evonne Liu , **DATE :** Sep. 02, 2014

Evonne Liu / Specialist

APPROVED BY : Sam chen , **DATE :** Sep. 02, 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	N/A	Test not applicable because of not ancillary equipment.
15.407(b/1/2/3)(b)(6)	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.75dB 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	Antenna connector is I-pex.

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

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	802.11a/b/g/n 3T3R Mini-PCI Express Module
MODEL NO.	JWX6082
POWER SUPPLY	5.0Vdc (host equipment)
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 135Mbps
OPERATING FREQUENCY	5180 ~ 5240MHz
NUMBER OF CHANNEL	4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	39.36mW
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 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, 2TX, 3TX
802.11n (40MHz)	1TX, 2TX, 3TX

2. 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

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	APCM	
A	√	√	√	1TX
B	-	-	√	2TX
C	√	-	√	3TX

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

EUT CONFIGURE MODE	MODE	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
C	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	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0

BANDEDGE MEASUREMENT:

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

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

EUT CONFIGURE MODE	MODE	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
C	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

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
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	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
B, C	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

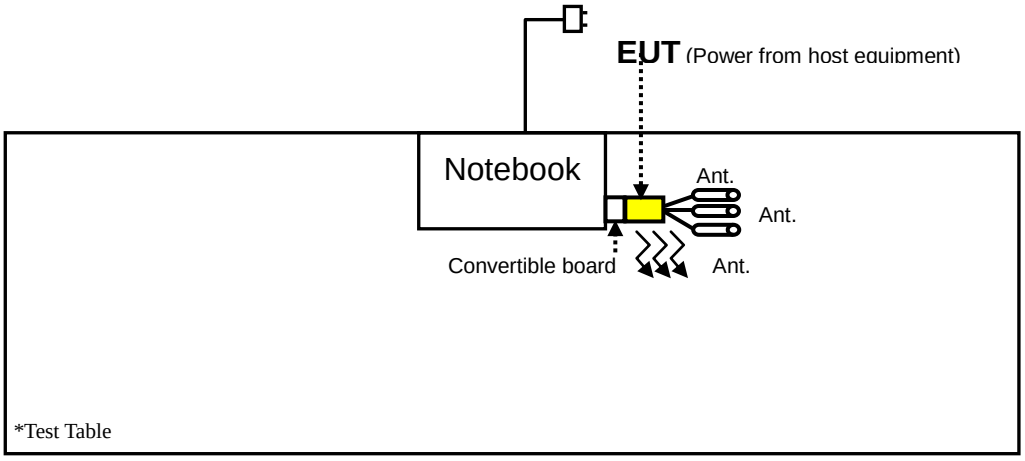
Test CONDITION:

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
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.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



3.4 DUTY CYCLE TEST SIGNAL

MODE A

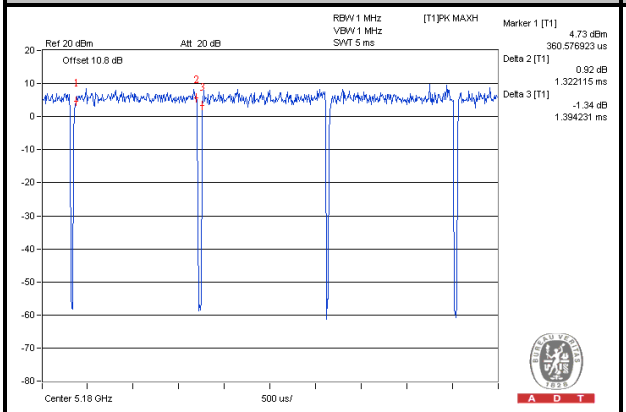
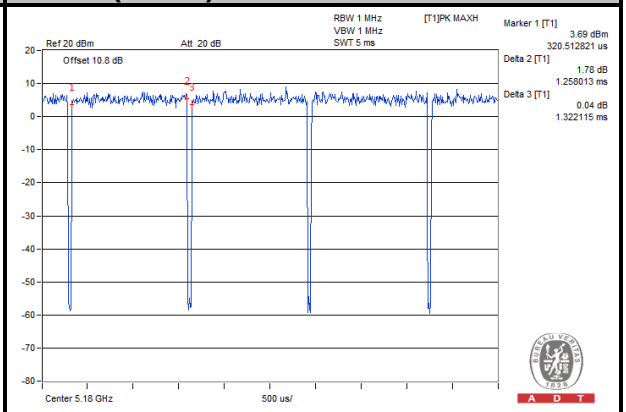
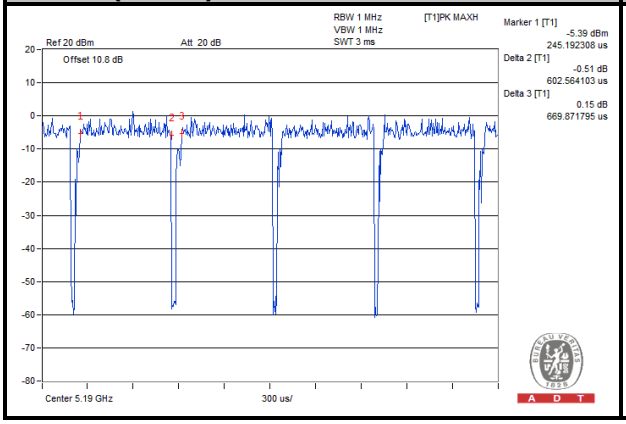
MODULATION TYPE: BPSK

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

802.11a: Duty cycle = 1.322/1.394 = 0.948, Duty factor = 10 * log(1/0.948) = 0.23

802.11n (20MHz): Duty cycle = 1.258/1.322 = 0.951, Duty factor = 10 * log(1/0.951) = 0.22

802.11n (40MHz): Duty cycle = 602/669 = 0.899, Duty factor = 10 * log(1/0.899) = 0.46

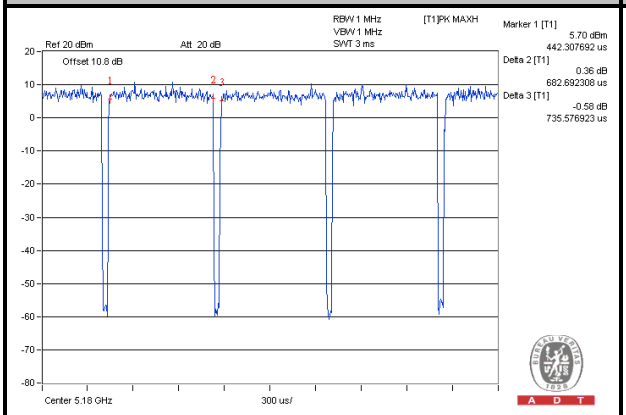
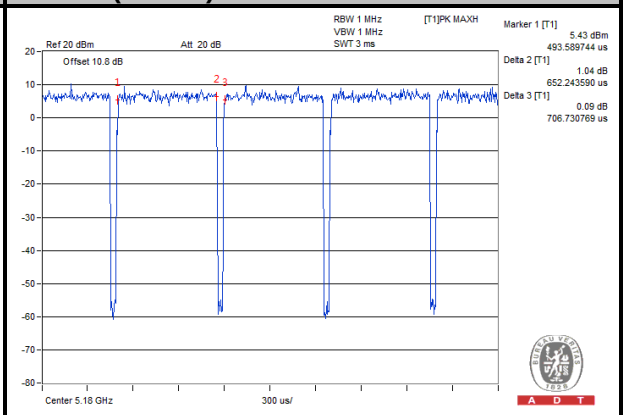
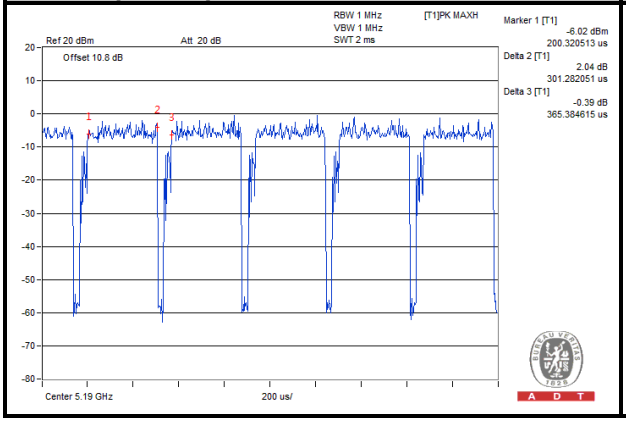
802.11a	802.11n (20MHz)
	
802.11n (40MHz)	
	

MODULATION TYPE: QPSK

802.11a: Duty cycle = 682/735 = 0.928, Duty factor = 10 * log(1/0.928) = 0.32

802.11n (20MHz): Duty cycle = 652/706 = 0.923, Duty factor = 10 * log(1/0.923) = 0.35

802.11n (40MHz): Duty cycle = 301/365 = 0.824, Duty factor = 10 * log(1/0.824) = 0.84

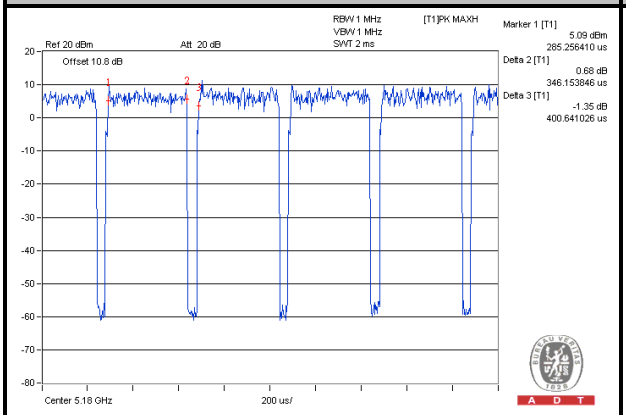
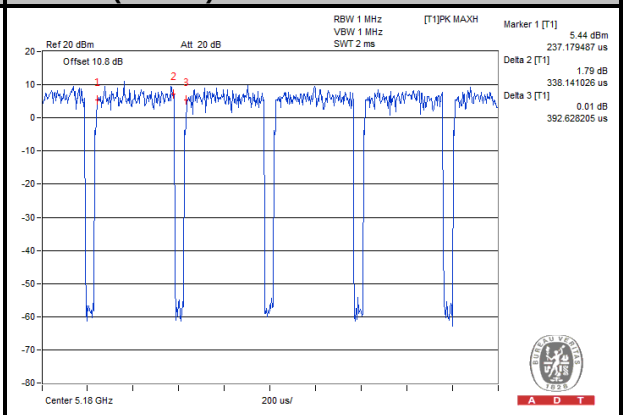
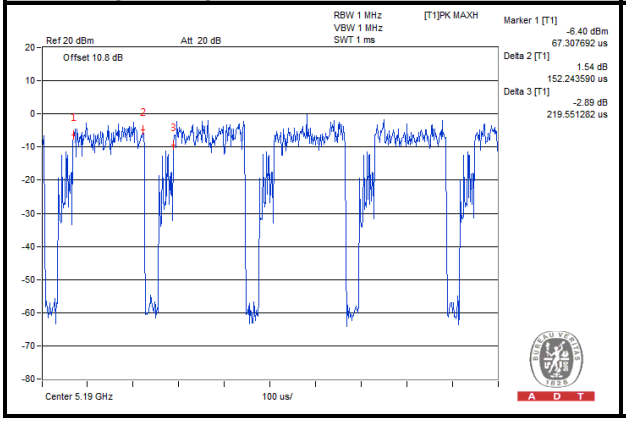
802.11a	802.11n (20MHz)
	
802.11n (40MHz)	
	

MODULATION TYPE: 16QAM

802.11a: Duty cycle = 346/400 = 0.864, Duty factor = 10 * log(1/0.864) = 0.63

802.11n (20MHz): Duty cycle = 338/392 = 0.861, Duty factor = 10 * log(1/0.861) = 0.65

802.11n (40MHz): Duty cycle = 152/219 = 0.693, Duty factor = 10 * log(1/0.693) = 1.59

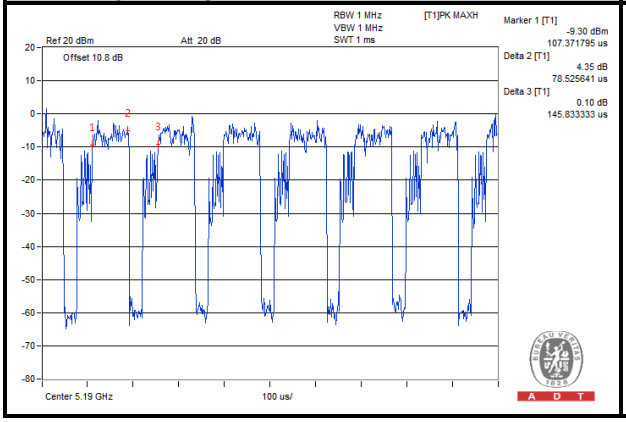
802.11a	802.11n (20MHz)
	
802.11n (40MHz)	
	

MODULATION TYPE: 64QAM

802.11a: Duty cycle = 177/232 = 0.765, Duty factor = 10 * log(1/0.765) = 1.16

802.11n (20MHz): Duty cycle = 184/237 = 0.777, Duty factor = 10 * log(1/0.777) = 1.10

802.11n (40MHz): Duty cycle = 78/145 = 0.538, Duty factor = 10 * log(1/0.538) = 2.69

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

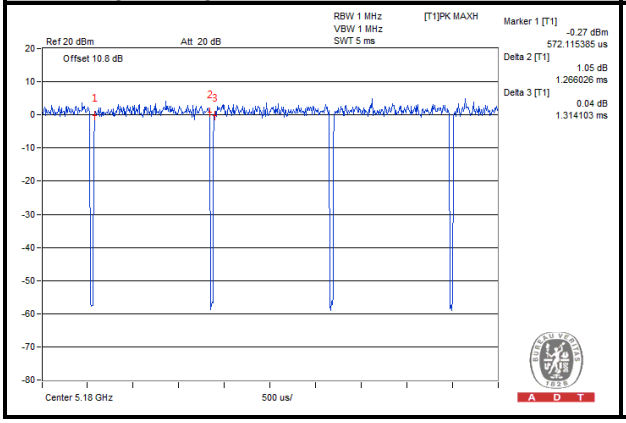
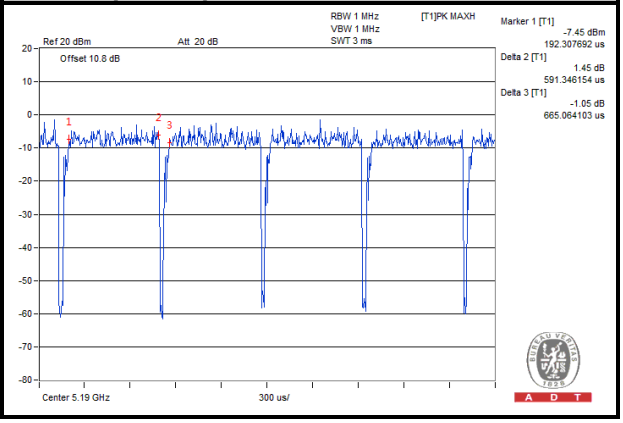
MODE C

MODULATION TYPE: BPSK

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

802.11n (20MHz): Duty cycle = 1.266/1.314 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16

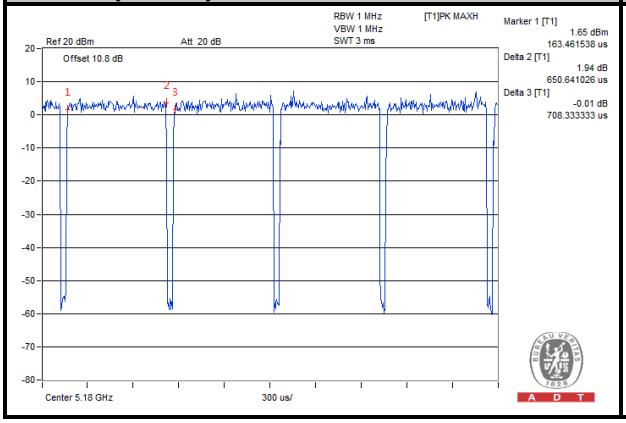
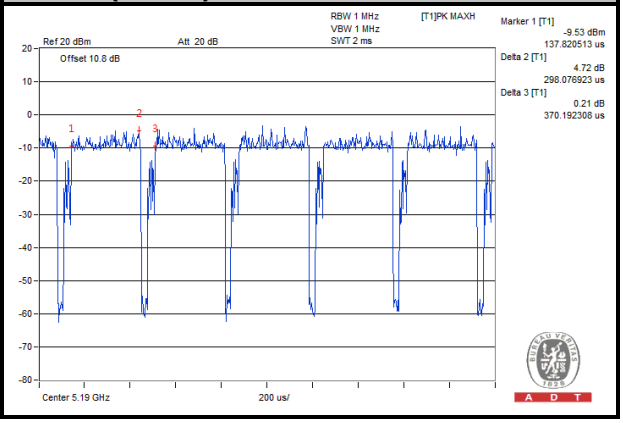
802.11n (40MHz): Duty cycle = 591/665 = 0.889, Duty factor = 10 * log(1/0.889) = 0.51

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

MODULATION TYPE: QPSK

802.11n (20MHz): Duty cycle = 650/708 = 0.918, Duty factor = 10 * log(1/0.918) = 0.37

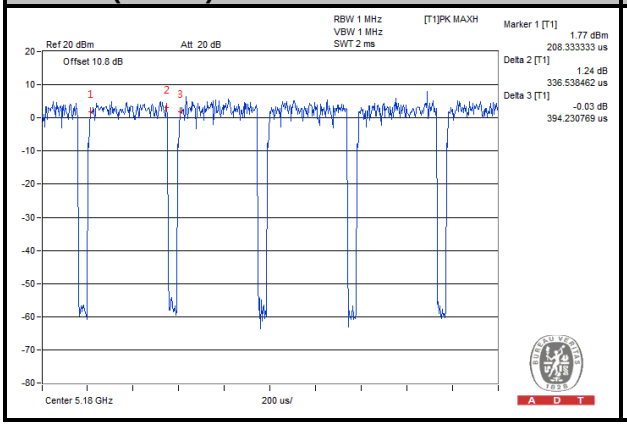
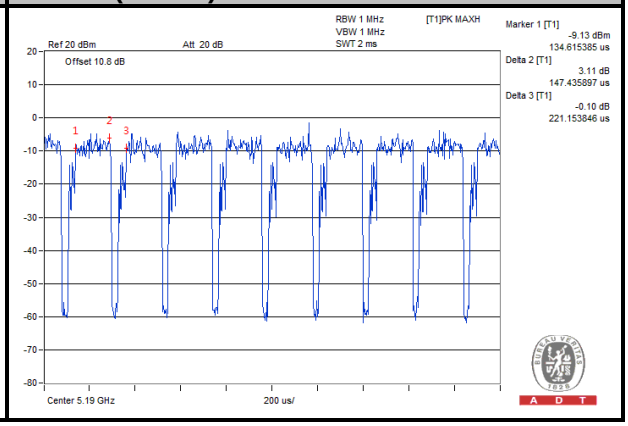
802.11n (40MHz): Duty cycle = 298/370 = 0.805, Duty factor = 10 * log(1/0.805) = 0.94

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

MODULATION TYPE: 16QAM

802.11n (20MHz): Duty cycle = 336/394 = 0.853, Duty factor = 10 * log(1/0.853) = 0.69

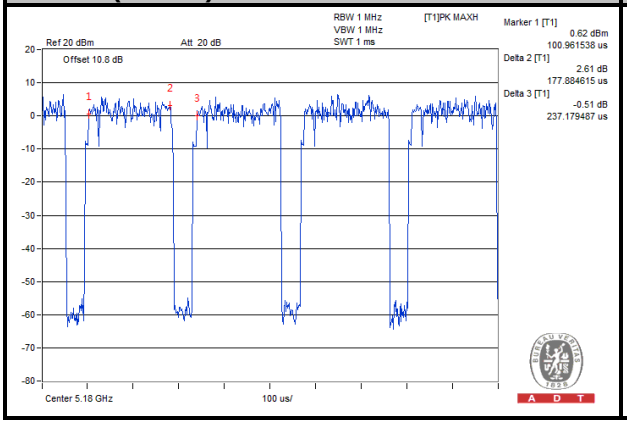
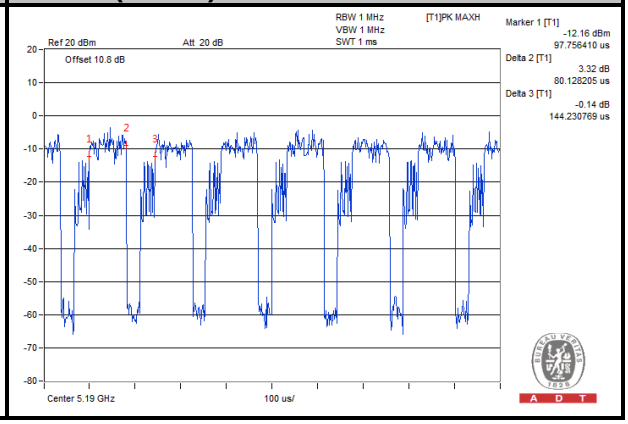
802.11n (40MHz): Duty cycle = 147/221 = 0.666, Duty factor = 10 * log(1/0.666) = 1.76

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

MODULATION TYPE: 64QAM

802.11n (20MHz): Duty cycle = 177/237 = 0.750, Duty factor = 10 * log(1/0.750) = 1.25

802.11n (40MHz): Duty cycle = 80/144 = 0.555, Duty factor = 10 * log(1/0.555) = 2.55

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 Old v01r04
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, 2013	Apr. 14, 2014
			Apr. 15, 2014	Apr. 14, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2013	Dec. 20, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Mar. 25, 2013	Mar. 24, 2014
			Feb. 27. 2014	Feb. 26, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-405	Feb. 21, 2013	Feb. 20, 2014
			Mar. 03, 2014	Mar. 02, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 26, 2013	Dec. 25, 2014
Preamplifier EMCI	EMC 330H	980071	Dec. 27, 2013	Dec. 26, 2014
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
Power Sensor	MA2411B	1207325	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:

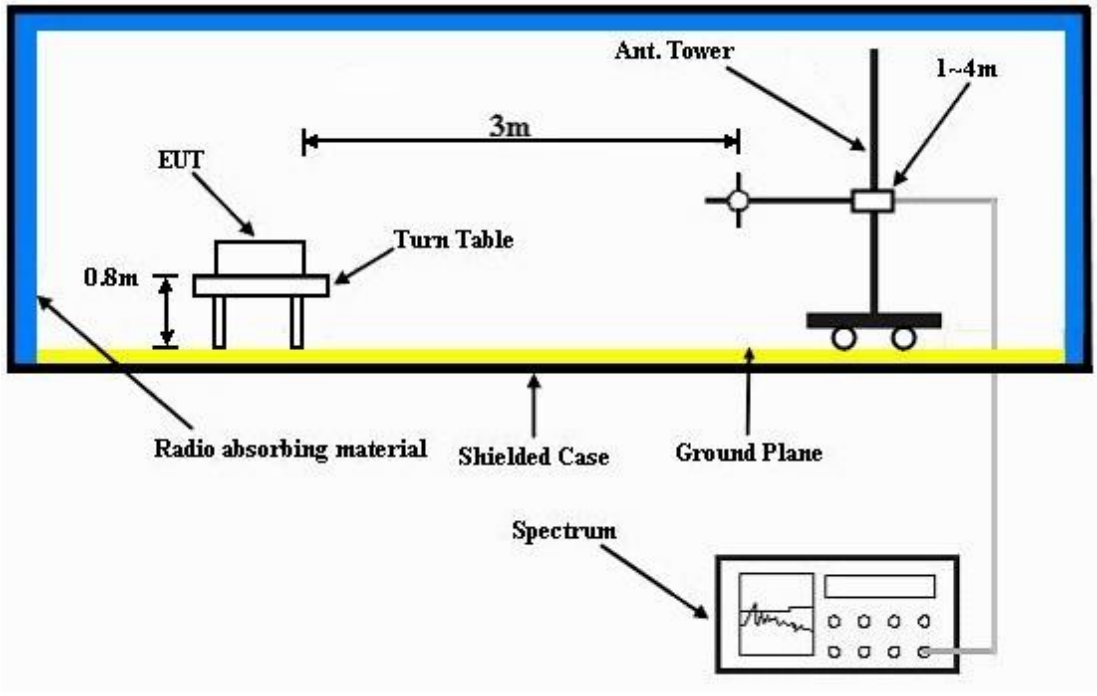
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency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

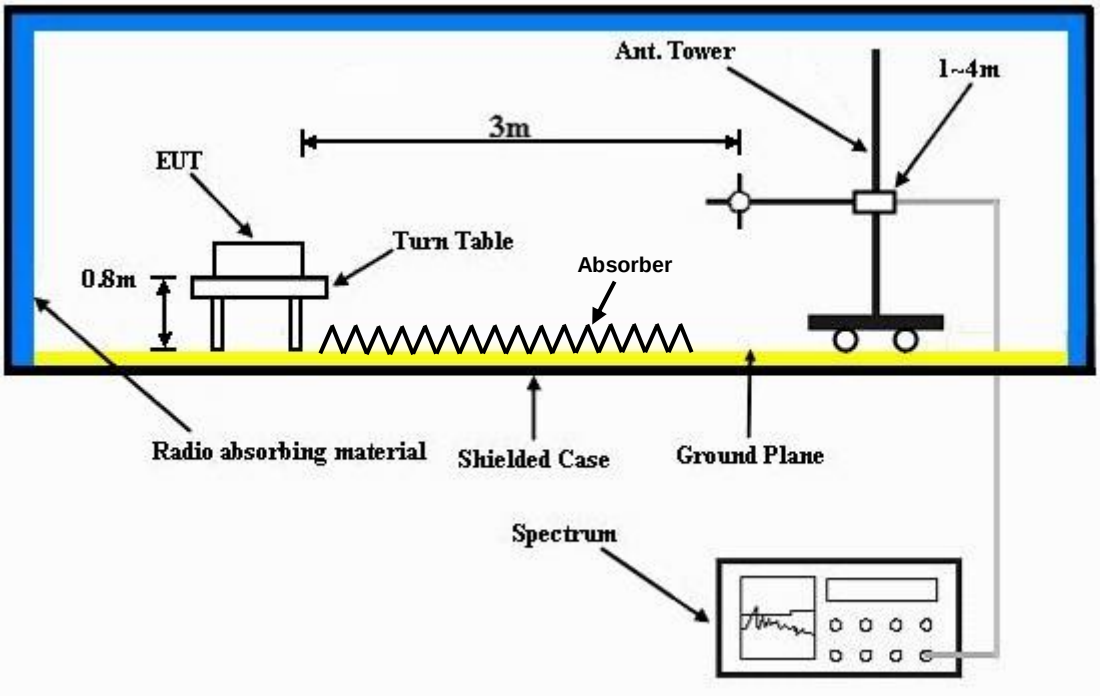
No deviation.

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
5150	53.25	45	54	-0.75	34.12	8.13	34	100	110	Average
5150	64.45	56.2	74	-9.55	34.12	8.13	34	100	110	Peak
5180	102.18	93.87			34.15	8.16	34	100	110	Average
5180	109.07	100.76			34.15	8.16	34	100	110	Peak
5364	46.5	37.86	54	-7.5	34.29	8.38	34.03	100	110	Average
5364	57.63	48.99	74	-16.37	34.29	8.38	34.03	100	110	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
5150	46.96	38.71	54	-7.04	34.12	8.13	34	131	230	Average
5150	59.39	51.14	74	-14.61	34.12	8.13	34	131	230	Peak
5180	97.62	89.31			34.15	8.16	34	131	230	Average
5180	104.87	96.56			34.15	8.16	34	131	230	Peak
5430	43.01	34.22	54	-10.99	34.35	8.48	34.04	131	230	Average
5430	57.3	48.51	74	-16.7	34.35	8.48	34.04	131	230	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
5030	43.11	35.05	54	-10.89	34.03	8	33.97	131	236	Average
5030	57.98	49.92	74	-16.02	34.03	8	33.97	131	236	Peak
5220	98.21	89.82			34.17	8.22	34	131	236	Average
5220	105.89	97.5			34.17	8.22	34	131	236	Peak
5440	43.06	34.27	54	-10.94	34.35	8.48	34.04	131	236	Average
5440	57.99	49.2	74	-16.01	34.35	8.48	34.04	131	236	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
5142	45.05	36.79	54	-8.95	34.12	8.13	33.99	110	100	Average
5142	58.43	50.17	74	-15.57	34.12	8.13	33.99	110	100	Peak
5220	103.85	95.46			34.17	8.22	34	110	100	Average
5220	110.08	101.69			34.17	8.22	34	110	100	Peak
5376	45.23	36.57	54	-8.77	34.29	8.41	34.04	110	100	Average
5376	59.25	50.59	74	-14.75	34.29	8.41	34.04	110	100	Peak
5142	45.05	36.79	54	-8.95	34.12	8.13	33.99	110	100	Average

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
5024	42.79	34.76	54	-11.21	34.03	7.97	33.97	129	235	Average
5024	56.82	48.79	74	-17.18	34.03	7.97	33.97	129	235	Peak
5240	97.56	89.12			34.19	8.26	34.01	129	235	Average
5240	105.3	96.86			34.19	8.26	34.01	129	235	Peak
5368	43.16	34.49	54	-10.84	34.29	8.41	34.03	129	235	Average
5368	57.29	48.62	74	-16.71	34.29	8.41	34.03	129	235	Peak
5024	42.79	34.76	54	-11.21	34.03	7.97	33.97	129	235	Average
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
5116	44.34	36.14	54	-9.66	34.09	8.1	33.99	108	110	Average
5116	58.09	49.89	74	-15.91	34.09	8.1	33.99	108	110	Peak
5240	102.97	94.53			34.19	8.26	34.01	108	110	Average
5240	109.48	101.04			34.19	8.26	34.01	108	110	Peak
5374	43.92	35.26	54	-10.08	34.29	8.41	34.04	108	110	Average
5374	58.47	49.81	74	-15.53	34.29	8.41	34.04	108	110	Peak
5116	44.34	36.14	54	-9.66	34.09	8.1	33.99	108	110	Average

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	46.65	38.4	54	-7.35	34.12	8.13	34	130	230	Average
5150	59.09	50.84	74	-14.91	34.12	8.13	34	130	230	Peak
5180	97.02	88.71			34.15	8.16	34	130	230	Average
5180	104.15	95.84			34.15	8.16	34	130	230	Peak
5432	43.1	34.31	54	-10.9	34.35	8.48	34.04	130	230	Average
5432	57.79	49	74	-16.21	34.35	8.48	34.04	130	230	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
5150	52.42	44.17	54	-1.58	34.12	8.13	34	100	109	Average
5150	64.39	56.14	74	-9.61	34.12	8.13	34	100	109	Peak
5180	102.08	93.77			34.15	8.16	34	100	109	Average
5180	108.99	100.68			34.15	8.16	34	100	109	Peak
5382	44.15	35.47	54	-9.85	34.31	8.41	34.04	100	109	Average
5382	57.54	48.86	74	-16.46	34.31	8.41	34.04	100	109	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
5078	43.01	34.89	54	-10.99	34.07	8.03	33.98	131	234	Average
5078	57.25	49.13	74	-16.75	34.07	8.03	33.98	131	234	Peak
5220	97.73	89.34			34.17	8.22	34	131	234	Average
5220	105.49	97.1			34.17	8.22	34	131	234	Peak
5400	43.12	34.4	54	-10.88	34.32	8.44	34.04	131	234	Average
5400	57.27	48.55	74	-16.73	34.32	8.44	34.04	131	234	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	44.65	36.4	54	-9.35	34.12	8.13	34	110	99	Average
5148	57.98	49.73	74	-16.02	34.12	8.13	34	110	99	Peak
5220	103.34	94.95			34.17	8.22	34	110	99	Average
5220	109.61	101.22			34.17	8.22	34	110	99	Peak
5364	45.34	36.7	54	-8.66	34.29	8.38	34.03	110	99	Average
5364	58.14	49.5	74	-15.86	34.29	8.38	34.03	110	99	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
5130	42.86	34.64	54	-11.14	34.11	8.1	33.99	129	234	Average
5130	57.72	49.5	74	-16.28	34.11	8.1	33.99	129	234	Peak
5240	97.08	88.64			34.19	8.26	34.01	129	234	Average
5240	104.59	96.15			34.19	8.26	34.01	129	234	Peak
5360	43.09	34.46	54	-10.91	34.28	8.38	34.03	129	234	Average
5360	57.76	49.13	74	-16.24	34.28	8.38	34.03	129	234	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
5118	44.31	36.11	54	-9.69	34.09	8.1	33.99	108	109	Average
5118	57.83	49.63	74	-16.17	34.09	8.1	33.99	108	109	Peak
5240	102.31	93.87			34.19	8.26	34.01	108	109	Average
5240	108.76	100.32			34.19	8.26	34.01	108	109	Peak
5416	44.16	35.43	54	-9.84	34.33	8.44	34.04	108	109	Average
5416	57.66	48.93	74	-16.34	34.33	8.44	34.04	108	109	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
5148	46.12	37.87	54	-7.88	34.12	8.13	34	129	230	Average
5148	58.01	49.76	74	-15.99	34.12	8.13	34	129	230	Peak
5190	92.15	83.81			34.15	8.19	34	129	230	Average
5190	99.41	91.07			34.15	8.19	34	129	230	Peak
5432	43.51	34.72	54	-10.49	34.35	8.48	34.04	129	230	Average
5432	57.66	48.87	74	-16.34	34.35	8.48	34.04	129	230	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
5150	51.63	43.38	54	-2.37	34.12	8.13	34	109	109	Average
5150	62.92	54.67	74	-11.08	34.12	8.13	34	109	109	Peak
5190	97.65	89.31			34.15	8.19	34	109	109	Average
5190	104.86	96.52			34.15	8.19	34	109	109	Peak
5434	44.01	35.22	54	-9.99	34.35	8.48	34.04	109	109	Average
5434	59.13	50.34	74	-14.87	34.35	8.48	34.04	109	109	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
5070	43.13	35.03	54	-10.87	34.05	8.03	33.98	130	235	Average
5070	56.82	48.72	74	-17.18	34.05	8.03	33.98	130	235	Peak
5230	92.34	83.94			34.19	8.22	34.01	130	235	Average
5230	99.72	91.32			34.19	8.22	34.01	130	235	Peak
5408	43.46	34.74	54	-10.54	34.32	8.44	34.04	130	235	Average
5408	57.29	48.57	74	-16.71	34.32	8.44	34.04	130	235	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
5050	44.1	36.04	54	-9.9	34.04	8	33.98	108	108	Average
5050	57.39	49.33	74	-16.61	34.04	8	33.98	108	108	Peak
5230	97.5	89.1			34.19	8.22	34.01	108	108	Average
5230	104.43	96.03			34.19	8.22	34.01	108	108	Peak
5350	44.31	35.68	54	-9.69	34.28	8.38	34.03	108	108	Average
5350	57.73	49.1	74	-16.27	34.28	8.38	34.03	108	108	Peak

REMARKS:

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

BELOW 1GHz WORST-CASE DATA:

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)
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
99.66	23.21	44.53	43.5	-20.29	9.66	1.28	32.26	155	124	Peak
166.62	25.36	45.8	43.5	-18.14	10.29	1.52	32.25	165	216	Peak
220.89	38.87	57.71	46	-7.13	11.72	1.65	32.21	158	215	Peak
311.2	38.01	53.51	46	-7.99	14.51	2.11	32.12	135	221	Peak
498.1	33.62	44.09	46	-12.38	19	2.63	32.1	165	124	Peak
697.6	29.41	35.29	46	-16.59	23.1	3.11	32.09	102	115	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
30	32.42	46.15	40	-7.58	17.8	0.74	32.27	165	216	Peak
99.66	22.4	43.72	43.5	-21.1	9.66	1.28	32.26	135	216	Peak
166.62	28.08	48.52	43.5	-15.42	10.29	1.52	32.25	158	20	Peak
365.1	26.22	39.74	46	-19.78	16.33	2.26	32.11	157	158	Peak
499.5	30.84	41.31	46	-15.16	19	2.63	32.1	166	215	Peak
869.8	31.58	35.21	46	-14.42	24.6	3.44	31.67	102	55	Peak

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

Margin value = Emission level – Limit value

MODE C

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
5096	44.09	35.93	54	-9.91	34.08	8.07	33.99	112	287	Average
5096	63.62	55.46	74	-10.38	34.08	8.07	33.99	112	287	Peak
5180	95.81	87.5			34.15	8.16	34	112	287	Average
5180	104.18	95.87			34.15	8.16	34	112	287	Peak
5402	43.16	34.44	54	-10.84	34.32	8.44	34.04	112	287	Average
5402	64.14	55.42	74	-9.86	34.32	8.44	34.04	112	287	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
5150	51.64	43.39	54	-2.36	34.12	8.13	34	126	38	Average
5150	66.66	58.41	74	-7.34	34.12	8.13	34	126	38	Peak
5180	105.3	96.99			34.15	8.16	34	126	100	Average
5180	112.92	104.61			34.15	8.16	34	126	100	Peak
5428	46.42	37.65	54	-7.58	34.33	8.48	34.04	126	100	Average
5428	64.06	55.29	74	-9.94	34.33	8.48	34.04	126	100	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
5112	43.44	35.24	54	-10.56	34.09	8.1	33.99	160	288	Average
5112	63.49	55.29	74	-10.51	34.09	8.1	33.99	160	288	Peak
5220	94.2	85.81			34.17	8.22	34	160	288	Average
5220	101.93	93.54			34.17	8.22	34	160	288	Peak
5366	43.88	35.24	54	-10.12	34.29	8.38	34.03	160	288	Average
5366	64.28	55.64	74	-9.72	34.29	8.38	34.03	160	288	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
5128	47.1	38.88	54	-6.9	34.11	8.1	33.99	126	100	Average
5128	63.45	55.23	74	-10.55	34.11	8.1	33.99	126	100	Peak
5220	104.38	95.99			34.17	8.22	34	126	100	Average
5220	111.3	102.91			34.17	8.22	34	126	100	Peak
5422	46.86	38.09	54	-7.14	34.33	8.48	34.04	126	100	Average
5422	64.21	55.44	74	-9.79	34.33	8.48	34.04	126	100	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
5148	43.09	34.84	54	-10.91	34.12	8.13	34	112	287	Average
5148	64.1	55.85	74	-9.9	34.12	8.13	34	112	287	Peak
5240	93.98	85.54			34.19	8.26	34.01	112	287	Average
5240	101.36	92.92			34.19	8.26	34.01	112	287	Peak
5456	43.21	34.39	54	-10.79	34.36	8.51	34.05	112	287	Average
5456	64.03	55.21	74	-9.97	34.36	8.51	34.05	112	287	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
5134	44.68	36.43	54	-9.32	34.11	8.13	33.99	124	42	Average
5134	63.24	54.99	74	-10.76	34.11	8.13	33.99	124	42	Peak
5240	104	95.56			34.19	8.26	34.01	124	42	Average
5240	111.06	102.62			34.19	8.26	34.01	124	42	Peak
5416	44.73	36	54	-9.27	34.33	8.44	34.04	124	42	Average
5416	63.72	54.99	74	-10.28	34.33	8.44	34.04	124	42	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
5104	43.75	35.59	54	-10.25	34.08	8.07	33.99	112	287	Average
5104	63.59	55.43	74	-10.41	34.08	8.07	33.99	112	287	Peak
5190	91.64	83.3			34.15	8.19	34	112	287	Average
5190	98.37	90.03			34.15	8.19	34	112	287	Peak
5400	43.46	34.74	54	-10.54	34.32	8.44	34.04	112	287	Average
5400	63.97	55.25	74	-10.03	34.32	8.44	34.04	112	287	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
5150	52.63	44.38	54	-1.37	34.12	8.13	34	143	199	Average
5150	67.56	59.31	74	-6.44	34.12	8.13	34	143	199	Peak
5190	102.08	93.74			34.15	8.19	34	126	43	Average
5190	108.67	100.33			34.15	8.19	34	126	43	Peak
5420	45.1	36.33	54	-8.9	34.33	8.48	34.04	126	43	Average
5420	63.43	54.66	74	-10.57	34.33	8.48	34.04	126	43	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
5098	43.69	35.53	54	-10.31	34.08	8.07	33.99	162	288	Average
5098	63.2	55.04	74	-10.8	34.08	8.07	33.99	162	288	Peak
5230	90.44	82.04			34.19	8.22	34.01	162	288	Average
5230	97.27	88.87			34.19	8.22	34.01	162	288	Peak
5448	44.21	35.38	54	-9.79	34.36	8.51	34.04	162	288	Average
5448	64.17	55.34	74	-9.83	34.36	8.51	34.04	162	288	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
5116	47.75	39.55	54	-6.25	34.09	8.1	33.99	126	100	Average
5116	64.11	55.91	74	-9.89	34.09	8.1	33.99	126	100	Peak
5230	100.89	92.49			34.19	8.22	34.01	126	100	Average
5230	108.14	99.74			34.19	8.22	34.01	126	100	Peak
5460	47.26	38.44	54	-6.74	34.36	8.51	34.05	126	100	Average
5460	64.97	56.15	74	-9.03	34.36	8.51	34.05	126	100	Peak

REMARKS:

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

4.2 PEAK TRANSMIT POWER MEASUREMENT

4.2.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

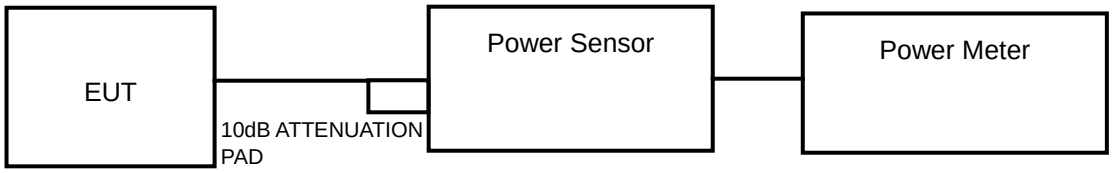
FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.250 ~ 5.350GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.470 ~ 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB

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

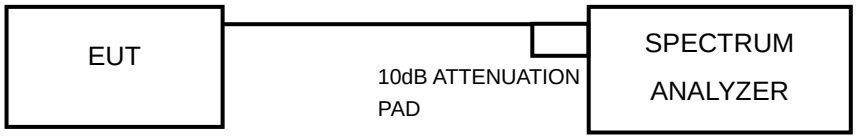
Per KDB 662911 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.
For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

4.2.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT



FOR 26dB BANDWIDTH



4.2.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.2.4 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%.

4.2.5 DEVIATION FROM TEST STANDARD

No deviation.

4.2.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.2.7 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	39.36	15.95	17	PASS
44	5220	38.11	15.81	17	PASS
48	5240	35.24	15.47	17	PASS

NOTE:
1. 4dBm + 10log(24.81) = 17.95dBm > 17dBm.
2. 4dBm + 10log(27.75) = 18.43dBm > 17dBm.
3. 4dBm + 10log(24.90) = 17.96dBm > 17dBm.

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	33.19	15.21	17	PASS
44	5220	32.96	15.18	17	PASS
48	5240	28.25	14.51	17	PASS

NOTE:
1. 4dBm + 10log(23.94) = 17.79dBm > 17dBm.
2. 4dBm + 10log(23.20) = 17.65dBm > 17dBm.
3. 4dBm + 10log(22.50) = 17.52dBm > 17dBm.

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	16.41	12.15	17	PASS
46	5230	15.10	11.79	17	PASS

NOTE:
1. 4dBm + 10log(43.57) = 20.39dBm > 17dBm.
2. 4dBm + 10log(43.14) = 20.35dBm > 17dBm.

MODE B

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	10.60	10.24	22.05	13.43	17	PASS
40	5200	10.58	10.12	21.71	13.37	17	PASS
48	5240	9.68	10.02	19.34	12.86	17	PASS

NOTE:
CHAIN 0
1. 4dBm + 10log(21.40) = 17.30dBm > 17dBm.
2. 4dBm + 10log(21.25) = 17.27dBm > 17dBm.
3. 4dBm + 10log(21.46) = 17.32dBm > 17dBm.

CHAIN 1
1. 4dBm + 10log(21.33) = 17.29dBm > 17dBm.
2. 4dBm + 10log(21.51) = 17.33dBm > 17dBm.
3. 4dBm + 10log(21.42) = 17.31dBm > 17dBm.

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	9.21	8.67	15.70	11.96	17	PASS
46	5230	8.64	8.02	13.65	11.35	17	PASS

NOTE:
CHAIN 0
1. 4dBm + 10log(42.96) = 20.33dBm > 17dBm.
2. 4dBm + 10log(42.55) = 21.29dBm > 17dBm.

CHAIN 1
1. 4dBm + 10log(50.15) = 21.00dBm > 17dBm.
2. 4dBm + 10log(49.05) = 20.91dBm > 17dBm.

MODE C

802.11n (20MHz)

CHAN.	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	10.71	10.28	10.66	34.08	15.33	17	PASS
40	5200	10.47	10.08	11.05	34.06	15.32	17	PASS
48	5240	9.72	10.05	11.15	32.52	15.12	17	PASS

NOTE:
CHAIN 0
1. 4dBm + 10log(21.26) = 17.28dBm > 17dBm.
2. 4dBm + 10log(21.37) = 17.30dBm > 17dBm.
3. 4dBm + 10log(20.98) = 17.22dBm > 17dBm.

CHAIN 1
1. 4dBm + 10log(21.43) = 17.31dBm > 17dBm.
2. 4dBm + 10log(21.51) = 17.33dBm > 17dBm.
3. 4dBm + 10log(21.28) = 17.28dBm > 17dBm.

CHAIN 2
1. 4dBm + 10log(21.56) = 17.34dBm > 17dBm.
2. 4dBm + 10log(21.19) = 17.26dBm > 17dBm.
3. 4dBm + 10log(21.23) = 17.27dBm > 17dBm.

802.11n (40MHz)

CHAN.	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	10.21	10.87	10.29	33.40	15.24	17	PASS
46	5230	8.87	8.11	9.48	23.05	13.63	17	PASS

NOTE:
CHAIN 0
1. 4dBm + 10log(41.75) = 20.21dBm > 17dBm.
2. 4dBm + 10log(42.70) = 20.30dBm > 17dBm.

CHAIN 1
1. 4dBm + 10log(43.46) = 20.38dBm > 17dBm.
2. 4dBm + 10log(43.45) = 20.38dBm > 17dBm.

CHAIN 2
1. 4dBm + 10log(42.06) = 20.24dBm > 17dBm.
2. 4dBm + 10log(42.07) = 20.24dBm > 17dBm.

26dB BANDWIDTH

MODE A

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	24.81	PASS
44	5220	27.75	PASS
48	5240	24.90	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	23.94	PASS
44	5220	23.20	PASS
48	5240	22.50	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
38	5190	43.57	PASS
46	5230	43.14	PASS

MODE C

802.11n (20MHz)

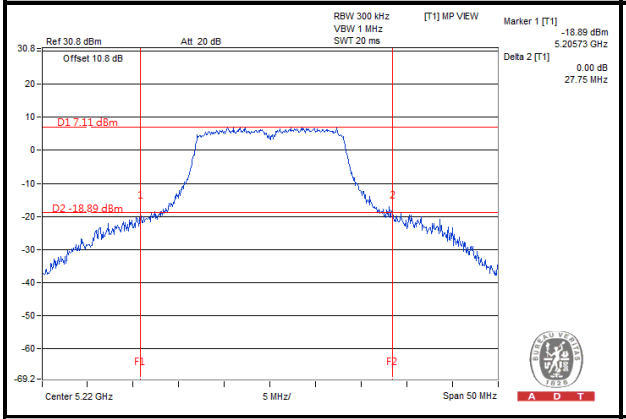
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
36	5180	21.26	21.43	21.56	PASS
40	5200	21.37	21.51	21.19	PASS
48	5240	20.98	21.28	21.23	PASS

802.11n (40MHz)

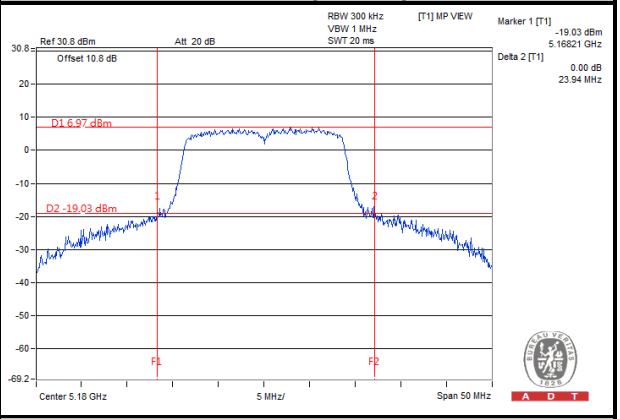
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
38	5190	41.75	43.46	42.06	PASS
46	5230	42.70	43.45	42.07	PASS

SPECTRUM PLOT OF WORST VALUE

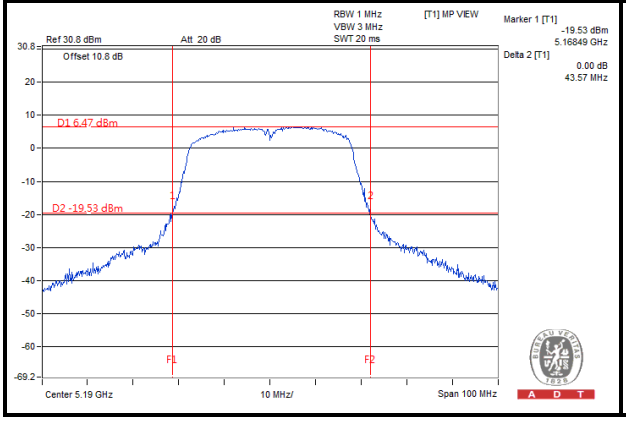
802.11a



802.11n (20MHz)



802.11n (40MHz)

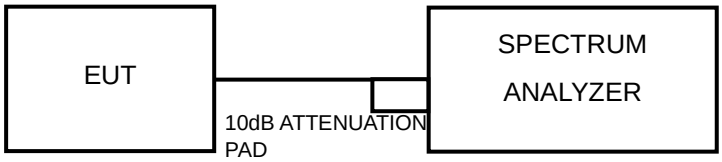


4.3 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.3.1 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

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.3.4 TEST PROCEDURES

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)

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.3.7 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	3.54	0.23	3.77	4	PASS
44	5220	3.64	0.23	3.87	4	PASS
48	5240	3.37	0.23	3.60	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	3.29	0.22	3.51	4	PASS
44	5220	3.13	0.22	3.35	4	PASS
48	5240	2.93	0.22	3.15	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	-2.38	0.46	-1.92	4	PASS
46	5230	-2.47	0.46	-2.01	4	PASS

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

MODE C

802.11n (20MHz)

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					
36	5180	-2.10	-3.29	-2.00	2.51	0.16	2.67	3.23	PASS
40	5200	-2.66	-4.74	-2.03	1.94	0.16	2.1	3.23	PASS
48	5240	-3.07	-5.14	-2.18	1.64	0.16	1.8	3.23	PASS

NOTE:

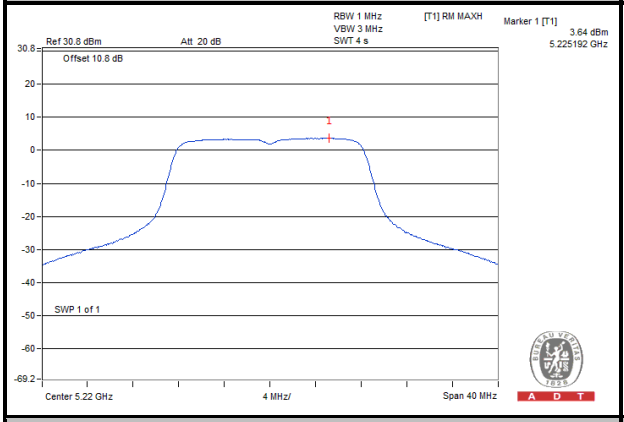
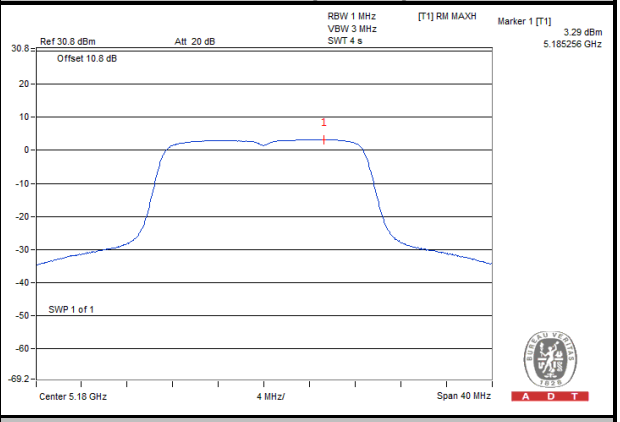
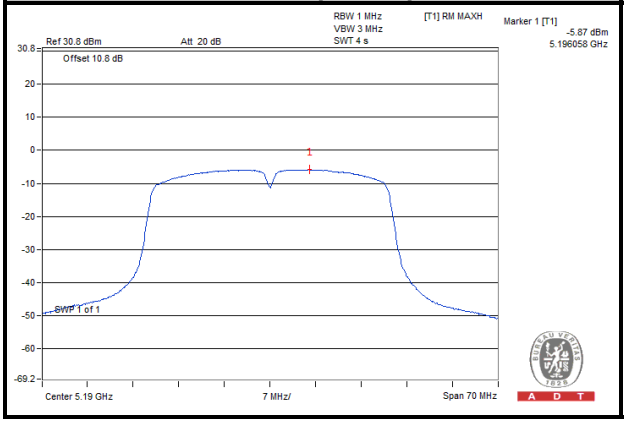
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power density limit shall be reduced to 4-(6.77-6) = 3.23dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

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	-5.87	-6.40	-7.16	-1.16	0.51	-0.65	3.23	PASS
46	5230	-6.76	-6.24	-7.14	-1.42	0.51	-0.91	3.23	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 = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power density limit shall be reduced to 4-(6.77-6) = 3.23dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

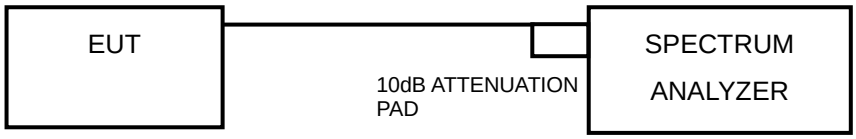
SPECTRUM PLOT OF WORST VALUE	
802.11a	**802.11n (20MHz)**
	
802.11n (40MHz)	
	

4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

Shall not exceed 13 dB.

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 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.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITION

Same as Item 4.3.6.

4.4.7 TEST RESULTS

MODE A

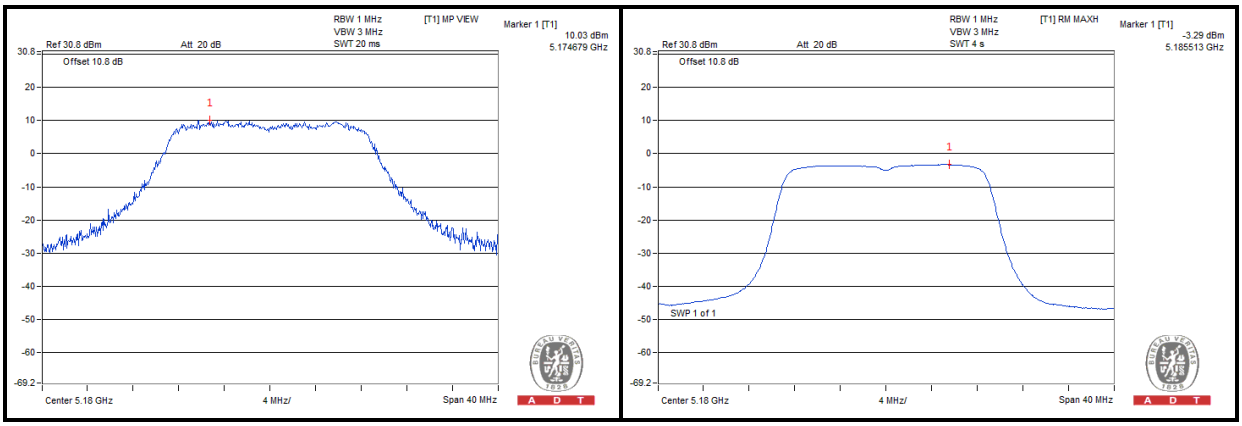
MODULATION MODE	MODULATION TYPE	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)	PPSD WITHOUT DUTY FACTOR (dBm)	PPSD WITH DUTY FACTOR (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS/FAIL
802.11a	BPSK	5180	13.00	3.54	3.77	9.23	13	PASS
	QPSK		13.40	3.55	3.87	9.53	13	PASS
	16QAM		13.42	3.31	3.94	9.48	13	PASS
	64QAM		13.39	2.84	4.00	9.39	13	PASS
802.11n (20MHz)	BPSK	5180	13.43	3.29	3.51	9.92	13	PASS
	QPSK		14.70	4.44	4.79	9.91	13	PASS
	16QAM		14.43	4.28	4.93	9.50	13	PASS
	64QAM		13.99	3.99	5.09	8.90	13	PASS
802.11n (40MHz)	BPSK	5190	5.93	-2.38	-1.92	7.85	13	PASS
	QPSK		6.29	-3.97	-3.13	9.42	13	PASS
	16QAM		5.98	-4.10	-2.51	8.49	13	PASS
	64QAM		6.23	-4.29	-1.60	7.83	13	PASS

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

MODE C

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 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
802.11n (20MHz)	BPSK	5180	7.87	10.03	6.69	-2.10	-3.29	-2.00	-1.94	-3.13	-1.84	9.81	13.16	8.53	13	PASS
	QPSK		10.26	9.71	8.40	0.45	-0.35	-1.61	0.82	0.02	-1.24	9.44	9.69	9.64	13	PASS
	16QAM		10.10	10.13	9.05	0.28	-0.40	-1.65	0.97	0.29	-0.96	9.13	9.84	10.01	13	PASS
	64QAM		11.00	10.25	9.33	0.00	-0.77	-1.93	1.25	0.48	-0.68	9.75	9.77	10.01	13	PASS
802.11n (40MHz)	BPSK	5190	3.25	4.31	3.02	-5.87	-6.40	-7.16	-5.36	-5.89	-6.65	8.61	10.20	9.67	13	PASS
	QPSK		2.68	3.64	2.85	-6.56	-7.36	-7.48	-5.62	-6.42	-6.54	8.30	10.06	9.39	13	PASS
	16QAM		3.83	3.37	2.66	-7.01	-7.27	-7.49	-5.25	-5.51	-5.73	9.08	8.88	8.39	13	PASS
	64QAM		3.28	3.29	2.64	-7.23	-7.37	-8.02	-4.68	-4.82	-5.47	7.96	8.11	8.11	13	PASS

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

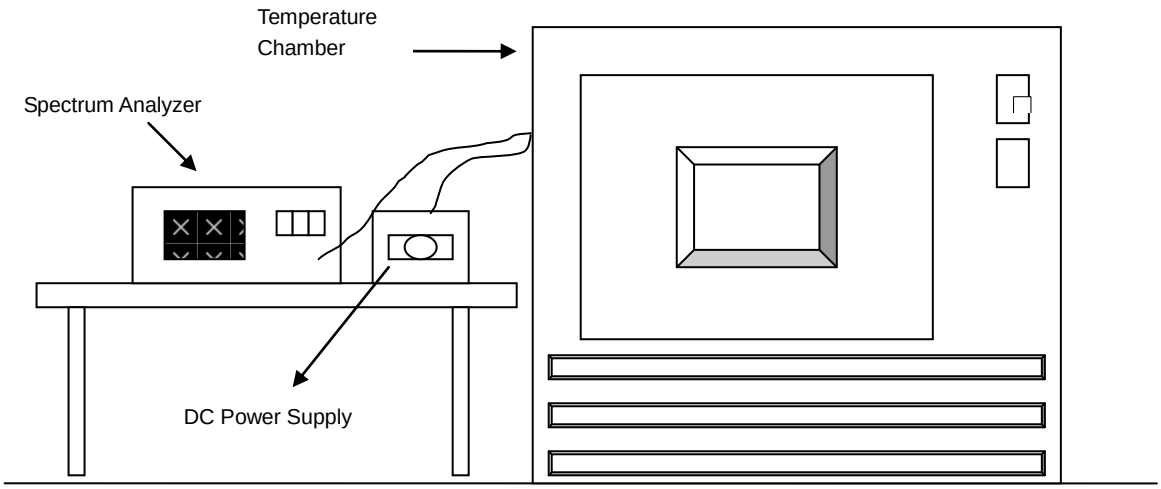


4.5 FREQUENCY STABILITY

4.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

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. 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.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

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

4.5.7 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	3.3	5180.039536	7.632	5180.039590	7.643	5180.040044	7.731	5180.039662	7.657
40	3.3	5180.040089	7.739	5180.040335	7.787	5180.039509	7.627	5180.039760	7.676
30	3.3	5180.041200	7.954	5180.040875	7.891	5180.041047	7.924	5180.040711	7.859
20	3.3	5180.042096	8.127	5180.042008	8.110	5180.042046	8.117	5180.042324	8.171
10	3.3	5180.043734	8.443	5180.043410	8.380	5180.043427	8.384	5180.043580	8.413
0	3.3	5180.042178	8.142	5180.041923	8.093	5180.042431	8.191	5180.042345	8.175
-10	3.3	5180.041030	7.921	5180.040587	7.835	5180.040528	7.824	5180.040846	7.885
-20	3.3	5180.040105	7.742	5180.039999	7.722	5180.040034	7.729	5180.040300	7.780

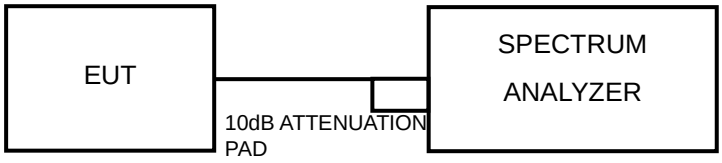
FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	3.2	5180.041794	8.068	5180.041408	7.994	5180.041832	8.076	5180.041738	8.058
	3.3	5180.041935	8.096	5180.042303	8.167	5180.042201	8.147	5180.041897	8.088
	3.40	5180.043279	8.355	5180.043295	8.358	5180.043233	8.346	5180.043663	8.429

4.6 20dBc BANDWIDTH MEASUREMENT

4.6.1 LIMITS OF 20dBc BANDWIDTH MEASUREMENT

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

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 PROCEDURES

789033 D01 General UNII Test Procedures v01r03

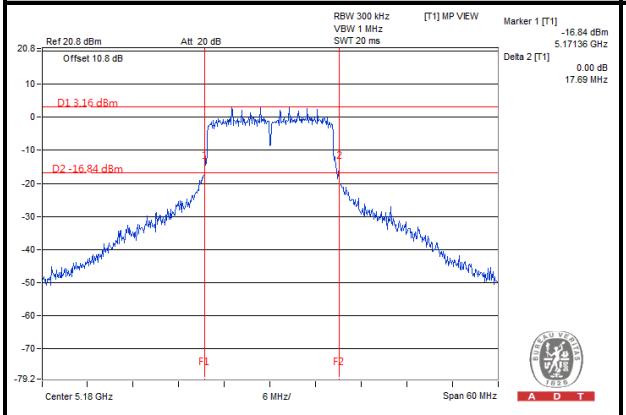
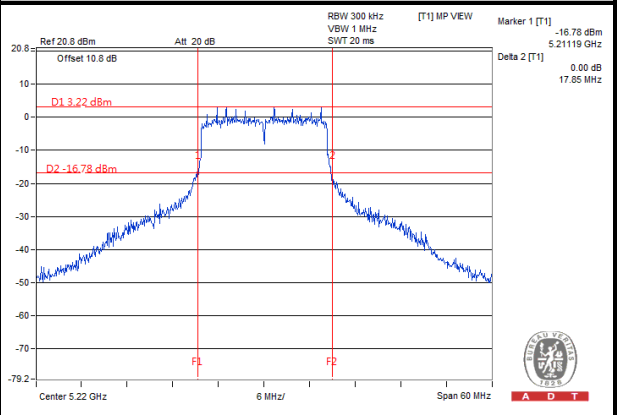
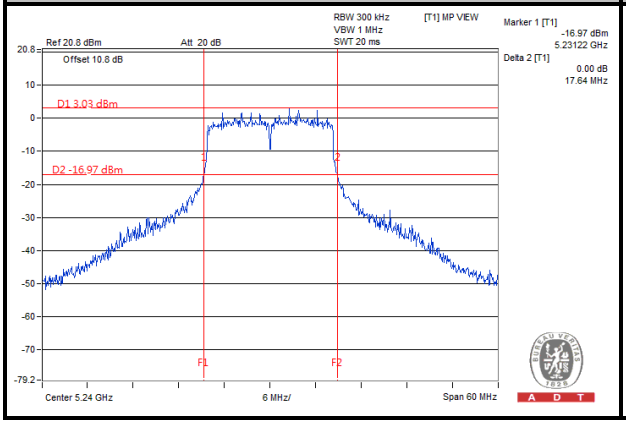
Emission bandwidth

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%.

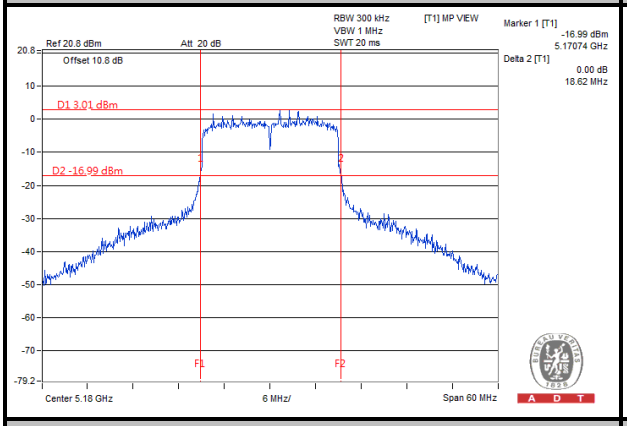
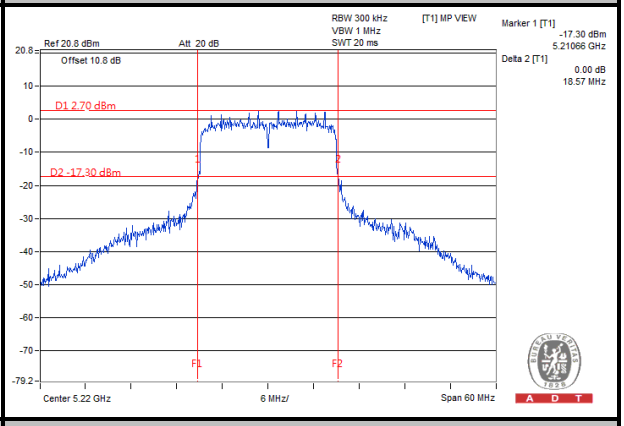
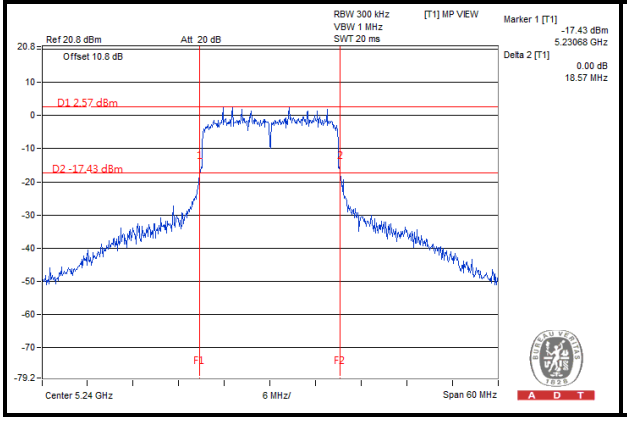
4.6.5 TEST RESULTS

MODE A

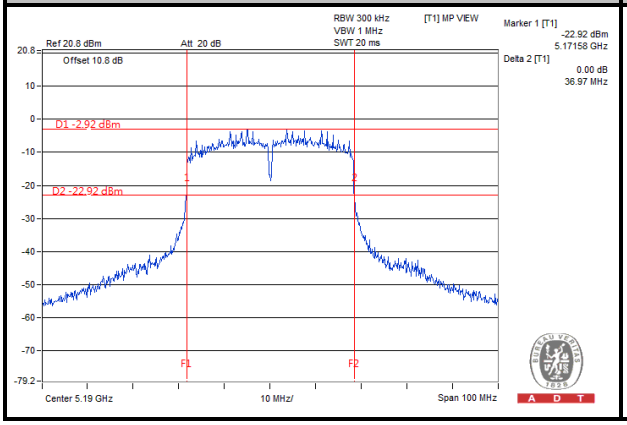
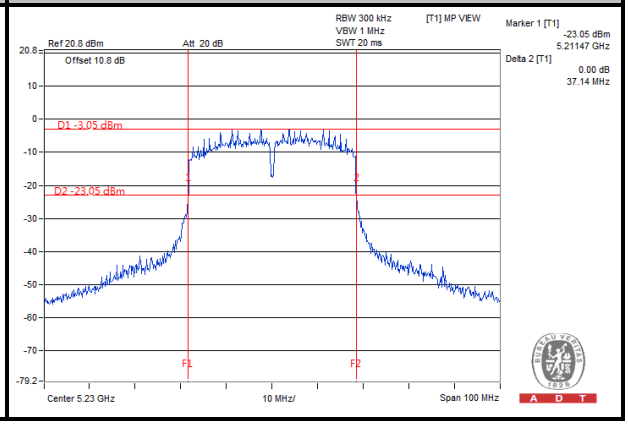
802.11a

5180MHz	5220MHz
	
5240MHz	
	

802.11n (20MHz)

5180MHz	5220MHz
	
5240MHz	
	

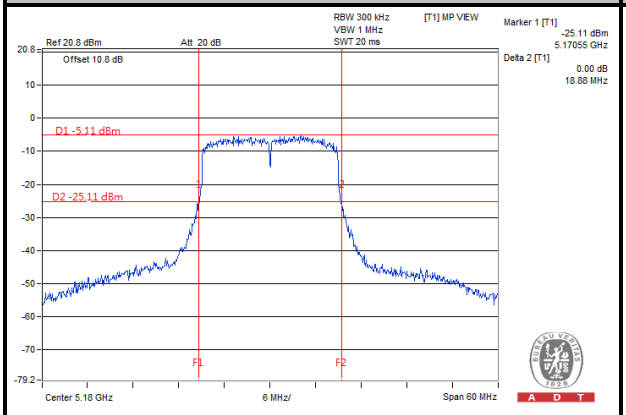
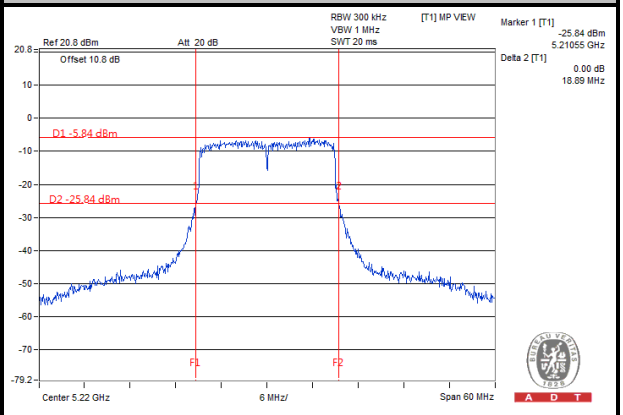
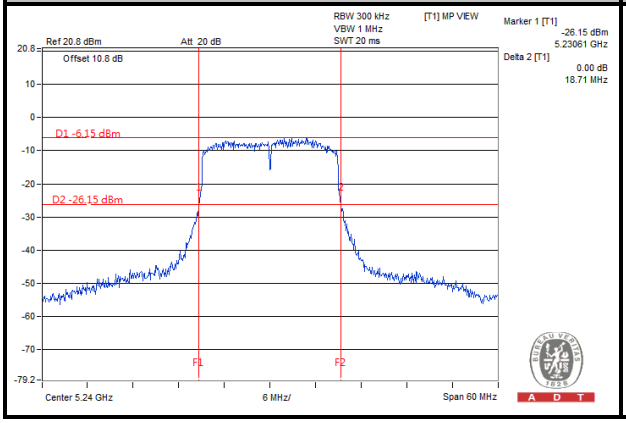
802.11n (40MHz)

5190MHz	5230MHz
	

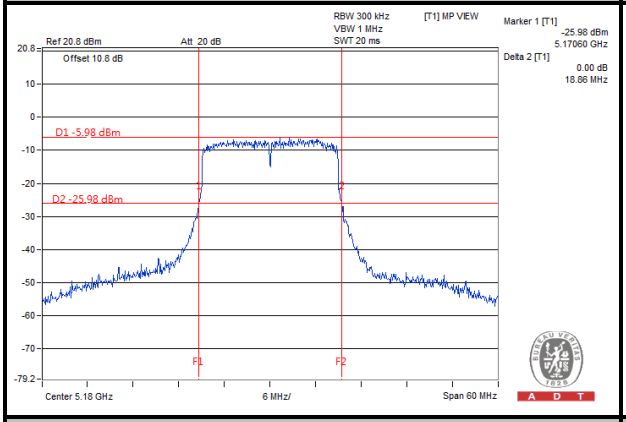
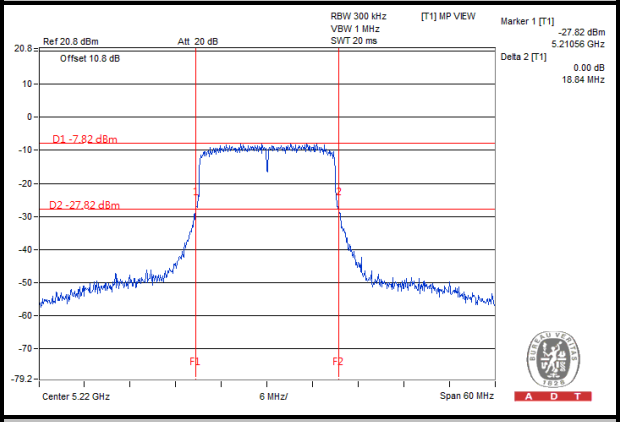
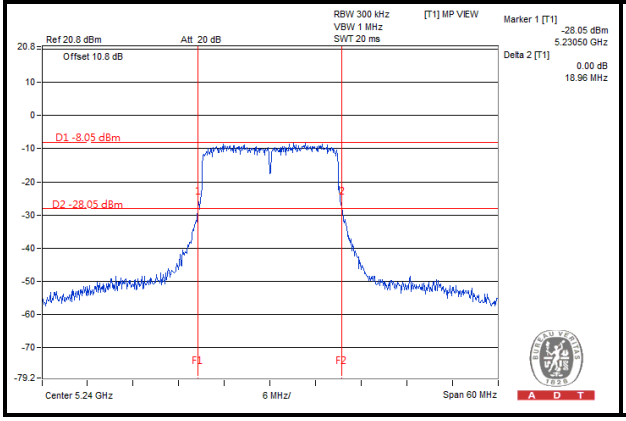
MODE C

802.11n (20MHz)

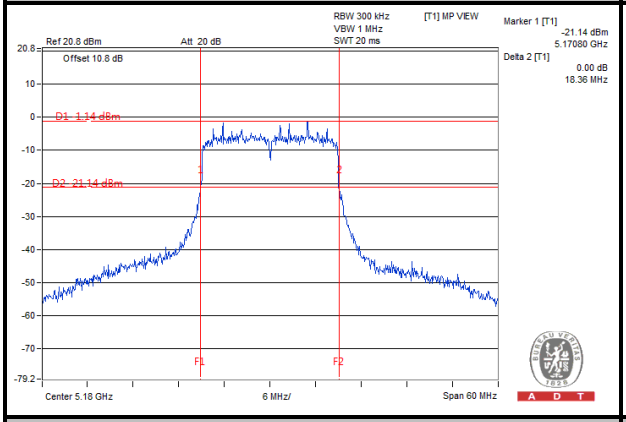
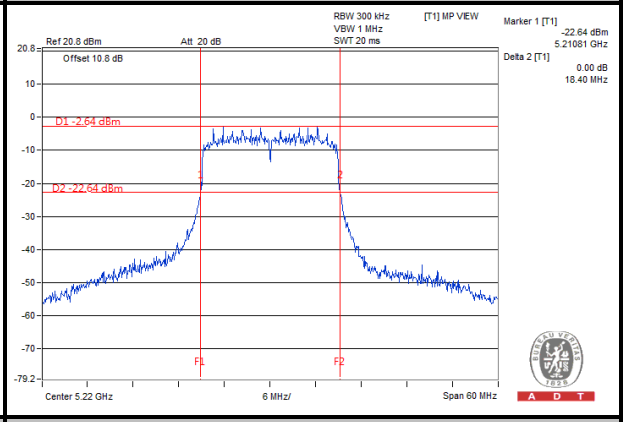
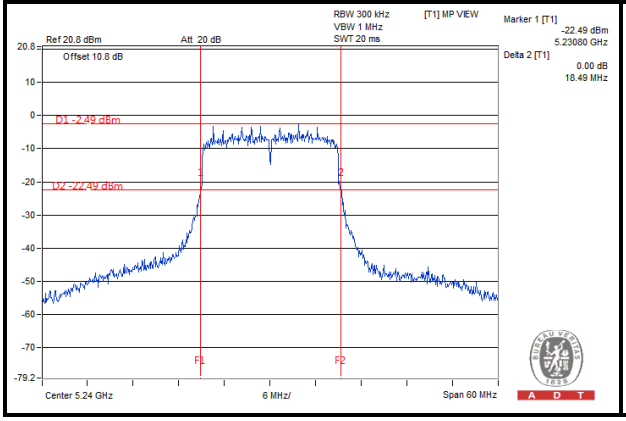
CHAIN 0

5180MHz	5220MHz
	
5240MHz	
	

CHAIN 1

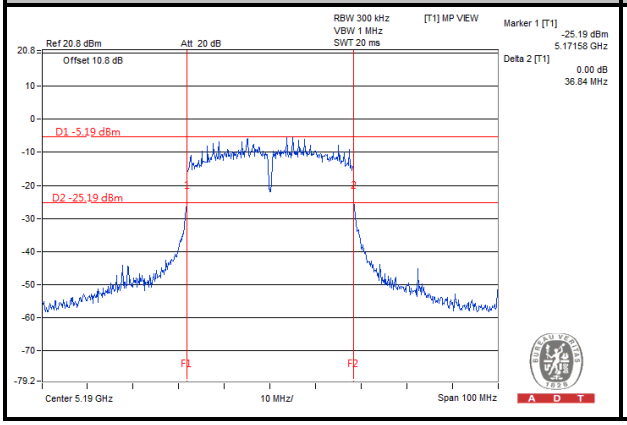
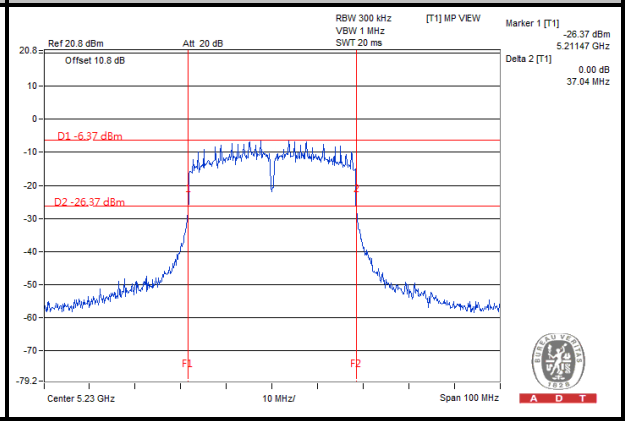
5180MHz	5220MHz
	
5240MHz	
	

CHAIN 2

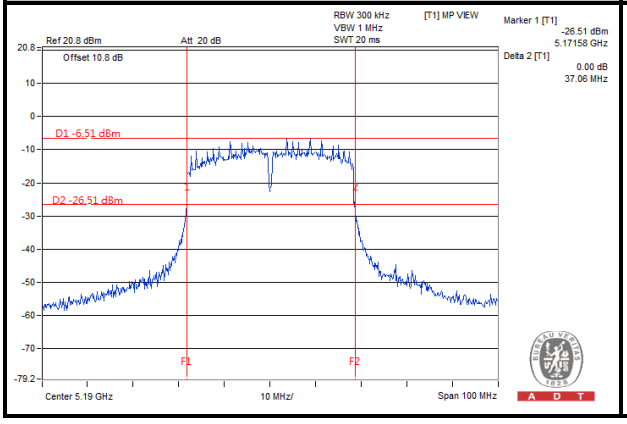
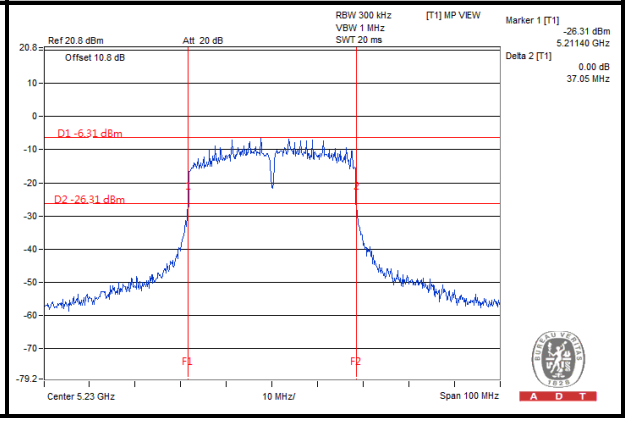
5180MHz	5220MHz
	
5240MHz	
	

802.11n (40MHz)

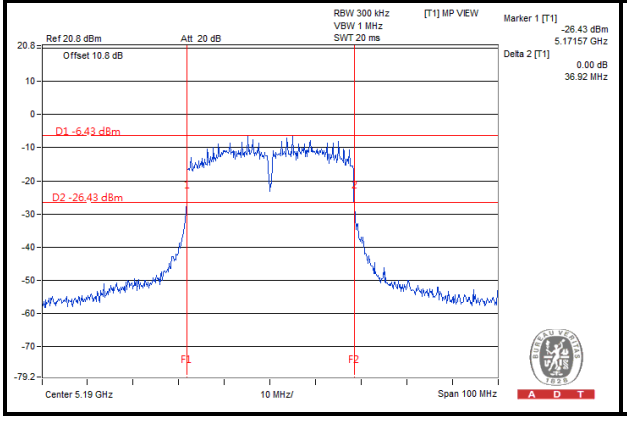
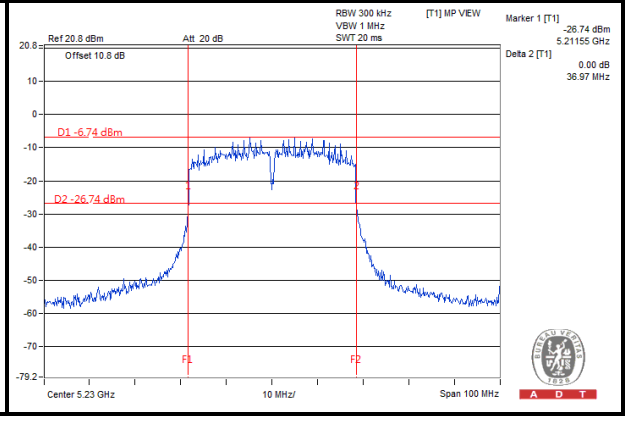
CHAIN 0

5190MHz	5230MHz
	

CHAIN 1

5190MHz	5230MHz
	

CHAIN 2

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---