FCC Test Report

Report No.:	RF150727C01A-1
FCC ID:	TE7D5V2
Test Model:	Archer D5
Received Date:	Aug. 05, 2015
Test Date:	Aug. 25 ~ Oct. 29, 2015
Issued Date:	Nov. 02, 2015
Applicant:	TP-LINK TECHNOLOGIES CO., LTD.
Address:	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 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 Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

Table of Contents

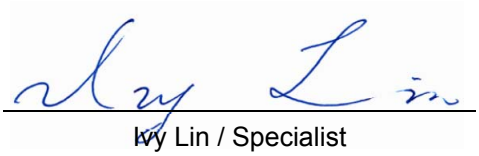
Release Control Record

Issue No.	Description	Date Issued
RF150727C01A-1	Original release	Nov. 02, 2015

1 Certificate of Conformity

Product:	AC1200 Wireless Dual Band Gigabit ADSL2+Modem Router
Brand:	TP-LINK
Test Model:	Archer D5
Sample Status:	Prototype
Applicant:	TP-LINK TECHNOLOGIES CO., LTD.
Test Date:	Aug. 25 ~ Oct. 29, 2015
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

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 :  , **Date:** Nov. 02, 2015

Ivy Lin / Specialist

Approved by :  , **Date:** Nov. 02, 2015

Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -8.76dB at 0.16955MHz
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5321.00MHz, 5281.00MHz, 5867.00MHz, 5868.00MHz, 5714.00MHz
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is SMA Plug Straight/Reverse not a standard connector.
15.215	Channel Bandwidth	Pass	Meet the requirement of limit. Minimun passing 99% OBW Highest frequency 5249.48MHz is not overlap 5250MHz.

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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC1200 Wireless Dual Band Gigabit ADSL2+Modem Router
Brand	TP-LINK
Test Model	Archer D5
Status of EUT	Prototype
Power Supply Rating	12Vdc from adapter
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	5180 ~ 5240MHz: 337.036mW 5745 ~ 5825MHz: 194.420mW
Antenna Type	Omni-Directional antenna with 3dBi gain
Antenna Connector	SMA Plug Straight/Reverse
Accessory Device	Adapter
Data Cable Supplied	N/A

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	Beamforming Mode	TX Function
802.11a	Not Support	1TX
802.11n(HT20)	Support	2TX
802.11n(HT40)	Support	2TX
802.11ac(VHT20)	Support	2TX
802.11ac(VHT40)	Support	2TX
802.11ac(VHT80)	Support	2TX

*The modulation and bandwidth are similar for 802.11n mode for HT20/HT40 and 802.11ac mode for VHT20/VHT40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

* For 5GHz band 802.11n and 802.11ac, after pre-tested two modes (with beamforming mode and CDD mode) found CDD mode was the worst, therefore chosen for final test for radiated emission and power line conducted emission test and presented in the test report.

2. The EUT uses following adapter.

Brand	Ten Pao Industrial Co., Ltd
Model	S040EU1200250
Input Power	100-240Vac, 50/60Hz, 1.2A Max.
Output Power	12Vdc/ 2500mA
Power Line	1.5m DC cable without core attached on adapter

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

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)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	65.5
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	65.5

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)
-	802.11n (HT20)	5180-5240	36 to 48	40	OFDM	BPSK	7.2
		5745-5825	149 to 165		OFDM	BPSK	7.2

Power Line Conducted Emission Test:

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (HT20)	5180-5240	36 to 48	40	OFDM	BPSK	7.2
		5745-5825	149 to 165		OFDM	BPSK	7.2

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)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	65.5
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	65.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	25deg. C, 66%RH	120Vac, 60Hz	Alan Wu
PLC	26deg. C, 63%RH	120Vac, 60Hz	Alan Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Ted Chang

3.3 Duty Cycle of Test Signal

CDD Mode

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

802.11a: Duty cycle = 2.063/2.085 = 0.989

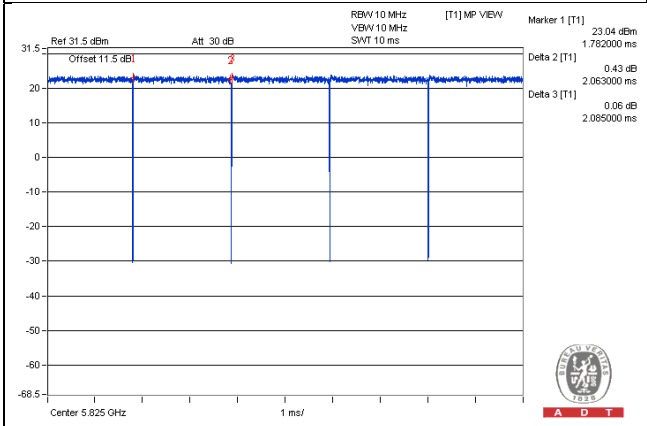
802.11n (HT20): Duty cycle = 1.918/1.938 = 0.990

Duty cycle of test signal is < 98 %, duty factor is required.

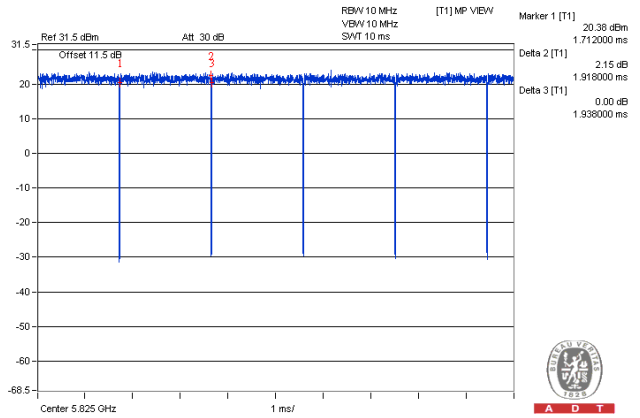
802.11n (HT40): Duty cycle = 0.942/0.962 = 0.979, Duty factor = 10 * log(1/0.979) = 0.09

802.11ac (VHT80): Duty cycle = 0.456/0.484 = 0.942, Duty factor = 10 * log(1/0.942) = 0.26

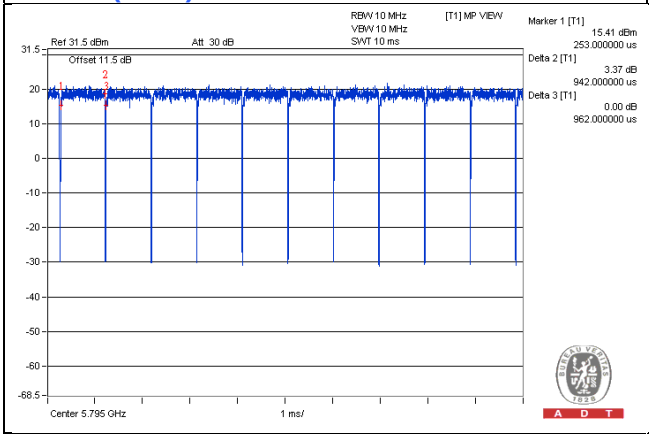
802.11a



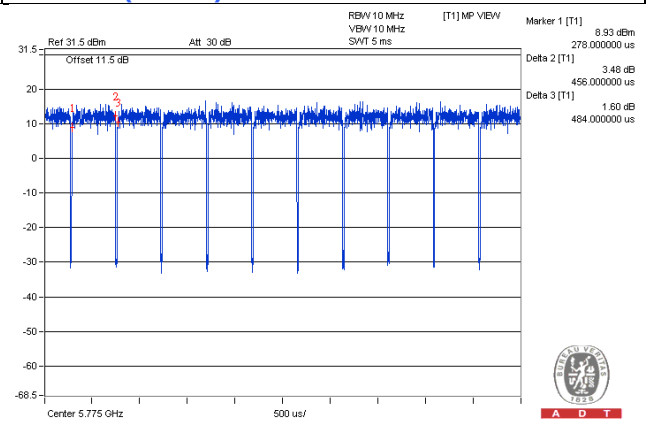
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



Beamforming Mode

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

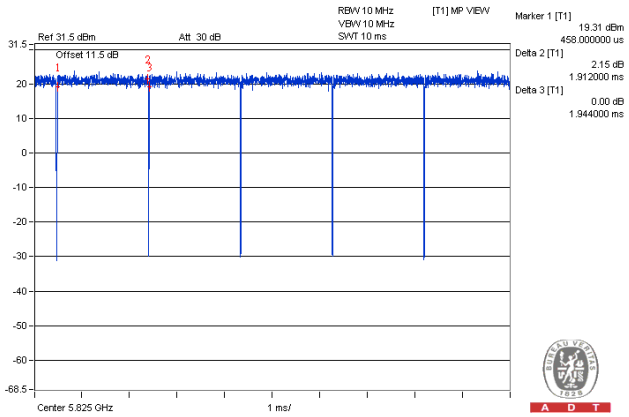
802.11n (HT20): Duty cycle = 1.912/1.944 = 0.984

Duty cycle of test signal is < 98 %, duty factor is required

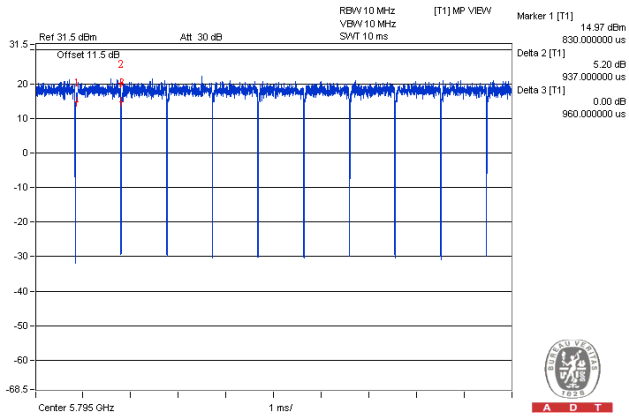
802.11n (HT40): Duty cycle = 0.937/0.960 = 0.976, Duty factor = 10 * log(1/0.976) = 0.11

802.11ac (VHT80): Duty cycle = 0.458/0.477 = 0.960, Duty factor = 10 * log(1/0.960) = 0.18

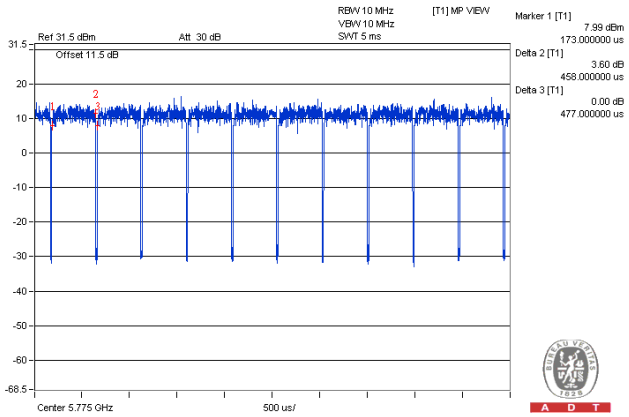
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

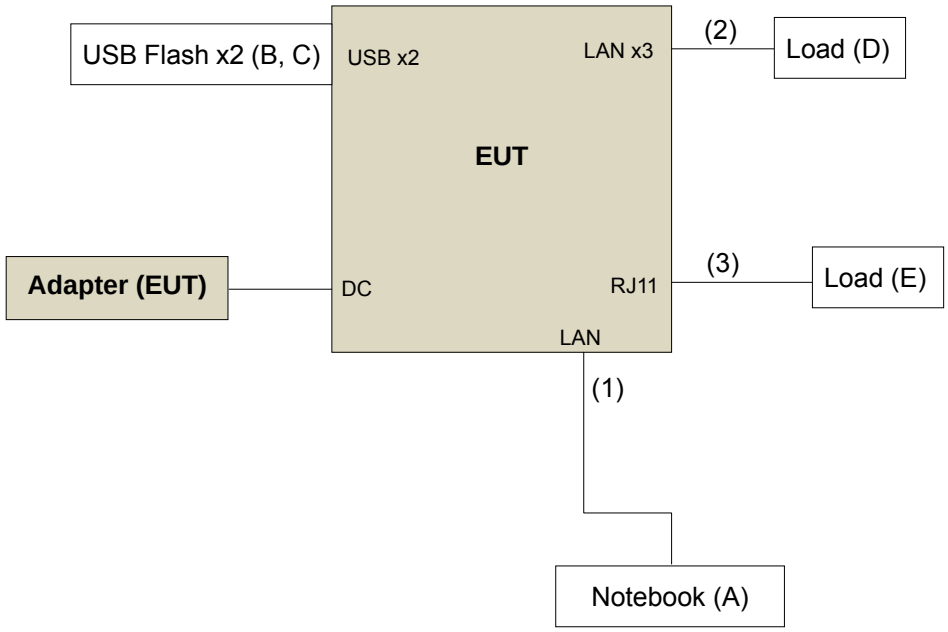
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	dell	E5430	79ZGLX1	FCC DoC Approved	-
B.	USB FLASH	N/A	N/A	N/A	N/A	-
C.	USB FLASH	N/A	N/A	N/A	N/A	-
D.	Load	N/A	N/A	N/A	N/A	-
E.	Load	N/A	N/A	N/A	N/A	-

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	10	N	0	Cat5e
2.	LAN cable	3	1.8	N	0	Cat.5e
3.	RJ11 cable	1	1.8	N	0	-

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)
789033 D02 General UNII Test Procedures New Rules v01
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

NOTE: The EUT 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. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) *1 PK:-17 (dBm/MHz) *2	PK: 68.2(dBμV/m) *1 PK: 78.2 (dBμV/m) *2

NOTE: *1 beyond 10MHz of the band edge *2 within 10 MHz of band edge

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).

4.1.2 Test Instruments

Test Date: Aug. 25 ~ Aug. 26, 2015 & Oct. 23 ~ Oct. 29, 2015

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
			Oct. 12, 2015	Oct. 11, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 08, 2015	Jul. 07, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01960	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-02(295012+ 309220)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	Aug. 09, 2015	Aug. 08, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 4.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

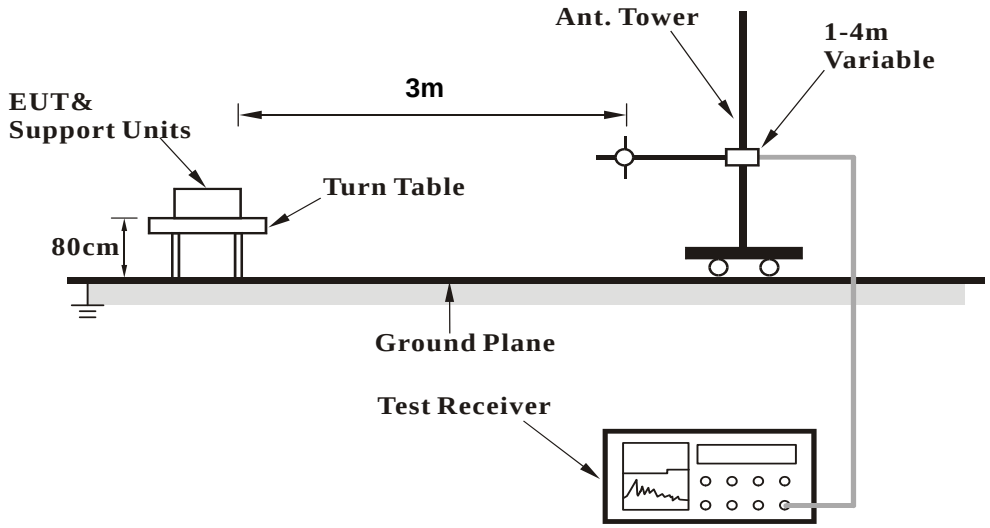
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

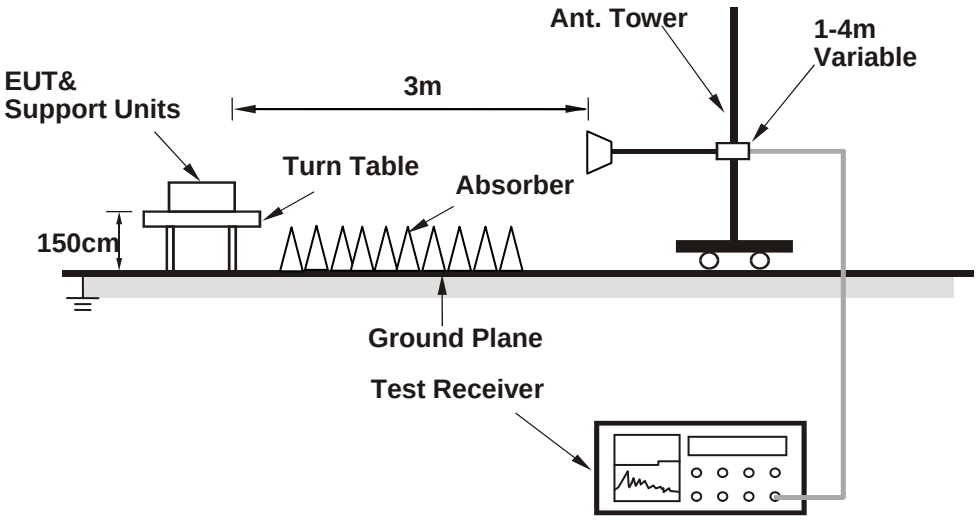
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz data:

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5099.00	56.9 PK	74.0	-17.1	1.50 H	75	52.00	4.90
2	5099.00	45.2 AV	54.0	-8.8	1.50 H	75	40.30	4.90
3	5150.00	60.0 PK	74.0	-14.0	1.60 H	80	55.00	5.00
4	5150.00	44.0 AV	54.0	-10.0	1.60 H	80	39.00	5.00
5	*5180.00	99.6 PK			1.47 H	73	60.50	39.10
6	*5180.00	89.8 AV			1.47 H	73	50.70	39.10
7	#10360.00	57.1 PK	74.0	-16.9	1.55 H	203	40.00	17.10
8	#10360.00	45.8 AV	54.0	-8.2	1.55 H	203	28.70	17.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5099.00	66.4 PK	74.0	-7.6	1.53 V	223	61.50	4.90
2	5099.00	53.5 AV	54.0	-0.5	1.53 V	223	48.60	4.90
3	5150.00	63.8 PK	74.0	-10.2	2.35 V	257	58.80	5.00
4	5150.00	49.5 AV	54.0	-4.5	2.35 V	257	44.50	5.00
5	*5180.00	108.3 PK			2.44 V	260	69.20	39.10
6	*5180.00	98.3 AV			2.44 V	260	59.20	39.10
7	#10360.00	59.7 PK	74.0	-14.3	1.10 V	123	42.60	17.10
8	#10360.00	47.7 AV	54.0	-6.3	1.10 V	123	30.60	17.10

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	102.2 PK			2.16 H	346	63.00	39.20
2	*5200.00	92.1 AV			2.16 H	346	52.90	39.20
3	#5281.00	57.1 PK	74.0	-16.9	2.14 H	13	52.00	5.10
4	#5281.00	45.4 AV	54.0	-8.6	2.14 H	13	40.30	5.10
5	#10400.00	57.2 PK	74.0	-16.8	1.23 H	64	39.90	17.30
6	#10400.00	45.8 AV	54.0	-8.2	1.23 H	64	28.50	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	109.1 PK			1.74 V	87	69.90	39.20
2	*5200.00	99.0 AV			1.74 V	87	59.80	39.20
3	#5281.00	64.2 PK	74.0	-9.8	2.24 V	162	59.10	5.10
4	#5281.00	53.5 AV	54.0	-0.5	2.24 V	162	48.40	5.10
5	#10400.00	58.8 PK	74.0	-15.2	1.23 V	64	41.50	17.30
6	#10400.00	47.9 AV	54.0	-6.1	1.23 V	64	30.60	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	99.6 PK			1.08 H	68	60.40	39.20
2	*5240.00	89.7 AV			1.08 H	68	50.50	39.20
3	#5321.00	57.2 PK	74.0	-16.8	2.44 H	16	51.80	5.40
4	#5321.00	44.8 AV	54.0	-9.2	2.44 H	16	39.40	5.40
5	5350.00	56.0 PK	74.0	-18.0	1.61 H	19	50.60	5.40
6	5350.00	42.7 AV	54.0	-11.3	1.61 H	19	37.30	5.40
7	#10480.00	57.6 PK	74.0	-16.4	1.25 H	87	40.30	17.30
8	#10480.00	47.0 AV	54.0	-7.0	1.25 H	87	29.70	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	109.5 PK			2.10 V	265	70.30	39.20
2	*5240.00	99.3 AV			2.10 V	265	60.10	39.20
3	#5321.00	65.0 PK	74.0	-9.0	1.96 V	194	59.60	5.40
4	**#5321.00**	**53.9 AV**	**54.0**	**-0.1**	**1.96 V**	**194**	**48.50**	**5.40**
5	5350.00	57.9 PK	74.0	-16.1	2.14 V	44	52.50	5.40
6	5350.00	43.2 AV	54.0	-10.8	2.14 V	44	37.80	5.40
7	#10480.00	58.8 PK	74.0	-15.2	1.33 V	226	41.50	17.30
8	#10480.00	47.5 AV	54.0	-6.5	1.33 V	226	30.20	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	59.0 PK	74.0	-15.0	1.29 H	208	53.00	6.00
2	#5714.00	44.8 AV	54.0	-9.2	1.29 H	208	38.80	6.00
3	#5722.00	67.1 PK	78.2	-11.1	1.36 H	210	61.00	6.10
4	#5725.00	60.2 PK	78.2	-18.0	1.39 H	227	54.10	6.10
5	*5745.00	98.4 PK			1.26 H	211	58.10	40.30
6	*5745.00	88.9 AV			1.26 H	211	48.60	40.30
7	11490.00	57.5 PK	74.0	-16.5	1.07 H	45	39.90	17.60
8	11490.00	46.0 AV	54.0	-8.0	1.07 H	45	28.40	17.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	66.6 PK	74.0	-7.4	2.00 V	219	60.60	6.00
2	#5714.00	51.0 AV	54.0	-3.0	2.00 V	219	45.00	6.00
3	#5722.00	77.7 PK	78.2	-0.5	1.95 V	215	71.60	6.10
4	#5725.00	65.1 PK	78.2	-13.1	2.10 V	223	59.00	6.10
5	*5745.00	109.2 PK			1.99 V	217	68.90	40.30
6	*5745.00	98.9 AV			1.99 V	217	58.60	40.30
7	11490.00	59.1 PK	74.0	-14.9	1.30 V	64	41.50	17.60
8	11490.00	48.2 AV	54.0	-5.8	1.30 V	64	30.60	17.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	98.8 PK			1.26 H	212	58.50	40.30
2	*5785.00	88.9 AV			1.26 H	212	48.60	40.30
3	#5864.00	58.0 PK	68.2	-10.2	1.50 H	360	51.60	6.40
4	11570.00	57.0 PK	74.0	-17.0	1.36 H	97	39.50	17.50
5	11570.00	46.2 AV	54.0	-7.8	1.36 H	97	28.70	17.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.2 PK			1.77 V	234	69.90	40.30
2	*5785.00	99.8 AV			1.77 V	234	59.50	40.30
3	#5864.00	67.7 PK	68.2	-0.5	1.94 V	100	61.30	6.40
4	11650.00	58.8 PK	74.0	-15.2	1.52 V	69	41.50	17.30
5	11650.00	47.9 AV	54.0	-6.1	1.52 V	69	30.60	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	99.0 PK			1.19 H	213	58.60	40.40
2	*5825.00	87.9 AV			1.19 H	213	47.50	40.40
3	#5850.00	60.7 PK	78.2	-17.5	1.29 H	223	54.30	6.40
4	#5853.00	63.1 PK	78.2	-15.1	1.14 H	210	56.70	6.40
5	#5861.00	57.4 PK	74.0	-16.6	1.20 H	222	51.00	6.40
6	#5861.00	46.3 AV	54.0	-7.7	1.20 H	222	39.90	6.40
7	11650.00	57.6 PK	74.0	-16.4	1.26 H	34	40.30	17.30
8	11650.00	46.0 AV	54.0	-8.0	1.26 H	34	28.70	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	110.0 PK			2.05 V	154	69.60	40.40
2	*5825.00	99.6 AV			2.05 V	154	59.20	40.40
3	#5850.00	64.8 PK	78.2	-13.4	2.50 V	N/A	58.40	6.40
4	#5853.00	77.7 PK	78.2	-0.5	2.00 V	236	71.30	6.40
5	#5861.00	67.8 PK	74.0	-6.2	2.10 V	240	61.40	6.40
6	#5861.00	50.9 AV	54.0	-3.1	2.10 V	240	44.50	6.40
7	11650.00	58.9 PK	74.0	-15.1	1.05 V	74	41.60	17.30
8	11650.00	47.2 AV	54.0	-6.8	1.05 V	74	29.90	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (HT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5098.00	57.0 PK	74.0	-17.0	1.22 H	314	52.10	4.90
2	5098.00	45.9 AV	54.0	-8.1	1.22 H	314	41.00	4.90
3	5150.00	55.8 PK	74.0	-18.2	1.30 H	320	50.80	5.00
4	5150.00	43.7 AV	54.0	-10.3	1.30 H	320	38.70	5.00
5	*5180.00	103.6 PK			1.37 H	241	64.50	39.10
6	*5180.00	92.8 AV			1.37 H	241	53.70	39.10
7	#10360.00	57.4 PK	74.0	-16.6	1.55 H	123	40.30	17.10
8	#10360.00	45.8 AV	54.0	-8.2	1.55 H	123	28.70	17.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5098.00	63.9 PK	74.0	-10.1	2.66 V	115	59.00	4.90
2	5098.00	53.7 AV	54.0	-0.3	2.66 V	115	48.80	4.90
3	5150.00	68.6 PK	74.0	-5.4	2.70 V	120	63.60	5.00
4	5150.00	46.9 AV	54.0	-7.1	2.70 V	120	41.90	5.00
5	*5180.00	110.2 PK			2.23 V	261	71.10	39.10
6	*5180.00	100.2 AV			2.23 V	261	61.10	39.10
7	#10360.00	58.7 PK	74.0	-15.3	1.23 V	64	41.60	17.10
8	#10360.00	47.7 AV	54.0	-6.3	1.23 V	64	30.60	17.10

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	102.2 PK			1.61 H	245	63.00	39.20
2	*5200.00	91.2 AV			1.61 H	245	52.00	39.20
3	#5281.00	57.6 PK	74.0	-16.4	1.92 H	4	52.50	5.10
4	#5281.00	46.8 AV	54.0	-7.2	1.92 H	4	41.70	5.10
5	#10400.00	56.3 PK	74.0	-17.7	1.06 H	54	39.00	17.30
6	#10400.00	46.1 AV	54.0	-7.9	1.06 H	54	28.80	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	111.0 PK			1.93 V	259	71.80	39.20
2	*5200.00	101.0 AV			1.93 V	259	61.80	39.20
3	#5281.00	64.8 PK	74.0	-9.2	2.28 V	261	59.70	5.10
4	**#5281.00**	**53.9 AV**	**54.0**	**-0.1**	**2.28 V**	**261**	**48.80**	**5.10**
5	#10400.00	58.9 PK	74.0	-15.1	1.36 V	97	41.60	17.30
6	#10400.00	47.6 AV	54.0	-6.4	1.36 V	97	30.30	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	101.0 PK			1.00 H	240	61.80	39.20
2	*5240.00	90.7 AV			1.00 H	240	51.50	39.20
3	#5320.00	57.3 PK	68.2	-10.9	1.30 H	303	51.90	5.40
4	5350.00	57.4 PK	74.0	-16.6	1.52 H	98	52.00	5.40
5	5350.00	45.3 AV	54.0	-8.7	1.52 H	98	39.90	5.40
6	#10480.00	56.3 PK	74.0	-17.7	1.55 H	203	39.00	17.30
7	#10480.00	46.3 AV	54.0	-7.7	1.55 H	203	29.00	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	111.6 PK			1.99 V	264	72.40	39.20
2	*5240.00	101.5 AV			1.99 V	264	62.30	39.20
3	#5321.00	67.7 PK	68.2	-0.5	2.05 V	260	62.30	5.40
4	5350.00	56.0 PK	74.0	-18.0	1.59 V	229	50.60	5.40
5	5350.00	44.3 AV	54.0	-9.7	1.59 V	229	38.90	5.40
6	#10480.00	58.9 PK	74.0	-15.1	1.55 V	123	41.60	17.30
7	#10480.00	47.3 AV	54.0	-6.7	1.55 V	123	30.00	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	57.6 PK	74.0	-16.4	2.10 H	90	51.60	6.00
2	#5714.00	46.6 AV	54.0	-7.4	2.10 H	90	40.60	6.00
3	#5722.00	68.7 PK	78.2	-9.5	2.08 H	99	62.60	6.10
4	#5725.00	59.1 PK	78.2	-19.1	1.98 H	112	53.00	6.10
5	*5745.00	101.1 PK			2.27 H	81	60.80	40.30
6	*5745.00	90.3 AV			2.27 H	81	50.00	40.30
7	11490.00	56.3 PK	74.0	-17.7	1.26 H	41	38.70	17.60
8	11490.00	46.0 AV	54.0	-8.0	1.26 H	41	28.40	17.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	62.9 PK	74.0	-11.1	2.29 V	115	56.90	6.00
2	#5714.00	46.4 AV	54.0	-7.6	2.29 V	115	40.40	6.00
3	#5722.00	78.1 PK	78.2	-0.1	2.18 V	304	72.00	6.10
4	#5725.00	63.0 PK	78.2	-15.2	2.34 V	120	56.90	6.10
5	*5745.00	110.4 PK			2.24 V	112	70.10	40.30
6	*5745.00	100.3 AV			2.24 V	112	60.00	40.30
7	11490.00	57.9 PK	74.0	-16.1	1.15 V	74	40.30	17.60
8	11490.00	47.2 AV	54.0	-6.8	1.15 V	74	29.60	17.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	101.9 PK			1.00 H	313	61.60	40.30
2	*5785.00	91.4 AV			1.00 H	313	51.10	40.30
3	#5867.00	58.7 PK	68.2	-9.5	1.78 H	10	52.30	6.40
4	11570.00	57.4 PK	74.0	-16.6	1.16 H	47	39.90	17.50
5	11570.00	46.2 AV	54.0	-7.8	1.16 H	47	28.70	17.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.8 PK			2.23 V	224	70.50	40.30
2	*5785.00	101.2 AV			2.23 V	224	60.90	40.30
3	**#5867.00**	**68.1 PK**	**68.2**	**-0.1**	**1.98 V**	**197**	**61.70**	**6.40**
4	11570.00	58.1 PK	74.0	-15.9	1.52 V	64	40.60	17.50
5	11570.00	47.2 AV	54.0	-6.8	1.52 V	64	29.70	17.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	100.0 PK			1.42 H	296	59.60	40.40
2	*5825.00	90.1 AV			1.42 H	296	49.70	40.40
3	#5850.00	59.0 PK	78.2	-19.2	1.47 H	128	52.60	6.40
4	#5853.00	65.0 PK	78.2	-13.2	1.56 H	310	58.60	6.40
5	#5861.00	57.1 PK	74.0	-16.9	1.50 H	300	50.70	6.40
6	#5861.00	46.3 AV	54.0	-7.7	1.50 H	300	39.90	6.40
7	11650.00	56.3 PK	74.0	-17.7	1.55 H	221	39.00	17.30
8	11650.00	45.8 AV	54.0	-8.2	1.55 H	221	28.50	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	110.1 PK			2.16 V	252	69.70	40.40
2	*5825.00	101.0 AV			2.16 V	252	60.60	40.40
3	#5850.00	63.4 PK	78.2	-14.8	2.18 V	156	57.00	6.40
4	#5853.00	77.7 PK	78.2	-0.5	1.98 V	236	71.30	6.40
5	#5861.00	65.4 PK	74.0	-8.6	2.05 V	124	59.00	6.40
6	#5861.00	47.9 AV	54.0	-6.1	2.05 V	124	41.50	6.40
7	11650.00	57.3 PK	74.0	-16.7	1.26 V	87	40.00	17.30
8	11650.00	47.0 AV	54.0	-7.0	1.26 V	87	29.70	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (HT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.7 PK	74.0	-14.3	2.09 H	206	54.70	5.00
2	5150.00	46.7 AV	54.0	-7.3	2.09 H	206	41.70	5.00
3	*5190.00	96.5 PK			1.83 H	246	57.40	39.10
4	*5190.00	86.6 AV			1.83 H	246	47.50	39.10
5	#10380.00	57.5 PK	74.0	-16.5	1.55 H	201	40.30	17.20
6	#10380.00	45.9 AV	54.0	-8.1	1.55 H	201	28.70	17.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	72.0 PK	74.0	-2.0	2.93 V	243	67.00	5.00
2	5150.00	53.5 AV	54.0	-0.5	2.93 V	243	48.50	5.00
3	*5190.00	106.1 PK			2.22 V	261	67.00	39.10
4	*5190.00	95.4 AV			2.22 V	261	56.30	39.10
5	#10380.00	58.7 PK	74.0	-15.3	1.55 V	226	41.50	17.20
6	#10380.00	46.9 AV	54.0	-7.1	1.55 V	226	29.70	17.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	97.9 PK			1.00 H	246	58.70	39.20
2	*5230.00	87.9 AV			1.00 H	246	48.70	39.20
3	5350.00	55.6 PK	74.0	-18.4	1.83 H	223	50.20	5.40
4	5350.00	43.3 AV	54.0	-10.7	1.83 H	223	37.90	5.40
5	#10460.00	57.0 PK	74.0	-17.0	1.56 H	314	39.80	17.20
6	#10460.00	45.6 AV	54.0	-8.4	1.56 H	314	28.40	17.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	107.6 PK			2.28 V	257	68.40	39.20
2	*5230.00	98.2 AV			2.28 V	257	59.00	39.20
3	5350.00	57.9 PK	74.0	-16.1	2.11 V	105	52.50	5.40
4	5350.00	45.4 AV	54.0	-8.6	2.11 V	105	40.00	5.40
5	#10460.00	57.8 PK	74.0	-16.2	1.55 V	52	40.60	17.20
6	#10460.00	46.2 AV	54.0	-7.8	1.55 V	52	29.00	17.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	57.7 PK	74.0	-16.3	1.13 H	322	51.70	6.00
2	#5714.00	45.0 AV	54.0	-9.0	1.13 H	322	39.00	6.00
3	#5722.00	62.4 PK	78.2	-15.8	2.11 H	24	56.30	6.10
4	#5725.00	58.4 PK	78.2	-19.8	1.62 H	301	52.30	6.10
5	*5755.00	96.9 PK			1.26 H	81	56.60	40.30
6	*5755.00	87.0 AV			1.26 H	81	46.70	40.30
7	11510.00	57.7 PK	74.0	-16.3	1.06 H	54	40.30	17.40
8	11510.00	45.9 AV	54.0	-8.1	1.06 H	54	28.50	17.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	73.1 PK	74.0	-0.9	1.81 V	224	67.10	6.00
2	#5714.00	53.5 AV	54.0	-0.5	1.81 V	224	47.50	6.00
3	#5722.00	73.6 PK	78.2	-4.6	2.26 V	223	67.50	6.10
4	#5725.00	63.0 PK	78.2	-15.2	1.56 V	305	56.90	6.10
5	*5755.00	105.5 PK			1.97 V	223	65.20	40.30
6	*5755.00	95.5 AV			1.97 V	223	55.20	40.30
7	11510.00	58.7 PK	74.0	-15.3	1.33 V	221	41.30	17.40
8	11510.00	48.0 AV	54.0	-6.0	1.33 V	221	30.60	17.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	99.7 PK			1.20 H	80	59.40	40.30
2	*5795.00	89.5 AV			1.20 H	80	49.20	40.30
3	#5850.00	58.7 PK	78.2	-19.5	1.33 H	258	52.30	6.40
4	#5853.00	62.0 PK	78.2	-16.2	1.52 H	74	55.60	6.40
5	#5861.00	58.0 PK	74.0	-16.0	1.36 H	100	51.60	6.40
6	#5861.00	46.9 AV	54.0	-7.1	1.36 H	100	40.50	6.40
7	11590.00	57.2 PK	74.0	-16.8	1.52 H	63	39.90	17.30
8	11590.00	45.8 AV	54.0	-8.2	1.52 H	63	28.50	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	107.6 PK			2.24 V	260	67.30	40.30
2	*5795.00	97.7 AV			2.24 V	260	57.40	40.30
3	#5850.00	64.7 PK	78.2	-13.5	1.29 V	87	58.30	6.40
4	#5853.00	64.8 PK	78.2	-13.4	2.23 V	272	58.40	6.40
5	#5868.00	66.7 PK	74.0	-7.3	2.15 V	274	60.30	6.40
6	**#5868.00**	**53.9 AV**	**54.0**	**-0.1**	**2.15 V**	**274**	**47.50**	**6.40**
7	11590.00	58.6 PK	74.0	-15.4	1.55 V	123	41.30	17.30
8	11590.00	46.9 AV	54.0	-7.1	1.55 V	123	29.60	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.54 H	313	57.10	5.00
2	5150.00	48.2 AV	54.0	-5.8	1.54 H	313	43.20	5.00
3	*5210.00	94.1 PK			1.22 H	247	54.90	39.20
4	*5210.00	82.9 AV			1.22 H	247	43.70	39.20
5	#10420.00	56.3 PK	74.0	-17.7	1.08 H	74	39.00	17.30
6	#10420.00	45.2 AV	54.0	-8.8	1.08 H	74	27.90	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.1 PK	74.0	-4.9	2.71 V	263	64.10	5.00
2	5150.00	53.7 AV	54.0	-0.3	2.71 V	263	48.70	5.00
3	*5210.00	102.2 PK			2.42 V	259	63.00	39.20
4	*5210.00	90.8 AV			2.42 V	259	51.60	39.20
5	#10420.00	57.6 PK	74.0	-16.4	1.55 V	224	40.30	17.30
6	#10420.00	46.3 AV	54.0	-7.7	1.55 V	224	29.00	17.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	57.5 PK	74.0	-16.5	1.63 H	214	51.50	6.00
2	#5714.00	46.3 AV	54.0	-7.7	1.63 H	214	40.30	6.00
3	#5722.00	59.7 PK	78.2	-18.5	1.35 H	89	53.60	6.10
4	#5725.00	58.4 PK	78.2	-19.8	1.65 H	87	52.30	6.10
5	*5775.00	92.5 PK			1.13 H	81	52.20	40.30
6	*5775.00	82.9 AV			1.13 H	81	42.60	40.30
7	11550.00	57.1 PK	74.0	-16.9	1.36 H	54	39.70	17.40
8	11550.00	45.9 AV	54.0	-8.1	1.36 H	54	28.50	17.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	70.9 PK	74.0	-3.1	2.18 V	221	64.90	6.00
2	**#5714.00**	**53.9 AV**	**54.0**	**-0.1**	**2.18 V**	**221**	**47.90**	**6.00**
3	#5722.00	70.8 PK	78.2	-7.4	2.03 V	223	64.70	6.10
4	#5725.00	62.5 PK	78.2	-15.7	1.47 V	85	56.40	6.10
5	*5775.00	101.4 PK			2.27 V	256	61.10	40.30
6	*5775.00	90.7 AV			2.27 V	256	50.40	40.30
7	11550.00	57.5 PK	74.0	-16.5	1.32 V	64	40.10	17.40
8	11550.00	47.3 AV	54.0	-6.7	1.32 V	64	29.90	17.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz worst-case data:

802.11n (HT20)

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	159.91	34.9 QP	43.5	-8.6	1.99 H	252	48.50	-13.60
2	278.27	40.5 QP	46.0	-5.5	1.00 H	11	53.60	-13.10
3	332.60	41.6 QP	46.0	-4.4	1.00 H	170	53.60	-12.00
4	375.29	37.9 QP	46.0	-8.1	1.00 H	62	49.30	-11.40
5	499.48	35.5 QP	46.0	-10.5	1.50 H	219	44.80	-9.30
6	778.89	38.2 QP	46.0	-7.8	1.00 H	7	41.50	-3.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.07	34.8 QP	40.0	-5.2	1.00 V	9	49.00	-14.20
2	123.04	34.9 QP	43.5	-8.6	1.00 V	304	50.90	-16.00
3	159.91	35.0 QP	43.5	-8.5	1.00 V	295	48.60	-13.60
4	276.33	33.0 QP	46.0	-13.0	1.50 V	199	46.10	-13.10
5	332.60	41.5 QP	46.0	-4.5	1.24 V	90	53.50	-12.00
6	493.66	37.0 QP	46.0	-9.0	1.00 V	255	46.50	-9.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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.

4.2.2 Test Instruments

Test Date: Oct. 28, 2015

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 11, 2014	Nov. 10, 2015
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2015	Feb. 25, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

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

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

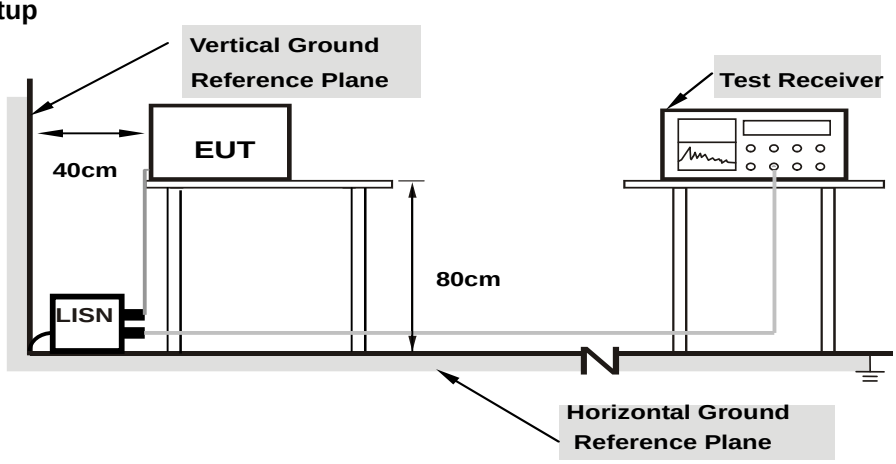
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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.

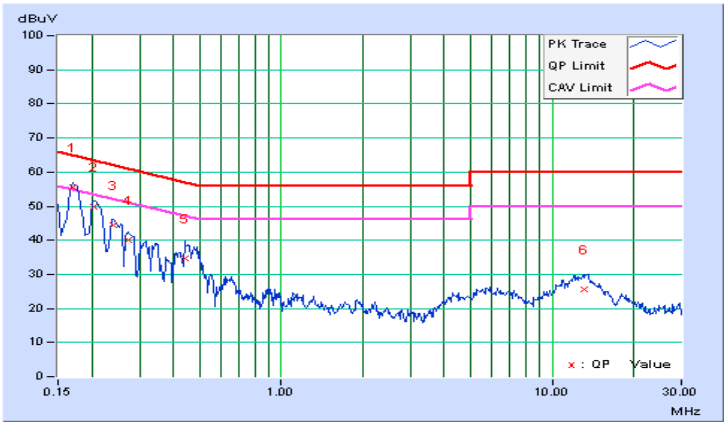
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	9.88	45.73	31.16	55.61	41.04	64.98	54.98	-9.38	-13.95
2	0.20474	9.93	40.01	25.61	49.94	35.54	63.42	53.42	-13.48	-17.88
3	0.23993	9.92	34.68	19.87	44.60	29.79	62.10	52.10	-17.49	-22.30
4	0.27121	9.92	29.99	13.30	39.91	23.22	61.08	51.08	-21.17	-27.86
5	0.43934	9.91	24.93	12.39	34.84	22.30	57.07	47.07	-22.24	-24.78
6	13.14837	10.74	14.74	8.43	25.48	19.17	60.00	50.00	-34.52	-30.83

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.

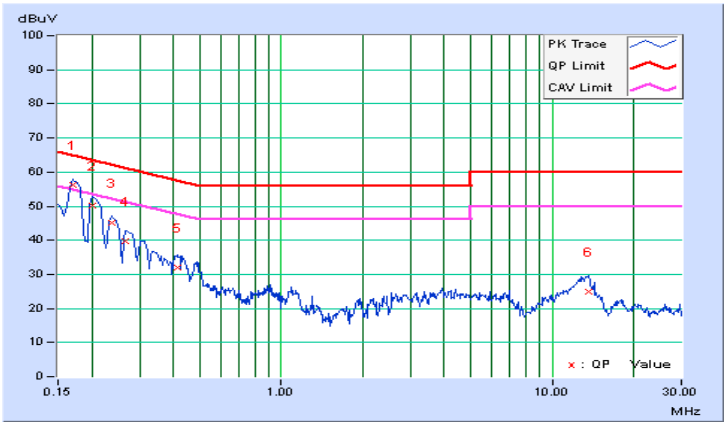


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	**0.16955**	**9.94**	**46.28**	**32.62**	**56.22**	**42.56**	**64.98**	**54.98**	**-8.76**	**-12.42**
2	0.20083	10.03	40.16	23.33	50.19	33.36	63.58	53.58	-13.39	-20.22
3	0.23602	10.02	35.06	18.27	45.08	28.29	62.24	52.24	-17.15	-23.94
4	0.26730	10.02	29.60	11.68	39.62	21.70	61.20	51.20	-21.58	-29.50
5	0.41588	9.99	22.11	11.23	32.10	21.22	57.53	47.53	-25.43	-26.31
6	13.64103	10.76	14.16	8.31	24.92	19.07	60.00	50.00	-35.08	-30.93

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 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	-		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	-		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

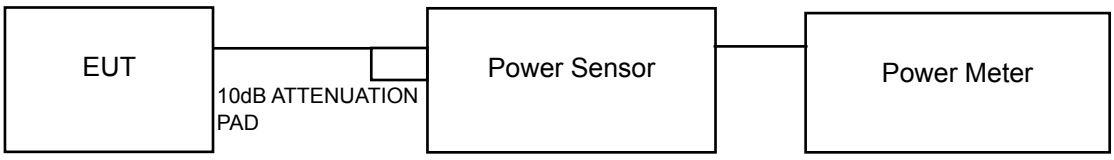
*B is the 26 dB emission bandwidth in megahertz

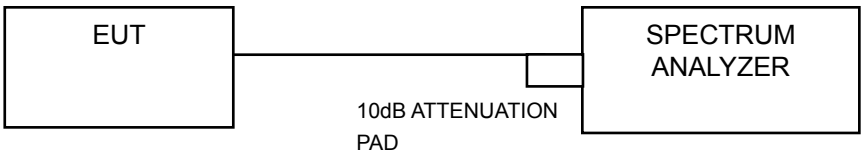
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup





4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

789033 D02 General UNII Test Procedures New Rules v01 E/3/b

For 802.11a, 802.11n (HT20), 802.11n (HT40)

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

For 802.11ac (VHT80)

789033 D02 General UNII Test Procedure New Rules v01

1) Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
2) Set sweep trigger to “free run”.
3) Set RBW = 1 MHz.
4) Set VBW ≥ 3 MHz
5) Number of points in sweep ≥ 2 Span / RBW.
6) Sweep time ≤ (number of points in sweep) * T
7) Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
8) Detector = RMS.
9) Trace mode = max hold.
10) Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

POWER OUTPUT:

CDD Mode

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	157.398	21.97	30	Pass
40	5200	161.065	22.07	30	Pass
48	5240	120.781	20.82	30	Pass
149	5745	135.831	21.33	30	Pass
157	5785	166.725	22.22	30	Pass
165	5825	137.088	21.37	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	21.79	21.77	301.322	24.79	30	Pass
40	5200	22.72	21.76	**337.036**	25.28	30	Pass
48	5240	20.63	21.09	244.14	23.88	30	Pass
149	5745	18.75	18.94	153.332	21.86	30	Pass
157	5785	19.29	18.88	162.186	22.10	30	Pass
165	5825	19.74	20.01	**194.42**	22.89	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.74	18.16	140.281	21.47	30	Pass
46	5230	21.20	21.46	271.785	24.34	30	Pass
151	5755	16.73	16.83	95.293	19.79	30	Pass
159	5795	19.30	18.92	163.097	22.12	30	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	17.07	17.76	110.637	20.44	30	Pass
155	5775	15.92	15.79	77.015	18.87	30	Pass

Beamforming Mode

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.01	18.79	155.299	21.91	29.99	Pass
40	5200	19.76	19.64	186.669	22.71	29.99	Pass
48	5240	20.53	20.47	224.409	23.51	29.99	Pass
149	5745	17.29	17.88	114.956	20.61	29.99	Pass
157	5785	17.73	18.13	124.306	20.94	29.99	Pass
165	5825	18.61	19.32	158.118	21.99	29.99	Pass

Note: Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power limit shall be reduced to 30-(6.01-6) = 29.99dBm.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.27	17.71	126.163	21.01	29.99	Pass
46	5230	21.20	21.46	271.785	24.34	29.99	Pass
151	5755	15.92	16.03	79.171	18.99	29.99	Pass
159	5795	18.44	18.77	145.159	21.62	29.99	Pass

Note: Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power limit shall be reduced to 30-(6.01-6) = 29.99dBm.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.35	16.26	85.419	19.32	29.99	Pass
155	5775	15.02	15.20	64.882	18.12	29.99	Pass

Note: Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power limit shall be reduced to 30-(6.01-6) = 29.99dBm.

26dB BANDWIDTH:

CDD Mode

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
36	5180	39.67	Pass
40	5200	39.70	Pass
48	5240	34.08	Pass

802.11n (HT20)

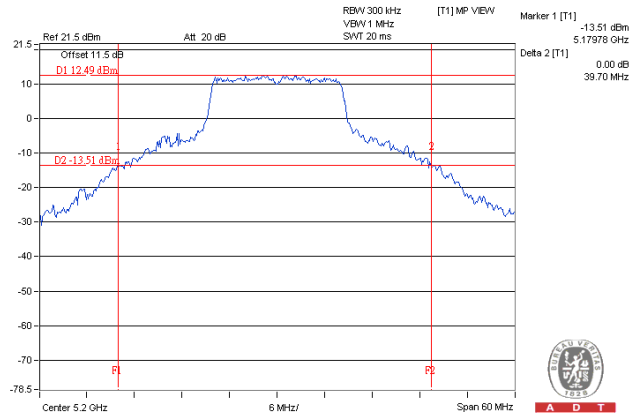
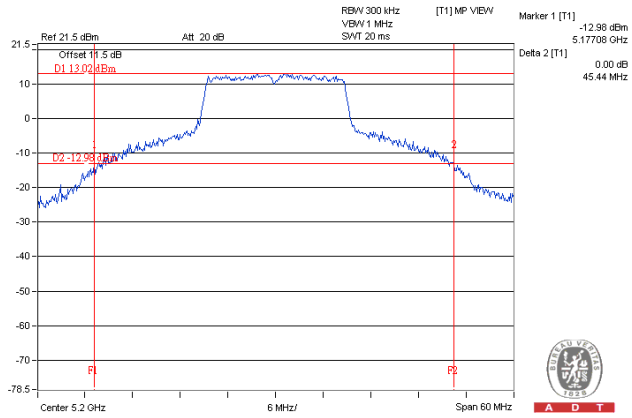
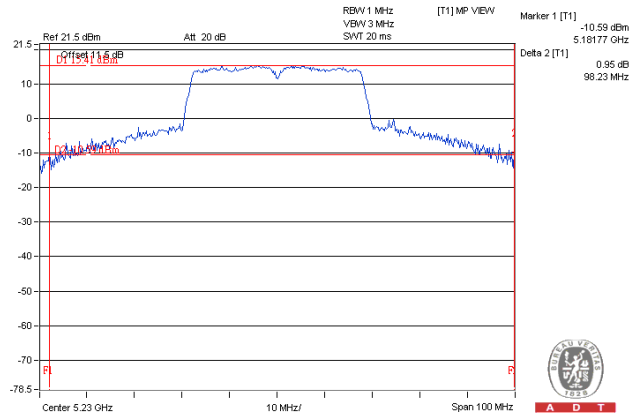
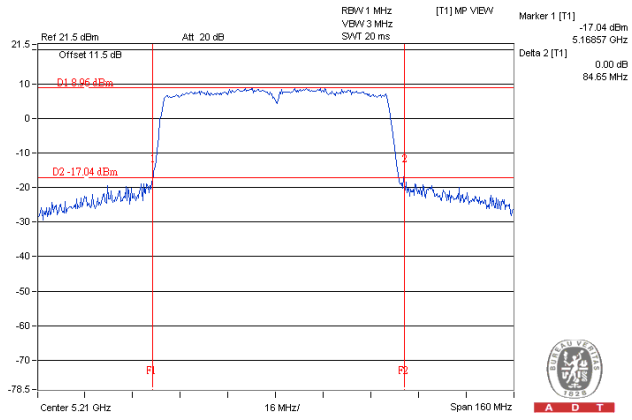
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	44.52	40.16	Pass
40	5200	45.44	41.42	Pass
48	5240	39.66	41.23	Pass

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	50.23	53.03	Pass
46	5230	98.23	93.27	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	83.36	84.65	Pass

SPECTRUM PLOT OF WORST VALUE	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

802.11n (HT20)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	28.49	24.98	Pass
40	5200	37.61	31.15	Pass
48	5240	36.95	39.73	Pass

802.11n (HT40)

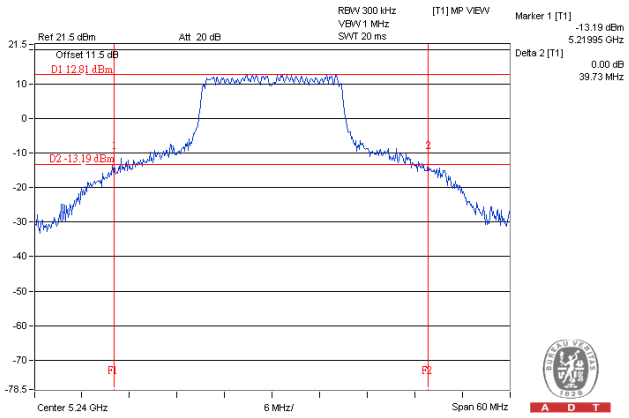
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	44.63	43.24	Pass
46	5230	93.35	93.86	Pass

802.11ac (VHT80)

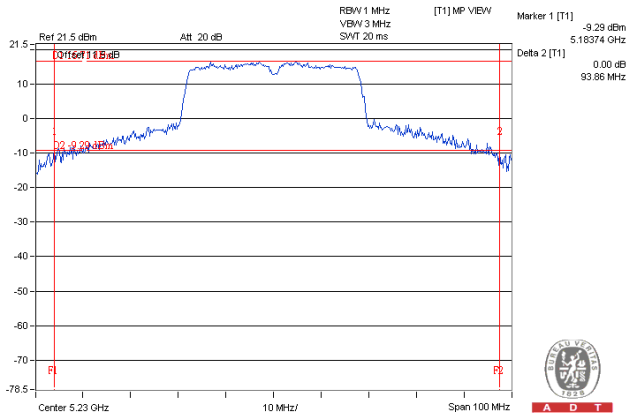
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	83.03	83.24	Pass

SPECTRUM PLOT OF WORST VALUE

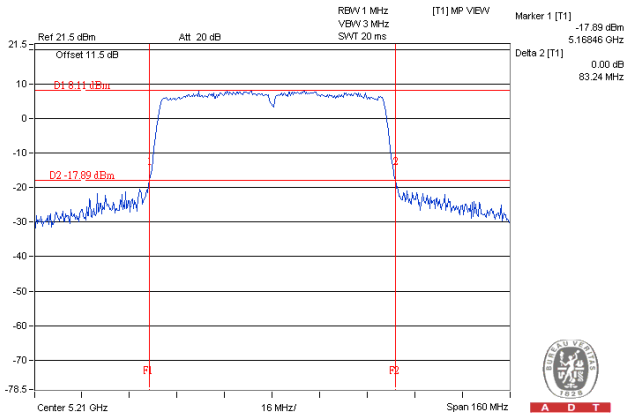
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



OCCUPIED BANDWIDTH:

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	22.80
40	5200	22.44
48	5240	19.20
149	5745	21.48
157	5785	31.44
165	5825	24.00

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	24.60	21.96
40	5200	25.08	22.68
48	5240	19.20	19.80
149	5745	18.00	18.26
157	5785	18.12	18.84
165	5825	18.12	22.80

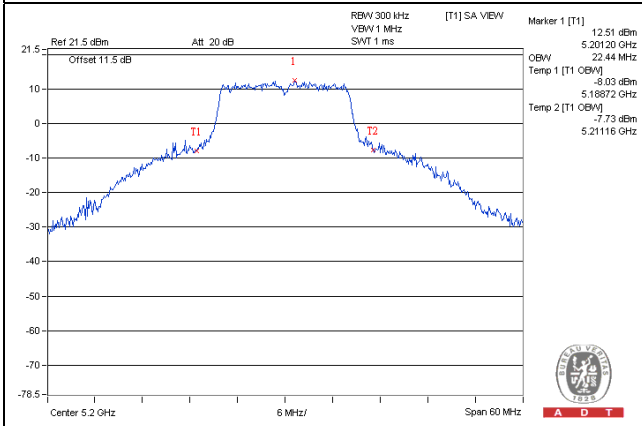
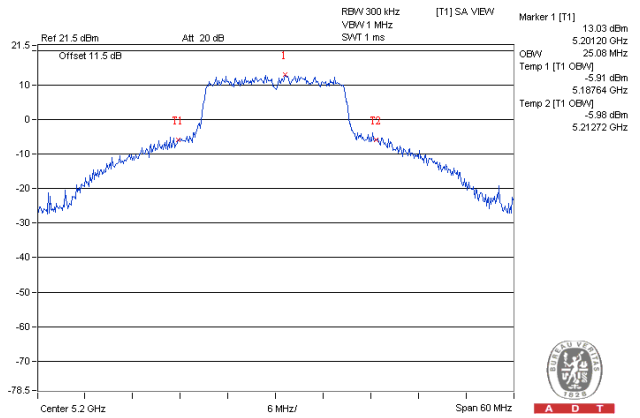
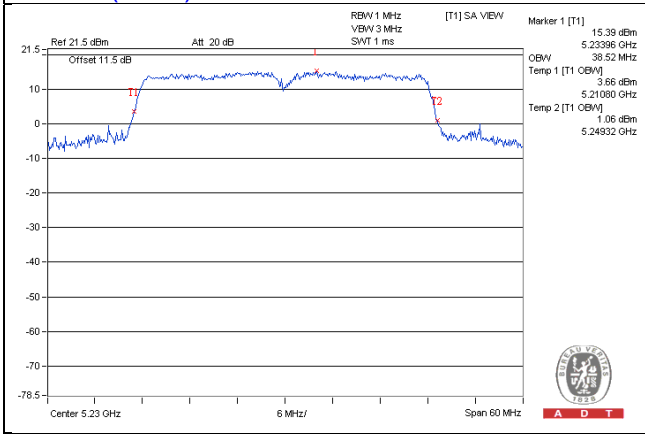
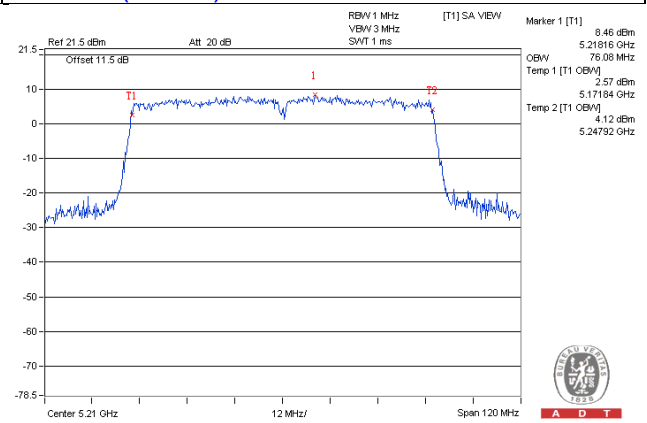
802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.60	36.60
46	5230	38.52	37.68
151	5755	36.72	36.72
159	5795	36.84	37.32

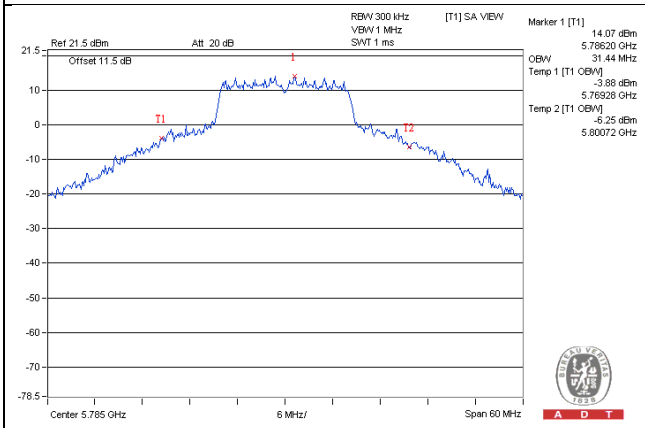
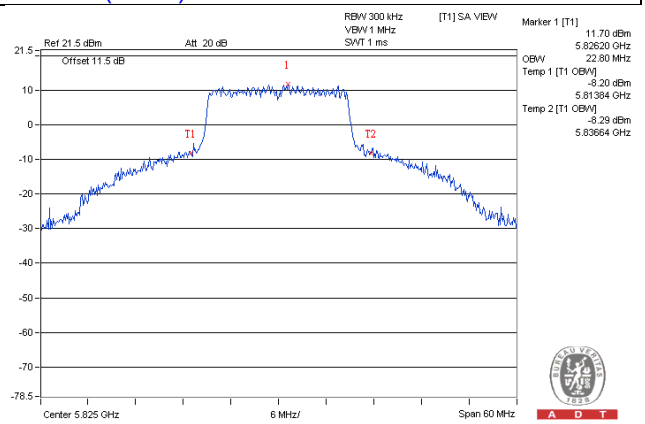
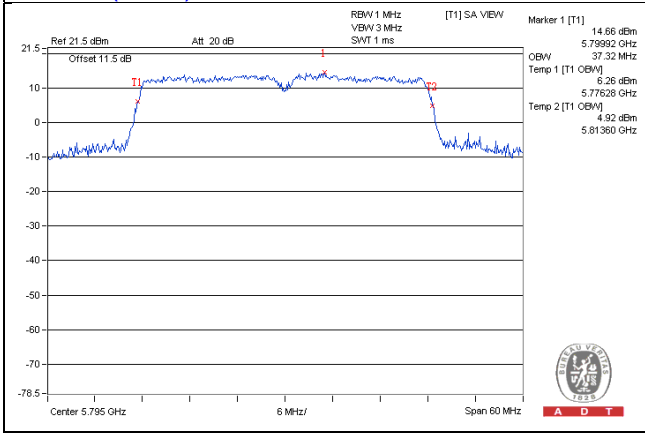
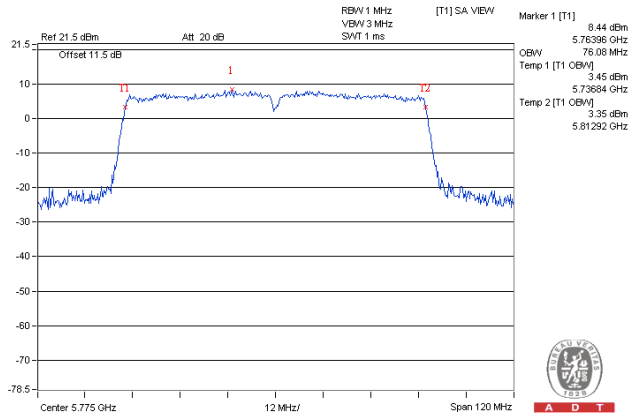
802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.88	76.08
155	5775	75.60	76.08

For U-NII-1 band:

SPECTRUM PLOT OF WORST VALUE	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

For U-NII-3 band:

SPECTRUM PLOT OF WORST VALUE	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.12	17.88
40	5200	18.24	18.12
48	5240	18.72	18.96
149	5745	18.00	18.00
157	5785	18.00	18.12
165	5825	18.00	18.36

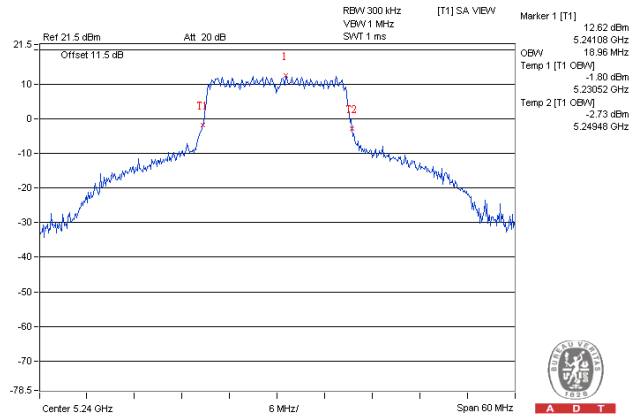
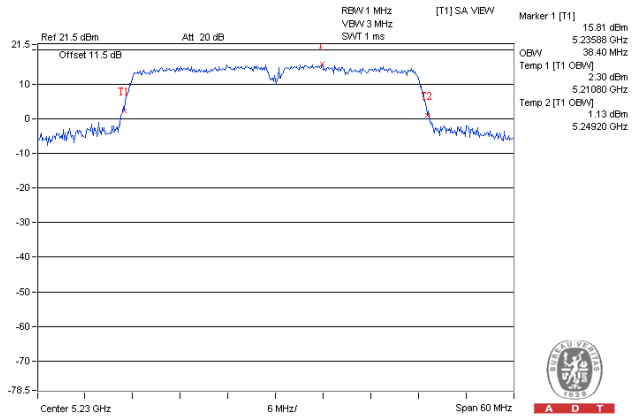
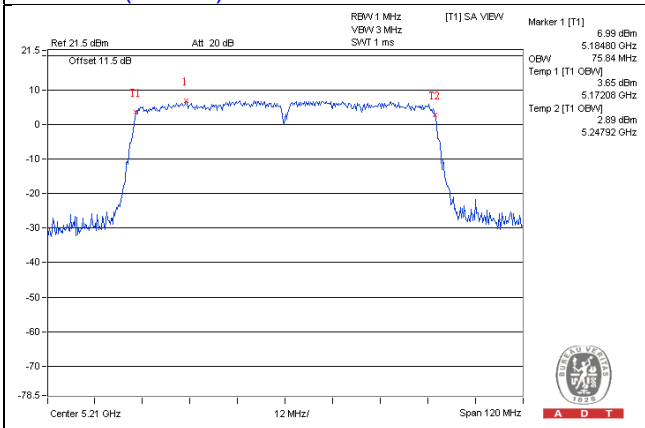
802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.60	36.60
46	5230	38.40	37.68
151	5755	36.72	36.60
159	5795	36.84	37.08

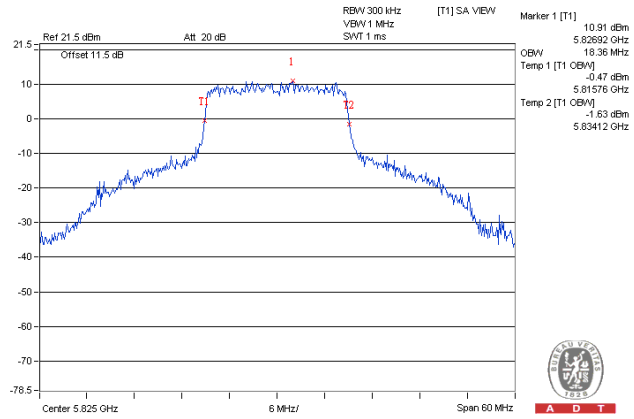
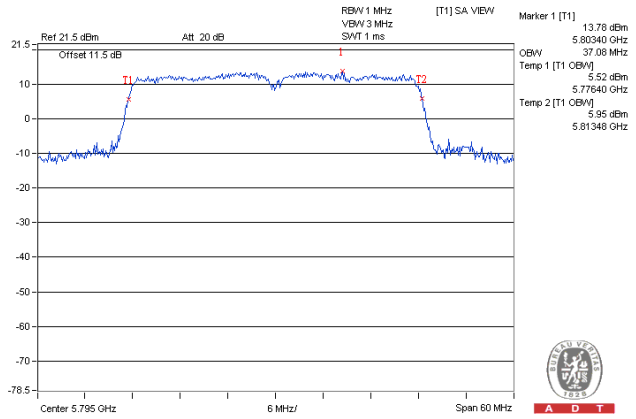
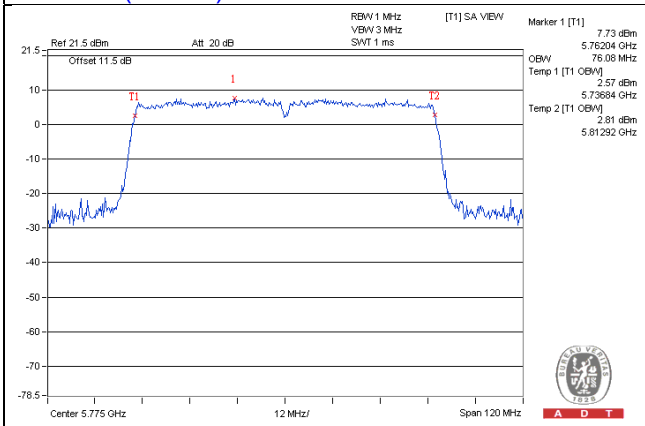
802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.60
155	5775	75.60	76.08

For U-NII-1 band:

SPECTRUM PLOT OF WORST VALUE	
802.11n (HT20)	802.11n (HT40)
	
802.11ac (VHT80)	
	

For U-NII-3 band:

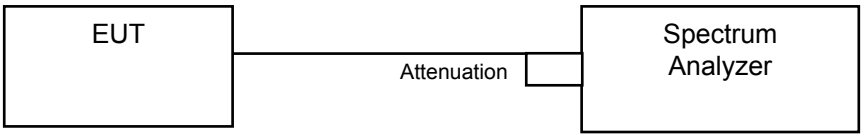
SPECTRUM PLOT OF WORST VALUE	
802.11n (HT20)	802.11n (HT40)
	
802.11ac (VHT80)	
	

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A	-		11dBm/ MHz
U-NII-2C	-		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

789033 D02 General UNII Test Procedures New Rules v01 E/2/b

For U-NII-1 band:

802.11a, 802.11n (HT20):

Using method SA-1

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 30 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Set Channel power measure = 1MHz

d. Sweep time = auto, trigger set to “free run”.

e. Trace average at least 100 traces in power averaging mode.

f. Record the max value

802.11n (HT40), 802.11ac (VHT80):

Using method SA-2

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS

c. Set Channel power measure = 1MHz

d. Sweep time = auto, trigger set to “free run”.

e. Trace average at least 100 traces in power averaging mode.

f. Record the max value and add 10 log (1/duty cycle)

789033 D02 General UNII Test Procedures New Rules v01 F/5

For U-NII-3 band:

802.11n (HT20):

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.

d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)

e. Sweep time = auto, trigger set to “free run”.

f. Trace average at least 100 traces in power averaging mode.

802.11n (HT40), 802.11ac (VHT80):

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 300 kHz, Set VBW ≥ 3 RBW, Detector = RMS

c. Sweep time = auto, trigger set to “free run”.

d. Trace average at least 100 traces in power averaging mode.

e. Record the max value and add 10 log (1/duty cycle)

f. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

CDD Mode

802.11a

Chan.	Frequency (MHz)	PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	8.67	17	Pass
40	5200	8.40	17	Pass
48	5240	8.12	17	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.

802.11n (HT20)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	8.69	8.34	11.53	16.99	Pass
40	5200	8.57	8.42	11.51	16.99	Pass
48	5240	7.71	7.86	10.80	16.99	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. **For U-NII-1:** Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 17-(6.01-6) = 16.99dBm.

802.11n (HT40)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD W/O Duty Factor (dBm/MHz)	Duty Factor	Total PSD With Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1					
38	5190	1.72	1.62	4.68	0.09	4.77	16.99	Pass
46	5230	5.09	5.32	8.22	0.09	8.31	16.99	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. **For U-NII-1:** Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 17-(6.01-6) = 16.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

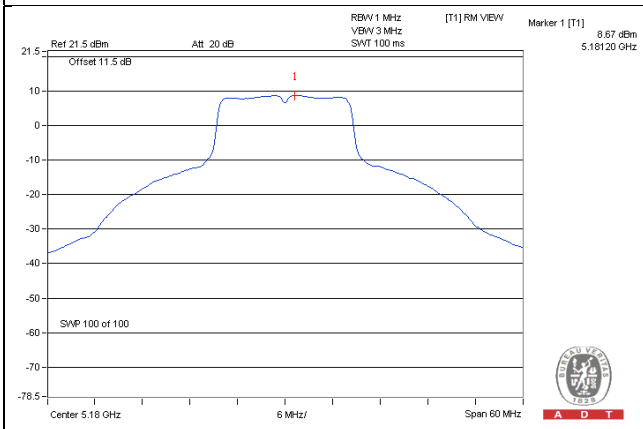
802.11ac (VHT80)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD W/O Duty Factor (dBm/MHz)	Duty Factor	Total PSD With Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1					
42	5210	-2.03	-1.89	1.05	0.26	1.31	16.99	Pass

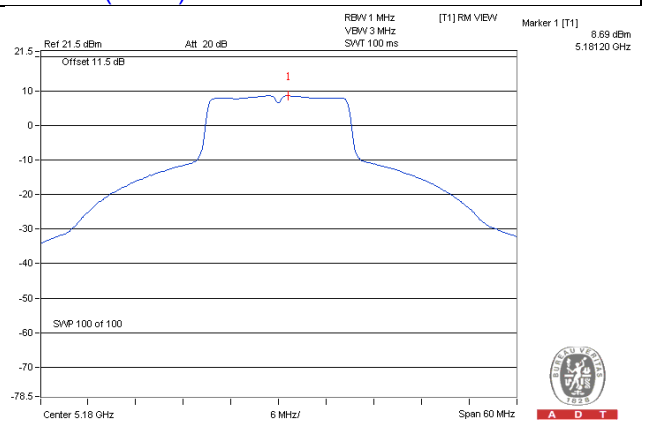
Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1:** Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 17-(6.01-6) = 16.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

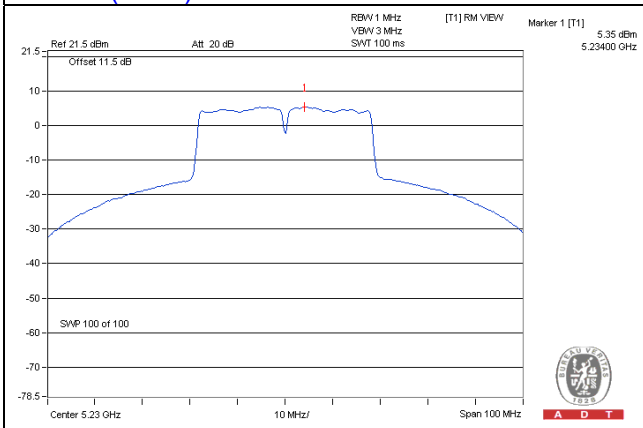
802.11a



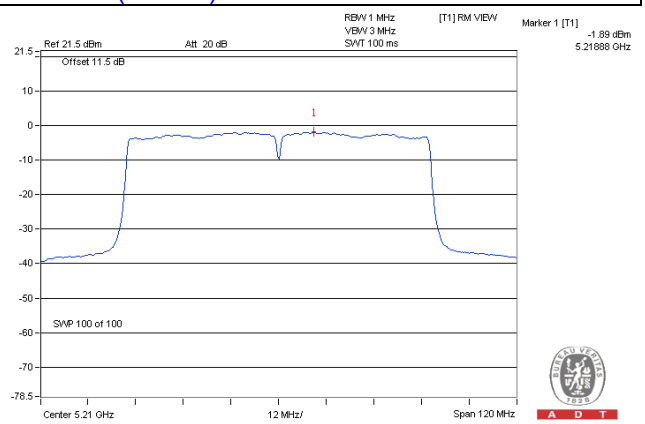
802.11n (HT20) / Ch 36 / Chain 0



802.11n (HT40) / Ch 46 / Chain 1



802.11ac (VHT80) / Ch 42 / Chain 1



Beamforming Mode

802.11n (HT20)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	5.86	5.87	8.88	16.99	Pass
40	5200	6.75	7.01	9.89	16.99	Pass
48	5240	7.73	7.76	10.76	16.99	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. **For U-NII-1:** Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 17-(6.01-6) = 16.99dBm.

802.11n (HT40)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD W/O Duty Factor (dBm/MHz)	Duty Factor	Total PSD With Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1					
38	5190	1.82	1.49	4.66	0.11	4.77	16.99	Pass
46	5230	5.72	5.58	8.66	0.11	8.77	16.99	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. **For U-NII-1:** Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 17-(6.01-6) = 16.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

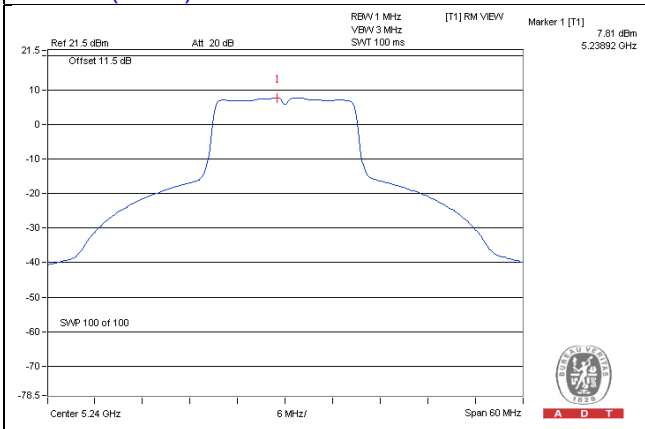
802.11ac (VHT80)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD W/O Duty Factor (dBm/MHz)	Duty Factor	Total PSD With Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1					
42	5210	-2.39	-2.76	0.44	0.18	0.62	16.99	Pass

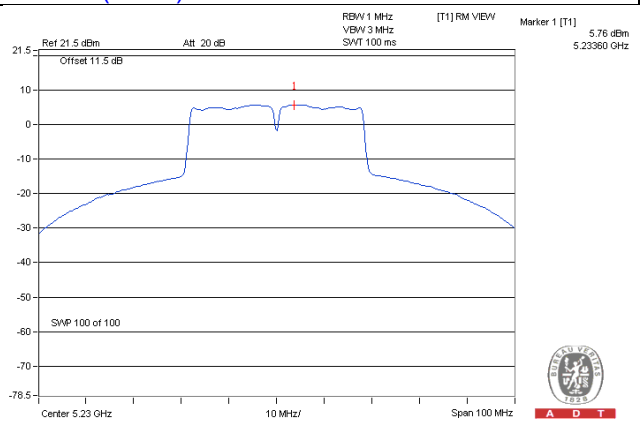
Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1:** Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 17-(6.01-6) = 16.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

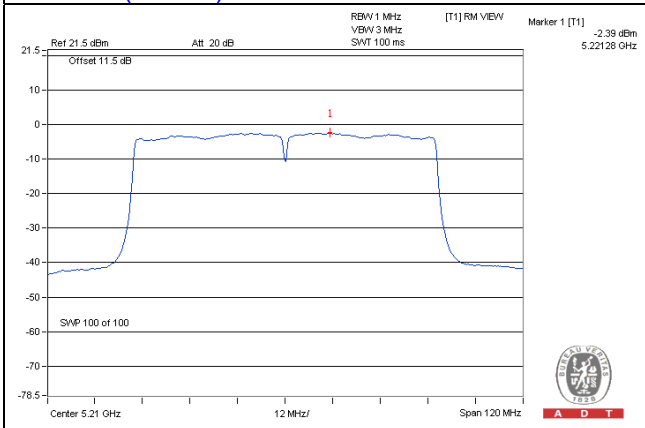
802.11n (HT20) / Ch 48 / Chain 2



802.11n (HT40) / Ch 46 / Chain 0



802.11ac (VHT80) / Ch 42 / Chain 0



For U-NII-3 Band

CDD Mode

802.11a

Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
149	5745	-0.75	1.47	30.00	Pass
157	5785	0.46	2.68	30.00	Pass
165	5825	-0.59	1.63	30.00	Pass

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
0	149	5745	-3.51	-1.29	3.01	1.72	29.99	Pass
	157	5785	-3.57	-1.35	3.01	1.66	29.99	Pass
	165	5825	-2.63	-0.41	3.01	2.60	29.99	Pass
1	149	5745	-2.10	0.12	3.01	3.13	29.99	Pass
	157	5785	-1.77	0.45	3.01	3.46	29.99	Pass
	165	5825	-1.06	1.16	3.01	4.17	29.99	Pass

Note:
1. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi,, so the power density limit shall be reduced to 30-(6.01-6) = 29.99dBm.

802.11n (HT40)

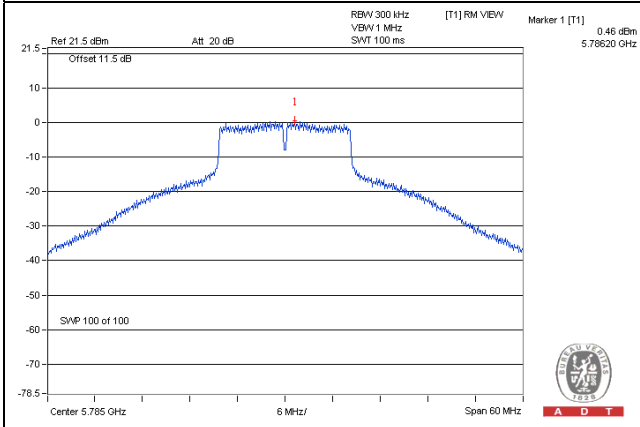
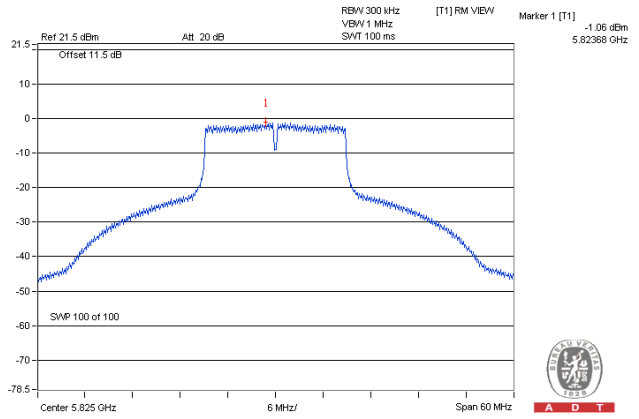
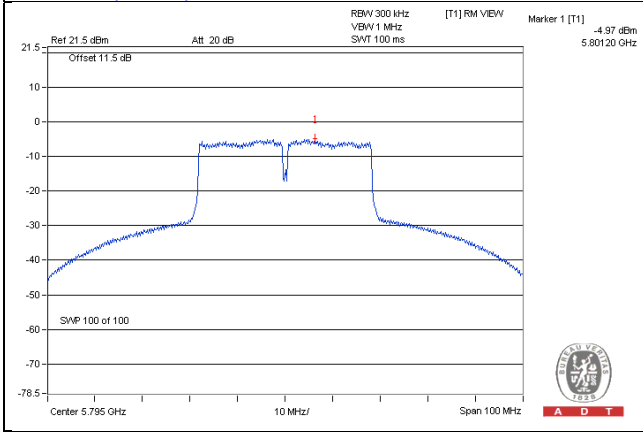
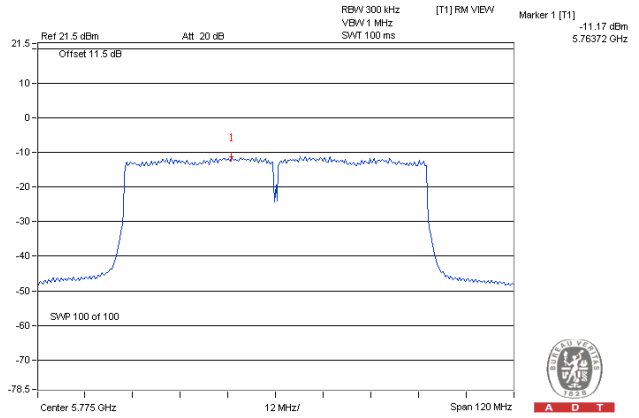
TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
0	151	5755	-9.03	-6.81	3.01	0.09	-3.71	29.99	Pass
	159	5795	-6.76	-4.54	3.01	0.09	-1.44	29.99	Pass
1	151	5755	-7.48	-5.26	3.01	0.09	-2.16	29.99	Pass
	159	5795	-4.97	-2.75	3.01	0.09	0.35	29.99	Pass

Note:
1. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi,, so the power density limit shall be reduced to 30-(6.01-6) = 29.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
0	155	5775	-12.62	-10.40	3.01	0.09	-7.13	29.99	Pass
1	155	5775	-11.17	-8.95	3.01	0.09	-5.68	29.99	Pass

Note:
1. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi,, so the power density limit shall be reduced to 30-(6.01-6) = 29.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
0	149	5745	-4.55	-2.33	3.01	0.68	29.99	Pass
	157	5785	-4.55	-2.33	3.01	0.68	29.99	Pass
	165	5825	-3.62	-1.40	3.01	1.61	29.99	Pass
1	149	5745	-3.09	-0.87	3.01	2.14	29.99	Pass
	157	5785	-2.99	-0.77	3.01	2.24	29.99	Pass
	165	5825	-1.89	0.33	3.01	3.34	29.99	Pass

Note:
1. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi,, so the power density limit shall be reduced to 30-(6.01-6) = 29.99dBm.

802.11n (HT40)

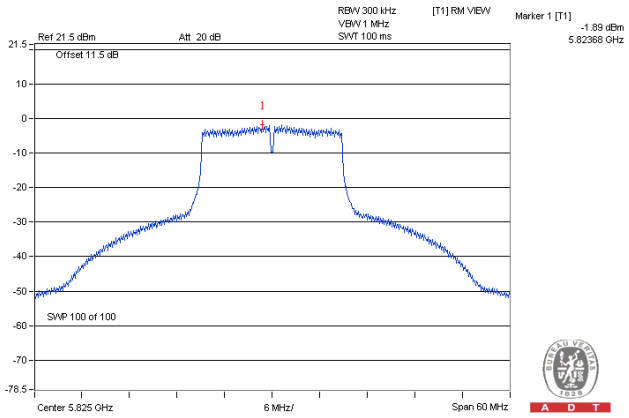
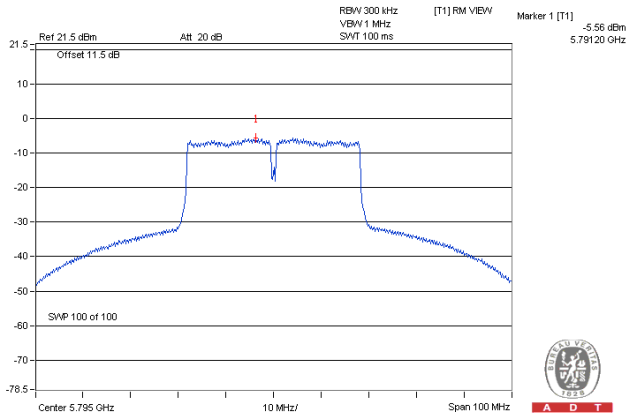
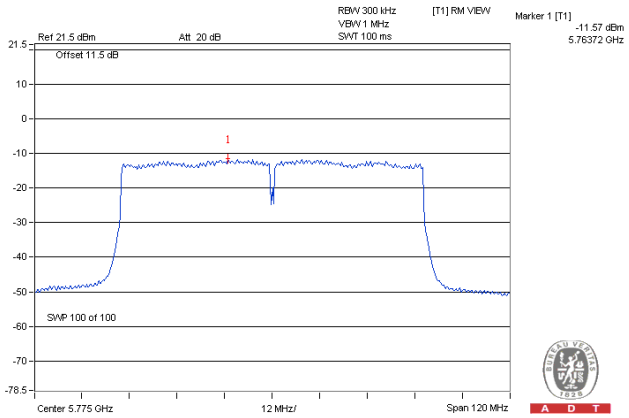
TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
0	151	5755	-9.90	-7.68	3.01	0.11	-4.56	29.99	Pass
	159	5795	-7.04	-4.82	3.01	0.11	-1.70	29.99	Pass
1	151	5755	-8.71	-6.49	3.01	0.11	-3.37	29.99	Pass
	159	5795	-5.56	-3.34	3.01	0.11	-0.22	29.99	Pass

Note:
1. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi,, so the power density limit shall be reduced to 30-(6.01-6) = 29.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
0	155	5775	-13.40	-11.18	3.01	0.18	-7.99	29.99	Pass
1	155	5775	-11.57	-9.35	3.01	0.18	-6.16	29.99	Pass

Note:
1. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi,, so the power density limit shall be reduced to 30-(6.01-6) = 29.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

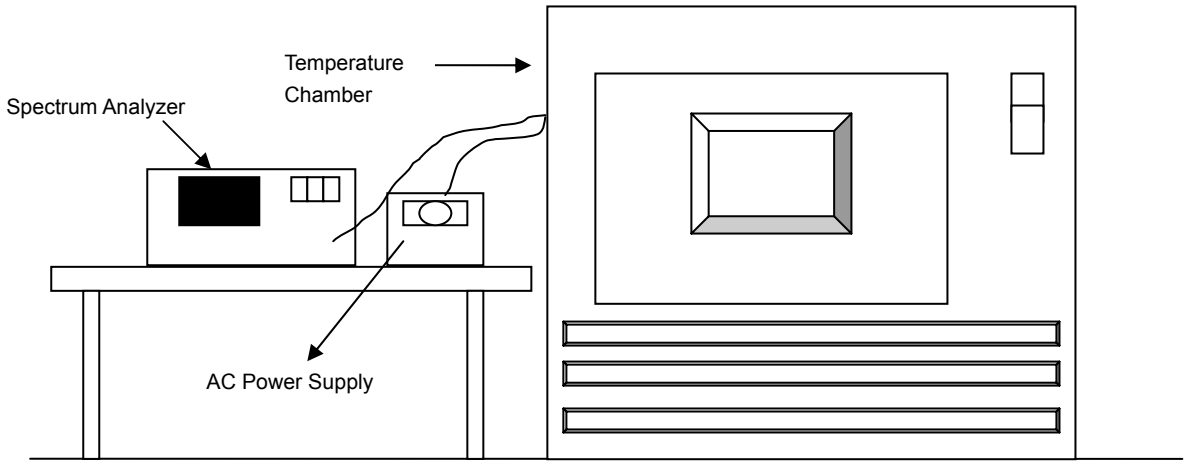
SPECTRUM PLOT OF WORST VALUE	
802.11n (HT20)	802.11n (HT40)
	
802.11ac (VHT80)	
	

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 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

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

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

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

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

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

4.5.5 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 (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0208	0.00040	5180.0212	0.00041	5180.0182	0.00035	5180.0167	0.00032
40	120	5179.9755	-0.00047	5179.9797	-0.00039	5179.9764	-0.00046	5179.9802	-0.00038
30	120	5180.0156	0.00030	5180.0121	0.00023	5180.0132	0.00025	5180.0141	0.00027
20	120	5179.9938	-0.00012	5179.9932	-0.00013	5179.9911	-0.00017	5179.9926	-0.00014
10	120	5179.9875	-0.00024	5179.9886	-0.00022	5179.9911	-0.00017	5179.9869	-0.00025
0	120	5180.0122	0.00024	5180.0152	0.00029	5180.0113	0.00022	5180.0135	0.00026
-10	120	5179.9874	-0.00024	5179.9894	-0.00020	5179.9907	-0.00018	5179.9874	-0.00024
-20	120	5180.0063	0.00012	5180.0061	0.00012	5180.0041	0.00008	5180.006	0.00012
-30	120	5180.0227	0.00044	5180.0235	0.00045	5180.0263	0.00051	5180.0221	0.00043

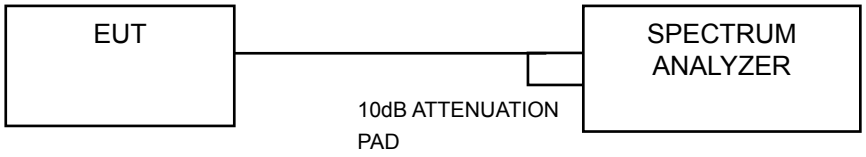
Frequemcy Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9935	-0.00013	5179.9926	-0.00014	5179.9902	-0.00019	5179.9933	-0.00013
	120	5179.9938	-0.00012	5179.9932	-0.00013	5179.9911	-0.00017	5179.9926	-0.00014
	102	5179.9941	-0.00011	5179.9923	-0.00015	5179.9918	-0.00016	5179.9917	-0.00016

4.6 20dB Bandwidth Measurement

4.6.1 Limits of Peak Transmit Power Measurement

Must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

789033 D02 General UNII Test Procedures New Rules v01 (II)(C)

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) 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%.

4.6.5 Test Result

CDD Mode

802.11a

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Pass / Fail
36	5180	29.55	Pass
40	5200	29.52	Pass
48	5240	20.67	Pass
149	5745	27.84	Pass
157	5785	34.18	Pass
165	5825	31.51	Pass

802.11n (HT20)

Channel	Frequency (MHz)	20dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	30.72	28.15	Pass
40	5200	33.15	30.06	Pass
48	5240	24.39	27.06	Pass
149	5745	19.95	20.37	Pass
157	5785	20.04	23.45	Pass
165	5825	20.18	27.78	Pass

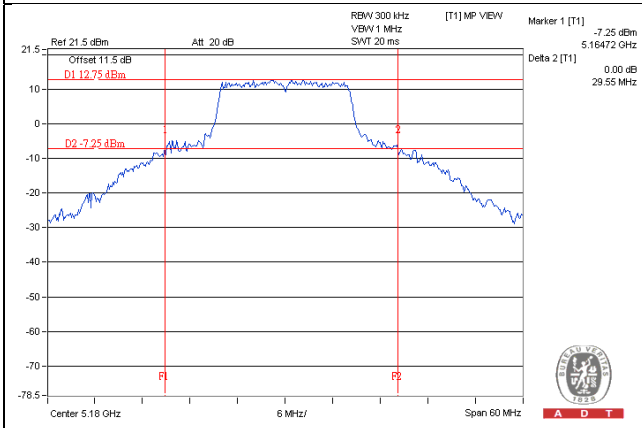
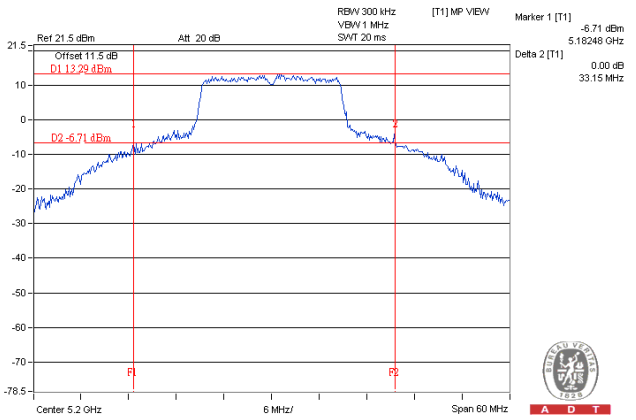
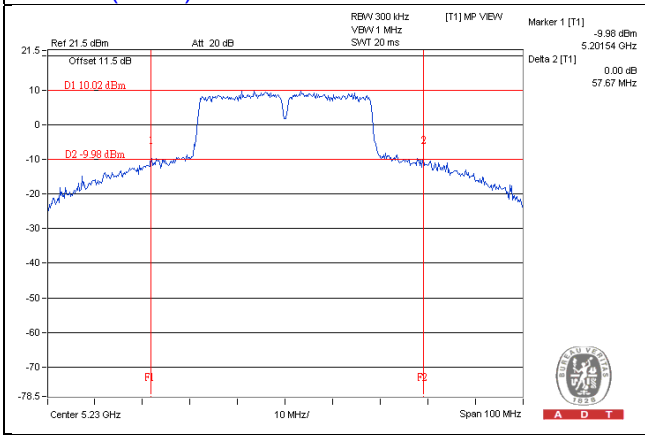
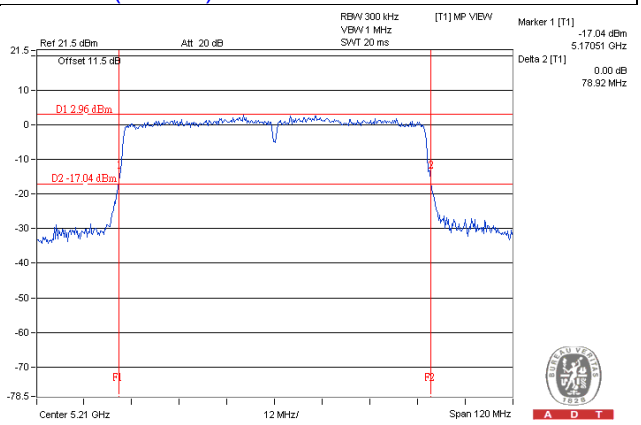
802.11n (HT40)

Channel	Frequency (MHz)	20dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	38.83	38.24	Pass
46	5230	57.67	47.69	Pass
151	5755	38.52	38.29	Pass
159	5795	38.87	38.95	Pass

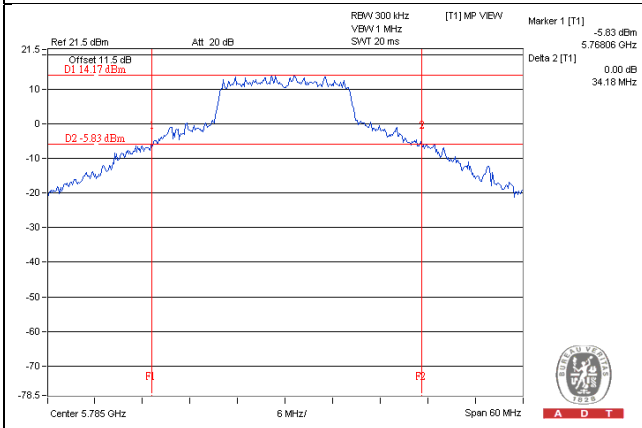
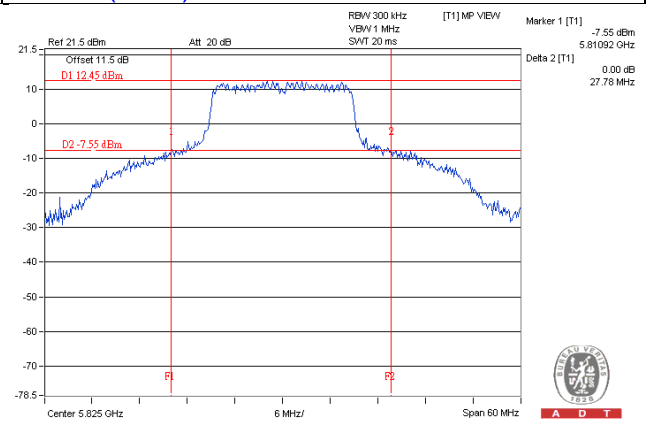
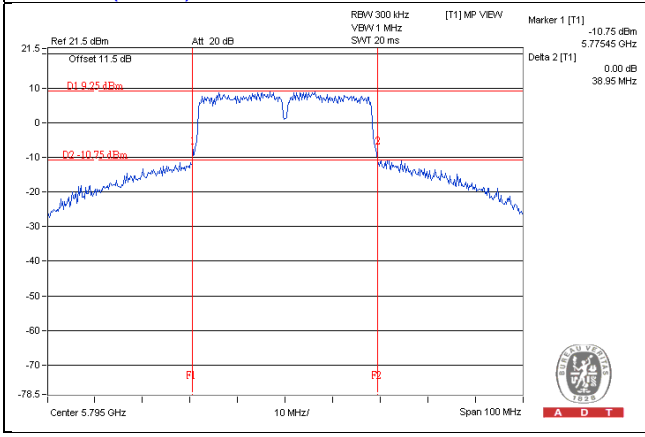
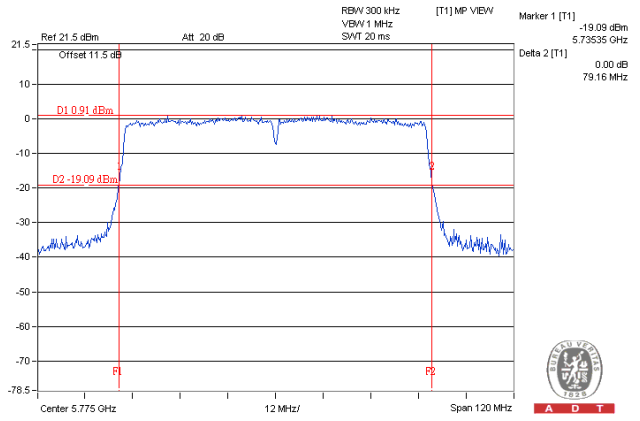
802.11ac (VHT80)

Channel	Frequency (MHz)	20dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	78.92	78.60	Pass
155	5775	79.16	78.66	Pass

For U-NII-1 Band

SPECTRUM PLOT OF WORST VALUE	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

For U-NII-3 Band

SPECTRUM PLOT OF WORST VALUE	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

802.11n (HT20)

Channel	Frequency (MHz)	20dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	20.05	19.95	Pass
40	5200	20.09	20.23	Pass
48	5240	21.21	26.56	Pass
149	5745	19.94	19.73	Pass
157	5785	20.01	19.87	Pass
165	5825	20.02	20.84	Pass

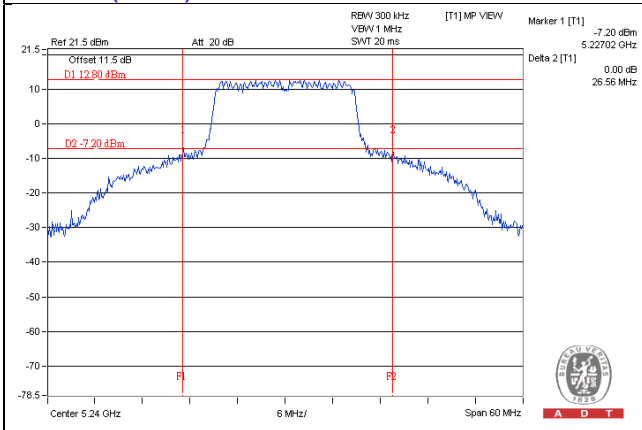
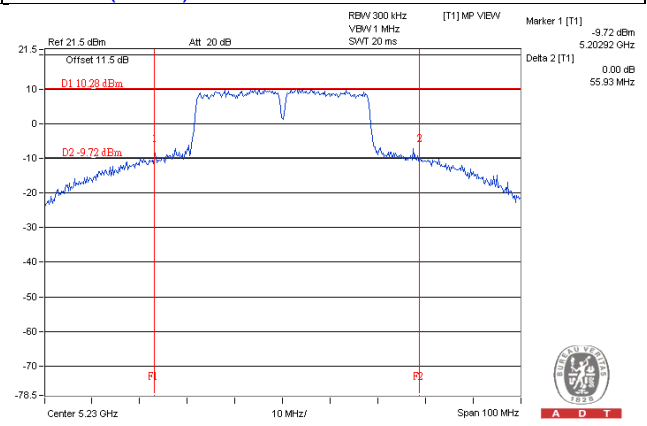
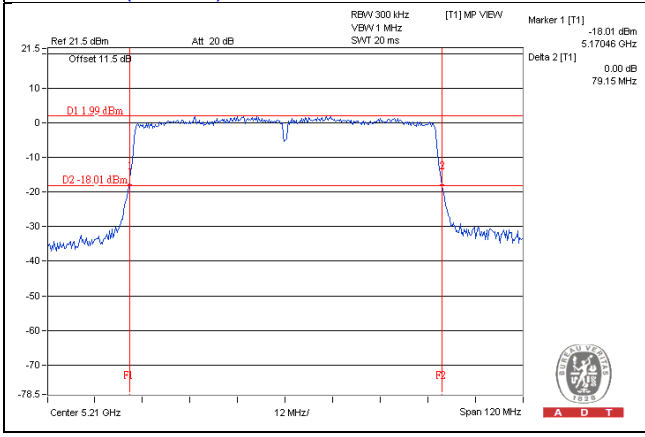
802.11n (HT40)

Channel	Frequency (MHz)	20dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	38.54	38.33	Pass
46	5230	55.93	50.04	Pass
151	5755	38.46	38.25	Pass
159	5795	38.58	38.58	Pass

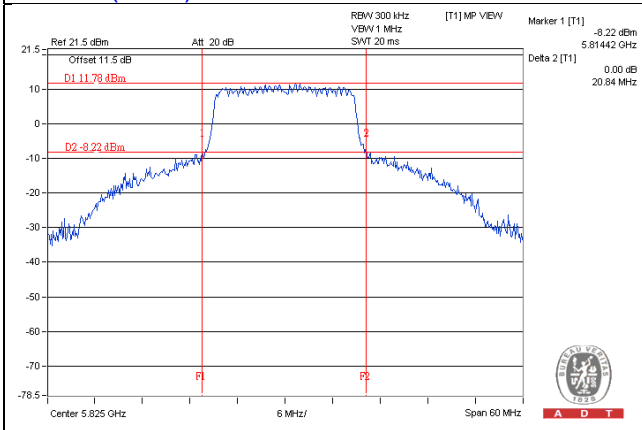
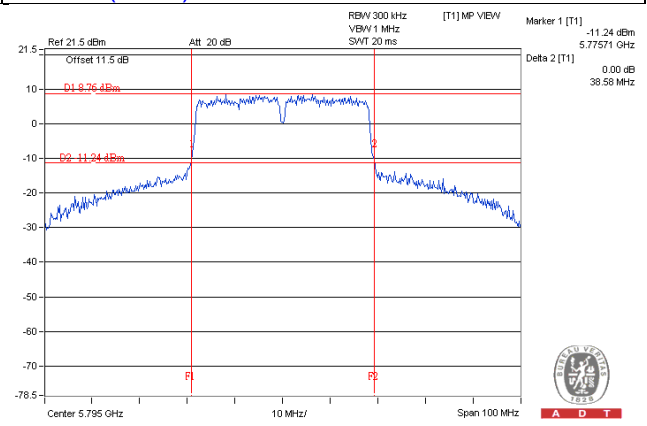
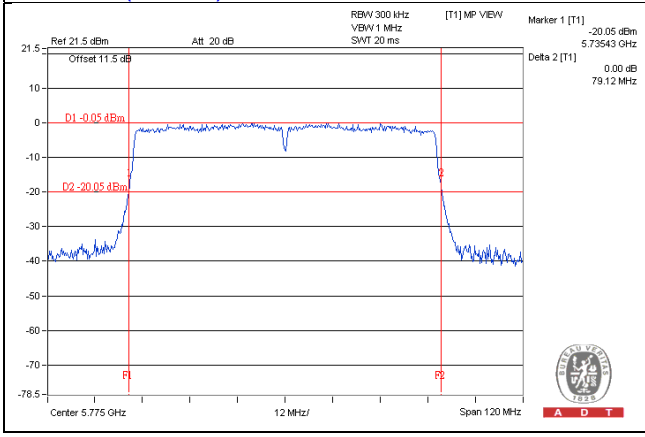
802.11ac (VHT80)

Channel	Frequency (MHz)	20dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	79.15	78.77	Pass
155	5775	79.12	78.83	Pass

For U-NII-1 Band

SPECTRUM PLOT OF WORST VALUE	
802.11n (HT20)	802.11n (HT40)
	
802.11ac (VHT80)	
	

For U-NII-3 Band

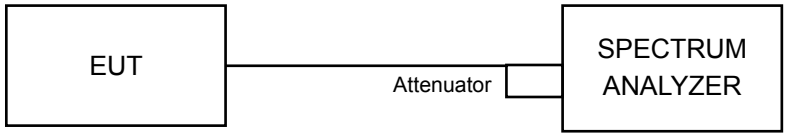
SPECTRUM PLOT OF WORST VALUE	
802.11n (HT20)	802.11n (HT40)
	
802.11ac (VHT80)	
	

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

789033 D02 General UNII Test Procedures New Rules v01 (C)

MEASUREMENT PROCEDURE REF

a. Set resolution bandwidth (RBW) = 100kHz

b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.

c. Trace mode = max hold.

d. Sweep = auto couple.

e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.35	0.5	Pass
157	5785	15.22	0.5	Pass
165	5825	16.37	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.64	17.63	0.5	Pass
157	5785	17.64	17.66	0.5	Pass
165	5825	17.63	17.64	0.5	Pass

802.11n (HT40)

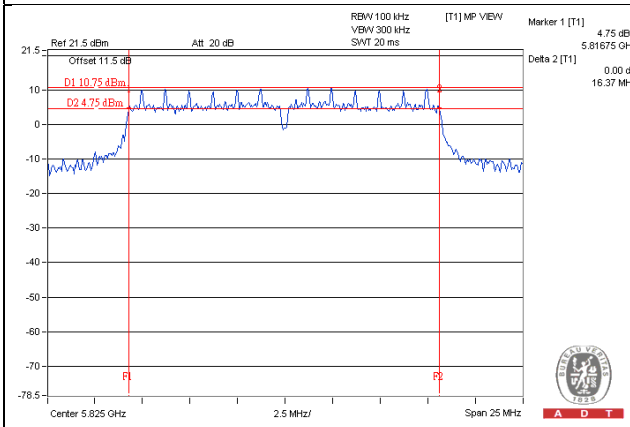
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.39	36.40	0.5	Pass
159	5795	36.20	36.41	0.5	Pass

802.11ac (VHT80)

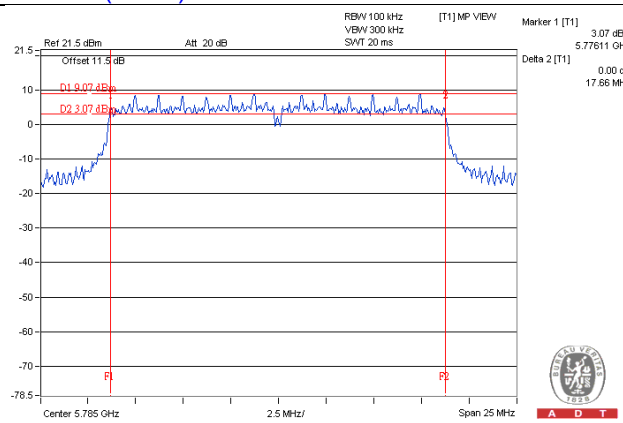
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.13	76.42	0.5	Pass

SPECTRUM PLOT OF WORST VALUE

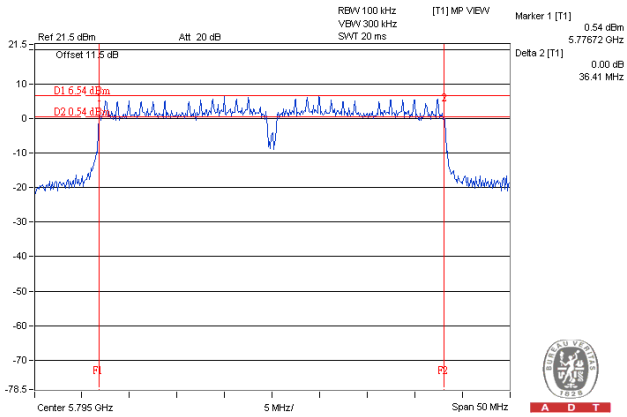
802.11a



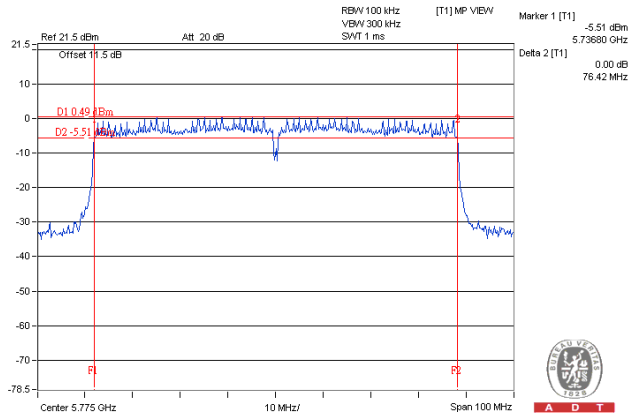
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



Beamforming Mode

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.62	17.64	0.5	Pass
157	5785	17.65	17.66	0.5	Pass
165	5825	17.64	17.64	0.5	Pass

802.11n (HT40)

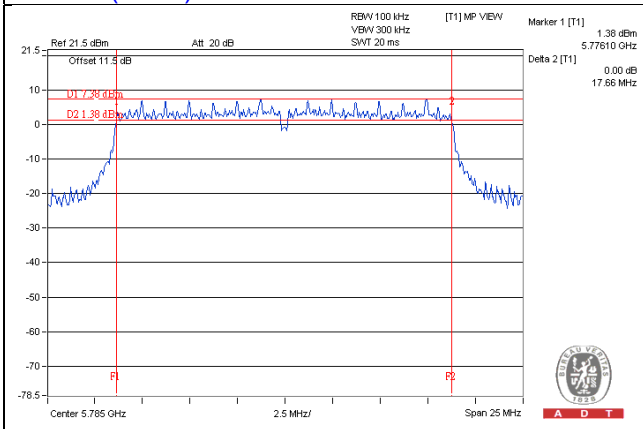
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.37	36.43	0.5	Pass
159	5795	36.34	36.38	0.5	Pass

802.11ac (VHT80)

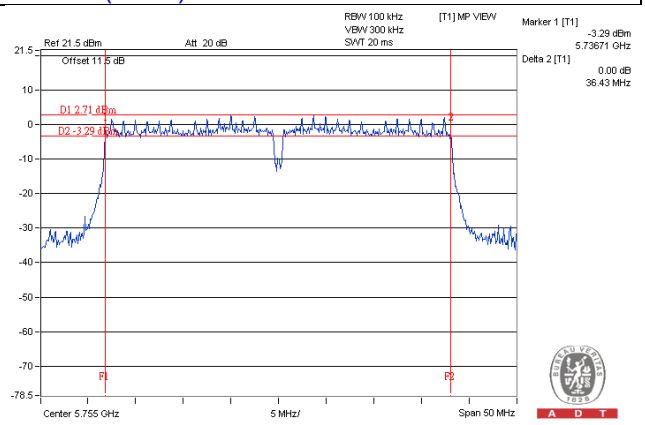
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.91	76.45	0.5	Pass

SPECTRUM PLOT OF WORST VALUE

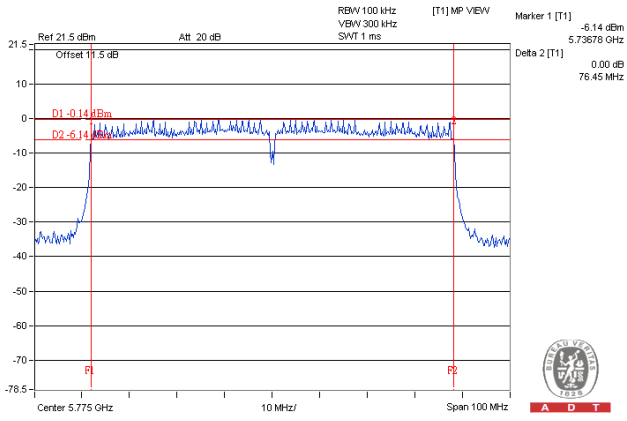
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



5 Pictures of Test Arrangements

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

Appendix – 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/Telecom Lab
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety
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.

--- END ---