FCC Test Report

Report No.:	RF160715C03-1
FCC ID:	PY316100334
Test Model:	EX6150v2
Received Date:	Jul. 11, 2016
Test Date:	Jul. 15 ~ Aug. 02, 2016
Issued Date:	Aug. 03, 2016
Applicant:	NETGEAR Inc.
Address:	350 East Plumeria Drive San Jose, CA 95134
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.)

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Release Control Record

Issue No.	Description	Date Issued
RF160715C03-1	Original release	Aug. 03, 2016

1 Certificate of Conformity

Product:	AC1200 WiFi Range Extender
Brand:	NETGEAR
Test Model:	EX6150v2
Sample Status:	Engineering sample
Applicant:	NETGEAR Inc.
Test Date:	Jul. 15 ~ Aug. 02, 2016
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 : Celine Chou , **Date:** Aug. 03, 2016

Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Aug. 03, 2016

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 -15.71dB at 0.54518MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz.
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 i-pex(MHF) not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

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	Expanded 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 WiFi Range Extender
Brand	NETGEAR
Test Model	EX6150v2
Status of EUT	Engineering sample
Power Supply Rating	100-240Vac
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
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 300Mbps 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	CDD Mode: 5180 ~ 5240MHz: 467.704mW 5745 ~ 5825MHz: 507.855mW Beamforming Mode: 5180 ~ 5240MHz: 456.975mW 5745 ~ 5825MHz: 494.903mW
Antenna Type	Dipole antenna with 3.48dBi gain
Antenna Connector	i-pex(MHF)
Accessory Device	NA
Data Cable Supplied	NA

Note:

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

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

*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, CDD mode is the worst case for final radiated emission and power line conducted emission tests after pretesting CDD mode and beamforming mode.

*The EUT incorporates AP & Extender functions, they are comply with standard, therefore, we chose worse case for AP function to performed the representative test after assessment

2. 2.4GHz and 5GHz technology can transmit at same time.

3. Spurious emission of the simultaneous operation (2.4GHz and 5GHz) has been evaluated and no non-compliance was found.

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	5210MHz

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	58.5
-	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	58.5

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)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
-	802.11a	5745-5825	149 to 165		OFDM	BPSK	6.0

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)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
-	802.11a	5745-5825	149 to 165		OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

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

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

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

EUT CONFIGURE MODE	MODE	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 (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	58.5
-	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 (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	58.5

Test Condition:

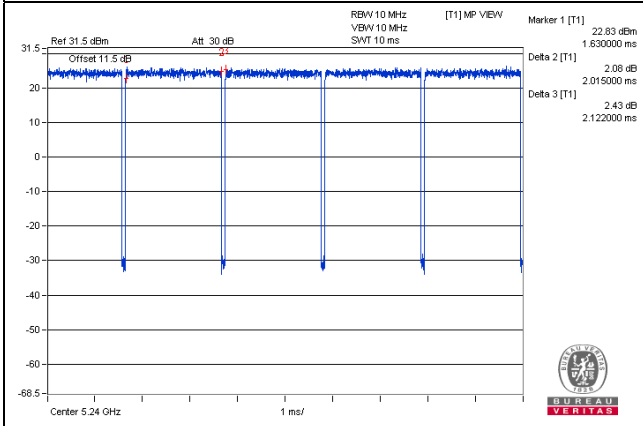
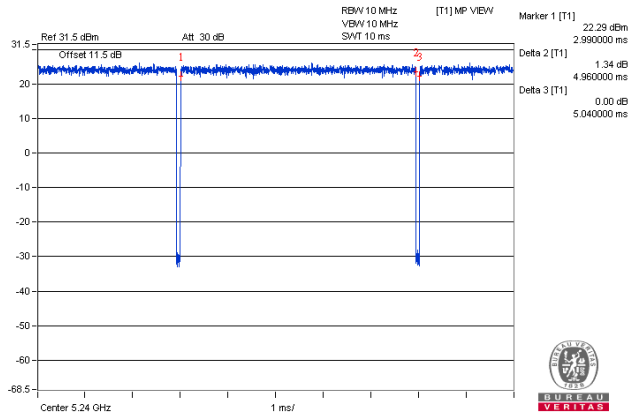
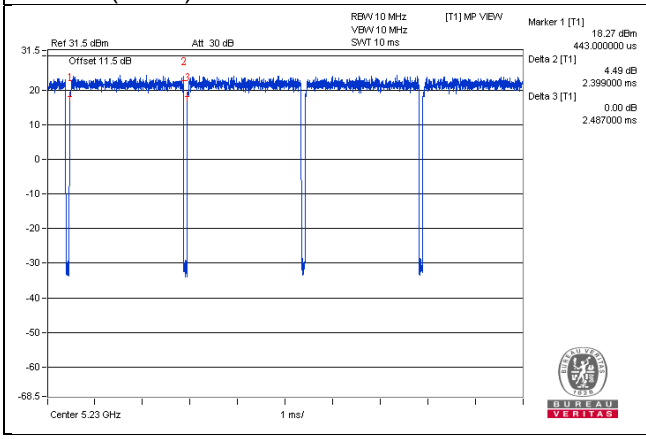
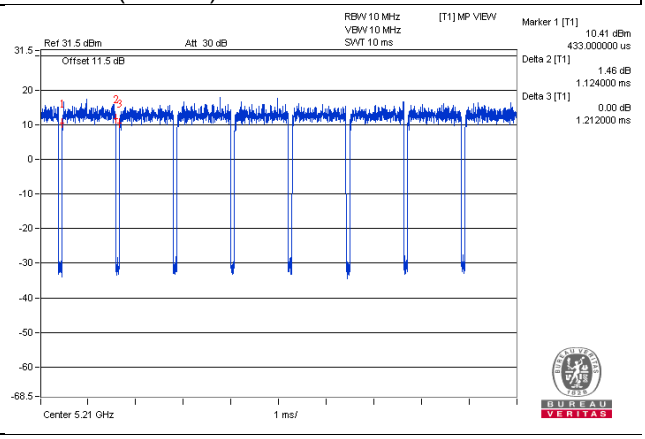
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	23deg. C, 70%RH	120Vac, 60Hz	Chris Lin
PLC	25deg. C, 65%RH	120Vac, 60Hz	Tank Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee

3.3 Duty Cycle of Test Signal

CDD Mode

802.11a, 802.11n (HT40), 802.11ac (VHT80): Duty cycle of test signal is < 98 %, duty factor is required.
802.11n (HT20): Duty cycle of test signal is > 98 %, duty factor is not required.

802.11a: Duty cycle = 2.015/2.112 = 0.950, Duty factor = 10 * log(1/0.950) = 0.22
802.11n (HT20): Duty cycle = 4.960/5.040 = 0.984
802.11n (HT40): Duty cycle = 2.399/2.487 = 0.965, Duty factor = 10 * log(1/0.965) = 0.16
802.11ac (VHT80): Duty cycle = 1.124/1.212 = 0.927, Duty factor = 10 * log(1/0.927) = 0.33

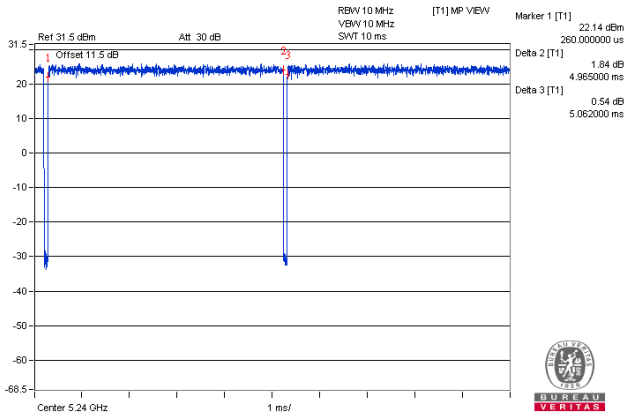
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

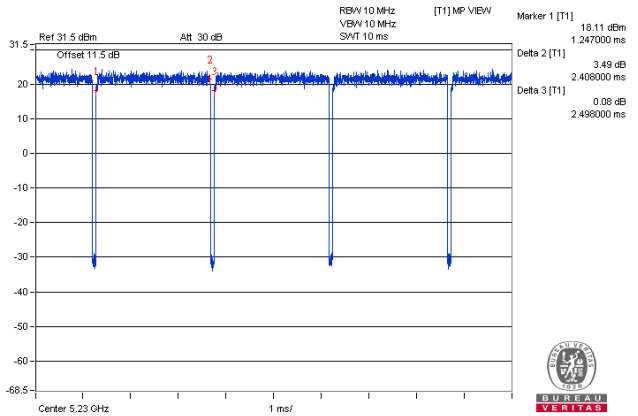
802.11ac (VHT40), 802.11ac (VHT80): Duty cycle of test signal is < 98 %, duty factor is required.
802.11ac (VHT20): Duty cycle of test signal is > 98 %, duty factor is not required.

802.11ac (VHT20): Duty cycle = 4.965/5.062 = 0.981
802.11ac (VHT40): Duty cycle = 2.408/2.498 = 0.964, Duty factor = 10 * log(1/0.964) = 0.16
802.11ac (VHT80): Duty cycle = 1.130/1.222 = 0.925, Duty factor = 10 * log(1/0.925) = 0.34

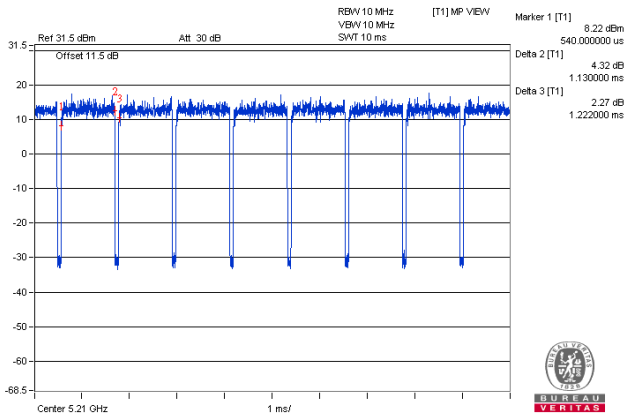
802.11ac (VHT20)



802.11ac (VHT40)



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.

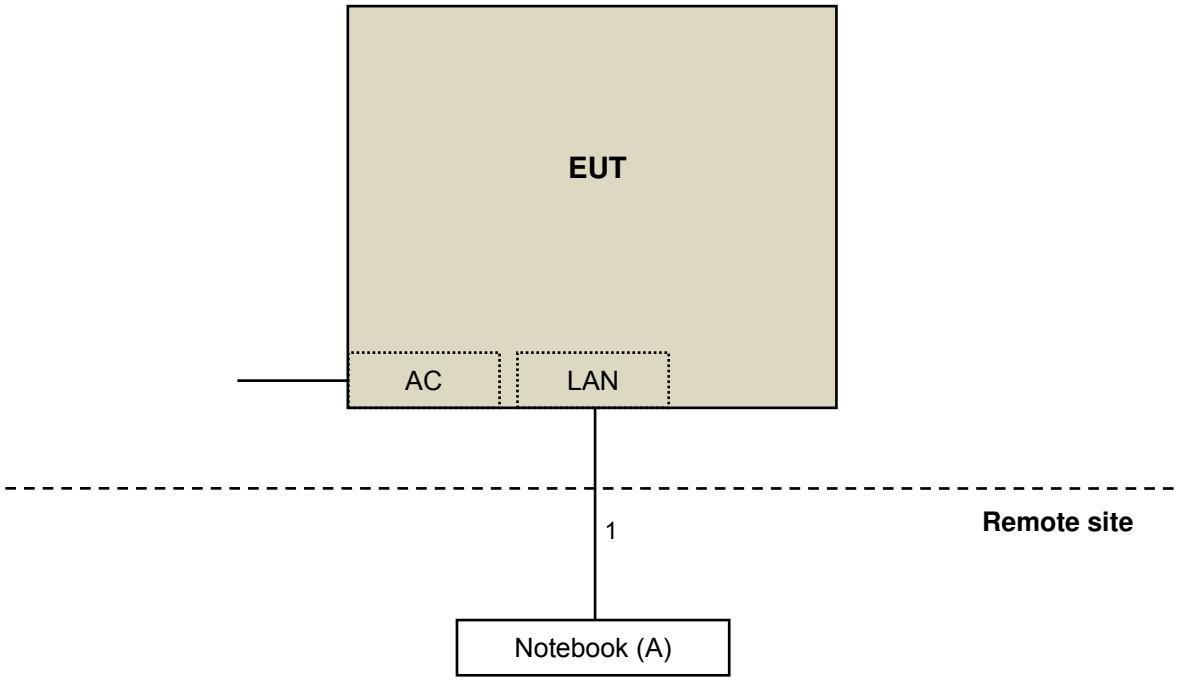
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45, Cat5e	1	3	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)

KDB 789033 D02 General UNII Test Procedure New Rules v01r02

KDB 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 is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r02</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 12, 2015	Oct. 11, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 08, 2016	Jul. 07, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Jan. 08, 2016	Jan. 07, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Jan. 18, 2016	Jan. 17, 2017
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	MY 13380+295012/04	Jul. 18, 2015	Jul. 17, 2016
			Jul. 18, 2016	Jul. 17, 2017
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, 2015	Oct. 17, 2016
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
			Jul. 09, 2016	Jul. 08, 2017
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016
			Jul. 09, 2016	Jul. 08, 2017
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2016	Jun. 07, 2017

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:

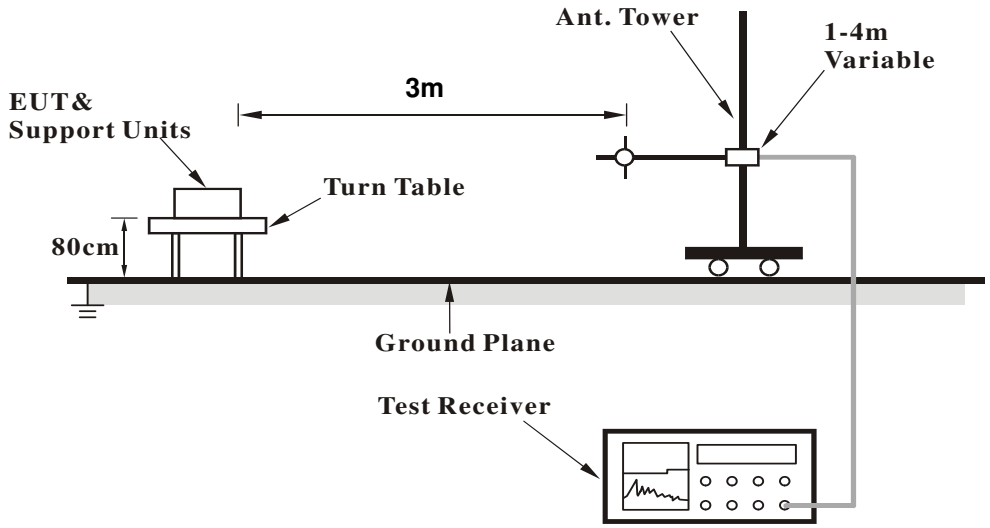
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

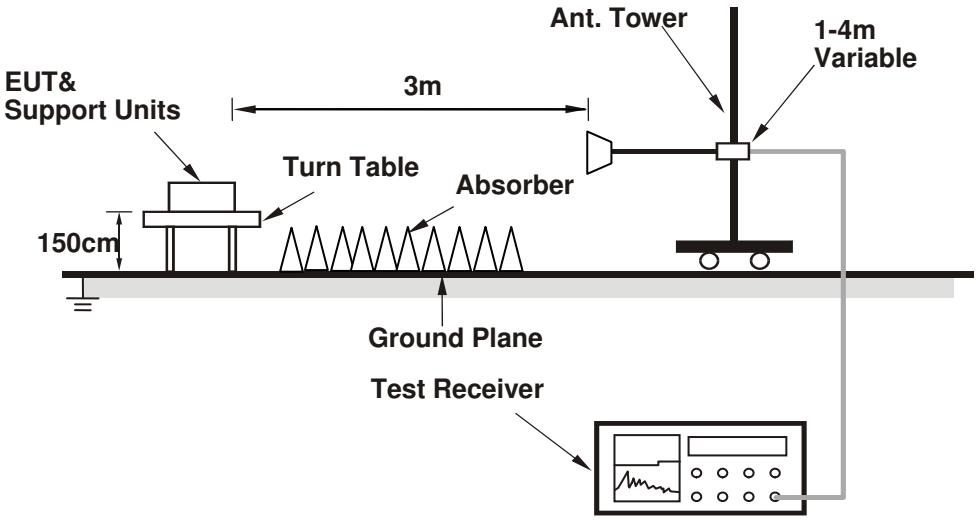
No deviation.

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 a notebook to act as a 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".

4.1.7 Test Results

Above 1GHz Worst-Case 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	5150.00	66.1 PK	74.0	-7.9	1.07 H	80	60.6	5.5
2	5150.00	49.5 AV	54.0	-4.5	1.07 H	80	44.0	5.5
3	*5180.00	107.6 PK			1.07 H	80	68.1	39.5
4	*5180.00	97.3 AV			1.07 H	80	57.8	39.5
5	#10360.00	59.5 PK	74.0	-14.5	1.47 H	85	42.0	17.5
6	#10360.00	46.2 AV	54.0	-7.8	1.47 H	85	28.7	17.5
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	71.0 PK	74.0	-3.0	1.61 V	321	65.5	5.5
2	5150.00	53.8 AV	54.0	-0.2	1.61 V	321	48.3	5.5
3	*5180.00	113.4 PK			1.61 V	321	73.9	39.5
4	*5180.00	102.9 AV			1.61 V	321	63.4	39.5
5	#10360.00	60.2 PK	74.0	-13.8	1.15 V	313	42.7	17.5
6	#10360.00	47.3 AV	54.0	-6.7	1.15 V	313	29.8	17.5

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	5150.00	58.7 PK	74.0	-15.3	1.21 H	243	53.2	5.5
2	5150.00	46.2 AV	54.0	-7.8	1.21 H	243	40.7	5.5
3	*5200.00	111.3 PK			1.21 H	243	71.7	39.6
4	*5200.00	100.6 AV			1.21 H	243	61.0	39.6
5	5350.00	56.8 PK	74.0	-17.2	1.21 H	243	51.1	5.7
6	5350.00	46.2 AV	54.0	-7.8	1.21 H	243	40.5	5.7
7	#10400.00	59.5 PK	74.0	-14.5	1.06 H	35	41.5	18.0
8	#10400.00	46.4 AV	54.0	-7.6	1.06 H	35	28.4	18.0
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	64.3 PK	74.0	-9.7	1.55 V	321	58.8	5.5
2	5150.00	49.0 AV	54.0	-5.0	1.55 V	321	43.5	5.5
3	*5200.00	115.8 PK			1.55 V	321	76.2	39.6
4	*5200.00	104.6 AV			1.55 V	321	65.0	39.6
5	5350.00	56.5 PK	74.0	-17.5	1.55 V	321	50.8	5.7
6	5350.00	43.8 AV	54.0	-10.2	1.55 V	321	38.1	5.7
7	#10400.00	60.1 PK	74.0	-13.9	1.00 V	112	42.1	18.0
8	#10400.00	47.7 AV	54.0	-6.3	1.00 V	112	29.7	18.0

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	111.1 PK			1.00 H	80	71.5	39.6
2	*5240.00	100.5 AV			1.00 H	80	60.9	39.6
3	5350.00	58.3 PK	74.0	-15.7	1.00 H	80	52.6	5.7
4	5350.00	46.3 AV	54.0	-7.7	1.00 H	80	40.6	5.7
5	#10480.00	59.6 PK	74.0	-14.4	1.47 H	87	41.6	18.0
6	#10480.00	46.7 AV	54.0	-7.3	1.47 H	87	28.7	18.0
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	114.4 PK			1.69 V	233	74.8	39.6
2	*5240.00	103.9 AV			1.69 V	233	64.3	39.6
3	5350.00	57.0 PK	74.0	-17.0	1.69 V	233	51.3	5.7
4	5350.00	44.1 AV	54.0	-9.9	1.69 V	233	38.4	5.7
5	#10480.00	59.8 PK	74.0	-14.2	1.10 V	223	41.8	18.0
6	#10480.00	47.5 AV	54.0	-6.5	1.10 V	223	29.5	18.0

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	#5647.20	57.2 PK	68.2	-11.0	1.96 H	249	51.4	5.8
2	*5745.00	111.4 PK			1.96 H	249	71.5	39.9
3	*5745.00	100.1 AV			1.96 H	249	60.2	39.9
4	#5953.60	57.4 PK	68.2	-10.8	1.96 H	249	50.9	6.5
5	11490.00	59.9 PK	74.0	-14.1	1.00 H	5	41.0	18.9
6	11490.00	46.3 AV	54.0	-7.7	1.00 H	5	27.4	18.9
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	#5621.60	58.4 PK	68.2	-9.8	1.22 V	311	52.3	6.1
2	*5745.00	113.3 PK			1.22 V	311	72.9	40.4
3	*5745.00	102.6 AV			1.22 V	311	62.2	40.4
4	#5984.80	59.4 PK	68.2	-8.8	1.22 V	311	52.7	6.7
5	11490.00	60.3 PK	74.0	-13.7	1.00 V	278	41.0	19.3
6	11490.00	47.0 AV	54.0	-7.0	1.00 V	278	27.7	19.3

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	#5636.80	57.5 PK	68.2	-10.7	2.04 H	257	51.7	5.8
2	*5785.00	111.7 PK			2.04 H	257	71.7	40.0
3	*5785.00	100.9 AV			2.04 H	257	60.9	40.0
4	#5950.40	57.3 PK	68.2	-10.9	2.04 H	257	50.8	6.5
5	11570.00	59.8 PK	74.0	-14.2	1.00 H	2	41.1	18.7
6	11570.00	45.9 AV	54.0	-8.1	1.00 H	2	27.2	18.7
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	#5618.40	58.5 PK	68.2	-9.7	1.20 V	312	52.4	6.1
2	*5785.00	112.5 PK			1.20 V	312	72.0	40.5
3	*5785.00	102.3 AV			1.20 V	312	61.8	40.5
4	#5981.60	60.5 PK	68.2	-7.7	1.20 V	312	53.8	6.7
5	11570.00	60.2 PK	74.0	-13.8	1.00 V	233	41.2	19.0
6	11570.00	46.5 AV	54.0	-7.5	1.00 V	233	27.5	19.0

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.

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	#5624.00	57.3 PK	68.2	-10.9	2.19 H	258	51.4	5.9
2	*5825.00	110.8 PK			2.19 H	258	70.6	40.2
3	*5825.00	100.6 AV			2.19 H	258	60.4	40.2
4	#5965.60	57.7 PK	68.2	-10.5	2.19 H	258	51.2	6.5
5	11650.00	59.3 PK	74.0	-14.7	1.00 H	17	41.0	18.3
6	11650.00	45.5 AV	54.0	-8.5	1.00 H	17	27.2	18.3
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	#5625.60	59.0 PK	68.2	-9.2	1.32 V	309	52.9	6.1
2	*5825.00	112.3 PK			1.32 V	309	71.7	40.6
3	*5825.00	101.8 AV			1.32 V	309	61.2	40.6
4	#5984.80	59.7 PK	68.2	-8.5	1.32 V	309	53.0	6.7
5	11650.00	59.8 PK	74.0	-14.2	1.00 V	276	41.3	18.5
6	11650.00	46.1 AV	54.0	-7.9	1.00 V	276	27.6	18.5

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	5150.00	61.8 PK	74.0	-12.2	1.39 H	77	56.3	5.5
2	5150.00	43.1 AV	54.0	-10.9	1.39 H	77	42.6	5.5
3	*5180.00	107.6 PK			1.39 H	77	68.1	39.5
4	*5180.00	97.2 AV			1.39 H	77	57.7	39.5
5	#10360.00	59.5 PK	74.0	-14.5	1.17 H	54	42.0	17.5
6	#10360.00	46.3 AV	54.0	-7.7	1.17 H	54	28.8	17.5
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	69.5 PK	74.0	-4.5	1.49 V	237	64.0	5.5
2	5150.00	53.6 AV	54.0	-0.4	1.49 V	237	48.1	5.5
3	*5180.00	113.2 PK			1.49 V	237	73.7	39.5
4	*5180.00	102.2 AV			1.49 V	237	62.7	39.5
5	#10360.00	59.0 PK	74.0	-15.0	1.00 V	184	41.5	17.5
6	#10360.00	46.7 AV	54.0	-7.3	1.00 V	184	29.2	17.5

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	110.1 PK			1.36 H	241	70.5	39.6
2	*5200.00	100.4 AV			1.36 H	241	60.8	39.6
3	#10400.00	59.5 PK	74.0	-14.5	1.32 H	96	41.5	18.0
4	#10400.00	46.4 AV	54.0	-7.6	1.32 H	96	28.4	18.0
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	113.1 PK			1.85 V	317	73.5	39.6
2	*5200.00	102.8 AV			1.85 V	317	63.2	39.6
3	#10400.00	59.2 PK	74.0	-14.8	1.00 V	281	41.2	18.0
4	#10400.00	46.5 AV	54.0	-7.5	1.00 V	281	28.5	18.0

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	110.8 PK			1.00 H	240	71.2	39.6
2	*5240.00	100.5 AV			1.00 H	240	60.9	39.6
3	5350.00	58.3 PK	74.0	-15.7	1.00 H	240	52.6	5.7
4	5350.00	45.9 AV	54.0	-8.1	1.00 H	240	40.2	5.7
5	#10480.00	59.9 PK	74.0	-14.1	1.33 H	205	41.9	18.0
6	#10480.00	46.1 AV	54.0	-7.9	1.33 H	205	28.1	18.0
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	112.7 PK			1.70 V	324	73.1	39.6
2	*5240.00	102.6 AV			1.70 V	324	63.0	39.6
3	5350.00	56.5 PK	74.0	-17.5	1.70 V	324	50.8	5.7
4	5350.00	43.7 AV	54.0	-10.3	1.70 V	324	38.0	5.7
5	#10480.00	60.0 PK	74.0	-14.0	1.00 V	287	42.0	18.0
6	#10480.00	47.2 AV	54.0	-6.8	1.00 V	287	29.2	18.0

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	#5640.00	57.5 PK	68.2	-10.7	2.20 H	290	51.7	5.8
2	*5745.00	109.9 PK			2.20 H	290	70.0	39.9
3	*5745.00	99.5 AV			2.20 H	290	59.6	39.9
4	#5966.40	58.0 PK	68.2	-10.2	2.20 H	290	51.5	6.5
5	11490.00	59.8 PK	74.0	-14.2	1.00 H	10	40.9	18.9
6	11490.00	46.5 AV	54.0	-7.5	1.00 H	10	27.6	18.9
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	#5632.00	57.6 PK	68.2	-10.6	1.58 V	309	51.5	6.1
2	*5745.00	111.8 PK			1.58 V	309	71.4	40.4
3	*5745.00	101.1 AV			1.58 V	309	60.7	40.4
4	#5990.40	58.5 PK	68.2	-9.7	1.58 V	309	51.8	6.7
5	11490.00	60.1 PK	74.0	-13.9	1.00 V	322	40.8	19.3
6	11490.00	47.2 AV	54.0	-6.8	1.00 V	322	27.9	19.3

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	#5631.20	57.6 PK	68.2	-10.6	2.17 H	255	51.8	5.8
2	*5785.00	110.2 PK			2.17 H	255	70.2	40.0
3	*5785.00	99.8 AV			2.17 H	255	59.8	40.0
4	#5953.60	58.3 PK	68.2	-9.9	2.17 H	255	51.8	6.5
5	11570.00	59.4 PK	74.0	-14.6	1.00 H	6	40.7	18.7
6	11570.00	45.7 AV	54.0	-8.3	1.00 H	6	27.0	18.7
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	#5643.20	57.6 PK	68.2	-10.6	1.29 V	308	51.5	6.1
2	*5785.00	111.5 PK			1.29 V	308	71.0	40.5
3	*5785.00	100.8 AV			1.29 V	308	60.3	40.5
4	#5932.80	58.3 PK	68.2	-9.9	1.29 V	308	51.6	6.7
5	11570.00	60.0 PK	74.0	-14.0	1.00 V	360	41.0	19.0
6	11570.00	46.7 AV	54.0	-7.3	1.00 V	360	27.7	19.0

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.

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	#5640.00	57.1 PK	68.2	-11.1	2.28 H	255	51.3	5.8
2	*5825.00	110.3 PK			2.28 H	255	70.1	40.2
3	*5825.00	100.0 AV			2.28 H	255	59.8	40.2
4	#5930.40	57.5 PK	68.2	-10.7	2.28 H	255	51.1	6.4
5	11650.00	59.4 PK	74.0	-14.6	1.00 H	6	41.1	18.3
6	11650.00	46.0 AV	54.0	-8.0	1.00 H	6	27.7	18.3
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	#5620.00	57.3 PK	68.2	-10.9	2.63 V	263	51.2	6.1
2	*5825.00	111.9 PK			2.63 V	263	71.3	40.6
3	*5825.00	100.9 AV			2.63 V	263	60.3	40.6
4	#5967.20	58.1 PK	68.2	-10.1	2.63 V	263	51.4	6.7
5	11650.00	59.9 PK	74.0	-14.1	1.20 V	214	41.4	18.5
6	11650.00	46.3 AV	54.0	-7.7	1.20 V	214	27.8	18.5

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	64.7 PK	74.0	-9.3	1.00 H	243	59.2	5.5
2	5150.00	52.5 AV	54.0	-1.5	1.00 H	243	47.0	5.5
3	*5190.00	101.8 PK			1.00 H	243	62.3	39.5
4	*5190.00	92.4 AV			1.00 H	243	52.9	39.5
5	#10380.00	59.0 PK	74.0	-15.0	1.16 H	30	41.2	17.8
6	#10380.00	46.2 AV	54.0	-7.8	1.16 H	30	28.4	17.8
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	67.9 PK	74.0	-6.1	1.58 V	321	62.4	5.5
2	5150.00	53.7 AV	54.0	-0.3	1.58 V	321	48.2	5.5
3	*5190.00	105.5 PK			1.58 V	321	66.0	39.5
4	*5190.00	96.2 AV			1.58 V	321	56.7	39.5
5	#10380.00	58.6 PK	74.0	-15.4	1.00 V	142	40.8	17.8
6	#10380.00	46.3 AV	54.0	-7.7	1.00 V	142	28.5	17.8

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	108.0 PK			1.22 H	81	68.4	39.6
2	*5230.00	97.7 AV			1.22 H	81	58.1	39.6
3	5350.00	59.3 PK	74.0	-14.7	1.22 H	81	53.6	5.7
4	5350.00	46.2 AV	54.0	-7.8	1.22 H	81	40.5	5.7
5	#10460.00	58.6 PK	74.0	-15.4	1.55 H	221	40.6	18.0
6	#10460.00	46.1 AV	54.0	-7.9	1.55 H	221	28.1	18.0
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	110.6 PK			1.63 V	318	71.0	39.6
2	*5230.00	100.5 AV			1.63 V	318	60.9	39.6
3	5350.00	57.7 PK	74.0	-16.3	1.63 V	318	52.0	5.7
4	5350.00	44.6 AV	54.0	-9.4	1.63 V	318	38.9	5.7
5	#10460.00	59.6 PK	74.0	-14.4	1.00 V	275	41.6	18.0
6	#10460.00	46.9 AV	54.0	-7.1	1.00 V	275	28.9	18.0

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	#5641.60	61.5 PK	68.2	-6.7	2.23 H	254	55.7	5.8
2	*5755.00	107.9 PK			2.23 H	254	67.9	40.0
3	*5755.00	98.2 AV			2.23 H	254	58.2	40.0
4	#5964.00	60.0 PK	68.2	-8.2	2.23 H	254	53.5	6.5
5	11510.00	60.8 PK	74.0	-13.2	1.00 H	1	42.1	18.7
6	11510.00	47.4 AV	54.0	-6.6	1.00 H	1	28.7	18.7
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	#5648.80	60.4 PK	68.2	-7.8	1.00 V	312	54.3	6.1
2	*5755.00	109.2 PK			1.00 V	312	68.7	40.5
3	*5755.00	99.5 AV			1.00 V	312	59.0	40.5
4	#5978.40	59.4 PK	68.2	-8.8	1.00 V	312	52.7	6.7
5	11510.00	61.5 PK	74.0	-12.5	1.00 V	289	42.4	19.1
6	11510.00	47.9 AV	54.0	-6.1	1.00 V	289	28.8	19.1

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	#5628.00	57.7 PK	68.2	-10.5	2.20 H	256	51.8	5.9
2	*5795.00	107.8 PK			2.20 H	256	67.8	40.0
3	*5795.00	97.6 AV			2.20 H	256	57.6	40.0
4	#5934.40	59.2 PK	68.2	-9.0	2.20 H	256	52.8	6.4
5	11590.00	60.6 PK	74.0	-13.4	1.00 H	13	42.2	18.4
6	11590.00	47.3 AV	54.0	-6.7	1.00 H	13	28.9	18.4
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	#5628.80	58.8 PK	68.2	-9.4	1.28 V	310	52.7	6.1
2	*5795.00	108.7 PK			1.28 V	310	68.2	40.5
3	*5795.00	98.7 AV			1.28 V	310	58.2	40.5
4	#5940.80	59.7 PK	68.2	-8.5	1.28 V	310	53.0	6.7
5	11590.00	61.3 PK	74.0	-12.7	1.00 V	331	42.6	18.7
6	11590.00	48.0 AV	54.0	-6.0	1.00 V	331	29.3	18.7

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	62.9 PK	74.0	-11.1	1.00 H	81	57.40	5.50
2	5150.00	51.1 AV	54.0	-2.9	1.00 H	81	45.60	5.50
3	*5210.00	98.6 PK			1.00 H	81	59.00	39.60
4	*5210.00	88.5 AV			1.00 H	81	48.90	39.60
5	5350.00	57.3 PK	74.0	-16.7	1.00 H	81	51.60	5.70
6	5350.00	46.2 AV	54.0	-7.8	1.00 H	81	40.50	5.70
7	#10420.00	58.6 PK	74.0	-15.4	1.55 H	226	40.60	18.00
8	#10420.00	46.1 AV	54.0	-7.9	1.55 H	226	28.10	18.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.7 PK	74.0	-7.3	1.60 V	317	61.20	5.50
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.60 V**	**317**	**48.40**	**5.50**
3	*5210.00	101.1 PK			1.60 V	317	61.50	39.60
4	*5210.00	90.1 AV			1.60 V	317	50.50	39.60
5	5350.00	60.1 PK	74.0	-13.9	1.60 V	317	54.40	5.70
6	5350.00	47.3 AV	54.0	-6.7	1.60 V	317	41.60	5.70
7	#10420.00	58.2 PK	74.0	-15.8	1.06 V	308	40.20	18.00
8	#10420.00	46.1 AV	54.0	-7.9	1.06 V	308	28.10	18.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	#5646.40	66.3 PK	68.2	-1.9	2.22 H	256	60.5	5.8
2	*5775.00	101.6 PK			2.22 H	256	61.6	40.0
3	*5775.00	92.7 AV			2.22 H	256	52.7	40.0
4	#5924.80	60.6 PK	68.3	-7.7	2.22 H	256	54.2	6.4
5	11550.00	60.2 PK	74.0	-13.8	1.00 H	4	41.5	18.7
6	11550.00	47.4 AV	54.0	-6.6	1.00 H	4	28.7	18.7
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	#5635.20	66.2 PK	68.2	-2.0	1.00 V	310	60.1	6.1
2	#5652.80	69.9 PK	70.3	-0.4	1.00 V	310	63.8	6.1
3	*5775.00	102.9 PK			1.00 V	310	62.4	40.5
4	*5775.00	93.8 AV			1.00 V	310	53.3	40.5
5	#5939.20	60.6 PK	68.2	-7.6	1.00 V	310	53.9	6.7
6	11550.00	60.8 PK	74.0	-13.2	1.00 V	266	41.8	19.0
7	11550.00	47.9 AV	54.0	-6.1	1.00 V	266	28.9	19.0

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:

802.11a

CHANNEL	TX Channel 36	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	97.81	23.2 QP	43.5	-20.3	2.00 H	57	42.0	-18.8
2	253.05	28.5 QP	46.0	-17.5	1.50 H	316	42.9	-14.4
3	532.46	25.4 QP	46.0	-20.6	1.50 H	21	34.4	-9.0
4	650.83	34.8 QP	46.0	-11.2	1.24 H	12	41.1	-6.3
5	749.79	29.0 QP	46.0	-17.0	1.00 H	128	32.9	-3.9
6	875.91	29.3 QP	46.0	-16.7	1.50 H	150	31.5	-2.2
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	29.90	31.8 QP	40.0	-8.2	1.00 V	157	47.2	-15.4
2	187.07	21.4 QP	43.5	-22.1	1.00 V	133	37.4	-16.0
3	532.46	26.9 QP	46.0	-19.1	1.26 V	98	35.9	-9.0
4	648.89	31.4 QP	46.0	-14.6	1.00 V	53	37.7	-6.3
5	749.79	27.5 QP	46.0	-18.5	1.00 V	148	31.4	-3.9
6	875.91	30.3 QP	46.0	-15.7	1.00 V	182	32.5	-2.2

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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 16, 2015	Nov. 15, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2015	Dec. 25, 2016
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2016	Feb. 25, 2017
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100220	Nov. 13, 2015	Nov. 12, 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.

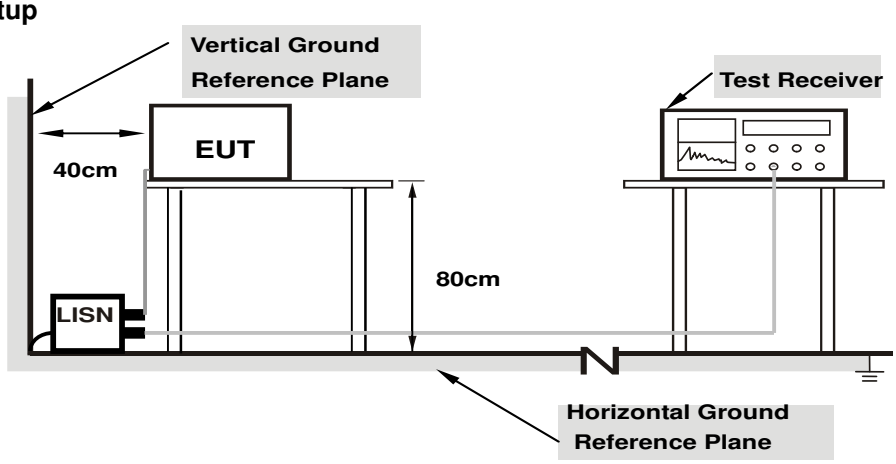
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

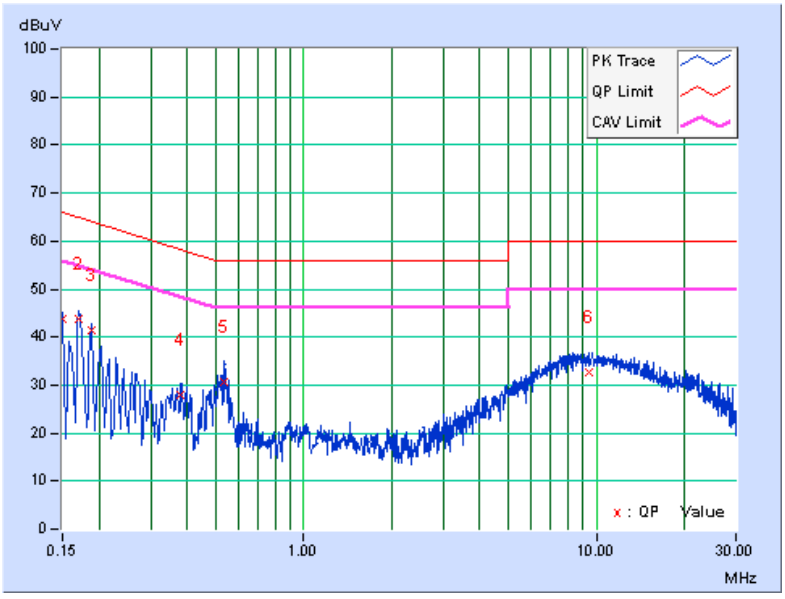
4.2.7 Test Results

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	0.15000	10.01	33.83	20.06	43.84	30.07	66.00	56.00	-22.16	-25.93
2	0.16967	10.02	33.68	18.07	43.70	28.09	64.98	54.98	-21.28	-26.89
3	0.18903	10.03	31.45	16.46	41.48	26.49	64.08	54.08	-22.60	-27.59
4	0.38099	10.11	17.71	10.19	27.82	20.30	58.26	48.26	-30.44	-27.96
5	0.53709	10.14	20.66	12.67	30.80	22.81	56.00	46.00	-25.20	-23.19
6	9.38151	10.70	21.88	14.06	32.58	24.76	60.00	50.00	-27.42	-25.24

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.

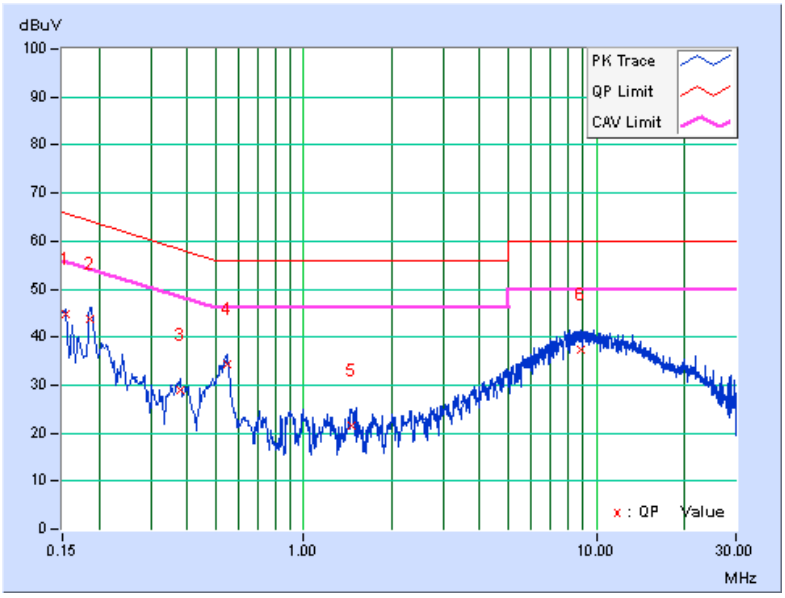


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15391	10.03	34.60	23.55	44.63	33.58	65.79	55.79	-21.16	-22.21
2	0.18508	10.04	33.58	23.02	43.62	33.06	64.25	54.25	-20.63	-21.19
3	0.37999	10.12	18.91	14.40	29.03	24.52	58.28	48.28	-29.25	-23.76
4	**0.54518**	**10.15**	**24.04**	**20.14**	**34.19**	**30.29**	**56.00**	**46.00**	**-21.81**	**-15.71**
5	1.45670	10.24	11.26	5.34	21.50	15.58	56.00	46.00	-34.50	-30.42
6	8.91231	10.73	26.50	18.70	37.23	29.43	60.00	50.00	-22.77	-20.57

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 Measurement

4.3.1 Limits of Transmit Power Measurement

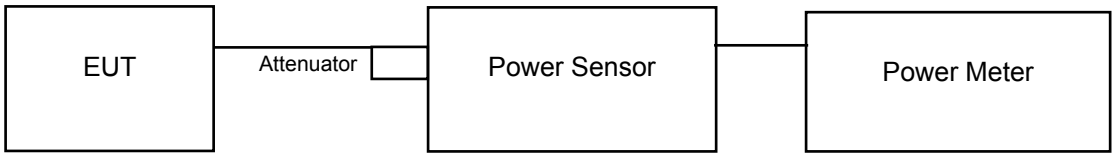
Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client 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

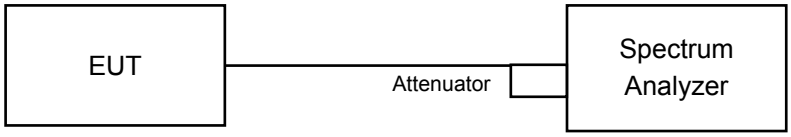
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz 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

For 802.11a, 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40)



For 802.11ac (VHT80)



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

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)

a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
b. Set sweep trigger to “free run”.
c. Set RBW = 1 MHz.
d. Set VBW ≥ 3 MHz
e. Number of points in sweep ≥ 2 Span / RBW.
f. Sweep time ≤ (number of points in sweep) * T
g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
h. Detector = RMS.
i. Trace mode = max hold.
j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
k. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

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

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.77	21.19	250.921	24.00	30	Pass
40	5200	24.35	22.91	**467.704**	26.70	30	Pass
48	5240	24.28	22.37	440.501	26.44	30	Pass
149	5745	24.30	22.23	436.262	26.40	30	Pass
157	5785	24.27	23.16	474.315	26.76	30	Pass
165	5825	24.11	22.96	455.329	26.58	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.81	21.22	252.938	24.03	30	Pass
40	5200	24.11	22.90	452.616	26.56	30	Pass
48	5240	24.24	22.76	454.260	26.57	30	Pass
149	5745	24.33	23.55	497.483	26.97	30	Pass
157	5785	24.16	23.46	482.435	26.83	30	Pass
165	5825	24.18	23.91	**507.855**	27.06	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.72	18.10	123.721	20.92	30	Pass
46	5230	24.26	22.31	436.902	26.40	30	Pass
151	5755	24.35	22.37	444.854	26.48	30	Pass
159	5795	24.39	22.49	452.208	26.55	30	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.58	16.73	92.597	19.67	30	Pass
155	5775	23.13	21.41	343.946	25.36	30	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.58	21.33	250.119	23.98	29.51	Pass
40	5200	24.03	22.91	448.364	26.52	29.51	Pass
48	5240	24.36	22.65	**456.975**	26.60	29.51	Pass
149	5745	24.28	23.56	**494.903**	26.95	29.51	Pass
157	5785	23.83	23.17	449.037	26.52	29.51	Pass
165	5825	24.21	23.55	490.097	26.90	29.51	Pass

Note: Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power limit shall be reduced to 30-(6.49-6) = 29.51dBm.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.56	18.02	120.403	20.81	29.51	Pass
46	5230	23.87	22.27	412.436	26.15	29.51	Pass
151	5755	24.47	22.41	454.079	26.57	29.51	Pass
159	5795	24.13	22.18	424.017	26.27	29.51	Pass

Note: Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power limit shall be reduced to 30-(6.49-6) = 29.51dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.24	16.43	86.027	19.35	29.51	Pass
155	5775	23.14	21.03	332.828	25.22	29.51	Pass

Note: Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power limit shall be reduced to 30-(6.49-6) = 29.51dBm.

26dB Bandwidth:

CDD Mode

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	26.05	30.04	Pass
40	5200	36.89	37.55	Pass
48	5240	34.93	36.08	Pass

802.11n (HT20)

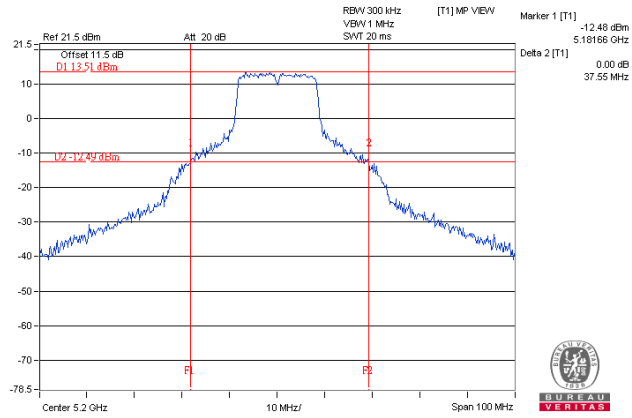
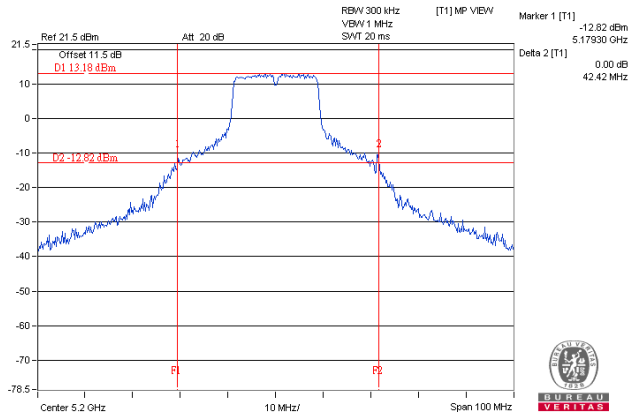
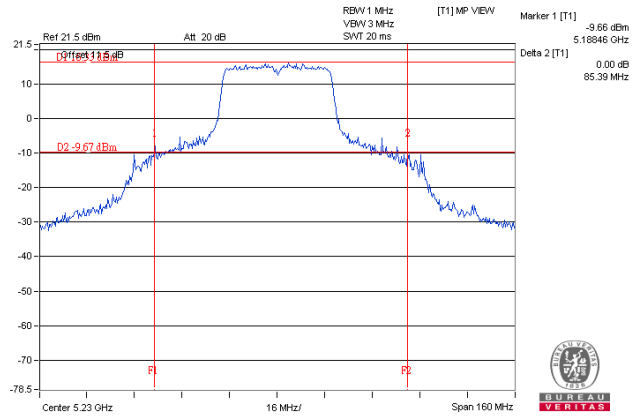
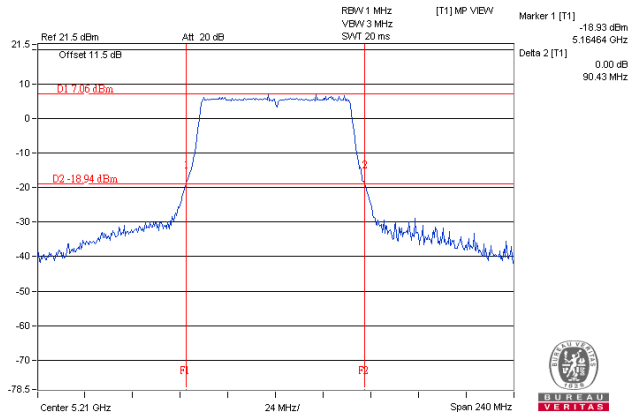
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	37.43	36.23	Pass
40	5200	39.94	42.42	Pass
48	5240	39.85	41.81	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	45.81	47.27	Pass
46	5230	85.39	82.04	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	89.47	90.43	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

802.11ac (VHT20)

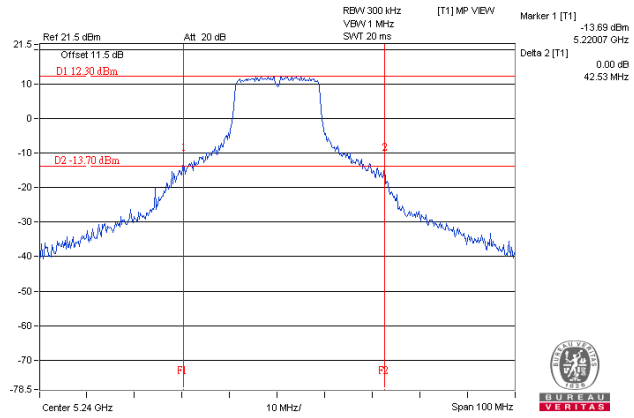
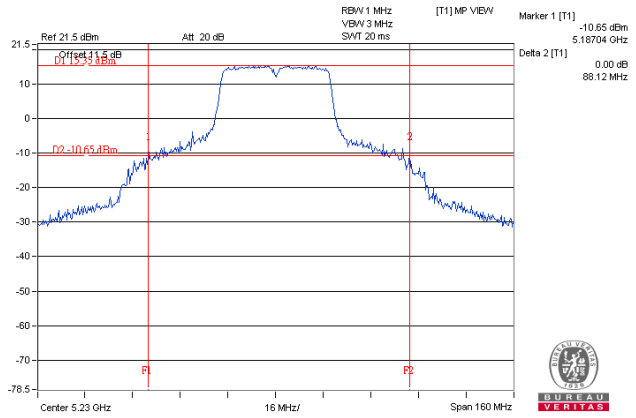
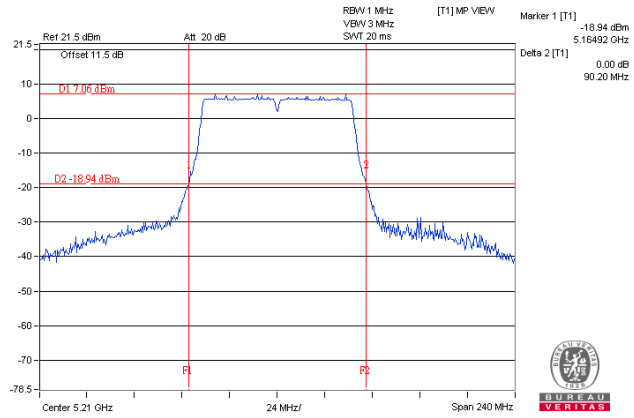
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	29.72	31.49	Pass
40	5200	40.85	41.29	Pass
48	5240	36.96	42.53	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	46.78	46.53	Pass
46	5230	86.43	88.12	Pass

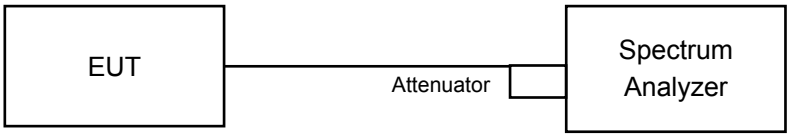
802.11ac (VHT80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	89.14	90.20	Pass

Spectrum Plot of Worst Value	
802.11ac (VHT20)	802.11ac (VHT40)
	
802.11ac (VHT80)	
	

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to Sample. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Test Result

CDD Mode

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.04	17.16
40	5200	18.60	19.20
48	5240	17.76	18.12
149	5745	21.56	21.56
157	5785	21.84	23.04
165	5825	22.32	22.92

802.11n (HT20)

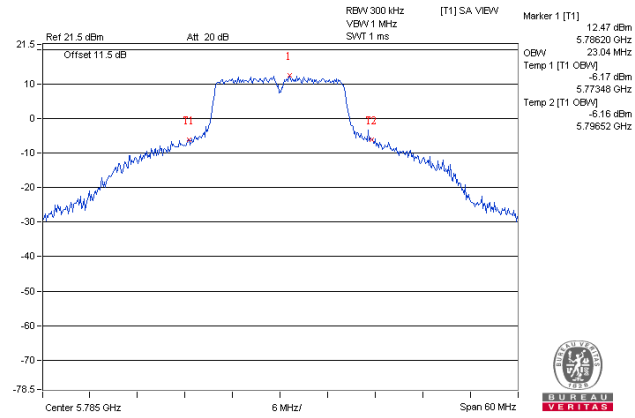
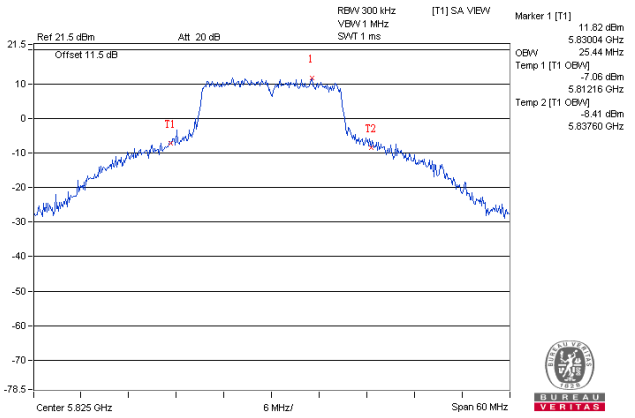
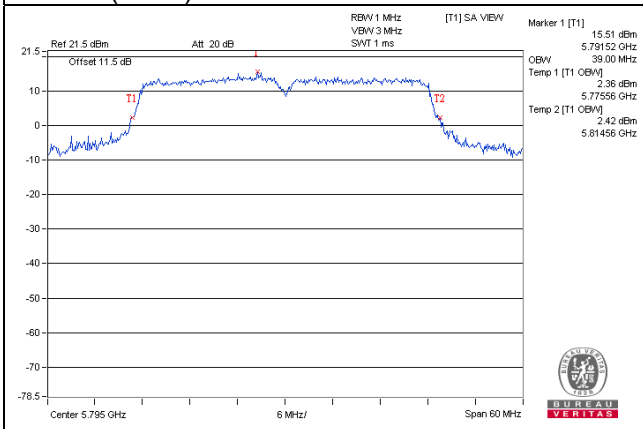
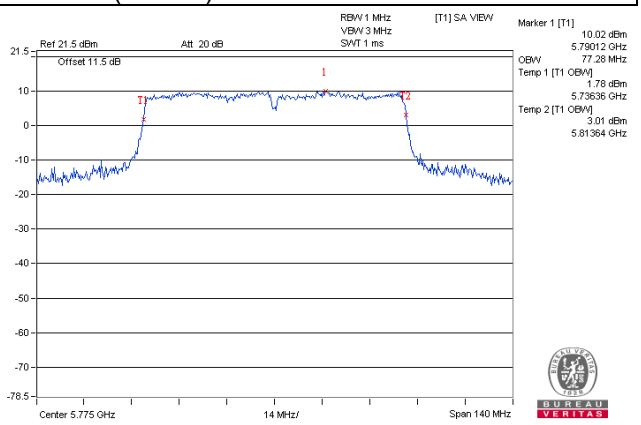
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.36	18.24
40	5200	20.16	20.16
48	5240	19.08	19.08
149	5745	24.60	23.40
157	5785	25.32	24.72
165	5825	25.44	24.72

802.11n (HT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.08	37.08
46	5230	37.68	37.80
151	5755	38.76	38.28
159	5795	39.00	39.00

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.44	76.16
155	5775	77.28	77.28

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

802.11ac (VHT20)

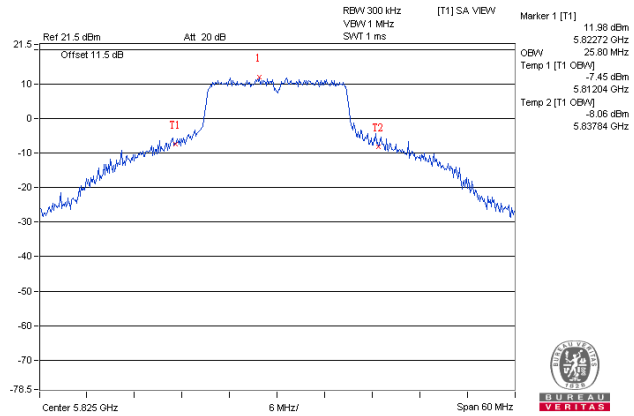
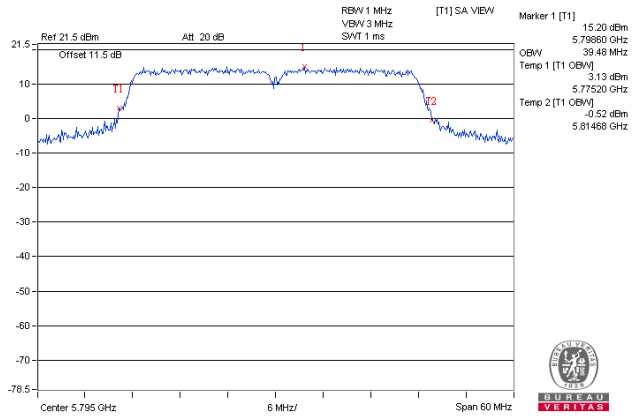
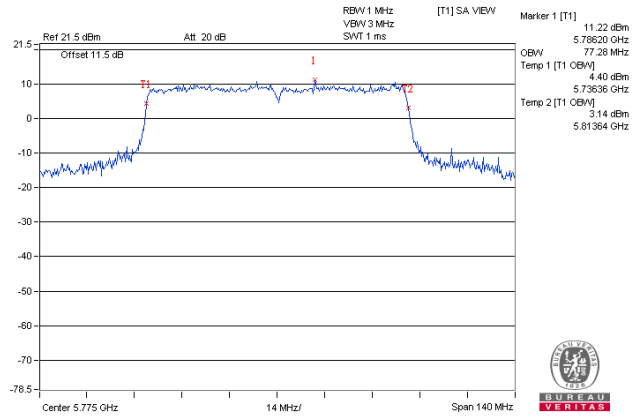
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.24	18.36
40	5200	19.44	20.64
48	5240	18.72	19.56
149	5745	23.82	23.91
157	5785	24.96	25.32
165	5825	24.84	25.80

802.11ac (VHT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.08	36.96
46	5230	37.68	37.68
151	5755	38.76	38.40
159	5795	39.00	39.48

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.16	76.16
155	5775	77.28	77.00

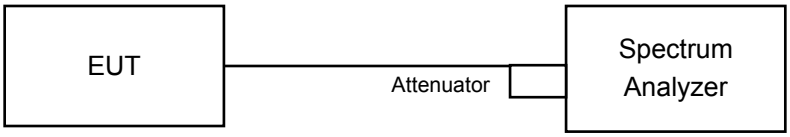
Spectrum Plot of Worst Value	
802.11ac (VHT20)	802.11ac (VHT40)
	
802.11ac (VHT80)	
	

4.5 Peak Power Spectral Density Measurement

4.5.1 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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1 band:
Using method SA-1, Duty cycle >98%:

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, 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

Using method SA-2, Duty cycle <98%

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, 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)

For U-NII-3 band:
Duty cycle >98%

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.
g. Record the max value

Duty cycle <98%

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1 Band

CDD Mode

802.11a

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
36	5180	7.08	7.34	10.22	0.22	10.44	16.51	Pass
40	5200	8.89	9.10	12.01	0.22	12.23	16.51	Pass
48	5240	8.11	8.32	11.23	0.22	11.45	16.51	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 17-(6.49-6) = 16.51dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	7.02	6.90	9.97	16.51	Pass
40	5200	8.74	8.65	11.71	16.51	Pass
48	5240	8.06	7.97	11.03	16.51	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 17-(6.49-6) = 16.51dBm.

802.11n (HT40)

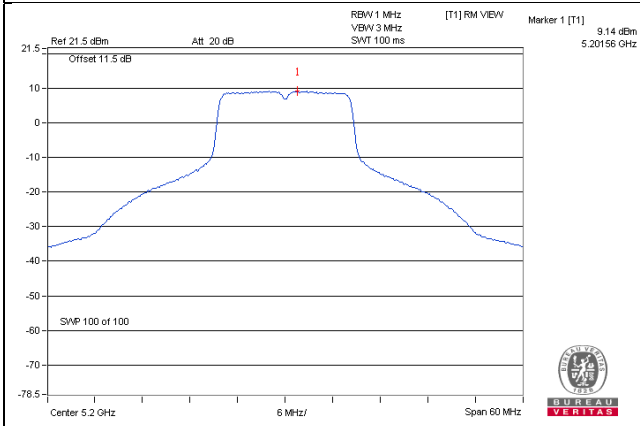
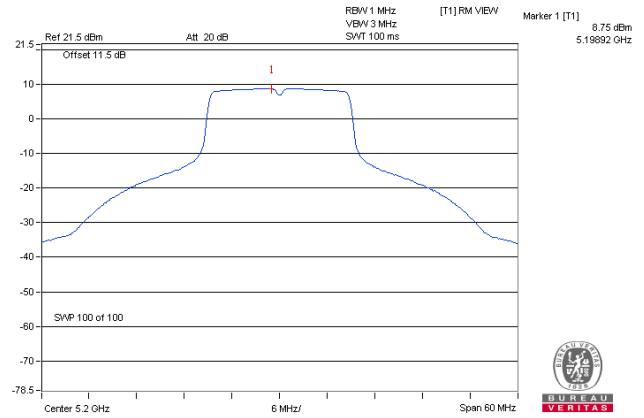
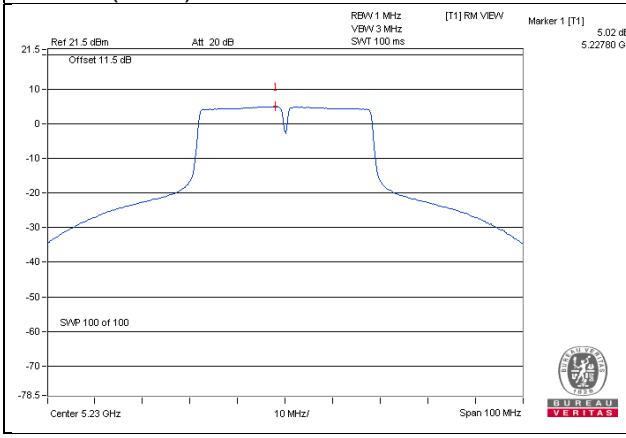
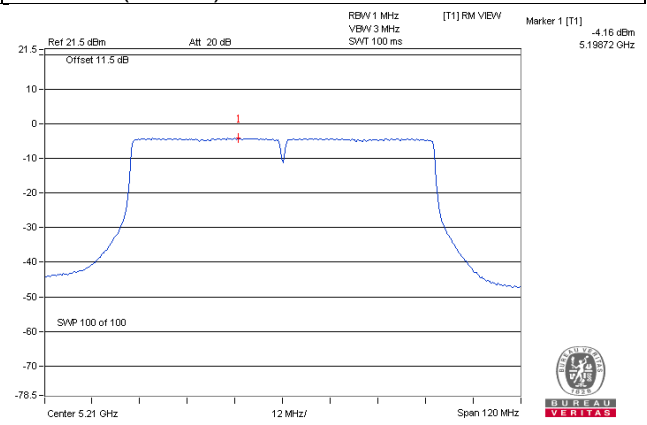
Chan.	Freq. (MHz)	PSD (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
38	5190	1.00	0.87	3.94	0.16	4.10	16.51	Pass
46	5230	5.02	4.74	7.89	0.16	8.05	16.51	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 17-(6.49-6) = 16.51dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
42	5210	-4.41	-4.32	-1.36	0.33	-1.03	16.51	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 17-(6.49-6) = 16.51dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 1 / CH 40	802.11n (HT20) / Chain 0 / CH 40
	
802.11n (HT40)/ Chain 0 / CH 46	802.11ac (VHT80) / Chain 1 / CH 42
	

Beamforming Mode

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.89	6.85	9.88	16.51	Pass
40	5200	8.62	8.72	11.68	16.51	Pass
48	5240	7.97	8.05	11.02	16.51	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 17-(6.49-6) = 16.51dBm.

802.11ac (VHT40)

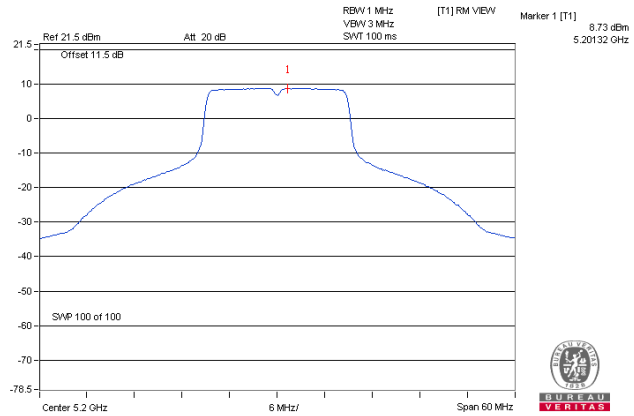
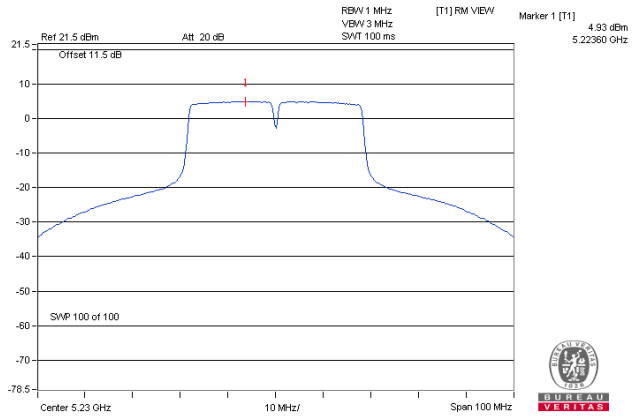
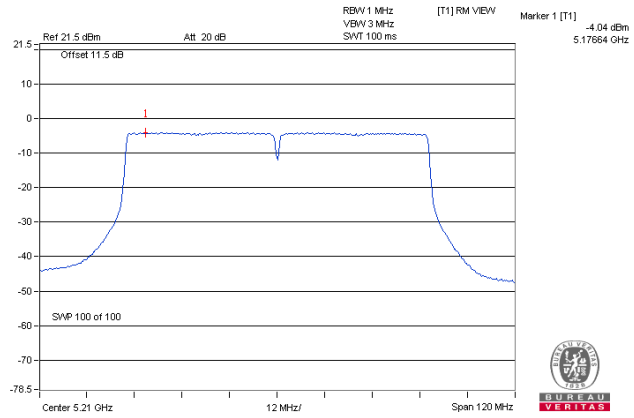
Chan.	Freq. (MHz)	PSD (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
38	5190	0.86	1.03	3.96	0.16	4.12	16.51	Pass
46	5230	4.79	4.89	7.85	0.16	8.01	16.51	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 17-(6.49-6) = 16.51dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
42	5210	-4.41	-4.11	-1.25	0.34	-0.91	16.51	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 17-(6.49-6) = 16.51dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11ac (VHT20) / Chain 1 / CH 40	802.11ac (VHT40)/ Chain 1 / CH 46
	
802.11ac (VHT80) / Chain 1 / CH 42	
	

For U-NII-3 Band

CDD Mode

802.11a

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-0.36	1.86	3.01	0.22	5.09	29.51	Pass
	157	5785	-0.68	1.54	3.01	0.22	4.77	29.51	Pass
	165	5825	-0.71	1.51	3.01	0.22	4.74	29.51	Pass
1	149	5745	-0.38	1.84	3.01	0.22	5.07	29.51	Pass
	157	5785	-0.08	2.14	3.01	0.22	5.37	29.51	Pass
	165	5825	-0.28	1.94	3.01	0.22	5.17	29.51	Pass

Note:
1. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 30-(6.49-6) = 29.51dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-0.66	1.56	3.01	4.57	29.51	Pass
	157	5785	-0.59	1.63	3.01	4.64	29.51	Pass
	165	5825	-0.72	1.50	3.01	4.51	29.51	Pass
1	149	5745	-0.83	1.39	3.01	4.40	29.51	Pass
	157	5785	-0.64	1.58	3.01	4.59	29.51	Pass
	165	5825	-0.68	1.54	3.01	4.55	29.51	Pass

Note: Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 30-(6.49-6) = 29.51dBm.

802.11n (HT40)

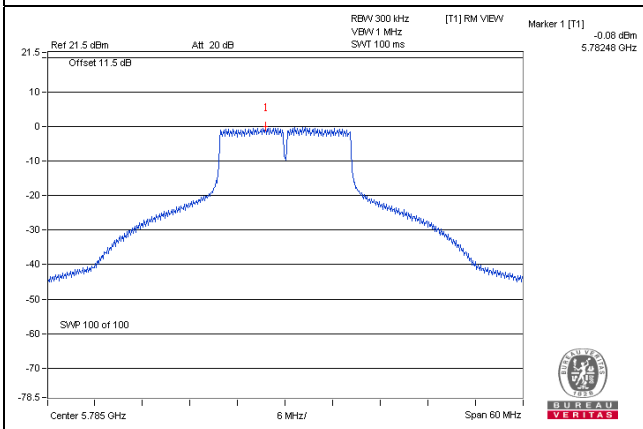
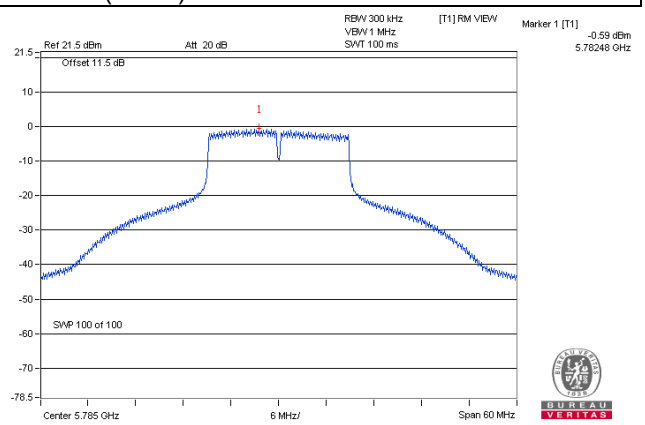
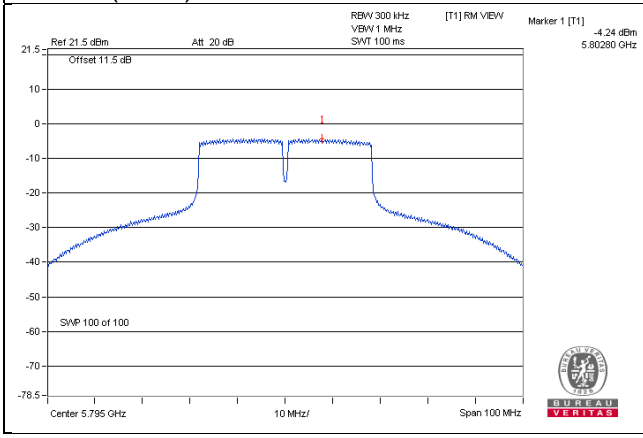
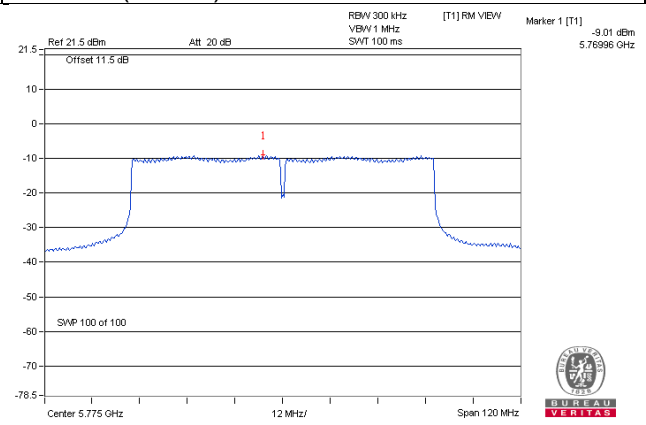
TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	151	5755	-4.36	-2.14	3.01	0.16	1.03	29.51	Pass
	159	5795	-4.49	-2.27	3.01	0.16	0.90	29.51	Pass
1	151	5755	-4.53	-2.31	3.01	0.16	0.86	29.51	Pass
	159	5795	-4.24	-2.02	3.01	0.16	1.15	29.51	Pass

Note:
1. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 30-(6.49-6) = 29.51dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	155	5775	-9.01	-6.79	3.01	0.33	-3.45	29.51	Pass
1	155	5775	-9.15	-6.93	3.01	0.33	-3.59	29.51	Pass

Note:
1. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 30-(6.49-6) = 29.51dBm.
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

802.11ac (VHT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-0.77	1.45	3.01	4.46	29.51	Pass
	157	5785	-0.89	1.33	3.01	4.34	29.51	Pass
	165	5825	-1.00	1.22	3.01	4.23	29.51	Pass
1	149	5745	-0.84	1.38	3.01	4.39	29.51	Pass
	157	5785	-0.70	1.52	3.01	4.53	29.51	Pass
	165	5825	-0.80	1.42	3.01	4.43	29.51	Pass

Note: Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 30-(6.49-6) = 29.51dBm.

802.11ac (VHT40)

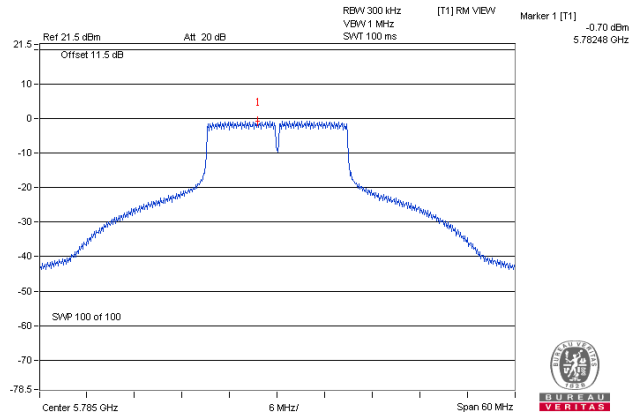
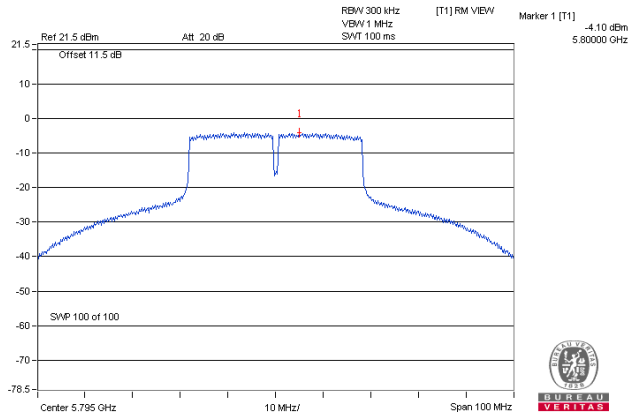
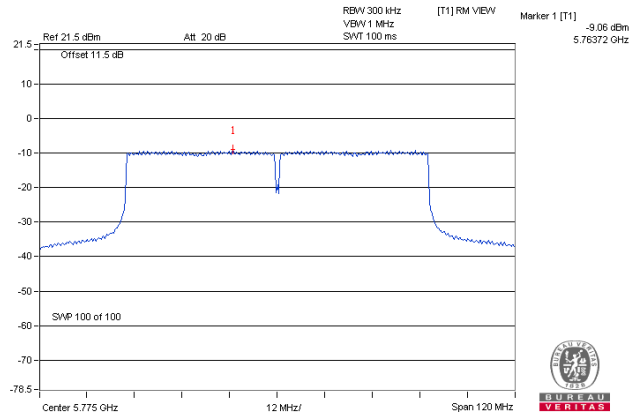
TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	151	5755	-4.46	-2.24	3.01	0.16	0.93	29.51	Pass
	159	5795	-4.56	-2.34	3.01	0.16	0.83	29.51	Pass
1	151	5755	-4.43	-2.21	3.01	0.16	0.96	29.51	Pass
	159	5795	-4.10	-1.88	3.01	0.16	1.29	29.51	Pass

Note:
1. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 30-(6.49-6) = 29.51dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	155	5775	-9.15	-6.93	3.01	0.34	-3.58	29.51	Pass
1	155	5775	-9.06	-6.84	3.01	0.34	-3.49	29.51	Pass

Note:
1. Directional gain = 3.48dBi + 10log(2) = 6.49dBi > 6dBi, so the power density limit shall be reduced to 30-(6.49-6) = 29.51dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

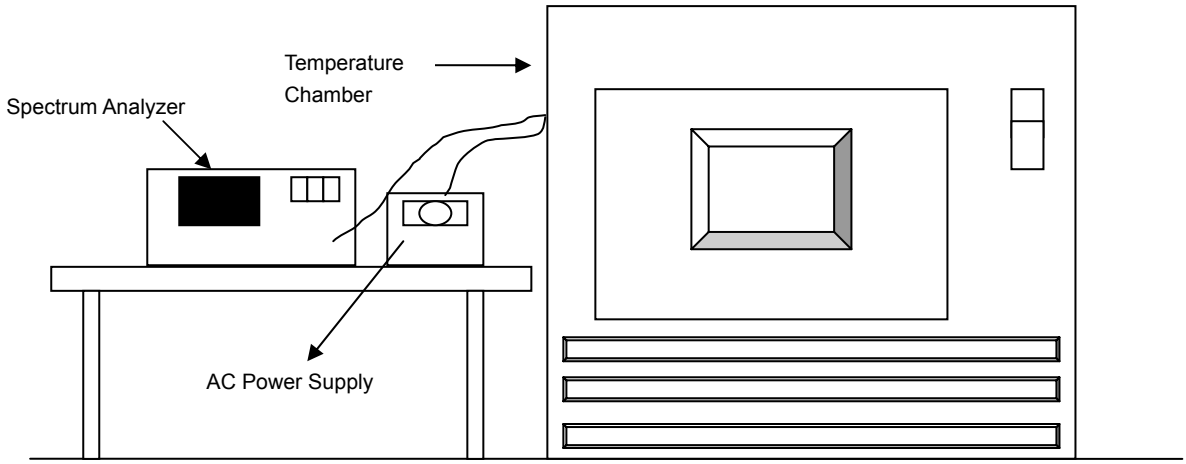
Spectrum Plot of Worst Value	
802.11ac (VHT20)	802.11ac (VHT40)
	
802.11ac (VHT80)	
	

4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Procedure

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

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

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

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

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

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

4.6.4 Deviation from Test Standard

No deviation.

4.6.5 EUT Operating Condition

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

4.6.6 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
50	120	5180.0128	0.00025	5180.014	0.00027	5180.0147	0.00028	5180.0143	0.00028
40	120	5180.0031	0.00006	5180.0027	0.00005	5180.0012	0.00002	5180.0029	0.00006
30	120	5179.9768	-0.00045	5179.9773	-0.00044	5179.9794	-0.00040	5179.9786	-0.00041
20	120	5179.9973	-0.00005	5179.996	-0.00008	5179.9954	-0.00009	5179.9973	-0.00005
10	120	5179.9945	-0.00011	5179.9978	-0.00004	5179.9949	-0.00010	5179.9969	-0.00006
0	120	5179.9898	-0.00020	5179.9886	-0.00022	5179.9864	-0.00026	5179.9895	-0.00020
-10	120	5179.9764	-0.00046	5179.9771	-0.00044	5179.9759	-0.00047	5179.9784	-0.00042
-20	120	5179.9863	-0.00026	5179.9875	-0.00024	5179.9881	-0.00023	5179.9863	-0.00026
-30	120	5180.0239	0.00046	5180.0197	0.00038	5180.0236	0.00046	5180.0212	0.00041

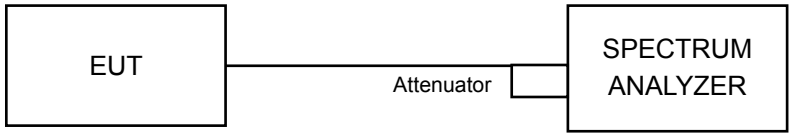
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5179.997	-0.00006	5179.9959	-0.00008	5179.9953	-0.00009	5179.9982	-0.00003
	120	5179.9973	-0.00005	5179.996	-0.00008	5179.9954	-0.00009	5179.9973	-0.00005
	102	5179.9976	-0.00005	5179.9965	-0.00007	5179.9956	-0.00008	5179.9968	-0.00006

4.7 6dB Bandwidth Measurement

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

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
		Chain 0	Chain 1		
149	5745	16.36	16.38	0.5	Pass
157	5785	16.39	16.41	0.5	Pass
165	5825	16.37	16.40	0.5	Pass

802.11n (HT20)

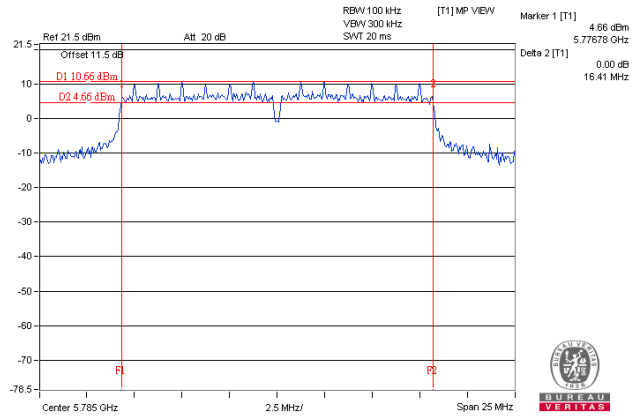
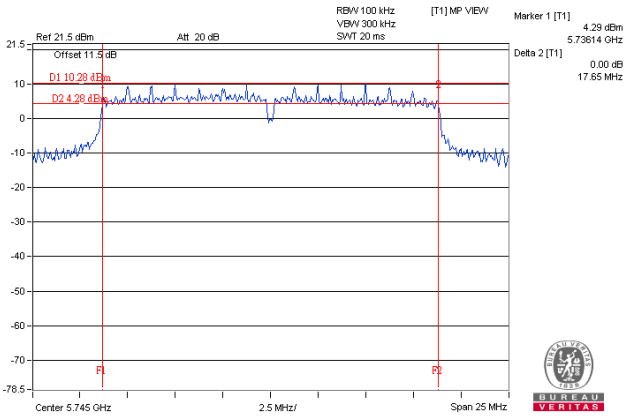
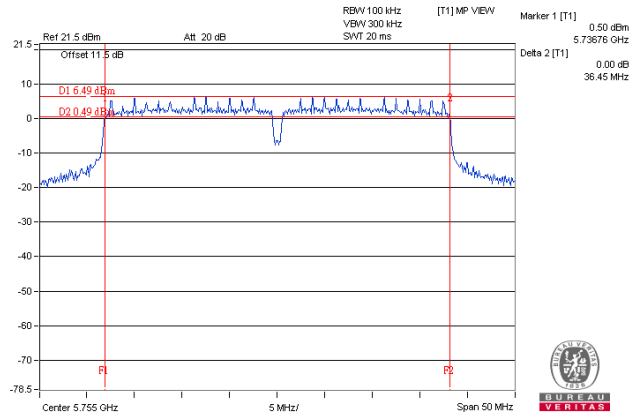
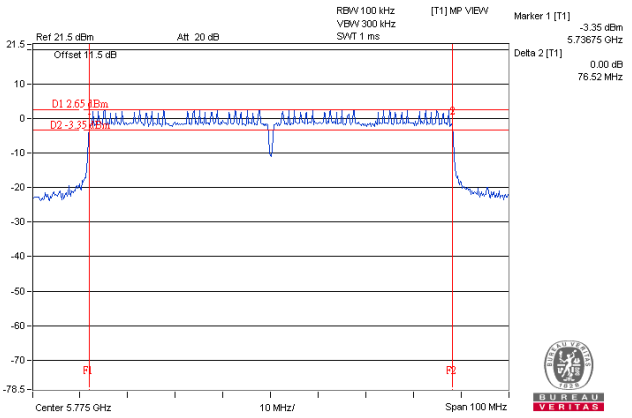
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.65	17.64	0.5	Pass
157	5785	17.58	17.64	0.5	Pass
165	5825	17.62	17.64	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.44	36.45	0.5	Pass
159	5795	36.42	36.43	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.47	76.52	0.5	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Beamforming Mode

802.11ac (VHT20)

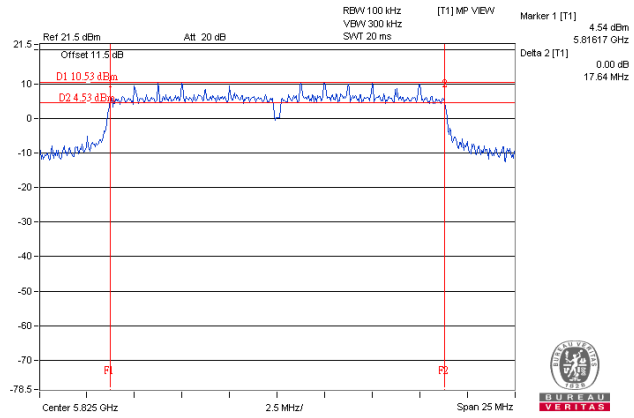
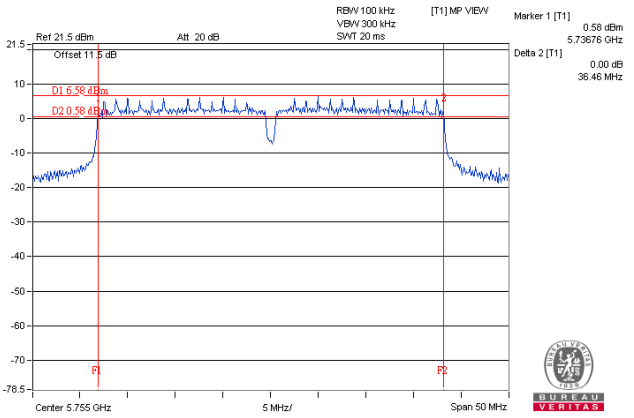
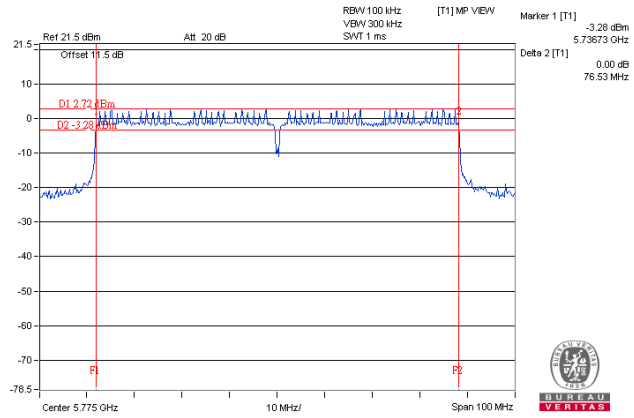
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.58	17.61	0.5	Pass
157	5785	17.59	17.63	0.5	Pass
165	5825	17.58	17.64	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.41	36.46	0.5	Pass
159	5795	36.43	36.44	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.46	76.53	0.5	Pass

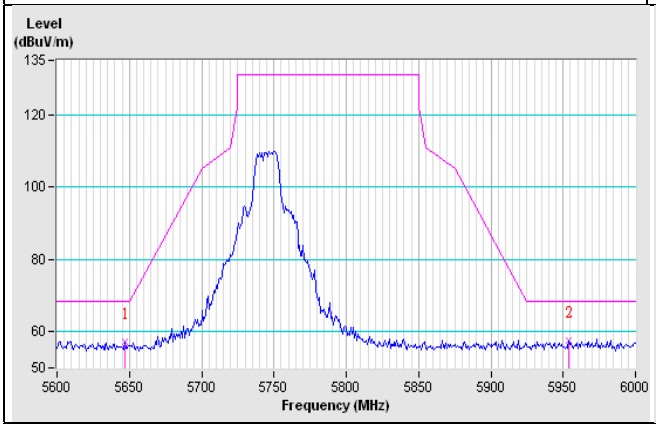
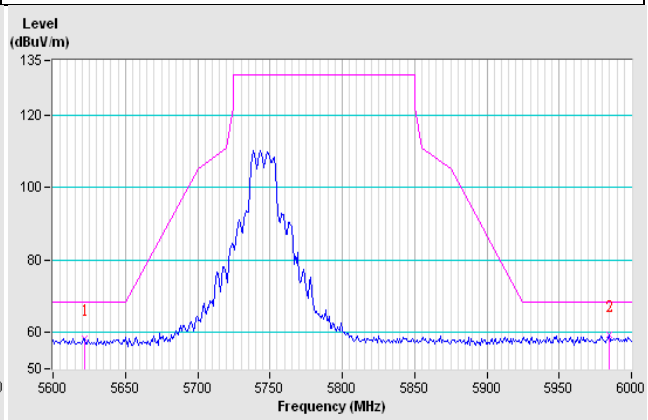
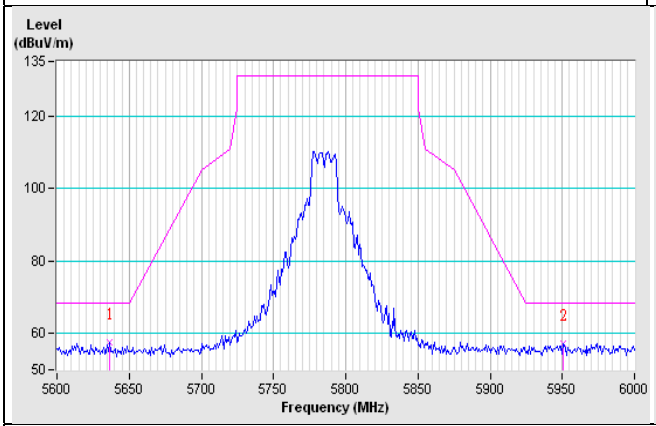
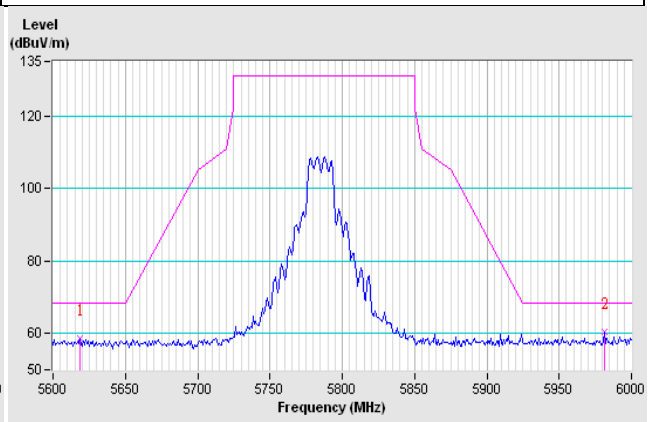
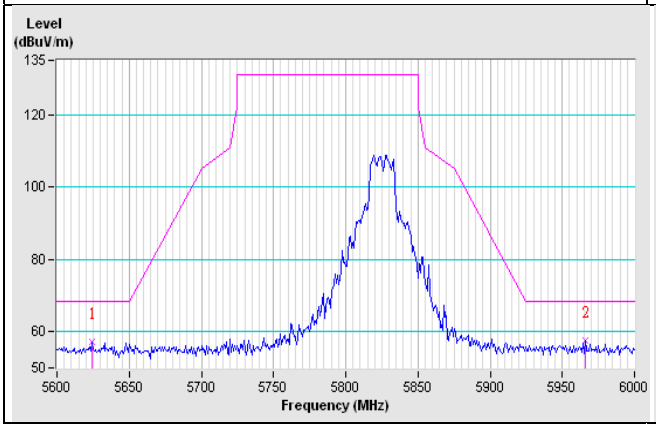
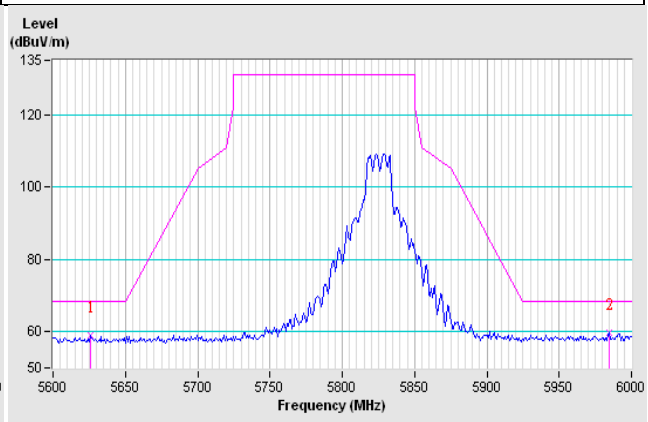
Spectrum Plot of Worst Value	
802.11ac (VHT20)	802.11ac (VHT40)
	
802.11ac (VHT80)	
	

5 Pictures of Test Arrangements

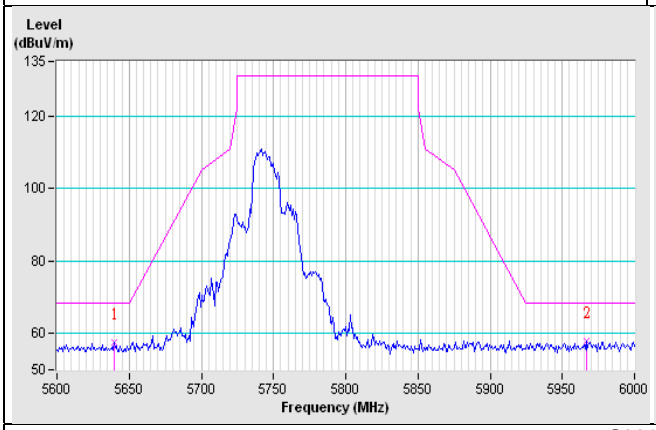
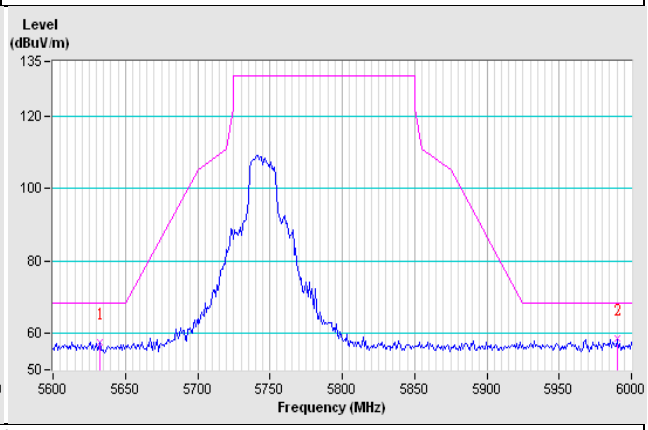
Please refer to the attached file (Test Setup Photo).

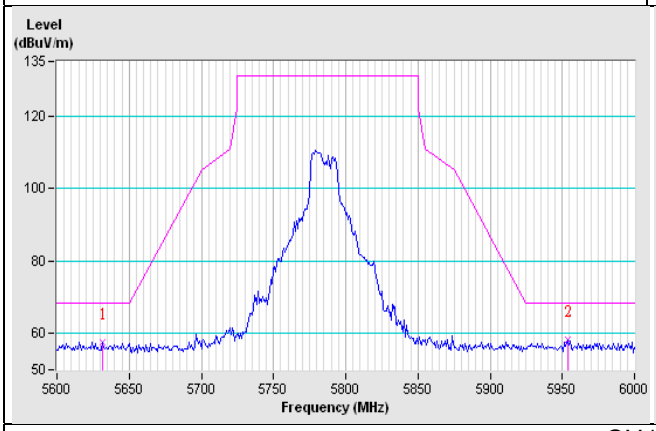
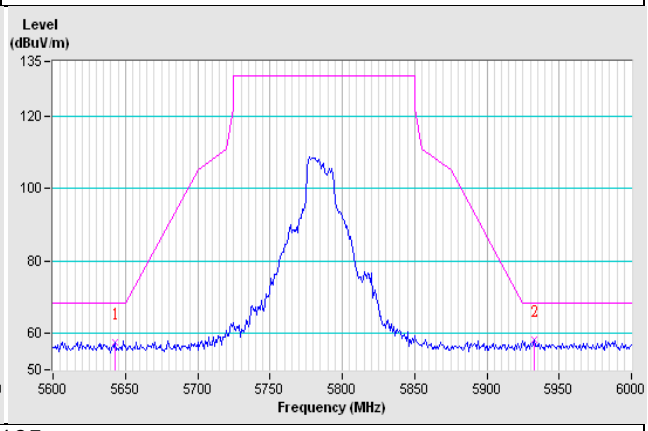
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

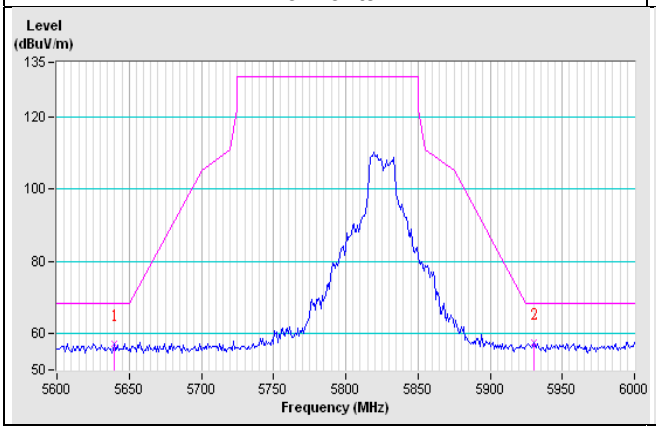
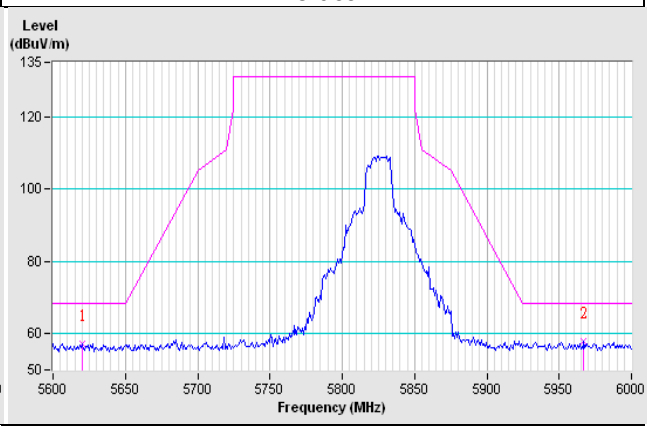
802.11a

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

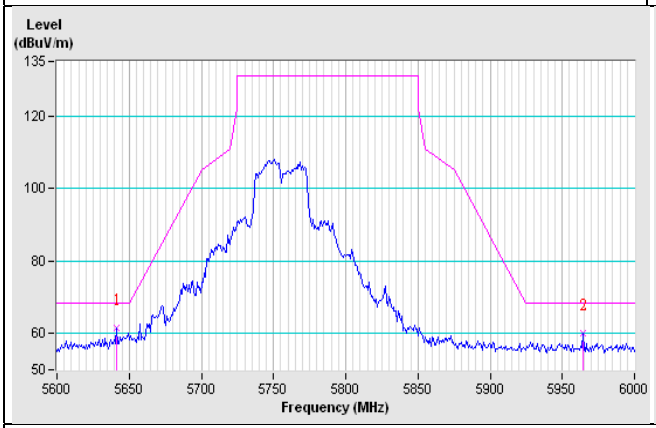
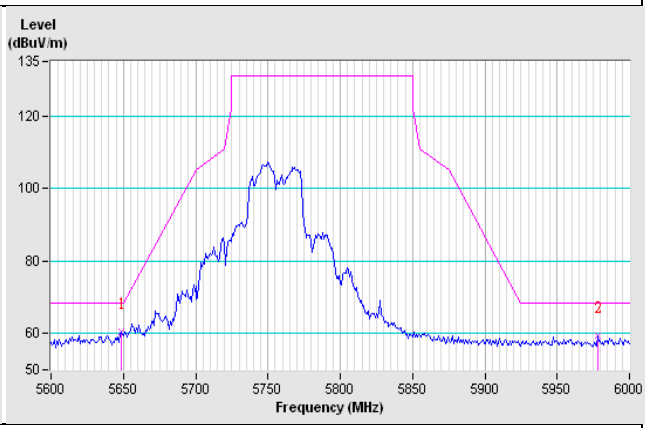
802.11n (HT20)

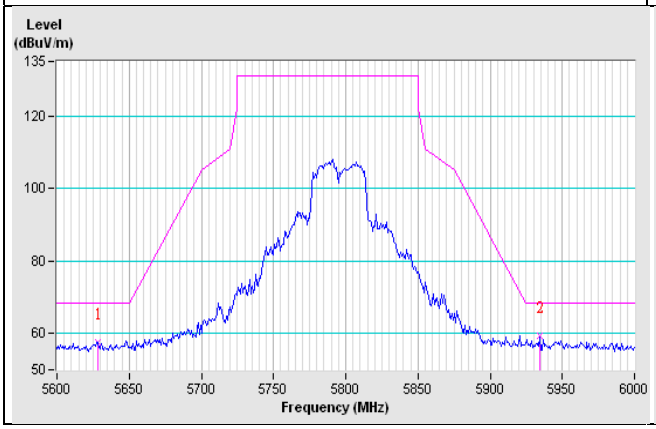
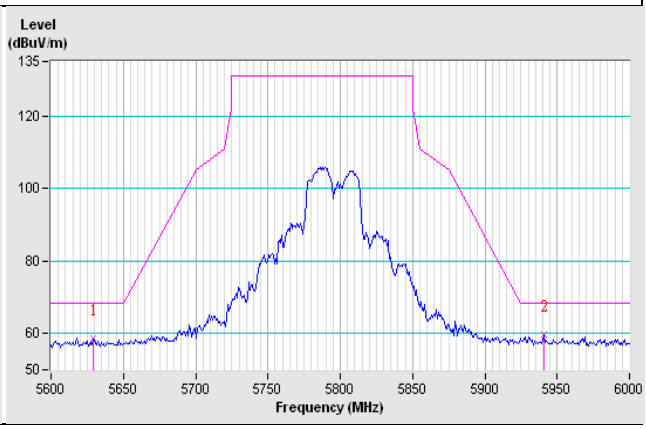
CH149	
Horizontal	Vertical
	

CH157	
Horizontal	Vertical
	

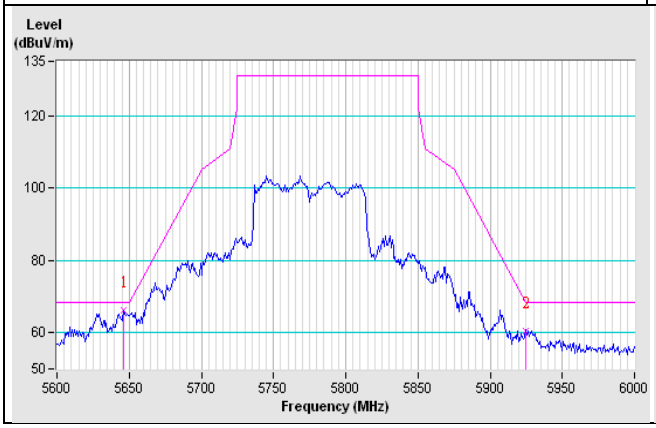
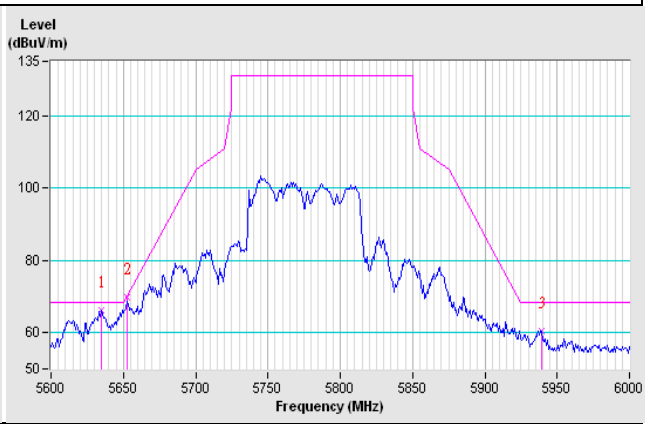
CH165	
Horizontal	Vertical
	

802.11n (HT40)

CH151	
Horizontal	Vertical
	

CH159	
Horizontal	Vertical
	

802.11ac (VHT80)

CH155	
Horizontal	Vertical
	

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:

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
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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.

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