FCC Test Report

Report No.:	RF150802C01C
FCC ID:	MSQ-CMBT00
Test Model:	CM-32_AC2600
Received Date:	Aug. 02, 2015
Test Date:	Nov. 19 ~ Nov. 30, 2015 (For radiated emissions below 1GHz and conducted emission) May 26 ~ May 31, 2016 (For all test items except radiated emissions below 1GHz and conducted emission)
Issued Date:	Jun. 01, 2016
Applicant:	ASUSTek COMPUTER INC.
Address:	4F, NO. 150, LI-TE RD. PEITOU, TAIPEI 112, TAIWAN
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
RF150802C01C	Original release	Jun. 01, 2016

1 Certificate of Conformity

Product:	Wireless-AC3100 Dual Band Gigabit Router
Brand:	ASUS
Test Model:	CM-32_AC2600
Sample Status:	Engineering sample
Applicant:	ASUSTek COMPUTER INC.
Test Date:	Nov. 19 ~ Nov. 30, 2015 (For radiated emissions below 1GHz and conducted emission) May 26 ~ May 31, 2016 (For all test items except radiated emissions below 1GHz and conducted emission)
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:** Jun. 01, 2016

Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Jun. 01, 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 Emission	Pass	Meet the requirement of limit. Minimum passing margin is -14.13dB at 0.41979MHz
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5648.00MHz.
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 RSMA not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 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	Wireless-AC3100 Dual Band Gigabit Router
Brand	ASUS
Test Model	CM-32_AC2600
Status of EUT	Engineering sample
Power Supply Rating	19Vdc from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 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 800.0Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	5745 ~ 5825MHz
Number of Channel	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	Beamforming off Mode: 950.964mW Beamforming on Mode: 341.746mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Adapter
Data Cable Supplied	1.4m non-shielded RJ45 cable without core

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV ADT report no.: RF150802C01) is updating U-NII-3 Band to new rule. All test items except radiated emissions below 1GHz and conducted emission had been tested for this addendum and the original test data was kept in this report.
2. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	TX Function	Beamforming Mode
802.11a	4TX	Not Support
802.11n (HT20)	4TX	Not Support
802.11n (HT40)	4TX	Not Support
802.11ac (VHT20)	4TX	Support
802.11ac (VHT40)	4TX	Support
802.11ac (VHT80)	4TX	Support

* For 5GHz Band, 802.11a, 802.11n (HT20) and 802.11n (HT40), the EUT doesn't support Beamforming mode.
* The modulation and bandwidth are similar for 802.11n mode for 20MHz / 40MHz and 802.11ac mode for 20MHz / 40MHz, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

3. The EUT consumes power from the following adapter.

Brand	ASUS
Model	ADP-45BW B
Input Power	100-240Vac, 50-60Hz, 1.2A
Output Power	19Vdc, 2.37A
Power Line	2.25m power cable without core attached on adapter

4. The EUT with follow antennas gain is listed as table below.

No.	Antenna type	Model	Manufacturer	connector	Gain(dBi)		
					2.4GHz	5.18- 5.24GHz	5.745-5.825 GHz
1	Dipole	AREEE-000002	ACON	RSMA	2.70	-	-
	Dipole	AREEE-000002	ACON	RSMA	-	2.1	3.60
2	Dipole	C1335-51008-A	Whayu	RSMA	2.45	-	-
	Dipole	C1335-51008-A	Whayu	RSMA	-	3.39	4.35
3	Dipole	C1335-51008-A	Whayu	RSMA	2.37	-	-
	Dipole	C1335-51008-A	Whayu	RSMA	-	3.26	3.10

* For 5GHz Band, Ant. 2 was chosen for final test.

3.2 Description of Test Modes

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	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

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	5745-5825	149 to 165	149	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	5745-5825	149 to 165	149	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	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	20deg. C, 69%RH,	120Vac, 60Hz	Bayu Chen,
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Tank Wu
PLC	25deg. C, 60%RH	120Vac, 60Hz	Tank Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Leo Tsai

3.3 Duty Cycle of Test Signal

Beamforming off Mode

802.11a, 802.11n (HT40), 802.11ac (VHT80): Duty cycle of test signal is < 98%, duty factor shall be considered.

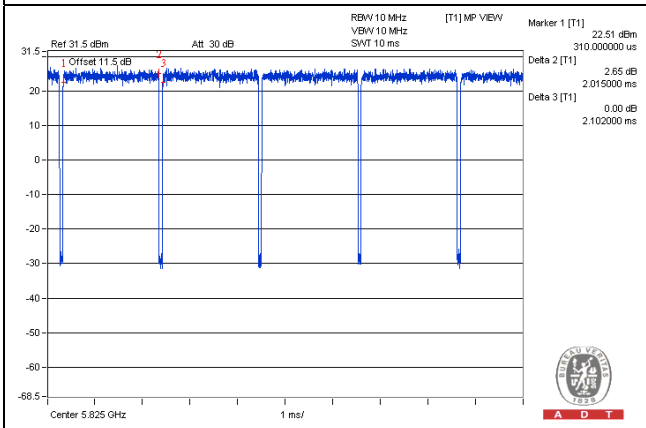
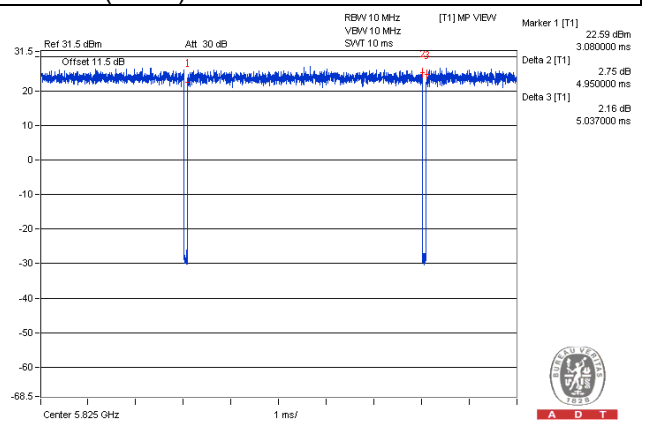
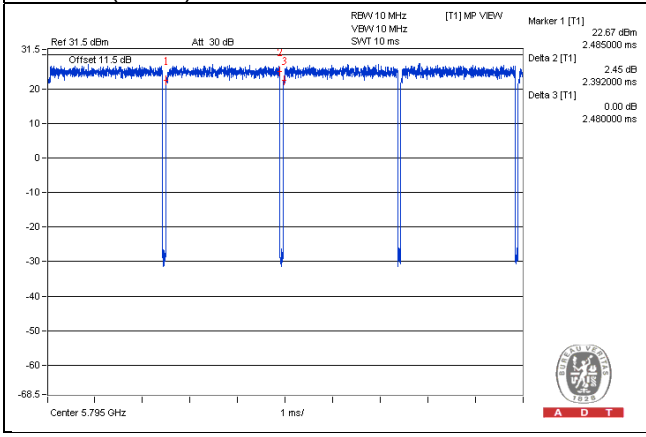
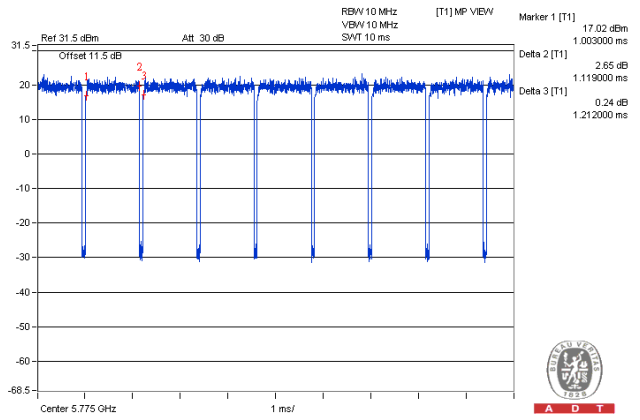
802.11n (HT20): Duty cycle of test signal is > 98%, duty factor is not request.

802.11a: Duty cycle = 2.015/2.102 = 0.959, Duty factor = 10 * log(1/0.959) = 0.18

802.11n (HT20): Duty cycle = 4.950/5.037 = 0.983

802.11n (HT40): Duty cycle = 2.392/2.480 = 0.965, Duty factor = 10 * log(1/0.965) = 0.16

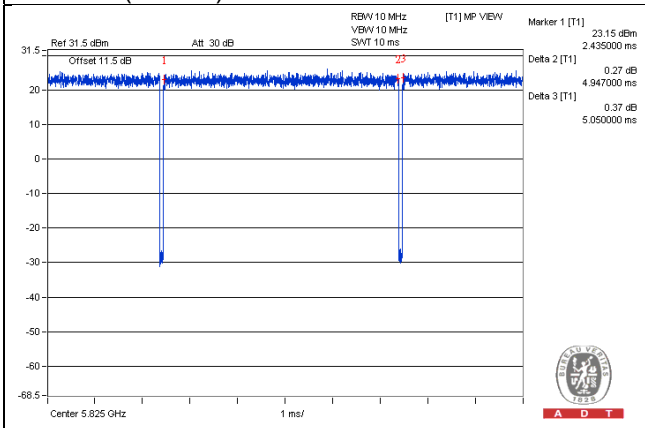
802.11ac (VHT80): Duty cycle = 1.119/1.212 = 0.923, Duty factor = 10 * log(1/0.923) = 0.35

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

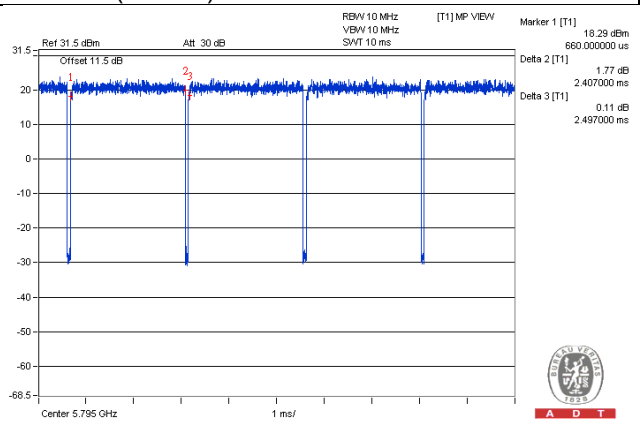
Beamforming on Mode

802.11ac (VHT20): Duty cycle of test signal is > 98%, duty factor is not request.
802.11n (HT40), 802.11ac (VHT80): Duty cycle of test signal is < 98%, duty factor shall be considered.
802.11ac (VHT20): Duty cycle = 4.947/5.050 = 0.980
802.11ac (VHT40): Duty cycle = 2.407/2.497 = 0.964, Duty factor = 10 * log(1/0.964) = 0.16
802.11ac (VHT80): Duty cycle = 1.127/1.222 = 0.922, Duty factor = 10 * log(1/0.922) = 0.35

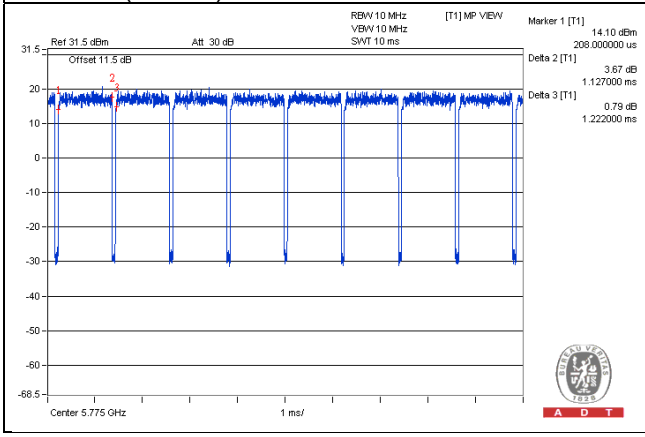
802.11ac (VHT20)



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.

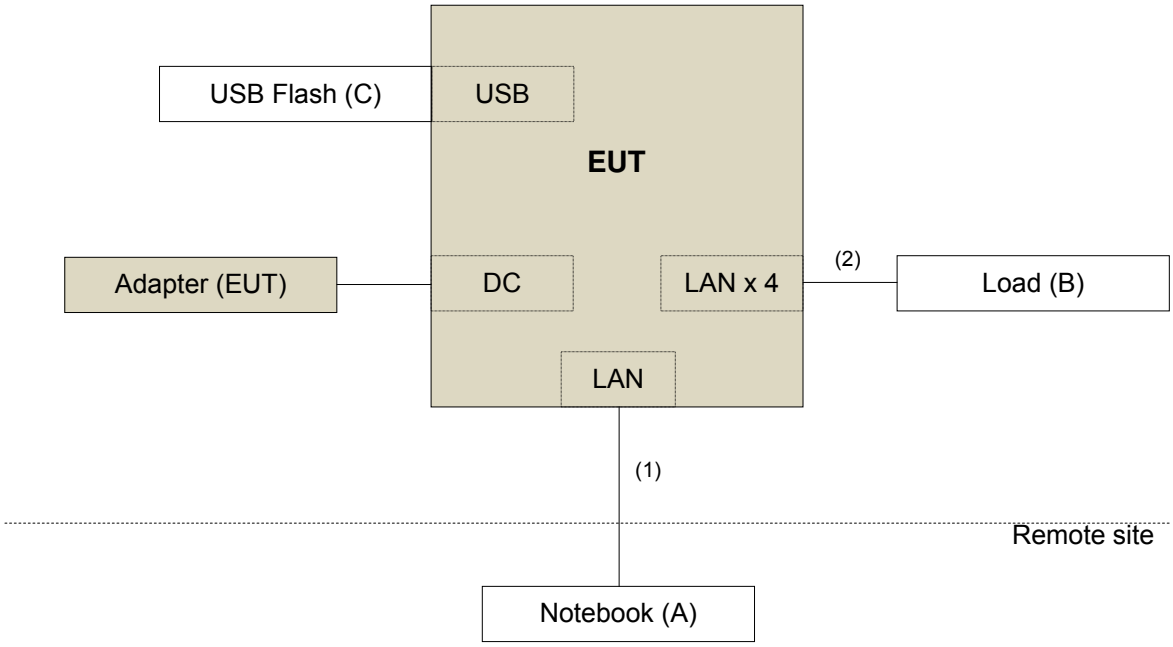
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	D531	CN-0XM006-48643-81U-2610	QDS-BRCM1020	-
B.	Load	NA	NA	NA	NA	-
C.	USB Flash	HP	v250W	01	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	3	N	0	-
2.	LAN cable	4	1.8	N	0	-

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart E (15.407)

789033 D02 General UNII Test Procedures New Rules v01r02

ANSI C63.10-2013

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

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

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01r02	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK:122.2 (dBμV/m) *4
15.407(b)(4)(ii)	FIELD STRENGTH at 3m / § 15.247(d),	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)

*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.

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

Test Date: Nov. 19 ~ Nov. 30, 2015

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 01, 2014	Nov. 30, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Mar. 30, 2015	Mar. 29, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Feb. 02, 2015	Feb. 01, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02(309222 +248780)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-03(274092)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 11, 2015	Aug. 10, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
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 215374.
5. The IC Site Registration No. is IC 7450F-9.

Test Date: May 26 ~ May 31, 2016

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 23, 2015	Dec. 22, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Apr. 19, 2016	Apr. 18, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Jan. 18, 2016	Jan. 17, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Jan. 08, 2016	Jan. 07, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Jan. 18, 2016	Jan. 17, 2017
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02(309222 +248780)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-03(274092)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 11, 2015	Aug. 10, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	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
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
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 215374.
5. The IC Site Registration No. is IC 7450F-9.

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

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

Note:

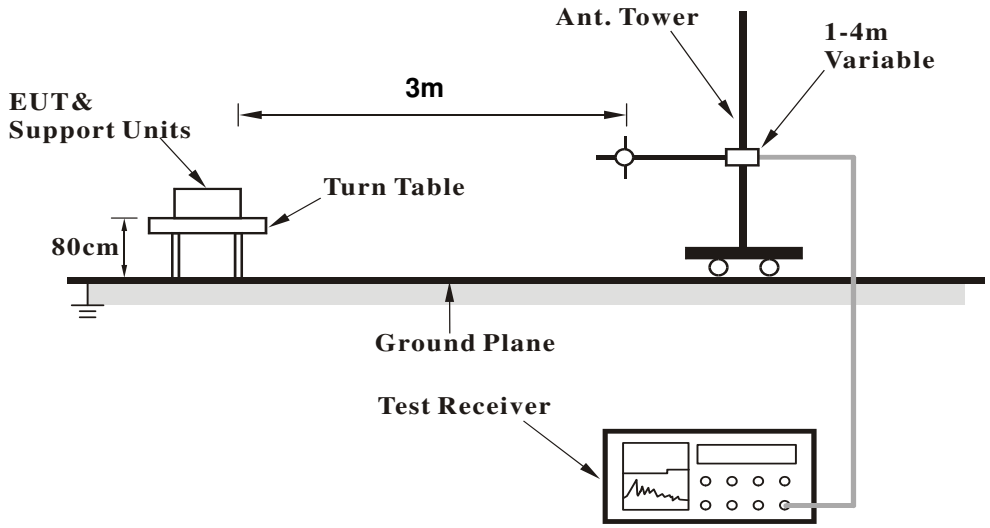
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

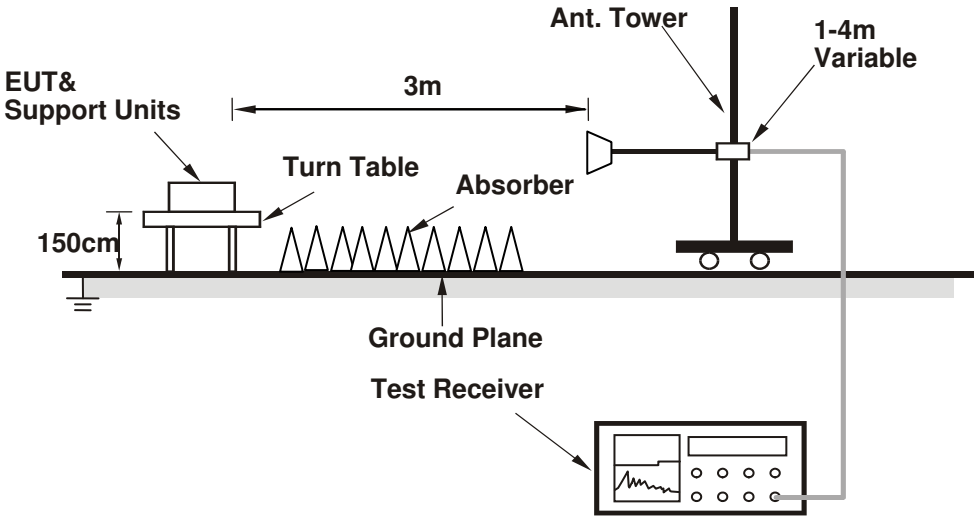
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz Worst-Case Data:

Beamforming off Mode

802.11a

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	#5600.80	50.5 PK	68.2	-17.7	1.59 H	178	45.60	4.90
2	*5745.00	110.3 PK			1.59 H	178	67.50	42.80
3	*5745.00	99.1 AV			1.59 H	178	56.30	42.80
4	#5957.60	49.7 PK	68.2	-18.5	1.59 H	178	44.50	5.20
5	11490.00	65.1 PK	74.0	-8.9	3.01 H	173	49.30	15.80
6	11490.00	50.7 AV	54.0	-3.3	3.01 H	173	34.90	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5624.80	62.0 PK	68.2	-6.2	1.41 V	223	57.10	4.90
2	*5745.00	117.4 PK			1.41 V	223	74.60	42.80
3	*5745.00	107.3 AV			1.41 V	223	64.50	42.80
4	#5942.40	61.1 PK	68.2	-7.1	1.41 V	223	55.90	5.20
5	11490.00	66.3 PK	74.0	-7.7	1.49 V	136	50.50	15.80
6	11490.00	51.8 AV	54.0	-2.2	1.49 V	136	36.00	15.80

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	3857.00	49.6 PK	74.0	-24.4	1.35 H	190	47.60	2.00
2	3857.00	41.5 AV	54.0	-12.5	1.35 H	190	39.50	2.00
3	#5600.80	50.4 PK	68.2	-17.8	1.54 H	179	45.50	4.90
4	*5785.00	110.2 PK			1.54 H	179	67.40	42.80
5	*5785.00	98.8 AV			1.54 H	179	56.00	42.80
6	#5998.40	49.7 PK	68.2	-18.5	1.54 H	179	44.50	5.20
7	11570.00	64.9 PK	74.0	-9.1	2.99 H	165	49.40	15.50
8	11570.00	50.5 AV	54.0	-3.5	2.99 H	165	35.00	15.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3857.00	51.7 PK	74.0	-22.3	1.21 V	347	49.70	2.00
2	3857.00	46.2 AV	54.0	-7.8	1.21 V	347	44.20	2.00
3	#5612.00	61.0 PK	68.2	-7.2	2.95 V	130	56.10	4.90
4	*5785.00	119.8 PK			2.95 V	130	77.00	42.80
5	*5785.00	109.4 AV			2.95 V	130	66.60	42.80
6	#5998.40	60.1 PK	68.2	-8.1	2.95 V	130	54.90	5.20
7	11570.00	65.7 PK	74.0	-8.3	1.27 V	138	50.20	15.50
8	11570.00	51.7 AV	54.0	-2.3	1.27 V	138	36.20	15.50

Remarks:

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

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	#5603.20	50.8 PK	68.2	-17.4	1.56 H	179	45.90	4.90
2	*5825.00	108.9 PK			1.56 H	179	66.10	42.80
3	*5825.00	97.6 AV			1.56 H	179	54.80	42.80
4	#5945.60	50.1 PK	68.2	-18.1	1.56 H	179	44.90	5.20
5	11650.00	64.7 PK	74.0	-9.3	3.19 H	158	48.90	15.80
6	11650.00	50.8 AV	54.0	-3.2	3.19 H	158	35.00	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5600.80	60.3 PK	68.2	-7.9	2.40 V	170	55.40	4.90
2	*5825.00	121.6 PK			2.40 V	170	78.80	42.80
3	*5825.00	110.4 AV			2.40 V	170	67.60	42.80
4	#5923.20	61.1 PK	68.2	-7.1	2.40 V	170	55.90	5.20
5	11650.00	66.1 PK	74.0	-7.9	1.52 V	136	50.30	15.80
6	11650.00	52.0 AV	54.0	-2.0	1.52 V	136	36.20	15.80

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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 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	#5615.20	57.8 PK	68.2	-10.4	1.36 H	179	52.90	4.90
2	*5745.00	109.5 PK			1.36 H	179	66.70	42.80
3	*5745.00	98.1 AV			1.36 H	179	55.30	42.80
4	#5928.00	59.3 PK	68.2	-8.9	1.36 H	179	54.10	5.20
5	11490.00	64.4 PK	74.0	-9.6	1.00 H	182	48.60	15.80
6	11490.00	49.8 AV	54.0	-4.2	1.00 H	182	34.00	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5625.60	60.4 PK	68.2	-7.8	1.40 V	223	55.50	4.90
2	*5745.00	117.2 PK			1.40 V	223	74.40	42.80
3	*5745.00	107.1 AV			1.40 V	223	64.30	42.80
4	#5963.20	60.6 PK	68.2	-7.6	1.40 V	223	55.40	5.20
5	11490.00	66.6 PK	74.0	-7.4	1.55 V	139	50.80	15.80
6	11490.00	52.0 AV	54.0	-2.0	1.55 V	139	36.20	15.80

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	3857.00	50.0 PK	74.0	-24.0	1.32 H	182	48.00	2.00
2	3857.00	41.5 AV	54.0	-12.5	1.32 H	182	39.50	2.00
3	#5645.60	58.1 PK	68.2	-10.1	1.53 H	179	53.10	5.00
4	*5785.00	109.7 PK			1.53 H	179	66.90	42.80
5	*5785.00	98.3 AV			1.53 H	179	55.50	42.80
6	#5960.00	59.3 PK	68.2	-8.9	1.53 H	179	54.10	5.20
7	11570.00	64.4 PK	74.0	-9.6	1.10 H	163	48.90	15.50
8	11570.00	49.1 AV	54.0	-4.9	1.10 H	163	33.60	15.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3857.00	51.8 PK	74.0	-22.2	1.14 V	353	49.80	2.00
2	3857.00	46.8 AV	54.0	-7.2	1.14 V	353	44.80	2.00
3	#5607.20	60.8 PK	68.2	-7.4	2.96 V	131	55.90	4.90
4	*5785.00	120.3 PK			2.96 V	131	77.50	42.80
5	*5785.00	109.2 AV			2.96 V	131	66.40	42.80
6	#5990.40	60.5 PK	68.2	-7.7	2.96 V	131	55.30	5.20
7	11570.00	66.6 PK	74.0	-7.4	1.43 V	140	51.10	15.50
8	11570.00	52.0 AV	54.0	-2.0	1.43 V	140	36.50	15.50

Remarks:

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

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	#5616.80	58.5 PK	68.2	-9.7	1.34 H	179	53.60	4.90
2	*5825.00	108.1 PK			1.34 H	179	65.30	42.80
3	*5825.00	97.3 AV			1.34 H	179	54.50	42.80
4	#5980.80	59.3 PK	68.2	-8.9	1.34 H	179	54.10	5.20
5	11650.00	65.6 PK	74.0	-8.4	1.07 H	176	49.80	15.80
6	11650.00	49.8 AV	54.0	-4.2	1.07 H	176	34.00	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5625.60	60.5 PK	68.2	-7.7	2.57 V	169	55.60	4.90
2	*5825.00	121.0 PK			2.57 V	169	78.20	42.80
3	*5825.00	110.5 AV			2.57 V	169	67.70	42.80
4	#5988.00	60.6 PK	68.2	-7.6	2.57 V	169	55.40	5.20
5	11650.00	67.2 PK	74.0	-6.8	1.53 V	139	51.40	15.80
6	11650.00	51.9 AV	54.0	-2.1	1.53 V	139	36.10	15.80

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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 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	#5635.20	58.5 PK	68.2	-9.7	1.57 H	180	53.50	5.00
2	*5755.00	107.1 PK			1.57 H	180	64.30	42.80
3	*5755.00	97.6 AV			1.57 H	180	54.80	42.80
4	#5940.00	59.2 PK	68.2	-9.0	1.57 H	180	54.00	5.20
5	11510.00	63.8 PK	74.0	-10.2	1.02 H	161	48.20	15.60
6	11510.00	50.9 AV	54.0	-3.1	1.02 H	161	35.30	15.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5642.40	61.5 PK	68.2	-6.7	2.55 V	258	56.50	5.00
2	*5755.00	118.5 PK			2.55 V	258	75.70	42.80
3	*5755.00	109.3 AV			2.55 V	258	66.50	42.80
4	#5963.20	60.9 PK	68.2	-7.3	2.55 V	258	55.70	5.20
5	11510.00	65.0 PK	74.0	-9.0	1.50 V	138	49.40	15.60
6	11510.00	52.0 AV	54.0	-2.0	1.50 V	138	36.40	15.60

Remarks:

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

CHANNEL	TX Channel 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	3864.00	49.2 PK	74.0	-24.8	1.07 H	213	47.20	2.00
2	3864.00	40.2 AV	54.0	-13.8	1.07 H	213	38.20	2.00
3	#5625.60	58.4 PK	68.2	-9.8	1.96 H	185	53.50	4.90
4	*5795.00	107.3 PK			1.96 H	185	64.50	42.80
5	*5795.00	97.7 AV			1.96 H	185	54.90	42.80
6	#5964.00	59.5 PK	68.2	-8.7	1.96 H	185	54.30	5.20
7	11590.00	63.2 PK	74.0	-10.8	1.04 H	167	47.70	15.50
8	11590.00	49.3 AV	54.0	-4.7	1.04 H	167	33.80	15.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3864.00	51.1 PK	74.0	-22.9	1.14 V	355	49.10	2.00
2	3864.00	45.5 AV	54.0	-8.5	1.14 V	355	43.50	2.00
3	#5633.60	60.5 PK	68.2	-7.7	2.16 V	340	55.50	5.00
4	*5795.00	120.0 PK			2.16 V	341	77.20	42.80
5	*5795.00	110.0 AV			2.16 V	341	67.20	42.80
6	#5995.20	61.0 PK	68.2	-7.2	2.16 V	340	55.80	5.20
7	11590.00	64.7 PK	74.0	-9.3	1.46 V	140	49.20	15.50
8	11590.00	51.3 AV	54.0	-2.7	1.46 V	140	35.80	15.50

Remarks:

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

802.11ac (VHT80)

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	3850.00	48.8 PK	74.0	-25.2	1.42 H	215	46.90	1.90
2	3850.00	39.7 AV	54.0	-14.3	1.42 H	215	37.80	1.90
3	#5640.00	58.4 PK	68.2	-9.8	1.56 H	253	53.40	5.00
4	*5775.00	102.0 PK			1.56 H	253	59.20	42.80
5	*5775.00	92.2 AV			1.56 H	253	49.40	42.80
6	#6000.00	59.2 PK	68.2	-9.0	1.56 H	253	54.00	5.20
7	11550.00	60.6 PK	74.0	-13.4	1.40 H	168	45.10	15.50
8	11550.00	47.8 AV	54.0	-6.2	1.40 H	168	32.30	15.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3850.00	51.7 PK	74.0	-22.3	1.15 V	354	49.80	1.90
2	3850.00	47.4 AV	54.0	-6.6	1.15 V	354	45.50	1.90
3	#5628.00	64.6 PK	68.2	-3.6	2.21 V	340	59.60	5.00
4	**#5648.00**	**67.2 PK**	**68.2**	**-1.0**	**3.03 V**	**190**	**62.20**	**5.00**
5	*5775.00	117.6 PK			2.21 V	340	74.80	42.80
6	*5775.00	107.5 AV			2.21 V	340	64.70	42.80
7	#5926.40	65.0 PK	68.2	-3.2	2.21 V	340	59.80	5.20
8	11550.00	62.5 PK	74.0	-11.5	1.60 V	141	47.00	15.50
9	11550.00	49.1 AV	54.0	-4.9	1.60 V	141	33.60	15.50

Remarks:

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

Beamforming on Mode

802.11n (VHT20)

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	#5615.20	51.2 PK	68.2	-17.0	1.26 H	213	46.30	4.90
2	*5745.00	114.1 PK			1.26 H	213	71.30	42.80
3	*5745.00	101.4 AV			1.26 H	213	58.60	42.80
4	#5931.20	50.4 PK	68.2	-17.8	1.26 H	213	45.20	5.20
5	11490.00	62.6 PK	74.0	-11.4	1.63 H	282	46.80	15.80
6	11490.00	49.1 AV	54.0	-4.9	1.63 H	282	33.30	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5600.00	62.1 PK	68.2	-6.1	1.93 V	328	57.20	4.90
2	*5745.00	125.7 PK			1.93 V	328	82.90	42.80
3	*5745.00	112.1 AV			1.93 V	328	69.30	42.80
4	#5968.80	61.6 PK	68.2	-6.6	1.93 V	328	56.40	5.20
5	11490.00	65.4 PK	74.0	-8.6	1.38 V	152	49.60	15.80
6	11490.00	51.6 AV	54.0	-2.4	1.38 V	152	35.80	15.80

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	#5608.00	51.1 PK	68.2	-17.1	1.18 H	123	46.20	4.90
2	*5785.00	114.8 PK			1.18 H	123	72.00	42.80
3	*5785.00	99.2 AV			1.18 H	123	56.40	42.80
4	#5970.40	50.3 PK	68.2	-17.9	1.18 H	123	45.10	5.20
5	11570.00	62.7 PK	74.0	-11.3	1.62 H	273	47.20	15.50
6	11570.00	48.7 AV	54.0	-5.3	1.62 H	273	33.20	15.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5623.20	61.5 PK	68.2	-6.7	1.89 V	315	56.60	4.90
2	*5785.00	126.1 PK			1.89 V	315	83.30	42.80
3	*5785.00	111.2 AV			1.89 V	315	68.40	42.80
4	#5968.80	60.9 PK	68.2	-7.3	1.89 V	315	55.70	5.20
5	11570.00	65.5 PK	74.0	-8.5	1.42 V	145	50.00	15.50
6	11570.00	51.6 AV	54.0	-2.4	1.42 V	145	36.10	15.50

Remarks:

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

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	3883.00	47.1 PK	74.0	-26.9	1.22 H	206	45.00	2.10
2	3883.00	41.9 AV	54.0	-12.1	1.22 H	206	39.80	2.10
3	#5600.80	57.8 PK	68.2	-10.4	1.25 H	121	52.90	4.90
4	*5825.00	113.7 PK			1.25 H	121	70.90	42.80
5	*5825.00	100.5 AV			1.25 H	121	57.70	42.80
6	#5974.40	58.9 PK	68.2	-9.3	1.25 H	121	53.70	5.20
7	7700.00	55.2 PK	74.0	-18.8	1.13 H	192	44.40	10.80
8	7700.00	45.8 AV	54.0	-8.2	1.13 H	192	35.00	10.80
9	11650.00	62.4 PK	74.0	-11.6	1.59 H	268	46.60	15.80
10	11650.00	48.9 AV	54.0	-5.1	1.59 H	268	33.10	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3883.00	51.2 PK	74.0	-22.8	2.29 V	355	49.10	2.10
2	3883.00	45.6 AV	54.0	-8.4	2.29 V	355	43.50	2.10
3	#5638.40	63.5 PK	68.2	-4.7	2.12 V	328	58.50	5.00
4	*5825.00	125.9 PK			2.12 V	329	83.10	42.80
5	*5825.00	111.8 AV			2.12 V	329	69.00	42.80
6	#5948.80	60.9 PK	68.2	-7.3	2.12 V	328	55.70	5.20
7	7700.00	57.1 PK	74.0	-16.9	1.16 V	293	46.30	10.80
8	7700.00	47.6 AV	54.0	-6.4	1.16 V	293	36.80	10.80
9	11650.00	65.5 PK	74.0	-8.5	1.33 V	138	49.70	15.80
10	11650.00	51.7 AV	54.0	-2.3	1.33 V	138	35.90	15.80

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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 (VHT40)

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	#5620.00	58.4 PK	68.2	-9.8	1.56 H	56	53.50	4.90
2	*5755.00	105.5 PK			1.56 H	56	62.70	42.80
3	*5755.00	93.4 AV			1.56 H	56	50.60	42.80
4	#5959.20	59.3 PK	68.2	-8.9	1.56 H	56	54.10	5.20
5	11510.00	60.4 PK	74.0	-13.6	1.68 H	253	44.80	15.60
6	11510.00	46.9 AV	54.0	-7.1	1.68 H	253	31.30	15.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5608.80	60.6 PK	68.2	-7.6	2.37 V	10	55.70	4.90
2	*5755.00	118.5 PK			2.37 V	10	75.70	42.80
3	*5755.00	106.1 AV			2.37 V	10	63.30	42.80
4	#5972.00	60.5 PK	68.2	-7.7	2.37 V	10	55.30	5.20
5	11510.00	63.2 PK	74.0	-10.8	1.42 V	138	47.60	15.60
6	11510.00	50.4 AV	54.0	-3.6	1.42 V	138	34.80	15.60

Remarks:

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

CHANNEL	TX Channel 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	3850.00	49.0 PK	74.0	-25.0	1.23 H	211	47.10	1.90
2	3850.00	40.6 AV	54.0	-13.4	1.23 H	211	38.70	1.90
3	#5638.40	57.5 PK	68.2	-10.7	1.24 H	124	52.50	5.00
4	*5795.00	108.3 PK			1.24 H	124	65.50	42.80
5	*5795.00	95.4 AV			1.24 H	124	52.60	42.80
6	#5939.20	58.5 PK	68.2	-9.7	1.24 H	124	53.30	5.20
7	7700.00	57.8 PK	74.0	-16.2	1.09 H	187	47.00	10.80
8	7700.00	46.1 AV	54.0	-7.9	1.09 H	187	35.30	10.80
9	11590.00	59.8 PK	74.0	-14.2	1.73 H	259	44.30	15.50
10	11590.00	46.1 AV	54.0	-7.9	1.73 H	259	30.60	15.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3850.00	51.2 PK	74.0	-22.8	1.16 V	350	49.30	1.90
2	3850.00	45.5 AV	54.0	-8.5	1.16 V	350	43.60	1.90
3	#5620.00	60.7 PK	68.2	-7.5	2.63 V	6	55.80	4.90
4	*5795.00	116.7 PK			2.63 V	6	73.90	42.80
5	*5795.00	104.5 AV			2.63 V	6	61.70	42.80
6	#5992.00	60.9 PK	68.2	-7.3	2.63 V	6	55.70	5.20
7	7700.00	58.3 PK	74.0	-15.7	1.12 V	288	47.50	10.80
8	7700.00	48.7 AV	54.0	-5.3	1.12 V	288	37.90	10.80
9	11590.00	62.9 PK	74.0	-11.1	1.50 V	137	47.40	15.50
10	11590.00	49.5 AV	54.0	-4.5	1.50 V	137	34.00	15.50

Remarks:

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

802.11ac (VHT80)

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	3850.00	49.3 PK	74.0	-24.7	1.48 H	73	47.40	1.90
2	3850.00	39.6 AV	54.0	-14.4	1.48 H	73	37.70	1.90
3	#5601.60	58.4 PK	68.2	-9.8	1.69 H	102	53.50	4.90
4	*5775.00	103.9 PK			1.69 H	102	61.10	42.80
5	*5775.00	92.1 AV			1.69 H	102	49.30	42.80
6	#5974.40	58.5 PK	68.2	-9.7	1.69 H	102	53.30	5.20
7	7700.00	56.5 PK	74.0	-17.5	1.70 H	212	45.70	10.80
8	7700.00	45.0 AV	54.0	-9.0	1.70 H	212	34.20	10.80
9	11550.00	59.9 PK	74.0	-14.1	1.72 H	261	44.40	15.50
10	11550.00	46.1 AV	54.0	-7.9	1.72 H	261	30.60	15.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3850.00	51.9 PK	74.0	-22.1	1.19 V	346	50.00	1.90
2	3850.00	46.9 AV	54.0	-7.1	1.19 V	346	45.00	1.90
3	#5624.00	61.9 PK	68.2	-6.3	2.11 V	2	57.00	4.90
4	*5775.00	115.3 PK			2.11 V	2	72.50	42.80
5	*5775.00	103.4 AV			2.11 V	2	60.60	42.80
6	#5925.60	61.1 PK	68.2	-7.1	2.11 V	2	55.90	5.20
7	7700.00	58.5 PK	74.0	-15.5	1.23 V	288	47.70	10.80
8	7700.00	51.8 AV	54.0	-2.2	1.23 V	288	41.00	10.80
9	11550.00	59.7 PK	74.0	-14.3	1.46 V	143	44.20	15.50
10	11550.00	47.1 AV	54.0	-6.9	1.46 V	143	31.60	15.50

Remarks:

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

Below 1GHz Worst-Case Data:

802.11a

CHANNEL	TX Channel 149	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	30.00	30.5 QP	40.0	-9.5	2.00 H	15	46.10	-15.60
2	169.68	23.1 QP	43.5	-20.4	1.00 H	257	37.20	-14.10
3	249.22	30.7 QP	46.0	-15.3	1.00 H	124	45.10	-14.40
4	499.48	40.0 QP	46.0	-6.0	1.50 H	136	48.60	-8.60
5	625.58	35.5 QP	46.0	-10.5	1.00 H	140	41.30	-5.80
6	802.12	35.3 QP	46.0	-10.7	1.00 H	218	38.00	-2.70
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	33.26	32.0 QP	40.0	-8.0	1.00 V	171	47.70	-15.70
2	42.77	26.5 QP	40.0	-13.5	1.00 V	61	41.00	-14.50
3	107.60	26.7 QP	43.5	-16.8	1.00 V	277	44.20	-17.50
4	274.44	25.4 QP	46.0	-20.6	1.50 V	225	38.60	-13.20
5	499.48	39.1 QP	46.0	-6.9	1.00 V	36	47.70	-8.60
6	875.84	34.8 QP	46.0	-11.2	1.00 V	9	36.50	-1.70

Remarks:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Test Date: Nov. 19 ~ Nov. 30, 2015

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, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2015	Feb. 25, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 Test Procedures

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

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

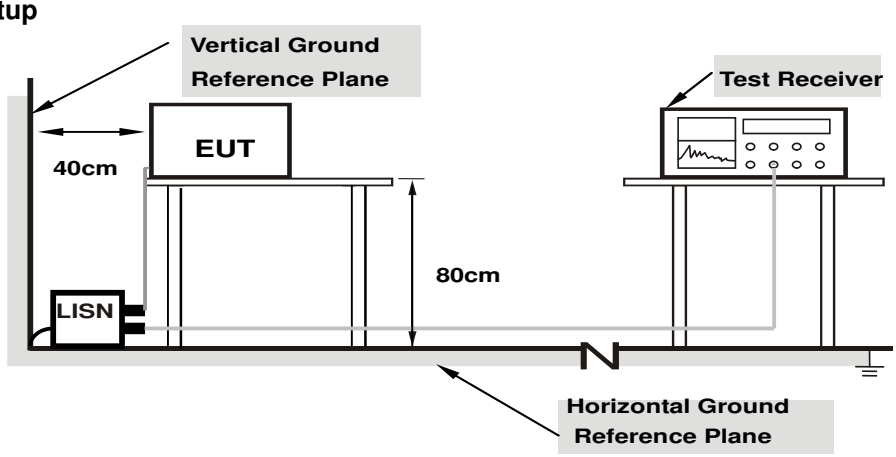
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

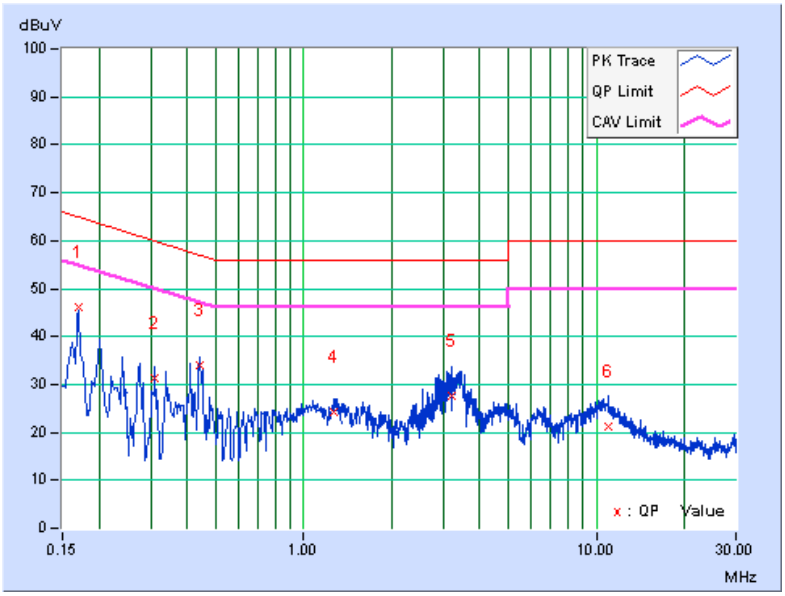
Worst-Case Data: 802.11a

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	9.83	36.23	26.51	46.06	36.34	64.98	54.98	-18.92	-18.64
2	0.31031	9.86	21.29	13.22	31.15	23.08	59.96	49.96	-28.81	-26.88
3	0.44040	9.88	24.25	12.97	34.13	22.85	57.05	47.05	-22.92	-24.20
4	1.26435	9.95	14.43	6.92	24.38	16.87	56.00	46.00	-31.62	-29.13
5	3.18807	10.08	17.67	7.53	27.75	17.61	56.00	46.00	-28.25	-28.39
6	10.97679	10.57	10.60	5.11	21.17	15.68	60.00	50.00	-38.83	-34.32

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.

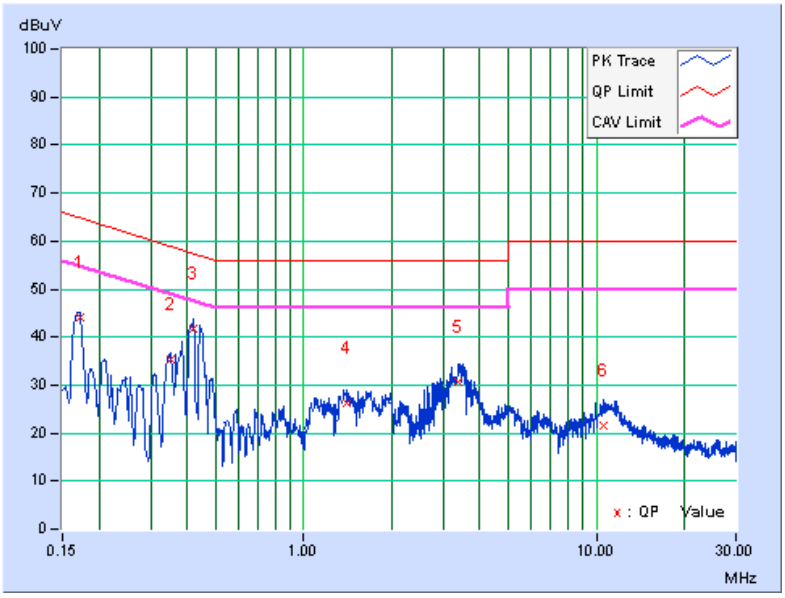


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.17346	9.82	34.14	26.57	43.96	36.39	64.79	54.79	-20.83	-18.40
2	0.34926	9.87	25.64	18.01	35.51	27.88	58.98	48.98	-23.47	-21.10
3	**0.41979**	**9.88**	**32.03**	**23.44**	**41.91**	**33.32**	**57.45**	**47.45**	**-15.54**	**-14.13**
4	1.39729	9.95	16.25	9.55	26.20	19.50	56.00	46.00	-29.80	-26.50
5	3.38357	10.09	20.44	9.49	30.53	19.58	56.00	46.00	-25.47	-26.42
6	10.61707	10.51	11.20	5.53	21.71	16.04	60.00	50.00	-38.29	-33.96

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.3 Transmit Power Measurment

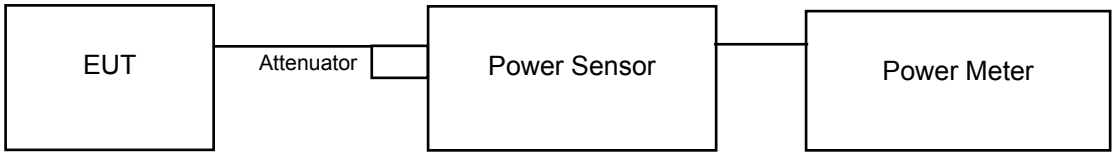
4.3.1 Limits of Transmit Power Measurement

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

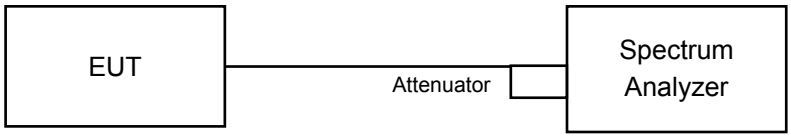
*B is the 26 dB emission bandwidth in megahertz

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:

Beamforming off 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	Chain 2	Chain 3				
149	5745	20.72	19.90	19.92	20.23	419.370	26.23	30	Pass
157	5785	20.77	19.86	19.93	20.21	419.582	26.23	30	Pass
165	5825	20.70	19.96	20.10	20.22	424.098	26.27	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	Chain 2	Chain 3				
149	5745	20.71	19.88	19.92	20.20	417.924	26.21	30	Pass
157	5785	20.68	19.93	19.99	20.10	417.450	26.21	30	Pass
165	5825	20.74	20.03	20.07	20.32	428.542	26.32	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	Chain 2	Chain 3				
151	5755	24.15	23.48	23.20	23.59	920.350	29.64	30	Pass
159	5795	24.91	23.01	23.11	23.74	**950.964**	29.78	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	Chain 2	Chain 3				
155	5775	23.10	23.07	23.03	23.01	807.837	29.07	30	Pass

Beamforming on Mode

802.11n (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	20.00	19.00	18.80	19.20	338.467	25.30	25.63	Pass
157	5785	19.90	19.00	18.90	19.20	337.958	25.29	25.63	Pass
165	5825	19.90	18.90	18.90	19.20	336.150	25.27	25.63	Pass

Note: Directional gain = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11n (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	19.90	19.00	19.00	19.20	339.766	25.31	25.63	Pass
159	5795	20.00	19.00	18.90	19.20	340.234	25.32	25.63	Pass

Note: Directional gain = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

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	Chain 2	Chain 3				
155	5775	19.90	18.90	19.10	19.30	**341.746**	25.34	25.63	Pass

Note: Directional gain = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

Occupied Bandwidth:

Beamforming off Mode

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	16.43	16.43	16.43	16.43
157	5785	16.44	16.44	16.44	16.44
165	5825	16.56	16.44	16.56	16.56

802.11n (HT20)

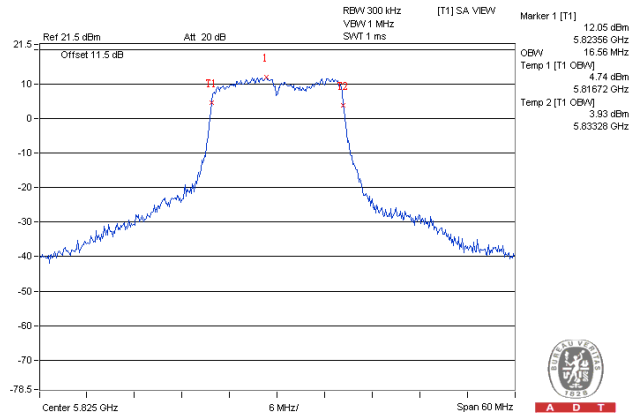
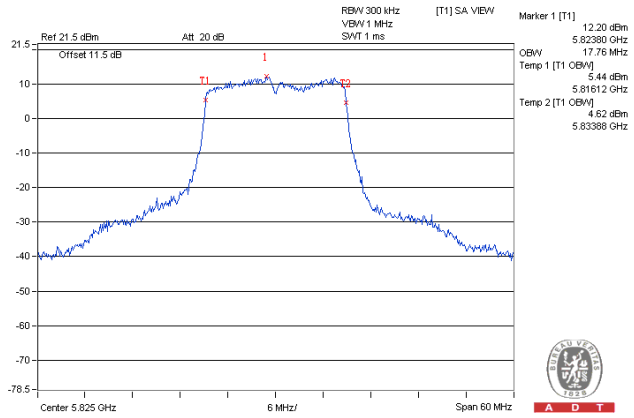
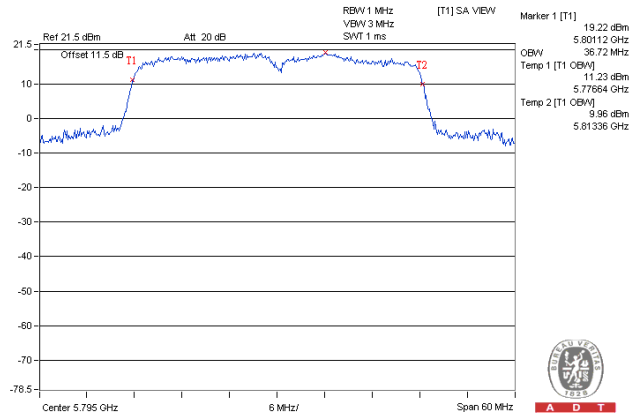
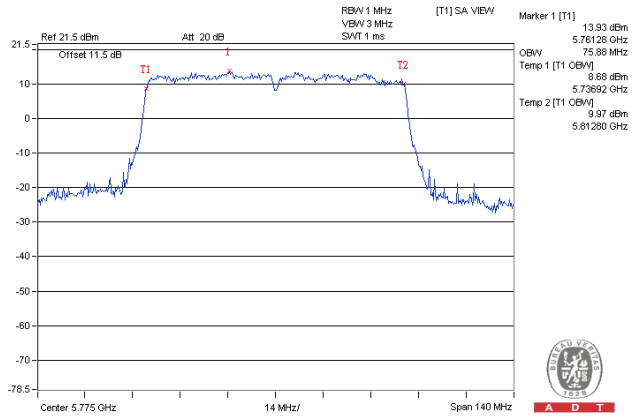
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	17.64	17.64	17.64	17.64
157	5785	17.64	17.64	17.64	17.64
165	5825	17.76	17.64	17.76	17.76

802.11n (HT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	36.48	36.36	36.24	36.36
159	5795	36.72	36.48	36.60	36.48

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	75.88	75.88	75.88	75.88

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

Beamforming on Mode

802.11n (VHT20)

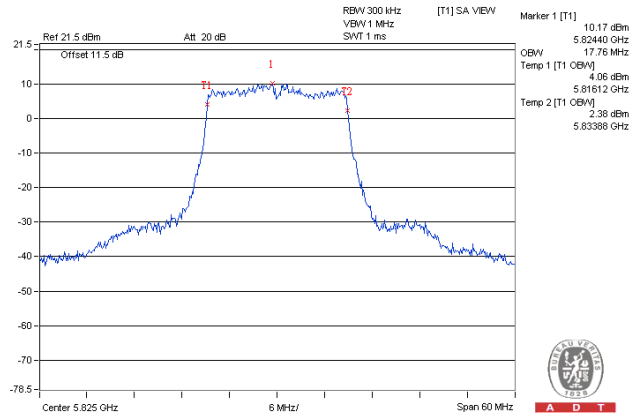
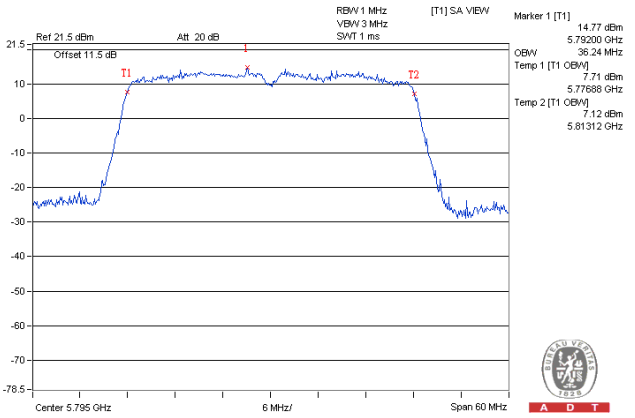
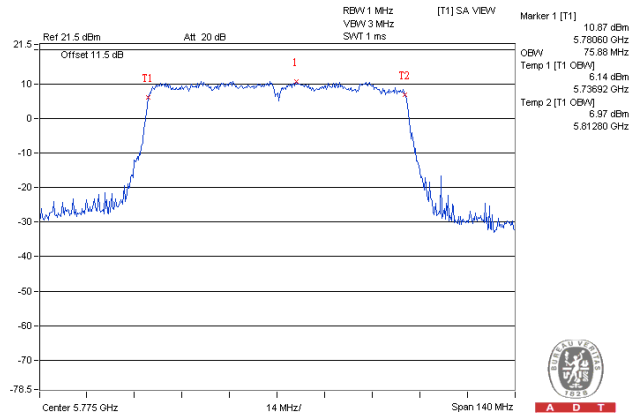
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	17.57	17.57	17.65	17.65
157	5785	17.52	17.64	17.64	17.64
165	5825	17.64	17.64	17.76	17.64

802.11n (VHT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	36.12	36.12	36.12	36.12
159	5795	36.12	36.00	36.24	36.12

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	75.88	75.88	75.88	75.88

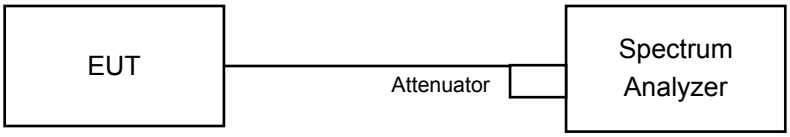
Spectrum Plot of Worst Value	
802.11n (VHT20)	802.11n (VHT40)
	
802.11ac (VHT80)	
	

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

Duty cycle of test signal is > 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 of test signal is < 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)

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

Beamforming off Mode

802.11a

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-0.85	1.37	6.02	0.18	7.57	25.63	Pass
	157	5785	-0.34	1.88	6.02	0.18	8.08	25.63	Pass
	165	5825	-0.06	2.16	6.02	0.18	8.36	25.63	Pass
1	149	5745	-1.64	0.58	6.02	0.18	6.78	25.63	Pass
	157	5785	-1.48	0.74	6.02	0.18	6.94	25.63	Pass
	165	5825	-0.68	1.54	6.02	0.18	7.74	25.63	Pass
2	149	5745	-1.58	0.64	6.02	0.18	6.84	25.63	Pass
	157	5785	-1.55	0.67	6.02	0.18	6.87	25.63	Pass
	165	5825	-0.90	1.32	6.02	0.18	7.52	25.63	Pass
3	149	5745	-1.94	0.28	6.02	0.18	6.48	25.63	Pass
	157	5785	-1.55	0.67	6.02	0.18	6.87	25.63	Pass
	165	5825	-0.78	1.44	6.02	0.18	7.64	25.63	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 = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
3. 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=4) dB	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-1.05	1.17	6.02	7.19	25.63	Pass
	157	5785	-0.63	1.59	6.02	7.61	25.63	Pass
	165	5825	-0.22	2.00	6.02	8.02	25.63	Pass
1	149	5745	-2.15	0.07	6.02	6.09	25.63	Pass
	157	5785	-2.08	0.14	6.02	6.16	25.63	Pass
	165	5825	-1.08	1.14	6.02	7.16	25.63	Pass
2	149	5745	-1.87	0.35	6.02	6.37	25.63	Pass
	157	5785	-1.61	0.61	6.02	6.63	25.63	Pass
	165	5825	-1.37	0.85	6.02	6.87	25.63	Pass
3	149	5745	-2.11	0.11	6.02	6.13	25.63	Pass
	157	5785	-1.90	0.32	6.02	6.34	25.63	Pass
	165	5825	-1.06	1.16	6.02	7.18	25.63	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 = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11n (HT40)

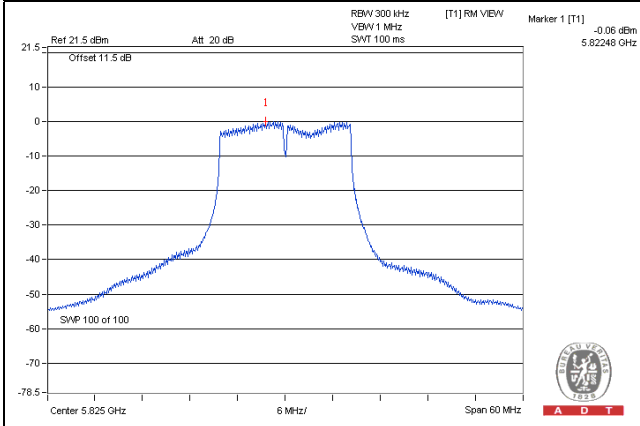
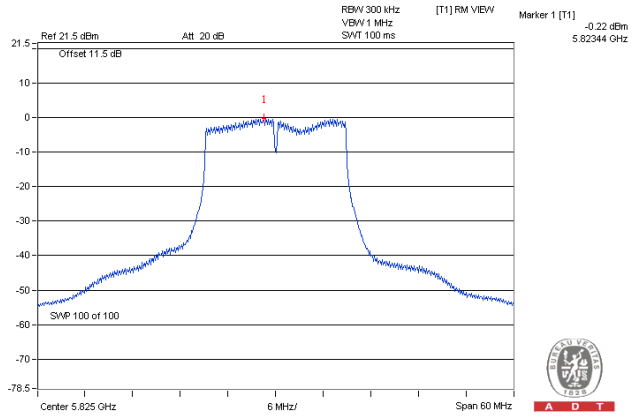
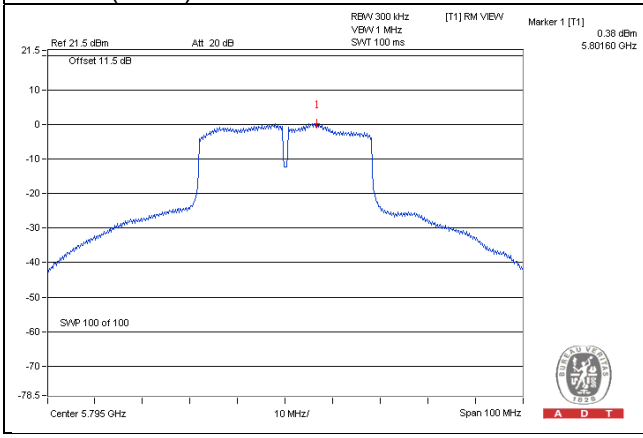
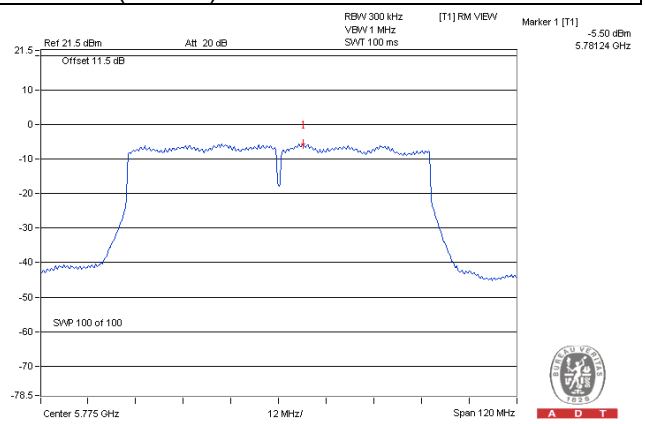
TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	151	5755	0.03	2.25	6.02	0.16	8.43	25.63	Pass
	159	5795	0.38	2.60	6.02	0.16	8.78	25.63	Pass
1	151	5755	-1.28	0.94	6.02	0.16	7.12	25.63	Pass
	159	5795	-1.11	1.11	6.02	0.16	7.29	25.63	Pass
2	151	5755	-1.39	0.83	6.02	0.16	7.01	25.63	Pass
	159	5795	-1.53	0.69	6.02	0.16	6.87	25.63	Pass
3	151	5755	-1.40	0.82	6.02	0.16	7.00	25.63	Pass
	159	5795	-1.49	0.73	6.02	0.16	6.91	25.63	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 = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
3. 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=4) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	155	5775	-5.50	-3.28	6.02	0.35	3.09	25.63	Pass
1	155	5775	-6.94	-4.72	6.02	0.35	1.65	25.63	Pass
2	155	5775	-6.89	-4.67	6.02	0.35	1.70	25.63	Pass
3	155	5775	-6.73	-4.51	6.02	0.35	1.86	25.63	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 = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
3. 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 on Mode

802.11n (VHT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=4) dB	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-2.16	0.06	6.02	6.08	25.63	Pass
	157	5785	-1.83	0.39	6.02	6.41	25.63	Pass
	165	5825	-1.37	0.85	6.02	6.87	25.63	Pass
1	149	5745	-3.39	-1.17	6.02	4.85	25.63	Pass
	157	5785	-3.22	-1.00	6.02	5.02	25.63	Pass
	165	5825	-2.33	-0.11	6.02	5.91	25.63	Pass
2	149	5745	-2.65	-0.43	6.02	5.59	25.63	Pass
	157	5785	-2.58	-0.36	6.02	5.66	25.63	Pass
	165	5825	-2.10	0.12	6.02	6.14	25.63	Pass
3	149	5745	-2.95	-0.73	6.02	5.29	25.63	Pass
	157	5785	-2.41	-0.19	6.02	5.83	25.63	Pass
	165	5825	-1.94	0.28	6.02	6.30	25.63	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 = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11n (VHT40)

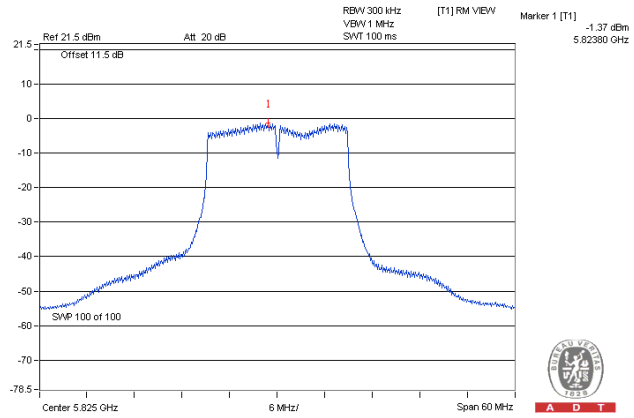
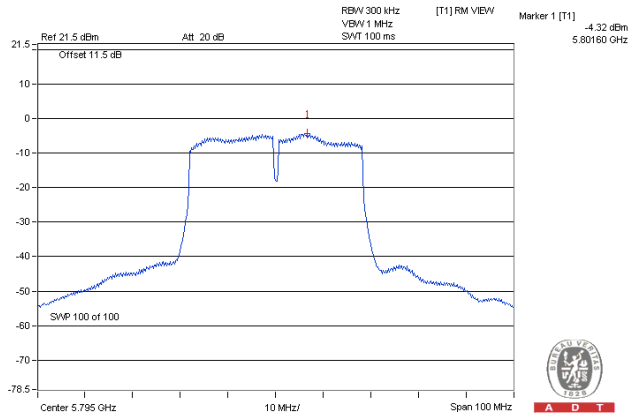
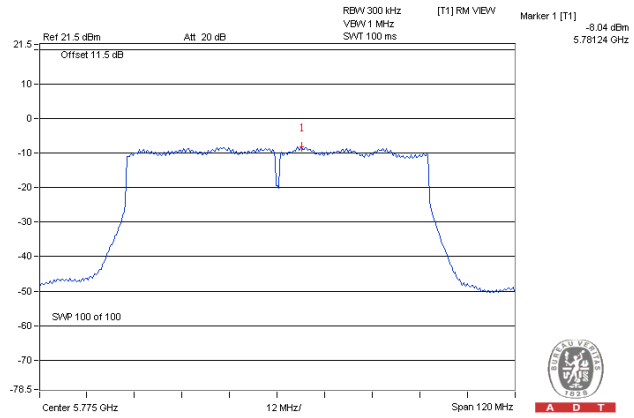
TX chain	Chan.	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	151	5755	-4.70	-2.48	6.02	0.16	3.70	25.63	Pass
	159	5795	-4.32	-2.10	6.02	0.16	4.08	25.63	Pass
1	151	5755	-5.94	-3.72	6.02	0.16	2.46	25.63	Pass
	159	5795	-5.79	-3.57	6.02	0.16	2.61	25.63	Pass
2	151	5755	-5.52	-3.30	6.02	0.16	2.88	25.63	Pass
	159	5795	-5.05	-2.83	6.02	0.16	3.35	25.63	Pass
3	151	5755	-5.44	-3.22	6.02	0.16	2.96	25.63	Pass
	159	5795	-4.80	-2.58	6.02	0.16	3.60	25.63	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 = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
3. 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=4) dB	Duty factor	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	155	5775	-8.04	-5.82	6.02	0.35	0.55	25.63	Pass
1	155	5775	-9.59	-7.37	6.02	0.35	-1.00	25.63	Pass
2	155	5775	-9.05	-6.83	6.02	0.35	-0.46	25.63	Pass
3	155	5775	-8.77	-6.55	6.02	0.35	-0.18	25.63	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 = 4.35dBi + 10log(4) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

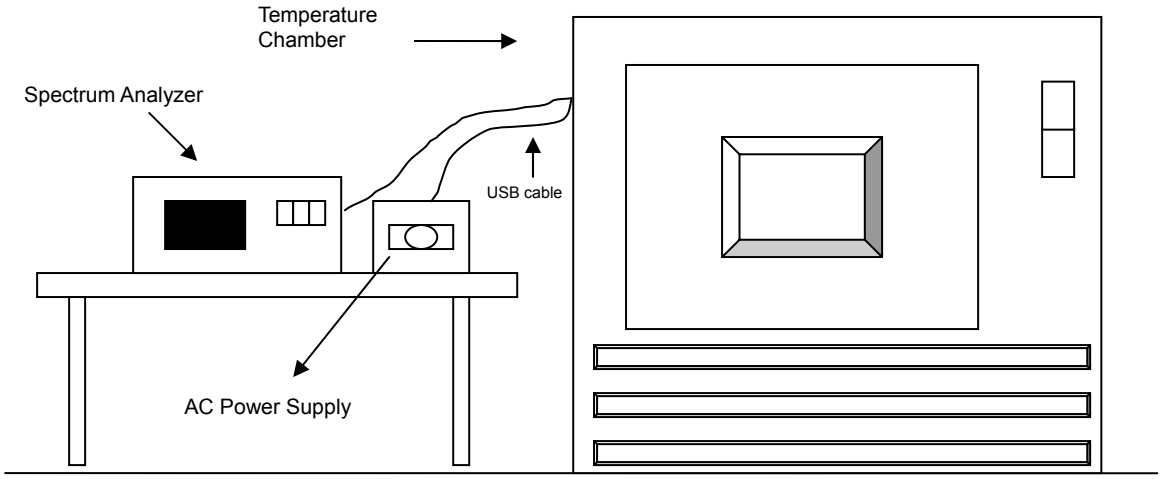
Spectrum Plot of Worst Value	
802.11ac (VHT20)	802.11ac (VHT40)
	
802.11ac (VHT80)	
	

4.5 Frequency Stability

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Agilent	E4446A	MY51100039	Aug. 18, 2015	Aug. 17, 2016
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016
Digital Multimeter Fluke	87-III	70360742	Jul. 03, 2015	Jul. 02, 2016
AC Power Supply Extech	CFW-105	E000603	NA	NA

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.4 Test Procedure

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

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

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

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

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

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 4Vdc to 6Vdc and the frequency record.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5745MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5744.9785	-0.00037	5744.9802	-0.00034	5744.9819	-0.00032	5744.9787	-0.00037
40	120	5744.9852	-0.00026	5744.9853	-0.00026	5744.9857	-0.00025	5744.9838	-0.00028
30	120	5745.0252	0.00044	5745.0262	0.00046	5745.0248	0.00043	5745.0269	0.00047
20	120	5745.0033	0.00006	5745.0024	0.00004	5745.0051	0.00009	5745.0064	0.00011
10	120	5744.9819	-0.00032	5744.9793	-0.00036	5744.9796	-0.00036	5744.984	-0.00028
0	120	5745.0252	0.00044	5745.0297	0.00052	5745.0296	0.00052	5745.025	0.00044
-10	120	5745.0006	0.00001	5744.9991	-0.00002	5745.0007	0.00001	5745.0014	0.00002
-20	120	5744.9794	-0.00036	5744.9811	-0.00033	5744.9834	-0.00029	5744.981	-0.00033
-30	120	5744.9804	-0.00034	5744.9802	-0.00034	5744.9783	-0.00038	5744.979	-0.00037

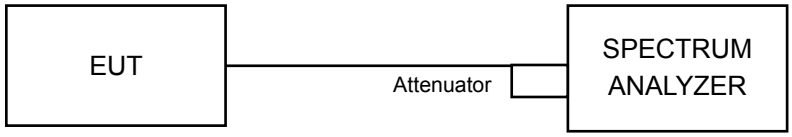
Frequency Stability Versus Voltage									
Operating Frequency: 5745MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5745.0037	0.00006	5745.0033	0.00006	5745.0054	0.00009	5745.0055	0.00010
	120	5745.0033	0.00006	5745.0024	0.00004	5745.0051	0.00009	5745.0064	0.00011
	102	5745.0023	0.00004	5745.002	0.00003	5745.0046	0.00008	5745.0057	0.00010

4.6 6dB Bandwidth Measurment

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Beamforming off Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.34	16.38	16.36	16.36	0.5	Pass
157	5785	16.36	16.40	16.39	16.39	0.5	Pass
165	5825	15.98	16.37	16.38	16.37	0.5	Pass

802.11n (HT20)

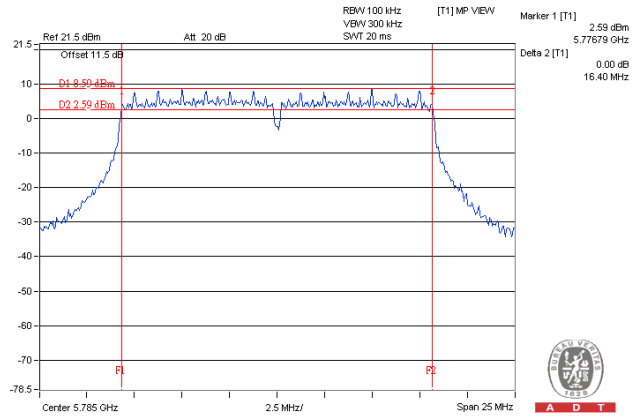
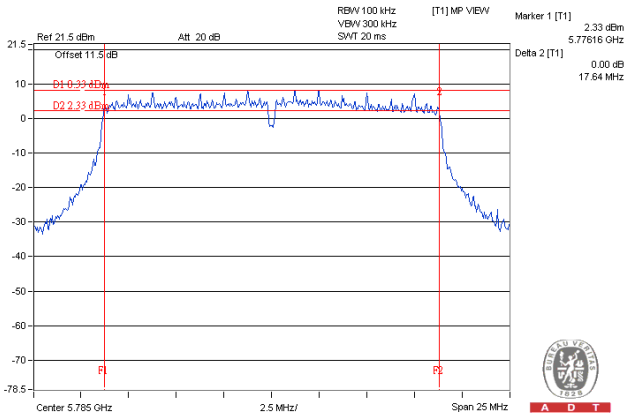
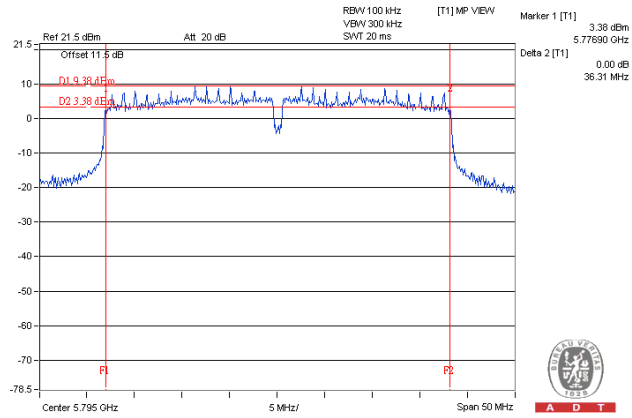
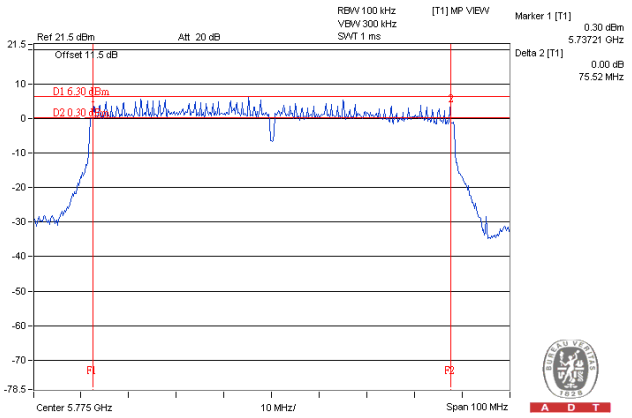
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.18	17.61	17.62	17.61	0.5	Pass
157	5785	16.93	17.63	17.64	17.62	0.5	Pass
165	5825	16.97	17.59	17.62	17.61	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.27	35.22	35.29	35.30	0.5	Pass
159	5795	35.15	35.26	36.31	35.39	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	75.51	75.45	75.51	75.52	0.5	Pass

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

Beamforming on Mode

802.11ac (VHT20)

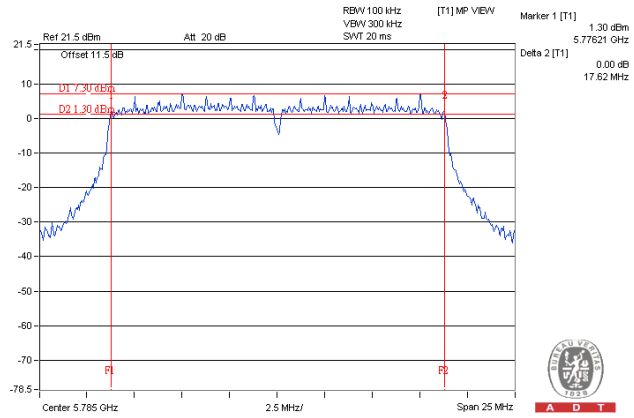
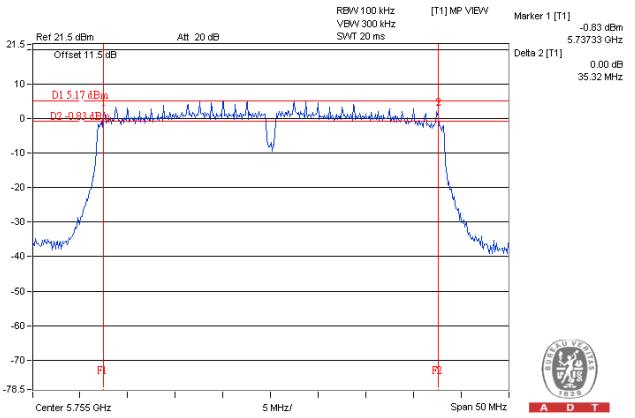
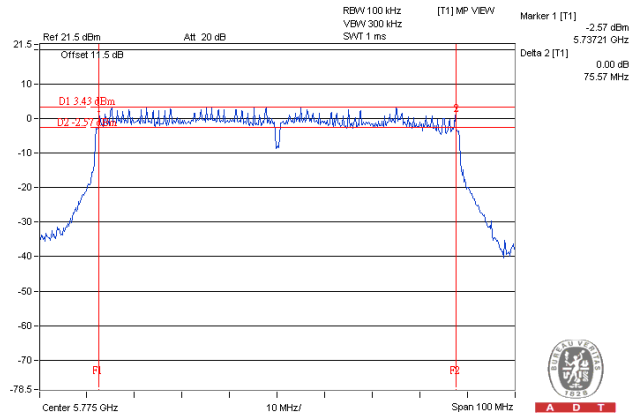
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.96	17.60	17.60	17.58	0.5	Pass
157	5785	17.21	17.62	17.62	17.60	0.5	Pass
165	5825	16.39	17.25	17.62	15.76	0.5	Pass

802.11an (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.30	35.22	35.32	35.22	0.5	Pass
159	5795	35.28	35.27	35.25	35.32	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	75.53	75.48	75.51	75.57	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).

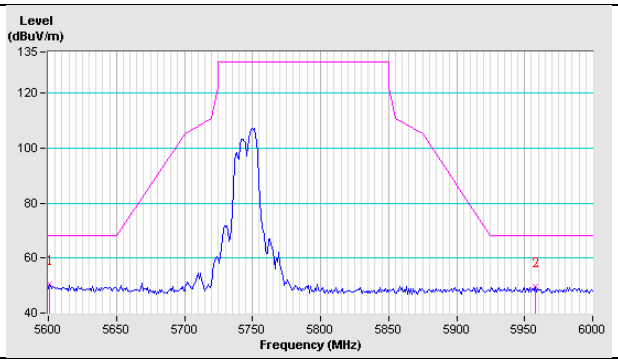
Annex A- Radiated Out of Band Emisison (OOBE) Measurement (For U-NII-3 band)

Beamforming off Mode

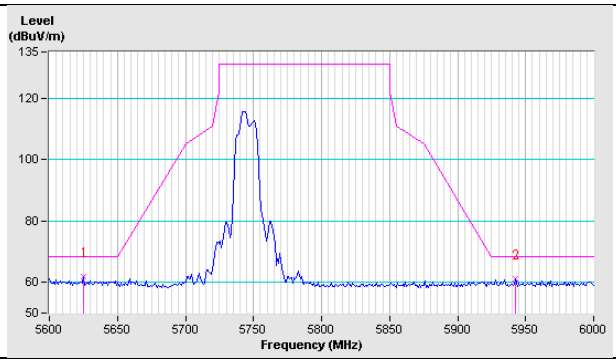
802.11a

CH149

Horizontal

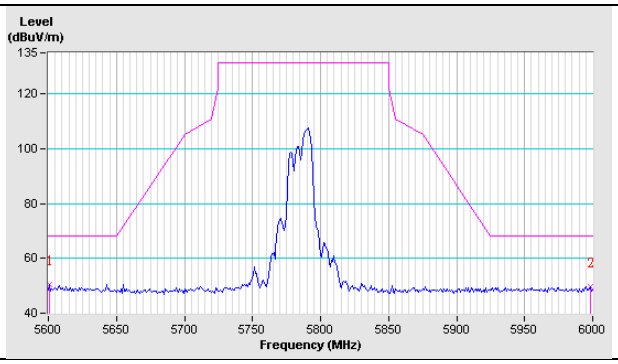


Vertical

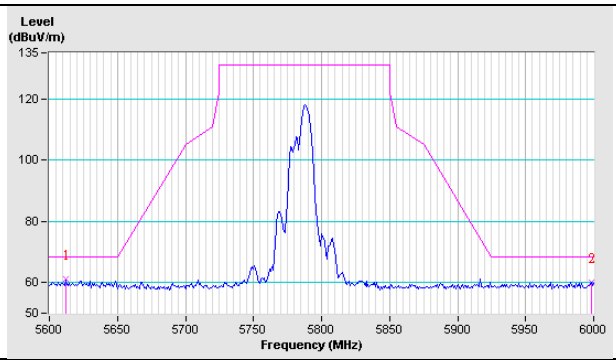


CH157

Horizontal

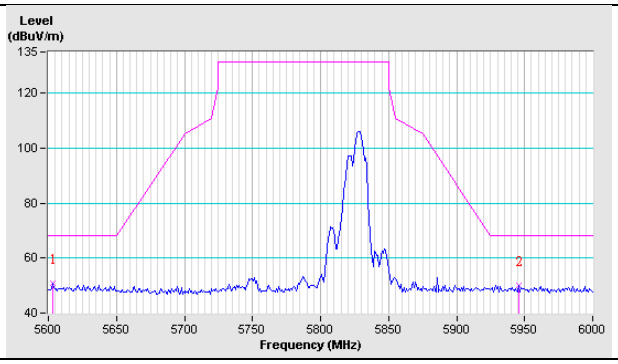


Vertical

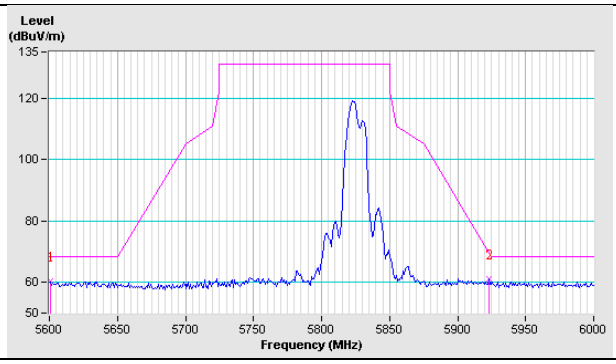


CH165

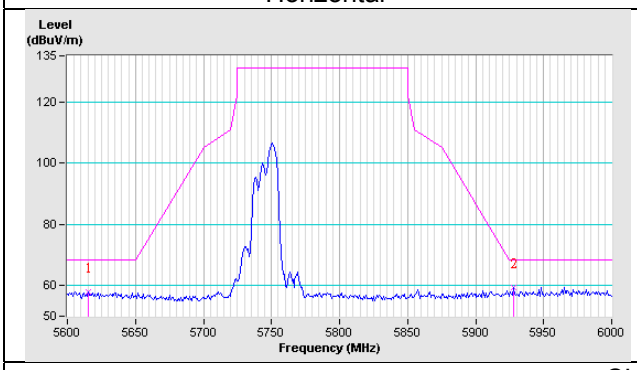
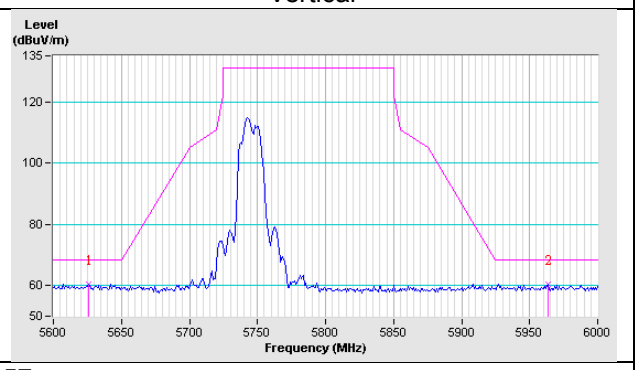
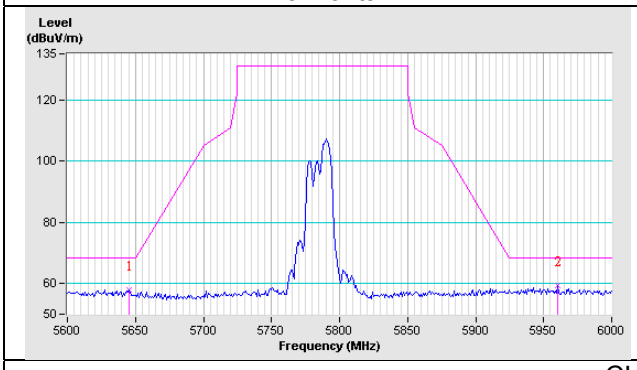
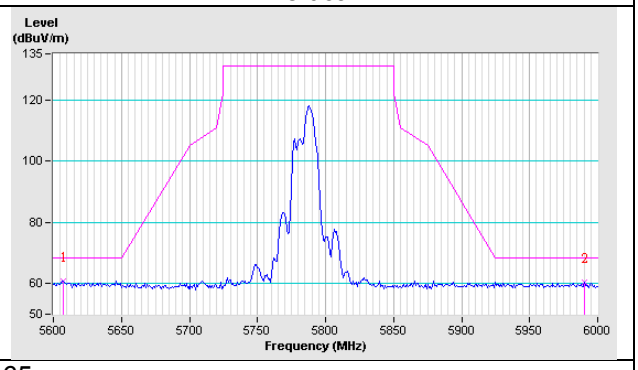
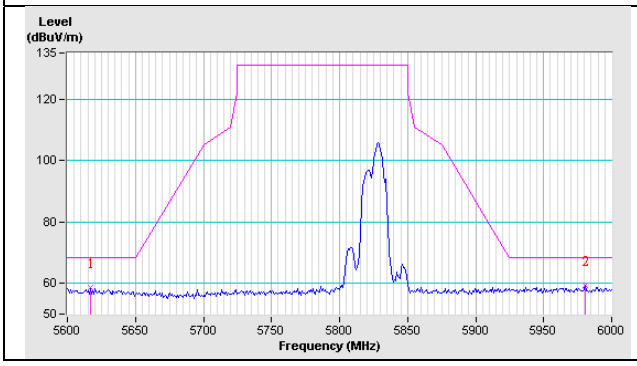
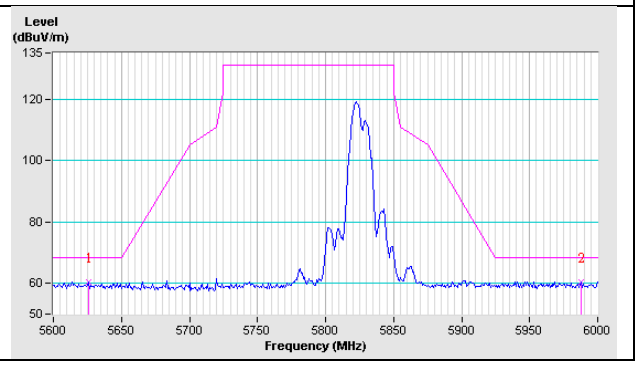
Horizontal



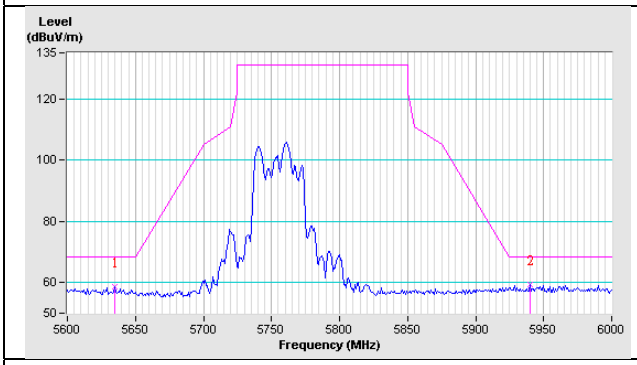
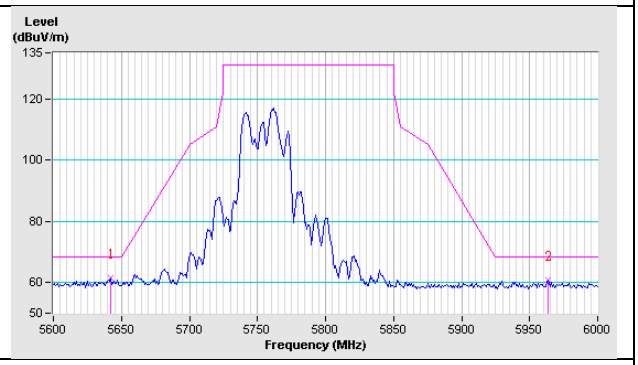
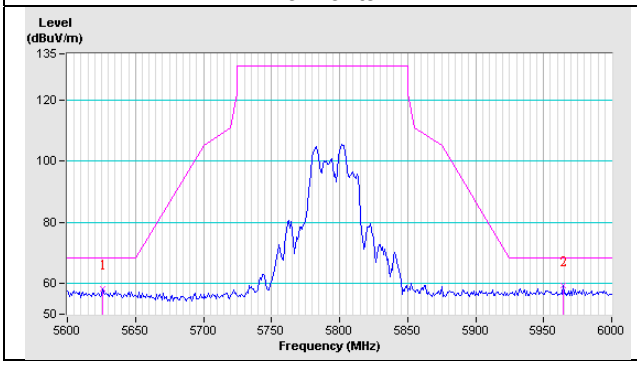
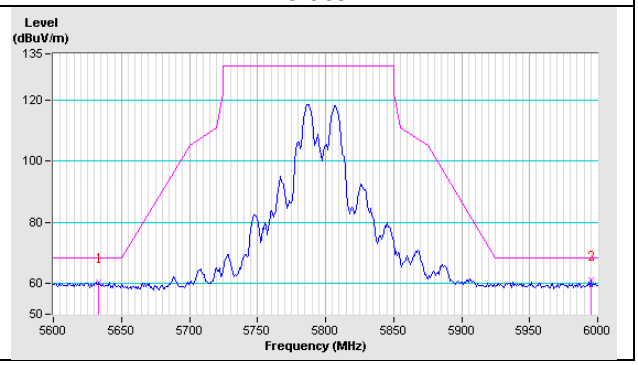
Vertical



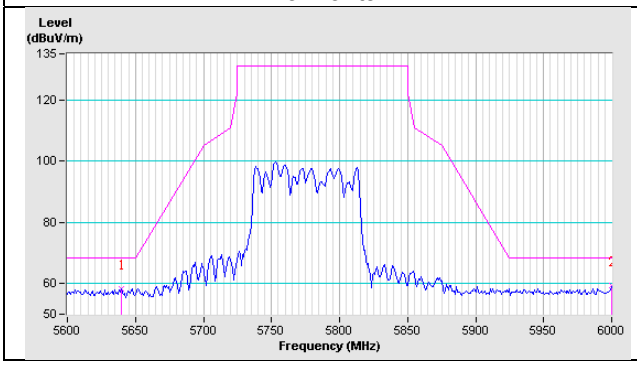
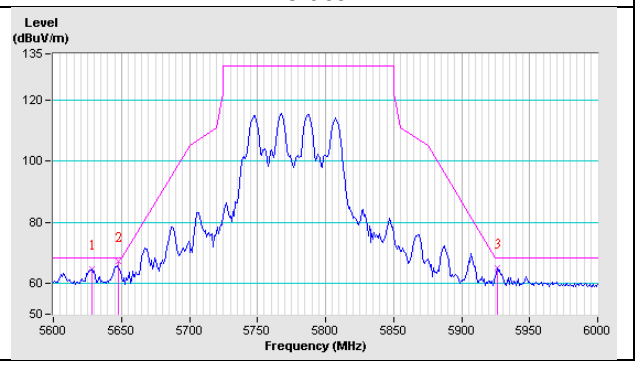
802.11n (HT20)

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11n (HT40)

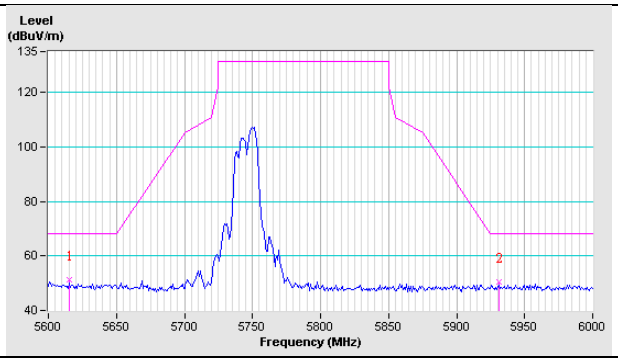
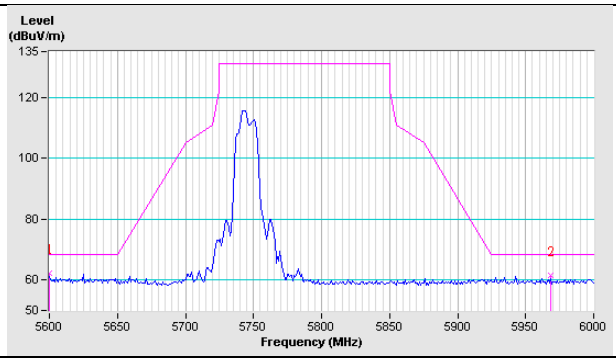
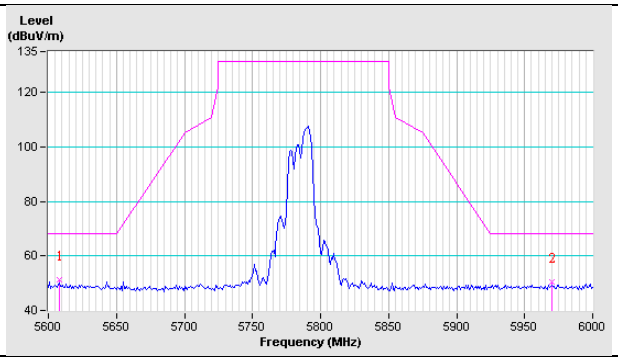
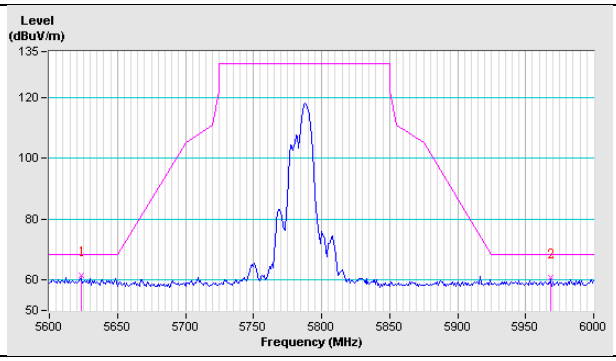
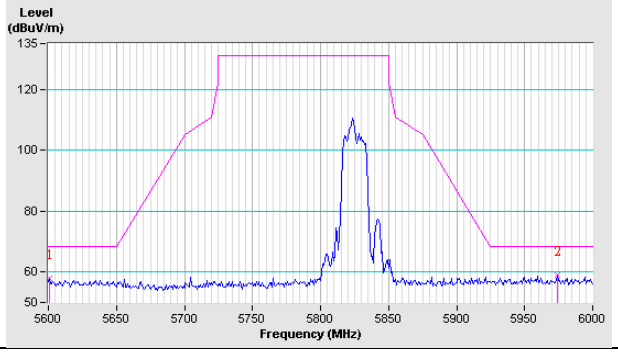
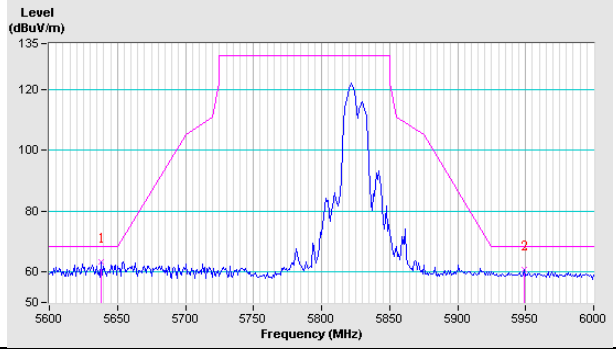
CH151	
Horizontal	Vertical
	
CH159	
Horizontal	Vertical
	

802.11ac (VHT80)

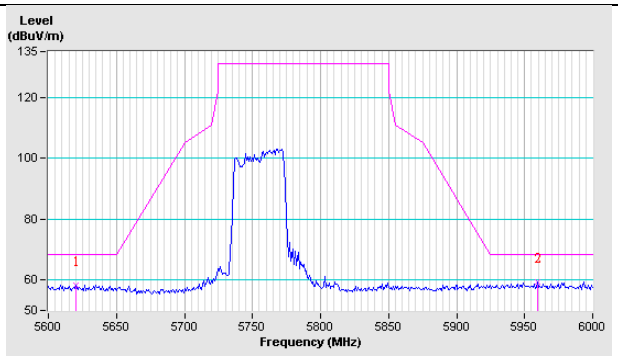
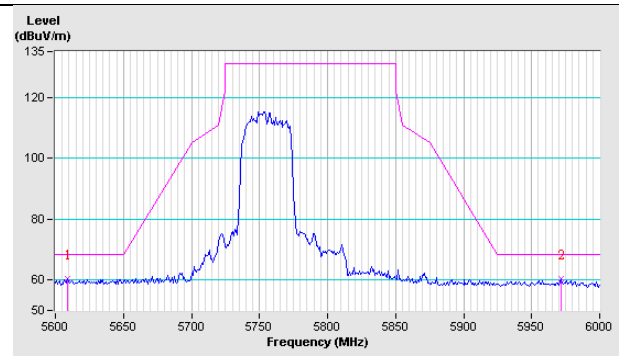
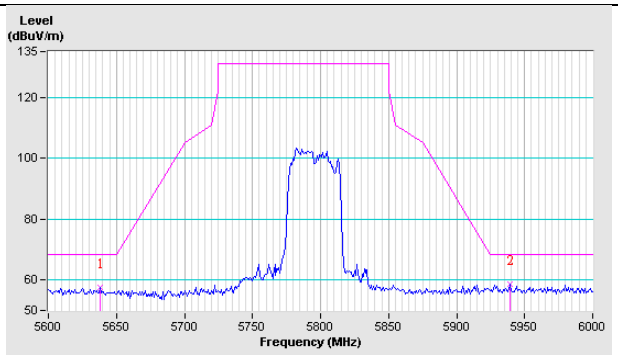
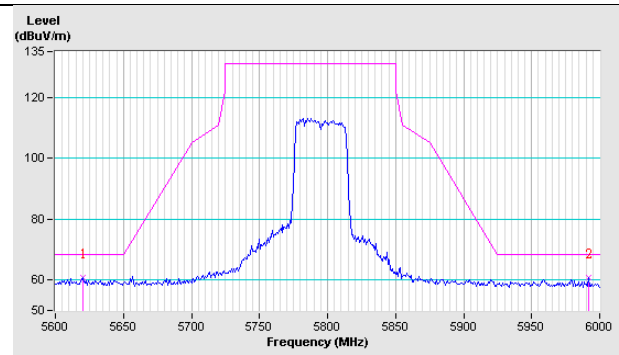
CH155	
Horizontal	Vertical
	

Beamforming on Mode

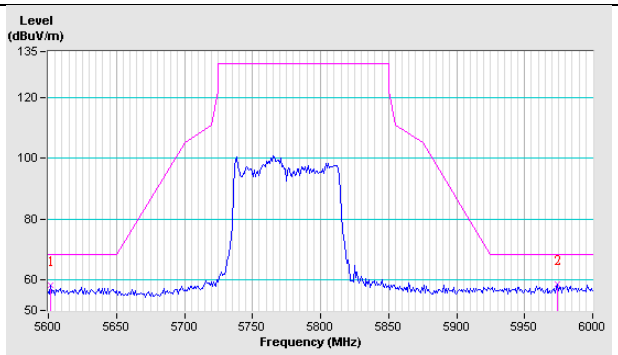
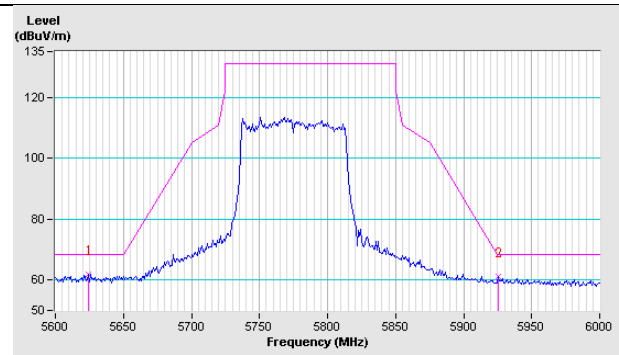
802.11n (VHT20)

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11n (VHT40)

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

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