FCC Test Report

Report No.:	RF160809C28-1
FCC ID:	PY316200339
Test Model:	R9000
Received Date:	Aug. 05, 2016
Test Date:	Aug. 12 ~ Sep. 09, 2016
Issued Date:	Sep. 10, 2016
Applicant:	NETGEAR, INC.
Address:	350 E. Plumeria Drive, San Jose CA 95134, USA
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
RF160809C28-1	Original release.	Sep. 10, 2016

1 Certificate of Conformity

Product:	AD7200 Smart WiFi Router
Brand:	NETGEAR
Test Model:	R9000
Sample Status:	Engineering sample
Applicant:	NETGEAR, INC.
Test Date:	Aug. 12 ~ Sep. 09, 2016
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the Conditions specified in this report.

Prepared by : _____ , **Date:** Sep. 10, 2016

Polly Chien / Specialist

Approved by : _____ , **Date:** Sep. 10, 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 -12.83dB at 0.50938MHz.
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 -0.3dB at 5136.00MHz & 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 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	AD7200 Smart WiFi Router
Brand	NETGEAR
Test Model	R9000
Sample Status	Engineering sample
Power Supply Rating	19Vdc (adapter)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	5180~5240MHz, 5745~5825MHz
Number of Channel	5180~5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5745~5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	CDD Mode: 5180~5240MHz: 900.428mW 5745~5825MHz: 929.395mW Beamforming Mode: 5180~5240MHz: 900.428mW 5745~5825MHz: 927.312mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Data Cable Supplied	NA

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Band	Modulation Mode	CDD Mode	Beamforming Mode	TX Function	Available Channel
5GHz (U-NII-1 band)	802.11a	Support	Not Support	4TX	36 ~ 48
	802.11ac (VHT20)	Support	Support	4TX	36 ~ 48
	802.11ac (VHT40)	Support	Support	4TX	38 ~ 46
	802.11ac (VHT80)	Support	Support	4TX	42
	802.11ac (VHT80+ VHT80)	Support	Support	2TX+2TX	42 + 155
5GHz (U-NII-3 band)	802.11a	Support	Not Support	4TX	149 ~ 165
	802.11ac (VHT20)	Support	Support	4TX	149 ~ 165
	802.11ac (VHT40)	Support	Support	4TX	151 ~ 159
	802.11ac (VHT80)	Support	Support	4TX	155
	802.11ac (VHT80+ VHT80)	Support	Support	2TX+2TX	42 + 155

* 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 802.11n & 802.11ac, after pre-tested two modes(with beamforming mode and CDD mode) found CDD mode was the worst, therefore chosen for final test and presented in the test report.

2. WLAN 2.4GHz, WLAN 5GHz, WLAN 60GHz 802.11ad and BT LE technologies can transmit at same time.
3. Spurious emission of the simultaneous operation (WLAN 2.4GHz, WLAN 5GHz, WLAN 60GHz 802.11ad and BT LE) has been evaluated and no non-compliance was found.
4. The EUT uses following antennas.

Ant. Type	Connecter Type	Antenna Gain (dBi)				
Dipole	I-PEX	5180MHz	5190MHz	5200MHz	5210MHz	5230MHz
		1.70	1.62	1.63	1.66	1.52
		5240MHz	5745MHz	5755MHz	5775MHz	5785MHz
		1.45	1.43	1.43	1.54	1.54
		5795MHz	5825MHz			
		1.58	1.81			
		Directional Gain (dBi)				
		5180MHz	5190MHz	5200MHz	5210MHz	5230MHz
		5.868	5.918	5.763	5.826	5.472
		5240MHz	5745MHz	5755MHz	5775MHz	5785MHz
		5.487	5.649	5.788	5.713	5.634
		5795MHz	5825MHz			
		5.693	5.516			
		802.11ac (VHT80+ VHT80) Directional Gain (dBi)				
		5210MHz			5775MHz	
		3.645			3.231	

5. The EUT consumes power from the following adapters.

Adapter 1	
Brand	NETGEAR
Model	AD2003F10
Part No.	332-10631-01
Input Power	100-120Vac, 50/60Hz, 1.5A
Output Power	19Vdc, 3.16A
Power Line	1.8m cable without core attached on adapter

Adapter 2	
Brand	NETGEAR
Model	2ABS060K 1 NA
Part No.	332-10788-01
Input Power	100-120Vac, 50/60Hz, 1.7A
Output Power	19Vdc, 3.16A
Power Line	1.8m cable without core attached on adapter

*After pre-tested two adapters, found adapter 2 was the worst and chosen for final test

3.2 Description of Test Modes

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), 802.11ac (VHT80+ VHT80):

Channel	Frequency
42	5210MHz

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), 802.11ac (VHT80+ 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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
CDD Mode							
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	130.0
-	802.11ac (VHT80+ VHT80)		42	42	OFDM	BPSK	130.0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	OFDM	BPSK	130.0	130.0
-	802.11ac (VHT80+ VHT80)		155	OFDM	BPSK	130.0	130.0

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
CDD Mode							
-	802.11a	5180-5240	36 to 48	165	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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
CDD Mode							
-	802.11a	5180-5240	36 to 48	165	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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
CDD Mode							
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	130.0
-	802.11ac (VHT80+ VHT80)		42	42	OFDM	BPSK	130.0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	OFDM	BPSK	130.0	130.0
-	802.11ac (VHT80+ VHT80)		155	OFDM	BPSK	130.0	130.0
Beamforming Mode							
-	802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	130.0
-	802.11ac (VHT80+ VHT80)		42	42	OFDM	BPSK	130.0
-	802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	OFDM	BPSK	130.0	130.0
-	802.11ac (VHT80+ VHT80)		155	OFDM	BPSK	130.0	130.0

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	24 deg. C, 66% RH	120Vac, 60Hz	Matthew Yang
	26 deg. C, 64% RH		Alan Wu
RE<1G	26 deg. C, 64% RH	120Vac, 60Hz	Alan Wu
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Chris Lin
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Frank Liu

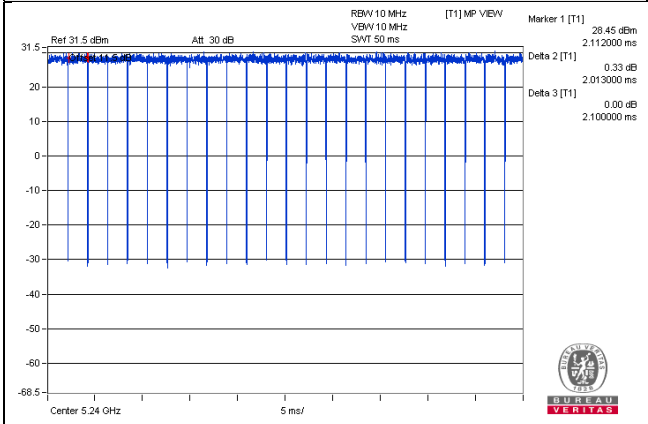
3.3 Duty Cycle of Test Signal

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

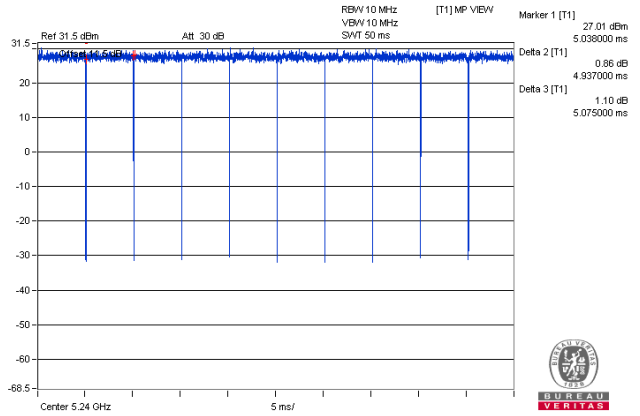
CDD Mode

802.11a: Duty cycle = 2..13/2.100 = 0.959, Duty factor = 10 * log(1/0.959) = 0.18
802.11n (VHT20): Duty cycle = 4.937/5.075 = 0.973, Duty factor = 10 * log(1/0.973) = 0.12
802.11n (VHT40): Duty cycle = 2.351/2.501 = 0.940, Duty factor = 10 * log(1/0.940) = 0.27
802.11ac (VHT80): Duty cycle = 1.112/1.212 = 0.917, Duty factor = 10 * log(1/0.917) = 0.37
802.11ac (VHT80+ VHT80): Duty cycle = 1.074/1.174 = 0.915, Duty factor = 10 * log(1/0.915) = 0.39

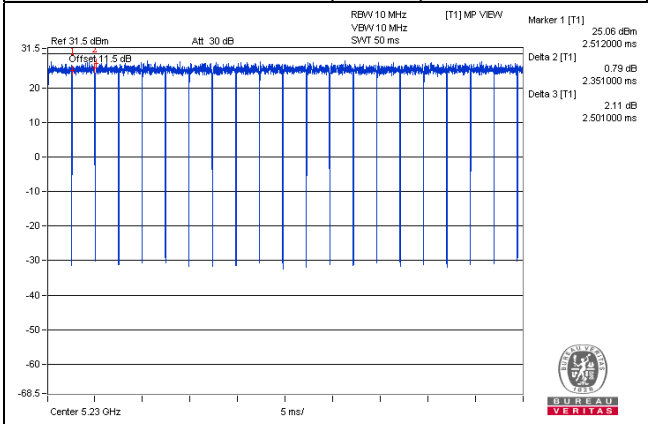
802.11a



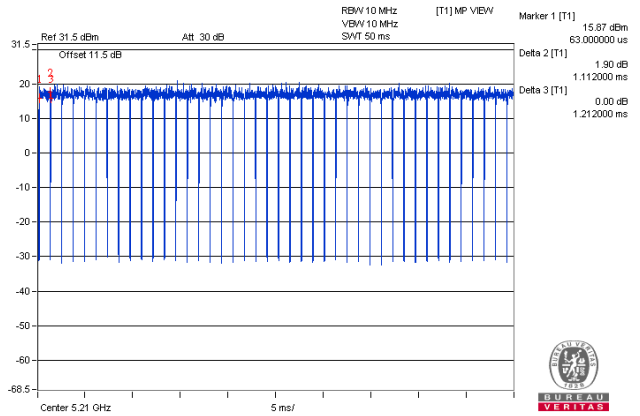
802.11n (VHT20)



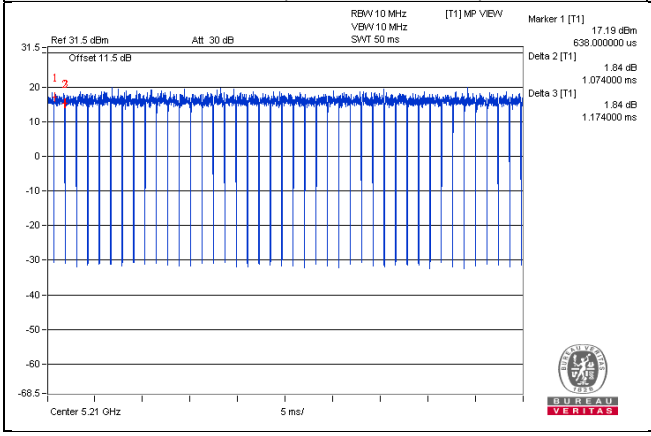
802.11n (VHT40)



802.11ac (VHT80)



802.11ac (VHT80+ 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.

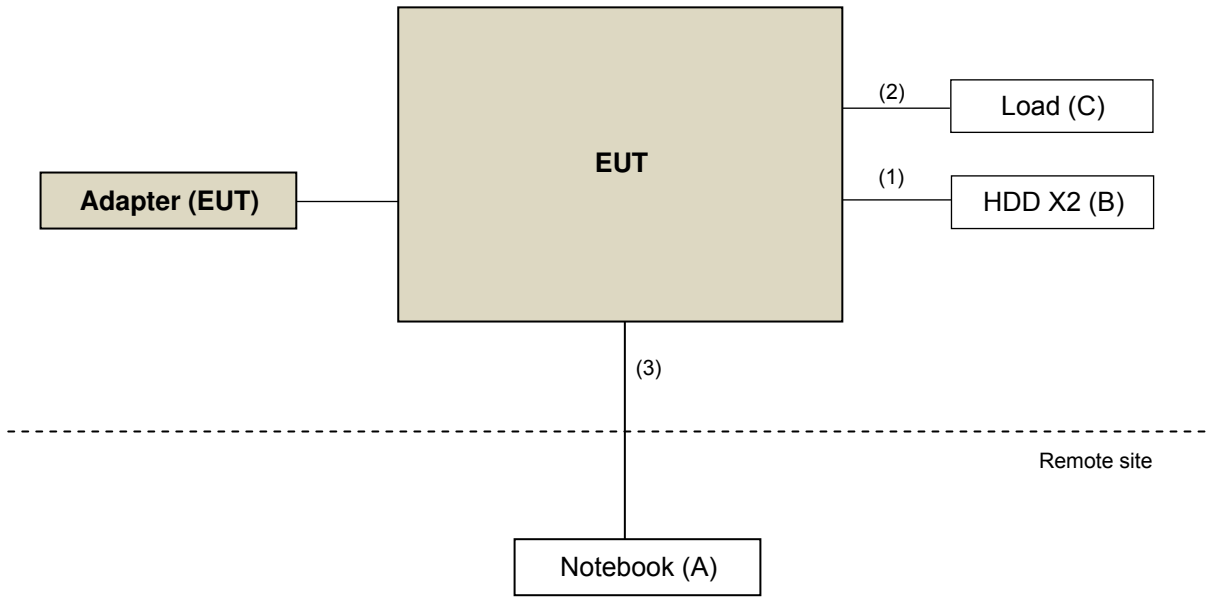
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-
B.	HDD	TOSHIBA	DTB305	X4RBCC3RT3ZB	NA	-
	HDD	TOSHIBA	DTB305	X4R2C64VT3ZB	NA	-
C.	Load	NA	NA	NA	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	2	0.5	Y	0	-
2.	RJ45 cable	6	1.8	N	0	Cat5e
3.	RJ45 cable	1	3	N	0	Cat5e

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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 v01r03
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 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

Applicable To	Limit	
789033 D02 General UNII Test Procedures New Rules v01r03	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

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	Aug. 16, 2016	Aug. 15, 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, 2016	Aug. 08, 2017
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	Aug. 09, 2016	Aug. 08, 2017
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
High Speed Peak Power Meter	ML2495A	0824012	Aug. 11, 2016	Aug. 10, 2017
Power Sensor	MA2411B	0738171	Aug. 11, 2016	Aug. 10, 2017
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2015	Oct. 17, 2016
WIT Standard Temperature and Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2016	Jun. 07, 2017
Digital Multimeter Fluke	87-III	70360742	Jul. 01, 2016	Jun. 30, 2017
AC Power supply EXTECH	CFW-105	E000603	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 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 Procedure

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:

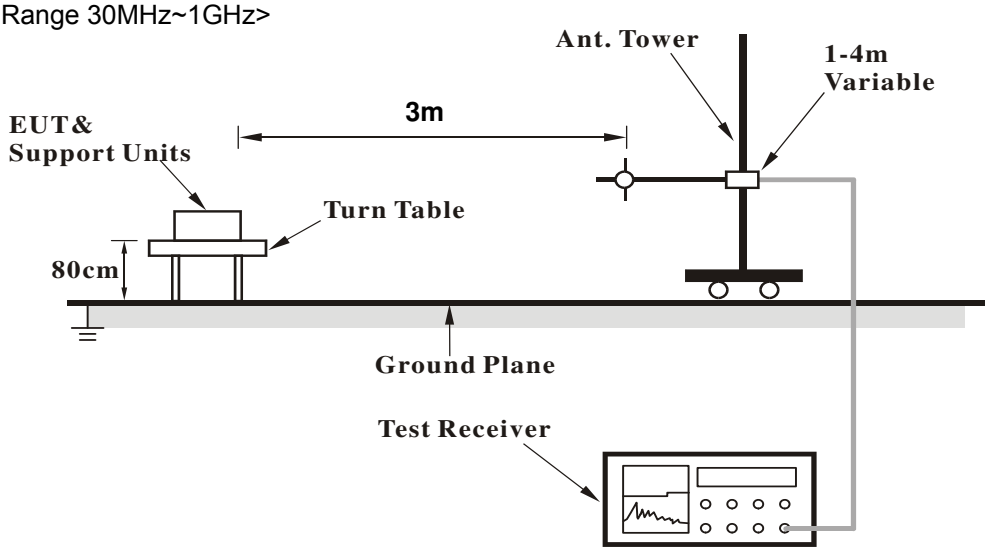
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

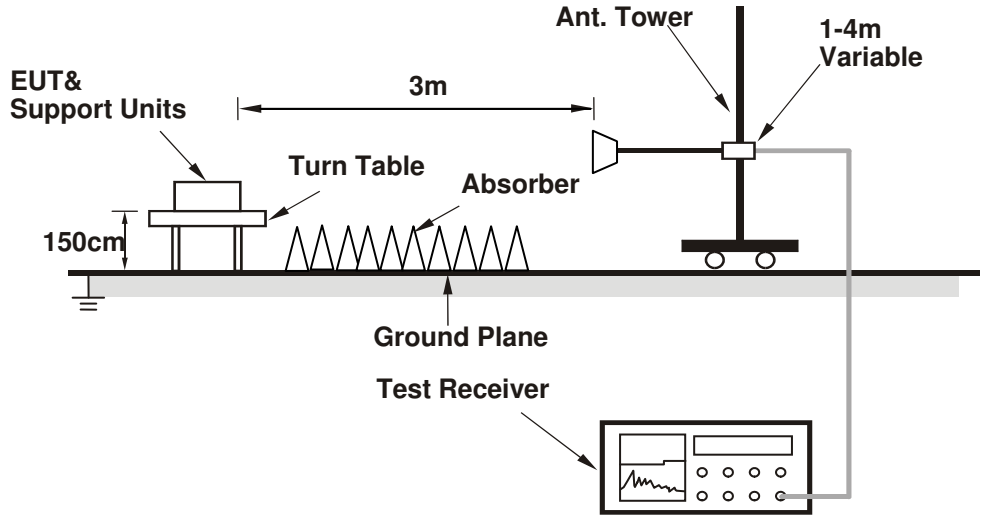
No deviation.

4.1.5 Test Setup

<Frequency Range 30MHz~1GHz>



<Frequency Range above 1GHz>



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

4.1.6 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 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	57.2 PK	74.0	-16.8	3.58 H	49	51.20	6.00
2	5150.00	44.4 AV	54.0	-9.6	3.58 H	49	38.40	6.00
3	*5180.00	112.8 PK			3.58 H	49	72.70	40.10
4	*5180.00	102.0 AV			3.58 H	49	61.90	40.10
5	#10360.00	61.9 PK	74.0	-12.1	1.00 H	100	44.20	17.70
6	#10360.00	49.3 AV	54.0	-4.7	1.00 H	100	31.60	17.70
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	5140.00	65.2 PK	74.0	-8.8	1.67 V	176	59.20	6.00
2	5140.00	53.6 AV	54.0	-0.4	1.67 V	176	47.60	6.00
3	*5180.00	125.9 PK			1.67 V	176	85.80	40.10
4	*5180.00	115.1 AV			1.67 V	176	75.00	40.10
5	#10360.00	58.7 PK	74.0	-15.3	1.00 V	220	41.00	17.70
6	#10360.00	46.0 AV	54.0	-8.0	1.00 V	220	28.30	17.70

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) – Pre-Amplifier 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	56.5 PK	74.0	-17.5	3.88 H	50	50.50	6.00
2	5150.00	44.2 AV	54.0	-9.8	3.88 H	50	38.20	6.00
3	*5200.00	114.4 PK			3.88 H	50	74.30	40.10
4	*5200.00	104.1 AV			3.88 H	50	64.00	40.10
5	#10400.00	63.9 PK	74.0	-10.1	1.98 H	54	45.90	18.00
6	#10400.00	51.5 AV	54.0	-2.5	1.98 H	54	33.50	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	64.5 PK	74.0	-9.5	1.66 V	169	58.50	6.00
2	5150.00	51.0 AV	54.0	-3.0	1.66 V	169	45.00	6.00
3	*5200.00	128.5 PK			1.66 V	169	88.40	40.10
4	*5200.00	118.5 AV			1.66 V	169	78.40	40.10
5	#10400.00	61.3 PK	74.0	-12.7	1.00 V	102	43.30	18.00
6	#10400.00	48.4 AV	54.0	-5.6	1.00 V	102	30.40	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) – Pre-Amplifier 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	114.6 PK			3.92 H	53	74.40	40.20
2	*5240.00	104.2 AV			3.92 H	53	64.00	40.20
3	5350.00	58.2 PK	74.0	-15.8	3.92 H	53	52.00	6.20
4	5350.00	44.3 AV	54.0	-9.7	3.92 H	53	38.10	6.20
5	#10480.00	66.3 PK	74.0	-7.7	1.85 H	61	48.10	18.20
6	#10480.00	53.4 AV	54.0	-0.6	1.85 H	61	35.20	18.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	125.2 PK			1.69 V	172	85.00	40.20
2	*5240.00	115.0 AV			1.69 V	172	74.80	40.20
3	5350.00	57.3 PK	74.0	-16.7	1.69 V	172	51.10	6.20
4	5350.00	45.0 AV	54.0	-9.0	1.69 V	172	38.80	6.20
5	#10480.00	59.5 PK	74.0	-14.5	1.00 V	276	41.30	18.20
6	#10480.00	48.2 AV	54.0	-5.8	1.00 V	276	30.00	18.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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	#5649.60	57.9 PK	68.2	-10.3	1.08 H	150	51.40	6.50
2	*5745.00	112.8 PK			1.08 H	150	71.90	40.90
3	*5745.00	101.7 AV			1.08 H	150	60.80	40.90
4	#5964.80	59.1 PK	68.2	-9.1	1.08 H	150	51.90	7.20
5	11490.00	63.1 PK	74.0	-10.9	1.10 H	202	42.60	20.50
6	11490.00	49.9 AV	54.0	-4.1	1.10 H	202	29.40	20.50
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	#5641.60	59.0 PK	68.2	-9.2	2.70 V	359	52.50	6.50
2	*5745.00	126.3 PK			2.70 V	359	85.40	40.90
3	*5745.00	115.8 AV			2.70 V	359	74.90	40.90
4	#5983.20	59.4 PK	68.2	-8.8	2.70 V	359	52.20	7.20
5	11490.00	60.8 PK	74.0	-13.2	1.00 V	234	40.30	20.50
6	11490.00	47.8 AV	54.0	-6.2	1.00 V	234	27.30	20.50

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) – Pre-Amplifier 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	#5614.40	58.7 PK	68.2	-9.5	3.41 H	238	52.30	6.40
2	*5785.00	113.7 PK			3.41 H	238	72.70	41.00
3	*5785.00	103.2 AV			3.41 H	238	62.20	41.00
4	#5973.60	59.1 PK	68.2	-9.1	3.41 H	238	51.90	7.20
5	11570.00	62.7 PK	74.0	-11.3	1.42 H	258	42.40	20.30
6	11570.00	49.9 AV	54.0	-4.1	1.42 H	258	29.60	20.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5620.00	58.9 PK	68.2	-9.3	2.85 V	356	52.50	6.40
2	*5785.00	126.8 PK			2.85 V	356	85.80	41.00
3	*5785.00	116.0 AV			2.85 V	356	75.00	41.00
4	#5974.40	59.1 PK	68.2	-9.1	2.85 V	356	51.90	7.20
5	11490.00	60.9 PK	74.0	-13.1	1.00 V	195	40.40	20.50
6	11490.00	47.7 AV	54.0	-6.3	1.00 V	195	27.20	20.50

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5629.60	57.7 PK	68.2	-10.5	3.35 H	221	51.20	6.50
2	*5825.00	113.9 PK			3.35 H	221	72.70	41.20
3	*5825.00	103.0 AV			3.35 H	221	61.80	41.20
4	#5983.20	59.4 PK	68.2	-8.8	3.35 H	221	52.20	7.20
5	11650.00	62.7 PK	74.0	-11.3	1.24 H	321	42.80	19.90
6	11650.00	49.6 AV	54.0	-4.4	1.24 H	321	29.70	19.90
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	58.8 PK	68.2	-9.4	2.74 V	20	52.30	6.50
2	*5825.00	127.0 PK			2.74 V	20	85.80	41.20
3	*5825.00	116.2 AV			2.74 V	20	75.00	41.20
4	#5998.40	65.5 PK	68.2	-2.7	2.74 V	20	58.30	7.20
5	11650.00	60.4 PK	74.0	-13.6	1.00 V	119	40.50	19.90
6	11650.00	47.4 AV	54.0	-6.6	1.00 V	119	27.50	19.90

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) – Pre-Amplifier 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 (VHT20)

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	56.5 PK	74.0	-17.5	3.61 H	49	50.50	6.00
2	5150.00	44.3 AV	54.0	-9.7	3.61 H	49	38.30	6.00
3	*5180.00	112.5 PK			3.61 H	49	72.40	40.10
4	*5180.00	101.5 AV			3.61 H	49	61.40	40.10
5	#10360.00	61.5 PK	74.0	-12.5	1.65 H	117	43.80	17.70
6	#10360.00	48.7 AV	54.0	-5.3	1.65 H	117	31.00	17.70
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	5147.00	67.7 PK	74.0	-6.3	1.53 V	169	61.70	6.00
2	5147.00	53.6 AV	54.0	-0.4	1.53 V	169	47.60	6.00
3	*5180.00	125.1 PK			1.53 V	169	85.00	40.10
4	*5180.00	114.7 AV			1.53 V	169	74.60	40.10
5	#10360.00	59.1 PK	74.0	-14.9	1.00 V	279	41.40	17.70
6	#10360.00	46.2 AV	54.0	-7.8	1.00 V	279	28.50	17.70

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) – Pre-Amplifier 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	56.7 PK	74.0	-17.3	3.86 H	50	50.70	6.00
2	5150.00	44.0 AV	54.0	-10.0	3.86 H	50	38.00	6.00
3	*5200.00	113.8 PK			3.86 H	50	73.70	40.10
4	*5200.00	103.5 AV			3.86 H	50	63.40	40.10
5	#10400.00	64.0 PK	74.0	-10.0	1.86 H	60	46.00	18.00
6	#10400.00	51.7 AV	54.0	-2.3	1.86 H	60	33.70	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	64.0 PK	74.0	-10.0	1.64 V	168	58.00	6.00
2	5150.00	50.2 AV	54.0	-3.8	1.64 V	168	44.20	6.00
3	*5200.00	128.8 PK			1.64 V	168	88.70	40.10
4	*5200.00	117.9 AV			1.64 V	168	77.80	40.10
5	#10400.00	59.2 PK	74.0	-14.8	1.00 V	208	41.20	18.00
6	#10400.00	48.6 AV	54.0	-5.4	1.00 V	208	30.60	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) – Pre-Amplifier 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	114.2 PK			3.84 H	50	74.00	40.20
2	*5240.00	103.7 AV			3.84 H	50	63.50	40.20
3	5350.00	57.0 PK	74.0	-17.0	3.84 H	50	50.80	6.20
4	5350.00	44.6 AV	54.0	-9.4	3.84 H	50	38.40	6.20
5	#10480.00	66.1 PK	74.0	-7.9	1.77 H	66	47.90	18.20
6	#10480.00	53.1 AV	54.0	-0.9	1.77 H	66	34.90	18.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	128.6 PK			1.57 V	173	88.40	40.20
2	*5240.00	117.8 AV			1.57 V	173	77.60	40.20
3	5350.00	56.9 PK	74.0	-17.1	1.57 V	173	50.70	6.20
4	5350.00	44.5 AV	54.0	-9.5	1.57 V	173	38.30	6.20
5	#10480.00	59.7 PK	74.0	-14.3	1.10 V	97	41.50	18.20
6	#10480.00	48.8 AV	54.0	-5.2	1.10 V	97	30.60	18.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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	58.1 PK	68.2	-10.1	3.27 H	239	51.60	6.50
2	*5745.00	114.6 PK			3.27 H	239	73.70	40.90
3	*5745.00	103.8 AV			3.27 H	239	62.90	40.90
4	#5929.60	59.1 PK	68.2	-9.1	3.27 H	239	52.00	7.10
5	11490.00	63.4 PK	74.0	-10.6	1.33 H	256	42.90	20.50
6	11490.00	50.3 AV	54.0	-3.7	1.33 H	256	29.80	20.50
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	#5634.40	64.4 PK	68.2	-3.8	2.77 V	254	57.90	6.50
2	*5745.00	126.2 PK			2.77 V	354	85.30	40.90
3	*5745.00	115.2 AV			2.77 V	354	74.30	40.90
4	#5985.60	65.3 PK	68.2	-2.9	2.77 V	354	58.10	7.20
5	11490.00	61.0 PK	74.0	-13.0	1.00 V	109	40.50	20.50
6	11490.00	48.1 AV	54.0	-5.9	1.00 V	109	27.60	20.50

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) – Pre-Amplifier 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	58.2 PK	68.2	-10.0	3.28 H	243	51.70	6.50
2	*5785.00	115.1 PK			3.28 H	243	74.10	41.00
3	*5785.00	104.0 AV			3.28 H	243	63.00	41.00
4	#5988.00	59.4 PK	68.2	-8.8	3.28 H	243	52.20	7.20
5	11570.00	63.3 PK	74.0	-10.7	1.51 H	56	43.00	20.30
6	11570.00	50.3 AV	54.0	-3.7	1.51 H	56	30.00	20.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.00	65.8 PK	68.2	-2.4	2.73 V	356	59.30	6.50
2	*5785.00	126.3 PK			2.73 V	356	85.30	41.00
3	*5785.00	115.1 AV			2.73 V	356	74.10	41.00
4	#5932.00	66.8 PK	68.2	-1.4	2.73 V	356	59.70	7.10
5	11570.00	60.7 PK	74.0	-13.3	1.00 V	183	40.40	20.30
6	11570.00	48.0 AV	54.0	-6.0	1.00 V	183	27.70	20.30

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5641.60	58.2 PK	68.2	-10.0	3.23 H	244	51.70	6.50
2	*5825.00	114.8 PK			3.23 H	244	73.60	41.20
3	*5825.00	103.7 AV			3.23 H	244	62.50	41.20
4	#5934.40	58.8 PK	68.2	-9.4	3.23 H	244	51.70	7.10
5	11650.00	62.5 PK	74.0	-11.5	1.23 H	320	42.60	19.90
6	11650.00	49.6 AV	54.0	-4.4	1.23 H	320	29.70	19.90
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	64.2 PK	68.2	-4.0	2.81 V	358	57.70	6.50
2	*5825.00	125.9 PK			2.81 V	358	84.70	41.20
3	*5825.00	115.3 AV			2.81 V	358	74.10	41.20
4	#5972.00	66.0 PK	68.2	-2.2	2.81 V	358	58.80	7.20
5	11650.00	60.2 PK	74.0	-13.8	1.00 V	121	40.30	19.90
6	11650.00	47.3 AV	54.0	-6.7	1.00 V	121	27.40	19.90

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) – Pre-Amplifier 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 (VHT40)

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	57.5 PK	74.0	-16.5	3.71 H	52	51.50	6.00
2	5150.00	45.3 AV	54.0	-8.7	3.71 H	52	39.30	6.00
3	*5190.00	107.3 PK			3.71 H	52	67.20	40.10
4	*5190.00	98.0 AV			3.71 H	52	57.90	40.10
5	#10380.00	59.6 PK	74.0	-14.4	1.55 H	224	41.80	17.80
6	#10380.00	48.6 AV	54.0	-5.4	1.55 H	224	30.80	17.80
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	5150.00	67.5 PK	74.0	-6.5	1.54 V	171	61.50	6.00
2	5150.00	53.6 AV	54.0	-0.4	1.54 V	171	47.60	6.00
3	*5190.00	121.6 PK			1.54 V	171	81.50	40.10
4	*5190.00	111.9 AV			1.54 V	171	71.80	40.10
5	#10380.00	59.1 PK	74.0	-14.9	1.00 V	124	41.30	17.80
6	#10380.00	46.8 AV	54.0	-7.2	1.00 V	124	29.00	17.80

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) – Pre-Amplifier 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	112.9 PK			3.65 H	49	72.70	40.20
2	*5230.00	102.9 AV			3.65 H	49	62.70	40.20
3	5350.00	57.9 PK	74.0	-16.1	3.65 H	49	51.70	6.20
4	5350.00	44.4 AV	54.0	-9.6	3.65 H	49	38.20	6.20
5	#10460.00	58.8 PK	74.0	-15.2	1.66 H	201	40.80	18.00
6	#10460.00	48.0 AV	54.0	-6.0	1.66 H	201	30.00	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	*5230.00	125.5 PK			1.73 V	170	85.30	40.20
2	*5230.00	115.3 AV			1.73 V	170	75.10	40.20
3	5350.00	58.0 PK	74.0	-16.0	1.73 V	170	51.80	6.20
4	5350.00	45.3 AV	54.0	-8.7	1.73 V	170	39.10	6.20
5	#10460.00	59.2 PK	74.0	-14.8	1.00 V	103	41.20	18.00
6	#10460.00	47.5 AV	54.0	-6.5	1.00 V	103	29.50	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) – Pre-Amplifier 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	#5622.40	57.5 PK	68.2	-10.7	3.38 H	245	51.10	6.40
2	*5755.00	110.2 PK			3.38 H	245	69.20	41.00
3	*5755.00	99.9 AV			3.38 H	245	58.90	41.00
4	#5994.40	59.2 PK	68.2	-9.0	3.38 H	245	52.00	7.20
5	11510.00	62.5 PK	74.0	-11.5	1.60 H	77	42.10	20.40
6	11510.00	49.4 AV	54.0	-4.6	1.60 H	77	29.00	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5619.20	58.4 PK	68.2	-9.8	2.73 V	19	52.00	6.40
2	*5755.00	123.3 PK			2.73 V	19	82.30	41.00
3	*5755.00	113.4 AV			2.73 V	19	72.40	41.00
4	#5984.00	59.8 PK	68.2	-8.4	2.73 V	19	52.60	7.20
5	11510.00	60.6 PK	74.0	-13.4	1.00 V	117	40.20	20.40
6	11510.00	47.8 AV	54.0	-6.2	1.00 V	117	27.40	20.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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	#5616.00	59.0 PK	68.2	-9.2	3.29 H	245	52.60	6.40
2	*5795.00	110.2 PK			3.29 H	245	69.10	41.10
3	*5795.00	100.3 AV			3.29 H	245	59.20	41.10
4	#5970.40	59.6 PK	68.2	-8.6	3.29 H	245	52.40	7.20
5	11590.00	62.2 PK	74.0	-11.8	1.39 H	125	42.00	20.20
6	11590.00	49.3 AV	54.0	-4.7	1.39 H	125	29.10	20.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.80	59.9 PK	68.2	-8.3	2.78 V	14	53.40	6.50
2	*5795.00	124.5 PK			2.78 V	14	83.40	41.10
3	*5795.00	113.8 AV			2.78 V	14	72.70	41.10
4	#5952.80	59.6 PK	68.2	-8.6	2.78 V	14	52.40	7.20
5	11590.00	60.3 PK	74.0	-13.7	1.00 V	63	40.10	20.20
6	11590.00	47.5 AV	54.0	-6.5	1.00 V	63	27.30	20.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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	60.7 PK	74.0	-13.3	3.67 H	50	54.70	6.00
2	5150.00	45.8 AV	54.0	-8.2	3.67 H	50	39.80	6.00
3	*5210.00	103.7 PK			3.67 H	50	63.60	40.10
4	*5210.00	93.9 AV			3.67 H	50	53.80	40.10
5	5350.00	59.4 PK	74.0	-14.6	3.67 H	50	53.20	6.20
6	5350.00	45.6 AV	54.0	-8.4	3.67 H	50	39.40	6.20
7	#10420.00	60.9 PK	74.0	-13.1	1.70 H	311	42.90	18.00
8	#10420.00	47.9 AV	54.0	-6.1	1.70 H	311	29.90	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	5136.00	72.6 PK	74.0	-1.4	1.72 V	170	66.60	6.00
2	**5136.00**	**53.7 AV**	**54.0**	**-0.3**	**1.72 V**	**170**	**47.70**	**6.00**
3	*5210.00	116.2 PK			1.72 V	170	76.10	40.10
4	*5210.00	106.4 AV			1.72 V	170	66.30	40.10
5	5350.00	60.4 PK	74.0	-13.6	1.72 V	170	54.20	6.20
6	5350.00	46.7 AV	54.0	-7.3	1.72 V	170	40.50	6.20
7	#10420.00	60.8 PK	74.0	-13.2	1.00 V	305	42.80	18.00
8	#10420.00	48.1 AV	54.0	-5.9	1.00 V	305	30.10	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) – Pre-Amplifier 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	#5628.80	57.6 PK	68.2	-10.6	3.30 H	245	51.10	6.50
2	*5775.00	105.7 PK			3.30 H	245	64.70	41.00
3	*5775.00	96.0 AV			3.30 H	245	55.00	41.00
4	#5960.00	60.4 PK	68.2	-7.8	3.30 H	245	53.20	7.20
5	11550.00	61.0 PK	74.0	-13.0	1.37 H	190	40.70	20.30
6	11550.00	48.5 AV	54.0	-5.5	1.37 H	190	28.20	20.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5644.00	67.8 PK	68.2	-0.4	2.82 V	18	61.30	6.50
2	*5775.00	117.8 PK			2.82 V	18	76.80	41.00
3	*5775.00	108.3 AV			2.82 V	18	67.30	41.00
4	#5928.80	63.0 PK	68.2	-5.2	2.82 V	18	55.90	7.10
5	11550.00	60.3 PK	74.0	-13.7	1.00 V	159	40.00	20.30
6	11550.00	47.6 AV	54.0	-6.4	1.00 V	159	27.30	20.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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+ 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	60.4 PK	74.0	-13.6	1.12 H	102	54.40	6.00
2	5150.00	45.7 AV	54.0	-8.3	1.12 H	102	39.70	6.00
3	*5210.00	101.8 PK			1.12 H	102	61.70	40.10
4	*5210.00	91.1 AV			1.12 H	102	51.00	40.10
5	5350.00	59.3 PK	74.0	-14.7	1.12 H	102	53.10	6.20
6	5350.00	45.4 AV	54.0	-8.6	1.12 H	102	39.20	6.20
7	#10420.00	60.5 PK	74.0	-13.5	1.72 H	310	42.50	18.00
8	#10420.00	47.7 AV	54.0	-6.3	1.72 H	310	29.70	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	69.5 PK	74.0	-4.5	1.63 V	102	63.50	6.00
2	**5150.00**	**53.7 AV**	**54.0**	**-0.3**	**1.63 V**	**102**	**47.70**	**6.00**
3	*5210.00	115.7 PK			1.63 V	102	75.60	40.10
4	*5210.00	105.0 AV			1.63 V	102	64.90	40.10
5	5350.00	60.2 PK	74.0	-13.8	1.63 V	102	54.00	6.20
6	5350.00	46.1 AV	54.0	-7.9	1.63 V	102	39.90	6.20
7	#10420.00	60.2 PK	74.0	-13.8	1.00 V	308	42.20	18.00
8	#10420.00	48.0 AV	54.0	-6.0	1.00 V	308	30.00	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) – Pre-Amplifier 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	#5608.80	58.7 PK	68.2	-9.5	1.13 H	222	51.20	7.50
2	*5775.00	99.0 PK			1.13 H	222	56.80	42.20
3	*5775.00	88.6 AV			1.13 H	222	46.40	42.20
4	#5931.20	60.1 PK	68.2	-8.1	1.13 H	222	51.60	8.50
5	11550.00	59.4 PK	74.0	-14.6	1.36 H	198	39.00	20.40
6	11550.00	47.0 AV	54.0	-7.0	1.36 H	198	26.60	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5615.20	60.5 PK	68.2	-7.7	2.02 V	110	52.90	7.60
2	*5775.00	112.1 PK			2.02 V	110	69.90	42.20
3	*5775.00	101.3 AV			2.02 V	110	59.10	42.20
4	#5947.20	59.9 PK	68.2	-8.3	2.02 V	110	51.30	8.60
5	11550.00	60.0 PK	74.0	-14.0	1.00 V	151	39.60	20.40
6	11550.00	47.4 AV	54.0	-6.6	1.00 V	151	27.00	20.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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 165	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	105.58	31.7 QP	43.5	-11.8	1.50 H	80	49.40	-17.70
2	185.13	38.4 QP	43.5	-5.1	1.24 H	171	54.10	-15.70
3	361.71	42.6 QP	46.0	-3.4	1.24 H	7	53.80	-11.20
4	499.48	38.8 QP	46.0	-7.2	2.00 H	328	47.30	-8.50
5	625.60	38.1 QP	46.0	-7.9	1.24 H	259	43.70	-5.60
6	800.24	39.4 QP	46.0	-6.6	1.00 H	318	41.50	-2.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	41.54	36.0 QP	40.0	-4.0	1.99 V	330	50.70	-14.70
2	97.81	31.8 QP	43.5	-11.7	1.75 V	256	50.60	-18.80
3	357.83	42.5 QP	46.0	-3.5	1.00 V	38	53.90	-11.40
4	480.07	40.4 QP	46.0	-5.6	1.00 V	95	49.40	-9.00
5	499.48	40.6 QP	46.0	-5.4	1.99 V	6	49.10	-8.50
6	625.60	38.0 QP	46.0	-8.0	1.00 V	247	43.60	-5.60

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) – Pre-Amplifier 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	ESCS30	100289	Dec. 23, 2015	Dec. 22, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 11, 2016	Jan. 10, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 26, 2016	Jul. 25, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedure

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.

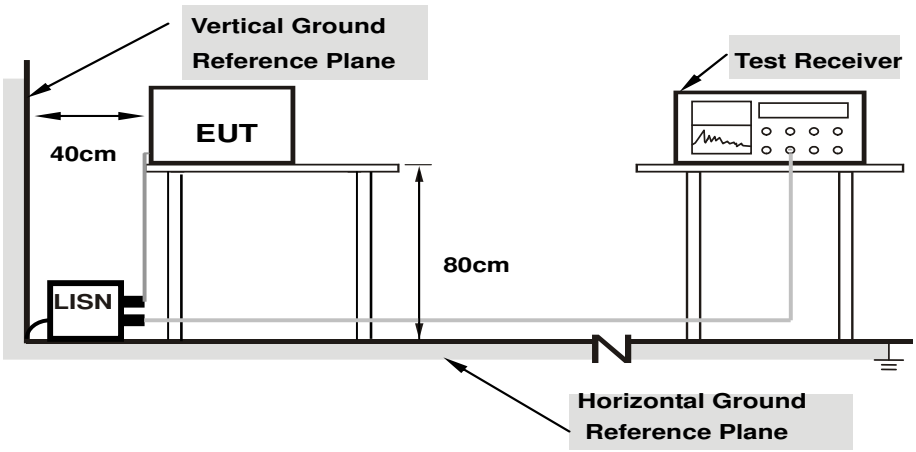
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

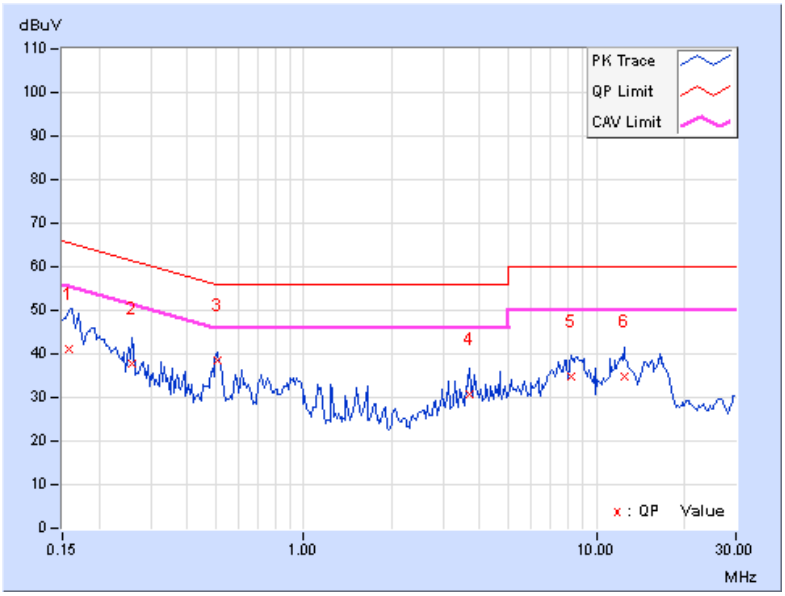
4.2.7 Test Results

Phase	Line (L)	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	0.15781	10.18	30.89	14.94	41.07	25.12	65.58	55.58	-24.51	-30.46
2	0.25938	10.22	27.59	16.21	37.81	26.43	61.45	51.45	-23.64	-25.02
3	**0.50938**	**10.25**	**28.21**	**22.92**	**38.46**	**33.17**	**56.00**	**46.00**	**-17.54**	**-12.83**
4	3.66406	10.40	20.23	12.05	30.63	22.45	56.00	46.00	-25.37	-23.55
5	8.20703	10.49	24.50	18.09	34.99	28.58	60.00	50.00	-25.01	-21.42
6	12.43750	10.55	24.33	18.48	34.88	29.03	60.00	50.00	-25.12	-20.97

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.

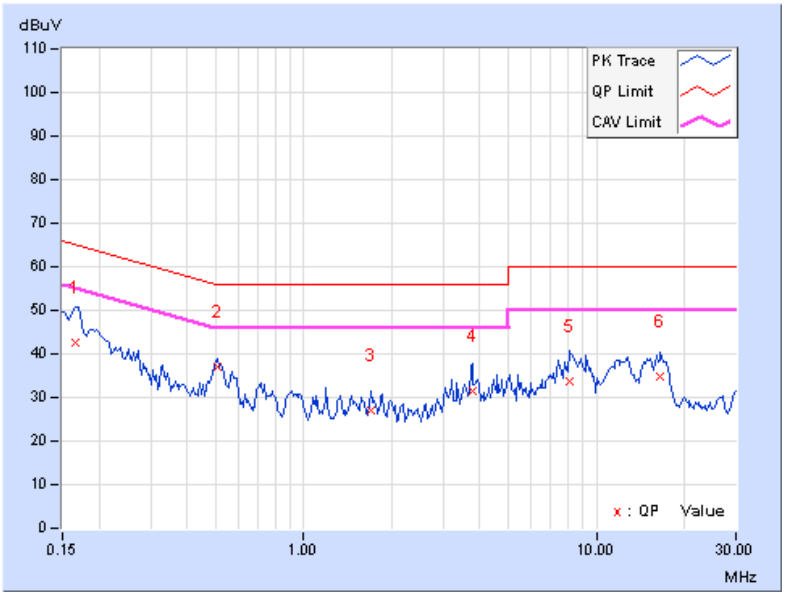


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.16562	10.19	32.31	20.09	42.50	30.28	65.18	55.18	-22.68	-24.90
2	0.50547	10.30	26.87	21.00	37.17	31.30	56.00	46.00	-18.83	-14.70
3	1.69922	10.37	16.49	8.77	26.86	19.14	56.00	46.00	-29.14	-26.86
4	3.77734	10.53	21.11	12.46	31.64	22.99	56.00	46.00	-24.36	-23.01
5	8.06641	10.59	23.18	17.23	33.77	27.82	60.00	50.00	-26.23	-22.18
6	16.58594	10.78	23.96	17.62	34.74	28.40	60.00	50.00	-25.26	-21.60

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)

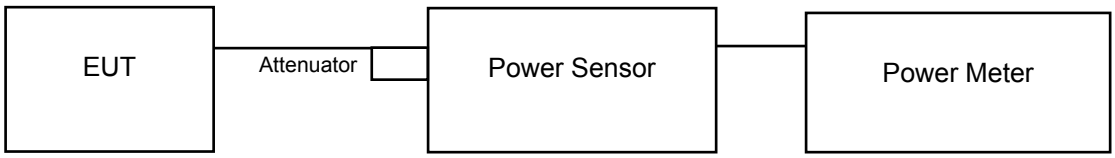
*B is the 26 dB emission bandwidth in megahertz

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 $N_{ANT} \geq 5$.

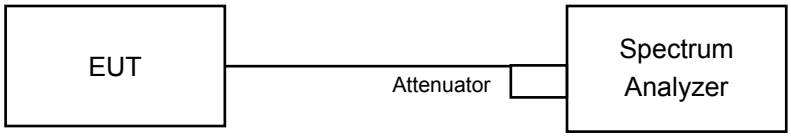
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

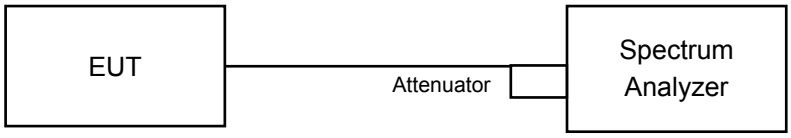
For Power Output Measurement
For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)



For 802.11ac (VHT80)



For Bandwidth



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, 802.11ac (VHT20), 802.11ac (VHT40)
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.

For 26dB Bandwidth
1) Set RBW = approximately 1% of the emission bandwidth.
2) Set the VBW > RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

For Occupied Bandwidth
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 Sampling. 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.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

CDD Mode

802.11a

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.06	21.06	20.65	20.73	463.484	26.66	30.00	Pass
40	5200	23.14	23.75	23.90	23.25	900.020	29.54	30.00	Pass
48	5240	23.38	23.66	23.61	23.29	892.964	29.51	30.00	Pass
149	5745	23.55	23.91	23.54	23.45	919.754	29.64	30.00	Pass
157	5785	23.15	23.33	23.83	23.57	890.872	29.50	30.00	Pass
165	5825	24.38	23.90	23.09	23.14	**929.395**	29.68	30.00	Pass

802.11ac (VHT20)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.00	20.73	20.24	20.27	430.400	26.34	30.00	Pass
40	5200	23.18	23.80	23.91	23.15	**900.428**	29.54	30.00	Pass
48	5240	23.25	23.42	23.60	23.44	881.022	29.45	30.00	Pass
149	5745	23.51	23.47	23.25	23.23	868.446	29.39	30.00	Pass
157	5785	23.16	23.21	23.73	23.67	885.282	29.47	30.00	Pass
165	5825	24.23	23.91	23.16	23.21	927.312	29.67	30.00	Pass

802.11ac (VHT40)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	19.19	20.77	20.46	20.27	419.971	26.23	30.00	Pass
46	5230	23.01	23.59	23.47	22.63	834.108	29.21	30.00	Pass
151	5755	23.45	23.64	23.07	23.08	858.519	29.34	30.00	Pass
159	5795	23.98	23.72	22.96	22.89	877.773	29.43	30.00	Pass

802.11ac (VHT80)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.40	18.56	18.58	18.34	267.078	24.27	30.00	Pass
155	5775	22.14	21.99	21.37	21.34	595.039	27.75	30.00	Pass

802.11ac (VHT80+VHT80)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.51	18.67	-	-	129.985	21.14	30.00	Pass
155	5775	-	-	18.16	17.97	128.125	21.08	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.00	20.73	20.24	20.27	430.400	26.34	30.00	Pass
40	5200	23.18	23.80	23.91	23.15	**900.428**	29.54	30.00	Pass
48	5240	23.25	23.42	23.60	23.44	881.022	29.45	30.00	Pass
149	5745	23.51	23.47	23.25	23.23	868.446	29.39	30.00	Pass
157	5785	23.16	23.21	23.73	23.67	885.282	29.47	30.00	Pass
165	5825	24.23	23.91	23.16	23.21	**927.312**	29.67	30.00	Pass

Note:

5180MHz: Directional gain = 5.868dBi < 6dBi, so the power limit no need to reduced.

5200MHz: Directional gain = 5.763dBi < 6dBi, so the power limit no need to reduced.

5240MHz: Directional gain = 5.487dBi < 6dBi, so the power limit no need to reduced.

5745MHz: Directional gain = 5.649dBi < 6dBi, so the power limit no need to reduced.

5785MHz: Directional gain = 5.634dBi < 6dBi, so the power limit no need to reduced.

5825MHz: Directional gain = 5.516dBi < 6dBi, so the power limit no need to reduced.

802.11ac (VHT40)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.94	19.15	19.26	19.37	331.397	25.20	30.00	Pass
46	5230	23.01	23.59	23.47	22.63	834.108	29.21	30.00	Pass
151	5755	23.45	23.64	23.07	23.08	858.519	29.34	30.00	Pass
159	5795	23.98	23.72	22.96	22.89	877.773	29.43	30.00	Pass

Note:

5190MHz: Directional gain = 5.918dBi < 6dBi, so the power limit no need to reduced.

5230MHz: Directional gain = 5.472dBi < 6dBi, so the power limit no need to reduced.

5755MHz: Directional gain = 5.788dBi < 6dBi, so the power limit no need to reduced.

5795MHz: Directional gain = 5.693dBi < 6dBi, so the power limit no need to reduced.

802.11ac (VHT80)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.40	18.56	18.58	18.34	267.078	24.27	30.00	Pass
155	5775	22.14	21.99	21.37	21.34	595.039	27.75	30.00	Pass

Note:

5210MHz: Directional gain = 5.826dBi < 6dBi, so the power limit no need to reduced.

5775MHz: Directional gain = 5.713dBi < 6dBi, so the power limit no need to reduced.

802.11ac (VHT80+ VHT80)

Channel	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.51	18.67	-	-	129.985	21.14	30.00	Pass
155	5775	-	-	18.16	17.97	128.125	21.08	30.00	Pass

Note:

5210MHz: Directional gain = 3.645dBi < 6dBi, so the power limit no need to reduced.

5775MHz: Directional gain = 3.231dBi < 6dBi, so the power limit no need to reduced.

26dB Bandwidth:

CDD Mode

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3	
36	5180	19.67	19.84	19.72	19.66	Pass
40	5200	20.19	19.83	20.34	19.84	Pass
48	5240	20.11	19.76	19.98	19.86	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3	
36	5180	20.58	20.71	20.54	20.57	Pass
40	5200	20.61	20.78	20.89	20.84	Pass
48	5240	21.12	20.77	20.80	20.77	Pass

802.11ac (VHT40)

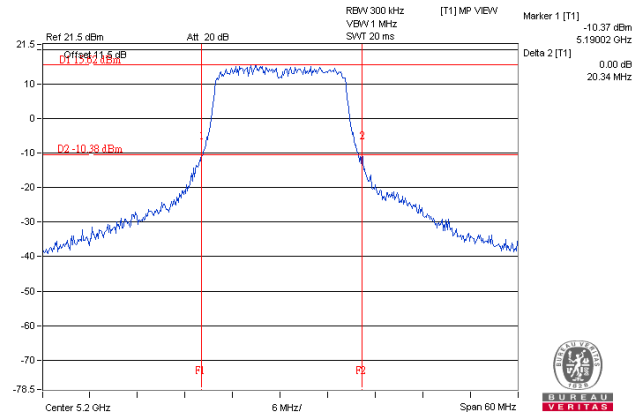
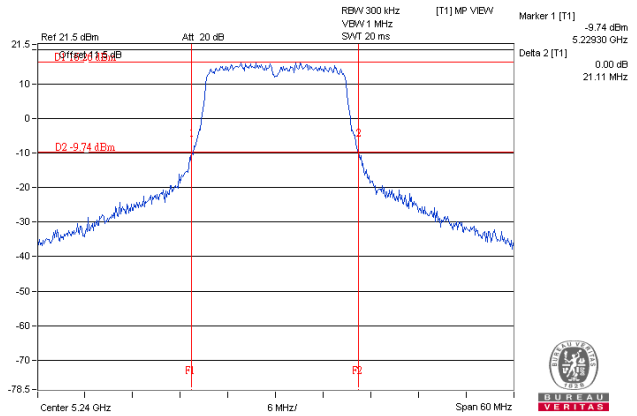
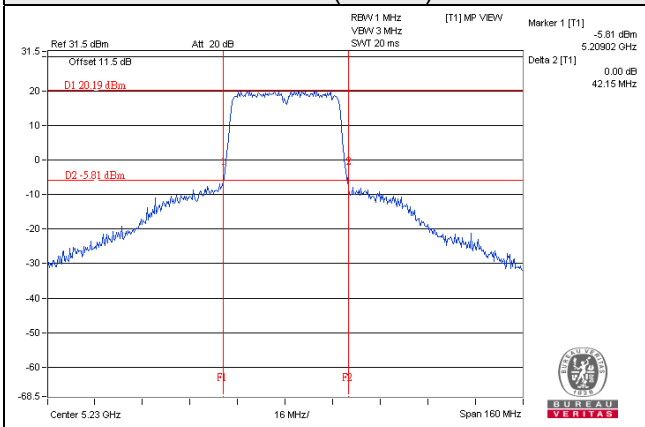
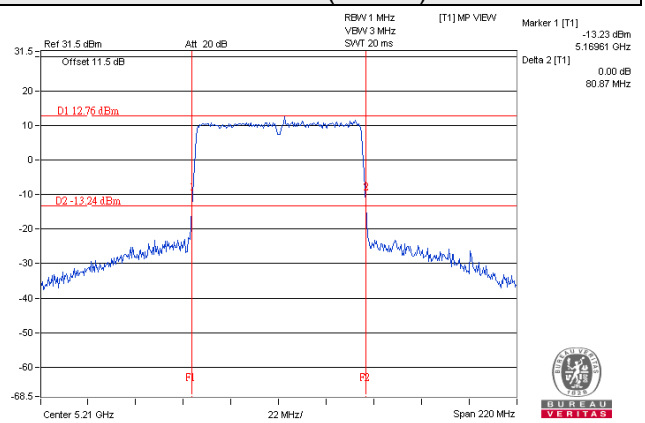
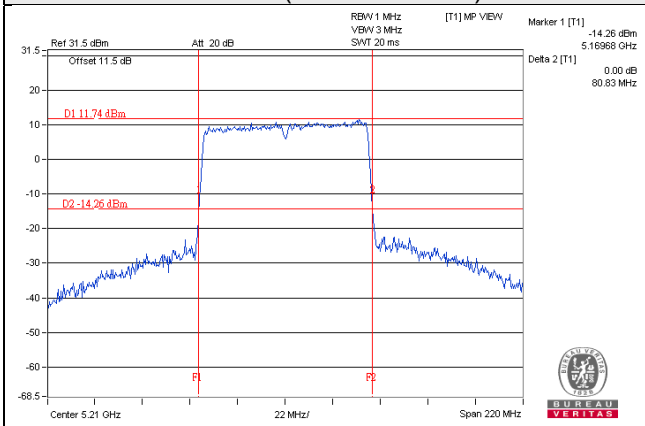
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3	
38	5190	41.39	41.30	40.86	41.00	Pass
46	5230	42.15	41.12	41.06	41.09	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3	
42	5210	80.87	80.84	80.73	80.84	Pass

802.11ac (VHT80+VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3	
42	5210	80.83	80.80	-	-	Pass

Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)_Ch 40/Chain 0
	
802.11ac (VHT40)	802.11ac (VHT80)
	
802.11ac (VHT80+VHT80)	
	

Occupied Bandwidth:

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	16.44	16.56	16.56	16.44
40	5200	16.56	16.56	16.56	16.56
48	5240	16.56	16.44	16.56	16.56
149	5745	16.68	16.44	16.68	16.56
157	5785	16.68	16.68	16.68	16.56
165	5825	16.68	16.80	16.68	16.92

802.11ac (VHT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	17.64	17.76	17.64	17.76
40	5200	17.76	17.76	17.76	17.76
48	5240	17.64	17.64	17.88	17.64
149	5745	17.64	17.64	17.64	17.64
157	5785	17.76	17.88	17.76	17.88
165	5825	17.88	17.88	17.88	17.88

802.11ac (VHT40)

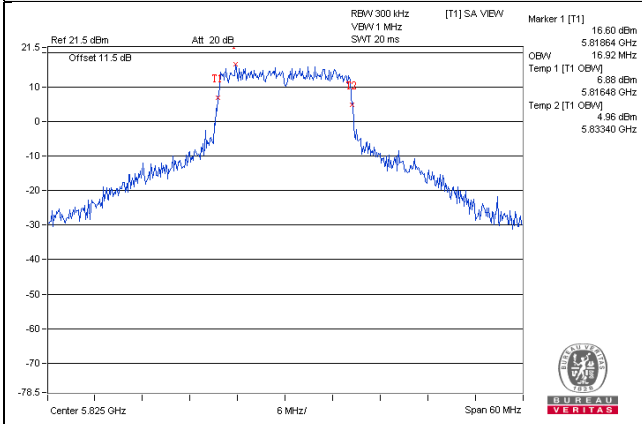
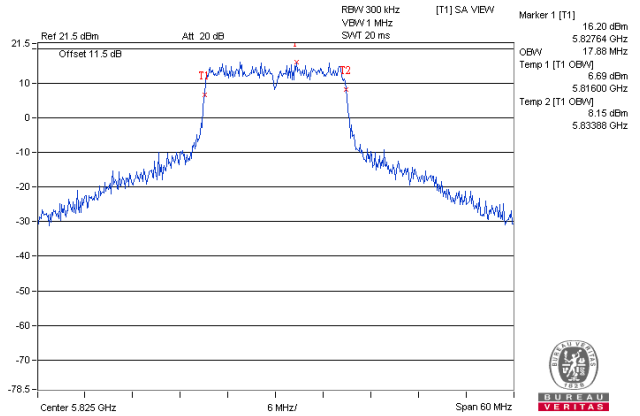
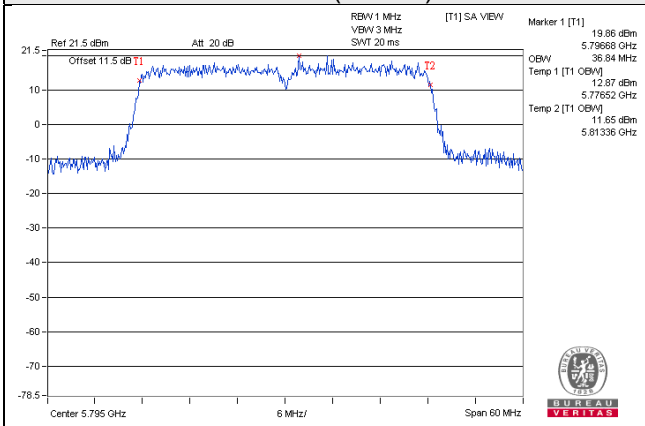
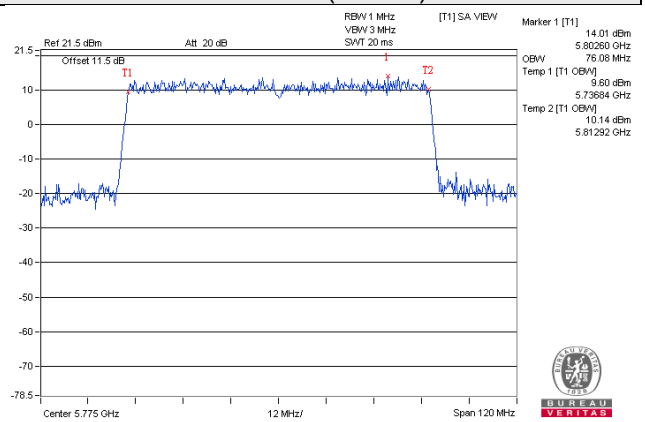
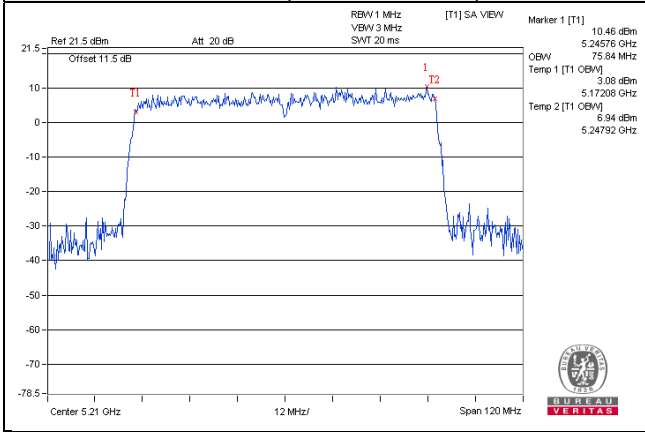
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	36.60	36.48	36.36	36.48
46	5230	36.60	36.48	36.48	36.48
151	5755	36.72	36.60	36.48	36.60
159	5795	36.60	36.72	36.84	36.60

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	75.84	75.84	75.84	75.84
155	5775	75.84	75.84	76.08	75.84

802.11ac (VHT80+ VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	75.84	75.84	-	-
155	5775	-	-	75.84	75.84

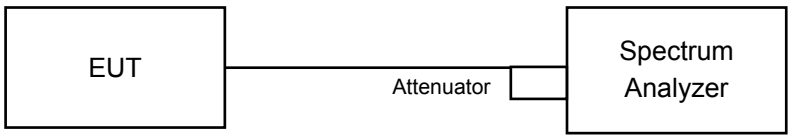
Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	
802.11ac (VHT80+VHT80)	
	

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 Procedure

For U-NII-1 band:
Using method SA-1
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:
a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 300 kHz, Set VBW ≥ 3 RBW, Detector = RMS
c. Sweep time = auto, trigger set to “free run”.
d. Trace average at least 100 traces in power averaging mode.
e. Record the max value and add 10 log (1/duty cycle).
f. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500kHz/300kHz).

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

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	Chain 2	Chain 3					
36	5180	8.46	7.12	6.13	7.06	13.30	0.18	13.48	17.00	Pass
40	5200	10.75	10.69	10.63	10.65	16.70	0.18	16.88	17.00	Pass
48	5240	10.80	10.48	10.60	10.55	16.63	0.18	16.81	17.00	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. 5180MHz: Directional gain = 5.868dBi < 6dBi, so the power density limit no need to reduced.
   5200MHz: Directional gain = 5.763dBi < 6dBi, so the power density limit no need to reduced.
   5240MHz: Directional gain = 5.487dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD (dBm)				Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
36	5180	6.49	7.90	7.00	6.52	13.04	0.12	13.16	17.00	Pass
40	5200	10.64	10.66	10.70	10.54	16.65	0.12	16.77	17.00	Pass
48	5240	10.40	10.43	10.36	10.39	16.41	0.12	16.53	17.00	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. 5180MHz: Directional gain = 5.868dBi < 6dBi, so the power density limit no need to reduced.
   5200MHz: Directional gain = 5.763dBi < 6dBi, so the power density limit no need to reduced.
   5240MHz: Directional gain = 5.487dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

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	Chain 2	Chain 3					
38	5190	5.15	4.15	3.98	4.12	10.40	0.27	10.67	17.00	Pass
46	5230	8.41	7.42	7.54	7.46	13.75	0.27	14.02	17.00	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. 5190MHz: Directional gain = 5.918dBi < 6dBi, so the power density limit no need to reduced.
   5230MHz: Directional gain = 5.472dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

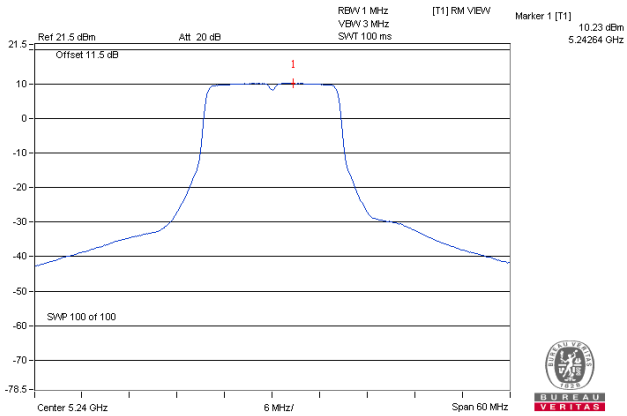
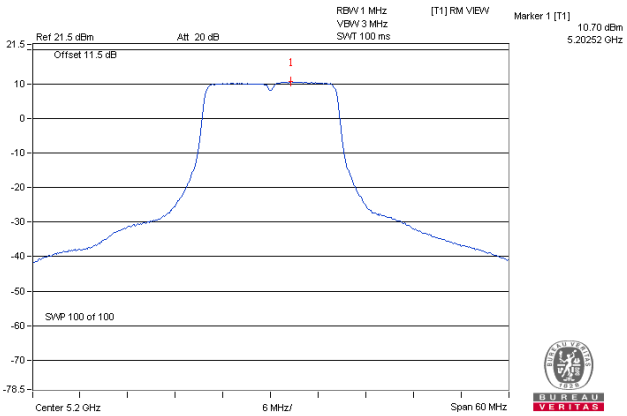
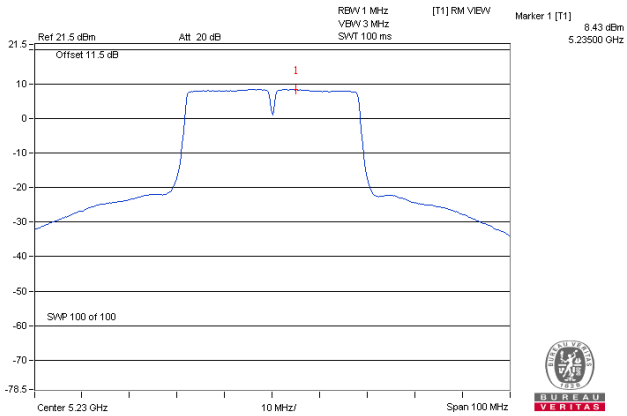
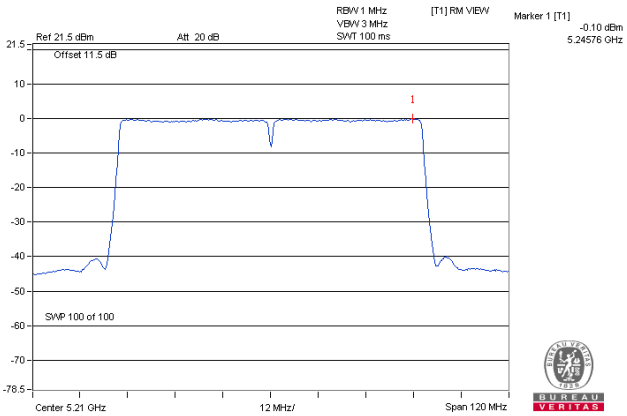
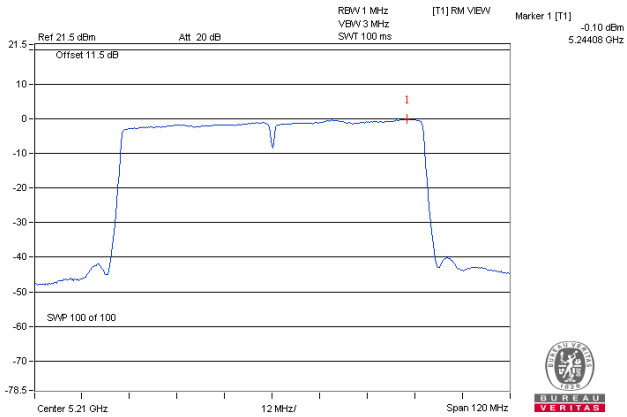
Chan.	Freq. (MHz)	PSD (dBm)				Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
42	5210	-0.10	-0.37	-0.24	-0.22	5.80	0.37	6.17	17.00	Pass

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 = 5.826dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80+ 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	Chain 2	Chain 3					
42	5210	-0.11	-0.10	-	-	2.90	0.39	3.29	17.00	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 = 3.645dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Ch 48 / Chain 0	802.11ac (VHT20) / Ch 40 / Chain 1
	
802.11ac (VHT40) / Ch 46 / Chain 0	802.11ac (VHT80) / Ch 42 / Chain 0
	
802.11ac (VHT80+ VHT80) / Ch 42 / Chain 1	
	

For U-NII-3 Band

CDD Mode

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	3.54	5.76	6.02	0.18	11.96	30.00	Pass
	157	5785	3.92	6.14	6.02	0.18	12.34	30.00	Pass
	165	5825	3.73	5.95	6.02	0.18	12.15	30.00	Pass
1	149	5745	3.52	5.74	6.02	0.18	11.94	30.00	Pass
	157	5785	3.96	6.18	6.02	0.18	12.38	30.00	Pass
	165	5825	3.88	6.10	6.02	0.18	12.30	30.00	Pass
2	149	5745	3.52	5.74	6.02	0.18	11.94	30.00	Pass
	157	5785	3.78	6.00	6.02	0.18	12.20	30.00	Pass
	165	5825	3.88	6.10	6.02	0.18	12.30	30.00	Pass
3	149	5745	3.53	5.75	6.02	0.18	11.95	30.00	Pass
	157	5785	4.01	6.23	6.02	0.18	12.43	30.00	Pass
	165	5825	3.81	6.03	6.02	0.18	12.23	30.00	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. 5745MHz: Directional gain = 5.649dBi < 6dBi, so the power density limit no need to reduced.
   5785MHz: Directional gain = 5.634dBi < 6dBi, so the power density limit no need to reduced.
   5825MHz: Directional gain = 5.516dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	3.02	5.24	6.02	0.12	11.38	30.00	Pass
	157	5785	3.32	5.54	6.02	0.12	11.68	30.00	Pass
	165	5825	3.41	5.63	6.02	0.12	11.77	30.00	Pass
1	149	5745	3.07	5.29	6.02	0.12	11.43	30.00	Pass
	157	5785	3.25	5.47	6.02	0.12	11.61	30.00	Pass
	165	5825	3.38	5.60	6.02	0.12	11.74	30.00	Pass
2	149	5745	3.00	5.22	6.02	0.12	11.36	30.00	Pass
	157	5785	3.40	5.62	6.02	0.12	11.76	30.00	Pass
	165	5825	3.36	5.58	6.02	0.12	11.72	30.00	Pass
3	149	5745	3.10	5.32	6.02	0.12	11.46	30.00	Pass
	157	5785	3.35	5.57	6.02	0.12	11.71	30.00	Pass
	165	5825	3.51	5.73	6.02	0.12	11.87	30.00	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. 5745MHz: Directional gain = 5.649dBi < 6dBi, so the power density limit no need to reduced.
   5785MHz: Directional gain = 5.634dBi < 6dBi, so the power density limit no need to reduced.
   5825MHz: Directional gain = 5.516dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	151	5755	-0.20	2.02	6.02	0.27	8.31	30.00	Pass
	159	5795	-0.06	2.16	6.02	0.27	8.45	30.00	Pass
1	151	5755	-0.15	2.07	6.02	0.27	8.36	30.00	Pass
	159	5795	-0.09	2.13	6.02	0.27	8.42	30.00	Pass
2	151	5755	-0.28	1.94	6.02	0.27	8.23	30.00	Pass
	159	5795	-0.14	2.08	6.02	0.27	8.37	30.00	Pass
3	151	5755	-0.11	2.11	6.02	0.27	8.40	30.00	Pass
	159	5795	-0.08	2.14	6.02	0.27	8.43	30.00	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. 5755MHz: Directional gain = 5.788dBi < 6dBi, so the power density limit no need to reduced.
   5795MHz: Directional gain = 5.693dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

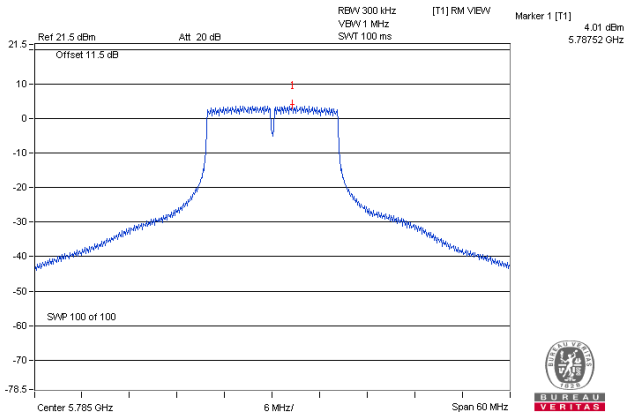
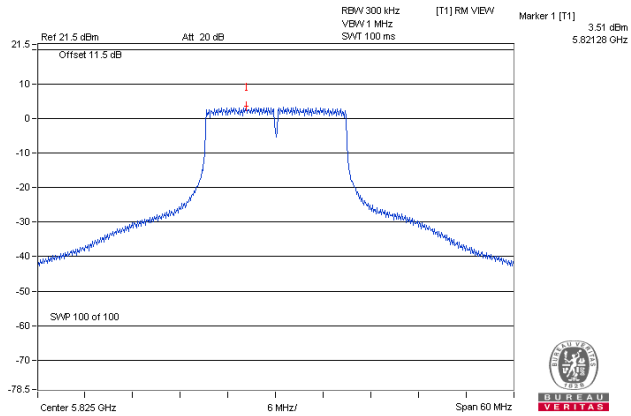
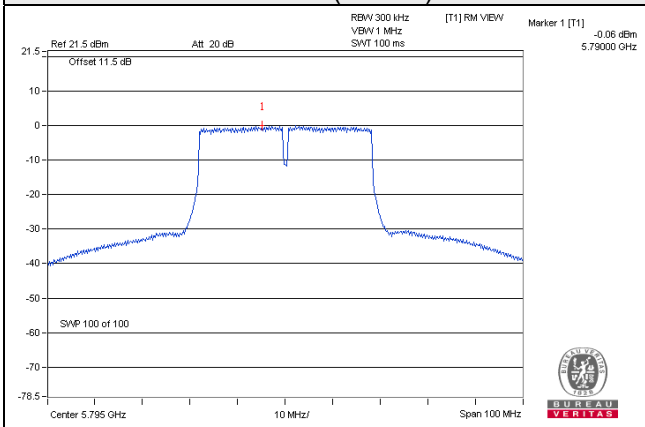
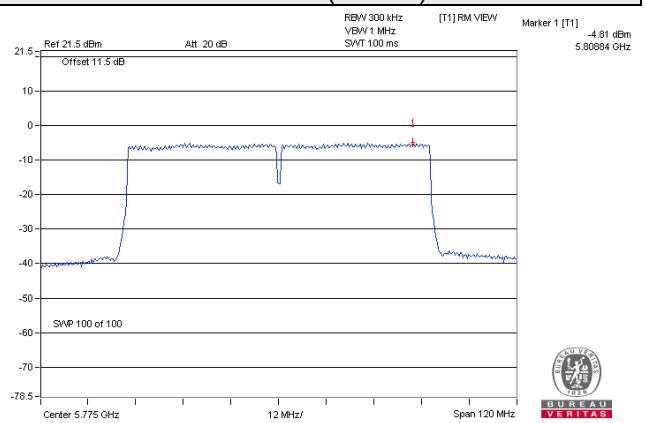
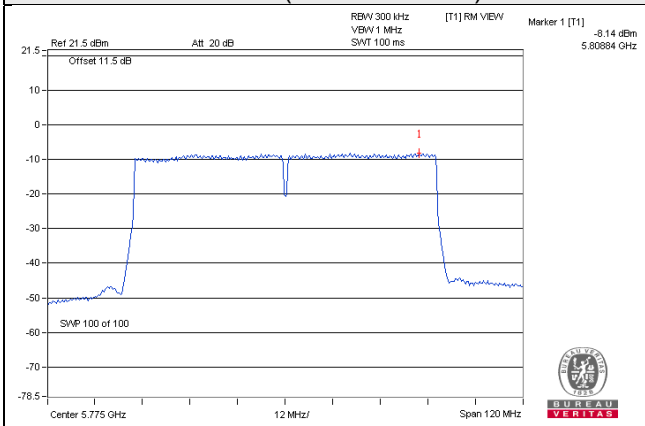
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	155	5775	-5.40	-3.18	6.02	0.37	3.21	30.00	Pass
1	155	5775	-5.54	-3.32	6.02	0.37	3.07	30.00	Pass
2	155	5775	-4.81	-2.59	6.02	0.37	3.80	30.00	Pass
3	155	5775	-5.47	-3.25	6.02	0.37	3.14	30.00	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 = 5.713dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80+VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
2	155	5775	-8.14	-5.92	6.02	0.39	-0.29	30.00	Pass
3	155	5775	-8.17	-5.95	6.02	0.39	-0.32	30.00	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 = 5.713dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

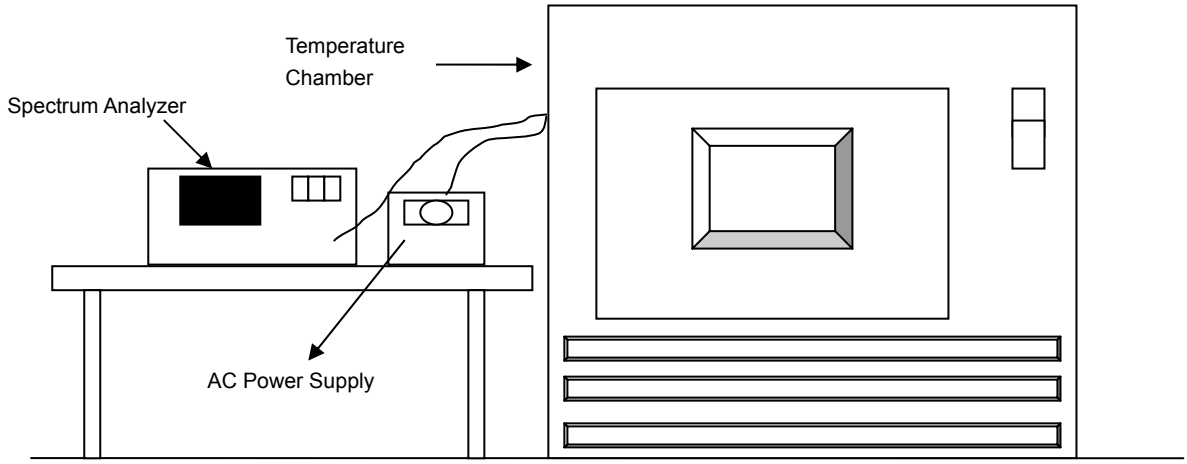
Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	
802.11ac (VHT80+VHT80)	
	

4.5 Frequency Stability

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0062	0.00012	5180.0027	0.00005	5180.0064	0.00012	5180.0032	0.00006
40	120	5179.9997	-0.00001	5179.9980	-0.00004	5179.9962	-0.00007	5180.0013	0.00003
30	120	5179.9976	-0.00005	5180.0002	0.00000	5179.9983	-0.00003	5179.9975	-0.00005
20	120	5180.0190	0.00037	5180.0208	0.00040	5180.0196	0.00038	5180.0231	0.00045
10	120	5180.0086	0.00017	5180.0072	0.00014	5180.0076	0.00015	5180.0057	0.00011
0	120	5180.0132	0.00025	5180.0104	0.00020	5180.0140	0.00027	5180.0121	0.00023
-10	120	5179.9958	-0.00008	5179.9953	-0.00009	5179.9946	-0.00010	5179.9941	-0.00011
-20	120	5180.0141	0.00027	5180.0138	0.00027	5180.0121	0.00023	5180.0118	0.00023
-30	120	5179.9837	-0.00031	5179.9837	-0.00031	5179.9851	-0.00029	5179.9807	-0.00037

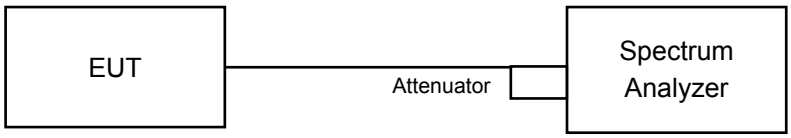
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5180.0195	0.00038	5180.0217	0.00042	5180.0206	0.00040	5180.0223	0.00043
	120	5180.0190	0.00037	5180.0208	0.00040	5180.0196	0.00038	5180.0231	0.00045
	102	5180.0199	0.00038	5180.0217	0.00042	5180.0202	0.00039	5180.0235	0.00045

4.6 6dB Bandwidth Measurement

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

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

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.38	16.39	16.38	16.38	0.5	Pass
157	5785	16.40	16.36	16.37	16.38	0.5	Pass
165	5825	16.38	16.41	16.39	16.40	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.58	17.62	17.61	17.56	0.5	Pass
157	5785	17.61	17.61	17.56	17.56	0.5	Pass
165	5825	17.61	17.58	17.63	17.63	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	36.06	36.42	36.31	36.37	0.5	Pass
159	5795	36.41	36.20	36.43	36.48	0.5	Pass

802.11ac (VHT80)

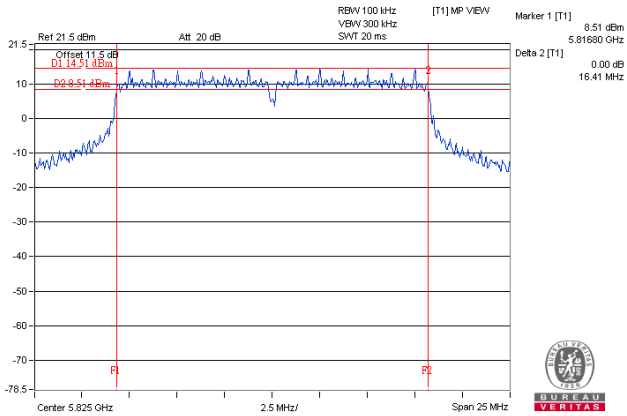
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.45	76.12	76.47	76.49	0.5	Pass

802.11ac (VHT80+VHT80)

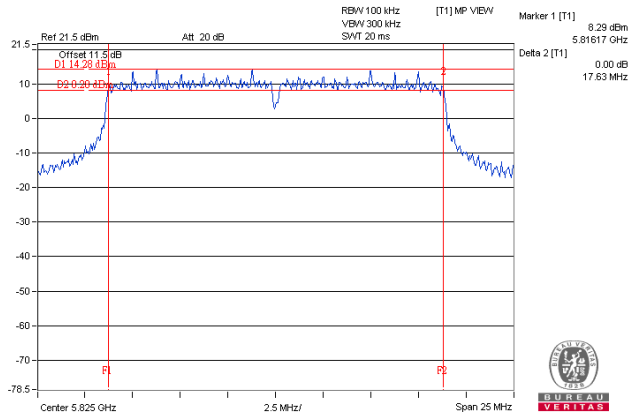
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	-	-	76.46	76.47	0.5	Pass

Spectrum Plot of Worst Value

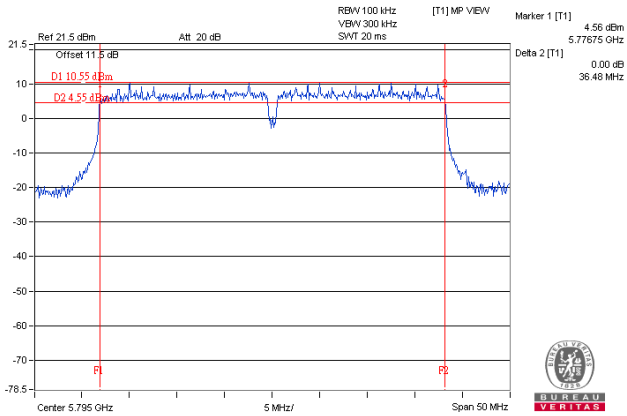
802.11a



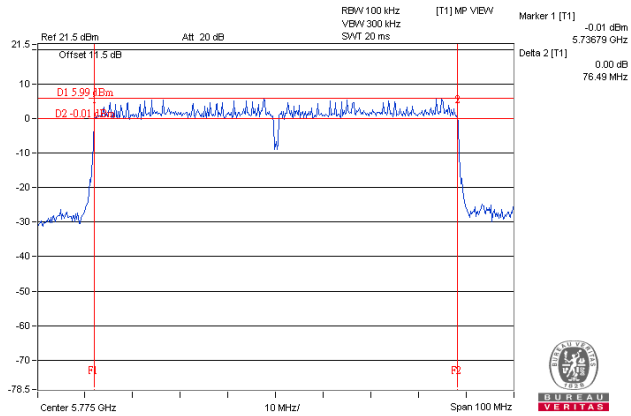
802.11ac (VHT20)



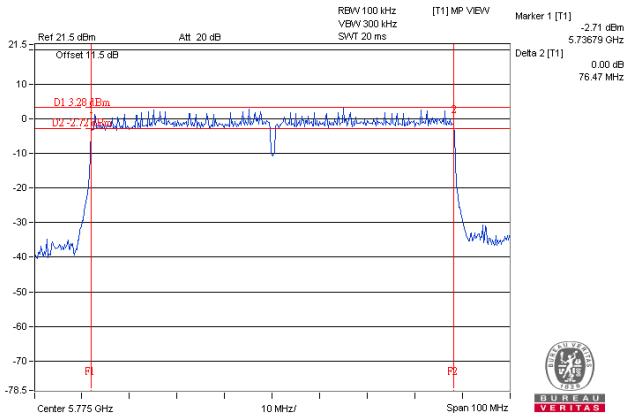
802.11ac (VHT40)



802.11ac (VHT80)



802.11ac (VHT80+ VHT80)



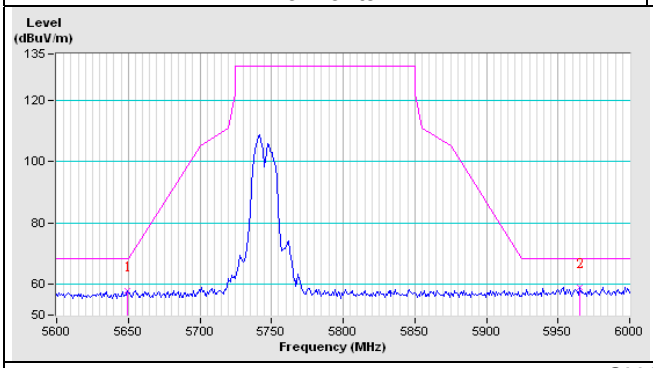
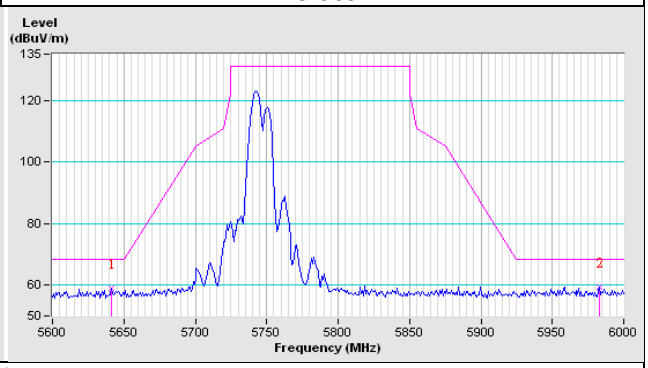
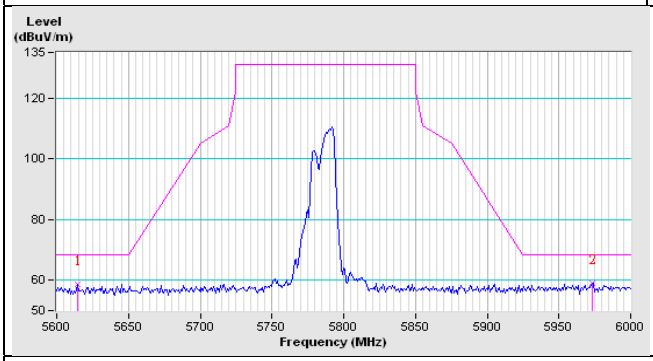
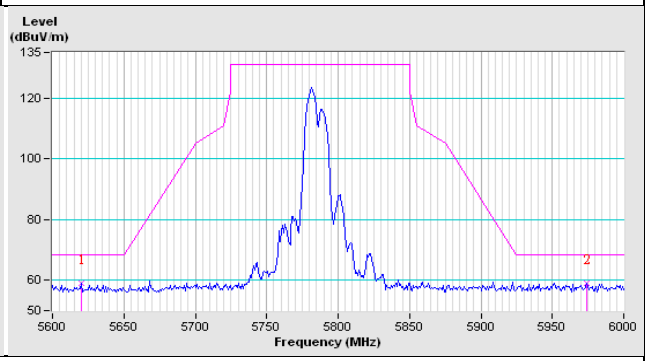
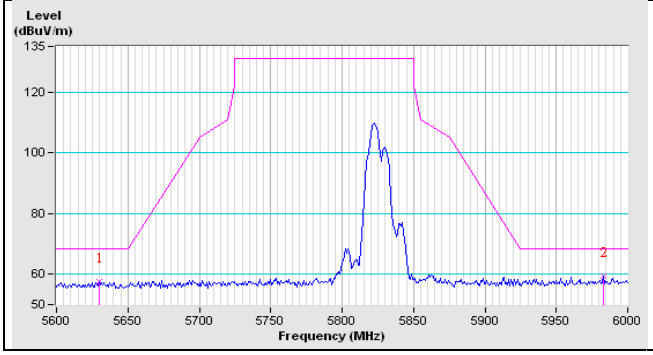
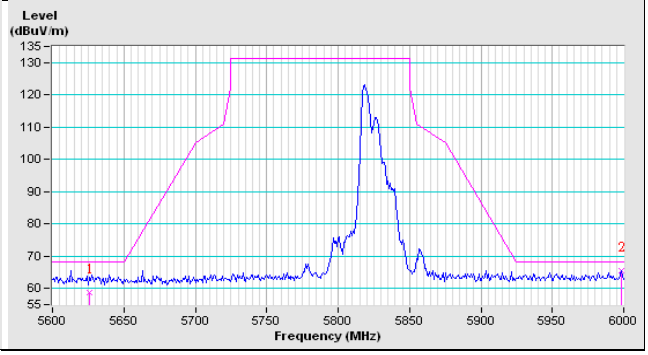
5 Pictures of Test Arrangements

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

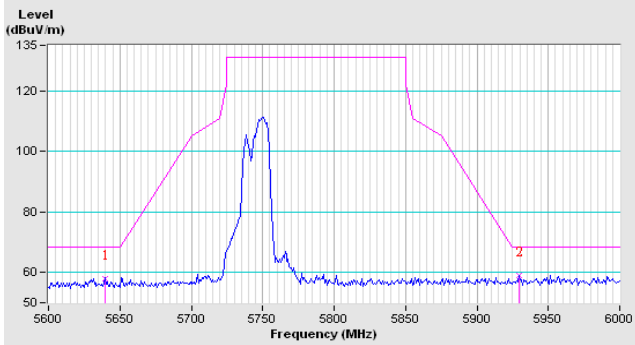
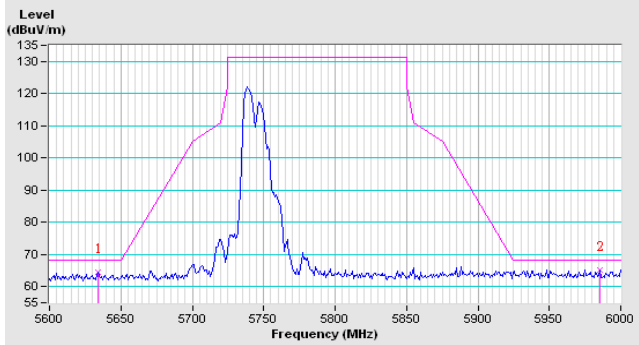
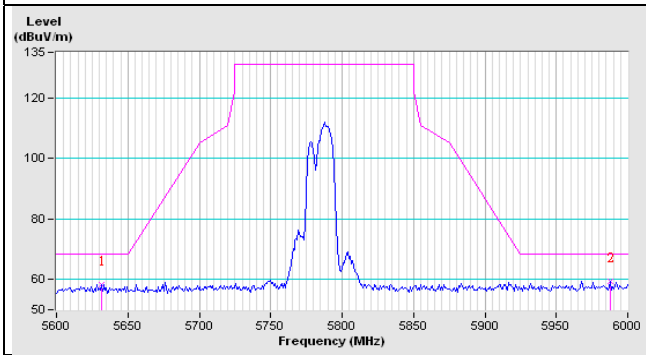
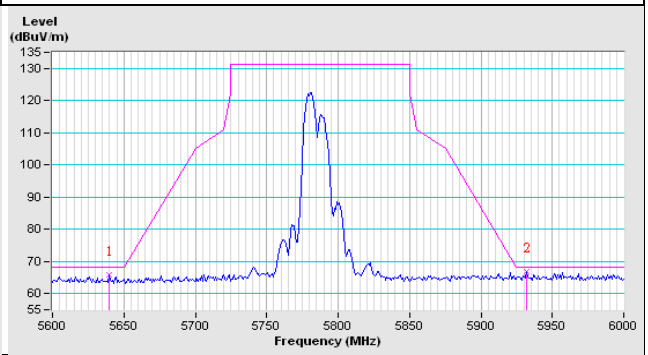
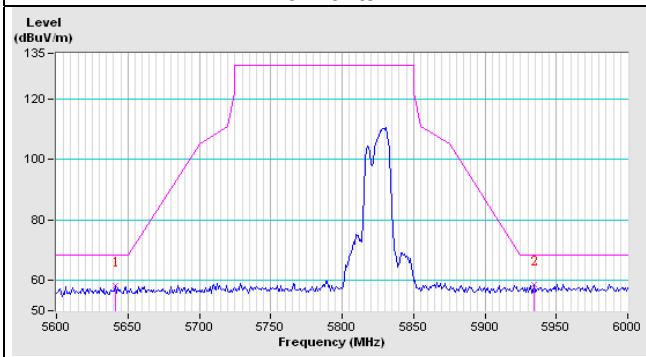
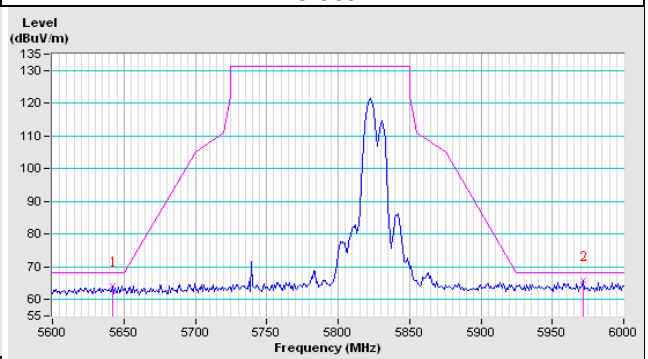
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

CDD Mode

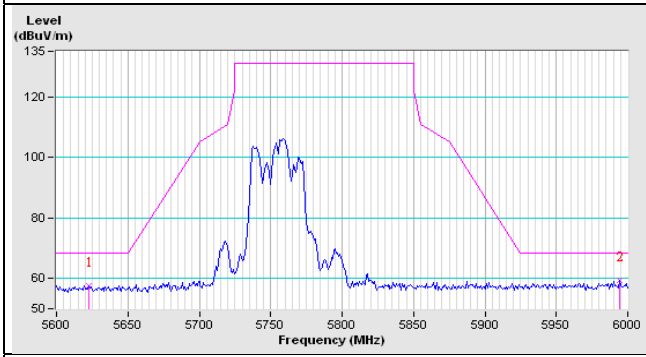
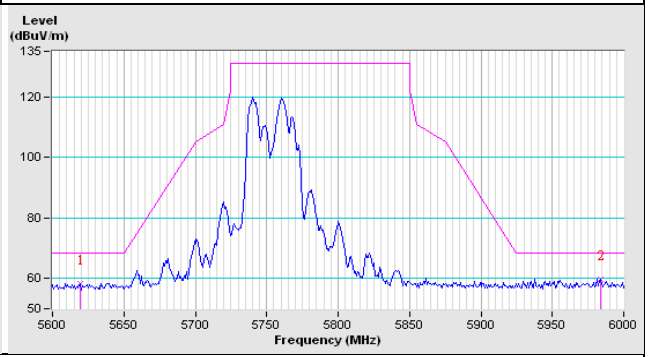
802.11a

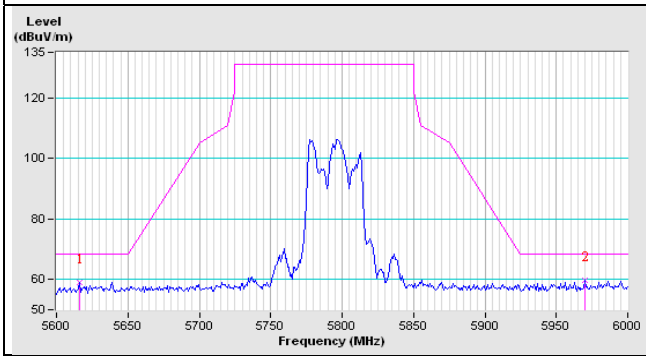
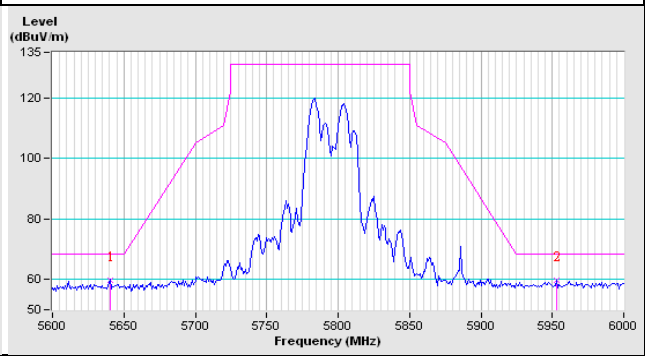
CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11ac (VHT20)

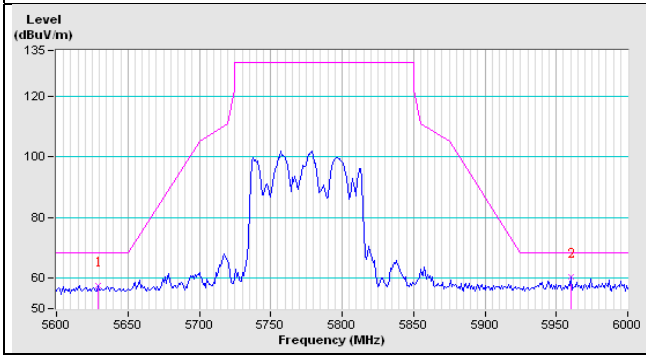
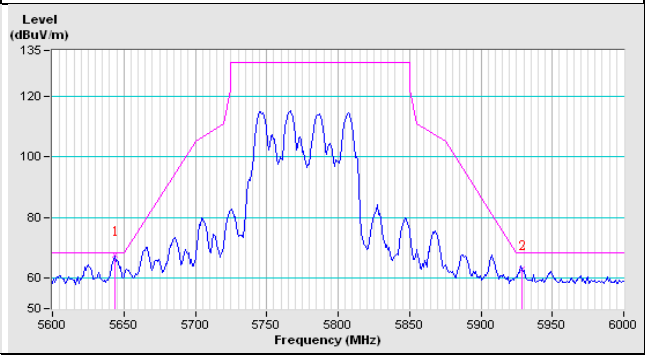
CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11ac (VHT40)

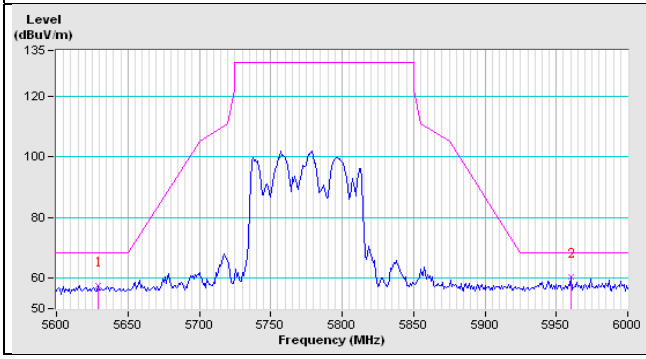
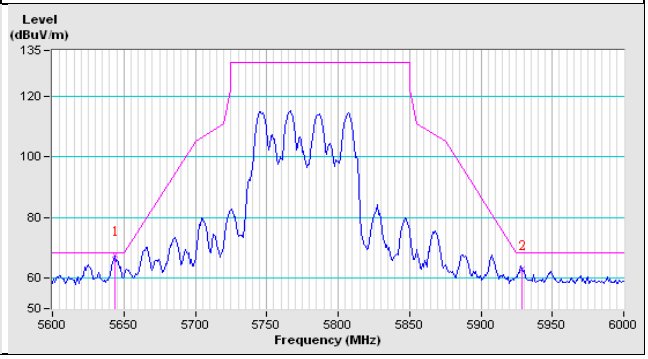
CH151	
Horizontal	Vertical
	

CH159	
Horizontal	Vertical
	

802.11ac (VHT80)

CH155	
Horizontal	Vertical
	

802.11ac (VHT80+ 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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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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