FCC Test Report

Report No.:	RF160719C19-1
FCC ID:	PY316100333
Test Model:	EX6100v2
Received Date:	Jul. 11, 2016
Test Date:	Jul. 26 ~ Aug. 17, 2016
Issued Date:	Aug. 23, 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
RF160719C19-1	Original release.	Aug. 23, 2016

1 Certificate of Conformity

Product:	WiFi Range Extender
Brand:	Netgear
Test Model:	EX6100v2
Sample Status:	Engineering sample
Applicant:	Netgear, Inc.
Test Date:	Jul. 26 ~ Aug. 17, 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:** Aug. 23, 2016

Suntee Liu / Specialist

Approved by : _____ , **Date:** Aug. 23, 2016

Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -15.07dB at 0.52109MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WiFi Range Extender
Brand	Netgear
Test Model	EX6100v2
Sample Status	Engineering sample
Power Supply Rating	100-240Vac
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 200Mbps 802.11ac: up to 433.3Mbps
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	5180~5240MHz: 255.270mW 5745~5825MHz: 281.190mW
Antenna Type	Dipole antenna with 3.9dBi gain
Antenna Connector	i-pex(MHF)
Accessory Device	NA
Data Cable Supplied	NA

Note:

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

Band	Modulation Mode	Beamforming Mode	TX Function
2.4GHz	802.11b	Not Support	2TX
	802.11g	Not Support	2TX
	802.11n (HT20)	Support	2TX
	802.11n (HT40)	Support	2TX
5GHz	802.11a	Not Support	1TX
	802.11n (HT20)	Not Support	1TX
	802.11n (HT40)	Not Support	1TX
	802.11ac (VHT20)	Not Support	1TX
	802.11ac (VHT40)	Not Support	1TX
	802.11ac (VHT80)	Not Support	1TX

* 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)

* The EUT incorporates AP & Extender functions, they comply with standard. In all extender function the power will meet U-NII requirement, therefore we chose worse case for AP function to perform the representative test after assessment.

2. WLAN 2.4GHz and WLAN 5GHz technologies can transmit at same time.
3. Spurious emission of the simultaneous operation (WLAN 2.4GHz and WLAN 5GHz) has been evaluated and no non-compliance was found.

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 (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (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):

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)
-	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	13.5
-	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
-	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	13.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
	802.11a	5745-5825	149 to 165		OFDM	BPSK	6.0

Power Line Conducted Emission Test:

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

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
	802.11a	5745-5825	149 to 165		OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
-	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	13.5
-	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
-	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	13.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

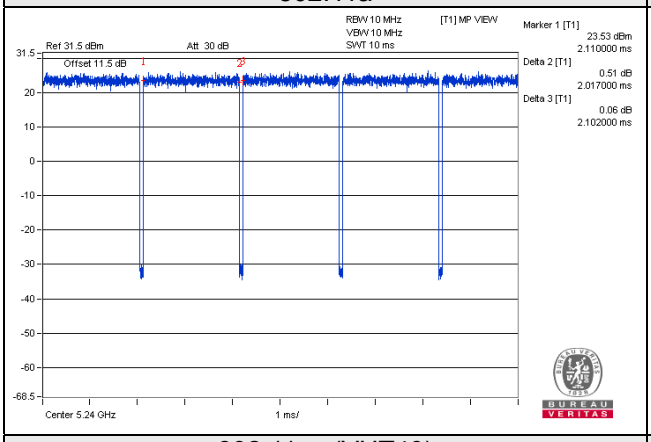
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	26 deg. C, 64% RH 27 deg. C, 61% RH	120Vac, 60Hz	Chris Lin Alan Wu
RE<1G	23 deg. C, 70% RH	120Vac, 60Hz	Matthew Yang
PLC	25 deg. C, 70% RH	120Vac, 60Hz	Matthew Yang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Frank Liu

3.3 Duty Cycle of Test Signal

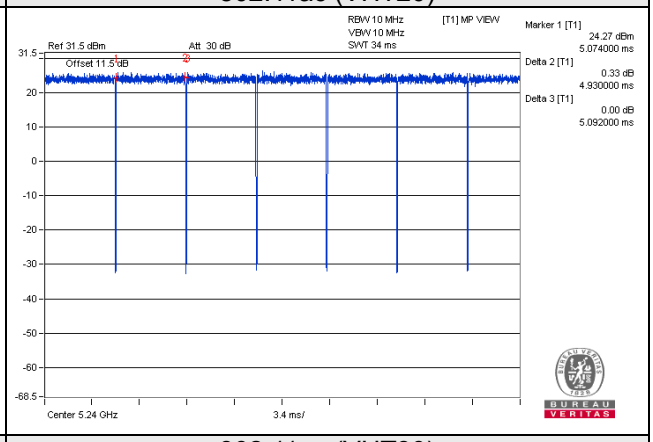
Duty cycle of test signal is ≥ 98%, duty factor is not required.
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 2.017/2.102 = 0.96, Duty factor = 10 * log(1/0.96) = 0.18
802.11ac (VHT20): Duty cycle = 4.93/5.092 = 0.968, Duty factor = 10 * log(1/0.968) = 0.14
802.11ac (VHT40): Duty cycle = 2.405/2.5 = 0.962, Duty factor = 10 * log(1/0.962) = 0.17
802.11ac (VHT80): Duty cycle = 1.122/1.227 = 0.914, Duty factor = 10 * log(1/0.914) = 0.39

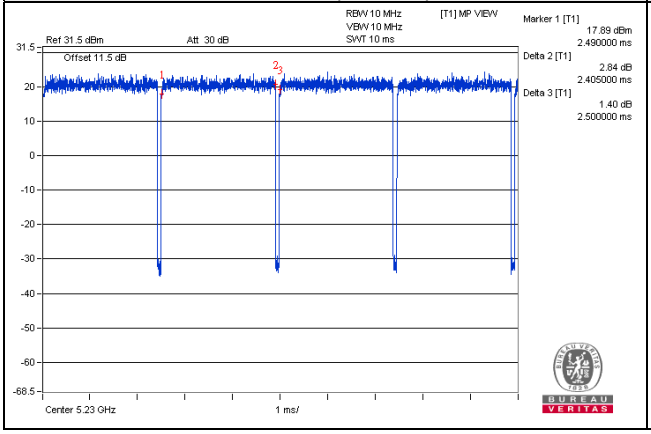
802.11a



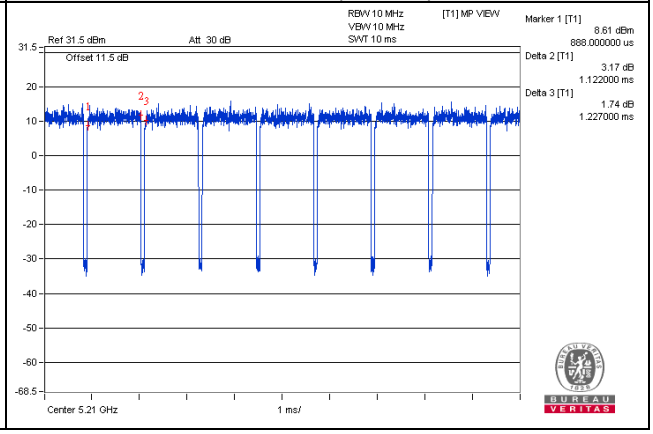
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

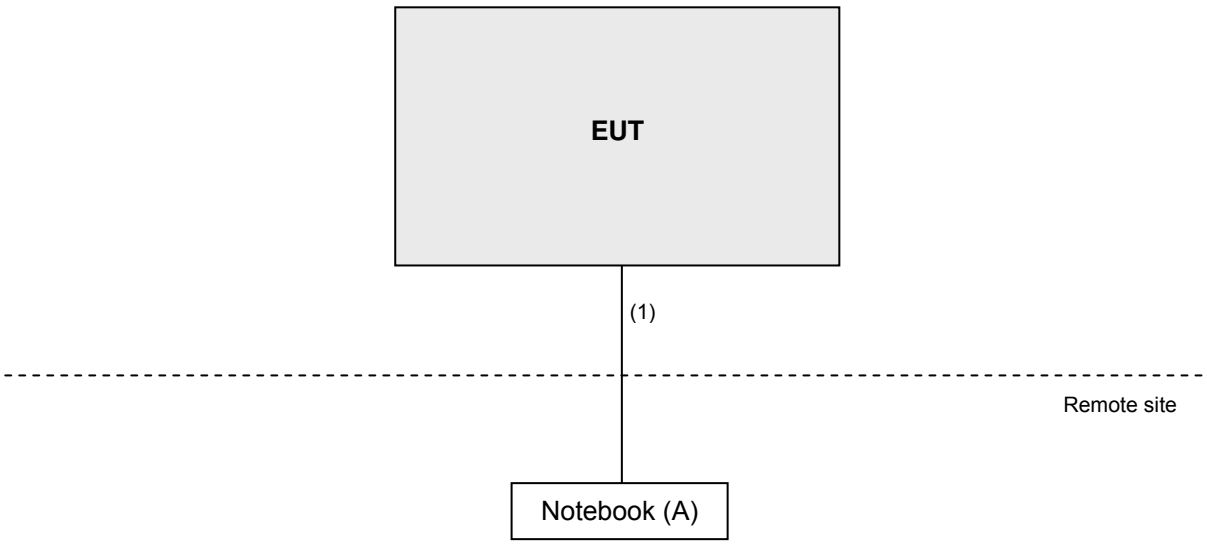
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45	1	3	N	0	-

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
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	100041	Sep. 02, 2015	Sep. 01, 2016
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	3008A01887	Feb. 26, 2016	Feb. 25, 2017
Preamplifier Agilent	8447D	2944A10640	May 18, 2016	May 17, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 09, 2015	Aug. 08, 2016
			Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	Aug. 09, 2015	Aug. 08, 2016
			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
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2015	Oct. 17, 2016
High Speed Peak Power Meter	ML2495A	1145013	Mar. 22, 2016	Mar. 21, 2017
Power Sensor	MA2411B	1126085	Mar. 22, 2016	Mar. 21, 2017

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

4.1.3 Test 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:

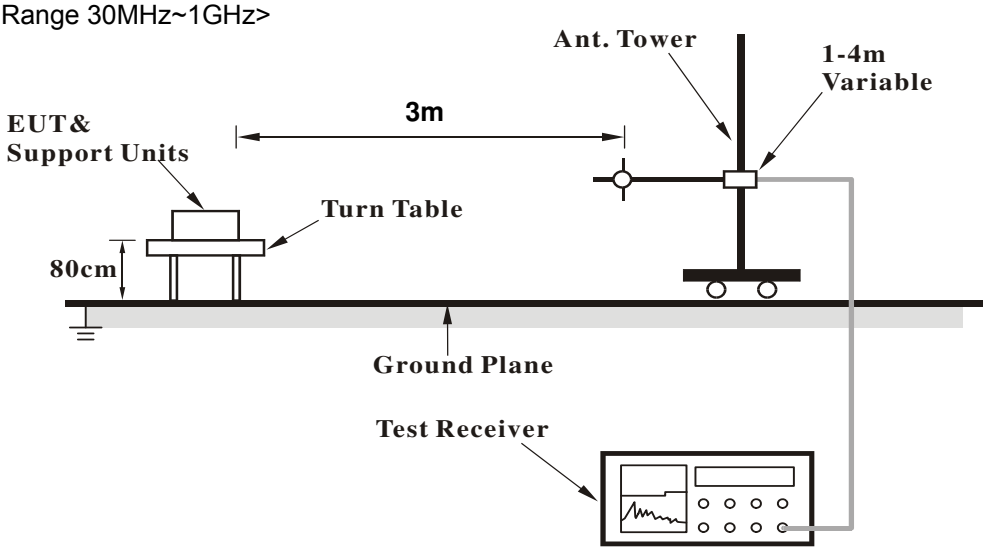
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

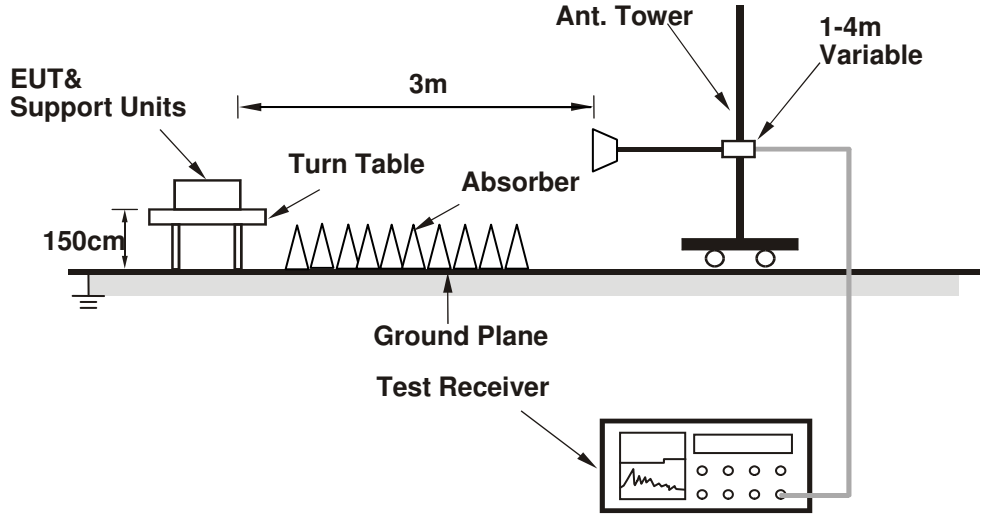
No deviation.

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	65.1 PK	74.0	-8.9	1.27 H	301	58.6	6.5
2	5150.00	51.7 AV	54.0	-2.3	1.27 H	301	45.2	6.5
3	*5180.00	106.7 PK			1.27 H	301	66.2	40.5
4	*5180.00	96.8 AV			1.27 H	301	56.3	40.5
5	#10360.00	57.5 PK	74.0	-16.5	1.06 H	302	40.8	16.7
6	#10360.00	45.4 AV	54.0	-8.6	1.06 H	302	28.7	16.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.0 PK	74.0	-5.0	2.83 V	157	62.5	6.5
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**2.83 V**	**157**	**47.4**	**6.5**
3	*5180.00	113.3 PK			2.83 V	157	72.8	40.5
4	*5180.00	103.3 AV			2.83 V	157	62.8	40.5
5	#10360.00	58.2 PK	74.0	-15.8	1.47 V	85	41.5	16.7
6	#10360.00	47.1 AV	54.0	-6.9	1.47 V	85	30.4	16.7

REMARKS:

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

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	59.7 PK	74.0	-14.3	1.35 H	300	53.2	6.5
2	5150.00	47.6 AV	54.0	-6.4	1.35 H	300	41.1	6.5
3	*5200.00	109.5 PK			1.35 H	300	69.0	40.5
4	*5200.00	99.5 AV			1.35 H	300	59.0	40.5
5	#10400.00	57.0 PK	74.0	-17.0	1.22 H	54	40.1	16.9
6	#10400.00	45.0 AV	54.0	-9.0	1.22 H	54	28.1	16.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.6 PK	74.0	-6.4	3.14 V	221	61.1	6.5
2	5150.00	53.5 AV	54.0	-0.5	3.14 V	221	47.0	6.5
3	*5200.00	117.6 PK			3.14 V	221	77.1	40.5
4	*5200.00	107.1 AV			3.14 V	221	66.6	40.5
5	#10400.00	58.4 PK	74.0	-15.6	1.06 V	32	41.5	16.9
6	#10400.00	47.1 AV	54.0	-6.9	1.06 V	32	30.2	16.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	108.5 PK			1.56 H	298	67.9	40.6
2	*5240.00	98.4 AV			1.56 H	298	57.8	40.6
3	5350.00	58.5 PK	74.0	-15.5	1.56 H	298	51.6	6.9
4	5350.00	46.3 AV	54.0	-7.7	1.56 H	298	39.4	6.9
5	#10480.00	57.9 PK	74.0	-16.1	1.17 H	54	40.6	17.3
6	#10480.00	45.7 AV	54.0	-8.3	1.17 H	54	28.4	17.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	115.7 PK			1.28 V	229	75.1	40.6
2	*5240.00	105.4 AV			1.28 V	229	64.8	40.6
3	5350.00	59.7 PK	74.0	-14.3	1.28 V	229	52.8	6.9
4	5350.00	47.8 AV	54.0	-6.2	1.28 V	229	40.9	6.9
5	#10480.00	59.9 PK	74.0	-14.1	1.06 V	39	42.6	17.3
6	#10480.00	47.4 AV	54.0	-6.6	1.06 V	39	30.1	17.3

REMARKS:

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

CHANNEL	TX Channel 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	#5625.60	57.9 PK	68.2	-10.3	1.52 H	36	52.0	5.9
2	*5745.00	108.3 PK			1.52 H	36	68.4	39.9
3	*5745.00	97.8 AV			1.52 H	36	57.9	39.9
4	#5952.00	58.5 PK	68.2	-9.7	1.52 H	36	52.0	6.5
5	11490.00	57.7 PK	74.0	-16.3	1.20 H	50	38.8	18.9
6	11490.00	45.6 AV	54.0	-8.4	1.20 H	50	26.7	18.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5647.20	61.2 PK	68.2	-7.0	1.00 V	260	55.4	5.8
2	*5745.00	117.4 PK			1.00 V	260	77.5	39.9
3	*5745.00	106.6 AV			1.00 V	260	66.7	39.9
4	#5939.20	57.4 PK	68.2	-10.8	1.00 V	260	51.0	6.4
5	11490.00	59.2 PK	74.0	-14.8	1.06 V	30	40.3	18.9
6	11490.00	48.3 AV	54.0	-5.7	1.06 V	30	29.4	18.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5616.00	58.6 PK	68.2	-9.6	1.16 H	36	52.7	5.9
2	*5785.00	109.4 PK			1.16 H	36	69.4	40.0
3	*5785.00	97.9 AV			1.16 H	36	57.9	40.0
4	#5939.20	58.4 PK	68.2	-9.8	1.16 H	36	52.0	6.4
5	11570.00	57.8 PK	74.0	-16.2	1.20 H	58	39.1	18.7
6	11570.00	45.8 AV	54.0	-8.2	1.20 H	58	27.1	18.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5637.60	58.3 PK	68.2	-9.9	1.05 V	262	52.5	5.8
2	*5785.00	117.6 PK			1.05 V	262	77.6	40.0
3	*5785.00	106.5 AV			1.05 V	262	66.5	40.0
4	#5939.20	58.9 PK	68.2	-9.3	1.05 V	262	52.5	6.4
5	11570.00	59.6 PK	74.0	-14.4	1.03 V	27	40.9	18.7
6	11570.00	48.4 AV	54.0	-5.6	1.03 V	27	29.7	18.7

REMARKS:

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

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	#5633.60	56.8 PK	68.2	-11.4	1.00 H	34	51.0	5.8
2	*5825.00	108.6 PK			1.00 H	34	68.4	40.2
3	*5825.00	98.0 AV			1.00 H	34	57.8	40.2
4	#5940.80	58.0 PK	68.2	-10.2	1.00 H	34	51.5	6.5
5	11650.00	57.4 PK	74.0	-16.6	1.22 H	54	39.1	18.3
6	11650.00	45.5 AV	54.0	-8.5	1.22 H	54	27.2	18.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5642.40	61.0 PK	68.2	-7.2	1.66 V	273	55.2	5.8
2	*5825.00	118.1 PK			1.66 V	273	77.9	40.2
3	*5825.00	107.0 AV			1.66 V	273	66.8	40.2
4	#5933.60	61.8 PK	68.2	-6.4	1.66 V	273	55.4	6.4
5	11650.00	59.0 PK	74.0	-15.0	1.07 V	23	40.7	18.3
6	11650.00	47.8 AV	54.0	-6.2	1.07 V	23	29.5	18.3

REMARKS:

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

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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	62.0 PK	74.0	-12.0	1.19 H	300	55.5	6.5
2	5150.00	47.7 AV	54.0	-6.3	1.19 H	300	41.2	6.5
3	*5180.00	104.7 PK			1.19 H	300	64.2	40.5
4	*5180.00	95.1 AV			1.19 H	300	54.6	40.5
5	#10360.00	57.2 PK	74.0	-16.8	1.06 H	331	40.5	16.7
6	#10360.00	45.4 AV	54.0	-8.6	1.06 H	331	28.7	16.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.6 PK	74.0	-2.4	3.02 V	226	65.1	6.5
2	5150.00	53.8 AV	54.0	-0.2	3.02 V	226	47.3	6.5
3	*5180.00	113.3 PK			3.02 V	226	72.8	40.5
4	*5180.00	102.9 AV			3.02 V	226	62.4	40.5
5	#10360.00	58.3 PK	74.0	-15.7	1.17 V	41	41.6	16.7
6	#10360.00	46.9 AV	54.0	-7.1	1.17 V	41	30.2	16.7

REMARKS:

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

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	68.1 PK	74.0	-5.9	1.37 H	301	61.6	6.5
2	5150.00	50.6 AV	54.0	-3.4	1.37 H	301	44.1	6.5
3	*5200.00	109.5 PK			1.37 H	301	69.0	40.5
4	*5200.00	98.8 AV			1.37 H	301	58.3	40.5
5	#10400.00	57.5 PK	74.0	-16.5	1.10 H	65	40.6	16.9
6	#10400.00	45.0 AV	54.0	-9.0	1.10 H	65	28.1	16.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.8 PK	74.0	-3.2	1.43 V	223	64.3	6.5
2	5150.00	53.6 AV	54.0	-0.4	1.43 V	223	47.1	6.5
3	*5200.00	115.3 PK			1.43 V	223	74.8	40.5
4	*5200.00	105.3 AV			1.43 V	223	64.8	40.5
5	#10400.00	59.5 PK	74.0	-14.5	1.22 V	63	42.6	16.9
6	#10400.00	46.9 AV	54.0	-7.1	1.22 V	63	30.0	16.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	108.7 PK			1.31 H	300	68.1	40.6
2	*5240.00	99.1 AV			1.31 H	300	58.5	40.6
3	5350.00	57.0 PK	74.0	-17.0	1.31 H	300	50.1	6.9
4	5350.00	46.3 AV	54.0	-7.7	1.31 H	300	39.4	6.9
5	#10480.00	57.8 PK	74.0	-16.2	1.05 H	66	40.5	17.3
6	#10480.00	45.4 AV	54.0	-8.6	1.05 H	66	28.1	17.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	115.8 PK			1.67 V	126	75.2	40.6
2	*5240.00	105.4 AV			1.67 V	126	64.8	40.6
3	5350.00	58.2 PK	74.0	-15.8	1.67 V	126	51.3	6.9
4	5350.00	47.4 AV	54.0	-6.6	1.67 V	126	40.5	6.9
5	#10480.00	58.6 PK	74.0	-15.4	1.05 V	22	41.3	17.3
6	#10480.00	47.3 AV	54.0	-6.7	1.05 V	22	30.0	17.3

REMARKS:

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

CHANNEL	TX Channel 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	#5629.60	57.5 PK	68.2	-10.7	1.00 H	35	51.7	5.8
2	*5745.00	108.2 PK			1.00 H	35	68.3	39.9
3	*5745.00	97.0 AV			1.00 H	35	57.1	39.9
4	#5968.80	58.3 PK	68.2	-9.9	1.00 H	35	51.8	6.5
5	11490.00	57.1 PK	74.0	-16.9	1.24 H	54	38.2	18.9
6	11490.00	44.8 AV	54.0	-9.2	1.24 H	54	25.9	18.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5639.20	60.5 PK	68.2	-7.7	1.06 V	261	54.7	5.8
2	*5745.00	117.0 PK			1.06 V	261	77.1	39.9
3	*5745.00	105.5 AV			1.06 V	261	65.6	39.9
4	#5940.80	57.0 PK	68.2	-11.2	1.06 V	261	50.5	6.5
5	11490.00	58.8 PK	74.0	-15.2	1.07 V	29	39.9	18.9
6	11490.00	47.1 AV	54.0	-6.9	1.07 V	29	28.2	18.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5623.20	57.3 PK	68.2	-10.9	1.18 H	34	51.4	5.9
2	*5785.00	108.7 PK			1.18 H	34	68.7	40.0
3	*5785.00	97.4 AV			1.18 H	34	57.4	40.0
4	#5937.60	57.6 PK	68.2	-10.6	1.18 H	34	51.2	6.4
5	11570.00	57.5 PK	74.0	-16.5	1.21 H	55	38.8	18.7
6	11570.00	45.1 AV	54.0	-8.9	1.21 H	55	26.4	18.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.80	61.2 PK	68.2	-7.0	1.98 V	323	55.4	5.8
2	*5785.00	118.3 PK			1.98 V	323	78.3	40.0
3	*5785.00	107.2 AV			1.98 V	323	67.2	40.0
4	#5925.60	59.7 PK	68.2	-8.5	1.98 V	323	53.3	6.4
5	11570.00	59.1 PK	74.0	-14.9	1.01 V	21	40.4	18.7
6	11570.00	47.9 AV	54.0	-6.1	1.01 V	21	29.2	18.7

REMARKS:

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

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	#5645.60	56.6 PK	68.2	-11.6	1.00 H	33	50.8	5.8
2	*5825.00	109.4 PK			1.00 H	33	69.2	40.2
3	*5825.00	97.5 AV			1.00 H	33	57.3	40.2
4	#5936.80	57.2 PK	68.2	-11.0	1.00 H	33	50.8	6.4
5	11650.00	57.3 PK	74.0	-16.7	1.25 H	53	39.0	18.3
6	11650.00	45.0 AV	54.0	-9.0	1.25 H	53	26.7	18.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5638.40	57.8 PK	68.2	-10.4	1.67 V	274	52.0	5.8
2	*5825.00	118.3 PK			1.67 V	274	78.1	40.2
3	*5825.00	106.6 AV			1.67 V	274	66.4	40.2
4	#5929.60	61.1 PK	68.2	-7.1	1.67 V	274	54.7	6.4
5	11650.00	58.9 PK	74.0	-15.1	1.05 V	25	40.6	18.3
6	11650.00	47.2 AV	54.0	-6.8	1.05 V	25	28.9	18.3

REMARKS:

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

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	62.1 PK	74.0	-11.9	1.45 H	303	55.6	6.5
2	5150.00	48.1 AV	54.0	-5.9	1.45 H	303	41.6	6.5
3	*5190.00	99.5 PK			1.45 H	303	59.0	40.5
4	*5190.00	90.2 AV			1.45 H	303	49.7	40.5
5	#10380.00	56.9 PK	74.0	-17.1	1.12 H	20	40.0	16.9
6	#10380.00	44.9 AV	54.0	-9.1	1.12 H	20	28.0	16.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.5 PK	74.0	-3.5	2.87 V	234	64.0	6.5
2	5150.00	53.6 AV	54.0	-0.4	2.87 V	234	47.1	6.5
3	*5190.00	108.3 PK			2.87 V	234	67.8	40.5
4	*5190.00	99.4 AV			2.87 V	234	58.9	40.5
5	#10380.00	58.2 PK	74.0	-15.8	1.05 V	21	41.3	16.9
6	#10380.00	46.9 AV	54.0	-7.1	1.05 V	21	30.0	16.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.4 PK	74.0	-12.6	1.33 H	300	54.9	6.5
2	5150.00	48.1 AV	54.0	-5.9	1.33 H	300	41.6	6.5
3	*5230.00	104.2 PK			1.33 H	300	63.7	40.5
4	*5230.00	95.4 AV			1.33 H	300	54.9	40.5
5	5350.00	58.9 PK	74.0	-15.1	1.33 H	300	52.0	6.9
6	5350.00	47.0 AV	54.0	-7.0	1.33 H	300	40.1	6.9
7	#10460.00	57.7 PK	74.0	-16.3	1.06 H	33	40.5	17.2
8	#10460.00	45.3 AV	54.0	-8.7	1.06 H	33	28.1	17.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.2 PK	74.0	-7.8	2.94 V	226	59.7	6.5
2	5150.00	53.5 AV	54.0	-0.5	2.94 V	226	47.0	6.5
3	*5230.00	111.8 PK			2.94 V	226	71.3	40.5
4	*5230.00	102.4 AV			2.94 V	226	61.9	40.5
5	5350.00	60.3 PK	74.0	-13.7	2.94 V	226	53.4	6.9
6	5350.00	47.4 AV	54.0	-6.6	2.94 V	226	40.5	6.9
7	#10460.00	58.8 PK	74.0	-15.2	1.05 V	22	41.6	17.2
8	#10460.00	47.2 AV	54.0	-6.8	1.05 V	22	30.0	17.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	#5624.00	57.8 PK	68.2	-10.4	1.00 H	37	51.9	5.9
2	*5755.00	104.3 PK			1.00 H	37	64.3	40.0
3	*5755.00	93.6 AV			1.00 H	37	53.6	40.0
4	#5932.00	57.6 PK	68.2	-10.6	1.00 H	37	51.2	6.4
5	11510.00	56.6 PK	74.0	-17.4	1.22 H	56	37.9	18.7
6	11510.00	44.2 AV	54.0	-9.8	1.22 H	56	25.5	18.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5650.40	66.4 PK	68.5	-2.1	1.97 V	311	60.6	5.8
2	*5755.00	114.4 PK			1.97 V	311	74.4	40.0
3	*5755.00	103.8 AV			1.97 V	311	63.8	40.0
4	#5945.60	60.9 PK	68.2	-7.3	1.97 V	311	54.4	6.5
5	11510.00	57.8 PK	74.0	-16.2	1.04 V	22	39.1	18.7
6	11510.00	46.6 AV	54.0	-7.4	1.04 V	22	27.9	18.7

REMARKS:

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

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	#5640.00	58.6 PK	68.2	-9.6	1.00 H	33	52.8	5.8
2	*5795.00	105.2 PK			1.00 H	33	65.2	40.0
3	*5795.00	94.5 AV			1.00 H	33	54.5	40.0
4	#5936.80	57.9 PK	68.2	-10.3	1.00 H	33	51.5	6.4
5	11590.00	56.7 PK	74.0	-17.3	1.23 H	54	38.3	18.4
6	11590.00	44.9 AV	54.0	-9.1	1.23 H	54	26.5	18.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5642.40	61.5 PK	68.2	-6.7	1.97 V	316	55.7	5.8
2	*5795.00	114.9 PK			1.97 V	316	74.9	40.0
3	*5795.00	104.4 AV			1.97 V	316	64.4	40.0
4	#5937.60	64.6 PK	68.2	-3.6	1.97 V	316	58.2	6.4
5	11590.00	58.8 PK	74.0	-15.2	1.02 V	24	40.4	18.4
6	11590.00	46.8 AV	54.0	-7.2	1.02 V	24	28.4	18.4

REMARKS:

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

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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	58.9 PK	74.0	-15.1	1.56 H	297	52.4	6.5
2	5150.00	47.0 AV	54.0	-7.0	1.56 H	297	40.5	6.5
3	*5210.00	94.9 PK			1.56 H	297	54.4	40.5
4	*5210.00	86.0 AV			1.56 H	297	45.5	40.5
5	5350.00	57.7 PK	74.0	-16.3	1.56 H	297	50.8	6.9
6	5350.00	46.0 AV	54.0	-8.0	1.56 H	297	39.1	6.9
7	#10420.00	58.2 PK	74.0	-15.8	1.06 H	31	41.2	17.0
8	#10420.00	45.0 AV	54.0	-9.0	1.06 H	31	28.0	17.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.7 PK	74.0	-5.3	2.72 V	232	62.7	6.0
2	5150.00	53.5 AV	54.0	-0.5	2.72 V	232	47.5	6.0
3	*5210.00	103.5 PK			2.72 V	232	63.4	40.1
4	*5210.00	93.4 AV			2.72 V	232	53.3	40.1
5	5350.00	58.8 PK	74.0	-15.2	2.72 V	232	52.6	6.2
6	5350.00	46.4 AV	54.0	-7.6	2.72 V	232	40.2	6.2
7	#10420.00	58.6 PK	74.0	-15.4	1.04 V	77	40.6	18.0
8	#10420.00	47.1 AV	54.0	-6.9	1.04 V	77	29.1	18.0

REMARKS:

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

CHANNEL	TX Channel 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	#5610.40	57.8 PK	68.2	-10.4	1.00 H	35	52.0	5.8
2	*5775.00	97.9 PK			1.00 H	35	57.9	40.0
3	*5775.00	88.3 AV			1.00 H	35	48.3	40.0
4	#5940.80	58.6 PK	68.2	-9.6	1.00 H	35	52.1	6.5
5	11550.00	55.8 PK	74.0	-18.2	1.20 H	55	37.1	18.7
6	11550.00	43.6 AV	54.0	-10.4	1.20 H	55	24.9	18.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.00	67.9 PK	68.2	-0.3	1.89 V	291	62.1	5.8
2	*5775.00	107.6 PK			1.89 V	291	67.6	40.0
3	*5775.00	97.7 AV			1.89 V	291	57.7	40.0
4	#5926.40	63.8 PK	68.2	-4.4	1.89 V	291	57.4	6.4
5	11550.00	57.4 PK	74.0	-16.6	1.03 V	23	38.7	18.7
6	11550.00	46.2 AV	54.0	-7.8	1.03 V	23	27.5	18.7

REMARKS:

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

Below 1GHz Worst-Case Data: 802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	35.72	31.7 QP	40.0	-8.3	1.00 H	143	46.6	-14.9
2	132.74	34.6 QP	43.5	-8.9	1.99 H	101	49.5	-14.9
3	297.68	20.6 QP	46.0	-25.4	1.00 H	12	33.5	-12.9
4	532.46	33.8 QP	46.0	-12.2	1.24 H	175	42.8	-9.0
5	613.96	42.1 QP	46.0	-3.9	1.24 H	192	48.8	-6.7
6	800.24	30.5 QP	46.0	-15.5	1.00 H	4	33.5	-3.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.66	36.6 QP	40.0	-3.4	1.00 V	17	51.3	-14.7
2	134.68	30.1 QP	43.5	-13.4	1.24 V	275	44.9	-14.8
3	301.56	20.6 QP	46.0	-25.4	1.00 V	194	33.3	-12.7
4	532.46	32.1 QP	46.0	-13.9	1.50 V	112	41.1	-9.0
5	612.02	36.2 QP	46.0	-9.8	1.99 V	118	43.0	-6.8
6	934.13	29.1 QP	46.0	-16.9	1.24 V	358	30.0	-0.9

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	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.

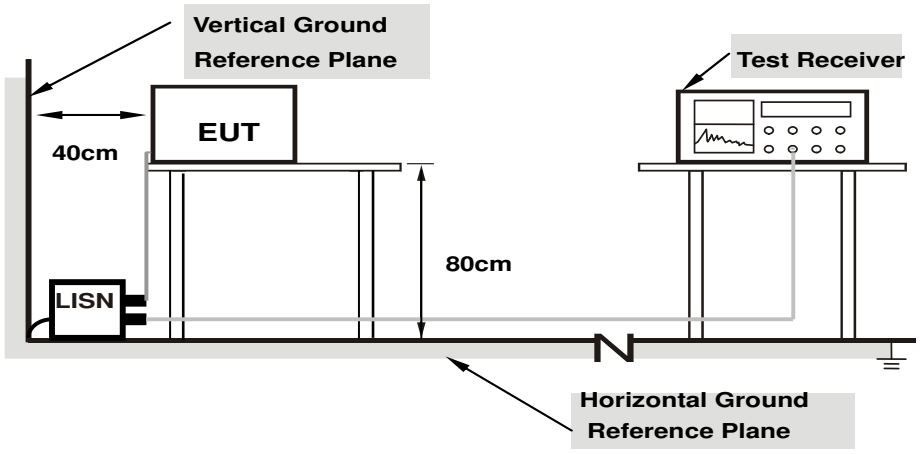
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

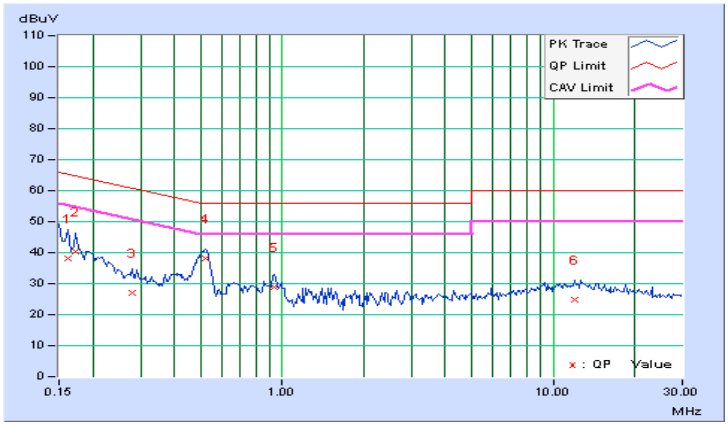
4.2.7 Test Results

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	0.16172	10.19	27.89	13.12	38.08	23.31	65.38	55.38	-27.30	-32.07
2	0.17344	10.19	30.10	19.62	40.29	29.81	64.79	54.79	-24.50	-24.98
3	0.27891	10.22	16.93	5.05	27.15	15.27	60.85	50.85	-33.70	-35.58
4	**0.52109**	**10.25**	**27.77**	**20.68**	**38.02**	**30.93**	**56.00**	**46.00**	**-17.98**	**-15.07**
5	0.93125	10.30	18.71	10.98	29.01	21.28	56.00	46.00	-26.99	-24.72
6	11.95313	10.55	14.14	6.42	24.69	16.97	60.00	50.00	-35.31	-33.03

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.

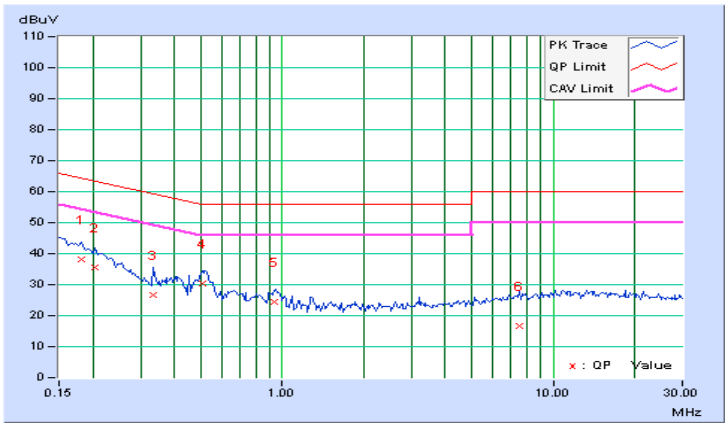


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.18125	10.20	27.82	12.13	38.02	22.33	64.43	54.43	-26.41	-32.10
2	0.20469	10.20	25.44	10.58	35.64	20.78	63.42	53.42	-27.78	-32.64
3	0.33359	10.27	16.55	3.47	26.82	13.74	59.36	49.36	-32.54	-35.62
4	0.50547	10.30	20.09	11.49	30.39	21.79	56.00	46.00	-25.61	-24.21
5	0.93125	10.29	14.03	6.47	24.32	16.76	56.00	46.00	-31.68	-29.24
6	7.54297	10.59	6.14	1.53	16.73	12.12	60.00	50.00	-43.27	-37.88

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)

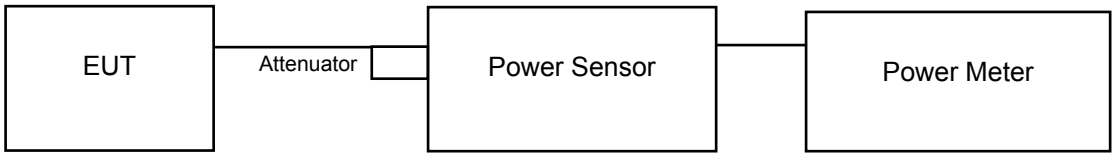
*B is the 26 dB emission bandwidth in megahertz

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 $N_{ANT} \geq 5$.

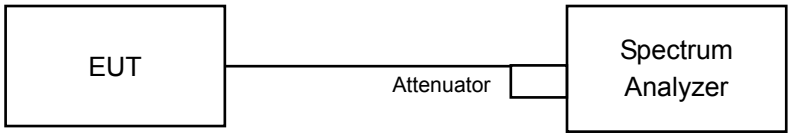
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

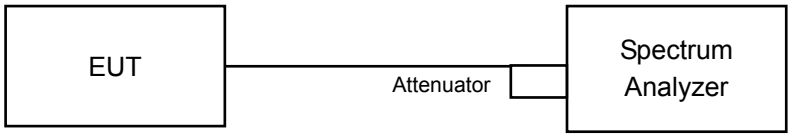
For Power Output Measurement
For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)



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:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	190.108	22.79	30	Pass
40	5200	247.742	23.94	30	Pass
48	5240	254.097	24.05	30	Pass
149	5745	273.527	24.37	30	Pass
157	5785	275.423	24.40	30	Pass
165	5825	268.534	24.29	30	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	185.353	22.68	30	Pass
40	5200	**255.270**	24.07	30	Pass
48	5240	252.348	24.02	30	Pass
149	5745	**281.190**	24.49	30	Pass
157	5785	271.644	24.34	30	Pass
165	5825	269.153	24.30	30	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	88.920	19.49	30	Pass
46	5230	244.343	23.88	30	Pass
151	5755	257.632	24.11	30	Pass
159	5795	256.448	24.09	30	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
42	5210	76.208	18.82	30	Pass
155	5775	255.859	24.08	30	Pass

26dB Bandwidth:

802.11a

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
36	5180	32.87	Pass
40	5200	38.66	Pass
48	5240	39.35	Pass

802.11ac (VHT20)

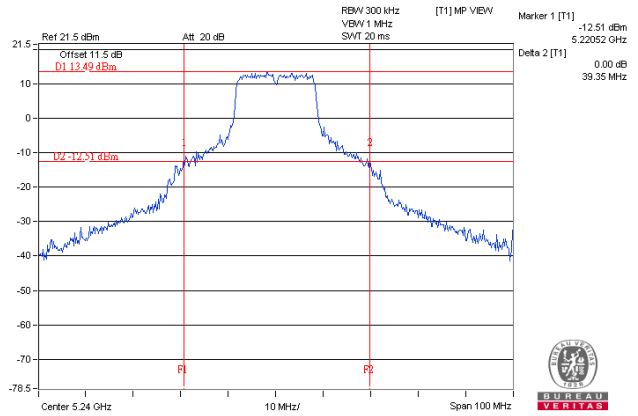
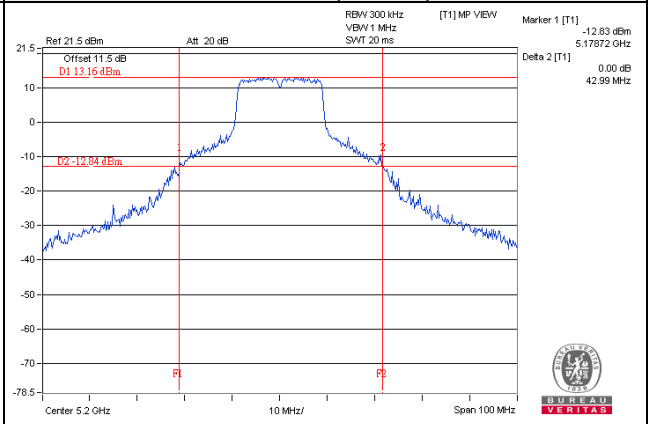
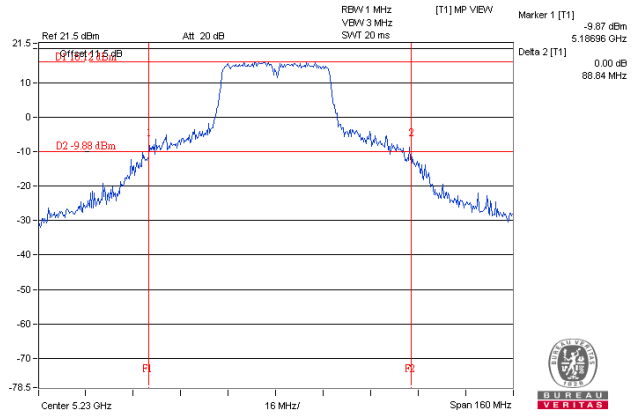
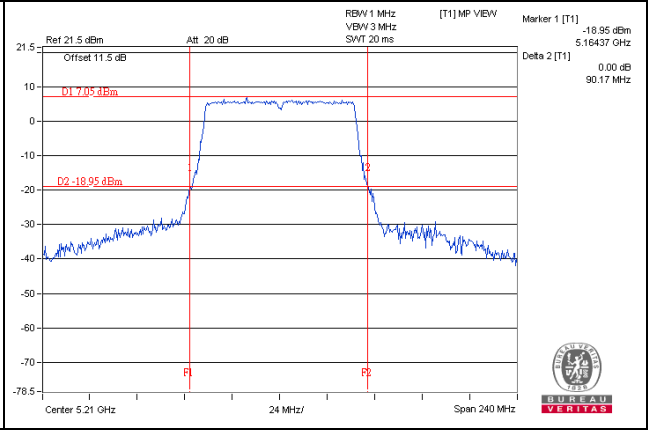
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
36	5180	27.75	Pass
40	5200	42.99	Pass
48	5240	40.40	Pass

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
38	5190	47.51	Pass
46	5230	88.84	Pass

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
42	5210	90.17	Pass

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

Occupied Bandwidth:

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.28
40	5200	18.72
48	5240	18.36
149	5745	40.80
157	5785	40.56
165	5825	41.04

802.11ac (VHT20)

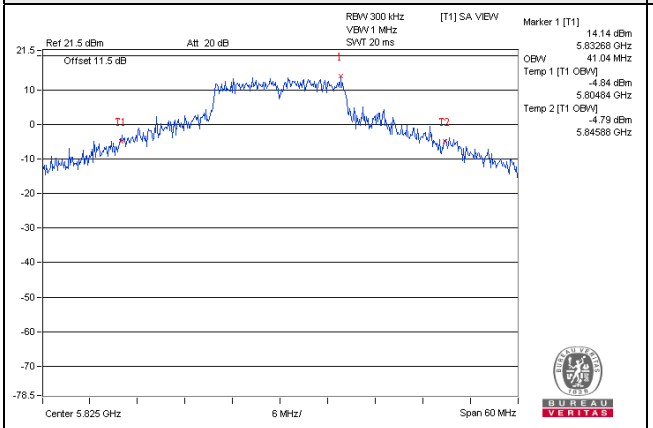
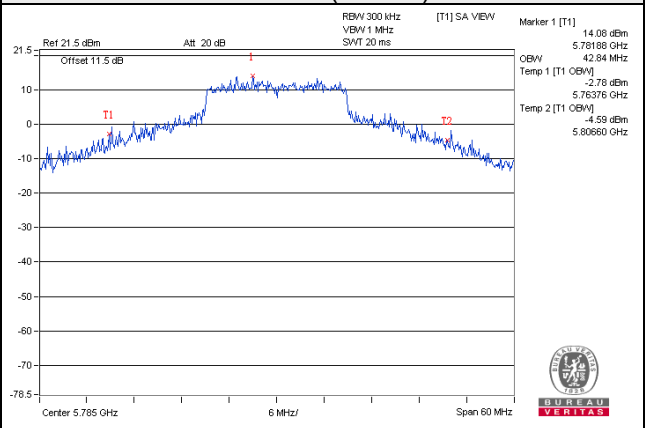
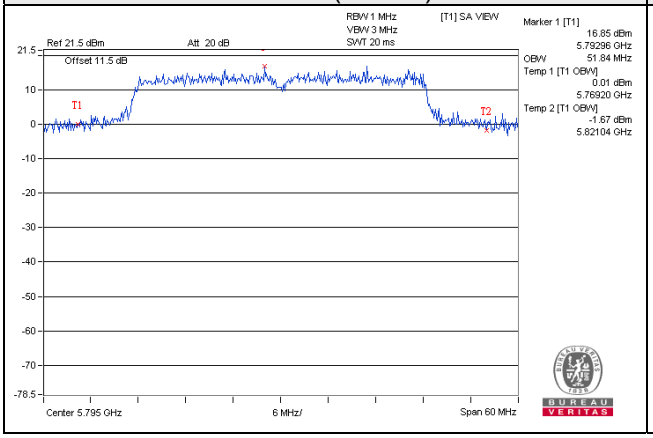
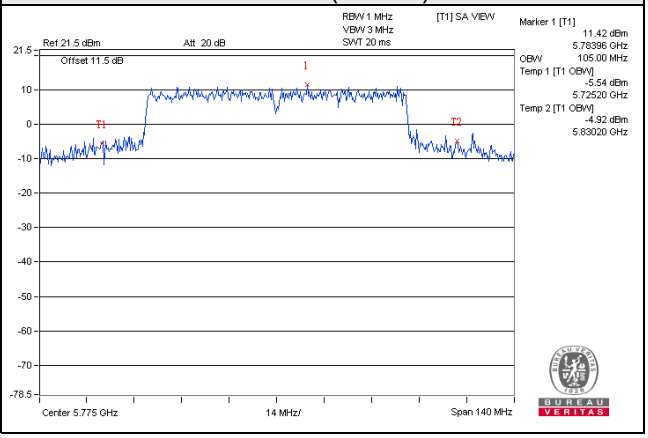
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	18.12
40	5200	21.24
48	5240	19.56
149	5745	42.36
157	5785	42.84
165	5825	42.00

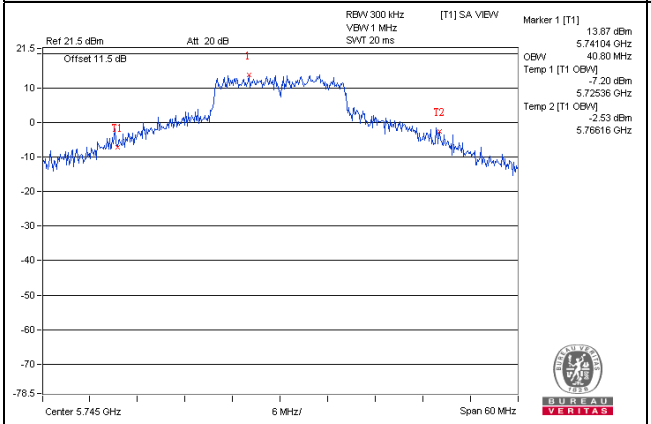
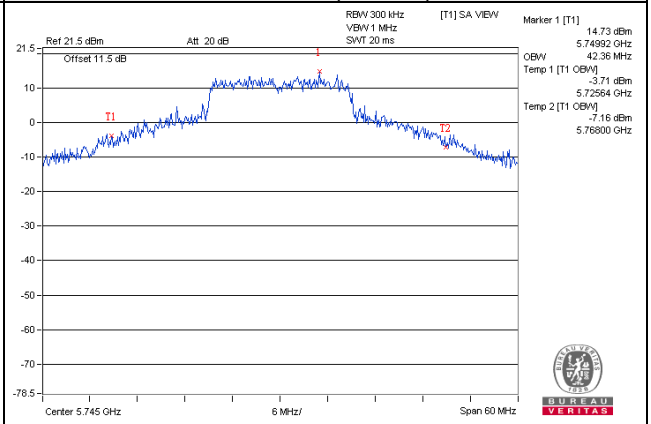
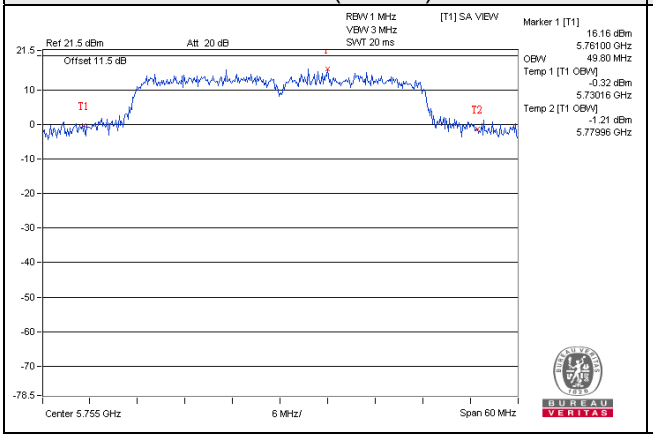
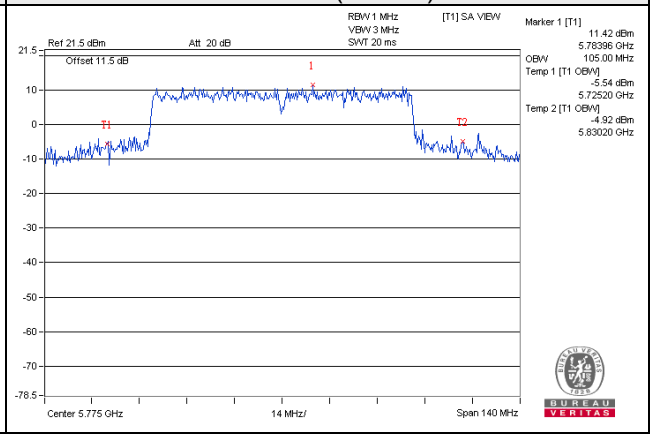
802.11ac (VHT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
38	5190	36.84
46	5230	39.00
151	5755	49.80
159	5795	51.84

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
42	5210	76.44
155	5775	105.00

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

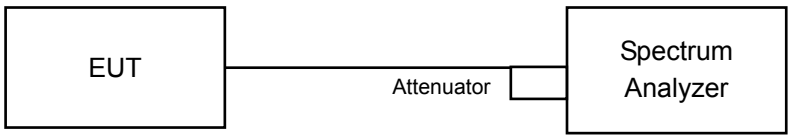
Low Channel of U-NII-3 band	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test 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:

802.11a

Chan.	Freq. (MHz)	PSD (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
36	5180	6.63	0.18	6.81	17	Pass
40	5200	7.75	0.18	7.93	17	Pass
48	5240	7.87	0.18	8.05	17	Pass

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

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
36	5180	6.63	0.14	6.77	17	Pass
40	5200	7.99	0.14	8.13	17	Pass
48	5240	7.56	0.14	7.70	17	Pass

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

802.11ac (VHT40)

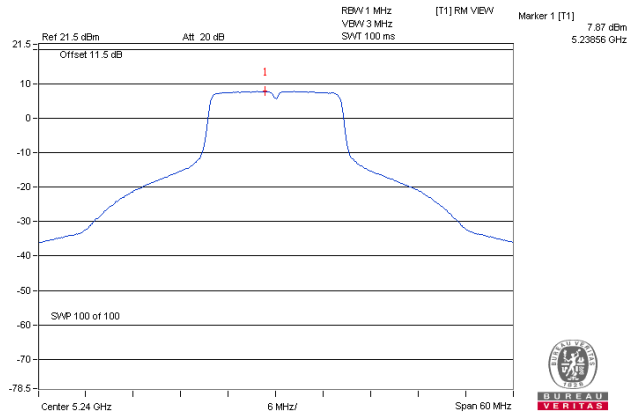
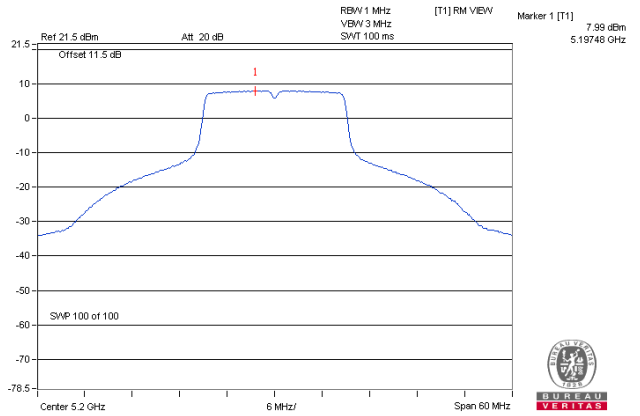
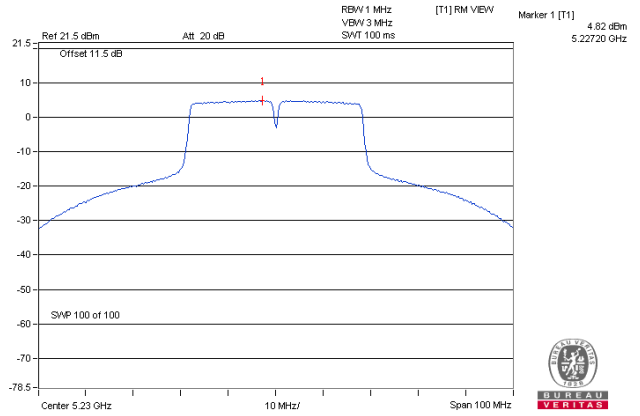
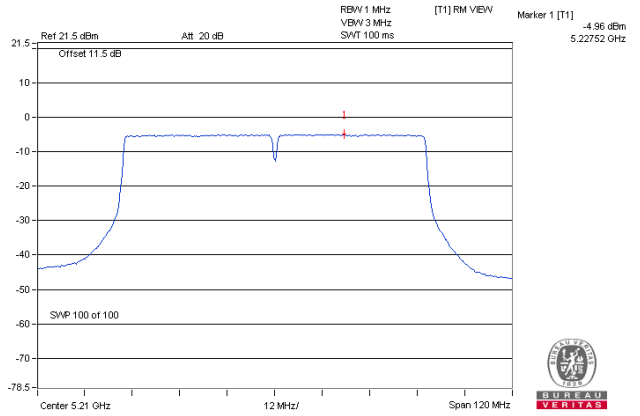
Chan.	Freq. (MHz)	PSD (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
38	5190	-1.03	0.17	-0.86	17	Pass
46	5230	4.82	0.17	4.99	17	Pass

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

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
42	5210	-4.96	0.39	-4.57	17	Pass

Note: 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)
	

For U-NII-3 band:

802.11a

Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
149	5745	1.00	3.22	0.18	3.40	30	Pass
157	5785	0.87	3.09	0.18	3.27	30	Pass
165	5825	0.97	3.19	0.18	3.37	30	Pass

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

802.11ac (VHT20)

Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
149	5745	0.75	2.97	0.14	3.11	30	Pass
157	5785	0.77	2.99	0.14	3.13	30	Pass
165	5825	0.76	2.98	0.14	3.12	30	Pass

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

802.11ac (VHT40)

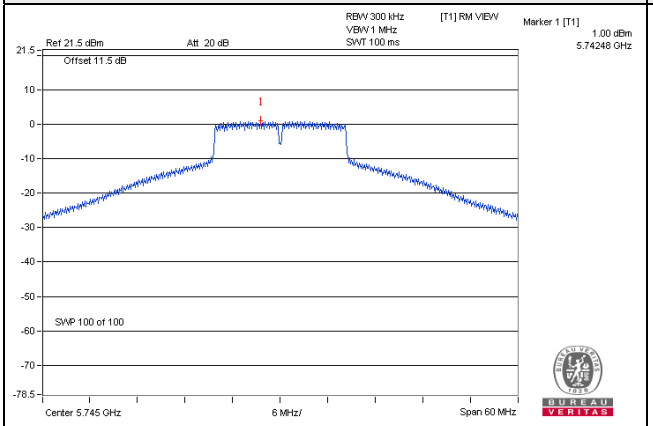
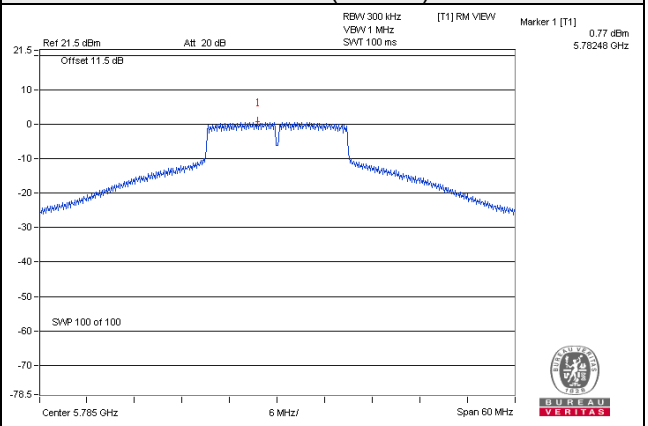
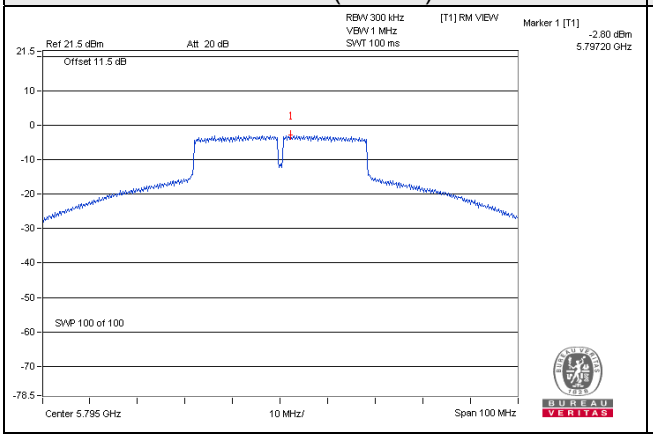
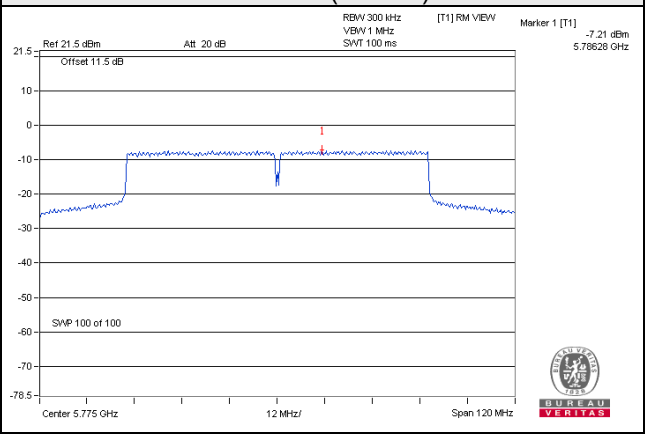
Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
151	5755	-3.14	-0.92	0.17	-0.75	30	Pass
159	5795	-2.80	-0.58	0.17	-0.41	30	Pass

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

802.11ac (VHT80)

Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
155	5775	-7.21	-4.99	0.39	-4.60	30	Pass

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

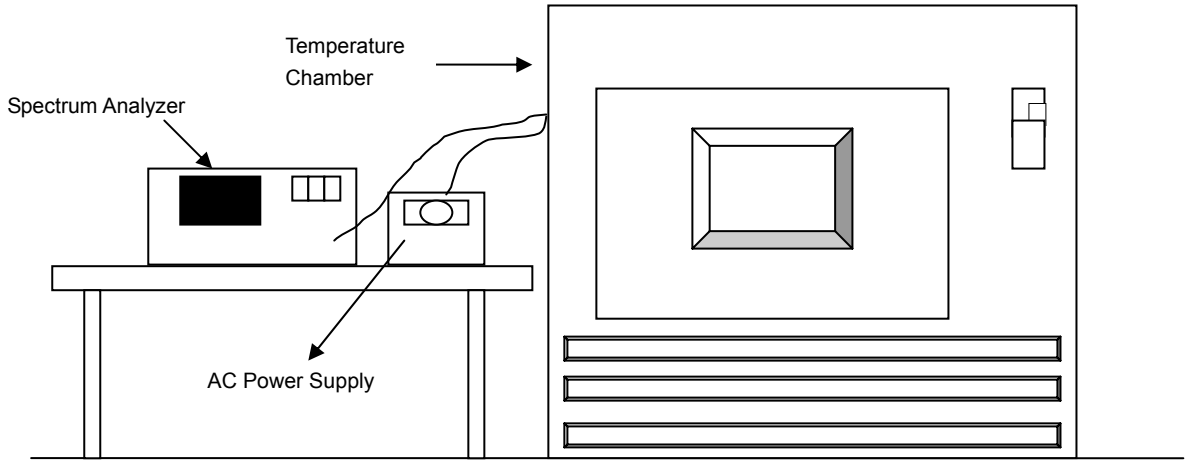
Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	

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	5179.9922	-0.00015	5179.9899	-0.00019	5179.9898	-0.00020	5179.9886	-0.00022
40	120	5180.019	0.00037	5180.0192	0.00037	5180.0179	0.00035	5180.0184	0.00036
30	120	5180.0052	0.00010	5180.0055	0.00011	5180.0075	0.00014	5180.0039	0.00008
20	120	5179.9895	-0.00020	5179.9857	-0.00028	5179.9893	-0.00021	5179.9885	-0.00022
10	120	5179.9848	-0.00029	5179.9808	-0.00037	5179.9836	-0.00032	5179.9808	-0.00037
0	120	5179.9927	-0.00014	5179.9958	-0.00008	5179.9929	-0.00014	5179.9923	-0.00015
-10	120	5179.9772	-0.00044	5179.9772	-0.00044	5179.9771	-0.00044	5179.9784	-0.00042
-20	120	5180.0186	0.00036	5180.0197	0.00038	5180.0174	0.00034	5180.0186	0.00036
-30	120	5180.0145	0.00028	5180.0106	0.00020	5180.0129	0.00025	5180.0119	0.00023

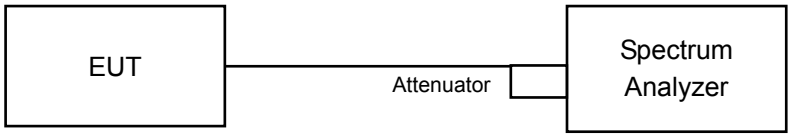
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9892	-0.00021	5179.9847	-0.00030	5179.9895	-0.00020	5179.9885	-0.00022
	120	5179.9895	-0.00020	5179.9857	-0.00028	5179.9893	-0.00021	5179.9885	-0.00022
	102	5179.9901	-0.00019	5179.9857	-0.00028	5179.9903	-0.00019	5179.9887	-0.00022

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

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.42	0.5	Pass
157	5785	16.39	0.5	Pass
165	5825	16.41	0.5	Pass

802.11ac (VHT20)

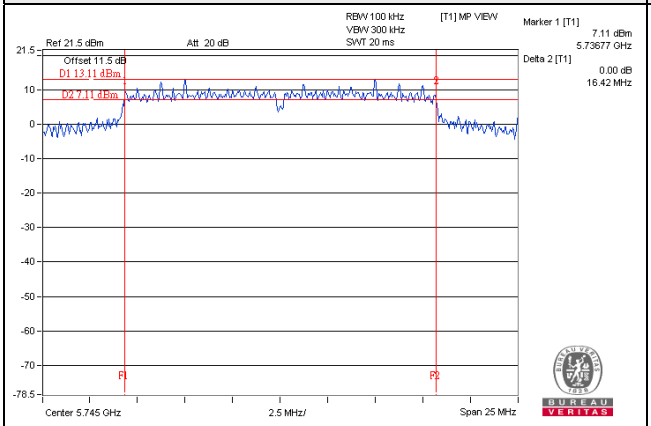
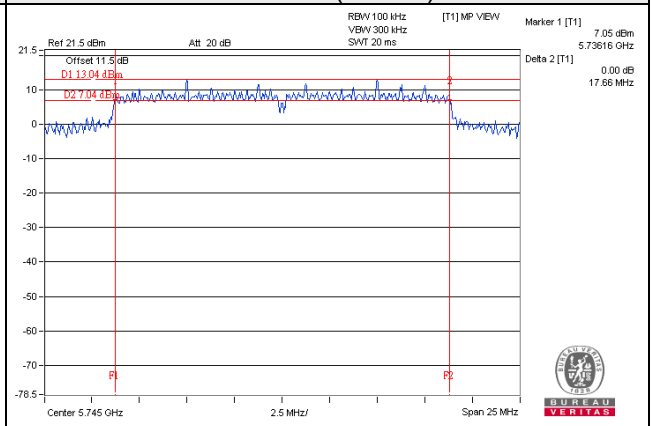
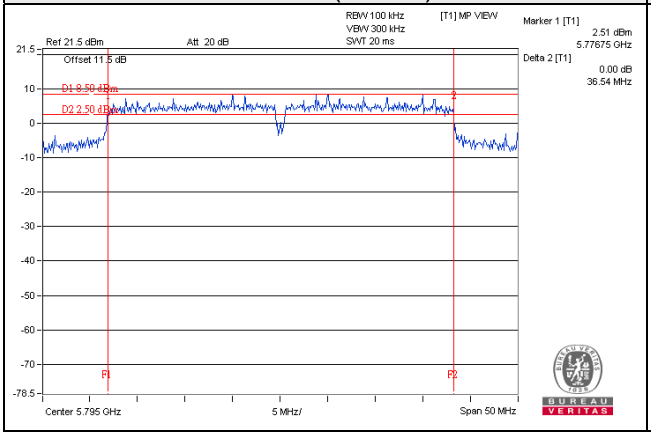
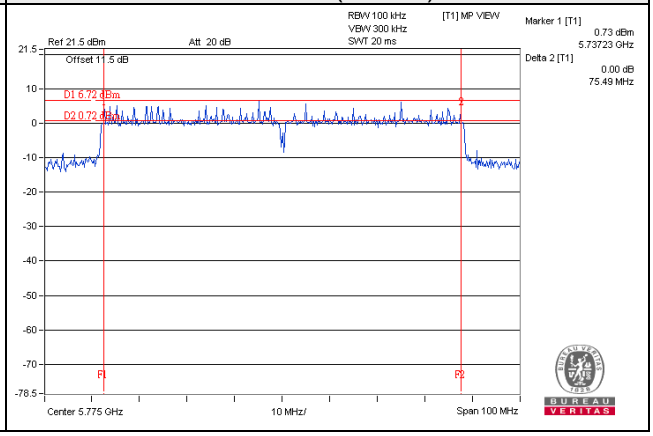
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	17.66	0.5	Pass
157	5785	17.63	0.5	Pass
165	5825	17.62	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	36.49	0.5	Pass
159	5795	36.54	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
155	5775	75.49	0.5	Pass

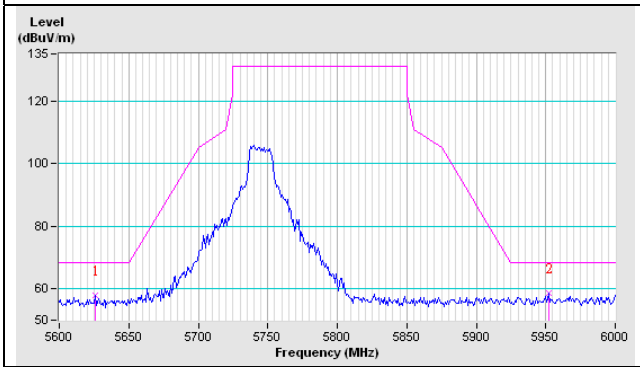
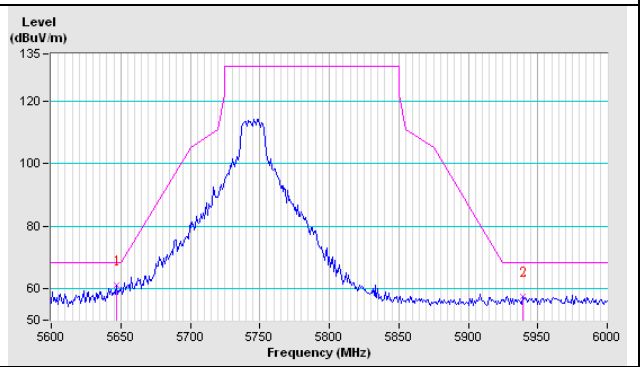
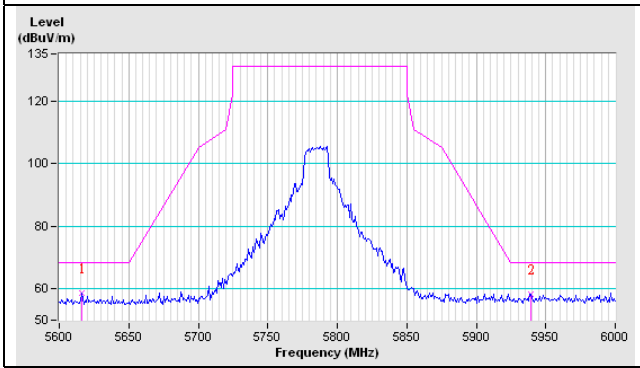
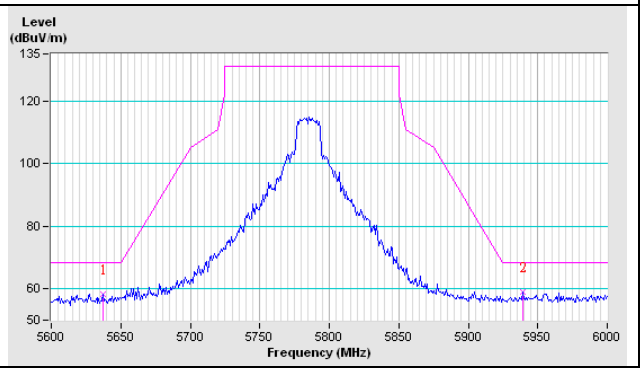
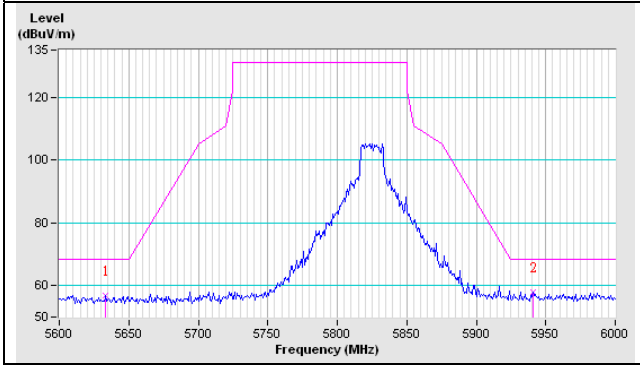
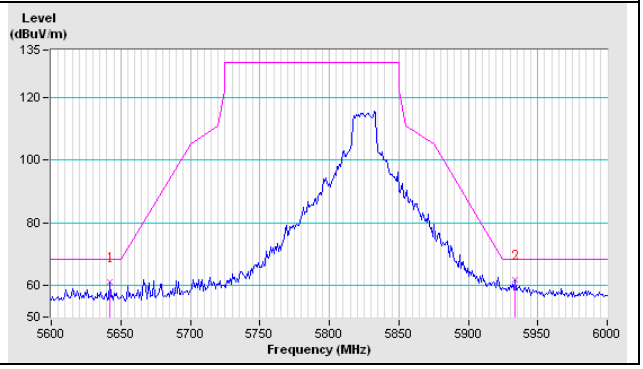
Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	

5 Pictures of Test Arrangements

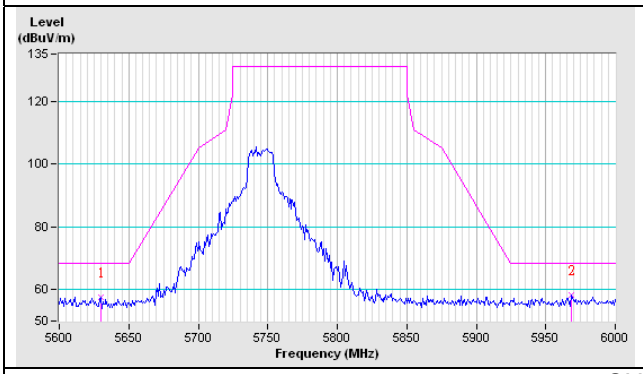
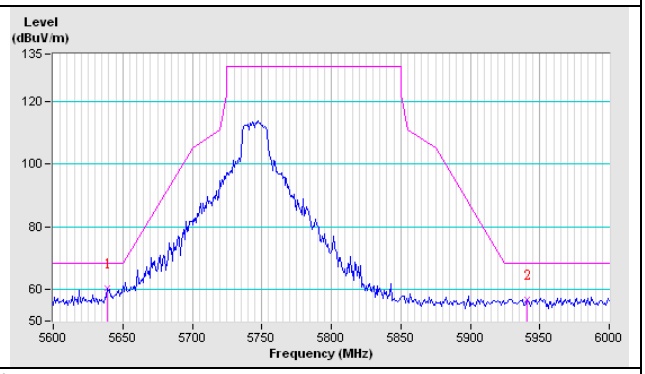
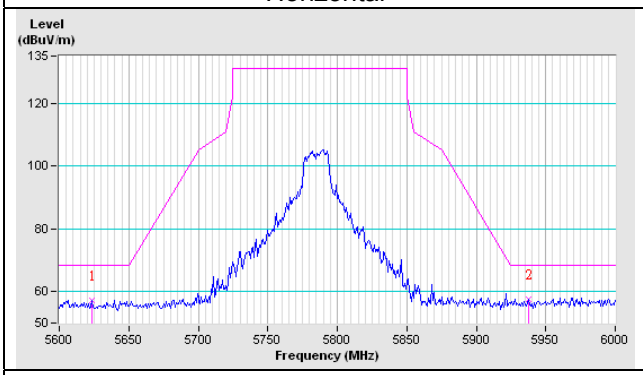
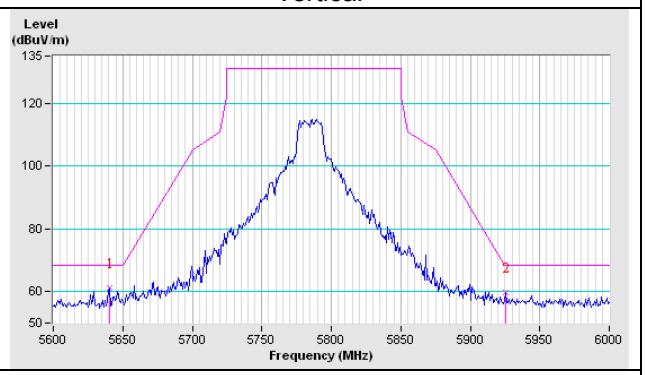
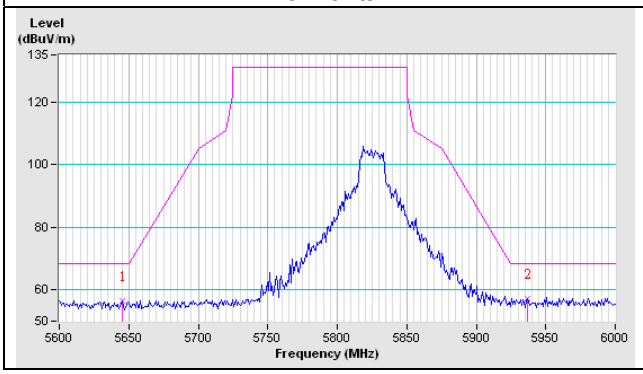
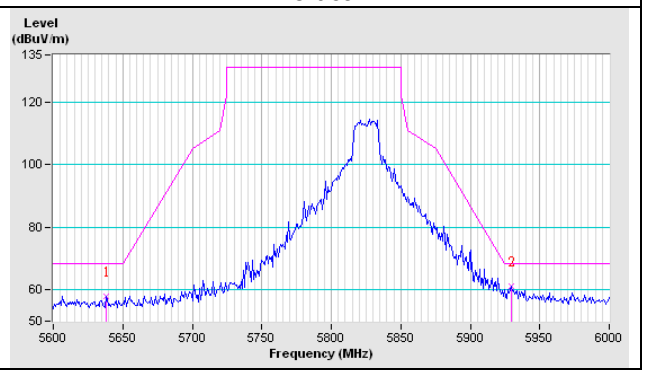
Please refer to the attached file (Test Setup Photo).

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

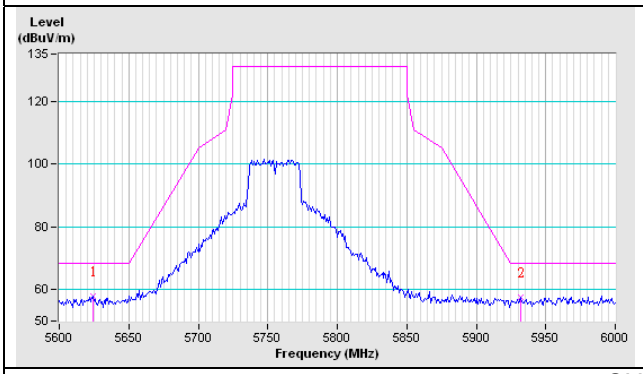
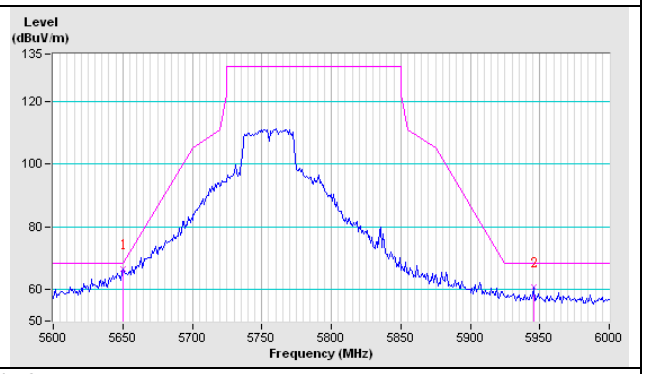
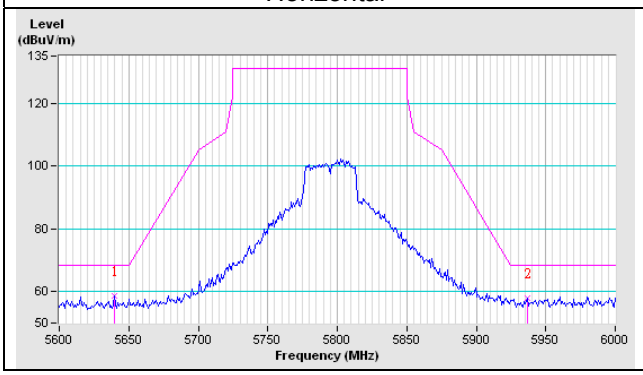
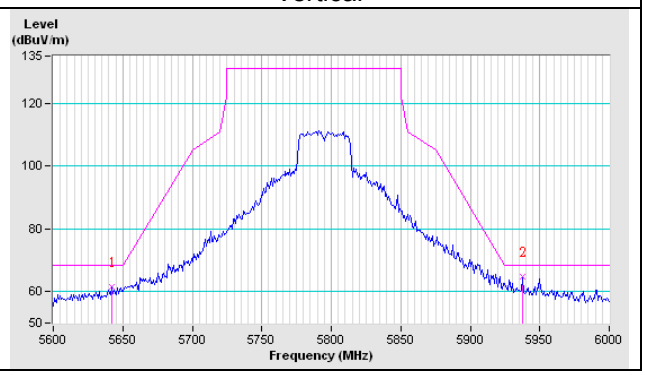
802.11a

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

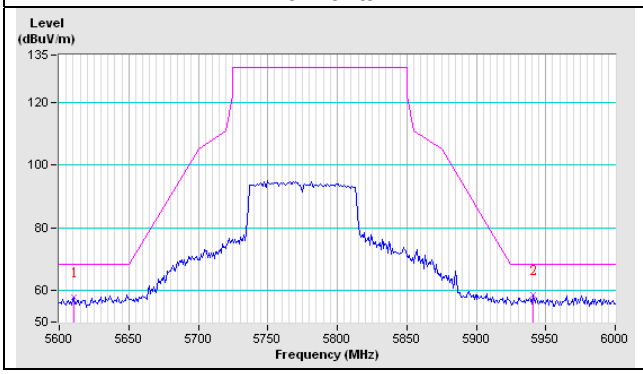
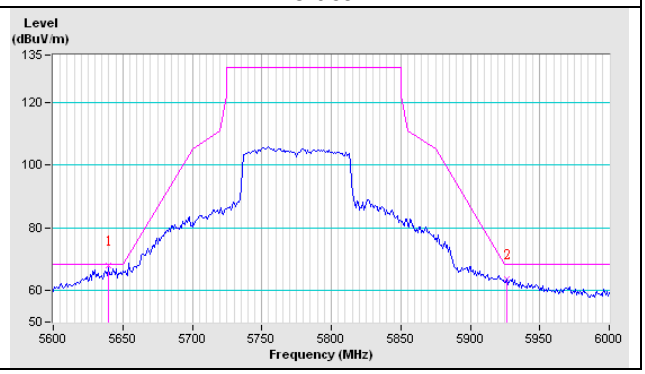
802.11ac (VHT20)

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11ac (VHT40)

CH151	
Horizontal	Vertical
	
CH159	
Horizontal	Vertical
	

802.11ac (VHT80)

CH155	
Horizontal	Vertical
	

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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