FCC Test Report

Report No.:	RF161017C17-1
FCC ID:	PY315400332
Test Model:	C6220
Received Date:	Oct. 17, 2016
Test Date:	Oct. 24 to Nov. 03, 2016
Issued Date:	Nov. 23, 2016
Applicant:	NETGEAR, INC.
Address:	350 East Plumeria Drive San Jose, CA 95134
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF161017C17-1	Original release.	Nov. 23, 2016

1 Certificate of Conformity

Product:	Cable Gateway
Brand:	Netgear
Test Model:	C6220
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, INC.
Test Date:	Oct. 24 to Nov. 03, 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 : Nico Liu , **Date:** Nov. 23, 2016

Nico Liu / Specialist

Approved by : , **Date:** Nov. 23, 2016

May Chen / 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 -14.99 dB at 0.15000 MHz.
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.
---	Occupied Bandwidth Measurement	-	Reference only.
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	No antenna connector is used.

*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	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.34 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.41 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	3.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Cable Gateway
Brand	Netgear
Test Model	C6220
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866Mbps
Operating Frequency	**For 2.4GHz** 2.412 ~ 2.462GHz
	For 5GHz 5.18 ~ 5.24GHz and 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (VHT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (VHT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz** **CDD Mode** 771.87mW
	5GHz: **5.18GHz ~ 5.24GHz:** **CDD Mode** 418.994mW **Beamforming Mode** 390.064mW **5.745GHz ~ 5.825GHz:** **CDD Mode** 539.27mW **Beamforming Mode** 565.69mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	WLAN (5GHz)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

2. The EUT must be supplied with a power adapter following table:

No	Brand Name	Model No.	PN	Spec.
1	NETGEAR	AD2067F10	332-10797-01	Input: 100-120Vac, 50/60Hz, 1.0A Output: 12Vdc, 2.5A DC cable 1.85m

3. The antennas provided to the EUT, please refer to the following table:

Antenna No.	Brand	Model	Antenna Gain(dBi)	Frequency range	Antenna connector	Antenna Type
ant_1	NA	NA	1.67	2.4~2.4835GHz	R-SMA	Dipole
			2.26	5.15~5.25GHz		
			2.41	5.725~5.85GHz		
ant_2	NA	NA	2.46	2.4~2.4835GH	R-SMA	Dipole
			3.69	5.15~5.25GHz		
			3.73	5.725~5.85GHz		

4. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	1TX diversity	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (VHT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (VHT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

Note:
1. All of modulation mode support beamforming function except 802.11a modulation mode and 2.4GHz band.
2. For 802.11b mode will select ant_1 for the final test.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (VHT20), 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	
A	√	√	√	√	Powered by adapter
B	-	√	√	-	Powered by POE

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
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
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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5745-5825	149 to 165	149	OFDM	BPSK	6.5

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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5745-5825	149 to 165	149	OFDM	BPSK	6.5

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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
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	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
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	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

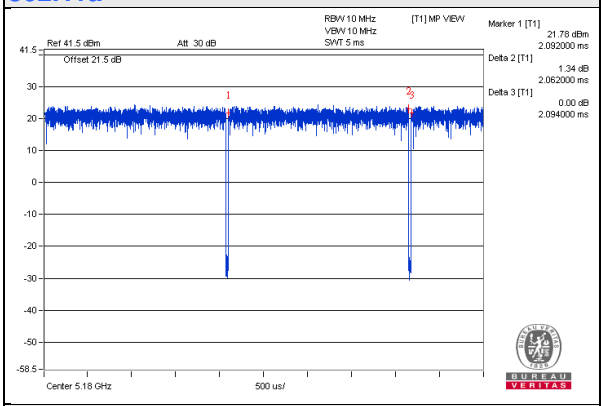
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	21deg. C, 66%RH	120Vac, 60Hz	Robert Cheng
RE<1G	27deg. C, 74%RH	120Vac, 60Hz	Robert Cheng
PLC	25deg. C, 60%RH	120Vac, 60Hz	Barry Lee
APCM	25deg. C, 60%RH	120Vac, 60Hz	Gary Cheng

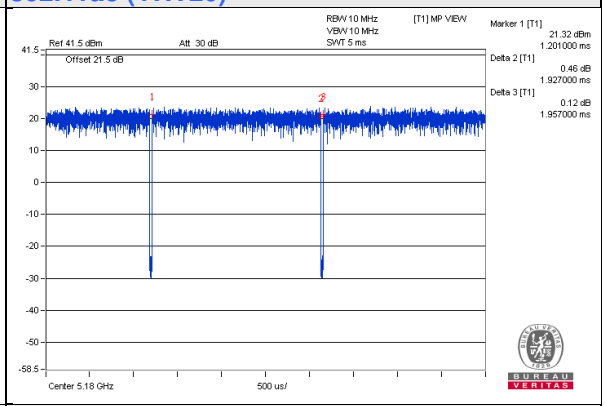
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.062ms/2.094ms = 0.984
802.11ac (VHT20): Duty cycle = 1.927ms/1.957ms = 0.984
802.11ac (VHT40): Duty cycle = 0.951ms/0.981ms = 0.969, Duty factor = 10 * log(1/0.969) = 0.16
802.11ac (VHT80): Duty cycle = 0.459ms/0.488ms = 0.940, Duty factor = 10 * log(1/0.940) = 0.18

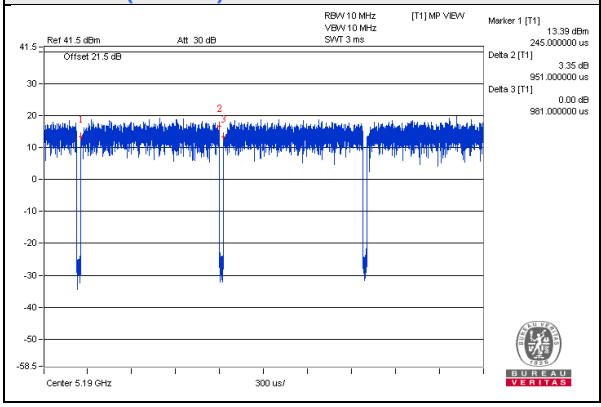
802.11a



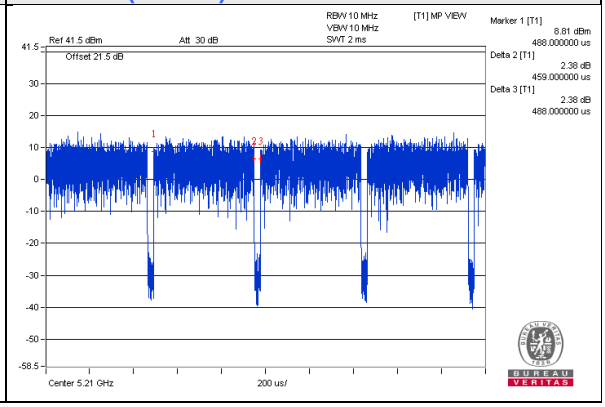
802.11ac (VHT20)



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.

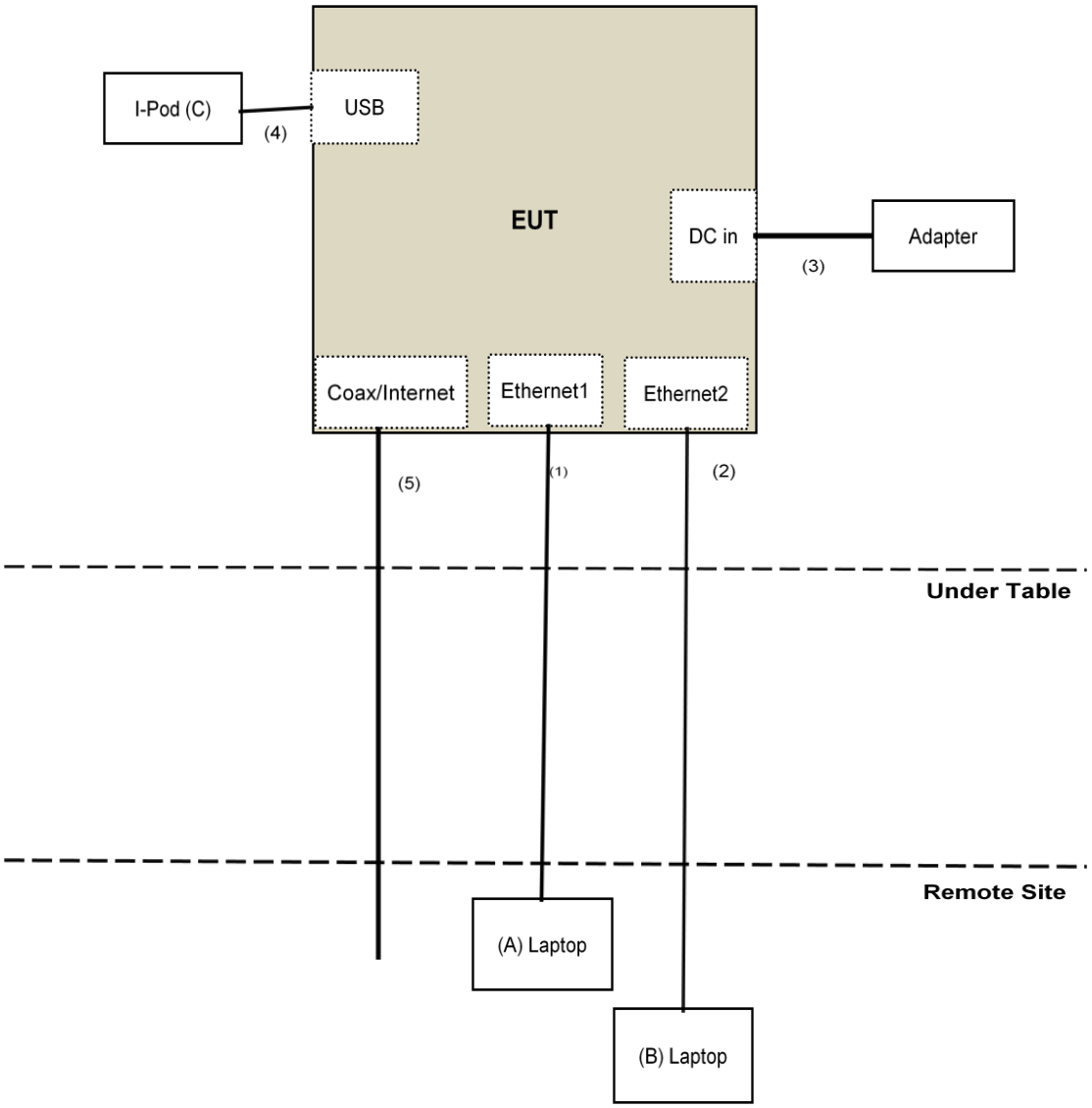
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	PP32LA	FSLB32S	FCC DoC	Provided by Lab
B.	Laptop	LENOVO	E440	PF071LWC	NA	Provided by Lab
C.	iPod	Apple	MD778TA/A	CC4JG680F4T1	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	DC Cable	1	1.85	No	0	Supplied by client
4.	USB Cable	1	0.1	Yes	0	Provided by Lab
5.	Coaxial Cable	1	10	Yes	0	Provided by Lab

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)
KDB 789033 D02 General UNII Test Procedure 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

<table>
<tr><td colspan="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r03</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBµV/m)</td><td>AV:54 (dBµV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBµV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBµV/m) *1
PK:105.2 (dBµV/m) *2
PK: 110.8(dBµV/m) *3
PK:122.2 (dBµV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2015	Nov. 09, 2016

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: Nov. 03, 2016

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case 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.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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:

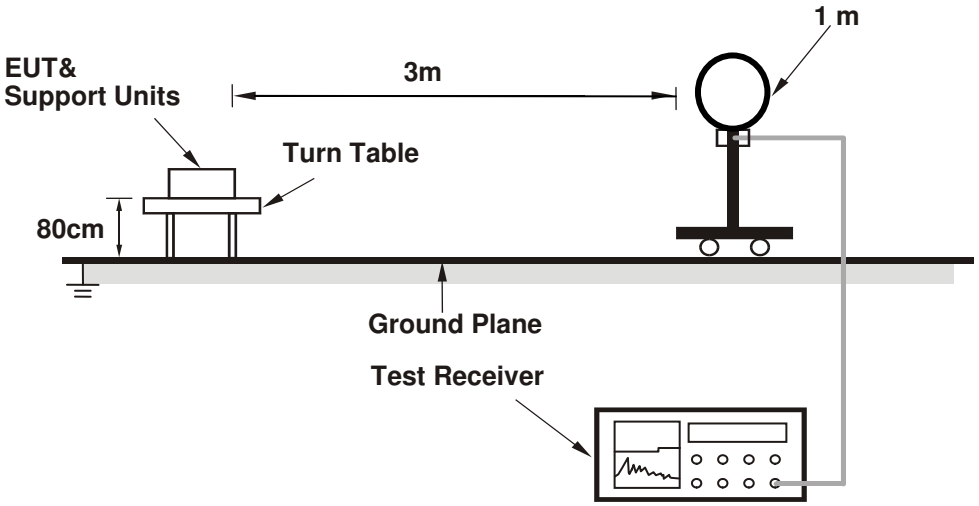
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

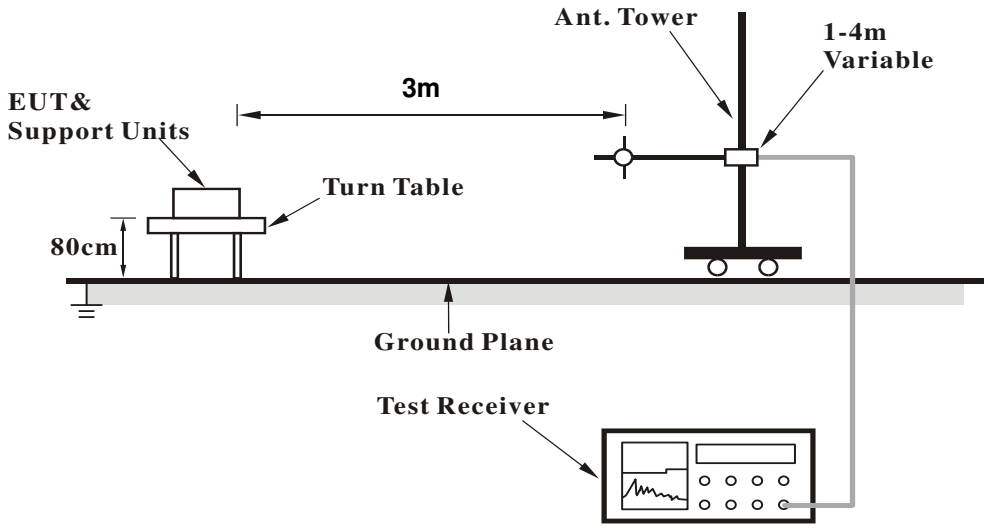
No deviation.

4.1.5 Test Setup

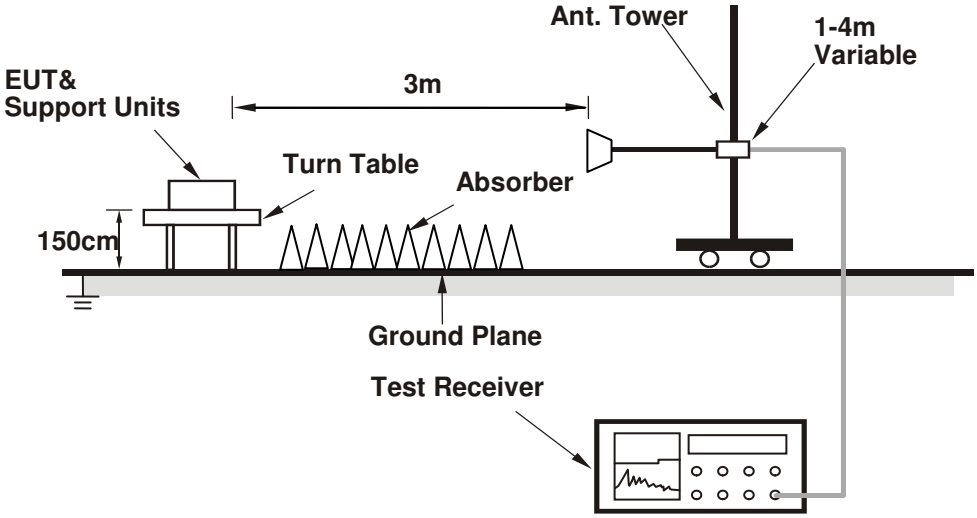
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the laptop which is placed on remote site.
b. Contorlling software (MTool_2.0.1.1.exe) has been activated to set the EUT on specific status.

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	64.0 PK	74.0	-10.0	2.30 H	223	62.5	1.5
2	5150.00	49.2 AV	54.0	-4.8	2.30 H	223	47.7	1.5
3	*5180.00	109.3 PK			2.30 H	223	107.7	1.6
4	*5180.00	98.5 AV			2.30 H	223	96.9	1.6
5	#10360.00	48.9 PK	74.0	-25.1	1.85 H	182	37.4	11.5
6	#10360.00	38.7 AV	54.0	-15.3	1.85 H	182	27.2	11.5
7	15540.00	50.5 PK	74.0	-23.5	1.63 H	341	37.4	13.1
8	15540.00	39.5 AV	54.0	-14.5	1.63 H	341	26.4	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.1 PK	74.0	-4.9	2.43 V	160	67.6	1.5
2	5150.00	53.5 AV	54.0	-0.5	2.43 V	160	52.0	1.5
3	*5180.00	114.6 PK			2.43 V	160	113.0	1.6
4	*5180.00	104.0 AV			2.43 V	160	102.4	1.6
5	#10360.00	51.2 PK	74.0	-22.8	2.94 V	227	39.7	11.5
6	#10360.00	40.2 AV	54.0	-13.8	2.94 V	227	28.7	11.5
7	15540.00	51.1 PK	74.0	-22.9	2.46 V	190	38.0	13.1
8	15540.00	40.4 AV	54.0	-13.6	2.46 V	190	27.3	13.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	64.0 PK	74.0	-10.0	2.25 H	220	62.5	1.5
2	5150.00	49.0 AV	54.0	-5.0	2.25 H	220	47.5	1.5
3	*5200.00	113.1 PK			2.25 H	220	111.4	1.7
4	*5200.00	102.3 AV			2.25 H	220	100.6	1.7
5	#10400.00	53.1 PK	74.0	-20.9	1.65 H	173	41.5	11.6
6	#10400.00	41.5 AV	54.0	-12.5	1.65 H	173	29.9	11.6
7	15600.00	52.2 PK	74.0	-21.8	1.77 H	300	39.1	13.1
8	15600.00	40.6 AV	54.0	-13.4	1.77 H	300	27.5	13.1
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	67.3 PK	74.0	-6.7	2.41 V	151	65.8	1.5
2	5150.00	53.3 AV	54.0	-0.7	2.41 V	151	51.8	1.5
3	*5200.00	119.9 PK			2.41 V	151	118.2	1.7
4	*5200.00	108.8 AV			2.41 V	151	107.1	1.7
5	#10400.00	56.1 PK	74.0	-17.9	2.90 V	234	44.5	11.6
6	#10400.00	44.3 AV	54.0	-9.7	2.90 V	234	32.7	11.6
7	15600.00	52.6 PK	74.0	-21.4	2.50 V	177	39.5	13.1
8	15600.00	41.4 AV	54.0	-12.6	2.50 V	177	28.3	13.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	111.8 PK			2.28 H	215	110.2	1.6
2	*5240.00	101.1 AV			2.28 H	215	99.5	1.6
3	5396.60	61.8 PK	74.0	-12.2	2.28 H	215	59.7	2.1
4	5396.60	46.3 AV	54.0	-7.7	2.28 H	215	44.2	2.1
5	#10480.00	49.5 PK	74.0	-24.5	1.87 H	174	37.5	12.0
6	#10480.00	39.1 AV	54.0	-14.9	1.87 H	174	27.1	12.0
7	15720.00	50.2 PK	74.0	-23.8	1.69 H	337	37.0	13.2
8	15720.00	39.2 AV	54.0	-14.8	1.69 H	337	26.0	13.2
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	*5240.00	118.0 PK			2.45 V	135	116.4	1.6
2	*5240.00	107.1 AV			2.45 V	135	105.5	1.6
3	5396.60	58.3 PK	74.0	-15.7	2.41 V	151	56.2	2.1
4	5396.60	48.5 AV	54.0	-5.5	2.41 V	151	46.4	2.1
5	#10480.00	50.9 PK	74.0	-23.1	2.98 V	226	38.9	12.0
6	#10480.00	40.1 AV	54.0	-13.9	2.98 V	226	28.1	12.0
7	15720.00	51.4 PK	74.0	-22.6	2.46 V	192	38.2	13.2
8	15720.00	40.7 AV	54.0	-13.3	2.46 V	192	27.5	13.2

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) – 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	#5553.80	61.3 PK	68.2	-6.9	3.77 H	190	58.8	2.5
2	*5745.00	112.1 PK			3.71 H	190	109.4	2.7
3	*5745.00	103.5 AV			3.71 H	190	100.8	2.7
4	#5934.75	61.4 PK	68.2	-6.8	3.77 H	190	58.3	3.1
5	11490.00	53.3 PK	74.0	-20.7	1.77 H	170	39.9	13.4
6	11490.00	41.6 AV	54.0	-12.4	1.77 H	170	28.2	13.4
7	#17235.00	56.9 PK	74.0	-17.1	1.76 H	320	38.6	18.3
8	#17235.00	46.1 AV	54.0	-7.9	1.76 H	320	27.8	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	#5590.37	63.1 PK	68.2	-5.1	2.42 V	160	60.6	2.5
2	*5745.00	120.4 PK			2.42 V	160	117.7	2.7
3	*5745.00	109.4 AV			2.42 V	160	106.7	2.7
4	#5936.65	63.0 PK	68.2	-5.2	2.42 V	160	59.9	3.1
5	11490.00	53.0 PK	74.0	-21.0	2.88 V	240	39.6	13.4
6	11490.00	41.9 AV	54.0	-12.1	2.88 V	240	28.5	13.4
7	#17235.00	57.6 PK	74.0	-16.4	2.40 V	178	39.3	18.3
8	#17235.00	46.0 AV	54.0	-8.0	2.40 V	178	27.7	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) – 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	#5626.95	61.5 PK	68.2	-6.7	3.74 H	190	58.9	2.6
2	*5785.00	111.6 PK			3.74 H	190	108.9	2.7
3	*5785.00	103.2 AV			3.74 H	190	100.5	2.7
4	#5979.40	62.1 PK	68.2	-6.1	3.74 H	190	58.8	3.3
5	11570.00	53.2 PK	74.0	-20.8	1.77 H	169	40.1	13.1
6	11570.00	41.5 AV	54.0	-12.5	1.77 H	169	28.4	13.1
7	#17355.00	56.8 PK	74.0	-17.2	1.78 H	313	38.0	18.8
8	#17355.00	45.9 AV	54.0	-8.1	1.78 H	313	27.1	18.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5621.73	63.8 PK	68.2	-4.4	2.42 V	157	61.2	2.6
2	*5785.00	120.7 PK			2.42 V	157	118.0	2.7
3	*5785.00	109.7 AV			2.42 V	157	107.0	2.7
4	#5947.10	64.9 PK	68.2	-3.3	2.42 V	157	61.8	3.1
5	11570.00	53.5 PK	74.0	-20.5	2.93 V	245	40.4	13.1
6	11570.00	42.4 AV	54.0	-11.6	2.93 V	245	29.3	13.1
7	#17355.00	57.8 PK	74.0	-16.2	2.36 V	183	39.0	18.8
8	#17355.00	46.2 AV	54.0	-7.8	2.36 V	183	27.4	18.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5630.75	60.8 PK	68.2	-7.4	3.67 H	188	58.2	2.6
2	*5825.00	110.7 PK			3.67 H	188	108.0	2.7
3	*5825.00	102.4 AV			3.67 H	188	99.7	2.7
4	#5987.00	61.9 PK	68.2	-6.3	3.67 H	188	58.6	3.3
5	11650.00	53.1 PK	74.0	-20.9	1.72 H	173	40.0	13.1
6	11650.00	41.3 AV	54.0	-12.7	1.72 H	173	28.2	13.1
7	#17475.00	57.1 PK	74.0	-16.9	1.73 H	315	37.9	19.2
8	#17475.00	46.1 AV	54.0	-7.9	1.73 H	315	26.9	19.2
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	#5587.05	63.5 PK	68.2	-4.7	2.36 V	168	61.0	2.5
2	*5825.00	120.7 PK			2.36 V	168	118.0	2.7
3	*5825.00	109.8 AV			2.36 V	168	107.1	2.7
4	#5992.23	63.9 PK	68.2	-4.3	2.36 V	168	60.5	3.4
5	11650.00	53.8 PK	74.0	-20.2	2.89 V	231	40.7	13.1
6	11650.00	42.9 AV	54.0	-11.1	2.89 V	231	29.8	13.1
7	#17475.00	58.0 PK	74.0	-16.0	2.34 V	176	38.8	19.2
8	#17475.00	46.5 AV	54.0	-7.5	2.34 V	176	27.3	19.2

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) – 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	64.1 PK	74.0	-9.9	2.31 H	211	62.6	1.5
2	5150.00	49.5 AV	54.0	-4.5	2.31 H	211	48.0	1.5
3	*5180.00	108.3 PK			2.31 H	211	106.7	1.6
4	*5180.00	98.1 AV			2.31 H	211	96.5	1.6
5	#10360.00	48.9 PK	74.0	-25.1	1.85 H	169	37.4	11.5
6	#10360.00	38.6 AV	54.0	-15.4	1.85 H	169	27.1	11.5
7	15540.00	51.0 PK	74.0	-23.0	1.63 H	324	37.9	13.1
8	15540.00	39.8 AV	54.0	-14.2	1.63 H	324	26.7	13.1
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	73.7 PK	74.0	-0.3	3.11 V	288	72.2	1.5
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**3.11 V**	**288**	**52.4**	**1.5**
3	*5180.00	114.9 PK			3.11 V	288	113.3	1.6
4	*5180.00	104.2 AV			3.11 V	288	102.6	1.6
5	#10360.00	50.9 PK	74.0	-23.1	2.95 V	222	39.4	11.5
6	#10360.00	39.8 AV	54.0	-14.2	2.95 V	222	28.3	11.5
7	15540.00	51.5 PK	74.0	-22.5	2.45 V	178	38.4	13.1
8	15540.00	40.9 AV	54.0	-13.1	2.45 V	178	27.8	13.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	63.5 PK	74.0	-10.5	2.26 H	233	62.0	1.5
2	5150.00	48.9 AV	54.0	-5.1	2.26 H	233	47.4	1.5
3	*5200.00	111.8 PK			2.26 H	233	110.1	1.7
4	*5200.00	101.2 AV			2.26 H	233	99.5	1.7
5	5359.00	57.2 PK	74.0	-16.8	2.26 H	233	55.2	2.0
6	5359.00	46.5 AV	54.0	-7.5	2.26 H	233	44.5	2.0
7	#10400.00	53.6 PK	74.0	-20.4	1.65 H	159	42.0	11.6
8	#10400.00	41.8 AV	54.0	-12.2	1.65 H	159	30.2	11.6
9	15600.00	52.8 PK	74.0	-21.2	1.74 H	315	39.7	13.1
10	15600.00	41.1 AV	54.0	-12.9	1.74 H	315	28.0	13.1
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	71.5 PK	74.0	-2.5	3.08 V	287	70.0	1.5
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**3.08 V**	**287**	**52.4**	**1.5**
3	*5200.00	118.2 PK			3.08 V	287	116.5	1.7
4	*5200.00	107.7 AV			3.08 V	287	106.0	1.7
5	5359.00	61.0 PK	74.0	-13.0	3.08 V	287	59.0	2.0
6	5359.00	50.9 AV	54.0	-3.1	3.08 V	287	48.9	2.0
7	#10400.00	55.4 PK	74.0	-18.6	2.95 V	224	43.8	11.6
8	#10400.00	43.9 AV	54.0	-10.1	2.95 V	224	32.3	11.6
9	15600.00	52.5 PK	74.0	-21.5	2.55 V	177	39.4	13.1
10	15600.00	41.4 AV	54.0	-12.6	2.55 V	177	28.3	13.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	110.2 PK			2.35 H	233	108.6	1.6
2	*5240.00	100.1 AV			2.35 H	233	98.5	1.6
3	5402.00	62.4 PK	74.0	-11.6	2.35 H	233	60.3	2.1
4	5402.00	47.1 AV	54.0	-6.9	2.35 H	233	45.0	2.1
5	#10480.00	48.9 PK	74.0	-25.1	1.85 H	194	36.9	12.0
6	#10480.00	39.0 AV	54.0	-15.0	1.85 H	194	27.0	12.0
7	15720.00	51.5 PK	74.0	-22.5	1.72 H	318	38.3	13.2
8	15720.00	40.1 AV	54.0	-13.9	1.72 H	318	26.9	13.2
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	*5240.00	116.7 PK			2.89 V	287	115.1	1.6
2	*5240.00	106.0 AV			2.89 V	287	104.4	1.6
3	5402.00	59.3 PK	74.0	-14.7	2.89 V	287	57.2	2.1
4	5402.00	50.3 AV	54.0	-3.7	2.89 V	287	48.2	2.1
5	#10480.00	51.6 PK	74.0	-22.4	2.98 V	216	39.6	12.0
6	#10480.00	40.5 AV	54.0	-13.5	2.98 V	216	28.5	12.0
7	15720.00	51.4 PK	74.0	-22.6	2.44 V	178	38.2	13.2
8	15720.00	40.9 AV	54.0	-13.1	2.44 V	178	27.7	13.2

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) – 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	#5633.12	61.5 PK	68.2	-6.7	3.69 H	180	58.9	2.6
2	*5745.00	110.2 PK			3.69 H	180	107.5	2.7
3	*5745.00	102.6 AV			3.69 H	180	99.9	2.7
4	#6004.10	62.0 PK	68.2	-6.2	3.69 H	180	58.6	3.4
5	11490.00	53.8 PK	74.0	-20.2	1.77 H	182	40.4	13.4
6	11490.00	42.0 AV	54.0	-12.0	1.77 H	182	28.6	13.4
7	#17235.00	57.3 PK	74.0	-16.7	1.71 H	308	39.0	18.3
8	#17235.00	46.4 AV	54.0	-7.6	1.71 H	308	28.1	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	#5583.25	62.6 PK	68.2	-5.6	2.91 V	291	60.1	2.5
2	*5745.00	120.9 PK			2.91 V	291	118.2	2.7
3	*5745.00	109.8 AV			2.91 V	291	107.1	2.7
4	#5970.85	61.3 PK	68.2	-6.9	2.91 V	291	58.1	3.2
5	11490.00	53.7 PK	74.0	-20.3	2.93 V	247	40.3	13.4
6	11490.00	42.5 AV	54.0	-11.5	2.93 V	247	29.1	13.4
7	#17235.00	57.9 PK	74.0	-16.1	2.35 V	174	39.6	18.3
8	#17235.00	46.3 AV	54.0	-7.7	2.35 V	174	28.0	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) – 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	#5619.82	61.3 PK	68.2	-6.9	3.69 H	190	58.7	2.6
2	*5785.00	110.0 PK			3.69 H	190	107.3	2.7
3	*5785.00	102.4 AV			3.69 H	190	99.7	2.7
4	#5942.35	61.5 PK	68.2	-6.7	3.69 H	190	58.4	3.1
5	11570.00	53.4 PK	74.0	-20.6	1.82 H	173	40.3	13.1
6	11570.00	41.9 AV	54.0	-12.1	1.82 H	173	28.8	13.1
7	#17355.00	57.2 PK	74.0	-16.8	1.78 H	332	38.4	18.8
8	#17355.00	46.4 AV	54.0	-7.6	1.78 H	332	27.6	18.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5630.27	61.2 PK	68.2	-7.0	2.95 V	305	58.6	2.6
2	*5785.00	120.1 PK			2.95 V	305	117.4	2.7
3	*5785.00	110.1 AV			2.95 V	305	107.4	2.7
4	#5942.35	64.2 PK	68.2	-4.0	2.95 V	305	61.1	3.1
5	11570.00	53.2 PK	74.0	-20.8	2.88 V	242	40.1	13.1
6	11570.00	42.2 AV	54.0	-11.8	2.88 V	242	29.1	13.1
7	#17355.00	57.9 PK	74.0	-16.1	2.36 V	173	39.1	18.8
8	#17355.00	46.5 AV	54.0	-7.5	2.36 V	173	27.7	18.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5635.02	62.3 PK	68.2	-5.9	3.69 H	190	59.7	2.6
2	*5825.00	109.9 PK			3.68 H	190	107.2	2.7
3	*5825.00	101.8 AV			3.68 H	190	99.1	2.7
4	#5986.52	61.3 PK	68.2	-6.9	3.69 H	190	58.0	3.3
5	11650.00	53.4 PK	74.0	-20.6	1.79 H	185	40.3	13.1
6	11650.00	42.0 AV	54.0	-12.0	1.79 H	185	28.9	13.1
7	#17475.00	57.2 PK	74.0	-16.8	1.77 H	334	38.0	19.2
8	#17475.00	46.1 AV	54.0	-7.9	1.77 H	334	26.9	19.2
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	#5585.15	60.0 PK	68.2	-8.2	2.85 V	303	57.5	2.5
2	*5825.00	119.9 PK			2.85 V	303	117.2	2.7
3	*5825.00	110.2 AV			2.85 V	303	107.5	2.7
4	#5984.62	65.6 PK	68.2	-2.6	2.85 V	303	62.3	3.3
5	11650.00	53.1 PK	74.0	-20.9	2.93 V	234	40.0	13.1
6	11650.00	42.2 AV	54.0	-11.8	2.93 V	234	29.1	13.1
7	#17475.00	58.4 PK	74.0	-15.6	2.40 V	198	39.2	19.2
8	#17475.00	46.7 AV	54.0	-7.3	2.40 V	198	27.5	19.2

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) – 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	64.1 PK	74.0	-9.9	2.36 H	235	62.6	1.5
2	5150.00	49.4 AV	54.0	-4.6	2.36 H	235	47.9	1.5
3	*5190.00	103.2 PK			2.36 H	235	101.5	1.7
4	*5190.00	91.5 AV			2.36 H	235	89.8	1.7
5	#10380.00	49.0 PK	74.0	-25.0	1.75 H	175	37.5	11.5
6	#10380.00	38.9 AV	54.0	-15.1	1.75 H	175	27.4	11.5
7	15570.00	51.0 PK	74.0	-23.0	1.73 H	324	37.9	13.1
8	15570.00	40.0 AV	54.0	-14.0	1.73 H	324	26.9	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	72.5 PK	74.0	-1.5	3.04 V	291	71.0	1.5
2	5150.00	53.8 AV	54.0	-0.2	3.04 V	291	52.3	1.5
3	*5190.00	109.5 PK			3.04 V	291	107.8	1.7
4	*5190.00	97.5 AV			3.04 V	291	95.8	1.7
5	#10380.00	49.4 PK	74.0	-24.6	2.98 V	234	37.9	11.5
6	#10380.00	39.0 AV	54.0	-15.0	2.98 V	234	27.5	11.5
7	15570.00	51.0 PK	74.0	-23.0	2.42 V	178	37.9	13.1
8	15570.00	40.0 AV	54.0	-14.0	2.42 V	178	26.9	13.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	5150.00	62.1 PK	74.0	-11.9	2.26 H	214	60.6	1.5
2	5150.00	46.8 AV	54.0	-7.2	2.26 H	214	45.3	1.5
3	*5230.00	107.2 PK			2.26 H	214	105.6	1.6
4	*5230.00	96.1 AV			2.26 H	214	94.5	1.6
5	5361.00	59.2 PK	74.0	-14.8	2.26 H	214	57.1	2.1
6	5361.00	44.1 AV	54.0	-9.9	2.26 H	214	42.0	2.1
7	#10460.00	48.9 PK	74.0	-25.1	1.82 H	182	37.0	11.9
8	#10460.00	38.7 AV	54.0	-15.3	1.82 H	182	26.8	11.9
9	15690.00	50.7 PK	74.0	-23.3	1.68 H	331	37.4	13.3
10	15690.00	39.6 AV	54.0	-14.4	1.68 H	331	26.3	13.3
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	5150.00	66.4 PK	74.0	-7.6	3.02 V	290	64.9	1.5
2	5150.00	51.6 AV	54.0	-2.4	3.02 V	290	50.1	1.5
3	*5230.00	113.3 PK			3.02 V	290	111.7	1.6
4	*5230.00	102.1 AV			3.02 V	290	100.5	1.6
5	5361.00	58.2 PK	74.0	-15.8	3.02 V	290	56.1	2.1
6	5361.00	47.9 AV	54.0	-6.1	3.02 V	290	45.8	2.1
7	#10460.00	49.0 PK	74.0	-25.0	3.01 V	228	37.1	11.9
8	#10460.00	38.5 AV	54.0	-15.5	3.01 V	228	26.6	11.9
9	15690.00	50.8 PK	74.0	-23.2	2.38 V	186	37.5	13.3
10	15690.00	39.6 AV	54.0	-14.4	2.38 V	186	26.3	13.3

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) – 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	#5598.45	62.4 PK	68.2	-5.8	3.71 H	202	59.9	2.5
2	*5755.00	107.7 PK			3.66 H	181	105.0	2.7
3	*5755.00	99.6 AV			3.66 H	181	96.9	2.7
4	#5931.43	60.9 PK	68.2	-7.3	3.71 H	202	57.8	3.1
5	11510.00	48.4 PK	74.0	-25.6	1.87 H	172	35.0	13.4
6	11510.00	38.3 AV	54.0	-15.7	1.87 H	172	24.9	13.4
7	#17265.00	51.3 PK	74.0	-22.7	1.63 H	343	33.0	18.3
8	#17265.00	40.1 AV	54.0	-13.9	1.63 H	343	21.8	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	#5649.27	64.4 PK	68.2	-3.8	2.92 V	281	61.8	2.6
2	*5755.00	117.2 PK			2.06 V	245	114.5	2.7
3	*5755.00	105.8 AV			2.06 V	245	103.1	2.7
4	#5932.37	62.4 PK	68.2	-5.8	2.92 V	281	59.3	3.1
5	11510.00	53.4 PK	74.0	-20.6	2.83 V	252	40.0	13.4
6	11510.00	42.4 AV	54.0	-11.6	2.83 V	252	29.0	13.4
7	#17265.00	57.6 PK	74.0	-16.4	2.40 V	164	39.3	18.3
8	#17265.00	45.8 AV	54.0	-8.2	2.40 V	164	27.5	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) – 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	#5590.37	61.0 PK	68.2	-7.2	3.71 H	202	58.5	2.5
2	*5795.00	106.9 PK			3.71 H	202	104.2	2.7
3	*5795.00	98.5 AV			3.71 H	202	95.8	2.7
4	#5938.07	61.7 PK	68.2	-6.5	3.71 H	202	58.6	3.1
5	11590.00	48.9 PK	74.0	-25.1	1.78 H	167	35.9	13.0
6	11590.00	39.0 AV	54.0	-15.0	1.78 H	167	26.0	13.0
7	#17385.00	50.4 PK	74.0	-23.6	1.69 H	335	31.4	19.0
8	#17385.00	39.4 AV	54.0	-14.6	1.69 H	335	20.4	19.0
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	#5645.95	61.3 PK	68.2	-6.9	2.91 V	301	58.7	2.6
2	*5795.00	117.1 PK			2.08 V	236	114.4	2.7
3	*5795.00	105.9 AV			2.08 V	236	103.2	2.7
4	#5939.50	63.5 PK	68.2	-4.7	2.91 V	301	60.4	3.1
5	11590.00	53.7 PK	74.0	-20.3	2.83 V	267	40.7	13.0
6	11590.00	42.7 AV	54.0	-11.3	2.83 V	267	29.7	13.0
7	#17385.00	57.4 PK	74.0	-16.6	2.40 V	162	38.4	19.0
8	#17385.00	45.8 AV	54.0	-8.2	2.40 V	162	26.8	19.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	63.9 PK	74.0	-10.1	3.62 H	186	62.4	1.5
2	5150.00	49.3 AV	54.0	-4.7	3.62 H	186	47.8	1.5
3	*5210.00	101.5 PK			3.62 H	186	99.8	1.7
4	*5210.00	89.3 AV			3.62 H	186	87.6	1.7
5	5350.00	55.8 PK	74.0	-18.2	3.62 H	186	53.9	1.9
6	5350.00	43.1 AV	54.0	-10.9	3.62 H	186	41.2	1.9
7	#10420.00	49.7 PK	74.0	-24.3	1.74 H	169	38.0	11.7
8	#10420.00	39.2 AV	54.0	-14.8	1.74 H	169	27.5	11.7
9	15630.00	50.6 PK	74.0	-23.4	1.73 H	334	37.4	13.2
10	15630.00	39.7 AV	54.0	-14.3	1.73 H	334	26.5	13.2
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	73.1 PK	74.0	-0.9	2.87 V	289	71.6	1.5
2	5150.00	53.8 AV	54.0	-0.2	2.87 V	289	52.3	1.5
3	*5210.00	106.1 PK			2.87 V	289	104.4	1.7
4	*5210.00	93.6 AV			2.87 V	289	91.9	1.7
5	5350.00	59.0 PK	74.0	-15.0	2.87 V	289	57.1	1.9
6	5350.00	46.7 AV	54.0	-7.3	2.87 V	289	44.8	1.9
7	#10420.00	49.5 PK	74.0	-24.5	2.94 V	246	37.8	11.7
8	#10420.00	38.8 AV	54.0	-15.2	2.94 V	246	27.1	11.7
9	15630.00	51.2 PK	74.0	-22.8	2.41 V	192	38.0	13.2
10	15630.00	40.3 AV	54.0	-13.7	2.41 V	192	27.1	13.2

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) – 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	#5644.52	64.6 PK	68.2	-3.6	3.65 H	181	62.0	2.6
2	*5775.00	103.8 PK			3.65 H	181	101.1	2.7
3	*5775.00	95.1 AV			3.65 H	181	92.4	2.7
4	#5925.25	62.6 PK	68.2	-5.6	3.65 H	181	59.5	3.1
5	11550.00	49.1 PK	74.0	-24.9	1.79 H	170	35.9	13.2
6	11550.00	38.8 AV	54.0	-15.2	1.79 H	170	25.6	13.2
7	#17325.00	50.4 PK	74.0	-23.6	1.70 H	322	31.8	18.6
8	#17325.00	39.5 AV	54.0	-14.5	1.70 H	322	20.9	18.6
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	#5642.15	67.8 PK	68.2	-0.4	2.29 V	22	65.2	2.6
2	*5775.00	112.4 PK			2.55 V	205	109.7	2.7
3	*5775.00	99.5 AV			2.55 V	205	96.8	2.7
4	#5953.27	66.1 PK	68.2	-2.1	2.29 V	22	62.9	3.2
5	11550.00	49.4 PK	74.0	-24.6	2.92 V	234	36.2	13.2
6	11550.00	39.2 AV	54.0	-14.8	2.92 V	234	26.0	13.2
7	#17325.00	51.4 PK	74.0	-22.6	2.45 V	165	32.8	18.6
8	#17325.00	40.1 AV	54.0	-13.9	2.45 V	165	21.5	18.6

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 Data:

802.11ac (VHT20)

CHANNEL	TX Channel 149	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	110.65	31.2 QP	43.5	-12.3	1.65 H	100	42.6	-11.4
2	174.21	31.6 QP	43.5	-11.9	1.24 H	34	41.1	-9.5
3	247.67	33.2 QP	46.0	-12.8	1.65 H	100	43.2	-10.0
4	375.21	33.1 QP	46.0	-12.9	1.65 H	100	39.1	-6.0
5	625.01	36.9 QP	46.0	-9.1	1.42 H	100	36.9	0.0
6	874.96	41.6 QP	46.0	-4.4	2.14 H	241	38.2	3.4
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	44.45	35.6 QP	40.0	-4.4	1.42 V	100	44.4	-8.8
2	109.61	32.3 QP	43.5	-11.2	1.24 V	100	43.8	-11.5
3	157.42	29.2 QP	43.5	-14.3	1.64 V	100	37.7	-8.5
4	540.02	35.4 QP	46.0	-10.6	1.34 V	100	37.6	-2.2
5	675.03	31.6 QP	46.0	-14.4	1.63 V	241	31.4	0.2
6	724.89	32.6 QP	46.0	-13.4	1.68 V	210	31.3	1.3

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) – 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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 16, 2016	Apr. 15, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-523	Oct. 11, 2016	Oct. 10, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
RF Cable	5D-FB	COACAB-001	May 24, 2016	May 23, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-001	Sep. 13, 2016	Sep. 12, 2017
50 ohms Terminator	50	3	Oct. 26, 2016	Oct. 25, 2017
50 ohms Terminator	N/A	EMC-04	Nov. 02, 2016	Nov. 01, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3 Tested Date:Nov. 03, 2016

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.

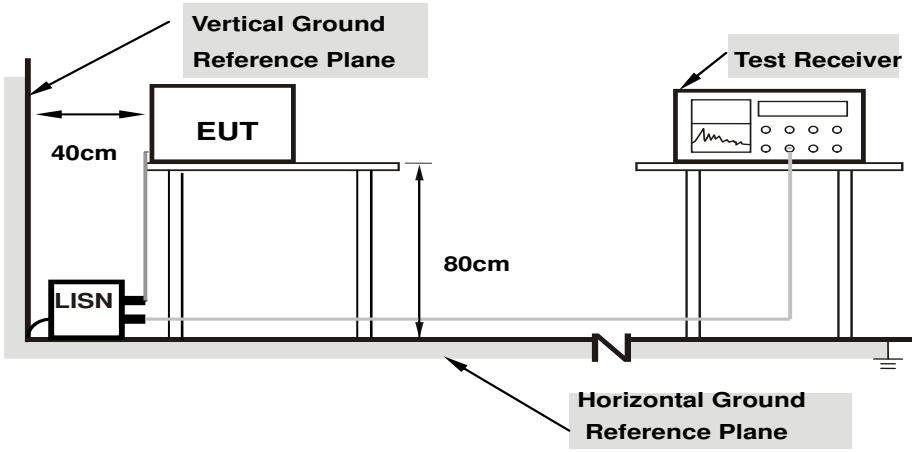
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

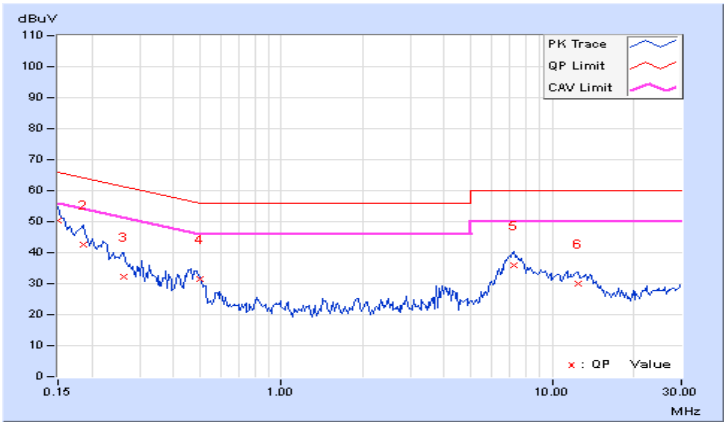
4.2.7 Test Results

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.30	39.96	24.35	50.26	34.65	66.00	56.00	-15.74	-21.35
2	0.18516	10.29	32.43	14.90	42.72	25.19	64.25	54.25	-21.53	-29.06
3	0.26328	10.31	21.87	7.07	32.18	17.38	61.33	51.33	-29.15	-33.95
4	0.50000	10.37	20.96	16.24	31.33	26.61	56.00	46.00	-24.67	-19.39
5	7.21484	10.58	25.53	20.37	36.11	30.95	60.00	50.00	-23.89	-19.05
6	12.44922	10.73	19.42	13.59	30.15	24.32	60.00	50.00	-29.85	-25.68

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

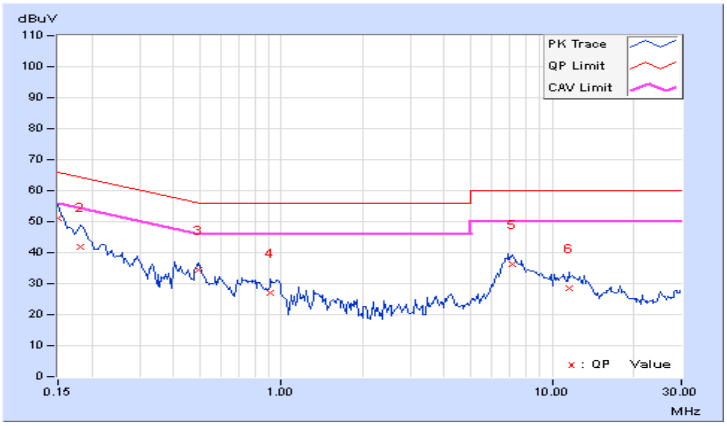


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	**0.15000**	**10.36**	**40.65**	**26.74**	**51.01**	**37.10**	**66.00**	**56.00**	**-14.99**	**-18.90**
2	0.18125	10.36	31.38	15.35	41.74	25.71	64.43	54.43	-22.69	-28.72
3	0.49375	10.46	24.04	19.46	34.50	29.92	56.10	46.10	-21.60	-16.18
4	0.91563	10.53	16.33	9.28	26.86	19.81	56.00	46.00	-29.14	-26.19
5	7.17188	10.62	25.59	20.73	36.21	31.35	60.00	50.00	-23.79	-18.65
6	11.53906	10.72	17.95	12.49	28.67	23.21	60.00	50.00	-31.33	-26.79

Remarks:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

CDD Mode

802.11a

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	19.81	19.58	186.501	22.71	30	Pass
40	5200	23.52	22.88	418.994	26.22	30	Pass
48	5240	21.00	20.34	234.036	23.69	30	Pass
149	5745	24.46	24.15	539.27	27.32	30	Pass
157	5785	24.26	24.20	529.713	27.24	30	Pass
165	5825	24.32	24.16	531.011	27.25	30	Pass

Beamforming Mode

802.11ac (VHT20)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	19.07	18.54	152.174	21.82	29.99	Pass
40	5200	23.39	22.35	390.064	25.91	29.99	Pass
48	5240	20.87	20.26	228.35	23.59	29.99	Pass
149	5745	24.58	24.45	565.69	27.53	29.89	Pass
157	5785	24.68	24.00	544.954	27.36	29.89	Pass
165	5825	24.19	24.20	525.449	27.21	29.89	Pass

Note:

For UNII-1: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.01dBi > 6dBi , so the power limit shall be reduced to 30-(6.01-6) = 29.99dBm.

For UNII-3: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.11dBi > 6dBi , so the power limit shall be reduced to 30-(6.11-6) = 29.89dBm.

802.11ac (VHT40)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
38	5190	16.71	15.73	84.292	19.26	29.99	Pass
46	5230	20.54	20.12	216.042	23.35	29.99	Pass
151	5755	24.53	23.97	533.251	27.27	29.89	Pass
159	5795	24.33	24.12	529.245	27.24	29.89	Pass

Note:

For UNII-1: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.01dBi > 6dBi , so the power limit shall be reduced to 30-(6.01-6) = 29.99dBm.

For UNII-3: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.11dBi > 6dBi , so the power limit shall be reduced to 30-(6.11-6) = 29.89dBm.

802.11ac (VHT80)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
42	5210	15.72	16.45	81.482	19.11	29.99	Pass
155	5775	20.78	20.43	230.082	23.62	29.99	Pass

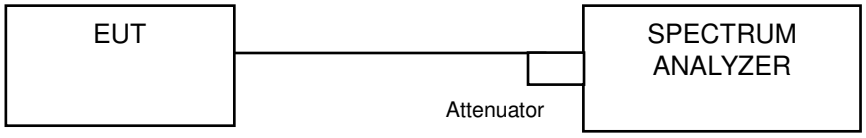
Note:

For UNII-1: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.01dBi > 6dBi , so the power limit shall be reduced to 30-(6.01-6) = 29.99dBm.

For UNII-3: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.11dBi > 6dBi , so the power limit shall be reduced to 30-(6.11-6) = 29.89dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	18.48	17.28
40	5200	30.00	27.48
48	5240	20.40	18.24
149	5745	29.16	29.64
157	5785	28.92	29.04
165	5825	28.92	28.32

Beamforming Mode

802.11ac (VHT20)

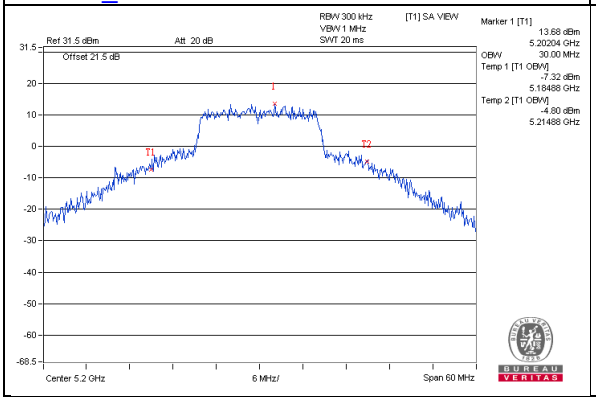
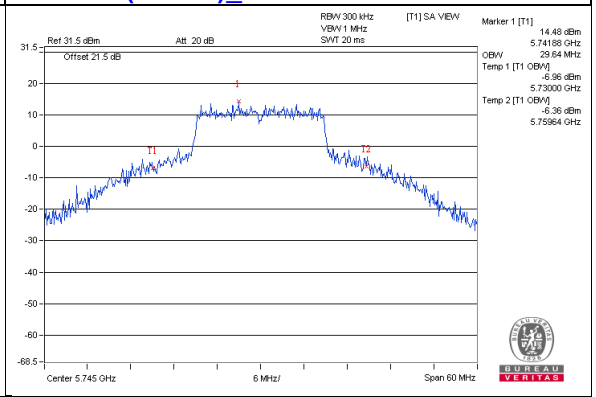
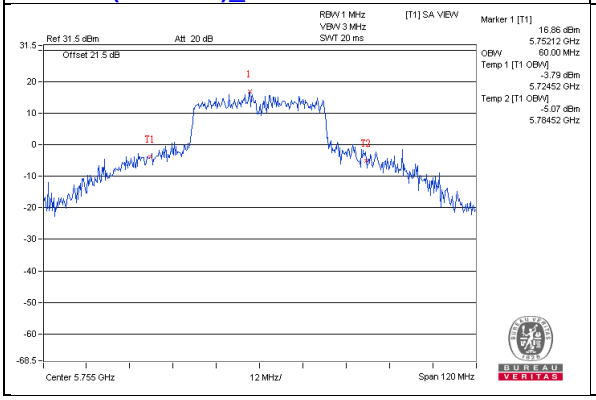
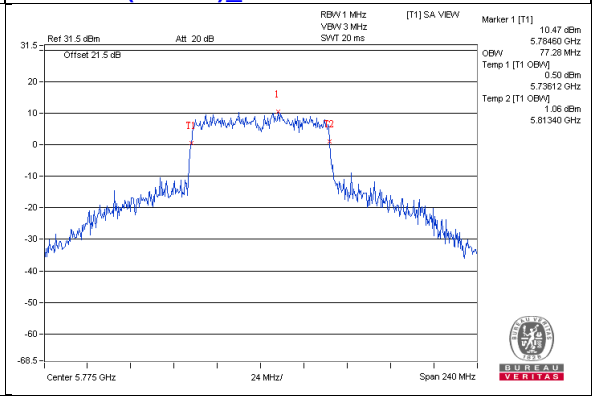
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	18.48	18.12
40	5200	28.56	28.92
48	5240	19.56	20.16
149	5745	24.60	29.64
157	5785	24.12	27.60
165	5825	22.68	27.24

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
38	5190	36.72	36.96
46	5230	42.24	37.44
151	5755	52.32	59.28
159	5795	53.04	54.72

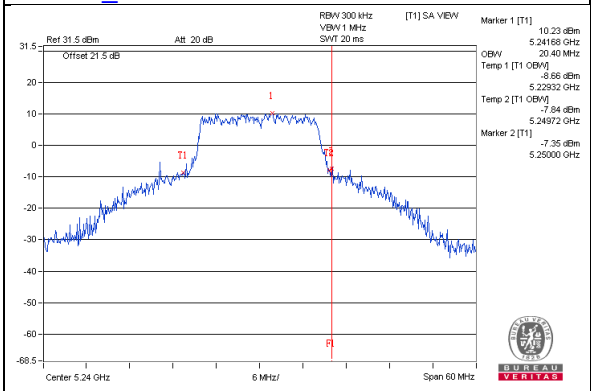
802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
42	5210	76.32	75.84
155	5775	77.28	76.80

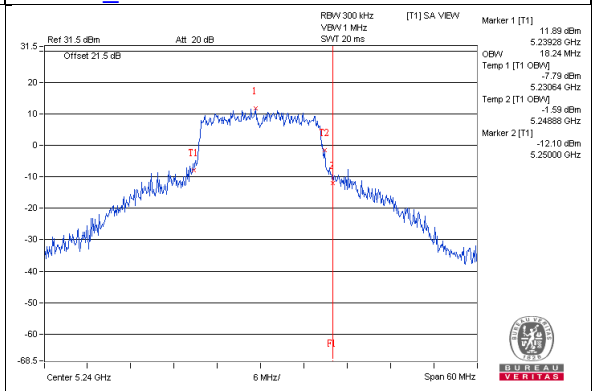
Spectrum Plot of Worst Value	
802.11a_Chain0 / CH40	802.11ac (VHT20)_Chain1 / CH149
	
802.11n (VVHT40)_Chain1 / CH151	802.11ac (VHT80)_Chain0 / CH155
	

Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

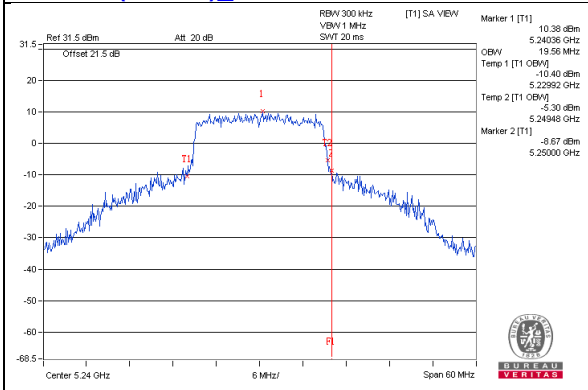
802.11a_Chain0 / CH48



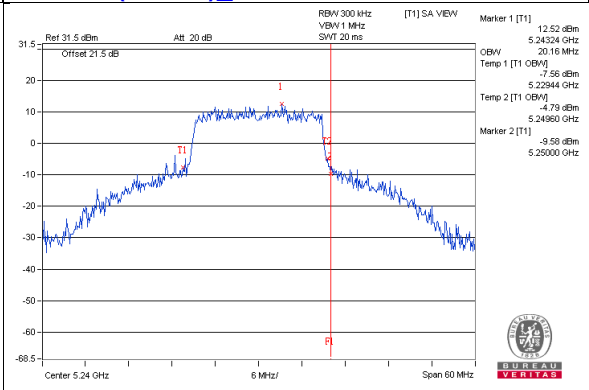
802.11a_Chain1 / CH48



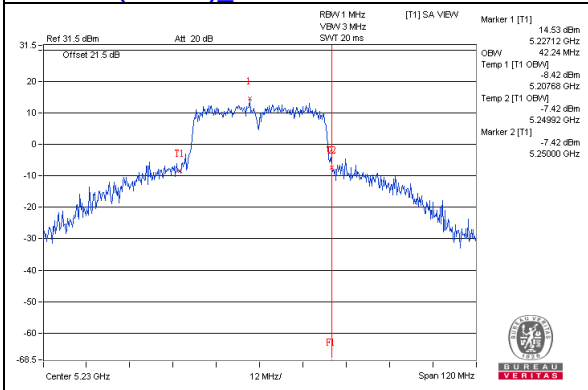
802.11ac(VHT20)_Chain0 / CH48



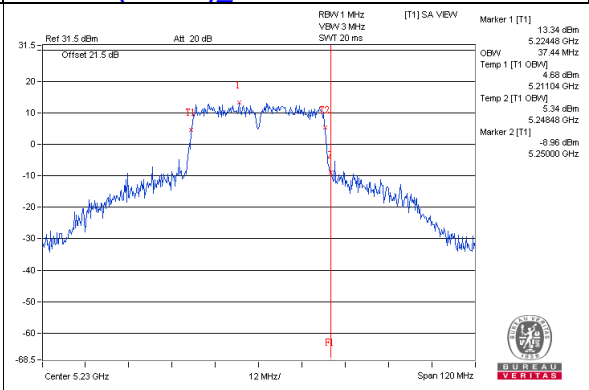
802.11ac(VHT20)_Chain1 / CH48



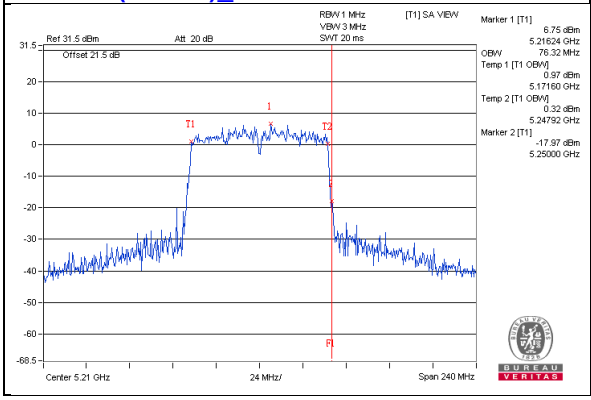
802.11ac(VHT40)_Chain0 / CH46



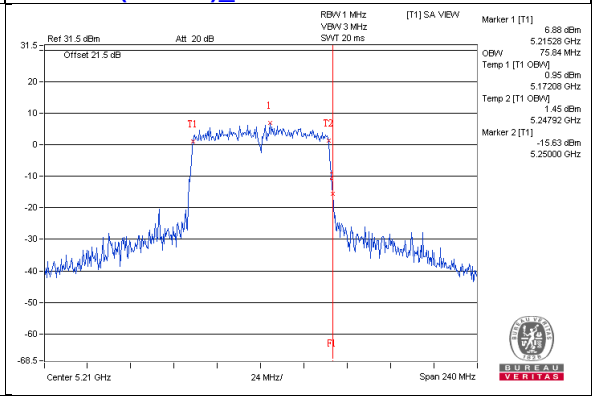
802.11ac(VHT40)_Chain1 / CH46



802.11ac(VHT80)_Chain0 / CH42

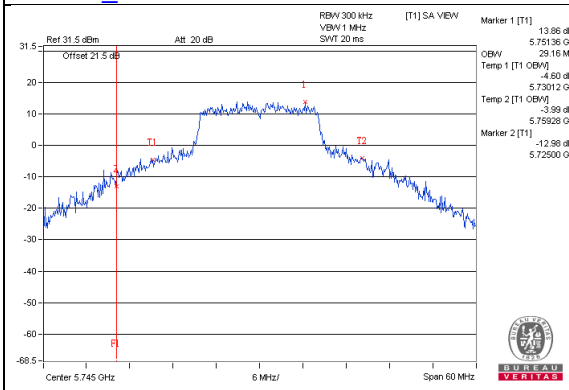


802.11ac(VHT80)_Chain1 / CH42

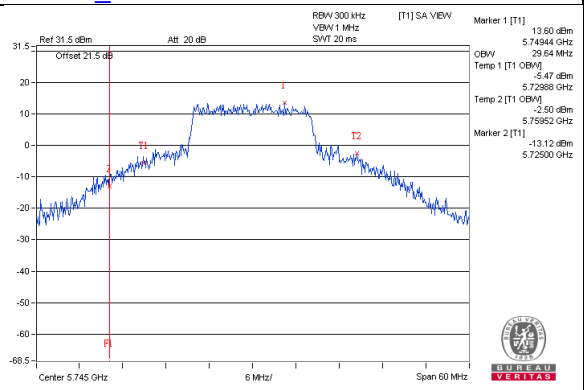


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

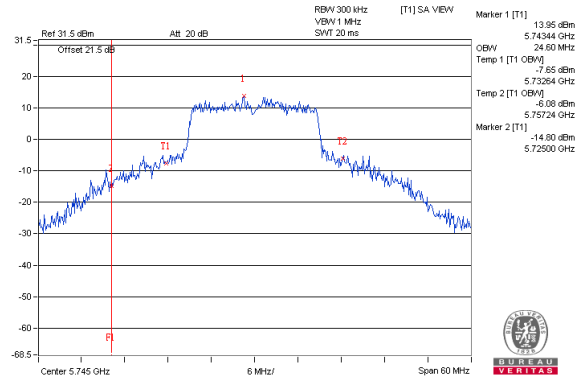
802.11a_Chain0 / CH149



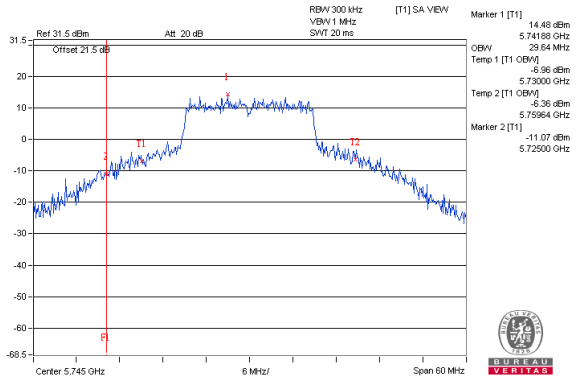
802.11a_Chain1 / CH149



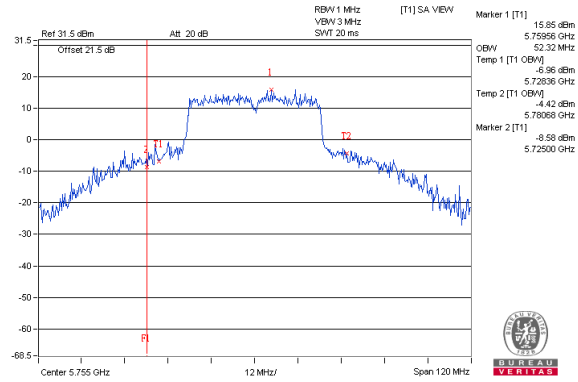
802.11ac(VHT20)_Chain0 / CH149



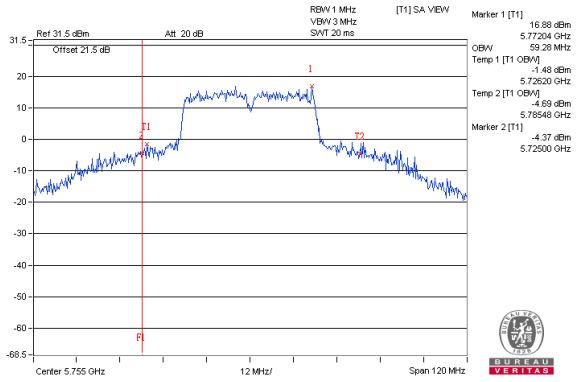
802.11ac(VHT20)_Chain1 / CH149



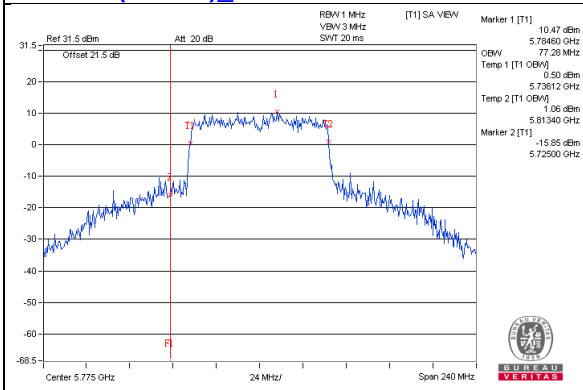
802.11ac(VHT40)_Chain0 / CH151



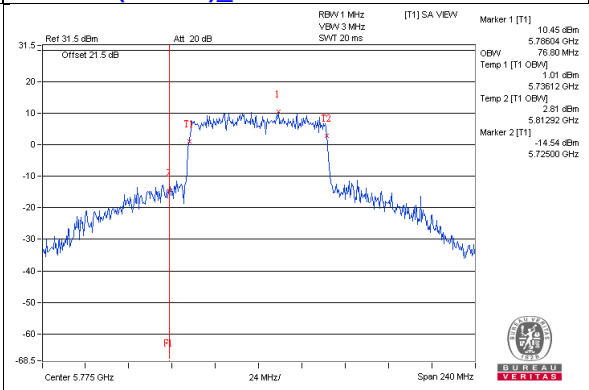
802.11ac(VHT40)_Chain1 / CH151



802.11ac(VHT80)_Chain0 / CH155



802.11ac(VHT80)_Chain1 / CH155

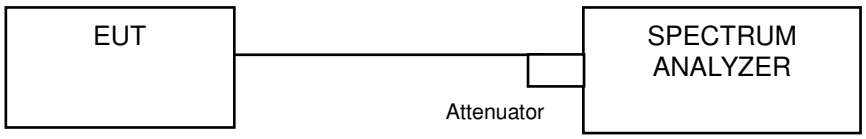


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

802.11a, 802.11ac (VHT20)

For U-NII-1:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

802.11ac (VHT40), 802.11ac (VHT80)

For U-NII-1:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.51	6.46	9.50	16.99	Pass
40	5200	8.77	9.60	12.22	16.99	Pass
48	5240	6.75	7.41	10.10	16.99	Pass

Note: 1. Method a) 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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.01dBi > 6dBi , so the power density limit shall be reduced to 17-(6.01-6) = 16.99 dBm.

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	5.62	5.67	8.66	16.99	Pass
40	5200	7.99	9.18	11.64	16.99	Pass
48	5240	6.17	7.49	9.89	16.99	Pass

Note: 1. Method a) 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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.01dBi > 6dBi , so the power density limit shall be reduced to 17-(6.01-6) = 16.99 dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	0.41	-0.47	0.13	3.14	16.99	PASS
46	5230	3.67	3.92	0.13	6.94	16.99	PASS

Note: 1. Method a) 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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.01dBi > 6dBi , so the power density limit shall be reduced to 17-(6.01-6) = 16.99 dBm.

3. Refer to section 3.3 for duty cycle spectrum plot

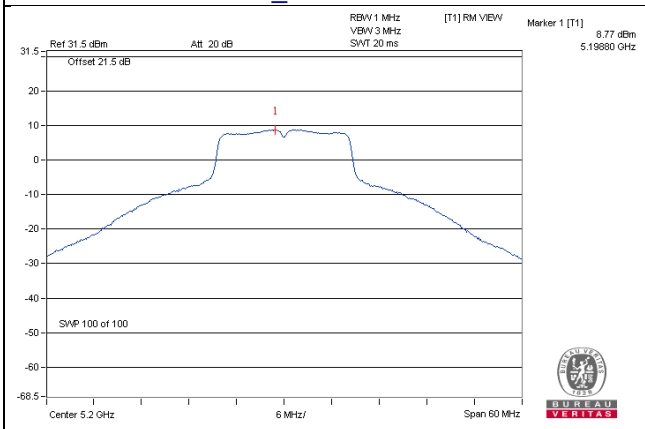
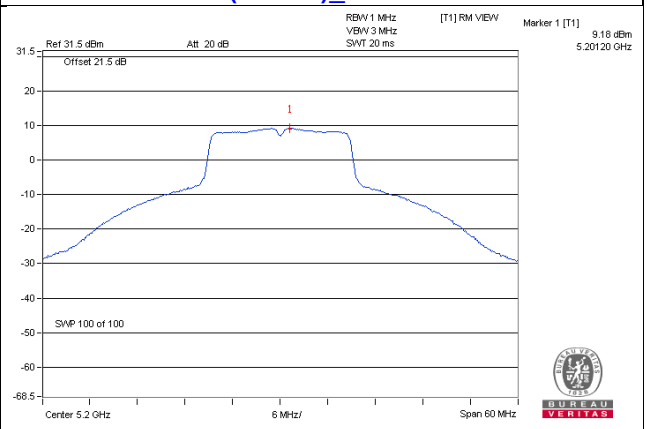
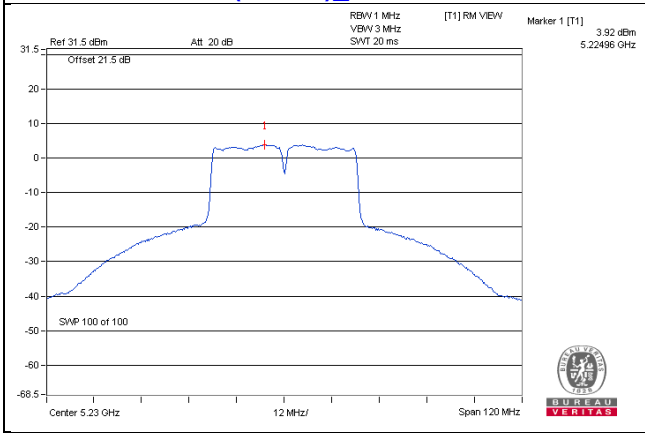
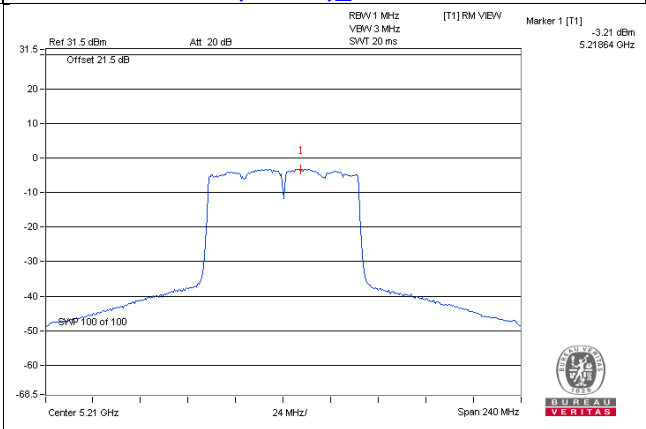
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-3.64	-3.21	0.27	-0.14	16.99	PASS

Note: 1. Method a) 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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.01dBi > 6dBi , so the power density limit shall be reduced to 17-(6.01-6) = 16.99 dBm.

3. Refer to section 3.3 for duty cycle spectrum plot

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH40	**802.11ac (VHT20)_Chain 1 / CH40**
	
802.11ac (VHT40)_Chain 1 / CH46	**802.11ac (VHT80)_Chain1 / CH42**
	

For U-NII-3:

CDD Mode

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	2.09	4.31	3.01	7.32	29.89	Pass
	157	5785	2.24	4.46	3.01	7.47	29.89	Pass
	165	5825	2.04	4.26	3.01	7.27	29.89	Pass
1	149	5745	1.72	3.94	3.01	6.95	29.89	Pass
	157	5785	1.83	4.05	3.01	7.06	29.89	Pass
	165	5825	1.81	4.03	3.01	7.04	29.89	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.11dBi > 6dBi , so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.

Beamforming Mode

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	1.00	3.22	3.01	6.23	29.89	Pass
	157	5785	1.05	3.27	3.01	6.28	29.89	Pass
	165	5825	0.65	2.87	3.01	5.88	29.89	Pass
1	149	5745	1.45	3.67	3.01	6.68	29.89	Pass
	157	5785	1.16	3.38	3.01	6.39	29.89	Pass
	165	5825	1.08	3.30	3.01	6.31	29.89	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.11dBi > 6dBi , so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-2.44	-0.22	3.01	0.13	2.92	29.89	Pass
	159	5795	-2.26	-0.04	3.01	0.13	3.10	29.89	Pass
1	151	5755	-2.19	0.03	3.01	0.13	3.17	29.89	Pass
	159	5795	-2.33	-0.11	3.01	0.13	3.03	29.89	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] =6.11dBi > 6dBi , so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.

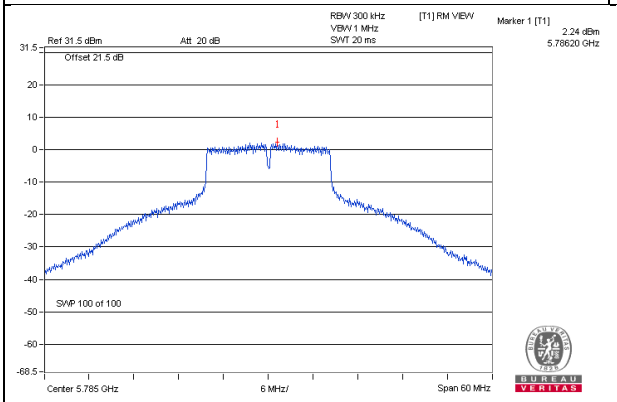
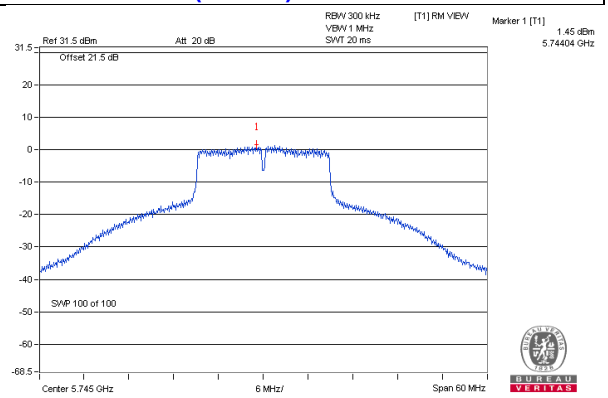
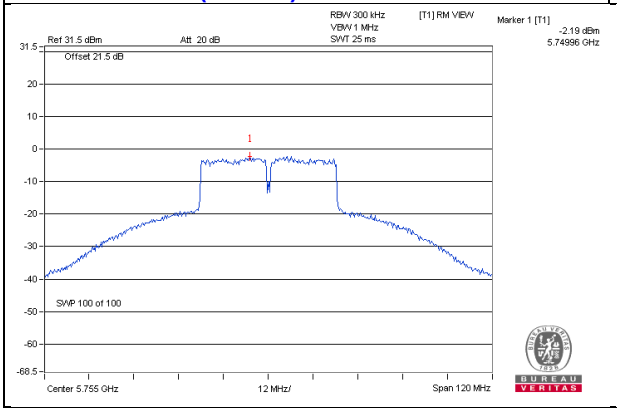
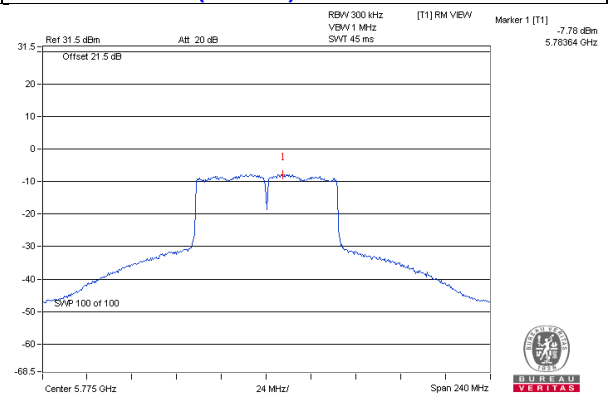
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-7.85	-5.63	3.01	0.27	-2.35	29.89	Pass
1	155	5775	-7.78	-5.56	3.01	0.27	-2.28	29.89	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.11dBi > 6dBi , so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.

2. Refer to section 3.3 for duty cycle spectrum plot.

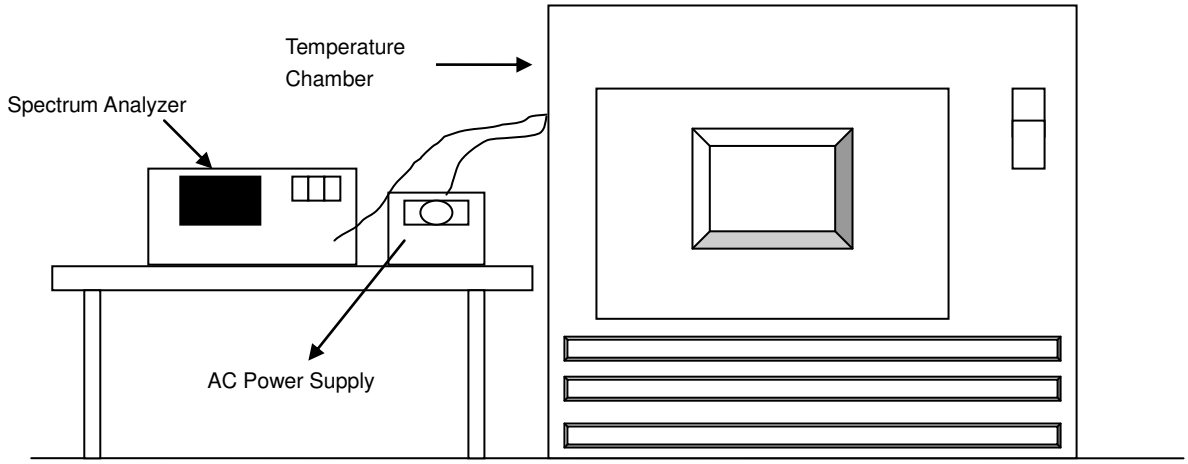
Spectrum Plot of Worst Value	
802.11a – Chain 0: CH 157	**802.11ac (VHT20) – Chain 1: CH 149**
	
802.11ac (VHT40) – Chain 1: CH 151	**802.11ac (VHT80) – Chain 1: CH 155**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 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.
.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5179.9925	PASS	5179.9945	PASS	5179.9932	PASS	5179.9918	PASS
40	120	5179.9887	PASS	5179.9887	PASS	5179.9894	PASS	5179.9904	PASS
30	120	5180.0037	PASS	5180.0034	PASS	5180.0035	PASS	5180.0016	PASS
20	120	5180.0152	PASS	5180.0114	PASS	5180.0113	PASS	5180.0125	PASS
10	120	5180.0166	PASS	5180.0167	PASS	5180.0187	PASS	5180.0144	PASS
0	120	5180.007	PASS	5180.0081	PASS	5180.0075	PASS	5180.0064	PASS
-10	120	5180.0113	PASS	5180.0075	PASS	5180.0099	PASS	5180.0099	PASS
-20	120	5180.0095	PASS	5180.0101	PASS	5180.0104	PASS	5180.0103	PASS
-30	120	5180.0178	PASS	5180.0183	PASS	5180.0192	PASS	5180.0184	PASS

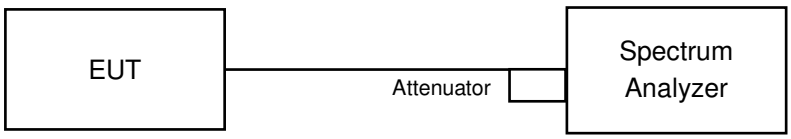
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0151	PASS	5180.0122	PASS	5180.0114	PASS	5180.0121	PASS
	120	5180.0152	PASS	5180.0114	PASS	5180.0113	PASS	5180.0125	PASS
	102	5180.0154	PASS	5180.0113	PASS	5180.0104	PASS	5180.0127	PASS

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

CDD Mode

802.11a

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

Beamforming Mode

802.11ac (VHT20)

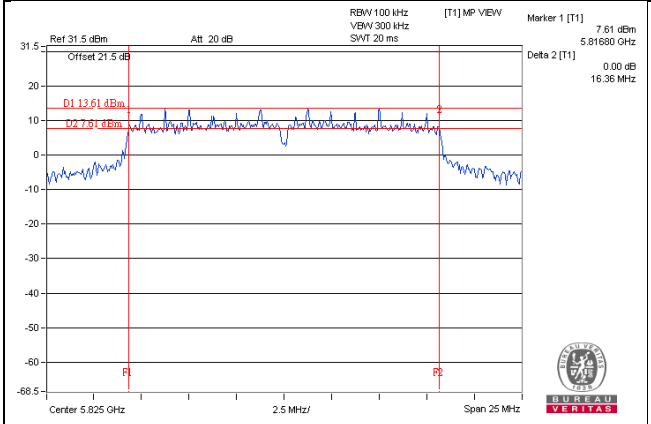
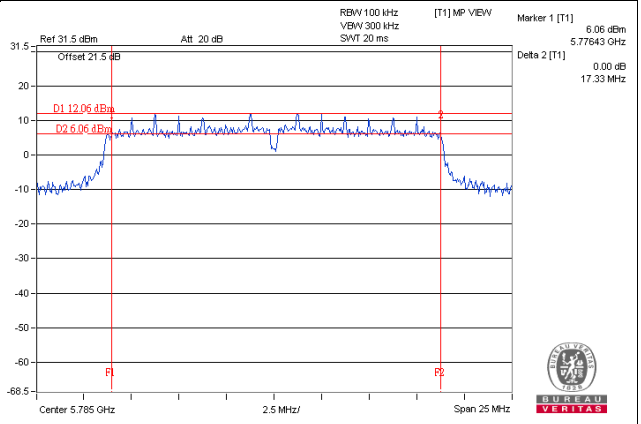
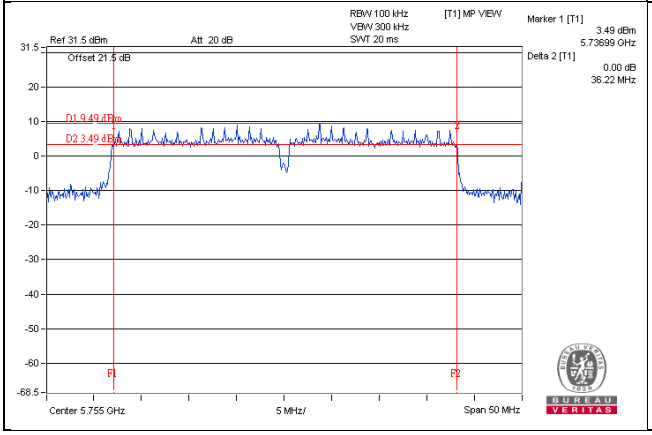
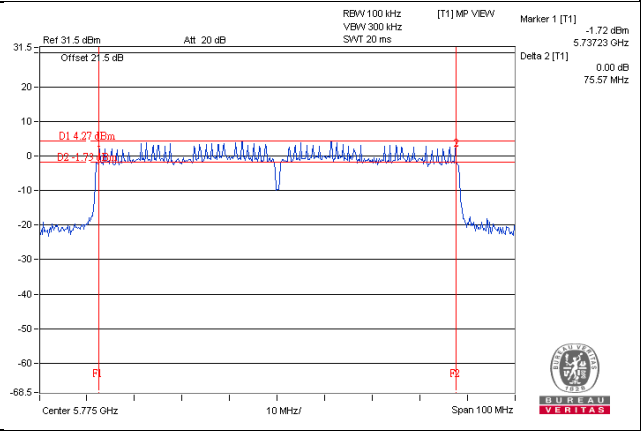
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.60	17.66	0.5	PASS
157	5785	17.33	17.61	0.5	PASS
165	5825	17.58	17.61	0.5	PASS

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.22	36.47	0.5	PASS
159	5795	36.42	36.47	0.5	PASS

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.57	75.82	0.5	PASS

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH165	**802.11ac (VHT20)_Chain 0 / CH157**
	
802.11ac (VHT40)_Chain 0 / CH151	**802.11ac (VHT80)_Chain 0 / CH155**
	

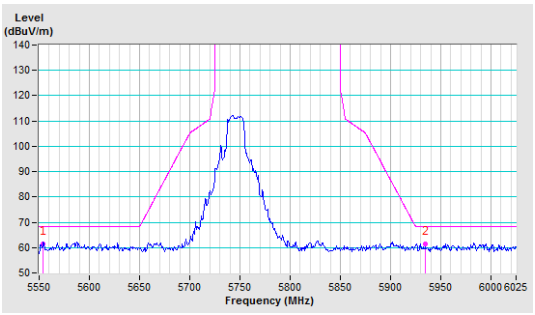
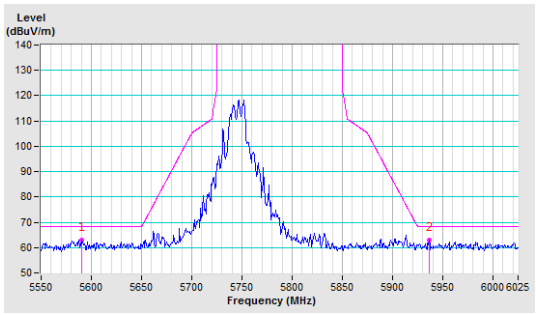
5 Pictures of Test Arrangements

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

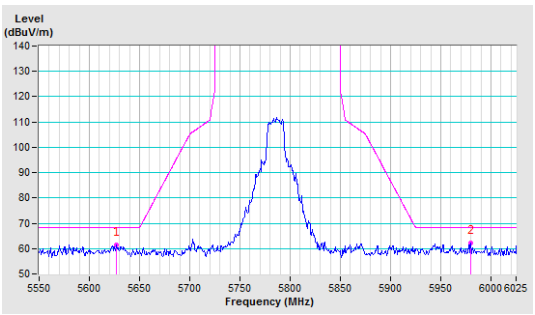
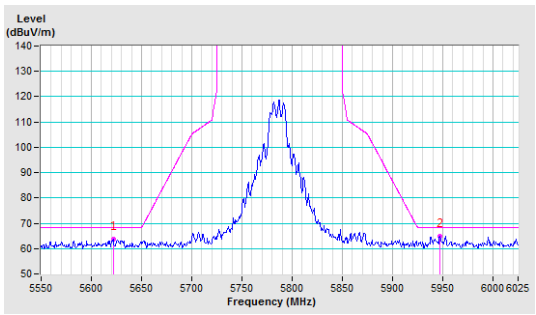
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

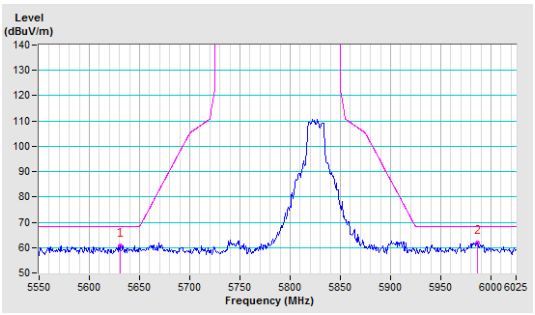
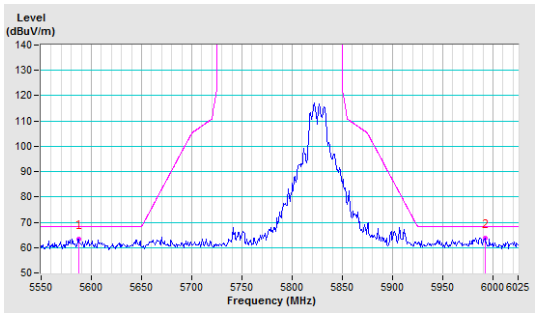
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

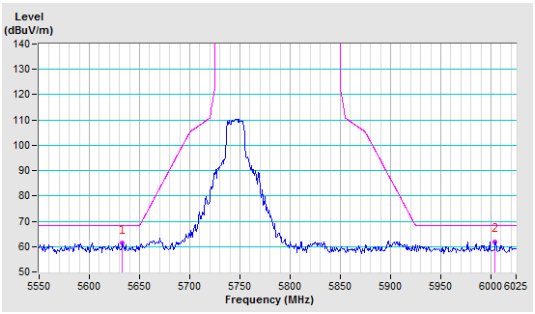
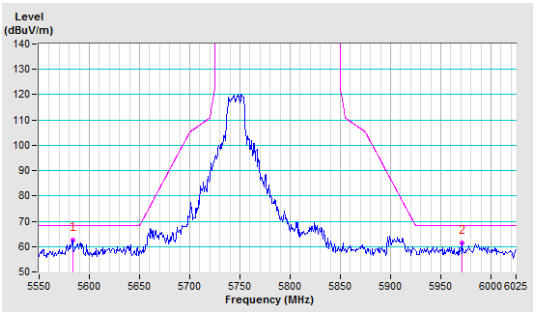
Horizontal	Vertical
	

CH 165 5825 MHz

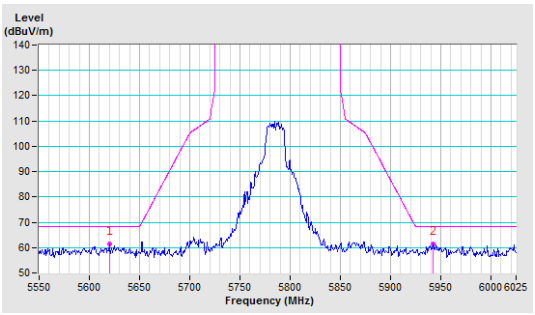
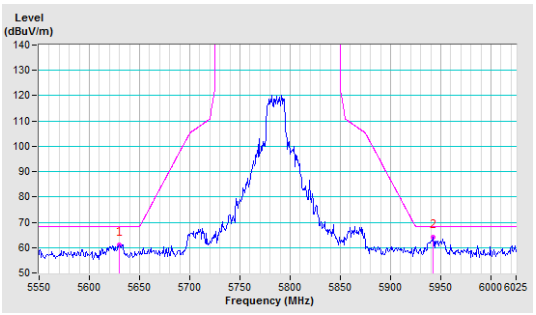
Horizontal	Vertical
	

802.11ac (VHT20)

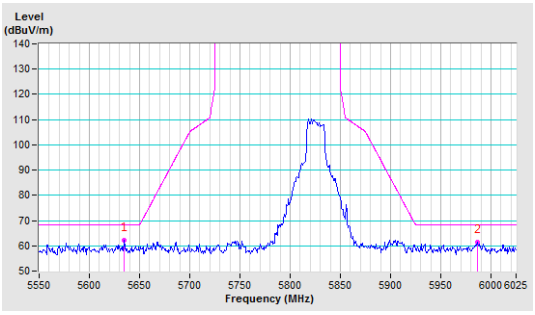
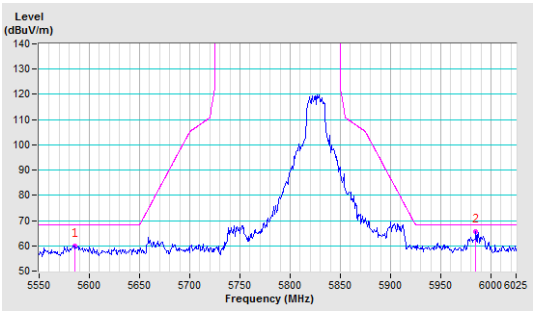
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

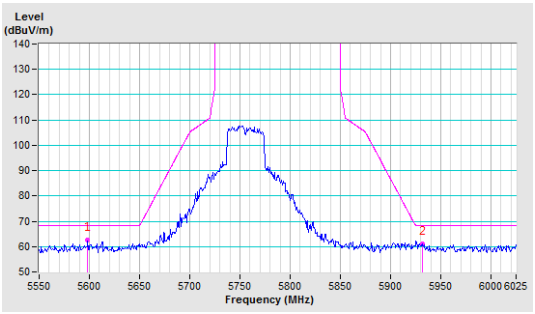
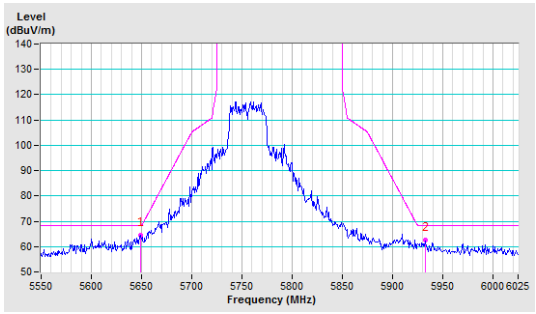
Horizontal	Vertical
	

CH 165 5825 MHz

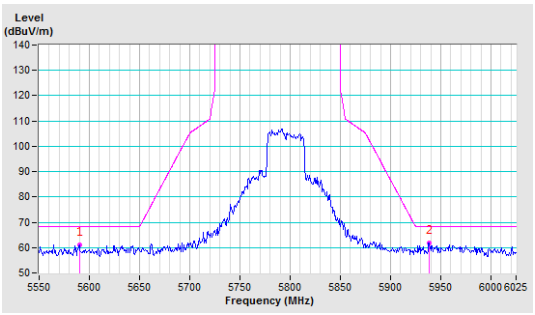
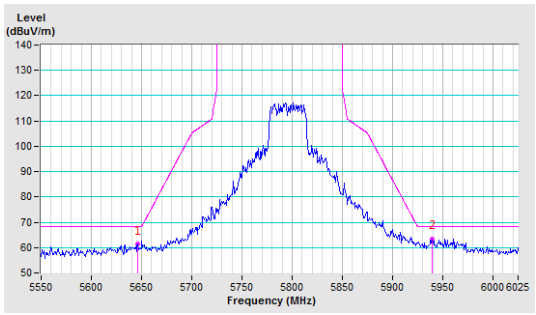
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

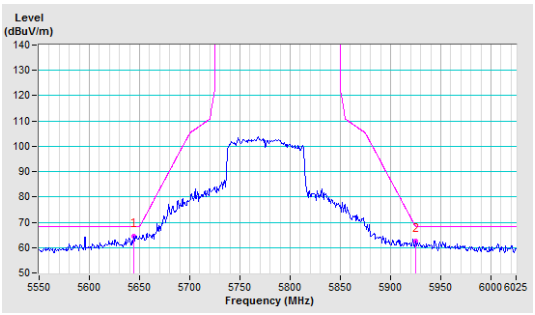
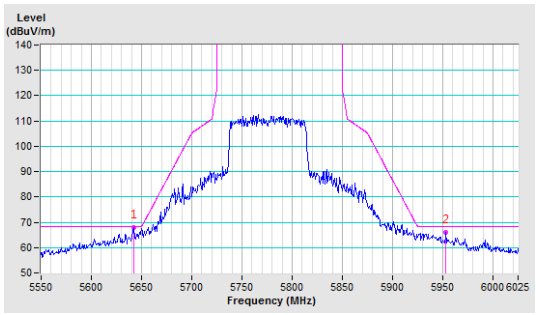
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

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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