FCC Test Report

Report No.:	RF180104E04-1
FCC ID:	PY317300396
Test Model:	CBR40
Received Date:	Jan. 04, 2018
Test Date:	Jan. 10 to 19, 2018
Issued Date:	Feb. 01, 2018
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:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF180104E04-1	Original release.	Feb. 01, 2018

1 Certificate of Conformity

Product:	Orbi Cable Router
Brand:	NETGEAR
Test Model:	CBR40
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	Jan. 10 to 19, 2018
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** Feb. 01, 2018
Phoenix Huang / Specialist

Approved by : _____ , **Date:** Feb. 01, 2018
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 -4.26dB at 0.34531MHz.
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 5150MHz.
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	Antenna connector is i-pex(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.70 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.53 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.08 dB
	6GHz ~ 18GHz	4.98 dB
	18GHz ~ 40GHz	5.19 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Orbi Cable Router
Brand	NETGEAR
Test Model	CBR40
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 and VHT (20/40) mode in 2.4GHz
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 866.7Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11ac (VHT20), VHT20: 11 802.11ac (VHT40), VHT40: 7 **5GHz:** 802.11a, 802.11ac (VHT20), 802.11ac (VHT20): 9 802.11ac (VHT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** 985.324mW **5GHz:** **5.18 ~ 5.24GHz:** 871.19mW **5.745 ~ 5.825GHz:** 906.078mW
Antenna Type	Dipole antenna
Antenna Connector	i-pex(MHF)
Accessory Device	Adapter x1
Data Cable Supplied	Ethernet Cable x1 (Unshielded, 2m)

Note:

1. Simultaneously transmission condition.

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

2. The EUT power needs to be supplied from power adapters, the information is as below table:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	AD2080F20	332-10883-01	Input: 100-240Vac, 1.0A, 50/60Hz Output: 12V, 3.5A DC output cable: Unshielded 1.8m
2	NETGEAR	2ABN042F NA	332-10888-01	Input: 100-240Vac, 1.5A, 50/60Hz Output: 12V, 3.5A DC output cable: Unshielded 1.8m
Note: From the above models, the worst radiated emission test was found in **Adapter 2**. Therefore only the test data of the modes were recorded in this report.				

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

Frequency Range (GHz)	Directional Antenna Gain (dBi)
2.4~2.4835	6.02
5.15~5.25	6.07
5.725~5.85	6.23

4. The EUT incorporates a MIMO function.

2.4GHz Band			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11ac (VHT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
VHT20	MCS 0~8, Nss=1	2TX	2RX
	MCS 0~8, Nss=2	2TX	2RX
VHT40	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
5GHz Band			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11ac (VHT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS 0~8, Nss=1	2TX	2RX
	MCS 0~8, Nss=2	2TX	2RX
802.11ac (VHT40)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
802.11ac (VHT80)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX

Note: 1. 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)
2. All of modulation mode support beamforming function except 802.11 a/b/g modulation mode.
3. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers 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, 802.11ac (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 802.11ac (VHT40), 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, 802.11ac (VHT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11ac (VHT40), 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	
1	√	√	√	√	Power from Adapter 2
2	-	-	√	-	Power from Adapter 1

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement
Note: "-" 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
802.11a	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

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 (VHT40)	5745-5825	149 to 165	159	OFDM	BPSK	13.5

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 (VHT40)	5745-5825	149 to 165	159	OFDM	BPSK	13.5

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:

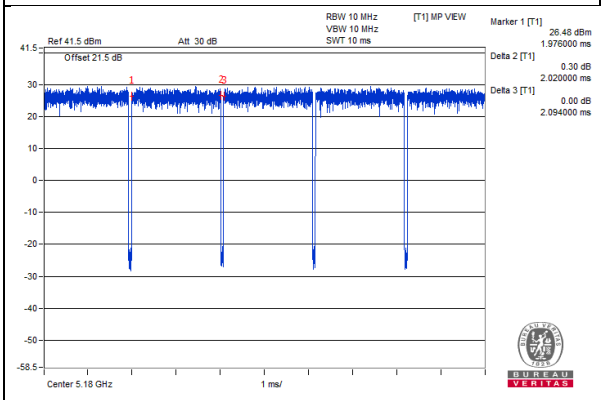
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 67%RH	120Vac, 60Hz	Weiwei Lo
RE<1G	25deg. C, 69%RH	120Vac, 60Hz	Weiwei Lo
PLC	25deg. C, 70%RH	120Vac, 60Hz	Weiwei Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

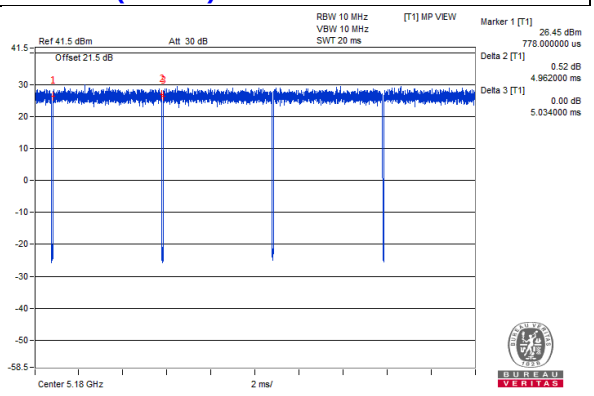
Duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11a: Duty cycle = 2.02 ms/2.094 ms = 0.965, Duty factor = 10 * log(1/0.965) = 0.16
802.11ac (VHT20): Duty cycle = 4.962 ms/5.034 ms = 0.986
802.11ac (VHT40): Duty cycle = 2.407 ms/2.492 ms = 0.966, Duty factor = 10 * log(1/0.966) = 0.15
802.11ac (VHT80): Duty cycle = 1.134 ms/1.197 ms = 0.947, Duty factor = 10 * log(1/0.947) = 0.23

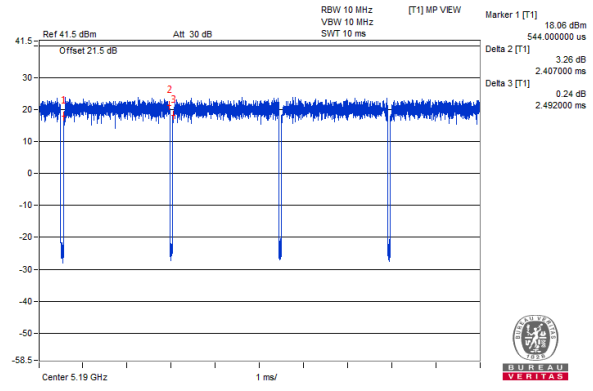
802.11a



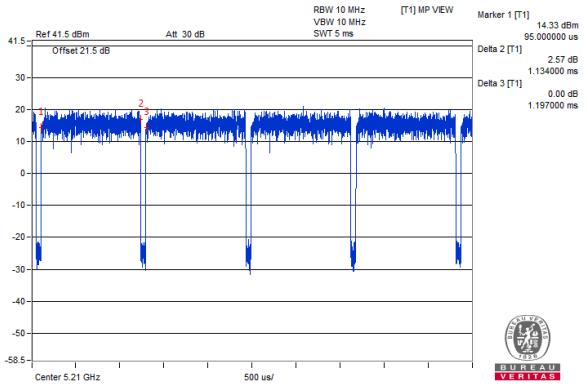
802.11ac (VHT20)



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.

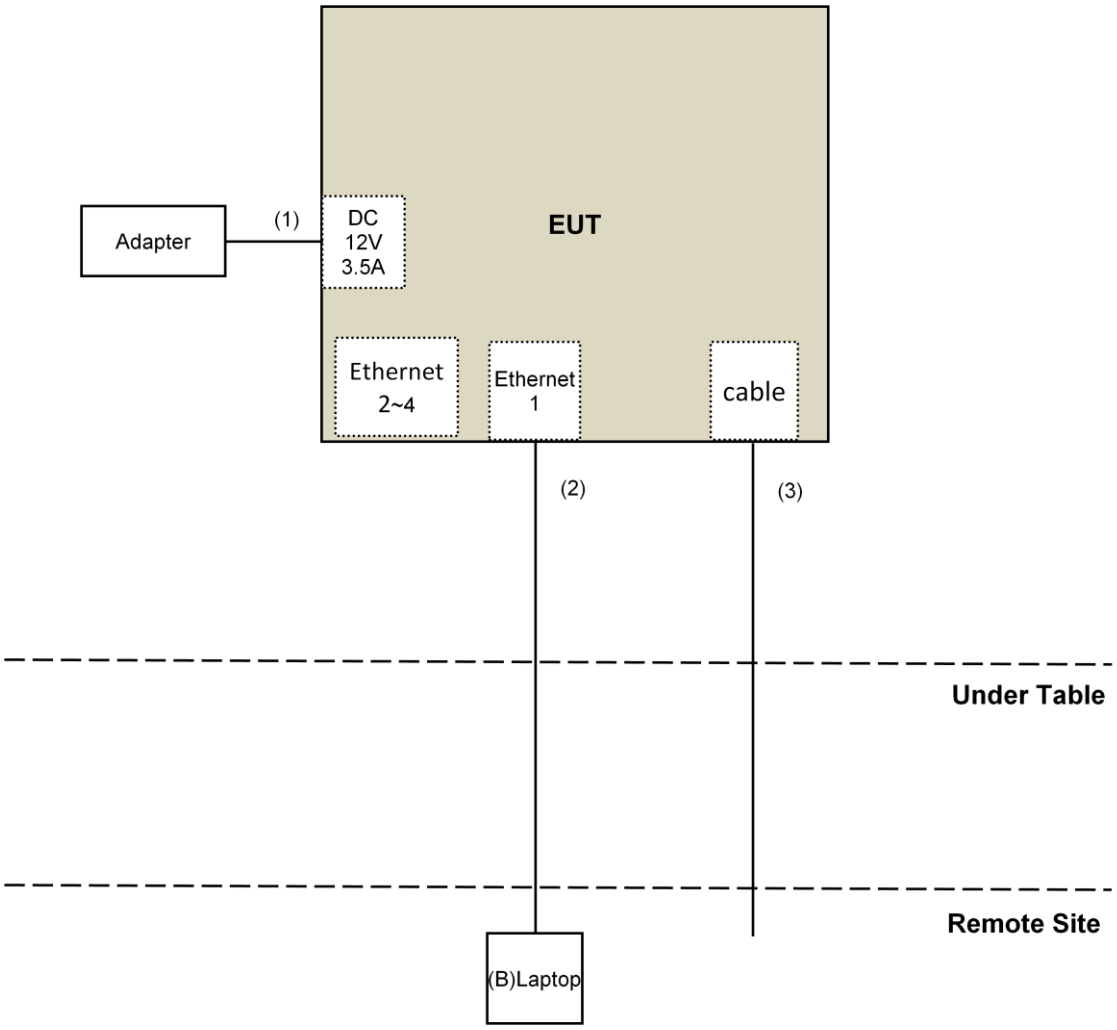
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	Inspiron 7570	DW3CSJ2	R43004	Provided by Lab

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.	DC Cable	1	1.8	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	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 v02r01
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="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</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

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Loop Antenna(*) TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The 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. 3.
4. The CANADA Site Registration No. is 20331-1
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Jan. 10, 2018

For Other Test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Spectrum Analyzer Keysight	N9030A	MY54490679	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 11, 2018	Jan. 10, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSV40	100964	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 29, 2017	May 28, 2018

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. The CANADA Site Registration No. is 20331-1
4. Tested Date: Jan. 19, 2018

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 detects 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:

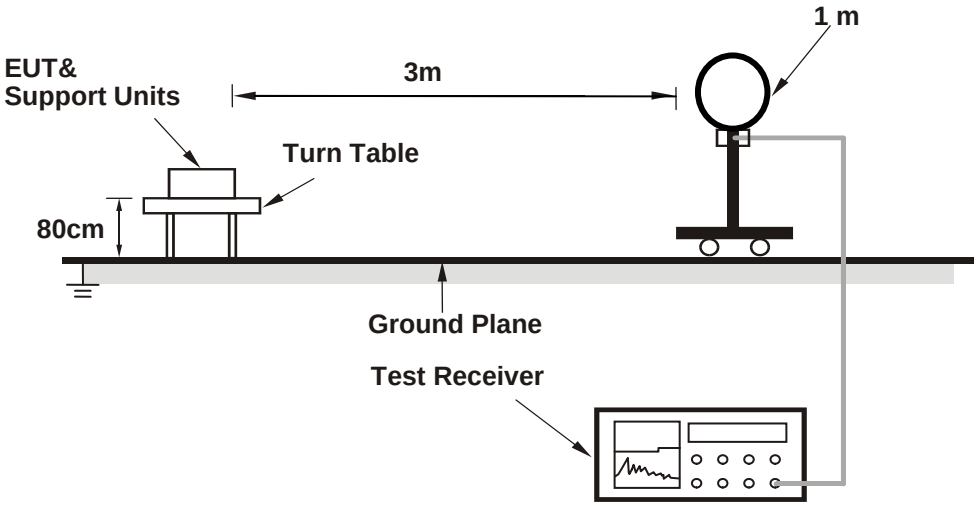
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

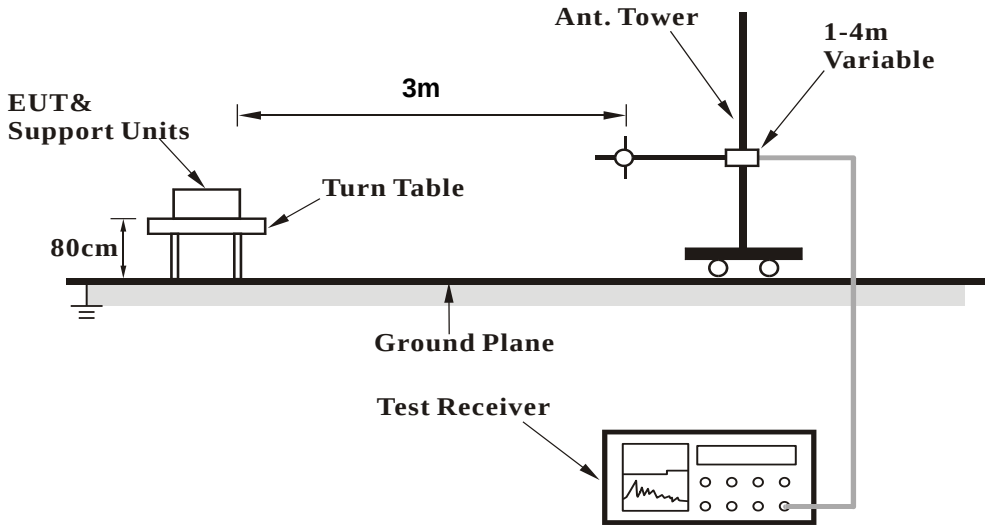
No deviation.

4.1.5 Test Setup

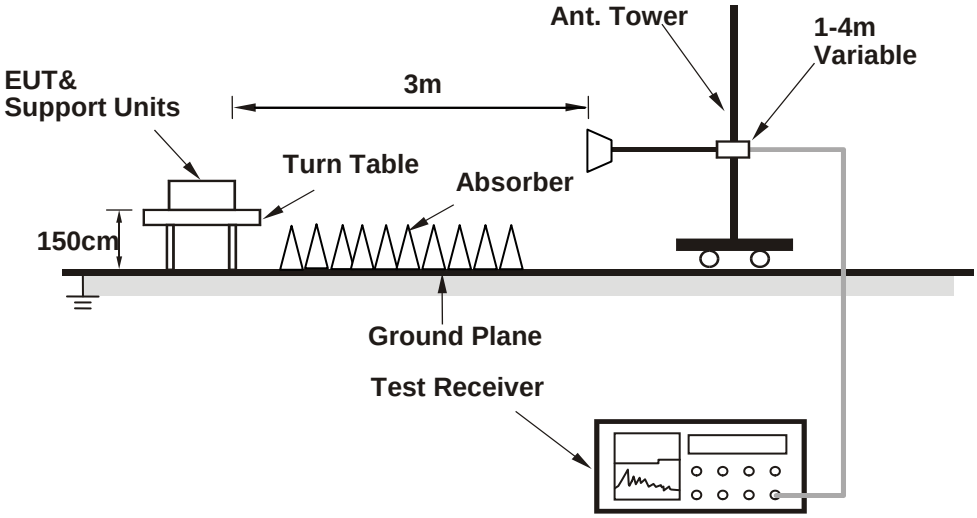
For Radiated emission below 30MHz



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 Notebook Computer which is placed on remote site.
b. Controlling software (QCA Radio Control Toolkit Version3.0.264.0) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

CDD Mode

802.11a

CHANNEL	TX Channel 36	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	66.3 PK	74.0	-7.7	1.11 H	174	62.3	4.0
2	5150.00	50.3 AV	54.0	-3.7	1.11 H	174	46.3	4.0
3	*5180.00	117.9 PK			1.11 H	174	114.0	3.9
4	*5180.00	104.1 AV			1.11 H	174	100.2	3.9
5	#10360.00	46.3 PK	74.0	-27.7	1.48 H	118	33.6	12.7
6	#10360.00	42.8 AV	54.0	-11.2	1.48 H	118	30.1	12.7
7	15540.00	42.6 PK	74.0	-31.4	1.47 H	239	29.7	12.9
8	15540.00	32.8 AV	54.0	-21.2	1.47 H	239	19.9	12.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	68.2 PK	74.0	-5.8	1.59 V	359	64.2	4.0
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.59 V**	**359**	**49.9**	**4.0**
3	*5180.00	118.6 PK			1.59 V	359	114.7	3.9
4	*5180.00	106.2 AV			1.59 V	359	102.3	3.9
5	#10360.00	51.4 PK	74.0	-22.6	1.49 V	220	38.7	12.7
6	#10360.00	47.7 AV	54.0	-6.3	1.49 V	220	35.0	12.7
7	15540.00	41.3 PK	74.0	-32.7	2.50 V	152	28.4	12.9
8	15540.00	32.9 AV	54.0	-21.1	2.50 V	152	20.0	12.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	62.5 PK	74.0	-11.5	1.11 H	175	58.5	4.0
2	5150.00	50.2 AV	54.0	-3.8	1.11 H	175	46.2	4.0
3	*5200.00	117.8 PK			1.11 H	175	114.0	3.8
4	*5200.00	105.0 AV			1.11 H	175	101.2	3.8
5	#10400.00	46.8 PK	74.0	-27.2	1.43 H	118	34.1	12.7
6	#10400.00	43.3 AV	54.0	-10.7	1.43 H	118	30.6	12.7
7	15600.00	42.8 PK	74.0	-31.2	1.39 H	242	29.7	13.1
8	15600.00	33.4 AV	54.0	-20.6	1.39 H	242	20.3	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	65.8 PK	74.0	-8.2	1.59 V	360	61.8	4.0
2	5150.00	53.8 AV	54.0	-0.2	1.59 V	360	49.8	4.0
3	*5200.00	118.7 PK			1.59 V	360	114.9	3.8
4	*5200.00	107.2 AV			1.59 V	360	103.4	3.8
5	#10400.00	51.6 PK	74.0	-22.4	1.56 V	218	38.9	12.7
6	#10400.00	47.8 AV	54.0	-6.2	1.56 V	218	35.1	12.7
7	15600.00	41.9 PK	74.0	-32.1	2.42 V	169	28.8	13.1
8	15600.00	33.3 AV	54.0	-20.7	2.42 V	169	20.2	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	116.4 PK			1.06 H	171	112.7	3.7
2	*5240.00	104.2 AV			1.06 H	171	100.5	3.7
3	5350.00	45.7 PK	74.0	-28.3	1.06 H	171	41.9	3.8
4	5350.00	33.6 AV	54.0	-20.4	1.06 H	171	29.8	3.8
5	#10480.00	46.1 PK	74.0	-27.9	1.37 H	128	32.8	13.3
6	#10480.00	42.6 AV	54.0	-11.4	1.37 H	128	29.3	13.3
7	15720.00	42.8 PK	74.0	-31.2	1.41 H	256	29.6	13.2
8	15720.00	33.2 AV	54.0	-20.8	1.41 H	256	20.0	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	117.5 PK			1.55 V	360	113.8	3.7
2	*5240.00	106.5 AV			1.55 V	360	102.8	3.7
3	5350.00	46.9 PK	74.0	-27.1	1.55 V	360	43.1	3.8
4	5350.00	34.7 AV	54.0	-19.3	1.55 V	360	30.9	3.8
5	#10480.00	52.1 PK	74.0	-21.9	1.53 V	217	38.8	13.3
6	#10480.00	48.0 AV	54.0	-6.0	1.53 V	217	34.7	13.3
7	15720.00	41.6 PK	74.0	-32.4	2.40 V	147	28.4	13.2
8	15720.00	32.7 AV	54.0	-21.3	2.40 V	147	19.5	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	*5745.00	119.5 PK			1.70 H	44	115.3	4.2
2	*5745.00	108.4 AV			1.70 H	44	104.2	4.2
3	11490.00	46.1 PK	74.0	-27.9	1.41 H	141	32.3	13.8
4	11490.00	42.5 AV	54.0	-11.5	1.41 H	141	28.7	13.8
5	#17235.00	42.4 PK	74.0	-31.6	1.40 H	230	26.1	16.3
6	#17235.00	32.9 AV	54.0	-21.1	1.40 H	230	16.6	16.3
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	*5745.00	120.4 PK			1.61 V	92	116.2	4.2
2	*5745.00	110.6 AV			1.61 V	92	106.4	4.2
3	11490.00	51.0 PK	74.0	-23.0	1.54 V	225	37.2	13.8
4	11490.00	47.4 AV	54.0	-6.6	1.54 V	225	33.6	13.8
5	#17235.00	41.3 PK	74.0	-32.7	2.49 V	161	25.0	16.3
6	#17235.00	33.0 AV	54.0	-21.0	2.49 V	161	16.7	16.3

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	*5785.00	118.3 PK			1.67 H	48	114.0	4.3
2	*5785.00	107.2 AV			1.67 H	48	102.9	4.3
3	11570.00	45.9 PK	74.0	-28.1	1.41 H	123	32.0	13.9
4	11570.00	42.6 AV	54.0	-11.4	1.41 H	123	28.7	13.9
5	#17355.00	42.3 PK	74.0	-31.7	1.42 H	238	25.1	17.2
6	#17355.00	33.0 AV	54.0	-21.0	1.42 H	238	15.8	17.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.2 PK			1.62 V	92	115.9	4.3
2	*5785.00	109.5 AV			1.62 V	92	105.2	4.3
3	11570.00	51.5 PK	74.0	-22.5	1.50 V	231	37.6	13.9
4	11570.00	47.5 AV	54.0	-6.5	1.50 V	231	33.6	13.9
5	#17355.00	41.6 PK	74.0	-32.4	2.47 V	146	24.4	17.2
6	#17355.00	33.1 AV	54.0	-20.9	2.47 V	146	15.9	17.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	*5825.00	117.6 PK			1.68 H	43	113.1	4.5
2	*5825.00	107.0 AV			1.68 H	43	102.5	4.5
3	11650.00	46.7 PK	74.0	-27.3	1.40 H	128	33.0	13.7
4	11650.00	43.1 AV	54.0	-10.9	1.40 H	128	29.4	13.7
5	#17475.00	42.6 PK	74.0	-31.4	1.40 H	242	24.5	18.1
6	#17475.00	33.2 AV	54.0	-20.8	1.40 H	242	15.1	18.1
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	*5825.00	120.4 PK			1.64 V	88	115.9	4.5
2	*5825.00	109.4 AV			1.64 V	88	104.9	4.5
3	11650.00	51.6 PK	74.0	-22.4	1.53 V	233	37.9	13.7
4	11650.00	47.7 AV	54.0	-6.3	1.53 V	233	34.0	13.7
5	#17475.00	42.1 PK	74.0	-31.9	2.38 V	145	24.0	18.1
6	#17475.00	33.4 AV	54.0	-20.6	2.38 V	145	15.3	18.1

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.

Beamforming Mode

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	66.6 PK	74.0	-7.4	1.13 H	177	62.6	4.0
2	5150.00	50.8 AV	54.0	-3.2	1.13 H	177	46.8	4.0
3	*5180.00	117.9 PK			1.13 H	177	114.0	3.9
4	*5180.00	104.2 AV			1.13 H	177	100.3	3.9
5	#10360.00	46.2 PK	74.0	-27.8	1.43 H	104	33.5	12.7
6	#10360.00	42.6 AV	54.0	-11.4	1.43 H	104	29.9	12.7
7	15540.00	42.9 PK	74.0	-31.1	1.45 H	230	30.0	12.9
8	15540.00	33.0 AV	54.0	-21.0	1.45 H	230	20.1	12.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	68.2 PK	74.0	-5.8	1.79 V	91	64.2	4.0
2	5150.00	53.8 AV	54.0	-0.2	1.79 V	91	49.8	4.0
3	*5180.00	116.8 PK			1.79 V	91	112.9	3.9
4	*5180.00	106.2 AV			1.79 V	91	102.3	3.9
5	#10360.00	51.4 PK	74.0	-22.6	1.61 V	213	38.7	12.7
6	#10360.00	47.4 AV	54.0	-6.6	1.61 V	213	34.7	12.7
7	15540.00	42.1 PK	74.0	-31.9	2.43 V	152	29.2	12.9
8	15540.00	33.7 AV	54.0	-20.3	2.43 V	152	20.8	12.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	62.9 PK	74.0	-11.1	1.13 H	186	58.9	4.0
2	5150.00	50.4 AV	54.0	-3.6	1.13 H	186	46.4	4.0
3	*5200.00	118.4 PK			1.13 H	186	114.6	3.8
4	*5200.00	105.4 AV			1.13 H	186	101.6	3.8
5	5350.00	45.3 PK	74.0	-28.7	1.13 H	186	41.5	3.8
6	5350.00	33.1 AV	54.0	-20.9	1.13 H	186	29.3	3.8
7	#10400.00	46.9 PK	74.0	-27.1	1.40 H	109	34.2	12.7
8	#10400.00	43.5 AV	54.0	-10.5	1.40 H	109	30.8	12.7
9	15600.00	42.5 PK	74.0	-31.5	1.41 H	249	29.4	13.1
10	15600.00	33.3 AV	54.0	-20.7	1.41 H	249	20.2	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	63.6 PK	74.0	-10.4	1.89 V	120	59.6	4.0
2	5150.00	53.7 AV	54.0	-0.3	1.89 V	120	49.7	4.0
3	*5200.00	119.3 PK			1.89 V	120	115.5	3.8
4	*5200.00	109.2 AV			1.89 V	120	105.4	3.8
5	5350.00	46.5 PK	74.0	-27.5	1.89 V	120	42.7	3.8
6	5350.00	34.3 AV	54.0	-19.7	1.89 V	120	30.5	3.8
7	#10400.00	51.6 PK	74.0	-22.4	1.58 V	229	38.9	12.7
8	#10400.00	47.8 AV	54.0	-6.2	1.58 V	229	35.1	12.7
9	15600.00	41.3 PK	74.0	-32.7	2.39 V	154	28.2	13.1
10	15600.00	32.7 AV	54.0	-21.3	2.39 V	154	19.6	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	116.5 PK			1.10 H	165	112.8	3.7
2	*5240.00	104.1 AV			1.10 H	165	100.4	3.7
3	5350.00	45.4 PK	74.0	-28.6	1.10 H	165	41.6	3.8
4	5350.00	33.2 AV	54.0	-20.8	1.10 H	165	29.4	3.8
5	#10480.00	46.6 PK	74.0	-27.4	1.32 H	140	33.3	13.3
6	#10480.00	42.9 AV	54.0	-11.1	1.32 H	140	29.6	13.3
7	15720.00	43.2 PK	74.0	-30.8	1.40 H	250	30.0	13.2
8	15720.00	33.4 AV	54.0	-20.6	1.40 H	250	20.2	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	118.7 PK			1.85 V	360	115.0	3.7
2	*5240.00	107.9 AV			1.85 V	360	104.2	3.7
3	5350.00	46.8 PK	74.0	-27.2	1.85 V	122	43.0	3.8
4	5350.00	34.9 AV	54.0	-19.1	1.85 V	122	31.1	3.8
5	#10480.00	51.9 PK	74.0	-22.1	1.49 V	236	38.6	13.3
6	#10480.00	47.8 AV	54.0	-6.2	1.49 V	236	34.5	13.3
7	15720.00	41.8 PK	74.0	-32.2	2.42 V	154	28.6	13.2
8	15720.00	33.1 AV	54.0	-20.9	2.42 V	154	19.9	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	*5745.00	118.2 PK			1.69 H	44	114.0	4.2
2	*5745.00	108.6 AV			1.69 H	44	104.4	4.2
3	11490.00	45.6 PK	74.0	-28.4	1.44 H	119	31.8	13.8
4	11490.00	42.5 AV	54.0	-11.5	1.44 H	119	28.7	13.8
5	#17235.00	42.8 PK	74.0	-31.2	1.37 H	249	26.5	16.3
6	#17235.00	33.3 AV	54.0	-20.7	1.37 H	249	17.0	16.3
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	*5745.00	120.0 PK			1.58 V	100	115.8	4.2
2	*5745.00	109.6 AV			1.58 V	100	105.4	4.2
3	11490.00	51.2 PK	74.0	-22.8	1.56 V	224	37.4	13.8
4	11490.00	47.2 AV	54.0	-6.8	1.56 V	224	33.4	13.8
5	#17235.00	41.3 PK	74.0	-32.7	2.47 V	163	25.0	16.3
6	#17235.00	32.9 AV	54.0	-21.1	2.47 V	163	16.6	16.3

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	*5785.00	117.7 PK			1.70 H	44	113.4	4.3
2	*5785.00	107.6 AV			1.70 H	44	103.3	4.3
3	11570.00	46.6 PK	74.0	-27.4	1.37 H	141	32.7	13.9
4	11570.00	43.1 AV	54.0	-10.9	1.37 H	141	29.2	13.9
5	#17355.00	42.2 PK	74.0	-31.8	1.46 H	233	25.0	17.2
6	#17355.00	32.5 AV	54.0	-21.5	1.46 H	233	15.3	17.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.2 PK			1.59 V	96	115.9	4.3
2	*5785.00	109.4 AV			1.59 V	96	105.1	4.3
3	11570.00	51.8 PK	74.0	-22.2	1.54 V	235	37.9	13.9
4	11570.00	47.9 AV	54.0	-6.1	1.54 V	235	34.0	13.9
5	#17355.00	42.3 PK	74.0	-31.7	2.46 V	170	25.1	17.2
6	#17355.00	33.6 AV	54.0	-20.4	2.46 V	170	16.4	17.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	*5825.00	117.6 PK			1.72 H	44	113.1	4.5
2	*5825.00	107.2 AV			1.72 H	44	102.7	4.5
3	11650.00	46.2 PK	74.0	-27.8	1.45 H	119	32.5	13.7
4	11650.00	42.9 AV	54.0	-11.1	1.45 H	119	29.2	13.7
5	#17475.00	41.9 PK	74.0	-32.1	1.37 H	230	23.8	18.1
6	#17475.00	32.5 AV	54.0	-21.5	1.37 H	230	14.4	18.1
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	*5825.00	119.9 PK			1.60 V	93	115.4	4.5
2	*5825.00	108.9 AV			1.60 V	93	104.4	4.5
3	11650.00	52.0 PK	74.0	-22.0	1.59 V	226	38.3	13.7
4	11650.00	48.1 AV	54.0	-5.9	1.59 V	226	34.4	13.7
5	#17475.00	41.7 PK	74.0	-32.3	2.48 V	148	23.6	18.1
6	#17475.00	33.2 AV	54.0	-20.8	2.48 V	148	15.1	18.1

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.

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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	63.4 PK	74.0	-10.6	1.57 H	59	59.4	4.0
2	5150.00	50.6 AV	54.0	-3.4	1.57 H	59	46.6	4.0
3	*5190.00	109.4 PK			1.57 H	59	105.5	3.9
4	*5190.00	99.9 AV			1.57 H	59	96.0	3.9
5	5350.00	46.4 PK	74.0	-27.6	1.57 H	59	42.6	3.8
6	5350.00	33.6 AV	54.0	-20.4	1.57 H	59	29.8	3.8
7	#10380.00	46.0 PK	74.0	-28.0	1.42 H	118	33.2	12.8
8	#10380.00	42.5 AV	54.0	-11.5	1.42 H	118	29.7	12.8
9	15570.00	42.7 PK	74.0	-31.3	1.36 H	237	29.7	13.0
10	15570.00	32.9 AV	54.0	-21.1	1.36 H	237	19.9	13.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.1 PK	74.0	-8.9	1.81 V	44	61.1	4.0
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.81 V**	**44**	**49.9**	**4.0**
3	*5190.00	111.9 PK			1.81 V	44	108.0	3.9
4	*5190.00	102.3 AV			1.81 V	44	98.4	3.9
5	5350.00	47.1 PK	74.0	-26.9	1.81 V	44	43.3	3.8
6	5350.00	34.6 AV	54.0	-19.4	1.81 V	44	30.8	3.8

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 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	64.2 PK	74.0	-9.8	1.60 H	43	60.2	4.0
2	5150.00	50.7 AV	54.0	-3.3	1.60 H	43	46.7	4.0
3	*5230.00	111.5 PK			1.60 H	43	107.8	3.7
4	*5230.00	101.8 AV			1.60 H	43	98.1	3.7
5	5350.00	46.5 PK	74.0	-27.5	1.60 H	43	42.7	3.8
6	5350.00	33.8 AV	54.0	-20.2	1.60 H	43	30.0	3.8
7	#10460.00	46.0 PK	74.0	-28.0	1.38 H	110	32.8	13.2
8	#10460.00	42.8 AV	54.0	-11.2	1.38 H	110	29.6	13.2
9	15690.00	42.0 PK	74.0	-32.0	1.47 H	236	28.6	13.4
10	15690.00	32.6 AV	54.0	-21.4	1.47 H	236	19.2	13.4
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	5150.00	65.3 PK	74.0	-8.7	1.80 V	44	61.3	4.0
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.80 V**	**44**	**49.9**	**4.0**
3	*5230.00	113.9 PK			1.80 V	44	110.2	3.7
4	*5230.00	104.6 AV			1.80 V	44	100.9	3.7
5	5350.00	46.3 PK	74.0	-27.7	1.80 V	44	42.5	3.8
6	5350.00	34.8 AV	54.0	-19.2	1.80 V	44	31.0	3.8

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 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	*5755.00	115.3 PK			1.58 H	44	111.0	4.3
2	*5755.00	106.2 AV			1.58 H	44	101.9	4.3
3	11510.00	46.0 PK	74.0	-28.0	1.44 H	114	32.1	13.9
4	11510.00	42.9 AV	54.0	-11.1	1.44 H	114	29.0	13.9
5	#17265.00	42.7 PK	74.0	-31.3	1.42 H	256	26.1	16.6
6	#17265.00	33.0 AV	54.0	-21.0	1.42 H	256	16.4	16.6
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	*5755.00	118.6 PK			1.60 V	90	114.3	4.3
2	*5755.00	108.7 AV			1.60 V	90	104.4	4.3
3	11510.00	51.5 PK	74.0	-22.5	1.59 V	223	37.6	13.9
4	11510.00	47.5 AV	54.0	-6.5	1.59 V	223	33.6	13.9
5	#17265.00	42.0 PK	74.0	-32.0	2.50 V	143	25.4	16.6
6	#17265.00	33.4 AV	54.0	-20.6	2.50 V	143	16.8	16.6

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.

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	*5795.00	113.9 PK			1.50 H	45	109.6	4.3
2	*5795.00	105.0 AV			1.50 H	45	100.7	4.3
3	11590.00	46.5 PK	74.0	-27.5	1.41 H	120	32.6	13.9
4	11590.00	43.0 AV	54.0	-11.0	1.41 H	120	29.1	13.9
5	#17385.00	42.5 PK	74.0	-31.5	1.45 H	251	25.0	17.5
6	#17385.00	33.0 AV	54.0	-21.0	1.45 H	251	15.5	17.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	116.2 PK			1.59 V	86	111.9	4.3
2	*5795.00	107.9 AV			1.59 V	86	103.6	4.3
3	11590.00	51.8 PK	74.0	-22.2	1.50 V	204	37.9	13.9
4	11590.00	48.0 AV	54.0	-6.0	1.50 V	204	34.1	13.9
5	#17385.00	41.2 PK	74.0	-32.8	2.44 V	146	23.7	17.5
6	#17385.00	32.7 AV	54.0	-21.3	2.44 V	146	15.2	17.5

REMARKS:

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

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CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.5 PK	74.0	-11.5	1.58 H	55	58.5	4.0
2	5150.00	50.7 AV	54.0	-3.3	1.58 H	55	46.7	4.0
3	*5210.00	104.8 PK			1.58 H	55	101.0	3.8
4	*5210.00	93.2 AV			1.58 H	55	89.4	3.8
5	5350.00	47.4 PK	74.0	-26.6	1.58 H	55	43.6	3.8
6	5350.00	36.5 AV	54.0	-17.5	1.58 H	55	32.7	3.8
7	#10420.00	46.6 PK	74.0	-27.4	1.44 H	110	33.7	12.9
8	#10420.00	43.1 AV	54.0	-10.9	1.44 H	110	30.2	12.9
9	15630.00	42.7 PK	74.0	-31.3	1.37 H	244	29.4	13.3
10	15630.00	33.3 AV	54.0	-20.7	1.37 H	244	20.0	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	65.9 PK	74.0	-8.1	1.49 V	327	61.9	4.0
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.49 V**	**327**	**49.9**	**4.0**
3	*5210.00	107.0 PK			1.49 V	327	103.2	3.8
4	*5210.00	96.6 AV			1.49 V	327	92.8	3.8
5	5350.00	48.5 PK	74.0	-25.5	1.49 V	327	44.7	3.8
6	5350.00	37.8 AV	54.0	-16.2	1.49 V	327	34.0	3.8

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 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	*5775.00	107.8 PK			1.60 H	44	103.6	4.2
2	*5775.00	99.3 AV			1.60 H	44	95.1	4.2
3	11550.00	46.2 PK	74.0	-27.8	1.43 H	125	32.3	13.9
4	11550.00	42.8 AV	54.0	-11.2	1.43 H	125	28.9	13.9
5	#17325.00	42.4 PK	74.0	-31.6	1.42 H	243	25.4	17.0
6	#17325.00	32.9 AV	54.0	-21.1	1.42 H	243	15.9	17.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	112.5 PK			1.52 V	274	108.3	4.2
2	*5775.00	103.0 AV			1.52 V	274	98.8	4.2
3	11550.00	51.4 PK	74.0	-22.6	1.55 V	220	37.5	13.9
4	11550.00	47.6 AV	54.0	-6.4	1.55 V	220	33.7	13.9
5	#17325.00	41.8 PK	74.0	-32.2	2.44 V	156	24.8	17.0
6	#17325.00	33.2 AV	54.0	-20.8	2.44 V	156	16.2	17.0

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.

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 159	**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	97.97	37.3 QP	43.5	-6.2	3.00 H	74	50.3	-13.0
2	145.16	34.8 QP	43.5	-8.7	2.00 H	95	42.9	-8.1
3	200.53	31.3 QP	43.5	-12.2	1.00 H	258	42.6	-11.3
4	370.69	37.4 QP	46.0	-8.6	1.00 H	126	43.1	-5.7
5	530.35	31.2 QP	46.0	-14.8	1.50 H	323	33.4	-2.2
6	864.66	33.0 QP	46.0	-13.0	2.00 H	0	30.0	3.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	97.10	39.3 QP	43.5	-4.2	1.00 V	18	52.4	-13.1
2	125.01	35.8 QP	43.5	-7.7	1.50 V	50	45.4	-9.6
3	345.35	31.4 QP	46.0	-14.6	1.50 V	258	37.6	-6.2
4	370.30	37.6 QP	46.0	-8.4	1.50 V	27	43.3	-5.7
5	536.80	33.0 QP	46.0	-13.0	1.00 V	151	35.1	-2.1
6	750.03	33.6 QP	46.0	-12.4	1.50 V	0	31.6	2.0

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

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	847124/029	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
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 Conduction 1.
3 Tested Date: Jan. 10, 2018

4.2.3 Test Procedure

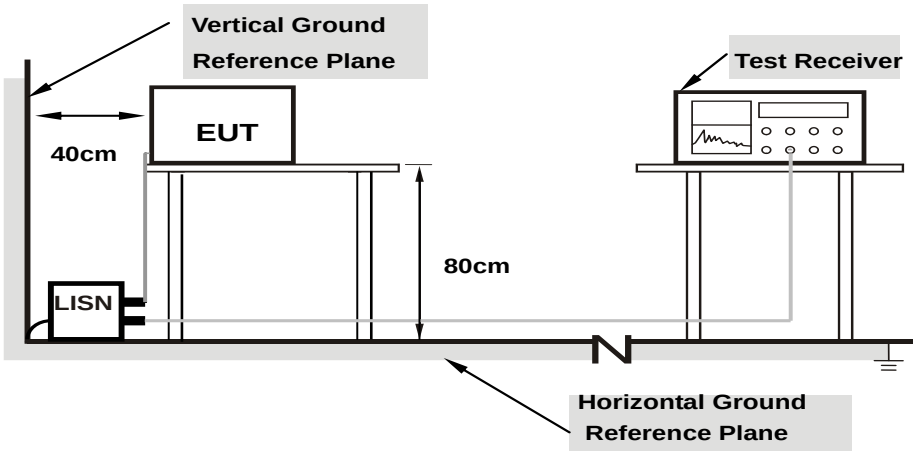
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

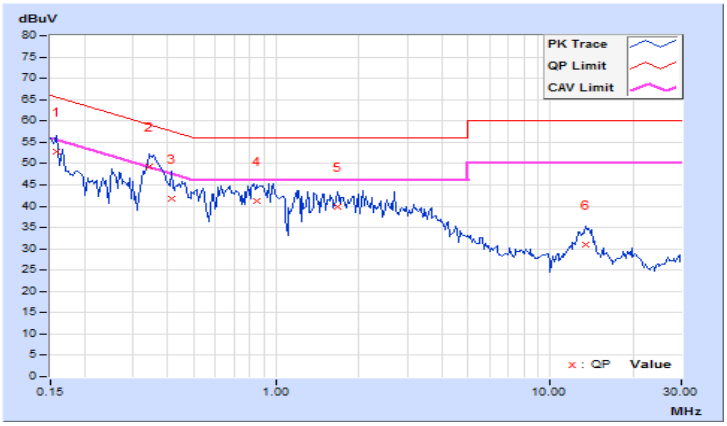
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.14	42.76	33.24	52.90	43.38	65.58	55.58	-12.68	-12.20
2	**0.34531**	**10.19**	**39.21**	**34.62**	**49.40**	**44.81**	**59.07**	**49.07**	**-9.67**	**-4.26**
3	0.41563	10.20	31.56	25.33	41.76	35.53	57.54	47.54	-15.78	-12.01
4	0.84922	10.24	31.10	25.29	41.34	35.53	56.00	46.00	-14.66	-10.47
5	1.67969	10.28	29.55	20.83	39.83	31.11	56.00	46.00	-16.17	-14.89
6	13.50000	11.06	19.98	14.10	31.04	25.16	60.00	50.00	-28.96	-24.84

Remarks:

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

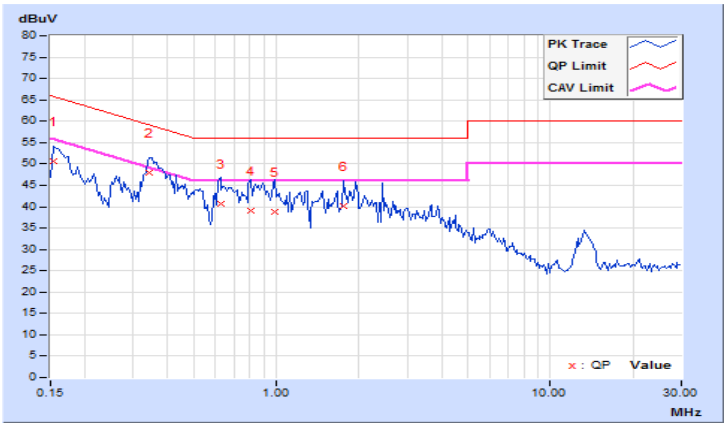


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.05	40.49	29.56	50.54	39.61	65.79	55.79	-15.25	-16.18
2	0.34141	10.09	37.87	31.12	47.96	41.21	59.17	49.17	-11.21	-7.96
3	0.62656	10.11	30.51	24.25	40.62	34.36	56.00	46.00	-15.38	-11.64
4	0.80625	10.11	28.97	20.00	39.08	30.11	56.00	46.00	-16.92	-15.89
5	0.98594	10.12	28.65	20.85	38.77	30.97	56.00	46.00	-17.23	-15.03
6	1.75781	10.17	29.90	22.96	40.07	33.13	56.00	46.00	-15.93	-12.87

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



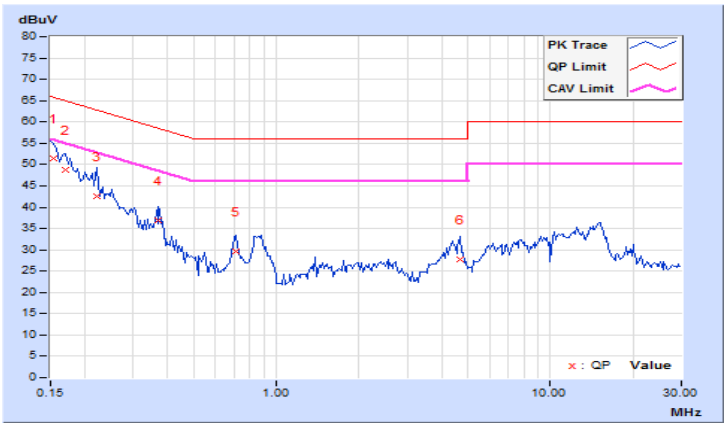
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.14	41.22	27.24	51.36	37.38	65.79	55.79	-14.43	-18.41
2	0.16953	10.14	38.54	26.21	48.68	36.35	64.98	54.98	-16.30	-18.63
3	0.22031	10.16	32.35	19.15	42.51	29.31	62.81	52.81	-20.30	-23.50
4	0.36875	10.19	26.62	18.83	36.81	29.02	58.53	48.53	-21.72	-19.51
5	0.71250	10.23	19.46	12.74	29.69	22.97	56.00	46.00	-26.31	-23.03
6	4.66797	10.48	17.31	10.47	27.79	20.95	56.00	46.00	-28.21	-25.05

Remarks:

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



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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	10.05	37.60	25.57	47.65	35.62	64.98	54.98	-17.33	-19.36
2	0.22422	10.06	32.76	21.78	42.82	31.84	62.66	52.66	-19.84	-20.82
3	0.36875	10.09	27.40	22.54	37.49	32.63	58.53	48.53	-21.04	-15.90
4	0.86094	10.12	18.93	11.66	29.05	21.78	56.00	46.00	-26.95	-24.22
5	4.52344	10.32	18.54	11.00	28.86	21.32	56.00	46.00	-27.14	-24.68
6	15.21094	10.99	22.51	17.72	33.50	28.71	60.00	50.00	-26.50	-21.29

Remarks:

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

4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	24.33	25.37	615.369	27.89	30.00	Pass
40	5200	26.66	26.09	869.89	29.39	30.00	Pass
48	5240	26.53	26.12	859.041	29.34	30.00	Pass
149	5745	25.51	26.49	801.287	29.04	30.00	Pass
157	5785	26.17	26.60	871.088	29.40	30.00	Pass
165	5825	25.90	26.11	797.364	29.02	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	24.28	25.04	587.071	27.69	29.93	Pass
40	5200	26.61	26.16	871.19	29.40	29.93	Pass
48	5240	26.50	26.08	852.193	29.31	29.93	Pass
149	5745	25.66	26.48	812.76	29.10	29.77	Pass
157	5785	26.02	26.72	869.839	29.39	29.77	Pass
165	5825	25.92	26.10	798.221	29.02	29.77	Pass

Note:

For U-NII-1: Directional gain = 6.07dBi > 6dBi, so the power limit shall be reduced to 30-(6.07-6) = 29.63dBm.
For U-NII-3: Directional gain = 6.23dBi > 6dBi, so the power limit shall be reduced to 30-(6.23-6) = 29.77dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	21.82	22.55	331.942	25.21	29.93	Pass
46	5230	23.90	24.10	502.511	27.01	29.93	Pass
151	5755	26.66	26.15	875.545	29.42	29.77	Pass
159	5795	26.79	26.32	906.078	29.57	29.77	Pass

Note:

For U-NII-1: Directional gain = 6.07dBi > 6dBi, so the power limit shall be reduced to 30-(6.07-6) = 29.63dBm.
For U-NII-3: Directional gain = 6.23dBi > 6dBi, so the power limit shall be reduced to 30-(6.23-6) = 29.77dBm.

802.11ac (VHT80)

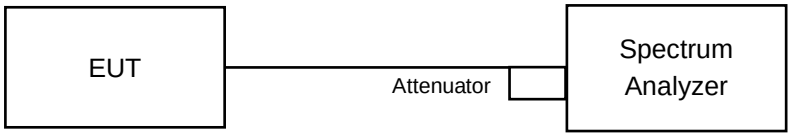
Chan.	Chan. Freq. (MHz)	Maximum Conducted (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	21.12	21.27	263.388	24.21	29.93	Pass
155	5775	24.16	24.30	529.768	27.24	29.77	Pass

Note:

For U-NII-1: Directional gain = 6.07dBi > 6dBi, so the power limit shall be reduced to 30-(6.07-6) = 29.63dBm.
For U-NII-3: Directional gain = 6.23dBi > 6dBi, so the power limit shall be reduced to 30-(6.23-6) = 29.77dBm.

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

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.68	16.68
40	5200	18.00	16.68
48	5240	16.92	16.68

802.11ac (VHT20)

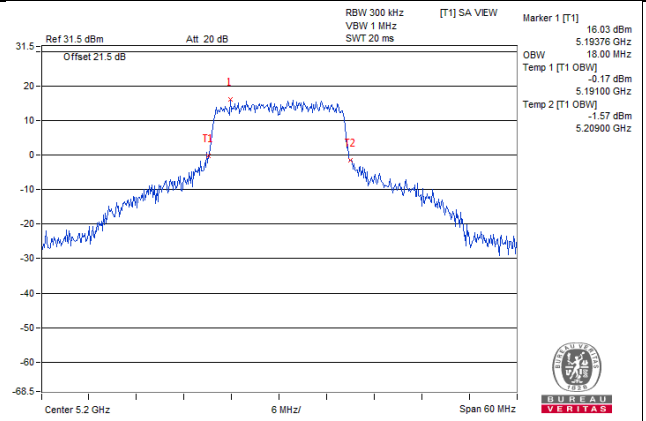
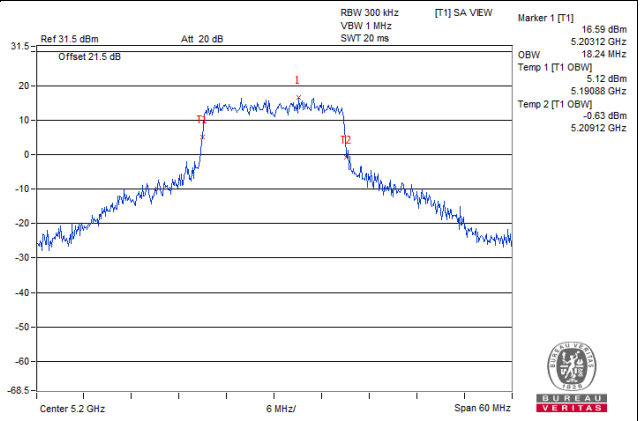
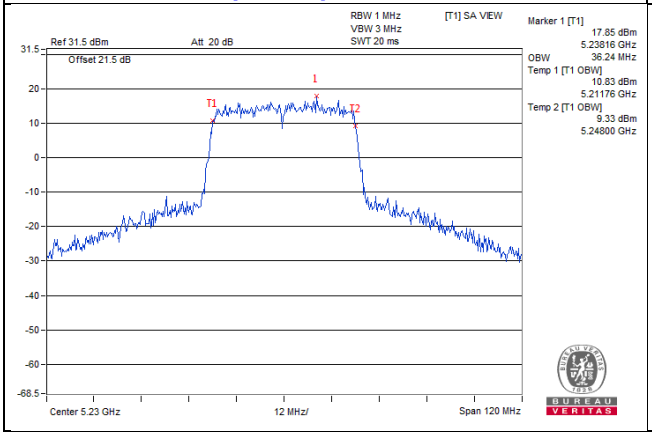
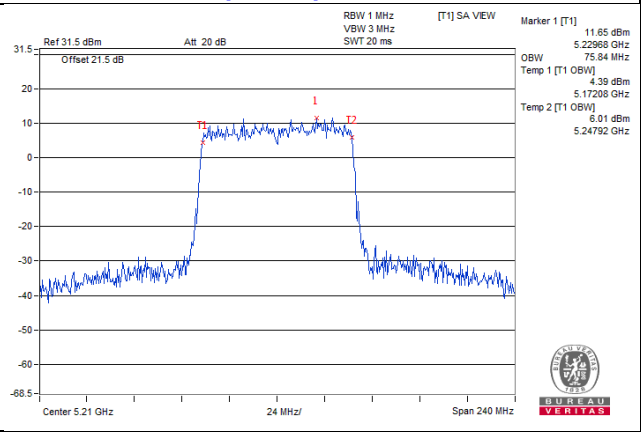
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.76	17.76
40	5200	18.24	17.88
48	5240	18.24	17.76

802.11ac (VHT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.24	36.24
46	5230	36.24	36.24

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.84

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH40	**802.11ac (VHT20)_Chain 0 / CH40**
	
802.11ac (VHT40) _Chain 0 / CH46	**802.11ac (VHT80) _Chain 0 / CH42**
	

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
149	5745	17.28	18.36
157	5785	18.24	18.48
165	5825	21.72	20.40

802.11ac (VHT20)

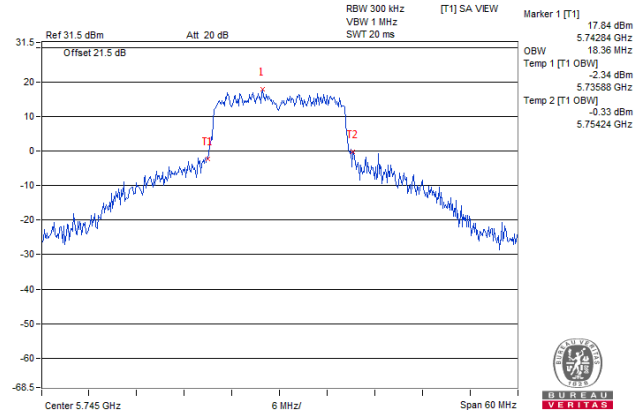
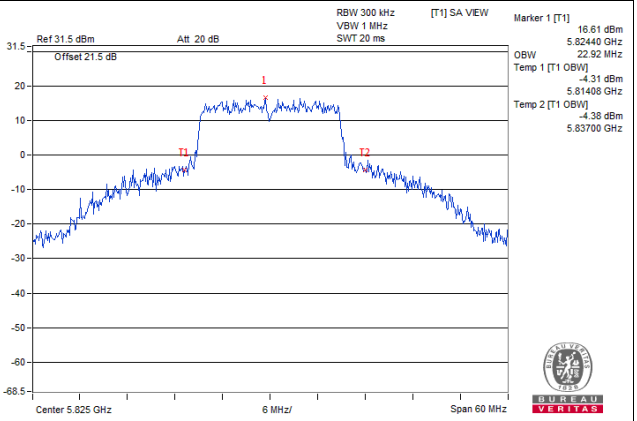
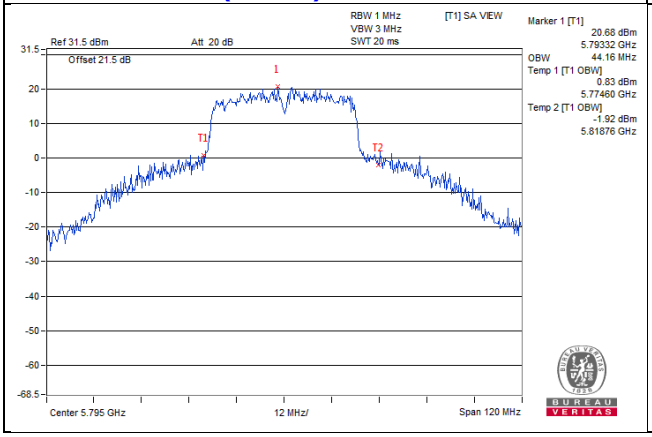
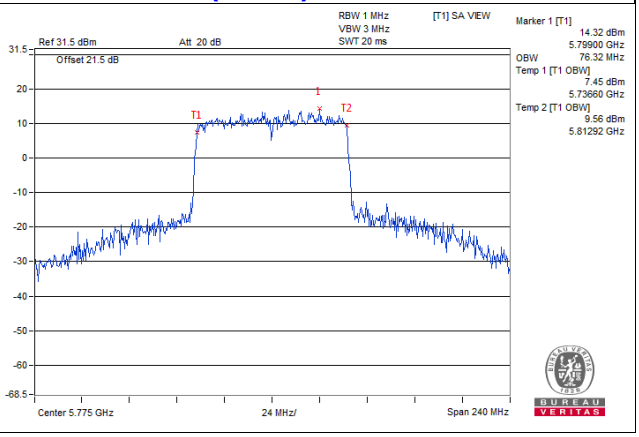
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
149	5745	18.12	18.12
157	5785	18.84	18.36
165	5825	22.92	22.32

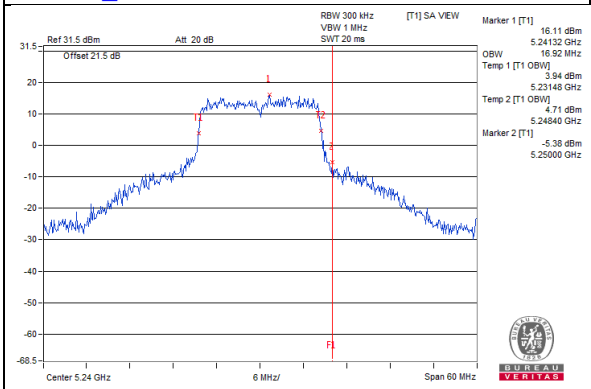
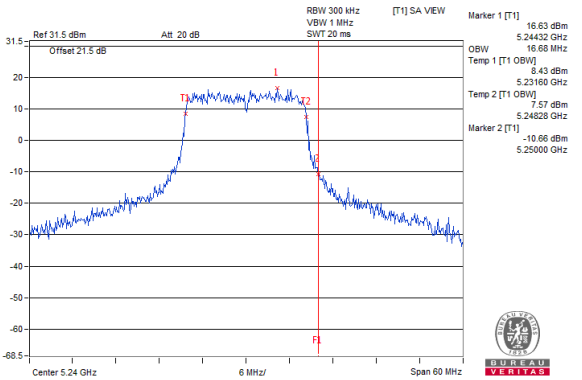
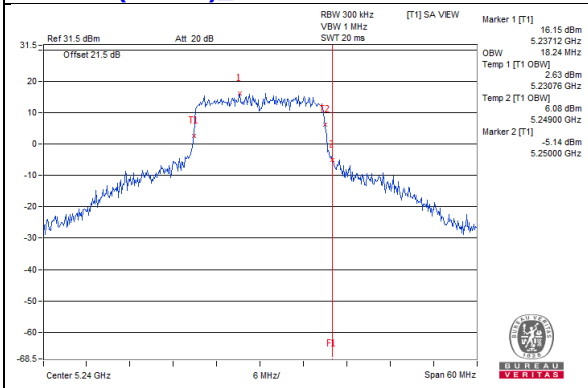
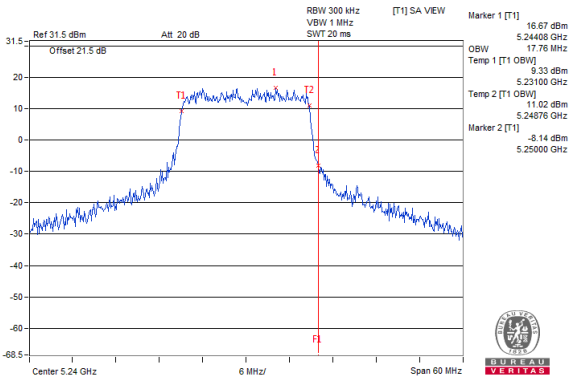
802.11ac (VHT40)

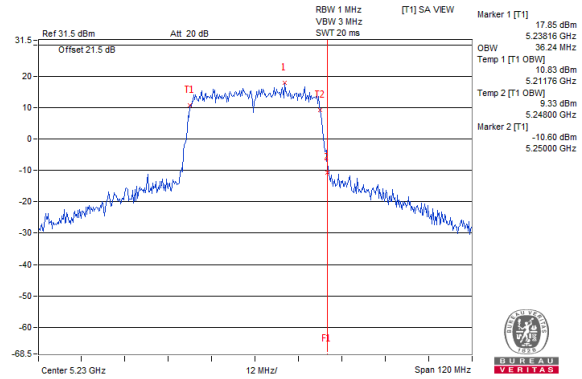
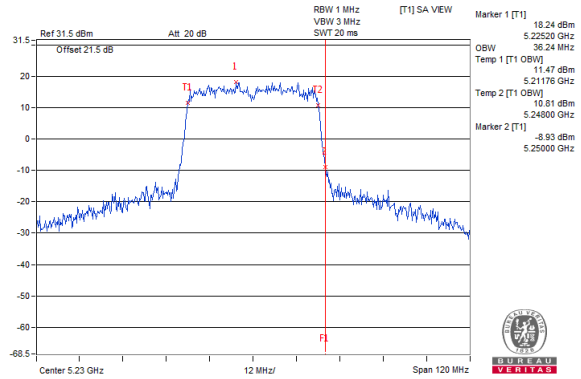
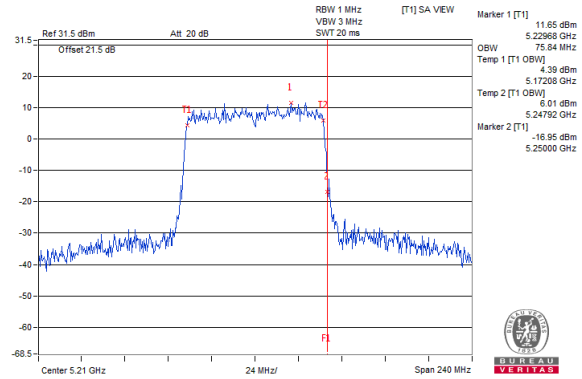
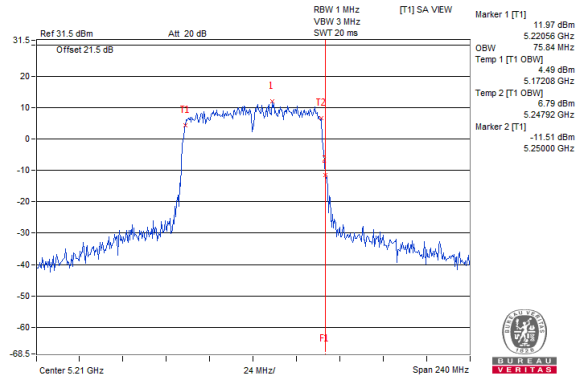
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
151	5755	41.04	36.96
159	5795	44.16	36.72

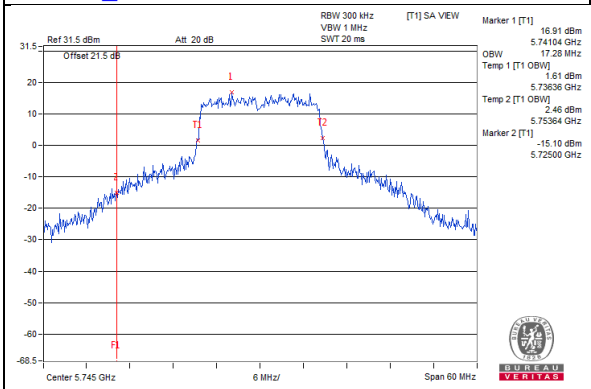
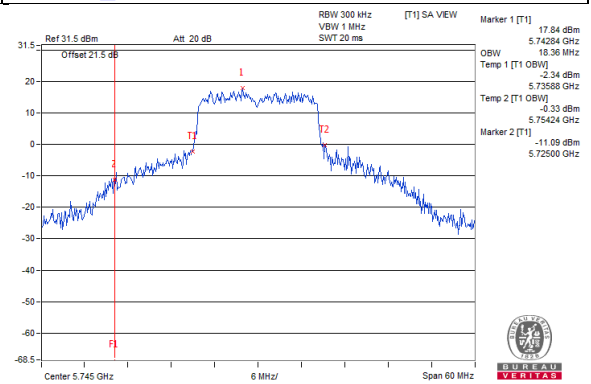
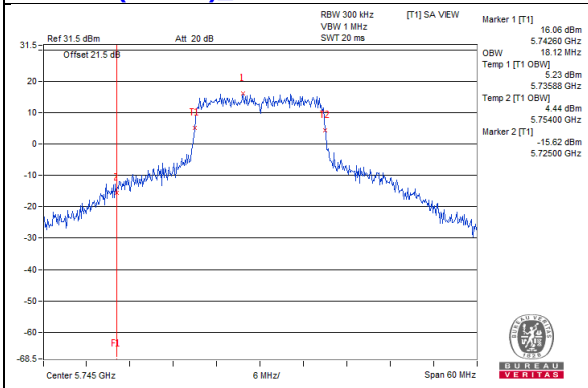
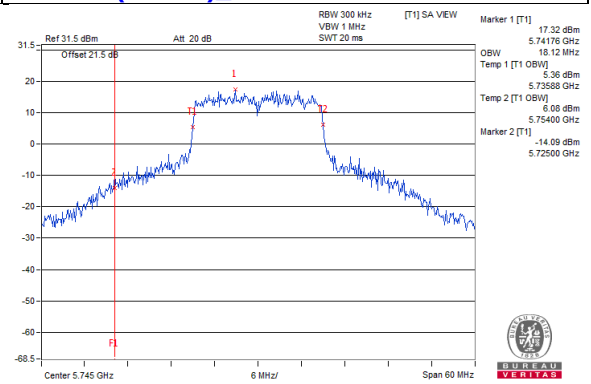
802.11ac (VHT80)

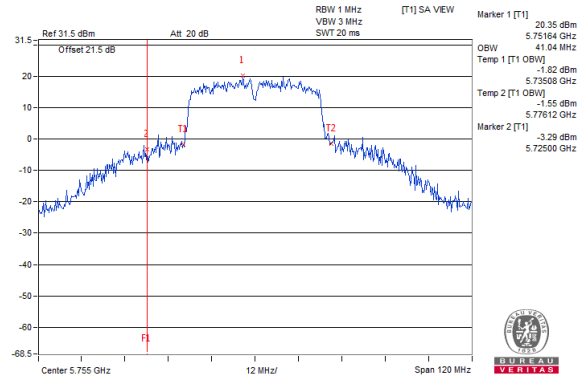
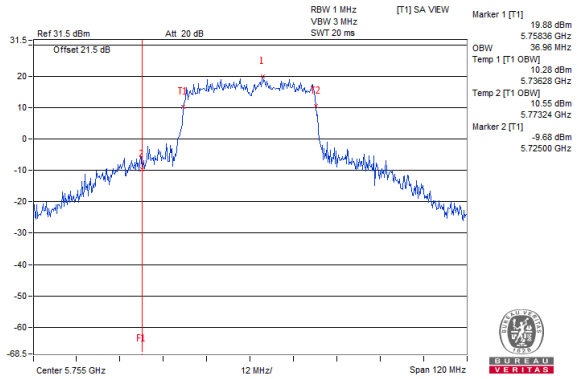
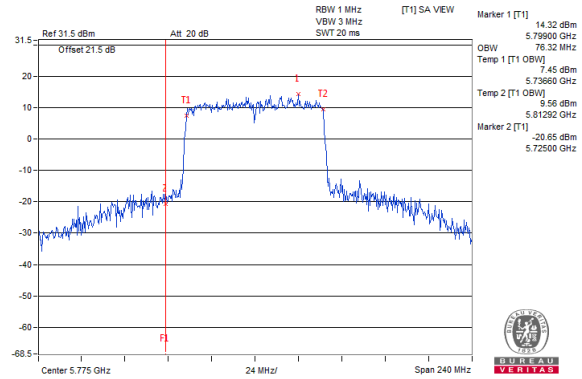
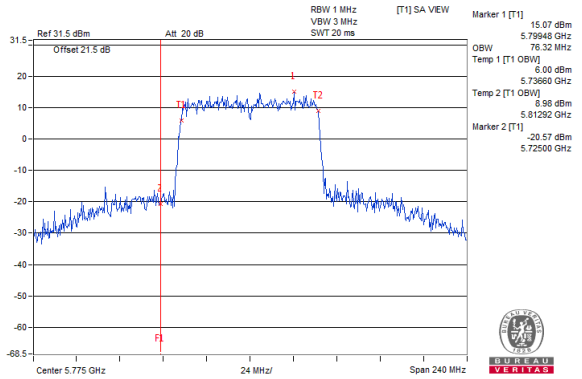
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
155	5775	76.32	76.32

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH149	**802.11ac (VHT20)_Chain 0 / CH165**
	
802.11ac (VHT40) _Chain 0 / CH159	**802.11ac (VHT80) _Chain 0 / 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**
	

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

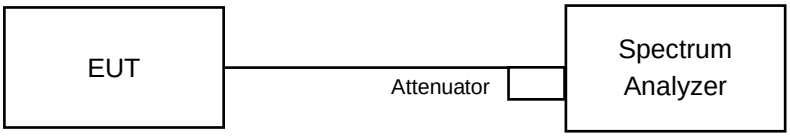
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ac(VHT40)_Chain0 / CH151	**802.11ac(VHT40)_Chain1 / CH151**
	
802.11ac(VHT80)_Chain0 / CH155	**802.11ac(VHT80)_Chain1 / CH155**
	

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	
		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

802.11ac (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
6.

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

802.11a, 802.11ac (VHT40), 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 W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	10.77	11.64	0.16	14.39	16.93	Pass
40	5200	12.16	12.23	0.16	15.36	16.93	Pass
48	5240	11.29	11.71	0.16	14.67	16.93	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 = 6.07dBi > 6dBi , so the power density limit shall be reduced to 17-(6.07-6) = 16.93dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

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	10.30	11.01	13.68	16.93	Pass
40	5200	11.77	12.26	15.03	16.93	Pass
48	5240	11.54	11.84	14.70	16.93	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 = 6.07dBi > 6dBi , so the power density limit shall be reduced to 17-(6.07-6) = 16.93dBm.

802.11ac (VHT40)

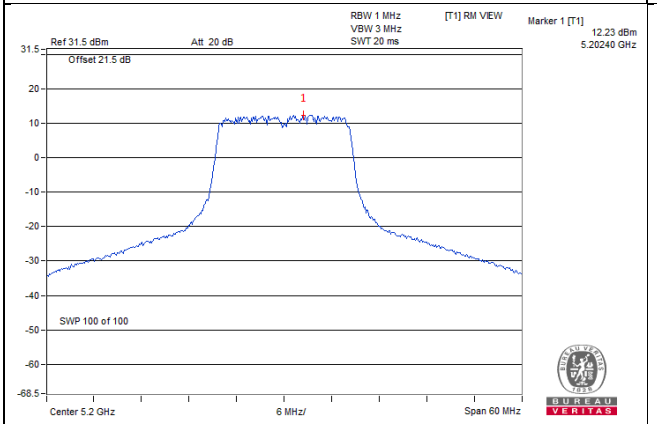
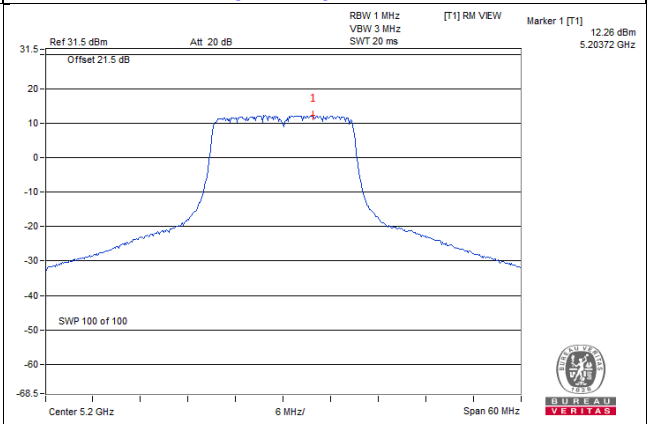
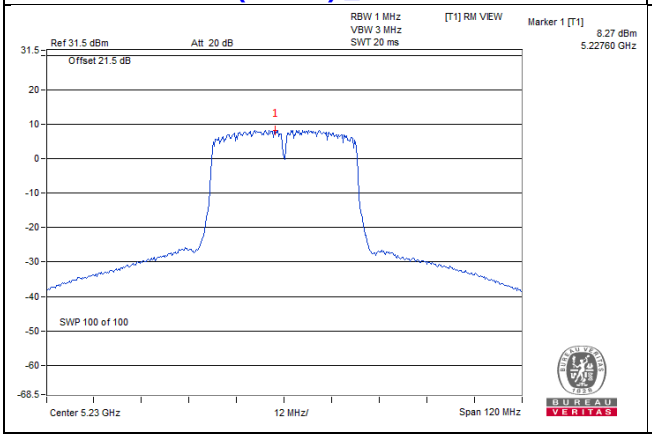
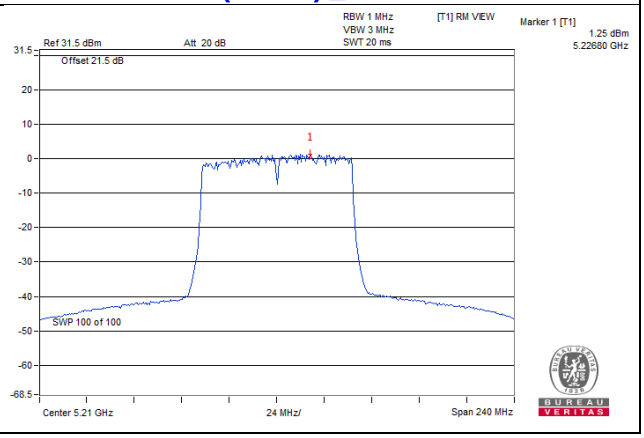
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	5.00	5.90	0.15	8.63	16.93	Pass
46	5230	7.02	8.20	0.15	10.81	16.93	Pass

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 = 6.07dBi > 6dBi , so the power density limit shall be reduced to 17-(6.07-6) = 16.93dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	1.25	1.22	0.23	4.48	16.93	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 = 6.07dBi > 6dBi , so the power density limit shall be reduced to 17-(6.07-6) = 16.93dBm.
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**
	
8802.11ac (VHT40) _Chain 1 / CH46	**802.11ac (VHT80) _Chain 0 / CH42**
	

For U-NII-3:

CDD Mode

802.11a

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	149	5745	4.43	6.65	3.01	0.16	9.82	29.77	Pass
	157	5785	4.29	6.51	3.01	0.16	9.68	29.77	Pass
	165	5825	4.49	6.71	3.01	0.16	9.88	29.77	Pass
1	149	5745	4.73	6.95	3.01	0.16	10.12	29.77	Pass
	157	5785	4.88	7.10	3.01	0.16	10.27	29.77	Pass
	165	5825	4.36	6.58	3.01	0.16	9.75	29.77	Pass

Note: 1. Directional gain = 6.23dBi > 6dB, so the power density limit shall be reduced to 30-(6.23-6) = 29.77dBm.

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

Beamforming Mode

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	3.84	6.06	3.01	9.07	29.77	Pass
	157	5785	3.92	6.14	3.01	9.15	29.77	Pass
	165	5825	4.20	6.42	3.01	9.43	29.77	Pass
1	149	5745	4.06	6.28	3.01	9.29	29.77	Pass
	157	5785	4.29	6.51	3.01	9.52	29.77	Pass
	165	5825	4.38	6.60	3.01	9.61	29.77	Pass

Note: 1. Directional gain = 6.23dBi > 6dB, so the power density limit shall be reduced to 30-(6.23-6) = 29.77dBm.

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	5745	1.31	3.53	3.01	0.15	6.69	29.77	Pass
	159	5785	2.11	4.33	3.01	0.15	7.49	29.77	Pass
1	151	5745	0.72	2.94	3.01	0.15	6.10	29.77	Pass
	159	5785	0.19	2.41	3.01	0.15	5.57	29.77	Pass

Note: 1. Directional gain = 6.23dBi > 6dB, so the power density limit shall be reduced to 30-(6.23-6) = 29.77dBm.

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

802.11ac (VHT80)

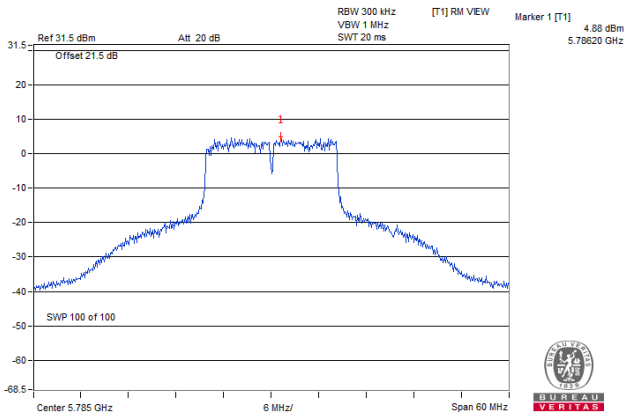
TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5745	-4.99	-2.77	3.01	0.23	0.47	29.77	Pass
1	155	5745	-4.72	-2.50	3.01	0.23	0.74	29.77	Pass

Note: 1. Directional gain = 6.23dBi > 6dB, so the power density limit shall be reduced to 30-(6.23-6) = 29.77dBm.

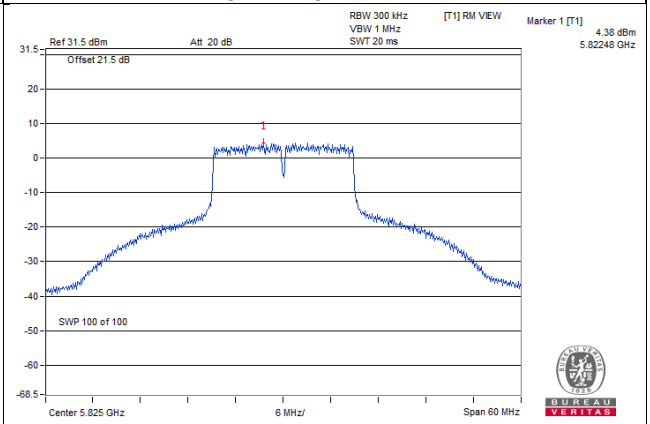
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

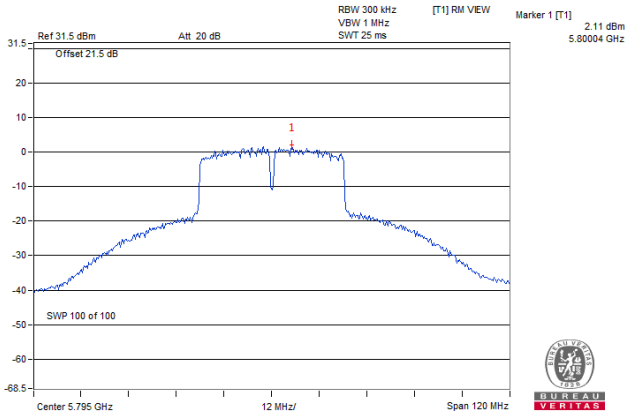
802.11a_Chain 1 / CH157



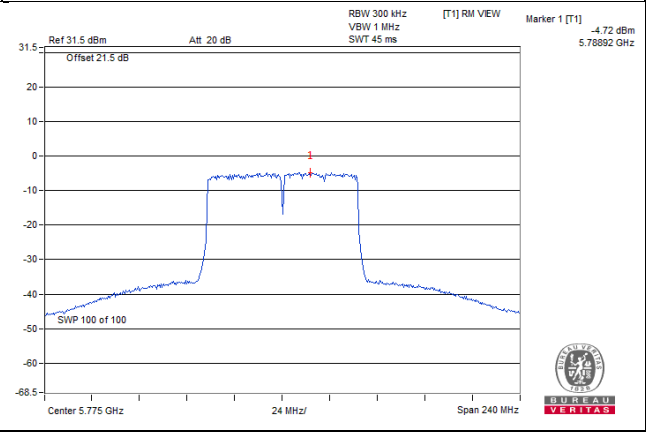
802.11ac (VHT20)_Chain 1 / CH165



8802.11ac (VHT40) _Chain 0 / CH159



802.11ac (VHT80) _Chain 1 / CH155

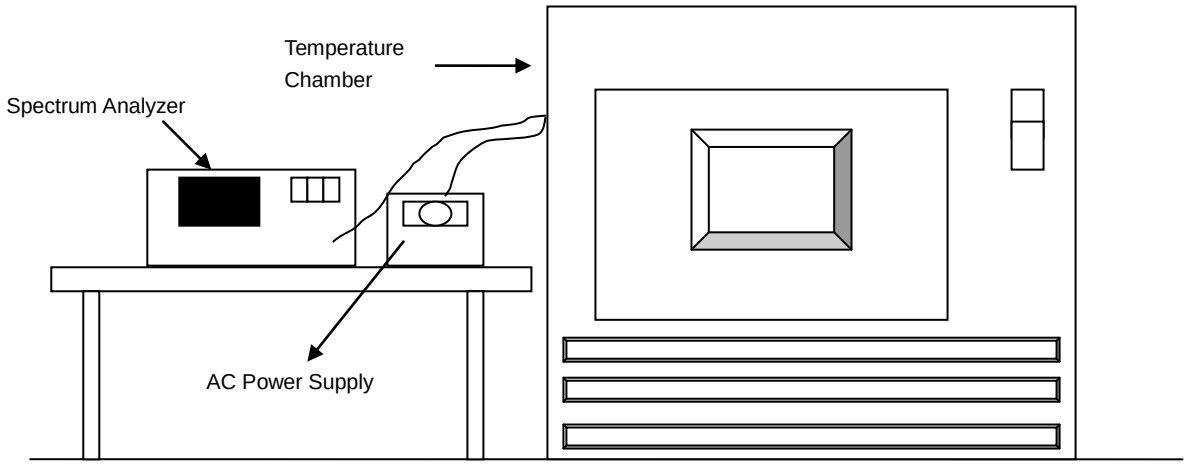


4.6 Frequency Stability Measurement

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 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5179.9934	Pass	5179.9924	Pass	5179.9932	Pass	5179.9912	Pass
40	120	5179.9824	Pass	5179.9785	Pass	5179.981	Pass	5179.9798	Pass
30	120	5179.9997	Pass	5179.9991	Pass	5179.9981	Pass	5179.995	Pass
20	120	5180.0168	Pass	5180.0183	Pass	5180.0184	Pass	5180.017	Pass
10	120	5179.9911	Pass	5179.9897	Pass	5179.989	Pass	5179.9882	Pass
0	120	5179.995	Pass	5179.9948	Pass	5179.9936	Pass	5179.9974	Pass
-10	120	5180.0057	Pass	5180.0058	Pass	5180.0048	Pass	5180.0056	Pass
-20	120	5180.0127	Pass	5180.0144	Pass	5180.012	Pass	5180.0129	Pass
-30	120	5179.9821	Pass	5179.9808	Pass	5179.9797	Pass	5179.9806	Pass

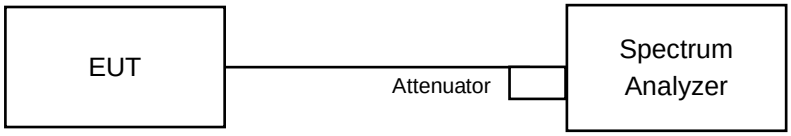
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0159	Pass	5180.0184	Pass	5180.0177	Pass	5180.018	Pass
	120	5180.0168	Pass	5180.0183	Pass	5180.0184	Pass	5180.017	Pass
	102	5180.0168	Pass	5180.0193	Pass	5180.0185	Pass	5180.0175	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

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

802.11ac (VHT20)

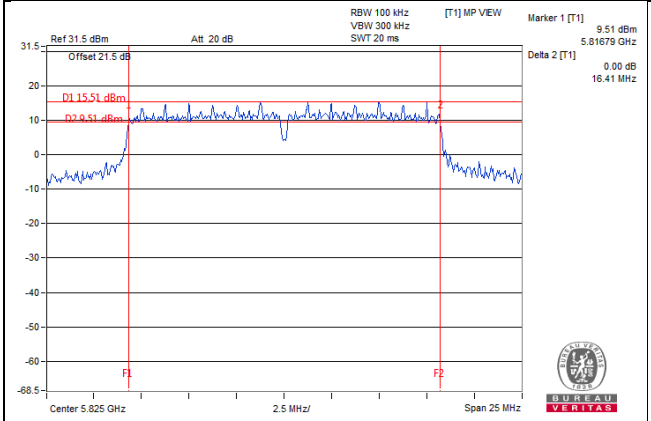
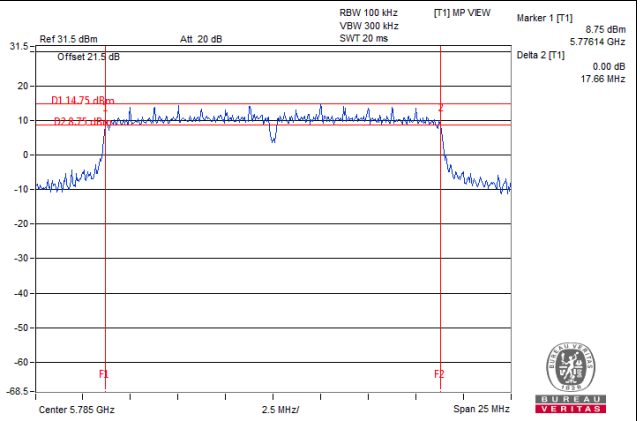
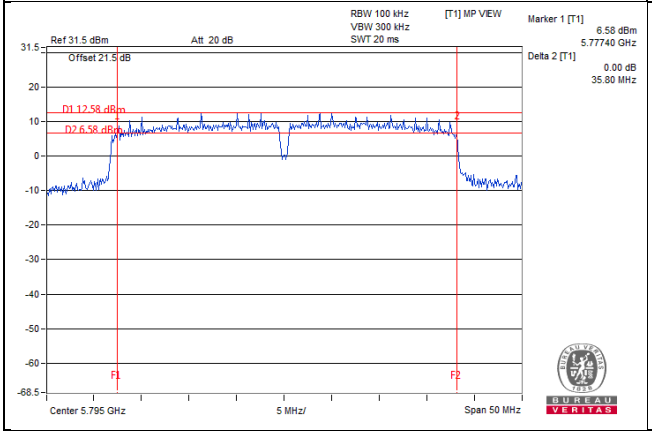
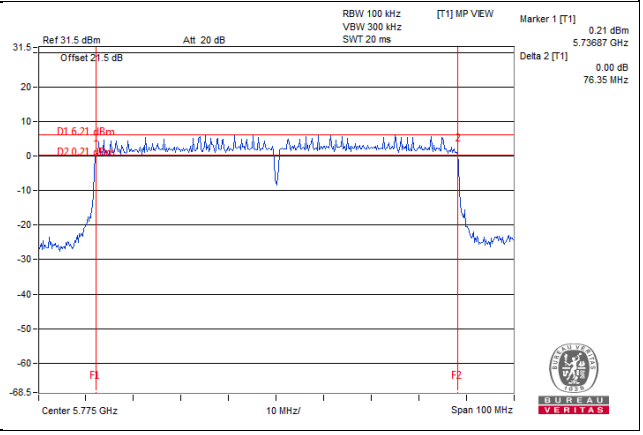
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.64	17.64	0.5	Pass
157	5785	17.66	17.65	0.5	Pass
165	5825	17.63	17.62	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.43	35.19	0.5	Pass
159	5795	35.80	35.45	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.35	76.21	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH165	**802.11ac (VHT20)_Chain 0 / CH157**
	
802.11ac (VHT40) __Chain 0 / CH159	**802.11ac (VHT80) _Chain 0 / CH155**
	

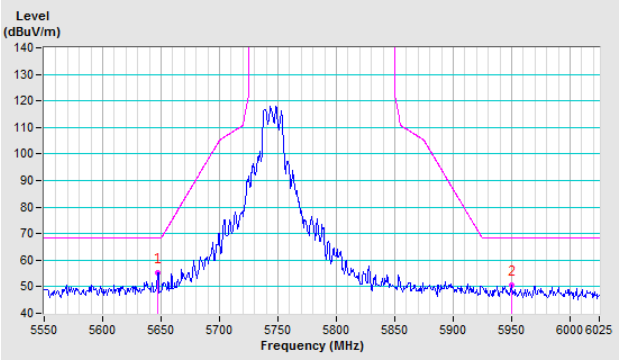
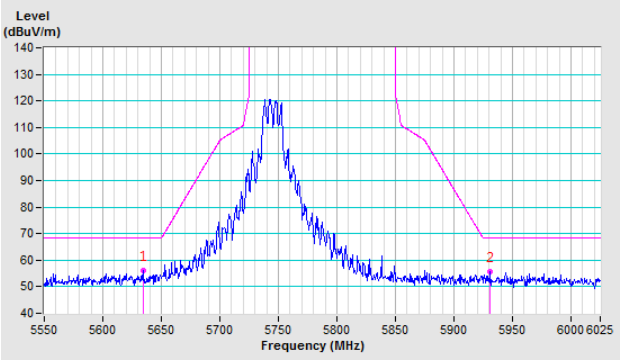
5 Pictures of Test Arrangements

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

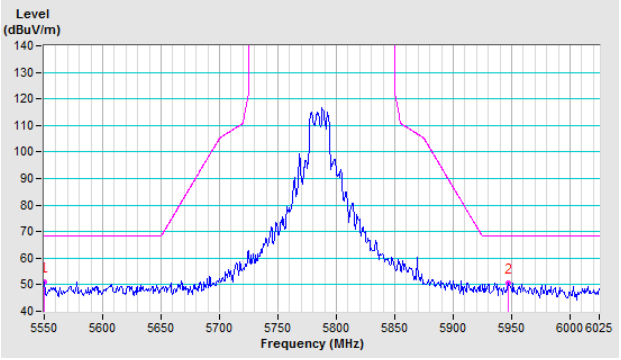
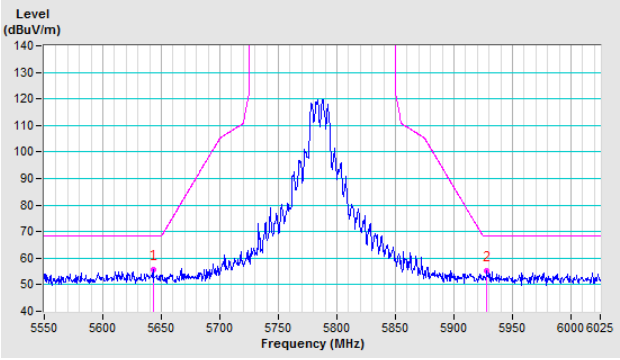
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

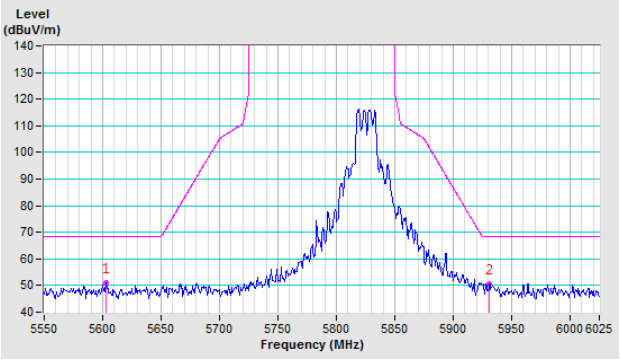
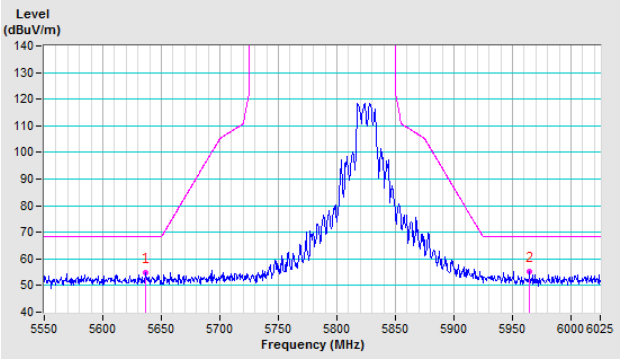
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

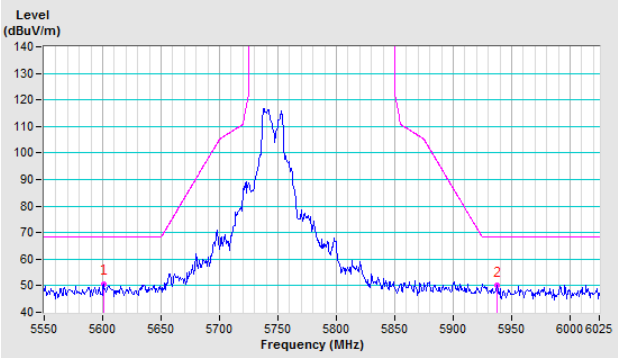
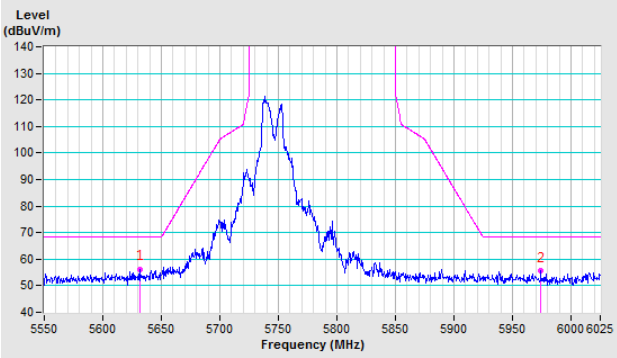
Horizontal	Vertical
	

CH 165 5825 MHz

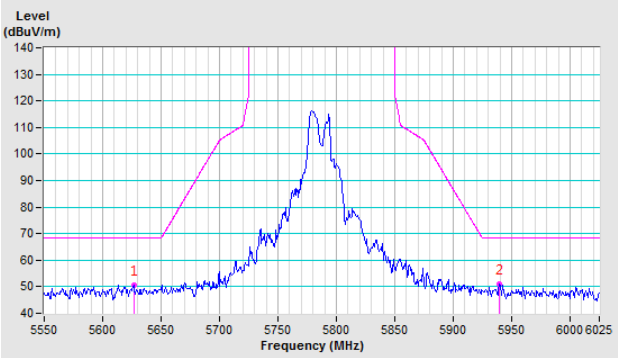
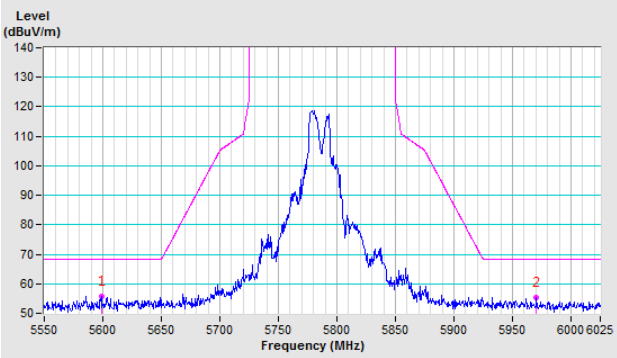
Horizontal	Vertical
	

802.11ac (VHT20)

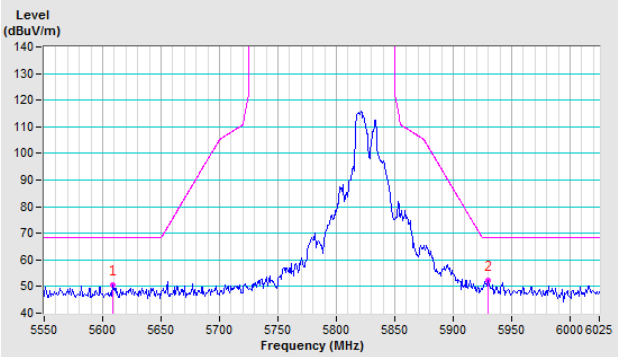
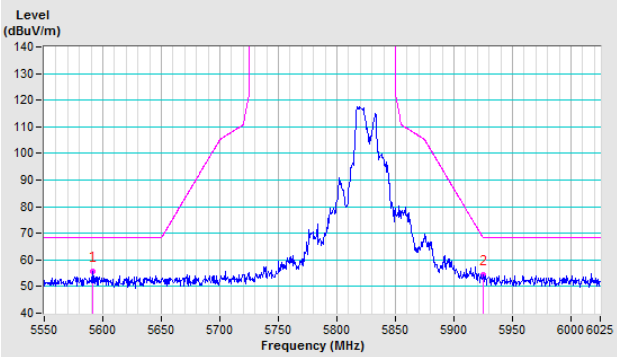
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

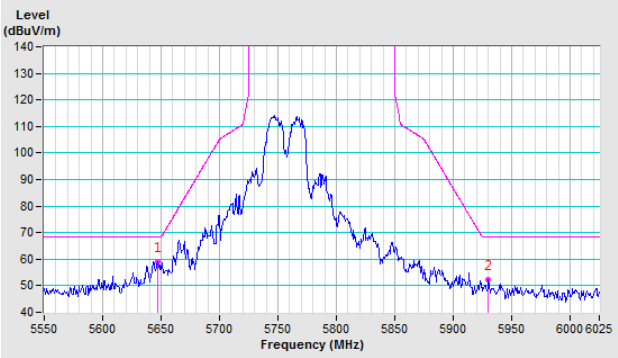
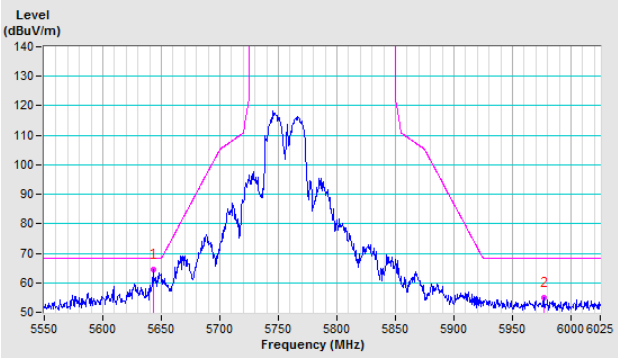
Horizontal	Vertical
	

CH 165 5825 MHz

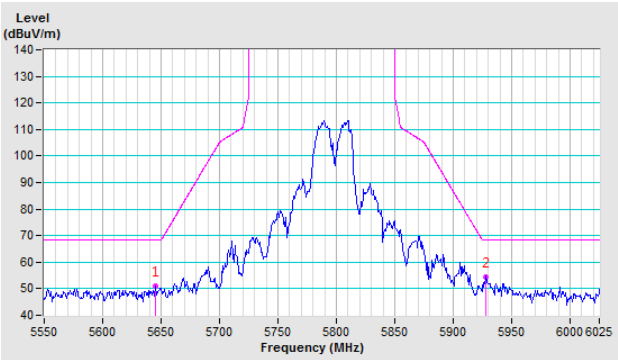
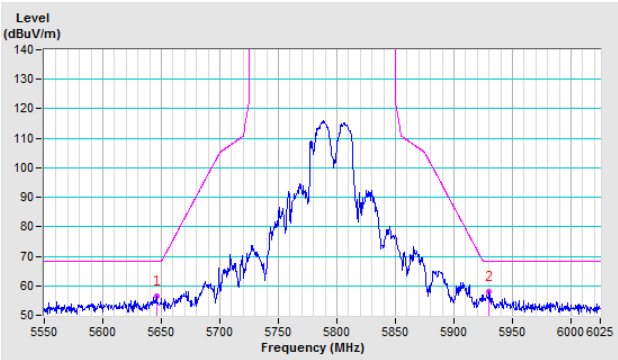
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

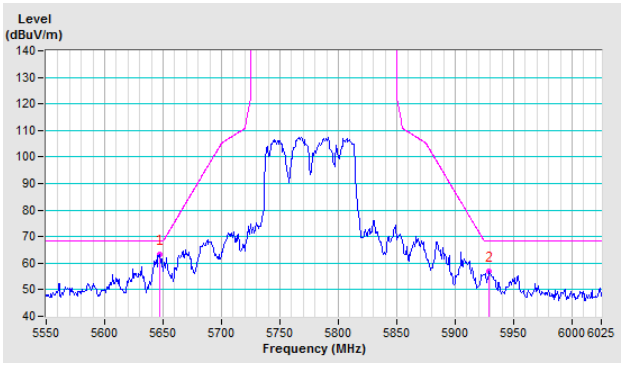
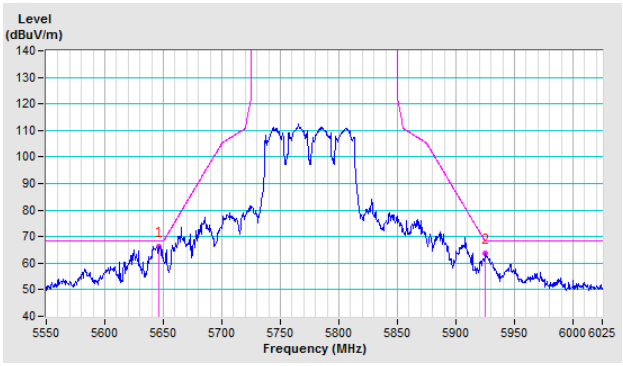
Horizontal	Vertical
	

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 FCC recognized accredited test firms and accredited 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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