FCC Test Report (WLAN)

Report No.:	RF180614E09-1
FCC ID:	PY318100406
Test Model:	Otter
Received Date:	June 14, 2018
Test Date:	June 27 to July 12, 2018
Issued Date:	July 19, 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
RF180614E09-1	Original release.	July 19, 2018

1 Certificate of Conformity

Product:	WiFi Device
Brand:	NETGEAR
Test Model:	Otter
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	June 27 to July 12, 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 : Phoenix Huang , **Date:** July 19, 2018

Phoenix Huang / Specialist

Approved by : , **Date:** July 19, 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 -19.91dB at 0.76719MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz and 5644.42MHz.
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	1.84 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 (WLAN)

Product	WiFi Device
Brand	NETGEAR
Test Model	Otter
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	19Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 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, 802.11n (HT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.412 ~ 2.462GHz** **CDD Mode:** 989.7mW **Beamforming Mode** 940.061mW **5.18 ~ 5.24GHz** **CDD Mode:** 907.203mW **Beamforming Mode** 869.426mW **5.745 ~ 5.825GHz** **CDD Mode:** 887.255mW **Beamforming Mode** 936.671mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. There are WLAN and Bluetooth technology used for the EUT. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3
WLAN (2.4GHz) + WLAN (5GHz HB)	WLAN (5GHz LB)	Bluetooth

2. Simultaneously transmission condition.

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

3. The EUT could be supplied from a power adapter as following table:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	AD2003F10	332-11039-01	Input: 100-120Vac, 1.5A, 50/60Hz Output: 19V, 3.16A DC output cable (unshielded, 1.8m)
2	NETGEAR	2ABS060K 1 NJ	332-11043-01	Input: 100-120Vac, 1.7A, 50/60Hz Output: 19V, 3.16A 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.				

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

For WLAN					
Antenna No.	Ant. Gain (dBi) (include cable loss)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length (mm)
Dual band (Black)	3.46	2.4 ~ 2.4835	Dipole	i-pex(MHF)	214
	2.99	5.15~5.25			
	2.99	5.25~5.35			
Dual band (Red)	2.73	2.4 ~ 2.4835	Dipole	i-pex(MHF)	156
	2.44	5.15~5.25			
	2.44	5.25~5.35			
5G Antenna (Blue)	3.31	5.47~5.725	Dipole	i-pex(MHF)	125
	2.65	5.725~5.85			
5G Antenna (Yellow)	2.26	5.47~5.725	Dipole	i-pex(MHF)	70
	3.24	5.725~5.85			
For Bluetooth					
Antenna No.	Ant. Gain (dBi) (include cable loss)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length (mm)
Antenna (White)	3.32	2.4 ~ 2.5	PIFA	i-pex(MHF)	200

5. 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
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

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

6. 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, 802.11n (HT20), 802.11ac (VHT20):

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With Adapter 2
2	-	-	√	-	With 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)**
802.11a	5180-5240	36 to 48	40	OFDM	BPSK	6
Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5745-5825	151 to 159	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)**
802.11a	5180-5240	36 to 48	40	OFDM	BPSK	6
Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5745-5825	151 to 159	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

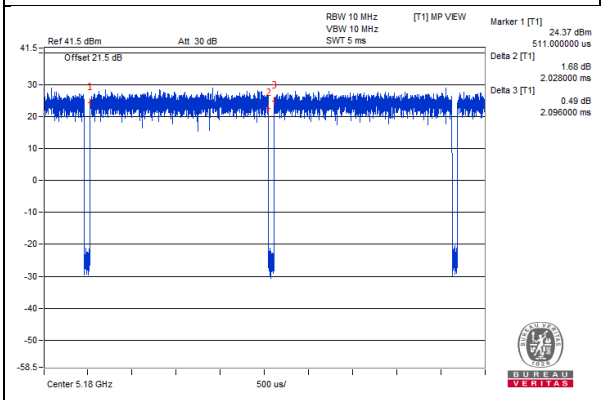
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	22deg. C, 67%RH	120Vac, 60Hz	Andy Ho
	23deg. C, 69%RH	120Vac, 60Hz	Andy Ho
	24deg. C, 67%RH	120Vac, 60Hz	Andy Ho
RE<1G	22deg. C, 68%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
	23deg. C, 76%RH	120Vac, 60Hz	Andy Ho
	23deg. C, 74%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

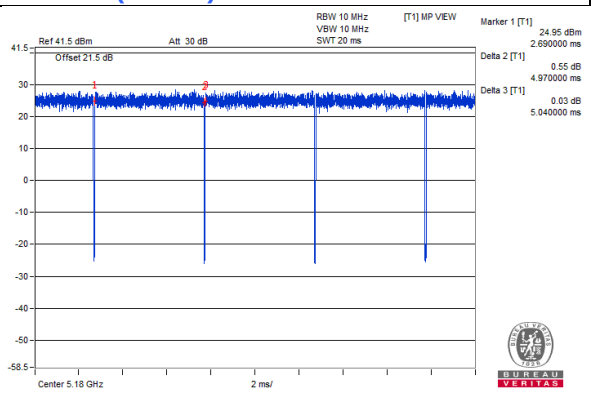
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.028 ms/2.096 ms = 0.968, Duty factor = 10 * log (1/Duty cycle) = 0.14
802.11ac (VHT20): Duty cycle = 4.97 ms/5.04 ms = 0.986
802.11ac (VHT40): Duty cycle = 2.413 ms/2.487 ms = 0.97, Duty factor = 10 * log (1/Duty cycle) = 0.13
802.11ac (VHT80): Duty cycle = 1.135 ms/1.195 ms = 0.95, Duty factor = 10 * log (1/Duty cycle) = 0.22

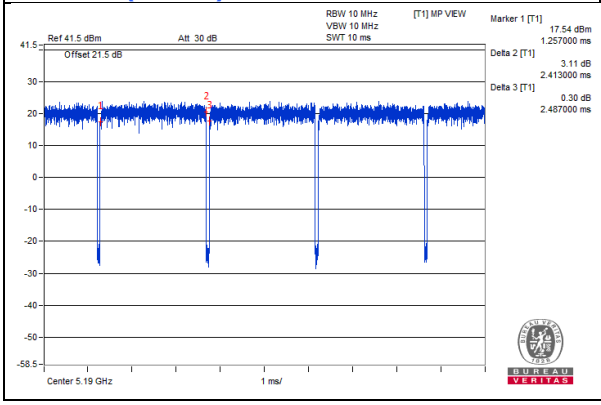
802.11a



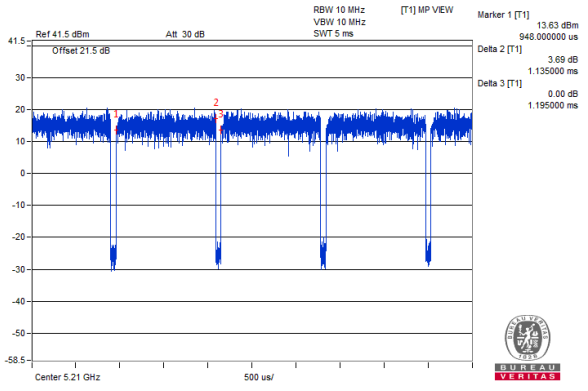
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

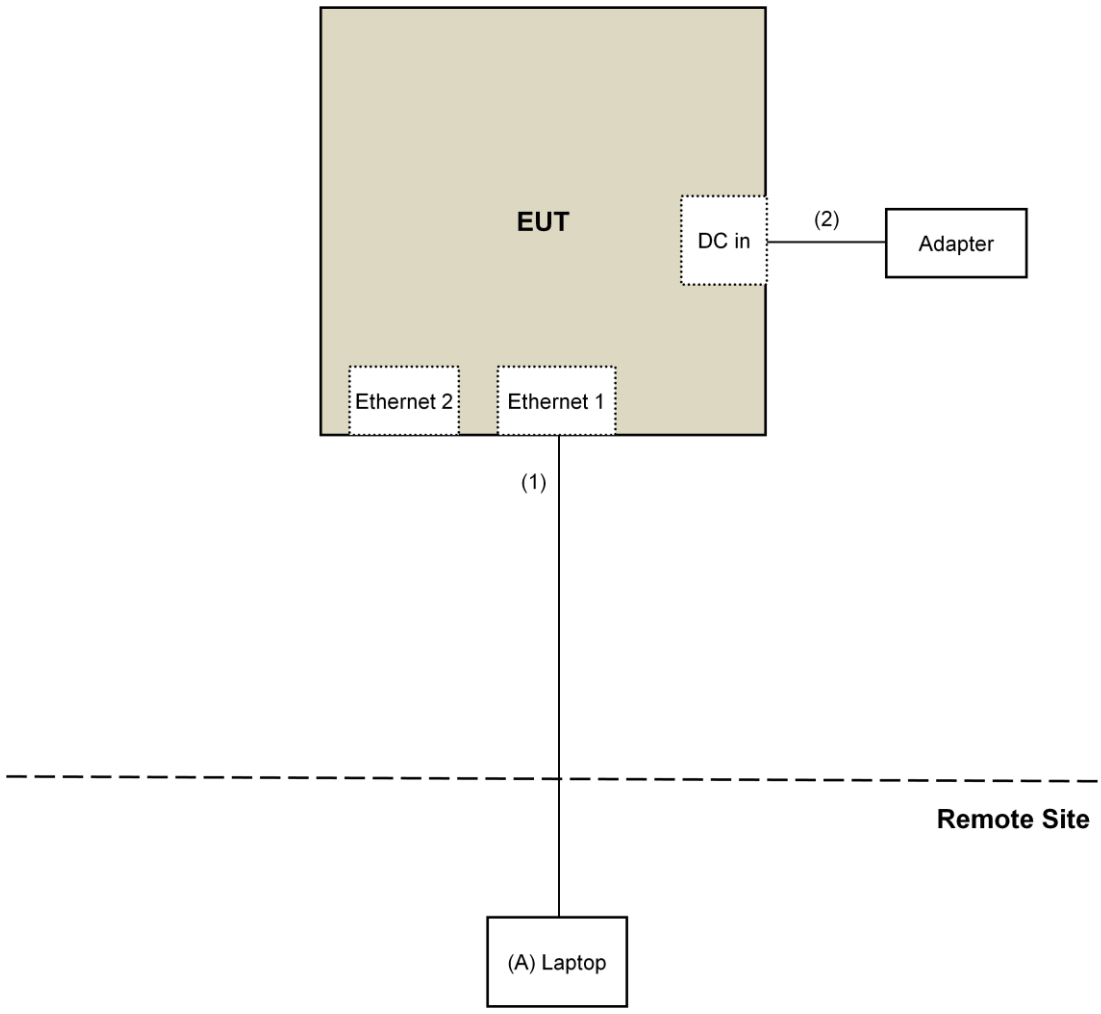
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	DC Cable	1	1.8	No	0	Supplied by client

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.

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 Radiated emission (below 1GHz) and OOBE test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 08, 2017	July 07, 2018
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 05, 2018	May 04, 2019
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	Mar. 20, 2018	Mar. 19, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Jan. 29, 2018	Jan. 28, 2019
Spectrum Analyzer Keysight	N9030A	MY54490679	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160924	Jan. 29, 2018	Jan. 28, 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	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
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
DC Power Supply Topward	6603D	795558	NA	NA
True RMS Clamp Meter FLUKE	325	31130711WS	May 22, 2018	May 21, 2019

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: June 27 to July 04, 2018

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Jan. 29, 2018	Jan. 28, 2019
Spectrum Analyzer Keysight	N9030A	MY54490679	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160924	Jan. 29, 2018	Jan. 28, 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	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
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
DC Power Supply Topward	6603D	795558	NA	NA
True RMS Clamp Meter FLUKE	325	31130711WS	May 22, 2018	May 21, 2019

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: July 07 to 12, 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. Parallel, perpendicular, and ground-parallel orientations 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:

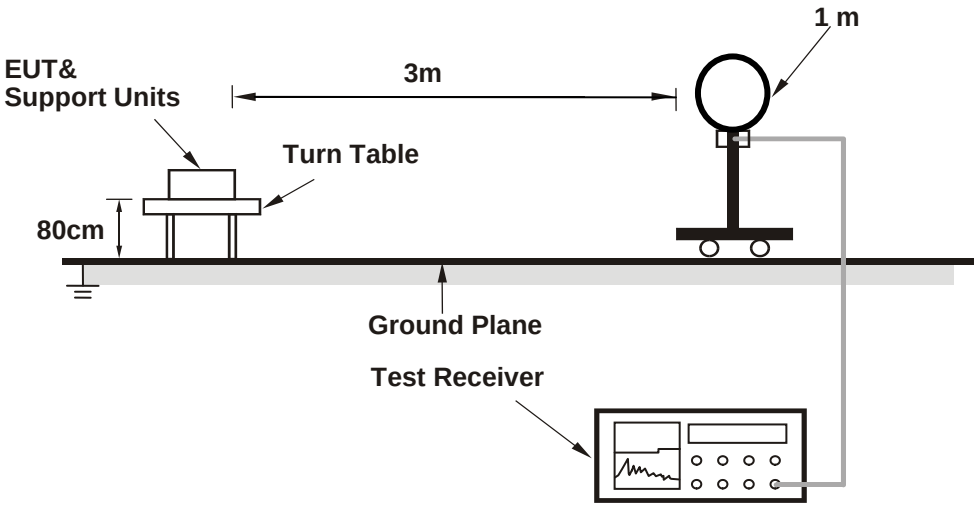
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

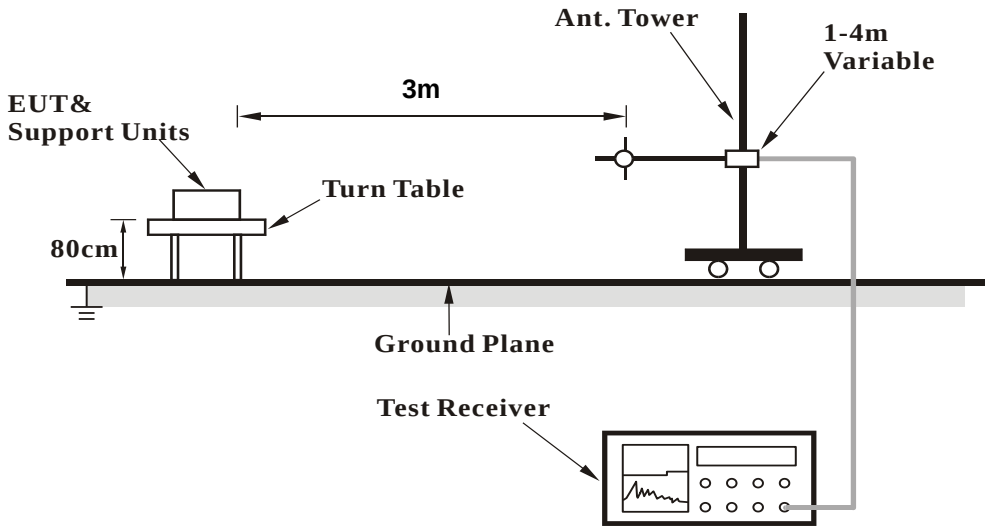
No deviation.

4.1.5 Test Setup

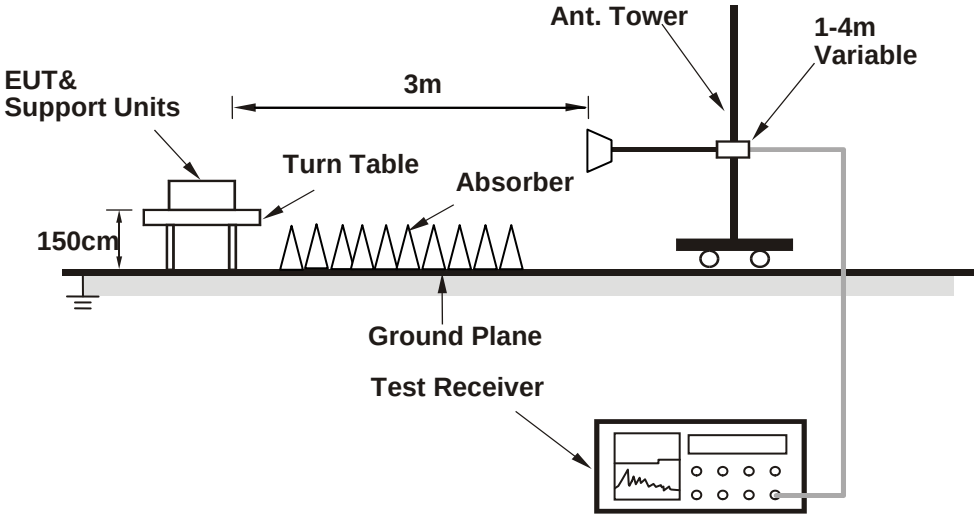
For Radiated emission below 30MHz



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 Laptop which is placed on remote site.
b. Controlling software (QDART-Connectivity (1.0.40)) 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	57.1 PK	74.0	-16.9	1.65 H	185	54.5	2.6
2	5150.00	47.6 AV	54.0	-6.4	1.65 H	185	45.0	2.6
3	*5180.00	112.2 PK			1.65 H	185	109.7	2.5
4	*5180.00	102.1 AV			1.65 H	185	99.6	2.5
5	#10360.00	48.1 PK	74.0	-25.9	1.54 H	214	36.2	11.9
6	#10360.00	35.7 AV	54.0	-18.3	1.54 H	214	23.8	11.9
7	15540.00	48.9 PK	74.0	-25.1	1.54 H	235	36.5	12.4
8	15540.00	37.6 AV	54.0	-16.4	1.54 H	235	25.2	12.4
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	67.1 PK	74.0	-6.9	1.70 V	201	64.5	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.70 V**	**201**	**51.3**	**2.6**
3	*5180.00	118.7 PK			1.70 V	201	116.2	2.5
4	*5180.00	107.5 AV			1.70 V	201	105.0	2.5
5	#10360.00	46.2 PK	74.0	-27.8	1.50 V	162	34.3	11.9
6	#10360.00	35.0 AV	54.0	-19.0	1.50 V	162	23.1	11.9
7	15540.00	47.8 PK	74.0	-26.2	1.55 V	244	35.4	12.4
8	15540.00	36.4 AV	54.0	-17.6	1.55 V	244	24.0	12.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.8 PK	74.0	-15.2	1.63 H	184	56.2	2.6
2	5150.00	46.4 AV	54.0	-7.6	1.63 H	184	43.8	2.6
3	*5200.00	114.4 PK			1.63 H	184	112.0	2.4
4	*5200.00	105.5 AV			1.63 H	184	103.1	2.4
5	5350.00	49.4 PK	74.0	-24.6	1.63 H	184	47.1	2.3
6	5350.00	37.8 AV	54.0	-16.2	1.63 H	184	35.5	2.3
7	#10400.00	48.6 PK	74.0	-25.4	1.51 H	199	36.4	12.2
8	#10400.00	36.1 AV	54.0	-17.9	1.51 H	199	23.9	12.2
9	15600.00	48.5 PK	74.0	-25.5	1.50 H	228	35.6	12.9
10	15600.00	37.1 AV	54.0	-16.9	1.50 H	228	24.2	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	64.8 PK	74.0	-9.2	1.78 V	196	62.2	2.6
2	5150.00	51.8 AV	54.0	-2.2	1.78 V	196	49.2	2.6
3	*5200.00	120.9 PK			1.78 V	196	118.5	2.4
4	*5200.00	110.9 AV			1.78 V	196	108.5	2.4
5	5350.00	51.6 PK	74.0	-22.4	1.78 V	196	49.3	2.3
6	5350.00	40.8 AV	54.0	-13.2	1.78 V	196	38.5	2.3
7	#10400.00	46.2 PK	74.0	-27.8	1.50 V	162	34.0	12.2
8	#10400.00	35.0 AV	54.0	-19.0	1.50 V	162	22.8	12.2
9	15600.00	47.8 PK	74.0	-26.2	1.55 V	244	34.9	12.9
10	15600.00	36.4 AV	54.0	-17.6	1.55 V	244	23.5	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 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	112.9 PK			1.59 H	173	110.7	2.2
2	*5240.00	104.6 AV			1.59 H	173	102.4	2.2
3	5350.00	48.9 PK	74.0	-25.1	1.59 H	173	46.6	2.3
4	5350.00	37.5 AV	54.0	-16.5	1.59 H	173	35.2	2.3
5	#10480.00	49.3 PK	74.0	-24.7	1.56 H	205	36.9	12.4
6	#10480.00	36.6 AV	54.0	-17.4	1.56 H	205	24.2	12.4
7	15720.00	49.1 PK	74.0	-24.9	1.54 H	237	37.1	12.0
8	15720.00	37.5 AV	54.0	-16.5	1.54 H	237	25.5	12.0
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	*5240.00	119.4 PK			1.50 V	200	117.2	2.2
2	*5240.00	110.0 AV			1.50 V	200	107.8	2.2
3	5350.00	51.9 PK	74.0	-22.1	1.50 V	200	49.6	2.3
4	5350.00	39.8 AV	54.0	-14.2	1.50 V	200	37.5	2.3
5	#10480.00	46.2 PK	74.0	-27.8	1.44 V	176	33.8	12.4
6	#10480.00	34.9 AV	54.0	-19.1	1.44 V	176	22.5	12.4
7	15720.00	48.3 PK	74.0	-25.7	1.50 V	244	36.3	12.0
8	15720.00	36.8 AV	54.0	-17.2	1.50 V	244	24.8	12.0

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.

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	#5630.61	59.3 PK	68.2	-8.9	2.42 H	313	56.5	2.8
2	*5745.00	115.0 PK			2.42 H	313	112.1	2.9
3	*5745.00	103.6 AV			2.42 H	313	100.7	2.9
4	#5953.37	58.0 PK	68.2	-10.2	2.42 H	313	54.8	3.2
5	11490.00	50.9 PK	74.0	-23.1	1.06 H	276	38.6	12.3
6	11490.00	39.3 AV	54.0	-14.7	1.06 H	276	27.0	12.3
7	#17235.00	56.7 PK	74.0	-17.3	1.36 H	213	41.4	15.3
8	#17235.00	43.5 AV	54.0	-10.5	1.36 H	213	28.2	15.3
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	#5569.74	60.7 PK	68.2	-7.5	1.89 V	179	57.9	2.8
2	*5745.00	122.6 PK			1.89 V	179	119.7	2.9
3	*5745.00	110.6 AV			1.89 V	179	107.7	2.9
4	#5937.75	61.0 PK	68.2	-7.2	1.89 V	179	57.6	3.4
5	11490.00	50.3 PK	74.0	-23.7	1.62 V	80	38.0	12.3
6	11490.00	38.9 AV	54.0	-15.1	1.62 V	80	26.6	12.3
7	#17235.00	54.3 PK	74.0	-19.7	1.39 V	189	39.0	15.3
8	#17235.00	41.3 AV	54.0	-12.7	1.39 V	189	26.0	15.3

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	#5624.14	58.4 PK	68.2	-9.8	1.79 H	309	55.6	2.8
2	*5785.00	115.6 PK			1.79 H	309	112.5	3.1
3	*5785.00	104.4 AV			1.79 H	309	101.3	3.1
4	#5938.27	58.2 PK	68.2	-10.0	1.79 H	309	54.8	3.4
5	11570.00	51.2 PK	74.0	-22.8	1.00 H	267	38.8	12.4
6	11570.00	39.6 AV	54.0	-14.4	1.00 H	267	27.2	12.4
7	#17355.00	55.9 PK	74.0	-18.1	1.39 H	210	39.9	16.0
8	#17355.00	43.0 AV	54.0	-11.0	1.39 H	210	27.0	16.0
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	#5621.19	58.1 PK	68.2	-10.1	1.60 V	202	55.3	2.8
2	*5785.00	120.5 PK			1.60 V	202	117.4	3.1
3	*5785.00	110.0 AV			1.60 V	202	106.9	3.1
4	#5985.80	56.6 PK	68.2	-11.6	1.60 V	202	53.4	3.2
5	11570.00	50.0 PK	74.0	-24.0	1.61 V	80	37.6	12.4
6	11570.00	38.7 AV	54.0	-15.3	1.61 V	80	26.3	12.4
7	#17355.00	54.3 PK	74.0	-19.7	1.42 V	174	38.3	16.0
8	#17355.00	41.0 AV	54.0	-13.0	1.42 V	174	25.0	16.0

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.

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	#5577.37	59.3 PK	68.2	-8.9	1.49 H	277	56.5	2.8
2	*5825.00	113.2 PK			1.49 H	277	110.0	3.2
3	*5825.00	102.4 AV			1.49 H	277	99.2	3.2
4	#5946.99	57.7 PK	68.2	-10.5	1.49 H	277	54.5	3.2
5	11650.00	51.9 PK	74.0	-22.1	1.02 H	267	39.5	12.4
6	11650.00	40.0 AV	54.0	-14.0	1.02 H	267	27.6	12.4
7	#17475.00	55.7 PK	74.0	-18.3	1.35 H	225	38.3	17.4
8	#17475.00	42.8 AV	54.0	-11.2	1.35 H	225	25.4	17.4
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	#5616.04	57.2 PK	68.2	-11.0	1.52 V	204	54.4	2.8
2	*5825.00	120.9 PK			1.52 V	204	117.7	3.2
3	*5825.00	109.6 AV			1.52 V	204	106.4	3.2
4	#5938.80	57.5 PK	68.2	-10.7	1.52 V	204	54.1	3.4
5	11650.00	50.0 PK	74.0	-24.0	1.66 V	80	37.6	12.4
6	11650.00	38.4 AV	54.0	-15.6	1.66 V	80	26.0	12.4
7	#17475.00	54.7 PK	74.0	-19.3	1.39 V	177	37.3	17.4
8	#17475.00	41.3 AV	54.0	-12.7	1.39 V	177	23.9	17.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	61.2 PK	74.0	-12.8	1.70 H	174	58.6	2.6
2	5150.00	48.5 AV	54.0	-5.5	1.70 H	174	45.9	2.6
3	*5180.00	112.2 PK			1.70 H	174	109.7	2.5
4	*5180.00	101.2 AV			1.70 H	174	98.7	2.5
5	#10360.00	48.4 PK	74.0	-25.6	1.52 H	187	36.5	11.9
6	#10360.00	36.1 AV	54.0	-17.9	1.52 H	187	24.2	11.9
7	15540.00	49.5 PK	74.0	-24.5	1.50 H	243	37.1	12.4
8	15540.00	37.7 AV	54.0	-16.3	1.50 H	243	25.3	12.4
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	67.2 PK	74.0	-6.8	1.44 V	200	64.6	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.44 V**	**200**	**51.3**	**2.6**
3	*5180.00	118.7 PK			1.44 V	200	116.2	2.5
4	*5180.00	106.6 AV			1.44 V	200	104.1	2.5
5	#10360.00	45.5 PK	74.0	-28.5	1.52 V	159	33.6	11.9
6	#10360.00	34.6 AV	54.0	-19.4	1.52 V	159	22.7	11.9
7	15540.00	46.9 PK	74.0	-27.1	1.54 V	248	34.5	12.4
8	15540.00	35.7 AV	54.0	-18.3	1.54 V	248	23.3	12.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	60.4 PK	74.0	-13.6	1.69 H	169	57.8	2.6
2	5150.00	45.0 AV	54.0	-9.0	1.69 H	169	42.4	2.6
3	*5200.00	115.4 PK			1.69 H	169	113.0	2.4
4	*5200.00	104.6 AV			1.69 H	169	102.2	2.4
5	5350.00	48.6 PK	74.0	-25.4	1.69 H	169	46.3	2.3
6	5350.00	37.6 AV	54.0	-16.4	1.69 H	169	35.3	2.3
7	#10400.00	48.9 PK	74.0	-25.1	1.50 H	199	36.7	12.2
8	#10400.00	36.5 AV	54.0	-17.5	1.50 H	199	24.3	12.2
9	15600.00	48.8 PK	74.0	-25.2	1.45 H	239	35.9	12.9
10	15600.00	37.2 AV	54.0	-16.8	1.45 H	239	24.3	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	66.4 PK	74.0	-7.6	1.01 V	202	63.8	2.6
2	5150.00	50.4 AV	54.0	-3.6	1.01 V	202	47.8	2.6
3	*5200.00	121.4 PK			1.01 V	202	119.0	2.4
4	*5200.00	110.0 AV			1.01 V	202	107.6	2.4
5	5350.00	51.1 PK	74.0	-22.9	1.01 V	202	48.8	2.3
6	5350.00	40.0 AV	54.0	-14.0	1.01 V	202	37.7	2.3
7	#10400.00	45.5 PK	74.0	-28.5	1.55 V	154	33.3	12.2
8	#10400.00	34.5 AV	54.0	-19.5	1.55 V	154	22.3	12.2
9	15600.00	47.2 PK	74.0	-26.8	1.53 V	241	34.3	12.9
10	15600.00	36.0 AV	54.0	-18.0	1.53 V	241	23.1	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 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	113.8 PK			1.63 H	155	111.6	2.2
2	*5240.00	103.9 AV			1.63 H	155	101.7	2.2
3	5350.00	48.4 PK	74.0	-25.6	1.63 H	155	46.1	2.3
4	5350.00	37.6 AV	54.0	-16.4	1.63 H	155	35.3	2.3
5	#10480.00	49.5 PK	74.0	-24.5	1.53 H	199	37.1	12.4
6	#10480.00	36.9 AV	54.0	-17.1	1.53 H	199	24.5	12.4
7	15720.00	49.0 PK	74.0	-25.0	1.51 H	224	37.0	12.0
8	15720.00	37.6 AV	54.0	-16.4	1.51 H	224	25.6	12.0
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	*5240.00	120.3 PK			1.14 V	203	118.1	2.2
2	*5240.00	109.3 AV			1.14 V	203	107.1	2.2
3	5350.00	50.6 PK	74.0	-23.4	1.14 V	203	48.3	2.3
4	5350.00	39.5 AV	54.0	-14.5	1.14 V	203	37.2	2.3
5	#10480.00	45.1 PK	74.0	-28.9	1.50 V	156	32.7	12.4
6	#10480.00	34.4 AV	54.0	-19.6	1.50 V	156	22.0	12.4
7	15720.00	47.5 PK	74.0	-26.5	1.55 V	243	35.5	12.0
8	15720.00	36.3 AV	54.0	-17.7	1.55 V	243	24.3	12.0

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.

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	#5610.76	59.2 PK	68.2	-9.0	1.78 H	311	56.4	2.8
2	*5745.00	116.0 PK			1.78 H	311	113.1	2.9
3	*5745.00	105.1 AV			1.78 H	311	102.2	2.9
4	#5952.16	59.0 PK	68.2	-9.2	1.78 H	311	55.8	3.2
5	11490.00	51.3 PK	74.0	-22.7	1.00 H	267	39.0	12.3
6	11490.00	40.0 AV	54.0	-14.0	1.00 H	267	27.7	12.3
7	#17235.00	55.4 PK	74.0	-18.6	1.33 H	195	40.1	15.3
8	#17235.00	42.8 AV	54.0	-11.2	1.33 H	195	27.5	15.3
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	#5617.15	57.8 PK	68.2	-10.4	1.59 V	149	55.0	2.8
2	*5745.00	121.2 PK			1.59 V	149	118.3	2.9
3	*5745.00	110.5 AV			1.59 V	149	107.6	2.9
4	#5977.36	57.0 PK	68.2	-11.2	1.59 V	149	53.8	3.2
5	11490.00	50.1 PK	74.0	-23.9	1.64 V	84	37.8	12.3
6	11490.00	38.9 AV	54.0	-15.1	1.64 V	84	26.6	12.3
7	#17235.00	53.9 PK	74.0	-20.1	1.40 V	180	38.6	15.3
8	#17235.00	40.5 AV	54.0	-13.5	1.40 V	180	25.2	15.3

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	#5598.75	59.2 PK	68.2	-9.0	1.77 H	308	56.4	2.8
2	*5785.00	114.9 PK			1.77 H	308	111.8	3.1
3	*5785.00	104.8 AV			1.77 H	308	101.7	3.1
4	#5949.05	58.1 PK	68.2	-10.1	1.77 H	308	54.9	3.2
5	11570.00	51.5 PK	74.0	-22.5	1.00 H	276	39.1	12.4
6	11570.00	40.1 AV	54.0	-13.9	1.00 H	276	27.7	12.4
7	#17355.00	56.1 PK	74.0	-17.9	1.36 H	218	40.1	16.0
8	#17355.00	43.1 AV	54.0	-10.9	1.36 H	218	27.1	16.0
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	#5634.34	59.3 PK	68.2	-8.9	1.89 V	151	56.5	2.8
2	*5785.00	120.2 PK			1.89 V	151	117.1	3.1
3	*5785.00	110.3 AV			1.89 V	151	107.2	3.1
4	#5951.97	58.2 PK	68.2	-10.0	1.89 V	151	55.0	3.2
5	11570.00	49.5 PK	74.0	-24.5	1.65 V	74	37.1	12.4
6	11570.00	38.4 AV	54.0	-15.6	1.65 V	74	26.0	12.4
7	#17355.00	54.3 PK	74.0	-19.7	1.47 V	167	38.3	16.0
8	#17355.00	40.7 AV	54.0	-13.3	1.47 V	167	24.7	16.0

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.

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	#5609.86	58.7 PK	68.2	-9.5	1.62 H	309	55.9	2.8
2	*5825.00	114.5 PK			1.62 H	307	111.3	3.2
3	*5825.00	103.0 AV			1.62 H	307	99.8	3.2
4	#5981.69	57.7 PK	68.2	-10.5	1.62 H	309	54.5	3.2
5	11650.00	51.6 PK	74.0	-22.4	1.02 H	259	39.2	12.4
6	11650.00	40.1 AV	54.0	-13.9	1.02 H	259	27.7	12.4
7	#17475.00	55.3 PK	74.0	-18.7	1.37 H	198	37.9	17.4
8	#17475.00	42.5 AV	54.0	-11.5	1.37 H	198	25.1	17.4
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	#5588.81	59.6 PK	68.2	-8.6	1.50 V	202	56.8	2.8
2	*5825.00	119.6 PK			1.50 V	202	116.4	3.2
3	*5825.00	109.3 AV			1.50 V	202	106.1	3.2
4	#5962.88	58.0 PK	68.2	-10.2	1.50 V	202	54.7	3.3
5	11650.00	50.6 PK	74.0	-23.4	1.63 V	73	38.2	12.4
6	11650.00	39.0 AV	54.0	-15.0	1.63 V	73	26.6	12.4
7	#17475.00	54.3 PK	74.0	-19.7	1.42 V	158	36.9	17.4
8	#17475.00	41.2 AV	54.0	-12.8	1.42 V	158	23.8	17.4

REMARKS:

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

802.11ac (VHT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.2 PK	74.0	-19.8	1.40 H	172	51.6	2.6
2	5150.00	44.3 AV	54.0	-9.7	1.40 H	172	41.7	2.6
3	*5190.00	106.8 PK			1.40 H	172	104.3	2.5
4	*5190.00	97.6 AV			1.40 H	172	95.1	2.5
5	5350.00	49.3 PK	74.0	-24.7	1.40 H	172	47.0	2.3
6	5350.00	37.3 AV	54.0	-16.7	1.40 H	172	35.0	2.3
7	#10380.00	49.1 PK	74.0	-24.9	1.47 H	223	37.1	12.0
8	#10380.00	36.8 AV	54.0	-17.2	1.47 H	223	24.8	12.0
9	15570.00	48.5 PK	74.0	-25.5	1.46 H	230	35.9	12.6
10	15570.00	37.0 AV	54.0	-17.0	1.46 H	230	24.4	12.6
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	5150.00	65.2 PK	74.0	-8.8	1.65 V	184	62.6	2.6
2	5150.00	53.6 AV	54.0	-0.4	1.65 V	184	51.0	2.6
3	*5190.00	112.7 PK			1.65 V	184	110.2	2.5
4	*5190.00	102.6 AV			1.65 V	184	100.1	2.5
5	5350.00	51.8 PK	74.0	-22.2	1.65 V	184	49.5	2.3
6	5350.00	40.1 AV	54.0	-13.9	1.65 V	184	37.8	2.3
7	#10380.00	45.0 PK	74.0	-29.0	1.49 V	157	33.0	12.0
8	#10380.00	34.2 AV	54.0	-19.8	1.49 V	157	22.2	12.0
9	15570.00	47.1 PK	74.0	-26.9	1.53 V	249	34.5	12.6
10	15570.00	35.7 AV	54.0	-18.3	1.53 V	249	23.1	12.6

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 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	58.6 PK	74.0	-15.4	1.45 H	174	56.0	2.6
2	5150.00	48.5 AV	54.0	-5.5	1.45 H	174	45.9	2.6
3	*5230.00	106.1 PK			1.45 H	174	103.9	2.2
4	*5230.00	101.6 AV			1.45 H	174	99.4	2.2
5	5350.00	48.5 PK	74.0	-25.5	1.45 H	174	46.2	2.3
6	5350.00	37.6 AV	54.0	-16.4	1.45 H	174	35.3	2.3
7	#10460.00	48.7 PK	74.0	-25.3	1.47 H	207	36.3	12.4
8	#10460.00	36.1 AV	54.0	-17.9	1.47 H	207	23.7	12.4
9	15690.00	49.4 PK	74.0	-24.6	1.48 H	225	37.2	12.2
10	15690.00	37.5 AV	54.0	-16.5	1.48 H	225	25.3	12.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.8 PK	74.0	-9.2	1.92 V	196	62.2	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.92 V**	**196**	**51.3**	**2.6**
3	*5230.00	116.3 PK			1.92 V	196	114.1	2.2
4	*5230.00	107.0 AV			1.92 V	196	104.8	2.2
5	5350.00	54.5 PK	74.0	-19.5	1.92 V	196	52.2	2.3
6	5350.00	43.1 AV	54.0	-10.9	1.92 V	196	40.8	2.3
7	#10460.00	45.2 PK	74.0	-28.8	1.56 V	149	32.8	12.4
8	#10460.00	34.2 AV	54.0	-19.8	1.56 V	149	21.8	12.4
9	15690.00	46.6 PK	74.0	-27.4	1.56 V	245	34.4	12.2
10	15690.00	35.6 AV	54.0	-18.4	1.56 V	245	23.4	12.2

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 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	#5637.41	59.2 PK	68.2	-9.0	1.72 H	312	56.5	2.7
2	*5755.00	112.7 PK			1.72 H	312	109.7	3.0
3	*5755.00	102.6 AV			1.72 H	312	99.6	3.0
4	#5924.50	59.1 PK	68.6	-9.5	1.72 H	312	55.7	3.4
5	11510.00	51.0 PK	74.0	-23.0	1.02 H	264	38.7	12.3
6	11510.00	40.0 AV	54.0	-14.0	1.02 H	264	27.7	12.3
7	#17265.00	55.3 PK	74.0	-18.7	1.31 H	201	39.9	15.4
8	#17265.00	42.9 AV	54.0	-11.1	1.31 H	201	27.5	15.4
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	#5603.59	60.2 PK	68.2	-8.0	1.66 V	180	57.4	2.8
2	*5755.00	118.8 PK			1.66 V	180	115.8	3.0
3	*5755.00	109.2 AV			1.66 V	180	106.2	3.0
4	#5961.48	58.6 PK	68.2	-9.6	1.66 V	180	55.3	3.3
5	11510.00	49.9 PK	74.0	-24.1	1.64 V	78	37.6	12.3
6	11510.00	38.9 AV	54.0	-15.1	1.64 V	78	26.6	12.3
7	#17265.00	54.4 PK	74.0	-19.6	1.40 V	173	39.0	15.4
8	#17265.00	40.9 AV	54.0	-13.1	1.40 V	173	25.5	15.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5618.86	59.0 PK	68.2	-9.2	1.44 H	312	56.2	2.8
2	*5795.00	110.8 PK			1.44 H	312	107.8	3.0
3	*5795.00	101.2 AV			1.44 H	312	98.2	3.0
4	#5958.80	58.3 PK	68.2	-9.9	1.44 H	312	55.1	3.2
5	11590.00	51.1 PK	74.0	-22.9	1.00 H	265	38.7	12.4
6	11590.00	39.6 AV	54.0	-14.4	1.00 H	265	27.2	12.4
7	#17385.00	55.4 PK	74.0	-18.6	1.33 H	185	39.2	16.2
8	#17385.00	42.7 AV	54.0	-11.3	1.33 H	185	26.5	16.2
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	#5602.68	59.3 PK	68.2	-8.9	1.50 V	201	56.5	2.8
2	*5795.00	116.6 PK			1.50 V	201	113.6	3.0
3	*5795.00	107.6 AV			1.50 V	201	104.6	3.0
4	#5970.68	58.3 PK	68.2	-9.9	1.50 V	201	55.1	3.2
5	11590.00	50.1 PK	74.0	-23.9	1.65 V	72	37.7	12.4
6	11590.00	39.0 AV	54.0	-15.0	1.65 V	72	26.6	12.4
7	#17385.00	54.6 PK	74.0	-19.4	1.42 V	178	38.4	16.2
8	#17385.00	40.9 AV	54.0	-13.1	1.42 V	178	24.7	16.2

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.3 PK	74.0	-15.7	1.45 H	198	55.7	2.6
2	5150.00	48.3 AV	54.0	-5.7	1.45 H	198	45.7	2.6
3	*5210.00	99.9 PK			1.45 H	198	97.5	2.4
4	*5210.00	91.2 AV			1.45 H	198	88.8	2.4
5	5350.00	49.6 PK	74.0	-24.4	1.45 H	198	47.3	2.3
6	5350.00	38.2 AV	54.0	-15.8	1.45 H	198	35.9	2.3
7	#10420.00	48.1 PK	74.0	-25.9	1.52 H	182	35.9	12.2
8	#10420.00	36.1 AV	54.0	-17.9	1.52 H	182	23.9	12.2
9	15630.00	48.4 PK	74.0	-25.6	1.45 H	245	35.7	12.7
10	15630.00	36.8 AV	54.0	-17.2	1.45 H	245	24.1	12.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.0 PK	74.0	-10.0	1.57 V	197	61.4	2.6
2	5150.00	53.2 AV	54.0	-0.8	1.57 V	197	50.6	2.6
3	*5210.00	108.8 PK			1.57 V	197	106.4	2.4
4	*5210.00	100.2 AV			1.57 V	197	97.8	2.4
5	5350.00	55.8 PK	74.0	-18.2	1.57 V	197	53.5	2.3
6	5350.00	43.6 AV	54.0	-10.4	1.57 V	197	41.3	2.3
7	#10420.00	44.6 PK	74.0	-29.4	1.45 V	153	32.4	12.2
8	#10420.00	33.9 AV	54.0	-20.1	1.45 V	153	21.7	12.2
9	15630.00	46.7 PK	74.0	-27.3	1.54 V	234	34.0	12.7
10	15630.00	35.8 AV	54.0	-18.2	1.54 V	234	23.1	12.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5650.18	60.7 PK	68.3	-7.6	1.50 H	273	57.9	2.8
2	*5775.00	103.5 PK			1.47 H	314	100.5	3.0
3	*5775.00	94.3 AV			1.47 H	314	91.3	3.0
4	#5937.73	57.5 PK	68.2	-10.7	1.50 H	273	54.1	3.4
5	11550.00	51.3 PK	74.0	-22.7	1.02 H	265	38.9	12.4
6	11550.00	39.7 AV	54.0	-14.3	1.02 H	265	27.3	12.4
7	#17325.00	55.2 PK	74.0	-18.8	1.28 H	197	39.5	15.7
8	#17325.00	42.7 AV	54.0	-11.3	1.28 H	197	27.0	15.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**#5644.42**	**68.1 PK**	**68.2**	**-0.1**	**1.75 V**	**182**	**65.4**	**2.7**
2	*5775.00	113.7 PK			1.75 V	182	110.7	3.0
3	*5775.00	104.1 AV			1.75 V	182	101.1	3.0
4	#5927.28	65.1 PK	68.2	-3.1	1.75 V	182	61.7	3.4
5	11550.00	50.4 PK	74.0	-23.6	1.63 V	76	38.0	12.4
6	11550.00	39.3 AV	54.0	-14.7	1.63 V	76	26.9	12.4
7	#17325.00	53.4 PK	74.0	-20.6	1.38 V	187	37.7	15.7
8	#17325.00	40.2 AV	54.0	-13.8	1.38 V	187	24.5	15.7

REMARKS:

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

CDD Mode

802.11a

CHANNEL	TX Channel 40	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	125.06	38.3 QP	43.5	-5.2	2.50 H	118	47.6	-9.3
2	270.33	32.8 QP	46.0	-13.2	3.50 H	179	40.8	-8.0
3	466.50	37.4 QP	46.0	-8.6	2.50 H	264	40.1	-2.7
4	570.30	33.3 QP	46.0	-12.7	2.00 H	264	34.0	-0.7
5	760.01	26.3 QP	46.0	-19.7	1.09 H	278	22.9	3.4
6	780.01	26.3 QP	46.0	-19.7	1.00 H	119	22.6	3.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	38.22	28.4 QP	40.0	-11.6	1.00 V	263	36.9	-8.5
2	270.33	41.8 QP	46.0	-4.2	1.00 V	255	49.8	-8.0
3	344.28	39.2 QP	46.0	-6.8	1.00 V	114	45.0	-5.8
4	491.72	41.6 QP	46.0	-4.4	1.10 V	264	43.8	-2.2
5	760.00	42.5 QP	46.0	-3.5	1.49 V	273	39.1	3.4
6	766.66	31.0 QP	46.0	-15.0	1.00 V	254	27.4	3.6

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

Beamforming Mode

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	125.06	38.6 QP	43.5	-4.9	2.50 H	248	47.9	-9.3
2	270.33	32.6 QP	46.0	-13.4	3.50 H	241	40.6	-8.0
3	466.50	37.7 QP	46.0	-8.3	2.49 H	263	40.4	-2.7
4	570.29	34.5 QP	46.0	-11.5	2.24 H	301	35.2	-0.7
5	760.01	26.7 QP	46.0	-19.3	1.10 H	318	23.3	3.4
6	780.01	26.4 QP	46.0	-19.6	1.00 H	263	22.7	3.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	38.21	28.5 QP	40.0	-11.5	1.04 V	183	37.0	-8.5
2	270.33	41.7 QP	46.0	-4.3	1.00 V	78	49.7	-8.0
3	344.28	39.3 QP	46.0	-6.7	1.00 V	266	45.1	-5.8
4	491.72	41.4 QP	46.0	-4.6	1.02 V	253	43.6	-2.2
5	760.00	42.4 QP	46.0	-3.6	1.52 V	271	39.0	3.4
6	766.65	31.5 QP	46.0	-14.5	1.00 V	231	27.9	3.6

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

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 04, 2018	June 03, 2019
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
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
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: June 29 to July 04, 2018

4.2.3 Test Procedure

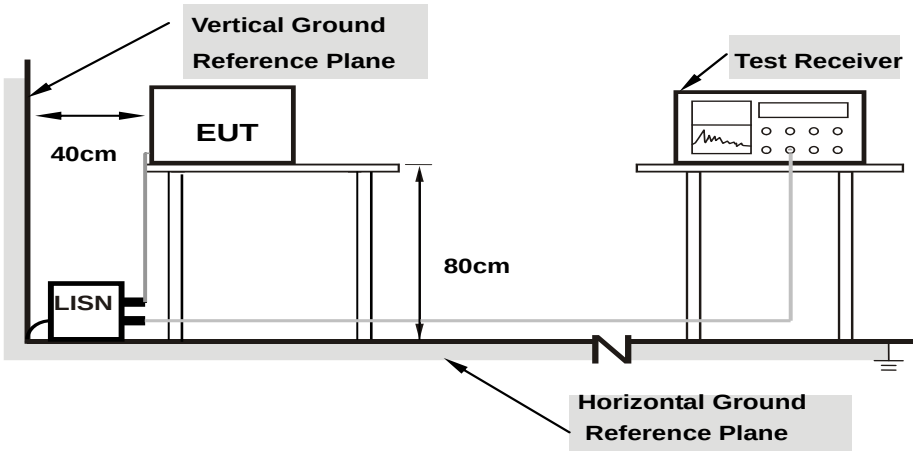
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

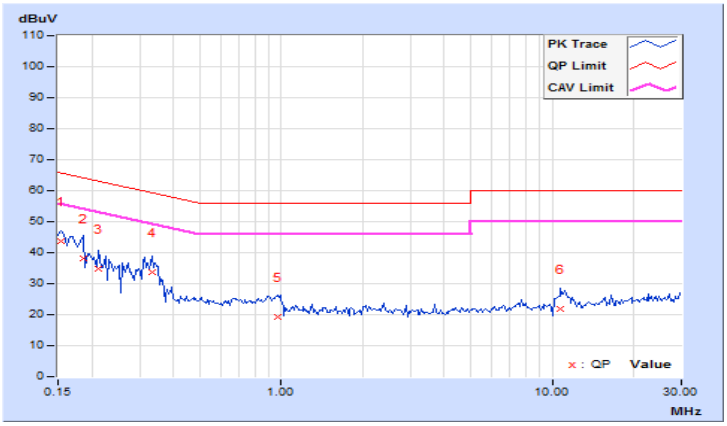
For Radio 1

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	0.15391	10.05	33.65	13.21	43.70	23.26	65.79	55.79	-22.09	-32.53
2	0.18516	10.06	27.91	10.85	37.97	20.91	64.25	54.25	-26.28	-33.34
3	0.21250	10.07	24.59	7.83	34.66	17.90	63.11	53.11	-28.45	-35.21
4	0.33359	10.10	23.45	14.34	33.55	24.44	59.36	49.36	-25.81	-24.92
5	0.96641	10.17	8.91	1.64	19.08	11.81	56.00	46.00	-36.92	-34.19
6	10.77344	10.76	11.06	0.62	21.82	11.38	60.00	50.00	-38.18	-38.62

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

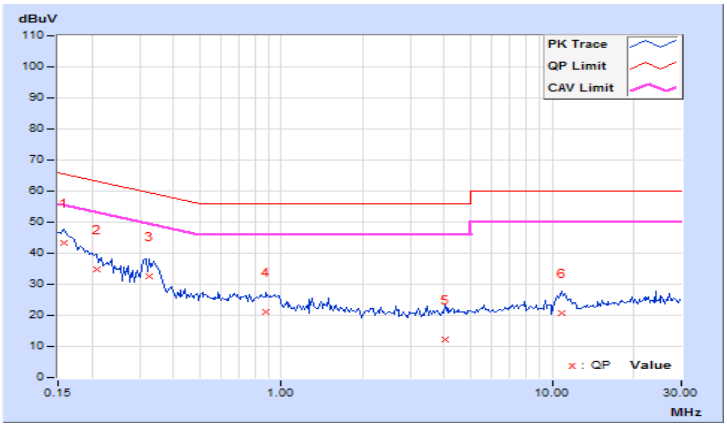


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15781	9.96	33.45	14.80	43.41	24.76	65.58	55.58	-22.17	-30.82
2	0.20859	9.97	24.71	8.90	34.68	18.87	63.26	53.26	-28.58	-34.39
3	0.32578	10.00	22.73	11.58	32.73	21.58	59.56	49.56	-26.83	-27.98
4	0.87656	10.04	10.89	3.85	20.93	13.89	56.00	46.00	-35.07	-32.11
5	4.00781	10.19	2.06	-4.99	12.25	5.20	56.00	46.00	-43.75	-40.80
6	10.81250	10.59	10.12	-1.26	20.71	9.33	60.00	50.00	-39.29	-40.67

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



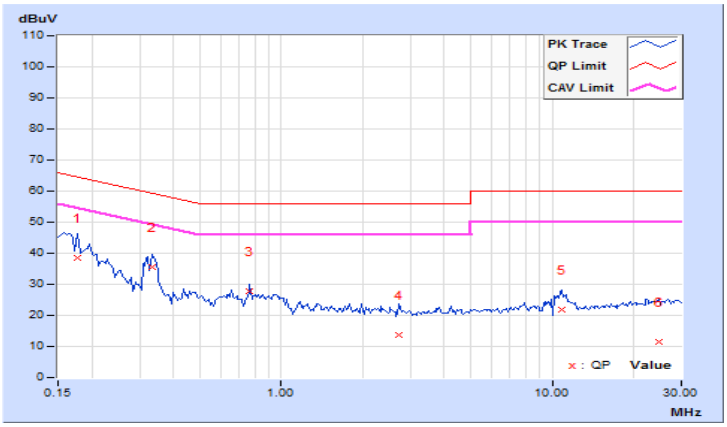
For Radio 2

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	0.17734	10.06	28.61	10.04	38.67	20.10	64.61	54.61	-25.94	-34.51
2	0.33359	10.10	25.47	17.65	35.57	27.75	59.36	49.36	-23.79	-21.61
3	**0.76719**	**10.15**	**17.81**	**15.94**	**27.96**	**26.09**	**56.00**	**46.00**	**-28.04**	**-19.91**
4	2.73438	10.26	3.28	-2.52	13.54	7.74	56.00	46.00	-42.46	-38.26
5	10.91016	10.77	11.02	2.04	21.79	12.81	60.00	50.00	-38.21	-37.19
6	24.66797	11.47	0.03	-5.49	11.50	5.98	60.00	50.00	-48.50	-44.02

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

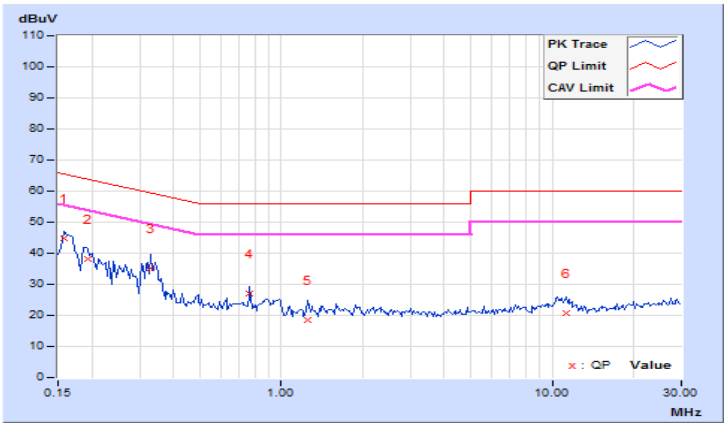


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15781	9.96	34.89	18.45	44.85	28.41	65.58	55.58	-20.73	-27.17
2	0.19297	9.97	28.34	11.94	38.31	21.91	63.91	53.91	-25.60	-32.00
3	0.32969	10.00	25.21	16.26	35.21	26.26	59.46	49.46	-24.25	-23.20
4	0.76719	10.03	16.94	15.72	26.97	25.75	56.00	46.00	-29.03	-20.25
5	1.25000	10.05	8.53	2.64	18.58	12.69	56.00	46.00	-37.42	-33.31
6	11.22656	10.62	10.11	2.50	20.73	13.12	60.00	50.00	-39.27	-36.88

Remarks:

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



4.2.8 Test Results (Mode 2)

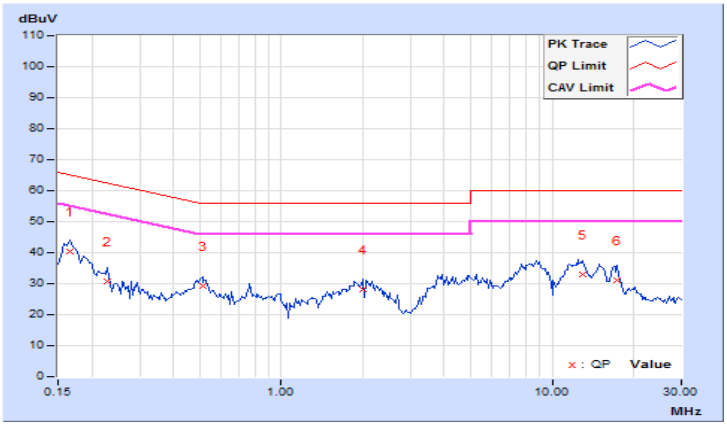
For Radio 1

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	0.16562	10.05	30.49	17.65	40.54	27.70	65.18	55.18	-24.64	-27.48
2	0.22812	10.08	20.50	8.03	30.58	18.11	62.52	52.52	-31.94	-34.41
3	0.51328	10.13	19.14	10.39	29.27	20.52	56.00	46.00	-26.73	-25.48
4	1.99219	10.22	17.98	11.14	28.20	21.36	56.00	46.00	-27.80	-24.64
5	12.94922	10.92	22.07	16.09	32.99	27.01	60.00	50.00	-27.01	-22.99
6	17.45703	11.22	20.05	14.52	31.27	25.74	60.00	50.00	-28.73	-24.26

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

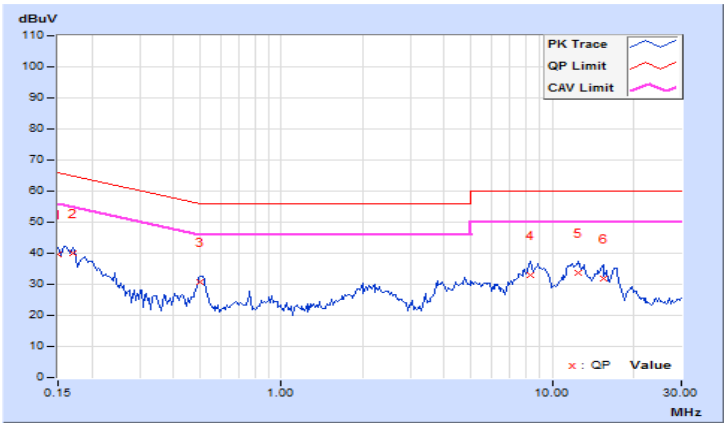


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15000	9.95	29.57	10.04	39.52	19.99	66.00	56.00	-26.48	-36.01
2	0.16953	9.96	29.87	14.16	39.83	24.12	64.98	54.98	-25.15	-30.86
3	0.50156	10.02	20.87	12.73	30.89	22.75	56.00	46.00	-25.11	-23.25
4	8.27344	10.44	22.57	16.07	33.01	26.51	60.00	50.00	-26.99	-23.49
5	12.45703	10.70	22.91	17.42	33.61	28.12	60.00	50.00	-26.39	-21.88
6	15.40234	10.89	20.81	14.89	31.70	25.78	60.00	50.00	-28.30	-24.22

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



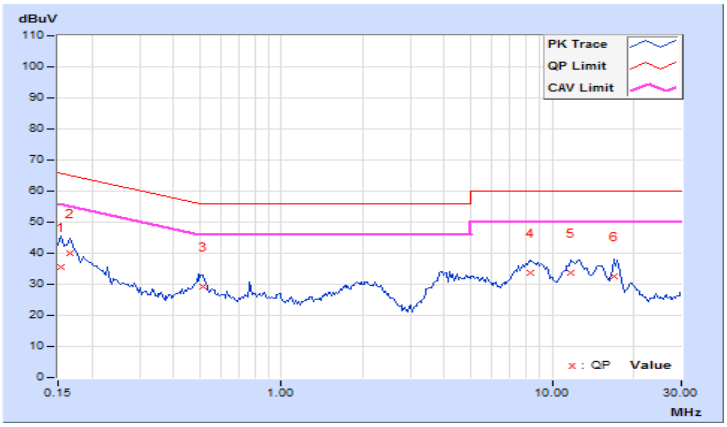
For Radio 2

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	10.05	25.52	9.40	35.57	19.45	65.79	55.79	-30.22	-36.34
2	0.16562	10.05	29.89	17.62	39.94	27.67	65.18	55.18	-25.24	-27.51
3	0.51328	10.13	19.24	10.43	29.37	20.56	56.00	46.00	-26.63	-25.44
4	8.28516	10.60	23.27	17.26	33.87	27.86	60.00	50.00	-26.13	-22.14
5	11.68750	10.83	23.01	17.81	33.84	28.64	60.00	50.00	-26.16	-21.36
6	16.87500	11.18	21.44	16.00	32.62	27.18	60.00	50.00	-27.38	-22.82

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

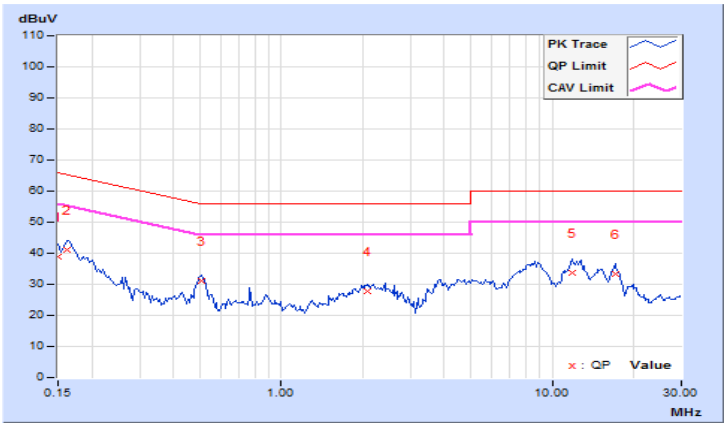


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15000	9.95	28.85	9.92	38.80	19.87	66.00	56.00	-27.20	-36.13
2	0.16172	9.96	31.08	15.73	41.04	25.69	65.38	55.38	-24.34	-29.69
3	0.50938	10.02	21.03	12.64	31.05	22.66	56.00	46.00	-24.95	-23.34
4	2.09375	10.10	17.75	11.59	27.85	21.69	56.00	46.00	-28.15	-24.31
5	11.83984	10.66	23.06	17.78	33.72	28.44	60.00	50.00	-26.28	-21.56
6	17.06641	10.99	22.47	17.43	33.46	28.42	60.00	50.00	-26.54	-21.58

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,

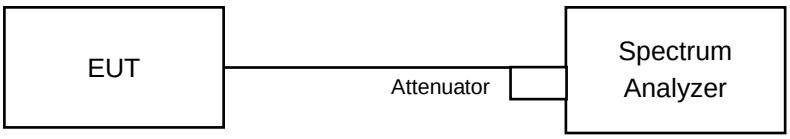
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

FOR 26dB OCCUPIED BANDWIDTH

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

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	22.88	22.78	383.76	25.84	30	Pass
40	5200	26.11	26.98	907.203	29.58	30	Pass
48	5240	24.45	25.89	666.762	28.24	30	Pass
149	5745	26.51	26.43	887.255	29.48	30	Pass
157	5785	26.45	26.49	887.226	29.48	30	Pass
165	5825	26.05	26.30	829.297	29.19	30	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	22.22	22.92	362.609	25.59	30	Pass
40	5200	25.87	26.84	869.426	29.39	30	Pass
48	5240	24.26	25.82	648.63	28.12	30	Pass
149	5745	26.51	26.42	886.244	29.48	30	Pass
157	5785	26.60	26.52	905.833	29.57	30	Pass
165	5825	26.16	26.67	877.563	29.43	30	Pass

Note: 1. For U-NII-1 band: the directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$)^2 / 2] = 5.73dBi < 6dBi , so the power limit shall not be reduced.

2. For U-NII-3 band: the directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$)^2 / 2] = 5.96dBi < 6dBi , so the power limit shall not be reduced.

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	21.76	21.86	303.43	24.82	30	Pass
46	5230	23.05	23.87	445.618	26.49	30	Pass
151	5755	26.81	26.41	917.255	29.62	30	Pass
159	5795	26.92	26.48	936.671	29.72	30	Pass

Note: 1. For U-NII-1 band: the directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 5.73dBi < 6dBi , so the power limit shall not be reduced.
2. For U-NII-3 band: the directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 5.96dBi < 6dBi , so the power limit shall not be reduced.

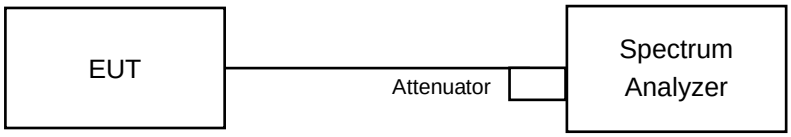
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	21.01	20.89	248.927	23.96	30	Pass
155	5775	23.51	23.73	460.436	26.63	30	Pass

Note: 1. For U-NII-1 band: the directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 5.73dBi < 6dBi , so the power limit shall not be reduced.
2. For U-NII-3 band: the directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 5.96dBi < 6dBi , so the power limit shall not be reduced.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.56	16.56
40	5200	17.04	18.96
48	5240	16.80	18.12
149	5745	17.64	19.92
157	5785	18.48	18.00
165	5825	19.44	23.28

Beamforming Mode

802.11ac (VHT20)

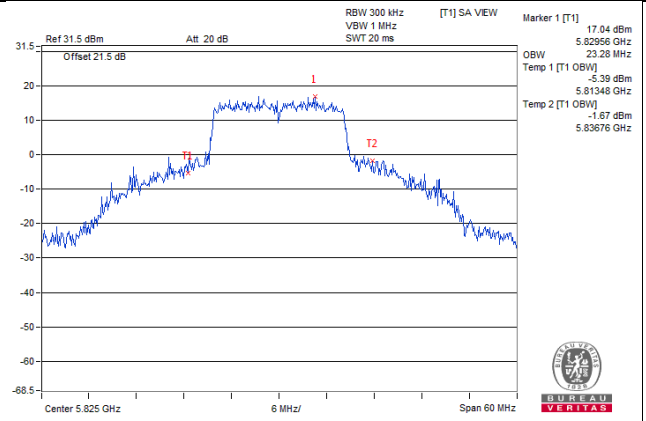
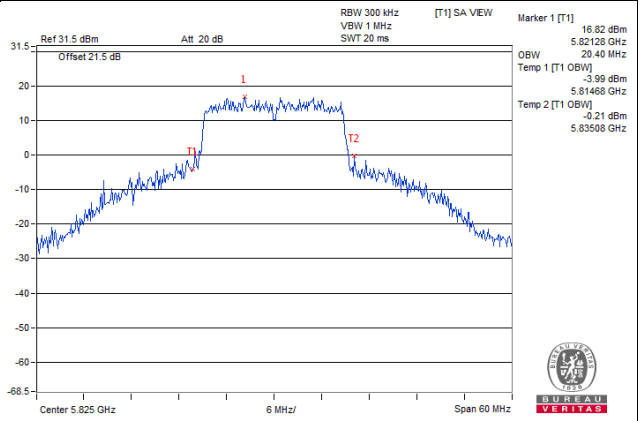
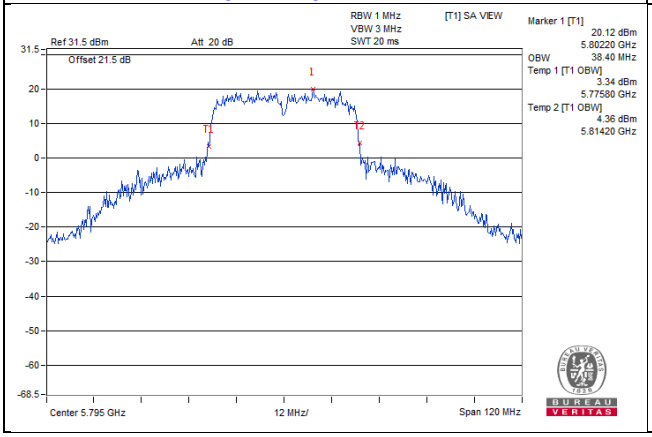
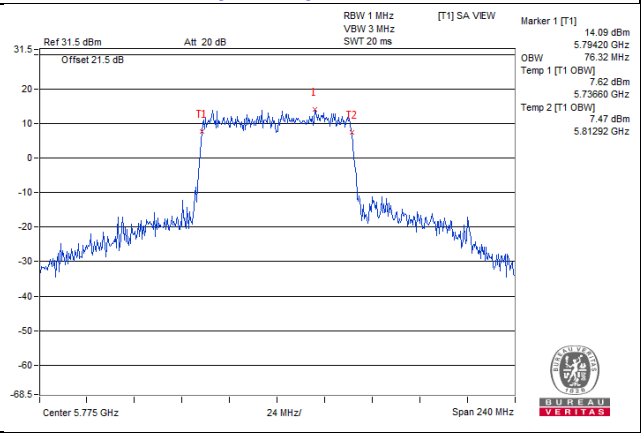
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.76	17.76
40	5200	18.12	18.96
48	5240	17.88	18.48
149	5745	18.36	18.72
157	5785	18.72	20.28
165	5825	20.40	19.80

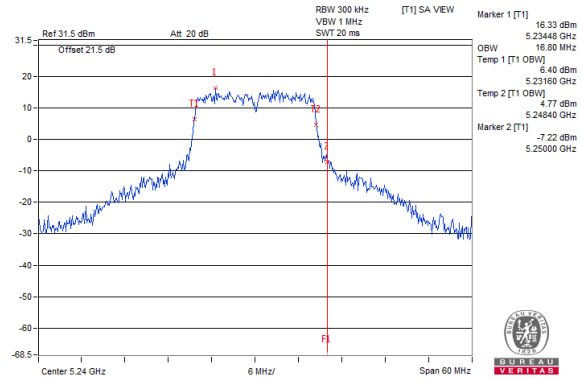
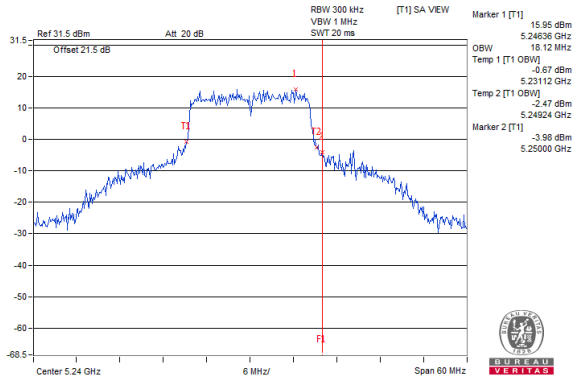
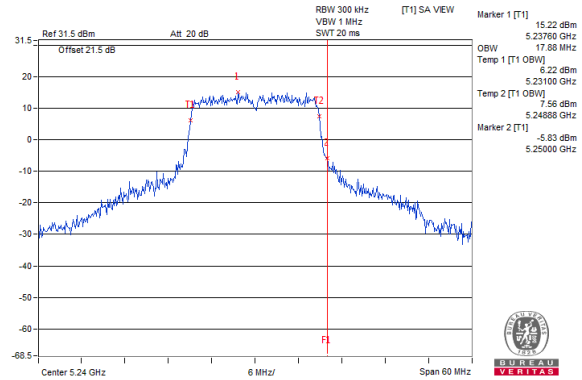
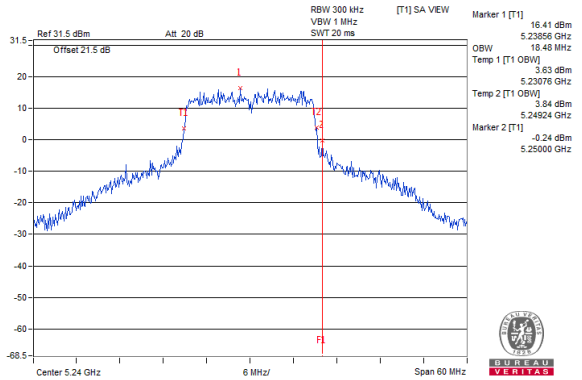
802.11ac (VHT40)

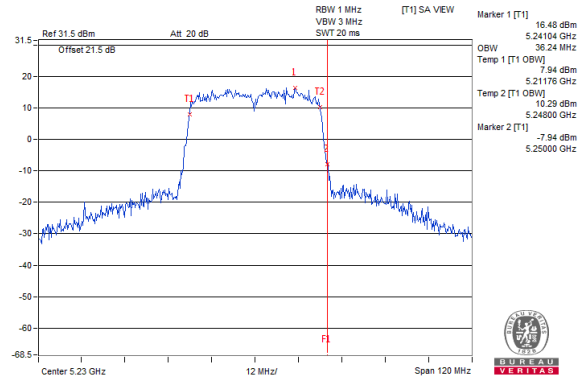
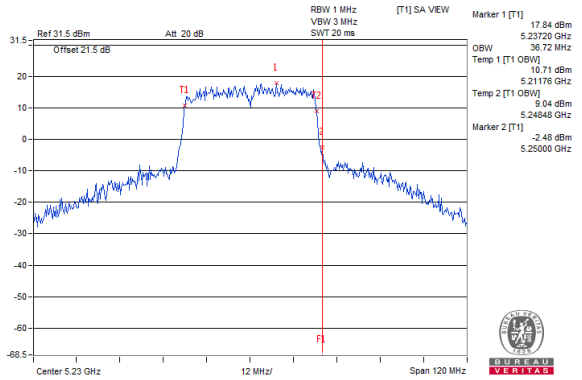
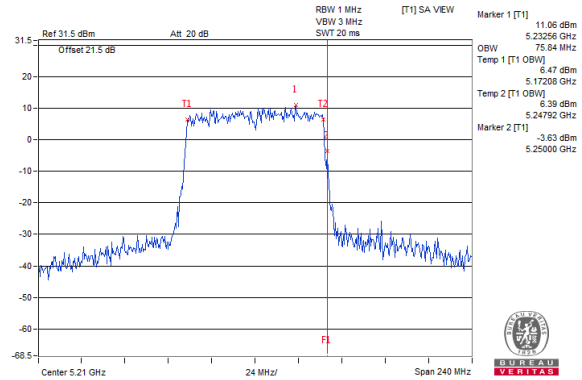
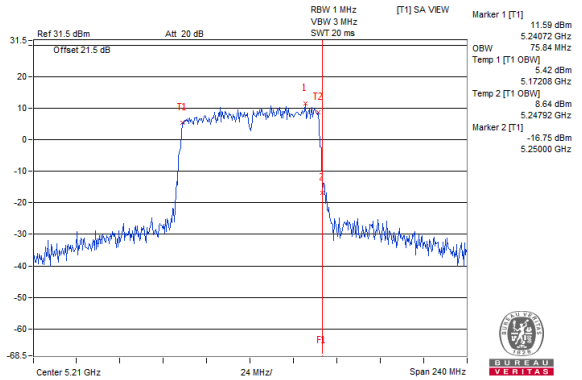
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.24	36.24
46	5230	36.24	36.72
151	5755	36.96	36.96
159	5795	38.40	37.92

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.84
155	5775	75.84	76.32

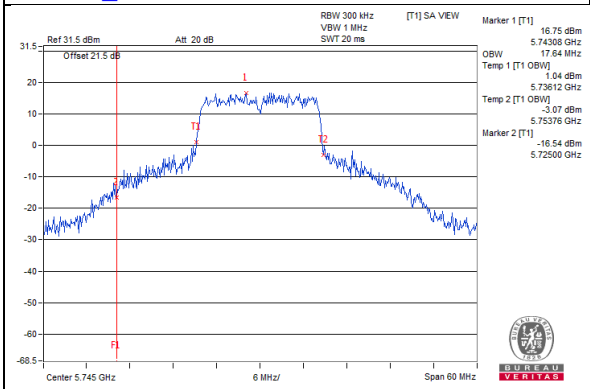
Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH165	**802.11ac (VHT20)_Chain 0 / CH165**
	
802.11ac (VHT40) _Chain 0 / CH159	**802.11ac (VHT80) _Chain 1 / CH155**
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11a_Chain 0 / CH48	**802.11a_Chain 1 / CH48**
	
802.11ac (VHT20)_Chain 0 / CH48	**802.11ac (VHT20)_Chain 1 / CH48**
	

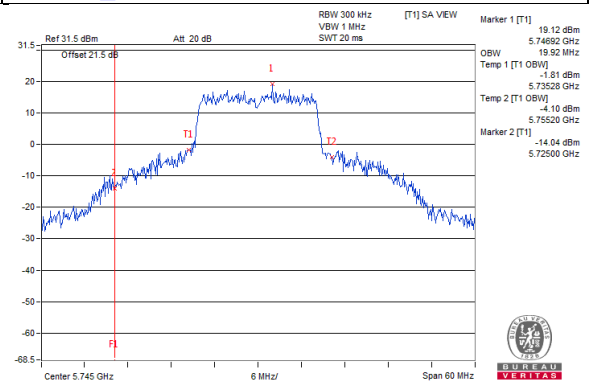
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11ac (VHT40)_Chain 0 / CH46	**802.11ac (VHT40)_Chain 1 / CH46**
	
802.11ac (VHT80)_Chain 0 / CH42	**802.11ac (VHT80)_Chain 1 / CH42**
	

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

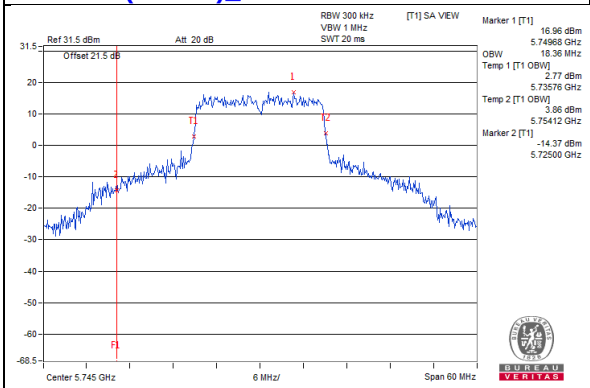
802.11a_Chain 0 / CH149



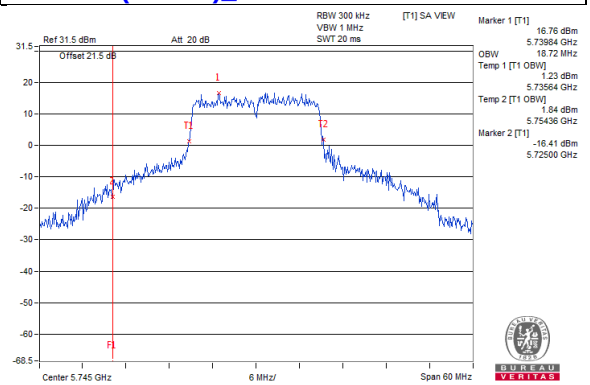
802.11a_Chain 1 / CH149

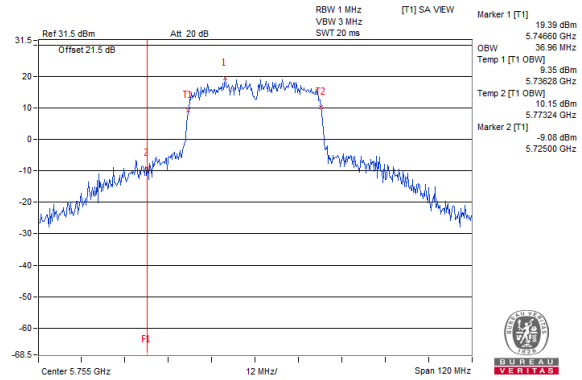
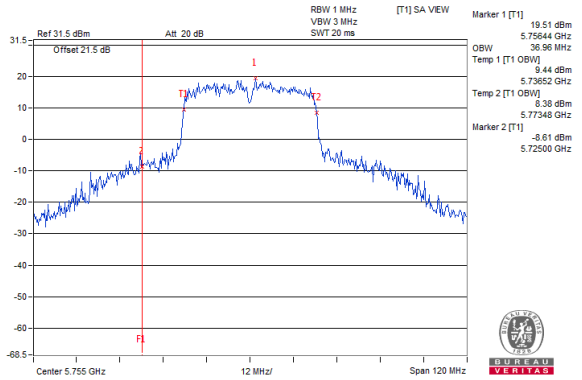
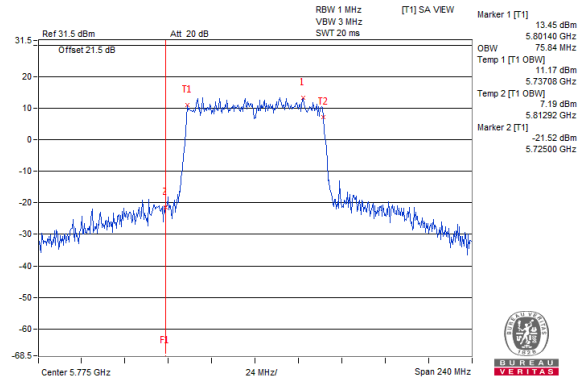
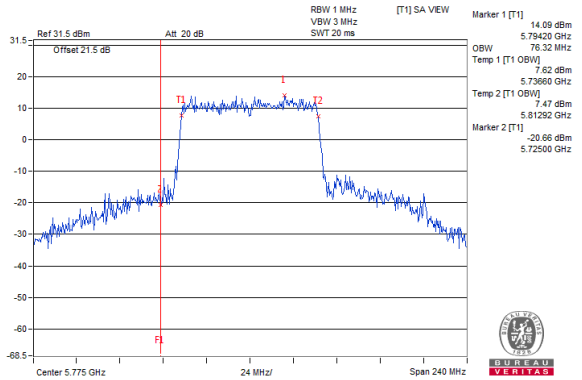


802.11ac (VHT20)_Chain 0 / CH149



802.11ac (VHT20)_Chain 1 / CH149



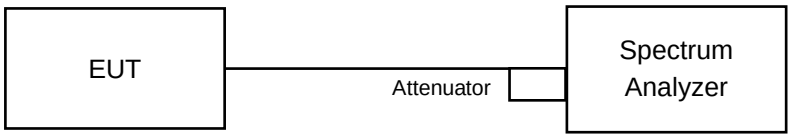
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ac (VHT40)_Chain 0 / CH151	**802.11ac (VHT40)_Chain 1 / CH151**
	
802.11ac (VHT80)_Chain 0 / CH155	**802.11ac (VHT80)_Chain 1 / CH155**
	

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

For U-NII-1 band:
For 802.11ac (VHT20):
Using method SA-1

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

For other Modulation test:
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:
For 802.11ac (VHT20):

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(500kHz/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

For other Modulation test:

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(500kHz/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	9.51	9.50	0.14	12.66	17	Pass
40	5200	12.75	12.97	0.14	16.01	17	Pass
48	5240	11.17	11.44	0.14	14.46	17	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. The Directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 5.73dBi < 6dBi , so the power density limit shall not be reduced.
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	8.91	8.75	11.84	17	Pass
40	5200	12.29	12.46	15.39	17	Pass
48	5240	10.85	11.04	13.96	17	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. The Directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 5.73dBi < 6dBi , so the power density limit shall not be reduced.

802.11ac (VHT40)

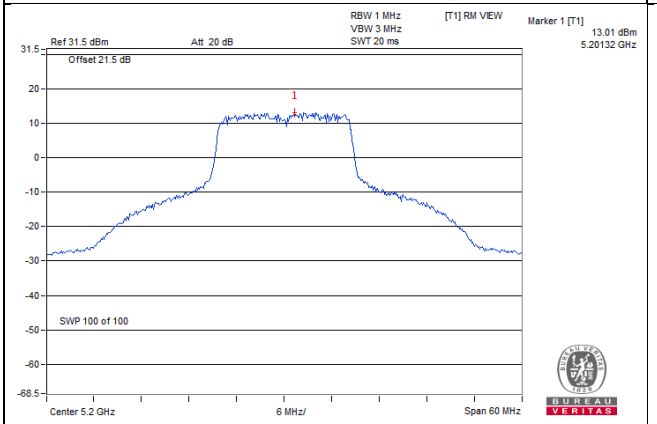
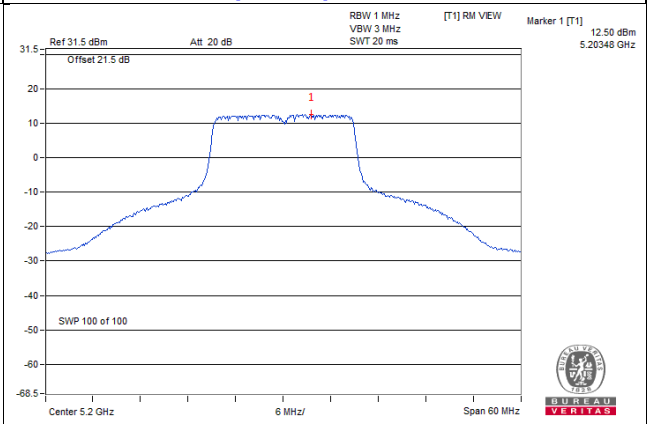
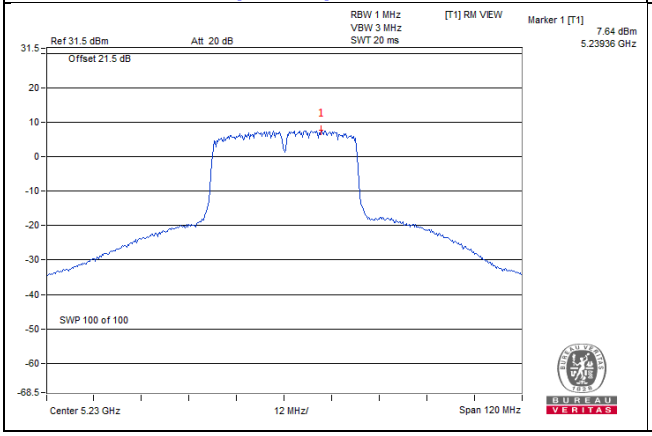
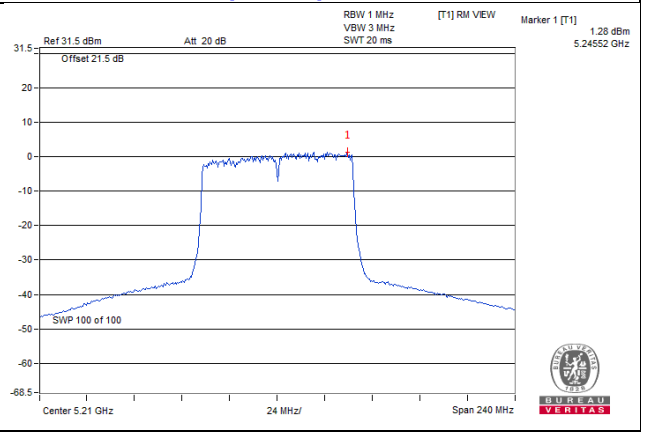
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	5.11	4.95	0.13	8.17	17	Pass
46	5230	6.75	7.50	0.13	10.28	17	Pass

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. The Directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 5.73dBi < 6dBi , so the power density limit shall not be reduced.
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	0.89	1.28	0.22	4.32	17	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. The Directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 5.73dBi < 6dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH40	**802.11ac (VHT20)_Chain 1 / CH40**
	
802.11ac (VHT40)_Chain 1 / CH46	**802.11ac (VHT80)_Chain 1 / 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	4.34	6.56	3.01	0.14	9.71	30	Pass
	157	5785	4.37	6.59	3.01	0.14	9.74	30	Pass
	165	5825	4.68	6.90	3.01	0.14	10.05	30	Pass
1	149	5745	4.72	6.94	3.01	0.14	10.09	30	Pass
	157	5785	3.79	6.01	3.01	0.14	9.16	30	Pass
	165	5825	4.42	6.64	3.01	0.14	9.79	30	Pass

Note: 1. The Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$)^2 / 2] = 5.96dBi < 6dBi , so the power density limit shall not be reduced.

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	4.20	6.42	3.01	9.43	30	Pass
	157	5785	4.13	6.35	3.01	9.36	30	Pass
	165	5825	4.28	6.50	3.01	9.51	30	Pass
1	149	5745	4.03	6.25	3.01	9.26	30	Pass
	157	5785	4.28	6.50	3.01	9.51	30	Pass
	165	5825	3.93	6.15	3.01	9.16	30	Pass

Note: 1. The Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$)^2 / 2] = 5.96dBi < 6dBi , so the power density limit shall not be reduced.

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	0.22	2.44	3.01	0.13	5.58	30	Pass
	159	5785	1.28	3.50	3.01	0.13	6.64	30	Pass
1	151	5745	0.33	2.55	3.01	0.13	5.69	30	Pass
	159	5785	0.67	2.89	3.01	0.13	6.03	30	Pass

Note: 1. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 5.96dBi < 6dBi , so the power density limit shall not be reduced.

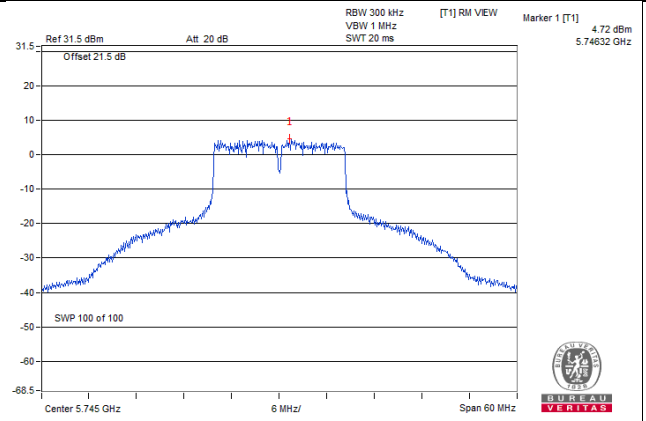
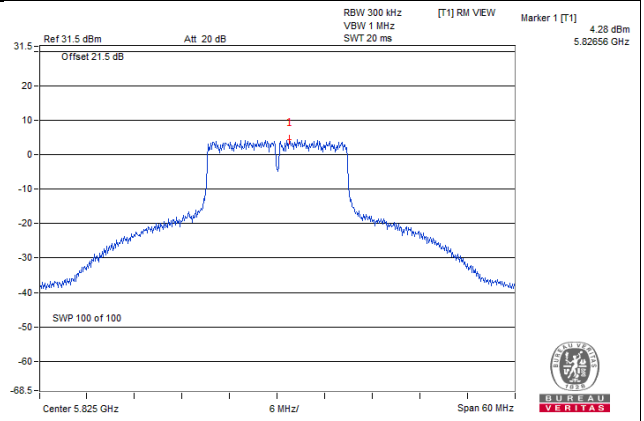
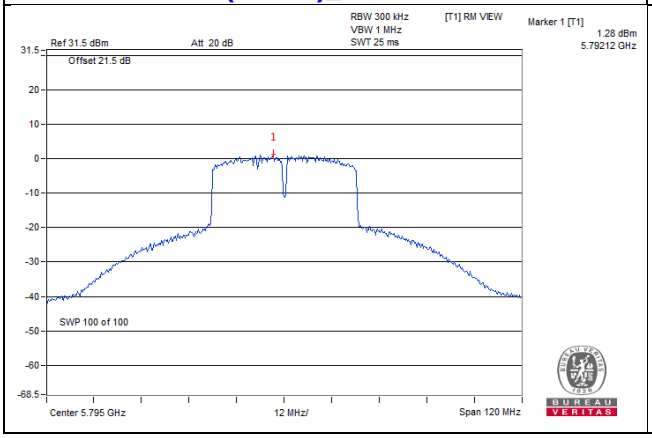
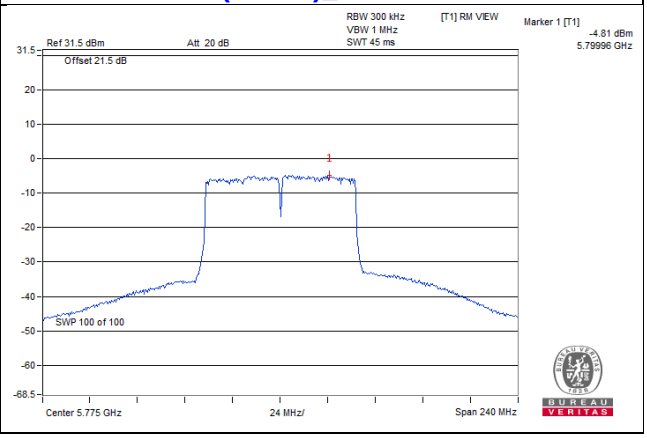
2. Refer to section 3.3 for duty cycle spectrum plot.

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	-5.19	-2.97	3.01	0.22	0.26	30	Pass
1	155	5745	-4.81	-2.59	3.01	0.22	0.64	30	Pass

Note: 1. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 5.96dBi < 6dBi , so the power density limit shall not be reduced.

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

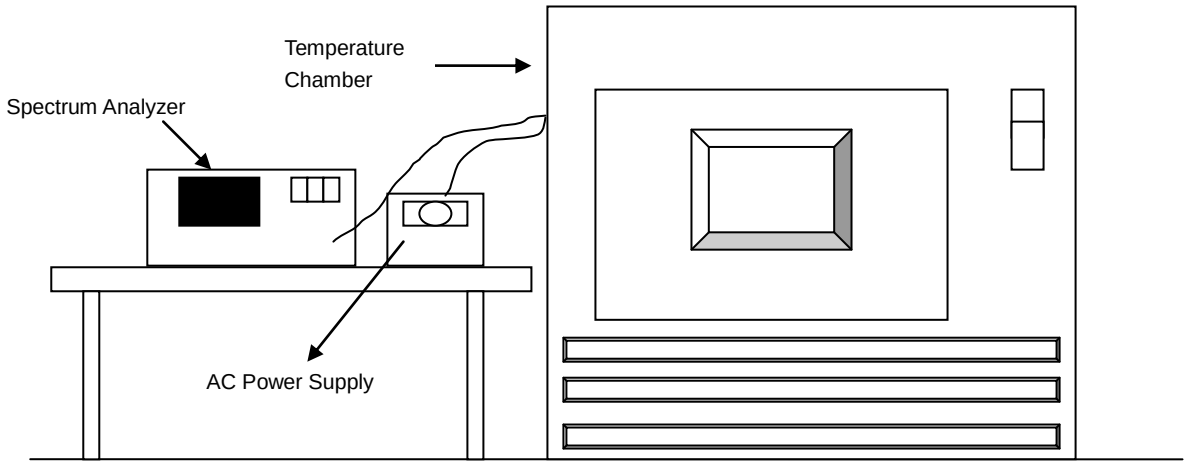
Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH149	**802.11ac (VHT20)_Chain 0 / CH165**
	
802.11ac (VHT40)_Chain 0 / CH159	**802.11ac (VHT80)_Chain 1 / CH155**
	

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	5179.9994	Pass	5180.002	Pass	5179.999	Pass	5180.0024	Pass
40	120	5180.0257	Pass	5180.0236	Pass	5180.0252	Pass	5180.0235	Pass
30	120	5180.0047	Pass	5180.0001	Pass	5180.0028	Pass	5180.0032	Pass
20	120	5180.0198	Pass	5180.0177	Pass	5180.0177	Pass	5180.0183	Pass
10	120	5179.9928	Pass	5179.995	Pass	5179.9959	Pass	5179.9948	Pass
0	120	5179.9775	Pass	5179.981	Pass	5179.9782	Pass	5179.9782	Pass
-10	120	5179.9874	Pass	5179.9905	Pass	5179.9878	Pass	5179.9877	Pass
-20	120	5180.0005	Pass	5180.004	Pass	5180.0009	Pass	5180.0007	Pass
-30	120	5179.9995	Pass	5179.997	Pass	5180.0014	Pass	5180.0007	Pass

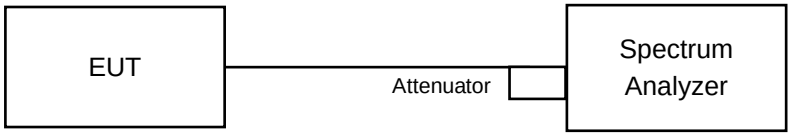
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0207	Pass	5180.0182	Pass	5180.0184	Pass	5180.0189	Pass
	120	5180.0198	Pass	5180.0177	Pass	5180.0177	Pass	5180.0183	Pass
	102	5180.0196	Pass	5180.0168	Pass	5180.0174	Pass	5180.018	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

CDD Mode

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	16.41	16.42	0.5	Pass
165	5825	16.40	16.39	0.5	Pass

Beamforming Mode

802.11ac (VHT20)

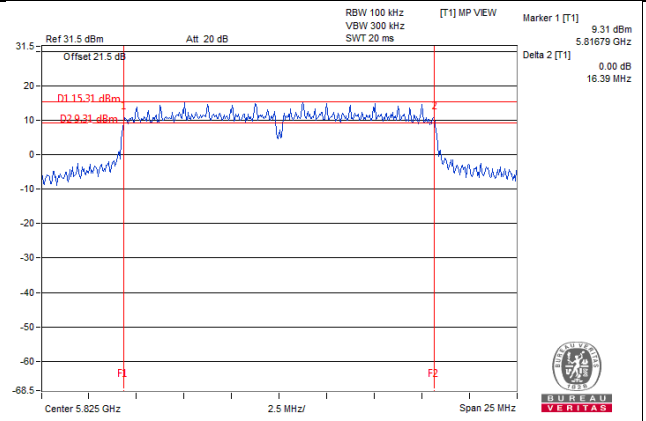
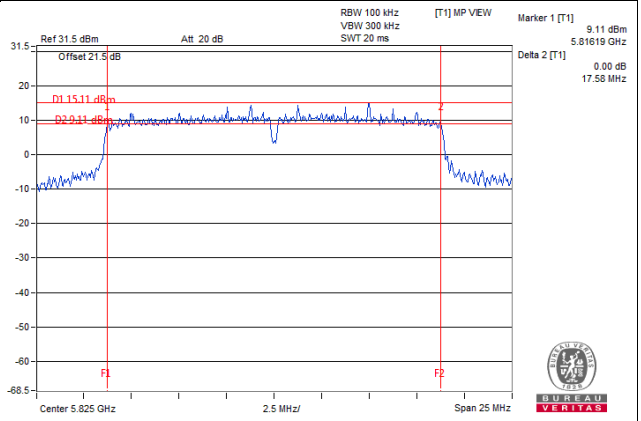
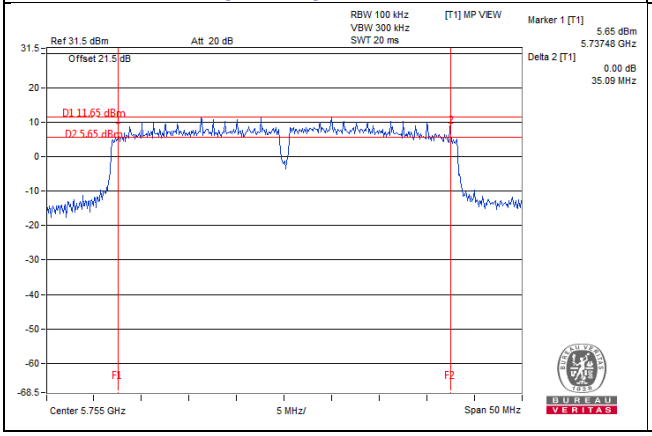
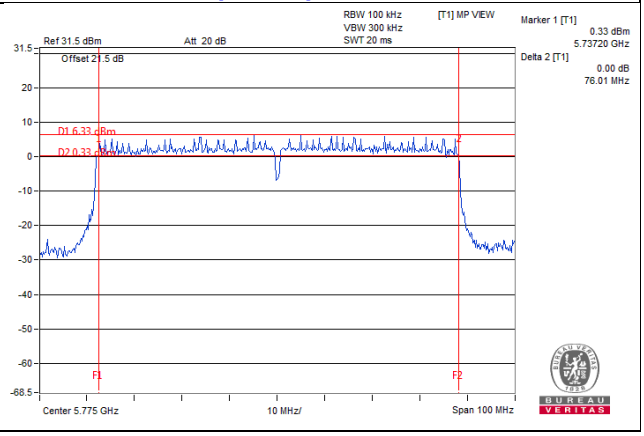
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.62	17.65	0.5	Pass
157	5785	17.64	17.62	0.5	Pass
165	5825	17.64	17.58	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.41	35.09	0.5	Pass
159	5795	35.16	35.26	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.01	76.44	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH165	**802.11ac (VHT20)_Chain 1 / CH165**
	
802.11ac (VHT40) _Chain 1 / CH151	**802.11ac (VHT80) _Chain 0 / CH155**
	

5 Pictures of Test Arrangements

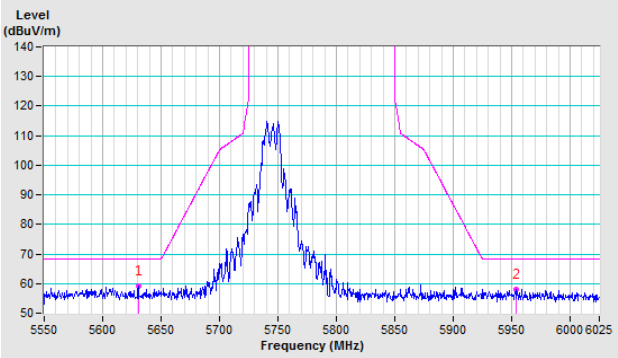
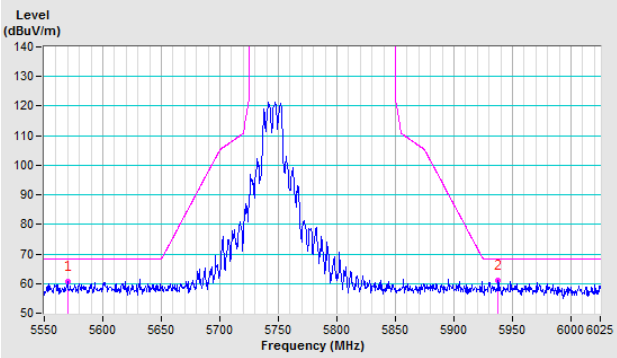
Please refer to the attached file (Test Setup Photo).

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

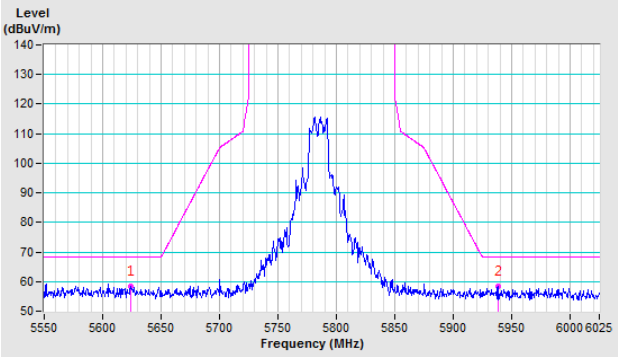
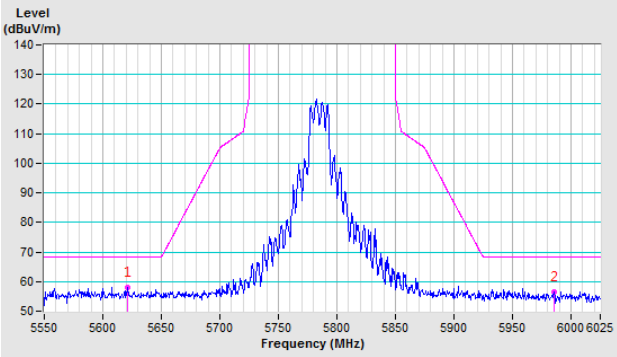
CDD Mode

802.11a

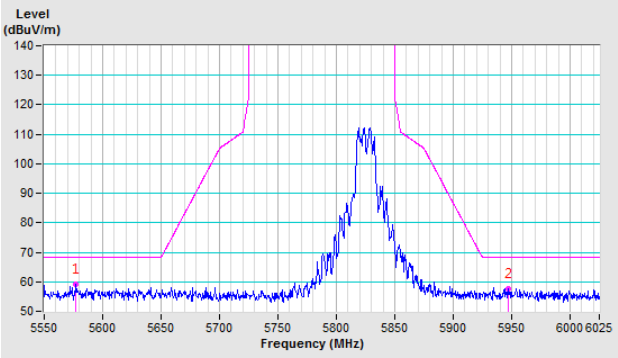
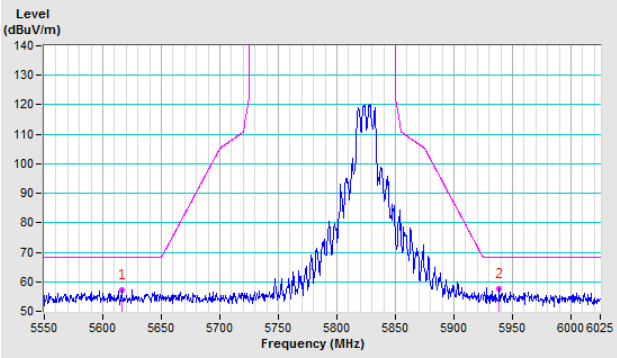
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

Horizontal	Vertical
	

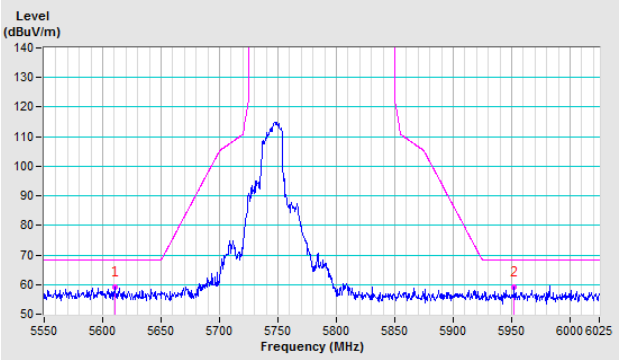
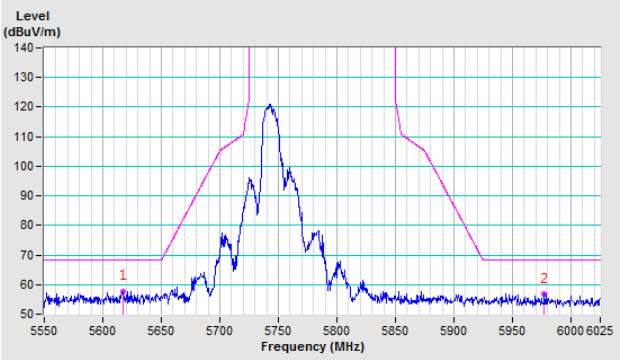
CH 165 5825 MHz

Horizontal	Vertical
	

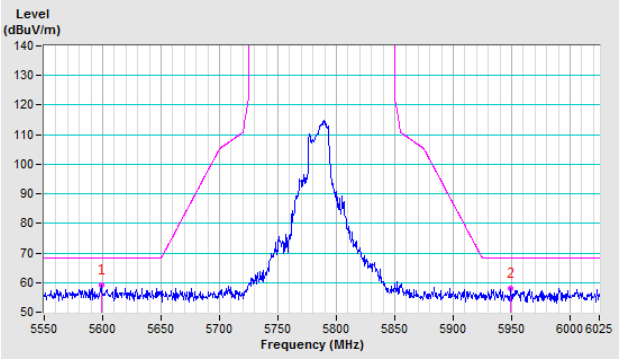
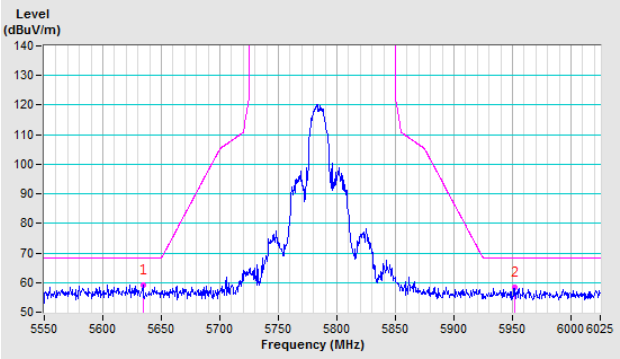
Beamforming Mode

802.11ac (VHT20)

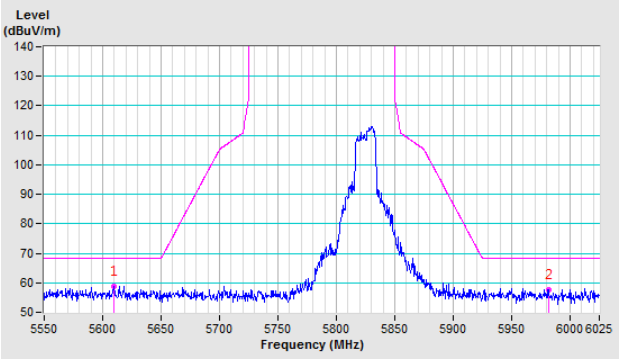
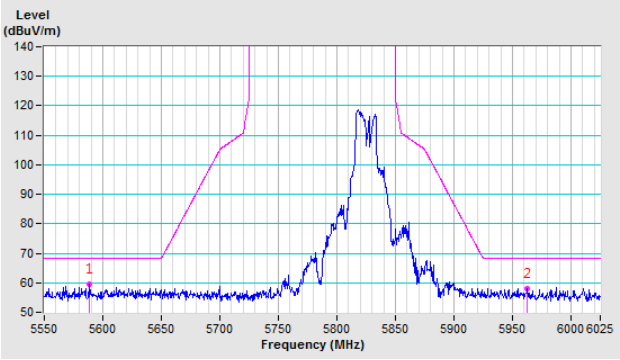
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

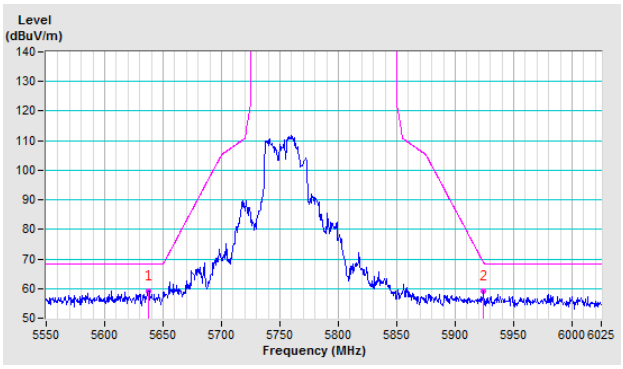
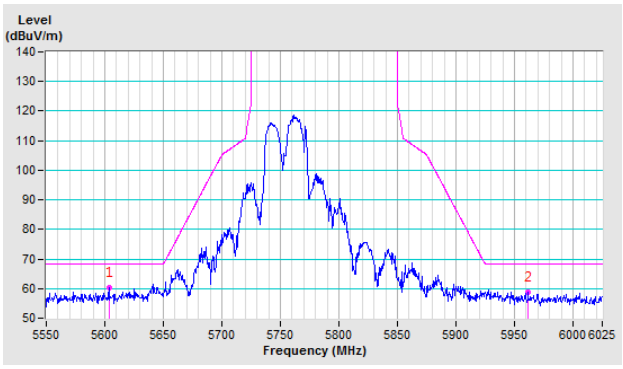
Horizontal	Vertical
	

CH 165 5825 MHz

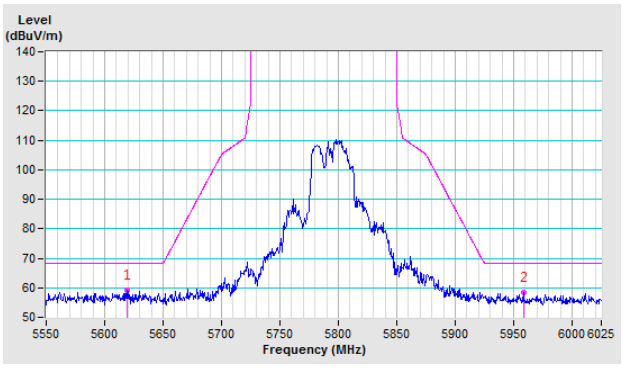
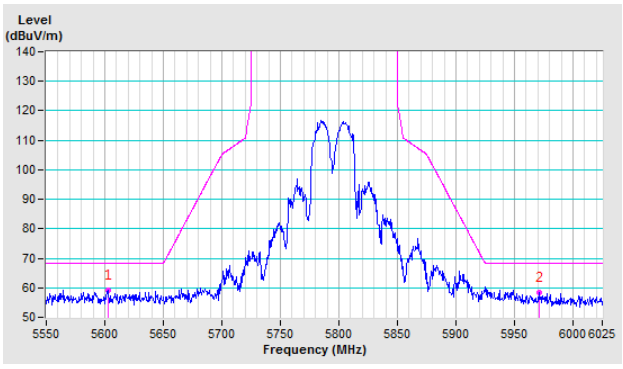
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

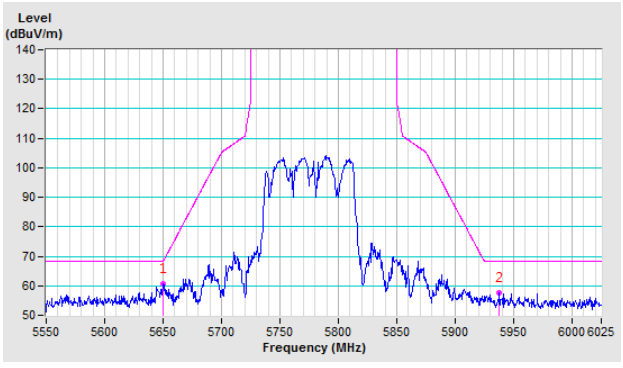
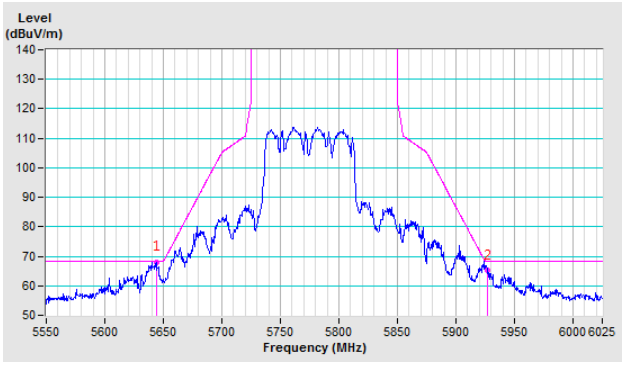
Horizontal	Vertical
	

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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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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