FCC Test Report

Report No.:	RF171206E03-1
FCC ID:	2AOIDGRYPHON01
Test Model:	Gryphon
Received Date:	Dec. 06, 2017
Test Date:	Dec. 19, 2017 to Jan. 12, 2018
Issued Date:	Jan. 30, 2018
Applicant:	Gryphon Online Safety, Inc.
Address:	10265 Prairie Springs Road,San Diego,California 92127,United States
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

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF171206E03-1	Original release.	Jan. 30, 2018

1 Certificate of Conformity

Product:	Wireless Router
Brand:	Gryphon
Test Model:	Gryphon
Sample Status:	ENGINEERING SAMPLE
Applicant:	Gryphon Online Safety, Inc.
Test Date:	Dec. 19, 2017 to Jan. 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 : _____ , **Date:** Jan. 30, 2018

Claire Kuan / Specialist

Approved by : _____ , **Date:** Jan. 30, 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 -14.99dB at 0.15000MHz.
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, 15690.00MHz, 17235.00MHz, 17265.00MHz, 17385.00MHz, 17475.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	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	5.30 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.16 dB
	6GHz ~ 18GHz	4.91 dB
	18GHz ~ 40GHz	5.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Router
Brand	Gryphon
Test Model	Gryphon
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** **CDD Mode:** 565.458mW **Beamforming Mode:** 547.294mW **5GHz:** **CDD Mode:** **5.18 ~ 5.24GHz:** 457.937mW **5.745 ~ 5.825GHz:** 875.673mW **Beamforming Mode:** **5.18 ~ 5.24GHz:** 445.887mW **5.745 ~ 5.825GHz:** 336.034mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	Ethernet Cable x 1 (Unshielded, 1m)

Note:

1. Simultaneously transmission condition.

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

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

Brand	Model No.	Spec.
Asian Power Devices Inc.	WA-36L12FU	Input: 200-240Vac, 0.6A, 50/60Hz Output: 12V, 2.0A DC cable: 1.8m, unshielded

3. The Chip of EUT as following table:

Technology	Chip Model	TX & RX Configuration
2.4GHz	IPQ-4019	2T2R
5GHz (UNII 1)		
5GHz (UNII 3)	QCA9984	4T4R

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

WLAN Antenna Spec.					
Antenna No.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connecter Type	*Cable Length (mm)
1	3.9	5.47~5.85GHz	PCB	i-pex(MHF)	235
2	4.17	5.47~5.85GHz	PCB	i-pex(MHF)	195
3	5.04	5.47~5.85GHz	PCB	i-pex(MHF)	160
4	5.62	5.47~5.85GHz	PCB	i-pex(MHF)	175
5	2.55	2.4~2.4835GHz	PCB	i-pex(MHF)	75
	5.49	5.15~5.35GHz			
6	3.14	2.4~2.4835GHz	PCB	i-pex(MHF)	60
	5.2	5.15~5.35GHz			
Buletooth Antenna Spec.					
Antenna No.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connecter Type	*Cable Length (mm)
7	1.96	2.4~2.4835GHz	-	-	-

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
VHT20	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
VHT40	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
5GHz Band (UNII 1)			
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
5GHz Band (UNII 3)			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
802.11ac (VHT20)	MCS0~8 Nss=1	4TX	4RX
	MCS0~8 Nss=2	4TX	4RX
802.11ac (VHT40)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
802.11ac (VHT80)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. 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 refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

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	
-	√	√	√	√	-

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

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

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

Power Line Conducted Emission Test:

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

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

Antenna Port Conducted Measurement:

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

CDD Mode / Beamforming Mode (output power only)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 69%RH	120Vac, 60Hz	Eason Tseng
RE<1G	25deg. C, 69%RH	120Vac, 60Hz	Andy Ho
PLC	24deg. C, 73%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

For U-NII-1:

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

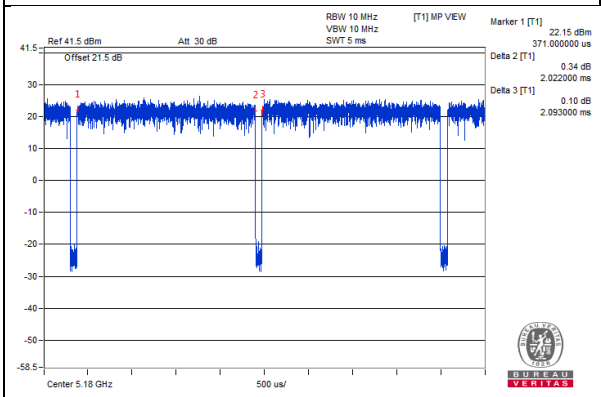
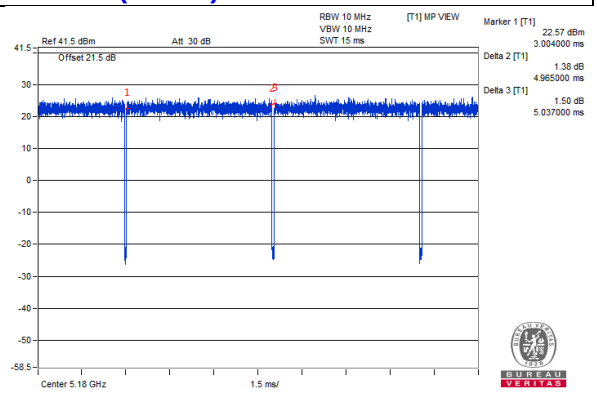
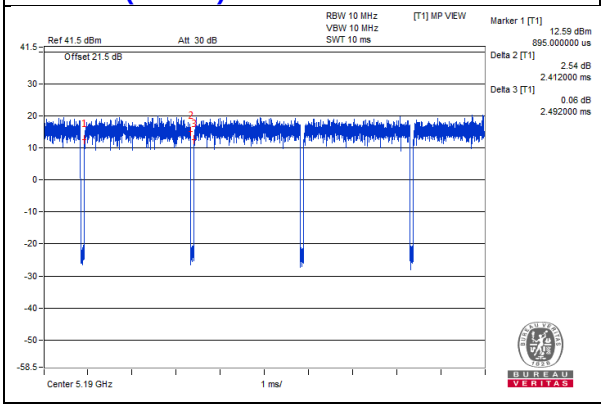
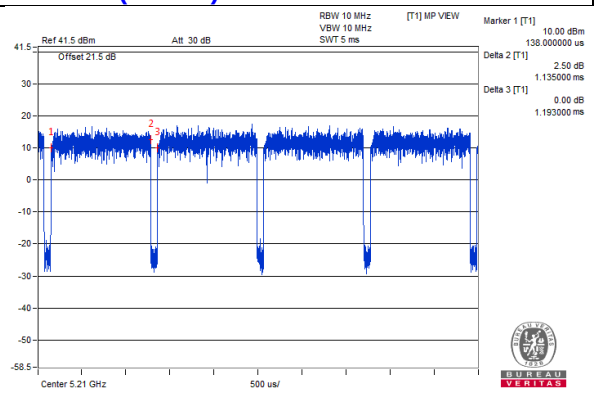
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 2.022/2.093 = 0.966, Duty factor = 10 * log(1/0.966) = 0.15

802.11ac (VHT20): Duty cycle = 4.967/5.037 = 0.986

802.11ac (VHT40): Duty cycle = 2.412/2.492 = 0.968, Duty factor = 10 * log(1/0.968) = 0.14

802.11ac (VHT80): Duty cycle = 1.135/1.193 = 0.951, Duty factor = 10 * log(1/0.951) = 0.22

802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	**802.11ac (VHT80)**
	

For U-NII-3:

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.

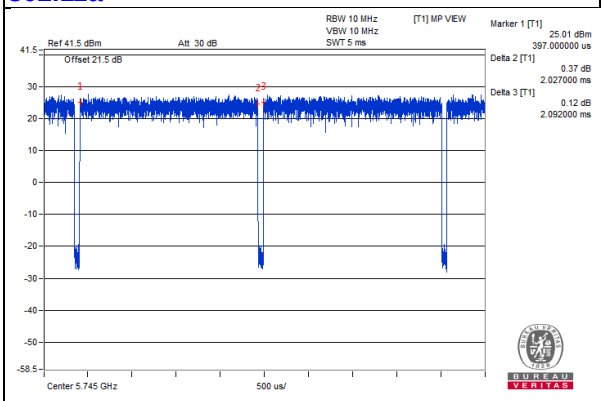
802.11a: Duty cycle = 2.027/2.092 = 0.969, Duty factor = 10 * log(1/0.969) = 0.14

802.11ac (VHT20): Duty cycle = 4.962/5.035 = 0.986

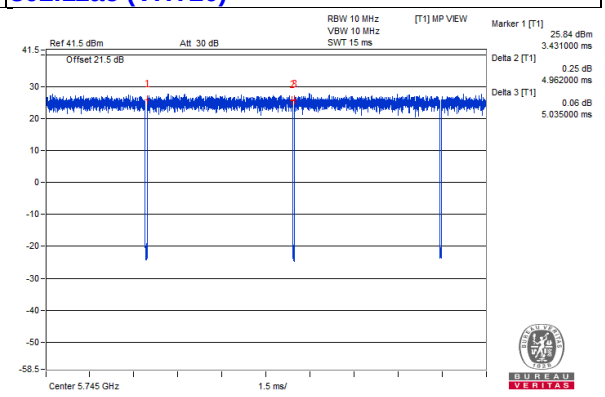
802.11ac (VHT40): Duty cycle = 2.409/2.494 = 0.966, Duty factor = 10 * log(1/0.966) = 0.15

802.11ac (VHT80): Duty cycle = 1.136/1.197 = 0.949, Duty factor = 10 * log(1/0.949) = 0.23

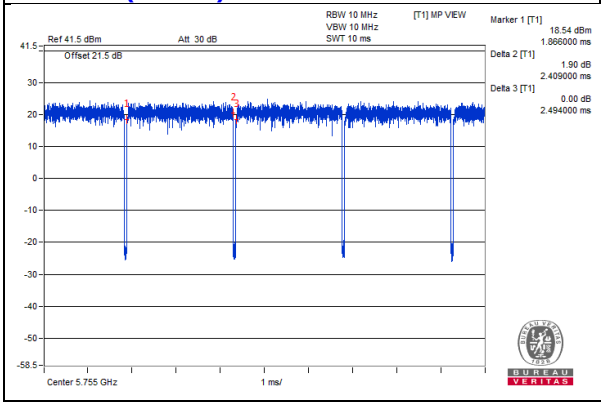
802.11a



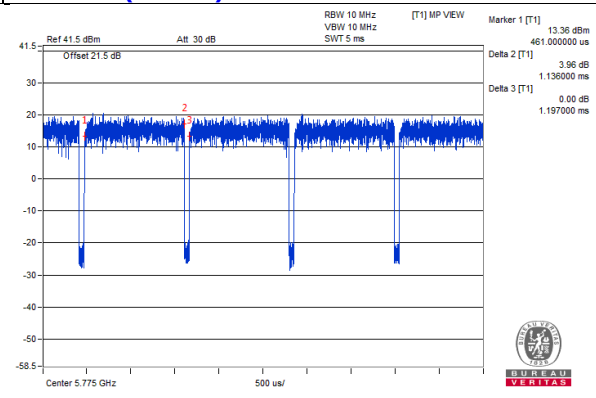
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

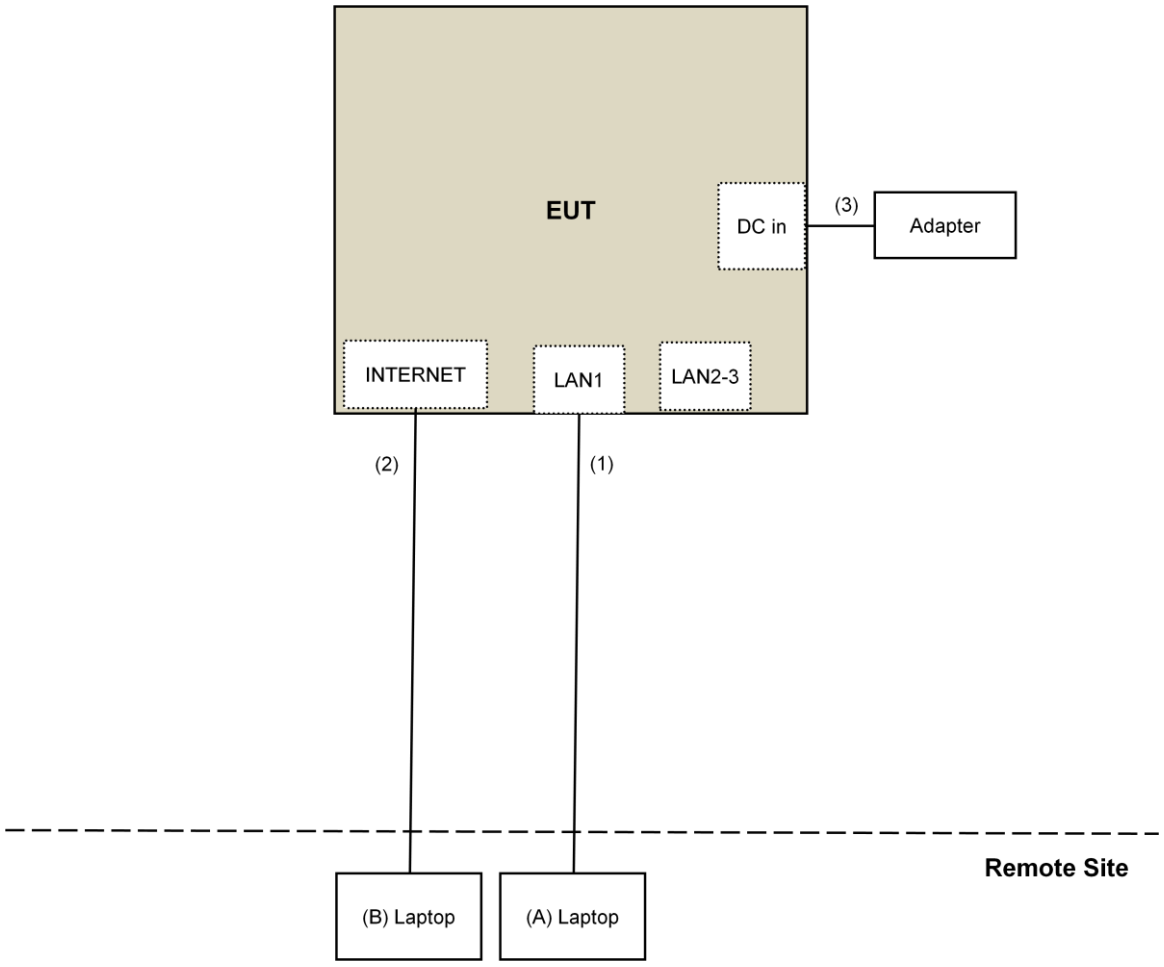
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E6420	482T3R1	FCC DoC	Provided by Lab

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.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	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.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules 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="4">*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 Out of Band Emission (OOBE) Measurement (For U-NII-3 band):

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	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Pre-Amplifier EMCI	EMC184045SE	980387	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer Agilent	E4446A	MY48250254	Nov. 21, 2017	Nov. 20, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Dec. 19, 2017

For other 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	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Pre-Amplifier EMCI	EMC184045SE	980387	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer Agilent	E4446A	MY48250254	Nov. 21, 2017	Nov. 20, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 29, 2017	May 28, 2018

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Jan. 11 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. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

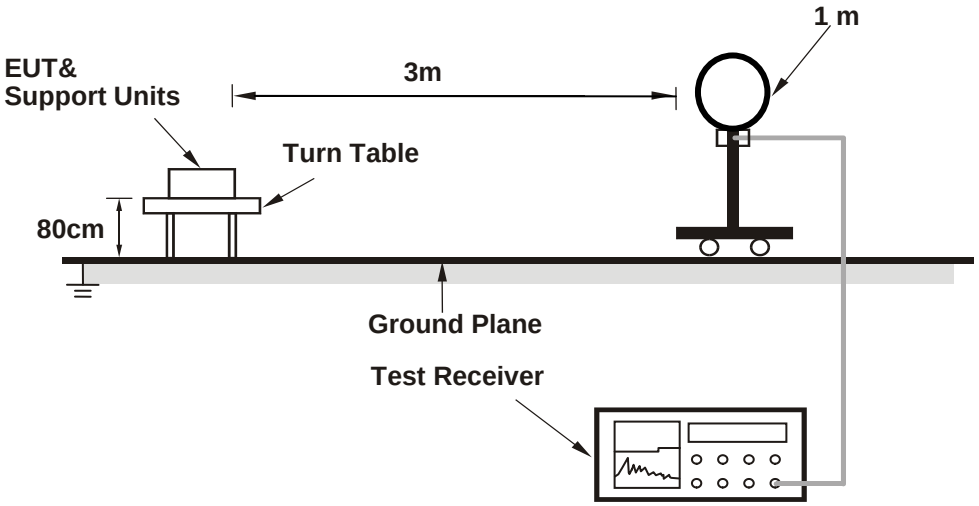
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

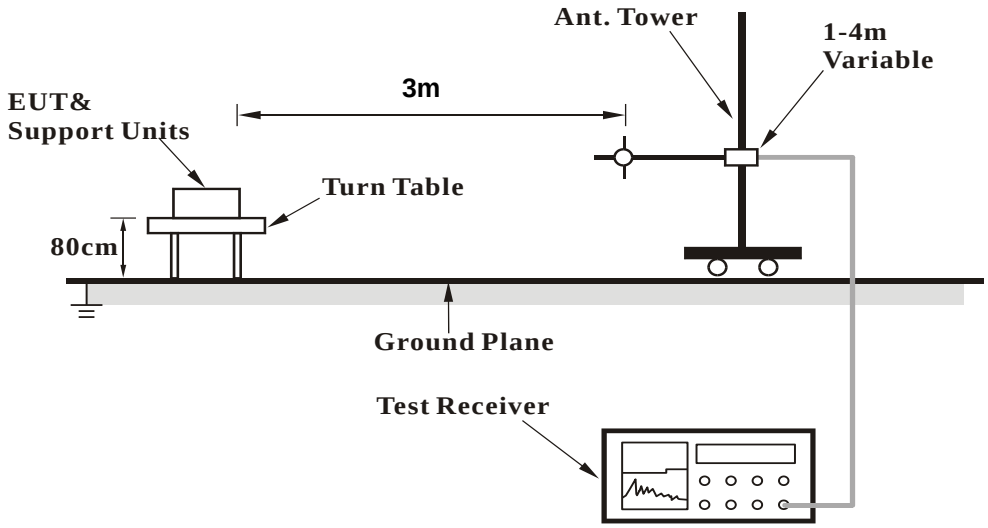
No deviation.

4.1.5 Test Setup

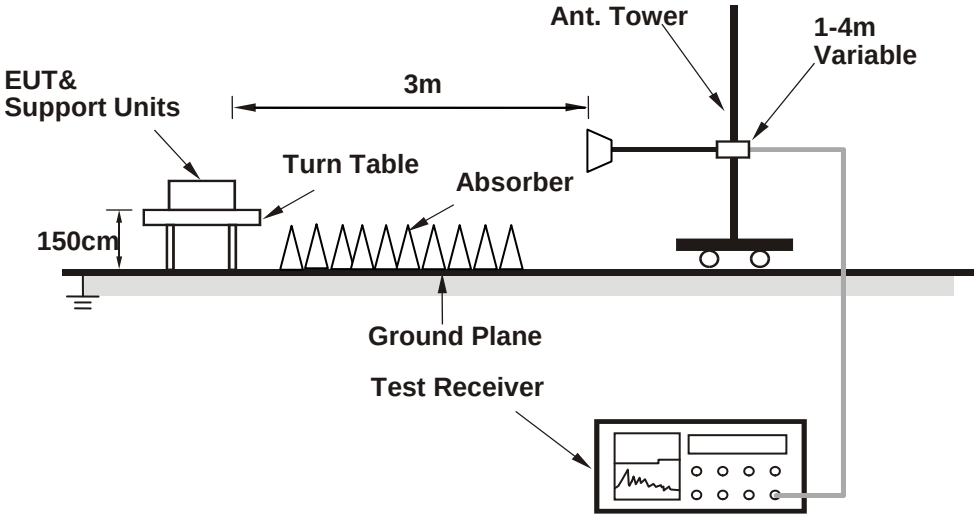
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QCARCT.exe[Ver10.0.0.4]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.0 PK	74.0	-11.0	3.33 H	236	58.7	4.3
2	5150.00	47.0 AV	54.0	-7.0	3.33 H	236	42.7	4.3
3	*5180.00	112.5 PK			3.33 H	236	108.4	4.1
4	*5180.00	100.9 AV			3.33 H	236	96.8	4.1
5	#10360.00	50.3 PK	74.0	-23.7	1.56 H	233	37.0	13.3
6	#10360.00	37.9 AV	54.0	-16.1	1.56 H	233	24.6	13.3
7	15540.00	58.8 PK	74.0	-15.2	3.59 H	272	45.9	12.9
8	15540.00	45.0 AV	54.0	-9.0	3.59 H	272	32.1	12.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.3 PK	74.0	-4.7	1.71 V	244	65.0	4.3
2	5150.00	53.8 AV	54.0	-0.2	1.71 V	244	49.5	4.3
3	*5180.00	119.0 PK			1.71 V	244	114.9	4.1
4	*5180.00	105.9 AV			1.71 V	244	101.8	4.1
5	#10360.00	48.7 PK	74.0	-25.3	2.29 V	28	35.4	13.3
6	#10360.00	37.7 AV	54.0	-16.3	2.29 V	28	24.4	13.3
7	15540.00	63.6 PK	74.0	-10.4	2.20 V	207	50.7	12.9
8	15540.00	49.2 AV	54.0	-4.8	2.20 V	207	36.3	12.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	114.6 PK			3.36 H	226	110.6	4.0
2	*5200.00	104.1 AV			3.36 H	226	100.1	4.0
3	#10400.00	54.3 PK	74.0	-19.7	1.52 H	219	40.8	13.5
4	#10400.00	42.0 AV	54.0	-12.0	1.52 H	219	28.5	13.5
5	15600.00	62.8 PK	74.0	-11.2	3.58 H	263	49.7	13.1
6	15600.00	49.0 AV	54.0	-5.0	3.58 H	263	35.9	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	121.1 PK			1.69 V	242	117.1	4.0
2	*5200.00	109.1 AV			1.69 V	242	105.1	4.0
3	#10400.00	52.7 PK	74.0	-21.3	2.29 V	43	39.2	13.5
4	#10400.00	41.7 AV	54.0	-12.3	2.29 V	43	28.2	13.5
5	15600.00	67.6 PK	74.0	-6.4	2.23 V	192	54.5	13.1
6	15600.00	53.2 AV	54.0	-0.8	2.23 V	192	40.1	13.1

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	111.3 PK			3.35 H	227	107.4	3.9
2	*5240.00	101.1 AV			3.35 H	227	97.2	3.9
3	5350.00	49.6 PK	74.0	-24.4	3.35 H	227	45.6	4.0
4	5350.00	37.4 AV	54.0	-16.6	3.35 H	227	33.4	4.0
5	#10480.00	54.3 PK	74.0	-19.7	1.56 H	222	40.3	14.0
6	#10480.00	42.0 AV	54.0	-12.0	1.56 H	222	28.0	14.0
7	15720.00	62.8 PK	74.0	-11.2	3.53 H	247	49.3	13.5
8	15720.00	49.1 AV	54.0	-4.9	3.53 H	247	35.6	13.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	117.8 PK			1.69 V	242	113.9	3.9
2	*5240.00	106.1 AV			1.69 V	242	102.2	3.9
3	5350.00	49.8 PK	74.0	-24.2	1.69 V	242	45.8	4.0
4	5350.00	37.4 AV	54.0	-16.6	1.69 V	242	33.4	4.0
5	#10480.00	52.6 PK	74.0	-21.4	2.30 V	43	38.6	14.0
6	#10480.00	41.8 AV	54.0	-12.2	2.30 V	43	27.8	14.0
7	15720.00	67.4 PK	74.0	-6.6	2.29 V	216	53.9	13.5
8	15720.00	53.7 AV	54.0	-0.3	2.29 V	216	40.2	13.5

REMARKS:

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

CHANNEL	TX Channel 149	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	#5582.02	56.0 PK	68.2	-12.2	1.31 H	355	51.8	4.2
2	*5745.00	116.4 PK			1.81 H	84	111.8	4.6
3	*5745.00	106.2 AV			1.81 H	84	101.6	4.6
4	#5987.19	56.1 PK	68.2	-12.1	1.31 H	355	51.4	4.7
5	11490.00	50.6 PK	74.0	-23.4	1.72 H	153	36.5	14.1
6	11490.00	40.1 AV	54.0	-13.9	1.72 H	153	26.0	14.1
7	#17235.00	65.8 PK	74.0	-8.2	1.76 H	141	48.9	16.9
8	**#17235.00**	**53.9 AV**	**54.0**	**-0.1**	**1.76 H**	**141**	**37.0**	**16.9**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5577.74	62.6 PK	68.2	-5.6	1.76 V	176	58.5	4.1
2	*5745.00	125.2 PK			1.76 V	176	120.6	4.6
3	*5745.00	115.1 AV			1.76 V	176	110.5	4.6
4	#5930.10	62.8 PK	68.2	-5.4	1.76 V	176	58.1	4.7
5	11490.00	46.8 PK	74.0	-27.2	1.58 V	135	32.7	14.1
6	11490.00	36.1 AV	54.0	-17.9	1.58 V	135	22.0	14.1
7	#17235.00	61.6 PK	74.0	-12.4	3.76 V	107	44.7	16.9
8	#17235.00	52.2 AV	54.0	-1.8	3.76 V	107	35.3	16.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5630.95	56.9 PK	68.2	-11.3	1.33 H	354	52.5	4.4
2	*5785.00	115.5 PK			1.82 H	87	110.9	4.6
3	*5785.00	105.4 AV			1.82 H	87	100.8	4.6
4	#5946.67	56.4 PK	68.2	-11.8	1.33 H	354	51.7	4.7
5	11570.00	48.6 PK	74.0	-25.4	1.70 H	161	34.5	14.1
6	11570.00	38.6 AV	54.0	-15.4	1.70 H	161	24.5	14.1
7	#17355.00	64.9 PK	74.0	-9.1	1.52 H	147	47.1	17.8
8	#17355.00	53.8 AV	54.0	-0.2	1.52 H	147	36.0	17.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5601.06	63.0 PK	68.2	-5.2	1.68 V	175	58.8	4.2
2	*5785.00	123.1 PK			1.68 V	175	118.5	4.6
3	*5785.00	113.2 AV			1.68 V	175	108.6	4.6
4	#5930.83	61.8 PK	68.2	-6.4	1.68 V	175	57.1	4.7
5	11570.00	46.6 PK	74.0	-27.4	1.53 V	132	32.5	14.1
6	11570.00	35.9 AV	54.0	-18.1	1.53 V	132	21.8	14.1
7	#17355.00	60.7 PK	74.0	-13.3	3.74 V	114	42.9	17.8
8	#17355.00	51.1 AV	54.0	-2.9	3.74 V	114	33.3	17.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5558.69	62.6 PK	68.2	-5.6	1.86 H	88	58.5	4.1
2	*5825.00	115.9 PK			1.86 H	88	111.1	4.8
3	*5825.00	105.8 AV			1.86 H	88	101.0	4.8
4	#5968.96	62.1 PK	68.2	-6.1	1.86 H	88	57.4	4.7
5	11650.00	49.9 PK	74.0	-24.1	1.01 H	102	35.9	14.0
6	11650.00	39.6 AV	54.0	-14.4	1.01 H	102	25.6	14.0
7	#17475.00	63.7 PK	74.0	-10.3	2.17 H	181	44.7	19.0
8	**#17475.00**	**53.9 AV**	**54.0**	**-0.1**	**2.17 H**	**181**	**34.9**	**19.0**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5627.29	62.0 PK	68.2	-6.2	1.64 V	174	57.8	4.2
2	*5825.00	124.3 PK			1.64 V	174	119.5	4.8
3	*5825.00	114.2 AV			1.64 V	174	109.4	4.8
4	#5930.36	62.2 PK	68.2	-6.0	1.64 V	174	57.5	4.7
5	11650.00	46.7 PK	74.0	-27.3	1.55 V	116	32.7	14.0
6	11650.00	35.9 AV	54.0	-18.1	1.55 V	116	21.9	14.0
7	#17475.00	60.9 PK	74.0	-13.1	3.74 V	126	41.9	19.0
8	#17475.00	51.1 AV	54.0	-2.9	3.74 V	126	32.1	19.0

REMARKS:

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

802.11ac (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	63.2 PK	74.0	-10.8	3.38 H	218	58.9	4.3
2	5150.00	47.5 AV	54.0	-6.5	3.38 H	218	43.2	4.3
3	*5180.00	112.8 PK			3.38 H	218	108.7	4.1
4	*5180.00	104.4 AV			3.38 H	218	100.3	4.1
5	#10360.00	50.4 PK	74.0	-23.6	1.52 H	239	37.1	13.3
6	#10360.00	38.2 AV	54.0	-15.8	1.52 H	239	24.9	13.3
7	15540.00	58.3 PK	74.0	-15.7	3.55 H	278	45.4	12.9
8	15540.00	44.6 AV	54.0	-9.4	3.55 H	278	31.7	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	69.5 PK	74.0	-4.5	1.70 V	241	65.2	4.3
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.70 V**	**241**	**49.6**	**4.3**
3	*5180.00	119.3 PK			1.70 V	241	115.2	4.1
4	*5180.00	107.3 AV			1.70 V	241	103.2	4.1
5	#10360.00	49.0 PK	74.0	-25.0	2.23 V	53	35.7	13.3
6	#10360.00	38.1 AV	54.0	-15.9	2.23 V	53	24.8	13.3
7	15540.00	60.6 PK	74.0	-13.4	2.33 V	221	47.7	12.9
8	15540.00	47.6 AV	54.0	-6.4	2.33 V	221	34.7	12.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	114.0 PK			3.40 H	214	110.0	4.0
2	*5200.00	104.4 AV			3.40 H	214	100.4	4.0
3	#10400.00	54.2 PK	74.0	-19.8	1.52 H	213	40.7	13.5
4	#10400.00	41.9 AV	54.0	-12.1	1.52 H	213	28.4	13.5
5	15600.00	62.7 PK	74.0	-11.3	3.59 H	275	49.6	13.1
6	15600.00	48.7 AV	54.0	-5.3	3.59 H	275	35.6	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	120.5 PK			1.60 V	250	116.5	4.0
2	*5200.00	109.4 AV			1.60 V	250	105.4	4.0
3	#10400.00	53.0 PK	74.0	-21.0	2.28 V	45	39.5	13.5
4	#10400.00	42.1 AV	54.0	-11.9	2.28 V	45	28.6	13.5
5	15600.00	64.6 PK	74.0	-9.4	2.31 V	214	51.5	13.1
6	15600.00	51.6 AV	54.0	-2.4	2.31 V	214	38.5	13.1

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	111.7 PK			3.41 H	218	107.8	3.9
2	*5240.00	102.3 AV			3.41 H	218	98.4	3.9
3	5350.00	43.4 PK	74.0	-30.6	3.41 H	218	39.4	4.0
4	5350.00	37.3 AV	54.0	-16.7	3.41 H	218	33.3	4.0
5	#10480.00	54.1 PK	74.0	-19.9	1.54 H	208	40.1	14.0
6	#10480.00	41.5 AV	54.0	-12.5	1.54 H	208	27.5	14.0
7	15720.00	62.9 PK	74.0	-11.1	3.57 H	275	49.4	13.5
8	15720.00	48.8 AV	54.0	-5.2	3.57 H	275	35.3	13.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	118.2 PK			1.65 V	239	114.3	3.9
2	*5240.00	107.3 AV			1.65 V	239	103.4	3.9
3	5350.00	49.7 PK	74.0	-24.3	1.65 V	239	45.7	4.0
4	5350.00	37.6 AV	54.0	-16.4	1.65 V	239	33.6	4.0
5	#10480.00	53.4 PK	74.0	-20.6	2.31 V	49	39.4	14.0
6	#10480.00	42.5 AV	54.0	-11.5	2.31 V	49	28.5	14.0
7	15720.00	68.5 PK	74.0	-5.5	2.32 V	214	55.0	13.5
8	15720.00	53.7 AV	54.0	-0.3	2.32 V	214	40.2	13.5

REMARKS:

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

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	#5615.82	62.0 PK	68.2	-6.2	2.92 H	75	57.8	4.2
2	*5745.00	118.6 PK			2.92 H	75	114.0	4.6
3	*5745.00	108.4 AV			2.92 H	75	103.8	4.6
4	#5933.23	62.4 PK	68.2	-5.8	2.92 H	75	57.7	4.7
5	11490.00	47.8 PK	74.0	-26.2	1.13 H	121	33.7	14.1
6	11490.00	37.9 AV	54.0	-16.1	1.13 H	121	23.8	14.1
7	#17235.00	66.7 PK	74.0	-7.3	1.43 H	158	49.8	16.9
8	#17235.00	53.8 AV	54.0	-0.2	1.43 H	158	36.9	16.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5616.10	63.4 PK	68.2	-4.8	1.83 V	176	59.2	4.2
2	*5745.00	125.8 PK			1.83 V	176	121.2	4.6
3	*5745.00	116.2 AV			1.83 V	176	111.6	4.6
4	#5933.00	61.6 PK	68.2	-6.6	1.83 V	176	56.9	4.7
5	11490.00	46.8 PK	74.0	-27.2	1.58 V	123	32.7	14.1
6	11490.00	36.1 AV	54.0	-17.9	1.58 V	123	22.0	14.1
7	#17235.00	60.7 PK	74.0	-13.3	3.73 V	116	43.8	16.9
8	#17235.00	50.9 AV	54.0	-3.1	3.73 V	116	34.0	16.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5636.44	61.4 PK	68.2	-6.8	2.96 H	83	57.3	4.1
2	*5785.00	117.2 PK			2.96 H	83	112.6	4.6
3	*5785.00	107.6 AV			2.96 H	83	103.0	4.6
4	#5963.74	61.4 PK	68.2	-6.8	2.96 H	83	56.7	4.7
5	11570.00	46.8 PK	74.0	-27.2	1.01 H	95	32.7	14.1
6	11570.00	36.2 AV	54.0	-17.8	1.01 H	95	22.1	14.1
7	#17355.00	64.2 PK	74.0	-9.8	1.55 H	146	46.4	17.8
8	#17355.00	53.8 AV	54.0	-0.2	1.55 H	146	36.0	17.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5571.72	63.0 PK	68.2	-5.2	1.67 V	175	58.9	4.1
2	*5785.00	123.2 PK			1.67 V	175	118.6	4.6
3	*5785.00	114.3 AV			1.67 V	175	109.7	4.6
4	#5941.10	62.6 PK	68.2	-5.6	1.67 V	175	57.9	4.7
5	11570.00	47.0 PK	74.0	-27.0	1.48 V	126	32.9	14.1
6	11570.00	36.1 AV	54.0	-17.9	1.48 V	126	22.0	14.1
7	#17355.00	60.5 PK	74.0	-13.5	3.80 V	118	42.7	17.8
8	#17355.00	50.9 AV	54.0	-3.1	3.80 V	118	33.1	17.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5621.15	62.0 PK	68.2	-6.2	2.93 H	90	57.8	4.2
2	*5825.00	118.4 PK			2.93 H	90	113.6	4.8
3	*5825.00	108.3 AV			2.93 H	90	103.5	4.8
4	#5962.26	62.1 PK	68.2	-6.1	2.93 H	90	57.4	4.7
5	11650.00	47.2 PK	74.0	-26.8	1.00 H	101	33.2	14.0
6	11650.00	37.3 AV	54.0	-16.7	1.00 H	101	23.3	14.0
7	#17475.00	65.5 PK	74.0	-8.5	1.54 H	149	46.5	19.0
8	**#17475.00**	**53.9 AV**	**54.0**	**-0.1**	**1.54 H**	**149**	**34.9**	**19.0**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5557.79	62.6 PK	68.2	-5.6	1.47 V	174	58.6	4.0
2	*5825.00	124.7 PK			1.47 V	174	119.9	4.8
3	*5825.00	115.5 AV			1.47 V	174	110.7	4.8
4	#5928.09	62.6 PK	68.2	-5.6	1.47 V	174	57.9	4.7
5	11650.00	46.9 PK	74.0	-27.1	1.57 V	145	32.9	14.0
6	11650.00	36.1 AV	54.0	-17.9	1.57 V	145	22.1	14.0
7	#17475.00	60.1 PK	74.0	-13.9	3.72 V	103	41.1	19.0
8	#17475.00	50.7 AV	54.0	-3.3	3.72 V	103	31.7	19.0

REMARKS:

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

802.11ac (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	63.1 PK	74.0	-10.9	3.36 H	227	58.8	4.3
2	5150.00	46.9 AV	54.0	-7.1	3.36 H	227	42.6	4.3
3	*5190.00	105.5 PK			3.36 H	227	101.4	4.1
4	*5190.00	95.3 AV			3.36 H	227	91.2	4.1
5	5350.00	48.7 PK	74.0	-25.3	3.36 H	227	44.7	4.0
6	5350.00	37.5 AV	54.0	-16.5	3.36 H	227	33.5	4.0
7	#10380.00	48.5 PK	74.0	-25.5	1.57 H	227	35.1	13.4
8	#10380.00	35.8 AV	54.0	-18.2	1.57 H	227	22.4	13.4
9	15570.00	57.1 PK	74.0	-16.9	3.57 H	293	44.1	13.0
10	15570.00	42.8 AV	54.0	-11.2	3.57 H	293	29.8	13.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.4 PK	74.0	-4.6	1.66 V	245	65.1	4.3
2	5150.00	53.7 AV	54.0	-0.3	1.66 V	245	49.4	4.3
3	*5190.00	112.0 PK			1.66 V	245	107.9	4.1
4	*5190.00	100.3 AV			1.66 V	245	96.2	4.1
5	5350.00	50.2 PK	74.0	-23.8	1.66 V	245	46.2	4.0
6	5350.00	39.1 AV	54.0	-14.9	1.66 V	245	35.1	4.0
7	#10380.00	47.5 PK	74.0	-26.5	2.38 V	44	34.1	13.4
8	#10380.00	36.6 AV	54.0	-17.4	2.38 V	44	23.2	13.4
9	15570.00	63.3 PK	74.0	-10.7	2.28 V	218	50.3	13.0
10	15570.00	47.9 AV	54.0	-6.1	2.28 V	218	34.9	13.0

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	111.6 PK			3.38 H	209	107.7	3.9
2	*5230.00	101.3 AV			3.38 H	209	97.4	3.9
3	5350.00	48.9 PK	74.0	-25.1	3.38 H	209	44.9	4.0
4	5350.00	37.6 AV	54.0	-16.4	3.38 H	209	33.6	4.0
5	#10460.00	54.5 PK	74.0	-19.5	1.55 H	213	40.6	13.9
6	#10460.00	41.8 AV	54.0	-12.2	1.55 H	213	27.9	13.9
7	15690.00	63.1 PK	74.0	-10.9	3.60 H	285	49.5	13.6
8	15690.00	48.8 AV	54.0	-5.2	3.60 H	285	35.2	13.6
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	*5230.00	118.1 PK			1.56 V	242	114.2	3.9
2	*5230.00	106.3 AV			1.56 V	242	102.4	3.9
3	5350.00	50.0 PK	74.0	-24.0	1.56 V	242	46.0	4.0
4	5350.00	39.2 AV	54.0	-14.8	1.56 V	242	35.2	4.0
5	#10460.00	53.5 PK	74.0	-20.5	2.33 V	57	39.6	13.9
6	#10460.00	42.6 AV	54.0	-11.4	2.33 V	57	28.7	13.9
7	15690.00	69.3 PK	74.0	-4.7	2.30 V	214	55.7	13.6
8	**15690.00**	**53.9 AV**	**54.0**	**-0.1**	**2.30 V**	**214**	**40.3**	**13.6**

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 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	#5616.50	62.2 PK	68.2	-6.0	1.79 H	86	58.0	4.2
2	*5755.00	111.7 PK			1.79 H	86	107.1	4.6
3	*5755.00	101.8 AV			1.79 H	86	97.2	4.6
4	#5967.88	62.2 PK	68.2	-6.0	1.79 H	86	57.5	4.7
5	11510.00	47.4 PK	74.0	-26.6	1.12 H	120	33.3	14.1
6	11510.00	37.2 AV	54.0	-16.8	1.12 H	120	23.1	14.1
7	#17265.00	65.7 PK	74.0	-8.3	1.79 H	145	48.6	17.1
8	**#17265.00**	**53.9 AV**	**54.0**	**-0.1**	**1.79 H**	**145**	**36.8**	**17.1**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.24	67.9 PK	68.2	-0.3	1.88 V	176	63.8	4.1
2	#5650.63	68.1 PK	68.7	-0.6	1.88 V	176	64.1	4.0
3	*5755.00	119.2 PK			1.88 V	176	114.6	4.6
4	*5755.00	109.3 AV			1.88 V	176	104.7	4.6
5	#5994.83	62.4 PK	68.2	-5.8	1.88 V	176	57.7	4.7
6	11510.00	46.7 PK	74.0	-27.3	1.63 V	140	32.6	14.1
7	11510.00	36.0 AV	54.0	-18.0	1.63 V	140	21.9	14.1
8	#17265.00	60.0 PK	74.0	-14.0	3.73 V	89	42.9	17.1
9	#17265.00	50.6 AV	54.0	-3.4	3.73 V	89	33.5	17.1

REMARKS:

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

CHANNEL	TX Channel 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	#5648.27	62.3 PK	68.2	-5.9	1.67 H	72	58.2	4.1
2	*5795.00	113.4 PK			1.67 H	72	108.7	4.7
3	*5795.00	101.2 AV			1.67 H	72	96.5	4.7
4	#5952.09	61.3 PK	68.2	-6.9	1.67 H	72	56.7	4.6
5	11590.00	46.5 PK	74.0	-27.5	1.18 H	120	32.4	14.1
6	11590.00	36.4 AV	54.0	-17.6	1.18 H	120	22.3	14.1
7	#17385.00	64.3 PK	74.0	-9.7	1.51 H	146	46.3	18.0
8	**#17385.00**	**53.9 AV**	**54.0**	**-0.1**	**1.51 H**	**146**	**35.9**	**18.0**
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	#5591.57	62.9 PK	68.2	-5.3	1.80 V	174	58.7	4.2
2	*5795.00	119.1 PK			1.80 V	174	114.4	4.7
3	*5795.00	109.1 AV			1.80 V	174	104.4	4.7
4	#6005.30	61.7 PK	68.2	-6.5	1.80 V	174	57.0	4.7
5	11590.00	46.9 PK	74.0	-27.1	1.52 V	149	32.8	14.1
6	11590.00	35.8 AV	54.0	-18.2	1.52 V	149	21.7	14.1
7	#17385.00	60.1 PK	74.0	-13.9	3.74 V	88	42.1	18.0
8	#17385.00	50.7 AV	54.0	-3.3	3.74 V	88	32.7	18.0

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.0 PK	74.0	-14.0	3.31 H	223	55.7	4.3
2	5150.00	47.0 AV	54.0	-7.0	3.31 H	223	42.7	4.3
3	*5210.00	102.3 PK			3.31 H	223	98.2	4.1
4	*5210.00	89.8 AV			3.31 H	223	85.7	4.1
5	5350.00	49.2 PK	74.0	-24.8	3.31 H	223	45.2	4.0
6	5350.00	37.8 AV	54.0	-16.2	3.31 H	223	33.8	4.0
7	#10420.00	49.1 PK	74.0	-24.9	1.56 H	243	35.5	13.6
8	#10420.00	36.3 AV	54.0	-17.7	1.56 H	243	22.7	13.6
9	15630.00	57.2 PK	74.0	-16.8	3.57 H	296	43.9	13.3
10	15630.00	42.7 AV	54.0	-11.3	3.57 H	296	29.4	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.3 PK	74.0	-7.7	1.57 V	243	62.0	4.3
2	5150.00	53.8 AV	54.0	-0.2	1.57 V	243	49.5	4.3
3	*5210.00	108.8 PK			1.57 V	243	104.7	4.1
4	*5210.00	94.8 AV			1.57 V	243	90.7	4.1
5	5350.00	52.0 PK	74.0	-22.0	1.57 V	243	48.0	4.0
6	5350.00	40.3 AV	54.0	-13.7	1.57 V	243	36.3	4.0
7	#10420.00	47.8 PK	74.0	-26.2	2.41 V	51	34.2	13.6
8	#10420.00	36.7 AV	54.0	-17.3	2.41 V	51	23.1	13.6
9	15630.00	62.6 PK	74.0	-11.4	2.28 V	231	49.3	13.3
10	15630.00	47.4 AV	54.0	-6.6	2.28 V	231	34.1	13.3

REMARKS:

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

CHANNEL	TX Channel 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	#5625.05	62.0 PK	68.2	-6.2	1.79 H	84	57.8	4.2
2	*5775.00	107.1 PK			1.79 H	84	102.5	4.6
3	*5775.00	99.2 AV			1.79 H	84	94.6	4.6
4	#5989.76	61.7 PK	68.2	-6.5	1.79 H	84	57.0	4.7
5	11550.00	42.4 PK	74.0	-31.6	1.23 H	123	28.3	14.1
6	11550.00	33.6 AV	54.0	-20.4	1.23 H	123	19.5	14.1
7	#17325.00	45.4 PK	74.0	-28.6	3.16 H	69	28.0	17.4
8	#17325.00	36.4 AV	54.0	-17.6	3.16 H	69	19.0	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	#5649.31	67.5 PK	68.2	-0.7	1.79 V	175	63.4	4.1
2	*5775.00	113.4 PK			1.79 V	175	108.8	4.6
3	*5775.00	105.1 AV			1.79 V	175	100.5	4.6
4	#5929.88	65.5 PK	68.2	-2.7	1.79 V	175	60.8	4.7
5	11550.00	42.1 PK	74.0	-31.9	1.51 V	143	28.0	14.1
6	11550.00	33.4 AV	54.0	-20.6	1.51 V	143	19.3	14.1
7	#17325.00	43.9 PK	74.0	-30.1	3.70 V	102	26.5	17.4
8	#17325.00	34.2 AV	54.0	-19.8	3.70 V	102	16.8	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.

Below 1GHz Data:

802.11ac (VHT20)

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	65.89	30.1 QP	40.0	-9.9	1.98 H	241	39.1	-9.0
2	125.01	39.1 QP	43.5	-4.4	1.25 H	178	48.5	-9.4
3	191.99	34.2 QP	43.5	-9.3	1.87 H	108	45.0	-10.8
4	262.80	40.0 QP	46.0	-6.0	1.56 H	225	48.6	-8.6
5	577.08	40.6 QP	46.0	-5.4	1.64 H	225	41.2	-0.6
6	962.17	41.5 QP	54.0	-12.5	1.00 H	84	36.4	5.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	49.40	35.6 QP	40.0	-4.4	1.09 V	138	43.5	-7.9
2	125.05	38.6 QP	43.5	-4.9	1.10 V	214	48.0	-9.4
3	192.01	35.3 QP	43.5	-8.2	1.05 V	143	46.1	-10.8
4	261.83	36.5 QP	46.0	-9.5	1.15 V	241	45.1	-8.6
5	399.57	36.5 QP	46.0	-9.5	1.10 V	243	41.1	-4.6
6	958.29	41.3 QP	46.0	-4.7	1.46 V	251	36.2	5.1

REMARKS:

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

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, 20167	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3. Tested Date: Dec. 22, 2017

4.2.3 Test Procedure

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

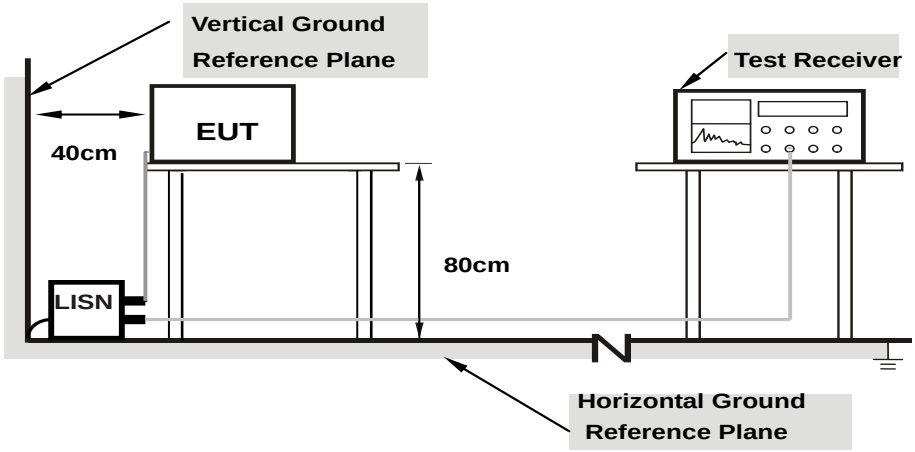
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

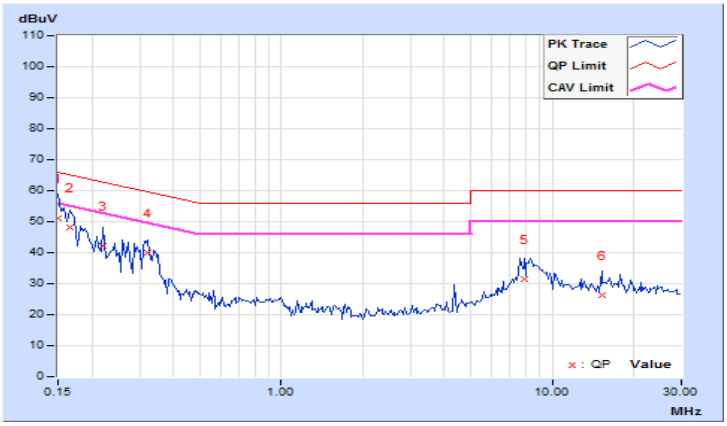
4.2.7 Test Results

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

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**	**10.09**	**40.92**	**27.00**	**51.01**	**37.09**	**66.00**	**56.00**	**-14.99**	**-18.91**
2	0.16562	10.08	38.19	22.58	48.27	32.66	65.18	55.18	-16.91	-22.52
3	0.22031	10.08	32.09	24.06	42.17	34.14	62.81	52.81	-20.64	-18.67
4	0.32188	10.10	29.81	21.75	39.91	31.85	59.66	49.66	-19.75	-17.81
5	7.92578	10.64	20.78	15.82	31.42	26.46	60.00	50.00	-28.58	-23.54
6	15.22266	11.22	15.04	6.59	26.26	17.81	60.00	50.00	-33.74	-32.19

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.

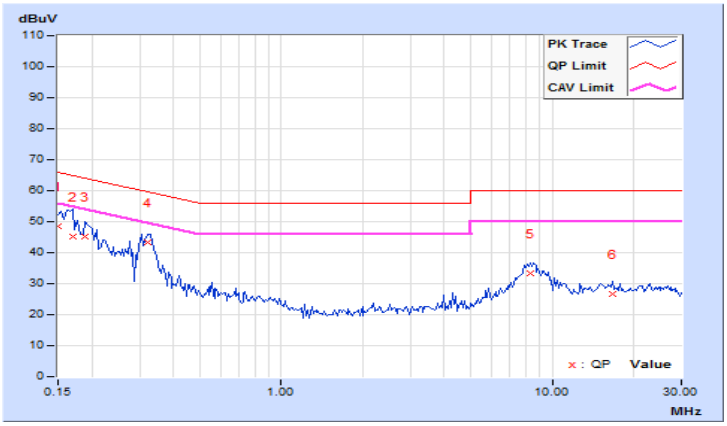


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	10.08	38.28	26.92	48.36	37.00	66.00	56.00	-17.64	-19.00
2	0.16953	10.06	35.28	23.15	45.34	33.21	64.98	54.98	-19.64	-21.77
3	0.18906	10.05	35.27	23.01	45.32	33.06	64.08	54.08	-18.76	-21.02
4	0.32188	10.09	33.22	21.52	43.31	31.61	59.66	49.66	-16.35	-18.05
5	8.32813	10.58	22.69	17.05	33.27	27.63	60.00	50.00	-26.73	-22.37
6	16.75391	11.11	15.49	9.45	26.60	20.56	60.00	50.00	-33.40	-29.44

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

For U-NII-1:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.04	19.87	197.976	22.97	30.00	Pass
40	5200	23.75	23.44	457.937	26.61	30.00	Pass
48	5240	21.41	21.27	272.325	24.35	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.01	19.95	199.086	22.99	30.00	Pass
40	5200	23.61	23.35	445.887	26.49	30.00	Pass
48	5240	21.86	21.65	299.68	24.77	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	15.66	15.12	69.322	18.41	30.00	Pass
46	5230	23.21	22.69	395.191	25.97	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	15.54	15.10	68.169	18.34	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.01	19.95	199.086	22.99	27.64	Pass
40	5200	23.61	23.35	445.887	26.49	27.64	Pass
48	5240	21.86	21.65	299.68	24.77	27.64	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.36dBi > 6dBi , so the power limit shall be reduced to 30-(8.36-6) = 27.64dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	15.66	15.12	69.322	18.41	27.64	Pass
46	5230	23.21	22.69	395.191	25.97	27.64	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.36dBi > 6dBi , so the power limit shall be reduced to 30-(8.36-6) = 27.64dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	15.54	15.10	68.169	18.34	27.64	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.36dBi > 6dBi , so the power limit shall be reduced to 30-(8.36-6) = 27.64dBm.

For U-NII-3:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	22.61	22.97	23.34	24.01	848.085	29.28	30.00	Pass
157	5785	22.51	22.85	22.86	23.77	802.419	29.04	30.00	Pass
165	5825	22.58	23.69	22.97	23.82	854.162	29.32	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	22.84	23.82	22.93	23.91	875.673	29.42	30.00	Pass
157	5785	22.47	23.65	22.68	23.66	825.97	29.17	30.00	Pass
165	5825	22.51	23.71	22.79	23.84	845.412	29.27	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	21.57	22.63	21.77	22.79	667.202	28.24	30.00	Pass
159	5795	21.46	22.51	21.61	22.45	638.866	28.05	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	20.31	21.03	20.55	21.27	481.633	26.83	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	18.33	19.41	18.51	19.79	321.612	25.07	25.27	Pass
157	5785	18.25	19.34	18.46	19.63	314.714	24.98	25.27	Pass
165	5825	18.27	19.38	18.47	19.73	318.118	25.03	25.27	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.73dBi > 6dBi , so the power limit shall be reduced to 30-(10.73-6) = 25.27dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	18.61	19.54	18.87	19.84	336.034	25.26	25.27	Pass
159	5795	18.36	19.48	18.74	19.57	322.655	25.09	25.27	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.73dBi > 6dBi , so the power limit shall be reduced to 30-(10.73-6) = 25.27dBm.

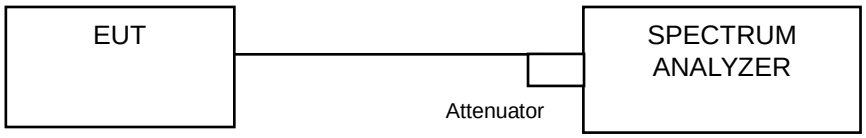
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	18.72	19.38	18.89	19.73	332.587	25.22	25.27	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.73dBi > 6dBi , so the power limit shall be reduced to 30-(10.73-6) = 25.27dBm.

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

For U-NII-1:

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.56	16.56
40	5200	28.68	16.92
48	5240	16.68	17.28

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.76	17.76
40	5200	29.16	18.12
48	5240	17.88	18.60

802.11ac (VHT40)

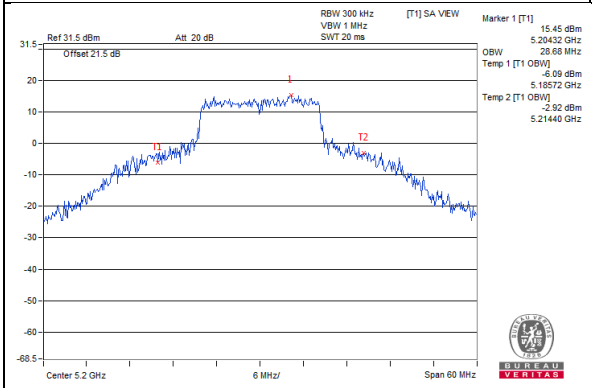
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.48	36.24
46	5230	36.72	37.92

802.11ac (VHT80)

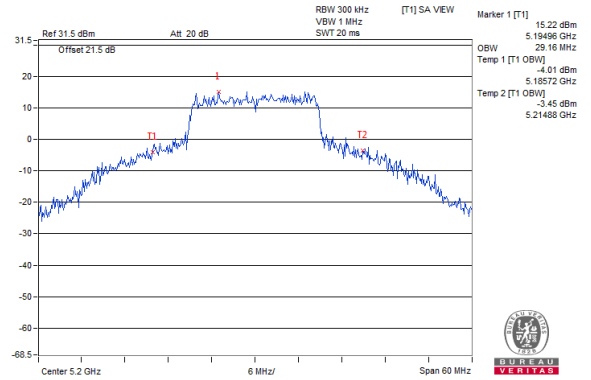
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.84

Spectrum Plot of Worst Value

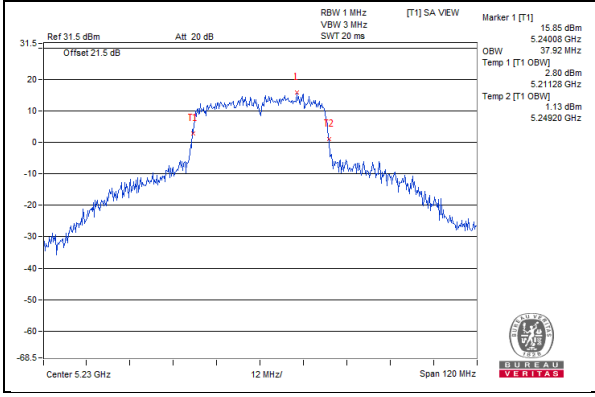
802.11a_Chain0 / CH40



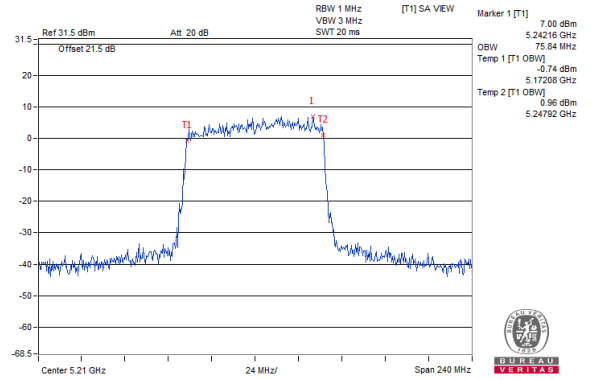
802.11ac (VHT20)_Chain0 / CH40



802.11ac (VHT40)_Chain1 / CH46



802.11ac (VHT80)_Chain0 / CH42



For U-NII-3:

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	16.56	16.68	16.56	16.92
157	5785	16.56	16.44	16.56	16.92
165	5825	16.56	16.44	16.56	16.68

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	17.88	17.76	17.76	17.88
157	5785	17.76	17.76	17.76	17.88
165	5825	17.76	17.76	17.64	17.76

802.11ac (VHT40)

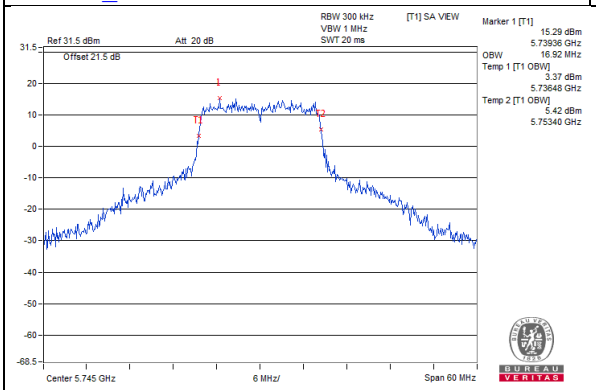
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	36.24	36.00	36.24	36.24
159	5795	36.48	36.24	36.24	36.24

802.11ac (VHT80)

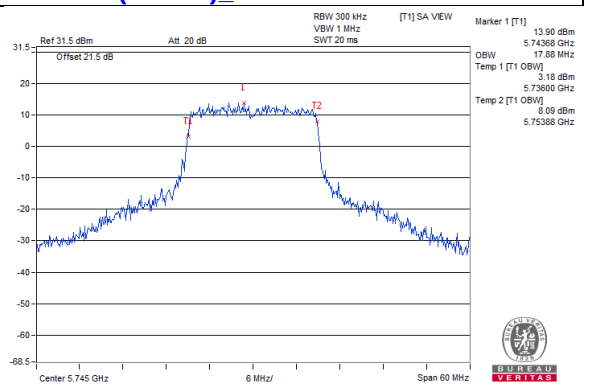
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	75.84	75.84	76.32	76.32

Spectrum Plot of Worst Value

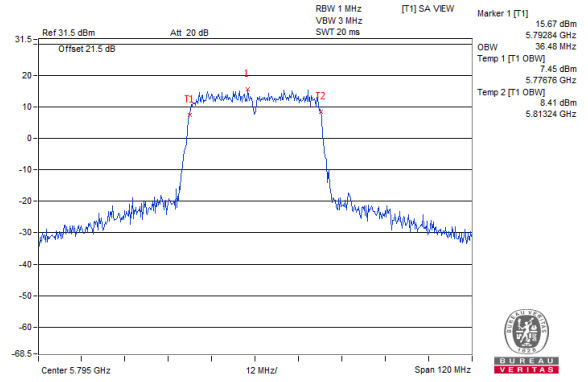
802.11a_Chain3 / CH149



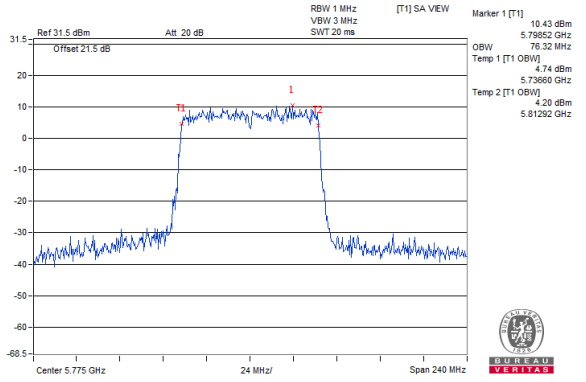
802.11ac (VHT20)_Chain0 / CH149

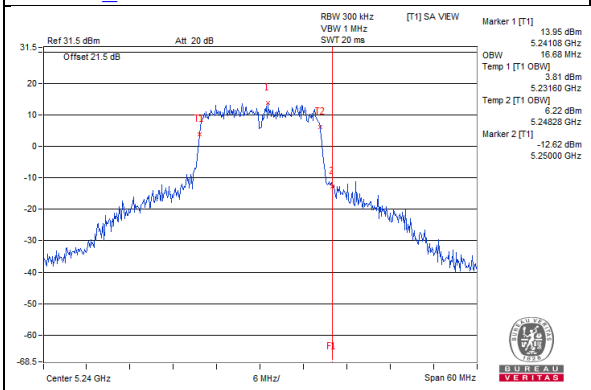
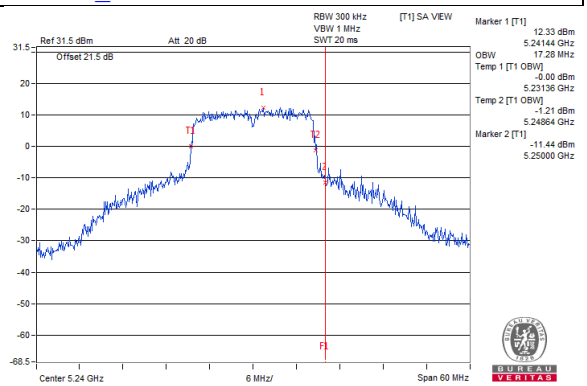
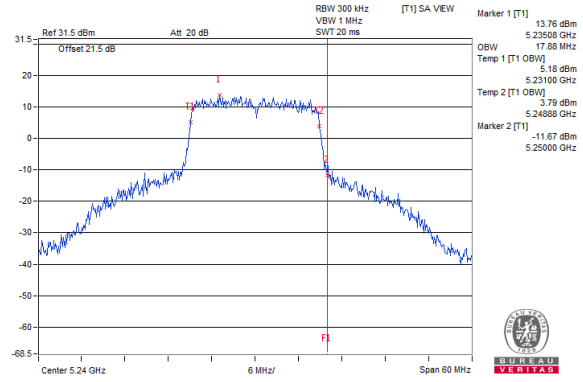
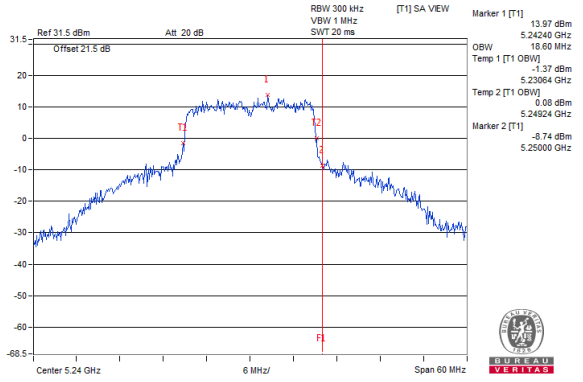


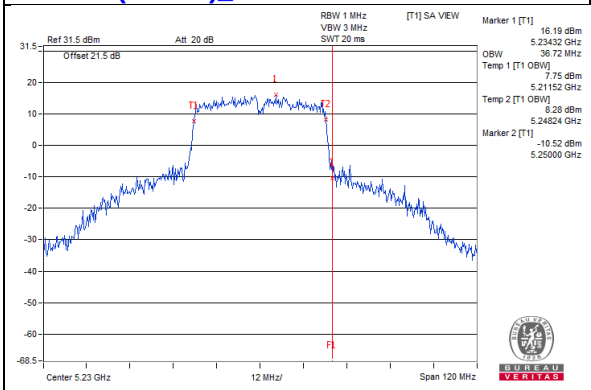
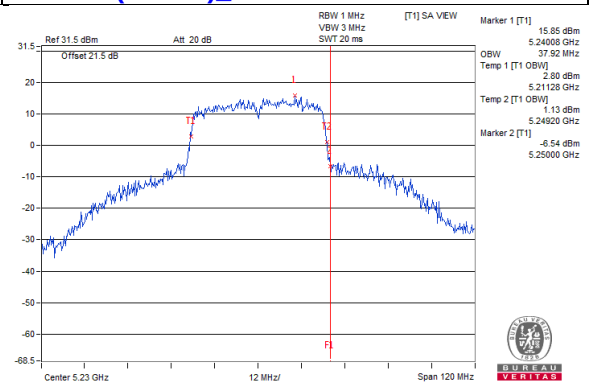
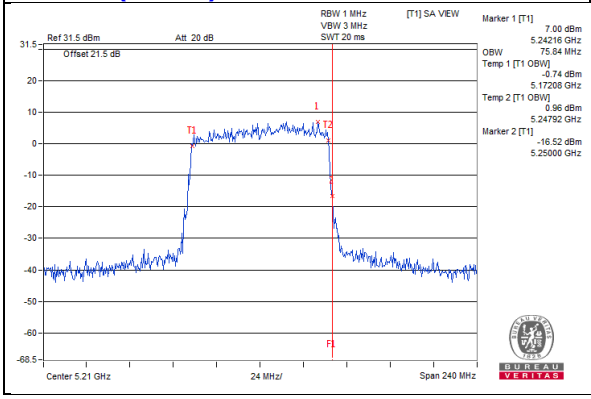
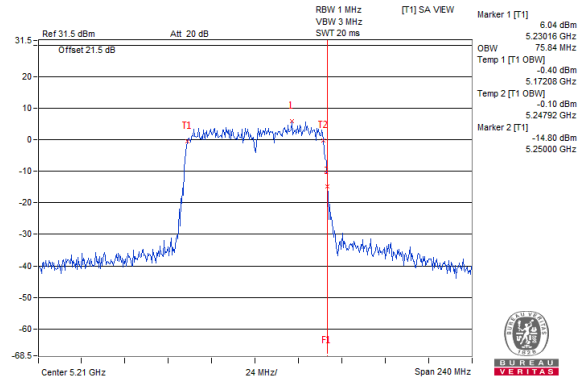
802.11ac (VHT40)_Chain0 / CH159

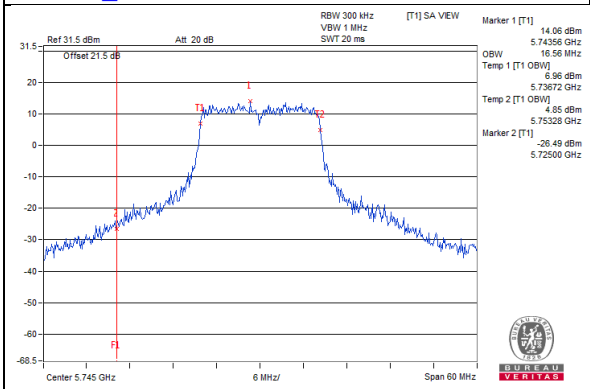
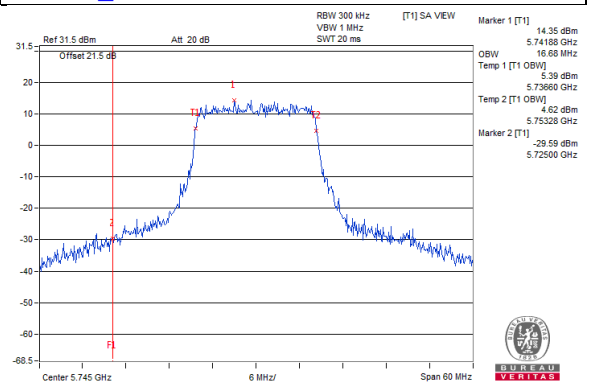
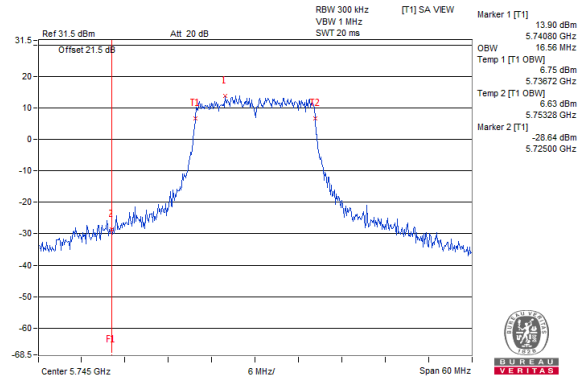
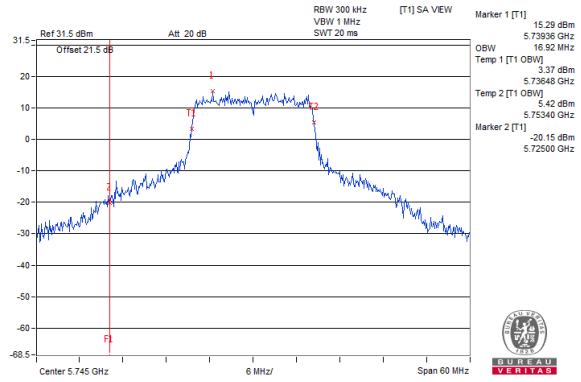


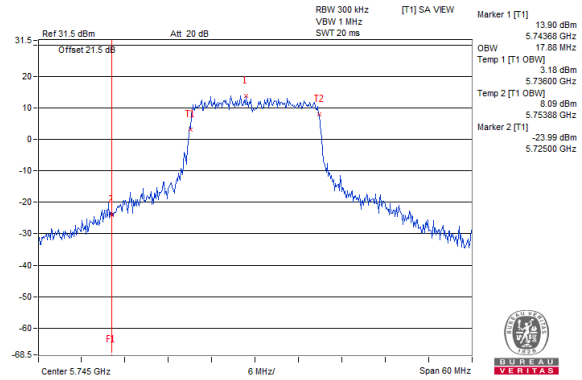
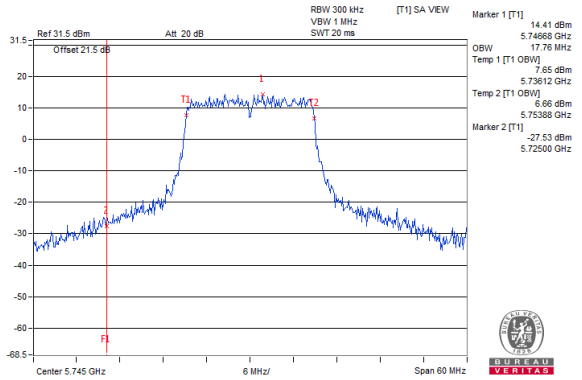
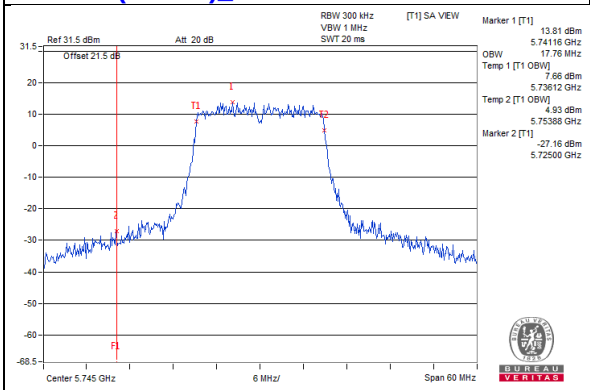
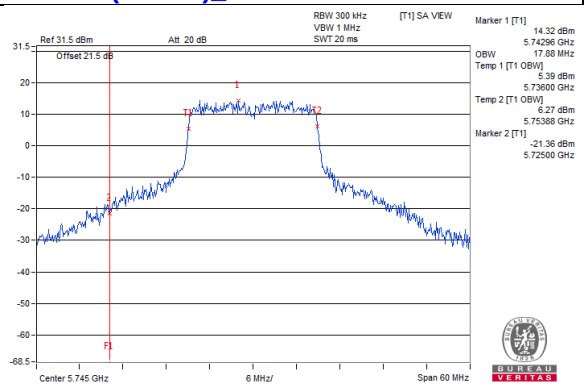
802.11ac (VHT80)_Chain2 / CH155

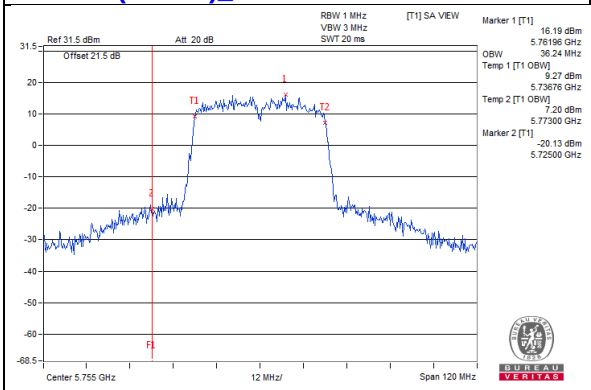
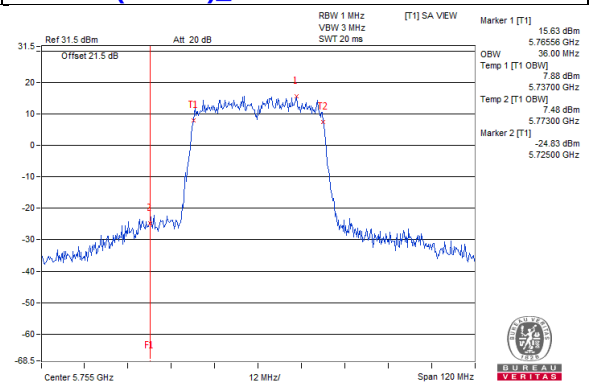
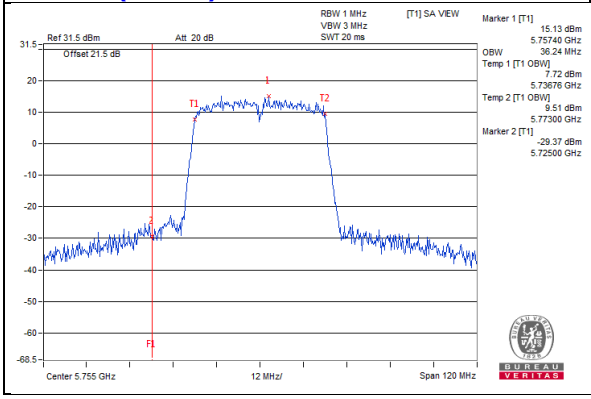
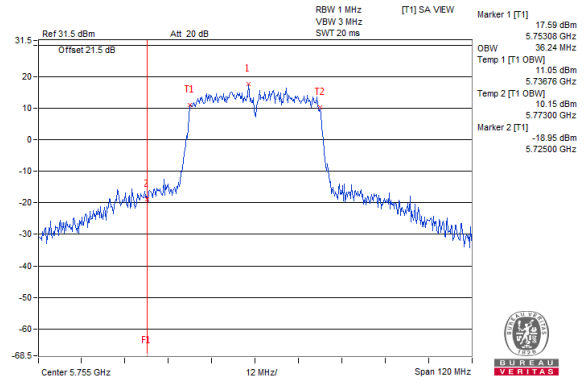


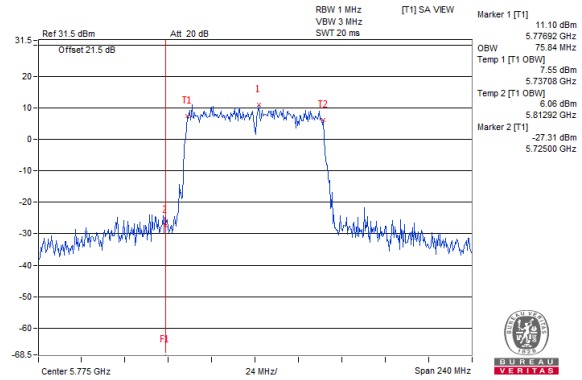
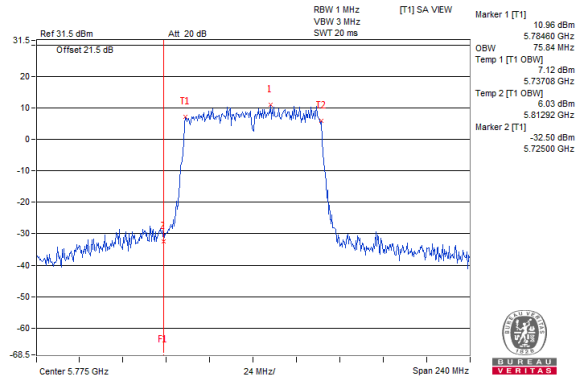
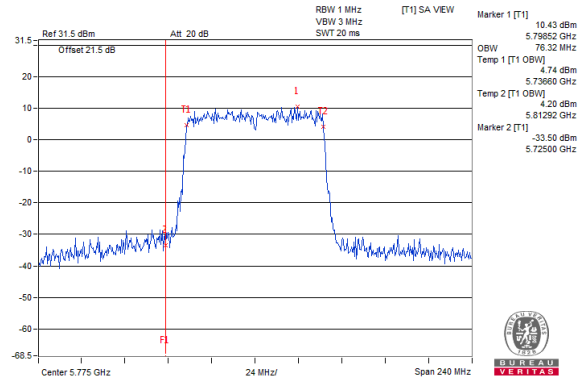
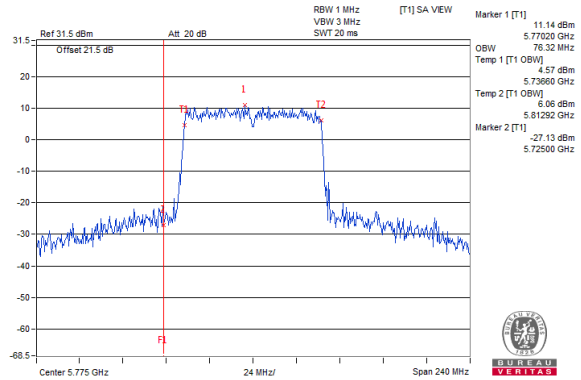
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11a_Chain0 / CH48	802.11a_Chain1 / CH48
	
802.11ac(VHT20)_Chain0 / CH48	802.11ac(VHT20)_Chain1 / CH48
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11ac(VHT40)_Chain0 / CH46	802.11ac(VHT40)_Chain1 / CH46
	
802.11ac(VHT80)_Chain0 / CH42	802.11ac(VHT80)_Chain1 / CH42
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11a_Chain0 / CH149	802.11a_Chain1 / CH149
	
802.11a_Chain2 / CH149	802.11a_Chain3 / CH149
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ac(VHT20)_Chain0 / CH149	802.11ac(VHT20)_Chain1 / CH149
	
802.11ac(VHT20)_Chain2 / CH149	802.11ac(VHT20)_Chain3 / CH149
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ac(VHT40)_Chain0 / CH151	802.11ac(VHT40)_Chain1 / CH151
	
802.11ac(VHT40)_Chain2 / CH151	802.11ac(VHT40)_Chain3 / CH151
	

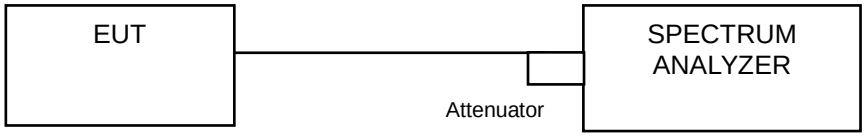
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ac(VHT80)_Chain0 / CH155	802.11ac(VHT80)_Chain1 / CH155
	
802.11ac(VHT80)_Chain2 / CH155	802.11ac(VHT80)_Chain3 / CH155
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

802.11ac (VHT20)

For U-NII-1:

Using method SA-1

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

For U-NII-3:

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

802.11a, 802.11ac (VHT40), 802.11ac (VHT80)

For U-NII-1:

Using method SA-2

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

For U-NII-3:

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	7.21	6.18	0.15	9.87	14.64	Pass
40	5200	11.29	9.45	0.15	13.61	14.64	Pass
48	5240	8.63	8.46	0.15	11.69	14.64	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.36dBi > 6dBi , so the power density limit shall be reduced to 17-(8.36-6) = 14.64dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

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	7.09	5.94	9.56	14.64	Pass
40	5200	10.83	9.65	13.29	14.64	Pass
48	5240	9.06	8.47	11.79	14.64	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.36dBi > 6dBi , so the power density limit shall be reduced to 17-(8.36-6) = 14.64dBm.

802.11ac (VHT40)

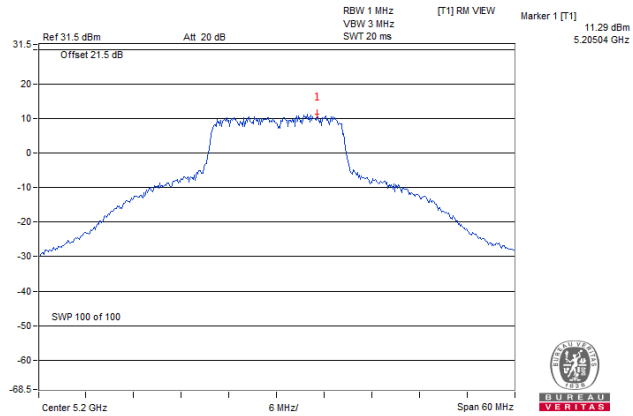
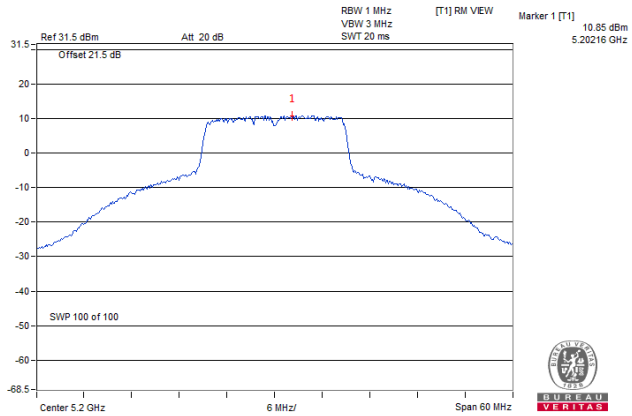
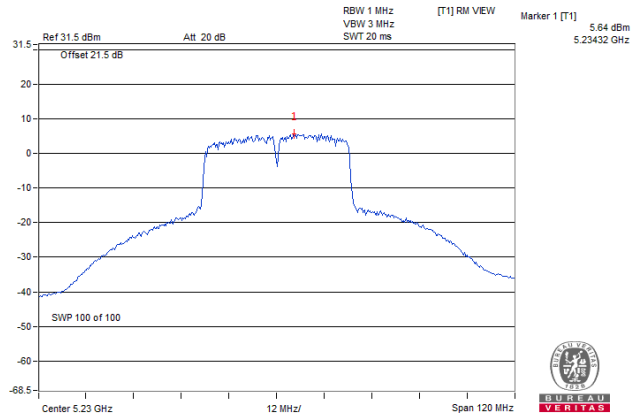
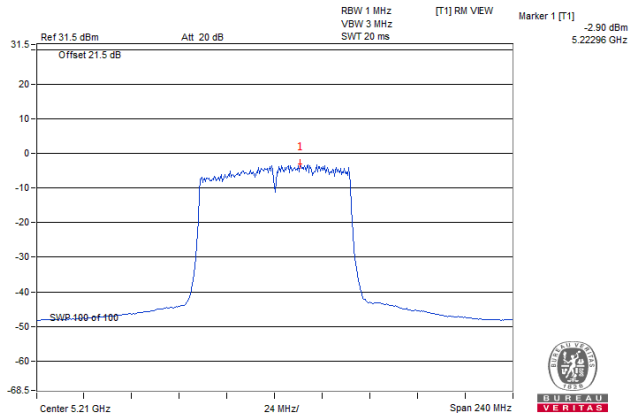
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-0.02	-2.12	0.14	2.22	14.64	Pass
46	5230	5.43	5.64	0.14	8.70	14.64	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.36dBi > 6dBi , so the power density limit shall be reduced to 17-(8.36-6) = 14.64dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-3.46	-4.56	0.22	-0.74	14.64	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.36dBi > 6dBi , so the power density limit shall be reduced to 17-(8.36-6) = 14.64dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH40	**802.11ac (VHT20)_Chain 0 / CH40**
	
802.11ac (VHT40)_Chain 1 / CH46	**802.11ac (VHT80)_Chain 0 / CH42**
	

For U-NII-3:

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	1.12	3.34	6.02	0.14	9.50	25.27	Pass
	157	5785	1.50	3.72	6.02	0.14	9.88	25.27	Pass
	165	5825	1.83	4.05	6.02	0.14	10.21	25.27	Pass
1	149	5745	1.32	3.54	6.02	0.14	9.70	25.27	Pass
	157	5785	0.89	3.11	6.02	0.14	9.27	25.27	Pass
	165	5825	0.77	2.99	6.02	0.14	9.15	25.27	Pass
2	149	5745	1.40	3.62	6.02	0.14	9.78	25.27	Pass
	157	5785	1.27	3.49	6.02	0.14	9.65	25.27	Pass
	165	5825	1.70	3.92	6.02	0.14	10.08	25.27	Pass
3	149	5745	1.86	4.08	6.02	0.14	10.24	25.27	Pass
	157	5785	2.31	4.53	6.02	0.14	10.69	25.27	Pass
	165	5825	2.96	5.18	6.02	0.14	11.34	25.27	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.73dBi > 6dBi , so the power density limit shall be reduced to 30-(10.73-6) = 25.27dBm.

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

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	1.25	3.47	6.02	9.49	25.27	Pass
	157	5785	1.72	3.94	6.02	9.96	25.27	Pass
	165	5825	2.06	4.28	6.02	10.30	25.27	Pass
1	149	5745	1.64	3.86	6.02	9.88	25.27	Pass
	157	5785	1.56	3.78	6.02	9.80	25.27	Pass
	165	5825	0.43	2.65	6.02	8.67	25.27	Pass
2	149	5745	0.75	2.97	6.02	8.99	25.27	Pass
	157	5785	0.86	3.08	6.02	9.10	25.27	Pass
	165	5825	0.76	2.98	6.02	9.00	25.27	Pass
3	149	5745	1.89	4.11	6.02	10.13	25.27	Pass
	157	5785	2.52	4.74	6.02	10.76	25.27	Pass
	165	5825	2.23	4.45	6.02	10.47	25.27	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.73dBi > 6dBi , so the power density limit shall be reduced to 30-(10.73-6) = 25.27dBm.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-3.00	-0.78	6.02	0.15	5.39	25.27	Pass
	159	5795	-2.77	-0.55	6.02	0.15	5.62	25.27	Pass
1	151	5755	-2.88	-0.66	6.02	0.15	5.51	25.27	Pass
	159	5795	-2.94	-0.72	6.02	0.15	5.45	25.27	Pass
2	151	5755	-3.75	-1.53	6.02	0.15	4.64	25.27	Pass
	159	5795	-3.39	-1.17	6.02	0.15	5.00	25.27	Pass
3	151	5755	-2.41	-0.19	6.02	0.15	5.98	25.27	Pass
	159	5795	-2.60	-0.38	6.02	0.15	5.79	25.27	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.73dBi > 6dBi , so the power density limit shall be reduced to 30-(10.73-6) = 25.27dBm.

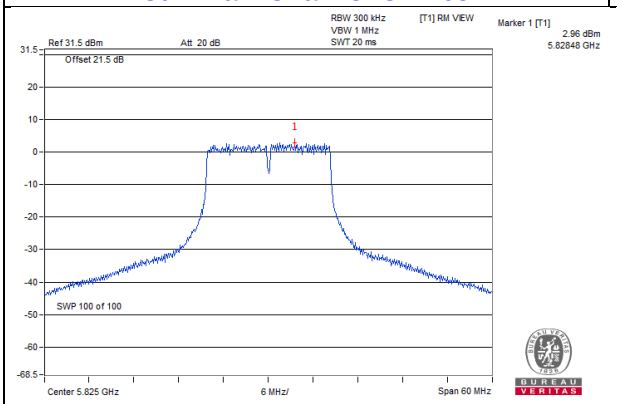
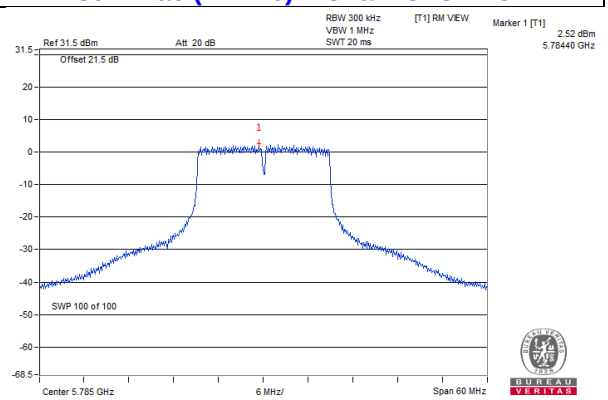
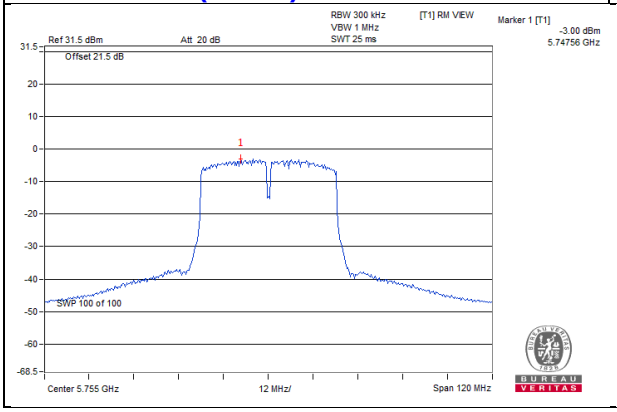
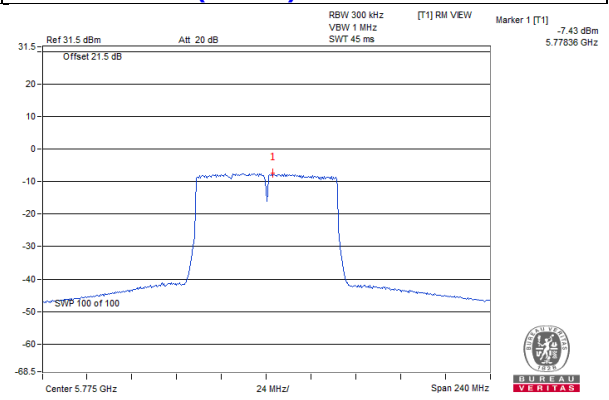
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-7.75	-5.53	6.02	0.23	0.72	25.27	Pass
1	155	5775	-7.60	-5.38	6.02	0.23	0.87	25.27	Pass
2	155	5775	-8.37	-6.15	6.02	0.23	0.10	25.27	Pass
3	155	5775	-7.43	-5.21	6.02	0.23	1.04	25.27	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.73dBi > 6dBi , so the power density limit shall be reduced to 30-(10.73-6) = 25.27dBm.

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

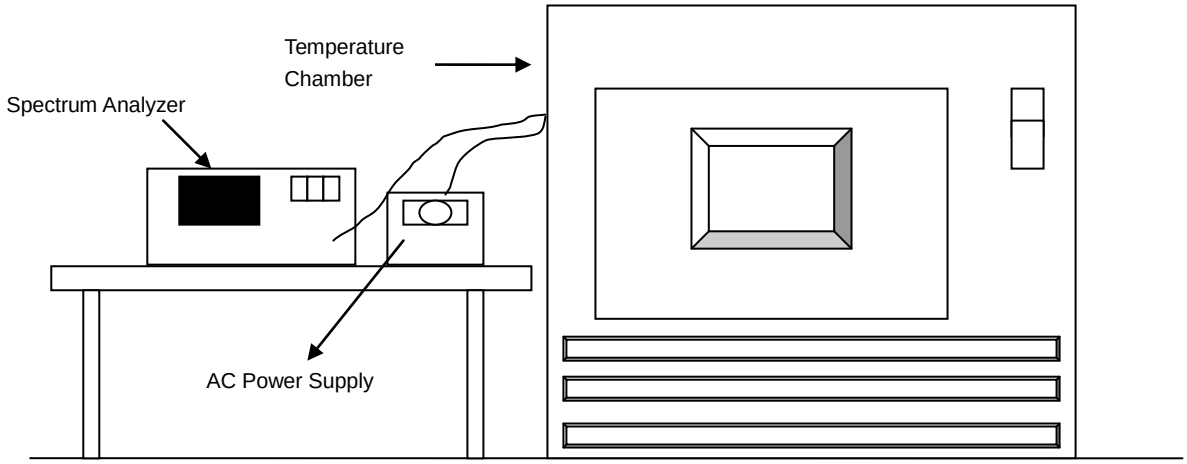
Spectrum Plot of Worst Value	
802.11a – Chain 3: CH 165	**802.11ac (VHT20) – Chain 3: CH 157**
	
802.11ac (VHT40) – Chain 3: CH 151	**802.11ac (VHT80) – Chain 3: CH 155**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 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	5179.9871	PASS	5179.9872	PASS	5179.9836	PASS	5179.9873	PASS
40	120	5180.0139	PASS	5180.0149	PASS	5180.016	PASS	5180.0157	PASS
30	120	5179.9937	PASS	5179.9971	PASS	5179.9959	PASS	5179.9937	PASS
20	120	5179.9892	PASS	5179.9889	PASS	5179.9896	PASS	5179.9905	PASS
10	120	5180.017	PASS	5180.014	PASS	5180.0173	PASS	5180.0176	PASS
0	120	5180.013	PASS	5180.011	PASS	5180.0129	PASS	5180.0142	PASS
-10	120	5179.9868	PASS	5179.9854	PASS	5179.9856	PASS	5179.988	PASS
-20	120	5180.0176	PASS	5180.0201	PASS	5180.021	PASS	5180.0213	PASS
-30	120	5180.005	PASS	5180.0081	PASS	5180.0033	PASS	5180.0077	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	5179.9883	PASS	5179.9882	PASS	5179.9905	PASS	5179.9898	PASS
	120	5179.9892	PASS	5179.9889	PASS	5179.9896	PASS	5179.9905	PASS
	102	5179.9894	PASS	5179.9891	PASS	5179.9906	PASS	5179.9902	PASS

Frequency Stability Versus Temp.									
Operating Frequency: 5745 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	5745.0134	PASS	5745.0133	PASS	5745.0131	PASS	5745.0132	PASS
40	120	5745.0103	PASS	5745.0097	PASS	5745.0121	PASS	5745.0083	PASS
30	120	5744.9989	PASS	5745.0044	PASS	5745.0042	PASS	5745.0031	PASS
20	120	5745.0101	PASS	5745.0087	PASS	5745.0115	PASS	5745.0096	PASS
10	120	5744.9986	PASS	5744.9966	PASS	5744.9936	PASS	5744.993	PASS
0	120	5744.991	PASS	5744.9894	PASS	5744.9913	PASS	5744.9937	PASS
-10	120	5745.0038	PASS	5745.005	PASS	5745.003	PASS	5745.0056	PASS
-20	120	5744.997	PASS	5745.0005	PASS	5744.9983	PASS	5744.9998	PASS
-30	120	5744.9869	PASS	5744.9899	PASS	5744.9892	PASS	5744.9877	PASS

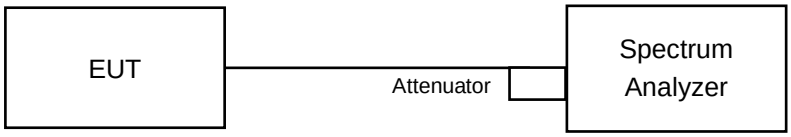
Frequency Stability Versus Voltage									
Operating Frequency: 5745 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5745.0106	PASS	5745.0078	PASS	5745.0126	PASS	5745.0107	PASS
	120	5745.0101	PASS	5745.0087	PASS	5745.0115	PASS	5745.0096	PASS
	102	5745.0111	PASS	5745.0076	PASS	5745.0125	PASS	5745.0105	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

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

802.11ac (VHT20)

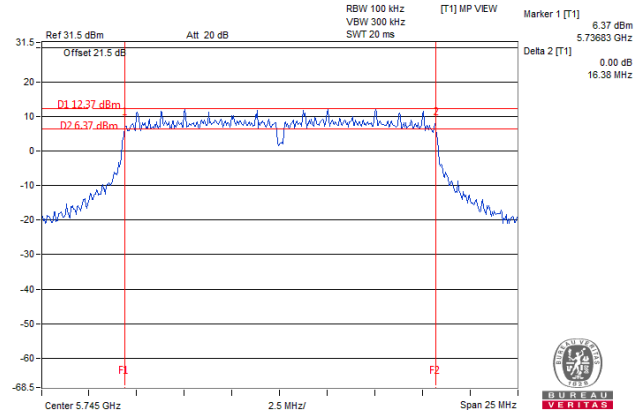
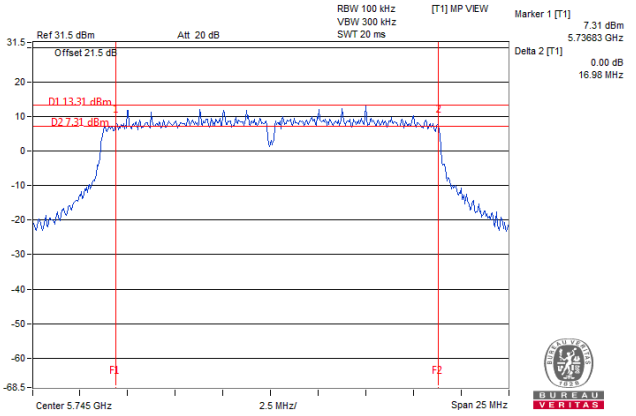
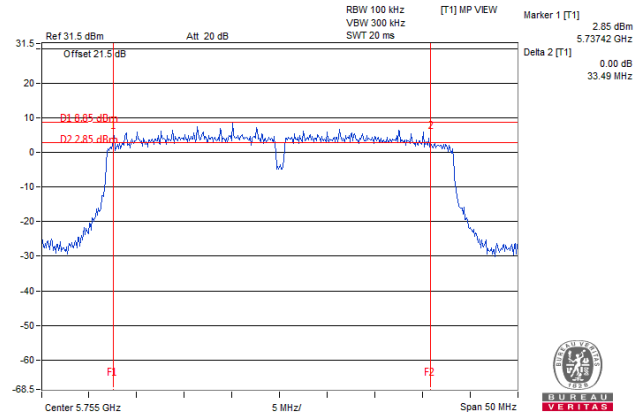
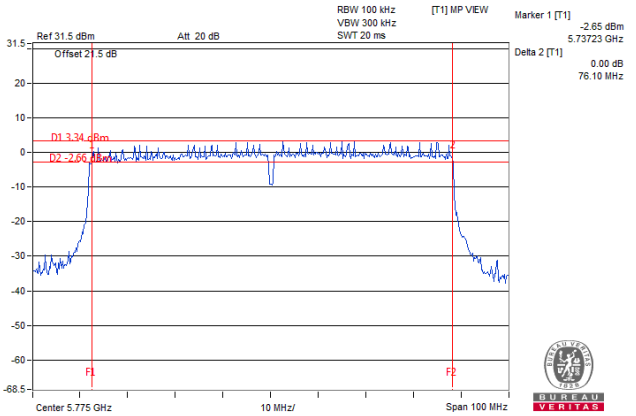
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.58	16.98	17.59	17.63	0.5	PASS
157	5785	17.63	17.62	17.61	17.58	0.5	PASS
165	5825	17.62	17.63	17.61	17.61	0.5	PASS

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	33.49	35.17	35.21	35.48	0.5	PASS
159	5795	35.34	35.21	35.08	35.09	0.5	PASS

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.30	76.10	76.47	76.46	0.5	PASS

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH149	**802.11ac (VHT20)_Chain 1 / CH149**
	
802.11ac (VHT40)_Chain 0 / CH151	**802.11ac (VHT80)_Chain 1 / CH155**
	

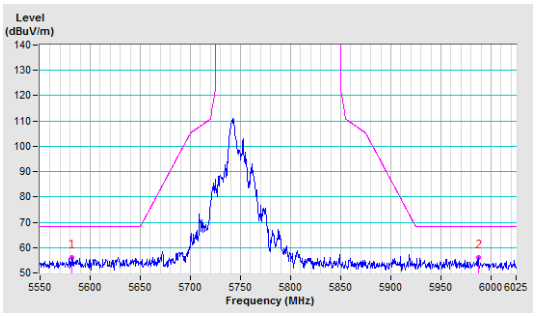
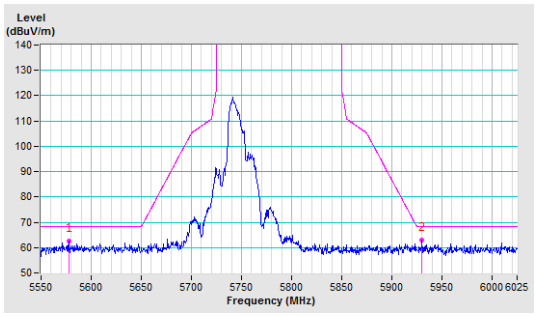
5 Pictures of Test Arrangements

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

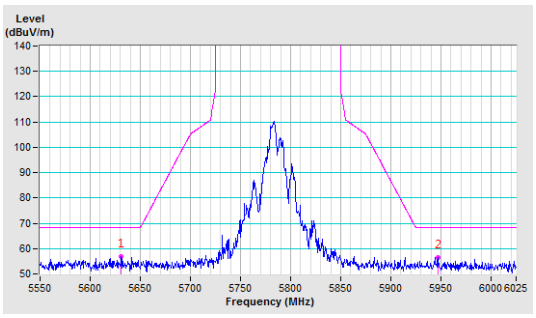
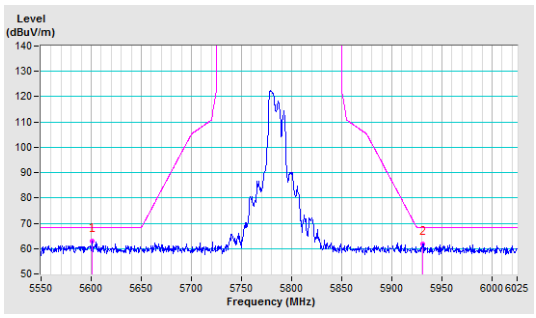
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

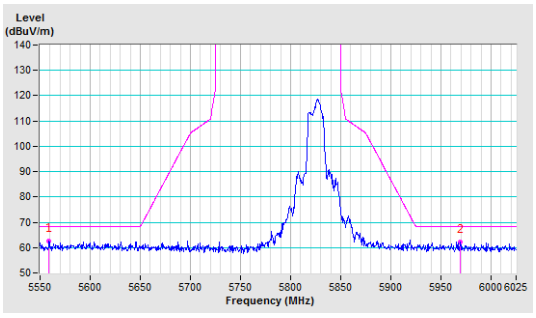
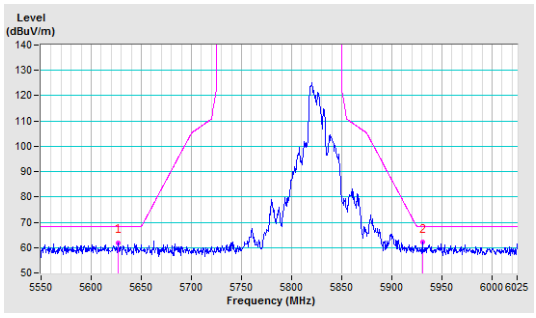
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

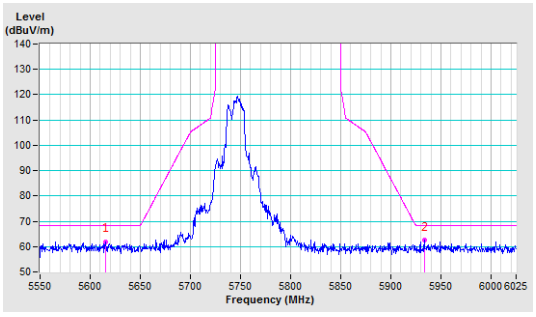
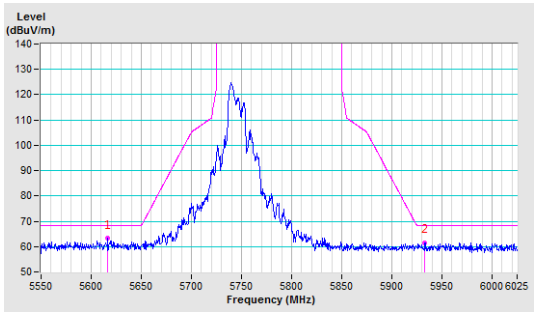
Horizontal	Vertical
	

CH 165 5825 MHz

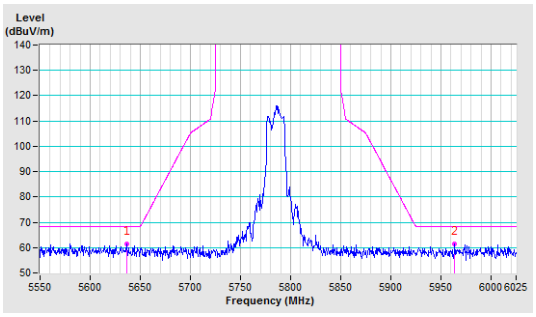
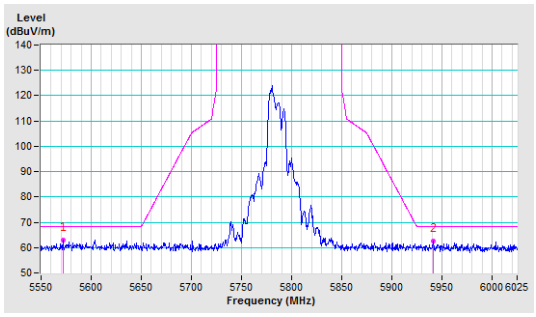
Horizontal	Vertical
	

802.11ac (VHT20)

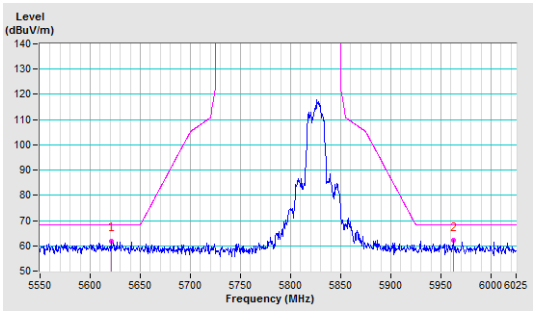
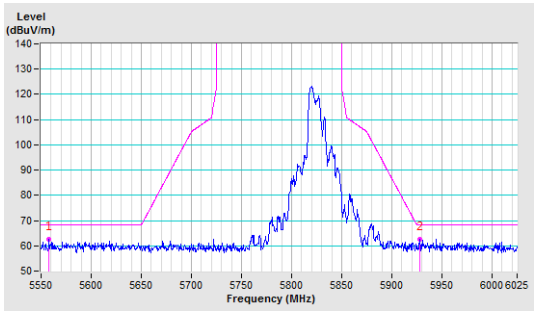
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

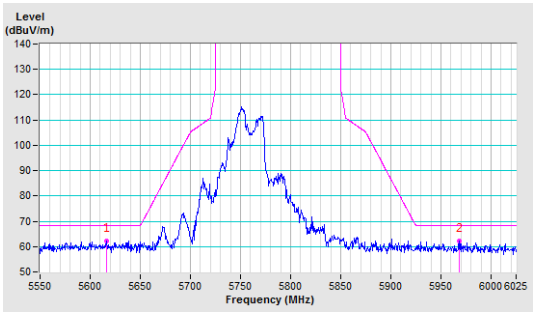
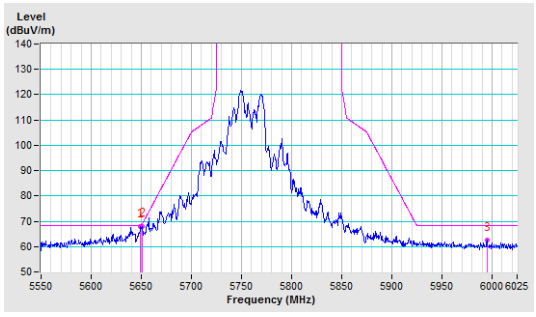
Horizontal	Vertical
	

CH 165 5825 MHz

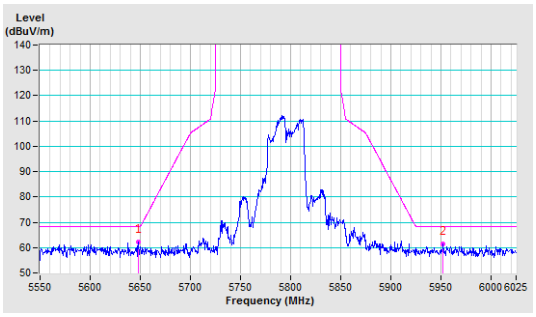
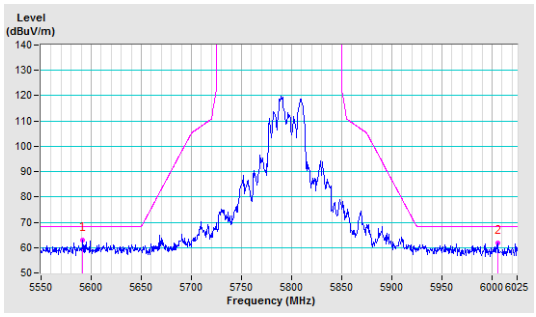
Horizontal	Vertical
	

802.11ac (VHT40)

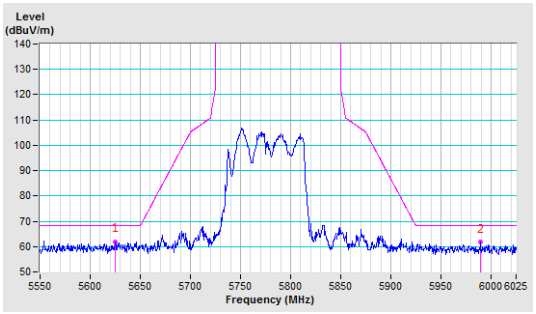
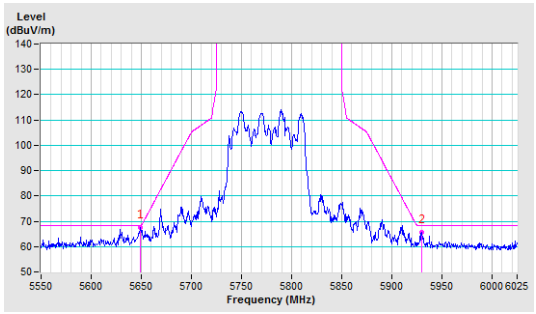
CH 151 5755 MHz

Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz	
Horizontal	**Vertical**
	

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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The address and road map of all our labs can be found in our web site also.

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