Report No.:	RF180731E06-1
FCC ID:	PKRNVWR1000
Test Model:	R1000
Received Date:	July 31, 2018
Test Date:	Aug. 01 to 04, 2018
Issued Date:	Aug. 22, 2018
Applicant:	Novatel Wireless, Inc.
Address:	9605 Scranton Road Suite 300, San Diego, CA 92121 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

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF180731E06-1	Original release.	Aug. 22, 2018

1 Certificate of Conformity

Product:	4G LTE Wireless Router
Brand:	Inseego
Test Model:	R1000
Sample Status:	ENGINEERING SAMPLE
Applicant:	Novatel Wireless, Inc.
Test Date:	Aug. 01 to 04, 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 : Wendy Wu , **Date:** Aug. 22, 2018

Wendy Wu / Specialist

Approved by : , **Date:** Aug. 22, 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 -12.06dB 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 -0.2dB at 5150.00MHz, 11570.00MHz, 11650.00MHz.
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	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	4G LTE Wireless Router
Brand	Inseego
Test Model	R1000
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 54V from power adapter (full function) or DC 4.5V from battery (only LTE work)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 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 1733.3Mbps
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:** 789.866mW **Beamforming Mode:** 686.883mW **5GHz:** **CDD Mode:** **5.18 ~ 5.24GHz:** 519.069mW **5.745 ~ 5.825GHz:** 948.281mW **Beamforming Mode:** **5.18 ~ 5.24GHz:** 519.069mW **5.745 ~ 5.825GHz:** 463.521mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	Adapter Power Cord x 1 (Unshielded, 1.8m), Ethernet Cable x 1 (Unshielded, 1m)

Note:

1. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3	Radio 4
WLAN - 2TX (2.4GHz)	WLAN - 2TX (5GHz Low Band)	WLAN - 4TX (5GHz High Band)	WWAN

2. Simultaneously transmission condition.

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

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

Antenna No.	Model	Antenna Net. Gain(dBi)	Frequency range	Antenna Type	Connecter Type	Cable Length
WiFi_1	C037-511493	2.8	2.4~2.4835GHz	PCB	i-pex(MHF)	100mm
		3.05	5.15~5.35GHz			
WiFi_2	C037-511494	4.41	2.4~2.4835GHz	PCB	i-pex(MHF)	60mm
		4.14	5.15~5.35GHz			
WiFi_DB_1	290-20358	2.79	5.47~5.725GHz	PCB	i-pex(MHF)	160mm
		2.62	5.725~5.85GHz			
WiFi_DB_3	290-20359	4.27	5.47~5.725GHz	PCB	i-pex(MHF)	65mm
		3.7	5.725~5.85GHz			
WiFi_DB_2+ WiFi_DB_4+ GPS	290-20357	3.52	5.47~5.725GHz	PCB	i-pex(MHF)	115mm (DB_2)
		3.45	5.725~5.85GHz			
		2.99	5.47~5.725GHz			105mm (DB_4)
		3	5.725~5.85GHz			
		4.58	1575MHz			230mm (GPS)
LTE	C037-511495	2.9	1850 -1910MHz	PCB	i-pex(MHF)	130mm
		2.98	1710-1755MHz			
		0.25	777-787MHz			

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

Brand	Model No.	Spec.
Leader	UNA3-6540240-I1	Input: 100-240Vac, 2.0A, 50/60Hz Output: 54V, 2.4A

5. Power suppied from batteries condition only support WWAN function.

6. 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 (Low Band)			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
5GHz Band (High band)			
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
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS0~8 Nss=1	4TX	4RX
	MCS0~8 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~8 Nss=4	4TX	4RX
802.11ac (VHT40)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX
802.11ac (VHT80)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	5GHz Low Band
2	√	√	√	√	5GHz High Band

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							
EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
1	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
2	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							
EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
1	802.11ac (VHT40)	5180-5240	38 to 46	46	OFDM	BPSK	13.5
2	802.11a	5745-5825	149 to 165	149	OFDM	BPSK	6

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							
EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
1	802.11ac (VHT40)	5180-5240	38 to 46	46	OFDM	BPSK	13.5
2	802.11a	5745-5825	149 to 165	149	OFDM	BPSK	6

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							
EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
1	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
2	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
Beamforming Mode (output power only)							
EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
1	802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
2	802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

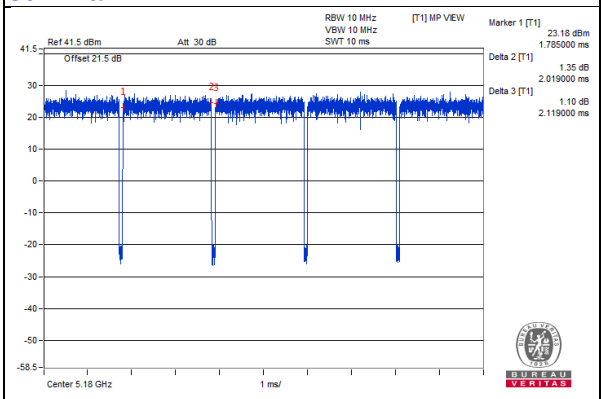
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	22deg. C, 67%RH	120Vac, 60Hz	Steven Chaing
RE<1G	21deg. C, 62%RH	120Vac, 60Hz	Steven Chaing
PLC	25deg. C, 65%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

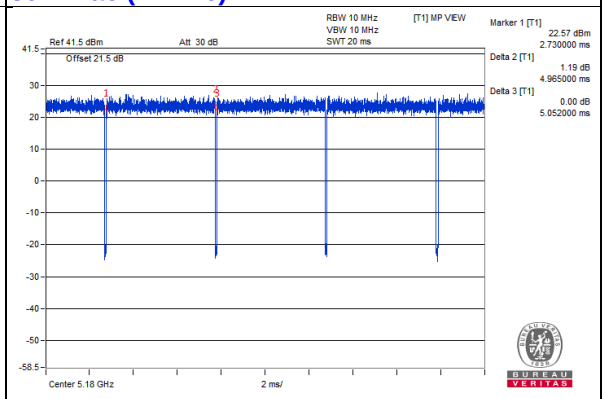
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.019 ms/2.119 ms = 0.953, Duty factor = 10 * log(1/0.953) = 0.21
802.11ac (VHT20): Duty cycle = 4.965 ms/5.052 ms = 0.983
802.11ac (VHT40): Duty cycle = 2.412 ms/2.501 ms = 0.964, Duty factor = 10 * log(1/0.964) = 0.16
802.11ac (VHT80): Duty cycle = 1.136 ms/1.216 ms = 0.934, Duty factor = 10 * log(1/0.934) = 0.30

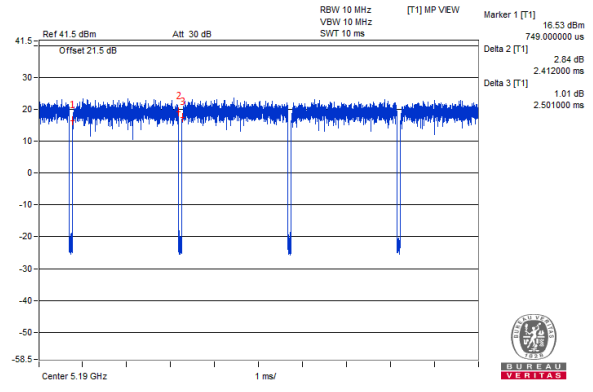
802.11a



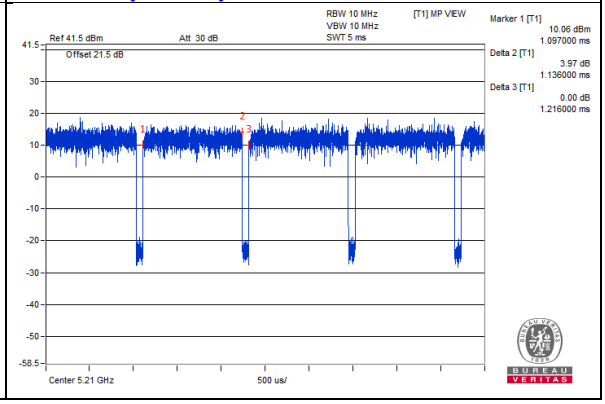
802.11ac (VHT20)



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.

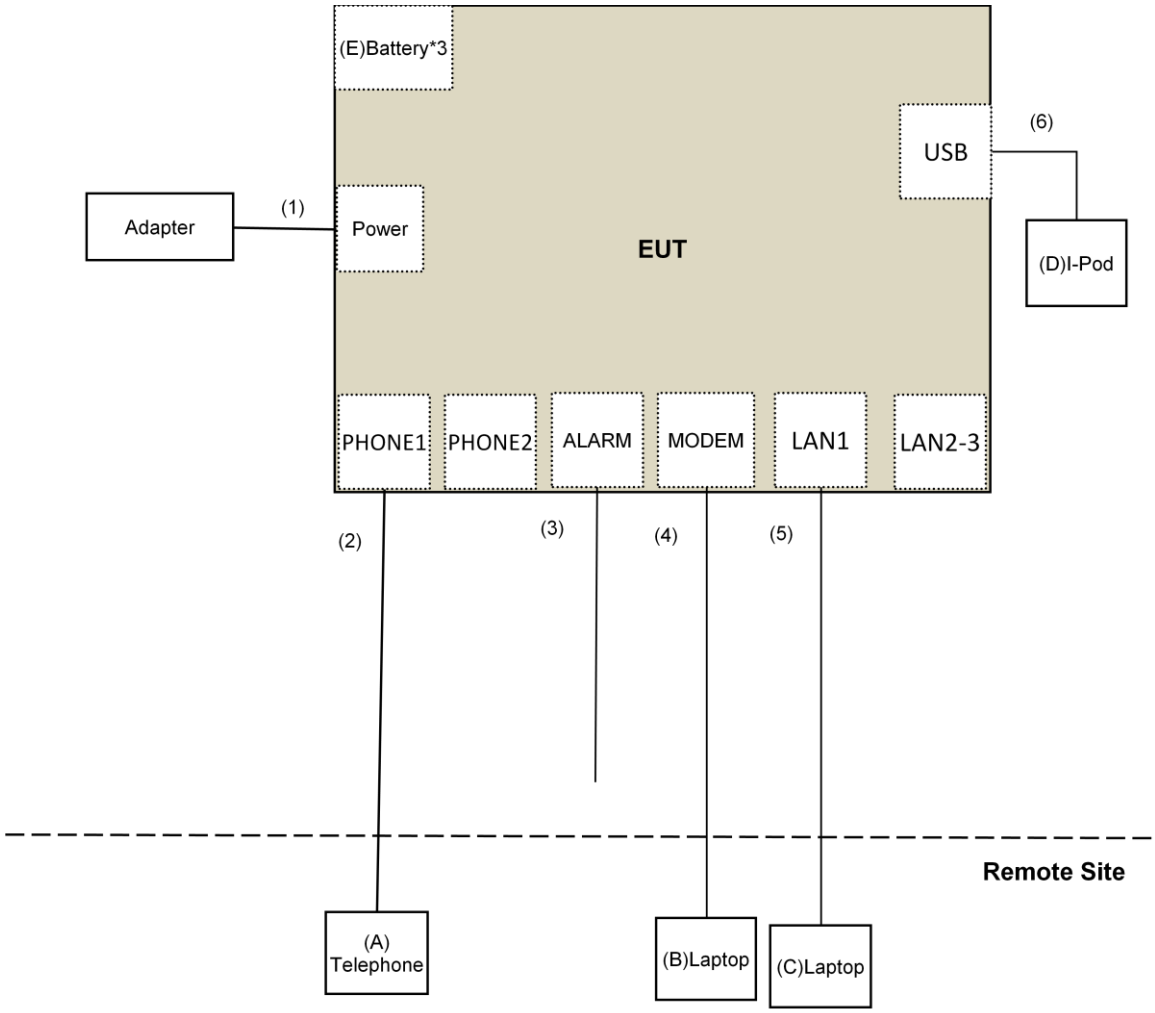
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA 04011	NA	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
D.	iPod	Apple	MD778TA/A	CC4JL03FF4T1	NA	Provided by Lab
E.	Battery	Duracell	AA	NA	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.4	No	0	Supplied by client
2.	RJ-11 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	1	10	No	0	Provided by Lab
5.	RJ-45 Cable	1	10	No	0	Provided by Lab
6.	USB Cable	1	0.1	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
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	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
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 Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 22, 2018	May 21, 2019

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Aug. 01 to 04, 2018

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

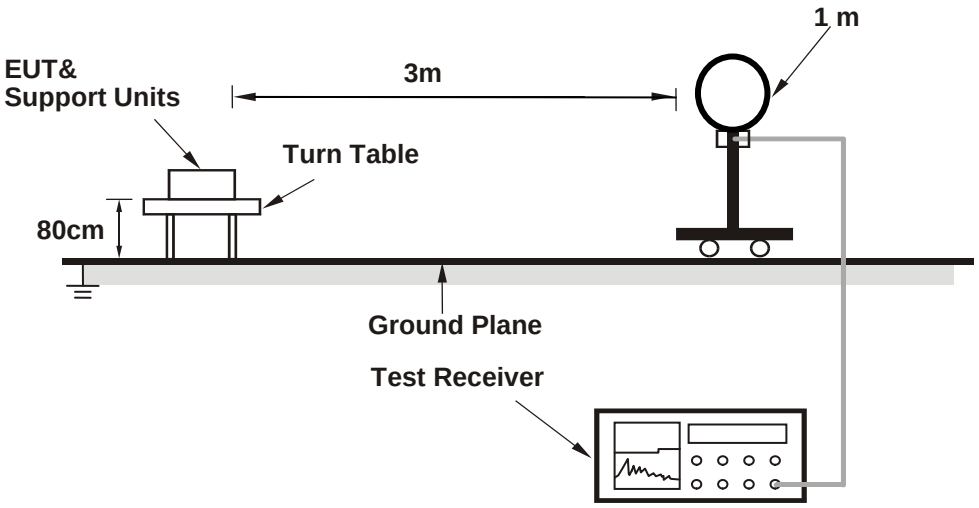
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

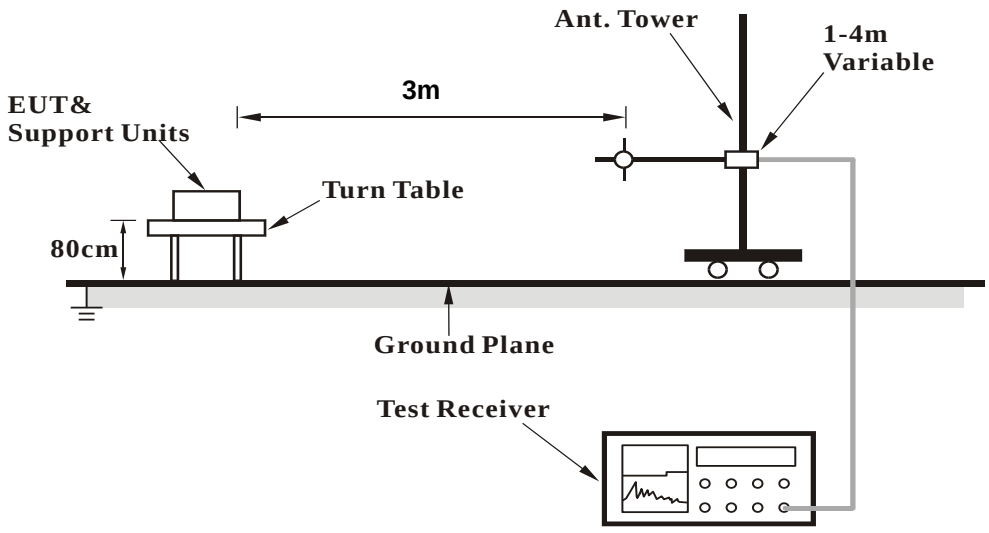
No deviation.

4.1.5 Test Setup

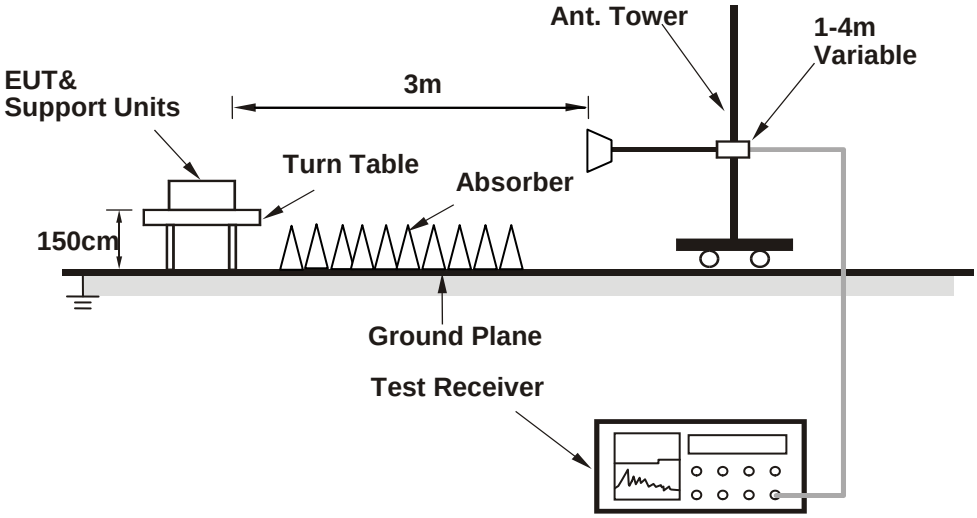
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QDRT 4.8.00055) has been activated to set the EUT on specific status.

4.1.7 Test Results (Mode 1)

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	61.6 PK	74.0	-12.4	1.18 H	349	58.6	3.0
2	5150.00	48.2 AV	54.0	-5.8	1.18 H	349	45.2	3.0
3	*5180.00	111.3 PK			1.18 H	349	108.5	2.8
4	*5180.00	101.3 AV			1.18 H	349	98.5	2.8
5	#10360.00	44.8 PK	68.2	-23.4	2.08 H	210	32.4	12.4
6	15540.00	53.7 PK	74.0	-20.3	1.04 H	139	40.9	12.8
7	15540.00	39.5 AV	54.0	-14.5	1.04 H	139	26.7	12.8
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	5150.00	68.5 PK	74.0	-5.5	1.63 V	175	65.5	3.0
2	**5150.00**	**53.8 AV**	**54.0**	**-0.2**	**1.63 V**	**175**	**50.8**	**3.0**
3	*5180.00	117.2 PK			1.63 V	175	114.4	2.8
4	*5180.00	107.1 AV			1.63 V	175	104.3	2.8
5	#10360.00	45.2 PK	68.2	-23.0	1.61 V	210	32.8	12.4
6	15540.00	53.1 PK	74.0	-20.9	1.56 V	111	40.3	12.8
7	15540.00	38.2 AV	54.0	-15.8	1.56 V	111	25.4	12.8

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	51.8 PK	74.0	-22.2	1.20 H	359	48.8	3.0
2	5150.00	39.1 AV	54.0	-14.9	1.20 H	359	36.1	3.0
3	*5200.00	113.4 PK			1.20 H	359	110.7	2.7
4	*5200.00	103.9 AV			1.20 H	359	101.2	2.7
5	#10400.00	46.1 PK	68.2	-22.1	2.02 H	198	33.6	12.5
6	15600.00	55.9 PK	74.0	-18.1	1.11 H	148	43.1	12.8
7	15600.00	41.9 AV	54.0	-12.1	1.11 H	148	29.1	12.8
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	5150.00	59.7 PK	74.0	-14.3	1.35 V	179	56.7	3.0
2	5150.00	46.2 AV	54.0	-7.8	1.35 V	179	43.2	3.0
3	*5200.00	119.0 PK			1.35 V	179	116.3	2.7
4	*5200.00	109.5 AV			1.35 V	179	106.8	2.7
5	#10400.00	46.5 PK	68.2	-21.7	1.59 V	235	34.0	12.5
6	15600.00	55.4 PK	74.0	-18.6	1.56 V	107	42.6	12.8
7	15600.00	40.6 AV	54.0	-13.4	1.56 V	107	27.8	12.8

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 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	5150.00	49.7 PK	74.0	-24.3	1.14 H	355	46.7	3.0
2	5150.00	36.7 AV	54.0	-17.3	1.14 H	355	33.7	3.0
3	*5240.00	113.8 PK			1.14 H	355	111.3	2.5
4	*5240.00	104.0 AV			1.14 H	355	101.5	2.5
5	5350.00	48.5 PK	74.0	-25.5	1.14 H	355	45.9	2.6
6	5350.00	36.1 AV	54.0	-17.9	1.14 H	355	33.5	2.6
7	#10480.00	45.9 PK	68.2	-22.3	2.08 H	213	32.9	13.0
8	15720.00	55.5 PK	74.0	-18.5	1.05 H	143	43.1	12.4
9	15720.00	41.7 AV	54.0	-12.3	1.05 H	143	29.3	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.3 PK	74.0	-23.7	1.34 V	176	47.3	3.0
2	5150.00	38.8 AV	54.0	-15.2	1.34 V	176	35.8	3.0
3	*5240.00	119.6 PK			1.34 V	176	117.1	2.5
4	*5240.00	109.7 AV			1.34 V	176	107.2	2.5
5	5350.00	48.9 PK	74.0	-25.1	1.34 V	176	46.3	2.6
6	5350.00	36.5 AV	54.0	-17.5	1.34 V	176	33.9	2.6
7	#10480.00	46.8 PK	68.2	-21.4	1.57 V	223	33.8	13.0
8	15720.00	55.1 PK	74.0	-18.9	1.58 V	104	42.7	12.4
9	15720.00	40.4 AV	54.0	-13.6	1.58 V	104	28.0	12.4

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.7 PK	74.0	-12.3	1.14 H	333	58.7	3.0
2	5150.00	48.3 AV	54.0	-5.7	1.14 H	333	45.3	3.0
3	*5180.00	110.5 PK			1.14 H	333	107.7	2.8
4	*5180.00	99.7 AV			1.14 H	333	96.9	2.8
5	#10360.00	45.1 PK	68.2	-23.1	2.05 H	213	32.7	12.4
6	15540.00	54.1 PK	74.0	-19.9	1.01 H	135	41.3	12.8
7	15540.00	39.3 AV	54.0	-14.7	1.01 H	135	26.5	12.8
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	5150.00	67.7 PK	74.0	-6.3	1.50 V	171	64.7	3.0
2	5150.00	53.5 AV	54.0	-0.5	1.50 V	171	50.5	3.0
3	*5180.00	116.3 PK			1.50 V	171	113.5	2.8
4	*5180.00	105.4 AV			1.50 V	171	102.6	2.8
5	#10360.00	44.8 PK	68.2	-23.4	1.60 V	209	32.4	12.4
6	15540.00	53.7 PK	74.0	-20.3	1.60 V	103	40.9	12.8
7	15540.00	38.8 AV	54.0	-15.2	1.60 V	103	26.0	12.8

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	51.7 PK	74.0	-22.3	1.18 H	332	48.7	3.0
2	5150.00	39.0 AV	54.0	-15.0	1.18 H	332	36.0	3.0
3	*5200.00	113.2 PK			1.18 H	332	110.5	2.7
4	*5200.00	102.7 AV			1.18 H	332	100.0	2.7
5	#10400.00	46.3 PK	68.2	-21.9	2.08 H	197	33.8	12.5
6	15600.00	55.3 PK	74.0	-18.7	1.00 H	159	42.5	12.8
7	15600.00	41.6 AV	54.0	-12.4	1.00 H	159	28.8	12.8
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	5150.00	62.1 PK	74.0	-11.9	1.51 V	168	59.1	3.0
2	5150.00	45.9 AV	54.0	-8.1	1.51 V	168	42.9	3.0
3	*5200.00	120.0 PK			1.51 V	168	117.3	2.7
4	*5200.00	108.6 AV			1.51 V	168	105.9	2.7
5	#10400.00	47.2 PK	68.2	-21.0	1.57 V	213	34.7	12.5
6	15600.00	55.1 PK	74.0	-18.9	1.52 V	100	42.3	12.8
7	15600.00	40.5 AV	54.0	-13.5	1.52 V	100	27.7	12.8

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 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	5150.00	49.2 PK	74.0	-24.8	1.17 H	323	46.2	3.0
2	5150.00	37.1 AV	54.0	-16.9	1.17 H	323	34.1	3.0
3	*5240.00	113.5 PK			1.17 H	323	111.0	2.5
4	*5240.00	102.6 AV			1.17 H	323	100.1	2.5
5	5350.00	48.1 PK	74.0	-25.9	1.17 H	323	45.5	2.6
6	5350.00	36.4 AV	54.0	-17.6	1.17 H	323	33.8	2.6
7	#10480.00	45.9 PK	68.2	-22.3	2.13 H	210	32.9	13.0
8	15720.00	55.6 PK	74.0	-18.4	1.01 H	145	43.2	12.4
9	15720.00	42.0 AV	54.0	-12.0	1.01 H	145	29.6	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	51.4 PK	74.0	-22.6	1.89 V	177	48.4	3.0
2	5150.00	39.1 AV	54.0	-14.9	1.89 V	177	36.1	3.0
3	*5240.00	119.6 PK			1.89 V	177	117.1	2.5
4	*5240.00	108.3 AV			1.89 V	177	105.8	2.5
5	5350.00	48.2 PK	74.0	-25.8	1.89 V	177	45.6	2.6
6	5350.00	36.9 AV	54.0	-17.1	1.89 V	177	34.3	2.6
7	#10480.00	46.3 PK	68.2	-21.9	1.61 V	235	33.3	13.0
8	15720.00	55.0 PK	74.0	-19.0	1.58 V	93	42.6	12.4
9	15720.00	40.5 AV	54.0	-13.5	1.58 V	93	28.1	12.4

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.13 H	317	59.1	3.0
2	5150.00	50.2 AV	54.0	-3.8	1.13 H	317	47.2	3.0
3	*5190.00	115.9 PK			1.13 H	317	113.1	2.8
4	*5190.00	107.3 AV			1.13 H	317	104.5	2.8
5	5350.00	48.5 PK	74.0	-25.5	1.13 H	317	45.9	2.6
6	5350.00	34.2 AV	54.0	-19.8	1.13 H	317	31.6	2.6
7	#10380.00	44.5 PK	68.2	-23.7	2.04 H	224	32.1	12.4
8	15570.00	55.9 PK	74.0	-18.1	1.00 H	130	43.1	12.8
9	15570.00	41.5 AV	54.0	-12.5	1.00 H	130	28.7	12.8
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	5150.00	67.1 PK	74.0	-6.9	1.51 V	174	64.1	3.0
2	5150.00	53.6 AV	54.0	-0.4	1.51 V	174	50.6	3.0
3	*5190.00	111.6 PK			1.51 V	174	108.8	2.8
4	*5190.00	102.9 AV			1.51 V	174	100.1	2.8
5	5350.00	49.0 PK	74.0	-25.0	1.51 V	174	46.4	2.6
6	5350.00	36.8 AV	54.0	-17.2	1.51 V	174	34.2	2.6
7	#10380.00	44.8 PK	68.2	-23.4	1.52 V	232	32.4	12.4
8	15570.00	54.1 PK	74.0	-19.9	1.54 V	119	41.3	12.8
9	15570.00	39.2 AV	54.0	-14.8	1.54 V	119	26.4	12.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.8 PK	74.0	-11.2	1.10 H	324	59.8	3.0
2	5150.00	50.9 AV	54.0	-3.1	1.10 H	324	47.9	3.0
3	*5230.00	110.7 PK			1.10 H	324	108.2	2.5
4	*5230.00	101.2 AV			1.10 H	324	98.7	2.5
5	5350.00	49.5 PK	74.0	-24.5	1.10 H	324	46.9	2.6
6	5350.00	36.5 AV	54.0	-17.5	1.10 H	324	33.9	2.6
7	#10460.00	46.1 PK	68.2	-22.1	2.13 H	227	33.2	12.9
8	15690.00	56.9 PK	74.0	-17.1	1.04 H	134	44.5	12.4
9	15690.00	42.3 AV	54.0	-11.7	1.04 H	134	29.9	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.6 PK	74.0	-8.4	1.69 V	166	62.6	3.0
2	5150.00	53.5 AV	54.0	-0.5	1.69 V	166	50.5	3.0
3	*5230.00	116.5 PK			1.69 V	166	114.0	2.5
4	*5230.00	107.0 AV			1.69 V	166	104.5	2.5
5	5350.00	52.3 PK	74.0	-21.7	1.69 V	166	49.7	2.6
6	5350.00	39.7 AV	54.0	-14.3	1.69 V	166	37.1	2.6
7	#10460.00	46.9 PK	68.2	-21.3	1.51 V	228	34.0	12.9
8	15690.00	55.4 PK	74.0	-18.6	1.58 V	116	43.0	12.4
9	15690.00	40.8 AV	54.0	-13.2	1.58 V	116	28.4	12.4

REMARKS:

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

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	62.5 PK	74.0	-11.5	1.10 H	343	59.5	3.0
2	5150.00	50.5 AV	54.0	-3.5	1.10 H	343	47.5	3.0
3	*5210.00	100.7 PK			1.10 H	343	98.0	2.7
4	*5210.00	91.3 AV			1.10 H	343	88.6	2.7
5	5350.00	49.8 PK	74.0	-24.2	1.10 H	343	47.2	2.6
6	5350.00	37.5 AV	54.0	-16.5	1.10 H	343	34.9	2.6
7	#10420.00	43.9 PK	68.2	-24.3	2.03 H	202	31.3	12.6
8	15630.00	52.8 PK	74.0	-21.2	1.04 H	155	40.1	12.7
9	15630.00	40.2 AV	54.0	-13.8	1.04 H	155	27.5	12.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.8 PK	74.0	-8.2	1.80 V	170	62.8	3.0
2	**5150.00**	**53.8 AV**	**54.0**	**-0.2**	**1.80 V**	**170**	**50.8**	**3.0**
3	*5210.00	105.9 PK			1.80 V	170	103.2	2.7
4	*5210.00	96.8 AV			1.80 V	170	94.1	2.7
5	5350.00	52.7 PK	74.0	-21.3	1.80 V	170	50.1	2.6
6	5350.00	41.0 AV	54.0	-13.0	1.80 V	170	38.4	2.6
7	#10420.00	43.5 PK	68.2	-24.7	1.58 V	238	30.9	12.6
8	15630.00	51.7 PK	74.0	-22.3	1.58 V	94	39.0	12.7
9	15630.00	38.9 AV	54.0	-15.1	1.58 V	94	26.2	12.7

REMARKS:

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

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 46	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	124.99	32.0 QP	43.5	-11.5	1.50 H	58	41.4	-9.4
2	250.00	33.7 QP	46.0	-12.3	1.00 H	87	42.6	-8.9
3	315.03	29.7 QP	46.0	-16.3	1.00 H	27	36.1	-6.4
4	757.18	31.9 QP	46.0	-14.1	1.50 H	129	28.5	3.4
5	868.54	32.7 QP	46.0	-13.3	1.50 H	47	28.0	4.7
6	956.40	35.2 QP	46.0	-10.8	1.50 H	360	29.2	6.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	37.78	32.8 QP	40.0	-7.2	1.50 V	228	41.3	-8.5
2	125.01	37.2 QP	43.5	-6.3	1.00 V	360	46.6	-9.4
3	250.02	30.9 QP	46.0	-15.1	1.00 V	13	39.8	-8.9
4	313.73	25.8 QP	46.0	-20.2	1.50 V	34	32.3	-6.5
5	764.92	31.2 QP	46.0	-14.8	2.00 V	156	27.7	3.5
6	916.43	34.5 QP	46.0	-11.5	1.00 V	360	28.5	6.0

REMARKS:

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

4.1.8 Test Results (Mode 2)

Above 1GHz Data:

802.11a

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	#5645.61	60.1 PK	68.2	-8.1	1.30 H	45	56.9	3.2
2	*5745.00	115.4 PK			1.30 H	45	112.1	3.3
3	*5745.00	104.2 AV			1.30 H	45	100.9	3.3
4	#5984.27	58.5 PK	68.2	-9.7	1.30 H	45	54.8	3.7
5	11490.00	58.9 PK	74.0	-15.1	1.47 H	123	45.5	13.4
6	11490.00	45.6 AV	54.0	-8.4	1.47 H	123	32.2	13.4
7	#17235.00	51.6 PK	68.2	-16.6	1.77 H	135	34.9	16.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.38	66.8 PK	68.2	-1.4	1.04 V	50	63.6	3.2
2	*5745.00	124.1 PK			1.04 V	50	120.8	3.3
3	*5745.00	112.1 AV			1.04 V	50	108.8	3.3
4	#5929.95	58.9 PK	68.2	-9.3	1.04 V	50	55.3	3.6
5	11490.00	66.6 PK	74.0	-7.4	1.10 V	130	53.2	13.4
6	11490.00	52.6 AV	54.0	-1.4	1.10 V	130	39.2	13.4
7	#17235.00	52.4 PK	68.2	-15.8	1.05 V	209	35.7	16.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5636.87	59.2 PK	68.2	-9.0	1.33 H	44	56.0	3.2
2	*5785.00	114.3 PK			1.33 H	44	111.0	3.3
3	*5785.00	102.9 AV			1.33 H	44	99.6	3.3
4	#5939.69	58.5 PK	68.2	-9.7	1.33 H	44	54.9	3.6
5	11570.00	59.0 PK	74.0	-15.0	1.49 H	131	45.6	13.4
6	11570.00	45.6 AV	54.0	-8.4	1.49 H	131	32.2	13.4
7	#17355.00	51.9 PK	68.2	-16.3	1.67 H	144	34.6	17.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5642.58	59.2 PK	68.2	-9.0	1.05 V	52	56.0	3.2
2	*5785.00	123.7 PK			1.05 V	52	120.4	3.3
3	*5785.00	111.8 AV			1.05 V	52	108.5	3.3
4	#5941.09	58.6 PK	68.2	-9.6	1.05 V	52	55.1	3.5
5	11570.00	66.9 PK	74.0	-7.1	1.07 V	134	53.5	13.4
6	**11570.00**	**53.8 AV**	**54.0**	**-0.2**	**1.07 V**	**134**	**40.4**	**13.4**
7	#17355.00	52.2 PK	68.2	-16.0	1.07 V	205	34.9	17.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5592.65	58.1 PK	68.2	-10.1	1.35 H	39	54.9	3.2
2	*5825.00	114.1 PK			1.35 H	39	110.6	3.5
3	*5825.00	102.5 AV			1.35 H	39	99.0	3.5
4	#5930.33	58.9 PK	68.2	-9.3	1.35 H	39	55.3	3.6
5	11650.00	58.6 PK	74.0	-15.4	1.44 H	133	45.3	13.3
6	11650.00	45.3 AV	54.0	-8.7	1.44 H	133	32.0	13.3
7	#17475.00	52.5 PK	68.2	-15.7	1.72 H	129	34.3	18.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5626.74	58.3 PK	68.2	-9.9	1.00 V	53	55.0	3.3
2	*5825.00	123.5 PK			1.00 V	53	120.0	3.5
3	*5825.00	111.5 AV			1.00 V	53	108.0	3.5
4	#5932.30	59.8 PK	68.2	-8.4	1.00 V	53	56.2	3.6
5	11650.00	66.4 PK	74.0	-7.6	1.01 V	133	53.1	13.3
6	**11650.00**	**53.8 AV**	**54.0**	**-0.2**	**1.01 V**	**133**	**40.5**	**13.3**
7	#17475.00	51.9 PK	68.2	-16.3	1.02 V	202	33.7	18.2

REMARKS:

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

802.11ac (VHT20)

CHANNEL	TX Channel 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	#5645.61	59.8 PK	68.2	-8.4	1.21 H	48	56.6	3.2
2	*5745.00	115.2 PK			1.21 H	48	111.9	3.3
3	*5745.00	105.9 AV			1.21 H	48	102.6	3.3
4	#5976.45	59.0 PK	68.2	-9.2	1.21 H	48	55.4	3.6
5	11490.00	58.4 PK	74.0	-15.6	1.49 H	132	45.0	13.4
6	11490.00	45.1 AV	54.0	-8.9	1.49 H	132	31.7	13.4
7	#17235.00	52.4 PK	68.2	-15.8	1.69 H	140	35.7	16.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.87	67.3 PK	68.2	-0.9	1.06 V	52	64.1	3.2
2	*5745.00	123.7 PK			1.06 V	52	120.4	3.3
3	*5745.00	113.2 AV			1.06 V	52	109.9	3.3
4	#5981.03	60.8 PK	68.2	-7.4	1.06 V	52	57.1	3.7
5	11490.00	66.1 PK	74.0	-7.9	1.00 V	131	52.7	13.4
6	11490.00	52.5 AV	54.0	-1.5	1.00 V	131	39.1	13.4
7	#17235.00	52.3 PK	68.2	-15.9	1.00 V	207	35.6	16.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5592.52	58.4 PK	68.2	-9.8	1.25 H	42	55.2	3.2
2	*5785.00	113.6 PK			1.25 H	42	110.3	3.3
3	*5785.00	104.6 AV			1.25 H	42	101.3	3.3
4	#5951.76	59.2 PK	68.2	-9.0	1.25 H	42	55.7	3.5
5	11570.00	59.1 PK	74.0	-14.9	1.48 H	132	45.7	13.4
6	11570.00	45.7 AV	54.0	-8.3	1.48 H	132	32.3	13.4
7	#17355.00	52.5 PK	68.2	-15.7	1.76 H	143	35.2	17.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5637.41	59.9 PK	68.2	-8.3	1.01 V	52	56.7	3.2
2	*5785.00	123.1 PK			1.01 V	52	119.8	3.3
3	*5785.00	112.7 AV			1.01 V	52	109.4	3.3
4	#5964.38	61.2 PK	68.2	-7.0	1.01 V	52	57.7	3.5
5	11570.00	68.2 PK	74.0	-5.8	1.02 V	132	54.8	13.4
6	11570.00	53.6 AV	54.0	-0.4	1.02 V	132	40.2	13.4
7	#17355.00	52.7 PK	68.2	-15.5	1.04 V	196	35.4	17.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5593.13	58.4 PK	68.2	-9.8	1.24 H	40	55.2	3.2
2	*5825.00	112.7 PK			1.24 H	40	109.2	3.5
3	*5825.00	103.8 AV			1.24 H	40	100.3	3.5
4	#5999.22	58.8 PK	68.2	-9.4	1.24 H	40	55.1	3.7
5	11650.00	59.3 PK	74.0	-14.7	1.48 H	131	46.0	13.3
6	11650.00	45.7 AV	54.0	-8.3	1.48 H	131	32.4	13.3
7	#17475.00	52.9 PK	68.2	-15.3	1.68 H	138	34.7	18.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5648.31	58.6 PK	68.2	-9.6	1.01 V	50	55.4	3.2
2	*5825.00	123.5 PK			1.01 V	50	120.0	3.5
3	*5825.00	112.3 AV			1.01 V	50	108.8	3.5
4	#5933.98	58.8 PK	68.2	-9.4	1.01 V	50	55.2	3.6
5	11650.00	67.9 PK	74.0	-6.1	1.02 V	132	54.6	13.3
6	11650.00	53.5 AV	54.0	-0.5	1.02 V	132	40.2	13.3
7	#17475.00	52.4 PK	68.2	-15.8	1.08 V	197	34.2	18.2

REMARKS:

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

802.11ac (VHT40)

CHANNEL	TX Channel 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	#5650.20	63.7 PK	68.3	-4.6	1.35 H	43	60.5	3.2
2	*5755.00	111.5 PK			1.35 H	43	108.2	3.3
3	*5755.00	101.9 AV			1.35 H	43	98.6	3.3
4	#5991.37	58.6 PK	68.2	-9.6	1.35 H	43	54.9	3.7
5	11510.00	59.2 PK	74.0	-14.8	1.38 H	108	45.8	13.4
6	11510.00	45.7 AV	54.0	-8.3	1.38 H	108	32.3	13.4
7	#17265.00	52.5 PK	68.2	-15.7	1.72 H	131	35.7	16.8
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	#5650.34	67.7 PK	68.5	-0.8	1.02 V	103	64.5	3.2
2	*5755.00	120.1 PK			1.02 V	103	116.8	3.3
3	*5755.00	110.8 AV			1.02 V	103	107.5	3.3
4	#5980.93	60.0 PK	68.2	-8.2	1.02 V	103	56.3	3.7
5	11510.00	64.5 PK	74.0	-9.5	1.03 V	129	51.1	13.4
6	11510.00	53.6 AV	54.0	-0.4	1.03 V	129	40.2	13.4
7	#17265.00	53.3 PK	68.2	-14.9	1.03 V	193	36.5	16.8

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 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	#5639.24	65.7 PK	68.2	-2.5	1.39 H	40	62.5	3.2
2	*5795.00	111.7 PK			1.39 H	40	108.4	3.3
3	*5795.00	101.1 AV			1.39 H	40	97.8	3.3
4	#5925.06	64.0 PK	68.2	-4.2	1.39 H	40	60.4	3.6
5	11590.00	58.4 PK	74.0	-15.6	1.45 H	132	45.0	13.4
6	11590.00	45.3 AV	54.0	-8.7	1.45 H	132	31.9	13.4
7	#17385.00	51.5 PK	68.2	-16.7	1.65 H	133	34.0	17.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5639.77	67.2 PK	68.2	-1.0	1.01 V	104	64.0	3.2
2	*5795.00	120.8 PK			1.01 V	104	117.5	3.3
3	*5795.00	110.9 AV			1.01 V	104	107.6	3.3
4	#5927.90	66.8 PK	68.2	-1.4	1.01 V	104	63.2	3.6
5	11590.00	65.0 PK	74.0	-9.0	1.02 V	134	51.6	13.4
6	11590.00	53.5 AV	54.0	-0.5	1.02 V	134	40.1	13.4
7	#17385.00	52.5 PK	68.2	-15.7	1.09 V	211	35.0	17.5

REMARKS:

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

802.11ac (VHT80)

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	#5649.47	62.7 PK	68.2	-5.5	1.33 H	44	59.5	3.2
2	*5775.00	104.4 PK			1.33 H	44	101.0	3.4
3	*5775.00	95.9 AV			1.33 H	44	92.5	3.4
4	#5930.78	59.4 PK	68.2	-8.8	1.33 H	44	55.8	3.6
5	11550.00	56.6 PK	74.0	-17.4	1.51 H	126	43.3	13.3
6	11550.00	43.9 AV	54.0	-10.1	1.51 H	126	30.6	13.3
7	#17325.00	50.7 PK	68.2	-17.5	1.68 H	124	33.6	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	#5650.70	68.1 PK	68.7	-0.6	1.03 V	51	64.9	3.2
2	*5775.00	113.7 PK			1.03 V	51	110.3	3.4
3	*5775.00	104.6 AV			1.03 V	51	101.2	3.4
4	#5932.56	66.2 PK	68.2	-2.0	1.03 V	51	62.6	3.6
5	11550.00	63.4 PK	74.0	-10.6	1.05 V	125	50.1	13.3
6	11550.00	51.7 AV	54.0	-2.3	1.05 V	125	38.4	13.3
7	#17325.00	51.0 PK	68.2	-17.2	1.13 V	225	33.9	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.

Below 1GHz Data:

802.11a

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	125.01	30.8 QP	43.5	-12.7	1.50 H	63	40.2	-9.4
2	154.28	26.6 QP	43.5	-16.9	1.50 H	106	34.3	-7.7
3	250.00	35.1 QP	46.0	-10.9	1.00 H	66	44.0	-8.9
4	642.02	29.6 QP	46.0	-16.4	2.00 H	360	28.2	1.4
5	759.17	31.5 QP	46.0	-14.5	1.50 H	309	28.2	3.3
6	916.24	36.1 QP	46.0	-9.9	1.00 H	66	30.1	6.0
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	36.86	32.2 QP	40.0	-7.8	1.00 V	21	40.9	-8.7
2	125.01	35.7 QP	43.5	-7.8	1.50 V	360	45.1	-9.4
3	250.00	30.4 QP	46.0	-15.6	1.00 V	10	39.3	-8.9
4	316.37	24.9 QP	46.0	-21.1	2.00 V	75	31.3	-6.4
5	709.78	29.8 QP	46.0	-16.2	1.50 V	351	27.7	2.1
6	932.90	34.2 QP	46.0	-11.8	2.00 V	0	28.2	6.0

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: Aug. 03, 2018

4.2.3 Test Procedure

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

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

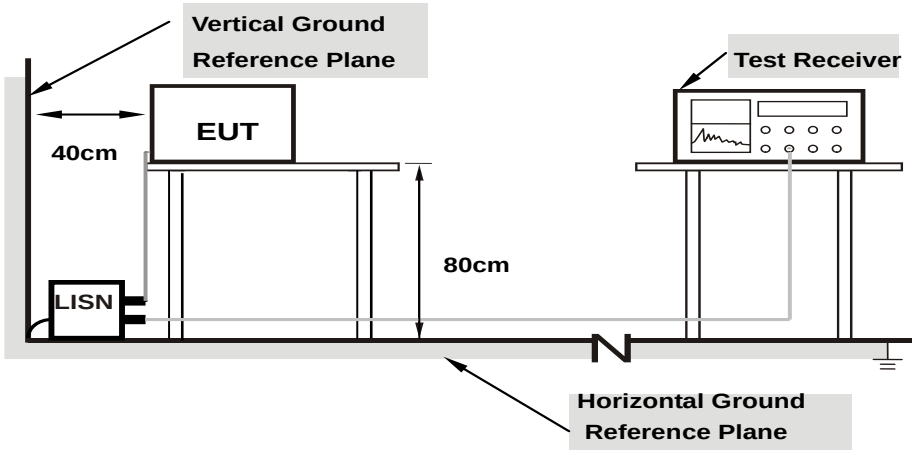
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

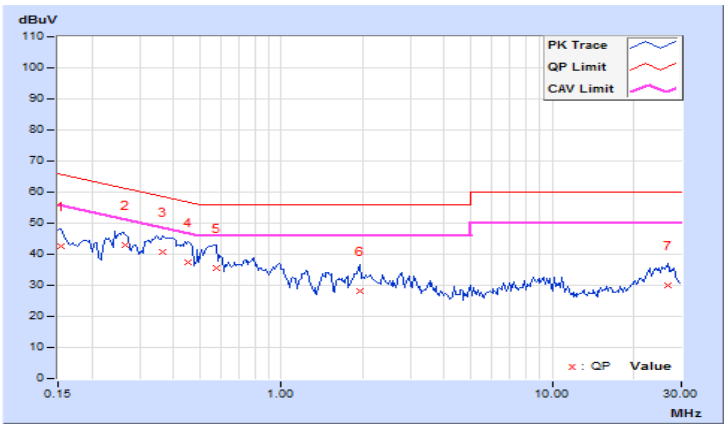
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.04	32.53	28.48	42.57	38.52	65.79	55.79	-23.22	-17.27
2	0.26475	10.08	32.87	20.88	42.95	30.96	61.28	51.28	-18.33	-20.32
3	0.36484	10.10	30.78	15.16	40.88	25.26	58.62	48.62	-17.74	-23.36
4	0.45469	10.11	27.27	12.33	37.38	22.44	56.79	46.79	-19.41	-24.35
5	0.57969	10.12	25.36	15.77	35.48	25.89	56.00	46.00	-20.52	-20.11
6	1.94922	10.19	17.90	10.75	28.09	20.94	56.00	46.00	-27.91	-25.06
7	26.61719	11.18	18.77	12.40	29.95	23.58	60.00	50.00	-30.05	-26.42

REMARKS:

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

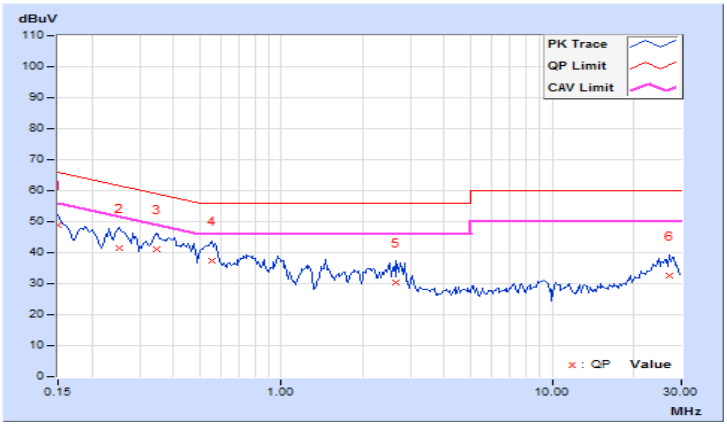


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	38.90	33.96	48.84	43.90	66.00	56.00	-17.16	-12.10
2	0.25156	9.97	31.34	25.10	41.31	35.07	61.71	51.71	-20.40	-16.64
3	0.34531	9.99	31.11	24.02	41.10	34.01	59.07	49.07	-17.97	-15.06
4	0.55234	10.01	27.50	18.11	37.51	28.12	56.00	46.00	-18.49	-17.88
5	2.66406	10.09	20.16	10.30	30.25	20.39	56.00	46.00	-25.75	-25.61
6	27.20313	10.95	21.49	15.32	32.44	26.27	60.00	50.00	-27.56	-23.73

REMARKS:

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



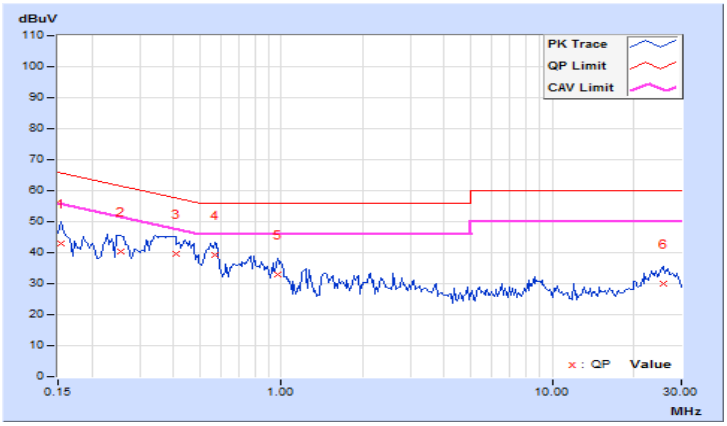
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.04	32.77	29.08	42.81	39.12	65.79	55.79	-22.98	-16.67
2	0.25547	10.07	30.35	22.86	40.42	32.93	61.58	51.58	-21.16	-18.65
3	0.40781	10.11	29.62	15.43	39.73	25.54	57.69	47.69	-17.96	-22.15
4	0.56797	10.12	28.96	19.21	39.08	29.33	56.00	46.00	-16.92	-16.67
5	0.97031	10.15	22.80	14.76	32.95	24.91	56.00	46.00	-23.05	-21.09
6	25.67578	11.16	18.78	12.45	29.94	23.61	60.00	50.00	-30.06	-26.39

REMARKS:

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

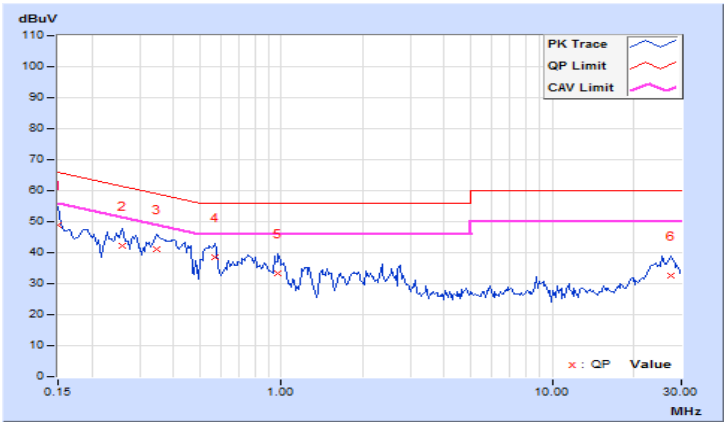


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**9.94**	**38.90**	**34.00**	**48.84**	**43.94**	**66.00**	**56.00**	**-17.16**	**-12.06**
2	0.25938	9.97	32.18	26.31	42.15	36.28	61.45	51.45	-19.30	-15.17
3	0.34531	9.99	31.01	23.62	41.00	33.61	59.07	49.07	-18.07	-15.46
4	0.56797	10.01	28.59	19.68	38.60	29.69	56.00	46.00	-17.40	-16.31
5	0.97422	10.03	23.32	16.17	33.35	26.20	56.00	46.00	-22.65	-19.80
6	27.35156	10.95	21.66	15.23	32.61	26.18	60.00	50.00	-27.39	-23.82

REMARKS:

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



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)

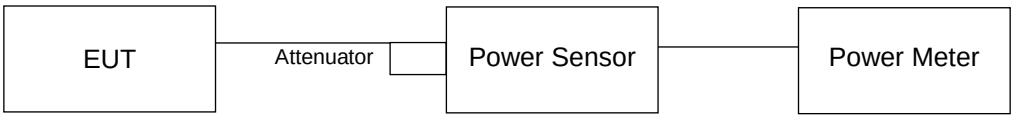
*B is the 26 dB emission bandwidth in megahertz

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 (Mode 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	21.45	21.35	276.095	24.41	30.00	Pass
40	5200	24.24	23.88	509.804	27.07	30.00	Pass
48	5240	24.16	23.94	508.357	27.06	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	20.97	20.81	245.53	23.90	30.00	Pass
40	5200	24.30	23.76	506.837	27.05	30.00	Pass
48	5240	24.03	23.91	498.967	26.98	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	20.13	19.98	202.58	23.07	30.00	Pass
46	5230	24.27	24.01	519.069	27.15	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	16.97	16.79	97.527	19.89	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	20.97	20.81	245.53	23.90	29.38	Pass
40	5200	24.30	23.76	506.837	27.05	29.38	Pass
48	5240	24.03	23.91	498.967	26.98	29.38	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.62dBi > 6dBi , so the power limit shall be reduced to 30-(6.62-6) = 29.38dBm.

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	20.13	19.98	202.58	23.07	29.38	Pass
46	5230	24.27	24.01	519.069	27.15	29.38	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.62dBi > 6dBi , so the power limit shall be reduced to 30-(6.62-6) = 29.38dBm.

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	16.97	16.79	97.527	19.89	29.38	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.62dBi > 6dBi , so the power limit shall be reduced to 30-(6.62-6) = 29.38dBm.

4.3.8 Test Result (Mode 2)

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	24.03	23.28	23.82	23.83	948.281	29.77	30.00	Pass
157	5785	23.16	22.04	22.89	22.92	757.39	28.79	30.00	Pass
165	5825	21.89	20.92	21.72	21.56	569.933	27.56	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	23.81	23.03	23.52	23.68	899.596	29.54	30.00	Pass
157	5785	22.63	21.84	22.56	22.76	705.089	28.48	30.00	Pass
165	5825	21.86	20.79	21.57	21.54	559.522	27.48	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	22.84	22.30	22.79	22.61	734.631	28.66	30.00	Pass
159	5795	23.74	23.03	23.56	23.66	896.761	29.53	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	19.45	18.74	19.42	19.37	336.917	25.28	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	20.81	20.03	20.52	20.68	450.867	26.54	26.78	Pass
157	5785	20.63	19.84	20.56	20.76	444.881	26.48	26.78	Pass
165	5825	20.86	19.79	20.57	20.54	444.444	26.48	26.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.22dBi > 6dBi , so the power limit shall be reduced to 30-(9.22-6) = 26.78dBm.

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	20.84	20.30	20.79	20.61	463.521	26.66	26.78	Pass
159	5795	20.74	20.03	20.56	20.66	449.446	26.53	26.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.22dBi > 6dBi , so the power limit shall be reduced to 30-(9.22-6) = 26.78dBm.

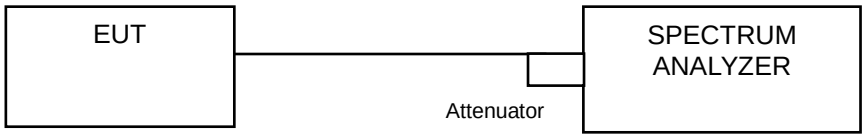
802.11ac (VHT80)

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	19.45	18.74	19.42	19.37	336.917	25.28	26.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.22dBi > 6dBi , so the power limit shall be reduced to 30-(9.22-6) = 26.78dBm.

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 (Mode 1)

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.56	16.56
40	5200	17.04	16.80
48	5240	16.92	16.92

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.76	17.76
40	5200	18.00	18.00
48	5240	17.88	18.00

802.11ac (VHT40)

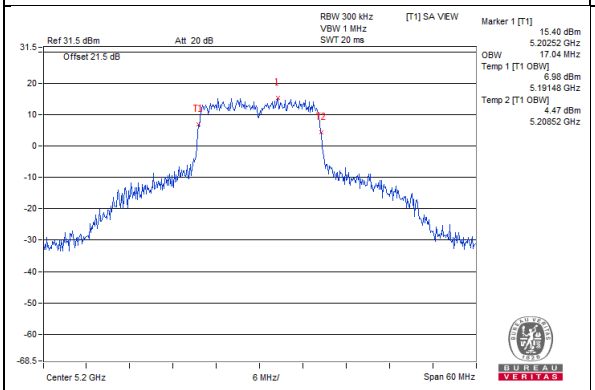
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.24	36.24
46	5230	36.72	36.72

802.11ac (VHT80)

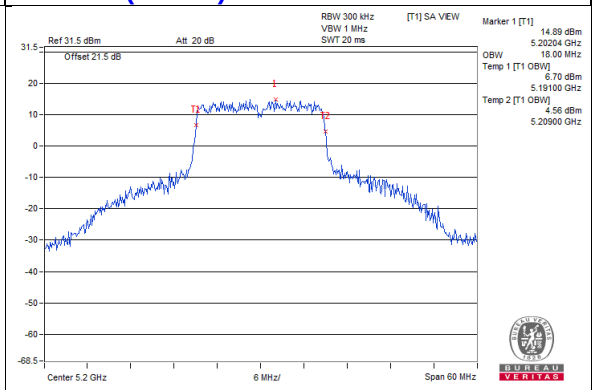
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.32	76.32

Spectrum Plot of Max Value

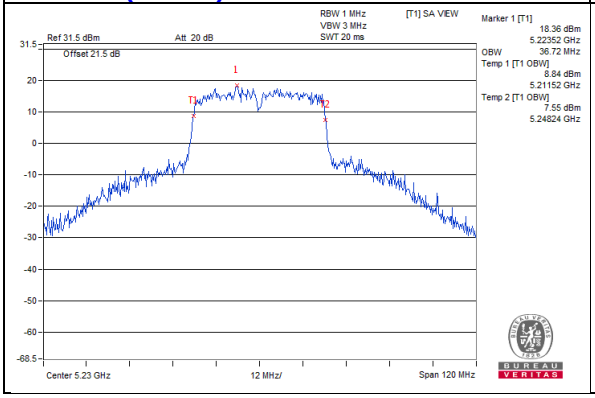
802.11a / Chain 0 : CH40



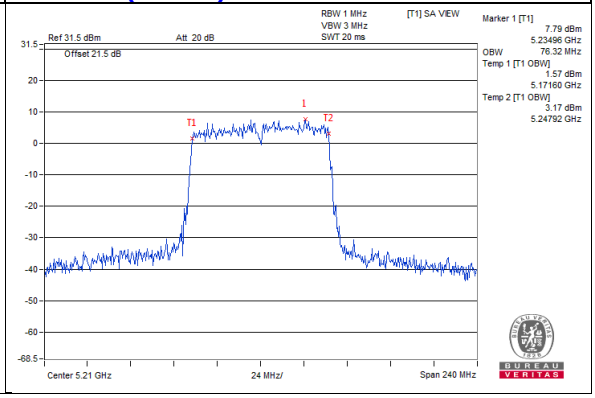
802.11ac (VHT20) / Chain 0: CH40



802.11ac (VHT40) / Chain 0: CH46

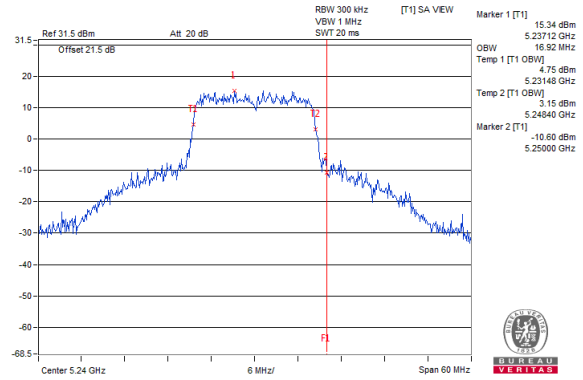


802.11ac (VHT80) / Chain 0 : CH42

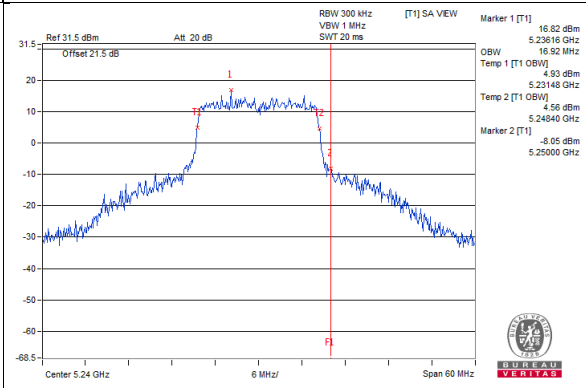


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

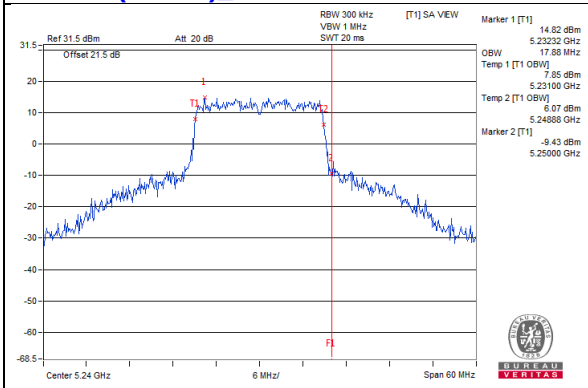
802.11a_Chain0 / CH48



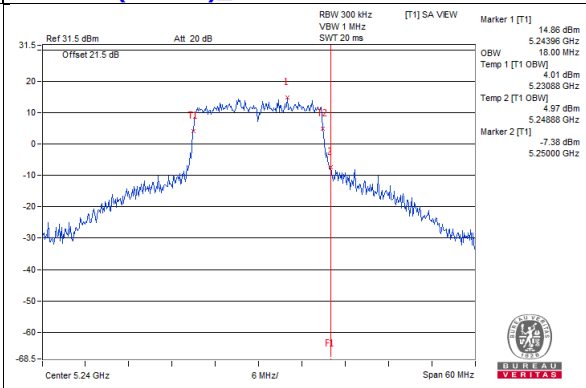
802.11a_Chain1 / CH48



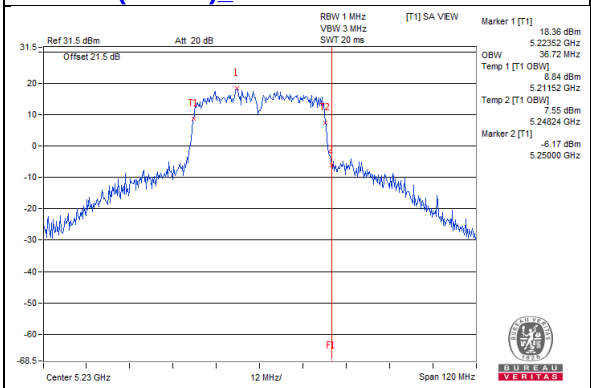
802.11ac(VHT20)_Chain0 / CH48



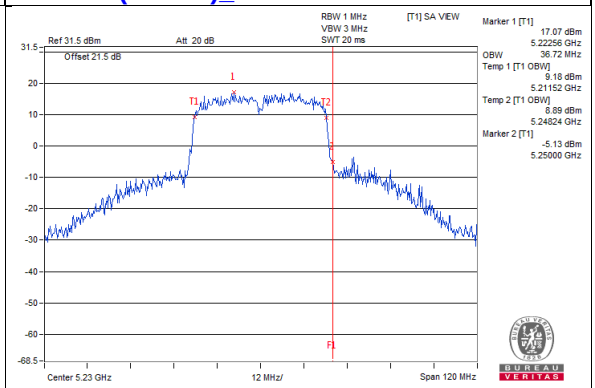
802.11ac(VHT20)_Chain1 / CH48



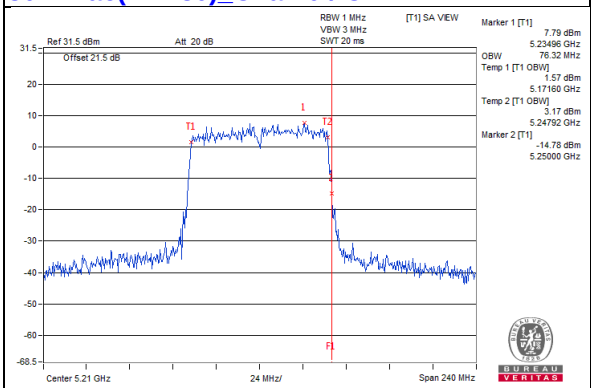
802.11ac(VHT40)_Chain0 / CH46



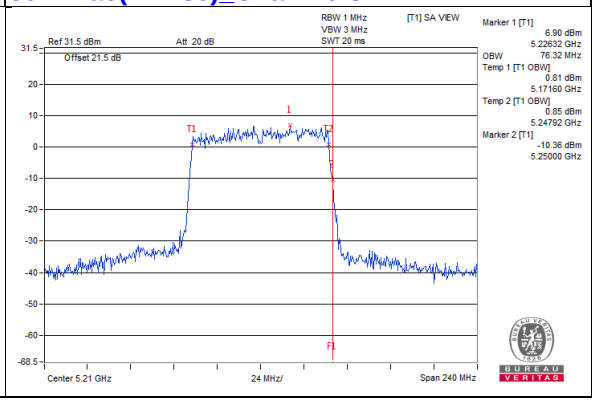
802.11ac(VHT40)_Chain1 / CH46



802.11ac(VHT80)_Chain0 / CH42



802.11ac(VHT80)_Chain1 / CH42



4.4.5 Test Results (Mode 2)

802.11a

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

802.11ac (VHT20)

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

802.11ac (VHT40)

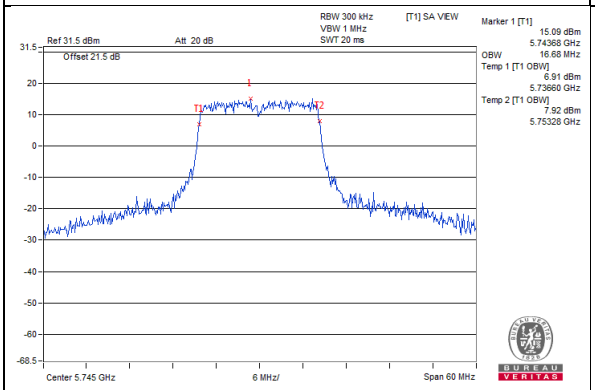
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	36.24	36.24	36.48	36.24
159	5795	36.48	36.48	36.48	36.48

802.11ac (VHT80)

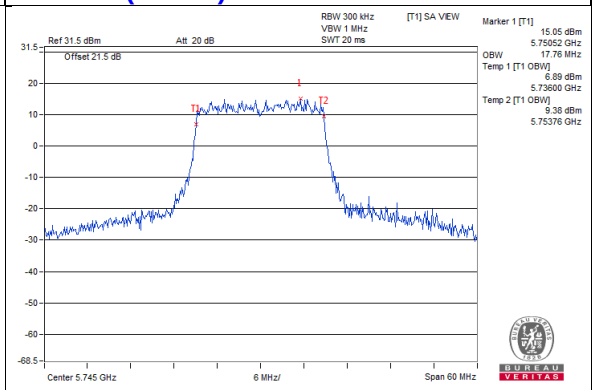
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	75.36	75.36	76.32	76.32

Spectrum Plot of Max Value

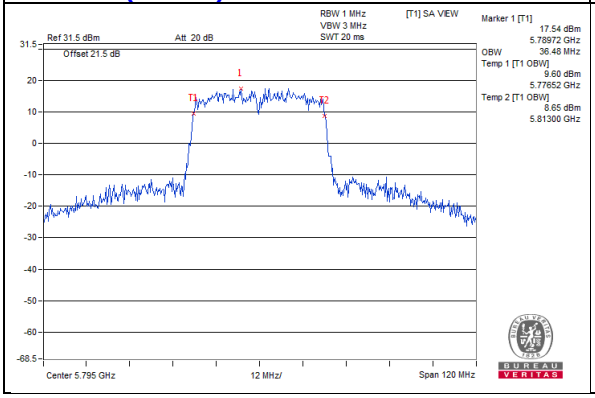
802.11a / Chain 2 : CH149



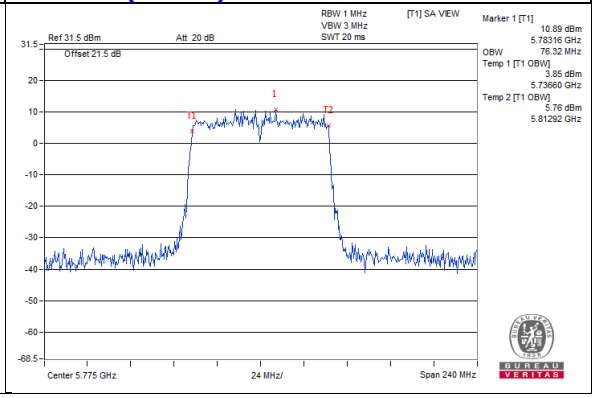
802.11ac (VHT20) / Chain 0: CH149



802.11ac (VHT40) / Chain 0: CH159

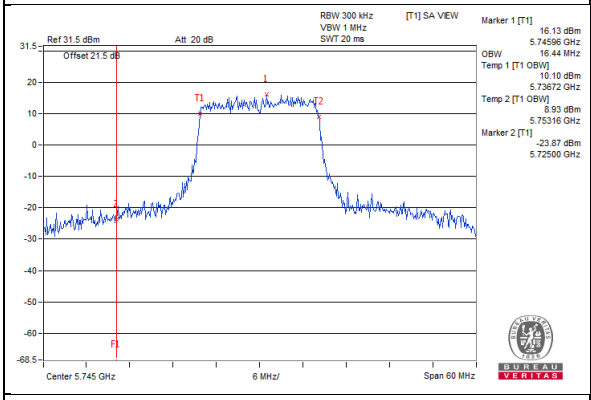


802.11ac (VHT80) / Chain 2 : CH155

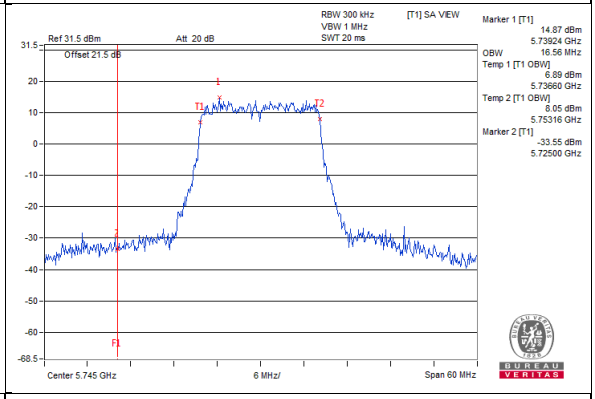


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

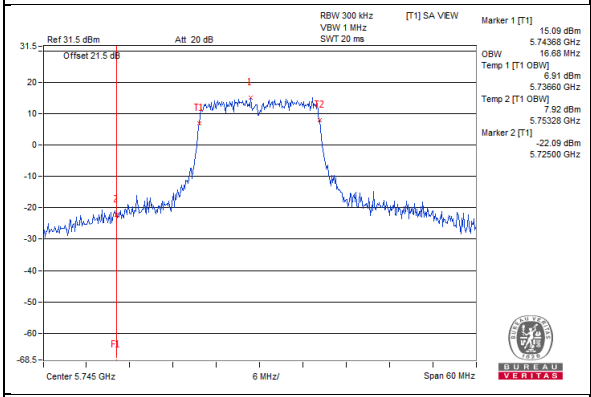
802.11a / Chain 0 : CH149



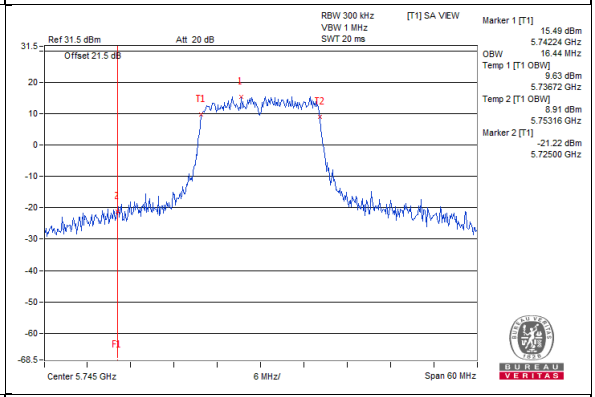
802.11a / Chain 1 : CH149



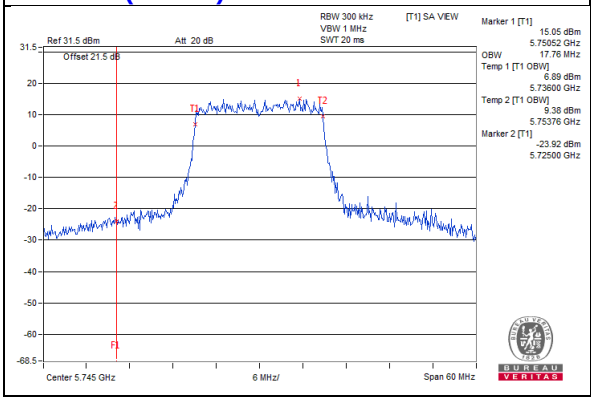
802.11a / Chain 2 : CH149



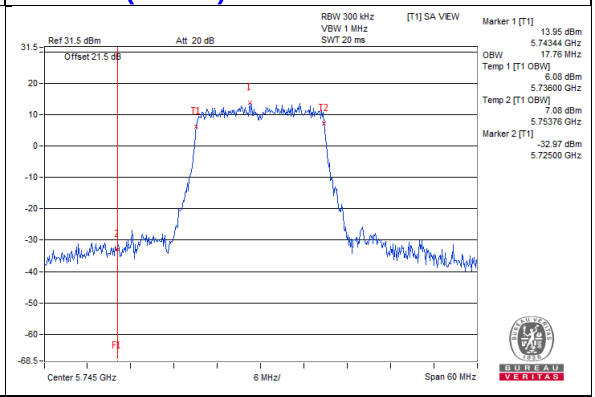
802.11a / Chain 3 : CH149



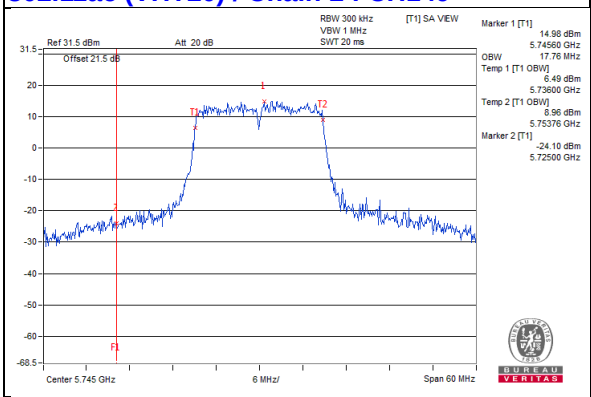
802.11ac (VHT20) / Chain 0 : CH149



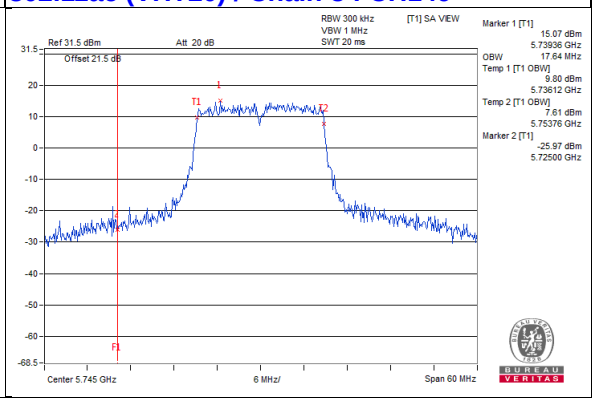
802.11ac (VHT20) / Chain 1 : CH149



802.11ac (VHT20) / Chain 2 : CH149

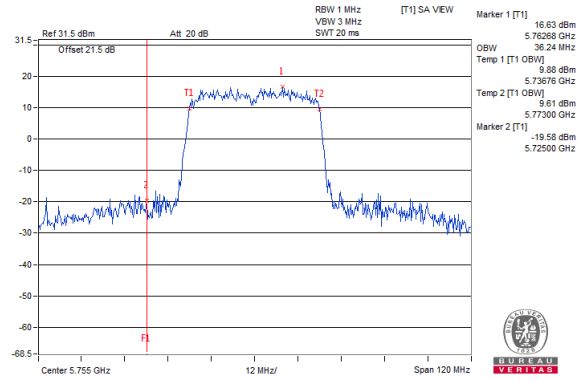


802.11ac (VHT20) / Chain 3 : CH149

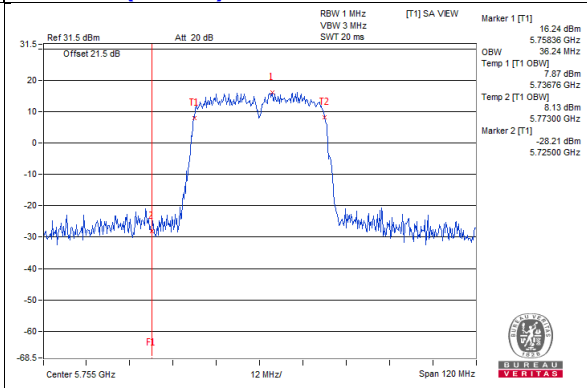


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

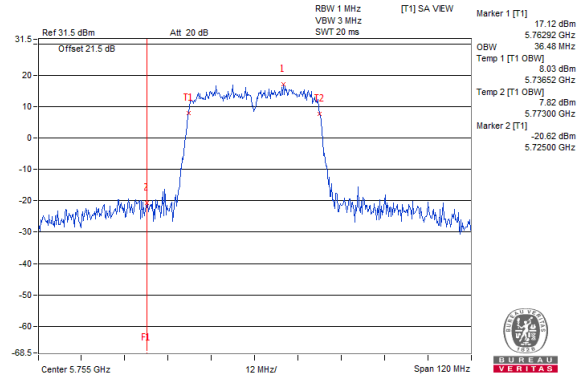
802.11ac (VHT40) / Chain 0 : CH151



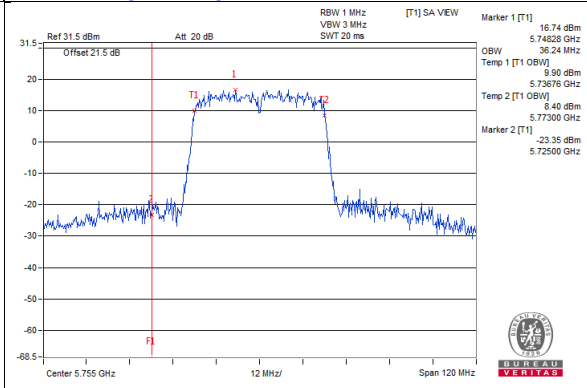
802.11ac (VHT40) / Chain 1 : CH151



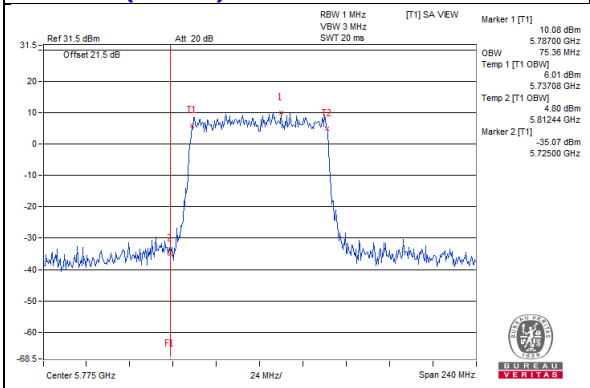
802.11ac (VHT40) / Chain 2 : CH151



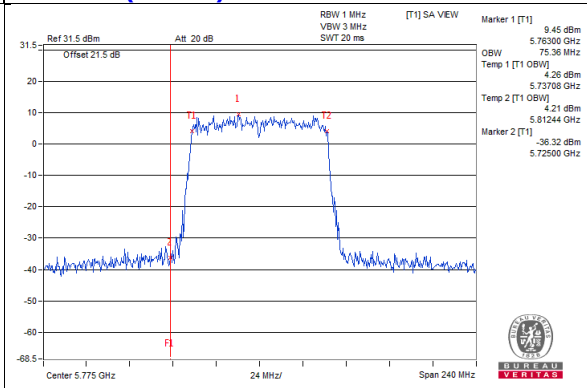
802.11ac (VHT40) / Chain 3 : CH151



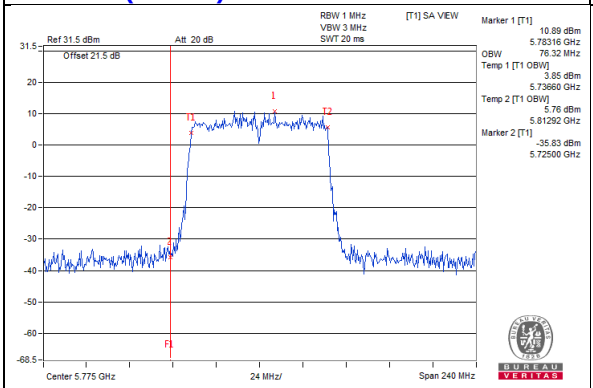
802.11ac (VHT80) / Chain 0 : CH155



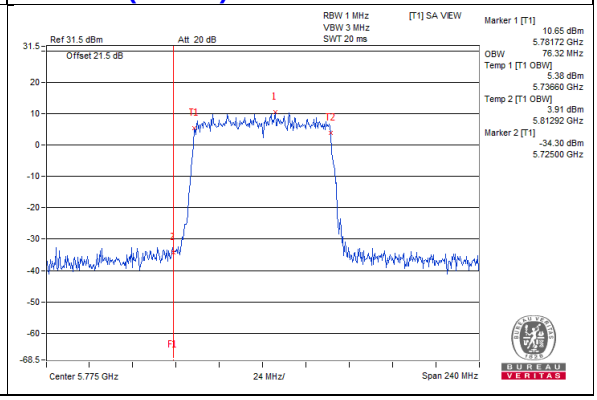
802.11ac (VHT80) / Chain 1 : CH155



802.11ac (VHT80) / Chain 2 : CH155



802.11ac (VHT80) / Chain 3 : CH155

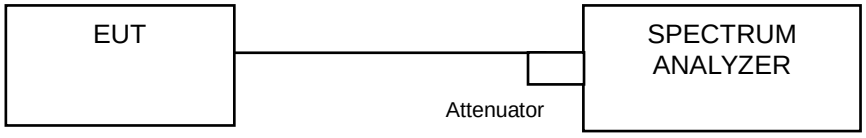


4.5 Peak Power Spectral Density Measurement

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), 802.11ac (VHT40)

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 (Mode 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	7.96	7.39	0.21	10.90	16.38	Pass
40	5200	10.99	9.91	0.21	13.70	16.38	Pass
48	5240	10.82	10.42	0.21	13.84	16.38	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] = 6.62dBi > 6dBi , so the power density limit shall be reduced to 17-(6.62-6) = 16.38dBm.
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	7.39	6.55	10.00	16.38	Pass
40	5200	10.78	9.77	13.31	16.38	Pass
48	5240	10.67	10.24	13.47	16.38	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] = 6.62dBi > 6dBi , so the power density limit shall be reduced to 17-(6.62-6) = 16.38dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	3.62	2.77	0.16	6.38	16.38	Pass
46	5230	7.96	6.79	0.16	10.58	16.38	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] = 6.62dBi > 6dBi , so the power density limit shall be reduced to 17-(6.62-6) = 16.38dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

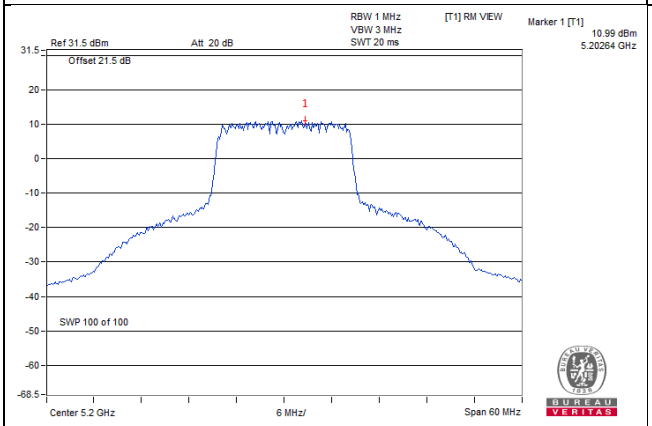
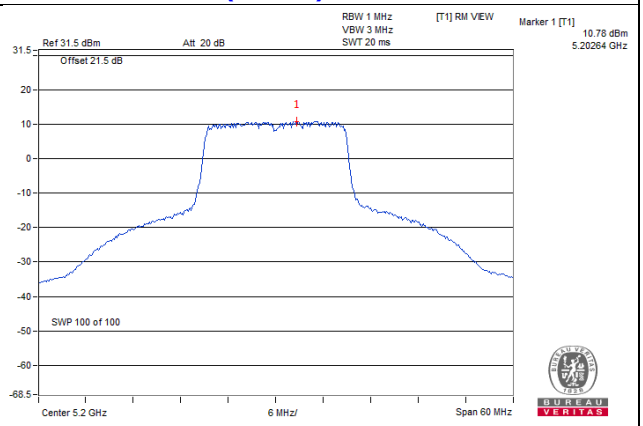
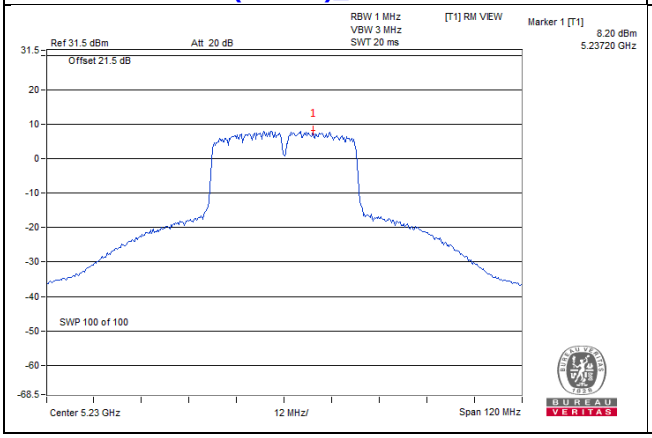
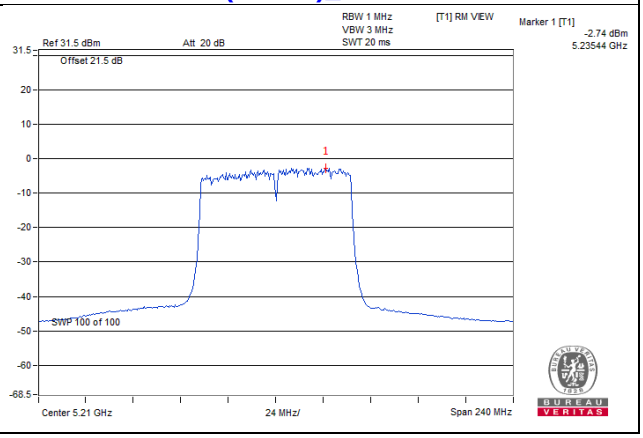
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-2.81	-3.32	0.30	0.25	16.38	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] = 6.62dBi > 6dBi , so the power density limit shall be reduced to 17-(6.62-6) = 16.38dBm.

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 0 / CH46	**802.11ac (VHT80)_Chain 0 / CH42**
	

4.5.8 Test Results (Mode 2)

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	2.67	4.89	6.02	0.21	11.12	26.78	Pass
	157	5785	1.67	3.89	6.02	0.21	10.12	26.78	Pass
	165	5825	0.54	2.76	6.02	0.21	8.99	26.78	Pass
1	149	5745	1.21	3.43	6.02	0.21	9.66	26.78	Pass
	157	5785	-0.15	2.07	6.02	0.21	8.30	26.78	Pass
	165	5825	-1.15	1.07	6.02	0.21	7.30	26.78	Pass
2	149	5745	2.89	5.11	6.02	0.21	11.34	26.78	Pass
	157	5785	1.77	3.99	6.02	0.21	10.22	26.78	Pass
	165	5825	0.65	2.87	6.02	0.21	9.10	26.78	Pass
3	149	5745	2.60	4.82	6.02	0.21	11.05	26.78	Pass
	157	5785	1.55	3.77	6.02	0.21	10.00	26.78	Pass
	165	5825	0.25	2.47	6.02	0.21	8.70	26.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.22dBi > 6dBi , so the power density limit shall be reduced to 30-(9.22-6) = 26.78dBm.

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	2.51	4.73	6.02	10.75	26.78	Pass
	157	5785	1.03	3.25	6.02	9.27	26.78	Pass
	165	5825	-0.26	1.96	6.02	7.98	26.78	Pass
1	149	5745	0.88	3.10	6.02	9.12	26.78	Pass
	157	5785	-0.54	1.68	6.02	7.70	26.78	Pass
	165	5825	-1.73	0.49	6.02	6.51	26.78	Pass
2	149	5745	2.33	4.55	6.02	10.57	26.78	Pass
	157	5785	1.13	3.35	6.02	9.37	26.78	Pass
	165	5825	-0.01	2.21	6.02	8.23	26.78	Pass
3	149	5745	2.36	4.58	6.02	10.60	26.78	Pass
	157	5785	1.41	3.63	6.02	9.65	26.78	Pass
	165	5825	0.01	2.23	6.02	8.25	26.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.22dBi > 6dBi , so the power density limit shall be reduced to 30-(9.22-6) = 26.78dBm.

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	-1.69	0.53	6.02	0.16	6.71	26.78	Pass
	159	5795	-1.35	0.87	6.02	0.16	7.05	26.78	Pass
1	151	5755	-2.26	-0.04	6.02	0.16	6.14	26.78	Pass
	159	5795	-1.66	0.56	6.02	0.16	6.74	26.78	Pass
2	151	5755	-1.90	0.32	6.02	0.16	6.50	26.78	Pass
	159	5795	-1.17	1.05	6.02	0.16	7.23	26.78	Pass
3	151	5755	-1.50	0.72	6.02	0.16	6.90	26.78	Pass
	159	5795	-1.05	1.17	6.02	0.16	7.35	26.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.22dBi > 6dBi , so the power density limit shall be reduced to 30-(9.22-6) = 26.78dBm.

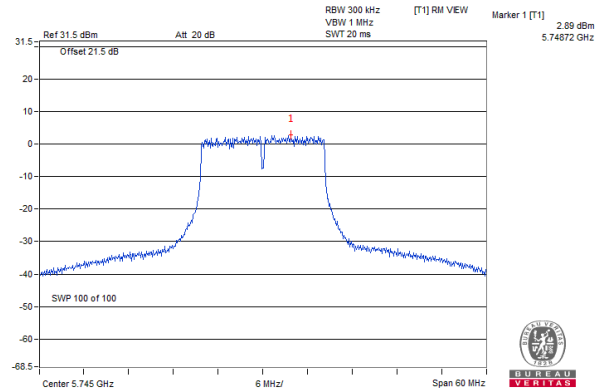
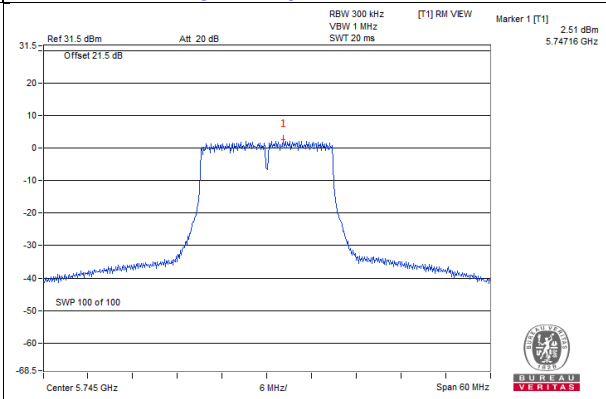
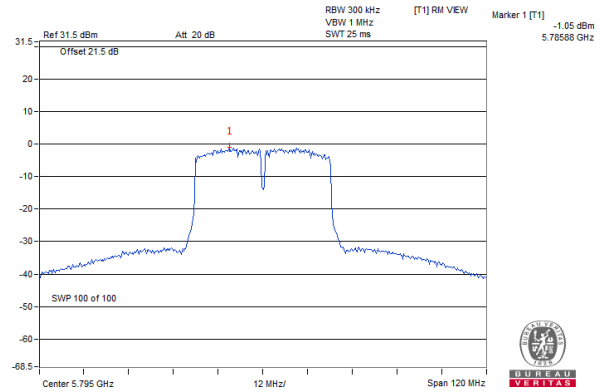
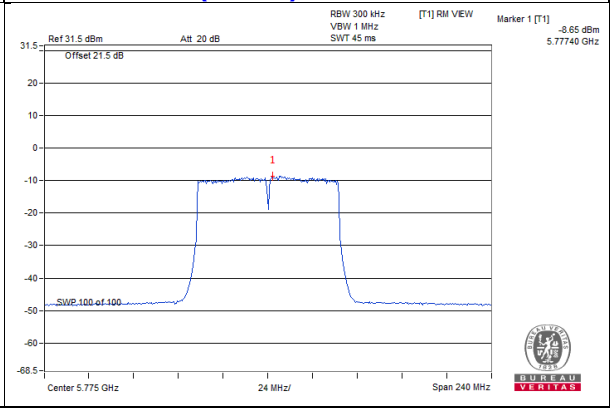
2. Refer to section 3.3 for duty cycle spectrum plot.

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	-8.66	-6.44	6.02	0.30	-0.12	26.78	Pass
1	155	5775	-9.21	-6.99	6.02	0.30	-0.67	26.78	Pass
2	155	155	-8.65	-6.43	6.02	0.30	-0.11	26.78	Pass
3	155	155	-8.66	-6.44	6.02	0.30	-0.12	26.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.22dBi > 6dBi , so the power density limit shall be reduced to 30-(9.22-6) = 26.78dBm.

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

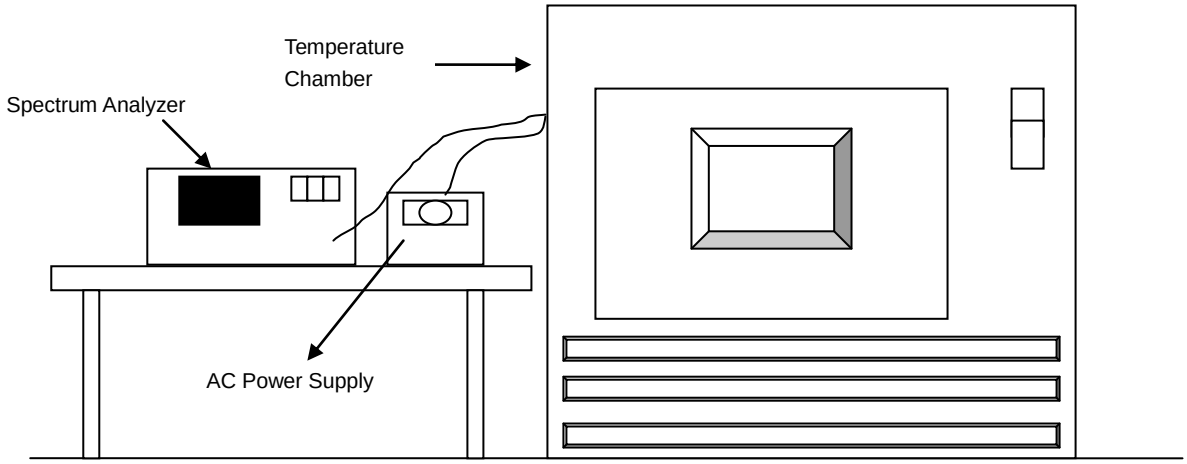
Spectrum Plot of Worst Value	
802.11a – Chain 2: CH 149	**802.11ac (VHT20) – Chain 0: CH 149**
	
802.11ac (VHT40) – Chain 3: CH 159	**802.11ac (VHT80) – Chain 2: CH 155**
	

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 (Mode 1)

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	5180.0011	PASS	5180.0036	PASS	5180.0046	PASS	5180.0001	PASS
40	120	5180.002	PASS	5179.9974	PASS	5180	PASS	5179.9993	PASS
30	120	5180.0197	PASS	5180.0207	PASS	5180.0208	PASS	5180.0175	PASS
20	120	5179.9798	PASS	5179.9788	PASS	5179.9794	PASS	5179.9822	PASS
10	120	5179.976	PASS	5179.9762	PASS	5179.9768	PASS	5179.9804	PASS
0	120	5180.0053	PASS	5180.0056	PASS	5180.0059	PASS	5180.006	PASS
-10	120	5179.9884	PASS	5179.9884	PASS	5179.9884	PASS	5179.9842	PASS
-20	120	5180.001	PASS	5180.0016	PASS	5180.0008	PASS	5180.0025	PASS
-30	120	5180.0165	PASS	5180.0161	PASS	5180.0182	PASS	5180.0179	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	5179.98	PASS	5179.9781	PASS	5179.9799	PASS	5179.9828	PASS
	120	5179.9798	PASS	5179.9788	PASS	5179.9794	PASS	5179.9822	PASS
	102	5179.979	PASS	5179.978	PASS	5179.9795	PASS	5179.9828	PASS

4.6.8 Test Results (Mode 2)

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	5745.0266	PASS	5745.0263	PASS	5745.0292	PASS	5745.0299	PASS
40	120	5745.0044	PASS	5745.005	PASS	5745.0021	PASS	5745.0023	PASS
30	120	5745.0221	PASS	5745.0227	PASS	5745.0195	PASS	5745.0227	PASS
20	120	5745.0174	PASS	5745.0199	PASS	5745.0178	PASS	5745.016	PASS
10	120	5744.9775	PASS	5744.9757	PASS	5744.9749	PASS	5744.9773	PASS
0	120	5744.9919	PASS	5744.9906	PASS	5744.9899	PASS	5744.9942	PASS
-10	120	5745.0194	PASS	5745.0171	PASS	5745.0193	PASS	5745.0222	PASS
-20	120	5745.026	PASS	5745.0252	PASS	5745.0253	PASS	5745.0228	PASS
-30	120	5744.9944	PASS	5744.9911	PASS	5744.9943	PASS	5744.9909	PASS

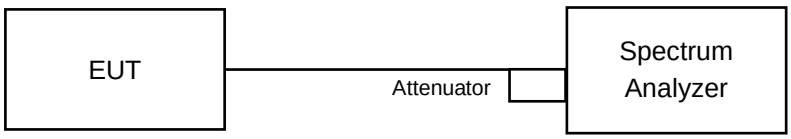
Frequency Stability Versus Voltage									
Operating Frequency: 5745 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5745.0179	PASS	5745.0201	PASS	5745.0177	PASS	5745.0159	PASS
	120	5745.0174	PASS	5745.0199	PASS	5745.0178	PASS	5745.016	PASS
	102	5745.0171	PASS	5745.0188	PASS	5745.017	PASS	5745.0154	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	16.37	16.38	16.37	0.5	PASS
157	5785	16.40	16.42	16.40	16.37	0.5	PASS
165	5825	16.40	16.40	16.38	16.38	0.5	PASS

802.11ac (VHT20)

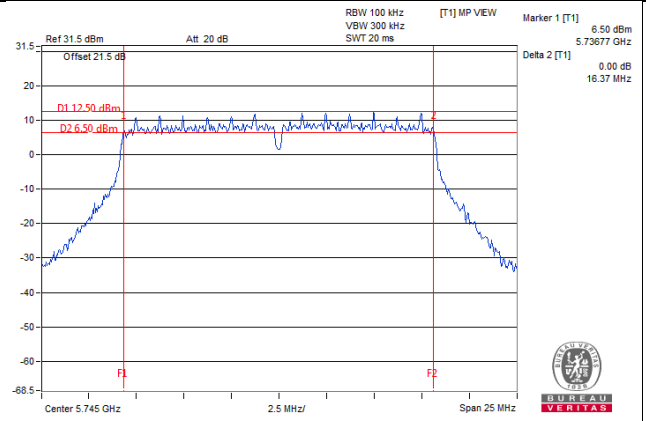
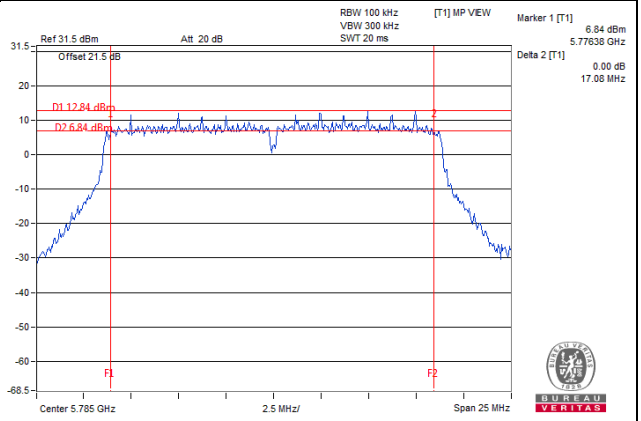
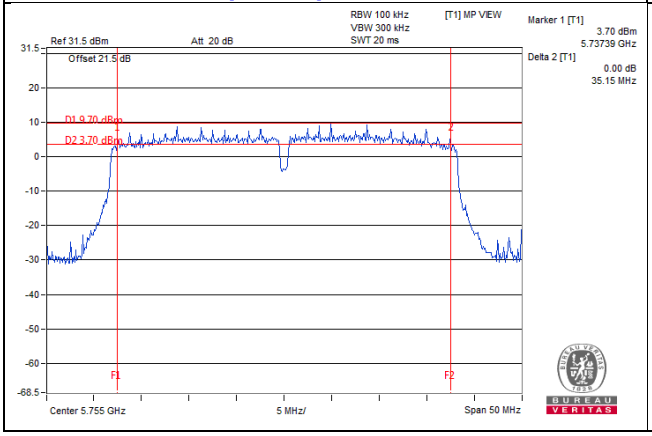
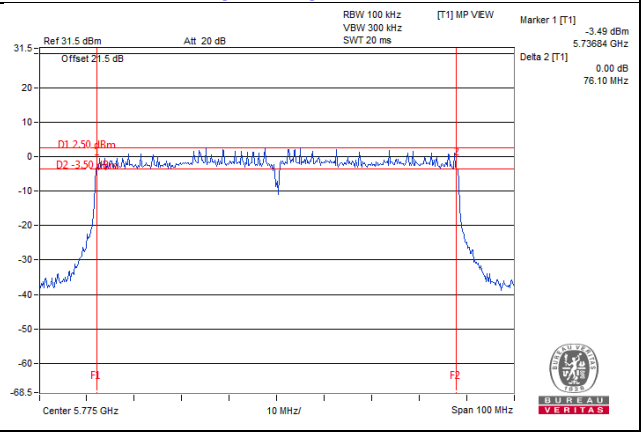
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.62	17.32	17.39	17.23	0.5	PASS
157	5785	17.62	17.60	17.08	17.61	0.5	PASS
165	5825	17.63	17.62	17.61	17.62	0.5	PASS

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.15	35.21	35.21	35.19	0.5	PASS
159	5795	35.22	35.22	34.58	35.19	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	76.10	76.29	76.44	76.46	0.5	PASS

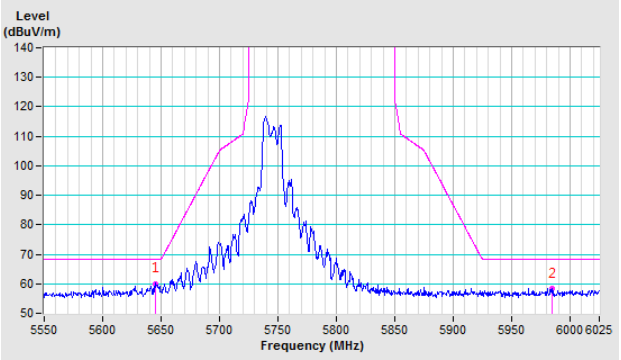
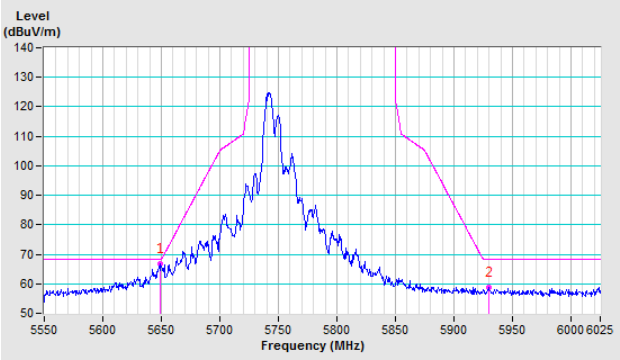
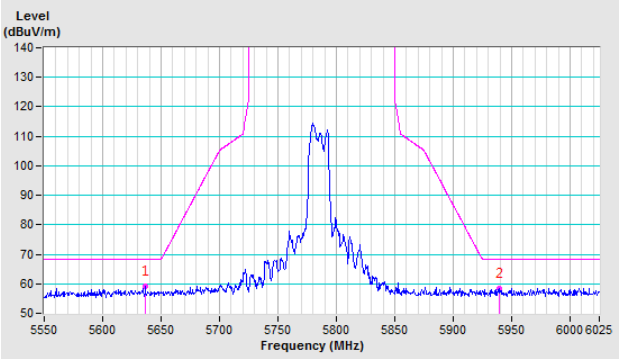
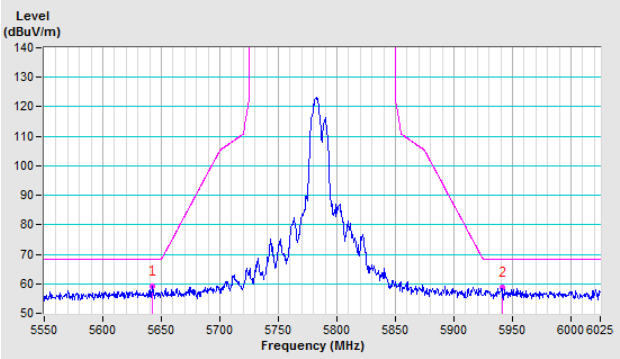
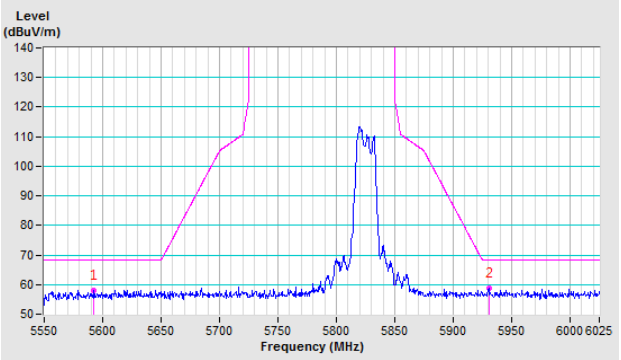
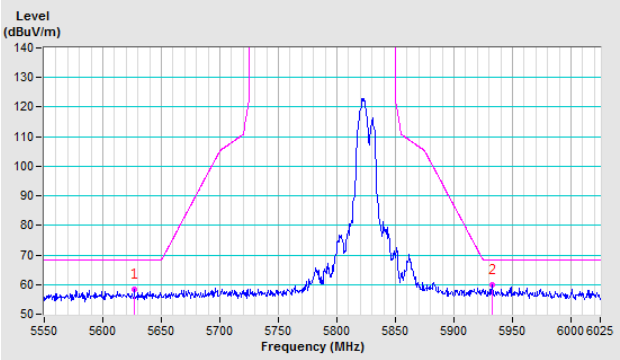
Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH149	**802.11ac (VHT20)_Chain 2 / CH157**
	
802.11ac (VHT40)_Chain 0 / CH151	**802.11ac (VHT80)_Chain 0 / CH155**
	

5 Pictures of Test Arrangements

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

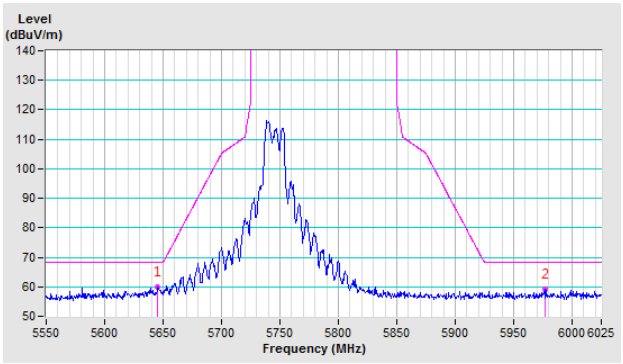
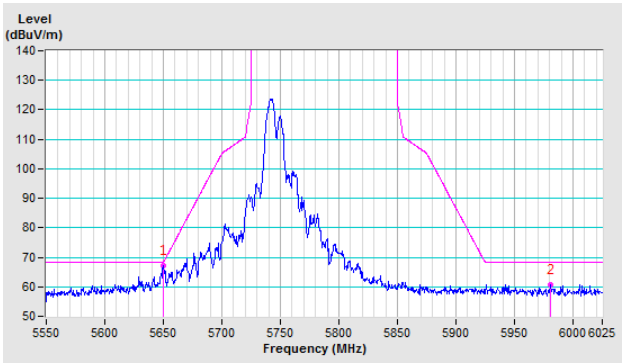
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

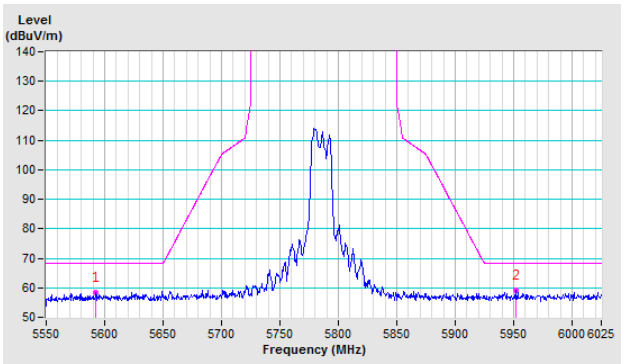
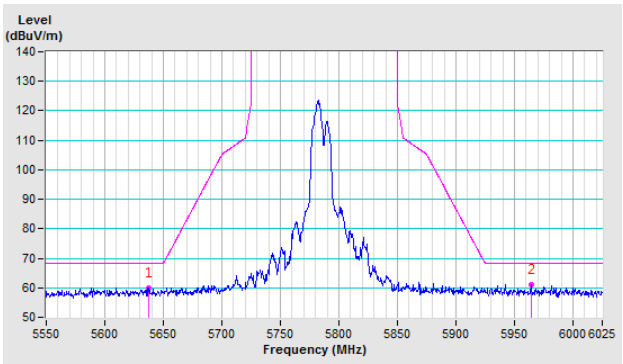
CH 149 5745 MHz	
Horizontal	**Vertical**
	
CH 157 5785 MHz	
Horizontal	**Vertical**
	
CH 165 5825 MHz	
Horizontal	**Vertical**
	

802.11ac (VHT20)

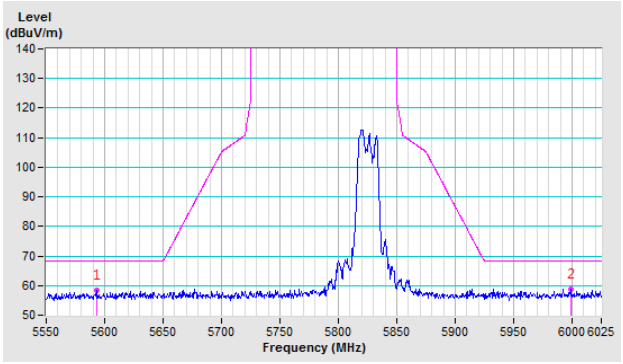
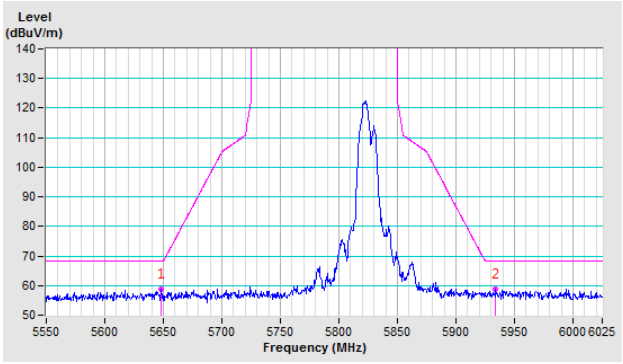
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

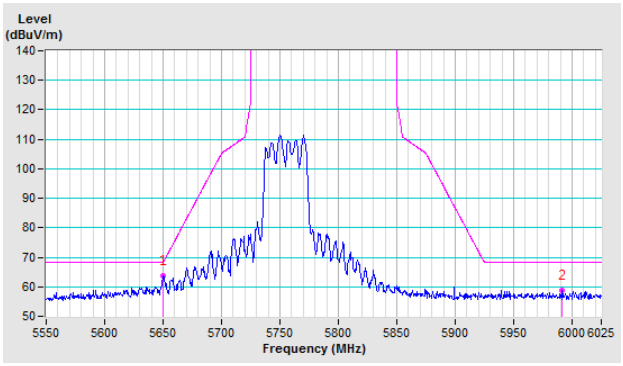
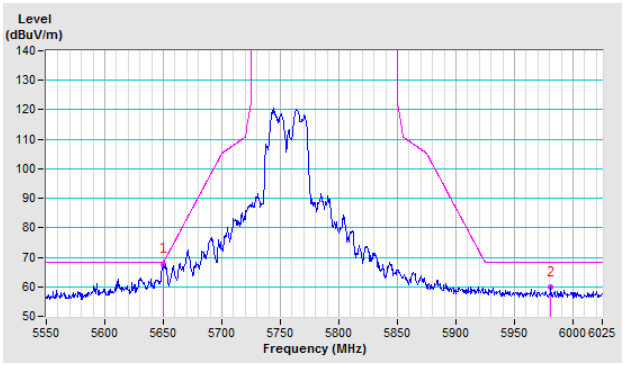
Horizontal	Vertical
	

CH 165 5825 MHz

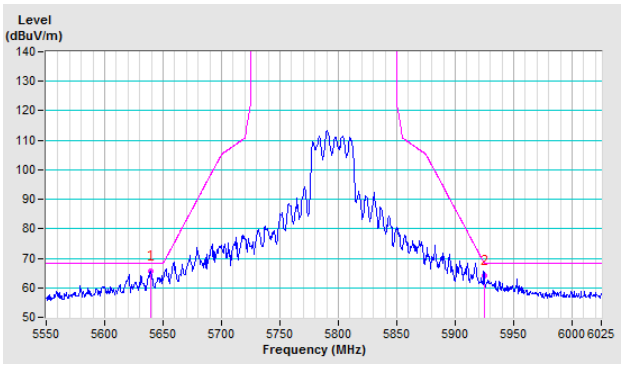
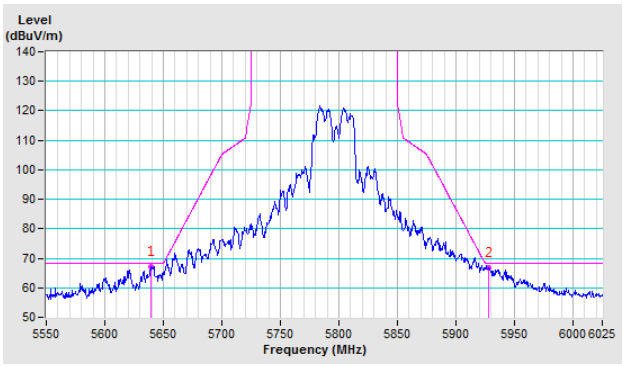
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

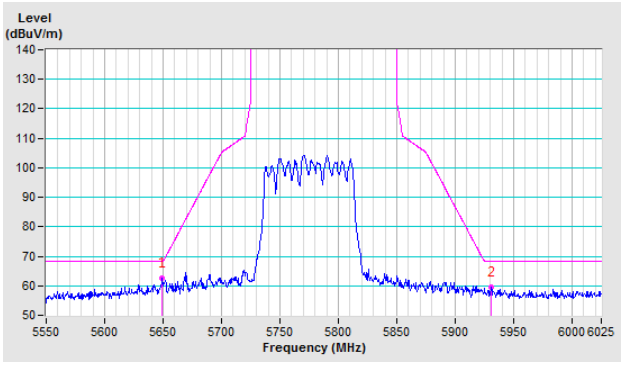
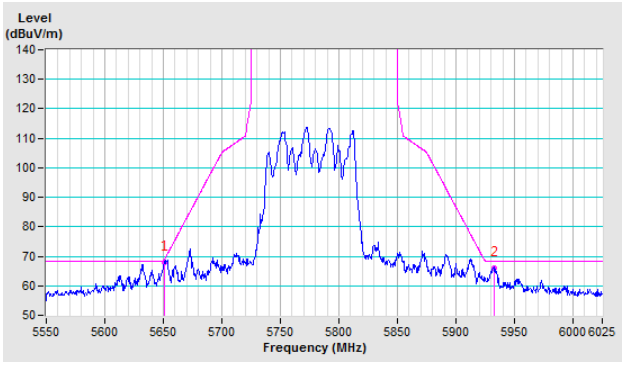
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

Appendix – Information on the Testing Laboratories

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

If you have any comments, please feel free to contact us at the following:

Linkou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

--- END ---