FCC Test Report

Report No.:	RF160914E11-1
FCC ID:	KA2IR883A1
Test Model:	DIR-883
Received Date:	Sep. 14, 2016
Test Date:	Oct. 18, 2016 to Jan. 13, 2017
Issued Date:	Mar. 17, 2017
Applicant:	D-Link Corporation
Address:	No 289, Xinhu 3rd Rd, Neihu District, Taipei City 11494, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF160914E11-1	Original release.	Mar. 17, 2017

1 Certificate of Conformity

Product:	Covr AC2600 Wi-Fi Router
Brand:	D-Link
Test Model:	DIR-883
Sample Status:	MASS-PRODUCTION
Applicant:	D-Link Corporation
Test Date:	Oct. 18, 2016 to Jan. 13, 2017
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:** Mar. 17, 2017

Wendy Wu / Specialist

Approved by : , **Date:** Mar. 17, 2017

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 -10.27dB at 0.47813MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 11570.00MHz, 5148.00MHz.
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 R-SMA 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	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.36 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.47 dB
	6GHz ~ 18GHz	3.75 dB
	18GHz ~ 40GHz	3.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Covr AC2600 Wi-Fi Router
Brand	D-Link
Test Model	DIR-883
Status of EUT	MASS-PRODUCTION
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz band
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps 802.11ac (80+80): up to 3466.7Mbps
Operating Frequency	**2.4GHz:** 2.412GHz ~ 2.462GHz **5GHz:** 5.18GHz ~ 5.24GHz, 5.745GHz ~ 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): 2 802.11ac (VHT80+80): 1 set
Output Power	**2.4GHz:** **CDD Mode:** 942.26mW **Beamforming Mode:** 825.722mW **5GHz:** **5.18GHz ~ 5.24GHz:** **Master Mode** **CDD Mode:** 710.326mW **Beamforming Mode:** 710.326mW **Client Mode** **CDD Mode:** 248.598mW **Beamforming Mode:** 180.988mW **5.745GHz ~ 5.825GHz:** **CDD Mode:** 931.576mW **Beamforming Mode:** 749.857mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

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

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

Brand	Model No.	Spec.
D-Link	WA-36A12R	AC Input: 100-240V, 0.9A, 50/60Hz DC Output: 12V, 3A DC Output cable: Unshielded, 1.2m

3. The antrovennas pided to the EUT, please refer to the following table:

Antenna No	Chain No.	Chain No.	Chain No.	Antenna Gain (dBi)	Frequency range (GHz)	Antenna Type	Connecter Type
1	Dongguan RF electronic technology Co., LTD	RF21S00506A	Chain 0	2	2.4~2.4835	Dipole	R-SMA
				3	5.15~5.85		
2	Dongguan RF electronic technology Co., LTD	RF21S00506A	Chain 1	2	2.4~2.4835	Dipole	R-SMA
				3	5.15~5.85		
3	Dongguan RF electronic technology Co., LTD	RF21S00506A	Chain 2	2	2.4~2.4835	Dipole	R-SMA
				3	5.15~5.85		
4	Dongguan RF electronic technology Co., LTD	RF21S00506A	Chain 3	2	2.4~2.4835	Dipole	R-SMA
				3	5.15~5.85		

4. The Directional gain table:

Frequency (MHz)	Max Gain (dBi)
2412-2462	6.49
5180-5825	7.13

Note:

1. Non-TxBF mode & TxBF mode antenna gain refer to KDB 662911 F 2) f) (ii)

$$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

2. Above directional gain were calculated from actual measurement data.

5. This device can support different category application which switched by access point mode and client mode by software.
6. For UNII-3 band: Both master mode and client mode used the same power setting.

7. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	4TX	4RX
802.11g	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
VHT20	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~8, Nss=4	4TX	4RX
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
5GHz 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)	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~8, Nss=4	4TX	4RX
802.11ac (VHT40)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT80)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT80+VHT80) noncontigurus	MCS 0~9, Nss=1	2TX+2TX	2RX +2RX
	MCS 0~9, Nss=2	2TX+2TX	2RX +2RX

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

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

For simultaneous transmission in non-adjacent channles:

1 channel is provided for 802.11ac (VHT80+80):

Channel	Frequency
42+155	5210 MHz + 5775 MHz

Note: The transmission is for noncontiguous transmission using two nonadjacent 80MHz channels.

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

NOTE:
1. The EUT had been pre-tested on the positioned of each 2axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3
802.11ac (VHT80+80)	5180-5240 5745-5825	42 to 155	42 + 155	OFDM	BPSK	58.5

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5745-5825	149 to 165	157	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						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5745-5825	149 to 165	157	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.

Master Mode						
CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3
802.11ac (VHT80+80)	5180-5240 5745-5825	42 to 155	42 + 155	OFDM	BPSK	58.5
Beamforming Mode (Output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3
802.11ac (VHT80+80)	5180-5240 5745-5825	42 to 155	42 + 155	OFDM	BPSK	58.5
Client Mode						
CDD Mode (Output power / PSD only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT80+80)	5180-5240 5745-5825	42 to 155	42 + 155	OFDM	BPSK	58.5
Beamforming Mode (Output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT80+80)		42 to 155	42 + 155	OFDM	BPSK	58.5

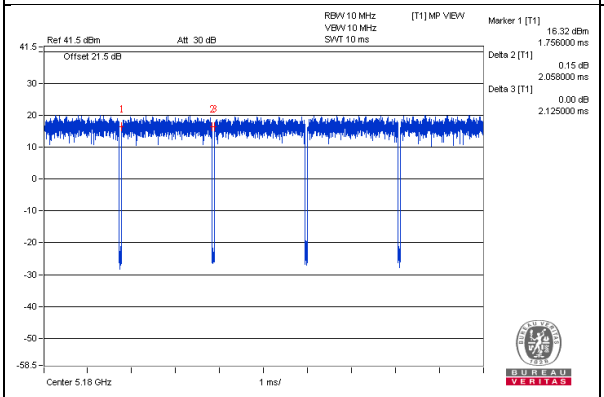
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 64%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	22deg. C, 66%RH	120Vac, 60Hz	Robert Cheng
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

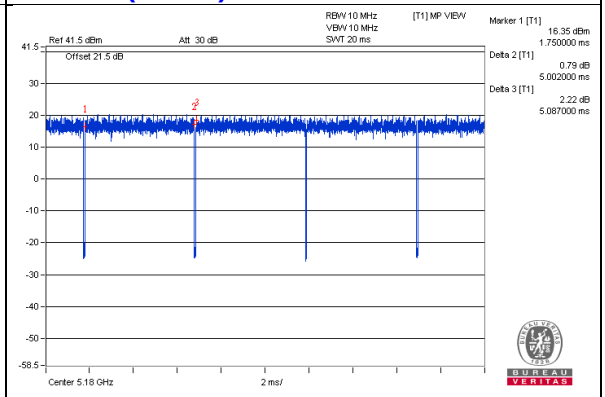
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.058 ms/2.125 ms = 0.968, Duty factor = 10 * log(1/0.968) = 0.14
802.11ac (VHT20): Duty cycle = 5.002 ms/5.087 ms = 0.983
802.11ac (VHT40): Duty cycle = 2.427 ms/2.5 ms = 0.971, Duty factor = 10 * log(1/0.971) = 0.13
802.11ac (VHT80): Duty cycle = 1.146 ms/1.21 ms = 0.947, Duty factor = 10 * log(1/0.947) = 0.24
802.11ac (VHT80+80): Duty cycle = 1.144 ms/1.215 ms = 0.942, Duty factor = 10 * log(1/0.942) = 0.26

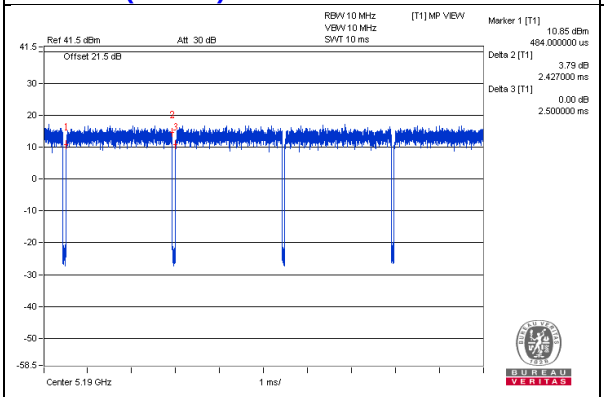
802.11a



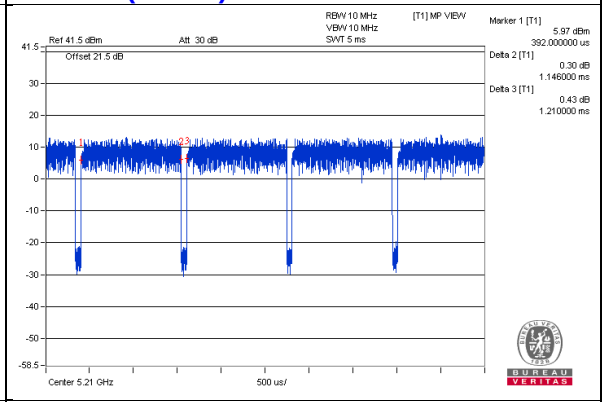
802.11ac (VHT20)



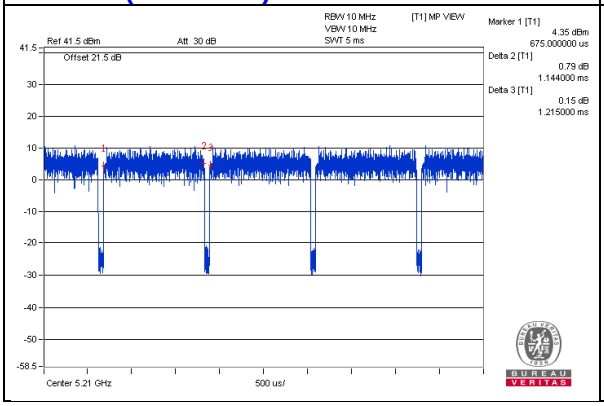
802.11ac (VHT40)



802.11ac (VHT80)



802.11ac (VHT80+80)



3.4 Description of Support Units

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

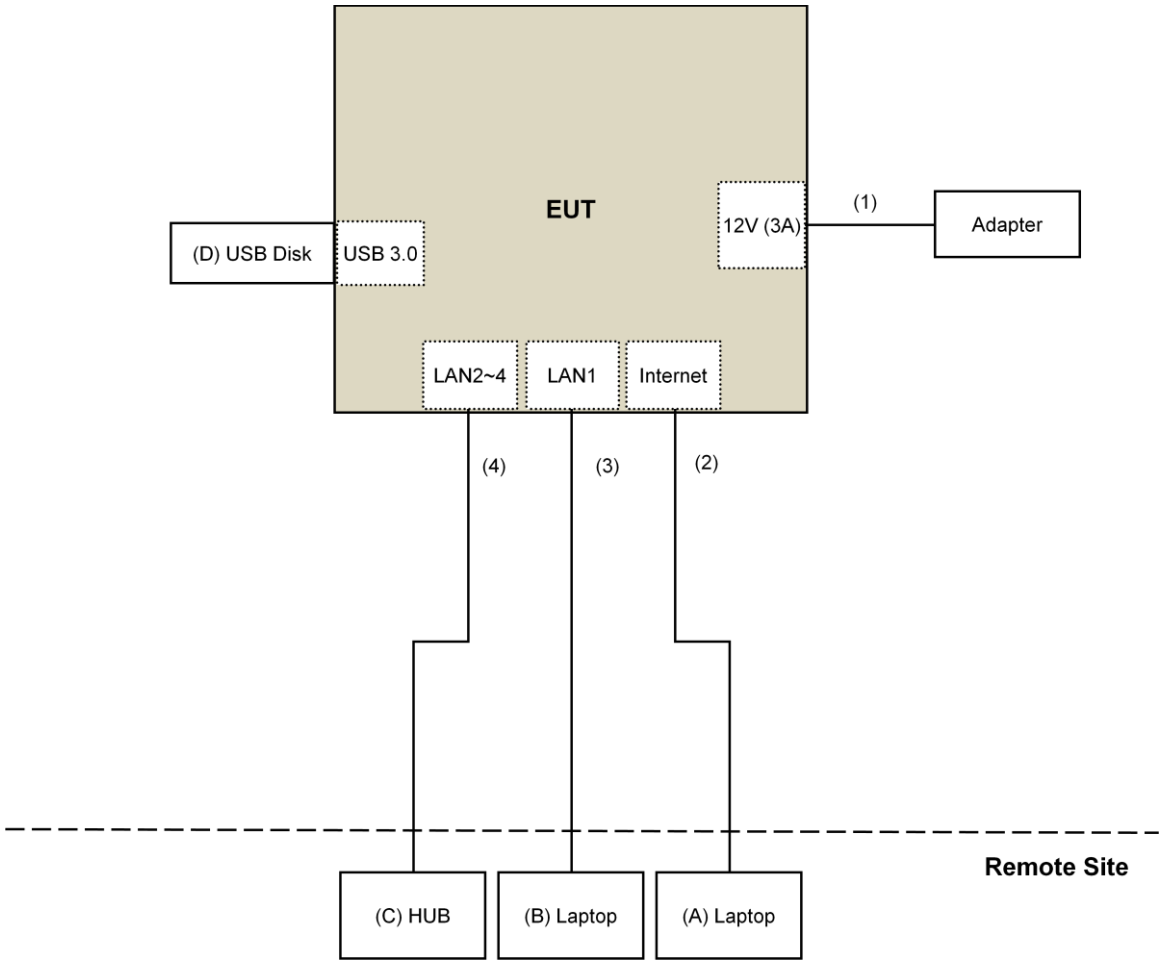
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	USB Disk	SanDisk	64GB	NA	NA	Provided by Lab

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	1.2	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	3	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v01r03
KDB 662911 D01 Multiple Transmitter Output v02r01
KDB 644545 D03 Guidance for IEEE 802.11ac v01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

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

Note:

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

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

4.1.2 Test Instruments

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 18, 2016	Aug. 17, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 02, 2016	Apr. 01, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 05, 2016	Oct. 04, 2017
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
5 Loop antenna was used for all emissions below 30 MHz.
6. The CANADA Site Registration No. is 20331-1
7. Tested Date: Dec, 06, 2016

For above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 18, 2016	Aug. 17, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Jan. 20, 2016	Jan. 19, 2017
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 05, 2016	Apr. 04, 2017
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 30, 2016	Mar. 29, 2017
Spectrum Analyzer Keysight	N9030A	MY54490520	July 29, 2016	July 28, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
5 Loop antenna was used for all emissions below 30 MHz.
6. The CANADA Site Registration No. is 20331-1
7. Tested Date: Jan. 13, 2017

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

c. Both X and Y axes of the antenna are set to make the measurement.

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

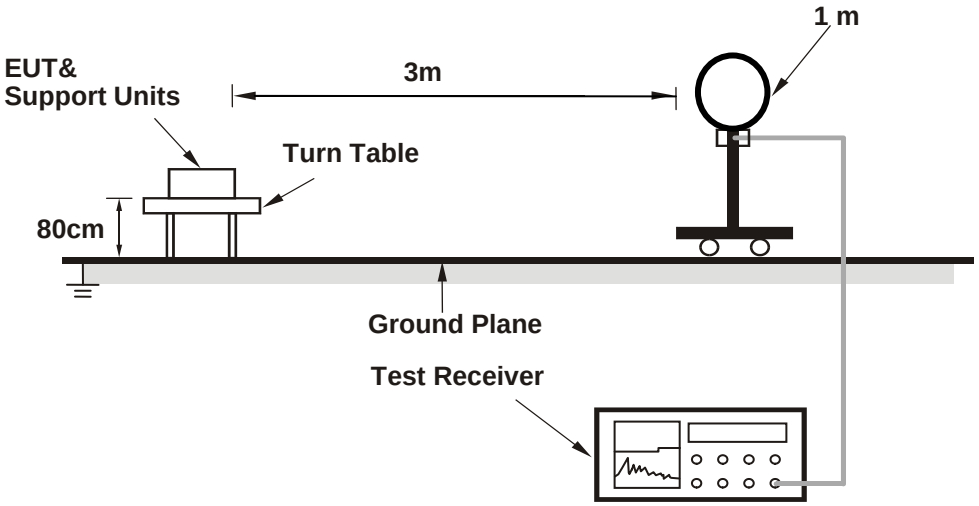
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

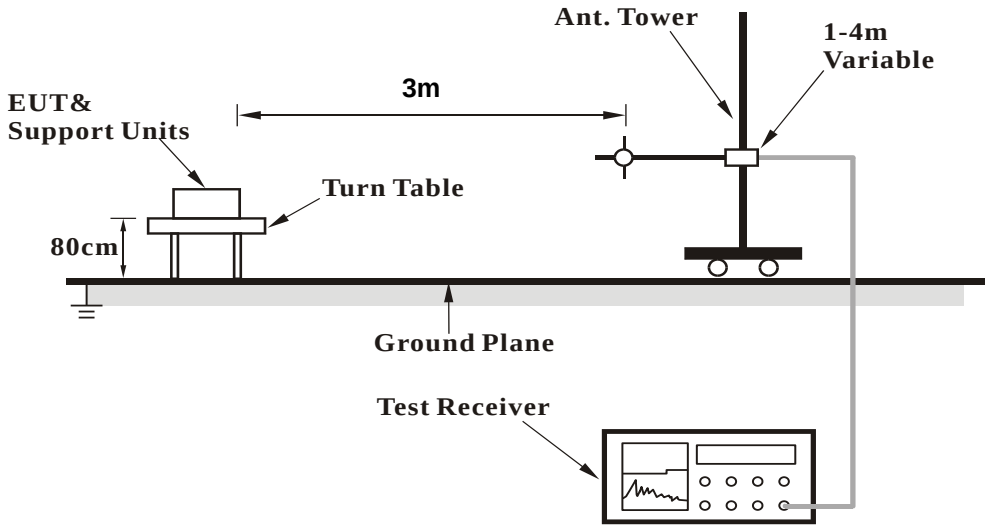
No deviation.

4.1.5 Test Setup

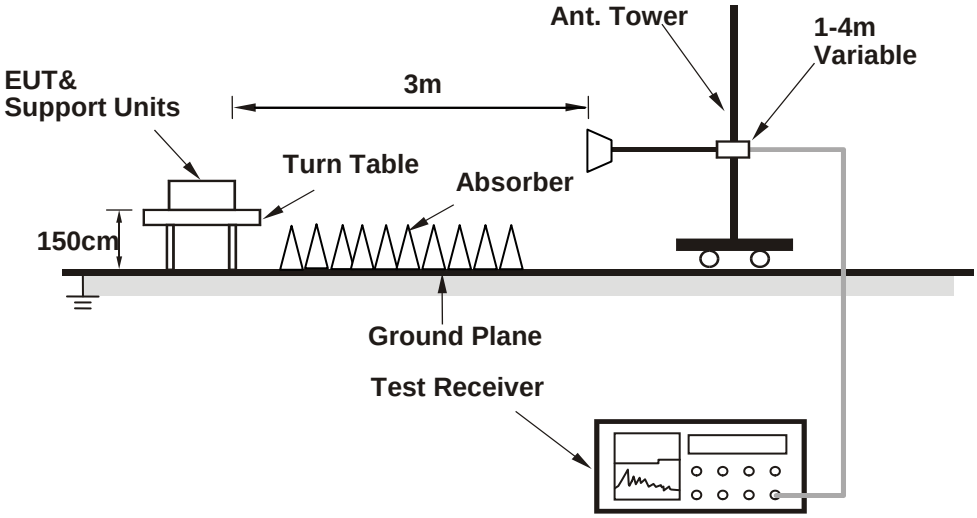
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.

b. Contorlling software (QRCT.exe V3.0.174) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.0 PK	74.0	-14.0	2.02 H	83	57.0	3.0
2	5150.00	47.2 AV	54.0	-6.8	2.02 H	83	44.2	3.0
3	*5180.00	113.1 PK			2.02 H	83	109.9	3.2
4	*5180.00	103.1 AV			2.02 H	83	99.9	3.2
5	#10360.00	51.5 PK	74.0	-22.5	1.50 H	40	38.4	13.1
6	#10360.00	39.0 AV	54.0	-15.0	1.50 H	40	25.9	13.1
7	15540.00	55.6 PK	74.0	-18.4	1.50 H	200	40.9	14.7
8	15540.00	43.0 AV	54.0	-11.0	1.50 H	200	28.3	14.7
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	67.4 PK	74.0	-6.6	1.45 V	224	64.4	3.0
2	5150.00	53.8 AV	54.0	-0.2	1.45 V	224	50.8	3.0
3	*5180.00	121.9 PK			1.45 V	224	118.7	3.2
4	*5180.00	111.4 AV			1.45 V	224	108.2	3.2
5	#10360.00	52.0 PK	74.0	-22.0	1.50 V	340	38.9	13.1
6	#10360.00	40.0 AV	54.0	-14.0	1.50 V	340	26.9	13.1
7	15540.00	55.1 PK	74.0	-18.9	1.50 V	200	40.4	14.7
8	15540.00	42.6 AV	54.0	-11.4	1.50 V	200	27.9	14.7

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 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	5142.00	59.4 PK	74.0	-14.6	2.08 H	101	56.4	3.0
2	5142.00	45.2 AV	54.0	-8.8	2.08 H	101	42.2	3.0
3	*5200.00	115.7 PK			2.08 H	101	112.5	3.2
4	*5200.00	105.4 AV			2.08 H	101	102.2	3.2
5	#10400.00	52.1 PK	74.0	-21.9	1.50 H	40	38.7	13.4
6	#10400.00	40.0 AV	54.0	-14.0	1.50 H	40	26.6	13.4
7	15600.00	55.8 PK	74.0	-18.2	1.50 H	231	41.0	14.8
8	15600.00	42.9 AV	54.0	-11.1	1.50 H	231	28.1	14.8
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	5142.00	67.4 PK	74.0	-6.6	1.49 V	129	64.4	3.0
2	5142.00	52.1 AV	54.0	-1.9	1.49 V	129	49.1	3.0
3	*5200.00	124.4 PK			1.49 V	129	121.2	3.2
4	*5200.00	113.7 AV			1.49 V	129	110.5	3.2
5	#10400.00	57.3 PK	74.0	-16.7	3.58 V	355	43.9	13.4
6	#10400.00	44.3 AV	54.0	-9.7	3.58 V	355	30.9	13.4
7	15600.00	57.4 PK	74.0	-16.6	1.50 V	187	42.6	14.8
8	15600.00	44.7 AV	54.0	-9.3	1.50 V	187	29.9	14.8

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	*5240.00	115.7 PK			2.03 H	95	112.6	3.1
2	*5240.00	105.4 AV			2.03 H	95	102.3	3.1
3	5350.00	54.2 PK	74.0	-19.8	2.03 H	95	51.0	3.2
4	5350.00	41.0 AV	54.0	-13.0	2.03 H	95	37.8	3.2
5	#10480.00	52.5 PK	74.0	-21.5	1.53 H	32	39.6	12.9
6	#10480.00	40.4 AV	54.0	-13.6	1.53 H	32	27.5	12.9
7	15720.00	55.9 PK	74.0	-18.1	1.47 H	237	40.9	15.0
8	15720.00	43.0 AV	54.0	-11.0	1.47 H	237	28.0	15.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	124.3 PK			1.50 V	131	121.2	3.1
2	*5240.00	113.4 AV			1.50 V	131	110.3	3.1
3	5350.00	56.0 PK	74.0	-18.0	1.50 V	131	52.8	3.2
4	5350.00	43.0 AV	54.0	-11.0	1.50 V	131	39.8	3.2
5	#10480.00	65.2 PK	74.0	-8.8	2.90 V	159	52.3	12.9
6	#10480.00	51.4 AV	54.0	-2.6	2.90 V	159	38.5	12.9
7	15720.00	56.3 PK	74.0	-17.7	1.45 V	161	41.3	15.0
8	15720.00	44.0 AV	54.0	-10.0	1.45 V	161	29.0	15.0

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.75	54.9 PK	68.2	-13.3	2.04 H	86	50.9	4.0
2	*5745.00	116.9 PK			2.04 H	86	112.9	4.0
3	*5745.00	106.5 AV			2.04 H	86	102.5	4.0
4	#5977.50	55.4 PK	68.2	-12.8	2.04 H	86	50.9	4.5
5	11490.00	59.2 PK	74.0	-14.8	1.50 H	203	45.2	14.0
6	11490.00	46.3 AV	54.0	-7.7	1.50 H	203	32.3	14.0
7	#17235.00	60.1 PK	74.0	-13.9	1.00 H	206	40.4	19.7
8	#17235.00	47.5 AV	54.0	-6.5	1.00 H	206	27.8	19.7
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	#5651.65	62.1 PK	69.4	-7.3	1.75 V	138	58.1	4.0
2	*5745.00	125.7 PK			1.75 V	138	121.7	4.0
3	*5745.00	114.7 AV			1.75 V	138	110.7	4.0
4	#5936.18	59.9 PK	68.2	-8.3	1.75 V	138	55.5	4.4
5	11490.00	66.8 PK	74.0	-7.2	2.94 V	154	52.8	14.0
6	11490.00	53.3 AV	54.0	-0.7	2.94 V	154	39.3	14.0
7	#17235.00	60.9 PK	74.0	-13.1	1.50 V	166	41.2	19.7
8	#17235.00	48.4 AV	54.0	-5.6	1.50 V	166	28.7	19.7

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	#5629.32	55.6 PK	68.2	-12.6	2.04 H	85	51.6	4.0
2	*5785.00	115.7 PK			2.04 H	85	111.7	4.0
3	*5785.00	106.0 AV			2.04 H	85	102.0	4.0
4	#5990.80	55.5 PK	68.2	-12.7	2.04 H	85	51.0	4.5
5	11570.00	58.6 PK	74.0	-15.4	1.54 H	209	44.8	13.8
6	11570.00	46.0 AV	54.0	-8.0	1.54 H	209	32.2	13.8
7	#17355.00	60.3 PK	74.0	-13.7	1.00 H	205	39.9	20.4
8	#17355.00	47.5 AV	54.0	-6.5	1.00 H	205	27.1	20.4
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	#5641.68	60.1 PK	68.2	-8.1	1.75 V	139	56.1	4.0
2	*5785.00	124.4 PK			1.75 V	139	120.4	4.0
3	*5785.00	114.0 AV			1.75 V	139	110.0	4.0
4	#6024.05	58.8 PK	68.2	-9.4	1.75 V	139	54.2	4.6
5	11570.00	67.3 PK	74.0	-6.7	2.85 V	155	53.5	13.8
6	**11570.00**	**53.9 AV**	**54.0**	**-0.1**	**2.85 V**	**155**	**40.1**	**13.8**
7	#17355.00	60.8 PK	74.0	-13.2	1.50 V	198	40.4	20.4
8	#17355.00	48.0 AV	54.0	-6.0	1.50 V	198	27.6	20.4

REMARKS:

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

CHANNEL	TX Channel 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	#5597.98	56.2 PK	68.2	-12.0	2.09 H	85	52.3	3.9
2	*5825.00	116.0 PK			2.09 H	85	112.0	4.0
3	*5825.00	105.9 AV			2.09 H	85	101.9	4.0
4	#5954.23	56.1 PK	68.2	-12.1	2.09 H	85	51.7	4.4
5	11650.00	59.4 PK	74.0	-14.6	1.53 H	207	45.7	13.7
6	11650.00	46.6 AV	54.0	-7.4	1.53 H	207	32.9	13.7
7	#17475.00	59.9 PK	74.0	-14.1	1.04 H	195	39.2	20.7
8	#17475.00	47.5 AV	54.0	-6.5	1.04 H	195	26.8	20.7
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	#5630.27	58.9 PK	68.2	-9.3	1.75 V	141	54.9	4.0
2	*5825.00	123.2 PK			1.75 V	141	119.2	4.0
3	*5825.00	113.3 AV			1.75 V	141	109.3	4.0
4	#5958.50	58.9 PK	68.2	-9.3	1.75 V	141	54.4	4.5
5	11650.00	67.0 PK	74.0	-7.0	2.93 V	152	53.3	13.7
6	11650.00	53.3 AV	54.0	-0.7	2.93 V	152	39.6	13.7
7	#17475.00	60.4 PK	74.0	-13.6	1.50 V	166	39.7	20.7
8	#17475.00	47.8 AV	54.0	-6.2	1.50 V	166	27.1	20.7

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.

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	62.7 PK	74.0	-11.3	1.19 H	325	59.7	3.0
2	5150.00	46.9 AV	54.0	-7.1	1.19 H	325	43.9	3.0
3	*5180.00	113.3 PK			1.19 H	325	110.1	3.2
4	*5180.00	103.3 AV			1.19 H	325	100.1	3.2
5	#10360.00	52.5 PK	74.0	-21.5	1.57 H	31	39.4	13.1
6	#10360.00	40.5 AV	54.0	-13.5	1.57 H	31	27.4	13.1
7	15540.00	55.8 PK	74.0	-18.2	1.48 H	252	41.1	14.7
8	15540.00	42.6 AV	54.0	-11.4	1.48 H	252	27.9	14.7
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	69.7 PK	74.0	-4.3	1.25 V	224	66.7	3.0
2	5150.00	53.8 AV	54.0	-0.2	1.25 V	224	50.8	3.0
3	*5180.00	124.5 PK			1.25 V	224	121.3	3.2
4	*5180.00	112.2 AV			1.25 V	224	109.0	3.2
5	#10360.00	52.7 PK	74.0	-21.3	1.57 V	196	39.6	13.1
6	#10360.00	40.6 AV	54.0	-13.4	1.57 V	196	27.5	13.1
7	15540.00	55.2 PK	74.0	-18.8	1.64 V	164	40.5	14.7
8	15540.00	42.7 AV	54.0	-11.3	1.64 V	164	28.0	14.7

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 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	5145.00	58.2 PK	74.0	-15.8	2.06 H	323	55.2	3.0
2	5145.00	42.5 AV	54.0	-11.5	2.06 H	323	39.5	3.0
3	*5200.00	115.2 PK			2.06 H	323	112.0	3.2
4	*5200.00	105.1 AV			2.06 H	323	101.9	3.2
5	#10400.00	52.5 PK	74.0	-21.5	1.53 H	21	39.1	13.4
6	#10400.00	40.6 AV	54.0	-13.4	1.53 H	21	27.2	13.4
7	15600.00	55.7 PK	74.0	-18.3	1.42 H	243	40.9	14.8
8	15600.00	42.6 AV	54.0	-11.4	1.42 H	243	27.8	14.8
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	5145.00	67.4 PK	74.0	-6.6	1.25 V	224	64.4	3.0
2	5145.00	51.7 AV	54.0	-2.3	1.25 V	224	48.7	3.0
3	*5200.00	126.3 PK			1.25 V	224	123.1	3.2
4	*5200.00	114.2 AV			1.25 V	224	111.0	3.2
5	#10400.00	52.5 PK	74.0	-21.5	1.52 V	166	39.1	13.4
6	#10400.00	40.3 AV	54.0	-13.7	1.52 V	166	26.9	13.4
7	15600.00	56.2 PK	74.0	-17.8	1.65 V	178	41.4	14.8
8	15600.00	43.2 AV	54.0	-10.8	1.65 V	178	28.4	14.8

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	5144.00	54.8 PK	74.0	-19.2	2.03 H	327	51.8	3.0
2	5144.00	41.3 AV	54.0	-12.7	2.03 H	327	38.3	3.0
3	*5240.00	115.4 PK			2.03 H	327	112.3	3.1
4	*5240.00	105.5 AV			2.03 H	327	102.4	3.1
5	5350.00	54.2 PK	74.0	-19.8	2.03 H	327	51.0	3.2
6	5350.00	41.0 AV	54.0	-13.0	2.03 H	327	37.8	3.2
7	#10480.00	52.6 PK	74.0	-21.4	1.55 H	37	39.7	12.9
8	#10480.00	40.2 AV	54.0	-13.8	1.55 H	37	27.3	12.9
9	15720.00	56.0 PK	74.0	-18.0	1.42 H	231	41.0	15.0
10	15720.00	42.9 AV	54.0	-11.1	1.42 H	231	27.9	15.0
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	5144.00	56.6 PK	74.0	-17.4	1.21 V	224	53.6	3.0
2	5144.00	44.2 AV	54.0	-9.8	1.21 V	224	41.2	3.0
3	*5240.00	125.8 PK			1.21 V	224	122.7	3.1
4	*5240.00	113.8 AV			1.21 V	224	110.7	3.1
5	5350.00	56.2 PK	74.0	-17.8	1.21 V	224	53.0	3.2
6	5350.00	43.6 AV	54.0	-10.4	1.21 V	224	40.4	3.2
7	#10480.00	52.8 PK	74.0	-21.2	1.50 V	171	39.9	12.9
8	#10480.00	40.5 AV	54.0	-13.5	1.50 V	171	27.6	12.9
9	15720.00	55.8 PK	74.0	-18.2	1.63 V	175	40.8	15.0
10	15720.00	43.2 AV	54.0	-10.8	1.63 V	175	28.2	15.0

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5611.75	55.7 PK	68.2	-12.5	2.16 H	86	51.8	3.9
2	*5745.00	115.6 PK			2.16 H	86	111.6	4.0
3	*5745.00	104.8 AV			2.16 H	86	100.8	4.0
4	#5927.15	55.7 PK	68.2	-12.5	2.16 H	86	51.3	4.4
5	11490.00	59.2 PK	74.0	-14.8	1.50 H	198	45.2	14.0
6	11490.00	46.4 AV	54.0	-7.6	1.50 H	198	32.4	14.0
7	#17235.00	60.6 PK	74.0	-13.4	1.00 H	207	40.9	19.7
8	#17235.00	48.3 AV	54.0	-5.7	1.00 H	207	28.6	19.7
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	#5611.27	60.4 PK	68.2	-7.8	1.85 V	320	56.5	3.9
2	*5745.00	124.6 PK			1.85 V	320	120.6	4.0
3	*5745.00	113.1 AV			1.85 V	320	109.1	4.0
4	#5933.32	60.0 PK	68.2	-8.2	1.85 V	320	55.6	4.4
5	11490.00	63.6 PK	74.0	-10.4	3.25 V	335	49.6	14.0
6	11490.00	50.0 AV	54.0	-4.0	3.25 V	335	36.0	14.0
7	#17235.00	60.6 PK	74.0	-13.4	1.60 V	211	40.9	19.7
8	#17235.00	47.9 AV	54.0	-6.1	1.60 V	211	28.2	19.7

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	#5592.27	55.4 PK	68.2	-12.8	2.02 H	86	51.5	3.9
2	*5785.00	115.5 PK			2.02 H	86	111.5	4.0
3	*5785.00	104.5 AV			2.02 H	86	100.5	4.0
4	#5968.00	55.8 PK	68.2	-12.4	2.02 H	86	51.3	4.5
5	11570.00	59.0 PK	74.0	-15.0	1.50 H	200	45.2	13.8
6	11570.00	45.9 AV	54.0	-8.1	1.50 H	200	32.1	13.8
7	#17355.00	60.8 PK	74.0	-13.2	1.01 H	210	40.4	20.4
8	#17355.00	48.1 AV	54.0	-5.9	1.01 H	210	27.7	20.4
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	#5650.23	59.4 PK	68.4	-9.0	1.85 V	322	55.4	4.0
2	*5785.00	124.0 PK			1.85 V	322	120.0	4.0
3	*5785.00	112.6 AV			1.85 V	322	108.6	4.0
4	#6013.12	58.8 PK	68.2	-9.4	1.85 V	322	54.3	4.5
5	11570.00	64.0 PK	74.0	-10.0	2.85 V	329	50.2	13.8
6	11570.00	50.5 AV	54.0	-3.5	2.85 V	329	36.7	13.8
7	#17355.00	60.1 PK	74.0	-13.9	1.55 V	201	39.7	20.4
8	#17355.00	47.8 AV	54.0	-6.2	1.55 V	201	27.4	20.4

REMARKS:

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

CHANNEL	TX Channel 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	#5611.27	54.7 PK	68.2	-13.5	2.00 H	85	50.8	3.9
2	*5825.00	115.3 PK			2.00 H	85	111.3	4.0
3	*5825.00	104.2 AV			2.00 H	85	100.2	4.0
4	#5971.32	55.2 PK	68.2	-13.0	2.00 H	85	50.7	4.5
5	11650.00	59.8 PK	74.0	-14.2	1.54 H	192	46.1	13.7
6	11650.00	46.4 AV	54.0	-7.6	1.54 H	192	32.7	13.7
7	#17475.00	59.9 PK	74.0	-14.1	1.01 H	215	39.2	20.7
8	#17475.00	47.5 AV	54.0	-6.5	1.01 H	215	26.8	20.7
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	#5618.40	59.5 PK	68.2	-8.7	2.01 V	352	55.6	3.9
2	*5825.00	123.9 PK			2.01 V	352	119.9	4.0
3	*5825.00	112.5 AV			2.01 V	352	108.5	4.0
4	#5986.05	59.3 PK	68.2	-8.9	2.01 V	352	54.8	4.5
5	11650.00	64.1 PK	74.0	-9.9	2.85 V	330	50.4	13.7
6	11650.00	50.4 AV	54.0	-3.6	2.85 V	330	36.7	13.7
7	#17475.00	60.3 PK	74.0	-13.7	1.62 V	195	39.6	20.7
8	#17475.00	47.6 AV	54.0	-6.4	1.62 V	195	26.9	20.7

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.

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	5148.00	59.3 PK	74.0	-14.7	1.97 H	78	56.3	3.0
2	5148.00	46.8 AV	54.0	-7.2	1.97 H	78	43.8	3.0
3	*5190.00	105.6 PK			1.97 H	78	102.4	3.2
4	*5190.00	96.9 AV			1.97 H	78	93.7	3.2
5	#10380.00	52.6 PK	74.0	-21.4	1.53 H	28	39.4	13.2
6	#10380.00	40.7 AV	54.0	-13.3	1.53 H	28	27.5	13.2
7	15570.00	55.4 PK	74.0	-18.6	1.46 H	221	40.7	14.7
8	15570.00	42.6 AV	54.0	-11.4	1.46 H	221	27.9	14.7
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	5148.00	66.2 PK	74.0	-7.8	1.24 V	223	63.2	3.0
2	5148.00	53.6 AV	54.0	-0.4	1.24 V	223	50.6	3.0
3	*5190.00	114.2 PK			1.24 V	223	111.0	3.2
4	*5190.00	105.2 AV			1.24 V	223	102.0	3.2
5	#10380.00	51.8 PK	74.0	-22.2	1.52 V	168	38.6	13.2
6	#10380.00	39.4 AV	54.0	-14.6	1.52 V	168	26.2	13.2
7	15570.00	55.8 PK	74.0	-18.2	1.65 V	175	41.1	14.7
8	15570.00	42.0 AV	54.0	-12.0	1.65 V	175	27.3	14.7

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5148.00	58.8 PK	74.0	-15.2	1.93 H	80	55.8	3.0
2	5148.00	47.1 AV	54.0	-6.9	1.93 H	80	44.1	3.0
3	*5230.00	114.5 PK			1.93 H	80	111.4	3.1
4	*5230.00	105.8 AV			1.93 H	80	102.7	3.1
5	5350.00	55.8 PK	74.0	-18.2	1.93 H	80	52.6	3.2
6	5350.00	41.3 AV	54.0	-12.7	1.93 H	80	38.1	3.2
7	#10460.00	52.8 PK	74.0	-21.2	1.48 H	33	39.8	13.0
8	#10460.00	40.8 AV	54.0	-13.2	1.48 H	33	27.8	13.0
9	15690.00	56.5 PK	74.0	-17.5	1.46 H	236	41.4	15.1
10	15690.00	43.3 AV	54.0	-10.7	1.46 H	236	28.2	15.1
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	5148.00	65.6 PK	74.0	-8.4	1.24 V	223	62.6	3.0
2	**5148.00**	**53.9 AV**	**54.0**	**-0.1**	**1.24 V**	**223**	**50.9**	**3.0**
3	*5230.00	123.0 PK			1.24 V	223	119.9	3.1
4	*5230.00	114.0 AV			1.24 V	223	110.9	3.1
5	5350.00	61.0 PK	74.0	-13.0	1.24 V	223	57.8	3.2
6	5350.00	47.6 AV	54.0	-6.4	1.24 V	223	44.4	3.2
7	#10460.00	51.5 PK	74.0	-22.5	1.52 V	182	38.5	13.0
8	#10460.00	39.4 AV	54.0	-14.6	1.52 V	182	26.4	13.0
9	15690.00	55.6 PK	74.0	-18.4	1.60 V	168	40.5	15.1
10	15690.00	42.8 AV	54.0	-11.2	1.60 V	168	27.7	15.1

REMARKS:

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

CHANNEL	TX Channel 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	#5649.75	56.9 PK	68.2	-11.3	2.05 H	86	52.9	4.0
2	*5755.00	113.0 PK			2.05 H	86	109.0	4.0
3	*5755.00	102.8 AV			2.05 H	86	98.8	4.0
4	#6022.15	55.5 PK	68.2	-12.7	2.05 H	86	50.9	4.6
5	11510.00	59.3 PK	74.0	-14.7	1.56 H	212	45.3	14.0
6	11510.00	46.2 AV	54.0	-7.8	1.56 H	212	32.2	14.0
7	#17265.00	60.1 PK	74.0	-13.9	1.00 H	220	40.2	19.9
8	#17265.00	47.5 AV	54.0	-6.5	1.00 H	220	27.6	19.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5638.82	63.1 PK	68.2	-5.1	1.79 V	320	59.1	4.0
2	*5755.00	121.1 PK			1.79 V	320	117.1	4.0
3	*5755.00	111.9 AV			1.79 V	320	107.9	4.0
4	#5986.05	59.1 PK	68.2	-9.1	1.79 V	320	54.6	4.5
5	11510.00	60.5 PK	74.0	-13.5	4.00 V	338	46.5	14.0
6	11510.00	50.2 AV	54.0	-3.8	4.00 V	338	36.2	14.0
7	#17265.00	60.2 PK	74.0	-13.8	1.66 V	208	40.3	19.9
8	#17265.00	47.9 AV	54.0	-6.1	1.66 V	208	28.0	19.9

REMARKS:

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

CHANNEL	TX Channel 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	#5608.90	54.7 PK	68.2	-13.5	2.00 H	85	50.8	3.9
2	*5795.00	112.9 PK			2.00 H	85	108.9	4.0
3	*5795.00	102.6 AV			2.00 H	85	98.6	4.0
4	#5935.23	56.1 PK	68.2	-12.1	2.00 H	85	51.7	4.4
5	11590.00	59.1 PK	74.0	-14.9	1.49 H	210	45.5	13.6
6	11590.00	46.2 AV	54.0	-7.8	1.49 H	210	32.6	13.6
7	#17385.00	60.0 PK	74.0	-14.0	1.00 H	191	39.5	20.5
8	#17385.00	47.5 AV	54.0	-6.5	1.00 H	191	27.0	20.5
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	#5639.30	58.9 PK	68.2	-9.3	1.79 V	320	54.9	4.0
2	*5795.00	120.1 PK			1.79 V	320	116.1	4.0
3	*5795.00	110.6 AV			1.79 V	320	106.6	4.0
4	#5923.35	61.0 PK	69.4	-8.4	1.79 V	320	56.6	4.4
5	11590.00	61.4 PK	74.0	-12.6	4.00 V	341	47.8	13.6
6	11590.00	50.5 AV	54.0	-3.5	4.00 V	341	36.9	13.6
7	#17385.00	60.0 PK	74.0	-14.0	1.71 V	192	39.5	20.5
8	#17385.00	47.8 AV	54.0	-6.2	1.71 V	192	27.3	20.5

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 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	5148.00	59.1 PK	74.0	-14.9	1.98 H	71	56.1	3.0
2	5148.00	46.5 AV	54.0	-7.5	1.98 H	71	43.5	3.0
3	*5210.00	100.9 PK			1.98 H	71	97.7	3.2
4	*5210.00	92.4 AV			1.98 H	71	89.2	3.2
5	5350.00	55.0 PK	74.0	-19.0	1.98 H	71	51.8	3.2
6	5350.00	41.8 AV	54.0	-12.2	1.98 H	71	38.6	3.2
7	#10420.00	52.7 PK	74.0	-21.3	1.49 H	19	39.5	13.2
8	#10420.00	40.8 AV	54.0	-13.2	1.49 H	19	27.6	13.2
9	15630.00	55.6 PK	74.0	-18.4	1.47 H	242	40.7	14.9
10	15630.00	42.5 AV	54.0	-11.5	1.47 H	242	27.6	14.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5148.00	66.0 PK	74.0	-8.0	1.25 V	224	63.0	3.0
2	5148.00	53.4 AV	54.0	-0.6	1.25 V	224	50.4	3.0
3	*5210.00	109.7 PK			1.25 V	224	106.5	3.2
4	*5210.00	100.8 AV			1.25 V	224	97.6	3.2
5	5350.00	57.3 PK	74.0	-16.7	1.25 V	224	54.1	3.2
6	5350.00	45.1 AV	54.0	-8.9	1.25 V	224	41.9	3.2
7	#10420.00	51.8 PK	74.0	-22.2	1.50 V	216	38.6	13.2
8	#10420.00	40.1 AV	54.0	-13.9	1.50 V	216	26.9	13.2
9	15630.00	55.1 PK	74.0	-18.9	1.50 V	200	40.2	14.9
10	15630.00	42.3 AV	54.0	-11.7	1.50 V	200	27.4	14.9

REMARKS:

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

CHANNEL	TX Channel 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	#5629.80	60.4 PK	68.2	-7.8	1.97 H	85	56.4	4.0
2	*5775.00	105.3 PK			1.97 H	85	101.3	4.0
3	*5775.00	95.6 AV			1.97 H	85	91.6	4.0
4	#5935.23	57.1 PK	68.2	-11.1	1.97 H	85	52.7	4.4
5	11550.00	52.1 PK	74.0	-21.9	1.53 H	216	38.2	13.9
6	11550.00	40.1 AV	54.0	-13.9	1.53 H	216	26.2	13.9
7	#17325.00	59.5 PK	74.0	-14.5	1.00 H	220	39.3	20.2
8	#17325.00	47.3 AV	54.0	-6.7	1.00 H	220	27.1	20.2
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	#5637.87	67.8 PK	68.2	-0.4	1.79 V	321	63.8	4.0
2	*5775.00	114.1 PK			1.79 V	321	110.1	4.0
3	*5775.00	104.2 AV			1.79 V	321	100.2	4.0
4	#5922.40	64.0 PK	70.1	-6.1	1.79 V	321	59.6	4.4
5	11550.00	57.2 PK	74.0	-16.8	4.00 V	340	43.3	13.9
6	11550.00	45.4 AV	54.0	-8.6	4.00 V	340	31.5	13.9
7	#17325.00	60.4 PK	74.0	-13.6	1.77 V	195	40.2	20.2
8	#17325.00	47.9 AV	54.0	-6.1	1.77 V	195	27.7	20.2

REMARKS:

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

802.11ac (VHT80+80)

CHANNEL	TX Channel 42+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	5150.00	62.3 PK	74.0	-11.7	1.98 H	80	59.3	3.0
2	5150.00	46.1 AV	54.0	-7.9	1.98 H	80	43.1	3.0
3	*5210.00	106.3 PK			1.98 H	80	103.1	3.2
4	*5210.00	96.4 AV			1.98 H	80	93.2	3.2
5	5350.00	53.8 PK	74.0	-20.2	1.98 H	80	50.6	3.2
6	5350.00	42.8 AV	54.0	-11.2	1.98 H	80	39.6	3.2
7	#5622.77	63.6 PK	68.2	-4.6	2.31 H	105	59.8	3.8
8	*5775.00	103.6 PK			2.31 H	105	99.6	4.0
9	*5775.00	92.9 AV			2.31 H	105	88.9	4.0
10	#5939.40	63.7 PK	68.2	-4.5	2.31 H	105	59.4	4.3
11	#10420.00	52.0 PK	74.0	-22.0	1.54 H	15	38.8	13.2
12	#10420.00	40.3 AV	54.0	-13.7	1.54 H	15	27.1	13.2
13	11550.00	60.1 PK	74.0	-13.9	1.03 H	220	46.2	13.9
14	11550.00	47.5 AV	54.0	-6.5	1.03 H	220	33.6	13.9
15	15630.00	55.7 PK	74.0	-18.3	1.49 H	237	40.8	14.9
16	15630.00	42.9 AV	54.0	-11.1	1.49 H	237	28.0	14.9
17	#17325.00	56.1 PK	74.0	-17.9	2.34 H	111	35.9	20.2
18	#17325.00	44.1 AV	54.0	-9.9	2.34 H	111	23.9	20.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.0 PK	74.0	-5.0	1.00 V	60	66.0	3.0
2	5150.00	52.9 AV	54.0	-1.1	1.00 V	60	49.9	3.0
3	*5210.00	113.1 PK			1.00 V	60	109.9	3.2
4	*5210.00	102.6 AV			1.00 V	60	99.4	3.2
5	5350.00	60.8 PK	74.0	-13.2	1.00 V	60	57.6	3.2
6	5350.00	49.6 AV	54.0	-4.4	1.00 V	60	46.4	3.2
7	#5629.34	64.3 PK	68.2	-3.9	2.55 V	162	60.5	3.8
8	*5775.00	110.4 PK			2.55 V	162	106.4	4.0
9	*5775.00	99.1 AV			2.55 V	162	95.1	4.0
10	#5927.71	62.0 PK	68.2	-6.2	2.55 V	162	57.7	4.3
11	#10420.00	53.7 PK	74.0	-20.3	1.60 V	158	40.5	13.2
12	#10420.00	40.8 AV	54.0	-13.2	1.60 V	158	27.6	13.2
13	11550.00	53.7 PK	74.0	-20.3	3.95 V	360	39.8	13.9
14	11550.00	40.5 AV	54.0	-13.5	3.95 V	360	26.6	13.9
15	15630.00	55.2 PK	74.0	-18.8	1.75 V	144	40.3	14.9
16	15630.00	42.5 AV	54.0	-11.5	1.75 V	144	27.6	14.9
17	#17325.00	60.0 PK	74.0	-14.0	1.78 V	196	39.8	20.2
18	#17325.00	47.7 AV	54.0	-6.3	1.78 V	196	27.5	20.2

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.

Below 1GHz Data:

802.11a

CHANNEL	TX Channel 157	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	93.51	36.1 QP	43.5	-7.4	1.45 H	301	50.0	-13.9
2	252.12	42.2 QP	46.0	-3.8	1.24 H	301	51.6	-9.4
3	287.25	41.1 QP	46.0	-4.9	1.13 H	88	48.8	-7.7
4	375.14	39.6 QP	46.0	-6.4	1.17 H	311	45.1	-5.5
5	875.12	39.4 QP	46.0	-6.6	1.87 H	99	35.7	3.7
6	904.11	42.3 QP	46.0	-3.7	1.88 H	98	37.9	4.4
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	30.12	35.3 QP	40.0	-4.7	1.42 V	241	45.1	-9.8
2	63.12	35.8 QP	40.0	-4.2	1.64 V	100	45.0	-9.2
3	236.12	39.0 QP	46.0	-7.0	1.34 V	301	49.2	-10.2
4	375.14	38.8 QP	46.0	-7.2	1.45 V	301	44.3	-5.5
5	625.12	38.2 QP	46.0	-7.8	1.30 V	241	37.8	0.4
6	897.61	41.2 QP	46.0	-4.8	1.24 V	222	36.9	4.3

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 20, 2016	June 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

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

4.2.3 Test Procedure

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

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

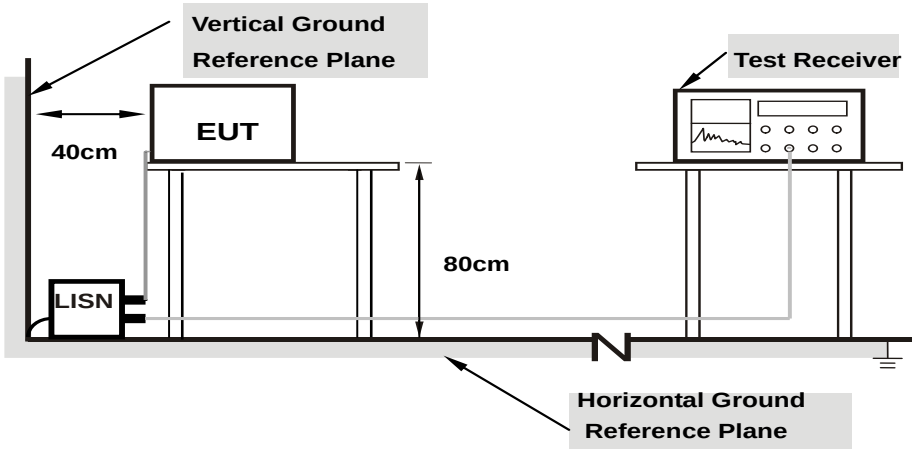
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

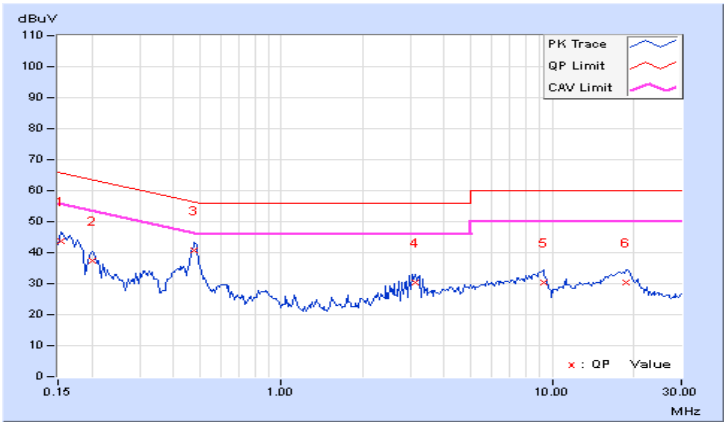
4.2.7 Test Results

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

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	10.20	33.65	22.02	43.85	32.22	65.79	55.79	-21.94	-23.57
2	0.20078	10.20	27.10	15.38	37.30	25.58	63.58	53.58	-26.28	-28.00
3	**0.47813**	**10.25**	**30.39**	**25.85**	**40.64**	**36.10**	**56.37**	**46.37**	**-15.73**	**-10.27**
4	3.14453	10.30	19.89	11.38	30.19	21.68	56.00	46.00	-25.81	-24.32
5	9.28125	10.68	19.56	14.85	30.24	25.53	60.00	50.00	-29.76	-24.47
6	18.68750	11.59	18.60	13.77	30.19	25.36	60.00	50.00	-29.81	-24.64

REMARKS:

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

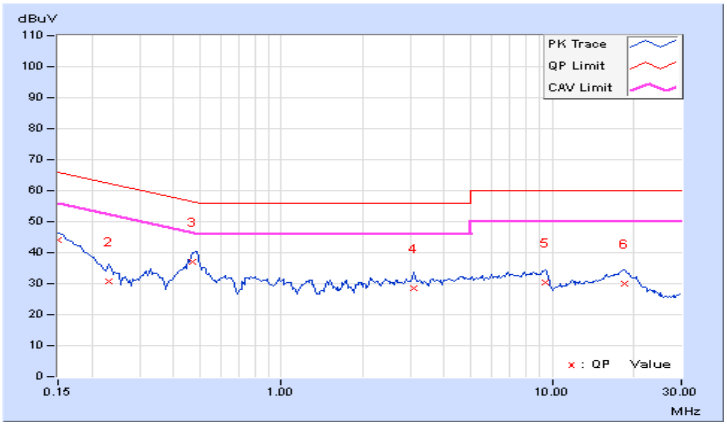


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	33.74	21.01	43.93	31.20	66.00	56.00	-22.07	-24.80
2	0.23203	10.18	20.38	9.96	30.56	20.14	62.38	52.38	-31.82	-32.24
3	0.47031	10.24	26.86	22.15	37.10	32.39	56.51	46.51	-19.41	-14.12
4	3.09375	10.26	18.26	12.46	28.52	22.72	56.00	46.00	-27.48	-23.28
5	9.45703	10.59	19.66	15.48	30.25	26.07	60.00	50.00	-29.75	-23.93
6	18.43359	11.29	18.66	13.77	29.95	25.06	60.00	50.00	-30.05	-24.94

REMARKS:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

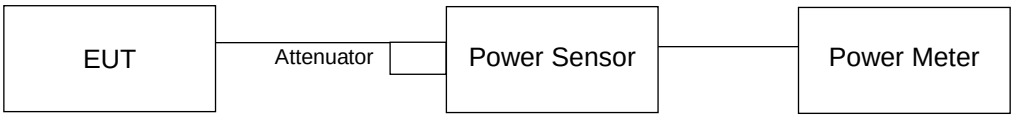
Note: This device can support different category application which switched by access point mode and client mode by software.

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	0824006	May 26, 2016	May 25, 2017
Power sensor Anritsu	MA2411B	0738172	May 26, 2016	May 25, 2017

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. Tested Date: Oct. 18, 2016 to Jan. 13, 2017

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

Master Mode

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				
36	5180	20.30	21.02	19.85	19.63	422.064	26.25	30.00	Pass
40	5200	22.40	23.37	21.94	22.04	707.321	28.50	30.00	Pass
48	5240	22.49	23.10	21.72	22.15	694.246	28.42	30.00	Pass
149	5745	22.91	23.61	23.83	23.62	896.739	29.53	30.00	Pass
157	5785	23.06	23.81	24.11	23.64	931.576	29.69	30.00	Pass
165	5825	22.68	23.66	23.81	23.67	890.872	29.50	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				
36	5180	20.95	21.65	20.55	20.45	495.087	26.95	30.00	Pass
40	5200	22.33	23.27	21.89	22.13	701.156	28.46	30.00	Pass
48	5240	22.34	22.93	21.81	22.53	698.498	28.44	30.00	Pass
149	5745	22.76	23.57	23.64	23.48	870.359	29.40	30.00	Pass
157	5785	22.55	23.51	23.51	23.52	853.568	29.31	30.00	Pass
165	5825	22.43	23.19	23.50	22.96	805.003	29.06	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				
38	5190	14.99	16.01	14.63	14.57	129.134	21.11	30.00	Pass
46	5230	22.58	23.11	21.84	22.35	710.326	28.51	30.00	Pass
151	5755	22.76	23.72	23.84	23.47	888.738	29.49	30.00	Pass
159	5795	22.61	23.67	23.81	23.49	878.992	29.44	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				
42	5210	13.75	14.66	13.17	13.52	96.196	19.83	30.00	Pass
155	5775	18.72	19.81	20.06	19.65	363.84	25.61	30.00	Pass

802.11ac (VHT80+80)

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				
42 +155	5210	19.81	20.51	-	-	208.179	23.18	30.00	Pass
	5775	-	-	20.06	19.65	193.648	22.87	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				
36	5180	20.95	21.65	20.55	20.45	495.087	26.95	28.87	Pass
40	5200	22.33	23.27	21.89	22.13	701.156	28.46	28.87	Pass
48	5240	22.34	22.93	21.81	22.53	698.498	28.44	28.87	Pass
149	5745	21.57	22.70	22.62	22.47	689.172	28.38	28.87	Pass
157	5785	21.49	22.70	22.66	22.51	689.878	28.39	28.87	Pass

NOTE: Directional gain = 7.13dBi > 6dBi, so the power limit shall be reduced to 30-(7.13-6) = 28.87dBm.

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				
38	5190	14.99	16.01	14.63	14.57	129.134	21.11	28.87	Pass
46	5230	22.58	23.11	21.84	22.35	710.326	28.51	28.87	Pass
151	5755	21.43	22.52	22.76	22.61	688.833	28.38	28.87	Pass
159	5795	21.77	22.94	23.07	23.01	749.857	28.75	28.87	Pass

NOTE: Directional gain = 7.13dBi > 6dBi, so the power limit shall be reduced to 30-(7.13-6) = 28.87dBm.

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				
42	5210	13.75	14.66	13.17	13.52	96.196	19.83	28.87	Pass
155	5775	18.72	19.81	20.06	19.65	363.84	25.61	28.87	Pass

NOTE: Directional gain = 7.13dBi > 6dBi, so the power limit shall be reduced to 30-(7.13-6) = 28.87dBm.

802.11ac (VHT80+80)

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				
42+155	5210	19.81	20.51	-	-	208.179	23.18	29.99	Pass
	5775	-	-	20.06	19.65	193.648	22.87	29.99	Pass

NOTE: Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power limit shall be reduced to 30-(6.01-6) = 29.99dBm.

Client Mode

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				
36	5180	16.43	17.76	16.04	16.13	184.857	22.67	24.00	Pass
40	5200	16.32	17.63	15.97	16.35	183.487	22.64	24.00	Pass
48	5240	16.54	17.17	15.84	16.82	183.656	22.64	24.00	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				
36	5180	16.30	17.58	15.82	15.90	177.037	22.48	24.00	Pass
40	5200	16.22	17.47	15.74	16.07	175.681	22.45	24.00	Pass
48	5240	16.44	16.99	15.60	16.62	176.286	22.46	24.00	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				
38	5190	14.99	16.01	14.63	14.57	129.134	21.11	24.00	Pass
46	5230	17.34	18.72	17.04	18.41	248.598	23.95	24.00	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				
42	5210	13.75	14.66	13.17	13.52	96.196	19.83	24.00	Pass

802.11ac (VHT80+80)

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				
42+155	5210	19.81	20.51	-	-	208.179	23.18	24.00	Pass
	5775	-	-	20.06	19.65	193.648	22.87	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				
36	5180	16.30	17.58	15.82	15.90	177.037	22.48	22.87	Pass
40	5200	16.22	17.47	15.74	16.07	175.681	22.45	22.87	Pass
48	5240	16.44	16.99	15.60	16.62	176.286	22.46	22.87	Pass

NOTE: Directional gain = 7.13dBi > 6dBi, so the power limit shall be reduced to 24-(7.13-6) = 22.87dBm.

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				
38	5190	16.34	17.61	15.83	16.23	180.988	22.58	22.87	Pass
46	5230	16.38	17.28	15.59	16.61	178.945	22.53	22.87	Pass

NOTE: Directional gain = 7.13dBi > 6dBi, so the power limit shall be reduced to 24-(7.13-6) = 22.87dBm.

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				
42	5210	13.75	14.66	13.17	13.52	96.196	19.83	22.87	Pass

NOTE: Directional gain = 7.13dBi > 6dBi, so the power limit shall be reduced to 24-(7.13-6) = 22.87dBm.

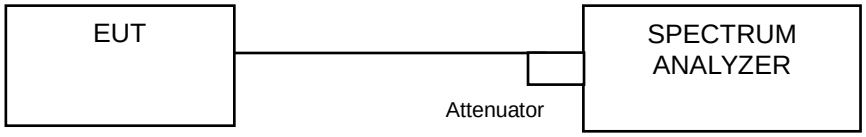
802.11ac (VHT80+80)

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				
42+155	5210	19.81	20.51	-	-	208.179	23.18	23.99	Pass
	5775	-	-	20.06	19.65	193.648	22.87	29.99	Pass

NOTE: Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power limit shall be reduced to 24-(6.01-6) = 23.99dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017

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. Tested Date: Oct. 18, 2016 to Jan. 13, 2017

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

Master Mode

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
36	5180	16.56	16.44	16.56	16.44
40	5200	16.56	16.56	16.44	16.44
48	5240	16.56	16.44	16.44	16.44
149	5745	16.56	16.56	16.56	16.56
157	5785	16.56	16.56	16.68	16.56
165	5825	16.68	16.44	16.68	16.44

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
36	5180	17.64	17.64	17.64	17.76
40	5200	17.76	17.64	17.64	17.64
48	5240	17.76	17.64	17.76	17.64
149	5745	17.76	17.64	17.64	17.76
157	5785	17.64	17.76	17.76	17.64
165	5825	17.76	17.76	17.76	17.76

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
38	5190	36.24	36.48	36.24	36.24
46	5230	36.24	36.24	36.24	36.24
151	5755	36.24	36.24	36.24	36.48
159	5795	36.72	36.24	36.24	36.24

802.11ac (VHT80)

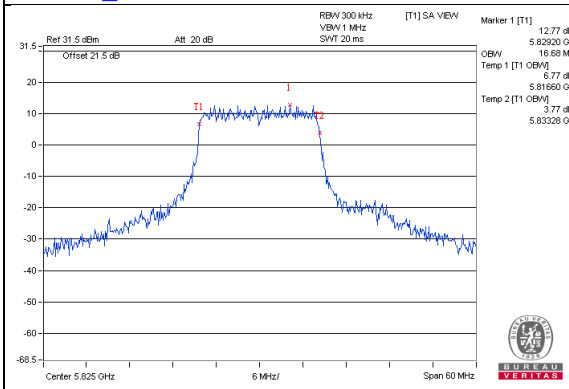
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
42	5210	76.32	76.32	75.84	75.84
155	5775	75.36	76.32	76.32	76.32

802.11ac (VHT80+80)

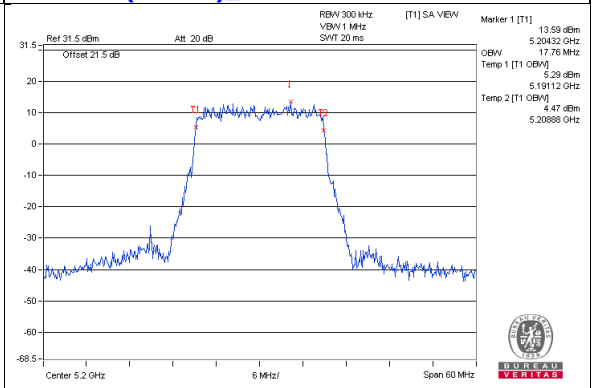
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
42+155	5210	76.32	76.32	-	-
	5775	-	-	75.84	76.32

Spectrum Plot of Worst Value

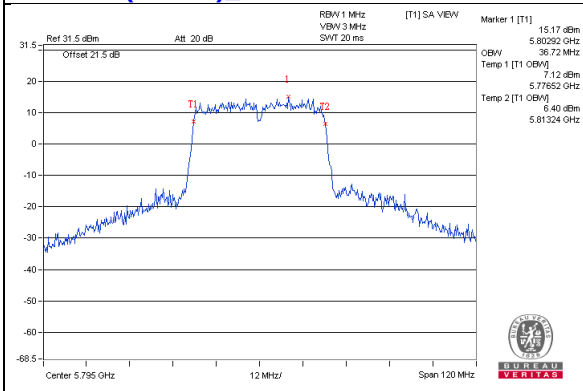
802.11a_Chain0 / CH165



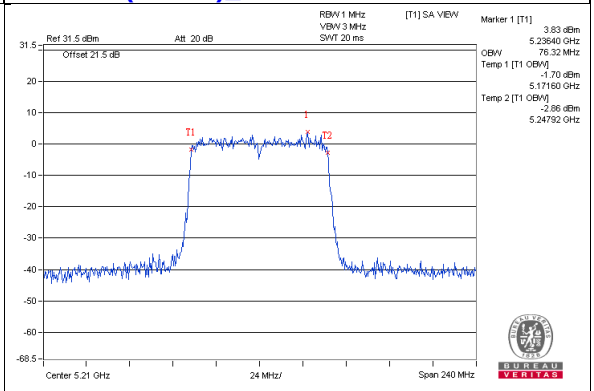
802.11ac (VHT20)_Chain0 / CH40



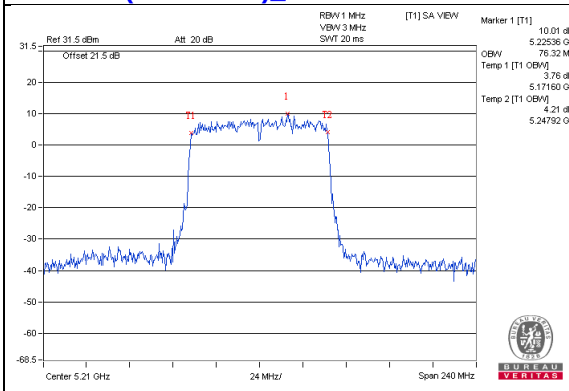
802.11ac (VHT40)_Chain0 / CH159



802.11ac (VHT80)_Chain0 / CH42

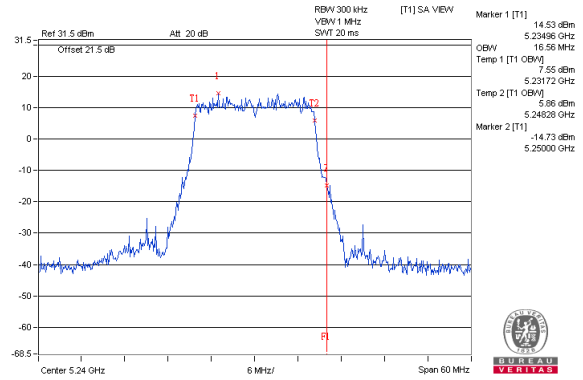


802.11ac (VHT80+80)_Chain0 / CH42

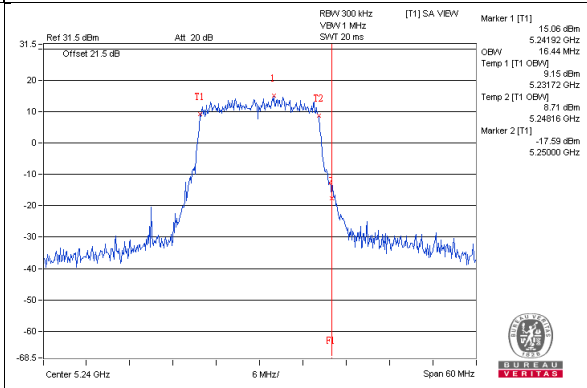


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

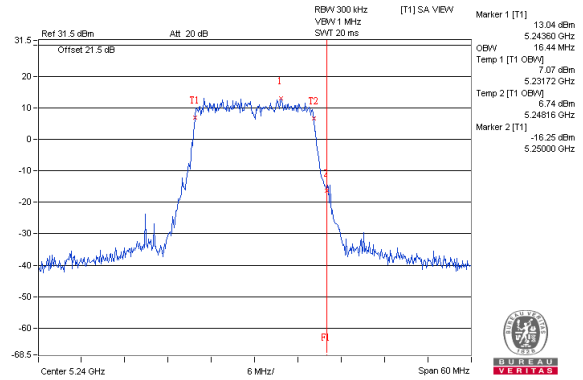
802.11a_Chain0 / CH48



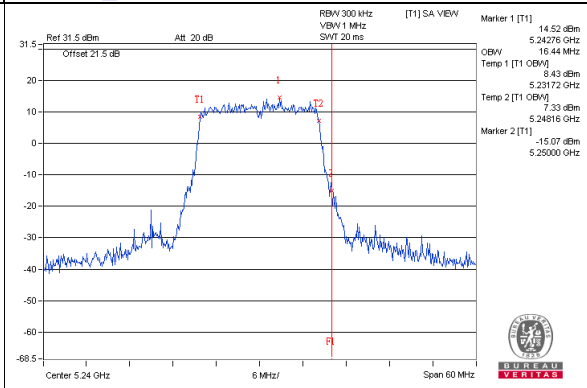
802.11a_Chain1 / CH48



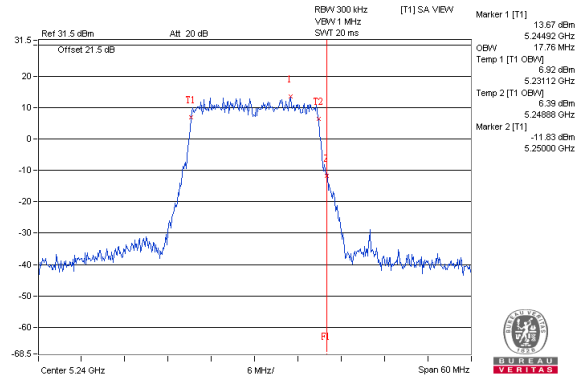
802.11a_Chain2 / CH48



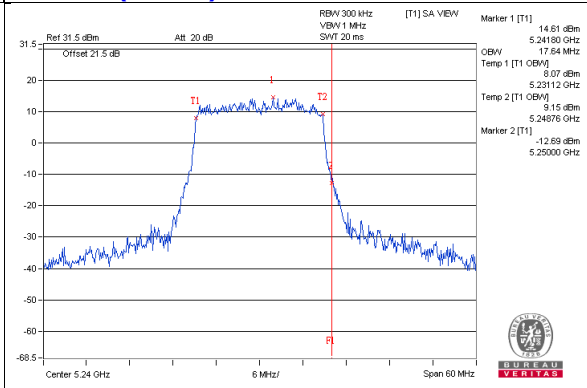
802.11a_Chain3 / CH48



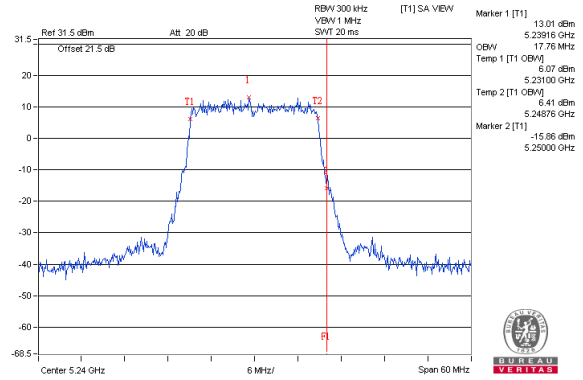
802.11ac(VHT20)_Chain0 / CH48



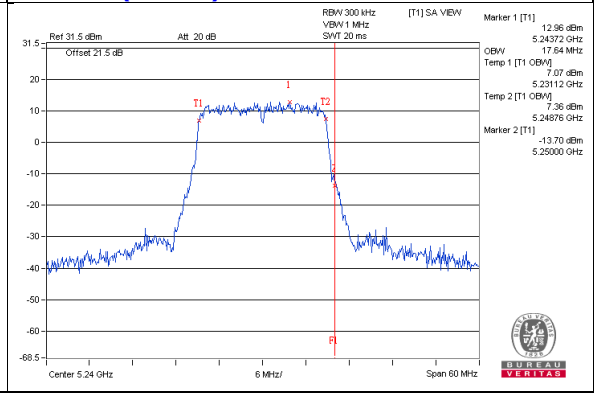
802.11ac(VHT20)_Chain1 / CH48



802.11ac(VHT20)_Chain2 / CH48

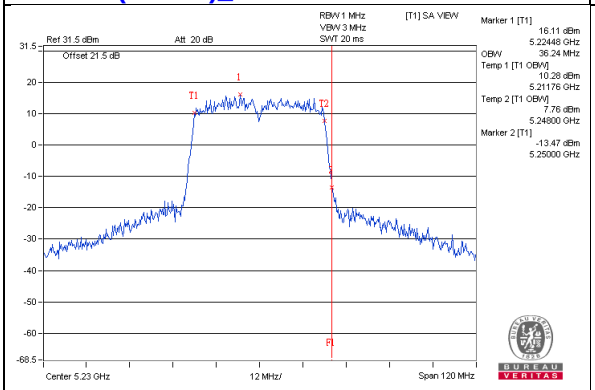


802.11ac(VHT20)_Chain3 / CH48

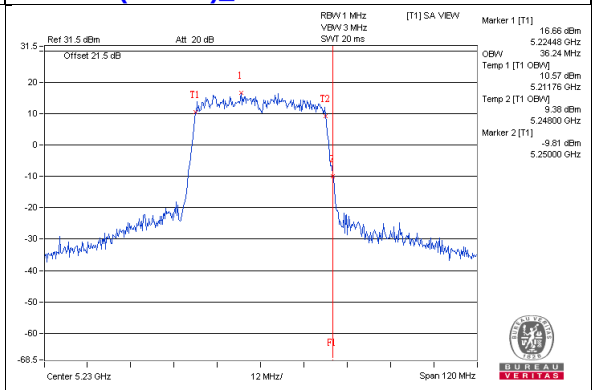


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

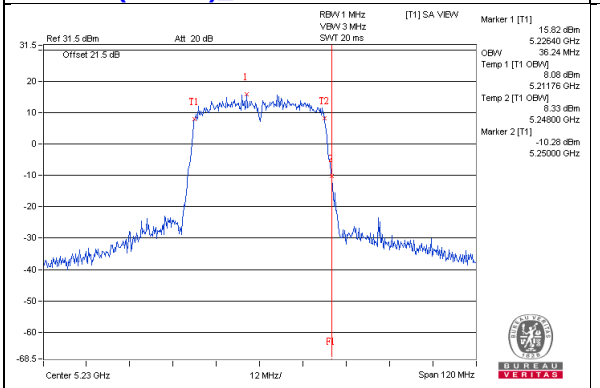
802.11ac(VHT40)_Chain0 / CH46



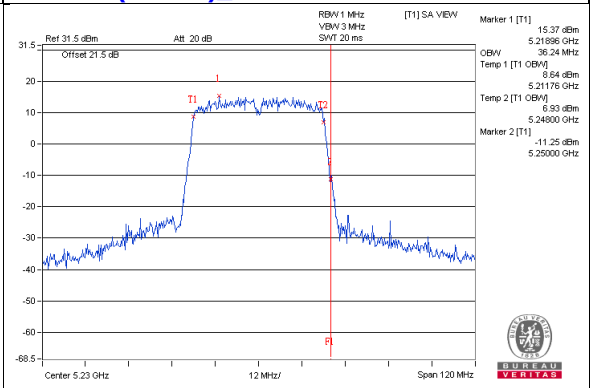
802.11ac(VHT40)_Chain1 / CH46



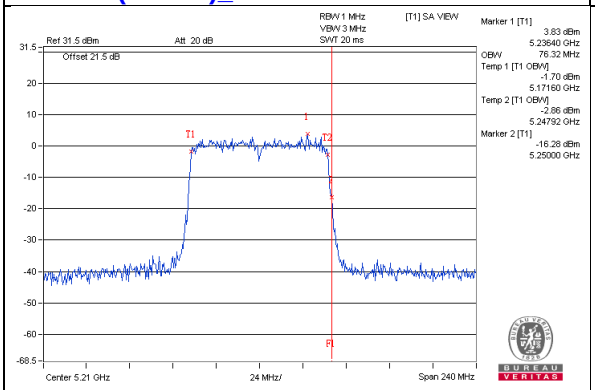
802.11ac(VHT40)_Chain2 / CH46



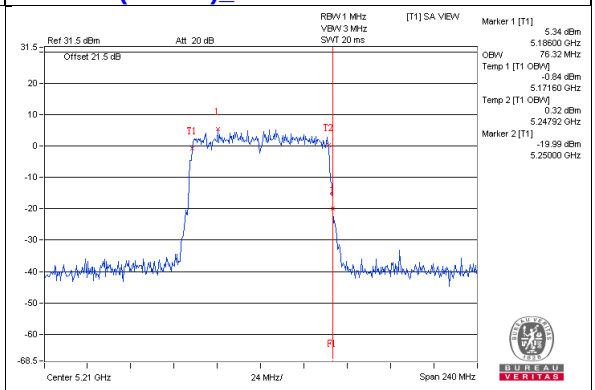
802.11ac(VHT40)_Chain3 / CH46



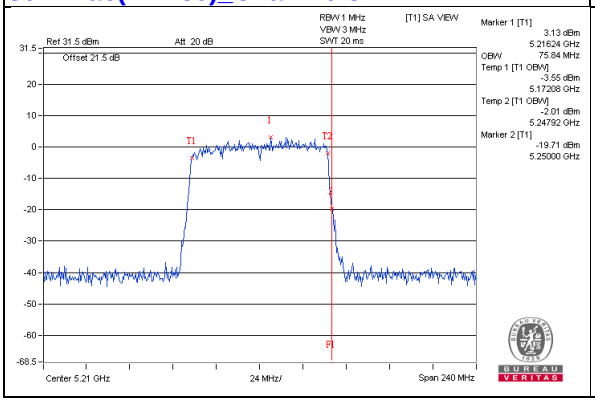
802.11ac(VHT80)_Chain0 / CH42



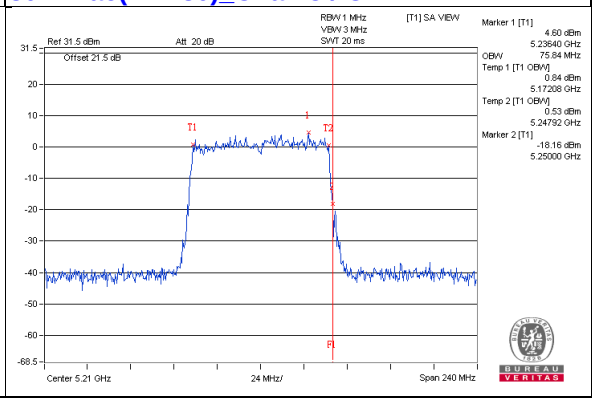
802.11ac(VHT80)_Chain1 / CH42



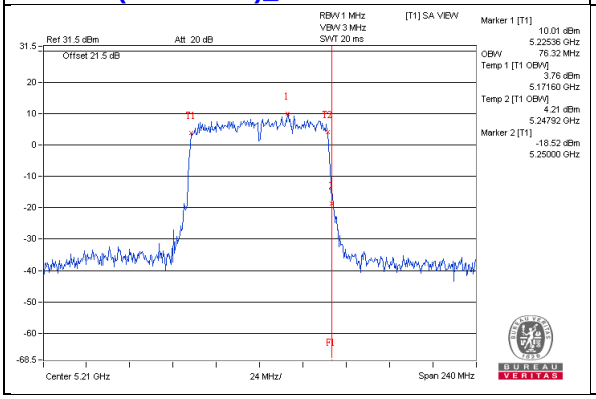
802.11ac(VHT80)_Chain2 / CH42



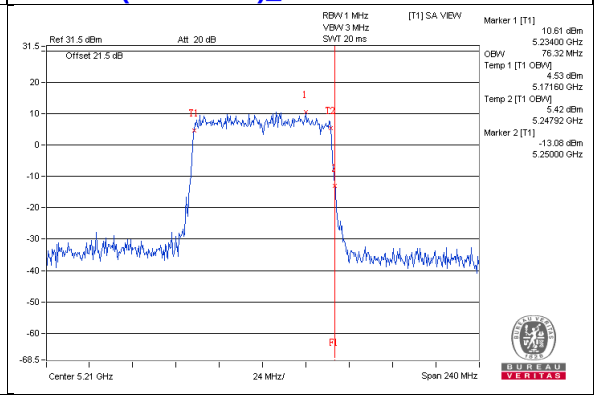
802.11ac(VHT80)_Chain3 / CH42



802.11ac(VHT80+80)_Chain0 / CH42

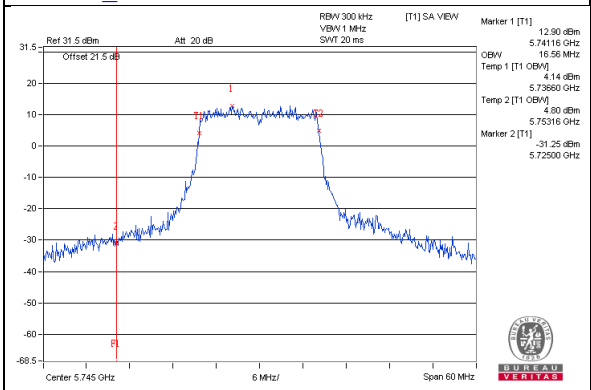


802.11ac(VHT80+80)_Chain1 / CH42

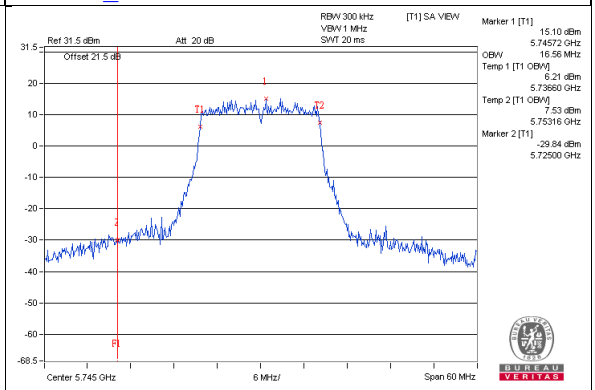


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

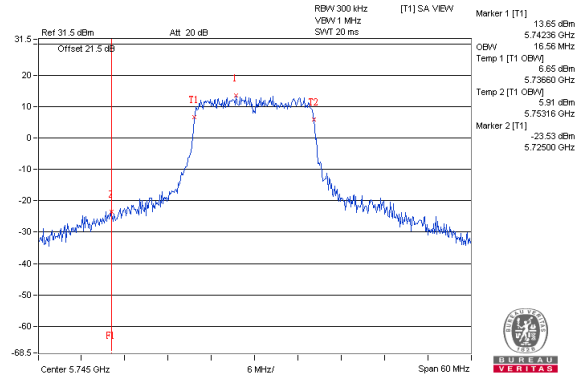
802.11a_Chain0 / CH149



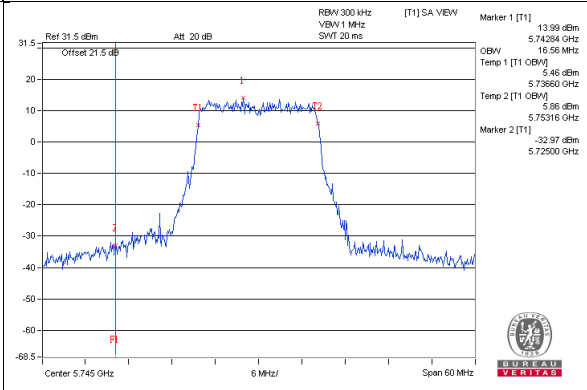
802.11a_Chain1 / CH149



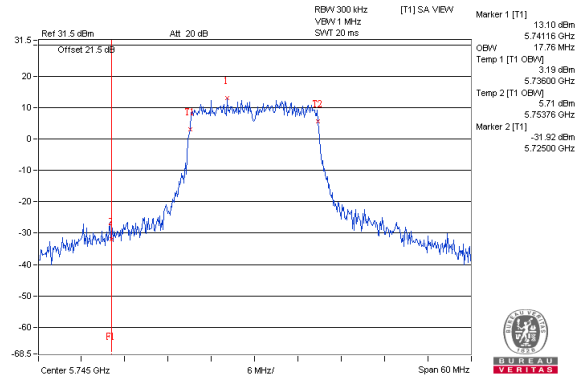
802.11a_Chain2 / CH149



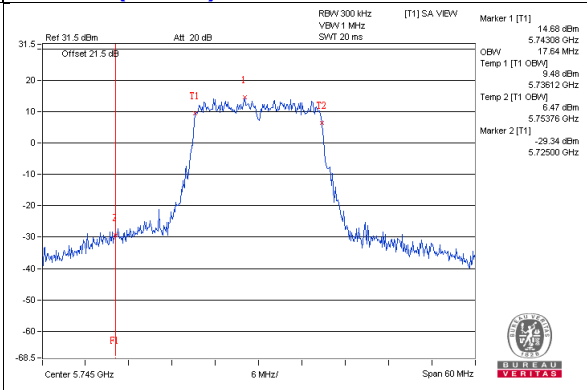
802.11a_Chain3 / CH149



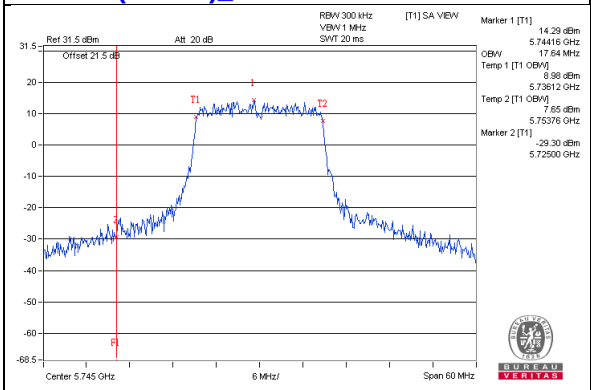
802.11ac(VHT20)_Chain0 / CH149



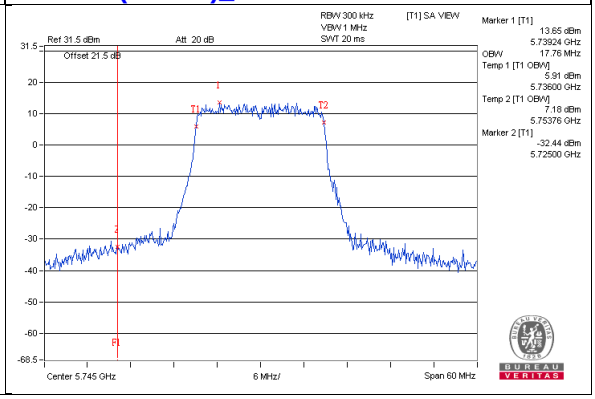
802.11ac(VHT20)_Chain1 / CH149



802.11ac(VHT20)_Chain2 / CH149

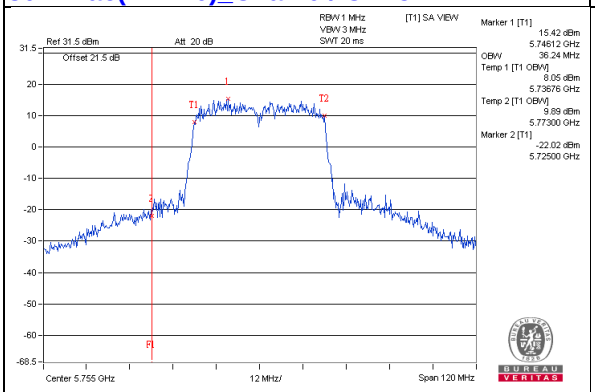


802.11ac(VHT20)_Chain3 / CH149

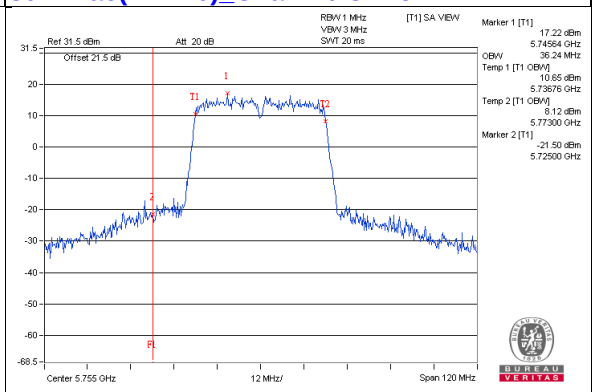


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

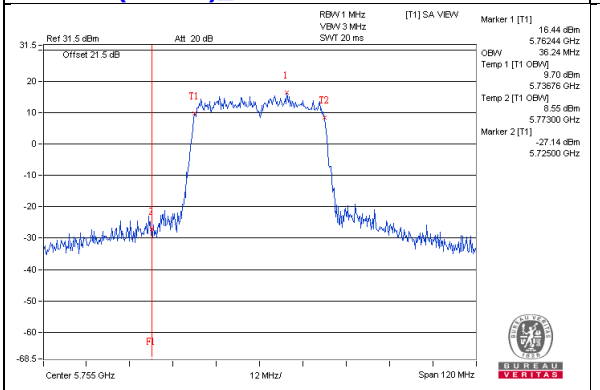
802.11ac(VHT40)_Chain0 / CH151



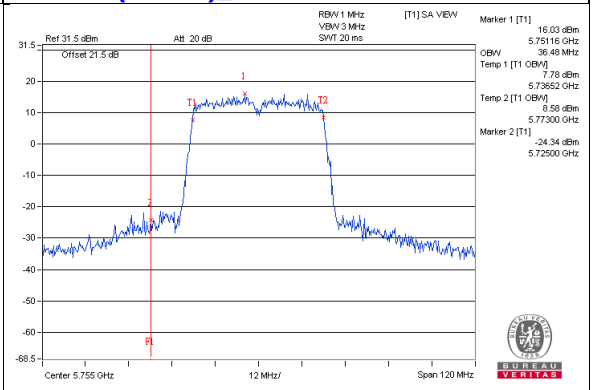
802.11ac(VHT40)_Chain1 / CH151



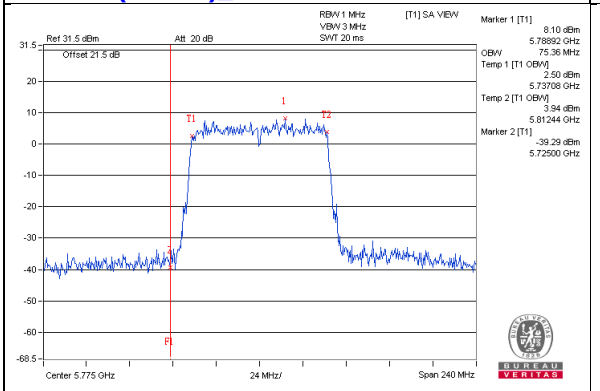
802.11ac(VHT40)_Chain2 / CH151



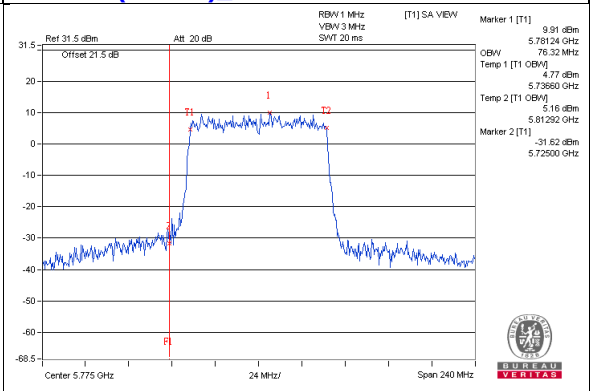
802.11ac(VHT40)_Chain3 / CH151



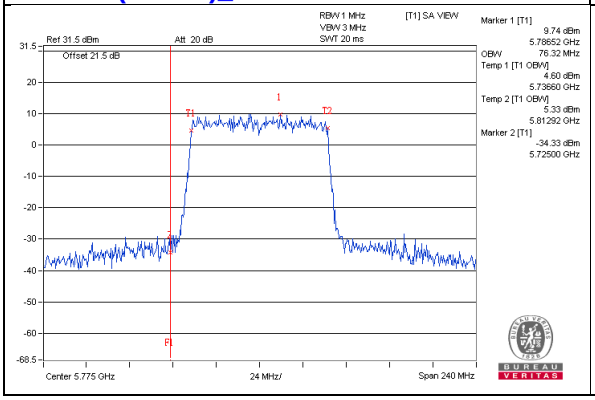
802.11ac(VHT80)_Chain0 / CH155



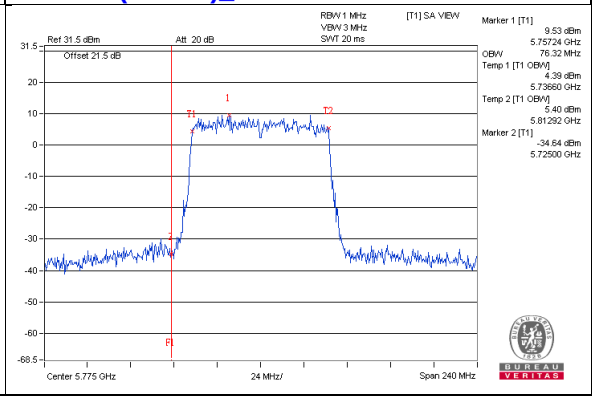
802.11ac(VHT80)_Chain1 / CH155



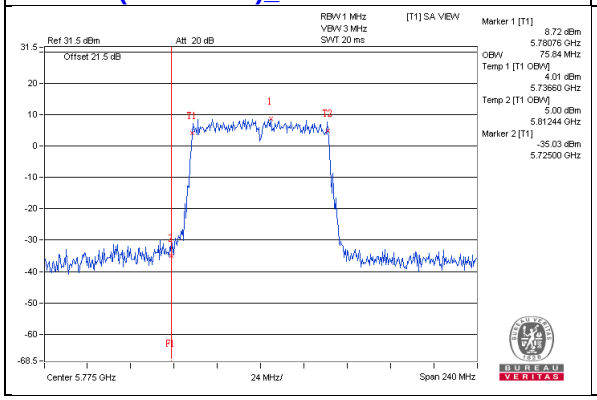
802.11ac(VHT80)_Chain2 / CH155



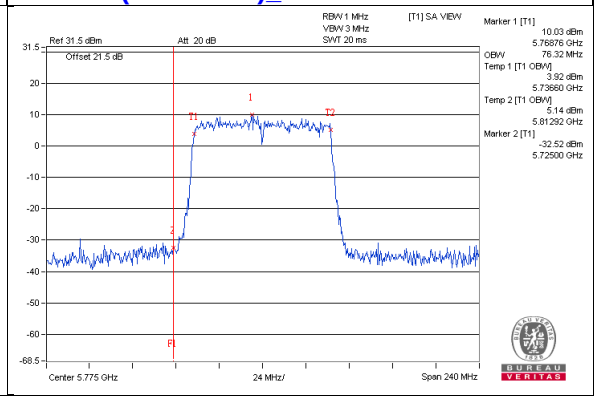
802.11ac(VHT80)_Chain3 / CH155



802.11ac(VHT80+80)_Chain2 / CH155



802.11ac(VHT80+80)_Chain3 / CH155



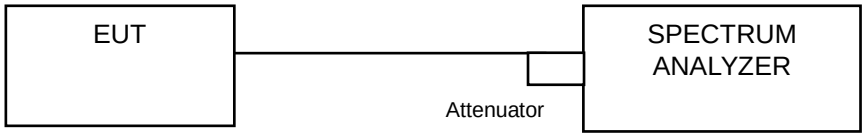
4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

Note: This device can support different category application which switched by access point mode and client mode by software.

4.5.2 Test Setup



4.5.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017

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. Tested Date: Oct. 18, 2016 to Jan. 13, 2017

4.5.4 Test Procedure

802.11ac (VHT20)

For U-NII-1:

Using method SA-1

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

For U-NII-3:

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

802.11a, 802.11ac (VHT40), 802.11ac (VHT80), 802.11ac (VHT80+80)

For U-NII-1:

Using method SA-2

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

For U-NII-3:

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

Master Mode

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	5.75	7.88	5.59	6.51	0.14	12.69	15.87	Pass
40	5200	8.43	10.18	7.18	8.11	0.14	14.78	15.87	Pass
48	5240	8.88	10.16	7.79	9.41	0.14	15.30	15.87	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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 17-(7.13-6) = 15.87dBm.
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	Chain 2	Chain 3			
36	5180	7.15	8.02	6.70	7.10	13.29	15.87	Pass
40	5200	7.79	9.59	7.11	7.59	14.15	15.87	Pass
48	5240	8.42	9.41	7.62	8.64	14.59	15.87	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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 17-(7.13-6) = 15.87dBm.

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	Chain 2	Chain 3				
38	5190	-2.00	0.25	-1.53	-1.69	0.13	5.00	15.87	Pass
46	5230	5.21	6.02	4.99	5.33	0.13	11.55	15.87	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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 17-(7.13-6) = 15.87dBm.
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	Chain 2	Chain 3				
42	5210	-7.16	-4.77	-7.94	-5.99	0.24	-0.04	15.87	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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 17-(7.13-6) = 15.87dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

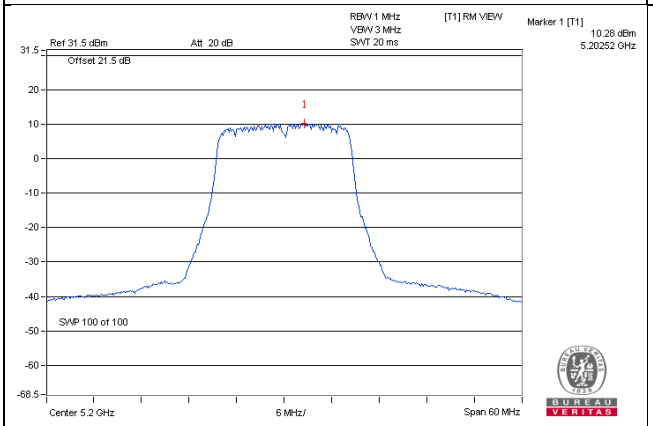
802.11ac (VHT80+80)

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	Chain 2	Chain 3				
42	5210	-0.54	-0.24	-	-	0.26	2.88	16.99	Pass

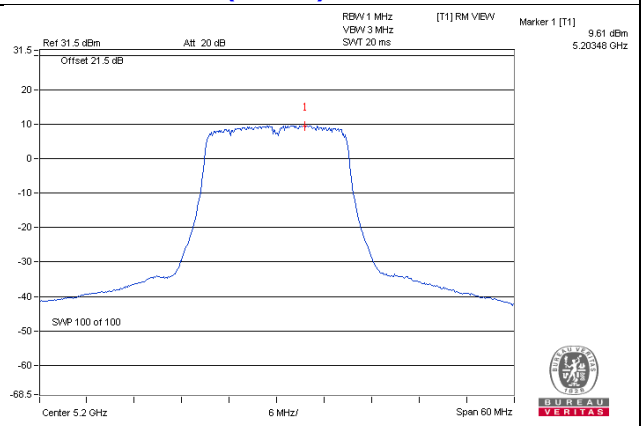
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 17-(6.01-6) = 16.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

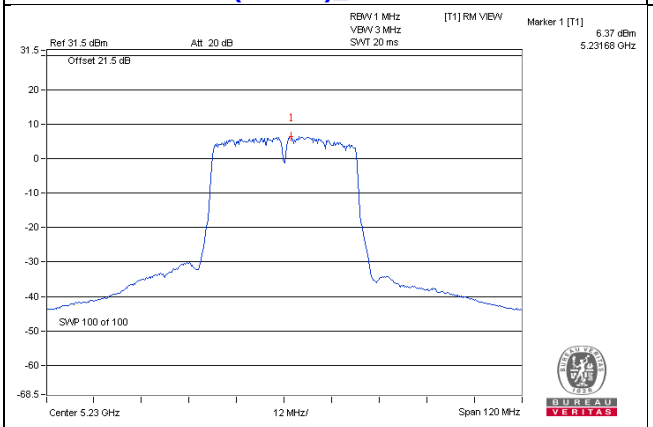
802.11a_Chain 1 / CH40



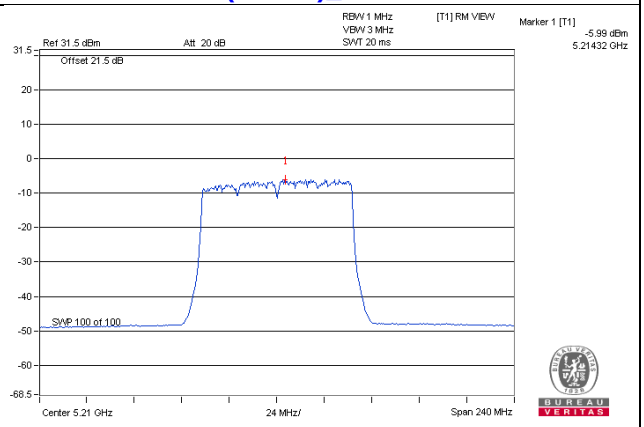
802.11ac (VHT20)_Chain 1 / CH40



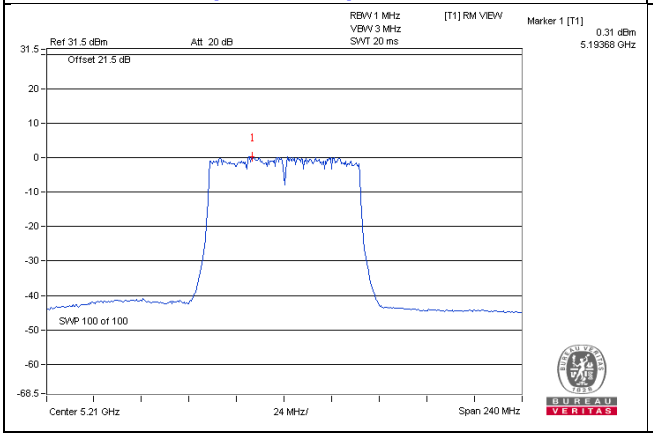
802.11ac (VHT40)_Chain 1 / CH46



802.11ac (VHT80)_Chain 3 / CH42



802.11ac (VHT80+80)_Chain 1 / CH42



Client Mode

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	2.01	4.19	2.27	1.63	0.14	8.80	9.87	Pass
40	5200	1.85	4.06	2.20	2.01	0.14	8.79	9.87	Pass
48	5240	3.01	3.83	2.29	3.17	0.14	9.27	9.87	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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 11-(7.13-6) = 9.87dBm.
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	Chain 2	Chain 3			
36	5180	2.01	3.49	1.48	1.01	8.12	9.87	Pass
40	5200	1.81	3.79	1.21	1.53	8.23	9.87	Pass
48	5240	2.52	3.40	1.71	2.62	8.62	9.87	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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 11-(7.13-6) = 9.87dBm.

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	Chain 2	Chain 3				
38	5190	-2.00	0.25	-1.53	-1.69	0.13	5.00	9.87	Pass
46	5230	0.79	3.06	0.25	2.33	0.13	7.90	9.87	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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 11-(7.13-6) = 9.87dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

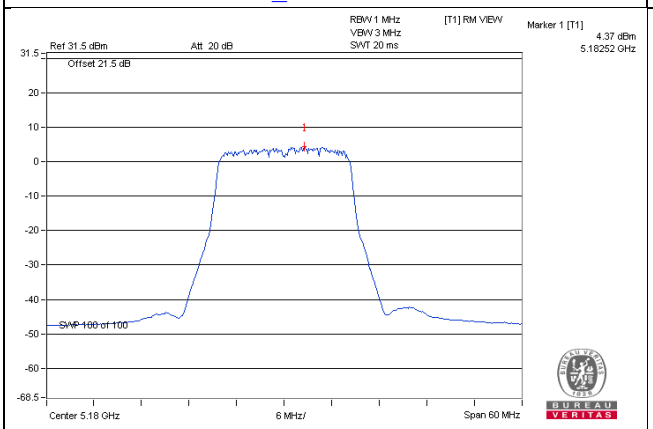
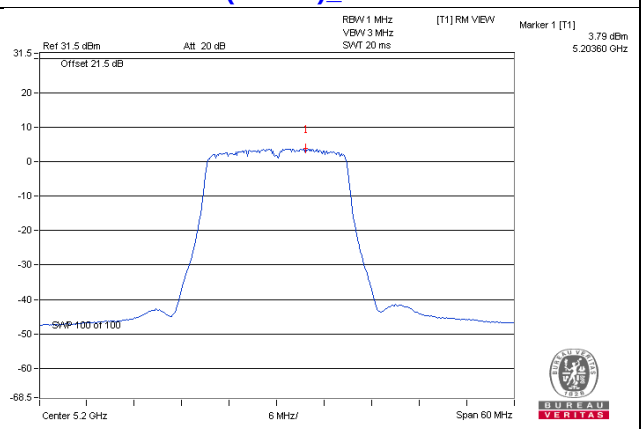
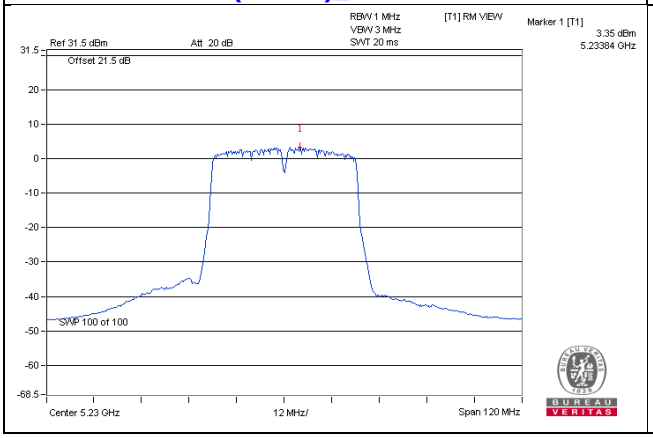
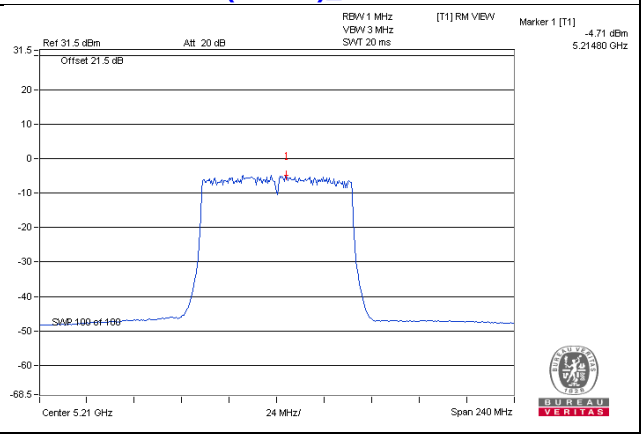
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	-7.16	-4.77	-7.94	-5.99	0.24	-0.04	9.87	Pass

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 = 7.13dBi > 6dBi, so the power density limit shall be reduced to 11-(7.13-6) = 9.87dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80+80)

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	Chain 2	Chain 3				
42	5210	-0.54	-0.24	-	-	0.26	2.88	10.99	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 11-(6.01-6) = 10.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH36	**802.11ac (VHT20)_Chain 1 / CH40**
	
802.11ac (VHT40)_Chain 1 / CH46	**802.11ac (VHT80)_Chain 1 / CH42**
	

For U-NII-3:

Master Mode

CDD Mode

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	0.11	2.33	6.02	0.14	8.49	28.87	Pass
	157	5785	-0.56	1.66	6.02	0.14	7.82	28.87	Pass
	165	5825	0.16	2.38	6.02	0.14	8.54	28.87	Pass
1	149	5745	1.89	4.11	6.02	0.14	10.27	28.87	Pass
	157	5785	1.69	3.91	6.02	0.14	10.07	28.87	Pass
	165	5825	1.22	3.44	6.02	0.14	9.60	28.87	Pass
2	149	5745	0.71	2.93	6.02	0.14	9.09	28.87	Pass
	157	5785	1.97	4.19	6.02	0.14	10.35	28.87	Pass
	165	5825	1.23	3.45	6.02	0.14	9.61	28.87	Pass
3	149	5745	0.91	3.13	6.02	0.14	9.29	28.87	Pass
	157	5785	1.06	3.28	6.02	0.14	9.44	28.87	Pass
	165	5825	0.44	2.66	6.02	0.14	8.82	28.87	Pass

Note: 1. Directional gain = 7.13dBi > 6dBi, so the power density limit shall be reduced to 30-(7.13-6) = 28.87dBm.

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	-0.31	1.91	6.02	7.93	28.87	Pass
	157	5785	-0.72	1.50	6.02	7.52	28.87	Pass
	165	5825	-0.34	1.88	6.02	7.90	28.87	Pass
1	149	5745	1.74	3.96	6.02	9.98	28.87	Pass
	157	5785	1.37	3.59	6.02	9.61	28.87	Pass
	165	5825	1.10	3.32	6.02	9.34	28.87	Pass
2	149	5745	1.30	3.52	6.02	9.54	28.87	Pass
	157	5785	1.42	3.64	6.02	9.66	28.87	Pass
	165	5825	1.51	3.73	6.02	9.75	28.87	Pass
3	149	5745	1.80	4.02	6.02	10.04	28.87	Pass
	157	5785	1.31	3.53	6.02	9.55	28.87	Pass
	165	5825	0.25	2.47	6.02	8.49	28.87	Pass

Note: 1. Directional gain = 7.13dBi > 6dBi, so the power density limit shall be reduced to 30-(7.13-6) = 28.87dBm.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-3.82	-1.60	6.02	0.13	4.55	28.87	Pass
	159	5795	-4.09	-1.87	6.02	0.13	4.28	28.87	Pass
1	151	5755	-1.67	0.55	6.02	0.13	6.70	28.87	Pass
	159	5795	-2.30	-0.08	6.02	0.13	6.07	28.87	Pass
2	151	5755	-2.93	-0.71	6.02	0.13	5.44	28.87	Pass
	159	5795	-2.70	-0.48	6.02	0.13	5.67	28.87	Pass
3	151	5755	-2.68	-0.46	6.02	0.13	5.69	28.87	Pass
	159	5795	-2.39	-0.17	6.02	0.13	5.98	28.87	Pass

Note: 1. Directional gain = 7.13dBi > 6dBi, so the power density limit shall be reduced to 30-(7.13-6) = 28.87dBm.

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	-11.42	-9.20	6.02	0.24	-2.94	28.87	Pass
1	155	5775	-9.29	-7.07	6.02	0.24	-0.81	28.87	Pass
2	155	5775	-9.02	-6.80	6.02	0.24	-0.54	28.87	Pass
3	155	5775	-9.51	-7.29	6.02	0.24	-1.03	28.87	Pass

Note: 1. Directional gain = 7.13dBi > 6dBi, so the power density limit shall be reduced to 30-(7.13-6) = 28.87dBm.

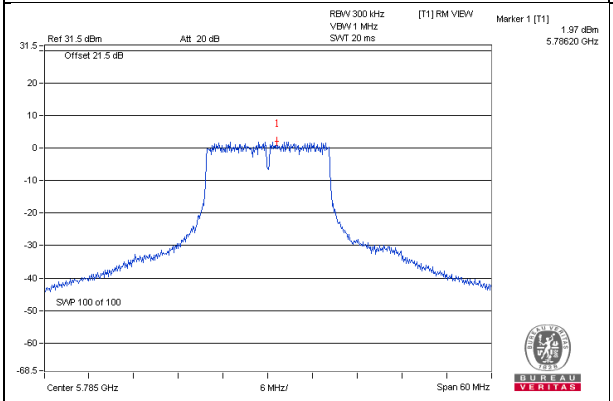
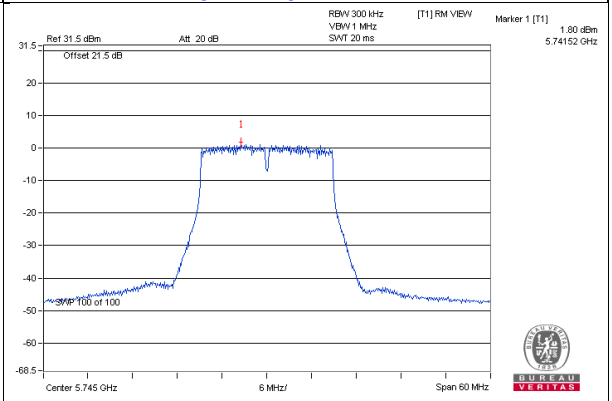
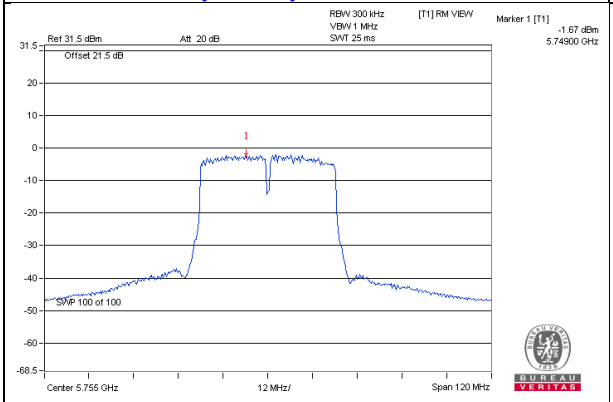
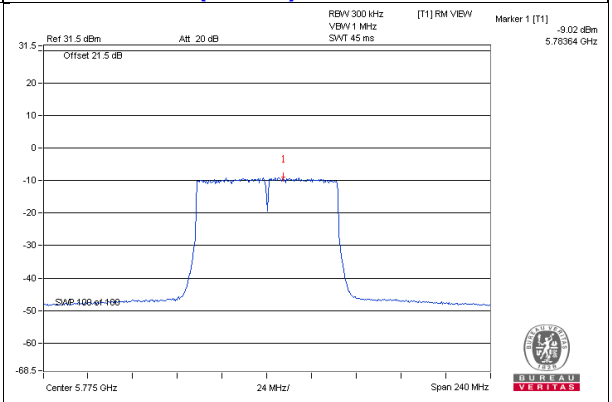
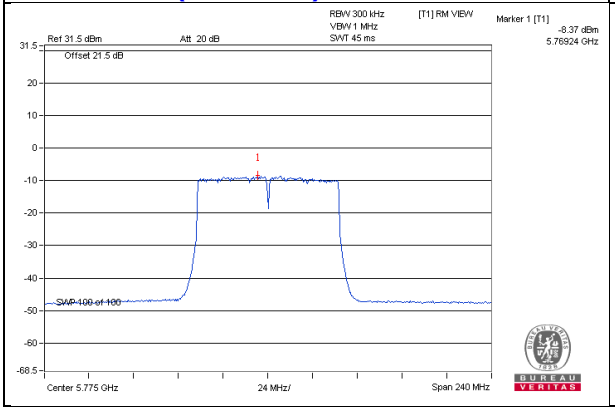
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80+80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
2	155	5775	-9.03	-6.81	3.01	0.26	-3.54	29.99	Pass
3	155	5775	-8.37	-6.15	3.01	0.26	-2.88	29.99	Pass

Note: 1. Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi, so the power density limit shall be reduced to 30-(6.01-6) = 29.99dBm.

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

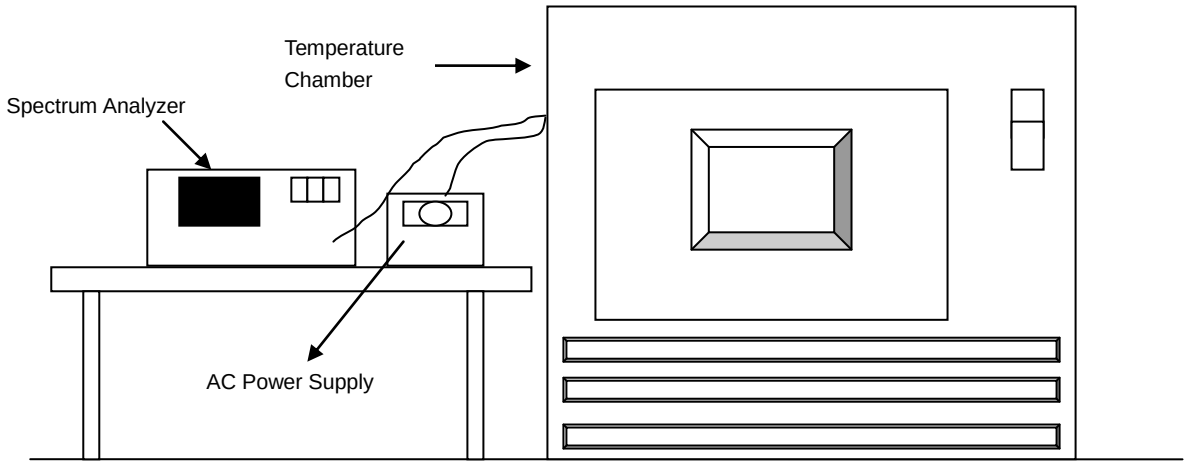
Spectrum Plot of Worst Value	
802.11a – Chain 2: CH 157	**802.11ac (VHT20) – Chain 3: CH 149**
	
802.11ac (VHT40) – Chain 1: CH 151	**802.11ac (VHT80) – Chain 2: CH 155**
	
802.11ac (VHT80+80) – Chain 3: CH 155	
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2015	Nov. 09, 2016
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017

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. Tested Date: Oct. 18, 2016

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5180.0087	PASS	5180.0088	PASS	5180.008	PASS	5180.0102	PASS
40	120	5180.0097	PASS	5180.0108	PASS	5180.0132	PASS	5180.0092	PASS
30	120	5180.0096	PASS	5180.009	PASS	5180.0099	PASS	5180.0107	PASS
20	120	5179.9907	PASS	5179.9935	PASS	5179.9941	PASS	5179.9932	PASS
10	120	5179.9843	PASS	5179.9832	PASS	5179.9838	PASS	5179.9837	PASS
0	120	5179.9893	PASS	5179.9896	PASS	5179.9913	PASS	5179.9885	PASS
-10	120	5180.0115	PASS	5180.008	PASS	5180.0094	PASS	5180.0127	PASS
-20	120	5179.989	PASS	5179.9892	PASS	5179.9857	PASS	5179.9867	PASS
-30	120	5180.0175	PASS	5180.0173	PASS	5180.0201	PASS	5180.019	PASS

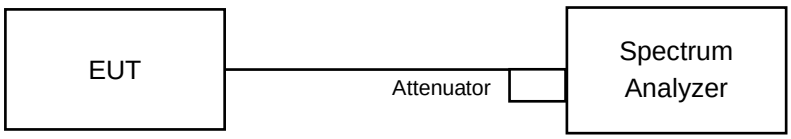
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9913	PASS	5179.9929	PASS	5179.9946	PASS	5179.9927	PASS
	120	5179.9907	PASS	5179.9935	PASS	5179.9941	PASS	5179.9932	PASS
	102	5179.9907	PASS	5179.9932	PASS	5179.994	PASS	5179.9937	PASS

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017

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. Tested Date: Oct. 18, 2016 to Jan. 13, 2017

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

Master Mode

CDD Mode

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	16.39	16.37	16.36	0.5	PASS
157	5785	16.40	16.37	16.36	16.39	0.5	PASS
165	5825	16.36	16.38	16.37	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	17.61	17.57	17.37	0.5	PASS
157	5785	17.62	17.61	17.62	17.61	0.5	PASS
165	5825	17.57	17.58	17.56	17.56	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	35.20	35.75	35.19	35.20	0.5	PASS
159	5795	35.19	35.16	35.17	35.22	0.5	PASS

802.11ac (VHT80)

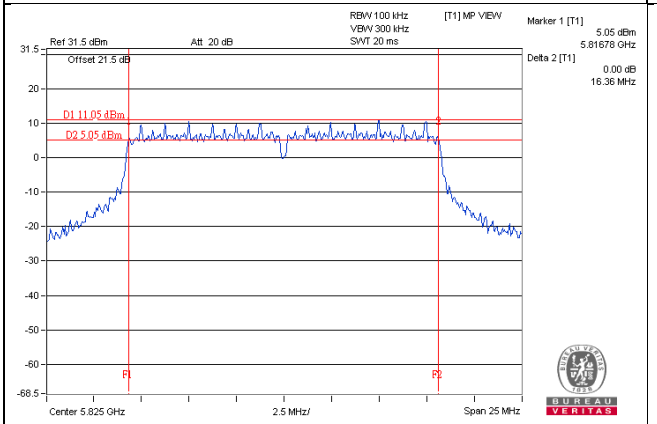
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.49	76.56	76.42	76.53	0.5	PASS

802.11ac (VHT80+80)

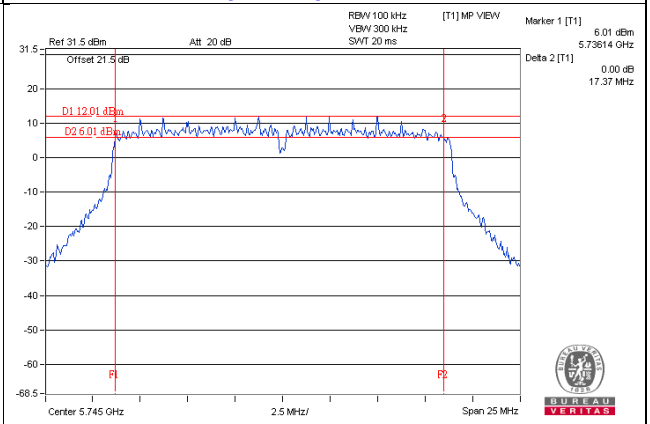
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	-	-	76.46	76.46	0.5	PASS

Spectrum Plot of Worst Value

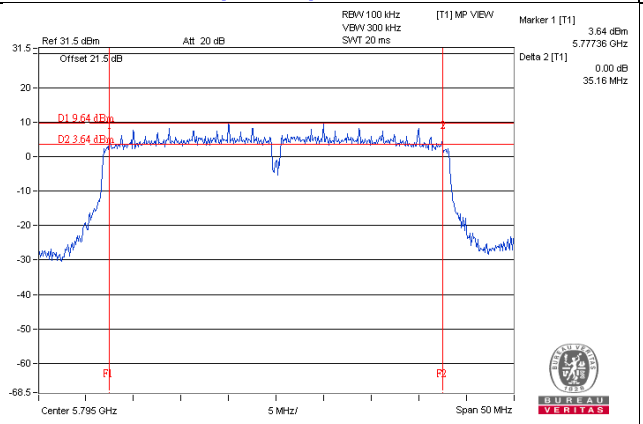
802.11a_Chain 0 / CH165



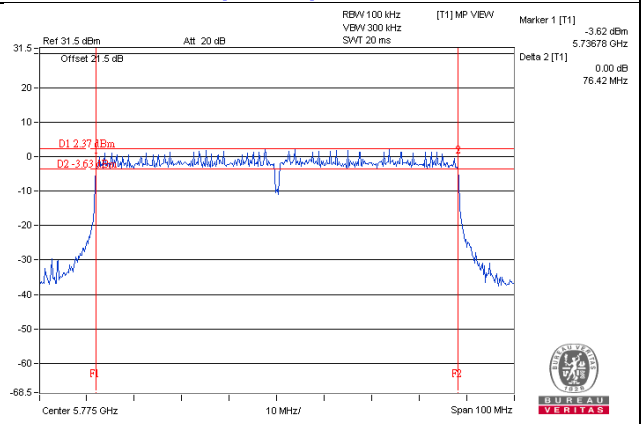
802.11ac (VHT20)_Chain 3 / CH149



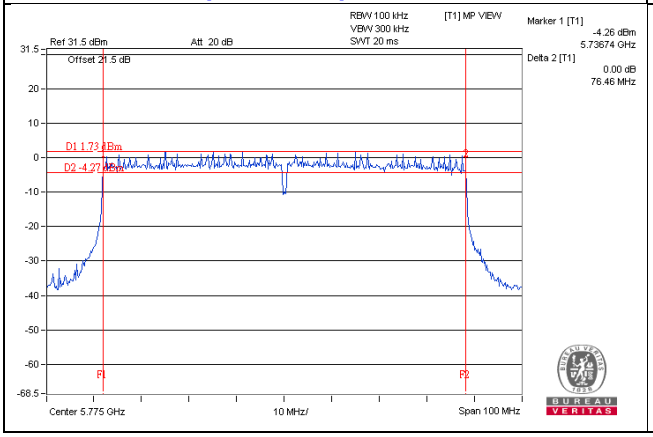
802.11ac (VHT40)_Chain 1 / CH159



802.11ac (VHT80)_Chain 2 / CH155



802.11ac (VHT80+80)_Chain 2 / CH155



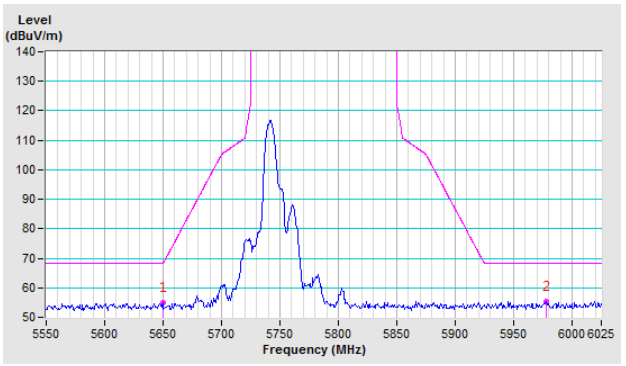
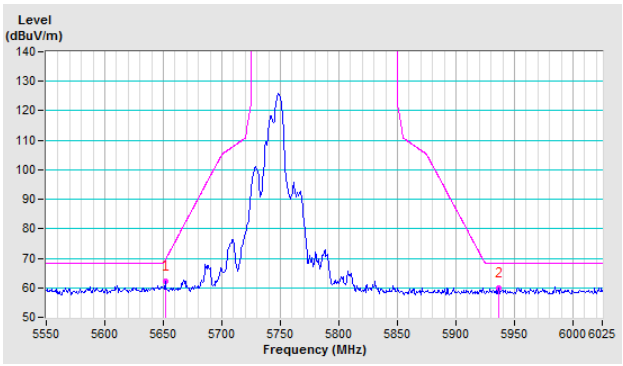
5 Pictures of Test Arrangements

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

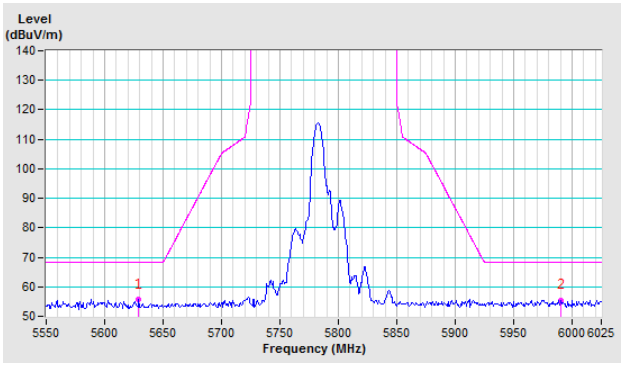
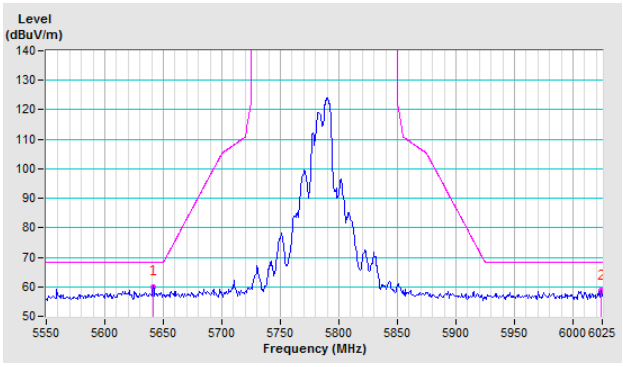
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

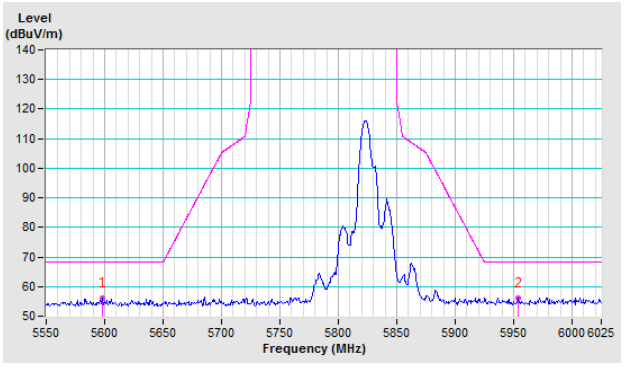
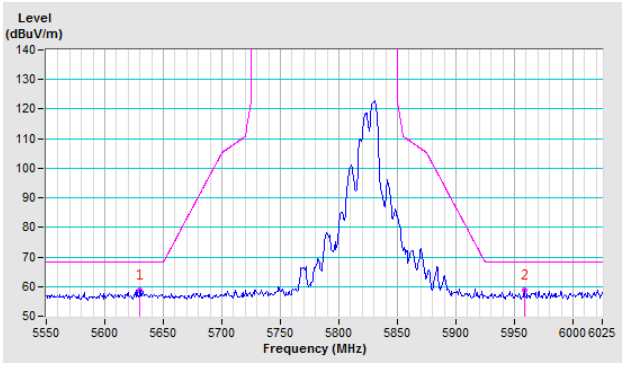
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

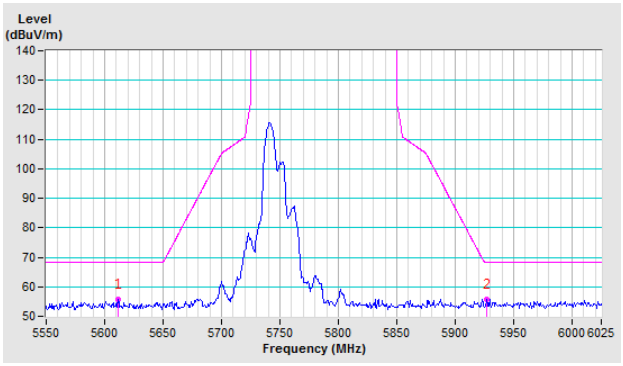
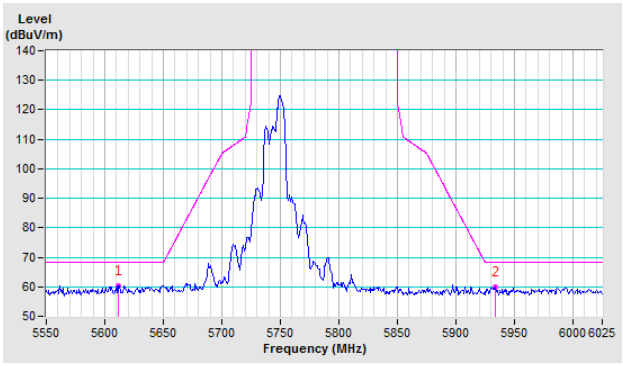
Horizontal	Vertical
	

CH 165 5825 MHz

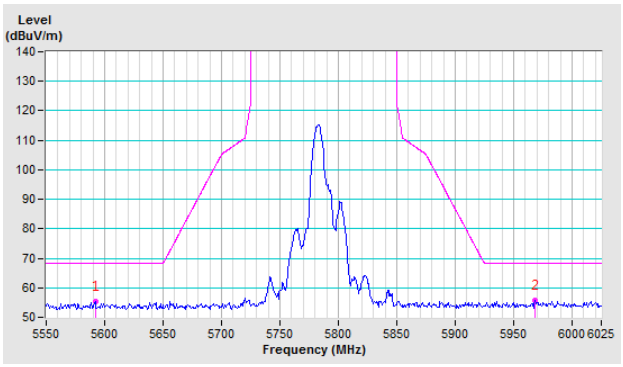
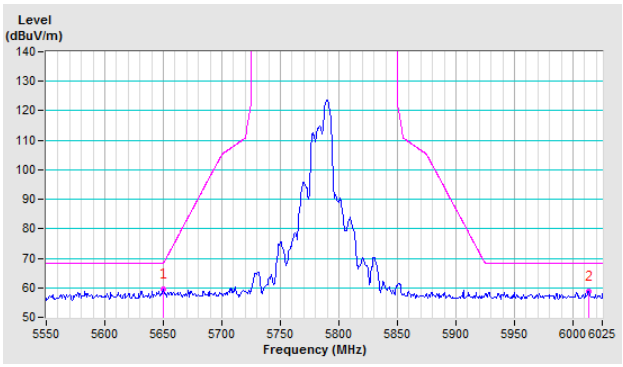
Horizontal	Vertical
	

802.11ac (VHT20)

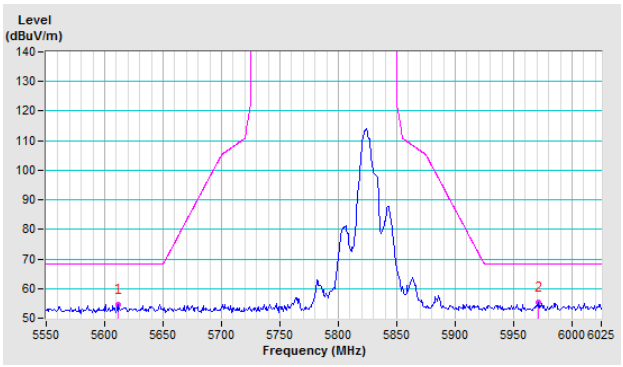
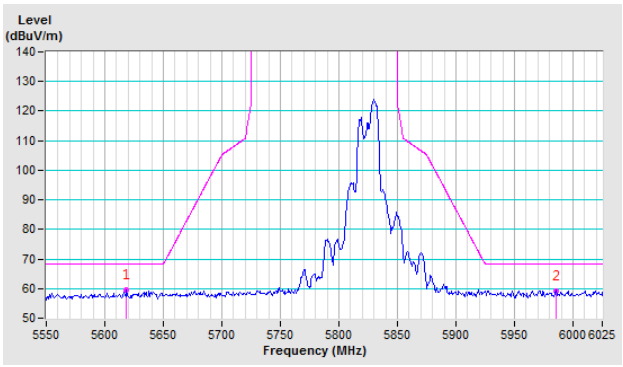
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

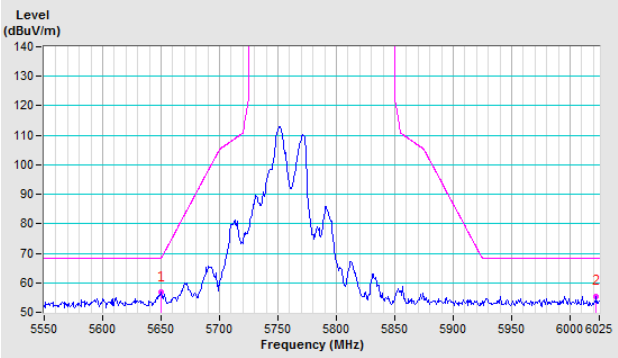
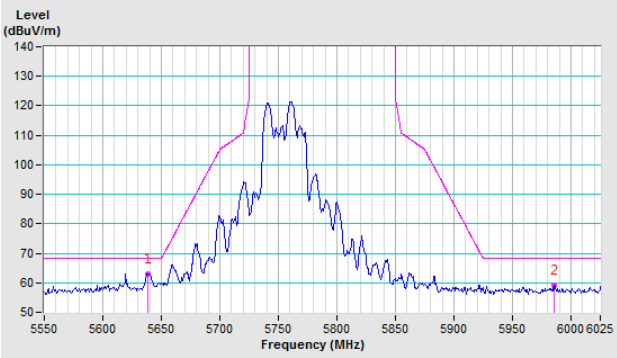
Horizontal	Vertical
	

CH 165 5825 MHz

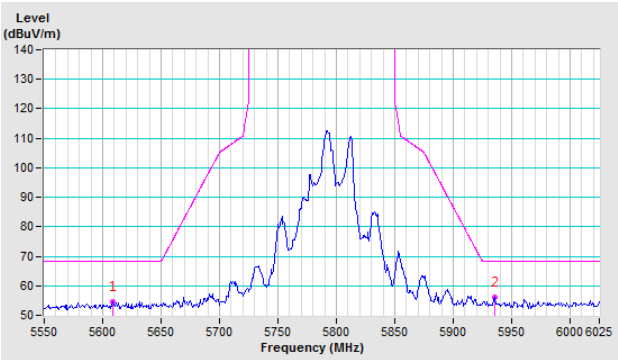
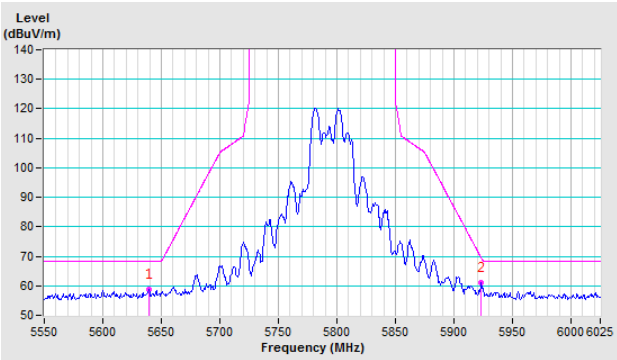
Horizontal	Vertical
	

802.11ac (VHT40)

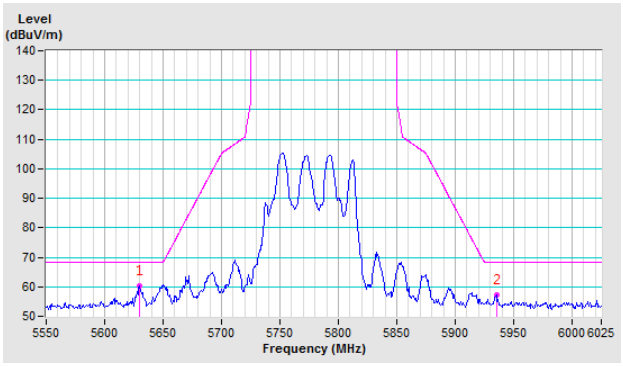
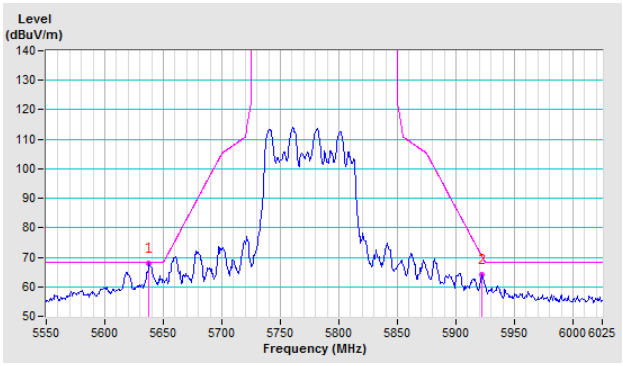
CH 151 5755 MHz

Horizontal	Vertical
	

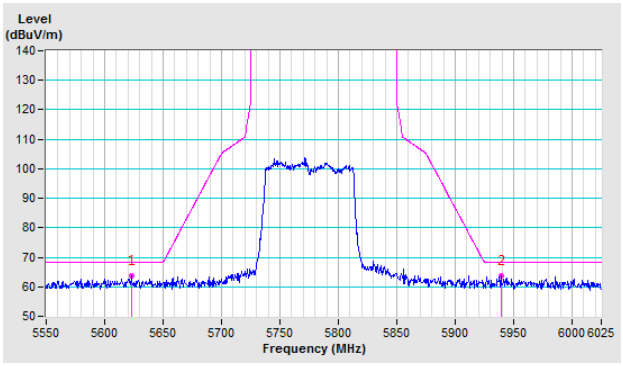
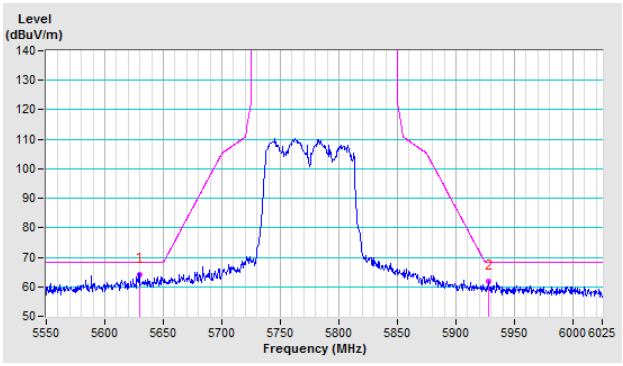
CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz	
Horizontal	**Vertical**
	

802.11ac (VHT80+80)

CH 42+155 5210+5775 MHz	
Horizontal	**Vertical**
	

Appendix – Information on the Testing Laboratories

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

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

Linko 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.

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