

FCC Test Report

Report No.: RF180111E04-1

FCC ID: I88WAP6906

Test Model: WAP6906

Received Date: Jan. 11, 2018

Test Date: Jan. 24 to 27, 2018

Issued Date: Feb. 23, 2018

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF180111E04-1	Original release.	Feb. 23, 2018

1 Certificate of Conformity

Product: AC3800 Tri-Band WiFi Repeater

Brand: ZYXEL

Test Model: WAP6906

Sample Status: ENGINEERING SAMPLE

Applicant: Zyxel Communications Corporation

Test Date: Jan. 24 to 27, 2018

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10: 2013

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

Prepared by : Phoenix Huang , **Date:** Feb. 23, 2018
Phoenix Huang / Specialist

Approved by : May Chen , **Date:** Feb. 23, 2018
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -12.33dB at 0.29453MHz.
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 -0.6dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.53 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.08 dB
	6GHz ~ 18GHz	4.98 dB
	18GHz ~ 40GHz	5.19 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC3800 Tri-Band WiFi Repeater
Brand	ZYXEL
Test Model	WAP6906
RF CPU Model No.	QT3840(Quantenna) + QT3860(Quantenna)
RF Chip Model No.	2.4GHz: RTL8192(Realtek) 5GHz: QT2518(Quantenna)
Version of Firmware	1.00(ABKO.1)b1
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
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
Operating Frequency	2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.18~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	2.412 ~ 2.462GHz: 489.577mW 5.18 ~ 5.24GHz (Client): 193.209mW 5.18 ~ 5.24GHz (Master): 801.982mW 5.745 ~ 5.825GHz: 661.083mW
Antenna Type	PCB
Antenna Connector	i-pex(MHF)
Accessory Device	Adapter x1
Data Cable Supplied	Ethernet cable × 1 (Unshielded, 1.5m)

Note:

1. This device can support different category application which switched to master mode or client mode by software.
2. The EUT has three radios as following table:

Radio 1	Radio 2	Radio 3
WLAN 2.4GHz	WLAN 5G (U-NII-1)	WLAN 5G (U-NII-3)

3. Simultaneously transmission condition.

Condition	Technology		
1	WLAN 2.4GHz	WLAN 5G (U-NII-1)	WLAN 5G (U-NII-3)

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

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

Brand	Model No.	Spec.
UMEC	UP0301A-12PA	Input: 100-240Vac, 0.8A, 50/60Hz Output: 12Vdc, 2.5A DC output cable: Unshielded 1.5m

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

Frequency Range (GHz)	Directional Antenna Gain (dBi)
2.4~2.4835	4.79
5.15~5.25	6.42
5.25~5.35	6.15
5.47~5.725	7.2
5.725~5.85	7.3

6. The power setting are list as below:

Modulation Mode	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting
For U-NII-I band (Client)						
802.11a	5180	16	5200	16	5240	16
802.11ac (VHT20)	5180	16	5200	16	5240	16
802.11ac (VHT40)	5190	15	5230	15		
802.11ac (VHT80)	5210	16				
For U-NII-I band (Master)						
802.11a	5180	21	5200	22	5240	22
802.11ac (VHT20)	5180	22	5200	22	5240	22
802.11ac (VHT40)	5190	17	5230	21		
802.11ac (VHT80)	5210	17				
For U-NII-3 band						
802.11a	5745	21	5785	21	5825	22
802.11ac (VHT20)	5745	21	5785	21	5825	22
802.11ac (VHT40)	5755	20	5795	20		
802.11ac (VHT80)	5775	21				

7. The EUT incorporates a MIMO function.

2.4GHz Band					
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION		NON-TXBF Mode	TXBF Mode
802.11b	1 ~ 11Mbps	2TX	2RX	√	-
802.11g	6 ~ 54Mbps	2TX	2RX	√	-
802.11n (HT20)	MCS 0~7	2TX	2RX	√	-
	MCS 8~15	2TX	2RX	√	-
802.11n (HT40)	MCS 0~7	2TX	2RX	√	-
	MCS 8~15	2TX	2RX	√	-
5GHz Band					
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION		NON-TXBF Mode	TXBF Mode
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	-	√

Note:

1. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
2. 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. All of modulation mode support beamforming function except 2.4G and 802.11a modulation mode.

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	165	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

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

Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	165	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

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

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE _≥ 1G	25deg. C, 68%RH	120Vac, 60Hz	Eason Tseng
RE _{<} 1G	22deg. C, 64%RH	120Vac, 60Hz	Eason Tseng
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

For Radio 1:

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

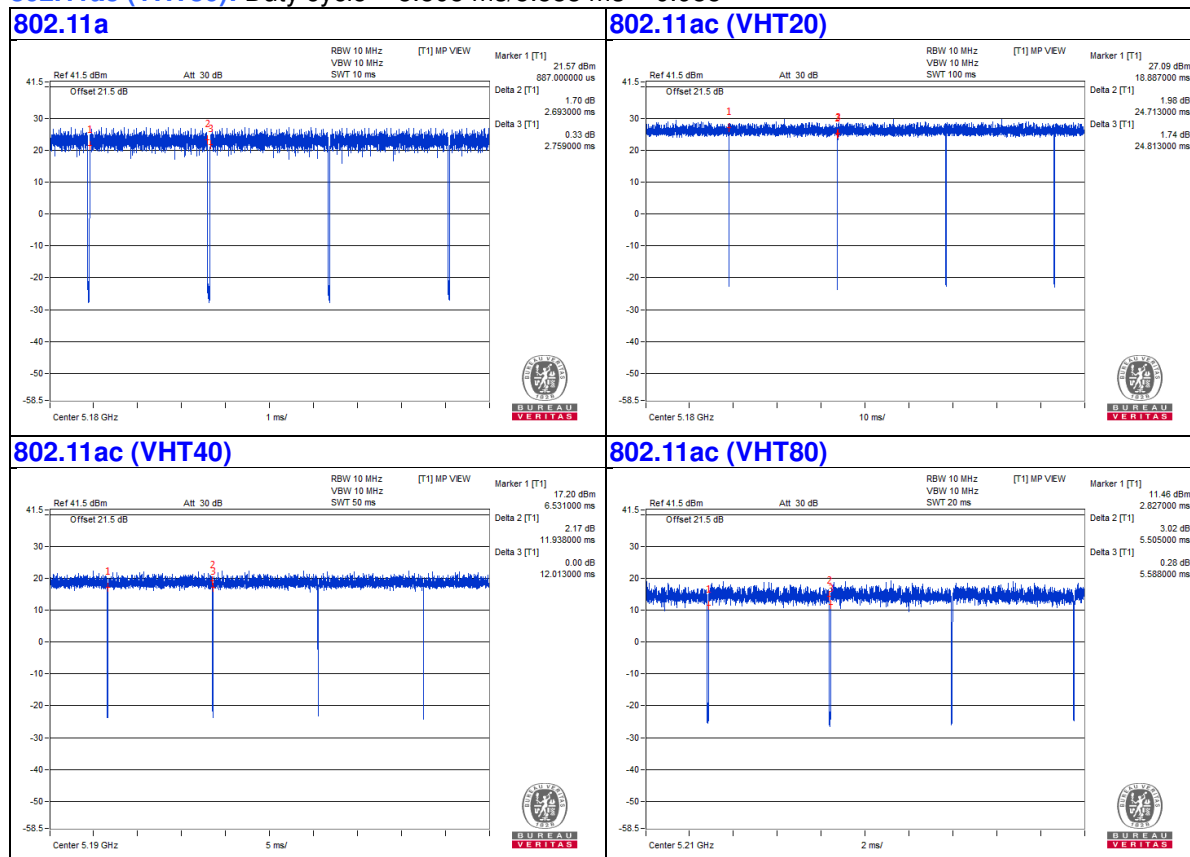
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $2.693 \text{ ms} / 2.759 \text{ ms} = 0.976$, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.11$

802.11ac (VHT20): Duty cycle = $24.713 \text{ ms} / 24.813 \text{ ms} = 0.996$

802.11ac (VHT40): Duty cycle = $11.938 \text{ ms} / 12.013 \text{ ms} = 0.994$

802.11ac (VHT80): Duty cycle = $5.505 \text{ ms} / 5.588 \text{ ms} = 0.985$



For Radio 2:

Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

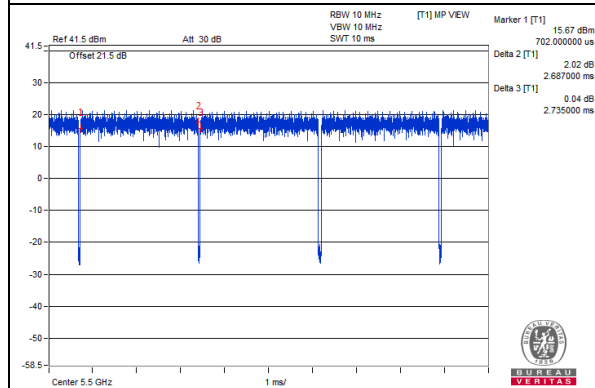
802.11a: Duty cycle = $2.687 \text{ ms} / 2.735 \text{ ms} = 0.982$

802.11ac (VHT20): Duty cycle = $24.675 \text{ ms} / 24.775 \text{ ms} = 0.996$

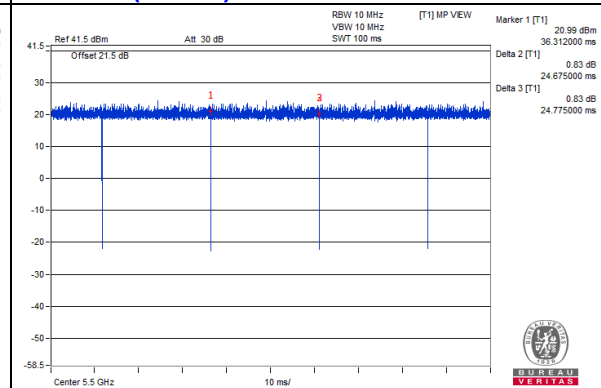
802.11ac (VHT40): Duty cycle = $11.937 \text{ ms} / 12.031 \text{ ms} = 0.992$

802.11ac (VHT80): Duty cycle = $5.5 \text{ ms} / 5.58 \text{ ms} = 0.986$

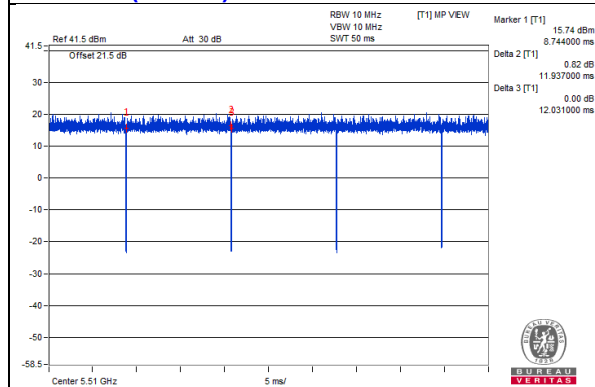
802.11a



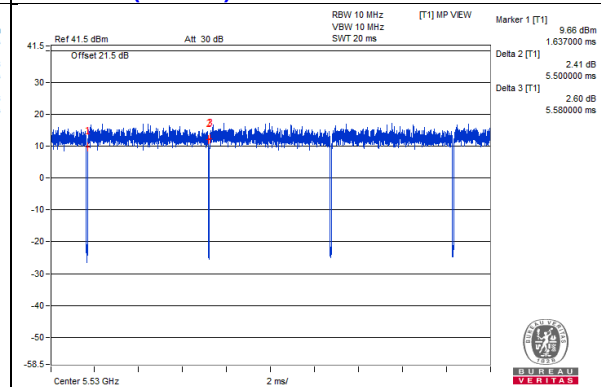
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

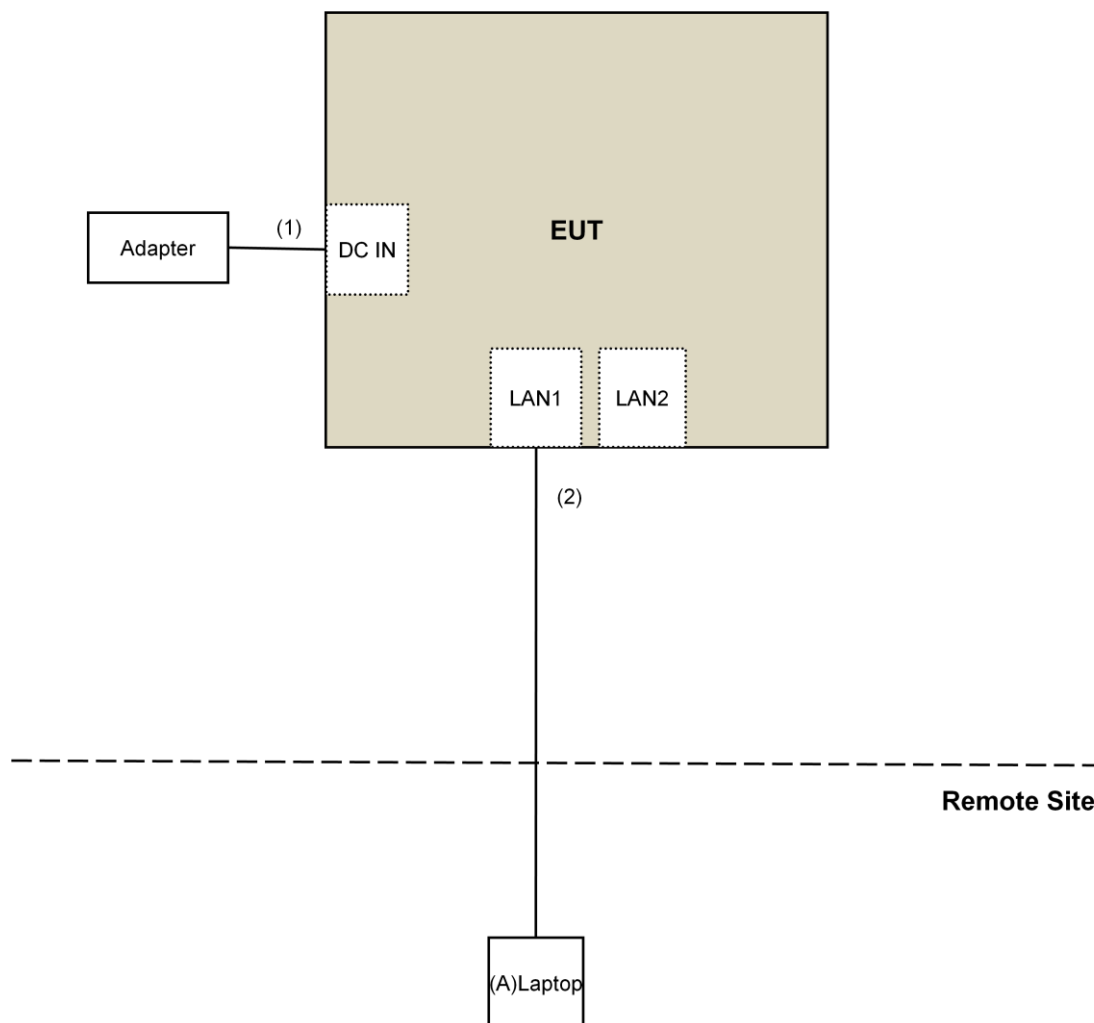
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.5	No	0	Supplied by client
2.	RJ-45 Cable	1	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 v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B. 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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v02r01			Field Strength at 3m	
			PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8(dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*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.				

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Loop Antenna(*) TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Horn Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM- SM-1200 EMC104-SM- SM-2000 EMC104-SM- SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Spectrum Analyzer Keysight	N9030A	MY54490679	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045S E	980386	Feb. 02, 2017	Feb. 01, 2018
Horn Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 11, 2018	Jan. 10, 2019
Software	ADT Radiated V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer Agilent	E4446A	MY48250254	Nov. 21, 2017	Nov. 20, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-S P-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 29, 2017	May 28, 2018

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The CANADA Site Registration No. is 20331-1
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Jan. 24 to 27, 2018

4.1.3 Test Procedure

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

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

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

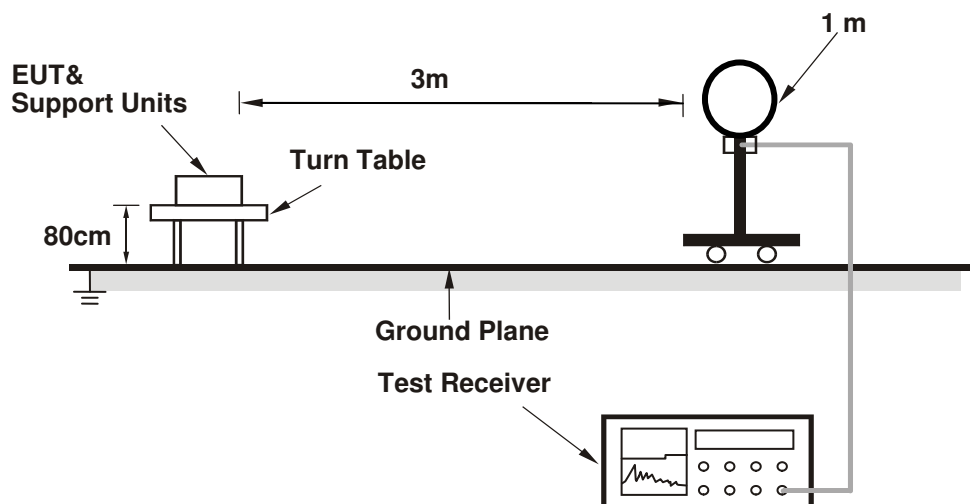
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) 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

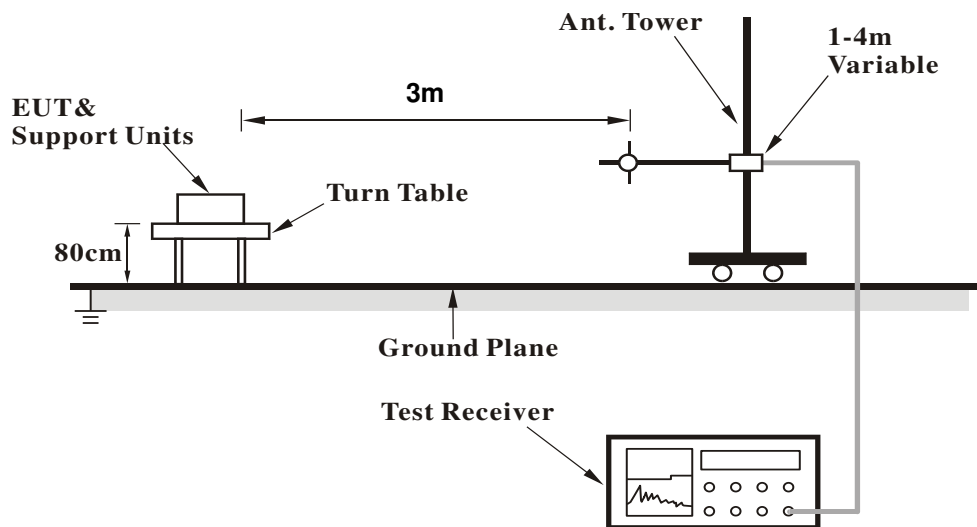
No deviation.

4.1.5 Test Setup

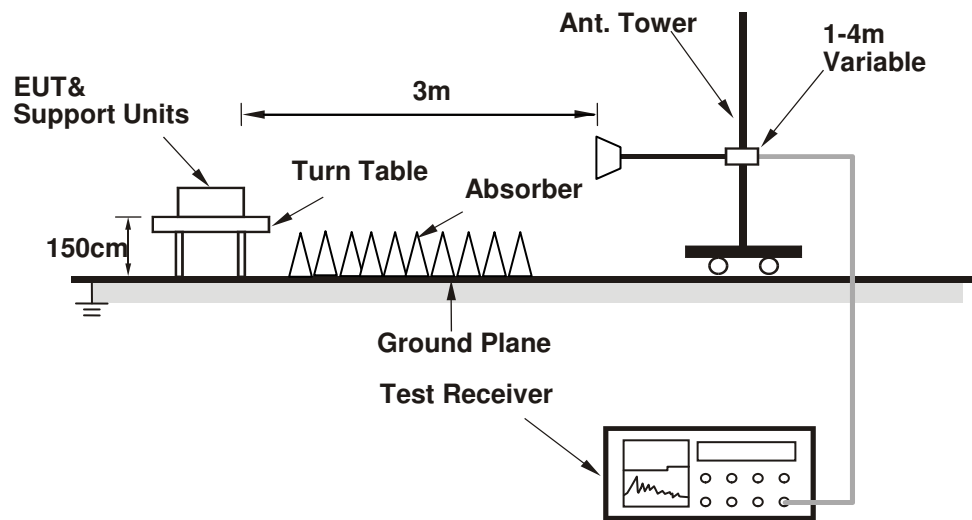
For Radiated emission below 30MHz



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

- Connected the EUT with the laptop which is placed on remote site.
- Controlling software (Telnet paste command) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

CDD Mode

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	2.05 H	177	58.1	4.0
2	5150.00	51.7 AV	54.0	-2.3	2.05 H	177	47.7	4.0
3	*5180.00	114.1 PK			2.05 H	177	110.2	3.9
4	*5180.00	105.6 AV			2.05 H	177	101.7	3.9
5	#10360.00	51.2 PK	74.0	-22.8	2.70 H	206	38.5	12.7
6	#10360.00	41.1 AV	54.0	-12.9	2.70 H	206	28.4	12.7
7	15540.00	46.5 PK	74.0	-27.5	1.90 H	35	33.6	12.9
8	15540.00	35.6 AV	54.0	-18.4	1.90 H	35	22.7	12.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.49 V	132	58.1	4.0
2	5150.00	53.4 AV	54.0	-0.6	1.49 V	132	49.4	4.0
3	*5180.00	114.5 PK			1.49 V	132	110.6	3.9
4	*5180.00	106.8 AV			1.49 V	132	102.9	3.9
5	#10360.00	47.6 PK	74.0	-26.4	3.83 V	150	34.9	12.7
6	#10360.00	40.1 AV	54.0	-13.9	3.83 V	150	27.4	12.7
7	15540.00	45.2 PK	74.0	-28.8	2.16 V	310	32.3	12.9
8	15540.00	34.2 AV	54.0	-19.8	2.16 V	310	21.3	12.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.5 PK	74.0	-18.5	2.55 H	167	51.5	4.0
2	5150.00	46.2 AV	54.0	-7.8	2.55 H	167	42.2	4.0
3	*5200.00	113.4 PK			2.55 H	167	109.6	3.8
4	*5200.00	105.1 AV			2.55 H	167	101.3	3.8
5	5350.00	47.2 PK	74.0	-26.8	2.55 H	167	43.4	3.8
6	5350.00	37.2 AV	54.0	-16.8	2.55 H	167	33.4	3.8
7	#10400.00	54.7 PK	74.0	-19.3	2.78 H	203	42.0	12.7
8	#10400.00	44.7 AV	54.0	-9.3	2.78 H	203	32.0	12.7
9	15600.00	49.1 PK	74.0	-24.9	2.04 H	104	36.0	13.1
10	15600.00	38.7 AV	54.0	-15.3	2.04 H	104	25.6	13.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.4 PK	74.0	-16.6	1.48 V	131	53.4	4.0
2	5150.00	47.8 AV	54.0	-6.2	1.48 V	131	43.8	4.0
3	*5200.00	115.4 PK			1.51 V	131	111.6	3.8
4	*5200.00	107.5 AV			1.51 V	131	103.7	3.8
5	5350.00	48.5 PK	74.0	-25.5	1.48 V	131	44.7	3.8
6	5350.00	37.4 AV	54.0	-16.6	1.48 V	131	33.6	3.8
7	#10400.00	51.9 PK	74.0	-22.1	3.82 V	151	39.2	12.7
8	#10400.00	44.2 AV	54.0	-9.8	3.82 V	151	31.5	12.7
9	15600.00	48.7 PK	74.0	-25.3	2.15 V	301	35.6	13.1
10	15600.00	38.1 AV	54.0	-15.9	2.15 V	301	25.0	13.1

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
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	*5240.00	112.6 PK			2.55 H	153	108.9	3.7
2	*5240.00	104.6 AV			2.55 H	153	100.9	3.7
3	5350.00	54.8 PK	74.0	-19.2	2.51 H	165	51.0	3.8
4	5350.00	45.8 AV	54.0	-8.2	2.51 H	165	42.0	3.8
5	#10480.00	55.1 PK	74.0	-18.9	2.77 H	188	41.8	13.3
6	#10480.00	44.8 AV	54.0	-9.2	2.77 H	188	31.5	13.3
7	15720.00	48.8 PK	74.0	-25.2	2.03 H	105	35.6	13.2
8	15720.00	38.2 AV	54.0	-15.8	2.03 H	105	25.0	13.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	115.3 PK			1.54 V	146	111.6	3.7
2	*5240.00	107.5 AV			1.54 V	146	103.8	3.7
3	5350.00	57.6 PK	74.0	-16.4	1.53 V	124	53.8	3.8
4	5350.00	47.9 AV	54.0	-6.1	1.53 V	124	44.1	3.8
5	#10480.00	52.0 PK	74.0	-22.0	3.81 V	167	38.7	13.3
6	#10480.00	44.4 AV	54.0	-9.6	3.81 V	167	31.1	13.3
7	15720.00	48.8 PK	74.0	-25.2	2.19 V	288	35.6	13.2
8	15720.00	38.3 AV	54.0	-15.7	2.19 V	288	25.1	13.2

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
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	#5593.80	62.8 PK	68.2	-5.4	1.51 H	216	58.6	4.2
2	*5745.00	114.0 PK			1.51 H	216	109.8	4.2
3	*5745.00	104.3 AV			1.51 H	216	100.1	4.2
4	#5999.67	62.4 PK	68.2	-5.8	1.51 H	216	57.7	4.7
5	11490.00	57.3 PK	74.0	-16.7	2.20 H	54	43.5	13.8
6	11490.00	44.2 AV	54.0	-9.8	2.20 H	54	30.4	13.8
7	#17235.00	59.3 PK	74.0	-14.7	1.53 H	174	43.0	16.3
8	#17235.00	47.7 AV	54.0	-6.3	1.53 H	174	31.4	16.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5602.56	63.2 PK	68.2	-5.0	1.56 V	24	59.0	4.2
2	*5745.00	116.3 PK			1.56 V	24	112.1	4.2
3	*5745.00	107.3 AV			1.56 V	24	103.1	4.2
4	#5970.03	61.9 PK	68.2	-6.3	1.56 V	24	57.2	4.7
5	11490.00	50.1 PK	74.0	-23.9	1.47 V	348	36.3	13.8
6	11490.00	37.7 AV	54.0	-16.3	1.47 V	348	23.9	13.8
7	#17235.00	51.4 PK	74.0	-22.6	1.62 V	343	35.1	16.3
8	#17235.00	40.2 AV	54.0	-13.8	1.62 V	343	23.9	16.3

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
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	#5631.90	62.0 PK	68.2	-6.2	1.54 H	217	57.8	4.2
2	*5785.00	114.2 PK			1.54 H	217	109.9	4.3
3	*5785.00	105.0 AV			1.54 H	217	100.7	4.3
4	#5952.81	61.5 PK	68.2	-6.7	1.54 H	217	56.9	4.6
5	11570.00	57.3 PK	74.0	-16.7	2.22 H	57	43.4	13.9
6	11570.00	45.2 AV	54.0	-8.8	2.22 H	57	31.3	13.9
7	#17355.00	59.2 PK	74.0	-14.8	1.48 H	186	42.0	17.2
8	#17355.00	47.8 AV	54.0	-6.2	1.48 H	186	30.6	17.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5651.14	63.6 PK	69.0	-5.4	1.42 V	25	59.6	4.0
2	*5785.00	115.3 PK			1.42 V	25	111.0	4.3
3	*5785.00	106.6 AV			1.42 V	25	102.3	4.3
4	#5960.20	63.0 PK	68.2	-5.2	1.42 V	25	58.3	4.7
5	11570.00	51.4 PK	74.0	-22.6	1.42 V	352	37.5	13.9
6	11570.00	39.2 AV	54.0	-14.8	1.42 V	352	25.3	13.9
7	#17355.00	53.1 PK	74.0	-20.9	1.63 V	356	35.9	17.2
8	#17355.00	41.3 AV	54.0	-12.7	1.63 V	356	24.1	17.2

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
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	#5616.71	62.0 PK	68.2	-6.2	1.50 H	229	57.8	4.2
2	*5825.00	114.2 PK			1.50 H	229	109.7	4.5
3	*5825.00	105.3 AV			1.50 H	229	100.8	4.5
4	#5952.98	61.2 PK	68.2	-7.0	1.50 H	229	56.6	4.6
5	11650.00	57.9 PK	74.0	-16.1	2.27 H	65	44.2	13.7
6	11650.00	45.1 AV	54.0	-8.9	2.27 H	65	31.4	13.7
7	#17475.00	60.2 PK	74.0	-13.8	1.51 H	185	42.1	18.1
8	#17475.00	48.8 AV	54.0	-5.2	1.51 H	185	30.7	18.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5627.08	62.2 PK	68.2	-6.0	1.35 V	23	58.0	4.2
2	*5825.00	116.5 PK			1.35 V	23	112.0	4.5
3	*5825.00	108.2 AV			1.35 V	23	103.7	4.5
4	#5997.03	61.5 PK	68.2	-6.7	1.35 V	23	56.8	4.7
5	11650.00	52.4 PK	74.0	-21.6	1.37 V	342	38.7	13.7
6	11650.00	40.1 AV	54.0	-13.9	1.37 V	342	26.4	13.7
7	#17475.00	53.8 PK	74.0	-20.2	1.63 V	355	35.7	18.1
8	#17475.00	41.8 AV	54.0	-12.2	1.63 V	355	23.7	18.1

REMARKS:

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

Beamforming Mode

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.2 PK	74.0	-18.8	2.00 H	188	51.2	4.0
2	5150.00	45.0 AV	54.0	-9.0	2.00 H	188	41.0	4.0
3	*5180.00	113.2 PK			2.00 H	188	109.3	3.9
4	*5180.00	103.9 AV			2.00 H	188	100.0	3.9
5	5350.00	48.7 PK	74.0	-25.3	2.00 H	188	44.9	3.8
6	5350.00	36.2 AV	54.0	-17.8	2.00 H	188	32.4	3.8
7	#10360.00	50.7 PK	74.0	-23.3	2.68 H	190	38.0	12.7
8	#10360.00	40.6 AV	54.0	-13.4	2.68 H	190	27.9	12.7
9	15540.00	46.1 PK	74.0	-27.9	1.85 H	42	33.2	12.9
10	15540.00	35.4 AV	54.0	-18.6	1.85 H	42	22.5	12.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.58 V	331	58.1	4.0
2	5150.00	51.7 AV	54.0	-2.3	1.58 V	331	47.7	4.0
3	*5180.00	116.8 PK			1.58 V	331	112.9	3.9
4	*5180.00	107.2 AV			1.58 V	331	103.3	3.9
5	5350.00	55.9 PK	74.0	-18.1	1.58 V	331	52.1	3.8
6	5350.00	42.8 AV	54.0	-11.2	1.58 V	331	39.0	3.8
7	#10360.00	44.7 PK	74.0	-29.3	3.82 V	157	32.0	12.7
8	#10360.00	37.9 AV	54.0	-16.1	3.82 V	157	25.2	12.7
9	15540.00	42.8 PK	74.0	-31.2	2.21 V	294	29.9	12.9
10	15540.00	31.8 AV	54.0	-22.2	2.21 V	294	18.9	12.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.9 PK	74.0	-18.1	2.01 H	181	51.9	4.0
2	5150.00	45.4 AV	54.0	-8.6	2.01 H	181	41.4	4.0
3	*5200.00	113.4 PK			2.01 H	181	109.6	3.8
4	*5200.00	103.9 AV			2.01 H	181	100.1	3.8
5	5350.00	48.8 PK	74.0	-25.2	2.01 H	181	45.0	3.8
6	5350.00	36.0 AV	54.0	-18.0	2.01 H	181	32.2	3.8
7	#10400.00	50.8 PK	74.0	-23.2	2.70 H	176	38.1	12.7
8	#10400.00	40.5 AV	54.0	-13.5	2.70 H	176	27.8	12.7
9	15600.00	46.1 PK	74.0	-27.9	1.85 H	58	33.0	13.1
10	15600.00	35.2 AV	54.0	-18.8	1.85 H	58	22.1	13.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.61 V	342	58.1	4.0
2	5150.00	51.7 AV	54.0	-2.3	1.61 V	342	47.7	4.0
3	*5200.00	116.8 PK			1.61 V	342	113.0	3.8
4	*5200.00	107.0 AV			1.61 V	342	103.2	3.8
5	5350.00	55.4 PK	74.0	-18.6	1.61 V	342	51.6	3.8
6	5350.00	42.6 AV	54.0	-11.4	1.61 V	342	38.8	3.8
7	#10400.00	44.4 PK	74.0	-29.6	3.79 V	171	31.7	12.7
8	#10400.00	37.8 AV	54.0	-16.2	3.79 V	171	25.1	12.7
9	15600.00	42.6 PK	74.0	-31.4	2.23 V	296	29.5	13.1
10	15600.00	31.5 AV	54.0	-22.5	2.23 V	296	18.4	13.1

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
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	*5240.00	113.3 PK			1.98 H	180	109.6	3.7
2	*5240.00	103.6 AV			1.98 H	180	99.9	3.7
3	5350.00	49.2 PK	74.0	-24.8	1.98 H	180	45.4	3.8
4	5350.00	36.1 AV	54.0	-17.9	1.98 H	180	32.3	3.8
5	#10480.00	51.4 PK	74.0	-22.6	2.70 H	183	38.1	13.3
6	#10480.00	40.9 AV	54.0	-13.1	2.70 H	183	27.6	13.3
7	15720.00	46.4 PK	74.0	-27.6	1.91 H	61	33.2	13.2
8	15720.00	35.6 AV	54.0	-18.4	1.91 H	61	22.4	13.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	117.0 PK			1.58 V	342	113.3	3.7
2	*5240.00	107.1 AV			1.58 V	342	103.4	3.7
3	5350.00	55.7 PK	74.0	-18.3	1.58 V	342	51.9	3.8
4	5350.00	42.8 AV	54.0	-11.2	1.58 V	342	39.0	3.8
5	#10480.00	44.8 PK	74.0	-29.2	3.79 V	179	31.5	13.3
6	#10480.00	38.0 AV	54.0	-16.0	3.79 V	179	24.7	13.3
7	15720.00	42.4 PK	74.0	-31.6	2.29 V	281	29.2	13.2
8	15720.00	31.5 AV	54.0	-22.5	2.29 V	281	18.3	13.2

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
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	#5616.52	62.9 PK	68.2	-5.3	2.01 H	174	58.7	4.2
2	*5745.00	113.2 PK			2.01 H	174	109.0	4.2
3	*5745.00	102.1 AV			2.01 H	174	97.9	4.2
4	#5958.14	62.5 PK	68.2	-5.7	2.01 H	174	57.9	4.6
5	11490.00	46.5 PK	74.0	-27.5	2.70 H	176	32.7	13.8
6	11490.00	39.1 AV	54.0	-14.9	2.70 H	176	25.3	13.8
7	#17235.00	43.2 PK	74.0	-30.8	1.92 H	7	26.9	16.3
8	#17235.00	32.4 AV	54.0	-21.6	1.92 H	7	16.1	16.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5587.00	60.1 PK	68.2	-8.1	1.55 V	348	56.0	4.1
2	*5745.00	117.1 PK			1.55 V	348	112.9	4.2
3	*5745.00	106.7 AV			1.55 V	348	102.5	4.2
4	#5965.34	57.0 PK	68.2	-11.2	1.55 V	348	52.3	4.7
5	11490.00	45.1 PK	74.0	-28.9	4.00 V	128	31.3	13.8
6	11490.00	38.3 AV	54.0	-15.7	4.00 V	128	24.5	13.8
7	#17235.00	41.4 PK	74.0	-32.6	2.09 V	291	25.1	16.3
8	#17235.00	31.3 AV	54.0	-22.7	2.09 V	291	15.0	16.3

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
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	#5618.22	62.0 PK	68.2	-6.2	1.97 H	163	57.8	4.2
2	*5785.00	113.5 PK			1.97 H	163	109.2	4.3
3	*5785.00	102.2 AV			1.97 H	163	97.9	4.3
4	#5942.14	61.6 PK	68.2	-6.6	1.97 H	163	56.9	4.7
5	11570.00	46.7 PK	74.0	-27.3	2.75 H	176	32.8	13.9
6	11570.00	39.5 AV	54.0	-14.5	2.75 H	176	25.6	13.9
7	#17355.00	43.2 PK	74.0	-30.8	1.95 H	17	26.0	17.2
8	#17355.00	32.3 AV	54.0	-21.7	1.95 H	17	15.1	17.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5651.83	63.7 PK	69.6	-5.9	1.53 V	347	59.7	4.0
2	*5785.00	117.3 PK			1.53 V	348	113.0	4.3
3	*5785.00	106.8 AV			1.53 V	348	102.5	4.3
4	#5946.86	62.4 PK	68.2	-5.8	1.53 V	347	57.8	4.6
5	11570.00	45.6 PK	74.0	-28.4	4.00 V	132	31.7	13.9
6	11570.00	38.7 AV	54.0	-15.3	4.00 V	132	24.8	13.9
7	#17355.00	40.9 PK	74.0	-33.1	2.08 V	288	23.7	17.2
8	#17355.00	30.8 AV	54.0	-23.2	2.08 V	288	13.6	17.2

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
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	#5608.99	61.8 PK	68.2	-6.4	2.05 H	194	57.6	4.2
2	*5825.00	115.7 PK			2.05 H	194	111.2	4.5
3	*5825.00	104.3 AV			2.05 H	194	99.8	4.5
4	#5923.30	61.9 PK	69.5	-7.6	2.05 H	194	57.2	4.7
5	11650.00	45.4 PK	74.0	-28.6	2.68 H	150	31.7	13.7
6	11650.00	39.8 AV	54.0	-14.2	2.68 H	150	26.1	13.7
7	#17475.00	43.8 PK	74.0	-30.2	1.97 H	30	25.7	18.1
8	#17475.00	32.8 AV	54.0	-21.2	1.97 H	30	14.7	18.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5580.76	60.9 PK	68.2	-7.3	2.05 V	194	56.8	4.1
2	*5825.00	118.0 PK			1.54 V	349	113.5	4.5
3	*5825.00	105.4 AV			1.54 V	349	100.9	4.5
4	#6004.57	61.1 PK	68.2	-7.1	2.05 V	194	56.4	4.7
5	11650.00	45.4 PK	74.0	-28.6	3.96 V	130	31.7	13.7
6	11650.00	38.8 AV	54.0	-15.2	3.96 V	130	25.1	13.7
7	#17475.00	41.9 PK	74.0	-32.1	2.16 V	295	23.8	18.1
8	#17475.00	31.5 AV	54.0	-22.5	2.16 V	295	13.4	18.1

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	48.5 PK	74.0	-25.5	2.05 H	178	44.5	4.0
2	5150.00	38.1 AV	54.0	-15.9	2.05 H	178	34.1	4.0
3	*5190.00	105.7 PK			2.05 H	178	101.8	3.9
4	*5190.00	96.2 AV			2.05 H	178	92.3	3.9
5	5350.00	41.2 PK	74.0	-32.8	2.05 H	178	37.4	3.8
6	5350.00	31.5 AV	54.0	-22.5	2.05 H	178	27.7	3.8
7	#10380.00	43.2 PK	74.0	-30.8	2.63 H	185	30.4	12.8
8	#10380.00	36.4 AV	54.0	-17.6	2.63 H	185	23.6	12.8
9	15570.00	41.2 PK	74.0	-32.8	1.91 H	29	28.2	13.0
10	15570.00	30.5 AV	54.0	-23.5	1.91 H	29	17.5	13.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.1 PK	74.0	-10.9	1.52 V	360	59.1	4.0
2	5150.00	53.4 AV	54.0	-0.6	1.52 V	360	49.4	4.0
3	*5190.00	109.2 PK			1.52 V	360	105.3	3.9
4	*5190.00	100.7 AV			1.52 V	360	96.8	3.9
5	5350.00	56.2 PK	74.0	-17.8	1.52 V	360	52.4	3.8
6	5350.00	45.1 AV	54.0	-8.9	1.52 V	360	41.3	3.8
7	#10380.00	45.0 PK	74.0	-29.0	3.83 V	164	32.2	12.8
8	#10380.00	38.0 AV	54.0	-16.0	3.83 V	164	25.2	12.8
9	15570.00	43.8 PK	74.0	-30.2	2.20 V	283	30.8	13.0
10	15570.00	32.4 AV	54.0	-21.6	2.20 V	283	19.4	13.0

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": 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	5150.00	51.4 PK	74.0	-22.6	2.05 H	168	47.4	4.0
2	5150.00	42.3 AV	54.0	-11.7	2.05 H	168	38.3	4.0
3	*5230.00	109.4 PK			2.04 H	172	105.7	3.7
4	*5230.00	100.2 AV			2.04 H	172	96.5	3.7
5	5350.00	48.8 PK	74.0	-25.2	2.05 H	168	45.0	3.8
6	5350.00	39.5 AV	54.0	-14.5	2.05 H	168	35.7	3.8
7	#10460.00	42.3 PK	74.0	-31.7	2.62 H	191	29.1	13.2
8	#10460.00	35.5 AV	54.0	-18.5	2.62 H	191	22.3	13.2
9	15690.00	39.8 PK	74.0	-34.2	1.87 H	35	26.4	13.4
10	15690.00	30.3 AV	54.0	-23.7	1.87 H	35	16.9	13.4

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.3 PK	74.0	-12.7	1.49 V	360	57.3	4.0
2	5150.00	50.2 AV	54.0	-3.8	1.49 V	360	46.2	4.0
3	*5230.00	113.2 PK			1.49 V	360	109.5	3.7
4	*5230.00	104.5 AV			1.49 V	360	100.8	3.7
5	5350.00	58.5 PK	74.0	-15.5	1.49 V	360	54.7	3.8
6	5350.00	47.2 AV	54.0	-6.8	1.49 V	360	43.4	3.8
7	#10460.00	47.8 PK	74.0	-26.2	3.79 V	172	34.6	13.2
8	#10460.00	40.1 AV	54.0	-13.9	3.79 V	172	26.9	13.2
9	15690.00	45.1 PK	74.0	-28.9	2.23 V	296	31.7	13.4
10	15690.00	34.3 AV	54.0	-19.7	2.23 V	296	20.9	13.4

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 151	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	#5625.82	62.0 PK	68.2	-6.2	2.05 H	208	57.8	4.2
2	*5755.00	105.4 PK			2.05 H	208	101.1	4.3
3	*5755.00	97.2 AV			2.05 H	208	92.9	4.3
4	#5960.92	61.7 PK	68.2	-6.5	2.05 H	208	57.0	4.7
5	11510.00	42.7 PK	74.0	-31.3	2.72 H	156	28.8	13.9
6	11510.00	35.8 AV	54.0	-18.2	2.72 H	156	21.9	13.9
7	#17265.00	40.2 PK	74.0	-33.8	1.88 H	11	23.6	16.6
8	#17265.00	30.1 AV	54.0	-23.9	1.88 H	11	13.5	16.6

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.18	63.7 PK	68.2	-4.5	1.47 V	322	59.6	4.1
2	*5755.00	113.5 PK			1.47 V	322	109.2	4.3
3	*5755.00	104.5 AV			1.47 V	322	100.2	4.3
4	#5993.58	62.6 PK	68.2	-5.6	1.47 V	322	57.9	4.7
5	11510.00	46.8 PK	74.0	-27.2	3.92 V	178	32.9	13.9
6	11510.00	39.6 AV	54.0	-14.4	3.92 V	178	25.7	13.9
7	#17265.00	44.7 PK	74.0	-29.3	2.17 V	308	28.1	16.6
8	#17265.00	33.2 AV	54.0	-20.8	2.17 V	308	16.6	16.6

REMARKS:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK)
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	#5620.43	62.4 PK	68.2	-5.8	2.00 H	196	58.2	4.2
2	*5795.00	105.4 PK			2.00 H	196	101.1	4.3
3	*5795.00	97.5 AV			2.00 H	196	93.2	4.3
4	#5924.74	61.6 PK	68.4	-6.8	2.00 H	196	56.9	4.7
5	11590.00	43.2 PK	74.0	-30.8	2.70 H	169	29.3	13.9
6	11590.00	36.3 AV	54.0	-17.7	2.70 H	169	22.4	13.9
7	#17385.00	40.3 PK	74.0	-33.7	1.91 H	360	22.8	17.5
8	#17385.00	30.2 AV	54.0	-23.8	1.91 H	360	12.7	17.5

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5646.96	63.3 PK	68.2	-4.9	1.45 V	340	59.2	4.1
2	*5795.00	113.4 PK			1.42 V	325	109.1	4.3
3	*5795.00	104.1 AV			1.42 V	325	99.8	4.3
4	#6016.40	62.4 PK	68.2	-5.8	1.45 V	340	57.7	4.7
5	11590.00	47.4 PK	74.0	-26.6	3.95 V	180	33.5	13.9
6	11590.00	40.0 AV	54.0	-14.0	3.95 V	180	26.1	13.9
7	#17385.00	44.5 PK	74.0	-29.5	2.16 V	299	27.0	17.5
8	#17385.00	32.8 AV	54.0	-21.2	2.16 V	299	15.3	17.5

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	53.4 PK	74.0	-20.6	2.68 H	172	49.4	4.0
2	5150.00	42.7 AV	54.0	-11.3	2.68 H	172	38.7	4.0
3	*5210.00	105.4 PK			2.68 H	172	101.6	3.8
4	*5210.00	95.9 AV			2.68 H	172	92.1	3.8
5	5350.00	50.2 PK	74.0	-23.8	2.68 H	172	46.4	3.8
6	5350.00	39.7 AV	54.0	-14.3	2.68 H	172	35.9	3.8
7	#10420.00	51.6 PK	74.0	-22.4	2.71 H	184	38.7	12.9
8	#10420.00	41.3 AV	54.0	-12.7	2.71 H	184	28.4	12.9
9	15630.00	46.1 PK	74.0	-27.9	1.82 H	39	32.8	13.3
10	15630.00	35.6 AV	54.0	-18.4	1.82 H	39	22.3	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.2 PK	74.0	-11.8	1.82 V	130	58.2	4.0
2	5150.00	53.3 AV	54.0	-0.7	1.82 V	130	49.3	4.0
3	*5210.00	106.1 PK			1.82 V	130	102.3	3.8
4	*5210.00	97.6 AV			1.82 V	130	93.8	3.8
5	5350.00	54.6 PK	74.0	-19.4	1.82 V	130	50.8	3.8
6	5350.00	42.7 AV	54.0	-11.3	1.82 V	130	38.9	3.8
7	#10420.00	44.1 PK	74.0	-29.9	3.78 V	155	31.2	12.9
8	#10420.00	37.2 AV	54.0	-16.8	3.78 V	155	24.3	12.9
9	15630.00	42.8 PK	74.0	-31.2	2.17 V	270	29.5	13.3
10	15630.00	30.5 AV	54.0	-23.5	2.17 V	270	17.2	13.3

REMARKS:

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

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK)
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	#5608.47	62.0 PK	68.2	-6.2	1.45 H	167	57.8	4.2
2	*5775.00	110.6 PK			1.45 H	167	106.4	4.2
3	*5775.00	101.4 AV			1.45 H	167	97.2	4.2
4	#5927.52	62.5 PK	68.2	-5.7	1.45 H	167	57.8	4.7
5	11550.00	43.5 PK	74.0	-30.5	2.77 H	143	29.6	13.9
6	11550.00	36.6 AV	54.0	-17.4	2.77 H	143	22.7	13.9
7	#17325.00	41.3 PK	74.0	-32.7	1.80 H	35	24.3	17.0
8	#17325.00	30.7 AV	54.0	-23.3	1.80 H	35	13.7	17.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5643.87	65.9 PK	68.2	-2.3	2.07 V	349	61.8	4.1
2	*5775.00	113.8 PK			2.07 V	349	109.6	4.2
3	*5775.00	104.4 AV			2.07 V	349	100.2	4.2
4	#6020.65	62.4 PK	68.2	-5.8	2.07 V	349	57.6	4.8
5	11550.00	47.7 PK	74.0	-26.3	3.89 V	181	33.8	13.9
6	11550.00	39.9 AV	54.0	-14.1	3.89 V	181	26.0	13.9
7	#17325.00	45.5 PK	74.0	-28.5	2.16 V	297	28.5	17.0
8	#17325.00	34.4 AV	54.0	-19.6	2.16 V	297	17.4	17.0

REMARKS:

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

Below 1GHz Data:

Beamforming Mode

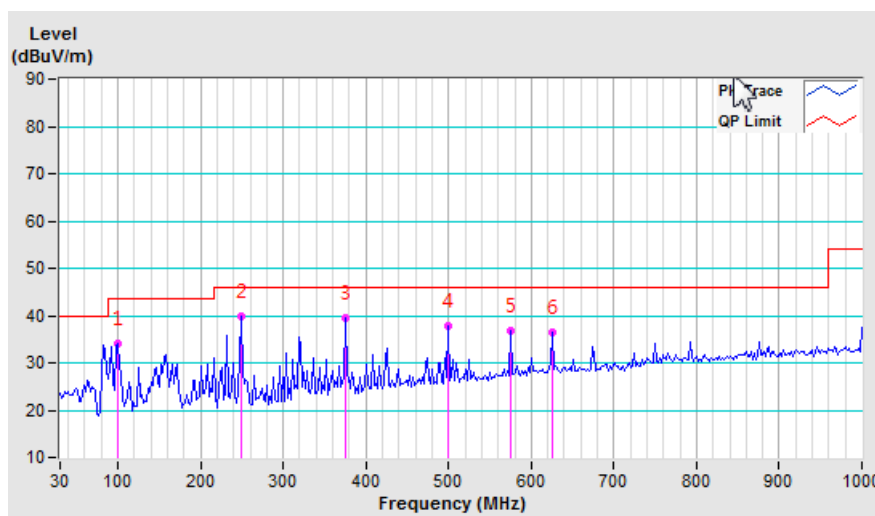
802.11ac (VHT20)

CHANNEL	TX Channel 165	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	99.84	34.1 QP	43.5	-9.4	2.00 H	37	46.5	-12.4
2	249.22	39.8 QP	46.0	-6.2	1.50 H	211	49.2	-9.4
3	375.32	39.5 QP	46.0	-6.5	1.00 H	297	45.1	-5.6
4	499.48	37.9 QP	46.0	-8.1	1.50 H	21	40.6	-2.7
5	575.14	36.8 QP	46.0	-9.2	1.00 H	314	38.0	-1.2
6	625.58	36.6 QP	46.0	-9.4	2.50 H	191	36.7	-0.1

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

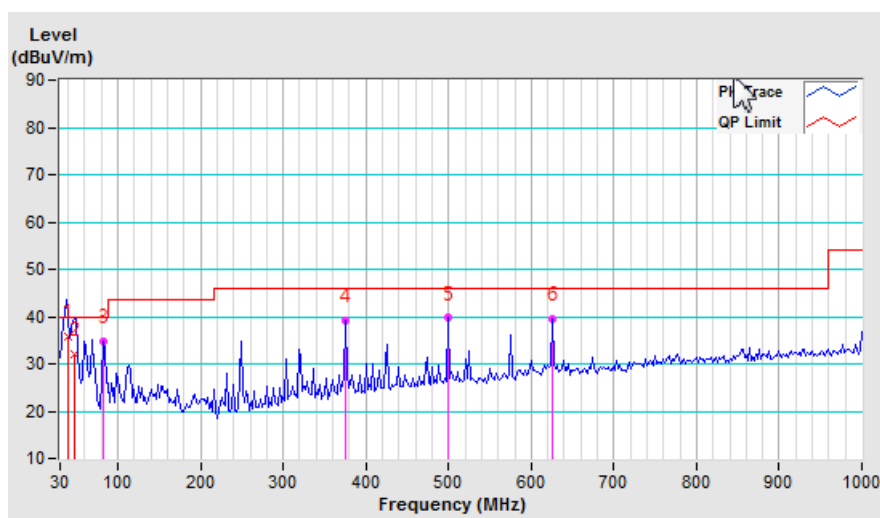


CHANNEL	TX Channel 165	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	39.09	35.8 QP	40.0	-4.2	1.00 V	127	44.2	-8.4
2	48.31	32.2 QP	40.0	-7.8	1.00 V	62	40.2	-8.0
3	82.38	34.7 QP	40.0	-5.3	1.50 V	201	47.9	-13.2
4	375.32	39.3 QP	46.0	-6.7	2.50 V	331	44.9	-5.6
5	499.48	39.7 QP	46.0	-6.3	2.00 V	43	42.4	-2.7
6	625.58	39.5 QP	46.0	-6.5	3.50 V	103	39.6	-0.1

REMARKS:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: Jan. 24, 2018

4.2.3 Test Procedure

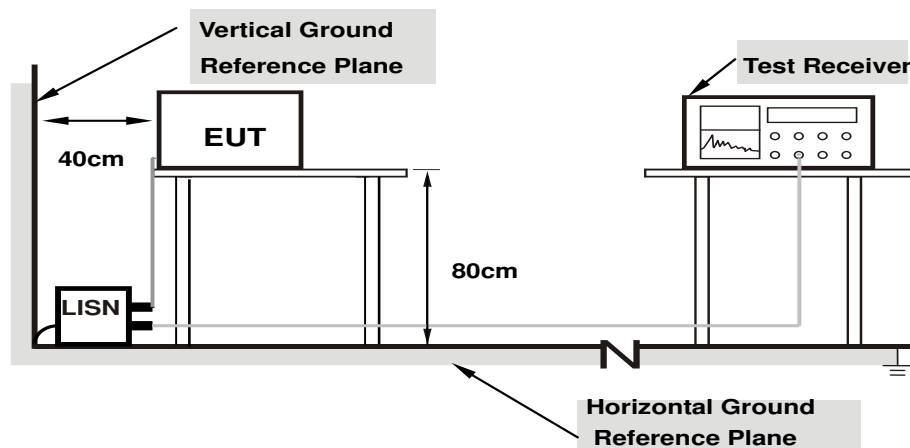
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

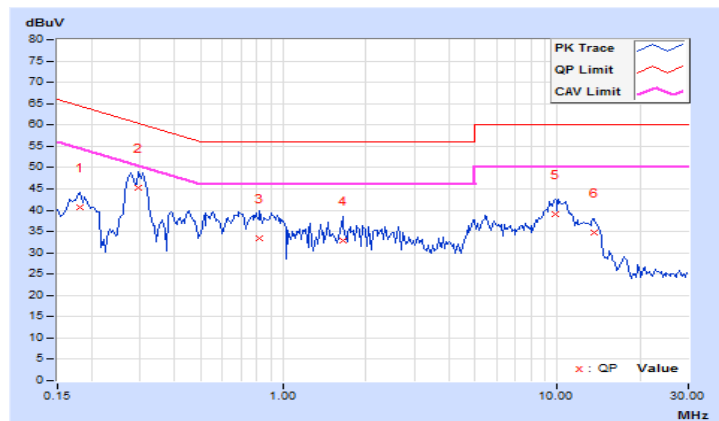
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18125	10.14	30.65	21.95	40.79	32.09	64.43	54.43	-23.64	-22.34
2	0.29453	10.17	35.14	27.90	45.31	38.07	60.40	50.40	-15.09	-12.33
3	0.81797	10.23	23.26	15.56	33.49	25.79	56.00	46.00	-22.51	-20.21
4	1.64844	10.28	22.50	15.02	32.78	25.30	56.00	46.00	-23.22	-20.70
5	9.85938	10.80	28.25	23.92	39.05	34.72	60.00	50.00	-20.95	-15.28
6	13.66797	11.07	23.59	19.95	34.66	31.02	60.00	50.00	-25.34	-18.98

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

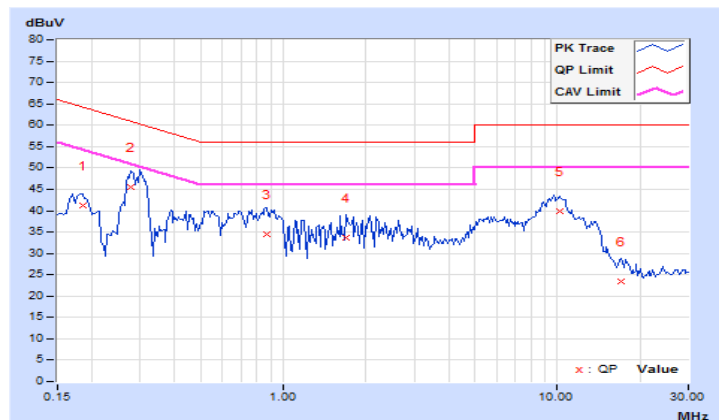


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	10.05	31.18	22.30	41.23	32.35	64.25	54.25	-23.02	-21.90
2	0.27891	10.07	35.42	27.07	45.49	37.14	60.85	50.85	-15.36	-13.71
3	0.87266	10.12	24.38	17.60	34.50	27.72	56.00	46.00	-21.50	-18.28
4	1.69922	10.16	23.48	15.94	33.64	26.10	56.00	46.00	-22.36	-19.90
5	10.17969	10.65	29.26	25.19	39.91	35.84	60.00	50.00	-20.09	-14.16
6	17.08403	11.11	12.29	8.45	23.40	19.56	60.00	50.00	-36.60	-30.44

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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,

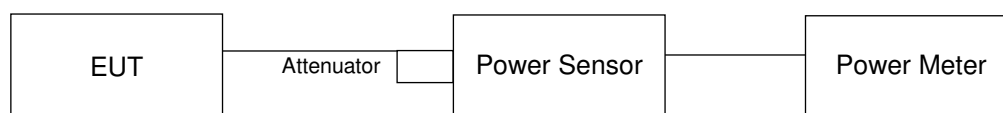
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

For Radio 1:

Master - 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	21.63	21.74	20.55	21.27	542.294	27.34	29.58	Pass
40	5200	23.32	23.53	22.21	22.91	801.982	29.04	29.58	Pass
48	5240	22.75	22.33	21.47	22.17	664.464	28.22	29.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $30-(6.42-6) = 29.58\text{dBm}$.

Master - 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	22.56	22.94	21.87	22.36	703.093	28.47	29.58	Pass
40	5200	22.84	22.97	21.74	22.59	721.293	28.58	29.58	Pass
48	5240	22.37	22.62	21.69	22.37	675.549	28.30	29.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $30-(6.42-6) = 29.58\text{dBm}$.

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	18.22	18.27	17.79	18.32	261.554	24.18	29.58	Pass
46	5230	22.79	22.70	21.24	22.37	681.946	28.34	29.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $30-(6.42-6) = 29.58\text{dBm}$.

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	17.82	17.82	17.41	17.34	230.349	23.62	29.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $30-(6.42-6) = 29.58\text{dBm}$.

Client - 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	16.49	16.68	15.44	16.11	166.952	22.23	23.58	Pass
40	5200	17.19	17.35	16.04	16.66	193.209	22.86	23.58	Pass
48	5240	16.57	16.49	15.41	16.21	166.497	22.21	23.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $24 - (6.42 - 6) = 23.58\text{dBm}$.

Client - 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	16.49	16.87	15.71	16.28	172.908	22.38	23.58	Pass
40	5200	16.73	16.91	15.72	16.42	177.367	22.49	23.58	Pass
48	5240	16.37	16.62	15.84	16.37	170.993	22.33	23.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $24 - (6.42 - 6) = 23.58\text{dBm}$.

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	16.39	16.42	15.64	16.17	165.448	22.19	23.58	Pass
46	5230	16.67	16.61	15.11	16.28	167.162	22.23	23.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $24 - (6.42 - 6) = 23.58\text{dBm}$.

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	16.91	16.94	16.37	16.28	184.335	22.66	23.58	Pass

Note: The directional gain is 6.42dBi > 6dBi, so the power limit shall be reduced to $24 - (6.42 - 6) = 23.58\text{dBm}$.

For Radio 2:

Master - CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	21.15	22.57	21.49	21.77	602.277	27.80	28.70	Pass
157	5785	21.24	22.26	21.64	21.28	581.469	27.65	28.70	Pass
165	5825	22.54	22.47	21.48	21.83	649.087	28.12	28.70	Pass

Note: The directional gain is 7.30dBi > 6dBi, so the power limit shall be reduced to $30-(7.30-6) = 28.70\text{dBm}$.

Master - Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	21.49	22.19	21.32	20.35	550.418	27.41	28.70	Pass
157	5785	21.47	22.32	21.37	20.48	559.663	27.48	28.70	Pass
165	5825	22.68	22.19	22.39	21.36	661.083	28.20	28.70	Pass

Note: The directional gain is 7.30dBi > 6dBi, so the power limit shall be reduced to $30-(7.30-6) = 28.70\text{dBm}$.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	21.64	21.82	21.04	20.79	544.943	27.36	28.70	Pass
159	5795	21.10	21.77	21.70	21.71	575.302	27.60	28.70	Pass

Note: The directional gain is 7.30dBi > 6dBi, so the power limit shall be reduced to $30-(7.30-6) = 28.70\text{dBm}$.

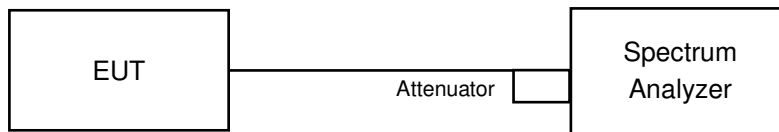
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	21.41	21.59	21.84	21.33	571.157	27.57	28.70	Pass

Note: The directional gain is 7.30dBi > 6dBi, so the power limit shall be reduced to $30-(7.30-6) = 28.70\text{dBm}$.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

For Radio 1:

Master - CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	16.92	17.04	16.80	16.80
40	5200	16.92	17.04	16.56	16.92
48	5240	16.92	17.04	16.80	16.92

Master - Beamforming Mode

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	18.12	18.36	18.00	18.24
40	5200	18.00	18.12	18.00	18.12
48	5240	18.12	18.12	18.00	18.12

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	36.96	36.72	36.96	36.72
46	5230	36.96	36.72	36.96	36.72

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	75.84	75.36	75.36	75.36

For Radio 2:

Master - CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	16.80	16.92	16.92	16.80
157	5785	16.92	17.16	16.92	16.80
165	5825	16.92	17.04	17.04	17.04

Master - Beamforming Mode

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	18.12	18.12	18.12	18.00
157	5785	18.12	18.00	18.12	18.00
165	5825	18.24	18.24	18.24	18.24

802.11ac (VHT40)

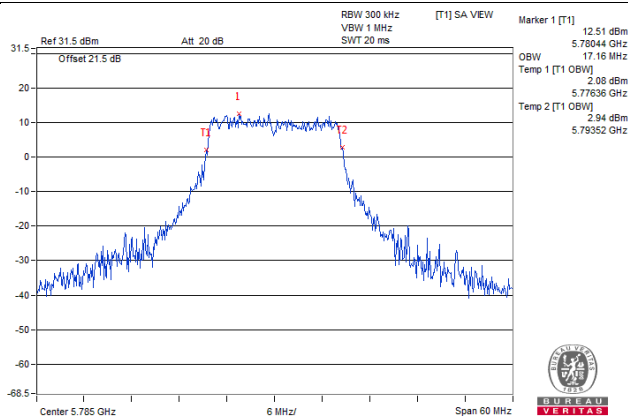
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	36.72	36.72	36.96	36.72
159	5795	36.96	37.20	36.72	36.96

802.11ac (VHT80)

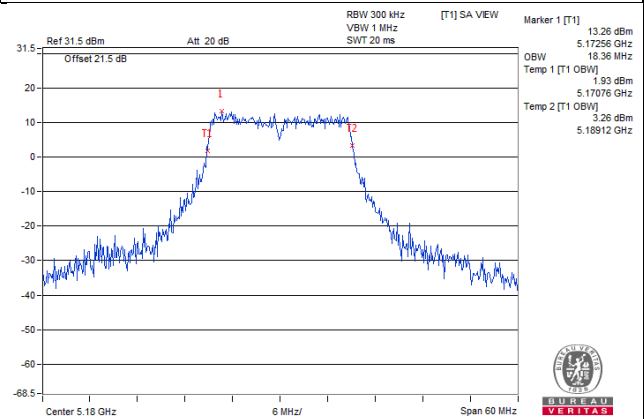
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	75.36	75.84	75.84	75.36

Spectrum Plot of Worst Value

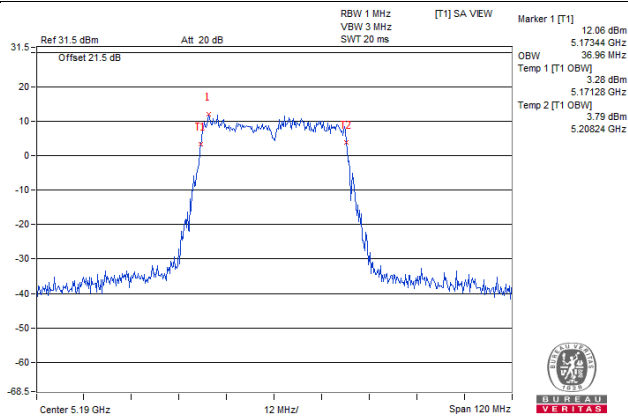
802.11a_Chain 1 / CH157



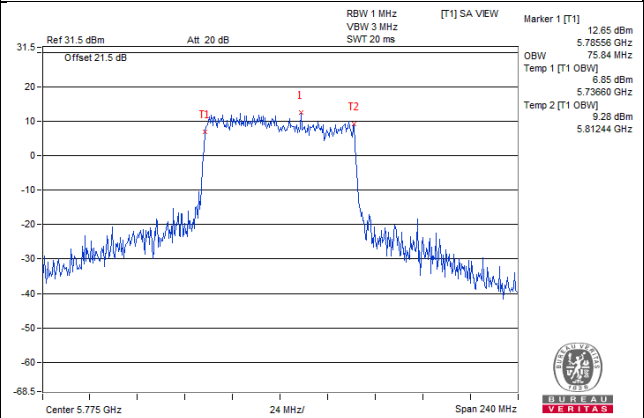
802.11ac (VHT20)_Chain 1 / CH36



802.11ac (VHT40)_Chain 0 / CH38



802.11ac (VHT80)_Chain 1 / CH155



For Radio 1:

Client - CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	16.80	16.92	16.68	16.92
40	5200	16.92	17.16	16.68	17.04
48	5240	17.04	16.92	16.92	16.92

Client - Beamforming Mode

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	18.00	18.24	18.00	18.12
40	5200	18.00	18.12	18.00	18.00
48	5240	18.12	18.36	18.00	18.00

802.11ac (VHT40)

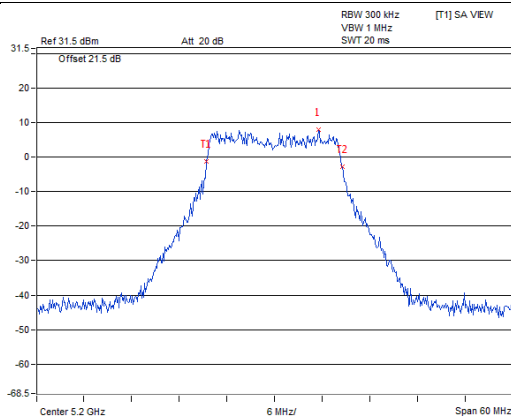
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	36.96	36.96	36.72	36.72
46	5230	36.72	36.72	36.96	36.72

802.11ac (VHT80)

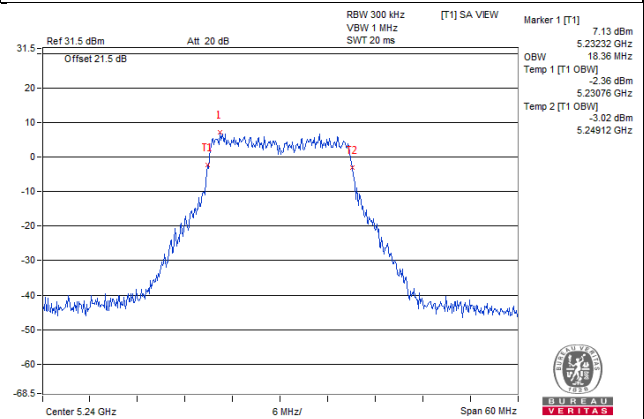
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	75.84	75.36	75.36	75.36

Spectrum Plot of Worst Value

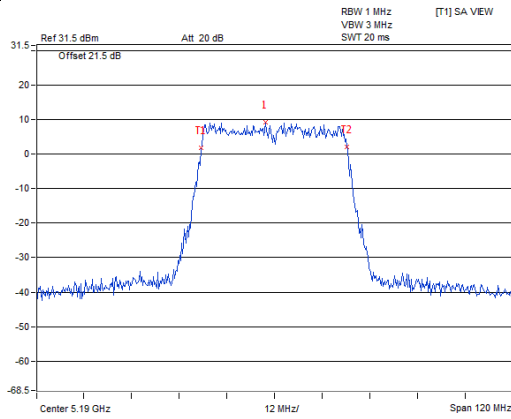
802.11a_Chain 1 / CH40



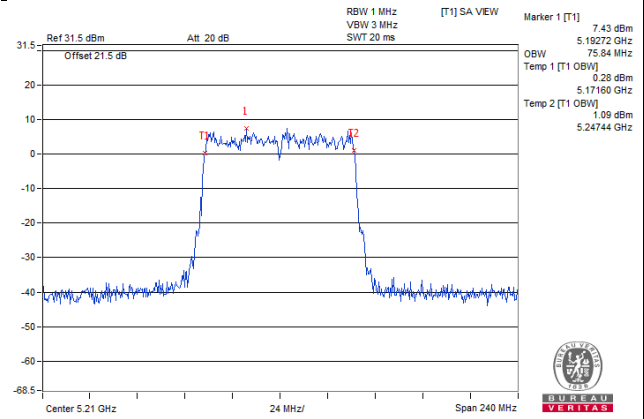
802.11ac (VHT20)_Chain 1 / CH48



802.11ac (VHT40)_Chain 0 / CH38

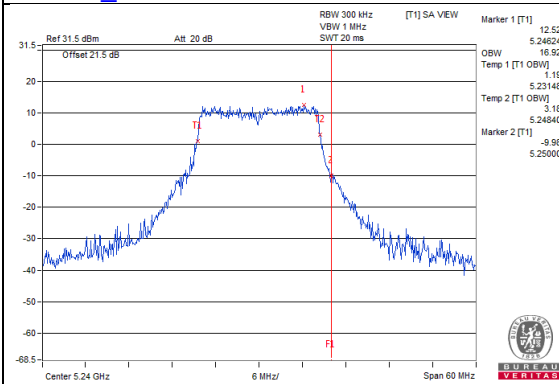


802.11ac (VHT80)_Chain 0 / CH42

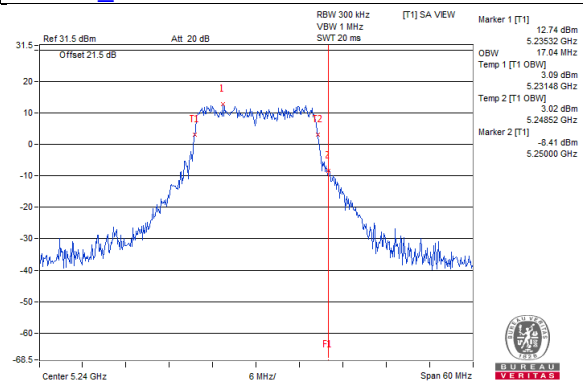


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

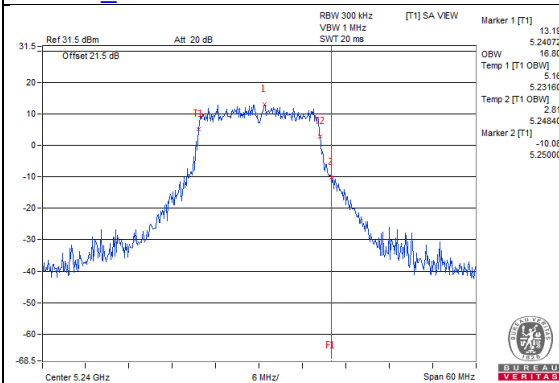
802.11a_Chain 0 / CH48



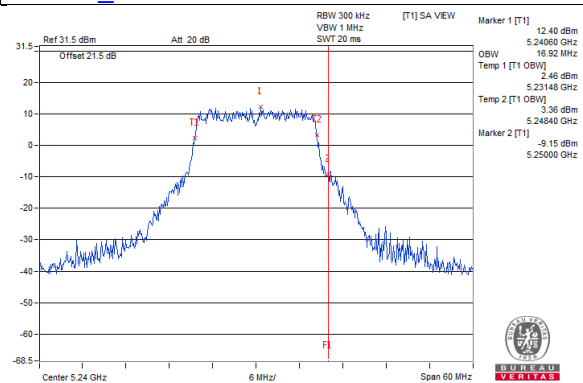
802.11a_Chain 1 / CH48



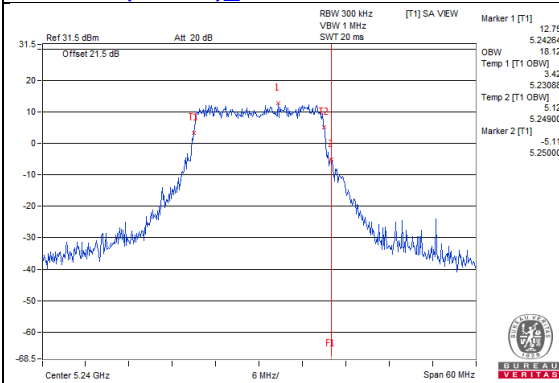
802.11a_Chain 2 / CH48



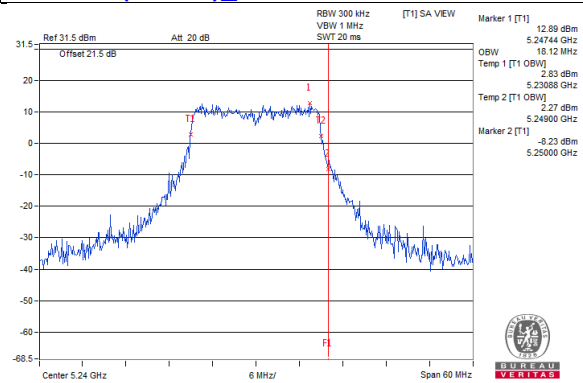
802.11a_Chain 3 / CH48



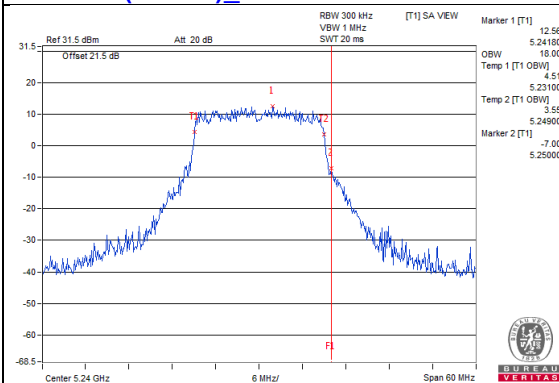
802.11ac (VHT20)_Chain 0 / CH48



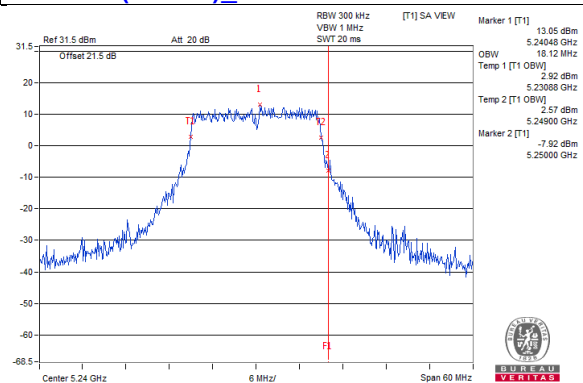
802.11ac (VHT20)_Chain 1 / CH48



802.11ac (VHT20)_Chain 2 / CH48

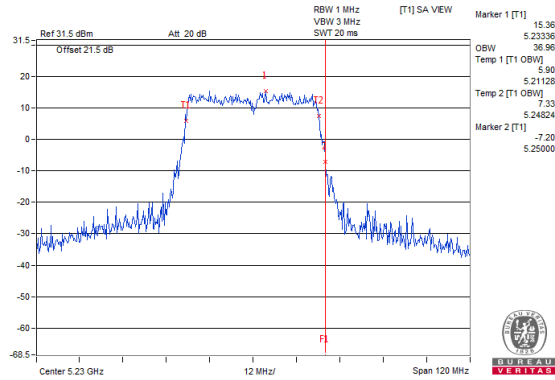


802.11ac (VHT20)_Chain 3 / CH48

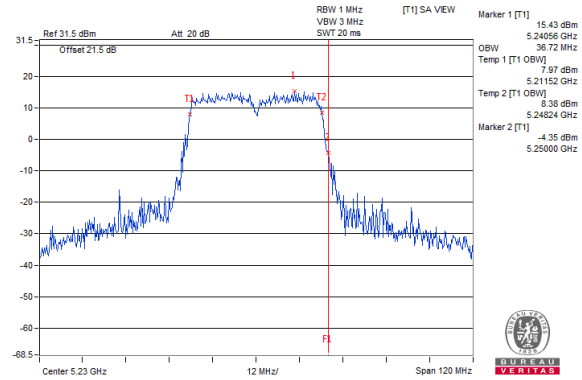


Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)

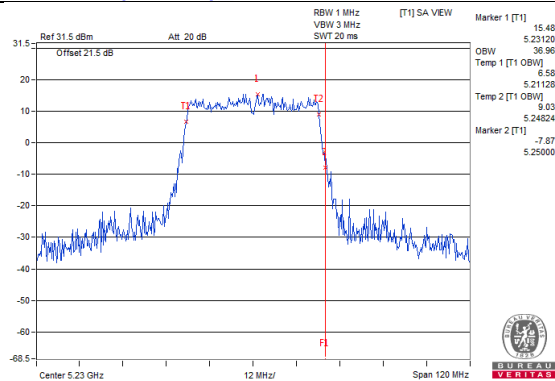
802.11ac (VHT40)_Chain 0 / CH46



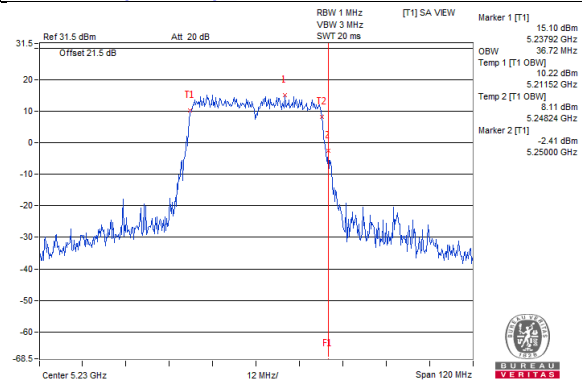
802.11ac (VHT40)_Chain 1 / CH46



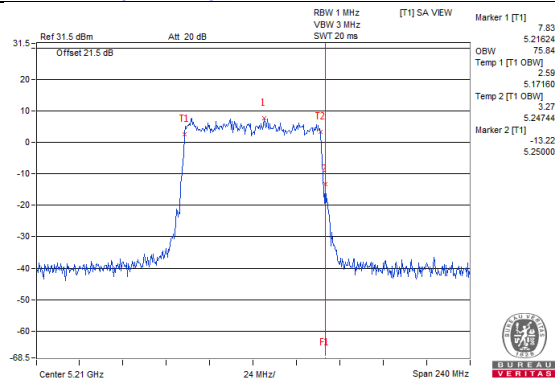
802.11ac (VHT40)_Chain 2 / CH46



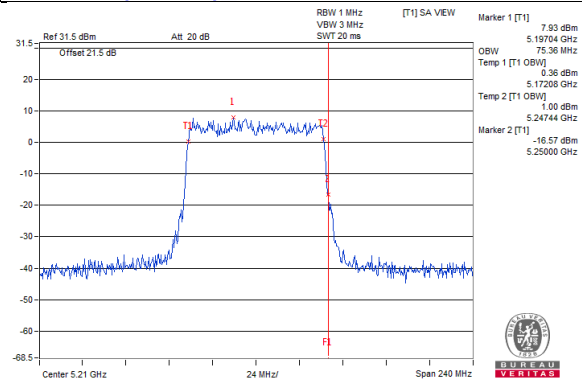
802.11ac (VHT40)_Chain 3 / CH46



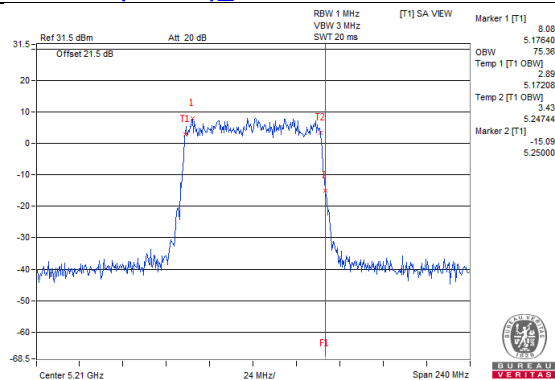
802.11ac (VHT80)_Chain 0 / CH42



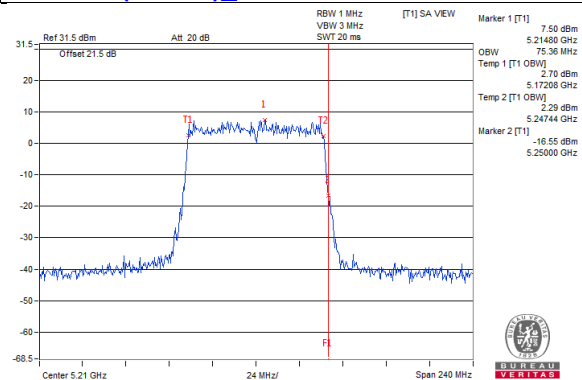
802.11ac (VHT80)_Chain 1 / CH42



802.11ac (VHT80)_Chain 2 / CH42

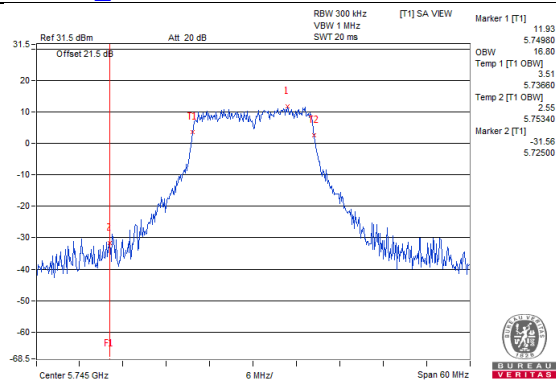


802.11ac (VHT80)_Chain 3 / CH42

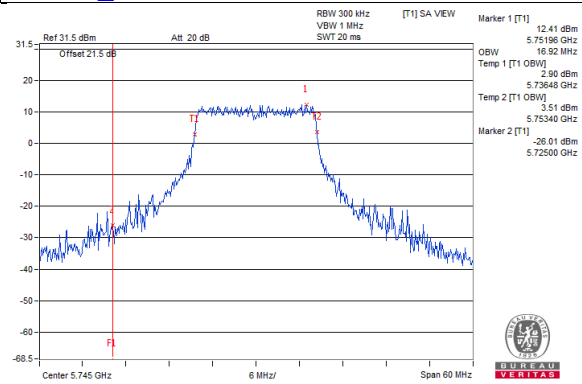


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

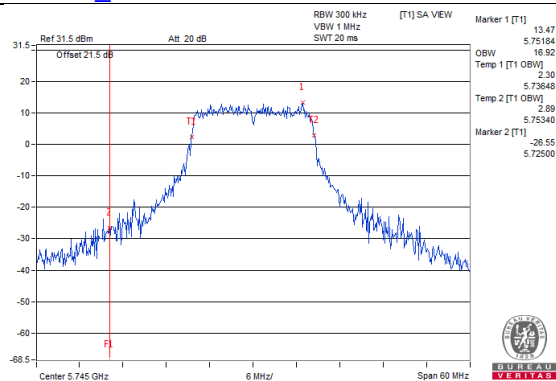
802.11a_Chain 0 / CH149



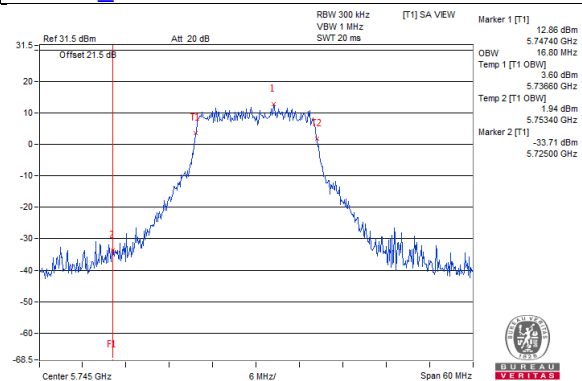
802.11a_Chain 1 / CH149



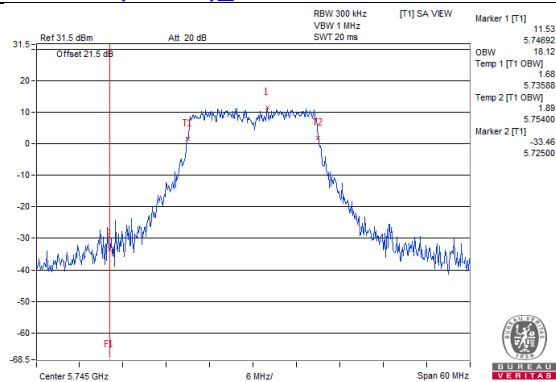
802.11a_Chain 2 / CH149



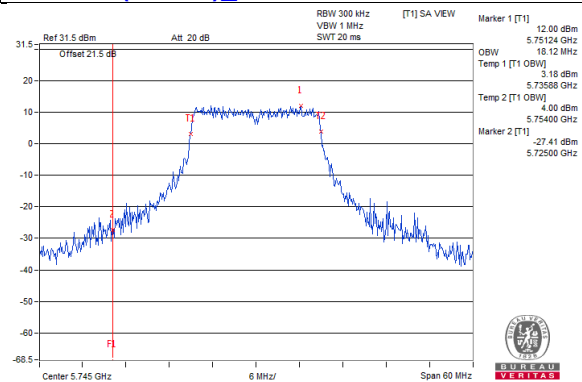
802.11a_Chain 3 / CH149



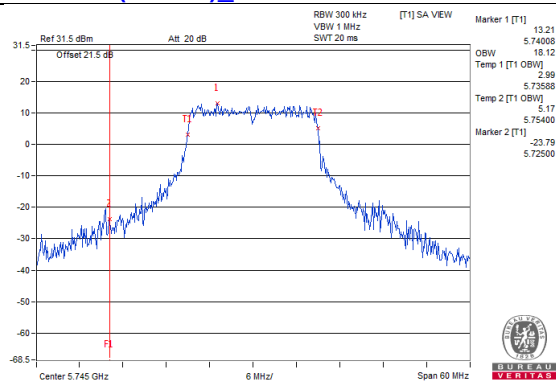
802.11ac (VHT20)_Chain 0 / CH149



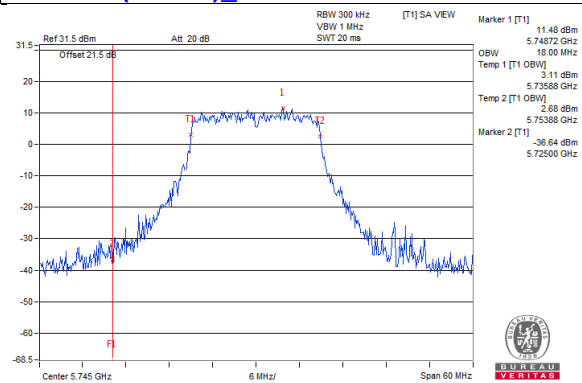
802.11ac (VHT20)_Chain 1 / CH149



802.11ac (VHT20)_Chain 2 / CH149

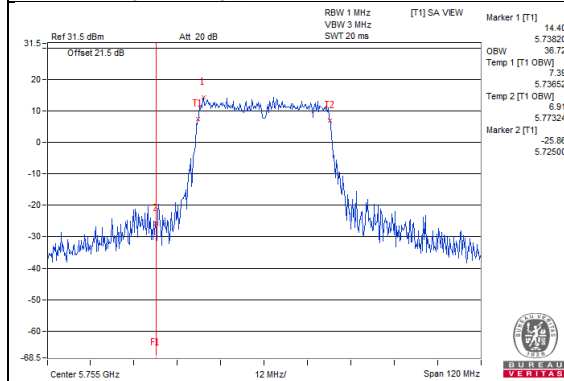


802.11ac (VHT20)_Chain 3 / CH149

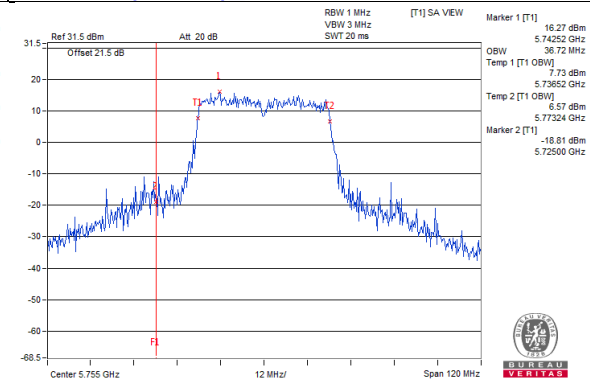


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

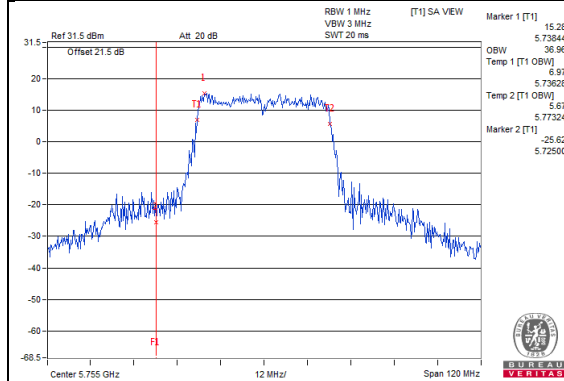
802.11ac (VHT40)_Chain 0 / CH151



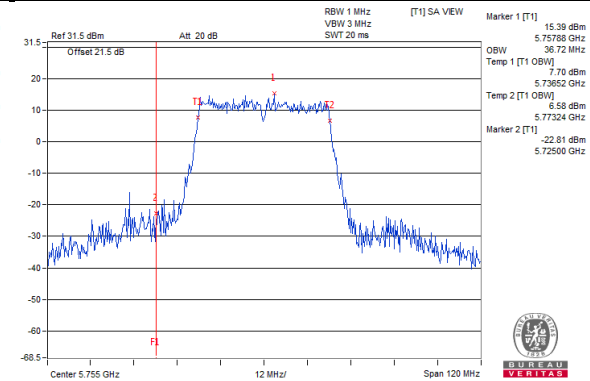
802.11ac (VHT40)_Chain 1 / CH151



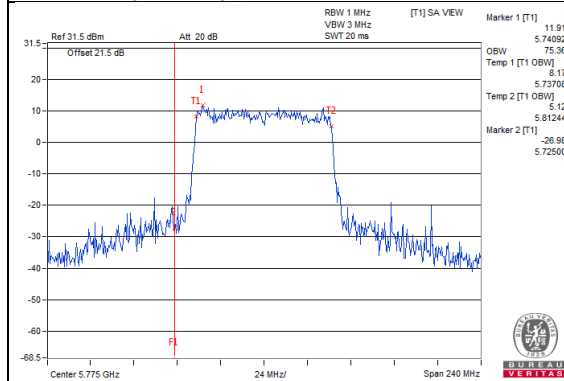
802.11ac (VHT40)_Chain 2 / CH151



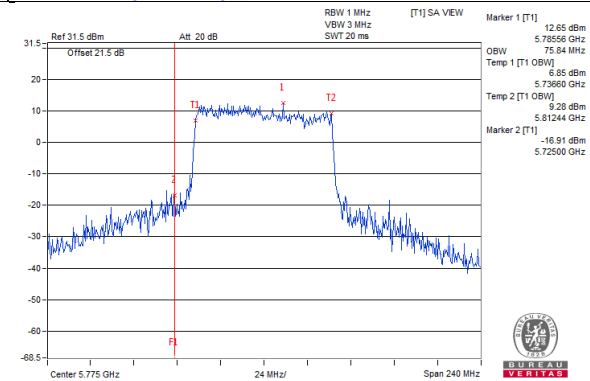
802.11ac (VHT40)_Chain 3 / CH151



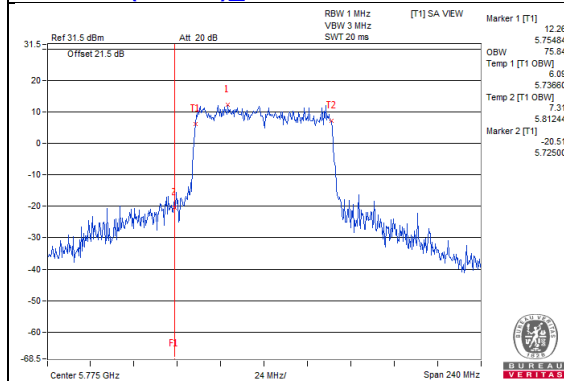
802.11ac (VHT80)_Chain 0 / CH155



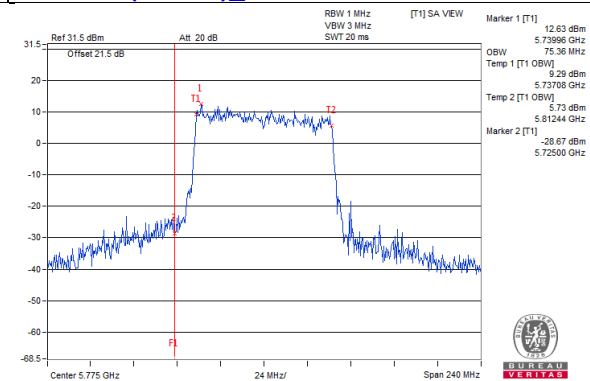
802.11ac (VHT80)_Chain 1 / CH155



802.11ac (VHT80)_Chain 2 / CH155



802.11ac (VHT80)_Chain 3 / CH155



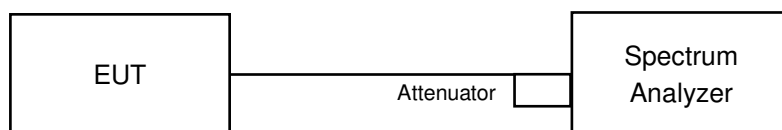
4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

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

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1 band:

802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80)

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 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

802.11a

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 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 $10 \log (1/\text{duty cycle})$

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 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 $\text{BWCF} = 10\log(500 \text{ kHz}/300\text{kHz})$
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

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 Radio 1:

For U-NII-1:

Master - 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	7.24	7.04	8.13	7.19	0.11	13.55	16.58	Pass
40	5200	9.11	8.68	9.24	8.31	0.11	14.98	16.58	Pass
48	5240	8.40	8.77	7.53	7.50	0.11	14.21	16.58	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to 17-(6.42-6) = 16.58dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Master - Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
36	5180	8.84	7.79	8.82	8.34	14.49	16.58	Pass
40	5200	8.51	7.88	9.16	8.71	14.61	16.58	Pass
48	5240	8.00	7.42	8.64	8.32	14.14	16.58	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to 17-(6.42-6) = 16.58dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
38	5190	1.78	0.64	2.10	1.48	7.55	16.58	Pass
46	5230	6.04	5.29	4.75	5.08	11.34	16.58	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to 17-(6.42-6) = 16.58dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
42	5210	-1.03	-2.03	-2.14	-2.04	4.24	16.58	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to $17-(6.42-6) = 16.58\text{dBm}$.

Client - 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	1.90	-0.86	0.29	-3.17	0.11	6.04	10.58	Pass
40	5200	-5.40	3.49	2.15	2.28	0.11	7.78	10.58	Pass
48	5240	2.34	2.36	3.15	1.79	0.11	8.56	10.58	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to $11-(6.42-6) = 10.58\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

Client - Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
36	5180	-1.83	3.41	0.89	1.74	7.46	10.58	Pass
40	5200	2.83	2.21	3.11	2.59	8.72	10.58	Pass
48	5240	2.48	1.68	2.74	2.32	8.34	10.58	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to $11-(6.42-6) = 10.58\text{dBm}$.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
38	5190	-0.04	-1.20	-0.68	-0.52	5.43	10.58	Pass
46	5230	0.00	-1.02	-0.56	-0.64	5.48	10.58	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to $11-(6.42-6) = 10.58\text{dBm}$.

802.11ac (VHT80)

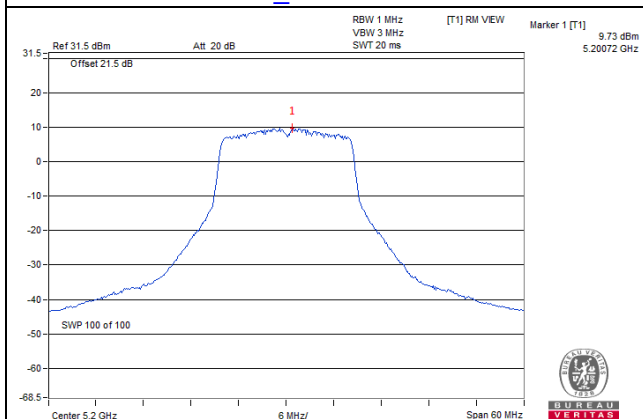
Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
42	5210	-1.71	-2.92	-3.61	-2.85	3.30	10.58	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

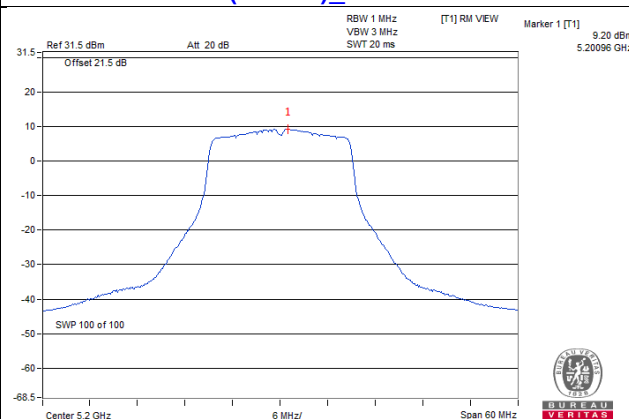
2. The Directional gain = 6.42dBi > 6dBi, so the power density limit shall be reduced to $11-(6.42-6) = 10.58\text{dBm}$.

Spectrum Plot of Worst Value

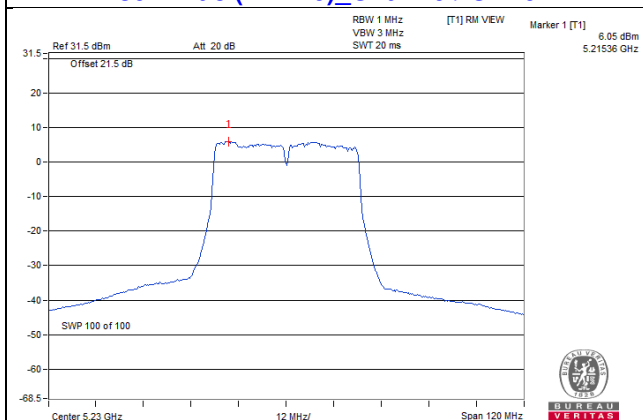
802.11a_Chain 2 / CH40



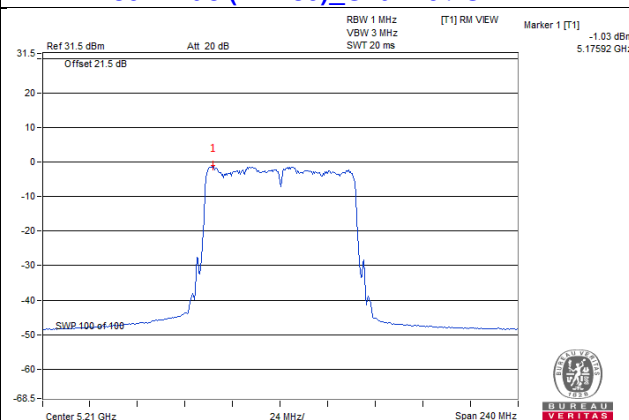
802.11ac (VHT20)_Chain 2 / CH40



802.11ac (VHT40)_Chain 0 / CH46



802.11ac (VHT80)_Chain 0 / CH42



For Radio 2:

For U-NII-3:

Master - CDD Mode

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-0.26	1.96	6.02	7.98	28.70	Pass
	157	5785	-0.58	1.64	6.02	7.66	28.70	Pass
	165	5825	1.06	3.28	6.02	9.30	28.70	Pass
1	149	5745	0.38	2.60	6.02	8.62	28.70	Pass
	157	5785	-0.03	2.19	6.02	8.21	28.70	Pass
	165	5825	0.53	2.75	6.02	8.77	28.70	Pass
2	149	5745	0.90	3.12	6.02	9.14	28.70	Pass
	157	5785	0.58	2.80	6.02	8.82	28.70	Pass
	165	5825	1.61	3.83	6.02	9.85	28.70	Pass
3	149	5745	-4.29	-2.07	6.02	3.95	28.70	Pass
	157	5785	-0.15	2.07	6.02	8.09	28.70	Pass
	165	5825	-0.39	1.83	6.02	7.85	28.70	Pass

Note: 1. The Directional gain = 7.3dBi > 6dBi, so the power density limit shall be reduced to $30 - (7.3 - 6) = 28.7\text{dBm}$.

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

Master - Beamforming Mode

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-0.38	1.84	6.02	7.86	28.70	Pass
	157	5785	-0.31	1.91	6.02	7.93	28.70	Pass
	165	5825	1.14	3.36	6.02	9.38	28.70	Pass
1	149	5745	0.60	2.82	6.02	8.84	28.70	Pass
	157	5785	0.18	2.40	6.02	8.42	28.70	Pass
	165	5825	0.71	2.93	6.02	8.95	28.70	Pass
2	149	5745	0.96	3.18	6.02	9.20	28.70	Pass
	157	5785	0.10	2.32	6.02	8.34	28.70	Pass
	165	5825	1.20	3.42	6.02	9.44	28.70	Pass
3	149	5745	-0.15	2.07	6.02	8.09	28.70	Pass
	157	5785	-0.49	1.73	6.02	7.75	28.70	Pass
	165	5825	-1.48	0.74	6.02	6.76	28.70	Pass

Note: 1. The Directional gain = 7.3dBi > 6dBi, so the power density limit shall be reduced to $30-(7.3-6) = 28.7\text{dBm}$.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	151	5745	-3.76	-1.54	6.02	4.48	28.70	Pass
	159	5785	-4.09	-1.87	6.02	4.15	28.70	Pass
1	151	5745	-2.72	-0.50	6.02	5.52	28.70	Pass
	159	5785	-2.39	-0.17	6.02	5.85	28.70	Pass
2	151	5745	-2.85	-0.63	6.02	5.39	28.70	Pass
	159	5785	-3.01	-0.79	6.02	5.23	28.70	Pass
3	151	5745	-3.53	-1.31	6.02	4.71	28.70	Pass
	159	5785	-4.31	-2.09	6.02	3.93	28.70	Pass

Note: 1. The Directional gain = 7.3dBi > 6dBi, so the power density limit shall be reduced to $30-(7.3-6) = 28.7\text{dBm}$.

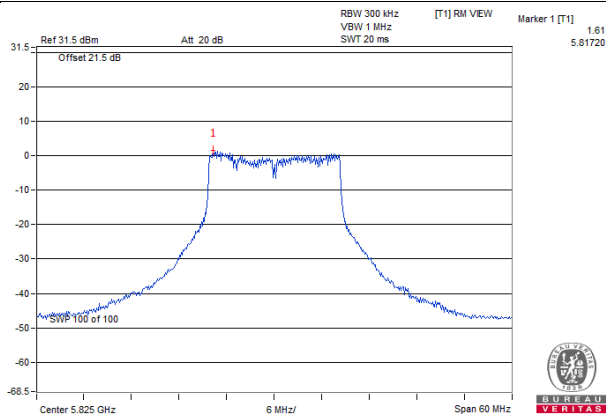
802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	155	5745	-5.36	-3.14	6.02	2.88	28.70	Pass
1	155	5745	-4.92	-2.70	6.02	3.32	28.70	Pass
2	155	5745	-4.76	-2.54	6.02	3.48	28.70	Pass
3	155	5745	-5.23	-3.01	6.02	3.01	28.70	Pass

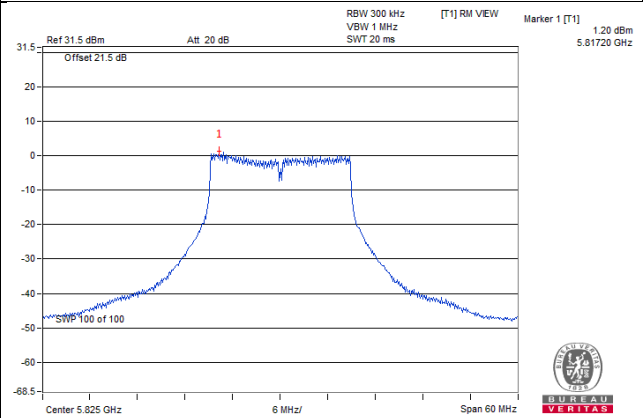
Note: 1. The Directional gain = 7.3dBi > 6dBi, so the power density limit shall be reduced to $30 - (7.3 - 6) = 28.7\text{dBm}$.

Spectrum Plot of Worst Value

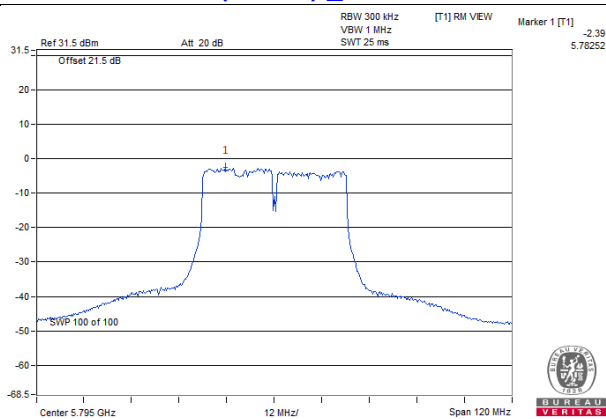
802.11a_Chain 2 / CH165



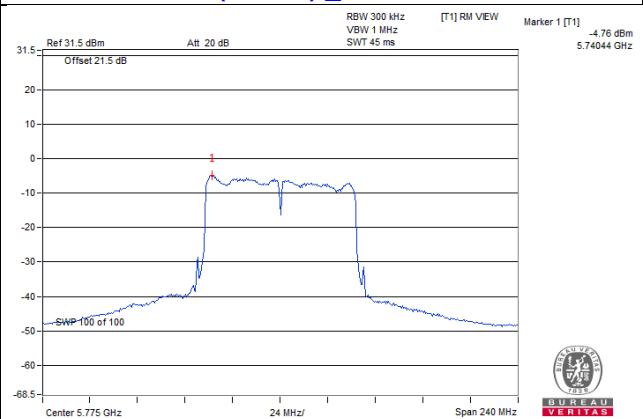
802.11ac (VHT20)_Chain 2 / CH165



8802.11ac (VHT40)_Chain 1 / CH159



802.11ac (VHT80)_Chain 2 / CH155

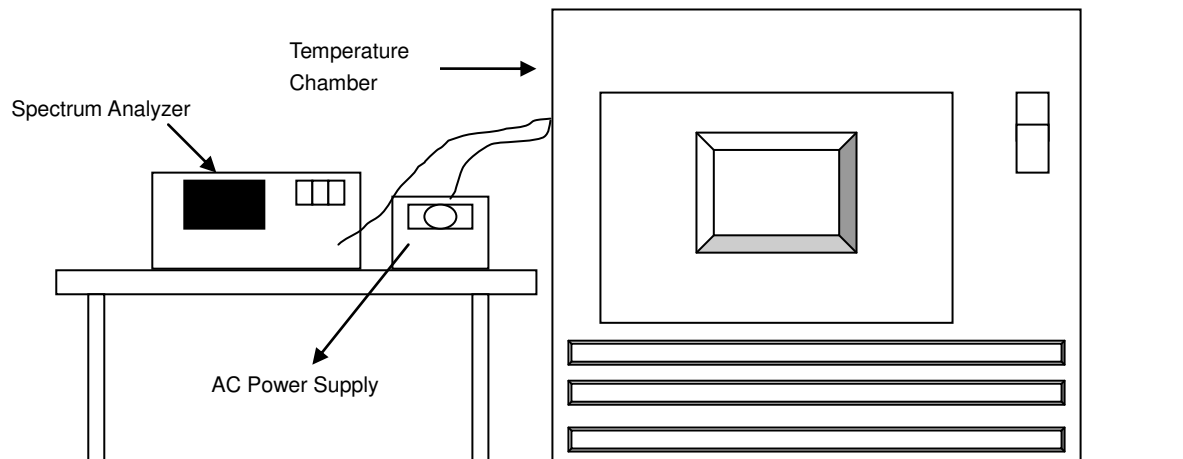


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- 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

For Radio 1:

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5179.9927	Pass	5179.9957	Pass	5179.9964	Pass	5179.9941	Pass
40	120	5180.0179	Pass	5180.0199	Pass	5180.0195	Pass	5180.0186	Pass
30	120	5180.0031	Pass	5180.0028	Pass	5180.0029	Pass	5180.0059	Pass
20	120	5180.0025	Pass	5180.0021	Pass	5180.002	Pass	5180.003	Pass
10	120	5180.017	Pass	5180.019	Pass	5180.0207	Pass	5180.017	Pass
0	120	5179.9951	Pass	5179.9922	Pass	5179.9932	Pass	5179.9925	Pass
-10	120	5180.0101	Pass	5180.0102	Pass	5180.0112	Pass	5180.0103	Pass
-20	120	5179.9876	Pass	5179.9862	Pass	5179.9873	Pass	5179.9899	Pass
-30	120	5180.0074	Pass	5180.0065	Pass	5180.0064	Pass	5180.0088	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0019	Pass	5180.0022	Pass	5180.0011	Pass	5180.0031	Pass
	120	5180.0025	Pass	5180.0021	Pass	5180.002	Pass	5180.003	Pass
	102	5180.0034	Pass	5180.0014	Pass	5180.0015	Pass	5180.0033	Pass

For Radio 2:

Frequency Stability Versus Temp.									
Operating Frequency: 5745 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5745.0231	Pass	5745.022	Pass	5745.0248	Pass	5745.0237	Pass
40	120	5744.9984	Pass	5744.9958	Pass	5744.9981	Pass	5744.9974	Pass
30	120	5744.9912	Pass	5744.9932	Pass	5744.9898	Pass	5744.995	Pass
20	120	5745.0093	Pass	5745.0087	Pass	5745.0132	Pass	5745.0131	Pass
10	120	5745.016	Pass	5745.0184	Pass	5745.019	Pass	5745.0165	Pass
0	120	5744.9888	Pass	5744.9858	Pass	5744.9906	Pass	5744.9898	Pass
-10	120	5745.0002	Pass	5744.9962	Pass	5744.995	Pass	5744.9949	Pass
-20	120	5745.0055	Pass	5745.0078	Pass	5745.0051	Pass	5745.0045	Pass
-30	120	5745.0186	Pass	5745.0181	Pass	5745.0213	Pass	5745.0176	Pass

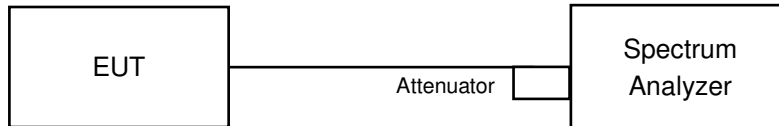
Frequency Stability Versus Voltage									
Operating Frequency: 5745 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5745.0083	Pass	5745.0096	Pass	5745.0133	Pass	5745.0127	Pass
	120	5745.0093	Pass	5745.0087	Pass	5745.0132	Pass	5745.0131	Pass
	102	5745.0093	Pass	5745.0086	Pass	5745.0129	Pass	5745.0141	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.41	16.45	16.44	16.45	0.5	Pass
157	5785	16.46	16.47	16.44	16.47	0.5	Pass
165	5825	16.47	16.44	16.48	16.48	0.5	Pass

Beamforming Mode

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.75	17.74	17.69	17.74	0.5	Pass
157	5785	17.68	17.81	17.72	17.79	0.5	Pass
165	5825	17.82	17.67	17.76	17.74	0.5	Pass

802.11ac (VHT40)

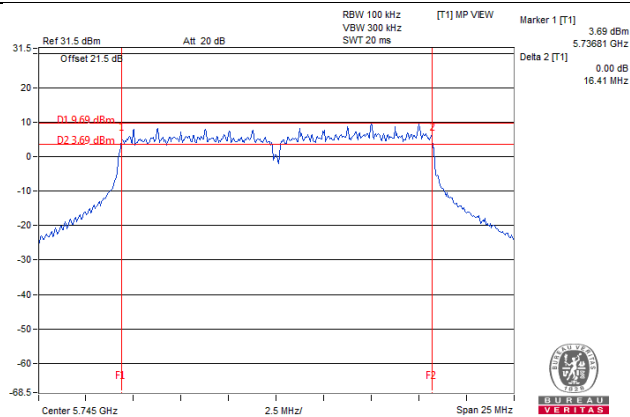
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	36.45	36.47	36.49	36.54	0.5	Pass
159	5795	36.51	36.50	36.50	36.54	0.5	Pass

802.11ac (VHT80)

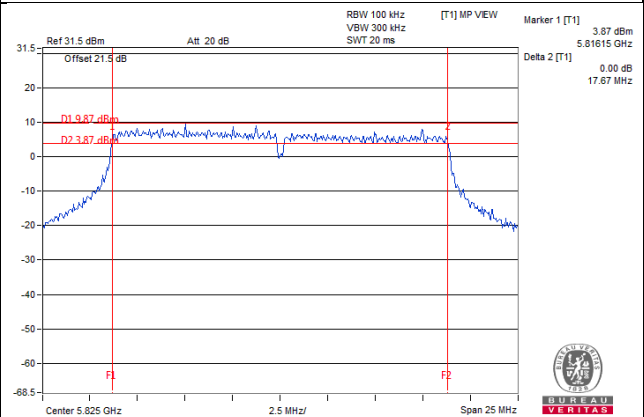
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	75.68	75.92	74.79	75.11	0.5	Pass

Spectrum Plot of Worst Value

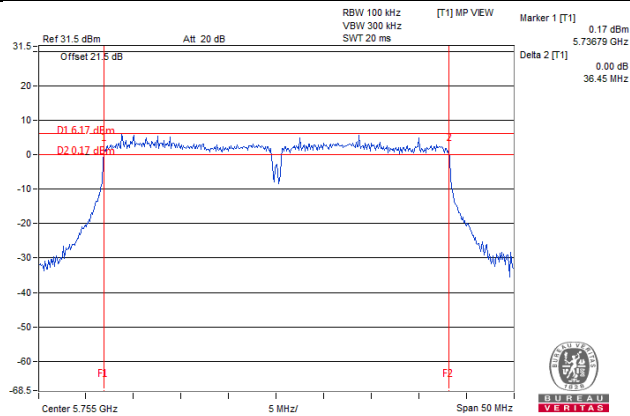
802.11a_Chain 0 / CH149



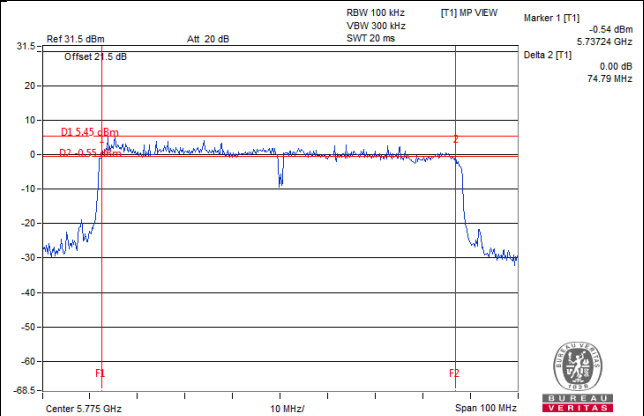
802.11ac (VHT20)_Chain 1 / CH165



802.11ac (VHT40)_Chain 0 / CH151



802.11ac (VHT80)_Chain 2 / CH155



5 Pictures of Test Arrangements

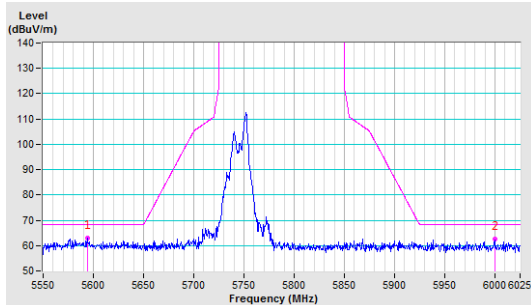
Please refer to the attached file (Test Setup Photo).

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

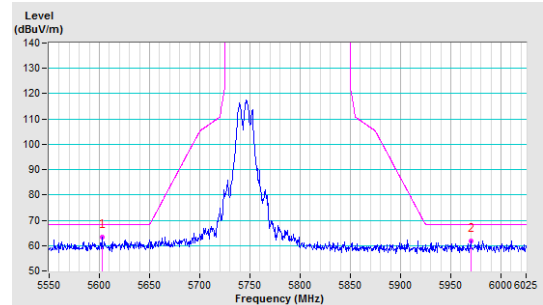
802.11a

CH 149 5745 MHz

Horizontal

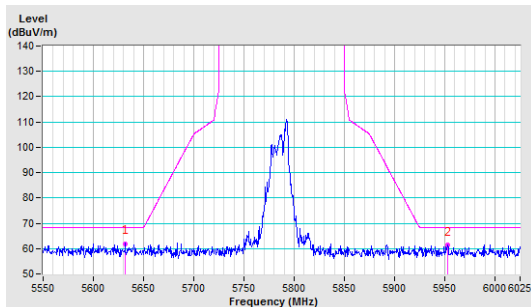


Vertical

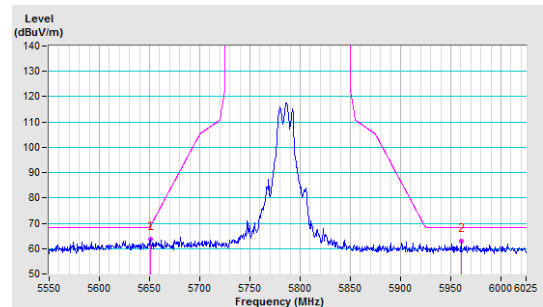


CH 157 5785 MHz

Horizontal

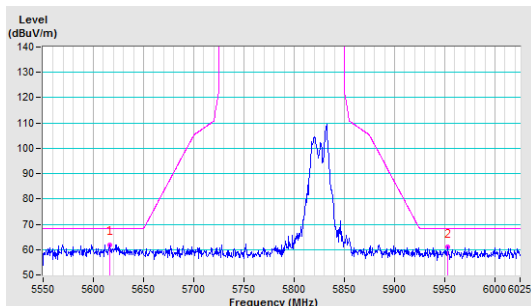


Vertical

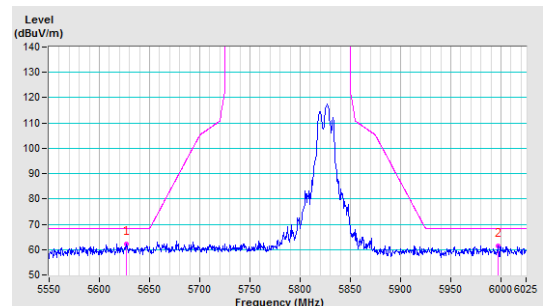


CH 165 5825 MHz

Horizontal



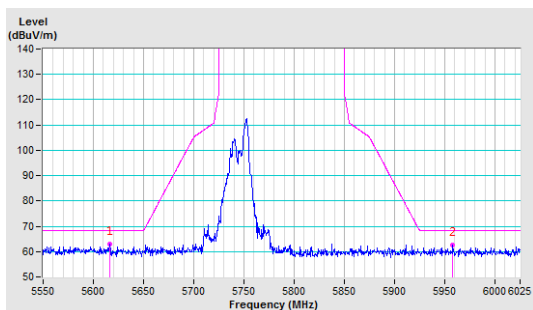
Vertical



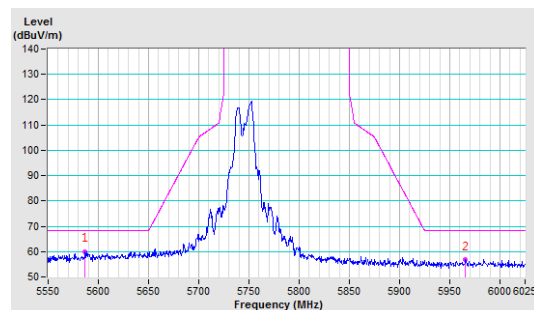
802.11ac (VHT20)

CH 149 5745 MHz

Horizontal

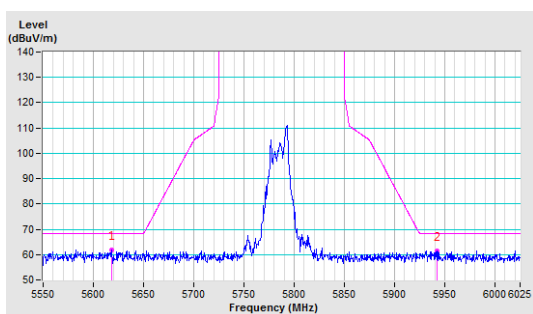


Vertical

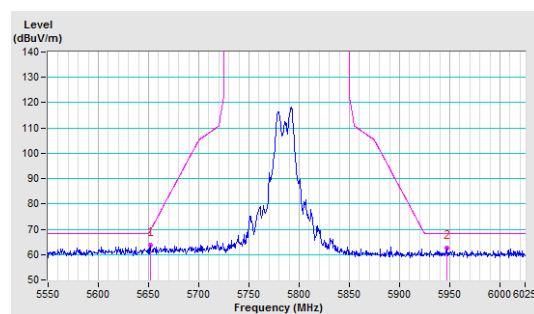


CH 157 5785 MHz

Horizontal

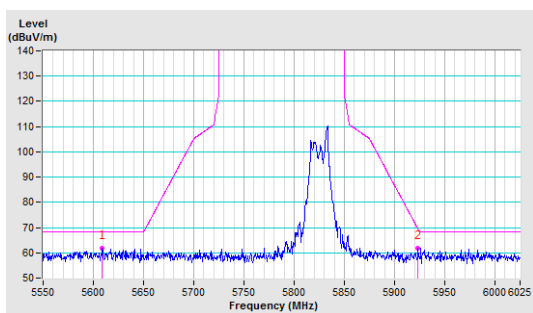


Vertical

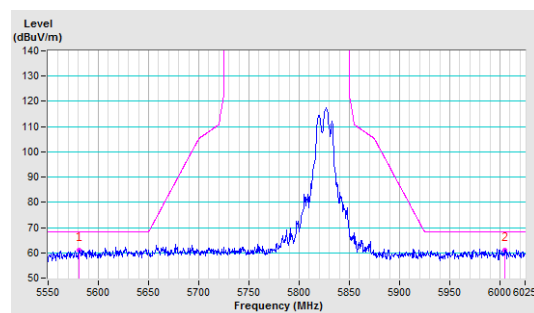


CH 165 5825 MHz

Horizontal



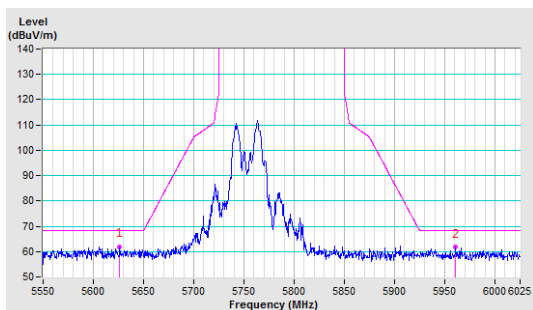
Vertical



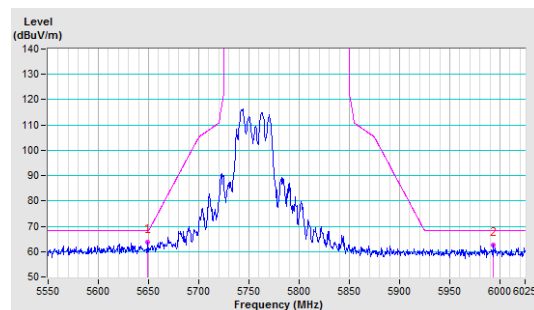
802.11ac (VHT40)

CH 151 5755 MHz

Horizontal

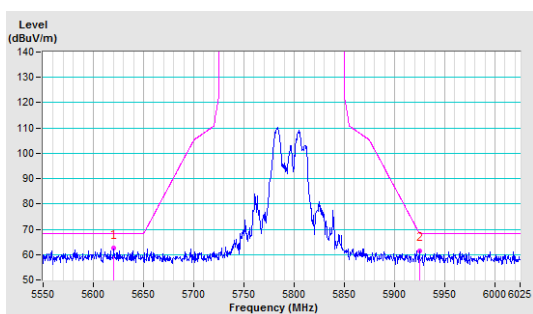


Vertical

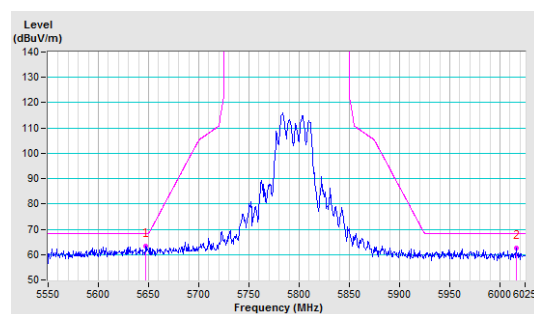


CH 159 5795 MHz

Horizontal



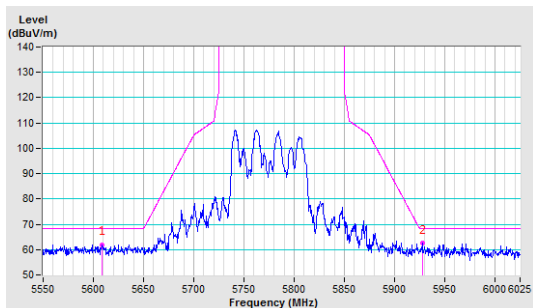
Vertical



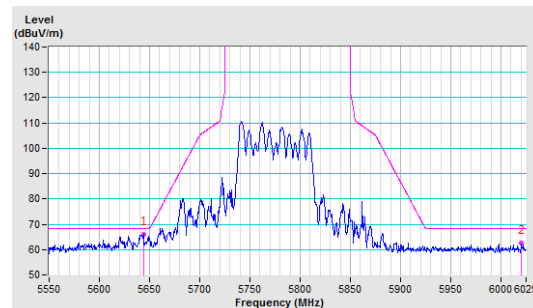
802.11ac (VHT80)

CH 155 5775 MHz

Horizontal



Vertical



Appendix – Information on the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

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