FCC Test Report

Report No.:	RFBAOZ-WTW-P20070419-1
FCC ID:	UIDWC4T
Test Model:	WC4T
Received Date:	June 18, 2020
Test Date:	June 18 to Aug. 27, 2020
Issued Date:	Sep. 22, 2020
Applicant:	ARRIS
Address:	3871 LAKEFIELD DRIVE SUWANEE GA 30024-1292 UNITED STATES
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RFBAOZ-WTW-P20070419-1	Original release.	Sep. 22, 2020

1 Certificate of Conformity

Product:	SURFboard Wi-Fi Router
Brand:	ARRIS
Test Model:	WC4T
Sample Status:	Engineering Sample
Applicant:	ARRIS
Test Date:	June 18 to Aug. 27, 2020
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:** Sep. 22, 2020

Phoenix Huang / Specialist

Approved by : , **Date:** Sep. 22, 2020

Clark Lin / Technical 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 -13.27 dB at 0.36494 MHz.
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 -0.1 dB at 17355.00MHz.
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 IPEX not a standard connector.

Note:
1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.
2. For U-NII-1 band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	SURFboard Wi-Fi Router
Brand	ARRIS
Test Model	WC4T
Status of EUT	Engineering Sample
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz band
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 600 Mbps 802.11ac: up to 1733.3 Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462 GHz **5GHz:** 5.18 ~ 5.24 GHz, 5.745 ~ 5.825 GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 613.378 mW **5.18 ~ 5.24 GHz:** 488.826 mW **5.745 ~ 5.825 GHz:** 989.696 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 515.311 mW **5.18 ~ 5.24 GHz:** 434.765 mW **5.745 ~ 5.825 GHz:** 619.855 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ-45 Cable x1 (Unshielded, 1.5 m)

Note:

1. The EUT has two radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz + WLAN 5GHz (low band)	WLAN 5GHz (high band)

2. Simultaneously transmission condition.

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

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

Brand	Model No.	Spec.
APD	WA-30P12FU	Input: 100-240 Vac, 0.9 A, 50-60 Hz Output: 12 Vdc, 2.5 A DC Output cable: Unshielded, 1.5 m

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

Device have two antenna configuration modes as below (set 1 & 2), the antenna set 1 were the highest antenna gain configuration, therefore antenna set 1 were chosen for final test.

Antenna Set 1			
Antenna No.	Frequency Range (MHz)	Antenna Type	Connector Type
Antenna 1	5470-5850	PCB	IPEX
Antenna 2	5470-5850	PCB	IPEX
Antenna 3	5470-5850	PCB	IPEX
Antenna 4	5470-5850	PCB	IPEX
Antenna 5	2400-2483.5 / 5150-5350	MTA	IPEX
Antenna 6	2400-2483.5 / 5150-5350	MTA	IPEX
Antenna 7	2400-2483.5 / 5150-5350	PCB	IPEX
Antenna 8	2400-2483.5 / 5150-5350	PCB	IPEX
Antenna Set 2			
Antenna No.	Frequency Range (MHz)	Antenna Type	Connector Type
Antenna 9	5470-5850	PCB	IPEX
Antenna 10	5470-5850	PCB	IPEX
Antenna 11	5470-5850	PCB	IPEX
Antenna 12	5470-5850	PCB	IPEX
Antenna 5	2400-2483.5 / 5150-5350	MTA	IPEX
Antenna 6	2400-2483.5 / 5150-5350	MTA	IPEX
Antenna 7	2400-2483.5 / 5150-5350	PCB	IPEX
Antenna 8	2400-2483.5 / 5150-5350	PCB	IPEX
Note: Antenna gain values for each antennas please refer to Operation Description exhibit.			

5. The directional antenna gain, please refer to the following table:

Frequency Range (GHz)	4TX Directional Antenna Gain (dBi) (Worst configuration)	3TX Directional Antenna Gain (dBi) (Worst configuration)
2.4~2.4835	7.37 (Antenna 5 / 6 / 7 / 8)	-
5.15 ~ 5.25	-	6.87 (Antenna 5 / 6 / 8)
5.25 ~ 5.35	-	6.94 (Antenna 5 / 7 / 8)
5.47 ~ 5.725	7.93 (Antenna 1 / 2 / 3 / 4)	-
5.725 ~ 5.85	7.92 (Antenna 1 / 2 / 3 / 4)	-

Note:
The directional gain is being calculated by individual antenna gains and per KDB 662911 formula.

$$\text{Directional gain} = 10\log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]\ \text{dBi}$$

More detailed information, please refer to Operation Description exhibit.

6. The EUT incorporates a MIMO function:

Radio 1 - 2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	4TX	4RX
802.11g	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
VHT20	4TX	4RX
VHT40	4TX	4RX

5GHz Band				
MODULATION MODE	**Radio 1 - 5GHz Band (low band)**		**Radio 2 - 5GHz Band (high band)**	
	TX & RX CONFIGURATION		**TX & RX CONFIGURATION**	
802.11a	3TX	3RX	4TX	4RX
802.11n (HT20)	3TX	3RX	4TX	4RX
802.11n (HT40)	3TX	3RX	4TX	4RX
802.11ac (VHT20)	3TX	3RX	4TX	4RX
802.11ac (VHT40)	3TX	3RX	4TX	4RX
802.11ac (VHT80)	3TX	3RX	4TX	4RX

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

7. 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.
8. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240, 5745-5825	36 to 48, 149 to 165	48	OFDM	BPSK	6
802.11ac (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	149	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240, 5745-5825	36 to 48, 149 to 165	48	OFDM	BPSK	6
802.11ac (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	149	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3
Beamforming Mode (output power only)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
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	24deg. C, 68%RH	120Vac, 60Hz	Tom Yang
RE<1G	24deg. C, 68%RH	120Vac, 60Hz	Tom Yang
PLC	25deg. C, 75%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Kevin Ko

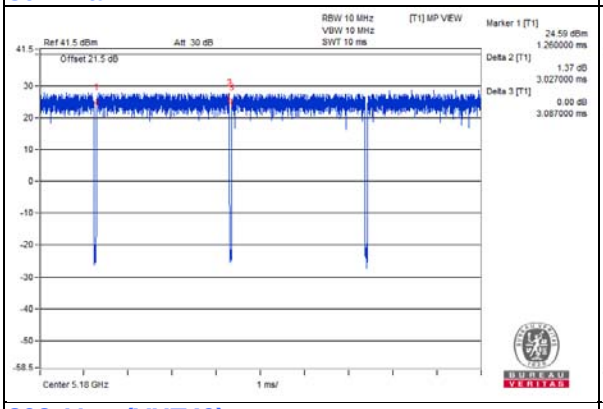
3.3 Duty Cycle of Test Signal

For Radio 1

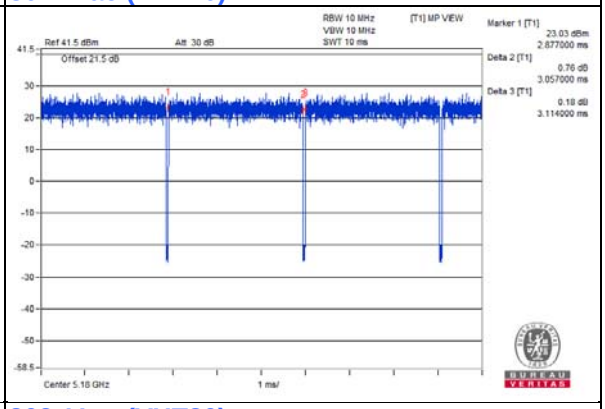
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 3.027 ms/3.087 ms = 0.981
802.11ac (VHT20): Duty cycle = 3.057 ms/3.114 ms = 0.982
802.11ac (VHT40): Duty cycle = 3.96 ms/4.019 ms = 0.985
802.11ac (VHT80): Duty cycle = 2.755 ms/2.828 ms = 0.974, Duty factor = 10 * log (1/Duty cycle) = 0.11 dB

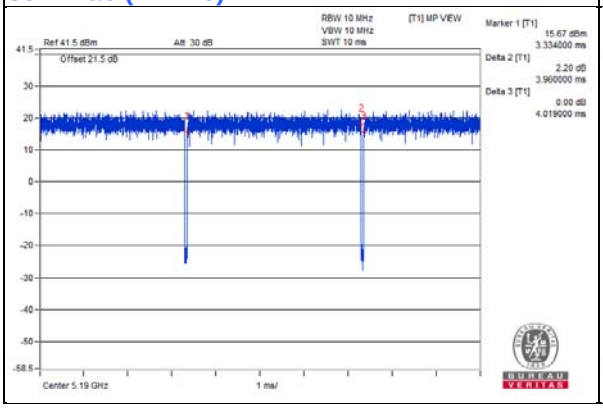
802.11a



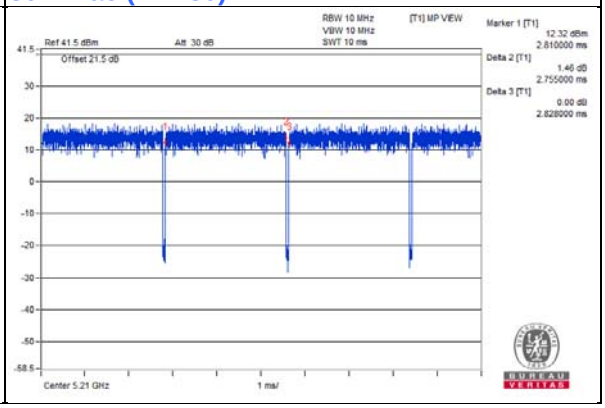
802.11ac (VHT20)



802.11ac (VHT40)



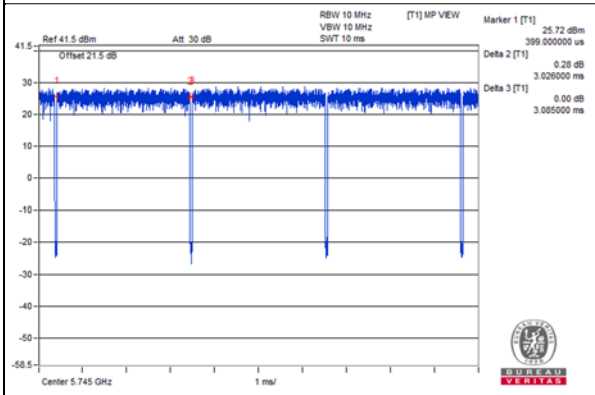
802.11ac (VHT80)



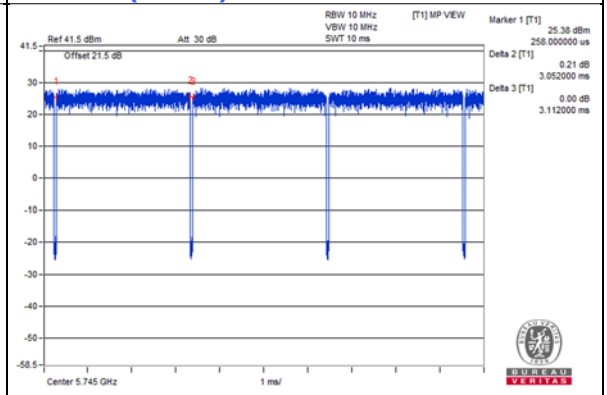
For Radio 2
Duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11a: Duty cycle = 3.026 ms/3.085 ms = 0.981
802.11ac (VHT20): Duty cycle = 3.052 ms/3.112 ms = 0.981
802.11ac (VHT40): Duty cycle = 3.961 ms/4.029 ms = 0.983
802.11ac (VHT80): Duty cycle = 5.467 ms/5.532 ms = 0.988

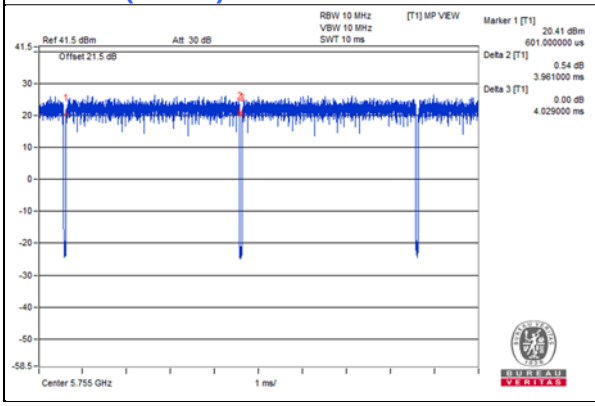
802.11a



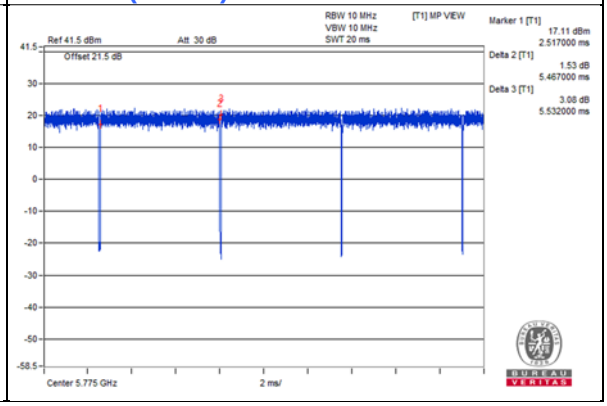
802.11ac (VHT20)



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.

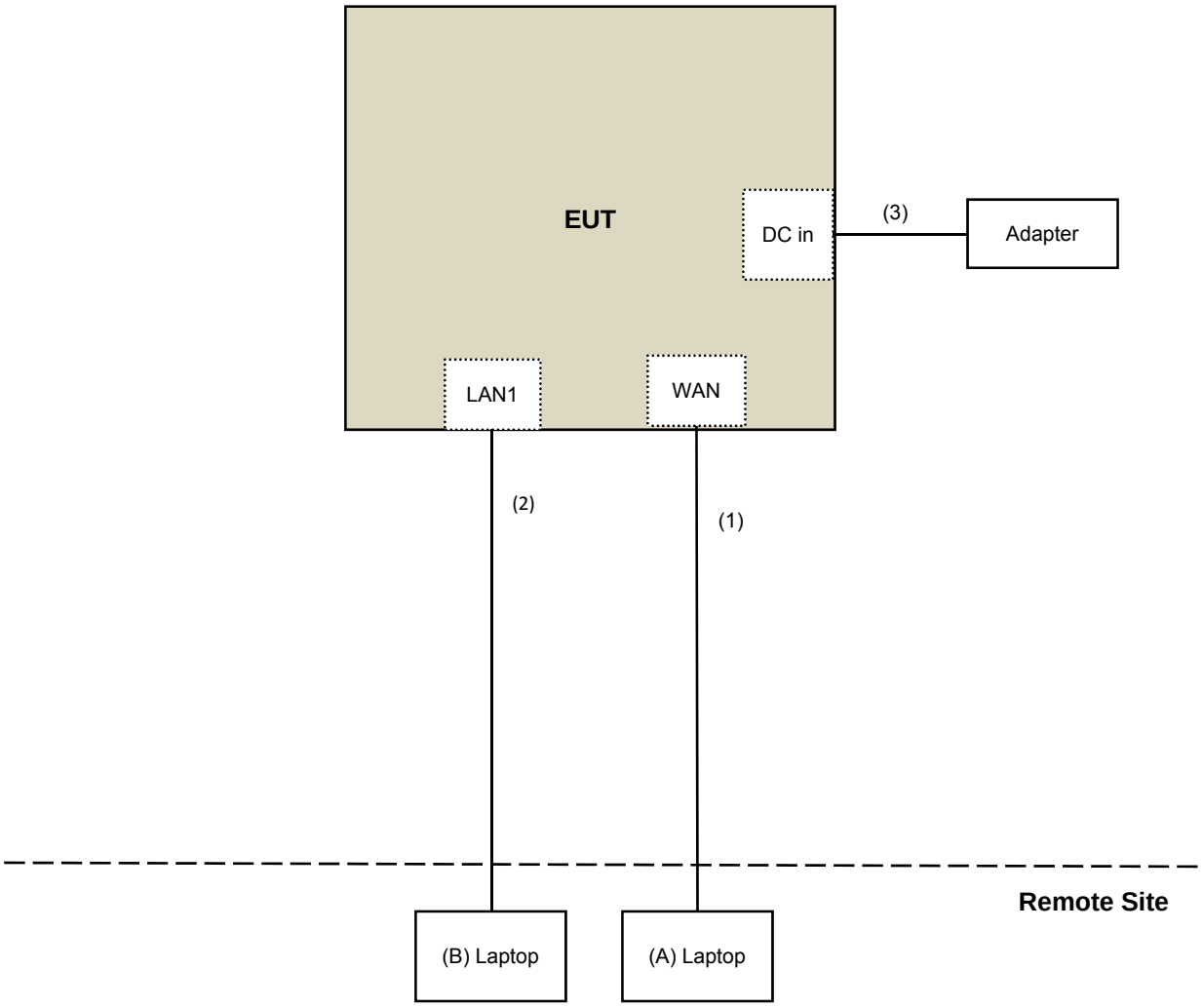
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	DC Cable	1	1.5	No	0	Supplied by client

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test Standard:
FCC Part 15, Subpart E (15.407)
ANSI C63.10-2013

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

References Test Guidance:
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

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
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

*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:

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

4.1.2 Test Instruments

For Bandedge test: (802.11a of U-NII-1 band)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 03, 2019	July 02, 2020
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1200	160922	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: June 18, 2020

For OOBE and other Radiated Emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 26, 2019	Sep. 25, 2020
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1200	160922	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: July 23 to Aug. 25, 2020

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 16, 2020	Jan. 15, 2021
True RMS Clamp Meter FLUKE	325	31130711WS	June 06, 2020	June 05, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Aug. 23 to 27, 2020

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

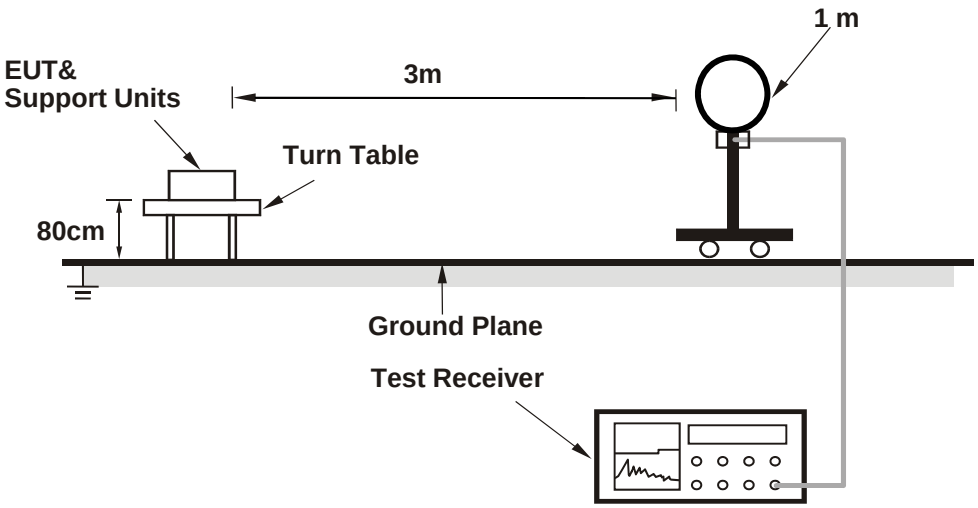
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

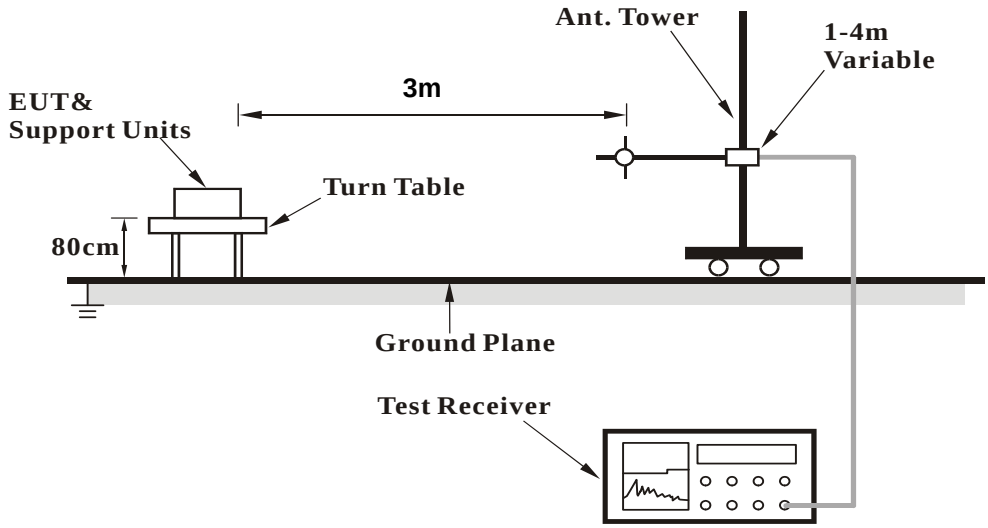
No deviation.

4.1.5 Test Setup

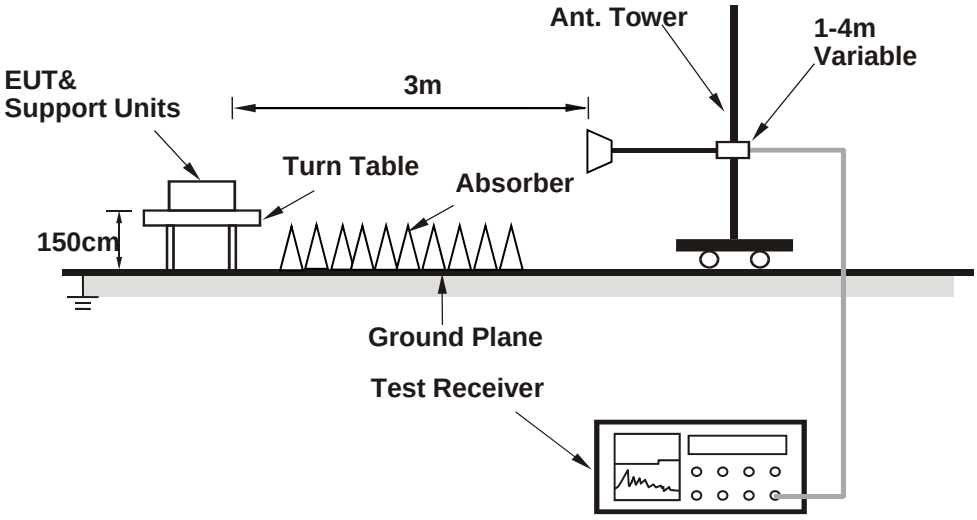
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Placed the EUT on the testing table.
b. Controlling software (QAtool 0.0.2.0) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

For Radio 1

CDD Mode

802.11a

Channel	TX Channel 36	**Detector Function**	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5150.00	69.1 PK	74.0	-4.9	1.83 H	329	65.4	3.7
2	5150.00	53.7 AV	54.0	-0.3	1.83 H	329	50.0	3.7
3	*5180.00	117.1 PK			1.83 H	329	113.5	3.6
4	*5180.00	106.0 AV			1.83 H	329	102.4	3.6
5	#10360.00	56.3 PK	68.2	-11.9	1.60 H	192	43.6	12.7
6	15540.00	57.4 PK	74.0	-16.6	1.50 H	283	44.2	13.2
7	15540.00	45.8 AV	54.0	-8.2	1.50 H	283	32.6	13.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5150.00	66.1 PK	74.0	-7.9	1.05 V	326	62.4	3.7
2	5150.00	53.7 AV	54.0	-0.3	1.05 V	326	50.0	3.7
3	*5180.00	120.2 PK			1.05 V	326	116.6	3.6
4	*5180.00	109.9 AV			1.05 V	326	106.3	3.6
5	#10360.00	51.4 PK	68.2	-16.8	3.58 V	349	38.7	12.7
6	15540.00	60.6 PK	74.0	-13.4	1.45 V	358	47.4	13.2
7	15540.00	48.6 AV	54.0	-5.4	1.45 V	358	35.4	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 40	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.8 PK	74.0	-7.2	1.50 H	254	63.1	3.7
2	5150.00	53.5 AV	54.0	-0.5	1.50 H	254	49.8	3.7
3	*5200.00	114.0 PK			1.50 H	254	110.5	3.5
4	*5200.00	106.2 AV			1.50 H	254	102.7	3.5
5	5350.00	50.4 PK	74.0	-23.6	1.50 H	254	47.0	3.4
6	5350.00	41.0 AV	54.0	-13.0	1.50 H	254	37.6	3.4
7	#10400.00	56.6 PK	68.2	-11.6	1.58 H	188	43.8	12.8
8	15600.00	57.3 PK	74.0	-16.7	1.53 H	292	43.8	13.5
9	15600.00	45.8 AV	54.0	-8.2	1.53 H	292	32.3	13.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.1 PK	74.0	-8.9	1.00 V	331	61.4	3.7
2	5150.00	53.5 AV	54.0	-0.5	1.00 V	331	49.8	3.7
3	*5200.00	119.3 PK			1.00 V	331	115.8	3.5
4	*5200.00	109.4 AV			1.00 V	331	105.9	3.5
5	5350.00	56.4 PK	74.0	-17.6	1.00 V	331	53.0	3.4
6	5350.00	45.3 AV	54.0	-8.7	1.00 V	331	41.9	3.4
7	#10400.00	50.8 PK	68.2	-17.4	3.59 V	349	38.0	12.8
8	15600.00	60.7 PK	74.0	-13.3	1.48 V	355	47.2	13.5
9	15600.00	48.4 AV	54.0	-5.6	1.48 V	355	34.9	13.5

Remarks:

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

Channel	TX Channel 48	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5080.85	68.1 PK	74.0	-5.9	1.50 H	264	64.4	3.7
2	5080.85	50.2 AV	54.0	-3.8	1.50 H	264	46.5	3.7
3	5145.43	61.0 PK	74.0	-13.0	1.50 H	264	57.3	3.7
4	5145.43	52.1 AV	54.0	-1.9	1.50 H	264	48.4	3.7
5	*5240.00	115.6 PK			1.50 H	264	112.1	3.5
6	*5240.00	107.2 AV			1.50 H	264	103.7	3.5
7	5356.37	53.2 PK	74.0	-20.8	1.50 H	264	49.8	3.4
8	5356.37	43.6 AV	54.0	-10.4	1.50 H	264	40.2	3.4
9	#10480.00	59.7 PK	68.2	-8.5	1.63 H	188	46.6	13.1
10	15720.00	59.4 PK	74.0	-14.6	1.51 H	299	45.6	13.8
11	15720.00	47.1 AV	54.0	-6.9	1.51 H	299	33.3	13.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5082.60	70.3 PK	74.0	-3.7	1.00 V	335	66.6	3.7
2	5082.60	53.0 AV	54.0	-1.0	1.00 V	335	49.3	3.7
3	5145.07	60.3 PK	74.0	-13.7	1.00 V	335	56.6	3.7
4	5145.07	53.5 AV	54.0	-0.5	1.00 V	335	49.8	3.7
5	*5240.00	118.6 PK			1.00 V	335	115.1	3.5
6	*5240.00	109.1 AV			1.00 V	335	105.6	3.5
7	5350.00	56.3 PK	74.0	-17.7	1.00 V	335	52.9	3.4
8	5350.00	47.5 AV	54.0	-6.5	1.00 V	335	44.1	3.4
9	#10480.00	54.4 PK	68.2	-13.8	3.56 V	345	41.3	13.1
10	15720.00	64.1 PK	74.0	-9.9	1.45 V	342	50.3	13.8
11	15720.00	50.7 AV	54.0	-3.3	1.45 V	342	36.9	13.8

Remarks:

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

802.11ac (VHT20)

Channel	TX Channel 36	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.6 PK	74.0	-8.4	1.77 H	341	61.9	3.7
2	5150.00	53.4 AV	54.0	-0.6	1.77 H	341	49.7	3.7
3	*5180.00	113.3 PK			1.77 H	341	109.7	3.6
4	*5180.00	104.7 AV			1.77 H	341	101.1	3.6
5	#10360.00	56.8 PK	68.2	-11.4	1.56 H	193	44.1	12.7
6	15540.00	57.0 PK	74.0	-17.0	1.54 H	275	43.8	13.2
7	15540.00	43.7 AV	54.0	-10.3	1.54 H	275	30.5	13.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.4 PK	74.0	-7.6	2.22 V	332	62.7	3.7
2	5150.00	53.5 AV	54.0	-0.5	2.22 V	332	49.8	3.7
3	*5180.00	117.7 PK			2.22 V	332	114.1	3.6
4	*5180.00	106.7 AV			2.22 V	332	103.1	3.6
5	#10360.00	50.3 PK	68.2	-17.9	3.63 V	356	37.6	12.7
6	15540.00	58.4 PK	74.0	-15.6	1.42 V	346	45.2	13.2
7	15540.00	46.5 AV	54.0	-7.5	1.42 V	346	33.3	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 40	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.9 PK	74.0	-7.1	1.46 H	267	63.2	3.7
2	5150.00	53.4 AV	54.0	-0.6	1.46 H	267	49.7	3.7
3	*5200.00	114.1 PK			1.46 H	267	110.6	3.5
4	*5200.00	106.4 AV			1.46 H	267	102.9	3.5
5	#10400.00	58.6 PK	68.2	-9.6	1.69 H	210	45.8	12.8
6	15600.00	57.6 PK	74.0	-16.4	1.46 H	306	44.1	13.5
7	15600.00	45.8 AV	54.0	-8.2	1.46 H	306	32.3	13.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.4 PK	74.0	-8.6	2.37 V	337	61.7	3.7
2	5150.00	53.7 AV	54.0	-0.3	2.37 V	337	50.0	3.7
3	*5200.00	118.4 PK			2.37 V	337	114.9	3.5
4	*5200.00	108.5 AV			2.37 V	337	105.0	3.5
5	#10400.00	53.7 PK	68.2	-14.5	3.68 V	343	40.9	12.8
6	15600.00	61.7 PK	74.0	-12.3	1.40 V	352	48.2	13.5
7	15600.00	49.0 AV	54.0	-5.0	1.40 V	352	35.5	13.5

Remarks:

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

Channel	TX Channel 48	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5081.38	70.3 PK	74.0	-3.7	1.73 H	337	66.6	3.7
2	5081.38	51.2 AV	54.0	-2.8	1.73 H	337	47.5	3.7
3	5150.00	59.1 PK	74.0	-14.9	1.73 H	337	55.4	3.7
4	5150.00	53.5 AV	54.0	-0.5	1.73 H	337	49.8	3.7
5	*5240.00	115.8 PK			1.73 H	337	112.3	3.5
6	*5240.00	106.4 AV			1.73 H	337	102.9	3.5
7	#10480.00	58.7 PK	68.2	-9.5	1.67 H	201	45.6	13.1
8	15720.00	57.9 PK	74.0	-16.1	1.52 H	290	44.1	13.8
9	15720.00	46.2 AV	54.0	-7.8	1.52 H	290	32.4	13.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	61.6 PK	74.0	-12.4	2.39 V	334	57.9	3.7
2	5150.00	53.5 AV	54.0	-0.5	2.39 V	334	49.8	3.7
3	*5240.00	118.5 PK			2.39 V	334	115.0	3.5
4	*5240.00	108.3 AV			2.39 V	334	104.8	3.5
5	#10480.00	53.3 PK	68.2	-14.9	3.62 V	353	40.2	13.1
6	15720.00	61.0 PK	74.0	-13.0	1.39 V	349	47.2	13.8
7	15720.00	48.5 AV	54.0	-5.5	1.39 V	349	34.7	13.8

Remarks:

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

802.11ac (VHT40)

Channel	TX Channel 38	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	64.5 PK	74.0	-9.5	1.67 H	338	60.8	3.7
2	5150.00	51.2 AV	54.0	-2.8	1.67 H	338	47.5	3.7
3	*5190.00	109.3 PK			1.67 H	338	105.7	3.6
4	*5190.00	99.8 AV			1.67 H	338	96.2	3.6
5	#10380.00	57.4 PK	68.2	-10.8	1.56 H	177	44.7	12.7
6	15570.00	56.9 PK	74.0	-17.1	1.56 H	267	43.5	13.4
7	15570.00	43.8 AV	54.0	-10.2	1.56 H	267	30.4	13.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.5 PK	74.0	-7.5	1.00 V	0	62.8	3.7
2	5150.00	53.7 AV	54.0	-0.3	1.00 V	0	50.0	3.7
3	*5190.00	112.6 PK			1.09 V	310	109.0	3.6
4	*5190.00	101.8 AV			1.09 V	310	98.2	3.6
5	#10380.00	50.7 PK	68.2	-17.5	3.61 V	344	38.0	12.7
6	15570.00	58.3 PK	74.0	-15.7	1.42 V	335	44.9	13.4
7	15570.00	46.2 AV	54.0	-7.8	1.42 V	335	32.8	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 46	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	60.6 PK	74.0	-13.4	1.71 H	343	56.9	3.7
2	5150.00	50.9 AV	54.0	-3.1	1.71 H	343	47.2	3.7
3	*5230.00	110.6 PK			1.71 H	343	107.1	3.5
4	*5230.00	102.7 AV			1.71 H	343	99.2	3.5
5	#10460.00	57.9 PK	68.2	-10.3	1.59 H	164	44.9	13.0
6	15690.00	57.5 PK	74.0	-16.5	1.58 H	283	43.6	13.9
7	15690.00	44.1 AV	54.0	-9.9	1.58 H	283	30.2	13.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	60.3 PK	74.0	-13.7	1.05 V	310	56.6	3.7
2	5150.00	53.5 AV	54.0	-0.5	1.05 V	310	49.8	3.7
3	*5230.00	115.9 PK			1.05 V	310	112.4	3.5
4	*5230.00	105.4 AV			1.05 V	310	101.9	3.5
5	#10460.00	51.0 PK	68.2	-17.2	3.67 V	331	38.0	13.0
6	15690.00	58.6 PK	74.0	-15.4	1.40 V	346	44.7	13.9
7	15690.00	46.2 AV	54.0	-7.8	1.40 V	346	32.3	13.9

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

Channel	TX Channel 42	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	61.8 PK	74.0	-12.2	1.50 H	342	58.1	3.7
2	5150.00	52.4 AV	54.0	-1.6	1.50 H	342	48.7	3.7
3	*5210.00	104.9 PK			1.50 H	342	101.3	3.6
4	*5210.00	94.4 AV			1.50 H	342	90.8	3.6
5	5350.00	47.0 PK	74.0	-27.0	1.50 H	342	43.6	3.4
6	5350.00	38.9 AV	54.0	-15.1	1.50 H	342	35.5	3.4
7	#10420.00	56.1 PK	68.2	-12.1	1.54 H	178	43.3	12.8
8	15630.00	55.5 PK	74.0	-18.5	1.54 H	269	41.8	13.7
9	15630.00	42.3 AV	54.0	-11.7	1.54 H	269	28.6	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	70.5 PK	74.0	-3.5	2.48 V	334	66.8	3.7
2	5150.00	53.6 AV	54.0	-0.4	2.48 V	334	49.9	3.7
3	*5210.00	107.9 PK			2.48 V	334	104.3	3.6
4	*5210.00	96.9 AV			2.48 V	334	93.3	3.6
5	5350.00	55.4 PK	74.0	-18.6	2.48 V	334	52.0	3.4
6	5350.00	43.8 AV	54.0	-10.2	2.48 V	334	40.4	3.4
7	#10420.00	49.4 PK	68.2	-18.8	3.60 V	345	36.6	12.8
8	15630.00	56.8 PK	74.0	-17.2	1.37 V	349	43.1	13.7
9	15630.00	44.7 AV	54.0	-9.3	1.37 V	349	31.0	13.7

Remarks:

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

Below 1GHz Data:

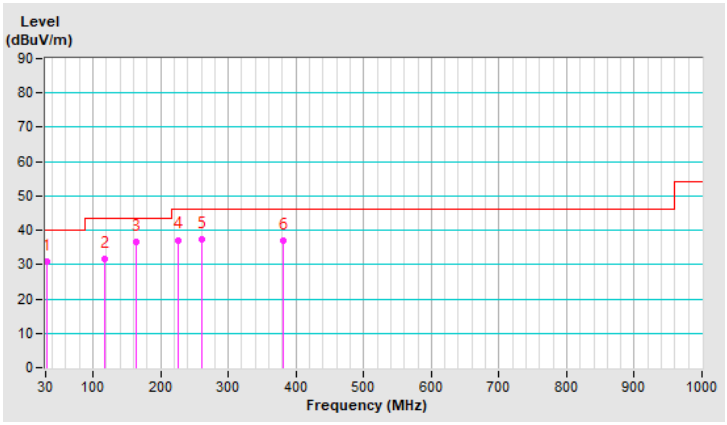
802.11a

Channel	TX Channel 48	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.70	31.0 QP	40.0	-9.0	1.00 H	188	39.9	-8.9
2	116.33	31.6 QP	43.5	-11.9	1.50 H	80	41.0	-9.4
3	163.52	36.6 QP	43.5	-6.9	2.00 H	299	43.6	-7.0
4	225.58	37.2 QP	46.0	-8.8	1.50 H	144	46.8	-9.6
5	261.81	37.4 QP	46.0	-8.6	1.00 H	74	45.0	-7.6
6	381.19	37.0 QP	46.0	-9.0	1.00 H	153	40.5	-3.5

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

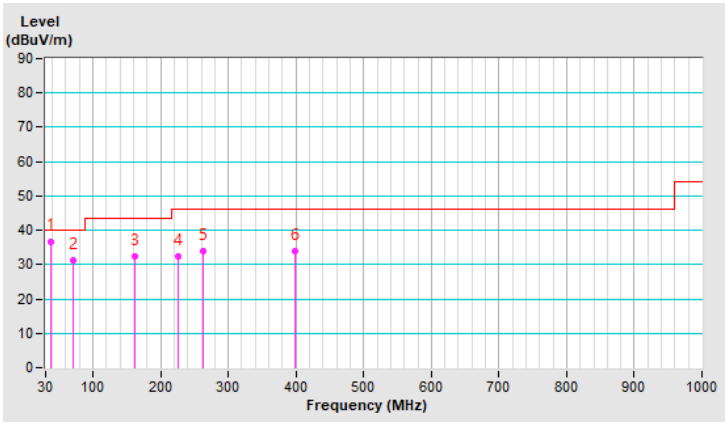


Channel	TX Channel 48	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	37.98	36.8 QP	40.0	-3.2	2.00 V	178	45.0	-8.2
2	71.13	31.4 QP	40.0	-8.6	1.50 V	0	41.6	-10.2
3	161.24	32.4 QP	43.5	-11.1	1.00 V	100	39.4	-7.0
4	225.82	32.4 QP	46.0	-13.6	1.00 V	360	42.0	-9.6
5	262.78	34.0 QP	46.0	-12.0	1.00 V	246	41.5	-7.5
6	398.48	33.9 QP	46.0	-12.1	2.00 V	240	36.9	-3.0

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



For Radio 2

CDD Mode

ABOVE 1GHz DATA

802.11a

Channel	TX Channel 149	**Detector Function**	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	#5650.05	58.4 PK	68.2	-9.8	1.65 H	45	54.0	4.4
2	*5745.00	116.8 PK			1.65 H	45	112.8	4.0
3	*5745.00	106.9 AV			1.65 H	45	102.9	4.0
4	#5927.62	52.3 PK	68.2	-15.9	1.65 H	45	47.4	4.9
5	11490.00	60.6 PK	74.0	-13.4	1.47 H	148	47.3	13.3
6	11490.00	49.1 AV	54.0	-4.9	1.47 H	148	35.8	13.3
7	#17235.00	67.9 PK	68.2	-0.3	1.52 H	234	50.3	17.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	#5646.31	68.0 PK	68.2	-0.2	1.64 V	69	63.7	4.3
2	*5745.00	120.9 PK			1.64 V	69	116.9	4.0
3	*5745.00	112.6 AV			1.64 V	69	108.6	4.0
4	#5935.44	60.8 PK	68.2	-7.4	1.64 V	69	55.9	4.9
5	11490.00	56.2 PK	74.0	-17.8	3.56 V	36	42.9	13.3
6	11490.00	45.1 AV	54.0	-8.9	3.56 V	36	31.8	13.3
7	#17235.00	64.7 PK	68.2	-3.5	1.51 V	207	47.1	17.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 157	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.79	57.8 PK	68.2	-10.4	1.59 H	48	53.4	4.4
2	*5785.00	119.7 PK			1.59 H	48	115.6	4.1
3	*5785.00	108.9 AV			1.59 H	48	104.8	4.1
4	#5928.71	53.7 PK	68.2	-14.5	1.59 H	48	48.8	4.9
5	11570.00	60.6 PK	74.0	-13.4	1.50 H	143	47.4	13.2
6	11570.00	47.2 AV	54.0	-6.8	1.50 H	143	34.0	13.2
7	**#17355.00**	**68.1 PK**	**68.2**	**-0.1**	**1.55 H**	**231**	**50.5**	**17.6**
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	#5647.59	65.9 PK	68.2	-2.3	1.42 V	145	61.5	4.4
2	*5785.00	124.2 PK			1.42 V	145	120.1	4.1
3	*5785.00	115.1 AV			1.42 V	145	111.0	4.1
4	#5928.65	60.4 PK	68.2	-7.8	1.42 V	145	55.5	4.9
5	11570.00	59.8 PK	74.0	-14.2	3.55 V	20	46.6	13.2
6	11570.00	48.2 AV	54.0	-5.8	3.55 V	20	35.0	13.2
7	#17355.00	67.7 PK	68.2	-0.5	1.51 V	221	50.1	17.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 165	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5648.15	55.6 PK	68.2	-12.6	1.61 H	46	51.2	4.4
2	*5825.00	117.1 PK			1.61 H	46	112.8	4.3
3	*5825.00	107.2 AV			1.61 H	46	102.9	4.3
4	#5927.86	55.1 PK	68.2	-13.1	1.61 H	46	50.2	4.9
5	11650.00	60.8 PK	74.0	-13.2	1.52 H	135	47.5	13.3
6	11650.00	49.5 AV	54.0	-4.5	1.52 H	135	36.2	13.3
7	#17475.00	68.0 PK	68.2	-0.2	1.56 H	249	50.1	17.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5647.87	62.3 PK	68.2	-5.9	1.56 V	71	57.9	4.4
2	*5825.00	124.9 PK			1.56 V	71	120.6	4.3
3	*5825.00	115.3 AV			1.56 V	71	111.0	4.3
4	#5927.64	65.6 PK	68.2	-2.6	1.56 V	71	60.7	4.9
5	11650.00	55.9 PK	74.0	-18.1	3.53 V	39	42.6	13.3
6	11650.00	44.8 AV	54.0	-9.2	3.53 V	39	31.5	13.3
7	#17475.00	64.6 PK	68.2	-3.6	1.56 V	203	46.7	17.9

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT20)

Channel	TX Channel 149	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5641.01	54.4 PK	68.2	-13.8	1.36 H	34	50.1	4.3
2	*5745.00	114.6 PK			1.36 H	34	110.6	4.0
3	*5745.00	104.5 AV			1.36 H	34	100.5	4.0
4	#5936.48	50.7 PK	68.2	-17.5	1.36 H	34	45.7	5.0
5	11490.00	61.3 PK	74.0	-12.7	1.82 H	250	48.0	13.3
6	11490.00	50.5 AV	54.0	-3.5	1.82 H	250	37.2	13.3
7	#17235.00	66.8 PK	68.2	-1.4	2.44 H	236	49.2	17.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5638.96	66.7 PK	68.2	-1.5	1.53 V	118	62.4	4.3
2	*5745.00	122.4 PK			1.53 V	118	118.4	4.0
3	*5745.00	113.1 AV			1.53 V	118	109.1	4.0
4	#5925.19	59.8 PK	68.2	-8.4	1.53 V	118	54.9	4.9
5	11490.00	58.5 PK	74.0	-15.5	2.30 V	12	45.2	13.3
6	11490.00	47.3 AV	54.0	-6.7	2.30 V	12	34.0	13.3
7	#17235.00	63.7 PK	68.2	-4.5	1.51 V	210	46.1	17.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 157	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.12	56.4 PK	68.2	-11.8	1.47 H	42	52.1	4.3
2	*5785.00	115.7 PK			1.47 H	42	111.6	4.1
3	*5785.00	105.5 AV			1.47 H	42	101.4	4.1
4	#5928.42	52.7 PK	68.2	-15.5	1.47 H	42	47.8	4.9
5	11570.00	63.3 PK	74.0	-10.7	1.78 H	264	50.1	13.2
6	11570.00	51.1 AV	54.0	-2.9	1.78 H	264	37.9	13.2
7	**#17355.00**	**68.1 PK**	**68.2**	**-0.1**	**2.41 H**	**238**	**50.5**	**17.6**
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	#5640.50	66.7 PK	68.2	-1.5	1.47 V	118	62.4	4.3
2	*5785.00	123.3 PK			1.47 V	118	119.2	4.1
3	*5785.00	113.9 AV			1.47 V	118	109.8	4.1
4	#5925.38	60.9 PK	68.2	-7.3	1.47 V	118	56.0	4.9
5	11570.00	59.9 PK	74.0	-14.1	2.32 V	25	46.7	13.2
6	11570.00	48.4 AV	54.0	-5.6	2.32 V	25	35.2	13.2
7	#17355.00	64.9 PK	68.2	-3.3	1.56 V	204	47.3	17.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 165	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.07	52.8 PK	68.2	-15.4	1.46 H	46	48.5	4.3
2	*5825.00	116.3 PK			1.46 H	46	112.0	4.3
3	*5825.00	105.8 AV			1.46 H	46	101.5	4.3
4	#5932.86	54.6 PK	68.2	-13.6	1.46 H	46	49.7	4.9
5	11650.00	61.8 PK	74.0	-12.2	1.77 H	235	48.5	13.3
6	11650.00	51.0 AV	54.0	-3.0	1.77 H	235	37.7	13.3
7	#17475.00	66.9 PK	68.2	-1.3	2.48 H	235	49.0	17.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.47	64.6 PK	68.2	-3.6	1.31 V	115	60.3	4.3
2	*5825.00	123.8 PK			1.31 V	115	119.5	4.3
3	*5825.00	115.3 AV			1.31 V	115	111.0	4.3
4	#5926.08	62.8 PK	68.2	-5.4	1.31 V	115	57.9	4.9
5	11650.00	58.1 PK	74.0	-15.9	2.33 V	18	44.8	13.3
6	11650.00	47.2 AV	54.0	-6.8	2.33 V	18	33.9	13.3
7	#17475.00	63.6 PK	68.2	-4.6	1.57 V	206	45.7	17.9

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT40)

Channel	TX Channel 151	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5630.44	55.5 PK	68.2	-12.7	1.38 H	36	51.2	4.3
2	*5755.00	110.7 PK			1.38 H	36	106.7	4.0
3	*5755.00	101.2 AV			1.38 H	36	97.2	4.0
4	#5957.61	51.3 PK	68.2	-16.9	1.38 H	36	46.4	4.9
5	11510.00	58.6 PK	74.0	-15.4	1.84 H	247	45.3	13.3
6	11510.00	48.1 AV	54.0	-5.9	1.84 H	247	34.8	13.3
7	#17265.00	64.3 PK	68.2	-3.9	2.45 H	241	46.8	17.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5636.65	67.1 PK	68.2	-1.1	1.50 V	116	62.8	4.3
2	*5755.00	121.1 PK			1.50 V	116	117.1	4.0
3	*5755.00	110.6 AV			1.50 V	116	106.6	4.0
4	#5931.32	59.4 PK	68.2	-8.8	1.50 V	116	54.5	4.9
5	11510.00	55.8 PK	74.0	-18.2	2.26 V	26	42.5	13.3
6	11510.00	44.7 AV	54.0	-9.3	2.26 V	26	31.4	13.3
7	#17265.00	61.4 PK	68.2	-6.8	1.51 V	204	43.9	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 159	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5642.41	56.8 PK	68.2	-11.4	1.44 H	39	52.5	4.3
2	*5795.00	111.8 PK			1.44 H	39	107.6	4.2
3	*5795.00	102.0 AV			1.44 H	39	97.8	4.2
4	#5937.73	52.9 PK	68.2	-15.3	1.44 H	39	47.9	5.0
5	11590.00	60.1 PK	74.0	-13.9	1.79 H	251	46.8	13.3
6	11590.00	48.3 AV	54.0	-5.7	1.79 H	251	35.0	13.3
7	#17385.00	67.1 PK	68.2	-1.1	2.42 H	235	49.4	17.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.43	66.3 PK	68.2	-1.9	1.51 V	108	62.0	4.3
2	*5795.00	120.4 PK			1.51 V	108	116.2	4.2
3	*5795.00	110.5 AV			1.51 V	108	106.3	4.2
4	#5926.92	64.2 PK	68.2	-4.0	1.51 V	108	59.3	4.9
5	11590.00	57.7 PK	74.0	-16.3	2.30 V	19	44.4	13.3
6	11590.00	46.3 AV	54.0	-7.7	2.30 V	19	33.0	13.3
7	#17385.00	63.1 PK	68.2	-5.1	1.55 V	208	45.4	17.7

Remarks:

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

802.11ac (VHT80)

Channel	TX Channel 155	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5640.58	57.5 PK	68.2	-10.7	1.41 H	43	53.2	4.3
2	*5775.00	106.5 PK			1.41 H	43	102.4	4.1
3	*5775.00	96.3 AV			1.41 H	43	92.2	4.1
4	#5943.10	52.0 PK	68.2	-16.2	1.41 H	43	47.1	4.9
5	11550.00	56.3 PK	74.0	-17.7	1.79 H	257	43.1	13.2
6	11550.00	45.7 AV	54.0	-8.3	1.79 H	257	32.5	13.2
7	#17325.00	61.4 PK	68.2	-6.8	2.47 H	233	43.8	17.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.66	67.4 PK	68.2	-0.8	1.44 V	110	63.1	4.3
2	*5775.00	114.9 PK			1.44 V	110	110.8	4.1
3	*5775.00	106.3 AV			1.44 V	110	102.2	4.1
4	#5926.38	61.1 PK	68.2	-7.1	1.44 V	110	56.2	4.9
5	11550.00	53.7 PK	74.0	-20.3	2.24 V	35	40.5	13.2
6	11550.00	42.5 AV	54.0	-11.5	2.24 V	35	29.3	13.2
7	#17325.00	58.6 PK	68.2	-9.6	1.55 V	209	41.0	17.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Data:

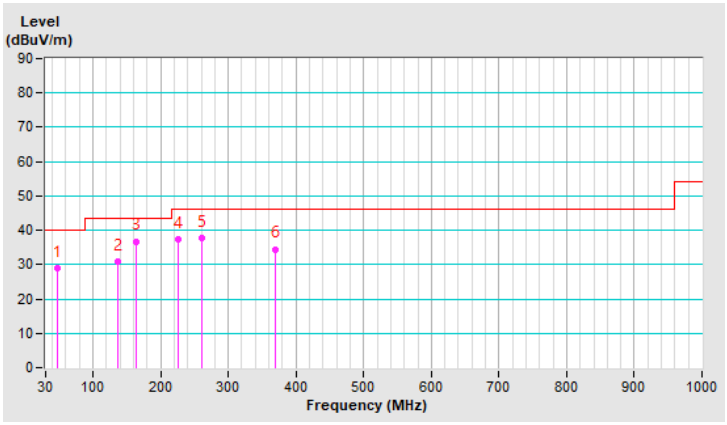
802.11ac (VHT20)

Channel	TX Channel 149	**Detector Function**	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	47.46	28.9 QP	40.0	-11.1	1.50 H	334	36.5	-7.6
2	137.14	30.7 QP	43.5	-12.8	2.00 H	297	38.3	-7.6
3	164.06	36.8 QP	43.5	-6.7	1.50 H	247	43.9	-7.1
4	226.19	37.3 QP	46.0	-8.7	2.00 H	136	46.8	-9.5
5	259.94	37.9 QP	46.0	-8.1	1.00 H	90	45.6	-7.7
6	369.94	34.5 QP	46.0	-11.5	1.00 H	150	38.2	-3.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

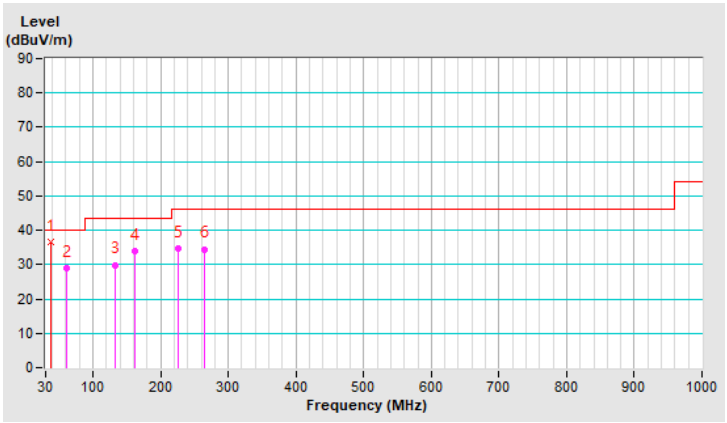


Channel	TX Channel 149	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	37.67	36.6 QP	40.0	-3.4	1.00 V	150	44.9	-8.3
2	60.53	29.1 QP	40.0	-10.9	1.50 V	353	37.4	-8.3
3	132.92	29.9 QP	43.5	-13.6	1.50 V	256	37.8	-7.9
4	162.31	33.9 QP	43.5	-9.6	1.00 V	255	40.8	-6.9
5	226.26	34.6 QP	46.0	-11.4	1.00 V	354	44.1	-9.5
6	264.32	34.5 QP	46.0	-11.5	1.00 V	267	41.8	-7.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 30, 2019	Aug. 29, 2020
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: July 22 to 23, 2020

4.2.3 Test Procedure

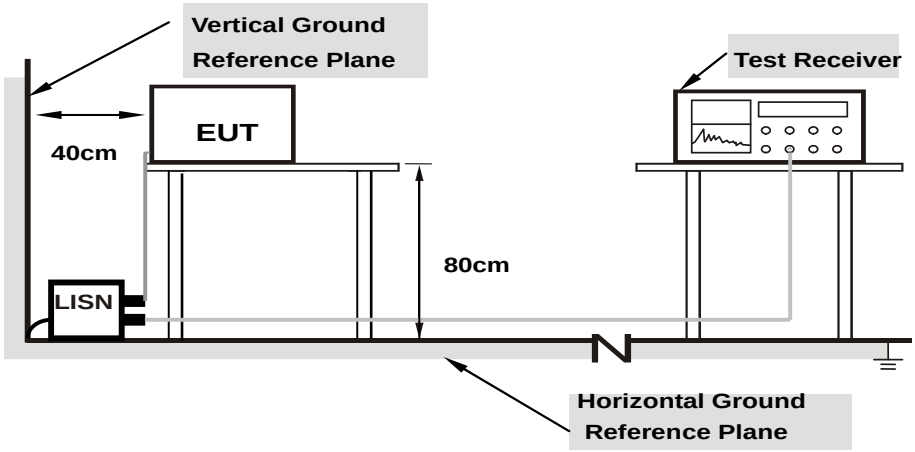
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

4.2.7 Test Results

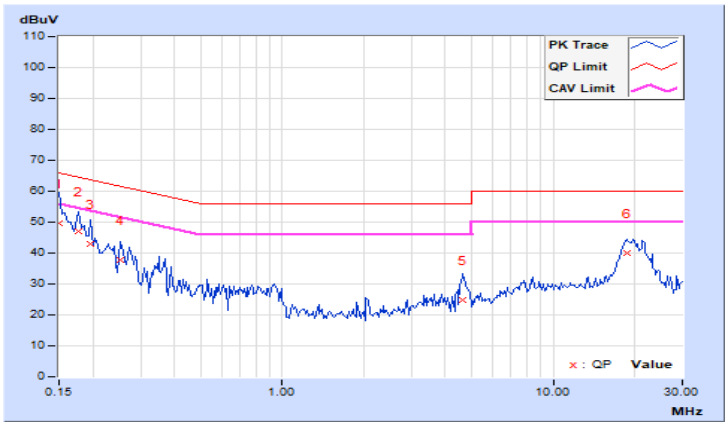
For Radio 1

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.98	39.56	25.03	49.54	35.01	66.00	56.00	-16.46	-20.99
2	0.17734	9.99	36.88	22.44	46.87	32.43	64.61	54.61	-17.74	-22.18
3	0.19687	9.99	33.07	18.75	43.06	28.74	63.74	53.74	-20.68	-25.00
4	0.25156	10.00	27.68	15.97	37.68	25.97	61.71	51.71	-24.03	-25.74
5	4.64844	10.31	14.56	2.93	24.87	13.24	56.00	46.00	-31.13	-32.76
6	18.72656	11.30	28.82	21.68	40.12	32.98	60.00	50.00	-19.88	-17.02

Remarks:

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

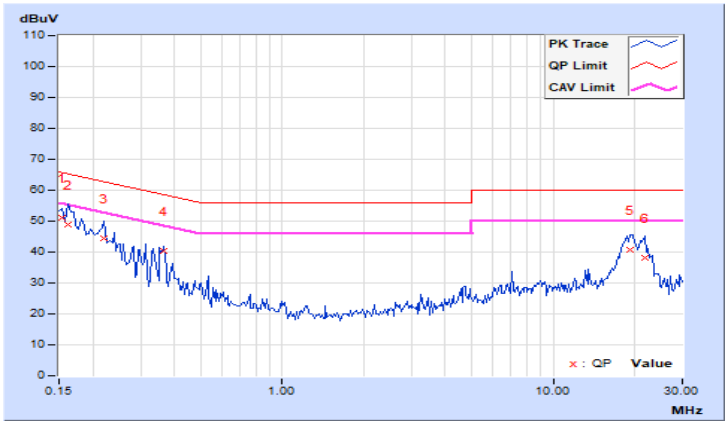


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.99	41.20	25.18	51.19	35.17	65.79	55.79	-14.60	-20.62
2	0.16172	9.99	38.73	25.69	48.72	35.68	65.38	55.38	-16.66	-19.70
3	0.22031	10.00	34.39	21.84	44.39	31.84	62.81	52.81	-18.42	-20.97
4	0.36484	10.02	30.24	25.23	40.26	35.25	58.62	48.62	-18.36	-13.37
5	19.21875	11.09	29.67	22.52	40.76	33.61	60.00	50.00	-19.24	-16.39
6	21.80078	11.18	27.11	20.57	38.29	31.75	60.00	50.00	-21.71	-18.25

Remarks:

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



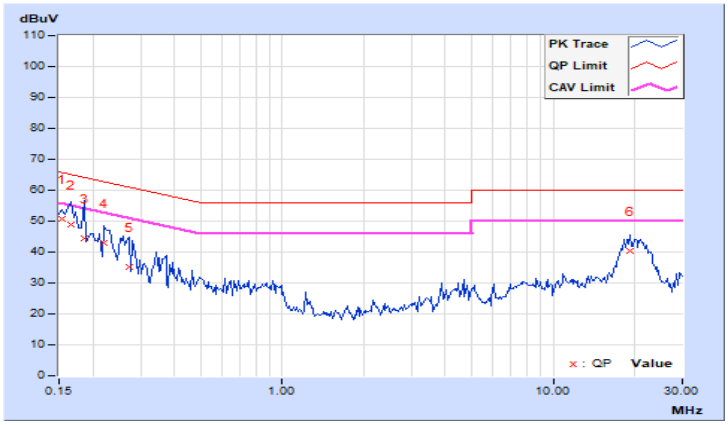
For Radio 2

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	9.98	40.66	25.12	50.64	35.10	65.78	55.78	-15.14	-20.68
2	0.16569	9.98	38.89	24.47	48.87	34.45	65.17	55.17	-16.30	-20.72
3	0.18530	9.99	34.39	20.69	44.38	30.68	64.24	54.24	-19.86	-23.56
4	0.22039	9.99	32.82	17.33	42.81	27.32	62.80	52.80	-19.99	-25.48
5	0.27119	10.00	25.19	9.42	35.19	19.42	61.08	51.08	-25.89	-31.66
6	19.13682	11.33	29.12	21.62	40.45	32.95	60.00	50.00	-19.55	-17.05

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

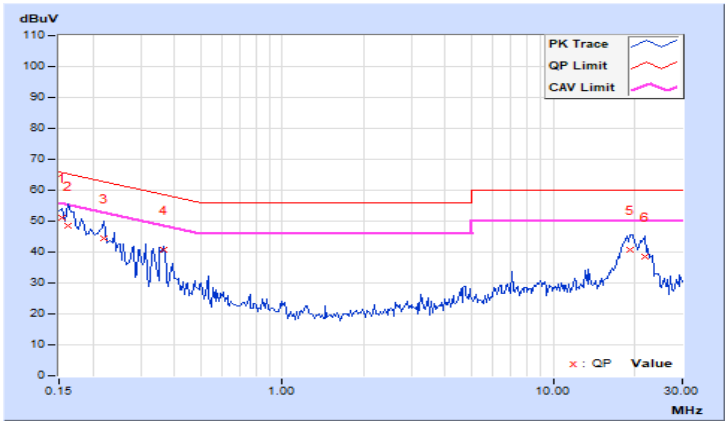


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15399	9.99	41.30	25.25	51.29	35.24	65.78	55.78	-14.49	-20.54
2	0.16179	9.99	38.53	25.99	48.52	35.98	65.37	55.37	-16.85	-19.39
3	0.22039	10.00	34.45	21.94	44.45	31.94	62.80	52.80	-18.35	-20.86
4	**0.36494**	**10.02**	**30.64**	**25.33**	**40.66**	**35.35**	**58.62**	**48.62**	**-17.96**	**-13.27**
5	19.21879	11.09	29.72	22.59	40.81	33.68	60.00	50.00	-19.19	-16.32
6	21.80088	11.18	27.19	20.50	38.37	31.68	60.00	50.00	-21.63	-18.32

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

For Radio 1

CDD Mode

POWER OUTPUT

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	21.35	21.44	21.35	412.232	26.15	30.00	Pass
40	5200	21.30	21.43	21.11	403.013	26.05	30.00	Pass
48	5240	22.11	22.06	22.19	488.826	26.89	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	20.56	21.13	20.84	364.82	25.62	30.00	Pass
40	5200	21.14	21.49	21.06	398.59	26.01	30.00	Pass
48	5240	21.46	21.66	21.71	434.765	26.38	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	18.96	19.28	19.26	247.761	23.94	30.00	Pass
46	5230	20.73	20.86	20.88	362.665	25.60	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	17.98	17.99	18.27	192.899	22.85	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	20.56	21.13	20.84	364.82	25.62	29.13	Pass
40	5200	21.14	21.49	21.06	398.59	26.01	29.13	Pass
48	5240	21.46	21.66	21.71	434.765	26.38	29.13	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.87 dBi > 6 dBi, so the power limit shall be reduced to 30-(6.87-6) = 29.13 dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	18.96	19.28	19.26	247.761	23.94	29.13	Pass
46	5230	20.73	20.86	20.88	362.665	25.60	29.13	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.87 dBi > 6 dBi, so the power limit shall be reduced to 30-(6.87-6) = 29.13 dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	17.98	17.99	18.27	192.899	22.85	29.13	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.87 dBi > 6 dBi, so the power limit shall be reduced to 30-(6.87-6) = 29.13 dBm.

For Radio 2

CDD Mode

POWER OUTPUT

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	22.53	22.13	22.66	22.04	686.823	28.37	30.00	Pass
157	5785	23.55	23.96	23.72	23.98	960.89	29.83	30.00	Pass
165	5825	23.29	24.06	23.62	23.89	943.038	29.75	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.74	23.73	23.91	24.33	989.696	29.96	30.00	Pass
157	5785	23.48	23.97	23.73	24.01	960.119	29.82	30.00	Pass
165	5825	23.78	23.60	23.57	23.65	927.117	29.67	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	23.53	23.71	23.75	24.05	951.622	29.78	30.00	Pass
159	5795	23.67	24.10	23.80	23.96	978.618	29.91	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	23.47	23.85	23.76	23.98	952.711	29.79	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	21.76	21.71	21.89	22.23	619.855	27.92	28.08	Pass
157	5785	21.53	22.00	21.78	22.05	611.707	27.87	28.08	Pass
165	5825	21.86	21.72	21.67	21.71	597.2	27.76	28.08	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.92 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.92-6) = 28.08dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	21.58	21.75	21.79	22.09	606.319	27.83	28.08	Pass
159	5795	20.71	22.12	21.85	21.98	591.56	27.72	28.08	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.92 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.92-6) = 28.08dBm.

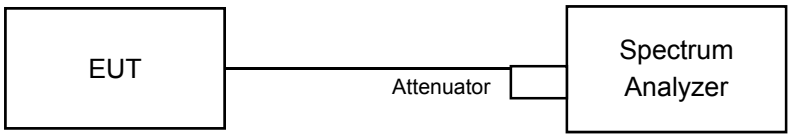
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	21.56	21.93	21.79	22.02	609.403	27.85	28.08	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.92 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.92-6) = 28.08dBm.

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

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	16.68	16.92	16.92
40	5200	16.8	16.68	16.92
48	5240	16.68	16.68	18.96

802.11ac (VHT20)

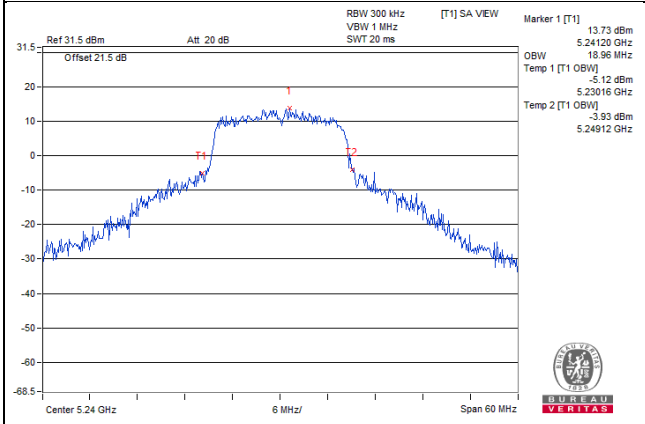
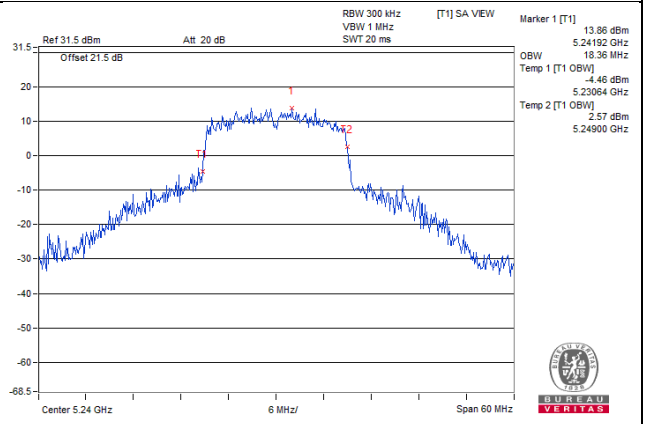
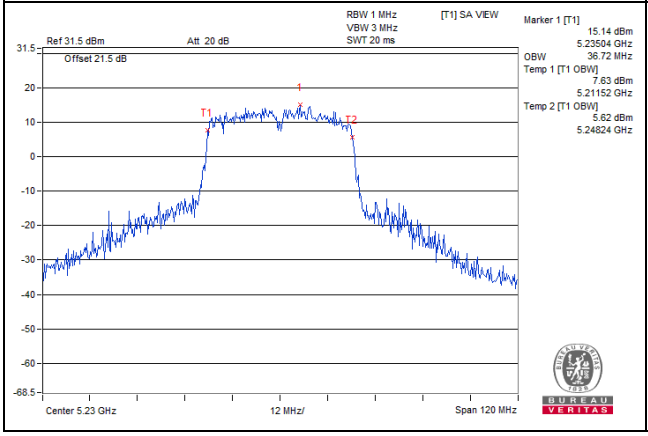
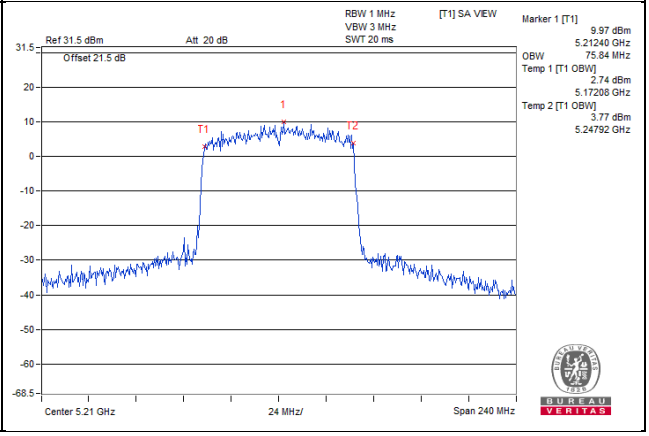
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	17.64	17.64	17.76
40	5200	17.64	17.64	17.88
48	5240	17.64	17.64	18.36

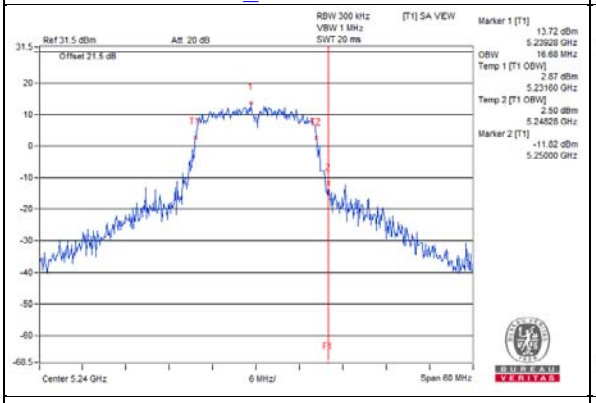
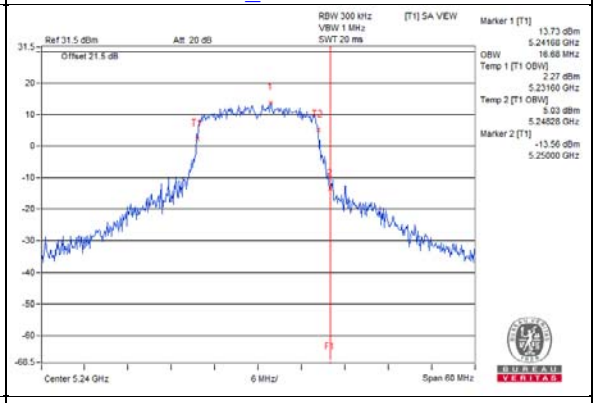
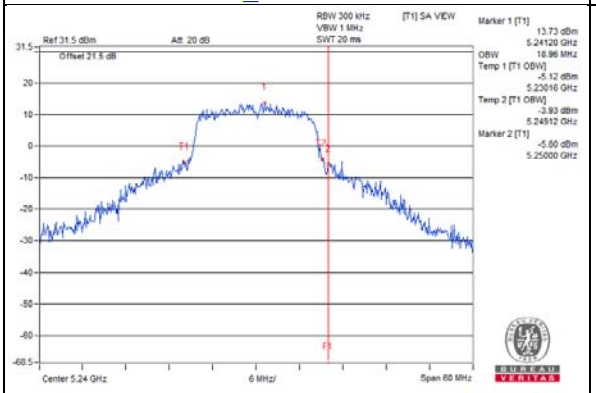
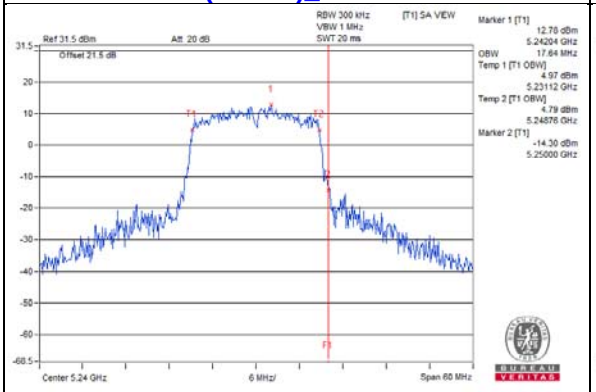
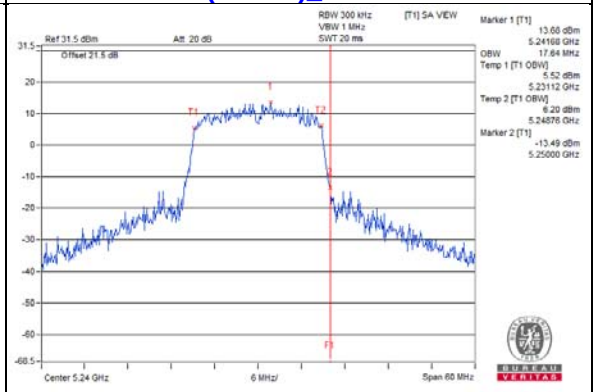
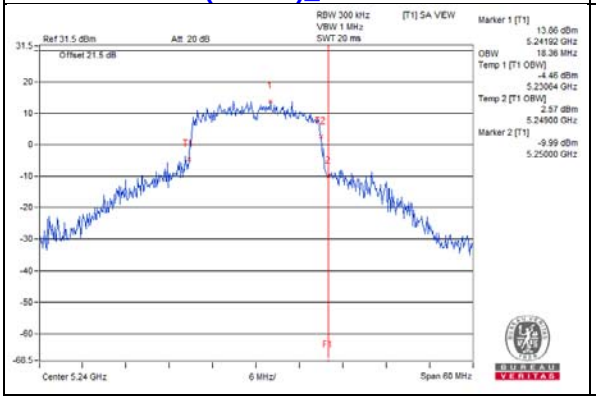
802.11ac (VHT40)

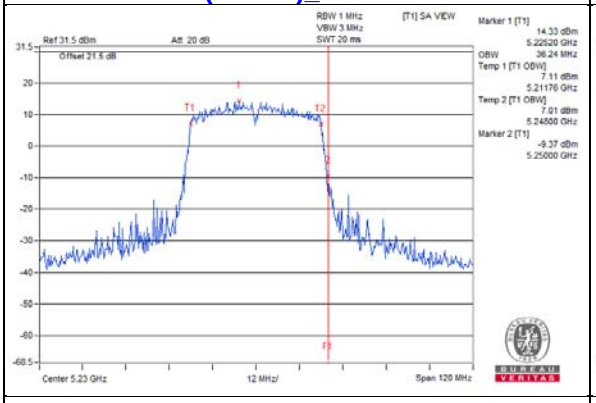
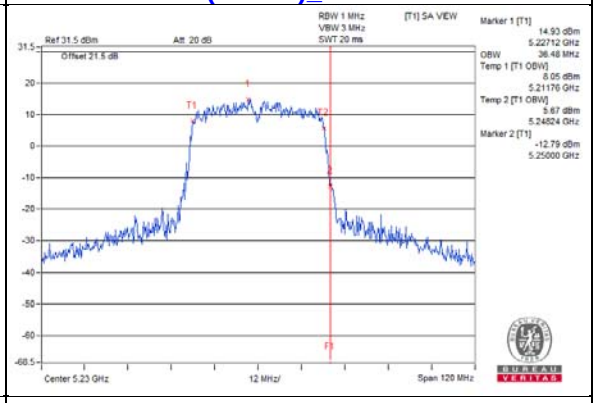
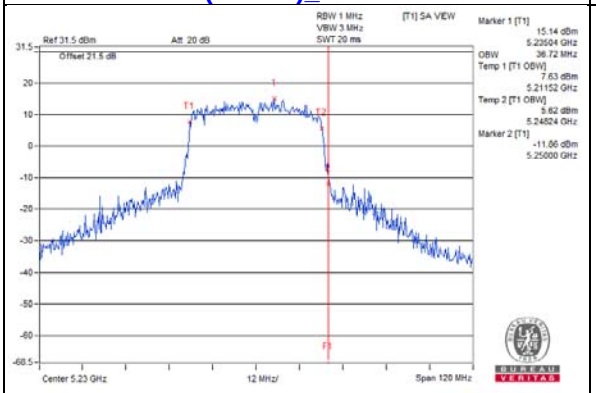
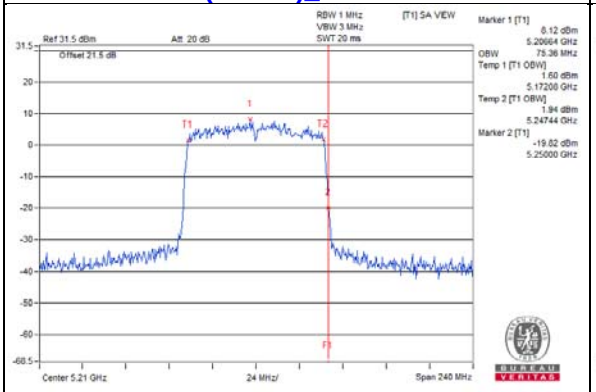
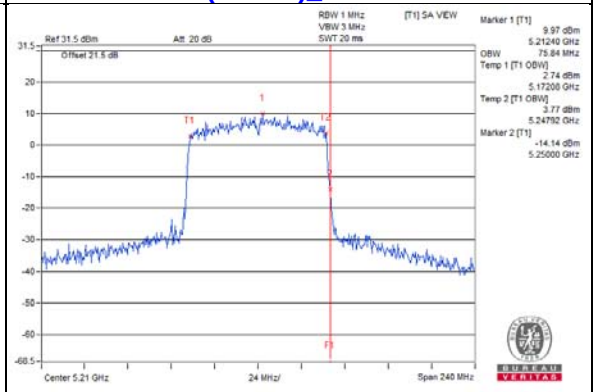
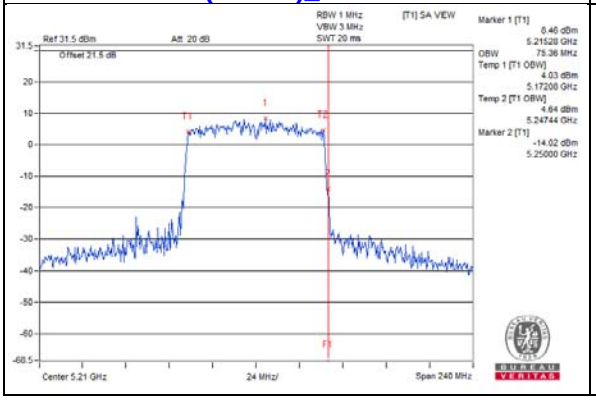
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
38	5190	36.48	36.48	36.24
46	5230	36.24	36.48	36.72

802.11ac (VHT80)

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

Spectrum Plot of Max. Value	
802.11a_Chain 2 / CH48	**802.11ac (VHT20)_Chain 2 / CH48**
	
802.11ac (VHT40)_Chain 2 / CH46	**802.11ac (VHT80)_Chain 1 / 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	
	
802.11ac (VHT20)_Chain 0 / CH48	**802.11ac (VHT20)_Chain 1 / CH48**
	
802.11ac (VHT20)_Chain 2 / 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 (VHT80)_Chain 0 / CH42	**802.11ac (VHT80)_Chain 1 / CH42**
	
802.11ac (VHT80)_Chain 2 / CH42	
	

For Radio 2

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	16.56	16.68	16.44	16.56
157	5785	16.92	16.68	16.92	16.68
165	5825	16.92	17.52	16.92	17.04

802.11ac (VHT20)

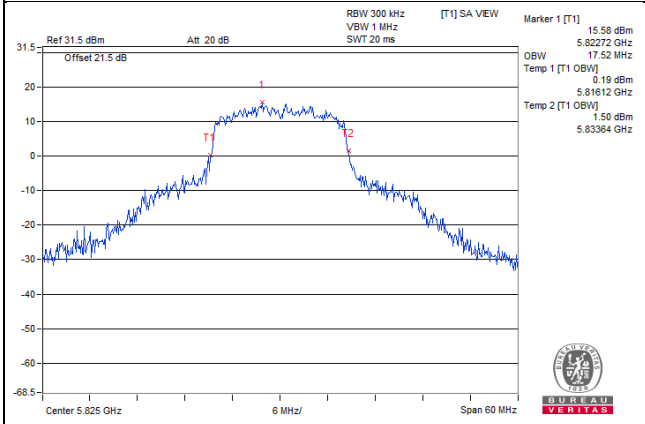
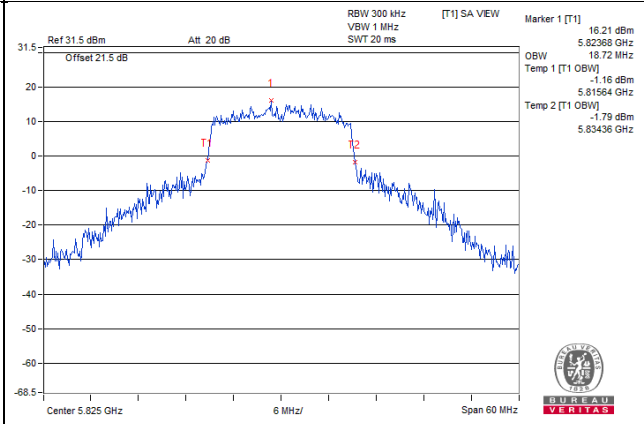
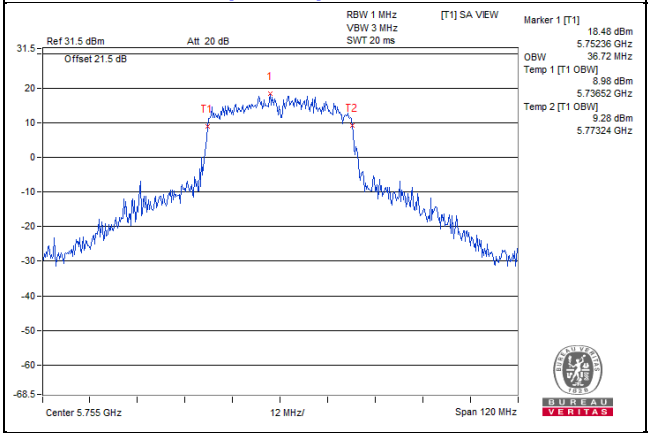
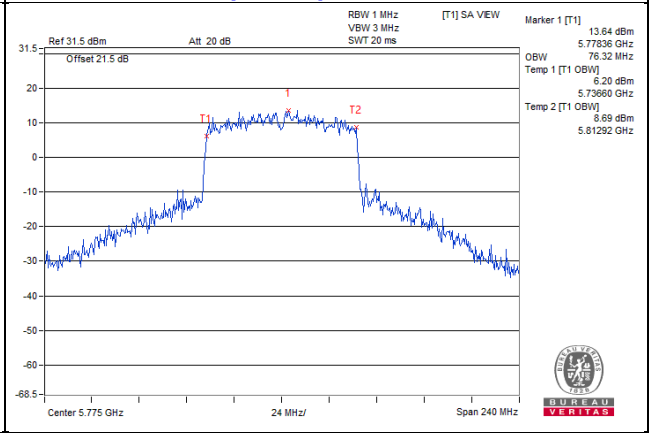
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	17.88	17.64	17.64	17.88
157	5785	18.24	17.88	17.76	17.88
165	5825	17.88	17.88	17.76	18.72

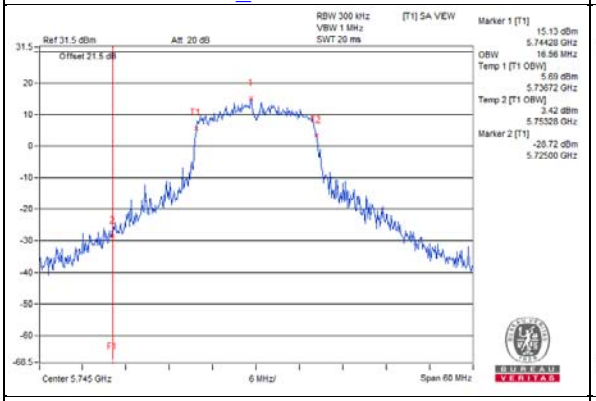
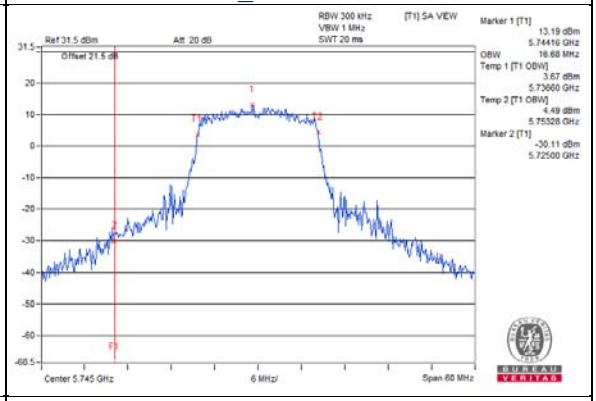
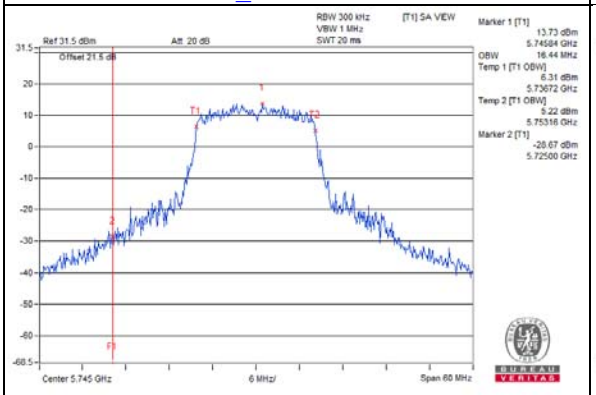
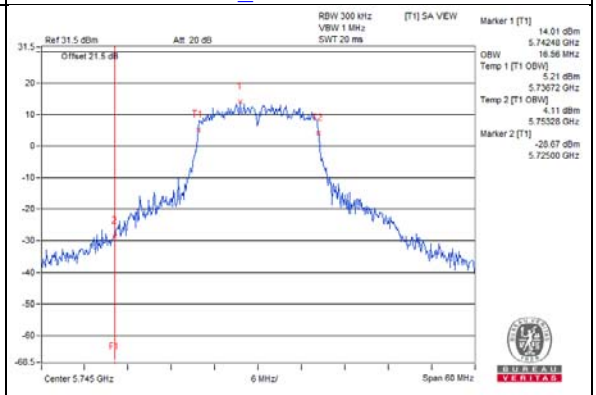
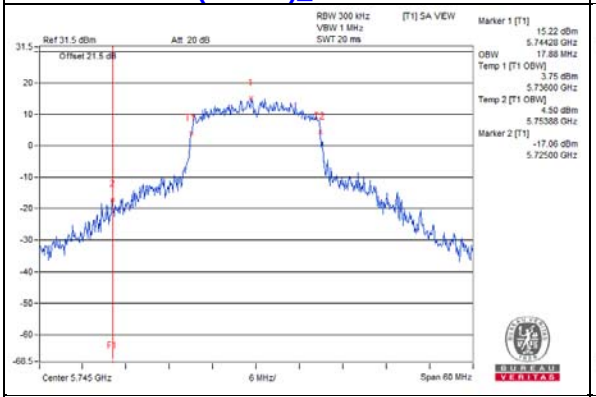
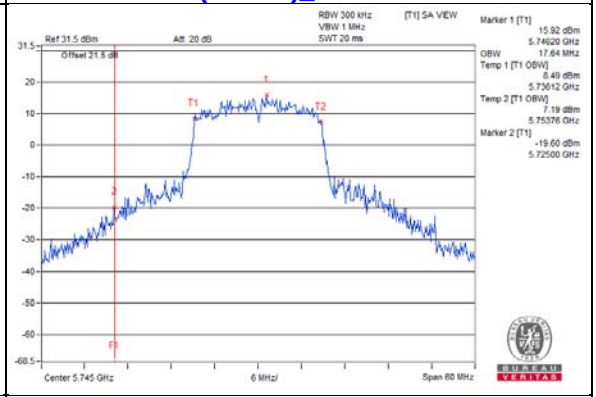
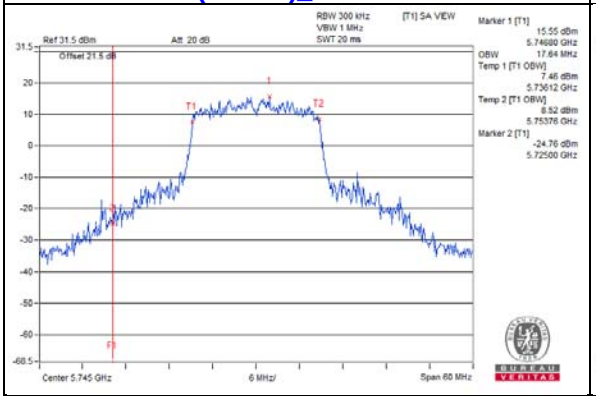
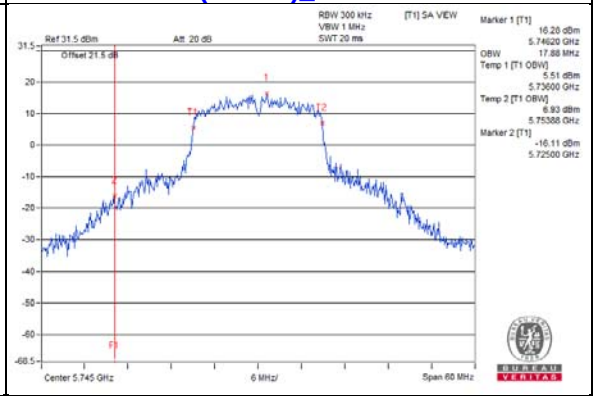
802.11ac (VHT40)

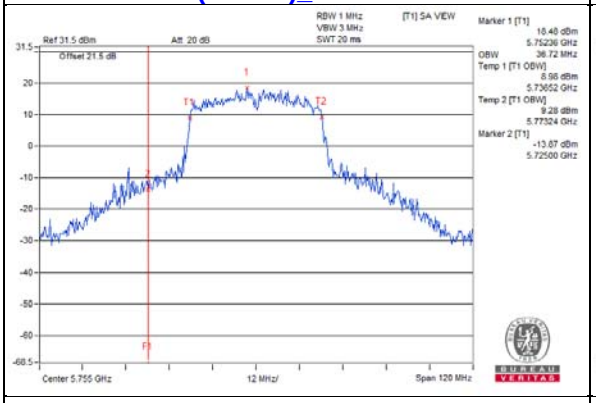
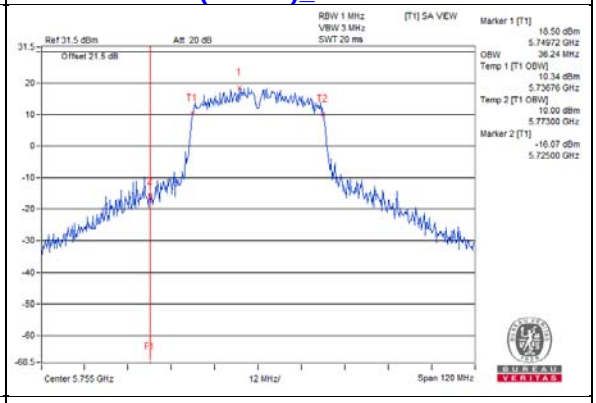
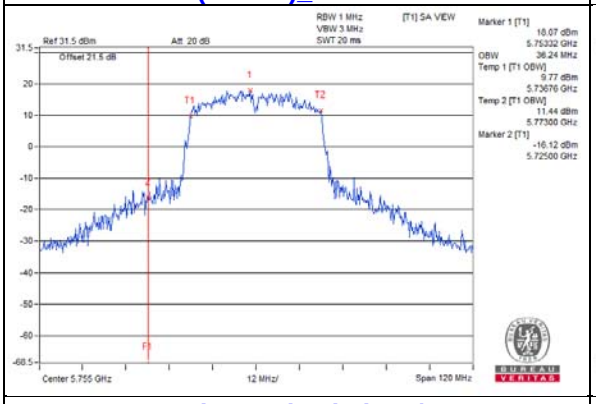
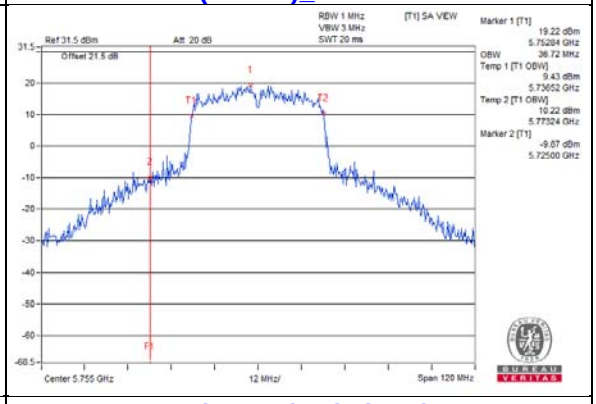
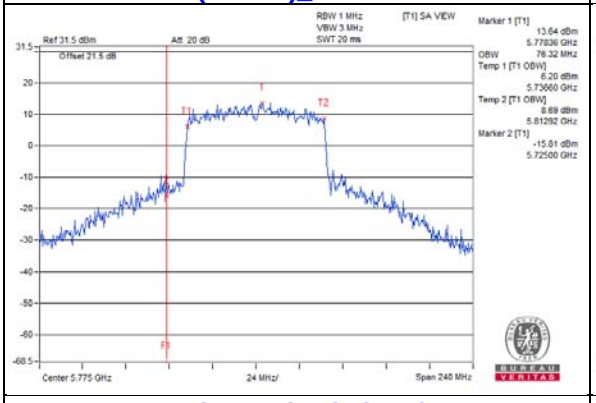
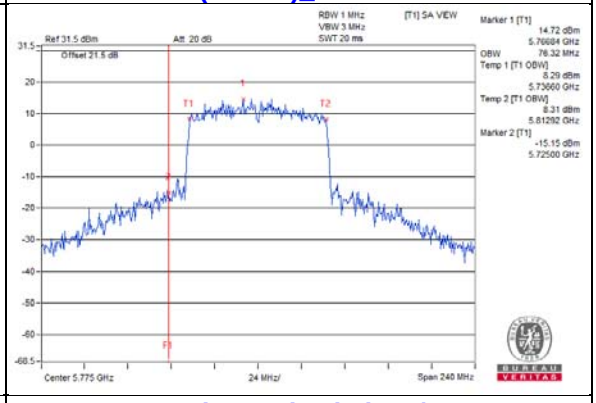
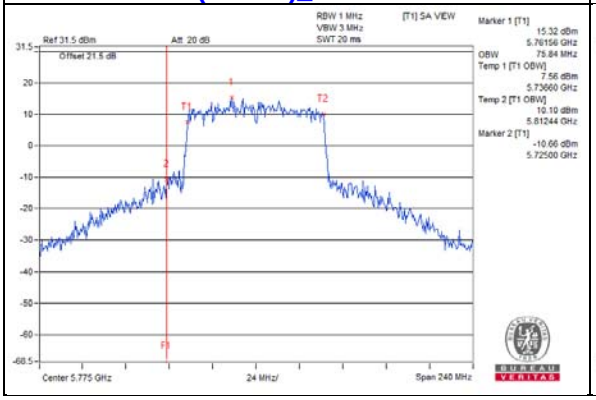
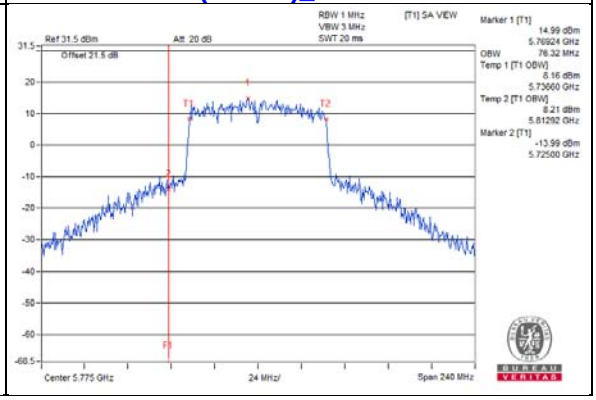
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	36.72	36.24	36.24	36.72
159	5795	36.72	36.48	36.72	36.72

802.11ac (VHT80)

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

Spectrum Plot of Max. Value	
802.11a_Chain 1 / CH165	**802.11ac (VHT20)_Chain 3 / CH165**
	
802.11ac (VHT40)_Chain 0 / CH151	**802.11ac (VHT80)_Chain 0 / CH155**
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11a_Chain 0 / CH149	**802.11a_Chain 1 / CH149**
	
802.11a_Chain 2 / CH149	**802.11a_Chain 3 / CH149**
	
802.11ac (VHT20)_Chain 0 / CH149	**802.11ac (VHT20)_Chain 1 / CH149**
	
802.11ac (VHT20)_Chain 2 / CH149	**802.11ac (VHT20)_Chain 3 / CH149**
	

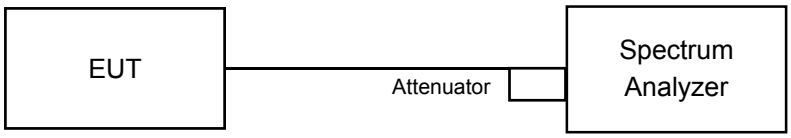
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ac (VHT40)_Chain 0 / CH151	**802.11ac (VHT40)_Chain 1 / CH151**
	
802.11ac (VHT40)_Chain 2 / CH151	**802.11ac (VHT40)_Chain 3 / CH151**
	
802.11ac (VHT80)_Chain 0 / CH155	**802.11ac (VHT80)_Chain 1 / CH155**
	
802.11ac (VHT80)_Chain 2 / CH155	**802.11ac (VHT80)_Chain 3 / CH155**
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1 band:

For 802.11ac (VHT80)

Using method SA-2

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

For other modulation mode

Using method SA-1

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

For U-NII-3 band:

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

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 (U-NII-1 Band)

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
36	5180	8.82	8.47	8.70	13.44	16.13	Pass
40	5200	9.36	8.33	8.58	13.55	16.13	Pass
48	5240	9.49	9.79	9.68	14.43	16.13	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.87 dBi > 6 dBi, so the power density limit shall be reduced to 17-(6.87-6) = 16.13 dBm/MHz.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
36	5180	7.57	8.12	8.45	12.83	16.13	Pass
40	5200	8.03	8.83	7.77	13.01	16.13	Pass
48	5240	8.36	8.80	9.68	13.75	16.13	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.87 dBi > 6 dBi, so the power density limit shall be reduced to 17-(6.87-6) = 16.13 dBm/MHz.

802.11ac (VHT40)

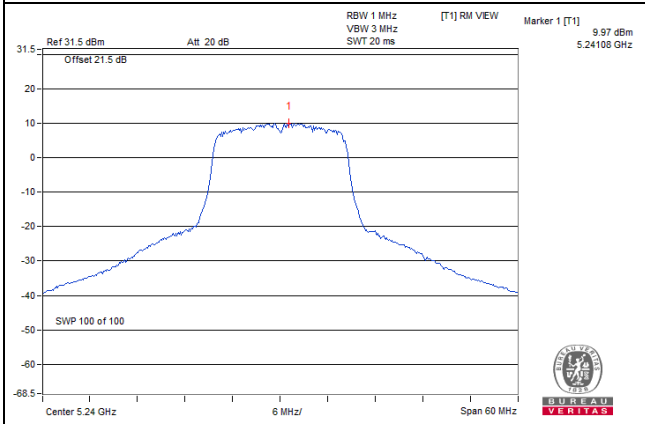
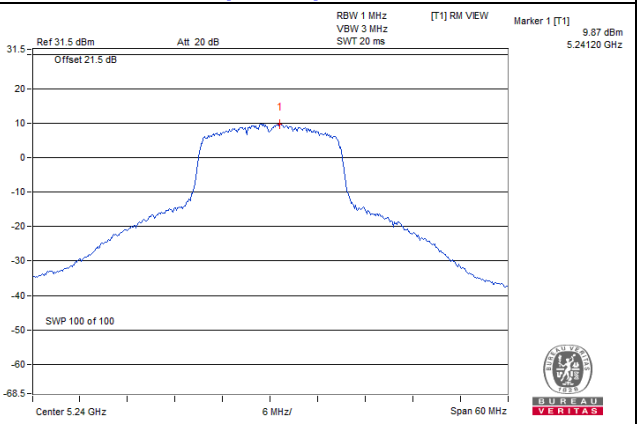
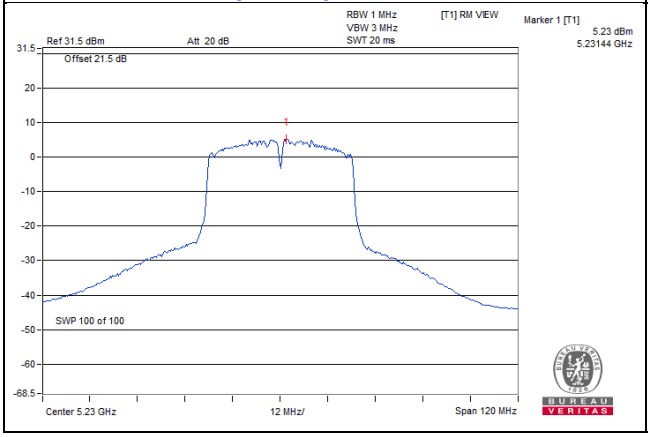
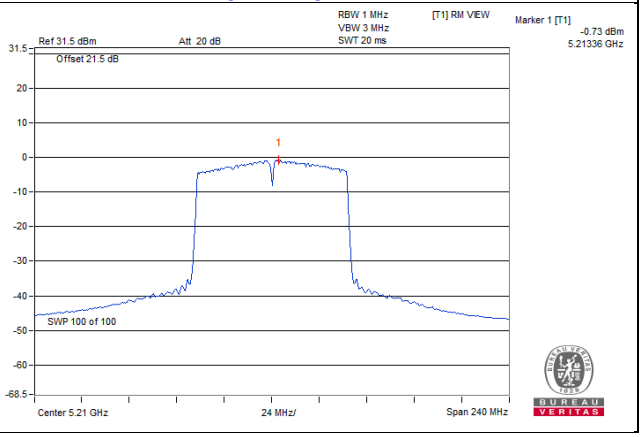
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
38	5190	2.93	3.35	3.48	8.03	16.13	Pass
46	5230	5.02	5.09	5.20	9.88	16.13	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.87 dBi > 6 dBi, so the power density limit shall be reduced to 17-(6.87-6) = 16.13 dBm/MHz.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)			Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	-1.48	-1.00	-1.28	0.11	3.63	16.13	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.87 dBi > 6 dBi, so the power density limit shall be reduced to 17-(6.87-6) = 16.13 dBm/MHz.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH48	**802.11ac (VHT20)_Chain 2 / CH48**
	
802.11ac (VHT40)_Chain 2 / CH46	**802.11ac (VHT80)_Chain 1 / CH42**
	

For Radio 2 (U-NII-3 Band)

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (dBm/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	2.27	1.55	2.83	1.69	8.14	10.36	28.08	Pass
157	5785	3.15	3.75	3.68	2.72	9.37	11.59	28.08	Pass
165	5825	3.20	3.46	2.89	2.90	9.14	11.36	28.08	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.92 > 6dBi, so the power density limit shall be reduced to 30-(7.92-6) = 28.08 dBm/500kHz.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (dBm/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	3.88	2.84	2.94	4.20	9.53	11.75	28.08	Pass
157	5785	3.76	3.40	2.88	3.18	9.34	11.56	28.08	Pass
165	5825	3.12	2.88	2.98	3.27	9.09	11.31	28.08	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.92 > 6dBi, so the power density limit shall be reduced to 30-(7.92-6) = 28.08 dBm/500kHz.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (dBm/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	-0.39	-0.17	0.04	1.39	6.30	8.52	28.08	Pass
159	5795	-0.74	-0.56	0.88	1.02	6.24	8.46	28.08	Pass

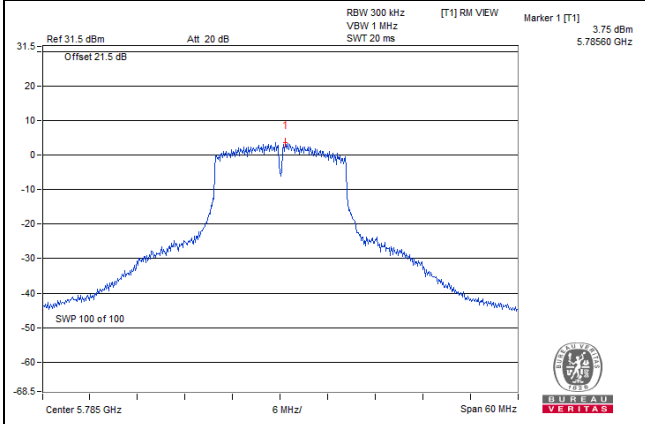
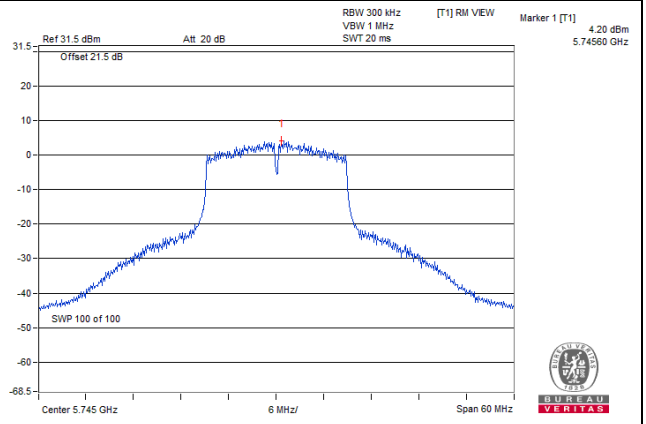
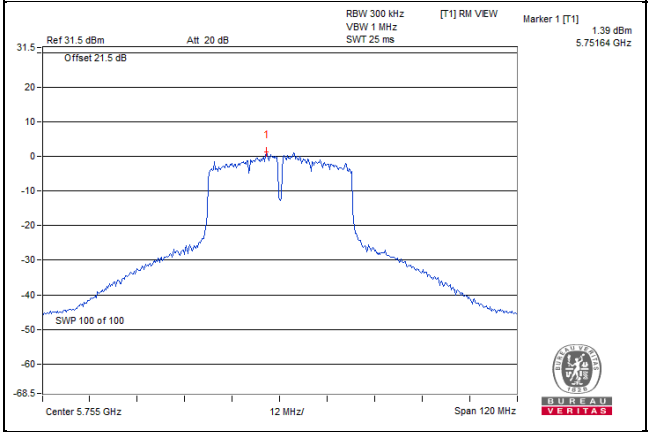
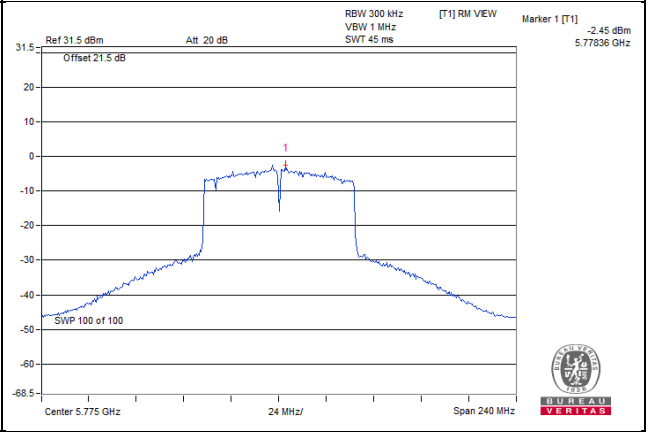
Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.92 > 6dBi, so the power density limit shall be reduced to 30-(7.92-6) = 28.08 dBm/500kHz.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (dBm/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	-4.50	-3.56	-3.43	-2.45	2.60	4.82	28.08	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.

2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.92 > 6dBi, so the power density limit shall be reduced to 30-(7.92-6) = 28.08 dBm/500kHz.

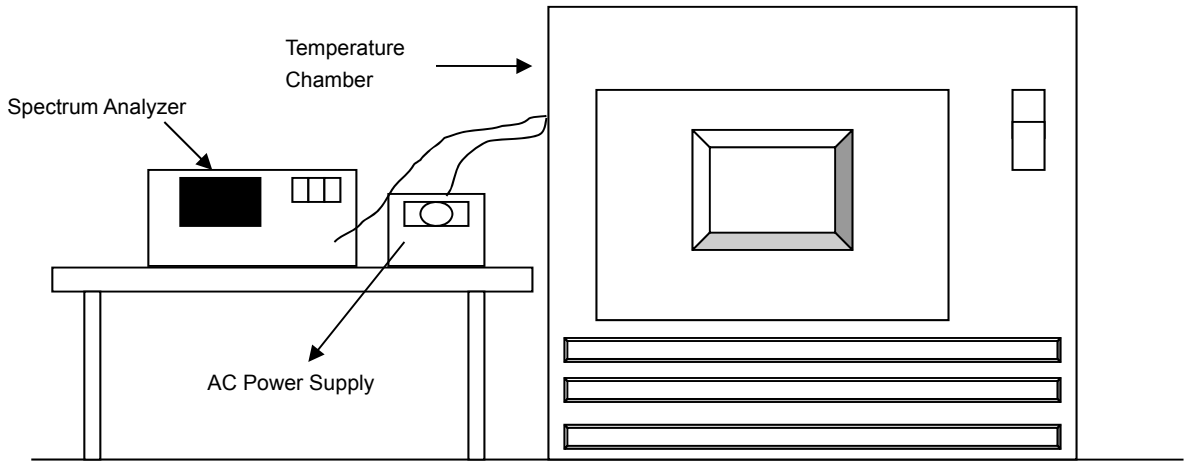
Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH157	**802.11ac (VHT20)_Chain 3 / CH149**
	
802.11ac (VHT40)_Chain 3 / CH151	**802.11ac (VHT80)_Chain 3 / CH155**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.

e. Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

For Radio 1

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5179.9832	Pass	5179.9859	Pass	5179.9829	Pass	5179.9854	Pass
30	120	5180.0112	Pass	5180.0095	Pass	5180.0142	Pass	5180.0115	Pass
20	120	5180.0064	Pass	5180.0088	Pass	5180.0037	Pass	5180.0086	Pass
10	120	5180.007	Pass	5180.0066	Pass	5180.0029	Pass	5180.0049	Pass
0	120	5179.9963	Pass	5179.9949	Pass	5179.9967	Pass	5179.9971	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0058	Pass	5180.0091	Pass	5180.0035	Pass	5180.0092	Pass
	120	5180.0064	Pass	5180.0088	Pass	5180.0037	Pass	5180.0086	Pass
	102	5180.0065	Pass	5180.0093	Pass	5180.0039	Pass	5180.0089	Pass

For Radio 2

Frequency Stability Versus Temp.									
Operating Frequency: 5745 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5744.9975	Pass	5744.9972	Pass	5744.9926	Pass	5744.9926	Pass
30	120	5744.9847	Pass	5744.9882	Pass	5744.9877	Pass	5744.9877	Pass
20	120	5745.0125	Pass	5745.0094	Pass	5745.0127	Pass	5745.0105	Pass
10	120	5745.0237	Pass	5745.019	Pass	5745.018	Pass	5745.0227	Pass
0	120	5744.9837	Pass	5744.9853	Pass	5744.9839	Pass	5744.9819	Pass

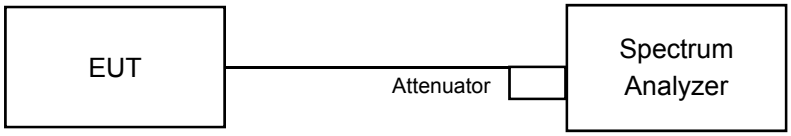
Frequency Stability Versus Voltage									
Operating Frequency: 5745 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5745.012	Pass	5745.0103	Pass	5745.0137	Pass	5745.0103	Pass
	120	5745.0125	Pass	5745.0094	Pass	5745.0127	Pass	5745.0105	Pass
	102	5745.0127	Pass	5745.0086	Pass	5745.0118	Pass	5745.011	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

For Radio 2

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	15.18	15.17	15.2	15.2	0.5	Pass
157	5785	15.14	15.16	15.13	15.14	0.5	Pass
165	5825	15.39	15.13	15.07	15.14	0.5	Pass

802.11ac (VHT20)

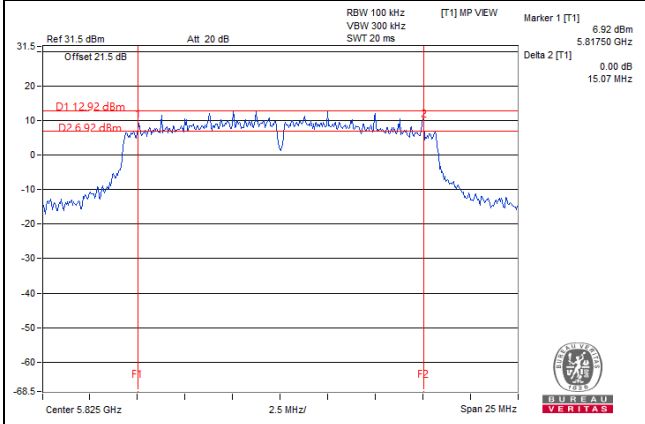
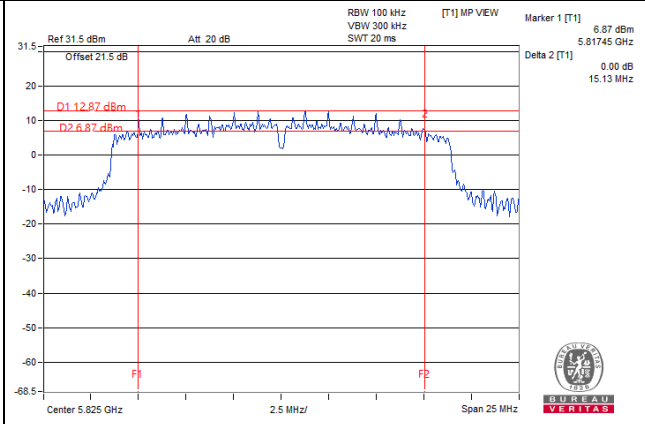
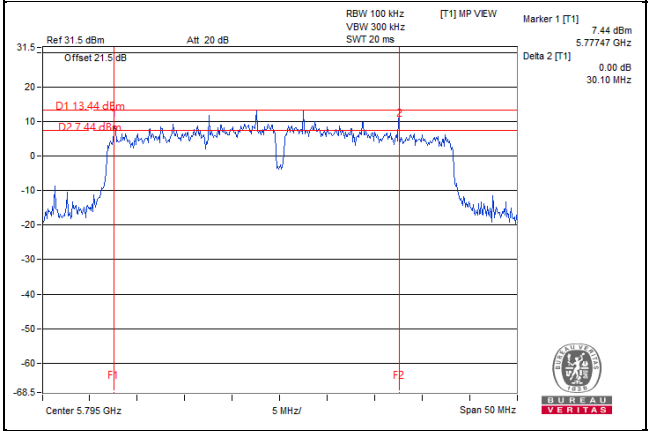
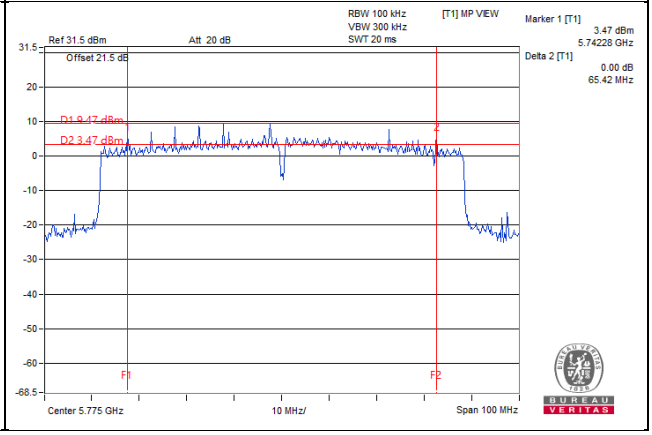
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	15.16	15.75	15.15	15.16	0.5	Pass
157	5785	15.14	15.98	15.17	16.05	0.5	Pass
165	5825	15.15	15.98	15.13	16	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	33.89	35.09	30.27	30.25	0.5	Pass
159	5795	33.85	33.88	30.19	30.1	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	74.26	72.38	76.11	65.42	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 2 / CH165	**802.11ac (VHT20)_Chain 2 / CH165**
	
802.11ac (VHT40) _Chain 3 / CH159	**802.11ac (VHT80) _Chain 3 / CH155**
	

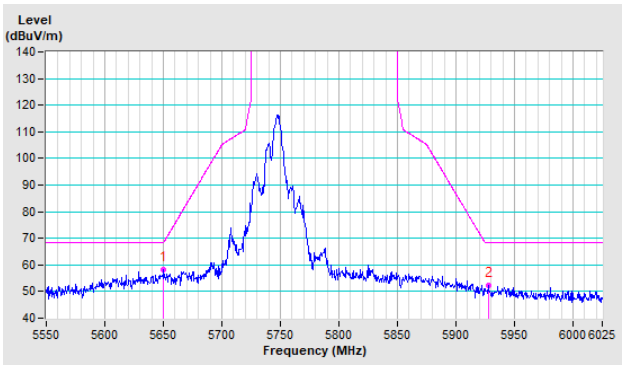
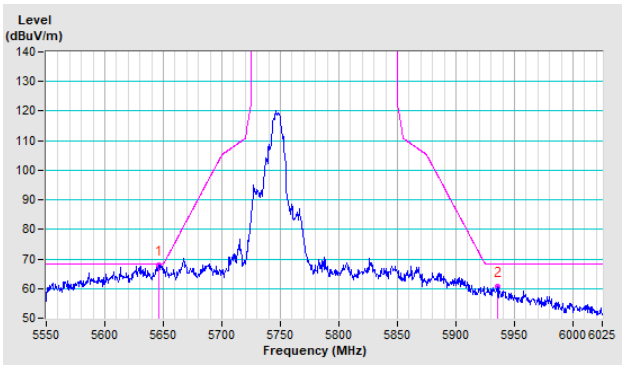
5 Pictures of Test Arrangements

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

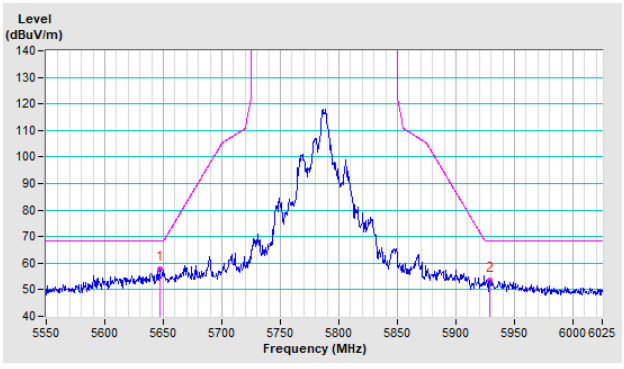
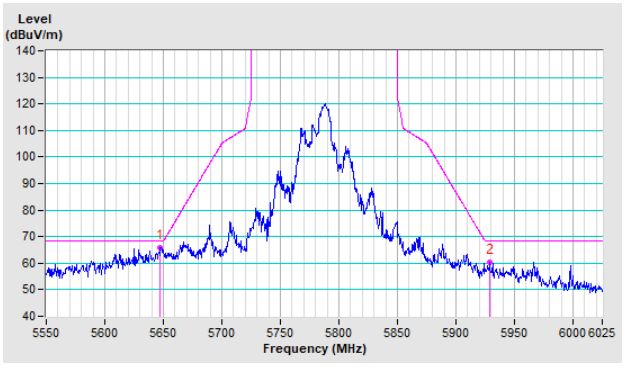
Annex A - Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

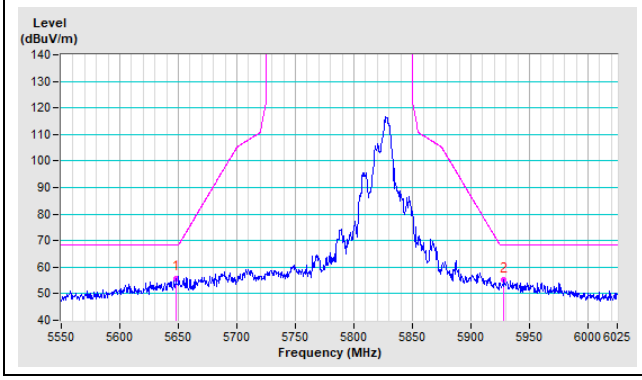
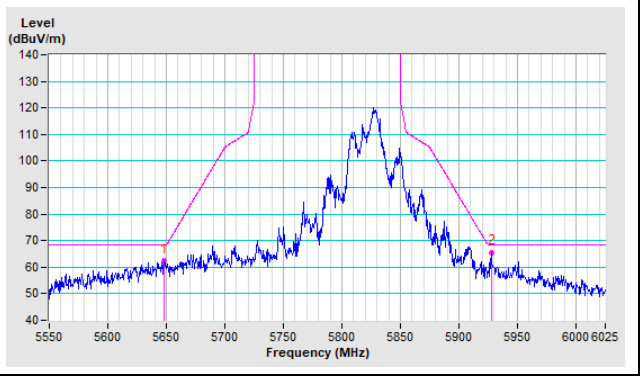
CH 149 5745 MHZ

HORIZONTAL	VERTICAL
	

CH 157 5785 MHZ

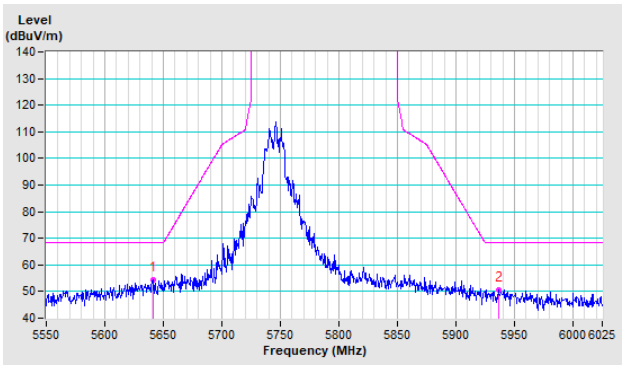
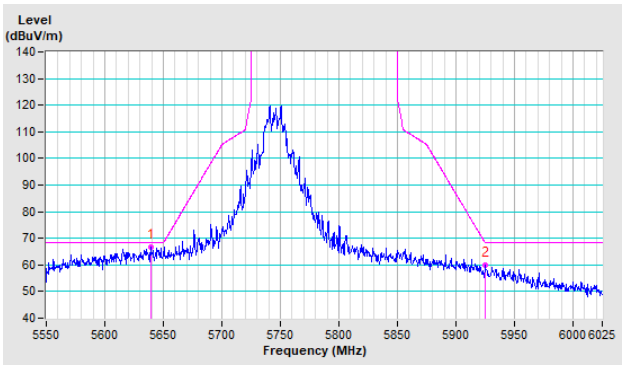
HORIZONTAL	VERTICAL
	

CH 165 5825 MHZ

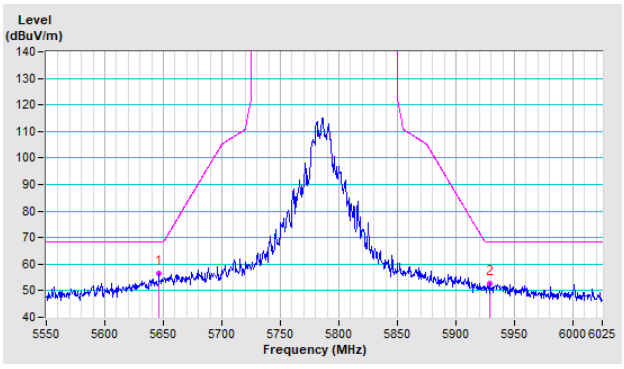
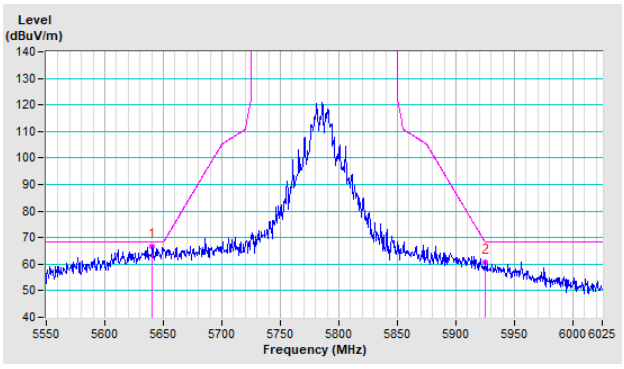
HORIZONTAL	VERTICAL
	

802.11ac (VHT20)

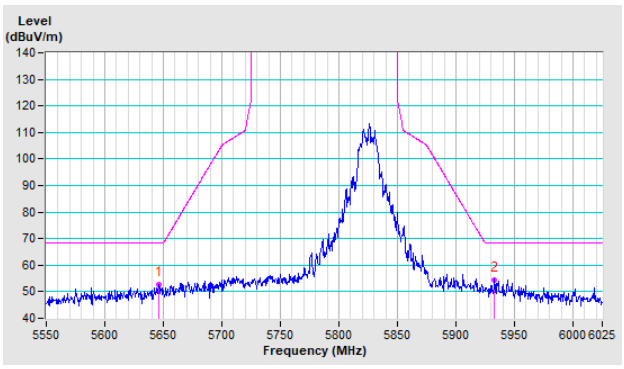
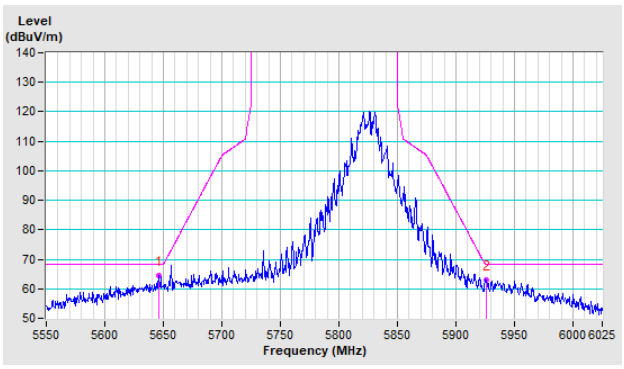
CH 149 5745 MHZ

HORIZONTAL	VERTICAL
	

CH 157 5785 MHZ

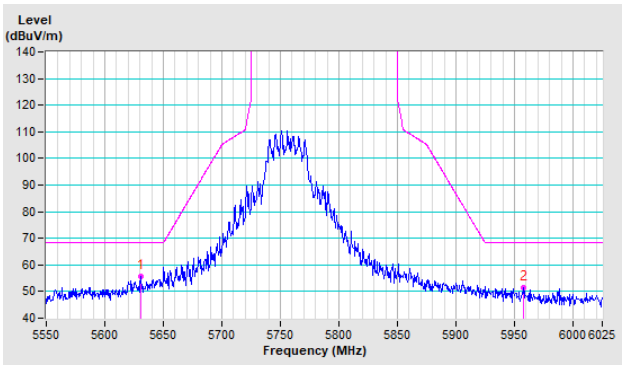
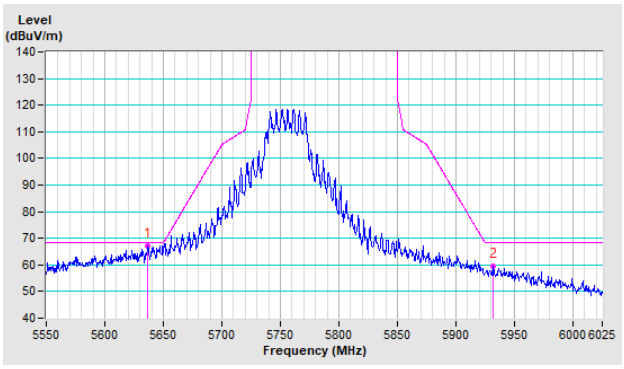
HORIZONTAL	VERTICAL
	

CH 165 5825 MHZ

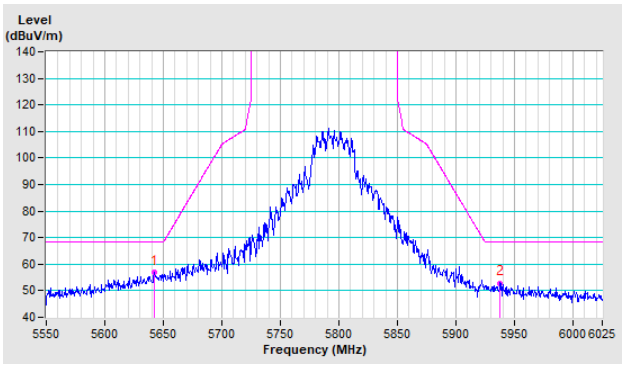
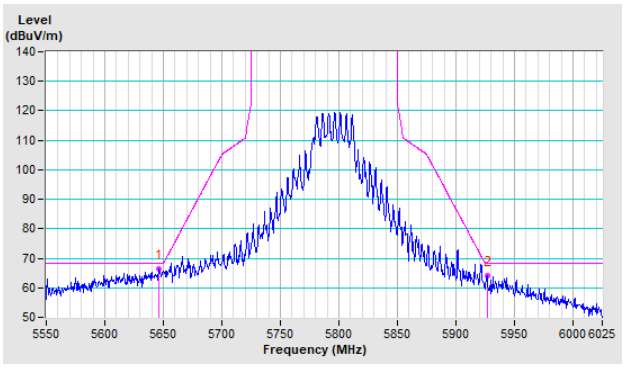
HORIZONTAL	VERTICAL
	

802.11ac (VHT40)

CH 151 5755 MHZ

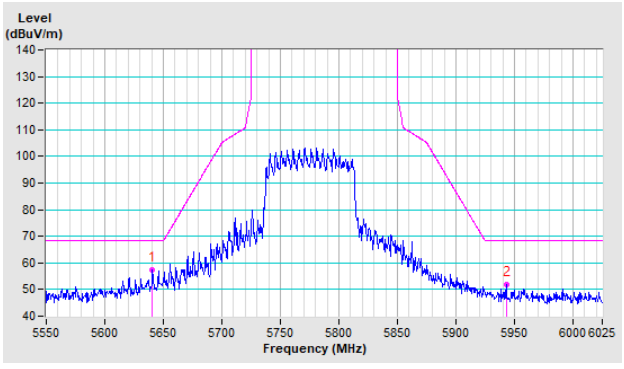
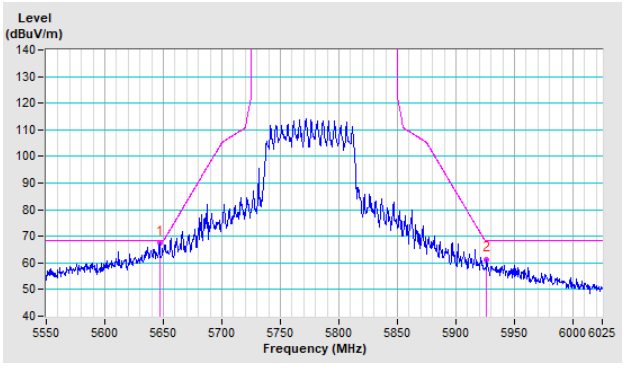
HORIZONTAL	VERTICAL
	

CH 159 5795 MHZ

HORIZONTAL	VERTICAL
	

802.11ac (VHT80)

CH 155 5775 MHZ

HORIZONTAL	VERTICAL
	

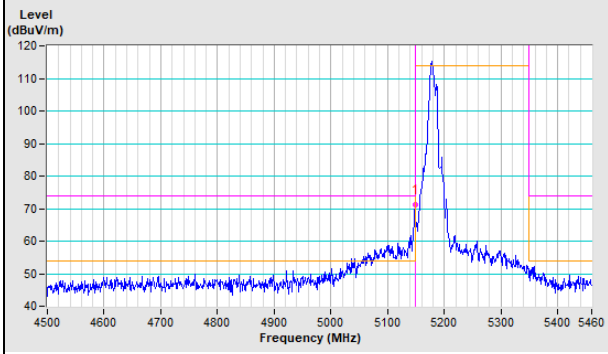
Annex B - Band-Edge Measurement (For U-NII-1 band)

For Radio 1

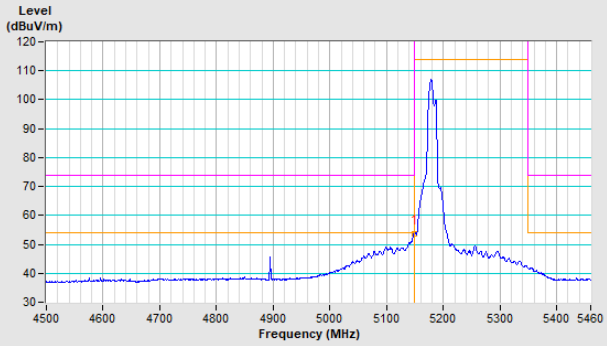
802.11a

Channel 36

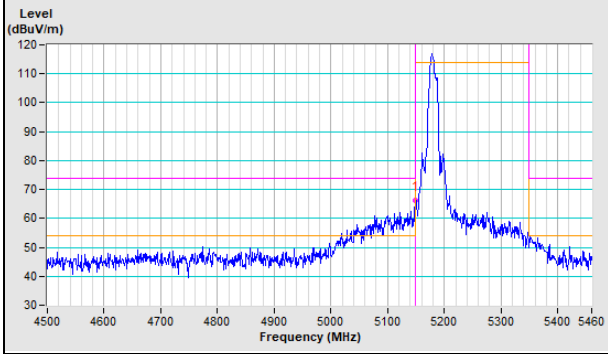
Horizontal (Peak)



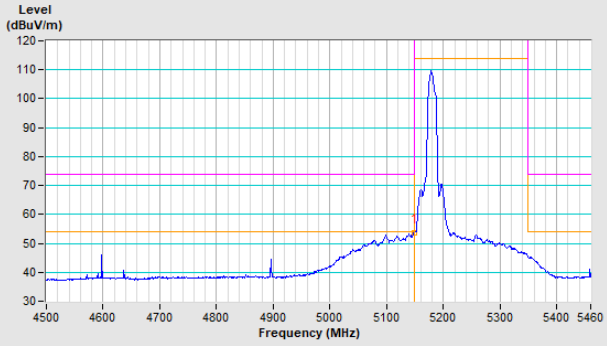
Horizontal (Average)



Vertical (Peak)

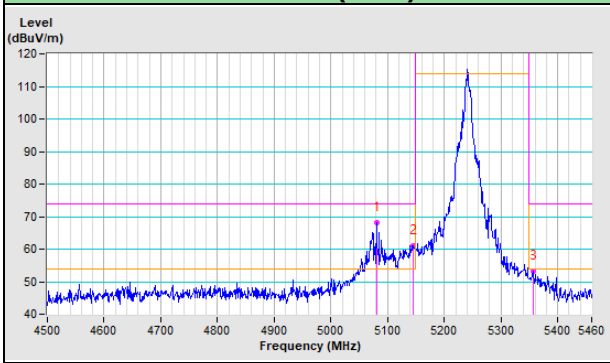


Vertical (Average)

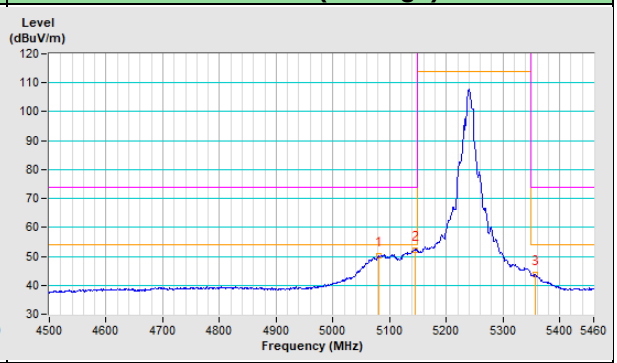


Channel 48

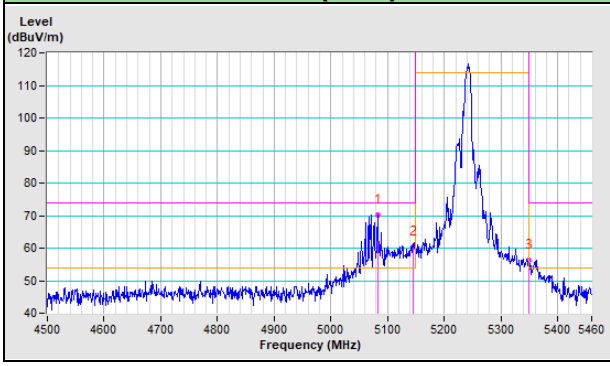
Horizontal (Peak)



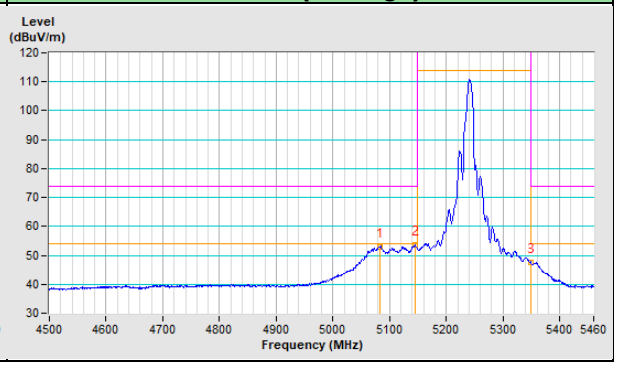
Horizontal (Average)



Vertical (Peak)



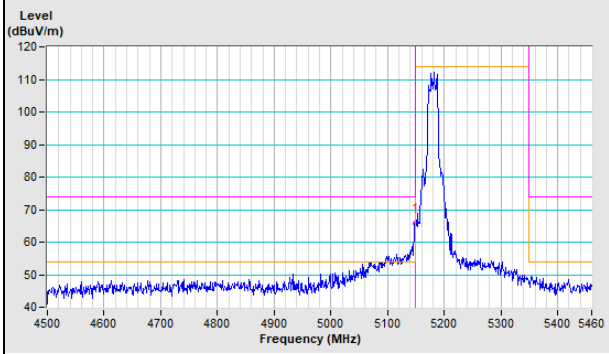
Vertical (Average)



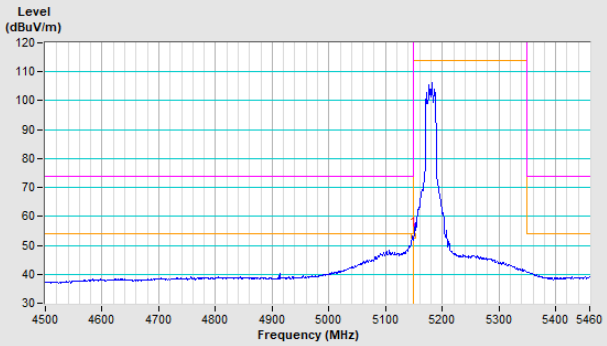
802.11ac (VHT20)

Channel 36

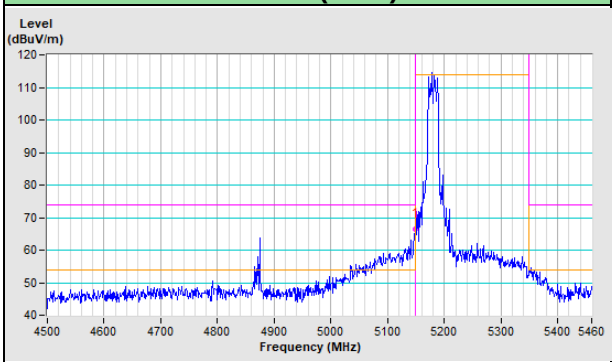
Horizontal (Peak)



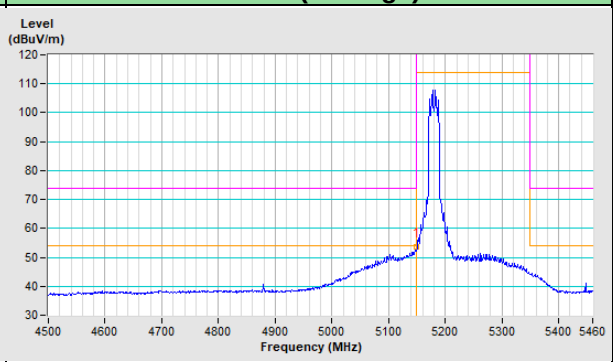
Horizontal (Average)



Vertical (Peak)

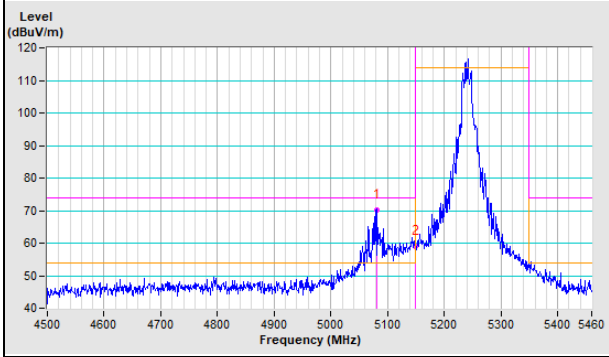


Vertical (Average)

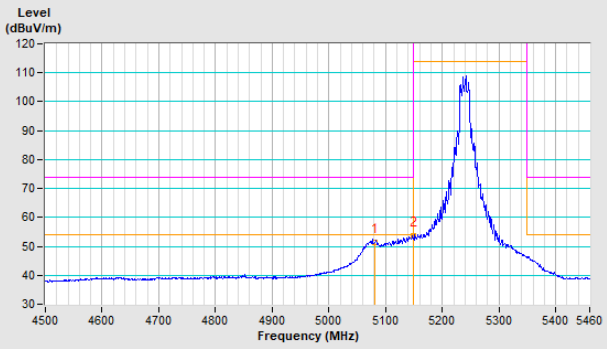


Channel 48

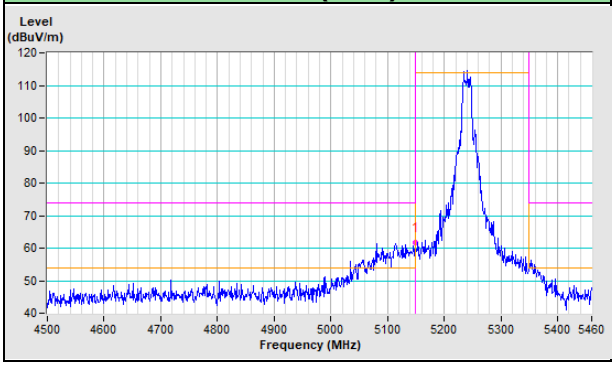
Horizontal (Peak)



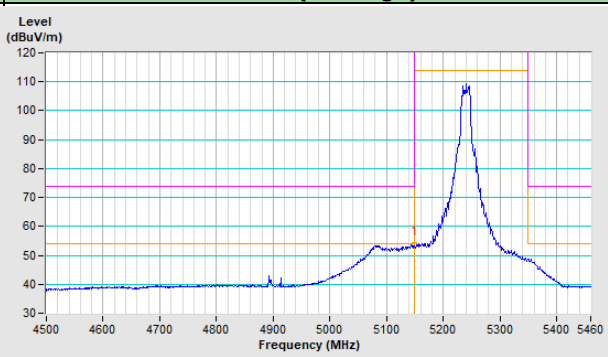
Horizontal (Average)



Vertical (Peak)



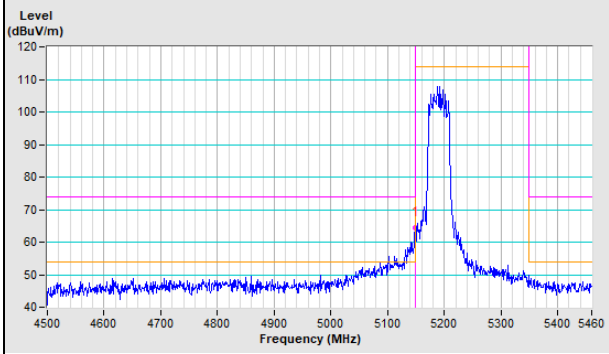
Vertical (Average)



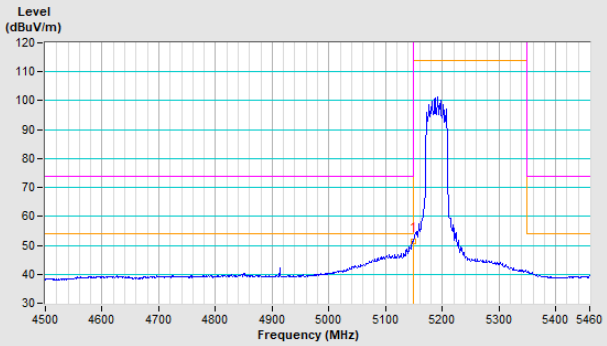
802.11ac (VHT40)

Channel 38

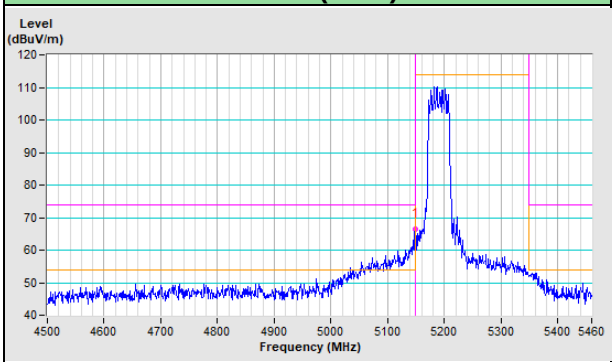
Horizontal (Peak)



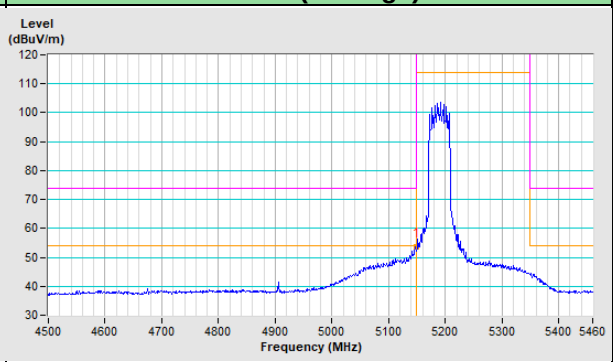
Horizontal (Average)



Vertical (Peak)

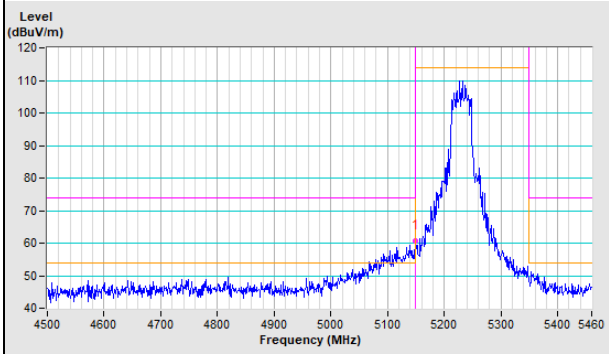


Vertical (Average)

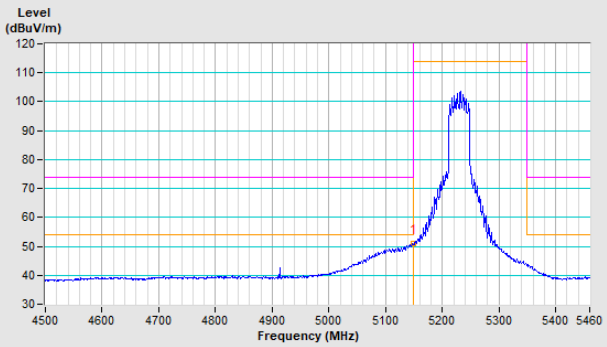


Channel 46

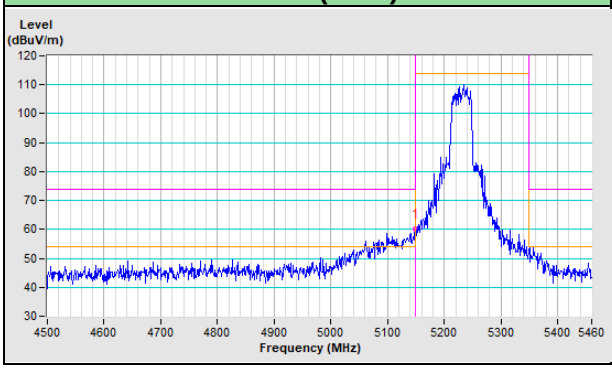
Horizontal (Peak)



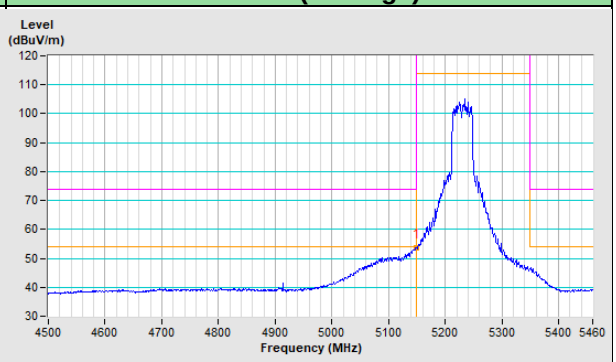
Horizontal (Average)



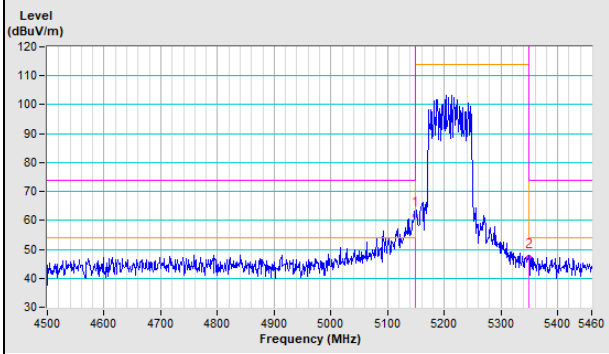
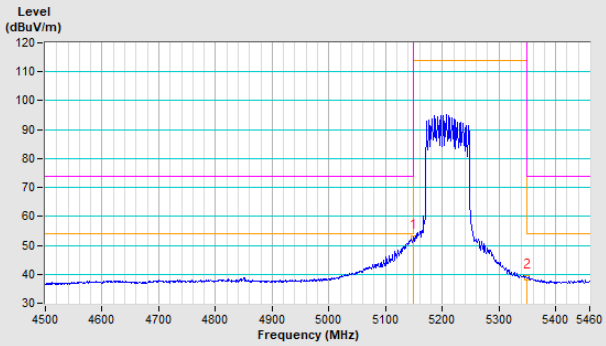
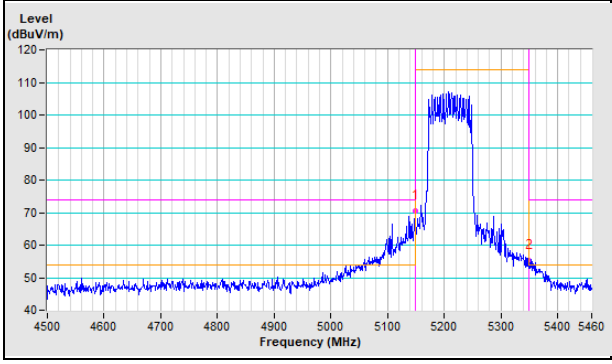
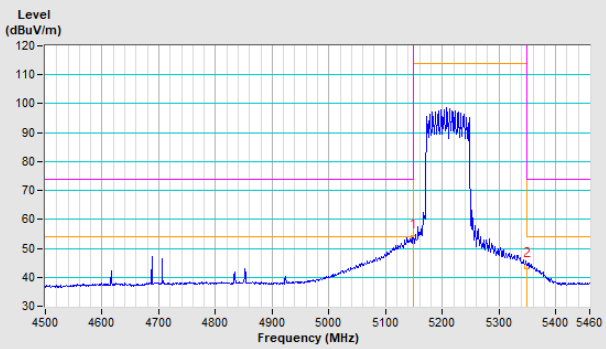
Vertical (Peak)



Vertical (Average)



802.11ac (VHT80)

Channel 42	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Appendix – Information of 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:

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

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

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

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

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

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