FCC Test Report (DFS Band)

Report No.:	RFBAOZ-WTW-P20070419A-1
FCC ID:	UIDWC4T
Test Model:	WC4T
Received Date:	July 08, 2020
Test Date:	July 23 to Sep. 21, 2020
Issued Date:	Oct. 08, 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-P20070419A-1	Original release.	Oct. 08, 2020

1 Certificate of Conformity

Product:	SURFboard Wi-Fi Router
Brand:	ARRIS
Test Model:	WC4T
Sample Status:	Engineering Sample
Applicant:	ARRIS
Test Date:	July 23 to Sep. 21, 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:** Oct. 08, 2020

Phoenix Huang / Specialist

Approved by : , **Date:** Oct. 08, 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 -13.28 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 5350.00MHz, 5725.00 MHz and 17100.00 MHz.
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(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-2A and U-NII-2C band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
2. 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 (DFS Band)

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	5.26 ~ 5.32 GHz, 5.50 ~ 5.70 GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 15 802.11n (HT40), 802.11ac (VHT40): 7 802.11ac (VHT80): 3
Output Power	**CDD Mode:** **5.26 ~ 5.32 GHz:** 233.577 mW **5.5 ~ 5.7 GHz:** 242.49 mW **Beamforming Mode:** **5.26 ~ 5.32 GHz:** 187.547 mW **5.5 ~ 5.7 GHz:** 155.446 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. This report is prepared for FCC class II change. The difference compared with the Report No.: RFBAOZ-WTW-P20070419-1 as the following:
   - ◆ Add DFS band <5250~5350 MHz & 5470~5725 MHz> by software.
2. According to above conditions, for DFS band all of test items need to be performed and all data was verified to meet the requirements.
3. The EUT has two radios as following table:

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

4. 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.			

5. 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

6. 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.			

7. 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.

8. 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, 80MHz), 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)

9. 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.

10. 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 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290 MHz

FOR 5500 ~ 5700MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 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	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320	54 to 62	54	OFDM	BPSK	13.5
802.11ac (VHT80)	5500-5700	106 to 122	122	OFDM	BPSK	29.3

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320	54 to 62	54	OFDM	BPSK	13.5
802.11ac (VHT80)	5500-5700	106 to 122	122	OFDM	BPSK	29.3

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	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	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)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	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, 65%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Kevin Ko

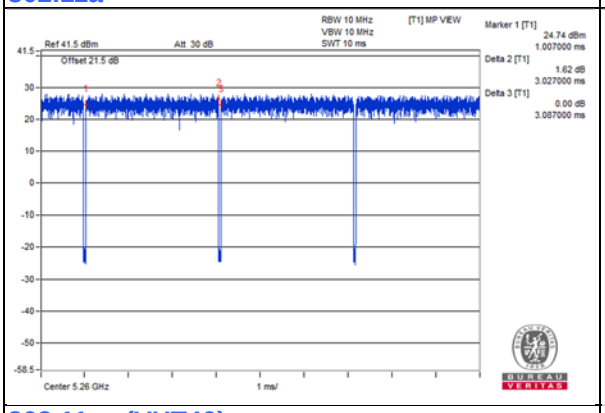
3.3 Duty Cycle of Test Signal

For Radio 1

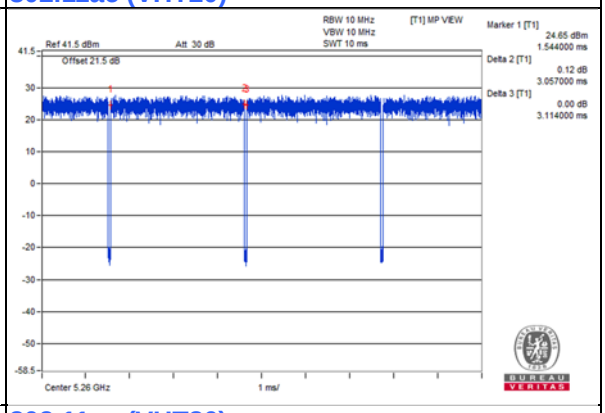
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

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

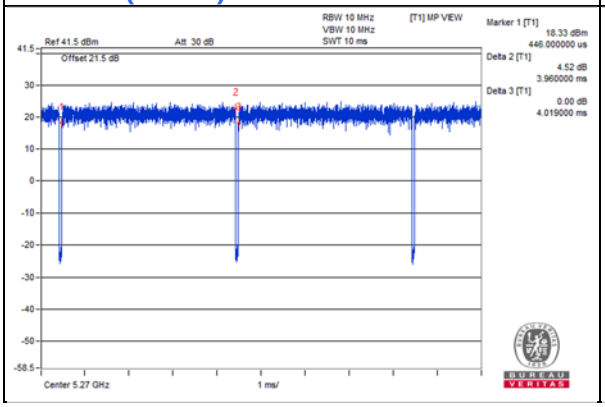
802.11a



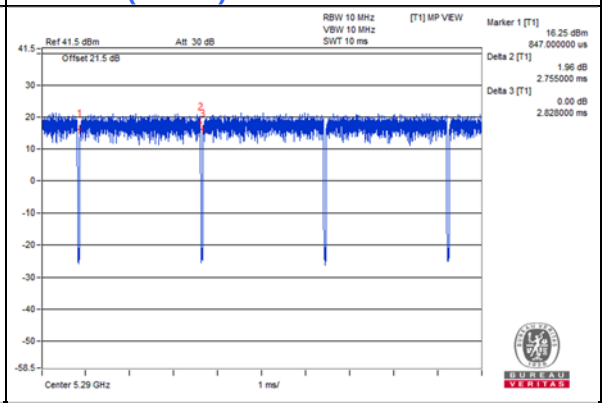
802.11ac (VHT20)



802.11ac (VHT40)



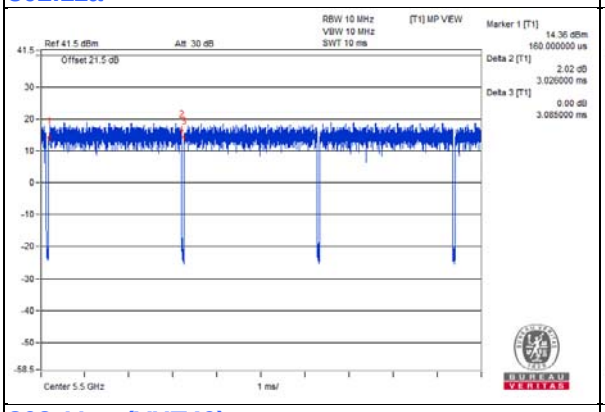
802.11ac (VHT80)



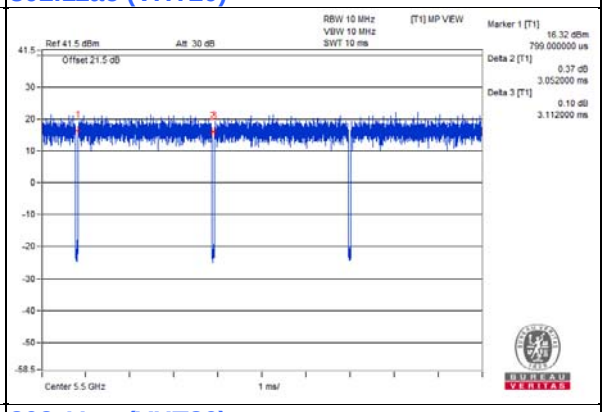
For Radio 2
Duty cycle of test signal is ≥ 98 %, duty factor is not required.

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

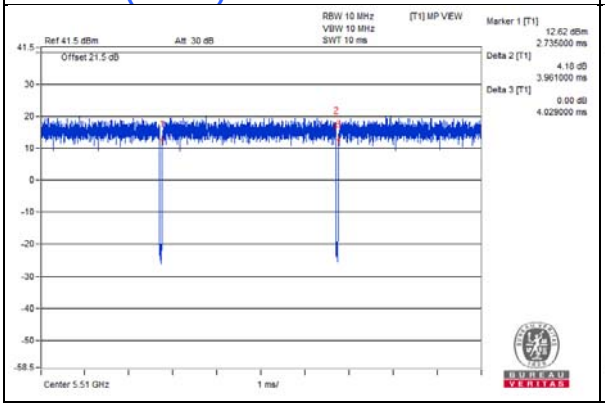
802.11a



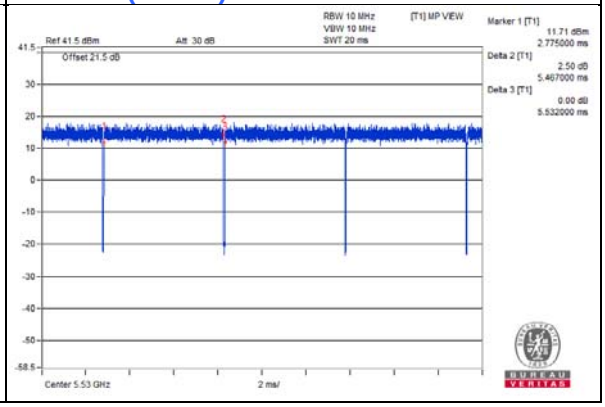
802.11ac (VHT20)



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.

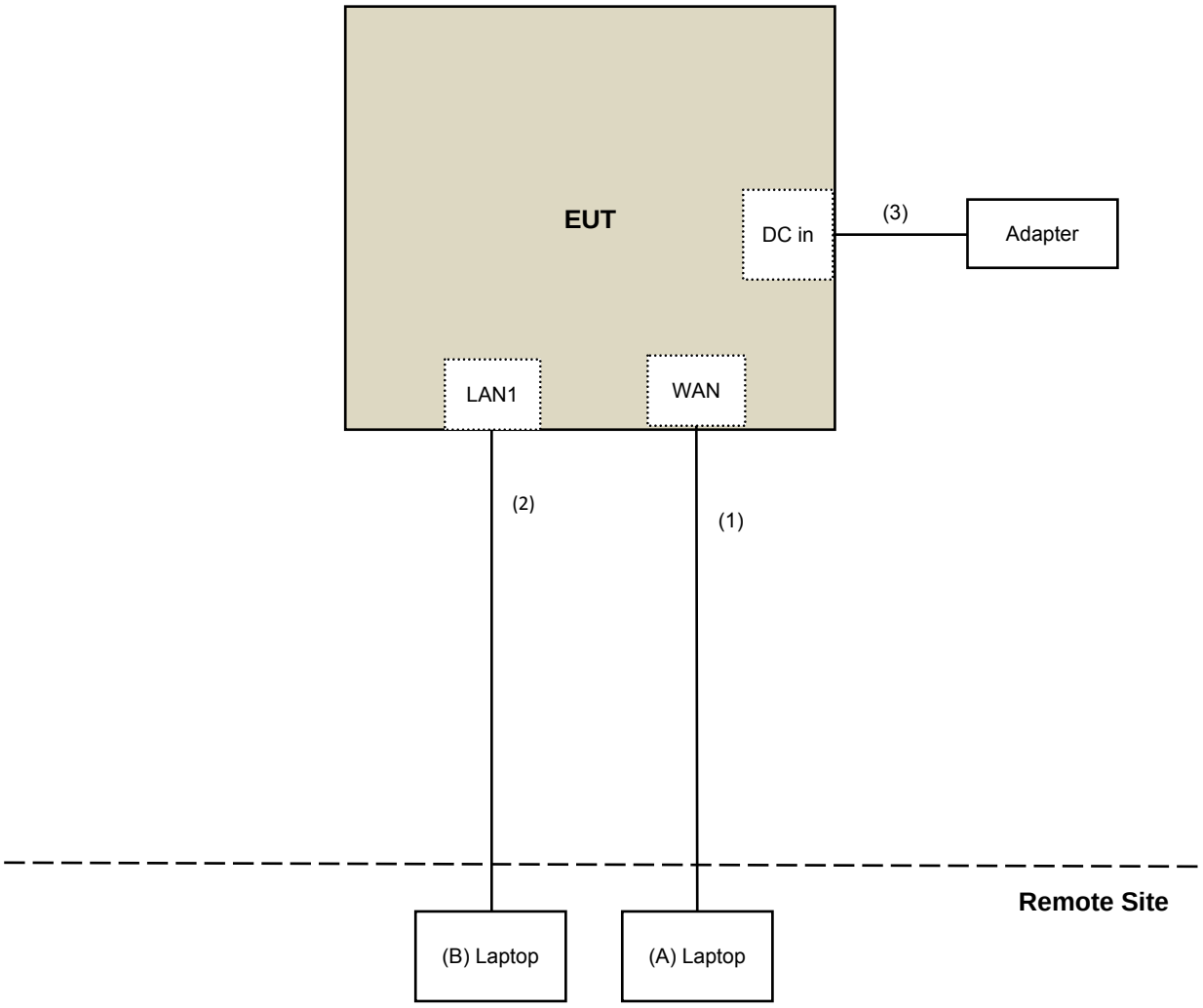
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

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 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 Sep. 21, 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:

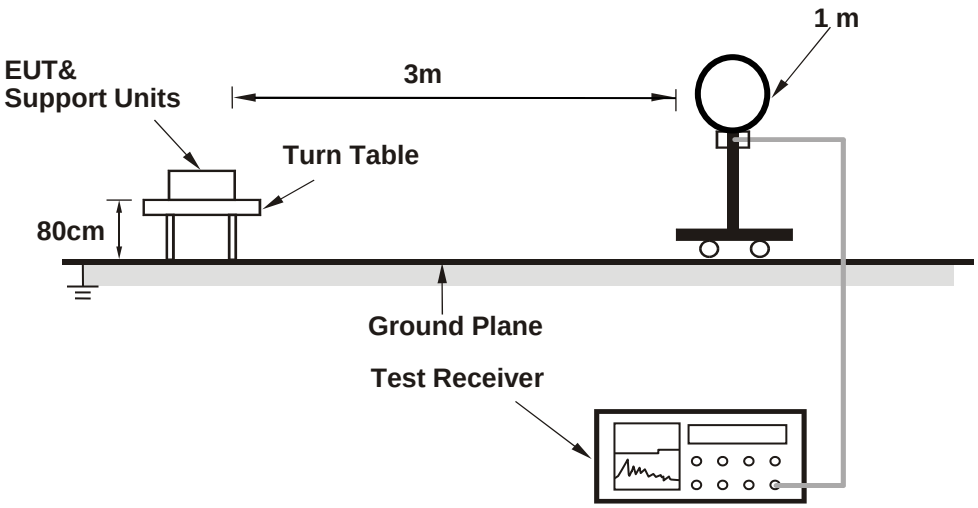
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

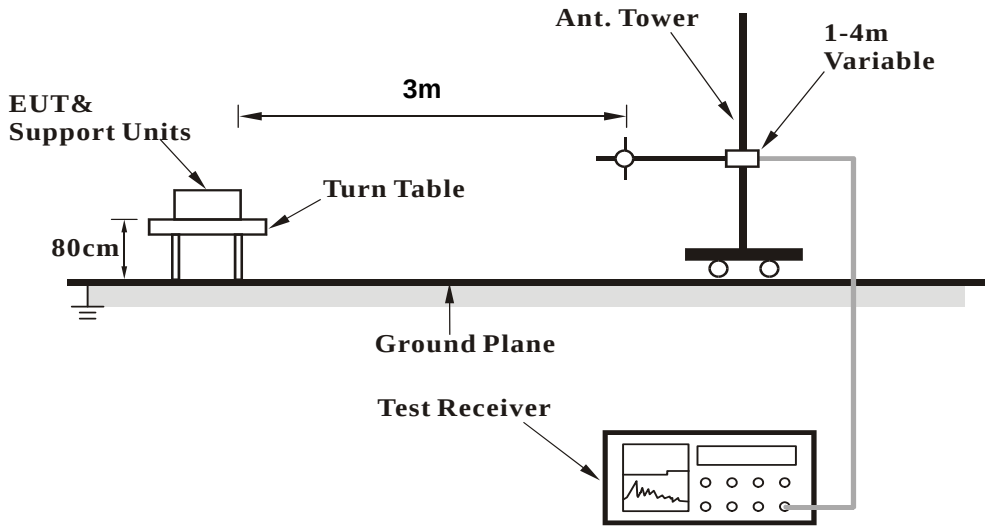
No deviation.

4.1.5 Test Setup

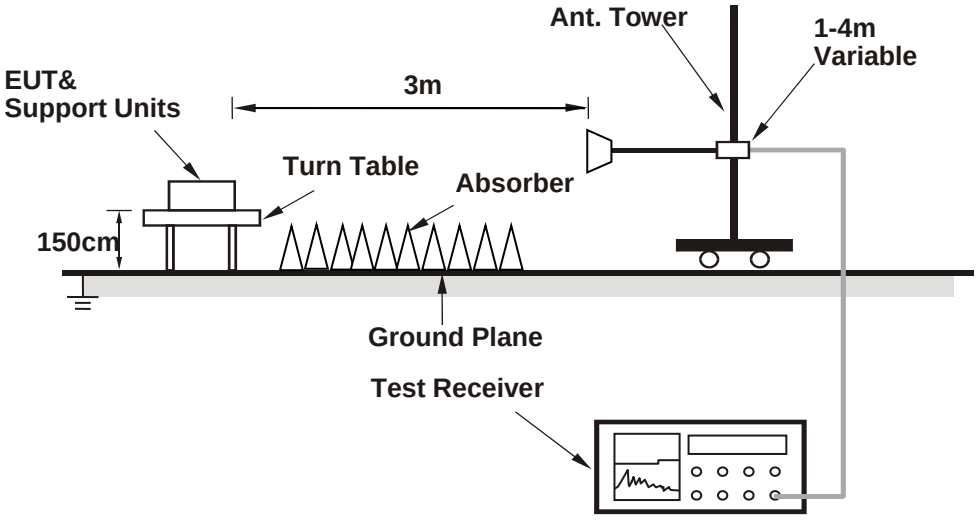
For Radiated emission below 30MHz



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

Above 1GHz Data

802.11a

Channel	TX Channel 52	**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	5064.12	53.7 PK	74.0	-20.3	2.23 H	344	50.2	3.5
2	5064.12	44.7 AV	54.0	-9.3	2.23 H	344	41.2	3.5
3	*5260.00	118.8 PK			2.23 H	344	115.4	3.4
4	*5260.00	107.9 AV			2.23 H	344	104.5	3.4
5	5350.00	51.2 PK	74.0	-22.8	2.23 H	344	47.8	3.4
6	5350.00	42.2 AV	54.0	-11.8	2.23 H	344	38.8	3.4
7	#10520.00	59.5 PK	68.2	-8.7	1.67 H	209	46.4	13.1
8	15780.00	56.7 PK	74.0	-17.3	1.45 H	290	43.2	13.5
9	15780.00	44.9 AV	54.0	-9.1	1.45 H	290	31.4	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	5060.23	54.2 PK	74.0	-19.8	1.00 V	323	50.7	3.5
2	5060.23	44.6 AV	54.0	-9.4	1.00 V	323	41.1	3.5
3	*5260.00	119.6 PK			1.00 V	323	116.2	3.4
4	*5260.00	109.8 AV			1.00 V	323	106.4	3.4
5	5350.00	53.2 PK	74.0	-20.8	1.00 V	323	49.8	3.4
6	5350.00	42.3 AV	54.0	-11.7	1.00 V	323	38.9	3.4
7	#10520.00	54.5 PK	68.2	-13.7	2.03 V	328	41.4	13.1
8	15780.00	61.7 PK	74.0	-12.3	3.30 V	322	48.2	13.5
9	15780.00	49.9 AV	54.0	-4.1	3.30 V	322	36.4	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 60	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	65.3 PK	74.0	-8.7	2.29 H	334	61.6	3.7
2	5150.00	51.1 AV	54.0	-2.9	2.29 H	334	47.4	3.7
3	*5300.00	118.5 PK			2.29 H	334	115.2	3.3
4	*5300.00	107.6 AV			2.29 H	334	104.3	3.3
5	5350.00	62.2 PK	74.0	-11.8	2.29 H	334	58.8	3.4
6	5350.00	51.0 AV	54.0	-3.0	2.29 H	334	47.6	3.4
7	10600.00	62.2 PK	74.0	-11.8	1.62 H	188	49.3	12.9
8	10600.00	50.8 AV	54.0	-3.2	1.62 H	188	37.9	12.9
9	15900.00	61.8 PK	74.0	-12.2	1.50 H	299	49.0	12.8
10	15900.00	50.2 AV	54.0	-3.8	1.50 H	299	37.4	12.8
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	62.0 PK	74.0	-12.0	1.52 V	13	58.3	3.7
2	5150.00	50.7 AV	54.0	-3.3	1.52 V	13	47.0	3.7
3	*5300.00	119.8 PK			1.52 V	13	116.5	3.3
4	*5300.00	109.6 AV			1.52 V	13	106.3	3.3
5	5350.00	63.4 PK	74.0	-10.6	1.52 V	13	60.0	3.4
6	5350.00	53.7 AV	54.0	-0.3	1.52 V	13	50.3	3.4
7	10600.00	57.2 PK	74.0	-16.8	1.97 V	349	44.3	12.9
8	10600.00	46.5 AV	54.0	-7.5	1.97 V	349	33.6	12.9
9	15900.00	65.7 PK	74.0	-8.3	3.39 V	344	52.9	12.8
10	15900.00	53.5 AV	54.0	-0.5	3.39 V	344	40.7	12.8

Remarks:

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

Channel	TX Channel 64	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	*5320.00	115.3 PK			2.34 H	320	111.9	3.4
2	*5320.00	105.1 AV			2.34 H	320	101.7	3.4
3	5356.32	59.9 PK	74.0	-14.1	2.34 H	320	56.5	3.4
4	5356.32	49.0 AV	54.0	-5.0	2.34 H	320	45.6	3.4
5	10640.00	59.3 PK	74.0	-14.7	1.73 H	188	46.4	12.9
6	10640.00	46.5 AV	54.0	-7.5	1.73 H	188	33.6	12.9
7	15960.00	56.9 PK	74.0	-17.1	1.46 H	274	44.1	12.8
8	15960.00	45.0 AV	54.0	-9.0	1.46 H	274	32.2	12.8
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	*5320.00	117.3 PK			1.57 V	13	113.9	3.4
2	*5320.00	107.4 AV			1.57 V	13	104.0	3.4
3	5350.00	65.6 PK	74.0	-8.4	1.57 V	13	62.2	3.4
4	5350.00	53.5 AV	54.0	-0.5	1.57 V	13	50.1	3.4
5	10640.00	53.7 PK	74.0	-20.3	2.09 V	335	40.8	12.9
6	10640.00	41.3 AV	54.0	-12.7	2.09 V	335	28.4	12.9
7	15960.00	62.0 PK	74.0	-12.0	3.38 V	315	49.2	12.8
8	15960.00	49.7 AV	54.0	-4.3	3.38 V	315	36.9	12.8

Remarks:

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

802.11ac (VHT20)

Channel	TX Channel 52	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	5050.63	53.7 PK	74.0	-20.3	2.27 H	337	50.2	3.5
2	5050.63	42.4 AV	54.0	-11.6	2.27 H	337	38.9	3.5
3	*5260.00	117.6 PK			2.27 H	337	114.2	3.4
4	*5260.00	106.5 AV			2.27 H	337	103.1	3.4
5	5447.45	53.2 PK	74.0	-20.8	2.27 H	337	49.5	3.7
6	5447.45	41.9 AV	54.0	-12.1	2.27 H	337	38.2	3.7
7	#10520.00	59.6 PK	68.2	-8.6	1.66 H	202	46.5	13.1
8	15780.00	56.8 PK	74.0	-17.2	1.47 H	292	43.3	13.5
9	15780.00	44.9 AV	54.0	-9.1	1.47 H	292	31.4	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	5071.68	53.3 PK	74.0	-20.7	2.36 V	335	49.7	3.6
2	5071.68	42.6 AV	54.0	-11.4	2.36 V	335	39.0	3.6
3	*5260.00	119.5 PK			2.36 V	335	116.1	3.4
4	*5260.00	109.5 AV			2.36 V	335	106.1	3.4
5	5450.00	54.6 PK	74.0	-19.4	2.36 V	335	50.9	3.7
6	5450.00	42.1 AV	54.0	-11.9	2.36 V	335	38.4	3.7
7	#10520.00	53.4 PK	68.2	-14.8	2.08 V	329	40.3	13.1
8	15780.00	61.6 PK	74.0	-12.4	3.31 V	319	48.1	13.5
9	15780.00	49.7 AV	54.0	-4.3	3.31 V	319	36.2	13.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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 60	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	*5300.00	116.1 PK			2.32 H	336	112.8	3.3
2	*5300.00	107.0 AV			2.32 H	336	103.7	3.3
3	5350.00	58.7 PK	74.0	-15.3	2.32 H	336	55.3	3.4
4	5350.00	50.2 AV	54.0	-3.8	2.32 H	336	46.8	3.4
5	10600.00	59.7 PK	74.0	-14.3	1.67 H	201	46.8	12.9
6	10600.00	46.9 AV	54.0	-7.1	1.67 H	201	34.0	12.9
7	15900.00	57.2 PK	74.0	-16.8	1.50 H	290	44.4	12.8
8	15900.00	45.3 AV	54.0	-8.7	1.50 H	290	32.5	12.8
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	*5300.00	119.2 PK			2.43 V	334	115.9	3.3
2	*5300.00	110.1 AV			2.43 V	334	106.8	3.3
3	5350.00	63.3 PK	74.0	-10.7	2.43 V	334	59.9	3.4
4	5350.00	52.6 AV	54.0	-1.4	2.43 V	334	49.2	3.4
5	10600.00	54.1 PK	74.0	-19.9	2.03 V	344	41.2	12.9
6	10600.00	41.6 AV	54.0	-12.4	2.03 V	344	28.7	12.9
7	15900.00	61.5 PK	74.0	-12.5	3.35 V	330	48.7	12.8
8	15900.00	49.5 AV	54.0	-4.5	3.35 V	330	36.7	12.8

Remarks:

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

Channel	TX Channel 64	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	*5320.00	116.3 PK			2.29 H	348	112.9	3.4
2	*5320.00	106.1 AV			2.29 H	348	102.7	3.4
3	5350.00	65.7 PK	74.0	-8.3	2.29 H	348	62.3	3.4
4	5350.00	53.3 AV	54.0	-0.7	2.29 H	348	49.9	3.4
5	10640.00	59.3 PK	74.0	-14.7	1.71 H	198	46.4	12.9
6	10640.00	46.5 AV	54.0	-7.5	1.71 H	198	33.6	12.9
7	15960.00	56.9 PK	74.0	-17.1	1.54 H	294	44.1	12.8
8	15960.00	45.3 AV	54.0	-8.7	1.54 H	294	32.5	12.8
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	*5320.00	118.1 PK			2.32 V	336	114.7	3.4
2	*5320.00	108.6 AV			2.32 V	336	105.2	3.4
3	5350.00	66.4 PK	74.0	-7.6	2.32 V	336	63.0	3.4
4	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**2.32 V**	**336**	**50.5**	**3.4**
5	10640.00	54.7 PK	74.0	-19.3	2.04 V	333	41.8	12.9
6	10640.00	42.0 AV	54.0	-12.0	2.04 V	333	29.1	12.9
7	15960.00	61.6 PK	74.0	-12.4	3.41 V	335	48.8	12.8
8	15960.00	49.8 AV	54.0	-4.2	3.41 V	335	37.0	12.8

Remarks:

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

802.11ac (VHT40)

Channel	TX Channel 54	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	55.8 PK	74.0	-18.2	2.25 H	338	52.1	3.7
2	5150.00	44.0 AV	54.0	-10.0	2.25 H	338	40.3	3.7
3	*5270.00	113.8 PK			2.25 H	338	110.4	3.4
4	*5270.00	103.1 AV			2.25 H	338	99.7	3.4
5	5350.00	64.3 PK	74.0	-9.7	2.25 H	338	60.9	3.4
6	5350.00	50.2 AV	54.0	-3.8	2.25 H	338	46.8	3.4
7	#10540.00	54.4 PK	68.2	-13.8	1.66 H	190	41.4	13.0
8	15810.00	53.6 PK	74.0	-20.4	1.52 H	279	40.4	13.2
9	15810.00	40.5 AV	54.0	-13.5	1.52 H	279	27.3	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	58.8 PK	74.0	-15.2	2.27 V	334	55.1	3.7
2	5150.00	46.9 AV	54.0	-7.1	2.27 V	334	43.2	3.7
3	*5270.00	117.0 PK			2.27 V	334	113.6	3.4
4	*5270.00	106.4 AV			2.27 V	334	103.0	3.4
5	5350.00	66.2 PK	74.0	-7.8	2.27 V	334	62.8	3.4
6	5350.00	51.3 AV	54.0	-2.7	2.27 V	334	47.9	3.4
7	#10540.00	53.5 PK	68.2	-14.7	1.98 V	345	40.5	13.0
8	15810.00	56.4 PK	74.0	-17.6	3.43 V	337	43.2	13.2
9	15810.00	44.5 AV	54.0	-9.5	3.43 V	337	31.3	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 62	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	*5310.00	111.2 PK			2.25 H	324	107.9	3.3
2	*5310.00	100.1 AV			2.25 H	324	96.8	3.3
3	5350.00	65.2 PK	74.0	-8.8	2.25 H	324	61.8	3.4
4	5350.00	51.2 AV	54.0	-2.8	2.25 H	324	47.8	3.4
5	10620.00	54.7 PK	74.0	-19.3	1.66 H	192	41.8	12.9
6	10620.00	41.7 AV	54.0	-12.3	1.66 H	192	28.8	12.9
7	15930.00	53.4 PK	74.0	-20.6	1.56 H	288	40.6	12.8
8	15930.00	40.4 AV	54.0	-13.6	1.56 H	288	27.6	12.8
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	*5310.00	113.3 PK			2.36 V	331	110.0	3.3
2	*5310.00	102.9 AV			2.36 V	331	99.6	3.3
3	5350.00	66.9 PK	74.0	-7.1	2.36 V	331	63.5	3.4
4	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**2.36 V**	**331**	**50.5**	**3.4**
5	10620.00	53.5 PK	74.0	-20.5	2.00 V	335	40.6	12.9
6	10620.00	40.0 AV	54.0	-14.0	2.00 V	335	27.1	12.9
7	15930.00	55.9 PK	74.0	-18.1	3.37 V	342	43.1	12.8
8	15930.00	44.1 AV	54.0	-9.9	3.37 V	342	31.3	12.8

Remarks:

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

802.11ac (VHT80)

Channel	TX Channel 58	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	*5290.00	106.9 PK			2.28 H	331	103.6	3.3
2	*5290.00	97.1 AV			2.28 H	331	93.8	3.3
3	5350.00	63.7 PK	74.0	-10.3	2.28 H	331	60.3	3.4
4	5350.00	50.9 AV	54.0	-3.1	2.28 H	331	47.5	3.4
5	#10580.00	54.2 PK	68.2	-14.0	1.66 H	192	41.3	12.9
6	15870.00	53.4 PK	74.0	-20.6	1.51 H	285	40.5	12.9
7	15870.00	40.2 AV	54.0	-13.8	1.51 H	285	27.3	12.9
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	58.3 PK	74.0	-15.7	2.39 V	335	54.6	3.7
2	5150.00	46.9 AV	54.0	-7.1	2.39 V	335	43.2	3.7
3	*5290.00	108.4 PK			2.39 V	335	105.1	3.3
4	*5290.00	98.9 AV			2.39 V	335	95.6	3.3
5	5350.00	65.9 PK	74.0	-8.1	2.39 V	335	62.5	3.4
6	5350.00	53.6 AV	54.0	-0.4	2.39 V	335	50.2	3.4
7	#10580.00	53.5 PK	68.2	-14.7	1.92 V	335	40.6	12.9
8	15870.00	56.7 PK	74.0	-17.3	3.39 V	342	43.8	12.9
9	15870.00	44.9 AV	54.0	-9.1	3.39 V	342	32.0	12.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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:

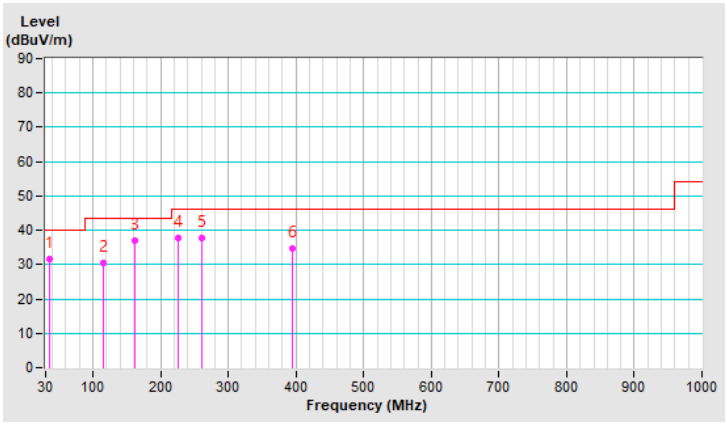
802.11ac (VHT40)

Channel	TX Channel 54	**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	35.99	31.7 QP	40.0	-8.3	1.00 H	94	40.4	-8.7
2	115.36	30.4 QP	43.5	-13.1	1.50 H	312	39.9	-9.5
3	161.41	36.8 QP	43.5	-6.7	2.00 H	284	43.7	-6.9
4	225.62	37.6 QP	46.0	-8.4	1.50 H	223	47.2	-9.6
5	260.52	37.8 QP	46.0	-8.2	1.00 H	72	45.5	-7.7
6	394.94	34.7 QP	46.0	-11.3	1.00 H	138	37.8	-3.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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.

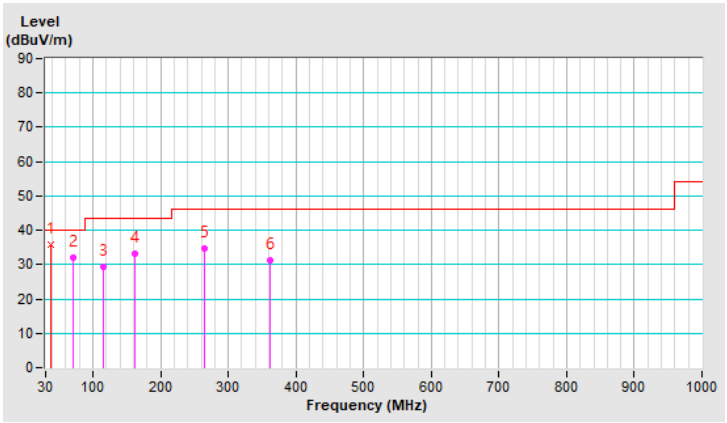


Channel	TX Channel 54	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

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	37.91	35.9 QP	40.0	-4.1	1.00 V	200	44.2	-8.3
2	71.08	32.0 QP	40.0	-8.0	1.00 V	0	42.2	-10.2
3	114.66	29.5 QP	43.5	-14.0	1.00 V	280	39.1	-9.6
4	162.55	33.1 QP	43.5	-10.4	1.00 V	85	40.0	-6.9
5	264.09	34.7 QP	46.0	-11.3	1.00 V	251	42.0	-7.3
6	360.77	31.4 QP	46.0	-14.6	1.50 V	358	35.3	-3.9

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 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

802.11a

Channel	TX Channel 100	**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	5460.00	54.5 PK	74.0	-19.5	1.63 H	48	50.7	3.8
2	5460.00	41.7 AV	54.0	-12.3	1.63 H	48	37.9	3.8
3	#5468.60	55.9 PK	68.2	-12.3	1.63 H	48	52.0	3.9
4	*5500.00	110.7 PK			1.63 H	48	106.8	3.9
5	*5500.00	101.3 AV			1.63 H	48	97.4	3.9
6	11000.00	58.0 PK	74.0	-16.0	1.66 H	249	45.0	13.0
7	11000.00	46.8 AV	54.0	-7.2	1.66 H	249	33.8	13.0
8	#16500.00	67.9 PK	68.2	-0.3	1.46 H	200	53.3	14.6
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	5460.00	62.6 PK	74.0	-11.4	1.50 V	62	58.8	3.8
2	5460.00	50.9 AV	54.0	-3.1	1.50 V	62	47.1	3.8
3	#5469.96	67.7 PK	68.2	-0.5	1.50 V	62	63.8	3.9
4	*5500.00	120.1 PK			1.50 V	62	116.2	3.9
5	*5500.00	110.6 AV			1.50 V	62	106.7	3.9
6	11000.00	46.9 PK	74.0	-27.1	1.48 V	322	33.9	13.0
7	11000.00	35.6 AV	54.0	-18.4	1.48 V	322	22.6	13.0
8	#16500.00	57.3 PK	68.2	-10.9	1.49 V	176	42.7	14.6

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 116	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	5460.00	61.3 PK	74.0	-12.7	1.58 H	37	57.5	3.8
2	5460.00	50.2 AV	54.0	-3.8	1.58 H	37	46.4	3.8
3	#5470.00	65.3 PK	68.2	-2.9	1.58 H	37	61.4	3.9
4	*5580.00	113.6 PK			1.58 H	37	109.8	3.8
5	*5580.00	104.7 AV			1.58 H	37	100.9	3.8
6	11160.00	58.7 PK	74.0	-15.3	1.69 H	257	45.6	13.1
7	11160.00	47.2 AV	54.0	-6.8	1.69 H	257	34.1	13.1
8	#16740.00	67.7 PK	68.2	-0.5	1.50 H	216	51.5	16.2
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	5460.00	64.2 PK	74.0	-9.8	1.55 V	125	60.4	3.8
2	5460.00	53.7 AV	54.0	-0.3	1.55 V	125	49.9	3.8
3	#5470.00	68.0 PK	68.2	-0.2	1.55 V	125	64.1	3.9
4	*5580.00	121.4 PK			1.55 V	125	117.6	3.8
5	*5580.00	113.0 AV			1.55 V	125	109.2	3.8
6	11160.00	50.3 PK	74.0	-23.7	1.50 V	313	37.2	13.1
7	11160.00	39.9 AV	54.0	-14.1	1.50 V	313	26.8	13.1
8	#16740.00	64.6 PK	68.2	-3.6	1.54 V	189	48.4	16.2

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 140	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	*5700.00	110.3 PK			1.56 H	24	106.3	4.0
2	*5700.00	101.1 AV			1.56 H	24	97.1	4.0
3	#5725.00	63.5 PK	68.2	-4.7	1.56 H	24	59.5	4.0
4	11400.00	58.1 PK	74.0	-15.9	1.65 H	249	44.9	13.2
5	11400.00	46.9 AV	54.0	-7.1	1.65 H	249	33.7	13.2
6	**#17100.00**	**68.1 PK**	**68.2**	**-0.1**	**1.50 H**	**216**	**50.9**	**17.2**
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	*5700.00	120.2 PK			1.55 V	71	116.2	4.0
2	*5700.00	110.7 AV			1.55 V	71	106.7	4.0
3	#5725.00	68.0 PK	68.2	-0.2	1.55 V	71	64.0	4.0
4	11400.00	47.0 PK	74.0	-27.0	1.49 V	317	33.8	13.2
5	11400.00	35.5 AV	54.0	-18.5	1.49 V	317	22.3	13.2
6	#17100.00	57.3 PK	68.2	-10.9	1.50 V	183	40.1	17.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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 100	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	5460.00	61.3 PK	74.0	-12.7	1.72 H	33	57.5	3.8
2	5460.00	49.7 AV	54.0	-4.3	1.72 H	33	45.9	3.8
3	#5469.18	65.7 PK	68.2	-2.5	1.72 H	33	61.8	3.9
4	*5500.00	117.4 PK			1.72 H	33	113.5	3.9
5	*5500.00	102.3 AV			1.72 H	33	98.4	3.9
6	11000.00	55.6 PK	74.0	-18.4	1.69 H	241	42.6	13.0
7	11000.00	44.8 AV	54.0	-9.2	1.69 H	241	31.8	13.0
8	#16500.00	63.7 PK	68.2	-4.5	1.50 H	223	49.1	14.6
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	5460.00	60.5 PK	74.0	-13.5	1.43 V	116	56.7	3.8
2	5460.00	51.0 AV	54.0	-3.0	1.43 V	116	47.2	3.8
3	#5470.00	67.9 PK	68.2	-0.3	1.43 V	116	64.0	3.9
4	*5500.00	119.2 PK			1.43 V	116	115.3	3.9
5	*5500.00	110.3 AV			1.43 V	116	106.4	3.9
6	11000.00	46.6 PK	74.0	-27.4	1.47 V	313	33.6	13.0
7	11000.00	35.1 AV	54.0	-18.9	1.47 V	313	22.1	13.0
8	#16500.00	57.6 PK	68.2	-10.6	1.45 V	175	43.0	14.6

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 116	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	5460.00	61.7 PK	74.0	-12.3	1.68 H	20	57.9	3.8
2	5460.00	50.0 AV	54.0	-4.0	1.68 H	20	46.2	3.8
3	#5470.00	65.8 PK	68.2	-2.4	1.68 H	20	61.9	3.9
4	*5580.00	117.3 PK			1.68 H	20	113.5	3.8
5	*5580.00	102.1 AV			1.68 H	20	98.3	3.8
6	11160.00	55.9 PK	74.0	-18.1	1.73 H	246	42.8	13.1
7	11160.00	45.0 AV	54.0	-9.0	1.73 H	246	31.9	13.1
8	#16740.00	63.7 PK	68.2	-4.5	1.54 H	236	47.5	16.2
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	5460.00	65.2 PK	74.0	-8.8	1.42 V	115	61.4	3.8
2	5460.00	53.8 AV	54.0	-0.2	1.42 V	115	50.0	3.8
3	#5470.00	67.7 PK	68.2	-0.5	1.42 V	115	63.8	3.9
4	*5580.00	120.9 PK			1.42 V	115	117.1	3.8
5	*5580.00	112.2 AV			1.42 V	115	108.4	3.8
6	11160.00	46.6 PK	74.0	-27.4	1.47 V	303	33.5	13.1
7	11160.00	35.3 AV	54.0	-18.7	1.47 V	303	22.2	13.1
8	#16740.00	56.9 PK	68.2	-11.3	1.49 V	175	40.7	16.2

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 140	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	*5700.00	117.4 PK			1.71 H	19	113.4	4.0
2	*5700.00	102.1 AV			1.71 H	19	98.1	4.0
3	#5725.00	65.2 PK	68.2	-3.0	1.71 H	19	61.2	4.0
4	11400.00	55.9 PK	74.0	-18.1	1.65 H	253	42.7	13.2
5	11400.00	44.8 AV	54.0	-9.2	1.65 H	253	31.6	13.2
6	#17100.00	63.9 PK	68.2	-4.3	1.48 H	214	46.7	17.2
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	*5700.00	119.2 PK			1.41 V	118	115.2	4.0
2	*5700.00	110.1 AV			1.41 V	118	106.1	4.0
3	#5725.00	67.9 PK	68.2	-0.3	1.41 V	118	63.9	4.0
4	11400.00	47.2 PK	74.0	-26.8	1.45 V	316	34.0	13.2
5	11400.00	35.5 AV	54.0	-18.5	1.45 V	316	22.3	13.2
6	#17100.00	57.5 PK	68.2	-10.7	1.50 V	182	40.3	17.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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 102	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	5460.00	60.1 PK	74.0	-13.9	1.63 H	42	56.3	3.8
2	5460.00	47.9 AV	54.0	-6.1	1.63 H	42	44.1	3.8
3	#5468.51	65.5 PK	68.2	-2.7	1.63 H	42	61.6	3.9
4	*5510.00	106.7 PK			1.63 H	42	102.8	3.9
5	*5510.00	96.3 AV			1.63 H	42	92.4	3.9
6	11020.00	55.2 PK	74.0	-18.8	1.64 H	231	42.2	13.0
7	11020.00	44.4 AV	54.0	-9.6	1.64 H	231	31.4	13.0
8	#16530.00	63.7 PK	68.2	-4.5	1.51 H	227	49.0	14.7
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	5460.00	62.0 PK	74.0	-12.0	1.75 V	71	58.2	3.8
2	5460.00	50.8 AV	54.0	-3.2	1.75 V	71	47.0	3.8
3	#5470.00	67.9 PK	68.2	-0.3	1.75 V	71	64.0	3.9
4	*5510.00	114.9 PK			1.75 V	71	111.0	3.9
5	*5510.00	104.9 AV			1.75 V	71	101.0	3.9
6	11020.00	47.3 PK	74.0	-26.7	1.52 V	330	34.3	13.0
7	11020.00	35.6 AV	54.0	-18.4	1.52 V	330	22.6	13.0
8	#16530.00	57.0 PK	68.2	-11.2	1.54 V	171	42.3	14.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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 110	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	5460.00	59.3 PK	74.0	-14.7	1.63 H	33	55.5	3.8
2	5460.00	50.2 AV	54.0	-3.8	1.63 H	33	46.4	3.8
3	#5470.00	62.3 PK	68.2	-5.9	1.63 H	33	58.4	3.9
4	*5550.00	109.2 PK			1.63 H	33	105.4	3.8
5	*5550.00	98.5 AV			1.63 H	33	94.7	3.8
6	11100.00	55.9 PK	74.0	-18.1	1.65 H	236	42.9	13.0
7	11100.00	44.9 AV	54.0	-9.1	1.65 H	236	31.9	13.0
8	#16650.00	63.9 PK	68.2	-4.3	1.46 H	225	48.2	15.7
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	5460.00	63.8 PK	74.0	-10.2	1.57 V	116	60.0	3.8
2	5460.00	53.6 AV	54.0	-0.4	1.57 V	116	49.8	3.8
3	#5470.00	65.6 PK	68.2	-2.6	1.57 V	116	61.7	3.9
4	*5550.00	117.8 PK			1.57 V	116	114.0	3.8
5	*5550.00	108.4 AV			1.57 V	116	104.6	3.8
6	11100.00	46.8 PK	74.0	-27.2	1.53 V	306	33.8	13.0
7	11100.00	35.6 AV	54.0	-18.4	1.53 V	306	22.6	13.0
8	#16650.00	57.7 PK	68.2	-10.5	1.46 V	175	42.0	15.7

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.

Channel	TX Channel 134	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	*5670.00	106.5 PK			1.69 H	36	102.5	4.0
2	*5670.00	96.0 AV			1.69 H	36	92.0	4.0
3	#5725.00	64.7 PK	68.2	-3.5	1.69 H	36	60.7	4.0
4	11340.00	56.2 PK	74.0	-17.8	1.65 H	256	43.0	13.2
5	11340.00	45.3 AV	54.0	-8.7	1.65 H	256	32.1	13.2
6	#17010.00	63.8 PK	68.2	-4.4	1.51 H	234	46.8	17.0
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	*5670.00	115.8 PK			1.64 V	283	111.8	4.0
2	*5670.00	106.0 AV			1.64 V	283	102.0	4.0
3	**#5725.00**	**68.1 PK**	**68.2**	**-0.1**	**1.64 V**	**283**	**64.1**	**4.0**
4	11340.00	47.0 PK	74.0	-27.0	1.48 V	328	33.8	13.2
5	11340.00	35.6 AV	54.0	-18.4	1.48 V	328	22.4	13.2
6	#17010.00	57.4 PK	68.2	-10.8	1.52 V	189	40.4	17.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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 106	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	5457.26	60.1 PK	74.0	-13.9	1.83 H	41	56.3	3.8
2	5457.26	49.0 AV	54.0	-5.0	1.83 H	41	45.2	3.8
3	#5464.15	65.5 PK	68.2	-2.7	1.83 H	41	61.7	3.8
4	*5530.00	101.5 PK			1.83 H	41	97.7	3.8
5	*5530.00	92.3 AV			1.83 H	41	88.5	3.8
6	11060.00	55.6 PK	74.0	-18.4	1.68 H	227	42.7	12.9
7	11060.00	44.5 AV	54.0	-9.5	1.68 H	227	31.6	12.9
8	#16590.00	63.9 PK	68.2	-4.3	1.55 H	231	49.0	14.9
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	5457.26	66.7 PK	74.0	-7.3	1.39 V	114	62.9	3.8
2	5457.26	53.4 AV	54.0	-0.6	1.39 V	114	49.6	3.8
3	#5464.15	67.9 PK	68.2	-0.3	1.39 V	114	64.1	3.8
4	*5530.00	107.4 PK			1.39 V	114	103.6	3.8
5	*5530.00	98.9 AV			1.39 V	114	95.1	3.8
6	11060.00	46.7 PK	74.0	-27.3	1.46 V	302	33.8	12.9
7	11060.00	35.1 AV	54.0	-18.9	1.46 V	302	22.2	12.9
8	#16590.00	57.3 PK	68.2	-10.9	1.47 V	193	42.4	14.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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 122	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	*5610.00	107.3 PK			1.77 H	32	103.6	3.7
2	*5610.00	98.9 AV			1.77 H	32	95.2	3.7
3	#5725.00	64.3 PK	68.2	-3.9	1.77 H	32	60.3	4.0
4	11220.00	55.4 PK	74.0	-18.6	1.75 H	245	42.2	13.2
5	11220.00	44.9 AV	54.0	-9.1	1.75 H	245	31.7	13.2
6	#16830.00	64.4 PK	68.2	-3.8	1.54 H	223	48.3	16.1
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	*5610.00	113.5 PK			1.46 V	116	109.8	3.7
2	*5610.00	105.1 AV			1.46 V	116	101.4	3.7
3	#5725.00	67.7 PK	68.2	-0.5	1.46 V	116	63.7	4.0
4	11220.00	46.9 PK	74.0	-27.1	1.47 V	333	33.7	13.2
5	11220.00	35.2 AV	54.0	-18.8	1.47 V	333	22.0	13.2
6	#16830.00	57.5 PK	68.2	-10.7	1.50 V	185	41.4	16.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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:

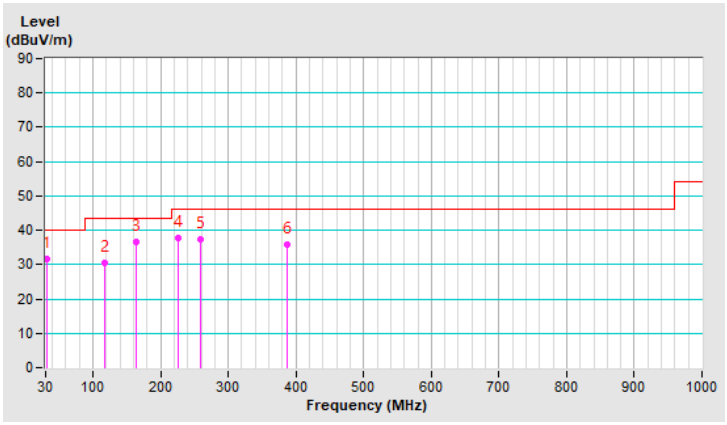
802.11ac (VHT80)

Channel	TX Channel 122	**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	31.84	31.5 QP	40.0	-8.5	1.00 H	108	40.3	-8.8
2	116.62	30.4 QP	43.5	-13.1	1.50 H	272	39.8	-9.4
3	163.88	36.5 QP	43.5	-7.0	1.50 H	265	43.6	-7.1
4	226.47	37.7 QP	46.0	-8.3	2.00 H	118	47.2	-9.5
5	259.72	37.5 QP	46.0	-8.5	1.00 H	76	45.2	-7.7
6	386.89	35.7 QP	46.0	-10.3	1.00 H	247	39.0	-3.3

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.

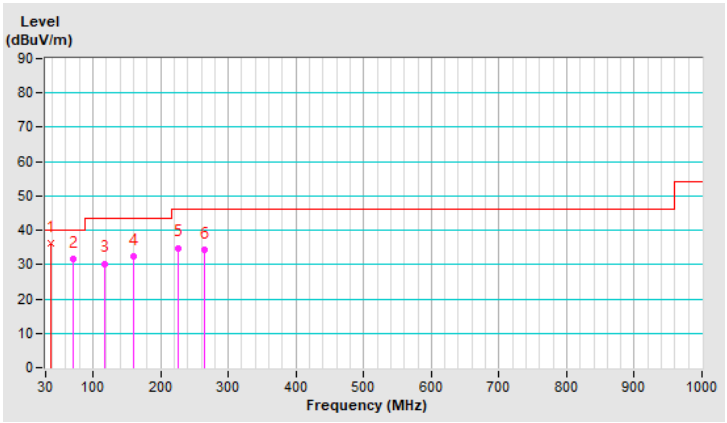


Channel	TX Channel 122	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

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	37.50	36.2 QP	40.0	-3.8	1.00 V	170	44.5	-8.3
2	70.91	31.7 QP	40.0	-8.3	2.00 V	360	41.8	-10.1
3	117.47	30.3 QP	43.5	-13.2	1.00 V	290	39.6	-9.3
4	160.93	32.4 QP	43.5	-11.1	1.00 V	278	39.4	-7.0
5	226.13	34.9 QP	46.0	-11.1	1.00 V	360	44.4	-9.5
6	264.18	34.4 QP	46.0	-11.6	1.00 V	239	41.7	-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 23, 2020

4.2.3 Test Procedure

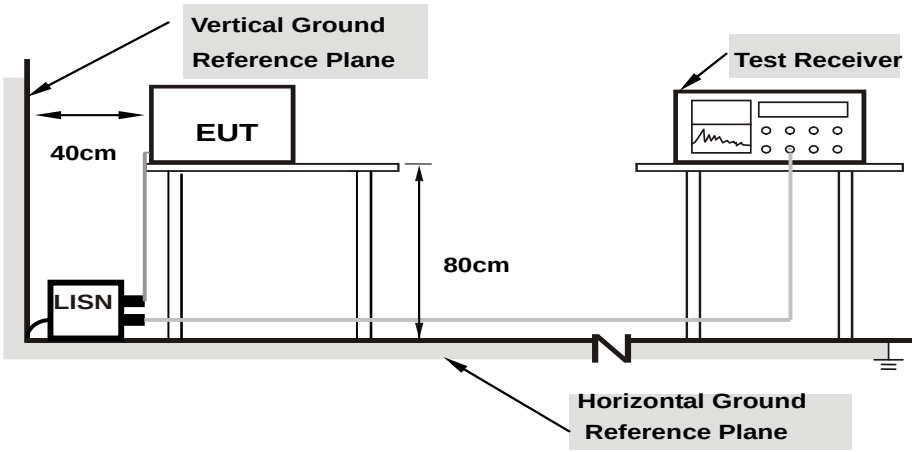
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

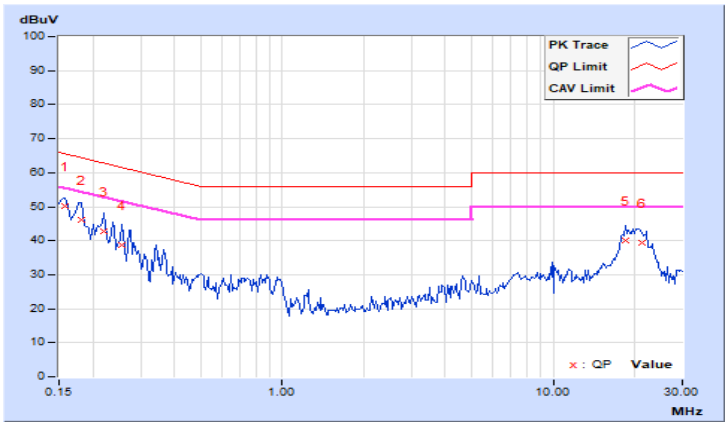
For Radio 1

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	0.15800	9.92	40.18	25.02	50.10	34.94	65.57	55.57	-15.47	-20.63
2	0.18130	9.94	36.25	21.70	46.19	31.64	64.43	54.43	-18.24	-22.79
3	0.22036	9.95	32.73	15.86	42.68	25.81	62.81	52.81	-20.13	-27.00
4	0.25556	9.96	28.62	19.59	38.58	29.55	61.57	51.57	-22.99	-22.02
5	18.57040	11.25	28.90	21.63	40.15	32.88	60.00	50.00	-19.85	-17.12
6	21.41781	11.41	27.89	21.32	39.30	32.73	60.00	50.00	-20.70	-17.27

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

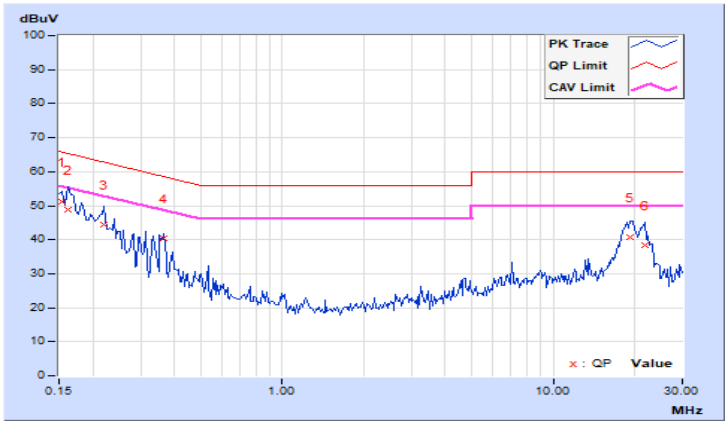


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15381	9.93	41.30	25.25	51.23	35.18	65.79	55.79	-14.56	-20.61
2	0.16192	9.94	38.79	25.89	48.73	35.83	65.36	55.36	-16.63	-19.53
3	0.22042	9.96	34.45	21.80	44.41	31.76	62.80	52.80	-18.39	-21.04
4	**0.36494**	**9.99**	**30.44**	**25.35**	**40.43**	**35.34**	**58.62**	**48.62**	**-18.19**	**-13.28**
5	19.21888	11.05	29.60	22.65	40.65	33.70	60.00	50.00	-19.35	-16.30
6	21.80088	11.14	27.19	20.69	38.33	31.83	60.00	50.00	-21.67	-18.17

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



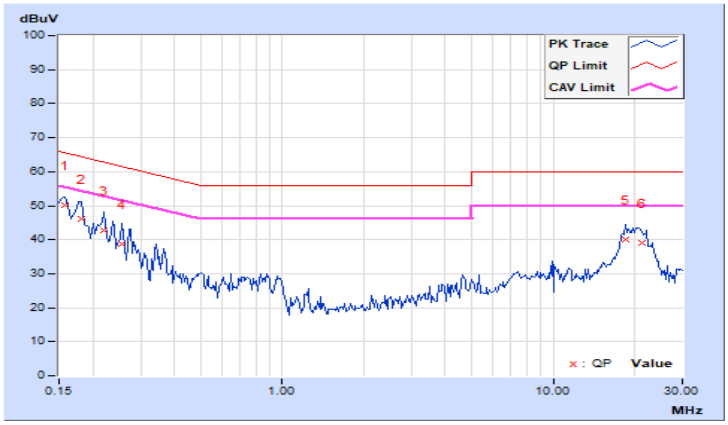
For Radio 2

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	0.15800	9.92	40.35	25.13	50.27	35.05	65.57	55.57	-15.30	-20.52
2	0.18150	9.94	36.20	21.88	46.14	31.82	64.42	54.42	-18.28	-22.60
3	0.22048	9.95	32.83	15.89	42.78	25.84	62.80	52.80	-20.02	-26.96
4	0.25536	9.96	28.82	19.52	38.78	29.48	61.58	51.58	-22.80	-22.10
5	18.57058	11.25	28.80	21.58	40.05	32.83	60.00	50.00	-19.95	-17.17
6	21.41791	11.41	27.80	21.39	39.21	32.80	60.00	50.00	-20.79	-17.20

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

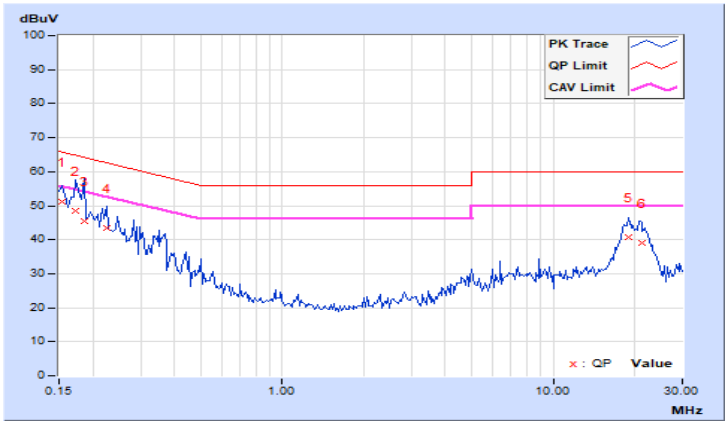


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15381	9.93	41.10	26.31	51.03	36.24	65.79	55.79	-14.76	-19.55
2	0.17349	9.94	38.66	25.12	48.60	35.06	64.79	54.79	-16.19	-19.73
3	0.18510	9.95	35.58	22.20	45.53	32.15	64.25	54.25	-18.72	-22.10
4	0.22435	9.96	33.47	20.69	43.43	30.65	62.66	52.66	-19.23	-22.01
5	18.99612	11.04	29.81	22.56	40.85	33.60	60.00	50.00	-19.15	-16.40
6	21.23040	11.12	27.90	20.92	39.02	32.04	60.00	50.00	-20.98	-17.96

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,

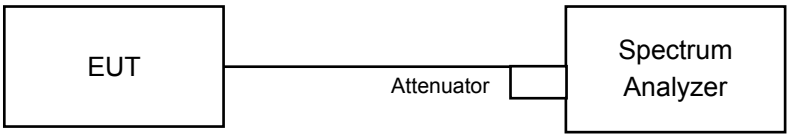
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

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.

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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				
52	5260	15.17	16.33	15.67	112.737	20.52	24.00	Pass
60	5300	15.46	16.21	15.83	115.222	20.62	24.00	Pass
64	5320	15.59	15.91	15.83	113.501	20.55	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
52	5260	20.12	24.03 > 24
60	5300	20.17	24.04 > 24
64	5320	20.19	24.05 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
52	5260	15.43	16.69	16.07	122.038	20.86	24.00	Pass
60	5300	15.25	16.41	15.91	116.243	20.65	24.00	Pass
64	5320	15.21	16.19	15.82	112.975	20.53	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
52	5260	20.2	24.05 > 24
60	5300	20.15	24.04 > 24
64	5320	20.23	24.05 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
54	5270	18.21	19.45	18.99	233.577	23.68	24.00	Pass
62	5310	18.09	18.75	18.29	206.859	23.16	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
54	5270	41.61	27.19 > 24
62	5310	41.63	27.19 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
58	5290	16.79	17.56	17.33	158.845	22.01	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
58	5290	81.23	30.09 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
52	5260	15.43	16.69	16.07	122.038	20.86	23.06	Pass
60	5300	15.25	16.41	15.91	116.243	20.65	23.06	Pass
64	5320	15.21	16.19	15.82	112.975	20.53	23.06	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$)^2 / 3] = 6.94 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(6.94-6)”.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
52	5260	20.2	24.05 > 24
60	5300	20.15	24.04 > 24
64	5320	20.23	24.05 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
54	5270	17.25	18.49	18.05	187.547	22.73	23.06	Pass
62	5310	17.63	18.29	17.84	186.209	22.70	23.06	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$)^2 / 3] = 6.94 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(6.94-6)”.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
54	5270	41.61	27.19 > 24
62	5310	41.63	27.19 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
58	5290	16.79	17.56	17.33	158.845	22.01	23.06	Pass

Note: The directional gain = 10 log[(10$^{G0/20}$ + 10$^{G1/20}$ + 10$^{G2/20}$)^2 / 3] = 6.94 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(6.94-6)”.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
58	5290	81.23	30.09 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

26dB OCCUPIED BANDWIDTH

CDD Mode

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	20.12	20.24	20.45
60	5300	20.17	20.26	20.41
64	5320	20.19	20.34	20.4

802.11ac (VHT20)

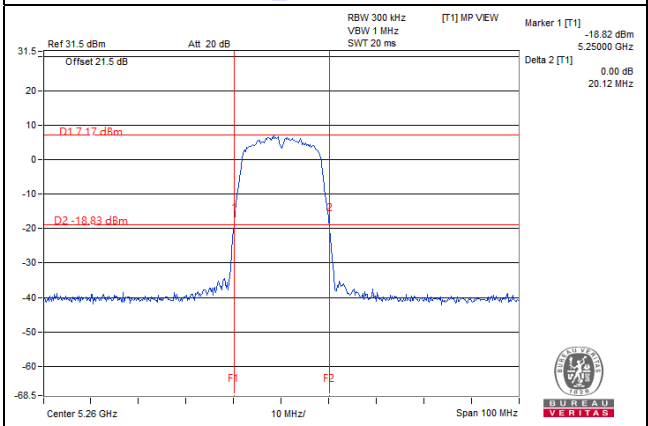
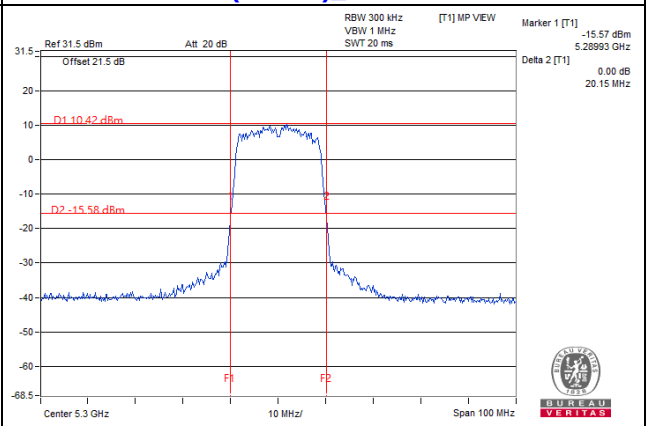
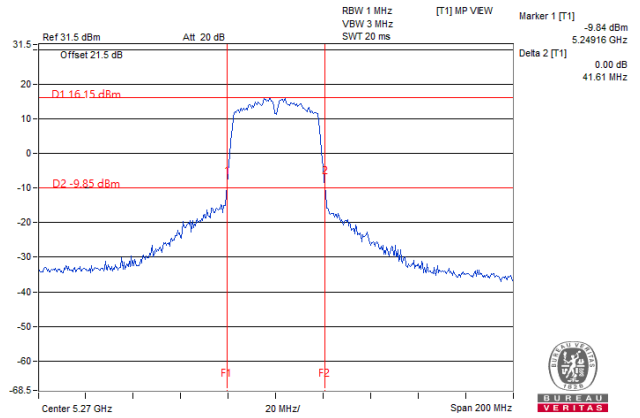
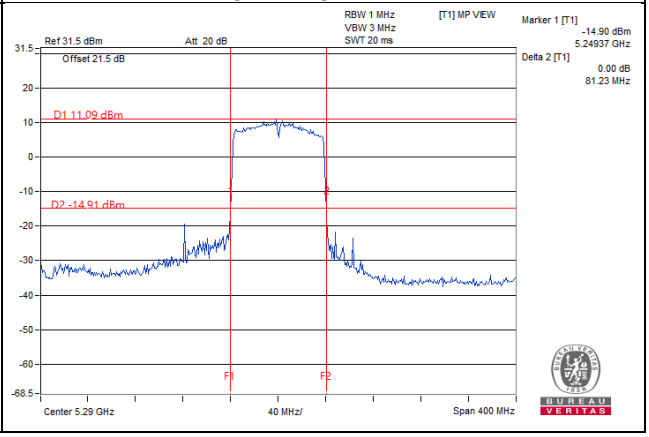
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	20.67	20.2	20.35
60	5300	20.64	20.15	20.36
64	5320	20.62	20.23	20.34

802.11ac (VHT40)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	42.19	41.61	41.89
62	5310	42.14	41.63	41.95

802.11ac (VHT80)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
58	5290	81.95	81.23	81.45

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH52	**802.11ac (VHT20)_Chain 1 / CH60**
	
802.11ac (VHT40)_Chain 1 / CH64	**802.11ac (VHT80)_Chain 1 / CH58**
	

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				
100	5500	12.58	13.21	13.48	13.56	84.038	19.24	24.00	Pass
116	5580	13.14	13.83	13.00	13.17	85.463	19.32	24.00	Pass
140	5700	13.59	13.79	13.26	13.08	88.296	19.46	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
100	5500	20.11	24.03 > 24
116	5580	21.37	24.29 > 24
140	5700	20.11	24.03 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
100	5500	12.93	13.59	13.74	13.31	87.578	19.42	24.00	Pass
116	5580	13.05	13.65	12.96	13.14	83.734	19.23	24.00	Pass
140	5700	13.35	13.75	12.90	13.05	85.023	19.30	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
100	5500	20.05	24.02 > 24
116	5580	21.51	24.32 > 24
140	5700	20.27	24.06 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
102	5510	15.93	15.97	16.04	16.49	163.456	22.13	24.00	Pass
110	5550	16.23	16.46	16.00	16.31	168.802	22.27	24.00	Pass
134	5670	16.04	16.63	16.35	16.22	171.236	22.34	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
102	5510	41.59	27.18 > 24
110	5550	41.46	27.17 > 24
134	5670	41.58	27.18 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
106	5530	17.62	17.83	17.15	17.73	229.656	23.61	24.00	Pass
122	5610	17.78	18.27	17.68	17.54	242.49	23.85	24.00	Pass

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
106	5530	81.84	30.12 > 24
122	5610	81.5	30.11 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
100	5500	12.93	13.59	13.74	13.31	87.578	19.42	22.07	Pass
116	5580	13.05	13.65	12.96	13.14	83.734	19.23	22.07	Pass
140	5700	13.35	13.75	12.90	13.05	85.023	19.30	22.07	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4] = 7.93 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.93-6)”.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
100	5500	20.05	24.02 > 24
116	5580	21.51	24.32 > 24
140	5700	20.27	24.06 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
102	5510	15.56	15.61	15.68	16.12	150.275	21.77	22.07	Pass
110	5550	15.73	15.96	15.50	15.81	150.445	21.77	22.07	Pass
134	5670	15.54	16.13	16.00	15.72	153.966	21.87	22.07	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4] = 7.93 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.93-6)”.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
102	5510	41.59	27.18 > 24
110	5550	41.46	27.17 > 24
134	5670	41.58	27.18 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

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				
106	5530	15.68	15.89	15.23	15.79	147.072	21.68	22.07	Pass
122	5610	15.85	16.37	15.73	15.59	155.446	21.92	22.07	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4] = 7.93 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.93-6)”.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
106	5530	81.84	30.12 > 24
122	5610	81.5	30.11 > 24

Note: For Output power limitation is determined based on 26dBc bandwidth.

26dB OCCUPIED BANDWIDTH

CDD Mode

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
100	5500	20.15	20.18	20.42	20.11
116	5580	21.63	21.38	21.61	21.37
140	5700	20.15	20.2	20.39	20.11

802.11ac (VHT20)

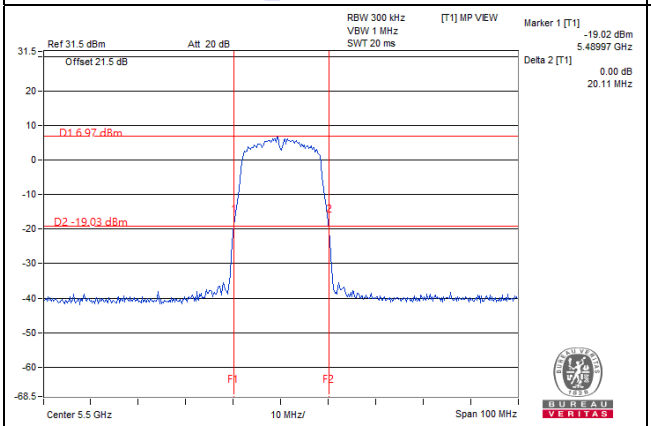
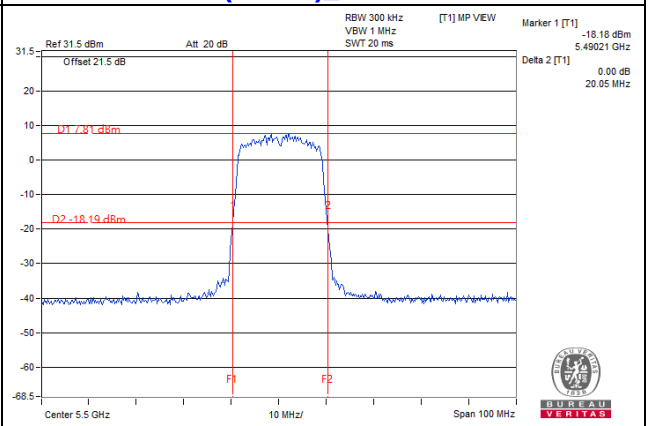
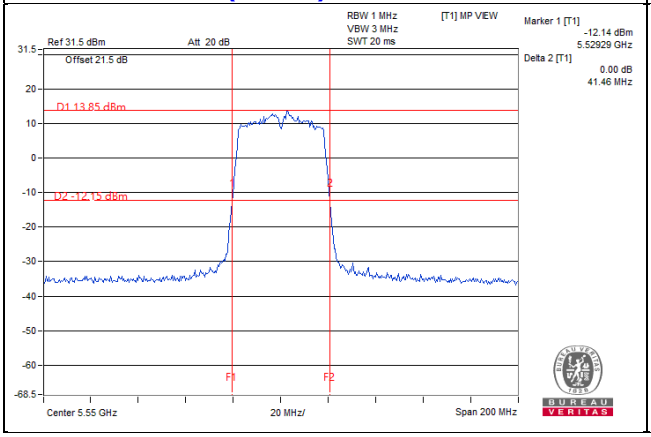
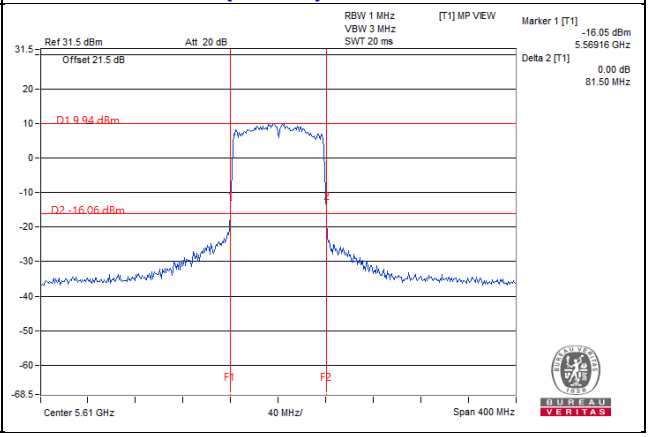
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
100	5500	20.65	20.05	20.36	20.45
116	5580	21.91	21.55	21.62	21.51
140	5700	20.54	20.27	20.33	20.48

802.11ac (VHT40)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
102	5510	42.28	41.81	41.6	41.59
110	5550	42.05	41.76	41.72	41.46
134	5670	42.08	41.78	41.79	41.58

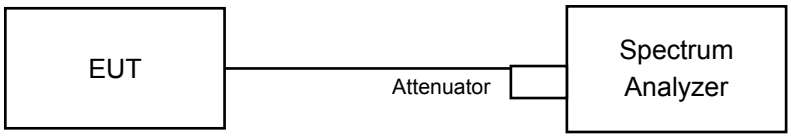
802.11ac (VHT80)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
106	5530	82.17	81.86	81.88	81.84
122	5610	82.19	81.75	82.07	81.5

Spectrum Plot of Worst Value	
802.11a_Chain 3 / CH100	**802.11ac (VHT20)_Chain 1 / CH100**
	
802.11ac (VHT40)_Chain 3 / CH110	**802.11ac (VHT80)_Chain 3 / CH122**
	

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
52	5260	16.44	16.56	16.44
60	5300	16.44	16.56	16.56
64	5320	16.44	16.68	16.56

802.11ac (VHT20)

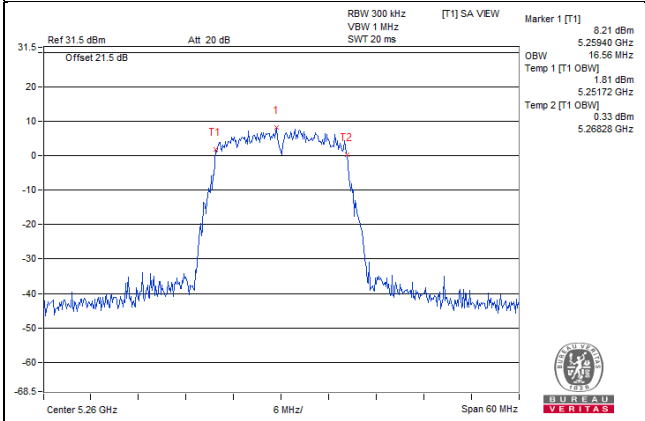
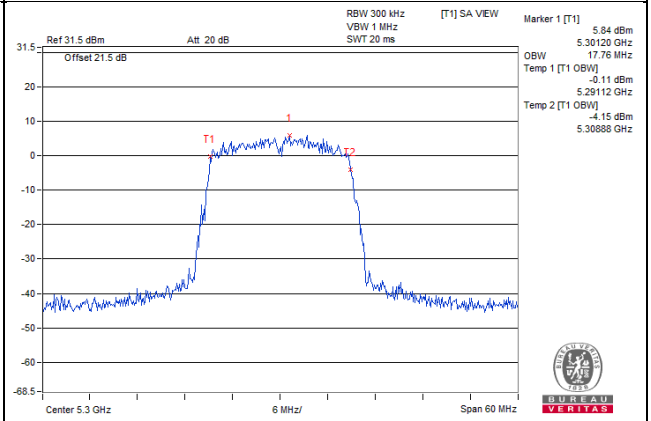
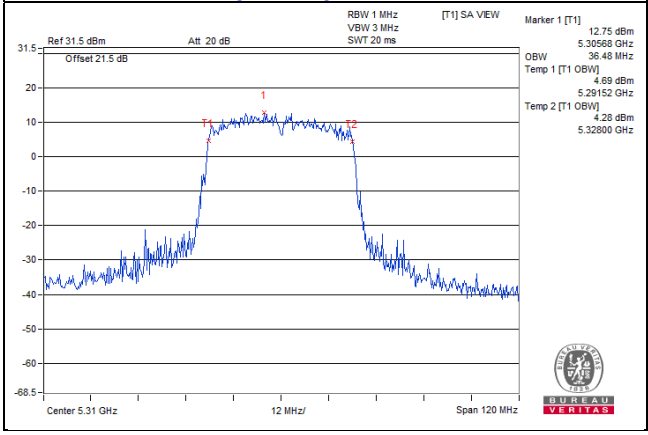
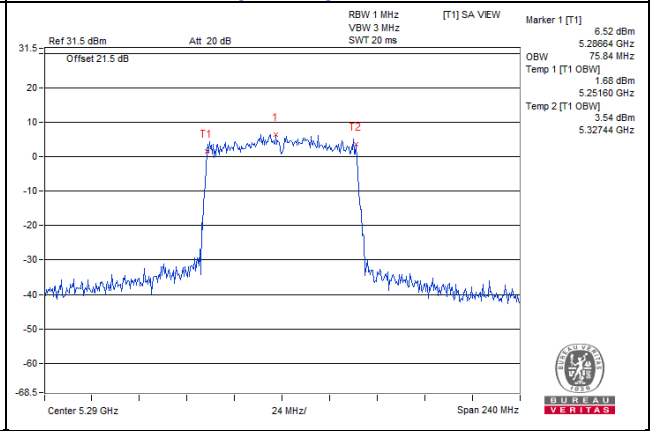
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	17.64	17.64	17.64
60	5300	17.76	17.64	17.64
64	5320	17.64	17.64	17.64

802.11ac (VHT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	36.24	36.24	36.24
62	5310	36.24	36	36.48

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
58	5290	75.84	75.84	75.36

Spectrum Plot of Max. Value	
802.11a_Chain 1 / CH64	**802.11ac (VHT20)_Chain 0 / CH60**
	
802.11ac (VHT40)_Chain 2 / CH62	**802.11ac (VHT80)_Chain 0 / CH58**
	

For Radio 2

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
100	5500	16.68	16.44	16.56	16.56
116	5580	16.68	16.68	16.56	16.68
140	5700	16.56	16.56	16.56	16.44

802.11ac (VHT20)

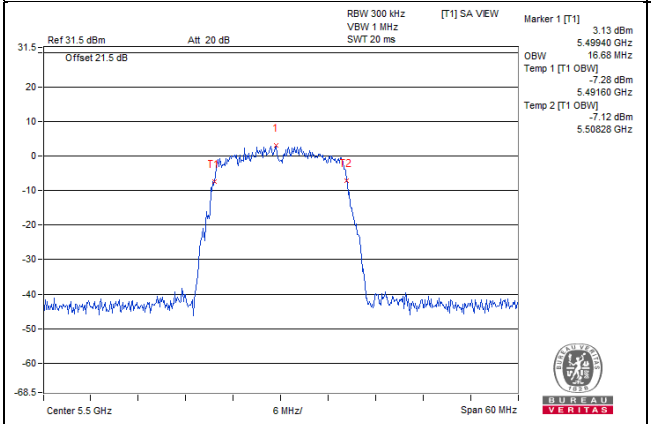
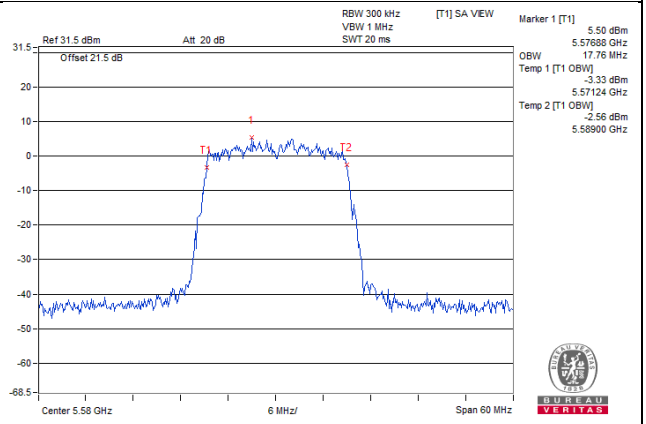
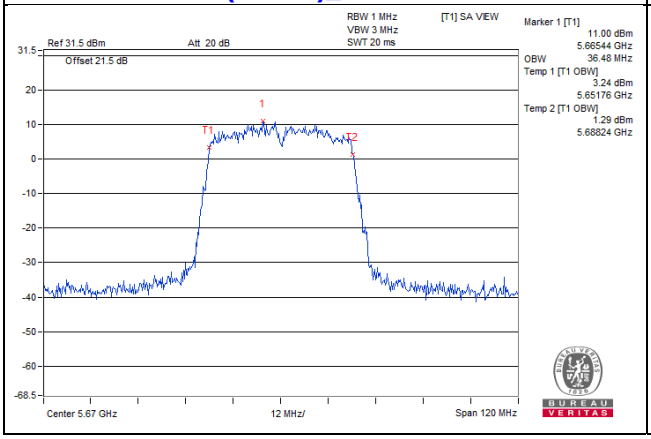
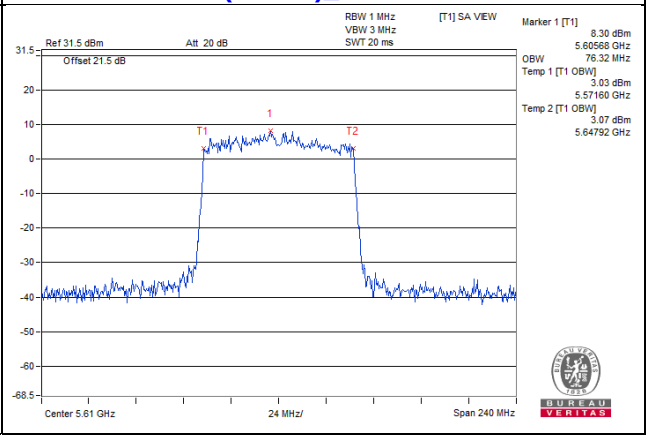
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
100	5500	17.64	17.52	17.64	17.64
116	5580	17.76	17.64	17.76	17.64
140	5700	17.64	17.64	17.64	17.64

802.11ac (VHT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
102	5510	36.24	36.24	36.24	36.24
110	5550	36.24	36.24	36.24	36.24
134	5670	36.48	36.48	36	36.24

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
106	5530	75.84	75.84	75.36	75.36
122	5610	76.32	75.84	75.84	75.36

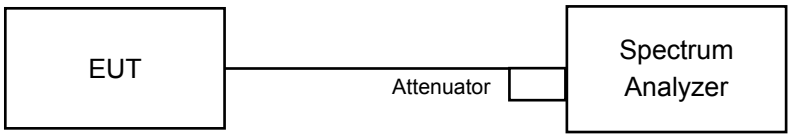
Spectrum Plot of Max. Value	
802.11a_Chain 0 / CH100	**802.11ac (VHT20)_Chain 0 / CH116**
	
802.11ac (VHT40)_Chain 0 / CH134	**802.11ac (VHT80)_Chain 0 / CH122**
	

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-2A 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-2C band:

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

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

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			
52	5260	2.17	4.40	3.27	8.15	10.06	Pass
60	5300	2.19	4.33	3.12	8.07	10.06	Pass
64	5320	2.60	3.11	2.25	7.44	10.06	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] = 6.94 dBi > 6 dBi, so the power density limit shall be reduced to 11-(6.94-6) = 10.06 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			
52	5260	2.20	3.50	3.20	7.77	10.06	Pass
60	5300	2.19	3.70	3.00	7.78	10.06	Pass
64	5320	2.24	3.28	2.97	7.62	10.06	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] = 6.94 dBi > 6 dBi, so the power density limit shall be reduced to 11-(6.94-6) = 10.06 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			
54	5270	2.08	3.74	2.95	7.75	10.06	Pass
62	5310	2.23	3.22	3.38	7.74	10.06	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] = 6.94 dBi > 6 dBi, so the power density limit shall be reduced to 11-(6.94-6) = 10.06 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				
58	5290	-2.99	-0.77	-2.17	0.11	3.00	10.06	Pass

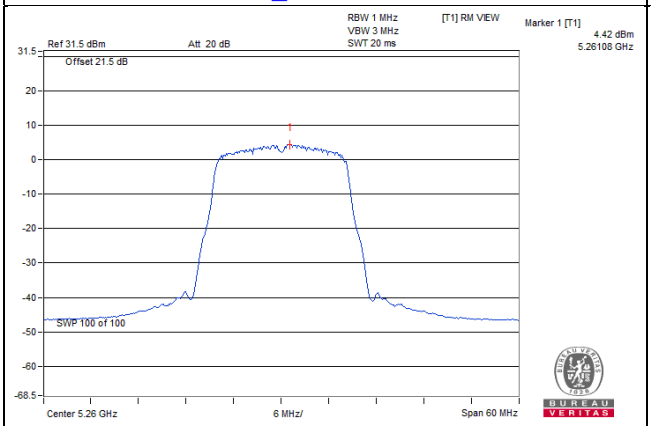
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2$ / 3] = 6.94 dBi > 6 dBi, so the power density limit shall be reduced to 11-(6.94-6) = 10.06 dBm/MHz.

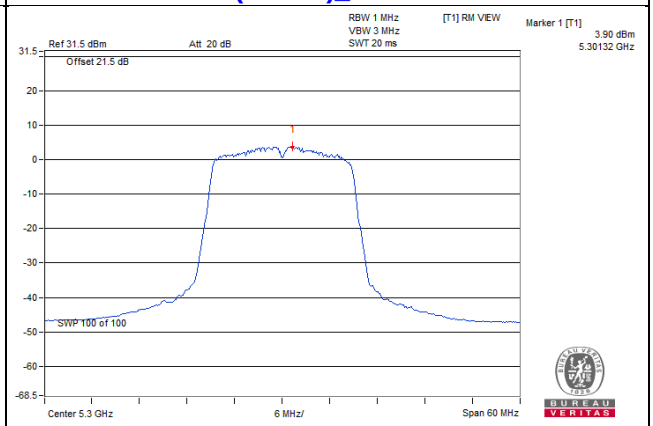
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

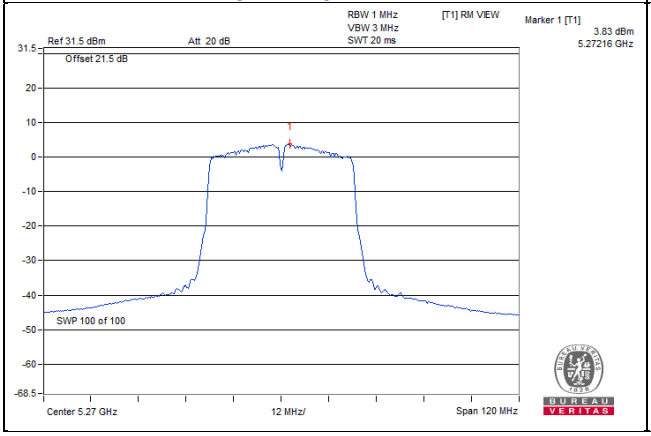
802.11a_Chain 1 / CH52



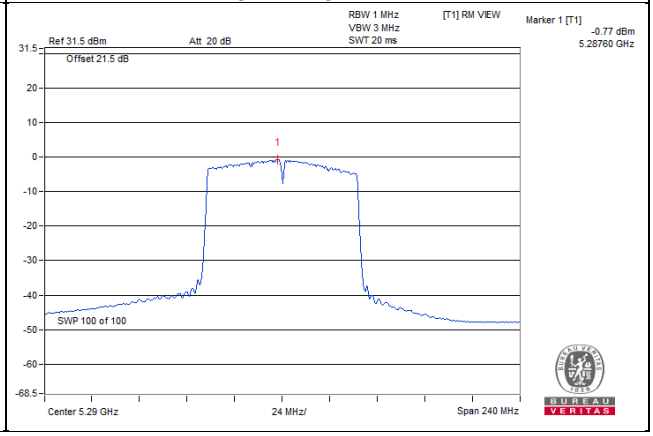
802.11ac (VHT20)_Chain 1 / CH60



802.11ac (VHT40)_Chain 1 / CH54



802.11ac (VHT80)_Chain 1 / CH58



For Radio 2

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	Chain 3			
100	5500	-0.75	0.19	0.49	0.67	6.20	9.07	Pass
116	5580	0.22	2.09	0.84	1.17	7.15	9.07	Pass
140	5700	0.99	2.21	1.71	0.23	7.37	9.07	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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.93 dBi > 6dBi, so the power density limit shall be reduced to 11-(7.93-6) = 9.07 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	Chain 3			
100	5500	0.31	0.45	0.80	0.25	6.48	9.07	Pass
116	5580	1.00	2.34	0.17	-0.75	6.86	9.07	Pass
140	5700	0.52	2.10	0.53	0.94	7.09	9.07	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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.93 dBi > 6dBi, so the power density limit shall be reduced to 11-(7.93-6) = 9.07 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	Chain 3			
102	5510	0.05	1.32	1.31	1.29	7.05	9.07	Pass
110	5550	-0.01	0.94	-0.17	0.44	6.34	9.07	Pass
134	5670	0.89	1.14	0.30	-0.07	6.61	9.07	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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 7.93 dBi > 6dBi, so the power density limit shall be reduced to 11-(7.93-6) = 9.07 dBm/MHz.

802.11ac (VHT80)

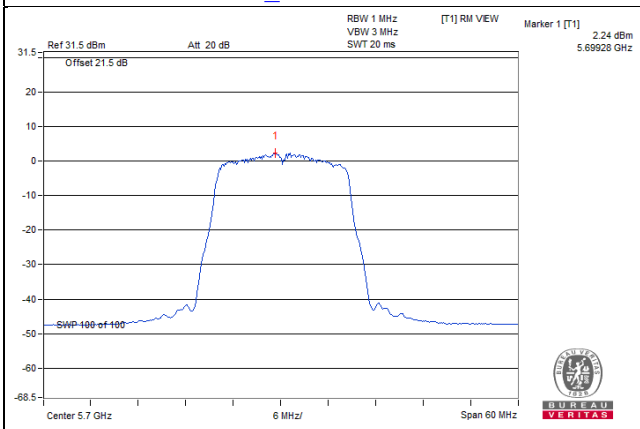
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
106	5530	-1.25	-1.64	-2.51	-0.57	4.58	9.07	Pass
122	5610	-1.28	-1.30	-3.30	-0.33	4.59	9.07	Pass

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.

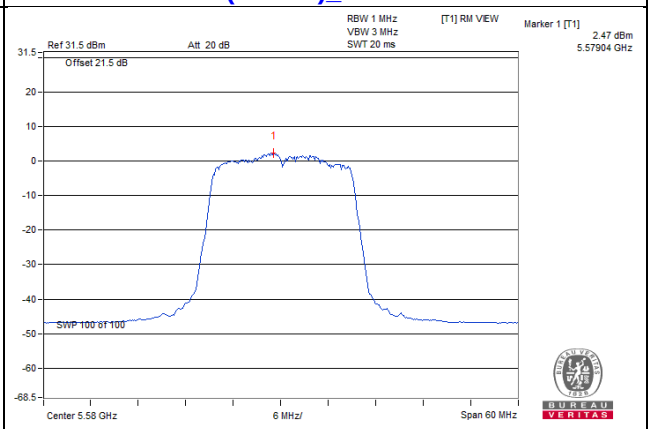
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 4] = 7.93 dBi > 6dBi, so the power density limit shall be reduced to 11-(7.93-6) = 9.07 dBm/MHz.

Spectrum Plot of Worst Value

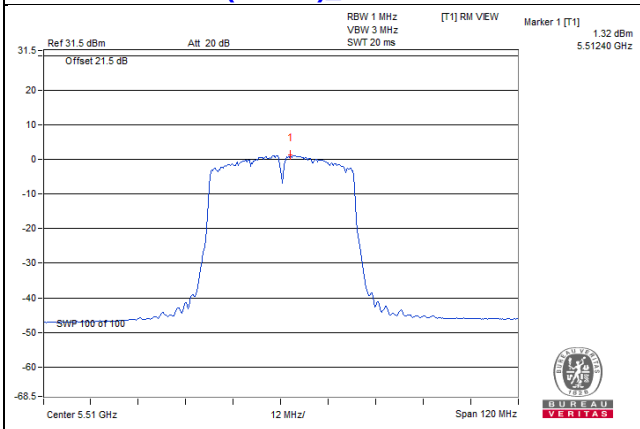
802.11a_Chain 1 / CH140



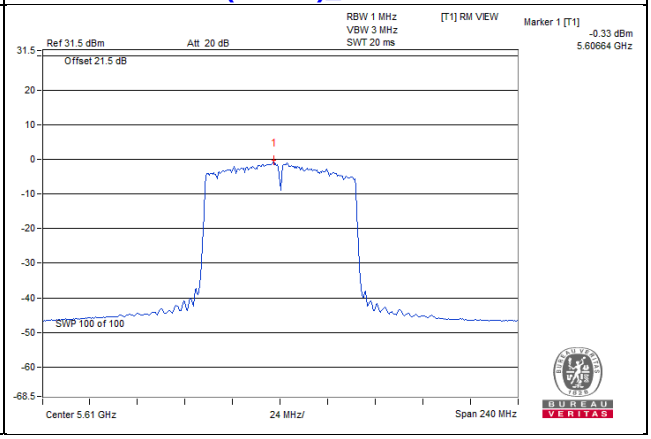
802.11ac (VHT20)_Chain 1 / CH116



802.11ac (VHT40)_Chain 1 / CH102



802.11ac (VHT80)_Chain 3 / CH122

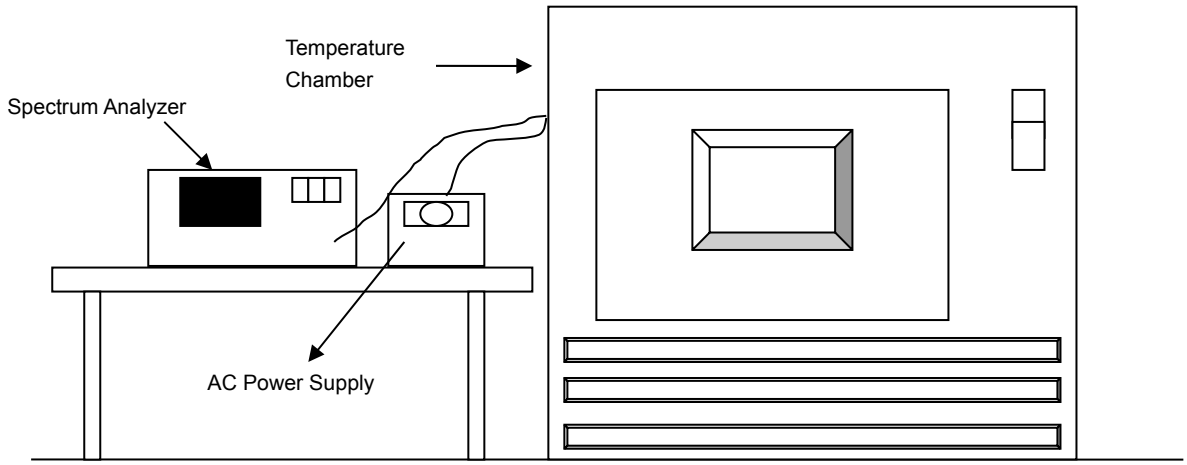


4.6 Frequency Stability Measurement

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: 5260 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	5259.9831	Pass	5259.9834	Pass	5259.9865	Pass	5259.9851	Pass
30	120	5260.0108	Pass	5260.0113	Pass	5260.0132	Pass	5260.0123	Pass
20	120	5259.9944	Pass	5259.9909	Pass	5259.9918	Pass	5259.9932	Pass
10	120	5259.9785	Pass	5259.9748	Pass	5259.9744	Pass	5259.9756	Pass
0	120	5259.9969	Pass	5259.9935	Pass	5259.9945	Pass	5259.996	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5260 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	5259.9935	Pass	5259.9912	Pass	5259.9917	Pass	5259.9926	Pass
	120	5259.9944	Pass	5259.9909	Pass	5259.9918	Pass	5259.9932	Pass
	102	5259.995	Pass	5259.99	Pass	5259.9915	Pass	5259.9937	Pass

For Radio 2

Frequency Stability Versus Temp.									
Operating Frequency: 5500 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	5499.9756	Pass	5499.9748	Pass	5499.973	Pass	5499.9729	Pass
30	120	5499.9875	Pass	5499.9914	Pass	5499.9917	Pass	5499.9877	Pass
20	120	5499.981	Pass	5499.98	Pass	5499.981	Pass	5499.9792	Pass
10	120	5499.975	Pass	5499.9739	Pass	5499.9735	Pass	5499.9772	Pass
0	120	5499.9851	Pass	5499.9872	Pass	5499.9852	Pass	5499.9876	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5500 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	5499.9749	Pass	5499.9747	Pass	5499.9726	Pass	5499.9777	Pass
	120	5499.975	Pass	5499.9739	Pass	5499.9735	Pass	5499.9772	Pass
	102	5499.9756	Pass	5499.9729	Pass	5499.9732	Pass	5499.9775	Pass

5 Pictures of Test Arrangements

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

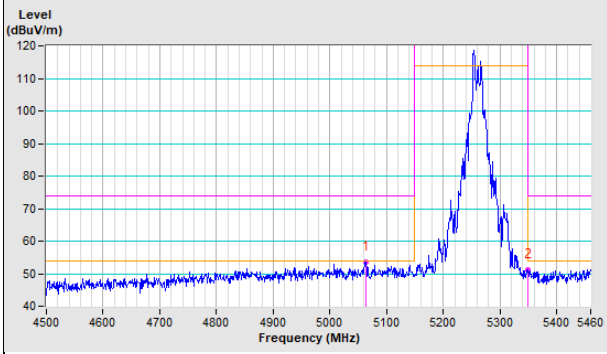
Annex A - Band-Edge Measurement (For U-NII-2A, U-NII-2C band)

For Radio 1

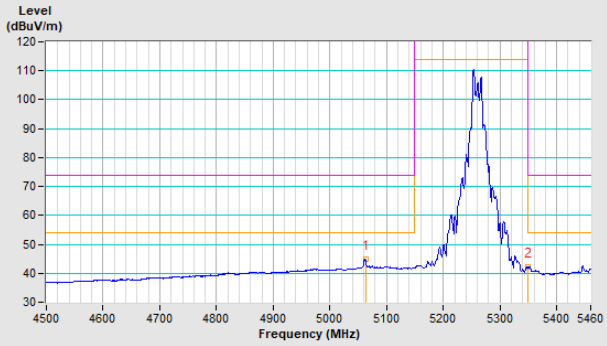
802.11a

Channel 52

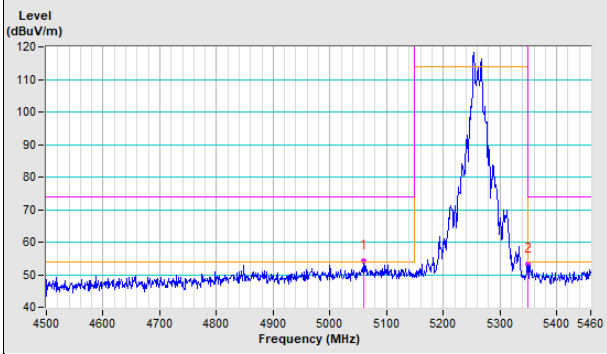
Horizontal (Peak)



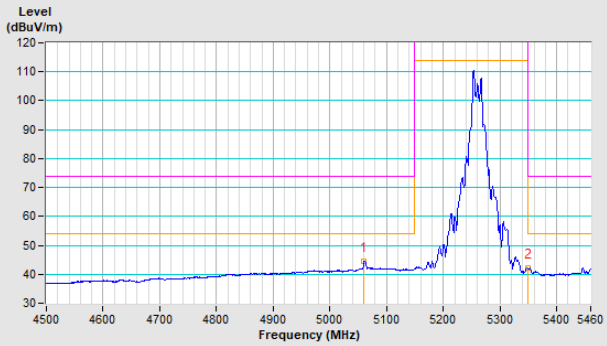
Horizontal (Average)



Vertical (Peak)

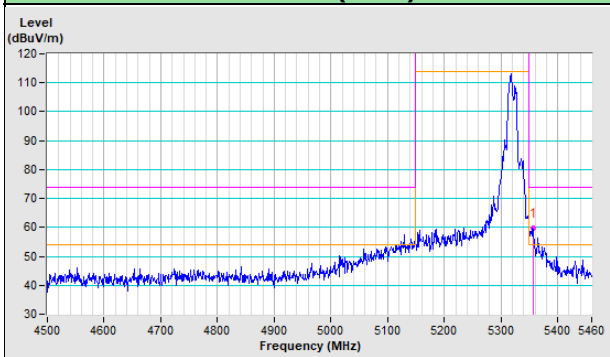


Vertical (Average)

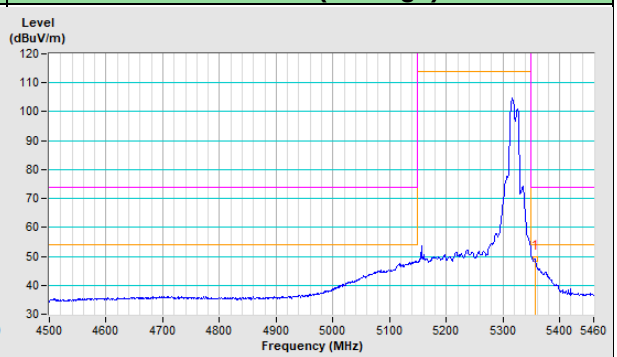


Channel 64

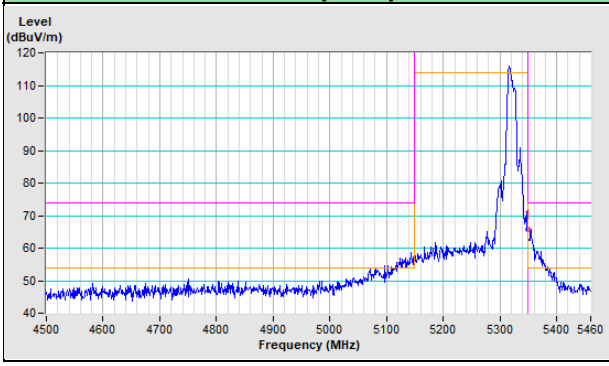
Horizontal (Peak)



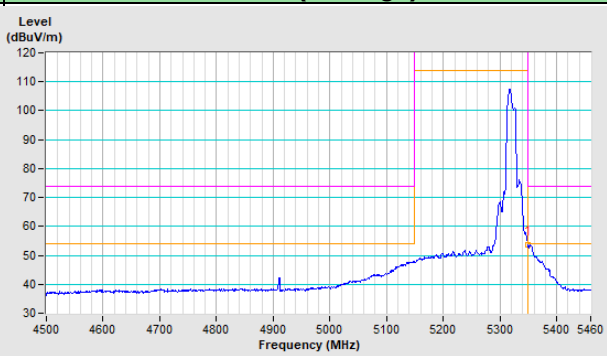
Horizontal (Average)



Vertical (Peak)



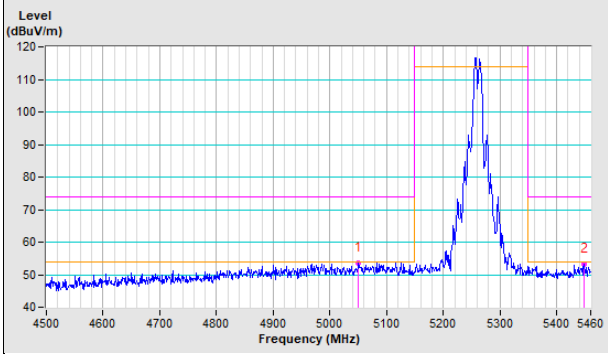
Vertical (Average)



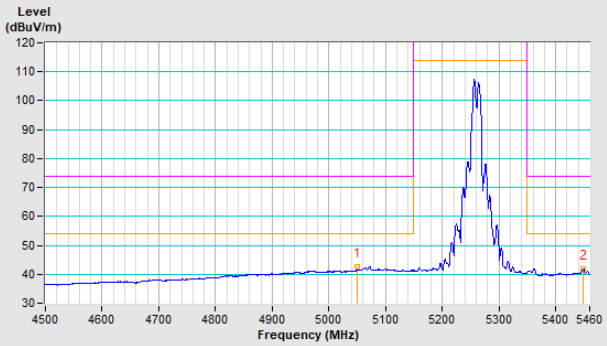
802.11ac (VHT20)

Channel 52

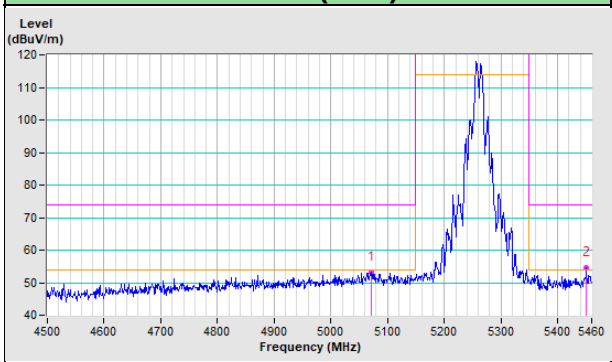
Horizontal (Peak)



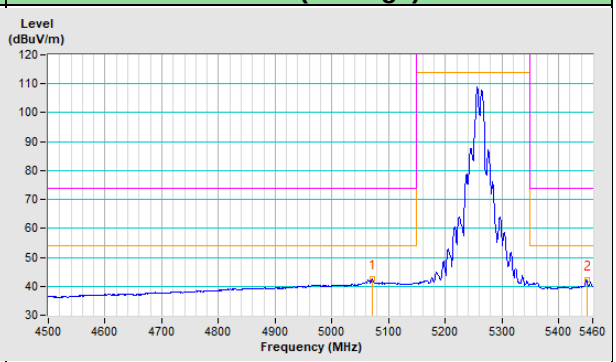
Horizontal (Average)



Vertical (Peak)

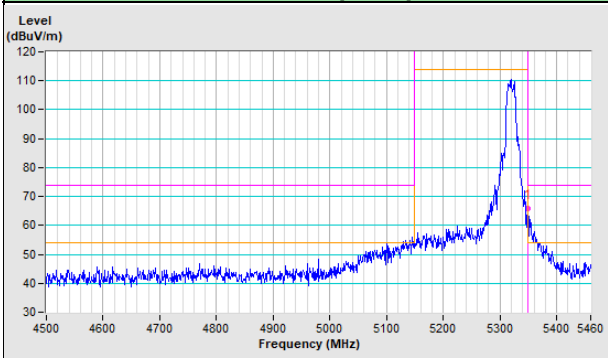


Vertical (Average)

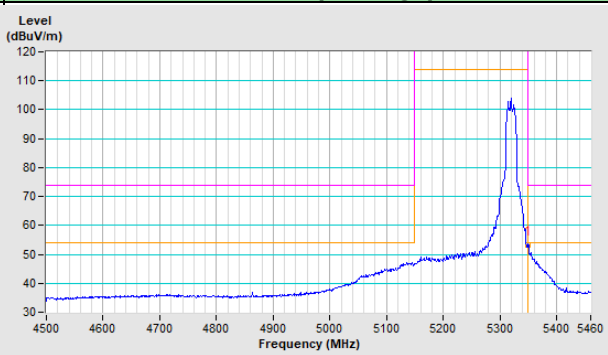


Channel 64

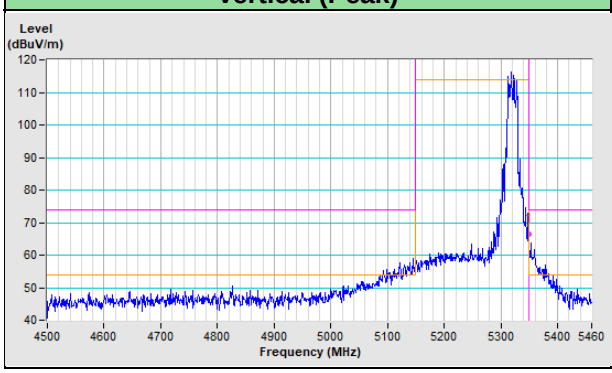
Horizontal (Peak)



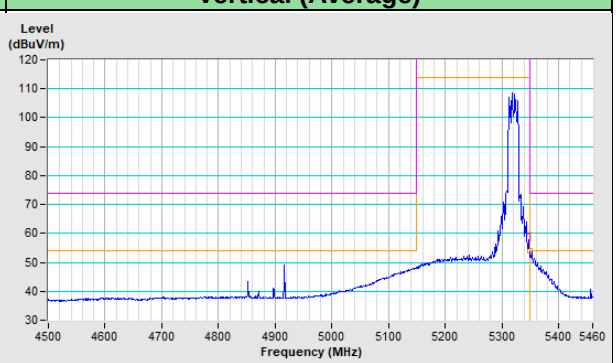
Horizontal (Average)



Vertical (Peak)



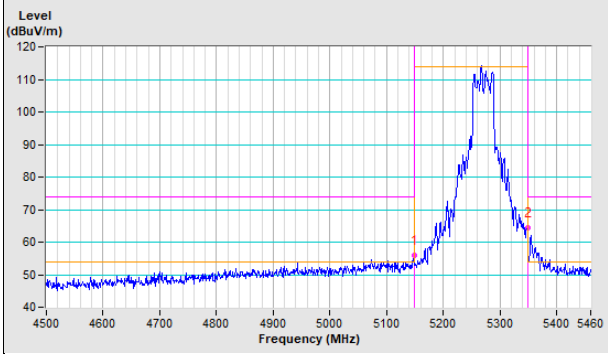
Vertical (Average)



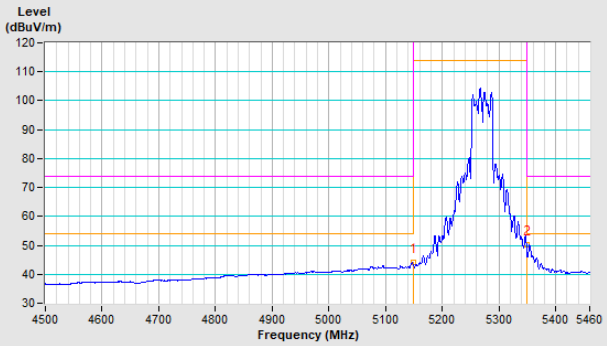
802.11ac (VHT40)

Channel 54

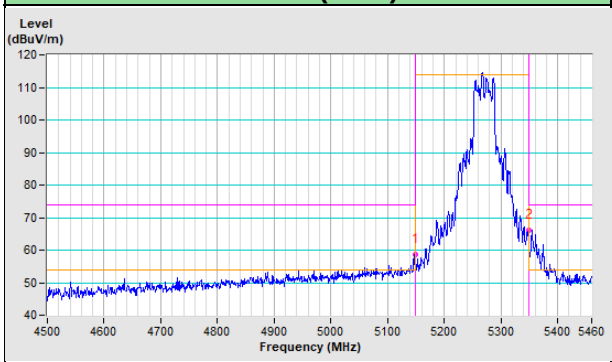
Horizontal (Peak)



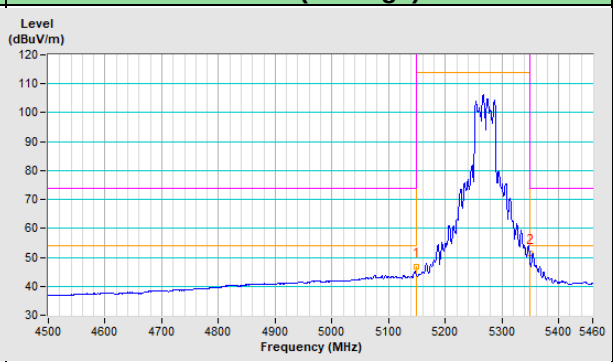
Horizontal (Average)



Vertical (Peak)

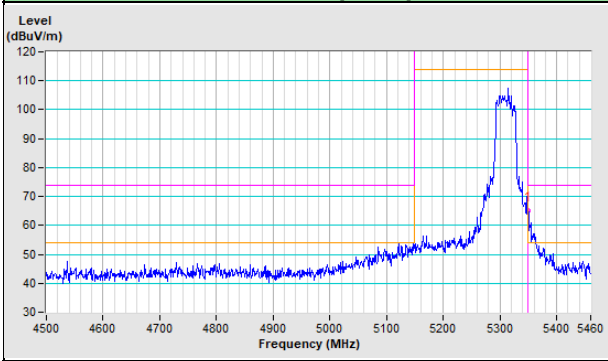


Vertical (Average)

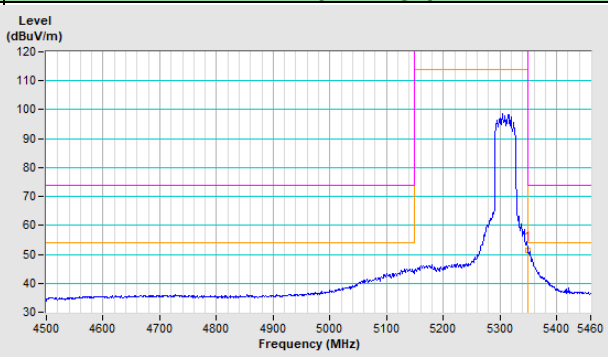


Channel 62

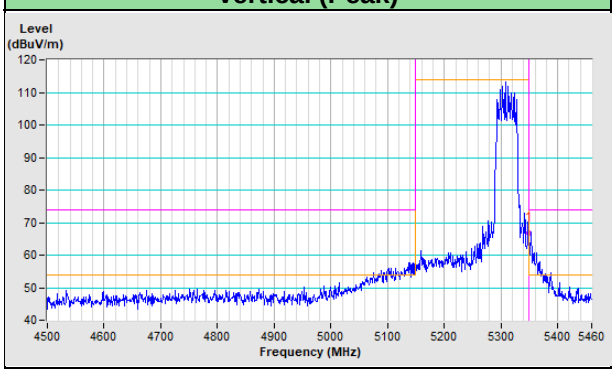
Horizontal (Peak)



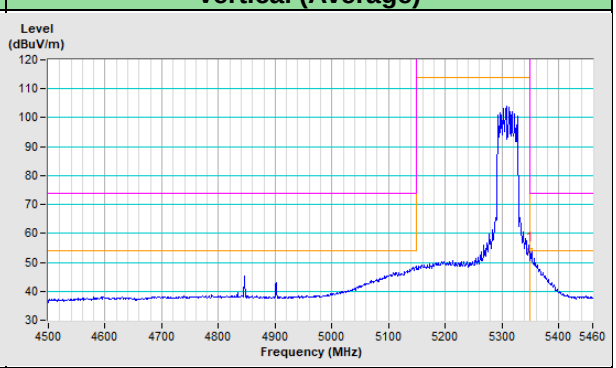
Horizontal (Average)



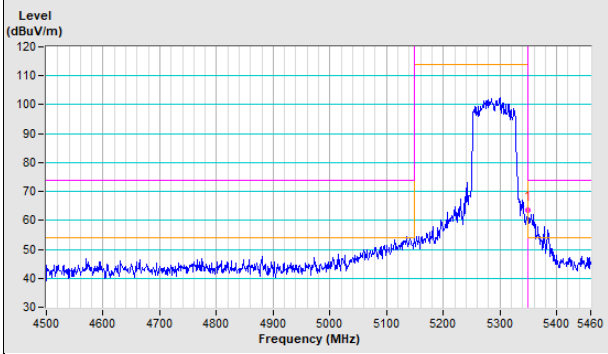
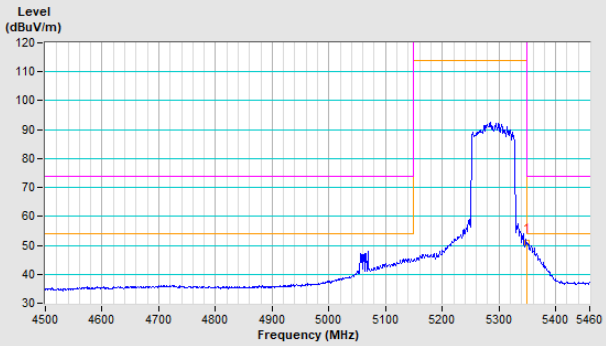
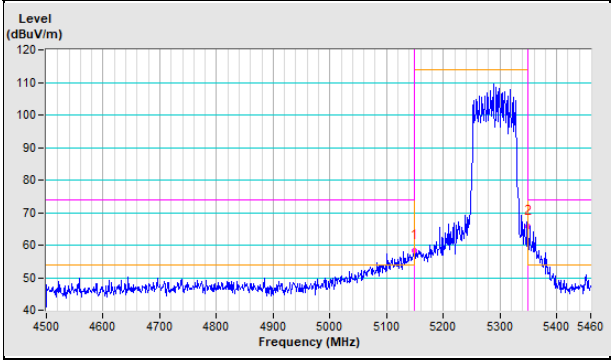
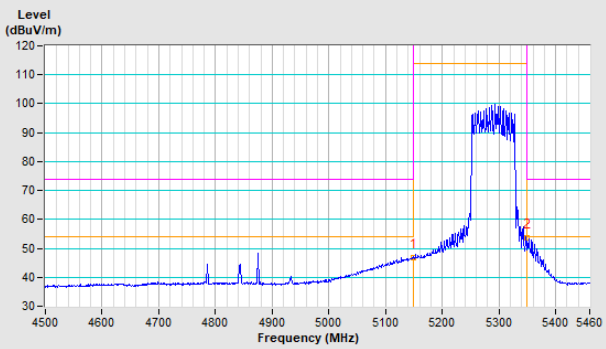
Vertical (Peak)



Vertical (Average)

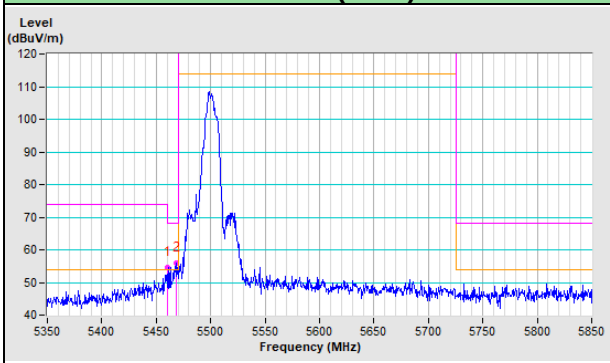
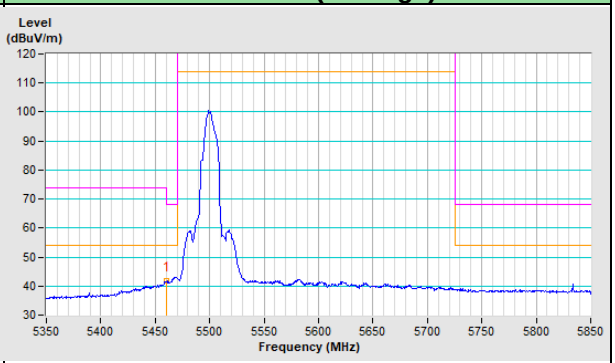
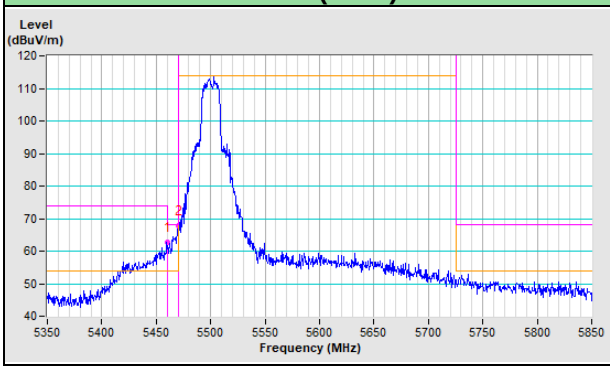
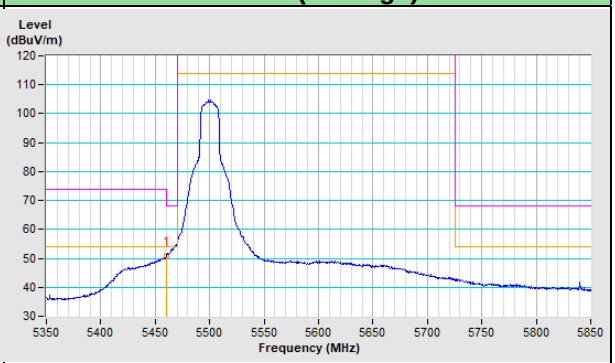


802.11ac (VHT80)

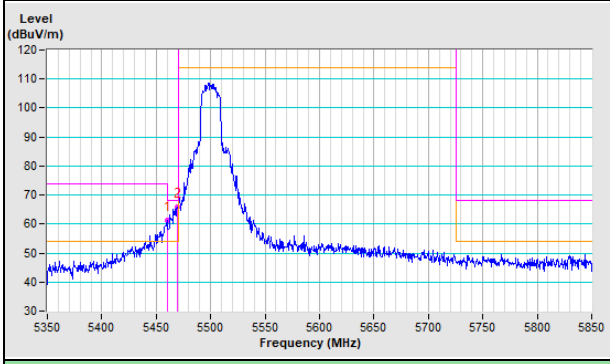
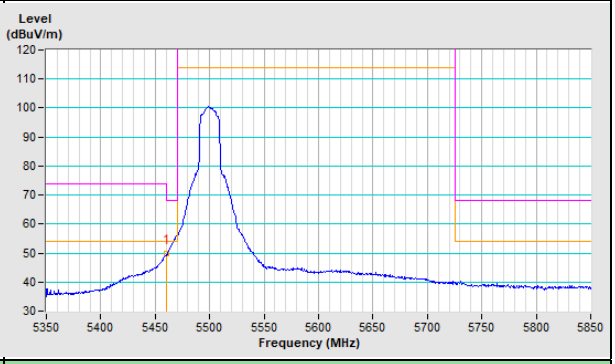
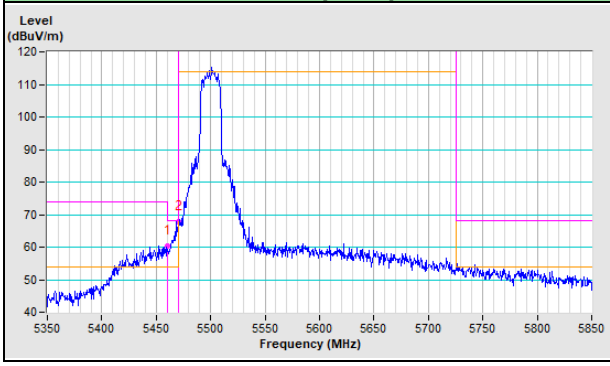
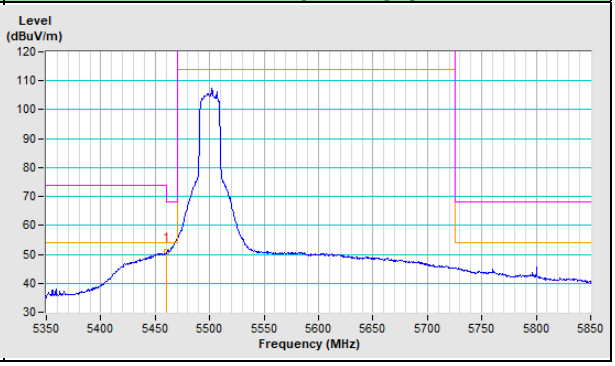
Channel 58	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

For Radio 2

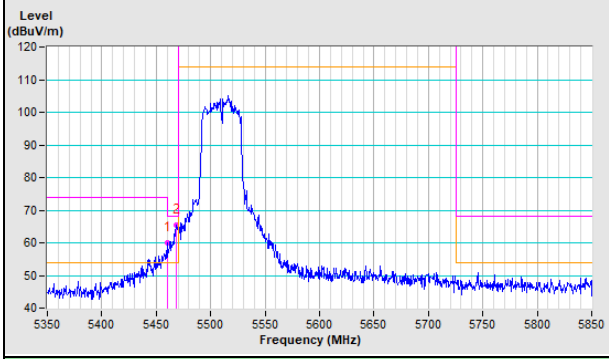
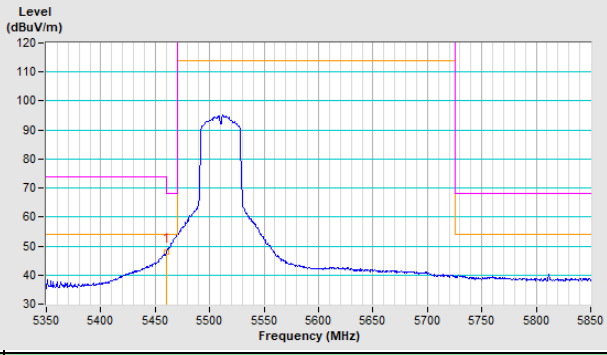
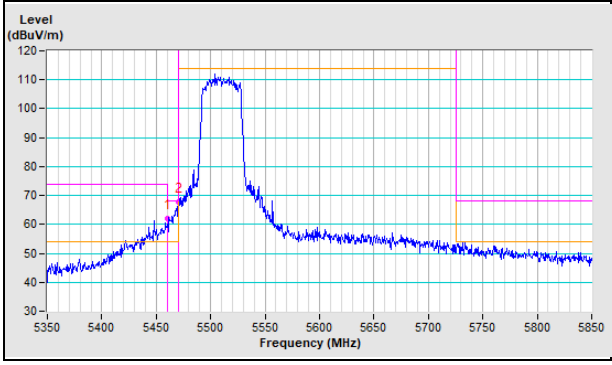
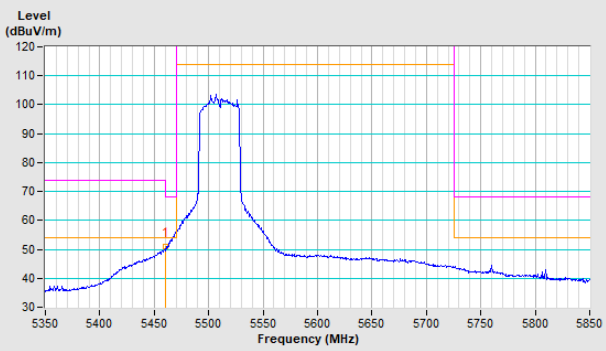
802.11a

Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

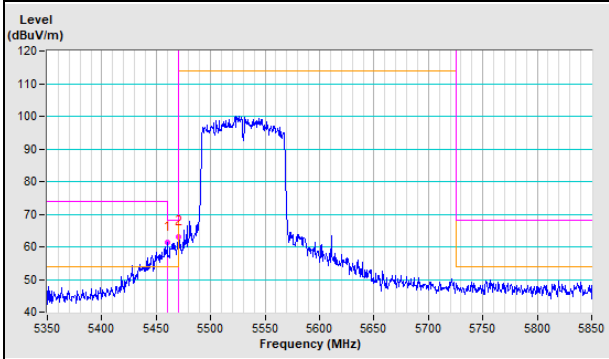
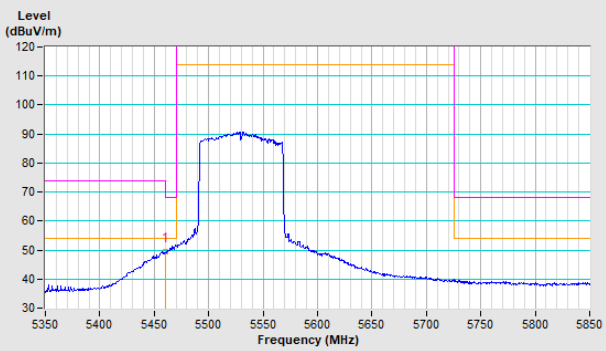
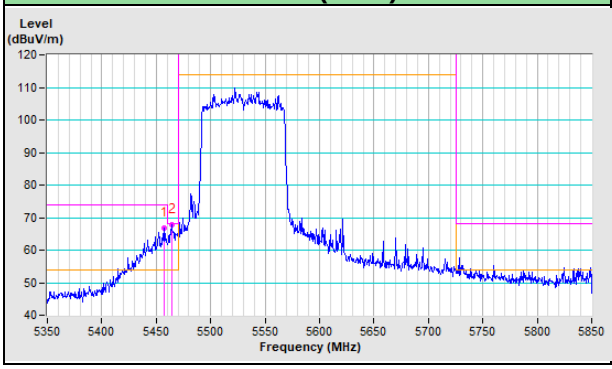
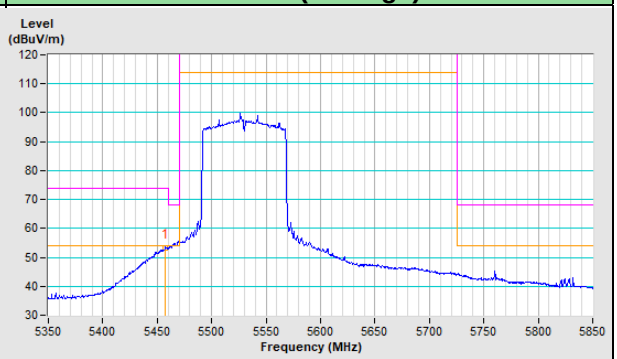
802.11ac (VHT20)

Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT40)

Channel 102	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT80)

Channel 106	
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:

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Web Site: www.bureauveritas-adt.com

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

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