

FCC Test Report (DFS Band)

Report No.: RF191227E09A-1

FCC ID: 2AF5PMH7021

Test Model: MH7021

Series Model: MH702XY (where X can be 0, 1, 2, 3, or 4, and Y can be A, B, C, D or blank)

Received Date: May 14, 2020

Test Date: June 01 to Oct. 15, 2020

Issued Date: Oct. 29, 2020

Applicant: MTRLC LLC

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



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Table of Contents

Release Control Record	4
1 Certificate of Conformity.....	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information.....	7
3.1 General Description of EUT (DFS Band)	7
3.2 Description of Test Modes	10
3.2.1 Test Mode Applicability and Tested Channel Detail	11
3.3 Duty Cycle of Test Signal	13
3.4 Description of Support Units	14
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standard and References	15
4 Test Types and Results	16
4.1 Radiated Emission and Bandedge Measurement.....	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement	16
4.1.2 Test Instruments	17
4.1.3 Test Procedure	19
4.1.4 Deviation from Test Standard	20
4.1.5 Test Setup.....	20
4.1.6 EUT Operating Condition	21
4.1.7 Test Results	22
4.2 Conducted Emission Measurement	48
4.2.1 Limits of Conducted Emission Measurement	48
4.2.2 Test Instruments	48
4.2.3 Test Procedure	49
4.2.4 Deviation from Test Standard	49
4.2.5 Test Setup.....	49
4.2.6 EUT Operating Condition	49
4.2.7 Test Results	50
4.3 Transmit Power Measurement	52
4.3.1 Limits of Transmit Power Measurement	52
4.3.2 Test Setup.....	52
4.3.3 Test Instruments	53
4.3.4 Test Procedure	53
4.3.5 Deviation from Test Standard	54
4.3.6 EUT Operating Condition	54
4.3.7 Test Results	55
4.4 Occupied Bandwidth Measurement	67
4.4.1 Test Setup.....	67
4.4.2 Test Instruments	67
4.4.3 Test Procedure	67
4.4.4 Test Results	68
4.5 Peak Power Spectral Density Measurement	70
4.5.1 Limits of Peak Power Spectral Density Measurement	70
4.5.2 Test Setup.....	70
4.5.3 Test Instruments	70
4.5.4 Test Procedure	70
4.5.5 Deviation from Test Standard	71
4.5.6 EUT Operating Condition	71
4.5.7 Test Results	72
4.6 Frequency Stability Measurement	77
4.6.1 Limits of Frequency Stability Measurement	77

4.6.2 Test Setup	77
4.6.3 Test Instruments	77
4.6.4 Test Procedure	77
4.6.5 Deviation from Test Standard	77
4.6.6 EUT Operating Condition	77
4.6.7 Test Results	78
5 Pictures of Test Arrangements	79
Annex A - Band-Edge Measurement (For U-NII-2A, U-NII-2C band)	80
Appendix – Information of the Testing Laboratories	87

Release Control Record

Issue No.	Description	Date Issued
RF191227E09A-1	Original release.	Oct. 29, 2020

1 Certificate of Conformity

Product: AC2200 Tri-band Mesh WiFi

Brand: Motorola

Test Model: MH7021

Series Model: MH702XY (where X can be 0, 1, 2, 3, or 4, and Y can be A, B, C, D or blank)

Sample Status: ENGINEERING SAMPLE

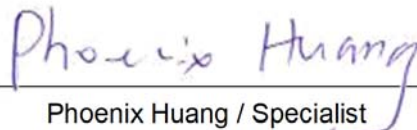
Applicant: MTRLC LLC

Test Date: June 01 to Oct. 15, 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 / Specialist

Date:

Oct. 29, 2020

Approved by :



Clark Lin / Technical Manager

Date:

Oct. 29, 2020

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 -8.88 dB at 0.34531 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 -0.2 dB at 5142.53 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(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex not a standard connector.

Note:

1. For U-NII-2A, 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	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 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	AC2200 Tri-band Mesh WiFi
Brand	Motorola
Test Model	MH7021
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to 400 Mbps 802.11ac: up to 866.7 Mbps
Operating Frequency	5.26 ~ 5.32 GHz, 5.50 ~ 5.72 GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 16 802.11n (HT40), 802.11ac (VHT40): 8 802.11ac (VHT80): 4
Output Power	CDD Mode: 5.26 ~ 5.32 GHz: 242.823 mW 5.5 ~ 5.72 GHz: 224.666 mW Beamforming Mode: 5.26 ~ 5.32 GHz: 161.916 mW 5.5 ~ 5.72 GHz: 144.228 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ-45 Cable x 1 (Unshielded, 2 m)

Note:

- This report is prepared for FCC Class II change. The difference compared with the Report No.: RF191227E09-1 design changed is as the following:
 - ◆ Added DFS band <5.26 ~ 5.32 GHz, 5.50 ~ 5.72 GHz> by software.
- According to above conditions, for DFS band all of test items need to be performed and all data was verified to meet the requirements.
- The EUT has below 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: In original report, the emission of the simultaneous operation has been evaluated and no non-compliance was found.			

5. The EUT has following model names, which are identical to each other in all aspects except for the following information:

Brand Name	Model Name	Difference
Motorola	MH7021	MH7021 x 1, black and white
	MH702XY (where X can be 0, 1, 2, 3, or 4, and Y can be A, B, C, D or blank)	for identical hardware for marketing purposes

Note: From the above models, model: MH7021 was selected as representative model for the test and its data are recorded in this report.

6. The EUT power needs to be supplied from a power adapter, the information is as below table:

No.	Brand Name	Model No.	Spec.
1	Shenzhen Gongjin Electronics Co., Ltd	S24B72-120A200-0K	Input: 100-240 Vac, 0.8 A, 50/60 Hz Output: 12 Vdc, 2 A DC Output cable: Unshielded, 1.5 m

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

Radio	Antenna No.	Antenna Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)	Cable Loss (dB)
Radio 1	ANT 1 (2.4GHz/5GHz)	2.88	2.4~2.5	PCB	i-pex	85±3	0.23
		4.31	5.15~5.85				0.36
	ANT 2 (2.4GHz/5GHz)	3	2.4~2.5	PCB	i-pex	125±3	0.31
		5.27	5.15~5.85				0.5
Radio 2	ANT 3 (5GHz)	5.19	5.15~5.85	METAL TUBE	i-pex	110±3	0.47
	ANT 4 (5GHz)	5.37	5.15~5.85	METAL TUBE	i-pex	110±3	0.47

8. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
5GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX

Note:

- All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
- 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.
- 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 refer 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 ~ 5720MHz

12 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	144	5720 MHz

6 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	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 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	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	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 5500-5720	54 to 62, 102 to 142	62	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5720	54 to 62, 102 to 142	62	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	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	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3
Beamforming Mode (output power only)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5250-5320	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)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	23deg. C, 67%RH, 19deg. C, 65%RH	120Vac, 60Hz	Nelson Teng, Sampson Chen
RE<1G	23deg. C, 67%RH	120Vac, 60Hz	Kevin Ko
PLC	22deg. C, 68%RH	120Vac, 60Hz	Nick Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Kevin Ko

3.3 Duty Cycle of Test Signal

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

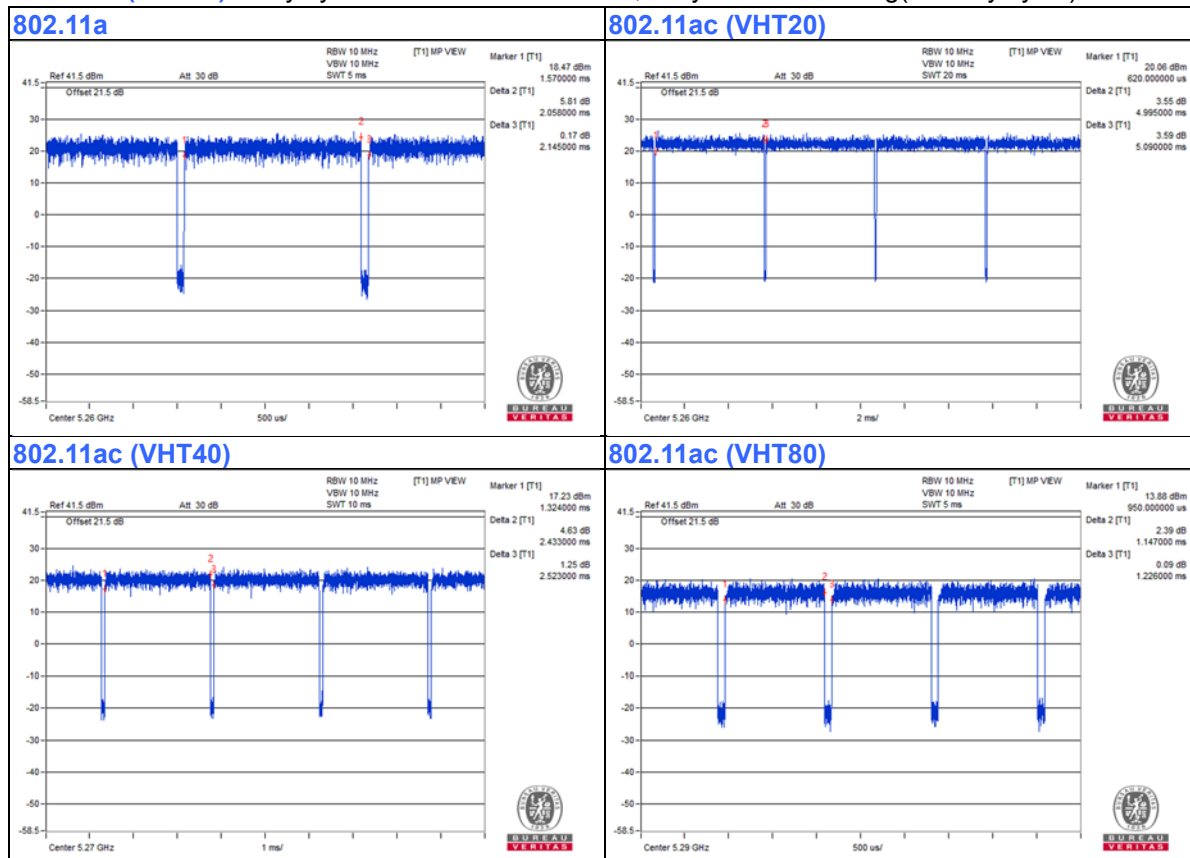
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $2.058/2.145 = 0.959$, Duty factor = $10 * \log(1/ \text{Duty cycle}) = 0.18 \text{ dB}$

802.11ac (VHT20): Duty cycle = $4.995/5.09 = 0.981$

802.11ac (VHT40): Duty cycle = $2.433/2.523 = 0.964$, Duty factor = $10 * \log(1/ \text{Duty cycle}) = 0.16 \text{ dB}$

802.11ac (VHT80): Duty cycle = $1.147/1.226 = 0.936$, Duty factor = $10 * \log(1/ \text{Duty cycle}) = 0.29 \text{ dB}$



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.

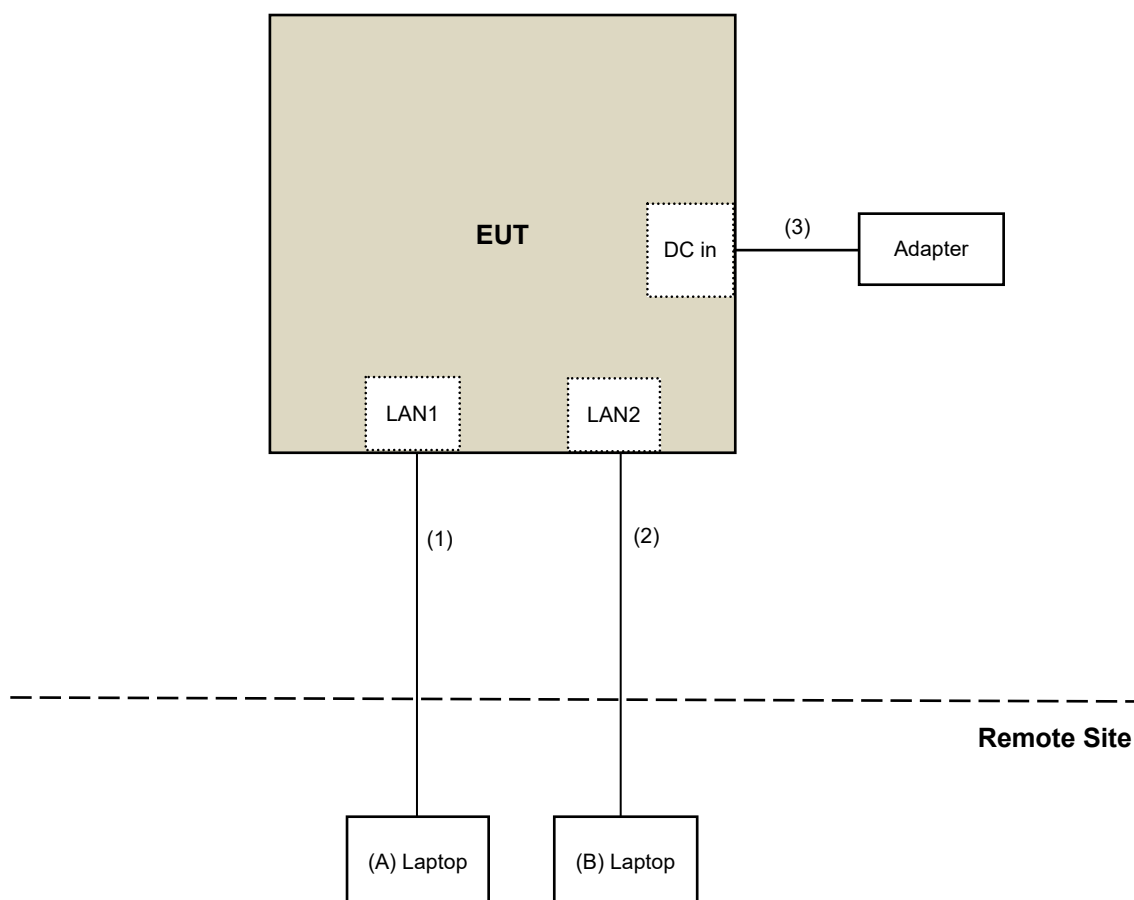
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

Note:

- 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 Standard 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:

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

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBuV/m)	AV:54 (dBuV/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(dBuV/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(dBuV/m) ^{*1} PK: 105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK: 122.2 (dBuV/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(dBuV/m) ^{*1} PK:105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK:122.2 (dBuV/m) ^{*4}
^{*1} beyond 75 MHz or more above of the band edge. ^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. ^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note:

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

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

4.1.2 Test Instruments

For Radioate Emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 22, 2020	May 21, 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 EMCi	EMC330N	980538	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB9168	9168-0842	Nov. 08, 2019	Nov. 07, 2020
RF Cable	8D	966-5-1	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-2	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-3	Apr. 29, 2020	Apr. 28, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 14, 2020	Jan. 13, 2021
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCi	EMC12630SE	980509	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-1500	180503	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-2000	180501	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-6000	180506	Apr. 29, 2020	Apr. 28, 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
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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. 5.
3. Tested Date: June 01 to Oct. 15, 2020

For Radioate Emission test:

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: Oct. 14, 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:

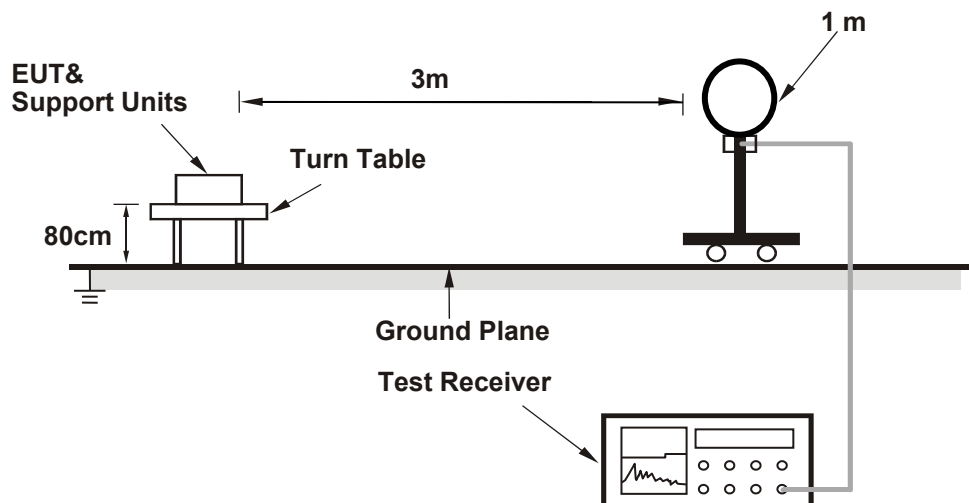
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

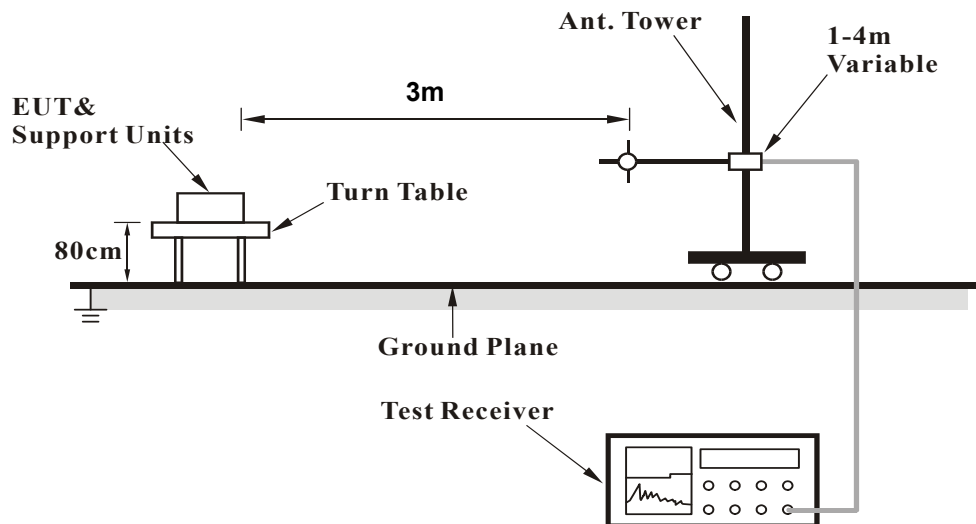
No deviation.

4.1.5 Test Setup

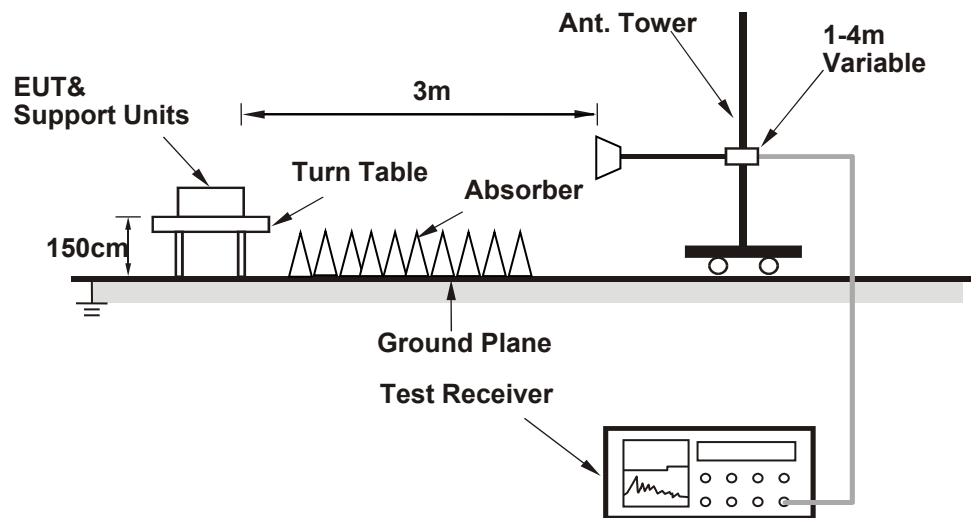
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

- Placed the EUT on the testing table.
- Controlling software (QRCT_V 3.0-00264) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 52 : 5260 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	52.3 PK	74.0	-21.7	3.12 H	148	50.6	1.7
2	5150.00	40.0 AV	54.0	-14.0	3.12 H	148	38.3	1.7
3	*5260.00	110.0 PK			3.12 H	148	108.8	1.2
4	*5260.00	100.0 AV			3.12 H	148	98.8	1.2
5	#10520.00	50.3 PK	68.2	-17.9	1.91 H	106	38.9	11.4
6	15780.00	50.6 PK	74.0	-23.4	2.83 H	294	39.9	10.7
7	15780.00	39.4 AV	54.0	-14.6	2.83 H	294	28.7	10.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	53.1 PK	74.0	-20.9	2.48 V	162	51.4	1.7
2	5150.00	41.7 AV	54.0	-12.3	2.48 V	162	40.0	1.7
3	*5260.00	117.9 PK			2.48 V	162	116.7	1.2
4	*5260.00	108.2 AV			2.48 V	162	107.0	1.2
5	#10520.00	47.2 PK	68.2	-21.0	2.87 V	263	35.8	11.4
6	15780.00	49.1 PK	74.0	-24.9	2.08 V	149	38.4	10.7
7	15780.00	38.8 AV	54.0	-15.2	2.08 V	149	28.1	10.7

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.

RF Mode	TX 802.11a	Channel	CH 60 : 5300 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	109.9 PK			3.17 H	136	108.7	1.2
2	*5300.00	101.1 AV			3.17 H	136	99.9	1.2
3	5350.00	51.8 PK	74.0	-22.2	3.17 H	136	50.4	1.4
4	5350.00	41.2 AV	54.0	-12.8	3.17 H	136	39.8	1.4
5	10600.00	50.1 PK	74.0	-23.9	1.94 H	98	38.3	11.8
6	10600.00	39.0 AV	54.0	-15.0	1.94 H	98	27.2	11.8
7	15900.00	50.3 PK	74.0	-23.7	2.84 H	283	39.6	10.7
8	15900.00	39.3 AV	54.0	-14.7	2.84 H	283	28.6	10.7
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	*5300.00	118.6 PK			2.56 V	164	117.4	1.2
2	*5300.00	109.2 AV			2.56 V	164	108.0	1.2
3	5350.00	60.8 PK	74.0	-13.2	2.56 V	164	59.4	1.4
4	5350.00	45.9 AV	54.0	-8.1	2.56 V	164	44.5	1.4
5	10600.00	46.8 PK	74.0	-27.2	2.89 V	249	35.0	11.8
6	10600.00	35.9 AV	54.0	-18.1	2.89 V	249	24.1	11.8
7	15900.00	48.9 PK	74.0	-25.1	2.10 V	145	38.2	10.7
8	15900.00	38.6 AV	54.0	-15.4	2.10 V	145	27.9	10.7

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.

RF Mode	TX 802.11a	Channel	CH 64 : 5320 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	109.6 PK			2.45 H	141	108.2	1.4
2	*5320.00	99.9 AV			2.45 H	141	98.5	1.4
3	5350.00	62.6 PK	74.0	-11.4	2.45 H	141	61.2	1.4
4	5350.00	45.9 AV	54.0	-8.1	2.45 H	141	44.5	1.4
5	10640.00	50.4 PK	74.0	-23.6	1.91 H	86	38.5	11.9
6	10640.00	39.2 AV	54.0	-14.8	1.91 H	86	27.3	11.9
7	15960.00	50.1 PK	74.0	-23.9	2.88 H	289	39.2	10.9
8	15960.00	39.3 AV	54.0	-14.7	2.88 H	289	28.4	10.9
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	*5320.00	116.1 PK			2.48 V	165	114.7	1.4
2	*5320.00	107.5 AV			2.48 V	165	106.1	1.4
3	5350.00	68.7 PK	74.0	-5.3	2.48 V	165	67.3	1.4
4	5350.00	50.8 AV	54.0	-3.2	2.48 V	165	49.4	1.4
5	10640.00	47.5 PK	74.0	-26.5	2.95 V	261	35.6	11.9
6	10640.00	36.3 AV	54.0	-17.7	2.95 V	261	24.4	11.9
7	15960.00	48.9 PK	74.0	-25.1	2.08 V	146	38.0	10.9
8	15960.00	38.4 AV	54.0	-15.6	2.08 V	146	27.5	10.9

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.

RF Mode	TX 802.11a	Channel	CH 100 : 5500 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5457.94	53.0 PK	74.0	-21.0	2.64 H	123	51.4	1.6
2	5457.94	41.7 AV	54.0	-12.3	2.64 H	123	40.1	1.6
3	#5470.00	55.9 PK	68.2	-12.3	2.64 H	123	54.3	1.6
4	*5500.00	111.8 PK			2.64 H	123	110.1	1.7
5	*5500.00	100.9 AV			2.64 H	123	99.2	1.7
6	11000.00	50.6 PK	74.0	-23.4	1.96 H	114	38.4	12.2
7	11000.00	39.2 AV	54.0	-14.8	1.96 H	114	27.0	12.2
8	#16500.00	49.9 PK	68.2	-18.3	2.82 H	286	36.5	13.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5457.94	57.8 PK	74.0	-16.2	2.70 V	256	56.2	1.6
2	5457.94	46.2 AV	54.0	-7.8	2.70 V	256	44.6	1.6
3	#5470.00	60.7 PK	68.2	-7.5	2.70 V	256	59.1	1.6
4	*5500.00	119.7 PK			2.70 V	256	118.0	1.7
5	*5500.00	108.0 AV			2.70 V	256	106.3	1.7
6	11000.00	47.0 PK	74.0	-27.0	2.94 V	263	34.8	12.2
7	11000.00	36.3 AV	54.0	-17.7	2.94 V	263	24.1	12.2
8	#16500.00	48.7 PK	68.2	-19.5	2.07 V	159	35.3	13.4

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 116 : 5580 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	*5580.00	110.1 PK			3.18 H	141	108.4	1.7
2	*5580.00	101.2 AV			3.18 H	141	99.5	1.7
3	11160.00	50.2 PK	74.0	-23.8	1.97 H	101	38.6	11.6
4	11160.00	38.8 AV	54.0	-15.2	1.97 H	101	27.2	11.6
5	#16740.00	49.8 PK	68.2	-18.4	2.79 H	274	35.1	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	*5580.00	119.9 PK			2.68 V	258	118.2	1.7
2	*5580.00	109.5 AV			2.68 V	258	107.8	1.7
3	11160.00	46.6 PK	74.0	-27.4	2.95 V	265	35.0	11.6
4	11160.00	36.0 AV	54.0	-18.0	2.95 V	265	24.4	11.6
5	#16740.00	49.1 PK	68.2	-19.1	2.09 V	150	34.4	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.

RF Mode	TX 802.11a	Channel	CH 140 : 5700 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	109.7 PK			3.17 H	136	107.9	1.8
2	*5700.00	100.6 AV			3.17 H	136	98.8	1.8
3	#5725.00	62.8 PK	68.2	-5.4	3.17 H	136	60.9	1.9
4	11400.00	50.2 PK	74.0	-23.8	1.91 H	111	37.4	12.8
5	11400.00	39.0 AV	54.0	-15.0	1.91 H	111	26.2	12.8
6	#17100.00	49.9 PK	68.2	-18.3	2.78 H	286	33.6	16.3
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	119.4 PK			1.63 V	256	117.6	1.8
2	*5700.00	109.5 AV			1.63 V	256	107.7	1.8
3	#5725.00	67.9 PK	68.2	-0.3	1.63 V	256	66.0	1.9
4	11400.00	47.1 PK	74.0	-26.9	2.91 V	273	34.3	12.8
5	11400.00	36.3 AV	54.0	-17.7	2.91 V	273	23.5	12.8
6	#17100.00	49.1 PK	68.2	-19.1	2.09 V	153	32.8	16.3

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	53.6 PK	74.0	-20.4	3.13 H	134	52.0	1.6
2	5460.00	41.3 AV	54.0	-12.7	3.13 H	134	39.7	1.6
3	#5470.00	55.8 PK	68.2	-12.4	3.13 H	134	54.2	1.6
4	*5720.00	110.4 PK			3.13 H	134	108.5	1.9
5	*5720.00	101.3 AV			3.13 H	134	99.4	1.9
6	#5850.00	54.9 PK	68.2	-13.3	3.13 H	134	52.6	2.3
7	11440.00	50.6 PK	74.0	-23.4	1.94 H	101	38.0	12.6
8	11440.00	39.6 AV	54.0	-14.4	1.94 H	101	27.0	12.6
9	#17160.00	50.1 PK	68.2	-18.1	2.83 H	275	34.2	15.9
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	5460.00	55.1 PK	74.0	-18.9	1.63 V	250	53.5	1.6
2	5460.00	43.3 AV	54.0	-10.7	1.63 V	250	41.7	1.6
3	#5470.00	56.7 PK	68.2	-11.5	1.63 V	250	55.1	1.6
4	*5720.00	120.7 PK			1.63 V	250	118.8	1.9
5	*5720.00	110.7 AV			1.63 V	250	108.8	1.9
6	#5850.00	54.5 PK	68.2	-13.7	1.63 V	250	52.2	2.3
7	11440.00	46.9 PK	74.0	-27.1	2.89 V	261	34.3	12.6
8	11440.00	36.3 AV	54.0	-17.7	2.89 V	261	23.7	12.6
9	#17160.00	48.7 PK	68.2	-19.5	2.09 V	156	32.8	15.9

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 52 : 5260 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	50.3 PK	74.0	-23.7	1.11 H	184	48.6	1.7
2	5150.00	40.0 AV	54.0	-14.0	1.11 H	184	38.3	1.7
3	*5260.00	109.9 PK			1.11 H	184	108.7	1.2
4	*5260.00	100.0 AV			1.11 H	184	98.8	1.2
5	#10520.00	51.0 PK	68.2	-17.2	2.01 H	110	39.6	11.4
6	15780.00	50.3 PK	74.0	-23.7	2.76 H	273	39.6	10.7
7	15780.00	39.2 AV	54.0	-14.8	2.76 H	273	28.5	10.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	53.4 PK	74.0	-20.6	2.56 V	162	51.7	1.7
2	5150.00	42.6 AV	54.0	-11.4	2.56 V	162	40.9	1.7
3	*5260.00	120.7 PK			2.56 V	162	119.5	1.2
4	*5260.00	109.0 AV			2.56 V	162	107.8	1.2
5	#10520.00	46.4 PK	68.2	-21.8	2.91 V	266	35.0	11.4
6	15780.00	49.4 PK	74.0	-24.6	2.04 V	153	38.7	10.7
7	15780.00	38.9 AV	54.0	-15.1	2.04 V	153	28.2	10.7

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 60 : 5300 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	112.0 PK			3.00 H	138	110.8	1.2
2	*5300.00	100.7 AV			3.00 H	138	99.5	1.2
3	10600.00	50.8 PK	74.0	-23.2	1.91 H	111	39.0	11.8
4	10600.00	39.2 AV	54.0	-14.8	1.91 H	111	27.4	11.8
5	15900.00	49.2 PK	74.0	-24.8	2.80 H	296	38.5	10.7
6	15900.00	38.8 AV	54.0	-15.2	2.80 H	296	28.1	10.7
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	*5300.00	120.9 PK			2.60 V	150	119.7	1.2
2	*5300.00	109.3 AV			2.60 V	150	108.1	1.2
3	10600.00	46.8 PK	74.0	-27.2	2.92 V	269	35.0	11.8
4	10600.00	36.1 AV	54.0	-17.9	2.92 V	269	24.3	11.8
5	15900.00	49.0 PK	74.0	-25.0	2.05 V	150	38.3	10.7
6	15900.00	38.5 AV	54.0	-15.5	2.05 V	150	27.8	10.7

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 64 : 5320 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	111.3 PK			2.44 H	139	109.9	1.4
2	*5320.00	100.1 AV			2.44 H	139	98.7	1.4
3	5350.00	62.1 PK	74.0	-11.9	2.44 H	139	60.7	1.4
4	5350.00	46.7 AV	54.0	-7.3	2.44 H	139	45.3	1.4
5	10640.00	50.6 PK	74.0	-23.4	1.85 H	107	38.7	11.9
6	10640.00	39.4 AV	54.0	-14.6	1.85 H	107	27.5	11.9
7	15960.00	49.8 PK	74.0	-24.2	2.74 H	274	38.9	10.9
8	15960.00	38.8 AV	54.0	-15.2	2.74 H	274	27.9	10.9
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	*5320.00	118.1 PK			2.54 V	164	116.7	1.4
2	*5320.00	108.2 AV			2.54 V	164	106.8	1.4
3	5350.00	70.1 PK	74.0	-3.9	2.54 V	164	68.7	1.4
4	5350.00	53.5 AV	54.0	-0.5	2.54 V	164	52.1	1.4
5	10640.00	47.5 PK	74.0	-26.5	2.98 V	274	35.6	11.9
6	10640.00	36.6 AV	54.0	-17.4	2.98 V	274	24.7	11.9
7	15960.00	48.5 PK	74.0	-25.5	2.04 V	152	37.6	10.9
8	15960.00	38.0 AV	54.0	-16.0	2.04 V	152	27.1	10.9

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 100 : 5500 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	52.2 PK	74.0	-21.8	3.00 H	139	50.6	1.6
2	5460.00	40.7 AV	54.0	-13.3	3.00 H	139	39.1	1.6
3	#5470.00	54.5 PK	68.2	-13.7	3.00 H	139	52.9	1.6
4	*5500.00	112.3 PK			3.00 H	139	110.6	1.7
5	*5500.00	101.1 AV			3.00 H	139	99.4	1.7
6	11000.00	50.8 PK	74.0	-23.2	1.88 H	103	38.6	12.2
7	11000.00	39.6 AV	54.0	-14.4	1.88 H	103	27.4	12.2
8	#16500.00	50.1 PK	68.2	-18.1	2.76 H	274	36.7	13.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	56.6 PK	74.0	-17.4	2.78 V	198	55.0	1.6
2	5460.00	44.2 AV	54.0	-9.8	2.78 V	198	42.6	1.6
3	#5470.00	63.8 PK	68.2	-4.4	2.78 V	198	62.2	1.6
4	*5500.00	118.4 PK			2.78 V	198	116.7	1.7
5	*5500.00	108.1 AV			2.78 V	198	106.4	1.7
6	11000.00	46.4 PK	74.0	-27.6	2.87 V	266	34.2	12.2
7	11000.00	36.0 AV	54.0	-18.0	2.87 V	266	23.8	12.2
8	#16500.00	49.4 PK	68.2	-18.8	2.10 V	158	36.0	13.4

Remarks:

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

RF Mode	TX 802.11ac (VHT20)	Channel	CH 116 : 5580 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	*5580.00	112.2 PK			3.13 H	147	110.5	1.7
2	*5580.00	100.8 AV			3.13 H	147	99.1	1.7
3	11160.00	51.2 PK	74.0	-22.8	1.87 H	119	39.6	11.6
4	11160.00	39.7 AV	54.0	-14.3	1.87 H	119	28.1	11.6
5	#16740.00	49.3 PK	68.2	-18.9	2.82 H	285	34.6	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	*5580.00	118.3 PK			2.74 V	199	116.6	1.7
2	*5580.00	107.9 AV			2.74 V	199	106.2	1.7
3	11160.00	47.0 PK	74.0	-27.0	3.00 V	251	35.4	11.6
4	11160.00	36.3 AV	54.0	-17.7	3.00 V	251	24.7	11.6
5	#16740.00	49.1 PK	68.2	-19.1	2.03 V	172	34.4	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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 140 : 5700 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	112.0 PK			3.09 H	153	110.2	1.8
2	*5700.00	101.0 AV			3.09 H	153	99.2	1.8
3	#5725.00	62.1 PK	68.2	-6.1	3.09 H	153	60.2	1.9
4	11400.00	50.7 PK	74.0	-23.3	1.95 H	107	37.9	12.8
5	11400.00	39.9 AV	54.0	-14.1	1.95 H	107	27.1	12.8
6	#17100.00	50.0 PK	68.2	-18.2	2.80 H	290	33.7	16.3
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	122.3 PK			1.64 V	264	120.5	1.8
2	*5700.00	110.7 AV			1.64 V	264	108.9	1.8
3	#5725.00	67.1 PK	68.2	-1.1	1.64 V	264	65.2	1.9
4	11400.00	46.5 PK	74.0	-27.5	2.86 V	268	33.7	12.8
5	11400.00	36.2 AV	54.0	-17.8	2.86 V	268	23.4	12.8
6	#17100.00	49.8 PK	68.2	-18.4	2.07 V	159	33.5	16.3

Remarks:

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

RF Mode	TX 802.11ac (VHT20)	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	54.0 PK	74.0	-20.0	3.06 H	140	52.4	1.6
2	5460.00	41.7 AV	54.0	-12.3	3.06 H	140	40.1	1.6
3	#5470.00	55.8 PK	68.2	-12.4	3.06 H	140	54.2	1.6
4	*5720.00	112.1 PK			3.06 H	140	110.2	1.9
5	*5720.00	100.9 AV			3.06 H	140	99.0	1.9
6	#5850.00	54.7 PK	68.2	-13.5	3.06 H	140	52.4	2.3
7	11440.00	50.3 PK	74.0	-23.7	1.94 H	105	37.7	12.6
8	11440.00	39.3 AV	54.0	-14.7	1.94 H	105	26.7	12.6
9	#17160.00	50.2 PK	68.2	-18.0	2.87 H	267	34.3	15.9
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	5460.00	55.8 PK	74.0	-18.2	2.52 V	179	54.2	1.6
2	5460.00	43.8 AV	54.0	-10.2	2.52 V	179	42.2	1.6
3	#5470.00	56.6 PK	68.2	-11.6	2.52 V	179	55.0	1.6
4	*5720.00	120.9 PK			2.52 V	179	119.0	1.9
5	*5720.00	109.2 AV			2.52 V	179	107.3	1.9
6	#5850.00	55.1 PK	68.2	-13.1	2.52 V	179	52.8	2.3
7	11440.00	46.7 PK	74.0	-27.3	2.97 V	265	34.1	12.6
8	11440.00	36.2 AV	54.0	-17.8	2.97 V	265	23.6	12.6
9	#17160.00	49.2 PK	68.2	-19.0	2.02 V	169	33.3	15.9

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 54 : 5270 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5139.00	57.1 PK	74.0	-16.9	1.50 H	67	55.4	1.7
2	5139.00	44.8 AV	54.0	-9.2	1.50 H	67	43.1	1.7
3	*5270.00	107.6 PK			1.50 H	67	106.4	1.2
4	*5270.00	97.7 AV			1.50 H	67	96.5	1.2
5	#10540.00	51.0 PK	68.2	-17.2	1.90 H	107	39.5	11.5
6	15810.00	50.2 PK	74.0	-23.8	2.75 H	278	39.6	10.6
7	15810.00	38.6 AV	54.0	-15.4	2.75 H	278	28.0	10.6
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	5145.53	68.7 PK	74.0	-5.3	2.56 V	163	67.0	1.7
2	5145.53	51.8 AV	54.0	-2.2	2.56 V	163	50.1	1.7
3	*5270.00	117.0 PK			2.56 V	163	115.8	1.2
4	*5270.00	107.1 AV			2.56 V	163	105.9	1.2
5	#10540.00	47.6 PK	68.2	-20.6	2.96 V	280	36.1	11.5
6	15810.00	48.6 PK	74.0	-25.4	1.99 V	166	38.0	10.6
7	15810.00	38.0 AV	54.0	-16.0	1.99 V	166	27.4	10.6

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 62 : 5310 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	104.6 PK			1.61 H	67	103.3	1.3
2	*5310.00	95.9 AV			1.61 H	67	94.6	1.3
3	5350.00	57.2 PK	74.0	-16.8	1.61 H	67	55.8	1.4
4	5350.00	42.5 AV	54.0	-11.5	1.61 H	67	41.1	1.4
5	10620.00	49.5 PK	74.0	-24.5	1.91 H	108	37.7	11.8
6	10620.00	38.3 AV	54.0	-15.7	1.91 H	108	26.5	11.8
7	15930.00	50.1 PK	74.0	-23.9	2.77 H	275	39.3	10.8
8	15930.00	39.0 AV	54.0	-15.0	2.77 H	275	28.2	10.8
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	114.9 PK			2.54 V	163	113.6	1.3
2	*5310.00	104.3 AV			2.54 V	163	103.0	1.3
3	5350.00	70.9 PK	74.0	-3.1	2.54 V	163	69.5	1.4
4	5350.00	53.2 AV	54.0	-0.8	2.54 V	163	51.8	1.4
5	10620.00	46.9 PK	74.0	-27.1	2.98 V	254	35.1	11.8
6	10620.00	36.1 AV	54.0	-17.9	2.98 V	254	24.3	11.8
7	15930.00	49.0 PK	74.0	-25.0	1.98 V	177	38.2	10.8
8	15930.00	38.3 AV	54.0	-15.7	1.98 V	177	27.5	10.8

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 102 : 5510 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	53.2 PK	74.0	-20.8	1.69 H	319	51.6	1.6
2	5460.00	41.1 AV	54.0	-12.9	1.69 H	319	39.5	1.6
3	#5470.00	59.3 PK	68.2	-8.9	1.69 H	319	57.7	1.6
4	*5510.00	106.4 PK			1.69 H	319	104.7	1.7
5	*5510.00	96.7 AV			1.69 H	319	95.0	1.7
6	11020.00	49.7 PK	74.0	-24.3	1.86 H	105	37.6	12.1
7	11020.00	38.6 AV	54.0	-15.4	1.86 H	105	26.5	12.1
8	#16530.00	50.4 PK	68.2	-17.8	2.82 H	285	36.8	13.6
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	59.1 PK	74.0	-14.9	1.72 V	258	57.5	1.6
2	5460.00	47.3 AV	54.0	-6.7	1.72 V	258	45.7	1.6
3	#5467.00	66.3 PK	68.2	-1.9	1.72 V	258	64.7	1.6
4	*5510.00	115.2 PK			1.72 V	258	113.5	1.7
5	*5510.00	104.8 AV			1.72 V	258	103.1	1.7
6	11020.00	47.9 PK	74.0	-26.1	2.99 V	275	35.8	12.1
7	11020.00	36.8 AV	54.0	-17.2	2.99 V	275	24.7	12.1
8	#16530.00	48.7 PK	68.2	-19.5	2.10 V	139	35.1	13.6

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 110 : 5550 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	*5550.00	108.1 PK			1.68 H	321	106.4	1.7
2	*5550.00	98.0 AV			1.68 H	321	96.3	1.7
3	11100.00	51.4 PK	74.0	-22.6	1.84 H	111	39.8	11.6
4	11100.00	39.7 AV	54.0	-14.3	1.84 H	111	28.1	11.6
5	#16650.00	49.5 PK	68.2	-18.7	2.76 H	287	35.0	14.5
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	*5550.00	119.3 PK			1.78 V	271	117.6	1.7
2	*5550.00	108.9 AV			1.78 V	271	107.2	1.7
3	11100.00	47.5 PK	74.0	-26.5	3.04 V	252	35.9	11.6
4	11100.00	36.7 AV	54.0	-17.3	3.04 V	252	25.1	11.6
5	#16650.00	48.8 PK	68.2	-19.4	2.07 V	177	34.3	14.5

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 134 : 5670 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	106.3 PK			1.71 H	316	104.5	1.8
2	*5670.00	95.7 AV			1.71 H	316	93.9	1.8
3	#5725.00	60.2 PK	68.2	-8.0	1.71 H	316	58.3	1.9
4	11340.00	50.8 PK	74.0	-23.2	1.96 H	93	38.3	12.5
5	11340.00	39.7 AV	54.0	-14.3	1.96 H	93	27.2	12.5
6	#17010.00	50.6 PK	68.2	-17.6	2.70 H	276	34.4	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	*5670.00	117.3 PK			1.64 V	266	115.5	1.8
2	*5670.00	107.3 AV			1.64 V	266	105.5	1.8
3	#5725.00	66.3 PK	68.2	-1.9	1.64 V	266	64.4	1.9
4	11340.00	47.6 PK	74.0	-26.4	3.01 V	268	35.1	12.5
5	11340.00	36.7 AV	54.0	-17.3	3.01 V	268	24.2	12.5
6	#17010.00	48.3 PK	68.2	-19.9	2.14 V	151	32.1	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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 142 : 5710 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	53.6 PK	74.0	-20.4	1.63 H	330	52.0	1.6
2	5460.00	42.6 AV	54.0	-11.4	1.63 H	330	41.0	1.6
3	#5470.00	55.5 PK	68.2	-12.7	1.63 H	330	53.9	1.6
4	*5710.00	107.3 PK			1.63 H	330	105.5	1.8
5	*5710.00	97.8 AV			1.63 H	330	96.0	1.8
6	#5850.00	55.7 PK	68.2	-12.5	1.63 H	330	53.4	2.3
7	11420.00	50.8 PK	74.0	-23.2	1.86 H	107	38.1	12.7
8	11420.00	39.2 AV	54.0	-14.8	1.86 H	107	26.5	12.7
9	#17130.00	50.0 PK	68.2	-18.2	2.73 H	284	33.9	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	5460.00	55.4 PK	74.0	-18.6	1.64 V	265	53.8	1.6
2	5460.00	44.1 AV	54.0	-9.9	1.64 V	265	42.5	1.6
3	#5470.00	57.2 PK	68.2	-11.0	1.64 V	265	55.6	1.6
4	*5710.00	119.4 PK			1.64 V	265	117.6	1.8
5	*5710.00	109.1 AV			1.64 V	265	107.3	1.8
6	#5850.00	54.8 PK	68.2	-13.4	1.64 V	265	52.5	2.3
7	11420.00	47.2 PK	74.0	-26.8	3.04 V	263	34.5	12.7
8	11420.00	36.5 AV	54.0	-17.5	3.04 V	263	23.8	12.7
9	#17130.00	48.5 PK	68.2	-19.7	2.06 V	188	32.4	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.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 58 : 5290 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5137.30	60.5 PK	74.0	-13.5	1.49 H	68	58.8	1.7
2	5137.30	46.1 AV	54.0	-7.9	1.49 H	68	44.4	1.7
3	*5290.00	103.1 PK			1.49 H	68	101.9	1.2
4	*5290.00	92.6 AV			1.49 H	68	91.4	1.2
5	5358.29	56.7 PK	74.0	-17.3	1.49 H	68	55.3	1.4
6	5358.29	43.4 AV	54.0	-10.6	1.49 H	68	42.0	1.4
7	#10580.00	51.0 PK	68.2	-17.2	2.00 H	100	39.3	11.7
8	15870.00	50.5 PK	74.0	-23.5	2.65 H	275	39.9	10.6
9	15870.00	38.7 AV	54.0	-15.3	2.65 H	275	28.1	10.6
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	5142.53	68.9 PK	74.0	-5.1	2.51 V	164	67.2	1.7
2	5142.53	53.8 AV	54.0	-0.2	2.51 V	164	52.1	1.7
3	*5290.00	110.8 PK			2.51 V	164	109.6	1.2
4	*5290.00	101.9 AV			2.51 V	164	100.7	1.2
5	5354.00	59.5 PK	74.0	-14.5	2.51 V	164	58.1	1.4
6	5354.00	48.1 AV	54.0	-5.9	2.51 V	164	46.7	1.4
7	#10580.00	48.0 PK	68.2	-20.2	2.92 V	278	36.3	11.7
8	15870.00	49.0 PK	74.0	-25.0	2.00 V	159	38.4	10.6
9	15870.00	38.2 AV	54.0	-15.8	2.00 V	159	27.6	10.6

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.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 106 : 5530 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5452.00	55.6 PK	74.0	-18.4	1.70 H	320	54.0	1.6
2	5452.00	43.6 AV	54.0	-10.4	1.70 H	320	42.0	1.6
3	#5467.00	57.6 PK	68.2	-10.6	1.70 H	320	56.0	1.6
4	*5530.00	101.1 PK			1.70 H	320	99.4	1.7
5	*5530.00	91.3 AV			1.70 H	320	89.6	1.7
6	#5725.00	51.4 PK	68.2	-16.8	1.70 H	320	49.5	1.9
7	11060.00	50.1 PK	74.0	-23.9	1.85 H	94	38.3	11.8
8	11060.00	38.8 AV	54.0	-15.2	1.85 H	94	27.0	11.8
9	#16590.00	49.5 PK	68.2	-18.7	2.74 H	281	35.3	14.2
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	5449.00	63.9 PK	74.0	-10.1	1.60 V	262	62.3	1.6
2	5449.00	50.9 AV	54.0	-3.1	1.60 V	262	49.3	1.6
3	#5468.00	66.3 PK	68.2	-1.9	1.60 V	262	64.7	1.6
4	*5530.00	109.1 PK			1.60 V	262	107.4	1.7
5	*5530.00	99.8 AV			1.60 V	262	98.1	1.7
6	#5725.00	53.3 PK	68.2	-14.9	1.60 V	262	51.4	1.9
7	11060.00	48.4 PK	74.0	-25.6	2.92 V	280	36.6	11.8
8	11060.00	37.3 AV	54.0	-16.7	2.92 V	280	25.5	11.8
9	#16590.00	48.6 PK	68.2	-19.6	2.04 V	154	34.4	14.2

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.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 122 : 5610 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	104.6 PK			1.66 H	314	103.0	1.6
2	*5610.00	94.4 AV			1.66 H	314	92.8	1.6
3	#5725.00	58.2 PK	68.2	-10.0	1.66 H	314	56.3	1.9
4	11220.00	50.5 PK	74.0	-23.5	1.95 H	90	38.8	11.7
5	11220.00	39.5 AV	54.0	-14.5	1.95 H	90	27.8	11.7
6	#16830.00	50.7 PK	68.2	-17.5	2.74 H	269	35.6	15.1
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	114.1 PK			1.62 V	263	112.5	1.6
2	*5610.00	104.2 AV			1.62 V	263	102.6	1.6
3	#5725.00	66.0 PK	68.2	-2.2	1.62 V	263	64.1	1.9
4	11220.00	47.1 PK	74.0	-26.9	3.02 V	264	35.4	11.7
5	11220.00	36.1 AV	54.0	-17.9	3.02 V	264	24.4	11.7
6	#16830.00	49.3 PK	68.2	-18.9	1.99 V	166	34.2	15.1

Remarks:

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

RF Mode	TX 802.11ac (VHT80)	Channel	CH 138 : 5690 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	53.9 PK	74.0	-20.1	1.71 H	321	52.3	1.6
2	5460.00	42.4 AV	54.0	-11.6	1.71 H	321	40.8	1.6
3	#5470.00	56.8 PK	68.2	-11.4	1.71 H	321	55.2	1.6
4	*5690.00	105.2 PK			1.71 H	321	103.5	1.7
5	*5690.00	94.8 AV			1.71 H	321	93.1	1.7
6	#5850.00	56.0 PK	68.2	-12.2	1.71 H	321	53.7	2.3
7	11380.00	50.0 PK	74.0	-24.0	1.95 H	102	37.4	12.6
8	11380.00	38.5 AV	54.0	-15.5	1.95 H	102	25.9	12.6
9	#17070.00	49.8 PK	68.2	-18.4	2.77 H	276	33.6	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	57.0 PK	74.0	-17.0	1.63 V	264	55.4	1.6
2	5460.00	45.9 AV	54.0	-8.1	1.63 V	264	44.3	1.6
3	#5470.00	59.0 PK	68.2	-9.2	1.63 V	264	57.4	1.6
4	*5690.00	114.4 PK			1.63 V	264	112.7	1.7
5	*5690.00	106.3 AV			1.63 V	264	104.6	1.7
6	#5850.00	66.2 PK	68.2	-2.0	1.63 V	264	63.9	2.3
7	11380.00	47.2 PK	74.0	-26.8	3.03 V	262	34.6	12.6
8	11380.00	36.3 AV	54.0	-17.7	3.03 V	262	23.7	12.6
9	#17070.00	48.9 PK	68.2	-19.3	2.08 V	180	32.7	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.

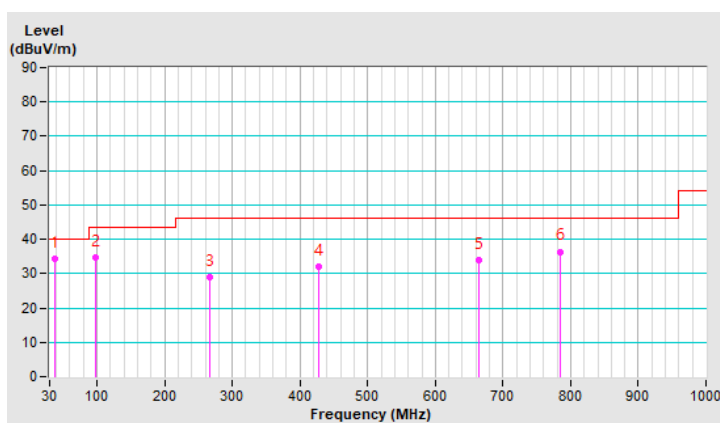
Below 1GHz Data:

RF Mode	TX 802.11ac (VHT40)	Channel	CH 62 : 5310 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	38.11	34.1 QP	40.0	-5.9	1.50 H	234	47.1	-13.0
2	97.35	34.6 QP	43.5	-8.9	1.00 H	340	52.0	-17.4
3	266.75	29.1 QP	46.0	-16.9	1.50 H	300	42.3	-13.2
4	428.50	32.1 QP	46.0	-13.9	1.50 H	143	40.8	-8.7
5	664.15	33.8 QP	46.0	-12.2	1.00 H	35	37.9	-4.1
6	784.51	36.4 QP	46.0	-9.6	1.50 H	253	38.7	-2.3

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.

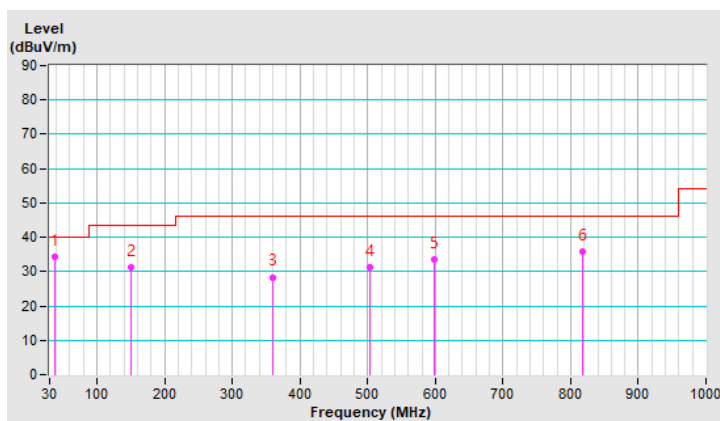


RF Mode	TX 802.11ac (VHT40)	Channel	CH 62 : 5310 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	37.46	34.2 QP	40.0	-5.8	1.50 V	134	47.4	-13.2
2	150.21	31.1 QP	43.5	-12.4	1.50 V	330	43.5	-12.4
3	359.18	28.4 QP	46.0	-17.6	1.50 V	124	39.1	-10.7
4	502.68	31.4 QP	46.0	-14.6	1.00 V	360	38.8	-7.4
5	598.43	33.5 QP	46.0	-12.5	1.50 V	164	38.4	-4.9
6	817.68	35.7 QP	46.0	-10.3	1.00 V	236	37.8	-2.1

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.



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: June 02, 2020

4.2.3 Test Procedure

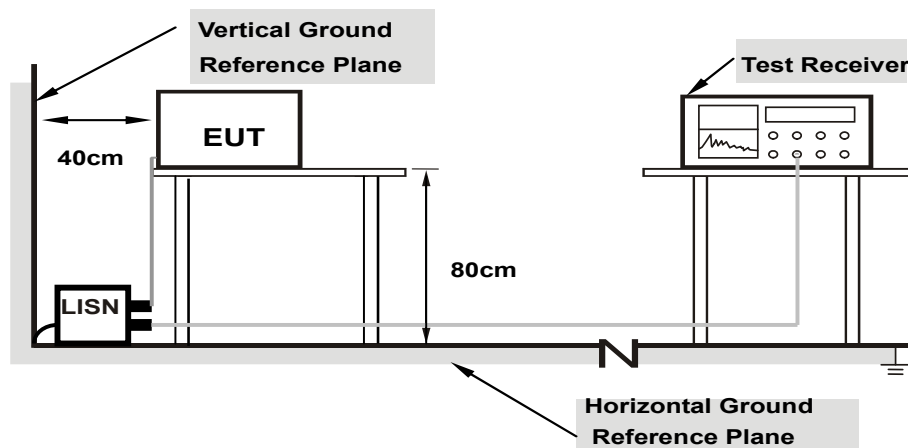
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

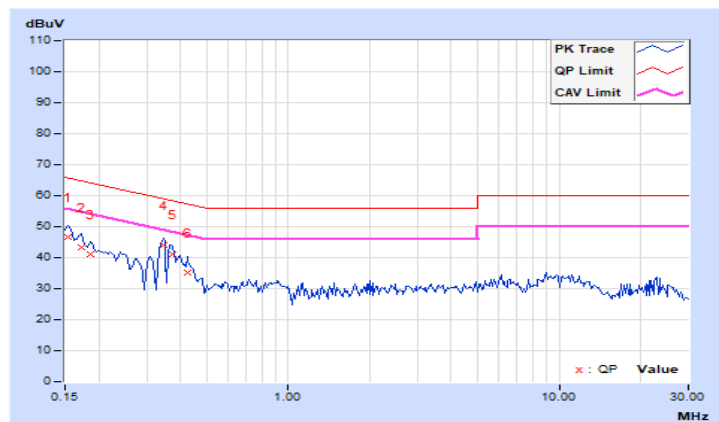
4.2.7 Test Results

RF Mode	TX 802.11ac (VHT40)	Channel	CH 62 : 5310 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

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	0.15391	10.03	36.54	22.00	46.57	32.03	65.79	55.79	-19.22	-23.76
2	0.17344	10.03	33.48	20.76	43.51	30.79	64.79	54.79	-21.28	-24.00
3	0.18516	10.04	31.08	18.50	41.12	28.54	64.25	54.25	-23.13	-25.71
4	0.34531	10.05	33.87	28.11	43.92	38.16	59.07	49.07	-15.15	-10.91
5	0.37266	10.05	31.14	26.16	41.19	36.21	58.44	48.44	-17.25	-12.23
6	0.42344	10.05	25.06	17.96	35.11	28.01	57.38	47.38	-22.27	-19.37

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

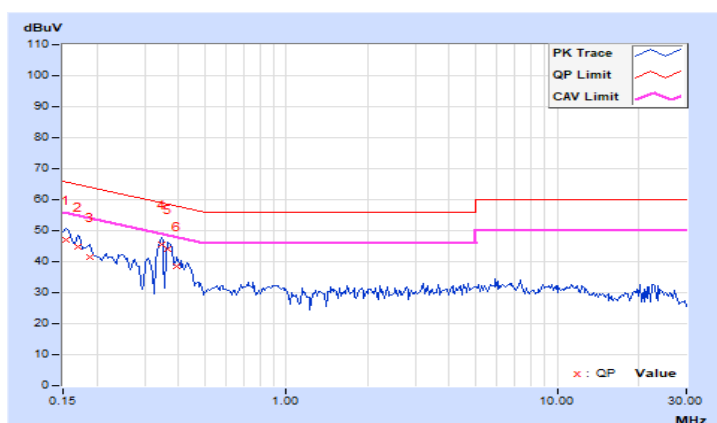


RF Mode	TX 802.11ac (VHT40)	Channel	CH 62 : 5310 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.02	37.00	22.50	47.02	32.52	65.79	55.79	-18.77	-23.27
2	0.16953	10.02	34.82	22.08	44.84	32.10	64.98	54.98	-20.14	-22.88
3	0.18906	10.03	31.28	18.19	41.31	28.22	64.08	54.08	-22.77	-25.86
4	0.34531	10.04	35.49	30.15	45.53	40.19	59.07	49.07	-13.54	-8.88
5	0.36484	10.04	33.92	25.74	43.96	35.78	58.62	48.62	-14.66	-12.84
6	0.39609	10.04	28.37	21.17	38.41	31.21	57.93	47.93	-19.52	-16.72

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

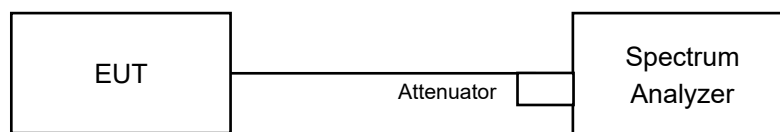
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

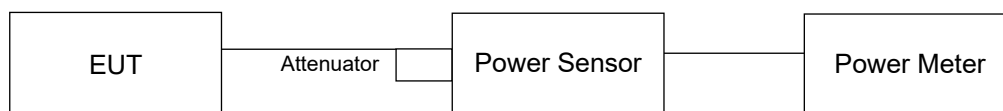
4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

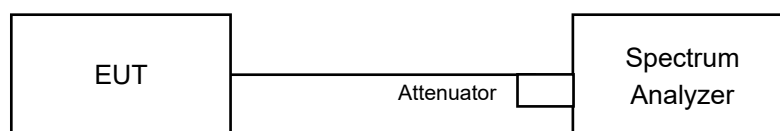
For channel straddling 5725MHz:



For other channels:



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

For channel straddling 5725MHz:

For 802.11ac (VHT20)

Follow FCC KDB 789033 UNII test procedure:

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

For other modulation mode

Follow FCC KDB 789033 UNII test procedure:

Method SA-2

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

For other channels:

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

Power Output:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.31	18.84	144.324	21.59	23.87	Pass
60	5300	18.46	19.06	150.683	21.78	23.90	Pass
64	5320	18.85	18.89	154.182	21.88	23.88	Pass
100	5500	18.36	18.14	133.712	21.26	23.97	Pass
116	5580	18.66	18.52	144.573	21.60	24.00	Pass
140	5700	18.73	18.50	145.439	21.63	24.00	Pass
*144 (U-NII-2C Band)	5720	15.79	16.67	87.95	19.44	22.73	Pass
*144 (U-NII-3 Band)	5720	9.73	9.87	19.91	12.99	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit					
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)		
52	5260	19.39	23.87	<	24
60	5300	19.52	23.9	<	24
64	5320	19.45	23.88	<	24
100	5500	19.86	23.97	<	24
116	5580	20.22	24.05	>	24
140	5700	19.98	24	=	24
144 (U-NII-2C Band)	5720	14.92	22.73	<	24

Note: For U-NII-2A U-NII-2C Band 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				
52	5260	18.42	19.22	153.063	21.85	24.00	Pass
60	5300	18.59	19.37	158.774	22.01	24.00	Pass
64	5320	18.93	19.23	161.916	22.09	24.00	Pass
100	5500	18.49	18.28	137.929	21.40	24.00	Pass
116	5580	18.62	18.54	144.228	21.59	24.00	Pass
140	5700	18.67	18.46	143.766	21.58	24.00	Pass
*144 (U-NII-2C Band)	5720	17.16	16.72	98.989	19.96	22.90	Pass
*144 (U-NII-3 Band)	5720	10.96	10.96	24.948	13.97	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

Determined Power Limit					
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)		
52	5260	20.58	24.13	>	24
60	5300	20.61	24.14	>	24
64	5320	20.55	24.12	>	24
100	5500	20.76	24.17	>	24
116	5580	20.78	24.17	>	24
140	5700	20.94	24.2	>	24
144 (U-NII-2C Band)	5720	15.52	22.9	<	24

Note: For U-NII-2A U-NII-2C Band 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				
54	5270	20.20	21.08	232.946	23.67	24.00	Pass
62	5310	20.69	20.99	242.823	23.85	24.00	Pass
102	5510	18.83	18.54	147.833	21.70	24.00	Pass
110	5550	20.56	20.37	222.656	23.48	24.00	Pass
134	5670	20.53	20.48	224.666	23.52	24.00	Pass
*142 (U-NII-2C Band)	5710	19.11	18.42	156.558	21.95	24.00	Pass
*142 (U-NII-3 Band)	5710	7.28	5.93	9.606	9.83	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit					
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)		
54	5270	50.77	28.05	>	24
62	5310	59.49	28.74	>	24
102	5510	40.63	27.08	>	24
110	5550	40.97	27.12	>	24
134	5670	40.8	27.1	>	24
142 (U-NII-2C Band)	5710	35.41	26.49	>	24

Note: For U-NII-2A U-NII-2C Band 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				
58	5290	20.04	20.53	213.905	23.30	24.00	Pass
106	5530	17.62	17.27	111.143	20.46	24.00	Pass
122	5610	19.77	19.93	193.243	22.86	24.00	Pass
*138 (U-NII-2C Band)	5690	17.29	18.02	125.023	20.97	24.00	Pass
*138 (U-NII-3 Band)	5690	2.76	4.13	4.785	6.80	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit					
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)		
58	5290	86.78	30.38	>	24
106	5530	84.28	30.25	>	24
122	5610	84.34	30.26	>	24
138 (U-NII-2C Band)	5690	77.21	29.87	>	24

Note: For U-NII-2A U-NII-2C Band 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				
52	5260	18.42	19.22	153.063	21.85	22.19	Pass
60	5300	18.59	19.37	158.774	22.01	22.19	Pass
64	5320	18.93	19.23	161.916	22.09	22.19	Pass
100	5500	18.49	18.28	137.929	21.40	21.71	Pass
116	5580	18.62	18.54	144.228	21.59	21.71	Pass
140	5700	18.67	18.46	143.766	21.58	21.71	Pass
*144 (U-NII-2C Band)	5720	17.16	16.72	98.989	19.96	20.61	Pass
*144 (U-NII-3 Band)	5720	10.96	10.96	24.948	13.97	27.71	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

For U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81 \text{ dBi} > 6 \text{ dBi}$, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.81-6)".

For U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(8.29-6)".

For U-NII-3: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, so the power limit shall be reduced to $30-(8.29-6) = 27.71 \text{ dBm}$.

Determined Power Limit					
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)		
52	5260	20.58	24.13	>	24
60	5300	20.61	24.14	>	24
64	5320	20.55	24.12	>	24
100	5500	20.76	24.17	>	24
116	5580	20.78	24.17	>	24
140	5700	20.94	24.2	>	24
144 (U-NII-2C Band)	5720	15.52	22.9	<	24

Note: For U-NII-2A U-NII-2C Band 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				
54	5270	18.21	19.23	149.975	21.76	22.19	Pass
62	5310	18.61	19.15	154.835	21.90	22.19	Pass
102	5510	18.39	18.01	132.265	21.21	21.71	Pass
110	5550	18.54	18.25	138.284	21.41	21.71	Pass
134	5670	18.50	18.42	140.297	21.47	21.71	Pass
*142 (U-NII-2C Band)	5710	16.89	16.41	96.043	19.82	21.71	Pass
*142 (U-NII-3 Band)	5710	4.72	4.69	6.128	7.87	27.71	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

For U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81 \text{ dBi} > 6 \text{ dBi}$, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.81-6)".

For U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(8.29-6)".

For U-NII-3: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, so the power limit shall be reduced to $30-(8.29-6) = 27.71 \text{ dBm}$.

Determined Power Limit					
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)		
54	5270	50.77	28.05	>	24
62	5310	59.49	28.74	>	24
102	5510	40.63	27.08	>	24
110	5550	40.97	27.12	>	24
134	5670	40.8	27.1	>	24
142 (U-NII-2C Band)	5710	35.41	26.49	>	24

Note: For U-NII-2A U-NII-2C Band 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				
58	5290	18.31	19.23	151.517	21.80	22.19	Pass
106	5530	17.62	17.27	111.143	20.46	21.71	Pass
122	5610	18.27	18.39	136.167	21.34	21.71	Pass
*138 (U-NII-2C Band)	5690	15.64	15.54	77.444	18.89	21.71	Pass
*138 (U-NII-3 Band)	5690	3.09	1.80	3.795	5.79	27.71	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

For U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81 \text{ dBi} > 6 \text{ dBi}$, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.81-6)".

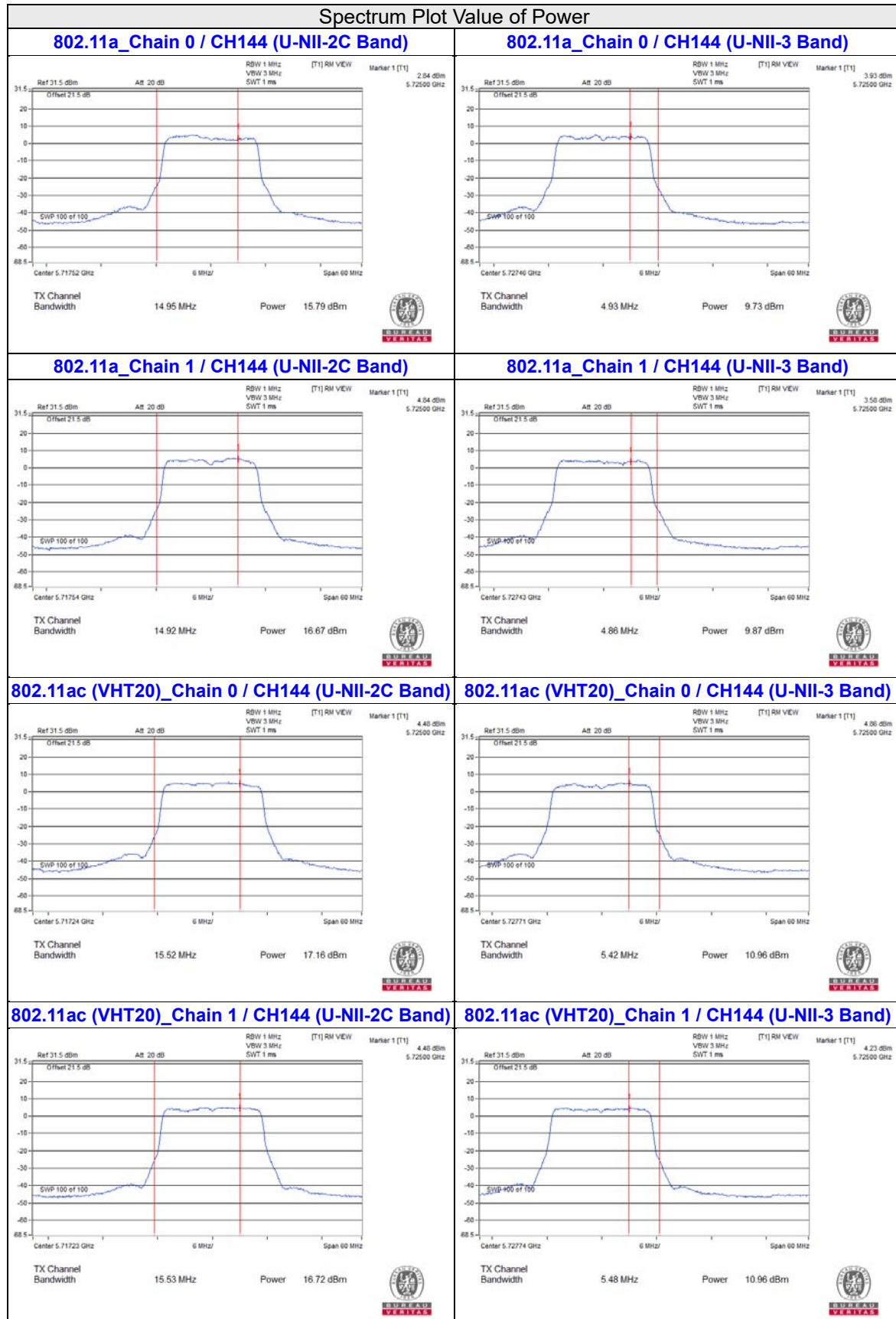
For U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(8.29-6)".

For U-NII-3: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, so the power limit shall be reduced to $30-(8.29-6) = 27.71 \text{ dBm}$.

Determined Power Limit					
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)		
58	5290	86.78	30.38	>	24
106	5530	84.28	30.25	>	24
122	5610	84.34	30.26	>	24
138 (U-NII-2C Band)	5690	77.21	29.87	>	24

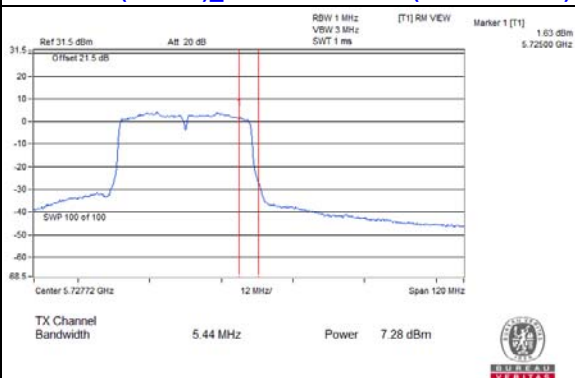
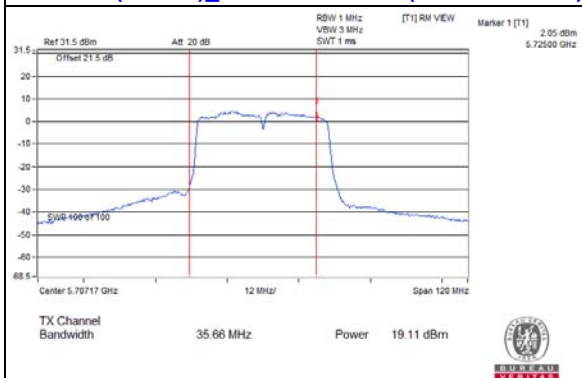
Note: For U-NII-2A U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

For channel straddling 5725MHz of Power
CDD Mode

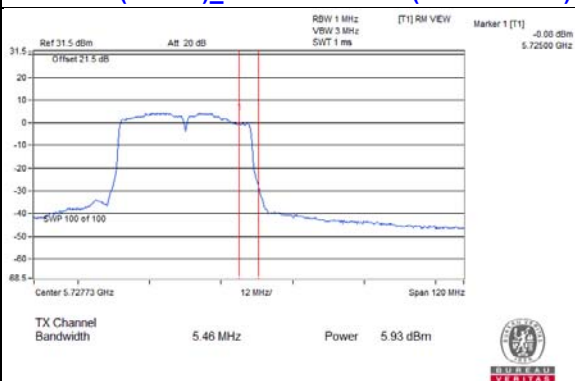
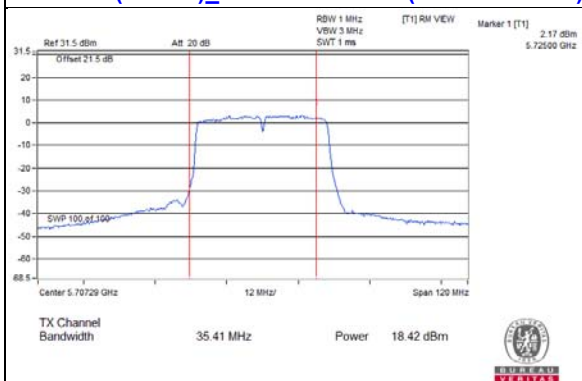


Spectrum Plot Value of Power

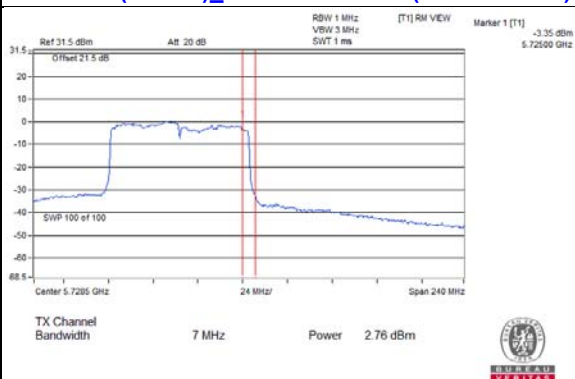
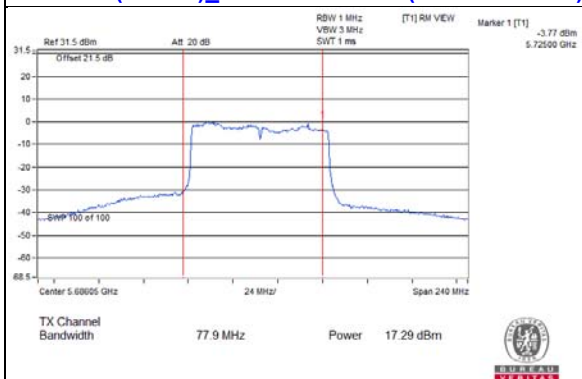
802.11ac (VHT40)_Chain 0 / CH142 (U-NII-2C Band) 802.11ac (VHT40)_Chain 0 / CH142 (U-NII-3 Band)



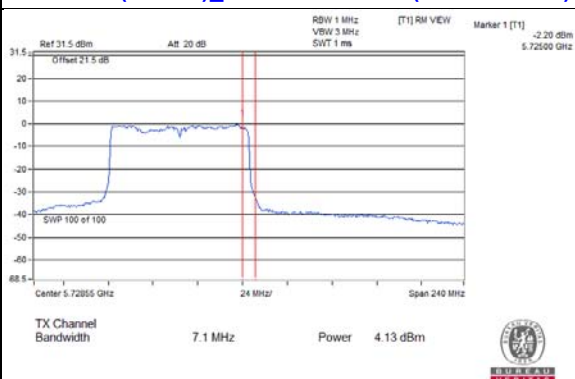
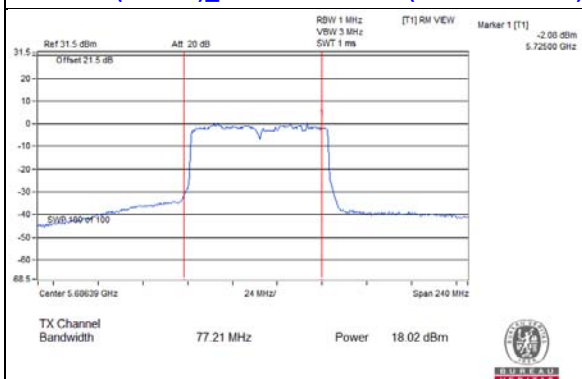
802.11ac (VHT40)_Chain 1 / CH142 (U-NII-2C Band) 802.11ac (VHT40)_Chain 1 / CH142 (U-NII-3 Band)



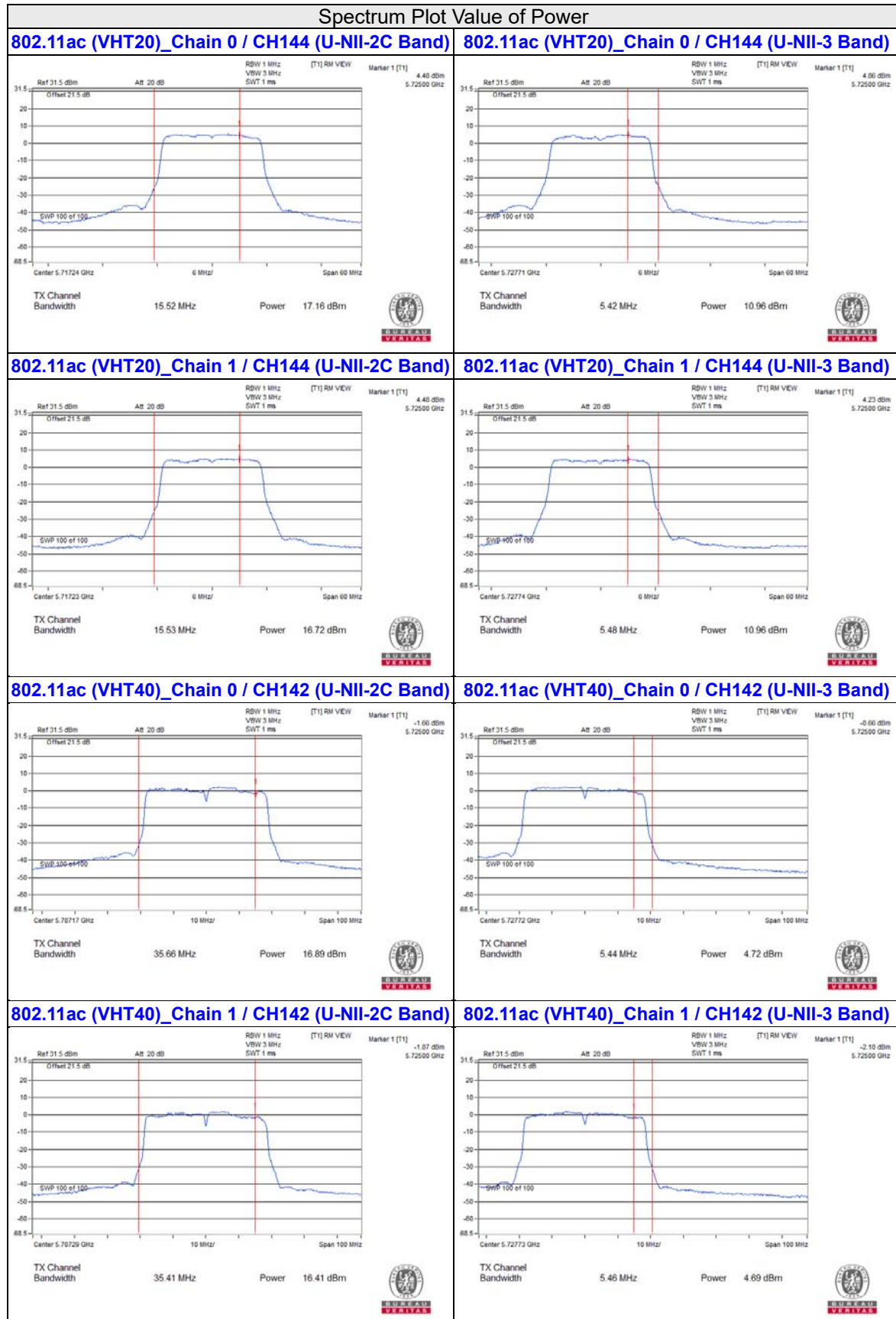
802.11ac (VHT80)_Chain 0 / CH138 (U-NII-2C Band) 802.11ac (VHT80)_Chain 0 / CH138 (U-NII-3 Band)



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-2C Band) 802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)

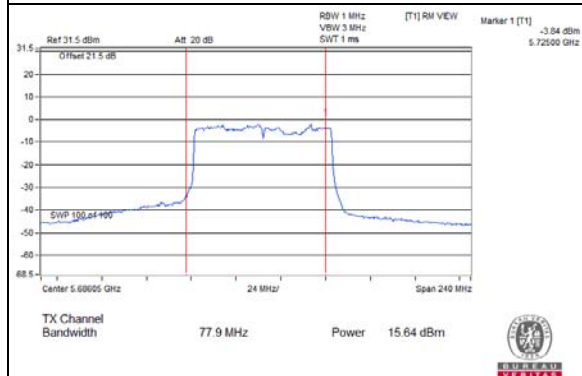


Beamforming Mode

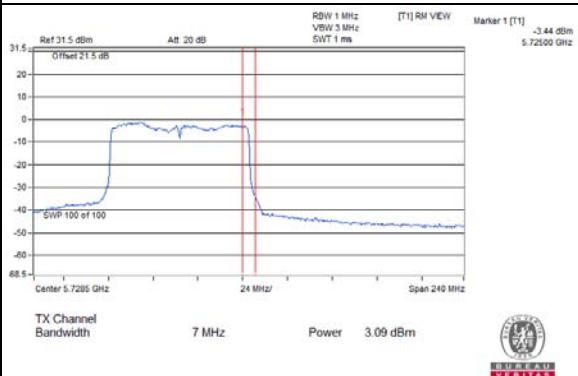


Spectrum Plot Value of Power

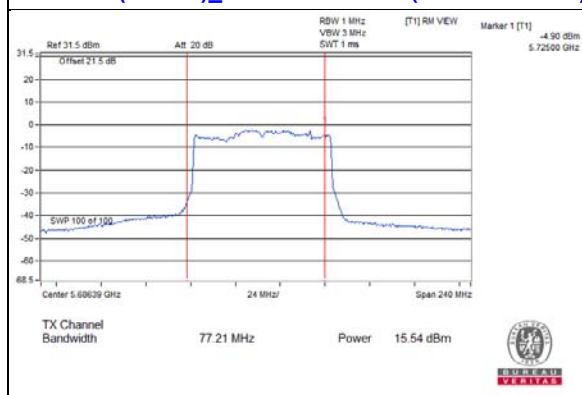
802.11ac (VHT80)_Chain 0 / CH138 (U-NII-2C Band)



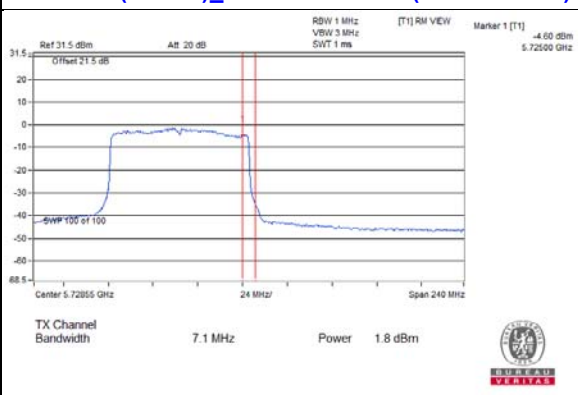
802.11ac (VHT80)_Chain 0 / CH138 (U-NII-3 Band)



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-2C Band)



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)



26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.7	19.39
60	5300	19.52	19.54
64	5320	19.76	19.45
100	5500	20.14	19.86
116	5580	20.47	20.22
140	5700	20.16	19.98
144 (U-NII-2C Band)	5720	14.95	14.92

802.11ac (VHT20)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.61	20.58
60	5300	20.76	20.61
64	5320	20.64	20.55
100	5500	21.11	20.76
116	5580	21.21	20.78
140	5700	20.94	20.95
144 (U-NII-2C Band)	5720	15.52	15.53

802.11ac (VHT40)

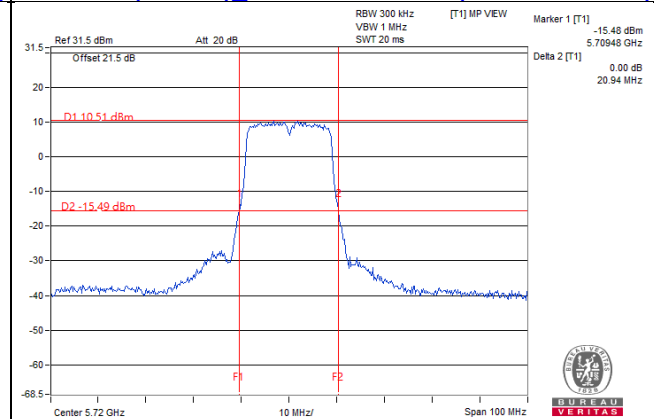
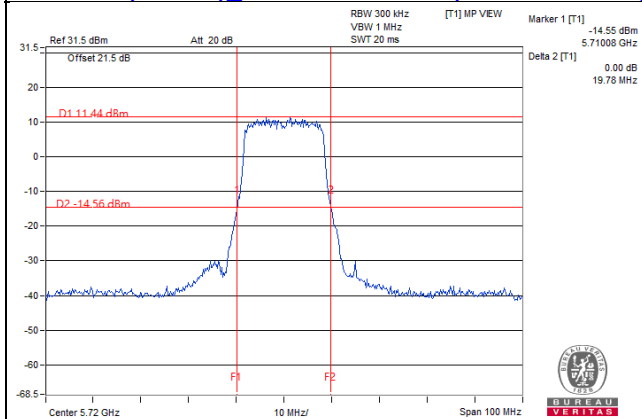
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	62.82	50.77
62	5310	59.49	71
102	5510	40.98	40.63
110	5550	40.97	41.11
134	5670	41.05	40.8
142 (U-NII-2C Band)	5710	35.66	35.41

802.11ac (VHT80)

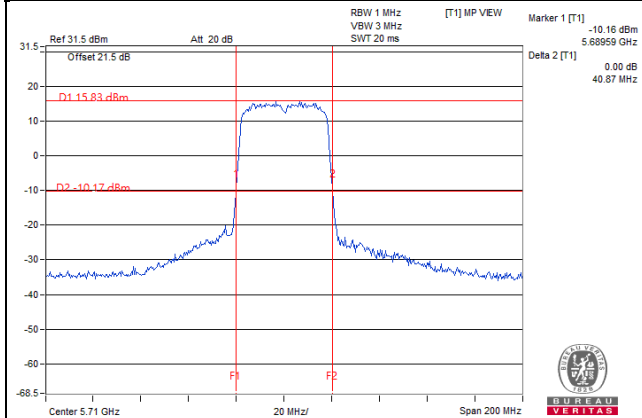
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	88.77	86.78
106	5530	84.71	84.28
122	5610	84.65	84.34
138 (U-NII-2C Band)	5690	77.9	77.21

Spectrum Plot of Worst Value

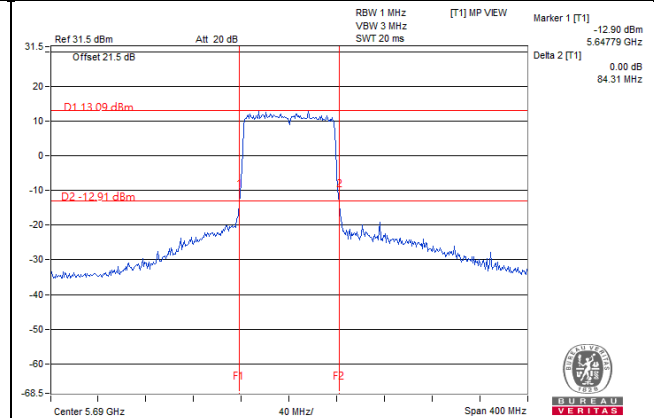
802.11ac (VHT20)_Chain 1 / CH144 (U-NII-2C Band) 802.11ac (VHT20)_Chain 0 / CH144 (U-NII-2C Band)



802.11ac (VHT40)_Chain 1 / CH142 (U-NII-2C Band)



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-2C Band)

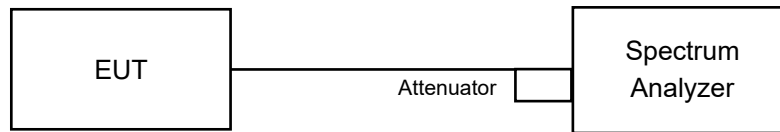


Note:

- For CH144 (U-NII-2C) = 5725MHz - Marker 1
- For CH142 (U-NII-2C) = 5725MHz - Marker 1
- For CH138 (U-NII-2C) = 5725MHz - Marker 1

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

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.44	16.44
60	5300	16.44	16.44
64	5320	16.44	16.44
100	5500	16.44	16.44
116	5580	16.44	16.44
140	5700	16.44	16.44
144 (U-NII-2C Band)	5720	13.28	13.28
144 (U-NII-3 Band)	5720	3.16	3.16

802.11ac (VHT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.64	17.64
60	5300	17.64	17.64
64	5320	17.64	17.64
100	5500	17.64	17.64
116	5580	17.64	17.64
140	5700	17.64	17.64
144 (U-NII-2C Band)	5720	13.88	13.88
144 (U-NII-3 Band)	5720	3.76	3.76

802.11ac (VHT40)

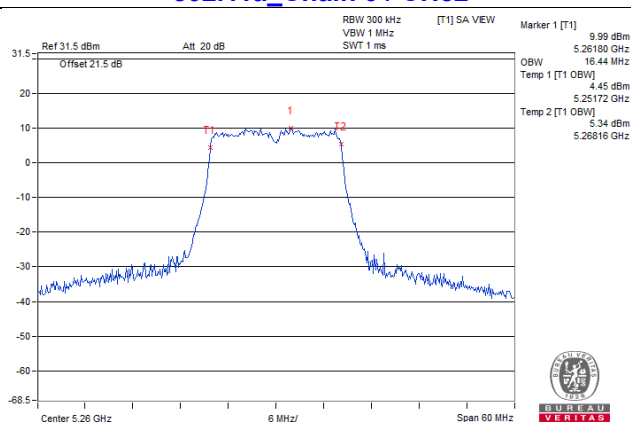
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.24	36.24
62	5310	36.24	36.48
102	5510	36.24	36.24
110	5550	36.24	36.24
134	5670	36.24	36.24
142 (U-NII-2C Band)	5710	33.24	33.24
142 (U-NII-3 Band)	5710	3	3

802.11ac (VHT80)

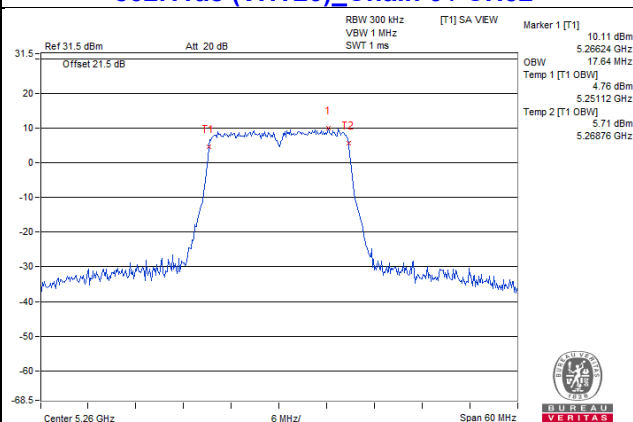
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.36	75.84
106	5530	76.32	75.84
122	5610	76.32	76.32
138 (U-NII-2C Band)	5690	73.4	72.92
138 (U-NII-3 Band)	5690	2.92	2.92

Spectrum Plot of Max. Value

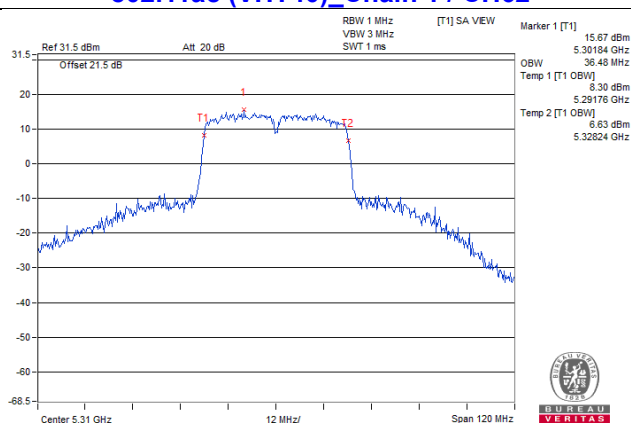
802.11a_Chain 0 / CH52



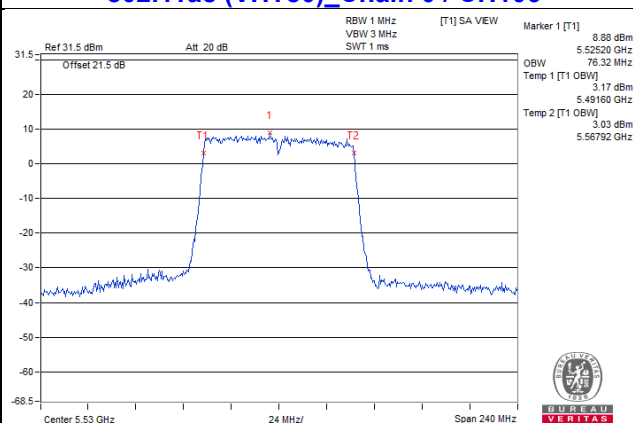
802.11ac (VHT20)_Chain 0 / CH52



802.11ac (VHT40)_Chain 1 / CH62



802.11ac (VHT80)_Chain 0 / CH106



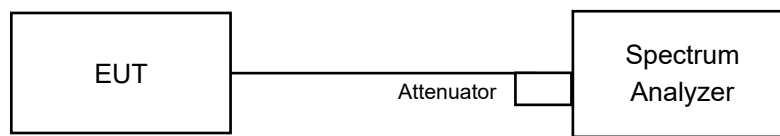
4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-2A, U-NII-2C band:

For 802.11ac (VHT20)

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 other modulation mode

Using method SA-2

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

For U-NII-3 band:

For 802.11ac (VHT20)

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

For other modulation mode

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

CDD Mode

For U-NII-2A, U-NII-2C band:

802.11a

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				
52	5260	5.89	5.91	0.18	9.09	9.19	Pass
60	5300	5.72	5.58	0.18	8.84	9.19	Pass
64	5320	6.10	4.43	0.18	8.54	9.19	Pass
100	5500	5.26	5.31	0.18	8.48	8.71	Pass
116	5580	5.44	5.55	0.18	8.69	8.71	Pass
140	5700	5.24	5.38	0.18	8.50	8.71	Pass
144 (U-NII-2C Band)	5720	5.42	5.60	0.18	8.70	8.71	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. For U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (7.81 - 6) = 9.19 \text{ dBm/MHz}$.
3. For U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (8.29 - 6) = 8.71 \text{ dBm/MHz}$.
4. Refer to section 3.3 for duty cycle spectrum plot.

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			
52	5260	5.51	5.49	8.51	9.19	Pass
60	5300	4.81	5.45	8.15	9.19	Pass
64	5320	4.79	5.12	7.97	9.19	Pass
100	5500	5.53	5.02	8.29	8.71	Pass
116	5580	4.80	5.19	8.01	8.71	Pass
140	5700	5.13	5.19	8.17	8.71	Pass
144 (U-NII-2C Band)	5720	5.56	5.00	8.30	8.71	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. For U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (7.81 - 6) = 9.19 \text{ dBm/MHz}$.
3. For U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (8.29 - 6) = 8.71 \text{ dBm/MHz}$.

802.11ac (VHT40)

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				
54	5270	3.91	5.14	0.16	7.74	9.19	Pass
62	5310	4.50	4.75	0.16	7.79	9.19	Pass
102	5510	2.61	2.57	0.16	5.76	8.71	Pass
110	5550	4.22	4.41	0.16	7.48	8.71	Pass
134	5670	4.57	4.45	0.16	7.68	8.71	Pass
142 (U-NII-2C Band)	5710	4.70	4.24	0.16	7.64	8.71	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. For U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (7.81 - 6) = 9.19 \text{ dBm/MHz}$.
3. For U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (8.29 - 6) = 8.71 \text{ dBm/MHz}$.
4. Refer to section 3.3 for duty cycle spectrum plot.

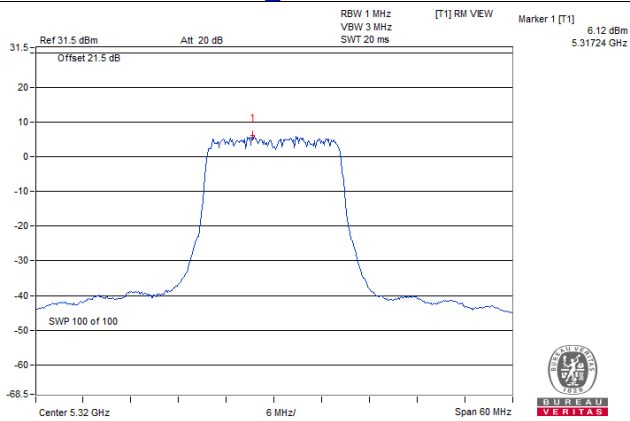
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	0.44	0.28	0.29	3.66	9.19	Pass
106	5530	-1.59	-1.78	0.29	1.62	8.71	Pass
122	5610	-0.53	0.69	0.29	3.42	8.71	Pass
138 (U-NII-2C Band)	5690	1.24	0.53	0.29	4.20	8.71	Pass

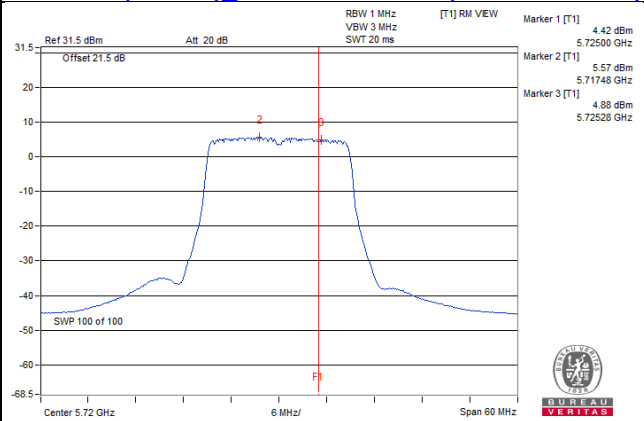
- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (7.81 - 6) = 9.19 \text{ dBm/MHz}$.
3. For U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $11 - (8.29 - 6) = 8.71 \text{ dBm/MHz}$.
4. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

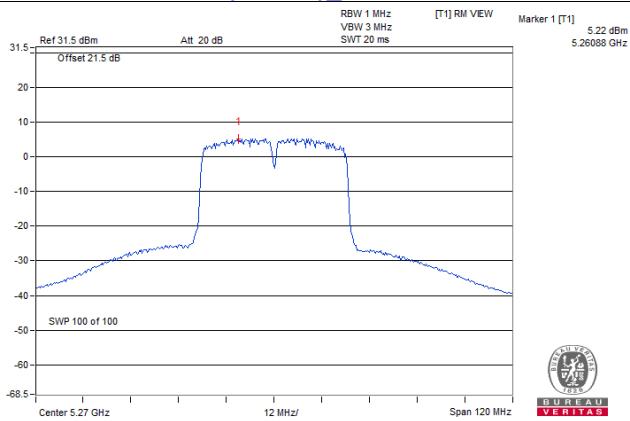
802.11a_Chain 0 / CH64



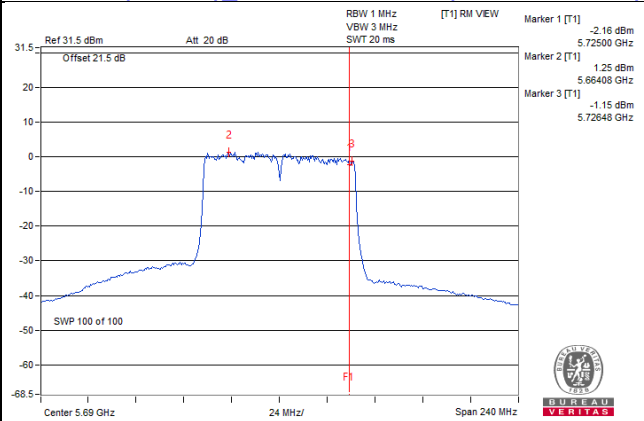
802.11ac (VHT20)_Chain 0 / CH144 (U-NII-2C Band)



802.11ac (VHT40)_Chain 1 / CH54



802.11ac (VHT80)_Chain 0 / CH138 (U-NII-2C Band)



For U-NII-3 band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
144 (U-NII-3 Band)	5720	-3.69	-3.77	0.18	-0.54	1.68	27.71	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (8.29 - 6) = 27.71 \text{ dBm/500kHz}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)		Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1				
144 (U-NII-3 Band)	5720	-3.77	-4.09	-0.92	1.30	27.71	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (8.29 - 6) = 27.71 \text{ dBm/500kHz}$.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
142 (U-NII-3 Band)	5710	-6.36	-6.31	0.16	-3.17	-0.95	27.71	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (8.29 - 6) = 27.71 \text{ dBm/500kHz}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

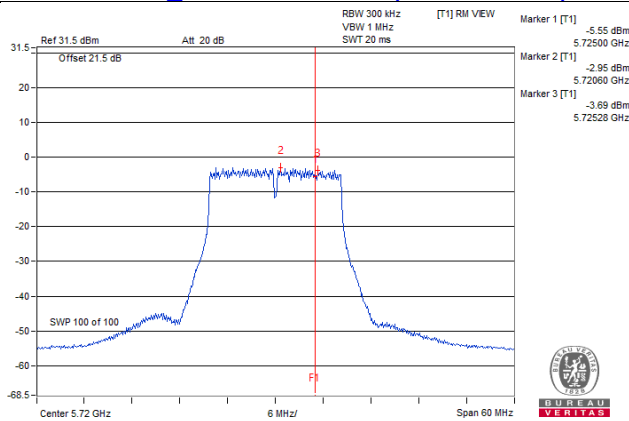
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
138 (U-NII-3 Band)	5690	-10.00	-9.18	0.29	-6.27	-4.05	27.71	Pass

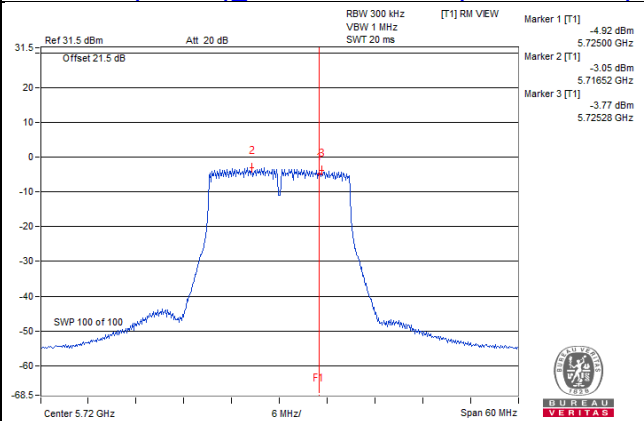
- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (8.29 - 6) = 27.71 \text{ dBm/500kHz}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

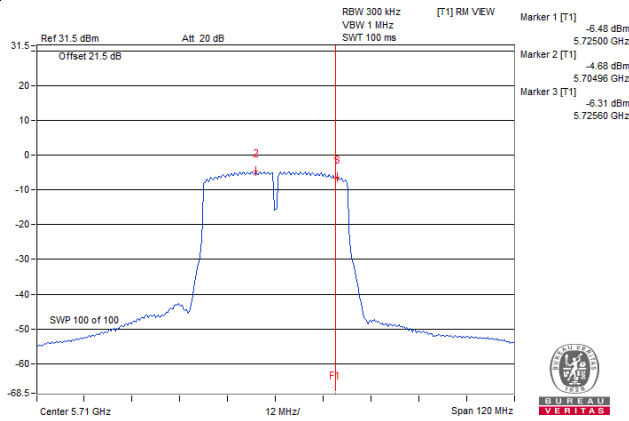
802.11a_Chain 0 / CH144 (U-NII-3 Band)



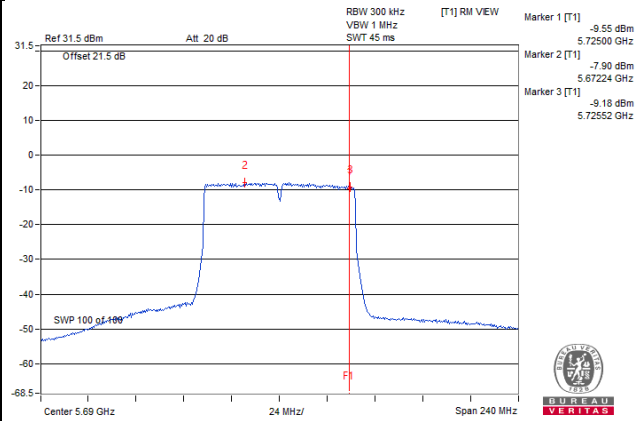
802.11ac (VHT20)_Chain 0 / CH144 (U-NII-3 Band)



802.11ac (VHT40)_Chain 1 / CH142 (U-NII-3 Band)



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)

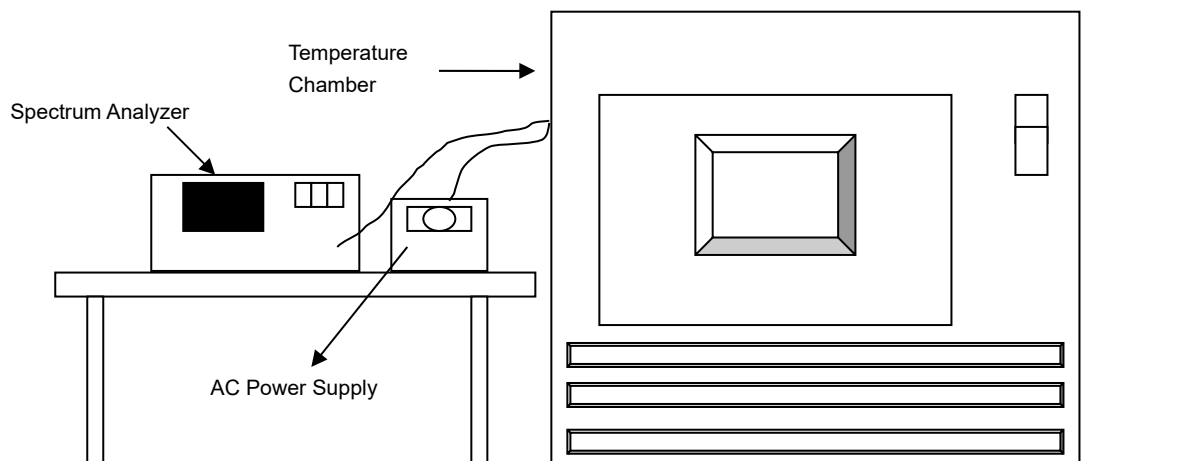


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

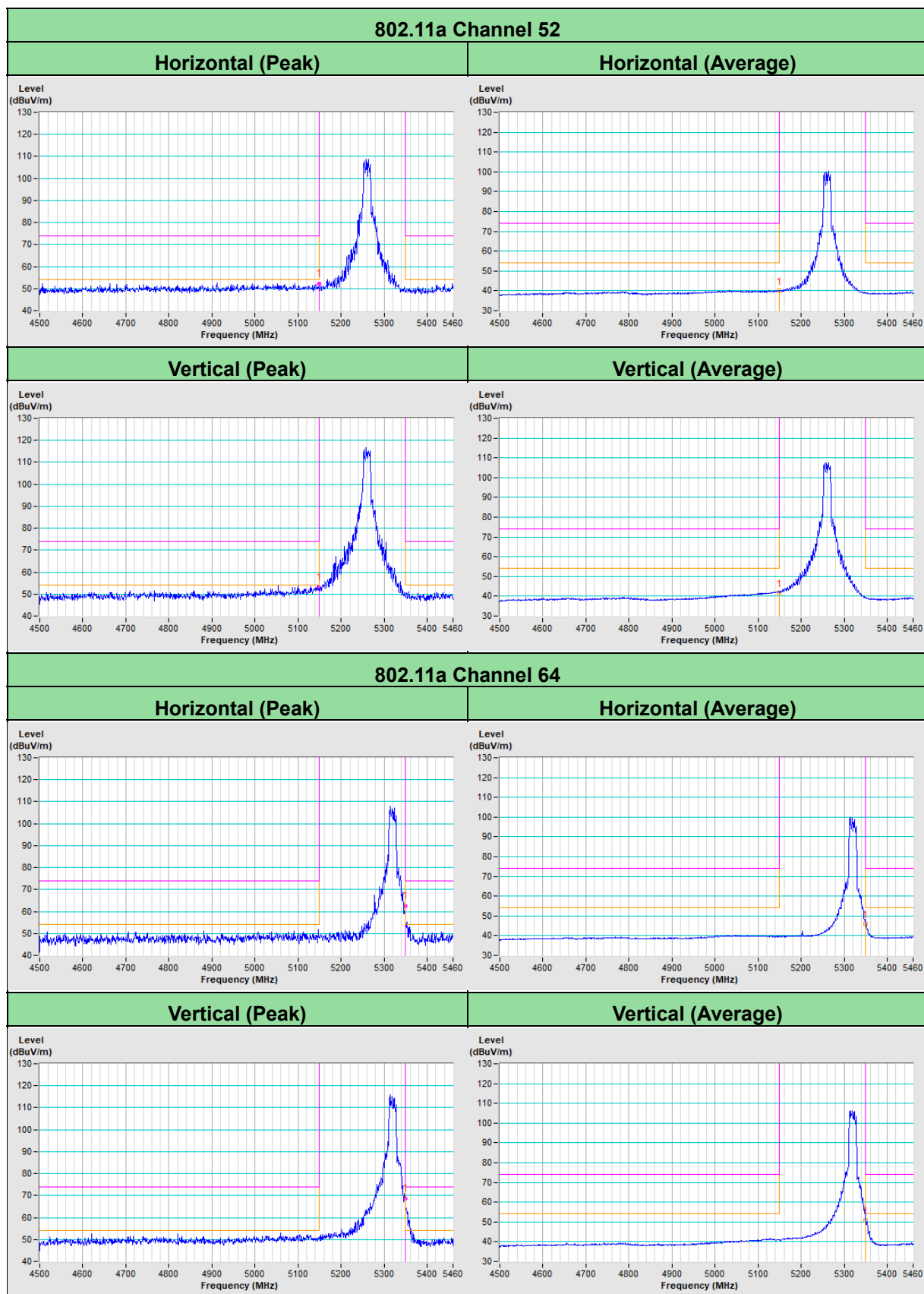
Frequency Stability Versus Temp.									
Operating Frequency: 5260 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5260.0064	Pass	5260.0088	Pass	5260.0039	Pass	5260.0065	Pass
30	120	5259.9803	Pass	5259.9794	Pass	5259.9801	Pass	5259.9798	Pass
20	120	5260.0165	Pass	5260.0129	Pass	5260.0164	Pass	5260.0147	Pass
10	120	5260.0242	Pass	5260.0233	Pass	5260.0252	Pass	5260.0259	Pass
0	120	5260.019	Pass	5260.0162	Pass	5260.0149	Pass	5260.0162	Pass

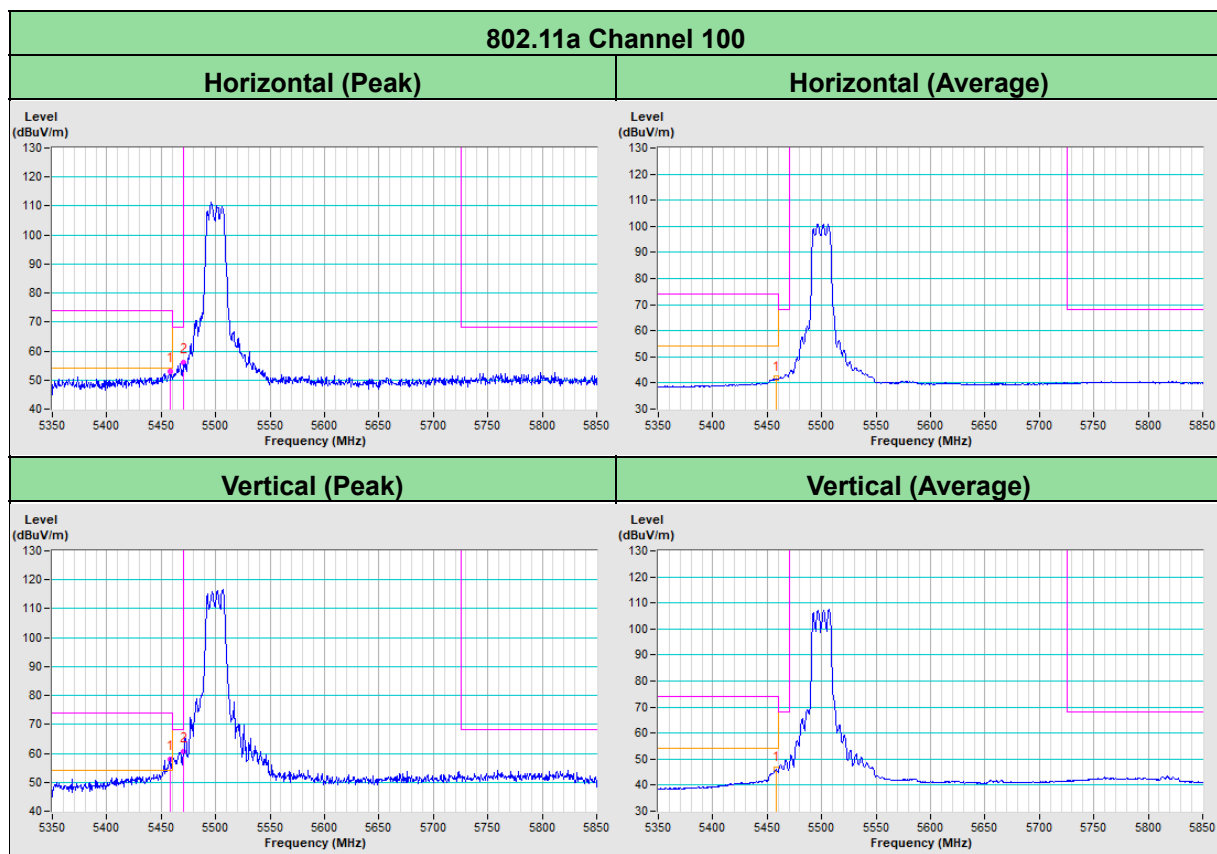
Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5260.0159	Pass	5260.0136	Pass	5260.016	Pass	5260.0137	Pass
	120	5260.0165	Pass	5260.0129	Pass	5260.0164	Pass	5260.0147	Pass
	102	5260.0155	Pass	5260.0133	Pass	5260.0154	Pass	5260.0148	Pass

5 Pictures of Test Arrangements

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

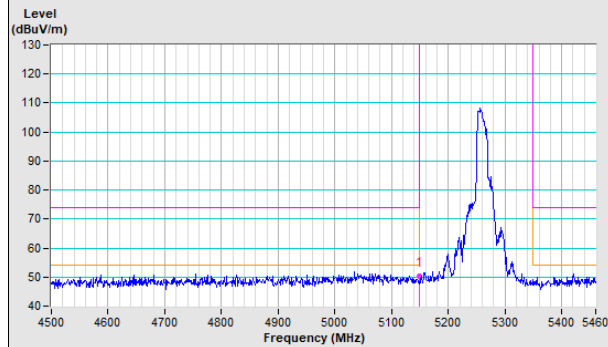
Annex A - Band-Edge Measurement (For U-NII-2A, U-NII-2C band)



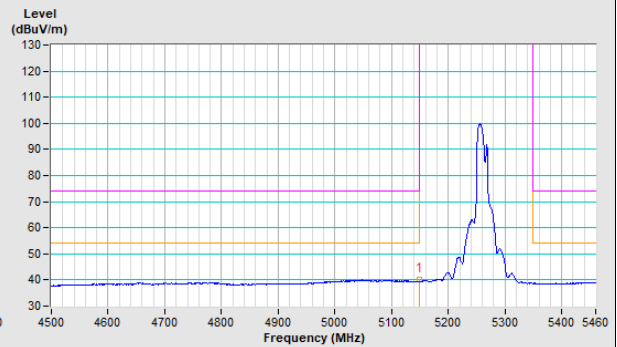


802.11ac (VHT20) Channel 52

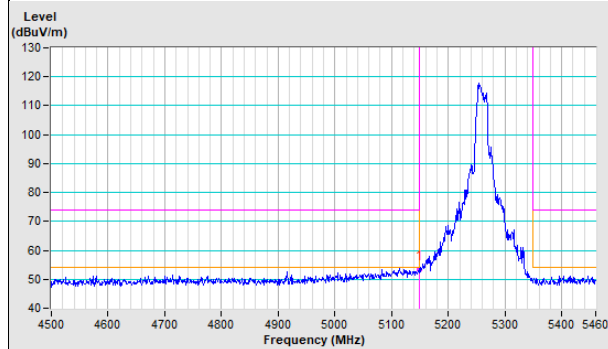
Horizontal (Peak)



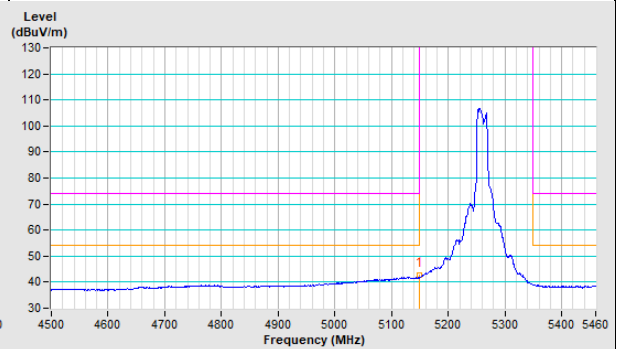
Horizontal (Average)



Vertical (Peak)

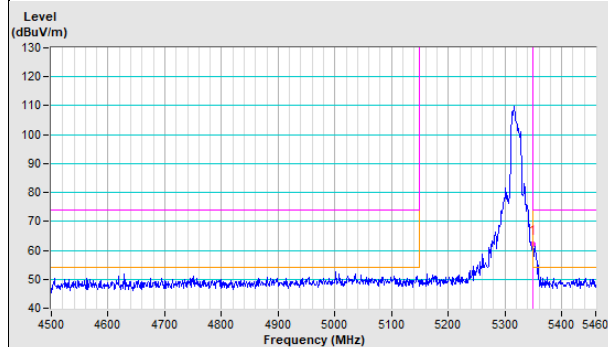


Vertical (Average)

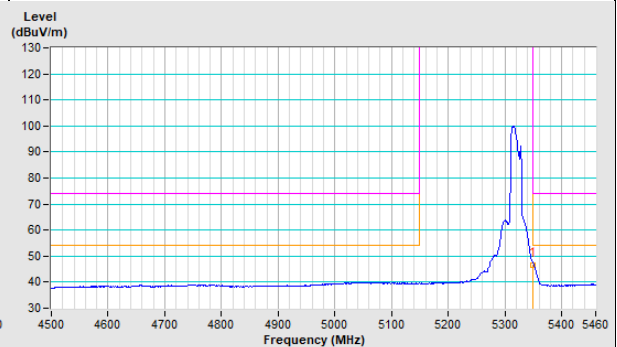


802.11ac (VHT20) Channel 64

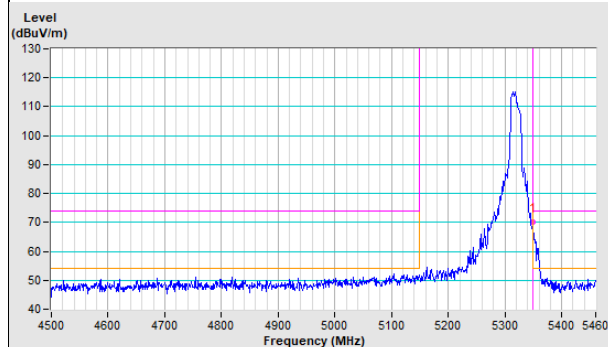
Horizontal (Peak)



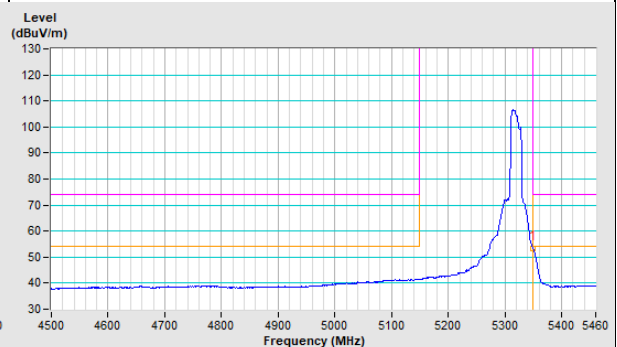
Horizontal (Average)

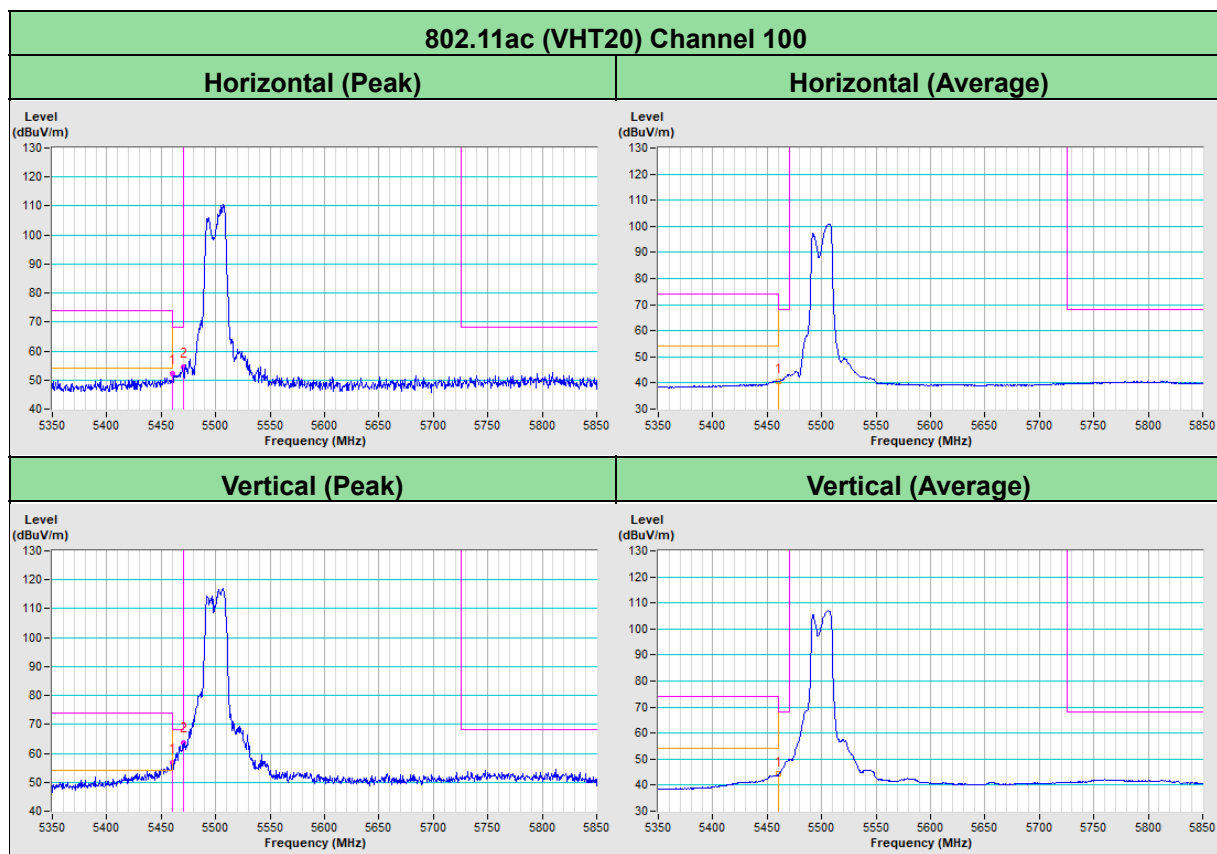


Vertical (Peak)



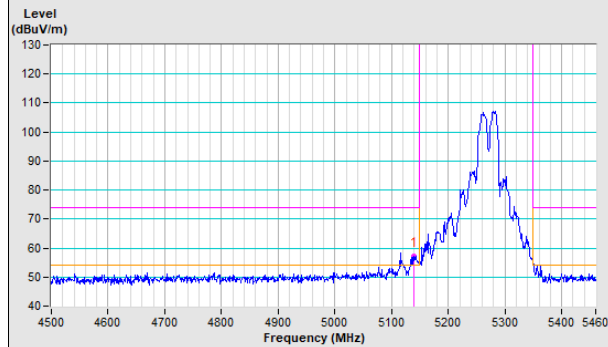
Vertical (Average)



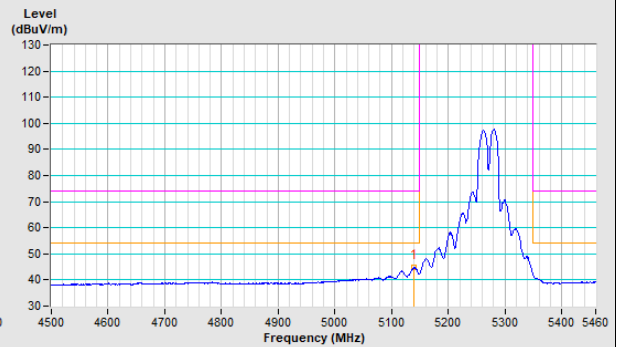


802.11ac (VHT40) Channel 54

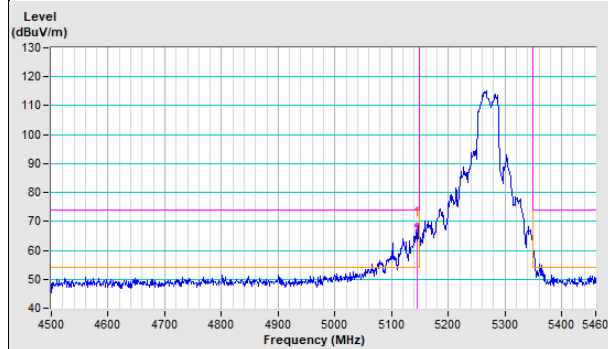
Horizontal (Peak)



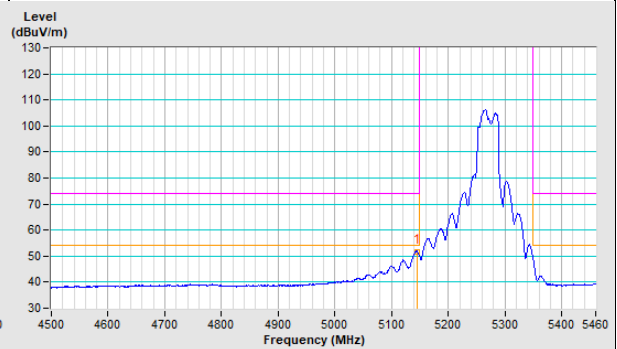
Horizontal (Average)



Vertical (Peak)

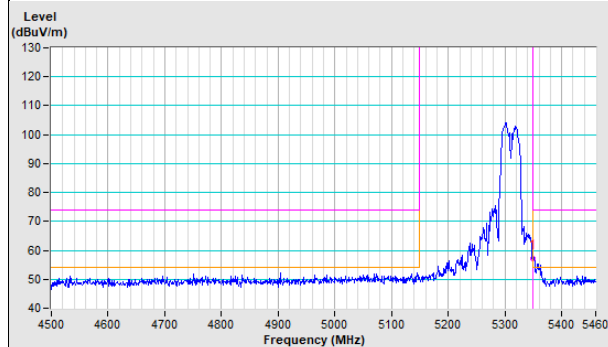


Vertical (Average)

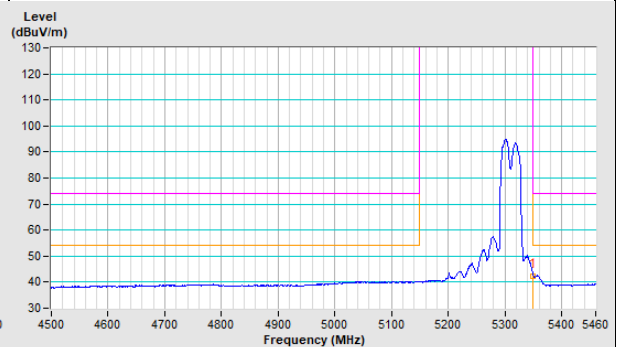


802.11ac (VHT40) Channel 62

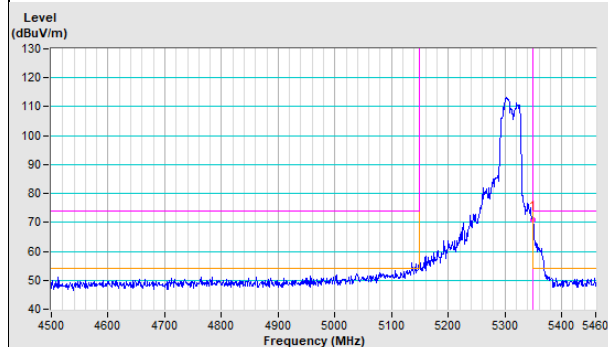
Horizontal (Peak)



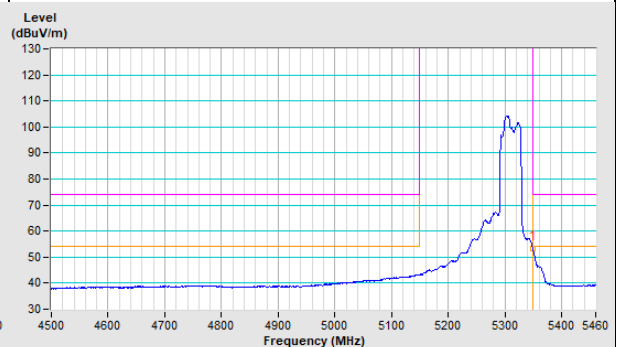
Horizontal (Average)

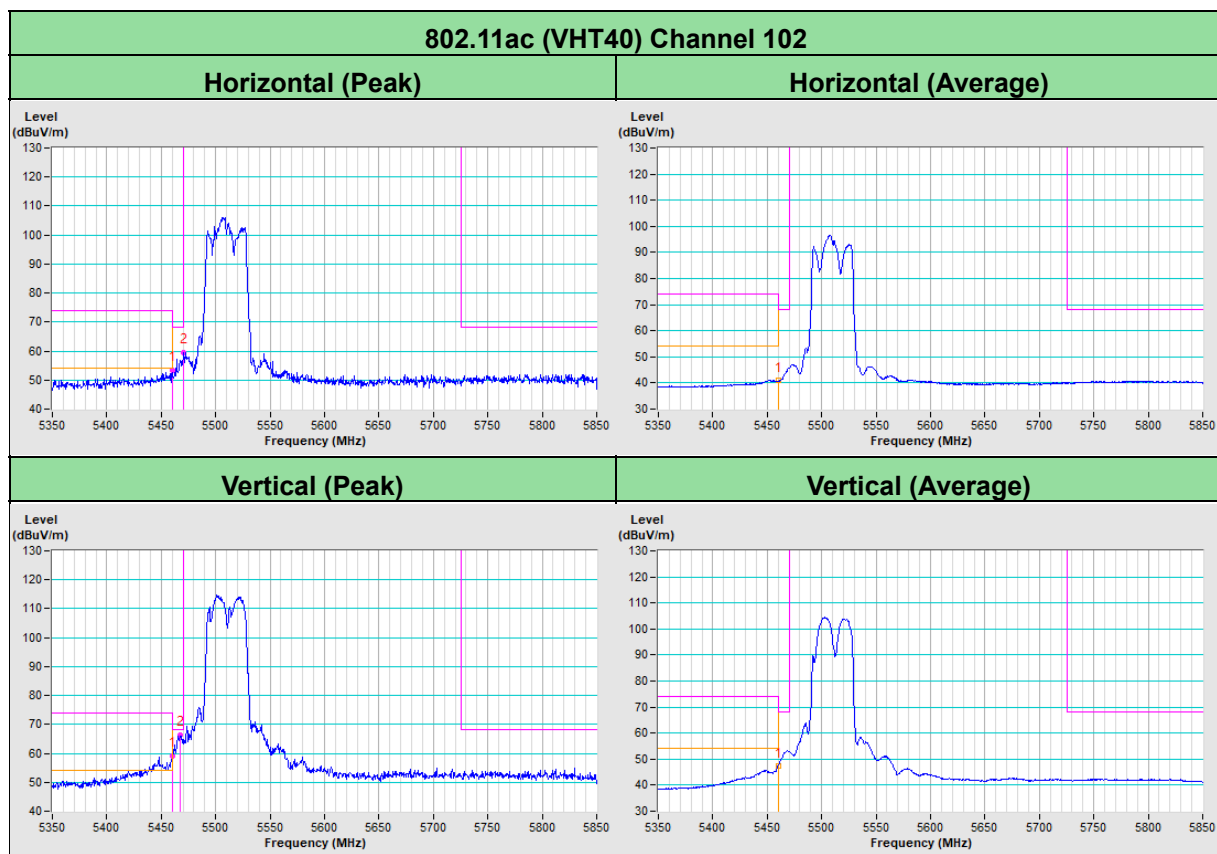


Vertical (Peak)



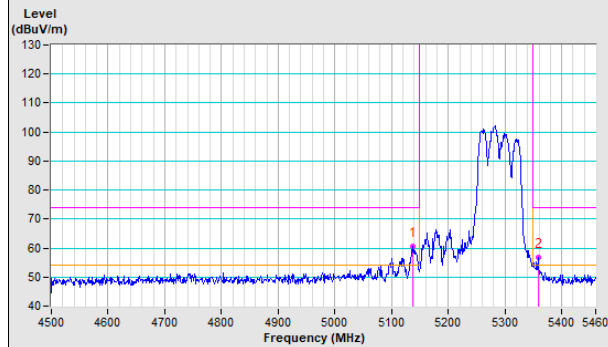
Vertical (Average)



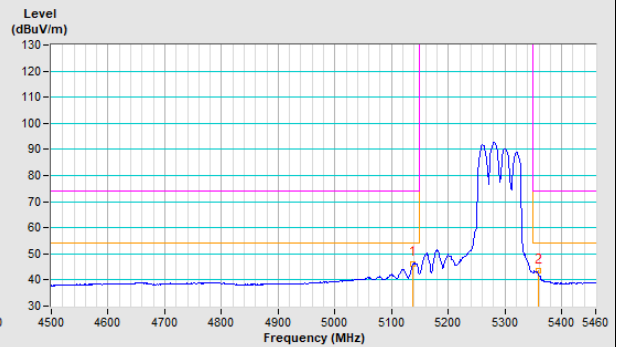


802.11ac (VHT80) Channel 58

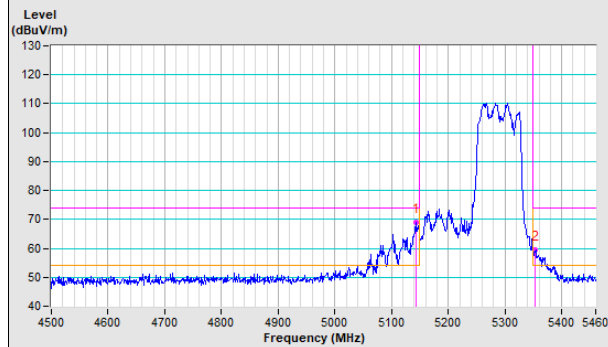
Horizontal (Peak)



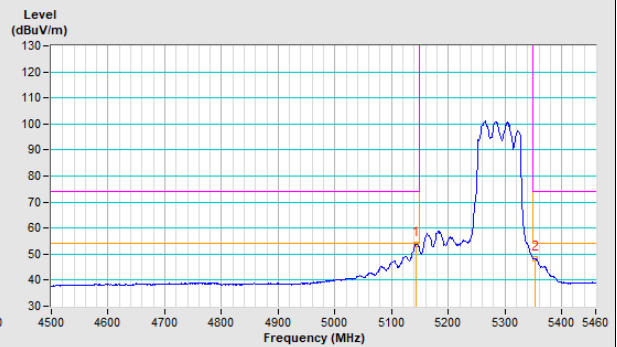
Horizontal (Average)



Vertical (Peak)

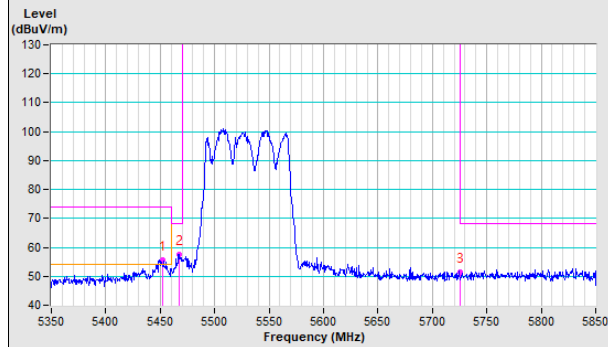


Vertical (Average)

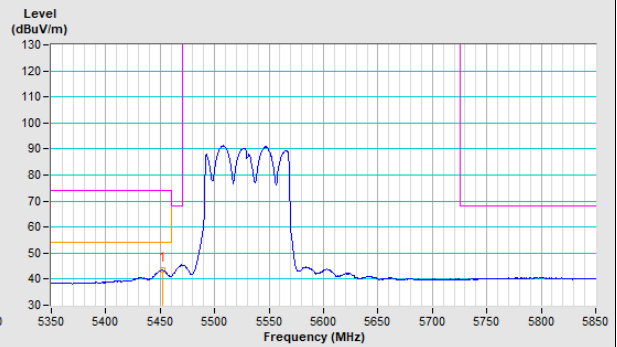


802.11ac (VHT80) Channel 106

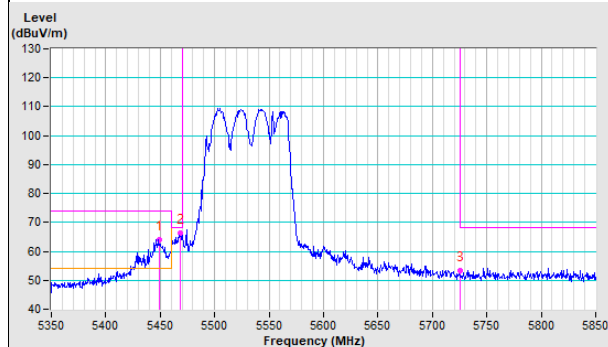
Horizontal (Peak)



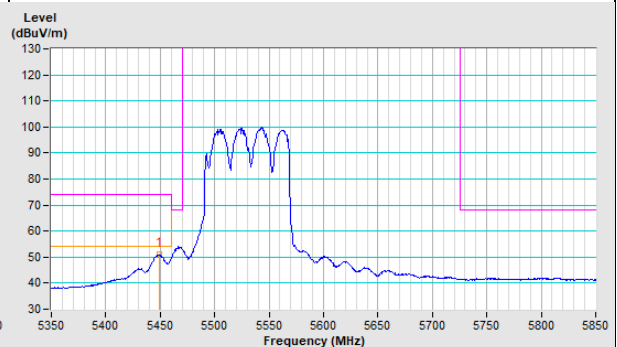
Horizontal (Average)



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.

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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