FCC Test Report (DFS Band)

Report No.:	RFBDUM-WTW-P20100787
FCC ID:	UXX-S5A036A
Test Model:	S5A037A
Series Model:	S5A036A
Received Date:	Oct. 30, 2020
Test Date:	Nov. 26 to 27, 2020
Issued Date:	Jan. 11, 2021
Applicant:	Cradlepoint, Inc
Address:	1111 W. Jefferson Street Suite 400 Boise, ID 83702 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022 for Test Location

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Release Control Record

Issue No.	Description	Date Issued
RFBDUM-WTW-P20100787	Original release.	Jan. 11, 2021

1 Certificate of Conformity

Product:	Enterprise Branch Router
Brand:	cradlepoint
Test Model:	S5A037A
Series Model:	S5A036A
Sample Status:	ENGINEERING SAMPLE
Applicant:	Cradlepoint, Inc
Test Date:	Nov. 26 to 27, 2020
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

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

Prepared by : Vivian Huang , **Date:** Jan. 11, 2021

Vivian Huang / Specialist

Approved by : , **Date:** Jan. 11, 2021

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -5.12 dB at 0.36107 MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1 dB at 5530.00 MHz and 5354.47 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(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS Band)

Product	Enterprise Branch Router
Brand	cradlepoint
Test Model	S5A037A
Series Model	S5A036A
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter or 7.26Vdc from battery
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps
Operating Frequency	**2.4GHz:** 2.412GHz ~ 2.462GHz **5GHz:** 5.26 ~ 5.32 GHz, 5.50 ~ 5.72 GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 16 802.11n (HT40), 802.11ac (VHT40): 8 802.11ac (VHT80): 4
Output Power	**CDD Mode:** **5.26 ~ 5.32 GHz:** 151.424 mW **5.5 ~ 5.72 GHz:** 141.505 mW **Beamforming Mode:** **5.26 ~ 5.32 GHz:** 151.424 mW **5.5 ~ 5.72 GHz:** 141.505 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter × 1, Battery x1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The difference compared with the Report No.: RF200703E03-1 as the following:
   - ◆ Add DFS band <5250~5350 MHz & 5470~5725 MHz> by software.
2. According to above conditions, for DFS band all of test items need to be performed and all data was verified to meet the requirements.
3. There are WLAN and LTE technology used for the EUT.
4. The EUT has below model names, which are identical to each other in all aspects except for the following table:

Brand	Product Marketing Name (PMN)	Model	Wi-Fi Function	Embedded Radio (WWAN Module)	Description
cradlepoint	E110-C4D	S5A036A	Yes	Brand: Quectel Model: EC-25AF Contains FCC ID: XMR201808EC25AF Contains IC: 10224A-2018EC25AF	1. Different location of LED. 2. GPS antenna: Bulit in: S5A036A, External: S5A037A 3. Different housing.
	E100-C4D	S5A037A	Yes		
Note: The EUT was pre-tested with above models, the worst case was found in S5A037A. Therefore only the test data of the model was recorded in this report.					

5. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3
WLAN (2.4GHz)	WLAN (5GHz)	WWAN

6. Simultaneously transmission condition.

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

7. The EUT must be supplied with a power and the following different models could be chosen:

Adapter			
No	Brand	Model No.	Spec.
1	KUANTECH	KSA-36W-120300D5	Input: 100-240V, 1A, 50-60Hz Output: 12V, 3A DC output cable (Unshielded, 1.5 m)
2	Asian Power Devices	WA-36A12R	Input: 100-240V, 1A, 50-60Hz Output: 12V, 3A DC output cable (Unshielded, 1.5 m)
3	Asian Power Devices	WA-36N12R	Input: 100-240V, 1A, 50-60Hz Output: 12V, 3A DC output cable (Unshielded, 1.5 m)
Battery			
No	Brand	Model No.	Spec.
1	Getac	170848-000	7.26V 7800Ah 56.62Wh

Note:
1. From the above adapters, the AC Power Conducted Emissions test worst case was found in **Adapter No.: 3**. Therefore only the test data of the mode was recorded in this report.
2. From the above adapters and battery, the Radiated Emissions test worst case was found in **Adapter No.: 1**. Therefore only the test data of the mode was recorded in this report.

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

WLAN Antenna								
Ant. No.	RF Chain No.	Brand	Ant. Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)	Cable Loss (dB)
1	WiFi Chain0	cradlepoint	2.9	2.4~2.4835	PCB	i-pex(MHF)	130	Including
			2.8	5.15~5.25				
			3.1	5.25~5.35				
			3.1	5.47~5.725				
			3.1	5.725~5.85				
2	WiFi Chain1	cradlepoint	2.9	2.4~2.4835	PCB	i-pex(MHF)	230	Including
			2.8	5.15~5.25				
			3.1	5.25~5.35				
			3.1	5.47~5.725				
			3.1	5.725~5.85				

WWAN Antenna				
Antenna No.	Band	Freq. Range (MHz)	Gain (dBi)	Antenna Type
1	WCDMA Band 2	1850~1910	1.4	Dipole
	WCDMA Band 4	1710~1755	1.4	
	WCDMA Band 5	824~849	0.72	
	LTE Band 2	1850~1910	1.54	
	LTE Band 4	1710~1755	1.54	
	LTE Band 5	824~849	0.7	
	LTE Band 12	688~716	0.7	
	LTE Band 13	777~787	0.7	
	LTE Band 14	788~798	0.7	
	LTE Band 66	1710~1780	1.54	
	LTE Band 71	663~698	0.7	
2	WCDMA Band 2	1850~1910	1.26	Dipole
	WCDMA Band 4	1710~1755	1.26	
	WCDMA Band 5	824~849	0.65	
	LTE Band 2	1850~1910	1.53	
	LTE Band 4	1710~1755	1.53	
	LTE Band 5	824~849	0.7	
	LTE Band 12	688~716	0.7	
	LTE Band 13	777~787	0.7	
	LTE Band 14	788~798	0.7	
	LTE Band 66	1710~1780	1.53	
	LTE Band 71	663~698	0.7	

9. 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:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and non-beamforming mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), 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)

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

11. 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	122	5610 MHz
138	5690 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
Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane.**

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5250-5320	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)	5250-5320 5500-5720	54 to 62 102 to 142	54	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)	5250-5320 5500-5720	54 to 62 102 to 142	54	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	5250-5320	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:

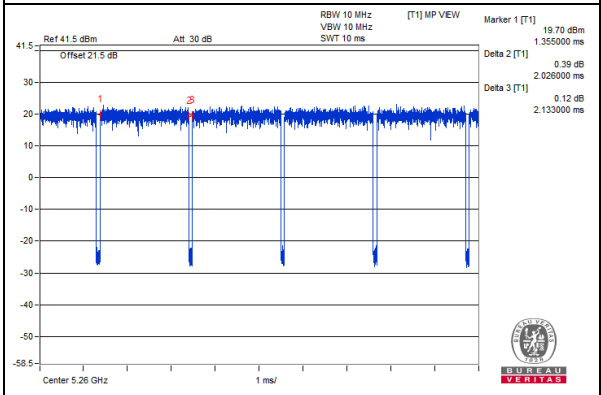
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	24deg. C, 68%RH	120Vac, 60Hz	Tom Yang
RE<1G	28deg. C, 68%RH	120Vac, 60Hz	Tom Yang
PLC	24deg. C, 68%RH	120Vac, 60Hz	Tom Yang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

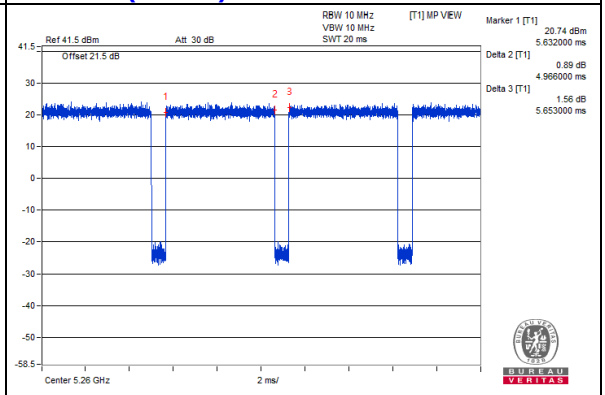
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 2.026 ms/2.133 ms = 0.95, Duty factor = 10 * log (1/Duty cycle) = 0.22
802.11ac (VHT20): Duty cycle = 4.966 ms/5.653 ms = 0.878, Duty factor = 10 * log (1/Duty cycle) = 0.56 dB
802.11ac (VHT40): Duty cycle = 2.415 ms/3.076 ms = 0.785, Duty factor = 10 * log (1/Duty cycle) = 1.05 dB
802.11ac (VHT80): Duty cycle = 3.31 ms/4.003 ms = 0.827, Duty factor = 10 * log (1/Duty cycle) = 0.83 dB

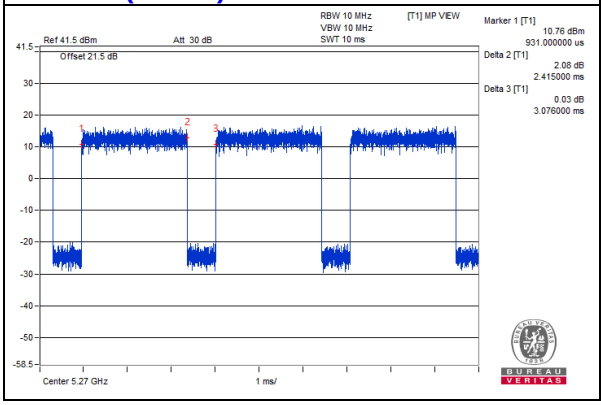
802.11a



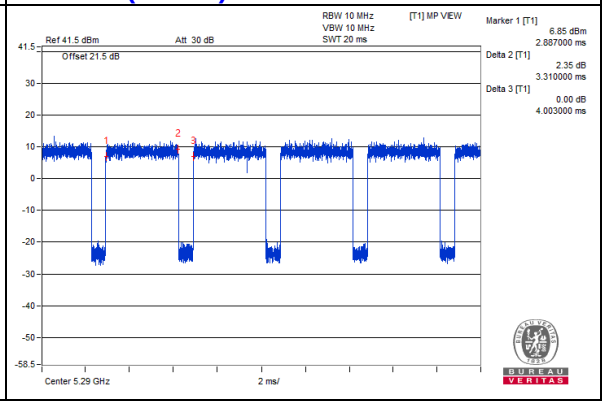
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

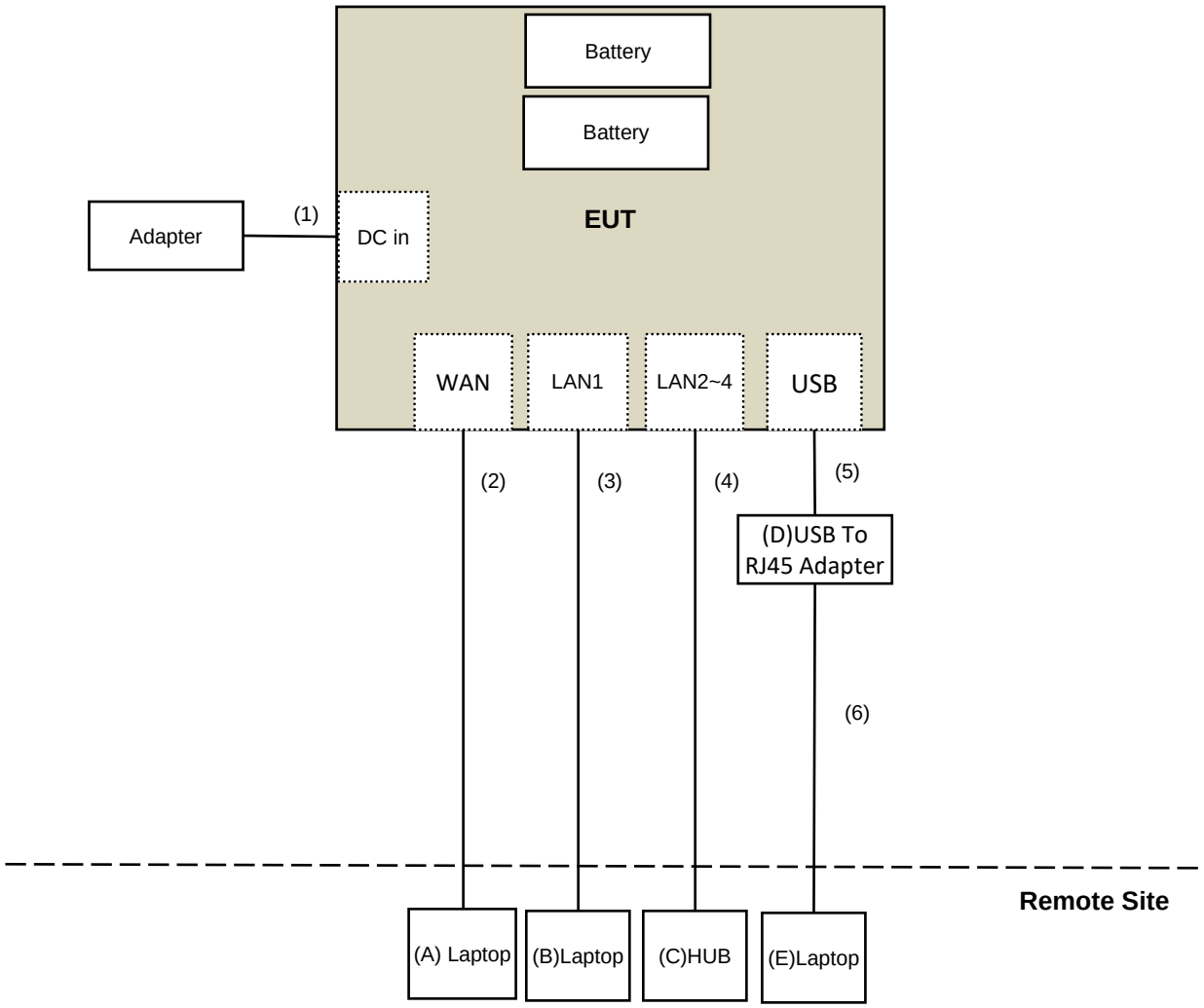
ID	Product	Brand	Model No.	Serial No	FCC ID	Remarks
A.	Laptop	DELL	Latitude E5440	519OP32	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	GS1100-16	S150H44000046	FCC DoC	Provided by Lab
D.	USB To RJ45 Adapter	Uptech	NET130	NA	NA	Supplied by client
E.	Laptop	DELL	E5430	GM1SKV1	FCC DoC	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.5m).

ID	Descriptions (Cables)	Qty	Length (m)	Shielding (Yes/No)	Cores (Number)	Remarks
1	DC Cable	1	1.5	No	0	Supplied by client
2	RJ-45 Cable	1	10	No	0	Provided by Lab
3	RJ-45 Cable	1	10	No	0	Provided by Lab
4	RJ-45 Cable	3	10	No	0	Provided by Lab
5	USB Cable	1	0.1	Yes	0	Supplied by client
6	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

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

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

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

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

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

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

4.1.2 Test Instruments

For radiated emission & bandedge test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1500	180504	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: Nov. 26 to 27, 2020

For other test items:

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

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Nov. 26, 2020

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

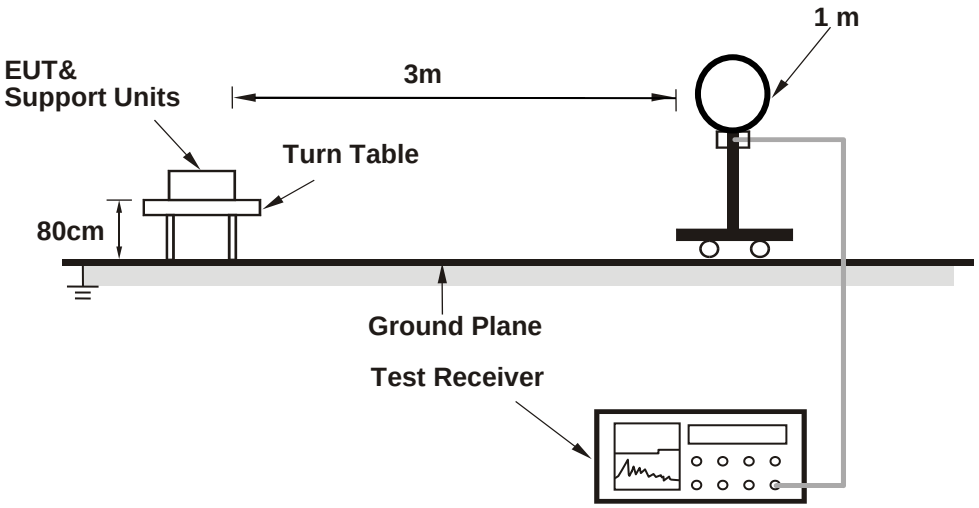
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

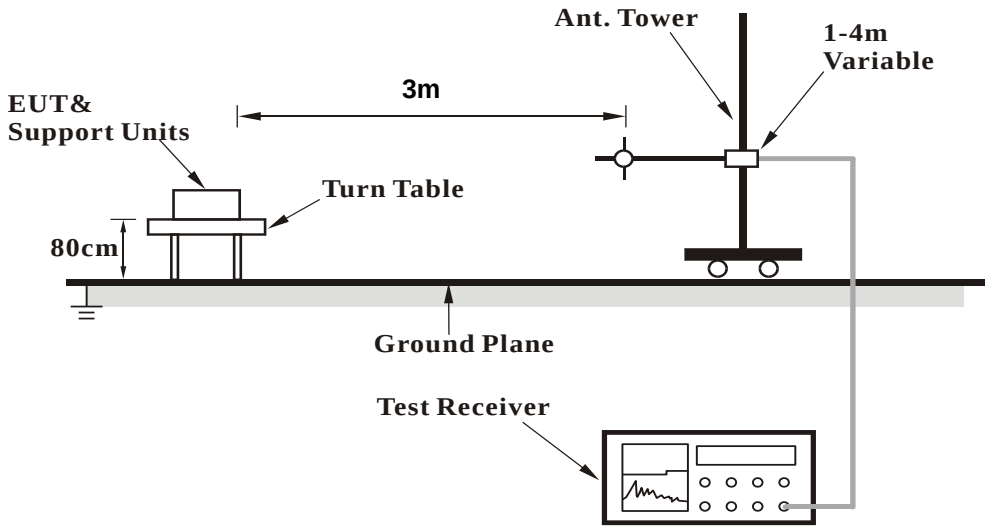
No deviation.

4.1.5 Test Setup

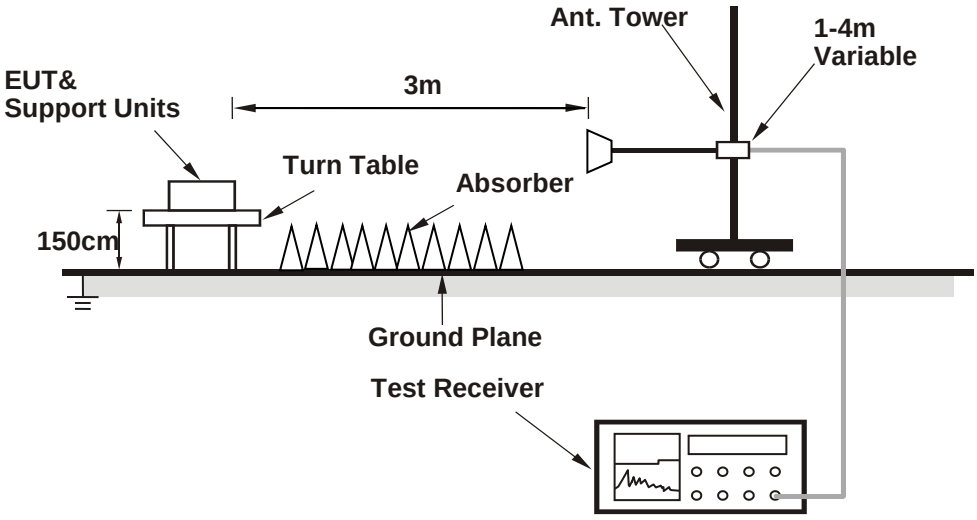
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QDART_1.0.44) 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	5119.85	51.4 PK	74.0	-22.6	1.20 H	19	46.5	4.9
2	5119.85	40.7 AV	54.0	-13.3	1.20 H	19	35.8	4.9
3	*5260.00	109.7 PK			1.20 H	19	105.4	4.3
4	*5260.00	101.0 AV			1.20 H	19	96.7	4.3
5	#10520.00	56.3 PK	68.2	-11.9	1.96 H	56	42.6	13.7
6	15780.00	51.9 PK	74.0	-22.1	1.66 H	69	37.9	14.0
7	15780.00	41.9 AV	54.0	-12.1	1.66 H	69	27.9	14.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	51.7 PK	74.0	-22.3	1.17 V	260	47.0	4.7
2	5150.00	41.6 AV	54.0	-12.4	1.17 V	260	36.9	4.7
3	*5260.00	112.7 PK			1.17 V	260	108.4	4.3
4	*5260.00	104.7 AV			1.17 V	260	100.4	4.3
5	#10520.00	61.6 PK	68.2	-6.6	2.01 V	52	47.9	13.7
6	15780.00	54.7 PK	74.0	-19.3	2.49 V	1	40.7	14.0
7	15780.00	45.2 AV	54.0	-8.8	2.49 V	1	31.2	14.0

Remarks:

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

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	110.0 PK			1.17 H	19	105.7	4.3
2	*5300.00	101.3 AV			1.17 H	19	97.0	4.3
3	10600.00	55.8 PK	74.0	-18.2	1.93 H	51	41.9	13.9
4	10600.00	45.9 AV	54.0	-8.1	1.93 H	51	32.0	13.9
5	15900.00	51.8 PK	74.0	-22.2	1.66 H	57	38.1	13.7
6	15900.00	41.7 AV	54.0	-12.3	1.66 H	57	28.0	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	112.0 PK			1.14 V	249	107.7	4.3
2	*5300.00	104.6 AV			1.14 V	249	100.3	4.3
3	10600.00	61.5 PK	74.0	-12.5	1.98 V	42	47.6	13.9
4	10600.00	51.6 AV	54.0	-2.4	1.98 V	42	37.7	13.9
5	15900.00	54.6 PK	74.0	-19.4	2.44 V	2	40.9	13.7
6	15900.00	45.2 AV	54.0	-8.8	2.44 V	2	31.5	13.7

Remarks:

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

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	108.2 PK			1.00 H	15	103.9	4.3
2	*5320.00	100.6 AV			1.00 H	15	96.3	4.3
3	5350.00	57.8 PK	74.0	-16.2	1.00 H	15	53.6	4.2
4	5350.00	47.6 AV	54.0	-6.4	1.00 H	15	43.4	4.2
5	10640.00	55.5 PK	74.0	-18.5	1.90 H	64	41.6	13.9
6	10640.00	45.7 AV	54.0	-8.3	1.90 H	64	31.8	13.9
7	15960.00	51.9 PK	74.0	-22.1	1.63 H	65	38.2	13.7
8	15960.00	41.5 AV	54.0	-12.5	1.63 H	65	27.8	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	113.7 PK			1.10 V	259	109.4	4.3
2	*5320.00	104.0 AV			1.10 V	259	99.7	4.3
3	5350.00	65.1 PK	74.0	-8.9	1.10 V	259	60.9	4.2
4	5350.00	53.5 AV	54.0	-0.5	1.10 V	259	49.3	4.2
5	10640.00	60.3 PK	74.0	-13.7	1.98 V	45	46.4	13.9
6	10640.00	50.6 AV	54.0	-3.4	1.98 V	45	36.7	13.9
7	15960.00	55.0 PK	74.0	-19.0	2.48 V	11	41.3	13.7
8	15960.00	44.8 AV	54.0	-9.2	2.48 V	11	31.1	13.7

Remarks:

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

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	5459.00	52.3 PK	74.0	-21.7	1.02 H	16	47.9	4.4
2	5459.00	41.1 AV	54.0	-12.9	1.02 H	16	36.7	4.4
3	#5468.51	57.7 PK	68.2	-10.5	1.02 H	16	53.2	4.5
4	*5500.00	107.7 PK			1.02 H	16	103.1	4.6
5	*5500.00	100.4 AV			1.02 H	16	95.8	4.6
6	11000.00	55.4 PK	74.0	-18.6	1.95 H	79	41.1	14.3
7	11000.00	45.4 AV	54.0	-8.6	1.95 H	79	31.1	14.3
8	#16500.00	52.1 PK	68.2	-16.1	1.63 H	75	36.6	15.5
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	5460.00	57.9 PK	74.0	-16.1	1.00 V	261	53.5	4.4
2	5460.00	44.8 AV	54.0	-9.2	1.00 V	261	40.4	4.4
3	#5466.30	67.6 PK	68.2	-0.6	1.00 V	261	63.1	4.5
4	*5500.00	111.3 PK			1.00 V	261	106.7	4.6
5	*5500.00	104.1 AV			1.00 V	261	99.5	4.6
6	11000.00	59.7 PK	74.0	-14.3	1.94 V	55	45.4	14.3
7	11000.00	50.3 AV	54.0	-3.7	1.94 V	55	36.0	14.3
8	#16500.00	54.8 PK	68.2	-13.4	2.48 V	0	39.3	15.5

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 802.11a	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	109.7 PK			1.12 H	6	105.1	4.6
2	*5580.00	101.1 AV			1.12 H	6	96.5	4.6
3	11160.00	55.9 PK	74.0	-18.1	1.99 H	40	41.7	14.2
4	11160.00	45.9 AV	54.0	-8.1	1.99 H	40	31.7	14.2
5	#16740.00	51.4 PK	68.2	-16.8	1.67 H	50	34.5	16.9
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	*5580.00	112.2 PK			1.18 V	254	107.6	4.6
2	*5580.00	104.9 AV			1.18 V	254	100.3	4.6
3	11160.00	61.3 PK	74.0	-12.7	1.93 V	30	47.1	14.2
4	11160.00	51.6 AV	54.0	-2.4	1.93 V	30	37.4	14.2
5	#16740.00	54.5 PK	68.2	-13.7	2.45 V	11	37.6	16.9

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 802.11a	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	108.4 PK			1.07 H	30	103.8	4.6
2	*5700.00	100.8 AV			1.07 H	30	96.2	4.6
3	#5725.00	58.4 PK	68.2	-9.8	1.07 H	30	53.7	4.7
4	11400.00	56.0 PK	74.0	-18.0	1.91 H	64	41.8	14.2
5	11400.00	46.2 AV	54.0	-7.8	1.91 H	64	32.0	14.2
6	#17100.00	51.9 PK	68.2	-16.3	1.60 H	58	34.1	17.8
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	*5700.00	112.8 PK			1.02 V	257	108.2	4.6
2	*5700.00	104.0 AV			1.02 V	257	99.4	4.6
3	#5725.00	67.6 PK	68.2	-0.6	1.02 V	257	62.9	4.7
4	11400.00	59.8 PK	74.0	-14.2	1.89 V	41	45.6	14.2
5	11400.00	50.7 AV	54.0	-3.3	1.89 V	41	36.5	14.2
6	#17100.00	54.7 PK	68.2	-13.5	2.42 V	6	36.9	17.8

Remarks:

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

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	49.0 PK	74.0	-25.0	1.13 H	35	44.6	4.4
2	5460.00	38.2 AV	54.0	-15.8	1.13 H	35	33.8	4.4
3	#5470.00	48.4 PK	68.2	-19.8	1.13 H	35	43.9	4.5
4	*5720.00	109.8 PK			1.13 H	35	105.1	4.7
5	*5720.00	101.0 AV			1.13 H	35	96.3	4.7
6	#5850.00	49.7 PK	68.2	-18.5	1.13 H	35	44.7	5.0
7	11440.00	55.4 PK	74.0	-18.6	1.98 H	49	40.9	14.5
8	11440.00	45.7 AV	54.0	-8.3	1.98 H	49	31.2	14.5
9	#17160.00	51.8 PK	68.2	-16.4	1.63 H	54	33.8	18.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	49.1 PK	74.0	-24.9	1.11 V	259	44.7	4.4
2	5460.00	38.6 AV	54.0	-15.4	1.11 V	259	34.2	4.4
3	#5470.00	48.9 PK	68.2	-19.3	1.11 V	259	44.4	4.5
4	*5720.00	113.2 PK			1.11 V	259	108.5	4.7
5	*5720.00	105.3 AV			1.11 V	259	100.6	4.7
6	#5850.00	50.2 PK	68.2	-18.0	1.11 V	259	45.2	5.0
7	11440.00	60.9 PK	74.0	-13.1	2.00 V	34	46.4	14.5
8	11440.00	51.2 AV	54.0	-2.8	2.00 V	34	36.7	14.5
9	#17160.00	54.9 PK	68.2	-13.3	2.49 V	11	36.9	18.0

Remarks:

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

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	5146.90	51.6 PK	74.0	-22.4	1.17 H	11	46.8	4.8
2	5146.90	41.2 AV	54.0	-12.8	1.17 H	11	36.4	4.8
3	*5260.00	109.7 PK			1.17 H	11	105.4	4.3
4	*5260.00	100.8 AV			1.17 H	11	96.5	4.3
5	#10520.00	55.3 PK	68.2	-12.9	1.91 H	74	41.6	13.7
6	15780.00	51.3 PK	74.0	-22.7	1.58 H	69	37.3	14.0
7	15780.00	40.7 AV	54.0	-13.3	1.58 H	69	26.7	14.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5113.78	51.8 PK	74.0	-22.2	1.00 V	260	46.8	5.0
2	5113.78	41.2 AV	54.0	-12.8	1.00 V	260	36.2	5.0
3	*5260.00	113.6 PK			1.00 V	260	109.3	4.3
4	*5260.00	104.9 AV			1.00 V	260	100.6	4.3
5	#10520.00	59.9 PK	68.2	-8.3	2.02 V	54	46.2	13.7
6	15780.00	53.7 PK	74.0	-20.3	2.46 V	9	39.7	14.0
7	15780.00	44.9 AV	54.0	-9.1	2.46 V	9	30.9	14.0

Remarks:

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

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	110.2 PK			1.23 H	18	105.9	4.3
2	*5300.00	101.1 AV			1.23 H	18	96.8	4.3
3	10600.00	55.7 PK	74.0	-18.3	1.88 H	62	41.8	13.9
4	10600.00	45.3 AV	54.0	-8.7	1.88 H	62	31.4	13.9
5	15900.00	52.1 PK	74.0	-21.9	1.63 H	54	38.4	13.7
6	15900.00	41.2 AV	54.0	-12.8	1.63 H	54	27.5	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	113.3 PK			1.06 V	255	109.0	4.3
2	*5300.00	104.6 AV			1.06 V	255	100.3	4.3
3	10600.00	59.8 PK	74.0	-14.2	1.96 V	43	45.9	13.9
4	10600.00	49.6 AV	54.0	-4.4	1.96 V	43	35.7	13.9
5	15900.00	54.0 PK	74.0	-20.0	2.49 V	8	40.3	13.7
6	15900.00	44.9 AV	54.0	-9.1	2.49 V	8	31.2	13.7

Remarks:

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

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	109.7 PK			1.06 H	15	105.4	4.3
2	*5320.00	100.2 AV			1.06 H	15	95.9	4.3
3	5350.00	59.8 PK	74.0	-14.2	1.06 H	15	55.6	4.2
4	5350.00	49.5 AV	54.0	-4.5	1.06 H	15	45.3	4.2
5	10640.00	55.9 PK	74.0	-18.1	1.85 H	70	42.0	13.9
6	10640.00	46.2 AV	54.0	-7.8	1.85 H	70	32.3	13.9
7	15960.00	51.6 PK	74.0	-22.4	1.62 H	71	37.9	13.7
8	15960.00	41.0 AV	54.0	-13.0	1.62 H	71	27.3	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	112.1 PK			1.12 V	256	107.8	4.3
2	*5320.00	103.8 AV			1.12 V	256	99.5	4.3
3	5350.00	68.0 PK	74.0	-6.0	1.12 V	256	63.8	4.2
4	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**1.12 V**	**256**	**49.7**	**4.2**
5	10640.00	58.4 PK	74.0	-15.6	2.00 V	51	44.5	13.9
6	10640.00	48.9 AV	54.0	-5.1	2.00 V	51	35.0	13.9
7	15960.00	54.1 PK	74.0	-19.9	2.55 V	18	40.4	13.7
8	15960.00	44.1 AV	54.0	-9.9	2.55 V	18	30.4	13.7

Remarks:

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

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	53.4 PK	74.0	-20.6	1.09 H	351	49.0	4.4
2	5460.00	43.1 AV	54.0	-10.9	1.09 H	351	38.7	4.4
3	#5470.00	57.2 PK	68.2	-11.0	1.09 H	351	52.7	4.5
4	*5500.00	109.2 PK			1.09 H	351	104.6	4.6
5	*5500.00	100.7 AV			1.09 H	351	96.1	4.6
6	11000.00	56.1 PK	74.0	-17.9	1.83 H	67	41.8	14.3
7	11000.00	46.2 AV	54.0	-7.8	1.83 H	67	31.9	14.3
8	#16500.00	50.9 PK	68.2	-17.3	1.58 H	72	35.4	15.5
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	5460.00	57.0 PK	74.0	-17.0	1.36 V	256	52.6	4.4
2	5460.00	45.0 AV	54.0	-9.0	1.36 V	256	40.6	4.4
3	#5468.25	67.5 PK	68.2	-0.7	1.36 V	256	63.0	4.5
4	*5500.00	111.5 PK			1.36 V	256	106.9	4.6
5	*5500.00	103.7 AV			1.36 V	256	99.1	4.6
6	11000.00	58.9 PK	74.0	-15.1	1.98 V	55	44.6	14.3
7	11000.00	49.3 AV	54.0	-4.7	1.98 V	55	35.0	14.3
8	#16500.00	54.4 PK	68.2	-13.8	2.50 V	13	38.9	15.5

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 (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	109.6 PK			1.16 H	16	105.0	4.6
2	*5580.00	101.0 AV			1.16 H	16	96.4	4.6
3	11160.00	56.2 PK	74.0	-17.8	1.83 H	77	42.0	14.2
4	11160.00	45.6 AV	54.0	-8.4	1.83 H	77	31.4	14.2
5	#16740.00	51.7 PK	68.2	-16.5	1.64 H	39	34.8	16.9
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	*5580.00	113.2 PK			1.08 V	268	108.6	4.6
2	*5580.00	104.8 AV			1.08 V	268	100.2	4.6
3	11160.00	59.9 PK	74.0	-14.1	1.99 V	57	45.7	14.2
4	11160.00	49.8 AV	54.0	-4.2	1.99 V	57	35.6	14.2
5	#16740.00	54.5 PK	68.2	-13.7	2.47 V	3	37.6	16.9

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 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	109.3 PK			1.05 H	353	104.7	4.6
2	*5700.00	100.9 AV			1.05 H	353	96.3	4.6
3	#5725.00	56.9 PK	68.2	-11.3	1.05 H	353	52.2	4.7
4	11400.00	55.7 PK	74.0	-18.3	1.84 H	65	41.5	14.2
5	11400.00	45.8 AV	54.0	-8.2	1.84 H	65	31.6	14.2
6	#17100.00	51.3 PK	68.2	-16.9	1.67 H	68	33.5	17.8
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	*5700.00	112.2 PK			1.02 V	262	107.6	4.6
2	*5700.00	103.5 AV			1.02 V	262	98.9	4.6
3	#5725.00	67.7 PK	68.2	-0.5	1.02 V	262	63.0	4.7
4	11400.00	58.0 PK	74.0	-16.0	2.05 V	54	43.8	14.2
5	11400.00	48.7 AV	54.0	-5.3	2.05 V	54	34.5	14.2
6	#17100.00	54.8 PK	68.2	-13.4	2.51 V	24	37.0	17.8

Remarks:

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

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	48.4 PK	74.0	-25.6	1.21 H	31	44.0	4.4
2	5460.00	37.9 AV	54.0	-16.1	1.21 H	31	33.5	4.4
3	#5470.00	47.9 PK	68.2	-20.3	1.21 H	31	43.4	4.5
4	*5720.00	110.4 PK			1.21 H	31	105.7	4.7
5	*5720.00	101.3 AV			1.21 H	31	96.6	4.7
6	#5850.00	50.1 PK	68.2	-18.1	1.21 H	31	45.1	5.0
7	11440.00	55.7 PK	74.0	-18.3	1.86 H	84	41.2	14.5
8	11440.00	45.3 AV	54.0	-8.7	1.86 H	84	30.8	14.5
9	#17160.00	52.0 PK	68.2	-16.2	1.66 H	30	34.0	18.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	47.5 PK	74.0	-26.5	1.00 V	261	43.1	4.4
2	5460.00	37.7 AV	54.0	-16.3	1.00 V	261	33.3	4.4
3	#5470.00	47.6 PK	68.2	-20.6	1.00 V	261	43.1	4.5
4	*5720.00	112.5 PK			1.00 V	261	107.8	4.7
5	*5720.00	104.4 AV			1.00 V	261	99.7	4.7
6	#5850.00	49.2 PK	68.2	-19.0	1.00 V	261	44.2	5.0
7	11440.00	60.2 PK	74.0	-13.8	2.03 V	54	45.7	14.5
8	11440.00	50.1 AV	54.0	-3.9	2.03 V	54	35.6	14.5
9	#17160.00	54.5 PK	68.2	-13.7	2.47 V	10	36.5	18.0

Remarks:

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

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	5108.47	51.8 PK	74.0	-22.2	1.08 H	20	46.8	5.0
2	5108.47	41.6 AV	54.0	-12.4	1.08 H	20	36.6	5.0
3	*5270.00	107.1 PK			1.08 H	20	102.8	4.3
4	*5270.00	99.0 AV			1.08 H	20	94.7	4.3
5	#10540.00	53.6 PK	68.2	-14.6	1.89 H	73	39.8	13.8
6	#10540.00	43.7 AV	54.0	-10.3	1.89 H	73	29.9	13.8
7	15810.00	50.9 PK	74.0	-23.1	1.58 H	72	37.0	13.9
8	15810.00	40.9 AV	54.0	-13.1	1.58 H	72	27.0	13.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5113.34	52.2 PK	74.0	-21.8	1.17 V	257	47.2	5.0
2	5113.34	41.7 AV	54.0	-12.3	1.17 V	257	36.7	5.0
3	*5270.00	110.6 PK			1.17 V	257	106.3	4.3
4	*5270.00	102.2 AV			1.17 V	257	97.9	4.3
5	#10540.00	55.8 PK	68.2	-12.4	1.97 V	46	42.0	13.8
6	#10540.00	45.6 AV	54.0	-8.4	1.97 V	46	31.8	13.8
7	15810.00	51.9 PK	74.0	-22.1	2.50 V	33	38.0	13.9
8	15810.00	42.5 AV	54.0	-11.5	2.50 V	33	28.6	13.9

Remarks:

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

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	101.3 PK			1.02 H	15	97.0	4.3
2	*5310.00	93.9 AV			1.02 H	15	89.6	4.3
3	5350.00	62.2 PK	74.0	-11.8	1.02 H	15	58.0	4.2
4	5350.00	53.2 AV	54.0	-0.8	1.02 H	15	49.0	4.2
5	10620.00	54.0 PK	74.0	-20.0	1.93 H	58	40.1	13.9
6	10620.00	43.8 AV	54.0	-10.2	1.93 H	58	29.9	13.9
7	15930.00	51.2 PK	74.0	-22.8	1.58 H	60	37.5	13.7
8	15930.00	41.3 AV	54.0	-12.7	1.58 H	60	27.6	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5310.00	104.9 PK			1.03 V	261	100.6	4.3
2	*5310.00	96.7 AV			1.03 V	261	92.4	4.3
3	5352.00	64.1 PK	74.0	-9.9	1.03 V	261	59.9	4.2
4	5352.00	53.8 AV	54.0	-0.2	1.03 V	261	49.6	4.2
5	10620.00	55.6 PK	74.0	-18.4	2.02 V	39	41.7	13.9
6	10620.00	45.5 AV	54.0	-8.5	2.02 V	39	31.6	13.9
7	15930.00	51.4 PK	74.0	-22.6	2.43 V	32	37.7	13.7
8	15930.00	42.3 AV	54.0	-11.7	2.43 V	32	28.6	13.7

Remarks:

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

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	55.5 PK	74.0	-18.5	1.10 H	15	51.1	4.4
2	5460.00	46.3 AV	54.0	-7.7	1.10 H	15	41.9	4.4
3	#5468.87	65.8 PK	68.2	-2.4	1.10 H	15	61.3	4.5
4	*5510.00	102.6 PK			1.10 H	15	98.0	4.6
5	*5510.00	94.6 AV			1.10 H	15	90.0	4.6
6	11020.00	52.9 PK	74.0	-21.1	1.83 H	63	38.7	14.2
7	11020.00	43.2 AV	54.0	-10.8	1.83 H	63	29.0	14.2
8	#16530.00	51.6 PK	68.2	-16.6	1.60 H	82	35.9	15.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	59.5 PK	74.0	-14.5	1.19 V	258	55.1	4.4
2	5460.00	51.5 AV	54.0	-2.5	1.19 V	258	47.1	4.4
3	#5469.68	67.7 PK	68.2	-0.5	1.19 V	258	63.2	4.5
4	*5510.00	105.6 PK			1.19 V	258	101.0	4.6
5	*5510.00	97.7 AV			1.19 V	258	93.1	4.6
6	11020.00	55.0 PK	74.0	-19.0	2.01 V	39	40.8	14.2
7	11020.00	44.9 AV	54.0	-9.1	2.01 V	39	30.7	14.2
8	#16530.00	51.9 PK	68.2	-16.3	2.42 V	41	36.2	15.7

Remarks:

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

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	107.1 PK			1.11 H	25	102.5	4.6
2	*5550.00	99.1 AV			1.11 H	25	94.5	4.6
3	11100.00	53.7 PK	74.0	-20.3	1.94 H	68	39.9	13.8
4	11100.00	43.7 AV	54.0	-10.3	1.94 H	68	29.9	13.8
5	#16650.00	51.1 PK	68.2	-17.1	1.59 H	73	34.6	16.5
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	110.7 PK			1.22 V	244	106.1	4.6
2	*5550.00	102.0 AV			1.22 V	244	97.4	4.6
3	11100.00	55.4 PK	74.0	-18.6	1.97 V	44	41.6	13.8
4	11100.00	45.2 AV	54.0	-8.8	1.97 V	44	31.4	13.8
5	#16650.00	51.6 PK	68.2	-16.6	2.47 V	39	35.1	16.5

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	106.6 PK			1.14 H	18	102.0	4.6
2	*5670.00	98.7 AV			1.14 H	18	94.1	4.6
3	#5725.00	63.5 PK	68.2	-4.7	1.14 H	18	58.8	4.7
4	11340.00	53.4 PK	74.0	-20.6	1.90 H	63	38.8	14.6
5	11340.00	43.3 AV	54.0	-10.7	1.90 H	63	28.7	14.6
6	#17010.00	51.3 PK	68.2	-16.9	1.56 H	62	33.6	17.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5670.00	109.4 PK			1.02 V	258	104.8	4.6
2	*5670.00	101.5 AV			1.02 V	258	96.9	4.6
3	#5725.00	67.6 PK	68.2	-0.6	1.02 V	258	62.9	4.7
4	11340.00	55.5 PK	74.0	-18.5	1.97 V	34	40.9	14.6
5	11340.00	45.1 AV	54.0	-8.9	1.97 V	34	30.5	14.6
6	#17010.00	52.0 PK	68.2	-16.2	2.46 V	44	34.3	17.7

Remarks:

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

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	47.6 PK	74.0	-26.4	1.13 H	27	43.2	4.4
2	5460.00	37.8 AV	54.0	-16.2	1.13 H	27	33.4	4.4
3	#5470.00	48.7 PK	68.2	-19.5	1.13 H	27	44.2	4.5
4	*5710.00	106.8 PK			1.13 H	27	102.1	4.7
5	*5710.00	98.7 AV			1.13 H	27	94.0	4.7
6	#5850.00	50.0 PK	68.2	-18.2	1.13 H	27	45.0	5.0
7	11420.00	53.2 PK	74.0	-20.8	1.89 H	65	38.9	14.3
8	11420.00	43.4 AV	54.0	-10.6	1.89 H	65	29.1	14.3
9	#17130.00	51.4 PK	68.2	-16.8	1.58 H	81	33.5	17.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	48.2 PK	74.0	-25.8	1.00 V	262	43.8	4.4
2	5460.00	38.1 AV	54.0	-15.9	1.00 V	262	33.7	4.4
3	#5470.00	48.4 PK	68.2	-19.8	1.00 V	262	43.9	4.5
4	*5710.00	110.7 PK			1.00 V	262	106.0	4.7
5	*5710.00	102.2 AV			1.00 V	262	97.5	4.7
6	#5850.00	49.7 PK	68.2	-18.5	1.00 V	262	44.7	5.0
7	11420.00	55.4 PK	74.0	-18.6	2.02 V	28	41.1	14.3
8	11420.00	45.4 AV	54.0	-8.6	2.02 V	28	31.1	14.3
9	#17130.00	51.7 PK	68.2	-16.5	2.50 V	47	33.8	17.9

Remarks:

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

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	5113.18	52.2 PK	74.0	-21.8	1.04 H	16	47.2	5.0
2	5113.18	41.6 AV	54.0	-12.4	1.04 H	16	36.6	5.0
3	*5290.00	95.8 PK			1.04 H	16	91.5	4.3
4	*5290.00	89.0 AV			1.04 H	16	84.7	4.3
5	5365.92	60.5 PK	74.0	-13.5	1.04 H	16	56.2	4.3
6	5365.92	50.0 AV	54.0	-4.0	1.04 H	16	45.7	4.3
7	#10580.00	53.2 PK	68.2	-15.0	1.88 H	49	39.4	13.8
8	15870.00	51.6 PK	74.0	-22.4	1.53 H	64	37.8	13.8
9	15870.00	41.7 AV	54.0	-12.3	1.53 H	64	27.9	13.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5114.14	51.2 PK	74.0	-22.8	1.05 V	262	46.2	5.0
2	5114.14	41.3 AV	54.0	-12.7	1.05 V	262	36.3	5.0
3	*5290.00	99.5 PK			1.05 V	262	95.2	4.3
4	*5290.00	92.1 AV			1.05 V	262	87.8	4.3
5	5354.47	62.9 PK	74.0	-11.1	1.05 V	262	58.7	4.2
6	**5354.47**	**53.9 AV**	**54.0**	**-0.1**	**1.05 V**	**262**	**49.7**	**4.2**
7	#10580.00	55.7 PK	68.2	-12.5	2.07 V	30	41.9	13.8
8	15870.00	51.1 PK	74.0	-22.9	2.43 V	30	37.3	13.8
9	15870.00	42.3 AV	54.0	-11.7	2.43 V	30	28.5	13.8

Remarks:

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

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	5446.89	57.6 PK	74.0	-16.4	1.07 H	14	53.3	4.3
2	5446.89	47.1 AV	54.0	-6.9	1.07 H	14	42.8	4.3
3	#5464.00	59.6 PK	68.2	-8.6	1.07 H	14	55.1	4.5
4	*5530.00	95.5 PK			1.07 H	14	90.9	4.6
5	*5530.00	87.8 AV			1.07 H	14	83.2	4.6
6	#5753.14	50.5 PK	68.2	-17.7	1.07 H	14	45.7	4.8
7	11060.00	54.2 PK	74.0	-19.8	1.85 H	71	40.2	14.0
8	11060.00	44.1 AV	54.0	-9.9	1.85 H	71	30.1	14.0
9	#16590.00	50.7 PK	68.2	-17.5	1.57 H	74	34.7	16.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	64.4 PK	74.0	-9.6	1.12 V	258	60.0	4.4
2	5460.00	53.5 AV	54.0	-0.5	1.12 V	258	49.1	4.4
3	#5461.69	63.4 PK	68.2	-4.8	1.12 V	258	59.0	4.4
4	*5530.00	97.7 PK			1.12 V	258	93.1	4.6
5	*5530.00	89.8 AV			1.12 V	258	85.2	4.6
6	#5849.55	50.4 PK	68.2	-17.8	1.12 V	258	45.5	4.9
7	11060.00	55.6 PK	74.0	-18.4	2.11 V	22	41.6	14.0
8	11060.00	45.1 AV	54.0	-8.9	2.11 V	22	31.1	14.0
9	#16590.00	50.9 PK	68.2	-17.3	2.48 V	24	34.9	16.0

Remarks:

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

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	105.4 PK			1.07 H	11	100.9	4.5
2	*5610.00	96.1 AV			1.07 H	11	91.6	4.5
3	#5725.00	64.3 PK	68.2	-3.9	1.07 H	11	59.6	4.7
4	11220.00	53.6 PK	74.0	-20.4	1.85 H	70	39.0	14.6
5	11220.00	43.4 AV	54.0	-10.6	1.85 H	70	28.8	14.6
6	#16830.00	51.7 PK	68.2	-16.5	1.56 H	69	34.6	17.1
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	106.2 PK			1.14 V	260	101.7	4.5
2	*5610.00	98.4 AV			1.14 V	260	93.9	4.5
3	#5725.00	68.0 PK	68.2	-0.2	1.14 V	260	63.3	4.7
4	11220.00	55.4 PK	74.0	-18.6	2.13 V	33	40.8	14.6
5	11220.00	45.1 AV	54.0	-8.9	2.13 V	33	30.5	14.6
6	#16830.00	51.1 PK	68.2	-17.1	2.49 V	38	34.0	17.1

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	53.1 PK	74.0	-20.9	1.03 H	10	48.7	4.4
2	5460.00	42.8 AV	54.0	-11.2	1.03 H	10	38.4	4.4
3	#5470.00	55.1 PK	68.2	-13.1	1.03 H	10	50.6	4.5
4	*5690.00	105.3 PK			1.03 H	10	100.6	4.7
5	*5690.00	95.8 AV			1.03 H	10	91.1	4.7
6	#5850.00	55.9 PK	68.2	-12.3	1.03 H	10	50.9	5.0
7	11380.00	53.6 PK	74.0	-20.4	1.91 H	74	39.2	14.4
8	11380.00	43.8 AV	54.0	-10.2	1.91 H	74	29.4	14.4
9	#17070.00	51.3 PK	68.2	-16.9	1.63 H	68	33.5	17.8
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	5460.00	53.5 PK	74.0	-20.5	1.09 V	255	49.1	4.4
2	5460.00	43.2 AV	54.0	-10.8	1.09 V	255	38.8	4.4
3	#5470.00	56.2 PK	68.2	-12.0	1.09 V	255	51.7	4.5
4	*5690.00	106.3 PK			1.09 V	255	101.6	4.7
5	*5690.00	99.4 AV			1.09 V	255	94.7	4.7
6	#5850.00	57.2 PK	68.2	-11.0	1.09 V	255	52.2	5.0
7	11380.00	55.2 PK	74.0	-18.8	1.97 V	45	40.8	14.4
8	11380.00	45.3 AV	54.0	-8.7	1.97 V	45	30.9	14.4
9	#17070.00	51.2 PK	68.2	-17.0	2.49 V	28	33.4	17.8

Remarks:

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

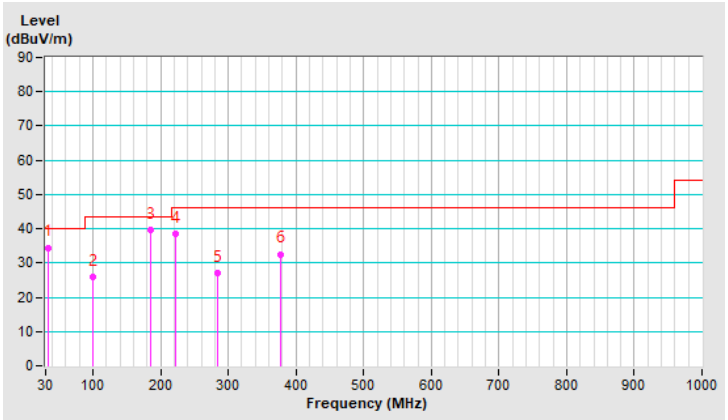
Below 1GHz Data:

RF Mode	TX 802.11ac (VHT40)	Channel	CH 54：5270 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	34.54	34.5 QP	40.0	-5.5	1.50 H	290	43.2	-8.7
2	99.76	26.0 QP	43.5	-17.5	2.00 H	80	37.7	-11.7
3	185.83	39.7 QP	43.5	-3.8	2.00 H	107	48.8	-9.1
4	221.24	38.6 QP	46.0	-7.4	1.00 H	42	48.4	-9.8
5	285.02	27.2 QP	46.0	-18.8	1.00 H	102	33.6	-6.4
6	377.51	32.6 QP	46.0	-13.4	1.50 H	341	36.3	-3.7

Remarks:

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

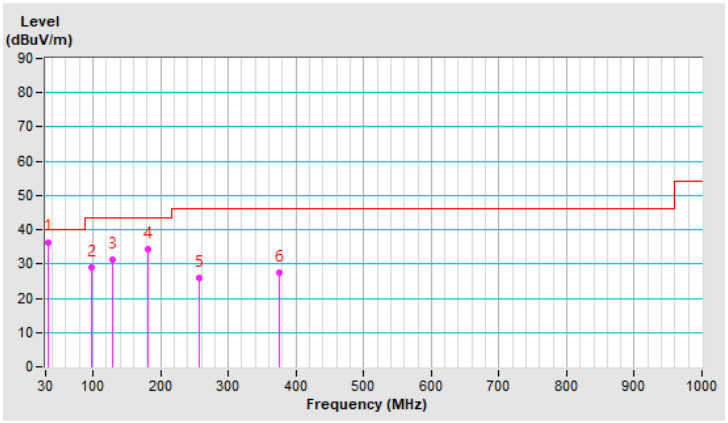


RF Mode	TX 802.11ac (VHT40)	Channel	CH 54：5270 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	33.23	36.4 QP	40.0	-3.6	1.00 V	348	45.2	-8.8
2	97.92	28.9 QP	43.5	-14.6	1.50 V	44	41.0	-12.1
3	128.09	31.2 QP	43.5	-12.3	1.50 V	313	39.5	-8.3
4	181.79	34.2 QP	43.5	-9.3	1.00 V	225	43.0	-8.8
5	256.56	25.8 QP	46.0	-20.2	1.00 V	6	33.6	-7.8
6	375.83	27.3 QP	46.0	-18.7	3.00 V	282	31.0	-3.7

Remarks:

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



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. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
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: Nov. 27, 2020

4.2.3 Test Procedure

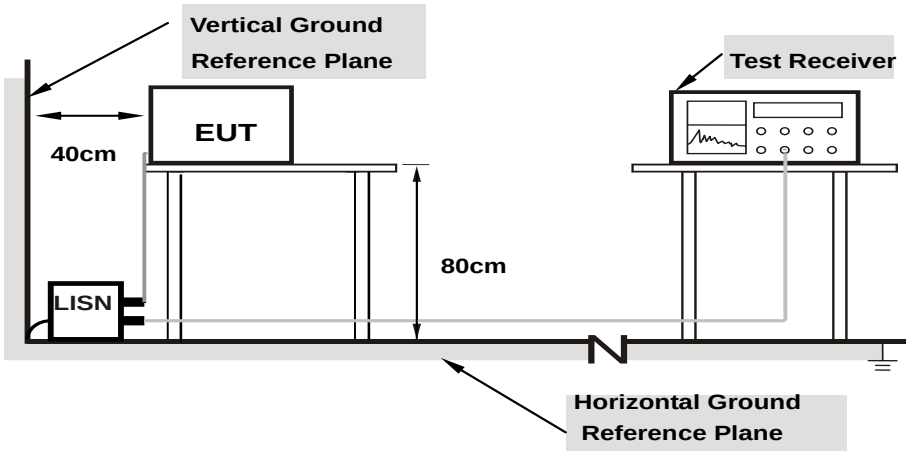
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

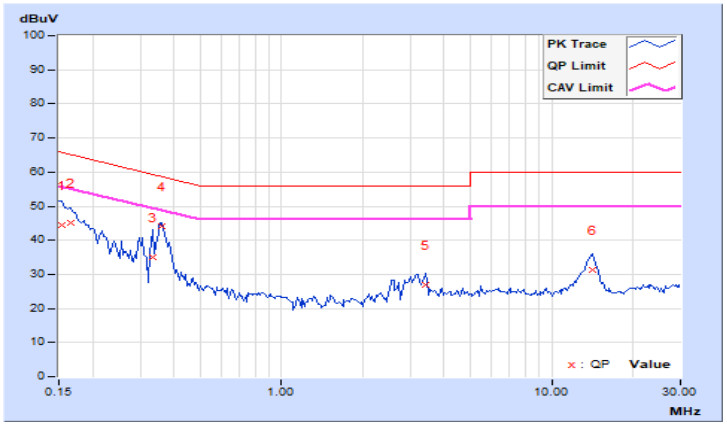
4.2.7 Test Results

RF Mode	TX 802.11ac (VHT40)	Channel	CH 54：5270 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	0.15385	9.96	34.35	15.90	44.31	25.86	65.79	55.79	-21.48	-29.93
2	0.16586	9.97	35.29	26.34	45.26	36.31	65.17	55.17	-19.91	-18.86
3	0.33343	10.01	24.84	19.92	34.85	29.93	59.37	49.37	-24.52	-19.44
4	**0.36107**	**10.01**	**34.15**	**33.57**	**44.16**	**43.58**	**58.70**	**48.70**	**-14.54**	**-5.12**
5	3.40642	10.24	16.59	6.94	26.83	17.18	56.00	46.00	-29.17	-28.82
6	14.11333	11.03	20.17	13.85	31.20	24.88	60.00	50.00	-28.80	-25.12

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

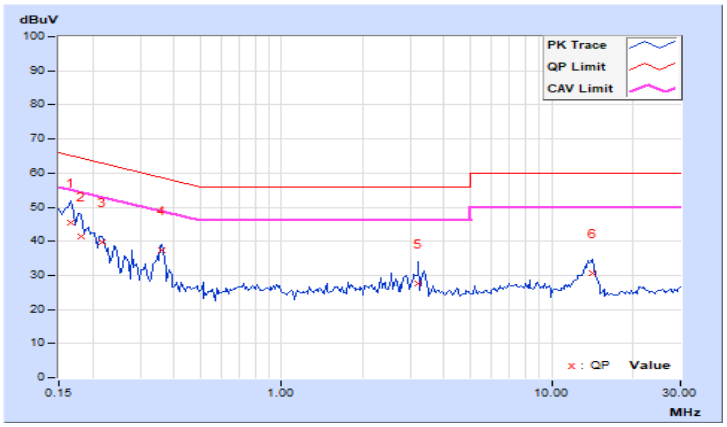


RF Mode	TX 802.11ac (VHT40)	Channel	CH 54：5270 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

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	0.16553	9.95	35.57	26.00	45.52	35.95	65.18	55.18	-19.66	-19.23
2	0.18138	9.97	31.57	13.11	41.54	23.08	64.42	54.42	-22.88	-31.34
3	0.21659	9.98	29.73	21.56	39.71	31.54	62.95	52.95	-23.24	-21.41
4	0.36107	10.00	27.28	26.42	37.28	36.42	58.70	48.70	-21.42	-12.28
5	3.19943	10.21	17.51	5.84	27.72	16.05	56.00	46.00	-28.28	-29.95
6	14.12117	10.85	19.63	13.50	30.48	24.35	60.00	50.00	-29.52	-25.65

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

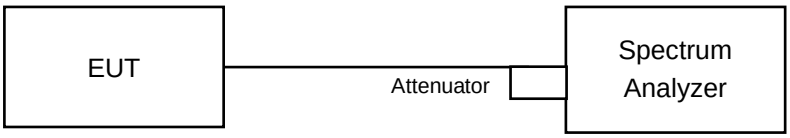
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

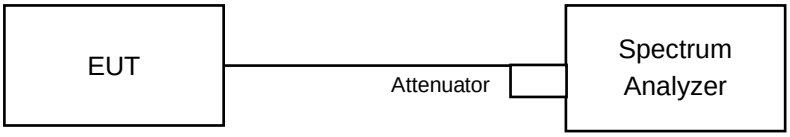
FOR POWER OUTPUT MEASUREMENT

For 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:

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 ≥ 3 x RBW.
4. Number of points in sweep ≥ 2 Span / 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

CDD Mode

POWER OUTPUT

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.24	18.49	137.312	21.38	24	PASS
60	5300	17.77	18.15	125.154	20.97	24	PASS
64	5320	17.14	17.57	108.909	20.37	24	PASS
100	5500	16.86	16.13	89.549	19.52	24	PASS
116	5580	18.48	17.92	132.413	21.22	24	PASS
140	5700	16.98	17.37	104.464	20.19	24	PASS
*144 (U-NII-2C Band)	5720	12.62	13.09	40.693	16.10	23.04	PASS
*144 (U-NII-3 Band)	5720	6.68	6.81	9.952	9.98	30	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.

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

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	32.62	26.13 > 24
60	5300	35.66	26.52 > 24
64	5320	27	25.31 > 24
100	5500	24.08	24.81 > 24
116	5580	29.35	25.67 > 24
140	5700	23.66	24.74 > 24
144 (U-NII-2C Band)	5720	16.03	23.04 < 24

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	18.27	18.49	137.775	21.39	24	PASS
60	5300	17.84	18.31	128.578	21.09	24	PASS
64	5320	17.12	17.45	107.113	20.30	24	PASS
100	5500	16.84	16.06	88.67	19.48	24	PASS
116	5580	18.56	17.83	132.453	21.22	24	PASS
140	5700	16.81	17.37	102.549	20.11	24	PASS
*144 (U-NII-2C Band)	5720	13.20	13.56	49.622	16.96	23.13	PASS
*144 (U-NII-3 Band)	5720	7.78	7.89	13.83	11.41	30	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.

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

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	29.63	25.71 > 24
60	5300	36.42	26.61 > 24
64	5320	31.08	25.92 > 24
100	5500	25.52	25.06 > 24
116	5580	35.63	26.51 > 24
140	5700	24.64	24.91 > 24
144 (U-NII-2C Band)	5720	16.35	23.13 < 24

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	18.67	18.91	151.424	21.80	24	PASS
62	5310	13.79	13.85	48.199	16.83	24	PASS
102	5510	14.89	14.23	57.317	17.58	24	PASS
110	5550	18.81	17.99	138.983	21.43	24	PASS
134	5670	18.35	18.59	140.668	21.48	24	PASS
*142 (U-NII-2C Band)	5710	13.90	14.38	66.185	18.21	24	PASS
*142 (U-NII-3 Band)	5710	2.74	2.96	4.912	6.91	30	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.

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

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	62.2	28.93 > 24
62	5310	41.29	27.15 > 24
102	5510	41.32	27.16 > 24
110	5550	65.4	29.15 > 24
134	5670	65.64	29.17 > 24
142 (U-NII-2C Band)	5710	38.35	26.83 > 24

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	11.38	11.49	27.833	14.45	24	PASS
106	5530	10.87	10.12	22.498	13.52	24	PASS
122	5610	18.64	18.35	141.505	21.51	24	PASS
*138 (U-NII-2C Band)	5690	13.09	13.22	50.019	16.99	24	PASS
*138 (U-NII-3 Band)	5690	-0.18	0.70	2.5811	4.12	30	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.

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

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	84.05	30.24 > 24
106	5530	84.52	30.26 > 24
122	5610	138.72	32.42 > 24
138 (U-NII-2C Band)	5690	77.93	29.91 > 24

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	18.27	18.49	137.775	21.39	23.89	PASS
60	5300	17.84	18.31	128.578	21.09	23.89	PASS
64	5320	17.12	17.45	107.113	20.30	23.89	PASS
100	5500	16.84	16.06	88.67	19.48	23.89	PASS
116	5580	18.56	17.83	132.453	21.22	23.89	PASS
140	5700	16.81	17.37	102.549	20.11	23.89	PASS
*144 (U-NII-2C Band)	5720	13.20	13.56	49.622	16.96	23.02	PASS
*144 (U-NII-3 Band)	5720	7.78	7.89	13.83	11.41	29.89	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.

1. For U-NII-2A: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit- (6.11-6)”.
2. For U-NII-2C: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit- (6.11-6)”.
3. For U-NII-3: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi , so the power limit shall be reduced to 30-(6.11-6) = 29.89dBm.

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

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	29.63	25.71 > 24
60	5300	36.42	26.61 > 24
64	5320	31.08	25.92 > 24
100	5500	25.52	25.06 > 24
116	5580	35.63	26.51 > 24
140	5700	24.64	24.91 > 24
144 (U-NII-2C Band)	5720	16.35	23.13 < 24

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	18.67	18.91	151.424	21.80	23.89	PASS
62	5310	13.79	13.85	48.199	16.83	23.89	PASS
102	5510	14.89	14.23	57.317	17.58	23.89	PASS
110	5550	18.81	17.99	138.983	21.43	23.89	PASS
134	5670	18.35	18.59	140.668	21.48	23.89	PASS
*142 (U-NII-2C Band)	5710	13.90	14.38	66.185	18.21	23.89	PASS
*142 (U-NII-3 Band)	5710	2.74	2.96	4.912	6.91	29.89	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.

1. For U-NII-2A: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit- (6.11-6)”.
2. For U-NII-2C: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit- (6.11-6)”.
3. For U-NII-3: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi , so the power limit shall be reduced to 30-(6.11-6) = 29.89dBm.

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

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	62.2	28.93 > 24
62	5310	41.29	27.15 > 24
102	5510	41.32	27.16 > 24
110	5550	65.4	29.15 > 24
134	5670	65.64	29.17 > 24
142 (U-NII-2C Band)	5710	38.35	26.83 > 24

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	11.38	11.49	27.833	14.45	23.89	PASS
106	5530	10.87	10.12	22.498	13.52	23.89	PASS
122	5610	18.64	18.35	141.505	21.51	23.89	PASS
*138 (U-NII-2C Band)	5690	13.09	13.22	50.019	16.99	23.89	PASS
*138 (U-NII-3 Band)	5690	-0.18	0.70	2.5811	4.12	29.89	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.

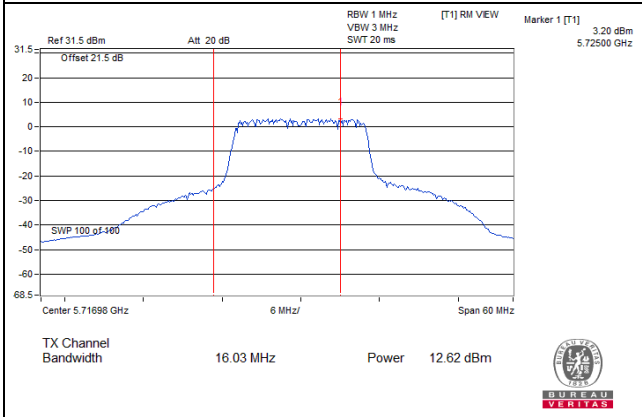
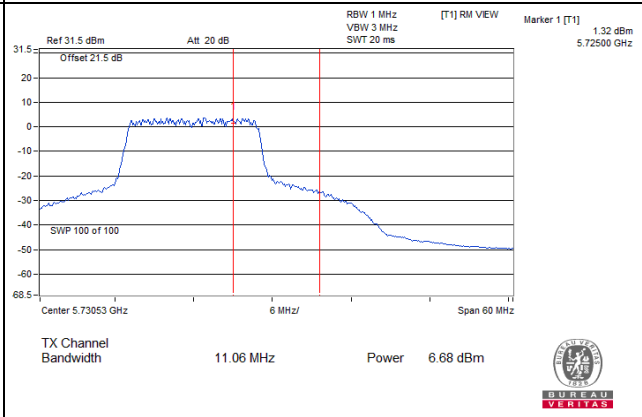
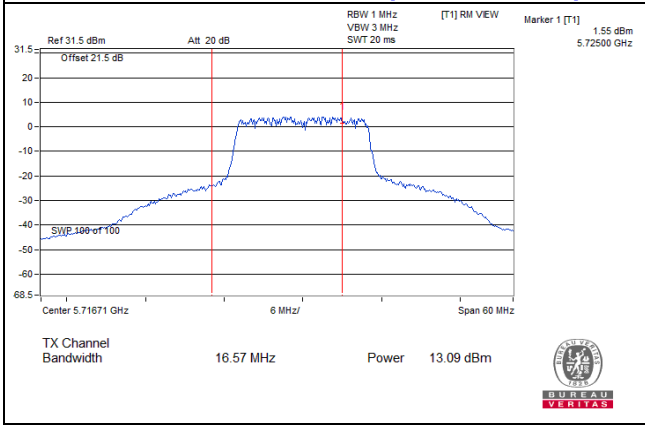
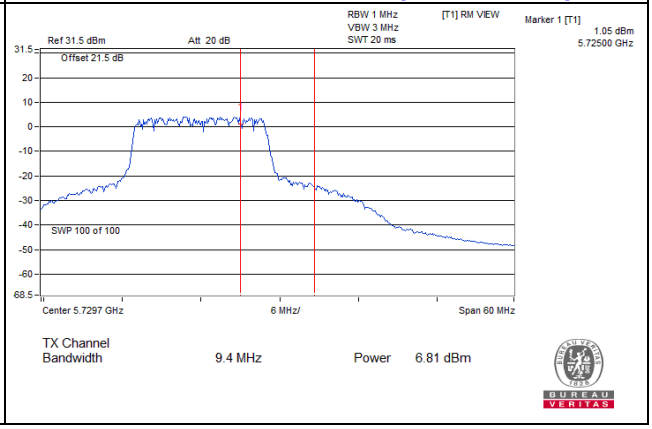
1. For U-NII-2A: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit- (6.11-6)”.
2. For U-NII-2C: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit- (6.11-6)”.
3. For U-NII-3: The directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi , so the power limit shall be reduced to 30-(6.11-6) = 29.89dBm.

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

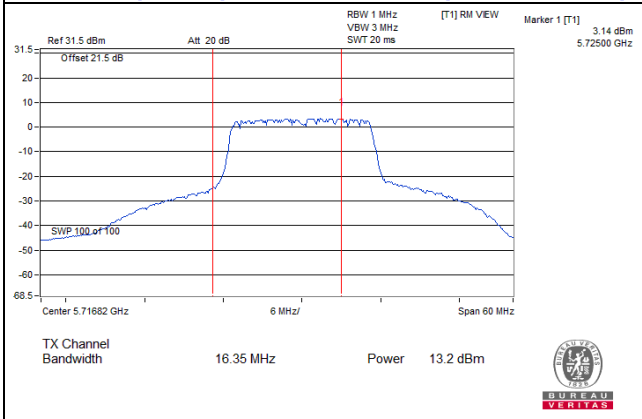
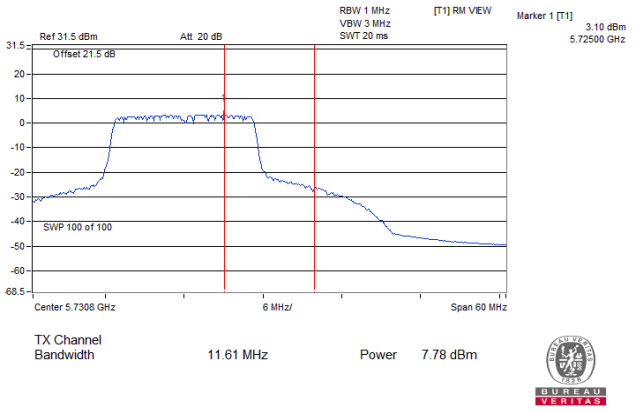
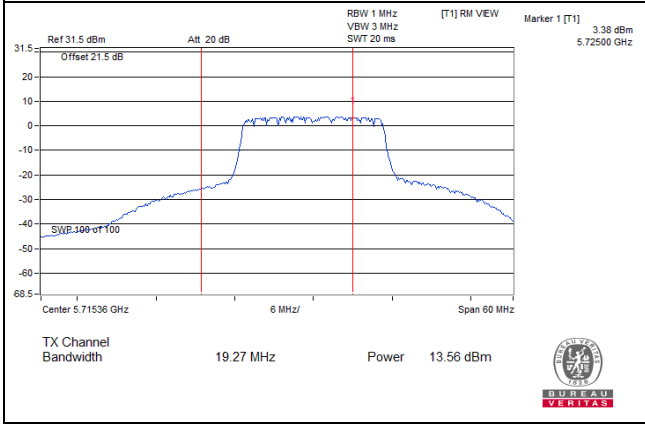
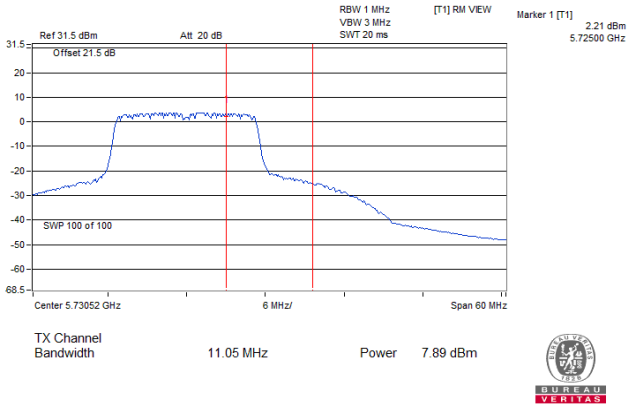
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	84.05	30.24 > 24
106	5530	84.52	30.26 > 24
122	5610	138.72	32.42 > 24
138 (U-NII-2C Band)	5690	77.93	29.91 > 24

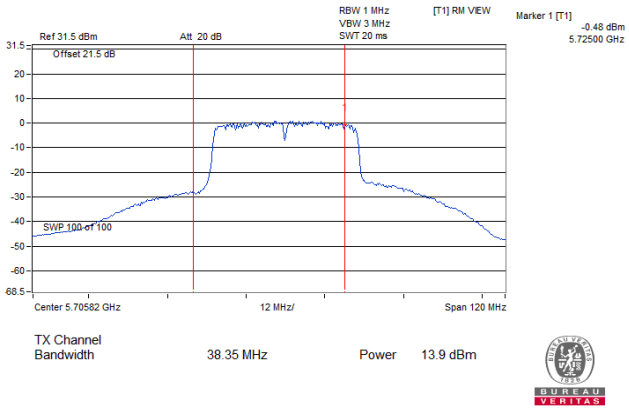
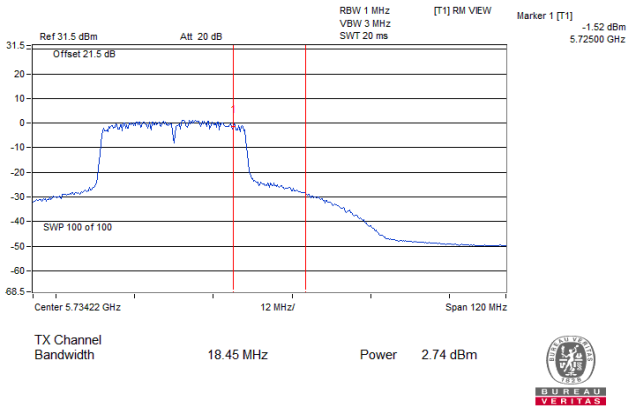
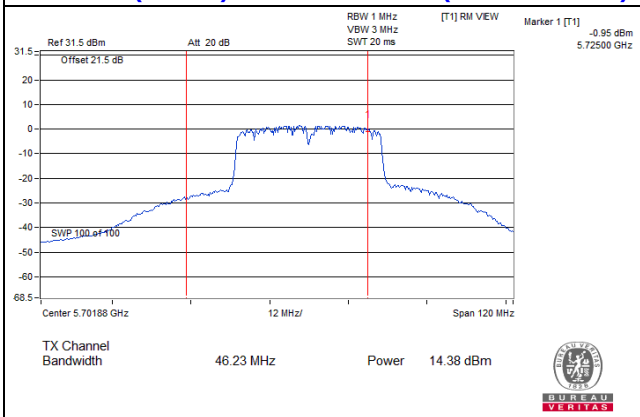
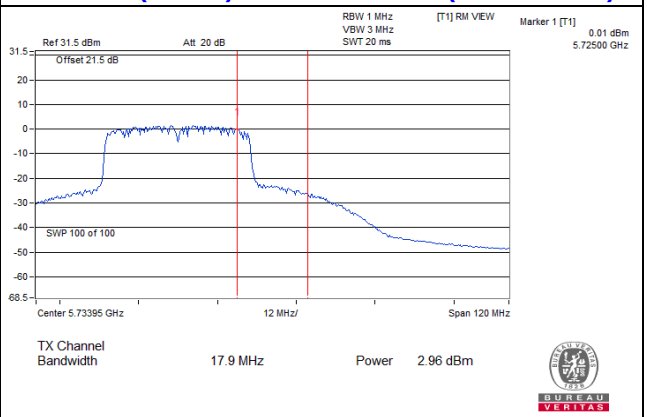
For channel straddling 5725MHz of Power

CDD Mode

Spectrum Plot Value of Power	
802.11a_Chain 0 / CH144 (U-NII-2C Band)	**802.11a_Chain 0 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 16.03 MHz Power 12.62 dBm	 TX Channel Bandwidth 11.06 MHz Power 6.68 dBm
802.11a_Chain 1 / CH144 (U-NII-2C Band)	**802.11a_Chain 1 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 16.57 MHz Power 13.09 dBm	 TX Channel Bandwidth 9.4 MHz Power 6.81 dBm

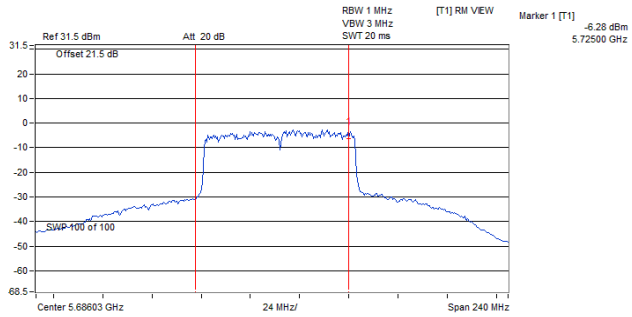
CDD / Beamforming Mode

Spectrum Plot Value of Power	
802.11ac (VHT20)_Chain 0 / CH144 (U-NII-2C Band)	**802.11ac (VHT20)_Chain 0 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 16.35 MHz Power 13.2 dBm	 TX Channel Bandwidth 11.61 MHz Power 7.78 dBm
802.11ac (VHT20)_Chain 1 / CH144 (U-NII-2C Band)	**802.11ac (VHT20)_Chain 1 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 19.27 MHz Power 13.56 dBm	 TX Channel Bandwidth 11.05 MHz Power 7.89 dBm

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)**
 TX Channel Bandwidth 38.35 MHz Power 13.9 dBm	 TX Channel Bandwidth 18.45 MHz Power 2.74 dBm
802.11ac (VHT40)_Chain 1 / CH142 (U-NII-2C Band)	**802.11ac (VHT40)_Chain 1 / CH142 (U-NII-3 Band)**
 TX Channel Bandwidth 46.23 MHz Power 14.38 dBm	 TX Channel Bandwidth 17.9 MHz Power 2.96 dBm

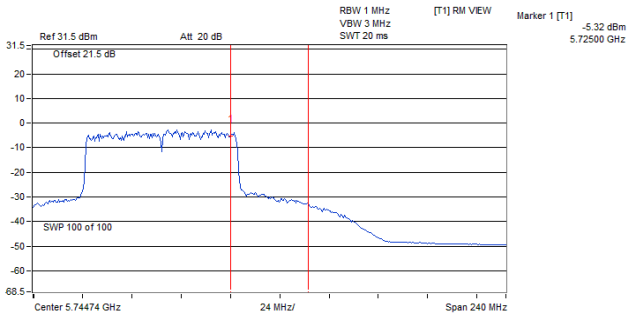
Spectrum Plot Value of Power

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



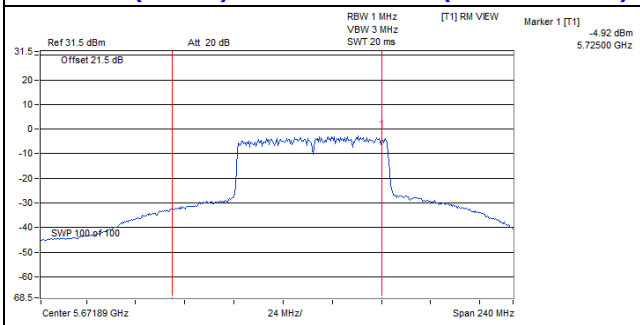
TX Channel Bandwidth 77.93 MHz Power 13.09 dBm

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



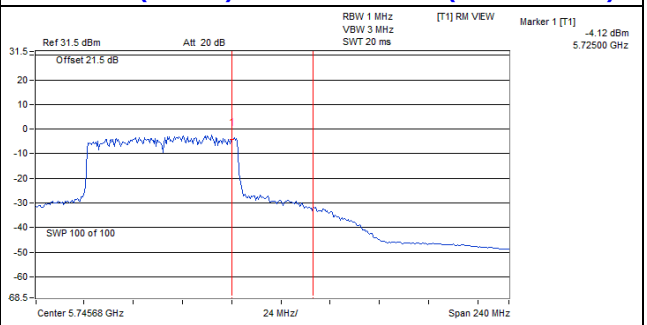
TX Channel Bandwidth 39.49 MHz Power -0.18 dBm

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



TX Channel Bandwidth 106.21 MHz Power 13.22 dBm

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



TX Channel Bandwidth 41.36 MHz Power 0.7 dBm

CDD Mode

26dB OCCUPIED BANDWIDTH

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain0	Chain1
52	5260	34.91	32.62
60	5300	36.68	35.66
64	5320	27	33.65
100	5500	26.69	24.08
116	5580	29.35	36.56
140	5700	26.46	23.66
144 (U-NII-2C Band)	5720	16.03	16.57

802.11ac (VHT20)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain0	Chain1
52	5260	38.74	29.63
60	5300	37.83	36.42
64	5320	32.6	31.08
100	5500	26.06	25.52
116	5580	35.63	39.09
140	5700	24.64	26.63
144 (U-NII-2C Band)	5720	16.35	19.27

802.11ac (VHT40)

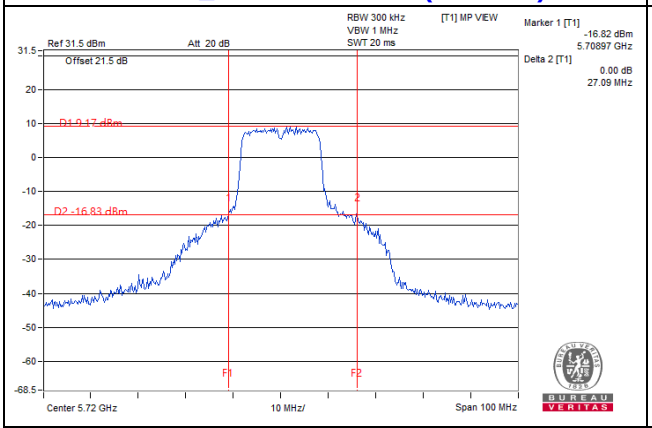
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain0	Chain1
54	5270	80.53	62.2
62	5310	42.46	41.29
102	5510	41.32	41.32
110	5550	65.4	73.07
134	5670	65.64	73.07
142 (U-NII-2C Band)	5710	38.35	46.23

802.11ac (VHT80)

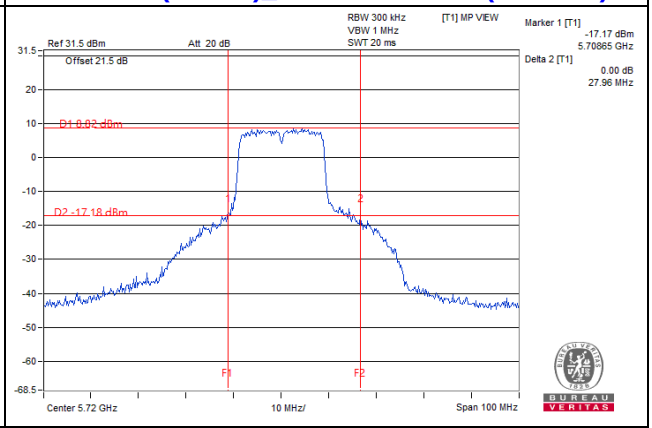
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain0	Chain1
58	5290	84.83	84.05
106	5530	84.52	84.76
122	5610	138.72	169.19
138 (U-NII-2C Band)	5690	77.93	106.21

Spectrum Plot of Worst Value

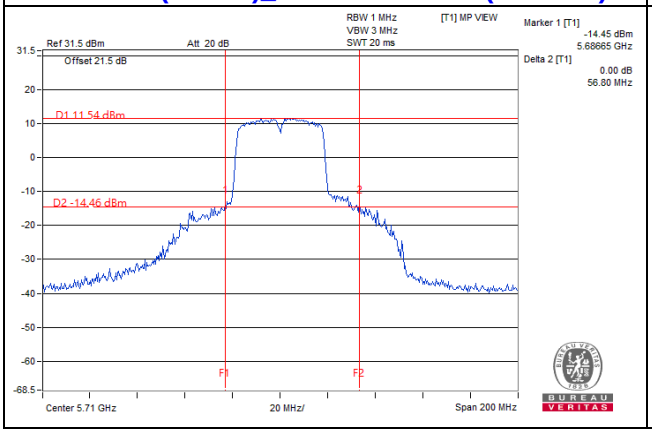
802.11a_Chain 0 / CH144 (U-NII-2C)



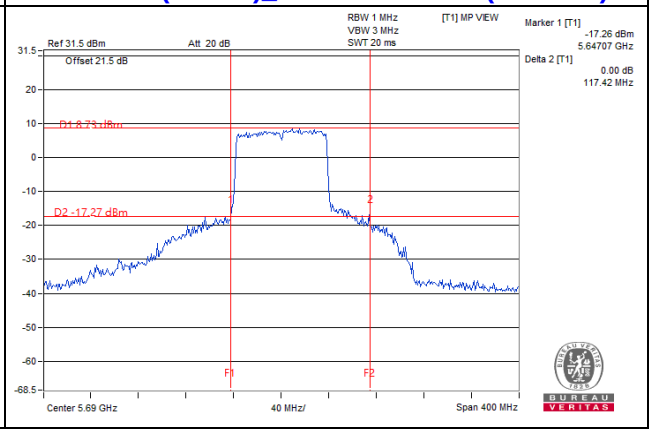
802.11ac (VHT20)_Chain 0 / CH144 (U-NII-2C)



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



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

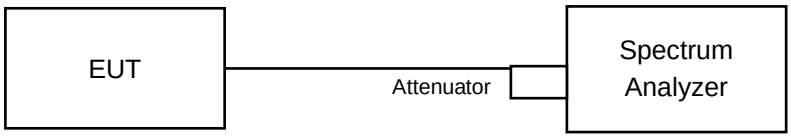


Note:

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	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.92	16.8
60	5300	16.68	16.92
64	5320	16.8	16.92
100	5500	16.68	16.68
116	5580	16.92	16.92
140	5700	16.68	16.68
144 (U-NII-2C Band)	5720	13.4	13.52
144 (U-NII-3 Band)	5720	3.28	3.28

802.11ac (VHT20)

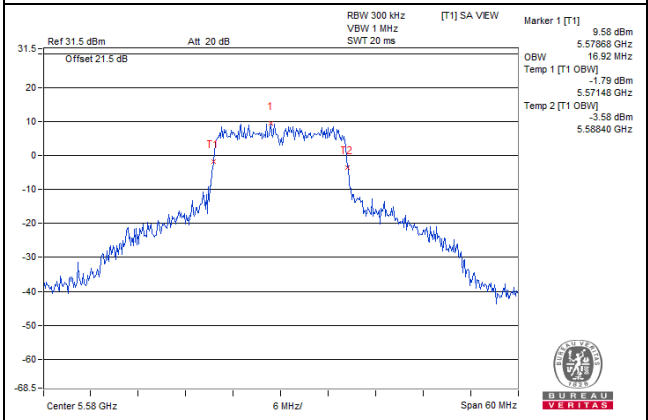
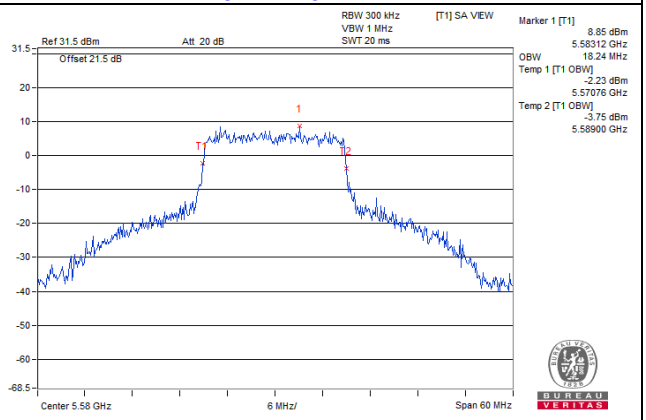
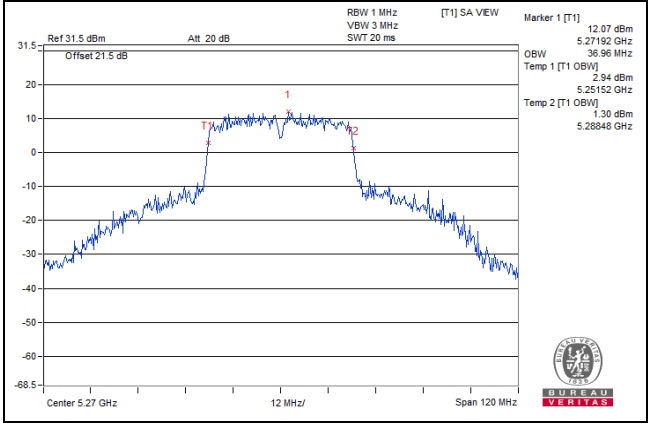
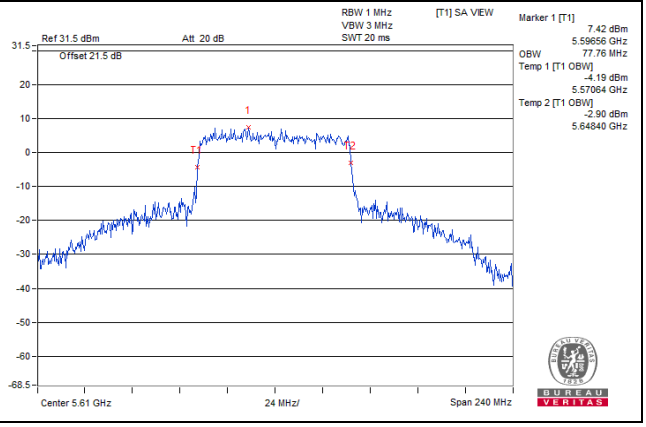
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	18.12	18
60	5300	17.88	18
64	5320	18	17.88
100	5500	17.88	17.88
116	5580	18	18.24
140	5700	17.88	17.88
144 (U-NII-2C Band)	5720	14	14
144 (U-NII-3 Band)	5720	4	4

802.11ac (VHT40)

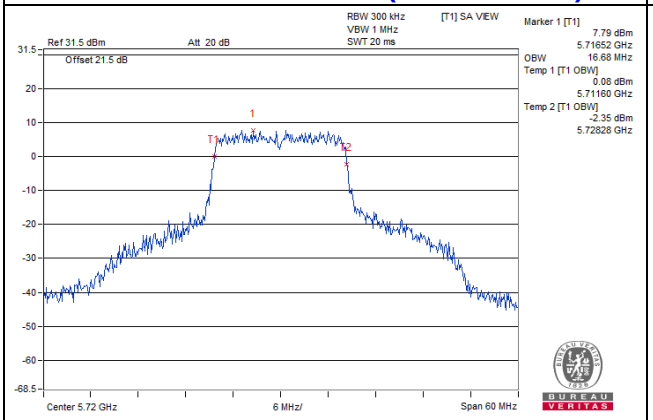
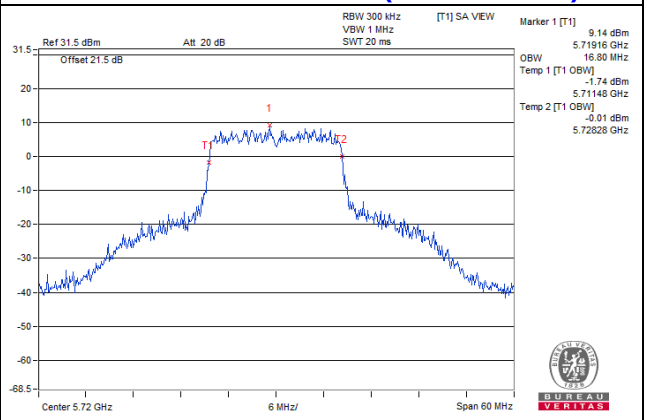
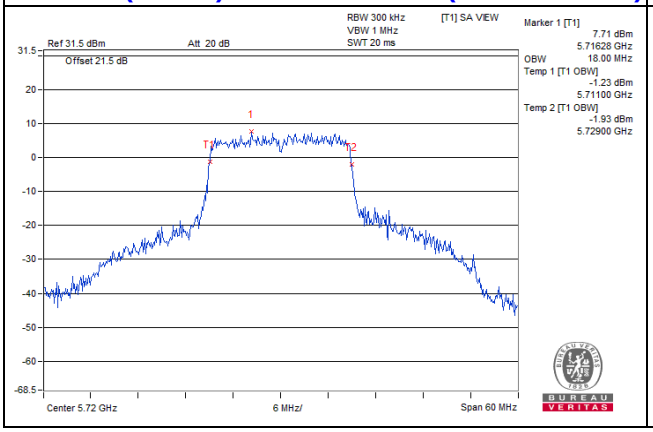
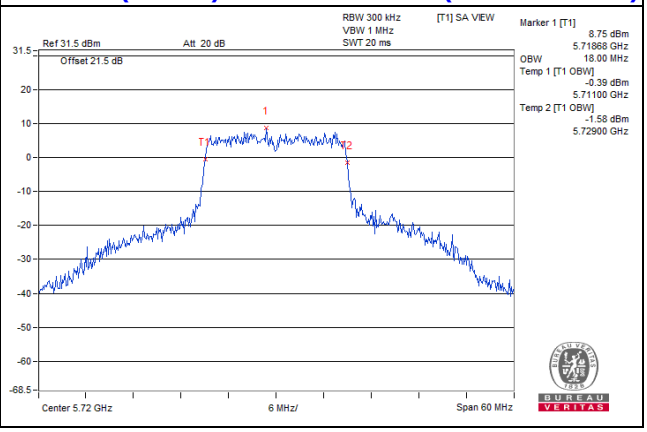
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.96	36.72
62	5310	36.48	36.24
102	5510	36.24	36.48
110	5550	36.72	36.96
134	5670	36.72	36.96
142 (U-NII-2C Band)	5710	33.24	33.24
142 (U-NII-3 Band)	5710	3.24	3.24

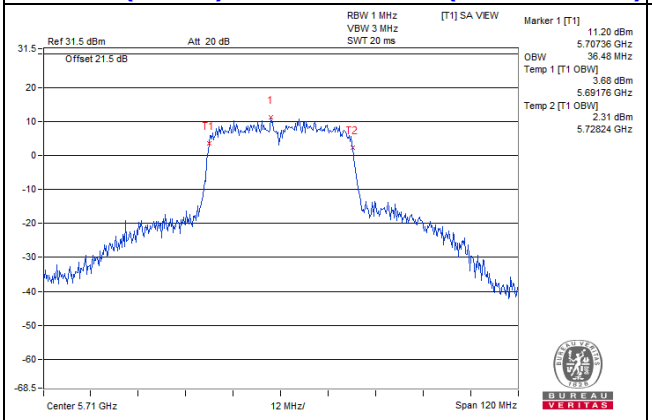
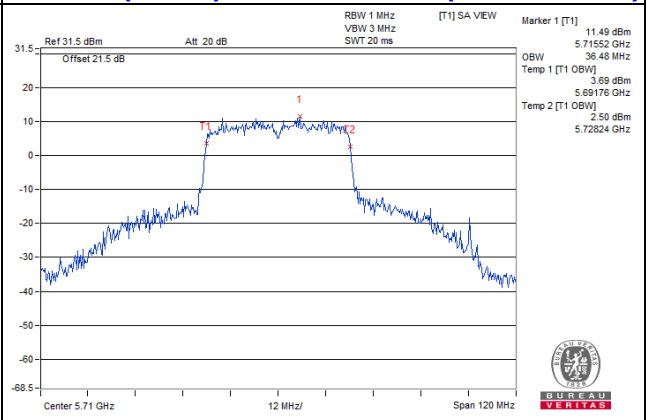
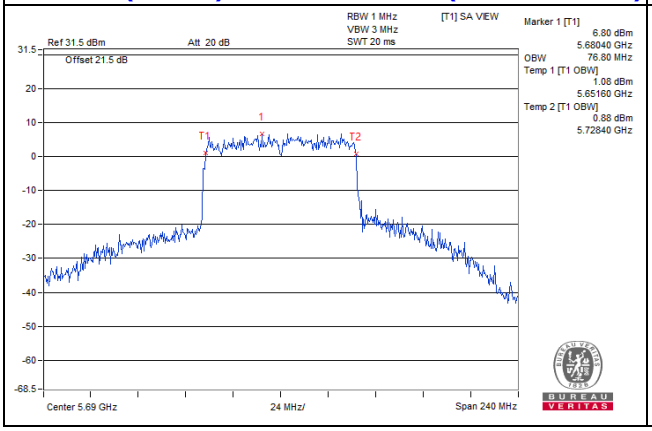
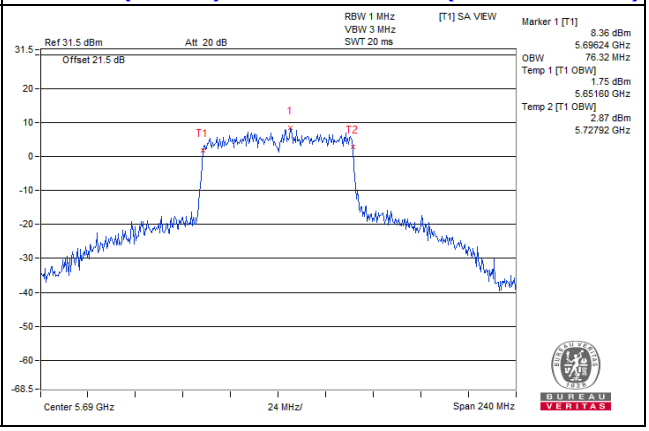
802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.84	75.84
106	5530	75.84	75.84
122	5610	76.32	77.76
138 (U-NII-2C Band)	5690	73.4	73.4
138 (U-NII-3 Band)	5690	3.4	2.92

Spectrum Plot of Max. Value	
802.11a_Chain 0 / CH116	**802.11ac (VHT20)_Chain 1 / CH116**
	
802.11ac (VHT40)_Chain 0 / CH54	**802.11ac (VHT80)_Chain 1 / CH122**
	

For channel straddling 5725MHz of OCP99 BW

Spectrum Plot Value of OCP99 BW	
802.11a / Chain0 : CH144 (U-NII-2C Band)	**802.11a / Chain1 : CH144 (U-NII-2C Band)**
	
802.11ac (VHT20) / Chain0 : CH144 (U-NII-2C Band)	**802.11ac (VHT20) / Chain1 : CH144 (U-NII-2C Band)**
	

Spectrum Plot Value of OCP99 BW	
802.11ac (VHT40) / Chain0 : CH142 (U-NII-2C Band)	**802.11ac (VHT40) / Chain1 : CH142 (U-NII-2C Band)**
	
802.11ac (VHT80) / Chain0 : CH138 (U-NII-2C Band)	**802.11ac (VHT80) / Chain1 : CH138 (U-NII-2C Band)**
	

Note:

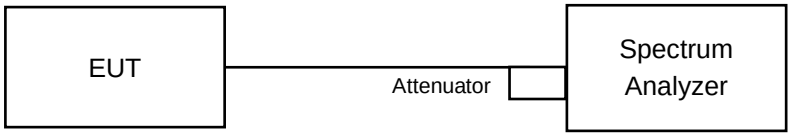
For CH144 (U-NII-2C) = 5725MHz - Temp 1
For CH142 (U-NII-2C) = 5725MHz - Temp 1
For CH138 (U-NII-2C) = 5725MHz - Temp 1
For CH144 (U-NII-3) = Temp 2 - 5725MHz
For CH142 (U-NII-3) = Temp 2 - 5725MHz
For CH138 (U-NII-3) = Temp 2 - 5725MHz

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

Using method SA-2

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

For U-NII-3:

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

CDD Mode

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

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	4.19	4.29	0.22	7.47	10.89	PASS
60	5300	3.82	4.38	0.22	7.34	10.89	PASS
64	5320	3.28	3.71	0.22	6.73	10.89	PASS
100	5500	3.24	2.34	0.22	6.05	10.89	PASS
116	5580	4.77	3.88	0.22	7.58	10.89	PASS
140	5700	2.98	3.08	0.22	6.26	10.89	PASS
144 (U-NII-2C Band)	5720	3.40	3.62	0.22	6.74	10.89	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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. For U-NII-2C: The directional gain = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

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	4.03	4.00	0.56	7.59	10.89	PASS
60	5300	3.83	3.90	0.56	7.44	10.89	PASS
64	5320	3.25	3.29	0.56	6.84	10.89	PASS
100	5500	3.20	1.94	0.56	6.19	10.89	PASS
116	5580	4.53	3.50	0.56	7.62	10.89	PASS
140	5700	2.66	2.98	0.56	6.40	10.89	PASS
144 (U-NII-2C Band)	5720	3.24	3.49	0.56	6.94	10.89	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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. For U-NII-2C: The directional gain = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

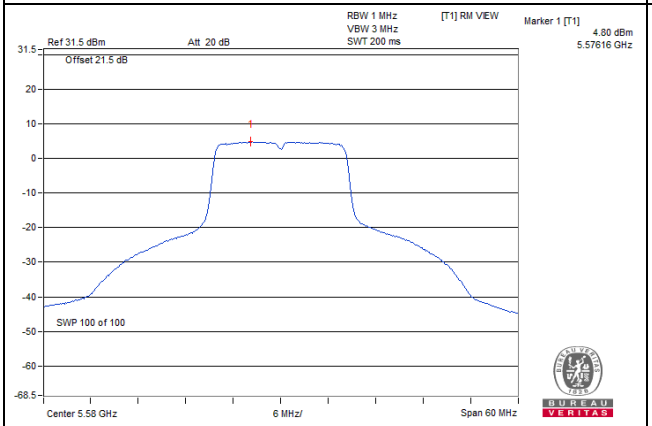
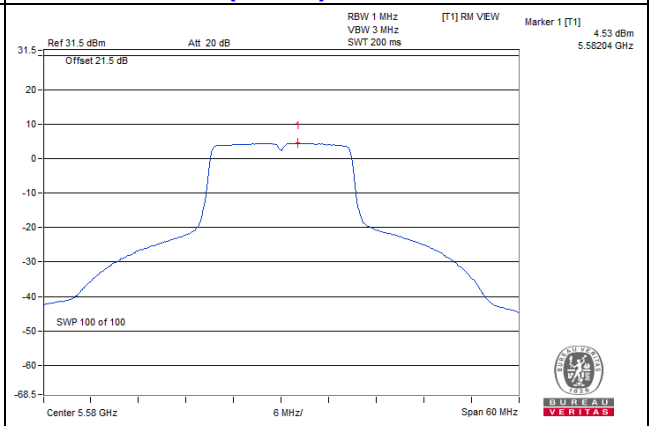
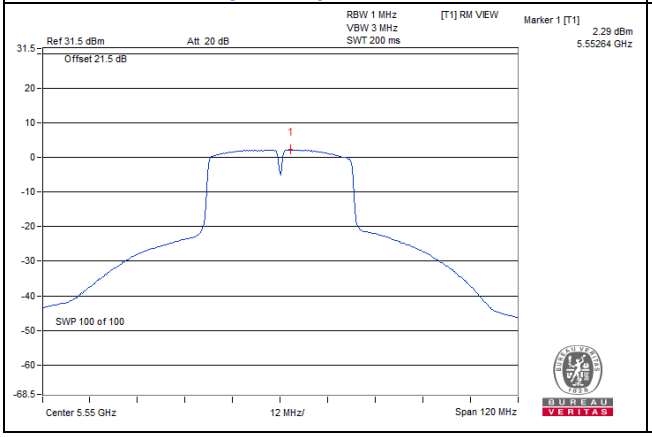
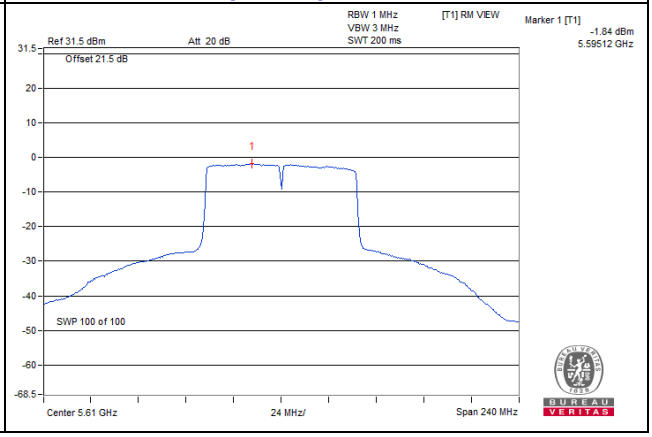
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	1.84	1.62	1.05	5.79	10.89	PASS
62	5310	-2.94	-3.11	1.05	1.04	10.89	PASS
102	5510	-1.40	-2.60	1.05	2.10	10.89	PASS
110	5550	2.21	1.04	1.05	5.73	10.89	PASS
134	5670	1.13	1.10	1.05	5.18	10.89	PASS
142 (U-NII-2C Band)	5710	0.94	1.11	1.05	5.09	10.89	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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. For U-NII-2C: The directional gain = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	-9.10	-9.18	0.83	-5.30	10.89	PASS
106	5530	-9.29	-10.33	0.83	-5.94	10.89	PASS
122	5610	-1.84	-2.51	0.83	1.67	10.89	PASS
138 (U-NII-2C Band)	5690	-2.61	-2.75	0.83	1.16	10.89	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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. For U-NII-2C: The directional gain = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 11-(6.11-6) = 10.89 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH116	**802.11ac (VHT20)_Chain 0 / CH116**
	
802.11ac (VHT40)_Chain 0 / CH110	**802.11ac (VHT80)_Chain 0 / CH122**
	

For U-NII-3:

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
		Chain0	Chain1					
144 (U-NII-3 Band)	5720	-4.62	-4.26	0.22	-1.20	1.02	29.89	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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

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
		Chain0	Chain1					
144 (U-NII-3 Band)	5720	-4.72	-4.64	0.56	-1.11	1.11	29.89	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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

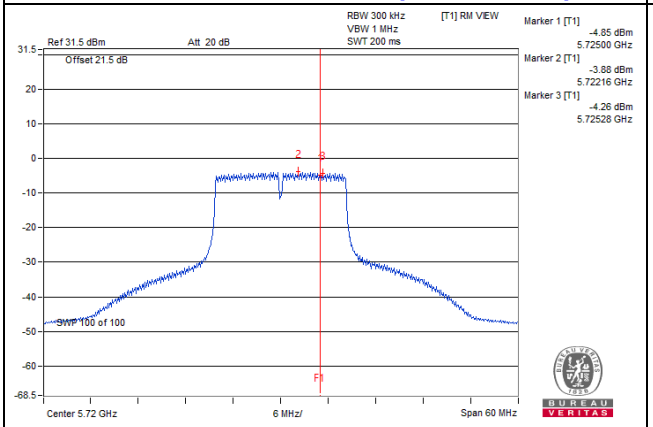
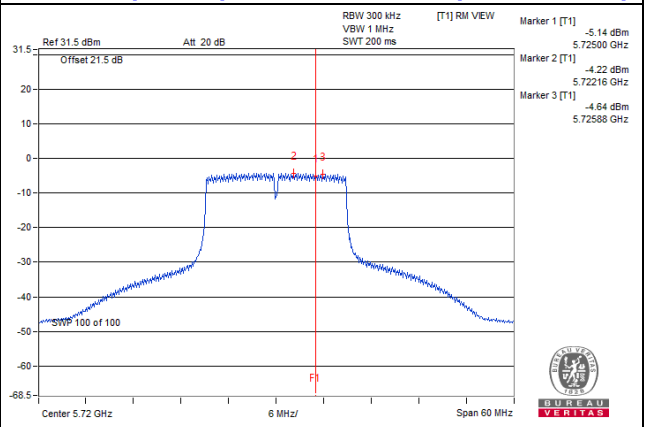
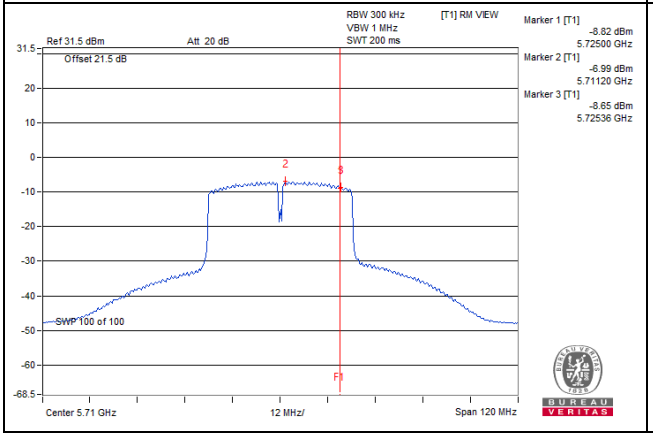
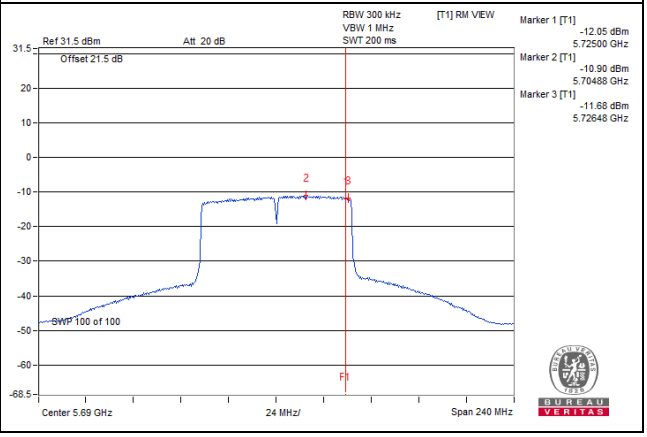
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain0	Chain1					
142 (U-NII-3 Band)	5710	-9.09	-8.65	1.05	-4.80	-2.58	29.89	Pass

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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.
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
		Chain0	Chain1					
138 (U-NII-3 Band)	5690	-12.12	-11.68	0.83	-8.06	-5.84	29.89	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 = 3.1dBi + 10log(2) = 6.11 dBi > 6dBi, so the power density limit shall be reduced to 30-(6.11-6) = 29.89 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

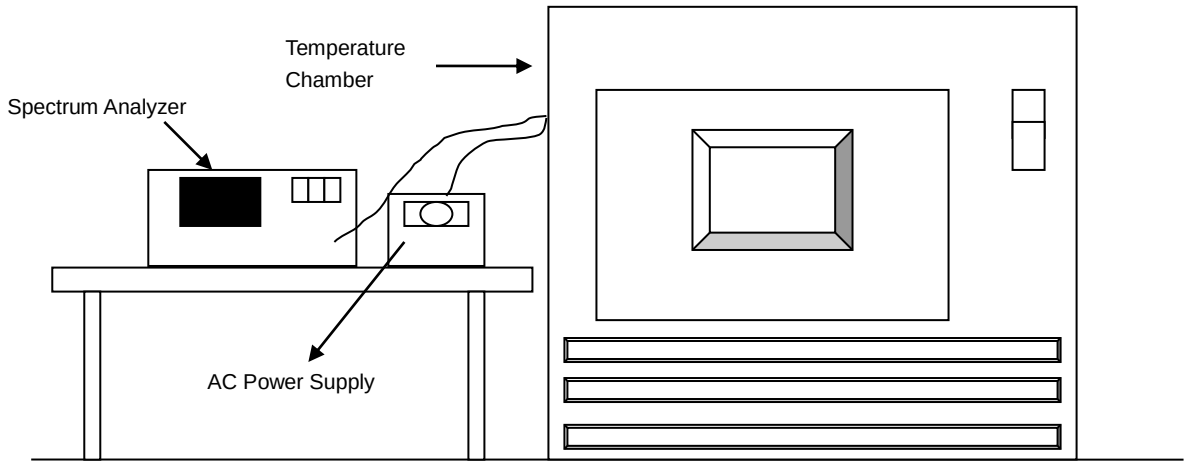
Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH144 (U-NII-3 Band)	**802.11ac (VHT20)_Chain 1 / CH144 (U-NII-3 Band)**
	
802.11ac (VHT40)_Chain 1 / CH142 (U-NII-3 Band)	**802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)**
	

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

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

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

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

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

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

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5259.9797	PASS	5259.9776	PASS	5259.9785	PASS	5259.9815	PASS
30	120	5259.9765	PASS	5259.9733	PASS	5259.9768	PASS	5259.9747	PASS
20	120	5259.9946	PASS	5259.9916	PASS	5259.9902	PASS	5259.9913	PASS
10	120	5259.983	PASS	5259.9793	PASS	5259.9786	PASS	5259.9827	PASS
0	120	5259.9902	PASS	5259.9912	PASS	5259.9904	PASS	5259.991	PASS

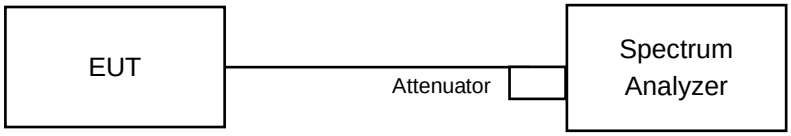
Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5259.9936	PASS	5259.9919	PASS	5259.9893	PASS	5259.9919	PASS
	120	5259.9946	PASS	5259.9916	PASS	5259.9902	PASS	5259.9913	PASS
	102	5259.9954	PASS	5259.9914	PASS	5259.9904	PASS	5259.9921	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequency.

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1		
144 (U-NII-3 Band)	5720	3.15	3.15	0.5	Pass

802.11ac (VHT20)

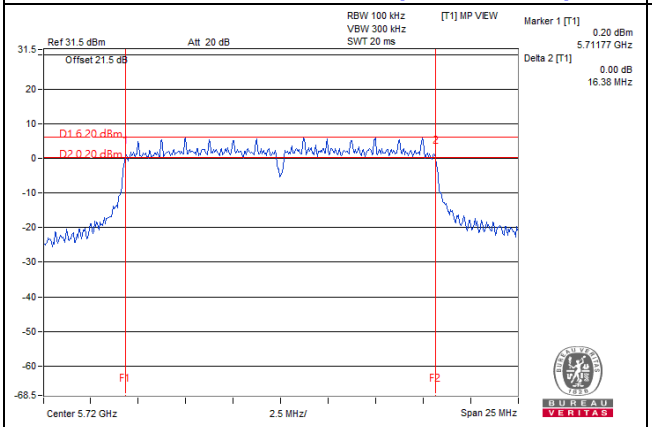
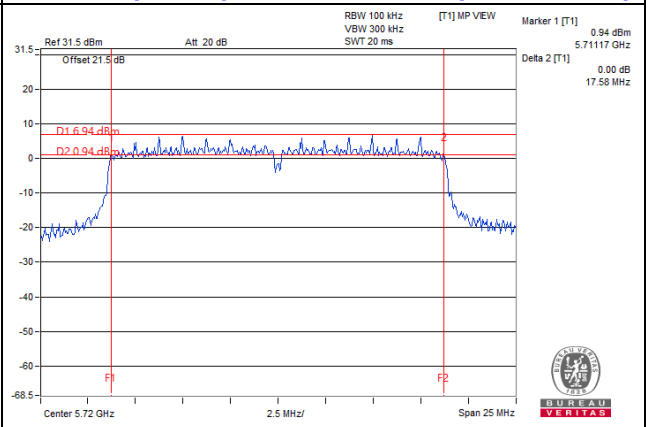
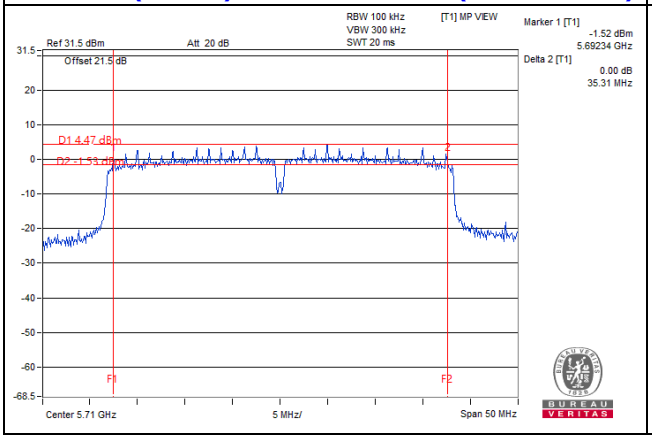
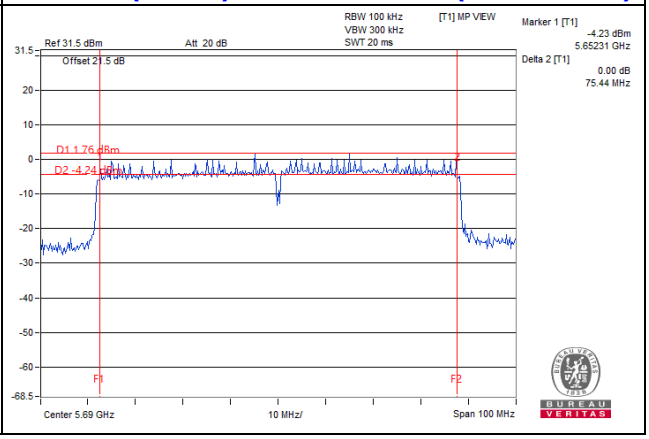
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1		
144 (U-NII-3 Band)	5720	3.78	3.75	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1		
142 (U-NII-3 Band)	5710	2.71	2.65	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain0	Chain1		
138 (U-NII-3 Band)	5690	2.79	2.75	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH144 (U-NII-3 Band)	**802.11ac (VHT20)_Chain 1 / 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)**
	

Note: The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

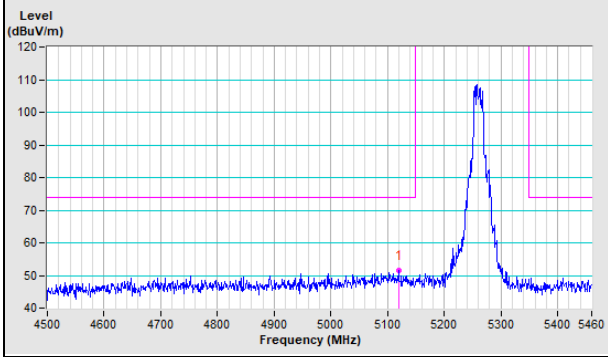
5 Pictures of Test Arrangements

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

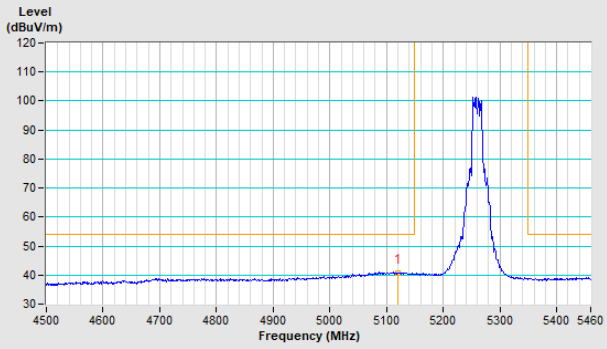
Annex A - Band-Edge Measurement (For U-NII-2A, U-NII-2C band)

802.11a Channel 52

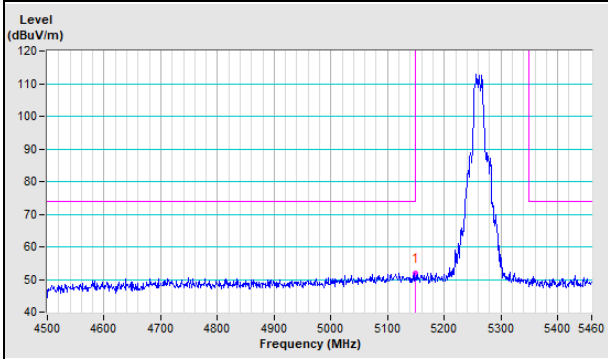
Horizontal (Peak)



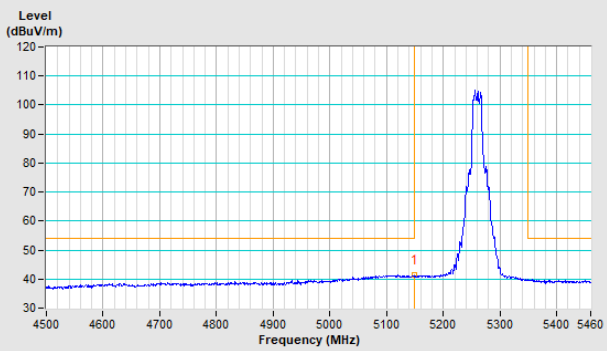
Horizontal (Average)



Vertical (Peak)

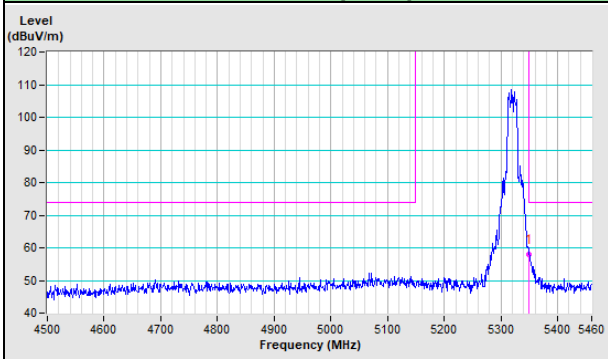


Vertical (Average)

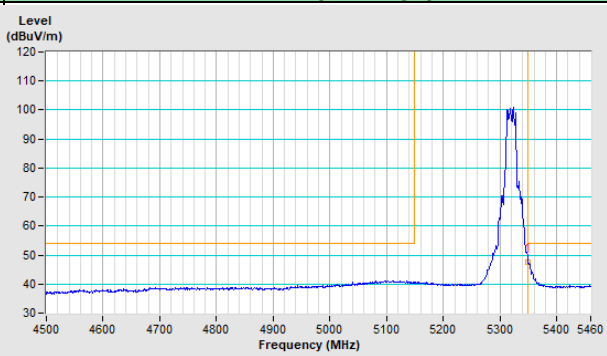


802.11a Channel 64

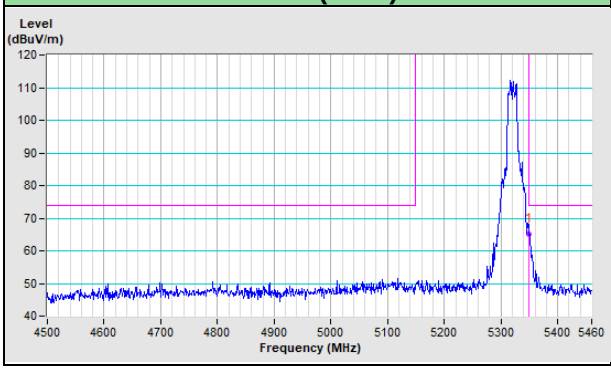
Horizontal (Peak)



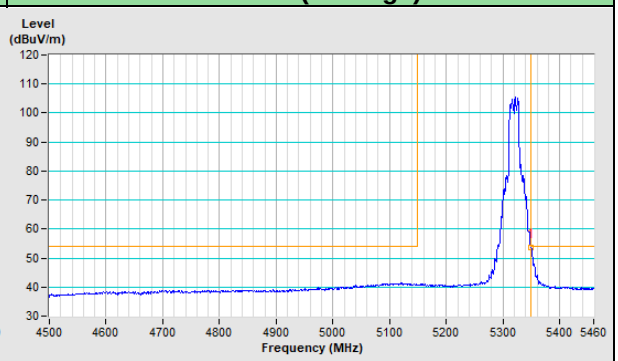
Horizontal (Average)

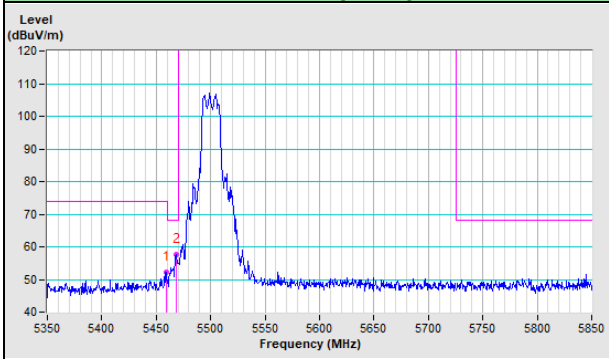
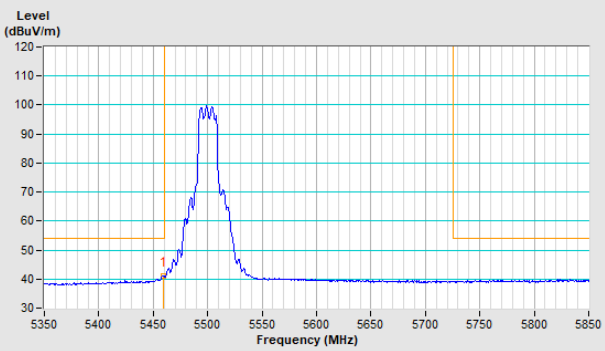
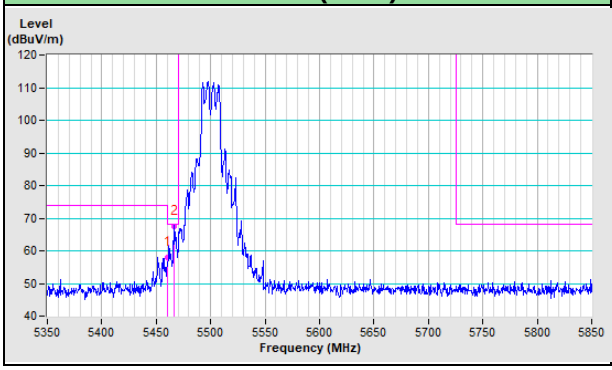
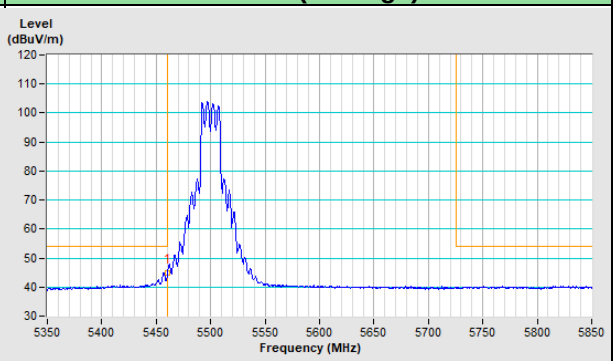


Vertical (Peak)



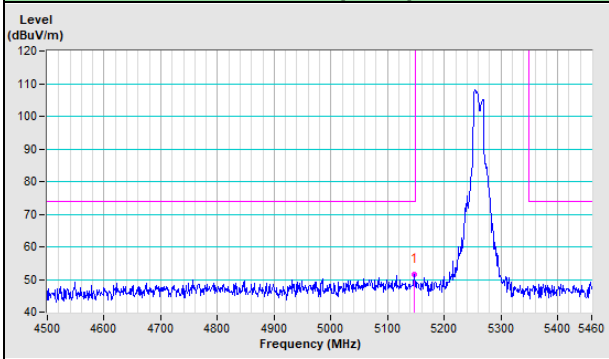
Vertical (Average)



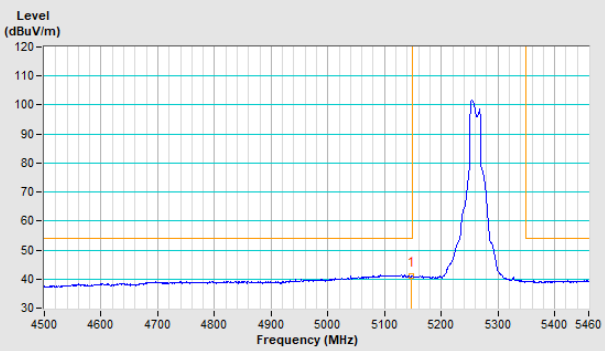
802.11a Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT20) Channel 52

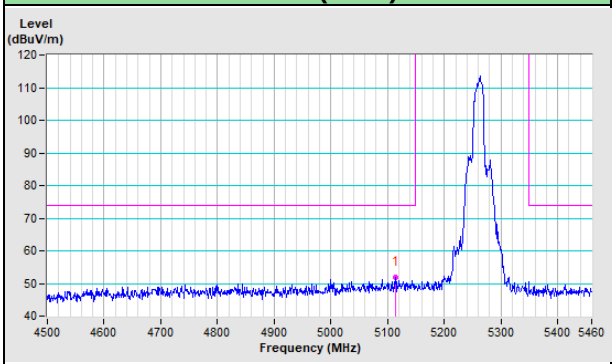
Horizontal (Peak)



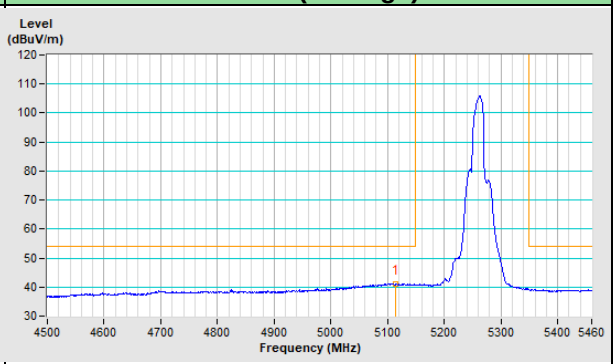
Horizontal (Average)



Vertical (Peak)

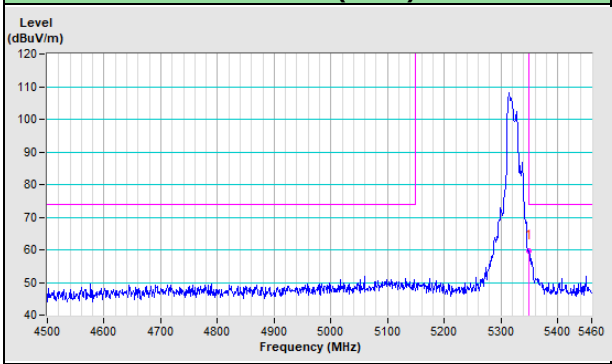


Vertical (Average)

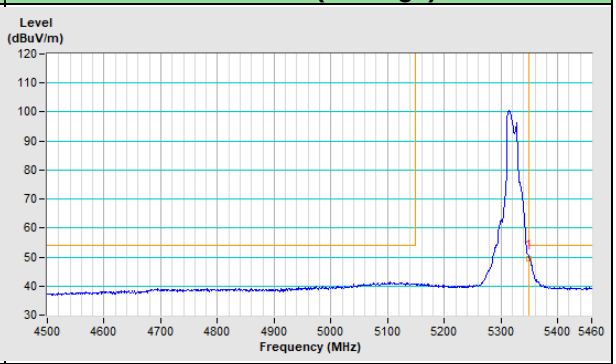


802.11ac (VHT20) Channel 64

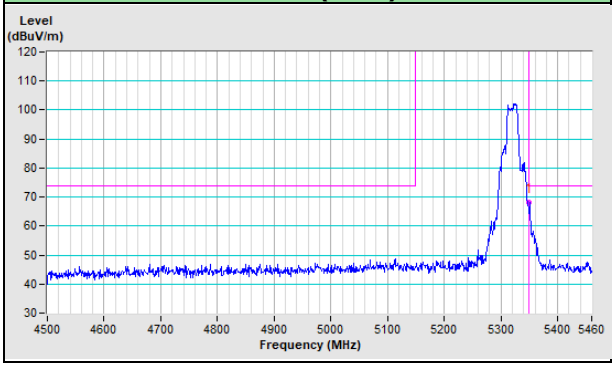
Horizontal (Peak)



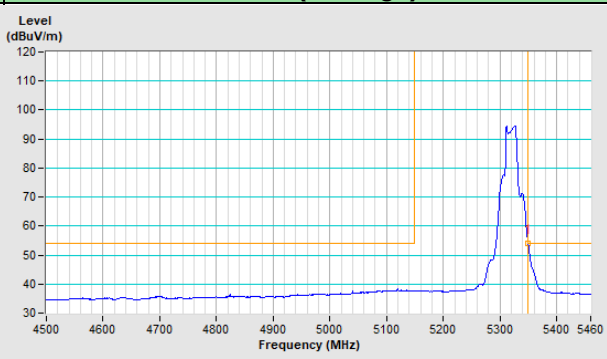
Horizontal (Average)

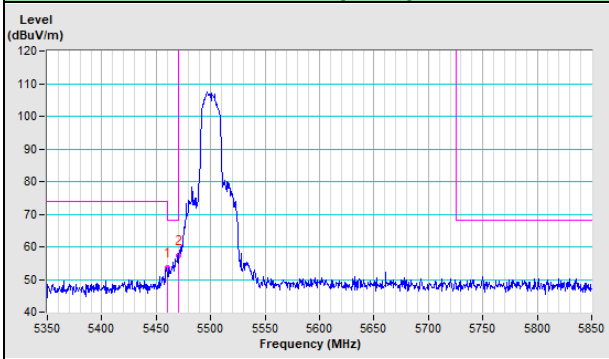
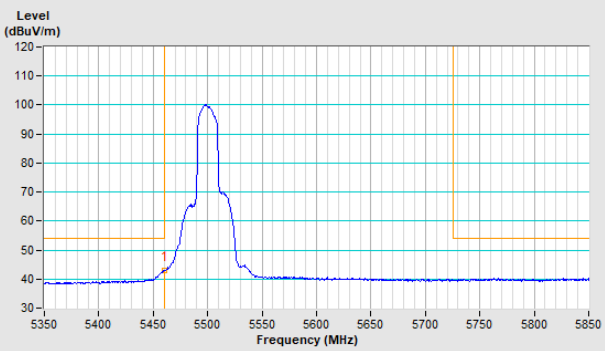
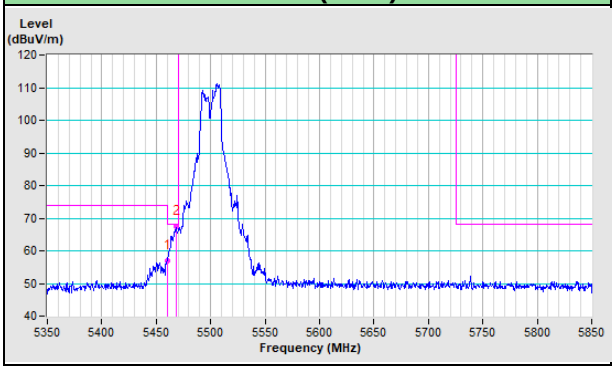
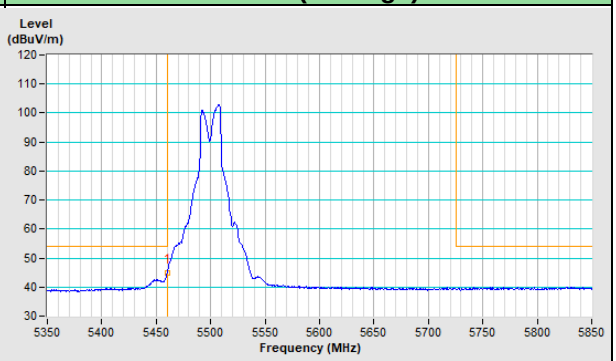


Vertical (Peak)



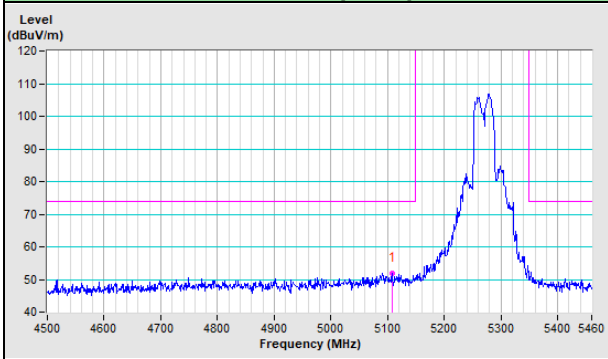
Vertical (Average)



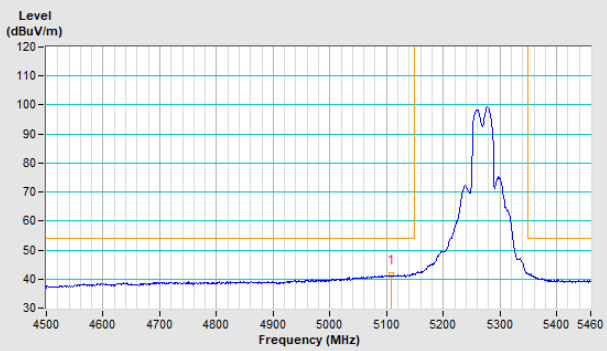
802.11ac (VHT20) Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT40) Channel 54

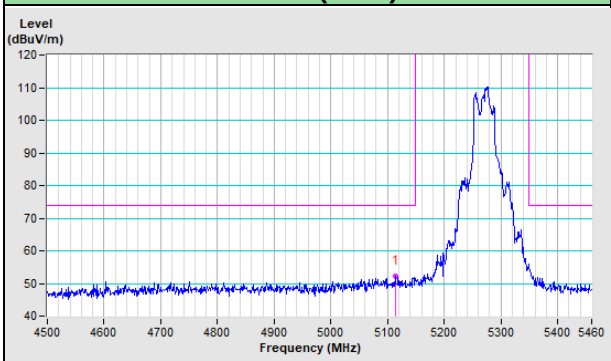
Horizontal (Peak)



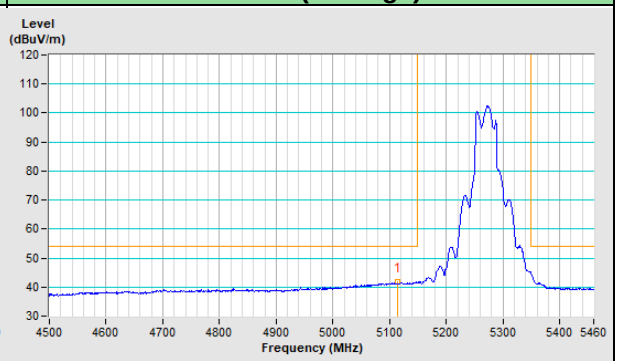
Horizontal (Average)



Vertical (Peak)

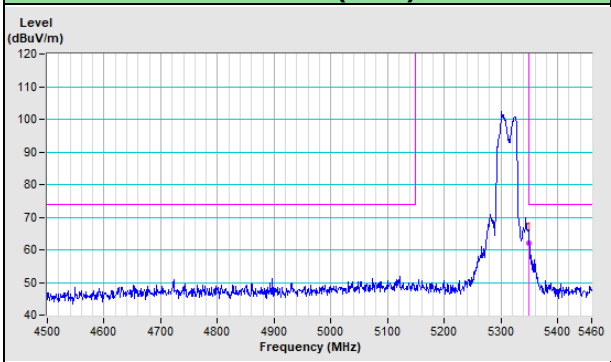


Vertical (Average)

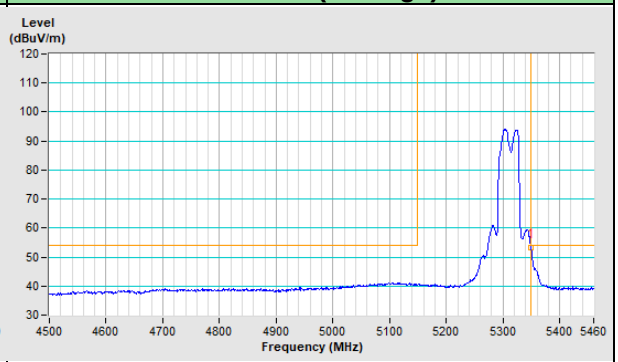


802.11ac (VHT40) Channel 62

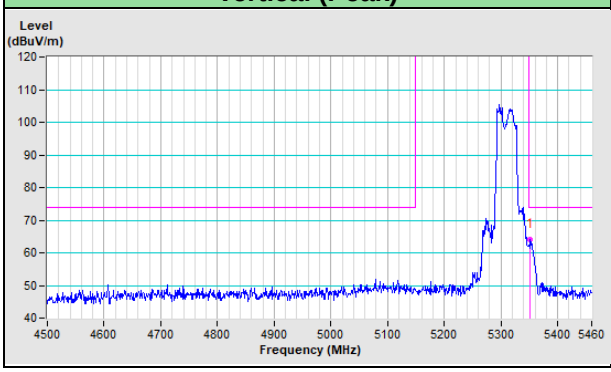
Horizontal (Peak)



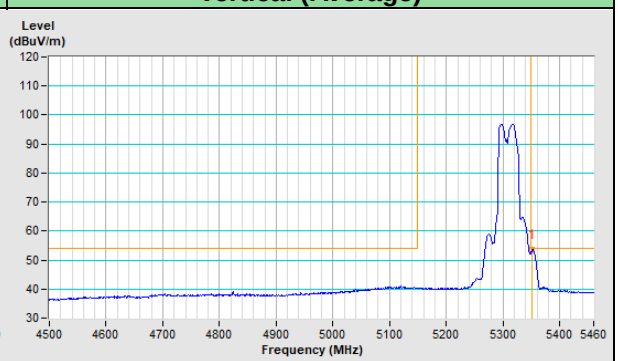
Horizontal (Average)

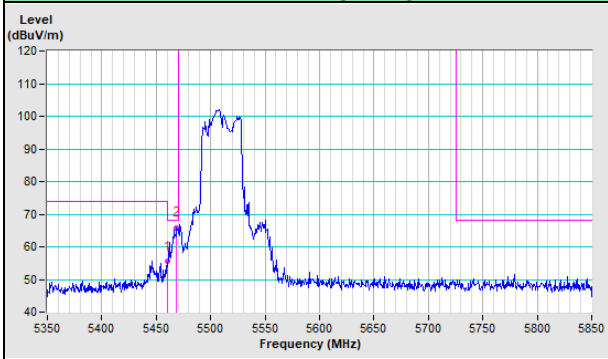
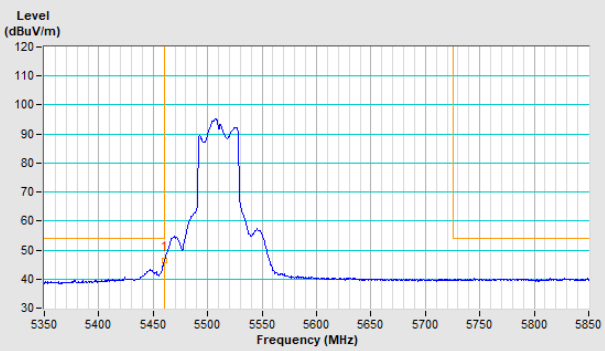
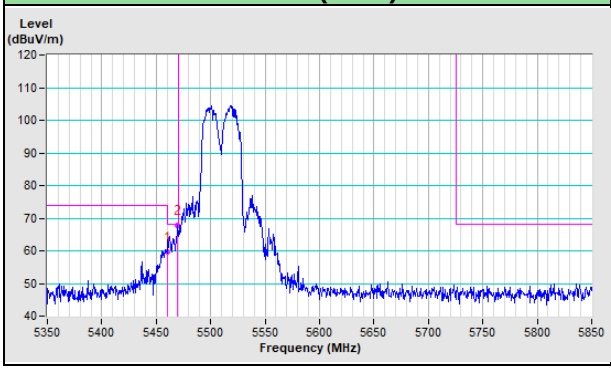
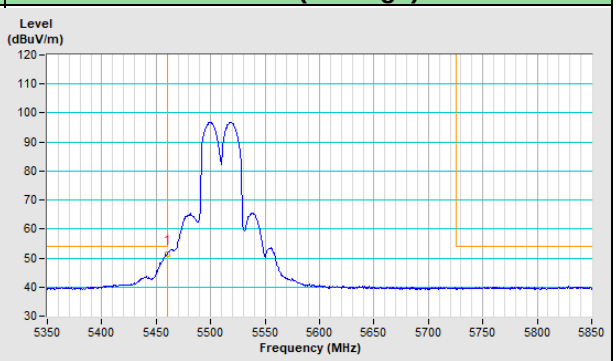


Vertical (Peak)



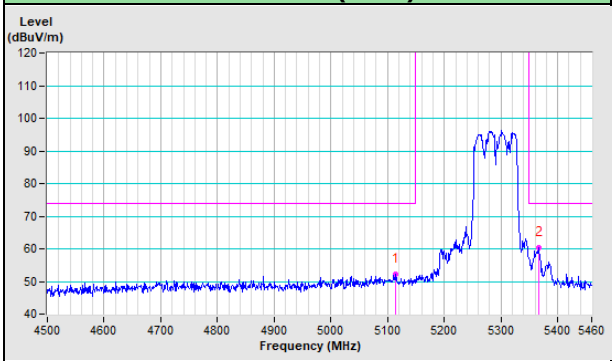
Vertical (Average)



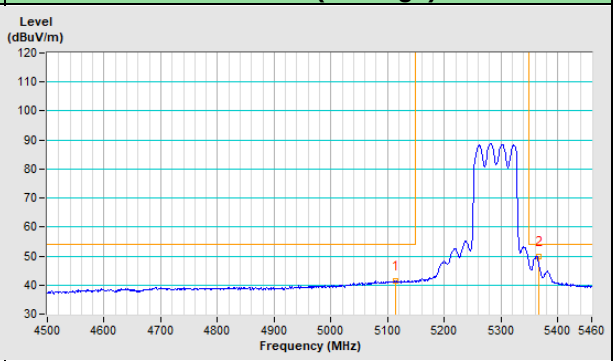
802.11ac (VHT40) Channel 102	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT80) Channel 58

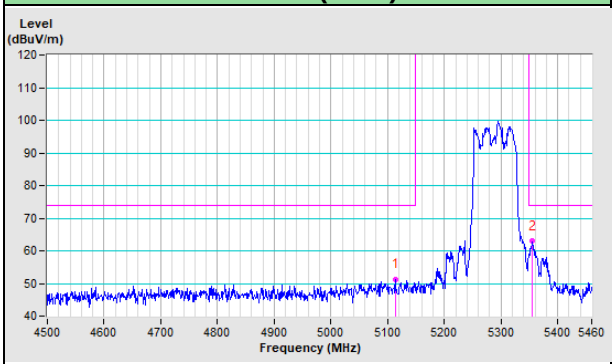
Horizontal (Peak)



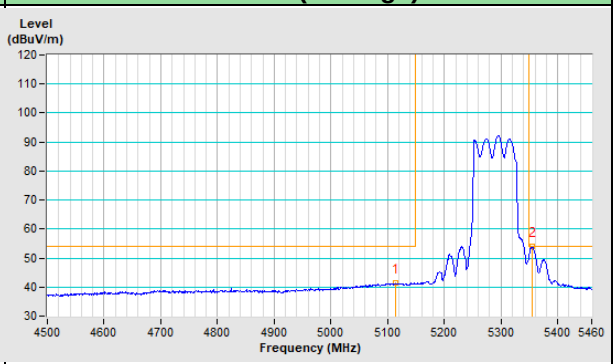
Horizontal (Average)



Vertical (Peak)

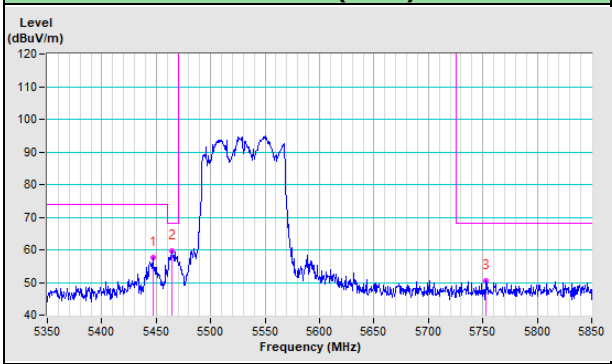


Vertical (Average)

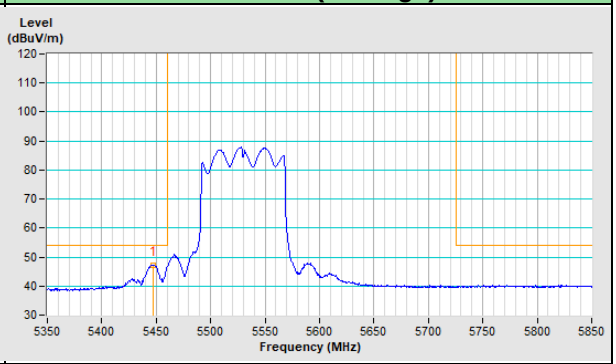


802.11ac (VHT80) Channel 106

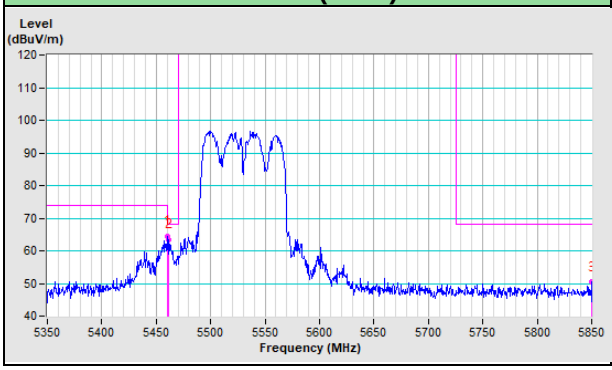
Horizontal (Peak)



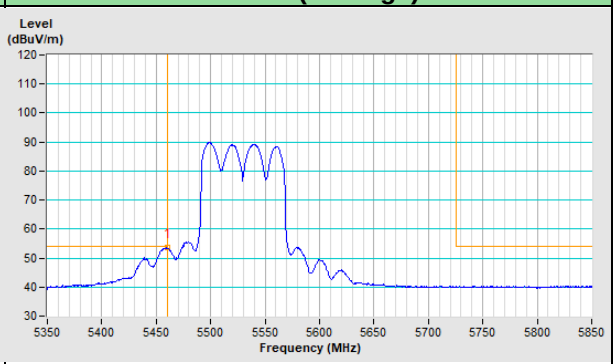
Horizontal (Average)



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

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