FCC Test Report (WLAN)

(Spot Check)

Report No.:	RFBCMA-WTW-P21050301A-1
FCC ID:	RAXWR3200
Original FCC ID:	RAXHT3000W
Test Model:	WR3200
Received Date:	2021/6/22
Test Date:	2021/6/22 ~ 2022/1/5
Issued Date:	2022/3/18
Applicant:	Arcadyan Technology Corporation
Address:	No.8, Sec.2, Guangfu Rd.,Hsinchu City 30071, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RFBCMA-WTW-P21050301A-1	Original release.	2022/3/18

1 Certificate of Conformity

Product:	Standalone Router
Brand:	Hughes
Test Model:	WR3200
Sample Status:	Engineering sample
Applicant:	Arcadyan Technology Corporation
Test Date:	2021/6/22 ~ 2022/1/5
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:** 2022/3/18

Vivian Huang / Specialist

Approved by : , **Date:** 2022/3/18

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 -14.97dB at 0.51328 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 -1.7 dB at 5146.94 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Refer to Note 1 below
15.407(a)(1/2/3)	Peak Power Spectral Density	NA	Refer to Note 1 below
15.407(e)	6dB bandwidth	NA	Refer to Note 1 below
15.407(g)	Frequency Stability	NA	Refer to Note 1 below
15.203	Antenna Requirement	Pass	Antenna connector is ipex(MHF) not a standard connector.

Note:

1. AC Power Conducted Emission & Radiated Emissions & Band Edge Measurement & Max Average Transmit Power were performed for this addendum. The others testing data refer to original test report.
2. For U-NII-1 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.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Standalone Router
Brand	Hughes
Test Model	WR3200
Status of EUT	Engineering sample
Power Supply Rating	12 Vdc
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	5.18~5.32GHz, 5.50~5.72GHz, 5.745 ~ 5.825GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 25 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 12 802.11ac (VHT80), 802.11ax (HE80): 6
Output Power	**CDD Mode:** **5.18 ~ 5.24 GHz:** 526.745 mW **5.26 ~ 5.32GHz:** 226.199 mW **5.5 ~ 5.72GHz:** 229.421 mW **5.745 ~ 5.825 GHz:** 440.884 mW **Beamforming Mode:** **5.18 ~ 5.24 GHz:** 425.79 mW **5.26 ~ 5.32GHz:** 221.422 mW **5.5 ~ 5.72GHz:** 223.117 mW **5.745 ~ 5.825 GHz:** 431.714 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Cable Supplied	NA

Note:

1. Exhibit prepared for Spot Check Verification report, the format, test items and amount of spot–check test data are decided by applicant's engineering judgment, for more details please refer to the declaration letter exhibit. (Original FCC ID: RAXHT3000W, Report No.: RFBCMA-WTW-P21050301-1)

2. Simultaneously transmission condition.

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

3. The EUT has below radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz	WLAN 5GHz

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

Antenna Set	RF Chain No.	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	0	WG622221-HS	1.9	2.4~2.4835	Dipole	i-pex(MHF)	60
	1	WG622221-HS	2.1	2.4~2.4835	Dipole	i-pex(MHF)	70
	0	WG622221-HS	2.5	5.15~5.85	Dipole	i-pex(MHF)	40
	1	WG622221-HS	3	5.15~5.85	Dipole	i-pex(MHF)	41
Note: Max. gain was selected for the final test.							

5. The EUT incorporates a MIMO function:

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
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz) and 802.11ax mode for 20MHz (40MH, 80MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report.

6. 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.
7. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

FOR 5180 ~ 5320MHz

8 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20) and 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	52	5260 MHz
40	5200 MHz	56	5280 MHz
44	5220 MHz	60	5300 MHz
48	5240 MHz	64	5320 MHz

4 channels are provided for 802.11n (HT40), 802.11ac (VHT40) and 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	54	5270 MHz
46	5230 MHz	62	5310 MHz

2 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz

FOR 5500 ~ 5720MHz

12 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20) and 802.11ax (HE20):

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) and 802.11ax (HE40):

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), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 MHz
122	5610 MHz		

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20) and 802.11ax (HE20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40) and 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Note: In the original report, the EUT's Dipole antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-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 Parameter
802.11a	5180-5320	36 to 64	36	OFDM	BPSK	6Mb/s

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 Parameter
802.11a	5180-5320 5500-5720 5745-5825	36 to 64 100 to 144 149 to 165	36	OFDM	BPSK	6Mb/s

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 Parameter
802.11a	5180-5320 5500-5720 5745-5825	36 to 64 100 to 144 149 to 165	36	OFDM	BPSK	6Mb/s

Antenna Port Conducted Measurement:

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

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

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11a	5180-5320	36 to 64	36, 40, 48, 52, 60, 64	OFDM	BPSK	6Mb/s
802.11ac (VHT20)		36 to 64	36, 40, 48, 52, 60, 64	OFDM	BPSK	MCS0
802.11ac (VHT40)		38 to 62	38, 46, 54, 62	OFDM	BPSK	MCS0
802.11ac (VHT80))		42, 58	42, 58	OFDM	BPSK	MCS0
802.11ax (HE20)		36 to 64	36, 40, 48, 52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 62	38, 46, 54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		42, 58	42, 58	OFDMA	BPSK	MCS0
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6Mb/s
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	MCS0
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	MCS0
802.11ac (VHT80))		106 to 138	106, 122, 138	OFDM	BPSK	MCS0
802.11ax (HE20)		100 to 144	100, 116, 140, 144	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 142	102, 110, 134, 142	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 138	106, 122, 138	OFDMA	BPSK	MCS0
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6Mb/s
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	MCS0
802.11ac (VHT80))		155	155	OFDM	BPSK	MCS0
802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	OFDMA	BPSK	MCS0

Beamforming Mode (output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11ac (VHT20)	5180-5320	36 to 64	36, 40, 48, 52, 60, 64	OFDM	BPSK	MCS0
802.11ac (VHT40)		38 to 62	38, 46, 54, 62	OFDM	BPSK	MCS0
802.11ac (VHT80)		42, 58	42, 58	OFDM	BPSK	MCS0
802.11ax (HE20)		36 to 64	36, 40, 48, 52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 62	38, 46, 54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		42, 58	42, 58	OFDMA	BPSK	MCS0
802.11ac (VHT20)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	MCS0
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	MCS0
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	MCS0
802.11ax (HE20)		100 to 144	100, 116, 140, 144	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 142	102, 110, 134, 142	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 138	106, 122, 138	OFDMA	BPSK	MCS0
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	MCS0
802.11ac (VHT80)		155	155	OFDM	BPSK	MCS0
802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	OFDMA	BPSK	MCS0

Test Condition:

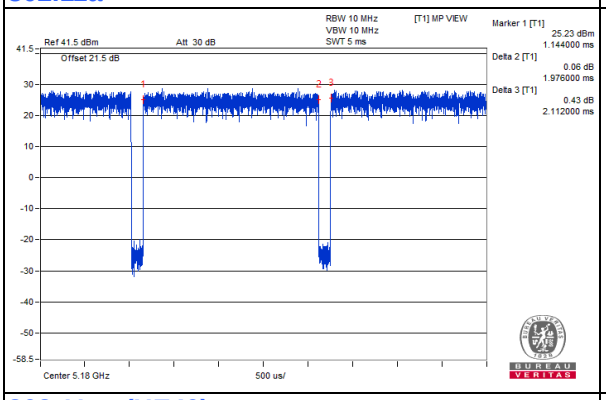
Applicable To	Environmental Conditions	Input Power (System)	Tested By
RE≥1G	25deg. C, 66%RH	120Vac, 60Hz	Sampson Chen
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Sampson Chen
PLC	25deg. C, 66%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Leon Dai

3.3 Duty Cycle of Test Signal

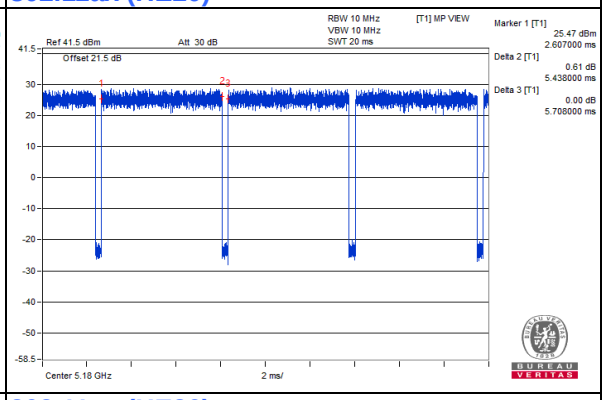
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 1.976 ms /2.112 ms=0.936, Duty factor = 10 * log (1/Duty cycle) = 0.29 dB
802.11ax (HE20): Duty cycle = 5.438 ms /5.708 ms=0.953, Duty factor = 10 * log (1/Duty cycle) = 0.2 dB
802.11ax (HE40): Duty cycle = 5.438 ms /5.758 ms=0.944, Duty factor = 10 * log (1/Duty cycle) = 0.25 dB
802.11ax (HE80): Duty cycle = 5.438 ms /5.76 ms=0.944, Duty factor = 10 * log (1/Duty cycle) = 0.18 dB

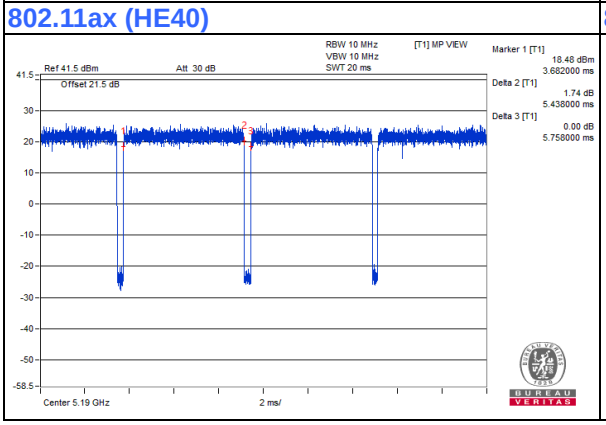
802.11a



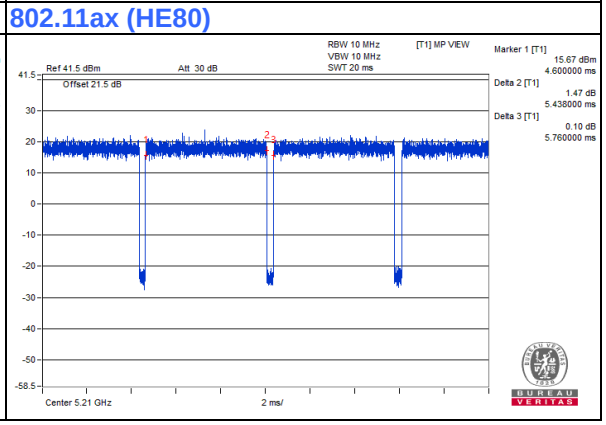
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



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.	Adapter	HUGHES	PSM75U-217-R	NA	NA	Supplied by applicant
B.	Laptop	DELL	Latitude E7440	NA	NA	Supplied by applicant
C.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

Note:

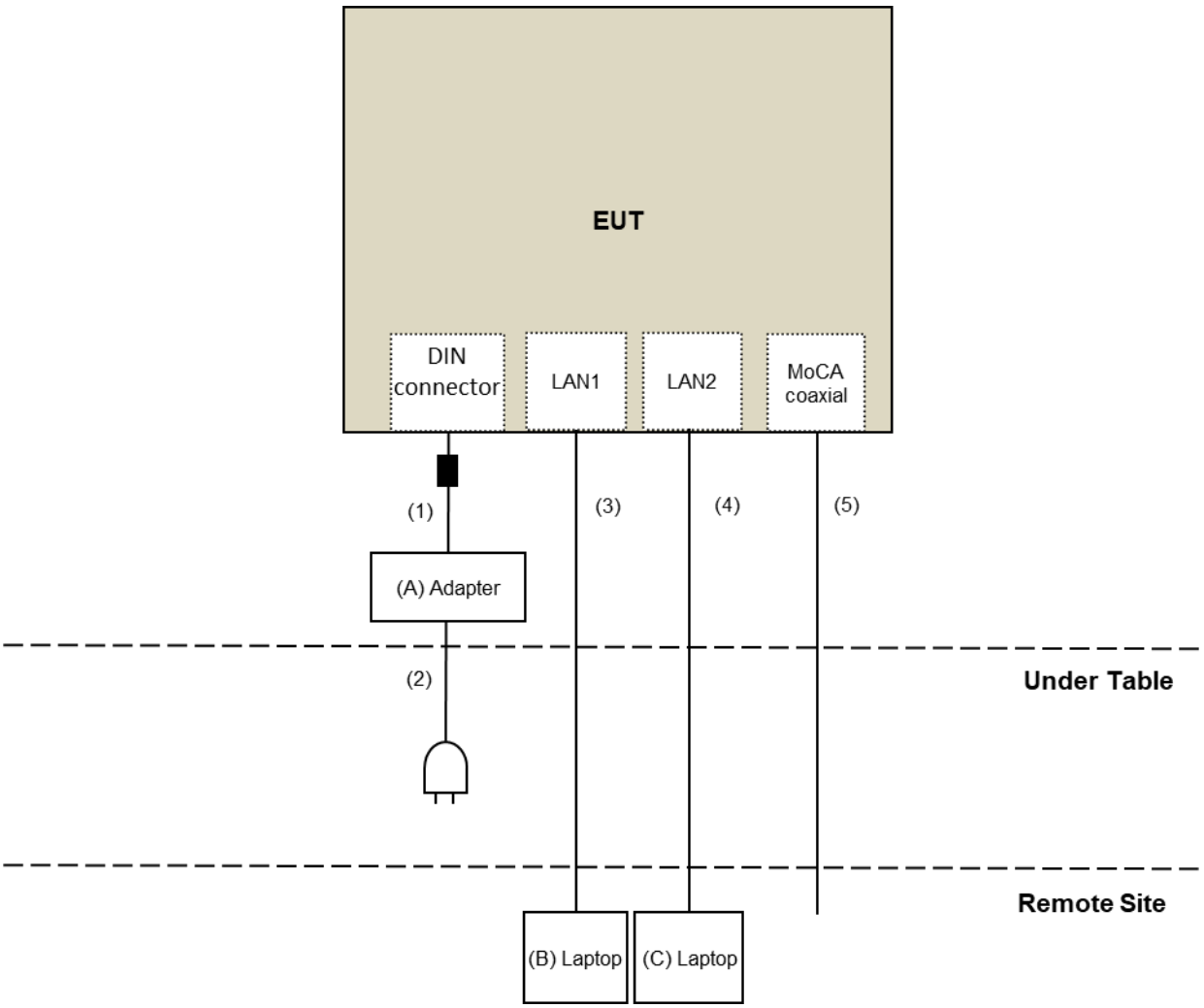
1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.2	No	1	Supplied by applicant
2.	AC Cable	1	1.8	No	0	Supplied by applicant
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	1	10	No	0	Provided by Lab
5.	Coaxial Cable	1	10	Yes	0	Provided by Lab

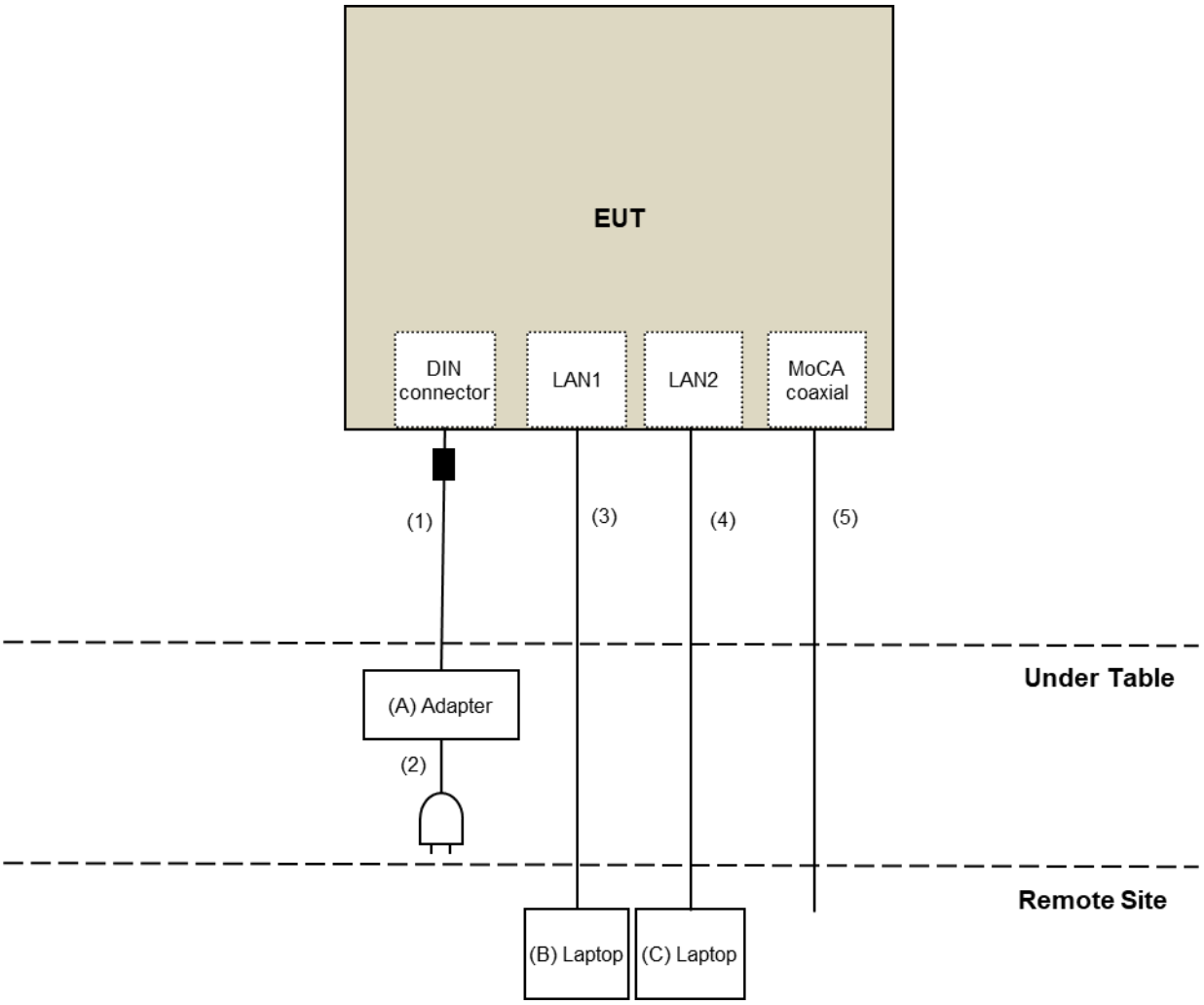
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For AC Power Conducted Emission test:



For Radiated Emission test:



3.5 General Description of Applied Standard and References

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

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

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

*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 (above 1GHz) test:

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Test Receiver R&S	ESR3	102528	2021/3/2	2022/3/1
Spectrum Analyzer KEYSIGHT	N9030B	MY57141948	2021/5/21	2022/5/20
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Broad-Band Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1819	2021/11/14	2022/11/13
Pre_Amplifier EMCI	EMC12630SE	980509	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-1500	180503	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180501	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	180506	2021/4/26	2022/4/25
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
SHF-EHF Horn Schwarzbeck	BBHA 9170	BBHA9170519	2021/11/14	2022/11/13
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 5.
3. Tested Date: 2021/12/20

For Radiated emission (below 1GHz) & Bandedge test:

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Test Receiver R&S	ESR3	102528	2021/3/2	2022/3/1
Spectrum Analyzer KEYSIGHT	N9030B	MY57141948	2021/5/21	2022/5/20
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Pre_Amplifier EMCI	EMC001340	980142	2021/5/24	2022/5/23
LOOP ANTENNA Electro-Metrics	EM-6879	264	2021/3/5	2022/3/4
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2021/1/7	2022/1/6
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-002	2021/1/7	2022/1/6
Pre_Amplifier EMCI	EMC330N	980538	2021/4/26	2022/4/25
Bilog Antenna Schwarzbeck	VULB9168	9168-0842	2020/11/3	2021/11/2
RF Coaxial Cable COMMATE/PEWC	8D	966-5-1	2021/4/26	2022/4/25
RF Coaxial Cable COMMATE/PEWC	8D	966-5-2	2021/4/26	2022/4/25
RF Coaxial Cable COMMATE/PEWC	8D	966-5-3	2021/4/26	2022/4/25
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	2021/1/11	2022/1/10

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 5.
3. Tested Date: 2021/6/22 ~ 2021/6/23

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	2021/3/8	2022/3/7
Power Meter Anritsu	ML2495A	1529002	2021/6/21	2022/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2021/5/31	2022/5/30
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2021/4/13	2022/4/12
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: 2022/1/5

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:

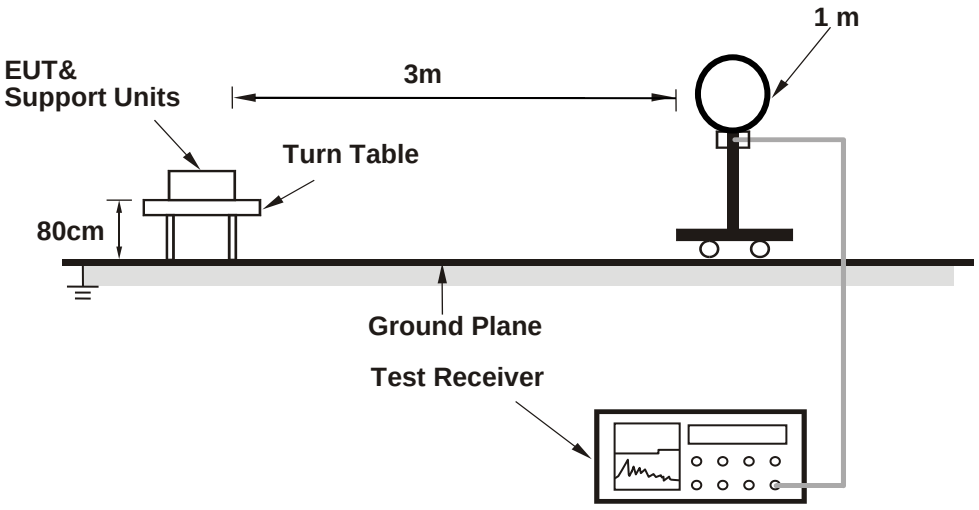
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

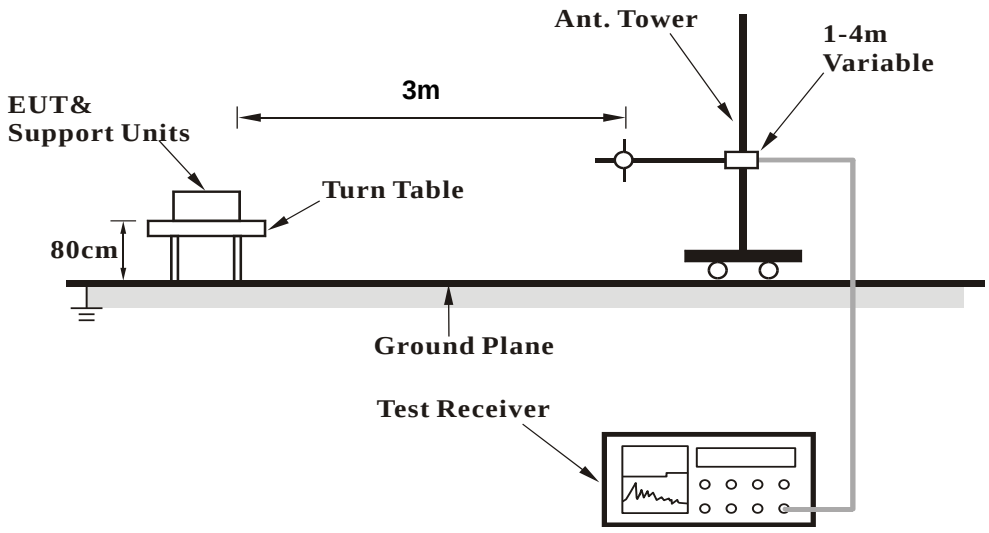
No deviation.

4.1.5 Test Setup

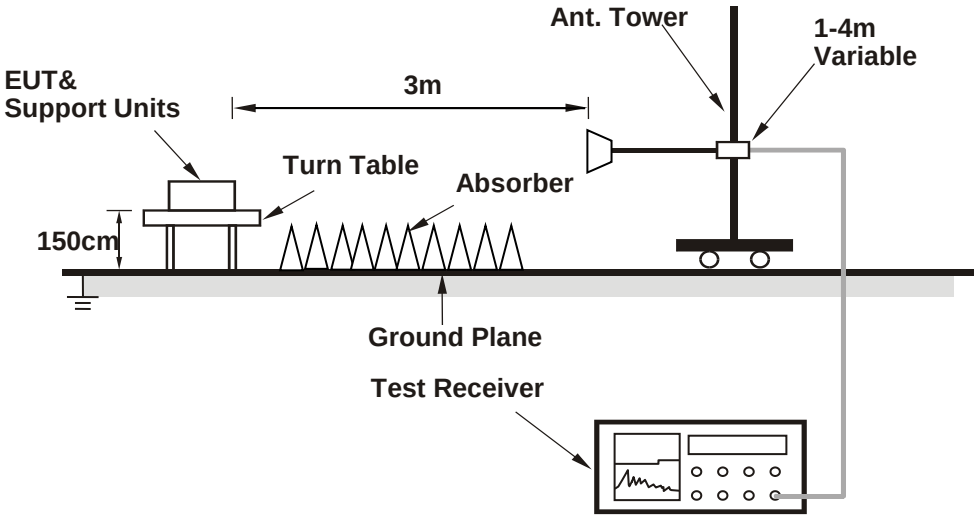
For Radiated emission below 30MHz



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 the testing table.
b. Controlling software (QRCT 4.0.00177.0) has been activated to set the EUT under transmission condition continuously.

4.1.7 Test Results

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 36：5180 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	5146.94	65.1 PK	74.0	-8.9	1.10 H	261	62.7	2.4
2	**5146.94**	**52.3 AV**	**54.0**	**-1.7**	**1.10 H**	**261**	**49.9**	**2.4**
3	*5180.00	119.0 PK			1.10 H	261	116.8	2.2
4	*5180.00	108.2 AV			1.10 H	261	106.0	2.2
5	#10360.00	47.9 PK	68.2	-20.3	1.75 H	128	36.2	11.7
6	15540.00	61.4 PK	74.0	-12.6	1.12 H	227	49.6	11.8
7	15540.00	47.8 AV	54.0	-6.2	1.12 H	227	36.0	11.8
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	5149.54	64.8 PK	74.0	-9.2	1.05 V	273	62.4	2.4
2	5149.54	52.1 AV	54.0	-1.9	1.05 V	273	49.7	2.4
3	*5180.00	117.0 PK			1.05 V	273	114.8	2.2
4	*5180.00	107.1 AV			1.05 V	273	104.9	2.2
5	#10360.00	48.0 PK	68.2	-20.2	1.09 V	151	36.3	11.7
6	15540.00	64.1 PK	74.0	-9.9	1.06 V	244	52.3	11.8
7	15540.00	50.2 AV	54.0	-3.8	1.06 V	244	38.4	11.8

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.

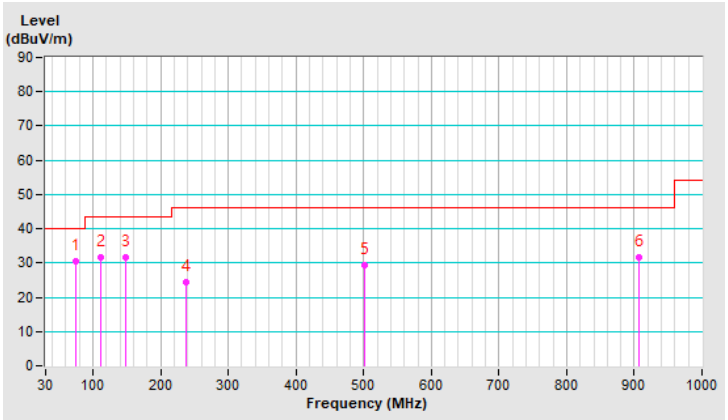
Below 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 36：5180 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	74.56	30.4 QP	40.0	-9.6	3.00 H	103	46.5	-16.1
2	111.89	31.8 QP	43.5	-11.7	2.00 H	290	47.5	-15.7
3	149.11	31.8 QP	43.5	-11.7	1.50 H	307	44.5	-12.7
4	236.95	24.3 QP	46.0	-21.7	1.00 H	273	39.0	-14.7
5	500.80	29.2 QP	46.0	-16.8	1.50 H	340	36.8	-7.6
6	906.96	31.8 QP	46.0	-14.2	1.00 H	358	32.9	-1.1

Remarks:

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

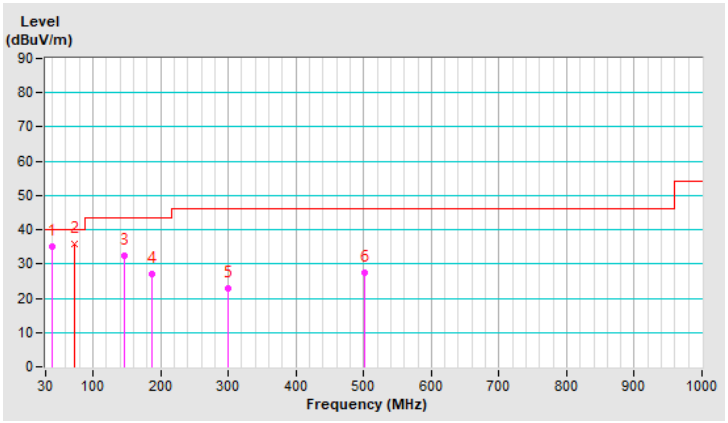


RF Mode	TX 802.11a	Channel	CH 36：5180 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	39.40	35.1 QP	40.0	-4.9	1.00 V	37	48.4	-13.3
2	72.12	35.9 QP	40.0	-4.1	1.00 V	21	51.4	-15.5
3	146.79	32.5 QP	43.5	-11.0	1.50 V	336	45.1	-12.6
4	187.01	27.0 QP	43.5	-16.5	1.00 V	137	42.3	-15.3
5	298.71	22.7 QP	46.0	-23.3	1.00 V	275	35.0	-12.3
6	500.75	27.3 QP	46.0	-18.7	1.50 V	346	34.9	-7.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit 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	2020/10/20	2021/10/19
LISN R&S	ESH3-Z5	848773/004	2020/10/27	2021/10/26
LISN R & S	ESH3-Z5	835239/001	2021/3/26	2022/3/25
50 ohms Terminator	50	3	2020/10/26	2021/10/25
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2020/9/26	2021/9/25
Fixed attenuator STI	STI02-2200-10	005	2020/8/29	2021/8/28
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: 2021/6/22

4.2.3 Test Procedure

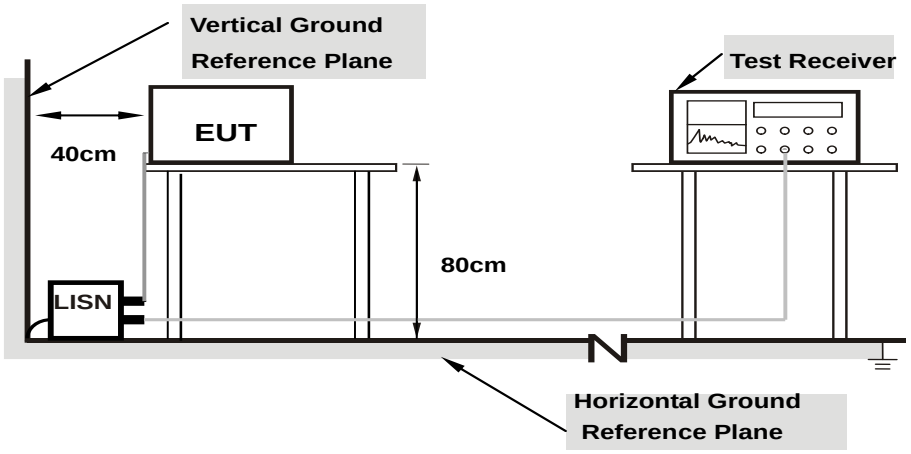
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

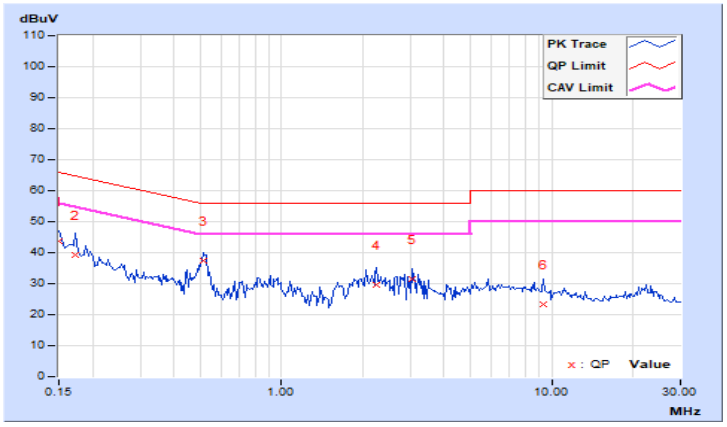
4.2.7 Test Results

RF Mode	TX 802.11a	Channel	CH 36：5180 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	0.15000	9.95	33.77	20.90	43.72	30.85	66.00	56.00	-22.28	-25.15
2	0.17344	9.96	29.40	19.56	39.36	29.52	64.79	54.79	-25.43	-25.27
3	**0.51328**	**10.00**	**27.52**	**21.03**	**37.52**	**31.03**	**56.00**	**46.00**	**-18.48**	**-14.97**
4	2.25391	10.08	19.37	11.59	29.45	21.67	56.00	46.00	-26.55	-24.33
5	3.03125	10.12	21.44	9.90	31.56	20.02	56.00	46.00	-24.44	-25.98
6	9.37891	10.49	13.02	6.99	23.51	17.48	60.00	50.00	-36.49	-32.52

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

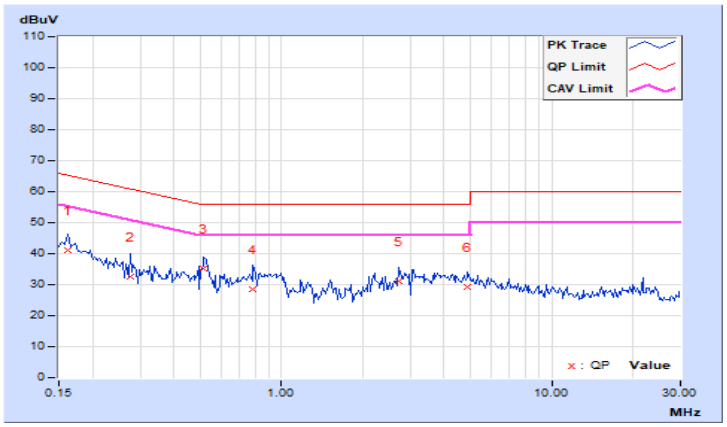


RF Mode	TX 802.11a	Channel	CH 36：5180 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

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	0.16172	9.93	31.16	20.25	41.09	30.18	65.38	55.38	-24.29	-25.20
2	0.27500	9.95	22.52	14.68	32.47	24.63	60.97	50.97	-28.50	-26.34
3	0.51719	9.97	25.33	18.37	35.30	28.34	56.00	46.00	-20.70	-17.66
4	0.78672	9.99	18.49	10.99	28.48	20.98	56.00	46.00	-27.52	-25.02
5	2.73047	10.07	21.05	11.87	31.12	21.94	56.00	46.00	-24.88	-24.06
6	4.89063	10.16	19.10	14.24	29.26	24.40	56.00	46.00	-26.74	-21.60

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 (24dBm) 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,

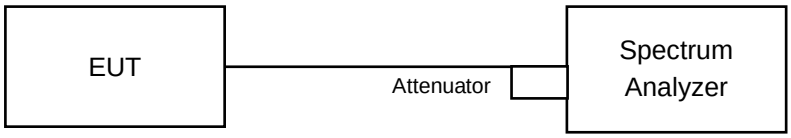
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

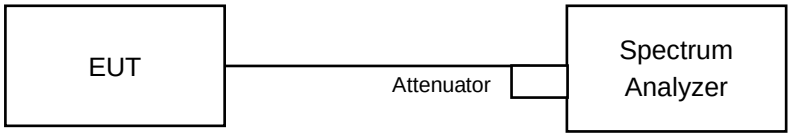
FOR POWER OUTPUT MEASUREMENT

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

POWER OUTPUT

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	23.89	24.50	526.745	27.22	30	Pass
40	5200	23.62	23.77	468.376	26.71	30	Pass
48	5240	23.18	22.93	404.306	26.07	30	Pass
52	5260	20.50	20.24	217.884	23.38	24	Pass
60	5300	20.45	20.03	211.611	23.26	24	Pass
64	5320	20.32	20.21	212.601	23.28	24	Pass
100	5500	20.46	20.49	223.117	23.49	24	Pass
116	5580	20.69	20.50	229.421	23.61	24	Pass
140	5700	20.76	20.36	227.767	23.57	24	Pass
*144 (U-NII-2C Band)	5720	18.09	18.06	137.227	21.37	22.82	Pass
*144 (U-NII-3 Band)	5720	11.68	11.59	31.15	14.93	30	Pass
149	5745	23.57	22.90	422.494	26.26	30	Pass
157	5785	23.30	23.05	415.633	26.19	30	Pass
165	5825	23.59	23.27	440.884	26.44	30	Pass

Notes:

1. * : 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.
2. Directional gain is the maximum gain of antennas.
3. For U-NII-1, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.

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	20.71	24.16 > 24
60	5300	20.52	24.12 > 24
64	5320	20.61	24.14 > 24
100	5500	20.59	24.13 > 24
116	5580	20.56	24.13 > 24
140	5700	20.7	24.15 > 24
144 (U-NII-2C Band)	5720	15.21	22.82 < 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				
36	5180	23.19	22.26	376.716	25.76	30	Pass
40	5200	23.19	22.93	404.785	26.07	30	Pass
48	5240	23.00	22.84	391.835	25.93	30	Pass
52	5260	20.19	19.95	203.327	23.08	24	Pass
60	5300	20.51	20.37	221.354	23.45	24	Pass
64	5320	20.68	20.28	223.61	23.49	24	Pass
100	5500	20.32	20.37	216.54	23.36	24	Pass
116	5580	20.54	20.25	219.165	23.41	24	Pass
140	5700	20.50	20.11	214.767	23.32	24	Pass
*144 (U-NII-2C Band)	5720	17.44	17.56	118.064	20.72	22.93	Pass
*144 (U-NII-3 Band)	5720	11.51	11.71	30.422	14.83	30	Pass
149	5745	23.17	22.56	387.793	25.89	30	Pass
157	5785	23.34	23.12	420.891	26.24	30	Pass
165	5825	23.35	22.94	413.06	26.16	30	Pass

Notes:

1. * : 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.
2. Directional gain is the maximum gain of antennas.
3. For U-NII-1, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.

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	21.4	24.3 > 24
60	5300	21.24	24.27 > 24
64	5320	21.24	24.27 > 24
100	5500	21.44	24.31 > 24
116	5580	21.41	24.3 > 24
140	5700	21.65	24.35 > 24
144 (U-NII-2C Band)	5720	15.62	22.93 < 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				
38	5190	22.09	21.69	309.379	24.90	30	Pass
46	5230	23.12	22.94	401.905	26.04	30	Pass
54	5270	20.57	20.19	218.497	23.39	24	Pass
62	5310	18.83	20.08	178.243	22.51	24	Pass
102	5510	19.86	20.10	199.157	22.99	24	Pass
110	5550	20.25	20.17	209.917	23.22	24	Pass
134	5670	20.46	20.17	215.165	23.33	24	Pass
*142 (U-NII-2C Band)	5710	18.07	18.25	138.661	21.42	24	Pass
*142 (U-NII-3 Band)	5710	7.45	7.77	12.222	10.87	30	Pass
151	5755	23.17	22.79	397.599	25.99	30	Pass
159	5795	22.53	22.46	355.258	25.51	30	Pass

Notes:

1. * : 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.
2. Directional gain is the maximum gain of antennas.
3. For U-NII-1, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.

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	42.58	27.29 > 24
62	5310	42.62	27.29 > 24
102	5510	42.45	27.27 > 24
110	5550	42.3	27.26 > 24
134	5670	42.16	27.24 > 24
142 (U-NII-2C Band)	5710	36.2	26.58 > 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				
42	5210	20.73	20.62	233.649	23.69	30	Pass
58	5290	17.69	17.51	115.113	20.61	24	Pass
106	5530	20.00	20.33	207.895	23.18	24	Pass
122	5610	20.10	20.37	211.222	23.25	24	Pass
*138 (U-NII-2C Band)	5690	16.10	16.10	86.3	19.36	24	Pass
*138 (U-NII-3 Band)	5690	1.88	2.04	3.327	5.22	30	Pass
155	5775	21.01	20.64	242.06	23.84	30	Pass

Notes:

1. * : 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.
2. Directional gain is the maximum gain of antennas.
3. For U-NII-1, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.

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	82.76	30.17 > 24
106	5530	82.94	30.18 > 24
122	5610	83.04	30.19 > 24
138 (U-NII-2C Band)	5690	76.28	29.82 > 24

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	23.35	22.31	386.488	25.87	30	Pass
40	5200	23.40	23.16	425.79	26.29	30	Pass
48	5240	23.22	22.94	406.683	26.09	30	Pass
52	5260	20.28	20.01	206.89	23.16	24	Pass
60	5300	20.57	20.45	224.942	23.52	24	Pass
64	5320	20.73	20.33	226.199	23.54	24	Pass
100	5500	20.46	20.49	223.117	23.49	24	Pass
116	5580	20.71	20.44	228.423	23.59	24	Pass
140	5700	20.69	20.31	224.618	23.51	24	Pass
*144 (U-NII-2C Band)	5720	17.60	17.76	123.069	20.90	22.93	Pass
*144 (U-NII-3 Band)	5720	11.98	12.18	33.899	15.30	30	Pass
149	5745	23.32	22.67	399.71	26.02	30	Pass
157	5785	23.46	23.24	432.682	26.36	30	Pass
165	5825	23.47	23.08	425.567	26.29	30	Pass

Notes:

1. * : 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.
2. Directional gain is the maximum gain of antennas.
3. For U-NII-1, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.

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	21.4	24.3 > 24
60	5300	21.24	24.27 > 24
64	5320	21.24	24.27 > 24
100	5500	21.44	24.31 > 24
116	5580	21.41	24.3 > 24
140	5700	21.65	24.35 > 24
144 (U-NII-2C Band)	5720	15.62	22.93 < 24

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	22.27	21.90	323.537	25.10	30	Pass
46	5230	23.30	23.15	420.334	26.24	30	Pass
54	5270	20.71	20.34	225.904	23.54	24	Pass
62	5310	19.07	20.28	187.383	22.73	24	Pass
102	5510	20.02	20.25	206.387	23.15	24	Pass
110	5550	20.53	20.42	223.134	23.49	24	Pass
134	5670	20.73	20.40	227.952	23.58	24	Pass
*142 (U-NII-2C Band)	5710	18.22	18.61	147.163	21.68	24	Pass
*142 (U-NII-3 Band)	5710	7.63	8.48	13.597	11.33	30	Pass
151	5755	23.41	22.95	416.523	26.20	30	Pass
159	5795	22.71	22.72	373.706	25.73	30	Pass

Notes:

1. * : 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.
2. Directional gain is the maximum gain of antennas.
3. For U-NII-1, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.

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	42.58	27.29 > 24
62	5310	42.62	27.29 > 24
102	5510	42.45	27.27 > 24
110	5550	42.3	27.26 > 24
134	5670	42.16	27.24 > 24
142 (U-NII-2C Band)	5710	36.2	26.58 > 24

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	20.95	20.82	245.233	23.90	30	Pass
58	5290	17.82	17.69	119.283	20.77	24	Pass
106	5530	20.25	20.47	217.355	23.37	24	Pass
122	5610	20.30	20.58	221.44	23.45	24	Pass
*138 (U-NII-2C Band)	5690	16.27	16.45	91.645	19.62	24	Pass
*138 (U-NII-3 Band)	5690	2.61	2.40	3.773	5.77	30	Pass
155	5775	21.18	20.81	251.724	24.01	30	Pass

Notes:

1. * : 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.
2. Directional gain is the maximum gain of antennas.
3. For U-NII-1, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 3 dBi < 6 dBi, so the output power limit shall not be reduced.

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	82.76	30.17 > 24
106	5530	82.94	30.18 > 24
122	5610	83.04	30.19 > 24
138 (U-NII-2C Band)	5690	76.28	29.82 > 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				
36	5180	21.89	21.09	283.054	24.52	30	Pass
40	5200	23.33	23.14	421.341	26.25	30	Pass
48	5240	23.19	22.84	400.758	26.03	30	Pass
52	5260	20.21	19.96	204.037	23.10	24	Pass
60	5300	20.41	20.29	216.806	23.36	24	Pass
64	5320	20.49	20.08	213.803	23.30	24	Pass
100	5500	20.38	20.42	219.298	23.41	24	Pass
116	5580	20.41	20.31	217.3	23.37	24	Pass
140	5700	19.62	19.25	175.762	22.45	24	Pass
*144 (U-NII-2C Band)	5720	16.44	16.50	93.129	19.69	22.93	Pass
*144 (U-NII-3 Band)	5720	10.97	10.94	26.156	14.18	30	Pass
149	5745	23.23	22.52	389.027	25.90	30	Pass
157	5785	23.36	23.11	421.415	26.25	30	Pass
165	5825	23.29	23.00	412.831	26.16	30	Pass

Notes:

1. * : 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.
2. Directional gain = $10 \log[(10^{Chain0/20} + 10^{Chain1/20})^2 / 2]$
3. For U-NII-1, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.

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	21.4	24.3 > 24
60	5300	21.24	24.27 > 24
64	5320	21.24	24.27 > 24
100	5500	21.44	24.31 > 24
116	5580	21.41	24.3 > 24
140	5700	21.65	24.35 > 24
144 (U-NII-2C Band)	5720	15.62	22.93 < 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				
38	5190	21.77	21.32	285.833	24.56	30	Pass
46	5230	21.79	21.86	304.47	24.84	30	Pass
54	5270	20.48	19.99	211.456	23.25	24	Pass
62	5310	19.00	20.17	183.425	22.63	24	Pass
102	5510	18.27	18.40	136.326	21.35	24	Pass
110	5550	20.17	20.12	206.794	23.16	24	Pass
134	5670	20.12	19.79	198.081	22.97	24	Pass
*142 (U-NII-2C Band)	5710	17.03	16.82	104.349	20.18	24	Pass
*142 (U-NII-3 Band)	5710	6.82	6.84	10.206	10.09	30	Pass
151	5755	23.30	22.84	406.105	26.09	30	Pass
159	5795	22.60	22.61	364.36	25.62	30	Pass

Notes:

1. * : 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.
2. Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$)^2 / 2]
3. For U-NII-1, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.

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	42.58	27.29 > 24
62	5310	42.62	27.29 > 24
102	5510	42.45	27.27 > 24
110	5550	42.3	27.26 > 24
134	5670	42.16	27.24 > 24
142 (U-NII-2C Band)	5710	36.2	26.58 > 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				
42	5210	20.84	20.71	239.099	23.79	30	Pass
58	5290	17.76	17.61	117.38	20.70	24	Pass
106	5530	19.52	19.60	180.738	22.57	24	Pass
122	5610	20.09	19.98	201.634	23.05	24	Pass
*138 (U-NII-2C Band)	5690	15.09	14.90	66.929	18.26	24	Pass
*138 (U-NII-3 Band)	5690	1.05	1.34	2.791	4.46	30	Pass
155	5775	21.07	20.70	245.428	23.90	30	Pass

Notes:

1. * : 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.
2. Directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2]
3. For U-NII-1, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.

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	82.76	30.17 > 24
106	5530	82.94	30.18 > 24
122	5610	83.04	30.19 > 24
138 (U-NII-2C Band)	5690	76.28	29.82 > 24

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	22.15	21.11	293.181	24.67	30	Pass
40	5200	23.40	23.16	425.79	26.29	30	Pass
48	5240	23.22	22.94	406.683	26.09	30	Pass
52	5260	20.28	20.01	206.89	23.16	24	Pass
60	5300	20.47	20.40	221.077	23.45	24	Pass
64	5320	20.68	20.19	221.422	23.45	24	Pass
100	5500	20.46	20.49	223.117	23.49	24	Pass
116	5580	20.51	20.41	222.361	23.47	24	Pass
140	5700	19.69	19.31	178.421	22.51	24	Pass
*144 (U-NII-2C Band)	5720	16.90	16.84	102.114	20.09	22.93	Pass
*144 (U-NII-3 Band)	5720	11.41	11.23	28.456	14.54	30	Pass
149	5745	23.32	22.67	399.71	26.02	30	Pass
157	5785	23.46	23.22	431.714	26.35	30	Pass
165	5825	23.39	23.08	421.509	26.25	30	Pass

Notes:

1. * : 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.
2. Directional gain = $10 \log[(10^{Chain0/20} + 10^{Chain1/20})^2 / 2]$
3. For U-NII-1, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.

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	21.4	24.3 > 24
60	5300	21.24	24.27 > 24
64	5320	21.24	24.27 > 24
100	5500	21.44	24.31 > 24
116	5580	21.41	24.3 > 24
140	5700	21.65	24.35 > 24
144 (U-NII-2C Band)	5720	15.62	22.93 < 24

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	21.83	21.40	290.444	24.63	30	Pass
46	5230	21.98	22.02	316.982	25.01	30	Pass
54	5270	20.59	20.16	218.304	23.39	24	Pass
62	5310	19.07	20.28	187.383	22.73	24	Pass
102	5510	18.38	18.51	139.823	21.46	24	Pass
110	5550	20.28	20.23	212.098	23.27	24	Pass
134	5670	20.23	19.90	203.162	23.08	24	Pass
*142 (U-NII-2C Band)	5710	17.69	17.45	121.068	20.83	24	Pass
*142 (U-NII-3 Band)	5710	7.35	7.49	11.693	10.68	30	Pass
151	5755	23.41	22.95	416.523	26.20	30	Pass
159	5795	22.71	22.72	373.706	25.73	30	Pass

Notes:

1. * : 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.
2. Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$)^2 / 2]
3. For U-NII-1, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.

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	42.58	27.29 > 24
62	5310	42.62	27.29 > 24
102	5510	42.45	27.27 > 24
110	5550	42.3	27.26 > 24
134	5670	42.16	27.24 > 24
142 (U-NII-2C Band)	5710	36.2	26.58 > 24

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	20.95	20.82	245.233	23.90	30	Pass
58	5290	17.82	17.69	119.283	20.77	24	Pass
106	5530	19.63	19.71	185.374	22.68	24	Pass
122	5610	20.20	20.08	206.572	23.15	24	Pass
*138 (U-NII-2C Band)	5690	15.65	15.52	76.659	18.85	24	Pass
*138 (U-NII-3 Band)	5690	1.73	1.74	3.159	5.00	30	Pass
155	5775	21.18	20.81	251.724	24.01	30	Pass

Notes:

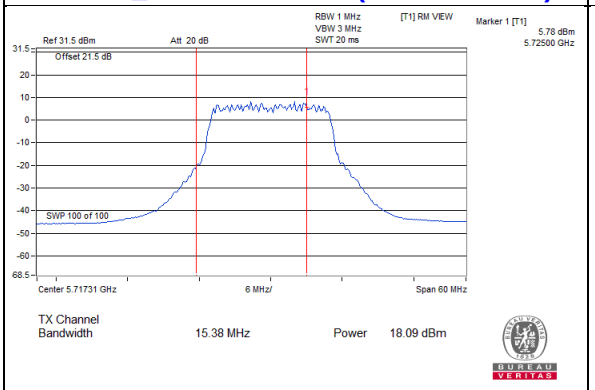
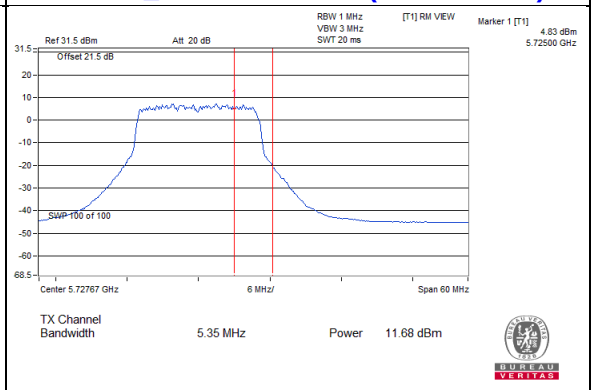
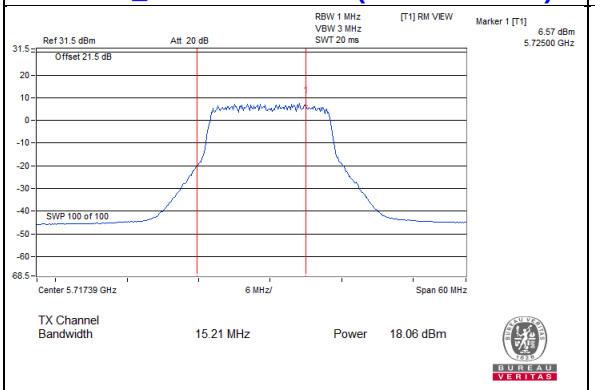
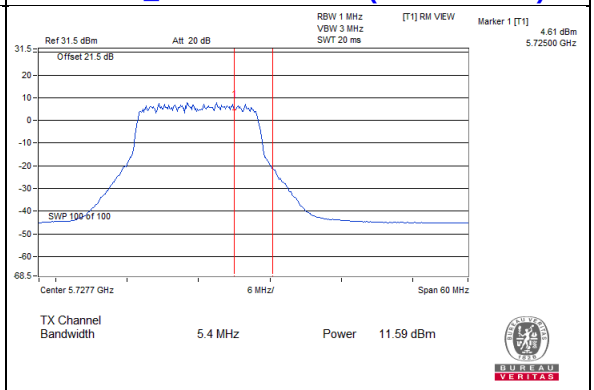
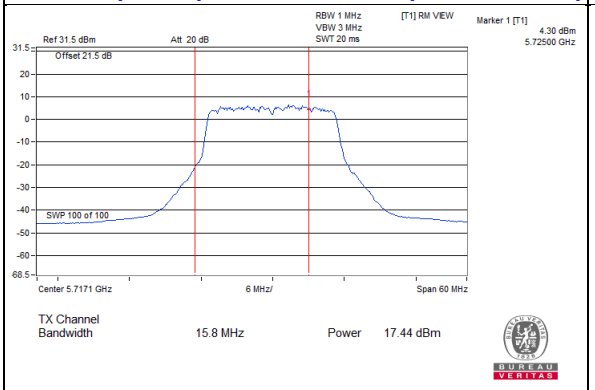
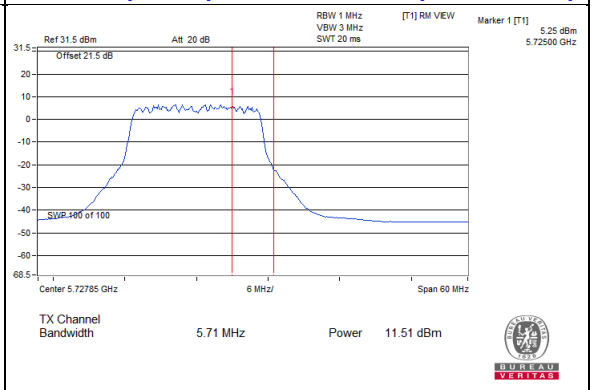
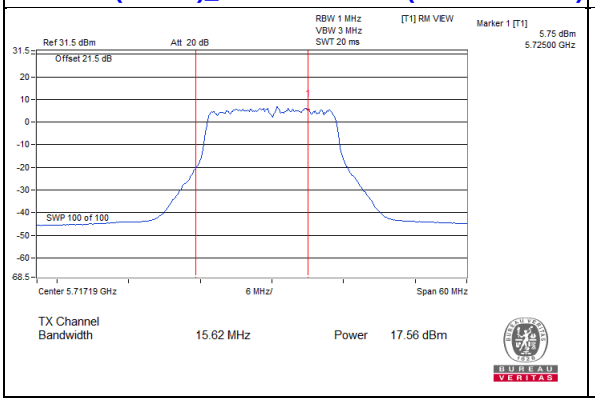
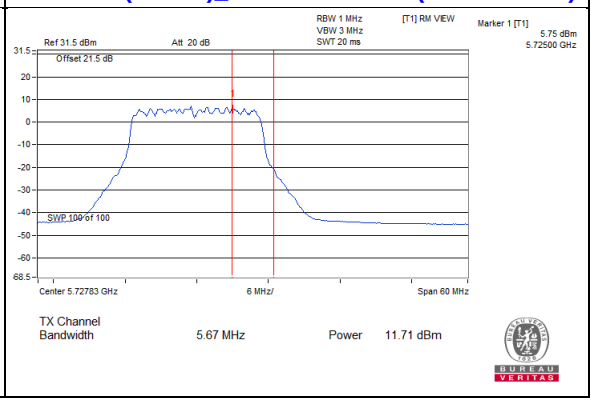
1. * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test , the duty factor was included in the total power.
2. Directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2]
3. For U-NII-1, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the directional gain is 5.76 dBi < 6 dBi, so the output power limit shall not be reduced.

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	82.76	30.17 > 24
106	5530	82.94	30.18 > 24
122	5610	83.04	30.19 > 24
138 (U-NII-2C Band)	5690	76.28	29.82 > 24

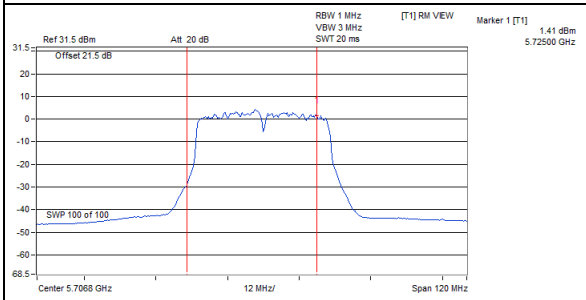
For channel straddling 5725MHz of Power

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 15.38 MHz Power 18.09 dBm	 TX Channel Bandwidth 5.35 MHz Power 11.68 dBm
802.11a_Chain 1 / CH144 (U-NII-2C Band)	**802.11a_Chain 1 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 15.21 MHz Power 18.06 dBm	 TX Channel Bandwidth 5.4 MHz Power 11.59 dBm
802.11ac (VHT20)_Chain 0 / CH144 (U-NII-2C Band)	**802.11ac (VHT20)_Chain 0 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 15.8 MHz Power 17.44 dBm	 TX Channel Bandwidth 5.71 MHz Power 11.51 dBm
802.11ac (VHT20)_Chain 1 / CH144 (U-NII-2C Band)	**802.11ac (VHT20)_Chain 1 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 15.62 MHz Power 17.56 dBm	 TX Channel Bandwidth 5.67 MHz Power 11.71 dBm

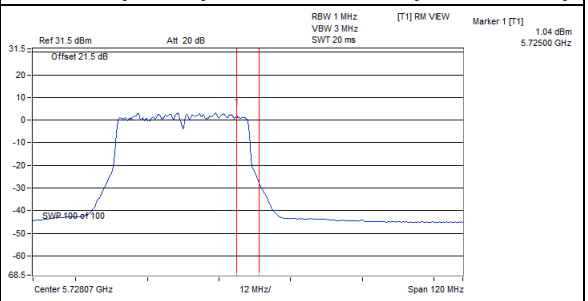
Spectrum Plot Value of Power

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



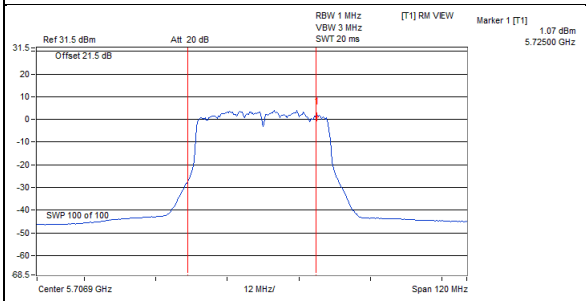
TX Channel Bandwidth 36.39 MHz Power 18.07 dBm

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



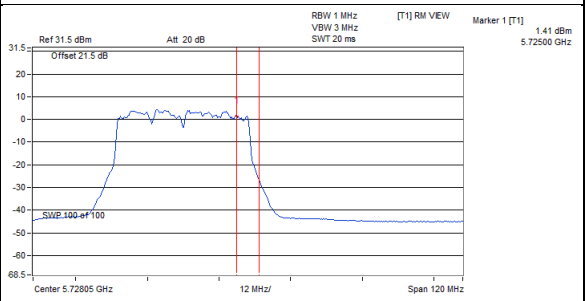
TX Channel Bandwidth 6.14 MHz Power 7.45 dBm

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



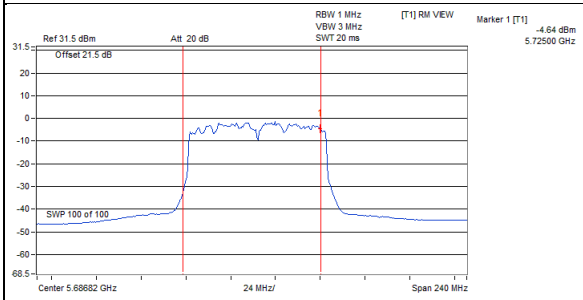
TX Channel Bandwidth 36.2 MHz Power 18.25 dBm

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



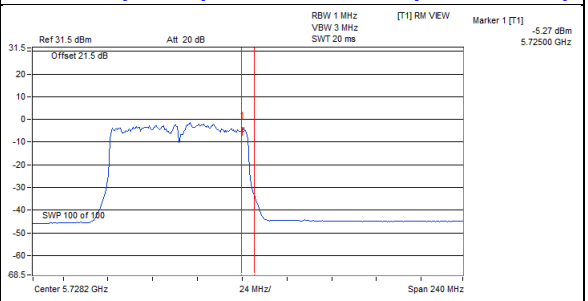
TX Channel Bandwidth 6.1 MHz Power 7.77 dBm

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



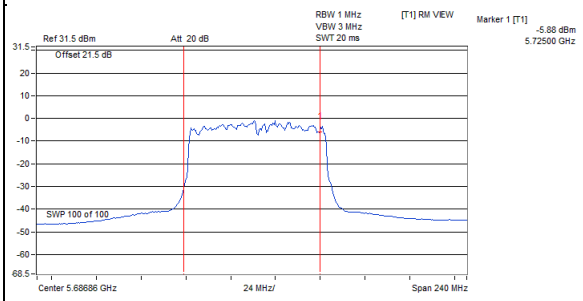
TX Channel Bandwidth 76.35 MHz Power 16.1 dBm

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



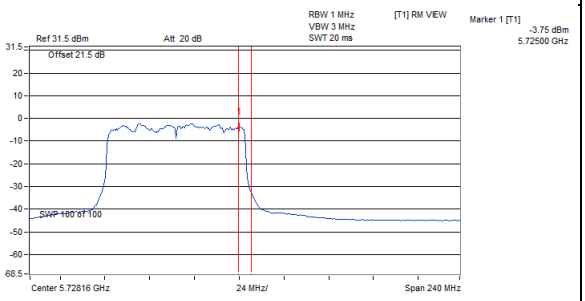
TX Channel Bandwidth 6.41 MHz Power 1.88 dBm

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



TX Channel Bandwidth 76.28 MHz Power 16.1 dBm

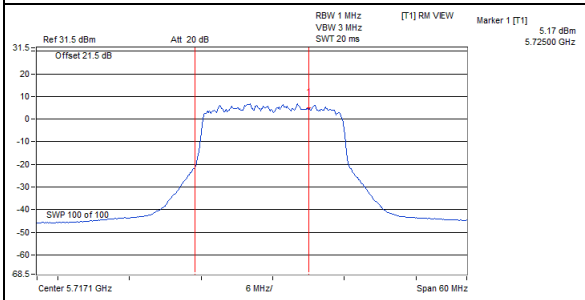
802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)



TX Channel Bandwidth 6.32 MHz Power 2.04 dBm

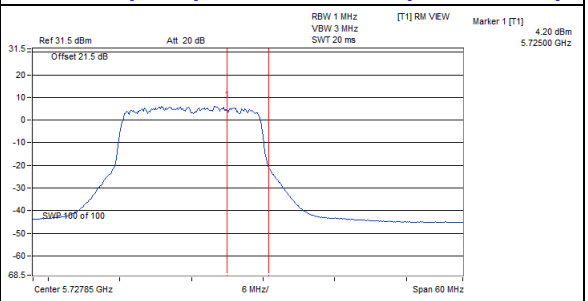
Spectrum Plot Value of Power

802.11ax (HE20)_Chain 0 / CH144 (U-NII-2C Band)



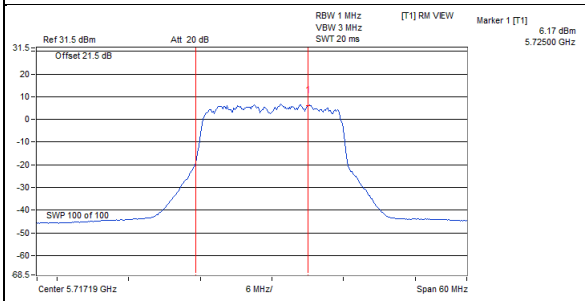
TX Channel Bandwidth 15.8 MHz Power 17.6 dBm

802.11ax (HE20)_Chain 0 / CH144 (U-NII-3 Band)



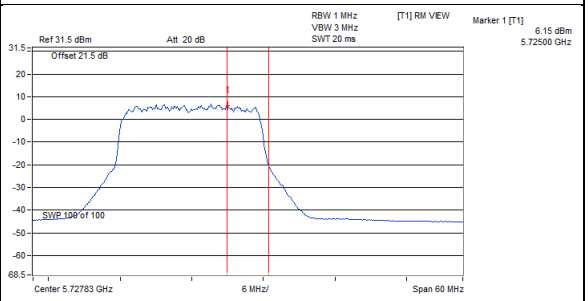
TX Channel Bandwidth 5.71 MHz Power 11.98 dBm

802.11ax (HE20)_Chain 1 / CH144 (U-NII-2C Band)



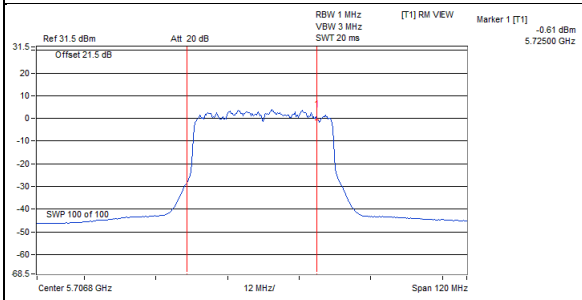
TX Channel Bandwidth 15.62 MHz Power 17.76 dBm

802.11ax (HE20)_Chain 1 / CH144 (U-NII-3 Band)



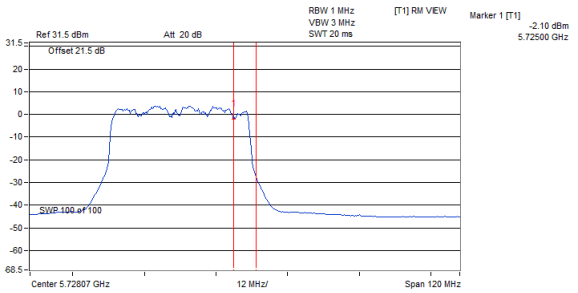
TX Channel Bandwidth 5.67 MHz Power 12.18 dBm

802.11ax (HE40)_Chain 0 / CH142 (U-NII-2C Band)



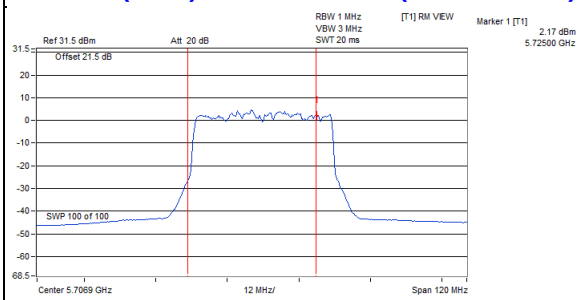
TX Channel Bandwidth 36.39 MHz Power 18.22 dBm

802.11ax (HE40)_Chain 0 / CH142 (U-NII-3 Band)



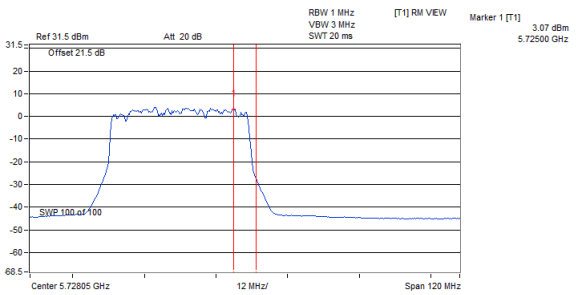
TX Channel Bandwidth 6.14 MHz Power 7.63 dBm

802.11ax (HE40)_Chain 1 / CH142 (U-NII-2C Band)

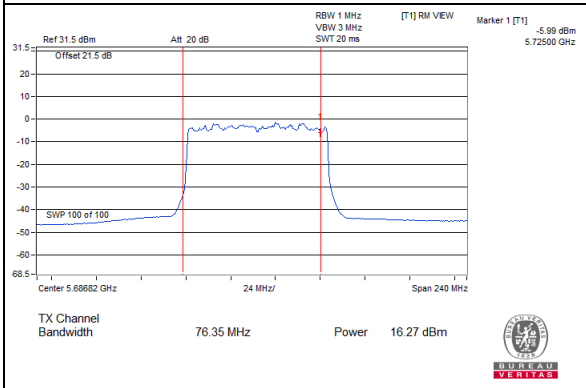
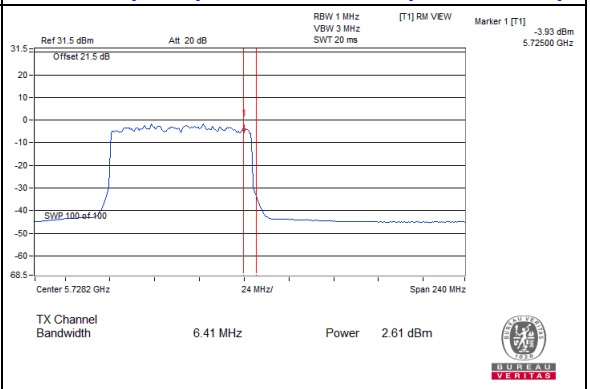
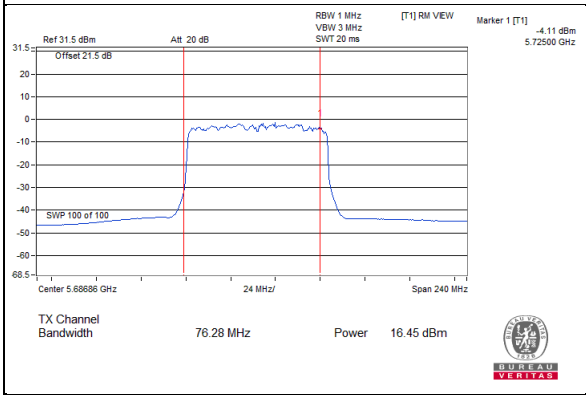
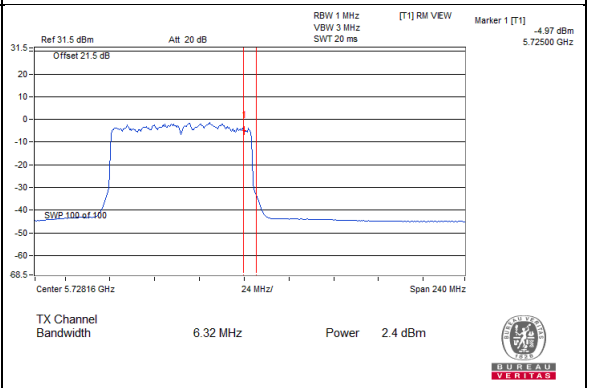


TX Channel Bandwidth 36.2 MHz Power 18.61 dBm

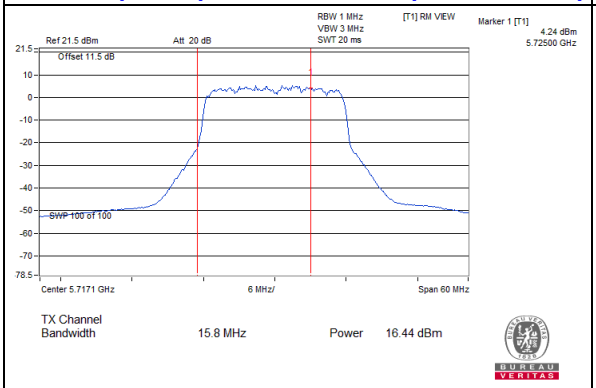
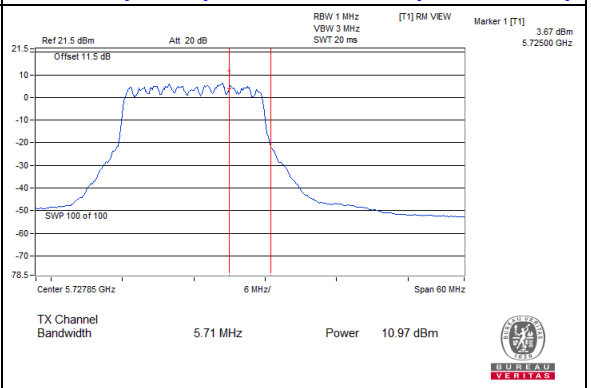
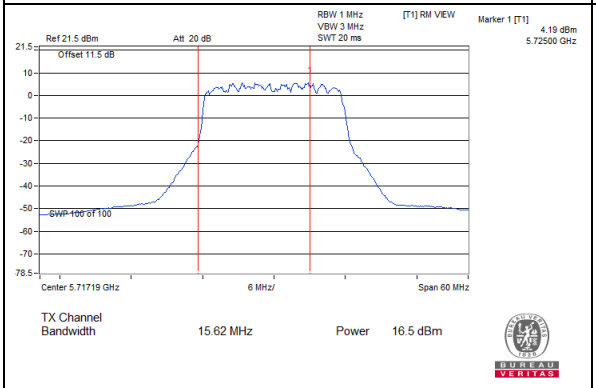
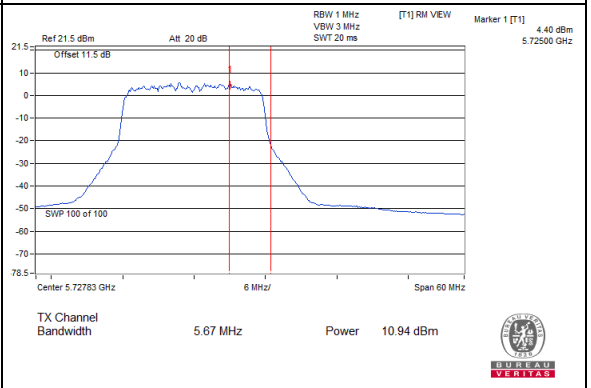
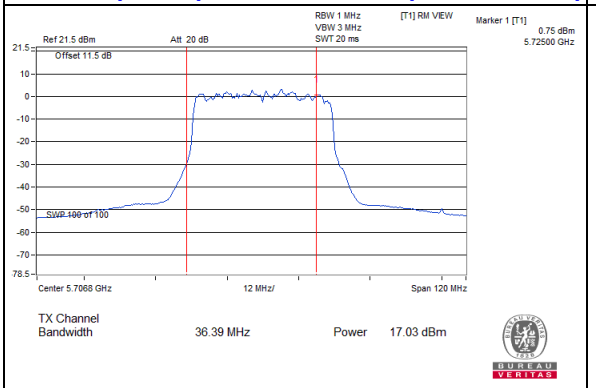
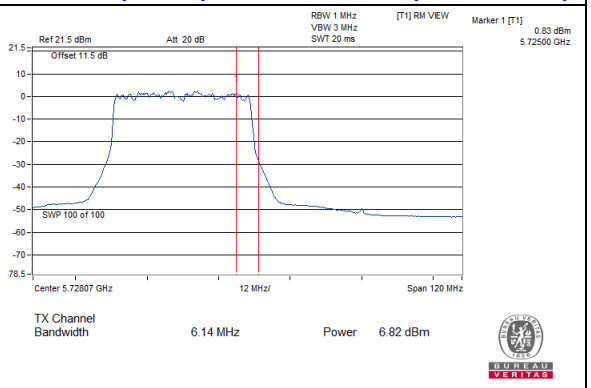
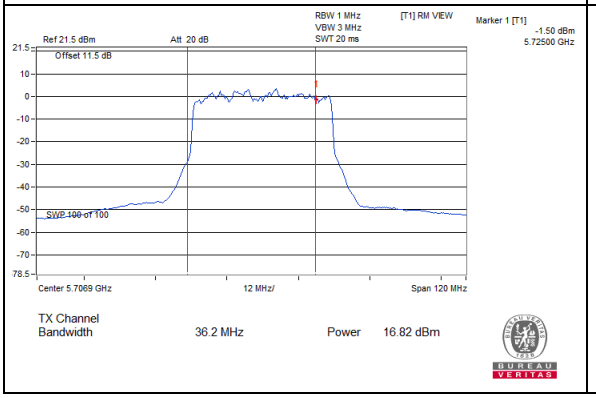
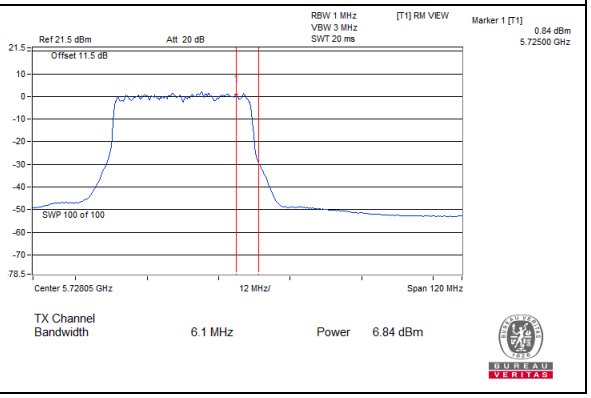
802.11ax (HE40)_Chain 1 / CH142 (U-NII-3 Band)

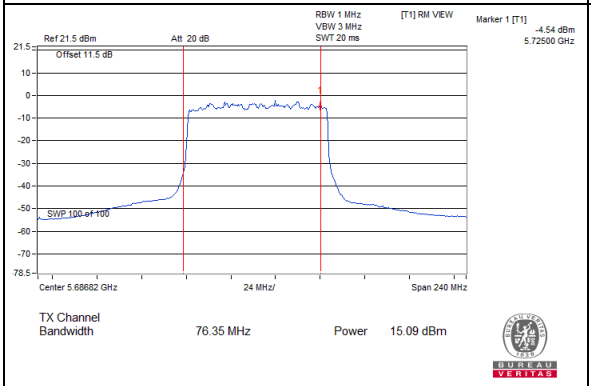
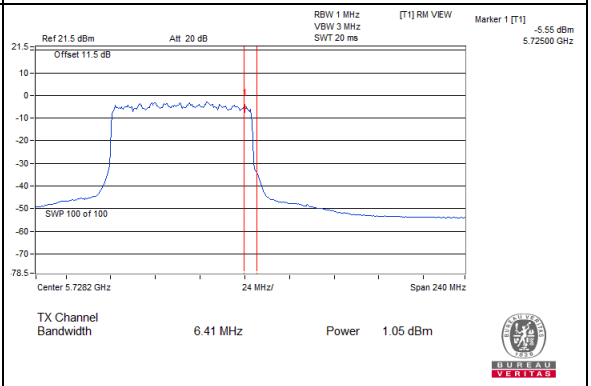
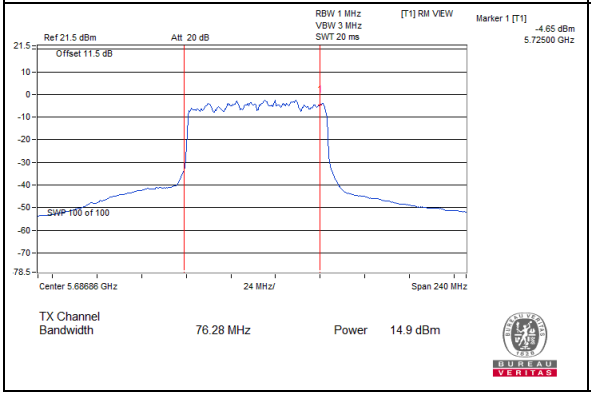
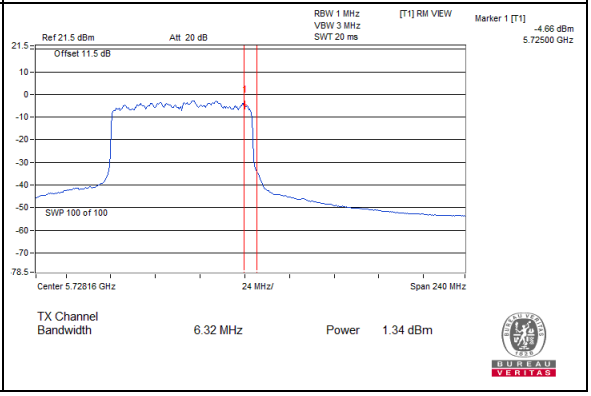


TX Channel Bandwidth 6.1 MHz Power 8.48 dBm

Spectrum Plot Value of Power	
802.11ax (HE80)_Chain 0 / CH138 (U-NII-2C Band)	**802.11ax (HE80)_Chain 0 / CH138 (U-NII-3 Band)**
 TX Channel Bandwidth 76.35 MHz Power 16.27 dBm	 TX Channel Bandwidth 6.41 MHz Power 2.61 dBm
802.11ax (HE80)_Chain 1 / CH138 (U-NII-2C Band)	**802.11ax (HE80)_Chain 1 / CH138 (U-NII-3 Band)**
 TX Channel Bandwidth 76.28 MHz Power 16.45 dBm	 TX Channel Bandwidth 6.32 MHz Power 2.4 dBm

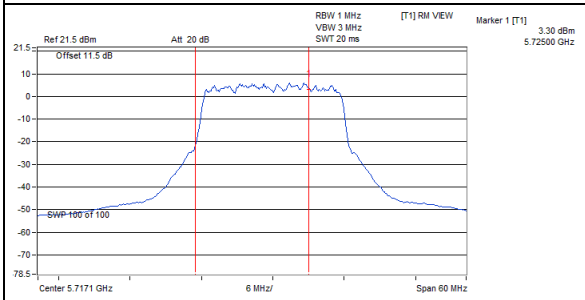
Beamforming Mode

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 15.8 MHz Power 16.44 dBm	 TX Channel Bandwidth 5.71 MHz Power 10.97 dBm
802.11ac (VHT20)_Chain 1 / CH144 (U-NII-2C Band)	**802.11ac (VHT20)_Chain 1 / CH144 (U-NII-3 Band)**
 TX Channel Bandwidth 15.62 MHz Power 16.5 dBm	 TX Channel Bandwidth 5.67 MHz Power 10.94 dBm
802.11ac (VHT40)_Chain 0 / CH142 (U-NII-2C Band)	**802.11ac (VHT40)_Chain 0 / CH142 (U-NII-3 Band)**
 TX Channel Bandwidth 36.39 MHz Power 17.03 dBm	 TX Channel Bandwidth 6.14 MHz Power 6.82 dBm
802.11ac (VHT40)_Chain 1 / CH142 (U-NII-2C Band)	**802.11ac (VHT40)_Chain 1 / CH142 (U-NII-3 Band)**
 TX Channel Bandwidth 36.2 MHz Power 16.82 dBm	 TX Channel Bandwidth 6.1 MHz Power 6.84 dBm

Spectrum Plot Value of Power	
802.11ac (VHT80)_Chain 0 / CH138 (U-NII-2C Band)	**802.11ac (VHT80)_Chain 0 / CH138 (U-NII-3 Band)**
	
802.11ac (VHT80)_Chain 1 / CH138 (U-NII-2C Band)	**802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)**
	

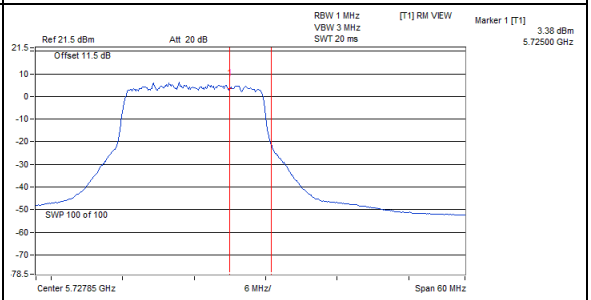
Spectrum Plot Value of Power

802.11ax (HE20)_Chain 0 / CH144 (U-NII-2C Band)



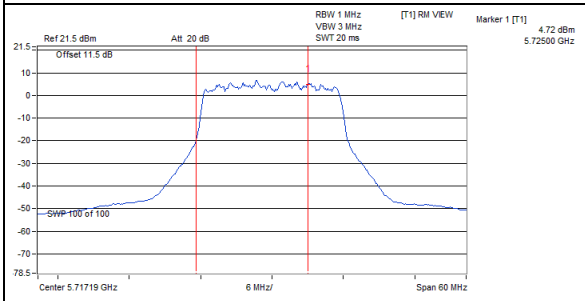
TX Channel Bandwidth 15.8 MHz Power 16.9 dBm

802.11ax (HE20)_Chain 0 / CH144 (U-NII-3 Band)



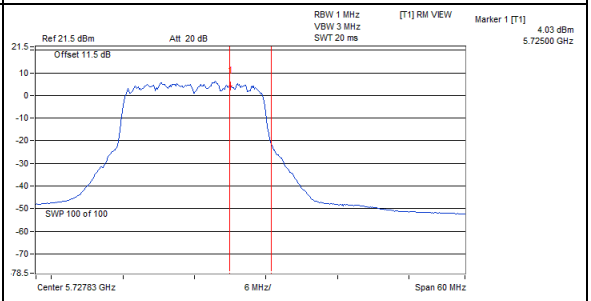
TX Channel Bandwidth 5.71 MHz Power 11.41 dBm

802.11ax (HE20)_Chain 1 / CH144 (U-NII-2C Band)



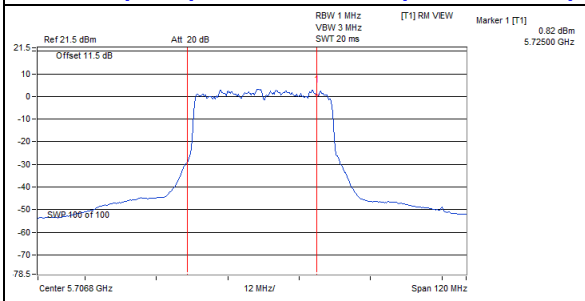
TX Channel Bandwidth 15.62 MHz Power 16.84 dBm

802.11ax (HE20)_Chain 1 / CH144 (U-NII-3 Band)



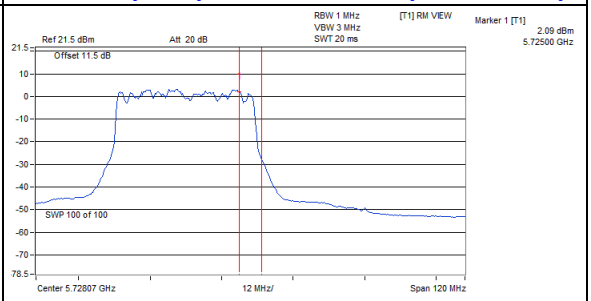
TX Channel Bandwidth 5.67 MHz Power 11.23 dBm

802.11ax (HE40)_Chain 0 / CH142 (U-NII-2C Band)



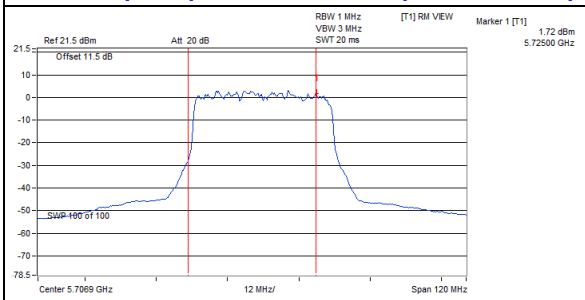
TX Channel Bandwidth 36.39 MHz Power 17.69 dBm

802.11ax (HE40)_Chain 0 / CH142 (U-NII-3 Band)



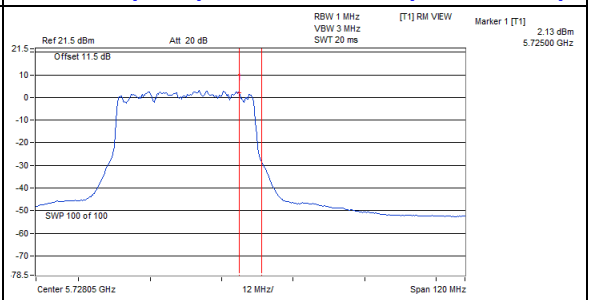
TX Channel Bandwidth 6.14 MHz Power 7.35 dBm

802.11ax (HE40)_Chain 1 / CH142 (U-NII-2C Band)

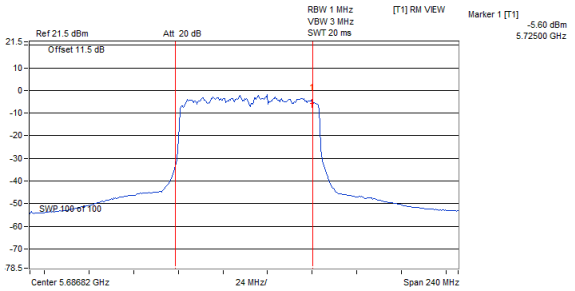
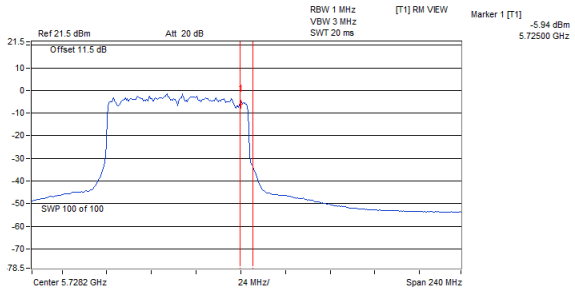
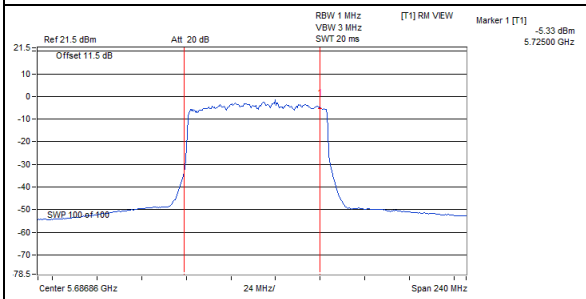
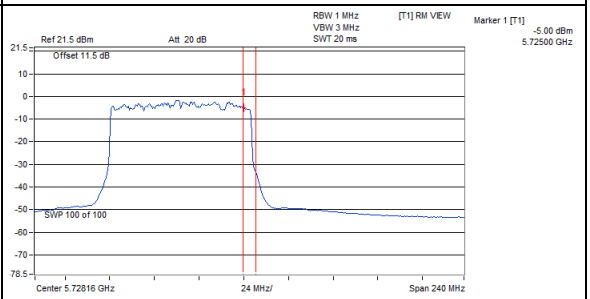


TX Channel Bandwidth 36.2 MHz Power 17.45 dBm

802.11ax (HE40)_Chain 1 / CH142 (U-NII-3 Band)



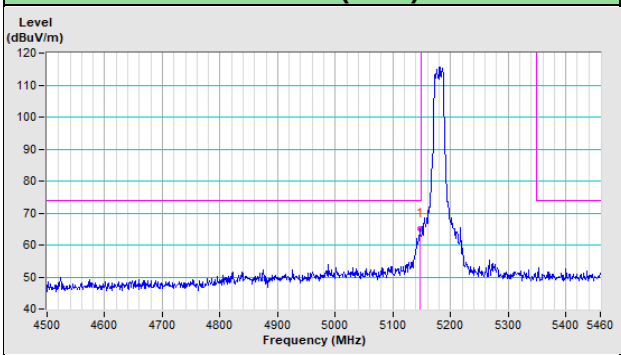
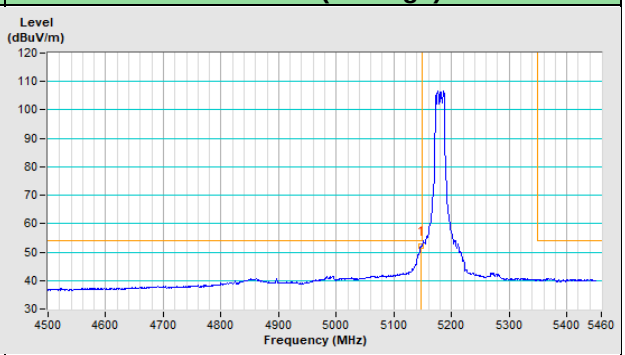
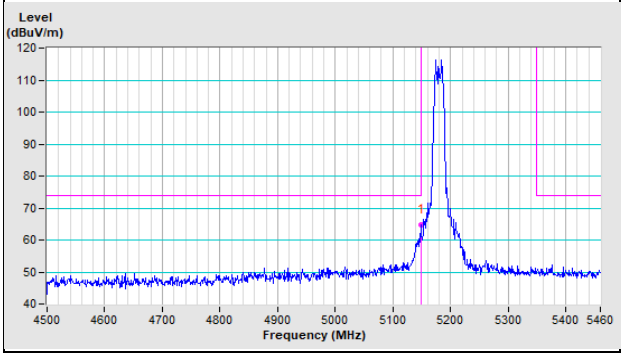
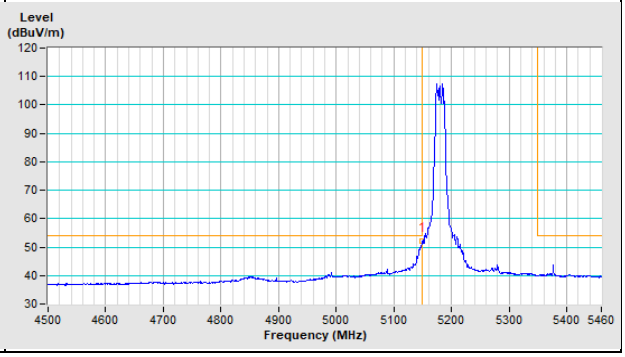
TX Channel Bandwidth 6.1 MHz Power 7.49 dBm

Spectrum Plot Value of Power	
802.11ax (HE80)_Chain 0 / CH138 (U-NII-2C Band)	**802.11ax (HE80)_Chain 0 / CH138 (U-NII-3 Band)**
 TX Channel Bandwidth 76.35 MHz Power 15.65 dBm	 TX Channel Bandwidth 6.41 MHz Power 1.73 dBm
802.11ax (HE80)_Chain 1 / CH138 (U-NII-2C Band)	**802.11ax (HE80)_Chain 1 / CH138 (U-NII-3 Band)**
 TX Channel Bandwidth 76.28 MHz Power 15.52 dBm	 TX Channel Bandwidth 6.32 MHz Power 1.74 dBm

5 Pictures of Test Arrangements

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

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

802.11a Channel 36	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Appendix – Information of the Testing Laboratories

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

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

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

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

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

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

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

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