TEST REPORT (SPOT CHECK)

CERTIFICATE OF CONFORMITY

Standard:	**47 CFR FCC Part 15, Subpart E (Section 15.407)**
Report No.:	RFBAOZ-WTW-P21060679D-1
FCC ID:	2AHKM-ARIA34118
Original FCC ID:	2AHKM-ARIA3411
Product:	Tri-band WiFi Extender
Brand:	hitron
Model No.:	ARIA3411
Series Model:	OS3411
Received Date:	2022/9/21
Test Date:	2022/11/13
Issued Date:	2022/12/5
Applicant:	Hitron Technologies Inc.
Address:	No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 30078, Taiwan
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

Approved by: _____ , **Date:** **2022/12/5**

May Chen / Manager

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Prepared by : Vito Lung / Specialist

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Report Issue History Record

Issue No.	Reason for Change	Date Issued
RFBAOZ-WTW-P21060679-1	Original release.	2021/11/30
RFBAOZ-WTW-P21060679-2	1. Add DFS band <5250~5350 MHz & 5470~5725 MHz> by software. 2. Add shielding & gasket.	2022/4/25
RFBAOZ-WTW-P21060679A-1	Add shielding & gasket.	2022/4/25
RFBAOZ-WTW-P21060679D-1	Exhibit prepared for Spot Check Verification report	2022/12/5

Release Control Record

Issue No.	Description	Date Issued
RFBAOZ-WTW-P21060679D-1	Original release.	2022/12/5

1 Certificate

Product:	Tri-band WiFi Extender
Brand:	hitron
Test Model:	ARIA3411
Series Model:	OS3411
Sample Status:	Engineering sample
Applicant:	Hitron Technologies Inc.
Test Date:	2022/11/13
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407)
Measurement procedure:	ANSI C63.10-2013 KDB 789033 D02 General UNII Test Procedure New Rules v02r01 KDB 662911 D01 Multiple Transmitter Output v02r01

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 RF characteristics under the conditions specified in this report.

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
Clause	Test Item	Result	Remark
15.407(a)(2)	26 dB Bandwidth	NA	Refer to Note 1 below
15.407(a)(1/2/3)	RF Output Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Power Spectral Density	NA	Refer to Note 1 below
15.407(e)	6 dB Bandwidth	NA	Refer to Note 1 below
---	Occupied Bandwidth	NA	Refer to Note 1 below
15.407(g)	Frequency Stability	NA	Refer to Note 1 below
15.407(b)(9)	AC Power Conducted Emissions	NA	Refer to Note 1 below
15.407(b)(9)	Unwanted Emissions below 1 GHz	NA	Refer to Note 1 below
15.407(b) (1/2/3/4(i)/10)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -5.1 dB at 17475.00 MHz
15.203	Antenna Requirement	Pass	Antenna connector is ipex(MHF) not a standard connector.

Note:

1. RF Output Power & Unwanted Emissions above 1 GHz Measurement were performed for this addendum. The others testing data refer to original test report.
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	Specification	Expanded Uncertainty (k=2) (±)
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	5.0 dB
	18 GHz ~ 40 GHz	5.3 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Tri-band WiFi Extender
Brand	hitron
Test Model	ARIA3411
Series Model	OS3411
Status of EUT	Engineering sample
Power Supply Rating	12 Vdc from power adapter
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 GHz ~ 5.24 GHz 5.26 GHz ~ 5.32 GHz 5.5 GHz ~ 5.72 GHz 5.745 GHz ~ 5.825 GHz
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 GHz ~ 5.24 GHz : 683.988mW (28.35 dBm) 5.26 GHz ~ 5.32 GHz : 238.36 mW (23.77 dBm) 5.5 GHz ~ 5.72 GHz : 231.144 mW (23.64 dBm) 5.745 GHz ~ 5.825 GHz : 767.488mW (28.85 dBm) **Beamforming Mode:** 5.18 GHz ~ 5.24 GHz : 613.277mW (27.88 dBm) 5.26 GHz ~ 5.32 GHz : 197.961mW (22.97 dBm) 5.5 GHz ~ 5.72 GHz : 198.242mW (22.97 dBm) 5.745 GHz ~ 5.825 GHz : 752.553mW (28.77 dBm)
EUT Category	Indoor Access Point Client device

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: 2AHKM-ARIA3411, Report No.: RFBAOZ-WTW-P21060679-1 & RFBAOZ-WTW-P21060679-2 & RFBAOZ-WTW-P21060679A-1)
2. The EUT has two model names which are identical to each other in all aspects except for the followings:

Model Name	Difference
ARIA3411	with black housing
OS3411	with white housing
Node: From the above models, the radiated emission worst case was found in **model: ARIA3411**. Therefore only the test data of the mode was recorded in this report.	

3. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3	Radio 4
Bluetooth	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz

4. Simultaneously transmission condition.

Condition	Technology			
1	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.				

5. The EUT uses following accessories.

AC Adapter 1			
Brand	Model	Specification	Description
APD	WA-30P12FU	AC Input : 100-240V~,50-60 Hz； 0.9 A Max DC Output : 12V--2.5A Signal Line : 1.5 meter	Black (for model: ARIA3411), White (for model: OS3411)
RJ45 Cable (Yellow for Model: ARIA3411)			
Brand	Model	Specification	
EKSON	ZQ01-C069	Signal Line : 1.5 meter, unshielded	
RJ45 Cable (White for Model: OS3411)			
Brand	Model	Specification	
EKSON	MT01-C044	Signal Line : 1.5 meter, unshielded	

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

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna NO.	RF Chain NO.	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length
1	0	RFPCA252525IMLB901	2.63	2.4~2.4835	printed PCB	ipex(MHF)	24cm
			4.02	5.15~5.85			
2	1	RFPCA282525IMLB901	2.6	2.4~2.4835	printed PCB	ipex(MHF)	24cm
			3.81	5.15~5.85			
3	0	RFPCA212009IMMB901	3.59	5.85~7.125	printed PCB	ipex(MHF)	10cm
4	1	RFPCA221508IMMB901	4.71	5.85~7.125	printed PCB	ipex(MHF)	7.5cm
5	2	RFPCA221514IMMB901	4.7	5.85~7.125	printed PCB	ipex(MHF)	13.5cm
6	3	RFPCA212009IMMB902	4.59	5.85~7.125	printed PCB	ipex(MHF)	8.5cm
7 (for BT)	-	RFPCA381007IMAB301	4.77	2.4~2.4835	printed PCB	ipex(MHF)	6.5cm

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2. The EUT incorporates a MIMO function:

5 GHz 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 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 (40MHz, 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.

3.3 Channel List

FOR 5180 ~ 5320 MHz

8 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 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), 802.11ax (HE40):

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

2 channels are provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz

FOR 5500 ~ 5720 MHz

12 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 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), 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 ~ 5825 MHz:

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

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. The RJ45 Cable has the following appearance: yellow/white. Pre-scan these of RJ45 Cable and find the worst case as a representative test condition. 2. 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).
Worst Case:	1. RJ45 Cable Worst condition : yellow RJ45 cable

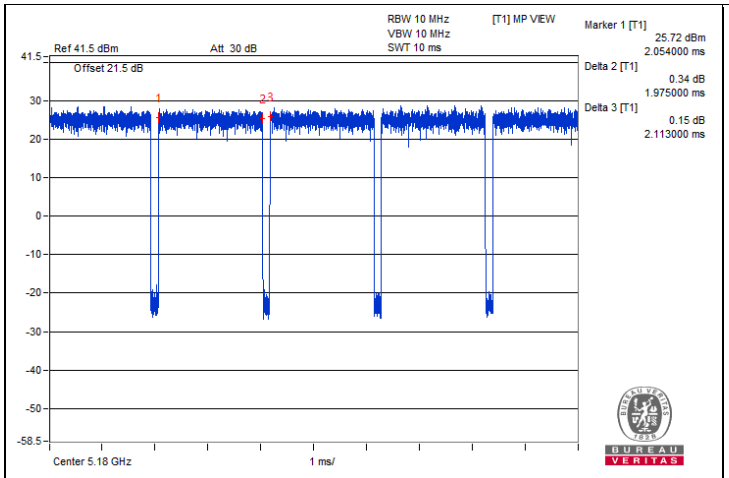
Following channel(s) was (were) selected for the final test as listed below:

Test Item	EUT Configure Mode	Mode	Signal Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power	A	802.11a	CDD	36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	6Mb/s
		802.11ac (VHT20)	CDD & Beamforming	36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	MCS0
		802.11ac (VHT40)	CDD & Beamforming	38, 46, 54, 62, 102, 110, 134, 142, 151, 159	BPSK	MCS0
		802.11ac (VHT80)	CDD & Beamforming	42, 58, 106, 122, 138, 155	BPSK	MCS0
		802.11ax (HE20)	CDD & Beamforming	36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	MCS0
		802.11ax (HE40)	CDD & Beamforming	38, 46, 54, 62, 102, 110, 134, 142, 151, 159	BPSK	MCS0
		802.11ax (HE80)	CDD & Beamforming	42, 58, 106, 122, 138, 155	BPSK	MCS0
Unwanted Emissions above 1 GHz	A	802.11a	CDD	165	BPSK	6Mb/s
EUT Configure Mode:	A	Master				

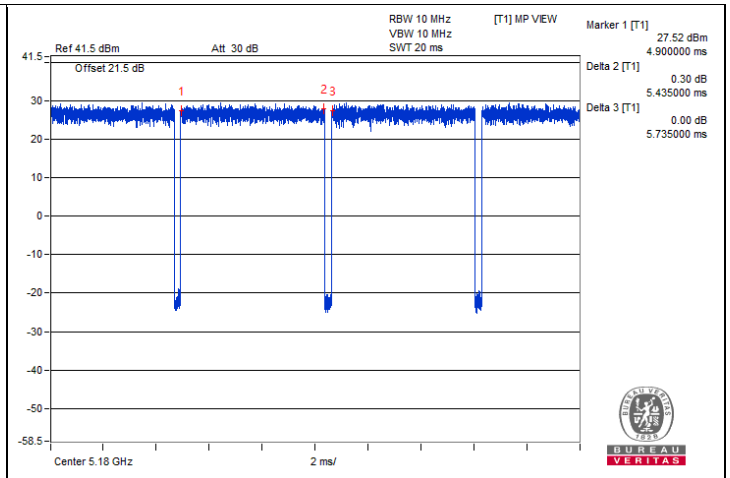
3.5 Duty Cycle of Test Signal

Mode A

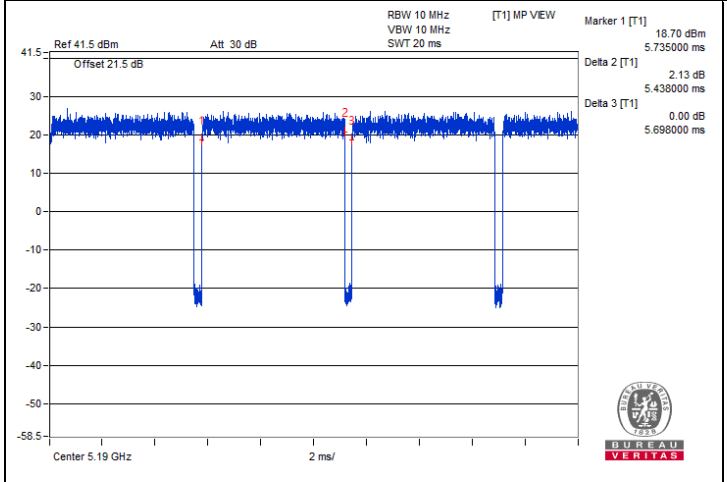
802.11a: Duty cycle = 1.975 ms / 2.113 ms x 100% = 93.5%, duty factor = 10 * log (1/Duty cycle) = 0.29 dB
802.11ax (HE20): Duty cycle = 5.435 ms / 5.735 ms x 100% = 94.8%, duty factor = 10 * log (1/Duty cycle) = 0.23 dB
802.11ax (HE40): Duty cycle = 5.438 ms / 5.698 ms x 100% = 95.4%, duty factor = 10 * log (1/Duty cycle) = 0.20 dB
802.11ax (HE80): Duty cycle = 5.437 ms / 5.713 ms x 100% = 95.2%, duty factor = 10 * log (1/Duty cycle) = 0.22 dB



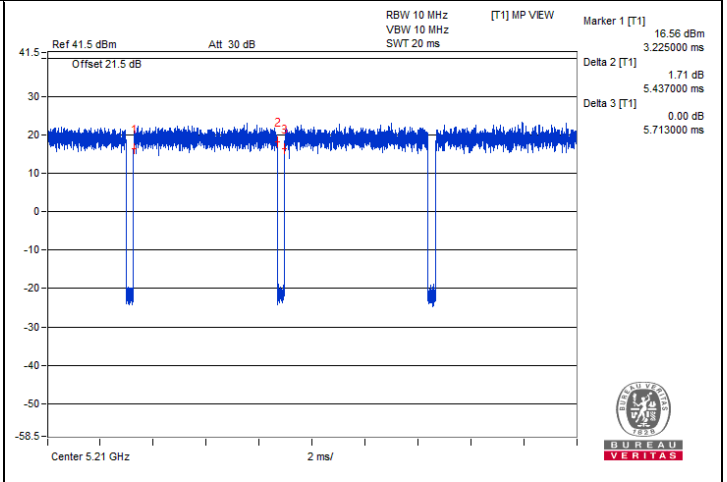
802.11a



802.11ax (HE20)



802.11ax (HE40)

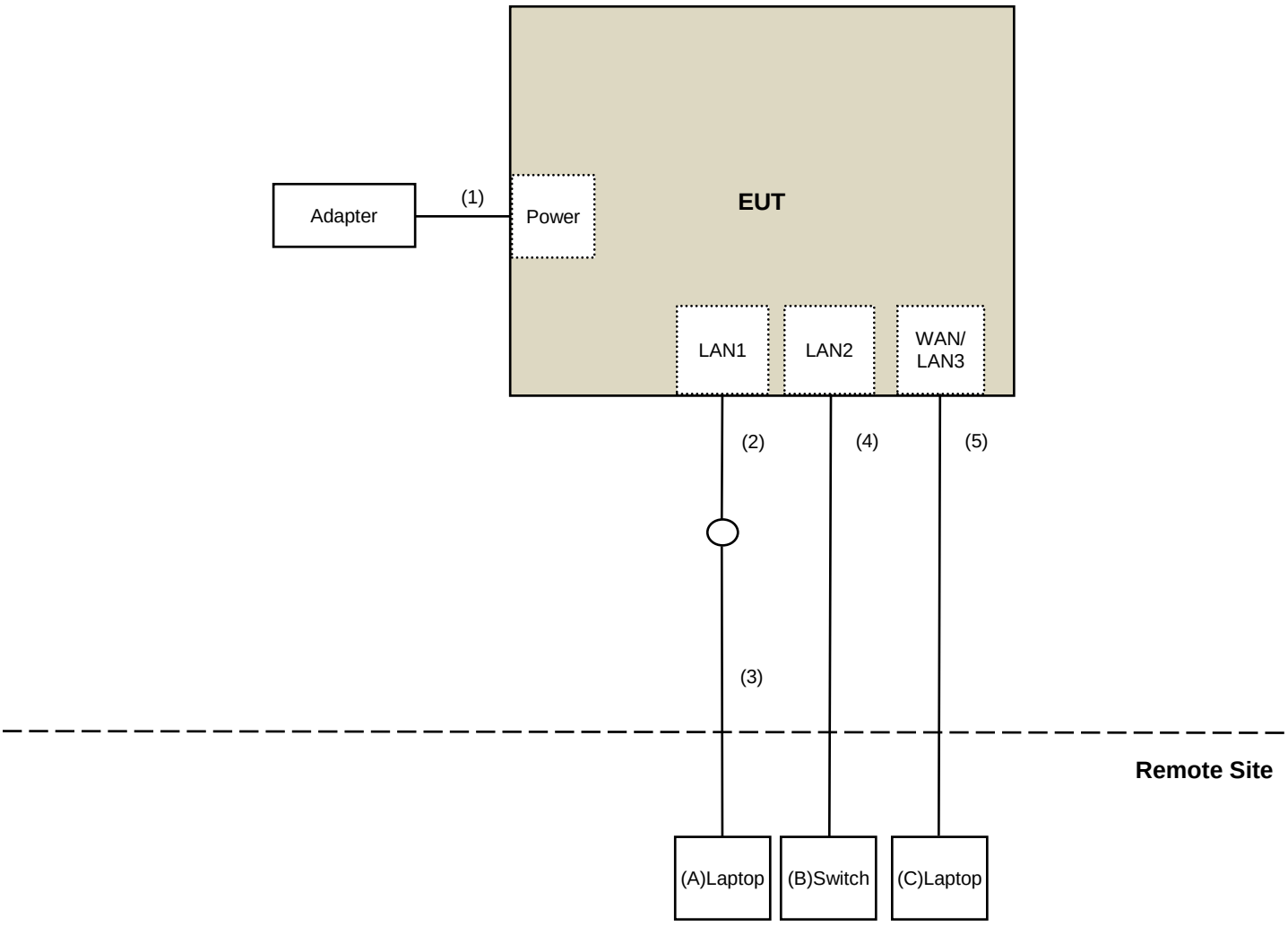


802.11ax (HE80)

3.6 Test Program Used and Operation Descriptions

Controlling software (qdart_conn.win.1.0_installer_00076.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	N/A	Provided by Lab
B	Switch	D-Link	DGS-1005D	DR8WC92000523	N/A	Provided by Lab
C	Laptop	Lenovo	20U5S01X00 L14	PF-28LKK7	N/A	Provided by Lab

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

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 RF Output Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2022/4/5	2023/4/4
Power Meter Anritsu	ML2495A	1529002	2022/6/22	2023/6/21
Pulse Power Sensor Anritsu	MA2411B	1726434	2022/6/22	2023/6/21
Software	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Spectrum Analyzer Keysight	N9020B	MY60112409	2022/3/11	2023/3/10

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2022/11/16

4.2 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	N/A	N/A
Fix tool for Boresight antenna tower BV	FBA-01	FBA_SIP01	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9170	9170-739	2021/11/14	2022/11/13
	BBHA9120-D	9120D-406	2022/11/13	2023/11/12
Pre_Amplifier EMCI	EMC12630SE	980384	2022/1/10	2023/1/9
	EMC184045SE	980387	2022/1/10	2023/1/9
RF Cable EMCI	EMC104-SM-SM-6000	210201	2022/5/10	2023/5/9
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2022/1/10	2023/1/9
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2022/3/8	2023/3/7
	EMC104-SM-SM-1500	180504	2022/4/25	2023/4/24
	EMC104-SM-SM-2000	180601	2022/6/6	2023/6/5
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Spectrum Analyzer KEYSIGHT	N9030B	MY57142938	2022/4/26	2023/4/25
Test Receiver KEYSIGHT	N9038A	MY59050100	2022/6/20	2023/6/19

Notes:

1. The test was performed in 966 Chamber No. 3.
2. Tested Date: 2022/11/13

5 Limits of Test Items

5.1 RF Output Power

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)
	Mobile and Portable client device	250mW (24 dBm)

Operation Band	Limit
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 D01 Multiple Transmitter Output 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.

5.2 Unwanted Emissions above 1 GHz

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)
Above 960	500	3

Notes:

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 1000 MHz, 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 20 dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

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

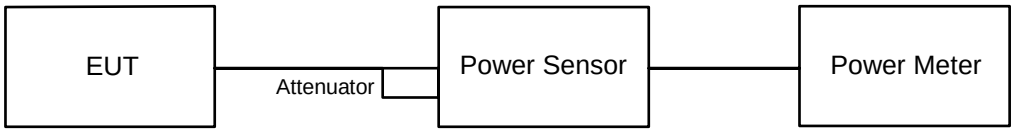
Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

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

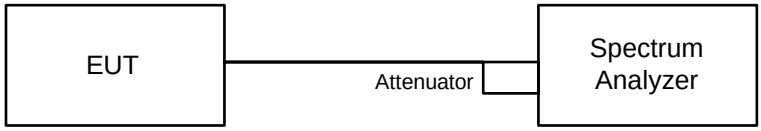
6 Test Arrangements

6.1 RF Output Power

6.1.1 Test Setup



For channel straddling:



6.1.2 Test Procedure

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

For channel straddling:

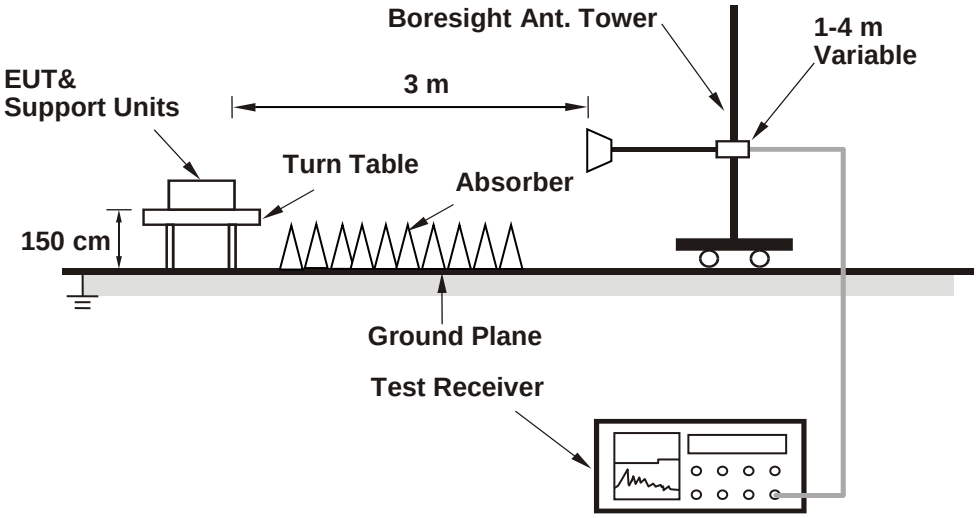
Method SA-2

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
c. Sweep points ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)Sweep time = auto, trigger set to “free run”.
d. Trace average at least 100 traces in power averaging mode.
e. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
f. Record the max value and add 10 log (1/duty cycle).

Note: When measuring straddle channel power, use compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

6.2 Unwanted Emissions above 1 GHz

6.2.1 Test Setup



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

6.2.2 Test Procedure

g. The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

i. 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.

j. 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.

k. 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.

Notes:

4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
5. For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10 Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1 GHz.
6. All modes of operation were investigated and the worst-case emissions are reported.

7 Test Results of Test Item

7.1 RF Output Power

Mode A

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Katina Lu

802.11a CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	23.30	23.04	415.169	26.18	30	Pass
40	5200	25.29	25.26	673.802	28.29	30	Pass
48	5240	25.30	25.38	683.988	28.35	30	Pass
52	5260	19.58	19.63	182.615	22.62	24	Pass
60	5300	19.76	19.86	191.452	22.82	24	Pass
64	5320	19.81	19.71	189.26	22.77	24	Pass
100	5500	19.78	19.74	189.249	22.77	24	Pass
116	5580	19.92	19.75	192.581	22.85	24	Pass
140	5700	19.99	19.43	187.47	22.73	24	Pass
*144 (U-NII-2C)	5720	18.58	18.22	148.161	21.71	22.86	Pass
*144 (U-NII-3)	5720	11.80	11.57	31.551	14.99	30	Pass
149	5745	24.78	25.14	627.195	27.97	30	Pass
157	5785	24.93	25.56	670.921	28.27	30	Pass
165	5825	25.90	25.78	767.488	28.85	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 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ac (VHT20) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	23.96	23.50	472.758	26.75	30	Pass
40	5200	24.45	24.41	554.67	27.44	30	Pass
48	5240	24.45	24.47	558.51	27.47	30	Pass
52	5260	19.61	19.87	188.462	22.75	24	Pass
60	5300	19.82	19.58	186.722	22.71	24	Pass
64	5320	19.78	19.59	186.052	22.70	24	Pass
100	5500	19.78	19.71	188.601	22.76	24	Pass
116	5580	19.38	19.30	171.81	22.35	24	Pass
140	5700	19.99	19.49	188.69	22.76	24	Pass
*144 (U-NII-2C)	5720	18.75	18.32	150.798	21.78	22.97	Pass
*144 (U-NII-3)	5720	12.71	12.51	38.502	15.85	30	Pass
149	5745	24.15	24.45	538.628	27.31	30	Pass
157	5785	24.15	24.83	564.104	27.51	30	Pass
165	5825	25.75	25.03	694.257	28.42	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 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ac (VHT40) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
38	5190	22.26	22.04	328.223	25.16	30	Pass
46	5230	24.68	25.01	610.722	27.86	30	Pass
54	5270	20.30	20.46	218.325	23.39	24	Pass
62	5310	20.24	19.80	201.181	23.04	24	Pass
102	5510	20.39	20.12	212.197	23.27	24	Pass
110	5550	20.45	20.08	212.777	23.28	24	Pass
134	5670	20.40	20.21	214.602	23.32	24	Pass
*142 (U-NII-2C)	5710	19.20	18.87	167.929	22.25	24	Pass
*142 (U-NII-3)	5710	7.81	7.89	12.774	11.06	30	Pass
151	5755	24.35	24.91	582.012	27.65	30	Pass
159	5795	24.52	24.83	587.228	27.69	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 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ac (VHT80) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
42	5210	21.14	21.16	260.634	24.16	30	Pass
58	5290	20.76	20.66	235.537	23.72	24	Pass
106	5530	19.99	19.76	194.394	22.89	24	Pass
122	5610	20.06	20.14	204.667	23.11	24	Pass
*138 (U-NII-2C)	5690	19.40	19.37	182.405	22.61	24	Pass
*138 (U-NII-3)	5690	3.76	4.43	5.412	7.33	30	Pass
155	5775	20.02	20.59	215.013	23.32	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 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE20) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	24.16	23.98	510.65	27.08	30	Pass
40	5200	24.61	24.67	582.157	27.65	30	Pass
48	5240	24.71	24.89	604.12	27.81	30	Pass
52	5260	20.02	19.93	198.863	22.99	24	Pass
60	5300	19.98	19.80	195.04	22.90	24	Pass
64	5320	20.02	19.83	196.623	22.94	24	Pass
100	5500	20.07	20.17	205.617	23.13	24	Pass
116	5580	20.00	19.80	195.499	22.91	24	Pass
140	5700	20.27	19.71	199.955	23.01	24	Pass
*144 (U-NII-2C)	5720	19.15	18.54	162.156	22.10	22.97	Pass
*144 (U-NII-3)	5720	13.40	12.96	43.946	16.43	30	Pass
149	5745	24.18	24.74	559.67	27.48	30	Pass
157	5785	24.58	25.48	640.261	28.06	30	Pass
165	5825	25.73	25.78	752.553	28.77	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 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE40) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
38	5190	22.13	22.26	331.573	25.21	30	Pass
46	5230	24.76	24.97	613.277	27.88	30	Pass
54	5270	20.52	20.27	219.134	23.41	24	Pass
62	5310	20.25	19.84	202.308	23.06	24	Pass
102	5510	20.44	20.23	216.101	23.35	24	Pass
110	5550	20.55	20.24	219.183	23.41	24	Pass
134	5670	20.50	20.14	215.478	23.33	24	Pass
*142 (U-NII-2C)	5710	19.42	19.24	179.641	22.54	24	Pass
*142 (U-NII-3)	5710	9.47	9.35	18.296	12.62	30	Pass
151	5755	24.20	25.23	596.453	27.76	30	Pass
159	5795	24.54	25.19	614.816	27.89	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 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE80) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
42	5210	21.40	21.61	282.916	24.52	30	Pass
58	5290	21.13	20.36	238.36	23.77	24	Pass
106	5530	20.43	20.35	218.801	23.40	24	Pass
122	5610	20.45	20.80	231.144	23.64	24	Pass
*138 (U-NII-2C)	5690	19.72	19.42	190.456	22.80	24	Pass
*138 (U-NII-3)	5690	4.64	6.23	7.469	8.73	30	Pass
155	5775	20.17	21.20	235.818	23.73	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 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
4. For U-NII-2A, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
5. For U-NII-2C, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.
6. For U-NII-3, the maximum gain is 4.02 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ac (VHT20) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	23.96	23.50	472.758	26.75	29.07	Pass
40	5200	24.45	24.41	554.67	27.44	29.07	Pass
48	5240	24.45	24.47	558.51	27.47	29.07	Pass
52	5260	19.39	19.26	171.23	22.34	23.07	Pass
60	5300	19.82	19.58	186.722	22.71	23.07	Pass
64	5320	19.36	19.11	167.768	22.25	23.07	Pass
100	5500	19.32	19.42	173.005	22.38	23.07	Pass
116	5580	19.38	19.30	171.81	22.35	23.07	Pass
140	5700	19.42	19.06	168.036	22.25	23.07	Pass
*144 (U-NII-2C)	5720	18.60	18.06	143.947	21.58	22.04	Pass
*144 (U-NII-3)	5720	12.11	12.41	35.532	15.51	29.07	Pass
149	5745	24.15	24.45	538.628	27.31	29.07	Pass
157	5785	24.15	24.83	564.104	27.51	29.07	Pass
165	5825	25.75	25.03	694.257	28.42	29.07	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 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.
4. For U-NII-2A, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
5. For U-NII-2C, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
6. For U-NII-3, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.

802.11ac (VHT40) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
38	5190	22.26	22.04	328.223	25.16	29.07	Pass
46	5230	24.68	25.01	610.722	27.86	29.07	Pass
54	5270	19.68	19.63	184.73	22.67	23.07	Pass
62	5310	19.74	19.18	176.983	22.48	23.07	Pass
102	5510	19.75	19.54	184.356	22.66	23.07	Pass
110	5550	19.75	19.52	183.943	22.65	23.07	Pass
134	5670	19.78	19.47	183.572	22.64	23.07	Pass
*142 (U-NII-2C)	5710	18.44	18.17	141.913	21.52	23.07	Pass
*142 (U-NII-3)	5710	8.21	5.27	10.465	10.20	29.07	Pass
151	5755	24.35	24.91	582.012	27.65	29.07	Pass
159	5795	24.52	24.83	587.228	27.69	29.07	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 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.
4. For U-NII-2A, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
5. For U-NII-2C, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
6. For U-NII-3, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.

802.11ac (VHT80) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
42	5210	21.14	21.16	260.634	24.16	29.07	Pass
58	5290	19.99	19.21	183.138	22.63	23.07	Pass
106	5530	19.69	19.64	185.156	22.68	23.07	Pass
122	5610	19.20	19.64	175.221	22.44	23.07	Pass
*138 (U-NII-2C)	5690	18.86	19.04	165.055	22.18	23.07	Pass
*138 (U-NII-3)	5690	4.26	4.73	5.925	7.73	29.07	Pass
155	5775	20.02	20.59	215.013	23.32	29.07	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 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.
4. For U-NII-2A, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
5. For U-NII-2C, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
6. For U-NII-3, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.

802.11ax (HE20) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	24.16	23.98	510.65	27.08	29.07	Pass
40	5200	24.61	24.67	582.157	27.65	29.07	Pass
48	5240	24.71	24.89	604.12	27.81	29.07	Pass
52	5260	19.66	19.51	181.8	22.60	23.07	Pass
60	5300	19.98	19.80	195.04	22.90	23.07	Pass
64	5320	19.68	19.42	180.395	22.56	23.07	Pass
100	5500	19.67	19.73	186.655	22.71	23.07	Pass
116	5580	20.00	19.80	195.499	22.91	23.07	Pass
140	5700	19.67	19.28	177.406	22.49	23.07	Pass
*144 (U-NII-2C)	5720	18.89	18.34	153.721	21.87	22.04	Pass
*144 (U-NII-3)	5720	12.75	13.26	42.229	16.26	29.07	Pass
149	5745	24.18	24.74	559.67	27.48	29.07	Pass
157	5785	24.58	25.48	640.261	28.06	29.07	Pass
165	5825	25.73	25.78	752.553	28.77	29.07	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 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.
4. For U-NII-2A, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
5. For U-NII-2C, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
6. For U-NII-3, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.

802.11ax (HE40) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
38	5190	22.13	22.26	331.573	25.21	29.07	Pass
46	5230	24.76	24.97	613.277	27.88	29.07	Pass
54	5270	20.02	19.89	197.961	22.97	23.07	Pass
62	5310	19.93	19.40	185.497	22.68	23.07	Pass
102	5510	19.92	19.84	194.558	22.89	23.07	Pass
110	5550	20.08	19.84	198.242	22.97	23.07	Pass
134	5670	19.99	19.76	194.394	22.89	23.07	Pass
*142 (U-NII-2C)	5710	19.08	18.50	158.957	22.01	23.07	Pass
*142 (U-NII-3)	5710	8.90	7.77	14.404	11.58	29.07	Pass
151	5755	24.20	25.23	596.453	27.76	29.07	Pass
159	5795	24.54	25.19	614.816	27.89	29.07	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 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.
4. For U-NII-2A, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
5. For U-NII-2C, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
6. For U-NII-3, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.

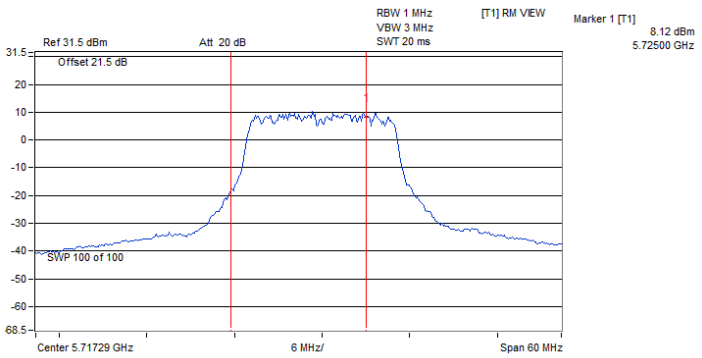
802.11ax (HE80) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
42	5210	21.40	21.61	282.916	24.52	29.07	Pass
58	5290	20.25	19.41	193.223	22.86	23.07	Pass
106	5530	19.97	19.93	197.713	22.96	23.07	Pass
122	5610	19.45	19.79	183.385	22.63	23.07	Pass
*138 (U-NII-2C)	5690	19.08	19.07	169.838	22.30	23.07	Pass
*138 (U-NII-3)	5690	4.91	5.35	6.856	8.36	29.07	Pass
155	5775	20.17	21.20	235.818	23.73	29.07	Pass

Notes:

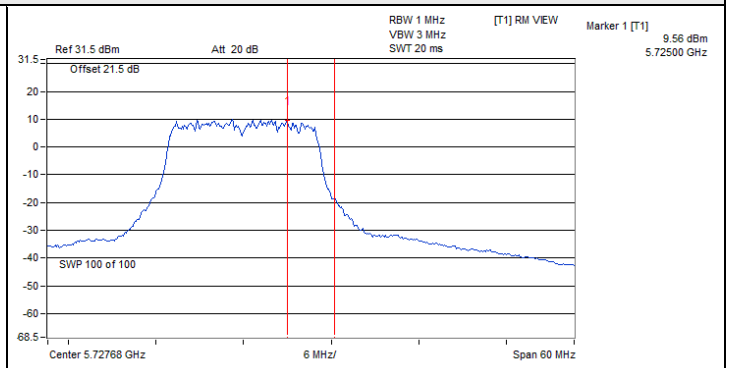
1. * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test , the duty factor was included in the total power.
2. Directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2]
3. For U-NII-1, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.
4. For U-NII-2A, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
5. For U-NII-2C, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to [Determined Conducted Power Limit-(6.93-6)].
6. For U-NII-3, the directional gain is 6.93 dBi > 6 dBi, so the output power limit shall be reduced to 30-(6.93-6) = 29.07 dBm.

Spectrum Plot for channel straddling



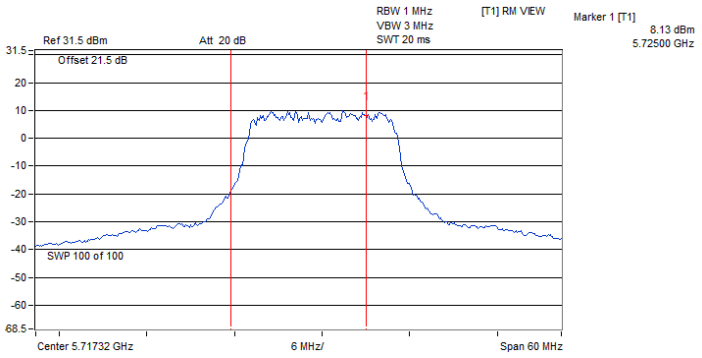
TX Channel Bandwidth 15.41 MHz Power 18.58 dBm

802.11a CDD / Chain 0 : CH 144 (U-NII-2C)



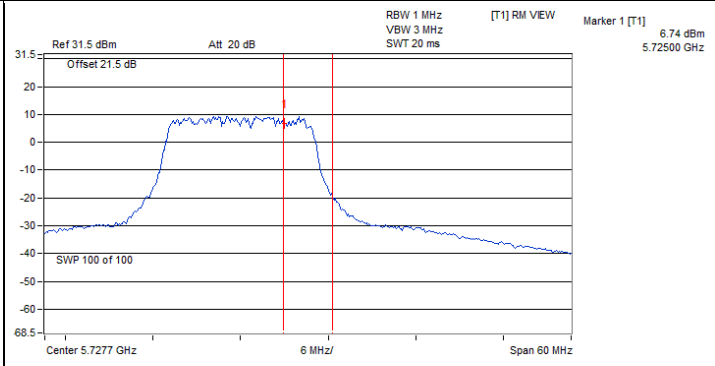
TX Channel Bandwidth 5.36 MHz Power 11.8 dBm

802.11a CDD / Chain 0 : CH 144 (U-NII-3)



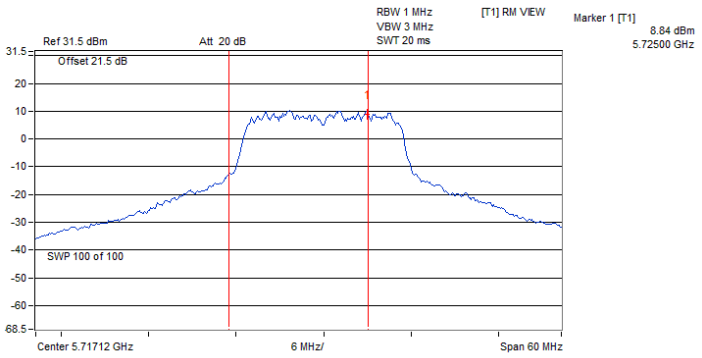
TX Channel Bandwidth 15.35 MHz Power 18.22 dBm

802.11a CDD / Chain 1 : CH 144 (U-NII-2C)



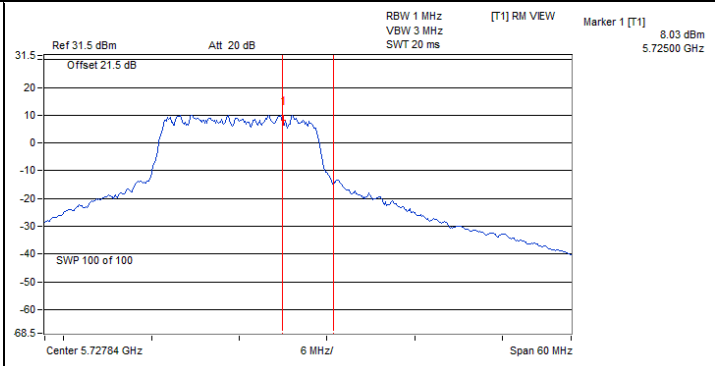
TX Channel Bandwidth 5.41 MHz Power 11.57 dBm

802.11a CDD / Chain 1 : CH 144 (U-NII-3)



TX Channel Bandwidth 15.76 MHz Power 18.75 dBm

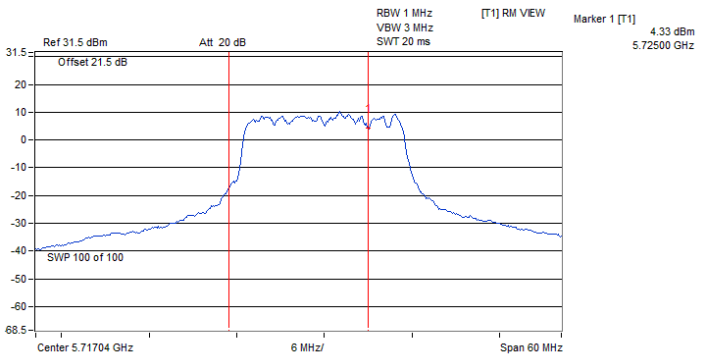
802.11ac (VHT20) CDD / Chain 0 : CH 144 (U-NII-2C)



TX Channel Bandwidth 5.68 MHz Power 12.71 dBm

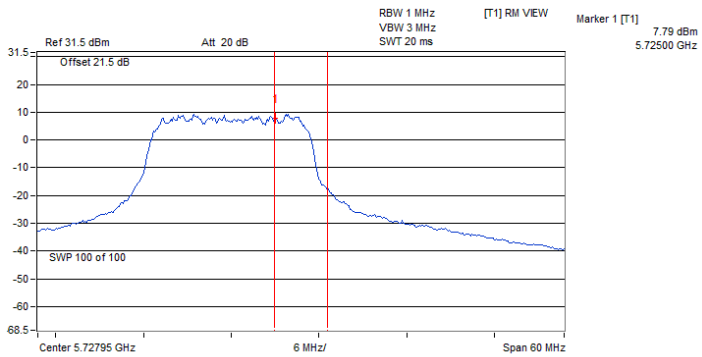
802.11ac (VHT20) CDD / Chain 0 : CH 144 (U-NII-3)

Spectrum Plot for channel straddling



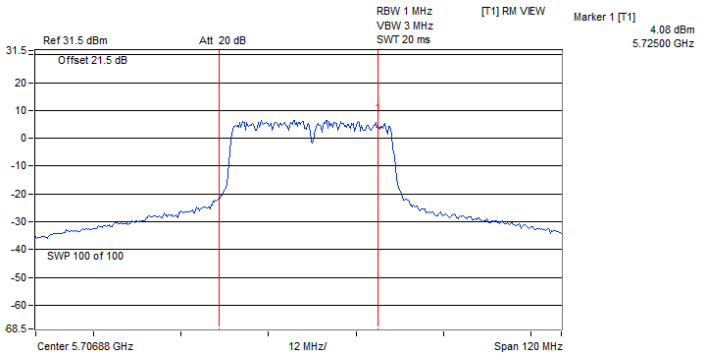
TX Channel Bandwidth 15.92 MHz Power 18.32 dBm

802.11ac (VHT20) CDD / Chain 1 : CH 144 (U-NII-2C)



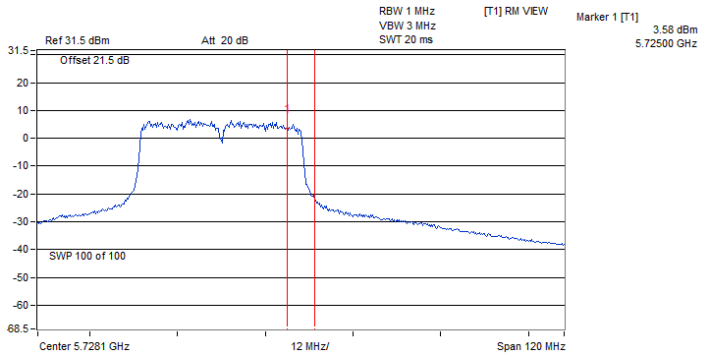
TX Channel Bandwidth 5.9 MHz Power 12.51 dBm

802.11ac (VHT20) CDD / Chain 1 : CH 144 (U-NII-3)



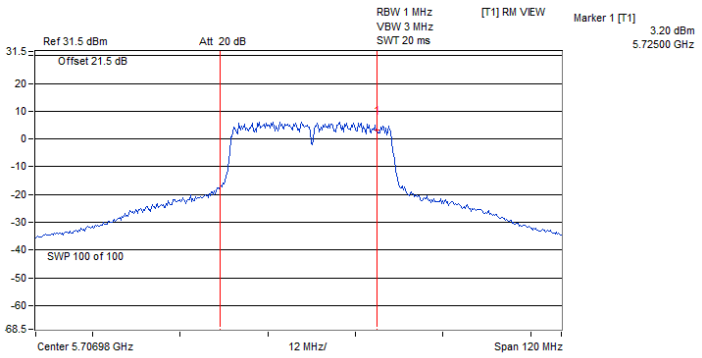
TX Channel Bandwidth 36.24 MHz Power 19.2 dBm

802.11ac (VHT40) CDD / Chain 0 : CH 142 (U-NII-2C)



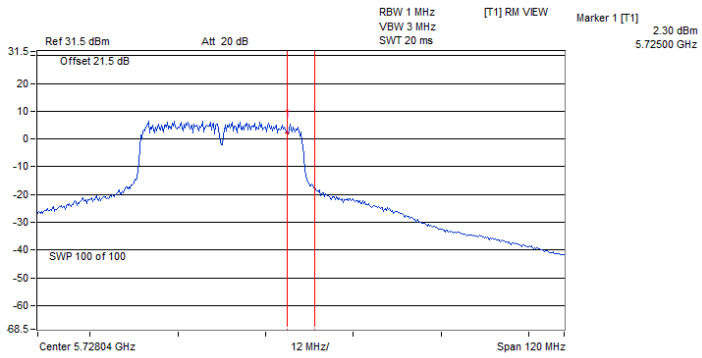
TX Channel Bandwidth 6.21 MHz Power 7.81 dBm

802.11ac (VHT40) CDD / Chain 0 : CH 142 (U-NII-3)



TX Channel Bandwidth 36.03 MHz Power 18.87 dBm

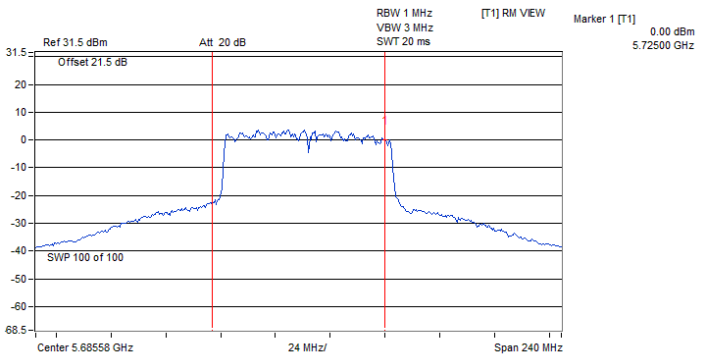
802.11ac (VHT40) CDD / Chain 1 : CH 142 (U-NII-2C)



TX Channel Bandwidth 6.09 MHz Power 7.89 dBm

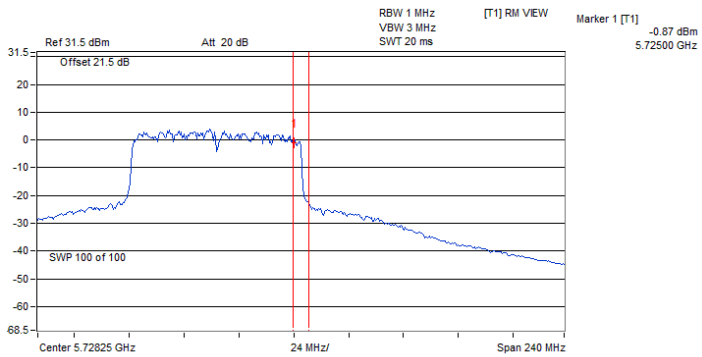
802.11ac (VHT40) CDD / Chain 1 : CH 142 (U-NII-3)

Spectrum Plot for channel straddling



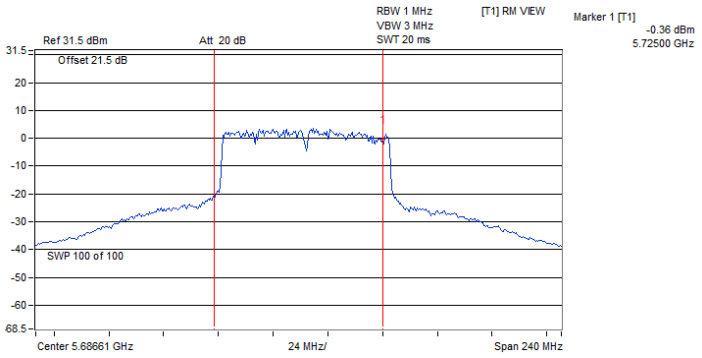
TX Channel Bandwidth 78.83 MHz Power 19.4 dBm

802.11ac (VHT80) CDD / Chain 0 : CH 138 (U-NII-2C)



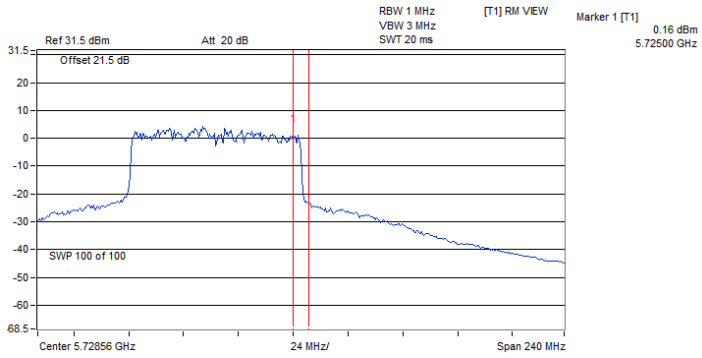
TX Channel Bandwidth 6.5 MHz Power 3.76 dBm

802.11ac (VHT80) CDD / Chain 0 : CH 138 (U-NII-3)



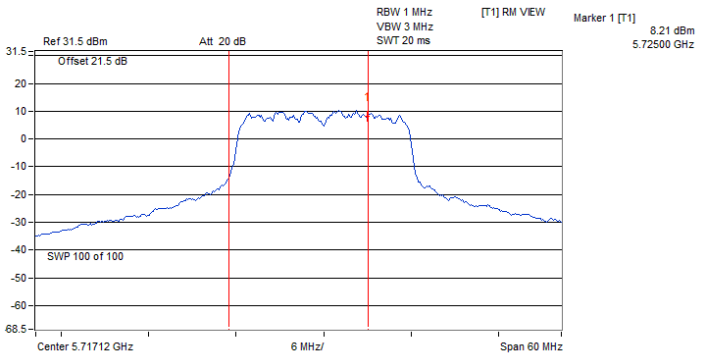
TX Channel Bandwidth 76.77 MHz Power 19.37 dBm

802.11ac (VHT80) CDD / Chain 1 : CH 138 (U-NII-2C)



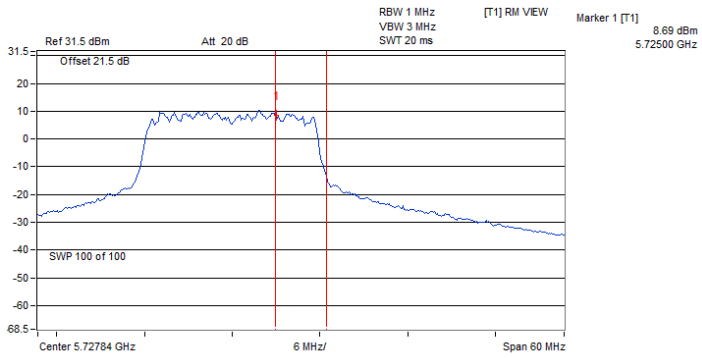
TX Channel Bandwidth 7.13 MHz Power 4.43 dBm

802.11ac (VHT80) CDD / Chain 1 : CH 138 (U-NII-3)



TX Channel Bandwidth 15.76 MHz Power 19.15 dBm

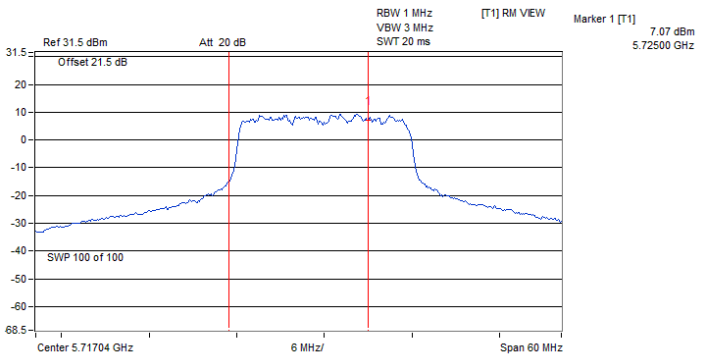
802.11ax (HE20) CDD / Chain 0 : CH 144 (U-NII-2C)



TX Channel Bandwidth 5.68 MHz Power 13.4 dBm

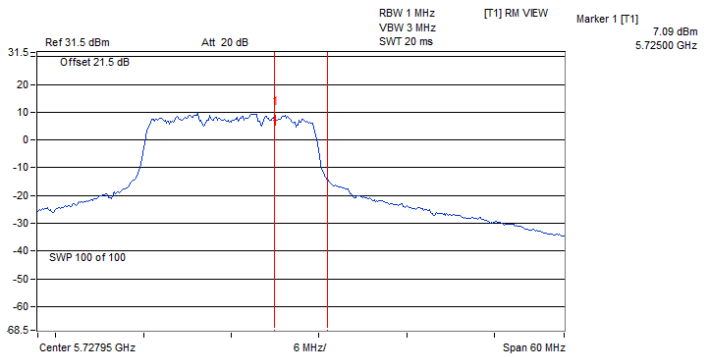
802.11ax (HE20) CDD / Chain 0 : CH 144 (U-NII-3)

Spectrum Plot for channel straddling



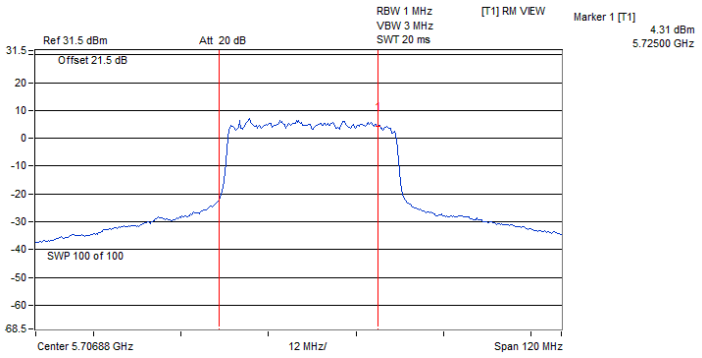
TX Channel Bandwidth 15.92 MHz Power 18.54 dBm

802.11ax (HE20) CDD / Chain 1 : CH 144 (U-NII-2C)



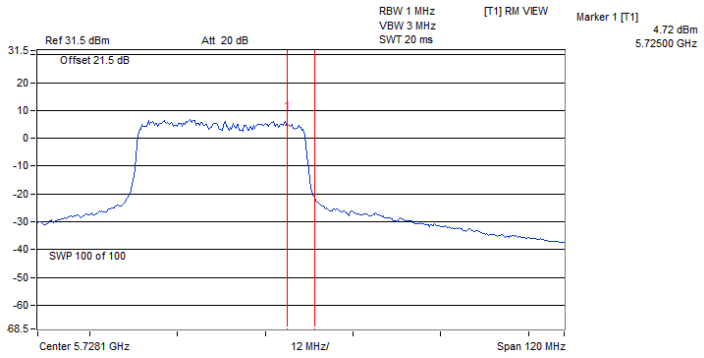
TX Channel Bandwidth 5.9 MHz Power 12.96 dBm

802.11ax (HE20) CDD / Chain 1 : CH 144 (U-NII-3)



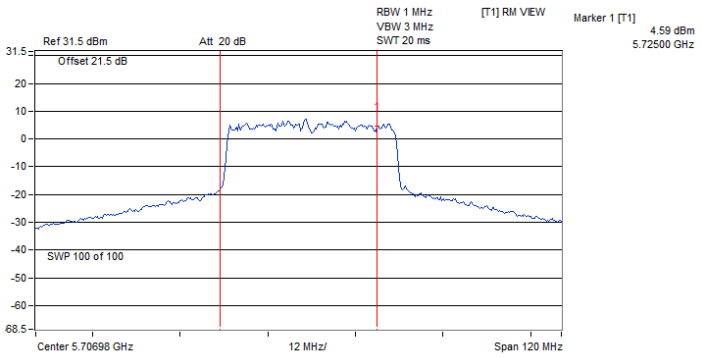
TX Channel Bandwidth 36.24 MHz Power 19.42 dBm

802.11ax (HE40) CDD / Chain 0 : CH 142 (U-NII-2C)



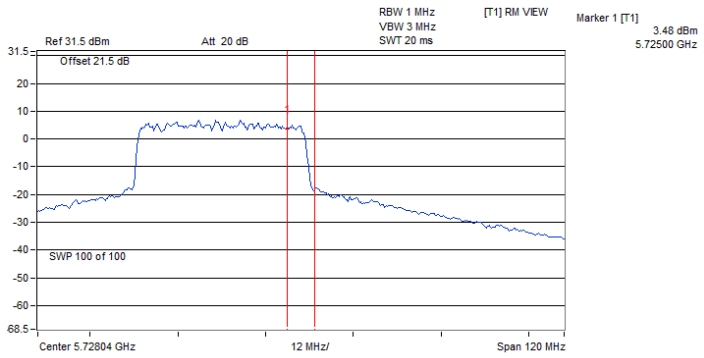
TX Channel Bandwidth 6.21 MHz Power 9.47 dBm

802.11ax (HE40) CDD / Chain 0 : CH 142 (U-NII-3)



TX Channel Bandwidth 36.03 MHz Power 19.24 dBm

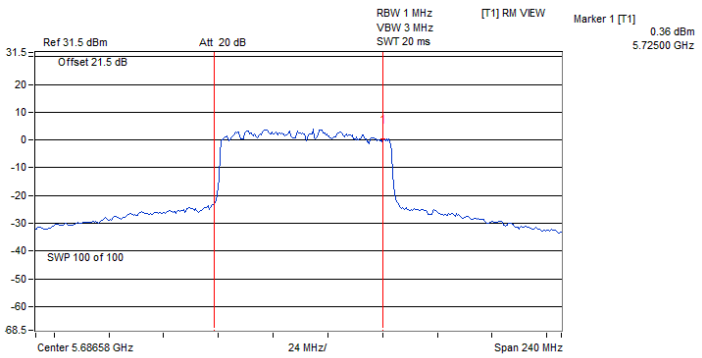
802.11ax (HE40) CDD / Chain 1 : CH 142 (U-NII-2C)



TX Channel Bandwidth 6.09 MHz Power 9.35 dBm

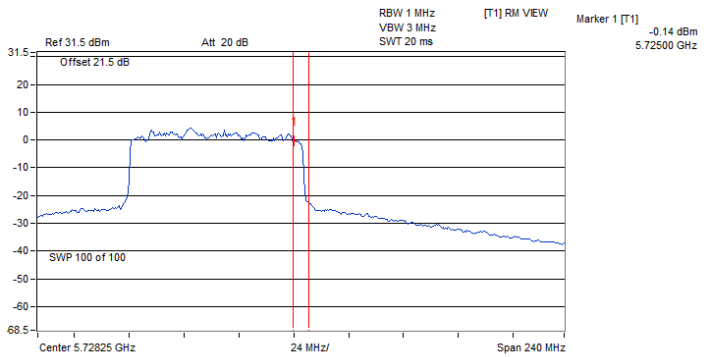
802.11ax (HE40) CDD / Chain 1 : CH 142 (U-NII-3)

Spectrum Plot for channel straddling



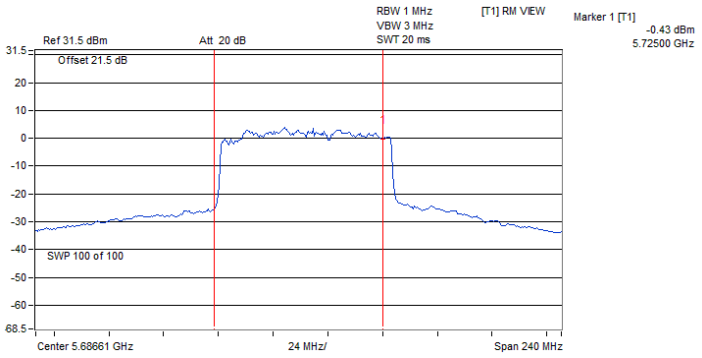
TX Channel Bandwidth 76.83 MHz Power 19.72 dBm

802.11ax (HE80) CDD / Chain 0 : CH 138 (U-NII-2C)



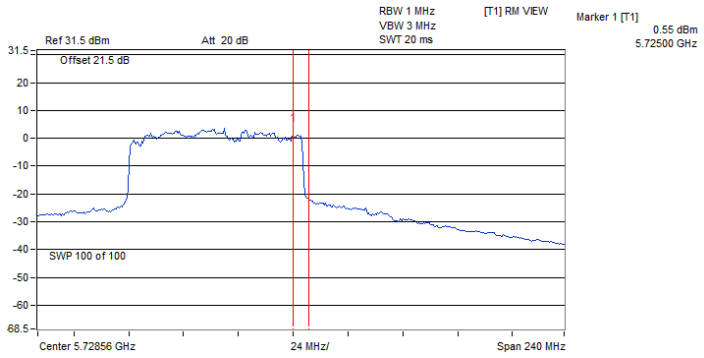
TX Channel Bandwidth 6.5 MHz Power 4.64 dBm

802.11ax (HE80) CDD / Chain 0 : CH 138 (U-NII-3)



TX Channel Bandwidth 76.77 MHz Power 19.42 dBm

802.11ax (HE80) CDD / Chain 1 : CH 138 (U-NII-2C)



TX Channel Bandwidth 7.13 MHz Power 6.23 dBm

802.11ax (HE80) CDD / Chain 1 : CH 138 (U-NII-3)

7.2 Unwanted Emissions above 1 GHz

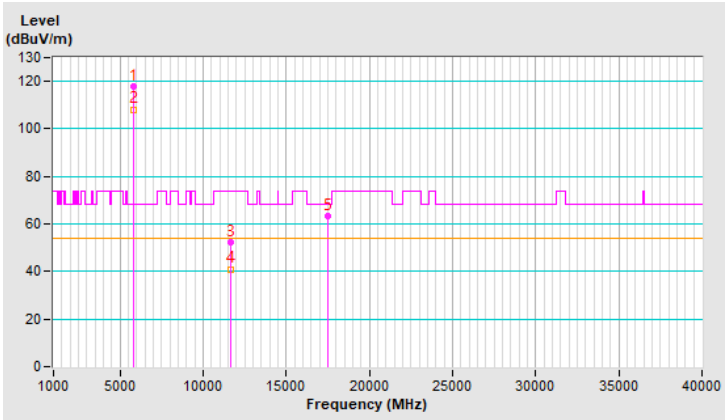
Mode A

RF Mode	802.11a	**Channel**	CH 165：5825 MHz
Frequency Range	1 GHz ~ 40 GHz	**Detector Function & Bandwidth**	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 510 Hz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	20°C, 70% RH
Tested By	Nelson Teng		

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	*5825.00	117.9 PK			3.82 H	144	112.5	5.4
2	*5825.00	108.2 AV			3.82 H	144	102.8	5.4
3	11650.00	52.1 PK	74.0	-21.9	2.17 H	195	37.0	15.1
4	11650.00	41.0 AV	54.0	-13.0	2.17 H	195	25.9	15.1
5	**#17475.00**	**63.1 PK**	**68.2**	**-5.1**	**1.90 H**	**148**	**44.1**	**19.0**

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, the limit was restricted at the RF Output Power.
6. " # ": The radiated frequency is out of the restricted band.

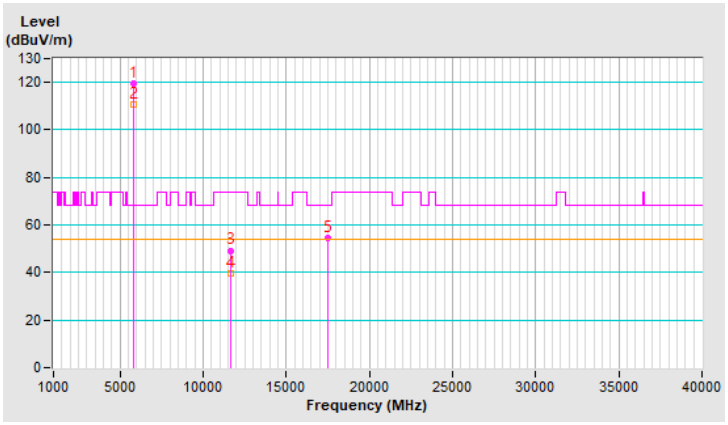


RF Mode	802.11a	Channel	CH 165：5825 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 510 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	20°C, 70% RH
Tested By	Nelson Teng		

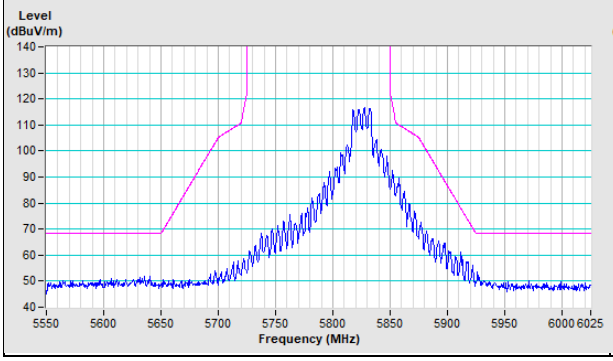
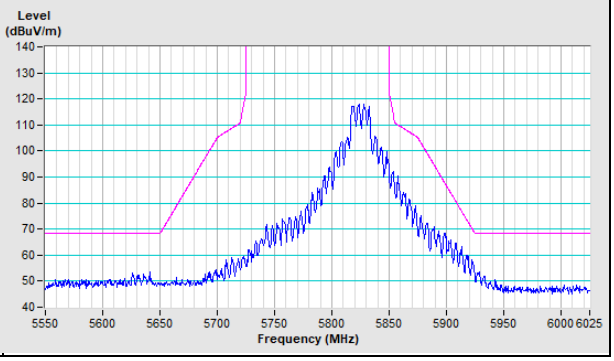
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5825.00	119.6 PK			1.56 V	198	114.2	5.4
2	*5825.00	110.5 AV			1.56 V	198	105.1	5.4
3	11650.00	49.3 PK	74.0	-24.7	1.36 V	314	34.2	15.1
4	11650.00	39.7 AV	54.0	-14.3	1.36 V	314	24.6	15.1
5	#17475.00	54.5 PK	68.2	-13.7	2.53 V	118	35.5	19.0

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, the limit was restricted at the RF Output Power.
6. " # ": The radiated frequency is out of the restricted band.



Mode A_Plot of Band Edge

802.11a Channel 165	
Horizontal (Peak)	**Vertical (Peak)**
	

8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 Information of the Testing Laboratories

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

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

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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@bureauveritas.com
Web Site: http://ee.bureauveritas.com.tw

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

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