FCC Test Report

Report No.: RFBHJS-WTW-P20100055

FCC ID: PD5-NSE1000

Test Model: NSE1000

Received Date: Oct. 07, 2020

Test Date: Oct. 08 ~ Oct. 21, 2020

Issued Date: Dec. 29, 2020

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / Designation Number: 788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBHJS-WTW-P20100055	Original release.	Dec. 29, 2020

1 Certificate of Conformity

Product: Wireless Access Point

Brand: Nile Global

Test Model: NSE1000

Sample Status: Engineering sample

Applicant: Delta Electronics, Inc.

Test Date: Oct. 08 ~ Oct. 21, 2020

Standards: 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 RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** Dec. 29, 2020

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Dec. 29, 2020

Bruce Chen / Senior Project Engineer

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 -18.23dB at 0.55400MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.2dB at 5350.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

Note:

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Access Point
Brand	Nile Global
Test Model	NSE1000
Sample Status	Engineering sample
Power Supply rating	100-240Vac, 50-60Hz, 0.5A Max
Modulation Type	BPSK, QPSK, 16QAM, 64QAM, 256QAM
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n (VHT20/40): up to 400Mbps 802.11ac (VHT20/40/80): up to MCS9
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5720MHz
Number of Channel	5260 ~ 5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500 ~ 5720MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 12 802.11n (HT40), 802.11ac (VHT40): 6 802.11ac (VHT80): 3
Output Power	5260 ~ 5320MHz: CDD Mode: 245.209mW Beamforming Mode: 179.901mW 5500 ~ 5720MHz: CDD Mode: 241.008mW Beamforming Mode: 176.639mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The differences compared with the original report (BV CPS report no.: RFBHJS-WTW-P20080454-1) are adding 5.26GHz to 5.32GHz and 5.50GHz to 5.72GHz by software.

2. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Band	Modulation Mode	Beamforming Mode	TX Function
5GHz Band	802.11a	Not Support	2TX
	802.11n (HT20)	Support	2TX
	802.11n (HT40)	Support	2TX
	802.11ac (VHT20)	Support	2TX
	802.11ac (VHT40)	Support	2TX
	802.11ac (VHT80)	Support	2TX

* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40/VHT80 on 802.11ac mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)

* For 802.11n/ac, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

3. The EUT uses following antennas.

Ant. Type	PIFA		
Ant. Connector	i-pex (MHF)		
Antenna Gain (dBi)			
Ant. No.	WLAN (2.4GHz Band)	WLAN (5.0GHz Band)	Bluetooth
Ant. 0	2.19	4.86	-
Ant. 1	2.86	3.70	-
Ant. 2	-	-	2.42

* The max. gain was chosen for final tests.
* 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.

4. WLAN 2.4GHz and WLAN 5GHz technologies can transmit simultaneously.
   WLAN 5GHz and Bluetooth technologies can transmit simultaneously.

3.2 Description of Test Modes

For 5260 ~ 5320MHz:

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

For 5500 ~ 5720MHz:

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission APCM: Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
-	802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	6.5
-	802.11ac (VHT40)		54 to 62	54, 62	OFDM	13.5
-	802.11ac (VHT80)		58	58	OFDM	29.3
-	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
-	802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
-	802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
-	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	29.3

Radiated Emission Test (Below 1GHz):

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

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	60	OFDM	6.0
	802.11a	5500-5720	100 to 144		OFDM	6.0

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	60	OFDM	6.0
	802.11a	5500-5720	100 to 144		OFDM	6.0

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
-	802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	6.5
-	802.11ac (VHT40)		54 to 62	54, 62	OFDM	13.5
-	802.11ac (VHT80)		58	58	OFDM	29.3
-	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
-	802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
-	802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
-	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	29.3

*802.11n (HT20), 802.11n (HT40) are for Conducted Output Power Measurement only.

Test Condition:

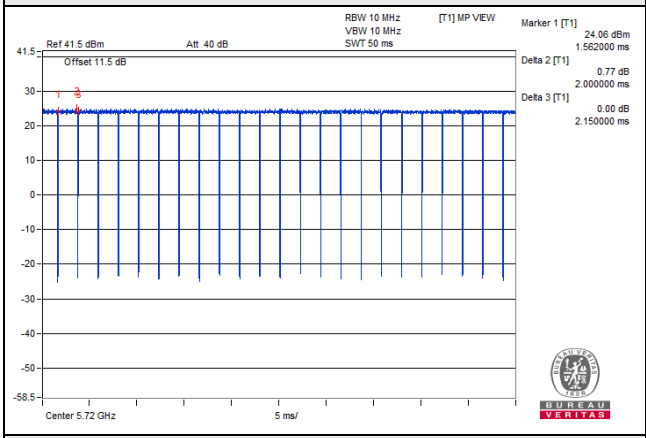
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 66% RH	120Vac, 60Hz	Titan Hsu Adair Peng
RE<1G	23 deg. C, 66% RH	120Vac, 60Hz	Titan Hsu
PLC	23 deg. C, 66% RH	120Vac, 60Hz	Titan Hsu
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Ivan Tseng

3.3 Duty Cycle of Test Signal

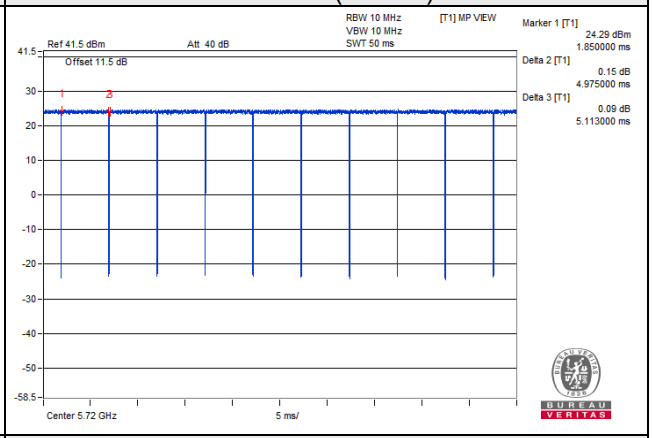
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 2/2.15 = 0.93, Duty factor = 10 * log (1/0.93) = 0.31
802.11ac (VHT20): Duty cycle = 4.975/5.113 = 0.973, Duty factor = 10 * log (1/0.973) = 0.12
802.11ac (VHT40): Duty cycle = 2.374/2.512 = 0.945, Duty factor = 10 * log (1/0.945) = 0.25
802.11ac (VHT80): Duty cycle = 1.135/1.260 = 0.901, Duty factor = 10 * log (1/0.901) = 0.45

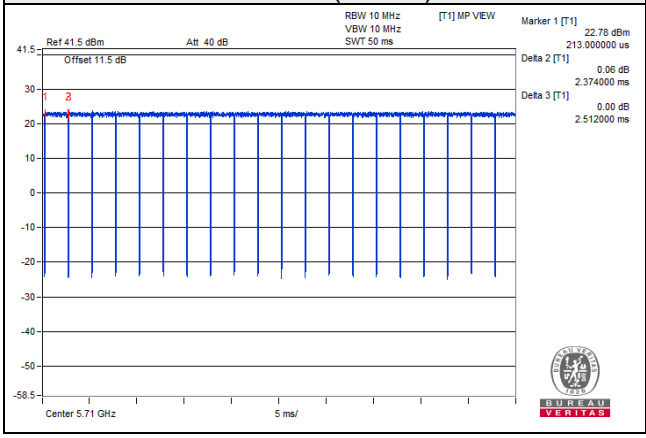
802.11a



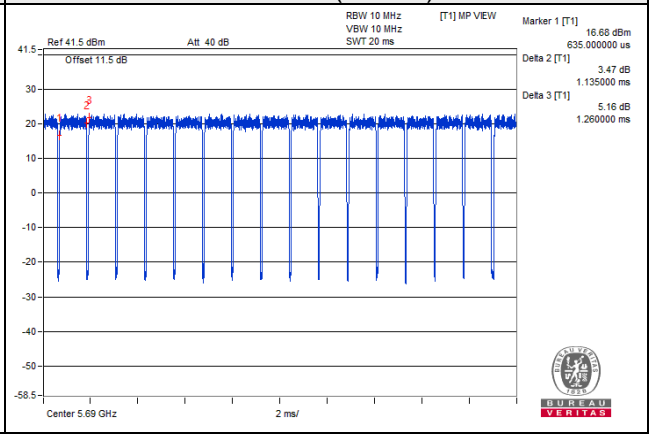
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

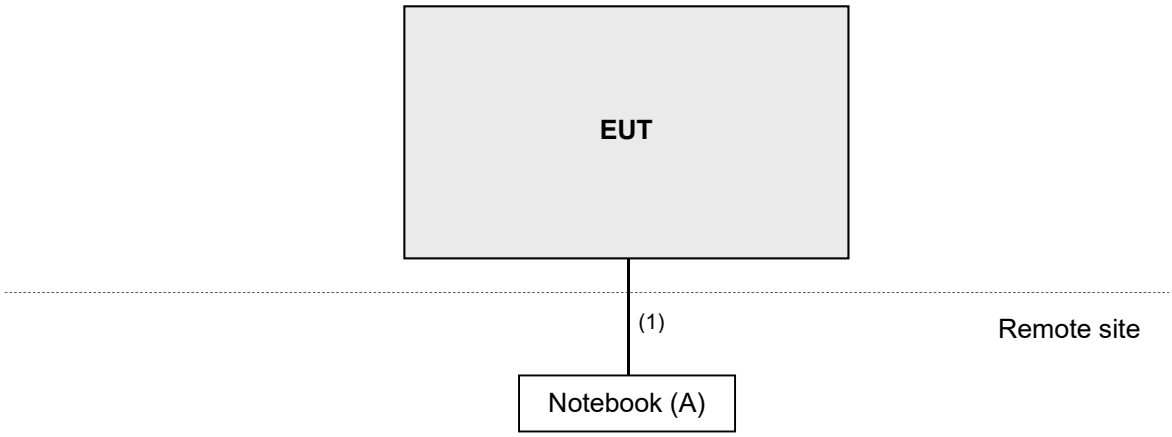
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	10	N	0	RJ45, Cat5e

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10:2013

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

KDB 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
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

*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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	9120D	209	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM- SM-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 04, 2020	Sep. 03, 2021
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 14, 2020	Jan. 13, 2021
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 13, 2020	Jan. 12, 2021

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 HwaYa Chamber 3.

4.1.3 Test Procedures

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 detect 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:

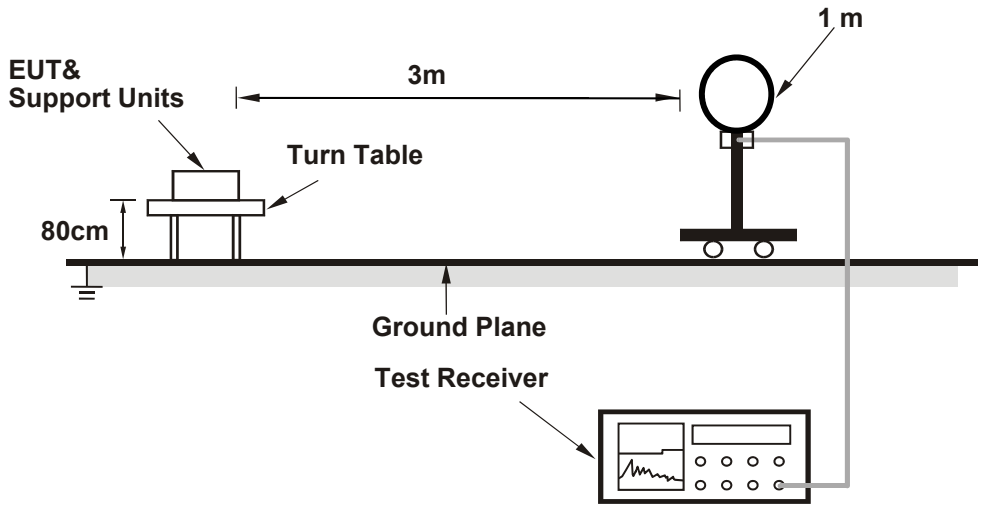
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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. (RBW = 1MHz, VBW = 1kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

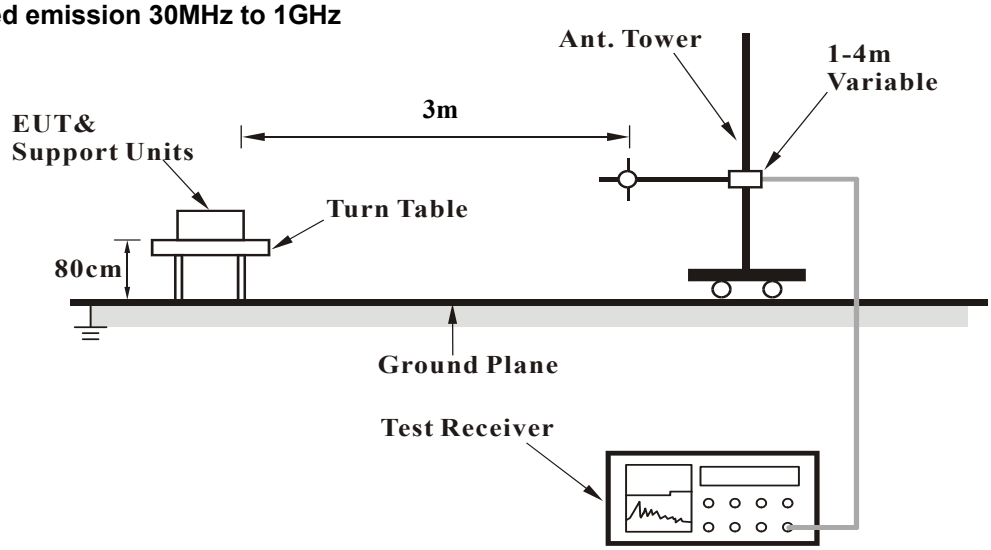
No deviation.

4.1.5 Test Setup

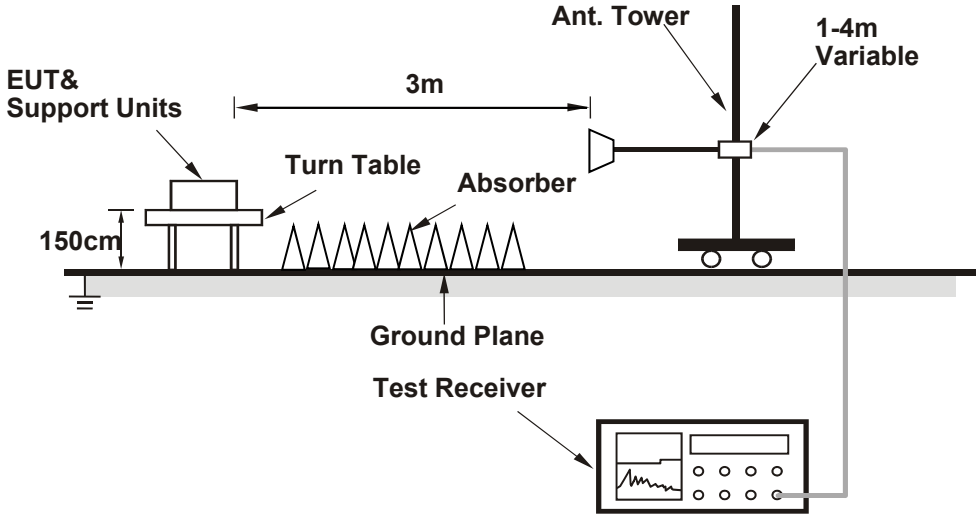
For Radiated emission below 30MHz



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 Conditions

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz data:

802.11a

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.0 PK	74.0	-16.0	1.00 H	131	51.5	6.5
2	5150.00	45.3 AV	54.0	-8.7	1.00 H	131	38.8	6.5
3	*5260.00	114.4 PK			1.00 H	131	72.6	41.8
4	*5260.00	104.0 AV			1.00 H	131	62.2	41.8
5	#10520.00	59.5 PK	68.2	-8.7	1.99 H	312	42.1	17.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.2 PK	74.0	-15.8	1.63 V	249	51.7	6.5
2	5150.00	44.8 AV	54.0	-9.2	1.63 V	249	38.3	6.5
3	*5260.00	116.4 PK			1.63 V	249	74.6	41.8
4	*5260.00	106.5 AV			1.63 V	249	64.7	41.8
5	#10520.00	59.6 PK	68.2	-8.6	4.00 V	303	42.2	17.4

Remarks:

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

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	114.7 PK			1.02 H	131	72.8	41.9
2	*5300.00	104.0 AV			1.02 H	131	62.1	41.9
3	10600.00	59.3 PK	74.0	-14.7	2.02 H	315	42.2	17.1
4	10600.00	46.1 AV	54.0	-7.9	2.02 H	315	29.0	17.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	116.7 PK			2.05 V	253	74.8	41.9
2	*5300.00	106.4 AV			2.05 V	253	64.5	41.9
3	10600.00	59.5 PK	74.0	-14.5	3.92 V	313	42.4	17.1
4	10600.00	46.2 AV	54.0	-7.8	3.92 V	313	29.1	17.1

Remarks:

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

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	113.7 PK			1.25 H	130	71.8	41.9
2	*5320.00	103.1 AV			1.25 H	130	61.2	41.9
3	5350.00	69.2 PK	74.0	-4.8	1.25 H	130	62.9	6.3
4	5350.00	52.0 AV	54.0	-2.0	1.25 H	130	45.7	6.3
5	10640.00	59.5 PK	74.0	-14.5	2.15 H	315	42.2	17.3
6	10640.00	46.3 AV	54.0	-7.7	2.15 H	315	29.0	17.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	115.9 PK			2.06 V	240	74.0	41.9
2	*5320.00	105.4 AV			2.06 V	240	63.5	41.9
3	5350.00	72.0 PK	74.0	-2.0	2.06 V	240	65.7	6.3
4	5350.00	53.3 AV	54.0	-0.7	2.06 V	240	47.0	6.3
5	10640.00	59.7 PK	74.0	-14.3	3.86 V	301	42.4	17.3
6	10640.00	46.5 AV	54.0	-7.5	3.86 V	301	29.2	17.3

Remarks:

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

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	59.4 PK	74.0	-14.6	1.48 H	139	53.2	6.2
2	5460.00	45.0 AV	54.0	-9.0	1.48 H	139	38.8	6.2
3	#5470.00	66.0 PK	68.2	-2.2	1.48 H	139	59.8	6.2
4	*5500.00	112.9 PK			1.48 H	139	71.0	41.9
5	*5500.00	102.2 AV			1.48 H	139	60.3	41.9
6	11000.00	60.8 PK	74.0	-13.2	2.29 H	322	42.4	18.4
7	11000.00	46.6 AV	54.0	-7.4	2.29 H	322	28.2	18.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	59.7 PK	74.0	-14.3	1.91 V	249	53.5	6.2
2	5460.00	45.7 AV	54.0	-8.3	1.91 V	249	39.5	6.2
3	#5470.00	67.2 PK	68.2	-1.0	1.91 V	249	61.0	6.2
4	*5500.00	115.2 PK			1.91 V	249	73.3	41.9
5	*5500.00	104.2 AV			1.91 V	249	62.3	41.9
6	11000.00	61.1 PK	74.0	-12.9	3.09 V	293	42.7	18.4
7	11000.00	46.9 AV	54.0	-7.1	3.09 V	293	28.5	18.4

Remarks:

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

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	114.3 PK			1.59 H	140	72.3	42.0
2	*5580.00	104.0 AV			1.59 H	140	62.0	42.0
3	11160.00	60.6 PK	74.0	-13.4	2.35 H	319	42.5	18.1
4	11160.00	46.6 AV	54.0	-7.4	2.35 H	319	28.5	18.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	116.3 PK			1.88 V	289	74.3	42.0
2	*5580.00	106.0 AV			1.88 V	289	64.0	42.0
3	11160.00	60.9 PK	74.0	-13.1	2.97 V	309	42.8	18.1
4	11160.00	46.9 AV	54.0	-7.1	2.97 V	309	28.8	18.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	111.8 PK			1.22 H	146	69.7	42.1
2	*5700.00	100.9 AV			1.22 H	146	58.8	42.1
3	#5725.00	64.5 PK	68.2	-3.7	1.22 H	146	58.2	6.3
4	11400.00	59.6 PK	74.0	-14.4	2.33 H	317	42.0	17.6
5	11400.00	45.6 AV	54.0	-8.4	2.33 H	317	28.0	17.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	114.1 PK			2.51 V	335	72.0	42.1
2	*5700.00	103.4 AV			2.51 V	335	61.3	42.1
3	#5725.00	67.7 PK	68.2	-0.5	2.51 V	335	61.4	6.3
4	11400.00	59.6 PK	74.0	-14.4	2.78 V	292	42.0	17.6
5	11400.00	45.8 AV	54.0	-8.2	2.78 V	292	28.2	17.6

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 144	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	56.1 PK	68.2	-12.1	1.18 H	155	49.9	6.2
2	*5720.00	114.7 PK			1.18 H	155	72.6	42.1
3	*5720.00	103.9 AV			1.18 H	155	61.8	42.1
4	#5850.00	57.8 PK	68.2	-10.4	1.18 H	155	51.1	6.7
5	11440.00	60.0 PK	74.0	-14.0	2.42 H	330	42.3	17.7
6	11440.00	45.8 AV	54.0	-8.2	2.42 H	330	28.1	17.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	56.2 PK	68.2	-12.0	2.86 V	341	50.0	6.2
2	*5720.00	116.1 PK			2.86 V	341	74.0	42.1
3	*5720.00	105.2 AV			2.86 V	341	63.1	42.1
4	#5850.00	58.0 PK	68.2	-10.2	2.86 V	341	51.3	6.7
5	11440.00	60.3 PK	74.0	-13.7	2.90 V	312	42.6	17.7
6	11440.00	46.1 AV	54.0	-7.9	2.90 V	312	28.4	17.7

Remarks:

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

802.11ac (VHT20)

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.1 PK	74.0	-15.9	1.22 H	135	51.6	6.5
2	5150.00	45.1 AV	54.0	-8.9	1.22 H	135	38.6	6.5
3	*5260.00	114.5 PK			1.22 H	135	72.7	41.8
4	*5260.00	104.0 AV			1.22 H	135	62.2	41.8
5	#10520.00	59.6 PK	68.2	-8.6	1.95 H	305	42.2	17.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.1 PK	74.0	-15.9	2.04 V	325	51.6	6.5
2	5150.00	44.5 AV	54.0	-9.5	2.04 V	325	38.0	6.5
3	*5260.00	116.0 PK			2.04 V	325	74.2	41.8
4	*5260.00	105.3 AV			2.04 V	325	63.5	41.8
5	#10520.00	59.8 PK	68.2	-8.4	3.77 V	311	42.4	17.4

Remarks:

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

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	114.8 PK			1.16 H	136	72.9	41.9
2	*5300.00	104.1 AV			1.16 H	136	62.2	41.9
3	10600.00	59.3 PK	74.0	-14.7	2.02 H	312	42.2	17.1
4	10600.00	46.2 AV	54.0	-7.8	2.02 H	312	29.1	17.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	116.4 PK			2.02 V	325	74.5	41.9
2	*5300.00	106.0 AV			2.02 V	325	64.1	41.9
3	10600.00	59.4 PK	74.0	-14.6	3.85 V	322	42.3	17.1
4	10600.00	46.4 AV	54.0	-7.6	3.85 V	322	29.3	17.1

Remarks:

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

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	113.1 PK			1.14 H	135	71.2	41.9
2	*5320.00	102.4 AV			1.14 H	135	60.5	41.9
3	5350.00	69.1 PK	74.0	-4.9	1.14 H	135	62.8	6.3
4	5350.00	52.9 AV	54.0	-1.1	1.14 H	135	46.6	6.3
5	10640.00	59.4 PK	74.0	-14.6	2.05 H	311	42.1	17.3
6	10640.00	46.3 AV	54.0	-7.7	2.05 H	311	29.0	17.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	114.8 PK			2.06 V	240	72.9	41.9
2	*5320.00	104.4 AV			2.06 V	240	62.5	41.9
3	5350.00	70.0 PK	74.0	-4.0	2.06 V	240	63.7	6.3
4	**5350.00**	**53.8 AV**	**54.0**	**-0.2**	**2.06 V**	**240**	**47.5**	**6.3**
5	10640.00	59.6 PK	74.0	-14.4	3.89 V	320	42.3	17.3
6	10640.00	46.5 AV	54.0	-7.5	3.89 V	320	29.2	17.3

Remarks:

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

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	58.2 PK	74.0	-15.8	1.17 H	158	52.0	6.2
2	5460.00	44.6 AV	54.0	-9.4	1.17 H	158	38.4	6.2
3	#5470.00	61.6 PK	68.2	-6.6	1.17 H	158	55.4	6.2
4	*5500.00	111.8 PK			1.17 H	158	69.9	41.9
5	*5500.00	100.5 AV			1.17 H	158	58.6	41.9
6	11000.00	60.5 PK	74.0	-13.5	2.17 H	302	42.1	18.4
7	11000.00	46.5 AV	54.0	-7.5	2.17 H	302	28.1	18.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	59.1 PK	74.0	-14.9	2.12 V	250	52.9	6.2
2	5460.00	44.5 AV	54.0	-9.5	2.12 V	250	38.3	6.2
3	#5470.00	67.8 PK	68.2	-0.4	2.12 V	250	61.6	6.2
4	*5500.00	113.4 PK			2.12 V	250	71.5	41.9
5	*5500.00	102.6 AV			2.12 V	250	60.7	41.9
6	11000.00	60.8 PK	74.0	-13.2	3.03 V	309	42.4	18.4
7	11000.00	46.7 AV	54.0	-7.3	3.03 V	309	28.3	18.4

Remarks:

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

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	114.1 PK			1.23 H	160	72.1	42.0
2	*5580.00	103.3 AV			1.23 H	160	61.3	42.0
3	11160.00	60.4 PK	74.0	-13.6	2.28 H	330	42.3	18.1
4	11160.00	46.3 AV	54.0	-7.7	2.28 H	330	28.2	18.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	116.4 PK			2.22 V	332	74.4	42.0
2	*5580.00	105.6 AV			2.22 V	332	63.6	42.0
3	11160.00	60.7 PK	74.0	-13.3	3.02 V	297	42.6	18.1
4	11160.00	46.6 AV	54.0	-7.4	3.02 V	297	28.5	18.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	113.7 PK			1.03 H	162	71.6	42.1
2	*5700.00	102.2 AV			1.03 H	162	60.1	42.1
3	#5725.00	65.7 PK	68.2	-2.5	1.03 H	162	59.4	6.3
4	11400.00	59.6 PK	74.0	-14.4	2.10 H	319	42.0	17.6
5	11400.00	45.6 AV	54.0	-8.4	2.10 H	319	28.0	17.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	114.4 PK			2.29 V	342	72.3	42.1
2	*5700.00	103.4 AV			2.29 V	342	61.3	42.1
3	#5725.00	67.5 PK	68.2	-0.7	2.29 V	342	61.2	6.3
4	11400.00	59.8 PK	74.0	-14.2	2.90 V	299	42.2	17.6
5	11400.00	45.9 AV	54.0	-8.1	2.90 V	299	28.3	17.6

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 144	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	56.6 PK	68.2	-11.6	1.06 H	159	50.4	6.2
2	*5720.00	115.8 PK			1.06 H	159	73.7	42.1
3	*5720.00	104.6 AV			1.06 H	159	62.5	42.1
4	#5850.00	57.6 PK	68.2	-10.6	1.06 H	159	50.9	6.7
5	11440.00	60.0 PK	74.0	-14.0	2.03 H	297	42.3	17.7
6	11440.00	46.0 AV	54.0	-8.0	2.03 H	297	28.3	17.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	56.8 PK	68.2	-11.4	1.80 V	334	50.6	6.2
2	*5720.00	116.0 PK			1.80 V	334	73.9	42.1
3	*5720.00	106.0 AV			1.80 V	334	63.9	42.1
4	#5850.00	57.7 PK	68.2	-10.5	1.80 V	334	51.0	6.7
5	11440.00	60.2 PK	74.0	-13.8	2.88 V	305	42.5	17.7
6	11440.00	46.2 AV	54.0	-7.8	2.88 V	305	28.5	17.7

Remarks:

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

802.11ac (VHT40)

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5270.00	111.6 PK			1.14 H	136	69.7	41.9
2	*5270.00	101.7 AV			1.14 H	136	59.8	41.9
3	5350.00	62.2 PK	74.0	-11.8	1.14 H	136	55.9	6.3
4	5350.00	47.3 AV	54.0	-6.7	1.14 H	136	41.0	6.3
5	#10540.00	59.7 PK	68.2	-8.5	1.95 H	312	42.2	17.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5270.00	113.7 PK			1.15 V	243	71.8	41.9
2	*5270.00	104.3 AV			1.15 V	243	62.4	41.9
3	5350.00	65.5 PK	74.0	-8.5	1.15 V	243	59.2	6.3
4	5350.00	50.5 AV	54.0	-3.5	1.15 V	243	44.2	6.3
5	#10540.00	60.0 PK	68.2	-8.2	3.88 V	333	42.5	17.5

Remarks:

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

CHANNEL	TX Channel 62	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5310.00	110.1 PK			1.41 H	136	68.2	41.9
2	*5310.00	100.5 AV			1.41 H	136	58.6	41.9
3	5350.00	69.2 PK	74.0	-4.8	1.41 H	136	62.9	6.3
4	5350.00	53.4 AV	54.0	-0.6	1.41 H	136	47.1	6.3
5	10620.00	59.5 PK	74.0	-14.5	2.05 H	318	42.2	17.3
6	10620.00	46.4 AV	54.0	-7.6	2.05 H	318	29.1	17.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5310.00	111.1 PK			1.91 V	245	69.2	41.9
2	*5310.00	101.6 AV			1.91 V	245	59.7	41.9
3	5350.00	73.1 PK	74.0	-0.9	1.91 V	245	66.8	6.3
4	5350.00	53.7 AV	54.0	-0.3	1.91 V	245	47.4	6.3
5	10620.00	59.6 PK	74.0	-14.4	3.90 V	309	42.3	17.3
6	10620.00	46.6 AV	54.0	-7.4	3.90 V	309	29.3	17.3

Remarks:

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

CHANNEL	TX Channel 102	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	63.7 PK	74.0	-10.3	1.19 H	318	57.5	6.2
2	5460.00	46.9 AV	54.0	-7.1	1.19 H	318	40.7	6.2
3	#5470.00	64.9 PK	68.2	-3.3	1.19 H	318	58.7	6.2
4	*5510.00	107.6 PK			1.19 H	318	65.7	41.9
5	*5510.00	98.4 AV			1.19 H	318	56.5	41.9
6	11020.00	60.3 PK	74.0	-13.7	2.35 H	300	42.0	18.3
7	11020.00	46.4 AV	54.0	-7.6	2.35 H	300	28.1	18.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	65.2 PK	74.0	-8.8	1.17 V	247	59.0	6.2
2	5460.00	48.7 AV	54.0	-5.3	1.17 V	247	42.5	6.2
3	#5470.00	67.4 PK	68.2	-0.8	1.17 V	247	61.2	6.2
4	*5510.00	109.6 PK			1.17 V	247	67.7	41.9
5	*5510.00	99.9 AV			1.17 V	247	58.0	41.9
6	11020.00	60.2 PK	74.0	-13.8	2.84 V	312	41.9	18.3
7	11020.00	46.6 AV	54.0	-7.4	2.84 V	312	28.3	18.3

Remarks:

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

CHANNEL	TX Channel 110	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5550.00	112.0 PK			1.23 H	320	70.0	42.0
2	*5550.00	102.6 AV			1.23 H	320	60.6	42.0
3	11100.00	59.7 PK	74.0	-14.3	2.12 H	306	41.8	17.9
4	11100.00	46.2 AV	54.0	-7.8	2.12 H	306	28.3	17.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5550.00	113.8 PK			1.19 V	280	71.8	42.0
2	*5550.00	104.3 AV			1.19 V	280	62.3	42.0
3	11100.00	59.9 PK	74.0	-14.1	2.90 V	301	42.0	17.9
4	11100.00	46.4 AV	54.0	-7.6	2.90 V	301	28.5	17.9

Remarks:

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

CHANNEL	TX Channel 134	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5670.00	109.0 PK			1.16 H	150	66.9	42.1
2	*5670.00	99.6 AV			1.16 H	150	57.5	42.1
3	#5725.00	63.0 PK	68.2	-5.2	1.16 H	150	56.7	6.3
4	11340.00	59.6 PK	74.0	-14.4	2.14 H	314	41.8	17.8
5	11340.00	45.8 AV	54.0	-8.2	2.14 H	314	28.0	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5670.00	111.1 PK			1.10 V	244	69.0	42.1
2	*5670.00	101.8 AV			1.10 V	244	59.7	42.1
3	#5725.00	67.2 PK	68.2	-1.0	1.10 V	244	60.9	6.3
4	11340.00	59.8 PK	74.0	-14.2	2.99 V	297	42.0	17.8
5	11340.00	46.0 AV	54.0	-8.0	2.99 V	297	28.2	17.8

Remarks:

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

CHANNEL	TX Channel 142	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	56.5 PK	68.2	-11.7	1.17 H	316	50.3	6.2
2	*5710.00	112.7 PK			1.17 H	316	70.5	42.2
3	*5710.00	103.0 AV			1.17 H	316	60.8	42.2
4	#5850.00	58.2 PK	68.2	-10.0	1.17 H	316	51.5	6.7
5	11420.00	59.6 PK	74.0	-14.4	2.13 H	313	42.0	17.6
6	11420.00	46.1 AV	54.0	-7.9	2.13 H	313	28.5	17.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	56.7 PK	68.2	-11.5	1.09 V	277	50.5	6.2
2	*5710.00	115.8 PK			1.09 V	277	73.6	42.2
3	*5710.00	105.5 AV			1.09 V	277	63.3	42.2
4	#5850.00	58.4 PK	68.2	-9.8	1.09 V	277	51.7	6.7
5	11420.00	59.8 PK	74.0	-14.2	2.88 V	307	42.2	17.6
6	11420.00	46.2 AV	54.0	-7.8	2.88 V	307	28.6	17.6

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

CHANNEL	TX Channel 58	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.6 PK	74.0	-15.4	1.39 H	135	52.1	6.5
2	5150.00	45.4 AV	54.0	-8.6	1.39 H	135	38.9	6.5
3	*5290.00	104.4 PK			1.39 H	135	62.5	41.9
4	*5290.00	94.3 AV			1.39 H	135	52.4	41.9
5	5350.00	65.4 PK	74.0	-8.6	1.39 H	135	59.1	6.3
6	5350.00	52.8 AV	54.0	-1.2	1.39 H	135	46.5	6.3
7	#10580.00	59.5 PK	68.2	-8.7	2.01 H	312	42.2	17.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	59.3 PK	74.0	-14.7	1.26 V	243	52.8	6.5
2	5150.00	45.5 AV	54.0	-8.5	1.26 V	243	39.0	6.5
3	*5290.00	105.8 PK			1.26 V	243	63.9	41.9
4	*5290.00	96.4 AV			1.26 V	243	54.5	41.9
5	5350.00	66.6 PK	74.0	-7.4	1.26 V	243	60.3	6.3
6	5350.00	53.2 AV	54.0	-0.8	1.26 V	243	46.9	6.3
7	#10580.00	59.7 PK	68.2	-8.5	3.84 V	315	42.4	17.3

Remarks:

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

CHANNEL	TX Channel 106	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	63.3 PK	74.0	-10.7	1.14 H	317	57.1	6.2
2	5460.00	49.6 AV	54.0	-4.4	1.14 H	317	43.4	6.2
3	#5470.00	64.8 PK	68.2	-3.4	1.14 H	317	58.6	6.2
4	*5530.00	105.0 PK			1.14 H	317	63.0	42.0
5	*5530.00	94.7 AV			1.14 H	317	52.7	42.0
6	#5725.00	57.2 PK	68.2	-11.0	1.14 H	317	50.9	6.3
7	11060.00	59.7 PK	74.0	-14.3	2.14 H	305	41.6	18.1
8	11060.00	46.2 AV	54.0	-7.8	2.14 H	305	28.1	18.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	66.1 PK	74.0	-7.9	1.10 V	277	59.9	6.2
2	5460.00	52.5 AV	54.0	-1.5	1.10 V	277	46.3	6.2
3	#5470.00	67.2 PK	68.2	-1.0	1.10 V	277	61.0	6.2
4	*5530.00	106.8 PK			1.10 V	277	64.8	42.0
5	*5530.00	96.5 AV			1.10 V	277	54.5	42.0
6	#5725.00	57.8 PK	68.2	-10.4	1.10 V	277	51.5	6.3
7	11060.00	59.9 PK	74.0	-14.1	2.91 V	320	41.8	18.1
8	11060.00	46.6 AV	54.0	-7.4	2.91 V	320	28.5	18.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 122	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	61.4 PK	74.0	-12.6	1.00 H	157	55.2	6.2
2	5460.00	45.9 AV	54.0	-8.1	1.00 H	157	39.7	6.2
3	#5470.00	63.0 PK	68.2	-5.2	1.00 H	157	56.8	6.2
4	*5610.00	108.2 PK			1.00 H	157	66.2	42.0
5	*5610.00	98.0 AV			1.00 H	157	56.0	42.0
6	#5725.00	65.6 PK	68.2	-2.6	1.00 H	157	59.3	6.3
7	11220.00	60.1 PK	74.0	-13.9	2.22 H	320	42.0	18.1
8	11220.00	46.4 AV	54.0	-7.6	2.22 H	320	28.3	18.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	62.4 PK	74.0	-11.6	1.09 V	241	56.2	6.2
2	5460.00	48.0 AV	54.0	-6.0	1.09 V	241	41.8	6.2
3	#5470.00	63.4 PK	68.2	-4.8	1.09 V	241	57.2	6.2
4	*5610.00	110.4 PK			1.09 V	241	68.4	42.0
5	*5610.00	100.2 AV			1.09 V	241	58.2	42.0
6	#5725.00	67.5 PK	68.2	-0.7	1.09 V	241	61.2	6.3
7	11220.00	60.2 PK	74.0	-13.8	2.97 V	299	42.1	18.1
8	11220.00	46.6 AV	54.0	-7.4	2.97 V	299	28.5	18.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 138	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	59.5 PK	68.2	-8.7	1.17 H	150	53.3	6.2
2	*5690.00	108.6 PK			1.17 H	150	66.5	42.1
3	*5690.00	98.7 AV			1.17 H	150	56.6	42.1
4	#5850.00	62.9 PK	68.2	-5.3	1.17 H	150	56.2	6.7
5	11380.00	59.6 PK	74.0	-14.4	2.12 H	307	42.0	17.6
6	11380.00	46.0 AV	54.0	-8.0	2.12 H	307	28.4	17.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5470.00	61.7 PK	68.2	-6.5	1.14 V	273	55.5	6.2
2	*5690.00	111.3 PK			1.14 V	273	69.2	42.1
3	*5690.00	101.3 AV			1.14 V	273	59.2	42.1
4	#5850.00	66.7 PK	68.2	-1.5	1.14 V	273	60.0	6.7
5	11380.00	59.8 PK	74.0	-14.2	3.09 V	303	42.2	17.6
6	11380.00	46.3 AV	54.0	-7.7	3.09 V	303	28.7	17.6

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Worst-Case

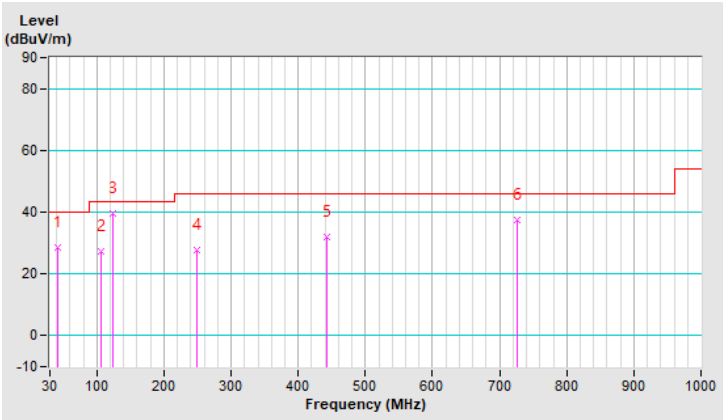
802.11a

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	41.25	28.7 QP	40.0	-11.3	1.50 H	23	38.0	-9.3
2	105.91	27.2 QP	43.5	-16.3	1.50 H	50	39.5	-12.3
3	124.19	39.5 QP	43.5	-4.0	1.50 H	201	50.0	-10.5
4	249.30	27.8 QP	46.0	-18.2	1.00 H	69	36.6	-8.8
5	443.30	31.8 QP	46.0	-14.2	1.00 H	96	35.2	-3.4
6	725.87	37.4 QP	46.0	-8.6	1.00 H	354	35.0	2.4

Remarks:

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

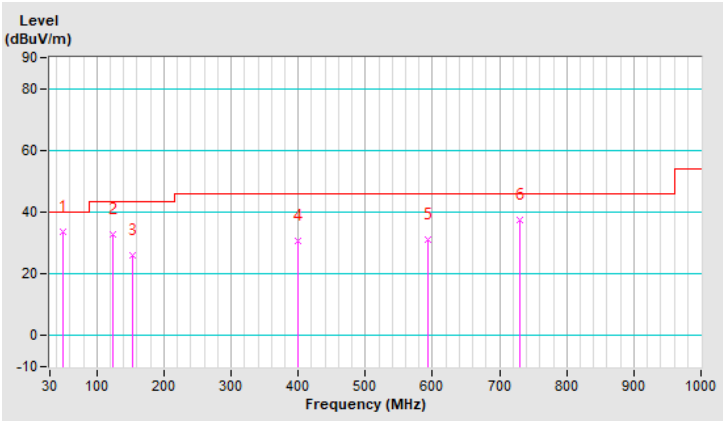


CHANNEL	TX Channel 60	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	49.68	33.7 QP	40.0	-6.3	1.49 V	6	42.8	-9.1
2	124.19	33.0 QP	43.5	-10.5	1.49 V	132	43.5	-10.5
3	153.71	26.2 QP	43.5	-17.3	1.00 V	254	34.6	-8.4
4	399.72	30.5 QP	46.0	-15.5	1.00 V	130	35.2	-4.7
5	593.72	31.1 QP	46.0	-14.9	1.00 V	80	31.0	0.1
6	730.09	37.3 QP	46.0	-8.7	1.49 V	154	34.7	2.6

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 emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB 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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 11, 2019	Dec. 10, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 04, 2020	Sep. 03, 2021
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 20, 2020	Feb. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 28, 2020	Aug. 27, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1 (Conduction 1).
3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

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.

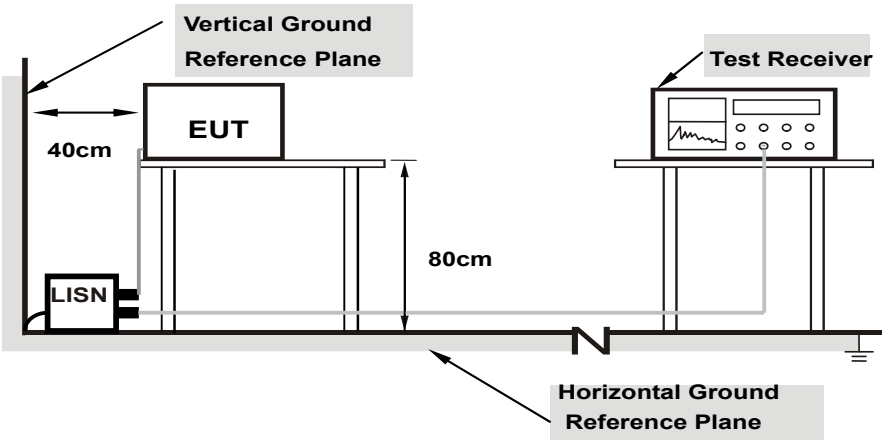
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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 Conditions

Same as 4.1.6.

4.2.7 Test Results

Worst-case data:

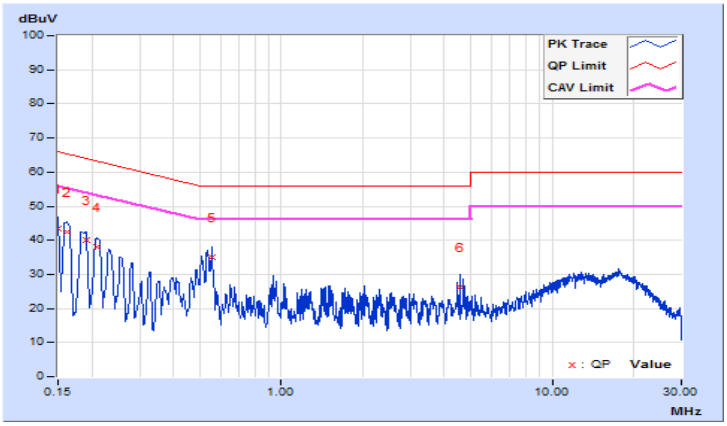
802.11a

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.82	33.51	18.11	43.33	27.93	66.00	56.00	-22.67	-28.07
2	0.16200	9.83	32.50	17.44	42.33	27.27	65.36	55.36	-23.03	-28.09
3	0.19000	9.84	30.25	17.32	40.09	27.16	64.04	54.04	-23.95	-26.88
4	0.20850	9.85	28.19	16.12	38.04	25.97	63.26	53.26	-25.22	-27.29
5	**0.55400**	**9.88**	**24.99**	**17.89**	**34.87**	**27.77**	**56.00**	**46.00**	**-21.13**	**-18.23**
6	4.57800	10.01	16.41	3.16	26.42	13.17	56.00	46.00	-29.58	-32.83

Remarks:

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

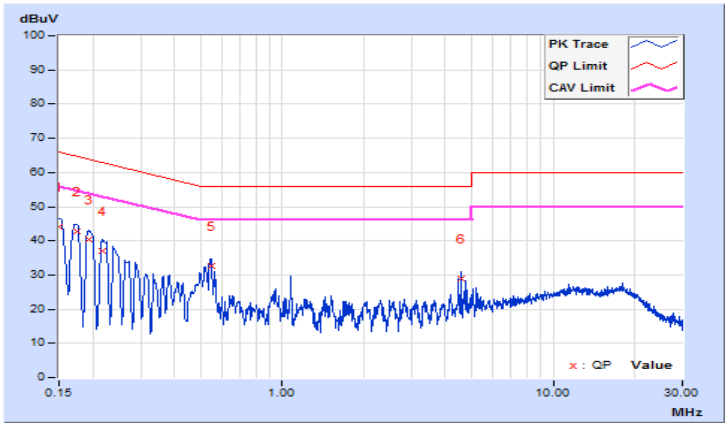


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.84	34.33	18.08	44.17	27.92	66.00	56.00	-21.83	-28.08
2	0.17384	9.84	32.86	17.78	42.70	27.62	64.77	54.77	-22.07	-27.15
3	0.19316	9.85	30.72	15.96	40.57	25.81	63.90	53.90	-23.33	-28.09
4	0.21800	9.85	27.09	12.55	36.94	22.40	62.89	52.89	-25.95	-30.49
5	0.54600	9.91	22.88	14.98	32.79	24.89	56.00	46.00	-23.21	-21.11
6	4.57400	10.05	18.80	5.75	28.85	15.80	56.00	46.00	-27.15	-30.20

Remarks:

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



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)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

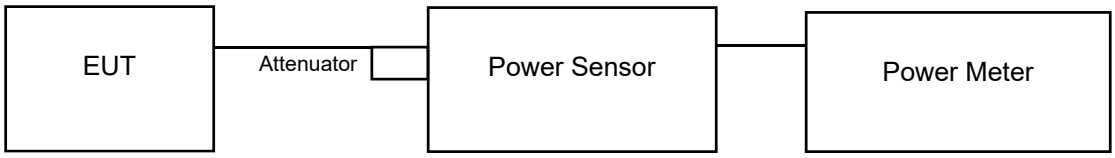
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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

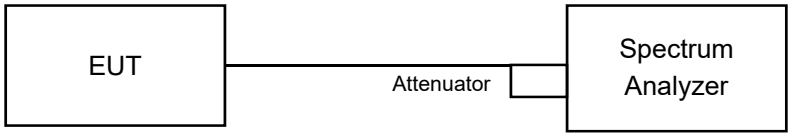
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

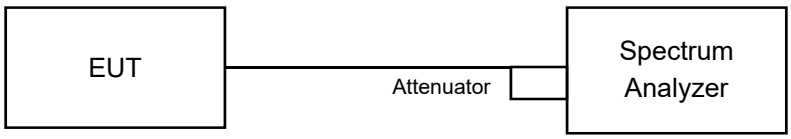
For Power Output
For 802.11a, 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40) and 802.11ac (VHT80)



For Straddle channels



For 26dB Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

For 802.11a, 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40) and 802.11ac (VHT80)
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 Straddle channels
Method SA-1 uses trace averaging with the EUT transmitting at full power throughout each sweep. The procedure for this method is as follows:
a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.
b) Set RBW = 1 MHz.
c) Set VBW ≥ 3 MHz.
d) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
g) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle ≥ 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.”
h) Trace average at least 100 traces in power averaging (rms) mode.
i) 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.

For 26dB Bandwidth
a. Set RBW = approximately 1% of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. 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 Conditions

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 Result

Power Output:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.54	19.57	180.523	22.57	24.00	Pass
60	5300	19.60	19.75	185.607	22.69	24.00	Pass
64	5320	19.34	19.22	169.462	22.29	24.00	Pass
100	5500	18.85	18.82	152.944	21.85	24.00	Pass
116	5580	19.46	19.34	174.209	22.41	24.00	Pass
140	5700	18.33	18.02	131.464	21.19	24.00	Pass
144	5720 For U-NII-2C	18.64	18.05	147.211	21.68	23.61	Pass
144	5720 For U-NII-3	10.51	12.24	30.095	14.78	30.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (29.54) = 25.70 > 24dBm
2. 11dBm + 10log (30.73) = 25.87 > 24dBm
3. 11dBm + 10log (29.45) = 25.69 > 24dBm
4. 11dBm + 10log (24.98) = 24.97 > 24dBm
5. 11dBm + 10log (34.96) = 26.43 > 24dBm
6. 11dBm + 10log (21.21) = 24.26 > 24dBm
7. 11dBm + 10log (5725.00 - 5703.30) = 24.36 > 24dBm

Chain 1

1. 11dBm + 10log (31.50) = 25.98 > 24dBm
2. 11dBm + 10log (30.71) = 25.87 > 24dBm
3. 11dBm + 10log (32.31) = 26.09 > 24dBm
4. 11dBm + 10log (24.95) = 24.97 > 24dBm
5. 11dBm + 10log (35.27) = 26.47 > 24dBm
6. 11dBm + 10log (21.16) = 24.25 > 24dBm
7. 11dBm + 10log (5725.00 - 5706.72) = 23.61 < 24dBm

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.86	19.85	193.433	22.87	24.00	Pass
60	5300	19.41	19.67	179.980	22.55	24.00	Pass
64	5320	19.31	19.13	167.156	22.23	24.00	Pass
100	5500	18.26	18.12	131.852	21.20	24.00	Pass
116	5580	20.35	20.39	217.788	23.38	24.00	Pass
140	5700	18.11	17.89	126.232	21.01	24.00	Pass
144	5720 For U-NII-2C	19.35	18.42	159.918	22.04	24.00	Pass
144	5720 For U-NII-3	13.42	13.55	45.863	16.61	30.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (29.35) = 25.67 > 24dBm
2. 11dBm + 10log (30.28) = 25.81 > 24dBm
3. 11dBm + 10log (22.68) = 24.55 > 24dBm
4. 11dBm + 10log (20.78) = 24.17 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.92) = 24.20 > 24dBm
7. 11dBm + 10log (5725.00 - 5702.35) = 24.55 > 24dBm

Chain 1

1. 11dBm + 10log (30.16) = 25.79 > 24dBm
2. 11dBm + 10log (34.12) = 26.33 > 24dBm
3. 11dBm + 10log (22.60) = 24.54 > 24dBm
4. 11dBm + 10log (20.82) = 24.18 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.43) = 24.10 > 24dBm
7. 11dBm + 10log (5725.00 - 5704.81) = 24.05 > 24dBm

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.79	20.71	237.711	23.76	24.00	Pass
62	5310	18.45	18.03	133.517	21.26	24.00	Pass
102	5510	17.16	17.19	104.360	20.19	24.00	Pass
110	5550	20.71	20.67	234.442	23.70	24.00	Pass
134	5670	18.21	17.96	128.739	21.10	24.00	Pass
142	5710 For U-NII-2C	19.28	18.72	168.450	22.26	24.00	Pass
142	5710 For U-NII-3	10.13	9.66	20.687	13.16	30.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (73.13) = 29.64 > 24dBm
2. 11dBm + 10log (41.33) = 27.16 > 24dBm
3. 11dBm + 10log (41.14) = 27.14 > 24dBm
4. 11dBm + 10log (80.85) = 30.07 > 24dBm
5. 11dBm + 10log (55.77) = 28.46 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.56) = 28.11 > 24dBm

Chain 1

1. 11dBm + 10log (72.78) = 29.62 > 24dBm
2. 11dBm + 10log (41.19) = 27.14 > 24dBm
3. 11dBm + 10log (41.06) = 27.13 > 24dBm
4. 11dBm + 10log (76.22) = 29.82 > 24dBm
5. 11dBm + 10log (41.07) = 27.13 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.60) = 28.10 > 24dBm

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.01	20.04	201.156	23.04	24.00	Pass
60	5300	19.55	19.81	185.877	22.69	24.00	Pass
64	5320	19.45	19.27	172.633	22.37	24.00	Pass
100	5500	18.37	18.33	136.784	21.36	24.00	Pass
116	5580	20.47	20.52	224.149	23.51	24.00	Pass
140	5700	18.24	18.04	130.360	21.15	24.00	Pass
144	5720 For U-NII-2C	19.43	18.47	162.390	22.11	24.00	Pass
144	5720 For U-NII-3	13.50	13.60	46.552	16.68	30.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (29.35) = 25.67 > 24dBm
2. 11dBm + 10log (30.28) = 25.81 > 24dBm
3. 11dBm + 10log (22.68) = 24.55 > 24dBm
4. 11dBm + 10log (20.78) = 24.17 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.92) = 24.20 > 24dBm
7. 11dBm + 10log (5725.00 - 5702.35) = 24.55 > 24dBm

Chain 1

1. 11dBm + 10log (30.16) = 25.79 > 24dBm
2. 11dBm + 10log (34.12) = 26.33 > 24dBm
3. 11dBm + 10log (22.60) = 24.54 > 24dBm
4. 11dBm + 10log (20.82) = 24.18 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.43) = 24.10 > 24dBm
7. 11dBm + 10log (5725.00 - 5704.81) = 24.05 > 24dBm

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.91	20.86	**245.209**	23.90	24.00	Pass
62	5310	18.61	18.22	138.985	21.43	24.00	Pass
102	5510	17.33	17.30	107.779	20.33	24.00	Pass
110	5550	20.82	20.80	**241.008**	23.82	24.00	Pass
134	5670	18.36	18.11	133.263	21.25	24.00	Pass
142	5710 For U-NII-2C	19.39	18.78	171.846	22.35	24.00	Pass
142	5710 For U-NII-3	10.26	9.75	21.224	13.27	30.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (73.13) = 29.64 > 24dBm
2. 11dBm + 10log (41.33) = 27.16 > 24dBm
3. 11dBm + 10log (41.14) = 27.14 > 24dBm
4. 11dBm + 10log (80.85) = 30.07 > 24dBm
5. 11dBm + 10log (55.77) = 28.46 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.56) = 28.11 > 24dBm

Chain 1

1. 11dBm + 10log (72.78) = 29.62 > 24dBm
2. 11dBm + 10log (41.19) = 27.14 > 24dBm
3. 11dBm + 10log (41.06) = 27.13 > 24dBm
4. 11dBm + 10log (76.22) = 29.82 > 24dBm
5. 11dBm + 10log (41.07) = 27.13 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.60) = 28.10 > 24dBm

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	16.70	16.56	92.063	19.64	24.00	Pass
106	5530	16.61	16.55	91.000	19.59	24.00	Pass
122	5610	19.82	19.98	195.481	22.91	24.00	Pass
138	5690 For U-NII-2C	17.45	18.26	136.079	21.34	24.00	Pass
138	5690 For U-NII-3	7.01	9.01	14.415	11.59	30.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (83.67) = 30.22 > 24dBm
2. 11dBm + 10log (84.19) = 30.25 > 24dBm
3. 11dBm + 10log (151.25) = 32.79 > 24dBm
4. 11dBm + 10log (5725.00 - 5598.45) = 32.02 > 24dBm

Chain 1

1. 11dBm + 10log (83.98) = 30.24 > 24dBm
2. 11dBm + 10log (83.94) = 30.23 > 24dBm
3. 11dBm + 10log (150.88) = 32.78 > 24dBm
4. 11dBm + 10log (5725.00 - 5606.77) = 31.72 > 24dBm

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.46	19.42	175.806	22.45	22.69	Pass
60	5300	19.03	19.31	165.293	22.18	22.69	Pass
64	5320	19.31	19.13	167.156	22.23	22.69	Pass
100	5500	18.37	18.33	136.784	21.36	22.69	Pass
116	5580	19.06	19.64	172.583	22.37	22.69	Pass
140	5700	18.24	18.04	130.360	21.15	22.69	Pass
144	5720 For U-NII-2C	19.29	18.31	156.917	21.96	22.69	Pass
144	5720 For U-NII-3	13.38	13.48	45.284	16.56	28.69	Pass

Note:

1. 5260-5320MHz, 5500-5720MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 24 - (7.31 - 6) = 22.69dBm.
2. 5745-5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 30 - (7.31 - 6) = 28.69dBm.

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

Chain 0

1. 11dBm + 10log (29.35) = 25.67 > 24dBm
2. 11dBm + 10log (30.28) = 25.81 > 24dBm
3. 11dBm + 10log (22.68) = 24.55 > 24dBm
4. 11dBm + 10log (20.78) = 24.17 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.92) = 24.20 > 24dBm
7. 11dBm + 10log (5725.00 - 5702.35) = 24.55 > 24dBm

Chain 1

1. 11dBm + 10log (30.16) = 25.79 > 24dBm
2. 11dBm + 10log (34.12) = 26.33 > 24dBm
3. 11dBm + 10log (22.60) = 24.54 > 24dBm
4. 11dBm + 10log (20.82) = 24.18 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.43) = 24.10 > 24dBm
7. 11dBm + 10log (5725.00 - 5704.81) = 24.05 > 24dBm

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	19.32	19.21	168.875	22.28	22.69	Pass
62	5310	18.45	18.03	133.517	21.26	22.69	Pass
102	5510	17.16	17.19	104.360	20.19	22.69	Pass
110	5550	19.28	19.26	169.056	22.28	22.69	Pass
134	5670	18.21	17.96	128.739	21.10	22.69	Pass
142	5710 For U-NII-2C	19.22	18.65	165.960	22.20	22.69	Pass
142	5710 For U-NII-3	10.16	9.54	20.496	13.12	28.69	Pass

Note:

1. 5260-5320MHz, 5500-5720MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 24 - (7.31 - 6) = 22.69dBm.
2. 5745-5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 30 - (7.31 - 6) = 28.69dBm.

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

Chain 0

1. 11dBm + 10log (73.13) = 29.64 > 24dBm
2. 11dBm + 10log (41.33) = 27.16 > 24dBm
3. 11dBm + 10log (41.14) = 27.14 > 24dBm
4. 11dBm + 10log (80.85) = 30.07 > 24dBm
5. 11dBm + 10log (55.77) = 28.46 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.56) = 28.11 > 24dBm

Chain 1

1. 11dBm + 10log (72.78) = 29.62 > 24dBm
2. 11dBm + 10log (41.19) = 27.14 > 24dBm
3. 11dBm + 10log (41.06) = 27.13 > 24dBm
4. 11dBm + 10log (76.22) = 29.82 > 24dBm
5. 11dBm + 10log (41.07) = 27.13 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.60) = 28.10 > 24dBm

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.52	19.56	**179.901**	22.55	22.69	Pass
60	5300	19.12	19.37	168.155	22.26	22.69	Pass
64	5320	19.45	19.27	172.633	22.37	22.69	Pass
100	5500	18.37	18.33	136.784	21.36	22.69	Pass
116	5580	19.06	19.64	172.583	22.37	22.69	Pass
140	5700	18.24	18.04	130.360	21.15	22.69	Pass
144	5720 For U-NII-2C	19.43	18.47	162.390	22.11	22.69	Pass
144	5720 For U-NII-3	13.50	13.60	46.552	16.68	28.69	Pass

Note:

1. 5260-5320MHz, 5500-5720MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 24 - (7.31 - 6) = 22.69dBm.
2. 5745-5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 30 - (7.31 - 6) = 28.69dBm.

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

Chain 0

1. 11dBm + 10log (29.35) = 25.67 > 24dBm
2. 11dBm + 10log (30.28) = 25.81 > 24dBm
3. 11dBm + 10log (22.68) = 24.55 > 24dBm
4. 11dBm + 10log (20.78) = 24.17 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.92) = 24.20 > 24dBm
7. 11dBm + 10log (5725.00 - 5702.35) = 24.55 > 24dBm

Chain 1

1. 11dBm + 10log (30.16) = 25.79 > 24dBm
2. 11dBm + 10log (34.12) = 26.33 > 24dBm
3. 11dBm + 10log (22.60) = 24.54 > 24dBm
4. 11dBm + 10log (20.82) = 24.18 > 24dBm
5. 11dBm + 10log (36.18) = 26.58 > 24dBm
6. 11dBm + 10log (20.43) = 24.10 > 24dBm
7. 11dBm + 10log (5725.00 - 5704.81) = 24.05 > 24dBm

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	19.46	19.35	174.407	22.42	22.69	Pass
62	5310	18.61	18.22	138.985	21.43	22.69	Pass
102	5510	17.33	17.30	107.779	20.33	22.69	Pass
110	5550	19.42	19.41	174.796	22.43	22.69	Pass
134	5670	18.36	18.11	133.263	21.25	22.69	Pass
142	5710 For U-NII-2C	19.39	18.78	171.846	22.35	22.69	Pass
142	5710 For U-NII-3	10.26	9.75	21.224	13.27	28.69	Pass

Note:

1. 5260-5320MHz, 5500-5720MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 24 - (7.31 - 6) = 22.69dBm.
2. 5745-5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 30 - (7.31 - 6) = 28.69dBm.

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

Chain 0

1. 11dBm + 10log (73.13) = 29.64 > 24dBm
2. 11dBm + 10log (41.33) = 27.16 > 24dBm
3. 11dBm + 10log (41.14) = 27.14 > 24dBm
4. 11dBm + 10log (80.85) = 30.07 > 24dBm
5. 11dBm + 10log (55.77) = 28.46 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.56) = 28.11 > 24dBm

Chain 1

1. 11dBm + 10log (72.78) = 29.62 > 24dBm
2. 11dBm + 10log (41.19) = 27.14 > 24dBm
3. 11dBm + 10log (41.06) = 27.13 > 24dBm
4. 11dBm + 10log (76.22) = 29.82 > 24dBm
5. 11dBm + 10log (41.07) = 27.13 > 24dBm
6. 11dBm + 10log (5725.00 - 5673.60) = 28.10 > 24dBm

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	16.70	16.56	92.063	19.64	22.69	Pass
106	5530	16.61	16.55	91.000	19.59	22.69	Pass
122	5610	19.39	19.53	**176.639**	22.47	22.69	Pass
138	5690 For U-NII-2C	17.45	18.26	136.079	21.34	22.69	Pass
138	5690 For U-NII-3	7.01	9.01	14.415	11.59	28.69	Pass

Note:

1. 5260-5320MHz, 5500-5720MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 24 - (7.31 - 6) = 22.69dBm.
2. 5745-5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the power limit shall be reduced to 30 - (7.31 - 6) = 28.69dBm.

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

Chain 0

1. 11dBm + 10log (83.67) = 30.22 > 24dBm
2. 11dBm + 10log (84.19) = 30.25 > 24dBm
3. 11dBm + 10log (151.25) = 32.79 > 24dBm
4. 11dBm + 10log (5725.00 - 5598.45) = 32.02 > 24dBm

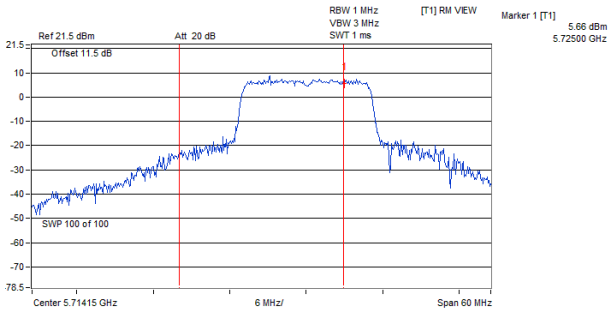
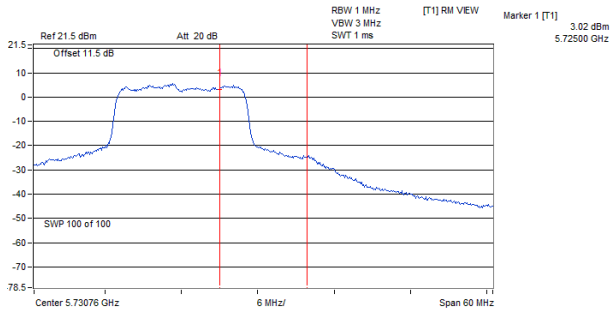
Chain 1

1. 11dBm + 10log (83.98) = 30.24 > 24dBm
2. 11dBm + 10log (83.94) = 30.23 > 24dBm
3. 11dBm + 10log (150.88) = 32.78 > 24dBm
4. 11dBm + 10log (5725.00 - 5606.77) = 31.72 > 24dBm

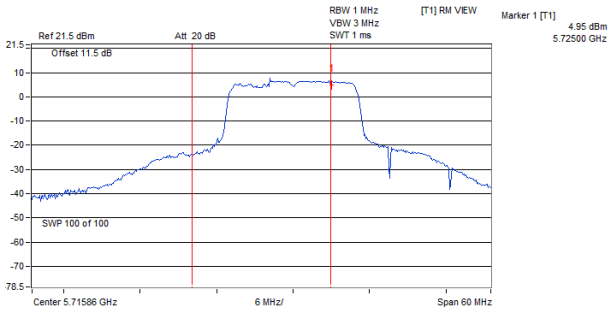
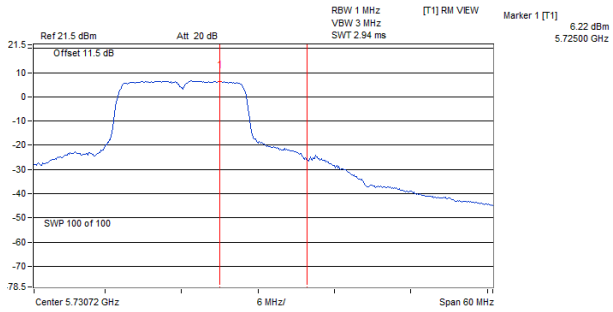
Straddle channel power plots:

802.11a

Chain 0

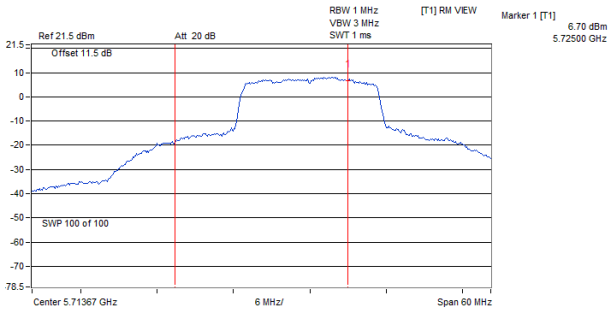
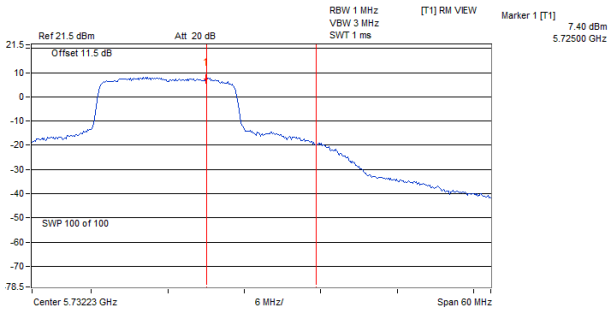
CH 144 (For U-NII-2C)	CH 144 (For U-NII-3)
	
TX Channel Bandwidth 21.7 MHz Power 18.64 dBm	TX Channel Bandwidth 11.52 MHz Power 10.51 dBm

Chain 1

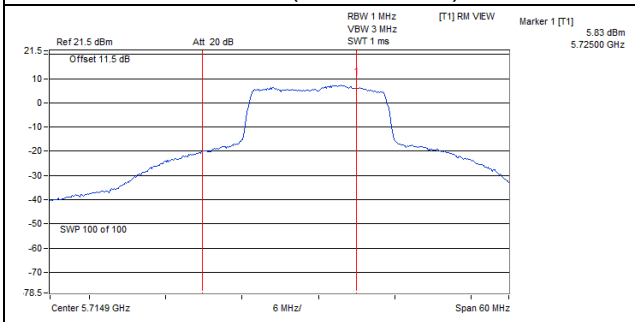
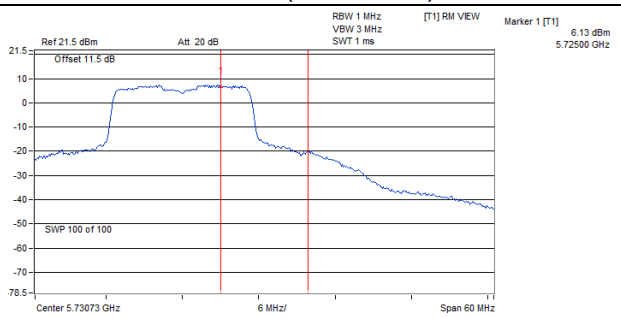
CH 144 (For U-NII-2C)	CH 144 (For U-NII-3)
	
TX Channel Bandwidth 18.28 MHz Power 18.05 dBm	TX Channel Bandwidth 11.45 MHz Power 12.24 dBm

802.11ac (VHT20)

Chain 0

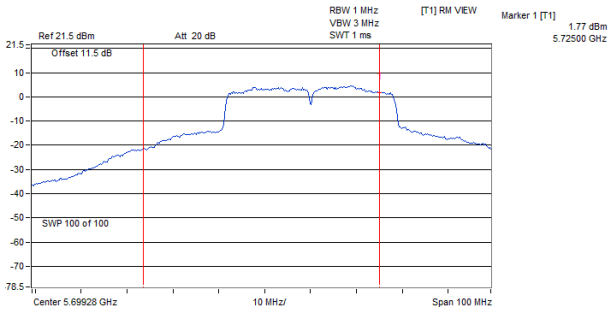
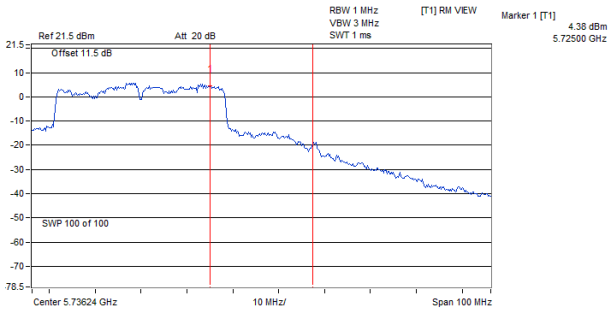
CH 144 (For U-NII-2C)	CH 144 (For U-NII-3)
	
TX Channel Bandwidth 22.65 MHz Power 19.43 dBm	TX Channel Bandwidth 14.47 MHz Power 13.5 dBm

Chain 1

CH 144 (For U-NII-2C)	CH 144 (For U-NII-3)
	
TX Channel Bandwidth 20.19 MHz Power 18.47 dBm	TX Channel Bandwidth 11.46 MHz Power 13.6 dBm

802.11ac (VHT40)

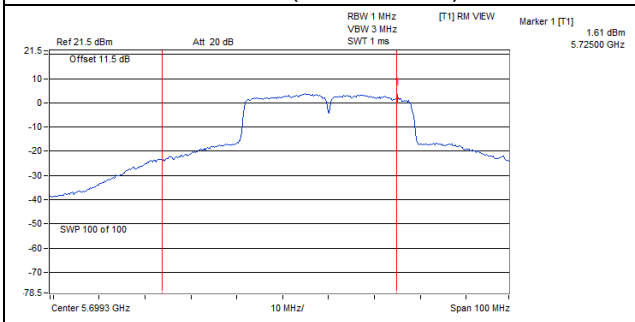
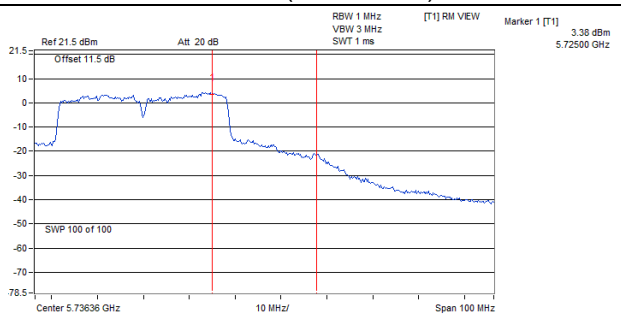
Chain 0

CH 142 (For U-NII-2C)	CH 142 (For U-NII-3)
	

TX Channel Bandwidth 51.44 MHz Power 19.39 dBm

TX Channel Bandwidth 22.48 MHz Power 10.26 dBm

Chain 1

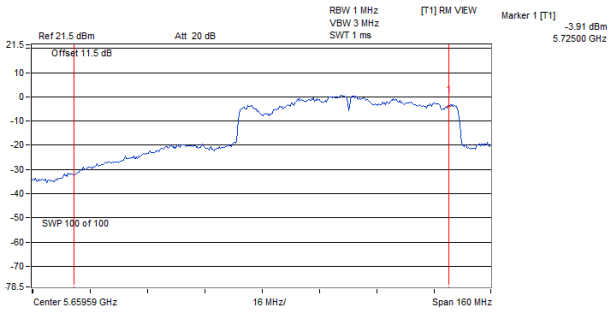
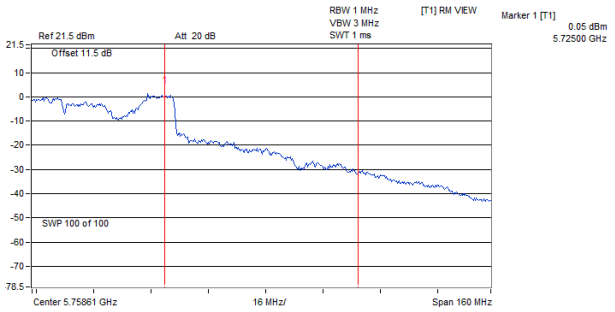
CH 142 (For U-NII-2C)	CH 142 (For U-NII-3)
	

TX Channel Bandwidth 51.4 MHz Power 18.78 dBm

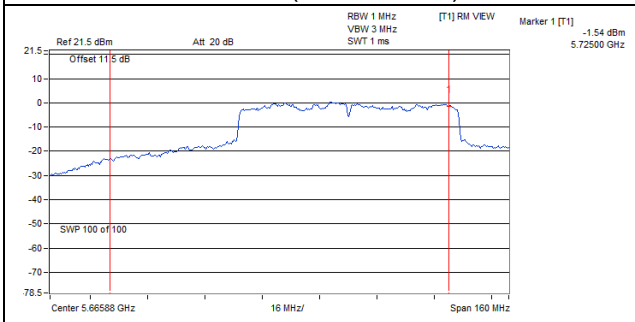
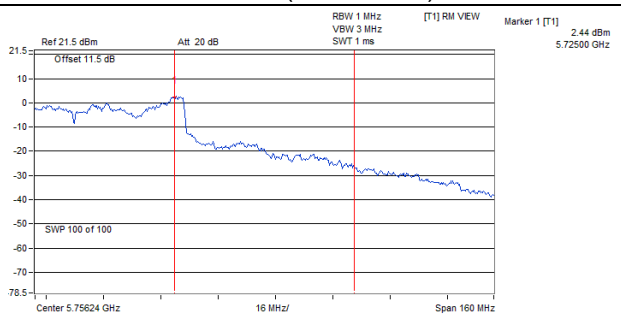
TX Channel Bandwidth 22.73 MHz Power 9.75 dBm

802.11ac (VHT80)

Chain 0

CH 138 (For U-NII-2C)	CH 138 (For U-NII-3)
	
TX Channel Bandwidth 130.82 MHz Power 17.45 dBm	TX Channel Bandwidth 67.23 MHz Power 7.01 dBm

Chain 1

CH 138 (For U-NII-2C)	CH 138 (For U-NII-3)
	
TX Channel Bandwidth 118.23 MHz Power 18.26 dBm	TX Channel Bandwidth 62.48 MHz Power 9.01 dBm

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	29.54	31.50
60	5300	30.73	30.71
64	5320	29.45	32.31
100	5500	24.98	24.95
116	5580	34.96	35.27
140	5700	21.21	21.16
144	5720 For U-NII-2C	21.70	18.28

802.11ac (VHT20)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	29.35	30.16
60	5300	30.28	34.12
64	5320	22.68	22.60
100	5500	20.78	20.82
116	5580	36.18	36.18
140	5700	20.92	20.43
144	5720 For U-NII-2C	22.65	20.19

802.11ac (VHT40)

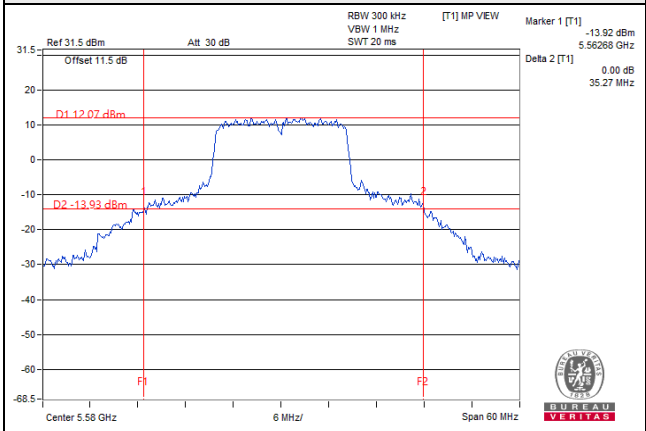
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	73.13	72.78
62	5310	41.33	41.19
102	5510	41.14	41.06
110	5550	80.85	76.22
134	5670	55.77	41.07
142	5710 For U-NII-2C	51.44	51.40

802.11ac (VHT80)

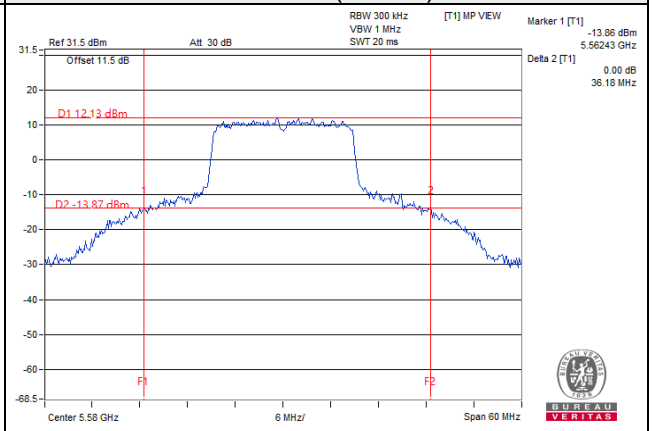
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.67	83.98
106	5530	84.19	83.94
122	5610	151.25	150.88
138	5690 For U-NII-2C	126.55	118.23

Spectrum Plot of Worst Value

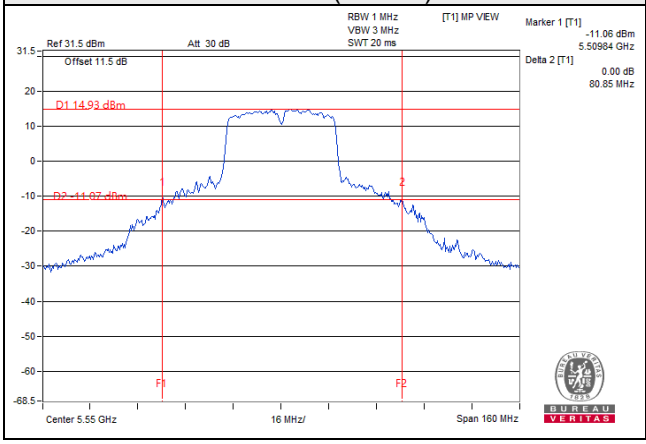
802.11a



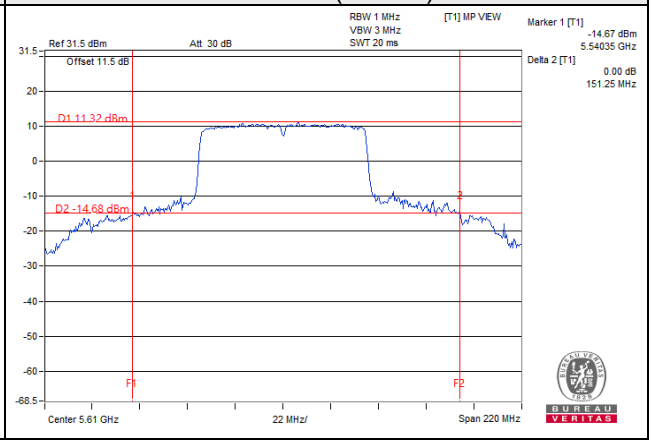
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



EUT Maximum Conducted Power

CDD Mode

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	185.607	22.69
5470~5725	174.209	22.41

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	193.433	22.87
5470~5725	217.788	23.38

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	237.711	23.76
5470~5725	234.442	23.70

802.11ac (VHT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	201.156	23.04
5470~5725	224.149	23.51

802.11ac (VHT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	245.209	23.90
5470~5725	241.008	23.82

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	92.063	19.64
5470~5725	195.481	22.91

Beamforming Mode

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	175.806	22.45
5470~5725	172.583	22.37

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	168.875	22.28
5470~5725	169.056	22.28

802.11ac (VHT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	179.901	22.55
5470~5725	172.583	22.37

802.11ac (VHT40)

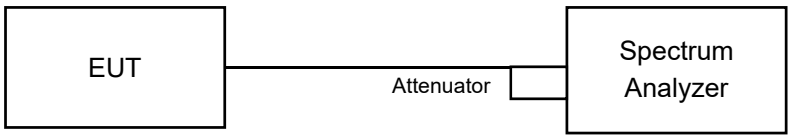
Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	174.407	22.42
5470~5725	174.796	22.43

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	92.063	19.64
5470~5725	176.639	22.47

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Test Result

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.92	16.80
60	5300	16.80	16.68
64	5320	16.68	16.80
100	5500	16.68	16.68
116	5580	17.16	17.16
140	5700	16.56	16.56
144	5720 For U-NII-2C	13.40	13.28
144	5720 For U-NII-3	3.40	3.28

802.11ac (VHT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.88	17.88
60	5300	17.88	18.00
64	5320	17.64	17.76
100	5500	17.64	17.76
116	5580	18.12	18.12
140	5700	17.64	17.64
144	5720 For U-NII-2C	14.12	14.00
144	5720 For U-NII-3	4.00	3.88

802.11ac (VHT40)

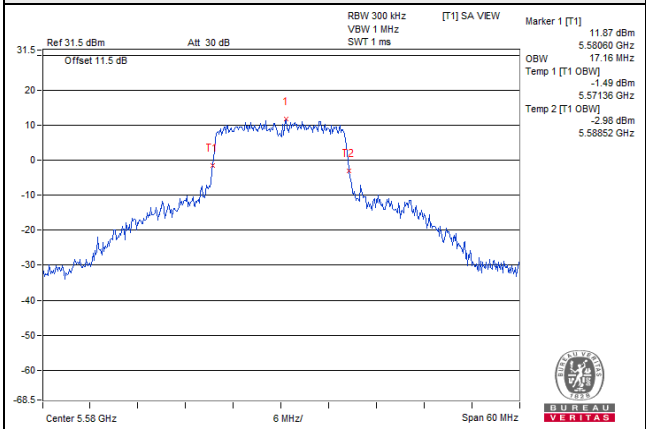
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.48	36.48
62	5310	36.12	36.12
102	5510	36.12	36.12
110	5550	36.72	36.84
134	5670	36.24	36.24
142	5710 For U-NII-2C	33.48	33.36
142	5710 For U-NII-3	3.36	3.24

802.11ac (VHT80)

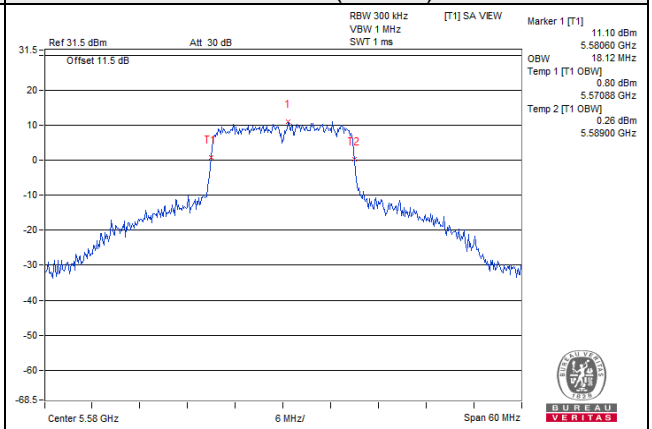
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.84	76.08
106	5530	75.84	76.08
122	5610	76.32	76.56
138	5690 For U-NII-2C	73.40	73.40
138	5690 For U-NII-3	3.64	3.64

Spectrum Plot of Worst Value

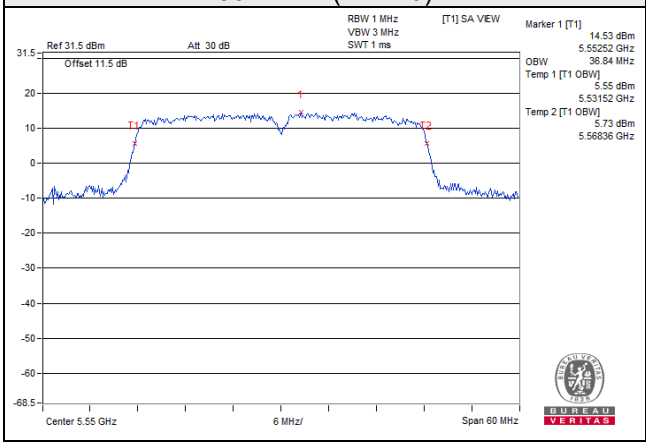
802.11a



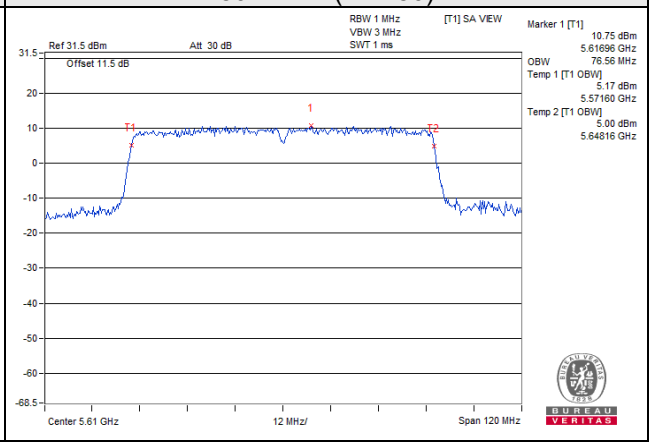
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

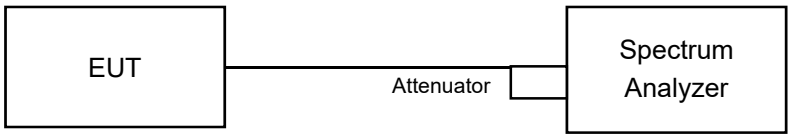


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

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

Duty cycle of test signal is < 98%
Using method SA-2
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band
Duty cycle <98%

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

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

802.11a

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	6.27	6.36	0.31	9.64	9.69	Pass
60	5300	6.06	6.51	0.31	9.62	9.69	Pass
64	5320	6.28	6.07	0.31	9.50	9.69	Pass
100	5500	5.72	5.68	0.31	9.02	9.69	Pass
116	5580	6.43	6.12	0.31	9.60	9.69	Pass
140	5700	5.20	5.14	0.31	8.49	9.69	Pass
144	5720 For U-NII-2C	6.23	6.17	0.31	9.52	9.69	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 11-(7.31-6) = 9.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	6.48	6.42	0.12	9.58	9.69	Pass
60	5300	6.09	6.42	0.12	9.39	9.69	Pass
64	5320	5.97	5.94	0.12	9.08	9.69	Pass
100	5500	5.18	5.07	0.12	8.25	9.69	Pass
116	5580	5.97	6.28	0.12	9.26	9.69	Pass
140	5700	5.04	4.58	0.12	7.94	9.69	Pass
144	5720 For U-NII-2C	6.46	6.47	0.12	9.59	9.69	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 11-(7.31-6) = 9.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

.

802.11ac (VHT40)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	4.68	4.65	0.25	7.92	9.69	Pass
62	5310	2.20	2.24	0.25	5.48	9.69	Pass
102	5510	1.40	1.29	0.25	4.60	9.69	Pass
110	5550	4.39	4.34	0.25	7.62	9.69	Pass
134	5670	2.45	1.95	0.25	5.46	9.69	Pass
142	5710 For U-NII-2C	4.44	4.27	0.25	7.61	9.69	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 11-(7.31-6) = 9.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	-2.86	-2.90	0.45	0.58	9.69	Pass
106	5530	-2.83	-2.89	0.45	0.60	9.69	Pass
122	5610	0.32	0.25	0.45	3.75	9.69	Pass
138	5690 For U-NII-2C	1.19	1.19	0.45	4.65	9.69	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 11-(7.31-6) = 9.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

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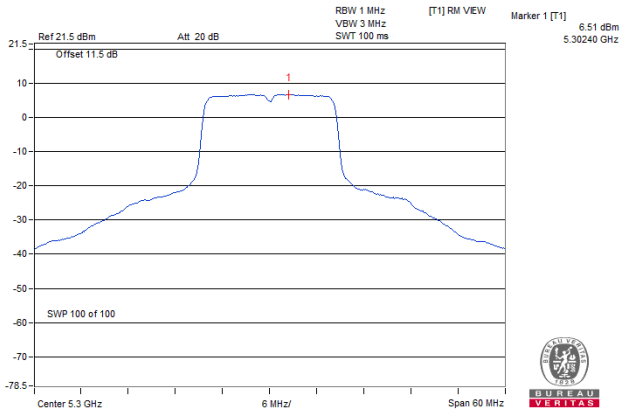
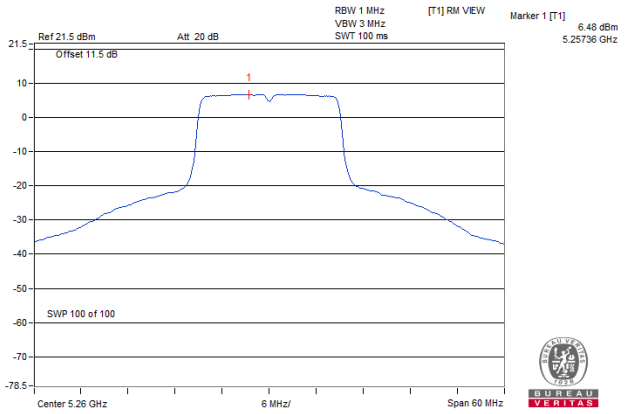
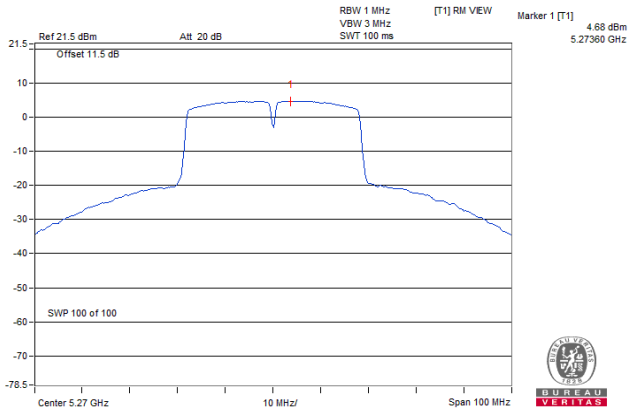
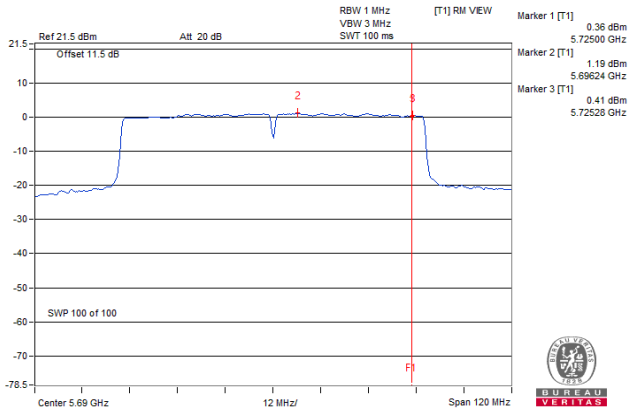
Spectrum Plot of Worst Value	
802.11a / Chain 1 / CH 60	802.11ac (VHT20) / Chain 0 / CH 52
	
802.11ac (VHT40) / Chain 0 / CH 54	802.11ac (VHT80) / Chain 0 / CH 138
	

For U-NII-3 band:

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/ 300kHz)	(dBm/ 500kHz)					
0	144	5720 For U-NII-3	-2.49	-0.27	3.01	0.31	3.05	28.69	Pass
1	144	5720 For U-NII-3	-2.34	-0.12	3.01	0.31	3.20	28.69	Pass

Note:
1. Method E)2)c) of power density measurement of KDB 662911 is using for calculating total power density. Measure and add 10 log (N_{ANT}) dB, where N_{ANT} is the number of outputs.
2. Directional Gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 30-(7.31-6) = 28.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/ 300kHz)	(dBm/ 500kHz)					
0	144	5720 For U-NII-3	-2.07	0.15	3.01	0.12	3.28	28.69	Pass
1	144	5720 For U-NII-3	-2.10	0.12	3.01	0.12	3.25	28.69	Pass

Note:
1. Method E)2)c) of power density measurement of KDB 662911 is using for calculating total power density. Measure and add 10 log (N_{ANT}) dB, where N_{ANT} is the number of outputs.
2. Directional Gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 30-(7.31-6) = 28.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/ 300kHz)	(dBm/ 500kHz)					
0	142	5710 For U-NII-3	-5.66	-3.44	3.01	0.25	-0.18	28.69	Pass
1	142	5710 For U-NII-3	-5.94	-3.72	3.01	0.25	-0.46	28.69	Pass

Note:
1. Method E)2)c) of power density measurement of KDB 662911 is using for calculating total power density. Measure and add 10 log (N_{ANT}) dB, where N_{ANT} is the number of outputs.
2. Directional Gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 30-(7.31-6) = 28.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

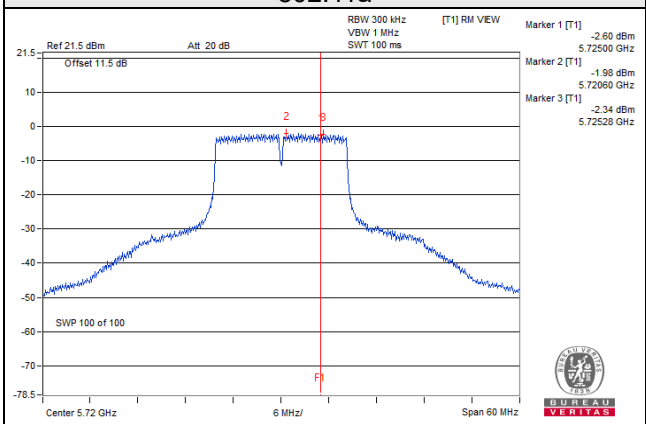
TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/ 300kHz)	(dBm/ 500kHz)					
0	138	5690 For U-NII-3	-8.56	-6.34	3.01	0.45	-2.88	28.69	Pass
1	138	5690 For U-NII-3	-8.58	-6.36	3.01	0.45	-2.90	28.69	Pass

Note:

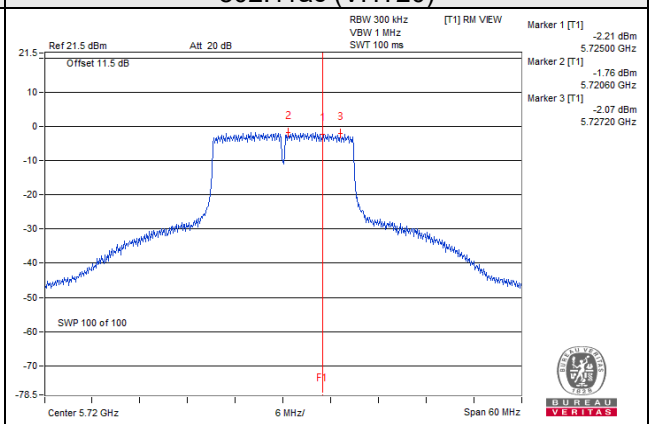
1. Method E)2)c) of power density measurement of KDB 662911 is using for calculating total power density. Measure and add 10 log (N_{ANT}) dB, where N_{ANT} is the number of outputs.
2. Directional Gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.31dBi > 6dBi, so the limit shall be reduced to 30-(7.31-6) = 28.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

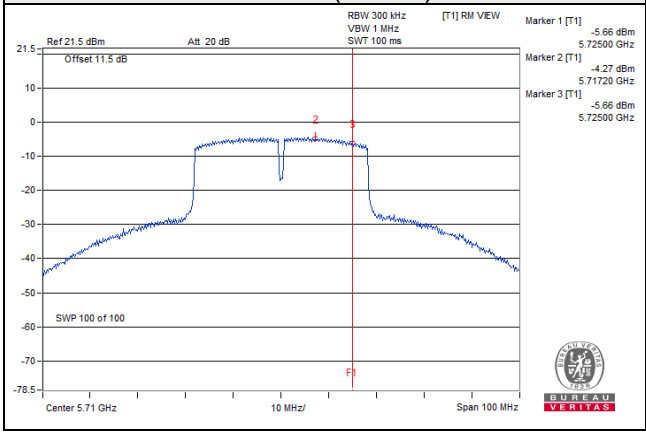
802.11a



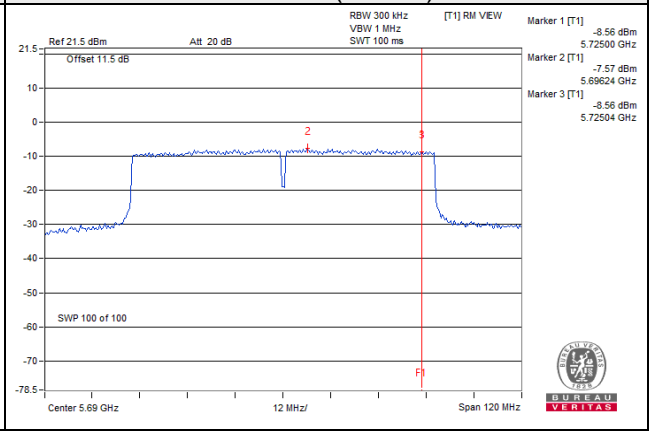
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

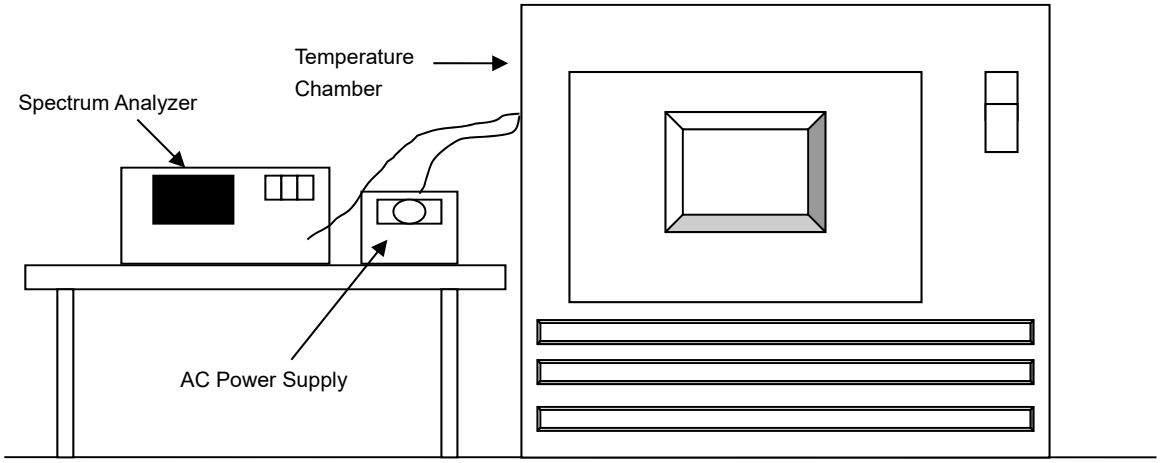


4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
Standard Temperature And Humidity Chamber	MHU-225AU	920842	May 28, 2020	May 27, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2020	Jun. 22, 2021
AC Power Supply Extech	CFW-105	E000603	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
50	120	5259.9943	PASS	5259.9930	PASS	5259.9932	PASS	5259.9970	PASS
40	120	5259.9818	PASS	5259.9817	PASS	5259.9820	PASS	5259.9862	PASS
30	120	5260.0156	PASS	5260.0176	PASS	5260.0180	PASS	5260.0198	PASS
20	120	5260.0101	PASS	5260.0074	PASS	5260.0082	PASS	5260.0088	PASS
10	120	5259.9898	PASS	5259.9898	PASS	5259.9889	PASS	5259.9874	PASS
0	120	5260.0000	PASS	5259.9984	PASS	5260.0000	PASS	5259.9993	PASS
-10	120	5260.0131	PASS	5260.0114	PASS	5260.0146	PASS	5260.0118	PASS
-20	120	5259.9884	PASS	5259.9859	PASS	5259.9844	PASS	5259.9864	PASS
-30	120	5260.0005	PASS	5260.0045	PASS	5260.0019	PASS	5260.0007	PASS

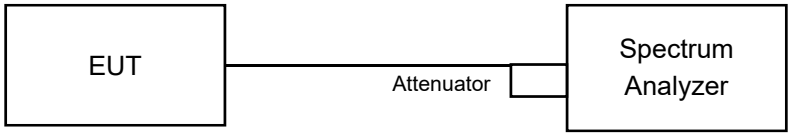
Frequency Stability Versus Voltage									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5260.0091	PASS	5260.0078	PASS	5260.0075	PASS	5260.0094	PASS
	120	5260.0101	PASS	5260.0074	PASS	5260.0082	PASS	5260.0088	PASS
	102	5260.0096	PASS	5260.0075	PASS	5260.0072	PASS	5260.0084	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

Measurement Procedure REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 For U-NII-3	3.15	3.15	0.5	Pass

802.11ac (VHT20)

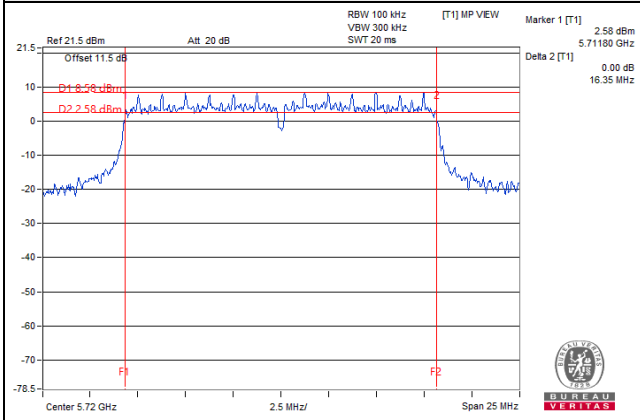
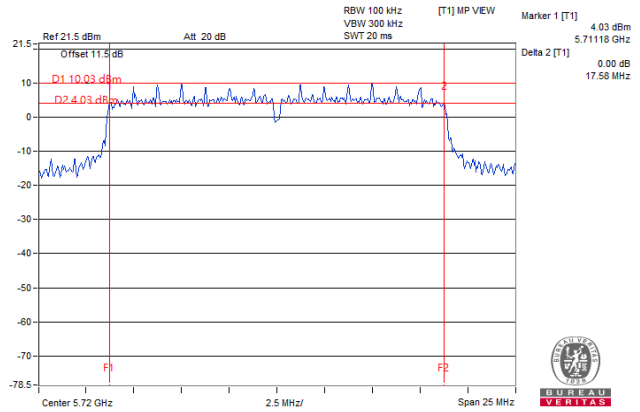
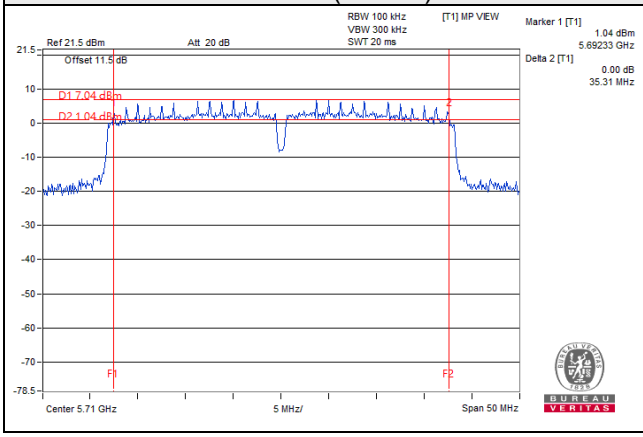
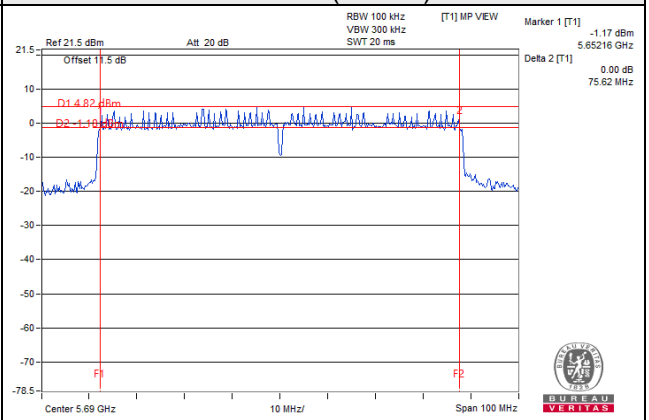
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 For U-NII-3	3.76	3.77	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710 For U-NII-3	2.65	2.64	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690 For U-NII-3	2.78	2.80	0.5	Pass

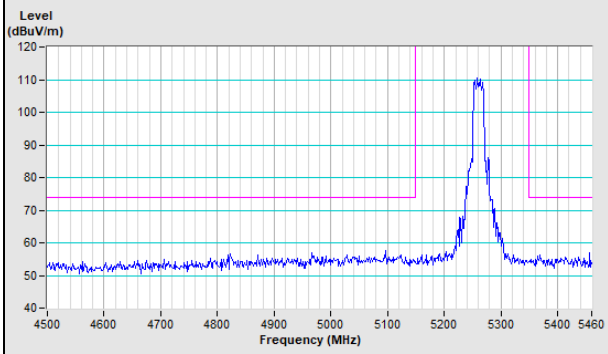
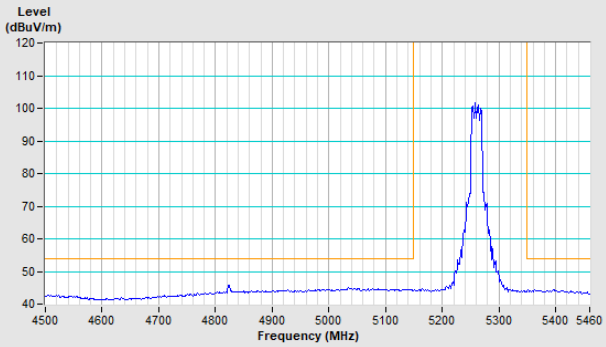
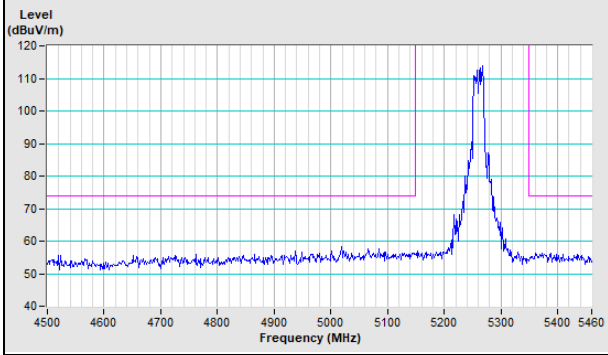
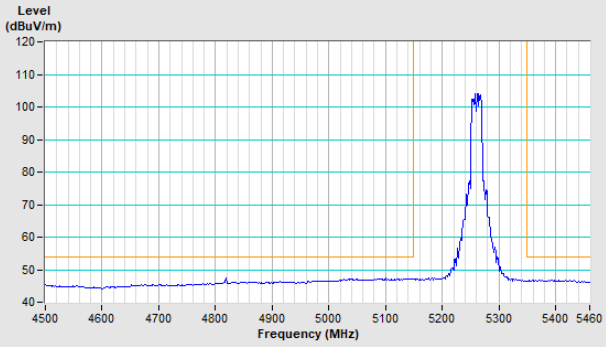
Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	

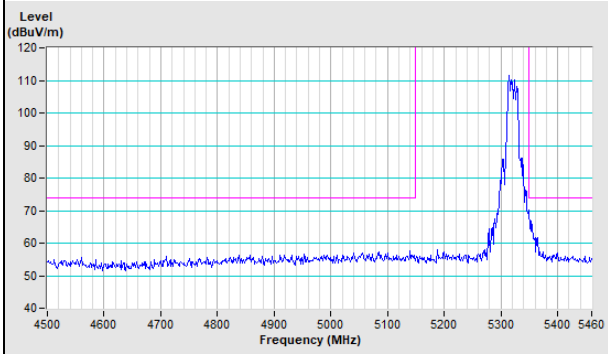
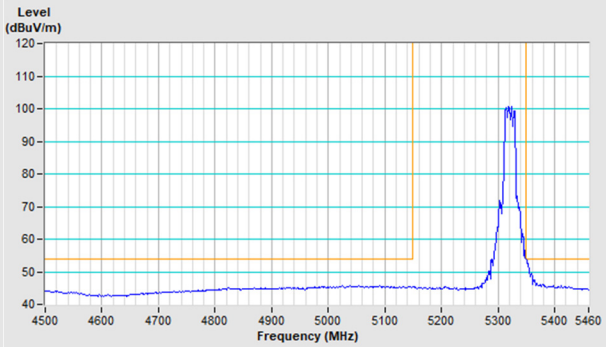
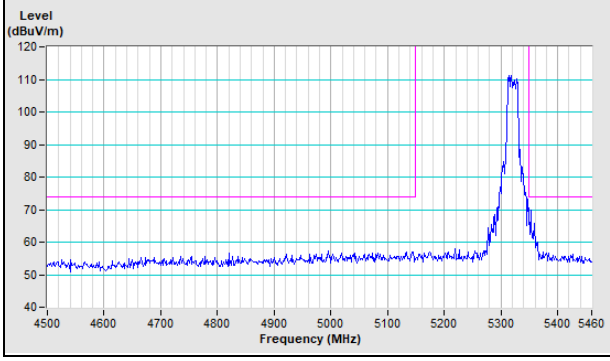
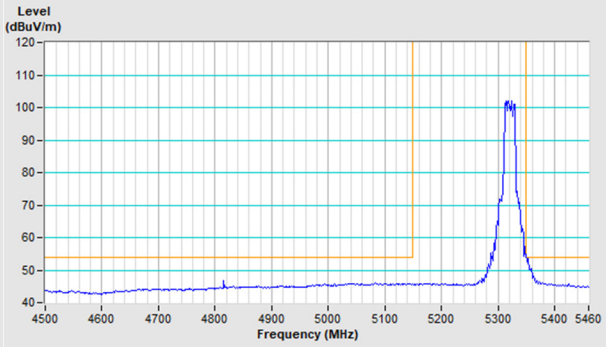
*802.11a: Ch 144 (5720MHz for U-NII-3): 16.35-(5725-5711.80) = 3.15
*802.11ac (VHT20): Ch 144 (5720MHz for U-NII-3): 17.58-(5725-5711.18) = 3.76
*802.11ac (VHT40): Ch 142 (5710MHz for U-NII-3): 35.31-(5725-5692.33) = 2.64
*802.11ac (VHT80): Ch 138 (5690MHz for U-NII-3): 75.62-(5725-5652.16) = 2.78

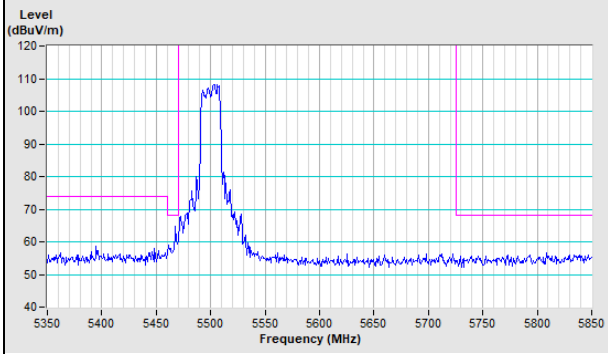
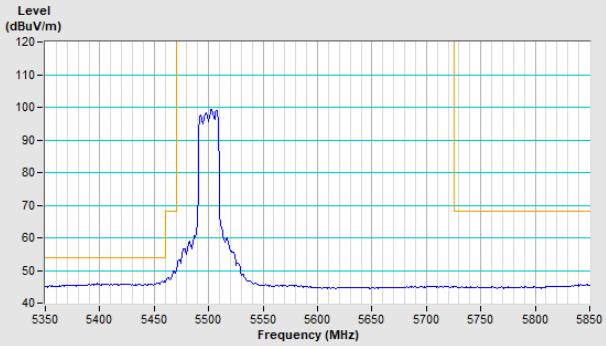
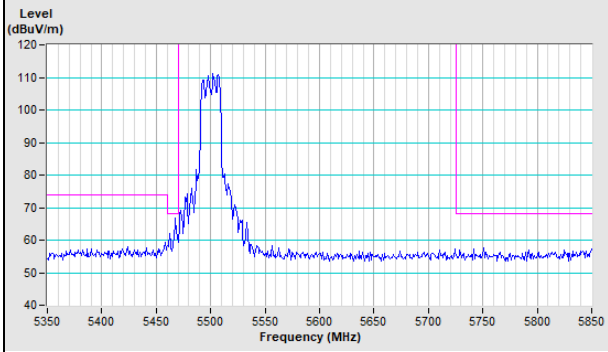
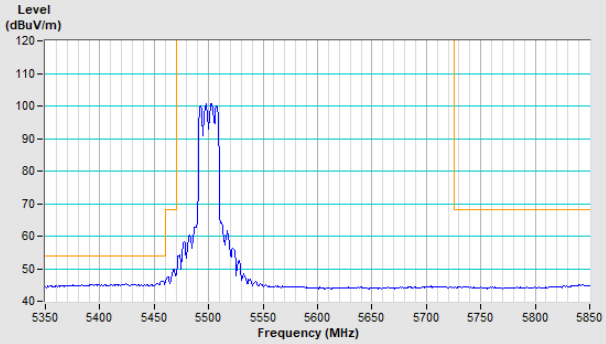
5 Pictures of Test Arrangements

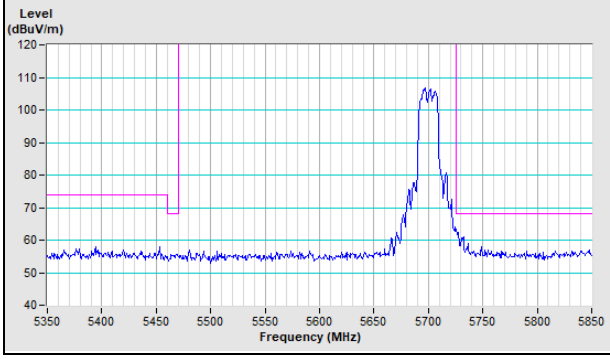
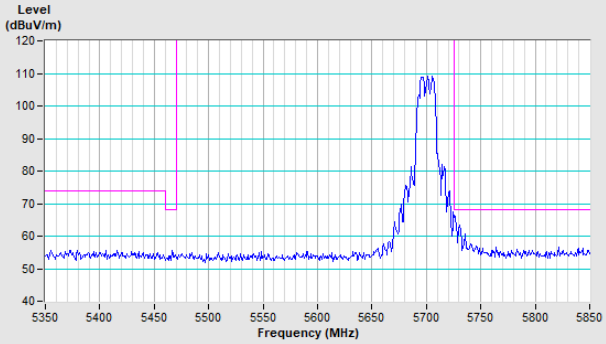
Please refer to the attached file (Test Setup Photo).

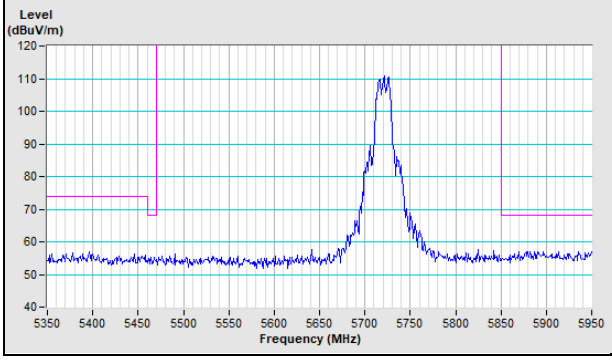
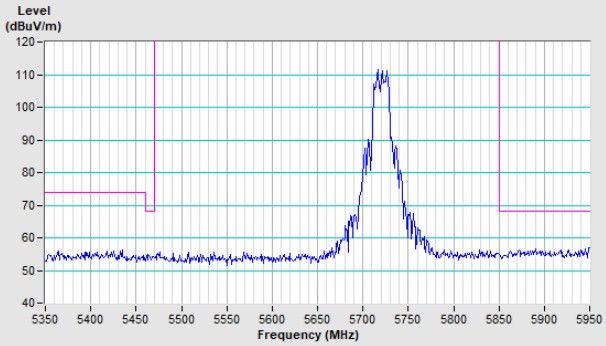
Annex A- Band Edge Measurement

802.11a Channel 52	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11a Channel 64	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

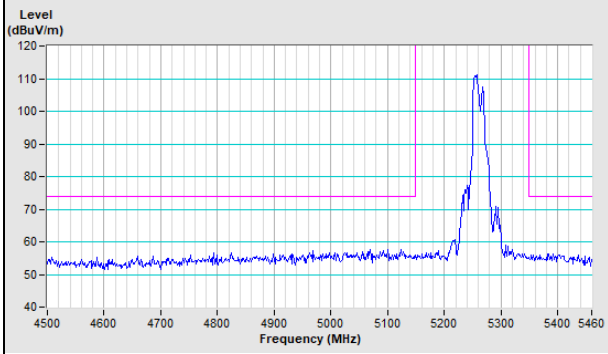
802.11a Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11a Channel 140	
Horizontal (Peak)	Vertical (Peak)
	

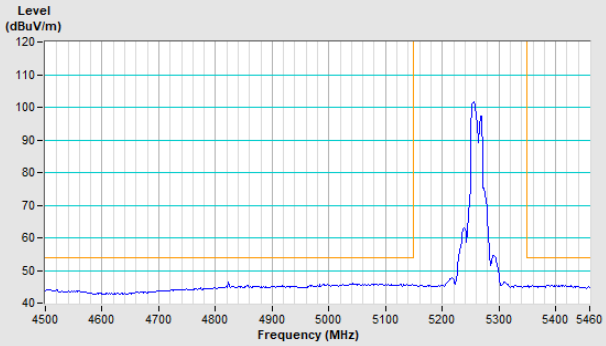
802.11a Channel 144	
Horizontal (Peak)	Vertical (Peak)
	

802.11ac (VHT20) Channel 52

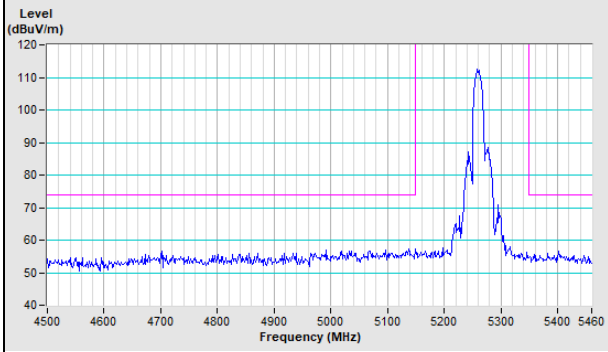
Horizontal (Peak)



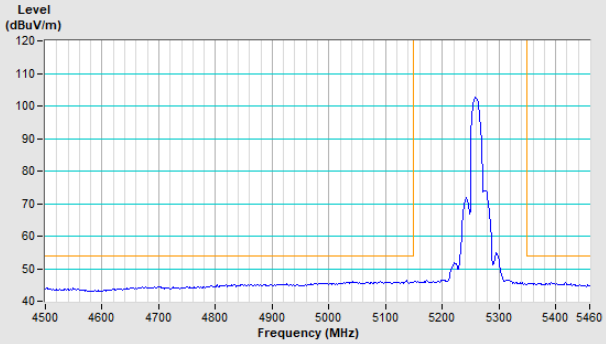
Horizontal (Average)



Vertical (Peak)

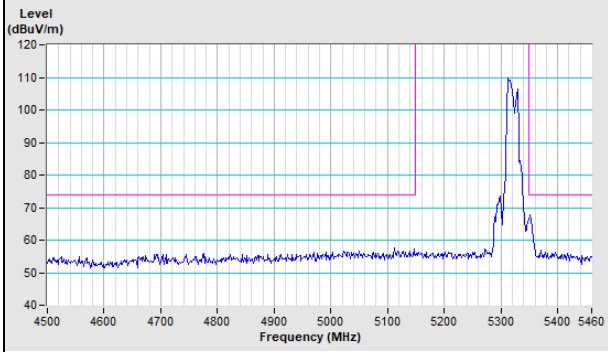


Vertical (Average)

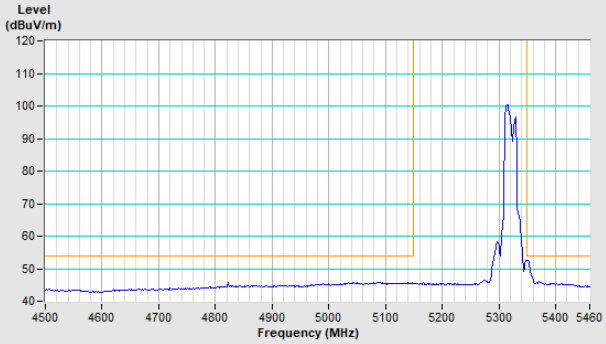


802.11ac (VHT20) Channel 64

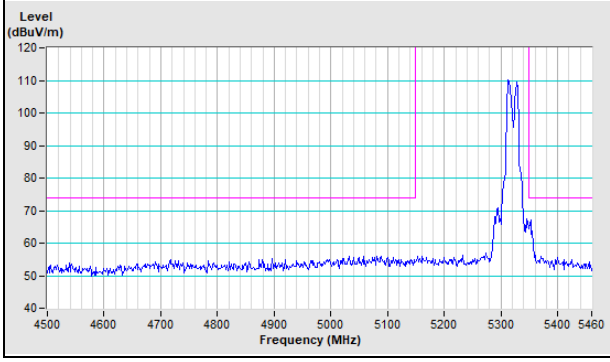
Horizontal (Peak)



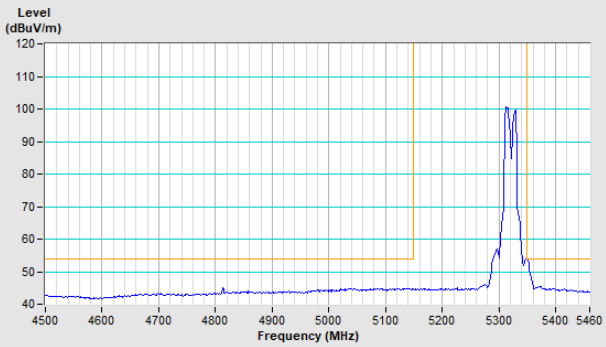
Horizontal (Average)

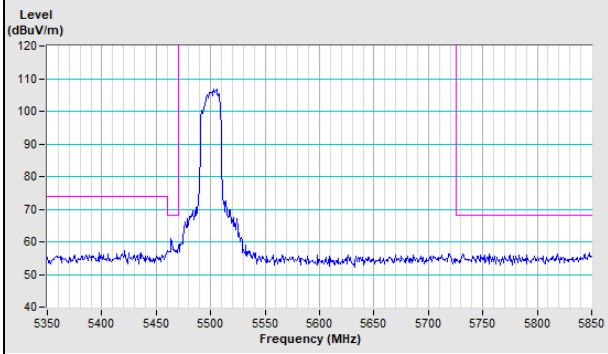
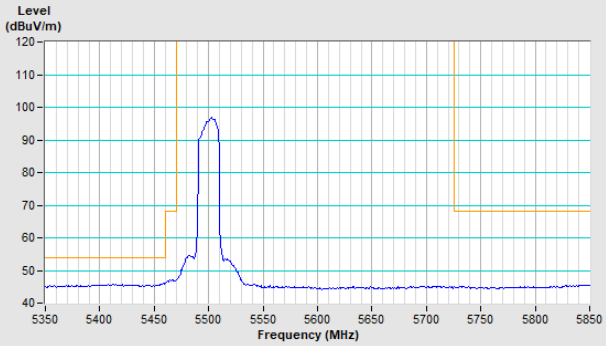
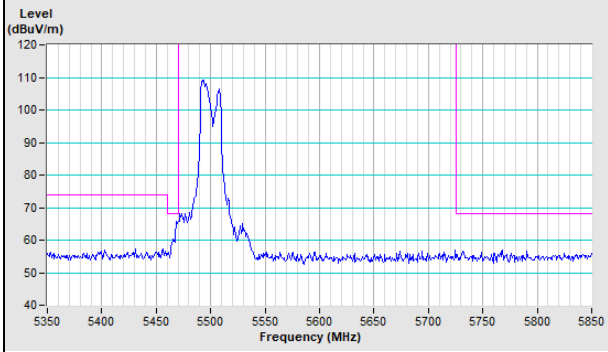
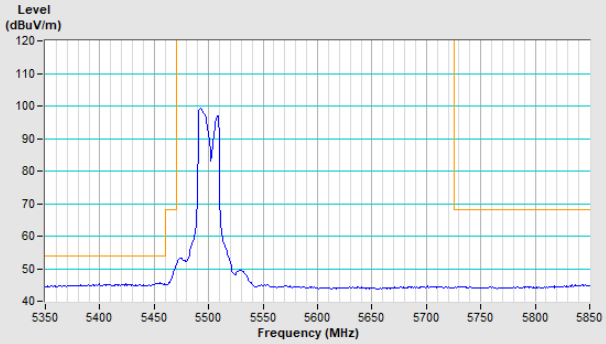


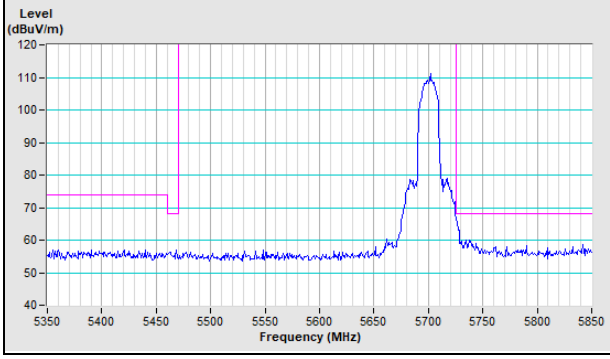
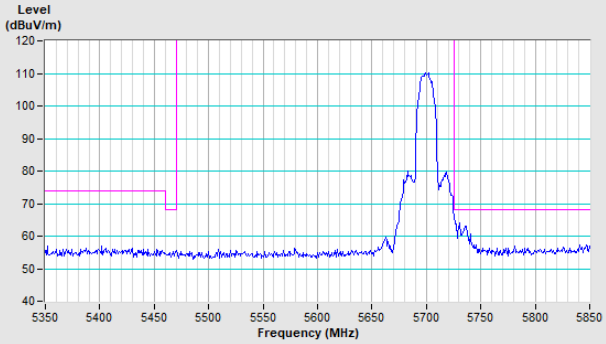
Vertical (Peak)

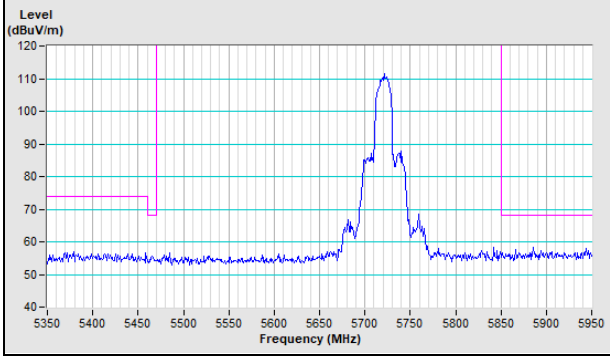
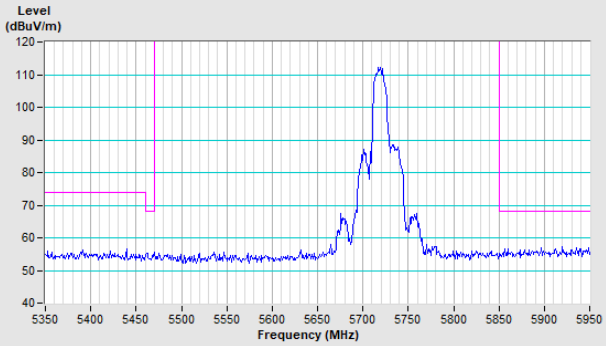


Vertical (Average)



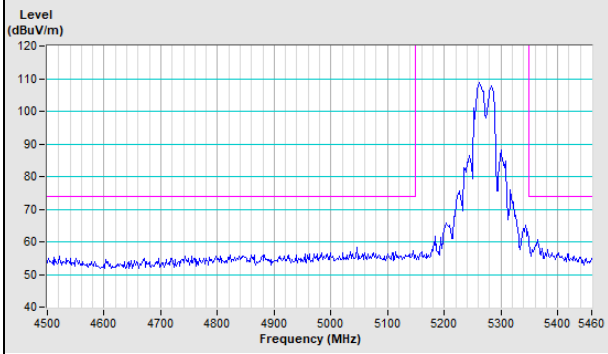
802.11ac (VHT20) Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT20) Channel 140	
Horizontal (Peak)	Vertical (Peak)
	

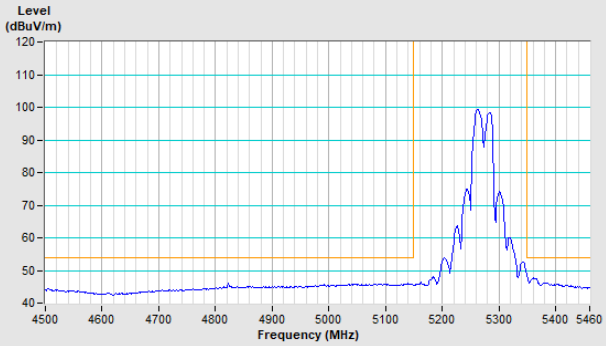
802.11ac (VHT20) Channel 144	
Horizontal (Peak)	Vertical (Peak)
	

802.11ac (VHT40) Channel 54

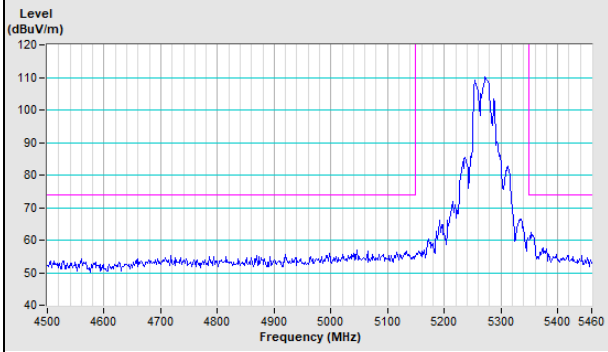
Horizontal (Peak)



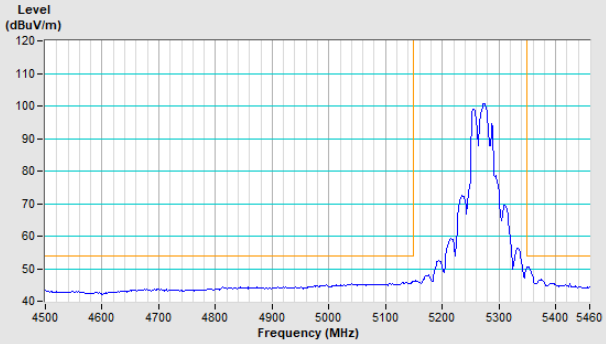
Horizontal (Average)



Vertical (Peak)

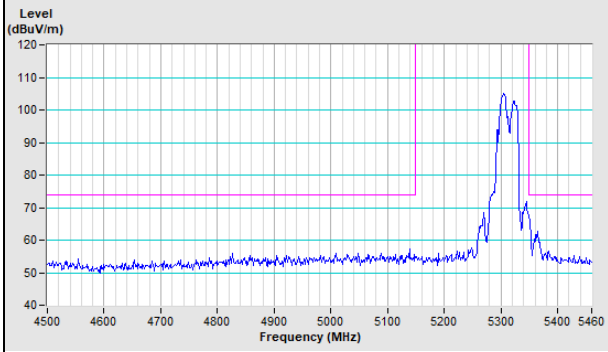


Vertical (Average)

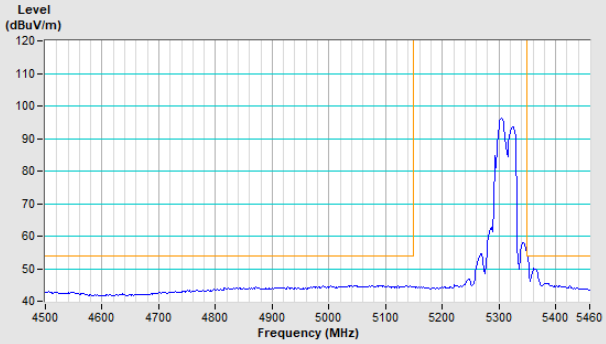


802.11ac (VHT40) Channel 62

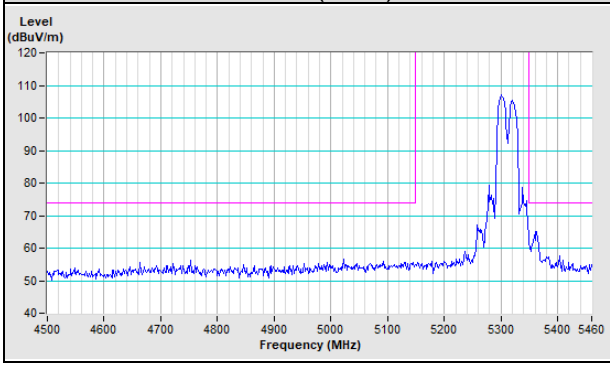
Horizontal (Peak)



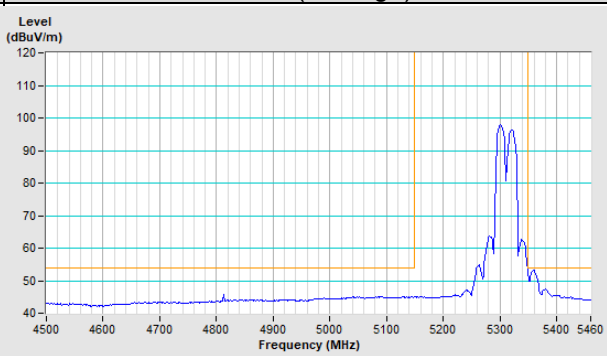
Horizontal (Average)

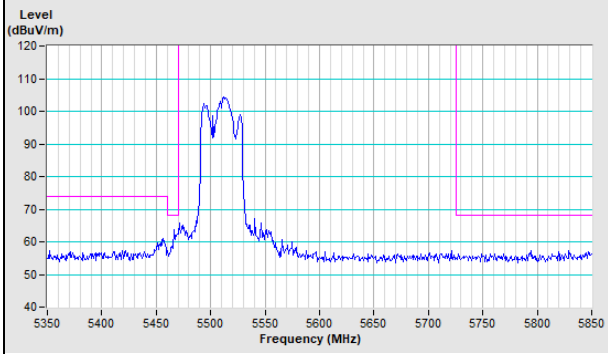
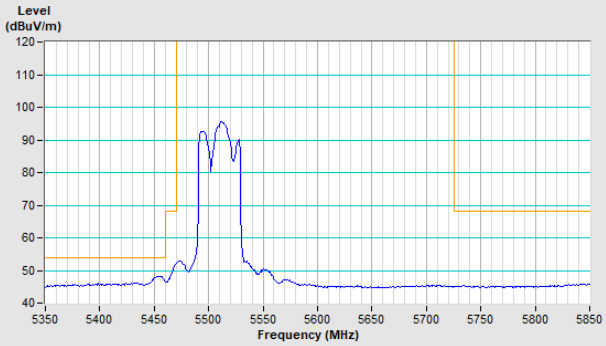
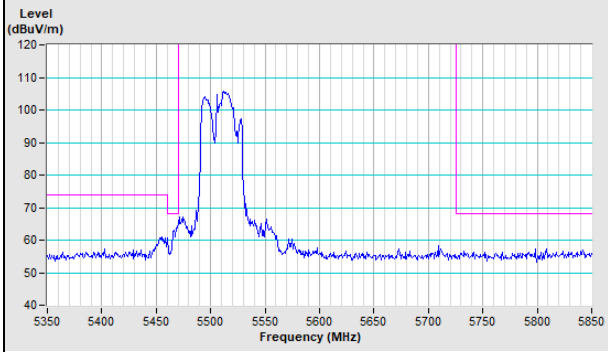
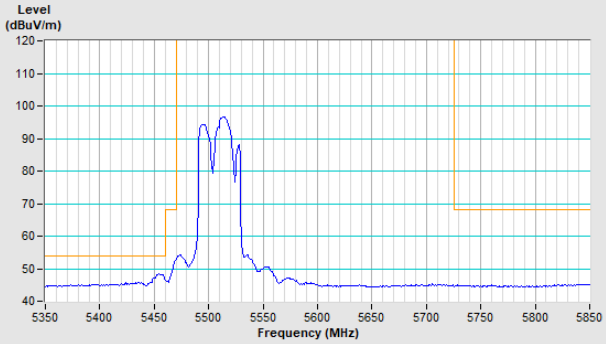


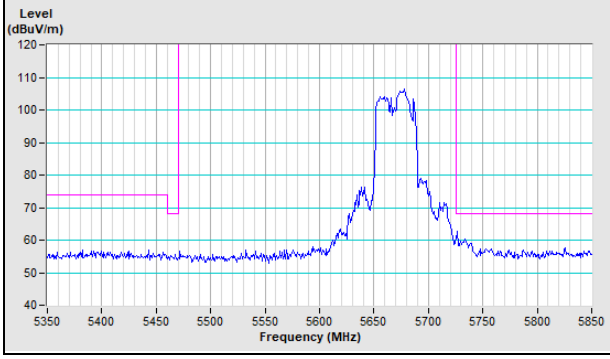
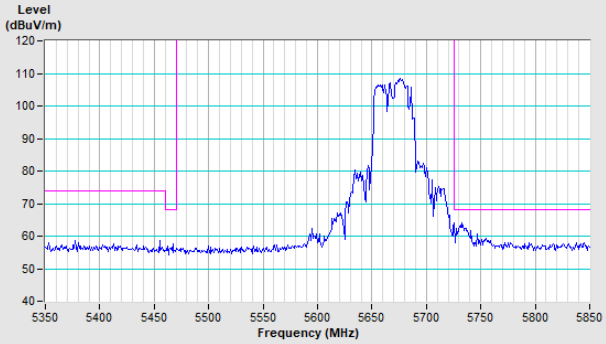
Vertical (Peak)

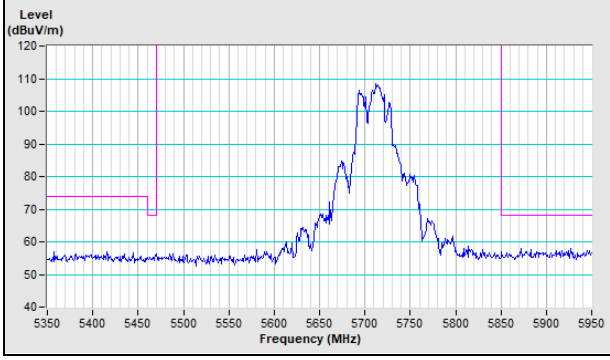
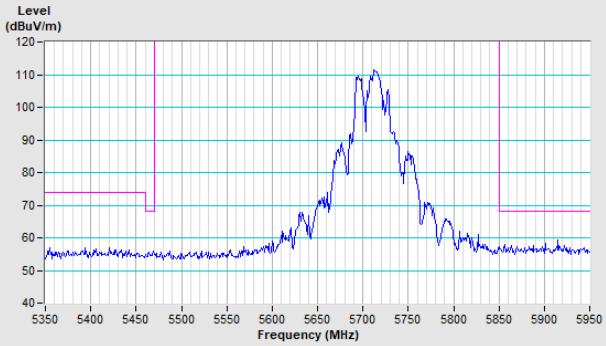


Vertical (Average)



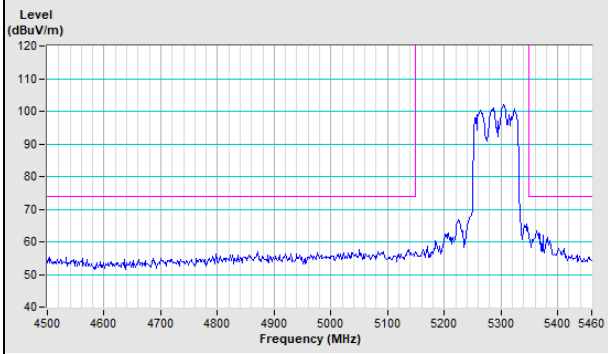
802.11ac (VHT40) Channel 102	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT40) Channel 134	
Horizontal (Peak)	Vertical (Peak)
	

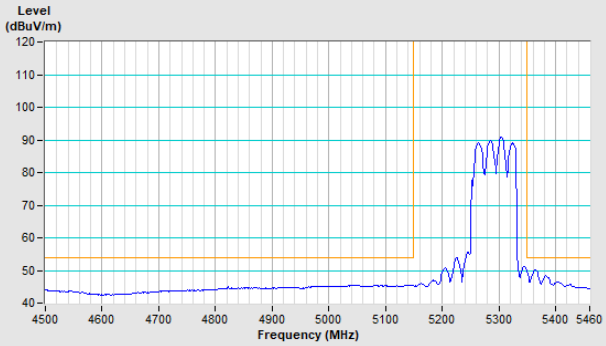
802.11ac (VHT40) Channel 142	
Horizontal (Peak)	Vertical (Peak)
	

802.11ac (VHT80) Channel 58

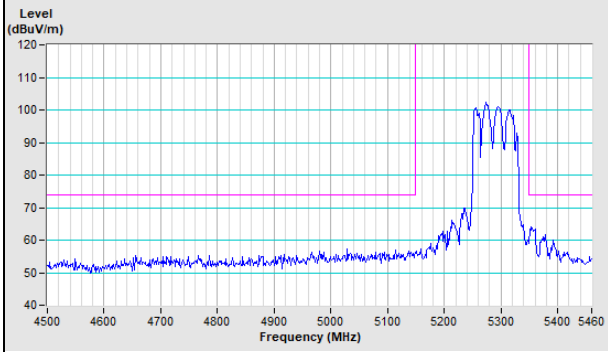
Horizontal (Peak)



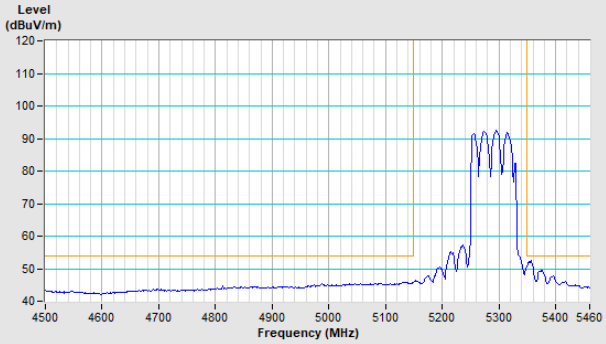
Horizontal (Average)



Vertical (Peak)

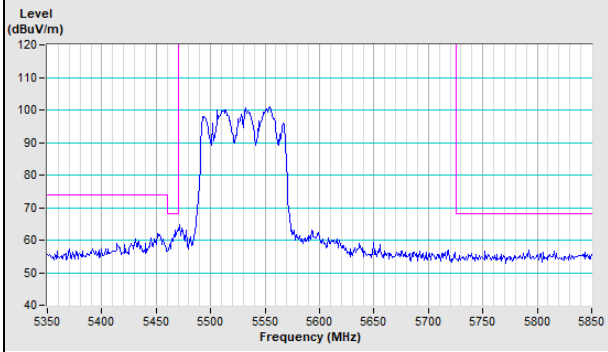


Vertical (Average)

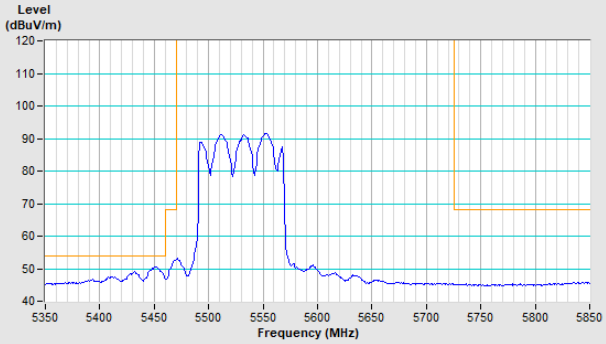


802.11ac (VHT80) Channel 106

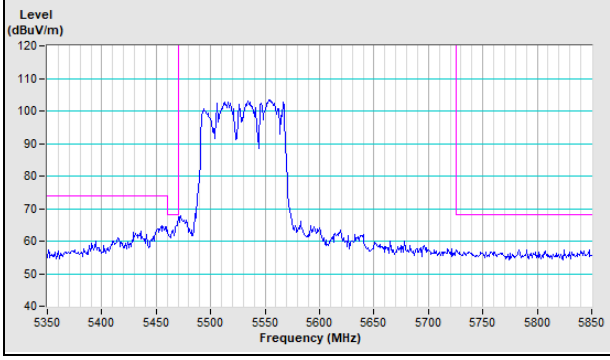
Horizontal (Peak)



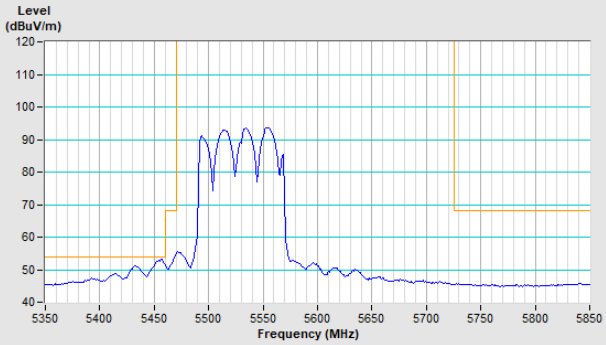
Horizontal (Average)

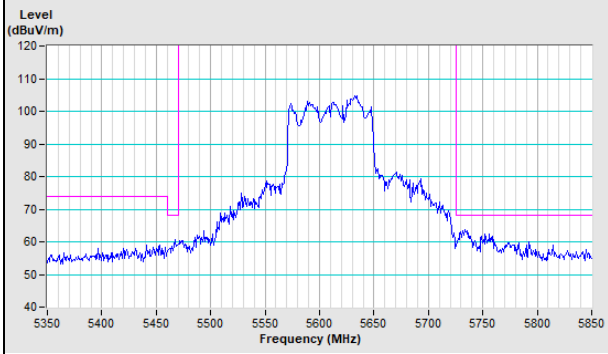
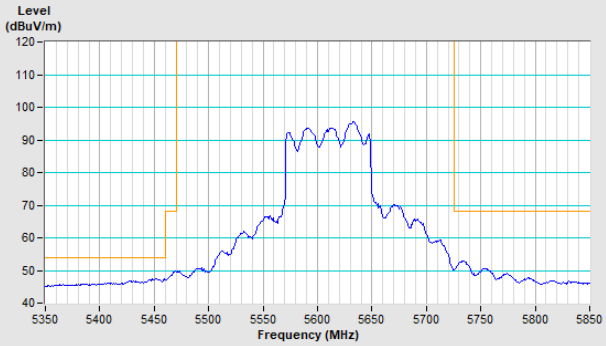
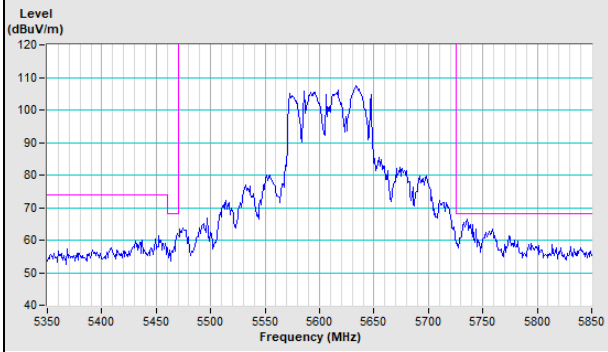
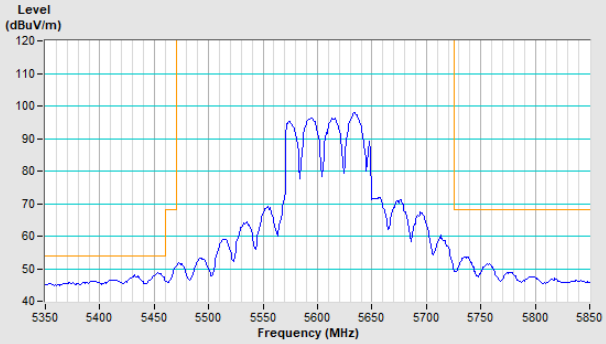


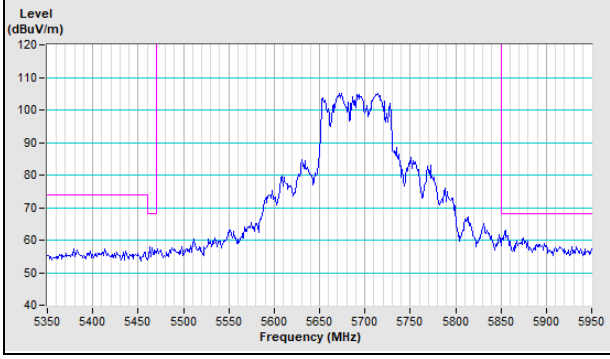
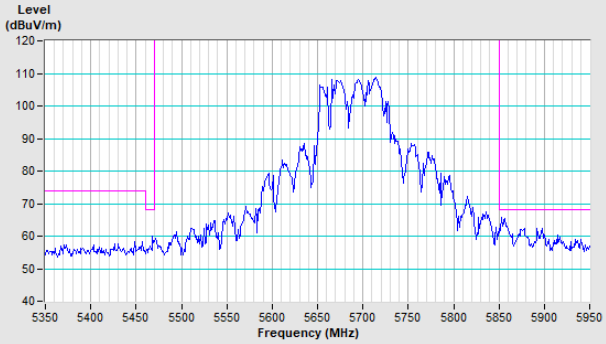
Vertical (Peak)



Vertical (Average)



802.11ac (VHT80) Channel 122	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT80) Channel 138	
Horizontal (Peak)	Vertical (Peak)
	

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 and approved according to ISO/IEC 17025.

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

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Web Site: www.bureauveritas-adt.com

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

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