

FCC Test Report

Report No.: RFBCUG-WTW-P21050577

FCC ID: B32M400WIFIBT

Test Model: M400 WIFI/BT

Received Date: May 14, 2021

Test Date: May 25 ~ Jun. 29, 2021

Issued Date: Jul. 09, 2021

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



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Release Control Record

Issue No.	Description	Date Issued
RFBCUG-WTW-P21050577	Original release	Jul. 09, 2021

1 Certificate of Conformity

Product: Point of Sale Terminal
Brand: Verifone
Test Model: M400 WIFI/BT
Sample Status: Production unit
Applicant: Verifone, Inc.
Test Date: May 25 ~ Jun. 29, 2021
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 : Celine Chou , **Date:** Jul. 09, 2021
Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Jul. 09, 2021
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)(8)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -30.08dB at 0.36896MHz.
15.407(b)(1/2/3/4(i/ii)/8)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -4.60dB at 49.40MHz.
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	No antenna connector is used.

Note:

- For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
- For U-NII-1, 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 B. Test Procedures refer to report 4.1.3.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.93 dB
	30MHz ~ 200MHz	2.95 dB
	200MHz ~ 1000MHz	2.26 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.94 dB
	18GHz ~ 40GHz	2.93 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Point of Sale Terminal
Brand	Verifone
Test Model	M400 WIFI/BT
Sample Status	Production unit
Power Supply Rating	12Vdc from adapter
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 150Mbps 802.11ac: up to 433.3Mbps
Operating Frequency	5180 ~ 5240MHz, 5260 ~ 5320MHz, 5500 ~ 5700MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5260 ~ 5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500 ~ 5700MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 11 802.11n (HT40), 802.11ac (VHT40): 5 802.11ac (VHT80): 2 5745 ~ 5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	5180 ~ 5240MHz: 9.683mW 5260 ~ 5320MHz: 9.594mW 5500 ~ 5700MHz: 14.421mW 5745 ~ 5825MHz: 12.162mW
Antenna Type	Internal PCB antenna with 3dBi gain
Antenna Connector	NA
Accessory Device	Adapter
Data Cable Supplied	1.5m shielded cable with one core (Brand: Verifone, Model: M400BAS)

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (Test Performed by: Intertek Testing Services, Report No.: 102971715MPK-003A, 102971715MPK-003B, 102971715MPK-003C, 102971715MPK-003D) is adding 802.11ac mode by software.

2. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11a	1TX
802.11n (HT20)	1TX
802.11n (HT40)	1TX
802.11ac (VHT20)	1TX
802.11ac (VHT40)	1TX
802.11ac (VHT80)	1TX

3. The EUT consumes power from the following adapter

Adapter	
Brand	Verifone
Model	2AAJ012F US
Input Power	100-240Vac, 50/60Hz, 0.35A
Output Power	12Vdc, 1A
Power Line	1.8m shielded DC power cable with one core attach on adapter

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

3.2 Description of Test Modes

For 5180 ~ 5240MHz:

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

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

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 ~ 5700MHz:

11 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		

5 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		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

For 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where RE $\geq$ 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 for U-NII-1 Band and Y-plane for U-NII-3 Band**.
- Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

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)
-	802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	7.2
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	15.0
	802.11ac (VHT80)		42	42	OFDM	32.5
-	802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	7.2
	802.11ac (VHT40)		54 to 62	54, 62	OFDM	15.0
	802.11ac (VHT80)		58	58	OFDM	32.5
-	802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	7.2
	802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	15.0
	802.11ac (VHT80)		106 to 122	106, 122	OFDM	32.5
-	802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	7.2
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	15.0
	802.11ac (VHT80)		155	155	OFDM	32.5

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)
-	802.11ac (VHT80)	5180-5240	42	42	OFDM	32.5
-	802.11ac (VHT80)	5260-5320	58		OFDM	32.5
-	802.11ac (VHT80)	5500-5700	106 to 122		OFDM	32.5
-	802.11ac (VHT80)	5745-5825	155		OFDM	32.5

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11ac (VHT80)	5180-5240	42	42	OFDM	32.5
-	802.11ac (VHT80)	5260-5320	58		OFDM	32.5
-	802.11ac (VHT80)	5500-5700	106 to 122		OFDM	32.5
-	802.11ac (VHT80)	5745-5825	155		OFDM	32.5

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	7.2
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	15.0
	802.11ac (VHT80)		42	42	OFDM	32.5
-	802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	7.2
	802.11ac (VHT40)		54 to 62	54, 62	OFDM	15.0
	802.11ac (VHT80)		58	58	OFDM	32.5
-	802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	7.2
	802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	15.0
	802.11ac (VHT80)		106 to 122	106, 122	OFDM	32.5
-	802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	7.2
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	15.0
	802.11ac (VHT80)		155	155	OFDM	32.5

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65% RH	120Vac, 60Hz (System)	Cookie Ku, Tim Chen
RE<1G	25 deg. C, 65% RH	120Vac, 60Hz (System)	Tim Chen
PLC	23 deg. C, 66% RH	120Vac, 60Hz (System)	Cookie Ku
APCM	25 deg. C, 60% RH	12Vdc	Chris Lin

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98%, duty factor is required.

802.11ac (VHT20): Duty cycle = $1.340/1.447 = 0.926$, Duty factor = $10 * \log(1/0.926) = 0.33$

802.11ac (VHT40): Duty cycle = $0.966/1.079 = 0.895$, Duty factor = $10 * \log(1/0.895) = 0.48$

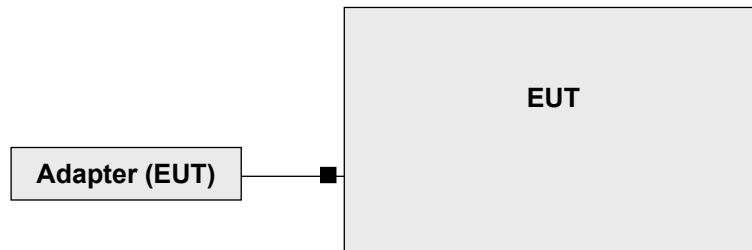
802.11ac (VHT80): Duty cycle = $0.327/0.432 = 0.757$, Duty factor = $10 * \log(1/0.757) = 1.21$



3.4 Description of Support Units

The EUT has been tested as an independent unit.

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10:2013

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

References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

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 (dBuV/m)	AV: 54 (dBuV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2(dBuV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBuV/m) ^{*1} PK: 105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK: 122.2 (dBuV/m) ^{*4}
^{*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:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 07, 2020	Dec. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 22, 2020	Nov. 21, 2021
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 06, 2020	Nov. 05, 2021
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Loop Antenna	EM-6879	269	Sep. 17, 2020	Sep. 16, 2021
Preamplifier EMCI	EMC001340	980201	Oct. 21, 2020	Oct. 20, 2021
Preamplifier EMCI	EMC 012645	980115	Oct. 07, 2020	Oct. 06, 2021
Preamplifier EMCI	EMC 184045	980116	Oct. 07, 2020	Oct. 06, 2021
Preamplifier EMCI	EMC 330H	980112	Oct. 07, 2020	Oct. 06, 2021
RF Coaxial Cable EMCI	EMC104-SM-SM-800 0	171005	Oct. 07, 2020	Oct. 06, 2021
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000 (140807)	Oct. 07, 2020	Oct. 06, 2021
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 07, 2020	Oct. 06, 2021
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100980	Apr. 14, 2021	Apr. 13, 2022
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY5519 0004/MY55190007/MY 55210005	Jul. 13, 2020	Jul. 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 10.

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:

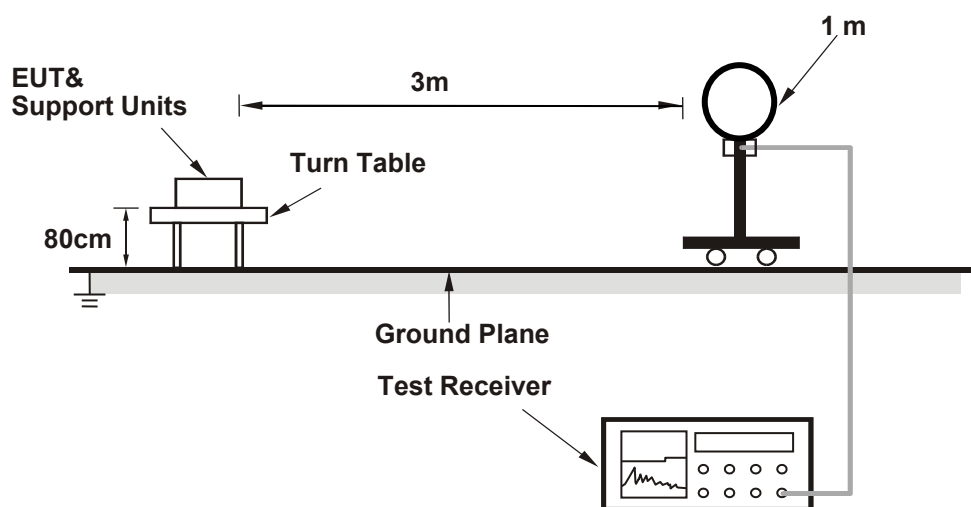
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
(802.11ac (VHT20): RBW = 1MHz, VBW = 1kHz; 802.11ac (VHT40): RBW = 1MHz, VBW = 3kHz;
802.11ac (VHT80): RBW = 1MHz, VBW = 10kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

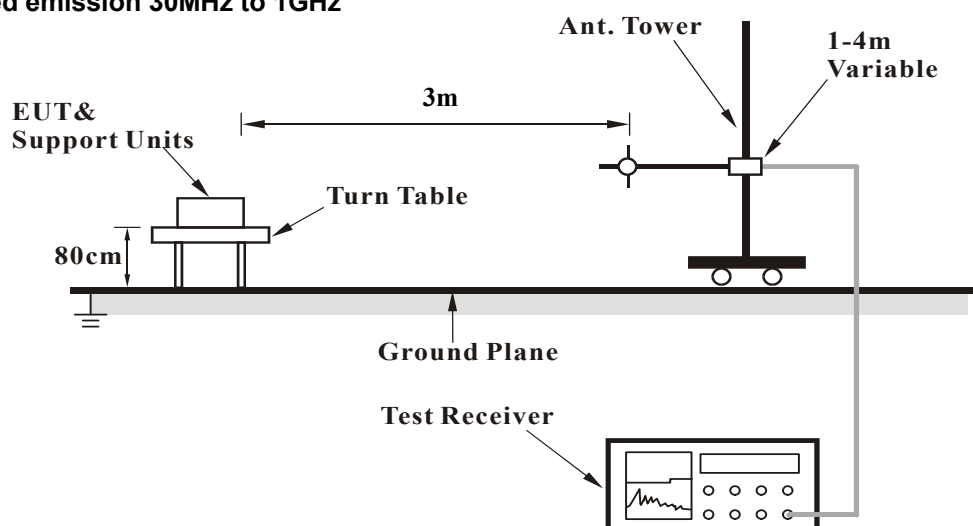
No deviation.

4.1.5 Test Setup

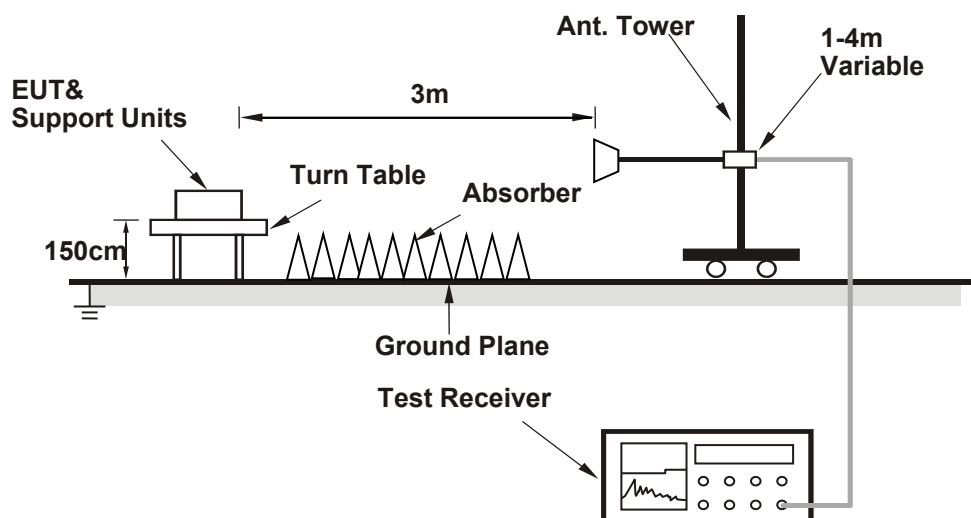
For Radiated emission below 30MHz



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

- Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz data:

802.11ac (VHT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.21	41.08	-0.87	54.00	-13.79	196	54	Average
5150.00	50.36	51.23	-0.87	74.00	-23.64	196	54	Peak
5180.00	86.87	87.77	-0.90			196	54	Average
5180.00	93.21	94.11	-0.90			196	54	Peak
*10360.00	50.57	55.51	-4.94	68.20	-17.63	145	296	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.20	41.07	-0.87	54.00	-13.80	100	130	Average
5150.00	49.62	50.49	-0.87	74.00	-24.38	100	130	Peak
5180.00	86.59	87.49	-0.90			100	130	Average
5180.00	92.72	93.62	-0.90			100	130	Peak
*10360.00	51.00	55.94	-4.94	68.20	-17.20	128	237	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5180 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 40	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.33	41.20	-0.87	54.00	-13.67	204	54	Average
5150.00	49.54	50.41	-0.87	74.00	-24.46	204	54	Peak
5200.00	86.84	87.77	-0.93			204	54	Average
5200.00	92.91	93.84	-0.93			204	54	Peak
*10400.00	52.21	57.04	-4.83	68.20	-15.99	104	329	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.10	40.97	-0.87	54.00	-13.90	100	133	Average
5150.00	50.18	51.05	-0.87	74.00	-23.82	100	133	Peak
5200.00	85.96	86.89	-0.93			100	133	Average
5200.00	91.95	92.88	-0.93			100	133	Peak
*10400.00	52.64	57.47	-4.83	68.20	-15.56	162	87	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5200 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.20	41.07	-0.87	54.00	-13.80	202	53	Average
5150.00	50.26	51.13	-0.87	74.00	-23.74	202	53	Peak
5240.00	87.27	88.41	-1.14			202	53	Average
5240.00	93.29	94.43	-1.14			202	53	Peak
5350.00	39.01	40.14	-1.13	54.00	-14.99	202	53	Average
5350.00	48.78	49.91	-1.13	74.00	-25.22	202	53	Peak
*10480.00	52.58	56.95	-4.37	68.20	-15.62	189	204	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.13	41.00	-0.87	54.00	-13.87	100	125	Average
5150.00	49.34	50.21	-0.87	74.00	-24.66	100	125	Peak
5240.00	86.22	87.36	-1.14			100	125	Average
5240.00	92.31	93.45	-1.14			100	125	Peak
5350.00	39.10	40.23	-1.13	54.00	-14.90	100	125	Average
5350.00	48.10	49.23	-1.13	74.00	-25.90	100	125	Peak
*10480.00	52.77	57.14	-4.37	68.20	-15.43	139	283	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.20	41.07	-0.87	54.00	-13.80	213	54	Average
5150.00	50.10	50.97	-0.87	74.00	-23.90	213	54	Peak
5260.00	86.50	87.81	-1.31			213	54	Average
5260.00	92.58	93.89	-1.31			213	54	Peak
5350.00	39.16	40.29	-1.13	54.00	-14.84	213	54	Average
5350.00	47.54	48.67	-1.13	74.00	-26.46	213	54	Peak
*10520.00	52.38	56.61	-4.23	68.20	-15.82	113	68	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.25	41.12	-0.87	54.00	-13.75	112	139	Average
5150.00	49.88	50.75	-0.87	74.00	-24.12	112	139	Peak
5260.00	85.82	87.13	-1.31			112	139	Average
5260.00	92.09	93.40	-1.31			112	139	Peak
5350.00	38.98	40.11	-1.13	54.00	-15.02	112	139	Average
5350.00	48.11	49.24	-1.13	74.00	-25.89	112	139	Peak
*10520.00	52.79	57.02	-4.23	68.20	-15.41	156	229	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5300.00	86.08	87.47	-1.39			209	54	Average
5300.00	92.32	93.71	-1.39			209	54	Peak
5350.00	39.04	40.17	-1.13	54.00	-14.96	209	54	Average
5350.00	47.84	48.97	-1.13	74.00	-26.16	209	54	Peak
10600.00	45.22	49.54	-4.32	54.00	-8.78	159	264	Average
10600.00	52.45	56.77	-4.32	74.00	-21.55	159	264	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5300.00	85.94	87.33	-1.39			100	139	Average
5300.00	91.83	93.22	-1.39			100	139	Peak
5350.00	39.08	40.21	-1.13	54.00	-14.92	100	139	Average
5350.00	47.81	48.94	-1.13	74.00	-26.19	100	139	Peak
10600.00	45.16	49.48	-4.32	54.00	-8.84	245	106	Average
10600.00	52.37	56.69	-4.32	74.00	-21.63	245	106	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320.00	86.41	87.72	-1.31			209	52	Average
5320.00	92.02	93.33	-1.31			209	52	Peak
5350.00	39.08	40.21	-1.13	54.00	-14.92	209	52	Average
5350.00	48.37	49.50	-1.13	74.00	-25.63	209	52	Peak
10640.00	46.10	50.40	-4.30	54.00	-7.90	152	304	Average
10640.00	53.31	57.61	-4.30	74.00	-20.69	152	304	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320.00	85.20	86.51	-1.31			100	122	Average
5320.00	91.94	93.25	-1.31			100	122	Peak
5350.00	39.13	40.26	-1.13	54.00	-14.87	100	122	Average
5350.00	47.74	48.87	-1.13	74.00	-26.26	100	122	Peak
10640.00	45.32	49.62	-4.30	54.00	-8.68	138	261	Average
10640.00	52.53	56.83	-4.30	74.00	-21.47	138	261	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.47	40.35	-0.88	54.00	-14.53	108	336	Average
5460.00	49.52	50.40	-0.88	74.00	-24.48	108	336	Peak
*5470.00	50.65	51.53	-0.88	68.20	-17.55	108	336	Peak
5500.00	87.01	87.86	-0.85			108	336	Average
5500.00	92.93	93.78	-0.85			108	336	Peak
*5725.00	49.80	50.74	-0.94	68.20	-18.40	108	336	Peak
11000.00	46.55	50.09	-3.54	54.00	-7.45	183	49	Average
11000.00	53.78	57.32	-3.54	74.00	-20.22	183	49	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.55	40.43	-0.88	54.00	-14.45	100	192	Average
5460.00	49.39	50.27	-0.88	74.00	-24.61	100	192	Peak
*5470.00	50.14	51.02	-0.88	68.20	-18.06	100	192	Peak
5500.00	87.59	88.44	-0.85			100	192	Average
5500.00	93.07	93.92	-0.85			100	192	Peak
*5725.00	49.92	50.86	-0.94	68.20	-18.28	100	192	Peak
11000.00	45.87	49.41	-3.54	54.00	-8.13	108	271	Average
11000.00	53.10	56.64	-3.54	74.00	-20.90	108	271	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.28	40.16	-0.88	54.00	-14.72	200	107	Average
5460.00	49.65	50.53	-0.88	74.00	-24.35	200	107	Peak
*5470.00	48.40	49.28	-0.88	68.20	-19.80	200	107	Peak
5580.00	87.90	88.89	-0.99			200	107	Average
5580.00	93.92	94.91	-0.99			200	107	Peak
*5725.00	50.44	51.38	-0.94	68.20	-17.76	200	107	Peak
11160.00	44.51	48.20	-3.69	54.00	-9.49	128	311	Average
11160.00	51.69	55.38	-3.69	74.00	-22.31	128	311	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.13	40.01	-0.88	54.00	-14.87	100	197	Average
5460.00	49.65	50.53	-0.88	74.00	-24.35	100	197	Peak
*5470.00	48.64	49.52	-0.88	68.20	-19.56	100	197	Peak
5580.00	88.66	89.65	-0.99			100	197	Average
5580.00	95.01	96.00	-0.99			100	197	Peak
*5725.00	49.22	50.16	-0.94	68.20	-18.98	100	197	Peak
11160.00	44.55	48.24	-3.69	54.00	-9.45	109	258	Average
11160.00	51.76	55.45	-3.69	74.00	-22.24	109	258	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5580 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.20	40.08	-0.88	54.00	-14.80	199	126	Average
5460.00	49.79	50.67	-0.88	74.00	-24.21	199	126	Peak
*5470.00	48.69	49.57	-0.88	68.20	-19.51	199	126	Peak
5700.00	87.16	88.20	-1.04			199	126	Average
5700.00	93.09	94.13	-1.04			199	126	Peak
*5725.00	50.09	51.03	-0.94	68.20	-18.11	199	126	Peak
11400.00	44.43	48.08	-3.65	54.00	-9.57	135	248	Average
11400.00	51.61	55.26	-3.65	74.00	-22.39	135	248	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.29	40.17	-0.88	54.00	-14.71	100	191	Average
5460.00	50.00	50.88	-0.88	74.00	-24.00	100	191	Peak
*5470.00	48.96	49.84	-0.88	68.20	-19.24	100	191	Peak
5700.00	88.28	89.32	-1.04			100	191	Average
5700.00	94.18	95.22	-1.04			100	191	Peak
*5725.00	51.35	52.29	-0.94	68.20	-16.85	100	191	Peak
11400.00	45.62	49.27	-3.65	54.00	-8.38	169	278	Average
11400.00	52.80	56.45	-3.65	74.00	-21.20	169	278	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5700 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745.00	87.20	88.11	-0.91			199	127	Average
5745.00	93.84	94.75	-0.91			199	127	Peak
11490.00	45.05	48.71	-3.66	54.00	-8.95	155	63	Average
11490.00	52.23	55.89	-3.66	74.00	-21.77	155	63	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745.00	87.89	88.80	-0.91			100	194	Average
5745.00	94.31	95.22	-0.91			100	194	Peak
11490.00	44.76	48.42	-3.66	54.00	-9.24	238	104	Average
11490.00	51.95	55.61	-3.66	74.00	-22.05	238	104	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5552.38	49.62	50.59	-0.97	68.20	-18.58	199	127	Peak
5651.18	48.49	49.37	-0.88	69.07	-20.58	199	127	Peak
5916.70	48.48	48.83	-0.35	74.32	-25.84	199	127	Peak
*5978.93	50.58	50.89	-0.31	68.20	-17.62	199	127	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5636.93	49.67	50.61	-0.94	68.20	-18.53	100	194	Peak
5651.18	49.08	49.96	-0.88	69.07	-19.99	100	194	Peak
5922.88	48.44	48.79	-0.35	69.77	-21.33	100	194	Peak
*6024.05	50.59	50.80	-0.21	68.20	-17.61	100	194	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5745 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785.00	86.65	87.48	-0.83			200	126	Average
5785.00	92.71	93.54	-0.83			200	126	Peak
11570.00	44.89	48.69	-3.80	54.00	-9.11	136	307	Average
11570.00	52.07	55.87	-3.80	74.00	-21.93	136	307	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785.00	86.89	87.72	-0.83			100	192	Average
5785.00	92.96	93.79	-0.83			100	192	Peak
11570.00	45.38	49.18	-3.80	54.00	-8.62	103	255	Average
11570.00	52.56	56.36	-3.80	74.00	-21.44	103	255	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5616.98	49.70	50.65	-0.95	68.20	-18.50	200	126	Peak
5651.18	49.00	49.88	-0.88	69.07	-20.07	200	126	Peak
5920.50	49.43	49.78	-0.35	71.52	-22.09	200	126	Peak
*5989.85	49.90	50.18	-0.28	68.20	-18.30	200	126	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5605.58	49.70	50.71	-1.01	68.20	-18.50	100	192	Peak
5658.78	49.60	50.54	-0.94	74.72	-25.12	100	192	Peak
5917.65	49.43	49.78	-0.35	73.62	-24.19	100	192	Peak
*5956.60	50.32	50.64	-0.32	68.20	-17.88	100	192	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5785 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825.00	86.25	86.85	-0.60			100	157	Average
5825.00	92.61	93.21	-0.60			100	157	Peak
11650.00	44.66	48.77	-4.11	54.00	-9.34	194	268	Average
11650.00	51.84	55.95	-4.11	74.00	-22.16	194	268	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825.00	87.60	88.20	-0.60			100	188	Average
5825.00	94.01	94.61	-0.60			100	188	Peak
11650.00	46.03	50.14	-4.11	54.00	-7.97	145	28	Average
11650.00	53.20	57.31	-4.11	74.00	-20.80	145	28	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5569.95	49.33	50.28	-0.95	68.20	-18.87	100	157	Peak
5656.88	49.32	50.26	-0.94	73.31	-23.99	100	157	Peak
5920.03	49.63	49.98	-0.35	71.87	-22.24	100	157	Peak
*6010.28	50.35	50.59	-0.24	68.20	-17.85	100	157	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5601.30	49.72	50.67	-0.95	68.20	-18.48	100	188	Peak
5654.98	49.16	50.10	-0.94	71.90	-22.74	100	188	Peak
5920.03	48.67	49.02	-0.35	71.87	-23.20	100	188	Peak
*5995.08	50.54	50.82	-0.28	68.20	-17.66	100	188	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5825 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

802.11ac (VHT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 38	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.90	41.77	-0.87	54.00	-13.10	205	100	Average
5150.00	49.78	50.65	-0.87	74.00	-24.22	205	100	Peak
5190.00	83.52	84.42	-0.90			205	100	Average
5190.00	90.50	91.40	-0.90			205	100	Peak
5350.00	39.78	40.91	-1.13	54.00	-14.22	205	100	Average
5350.00	48.69	49.82	-1.13	74.00	-25.31	205	100	Peak
*10380.00	51.89	56.77	-4.88	68.20	-16.31	155	243	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.86	41.73	-0.87	54.00	-13.14	128	208	Average
5150.00	49.81	50.68	-0.87	74.00	-24.19	128	208	Peak
5190.00	84.22	85.12	-0.90			128	208	Average
5190.00	91.42	92.32	-0.90			128	208	Peak
5350.00	39.66	40.79	-1.13	54.00	-14.34	128	208	Average
5350.00	48.28	49.41	-1.13	74.00	-25.72	128	208	Peak
*10380.00	52.21	57.09	-4.88	68.20	-15.99	102	104	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5190 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 46	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.85	41.72	-0.87	54.00	-13.15	202	107	Average
5150.00	49.29	50.16	-0.87	74.00	-24.71	202	107	Peak
5230.00	83.61	84.75	-1.14			202	107	Average
5230.00	89.90	91.04	-1.14			202	107	Peak
5350.00	39.57	40.70	-1.13	54.00	-14.43	202	107	Average
5350.00	48.18	49.31	-1.13	74.00	-25.82	202	107	Peak
*10460.00	53.09	57.63	-4.54	68.20	-15.11	103	262	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.78	41.65	-0.87	54.00	-13.22	100	219	Average
5150.00	50.05	50.92	-0.87	74.00	-23.95	100	219	Peak
5230.00	84.96	86.10	-1.14			100	219	Average
5230.00	91.30	92.44	-1.14			100	219	Peak
5350.00	39.53	40.66	-1.13	54.00	-14.47	100	219	Average
5350.00	48.53	49.66	-1.13	74.00	-25.47	100	219	Peak
*10460.00	52.69	57.23	-4.54	68.20	-15.51	168	62	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5230 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 54	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.94	41.81	-0.87	54.00	-13.06	192	360	Average
5150.00	49.29	50.16	-0.87	74.00	-24.71	192	360	Peak
5270.00	84.05	85.36	-1.31			192	360	Average
5270.00	90.60	91.91	-1.31			192	360	Peak
5350.00	39.63	40.76	-1.13	54.00	-14.37	192	360	Average
5350.00	48.97	50.10	-1.13	74.00	-25.03	192	360	Peak
*10540.00	52.20	56.48	-4.28	68.20	-16.00	162	341	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.80	41.67	-0.87	54.00	-13.20	100	221	Average
5150.00	50.28	51.15	-0.87	74.00	-23.72	100	221	Peak
5270.00	84.58	85.89	-1.31			100	221	Average
5270.00	90.63	91.94	-1.31			100	221	Peak
5350.00	39.89	41.02	-1.13	54.00	-14.11	100	221	Average
5350.00	48.88	50.01	-1.13	74.00	-25.12	100	221	Peak
*10540.00	52.61	56.89	-4.28	68.20	-15.59	102	157	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5270 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 62	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.93	41.80	-0.87	54.00	-13.07	187	0	Average
5150.00	50.65	51.52	-0.87	74.00	-23.35	187	0	Peak
5310.00	82.74	84.05	-1.31			187	0	Average
5310.00	89.79	91.10	-1.31			187	0	Peak
5350.00	41.20	42.33	-1.13	54.00	-12.80	187	0	Average
5350.00	49.78	50.91	-1.13	74.00	-24.22	187	0	Peak
10620.00	45.36	49.67	-4.31	54.00	-8.64	152	113	Average
10620.00	53.70	58.01	-4.31	74.00	-20.30	152	113	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	41.14	42.01	-0.87	54.00	-12.86	104	243	Average
5150.00	49.30	50.17	-0.87	74.00	-24.70	104	243	Peak
5310.00	83.74	85.05	-1.31			104	243	Average
5310.00	91.09	92.40	-1.31			104	243	Peak
5350.00	41.44	42.57	-1.13	54.00	-12.56	104	243	Average
5350.00	48.95	50.08	-1.13	74.00	-25.05	104	243	Peak
10620.00	45.33	49.64	-4.31	54.00	-8.67	132	167	Average
10620.00	53.01	57.32	-4.31	74.00	-20.99	132	167	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5310 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 102	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	41.05	41.93	-0.88	54.00	-12.95	187	336	Average
5460.00	50.46	51.34	-0.88	74.00	-23.54	187	336	Peak
*5470.00	52.58	53.46	-0.88	68.20	-15.62	187	336	Peak
5510.00	85.12	86.00	-0.88			187	336	Average
5510.00	91.14	92.02	-0.88			187	336	Peak
*5725.00	49.54	50.48	-0.94	68.20	-18.66	187	336	Peak
11020.00	44.72	48.26	-3.54	54.00	-9.28	153	302	Average
11020.00	52.40	55.94	-3.54	74.00	-21.60	153	302	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	41.29	42.17	-0.88	54.00	-12.71	102	240	Average
5460.00	50.37	51.25	-0.88	74.00	-23.63	102	240	Peak
*5470.00	54.31	55.19	-0.88	68.20	-13.89	102	240	Peak
5510.00	85.11	85.99	-0.88			102	240	Average
5510.00	90.89	91.77	-0.88			102	240	Peak
*5725.00	49.42	50.36	-0.94	68.20	-18.78	102	240	Peak
11020.00	43.90	47.44	-3.54	54.00	-10.10	124	157	Average
11020.00	52.62	56.16	-3.54	74.00	-21.38	124	157	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5510 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 110	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	40.02	40.90	-0.88	54.00	-13.98	179	360	Average
5460.00	49.65	50.53	-0.88	74.00	-24.35	179	360	Peak
*5470.00	49.04	49.92	-0.88	68.20	-19.16	179	360	Peak
5550.00	86.06	87.00	-0.94			179	360	Average
5550.00	92.15	93.09	-0.94			179	360	Peak
*5725.00	49.76	50.70	-0.94	68.20	-18.44	179	360	Peak
11100.00	44.37	48.03	-3.66	54.00	-9.63	121	164	Average
11100.00	52.71	56.37	-3.66	74.00	-21.29	121	164	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.89	40.77	-0.88	54.00	-14.11	170	199	Average
5460.00	49.51	50.39	-0.88	74.00	-24.49	170	199	Peak
*5470.00	49.61	50.49	-0.88	68.20	-18.59	170	199	Peak
5550.00	85.23	86.17	-0.94			170	199	Average
5550.00	92.12	93.06	-0.94			170	199	Peak
*5725.00	49.64	50.58	-0.94	68.20	-18.56	170	199	Peak
11100.00	44.36	48.02	-3.66	54.00	-9.64	163	201	Average
11100.00	52.85	56.51	-3.66	74.00	-21.15	163	201	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5550 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 134	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.63	40.51	-0.88	54.00	-14.37	194	335	Average
5460.00	49.57	50.45	-0.88	74.00	-24.43	194	335	Peak
*5470.00	47.60	48.48	-0.88	68.20	-20.60	194	335	Peak
5670.00	84.58	85.54	-0.96			194	335	Average
5670.00	90.93	91.89	-0.96			194	335	Peak
*5725.00	50.13	51.07	-0.94	68.20	-18.07	194	335	Peak
11340.00	44.18	48.03	-3.85	54.00	-9.82	122	101	Average
11340.00	52.10	55.95	-3.85	74.00	-21.90	122	101	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	39.91	40.79	-0.88	54.00	-14.09	181	197	Average
5460.00	49.26	50.14	-0.88	74.00	-24.74	181	197	Peak
*5470.00	48.77	49.65	-0.88	68.20	-19.43	181	197	Peak
5670.00	84.25	85.21	-0.96			181	197	Average
5670.00	90.28	91.24	-0.96			181	197	Peak
*5725.00	50.53	51.47	-0.94	68.20	-17.67	181	197	Peak
11340.00	43.41	47.26	-3.85	54.00	-10.59	121	55	Average
11340.00	52.36	56.21	-3.85	74.00	-21.64	121	55	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5670 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 151	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755.00	84.28	85.12	-0.84			181	336	Average
5755.00	90.43	91.27	-0.84			181	336	Peak
11510.00	43.68	47.36	-3.68	54.00	-10.32	122	178	Average
11510.00	51.14	54.82	-3.68	74.00	-22.86	122	178	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755.00	83.40	84.24	-0.84			194	303	Average
5755.00	89.64	90.48	-0.84			194	303	Peak
11510.00	44.56	48.24	-3.68	54.00	-9.44	108	302	Average
11510.00	51.98	55.66	-3.68	74.00	-22.02	108	302	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5635.03	50.19	51.13	-0.94	68.20	-18.01	181	336	Peak
5656.88	49.26	50.20	-0.94	73.31	-24.05	181	336	Peak
5921.93	48.75	49.10	-0.35	70.47	-21.72	181	336	Peak
*5968.00	49.95	50.28	-0.33	68.20	-18.25	181	336	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5625.05	49.66	50.61	-0.95	68.20	-18.54	194	303	Peak
5657.35	49.86	50.80	-0.94	73.66	-23.80	194	303	Peak
5917.18	48.81	49.16	-0.35	73.97	-25.16	194	303	Peak
*5999.35	49.99	50.27	-0.28	68.20	-18.21	194	303	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5755 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 159	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795.00	84.37	85.13	-0.76			192	341	Average
5795.00	90.69	91.45	-0.76			192	341	Peak
11590.00	44.95	48.79	-3.84	54.00	-9.05	177	105	Average
11590.00	52.84	56.68	-3.84	74.00	-21.16	177	105	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795.00	83.76	84.52	-0.76			191	302	Average
5795.00	91.38	92.14	-0.76			191	302	Peak
11590.00	44.39	48.23	-3.84	54.00	-9.61	103	165	Average
11590.00	52.56	56.40	-3.84	74.00	-21.44	103	165	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5644.05	49.98	50.92	-0.94	68.20	-18.22	192	341	Peak
5656.40	48.76	49.70	-0.94	72.95	-24.19	192	341	Peak
5919.55	49.81	50.16	-0.35	72.22	-22.41	192	341	Peak
*5996.50	50.85	51.13	-0.28	68.20	-17.35	192	341	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5620.30	49.98	50.93	-0.95	68.20	-18.22	191	302	Peak
5650.70	49.29	50.17	-0.88	68.72	-19.43	191	302	Peak
5921.93	48.18	48.53	-0.35	70.47	-22.29	191	302	Peak
*6017.40	49.90	50.13	-0.23	68.20	-18.30	191	302	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5795 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	46.39	47.26	-0.87	54.00	-7.61	198	108	Average
5150.00	54.87	55.74	-0.87	74.00	-19.13	198	108	Peak
5210.00	84.95	86.01	-1.06			198	108	Average
5210.00	90.52	91.58	-1.06			198	108	Peak
5350.00	40.36	41.49	-1.13	54.00	-13.64	198	108	Average
5350.00	48.05	49.18	-1.13	74.00	-25.95	198	108	Peak
*10420.00	52.08	56.85	-4.77	68.20	-16.12	189	306	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	48.07	48.94	-0.87	54.00	-5.93	101	137	Average
5150.00	57.93	58.80	-0.87	74.00	-16.07	101	137	Peak
5210.00	86.97	88.03	-1.06			101	137	Average
5210.00	92.40	93.46	-1.06			101	137	Peak
5350.00	41.03	42.16	-1.13	54.00	-12.97	101	137	Average
5350.00	47.73	48.86	-1.13	74.00	-26.27	101	137	Peak
*10420.00	51.78	56.55	-4.77	68.20	-16.42	168	224	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5210 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 58	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	40.94	41.81	-0.87	54.00	-13.06	200	109	Average
5150.00	49.80	50.67	-0.87	74.00	-24.20	200	109	Peak
5290.00	82.82	84.16	-1.34			200	109	Average
5290.00	88.97	90.31	-1.34			200	109	Peak
5350.00	45.91	47.04	-1.13	54.00	-8.09	200	109	Average
5350.00	53.07	54.20	-1.13	74.00	-20.93	200	109	Peak
*10580.00	52.62	56.96	-4.34	68.20	-15.58	148	79	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150.00	41.12	41.99	-0.87	54.00	-12.88	100	139	Average
5150.00	49.56	50.43	-0.87	74.00	-24.44	100	139	Peak
5290.00	85.51	86.85	-1.34			100	139	Average
5290.00	91.54	92.88	-1.34			100	139	Peak
5350.00	48.61	49.74	-1.13	54.00	-5.39	100	139	Average
5350.00	58.35	59.48	-1.13	74.00	-15.65	100	139	Peak
*10580.00	52.25	56.59	-4.34	68.20	-15.95	225	106	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5290 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 106	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	47.52	48.40	-0.88	54.00	-6.48	201	339	Average
5460.00	56.40	57.28	-0.88	74.00	-17.60	201	339	Peak
*5470.00	57.38	58.26	-0.88	68.20	-10.82	201	339	Peak
5530.00	83.71	84.63	-0.92			201	339	Average
5530.00	88.43	89.35	-0.92			201	339	Peak
*5725.00	48.85	49.79	-0.94	68.20	-19.35	201	339	Peak
11060.00	45.54	49.14	-3.60	54.00	-8.46	175	226	Average
11060.00	52.76	56.36	-3.60	74.00	-21.24	175	226	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	49.20	50.08	-0.88	54.00	-4.80	100	120	Average
5460.00	57.57	58.45	-0.88	74.00	-16.43	100	120	Peak
*5470.00	58.52	59.40	-0.88	68.20	-9.68	100	120	Peak
5530.00	85.02	85.94	-0.92			100	120	Average
5530.00	90.22	91.14	-0.92			100	120	Peak
*5725.00	49.59	50.53	-0.94	68.20	-18.61	100	120	Peak
11060.00	45.97	49.57	-3.60	54.00	-8.03	128	332	Average
11060.00	53.21	56.81	-3.60	74.00	-20.79	128	332	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5530 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 122	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	40.69	41.57	-0.88	54.00	-13.31	200	341	Average
5460.00	49.44	50.32	-0.88	74.00	-24.56	200	341	Peak
*5470.00	49.20	50.08	-0.88	68.20	-19.00	200	341	Peak
5610.00	83.49	84.50	-1.01			200	341	Average
5610.00	88.47	89.48	-1.01			200	341	Peak
*5725.00	49.97	50.91	-0.94	68.20	-18.23	200	341	Peak
11220.00	45.47	49.25	-3.78	54.00	-8.53	156	238	Average
11220.00	52.70	56.48	-3.78	74.00	-21.30	156	238	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.00	40.99	41.87	-0.88	54.00	-13.01	100	125	Average
5460.00	50.31	51.19	-0.88	74.00	-23.69	100	125	Peak
*5470.00	49.89	50.77	-0.88	68.20	-18.31	100	125	Peak
5610.00	85.09	86.10	-1.01			100	125	Average
5610.00	90.17	91.18	-1.01			100	125	Peak
*5725.00	49.91	50.85	-0.94	68.20	-18.29	100	125	Peak
11220.00	45.33	49.11	-3.78	54.00	-8.67	145	228	Average
11220.00	52.55	56.33	-3.78	74.00	-21.45	145	228	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5610 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 155	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Cookie Ku

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775.00	82.64	83.43	-0.79			200	301	Average
5775.00	87.97	88.76	-0.79			200	301	Peak
11550.00	45.38	49.16	-3.78	54.00	-8.62	144	58	Average
11550.00	52.61	56.39	-3.78	74.00	-21.39	144	58	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775.00	83.38	84.17	-0.79			100	121	Average
5775.00	89.08	89.87	-0.79			100	121	Peak
11550.00	45.89	49.67	-3.78	54.00	-8.11	169	284	Average
11550.00	53.12	56.90	-3.78	74.00	-20.88	169	284	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5640.73	49.65	50.59	-0.94	68.20	-18.55	200	301	Peak
5658.30	50.02	50.96	-0.94	74.36	-24.34	200	301	Peak
5916.23	49.58	49.93	-0.35	74.67	-25.09	200	301	Peak
*5945.20	51.29	51.64	-0.35	68.20	-16.91	200	301	Peak
*5640.73	49.65	50.59	-0.94	68.20	-18.55	200	301	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5625.53	50.41	51.36	-0.95	68.20	-17.79	100	121	Peak
5658.78	50.90	51.84	-0.94	74.72	-23.82	100	121	Peak
5917.18	49.20	49.55	-0.35	73.97	-24.77	100	121	Peak
*5979.40	50.11	50.42	-0.31	68.20	-18.09	100	121	Peak
*5625.53	50.41	51.36	-0.95	68.20	-17.79	100	121	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5775 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

9 kHz ~ 30 MHz Data:

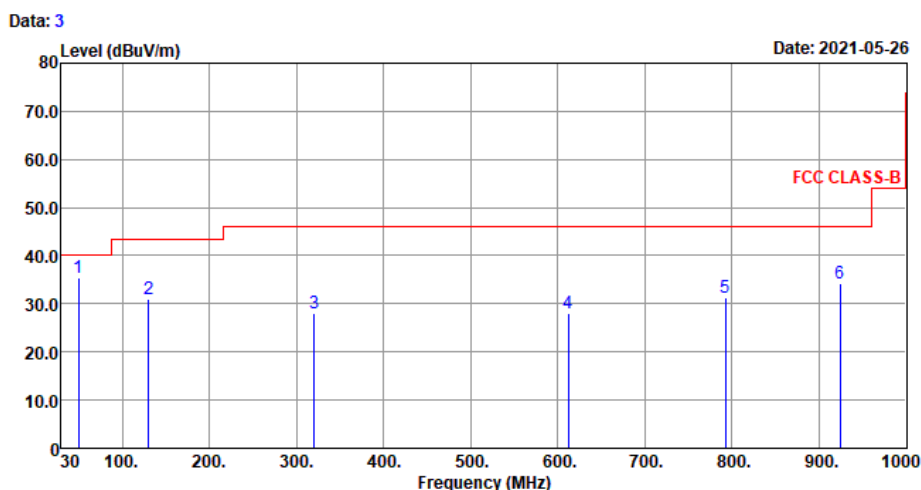
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

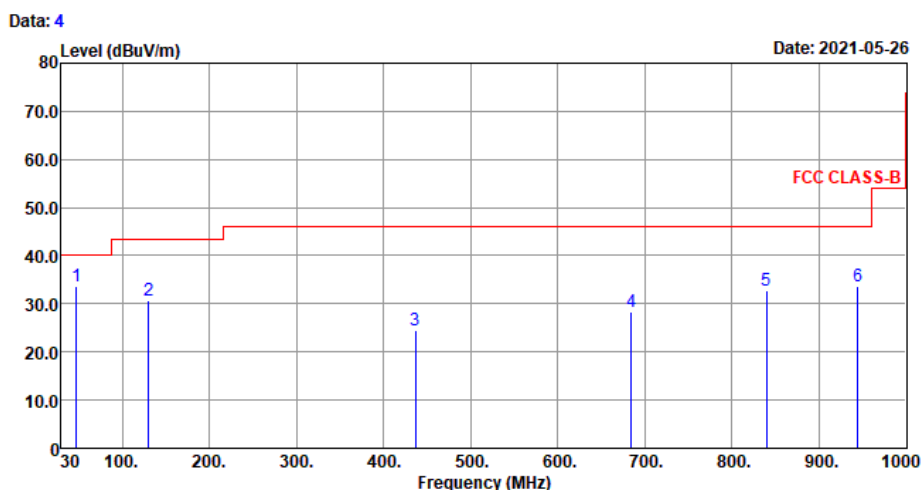
802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
49.40	35.40	47.88	-12.48	40.00	-4.60	102	302	QP
129.91	31.10	44.17	-13.07	43.50	-12.40	114	171	QP
320.03	27.94	38.66	-10.72	46.00	-18.06	125	108	QP
612.00	28.08	30.54	-2.46	46.00	-17.92	306	298	QP
792.42	31.18	30.77	0.41	46.00	-14.82	102	10	QP
924.34	34.23	31.31	2.92	46.00	-11.77	199	277	QP
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
47.46	33.51	46.09	-12.58	40.00	-6.49	125	134	QP
129.91	30.74	43.81	-13.07	43.50	-12.76	111	147	QP
436.43	24.64	32.05	-7.41	46.00	-21.36	153	168	QP
684.75	28.36	29.71	-1.35	46.00	-17.64	101	108	QP
839.95	32.64	31.25	1.39	46.00	-13.36	100	323	QP
944.71	33.56	30.31	3.25	46.00	-12.44	100	52	QP

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit

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	ESR3	102783	Dec. 21, 2020	Dec. 20, 2021
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2020	Sep. 03, 2021
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 28, 2021	Jan. 27, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 18, 2020	Aug. 17, 2021
Software ADT	BV ADT_Conc_ 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 2 (Conduction 2).

3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

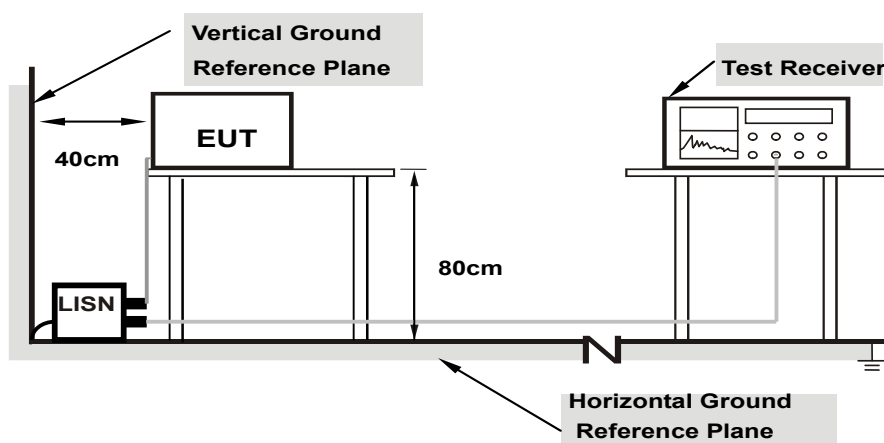
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

Note: 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:

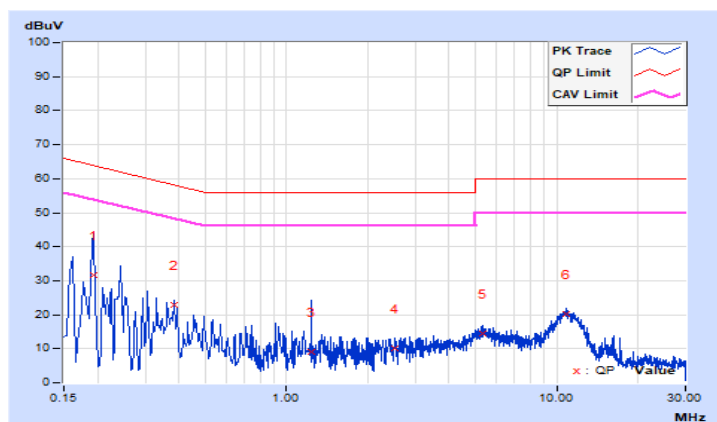
802.11ac (VHT80)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19301	0.16	31.46	12.23	31.62	12.39	63.91	53.91	-32.29	-41.52
2	0.38460	0.23	22.52	9.89	22.75	10.12	58.18	48.18	-35.43	-38.06
3	1.23307	0.31	8.65	3.09	8.96	3.40	56.00	46.00	-47.04	-42.60
4	2.53119	0.37	9.69	2.12	10.06	2.49	56.00	46.00	-45.94	-43.51
5	5.29947	0.44	14.12	3.12	14.56	3.56	60.00	50.00	-45.44	-46.44
6	10.78911	0.54	19.70	6.18	20.24	6.72	60.00	50.00	-39.76	-43.28

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.

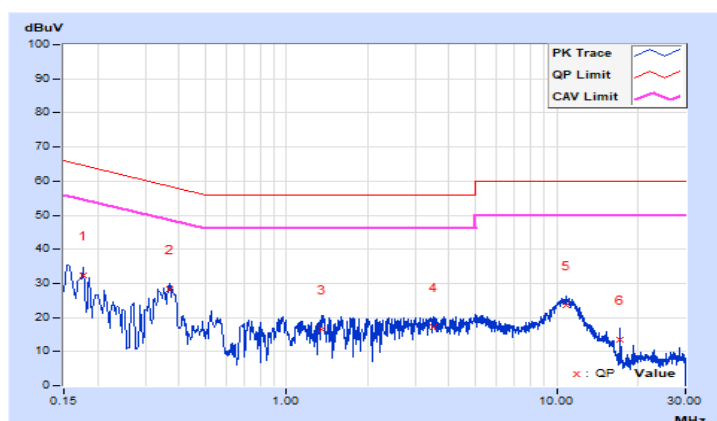


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17737	0.16	32.17	21.11	32.33	21.27	64.61	54.61	-32.28	-33.34
2	0.36896	0.24	28.20	16.20	28.44	16.44	58.52	48.52	-30.08	-32.08
3	1.35819	0.34	16.22	6.52	16.56	6.86	56.00	46.00	-39.44	-39.14
4	3.50087	0.46	16.84	5.03	17.30	5.49	56.00	46.00	-38.70	-40.51
5	10.88686	0.67	22.83	11.96	23.50	12.63	60.00	50.00	-36.50	-37.37
6	17.24814	0.86	12.66	5.26	13.52	6.12	60.00	50.00	-46.48	-43.88

Remarks:

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



4.3 Transmit Power Measurement

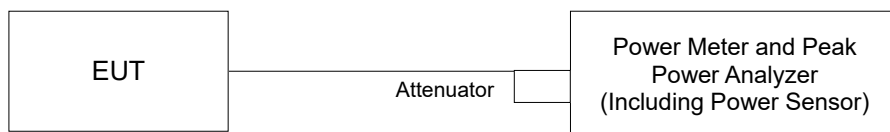
4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	✓	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)

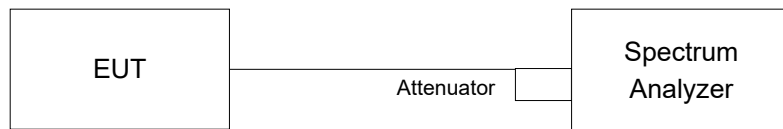
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

For Power Output



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

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

For 26dB Bandwidth

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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:
802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	8.395	9.24	24.00	Pass
40	5200	8.337	9.21	24.00	Pass
48	5240	8.492	9.29	24.00	Pass
52	5260	8.185	9.13	24.00	Pass
60	5300	8.414	9.25	24.00	Pass
64	5320	8.279	9.18	24.00	Pass
100	5500	11.722	10.69	24.00	Pass
116	5580	14.158	11.51	24.00	Pass
140	5700	11.830	10.73	24.00	Pass
149	5745	11.912	10.76	30.00	Pass
157	5785	10.495	10.21	30.00	Pass
165	5825	10.423	10.18	30.00	Pass

Note:

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

1. $11\text{dBm} + 10\log(22.01) = 24.42 > 24\text{dBm}$
2. $11\text{dBm} + 10\log(21.95) = 24.41 > 24\text{dBm}$
3. $11\text{dBm} + 10\log(21.79) = 24.38 > 24\text{dBm}$
4. $11\text{dBm} + 10\log(21.92) = 24.40 > 24\text{dBm}$
5. $11\text{dBm} + 10\log(21.97) = 24.41 > 24\text{dBm}$
6. $11\text{dBm} + 10\log(21.66) = 24.35 > 24\text{dBm}$

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	8.770	9.43	24.00	Pass
46	5230	8.610	9.35	24.00	Pass
54	5270	8.147	9.11	24.00	Pass
62	5310	8.433	9.26	24.00	Pass
102	5510	12.531	10.98	24.00	Pass
110	5550	14.158	11.51	24.00	Pass
134	5670	11.324	10.54	24.00	Pass
151	5755	11.776	10.71	30.00	Pass
159	5795	11.535	10.62	30.00	Pass

Note:

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

1. $11\text{dBm} + 10\log(41.37) = 27.16 > 24\text{dBm}$
2. $11\text{dBm} + 10\log(41.45) = 27.17 > 24\text{dBm}$
3. $11\text{dBm} + 10\log(41.49) = 27.17 > 24\text{dBm}$
4. $11\text{dBm} + 10\log(41.44) = 27.17 > 24\text{dBm}$
5. $11\text{dBm} + 10\log(41.26) = 27.15 > 24\text{dBm}$

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Power Limit (dBm)	Pass / Fail
42	5210	9.683	9.86	24.00	Pass
58	5290	9.594	9.82	24.00	Pass
106	5530	14.421	11.59	24.00	Pass
122	5610	14.158	11.51	24.00	Pass
155	5775	12.162	10.85	30.00	Pass

Note:

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

1. $11\text{dBm} + 10\log(82.77) = 30.17 > 24\text{dBm}$
2. $11\text{dBm} + 10\log(82.35) = 30.15 > 24\text{dBm}$
3. $11\text{dBm} + 10\log(82.33) = 30.15 > 24\text{dBm}$

26dB Bandwidth:

802.11ac (VHT20)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)
52	5260	22.01
60	5300	21.95
64	5320	21.79
100	5500	21.92
116	5580	21.97
140	5700	21.66

802.11ac (VHT40)

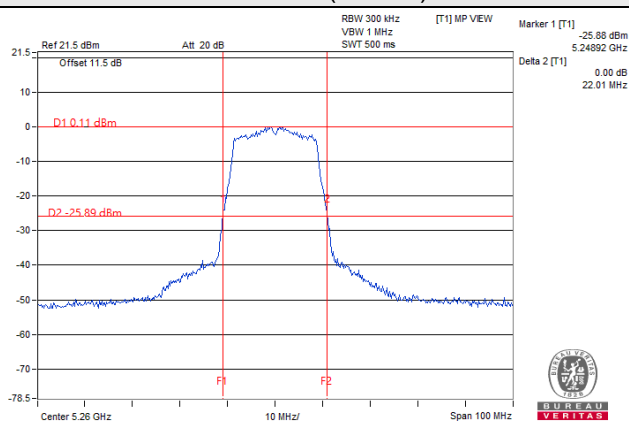
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)
54	5270	41.37
62	5310	41.45
102	5510	41.49
110	5550	41.44
134	5670	41.26

802.11ac (VHT80)

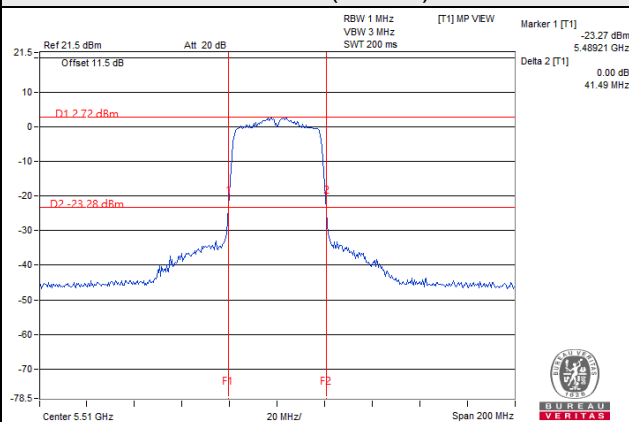
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)
58	5290	82.77
106	5530	82.35
122	5610	82.33

Spectrum Plot of Worst Value

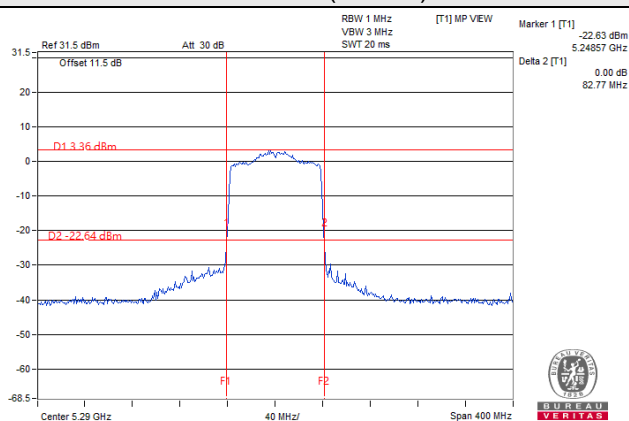
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



EUT Average Power

802.11ac (VHT20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	9.25	8.414
5470~5725	11.51	14.158

802.11ac (VHT40)

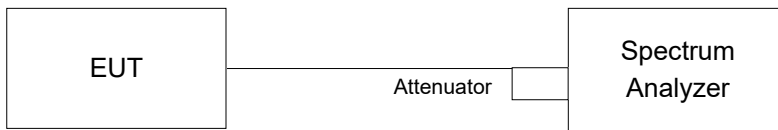
Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	9.26	8.433
5470~5725	11.51	14.158

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	9.82	9.594
5470~5725	11.59	14.421

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

802.11ac (VHT20)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
36	5180	18.12
40	5200	18.00
48	5240	17.88
52	5260	18.00
60	5300	18.00
64	5320	18.00
100	5500	18.00
116	5580	18.00
140	5700	18.00
149	5745	18.00
157	5785	18.12
165	5825	18.00

802.11ac (VHT40)

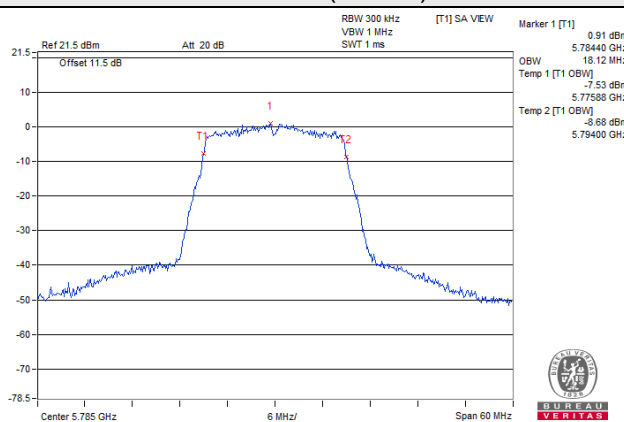
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
38	5190	36.48
46	5230	36.48
54	5270	36.36
62	5310	36.48
102	5510	36.48
110	5550	36.48
134	5670	36.72
151	5755	36.72
159	5795	36.48

802.11ac (VHT80)

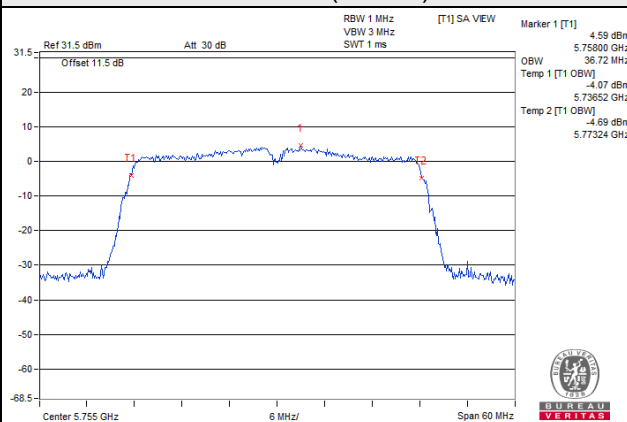
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
42	5210	75.60
58	5290	75.60
106	5530	75.60
122	5610	75.60
155	5775	75.60

Spectrum Plot of Worst Value

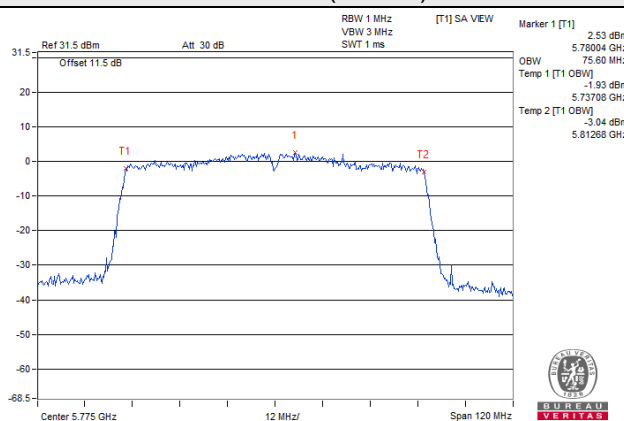
802.11ac (VHT20)



802.11ac (VHT40)

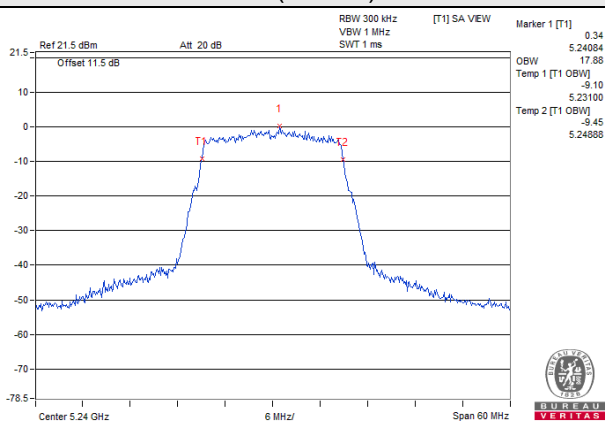


802.11ac (VHT80)

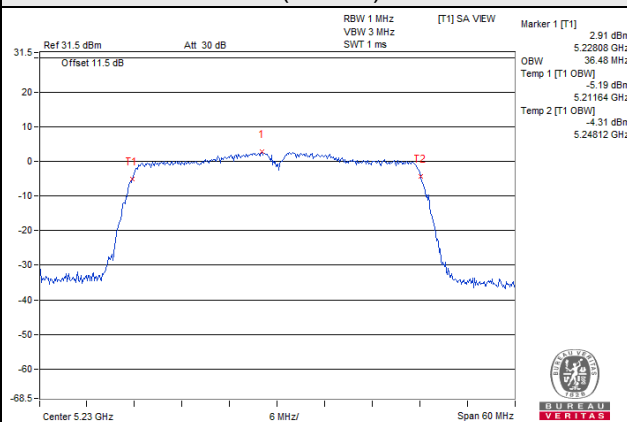


Spectrum Plot for near By DFS Band

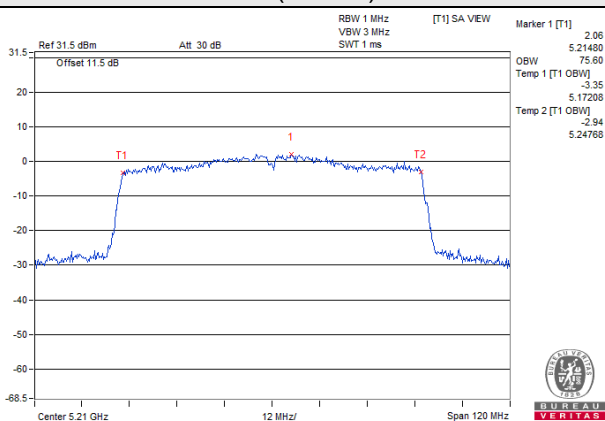
802.11ac (VHT20) / CH 48



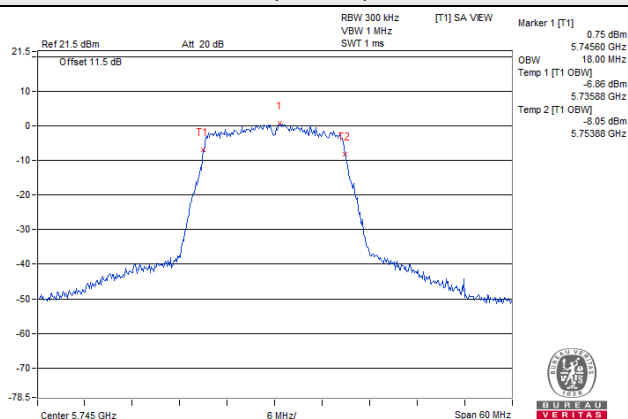
802.11ac (VHT40) / CH 46



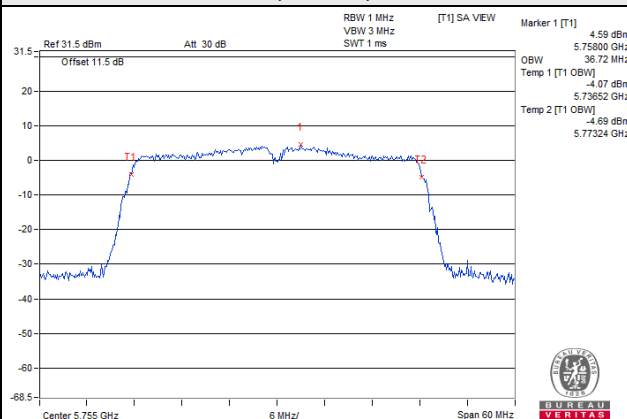
802.11ac (VHT80) / CH 42



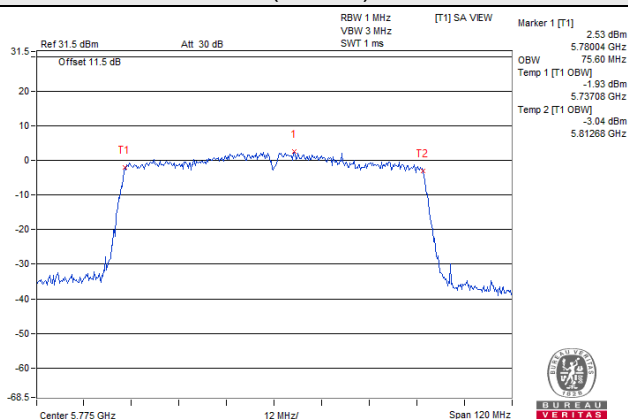
802.11ac (VHT20) / CH 149



802.11ac (VHT40) / CH 151



802.11ac (VHT80) / CH 155

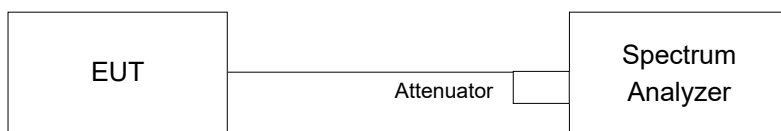


4.5 Peak Power Spectral Density Measurement

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-1, U-NII-2A and U-NII-2C band:

Using method SA-2

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

For U-NII-3 band:

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

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
36	5180	-3.27	0.33	-2.94	11.00	Pass
40	5200	-3.21	0.33	-2.88	11.00	Pass
48	5240	-3.19	0.33	-2.86	11.00	Pass
52	5260	-3.37	0.33	-3.04	11.00	Pass
60	5300	-3.32	0.33	-2.99	11.00	Pass
64	5320	-3.38	0.33	-3.05	11.00	Pass
100	5500	-1.75	0.33	-1.42	11.00	Pass
116	5580	-0.93	0.33	-0.60	11.00	Pass
140	5700	-1.82	0.33	-1.49	11.00	Pass

Note: 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)	PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
38	5190	-5.94	0.48	-5.46	11.00	Pass
46	5230	-5.88	0.48	-5.40	11.00	Pass
54	5270	-5.90	0.48	-5.42	11.00	Pass
62	5310	-6.16	0.48	-5.68	11.00	Pass
102	5510	-6.40	0.48	-5.92	11.00	Pass
110	5550	-6.52	0.48	-6.04	11.00	Pass
134	5670	-4.79	0.48	-4.31	11.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

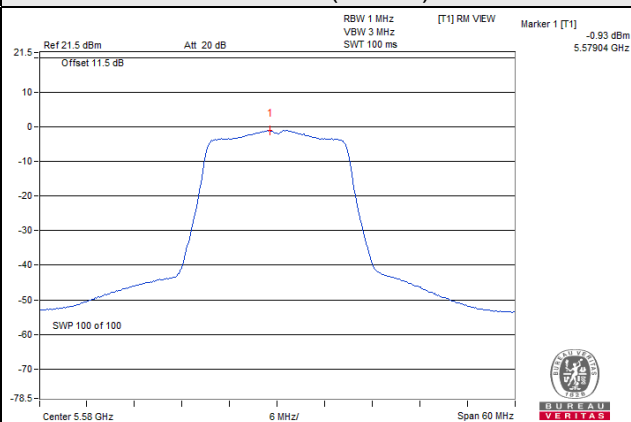
802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
42	5210	-7.05	1.21	-5.84	11.00	Pass
58	5290	-6.91	1.21	-5.70	11.00	Pass
106	5530	-7.36	1.21	-6.15	11.00	Pass
122	5610	-7.15	1.21	-5.94	11.00	Pass

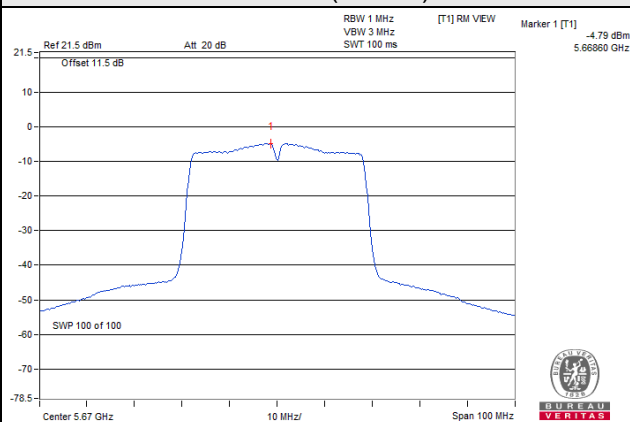
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

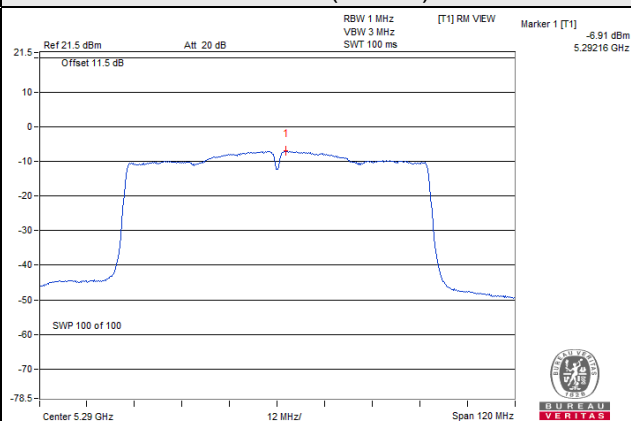
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



For U-NII-3 band:

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		(dBm/300kHz)	(dBm/500kHz)				
149	5745	-6.71	-4.49	0.33	-4.16	30.00	Pass
157	5785	-6.29	-4.07	0.33	-3.74	30.00	Pass
165	5825	-6.43	-4.21	0.33	-3.88	30.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

Chan.	Freq. (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		(dBm/300kHz)	(dBm/500kHz)				
151	5755	-9.67	-7.45	0.48	-6.97	30.00	Pass
159	5795	-9.61	-7.39	0.48	-6.91	30.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

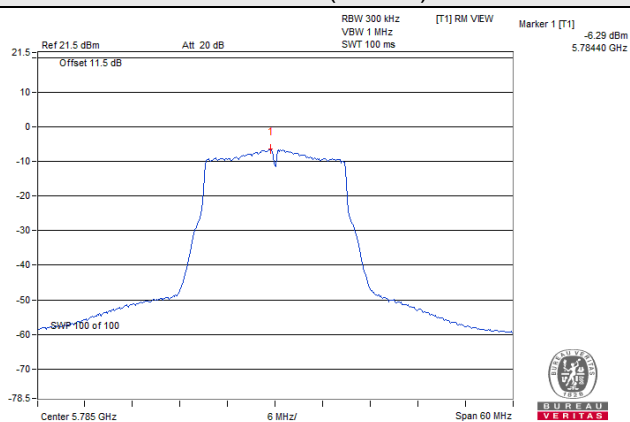
802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		(dBm/300kHz)	(dBm/500kHz)				
155	5775	-11.99	-9.77	1.21	-8.56	30.00	Pass

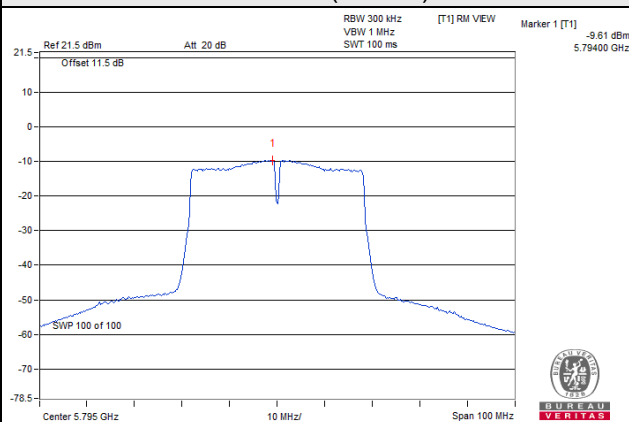
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

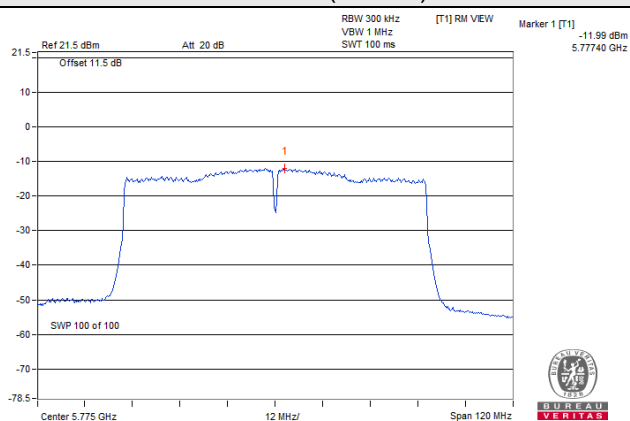
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

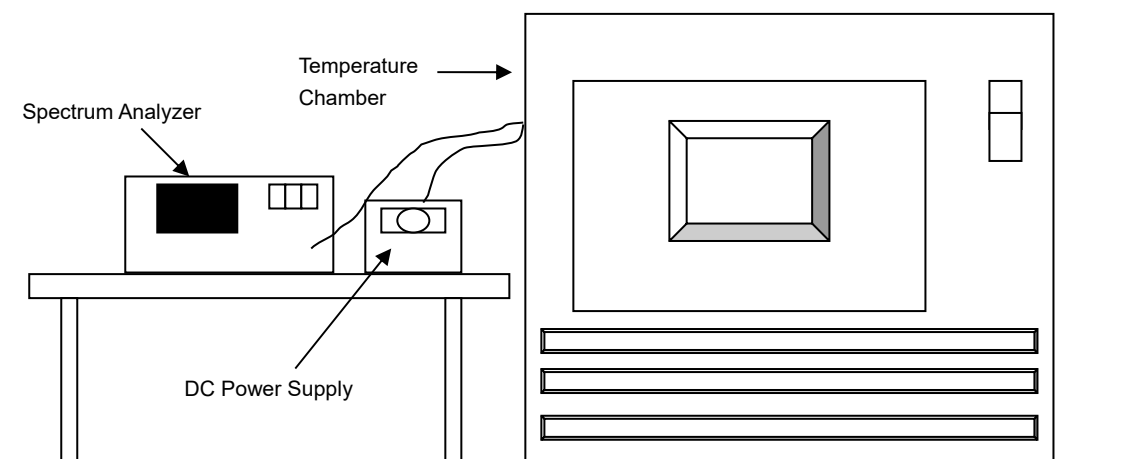


4.6 Frequency Stability

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	100040	Sep. 16, 2020	Sep. 15, 2021
Standard Temperature And Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 24, 2020	Dec. 23, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2020	Jun. 22, 2021
DC Power Supply TOPWARD	6306A	727263	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

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step d with every 10 degrees reduction until the lowest temperature achieved.
- 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: 5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
75	12	5179.9937	Pass	5179.9953	Pass	5179.9965	Pass	5179.9938	Pass
70	12	5179.9887	Pass	5179.9853	Pass	5179.9869	Pass	5179.9866	Pass
60	12	5179.9788	Pass	5179.9805	Pass	5179.981	Pass	5179.9791	Pass
50	12	5179.9928	Pass	5179.9888	Pass	5179.9903	Pass	5179.9932	Pass
40	12	5180.0117	Pass	5180.0115	Pass	5180.0106	Pass	5180.0111	Pass
30	12	5180.0108	Pass	5180.0099	Pass	5180.0114	Pass	5180.0105	Pass
20	12	5180.0189	Pass	5180.0186	Pass	5180.0169	Pass	5180.0153	Pass
10	12	5179.9979	Pass	5179.998	Pass	5179.9961	Pass	5179.9935	Pass
0	12	5179.978	Pass	5179.9772	Pass	5179.9779	Pass	5179.9792	Pass
-10	12	5180.0204	Pass	5180.0189	Pass	5180.0216	Pass	5180.0189	Pass
-20	12	5180.0124	Pass	5180.0104	Pass	5180.0124	Pass	5180.009	Pass

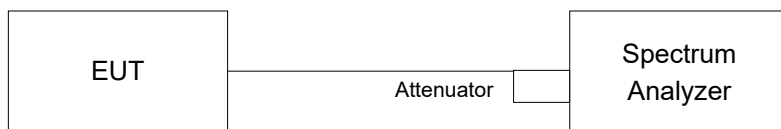
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	13.8	5180.018	Pass	5180.0192	Pass	5180.0174	Pass	5180.0149	Pass
	12	5180.0189	Pass	5180.0186	Pass	5180.0169	Pass	5180.0153	Pass
	10.2	5180.0196	Pass	5180.018	Pass	5180.0168	Pass	5180.0156	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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

802.11ac (VHT20)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	17.58	0.50	Pass
157	5785	17.58	0.50	Pass
165	5825	17.61	0.50	Pass

802.11ac (VHT40)

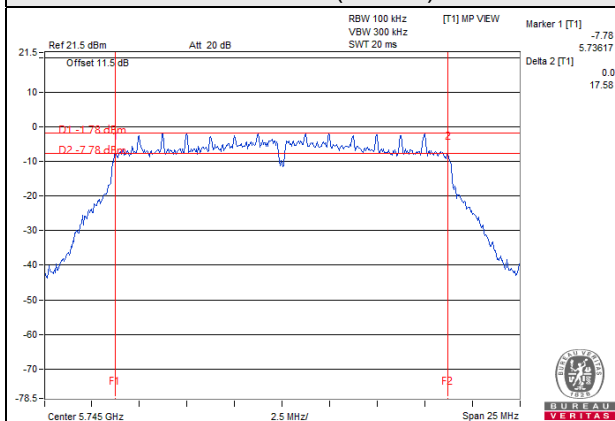
Chan.	Freq. (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	36.15	0.50	Pass
159	5795	35.99	0.50	Pass

802.11ac (VHT80)

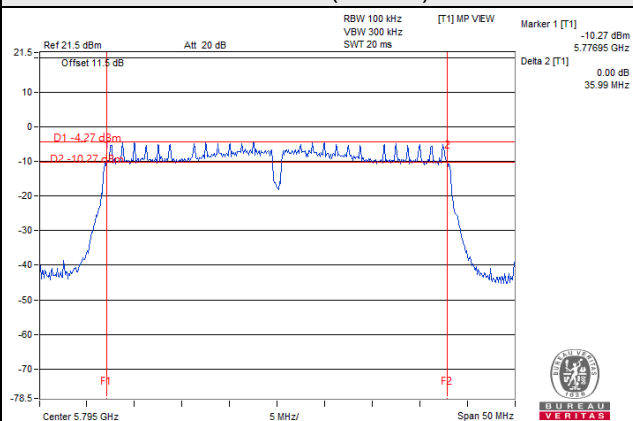
Chan.	Freq. (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
155	5775	75.62	0.50	Pass

Spectrum Plot of Worst Value

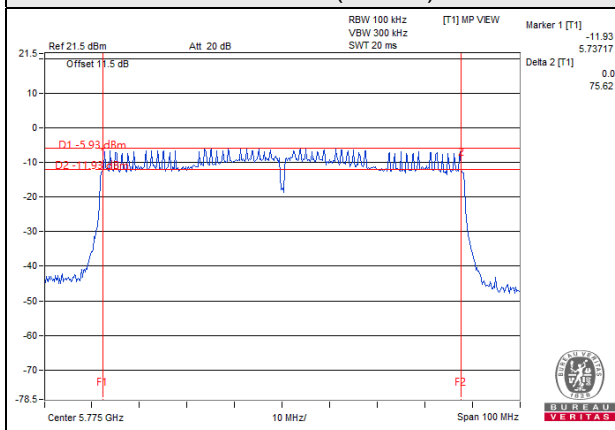
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

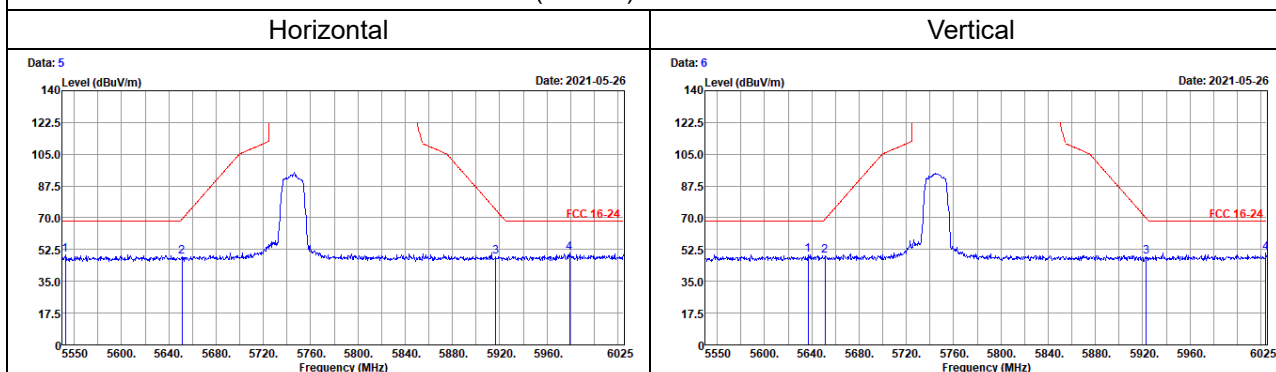


5 Pictures of Test Arrangements

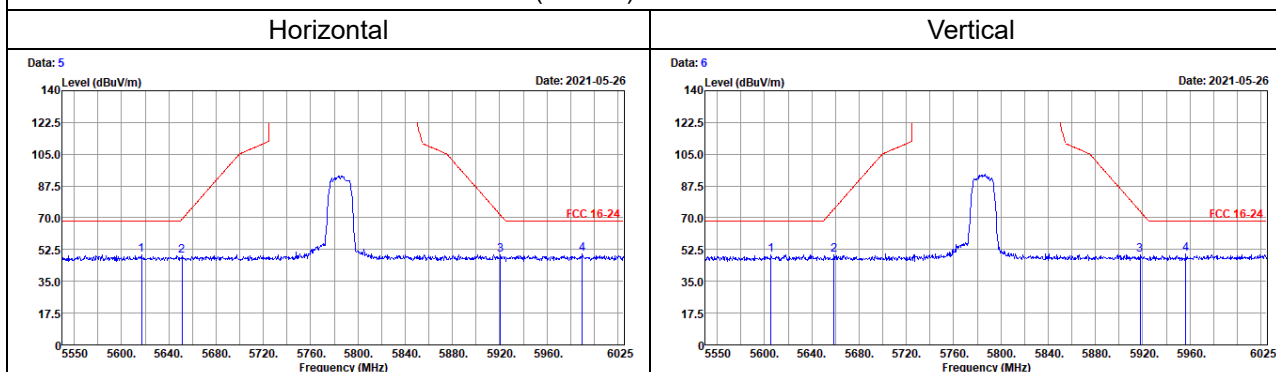
Please refer to the attached file (Test Setup Photo).

Annex A - Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

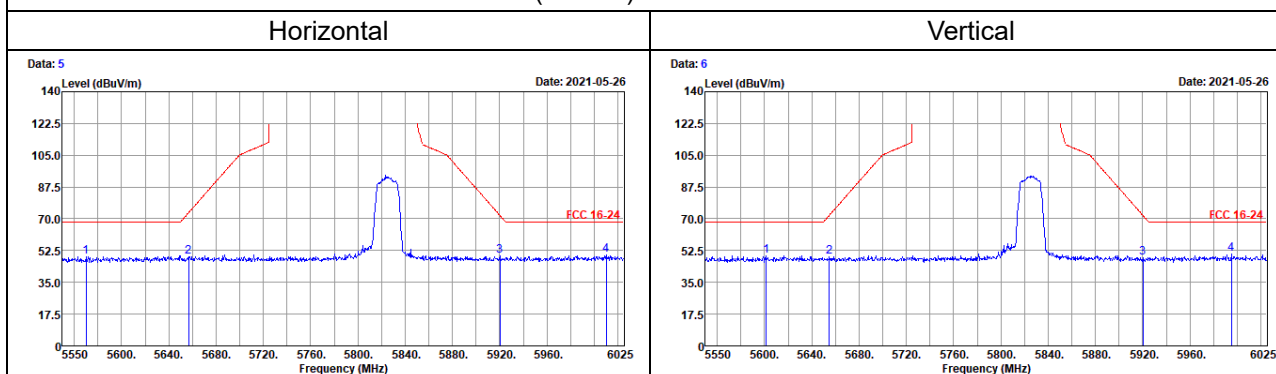
802.11ac (VHT20) CH 149 : 5745 MHz



802.11ac (VHT20) CH 157 : 5785 MHz

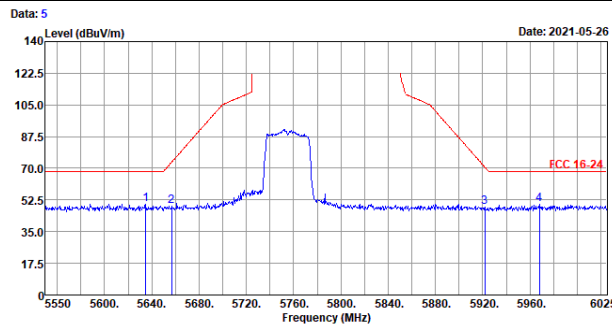


802.11ac (VHT20) CH 165 : 5825 MHz

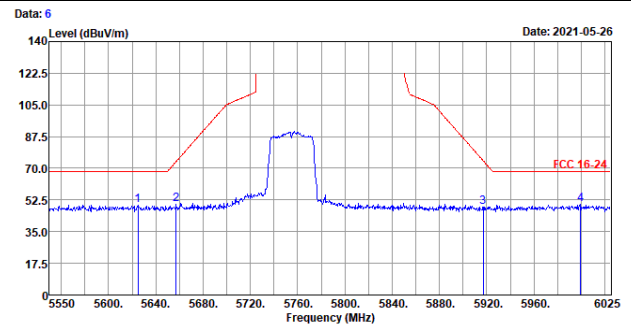


802.11ac (VHT40) CH 151 : 5755 MHz

Horizontal

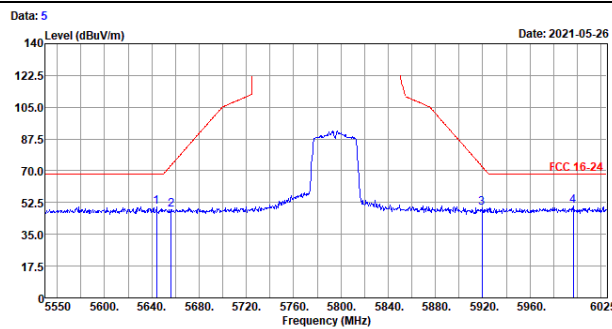


Vertical

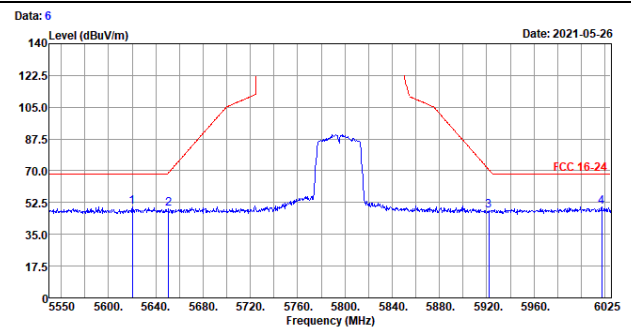


802.11ac (VHT40) CH 159 : 5795 MHz

Horizontal

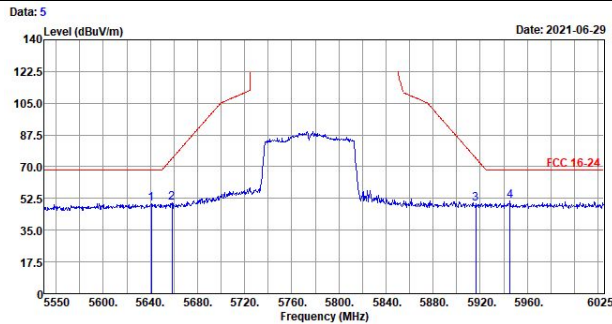


Vertical

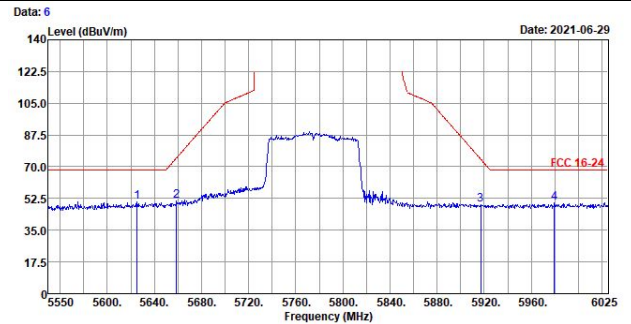


802.11ac (VHT80) CH 155 : 5775 MHz

Horizontal



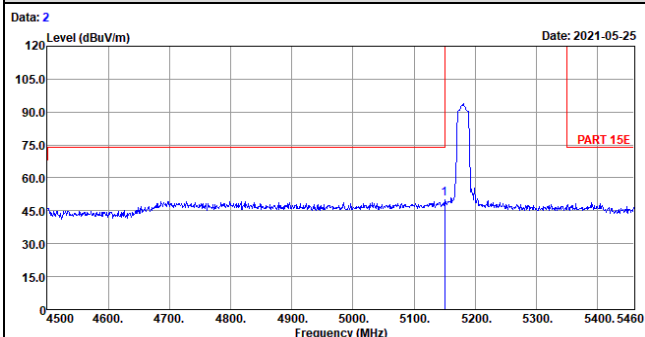
Vertical



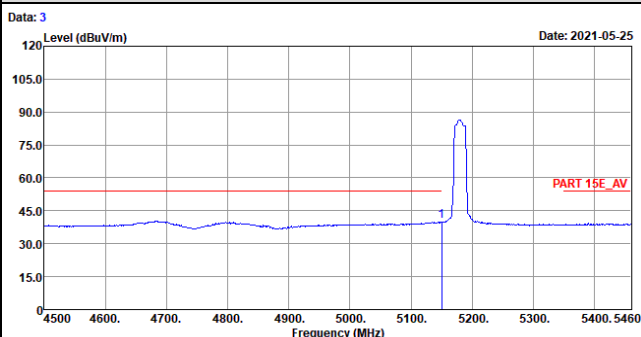
Annex B - Band Edge Measurement

802.11ac (VHT20) Channel 36

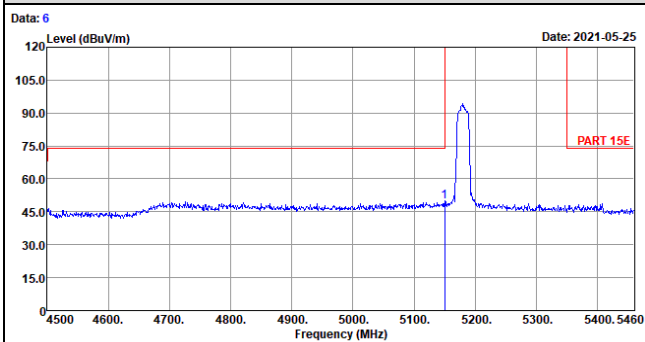
Horizontal (Peak)



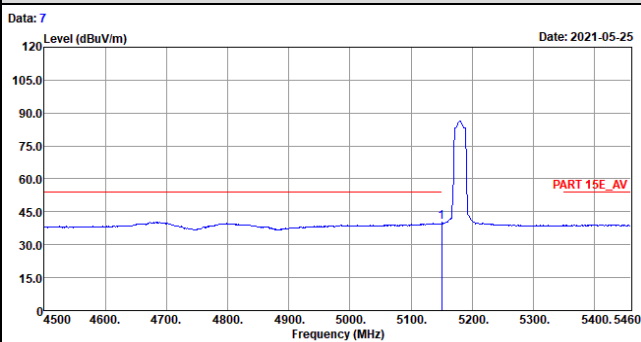
Horizontal (Average)



Vertical (Peak)

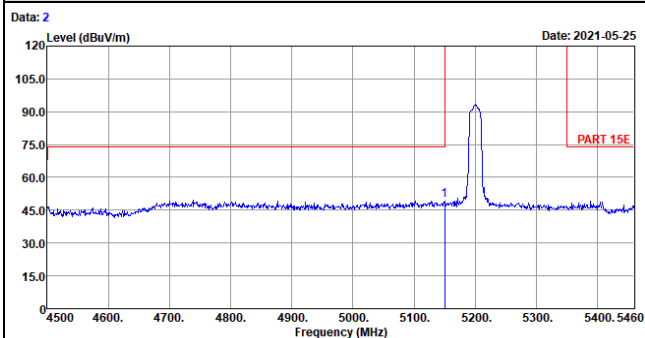


Vertical (Average)

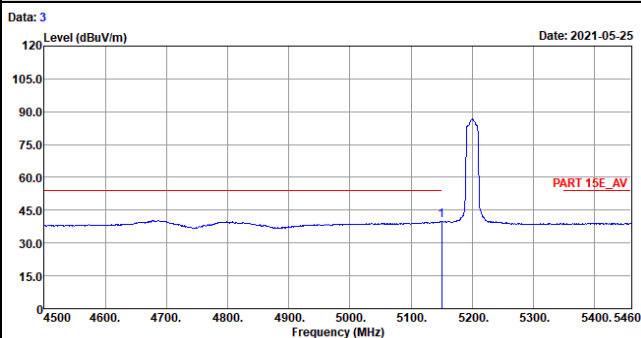


802.11ac (VHT20) Channel 40

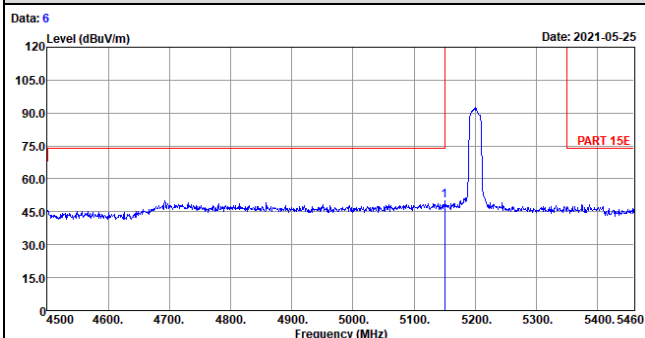
Horizontal (Peak)



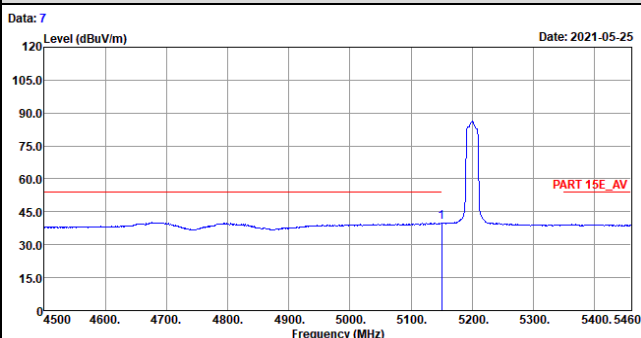
Horizontal (Average)



Vertical (Peak)

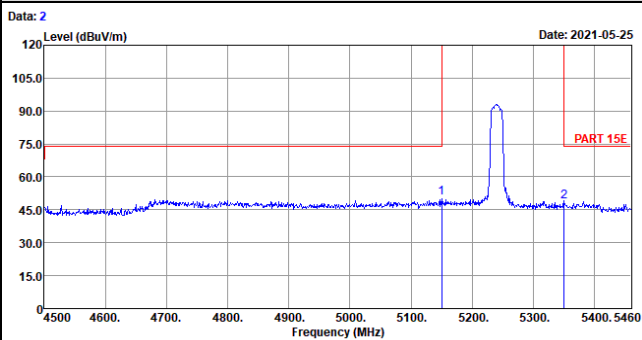


Vertical (Average)

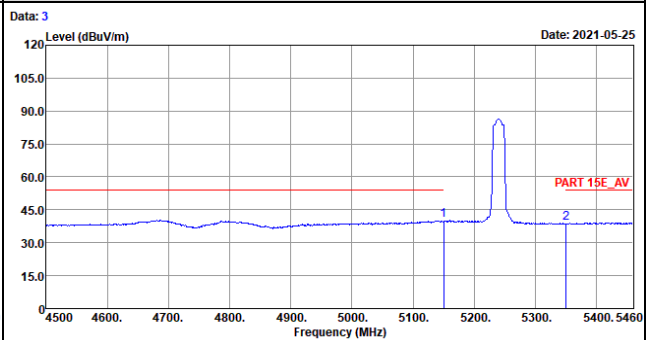


802.11ac (VHT20) Channel 48

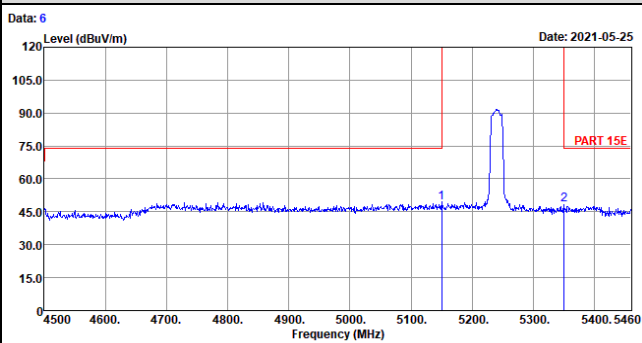
Horizontal (Peak)



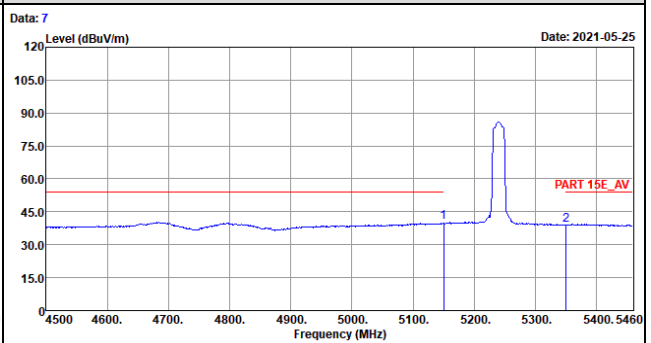
Horizontal (Average)



Vertical (Peak)

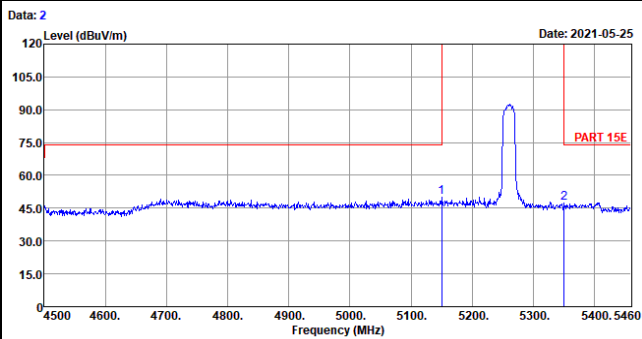


Vertical (Average)

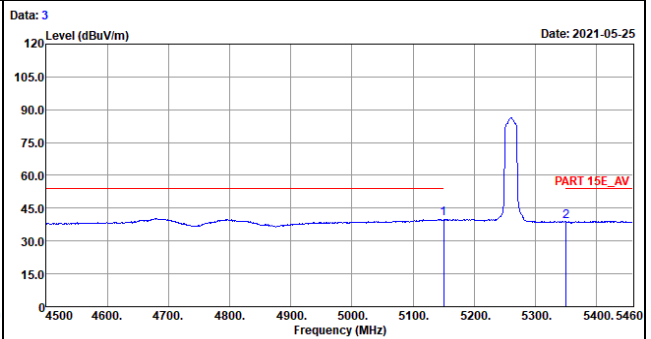


802.11ac (VHT20) Channel 52

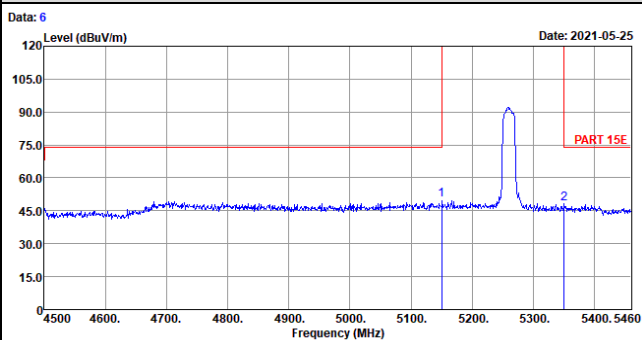
Horizontal (Peak)



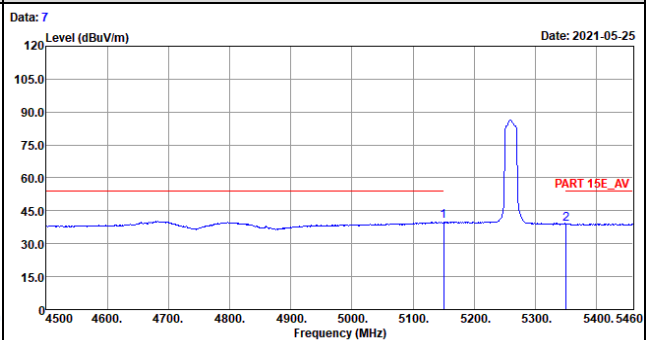
Horizontal (Average)



Vertical (Peak)

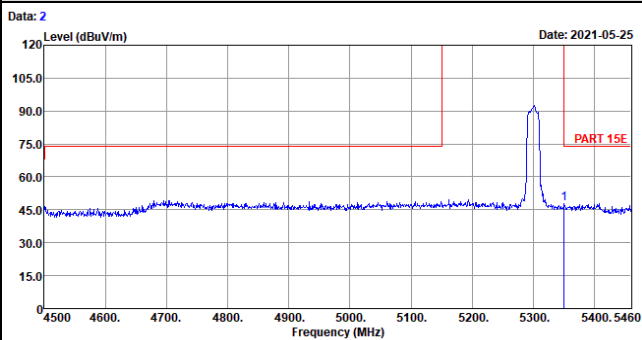


Vertical (Average)

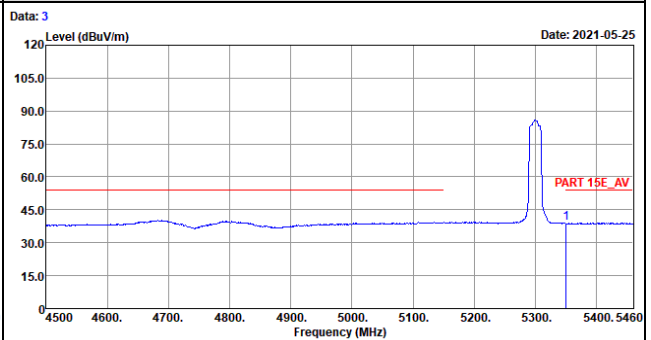


802.11ac (VHT20) Channel 60

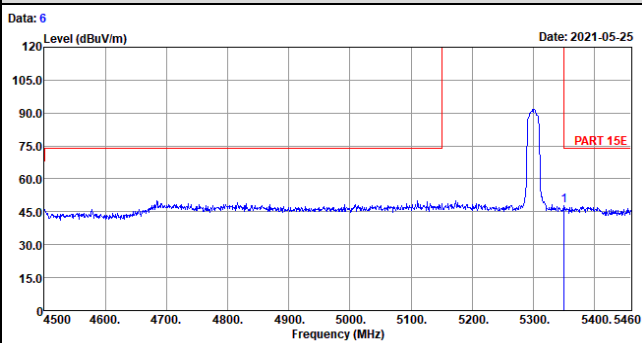
Horizontal (Peak)



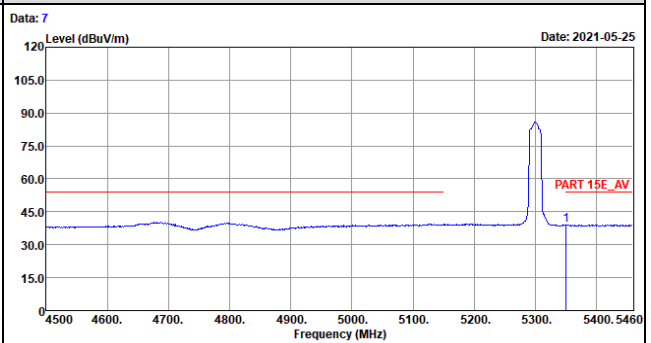
Horizontal (Average)



Vertical (Peak)

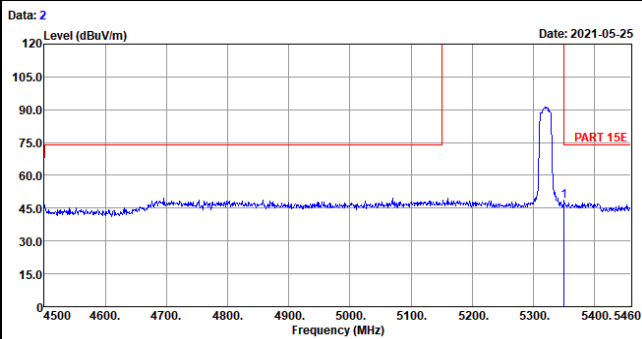


Vertical (Average)

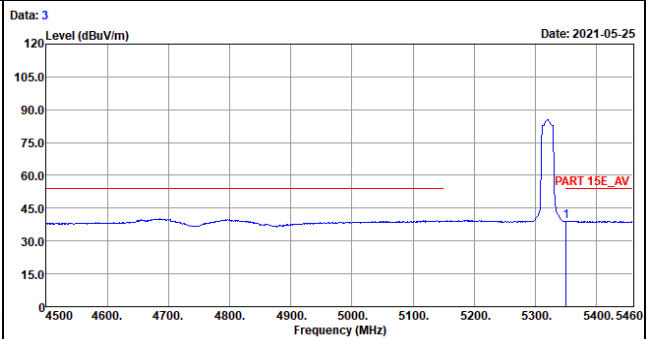


802.11ac (VHT20) Channel 64

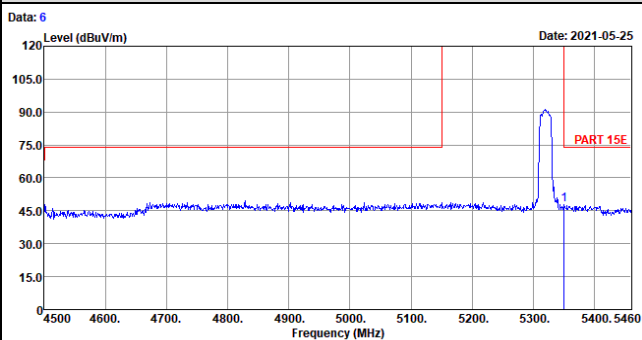
Horizontal (Peak)



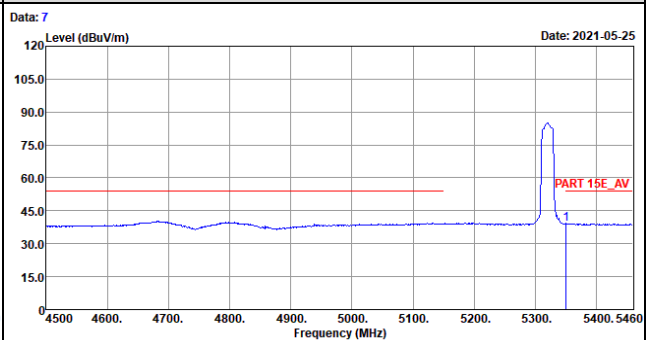
Horizontal (Average)



Vertical (Peak)

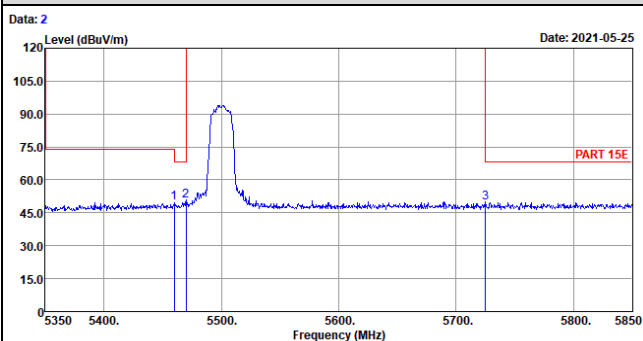


Vertical (Average)

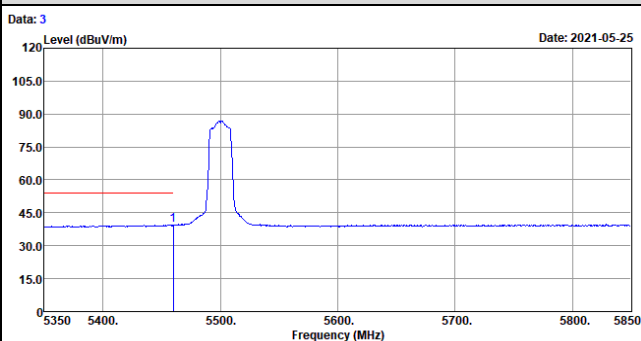


802.11ac (VHT20) Channel 100

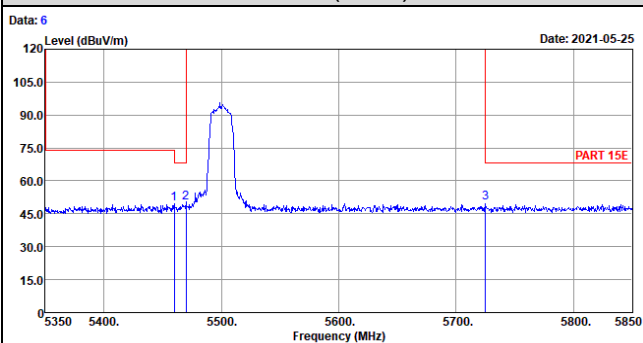
Horizontal (Peak)



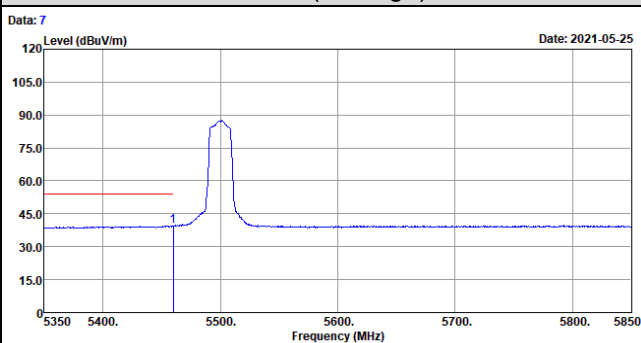
Horizontal (Average)



Vertical (Peak)

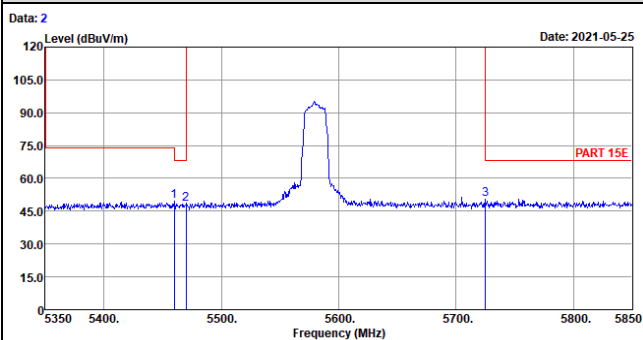


Vertical (Average)

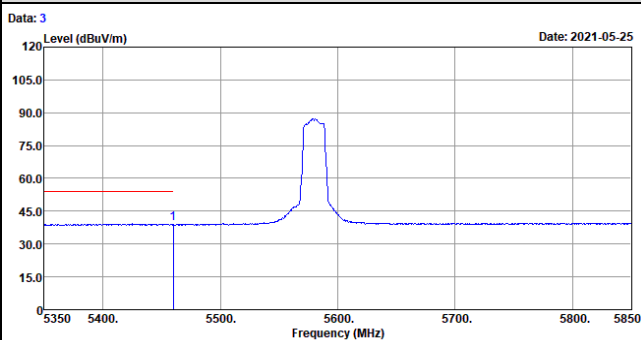


802.11ac (VHT20) Channel 116

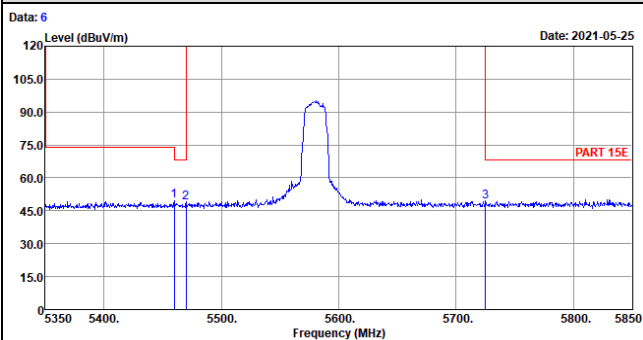
Horizontal (Peak)



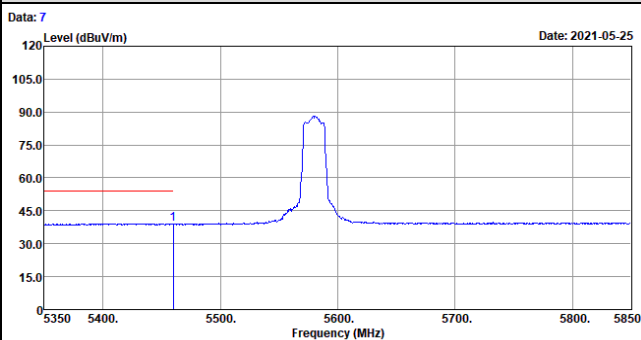
Horizontal (Average)



Vertical (Peak)

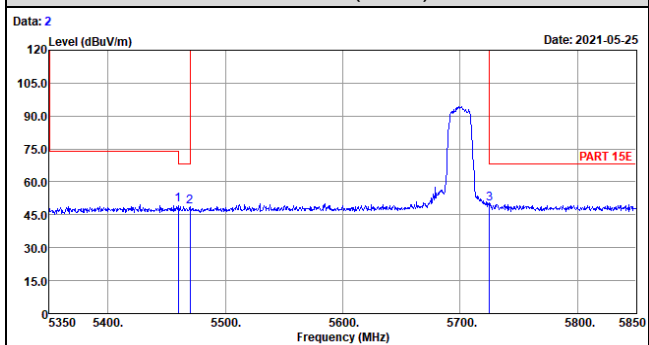


Vertical (Average)

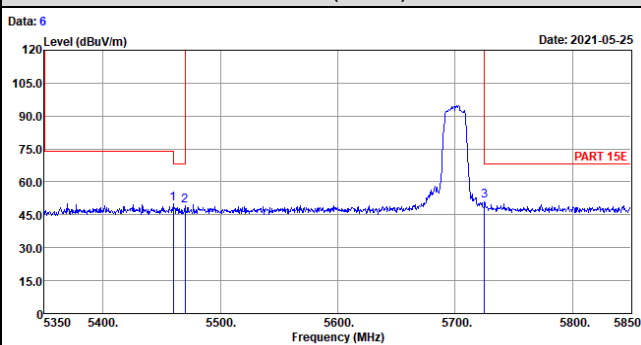


802.11ac (VHT20) Channel 140

Horizontal (Peak)

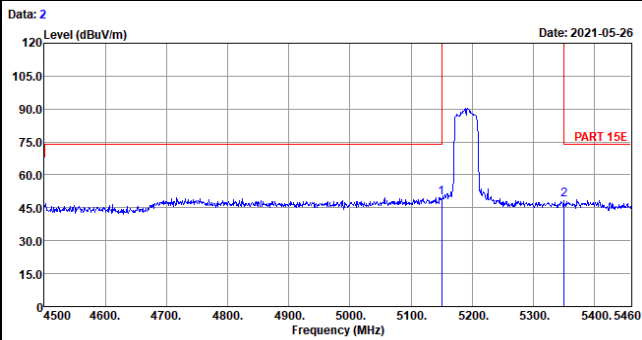


Vertical (Peak)

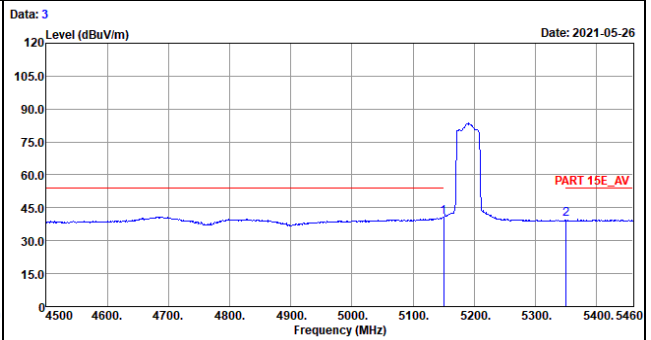


802.11ac (VHT40) Channel 38

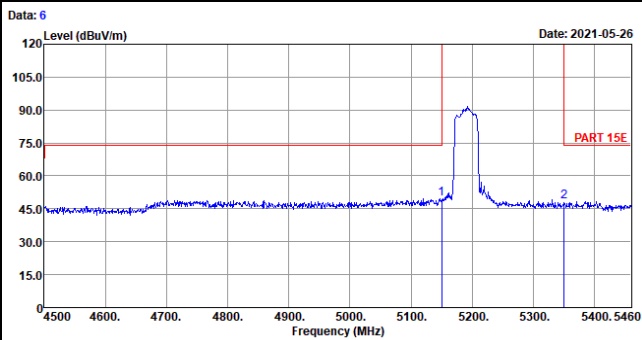
Horizontal (Peak)



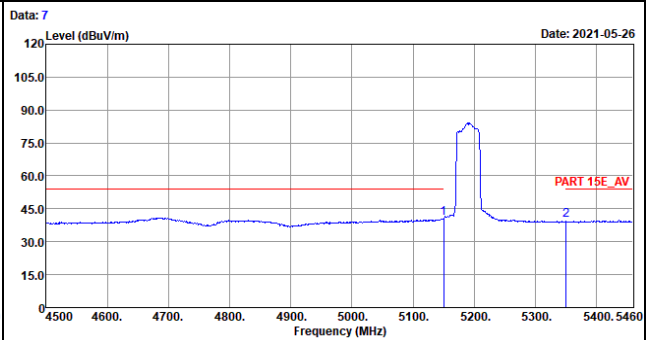
Horizontal (Average)



Vertical (Peak)

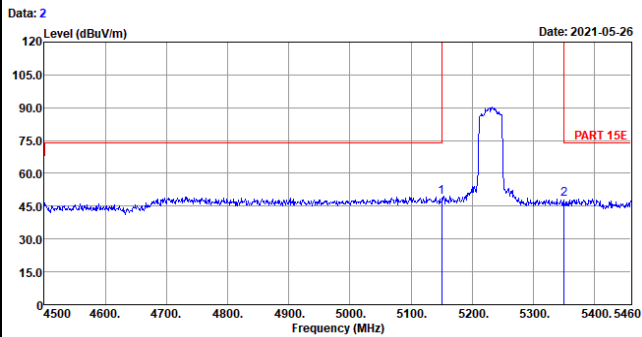


Vertical (Average)

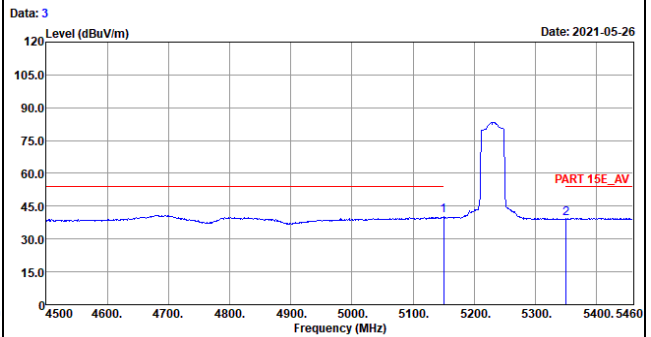


802.11ac (VHT40) Channel 46

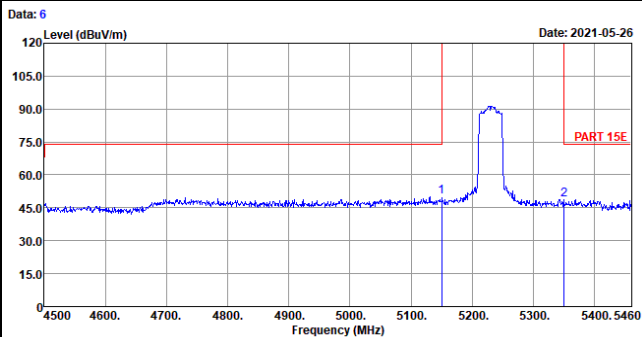
Horizontal (Peak)



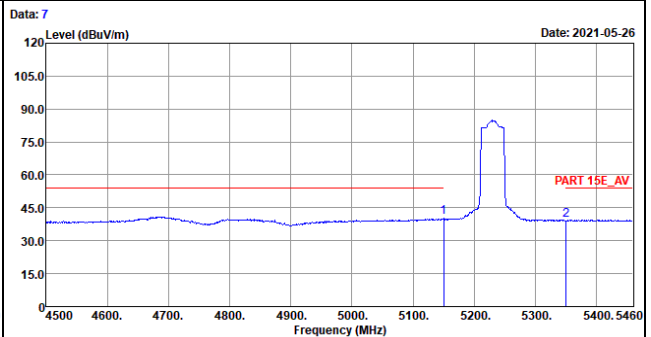
Horizontal (Average)



Vertical (Peak)

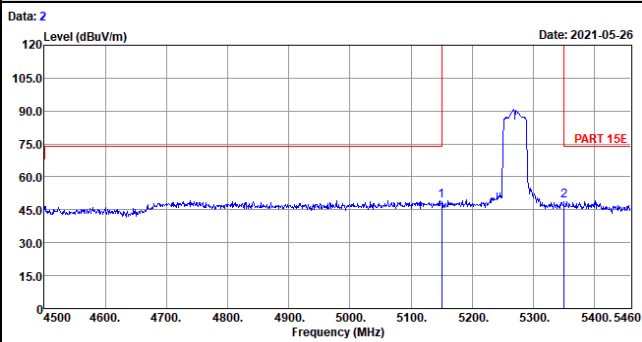


Vertical (Average)

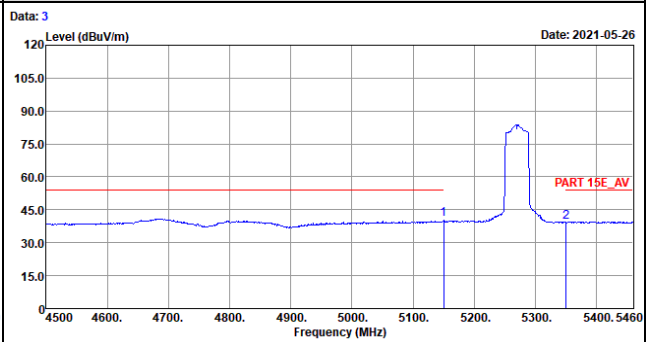


802.11ac (VHT40) Channel 54

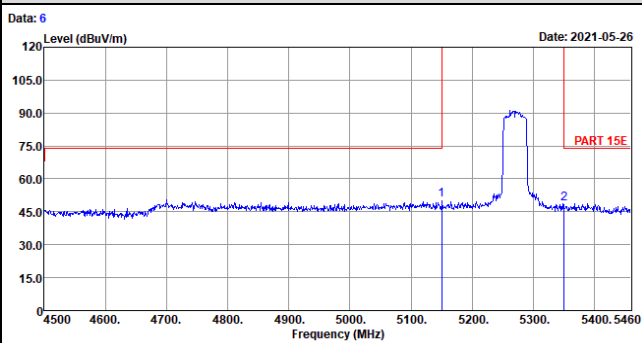
Horizontal (Peak)



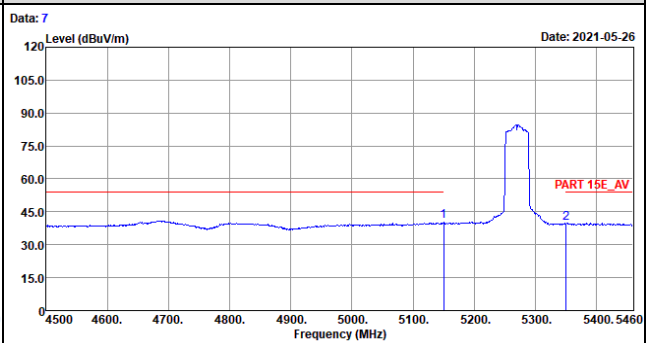
Horizontal (Average)



Vertical (Peak)

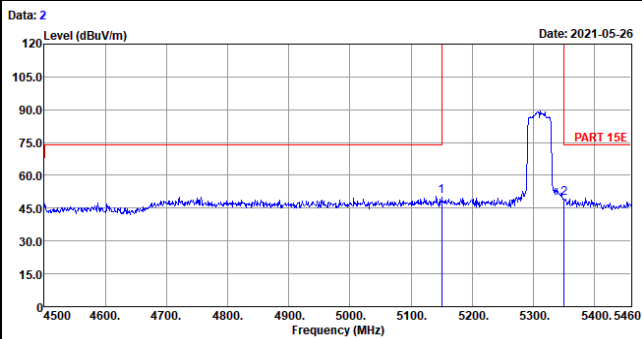


Vertical (Average)

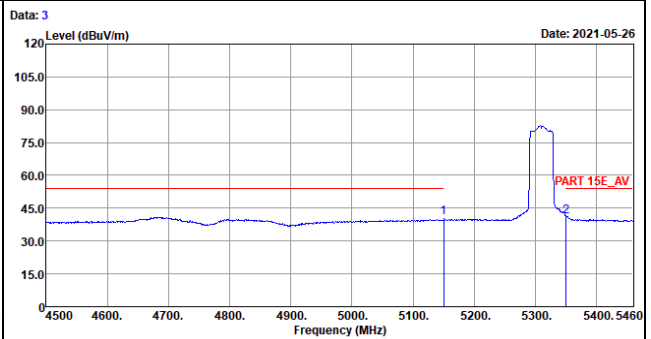


802.11ac (VHT40) Channel 62

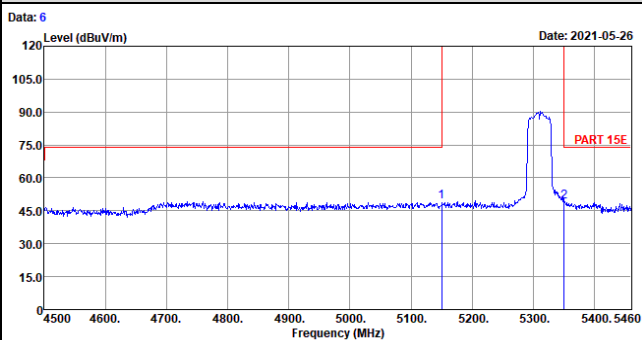
Horizontal (Peak)



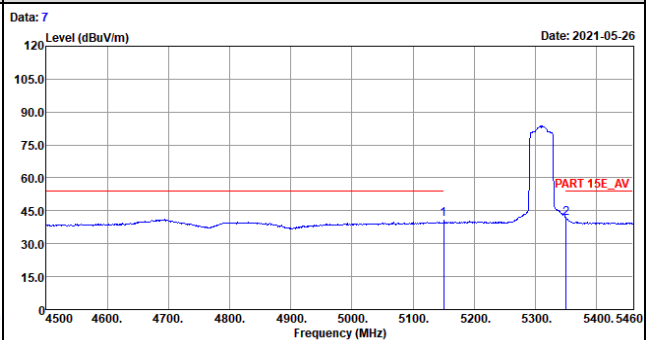
Horizontal (Average)



Vertical (Peak)

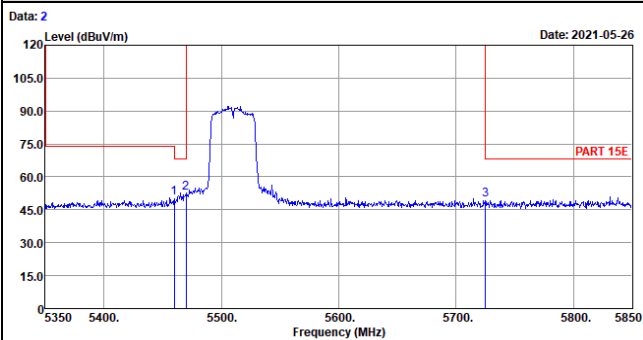


Vertical (Average)

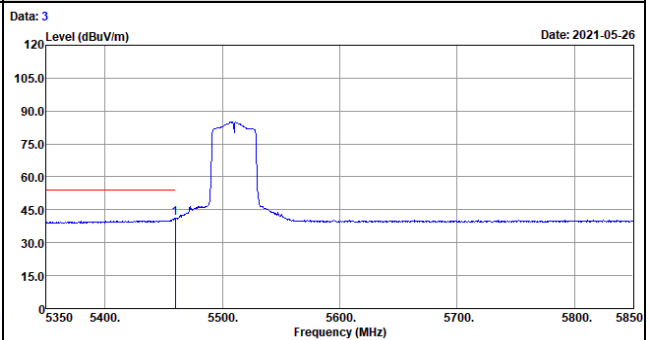


802.11ac (VHT40) Channel 102

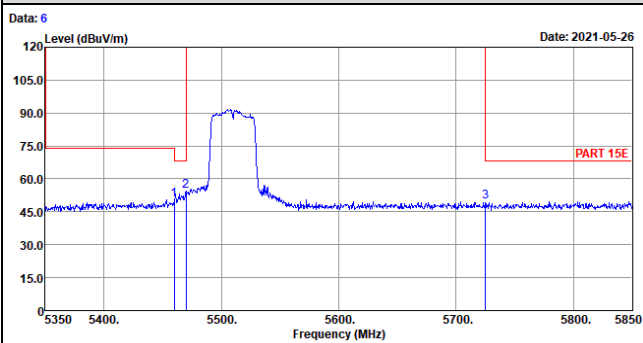
Horizontal (Peak)



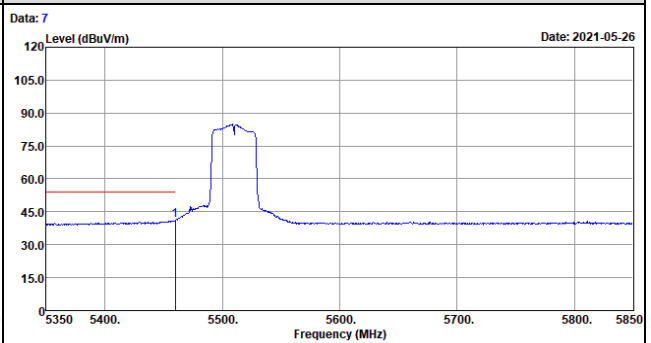
Horizontal (Average)



Vertical (Peak)

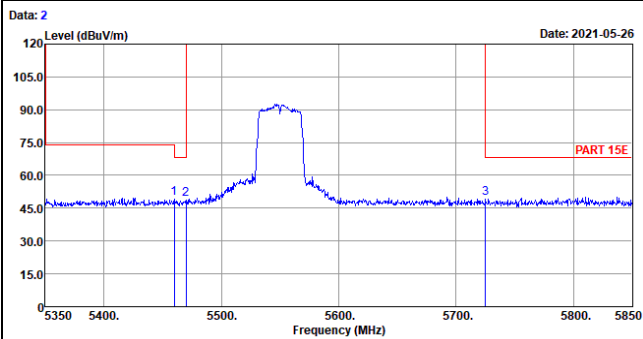


Vertical (Average)

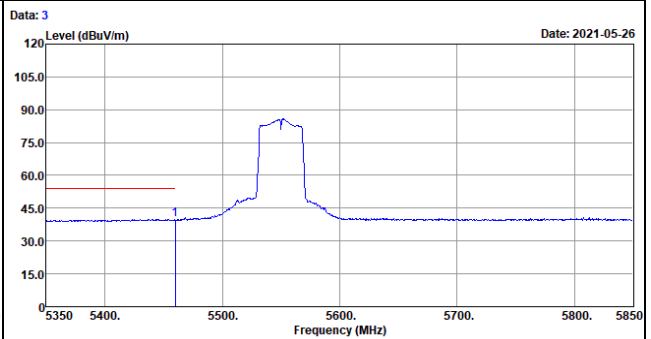


802.11ac (VHT40) Channel 110

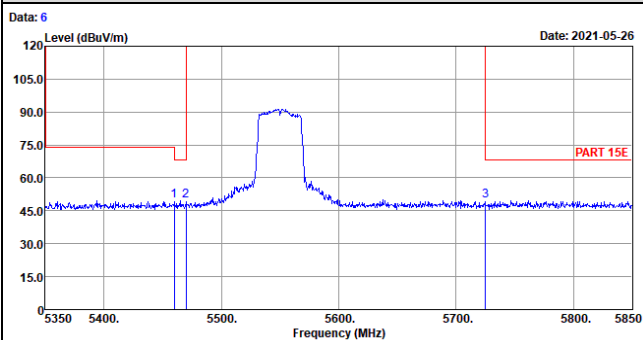
Horizontal (Peak)



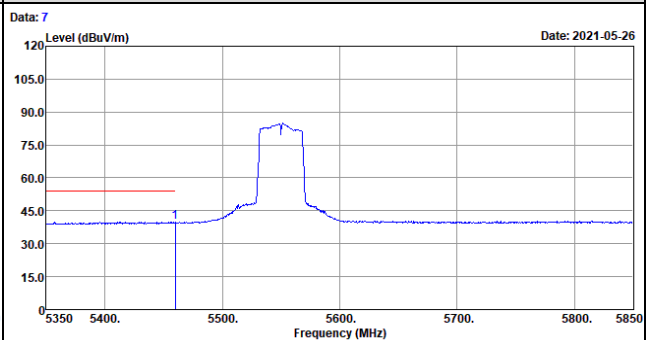
Horizontal (Average)



Vertical (Peak)

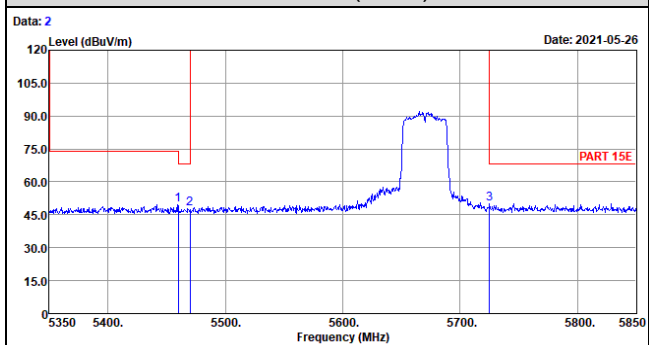


Vertical (Average)

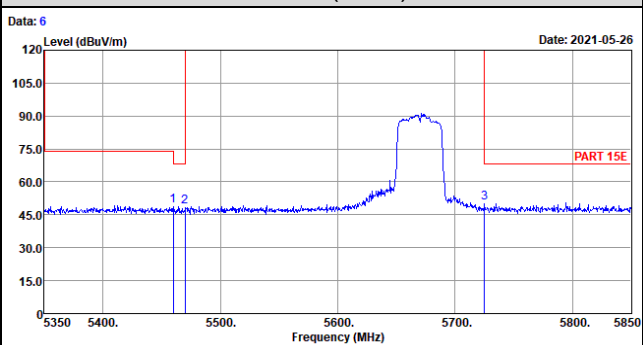


802.11ac (VHT40) Channel 134

Horizontal (Peak)

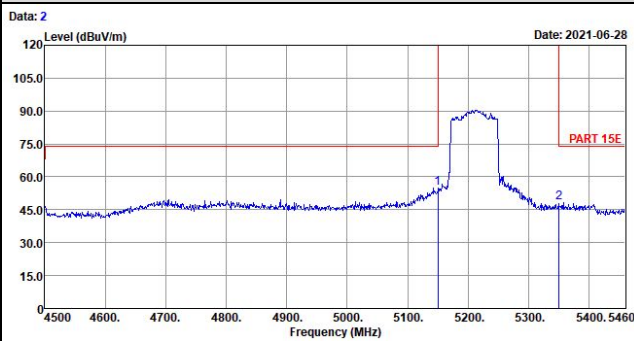


Vertical (Peak)

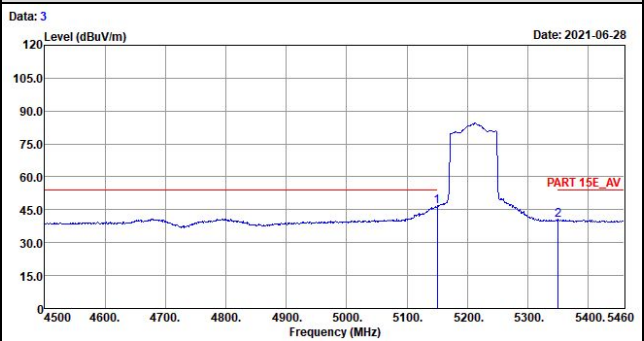


802.11ac (VHT80) Channel 42

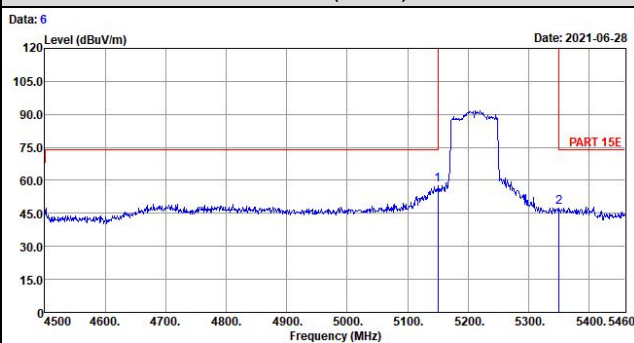
Horizontal (Peak)



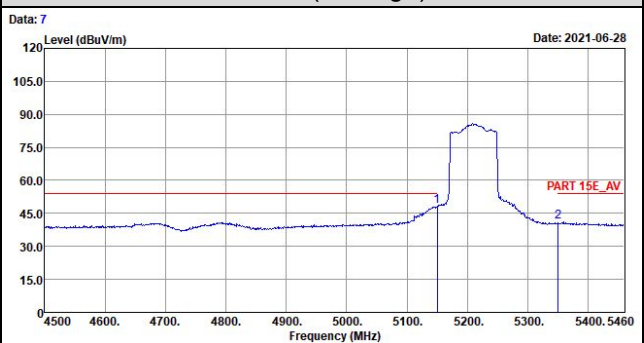
Horizontal (Average)



Vertical (Peak)

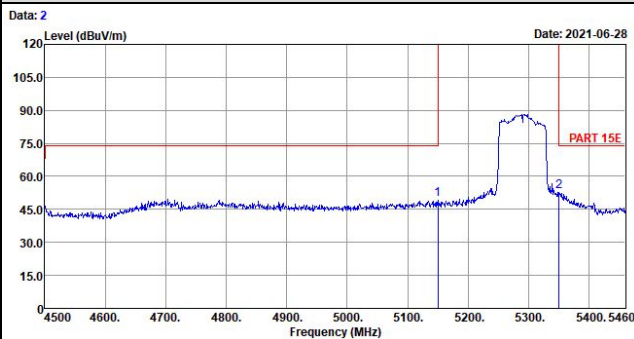


Vertical (Average)

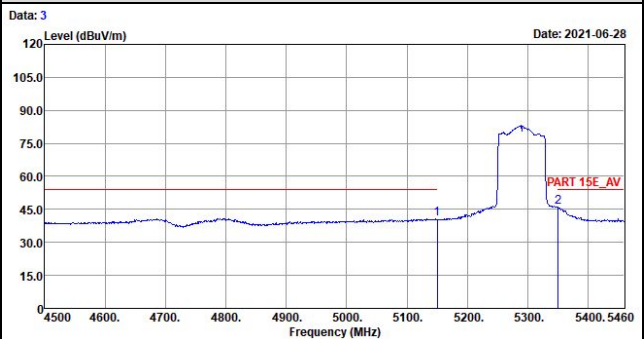


802.11ac (VHT80) Channel 58

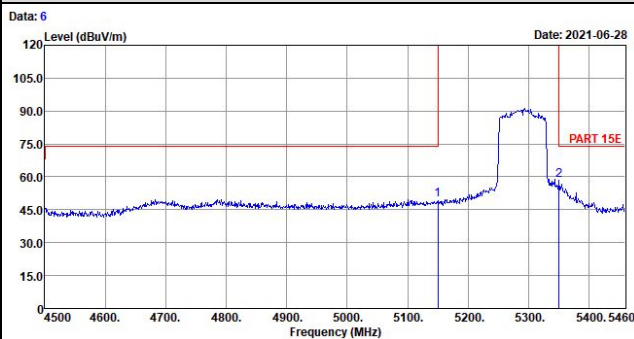
Horizontal (Peak)



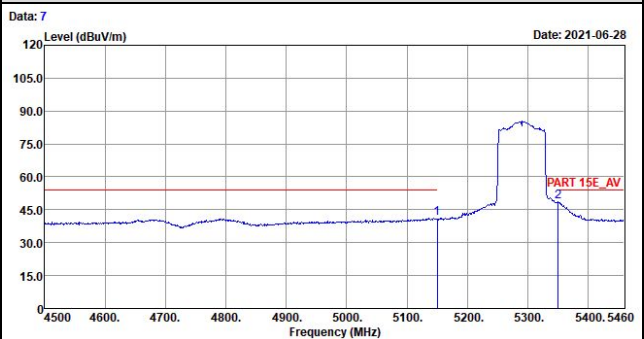
Horizontal (Average)



Vertical (Peak)

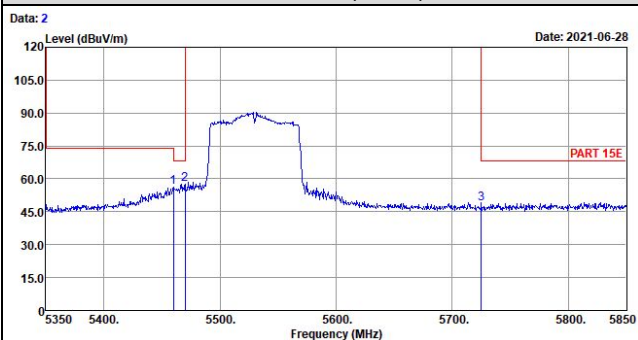


Vertical (Average)

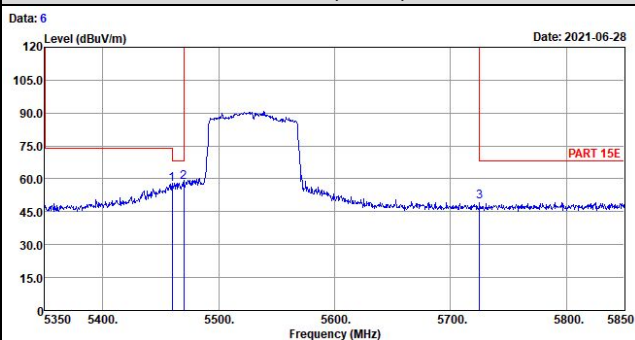


802.11ac (VHT80) Channel 106

Horizontal (Peak)

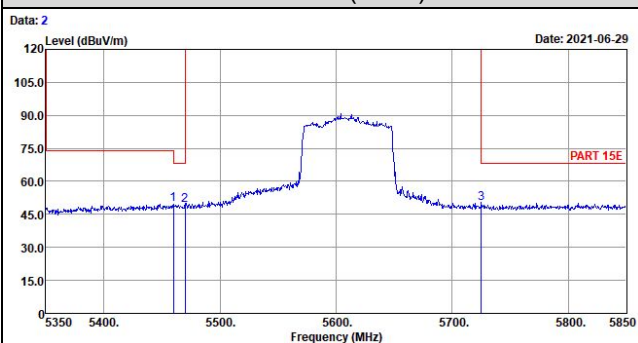


Vertical (Peak)

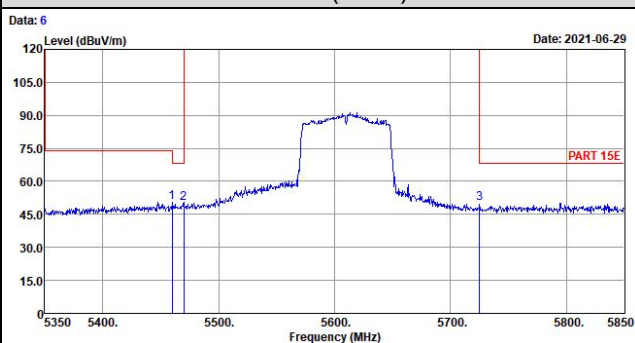


802.11ac (VHT80) Channel 122

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.

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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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