FCC Test Report

Report No.:	RFBEAD-WTW-P21060534-1
FCC ID:	M82-AIM78S6
Model:	AIM-78S-6
Series Model:	AIM-78H-6, AIM-78H-6XXXXXXXXXXXXXXX, AIM-78S-6XXXXXXXXXXXXXXX (X: maybe 1-9, A-Z, or blank) (refer to item 3.1 for more details)
Received Date:	Jun. 16, 2021
Test Date:	Jul. 26 ~ Aug. 25, 2021
Issued Date:	Dec. 27, 2021
Applicant:	ADVANTECH CO., LTD
Address:	No. 1, Alley 20, Lane 26, Rueiguang Rd, Neihu District, Taipei, Taiwan 114
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location(1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number(1):	788550 / TW0003
Test Location(2):	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan
FCC Registration / Designation Number(2):	427177 / TW0011

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBEAD-WTW-P21060534-1	Original release	Dec. 27, 2021

1 Certificate of Conformity

Product:	10.1” Tablet PC
Brand:	ADVANTECH
Model:	AIM-78S-6
Series Model:	AIM-78H-6, AIM-78H-6XXXXXXXXXXXXXXXX, AIM-78S-6XXXXXXXXXXXXXXXX (X: maybe 1-9, A-Z, or blank) (refer to item 3.1 for more details)
Sample Status:	Engineering sample
Applicant:	ADVANTECH CO., LTD
Test Date:	Jul. 26 ~ Aug. 25, 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 : Pettie Chen , **Date:** Dec. 27, 2021

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** Dec. 27, 2021

Jeremy Lin / 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 -6.34dB at 0.55000MHz.
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 -1dB at 5470.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is I-PEX_IV not a standard connector.

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.
3. For U-NII-1, U-NII-2A and U-NII-2C band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	2.0153 dB
	200MHz ~1000MHz	2.0224 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	10.1” Tablet PC
Brand	ADVANTECH
Model	AIM-78S-6
Series Model	AIM-78H-6, AIM-78H-6XXXXXXXXXXXXXXX, AIM-78S-6XXXXXXXXXXXXXXX (X: maybe 1-9, A-Z, or blank)
Model Difference	Refer to note
Sample Status	Engineering sample
Power Supply Rating	10.8Vdc (Battery) 19Vdc (Adapter)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps 802.11ac: up to 867Mbps
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: 35.079mW 5260 ~ 5320MHz: 35.027mW 5500 ~ 5700MHz: 34.839mW 5745 ~ 5825MHz: 35.362mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Refer to note
Cable Supplied	Refer to note

Note:

1. The following models are provided to this EUT. The model of the AIM-78S-6 was chosen for final test.

Model	Description
AIM-78S-6, AIM-78H-6, AIM-78H-6XXXXXXXXXXXXXXX, AIM-78S-6XXXXXXXXXXXXXXX (X: maybe 1-9, A-Z, or blank)	For marketing purpose

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

Modulation Mode	TX Function
802.11a	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT20)	2TX
802.11ac (VHT40)	2TX
802.11ac (VHT80)	2TX

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

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	Tamura	XEW1934N	Input: 100-240Vac~1.5A, 50/60Hz Output: 19Vdc / 3.42A Power Line: AC: 1.5m cable without core DC: 1.2m cable without core
Adapter 2 (option)	FSP	FSP065-DBCM1	Input: 100-240Vac~ 2.0-1.0A, 50-60Hz Output: 19Vdc / 3.43A Power Line: AC: 1.5m cable without core DC: 1.5m cable with 1 core
Battery	ADVANTECH	AIM-BAT-10	Rating: 10.8Vdc, 24.84Wh, 2300mAh
WWAN+WLAN module	USI	MS-01 Pro	-
Docking Stations (option)	ADVANTECH	AIM-DOC-0001	Rating: 19Vdc, 3.42A (VESA Dock)
Docking Stations (option)	ADVANTECH	AIM-VED0	Rating: 9 ~ 32Vdc (Vehicle Dock)
Docking Stations (option)	ADVANTECH	AIM-OFD-0000	Rating: 19Vdc (Office Dock)
Extension Modules-Barcode scanner (20°) (option)	ADVANTECH	AIM-EXT0-0040 (20 degree)	Sensor: 640 x 480 CMOS sensor
Extension Modules-Barcode scanner (70°) (option)	ADVANTECH	AIM-EXT0-0041 (70 degree)	Sensor: 640 x 480 CMOS sensor

4. The EUT uses the following antennas.

Ant. Type	PIFA										
Ant. Connector	I-PEX_IV										
WiFi_Main / BT											
Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain (dBi)	3.36	3.36	3.15	3.16	3.06	3.25	3.22	3.23	3.32	3.01	3.12
Frequency (MHz)	5150	5250	5350	5450	5550	5650	5750	5850			
Peak Gain (dBi)	4.31	3.23	2.63	1.97	2.33	2.76	2.61	2.71			
WiFi_Aux											
Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain (dBi)	4.19	4.09	4.25	4.12	4.07	3.95	3.86	3.86	3.71	3.46	3.43
Frequency (MHz)	5150	5250	5350	5450	5550	5650	5750	5850			
Peak Gain (dBi)	0.97	1.81	2.02	1.08	1.63	1.95	0.30	0.41			

* The max. gain was chosen for final tests.
* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

5. The device WLAN 2.4GHz, BT and NFC can transmit simultaneously.
   The device WLAN 5GHz, BT and NFC can transmit simultaneously.
6. Spurious emission of the simultaneous operation (WLAN 2.4GHz, BT and NFC or WLAN 5GHz, BT and NFC) has been evaluated and no non-compliance was found.

3.2 Description of Test Modes

For 5180 ~ 5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20) and 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) and 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) and 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) and 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) and 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) and 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) and 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) and 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≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	EUT + Adapter
B	-	√	√	-	EUT + VESA Dock
C	-	√	√	-	EUT + Vehicle Dock
D	-	√	√	-	EUT + Office Dock

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

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

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z plane**.
2. For radiated emission (below 1GHz) and power line conducted emission test items chosen the worst maximum fundamental emission level channel.
3. "-": Means no effect.

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)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ac (VHT20)		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	29.3
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11ac (VHT20)		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	29.3
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
	802.11ac (VHT20)		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	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ac (VHT20)		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	29.3

Radiated Emission Test (Below 1GHz):

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

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B, C, D	802.11ac (VHT20)	5180-5240	36, 40, 48	149	OFDM	6.0
		5260-5320	52, 60, 64		OFDM	6.0
		5500-5700	100 to 140		OFDM	6.0
		5745-5825	149, 157, 165		OFDM	6.0

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B, C, D	802.11ac (VHT20)	5180-5240	36, 40, 48	149	OFDM	6.0
		5260-5320	52, 60, 64		OFDM	6.0
		5500-5700	100 to 140		OFDM	6.0
		5745-5825	149, 157, 165		OFDM	6.0

Conducted Power 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)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	6.5
	802.11n (HT40)		38 to 46	38, 46	OFDM	13.5
	802.11ac (VHT20)		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	29.3
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT20)		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	29.3
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	6.5
	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	13.5
	802.11ac (VHT20)		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	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	6.5
	802.11n (HT40)		151 to 159	151, 159	OFDM	13.5
	802.11ac (VHT20)		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	29.3

Bandwidth, Peak Power Spectral Density 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)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ac (VHT20)		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	29.3
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11ac (VHT20)		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	29.3
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
	802.11ac (VHT20)		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	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ac (VHT20)		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	29.3

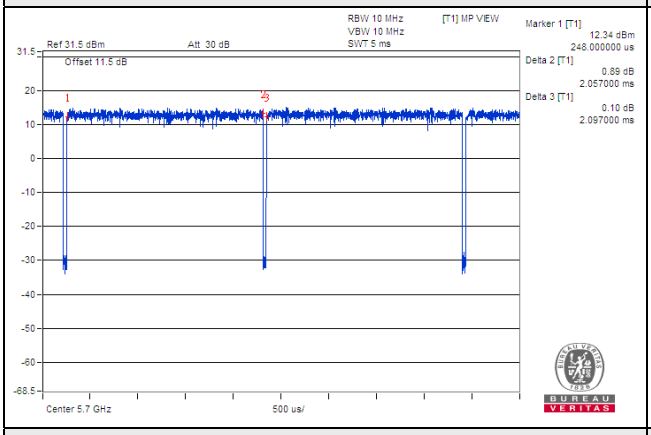
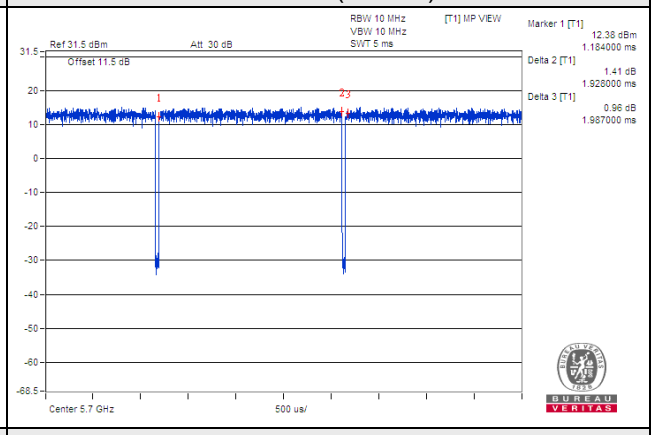
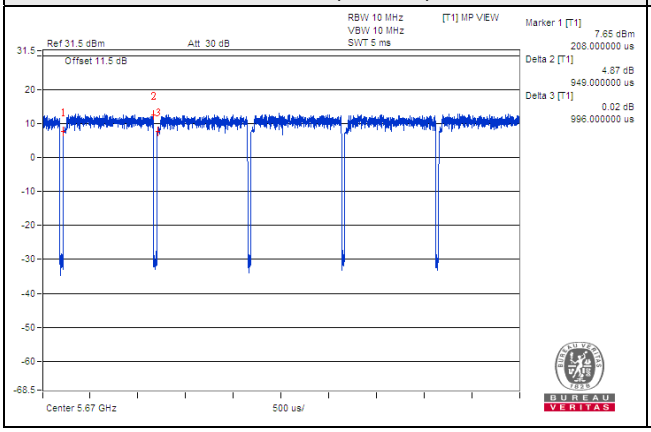
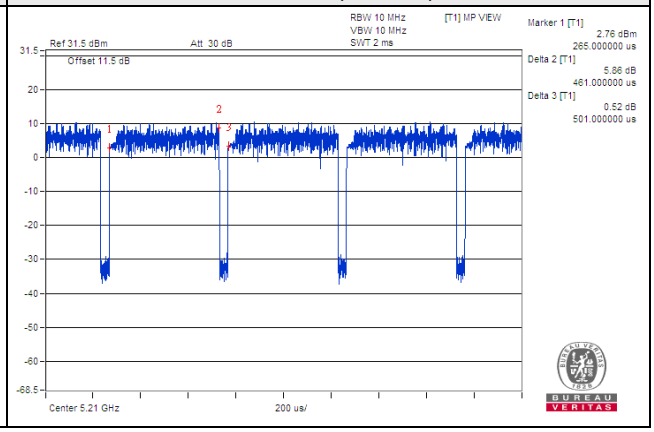
Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 75% RH	120Vac, 60Hz	Karl Lee
RE<1G	25 deg. C, 75% RH	120Vac, 60Hz	Karl Lee
PLC	25 deg. C, 75% RH 23 deg. C, 66% RH	120Vac, 60Hz	Edison Lee Cookie Ku
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Jisyong Wang

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is > 98%, duty factor is not required.
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 2.057/2.097 = 0.981
802.11ac (VHT20): Duty cycle = 1.928/1.987 = 0.970, Duty factor = 10 * log (1/0.970) = 0.13
802.11ac (VHT40): Duty cycle = 0.949/0.996 = 0.953, Duty factor = 10 * log (1/0.953) = 0.21
802.11ac (VHT80): Duty cycle = 0.461/0.501 = 0.920, Duty factor = 10 * log (1/0.920) = 0.36

802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	

3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Flash	HP	v250W	05	NA	Type-A
B.	Flash	HP	v250W	03	NA	Type-A
C.	Earphone	APPLE	NA	NA	NA	-
D.	Load	NA	NA	NA	NA	-
E.	Power Supply	TOPWARD	6306D	809760	NA	-
F.	GPS Antenna	CONNECTEC	SP070809-001	3-6004-031R000	NA	Provided by client
G.	Monitor	DELL	SE2416Hc	CN-OWJKMC-641 80-66D-013B-A00	NA	-
H.	Docking Station	ADVANTECH	AIM-DOC-0001	NA	NA	Provided by client
I.	Docking Station	ADVANTECH	AIM-VED0	NA	NA	Provided by client
J.	Docking Station	ADVANTECH	AIM-OFD-0000	NA	NA	Provided by client
K.	Adapter	FSP	FSP065-DBCM1	NA	NA	Provided by client

Note:

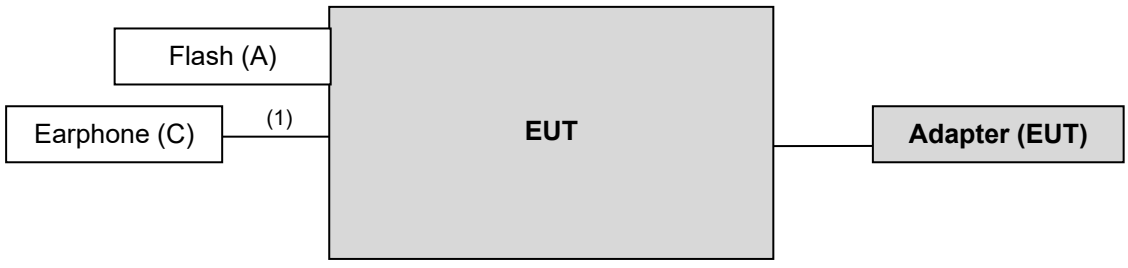
1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Audio cable	1	1.2	N	0	-
2.	RS232 cable	1	1.5	N	0	-
3.	LAN cable	1	7	N	0	RJ45, Cat.5e
4.	Antenna cable	1	5	N	0	Provided by client
5.	Power cable	1	1	N	0	Provided by client
6.	HDMI cable	1	2.0	Y	0	Provided by Lab. (Brand: Amber, Model: HDMI-AA120)
7.	DC Power cable	1	1.5	N	1	Provided by client
8.	AC Power cable	1	1.5	N	0	Provided by client

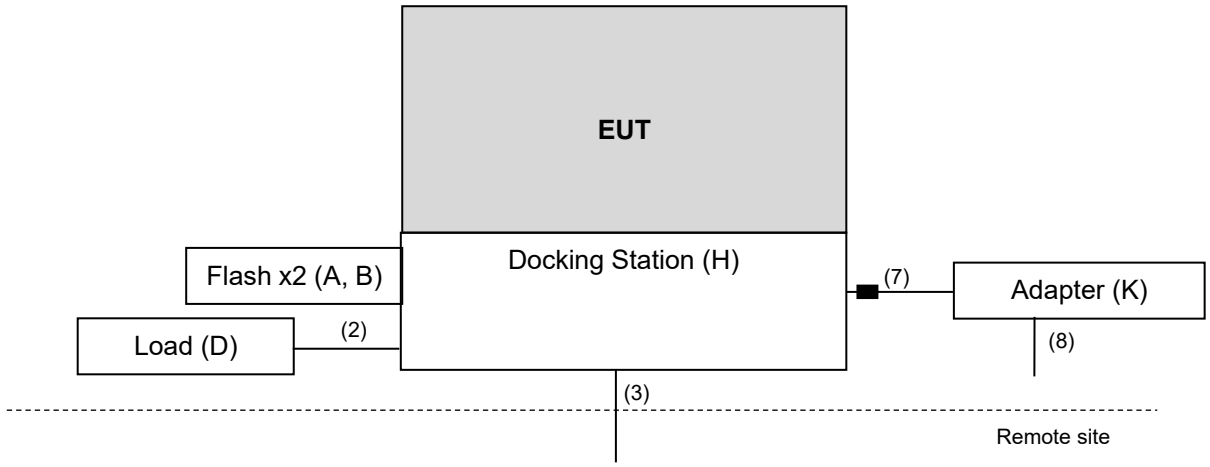
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

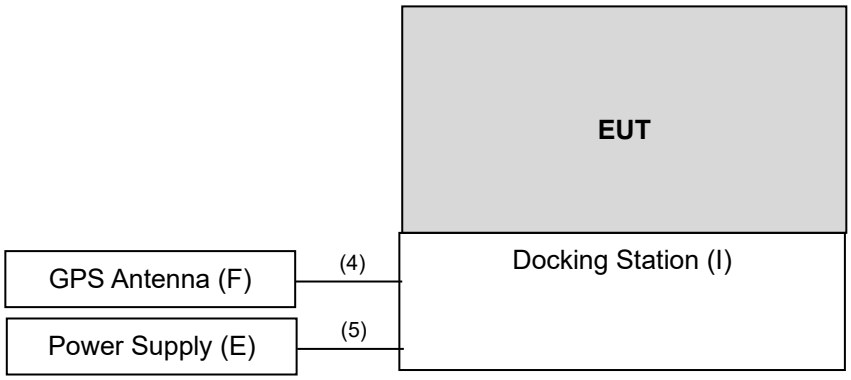
Mode A



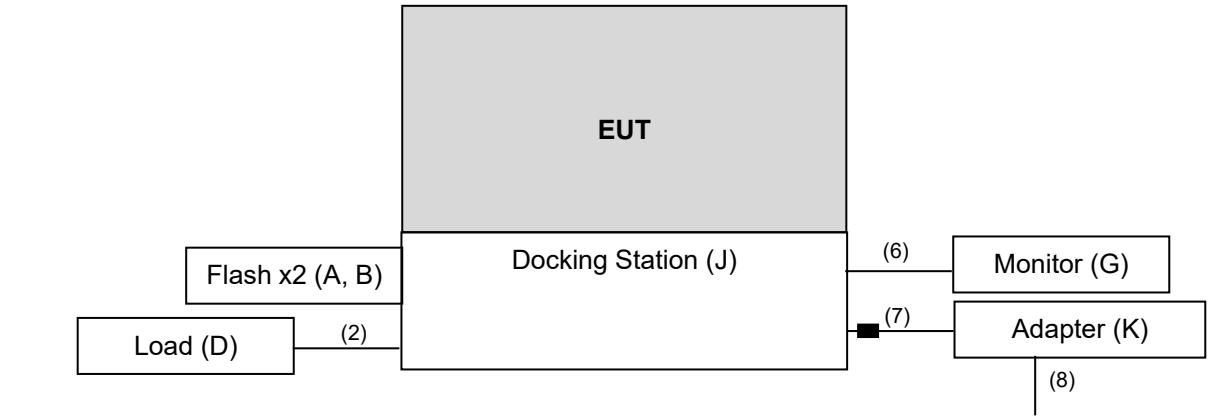
Mode B



Mode C



Mode D



3.5 General Description of Applied Standards and References

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

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

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

Limits of unwanted emission out of the restricted bands

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

*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:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Agilent Technologies	N9038A	MY55420137	Apr. 09, 2021	Apr. 08, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 22, 2020	Nov. 21, 2021
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 09, 2020	Nov. 08, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 22, 2020	Nov. 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2020	Nov. 24, 2021
Preamplifier Agilent	310N	187226	Jun. 17, 2021	Jun. 16, 2022
Preamplifier Agilent	83017A	MY39501357	Jun. 17, 2021	Jun. 16, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 07, 2020	Oct. 06, 2021
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 17, 2021	Jun. 16, 2022
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 17, 2021	Jun. 16, 2022
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 19, 2021	Jan. 18, 2022
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 11, 2021	Jan. 10, 2022

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 Xindian Chamber 6.

4.1.3 Test Procedures

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

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

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

3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz. (802.11a: RBW = 1MHz, VBW = 10Hz; 802.11ac (VHT20): RBW = 1MHz, VBW = 1kHz; 802.11ac (VHT40): RBW = 1MHz, VBW = 3kHz; 802.11ac (VHT80): RBW = 1MHz, VBW = 3kHz)

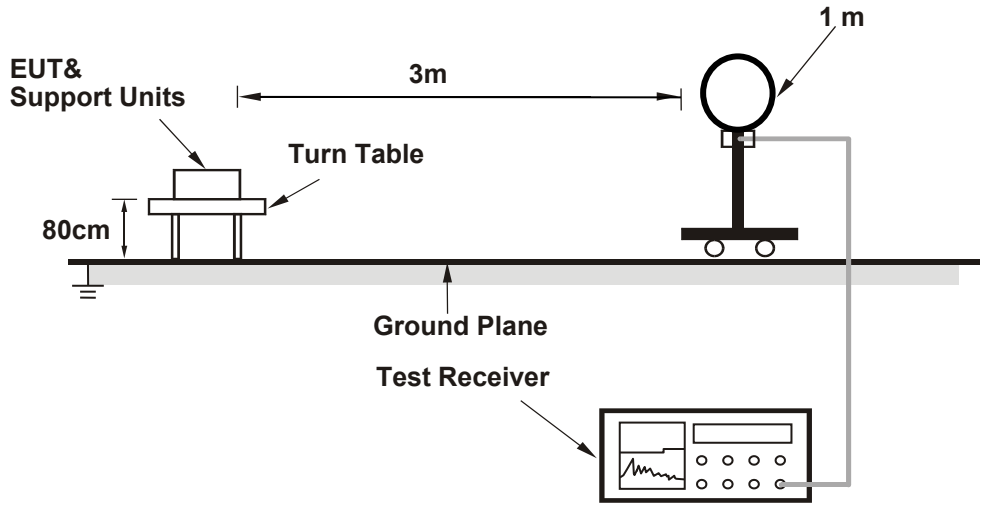
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

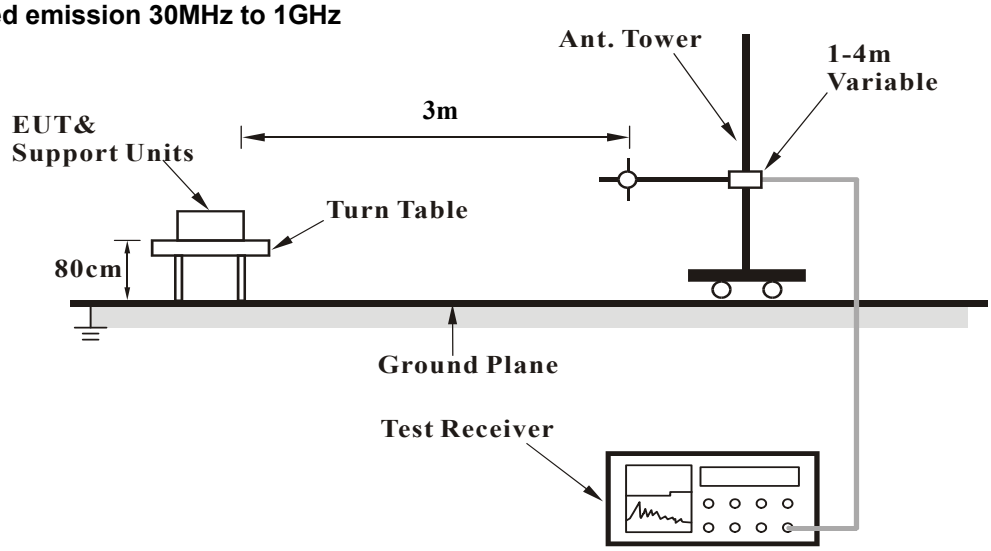
No deviation.

4.1.5 Test Setup

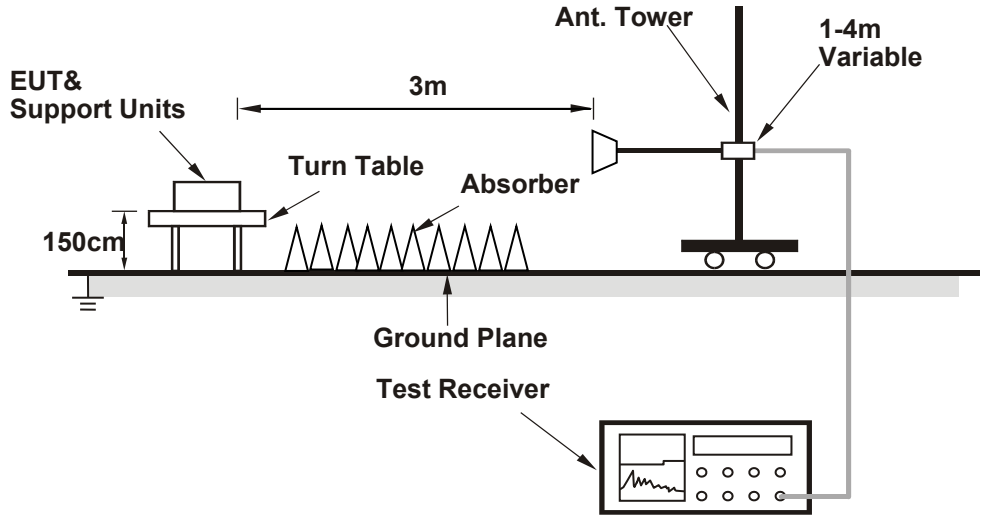
For Radiated emission below 30MHz



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

Mode A

a. The EUT powered by adapter.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via USB cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

Mode B

a. The EUT powered by cradle.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via LAN cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

Mode C

a. The EUT powered by cradle.
b. The EUT under transmission condition continuously at specific channel frequency.

Mode D

a. The EUT powered by cradle.
b. The EUT communicated with monitor via HDMI cables and transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data：

802.11a

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	Karl Lee

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	51.39	41.34	10.05	54	-2.61	207	154	Average
5150	68.21	58.16	10.05	74	-5.79	207	154	Peak
5180	108.83	98.71	10.12			216	163	Average
5180	114.33	104.21	10.12			216	163	Peak
*10360	55.89	39.87	16.02	68.2	-12.31	174	256	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	48.39	38.34	10.05	54	-5.61	201	36	Average
5150	64.59	54.54	10.05	74	-9.41	201	36	Peak
5180	105.67	95.55	10.12			200	4	Average
5180	111.17	101.05	10.12			200	4	Peak
*10360	55.91	39.89	16.02	68.2	-12.29	182	143	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5180 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 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	Karl Lee

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	46.85	36.8	10.05	54	-7.15	207	159	Average
5150	64.2	54.15	10.05	74	-9.8	207	159	Peak
5200	109.47	99.31	10.16			216	163	Average
5200	114.37	104.21	10.16			216	163	Peak
5350	43.1	32.87	10.23	54	-10.9	207	159	Average
5350	52.63	42.4	10.23	74	-21.37	207	159	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	44.87	34.82	10.05	54	-9.13	200	8	Average
5150	61.26	51.21	10.05	74	-12.74	200	8	Peak
5200	106.93	96.77	10.16			200	8	Average
5200	111.81	101.65	10.16			200	8	Peak
5350	42.99	32.76	10.23	54	-11.01	200	8	Average
5350	52.53	42.3	10.23	74	-21.47	200	8	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	Karl Lee

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
5240	108.76	98.62	10.14			216	163	Average
5240	114.43	104.29	10.14			216	163	Peak
5350	44.39	34.16	10.23	54	-9.61	216	163	Average
5350	52.86	42.63	10.23	74	-21.14	216	163	Peak
*10480	55.82	39.92	15.9	68.2	-12.38	131	82	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
5240	106.31	96.17	10.14			200	4	Average
5240	111.67	101.53	10.14			200	4	Peak
5350	43.85	33.62	10.23	54	-10.15	200	4	Average
5350	52.67	42.44	10.23	74	-21.33	200	4	Peak
*10480	55.72	39.82	15.9	68.2	-12.48	243	182	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	Karl Lee

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	43.38	33.33	10.05	54	-10.62	244	163	Average
5150	52.8	42.75	10.05	74	-21.2	244	163	Peak
5260	107.8	97.68	10.12			244	163	Average
5260	113.31	103.19	10.12			244	163	Peak
*10520	55.78	39.9	15.88	68.2	-12.42	241	82	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	43.04	32.99	10.05	54	-10.96	188	12	Average
5150	52.76	42.71	10.05	74	-21.24	188	12	Peak
5260	104.7	94.58	10.12			188	12	Average
5260	110.45	100.33	10.12			188	12	Peak
*10520	55.97	40.09	15.88	68.2	-12.23	261	47	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	Karl Lee

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	43.18	33.13	10.05	54	-10.82	244	163	5150
5150	52.71	42.66	10.05	74	-21.29	244	163	5150
5300	106.71	96.65	10.06			244	163	5300
5300	111.18	101.12	10.06			244	163	5300
5350	46.16	35.93	10.23	54	-7.84	260	167	5350
5350	60.71	50.48	10.23	74	-13.29	260	167	5350
10600	47.14	31.38	15.76	54	-6.86	248	142	10600
10600	56.9	41.14	15.76	74	-17.1	248	142	10600
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	43.81	33.76	10.05	54	-10.19	188	12	5150
5150	51.94	41.89	10.05	74	-22.06	188	12	5150
5300	104.31	94.25	10.06			188	12	5300
5300	109.42	99.36	10.06			188	12	5300
5350	45.29	35.06	10.23	54	-8.71	191	3	5350
5350	56.5	46.27	10.23	74	-17.5	191	3	5350
10600	45.82	30.06	15.76	54	-8.18	152	247	10600
10600	55.6	39.84	15.76	74	-18.4	152	247	10600

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	Karl Lee

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	107.88	97.79	10.09			244	163	Average
5320	112.68	102.59	10.09			244	163	Peak
5350	50.48	40.25	10.23	54	-3.52	245	129	Average
5350	62.68	52.45	10.23	74	-11.32	245	129	Peak
10640	45.84	29.85	15.99	54	-8.16	198	124	Average
10640	55.59	39.6	15.99	74	-18.41	198	124	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	105.62	95.53	10.09			188	12	Average
5320	110.49	100.4	10.09			188	12	Peak
5350	49.93	39.7	10.23	54	-4.07	192	23	Average
5350	60.54	50.31	10.23	74	-13.46	192	23	Peak
10640	46.59	30.6	15.99	54	-7.41	235	70	Average
10640	56.17	40.18	15.99	74	-17.83	235	70	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	Karl Lee

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	46.56	36.05	10.51	54	-7.44	137	191	Average
5460	65.03	54.52	10.51	74	-8.97	137	191	Peak
*5470	67.14	56.61	10.53	68.2	-1.06	137	191	Peak
5500	106.65	96.05	10.6			137	191	Average
5500	113.4	102.8	10.6			137	191	Peak
11000	47.06	30.93	16.13	54	-6.94	225	140	Average
11000	57.15	41.02	16.13	74	-16.85	225	140	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	44.97	34.46	10.51	54	-9.03	214	12	Average
5460	62.56	52.05	10.51	74	-11.44	214	12	Peak
*5470	63.75	53.22	10.53	68.2	-4.45	214	12	Peak
5500	104.47	93.87	10.6			214	12	Average
5500	111.38	100.78	10.6			214	12	Peak
11000	47.11	30.98	16.13	54	-6.89	164	28	Average
11000	56.89	40.76	16.13	74	-17.11	164	28	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	Karl Lee

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	42.54	32.03	10.51	54	-11.46	137	191	Average
5460	52.72	42.21	10.51	74	-21.28	137	191	Peak
*5470	51.37	40.84	10.53	68.2	-16.83	137	191	Peak
5580	105.53	94.82	10.71			137	191	Average
5580	112.82	102.11	10.71			137	191	Peak
*5725	52.39	41.47	10.92	68.2	-15.81	137	191	Peak
11160	48.17	31.81	16.36	54	-5.83	144	125	Average
11160	58.33	41.97	16.36	74	-15.67	144	125	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	42.83	32.32	10.51	54	-11.17	214	12	Average
5460	52.78	42.27	10.51	74	-21.22	214	12	Peak
*5470	51.53	41	10.53	68.2	-16.67	214	12	Peak
5580	104.52	93.81	10.71			214	12	Average
5580	111.3	100.59	10.71			214	12	Peak
*5725	52.12	41.2	10.92	68.2	-16.08	214	12	Peak
11160	47.38	31.02	16.36	54	-6.62	243	182	Average
11160	57.56	41.2	16.36	74	-16.44	243	182	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5580 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 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	Karl Lee

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
5700	104.64	93.69	10.95			137	191	Average
5700	111.68	100.73	10.95			137	191	Peak
*5725	66.87	55.95	10.92	68.2	-1.33	130	153	Peak
11400	46.54	30.35	16.19	54	-7.46	128	174	Average
11400	56.78	40.59	16.19	74	-17.22	128	174	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
5700	102.45	91.5	10.95			214	12	Average
5700	109.3	98.35	10.95			214	12	Peak
*5725	57.35	46.43	10.92	68.2	-10.85	214	12	Peak
11400	48.27	32.08	16.19	54	-5.73	136	62	Average
11400	58.14	41.95	16.19	74	-15.86	136	62	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5700 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 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	Karl Lee

<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	109.54	98.66	10.88			137	191	Average
5745	116.07	105.19	10.88			137	191	Peak
11490	47.81	31.34	16.47	54	-6.19	156	6	Average
11490	56.35	39.88	16.47	74	-17.65	156	6	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	107.48	96.6	10.88			214	12	Average
5745	114.47	103.59	10.88			214	12	Peak
11490	47.91	31.44	16.47	54	-6.09	187	7	Average
11490	57.15	40.68	16.47	74	-16.85	187	7	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
*5618.65	53.19	42.4	10.79	68.2	-15.01	137	191	Peak
5656.45	52.92	42.05	10.87	72.97	-20.05	137	191	Peak
5920.525	52.5	41.41	11.09	71.51	-19.01	137	191	Peak
*5975.65	53.62	42.36	11.26	68.2	-14.58	137	191	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
*5634.4	53.7	42.87	10.83	68.2	-14.5	214	12	Peak
5656.45	52.19	41.32	10.87	72.97	-20.78	214	12	Peak
5919.475	52.11	41.02	11.09	72.29	-20.18	214	12	Peak
*6017.125	53.72	42.37	11.35	68.2	-14.48	214	12	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5745 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 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	Karl Lee

<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	109.63	98.82	10.81			137	191	Average
5785	116.02	105.21	10.81			137	191	Peak
11570	47.69	31.2	16.49	54	-6.31	136	6	Average
11570	59.67	43.18	16.49	74	-14.33	136	6	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	105.62	94.81	10.81			214	12	Average
5785	112.62	101.81	10.81			214	12	Peak
11570	47.78	31.29	16.49	54	-6.22	145	14	Average
11570	58.93	42.44	16.49	74	-15.07	145	14	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
*5613.4	53.31	42.54	10.77	68.2	-14.89	137	191	Peak
5655.925	52.26	41.39	10.87	72.58	-20.32	137	191	Peak
5920	52.65	41.56	11.09	71.9	-19.25	137	191	Peak
*5983.525	53.62	42.36	11.26	68.2	-14.58	137	191	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
*5628.625	52.62	41.81	10.81	68.2	-15.58	214	12	Peak
5654.35	51.11	40.24	10.87	71.42	-20.31	214	12	Peak
5920.525	51.59	40.5	11.09	71.51	-19.92	214	12	Peak
*6016.075	53.63	42.28	11.35	68.2	-14.57	214	12	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5785 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 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	Karl Lee

<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	109.74	98.86	10.88			137	191	Average
5825	116.57	105.69	10.88			137	191	Peak
11650	48.06	31.28	16.78	54	-5.94	157	7	Average
11650	58.38	41.6	16.78	74	-15.62	157	7	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	106.37	95.49	10.88			214	20	Average
5825	113.6	102.72	10.88			214	20	Peak
11650	48.11	31.33	16.78	54	-5.89	158	88	Average
11650	58.91	42.13	16.78	74	-15.09	158	88	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
*5575.6	53.13	42.4	10.73	68.2	-15.07	137	191	Peak
5654.875	52.87	42	10.87	71.81	-18.94	137	191	Peak
5921.05	53.83	42.74	11.09	71.12	-17.29	137	191	Peak
*5933.125	55.14	44.03	11.11	68.2	-13.06	137	191	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
*5642.8	52.79	41.96	10.83	68.2	-15.41	214	20	Peak
5658.025	52.55	41.68	10.87	74.14	-21.59	214	20	Peak
5922.1	51.79	40.68	11.11	70.35	-18.56	214	20	Peak
*5948.875	54.94	43.76	11.18	68.2	-13.26	214	20	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Karl Lee

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	52.58	42.53	10.05	54	-1.42	223	141	Average
5150	68.39	58.34	10.05	74	-5.61	223	141	Peak
5180	107.06	96.94	10.12			216	163	Average
5180	112.14	102.02	10.12			216	163	Peak
*10360	55.9	39.88	16.02	68.2	-12.3	267	31	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	49.31	39.26	10.05	54	-4.69	200	8	Average
5150	64.61	54.56	10.05	74	-9.39	200	8	Peak
5180	104.25	94.13	10.12			200	8	Average
5180	110.27	100.15	10.12			200	8	Peak
*10360	54.69	38.67	16.02	68.2	-13.51	251	46	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5180 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 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	Karl Lee

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	46.91	36.86	10.05	54	-7.09	217	124	Average
5150	63.93	53.88	10.05	74	-10.07	217	124	Peak
5200	108.71	98.55	10.16			216	163	Average
5200	114.14	103.98	10.16			216	163	Peak
5350	43.1	32.87	10.23	54	-10.9	216	163	Average
5350	52.92	42.69	10.23	74	-21.08	216	163	Peak
*10400	55.71	39.53	16.18	68.2	-12.49	135	228	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	44.69	34.64	10.05	54	-9.31	194	16	Average
5150	61.57	51.52	10.05	74	-12.43	194	16	Peak
5200	105.85	95.69	10.16			200	9	Average
5200	111.29	101.13	10.16			200	9	Peak
5350	43.02	32.79	10.23	54	-10.98	200	9	Average
5350	52.9	42.67	10.23	74	-21.1	200	9	Peak
*10400	56.37	40.19	16.18	68.2	-11.83	123	172	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	Karl Lee

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
5240	109	98.86	10.14			216	163	Average
5240	114.03	103.89	10.14			216	163	Peak
5350	44.12	33.89	10.23	54	-9.88	216	163	Average
5350	54.44	44.21	10.23	74	-19.56	216	163	Peak
*10480	55.61	39.71	15.9	68.2	-12.59	261	274	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
5240	106.84	96.7	10.14			200	11	Average
5240	112.48	102.34	10.14			200	11	Peak
5350	43.94	33.71	10.23	54	-10.06	200	11	Average
5350	53.23	43	10.23	74	-20.77	200	11	Peak
*10480	56.26	40.36	15.9	68.2	-11.94	135	227	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	Karl Lee

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	43.37	33.32	10.05	54	-10.63	244	163	Average
5150	52.56	42.51	10.05	74	-21.44	244	163	Peak
5260	107.42	97.3	10.12			244	163	Average
5260	112.24	102.12	10.12			244	163	Peak
*10520	56.48	40.6	15.88	68.2	-11.72	191	26	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	43.1	33.05	10.05	54	-10.9	188	12	Average
5150	52.93	42.88	10.05	74	-21.07	188	12	Peak
5260	104.12	94	10.12			188	12	Average
5260	110.83	100.71	10.12			188	12	Peak
*10520	55.94	40.06	15.88	68.2	-12.26	253	184	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	Karl Lee

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	43.24	33.19	10.05	54	-10.76	244	163	Average
5150	52.15	42.1	10.05	74	-21.85	244	163	Peak
5300	105.99	95.93	10.06			244	163	Average
5300	111.17	101.11	10.06			244	163	Peak
5350	46.2	35.97	10.23	54	-7.8	224	184	Average
5350	59.62	49.39	10.23	74	-14.38	224	184	Peak
10600	46.51	30.75	15.76	54	-7.49	182	354	Average
10600	56.14	40.38	15.76	74	-17.86	182	354	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	42.95	32.9	10.05	54	-11.05	188	12	Average
5150	52.91	42.86	10.05	74	-21.09	188	12	Peak
5300	103.74	93.68	10.06			188	12	Average
5300	108.72	98.66	10.06			188	12	Peak
5350	45.3	35.07	10.23	54	-8.7	190	12	Average
5350	56.69	46.46	10.23	74	-17.31	190	12	Peak
10600	46.39	30.63	15.76	54	-7.61	135	272	Average
10600	56.12	40.36	15.76	74	-17.88	135	272	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	Karl Lee

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	106.29	96.2	10.09			244	163	Average
5320	111.3	101.21	10.09			244	163	Peak
5350	51.82	41.59	10.23	54	-2.18	236	163	Average
5350	62.08	51.85	10.23	74	-11.92	236	163	Peak
10640	46.21	30.22	15.99	54	-7.79	180	125	Average
10640	55.98	39.99	15.99	74	-18.02	180	125	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	104.23	94.14	10.09			188	12	Average
5320	109.57	99.48	10.09			188	12	Peak
5350	50.63	40.4	10.23	54	-3.37	194	28	Average
5350	61.22	50.99	10.23	74	-12.78	194	28	Peak
10640	46.55	30.56	15.99	54	-7.45	231	274	Average
10640	56.35	40.36	15.99	74	-17.65	231	274	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	Karl Lee

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	47.63	37.12	10.51	54	-6.37	137	191	Average
5460	66.5	55.99	10.51	74	-7.5	137	191	Peak
***5470**	**67.2**	**56.67**	**10.53**	**68.2**	**-1**	**137**	**191**	**Peak**
5500	106.42	95.82	10.6			137	191	Average
5500	113.18	102.58	10.6			137	191	Peak
11000	46.51	30.38	16.13	54	-7.49	198	131	Average
11000	56.79	40.66	16.13	74	-17.21	198	131	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	45.52	35.01	10.51	54	-8.48	214	12	Average
5460	62.14	51.63	10.51	74	-11.86	214	12	Peak
*5470	63.97	53.44	10.53	68.2	-4.23	214	12	Peak
5500	105.56	94.96	10.6			214	12	Average
5500	112.12	101.52	10.6			214	12	Peak
11000	46.95	30.82	16.13	54	-7.05	241	182	Average
11000	56.89	40.76	16.13	74	-17.11	241	182	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	Karl Lee

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	42.72	32.21	10.51	54	-11.28	137	191	Average
5460	53.33	42.82	10.51	74	-20.67	137	191	Peak
*5470	51.8	41.27	10.53	68.2	-16.4	137	191	Peak
5580	105.65	94.94	10.71			137	191	Average
5580	112.6	101.89	10.71			137	191	Peak
*5725	52.3	41.38	10.92	68.2	-15.9	137	191	Peak
11160	46.37	30.01	16.36	54	-7.63	216	30	Average
11160	56.71	40.35	16.36	74	-17.29	216	30	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	42.83	32.32	10.51	54	-11.17	214	12	Average
5460	52.38	41.87	10.51	74	-21.62	214	12	Peak
*5470	52.01	41.48	10.53	68.2	-16.19	214	12	Peak
5580	104.68	93.97	10.71			214	12	Average
5580	111.65	100.94	10.71			214	12	Peak
*5725	52.24	41.32	10.92	68.2	-15.96	214	12	Peak
11160	47.01	30.65	16.36	54	-6.99	282	146	Average
11160	57.13	40.77	16.36	74	-16.87	282	146	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5580 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 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	Karl Lee

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
5700	104.57	93.62	10.95			137	191	Average
5700	111.1	100.15	10.95			137	191	Peak
*5725	66.95	56.03	10.92	68.2	-1.25	130	153	Peak
11400	46.14	29.95	16.19	54	-7.86	132	284	Average
11400	56.55	40.36	16.19	74	-17.45	132	284	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
5700	102.36	91.41	10.95			214	12	Average
5700	109.28	98.33	10.95			214	12	Peak
*5725	62.89	51.97	10.92	68.2	-5.31	214	12	Peak
11400	47.21	31.02	16.19	54	-6.79	136	274	Average
11400	57.05	40.86	16.19	74	-16.95	136	274	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5700 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 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	Karl Lee

<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	109.14	98.26	10.88			137	191	Average
5745	116.67	105.79	10.88			137	191	Peak
11490	47.67	31.2	16.47	54	-6.33	198	89	Average
11490	57.49	41.02	16.47	74	-16.51	198	89	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	107.74	96.86	10.88			198	17	Average
5745	114.49	103.61	10.88			198	17	Peak
11490	47.61	31.14	16.47	54	-6.39	105	24	Average
11490	56.39	39.92	16.47	74	-17.61	105	24	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
*5621.275	52.93	42.14	10.79	68.2	-15.27	137	191	Peak
5653.825	53.27	42.4	10.87	71.03	-17.76	137	191	Peak
5918.425	52.22	41.13	11.09	73.07	-20.85	137	191	Peak
*5978.8	52.69	41.43	11.26	68.2	-15.51	137	191	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
*5643.325	52.99	42.16	10.83	68.2	-15.21	198	17	Peak
5652.775	53.85	42.98	10.87	70.25	-16.4	198	17	Peak
5916.325	52.65	41.56	11.09	74.62	-21.97	198	17	Peak
*6007.15	53.53	42.18	11.35	68.2	-14.67	198	17	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5745 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 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	Karl Lee

<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	109.45	98.64	10.81			137	191	Average
5785	116.5	105.69	10.81			137	191	Peak
11570	47.77	31.28	16.49	54	-6.23	132	332	Average
11570	56.15	39.66	16.49	74	-17.85	132	332	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	106.34	95.53	10.81			198	17	Average
5785	113.28	102.47	10.81			198	17	Peak
11570	47.76	31.27	16.49	54	-6.24	158	9	Average
11570	57.17	40.68	16.49	74	-16.83	158	9	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
*5598.175	53.3	42.55	10.75	68.2	-14.9	137	191	Peak
5654.35	51.87	41	10.87	71.42	-19.55	137	191	Peak
5922.1	53.98	42.87	11.11	70.35	-16.37	137	191	Peak
*5934.175	53.76	42.63	11.13	68.2	-14.44	137	191	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
*5646.475	52.97	42.12	10.85	68.2	-15.23	198	17	Peak
5651.725	52.55	41.68	10.87	69.48	-16.93	198	17	Peak
5914.225	52.99	41.92	11.07	76.17	-23.18	198	17	Peak
*5966.725	53.92	42.69	11.23	68.2	-14.28	198	17	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5785 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 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	Karl Lee

<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	108.88	98	10.88			137	191	Average
5825	115.21	104.33	10.88			137	191	Peak
11650	48.23	31.45	16.78	54	-5.77	159	8	Average
11650	56.53	39.75	16.78	74	-17.47	159	8	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	106.54	95.66	10.88			214	20	Average
5825	113.37	102.49	10.88			214	20	Peak
11650	48.13	31.35	16.78	54	-5.87	117	187	Average
11650	58.2	41.42	16.78	74	-15.8	117	187	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
*5649.625	53.32	42.45	10.87	68.2	-14.88	137	191	Peak
5659.075	51.1	40.23	10.87	74.92	-23.82	137	191	Peak
5923.15	59.28	48.17	11.11	69.57	-10.29	137	191	Peak
*5974.6	54.14	42.88	11.26	68.2	-14.06	137	191	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
*5623.375	52.27	41.48	10.79	68.2	-15.93	214	20	Peak
5651.725	51.57	40.7	10.87	69.48	-17.91	214	20	Peak
5920	54.1	43.01	11.09	71.9	-17.8	214	20	Peak
*5960.425	54.06	42.83	11.23	68.2	-14.14	214	20	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. 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	Karl Lee

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	51.9	41.85	10.05	54	-2.1	271	154	Average
5150	59.88	49.83	10.05	74	-14.12	271	154	Peak
5190	100.14	90.02	10.12			249	162	Average
5190	106.4	96.28	10.12			249	162	Peak
5350	43.35	33.12	10.23	54	-10.65	249	162	Average
5350	53.06	42.83	10.23	74	-20.94	249	162	Peak
*10380	55.82	39.72	16.1	68.2	-12.38	281	45	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	47.96	37.91	10.05	54	-6.04	200	4	Average
5150	59.09	49.04	10.05	74	-14.91	200	4	Peak
5190	97.33	87.21	10.12			200	4	Average
5190	103.63	93.51	10.12			200	4	Peak
5350	43.09	32.86	10.23	54	-10.91	200	4	Average
5350	52.41	42.18	10.23	74	-21.59	200	4	Peak
*10380	55	38.9	16.1	68.2	-13.2	263	72	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5190 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 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	Karl Lee

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	47.51	37.46	10.05	54	-6.49	231	157	Average
5150	59.46	49.41	10.05	74	-14.54	231	157	Peak
5230	104.5	94.36	10.14			216	163	Average
5230	110.22	100.08	10.14			216	163	Peak
5350	44.76	34.53	10.23	54	-9.24	214	174	Average
5350	54.53	44.3	10.23	74	-19.47	214	174	Peak
*10460	55.82	39.82	16	68.2	-12.38	296	146	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	45.45	35.4	10.05	54	-8.55	196	11	Average
5150	54.88	44.83	10.05	74	-19.12	196	11	Peak
5230	100.89	90.75	10.14			200	11	Average
5230	108.35	98.21	10.14			200	11	Peak
5350	44.55	34.32	10.23	54	-9.45	201	19	Average
5350	56.32	46.09	10.23	74	-17.68	201	19	Peak
*10460	55.5	39.5	16	68.2	-12.7	285	146	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	Karl Lee

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	42.64	32.59	10.05	54	-11.36	244	162	Average
5150	55.6	45.55	10.05	74	-18.4	244	162	Peak
5270	104.75	94.63	10.12			244	162	Average
5270	109.77	99.65	10.12			244	162	Peak
5350	46.81	36.58	10.23	54	-7.19	207	163	Average
5350	55.91	45.68	10.23	74	-18.09	207	163	Peak
*10540	54.87	39.04	15.83	68.2	-13.33	186	74	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	43.18	33.13	10.05	54	-10.82	188	12	Average
5150	52.84	42.79	10.05	74	-21.16	188	12	Peak
5270	102.15	92.03	10.12			188	12	Average
5270	108.66	98.54	10.12			188	12	Peak
5350	45.89	35.66	10.23	54	-8.11	191	56	Average
5350	55.99	45.76	10.23	74	-18.01	191	56	Peak
*10540	55.78	39.95	15.83	68.2	-12.42	230	173	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5270 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 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	Karl Lee

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	43.3	33.25	10.05	54	-10.7	244	163	Average
5150	52.44	42.39	10.05	74	-21.56	244	163	Peak
5310	99.2	89.11	10.09			244	163	Average
5310	105.53	95.44	10.09			244	163	Peak
5350	52.12	41.89	10.23	54	-1.88	239	142	Average
5350	62.06	51.83	10.23	74	-11.94	239	142	Peak
10620	47.04	31.16	15.88	54	-6.96	246	172	Average
10620	56.83	40.95	15.88	74	-17.17	246	172	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	43.1	33.05	10.05	54	-10.9	188	12	Average
5150	52.8	42.75	10.05	74	-21.2	188	12	Peak
5310	97.82	87.73	10.09			188	12	Average
5310	104.26	94.17	10.09			188	12	Peak
5350	51.31	41.08	10.23	54	-2.69	198	12	Average
5350	59.31	49.08	10.23	74	-14.69	198	12	Peak
10620	46.02	30.14	15.88	54	-7.98	133	187	Average
10620	55.94	40.06	15.88	74	-18.06	133	187	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	Karl Lee

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	50.96	40.45	10.51	54	-3.04	136	188	Average
5460	65.56	55.05	10.51	74	-8.44	136	188	Peak
*5470	66.35	55.82	10.53	68.2	-1.85	136	188	Peak
5510	101.44	90.84	10.6			137	191	Average
5510	108.3	97.7	10.6			137	191	Peak
*5725	52.41	41.49	10.92	68.2	-15.79	137	191	Peak
11020	46.49	30.33	16.16	54	-7.51	263	182	Average
11020	56.74	40.58	16.16	74	-17.26	263	182	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	49.07	38.56	10.51	54	-4.93	214	12	Average
5460	59.36	48.85	10.51	74	-14.64	214	12	Peak
*5470	64.28	53.75	10.53	68.2	-3.92	214	12	Peak
5510	100.37	89.77	10.6			214	12	Average
5510	107.12	96.52	10.6			214	12	Peak
*5725	52.37	41.45	10.92	68.2	-15.83	214	12	Peak
11020	46.08	29.92	16.16	54	-7.92	185	162	Average
11020	56.32	40.16	16.16	74	-17.68	185	162	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5510 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 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	Karl Lee

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	44.21	33.7	10.51	54	-9.79	137	191	Average
5460	58.43	47.92	10.51	74	-15.57	137	191	Peak
*5470	60.68	50.15	10.53	68.2	-7.52	137	191	Peak
5550	103.28	92.6	10.68			137	191	Average
5550	110.39	99.71	10.68			137	191	Peak
*5725	53.8	42.88	10.92	68.2	-14.4	137	191	Peak
11000	46.36	30.23	16.13	54	-7.64	168	144	Average
11000	56.43	40.3	16.13	74	-17.57	168	144	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	44.27	33.76	10.51	54	-9.73	214	12	Average
5460	54.85	44.34	10.51	74	-19.15	214	12	Peak
*5470	56.94	46.41	10.53	68.2	-11.26	214	12	Peak
5550	102.57	91.89	10.68			214	12	Average
5550	109.73	99.05	10.68			214	12	Peak
*5725	52.1	41.18	10.92	68.2	-16.1	214	12	Peak
11000	46.47	30.34	16.13	54	-7.53	135	284	Average
11000	56.19	40.06	16.13	74	-17.81	135	284	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	Karl Lee

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	42.95	32.44	10.51	54	-11.05	137	191	Average
5460	52.66	42.15	10.51	74	-21.34	137	191	Peak
5470	51.74	41.21	10.53	68.2	-16.46	137	191	Peak
5670	101.57	90.67	10.9			137	191	Average
5670	108.25	97.35	10.9			137	191	Peak
5725	66.92	56	10.92	68.2	-1.28	137	195	Peak
11340	46.95	30.53	16.42	54	-7.05	185	274	Average
11340	56.87	40.45	16.42	74	-17.13	185	274	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	42.8	32.29	10.51	54	-11.2	214	12	Average
5460	52.82	42.31	10.51	74	-21.18	214	12	Peak
5470	50.9	40.37	10.53	68.2	-17.3	214	12	Peak
5670	99.68	88.78	10.9			214	12	Average
5670	106.14	95.24	10.9			214	12	Peak
5725	63.11	52.19	10.92	68.2	-5.09	214	12	Peak
11340	47.16	30.74	16.42	54	-6.84	253	170	Average
11340	57.37	40.95	16.42	74	-16.63	253	170	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5670 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 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	Karl Lee

<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	106.94	96.04	10.9			137	191	Average
5755	113.39	102.49	10.9			137	191	Peak
11510	47.77	31.26	16.51	54	-6.23	199	156	Average
11510	56.55	40.04	16.51	74	-17.45	199	156	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	103.64	92.74	10.9			214	12	Average
5755	110.52	99.62	10.9			214	12	Peak
11510	47.66	31.15	16.51	54	-6.34	179	15	Average
11510	57.26	40.75	16.51	74	-16.74	179	15	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
*5647.525	54.11	43.26	10.85	68.2	-14.09	137	191	Peak
5654.875	54.14	43.27	10.87	71.81	-17.67	137	191	Peak
5920.525	51.57	40.48	11.09	71.51	-19.94	137	191	Peak
*6005.575	54.12	42.79	11.33	68.2	-14.08	137	191	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
*5620.75	54.02	43.23	10.79	68.2	-14.18	214	12	Peak
5651.2	52.44	41.57	10.87	69.09	-16.65	214	12	Peak
5919.475	50.83	39.74	11.09	72.29	-21.46	214	12	Peak
*6010.825	53.26	41.91	11.35	68.2	-14.94	214	12	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5755 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 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	Karl Lee

<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	105.48	94.66	10.82			137	191	Average
5795	112.13	101.31	10.82			137	191	Peak
11590	47.59	31.08	16.51	54	-6.41	188	269	Average
11590	56.72	40.21	16.51	74	-17.28	188	269	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	103.29	92.47	10.82			200	18	Average
5795	110.66	99.84	10.82			200	18	Peak
11590	47.65	31.14	16.51	54	-6.35	126	299	Average
11590	56.78	40.27	16.51	74	-17.22	126	299	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
*5540.425	52.78	42.12	10.66	68.2	-15.42	137	191	Peak
5656.975	52.67	41.8	10.87	73.36	-20.69	137	191	Peak
5921.575	55.08	43.97	11.11	70.73	-15.65	137	191	Peak
*5929.975	56.26	45.15	11.11	68.2	-11.94	137	191	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
*5596.075	52.35	41.6	10.75	68.2	-15.85	200	18	Peak
5652.775	52.07	41.2	10.87	70.25	-18.18	200	18	Peak
5920.525	53.22	42.13	11.09	71.51	-18.29	200	18	Peak
*5936.8	54.06	42.9	11.16	68.2	-14.14	200	18	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5795 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. 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	Karl Lee

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	49.53	39.48	10.05	54	-4.47	208	164	Average
5150	58.85	48.8	10.05	74	-15.15	208	164	Peak
5210	96.12	85.95	10.17			213	165	Average
5210	102.12	91.95	10.17			213	165	Peak
5350	44.13	33.9	10.23	54	-9.87	213	165	Average
5350	52.92	42.69	10.23	74	-21.08	213	165	Peak
*10420	55.71	39.55	16.16	68.2	-12.49	139	236	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	47.94	37.89	10.05	54	-6.06	186	11	Average
5150	56.72	46.67	10.05	74	-17.28	186	11	Peak
5210	94.03	83.86	10.17			200	4	Average
5210	99.87	89.7	10.17			200	4	Peak
5350	44.3	34.07	10.23	54	-9.7	200	4	Average
5350	52.81	42.58	10.23	74	-21.19	200	4	Peak
*10420	55.07	38.91	16.16	68.2	-13.13	234	170	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5210 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 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	Karl Lee

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	43.41	33.36	10.05	54	-10.59	233	160	Average
5150	52.48	42.43	10.05	74	-21.52	233	160	Peak
5290	95.89	85.79	10.1			233	160	Average
5290	101.99	91.89	10.1			233	160	Peak
5350	52.74	42.51	10.23	54	-1.26	230	125	Average
5350	60.52	50.29	10.23	74	-13.48	230	125	Peak
*10580	55.38	39.67	15.71	68.2	-12.82	187	128	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	43.25	33.2	10.05	54	-10.75	188	12	Average
5150	52.48	42.43	10.05	74	-21.52	188	12	Peak
5290	92.9	82.8	10.1			188	12	Average
5290	99.33	89.23	10.1			188	12	Peak
5350	52.12	41.89	10.23	54	-1.88	203	17	Average
5350	60.37	50.14	10.23	74	-13.63	203	17	Peak
*10580	56.23	40.52	15.71	68.2	-11.97	194	326	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5290 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 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	Karl Lee

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	52.66	42.15	10.51	54	-1.34	131	194	Average
5460	63.19	52.68	10.51	74	-10.81	131	194	Peak
5470	60.51	49.98	10.53	68.2	-7.69	131	194	Peak
5530	97.31	86.68	10.63			131	191	Average
5530	104	93.37	10.63			131	191	Peak
5725	52.36	41.44	10.92	68.2	-15.84	131	191	Peak
11060	46.81	30.58	16.23	54	-7.19	168	238	Average
11060	57.1	40.87	16.23	74	-16.9	168	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	52.86	42.35	10.51	54	-1.14	213	15	Average
5460	61.97	51.46	10.51	74	-12.03	213	15	Peak
5470	58.75	48.22	10.53	68.2	-9.45	213	15	Peak
5530	95.56	84.93	10.63			214	12	Average
5530	102.94	92.31	10.63			214	12	Peak
5725	51.83	40.91	10.92	68.2	-16.37	214	12	Peak
11060	46.56	30.33	16.23	54	-7.44	271	151	Average
11060	56.86	40.63	16.23	74	-17.14	271	151	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5530 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 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	Karl Lee

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	45.02	34.51	10.51	54	-8.98	137	191	Average
5460	54.61	44.1	10.51	74	-19.39	137	191	Peak
*5470	55.58	45.05	10.53	68.2	-12.62	137	191	Peak
5610	101.56	90.79	10.77			137	191	Average
5610	108.73	97.96	10.77			137	191	Peak
*5725	60.76	49.84	10.92	68.2	-7.44	137	191	Peak
11220	48.38	31.96	16.42	54	-5.62	196	174	Average
11220	58.24	41.82	16.42	74	-15.76	196	174	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	45.9	35.39	10.51	54	-8.1	214	12	Average
5460	55.47	44.96	10.51	74	-18.53	214	12	Peak
*5470	54.72	44.19	10.53	68.2	-13.48	214	12	Peak
5610	100.25	89.48	10.77			214	12	Average
5610	107.04	96.27	10.77			214	12	Peak
*5725	58.32	47.4	10.92	68.2	-9.88	214	12	Peak
11220	47.36	30.94	16.42	54	-6.64	154	278	Average
11220	57.51	41.09	16.42	74	-16.49	154	278	Peak

Remarks:

1. Emission Level = Read Level + 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	Karl Lee

<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	103.36	92.49	10.87			137	191	Average
5775	110.91	100.04	10.87			137	191	Peak
11550	47.53	31.03	16.5	54	-6.47	155	19	Average
11550	58.11	41.61	16.5	74	-15.89	155	19	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	100.44	89.57	10.87			214	12	Average
5775	107.04	96.17	10.87			214	12	Peak
11550	47.52	31.02	16.5	54	-6.48	157	44	Average
11550	56.49	39.99	16.5	74	-17.51	157	44	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
*5649.625	65.61	54.74	10.87	68.2	-2.59	137	187	Peak
5668	78.55	67.65	10.9	81.52	-2.97	137	187	Peak
5919.475	63.43	52.34	11.09	72.29	-8.86	137	191	Peak
*5928.925	66.6	55.49	11.11	68.2	-1.6	132	196	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
*5643.85	62.49	51.66	10.83	68.2	-5.71	214	12	Peak
5652.775	63.85	52.98	10.87	70.25	-6.4	214	12	Peak
5914.225	59.41	48.34	11.07	76.17	-16.76	214	12	Peak
*5929.975	59.7	48.59	11.11	68.2	-8.5	214	12	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5775 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

9 kHz ~ 30 MHz Data:

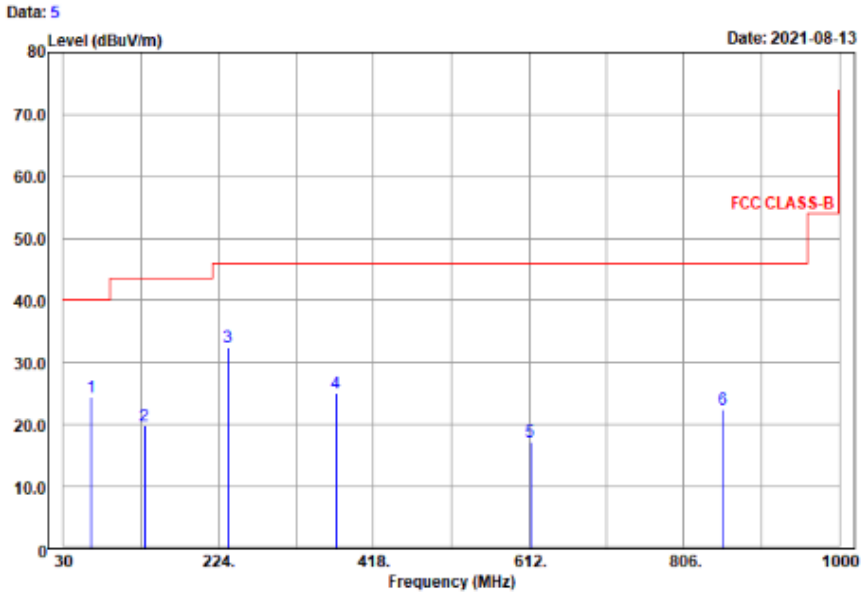
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

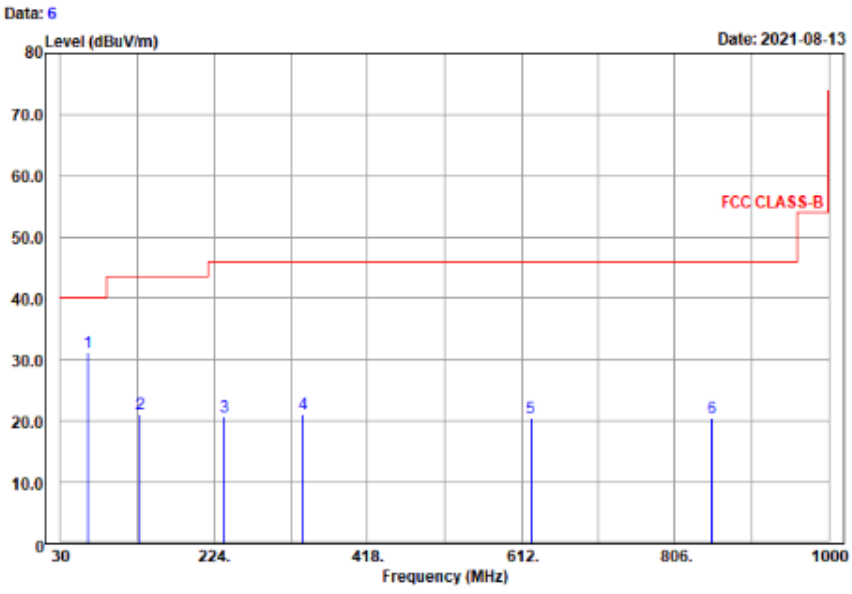
802.11ac (VHT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 149	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	Karl Lee
Test Mode	A		

Horizontal



Vertical



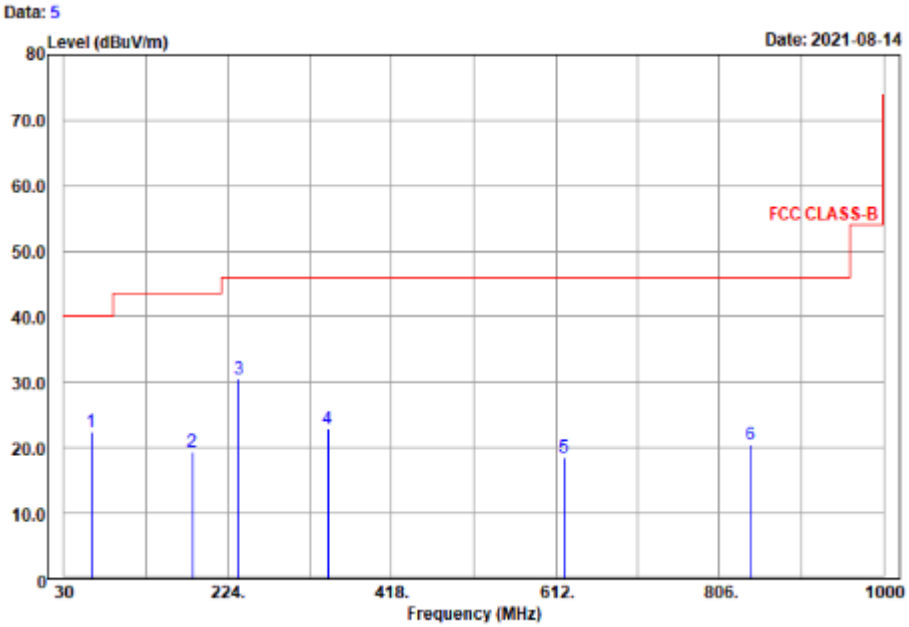
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
64.82	24.52	42.03	-17.51	40	-15.48	172	126	QP
131.52	19.74	40.29	-20.55	43.5	-23.76	214	120	QP
236.47	32.46	49.67	-17.21	46	-13.54	104	32	QP
371.58	25.02	39.39	-14.37	46	-20.98	142	179	QP
614.53	17.22	27.57	-10.35	46	-28.78	216	108	QP
854.33	22.47	29.18	-6.71	46	-23.53	125	180	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
65.28	31.12	48.63	-17.51	40	-8.88	134	187	QP
130.52	21.14	41.64	-20.5	43.5	-22.36	136	228	QP
237.19	20.73	37.83	-17.1	46	-25.27	185	24	QP
336.45	21.04	36.12	-15.08	46	-24.96	135	218	QP
624.45	20.46	30.82	-10.36	46	-25.54	176	131	QP
853.2	20.44	27.17	-6.73	46	-25.56	129	155	QP

Remarks:

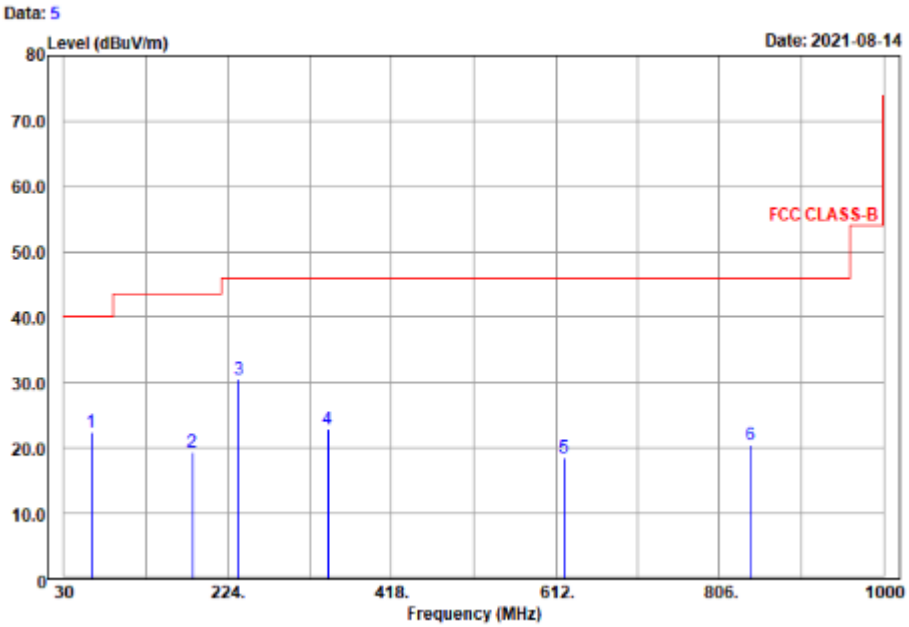
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	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	Karl Lee
Test Mode	B		

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
62.63	22.47	39.44	-16.97	40	-17.53	152	143	QP
182.17	19.44	38.89	-19.45	43.5	-24.06	161	108	QP
236.82	30.42	47.56	-17.14	46	-15.58	119	230	QP
342.36	22.92	37.85	-14.93	46	-23.08	155	216	QP
622.84	18.6	28.94	-10.34	46	-27.4	221	191	QP
842.69	20.44	27.36	-6.92	46	-25.56	278	94	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
62.04	30.81	47.5	-16.69	40	-9.19	112	14	QP
124.6	21.58	41.55	-19.97	43.5	-21.92	159	210	QP
206.63	18.75	36.92	-18.17	43.5	-24.75	124	150	QP
326.02	20.93	36.35	-15.42	46	-25.07	127	205	QP
605.38	20.49	31	-10.51	46	-25.51	185	175	QP
867.16	21.38	27.77	-6.39	46	-24.62	216	48	QP

Remarks:

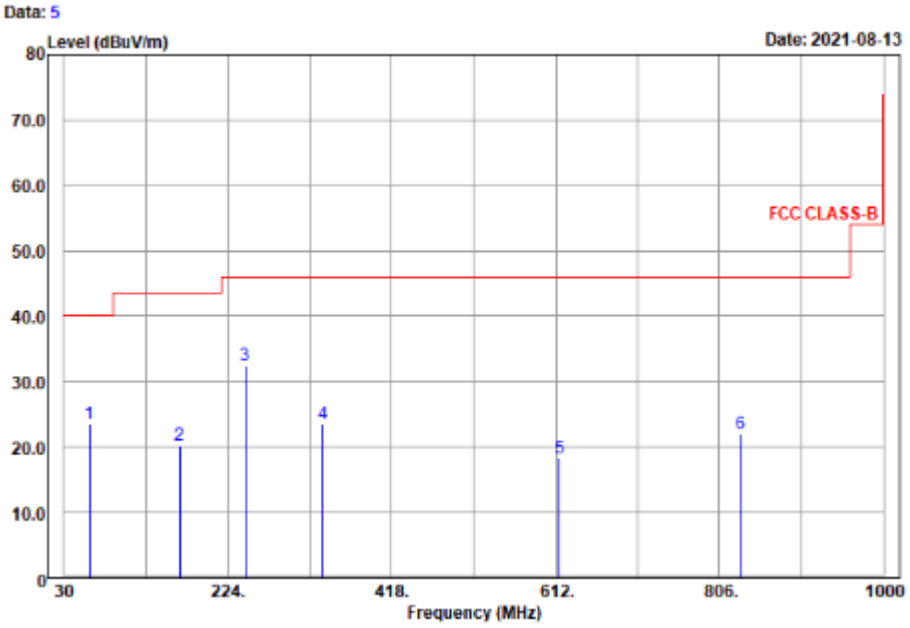
1. Emission Level = Read Level + Factor

   Margin value = Emission level – Limit value

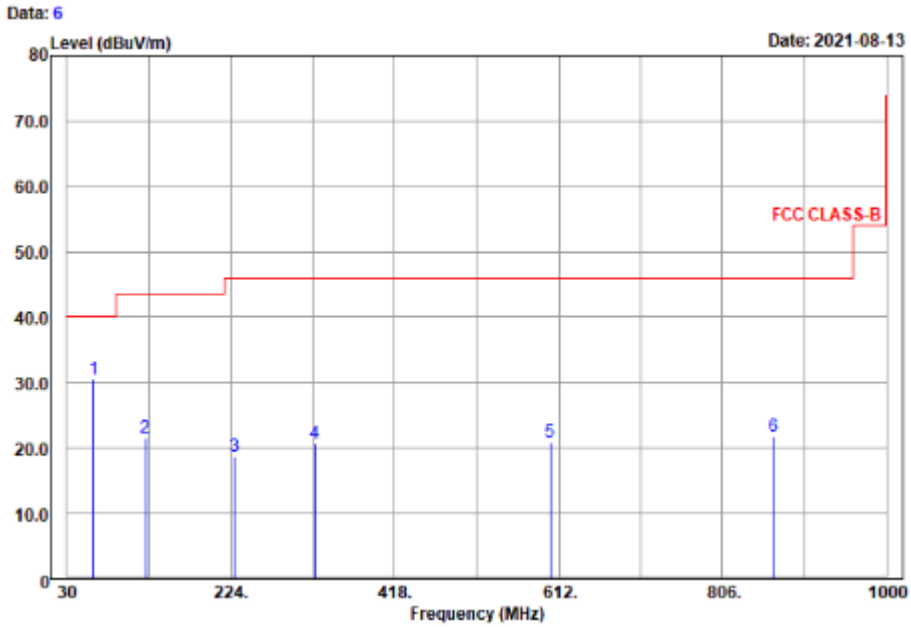
2. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	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	Karl Lee
Test Mode	C		

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
61.13	23.64	40.06	-16.42	40	-16.36	168	224	QP
167.45	20.36	40.74	-20.38	43.5	-23.14	206	172	QP
244.93	32.54	49.47	-16.93	46	-13.46	148	117	QP
336.25	23.57	38.65	-15.08	46	-22.43	196	274	QP
616.46	18.38	28.72	-10.34	46	-27.62	207	282	QP
831.24	21.96	29	-7.04	46	-24.04	131	174	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
61.78	30.59	47.28	-16.69	40	-9.41	116	279	QP
123.32	21.68	41.45	-19.77	43.5	-21.82	148	191	QP
228.26	18.69	36.17	-17.48	46	-27.31	121	57	QP
323.96	20.74	36.21	-15.47	46	-25.26	161	287	QP
602.13	20.91	31.44	-10.53	46	-25.09	123	34	QP
866.06	21.79	28.2	-6.41	46	-24.21	296	2	QP

Remarks:

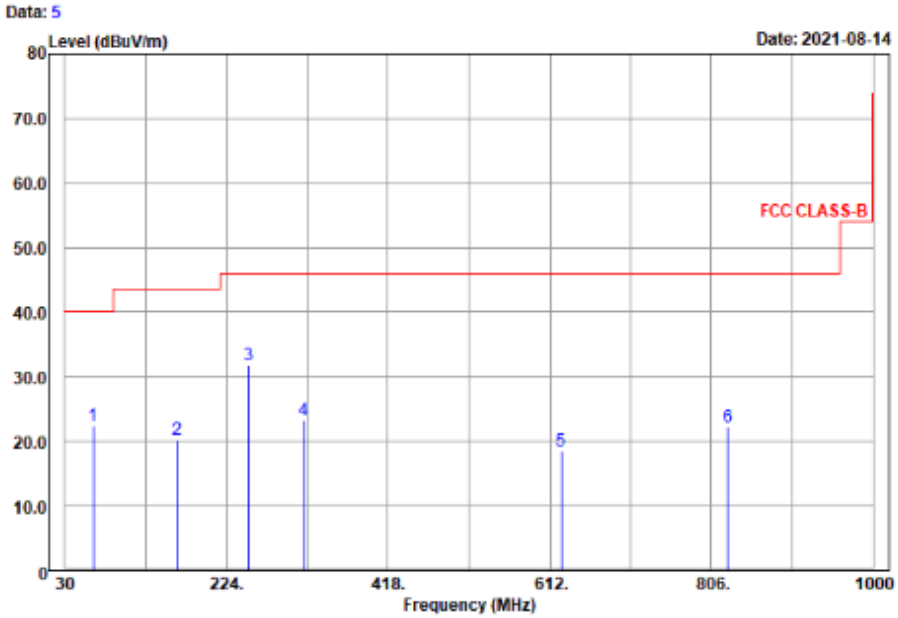
1. Emission Level = Read Level + Factor

   Margin value = Emission level – Limit value

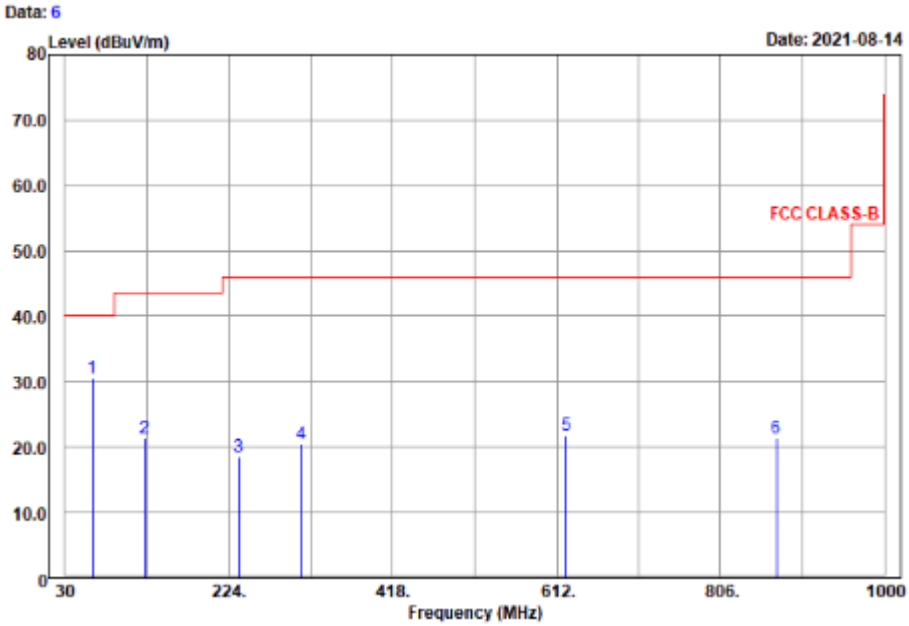
2. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	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	Karl Lee
Test Mode	D		

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
64.25	22.49	39.73	-17.24	40	-17.51	130	144	QP
165.35	20.29	40.72	-20.43	43.5	-23.21	243	148	QP
250.236	31.81	48.64	-16.83	46	-14.19	153	205	QP
317.16	23.39	38.96	-15.57	46	-22.61	201	148	QP
625.63	18.44	28.8	-10.36	46	-27.56	169	247	QP
825.52	22.27	29.5	-7.23	46	-23.73	105	24	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
62.29	30.46	47.15	-16.69	40	-9.54	128	127	QP
125.29	21.47	41.44	-19.97	43.5	-22.03	136	50	QP
235.83	18.47	35.7	-17.23	46	-27.53	126	105	QP
309.65	20.47	36.09	-15.62	46	-25.53	144	187	QP
623.32	21.78	32.13	-10.35	46	-24.22	105	138	QP
872.26	21.34	27.65	-6.31	46	-24.66	308	67	QP

Remarks:

1. Emission Level = Read Level + Factor

   Margin value = Emission level – Limit value

2. 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	ESCI	100613	Dec. 04, 2020	Dec. 03, 2021
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 16, 2021	Jan. 15, 2022
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 25, 2021	Feb. 24, 2022
V-LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 28, 2020	Aug. 27, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

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

4.2.3 Test Procedures

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

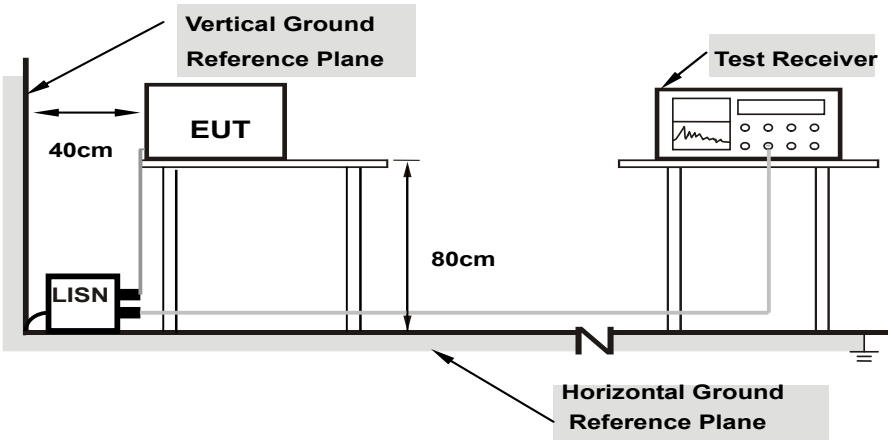
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

Worst-case data:

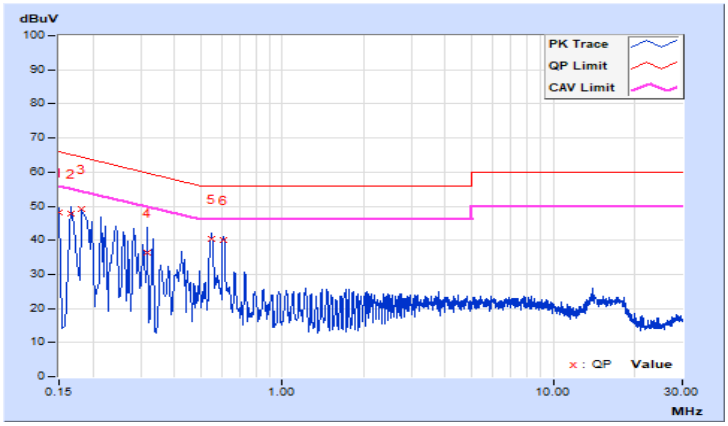
802.11ac (VHT20)

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.71	38.27	10.23	47.98	19.94	66.00	56.00	-18.02	-36.06
2	0.16600	9.71	38.10	10.62	47.81	20.33	65.16	55.16	-17.35	-34.83
3	0.18200	9.71	39.35	26.08	49.06	35.79	64.39	54.39	-15.33	-18.60
4	0.31800	9.72	26.50	2.23	36.22	11.95	59.76	49.76	-23.54	-37.81
5	0.55000	9.74	30.81	25.99	40.55	35.73	56.00	46.00	-15.45	-10.27
6	0.60600	9.74	30.46	28.00	40.20	37.74	56.00	46.00	-15.80	-8.26

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.

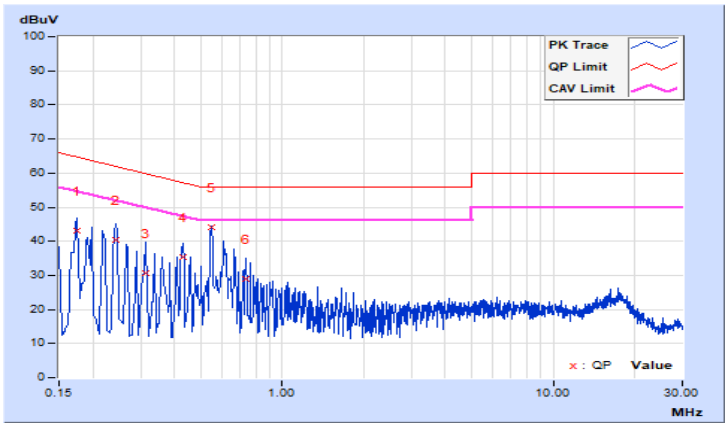


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17400	9.77	33.47	13.16	43.24	22.93	64.77	54.77	-21.53	-31.84
2	0.24200	9.77	30.61	20.45	40.38	30.22	62.03	52.03	-21.65	-21.81
3	0.31400	9.78	21.00	2.79	30.78	12.57	59.86	49.86	-29.08	-37.29
4	0.43000	9.79	25.47	18.52	35.26	28.31	57.25	47.25	-21.99	-18.94
5	**0.55000**	**9.80**	**34.15**	**29.86**	**43.95**	**39.66**	**56.00**	**46.00**	**-12.05**	**-6.34**
6	0.73800	9.81	19.26	8.26	29.07	18.07	56.00	46.00	-26.93	-27.93

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.

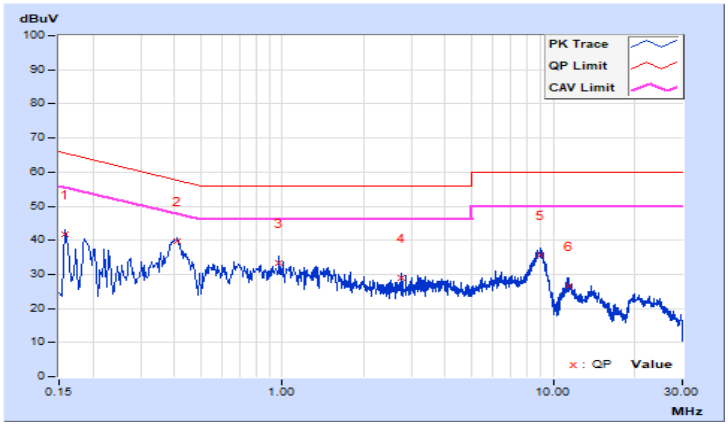


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	9.71	32.20	18.11	41.91	27.82	65.58	55.58	-23.67	-27.76
2	0.40800	9.73	29.87	22.58	39.60	32.31	57.69	47.69	-18.09	-15.38
3	0.97340	9.76	23.69	12.19	33.45	21.95	56.00	46.00	-22.55	-24.05
4	2.74233	9.78	19.23	8.18	29.01	17.96	56.00	46.00	-26.99	-28.04
5	8.96314	9.85	25.75	18.65	35.60	28.50	60.00	50.00	-24.40	-21.50
6	11.39516	9.85	16.69	8.17	26.54	18.02	60.00	50.00	-33.46	-31.98

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.

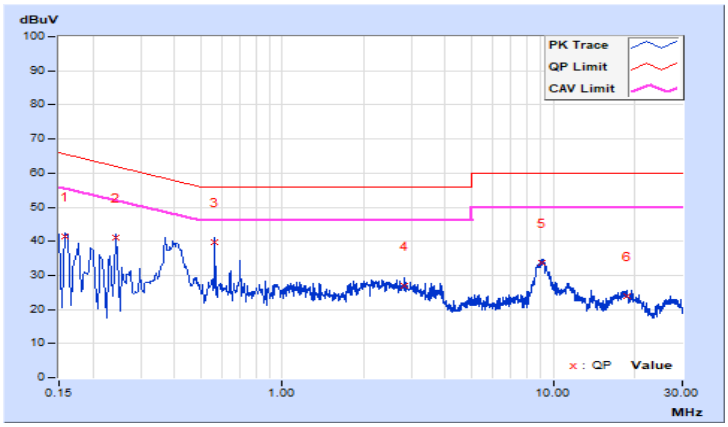


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	9.77	31.56	17.41	41.33	27.18	65.58	55.58	-24.25	-28.40
2	0.24384	9.77	31.35	9.02	41.12	18.79	61.96	51.96	-20.84	-33.17
3	0.56446	9.80	29.87	7.34	39.67	17.14	56.00	46.00	-16.33	-28.86
4	2.84008	9.84	17.23	7.27	27.07	17.11	56.00	46.00	-28.93	-28.89
5	9.08044	9.92	23.64	16.56	33.56	26.48	60.00	50.00	-26.44	-23.52
6	18.64430	9.98	13.88	7.24	23.86	17.22	60.00	50.00	-36.14	-32.78

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.

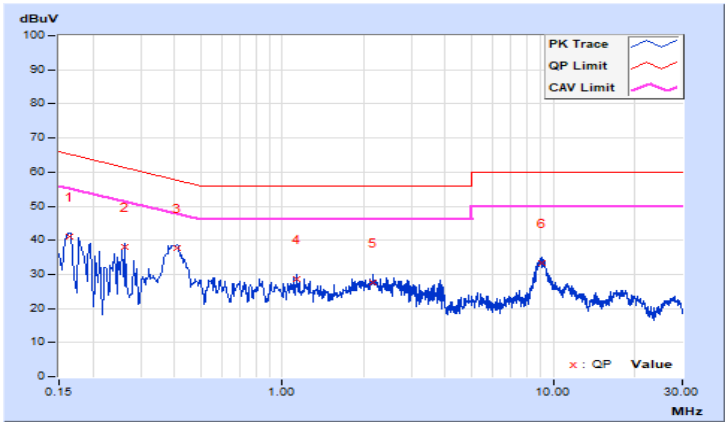


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16309	9.71	31.52	15.82	41.23	25.53	65.31	55.31	-24.08	-29.78
2	0.26339	9.72	28.20	6.74	37.92	16.46	61.32	51.32	-23.40	-34.86
3	0.40693	9.73	27.83	22.14	37.56	31.87	57.71	47.71	-20.15	-15.84
4	1.13532	9.76	18.77	6.90	28.53	16.66	56.00	46.00	-27.47	-29.34
5	2.17147	9.77	18.00	9.12	27.77	18.89	56.00	46.00	-28.23	-27.11
6	9.06480	9.85	23.55	16.56	33.40	26.41	60.00	50.00	-26.60	-23.59

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.

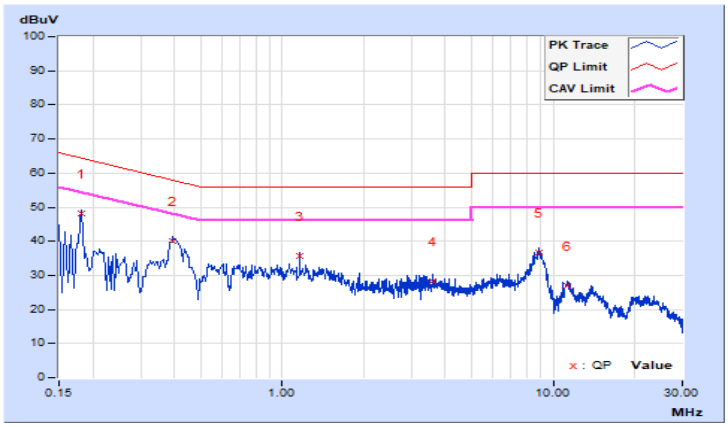


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18122	9.77	38.23	18.23	48.00	28.00	64.43	54.43	-16.43	-26.43
2	0.39633	9.79	30.17	22.20	39.96	31.99	57.93	47.93	-17.97	-15.94
3	1.16269	9.82	25.73	12.85	35.55	22.67	56.00	46.00	-20.45	-23.33
4	3.61035	9.85	18.45	9.60	28.30	19.45	56.00	46.00	-27.70	-26.55
5	8.81847	9.91	26.73	18.81	36.64	28.72	60.00	50.00	-23.36	-21.28
6	11.31696	9.94	17.12	8.44	27.06	18.38	60.00	50.00	-32.94	-31.62

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.

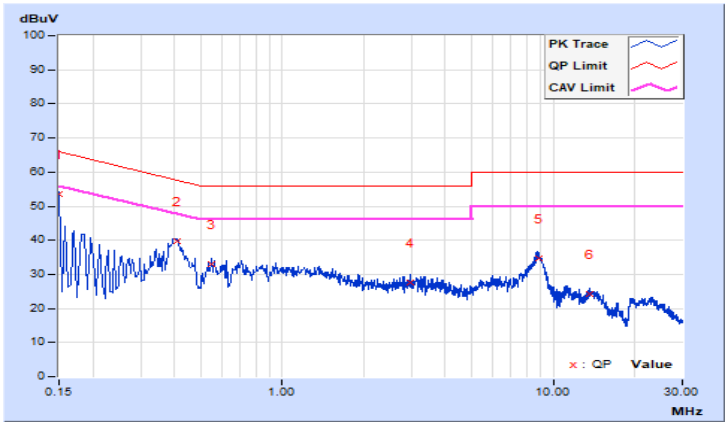


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.71	43.70	16.83	53.41	26.54	66.00	56.00	-12.59	-29.46
2	0.40806	9.73	30.15	22.43	39.88	32.16	57.69	47.69	-17.81	-15.53
3	0.54882	9.74	23.09	13.90	32.83	23.64	56.00	46.00	-23.17	-22.36
4	2.95738	9.78	17.77	8.76	27.55	18.54	56.00	46.00	-28.45	-27.46
5	8.85366	9.85	24.86	17.65	34.71	27.50	60.00	50.00	-25.29	-22.50
6	13.69424	9.84	14.52	6.32	24.36	16.16	60.00	50.00	-35.64	-33.84

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.

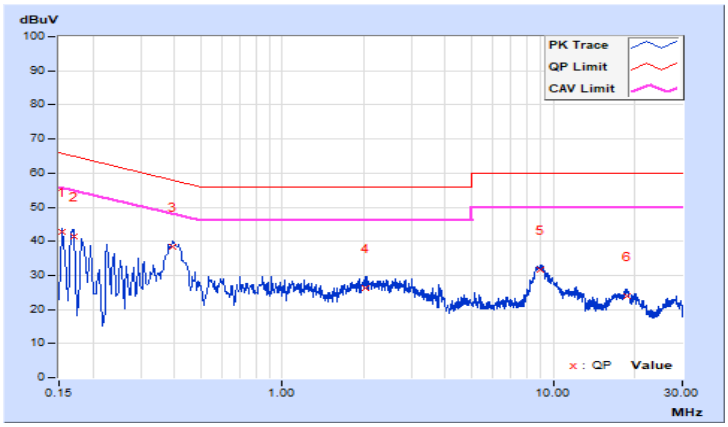


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.77	33.05	17.80	42.82	27.57	65.79	55.79	-22.97	-28.22
2	0.16955	9.77	31.50	12.86	41.27	22.63	64.98	54.98	-23.71	-32.35
3	0.39531	9.79	28.67	20.55	38.46	30.34	57.95	47.95	-19.49	-17.61
4	2.03462	9.83	16.57	8.32	26.40	18.15	56.00	46.00	-29.60	-27.85
5	9.01006	9.92	21.89	14.77	31.81	24.69	60.00	50.00	-28.19	-25.31
6	18.80461	9.98	13.83	7.11	23.81	17.09	60.00	50.00	-36.19	-32.91

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

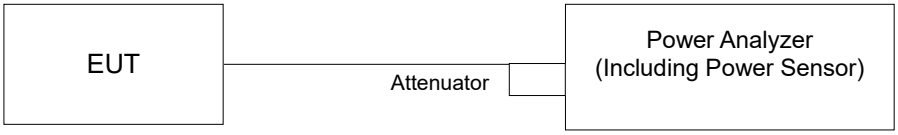
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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

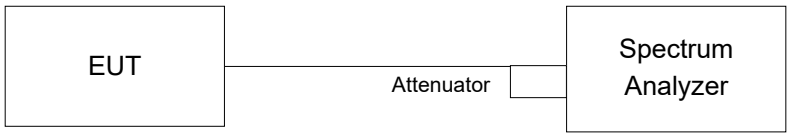
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

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



For 802.11ac (VHT80) & 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.

802.11a, 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40)

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

802.11ac (VHT80)

a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
b. Set sweep trigger to “free run”.
c. Set RBW = 1 MHz
d. Set VBW ≥ 3 MHz
e. Number of points in sweep ≥ 2 Span / RBW
f. Sweep time ≤ (number of points in sweep) * T
g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
h. Detector = RMS
i. Trace mode = max hold
j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
k. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

For 26dB Bandwidth

a. Set RBW = approximately 1% of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
f. For channel aggregation (channel 138, 142, 144) measurement refer to KDB 789033 D02 Section III. CHANNEL AGGREGATION.

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:

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	12.41	12.13	33.749	15.28	24.00	Pass
40	5200	12.40	12.48	**35.079**	15.45	24.00	Pass
48	5240	12.35	12.52	35.044	15.45	24.00	Pass
52	5260	12.20	12.43	34.094	15.33	24.00	Pass
60	5300	12.02	12.35	33.101	15.20	24.00	Pass
64	5320	11.95	12.30	32.650	15.14	24.00	Pass
100	5500	12.23	12.47	34.371	15.36	24.00	Pass
116	5580	12.09	12.20	32.777	15.16	24.00	Pass
140	5700	12.10	12.35	33.397	15.24	24.00	Pass
149	5745	12.05	12.26	32.859	15.17	30.00	Pass
157	5785	11.91	12.37	32.782	15.16	30.00	Pass
165	5825	11.86	12.31	32.368	15.10	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (23.13) = 24.64 > 24dBm
2. 11dBm + 10log (22.45) = 24.51 > 24dBm
3. 11dBm + 10log (23.18) = 24.65 > 24dBm
4. 11dBm + 10log (22.52) = 24.52 > 24dBm
5. 11dBm + 10log (23.11) = 24.63 > 24dBm
6. 11dBm + 10log (23.26) = 24.66 > 24dBm

Chain 1
1. 11dBm + 10log (23.10) = 24.63 > 24dBm
2. 11dBm + 10log (23.14) = 24.64 > 24dBm
3. 11dBm + 10log (23.26) = 24.66 > 24dBm
4. 11dBm + 10log (22.39) = 24.50 > 24dBm
5. 11dBm + 10log (22.99) = 24.61 > 24dBm
6. 11dBm + 10log (23.21) = 24.65 > 24dBm

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	12.28	12.11	33.160	15.21	24.00	Pass
40	5200	12.23	12.45	34.290	15.35	24.00	Pass
48	5240	12.08	12.47	33.804	15.29	24.00	Pass
52	5260	12.14	12.32	33.429	15.24	24.00	Pass
60	5300	11.80	12.23	31.847	15.03	24.00	Pass
64	5320	11.78	12.25	31.854	15.03	24.00	Pass
100	5500	12.13	12.35	33.510	15.25	24.00	Pass
116	5580	11.97	12.13	32.070	15.06	24.00	Pass
140	5700	11.92	12.18	32.079	15.06	24.00	Pass
149	5745	12.00	12.17	32.331	15.10	30.00	Pass
157	5785	11.78	12.32	32.127	15.07	30.00	Pass
165	5825	11.78	12.25	31.854	15.03	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (23.36) = 24.68 > 24dBm
2. 11dBm + 10log (24.12) = 24.82 > 24dBm
3. 11dBm + 10log (24.56) = 24.90 > 24dBm
4. 11dBm + 10log (23.87) = 24.77 > 24dBm
5. 11dBm + 10log (23.88) = 24.78 > 24dBm
6. 11dBm + 10log (23.40) = 24.69 > 24dBm

Chain 1
1. 11dBm + 10log (23.83) = 24.77 > 24dBm
2. 11dBm + 10log (24.57) = 24.90 > 24dBm
3. 11dBm + 10log (24.62) = 24.91 > 24dBm
4. 11dBm + 10log (23.45) = 24.70 > 24dBm
5. 11dBm + 10log (23.45) = 24.70 > 24dBm
6. 11dBm + 10log (25.43) = 25.05 > 24dBm

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	12.13	12.30	33.313	15.23	24.00	Pass
46	5230	12.28	12.47	34.565	15.39	24.00	Pass
54	5270	12.03	12.37	33.217	15.21	24.00	Pass
62	5310	12.12	12.67	34.786	15.41	24.00	Pass
102	5510	12.17	12.60	34.679	15.40	24.00	Pass
110	5550	12.32	12.38	34.359	15.36	24.00	Pass
134	5670	12.28	12.42	34.363	15.36	24.00	Pass
151	5755	12.10	12.46	33.838	15.29	30.00	Pass
159	5795	12.49	12.46	**35.362**	15.49	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (42.15) = 27.24 > 24dBm
2. 11dBm + 10log (42.24) = 27.25 > 24dBm
3. 11dBm + 10log (42.13) = 27.24 > 24dBm
4. 11dBm + 10log (42.18) = 27.25 > 24dBm
5. 11dBm + 10log (42.23) = 27.25 > 24dBm

Chain 1
1. 11dBm + 10log (42.34) = 27.26 > 24dBm
2. 11dBm + 10log (42.16) = 27.24 > 24dBm
3. 11dBm + 10log (42.15) = 27.24 > 24dBm
4. 11dBm + 10log (42.16) = 27.24 > 24dBm
5. 11dBm + 10log (42.14) = 27.24 > 24dBm

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	12.31	12.13	33.352	15.23	24.00	Pass
40	5200	12.25	12.47	34.448	15.37	24.00	Pass
48	5240	12.10	12.50	34.001	15.31	24.00	Pass
52	5260	12.16	12.35	33.623	15.27	24.00	Pass
60	5300	11.82	12.25	31.994	15.05	24.00	Pass
64	5320	11.80	12.27	32.001	15.05	24.00	Pass
100	5500	12.15	12.37	33.664	15.27	24.00	Pass
116	5580	12.00	12.16	32.293	15.09	24.00	Pass
140	5700	11.95	12.21	32.302	15.09	24.00	Pass
149	5745	12.02	12.20	32.518	15.12	30.00	Pass
157	5785	11.81	12.34	32.310	15.09	30.00	Pass
165	5825	11.80	12.27	32.001	15.05	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (23.36) = 24.68 > 24dBm
2. 11dBm + 10log (24.12) = 24.82 > 24dBm
3. 11dBm + 10log (24.56) = 24.90 > 24dBm
4. 11dBm + 10log (23.87) = 24.77 > 24dBm
5. 11dBm + 10log (23.88) = 24.78 > 24dBm
6. 11dBm + 10log (23.40) = 24.69 > 24dBm

Chain 1
1. 11dBm + 10log (23.83) = 24.77 > 24dBm
2. 11dBm + 10log (24.57) = 24.90 > 24dBm
3. 11dBm + 10log (24.62) = 24.91 > 24dBm
4. 11dBm + 10log (23.45) = 24.70 > 24dBm
5. 11dBm + 10log (23.45) = 24.70 > 24dBm
6. 11dBm + 10log (25.43) = 25.05 > 24dBm

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	12.15	12.32	33.467	15.25	24.00	Pass
46	5230	12.31	12.51	34.845	15.42	24.00	Pass
54	5270	12.05	12.39	33.370	15.23	24.00	Pass
62	5310	12.15	12.70	**35.027**	15.44	24.00	Pass
102	5510	12.19	12.62	**34.839**	15.42	24.00	Pass
110	5550	12.35	12.41	34.597	15.39	24.00	Pass
134	5670	12.30	12.45	34.562	15.39	24.00	Pass
151	5755	11.82	12.52	33.070	15.19	30.00	Pass
159	5795	12.02	12.70	34.543	15.38	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (42.15) = 27.24 > 24dBm
2. 11dBm + 10log (42.24) = 27.25 > 24dBm
3. 11dBm + 10log (42.13) = 27.24 > 24dBm
4. 11dBm + 10log (42.18) = 27.25 > 24dBm
5. 11dBm + 10log (42.23) = 27.25 > 24dBm

Chain 1
1. 11dBm + 10log (42.34) = 27.26 > 24dBm
2. 11dBm + 10log (42.16) = 27.24 > 24dBm
3. 11dBm + 10log (42.15) = 27.24 > 24dBm
4. 11dBm + 10log (42.16) = 27.24 > 24dBm
5. 11dBm + 10log (42.14) = 27.24 > 24dBm

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	12.11	12.39	33.594	15.26	24.00	Pass
58	5290	12.33	11.96	32.804	15.16	24.00	Pass
106	5530	12.11	11.04	28.961	14.62	24.00	Pass
122	5610	12.35	12.20	33.775	15.29	24.00	Pass
155	5775	12.25	12.55	34.777	15.41	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (84.55) = 30.27 > 24dBm
2. 11dBm + 10log (84.38) = 30.26 > 24dBm
3. 11dBm + 10log (85.02) = 30.29 > 24dBm

Chain 1
1. 11dBm + 10log (83.74) = 30.22 > 24dBm
2. 11dBm + 10log (84.40) = 30.26 > 24dBm
3. 11dBm + 10log (84.95) = 30.29 > 24dBm

26dB Bandwidth:

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	22.85	23.11
40	5200	23.21	23.18
48	5240	23.18	23.17
52	5260	23.13	23.10
60	5300	22.45	23.14
64	5320	23.18	23.26
100	5500	22.52	22.39
116	5580	23.11	22.99
140	5700	23.26	23.21

802.11ac (VHT20)

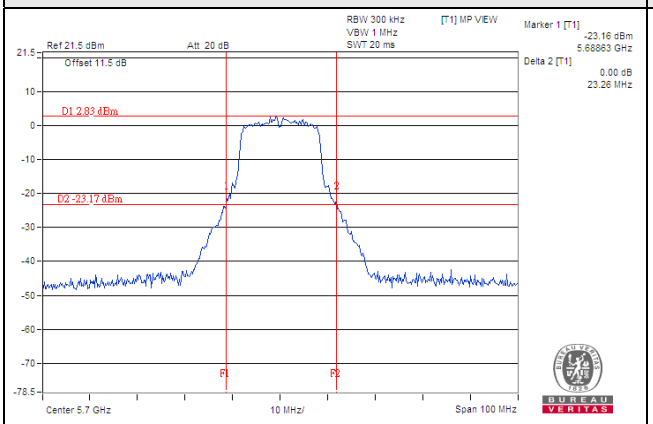
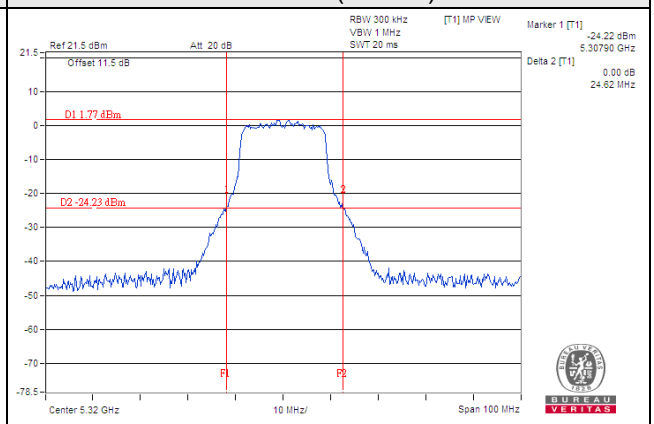
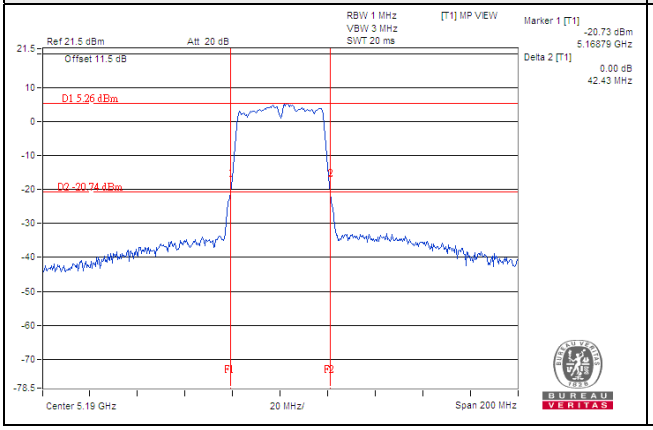
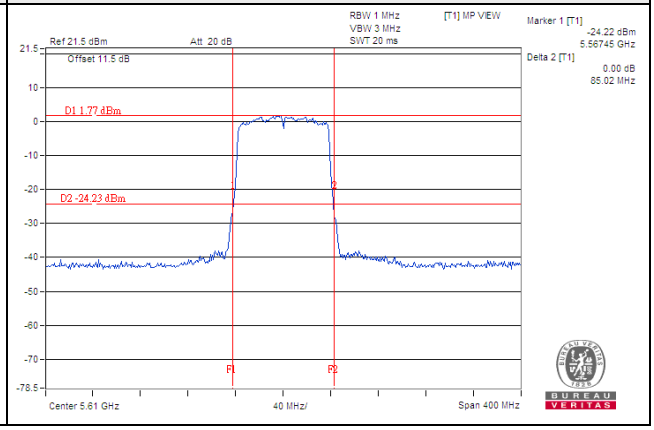
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	24.55	23.42
40	5200	23.27	23.43
48	5240	23.61	24.03
52	5260	23.36	23.83
60	5300	24.12	24.57
64	5320	24.56	24.62
100	5500	23.87	23.45
116	5580	23.88	23.45
140	5700	23.40	25.43

802.11ac (VHT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	42.28	42.43
46	5230	42.19	42.08
54	5270	42.15	42.34
62	5310	42.24	42.16
102	5510	42.13	42.15
110	5550	42.18	42.16
134	5670	42.23	42.14

802.11ac (VHT80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	84.53	84.39
58	5290	84.55	83.74
106	5530	84.38	84.40
122	5610	85.02	84.95

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

EUT Maximum Conducted Power

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	34.094	15.33
5470~5725	34.371	15.36

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	33.429	15.24
5470~5725	33.510	15.25

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	34.786	15.41
5470~5725	34.679	15.40

802.11ac (VHT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	33.623	15.27
5470~5725	33.664	15.27

802.11ac (VHT40)

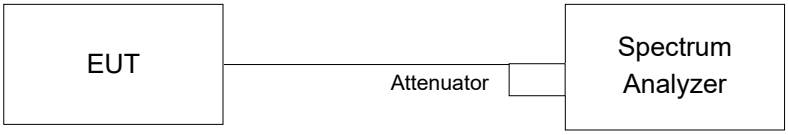
Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	35.027	15.44
5470~5725	34.839	15.42

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	32.804	15.16
5470~5725	33.775	15.29

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Result

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.68	16.68
40	5200	16.68	16.68
48	5240	16.68	16.68
52	5260	16.68	16.68
60	5300	16.68	16.68
64	5320	16.68	16.68
100	5500	16.68	16.68
116	5580	16.68	16.68
140	5700	16.68	16.68
149	5745	16.61	16.61
157	5785	16.68	16.68
165	5825	16.68	16.68

802.11ac (VHT20)

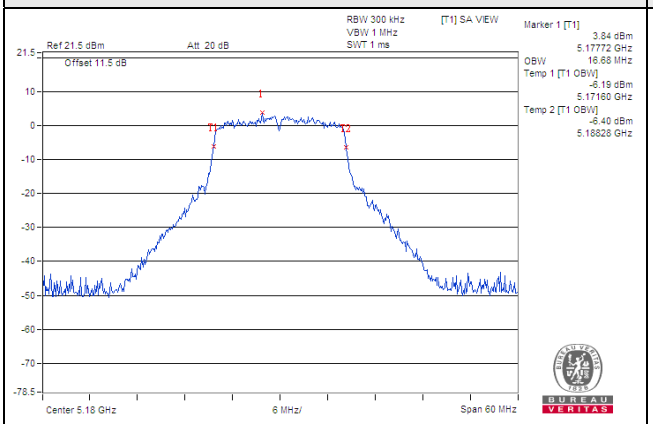
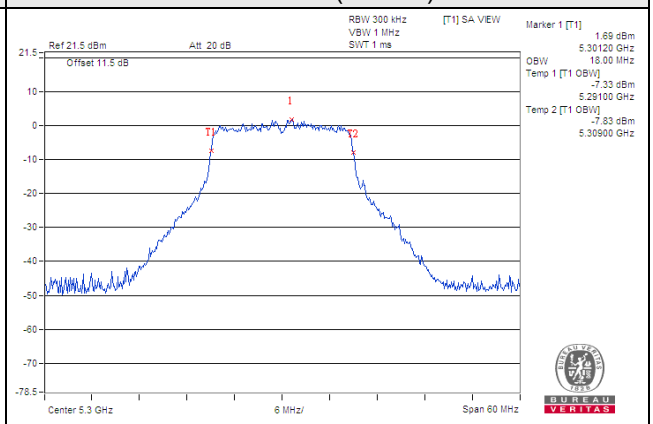
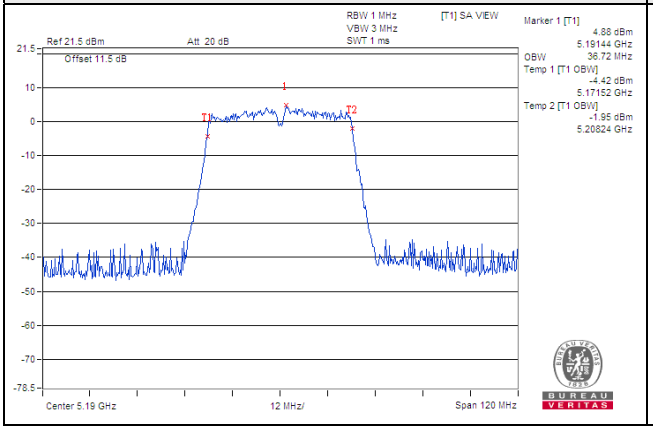
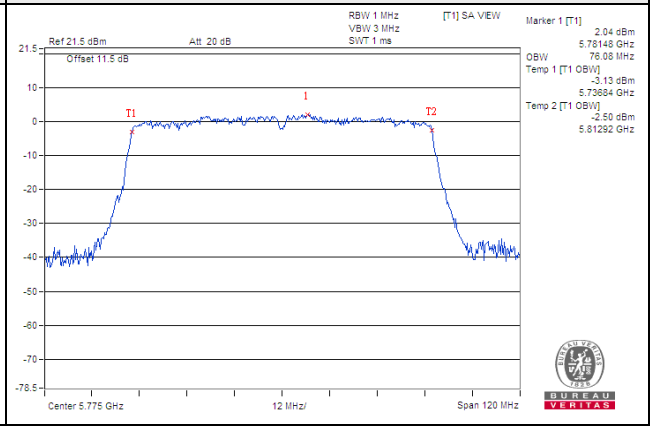
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.88	17.88
40	5200	17.88	17.88
48	5240	17.88	18.00
52	5260	17.88	17.88
60	5300	18.00	17.88
64	5320	17.88	18.00
100	5500	17.88	17.88
116	5580	17.88	17.88
140	5700	17.88	18.00
149	5745	17.88	17.88
157	5785	17.88	17.88
165	5825	17.88	17.88

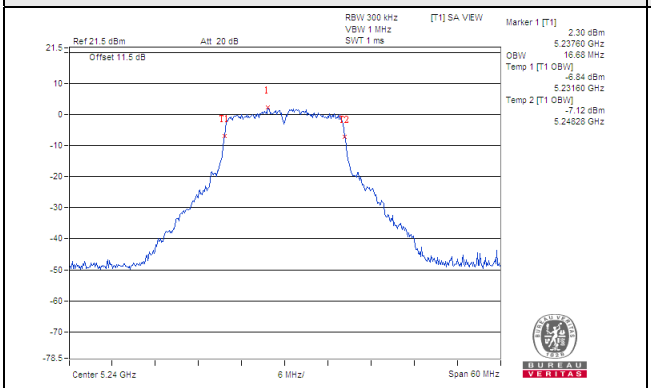
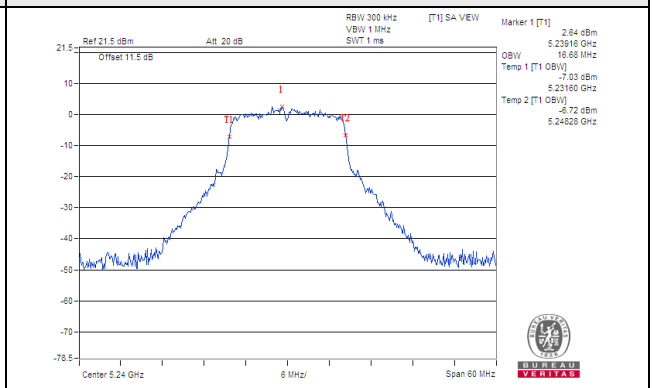
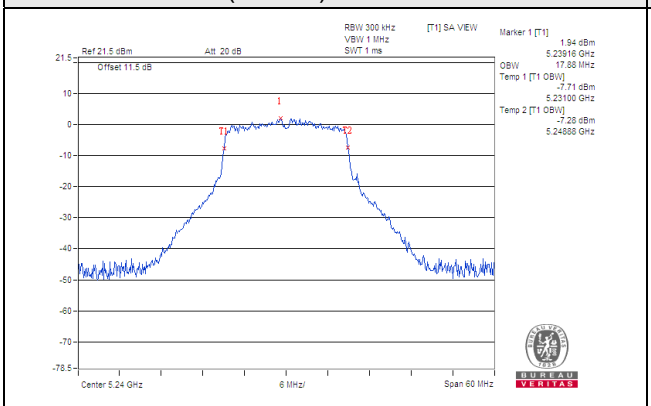
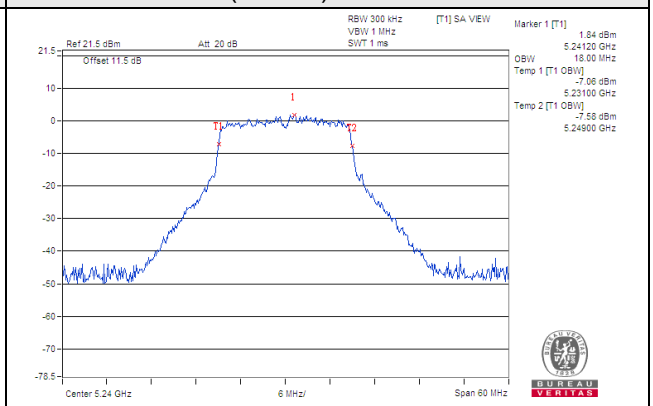
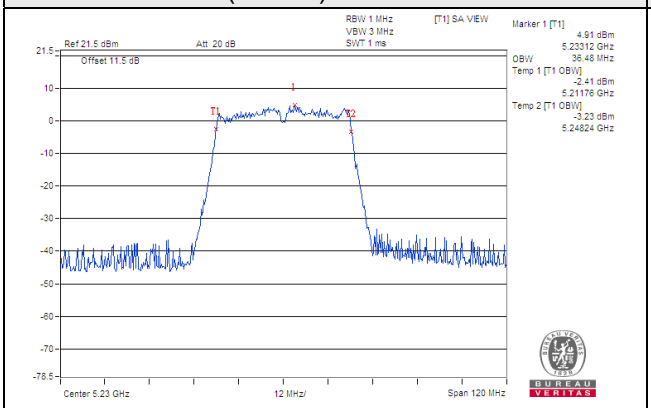
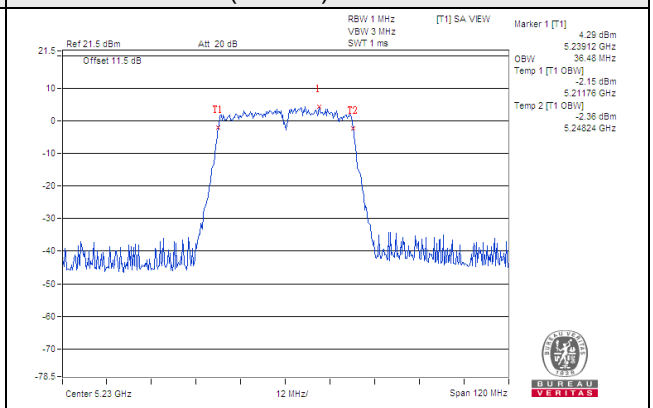
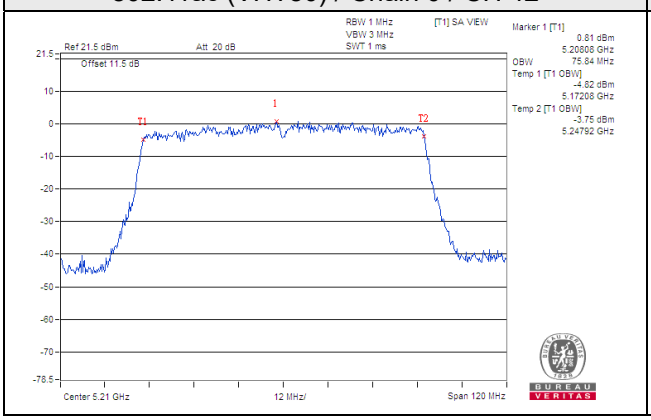
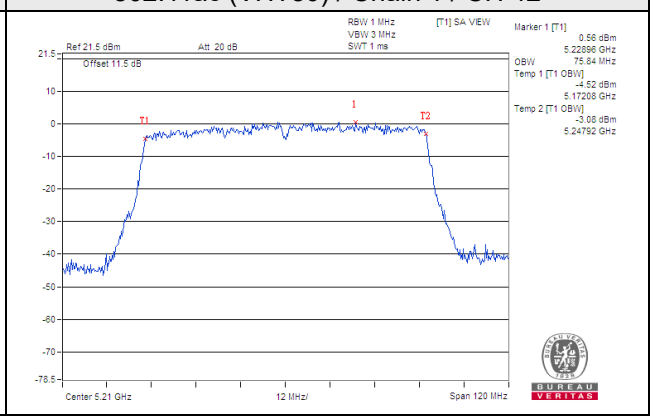
802.11ac (VHT40)

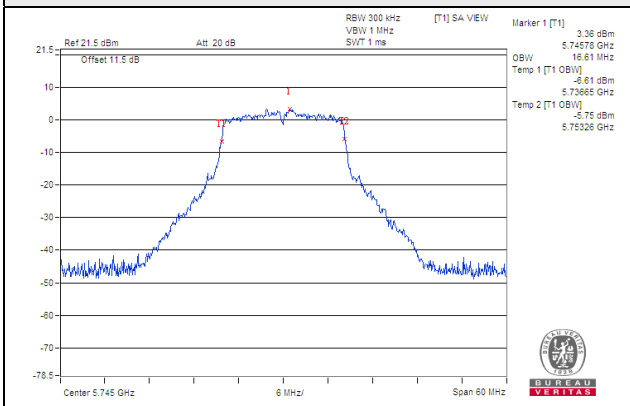
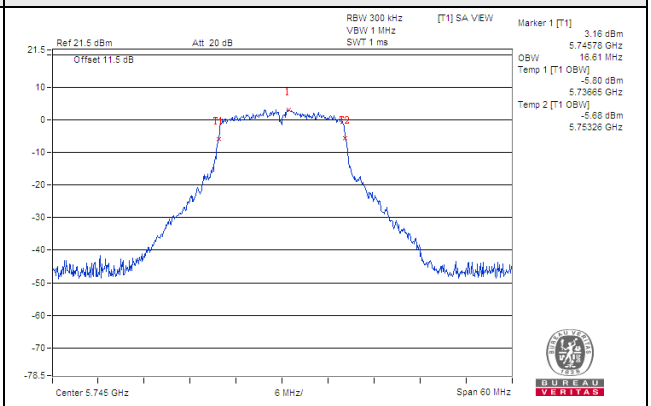
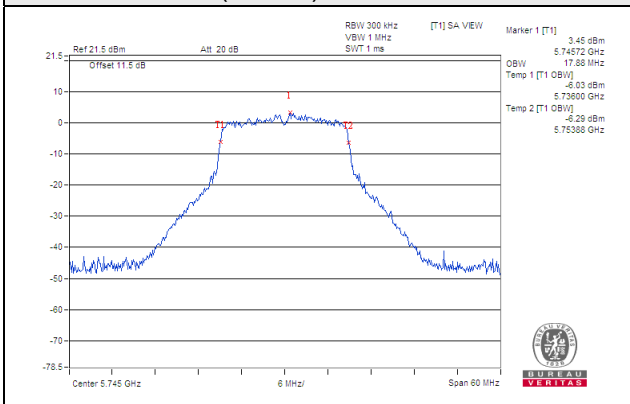
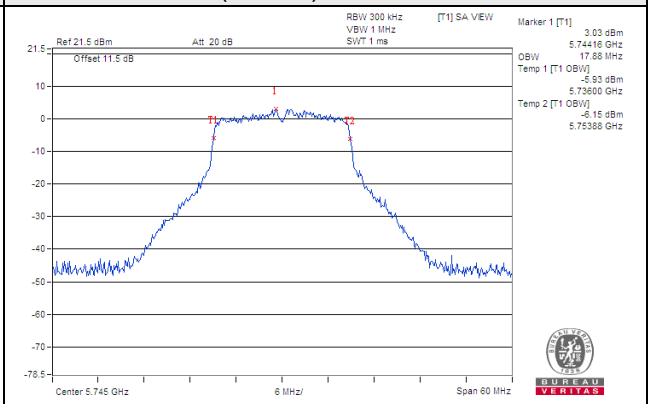
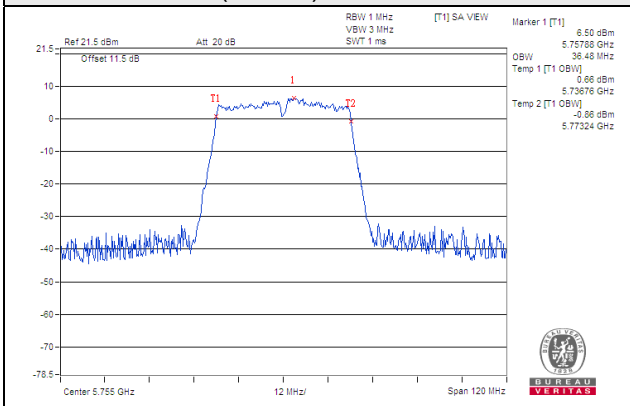
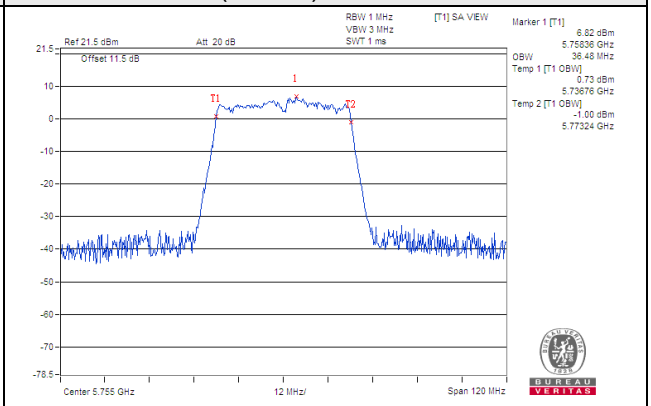
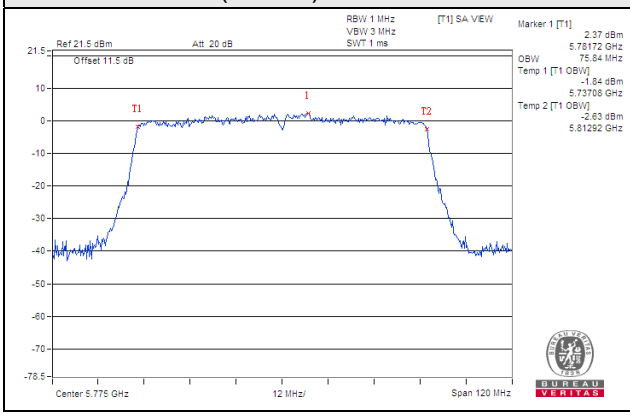
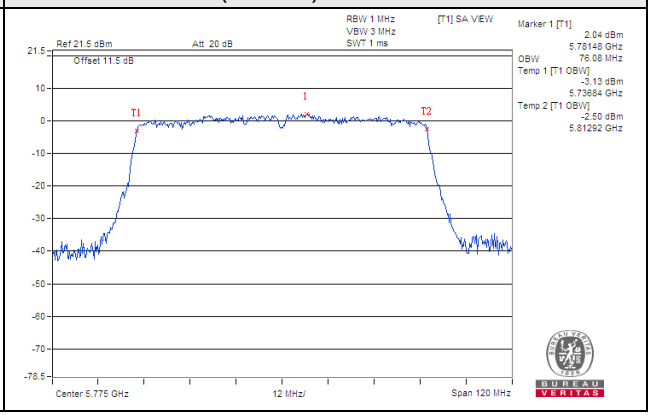
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.72	36.48
46	5230	36.48	36.48
54	5270	36.48	36.48
62	5310	36.48	36.48
102	5510	36.72	36.48
110	5550	36.48	36.48
134	5670	36.48	36.48
151	5755	36.48	36.48
159	5795	36.72	36.48

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.84
58	5290	75.84	75.84
106	5530	75.84	75.84
122	5610	75.84	76.08
155	5775	75.84	76.08

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

Spectrum Plot for near By DFS Band	
802.11a / Chain 0 / CH 48	802.11a / Chain 1 / CH 48
	
802.11ac (VHT20) / Chain 0 / CH 48	802.11ac (VHT20) / Chain 1 / CH 48
	
802.11ac (VHT40) / Chain 0 / CH 46	802.11ac (VHT40) / Chain 1 / CH 46
	
802.11ac (VHT80) / Chain 0 / CH 42	802.11ac (VHT80) / Chain 1 / CH 42
	

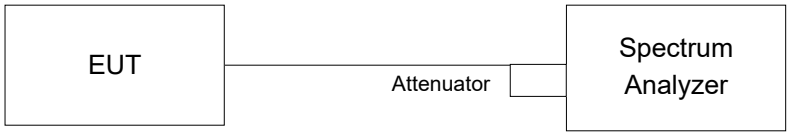
Spectrum Plot for near By DFS Band	
802.11a / Chain 0 / CH 149	802.11a / Chain 1 / CH 149
	
802.11ac (VHT20) / Chain 0 / CH 149	802.11ac (VHT20) / Chain 1 / CH 149
	
802.11ac (VHT40) / Chain 0 / CH 151	802.11ac (VHT40) / Chain 1 / CH 151
	
802.11ac (VHT80) / Chain 0 / CH 155	802.11ac (VHT80) / Chain 1 / 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:

Duty cycle of test signal is > 98%

Using method SA-1

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
c. Sweep time = auto, trigger set to “free run”.
d. Trace average at least 100 traces in power averaging mode.
e. Record the max value

Duty cycle of test signal is < 98%

Using method SA-2

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

For U-NII-3 band:

Duty cycle of test signal is > 98%

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

Duty cycle of test signal is < 98%

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz)
e. Sweep time = auto, trigger set to “free run”.
f. Trace average at least 100 traces in power averaging mode.
g. 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:

802.11a

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	-0.46	-0.97	2.30	10.84	Pass
40	5200	-0.77	-1.77	1.77	10.84	Pass
48	5240	-0.33	-0.76	2.47	10.84	Pass
52	5260	-0.82	-0.39	2.41	11.00	Pass
60	5300	-1.02	-0.52	2.25	11.00	Pass
64	5320	-1.15	-0.78	2.05	11.00	Pass
100	5500	-0.52	-0.56	2.47	11.00	Pass
116	5580	-1.06	-1.25	1.86	11.00	Pass
140	5700	-0.86	-0.66	2.25	11.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5180~5240MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=6.16dBi > 6dBi, so the limit shall be reduced to 11-(6.16-6) = 10.84dBm.
   5260~5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.66dBi < 6dBi, so the limit is not reduced.
   5500~5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.37dBi < 6dBi, so the limit is not reduced.

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	-0.48	-0.83	0.13	2.49	10.84	Pass
40	5200	-0.56	-0.47	0.13	2.63	10.84	Pass
48	5240	-1.17	-0.48	0.13	2.33	10.84	Pass
52	5260	-0.97	-0.65	0.13	2.33	11.00	Pass
60	5300	-1.20	-0.75	0.13	2.17	11.00	Pass
64	5320	-1.29	-0.81	0.13	2.10	11.00	Pass
100	5500	-0.81	-0.54	0.13	2.47	11.00	Pass
116	5580	-1.10	-0.96	0.13	2.11	11.00	Pass
140	5700	-1.12	-0.77	0.13	2.20	11.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5180~5240MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=6.16dBi > 6dBi, so the limit shall be reduced to 11-(6.16-6) = 10.84dBm.
   5260~5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.66dBi < 6dBi, so the limit is not reduced.
   5500~5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.37dBi < 6dBi, so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

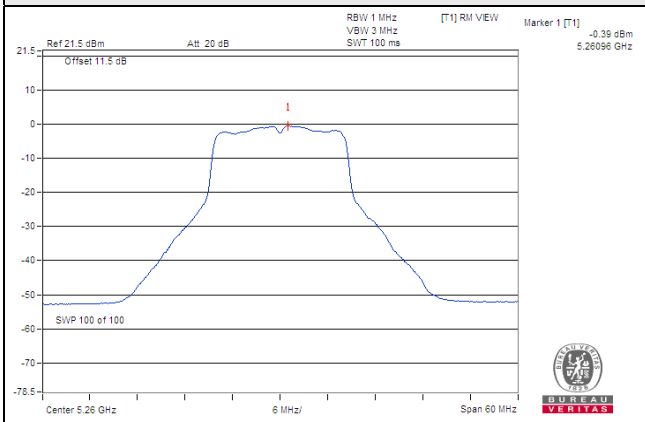
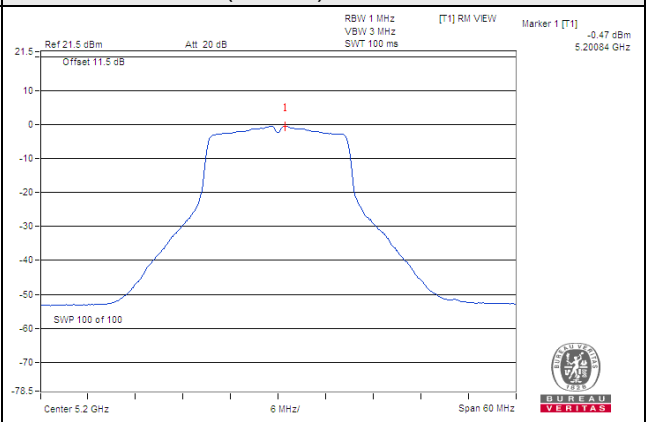
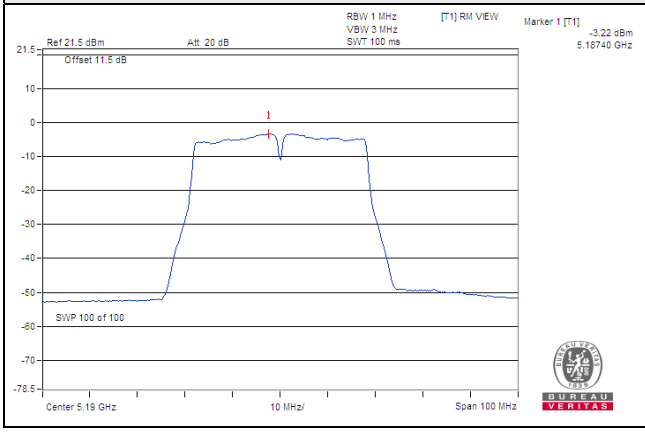
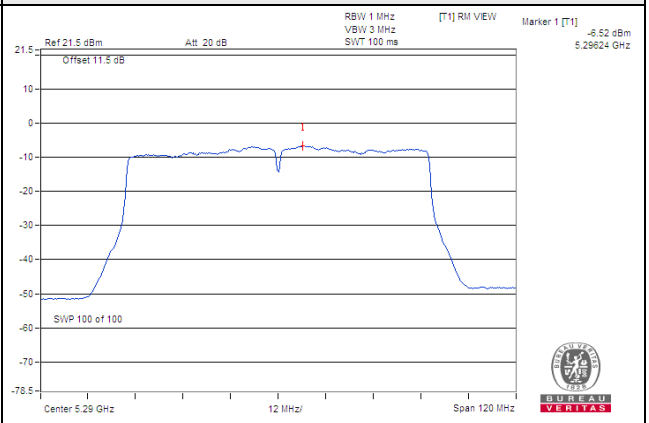
Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-3.43	-3.22	0.21	-0.10	10.84	Pass
46	5230	-3.41	-3.44	0.21	-0.20	10.84	Pass
54	5270	-3.78	-3.40	0.21	-0.37	11.00	Pass
62	5310	-3.74	-3.48	0.21	-0.39	11.00	Pass
102	5510	-3.76	-3.63	0.21	-0.47	11.00	Pass
110	5550	-3.58	-3.94	0.21	-0.54	11.00	Pass
134	5670	-3.76	-3.85	0.21	-0.58	11.00	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5180~5240MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=6.16dBi > 6dBi, so the limit shall be reduced to 11-(6.16-6) = 10.84dBm.
   5260~5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.66dBi < 6dBi, so the limit is not reduced.
   5500~5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.37dBi < 6dBi, so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-6.67	-6.60	0.36	-3.26	10.84	Pass
58	5290	-6.70	-6.52	0.36	-3.24	11.00	Pass
106	5530	-7.14	-6.94	0.36	-3.67	11.00	Pass
122	5610	-6.68	-6.61	0.36	-3.27	11.00	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5180~5240MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=6.16dBi > 6dBi, so the limit shall be reduced to 11-(6.16-6) = 10.84dBm.
   5260~5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.66dBi < 6dBi, so the limit is not reduced.
   5500~5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.37dBi < 6dBi, so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 1 / CH 52	802.11ac (VHT20) / Chain 1 / CH 40
	
802.11ac (VHT40) / Chain 1 / CH 38	802.11ac (VHT80) / Chain 0 / CH 58
	

For U-NII-3 band:

802.11a

TX chain	Chan.	Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-8.75	-6.53	3.01	-3.52	30.00	Pass
	157	5785	-8.64	-6.42	3.01	-3.41	30.00	Pass
	165	5825	-8.56	-6.34	3.01	-3.33	30.00	Pass
1	149	5745	-8.83	-6.61	3.01	-3.60	30.00	Pass
	157	5785	-8.61	-6.39	3.01	-3.38	30.00	Pass
	165	5825	-8.53	-6.31	3.01	-3.30	30.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 10 log[($10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20}$)^2/2]=4.65dBi < 6dBi, so the limit is not reduced.

802.11ac (VHT20)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	-9.35	-7.13	3.01	0.13	-3.99	30.00	Pass
	157	5785	-9.21	-6.99	3.01	0.13	-3.85	30.00	Pass
	165	5825	-9.22	-7.00	3.01	0.13	-3.86	30.00	Pass
1	149	5745	-9.41	-7.19	3.01	0.13	-4.05	30.00	Pass
	157	5785	-8.61	-6.39	3.01	0.13	-3.25	30.00	Pass
	165	5825	-9.23	-7.01	3.01	0.13	-3.87	30.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 10 log[($10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20}$)^2/2]=4.65dBi < 6dBi, so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

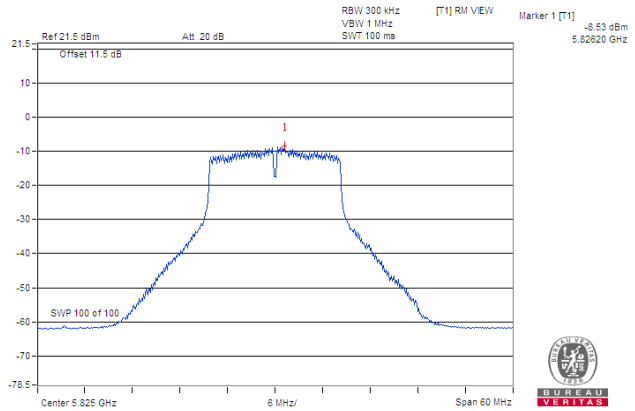
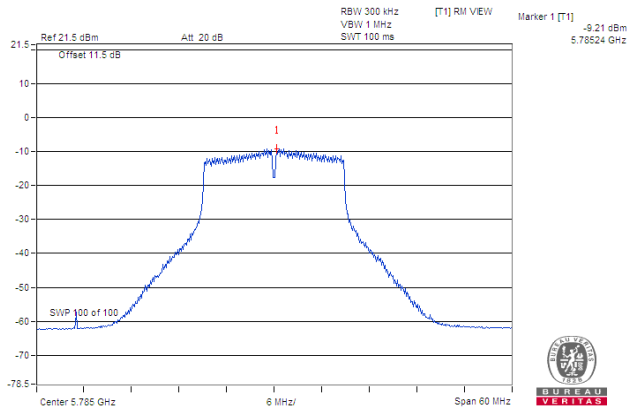
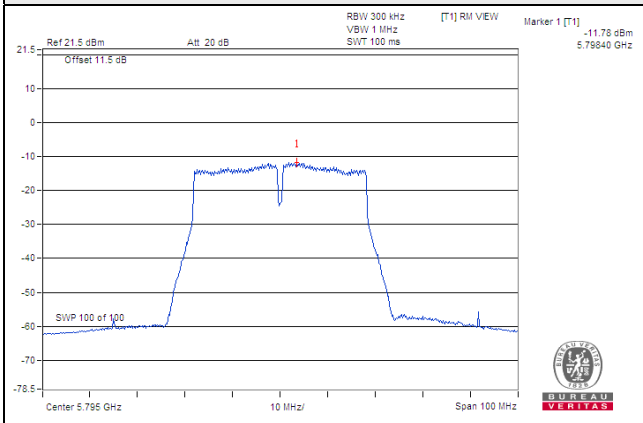
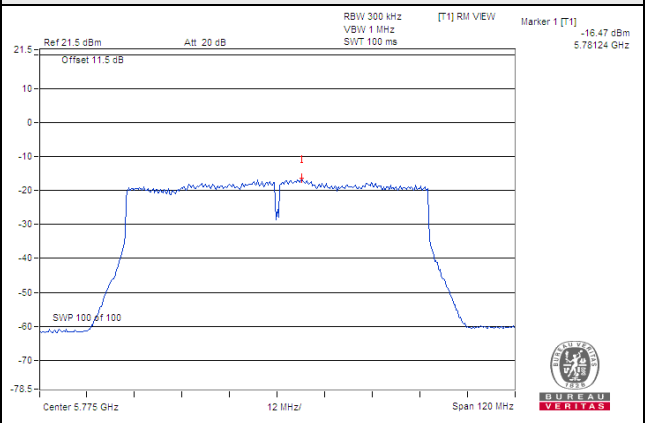
TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-12.40	-10.18	3.01	0.21	-6.96	30.00	Pass
	159	5795	-11.78	-9.56	3.01	0.21	-6.34	30.00	Pass
1	151	5755	-12.55	-10.33	3.01	0.21	-7.11	30.00	Pass
	159	5795	-11.78	-9.56	3.01	0.21	-6.34	30.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=4.65dBi < 6dBi, so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-16.47	-14.25	3.01	0.36	-10.88	30.00	Pass
1	155	5775	-16.48	-14.26	3.01	0.36	-10.89	30.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=4.65dBi < 6dBi, so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

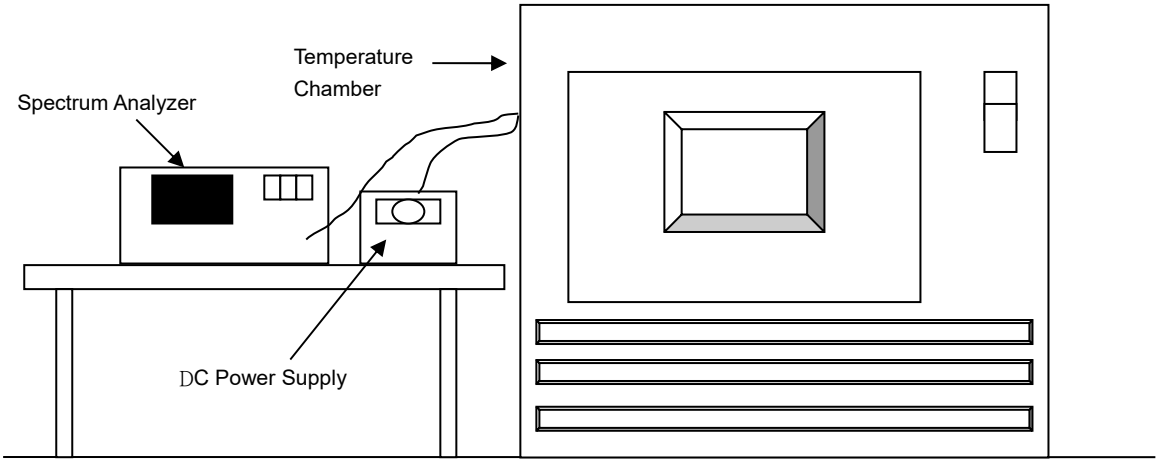
Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	

4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Test Date: Aug. 25, 2021

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 01, 2021	May 31, 2022
Three-phase coupling / decoupling network TESEQ	CDN 3063	4006	Mar. 10, 2021	Mar. 09, 2022
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

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

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

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

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

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

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	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
50	10.8	5180.0110	PASS	5180.0135	PASS	5180.0112	PASS	5180.0117	PASS
40	10.8	5180.0113	PASS	5180.0159	PASS	5180.0122	PASS	5180.0138	PASS
30	10.8	5179.9838	PASS	5179.9831	PASS	5179.9821	PASS	5179.9850	PASS
20	10.8	5180.0065	PASS	5180.0061	PASS	5180.0076	PASS	5180.0041	PASS
10	10.8	5179.9887	PASS	5179.9855	PASS	5179.9874	PASS	5179.9875	PASS
0	10.8	5179.9864	PASS	5179.9886	PASS	5179.9889	PASS	5179.9878	PASS
-10	10.8	5179.9906	PASS	5179.9909	PASS	5179.9891	PASS	5179.9933	PASS

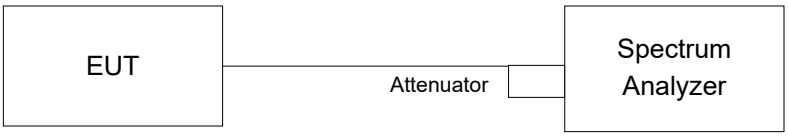
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	12.42	5180.0070	PASS	5180.0057	PASS	5180.0078	PASS	5180.0031	PASS
	10.8	5180.0065	PASS	5180.0061	PASS	5180.0076	PASS	5180.0041	PASS
	9.18	5180.0062	PASS	5180.0056	PASS	5180.0080	PASS	5180.0031	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

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.35	15.18	0.5	Pass
157	5785	15.33	15.38	0.5	Pass
165	5825	15.52	15.22	0.5	Pass

802.11ac (VHT20)

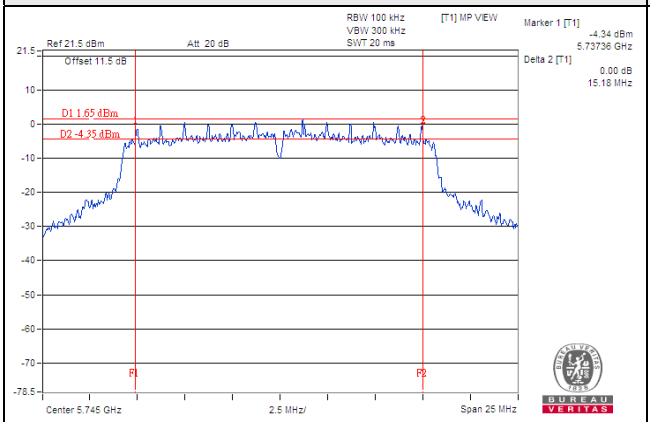
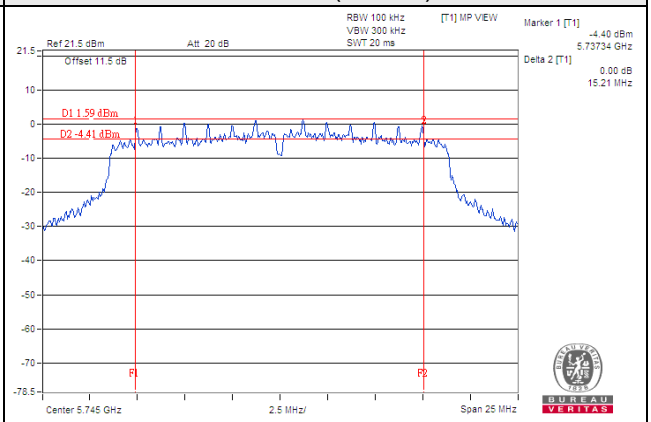
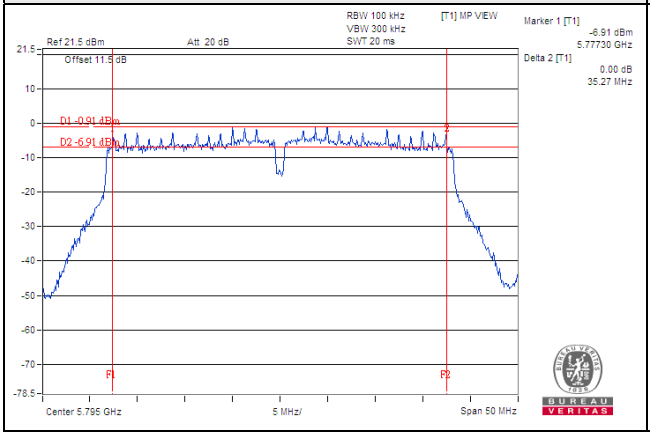
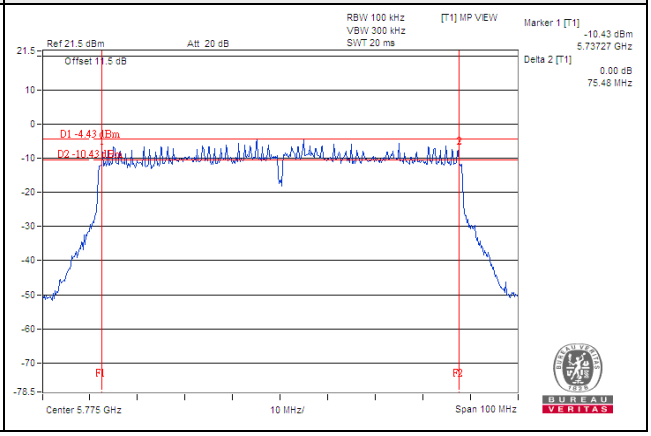
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.21	15.71	0.5	Pass
157	5785	15.74	16.83	0.5	Pass
165	5825	15.76	15.74	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.39	35.96	0.5	Pass
159	5795	35.27	35.96	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.48	75.48	0.5	Pass

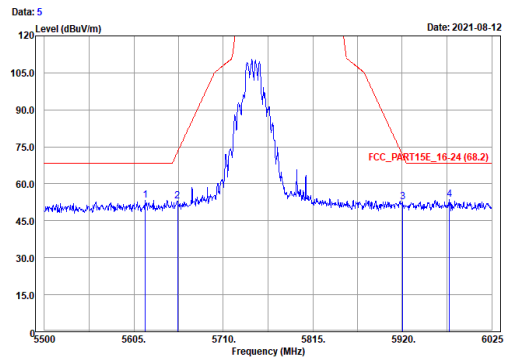
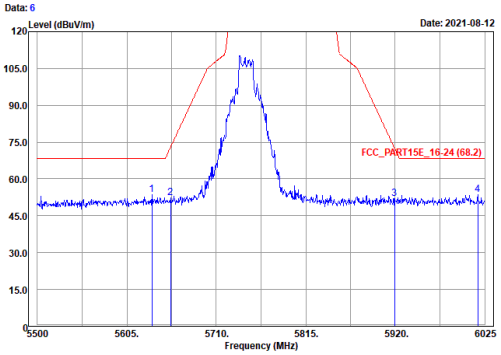
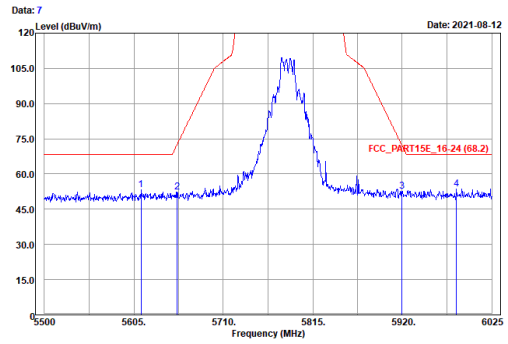
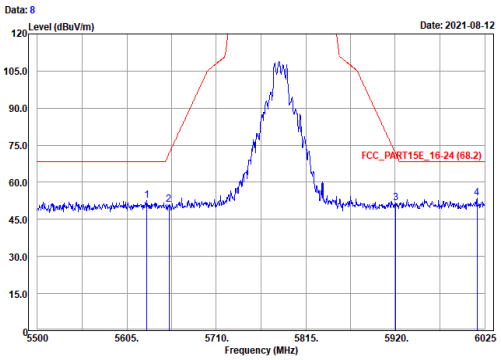
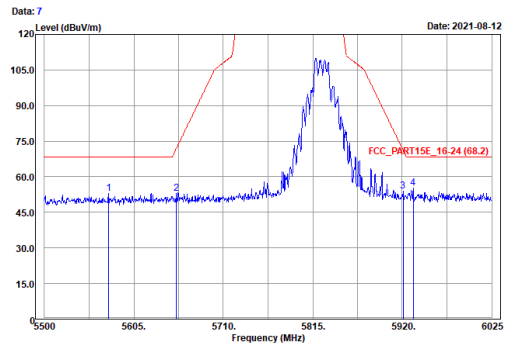
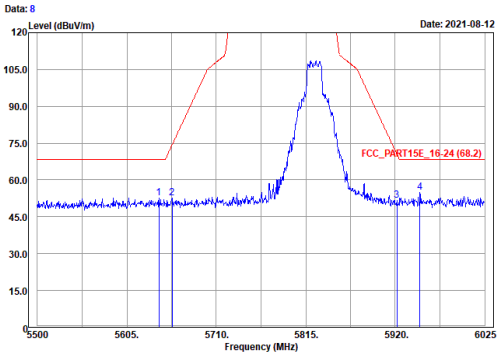
Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	802.11ac (VHT80)
	

5 Pictures of Test Arrangements

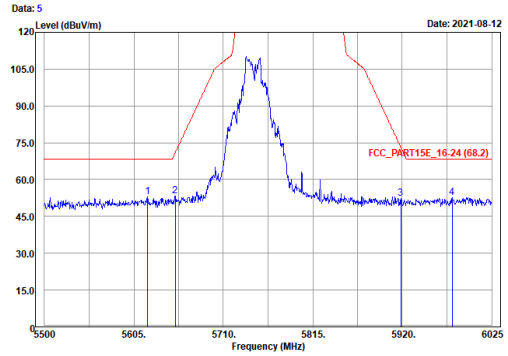
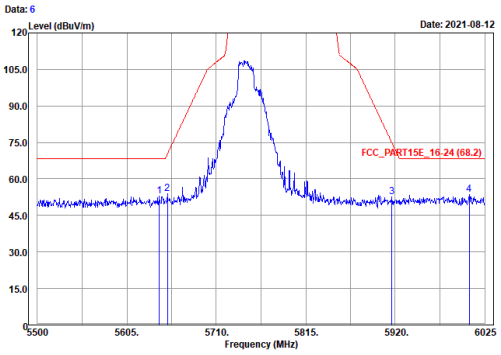
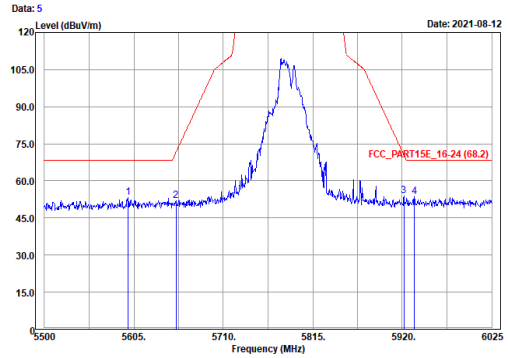
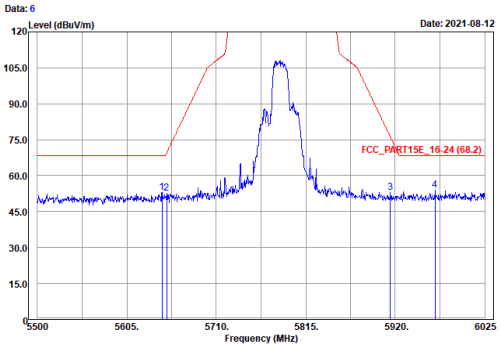
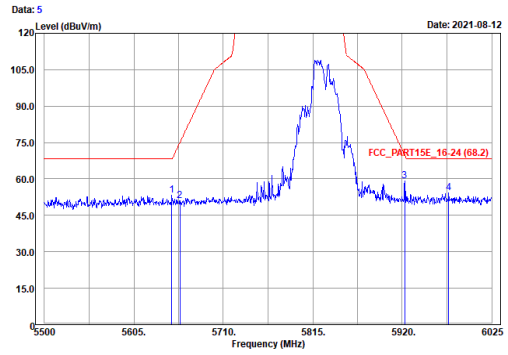
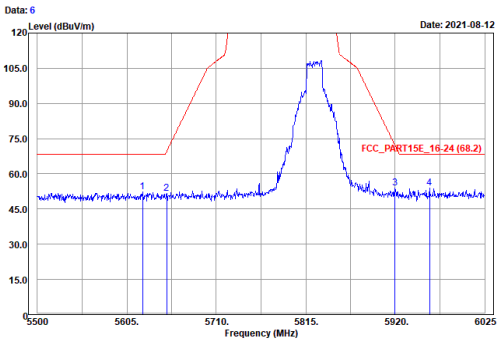
Please refer to the attached file (Test Setup Photo).

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

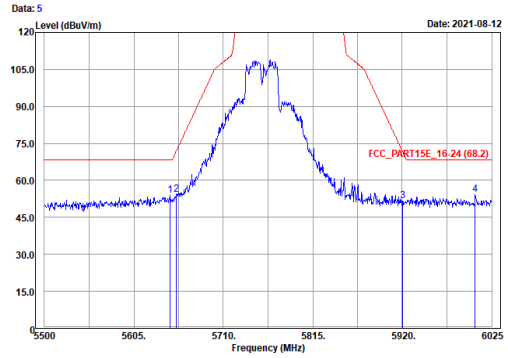
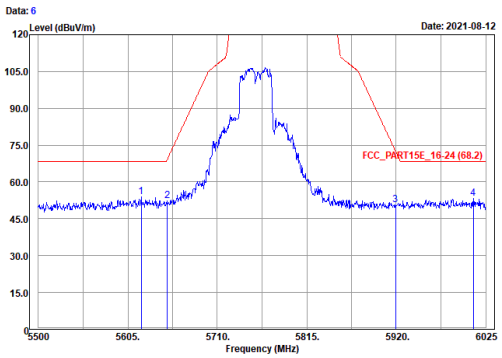
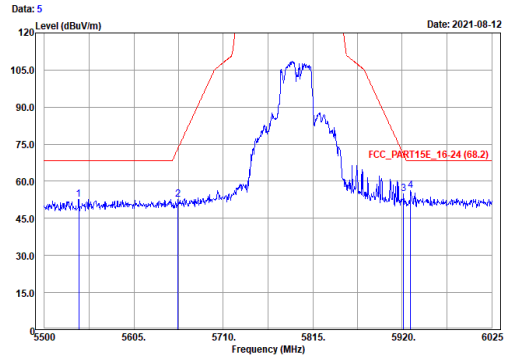
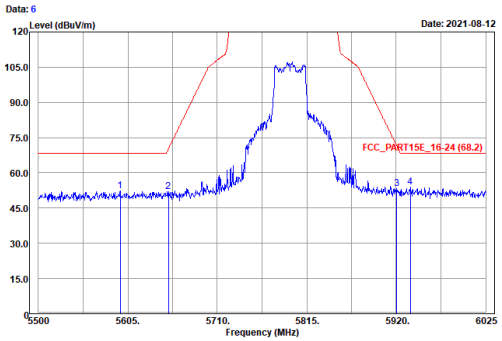
802.11a

CH 149 5745 MHz	
Horizontal	Vertical
	
CH 157 5785 MHz	
Horizontal	Vertical
	
CH 165 5825 MHz	
Horizontal	Vertical
	

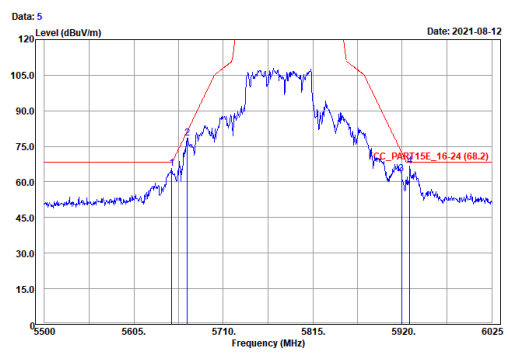
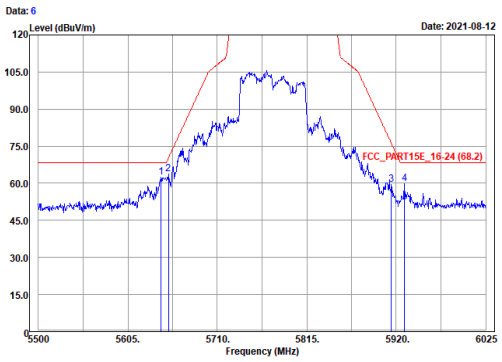
802.11ac (VHT20)

CH 149 5745 MHz	
Horizontal	Vertical
	
CH 157 5785 MHz	
Horizontal	Vertical
	
CH 165 5825 MHz	
Horizontal	Vertical
	

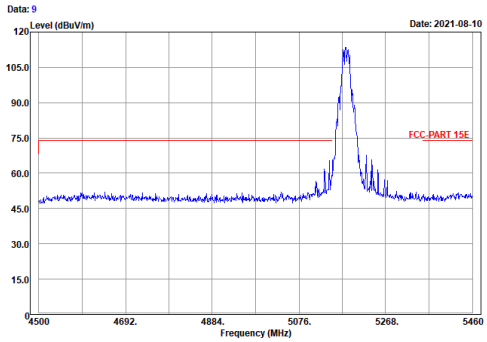
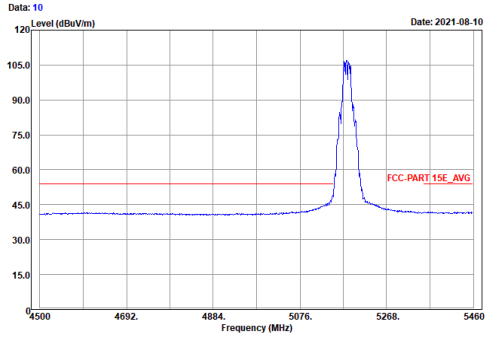
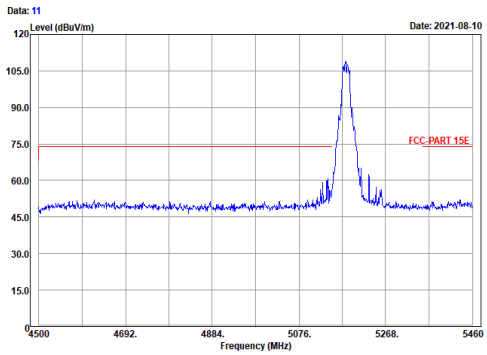
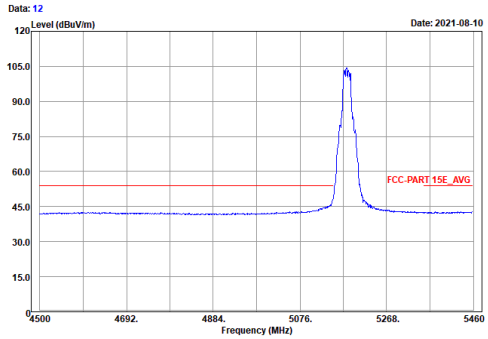
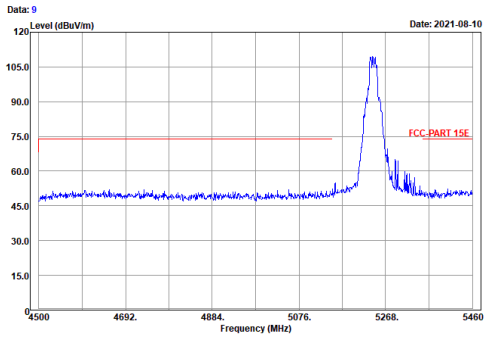
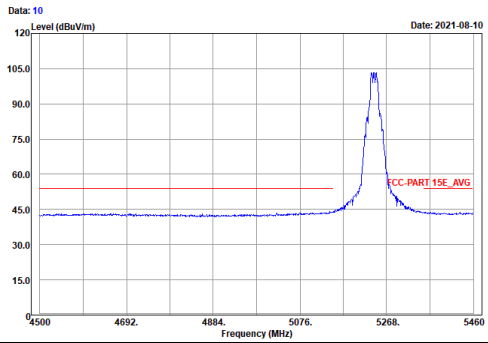
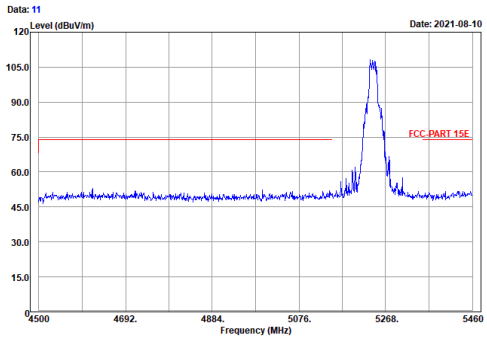
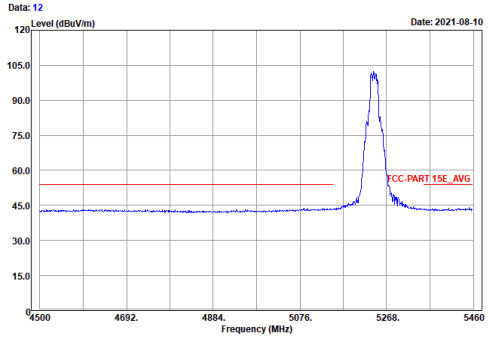
802.11ac (VHT40)

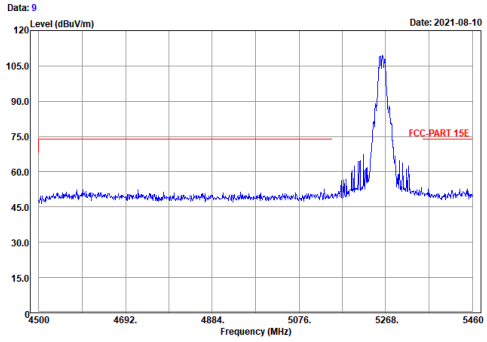
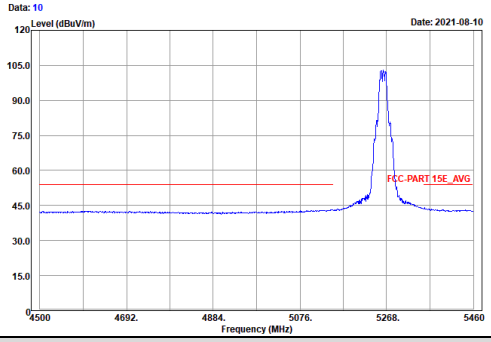
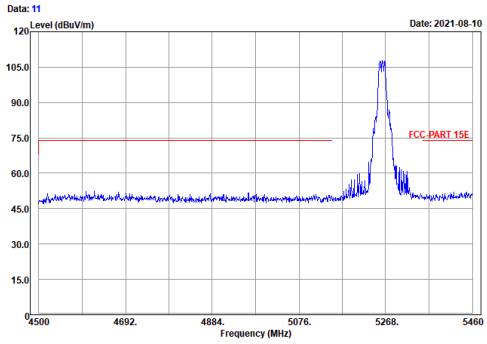
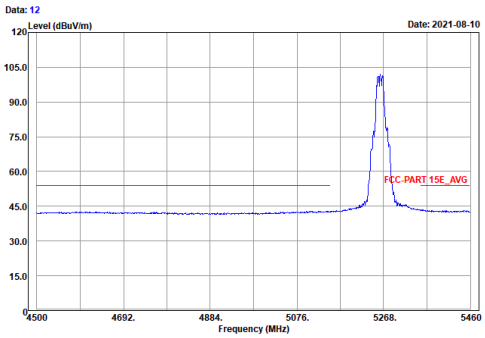
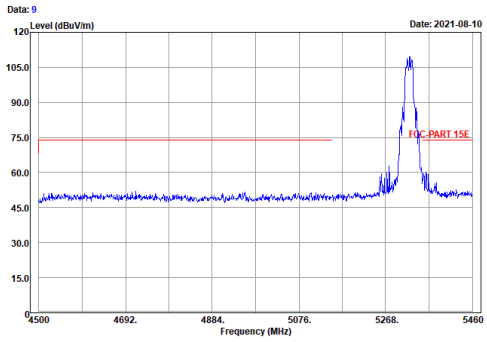
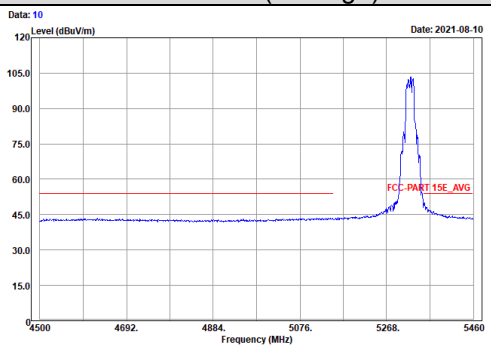
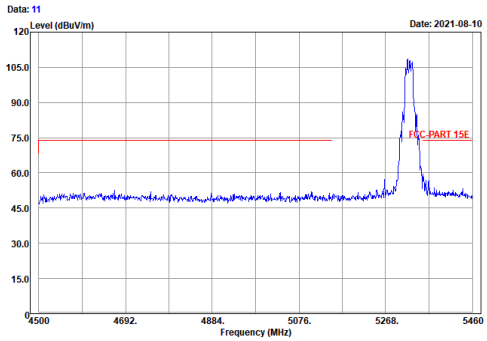
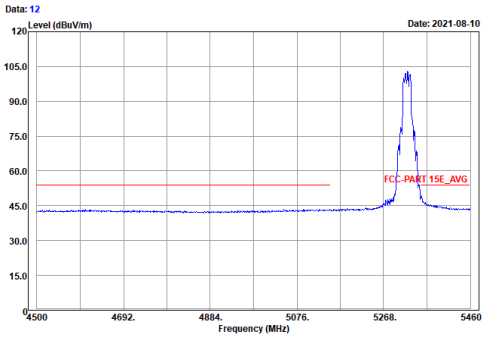
CH 151 5755 MHz	
Horizontal	Vertical
	
CH 159 5795 MHz	
Horizontal	Vertical
	

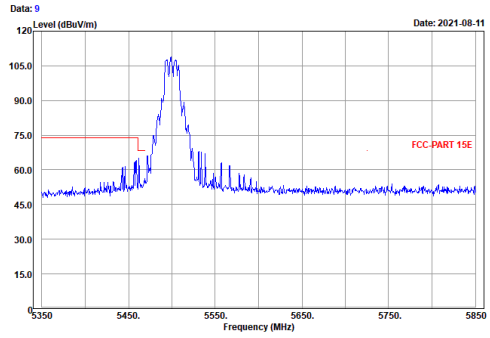
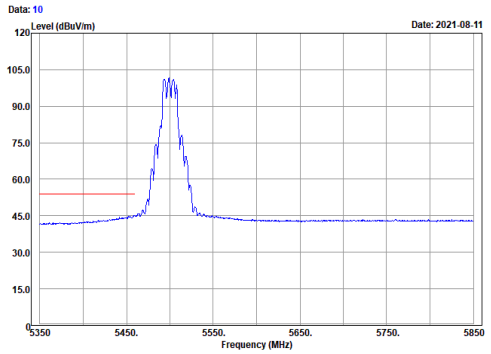
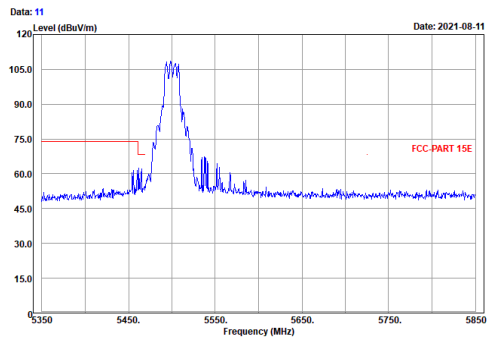
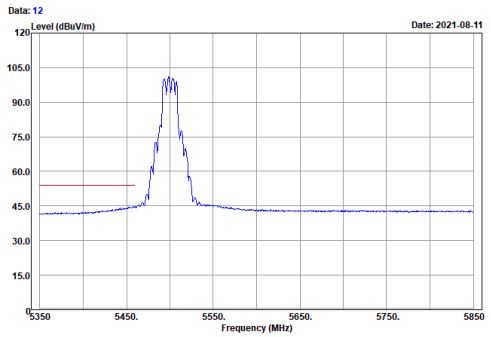
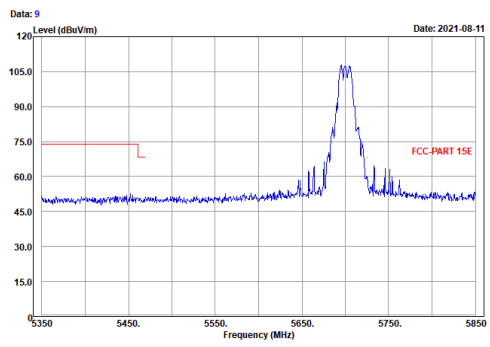
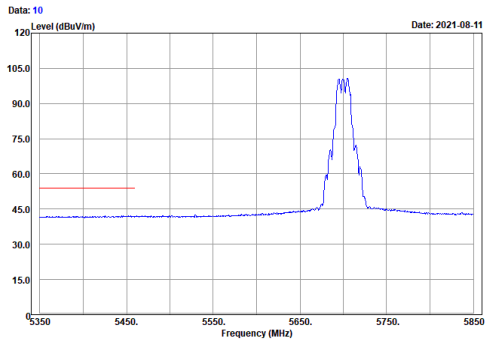
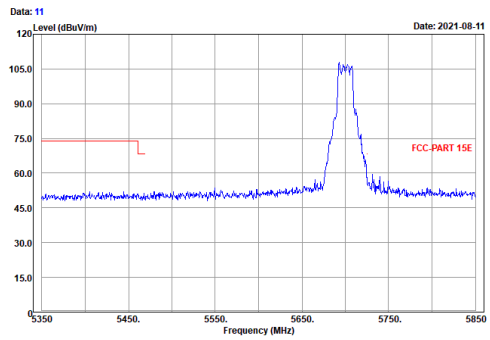
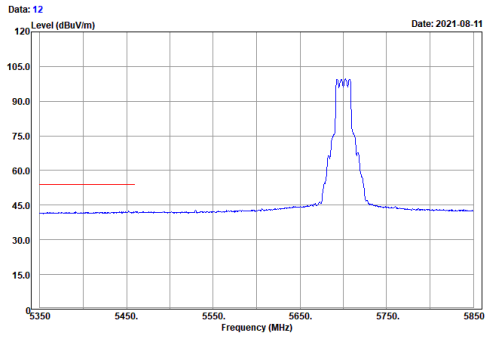
802.11ac (VHT80)

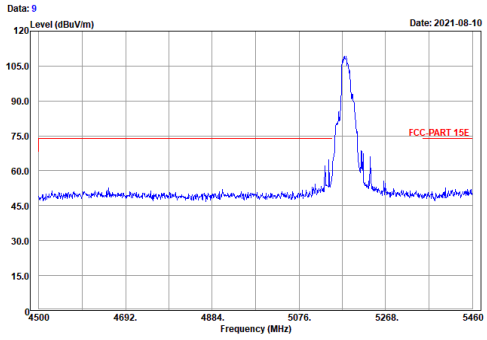
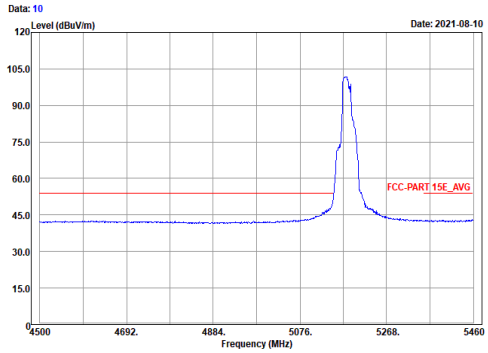
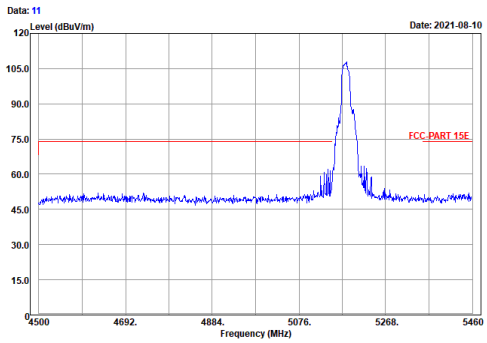
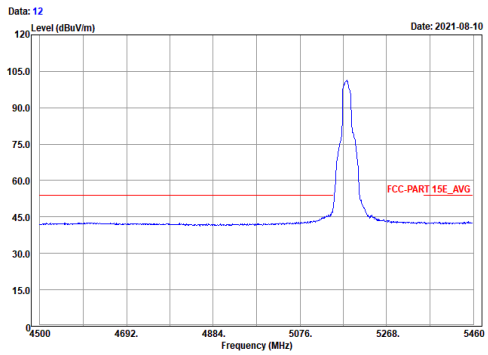
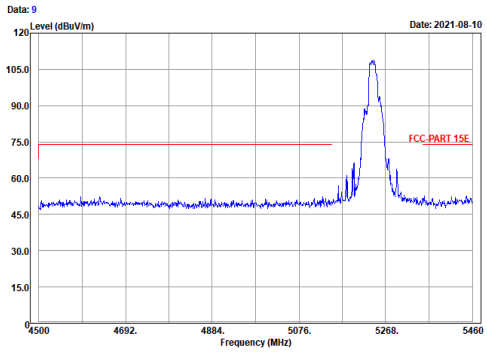
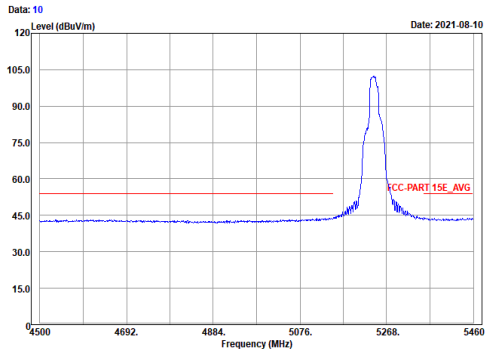
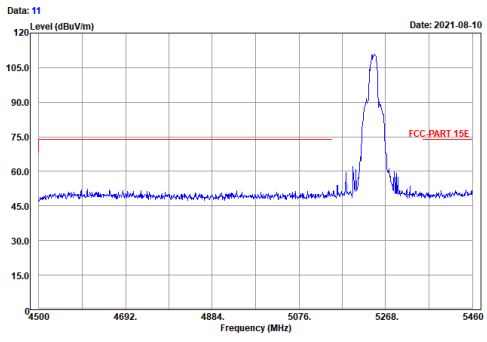
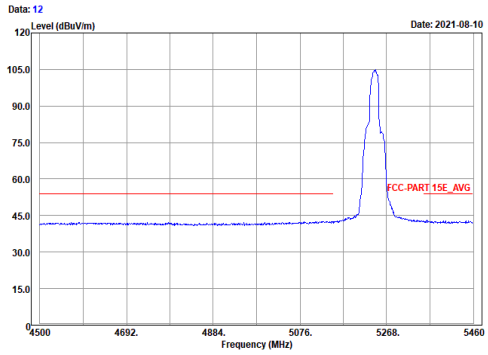
CH 155 5775 MHz	
Horizontal	Vertical
	

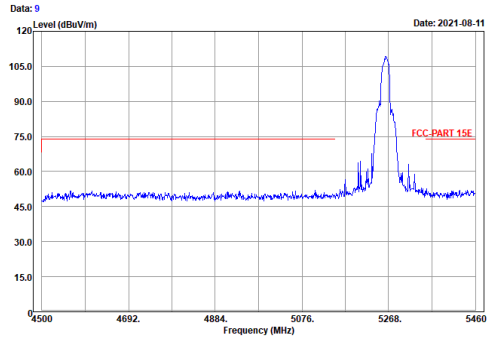
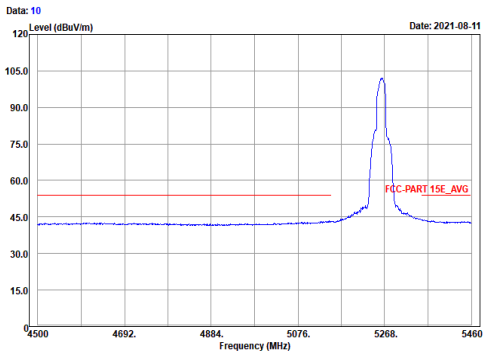
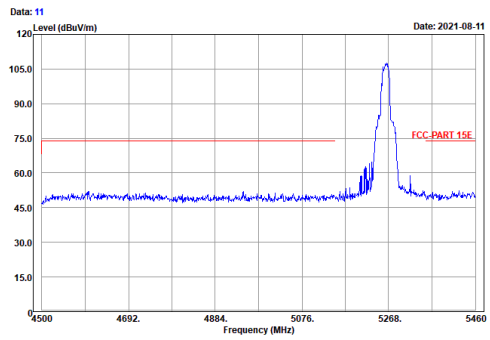
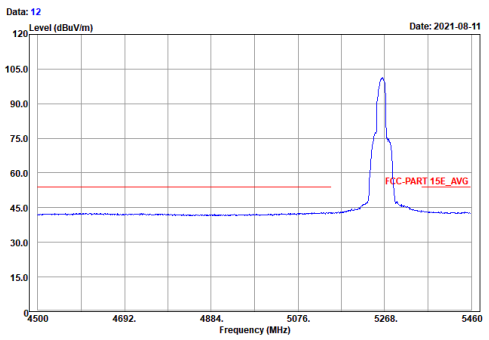
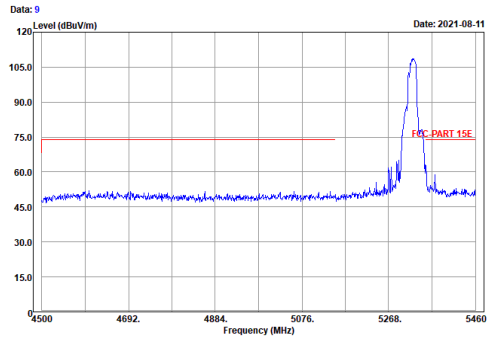
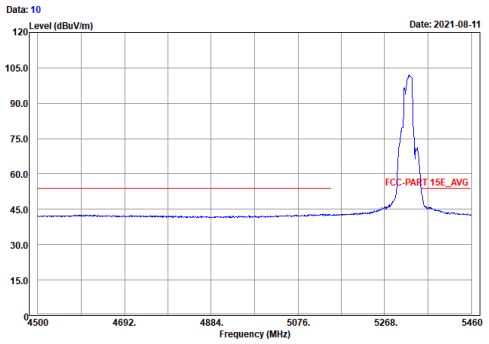
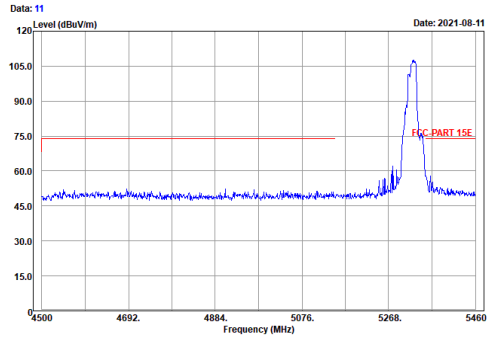
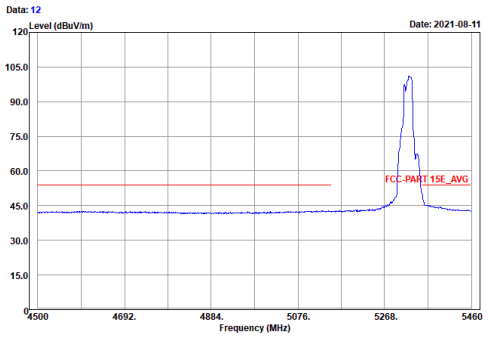
Annex B- Band Edge Measurement

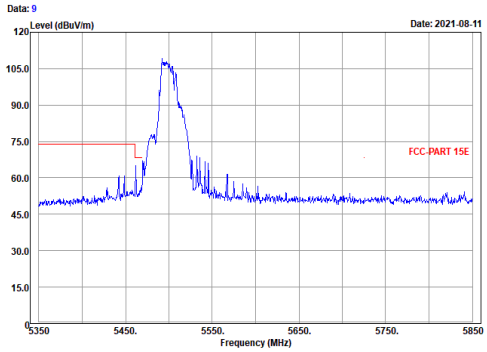
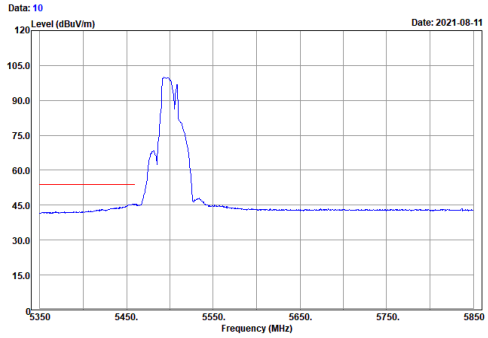
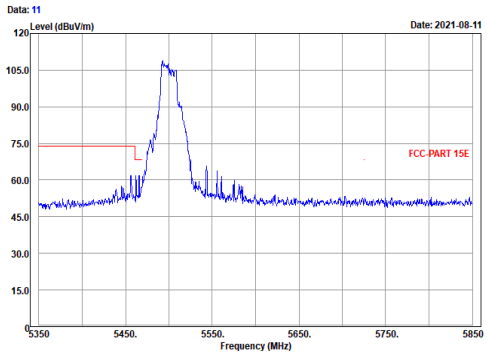
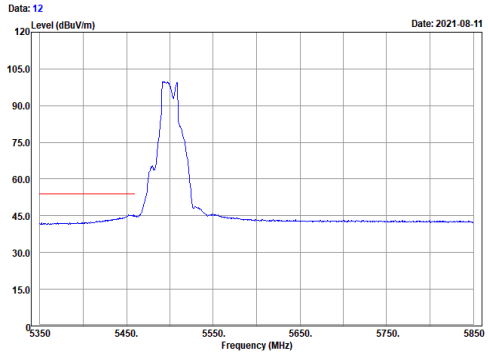
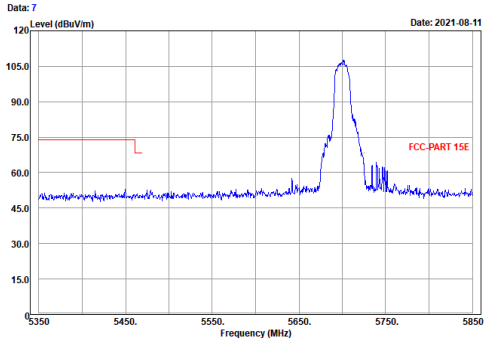
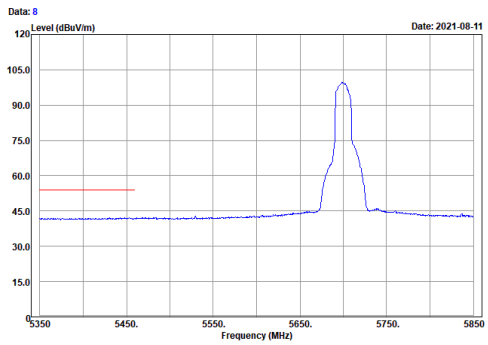
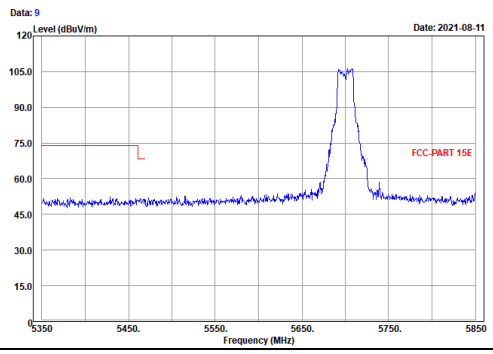
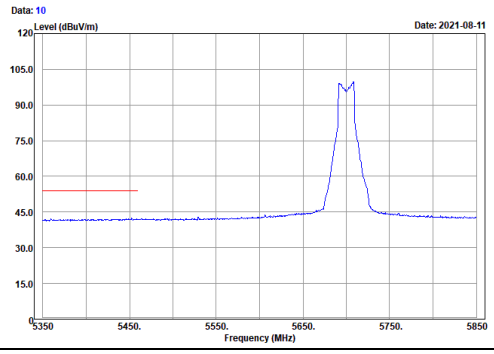
802.11a Channel 36	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
802.11a Channel 48	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

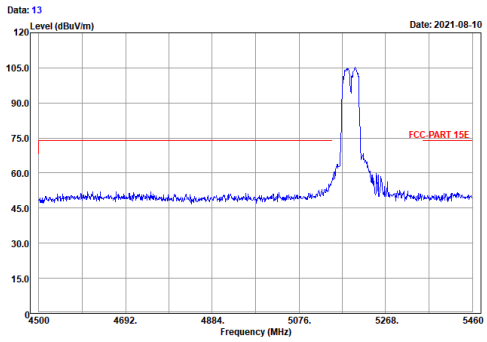
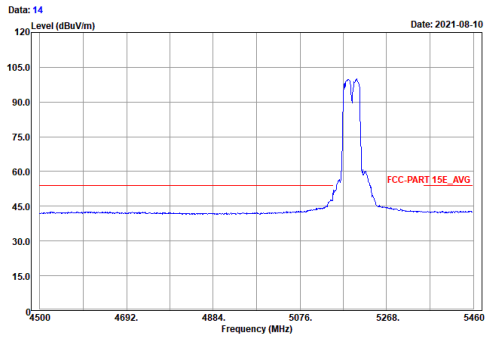
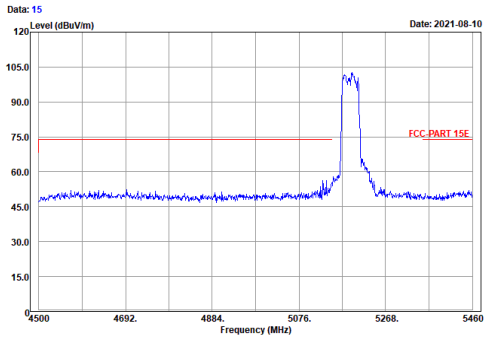
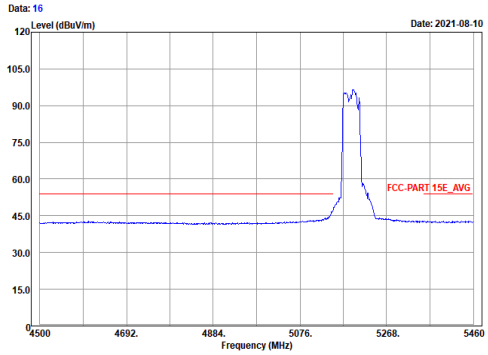
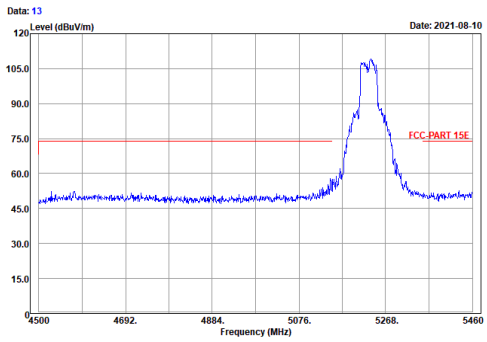
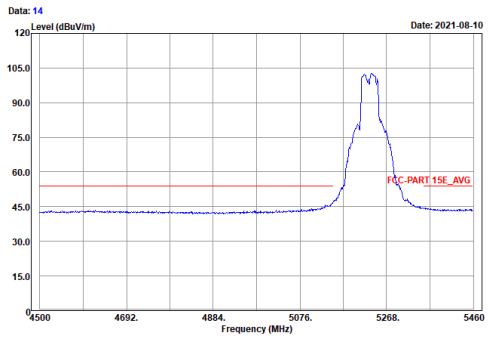
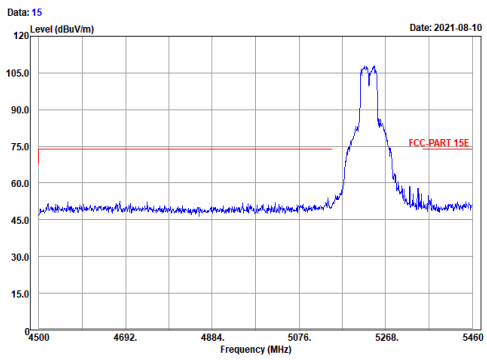
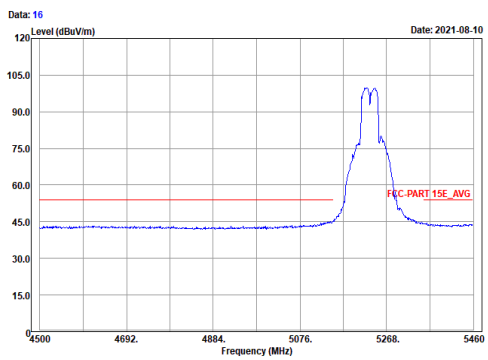
802.11a Channel 52	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
802.11a Channel 64	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

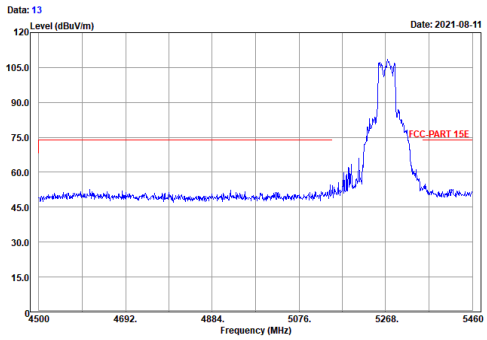
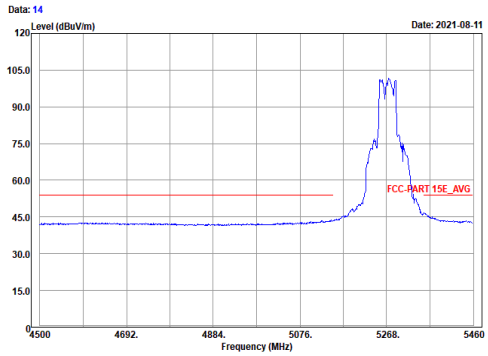
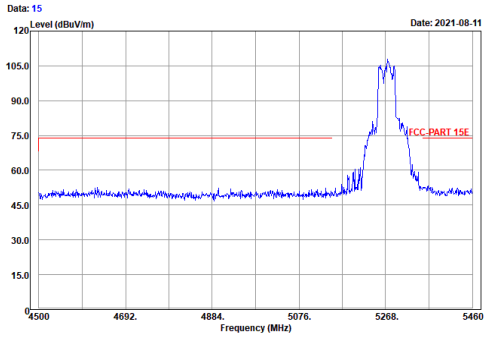
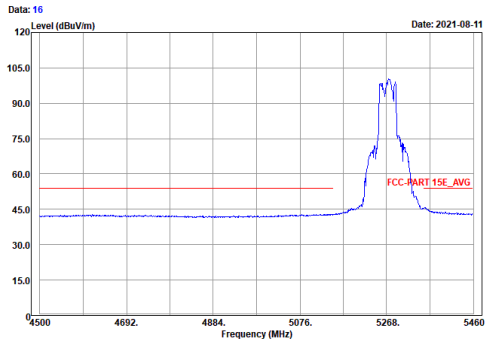
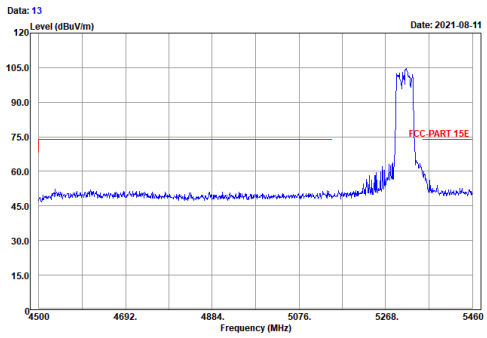
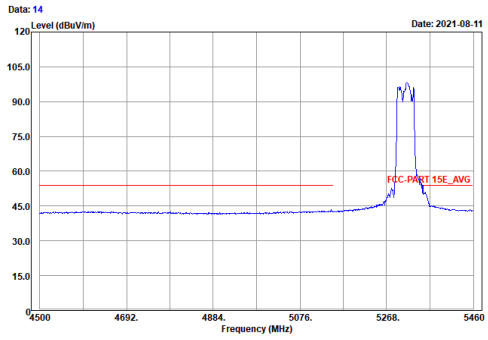
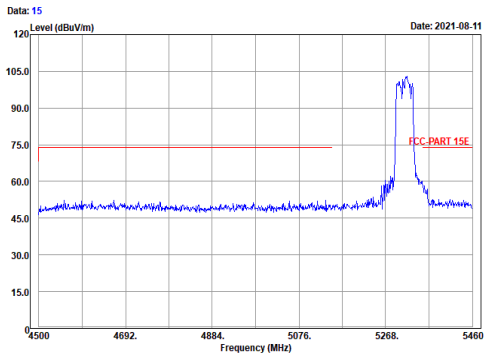
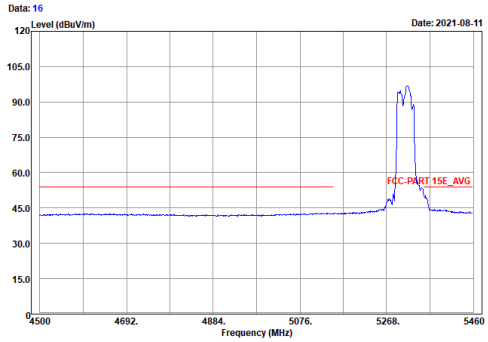
802.11a Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
802.11a Channel 140	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

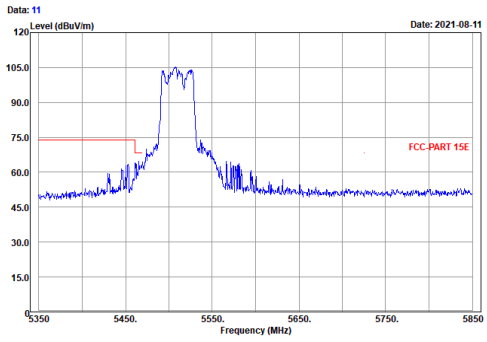
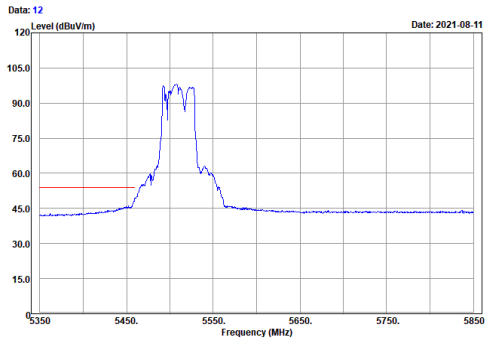
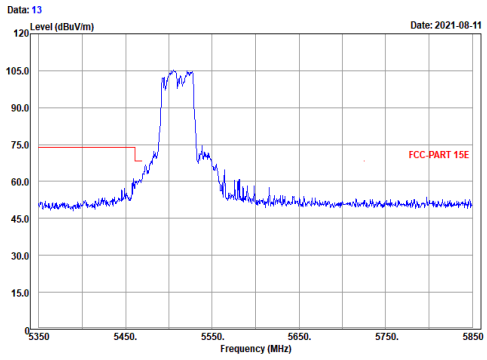
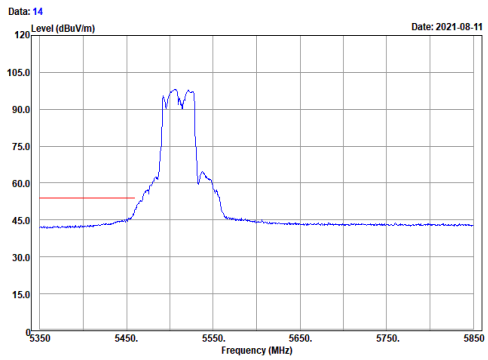
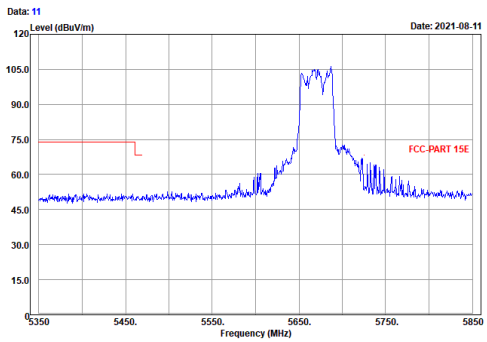
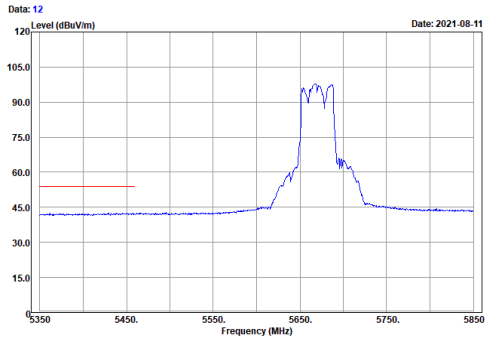
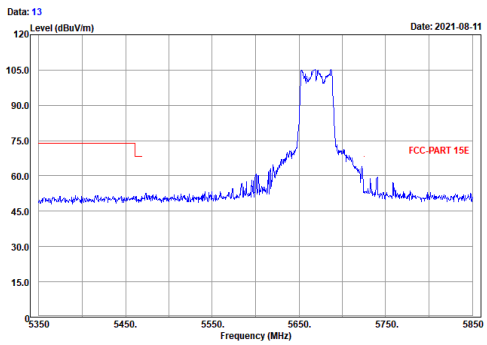
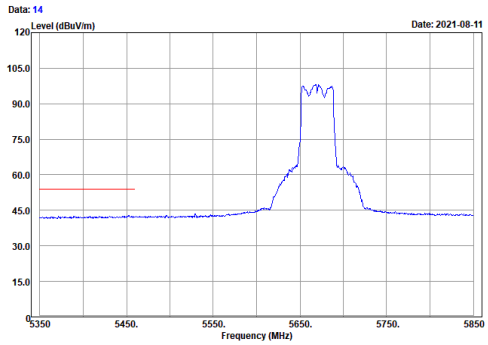
802.11ac (VHT20) Channel 36	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
802.11ac (VHT20) Channel 48	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

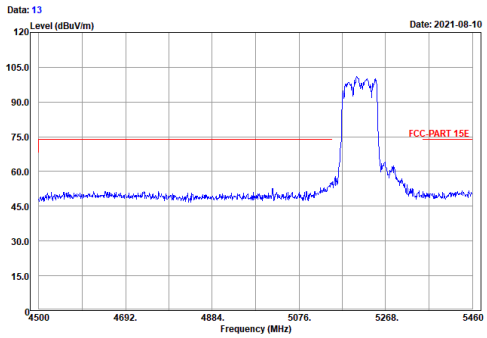
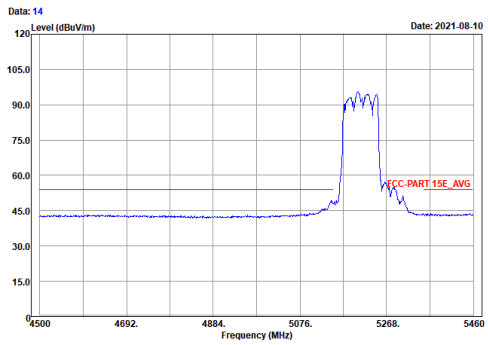
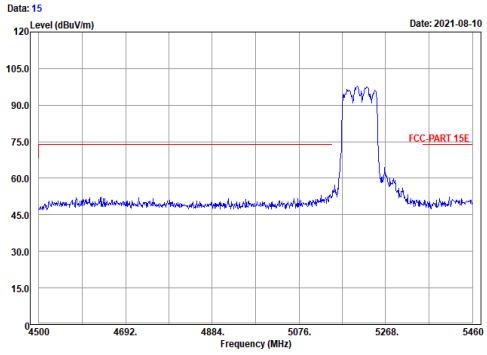
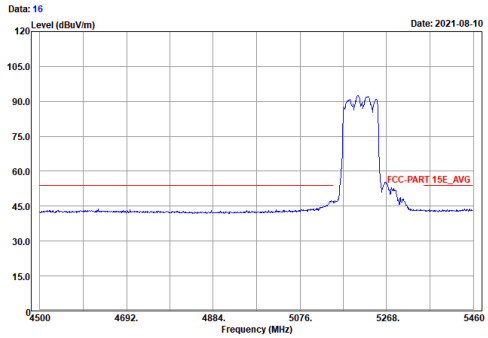
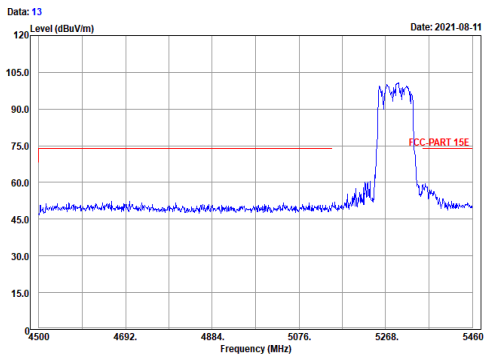
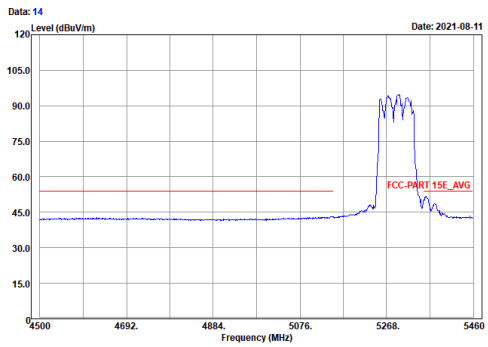
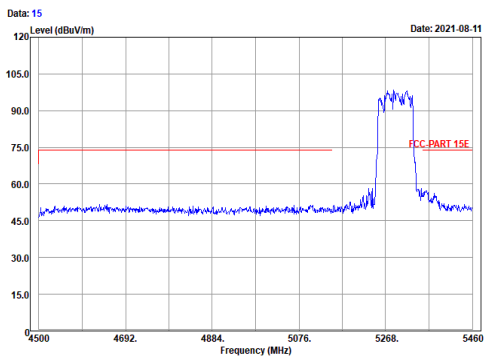
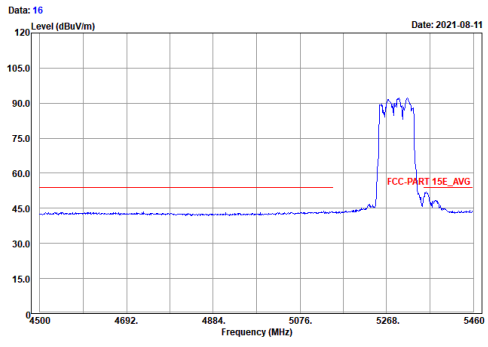
802.11ac (VHT20) Channel 52	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
802.11ac (VHT20) Channel 64	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

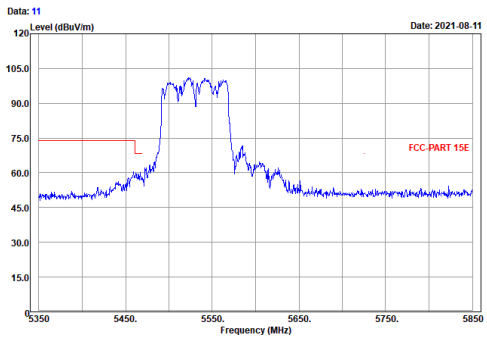
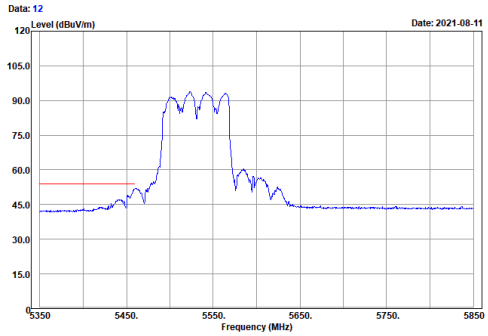
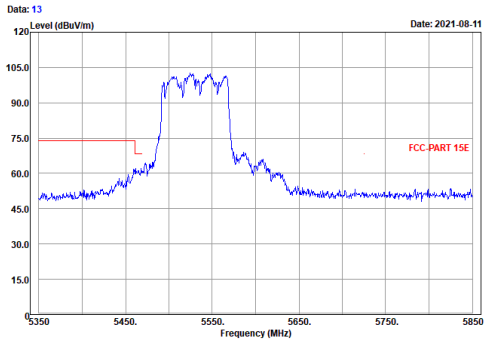
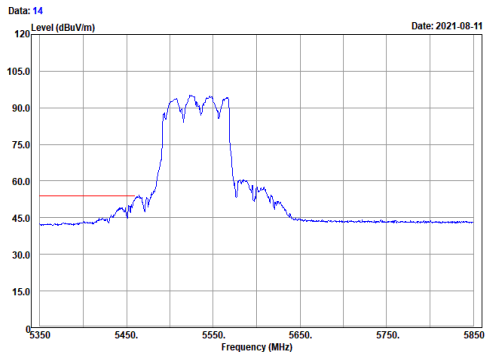
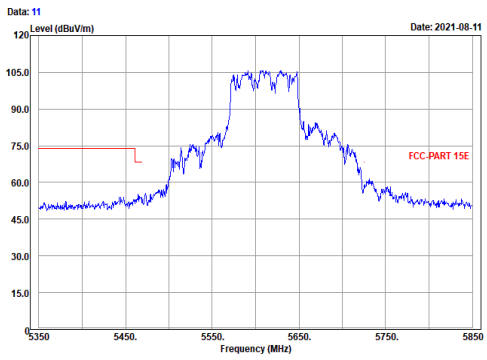
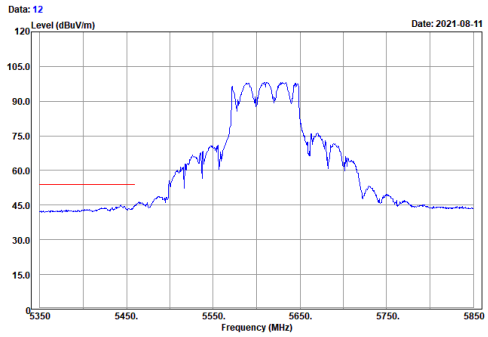
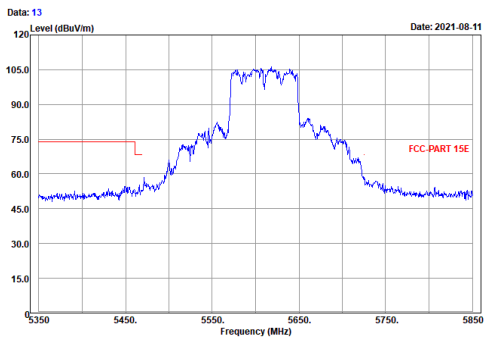
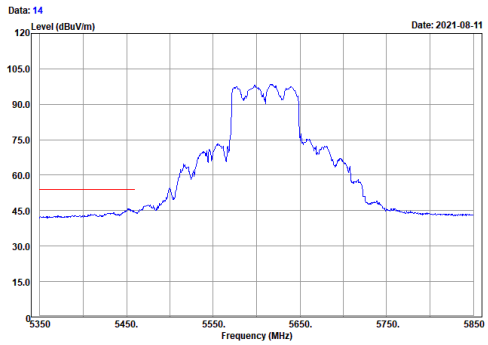
802.11ac (VHT20) Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
802.11ac (VHT20) Channel 140	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

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 134	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

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

Appendix – Information of the Testing Laboratories

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

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

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

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

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

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

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

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