

Partial FCC Test Report

Report No.: RF191205C07-3

FCC ID: J9C-QCNFA524

Test Model: QCNFA524

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Test Date: Jan. 18 ~ Feb. 26, 2020

Issued Date: Mar. 05, 2020

Applicant: Qualcomm Technologies, Inc.

Address: 5775 Morehouse Drive, San Diego, CA 92121-1714

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

Test Location (2): B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231,
Taiwan

FCC Registration / 788550 / TW0003

Designation Number: 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF191205C07-3	Original Release	Mar. 05, 2020

1 Certificate of Conformity

Product: Wi-Fi 6 + BT 5.1 M.2 1216 Module

Brand: Qualcomm

Test Model: QCNFA524

Sample Status: Engineering Sample

Applicant: Qualcomm Technologies, Inc.

Test Date: Jan. 18 ~ Feb. 26, 2020

Standards: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Lena Wang , Date: Mar. 05, 2020
Lena Wang / Specialist

Approved by : Dylan Chiou , Date: Mar. 05, 2020
Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -5.27 dB at 0.15000 MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -5.04 dB at 35.13 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	N/A	Refer to Note
15.407(a)(1/2/3)	Peak Power Spectral Density	N/A	Refer to Note
15.407(e)	6 dB Bandwidth	N/A	Refer to Note
15.407(g)	Frequency Stability	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note:

1. This is a partial report. Only test item of AC Power Conducted Emissions, Max Average Transmit Power and Radiated Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RF190716E01-7 for module (Brand: Qualcomm, Model: QCNFA524)
2. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wi-Fi 6 + BT 5.1 M.2 1216 Module
Brand	Qualcomm
Test Model	QCNFA524
Status of EUT	Engineering Sample
Power Supply Rating	3.3 Vdc (host equipment)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5720 MHz, 5745 ~ 5825 MHz
Number of Channel	5180 ~ 5240 MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20) 2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40) 1 for 802.11ac (VHT80), 802.11ax (HE80) 5260 ~ 5320 MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20) 2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40) 1 for 802.11ac (VHT80), 802.11ax (HE80) 5500 ~ 5720 MHz: 12 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20) 6 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40) 3 for 802.11ac (VHT80), 802.11ax (HE80) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20) 2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40) 1 for 802.11ac (VHT80), 802.11ax (HE80)
Output Power	81.096 mW for 5180 ~ 5240 MHz 81.658 mW for 5260 ~ 5320 MHz 87.297 mW for 5500 ~ 5720 MHz 88.512 mW for 5745 ~ 5825 MHz
Antenna Type	Refer to Note as below
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT is authorized for use in specific End-product. Please refer to below table for further details.

Product Name	Brand Name	Model	Description
Portable Computer	DELL	P91F	--

2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two 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
802.11ax (HE20)	2TX
802.11ax (HE40)	2TX
802.11ax (HE80)	2TX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40 / VHT80 and 802.11ax mode for HE20 / HE40 / HE80, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

3. The antenna information is listed as below.

Color	Antenna Type	Antenna Mode	Manufacturer	Parts Number	Antenna Gain (dBi)			
					BT / WLAN 2.4 GHz	WLAN 5.15~5.35 GHz	WLAN 5.47~5.72 5 GHz	WLAN 5.725~5.8 5 GHz
Black	Slot	0	Speedwire	Main Antenna: F.0G.FH-6101-004-00 (DC33002CW3L) Aux. Antenna: F.0G.FH-6101-003-00 (DC33002CW2L)	Main: -3.46 Aux.: -2.31	Main: 2.38 Aux.: -2.47	Main: 0.35 Aux.: -3.33	Main: -2.01 Aux.: -3.24
		1			Main: -3.53 Aux.: -2.41	Main: 0.11 Aux.: -1.31	Main: -1.56 Aux.: -1.61	Main: -1.56 Aux.: -2.78
White	Slot	0	Speedwire	Main Antenna: F.0G.FH-6101-008-00 (DC33002CW7L) Aux. Antenna: F.0G.FH-6101-007-00 (DC33002CW6L)	Main: -2.78 Aux.: -1.56	Main: 2.77 Aux.: -1.86	Main: 1.32 Aux.: -2.68	Main: -1.36 Aux.: -2.68
		1			Main: -2.97 Aux.: -1.88	Main: 0.96 Aux.: -0.70	Main: -0.61 Aux.: -0.97	Main: -0.61 Aux.: -1.95
Black	Slot	0	Wistron Neweb Corporation	Main Antenna: 81ELAS15.G34 (DC33002CV3L) Aux. Antenna: 81ELAS15.G33 (DC33002CV2L)	Main: -3.46 Aux.: -2.31	Main: 2.38 Aux.: -2.47	Main: 2.21 Aux.: -3.33	Main: -2.01 Aux.: -3.24
		1			Main: -3.53 Aux.: -2.41	Main: 0.11 Aux.: -1.31	Main: -1.56 Aux.: -1.61	Main: -1.56 Aux.: -2.78
White	Slot	0	Wistron Neweb Corporation	Main Antenna: 81ELAS15.G69 (DC33002CV7L) Aux. Antenna: 81ELAS15.G70 (DC33002CV6L)	Main: -5.12 Aux.: -1.78	Main: -3.01 Aux.: 2.26	Main: -4.82 Aux.: -0.47	Main: -4.82 Aux.: -4.31
		1			Main: -2.47 Aux.: -1.69	Main: -0.61 Aux.: 0.91	Main: -4.87 Aux.: -2.96	Main: -5.17 Aux.: -5.07

4. The End-product contains following accessory devices.

Product	Brand	Model	Description
Adapter	DELL	HA130PM170	I/P: 100-240Vac, 50-60Hz, 1.8A O/P: 20Vdc, 6.5A or 5Vdc, 1A
Battery 1	DELL	8FCTC	11.4Vdc, 4650mAh, 56Wh
Battery 2	DELL	69KF2	11.4Vdc, 7167mAh, 86Wh

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

3.2 Description of Test Modes

For 5180 ~ 5240 MHz

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

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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

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

Channel	Frequency (MHz)
42	5210

For 5260 ~ 5320 MHz

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

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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	62	5310

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

Channel	Frequency (MHz)
58	5290

For 5500 ~ 5720 MHz

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

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

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

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

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

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

For 5745 ~ 5825 MHz:

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

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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

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

Channel	Frequency (MHz)
155	5775

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE≥1G**: Radiated Emission above 1 GHz

RE<1G: Radiated Emission below 1 GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Note:

1. “-” means no effect.

Radiated Emission Test (Above 1 GHz):

- ☒ 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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36	OFDM	BPSK	6.5
-		802.11n (HT40)	38 to 46	38	OFDM	BPSK	13.5
-		802.11ac (VHT80)	42	42	OFDM	BPSK	29.3
		802.11ax (HE20)	36 to 48	36	OFDM	BPSK	6.5
		802.11ax (HE40)	38 to 46	38	OFDM	BPSK	13.5
		802.11ax (HE80)	42	42	OFDM	BPSK	29.3
-	5260-5320	802.11a	52 to 64	64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	64	OFDM	BPSK	6.5
-		802.11n (HT40)	54 to 62	62	OFDM	BPSK	13.5
-		802.11ac (VHT80)	58	58	OFDM	BPSK	29.3
		802.11ax (HE20)	52 to 64	64	OFDM	BPSK	6.5
		802.11ax (HE40)	54 to 62	62	OFDM	BPSK	13.5
		802.11ax (HE80)	58	58	OFDM	BPSK	29.3
-	5500-5720	802.11a	100 to 144	100, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 144	100, 140	OFDM	BPSK	6.5
-		802.11n (HT40)	102 to 142	102, 134	OFDM	BPSK	13.5
-		802.11ac (VHT80)	106 to 138	106, 122	OFDM	BPSK	29.3
		802.11ax (HE20)	100 to 144	100, 140	OFDM	BPSK	6.5
		802.11ax (HE40)	102 to 142	102, 134	OFDM	BPSK	13.5
		802.11ax (HE80)	106 to 138	106, 122	OFDM	BPSK	29.3
-	5745-5825	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 165	OFDM	BPSK	6.5
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5
-		802.11ac (VHT80)	155	155	OFDM	BPSK	29.3
		802.11ax (HE20)	149 to 165	149, 165	OFDM	BPSK	6.5
		802.11ax (HE40)	151 to 159	151, 159	OFDM	BPSK	13.5
		802.11ax (HE80)	155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1 GHz):

- ☒ 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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11ax (HE40)	38 to 46	38	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11ax (HE40)	38 to 46	38	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 40, 44, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 40, 44, 48	OFDM	BPSK	6.5
-		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	13.5
-		802.11ac (VHT80)	42	42	OFDM	BPSK	29.3
		802.11ax (HE20)	36 to 48	36, 40, 44, 48	OFDMA	BPSK	6.5
		802.11ax (HE40)	38 to 46	36, 40, 44, 48	OFDMA	BPSK	13.5
		802.11ax (HE80)	42	38, 46	OFDMA	BPSK	29.3
-	5260-5320	802.11a	52 to 64	52, 56, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 56, 60, 64	OFDM	BPSK	6.5
-		802.11n (HT40)	54 to 62	54, 62	OFDM	BPSK	13.5
-		802.11ac (VHT80)	58	58	OFDM	BPSK	29.3
		802.11ax (HE20)	52 to 64	52, 56, 60, 64	OFDMA	BPSK	6.5
		802.11ax (HE40)	54 to 62	54, 62	OFDMA	BPSK	13.5
		802.11ax (HE80)	58	58	OFDMA	BPSK	29.3
-	5500-5720	802.11a	100 to 144	100, 116, 120, 124, 132, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 144	100, 116, 120, 124, 132, 140	OFDM	BPSK	6.5
-		802.11n (HT40)	102 to 142	102, 110, 118, 126, 134	OFDM	BPSK	13.5
-		802.11ac (VHT80)	106 to 138	106, 122	OFDM	BPSK	29.3
		802.11ax (HE20)	100 to 144	100, 116, 120, 124, 132, 140	OFDMA	BPSK	6.5
		802.11ax (HE40)	102 to 142	102, 110, 118, 126, 134	OFDMA	BPSK	13.5
		802.11ax (HE80)	106 to 138	106, 122	OFDMA	BPSK	29.3
-	5745-5825	802.11a	149 to 165	149, 153, 157, 161, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 153, 157, 161, 165	OFDM	BPSK	6.5
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5
-		802.11ac (VHT80)	155	155	OFDM	BPSK	29.3
		802.11ax (HE20)	149 to 165	149, 153, 157, 161, 165	OFDMA	BPSK	6.5
		802.11ax (HE40)	151 to 159	151, 159	OFDMA	BPSK	13.5
		802.11ax (HE80)	155	155	OFDMA	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsueh, Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jones Chang
APCM	25 deg. C, 65 % RH	120 Vac, 60 Hz	Wayne Lin

3.3 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.

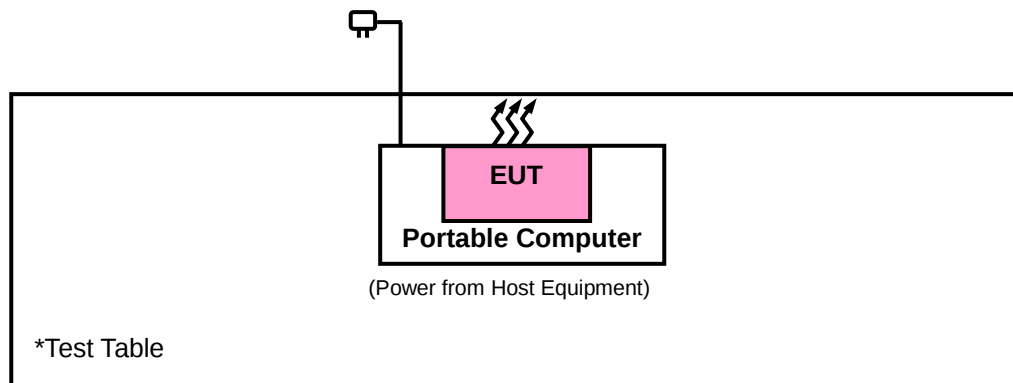
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Adapter	DELL	HA130PM170	NA	NA
2.	Portable Computer	DELL	P91F	NA	FCC DoC Approved

No.	Signal Cable Description Of The Above Support Units
1.	Type C cable: 0.85m

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1, 2 was provided by client

3.3.1 Configuration of System under Test



3.4 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 Procedures 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 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

4.1.2 Limits of Unwanted Emission Out of the Restricted Bands

Applicable To		Limit	
789033 D02 General UNII Test Procedures New Rules v02r01		Field Strength at 3 m	
		PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	☒ 15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2 (dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8 (dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
	☐ 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

^{*1} beyond 75 MHz or more above of the band edge.

^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

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

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

4.1.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 26, 2019	Aug. 25, 2020
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 12, 2019	Nov. 11, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 24, 2019	Nov. 23, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
Loop Antenna	EM-6879	269	Sep. 16, 2019	Sep. 15, 2020
Preamplifier Agilent	310N	187226	Jun. 18, 2019	Jun. 17, 2020
Preamplifier Agilent	83017A	MY39501357	Jun. 18, 2019	Jun. 17, 2020
Power Meter Anritsu	ML2495A	1012010	Sep. 04, 2019	Sep. 03, 2020
Power Meter Anritsu	MA2411B	1315050	Sep. 04, 2019	Sep. 03, 2020
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 18, 2019	Jun. 17, 2020
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 18, 2019	Jun. 17, 2020
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
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 06, 2019	Sep. 05, 2020
Digital Multimeter Fluke	87-III	70360742	Jun. 27, 2019	Jun. 26, 2020

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 HsinTien Chamber 1.

4.1.4 Test Procedures

For Radiated Emission below 30 MHz

- 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 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:

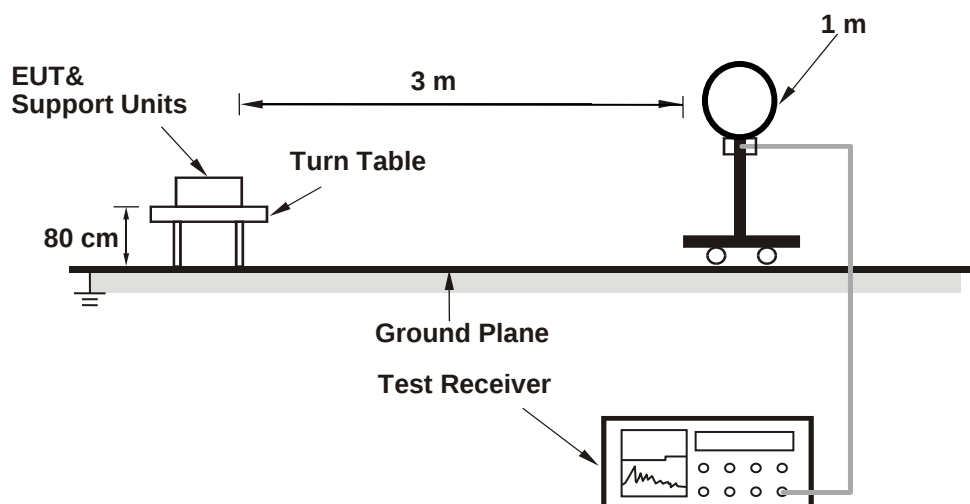
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
(11a: RBW = 1 MHz, VBW = 3 kHz ; 11n (HT20): RBW = 1 MHz, VBW = 1 kHz ;
11n (HT40): RBW = 1 MHz, VBW = 1 kHz ; 11ac (VHT80): RBW = 1 MHz, VBW = 1 kHz ; 11ax (HE20): RBW = 1 MHz, VBW = 1 kHz ; 11ax (HE40): RBW = 1 MHz, VBW = 1 kHz ; 11ax (HE80): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 Deviation from Test Standard

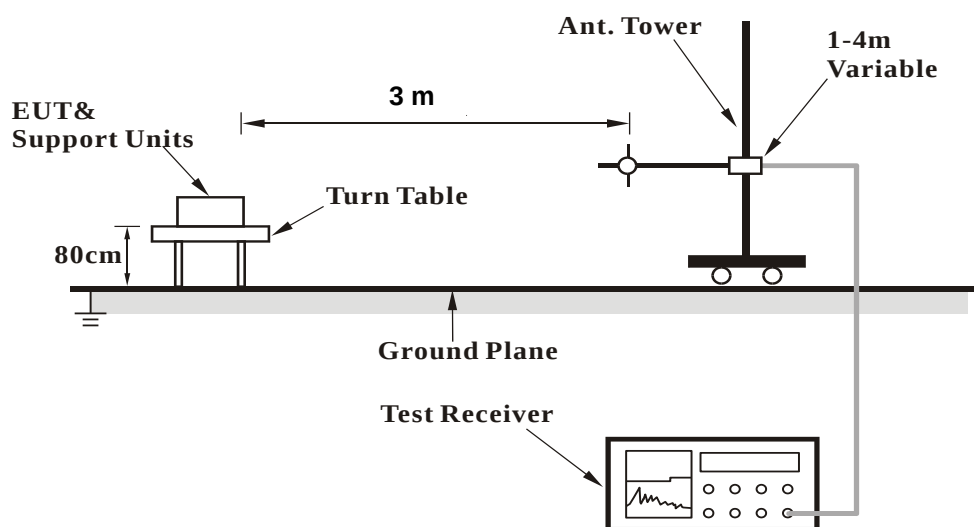
No deviation.

4.1.6 Test Setup

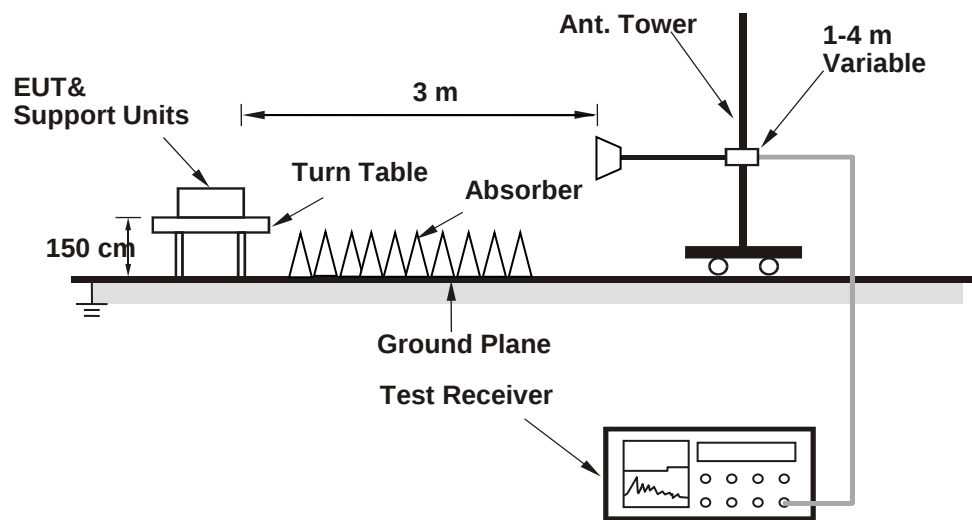
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.7 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.8 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	Charles Hsueh

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	43.6	33.55	10.05	54	-10.4	100	34	Average
5150	54.45	44.4	10.05	74	-19.55	100	34	Peak
5180	93.67	83.55	10.12			100	34	Average
5180	100.14	90.02	10.12			100	34	Peak
*10360	56.03	40.01	16.02	68.2	-12.17	124	253	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
5148.2	47.26	37.21	10.05	54	-6.74	201	86	Average
5148.2	60.78	50.73	10.05	74	-13.22	201	86	Peak
5180	97.47	87.35	10.12			201	86	Average
5180	104.47	94.35	10.12			201	86	Peak
*10360	54.8	38.78	16.02	68.2	-13.4	125	112	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Charles Hsueh

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	89.67	79.58	10.09			277	35	Average
5320	96.11	86.02	10.09			277	35	Peak
5447.35	42.44	31.95	10.49	54	-11.56	277	35	Average
5447.35	53.43	42.94	10.49	74	-20.57	277	35	Peak
10640	47.54	31.55	15.99	54	-6.46	154	310	Average
10640	55.91	39.92	15.99	74	-18.09	154	310	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	95.49	85.4	10.09			100	258	Average
5320	102.87	92.78	10.09			100	258	Peak
5351.21	43.86	33.63	10.23	54	-10.14	100	258	Average
5351.21	53.61	43.38	10.23	74	-20.39	100	258	Peak
10640	47.35	31.36	15.99	54	-6.65	140	144	Average
10640	56	40.01	15.99	74	-18	140	144	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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
5433.68	43.49	33.01	10.48	54	-10.51	233	336	Average
5433.68	52.16	41.68	10.48	74	-21.84	233	336	Peak
*5470	54.06	43.53	10.53	68.2	-14.14	213	317	Peak
5500	91.31	80.71	10.6			233	336	Average
5500	97.84	87.24	10.6			233	336	Peak
11000	47.23	31.1	16.13	54	-6.77	143	182	Average
11000	56.91	40.78	16.13	74	-17.09	143	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
5459.92	43.88	33.37	10.51	54	-10.12	241	291	Average
5459.92	52.81	42.3	10.51	74	-21.19	241	291	Peak
*5469.52	62.91	52.38	10.53	68.2	-5.29	227	272	Peak
5500	99.06	88.46	10.6			241	291	Average
5500	105.04	94.44	10.6			241	291	Peak
11000	46.75	30.62	16.13	54	-7.25	147	234	Average
11000	56.5	40.37	16.13	74	-17.5	147	234	Peak

Remarks:

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

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	90.66	79.71	10.95			233	336	Average
5700	97.57	86.62	10.95			233	336	Peak
*5725.72	56.24	45.32	10.92	68.2	-11.96	233	336	Peak
11400	47.74	31.55	16.19	54	-6.26	132	68	Average
11400	57.33	41.14	16.19	74	-16.67	132	68	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5700	97.47	86.52	10.95			230	306	Average
5700	105.1	94.15	10.95			230	306	Peak
*5725.16	62.66	51.74	10.92	68.2	-5.54	195	306	Peak
11400	46.84	30.65	16.19	54	-7.16	105	31	Average
11400	56.46	40.27	16.19	74	-17.54	105	31	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	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	85.84	74.96	10.88			234	336	Average
5745	92.79	81.91	10.88			234	336	Peak
11490	46.81	30.34	16.47	54	-7.19	137	121	Average
11490	56.45	39.98	16.47	74	-17.55	137	121	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	95.61	84.73	10.88			220	305	Average
5745	103.48	92.6	10.88			220	305	Peak
11490	47.55	31.08	16.47	54	-6.45	162	145	Average
11490	57.1	40.63	16.47	74	-16.9	162	145	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	53.38	42.53	10.85	68.2	-14.82	234	336	Peak
5652.25	51.62	40.75	10.87	69.86	-18.24	234	336	Peak
5921.575	51	39.89	11.11	70.73	-19.73	234	336	Peak
*5935.225	52.44	41.28	11.16	68.2	-15.76	234	336	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5629.675	53.32	42.51	10.81	68.2	-14.88	220	305	Peak
5660.65	52.33	41.46	10.87	76.08	-23.75	220	305	Peak
5912.65	52.52	41.45	11.07	77.34	-24.82	220	305	Peak
*5927.35	52.82	41.71	11.11	68.2	-15.38	220	305	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	85.32	74.44	10.88			234	336	Average
5825	92.75	81.87	10.88			234	336	Peak
11650	47.33	30.55	16.78	54	-6.67	136	47	Average
11650	56.78	40	16.78	74	-17.22	136	47	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	96.32	85.44	10.88			220	305	Average
5825	103.21	92.33	10.88			220	305	Peak
11650	47.73	30.95	16.78	54	-6.27	182	95	Average
11650	57.43	40.65	16.78	74	-16.57	182	95	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
*5620.225	52.03	41.24	10.79	68.2	-16.17	234	336	Peak
5653.825	50.08	39.21	10.87	71.03	-20.95	234	336	Peak
5918.95	50.83	39.74	11.09	72.68	-21.85	234	336	Peak
*5974.075	52.17	40.91	11.26	68.2	-16.03	234	336	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5617.6	52.53	41.74	10.79	68.2	-15.67	220	305	Peak
5658.55	52.45	41.58	10.87	74.53	-22.08	220	305	Peak
5917.375	51.32	40.23	11.09	73.84	-22.52	220	305	Peak
*5970.925	52.47	41.22	11.25	68.2	-15.73	220	305	Peak

Remarks:

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

802.11n (HT20)

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	Charles Hsueh

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
5148.5	41.83	31.78	10.05	54	-12.17	118	226	Average
5148.5	53.11	43.06	10.05	74	-20.89	118	226	Peak
5180	90.55	80.43	10.12			118	226	Average
5180	97.17	87.05	10.12			118	226	Peak
*10360	55.11	39.09	16.02	68.2	-13.09	155	107	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
5149.85	43.53	33.48	10.05	54	-10.47	214	55	Average
5149.85	53.58	43.53	10.05	74	-20.42	214	55	Peak
5180	94.74	84.62	10.12			214	55	Average
5180	101.29	91.17	10.12			214	55	Peak
*10360	56.96	40.94	16.02	68.2	-11.24	143	112	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Charles Hsueh

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	87.79	77.7	10.09			118	226	Average
5320	94.54	84.45	10.09			118	226	Peak
5451.75	41.77	31.26	10.51	54	-12.23	118	226	Average
5451.75	52.26	41.75	10.51	74	-21.74	118	226	Peak
10640	44.87	28.88	15.99	54	-9.13	192	263	Average
10640	54.57	38.58	15.99	74	-19.43	192	263	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	92.56	82.47	10.09			249	297	Average
5320	99.36	89.27	10.09			249	297	Peak
5442.51	42.62	32.14	10.48	54	-11.38	249	297	Average
5442.51	52.09	41.61	10.48	74	-21.91	249	297	Peak
10640	45.63	29.64	15.99	54	-8.37	172	131	Average
10640	55.02	39.03	15.99	74	-18.98	172	131	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
5448.08	41.57	31.08	10.49	54	-12.43	122	219	Average
5448.08	52.25	41.76	10.49	74	-21.75	122	219	Peak
*5469.04	50.31	39.78	10.53	68.2	-17.89	122	219	Peak
5500	89.77	79.17	10.6			122	219	Average
5500	96.24	85.64	10.6			122	219	Peak
11000	45.86	29.73	16.13	54	-8.14	127	154	Average
11000	55.2	39.07	16.13	74	-18.8	127	154	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
5451.44	42.74	32.23	10.51	54	-11.26	241	291	Average
5451.44	52.43	41.92	10.51	74	-21.57	241	291	Peak
*5469.52	54.6	44.07	10.53	68.2	-13.6	241	291	Peak
5500	95.66	85.06	10.6			241	291	Average
5500	102.89	92.29	10.6			241	291	Peak
11000	45.69	29.56	16.13	54	-8.31	143	275	Average
11000	55.37	39.24	16.13	74	-18.63	143	275	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	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	86.44	75.49	10.95			132	360	Average
5700	93.68	82.73	10.95			132	360	Peak
*5725.32	52.03	41.11	10.92	68.2	-16.17	132	360	Peak
11400	47.42	31.23	16.19	54	-6.58	172	139	Average
11400	57.01	40.82	16.19	74	-16.99	172	139	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	92.79	81.84	10.95			241	291	Average
5700	99	88.05	10.95			241	291	Peak
*5725.56	53.66	42.74	10.92	68.2	-14.54	241	291	Peak
11400	46.63	30.44	16.19	54	-7.37	135	183	Average
11400	56.26	40.07	16.19	74	-17.74	135	183	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	80.37	69.49	10.88			181	335	Average
5745	87.13	76.25	10.88			181	335	Peak
11490	46.92	30.45	16.47	54	-7.08	173	106	Average
11490	56.58	40.11	16.47	74	-17.42	173	106	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	92.58	81.7	10.88			249	305	Average
5745	100.23	89.35	10.88			249	305	Peak
11490	47.58	31.11	16.47	54	-6.42	186	134	Average
11490	57.12	40.65	16.47	74	-16.88	186	134	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
*5642.8	52.33	41.5	10.83	68.2	-15.87	181	335	Peak
5656.45	52.47	41.6	10.87	72.97	-20.5	181	335	Peak
5922.625	51.54	40.43	11.11	69.96	-18.42	181	335	Peak
*5979.325	53.03	41.77	11.26	68.2	-15.17	181	335	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
*5592.925	52.49	41.74	10.75	68.2	-15.71	249	305	Peak
5652.25	51.63	40.76	10.87	69.86	-18.23	249	305	Peak
5923.675	50.43	39.32	11.11	69.18	-18.75	249	305	Peak
*5963.05	52.22	40.99	11.23	68.2	-15.98	249	305	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	79.95	69.07	10.88			181	335	Average
5825	87.15	76.27	10.88			181	335	Peak
11650	45.87	29.09	16.78	54	-8.13	146	211	Average
11650	55.6	38.82	16.78	74	-18.4	146	211	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	92.99	82.11	10.88			249	305	Average
5825	100.52	89.64	10.88			249	305	Peak
11650	45.69	28.91	16.78	54	-8.31	120	13	Average
11650	55.36	38.58	16.78	74	-18.64	120	13	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
*5522.05	52.53	41.88	10.65	68.2	-15.67	181	335	Peak
5654.875	50.91	40.04	10.87	71.81	-20.9	181	335	Peak
5922.625	51.25	40.14	11.11	69.96	-18.71	181	335	Peak
*5945.2	53.38	42.2	11.18	68.2	-14.82	181	335	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
*5585.575	52.15	41.42	10.73	68.2	-16.05	249	305	Peak
5652.25	50.81	39.94	10.87	69.86	-19.05	249	305	Peak
5922.1	50.44	39.33	11.11	70.35	-19.91	249	305	Peak
*5982.475	52.88	41.62	11.26	68.2	-15.32	249	305	Peak

Remarks:

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

802.11n (HT40)

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	Charles Hsueh

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
5149.4	42.21	32.16	10.05	54	-11.79	118	226	Average
5149.4	53	42.95	10.05	74	-21	118	226	Peak
5190	87.64	77.52	10.12			118	226	Average
5190	94.45	84.33	10.12			118	226	Peak
5451.75	41.63	31.12	10.51	54	-12.37	118	226	Average
5451.75	51.64	41.13	10.51	74	-22.36	118	226	Peak
*10380	55.21	39.11	16.1	68.2	-12.99	125	76	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
5149.85	44.45	34.4	10.05	54	-9.55	214	55	Average
5149.85	60.13	50.08	10.05	74	-13.87	214	55	Peak
5190	91.87	81.75	10.12			214	55	Average
5190	98.24	88.12	10.12			214	55	Peak
5444.05	41.6	31.12	10.48	54	-12.4	214	55	Average
5444.05	52.51	42.03	10.48	74	-21.49	214	55	Peak
*10380	54.8	38.7	16.1	68.2	-13.4	126	304	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Charles Hsueh

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
5114.3	41.67	31.71	9.96	54	-12.33	118	226	Average
5114.3	52.64	42.68	9.96	74	-21.36	118	226	Peak
5310	85.55	75.46	10.09			118	226	Average
5310	92.41	82.32	10.09			118	226	Peak
5350	42.08	31.85	10.23	54	-11.92	118	226	Average
5350	52.59	42.36	10.23	74	-21.41	118	226	Peak
10620	45.23	29.35	15.88	54	-8.77	179	324	Average
10620	54.72	38.84	15.88	74	-19.28	179	324	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
5138.45	41.66	31.66	10	54	-12.34	214	55	Average
5138.45	51.96	41.96	10	74	-22.04	214	55	Peak
5310	90.58	80.49	10.09			214	55	Average
5310	97.36	87.27	10.09			214	55	Peak
5351.43	41.72	31.49	10.23	54	-12.28	214	55	Average
5351.43	53.69	43.46	10.23	74	-20.31	214	55	Peak
10620	45.69	29.81	15.88	54	-8.31	135	122	Average
10620	55.38	39.5	15.88	74	-18.62	135	122	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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
5456.4	42.71	32.2	10.51	54	-11.29	122	230	Average
5456.4	52.36	41.85	10.51	74	-21.64	122	230	Peak
*5469.2	51.22	40.69	10.53	68.2	-16.98	122	230	Peak
5510	82.26	71.66	10.6			122	230	Average
5510	90.47	79.87	10.6			122	230	Peak
*5725.8	51.8	40.88	10.92	68.2	-16.4	122	230	Peak
11020	46.11	29.95	16.16	54	-7.89	137	268	Average
11020	55.79	39.63	16.16	74	-18.21	137	268	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5407.76	42.8	32.4	10.4	54	-11.2	267	291	Average
5407.76	52.37	41.97	10.4	74	-21.63	267	291	Peak
*5469.04	53.44	42.91	10.53	68.2	-14.76	267	291	Peak
5510	88.24	77.64	10.6			267	291	Average
5510	96.84	86.24	10.6			267	291	Peak
*5726.04	51.64	40.72	10.92	68.2	-16.56	267	291	Peak
11020	46.62	30.46	16.16	54	-7.38	135	131	Average
11020	56.11	39.95	16.16	74	-17.89	135	131	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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
5448.4	42.8	32.31	10.49	54	-11.2	122	230	Average
5448.4	52.34	41.85	10.49	74	-21.66	122	230	Peak
*5469.52	51.2	40.67	10.53	68.2	-17	122	230	Peak
5670	84.67	73.77	10.9			122	230	Average
5670	91.91	81.01	10.9			122	230	Peak
*5725.4	51.34	40.42	10.92	68.2	-16.86	122	230	Peak
11340	47.11	30.69	16.42	54	-6.89	127	56	Average
11340	56.74	40.32	16.42	74	-17.26	127	56	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
5453.52	43.11	32.6	10.51	54	-10.89	241	291	Average
5453.52	52.47	41.96	10.51	74	-21.53	241	291	Peak
*5469.52	50.52	39.99	10.53	68.2	-17.68	241	291	Peak
5670	91.17	80.27	10.9			241	291	Average
5670	98.38	87.48	10.9			241	291	Peak
*5725.32	52.59	41.67	10.92	68.2	-15.61	241	291	Peak
11340	46.99	30.57	16.42	54	-7.01	150	167	Average
11340	56.7	40.28	16.42	74	-17.3	150	167	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 151	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	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	76.85	65.95	10.9			181	335	Average
5755	85.59	74.69	10.9			181	335	Peak
11510	46.35	29.84	16.51	54	-7.65	190	236	Average
11510	56.03	39.52	16.51	74	-17.97	190	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
5755	90.45	79.55	10.9			249	305	Average
5755	98.29	87.39	10.9			249	305	Peak
11510	46.84	30.33	16.51	54	-7.16	148	127	Average
11510	56.5	39.99	16.51	74	-17.5	148	127	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
*5593.45	53.71	42.96	10.75	68.2	-14.49	181	335	Peak
5651.725	50.92	40.05	10.87	69.48	-18.56	181	335	Peak
5919.475	51.1	40.01	11.09	72.29	-21.19	181	335	Peak
*5959.9	53.31	42.08	11.23	68.2	-14.89	181	335	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
*5645.425	52.7	41.87	10.83	68.2	-15.5	249	305	Peak
5653.3	50.92	40.05	10.87	70.64	-19.72	249	305	Peak
5912.125	52.96	41.89	11.07	77.73	-24.77	249	305	Peak
*5963.575	53.12	41.89	11.23	68.2	-15.08	249	305	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 159	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	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	78.29	67.47	10.82			283	335	Average
5795	86.74	75.92	10.82			283	335	Peak
11590	45.79	29.28	16.51	54	-8.21	120	46	Average
11590	55.57	39.06	16.51	74	-18.43	120	46	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	91.69	80.87	10.82			249	305	Average
5795	98.64	87.82	10.82			249	305	Peak
11590	46.87	30.36	16.51	54	-7.13	126	311	Average
11590	56.44	39.93	16.51	74	-17.56	126	311	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
5582.425	51.51	40.78	10.73	68.2	-16.69	283	335	Peak
5660.125	52.36	41.49	10.87	75.69	-23.33	283	335	Peak
5919.475	50.53	39.44	11.09	72.29	-21.76	283	335	Peak
6002.95	52.08	40.75	11.33	68.2	-16.12	283	335	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
5591.35	52.51	41.78	10.73	68.2	-15.69	249	305	Peak
5658.025	52.25	41.38	10.87	74.14	-21.89	249	305	Peak
5920	50.72	39.63	11.09	71.9	-21.18	249	305	Peak
6013.45	52.59	41.24	11.35	68.2	-15.61	249	305	Peak

Remarks:

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

802.11ac (VHT80)

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

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
5140.25	42.05	32.04	10.01	54	-11.95	118	226	Average
5140.25	52.83	42.82	10.01	74	-21.17	118	226	Peak
5210	84.36	74.19	10.17			118	226	Average
5210	91.61	81.44	10.17			118	226	Peak
5453.51	41.6	31.09	10.51	54	-12.4	118	226	Average
5453.51	52.39	41.88	10.51	74	-21.61	118	226	Peak
*10420	54.54	38.38	16.16	68.2	-13.66	119	164	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.25	44.86	34.81	10.05	54	-9.14	214	55	Average
5149.25	57.33	47.28	10.05	74	-16.67	214	55	Peak
5210	88.64	78.47	10.17			214	55	Average
5210	95.27	85.1	10.17			214	55	Peak
5448.23	41.65	31.16	10.49	54	-12.35	214	55	Average
5448.23	52.37	41.88	10.49	74	-21.63	214	55	Peak
*10420	56.07	39.91	16.16	68.2	-12.13	134	185	Peak

Remarks:

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

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

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
5141.75	41.71	31.7	10.01	54	-12.29	118	226	Average
5141.75	52.29	42.28	10.01	74	-21.71	118	226	Peak
5290	81.49	71.39	10.1			118	226	Average
5290	88.22	78.12	10.1			118	226	Peak
5356.16	41.72	31.49	10.23	54	-12.28	118	226	Average
5356.16	52.82	42.59	10.23	74	-21.18	118	226	Peak
*10580	55.5	39.79	15.71	68.2	-12.7	121	86	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
5138.6	41.85	31.85	10	54	-12.15	214	55	Average
5138.6	53.44	43.44	10	74	-20.56	214	55	Peak
5290	86.74	76.64	10.1			214	55	Average
5290	93.76	83.66	10.1			214	55	Peak
5350.33	43.86	33.63	10.23	54	-10.14	214	55	Average
5350.33	53.92	43.69	10.23	74	-20.08	214	55	Peak
*10580	56.41	40.7	15.71	68.2	-11.79	154	217	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 106	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	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
5451.12	42.85	32.34	10.51	54	-11.15	122	230	Average
5451.12	53.01	42.5	10.51	74	-20.99	122	230	Peak
*5470	52.48	41.95	10.53	68.2	-15.72	122	230	Peak
5530	80.42	69.79	10.63			122	230	Average
5530	88.06	77.43	10.63			122	230	Peak
*5726.04	51.99	41.07	10.92	68.2	-16.21	122	230	Peak
11060	45.72	29.49	16.23	54	-8.28	152	304	Average
11060	55.3	39.07	16.23	74	-18.7	152	304	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.28	43.52	33.01	10.51	54	-10.48	241	291	Average
5459.28	53.53	43.02	10.51	74	-20.47	241	291	Peak
*5469.04	52.21	41.68	10.53	68.2	-15.99	241	291	Peak
5530	87.36	76.73	10.63			241	291	Average
5530	94.41	83.78	10.63			241	291	Peak
*5725.16	51.93	41.01	10.92	68.2	-16.27	241	291	Peak
11060	45.61	29.38	16.23	54	-8.39	158	311	Average
11060	55.24	39.01	16.23	74	-18.76	158	311	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 122	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	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
5445.68	42.79	32.3	10.49	54	-11.21	122	230	Average
5445.68	52.36	41.87	10.49	74	-21.64	122	230	Peak
*5470	50.23	39.7	10.53	68.2	-17.97	122	230	Peak
5610	82.03	71.26	10.77			122	230	Average
5610	90.12	79.35	10.77			122	230	Peak
*5725.56	50.7	39.78	10.92	68.2	-17.5	122	230	Peak
11220	46.53	30.11	16.42	54	-7.47	162	331	Average
11220	56.2	39.78	16.42	74	-17.8	162	331	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
5455.76	42.86	32.35	10.51	54	-11.14	241	291	Average
5455.76	52.36	41.85	10.51	74	-21.64	241	291	Peak
*5469.36	50.84	40.31	10.53	68.2	-17.36	241	291	Peak
5610	88.5	77.73	10.77			241	291	Average
5610	97.1	86.33	10.77			241	291	Peak
*5725	51.95	41.03	10.92	68.2	-16.25	241	291	Peak
11220	47.61	31.19	16.42	54	-6.39	125	236	Average
11220	57.25	40.83	16.42	74	-16.75	125	236	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5610 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 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	75.1	64.23	10.87			181	335	Average
5775	82.82	71.95	10.87			181	335	Peak
11550	47.13	30.63	16.5	54	-6.87	130	88	Average
11550	56.83	40.33	16.5	74	-17.17	130	88	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	86.32	75.45	10.87			249	305	Average
5775	95.47	84.6	10.87			249	305	Peak
11550	46.29	29.79	16.5	54	-7.71	147	216	Average
11550	55.85	39.35	16.5	74	-18.15	147	216	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
5591.875	53.05	42.3	10.75	68.2	-15.15	181	335	Peak
5655.925	50.9	40.03	10.87	72.58	-21.68	181	335	Peak
5917.9	51.01	39.92	11.09	73.45	-22.44	181	335	Peak
6021.325	52.79	41.44	11.35	68.2	-15.41	181	335	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
5614.975	52.87	42.1	10.77	68.2	-15.33	249	305	Peak
5652.775	51.55	40.68	10.87	70.25	-18.7	249	305	Peak
5917.9	50.41	39.32	11.09	73.45	-23.04	249	305	Peak
6017.65	52.86	41.51	11.35	68.2	-15.34	249	305	Peak

Remarks:

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

802.11n (HT20)

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		Charles Hsueh	
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
5148.8	42.15	32.1	10.05	54	-11.85	100	34	Average
5148.8	52.92	42.87	10.05	74	-21.08	100	34	Peak
5180	91.49	81.37	10.12			100	34	Average
5180	98.39	88.27	10.12			100	34	Peak
*10360	55.07	39.05	16.02	68.2	-13.13	164	34	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
5149.85	45.13	35.08	10.05	54	-8.87	160	306	Average
5149.85	55.95	45.9	10.05	74	-18.05	160	306	Peak
5180	95.68	85.56	10.12			160	306	Average
5180	102.56	92.44	10.12			160	306	Peak
*10360	55.02	39	16.02	68.2	-13.18	158	285	Peak

Remarks:

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

b. 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	88.59	78.5	10.09			277	35	Average
5320	95.59	85.5	10.09			277	35	Peak
5375.63	43.56	33.27	10.29	54	-10.44	277	35	Average
5375.63	52.85	42.56	10.29	74	-21.15	277	35	Peak
10640	47.44	31.45	15.99	54	-6.56	111	31	Average
10640	57.12	41.13	15.99	74	-16.88	111	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
5320	94.37	84.28	10.09			249	297	Average
5320	101.12	91.03	10.09			249	297	Peak
5350	43.75	33.52	10.23	54	-10.25	249	297	Average
5350	53.21	42.98	10.23	74	-20.79	249	297	Peak
10640	47.56	31.57	15.99	54	-6.44	164	285	Average
10640	55.96	39.97	15.99	74	-18.04	164	285	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 other emission levels 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
5450.48	42.76	32.25	10.51	54	-11.24	233	336	Average
5450.48	53.05	42.54	10.51	74	-20.95	233	336	Peak
*5469.2	51.18	40.65	10.53	68.2	-17.02	233	336	Peak
5500	88.38	77.78	10.6			233	336	Average
5500	97.16	86.56	10.6			233	336	Peak
11000	46.67	30.54	16.13	54	-7.33	196	234	Average
11000	56.39	40.26	16.13	74	-17.61	196	234	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
5454.16	42.92	32.41	10.51	54	-11.08	241	291	Average
5454.16	52.56	42.05	10.51	74	-21.44	241	291	Peak
*5469.52	61.89	51.36	10.53	68.2	-6.31	227	273	Peak
5500	94.32	83.72	10.6			241	291	Average
5500	103.13	92.53	10.6			241	291	Peak
11000	46.23	30.1	16.13	54	-7.77	184	124	Average
11000	55.94	39.81	16.13	74	-18.06	184	124	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 other emission levels 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	86.9	75.95	10.95			233	336	Average
5700	95.39	84.44	10.95			233	336	Peak
*5725.24	51.98	41.06	10.92	68.2	-16.22	233	336	Peak
11400	47.54	31.35	16.19	54	-6.46	187	123	Average
11400	57.23	41.04	16.19	74	-16.77	187	123	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	92.11	81.16	10.95			227	305	Average
5700	101.08	90.13	10.95			227	305	Peak
*5725.4	59.07	48.15	10.92	68.2	-9.13	227	305	Peak
11400	46.26	30.07	16.19	54	-7.74	152	304	Average
11400	55.99	39.8	16.19	74	-18.01	152	304	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
- 5700 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels 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	81.33	70.45	10.88			234	335	Average
5745	89.67	78.79	10.88			234	335	Peak
11490	46.82	30.35	16.47	54	-7.18	129	10	Average
11490	56.49	40.02	16.47	74	-17.51	129	10	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	92.4	81.52	10.88			220	305	Average
5745	101.33	90.45	10.88			220	305	Peak
11490	46.36	29.89	16.47	54	-7.64	125	76	Average
11490	55.93	39.46	16.47	74	-18.07	125	76	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
*5523.625	52.41	41.76	10.65	68.2	-15.79	234	335	Peak
5652.25	50.04	39.17	10.87	69.86	-19.82	234	335	Peak
5922.625	52.19	41.08	11.11	69.96	-17.77	234	335	Peak
*5965.675	53.47	42.24	11.23	68.2	-14.73	234	335	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
*5622.85	52.71	41.92	10.79	68.2	-15.49	220	305	Peak
5655.4	51.68	40.81	10.87	72.2	-20.52	220	305	Peak
5923.15	52.13	41.02	11.11	69.57	-17.44	220	305	Peak
*5972.5	52	40.75	11.25	68.2	-16.2	220	305	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
- 5745 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels 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	81.61	70.73	10.88			234	335	Average
5825	89.78	78.9	10.88			234	335	Peak
11650	46.78	30	16.78	54	-7.22	161	49	Average
11650	56.4	39.62	16.78	74	-17.6	161	49	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	93.4	82.52	10.88			220	305	Average
5825	101.58	90.7	10.88			220	305	Peak
11650	45.54	28.76	16.78	54	-8.46	180	234	Average
11650	55.28	38.5	16.78	74	-18.72	180	234	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
*5632.3	52.46	41.65	10.81	68.2	-15.74	234	335	Peak
5652.25	51.36	40.49	10.87	69.86	-18.5	234	335	Peak
5921.575	51.88	40.77	11.11	70.73	-18.85	234	335	Peak
*6008.725	52.61	41.26	11.35	68.2	-15.59	234	335	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
*5538.85	54.13	43.47	10.66	68.2	-14.07	220	305	Peak
5654.35	51.62	40.75	10.87	71.42	-19.8	220	305	Peak
5920	51.35	40.26	11.09	71.9	-20.55	220	305	Peak
*6004	52.36	41.03	11.33	68.2	-15.84	220	305	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 5825 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels were very low against the limit.

802.11ax (HE40)

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	Charles Hsueh

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	44.23	34.18	10.05	54	-9.77	100	34	Average
5150	55.98	45.93	10.05	74	-18.02	100	34	Peak
5190	88.58	78.46	10.12			100	34	Average
5190	95.67	85.55	10.12			100	34	Peak
5450.76	41.73	31.22	10.51	54	-12.27	100	34	Average
5450.76	53.15	42.64	10.51	74	-20.85	100	34	Peak
*10380	55.02	38.92	16.1	68.2	-13.18	185	5	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
5149.1	48.09	38.04	10.05	54	-5.91	160	306	Average
5149.1	61.11	51.06	10.05	74	-12.89	160	306	Peak
5190	92.58	82.46	10.12			160	306	Average
5190	99.67	89.55	10.12			160	306	Peak
5449.88	42.11	31.6	10.51	54	-11.89	160	306	Average
5449.88	53.24	42.73	10.51	74	-20.76	160	306	Peak
*10380	56.34	40.24	16.1	68.2	-11.86	129	46	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
- 5190 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels 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	Charles Hsueh

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
5122.85	41.84	31.85	9.99	54	-12.16	277	35	Average
5122.85	52.28	42.29	9.99	74	-21.72	277	35	Peak
5310	85.48	75.39	10.09			277	35	Average
5310	92.13	82.04	10.09			277	35	Peak
5445.04	42.76	32.28	10.48	54	-11.24	277	35	Average
5445.04	53.91	43.43	10.48	74	-20.09	277	35	Peak
10620	47.52	31.64	15.88	54	-6.48	196	66	Average
10620	55.52	39.64	15.88	74	-18.48	196	66	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
5123.75	41.91	31.92	9.99	54	-12.09	249	297	Average
5123.75	53.25	43.26	9.99	74	-20.75	249	297	Peak
5310	91.74	81.65	10.09			249	297	Average
5310	98.29	88.2	10.09			249	297	Peak
5350.44	47.68	37.45	10.23	54	-6.32	249	297	Average
5350.44	59.87	49.64	10.23	74	-14.13	249	297	Peak
10620	47.64	31.76	15.88	54	-6.36	119	25	Average
10620	55.86	39.98	15.88	74	-18.14	119	25	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 other emission levels 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
5459.44	41.76	31.25	10.51	54	-12.24	233	336	Average
5459.44	51.76	41.25	10.51	74	-22.24	233	336	Peak
*5469.2	51.03	40.5	10.53	74	-22.97	233	336	Peak
5510	84.24	73.64	10.6			233	336	Average
5510	93.2	82.6	10.6			233	336	Peak
*5725.36	51.26	40.34	10.92	74	-22.74	228	274	Peak
11020	46.89	30.73	16.16	54	-7.11	160	231	Average
11020	56.45	40.29	16.16	74	-17.55	160	231	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
5459.92	44.07	33.56	10.51	54	-9.93	228	274	Average
5459.92	55.25	44.74	10.51	74	-18.75	228	274	Peak
*5470	63.66	53.13	10.53	74	-10.34	228	274	Peak
5510	91.83	81.23	10.6			228	274	Average
5510	99.85	89.25	10.6			228	274	Peak
*5725.59	51.46	40.54	10.92	74	-22.54	233	336	Peak
11020	47.46	31.3	16.16	54	-6.54	185	168	Average
11020	56.93	40.77	16.16	74	-17.07	185	168	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
- 5510 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels 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
5395.27	42.56	32.19	10.37	54	-11.44	233	336	Average
5395.27	52.71	42.34	10.37	74	-21.29	233	336	Peak
*5469.83	51.36	40.83	10.53	68.2	-16.84	233	336	Peak
5670	84.22	73.32	10.9			233	336	Average
5670	93.11	82.21	10.9			233	336	Peak
*5725.72	52	41.08	10.92	68.2	-16.2	233	336	Peak
11340	46.9	30.48	16.42	54	-7.1	128	77	Average
11340	56.46	40.04	16.42	74	-17.54	128	77	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
5432.29	41.63	31.15	10.48	54	-12.37	227	305	Average
5432.29	52.16	41.68	10.48	74	-21.84	227	305	Peak
*5469.76	51.58	41.05	10.53	68.2	-16.62	227	305	Peak
5670	89.75	78.85	10.9			227	305	Average
5670	99.32	88.42	10.9			227	305	Peak
*5725.32	58.18	47.26	10.92	68.2	-10.02	227	305	Peak
11340	47.97	31.55	16.42	54	-6.03	158	161	Average
11340	57.69	41.27	16.42	74	-16.31	158	161	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 other emission levels 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	79.31	68.41	10.9			234	335	Average
5755	87.06	76.16	10.9			234	335	Peak
11510	46.53	30.02	16.51	54	-7.47	187	225	Average
11510	56.25	39.74	16.51	74	-17.75	187	225	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	90.92	80.02	10.9			220	305	Average
5755	99.32	88.42	10.9			220	305	Peak
11510	46.89	30.38	16.51	54	-7.11	126	204	Average
11510	56.53	40.02	16.51	74	-17.47	126	204	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
*5621.8	52.55	41.76	10.79	68.2	-15.65	234	335	Peak
5654.35	52.28	41.41	10.87	71.42	-19.14	234	335	Peak
5919.475	50.87	39.78	11.09	72.29	-21.42	234	335	Peak
*5984.575	53.25	41.99	11.26	68.2	-14.95	234	335	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
*5576.65	52.33	41.6	10.73	68.2	-15.87	220	305	Peak
5653.825	51.18	40.31	10.87	71.03	-19.85	220	305	Peak
5922.625	51.87	40.76	11.11	69.96	-18.09	220	305	Peak
*5958.325	52.53	41.32	11.21	68.2	-15.67	220	305	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 5755 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels 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	78.97	68.15	10.82			234	335	Average
5795	87.2	76.38	10.82			234	335	Peak
11590	47.15	30.64	16.51	54	-6.85	106	350	Average
11590	56.72	40.21	16.51	74	-17.28	106	350	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	90.69	79.87	10.82			220	305	Average
5795	99.21	88.39	10.82			220	305	Peak
11590	46.53	30.02	16.51	54	-7.47	151	87	Average
11590	56.33	39.82	16.51	74	-17.67	151	87	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
*5639.125	52.05	41.22	10.83	68.2	-16.15	234	335	Peak
5653.825	51.56	40.69	10.87	71.03	-19.47	234	335	Peak
5916.325	51.67	40.58	11.09	74.62	-22.95	234	335	Peak
*5999.275	52.73	41.4	11.33	68.2	-15.47	234	335	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
*5577.7	52.93	42.22	10.71	68.2	-15.27	220	305	Peak
5658.025	52.02	41.15	10.87	74.14	-22.12	220	305	Peak
5915.275	52.27	41.18	11.09	75.4	-23.13	220	305	Peak
*5984.05	52.75	41.49	11.26	68.2	-15.45	220	305	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 5795 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels were very low against the limit.

802.11ax (HE80)

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	Charles Hsueh

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
5139.35	43.73	33.73	10	54	-10.27	100	34	Average
5139.35	54.4	44.4	10	74	-19.6	100	34	Peak
5210	85.57	75.4	10.17			100	34	Average
5210	92.73	82.56	10.17			100	34	Peak
5373.54	41.71	31.42	10.29	54	-12.29	100	34	Average
5373.54	52.79	42.5	10.29	74	-21.21	100	34	Peak
*10420	55.51	39.35	16.16	68.2	-12.69	166	285	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
5148.2	46.73	36.68	10.05	54	-7.27	160	306	Average
5148.2	58.98	48.93	10.05	74	-15.02	160	306	Peak
5210	89.74	79.57	10.17			160	306	Average
5210	96.53	86.36	10.17			160	306	Peak
5443.5	41.91	31.43	10.48	54	-12.09	160	306	Average
5443.5	52.54	42.06	10.48	74	-21.46	160	306	Peak
*10420	55.43	39.27	16.16	68.2	-12.77	115	245	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
- 5210 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels 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	Charles Hsueh

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
5149.7	41.92	31.87	10.05	54	-12.08	277	35	Average
5149.7	52.18	42.13	10.05	74	-21.82	277	35	Peak
5290	82.6	72.5	10.1			277	35	Average
5290	89.3	79.2	10.1			277	35	Peak
5449.77	41.88	31.37	10.51	54	-12.12	277	35	Average
5449.77	53.03	42.52	10.51	74	-20.97	277	35	Peak
*10580	55.55	39.84	15.71	68.2	-12.65	105	58	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5140.7	41.95	31.94	10.01	54	-12.05	249	297	Average
5140.7	52.86	42.85	10.01	74	-21.14	249	297	Peak
5290	88.57	78.47	10.1			249	297	Average
5290	95.14	85.04	10.1			249	297	Peak
5350.88	43.44	33.21	10.23	54	-10.56	249	297	Average
5350.88	57.07	46.84	10.23	74	-16.93	249	297	Peak
*10580	54.76	39.05	15.71	68.2	-13.44	124	4	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 other emission levels 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
5443.12	42.86	32.38	10.48	54	-11.14	233	336	Average
5443.12	53.57	43.09	10.48	74	-20.43	233	336	Peak
*5469.04	51.53	41	10.53	68.2	-16.67	233	336	Peak
5530	82.17	71.54	10.63			233	336	Average
5530	90.19	79.56	10.63			233	336	Peak
*5725.88	51.22	40.3	10.92	68.2	-16.98	233	336	Peak
11060	46.32	30.09	16.23	54	-7.68	188	257	Average
11060	55.82	39.59	16.23	74	-18.18	188	257	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
5458.48	44.56	34.05	10.51	54	-9.44	240	272	Average
5458.48	55.56	45.05	10.51	74	-18.44	240	272	Peak
*5469.2	63.66	53.13	10.53	68.2	-4.54	246	272	Peak
5530	88.51	77.88	10.63			240	272	Average
5530	96.17	85.54	10.63			240	272	Peak
*5725.8	51.36	40.44	10.92	68.2	-16.84	246	272	Peak
11060	46.35	30.12	16.23	54	-7.65	127	49	Average
11060	55.92	39.69	16.23	74	-18.08	127	49	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 other emission levels 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
5454.64	42.86	32.35	10.51	54	-11.14	233	336	Average
5454.64	52.49	41.98	10.51	74	-21.51	233	336	Peak
*5470	50.59	40.06	10.53	68.2	-17.61	233	336	Peak
5610	81	70.23	10.77			233	336	Average
5610	89.94	79.17	10.77			233	336	Peak
*5725.64	52.38	41.46	10.92	68.2	-15.82	233	336	Peak
11220	47.45	31.03	16.42	54	-6.55	192	216	Average
11220	57.02	40.6	16.42	74	-16.98	192	216	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
5451.6	41.76	31.25	10.51	54	-12.24	230	306	Average
5451.6	52.23	41.72	10.51	74	-21.77	230	306	Peak
*5469.52	51.43	40.9	10.53	68.2	-16.77	230	306	Peak
5610	86.95	76.18	10.77			230	306	Average
5610	95.81	85.04	10.77			230	306	Peak
*5725.72	52.71	41.79	10.92	68.2	-15.49	230	306	Peak
11220	47.14	30.72	16.42	54	-6.86	161	19	Average
11220	56.95	40.53	16.42	74	-17.05	161	19	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 other emission levels 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	76.47	65.6	10.87			234	335	Average
5775	84.71	73.84	10.87			234	335	Peak
11550	46.82	30.32	16.5	54	-7.18	112	268	Average
11550	56.36	39.86	16.5	74	-17.64	112	268	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775	87.47	76.6	10.87			220	305	Average
5775	96.41	85.54	10.87			220	305	Peak
11550	46.62	30.12	16.5	54	-7.38	104	283	Average
11550	56.35	39.85	16.5	74	-17.65	104	283	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5569.825	52.09	41.39	10.7	68.2	-16.11	234	335	Peak
5654.35	50.76	39.89	10.87	71.42	-20.66	234	335	Peak
5923.15	50.99	39.88	11.11	69.57	-18.58	234	335	Peak
5988.775	52.54	41.23	11.31	68.2	-15.66	234	335	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
5595.55	53.03	42.28	10.75	68.2	-15.17	220	305	Peak
5652.775	51.36	40.49	10.87	70.25	-18.89	220	305	Peak
5917.9	50.79	39.7	11.09	73.45	-22.66	220	305	Peak
6006.625	52.36	41.01	11.35	68.2	-15.84	220	305	Peak

Remarks:

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

9 kHz ~ 30 MHz Data:

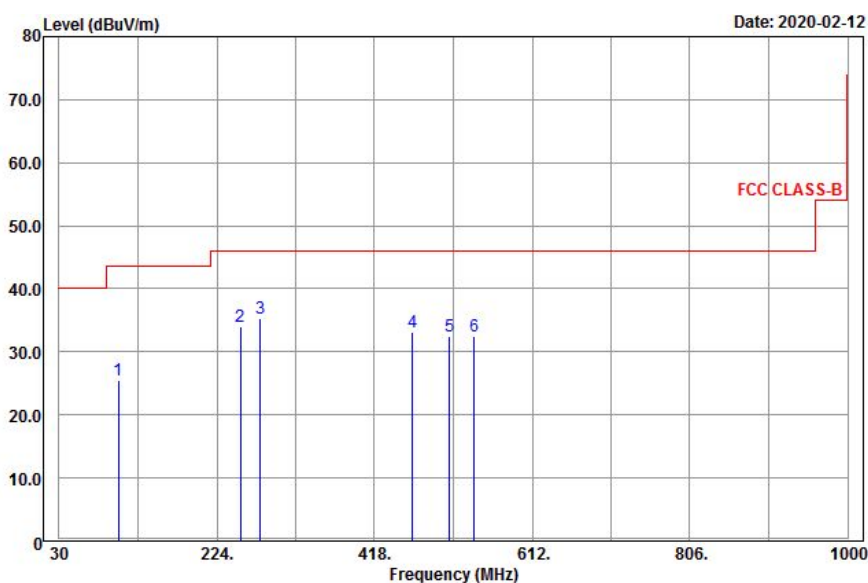
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

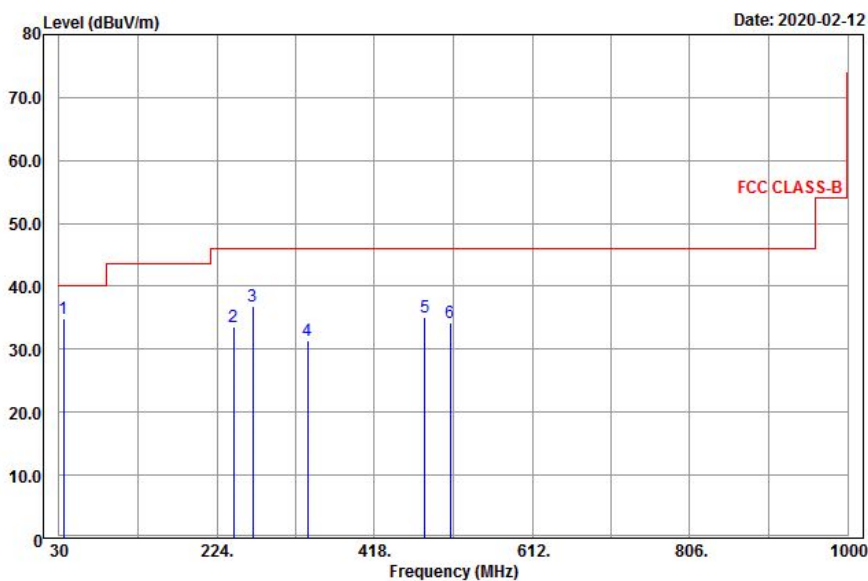
802.11ax (HE40)

EUT Test Condition		Measurement Detail	
Channel	Channel 38	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	Charles Hsueh

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
102.63	25.61	42.76	-17.15	43.5	-17.89	163	232	Peak
253.02	33.9	50.7	-16.8	46	-12.1	140	44	Peak
277.32	35.29	51.74	-16.45	46	-10.71	178	277	Peak
464.5	33.19	46.24	-13.05	46	-12.81	105	5	Peak
510	32.47	44.68	-12.21	46	-13.53	158	287	Peak
540.8	32.5	44.23	-11.73	46	-13.5	140	114	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
35.13	34.96	52.6	-17.64	40	-5.04	113	32	Peak
244.38	33.64	50.59	-16.95	46	-12.36	105	244	Peak
267.87	36.76	53.32	-16.56	46	-9.24	136	6	Peak
335.7	31.3	46.41	-15.11	46	-14.7	158	335	Peak
479.9	35.17	47.86	-12.69	46	-10.83	147	78	Peak
511.4	34.21	46.41	-12.2	46	-11.79	168	55	Peak

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 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 11, 2019	Dec. 10, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 20, 2020	Feb. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
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.
 3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

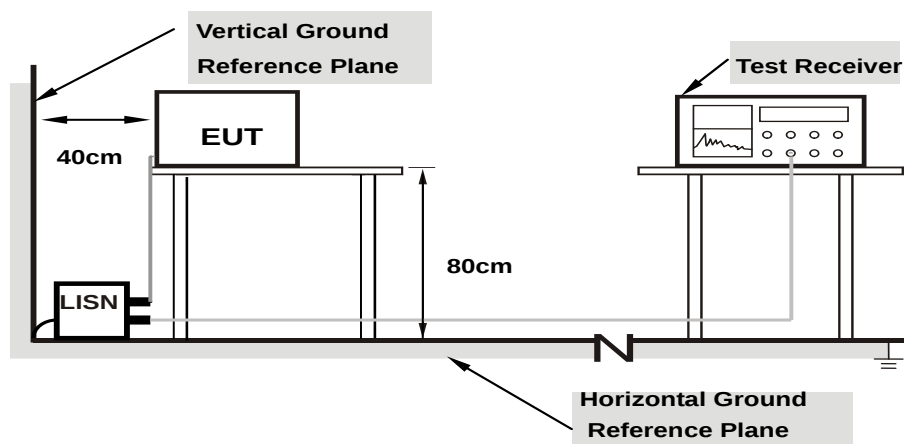
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



- Note:**
- 1.Support units were connected to second LISN.
 - 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

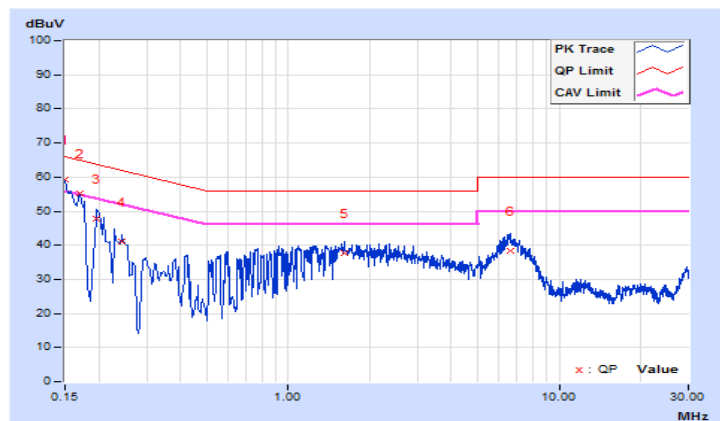
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 75%RH
Tested by	Jones Chang	Test Date	2020/2/26

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.63	49.57	41.10	59.20	50.73	66.00	56.00	-6.80	-5.27
2	0.16955	9.63	45.47	36.93	55.10	46.56	64.98	54.98	-9.88	-8.42
3	0.19692	9.62	38.22	18.39	47.84	28.01	63.74	53.74	-15.90	-25.73
4	0.24384	9.63	31.32	19.22	40.95	28.85	61.96	51.96	-21.01	-23.11
5	1.61234	9.71	28.06	16.08	37.77	25.79	56.00	46.00	-18.23	-20.21
6	6.57804	9.82	28.41	22.14	38.23	31.96	60.00	50.00	-21.77	-18.04

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

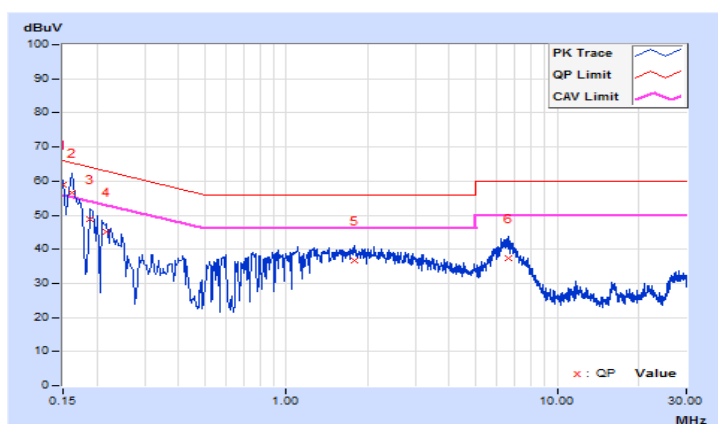


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 75%RH
Tested by	Jones Chang	Test Date	2020/2/26

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.66	49.32	40.81	58.98	50.47	66.00	56.00	-7.02	-5.53
2	0.16173	9.66	46.91	34.85	56.57	44.51	65.37	55.37	-8.80	-10.86
3	0.18910	9.64	39.16	18.54	48.80	28.18	64.08	54.08	-15.28	-25.90
4	0.21565	9.64	35.50	21.00	45.14	30.64	62.98	52.98	-17.84	-22.34
5	1.77656	9.75	27.00	15.49	36.75	25.24	56.00	46.00	-19.25	-20.76
6	6.58195	9.86	27.49	21.39	37.35	31.25	60.00	50.00	-22.65	-18.75

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125 mW (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	250 mW (24 dBm)
U-NII-2A	√		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C	√		250 mW (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 $N_{ANT} \leq 4$;

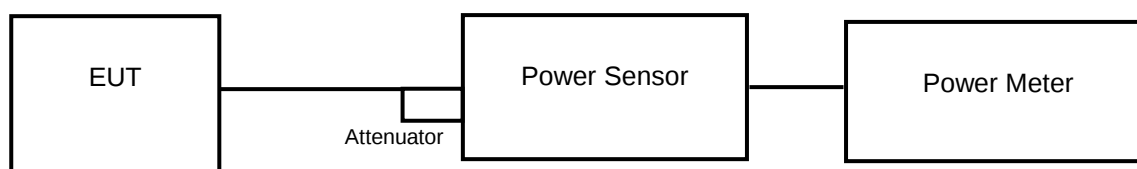
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20 MHz channel widths with $N_{ANT} \geq 5$.

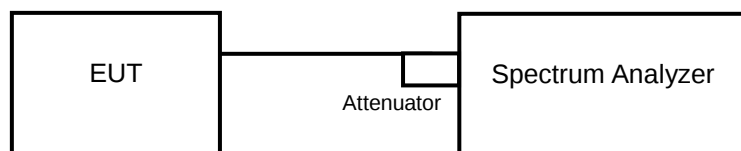
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

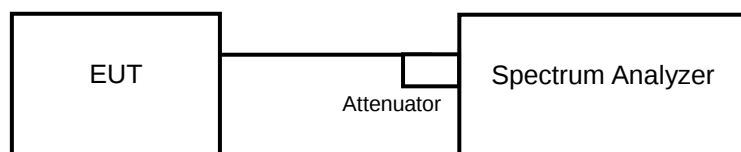
<Power Output Measurement>



or



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.3.4 Test Procedure

Average Power Measurement

<802.11a, 802.11n (HT20), 802.11n (HT40)>

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 $\geq$ 3 MHz
- e. Number of points in sweep $\geq$ 2 Span / RBW.
- f. Sweep time $\leq$ (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

26 dB Bandwidth

- a. Set RBW = approximately 1 % of the emission bandwidth.
- b. Set the VBW > RBW.
- c. Detector = Peak.
- d. Trace mode = max hold.
- e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Results

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.23	16.25	75.509	18.78	24	Pass
40	5200	15.20	16.19	74.645	18.73	24	Pass
44	5220	15.30	16.13	74.989	18.75	24	Pass
48	5240	15.23	16.21	75.162	18.76	24	Pass
52	5260	15.18	16.18	74.473	18.72	24	Pass
56	5280	15.23	16.08	73.961	18.69	24	Pass
60	5300	15.29	16.22	75.683	18.79	24	Pass
64	5320	15.45	16.06	75.509	18.78	24	Pass
100	5500	16.31	16.46	87.096	19.40	24	Pass
116	5580	16.34	16.32	85.901	19.34	24	Pass
120	5600	16.28	16.29	85.114	19.30	24	Pass
124	5620	16.12	16.22	82.794	19.18	24	Pass
132	5660	16.18	16.23	83.560	19.22	24	Pass
140	5700	16.25	16.28	84.723	19.28	24	Pass
149	5745	16.48	16.44	88.512	19.47	30	Pass
153	5765	16.39	16.09	84.140	19.25	30	Pass
157	5785	16.22	16.12	82.794	19.18	30	Pass
161	5805	16.09	16.01	80.538	19.06	30	Pass
165	5825	16.11	16.04	81.096	19.09	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.12	16.32	75.336	18.77	24	Pass
40	5200	15.09	16.18	73.790	18.68	24	Pass
44	5220	15.21	16.15	74.473	18.72	24	Pass
48	5240	15.18	16.21	74.817	18.74	24	Pass
52	5260	15.09	16.12	73.282	18.65	24	Pass
56	5280	15.01	16.22	73.621	18.67	24	Pass
60	5300	15.09	16.13	73.282	18.65	24	Pass
64	5320	15.12	16.21	74.302	18.71	24	Pass
100	5500	15.91	16.23	80.910	19.08	24	Pass
116	5580	15.84	16.34	81.470	19.11	24	Pass
120	5600	16.23	16.10	82.794	19.18	24	Pass
124	5620	16.22	16.12	82.794	19.18	24	Pass
132	5660	16.21	16.03	81.846	19.13	24	Pass
140	5700	16.32	16.17	84.333	19.26	24	Pass
149	5745	16.23	16.20	83.753	19.23	30	Pass
153	5765	16.31	16.01	82.604	19.17	30	Pass
157	5785	16.28	16.05	82.794	19.18	30	Pass
161	5805	16.22	16.06	82.224	19.15	30	Pass
165	5825	16.28	16.08	82.985	19.19	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	15.24	15.77	71.121	18.52	24	Pass
46	5230	15.31	15.83	72.277	18.59	24	Pass
54	5270	15.44	15.89	73.790	18.68	24	Pass
62	5310	15.41	15.85	73.282	18.65	24	Pass
102	5510	14.61	14.78	59.020	17.71	24	Pass
110	5550	16.73	15.22	80.353	19.05	24	Pass
118	5590	16.78	15.18	80.538	19.06	24	Pass
126	5630	16.72	15.20	80.168	19.04	24	Pass
134	5670	16.12	16.46	85.114	19.30	24	Pass
151	5755	17.32	15.37	88.308	19.46	30	Pass
159	5795	17.14	14.82	82.035	19.14	30	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.69	14.51	74.989	18.75	24	Pass
58	5290	16.76	14.75	77.268	18.88	24	Pass
106	5530	15.28	15.89	72.611	18.61	24	Pass
122	5610	16.83	15.05	80.168	19.04	24	Pass
155	5775	17.11	15.04	83.368	19.21	30	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.11	16.15	73.621	18.67	24	Pass
40	5200	15.23	16.09	73.961	18.69	24	Pass
44	5220	15.10	16.12	73.282	18.65	24	Pass
48	5240	15.13	16.20	74.302	18.71	24	Pass
52	5260	15.12	16.17	73.961	18.69	24	Pass
56	5280	15.09	16.13	73.282	18.65	24	Pass
60	5300	15.14	16.07	73.114	18.64	24	Pass
64	5320	15.15	16.09	73.451	18.66	24	Pass
100	5500	17.26	15.09	85.507	19.32	24	Pass
116	5580	17.33	15.15	86.896	19.39	24	Pass
120	5600	16.12	16.09	81.658	19.12	24	Pass
124	5620	16.20	16.11	82.604	19.17	24	Pass
132	5660	16.19	16.01	81.470	19.11	24	Pass
140	5700	16.28	16.11	83.368	19.21	24	Pass
149	5745	16.20	16.17	83.176	19.20	30	Pass
153	5765	16.28	16.00	82.224	19.15	30	Pass
157	5785	16.25	16.03	82.224	19.15	30	Pass
161	5805	16.19	16.02	81.658	19.12	30	Pass
165	5825	16.23	16.05	82.224	19.15	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	15.36	15.67	71.285	18.53	24	Pass
46	5230	15.44	15.61	71.450	18.54	24	Pass
54	5270	15.39	15.69	71.614	18.55	24	Pass
62	5310	15.34	15.72	71.450	18.54	24	Pass
102	5510	14.41	14.89	58.479	17.67	24	Pass
110	5550	16.80	15.24	81.283	19.10	24	Pass
118	5590	17.20	15.20	85.507	19.32	24	Pass
126	5630	17.22	15.18	85.704	19.33	24	Pass
134	5670	15.78	16.45	82.035	19.14	24	Pass
151	5755	16.99	14.89	80.910	19.08	30	Pass
159	5795	17.00	14.86	80.724	19.07	30	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.64	14.39	73.621	18.67	24	Pass
58	5290	16.59	14.64	74.645	18.73	24	Pass
106	5530	15.24	15.79	71.285	18.53	24	Pass
122	5610	17.2	15.41	87.297	19.41	24	Pass
155	5775	17.3	15.38	88.308	19.46	30	Pass

802.11ax (HE20_RU26)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	13.16	14.29	47.534	16.77	24	Pass
40	5200	13.13	14.20	46.881	16.71	24	Pass
48	5240	13.12	14.22	46.989	16.72	24	Pass
52	5260	13.17	14.21	47.098	16.73	24	Pass
60	5300	12.88	13.91	44.055	16.44	24	Pass
64	5320	13.21	14.19	47.206	16.74	24	Pass
100	5500	12.50	13.11	38.282	15.83	24	Pass
116	5580	12.61	13.01	38.194	15.82	24	Pass
140	5700	12.43	13.12	38.019	15.80	24	Pass
149	5745	16.12	15.98	80.538	19.06	30	Pass
157	5785	16.11	15.93	79.983	19.03	30	Pass
165	5825	16.12	16.01	80.910	19.08	30	Pass

802.11ax (HE20_RU52)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	14.98	16.15	72.611	18.61	24	Pass
40	5200	13.09	13.98	45.394	16.57	24	Pass
48	5240	15.46	16.63	81.096	19.09	24	Pass
52	5260	15.55	16.61	81.658	19.12	24	Pass
60	5300	12.72	13.93	43.451	16.38	24	Pass
64	5320	15.58	16.12	77.090	18.87	24	Pass
100	5500	14.58	15.16	61.518	17.89	24	Pass
116	5580	14.40	15.11	59.979	17.78	24	Pass
140	5700	14.65	15.13	61.802	17.91	24	Pass
149	5745	16.14	16.04	81.283	19.10	30	Pass
157	5785	16.18	16.02	81.470	19.11	30	Pass
165	5825	16.04	16.10	80.910	19.08	30	Pass

802.11ax (HE20_RU106)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.01	16.18	73.114	18.64	24	Pass
40	5200	13.11	13.93	45.186	16.55	24	Pass
48	5240	15.03	16.19	73.451	18.66	24	Pass
52	5260	15.05	16.04	72.111	18.58	24	Pass
60	5300	12.75	13.91	43.451	16.38	24	Pass
64	5320	15.41	16.28	77.268	18.88	24	Pass
100	5500	15.68	15.99	76.736	18.85	24	Pass
116	5580	15.95	16.12	80.353	19.05	24	Pass
140	5700	15.91	16.15	80.168	19.04	24	Pass
149	5745	16.10	14.05	66.222	18.21	30	Pass
157	5785	16.29	14.02	67.764	18.31	30	Pass
165	5825	16.14	13.86	65.464	18.16	30	Pass

802.11ax (HE20_RU242)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.31	16.12	74.817	18.74	24	Pass
40	5200	13.26	14.09	46.881	16.71	24	Pass
48	5240	15.22	16.33	76.208	18.82	24	Pass
52	5260	15.11	16.12	73.282	18.65	24	Pass
60	5300	12.66	13.45	40.551	16.08	24	Pass
64	5320	15.17	16.09	73.451	18.66	24	Pass
100	5500	15.23	16.21	75.162	18.76	24	Pass
116	5580	16.80	15.44	82.794	19.18	24	Pass
140	5700	15.91	16.39	82.604	19.17	24	Pass
149	5745	17.10	15.02	82.985	19.19	30	Pass
157	5785	17.17	15.15	84.918	19.29	30	Pass
165	5825	17.13	15.01	83.368	19.21	30	Pass

802.11ax (HE40_RU484)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	11.99	12.51	33.651	15.27	24	Pass
46	5230	15.56	16.19	77.625	18.90	24	Pass
54	5270	15.61	16.13	77.446	18.89	24	Pass
62	5310	12.12	12.61	34.514	15.38	24	Pass
102	5510	10.23	10.61	22.029	13.43	24	Pass
110	5550	17.05	15.48	86.099	19.35	24	Pass
134	5670	16.34	14.35	70.307	18.47	24	Pass
151	5755	17.35	15.33	88.512	19.47	30	Pass
159	5795	17.11	14.80	81.658	19.12	30	Pass

802.11ax (HE80_RU996)

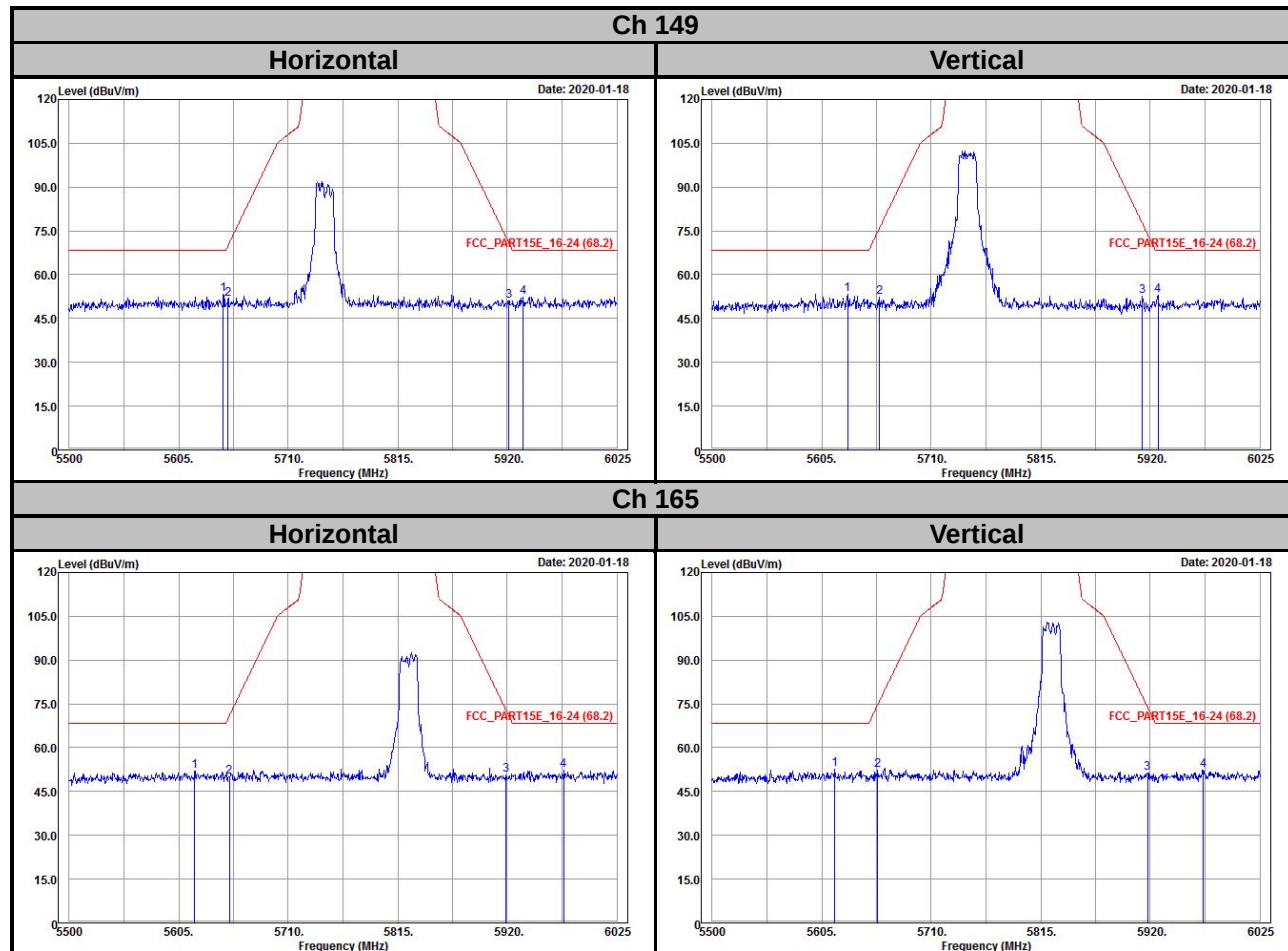
Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.54	14.34	72.277	18.59	24	Pass
58	5290	16.58	14.51	73.790	18.68	24	Pass
106	5530	12.14	12.5	34.119	15.33	24	Pass
122	5610	17.13	15.39	86.298	19.36	24	Pass
155	5775	17.29	15.42	88.512	19.47	30	Pass

5 Pictures of Test Arrangements

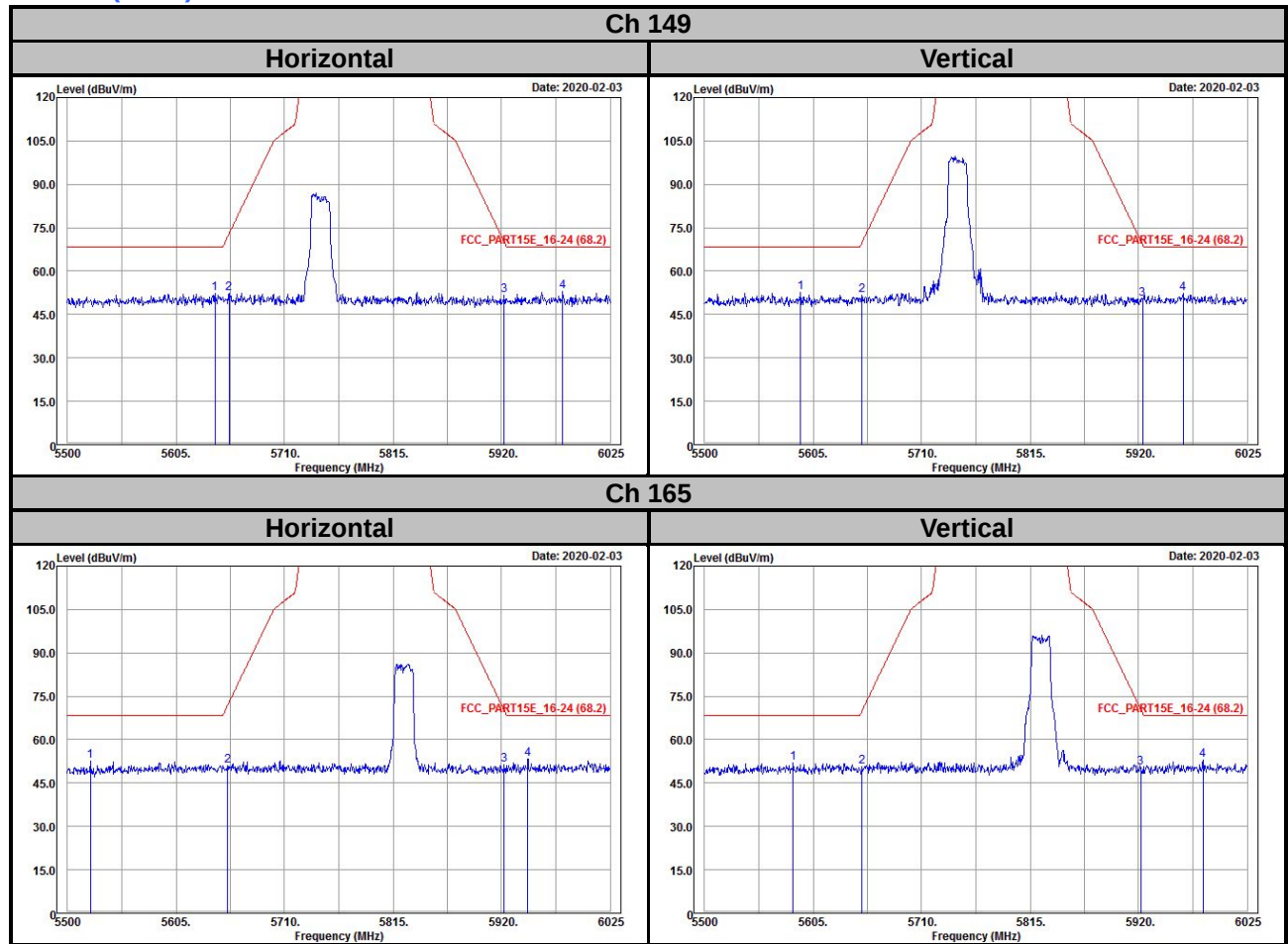
Please refer to the attached file (Test Setup Photo).

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

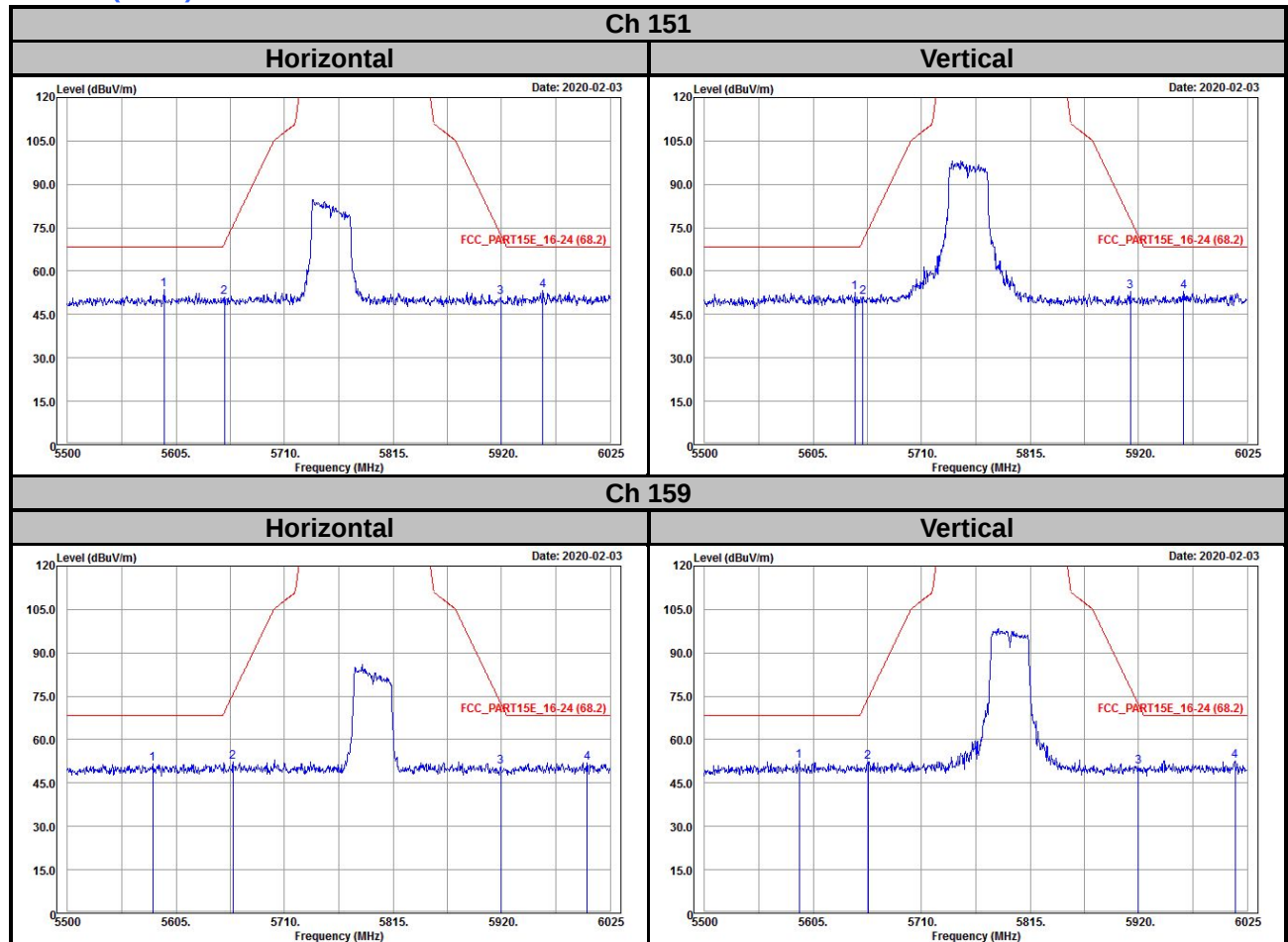
802.11a



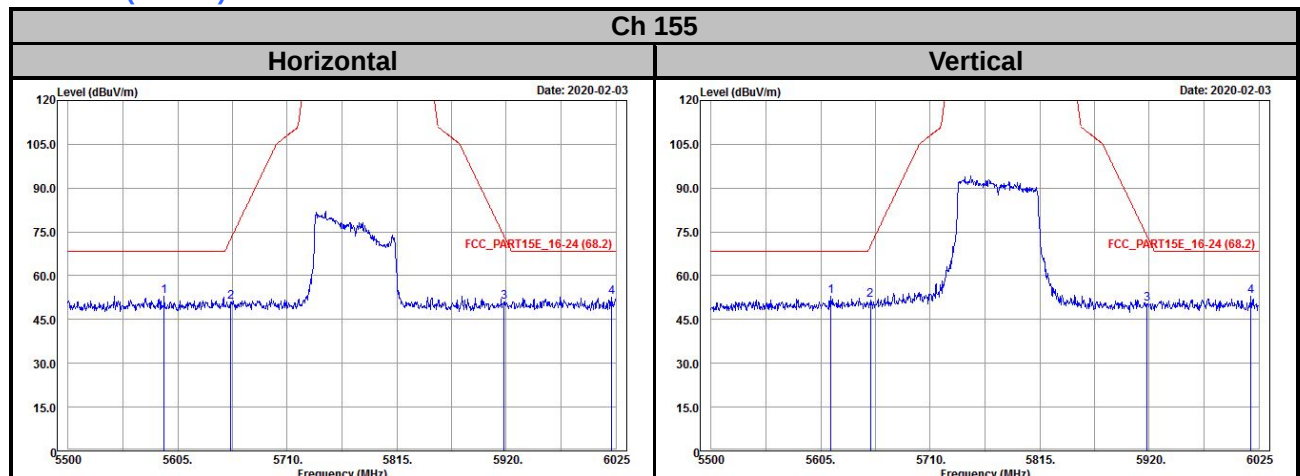
802.11n (HT20)



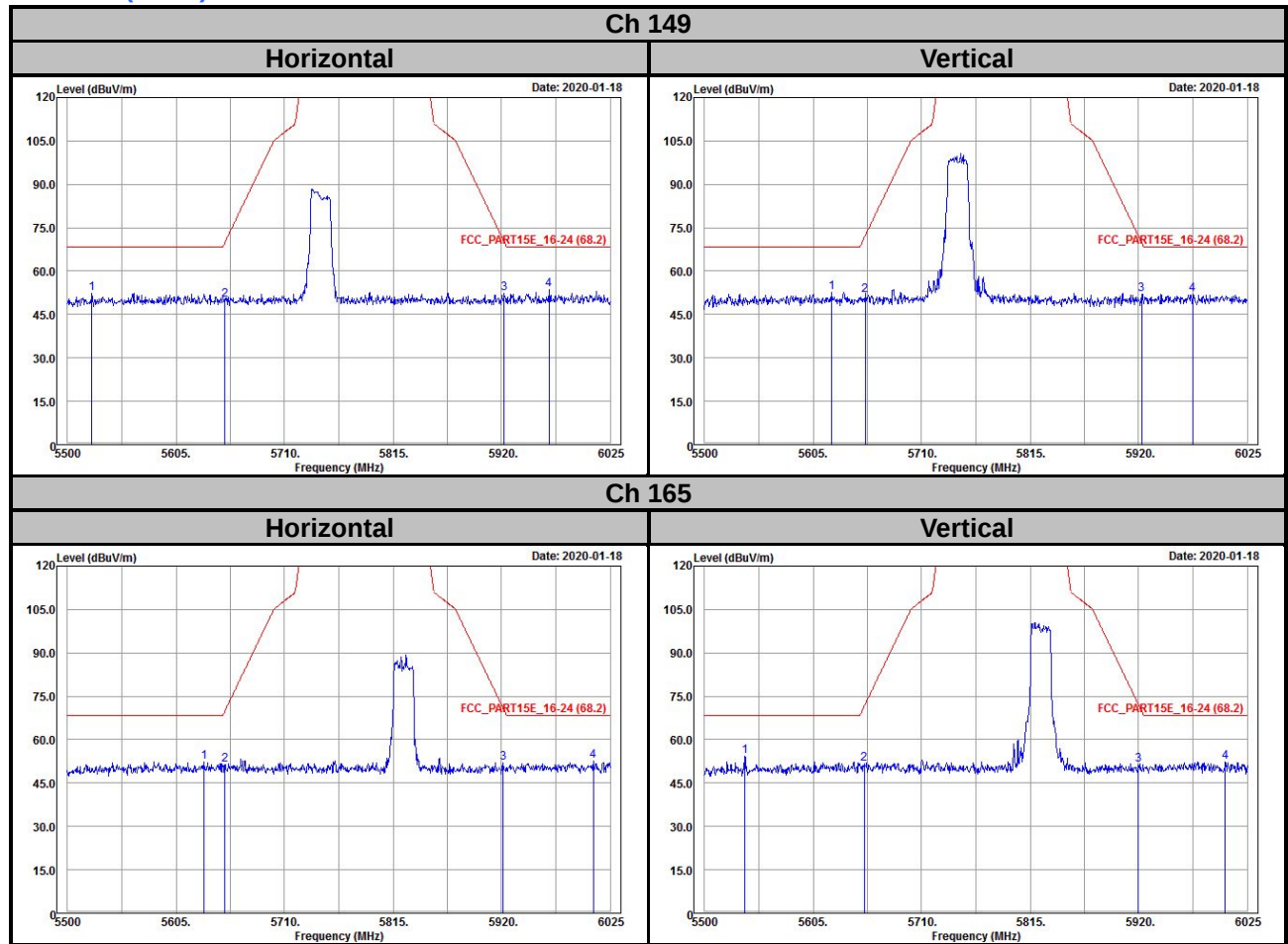
802.11n (HT40)



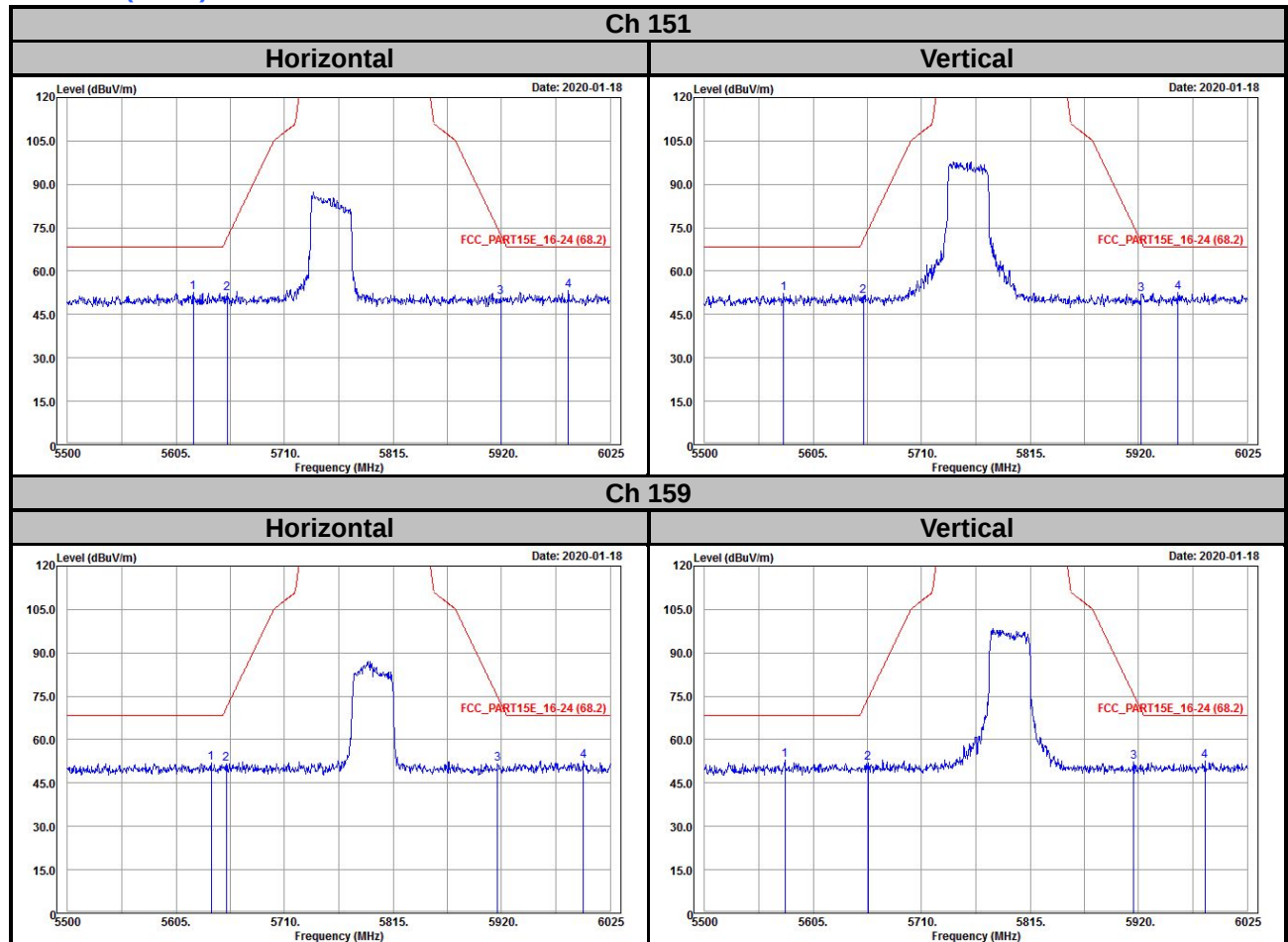
802.11ac (VHT80)



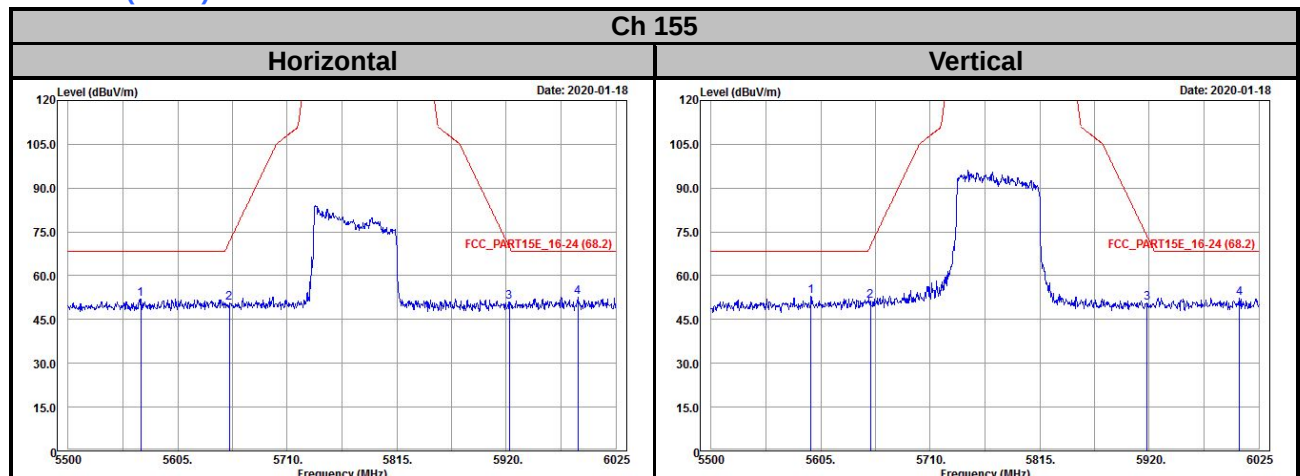
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



Appendix – Information of the Testing Laboratories

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

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

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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