

FCC Test Report

Report No.: RFBARR-WTW-P21100969-2

FCC ID: RAS-MT7902

Test Model: MT7902

Received Date: 2021/10/28

Test Date: 2021/11/8 ~ 2022/1/16

Issued Date: 2022/1/27

Applicant: MediaTek Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RFBARR-WTW-P21100969-2	Original release.	2022/1/27

1 Certificate of Conformity

Product: 1TX 11ax (WiFi6E) BW160 + BT/BLE Combo Card

Brand: MediaTek

Test Model: MT7902

Sample Status: Engineering sample

Applicant: MediaTek Inc.

Test Date: 2021/11/8 ~ 2022/1/16

Standard: 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 EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** 2022/1/27
Claire Kuan / Specialist

Approved by :  , **Date:** 2022/1/27
Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(8)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -15.09 dB at 0.52109 MHz.
15.407(b)(5)(8)	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -0.3 dB at 11690.00 MHz, 11770.00 MHz.
15.407(a)(3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB Bandwidth Measurement	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.403	Operational restrictions U-NII 4 devices	Pass	Declaration by applicant
15.203 or 15.403	Antenna Requirement	Pass	Antenna connector is ipex(MHF) not a standard connector.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	1TX 11ax (WiFi6E) BW160 + BT/BLE Combo Card
Brand	MediaTek
Test Model	MT7902
Status of EUT	Engineering sample
Power Supply Rating	3.3 Vdc from host equipment
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only 1024QAM for OFDMA in 11ax mode only
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to 150 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	5.845 ~ 5.885 GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 3 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2 802.11ac (VHT80), 802.11ax (HE80): 1 802.11ac (VHT160), 802.11ax (HE160): 1
EIRP	27.78 dBm (599.791 mW)
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. There are Bluetooth and WLAN (2.4GHz & 5GHz & 5.9GHz & 6GHz) technology used for the EUT.
2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (5GHz or 5.9GHz)	Bluetooth
2	WLAN (6GHz)	Bluetooth

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

3. The EUT have four HW SKUs as following table:

SKU	Sample	Difference
1	Diversity version A	1. Version A & B are also same PCB with layout change. 2. The difference is adding/removing MOSFET components in GPIO bus for function optional.
2	Diversity version B	
3	1 TX only version A	
4	1 TX only version B	

Note: From the above HW SKUs, the worse case was found in **SKU No.: 1**. Therefore only the test data of the SKU was recorded in this report.

4. The antennas provided to the EUT, please refer to the following table:

Antenna Set No	RF Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain0	PSA	RFMTA340718EMLB302	3.18	2.4~2.4835	PIFA	ipex(MHF)	200
				4.92	5.15~5.895			
	Chain1 (only DiversitySample)	PSA	RFMTA340718EMLB302	3.18	2.4~2.4835	PIFA	ipex(MHF)	200
				4.92	5.15~5.895			
2	Chain0	PSA	RFMTA311020EMMB301	1.71	2.4~2.4835	PIFA	ipex(MHF)	200
				4.82	5.15~5.895			
				4.76	5.925~6.425			
				4.29	6.425~6.525			
				4.61	6.525~6.875			
				4.09	6.875~7.125			
	Chain1 (only DiversitySample)	PSA	RFMTA311020EMMB301	1.71	2.4~2.4835	PIFA	ipex(MHF)	200
				4.82	5.15~5.895			
				4.76	5.925~6.425			
				4.29	6.425~6.525			
				4.61	6.525~6.875			
				4.09	6.875~7.125			

Note:

1. From the above transmission chains, the worse case was found in transmission on Chain 0 for 1TX diversity sample. Therefore only the test data of the mode was recorded in this report.
2. The Bluetooth technology will fix transmission on Chain 0.
3. Max. gain was selected for the final test.

5. The EUT incorporates a SISO function:

5.9GHz Band					
MODULATION MODE	TX & RX CONFIGURATION		SISO mode	Beamforming mode	
802.11a	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11n (HT20)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11n (HT40)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ac (VHT20)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ac (VHT40)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ac (VHT80)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ac (VHT160)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ax (HE20)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ax (HE40)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ax (HE80)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ax (HE160)	1TX Diversity or 1TX	1RX	Support	Not Support	
802.11ax (RU26/52/106/242/484/996/1992)	1TX Diversity or 1TX	1RX	Support	Not Support	

Note:

1. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz, 160MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz, 160MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)
 2. For Partial RU, after pre-tested, only the worse cases were chosen for final test and presented in the test report. (Final test mode refer section 3.2.1)
-
6. 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.
 7. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

For U-NII-4

3 channels are provided for 802.11a, 802.11n, 802.11ac, 802.11ax (HE20):

Channel	Frequency	Channel	Frequency	Channel	Frequency
*169	5845 MHz	173	5865 MHz	177	5885 MHz

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

Channel	Frequency	Channel	Frequency
*167	5835 MHz	175	5875 MHz

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

Channel	Frequency
*171	5855 MHz

1 channel is provided for 802.11n, 802.11ac, 802.11ax (HE160):

Channel	Frequency
*163	5815 MHz

Note: *U-NII-3 & -4 span channels

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz
PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

Note: The EUT's PIFA antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-place**.

Radiated Emission Measurement (Above 1GHz):

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
802.11a	169 to 177	169, 173, 177	OFDM	BPSK	6Mb/s	-
802.11ax (HE20)	169 to 177	169, 173, 177	OFDMA	BPSK	MCS0	-
802.11ax (HE40)	167 to 175	167, 175	OFDMA	BPSK	MCS0	-
802.11ax (HE80)	171	171	OFDMA	BPSK	MCS0	-
802.11ax (HE160)	163	163	OFDMA	BPSK	MCS0	-
802.11ax (RU26)	169 to 177	177	OFDMA	BPSK	MCS0	26/8
802.11ax (RU52)	169 to 177	177	OFDMA	BPSK	MCS0	52/40
802.11ax (RU106)	169 to 177	177	OFDMA	BPSK	MCS0	106/54

Radiated Emission Measurement (Below 1GHz):

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE40)	167 to 175	167	OFDMA	BPSK	MCS0

Power Line Conducted Emission Measurement:

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE40)	167 to 175	167	OFDMA	BPSK	MCS0

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, RU configurations and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
802.11a	169 to 177	169, 173, 177	OFDM	BPSK	6Mb/s	
802.11ac (VHT20) (output power only)	169 to 177	169, 173, 177	OFDM	BPSK	MCS0	-
802.11ac (VHT40) (output power only)	167 to 175	167, 175	OFDM	BPSK	MCS0	-
802.11ac (VHT80) (output power only)	171	171	OFDM	BPSK	MCS0	-
802.11ac (VHT160) (output power only)	163	163	OFDM	BPSK	MCS0	-
802.11ax (HE20)	169 to 177	169, 173, 177	OFDMA	BPSK	MCS0	
802.11ax (HE40)	167 to 175	167, 175	OFDMA	BPSK	MCS0	
802.11ax (HE80)	171	171	OFDMA	BPSK	MCS0	
802.11ax (HE160)	163	163	OFDMA	BPSK	MCS0	
802.11ax (RU26)	169 to 177	177	OFDMA	BPSK	MCS0	26/8
802.11ax (RU52)	169 to 177	177	OFDMA	BPSK	MCS0	52/40
802.11ax (RU106)	169 to 177	177	OFDMA	BPSK	MCS0	106/54

Test Condition:

Applicable To	Environmental Conditions	Input Power (System)	Tested By
RE$\geq$1G	25deg. C, 65%RH 20deg. C, 70%RH	120Vac, 60Hz	Carter Lin
RE$<$1G	23deg. C, 66%RH	120Vac, 60Hz	Ryan Du
PLC	25deg. C, 75%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Eric Peng Leon Dai

3.3 Duty Cycle of Test Signal

For Legacy mode:

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

802.11a: Duty cycle = 5.484 ms/5.996 ms = 0.915, Duty factor = $10 * \log (1/\text{Duty cycle}) = 0.39 \text{ dB}$

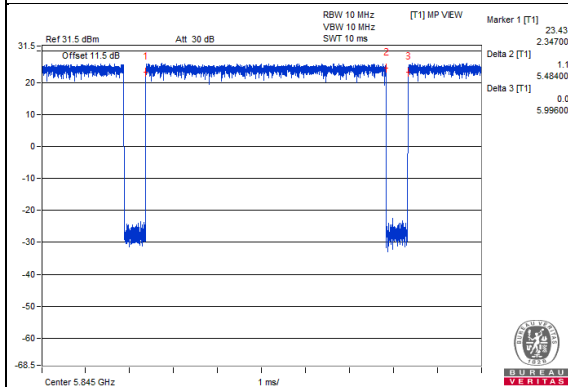
802.11ax (HE20): Duty cycle = 3.878 ms/4.382 ms = 0.885, Duty factor = $10 * \log (1/\text{Duty cycle}) = 0.53 \text{ dB}$

802.11ax (HE40): Duty cycle = 3.878 ms/4.536 ms = 0.855, Duty factor = $10 * \log (1/\text{Duty cycle}) = 0.68 \text{ dB}$

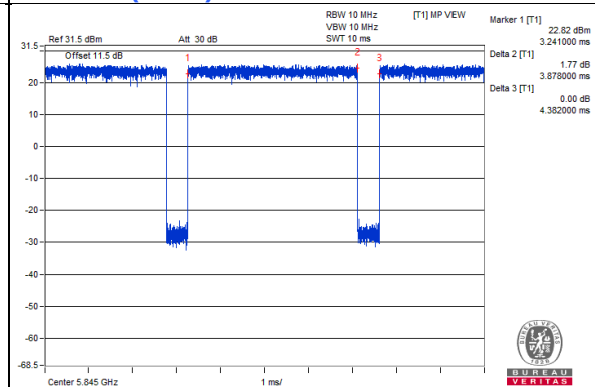
802.11ax (HE80): Duty cycle = 1.887 ms/2.543 ms = 0.742, Duty factor = $10 * \log (1/\text{Duty cycle}) = 1.3 \text{ dB}$

802.11ax (HE160): Duty cycle = 1.001 ms/1.621 ms = 0.618, Duty factor = $10 * \log (1/\text{Duty cycle}) = 2.09 \text{ dB}$

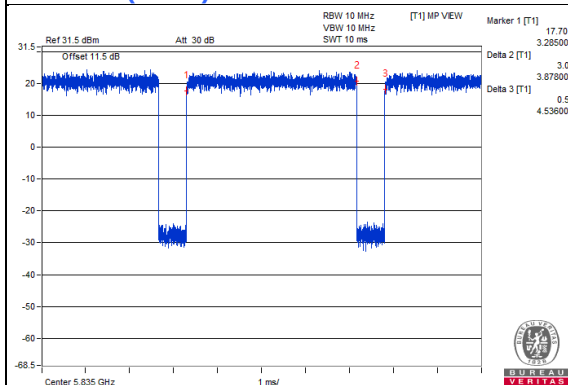
802.11a



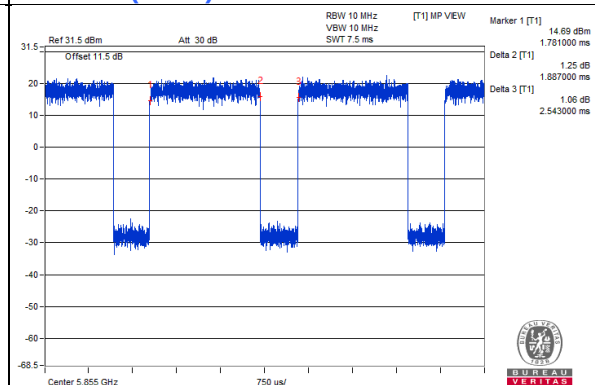
802.11ax (HE20)



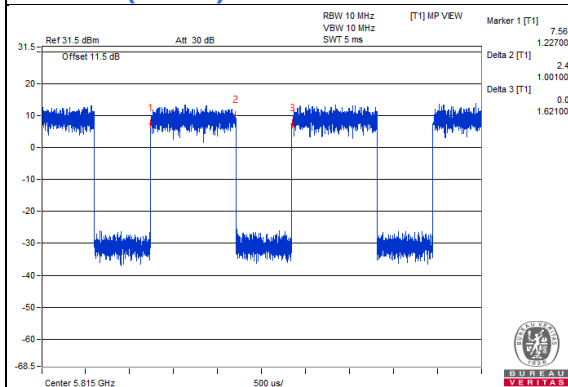
802.11ax (HE40)



802.11ax (HE80)



802.11ax (HE160)



For RU mode:

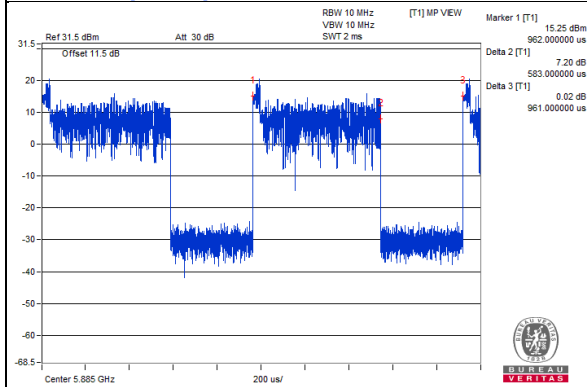
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11ax (RU26): Duty cycle = 0.583 ms/0.961 ms = 0.607, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 2.17 \text{ dB}$

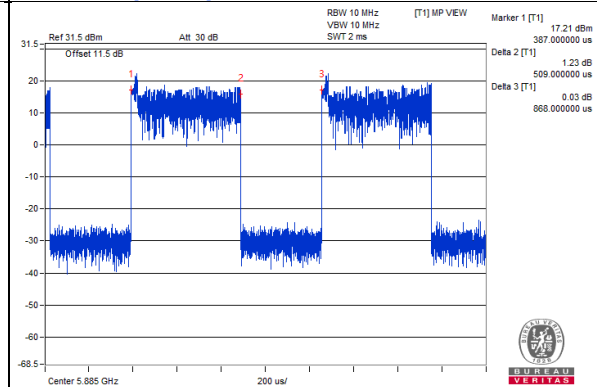
802.11ax (RU52): Duty cycle = 0.509 ms/0.868 ms = 0.586, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 2.32 \text{ dB}$

802.11ax (RU106): Duty cycle = 0.436 ms/0.804 ms = 0.542, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 2.66 \text{ dB}$

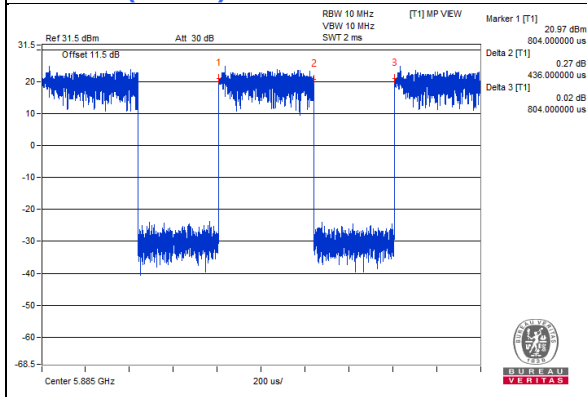
802.11ax (RU26)



802.11ax (RU52)



802.11ax (RU106)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6440	F9LYQ32	FCC DoC	Provided by Lab
B.	Test Tool	MTK	NA	NA	NA	Supplied by client
C.	Adapter	Dell	LA65NS2-01	NA	NA	Provided by Lab

Note:

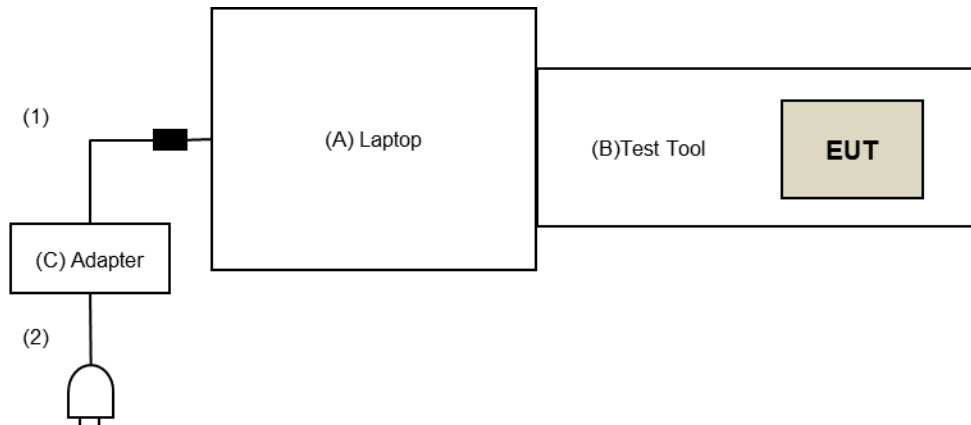
1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.8	No	1	Provided by Lab
2.	AC Cable	1	1.8	No	0	Provided by Lab

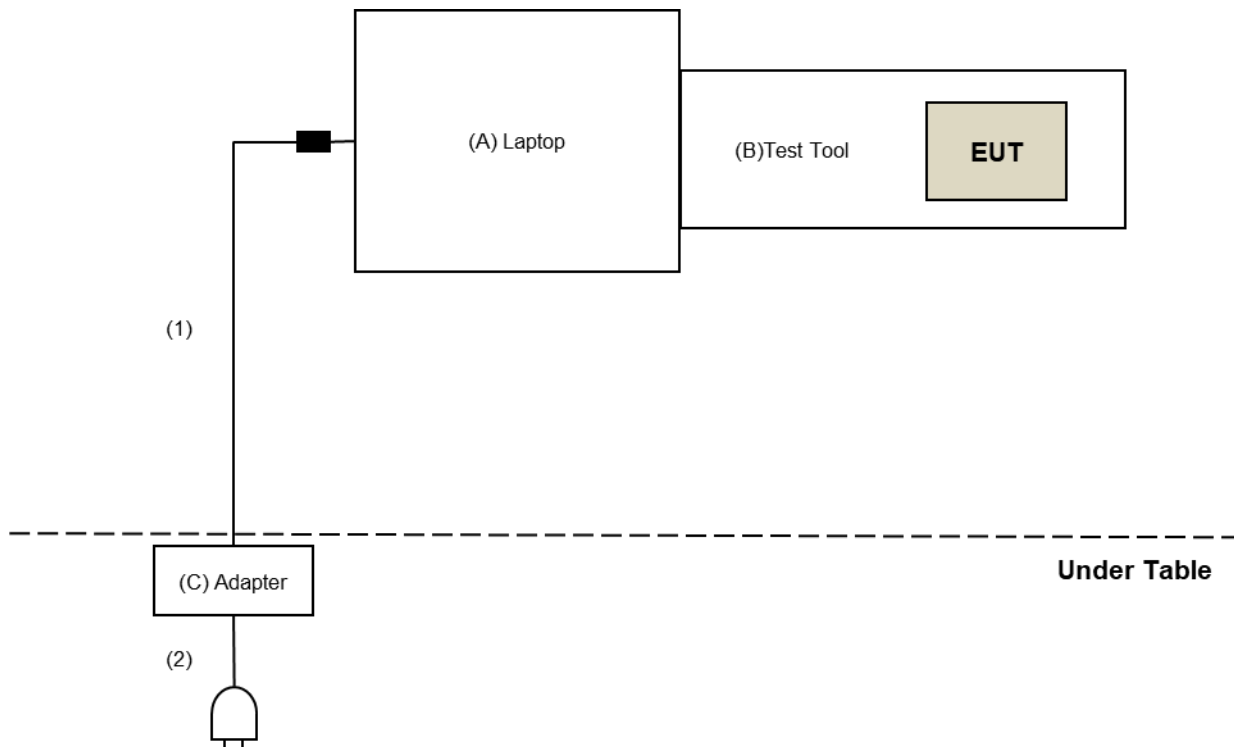
Note: The core is originally attached to the cable.

3.4.1 Configuration of System under Test

For AC Power Conducted Emission test:



For Radiated Emission test:



3.5 General Description of Applied Standards and References

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

Test Standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10-2013

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

References Test Guidance:

KDB 291074 D02 EMC Measurement v01

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

- (i) For an indoor access point or subordinate device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of 15 dBm/MHz and shall decrease linearly to an e.i.r.p. of -7 dBm/MHz at or above 5.925 GHz.
- (ii) For a client device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of -5 dBm/MHz and shall decrease linearly to an e.i.r.p. of -27 dBm/MHz at or above 5.925 GHz.
- (iii) For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of -27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of 27 dBm/MHz at 5.725 GHz.

Note:

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

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

4.1.2 Test Instruments

For Radiated Emission & Band-Edge (RU mode) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	2021/11/19	2022/11/18
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Pre_Amplifier EMCI	EMC001340	980142	2021/5/24	2022/5/23
LOOP ANTENNA Electro-Metrics	EM-6879	264	2021/3/5	2022/3/4
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2022/1/6	2023/1/5
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-002	2022/1/6	2023/1/5
Pre_Amplifier EMCI	EMC330N	980701	2021/3/10	2022/3/9
Trilog Broadband Antenna Schwarzbeck	VULB 9168	9168-406	2021/10/27	2022/10/26
RF Coaxial Cable COMMATE/PEWC	8D	966-4-1	2021/3/17	2022/3/16
RF Coaxial Cable COMMATE/PEWC	8D	966-4-2	2021/3/17	2022/3/16
RF Coaxial Cable COMMATE/PEWC	8D	966-4-3	2021/3/17	2022/3/16
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-03	2022/1/10	2023/1/9
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-783	2021/11/14	2022/11/13
Pre_Amplifier EMCI	EMC 12630 SE	980638	2021/4/7	2022/4/6
RF Cable-Frequency Range : 1-26.5GHz EMCI	EMC104-SM-SM-1200	160922	2021/12/24	2022/12/23
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180502	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	210704	2021/11/9	2022/11/8
Pre_Amplifier EMCI	EMC184045SE	980387	2022/1/10	2023/1/9
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170519	2021/11/14	2022/11/13
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2022/1/10	2023/1/9
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

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 966 Chamber No. 4.
3. Tested Date: 2022/1/11 ~ 2022/1/16

For Band-Edge (Legacy mode) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Signal Analyzer Keysight	N9010A	MY56070348	2021/9/15	2022/9/14
MXE EMI Receiver KEYSIGHT	N9038B	MY60180019	2021/2/1	2022/1/31
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-783	2020/11/22	2021/11/21
Pre_Amplifier EMCi	EMC 12630 SE	980638	2021/4/7	2022/4/6
RF Cable-Frequency Range : 1-26.5GHz EMCi	EMC104-SM-SM-1200	160922	2020/12/25	2021/12/24
RF Coaxial Cable EMCi	EMC104-SM-SM-2000	180502	2021/4/26	2022/4/25
RF Coaxial Cable EMCi	EMC104-SM-SM-6000	180418	2021/4/26	2022/4/25
Pre_Amplifier EMCi	EMC184045SE	980387	2021/1/11	2022/1/10
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170519	2020/11/22	2021/11/21
RF Cable-Frequency range: 1-40GHz EMCi	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCi	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

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 966 Chamber No. 4.
3. Tested Date: 2021/11/8 ~ 2021/11/10

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	2021/3/8	2022/3/7
Power Meter Anritsu	ML2495A	1529002	2021/6/21	2022/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2021/5/31	2022/5/30
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2021/4/13	2022/4/12
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA
DC POWER SUPPLY Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber	GTH-150-40-SP-AR	MAA0812-008	2021/1/14	2022/1/13
Giant Force				
True RMS Clamp Meter Fluke	325	31130711WS	2021/6/2	2022/6/1

- NOTE:**
1. The test was performed in Oven room 2.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. Tested Date: 2021/12/1 ~2021/12/30

4.1.3 Test Procedure

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz

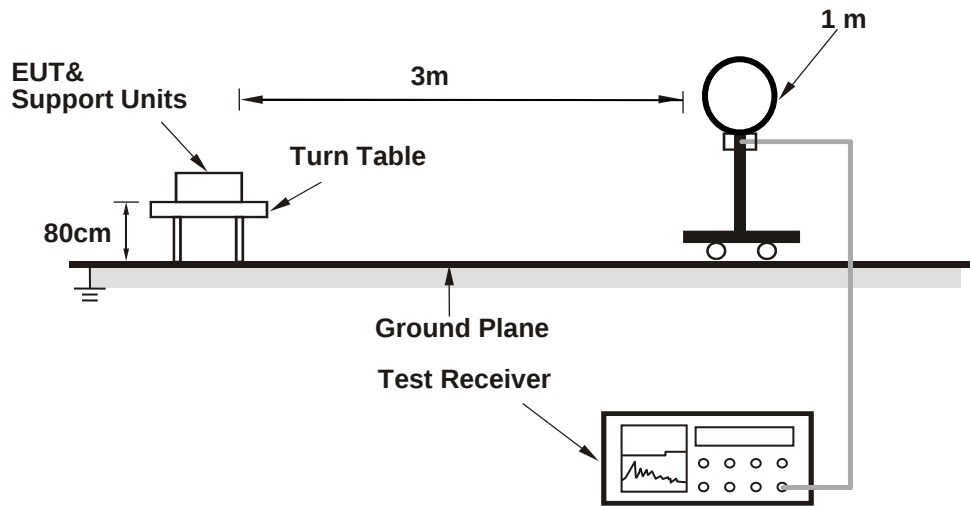
- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the RMS detector is unnecessary.

Note:

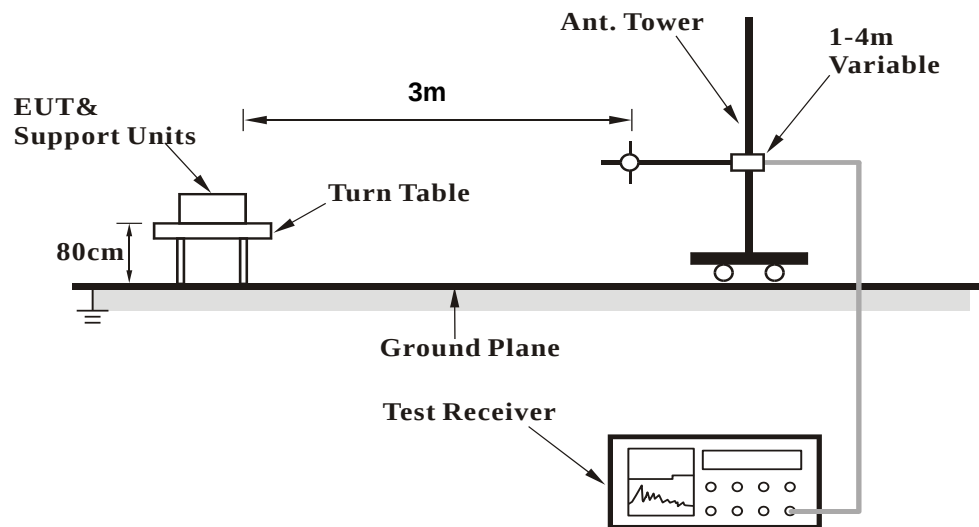
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Test Setup

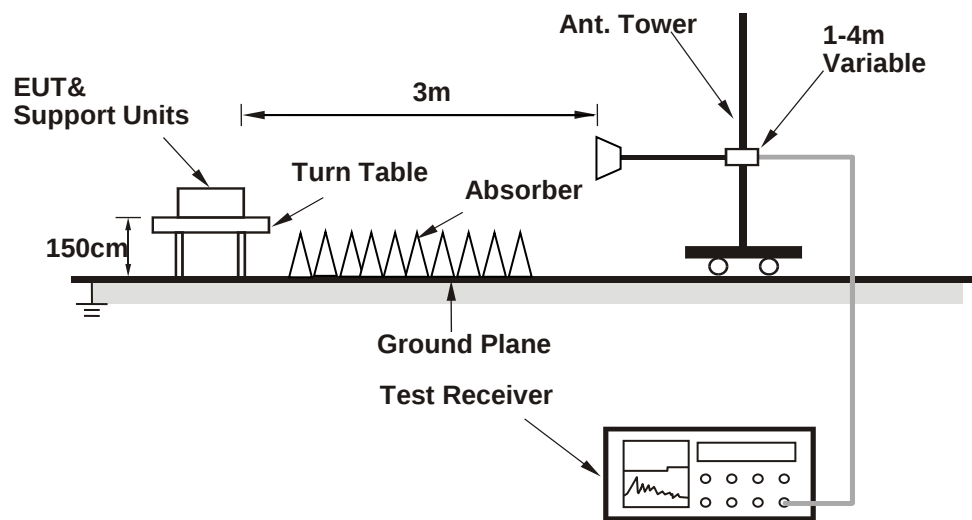
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.5 EUT Operating Condition

- Placed the EUT on the testing table.
- Controlling software (MT7902 QA 0.0.2.82) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.6 Test Results

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 169 : 5845 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5845.00	119.9 PK			2.97 H	95	118.6	1.3
2	*5845.00	112.3 AV			2.97 H	95	111.0	1.3
3	11690.00	65.8 PK	74.0	-8.2	2.43 H	46	54.5	11.3
4	11690.00	53.7 AV	54.0	-0.3	2.43 H	46	42.4	11.3
5	#17535.00	51.9 PK	88.2	-36.3	1.95 H	103	33.9	18.0
6	#17535.00	38.1 AV	68.2	-30.1	1.95 H	103	20.1	18.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5845.00	112.6 PK			1.00 V	121	111.3	1.3
2	*5845.00	101.6 AV			1.00 V	121	100.3	1.3
3	11690.00	64.4 PK	74.0	-9.6	2.28 V	101	53.1	11.3
4	11690.00	52.7 AV	54.0	-1.3	2.28 V	101	41.4	11.3
5	#17535.00	51.4 PK	88.2	-36.8	2.04 V	75	33.4	18.0
6	#17535.00	37.6 AV	68.2	-30.6	2.04 V	75	19.6	18.0

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 173 : 5865 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5865.00	120.1 PK			3.02 H	83	118.7	1.4
2	*5865.00	112.7 AV			3.02 H	83	111.3	1.4
3	11730.00	65.9 PK	74.0	-8.1	2.50 H	60	54.7	11.2
4	11730.00	53.5 AV	54.0	-0.5	2.50 H	60	42.3	11.2
5	#17595.00	52.3 PK	88.2	-35.9	1.97 H	117	33.9	18.4
6	#17595.00	38.3 AV	68.2	-29.9	1.97 H	117	19.9	18.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5865.00	112.1 PK			1.06 V	317	110.7	1.4
2	*5865.00	101.2 AV			1.06 V	317	99.8	1.4
3	11730.00	64.6 PK	74.0	-9.4	2.24 V	114	53.4	11.2
4	11730.00	52.6 AV	54.0	-1.4	2.24 V	114	41.4	11.2
5	#17595.00	50.8 PK	88.2	-37.4	2.13 V	92	32.4	18.4
6	#17595.00	37.5 AV	68.2	-30.7	2.13 V	92	19.1	18.4

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 177 : 5885 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	119.0 PK			2.98 H	94	117.7	1.3
2	*5885.00	110.6 AV			2.98 H	94	109.3	1.3
3	11770.00	65.8 PK	74.0	-8.2	2.44 H	46	54.7	11.1
4	11770.00	52.6 AV	54.0	-1.4	2.44 H	46	41.5	11.1
5	#17655.00	52.4 PK	88.2	-35.8	1.89 H	99	33.7	18.7
6	#17655.00	38.4 AV	68.2	-29.8	1.89 H	99	19.7	18.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	110.0 PK			1.01 V	45	108.7	1.3
2	*5885.00	99.9 AV			1.01 V	45	98.6	1.3
3	11770.00	63.9 PK	74.0	-10.1	2.24 V	98	52.8	11.1
4	11770.00	52.4 AV	54.0	-1.6	2.24 V	98	41.3	11.1
5	#17655.00	51.8 PK	88.2	-36.4	2.03 V	90	33.1	18.7
6	#17655.00	38.0 AV	68.2	-30.2	2.03 V	90	19.3	18.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 169 : 5845 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5845.00	121.9 PK			2.98 H	96	120.6	1.3
2	*5845.00	110.9 AV			2.98 H	96	109.6	1.3
3	11690.00	65.1 PK	74.0	-8.9	2.23 H	101	53.8	11.3
4	11690.00	53.5 AV	54.0	-0.5	2.23 H	101	42.2	11.3
5	#17535.00	51.6 PK	88.2	-36.6	1.90 H	93	33.6	18.0
6	#17535.00	37.7 AV	68.2	-30.5	1.90 H	93	19.7	18.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5845.00	115.0 PK			2.51 V	93	113.7	1.3
2	*5845.00	104.7 AV			2.51 V	93	103.4	1.3
3	11690.00	64.7 PK	74.0	-9.3	2.19 V	119	53.4	11.3
4	11690.00	52.8 AV	54.0	-1.2	2.19 V	119	41.5	11.3
5	#17535.00	50.8 PK	88.2	-37.4	2.06 V	78	32.8	18.0
6	#17535.00	37.4 AV	68.2	-30.8	2.06 V	78	19.4	18.0

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 173 : 5865 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5865.00	122.4 PK			3.01 H	109	121.0	1.4
2	*5865.00	111.3 AV			3.01 H	109	109.9	1.4
3	11730.00	65.5 PK	74.0	-8.5	2.50 H	75	54.3	11.2
4	11730.00	53.5 AV	54.0	-0.5	2.50 H	75	42.3	11.2
5	#17595.00	51.6 PK	88.2	-36.6	1.98 H	94	33.2	18.4
6	#17595.00	37.7 AV	68.2	-30.5	1.98 H	94	19.3	18.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5865.00	114.3 PK			2.52 V	92	112.9	1.4
2	*5865.00	104.0 AV			2.52 V	92	102.6	1.4
3	11730.00	64.3 PK	74.0	-9.7	2.24 V	108	53.1	11.2
4	11730.00	52.7 AV	54.0	-1.3	2.24 V	108	41.5	11.2
5	#17595.00	51.1 PK	88.2	-37.1	2.07 V	79	32.7	18.4
6	#17595.00	37.5 AV	68.2	-30.7	2.07 V	79	19.1	18.4

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 177 : 5885 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	113.6 PK			2.98 H	96	112.3	1.3
2	*5885.00	103.2 AV			2.98 H	96	101.9	1.3
3	11770.00	66.2 PK	74.0	-7.8	2.42 H	48	55.1	11.1
4	11770.00	53.7 AV	54.0	-0.3	2.42 H	48	42.6	11.1
5	#17655.00	52.2 PK	88.2	-36.0	1.97 H	100	33.5	18.7
6	#17655.00	38.5 AV	68.2	-29.7	1.97 H	100	19.8	18.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	107.5 PK			2.50 V	84	106.2	1.3
2	*5885.00	97.1 AV			2.50 V	84	95.8	1.3
3	11770.00	63.9 PK	74.0	-10.1	2.29 V	100	52.8	11.1
4	11770.00	52.4 AV	54.0	-1.6	2.29 V	100	41.3	11.1
5	#17655.00	51.1 PK	88.2	-37.1	2.09 V	77	32.4	18.7
6	#17655.00	37.6 AV	68.2	-30.6	2.09 V	77	18.9	18.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 167 : 5835 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5835.00	118.6 PK			2.99 H	96	117.3	1.3
2	*5835.00	108.8 AV			2.99 H	96	107.5	1.3
3	11670.00	59.6 PK	74.0	-14.4	2.45 H	77	48.4	11.2
4	11670.00	48.6 AV	54.0	-5.4	2.45 H	77	37.4	11.2
5	#17505.00	46.8 PK	88.2	-41.4	1.93 H	135	29.0	17.8
6	#17505.00	32.4 AV	68.2	-35.8	1.93 H	135	14.6	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5835.00	115.0 PK			3.20 V	79	113.7	1.3
2	*5835.00	104.1 AV			3.20 V	79	102.8	1.3
3	11670.00	58.6 PK	74.0	-15.4	2.23 V	97	47.4	11.2
4	11670.00	47.3 AV	54.0	-6.7	2.23 V	97	36.1	11.2
5	#17505.00	45.9 PK	88.2	-42.3	1.95 V	80	28.1	17.8
6	#17505.00	31.8 AV	68.2	-36.4	1.95 V	80	14.0	17.8

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 175 : 5875 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5875.00	117.8 PK			2.96 H	94	116.4	1.4
2	*5875.00	107.1 AV			2.96 H	94	105.7	1.4
3	11750.00	59.3 PK	74.0	-14.7	2.43 H	78	48.2	11.1
4	11750.00	48.1 AV	54.0	-5.9	2.43 H	78	37.0	11.1
5	#17625.00	47.0 PK	88.2	-41.2	1.90 H	139	28.4	18.6
6	#17625.00	32.5 AV	68.2	-35.7	1.90 H	139	13.9	18.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5875.00	109.4 PK			3.34 V	81	108.0	1.4
2	*5875.00	100.0 AV			3.34 V	81	98.6	1.4
3	11750.00	58.4 PK	74.0	-15.6	2.26 V	91	47.3	11.1
4	11750.00	47.0 AV	54.0	-7.0	2.26 V	91	35.9	11.1
5	#17625.00	46.6 PK	88.2	-41.6	1.98 V	69	28.0	18.6
6	#17625.00	32.4 AV	68.2	-35.8	1.98 V	69	13.8	18.6

Remarks:

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

RF Mode	TX 802.11ax (HE80)	Channel	CH 171 : 5855 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5855.00	112.3 PK			2.98 H	94	111.0	1.3
2	*5855.00	102.4 AV			2.98 H	94	101.1	1.3
3	11710.00	58.3 PK	74.0	-15.7	2.50 H	81	47.1	11.2
4	11710.00	47.3 AV	54.0	-6.7	2.50 H	81	36.1	11.2
5	#17565.00	46.5 PK	88.2	-41.7	1.91 H	128	28.4	18.1
6	#17565.00	32.3 AV	68.2	-35.9	1.91 H	128	14.2	18.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5855.00	107.4 PK			3.19 V	81	106.1	1.3
2	*5855.00	96.5 AV			3.19 V	81	95.2	1.3
3	11710.00	57.3 PK	74.0	-16.7	2.32 V	82	46.1	11.2
4	11710.00	45.6 AV	54.0	-8.4	2.32 V	82	34.4	11.2
5	#17565.00	46.3 PK	88.2	-41.9	2.00 V	84	28.2	18.1
6	#17565.00	32.1 AV	68.2	-36.1	2.00 V	84	14.0	18.1

Remarks:

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

RF Mode	TX 802.11ax (HE160)	Channel	CH 163 : 5815 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5815.00	106.3 PK			2.99 H	96	104.9	1.4
2	*5815.00	96.1 AV			2.99 H	96	94.7	1.4
3	11630.00	55.3 PK	74.0	-18.7	2.46 H	67	44.0	11.3
4	11630.00	45.1 AV	54.0	-8.9	2.46 H	67	33.8	11.3
5	#17445.00	46.9 PK	88.2	-41.3	1.91 H	128	29.7	17.2
6	#17445.00	32.3 AV	68.2	-35.9	1.91 H	128	15.1	17.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5815.00	99.5 PK			3.23 V	79	98.1	1.4
2	*5815.00	88.9 AV			3.23 V	79	87.5	1.4
3	11630.00	54.2 PK	74.0	-19.8	2.36 V	85	42.9	11.3
4	11630.00	43.3 AV	54.0	-10.7	2.36 V	85	32.0	11.3
5	#17445.00	45.9 PK	88.2	-42.3	1.95 V	69	28.7	17.2
6	#17445.00	32.0 AV	68.2	-36.2	1.95 V	69	14.8	17.2

Remarks:

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

RF Mode	TX 20MHz Preamble 802.11ax (RU26)	Channel	CH 177 : 5885 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	112.9 PK			2.96 H	95	111.6	1.3
2	*5885.00	103.2 AV			2.96 H	95	101.9	1.3
3	11770.00	52.4 PK	74.0	-21.6	2.42 H	32	41.3	11.1
4	11770.00	40.7 AV	54.0	-13.3	2.42 H	32	29.6	11.1
5	#17655.00	47.0 PK	88.2	-41.2	2.14 H	163	28.3	18.7
6	#17655.00	34.8 AV	68.2	-33.4	2.14 H	163	16.1	18.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	102.6 PK			1.03 V	43	101.3	1.3
2	*5885.00	94.0 AV			1.03 V	43	92.7	1.3
3	11770.00	50.6 PK	74.0	-23.4	2.31 V	102	39.5	11.1
4	11770.00	38.9 AV	54.0	-15.1	2.31 V	102	27.8	11.1
5	#17655.00	46.7 PK	88.2	-41.5	2.09 V	195	28.0	18.7
6	#17655.00	35.2 AV	68.2	-33.0	2.09 V	195	16.5	18.7

Remarks:

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

RF Mode	TX 20MHz Preamble 802.11ax (RU52)	Channel	CH 177 : 5885 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	112.6 PK			2.94 H	95	111.3	1.3
2	*5885.00	103.5 AV			2.94 H	95	102.2	1.3
3	11770.00	52.2 PK	74.0	-21.8	2.39 H	23	41.1	11.1
4	11770.00	40.8 AV	54.0	-13.2	2.39 H	23	29.7	11.1
5	#17655.00	47.4 PK	88.2	-40.8	2.11 H	147	28.7	18.7
6	#17655.00	35.0 AV	68.2	-33.2	2.11 H	147	16.3	18.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	103.4 PK			1.00 V	40	102.1	1.3
2	*5885.00	93.6 AV			1.00 V	40	92.3	1.3
3	11770.00	50.3 PK	74.0	-23.7	2.28 V	97	39.2	11.1
4	11770.00	38.6 AV	54.0	-15.4	2.28 V	97	27.5	11.1
5	#17655.00	46.9 PK	88.2	-41.3	2.08 V	188	28.2	18.7
6	#17655.00	35.3 AV	68.2	-32.9	2.08 V	188	16.6	18.7

Remarks:

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

RF Mode	TX 20MHz Preamble 802.11ax (RU106)	Channel	CH 177 : 5885 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	110.3 PK			2.96 H	96	109.0	1.3
2	*5885.00	101.4 AV			2.96 H	96	100.1	1.3
3	11770.00	52.2 PK	74.0	-21.8	2.38 H	24	41.1	11.1
4	11770.00	40.6 AV	54.0	-13.4	2.38 H	24	29.5	11.1
5	#17655.00	47.4 PK	88.2	-40.8	2.09 H	136	28.7	18.7
6	#17655.00	35.2 AV	68.2	-33.0	2.09 H	136	16.5	18.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5885.00	101.4 PK			1.07 V	44	100.1	1.3
2	*5885.00	91.7 AV			1.07 V	44	90.4	1.3
3	11770.00	49.7 PK	74.0	-24.3	2.33 V	103	38.6	11.1
4	11770.00	38.3 AV	54.0	-15.7	2.33 V	103	27.2	11.1
5	#17655.00	46.3 PK	88.2	-41.9	2.04 V	191	27.6	18.7
6	#17655.00	34.9 AV	68.2	-33.3	2.04 V	191	16.2	18.7

Remarks:

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

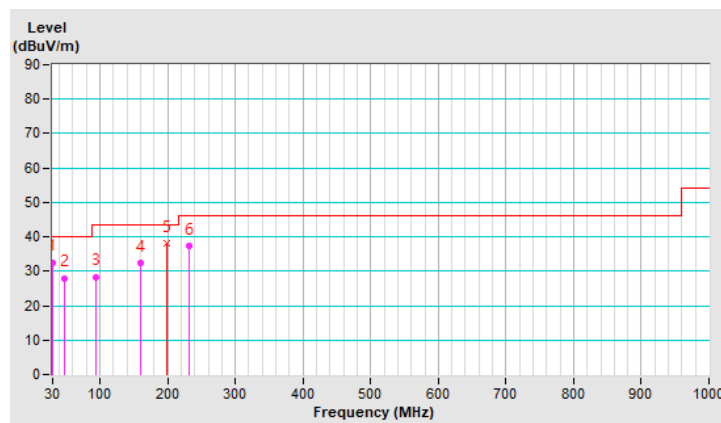
Below 1GHz Data:

RF Mode	TX 802.11ax (HE40)	Channel	CH 167 : 5835 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Ryan Du		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.37	32.6 QP	40.0	-7.4	1.00 H	149	46.2	-13.6
2	47.86	28.0 QP	40.0	-12.0	1.00 H	233	40.6	-12.6
3	94.97	28.4 QP	43.5	-15.1	1.00 H	291	46.0	-17.6
4	159.04	32.3 QP	43.5	-11.2	1.00 H	214	44.3	-12.0
5	199.09	38.0 QP	43.5	-5.5	1.00 H	317	53.1	-15.1
6	232.66	37.2 QP	46.0	-8.8	1.50 H	298	51.3	-14.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

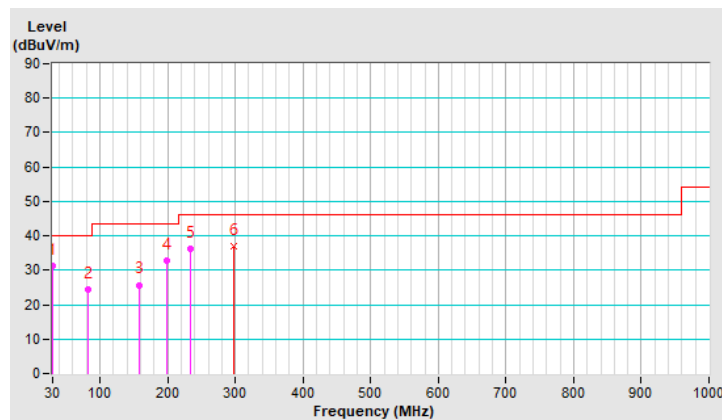


RF Mode	TX 802.11ax (HE40)	Channel	CH 167 : 5835 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Ryan Du		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.32	31.4 QP	40.0	-8.6	1.00 V	257	45.0	-13.6
2	82.98	24.5 QP	40.0	-15.5	1.50 V	242	42.4	-17.9
3	158.08	25.7 QP	43.5	-17.8	1.00 V	301	37.6	-11.9
4	199.45	32.7 QP	43.5	-10.8	2.00 V	236	47.8	-15.1
5	232.76	36.3 QP	46.0	-9.7	1.00 V	305	50.4	-14.1
6	298.50	37.0 QP	46.0	-9.0	1.00 V	145	48.0	-11.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	2021/10/13	2022/10/12
LISN R&S	ESH3-Z5	848773/004	2021/10/29	2022/10/28
LISN R & S	ESH3-Z5	835239/001	2021/3/26	2022/3/25
50 ohms Terminator NA	50	3	2021/10/27	2022/10/26
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2021/9/25	2022/9/24
Fixed attenuator STI	STI02-2200-10	005	2021/8/27	2022/8/26
Software BVADT	BVADT_Cond_V7.3.7.4	NA	NA	NA

Note:

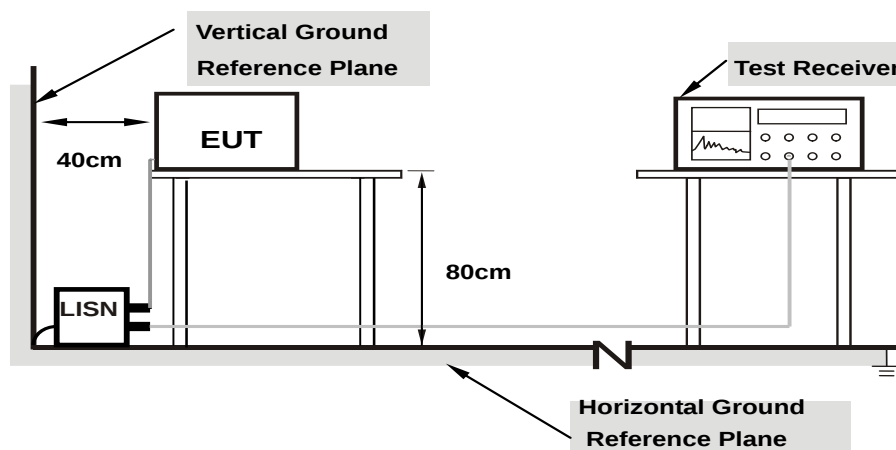
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3. Tested Date: 2022/1/12

4.2.3 Test Procedure

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

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

4.2.4 Test Setup



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

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

4.2.5 EUT Operating Condition

Same as 4.1.5.

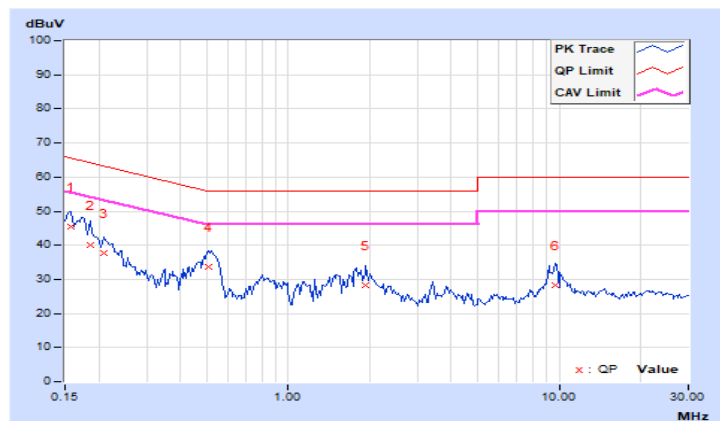
4.2.6 Test Results

RF Mode	TX 802.11ax (HE40)	Channel	CH 167 : 5835 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 75 % RH
Tested By	Sampson Chen		

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	0.15781	10.05	35.31	25.82	45.36	35.87	65.58	55.58	-20.22	-19.71
2	0.18516	10.05	30.05	18.05	40.10	28.10	64.25	54.25	-24.15	-26.15
3	0.20859	10.05	27.63	17.85	37.68	27.90	63.26	53.26	-25.58	-25.36
4	0.50938	10.07	23.60	10.05	33.67	20.12	56.00	46.00	-22.33	-25.88
5	1.93359	10.16	18.16	9.15	28.32	19.31	56.00	46.00	-27.68	-26.69
6	9.63281	10.59	17.83	12.04	28.42	22.63	60.00	50.00	-31.58	-27.37

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

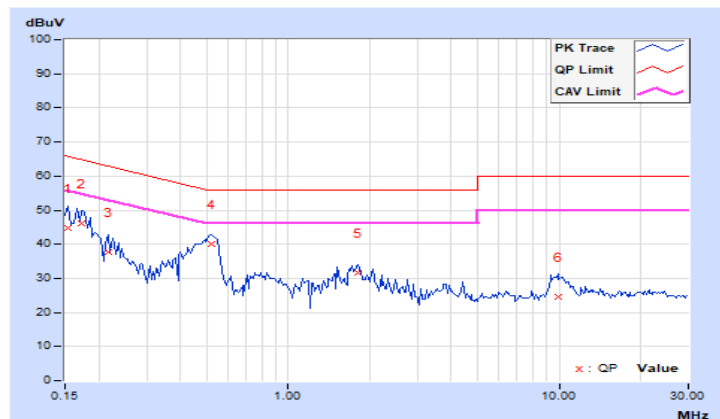


RF Mode	TX 802.11ax (HE40)	Channel	CH 167 : 5835 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 75 % RH
Tested By	Sampson Chen		

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	0.15391	10.02	34.86	22.64	44.88	32.66	65.79	55.79	-20.91	-23.13
2	0.17344	10.02	36.07	25.00	46.09	35.02	64.79	54.79	-18.70	-19.77
3	0.21641	10.03	27.59	18.57	37.62	28.60	62.96	52.96	-25.34	-24.36
4	0.52109	10.04	29.90	20.87	39.94	30.91	56.00	46.00	-16.06	-15.09
5	1.81641	10.12	21.40	12.84	31.52	22.96	56.00	46.00	-24.48	-23.04
6	9.91797	10.49	14.15	7.51	24.64	18.00	60.00	50.00	-35.36	-32.00

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

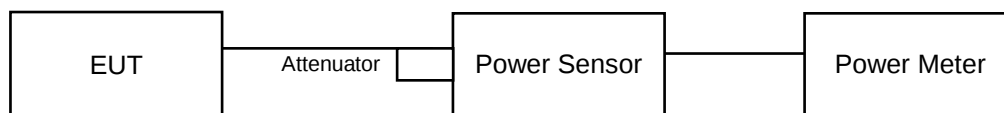


4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Device Category		Limit (Max Average Power)
☐	Indoor access point	EIRP 36 dBm
☐	Subordinate device	EIRP 36 dBm
☒	Client device	EIRP 30 dBm
Note: For all U-NII-4 and U-NII-3 & -4 span channels shall met above EIRP values.		

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 EUT Operating Condition

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

4.3.6 Test Result

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
169	5845	71.945	18.57	4.92	223.357	23.49	30	Pass
173	5865	76.208	18.82	4.92	236.592	23.74	30	Pass
177	5885	75.683	18.79	4.92	234.963	23.71	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
169	5845	79.983	19.03	4.92	248.313	23.95	30	Pass
173	5865	81.283	19.10	4.92	252.348	24.02	30	Pass
177	5885	30.761	14.88	4.92	95.499	19.8	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
167	5835	183.654	22.64	4.92	570.164	27.56	30	Pass
175	5875	165.959	22.20	4.92	515.229	27.12	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
171	5855	101.859	20.08	4.92	316.228	25	30	Pass

802.11ac (VHT160)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
163	5815	32.659	15.14	4.92	101.391	20.06	30	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
169	5845	83.368	19.21	4.92	258.821	24.13	30	Pass
173	5865	85.507	19.32	4.92	265.461	24.24	30	Pass
177	5885	31.989	15.05	4.92	99.312	19.97	30	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
167	5835	193.197	22.86	4.92	599.791	27.78	30	Pass
175	5875	171.791	22.35	4.92	533.335	27.27	30	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
171	5855	104.232	20.18	4.92	323.594	25.1	30	Pass

802.11ax (HE160)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
163	5815	34.277	15.35	4.92	106.414	20.27	30	Pass

802.11ax (RU26)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
177	5885	18.578	12.69	4.83	56.494	17.52	30	Pass

802.11ax (RU52)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
177	5885	32.509	15.12	4.83	98.855	19.95	30	Pass

802.11ax (RU106)

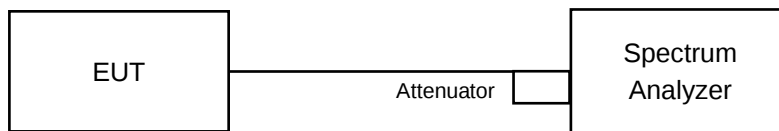
Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Maximum Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Test Result
177	5885	64.269	18.08	4.83	195.434	22.91	30	Pass

4.4 6dB Bandwidth Measurement

4.4.1 Limits of Emission Bandwidth Measurement

Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

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

4.4.5 EUT Operating Condition

Same as Item 4.3.5.

4.4.6 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
169	5845	15.09	0.5	Pass
173	5865	15.16	0.5	Pass
177	5885	15.16	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
169	5845	15.71	0.5	Pass
173	5865	16.56	0.5	Pass
177	5885	17.15	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
167	5835	35.15	0.5	Pass
175	5875	36.59	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
171	5855	75.36	0.5	Pass

802.11ax (HE160)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
163	5815	154.14	0.5	Pass

802.11ax (RU26)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
177	5885	2.11	0.5	Pass

802.11ax (RU52)

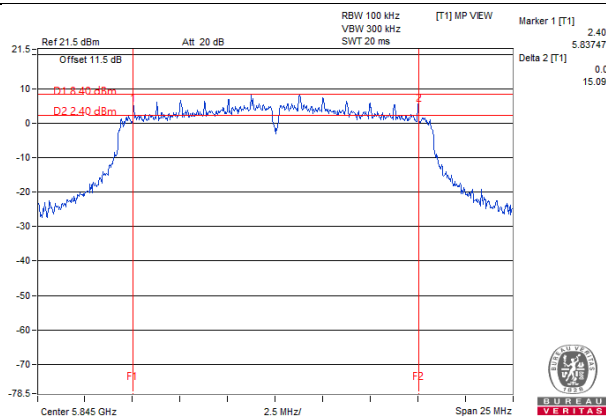
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
177	5885	17.13	0.5	Pass

802.11ax (RU106)

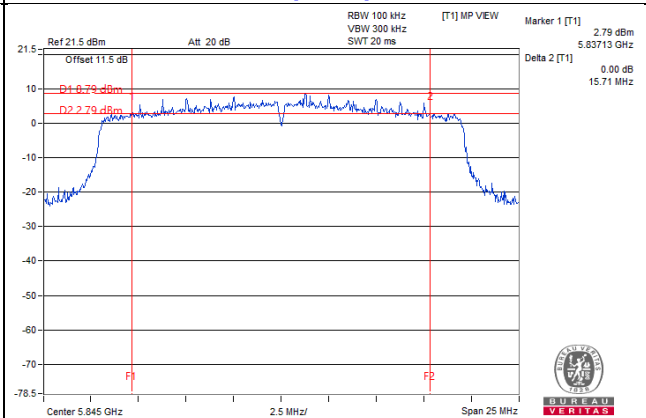
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
177	5885	17.17	0.5	Pass

Spectrum Plot of Worst Value

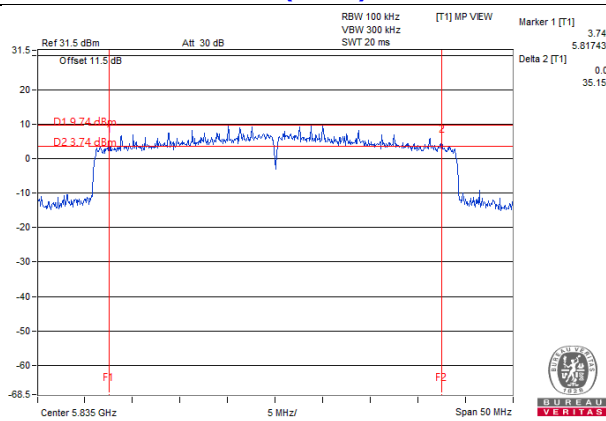
802.11a / CH169



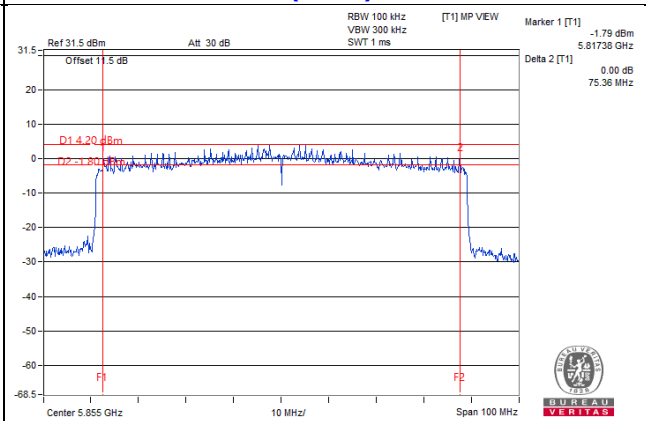
802.11ax (HE20) / CH169



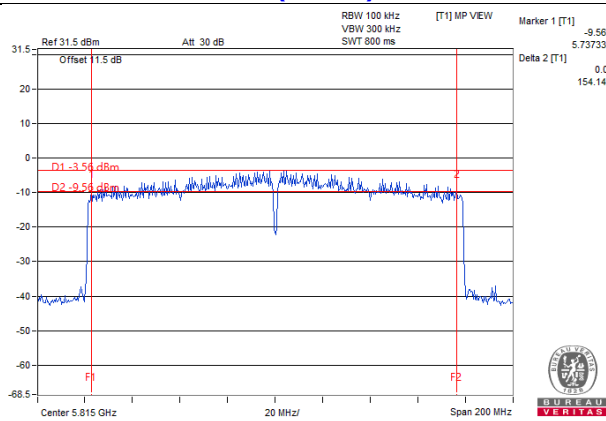
802.11ax (HE40) / CH167



802.11ax (HE80) / CH171

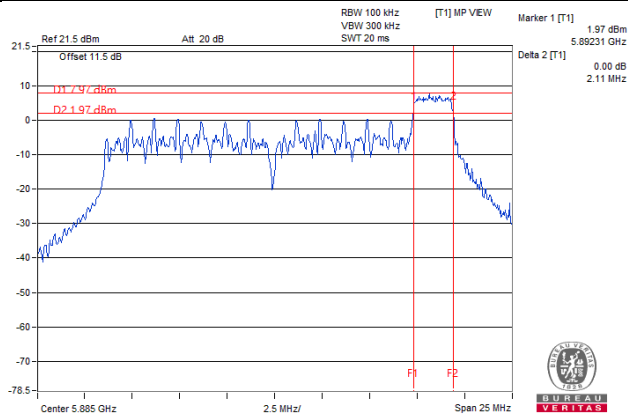


802.11ax (HE160) / CH163

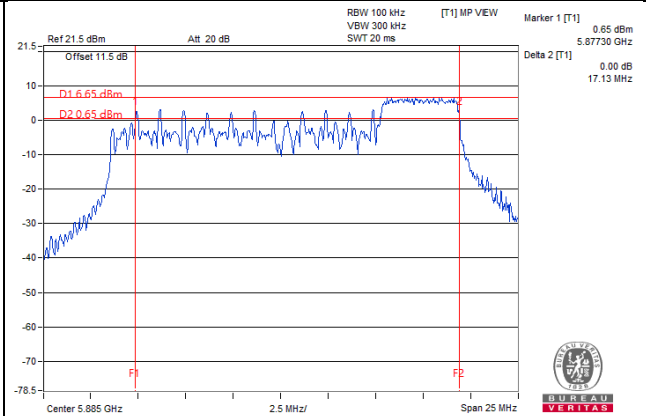


Spectrum Plot of Worst Value

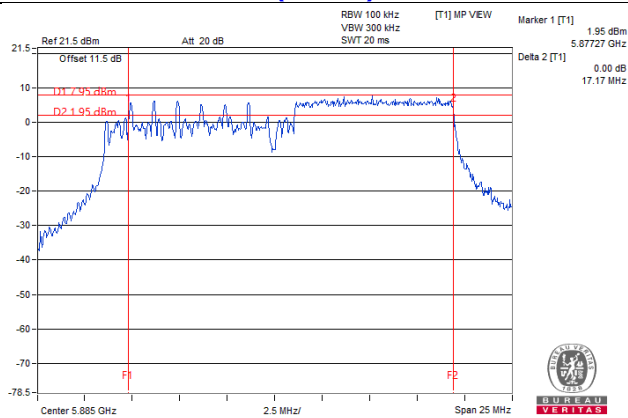
802.11ax (RU26) / CH177



802.11ax (RU52) / CH177



802.11ax (RU106) / CH177

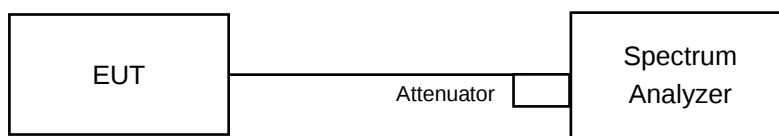


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Device Category		Limit
☐	Indoor access point	EIRP 20 dBm/MHz
☐	Subordinate device	EIRP 20 dBm/MHz
☒	Client device	EIRP 14 dBm/MHz
Note: For all U-NII-4 and U-NII-3 & -4 span channels shall met above EIRP values.		

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

Method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
6. Scale the observed power level to an equivalent value in 1 MHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log(1 \text{ MHz}/300 \text{ kHz}) = 5.23 \text{ dB}$
7. Record the max value and add $10 \log(1/\text{duty cycle})$.

4.5.5 EUT Operating Condition

Same as Item 4.3.5.

4.5.6 Test Results

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
169	5845	2.87	0.39	8.49	4.92	13.41	14	Pass
173	5865	3.02	0.39	8.64	4.92	13.56	14	Pass
177	5885	3	0.39	8.62	4.92	13.54	14	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
169	5845	2.75	0.53	8.51	4.92	13.43	14	Pass
173	5865	2.83	0.53	8.59	4.92	13.51	14	Pass
177	5885	-1.18	0.53	4.58	4.92	9.5	14	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
167	5835	3.09	0.68	9.00	4.92	13.92	14	Pass
175	5875	2.05	0.68	7.96	4.92	12.88	14	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
171	5855	-3.58	1.3	2.95	4.92	7.87	14	Pass

802.11ax (HE160)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
163	5815	-11.94	2.09	-4.62	4.92	0.3	14	Pass

802.11ax (RU26)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
177	5885	1.67	2.17	9.07	4.83	13.9	14	Pass

802.11ax (RU52)

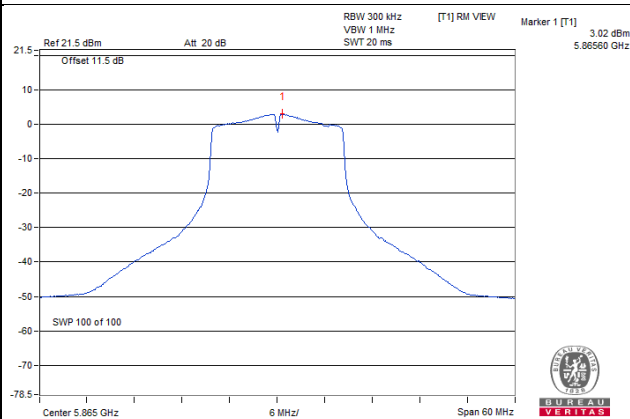
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
177	5885	1.11	2.32	8.66	4.83	13.49	14	Pass

802.11ax (RU106)

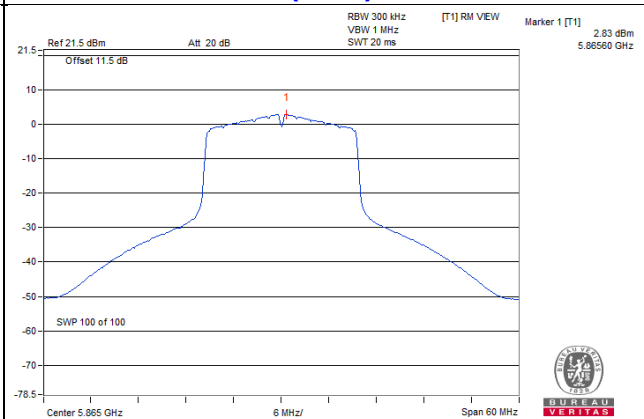
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	PSD (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Test Result
177	5885	1.02	2.66	8.91	4.83	13.74	14	Pass

Spectrum Plot of Worst Value

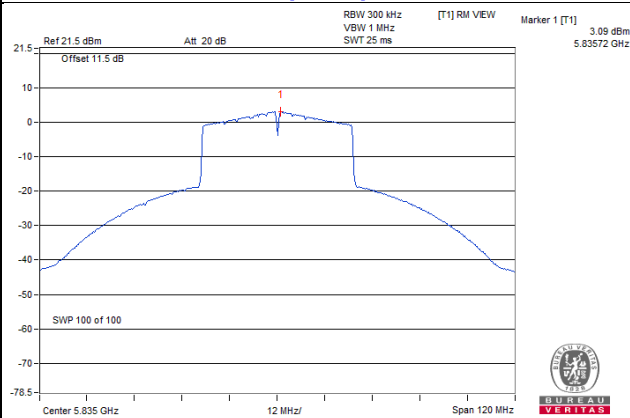
802.11a / CH173



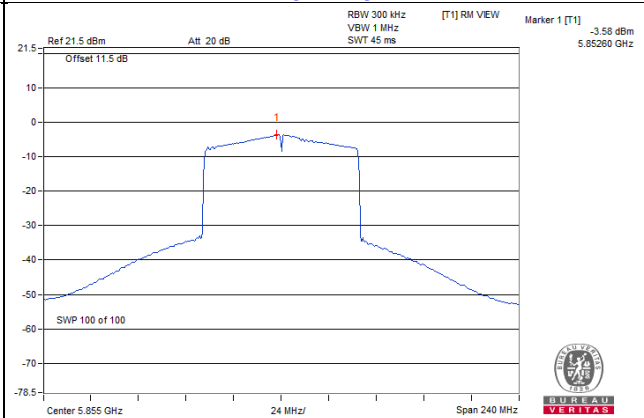
802.11ax (HE20) / CH173



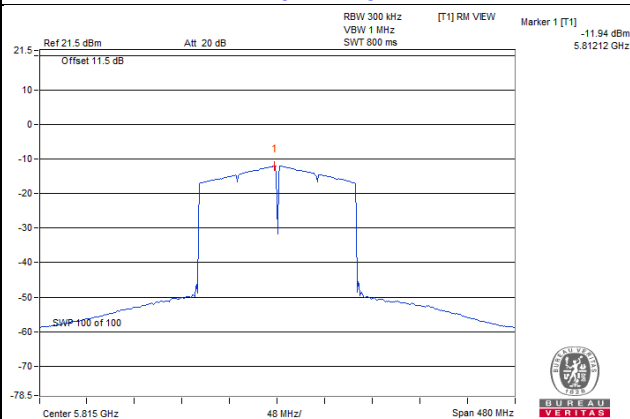
802.11ax (HE40) / CH167



802.11ax (HE80) / CH171

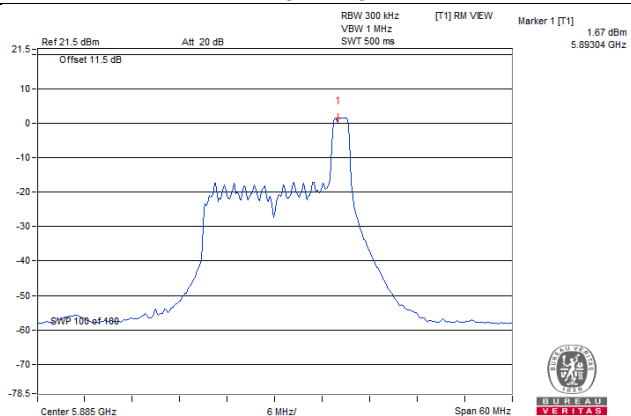


802.11ax (HE160) / CH163

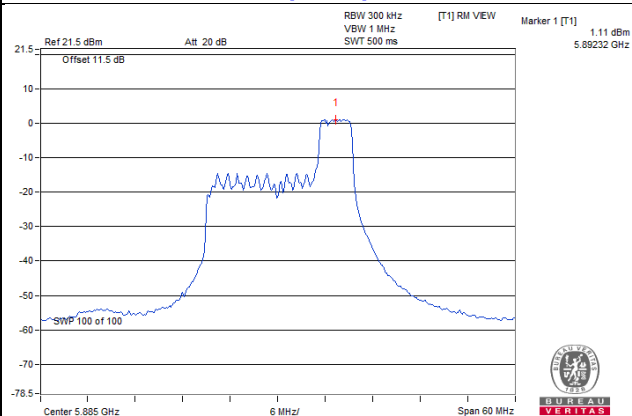


Spectrum Plot of Worst Value

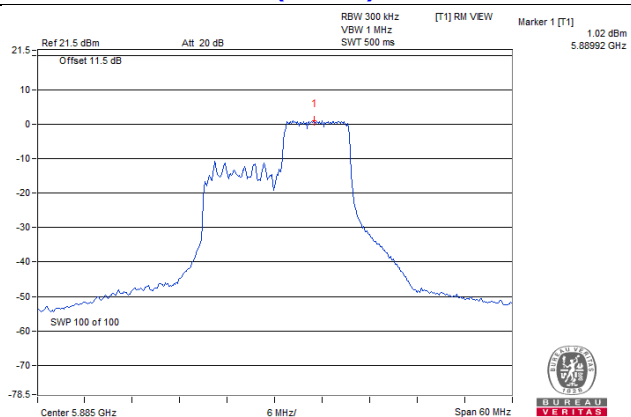
802.11ax (RU26) / CH177



802.11ax (RU52) / CH177



802.11ax (RU106) / CH177

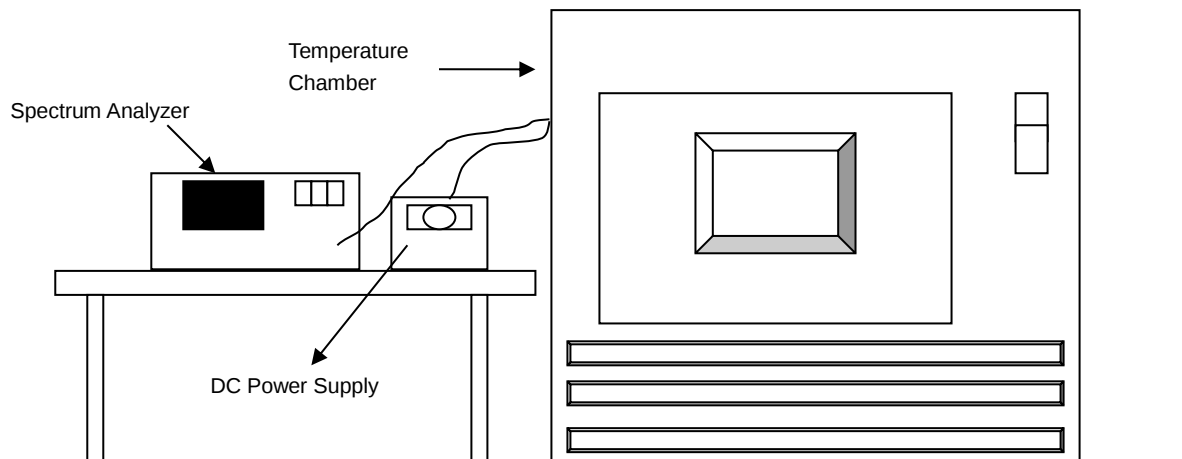


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 EUT Operating Condition

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

4.6.6 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5865MHz									
TEMP. (°C)	Power Supply (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
70	3.3	5865.0023	Pass	5865.0037	Pass	5865.0022	Pass	5865.0013	Pass
60	3.3	5864.9995	Pass	5865	Pass	5864.999	Pass	5864.9987	Pass
50	3.3	5864.9955	Pass	5864.9951	Pass	5864.9961	Pass	5864.9928	Pass
40	3.3	5864.9911	Pass	5864.9918	Pass	5864.991	Pass	5864.9905	Pass
30	3.3	5864.9941	Pass	5864.9944	Pass	5864.991	Pass	5864.9933	Pass
20	3.3	5864.9804	Pass	5864.986	Pass	5864.9818	Pass	5864.9842	Pass
10	3.3	5865.0066	Pass	5865.0078	Pass	5865.0046	Pass	5865.0061	Pass
0	3.3	5864.977	Pass	5864.9725	Pass	5864.9731	Pass	5864.9763	Pass
-10	3.3	5864.9776	Pass	5864.9789	Pass	5864.9816	Pass	5864.9802	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5865MHz									
TEMP. (°C)	Power Supply (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	3.795	5864.9849	Pass	5864.9819	Pass	5864.9842	Pass	5864.9834	Pass
	3.3	5864.9804	Pass	5864.986	Pass	5864.9818	Pass	5864.9842	Pass
	2.805	5864.9877	Pass	5864.9836	Pass	5864.9839	Pass	5864.9838	Pass

4.7 Operational Restrictions for U-NII 4 Devices

4.7.1 Limits of Operational Restrictions for U-NII 4 Devices

☐ (1) *Indoor Access Point.*

An access point that operates in the 5.850-5.895 GHz, is supplied power from a wired connection, has an integrated antenna, is not battery powered, and does not have a weatherized enclosure. Indoor access point devices must bear the following statement in a conspicuous location on the device and in the user's manual: FCC regulations restrict operation of this device to indoor use only.

☐ (2) *Subordinate Device.*

A subordinate device that operates in the 5.850-5.895 GHz band under the control of an Indoor Access Point, is supplied power from a wired connection, has an integrated antenna, is not battery powered, does not have a weatherized enclosure, and does not have a direct connection to the internet. Subordinate devices must not be used to connect devices between separate buildings or structures. Subordinate devices must be authorized under certification procedures in part 2 of this chapter. Modules may not be certified as subordinate devices.

☒ (3) *Client Device.*

A client device whose transmissions are generally under the control of an access point and is not capable of initiating a network

4.7.2 Test Setup

N/A

4.7.3 Test Instruments

N/A

4.7.4 Test Procedure

N/A.

4.7.5 Test Results

Device is a client device, all restrictions are meet the §15.403 requirements. Please refer to the Attestation letter exhibit supplied within this application.

5 Pictures of Test Arrangements

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

Annex A - Band-Edge Measurement

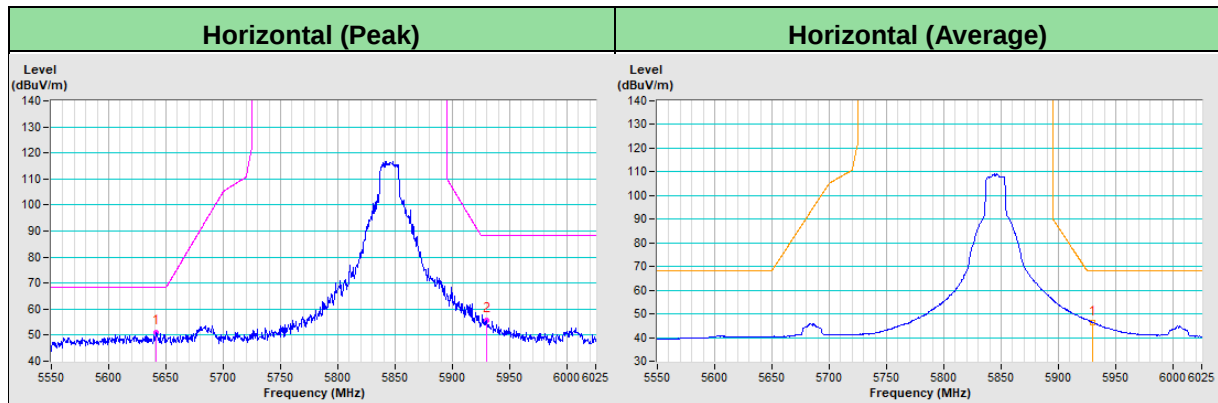
RF Mode	TX 802.11a	Channel	CH 169 : 5845 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5641.32	50.9 PK	68.2	-17.3	2.97 H	95	49.1	1.8
PK.2	#5930.02	55.7 PK	88.2	-32.5	2.97 H	95	53.5	2.2
AV.1	#5930.02	46.5 AV	68.2	-21.7	2.97 H	95	44.3	2.2

Remarks:

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

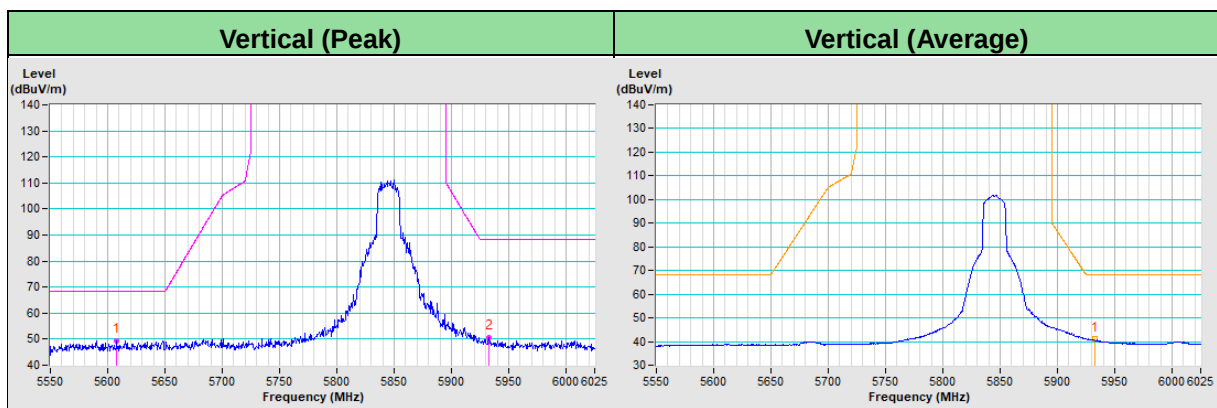


RF Mode	TX 802.11a	Channel	CH 169 : 5845 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5607.69	49.3 PK	68.2	-18.9	1.00 V	121	47.6	1.7
PK.2	#5932.79	50.6 PK	88.2	-37.6	1.00 V	121	48.4	2.2
AV.1	#5932.79	41.3 AV	68.2	-26.9	1.00 V	121	39.1	2.2

Remarks:

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

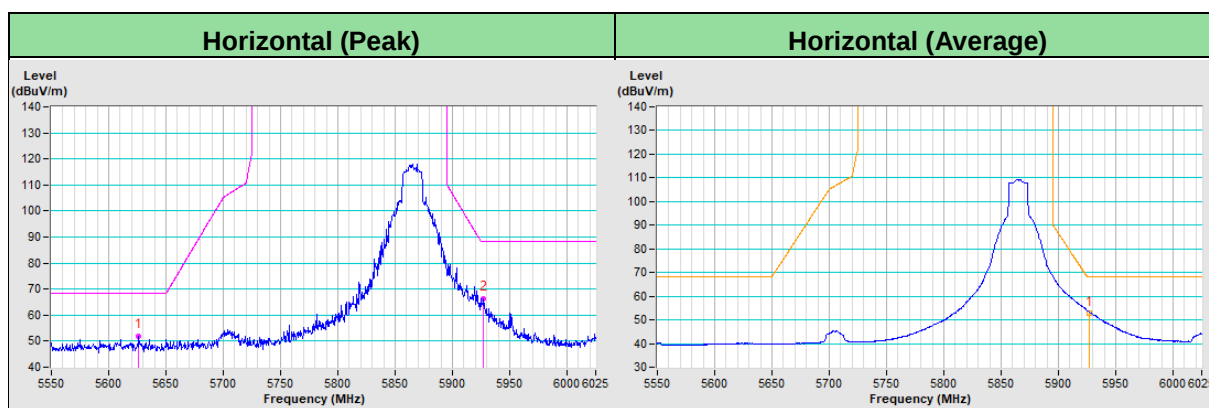


RF Mode	TX 802.11a	Channel	CH 173 : 5865 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5626.14	51.9 PK	68.2	-16.3	3.02 H	83	50.1	1.8
PK.2	#5927.23	66.4 PK	88.2	-21.8	3.02 H	83	64.2	2.2
AV.1	#5927.23	52.9 AV	68.2	-15.3	3.02 H	83	50.7	2.2

Remarks:

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

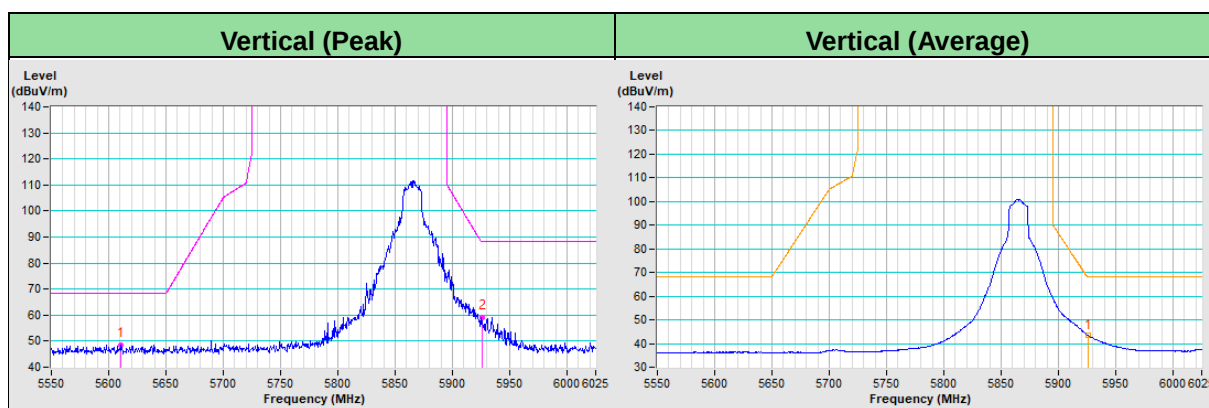


RF Mode	TX 802.11a	Channel	CH 173 : 5865 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	19 °C, 67 % RH
Tested By	Ryan Du		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5610.57	48.6 PK	68.2	-19.6	1.06 V	317	46.9	1.7
PK.2	#5925.90	59.2 PK	88.2	-29.0	1.06 V	317	57.0	2.2
AV.1	#5925.90	43.4 AV	68.2	-24.8	1.06 V	317	41.2	2.2

Remarks:

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

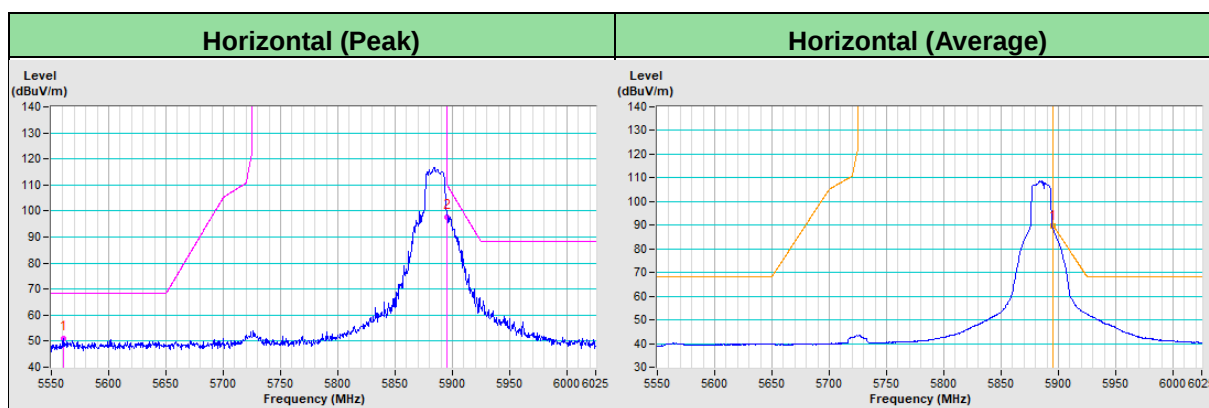


RF Mode	TX 802.11a	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5561.04	51.2 PK	68.2	-17.0	2.98 H	94	49.6	1.6
PK.2	#5895.00	97.7 PK	110.2	-12.5	2.98 H	94	95.5	2.2
AV.1	#5895.00	89.5 AV	90.2	-0.7	2.98 H	94	87.3	2.2

Remarks:

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

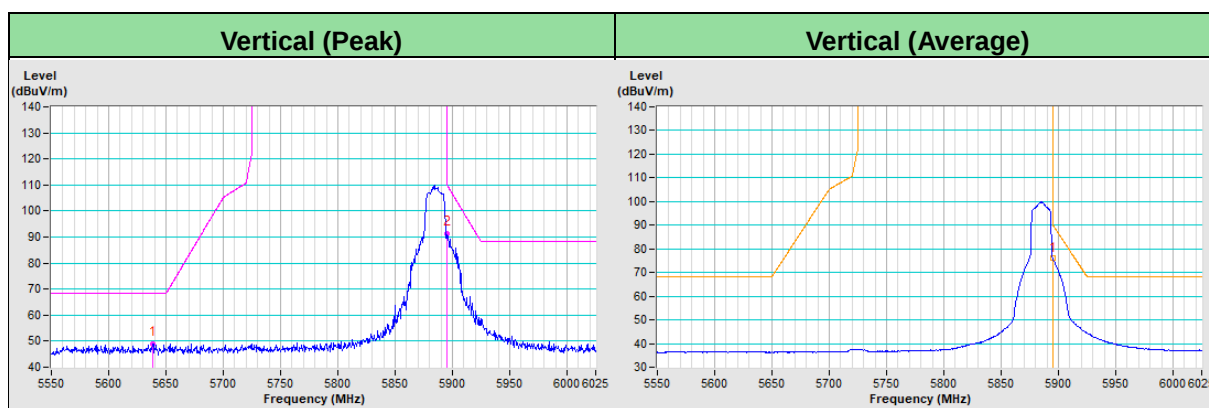


RF Mode	TX 802.11a	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	19 °C, 67 % RH
Tested By	Ryan Du		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5638.71	49.1 PK	68.2	-19.1	1.01 V	45	47.3	1.8
PK.2	#5895.00	91.2 PK	110.2	-19.0	1.01 V	45	89.0	2.2
AV.1	#5895.00	76.0 AV	90.2	-14.2	1.01 V	45	73.8	2.2

Remarks:

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

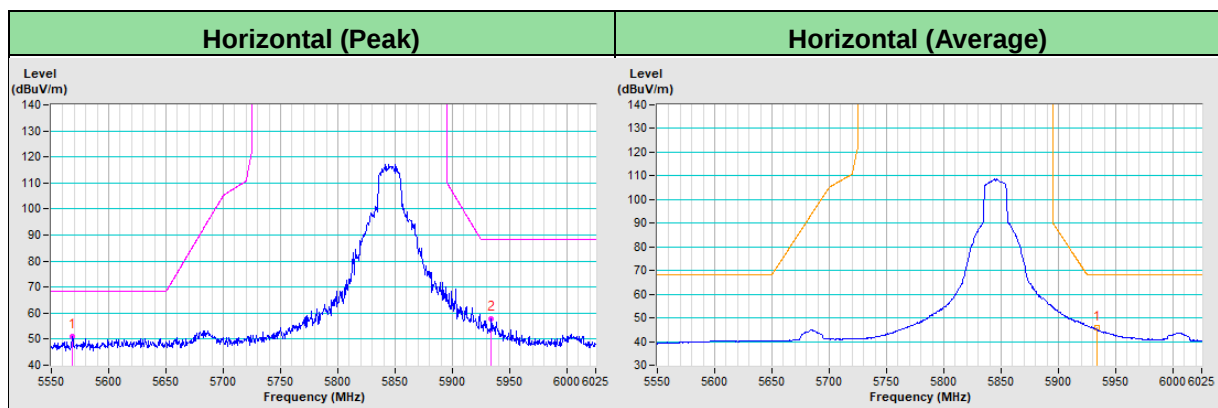


RF Mode	TX 802.11ax (HE20)	Channel	CH 169 : 5845 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5568.48	51.2 PK	68.2	-17.0	2.98 H	96	49.5	1.7
PK.2	#5933.49	57.8 PK	88.2	-30.4	2.98 H	96	55.6	2.2
AV.1	#5933.49	45.9 AV	68.2	-22.3	2.98 H	96	43.7	2.2

Remarks:

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

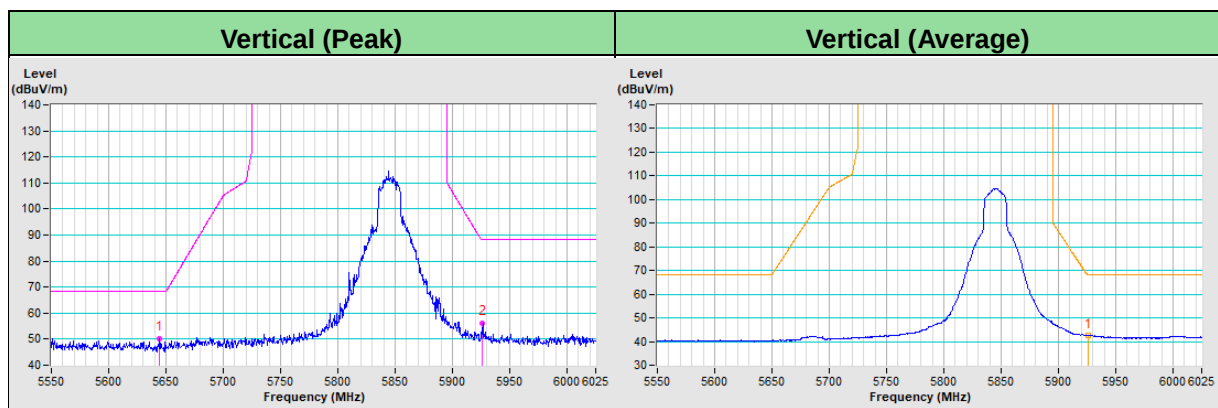


RF Mode	TX 802.11ax (HE20)	Channel	CH 169 : 5845 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Ryan Du		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5644.70	50.3 PK	68.2	-17.9	2.51 V	93	48.7	1.6
PK.2	#5926.32	56.1 PK	88.2	-32.1	2.51 V	93	54.1	2.0
AV.1	#5926.32	42.7 AV	68.2	-25.5	2.51 V	93	40.7	2.0

Remarks:

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

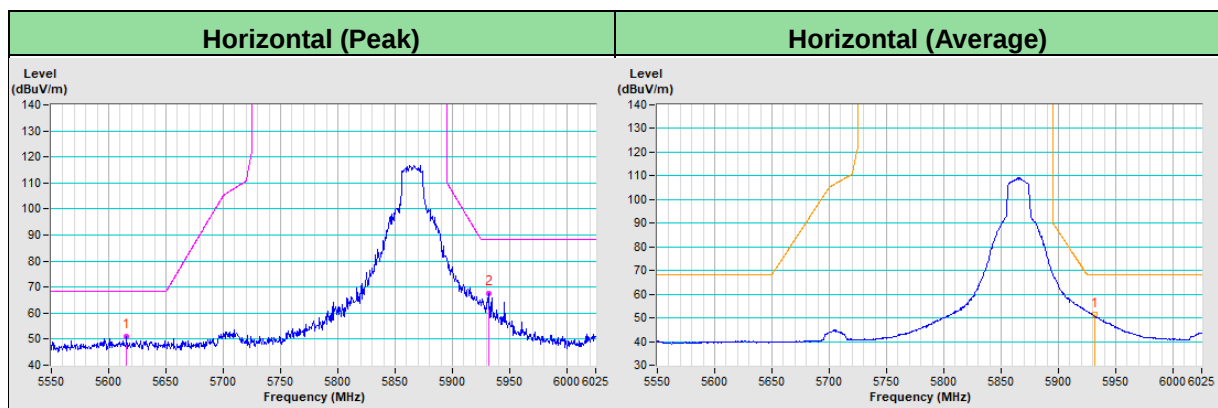


RF Mode	TX 802.11ax (HE20)	Channel	CH 173 : 5865 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5615.59	50.9 PK	68.2	-17.3	3.01 H	109	49.1	1.8
PK.2	#5932.20	67.7 PK	88.2	-20.5	3.01 H	109	65.5	2.2
AV.1	#5932.20	51.4 AV	68.2	-16.8	3.01 H	109	49.2	2.2

Remarks:

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

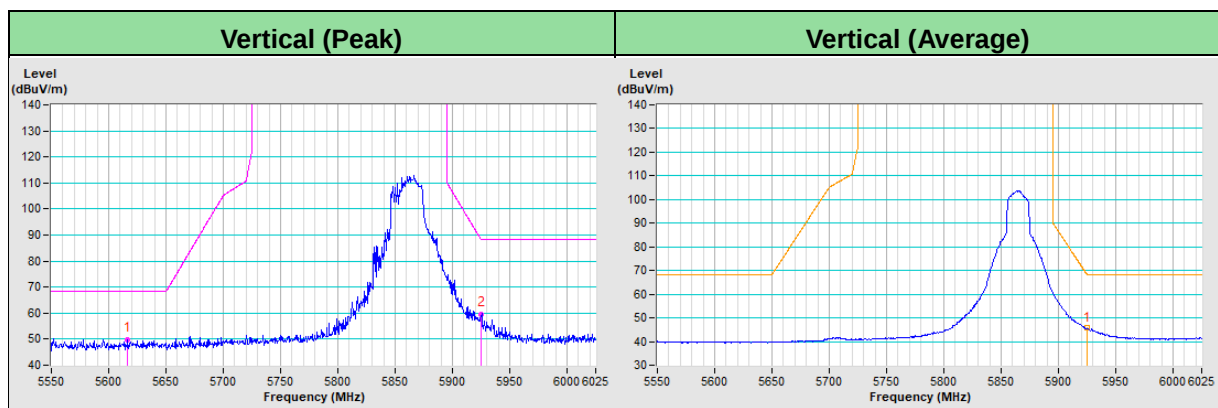


RF Mode	TX 802.11ax (HE20)	Channel	CH 173 : 5865 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Ryan Du		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5616.70	49.8 PK	68.2	-18.4	2.52 V	92	48.3	1.5
PK.2	#5925.00	59.7 PK	88.2	-28.5	2.52 V	92	57.7	2.0
AV.1	#5925.00	45.7 AV	68.2	-22.5	2.52 V	92	43.7	2.0

Remarks:

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

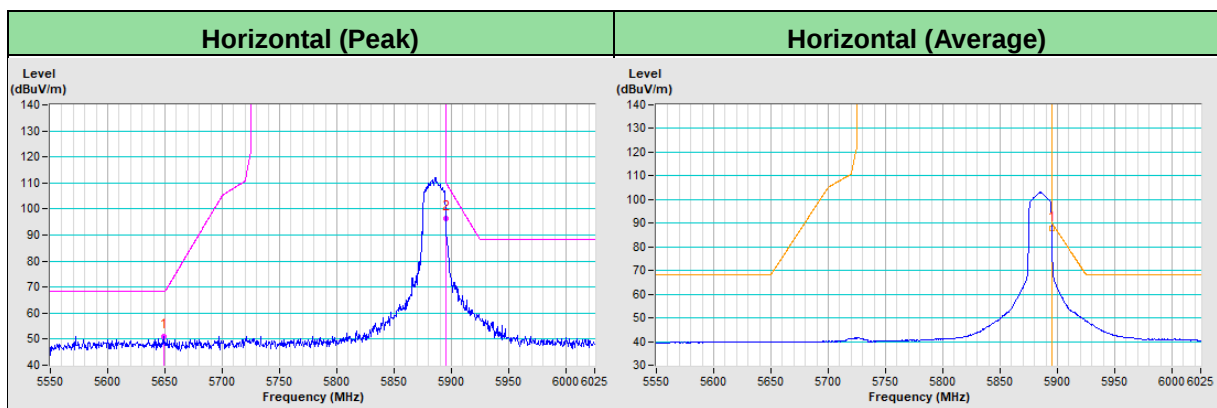


RF Mode	TX 802.11ax (HE20)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5649.22	50.9 PK	68.2	-17.3	2.98 H	96	49.1	1.8
PK.2	#5895.00	96.5 PK	110.2	-13.7	2.98 H	96	94.3	2.2
AV.1	#5895.00	87.7 AV	90.2	-2.5	2.98 H	96	85.5	2.2

Remarks:

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

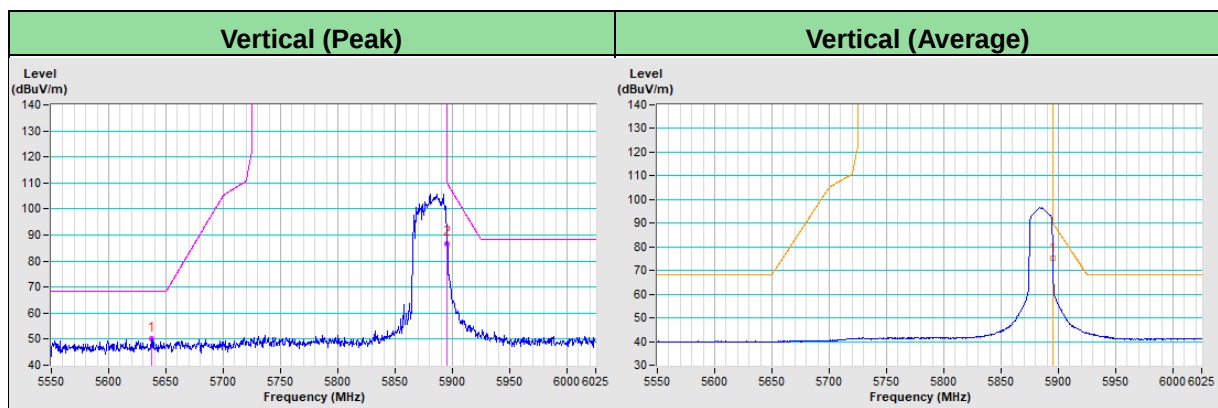


RF Mode	TX 802.11ax (HE20)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20 °C, 70 % RH
Tested By	Ryan Du		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBUV)	Correction Factor (dB/m)
PK.1	#5637.17	50.0 PK	68.2	-18.2	2.50 V	84	48.4	1.6
PK.2	#5895.00	86.6 PK	110.2	-23.6	2.50 V	84	84.7	1.9
AV.1	#5895.00	75.0 AV	90.2	-15.2	2.50 V	84	73.1	1.9

Remarks:

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

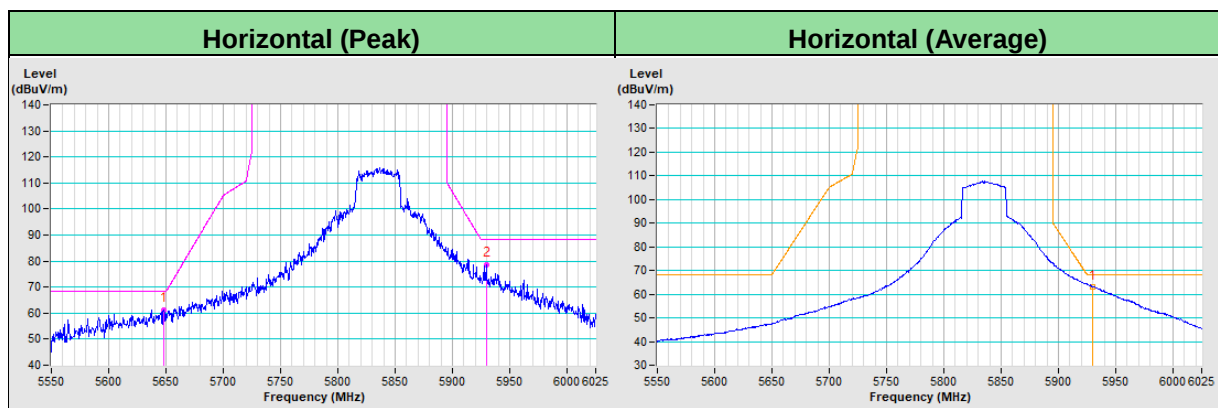


RF Mode	TX 802.11ax (HE40)	Channel	CH 167 : 5835 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5648.12	61.3 PK	68.2	-6.9	2.99 H	96	59.5	1.8
PK.2	#5929.67	78.5 PK	88.2	-9.7	2.99 H	96	76.3	2.2
AV.1	#5929.67	63.2 AV	68.2	-5.0	2.99 H	96	61.0	2.2

Remarks:

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

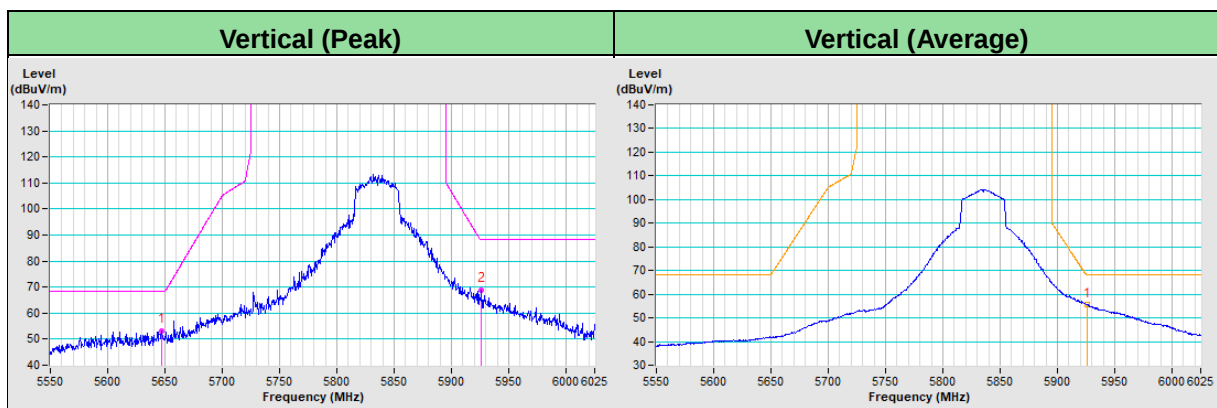


RF Mode	TX 802.11ax (HE40)	Channel	CH 167 : 5835 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 66 % RH
Tested By	Tom Yang		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5647.14	53.3 PK	68.2	-14.9	3.20 V	79	51.7	1.6
PK.2	#5926.39	68.8 PK	88.2	-19.4	3.20 V	79	66.8	2.0
AV.1	#5926.39	55.6 AV	68.2	-12.6	3.20 V	79	53.6	2.0

Remarks:

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

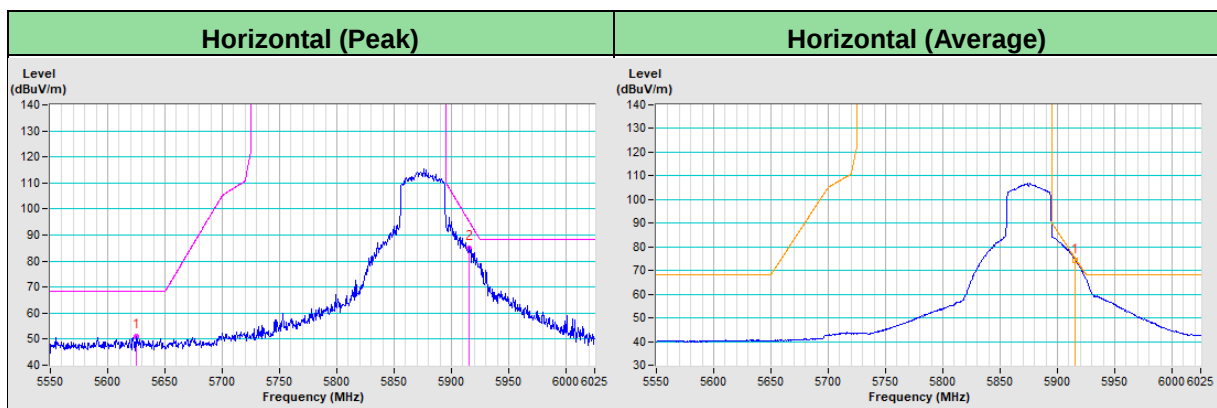


RF Mode	TX 802.11ax (HE40)	Channel	CH 175 : 5875 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5625.48	51.2 PK	68.2	-17.0	2.96 H	94	49.5	1.7
PK.2	#5915.57	85.1 PK	95.1	-10.0	2.96 H	94	82.9	2.2
AV.1	#5915.57	74.5 AV	75.1	-0.6	2.96 H	94	72.3	2.2

Remarks:

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

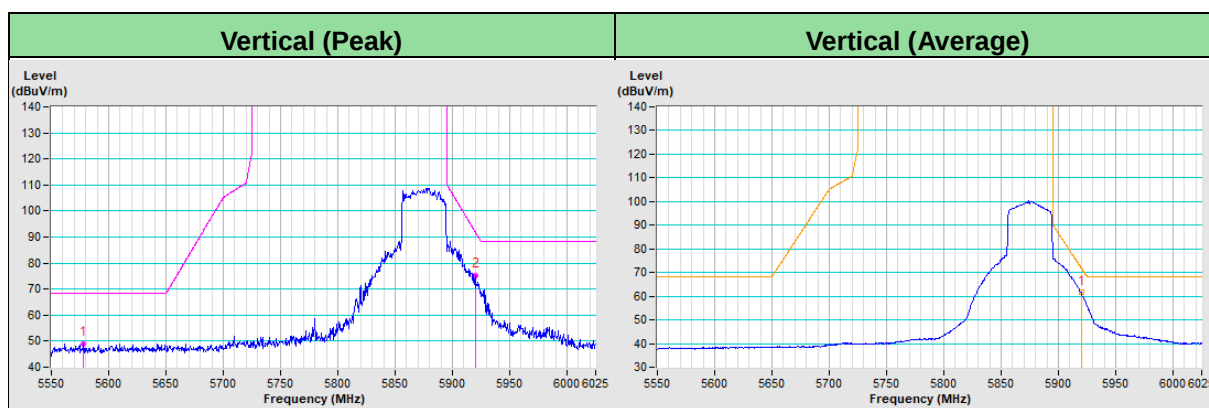


RF Mode	TX 802.11ax (HE40)	Channel	CH 175 : 5875 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 66 % RH
Tested By	Tom Yang		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5577.62	49.1 PK	68.2	-19.1	3.34 V	81	47.7	1.4
PK.2	#5919.85	75.1 PK	92.0	-16.9	3.34 V	81	73.1	2.0
AV.1	#5919.85	61.7 AV	72.0	-10.3	3.34 V	81	59.7	2.0

Remarks:

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

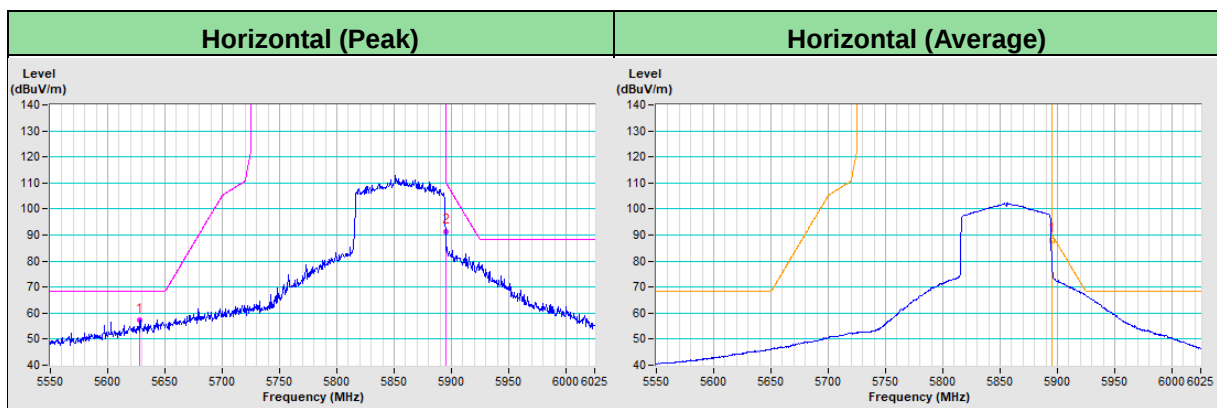


RF Mode	TX 802.11ax (HE80)	Channel	CH 171 : 5855 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5628.36	57.2 PK	68.2	-11.0	2.98 H	94	55.4	1.8
PK.2	#5895.00	91.2 PK	110.2	-19.0	2.98 H	94	89.0	2.2
AV.1	#5895.00	87.9 AV	90.2	-2.3	2.98 H	94	85.7	2.2

Remarks:

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

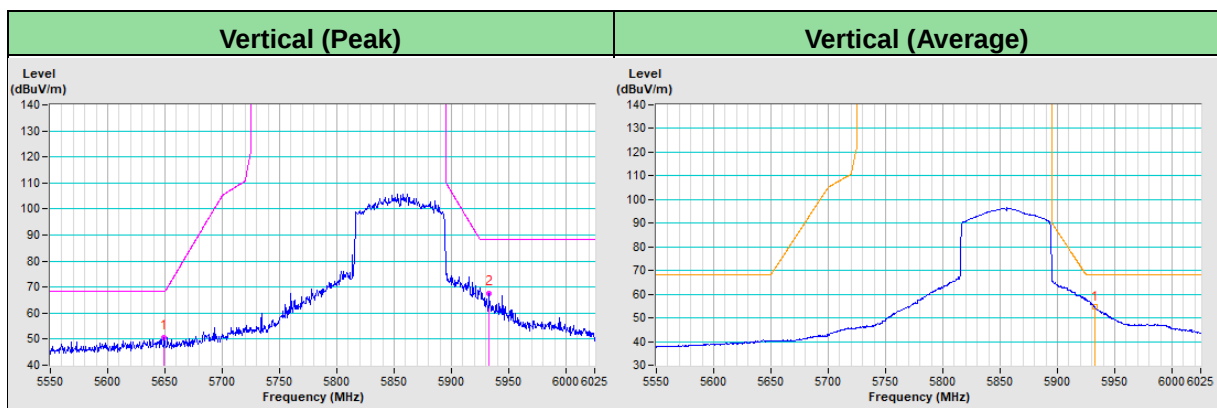


RF Mode	TX 802.11ax (HE80)	Channel	CH 171 : 5855 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 66 % RH
Tested By	Tom Yang		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5649.33	50.6 PK	68.2	-17.6	3.19 V	81	49.0	1.6
PK.2	#5932.59	67.5 PK	88.2	-20.7	3.19 V	81	65.5	2.0
AV.1	#5932.59	54.5 AV	68.2	-13.7	3.19 V	81	52.5	2.0

Remarks:

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

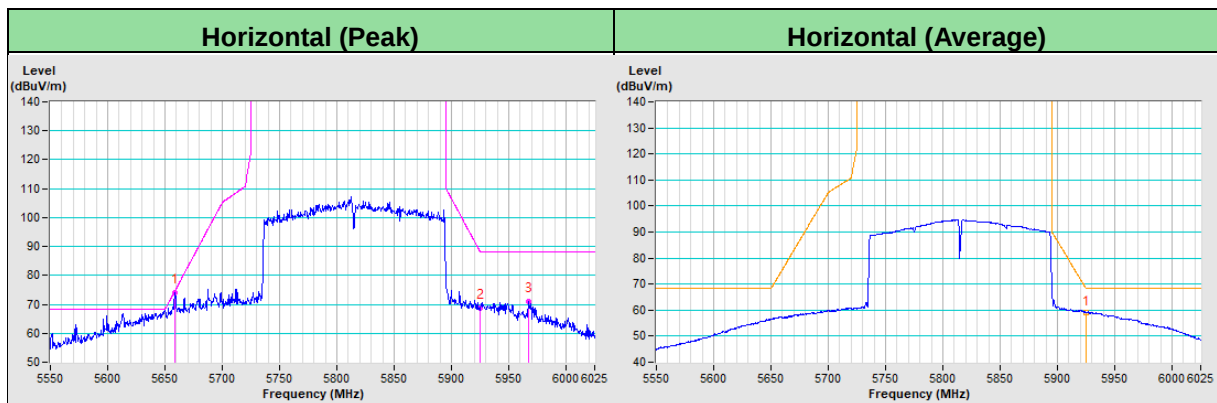


RF Mode	TX 802.11ax (HE160)	Channel	CH 163 : 5815 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5658.73	74.1 PK	74.7	-0.6	2.99 H	96	72.3	1.8
PK.2	#5925.00	68.6 PK	88.2	-19.6	2.99 H	96	66.4	2.2
PK.3	#5967.00	70.9 PK	88.2	-17.3	2.99 H	96	68.6	2.3
AV.1	#5925.00	58.9 AV	68.2	-9.3	2.99 H	96	56.7	2.2

Remarks:

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

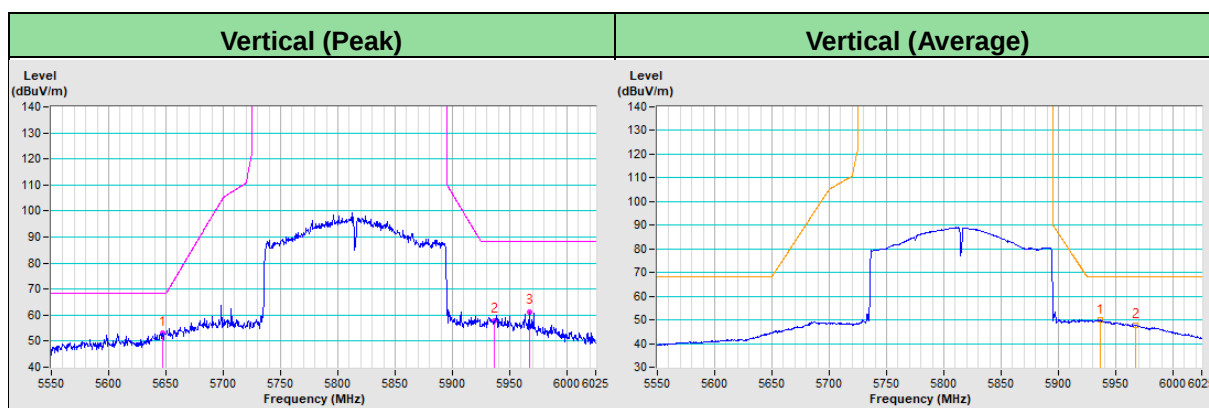


RF Mode	TX 802.11ax (HE160)	Channel	CH 163 : 5815 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 66 % RH
Tested By	Tom Yang		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5647.11	53.0 PK	68.2	-15.2	3.23 V	79	51.4	1.6
PK.2	#5936.50	57.7 PK	88.2	-30.5	3.23 V	79	55.7	2.0
PK.3	#5966.94	61.2 PK	88.2	-27.0	3.23 V	79	59.0	2.2
AV.1	#5936.50	49.9 AV	68.2	-18.3	3.23 V	79	47.9	2.0
AV.2	#5966.94	47.7 AV	68.2	-20.5	3.23 V	79	45.5	2.2

Remarks:

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

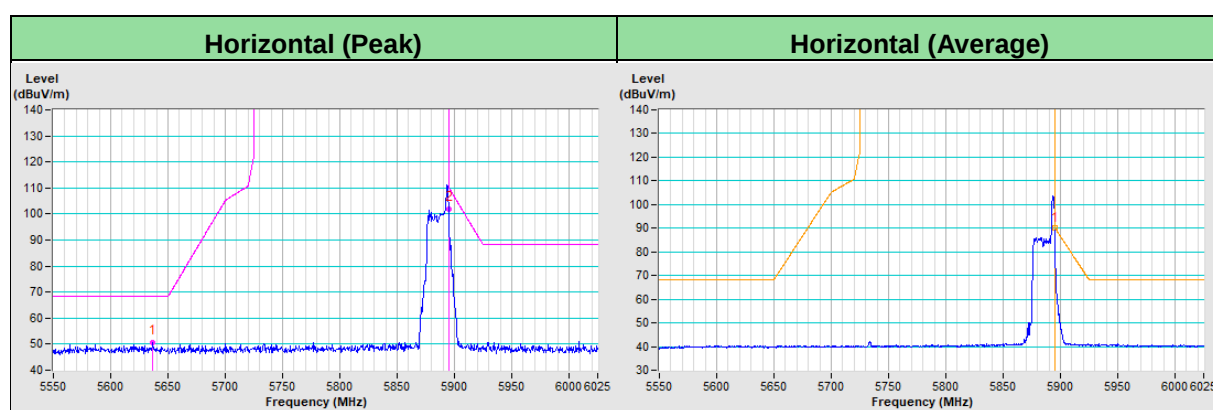


RF Mode	TX 20MHz Preamble 802.11ax (RU26)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5636.51	50.7 PK	68.2	-17.5	2.96 H	95	48.9	1.8
PK.2	#5895.00	102.0 PK	110.2	-8.2	2.96 H	95	99.8	2.2
AV.1	#5895.00	89.9 AV	90.2	-0.3	2.96 H	95	87.7	2.2

Remarks:

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

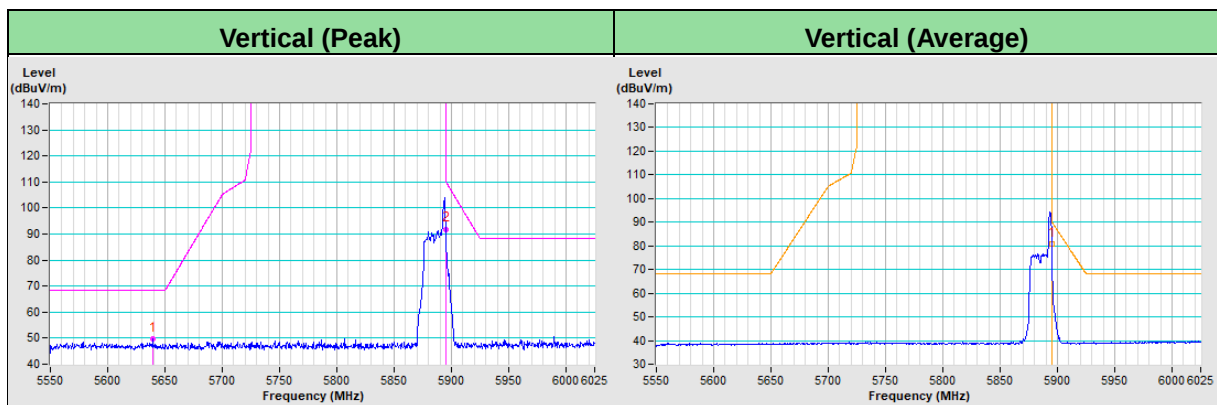


RF Mode	TX 20MHz Preamble 802.11ax (RU26)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Tom Yang		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5639.73	49.6 PK	68.2	-18.6	1.03 V	43	48.6	1.0
PK.2	#5895.00	91.9 PK	110.2	-18.3	1.03 V	43	90.6	1.3
AV.1	#5895.00	81.0 AV	90.2	-9.2	1.03 V	43	79.7	1.3

Remarks:

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

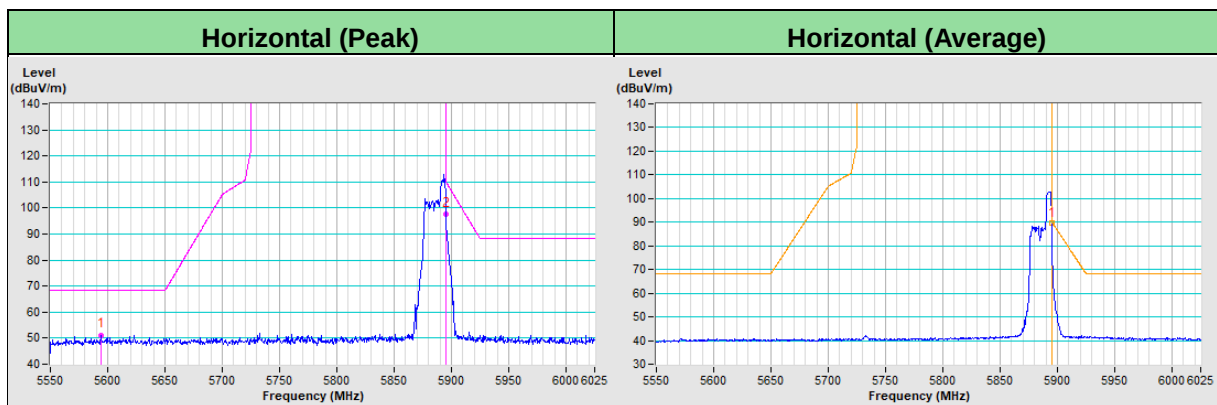


RF Mode	TX 20MHz Preamble 802.11ax (RU52)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5594.14	51.1 PK	68.2	-17.1	2.94 H	95	49.4	1.7
PK.2	#5895.00	97.5 PK	110.2	-12.7	2.94 H	95	95.3	2.2
AV.1	#5895.00	89.5 AV	90.2	-0.7	2.94 H	95	87.3	2.2

Remarks:

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

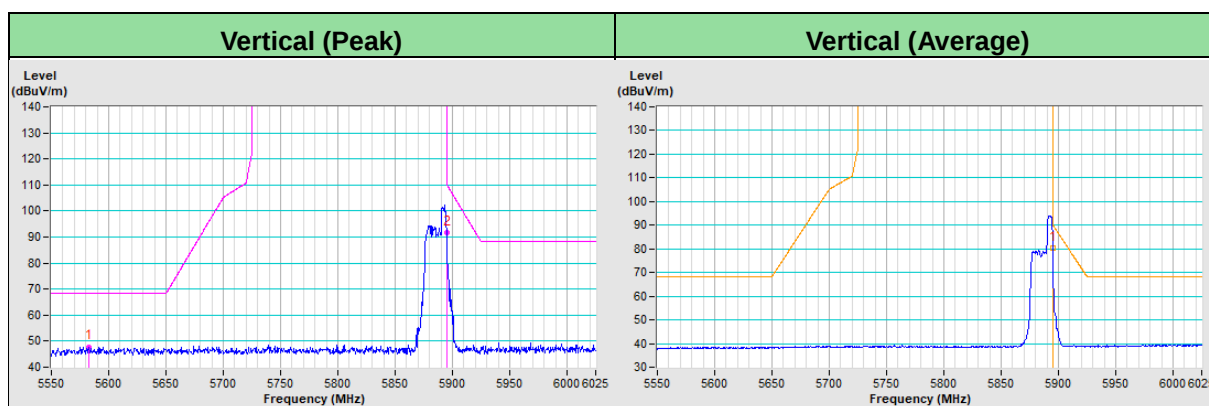


RF Mode	TX 20MHz Preamble 802.11ax (RU52)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Tom Yang		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5583.08	47.8 PK	68.2	-20.4	1.00 V	40	46.9	0.9
PK.2	#5895.00	91.5 PK	110.2	-18.7	1.00 V	40	90.2	1.3
AV.1	#5895.00	80.5 AV	90.2	-9.7	1.00 V	40	79.2	1.3

Remarks:

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

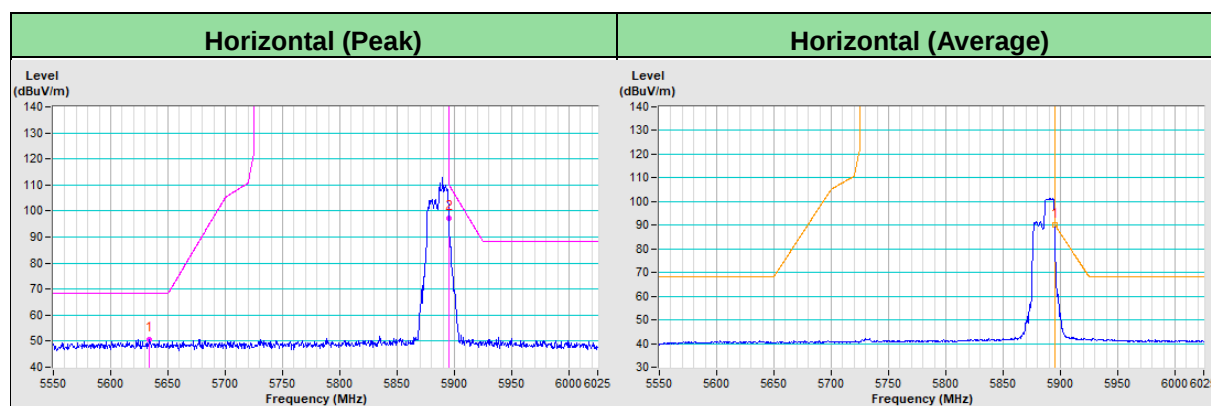


RF Mode	TX 20MHz Preamble 802.11ax (RU106)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 65 % RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5633.74	50.6 PK	68.2	-17.6	2.96 H	96	48.8	1.8
PK.2	#5895.00	97.1 PK	110.2	-13.1	2.96 H	96	94.9	2.2
AV.1	#5895.00	90.1 AV	90.2	-0.1	2.96 H	96	87.9	2.2

Remarks:

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

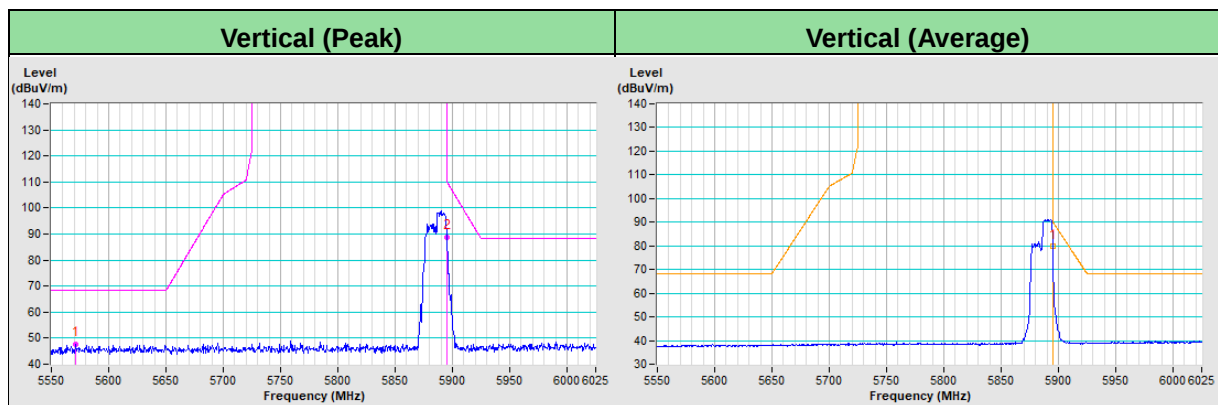


RF Mode	TX 20MHz Preamble 802.11ax (RU106)	Channel	CH 177 : 5885 MHz
Frequency Range	5550MHz ~ 6025MHz	Detector Function	Peak (PK) Average (AV)
Input Power (System)	120Vac, 60Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Tom Yang		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
PK.1	#5570.95	47.8 PK	68.2	-20.4	1.07 V	44	47.0	0.8
PK.2	#5895.00	88.7 PK	110.2	-21.5	1.07 V	44	87.4	1.3
AV.1	#5895.00	80.0 AV	90.2	-10.2	1.07 V	44	78.7	1.3

Remarks:

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



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:

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Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

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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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