FCC Test Report

Report No.:	RFBDQY-WTW-P21070082A-1
FCC ID:	YOR-RT6600AX
Test Model:	RT6600ax
Received Date:	Jul. 01, 2021
Test Date:	Oct. 28, 2021 ~ Jan. 08, 2022
Issued Date:	Jan. 24, 2022
Applicant:	Synology Incorporated
Address:	9F., No. 1, Yuandong Rd., Banqiao Dist., New Taipei City 220632, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location (1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003
Test Location (2):	No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
FCC Registration / Designation Number:	281270 / TW0032

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Release Control Record

Issue No.	Description	Date Issued
RFBDQY-WTW-P21070082A-1	Original release	Jan. 24, 2022

1 Certificate of Conformity

Product:	802.11ax Wireless Router
Brand:	Synology
Test Model:	RT6600ax
Sample Status:	Engineering sample
Applicant:	Synology Incorporated
Test Date:	Oct. 28, 2021 ~ Jan. 08, 2022
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

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

Prepared by : Celine Chou , **Date:** Jan. 24, 2022

Celine Chou / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jan. 24, 2022

Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(9)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -8.12dB at 0.46200MHz.
15.407(b)(5) (9)	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is 5647.85dB at -0.2MHz.
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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	802.11ax Wireless Router
Brand	Synology
Test Model	RT6600ax
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 600Mbps 802.11ac: up to 3466.7Mbps 802.11ax: up to 4804.0Mbps
Operating Frequency	5845 ~ 5885MHz
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 Power	CDD Mode: 3140.509mW Beamforming Mode: 3140.509mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Adapter
Cable Supplied	0.93m non-shielded RJ45 cable without core

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV CPS report no.: RFBDQY-WTW-P21070082-1) is adding 5.26GHz to 5.32GHz, 5.50GHz to 5.75GHz and 5.845GHz to 5.885GHz by software and adding one adapter.

2. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	Beamforming Mode	TX Function
802.11a	Not Support	4TX
802.11n (HT20)	Support	4TX
802.11n (HT40)	Support	4TX
802.11ac (VHT20)	Support	4TX
802.11ac (VHT40)	Support	4TX
802.11ac (VHT80)	Support	4TX
802.11ac (VHT160)	Support	4TX
802.11ax (HE20)	Support	4TX
802.11ax (HE40)	Support	4TX
802.11ax (HE80)	Support	4TX
802.11ax (HE160)	Support	4TX

* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40/VHT80/VHV160 on 802.11ac mode and HE20/HE40/HE80/HE160 on 802.11ax mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)

* CDD mode is the worst case for final tests after pretesting CDD mode and Beamforming Mode mode except output power test.

3. There are three radios for the EUT.

Radio	Brand	Model	Function	TX/RX Function
1	Qualcomm	QCN5022	2412 ~ 2462MHz	2x2
2	Qualcomm	QCN5052	5180 ~ 5240MHz 5260 ~ 5320MHz	2x2
3	Qualcomm	QCN9024	5500 ~ 5720MHz 5745 ~ 5825MHz 5845 ~ 5885MHz	4x4

4. The EUT consumes power from the following adapter. (The new adapter is adapter 2)

Adapter 1	
Brand	CWT
Model	2AEJ042FC
Input Power	100-240Vac, 50-60Hz, 1.3A
Output Power	12Vdc, 3.5A, 42.0W
Power Line	1.5m cable without core attached on adapter

Adapter 2	
Brand	CWT
Model	2ABN042F
Input Power	100-240Vac, 50-60Hz, 1.3A
Output Power	12Vdc, 3.5A
Power Line	1.5m cable without core attached on adapter

5. The antenna information is listed as below.

No.	Brand	Model	Type	Connector	Gain (dBi)			
					2412-2462 MHz	5180-5320 MHz	5500-5825 MHz	5845-5885 MHz
1	LYNwave	ALX21X-221031-00	Dipole	ipex(MHF)	2.00	3.00	-	-
2	LYNwave	ALX21X-221032-00	Dipole	ipex(MHF)	2.00	3.00	-	-
3	LYNwave	ALX21X-221033-00	Dipole	ipex(MHF)	-	-	3.00	3.30
4	LYNwave	ALX21X-221034-00	Dipole	ipex(MHF)	-	-	3.00	3.30
5	LYNwave	ALX21X-221035-00	Dipole	ipex(MHF)	-	-	3.00	3.30
6	LYNwave	ALX21X-221036-00	Dipole	ipex(MHF)	-	-	3.00	3.30

* 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

3 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 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 (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
*167	5835 MHz	175	5875 MHz

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

Channel	Frequency
*171	5855 MHz

1 channel is provided for 802.11ac (VHT160), 802.11ax (HE160):

Channel	Frequency
*163	5815 MHz

Note: * Straddle channels.

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Powered by adapter 1
B	-	√	√	-	Powered by adapter 2

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission APCM: Antenna Port Conducted Measurement

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	5845-5885	169 to 177	169, 173, 177	OFDM	BPSK	6Mb/s
	802.11ax (HE20)	5845-5885	169 to 177	169, 173, 177	OFDMA	BPSK	MCS0
	802.11ax (HE40)	5835-5875	167 to 175	167, 175	OFDMA	BPSK	MCS0
	802.11ax (HE80)	5855-5855	171	171	OFDMA	BPSK	MCS0
	802.11ax (HE160)	5815-5815	163	163	OFDMA	BPSK	MCS0

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11ax (HE40)	5835-5875	167 to 175	167	OFDMA	BPSK	MCS0

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11ax (HE40)	5835-5875	167 to 175	167	OFDMA	BPSK	MCS0

Bandwidth, Power Spectral Density and Frequency Stability Measurement:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	5845-5885	169 to 177	169, 173, 177	OFDM	BPSK	6Mb/s
	802.11ax (HE20)	5845-5885	169 to 177	169, 173, 177	OFDMA	BPSK	MCS0
	802.11ax (HE40)	5835-5875	167 to 175	167, 175	OFDMA	BPSK	MCS0
	802.11ax (HE80)	5855-5855	171	171	OFDMA	BPSK	MCS0
	802.11ax (HE160)	5815-5815	163	163	OFDMA	BPSK	MCS0

Conducted Output Power Measurement:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	5845-5885	169 to 177	169, 173, 177	OFDM	BPSK	6Mb/s
	802.11n (HT20)	5845-5885	169 to 177	169, 173, 177	OFDM	BPSK	MCS0
	802.11n (HT40)	5835-5875	167 to 175	167, 175	OFDM	BPSK	MCS0
	802.11ac (VHT20)	5845-5885	169 to 177	169, 173, 177	OFDM	BPSK	MCS0
	802.11ac (VHT40)	5835-5875	167 to 175	167, 175	OFDM	BPSK	MCS0
	802.11ac (VHT80)	5855-5855	171	171	OFDM	BPSK	MCS0
	802.11ac (VHT160)	5815-5815	163	163	OFDMA	BPSK	MCS0
	802.11ax (HE20)	5845-5885	169 to 177	169, 173, 177	OFDMA	BPSK	MCS0
	802.11ax (HE40)	5835-5875	167 to 175	167, 175	OFDMA	BPSK	MCS0
	802.11ax (HE80)	5855-5855	171	171	OFDMA	BPSK	MCS0
	802.11ax (HE160)	5815-5815	163	163	OFDMA	BPSK	MCS0

Test Condition:

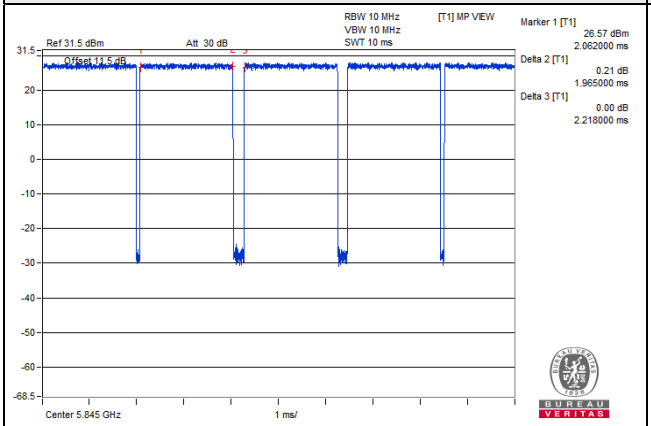
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 68% RH	120Vac, 60Hz	Raymond Lee
RE<1G	23 deg. C, 68% RH 24 deg. C, 67% RH	120Vac, 60Hz	Raymond Lee
PLC	21 deg. C, 68% RH 24 deg. C, 68% RH	120Vac, 60Hz	Tim Chen Raymond Lee
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Alan Wu

3.3 Duty Cycle of Test Signal

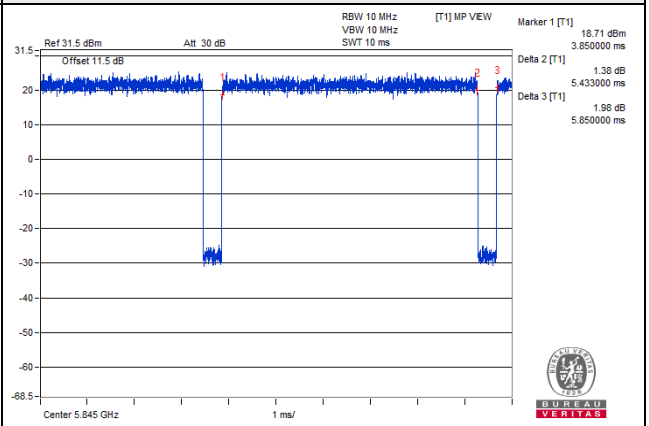
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 1.965/2.218 = 0.886, Duty factor = 10 * log (1/0.886) = 0.53
802.11ax (HE20): Duty cycle = 5.433/5.850 = 0.929, Duty factor = 10 * log (1/0.929) = 0.32
802.11ax (HE40): Duty cycle = 5.400/5.845 = 0.924, Duty factor = 10 * log (1/0.924) = 0.34
802.11ax (HE80): Duty cycle = 5.400/5.910 = 0.914, Duty factor = 10 * log (1/0.914) = 0.39
802.11ax (HE160):Duty cycle = 5.435/5.830 = 0.932, Duty factor = 11 * log (1/0.932) = 0.30

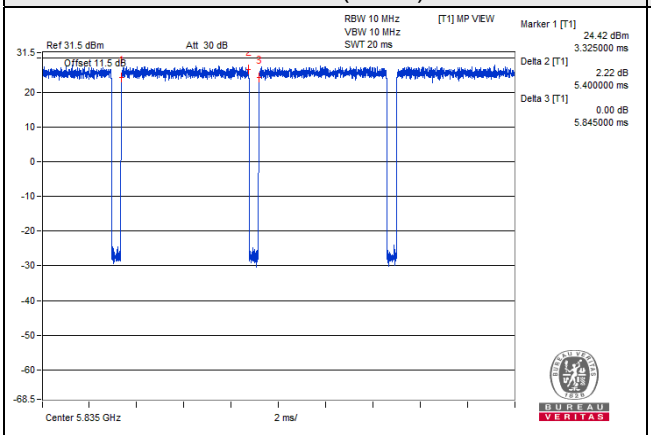
802.11a



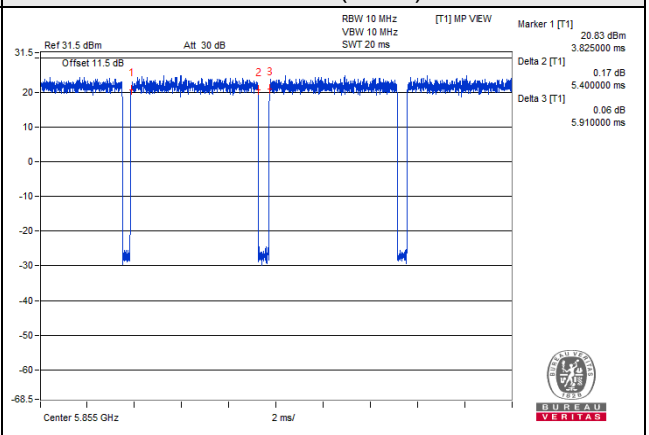
802.11ax (HE20)



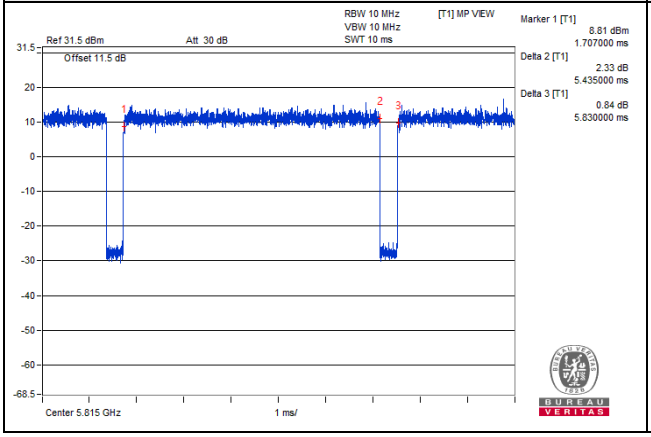
802.11ax (HE40)



802.11ax (HE80)



802.11ax (HE160)



3.4 Description of Support Units

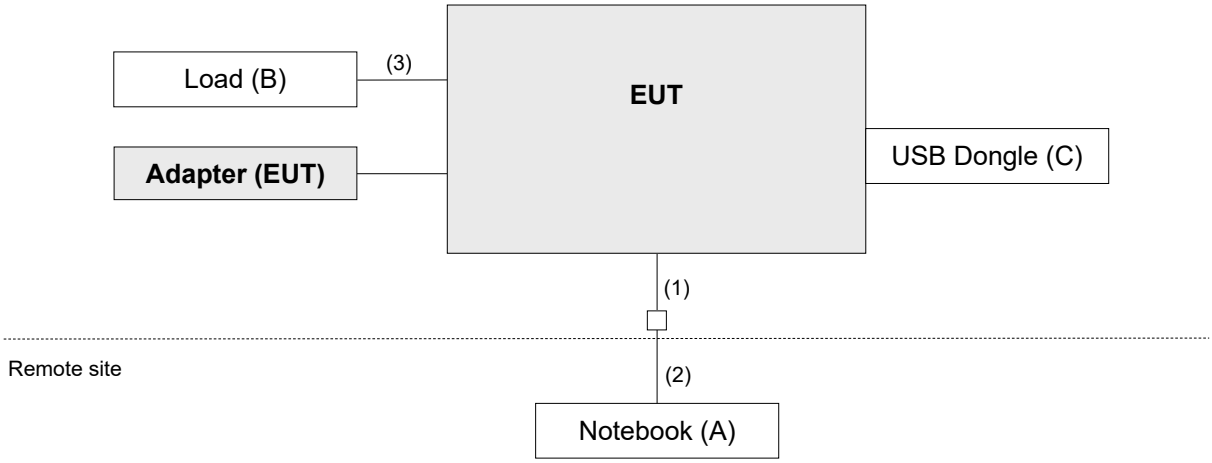
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5430	2RL3YW1	FCC DoC Approved	-
B.	Load	NA	NA	NA	FCC DoC Approved	-
C.	USB Dongle	D-Link	DWM-157	RD0S1F9000417	NA	-

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN Cable	1	0.93	N	0	Accessory of EUT
2.	LAN Cable	1	6	N	0	RJ45, Cat5e
3.	LAN Cable	4	1.5	N	0	RJ45, Cat5e

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

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

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

References Test Guidance:
KDB 987594 D02 EMC Measurement v01r01
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
KDB 291074 D02 EMC Measurement v01

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:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Rohde & Schwarz	ESR3	102783	Dec. 21, 2020	Dec. 20, 2021
			Dec. 20, 2021	Dec. 19, 2022
Spectrum Analyzer KEYSIGHT	N9020B	MY60110513	Dec. 21, 2020	Dec. 20, 2021
			Dec. 24, 2021	Dec. 23, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-1214	Nov. 04, 2020	Nov. 03, 2021
			Oct. 28, 2021	Oct. 27, 2022
HORN Antenna RF SPIN	DRH18-E	210104A18E	Jan. 08, 2021	Jan. 07, 2022
			Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1049	Dec. 09, 2020	Dec. 08, 2021
			Nov. 14, 2021	Nov. 13, 2022
Preamplifier EMCI	EMC330N	980798	Jan. 12, 2021	Jan. 11, 2022
Preamplifier EMCI	EMC118A45SE	980809	Jan. 12, 2021	Jan. 11, 2022
Preamplifier EMCI	EMC184045SE	980786	Jan. 12, 2021	Jan. 11, 2022
RF signal cable EMCI	EMC104-SM-SM-(9000+2000+1000)	201244+ 201232+ 210103	Jan. 12, 2021	Jan. 11, 2022
RF signal cable EMCI	EMCCFD400-NM-NM-(9000+300+500)	201251+ 201249+ 201248	Jan. 12, 2021	Jan. 11, 2022
RF signal cable EMCI	EMC101G-KM-KM-(5000+3000+2000)	201261+201258+201249	Jan. 12, 2021	Jan. 11, 2022
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFA-515BSN	NA	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208676	NA	NA
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 19, 2021	Jan. 18, 2022
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 11, 2021	Jan. 10, 2022

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in WM Chamber 9.

4.1.3 Test Procedures

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

g. When operating in U-NII-4 OOBE and spurious emissions are to be measured outside of the 5725-5895 MHz band. Below 5725 MHz the -27 dBm EIRP is measured with a Peak detector and above 5895 MHz it is measured with an RMS detector. If the -27 dBm EIRP limit is met with a Peak detector retesting with an RMS detector is not required.

Note:

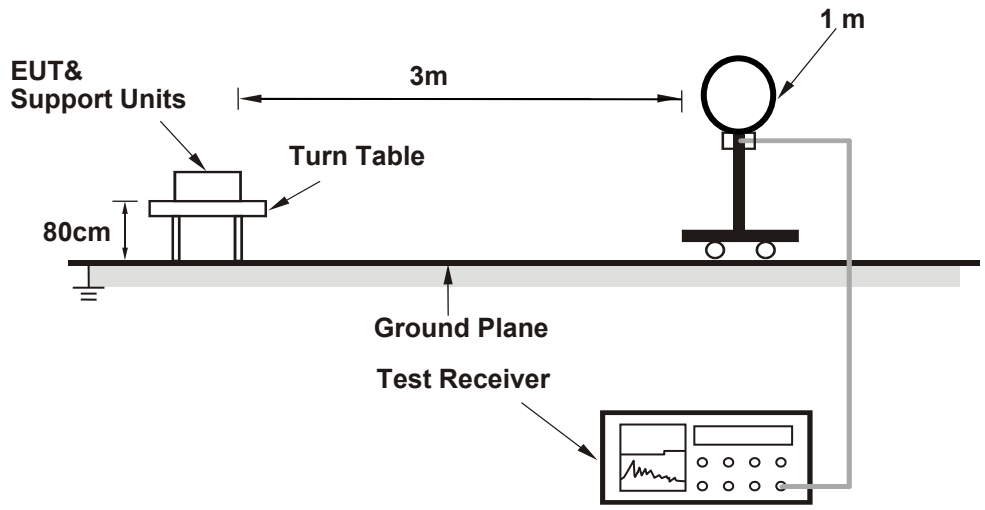
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz. (802.11a: RBW = 1MHz, VBW = 1kHz; 802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE80): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE160): RBW = 1MHz, VBW = 1kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

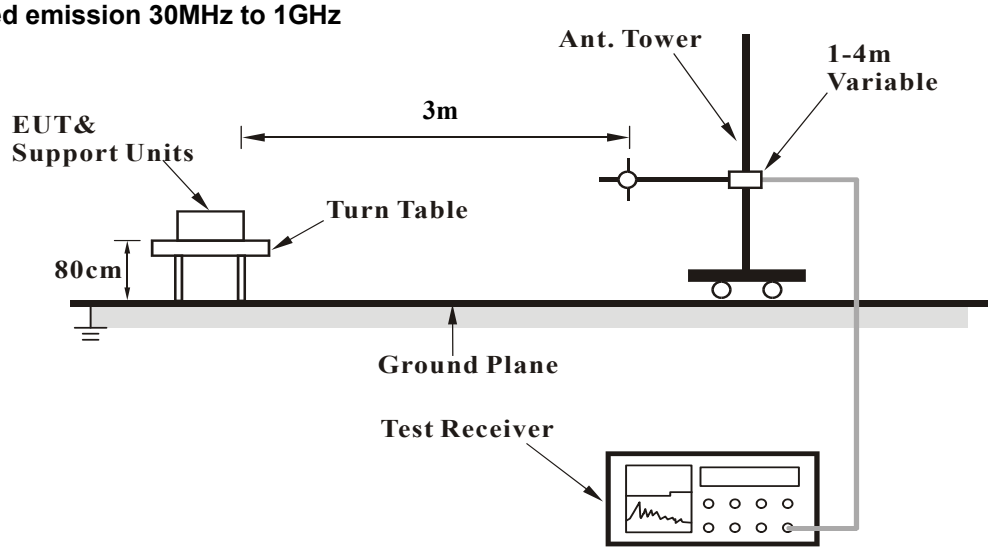
No deviation.

4.1.5 Test Setup

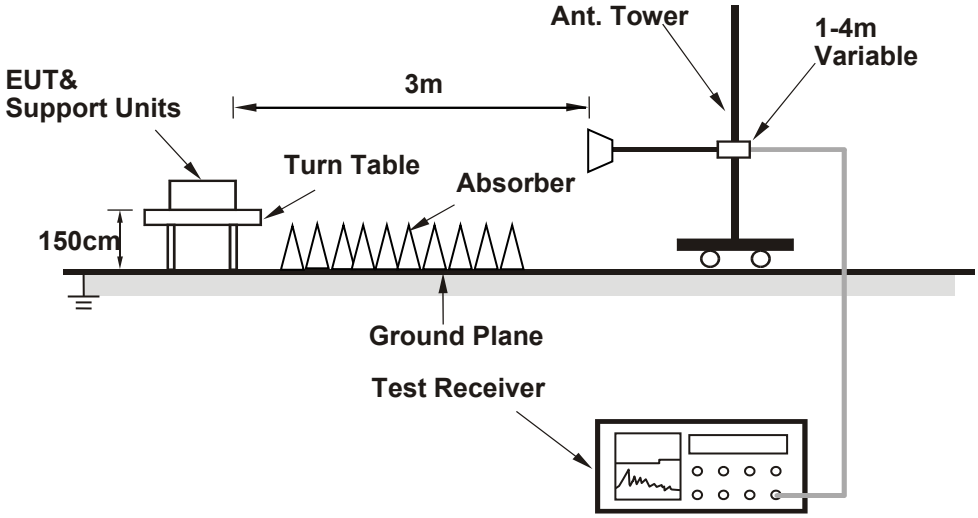
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz data:

RF Mode	TX 11a 5.9G	Channel	CH 169：5845 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	#5634.55	59.5 PK	68.2	-8.7	3.12 H	331	55.1	4.4
2	*5845.00	116.3 PK			3.12 H	331	74.7	41.6
3	*5845.00	107.0 AV			3.12 H	331	65.4	41.6
4	#5920.02	61.1 PK	91.8	-30.7	3.12 H	331	55.8	5.3
5	#5957.55	59.9 PK	88.2	-28.3	3.12 H	331	54.6	5.3
6	11690.00	58.9 PK	74.0	-15.1	1.39 H	67	48.6	10.3
7	11690.00	47.6 AV	54.0	-6.4	1.39 H	67	37.3	10.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5630.27	59.7 PK	68.2	-8.5	1.84 V	346	55.3	4.4
2	*5845.00	128.4 PK			1.84 V	346	86.8	41.6
3	*5845.00	119.6 AV			1.84 V	346	78.0	41.6
4	#5898.18	63.7 PK	107.9	-44.2	1.84 V	346	58.5	5.2
5	#5947.57	60.6 PK	88.2	-27.6	1.84 V	346	55.3	5.3
6	11690.00	60.3 PK	74.0	-13.7	1.35 V	92	50.0	10.3
7	11690.00	47.9 AV	54.0	-6.1	1.35 V	92	37.6	10.3

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 11a 5.9G	Channel	CH 173：5865 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5580.87	59.6 PK	68.2	-8.6	2.99 H	324	55.4	4.2
2	*5865.00	115.4 PK			2.99 H	324	73.8	41.6
3	*5865.00	106.5 AV			2.99 H	324	64.9	41.6
4	#5896.27	68.3 PK	109.3	-41.0	2.99 H	324	63.1	5.2
5	#5939.98	60.7 PK	88.2	-27.5	2.99 H	324	55.4	5.3
6	11730.00	58.8 PK	74.0	-15.2	1.46 H	66	48.7	10.1
7	11730.00	47.5 AV	54.0	-6.5	1.46 H	66	37.4	10.1
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	#5576.12	60.3 PK	68.2	-7.9	1.79 V	342	56.1	4.2
2	*5865.00	127.7 PK			1.79 V	342	86.1	41.6
3	*5865.00	118.7 AV			1.79 V	342	77.1	41.6
4	#5896.27	75.4 PK	109.3	-33.9	1.79 V	342	70.2	5.2
5	#5947.10	60.5 PK	88.2	-27.7	1.79 V	342	55.2	5.3
6	11730.00	58.5 PK	74.0	-15.5	1.33 V	95	48.4	10.1
7	11730.00	47.5 AV	54.0	-6.5	1.33 V	95	37.4	10.1

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 11a 5.9G	Channel	CH 177：5885 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	#5612.70	59.6 PK	68.2	-8.6	3.17 H	354	55.3	4.3
2	*5885.00	115.9 PK			3.17 H	354	74.3	41.6
3	*5885.00	107.1 AV			3.17 H	354	65.5	41.6
4	#5895.80	92.7 PK	109.6	-16.9	3.17 H	354	87.5	5.2
5	#5988.90	61.9 PK	88.2	-26.3	3.17 H	354	56.4	5.5
6	11770.00	58.3 PK	74.0	-15.7	1.34 H	58	48.2	10.1
7	11770.00	47.4 AV	54.0	-6.6	1.34 H	58	37.3	10.1
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	#5626.00	60.6 PK	68.2	-7.6	1.81 V	344	56.2	4.4
2	*5885.00	126.5 PK			1.81 V	344	84.9	41.6
3	*5885.00	117.5 AV			1.81 V	344	75.9	41.6
4	#5898.65	91.2 PK	107.5	-16.3	1.81 V	344	86.0	5.2
5	#5931.43	68.3 PK	88.2	-19.9	1.81 V	344	63.0	5.3
6	11770.00	58.7 PK	74.0	-15.3	1.30 V	89	48.6	10.1
7	11770.00	47.4 AV	54.0	-6.6	1.30 V	89	37.3	10.1

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 (HE20)	Channel	CH 169：5845 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	#5597.50	59.1 PK	68.2	-9.1	3.13 H	333	54.8	4.3
2	*5845.00	117.8 PK			3.13 H	333	76.2	41.6
3	*5845.00	107.8 AV			3.13 H	333	66.2	41.6
4	#5897.70	61.7 PK	108.2	-46.5	3.13 H	333	56.5	5.2
5	#5992.70	60.6 PK	88.2	-27.6	3.13 H	333	55.1	5.5
6	11690.00	58.6 PK	74.0	-15.4	1.48 H	70	48.3	10.3
7	11690.00	47.5 AV	54.0	-6.5	1.48 H	70	37.2	10.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5633.12	60.8 PK	68.2	-7.4	1.89 V	347	56.4	4.4
2	*5845.00	128.2 PK			1.89 V	347	86.6	41.6
3	*5845.00	119.5 AV			1.89 V	347	77.9	41.6
4	#5900.07	70.5 PK	106.5	-36.0	1.89 V	347	65.3	5.2
5	#5967.05	61.4 PK	88.2	-26.8	1.89 V	347	56.1	5.3
6	11690.00	58.9 PK	74.0	-15.1	1.34 V	94	48.6	10.3
7	11690.00	47.8 AV	54.0	-6.2	1.34 V	94	37.5	10.3

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. " * ": 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)

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	#5613.18	59.0 PK	68.2	-9.2	3.08 H	325	54.7	4.3
2	*5865.00	117.2 PK			3.08 H	325	75.6	41.6
3	*5865.00	107.6 AV			3.08 H	325	66.0	41.6
4	#5902.45	76.1 PK	104.7	-28.6	3.08 H	325	70.9	5.2
5	#5992.70	61.1 PK	88.2	-27.1	3.08 H	325	55.6	5.5
6	11730.00	58.6 PK	74.0	-15.4	1.47 H	69	48.5	10.1
7	11730.00	47.3 AV	54.0	-6.7	1.47 H	69	37.2	10.1
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	#5635.02	59.9 PK	68.2	-8.3	1.85 V	348	55.5	4.4
2	*5865.00	128.6 PK			1.85 V	348	87.0	41.6
3	*5865.00	119.2 AV			1.85 V	348	77.6	41.6
4	#5897.23	86.3 PK	108.6	-22.3	1.85 V	348	81.1	5.2
5	#5973.70	59.8 PK	88.2	-28.4	1.85 V	348	54.5	5.3
6	11730.00	58.4 PK	74.0	-15.6	1.22 V	95	48.3	10.1
7	11730.00	47.7 AV	54.0	-6.3	1.22 V	95	37.6	10.1

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 (HE20)	Channel	CH 177：5885 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	#5564.25	59.0 PK	68.2	-9.2	3.17 H	335	54.8	4.2
2	*5885.00	117.7 PK			3.17 H	335	76.1	41.6
3	*5885.00	106.2 AV			3.17 H	335	64.6	41.6
4	#5901.98	86.0 PK	105.1	-19.1	3.17 H	335	80.8	5.2
5	#5961.82	61.1 PK	88.2	-27.1	3.17 H	335	55.8	5.3
6	11770.00	58.5 PK	74.0	-15.5	1.48 H	78	48.4	10.1
7	11770.00	47.7 AV	54.0	-6.3	1.48 H	78	37.6	10.1
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	#5622.68	59.8 PK	68.2	-8.4	1.88 V	345	55.5	4.3
2	*5885.00	128.6 PK			1.88 V	345	87.0	41.6
3	*5885.00	118.5 AV			1.88 V	345	76.9	41.6
4	#5899.12	95.9 PK	107.2	-11.3	1.88 V	345	90.7	5.2
5	#5930.48	67.5 PK	88.2	-20.7	1.88 V	345	62.2	5.3
6	11770.00	58.7 PK	74.0	-15.3	1.25 V	99	48.6	10.1
7	11770.00	47.8 AV	54.0	-6.2	1.25 V	99	37.7	10.1

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 (HE40)	Channel	CH 167：5835 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	#5611.75	60.2 PK	68.2	-8.0	3.12 H	336	56.0	4.2
2	*5835.00	117.3 PK			3.12 H	336	75.7	41.6
3	*5835.00	107.6 AV			3.12 H	336	66.0	41.6
4	#5912.43	69.1 PK	97.4	-28.3	3.12 H	336	63.8	5.3
5	#5932.85	62.1 PK	88.2	-26.1	3.12 H	336	56.8	5.3
6	11670.00	58.5 PK	74.0	-15.5	1.43 H	61	48.2	10.3
7	11670.00	47.3 AV	54.0	-6.7	1.43 H	61	37.0	10.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5559.50	60.1 PK	68.2	-8.1	1.92 V	340	55.9	4.2
2	*5835.00	125.7 PK			1.92 V	340	84.1	41.6
3	*5835.00	116.3 AV			1.92 V	340	74.7	41.6
4	#5905.30	81.4 PK	102.6	-21.2	1.92 V	340	76.2	5.2
5	#5927.62	72.4 PK	88.2	-15.8	1.92 V	340	67.1	5.3
6	11670.00	58.9 PK	74.0	-15.1	1.35 V	85	48.6	10.3
7	11670.00	47.7 AV	54.0	-6.3	1.35 V	85	37.4	10.3

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. " * ": 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)

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	#5602.25	59.9 PK	68.2	-8.3	3.07 H	332	55.7	4.2
2	*5875.00	112.4 PK			3.07 H	332	70.8	41.6
3	*5875.00	104.2 AV			3.07 H	332	62.6	41.6
4	#5912.43	84.1 PK	97.4	-13.3	3.07 H	332	78.8	5.3
5	#5933.32	72.5 PK	88.2	-15.7	3.07 H	332	67.2	5.3
6	11750.00	59.0 PK	74.0	-15.0	1.51 H	76	48.9	10.1
7	11750.00	47.6 AV	54.0	-6.4	1.51 H	76	37.5	10.1
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	#5625.05	60.3 PK	68.2	-7.9	1.74 V	346	55.9	4.4
2	*5875.00	124.9 PK			1.74 V	346	83.3	41.6
3	*5875.00	115.4 AV			1.74 V	346	73.8	41.6
4	#5907.68	96.2 PK	100.9	-4.7	1.74 V	346	91.0	5.2
5	#5926.68	84.4 PK	88.2	-3.8	1.74 V	346	79.1	5.3
6	11750.00	58.5 PK	74.0	-15.5	1.31 V	87	48.4	10.1
7	11750.00	47.8 AV	54.0	-6.2	1.31 V	87	37.7	10.1

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 (HE80)	Channel	CH 171：5855 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	#5578.02	59.5 PK	68.2	-8.7	3.02 H	330	55.3	4.2
2	*5855.00	110.1 PK			3.02 H	330	68.5	41.6
3	*5855.00	101.0 AV			3.02 H	330	59.4	41.6
4	#5920.02	84.1 PK	91.8	-7.7	3.02 H	330	78.8	5.3
5	#5925.00	58.7 PK	88.2	-29.5	3.02 H	330	53.4	5.3
6	#5927.62	77.0 PK	88.2	-11.2	3.02 H	330	71.7	5.3
7	11710.00	58.7 PK	74.0	-15.3	1.53 H	78	48.5	10.2
8	11710.00	47.9 AV	54.0	-6.1	1.53 H	78	37.7	10.2
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	#5611.27	66.6 PK	68.2	-1.6	1.85 V	330	62.4	4.2
2	*5855.00	124.8 PK			1.85 V	330	83.2	41.6
3	*5855.00	114.7 AV			1.85 V	330	73.1	41.6
4	#5902.45	98.1 PK	124.7	-26.6	1.85 V	330	92.9	5.2
5	#5913.85	91.6 AV	96.4	-4.8	1.85 V	330	86.3	5.3
6	#5928.10	91.7 PK	108.2	-16.5	1.85 V	330	86.4	5.3
7	#5929.52	87.4 AV	88.2	-0.8	1.85 V	330	82.1	5.3
8	11710.00	58.6 PK	74.0	-15.4	1.23 V	87	48.4	10.2
9	11710.00	47.5 AV	54.0	-6.5	1.23 V	87	37.3	10.2

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 802.11ax (HE160)	Channel	CH 163：5815 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	#5648.80	59.4 PK	68.2	-8.8	3.15 H	326	54.9	4.5
2	*5815.00	100.4 PK			3.15 H	326	58.8	41.6
3	*5815.00	90.4 AV			3.15 H	326	48.8	41.6
4	#5920.98	60.0 PK	91.1	-31.1	3.15 H	326	54.7	5.3
5	#5925.00	62.2 PK	88.2	-26.0	3.15 H	326	56.9	5.3
6	#5961.35	61.2 PK	88.2	-27.0	3.15 H	326	55.9	5.3
7	11630.00	58.7 PK	74.0	-15.3	1.38 H	68	48.4	10.3
8	11630.00	47.6 AV	54.0	-6.4	1.38 H	68	37.3	10.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**#5647.85**	**68.0 PK**	**68.2**	**-0.2**	**1.77 V**	**345**	**63.5**	**4.5**
2	*5815.00	114.3 PK			1.77 V	345	72.7	41.6
3	*5815.00	105.0 AV			1.77 V	345	63.4	41.6
4	#5908.62	70.2 PK	100.2	-30.0	1.77 V	345	64.9	5.3
5	#5925.00	75.3 PK	88.2	-12.9	1.77 V	345	70.0	5.3
6	#5947.10	69.2 PK	88.2	-19.0	1.77 V	345	63.9	5.3
7	11630.00	58.9 PK	74.0	-15.1	1.34 V	90	48.6	10.3
8	11630.00	47.7 AV	54.0	-6.3	1.34 V	90	37.4	10.3

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

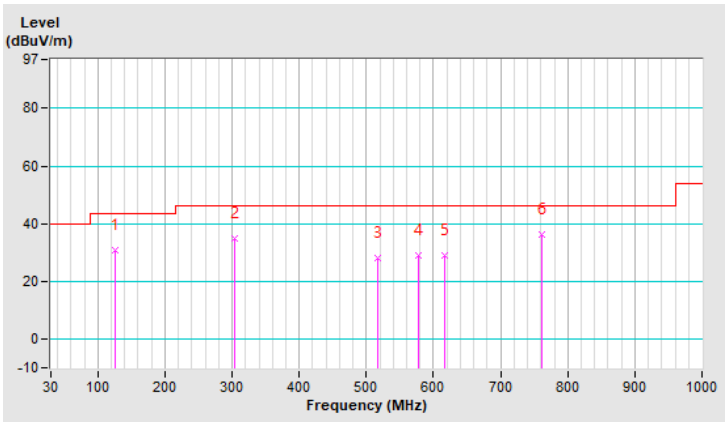
Below 1GHz Worst-Case Data:

RF Mode	TX 802.11ax (HE40)	Channel	CH 175：5875 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	A		

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	125.06	30.6 QP	43.5	-12.9	1.49 H	272	50.7	-20.1
2	303.54	34.7 QP	46.0	-11.3	1.01 H	160	52.4	-17.7
3	517.91	28.3 QP	46.0	-17.7	1.99 H	98	41.0	-12.7
4	577.08	29.1 QP	46.0	-16.9	1.99 H	305	40.5	-11.4
5	615.88	28.8 QP	46.0	-17.2	1.49 H	84	39.2	-10.4
6	762.35	36.1 QP	46.0	-9.9	1.99 H	18	44.3	-8.2

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. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

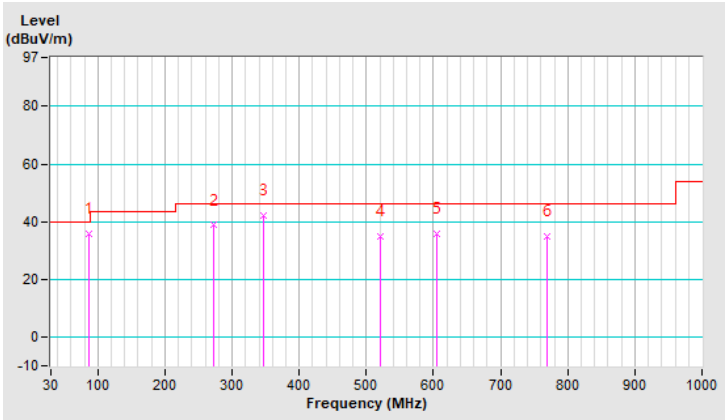


RF Mode	TX 802.11ax (HE40)	Channel	CH 175：5875 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	A		

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	86.26	35.9 QP	40.0	-4.1	1.99 V	18	59.9	-24.0
2	273.47	38.7 QP	46.0	-7.3	1.99 V	260	57.4	-18.7
3	346.22	42.3 QP	46.0	-3.7	1.49 V	2	59.1	-16.8
4	520.82	34.7 QP	46.0	-11.3	1.01 V	5	47.3	-12.6
5	604.24	35.7 QP	46.0	-10.3	1.99 V	18	46.2	-10.5
6	769.14	34.8 QP	46.0	-11.2	1.01 V	160	42.9	-8.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

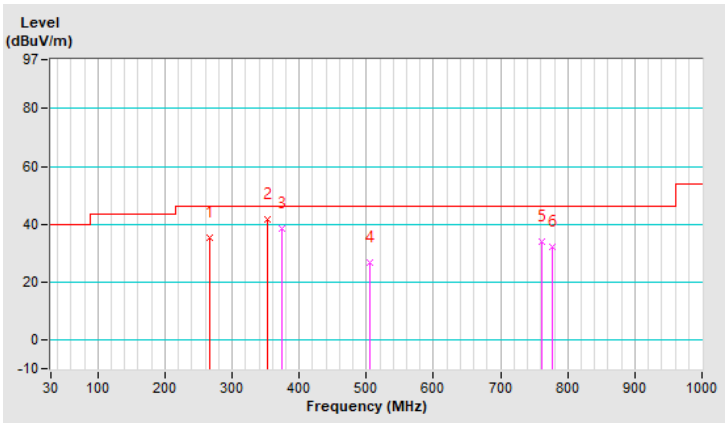


RF Mode	TX 802.11ax (HE40)	Channel	CH 175：5875 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

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	267.54	35.15 QP	46.00	-10.85	1.50 H	106	53.92	-18.77
2	352.01	41.87 QP	46.00	-4.13	1.00 H	87	58.45	-16.58
3	374.35	38.68 QP	46.00	-7.32	2.00 H	133	54.53	-15.85
4	505.30	26.76 QP	46.00	-19.24	1.50 H	97	39.66	-12.90
5	762.35	34.15 QP	46.00	-11.85	1.00 H	120	42.29	-8.14
6	777.87	32.09 QP	46.00	-13.91	1.00 H	231	40.06	-7.97

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

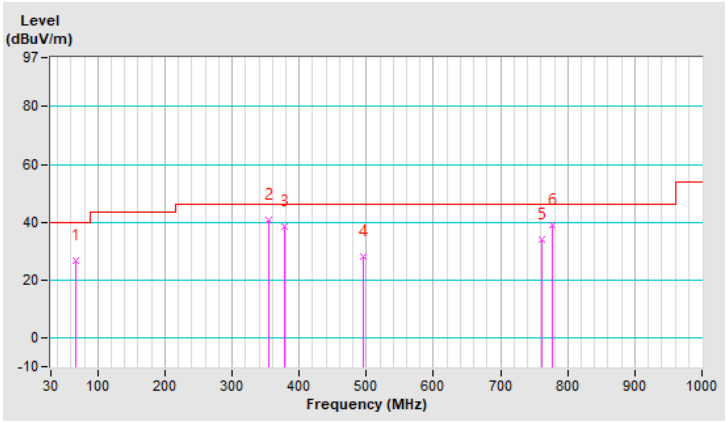


RF Mode	TX 802.11ax (HE40)	Channel	CH 175：5875 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

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	66.86	26.68 QP	40.00	-13.32	1.50 V	189	46.30	-19.62
2	353.98	40.60 QP	46.00	-5.40	1.00 V	336	57.13	-16.53
3	377.26	38.42 QP	46.00	-7.58	2.00 V	290	54.20	-15.78
4	494.63	28.29 QP	46.00	-17.71	1.00 V	177	41.40	-13.11
5	762.35	34.13 QP	46.00	-11.87	1.50 V	344	42.27	-8.14
6	777.87	39.14 QP	46.00	-6.86	1.00 V	298	47.11	-7.97

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 21, 2020	Dec. 20, 2021
			Dec. 20, 2021	Dec. 19, 2022
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2021	Sep. 03, 2022
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 28, 2021	Jan. 27, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Sep. 17, 2021	Sep. 16, 2022
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

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

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

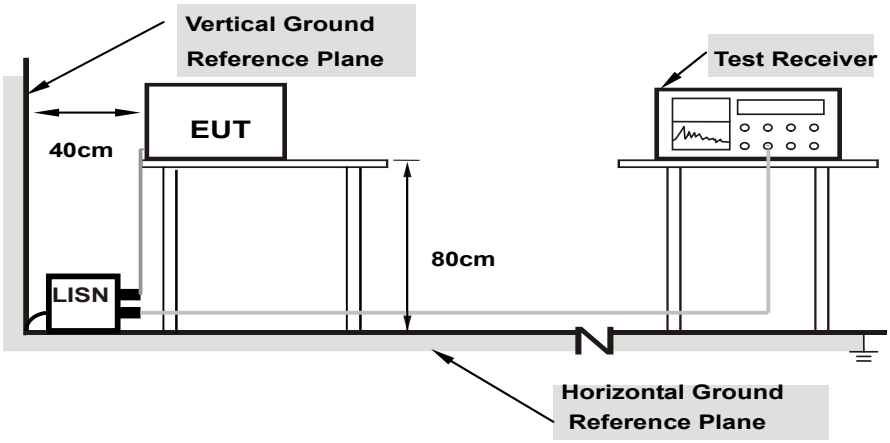
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

Worst-case data:

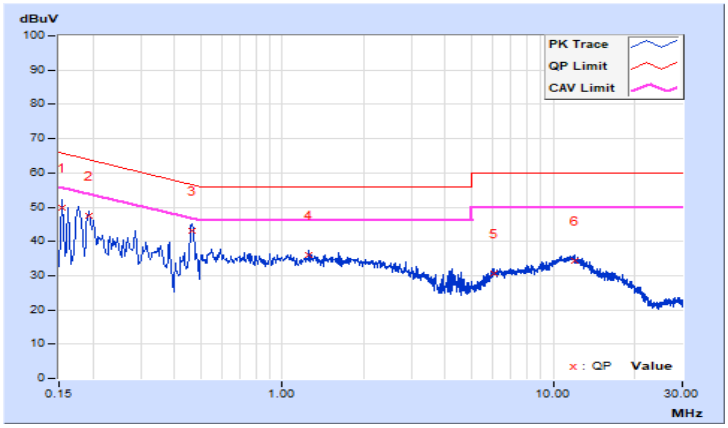
802.11ax (HE40)

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.11	39.64	22.49	49.75	32.60	65.78	55.78	-16.03	-23.18
2	0.19400	10.13	37.47	23.75	47.60	33.88	63.86	53.86	-16.26	-19.98
3	**0.46200**	**10.14**	**32.81**	**28.40**	**42.95**	**38.54**	**56.66**	**46.66**	**-13.71**	**-8.12**
4	1.25800	10.18	25.90	18.01	36.08	28.19	56.00	46.00	-19.92	-17.81
5	6.03000	10.27	20.45	10.00	30.72	20.27	60.00	50.00	-29.28	-29.73
6	12.01400	10.35	24.10	17.18	34.45	27.53	60.00	50.00	-25.55	-22.47

Remarks:

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

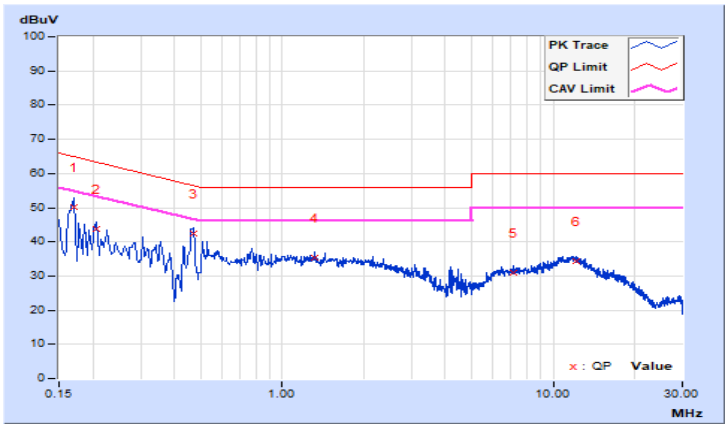


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17000	10.12	40.07	21.78	50.19	31.90	64.96	54.96	-14.77	-23.06
2	0.20577	10.13	33.54	21.48	43.67	31.61	63.37	53.37	-19.70	-21.76
3	0.47000	10.15	32.42	23.44	42.57	33.59	56.51	46.51	-13.94	-12.92
4	1.32200	10.19	25.28	17.28	35.47	27.47	56.00	46.00	-20.53	-18.53
5	7.16200	10.35	20.70	10.30	31.05	20.65	60.00	50.00	-28.95	-29.35
6	12.16200	10.47	23.97	16.83	34.44	27.30	60.00	50.00	-25.56	-22.70

Remarks:

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

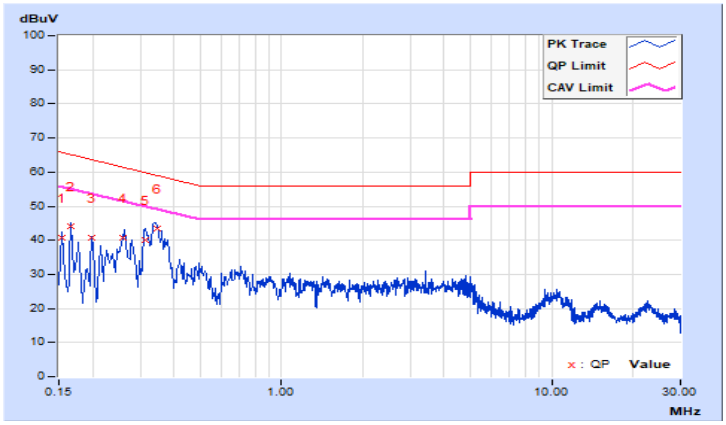


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	9.76	31.04	21.11	40.80	30.87	65.78	55.78	-24.98	-24.91
2	0.16535	9.76	34.20	18.32	43.96	28.08	65.19	55.19	-21.23	-27.11
3	0.19728	9.77	31.09	16.50	40.86	26.27	63.72	53.72	-22.86	-27.45
4	0.25742	9.79	30.85	23.11	40.64	32.90	61.51	51.51	-20.87	-18.61
5	0.31200	9.80	30.12	21.07	39.92	30.87	59.92	49.92	-20.00	-19.05
6	0.34600	9.81	33.54	26.81	43.35	36.62	59.06	49.06	-15.71	-12.44

Remarks:

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

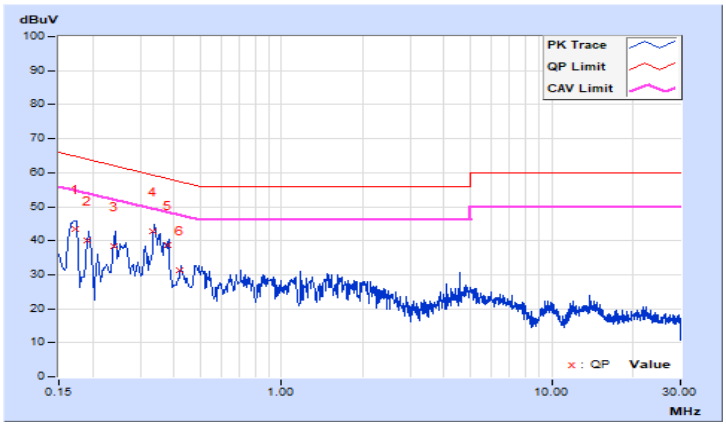


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17157	9.82	33.58	21.03	43.40	30.85	64.88	54.88	-21.48	-24.03
2	0.19164	9.83	30.38	14.83	40.21	24.66	63.97	53.97	-23.76	-29.31
3	0.23974	9.84	28.55	14.64	38.39	24.48	62.11	52.11	-23.72	-27.63
4	0.33501	9.88	33.04	27.25	42.92	37.13	59.33	49.33	-16.41	-12.20
5	0.37917	9.89	28.92	18.39	38.81	28.28	58.30	48.30	-19.49	-20.02
6	0.42242	9.90	21.46	16.14	31.36	26.04	57.40	47.40	-26.04	-21.36

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

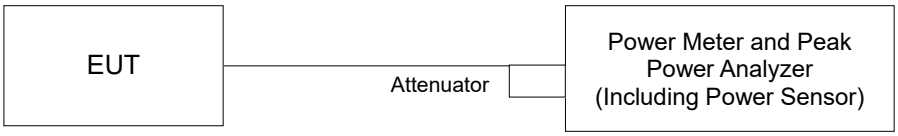
Note: For all U-NII-4 and U-NII-3 & -4 span channels shall met above EIRP values.

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

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

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

4.3.2 Test Setup



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 and set the detector to average. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

CDD Mode

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
169	5845	19.82	19.11	19.46	19.94	364.346	25.62	3.30	779.830	28.92	36.00	Pass
173	5865	19.80	18.46	18.99	19.93	343.296	25.36	3.30	734.514	28.66	36.00	Pass
177	5885	19.04	18.77	19.14	19.40	324.635	25.11	3.30	693.426	28.41	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.

2. EIRP Power = conducted output power + antenna gain.

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
169	5845	20.17	20.78	20.02	20.37	433.021	26.37	3.30	926.830	29.67	36.00	Pass
173	5865	20.34	19.15	19.83	20.61	401.609	26.04	3.30	859.014	29.34	36.00	Pass
177	5885	19.67	19.02	19.37	20.01	359.210	25.55	3.30	767.361	28.85	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.

2. EIRP Power = conducted output power + antenna gain.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
167	5835	25.82	25.40	25.30	25.81	1448.591	31.61	3.30	3097.419	34.91	36.00	Pass
175	5875	25.06	25.52	25.43	25.74	1401.191	31.46	3.30	2992.265	34.76	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.

2. EIRP Power = conducted output power + antenna gain.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
169	5845	20.25	20.80	20.03	20.43	437.253	26.41	3.30	935.406	29.71	36.00	Pass
173	5865	20.40	19.23	19.85	20.65	406.151	26.09	3.30	868.960	29.39	36.00	Pass
177	5885	19.70	19.04	19.43	20.02	361.655	25.58	3.30	772.681	28.88	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
167	5835	25.84	25.42	25.34	25.85	1458.616	31.64	3.30	3118.890	34.94	36.00	Pass
175	5875	25.10	25.62	25.49	25.79	1421.66	31.53	3.30	3040.885	34.83	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
171	5855	23.05	21.59	21.99	23.10	708.347	28.50	3.30	1513.561	31.80	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

802.11ac (VHT160)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
163	5815	18.64	18.14	18.25	18.53	276.396	24.42	3.30	591.562	27.72	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
169	5845	20.32	20.91	20.12	20.49	445.702	26.49	3.30	952.796	29.79	36.00	Pass
173	5865	20.46	19.30	19.96	20.69	412.590	26.16	3.30	883.080	29.46	36.00	Pass
177	5885	19.73	19.05	19.49	20.11	365.810	25.63	3.30	781.628	28.93	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
167	5835	25.86	25.44	25.37	25.89	1467.924	31.67	3.30	**3140.509**	34.97	36.00	Pass
175	5875	25.21	25.74	25.51	25.90	1451.544	31.62	3.30	3104.560	34.92	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
171	5855	23.07	21.61	22.02	23.12	711.983	28.52	3.30	1520.548	31.82	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

802.11ax (HE160)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Max. Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
163	5815	18.67	18.16	18.30	18.56	278.472	24.45	3.30	595.662	27.75	36.00	Pass

Note:

1. Antenna gain = 3.30dBi.
2. EIRP Power = conducted output power + antenna gain.

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
169	5845	14.15	14.76	14.00	14.35	108.27	20.35	9.32	926.830	29.67	36.00	Pass
173	5865	14.32	13.13	13.81	14.59	100.416	20.02	9.32	859.014	29.34	36.00	Pass
177	5885	13.65	13.00	13.35	13.99	89.815	19.53	9.32	767.361	28.85	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
167	5835	19.80	19.38	19.28	19.79	362.198	25.59	9.32	3097.419	34.91	36.00	Pass
175	5875	19.04	19.50	19.41	19.72	350.346	25.44	9.32	2992.265	34.76	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
169	5845	14.23	14.78	14.01	14.41	109.328	20.39	9.32	935.406	29.71	36.00	Pass
173	5865	14.38	13.21	13.83	14.63	101.552	20.07	9.32	868.960	29.39	36.00	Pass
177	5885	13.68	13.02	13.41	14.00	90.426	19.56	9.32	772.681	28.88	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
167	5835	19.82	19.40	19.32	19.83	364.704	25.62	9.32	3118.89	34.94	36.00	Pass
175	5875	19.08	19.60	19.47	19.77	355.464	25.51	9.32	3040.885	34.83	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
171	5855	17.03	15.57	15.97	17.08	177.111	22.48	9.32	1513.561	31.80	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ac (VHT160)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
163	5815	12.62	12.12	12.23	12.51	69.109	18.40	9.32	591.562	27.72	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
169	5845	14.30	14.89	14.10	14.47	111.441	20.47	9.32	952.796	29.79	36.00	Pass
173	5865	14.44	13.28	13.94	14.67	103.162	20.14	9.32	883.08	29.46	36.00	Pass
177	5885	13.71	13.03	13.47	14.09	91.465	19.61	9.32	781.628	28.93	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
167	5835	19.84	19.42	19.35	19.87	367.032	25.65	9.32	**3140.509**	34.97	36.00	Pass
175	5875	19.19	19.72	19.49	19.88	362.936	25.60	9.32	3104.560	34.92	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
171	5855	17.05	15.59	16.00	17.10	178.02	22.50	9.32	1520.548	31.82	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

2. EIRP Power = conducted output power + directional gain.

802.11ax (HE160)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Directional Gain (dBi)	EIRP (mW)	EIRP (dBm)	EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3							
163	5815	12.65	12.14	12.28	12.54	69.628	18.43	9.32	595.662	27.75	36.00	Pass

Note:

1. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.

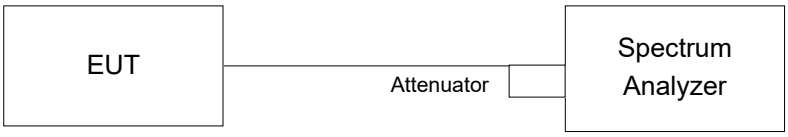
2. EIRP Power = conducted output power + directional gain.

4.4 6dB Bandwidth Measurement

4.4.1 Limits of Emission Bandwidth Measurement

Within the 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

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

4.4.5 Test Result

802.11a

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
169	5845	16.37	16.38	16.35	16.36	0.50	Pass
173	5865	16.36	16.38	16.38	16.37	0.50	Pass
177	5885	16.37	16.37	16.38	16.37	0.50	Pass

802.11ax (HE20)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
169	5845	19.08	19.11	19.09	19.09	0.50	Pass
173	5865	19.11	19.13	19.07	19.11	0.50	Pass
177	5885	19.11	19.13	19.10	19.14	0.50	Pass

802.11ax (HE40)

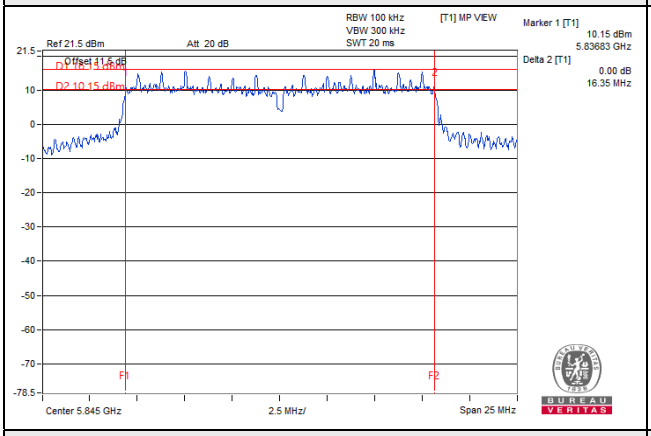
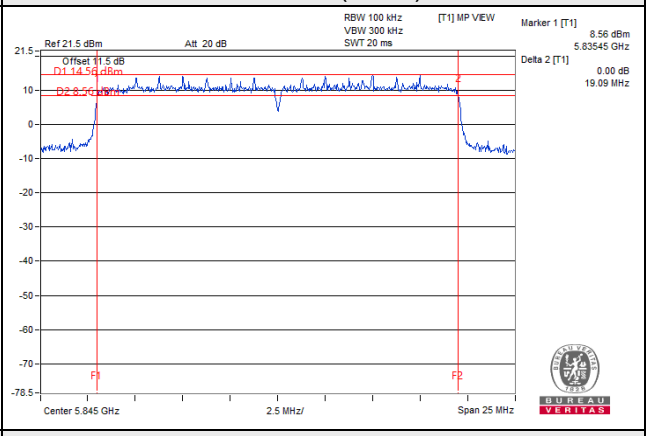
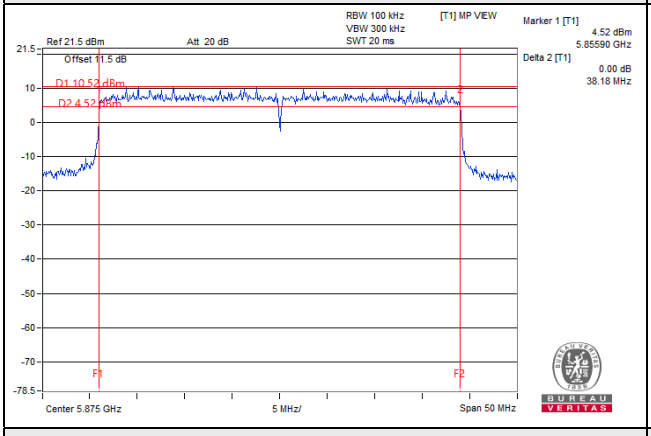
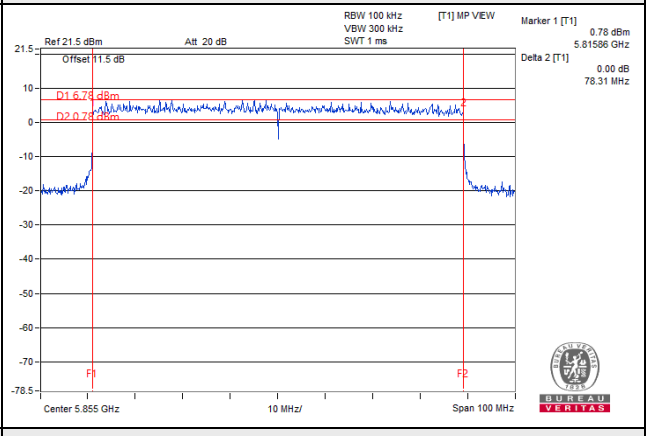
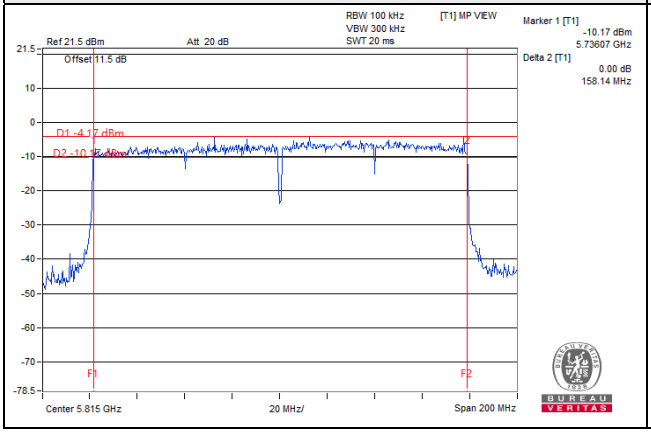
Chan.	Freq. (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
167	5835	38.28	38.22	38.20	38.26	0.50	Pass
175	5875	38.18	38.22	38.19	38.19	0.50	Pass

802.11ax (HE80)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
171	5855	78.34	78.36	78.34	78.31	0.50	Pass

802.11ax (HE160)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
163	5815	158.54	158.14	158.36	158.32	0.50	Pass

Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	
802.11ax (HE160)	
	

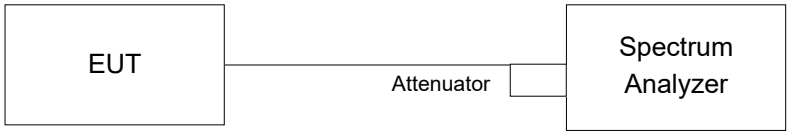
4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Device Category		Limit
☒	Indoor access point	EIRP 20dBm in any 1-megahertz band
☐	Subordinate device	EIRP 20dBm in any 1-megahertz band
☐	Client device	EIRP 14dBm in any 1-megahertz band

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 Procedures

Using method SA-2

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Sweep time = auto, trigger set to “free run”.

d. Trace average at least 100 traces in power averaging mode.

e. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

f. Scale the observed power level to an equivalent value in 1 MHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10 log(1000 kHz/300 kHz) = 5.23 dB

g. Record the max value and add 10 log (1/duty cycle).

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Total Factor (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3						
169	5845	-1.61	-1.11	-1.18	-1.10	0.53	10.54	9.32	19.86	20.00	Pass
173	5865	-1.58	-0.96	-1.48	-1.94	0.53	10.30	9.32	19.62	20.00	Pass
177	5885	-1.11	-1.03	-1.72	-1.23	0.53	10.52	9.32	19.84	20.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.
3. Total Factor = Duty Factor + BWCF.
4. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Total Factor (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3						
169	5845	-0.65	-0.58	-0.63	-1.98	0.32	10.65	9.32	19.97	20.00	Pass
173	5865	-1.92	-0.91	-0.43	-0.59	0.32	10.65	9.32	19.97	20.00	Pass
177	5885	-0.60	-0.92	-0.72	-2.14	0.32	10.52	9.32	19.84	20.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.
3. Total Factor = Duty Factor + BWCF.
4. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Total Factor (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3						
167	5835	-1.12	-1.39	-1.32	-1.49	0.34	10.26	9.32	19.58	20.00	Pass
175	5875	-1.57	-1.09	-2.22	-1.18	0.34	10.10	9.32	19.42	20.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.
3. Total Factor = Duty Factor + BWCF.
4. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Total Factor (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3						
171	5855	-5.64	-5.99	-6.35	-5.77	0.39	5.71	9.32	15.03	20.00	Pass

Note:

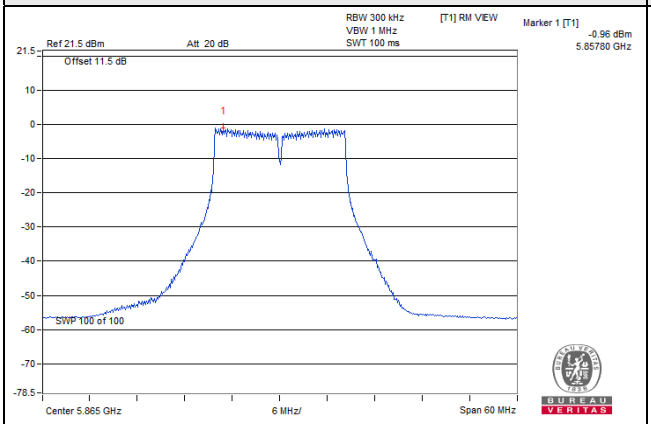
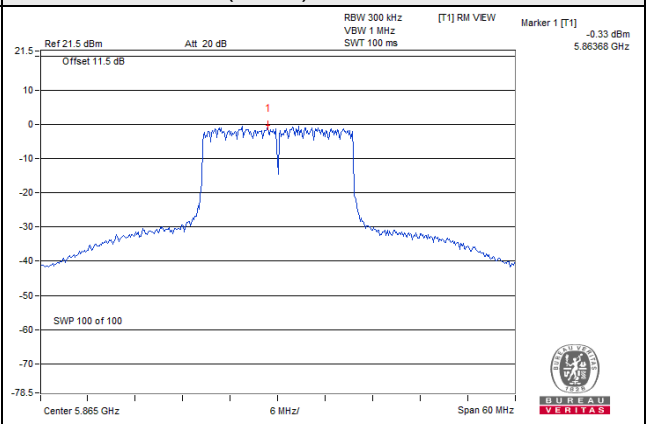
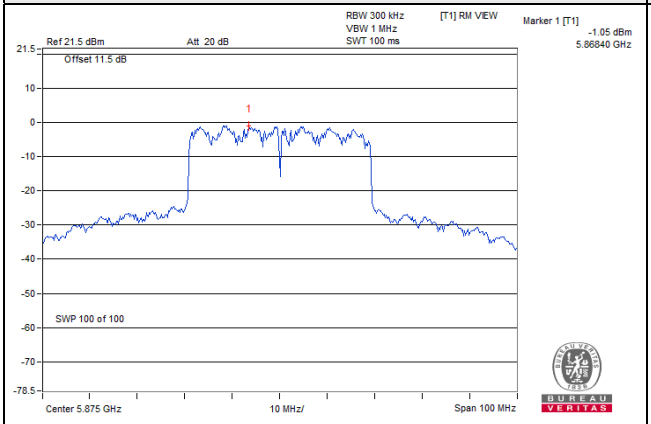
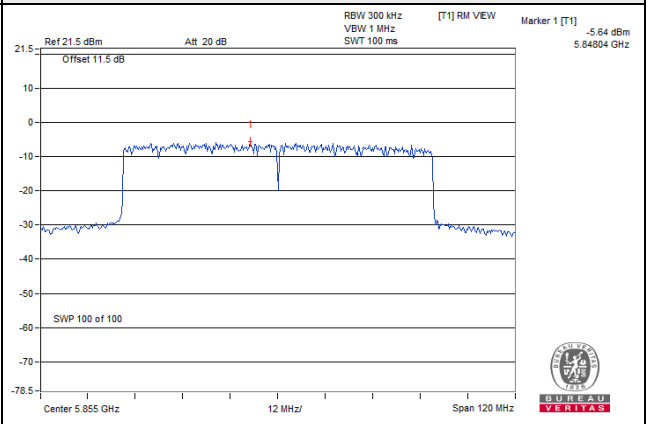
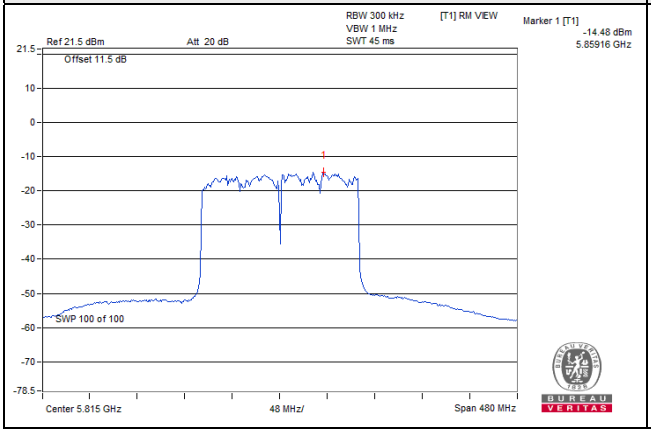
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.
3. Total Factor = Duty Factor + BWCF.
4. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE160)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Total Factor (dBm/MHz)	Directional Gain (dBi)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3						
163	5815	-14.96	-14.92	-14.54	-14.82	0.30	-3.26	9.32	6.06	20.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.3dBi + 10log(4) = 9.32dBi.
3. Total Factor = Duty Factor + BWCF.
4. Refer to section 3.3 for duty cycle spectrum plot.

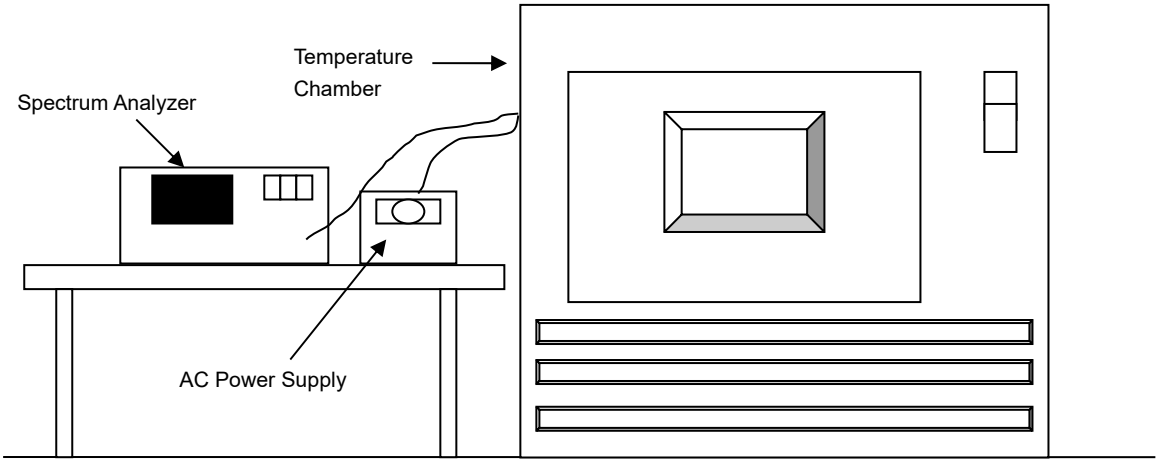
Spectrum Plot of Worst Value	
802.11a / Chain 1 / CH 173	802.11ax (HE20) / Chain 2 / CH 173
	
802.11ax (HE40) / Chain 1 / CH 175	802.11ax (HE80) / Chain 0 / CH 171
	
802.11ax (HE160) / Chain 2 / CH 163	
	

4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 15, 2021	Sep. 14, 2022
Temperature & Humidity Chamber Giant Force	GTH-120-40-CP-AR	MAA1306-019	Sep. 10, 2021	Sep. 09, 2022
Digital Multimeter Fluke	87-III	70360755	Jul. 08, 2021	Jul. 07, 2022
AC Power Supply Extech	CFW-105	E000603	NA	NA

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

4.6.4 Test Procedure

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

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

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

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

e. Repeat step d with every 10 degrees reduction until the lowest temperature achieved.

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5885MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
40	120	5884.9842	Pass	5884.9823	Pass	5884.9822	Pass	5884.9793	Pass
30	120	5885.0249	Pass	5885.0255	Pass	5885.0221	Pass	5885.0233	Pass
20	120	5884.9918	Pass	5884.9894	Pass	5884.9875	Pass	5884.9909	Pass
10	120	5884.9899	Pass	5884.9913	Pass	5884.9917	Pass	5884.9898	Pass
0	120	5884.9978	Pass	5884.9954	Pass	5884.9939	Pass	5884.9977	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5885MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5885.0016	Pass	5885.0043	Pass	5885.0012	Pass	5885.0048	Pass
	120	5884.9918	Pass	5884.9894	Pass	5884.9875	Pass	5884.9909	Pass
	102	5884.9979	Pass	5885.0004	Pass	5885.0022	Pass	5884.9982	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.

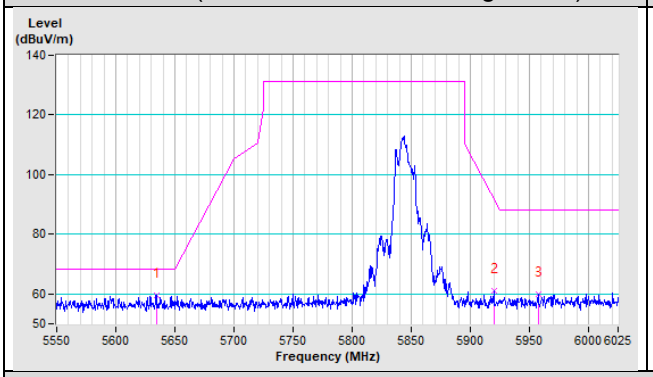
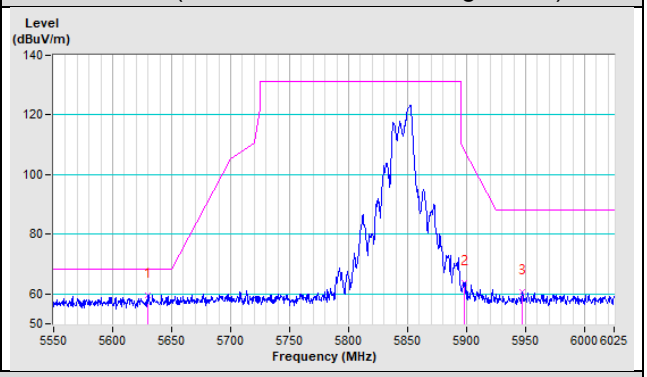
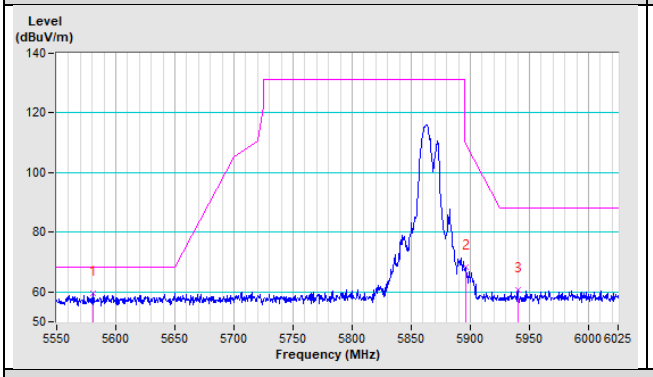
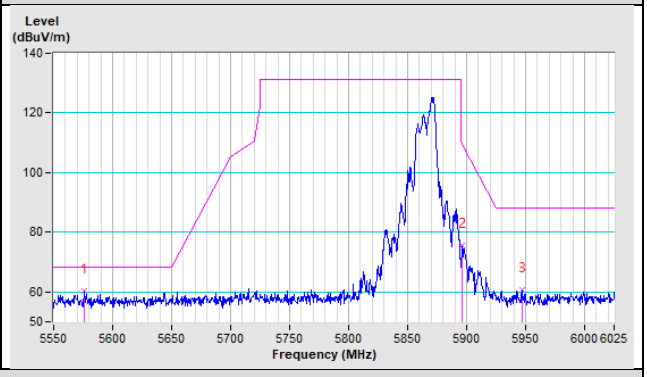
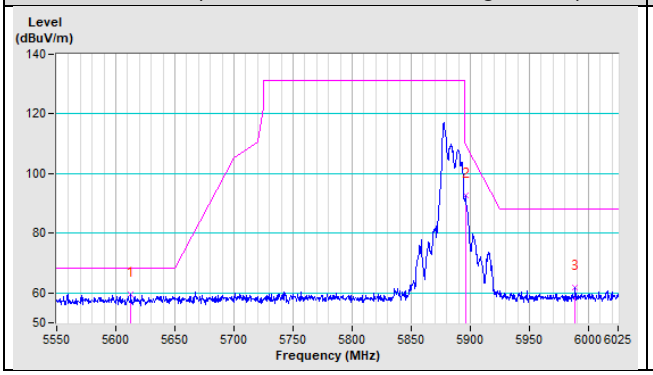
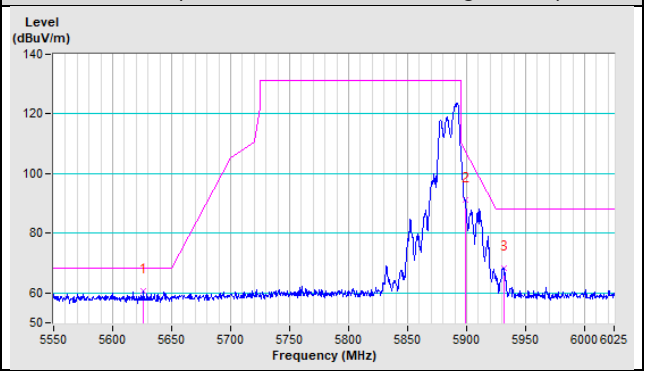
4.7.5 Test Results

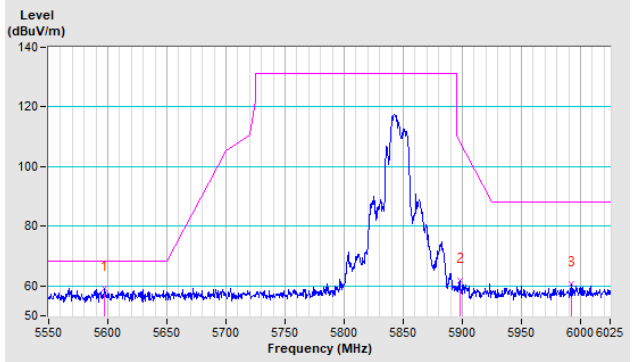
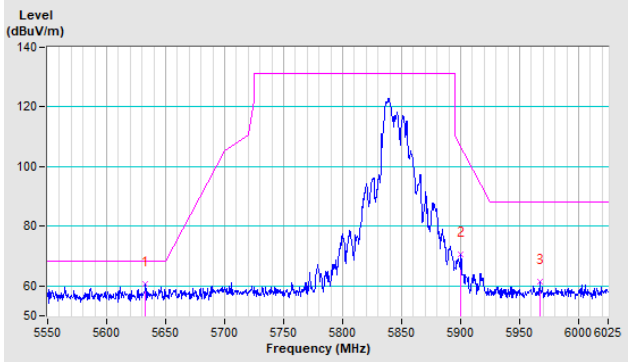
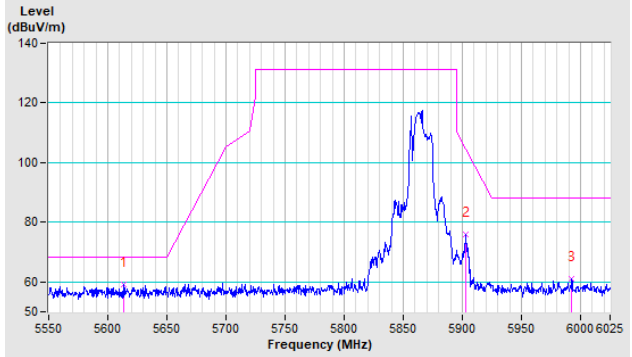
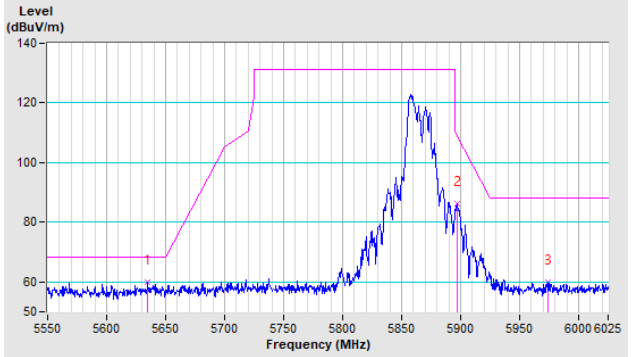
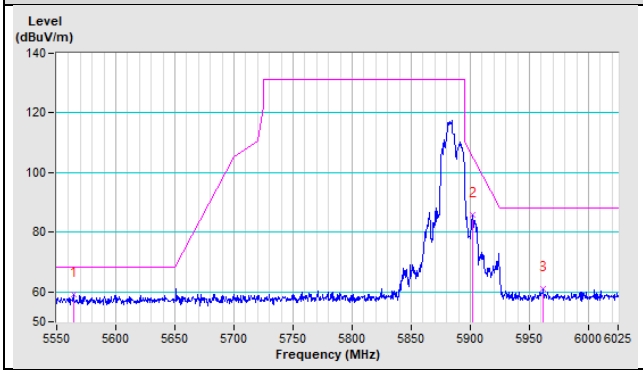
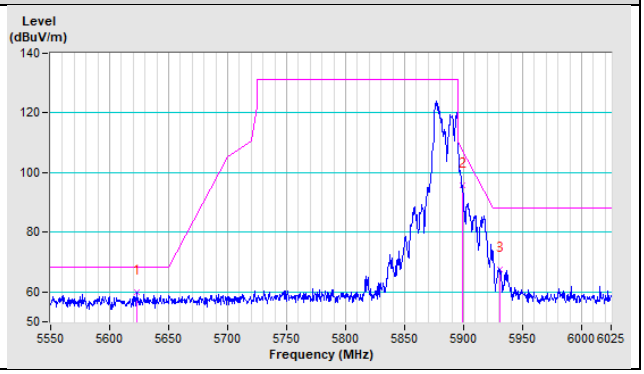
Device is an indoor access point, all restrictions are meet the §15.403 requirements. Please refer to the Attestation letter exhibit supplied within this application.

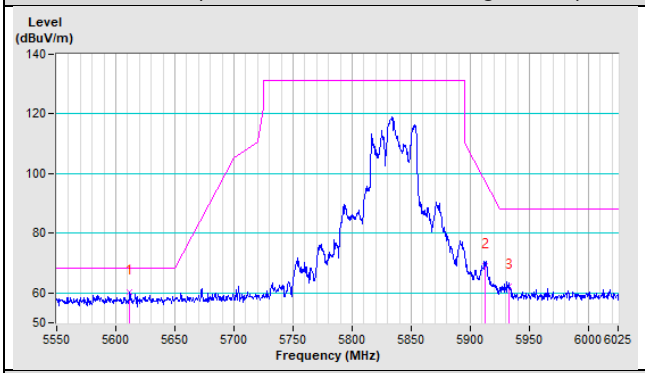
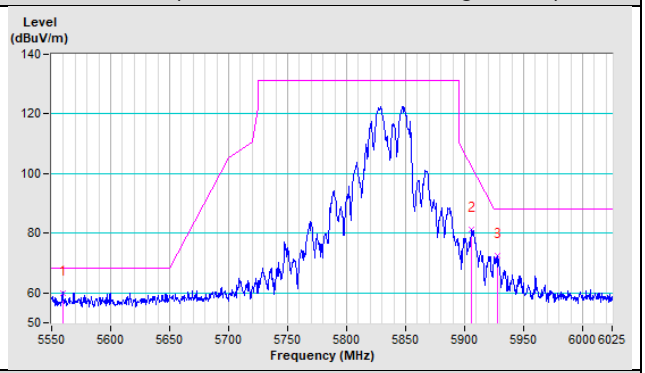
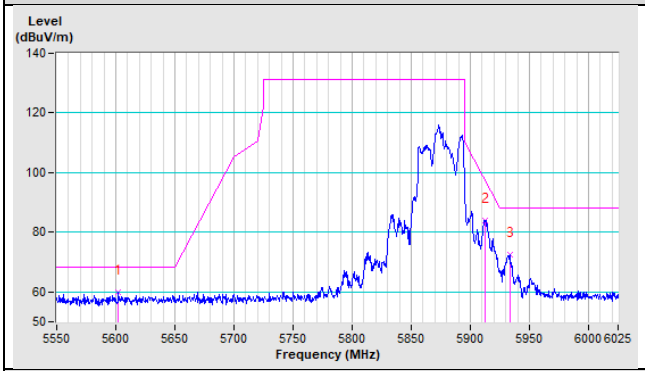
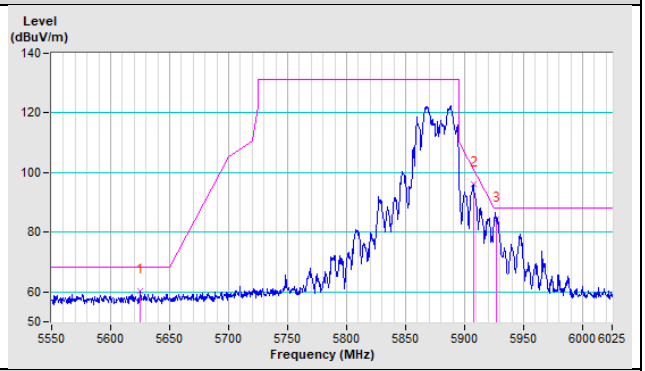
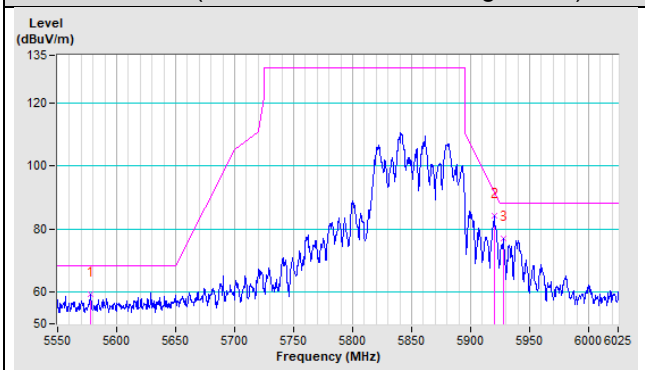
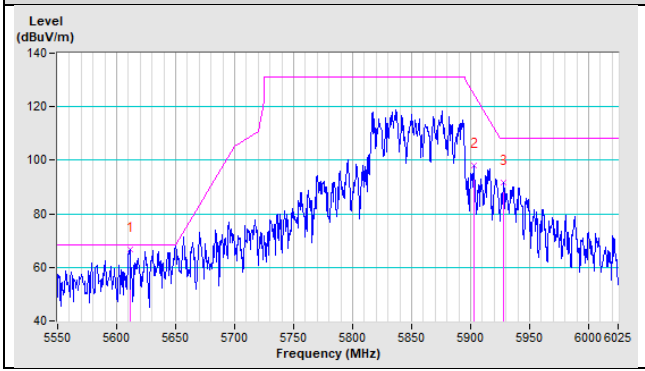
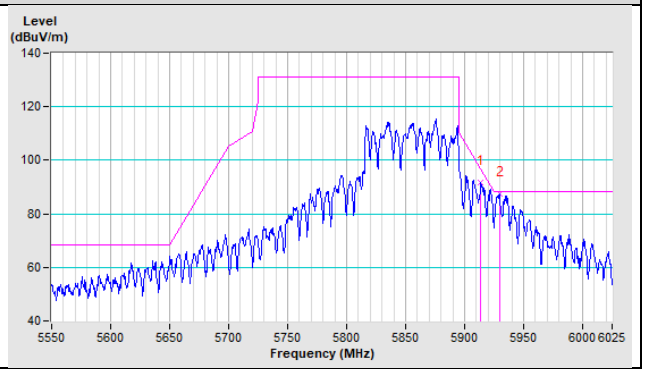
5 Pictures of Test Arrangements

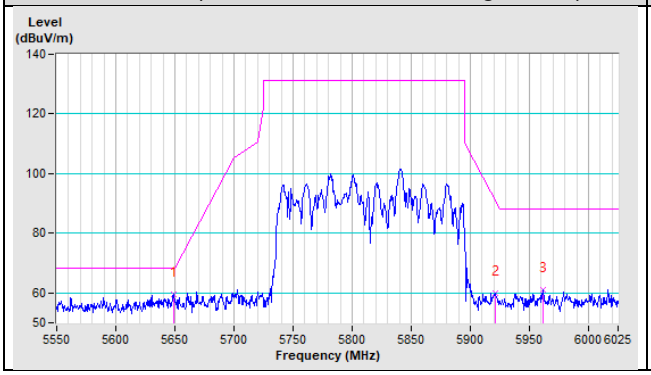
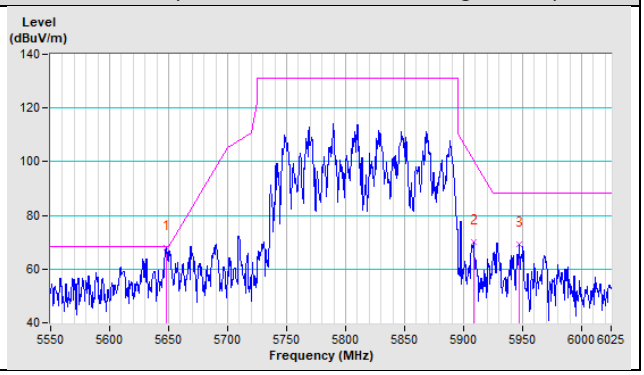
Please refer to the attached file (Test Setup Photo).

Annex A - Band Edge Measurement

11a 5.9G Channel 169	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	
11a 5.9G Channel 173	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	
11a 5.9G Channel 177	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	

802.11ax (HE20) Channel 169	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	
802.11ax (HE20) Channel 173	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	
802.11ax (HE20) Channel 177	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	

802.11ax (HE40) Channel 167	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	
802.11ax (HE40) Channel 175	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	
802.11ax (HE80) Channel 171	
Horizontal (Peak trace under Average Limit)	
	
Vertical (Peak trace under Peak Limit)	Vertical (Average trace under Average Limit)
	

802.11ax (HE160) Channel 163	
Horizontal (Peak trace under Average Limit)	Vertical (Peak trace under Average Limit)
	

Appendix – Information of the Testing Laboratories

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

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

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

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