FCC Test Report

Report No.:	RFBDYS-WTW-P21030960
FCC ID:	A8J-EWS357APV3A
Test Model:	EWS357AP v3
Series Model:	ECW220 v2
Received Date:	Apr. 01, 2021
Test Date:	Apr. 01, 2021 ~ Apr. 13, 2021
Issued Date:	Apr. 22, 2021
Applicant:	EnGenius Technologies
Address:	1580 Scenic Avenue, Costa Mesa, CA92626
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:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RFBDYS-WTW-P21030960	Original Release	Apr. 22, 2021

1 Certificate of Conformity

Product:	11ax Indoor Managed AP, 11ax Cloud Managed AP
Brand:	EnGenius
Test Model:	EWS357AP v3
Series Model:	ECW220 v2
Sample Status:	Engineering Sample
Applicant:	EnGenius Technologies
Test Date:	Apr. 01, 2021 ~ Apr. 13, 2021
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

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

Prepared by : Vera Huang , **Date:** Apr. 22, 2021

Vera Huang / Specialist

Approved by : , **Date:** Apr. 22, 2021

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(8)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -6.81dB at 0.52016MHz.
15.407(b) (1/2/3/4(i/ii)/8)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.8dB at 5725.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	N/A	Not Applicable
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is IPEX not a standard connector.

Note:

1. For U-NII-2A, U-NII-2C band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
2. 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	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	11ax Indoor Managed AP, 11ax Cloud Managed AP
Brand	EnGenius
Test Model	EWS357AP v3
Series Model	ECW220 v2
Model Difference	Refer to note
Sample Status	Engineering Sample
Power Supply Rating	12Vdc from Adapter 54Vdc from PoE
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 300Mbps 802.11ac: up to 866.7Mbps 802.11ax: up to 1200Mbps
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5700MHz
Number of Channel	5260 ~ 5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 4 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2 802.11ac (VHT80), 802.11ax (HE80): 1 5500 ~ 5700MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 11 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 5 802.11ac (VHT80), 802.11ax (HE80): 2
Output Power	CDD Mode: 5260 ~ 5320MHz: 169.17mW 5500 ~ 5700MHz: 156.872mW Beamforming Mode: 5260 ~ 5320MHz: 84.591 mW 5500 ~ 5700MHz: 146.067mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	NA
Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV CPS report no.: RFBDYS-WTW-P20100844-1) is adding 5.26GHz to 5.32GHz and 5.50GHz to 5.70GHz by software.
2. All models are listed as below.

Product	Model	Difference
11ax Indoor Managed AP	EWS357AP v3	All models are electrically identical, different product names and model names are for marketing purpose.
11ax Cloud Managed AP	ECW220 v2	

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

Modulation Mode	Beamforming Mode	TX Function
802.11a	Not Support	2TX
802.11n (HT20)	Not Support	2TX
802.11n (HT40)	Not Support	2TX
802.11ac (VHT20)	Support	2TX
802.11ac (VHT40)	Support	2TX
802.11ac (VHT80)	Support	2TX
802.11ax (HE20)	Support	2TX
802.11ax (HE40)	Support	2TX
802.11ax (HE80)	Support	2TX

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

* For 802.11ax and 802.11ac, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

4. The EUT consumes power from the following adapter and PoE.

Adapter (support unit only)	
Brand	Asian Power Devices Inc.
Model	WA-30J12R
Input Power	100-240Vac, 50-60Hz, 0.9A Max
Output Power	12Vdc, 2.5A
Power Line	1.45m DC cable without core attached on adapter

PoE (support unit only)	
Brand	SENAO Networks, Inc.
Model	EPA5006GAT
Input Power	100-240Vac, 50-60Hz, 0.8A
Output Power	54Vdc, 0.6A
Power Line	0.5m AC cable without core

5. The following antennas were provided to the EUT.

Antenna Type	PIFA					
Antenna Connector	IPEX					
Antenna No.	Gain (dBi)					
	2400MHz	2450MHz	2500MHz	5150MHz	5500MHz	5850MHz
2G1	3.35	3.46	3.41	-	-	-
2G2	3.13	3.40	3.31	-	-	-
5G1	-	-	-	4.22	4.85	4.75
5G2	-	-	-	4.22	4.52	3.77

* 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.

6. Spurious emission of the simultaneous operation (2.4GHz and 5GHz) has been evaluated and no non-compliance was found.

3.2 Description of Test Modes

For 5260 ~ 5320MHz:

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

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

Channel	Frequency
58	5290MHz

For 5500 ~ 5700MHz:

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

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

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

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

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from PoE

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

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

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
2. "-": Means no effect.
3. Radiated Emission below 1GHz and Power Line Conducted Emission test items chosen the worst maximum power.

Radiated Emission Test (Above 1GHz):

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

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	MCS0
	802.11ax (HE40)		54 to 62	54, 62	OFDMA	MCS0
	802.11ax (HE80)		58	58	OFDMA	MCS0
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
	802.11ax (HE20)		100 to 140	100, 116, 140	OFDMA	MCS0
	802.11ax (HE40)		102 to 134	102, 110, 134	OFDMA	MCS0
	802.11ax (HE80)		106 to 122	106, 122	OFDMA	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	Data Rate (Mbps)
A, B	802.11ax (HE20)	5260-5320	52 to 64	140	OFDMA	MCS0
	802.11ax (HE20)	5500-5700	100 to 140		OFDMA	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	Data Rate (Mbps)
A, B	802.11ax (HE20)	5260-5320	52 to 64	140	OFDMA	MCS0
	802.11ax (HE20)	5500-5700	100 to 140		OFDMA	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 and antenna ports (if EUT with antenna diversity architecture).

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	7.2
	802.11ac (VHT40)		54 to 62	54, 62	OFDM	15.0
	802.11ac (VHT80)		58	58	OFDM	29.3
	802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	MCS0
	802.11ax (HE40)		54 to 62	54, 62	OFDMA	MCS0
	802.11ax (HE80)		58	58	OFDMA	MCS0
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	6.5
	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	13.5
	802.11ac (VHT20)		100 to 140	100, 116, 140	OFDM	7.2
	802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	15.0
	802.11ac (VHT80)		106 to 122	106, 122	OFDM	29.3
	802.11ax (HE20)		100 to 140	100, 116, 140	OFDMA	MCS0
	802.11ax (HE40)		102 to 134	102, 110, 134	OFDMA	MCS0
	802.11ax (HE80)		106 to 122	106, 122	OFDMA	MCS0

* 802.11a, 802.11n, 802.11ac, 802.11ax modes are for conducted output power measuremenst only. For other test items, only test 802.11a, 802.11ax modes.

Test Condition:

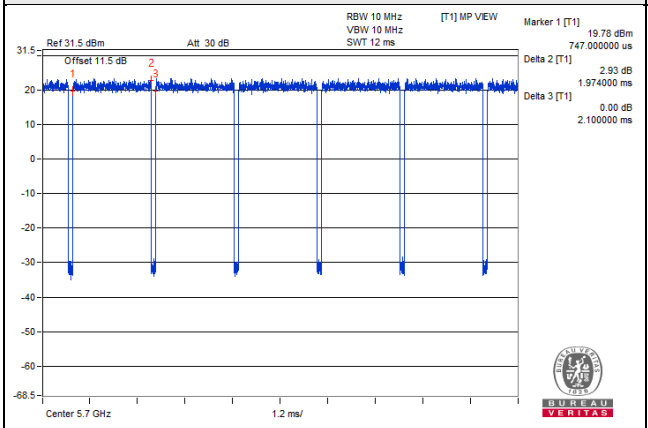
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	22 deg. C, 69% RH	120Vac, 60Hz	Edison Lee
RE<1G	23 deg. C, 66% RH	120Vac, 60Hz 54Vdc	Titan Hsu
PLC	25 deg. C, 75% RH	120Vac, 60Hz 54Vdc	Rex Wang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Chris Lin

3.3 Duty Cycle of Test Signal

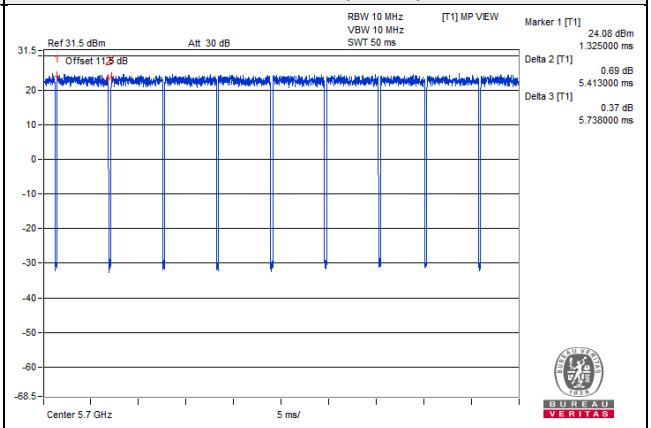
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 1.974/2.1 = 0.94, Duty factor = 10 * log (1/0.94) = 0.27
802.11ax (HE20): Duty cycle = 5.413/5.738 = 0.943, Duty factor = 10 * log (1/0.943) = 0.25
802.11ax (HE40): Duty cycle = 5.401/5.701 = 0.947, Duty factor = 10 * log (1/0.947) = 0.23
802.11ax (HE80): Duty cycle = 5.388/5.7 = 0.945, Duty factor = 10 * log (1/0.945) = 0.24

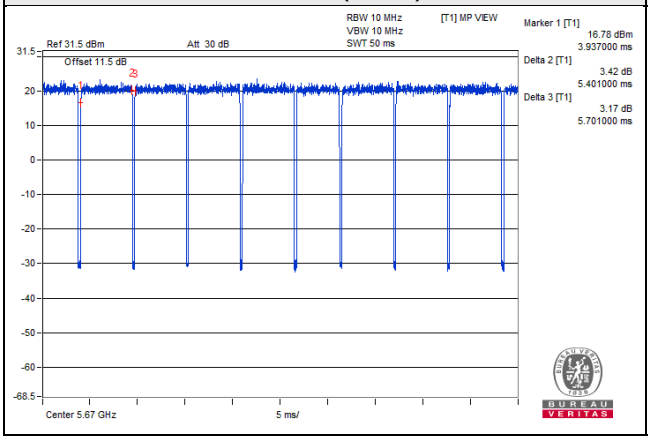
802.11a



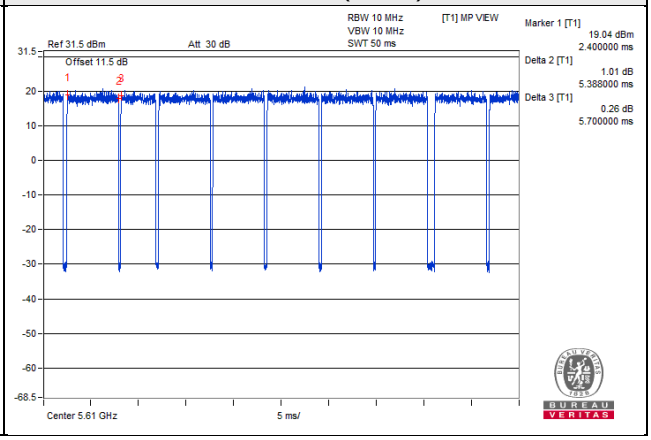
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



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	E5410	1HC2XM1	FCC DoC Approved	-
B.	Adapter	Asian Power Devices Inc.	WA-30J12R	NA	NA	Provided by client
C.	POE	SENAO Networks, Inc.	EPA5006GAT	NA	NA	Provided by client

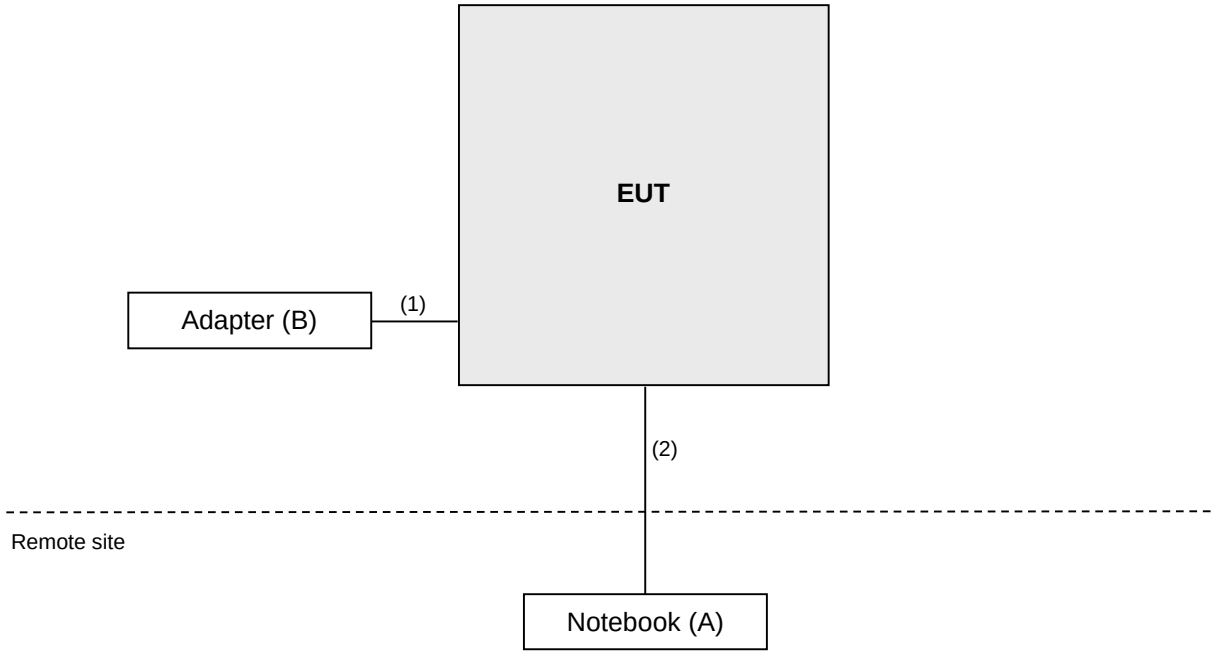
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items A acted as communication partner to transfer data.

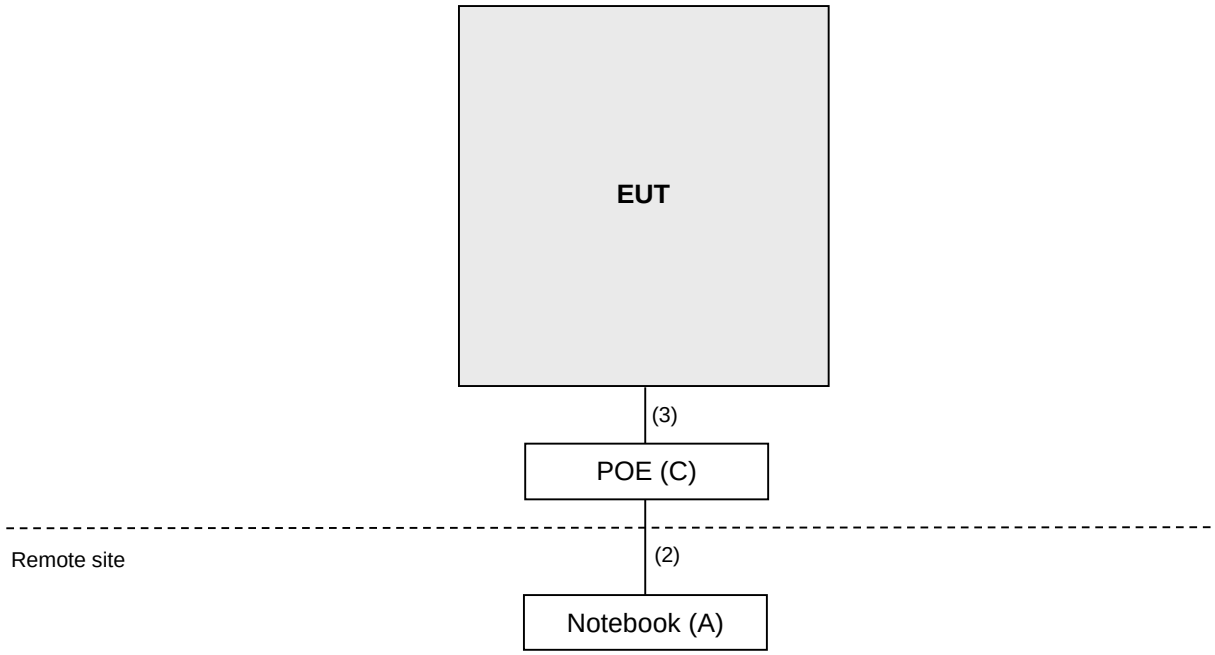
ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power Cable	1	1.5	-	0	Provided by client
2.	LAN Cable	1	7.0	N	0	RJ45, Cat5e
3.	LAN Cable	1	1.5	N	0	RJ45, Cat5e

3.4.1 Configuration of System under Test

Test Mode A



Test Mode B



3.5 General Description of Applied Standards and References

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

Test standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10:2013

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

References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK: 74 (dBµV/m)</td><td>AV: 54 (dBµV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK: -27 (dBm/MHz)</td><td rowspan="3">PK: 68.2(dBµV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK: -27 (dBm/MHz) *1
PK: 10 (dBm/MHz) *2
PK: 15.6 (dBm/MHz) *3
PK: 27 (dBm/MHz) *4</td><td>PK: 68.2(dBµV/m) *1
PK: 105.2 (dBµV/m) *2
PK: 110.8(dBµV/m) *3
PK: 122.2 (dBµV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

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	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 22, 2021	Mar. 21, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM- SM-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 04, 2020	Sep. 03, 2021
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY5519 0004/MY55190007/MY 55210005	Jul. 13, 2020	Jul. 12, 2021

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.

4.1.3 Test Procedures

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

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

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

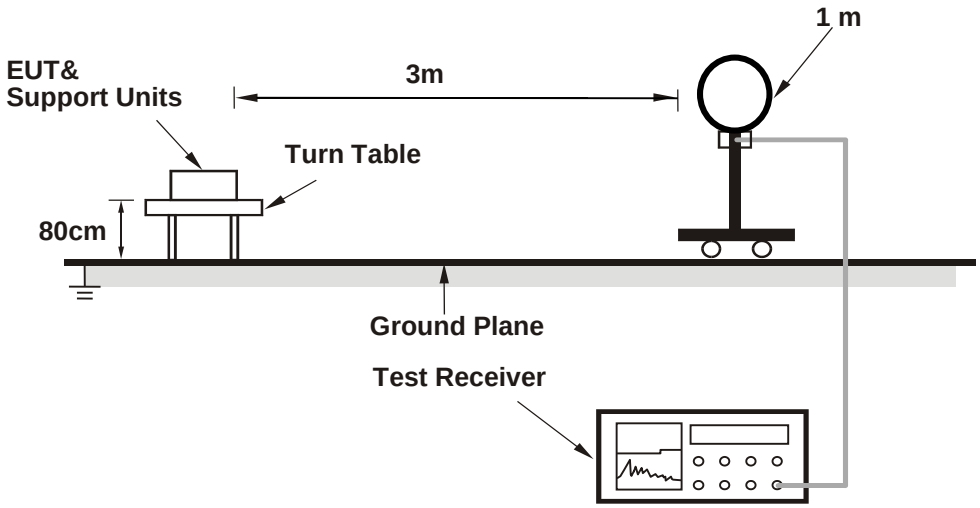
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz. (802.11a: RBW = 1MHz, VBW = 1kHz; 802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz,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

4.1.4 Deviation from Test Standard

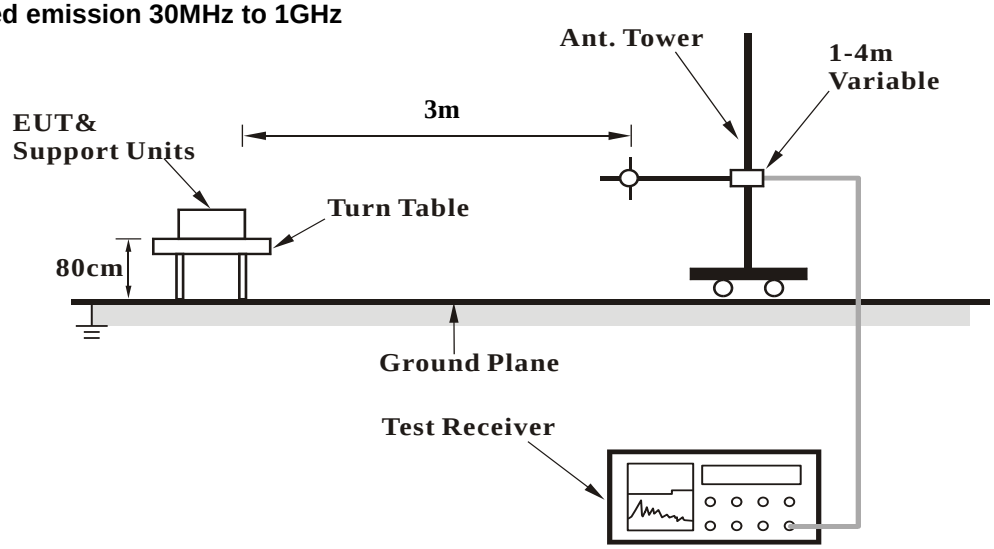
No deviation.

4.1.5 Test Setup

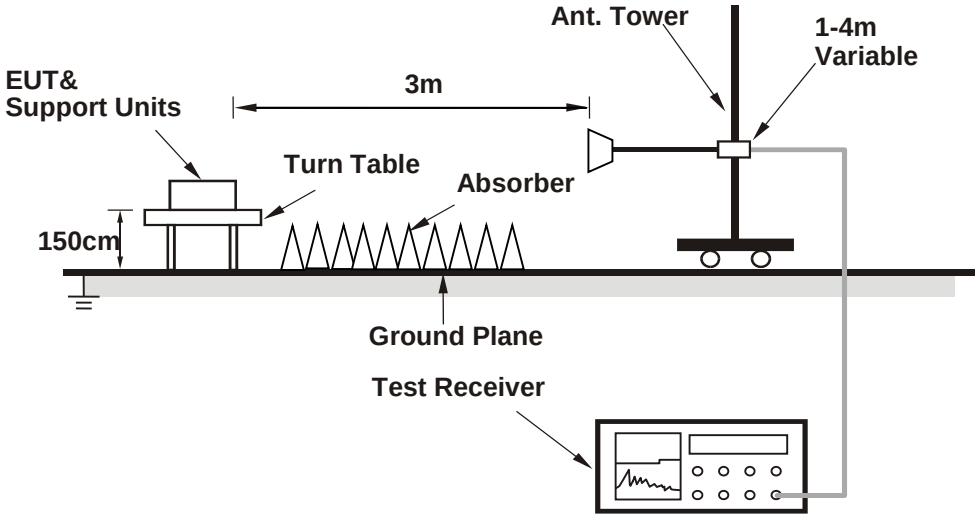
For Radiated emission below 30MHz



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 "PING".

4.1.7 Test Results

Above 1GHz data:

RF Mode	TX 802.11a	Channel	CH 52：5260 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	5150.00	57.9 PK	74.0	-16.1	2.78 H	318	51.5	6.4
2	5150.00	44.9 AV	54.0	-9.1	2.78 H	318	38.5	6.4
3	*5260.00	117.5 PK			2.66 H	315	75.6	41.9
4	*5260.00	106.6 AV			2.66 H	315	64.7	41.9
5	#10520.00	60.6 PK	68.2	-7.6	2.01 H	156	42.4	18.2
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	5150.00	57.9 PK	74.0	-16.1	1.62 V	34	51.5	6.4
2	5150.00	45.2 AV	54.0	-8.8	1.62 V	34	38.8	6.4
3	*5260.00	118.6 PK			1.63 V	26	76.7	41.9
4	*5260.00	106.8 AV			1.63 V	26	64.9	41.9
5	#10520.00	60.6 PK	68.2	-7.6	2.23 V	203	42.4	18.2

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 802.11a	Channel	CH 60：5300 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	*5300.00	118.1 PK			2.24 H	310	76.2	41.9
2	*5300.00	107.9 AV			2.24 H	310	66.0	41.9
3	10600.00	59.6 PK	74.0	-14.4	2.12 H	195	42.0	17.6
4	10600.00	45.7 AV	54.0	-8.3	2.12 H	195	28.1	17.6
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	*5300.00	119.1 PK			1.98 V	1	77.2	41.9
2	*5300.00	109.3 AV			1.98 V	1	67.4	41.9
3	10600.00	59.7 PK	74.0	-14.3	2.17 V	199	42.1	17.6
4	10600.00	46.2 AV	54.0	-7.8	2.17 V	199	28.6	17.6

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.

RF Mode	TX 802.11a	Channel	CH 64：5320 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	*5320.00	116.2 PK			2.37 H	313	74.2	42.0
2	*5320.00	105.7 AV			2.37 H	313	63.7	42.0
3	5350.00	65.8 PK	74.0	-8.2	2.21 H	317	59.5	6.3
4	5350.00	51.1 AV	54.0	-2.9	2.21 H	317	44.8	6.3
5	10640.00	59.1 PK	74.0	-14.9	1.93 H	154	41.6	17.5
6	10640.00	45.2 AV	54.0	-8.8	1.93 H	154	27.7	17.5
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	*5320.00	117.5 PK			1.94 V	1	75.5	42.0
2	*5320.00	107.2 AV			1.94 V	1	65.2	42.0
3	5350.00	64.2 PK	74.0	-9.8	1.91 V	307	57.9	6.3
4	5350.00	52.5 AV	54.0	-1.5	1.91 V	307	46.2	6.3
5	10640.00	59.7 PK	74.0	-14.3	2.31 V	211	42.2	17.5
6	10640.00	46.1 AV	54.0	-7.9	2.31 V	211	28.6	17.5

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.

RF Mode	TX 802.11a	Channel	CH 100：5500 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	5460.00	58.9 PK	74.0	-15.1	2.66 H	310	52.6	6.3
2	5460.00	46.3 AV	54.0	-7.7	2.66 H	310	40.0	6.3
3	#5470.00	65.0 PK	68.2	-3.2	2.62 H	311	58.8	6.2
4	*5500.00	118.0 PK			2.54 H	311	75.9	42.1
5	*5500.00	108.1 AV			2.54 H	311	66.0	42.1
6	11000.00	59.4 PK	74.0	-14.6	2.10 H	157	41.3	18.1
7	11000.00	45.4 AV	54.0	-8.6	2.10 H	157	27.3	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	5460.00	59.3 PK	74.0	-14.7	1.88 V	357	53.0	6.3
2	5460.00	46.7 AV	54.0	-7.3	1.88 V	357	40.4	6.3
3	#5470.00	66.6 PK	68.2	-1.6	1.86 V	353	60.4	6.2
4	*5500.00	118.7 PK			1.60 V	23	76.6	42.1
5	*5500.00	108.7 AV			1.60 V	23	66.6	42.1
6	11000.00	59.1 PK	74.0	-14.9	2.27 V	201	41.0	18.1
7	11000.00	45.3 AV	54.0	-8.7	2.27 V	201	27.2	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 802.11a	Channel	CH 116：5580 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	*5580.00	117.0 PK			2.59 H	285	74.9	42.1
2	*5580.00	107.1 AV			2.59 H	285	65.0	42.1
3	11160.00	60.1 PK	74.0	-13.9	2.00 H	171	41.7	18.4
4	11160.00	45.6 AV	54.0	-8.4	2.00 H	171	27.2	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	*5580.00	117.6 PK			1.60 V	20	75.5	42.1
2	*5580.00	107.7 AV			1.60 V	20	65.6	42.1
3	11160.00	59.7 PK	74.0	-14.3	2.17 V	193	41.3	18.4
4	11160.00	45.7 AV	54.0	-8.3	2.17 V	193	27.3	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.

RF Mode	TX 802.11a	Channel	CH 140：5700 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	*5700.00	116.5 PK			2.67 H	313	74.2	42.3
2	*5700.00	106.3 AV			2.67 H	313	64.0	42.3
3	#5725.00	65.1 PK	68.2	-3.1	2.63 H	315	58.9	6.2
4	11400.00	59.7 PK	74.0	-14.3	1.99 H	156	41.8	17.9
5	11400.00	45.1 AV	54.0	-8.9	1.99 H	156	27.2	17.9
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	*5700.00	116.5 PK			1.81 V	358	74.2	42.3
2	*5700.00	106.6 AV			1.81 V	358	64.3	42.3
3	#5725.00	66.8 PK	68.2	-1.4	1.80 V	307	60.6	6.2
4	11400.00	59.1 PK	74.0	-14.9	1.99 V	192	41.2	17.9
5	11400.00	45.4 AV	54.0	-8.6	1.99 V	192	27.5	17.9

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 52：5260 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	5150.00	57.6 PK	74.0	-16.4	2.22 H	320	51.2	6.4
2	5150.00	44.8 AV	54.0	-9.2	2.22 H	320	38.4	6.4
3	*5260.00	118.6 PK			2.19 H	318	76.7	41.9
4	*5260.00	107.0 AV			2.19 H	318	65.1	41.9
5	#10520.00	59.4 PK	68.2	-8.8	2.00 H	174	41.2	18.2
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	5150.00	57.8 PK	74.0	-16.2	1.99 V	357	51.4	6.4
2	5150.00	44.7 AV	54.0	-9.3	1.99 V	357	38.3	6.4
3	*5260.00	120.7 PK			1.99 V	2	78.8	41.9
4	*5260.00	108.3 AV			1.99 V	2	66.4	41.9
5	#10520.00	60.0 PK	68.2	-8.2	2.31 V	208	41.8	18.2

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 (HE20)	Channel	CH 60：5300 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	*5300.00	120.1 PK			2.31 H	310	78.2	41.9
2	*5300.00	107.1 AV			2.31 H	310	65.2	41.9
3	10600.00	58.9 PK	74.0	-15.1	1.99 H	156	41.3	17.6
4	10600.00	45.0 AV	54.0	-9.0	1.99 H	156	27.4	17.6
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	*5300.00	121.6 PK			1.95 V	1	79.7	41.9
2	*5300.00	108.9 AV			1.95 V	1	67.0	41.9
3	10600.00	59.6 PK	74.0	-14.4	2.24 V	195	42.0	17.6
4	10600.00	45.7 AV	54.0	-8.3	2.24 V	195	28.1	17.6

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 64：5320 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	*5320.00	118.0 PK			2.60 H	315	76.0	42.0
2	*5320.00	104.9 AV			2.60 H	315	62.9	42.0
3	5350.00	67.4 PK	74.0	-6.6	2.47 H	319	61.1	6.3
4	5350.00	50.9 AV	54.0	-3.1	2.47 H	319	44.6	6.3
5	10640.00	58.6 PK	74.0	-15.4	2.12 H	174	41.1	17.5
6	10640.00	45.1 AV	54.0	-8.9	2.12 H	174	27.6	17.5
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	*5320.00	119.3 PK			1.82 V	360	77.3	42.0
2	*5320.00	106.6 AV			1.82 V	360	64.6	42.0
3	5350.00	66.7 PK	74.0	-7.3	1.89 V	309	60.4	6.3
4	5350.00	52.8 AV	54.0	-1.2	1.89 V	309	46.5	6.3
5	10640.00	59.0 PK	74.0	-15.0	2.33 V	210	41.5	17.5
6	10640.00	45.4 AV	54.0	-8.6	2.33 V	210	27.9	17.5

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 100：5500 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	5460.00	58.6 PK	74.0	-15.4	2.60 H	307	52.3	6.3
2	5460.00	46.5 AV	54.0	-7.5	2.60 H	307	40.2	6.3
3	#5470.00	64.4 PK	68.2	-3.8	2.66 H	315	58.2	6.2
4	*5500.00	120.1 PK			2.65 H	310	78.0	42.1
5	*5500.00	107.1 AV			2.65 H	310	65.0	42.1
6	11000.00	59.6 PK	74.0	-14.4	2.17 H	158	41.5	18.1
7	11000.00	45.2 AV	54.0	-8.8	2.17 H	158	27.1	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	5460.00	58.6 PK	74.0	-15.4	1.65 V	30	52.3	6.3
2	5460.00	46.3 AV	54.0	-7.7	1.65 V	30	40.0	6.3
3	#5470.00	66.4 PK	68.2	-1.8	1.63 V	24	60.2	6.2
4	*5500.00	120.3 PK			1.63 V	24	78.2	42.1
5	*5500.00	107.8 AV			1.63 V	24	65.7	42.1
6	11000.00	58.9 PK	74.0	-15.1	2.08 V	189	40.8	18.1
7	11000.00	45.2 AV	54.0	-8.8	2.08 V	189	27.1	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 (HE20)	Channel	CH 116：5580 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	*5580.00	120.0 PK			2.66 H	312	77.9	42.1
2	*5580.00	107.4 AV			2.66 H	312	65.3	42.1
3	11160.00	59.3 PK	74.0	-14.7	2.06 H	167	40.9	18.4
4	11160.00	45.4 AV	54.0	-8.6	2.06 H	167	27.0	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	*5580.00	120.8 PK			1.69 V	23	78.7	42.1
2	*5580.00	107.6 AV			1.69 V	23	65.5	42.1
3	11160.00	60.0 PK	74.0	-14.0	2.03 V	193	41.6	18.4
4	11160.00	45.5 AV	54.0	-8.5	2.03 V	193	27.1	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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 140：5700 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	*5700.00	118.8 PK			2.57 H	318	76.5	42.3
2	*5700.00	105.8 AV			2.57 H	318	63.5	42.3
3	#5725.00	62.6 PK	68.2	-5.6	2.57 H	311	56.4	6.2
4	11400.00	59.5 PK	74.0	-14.5	2.13 H	166	41.6	17.9
5	11400.00	45.0 AV	54.0	-9.0	2.13 H	166	27.1	17.9
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	*5700.00	119.3 PK			1.44 V	358	77.0	42.3
2	*5700.00	106.3 AV			1.44 V	358	64.0	42.3
3	**#5725.00**	**67.4 PK**	**68.2**	**-0.8**	**1.56 V**	**360**	**61.2**	**6.2**
4	11400.00	59.8 PK	74.0	-14.2	2.11 V	199	41.9	17.9
5	11400.00	45.4 AV	54.0	-8.6	2.11 V	199	27.5	17.9

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 54：5270 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	5150.00	58.8 PK	74.0	-15.2	2.55 H	310	52.4	6.4
2	5150.00	45.8 AV	54.0	-8.2	2.55 H	310	39.4	6.4
3	*5270.00	118.5 PK			2.54 H	315	76.6	41.9
4	*5270.00	105.3 AV			2.54 H	315	63.4	41.9
5	5350.00	66.3 PK	74.0	-7.7	2.61 H	315	60.0	6.3
6	5350.00	52.2 AV	54.0	-1.8	2.61 H	315	45.9	6.3
7	#10540.00	59.7 PK	68.2	-8.5	1.96 H	158	41.6	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	5150.00	59.2 PK	74.0	-14.8	1.99 V	1	52.8	6.4
2	5150.00	46.3 AV	54.0	-7.7	1.99 V	1	39.9	6.4
3	*5270.00	119.4 PK			1.87 V	3	77.5	41.9
4	*5270.00	106.4 AV			1.87 V	3	64.5	41.9
5	5350.00	67.3 PK	74.0	-6.7	1.99 V	307	61.0	6.3
6	5350.00	52.1 AV	54.0	-1.9	1.99 V	307	45.8	6.3
7	#10540.00	59.3 PK	68.2	-8.9	2.19 V	201	41.2	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 (HE40)	Channel	CH 62：5310 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	*5310.00	115.7 PK			2.64 H	316	73.7	42.0
2	*5310.00	102.5 AV			2.64 H	316	60.5	42.0
3	5350.00	68.9 PK	74.0	-5.1	2.53 H	316	62.6	6.3
4	5350.00	49.7 AV	54.0	-4.3	2.53 H	316	43.4	6.3
5	10620.00	58.5 PK	74.0	-15.5	1.98 H	145	40.8	17.7
6	10620.00	44.8 AV	54.0	-9.2	1.98 H	145	27.1	17.7
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	*5310.00	116.6 PK			1.96 V	360	74.6	42.0
2	*5310.00	103.6 AV			1.96 V	360	61.6	42.0
3	5350.00	67.1 PK	74.0	-6.9	1.84 V	5	60.8	6.3
4	5350.00	52.5 AV	54.0	-1.5	1.84 V	5	46.2	6.3
5	10620.00	59.8 PK	74.0	-14.2	2.22 V	217	42.1	17.7
6	10620.00	45.9 AV	54.0	-8.1	2.22 V	217	28.2	17.7

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.

RF Mode	TX 802.11ax (HE40)	Channel	CH 102：5510 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	5460.00	50.9 PK	74.0	-23.1	2.70 H	310	44.6	6.3
2	5460.00	45.9 AV	54.0	-8.1	2.70 H	310	39.6	6.3
3	#5470.00	63.9 PK	68.2	-4.3	2.77 H	321	57.7	6.2
4	*5510.00	116.3 PK			2.73 H	314	74.2	42.1
5	*5510.00	103.3 AV			2.73 H	314	61.2	42.1
6	11020.00	59.2 PK	74.0	-14.8	2.08 H	159	41.1	18.1
7	11020.00	45.4 AV	54.0	-8.6	2.08 H	159	27.3	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	5460.00	61.8 PK	74.0	-12.2	1.61 V	25	55.5	6.3
2	5460.00	46.5 AV	54.0	-7.5	1.61 V	25	40.2	6.3
3	#5470.00	67.2 PK	68.2	-1.0	1.59 V	27	61.0	6.2
4	*5510.00	116.3 PK			1.61 V	22	74.2	42.1
5	*5510.00	103.8 AV			1.61 V	22	61.7	42.1
6	11020.00	59.3 PK	74.0	-14.7	1.99 V	175	41.2	18.1
7	11020.00	45.6 AV	54.0	-8.4	1.99 V	175	27.5	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 (HE40)	Channel	CH 110：5550 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	*5550.00	117.9 PK			2.74 H	311	75.8	42.1
2	*5550.00	105.1 AV			2.74 H	311	63.0	42.1
3	11100.00	59.2 PK	74.0	-14.8	2.01 H	162	41.0	18.2
4	11100.00	45.9 AV	54.0	-8.1	2.01 H	162	27.7	18.2
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	*5550.00	118.3 PK			1.63 V	24	76.2	42.1
2	*5550.00	105.7 AV			1.63 V	24	63.6	42.1
3	11100.00	59.3 PK	74.0	-14.7	2.03 V	178	41.1	18.2
4	11100.00	45.3 AV	54.0	-8.7	2.03 V	178	27.1	18.2

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.

RF Mode	TX 802.11ax (HE40)	Channel	CH 134：5670 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	*5670.00	113.7 PK			2.71 H	321	71.5	42.2
2	*5670.00	102.9 AV			2.73 H	321	60.7	42.2
3	#5725.00	65.5 PK	68.2	-2.7	2.77 H	316	59.3	6.2
4	11340.00	59.7 PK	74.0	-14.3	2.13 H	173	41.4	18.3
5	11340.00	45.3 AV	54.0	-8.7	2.13 H	173	27.0	18.3
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	*5670.00	115.0 PK			1.56 V	357	72.8	42.2
2	*5670.00	103.2 AV			1.56 V	357	61.0	42.2
3	#5725.00	66.5 PK	68.2	-1.7	1.55 V	355	60.3	6.2
4	11340.00	59.8 PK	74.0	-14.2	2.22 V	193	41.5	18.3
5	11340.00	45.4 AV	54.0	-8.6	2.22 V	193	27.1	18.3

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 (HE80)	Channel	CH 58：5290 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	5150.00	57.8 PK	74.0	-16.2	2.00 H	337	51.4	6.4
2	5150.00	44.8 AV	54.0	-9.2	2.00 H	337	38.4	6.4
3	*5290.00	111.2 PK			1.93 H	337	69.3	41.9
4	*5290.00	98.7 AV			1.93 H	337	56.8	41.9
5	5350.00	67.8 PK	74.0	-6.2	1.95 H	339	61.5	6.3
6	5350.00	49.6 AV	54.0	-4.4	1.95 H	339	43.3	6.3
7	#10580.00	59.5 PK	68.2	-8.7	1.88 H	156	41.7	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	5150.00	58.8 PK	74.0	-15.2	1.89 V	344	52.4	6.4
2	5150.00	45.4 AV	54.0	-8.6	1.89 V	344	39.0	6.4
3	*5290.00	113.2 PK			1.96 V	1	71.3	41.9
4	*5290.00	100.1 AV			1.96 V	1	58.2	41.9
5	5350.00	70.8 PK	74.0	-3.2	1.88 V	357	64.5	6.3
6	5350.00	52.9 AV	54.0	-1.1	1.88 V	357	46.6	6.3
7	#10580.00	60.0 PK	68.2	-8.2	2.21 V	196	42.2	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 (HE80)	Channel	CH 106：5530 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	5460.00	64.7 PK	74.0	-9.3	2.69 H	309	58.4	6.3
2	5460.00	46.7 AV	54.0	-7.3	2.69 H	309	40.4	6.3
3	#5470.00	66.2 PK	68.2	-2.0	2.79 H	318	60.0	6.2
4	*5530.00	110.7 PK			2.70 H	318	68.6	42.1
5	*5530.00	97.5 AV			2.70 H	318	55.4	42.1
6	#5725.00	58.3 PK	68.2	-9.9	2.66 H	300	52.1	6.2
7	11060.00	59.9 PK	74.0	-14.1	2.08 H	153	41.8	18.1
8	11060.00	45.2 AV	54.0	-8.8	2.08 H	153	27.1	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	5460.00	65.0 PK	74.0	-9.0	1.77 V	356	58.7	6.3
2	5460.00	47.2 AV	54.0	-6.8	1.77 V	356	40.9	6.3
3	#5470.00	67.2 PK	68.2	-1.0	1.75 V	358	61.0	6.2
4	*5530.00	110.7 PK			1.83 V	353	68.6	42.1
5	*5530.00	98.3 AV			1.83 V	353	56.2	42.1
6	#5725.00	59.1 PK	68.2	-9.1	1.75 V	359	52.9	6.2
7	11060.00	60.1 PK	74.0	-13.9	2.10 V	192	42.0	18.1
8	11060.00	45.3 AV	54.0	-8.7	2.10 V	192	27.2	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 (HE80)	Channel	CH 122：5610 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	5460.00	62.5 PK	74.0	-11.5	2.66 H	301	56.2	6.3
2	5460.00	46.2 AV	54.0	-7.8	2.66 H	301	39.9	6.3
3	#5470.00	62.6 PK	68.2	-5.6	2.73 H	312	56.4	6.2
4	*5610.00	111.3 PK			2.70 H	328	69.2	42.1
5	*5610.00	98.1 AV			2.70 H	328	56.0	42.1
6	#5725.00	66.2 PK	68.2	-2.0	2.71 H	311	60.0	6.2
7	11220.00	60.3 PK	74.0	-13.7	2.12 H	159	41.8	18.5
8	11220.00	45.5 AV	54.0	-8.5	2.12 H	159	27.0	18.5
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	5460.00	62.6 PK	74.0	-11.4	1.45 V	350	56.3	6.3
2	5460.00	46.3 AV	54.0	-7.7	1.45 V	350	40.0	6.3
3	#5470.00	62.9 PK	68.2	-5.3	1.44 V	356	56.7	6.2
4	*5610.00	111.8 PK			1.69 V	357	69.7	42.1
5	*5610.00	98.5 AV			1.69 V	357	56.4	42.1
6	#5725.00	66.7 PK	68.2	-1.5	1.44 V	357	60.5	6.2
7	11220.00	60.0 PK	74.0	-14.0	2.00 V	174	41.5	18.5
8	11220.00	45.7 AV	54.0	-8.3	2.00 V	174	27.2	18.5

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:

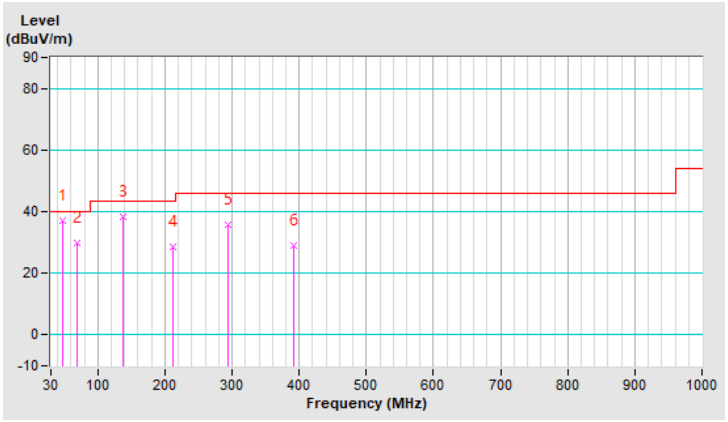
Mode A

RF Mode	TX 802.11ax (HE20)	Channel	CH 140：5700 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	46.87	36.9 QP	40.0	-3.1	1.00 H	355	46.1	-9.2
2	69.36	29.9 QP	40.0	-10.1	1.99 H	162	40.9	-11.0
3	136.84	38.2 QP	43.5	-5.3	1.99 H	94	47.5	-9.3
4	212.75	28.6 QP	43.5	-14.9	1.00 H	242	39.4	-10.8
5	294.29	35.7 QP	46.0	-10.3	1.00 H	229	42.4	-6.7
6	392.70	28.9 QP	46.0	-17.1	1.99 H	340	33.7	-4.8

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. 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.

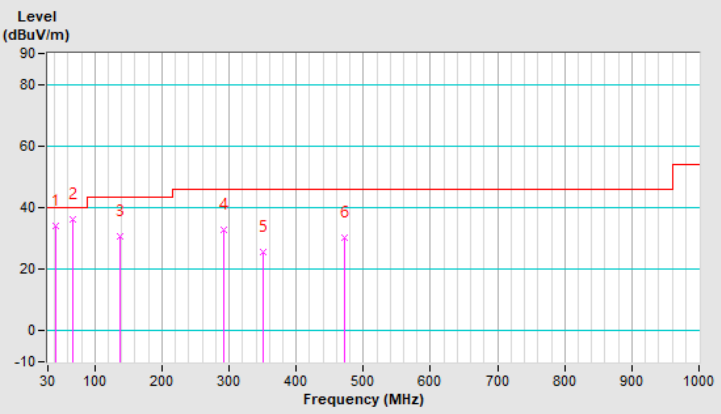


RF Mode	TX 802.11ax (HE20)	Channel	CH 140：5700 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	41.25	33.9 QP	40.0	-6.1	1.00 V	121	43.2	-9.3
2	67.96	36.0 QP	40.0	-4.0	2.00 V	8	46.5	-10.5
3	138.25	30.8 QP	43.5	-12.7	1.00 V	16	39.9	-9.1
4	291.48	32.7 QP	46.0	-13.3	1.51 V	173	39.4	-6.7
5	350.52	25.7 QP	46.0	-20.3	1.51 V	153	31.3	-5.6
6	471.42	30.3 QP	46.0	-15.7	1.00 V	167	33.1	-2.8

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. 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.



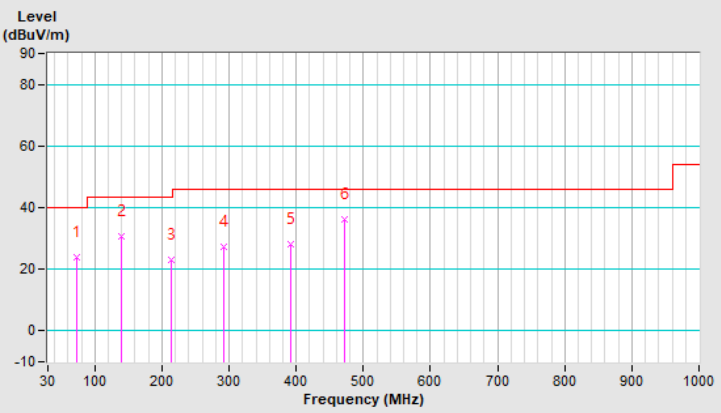
Mode B

RF Mode	TX 802.11ax (HE20)	Channel	CH 140：5700 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	72.17	23.9 QP	40.0	-16.1	1.00 H	264	35.4	-11.5
2	139.65	30.5 QP	43.5	-13.0	2.00 H	72	39.5	-9.0
3	214.16	22.9 QP	43.5	-20.6	1.00 H	235	33.7	-10.8
4	292.88	27.3 QP	46.0	-18.7	1.00 H	214	34.0	-6.7
5	392.70	28.2 QP	46.0	-17.8	2.00 H	355	33.0	-4.8
6	471.42	36.0 QP	46.0	-10.0	2.00 H	119	38.8	-2.8

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. 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.

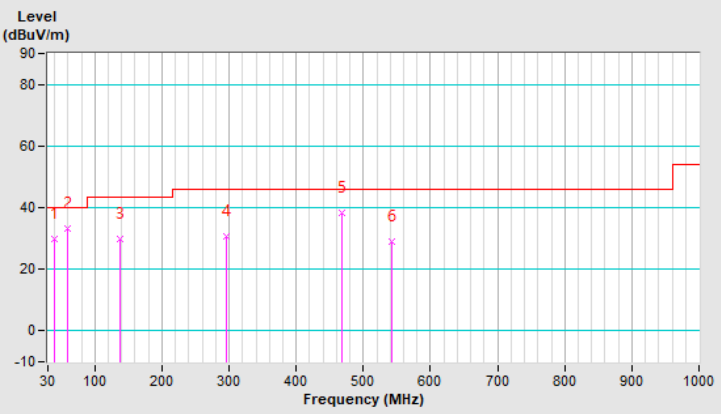


RF Mode	TX 802.11ax (HE20)	Channel	CH 140：5700 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.84	29.7 QP	40.0	-10.3	1.00 V	3	39.4	-9.7
2	59.52	33.1 QP	40.0	-6.9	1.00 V	337	42.5	-9.4
3	138.25	29.9 QP	43.5	-13.6	1.00 V	192	39.0	-9.1
4	295.70	30.5 QP	46.0	-15.5	1.49 V	328	37.1	-6.6
5	468.61	38.3 QP	46.0	-7.7	1.00 V	175	41.2	-2.9
6	543.12	28.9 QP	46.0	-17.1	1.00 V	6	30.2	-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. 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
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2020	Sep. 03, 2021
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 18, 2021	Jan. 17, 2022
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 18, 2020	Aug. 17, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2 (Conduction 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.

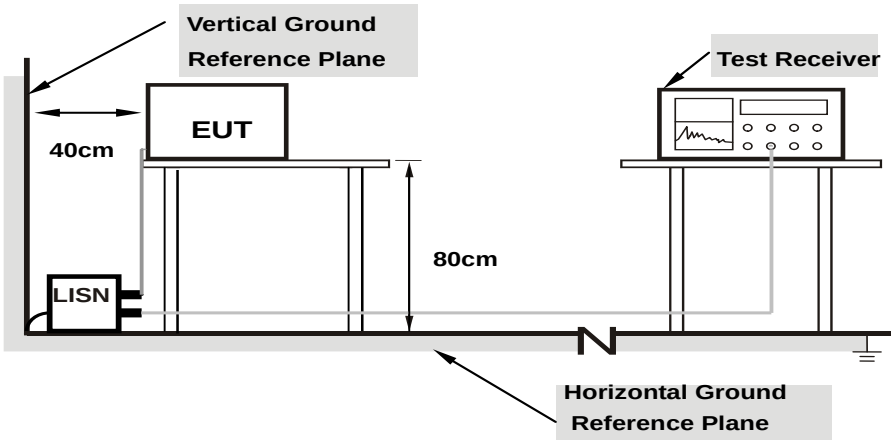
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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:

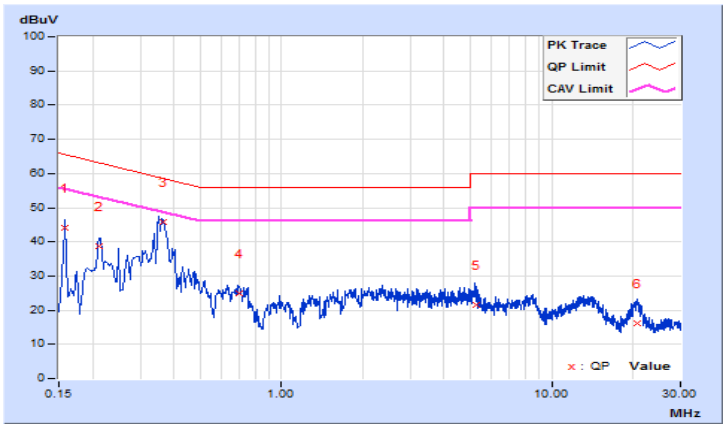
Mode A

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 75%RH
Tested by	Rex Wang	Test Date	2021/4/6

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	0.15687	10.09	34.03	17.40	44.12	27.49	65.63	55.63	-21.51	-28.14
2	0.21015	10.12	28.47	15.93	38.59	26.05	63.20	53.20	-24.61	-27.15
3	0.36600	10.17	35.54	28.86	45.71	39.03	58.59	48.59	-12.88	-9.56
4	0.69400	10.22	14.75	7.94	24.97	18.16	56.00	46.00	-31.03	-27.84
5	5.23800	10.39	11.30	3.17	21.69	13.56	60.00	50.00	-38.31	-36.44
6	20.68600	10.64	5.52	1.49	16.16	12.13	60.00	50.00	-43.84	-37.87

Remarks:

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

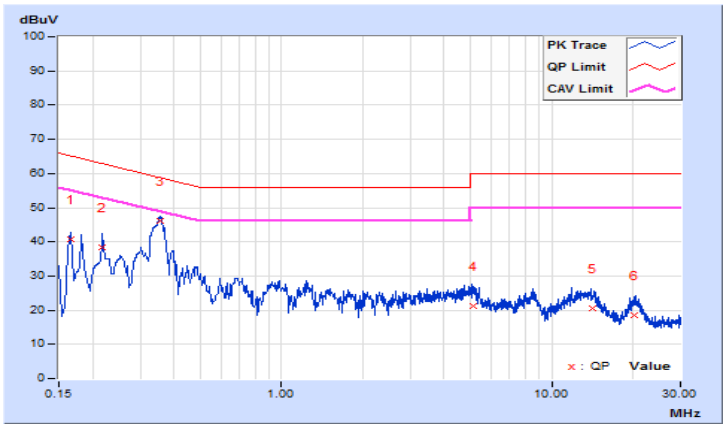


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 75%RH
Tested by	Rex Wang	Test Date	2021/4/6

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	0.16535	10.10	30.58	18.02	40.68	28.12	65.19	55.19	-24.51	-27.07
2	0.21576	10.13	28.13	16.93	38.26	27.06	62.98	52.98	-24.72	-25.92
3	0.35400	10.18	35.95	26.21	46.13	36.39	58.87	48.87	-12.74	-12.48
4	5.10200	10.46	10.80	3.35	21.26	13.81	60.00	50.00	-38.74	-36.19
5	14.14600	10.72	9.85	3.95	20.57	14.67	60.00	50.00	-39.43	-35.33
6	20.14200	10.90	7.50	1.17	18.40	12.07	60.00	50.00	-41.60	-37.93

Remarks:

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



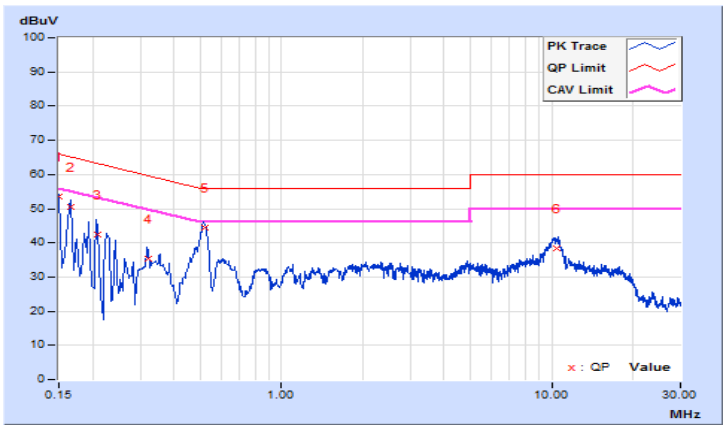
Mode B

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 75%RH
Tested by	Rex Wang	Test Date	2021/4/6

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.07	43.31	26.21	53.38	36.28	66.00	56.00	-12.62	-19.72
2	0.16535	10.07	40.34	22.91	50.41	32.98	65.19	55.19	-14.78	-22.21
3	0.21000	10.08	32.38	16.44	42.46	26.52	63.21	53.21	-20.75	-26.69
4	0.32200	10.09	25.16	17.18	35.25	27.27	59.66	49.66	-24.41	-22.39
5	**0.52016**	**10.10**	**34.46**	**29.09**	**44.56**	**39.19**	**56.00**	**46.00**	**-11.44**	**-6.81**
6	10.42600	10.33	28.15	22.99	38.48	33.32	60.00	50.00	-21.52	-16.68

Remarks:

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

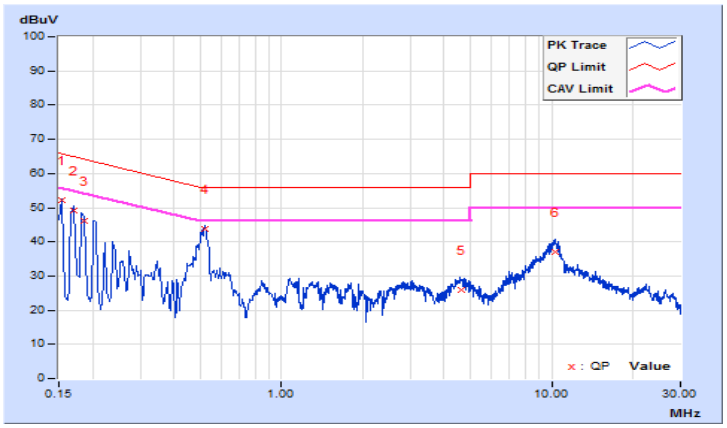


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 75%RH
Tested by	Rex Wang	Test Date	2021/4/6

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	0.15400	10.08	42.08	24.64	52.16	34.72	65.78	55.78	-13.62	-21.06
2	0.16932	10.08	39.10	21.54	49.18	31.62	64.99	54.99	-15.81	-23.37
3	0.18600	10.08	36.10	18.89	46.18	28.97	64.21	54.21	-18.03	-25.24
4	0.51800	10.11	33.50	28.26	43.61	38.37	56.00	46.00	-12.39	-7.63
5	4.61800	10.28	15.75	9.24	26.03	19.52	56.00	46.00	-29.97	-26.48
6	10.28200	10.42	26.70	21.23	37.12	31.65	60.00	50.00	-22.88	-18.35

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

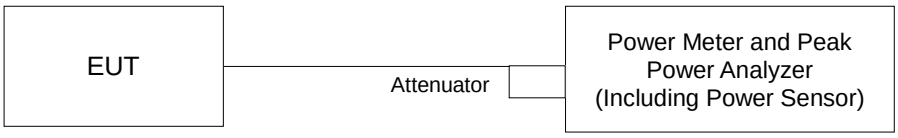
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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

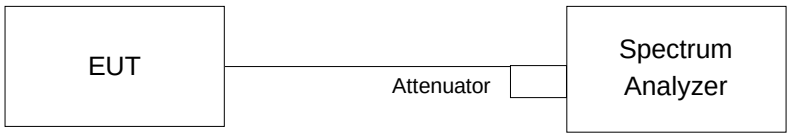
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

For Power Output



For 26dB Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

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

For 26dB Bandwidth

a. Set RBW = approximately 1% of the emission bandwidth.

b. Set the VBW > RBW.

c. Detector = Peak.

d. Trace mode = max hold.

e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.11	18.41	150.813	21.78	24	Pass
60	5300	19.08	18.39	149.934	21.76	24	Pass
64	5320	19.52	18.91	167.34	22.24	24	Pass
100	5500	18.97	18.67	152.507	21.83	24	Pass
116	5580	18.93	18.58	150.274	21.77	24	Pass
140	5700	18.84	18.52	147.681	21.69	24	Pass

Note:

Chain 0

1. 11 dBm + 10log (20.88) = 24.20 dBm > 24 dBm.
2. 11 dBm + 10log (20.74) = 24.17 dBm > 24 dBm.
3. 11 dBm + 10log (20.81) = 24.18 dBm > 24 dBm.
4. 11 dBm + 10log (20.79) = 24.18 dBm > 24 dBm.
5. 11 dBm + 10log (20.79) = 24.18 dBm > 24 dBm.
6. 11 dBm + 10log (20.72) = 24.16 dBm > 24 dBm.

Chain 1

1. 11 dBm + 10log (20.30) = 24.07 dBm > 24 dBm.
2. 11 dBm + 10log (20.94) = 24.21 dBm > 24 dBm.
3. 11 dBm + 10log (20.80) = 24.18 dBm > 24 dBm.
4. 11 dBm + 10log (20.87) = 24.20 dBm > 24 dBm.
5. 11 dBm + 10log (21.00) = 24.22 dBm > 24 dBm.
6. 11 dBm + 10log (20.91) = 24.20 dBm > 24 dBm.

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.75	18.13	140.002	21.46	24	Pass
60	5300	18.73	18.14	139.808	21.46	24	Pass
64	5320	19.42	18.63	160.444	22.05	24	Pass
100	5500	18.66	18.34	141.685	21.51	24	Pass
116	5580	18.69	18.36	142.509	21.54	24	Pass
140	5700	18.65	18.77	148.618	21.72	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (22.06) = 24.44 dBm > 24 dBm.
2. 11 dBm + 10log (21.97) = 24.42 dBm > 24 dBm.
3. 11 dBm + 10log (22.27) = 24.48 dBm > 24 dBm.
4. 11 dBm + 10log (21.85) = 24.39 dBm > 24 dBm.
5. 11 dBm + 10log (21.89) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.74) = 24.37 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
2. 11 dBm + 10log (21.63) = 24.35 dBm > 24 dBm.
3. 11 dBm + 10log (21.72) = 24.37 dBm > 24 dBm.
4. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
5. 11 dBm + 10log (21.87) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.73) = 24.37 dBm > 24 dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	18.84	18.05	140.386	21.47	24	Pass
62	5310	17.82	17.74	119.963	20.79	24	Pass
102	5510	18.22	18.30	133.983	21.27	24	Pass
110	5550	18.54	18.11	136.164	21.34	24	Pass
134	5670	18.46	18.23	136.673	21.36	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (42.53) = 27.29 dBm > 24 dBm.
2. 11 dBm + 10log (42.23) = 27.26 dBm > 24 dBm.
3. 11 dBm + 10log (42.24) = 27.26 dBm > 24 dBm.
4. 11 dBm + 10log (42.09) = 27.24 dBm > 24 dBm.
5. 11 dBm + 10log (42.62) = 27.30 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (42.50) = 27.28 dBm > 24 dBm.
2. 11 dBm + 10log (42.19) = 27.25 dBm > 24 dBm.
3. 11 dBm + 10log (42.72) = 27.31 dBm > 24 dBm.
4. 11 dBm + 10log (43.27) = 27.36 dBm > 24 dBm.
5. 11 dBm + 10log (42.36) = 27.27 dBm > 24 dBm.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.84	18.20	142.629	21.54	24	Pass
60	5300	18.82	18.23	142.735	21.55	24	Pass
64	5320	19.53	18.71	164.045	22.15	24	Pass
100	5500	18.72	18.43	144.136	21.59	24	Pass
116	5580	18.76	18.40	144.345	21.59	24	Pass
140	5700	18.75	18.83	151.373	21.80	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (22.06) = 24.44 dBm > 24 dBm.
2. 11 dBm + 10log (21.97) = 24.42 dBm > 24 dBm.
3. 11 dBm + 10log (22.27) = 24.48 dBm > 24 dBm.
4. 11 dBm + 10log (21.85) = 24.39 dBm > 24 dBm.
5. 11 dBm + 10log (21.89) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.74) = 24.37 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
2. 11 dBm + 10log (21.63) = 24.35 dBm > 24 dBm.
3. 11 dBm + 10log (21.72) = 24.37 dBm > 24 dBm.
4. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
5. 11 dBm + 10log (21.87) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.73) = 24.37 dBm > 24 dBm.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	18.97	18.16	144.35	21.59	24	Pass
62	5310	17.94	17.83	122.904	20.90	24	Pass
102	5510	18.30	18.45	137.592	21.39	24	Pass
110	5550	18.68	18.20	139.86	21.46	24	Pass
134	5670	18.53	18.32	139.206	21.44	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (42.53) = 27.29 dBm > 24 dBm.
2. 11 dBm + 10log (42.23) = 27.26 dBm > 24 dBm.
3. 11 dBm + 10log (42.24) = 27.26 dBm > 24 dBm.
4. 11 dBm + 10log (42.09) = 27.24 dBm > 24 dBm.
5. 11 dBm + 10log (42.62) = 27.30 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (42.50) = 27.28 dBm > 24 dBm.
2. 11 dBm + 10log (42.19) = 27.25 dBm > 24 dBm.
3. 11 dBm + 10log (42.72) = 27.31 dBm > 24 dBm.
4. 11 dBm + 10log (43.27) = 27.36 dBm > 24 dBm.
5. 11 dBm + 10log (42.36) = 27.27 dBm > 24 dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	17.75	17.72	118.722	20.75	24	Pass
106	5530	18.06	17.78	123.953	20.93	24	Pass
122	5610	18.49	18.41	139.974	21.46	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (83.04) = 30.19 dBm > 24 dBm.
2. 11 dBm + 10log (83.43) = 30.21 dBm > 24 dBm.
3. 11 dBm + 10log (83.20) = 30.20 dBm > 24 dBm.
Chain 1
1. 11 dBm + 10log (83.19) = 30.20 dBm > 24 dBm.
2. 11 dBm + 10log (83.60) = 30.22 dBm > 24 dBm.
3. 11 dBm + 10log (83.38) = 30.21 dBm > 24 dBm.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.98	18.33	147.145	21.68	24	Pass
60	5300	19.03	18.37	148.69	21.72	24	Pass
64	5320	19.65	18.86	**169.17**	22.28	24	Pass
100	5500	18.89	18.62	150.224	21.77	24	Pass
116	5580	18.96	18.57	150.649	21.78	24	Pass
140	5700	18.91	18.98	156.872	21.96	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (22.06) = 24.44 dBm > 24 dBm.
2. 11 dBm + 10log (21.97) = 24.42 dBm > 24 dBm.
3. 11 dBm + 10log (22.27) = 24.48 dBm > 24 dBm.
4. 11 dBm + 10log (21.85) = 24.39 dBm > 24 dBm.
5. 11 dBm + 10log (21.89) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.74) = 24.37 dBm > 24 dBm.
Chain 1
1. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
2. 11 dBm + 10log (21.63) = 24.35 dBm > 24 dBm.
3. 11 dBm + 10log (21.72) = 24.37 dBm > 24 dBm.
4. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
5. 11 dBm + 10log (21.87) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.73) = 24.37 dBm > 24 dBm.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	19.12	18.33	149.735	21.75	24	Pass
62	5310	18.13	18.01	128.254	21.08	24	Pass
102	5510	18.44	18.62	142.601	21.54	24	Pass
110	5550	18.89	18.34	145.68	21.63	24	Pass
134	5670	18.72	18.46	144.619	21.60	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (42.53) = 27.29 dBm > 24 dBm.
2. 11 dBm + 10log (42.23) = 27.26 dBm > 24 dBm.
3. 11 dBm + 10log (42.24) = 27.26 dBm > 24 dBm.
4. 11 dBm + 10log (42.09) = 27.24 dBm > 24 dBm.
5. 11 dBm + 10log (42.62) = 27.30 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (42.50) = 27.28 dBm > 24 dBm.
2. 11 dBm + 10log (42.19) = 27.25 dBm > 24 dBm.
3. 11 dBm + 10log (42.72) = 27.31 dBm > 24 dBm.
4. 11 dBm + 10log (43.27) = 27.36 dBm > 24 dBm.
5. 11 dBm + 10log (42.36) = 27.27 dBm > 24 dBm.

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	17.92	17.88	123.32	20.91	24	Pass
106	5530	18.21	17.95	128.595	21.09	24	Pass
122	5610	18.68	18.59	146.067	21.65	24	Pass

Note:
Chain 0
1. 11 dBm + 10log (83.04) = 30.19 dBm > 24 dBm.
2. 11 dBm + 10log (83.43) = 30.21 dBm > 24 dBm.
3. 11 dBm + 10log (83.20) = 30.20 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (83.19) = 30.20 dBm > 24 dBm.
2. 11 dBm + 10log (83.60) = 30.22 dBm > 24 dBm.
3. 11 dBm + 10log (83.38) = 30.21 dBm > 24 dBm.

Beamforming Mode

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	15.83	15.19	71.319	18.53	22.77	Pass
60	5300	15.81	15.22	71.373	18.54	22.77	Pass
64	5320	16.52	15.70	82.028	19.14	22.77	Pass
100	5500	15.71	15.42	72.073	18.58	22.3	Pass
116	5580	15.75	15.39	72.178	18.58	22.3	Pass
140	5700	15.74	15.82	75.692	18.79	22.3	Pass

Note:

1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power limit shall be reduced to 24 - (7.23 - 6) = 22.77dBm.
2. 5500-5700MHz: Directional gain = Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power limit shall be reduced to 24 - (7.7 - 6) = 22.3dBm.

Chain 0

1. 11 dBm + 10log (22.06) = 24.44 dBm > 24 dBm.
2. 11 dBm + 10log (21.97) = 24.42 dBm > 24 dBm.
3. 11 dBm + 10log (22.27) = 24.48 dBm > 24 dBm.
4. 11 dBm + 10log (21.85) = 24.39 dBm > 24 dBm.
5. 11 dBm + 10log (21.89) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.74) = 24.37 dBm > 24 dBm.

Chain 1

1. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
2. 11 dBm + 10log (21.63) = 24.35 dBm > 24 dBm.
3. 11 dBm + 10log (21.72) = 24.37 dBm > 24 dBm.
4. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
5. 11 dBm + 10log (21.87) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.73) = 24.37 dBm > 24 dBm.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	15.96	15.15	72.18	18.58	22.77	Pass
62	5310	14.93	14.82	61.456	17.89	22.77	Pass
102	5510	15.29	15.44	68.801	18.38	22.3	Pass
110	5550	15.67	15.19	69.935	18.45	22.3	Pass
134	5670	15.52	15.31	69.608	18.43	22.3	Pass

Note:
1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power limit shall be reduced to 24 - (7.23 - 6) = 22.77dBm.
2. 5500-5700MHz: Directional gain = Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power limit shall be reduced to 24 - (7.7 - 6) = 22.3dBm.

Chain 0
1. 11 dBm + 10log (42.53) = 27.29 dBm > 24 dBm.
2. 11 dBm + 10log (42.23) = 27.26 dBm > 24 dBm.
3. 11 dBm + 10log (42.24) = 27.26 dBm > 24 dBm.
4. 11 dBm + 10log (42.09) = 27.24 dBm > 24 dBm.
5. 11 dBm + 10log (42.62) = 27.30 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (42.50) = 27.28 dBm > 24 dBm.
2. 11 dBm + 10log (42.19) = 27.25 dBm > 24 dBm.
3. 11 dBm + 10log (42.72) = 27.31 dBm > 24 dBm.
4. 11 dBm + 10log (43.27) = 27.36 dBm > 24 dBm.
5. 11 dBm + 10log (42.36) = 27.27 dBm > 24 dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	14.74	14.71	59.365	17.74	22.77	Pass
106	5530	15.05	14.77	61.981	17.92	22.3	Pass
122	5610	15.48	15.40	69.992	18.45	22.3	Pass

Note:
1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power limit shall be reduced to 24 - (7.23 - 6) = 22.77dBm.
2. 5500-5700MHz: Directional gain = Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power limit shall be reduced to 24 - (7.7 - 6) = 22.3dBm.

Chain 0
1. 11 dBm + 10log (83.04) = 30.19 dBm > 24 dBm.
2. 11 dBm + 10log (83.43) = 30.21 dBm > 24 dBm.
3. 11 dBm + 10log (83.20) = 30.20 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (83.19) = 30.20 dBm > 24 dBm.
2. 11 dBm + 10log (83.60) = 30.22 dBm > 24 dBm.
3. 11 dBm + 10log (83.38) = 30.21 dBm > 24 dBm.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	15.97	15.32	73.577	18.67	22.77	Pass
60	5300	16.02	15.36	74.35	18.71	22.77	Pass
64	5320	16.64	15.85	84.591	19.27	22.77	Pass
100	5500	15.88	15.61	75.117	18.76	22.3	Pass
116	5580	15.95	15.56	75.33	18.77	22.3	Pass
140	5700	15.90	15.97	78.441	18.95	22.3	Pass

Note:
1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power limit shall be reduced to 24 - (7.23 - 6) = 22.77dBm.
2. 5500-5700MHz: Directional gain = Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power limit shall be reduced to 24 - (7.7 - 6) = 22.3dBm.

Chain 0
1. 11 dBm + 10log (22.06) = 24.44 dBm > 24 dBm.
2. 11 dBm + 10log (21.97) = 24.42 dBm > 24 dBm.
3. 11 dBm + 10log (22.27) = 24.48 dBm > 24 dBm.
4. 11 dBm + 10log (21.85) = 24.39 dBm > 24 dBm.
5. 11 dBm + 10log (21.89) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.74) = 24.37 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
2. 11 dBm + 10log (21.63) = 24.35 dBm > 24 dBm.
3. 11 dBm + 10log (21.72) = 24.37 dBm > 24 dBm.
4. 11 dBm + 10log (21.77) = 24.38 dBm > 24 dBm.
5. 11 dBm + 10log (21.87) = 24.40 dBm > 24 dBm.
6. 11 dBm + 10log (21.73) = 24.37 dBm > 24 dBm.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	16.11	15.32	74.873	18.74	22.77	Pass
62	5310	15.12	15.00	64.132	18.07	22.77	Pass
102	5510	15.43	15.61	71.306	18.53	22.3	Pass
110	5550	15.88	15.33	72.845	18.62	22.3	Pass
134	5670	15.71	15.45	72.314	18.59	22.3	Pass

Note:
1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power limit shall be reduced to 24 - (7.23 - 6) = 22.77dBm.
2. 5500-5700MHz: Directional gain = Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power limit shall be reduced to 24 - (7.7 - 6) = 22.3dBm.

Chain 0
1. 11 dBm + 10log (42.53) = 27.29 dBm > 24 dBm.
2. 11 dBm + 10log (42.23) = 27.26 dBm > 24 dBm.
3. 11 dBm + 10log (42.24) = 27.26 dBm > 24 dBm.
4. 11 dBm + 10log (42.09) = 27.24 dBm > 24 dBm.
5. 11 dBm + 10log (42.62) = 27.30 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (42.50) = 27.28 dBm > 24 dBm.
2. 11 dBm + 10log (42.19) = 27.25 dBm > 24 dBm.
3. 11 dBm + 10log (42.72) = 27.31 dBm > 24 dBm.
4. 11 dBm + 10log (43.27) = 27.36 dBm > 24 dBm.
5. 11 dBm + 10log (42.36) = 27.27 dBm > 24 dBm.

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	14.91	14.87	61.664	17.90	22.77	Pass
106	5530	18.21	17.95	128.595	21.09	22.3	Pass
122	5610	18.68	18.59	**146.067**	21.65	22.3	Pass

Note:
1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power limit shall be reduced to 24 - (7.23 - 6) = 22.77dBm.
2. 5500-5700MHz: Directional gain = Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power limit shall be reduced to 24 - (7.7 - 6) = 22.3dBm.

Chain 0
1. 11 dBm + 10log (83.04) = 30.19 dBm > 24 dBm.
2. 11 dBm + 10log (83.43) = 30.21 dBm > 24 dBm.
3. 11 dBm + 10log (83.20) = 30.20 dBm > 24 dBm.

Chain 1
1. 11 dBm + 10log (83.19) = 30.20 dBm > 24 dBm.
2. 11 dBm + 10log (83.60) = 30.22 dBm > 24 dBm.
3. 11 dBm + 10log (83.38) = 30.21 dBm > 24 dBm.

26dB Bandwidth:

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.88	20.30
60	5300	20.74	20.94
64	5320	20.81	20.80
100	5500	20.79	20.87
116	5580	20.79	21.00
140	5700	20.72	20.91

802.11ax (HE20)

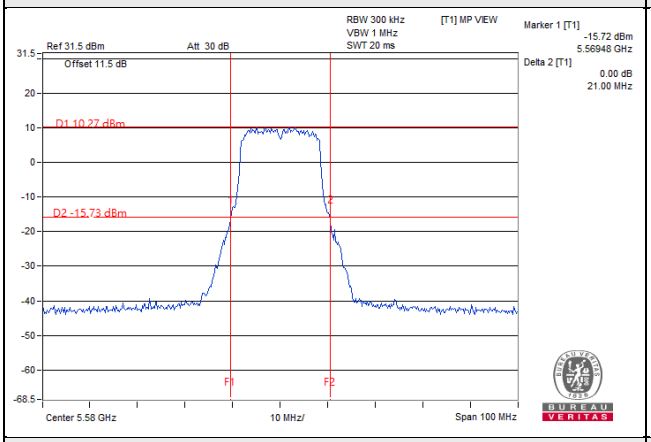
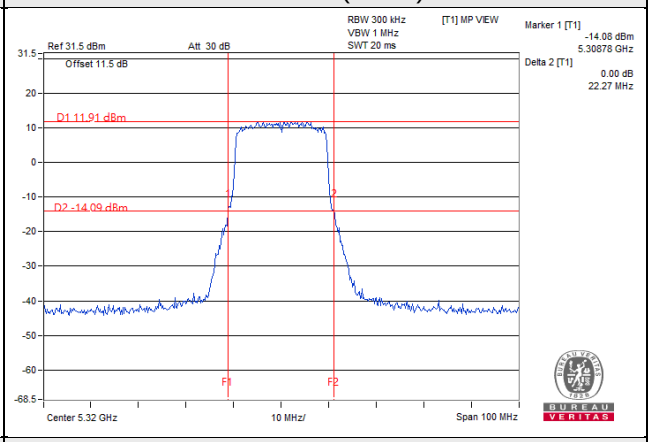
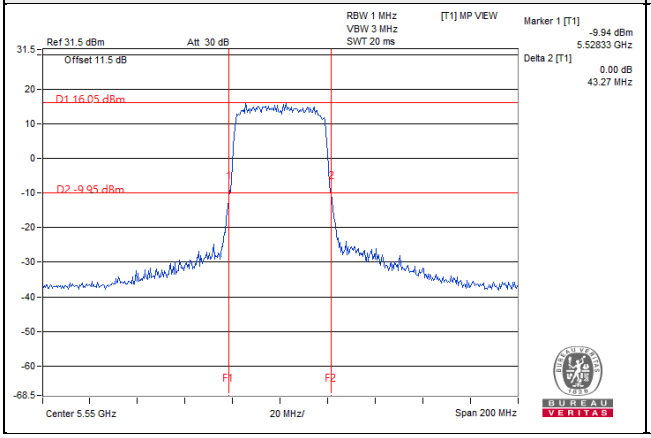
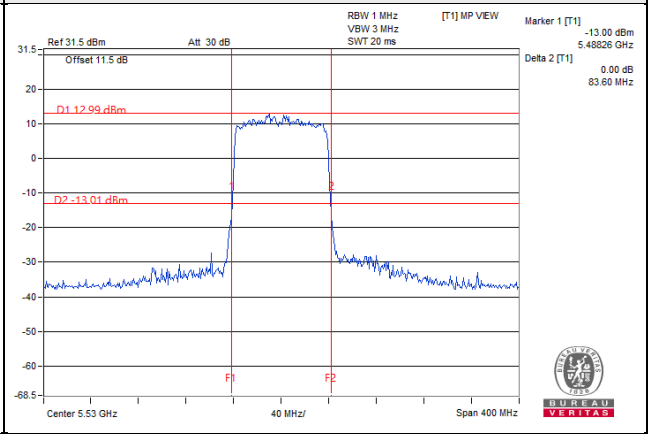
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	22.06	21.77
60	5300	21.97	21.63
64	5320	22.27	21.72
100	5500	21.85	21.77
116	5580	21.89	21.87
140	5700	21.74	21.73

802.11ax (HE40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	42.53	42.50
62	5310	42.23	42.19
102	5510	42.24	42.72
110	5550	42.09	43.27
134	5670	42.62	42.36

802.11ax (HE80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.04	83.19
106	5530	83.43	83.60
122	5610	83.20	83.38

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

EUT Average Power

CDD Mode

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	22.24	167.34
5470~5725	21.83	152.507

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	22.05	160.444
5470~5725	21.72	148.618

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	21.47	140.386
5470~5725	21.36	136.673

802.11ac (VHT20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	22.15	164.045
5470~5725	21.80	151.373

802.11ac (VHT40)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	21.59	144.35
5470~5725	21.46	139.86

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	20.75	118.722
5470~5725	21.46	139.974

802.11ax (HE20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	22.28	169.17
5470~5725	21.96	156.872

802.11ax (HE40)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	21.75	149.735
5470~5725	21.63	145.68

802.11ax (HE80)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	20.91	123.32
5470~5725	21.65	146.067

Beamforming Mode

802.11ac (VHT20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	19.14	82.028
5470~5725	18.79	75.692

802.11ac (VHT40)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	18.58	72.18
5470~5725	18.45	69.935

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	17.74	59.365
5470~5725	18.45	69.992

802.11ax (HE20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	19.27	84.591
5470~5725	18.95	78.441

802.11ax (HE40)

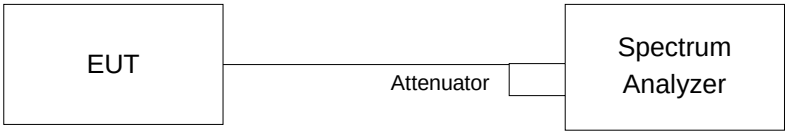
Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	18.74	74.873
5470~5725	18.62	72.845

802.11ax (HE80)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	17.90	61.664
5470~5725	21.65	146.067

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Result

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.44	16.44
60	5300	16.44	16.44
64	5320	16.44	16.44
100	5500	16.44	16.44
116	5580	16.44	16.44
140	5700	16.44	16.44

802.11ax (HE20)

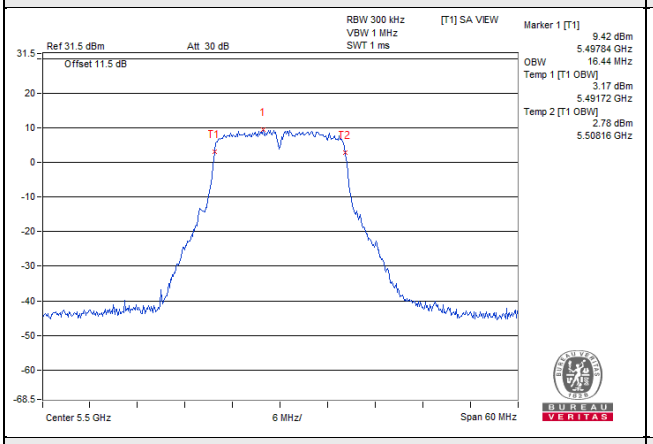
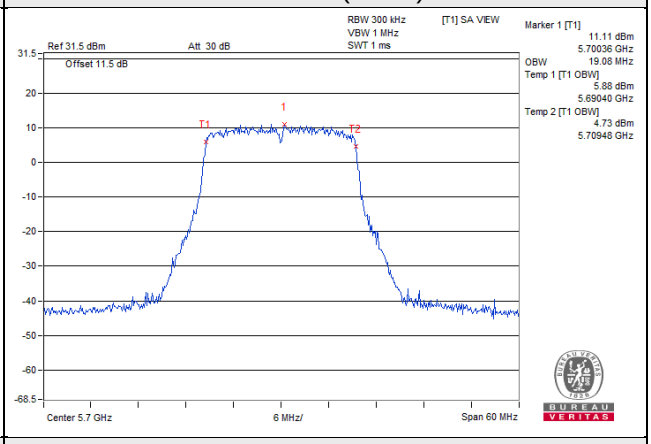
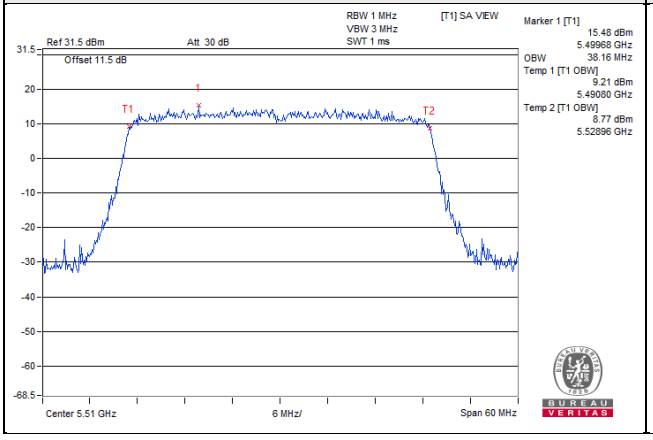
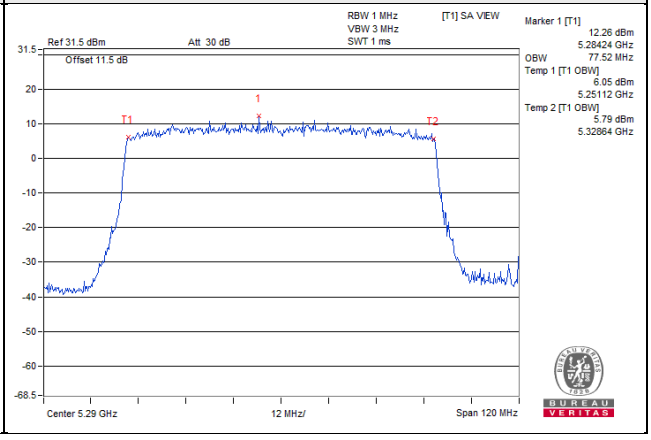
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	18.96	18.96
60	5300	18.96	18.96
64	5320	18.96	18.84
100	5500	18.96	18.96
116	5580	18.96	18.96
140	5700	19.08	18.96

802.11ax (HE40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	38.04	37.92
62	5310	37.92	38.04
102	5510	37.92	38.16
110	5550	37.92	38.04
134	5670	37.92	37.92

802.11ax (HE80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	77.52	77.28
106	5530	77.04	77.04
122	5610	77.28	77.28

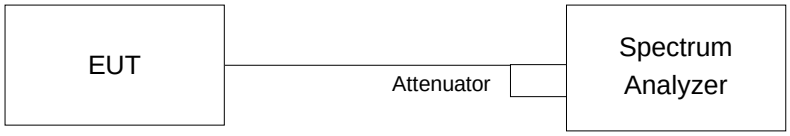
Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3			30dBm/ 500kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-2A and U-NII-2C band:

Using method SA-2

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

b. Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS

c. Set Channel power measure = 1MHz

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

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

For U-NII-2A and U-NII-2C band:

802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	6.67	5.92	0.27	9.59	9.77	Pass
60	5300	6.69	6.19	0.27	9.73	9.77	Pass
64	5320	6.76	6.01	0.27	9.68	9.77	Pass
100	5500	6.07	5.96	0.27	9.29	9.30	Pass
116	5580	6.12	5.90	0.27	9.29	9.30	Pass
140	5700	6.04	5.99	0.27	9.29	9.30	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. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.23 - 6) = 9.77dBm.
   5500-5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.7 - 6) = 9.30dBm.
3. 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 Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	6.19	6.63	0.25	9.68	9.77	Pass
60	5300	6.62	6.23	0.25	9.69	9.77	Pass
64	5320	6.40	6.58	0.25	9.75	9.77	Pass
100	5500	6.25	5.79	0.25	9.29	9.30	Pass
116	5580	5.93	6.12	0.25	9.29	9.30	Pass
140	5700	6.32	5.67	0.25	9.27	9.30	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. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.23 - 6) = 9.77dBm.
   5500-5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.7 - 6) = 9.30dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

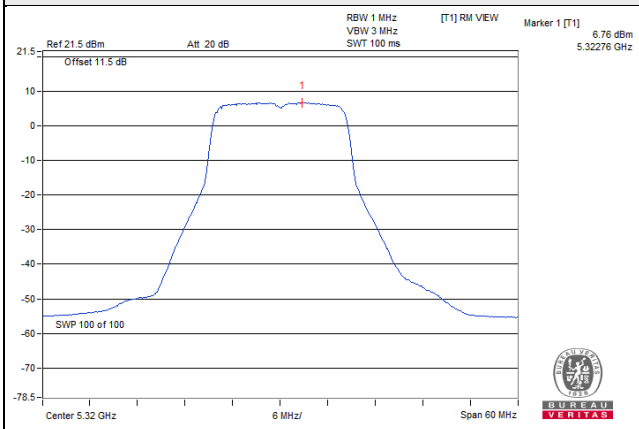
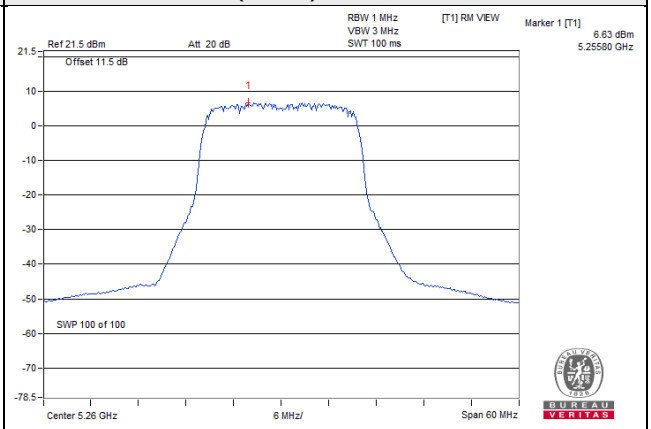
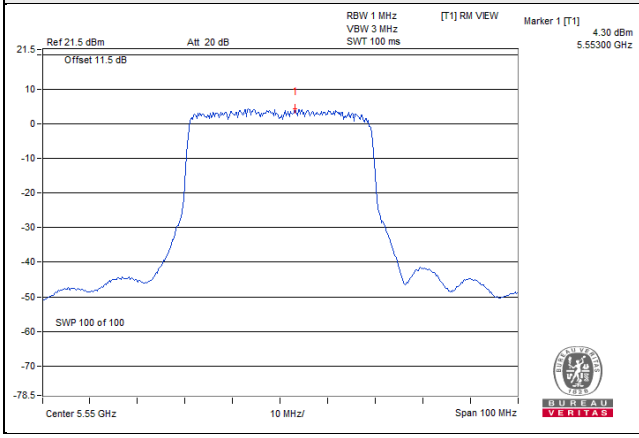
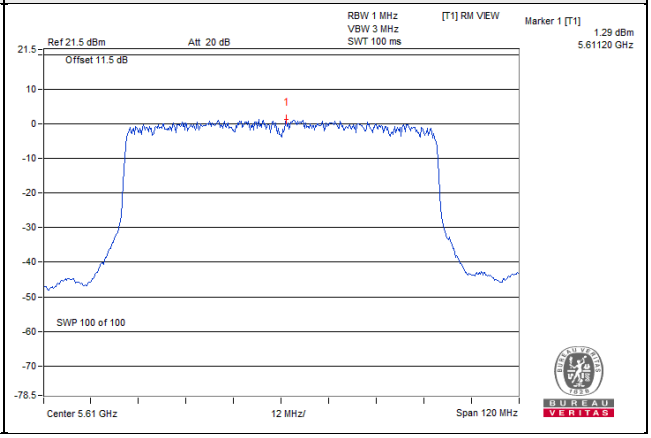
Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	4.01	4.18	0.23	7.34	9.77	Pass
62	5310	3.95	3.57	0.23	7.01	9.77	Pass
102	5510	4.04	4.10	0.23	7.32	9.30	Pass
110	5550	3.78	4.24	0.23	7.26	9.30	Pass
134	5670	3.66	4.00	0.23	7.08	9.30	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. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.23 - 6) = 9.77dBm.
   5500-5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.7 - 6) = 9.30dBm.
3. 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 Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	0.02	-0.03	0.24	3.25	9.77	Pass
106	5530	0.20	0.64	0.24	3.68	9.30	Pass
122	5610	0.03	1.29	0.24	3.96	9.30	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. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.23dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.23 - 6) = 9.77dBm.
   5500-5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2$] = 7.7dBi > 6dBi, so the power density limit shall be reduced to 11 - (7.7 - 6) = 9.30dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

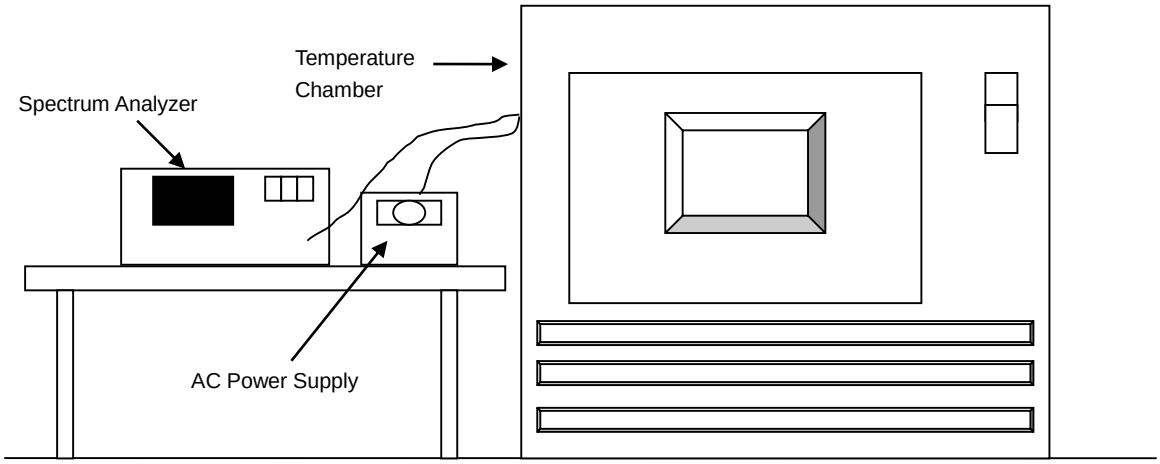
Spectrum Plot of Worst Value	
802.11a / Chain 0 / CH 64	802.11ax (HE20) / Chain 1 / CH 52
	
802.11ax (HE40) / Chain 1 / CH 110	802.11ax (HE80) / Chain 1 / CH 122
	

4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
Temperature And Humidity Chamber TERCHY	MHU-225AU	920842	May 27, 2020	May 26, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2020	Jun. 22, 2021
AC Power Source EEC	6905S	1991553	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: 5260MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
40	120	5259.9957	PASS	5259.9955	PASS	5259.9914	PASS	5259.9952	PASS
30	120	5259.9998	PASS	5259.9973	PASS	5259.997	PASS	5259.9995	PASS
20	120	5259.9927	PASS	5259.9919	PASS	5259.9918	PASS	5259.9953	PASS
10	120	5259.998	PASS	5259.9969	PASS	5259.9986	PASS	5259.9954	PASS
0	120	5260.0018	PASS	5260.0064	PASS	5260.0065	PASS	5260.0047	PASS

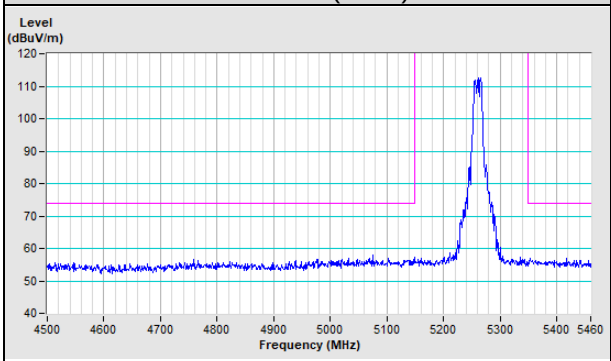
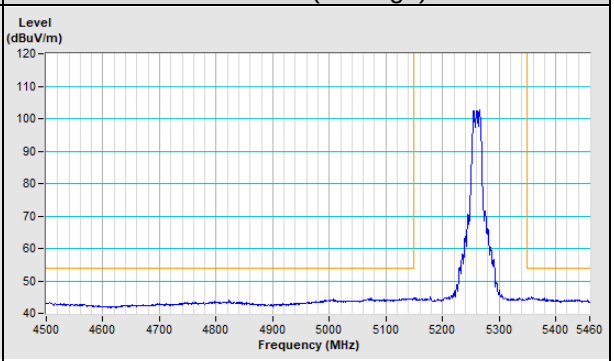
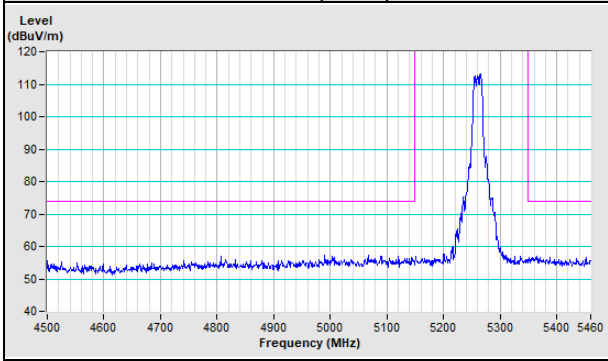
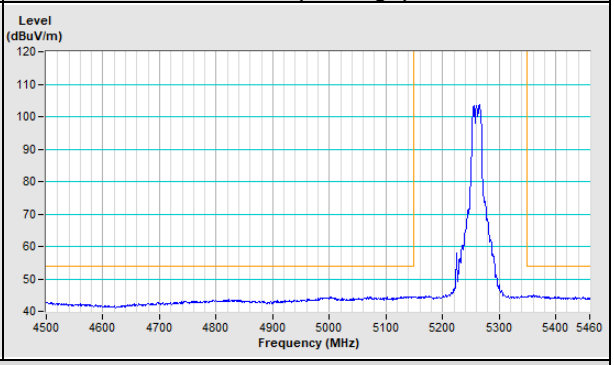
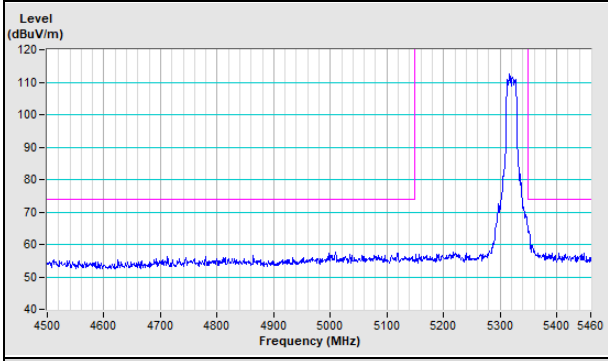
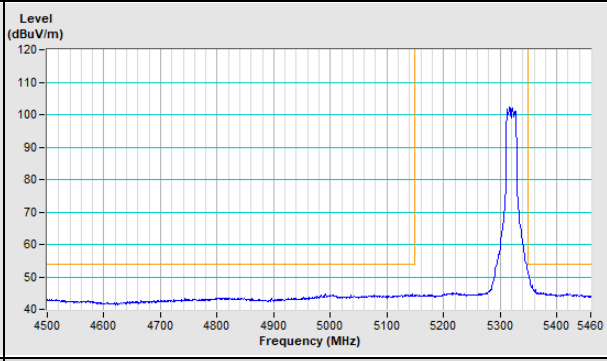
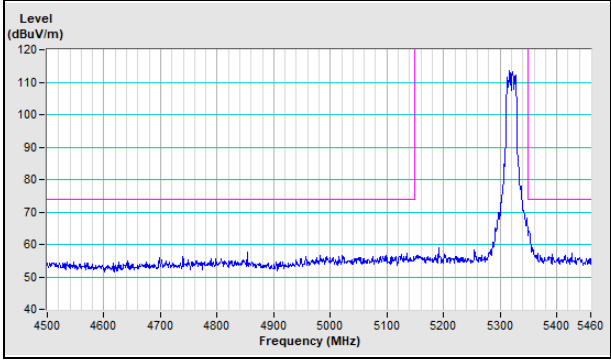
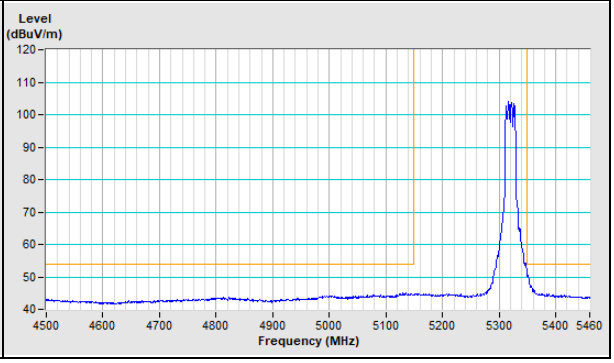
Frequency Stability Versus Voltage									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5259.9923	PASS	5259.9926	PASS	5259.992	PASS	5259.9958	PASS
	120	5259.9927	PASS	5259.9919	PASS	5259.9918	PASS	5259.9953	PASS
	102	5259.9921	PASS	5259.9929	PASS	5259.9918	PASS	5259.9944	PASS

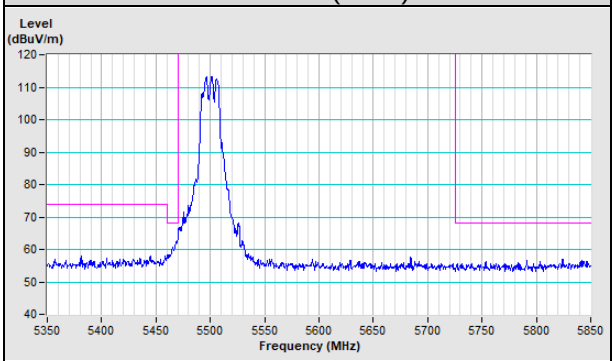
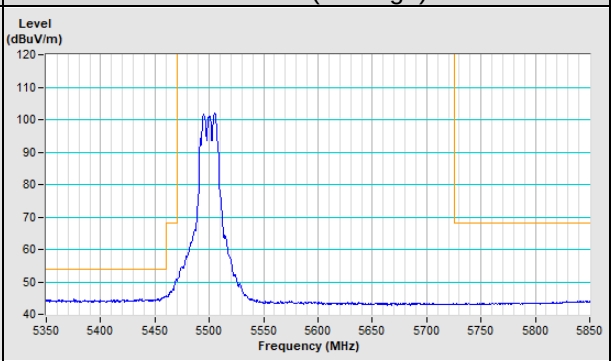
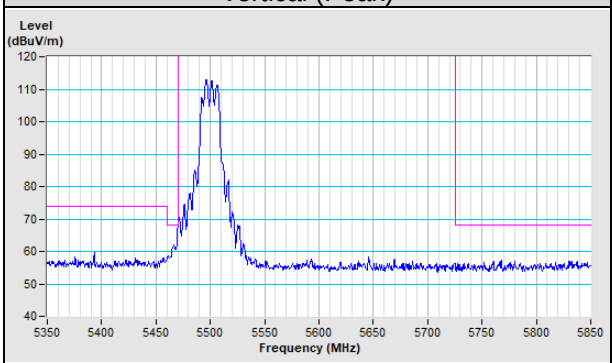
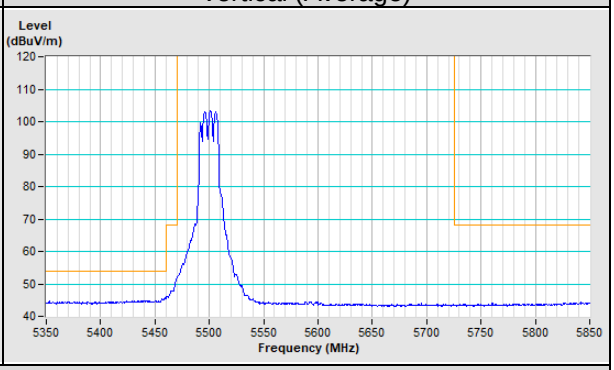
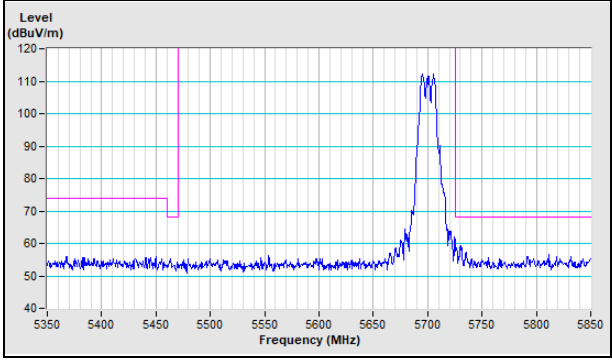
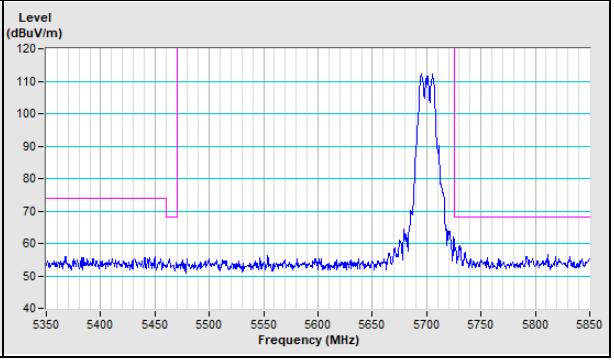
5 Pictures of Test Arrangements

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

Annex A - Band Edge Measurement

802.11a

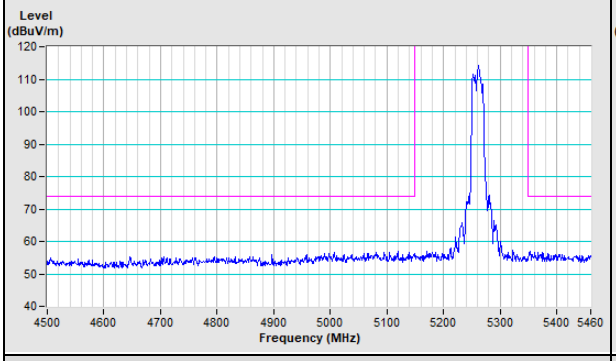
Channel 52	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 64	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

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

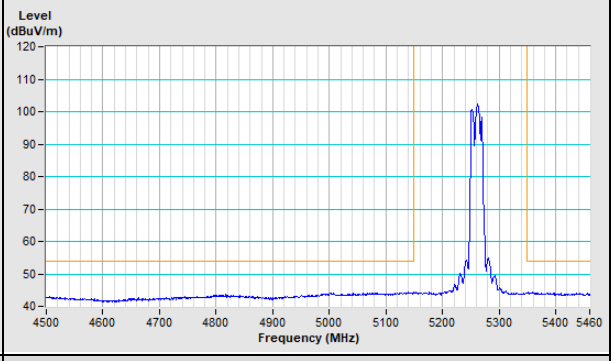
802.11ax (HE20)

Channel 52

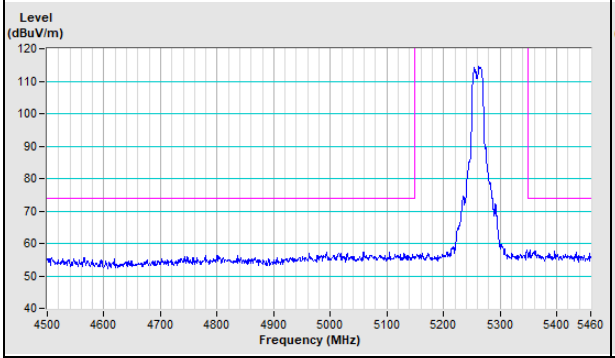
Horizontal (Peak)



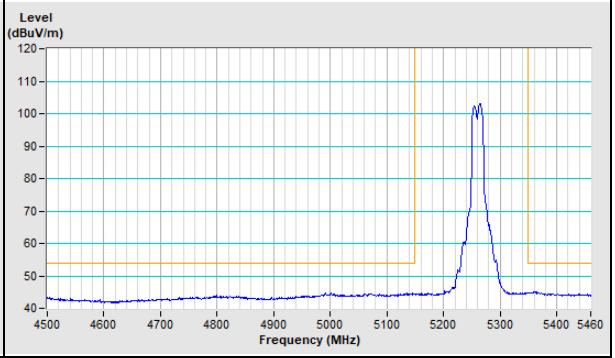
Horizontal (Average)



Vertical (Peak)

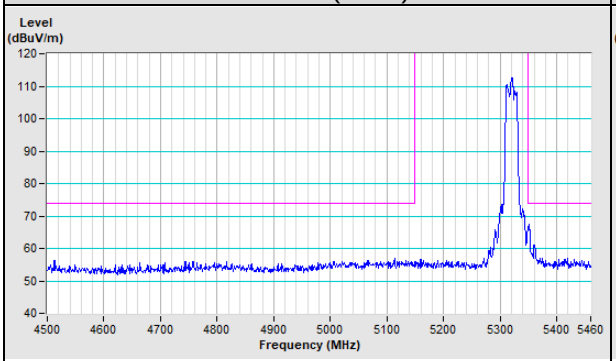


Vertical (Average)

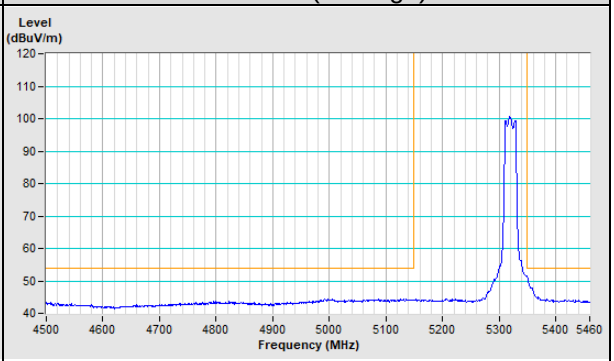


Channel 64

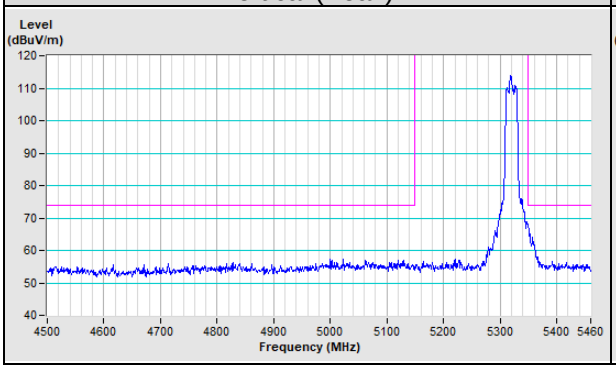
Horizontal (Peak)



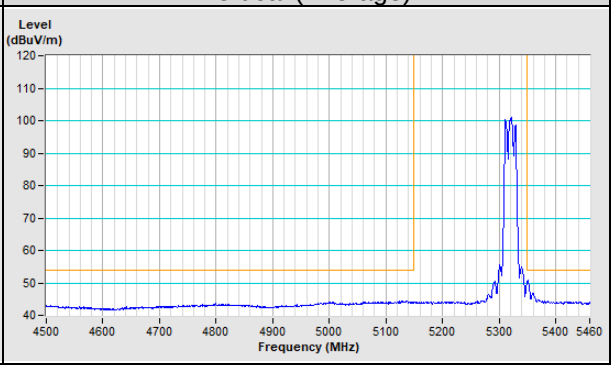
Horizontal (Average)

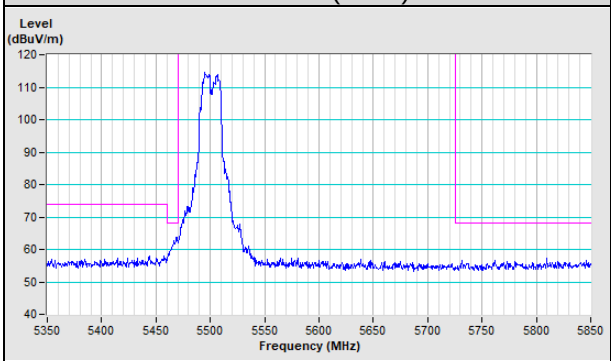
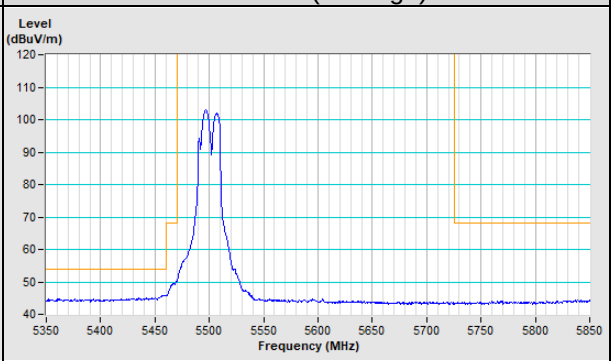
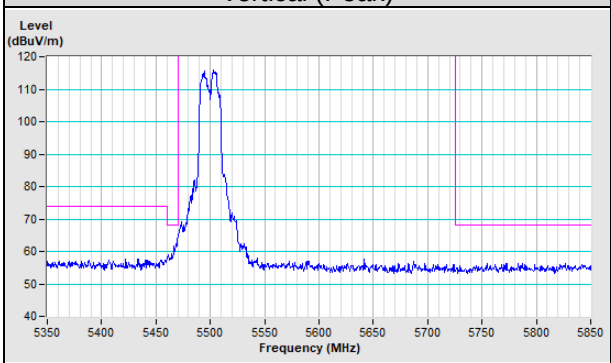
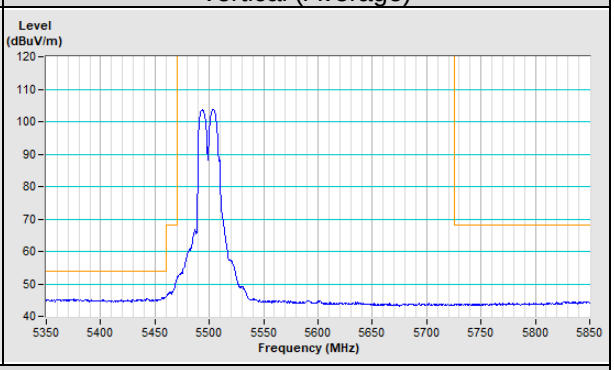
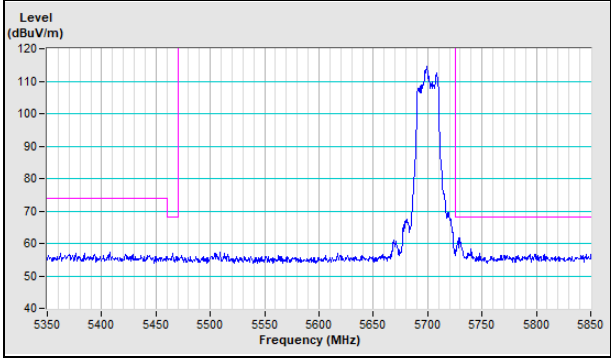
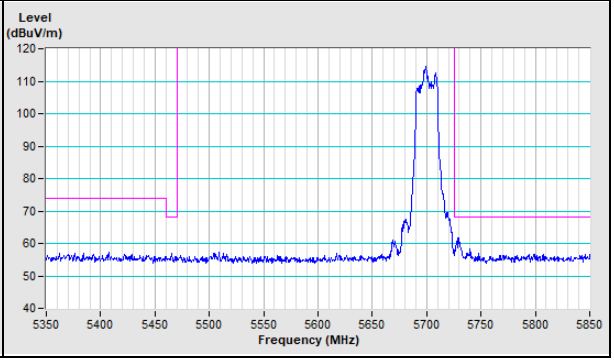


Vertical (Peak)



Vertical (Average)

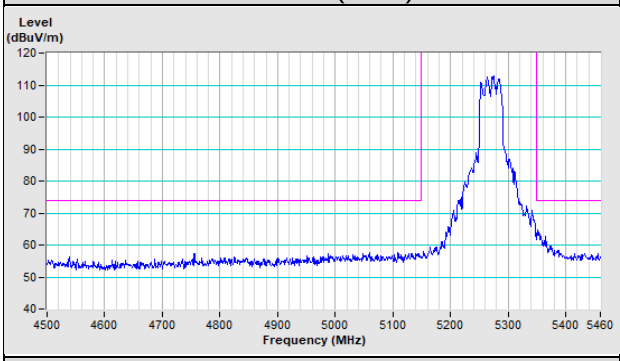


Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 140	
Horizontal (Peak)	Vertical (Peak)
	

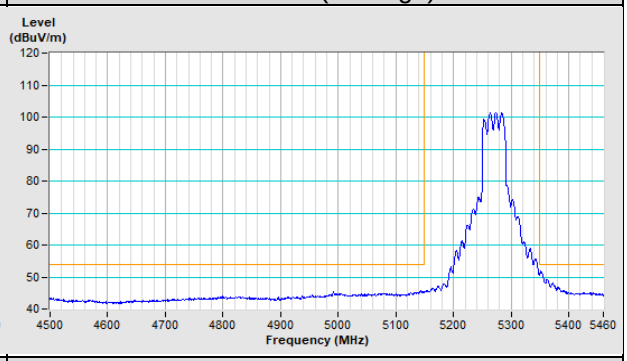
802.11ax (HE40)

Channel 54

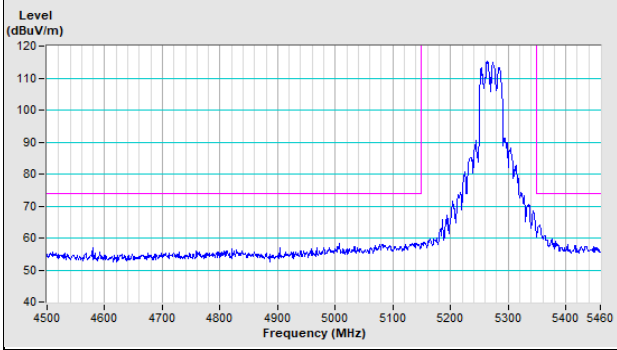
Horizontal (Peak)



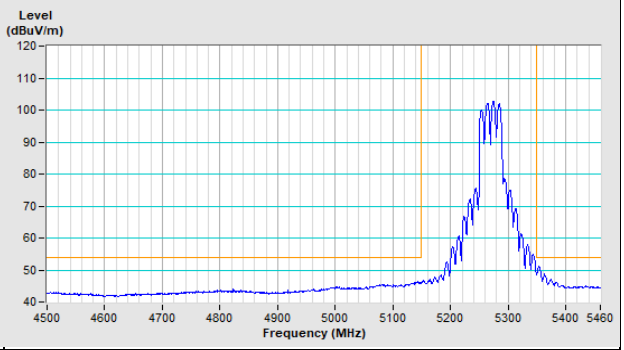
Horizontal (Average)



Vertical (Peak)

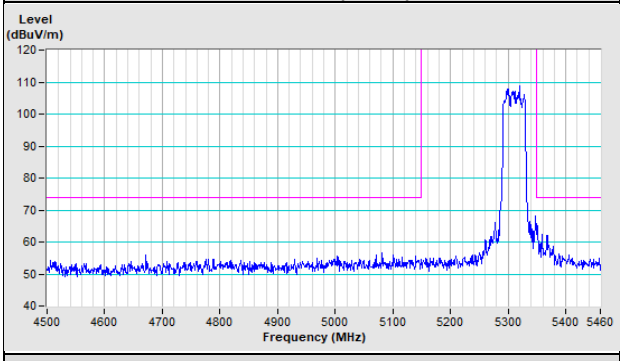


Vertical (Average)

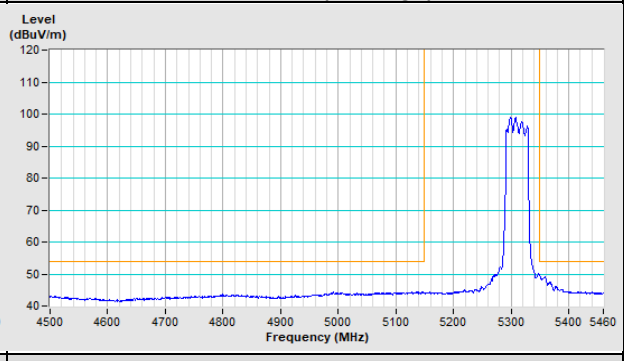


Channel 62

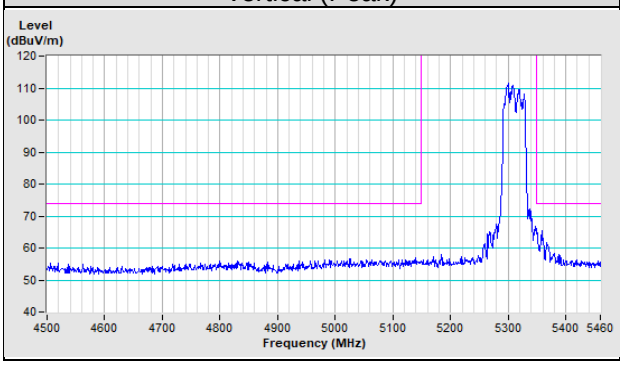
Horizontal (Peak)



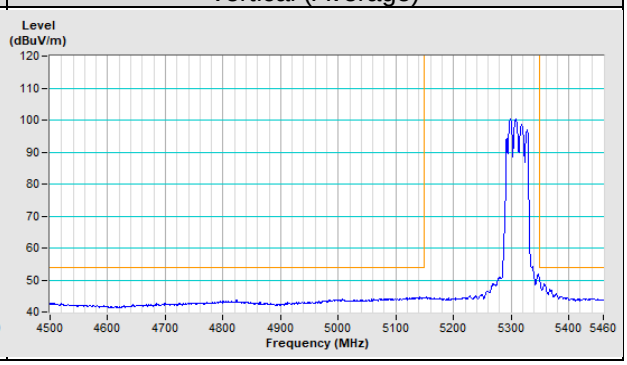
Horizontal (Average)

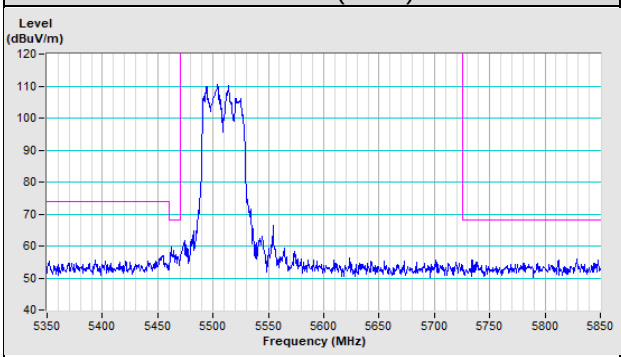
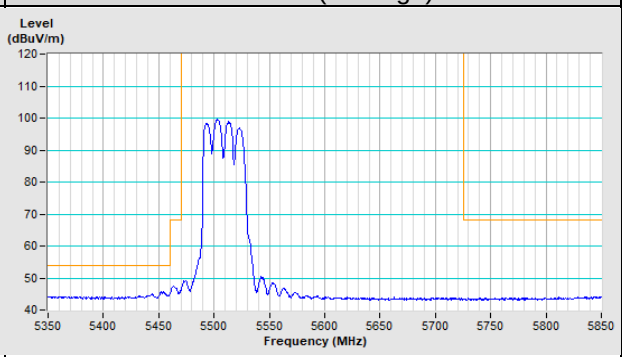
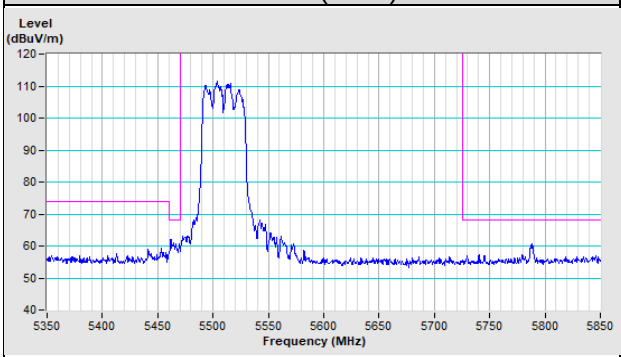
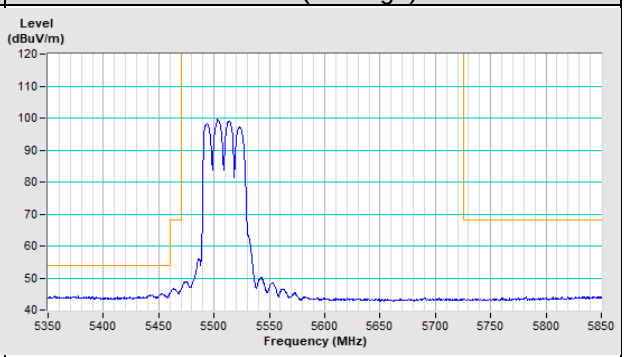
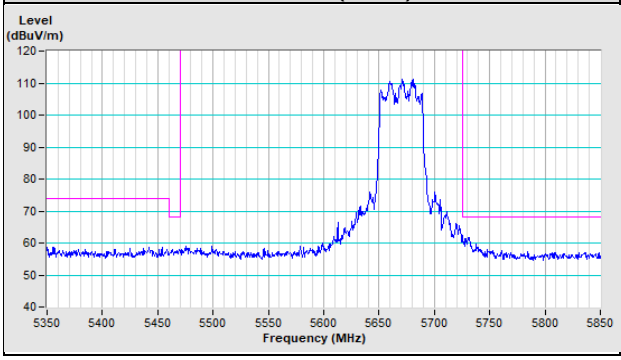
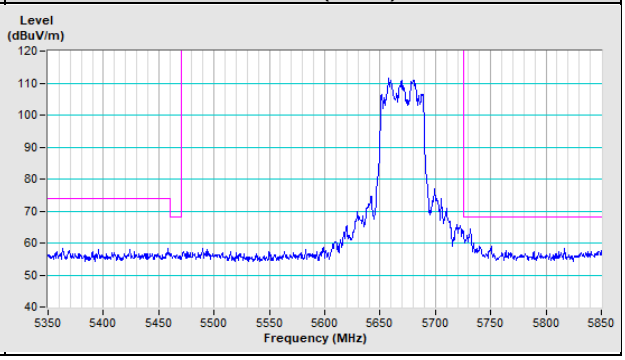


Vertical (Peak)



Vertical (Average)

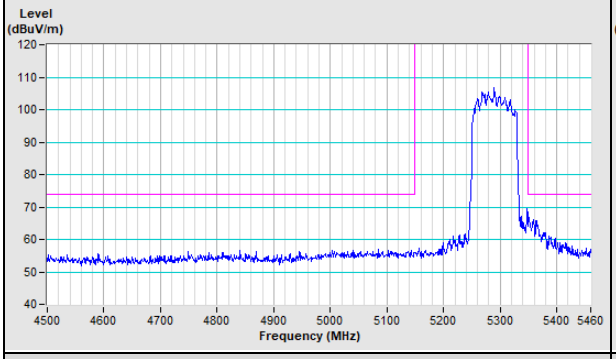


Channel 102	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 134	
Horizontal (Peak)	Vertical (Peak)
	

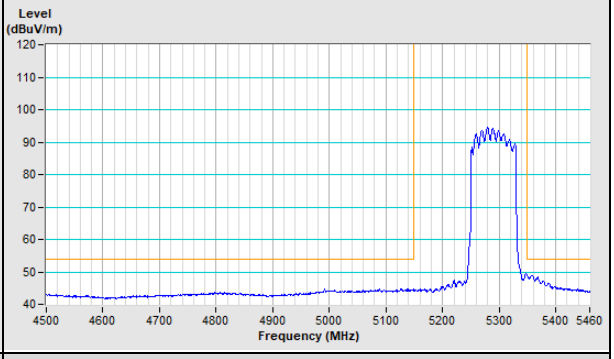
802.11ax (HE80)

Channel 58

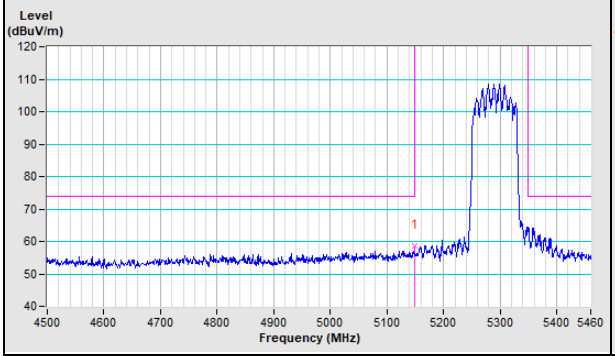
Horizontal (Peak)



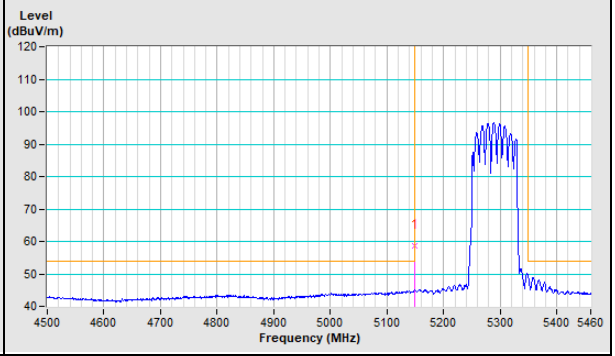
Horizontal (Average)



Vertical (Peak)

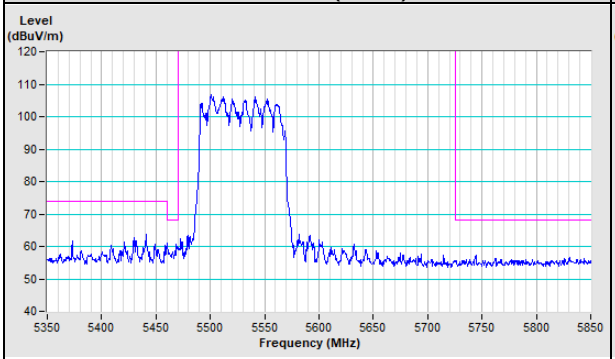


Vertical (Average)

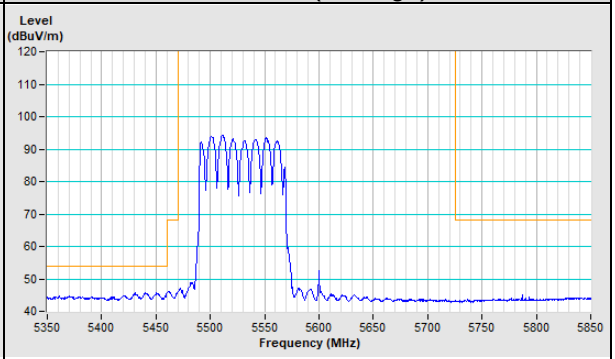


Channel 106

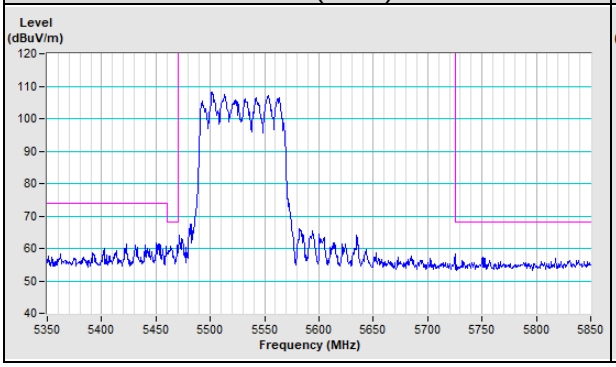
Horizontal (Peak)



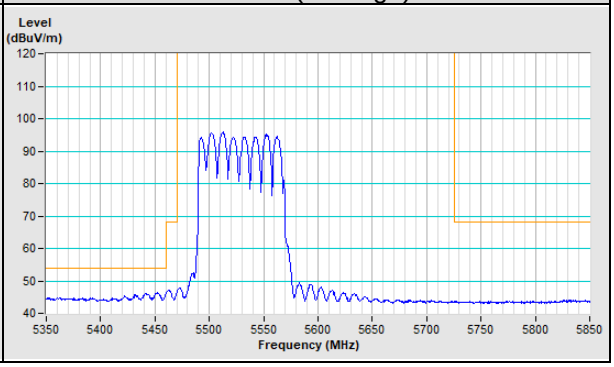
Horizontal (Average)

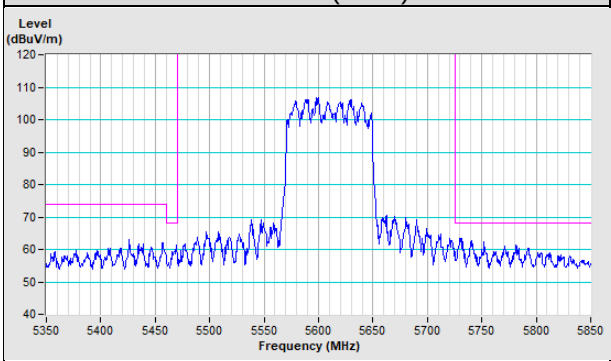
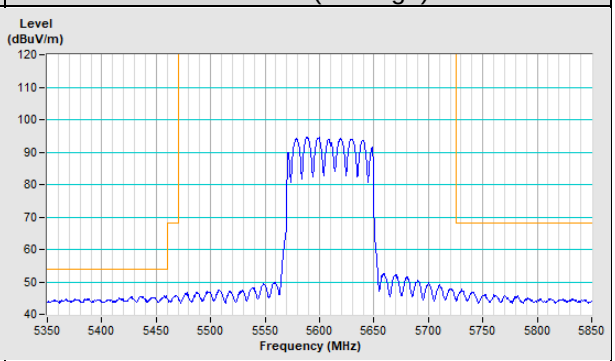
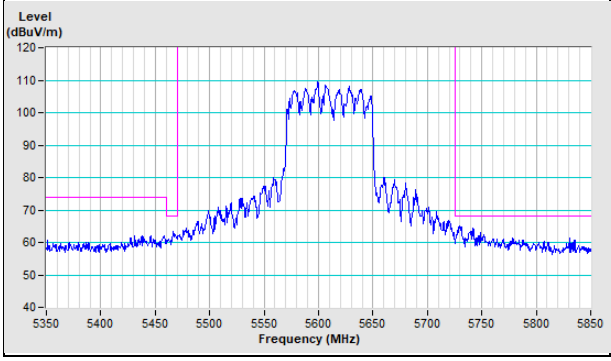
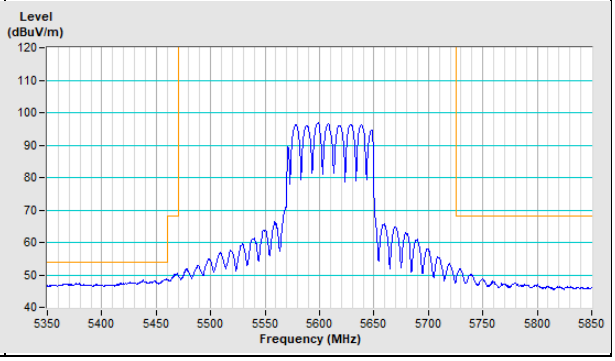


Vertical (Peak)



Vertical (Average)



Channel 122	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Appendix – Information of the Testing Laboratories

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

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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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