FCC Test Report

Report No.:	RFBDYS-WTW-P22090601-1
FCC ID:	Q6G-AP332CR
Test Model:	AP332CR
Received Date:	May 20, 2022
Test Date:	Sep. 14 ~ Sep. 21, 2022
Issued Date:	Sep. 23, 2022
Applicant:	WatchGuard Technologies, Inc.
Address:	505 Fifth Avenue South, Suite 500 Seattle WA United States 98104
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location (1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kewi Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number (1):	788550 / TW0003
Test Location (2):	No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
FCC Registration / Designation Number (2):	281270 / TW0032

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Release Control Record

Issue No.	Description	Date Issued
RFBDYS-WTW-P22090601-1	Original release	Sep. 23, 2022

1 Certificate of Conformity

Product:	Wireless Access Point
Brand:	WatchGuard
Test Model:	AP332CR
Sample Status:	Engineering sample
Applicant:	WatchGuard Technologies, Inc.
Test Date:	Sep. 14 ~ Sep. 21, 2022
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

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

Prepared by : Pettie Chen , **Date:** Sep. 23, 2022

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** Sep. 23, 2022

Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(9)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum Passing margin is -4.76dB at 0.53400MHz.
15.407(b) (1/2/3/4(i/ii)/9)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum Passing margin is -0.7dB at 5648.80MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is R-SMA not a standard connector.

Note:

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Access Point
Brand	WatchGuard
Test Model	AP332CR
Sample Status	Engineering sample
Power Supply Rating	54Vdc (POE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM 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 867Mbps 802.11ax: up to 1200Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 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 5745 ~ 5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 5 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2 802.11ac (VHT80), 802.11ax (HE80): 1
Output Power	CDD Mode: 5180 ~ 5240MHz: 44.745mW 5745 ~ 5825MHz: 477.665mW Beamforming Mode: 5180 ~ 5240MHz: 21.952mW 5745 ~ 5825MHz: 476.083mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	POE
Cable Supplied	1.75m non-shielded ground cable without core

Note:

1. 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)	Support	2TX
802.11n (HT40)	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 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 802.11n 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.
* EUT supports full-RU only

2. The EUT consumes power from the following PoE (support unit only).

Brand	EnGenius
Model	EPA5006GP
Input Power	100-240Vac, 0.8A, 50-60Hz
Output Power	54Vdc, 0.6A PIN 4,5: 54Vdc
Power Line	0.5m non-shielded AC power cable without core

3. There are 2 radios for the EUT.

Radio	Function	TX/RX Function
1	WLAN 2.4G	2TX / 2RX
2	WLAN 5G	2TX / 2RX

4. The EUT with follow antennas gain is listed as table below.

Ant. Type	Dipole			
Connector	R-SMA			
Gain (dBi)				
Frequency (MHz)	2400 ~ 2483.5MHz	5150~5350MHz	5470~5725MHz	5715~5850MHz
Ant. 1	5.17	-	-	-
Ant. 2	5.17	-	-	-
Ant. 3	-	5.12	5.17	5.17
Ant. 4	-	5.12	5.17	5.17

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

5. The EUT will install at outdoor area, the highest antenna gain from the horizon above 30 degrees as below, for more detail information please refer to antenna specification and user manual.

Antenna Model	Antenna gain	Antenna install degree
7102A0414000	4.45 dBi	

* Due to device Will restriced installation position as above photo, thus consider to above 30 degrees highest antenna gain are chosen from XZ and YZ Plane (antenna specification of 60~-60 deg and 120~-120 deg)
* 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. 2.4GHz (Radio 1) & 5GHz (Radio 2) technology can transmit at same time.

3.2 Description of Test Modes

For 5180 ~ 5240MHz:

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

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

Channel	Frequency
42	5210MHz

For 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

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

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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. Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (HE80)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (HE80)		155	155	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)
-	802.11ax (HE40)	5180-5240	38 to 46	151	OFDMA	MCS0
-	802.11ax (HE40)	5745-5825	151 to 159		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)
-	802.11ax (HE40)	5180-5240	38 to 46	151	OFDMA	MCS0
-	802.11ax (HE40)	5745-5825	151 to 159		OFDMA	MCS0

Transmit Power Measurement:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	7.2
	802.11n (HT40)		38 to 46	38, 46	OFDM	15.0
	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	7.2
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	15.0
	802.11ac (VHT80)		42	42	OFDM	29.3
	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (HE80)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	7.2
	802.11n (HT40)		151 to 159	151, 159	OFDM	15.0
	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	7.2
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	15.0
	802.11ac (VHT80)		155	155	OFDM	29.3
	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (HE80)		155	155	OFDMA	MCS0

Bandwidth, Peak Power Spectral Density and Frequency Stability Measurement:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (HE80)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (HE80)		155	155	OFDMA	MCS0

Test Condition:

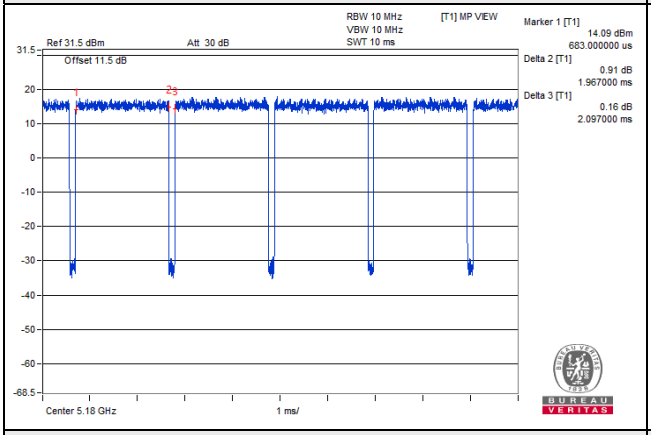
Applicable to	Environmental Conditions	Input Power (System)	Tested by
RE≥1G	23 deg. C, 67% RH	120Vac, 60Hz	Adair Peng
RE<1G	21 deg. C, 68% RH	120Vac, 60Hz	Thomas Cheng
PLC	21.4 deg. C, 68.1% RH	120Vac, 60Hz	Thomas Cheng
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Alan Wu

3.3 Duty Cycle of Test Signal

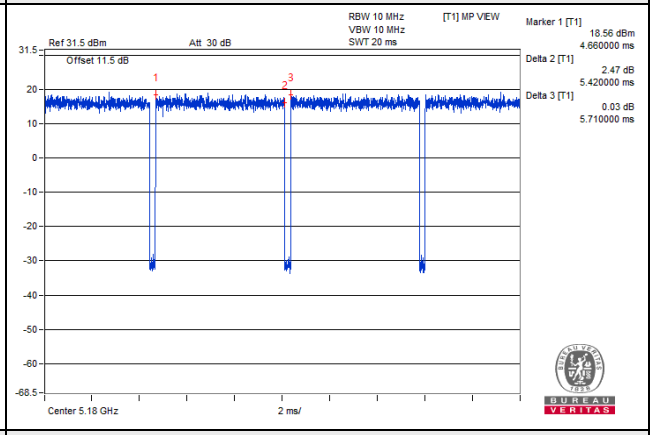
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 1.967/2.097 = 0.938, Duty factor = 10 * log (1/0.938) = 0.28
802.11ax (HE20): Duty cycle = 5.42/5.71 = 0.949, Duty factor = 10 * log (1/0.949) = 0.23
802.11ax (HE40): Duty cycle = 5.43/5.73 = 0.948, Duty factor = 10 * log (1/0.948) = 0.23
802.11ax (HE80): Duty cycle = 9.38/9.70 = 0.967, Duty factor = 10 * log (1/0.967) = 0.15

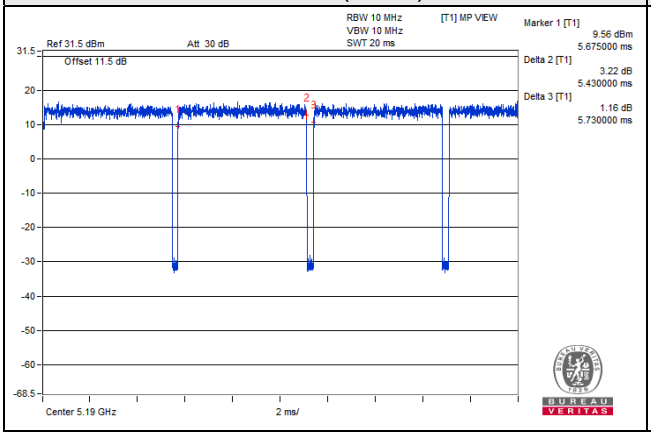
802.11a



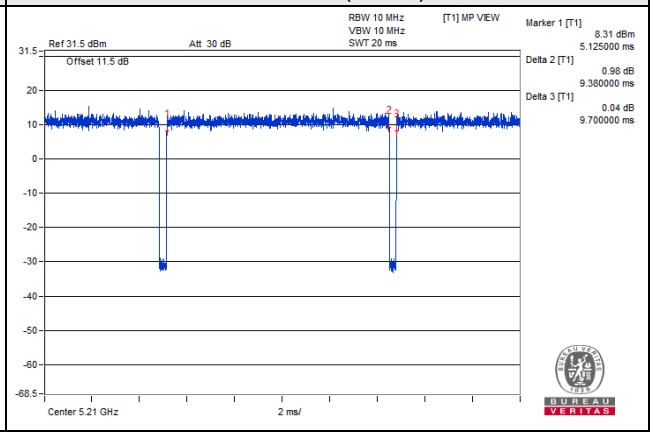
802.11ax (HE20)



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.

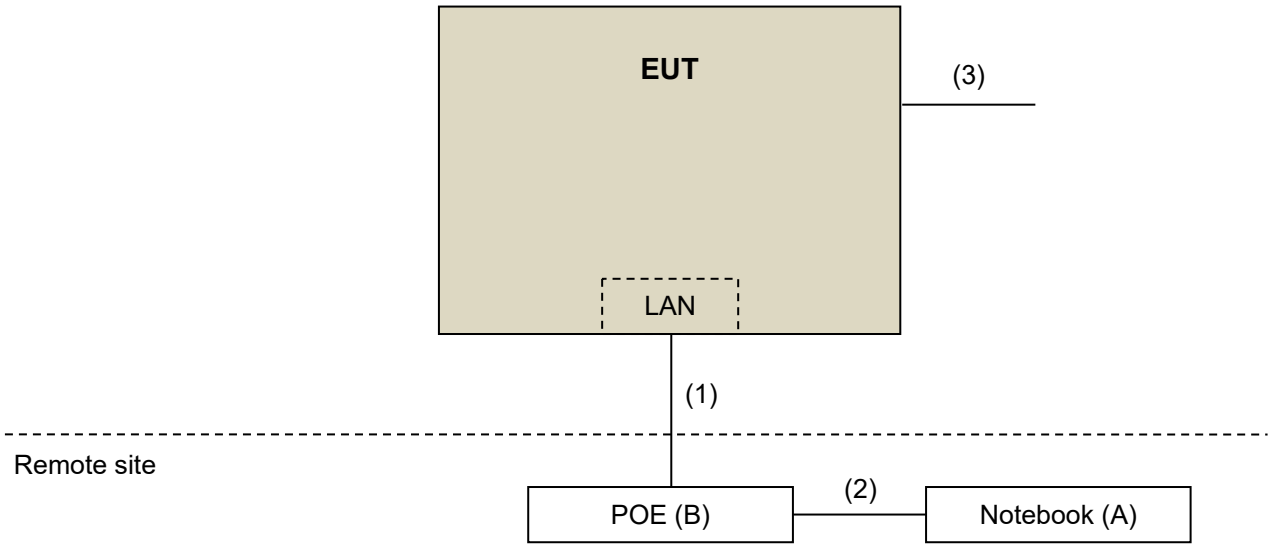
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	PoE	EnGenius	EPA5006GP	NA	NA	Provided by client

Note:

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	1.5	N	0	RJ45, Cat5e
2.	LAN cable	1	7	N	0	RJ45, Cat5e
3.	Ground cable	1	1.75	N	0	Accessory of EUT

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

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

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

References Test Guidance:
KDB 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	N9038A	MY55420137	Apr. 27, 2022	Apr. 26, 2023
Spectrum Analyzer KEYSIGHT	N9020B	MY60110440	Dec. 09, 2021	Dec. 08, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-1213	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-995	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 27, 2022	Jul. 26, 2023
Preamplifier EMCI	EMC330N	980782	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI	EMC118A45SE	980808	Dec. 30, 2021	Dec. 29, 2022
Preamplifier EMCI	EMC184045SE	980788	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC104-SM-SM-(9000+2000+1000)	201243+ 201231+ 210102	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMCCFD400-NM-NM-(9000+300+500)	201236+ 201235+ 201233	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM-(5000+3000+2000)	201260+201257+201254	Jan. 17, 2022	Jan. 16, 2023
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 03, 2022	Sep. 02, 2023
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 13, 2022	Jul. 12, 2023

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in WM Chamber 8.

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:

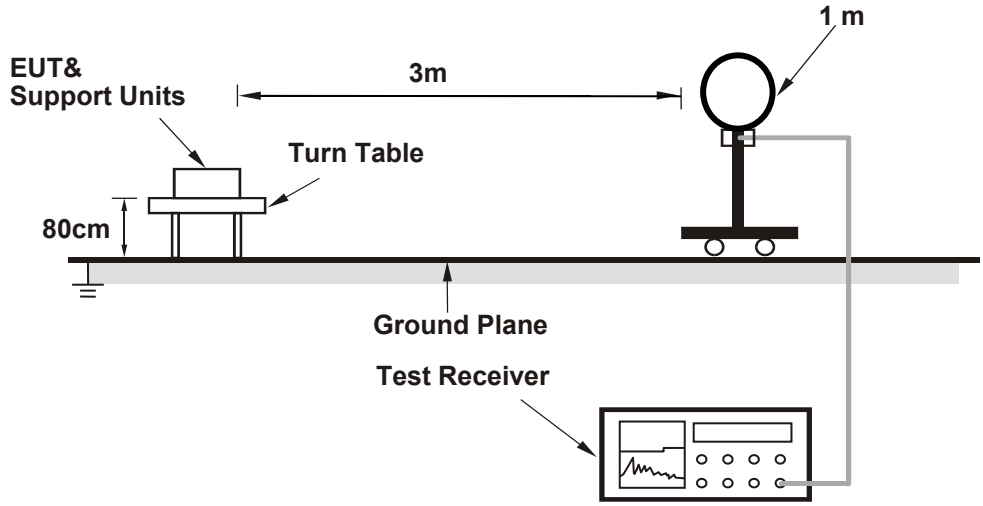
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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. (RBW = 1MHz, VBW = 1kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

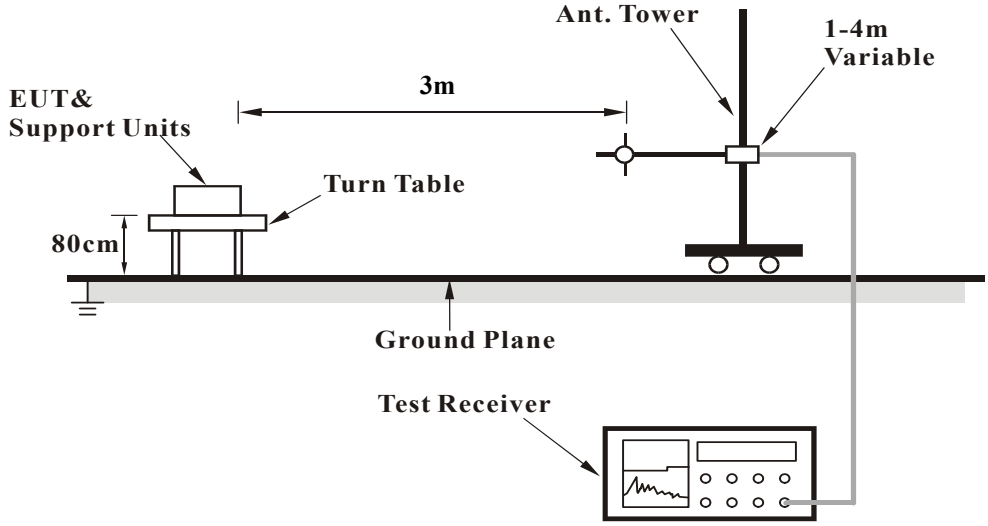
No deviation.

4.1.5 Test Setup

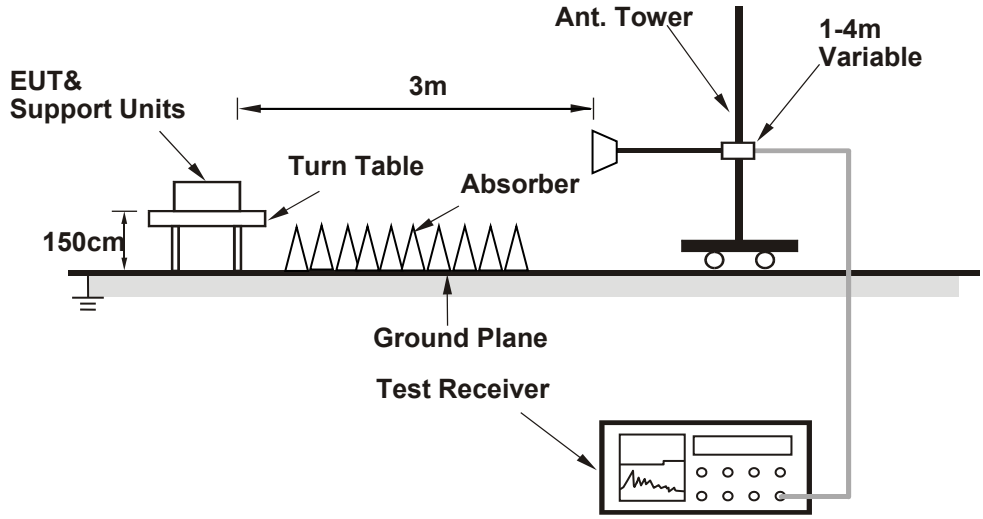
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz data:

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	58.4 PK	74.0	-15.6	2.28 H	64	55.9	2.5
2	5150.00	45.3 AV	54.0	-8.7	2.28 H	64	42.8	2.5
3	*5180.00	106.8 PK			2.35 H	57	66.5	40.3
4	*5180.00	96.7 AV			2.35 H	57	56.4	40.3
5	#10360.00	57.3 PK	68.2	-10.9	1.59 H	299	48.8	8.5
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	5150.00	59.0 PK	74.0	-15.0	2.03 V	343	56.5	2.5
2	5150.00	45.9 AV	54.0	-8.1	2.03 V	343	43.4	2.5
3	*5180.00	116.0 PK			1.97 V	332	75.7	40.3
4	*5180.00	106.1 AV			1.97 V	332	65.8	40.3
5	#10360.00	57.7 PK	68.2	-10.5	3.93 V	338	49.2	8.5

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.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5200.00	106.9 PK			2.34 H	63	66.7	40.2
2	*5200.00	97.0 AV			2.34 H	63	56.8	40.2
3	#10400.00	57.1 PK	68.2	-11.1	1.67 H	303	48.7	8.4
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	*5200.00	116.5 PK			2.03 V	337	76.3	40.2
2	*5200.00	106.5 AV			2.03 V	337	66.3	40.2
3	#10400.00	57.8 PK	68.2	-10.4	3.87 V	342	49.4	8.4

Remarks:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5240.00	106.4 PK			2.32 H	54	66.3	40.1
2	*5240.00	96.3 AV			2.32 H	54	56.2	40.1
3	5350.00	57.4 PK	74.0	-16.6	2.43 H	68	55.3	2.1
4	5350.00	44.9 AV	54.0	-9.1	2.43 H	68	42.8	2.1
5	#10480.00	57.1 PK	68.2	-11.1	1.63 H	307	48.6	8.5
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	*5240.00	115.8 PK			2.00 V	325	75.7	40.1
2	*5240.00	105.9 AV			2.00 V	325	65.8	40.1
3	5350.00	57.8 PK	74.0	-16.2	2.14 V	331	55.7	2.1
4	5350.00	45.3 AV	54.0	-8.7	2.14 V	331	43.2	2.1
5	#10480.00	57.7 PK	68.2	-10.5	3.91 V	326	49.2	8.5

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.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5640.80	58.5 PK	68.2	-9.7	2.24 H	96	55.1	3.4
2	*5745.00	112.5 PK			2.24 H	96	70.8	41.7
3	*5745.00	102.9 AV			2.24 H	96	61.2	41.7
4	#5943.60	59.0 PK	68.2	-9.2	2.24 H	96	55.3	3.7
5	11490.00	61.1 PK	74.0	-12.9	1.80 H	328	51.5	9.6
6	11490.00	48.8 AV	54.0	-5.2	1.80 H	328	39.2	9.6
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	#5645.60	60.7 PK	68.2	-7.5	1.96 V	3	57.3	3.4
2	*5745.00	125.4 PK			1.96 V	3	83.7	41.7
3	*5745.00	115.6 AV			1.96 V	3	73.9	41.7
4	#5925.20	60.5 PK	68.2	-7.7	1.96 V	3	56.8	3.7
5	11490.00	65.1 PK	74.0	-8.9	3.59 V	358	55.5	9.6
6	11490.00	52.8 AV	54.0	-1.2	3.59 V	358	43.2	9.6

Remarks:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5639.60	57.6 PK	68.2	-10.6	2.26 H	80	54.2	3.4
2	*5785.00	111.7 PK			2.22 H	106	69.9	41.8
3	*5785.00	102.3 AV			2.22 H	106	60.5	41.8
4	#5940.80	58.8 PK	68.2	-9.4	2.26 H	80	55.1	3.7
5	11570.00	61.6 PK	74.0	-12.4	1.88 H	329	52.0	9.6
6	11570.00	49.1 AV	54.0	-4.9	1.88 H	329	39.5	9.6
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	#5636.80	60.3 PK	68.2	-7.9	1.98 V	3	56.9	3.4
2	*5785.00	126.1 PK			1.98 V	3	84.3	41.8
3	*5785.00	116.0 AV			1.98 V	3	74.2	41.8
4	#5976.40	60.5 PK	68.2	-7.7	1.98 V	3	56.5	4.0
5	11570.00	65.0 PK	74.0	-9.0	3.39 V	357	55.4	9.6
6	11570.00	52.8 AV	54.0	-1.2	3.39 V	357	43.2	9.6

Remarks:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5639.20	58.2 PK	68.2	-10.0	1.66 H	340	54.8	3.4
2	*5825.00	115.4 PK			1.66 H	340	73.6	41.8
3	*5825.00	105.7 AV			1.66 H	340	63.9	41.8
4	#5974.00	59.0 PK	68.2	-9.2	1.66 H	340	55.0	4.0
5	11650.00	60.9 PK	74.0	-13.1	1.78 H	325	51.4	9.5
6	11650.00	48.8 AV	54.0	-5.2	1.78 H	325	39.3	9.5
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	#5628.80	61.1 PK	68.2	-7.1	2.22 V	360	57.8	3.3
2	*5825.00	126.0 PK			2.22 V	360	84.2	41.8
3	*5825.00	116.3 AV			2.22 V	360	74.5	41.8
4	#5927.60	60.9 PK	68.2	-7.3	2.22 V	360	57.2	3.7
5	11650.00	66.0 PK	74.0	-8.0	3.55 V	359	56.5	9.5
6	11650.00	53.0 AV	54.0	-1.0	3.55 V	359	43.5	9.5

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.

802.11ax (HE20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.9 PK	74.0	-16.1	2.38 H	65	55.4	2.5
2	5150.00	45.6 AV	54.0	-8.4	2.38 H	65	43.1	2.5
3	*5180.00	109.1 PK			2.33 H	60	68.8	40.3
4	*5180.00	96.8 AV			2.33 H	60	56.5	40.3
5	#10360.00	57.0 PK	68.2	-11.2	1.62 H	293	48.5	8.5
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	5150.00	59.1 PK	74.0	-14.9	1.97 V	323	56.6	2.5
2	5150.00	46.4 AV	54.0	-7.6	1.97 V	323	43.9	2.5
3	*5180.00	118.9 PK			1.90 V	317	78.6	40.3
4	*5180.00	106.5 AV			1.90 V	317	66.2	40.3
5	#10360.00	57.8 PK	68.2	-10.4	3.86 V	327	49.3	8.5

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.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5200.00	109.5 PK			2.40 H	68	69.3	40.2
2	*5200.00	97.1 AV			2.40 H	68	56.9	40.2
3	#10400.00	57.0 PK	68.2	-11.2	1.63 H	302	48.6	8.4
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	*5200.00	119.4 PK			1.94 V	326	79.2	40.2
2	*5200.00	106.9 AV			1.94 V	326	66.7	40.2
3	#10400.00	57.6 PK	68.2	-10.6	3.84 V	326	49.2	8.4

Remarks:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5240.00	108.8 PK			2.33 H	49	68.7	40.1
2	*5240.00	95.5 AV			2.33 H	49	55.4	40.1
3	5350.00	57.5 PK	74.0	-16.5	2.34 H	55	55.4	2.1
4	5350.00	45.1 AV	54.0	-8.9	2.34 H	55	43.0	2.1
5	#10480.00	57.1 PK	68.2	-11.1	1.66 H	312	48.6	8.5
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	*5240.00	117.4 PK			1.96 V	330	77.3	40.1
2	*5240.00	105.1 AV			1.96 V	330	65.0	40.1
3	5350.00	57.6 PK	74.0	-16.4	1.95 V	327	55.5	2.1
4	5350.00	45.8 AV	54.0	-8.2	1.95 V	327	43.7	2.1
5	#10480.00	58.1 PK	68.2	-10.1	3.85 V	321	49.6	8.5

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.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5639.60	58.9 PK	68.2	-9.3	1.66 H	344	55.5	3.4
2	*5745.00	117.2 PK			1.66 H	344	75.5	41.7
3	*5745.00	104.8 AV			1.66 H	344	63.1	41.7
4	#5981.60	59.5 PK	68.2	-8.7	1.66 H	344	55.5	4.0
5	11490.00	59.5 PK	74.0	-14.5	1.78 H	315	49.9	9.6
6	11490.00	46.7 AV	54.0	-7.3	1.78 H	315	37.1	9.6
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	#5645.60	60.1 PK	68.2	-8.1	2.07 V	359	56.7	3.4
2	*5745.00	126.9 PK			2.07 V	359	85.2	41.7
3	*5745.00	113.7 AV			2.07 V	359	72.0	41.7
4	#5978.40	59.8 PK	68.2	-8.4	2.07 V	359	55.8	4.0
5	11490.00	64.4 PK	74.0	-9.6	3.66 V	357	54.8	9.6
6	11490.00	50.1 AV	54.0	-3.9	3.66 V	357	40.5	9.6

Remarks:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5635.60	58.8 PK	68.2	-9.4	1.62 H	343	55.4	3.4
2	*5785.00	116.3 PK			1.62 H	343	74.5	41.8
3	*5785.00	104.9 AV			1.62 H	343	63.1	41.8
4	#5987.20	58.4 PK	68.2	-9.8	1.62 H	343	54.4	4.0
5	11570.00	59.3 PK	74.0	-14.7	1.83 H	321	49.7	9.6
6	11570.00	46.8 AV	54.0	-7.2	1.83 H	321	37.2	9.6
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	#5635.20	60.3 PK	68.2	-7.9	1.81 V	9	56.9	3.4
2	*5785.00	127.0 PK			1.81 V	9	85.2	41.8
3	*5785.00	114.7 AV			1.81 V	9	72.9	41.8
4	#5972.00	60.3 PK	68.2	-7.9	1.81 V	9	56.3	4.0
5	11570.00	64.8 PK	74.0	-9.2	3.60 V	359	55.2	9.6
6	11570.00	50.3 AV	54.0	-3.7	3.60 V	359	40.7	9.6

Remarks:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5640.80	59.1 PK	68.2	-9.1	1.65 H	345	55.7	3.4
2	*5825.00	116.3 PK			1.65 H	345	74.5	41.8
3	*5825.00	104.1 AV			1.65 H	345	62.3	41.8
4	#5981.60	58.5 PK	68.2	-9.7	1.65 H	345	54.5	4.0
5	11650.00	58.9 PK	74.0	-15.1	1.75 H	322	49.4	9.5
6	11650.00	46.6 AV	54.0	-7.4	1.75 H	322	37.1	9.5
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	#5625.20	60.3 PK	68.2	-7.9	1.97 V	3	57.0	3.3
2	*5825.00	127.3 PK			1.97 V	3	85.5	41.8
3	*5825.00	114.9 AV			1.97 V	3	73.1	41.8
4	#5927.60	60.8 PK	68.2	-7.4	1.97 V	3	57.1	3.7
5	11650.00	64.4 PK	74.0	-9.6	3.66 V	357	54.9	9.5
6	11650.00	49.8 AV	54.0	-4.2	3.66 V	357	40.3	9.5

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.

802.11ax (HE40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.5 PK	74.0	-16.5	2.31 H	58	55.0	2.5
2	5150.00	45.2 AV	54.0	-8.8	2.31 H	58	42.7	2.5
3	*5190.00	103.3 PK			2.29 H	55	63.0	40.3
4	*5190.00	93.1 AV			2.29 H	55	52.8	40.3
5	#10380.00	56.8 PK	68.2	-11.4	1.66 H	312	48.3	8.5
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	5150.00	58.6 PK	74.0	-15.4	1.99 V	332	56.1	2.5
2	5150.00	46.5 AV	54.0	-7.5	1.99 V	332	44.0	2.5
3	*5190.00	115.3 PK			1.97 V	323	75.0	40.3
4	*5190.00	103.0 AV			1.97 V	323	62.7	40.3
5	#10380.00	57.4 PK	68.2	-10.8	3.90 V	326	48.9	8.5

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.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5230.00	104.5 PK			2.40 H	54	64.4	40.1
2	*5230.00	91.8 AV			2.40 H	54	51.7	40.1
3	5350.00	58.3 PK	74.0	-15.7	2.44 H	55	56.2	2.1
4	5350.00	44.4 AV	54.0	-9.6	2.44 H	55	42.3	2.1
5	#10460.00	56.6 PK	68.2	-11.6	1.63 H	302	48.1	8.5
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	*5230.00	115.1 PK			1.89 V	324	75.0	40.1
2	*5230.00	102.4 AV			1.89 V	324	62.3	40.1
3	5350.00	58.4 PK	74.0	-15.6	1.99 V	333	56.3	2.1
4	5350.00	45.4 AV	54.0	-8.6	1.99 V	333	43.3	2.1
5	#10460.00	57.0 PK	68.2	-11.2	3.84 V	321	48.5	8.5

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.

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5601.60	59.0 PK	68.2	-9.2	1.60 H	348	55.8	3.2
2	*5755.00	115.2 PK			1.60 H	348	73.4	41.8
3	*5755.00	102.4 AV			1.60 H	348	60.6	41.8
4	#5973.20	59.0 PK	68.2	-9.2	1.60 H	348	55.0	4.0
5	11510.00	58.2 PK	74.0	-15.8	1.80 H	327	48.6	9.6
6	11510.00	46.1 AV	54.0	-7.9	1.80 H	327	36.5	9.6
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	#5648.00	61.2 PK	68.2	-7.0	1.57 V	327	57.8	3.4
2	*5755.00	126.4 PK			1.57 V	327	84.6	41.8
3	*5755.00	112.3 AV			1.57 V	327	70.5	41.8
4	#5947.20	58.9 PK	68.2	-9.3	1.57 V	327	55.2	3.7
5	11510.00	61.8 PK	74.0	-12.2	3.58 V	348	52.2	9.6
6	11510.00	47.8 AV	54.0	-6.2	3.58 V	348	38.2	9.6

Remarks:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5620.80	57.2 PK	68.2	-11.0	1.55 H	343	53.9	3.3
2	*5795.00	114.8 PK			1.55 H	343	73.0	41.8
3	*5795.00	102.5 AV			1.55 H	343	60.7	41.8
4	#5957.60	57.8 PK	68.2	-10.4	1.55 H	343	53.9	3.9
5	11590.00	58.0 PK	74.0	-16.0	1.87 H	303	48.5	9.5
6	11590.00	45.9 AV	54.0	-8.1	1.87 H	303	36.4	9.5
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	#5604.00	59.8 PK	68.2	-8.4	1.60 V	321	56.6	3.2
2	*5795.00	123.4 PK			1.60 V	321	81.6	41.8
3	*5795.00	112.3 AV			1.60 V	321	70.5	41.8
4	#5952.00	60.2 PK	68.2	-8.0	1.60 V	321	56.4	3.8
5	11590.00	62.0 PK	74.0	-12.0	3.63 V	356	52.5	9.5
6	11590.00	47.8 AV	54.0	-6.2	3.63 V	356	38.3	9.5

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.

802.11ax (HE80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.8 PK	74.0	-16.2	2.29 H	66	55.3	2.5
2	5150.00	46.2 AV	54.0	-7.8	2.29 H	66	43.7	2.5
3	*5210.00	109.5 PK			2.23 H	62	69.3	40.2
4	*5210.00	96.6 AV			2.23 H	62	56.4	40.2
5	#10420.00	56.3 PK	68.2	-11.9	1.68 H	317	47.9	8.4
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	5150.00	65.5 PK	74.0	-8.5	1.96 V	320	63.0	2.5
2	5150.00	48.7 AV	54.0	-5.3	1.96 V	320	46.2	2.5
3	*5210.00	111.8 PK			1.99 V	323	71.6	40.2
4	*5210.00	99.2 AV			1.99 V	323	59.0	40.2
5	#10420.00	56.9 PK	68.2	-11.3	3.86 V	322	48.5	8.4

Remarks:

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

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5646.40	60.6 PK	68.2	-7.6	1.61 H	351	57.2	3.4
2	#5650.00	60.1 PK	68.2	-8.1	1.61 H	351	56.7	3.4
3	*5775.00	110.2 PK			1.59 H	343	68.5	41.7
4	*5775.00	97.4 AV			1.59 H	343	55.7	41.7
5	#5959.20	58.9 PK	68.2	-9.3	1.61 H	351	55.0	3.9
6	11550.00	57.5 PK	74.0	-16.5	1.86 H	322	47.9	9.6
7	11550.00	45.7 AV	54.0	-8.3	1.86 H	322	36.1	9.6
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	**#5648.80**	**67.5 PK**	**68.2**	**-0.7**	**1.80 V**	**62**	**64.1**	**3.4**
2	#5650.00	66.9 PK	68.2	-1.3	1.80 V	62	63.5	3.4
3	*5775.00	118.8 PK			1.60 V	326	77.1	41.7
4	*5775.00	106.7 AV			1.60 V	326	65.0	41.7
5	#5927.20	61.7 PK	68.2	-6.5	1.80 V	62	58.0	3.7
6	11550.00	61.2 PK	74.0	-12.8	3.56 V	360	51.6	9.6
7	11550.00	47.5 AV	54.0	-6.5	3.56 V	360	37.9	9.6

Remarks:

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

Below 1GHz Worst-Case Data:

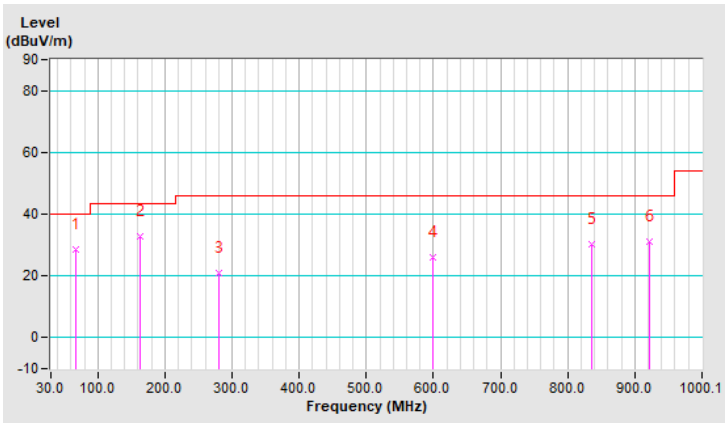
802.11ax (HE40)

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	66.86	28.4 QP	40.0	-11.6	2.32 H	164	42.6	-14.2
2	163.87	32.9 QP	43.5	-10.6	2.47 H	25	45.7	-12.8
3	281.26	20.8 QP	46.0	-25.2	3.32 H	169	33.8	-13.0
4	598.48	26.2 QP	46.0	-19.8	1.04 H	220	29.8	-3.6
5	835.18	30.3 QP	46.0	-15.7	1.58 H	232	29.2	1.1
6	921.52	31.0 QP	46.0	-15.0	1.36 H	117	28.9	2.1

Remarks:

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

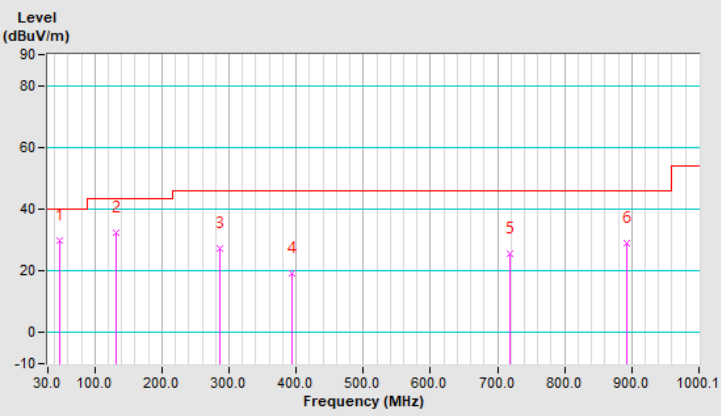


CHANNEL	TX Channel 151	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	48.43	29.7 QP	40.0	-10.3	1.03 V	247	42.2	-12.5
2	130.89	32.5 QP	43.5	-11.0	2.06 V	252	45.7	-13.2
3	287.08	27.4 QP	46.0	-18.6	3.41 V	11	40.0	-12.6
4	394.76	19.2 QP	46.0	-26.8	2.78 V	252	28.6	-9.4
5	718.77	25.5 QP	46.0	-20.5	3.37 V	149	27.2	-1.7
6	893.39	28.9 QP	46.0	-17.1	1.51 V	200	27.4	1.5

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. 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	ESCI	100613	Dec. 03, 2021	Dec. 02, 2022
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 15, 2022	Jan. 14, 2023
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Mar. 14, 2022	Mar. 13, 2023
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Sep. 12, 2022	Sep. 11, 2023
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

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

4.2.3 Test Procedures

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

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

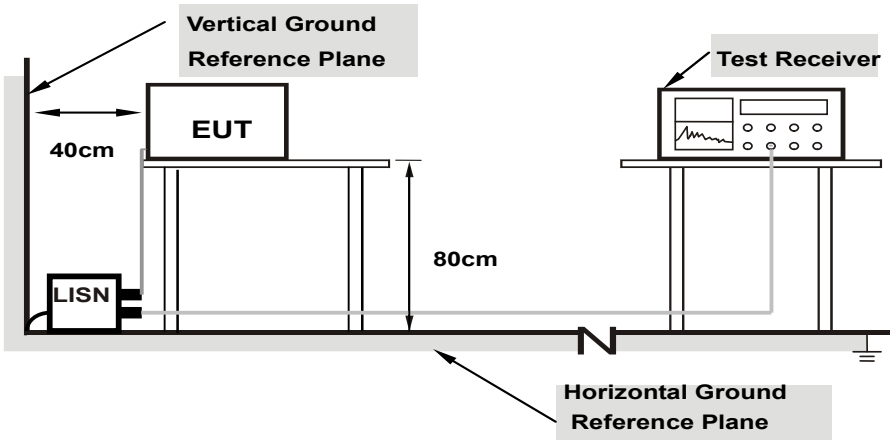
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

Worst-case data:

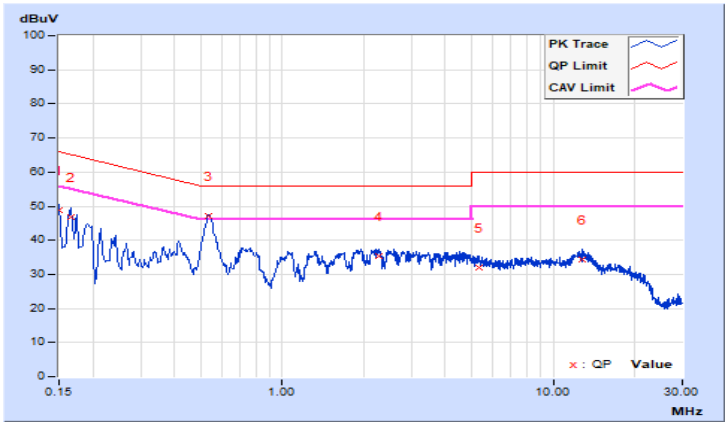
802.11ax (HE40)

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.62	39.07	26.92	48.69	36.54	66.00	56.00	-17.31	-19.46
2	0.16600	9.63	37.09	23.09	46.72	32.72	65.16	55.16	-18.44	-22.44
3	**0.53400**	**9.69**	**37.38**	**31.55**	**47.07**	**41.24**	**56.00**	**46.00**	**-8.93**	**-4.76**
4	2.28200	9.72	25.54	19.61	35.26	29.33	56.00	46.00	-20.74	-16.67
5	5.35000	9.76	22.28	15.56	32.04	25.32	60.00	50.00	-27.96	-24.68
6	12.83800	9.78	24.56	16.39	34.34	26.17	60.00	50.00	-25.66	-23.83

Remarks:

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

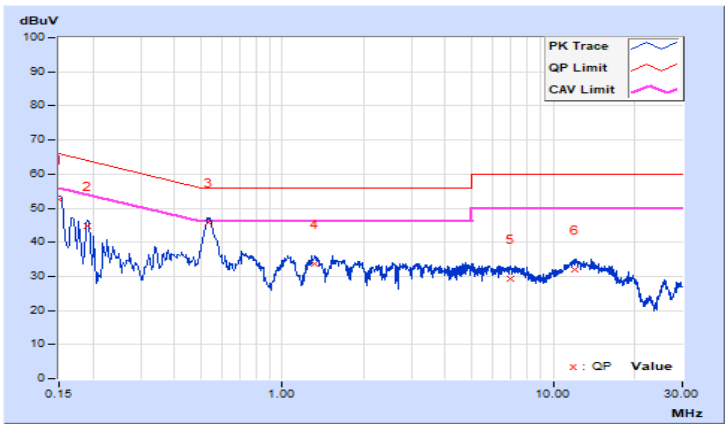


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.62	42.93	26.96	52.55	36.58	66.00	56.00	-13.45	-19.42
2	0.19000	9.63	35.27	19.90	44.90	29.53	64.04	54.04	-19.14	-24.51
3	0.53688	9.68	36.18	31.30	45.86	40.98	56.00	46.00	-10.14	-5.02
4	1.32200	9.71	23.80	20.25	33.51	29.96	56.00	46.00	-22.49	-16.04
5	6.92200	9.77	19.54	13.66	29.31	23.43	60.00	50.00	-30.69	-26.57
6	12.06600	9.81	22.02	15.84	31.83	25.65	60.00	50.00	-28.17	-24.35

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)

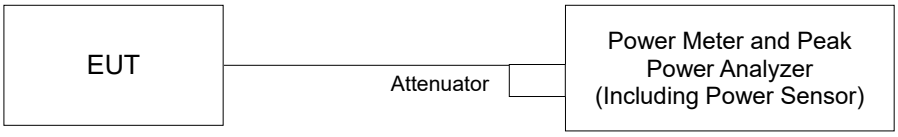
*B is the 26 dB emission bandwidth in megahertz

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



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

For U-NII-1 band (Indoor/Outdoor Access Point):

CDD Mode

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	13.48	13.07	42.561	16.29	30.00	4.45	20.74	21.00	Pass
40	5200	13.51	13.05	42.622	16.30	30.00	4.45	20.75	21.00	Pass
48	5240	13.16	13.81	**44.745**	16.51	30.00	4.45	20.96	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	13.13	12.87	39.923	16.01	30.00	4.45	20.46	21.00	Pass
40	5200	12.96	12.85	39.045	15.92	30.00	4.45	20.37	21.00	Pass
48	5240	13.27	12.82	40.375	16.06	30.00	4.45	20.51	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
38	5190	12.68	13.33	40.063	16.03	30.00	4.45	20.48	21.00	Pass
46	5230	12.86	13.05	39.503	15.97	30.00	4.45	20.42	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	13.16	13.10	41.119	16.14	30.00	4.45	20.59	21.00	Pass
40	5200	13.04	12.94	39.816	16.00	30.00	4.45	20.45	21.00	Pass
48	5240	13.54	12.93	42.228	16.26	30.00	4.45	20.71	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
38	5190	12.82	13.49	41.478	16.18	30.00	4.45	20.63	21.00	Pass
46	5230	13.08	13.16	41.025	16.13	30.00	4.45	20.58	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
42	5210	13.16	12.63	39.025	15.91	30.00	4.45	20.36	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	13.33	13.21	42.469	16.28	30.00	4.45	20.73	21.00	Pass
40	5200	13.21	13.15	41.595	16.19	30.00	4.45	20.64	21.00	Pass
48	5240	13.66	13.15	43.881	16.42	30.00	4.45	20.87	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
38	5190	13.01	13.71	43.495	16.38	30.00	4.45	20.83	21.00	Pass
46	5230	13.22	13.41	42.917	16.33	30.00	4.45	20.78	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
42	5210	13.33	12.87	40.892	16.12	30.00	4.45	20.57	21.00	Pass

Note:
1. Antenna gain = 5.12dBi, so the power limit no need to reduce.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. EIRP = average power + (4.45dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

Beamforming Mode

2TX

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	10.05	10.00	20.116	13.04	27.87	7.46	20.50	21.00	Pass
40	5200	10.05	10.02	20.162	13.05	27.87	7.46	20.51	21.00	Pass
48	5240	10.19	10.00	20.447	13.11	27.87	7.46	20.57	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

802.11 (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
38	5190	10.04	10.26	20.709	13.16	27.87	7.46	20.62	21.00	Pass
46	5230	10.04	10.15	20.444	13.11	27.87	7.46	20.57	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	10.07	10.01	20.186	13.05	27.87	7.46	20.51	21.00	Pass
40	5200	10.14	10.03	20.397	13.10	27.87	7.46	20.56	21.00	Pass
48	5240	10.49	10.02	21.241	13.27	27.87	7.46	20.73	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
38	5190	10.10	10.43	21.274	13.28	27.87	7.46	20.74	21.00	Pass
46	5230	10.08	10.27	20.827	13.19	27.87	7.46	20.65	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
42	5210	10.17	10.04	20.492	13.12	27.87	7.46	20.58	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	10.26	10.13	20.921	13.21	27.87	7.46	20.67	21.00	Pass
40	5200	10.16	10.06	20.514	13.12	27.87	7.46	20.58	21.00	Pass
48	5240	10.62	10.16	21.910	13.41	27.87	7.46	20.87	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
38	5190	10.11	10.68	**21.952**	13.41	27.87	7.46	20.87	21.00	Pass
46	5230	10.14	10.35	21.167	13.26	27.87	7.46	20.72	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Directional Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
42	5210	10.26	10.05	20.733	13.17	27.87	7.46	20.63	21.00	Pass

Note:
1. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power limit shall be reduced to 30 - (8.13 - 6) = 27.87dBm.
2. Antenna gain = 4.45dBi (above 30 degrees from the horizon).
3. Beamforming gain = 3.01dBi
4. EIRP = average power + (4.45dBi) + beamforming gain (3.01dBi) = 7.46dBi.

For U-NII-3 band:

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				
149	5745	23.69	23.87	**477.665**	26.79	30.00	Pass
157	5785	23.88	23.42	464.129	26.67	30.00	Pass
165	5825	23.68	23.54	459.289	26.62	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	22.67	22.83	376.794	25.76	30.00	Pass
157	5785	22.34	22.70	357.604	25.53	30.00	Pass
165	5825	22.70	22.63	369.440	25.68	30.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	22.81	23.59	419.545	26.23	30.00	Pass
159	5795	23.35	23.58	444.306	26.48	30.00	Pass

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	22.85	22.86	385.949	25.87	30.00	Pass
157	5785	22.48	22.98	375.620	25.75	30.00	Pass
165	5825	22.71	22.80	377.184	25.77	30.00	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	23.07	23.69	436.652	26.40	30.00	Pass
159	5795	23.45	23.76	458.993	26.62	30.00	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
155	5775	21.85	22.89	347.645	25.41	30.00	Pass

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	23.01	23.11	404.631	26.07	30.00	Pass
157	5785	22.66	23.11	389.146	25.90	30.00	Pass
165	5825	22.95	22.92	393.127	25.95	30.00	Pass

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	23.17	23.92	454.095	26.57	30.00	Pass
159	5795	23.65	23.88	476.083	26.78	30.00	Pass

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
155	5775	22.08	23.12	366.552	25.64	30.00	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	22.67	22.83	376.794	25.76	27.82	Pass
157	5785	22.34	22.70	357.604	25.53	27.82	Pass
165	5825	22.70	22.63	369.440	25.68	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	22.81	23.59	419.545	26.23	27.82	Pass
159	5795	23.35	23.58	444.306	26.48	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	22.85	22.86	385.949	25.87	27.82	Pass
157	5785	22.48	22.98	375.620	25.75	27.82	Pass
165	5825	22.71	22.80	377.184	25.77	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	23.07	23.69	436.652	26.40	27.82	Pass
159	5795	23.45	23.76	458.993	26.62	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
155	5775	21.85	22.89	347.645	25.41	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	23.01	23.11	404.631	26.07	27.82	Pass
157	5785	22.66	23.11	389.146	25.90	27.82	Pass
165	5825	22.95	22.92	393.127	25.95	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	23.17	23.92	454.095	26.57	27.82	Pass
159	5795	23.65	23.88	**476.083**	26.78	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

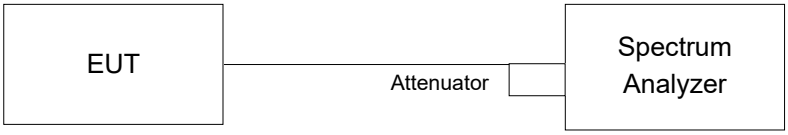
802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
155	5775	22.08	23.12	366.552	25.64	27.82	Pass

Note: Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power limit shall be reduced to 30 - (8.18 - 6) = 27.82dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Result

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.44	16.44
40	5200	16.44	16.44
48	5240	16.44	16.44
149	5745	16.44	16.44
157	5785	16.44	16.44
165	5825	16.44	16.44

802.11ax (HE20)

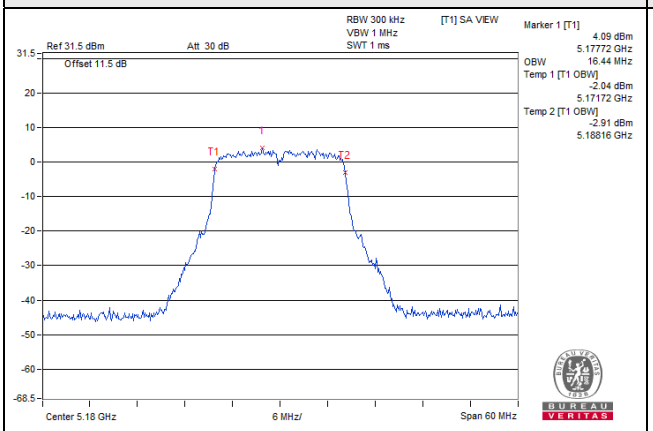
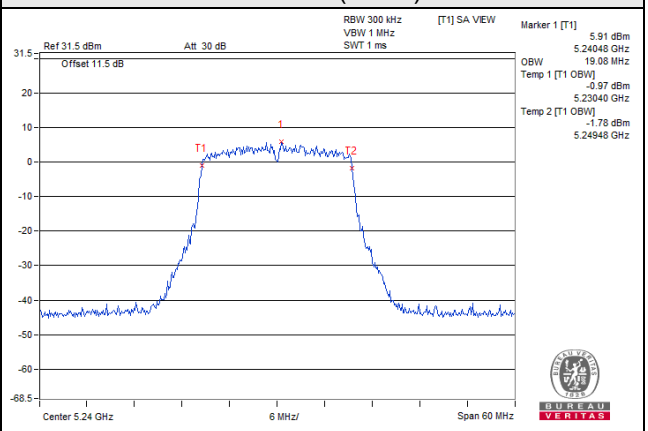
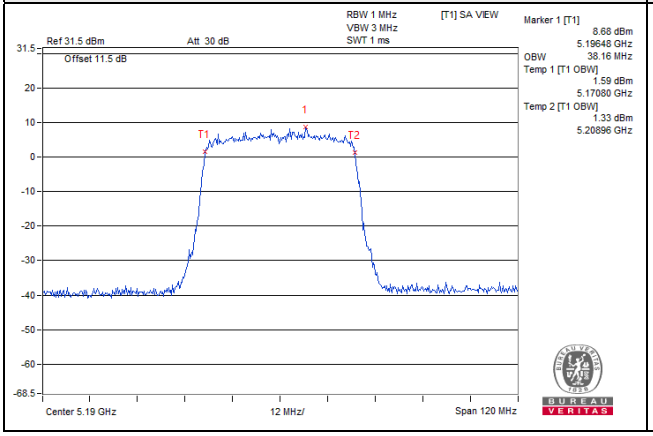
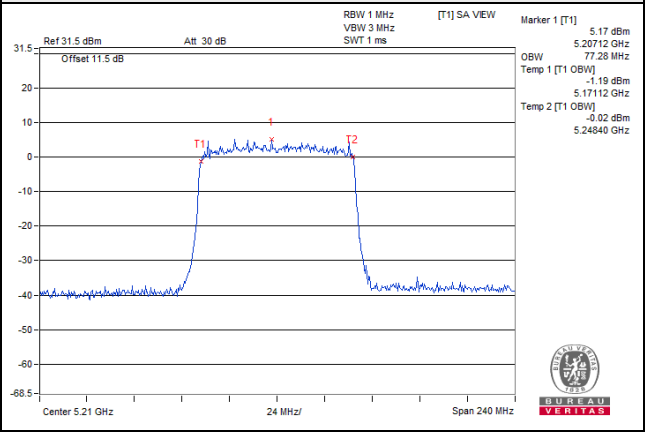
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.96	18.84
40	5200	18.96	18.96
48	5240	18.96	19.08
149	5745	18.96	18.84
157	5785	19.08	18.96
165	5825	19.08	19.08

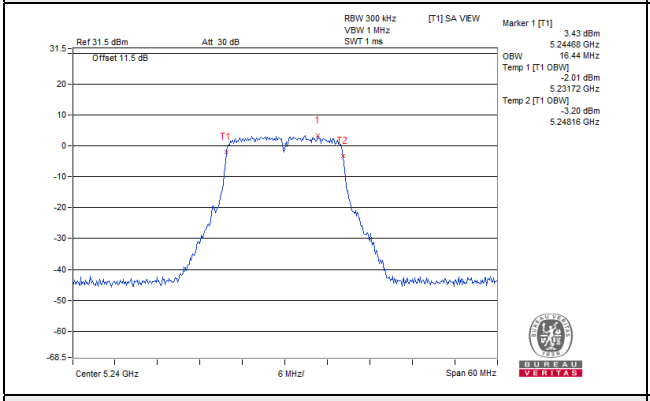
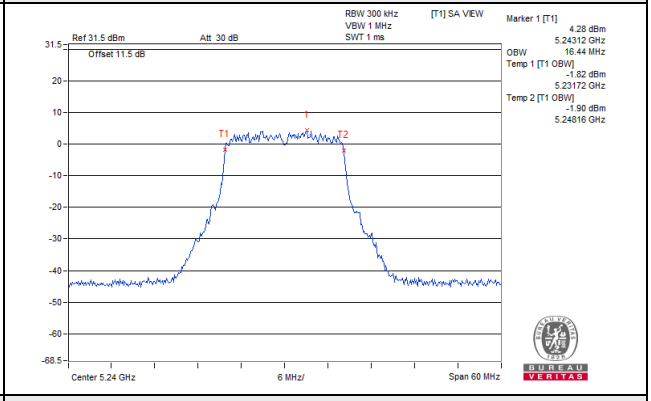
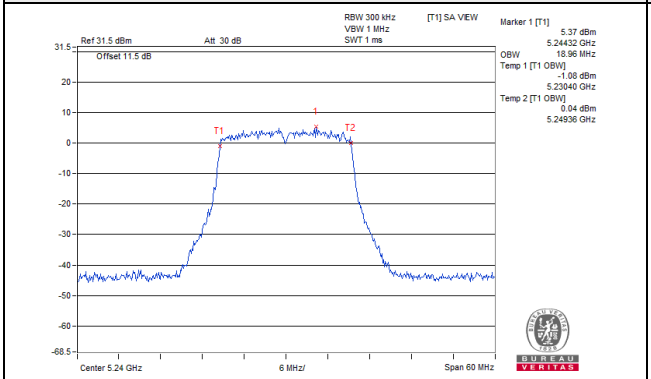
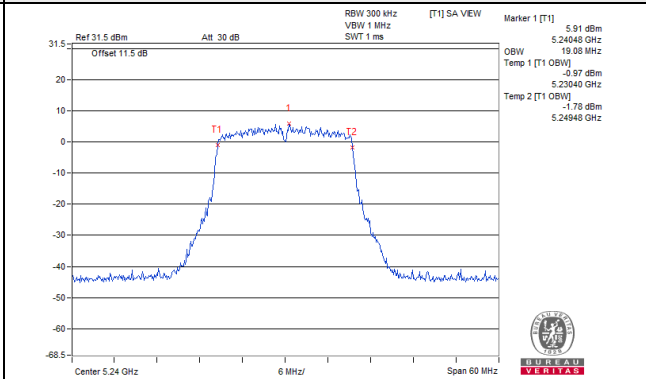
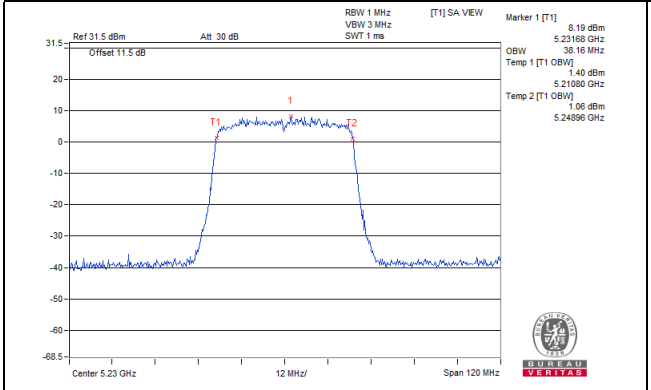
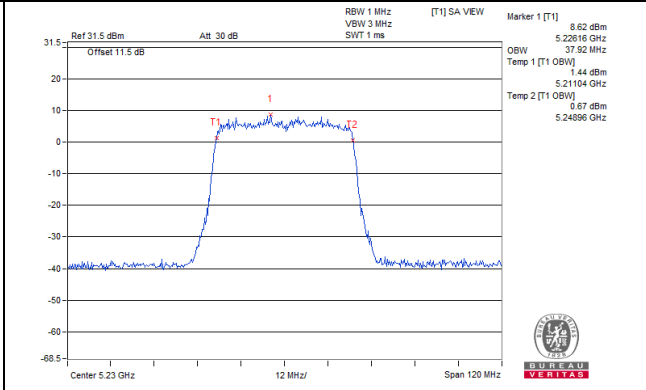
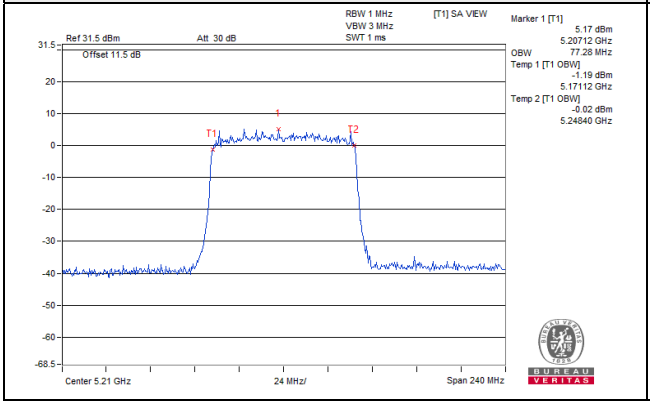
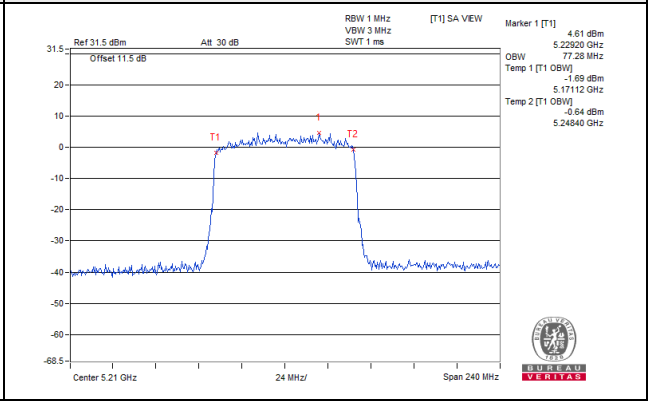
802.11ax (HE40)

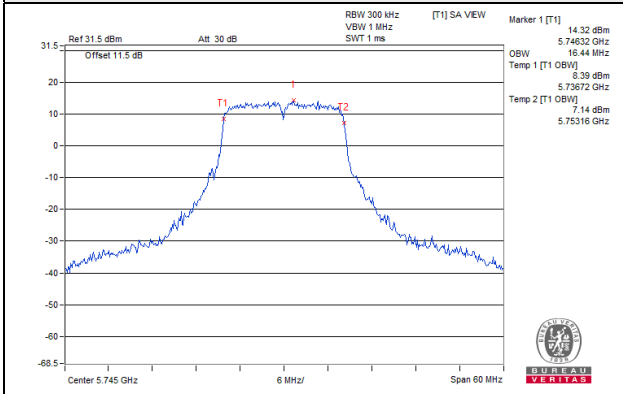
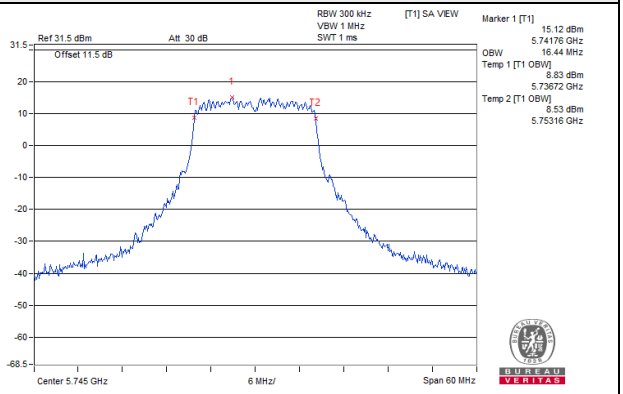
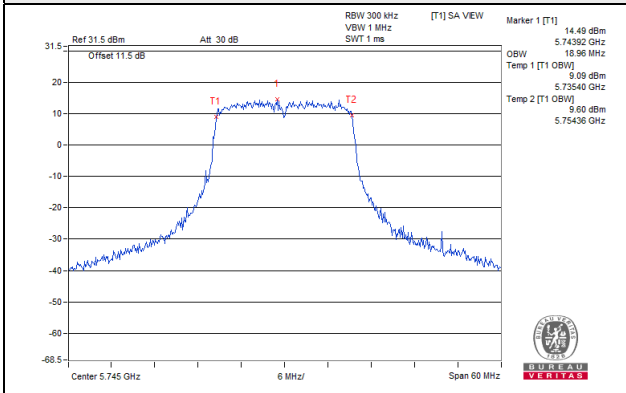
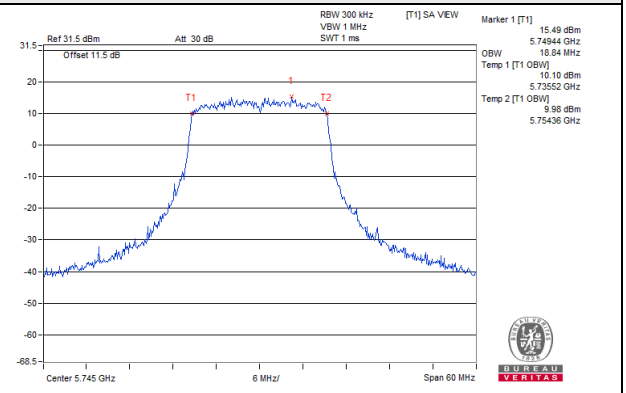
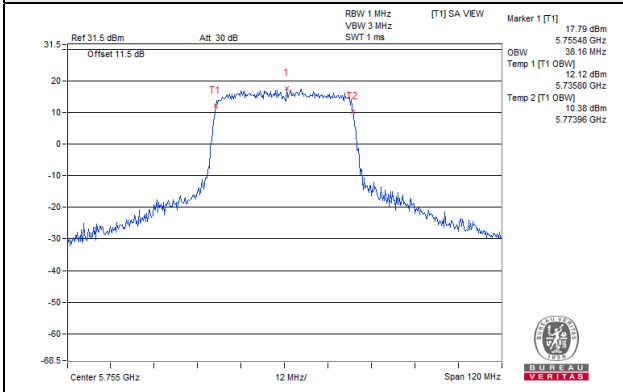
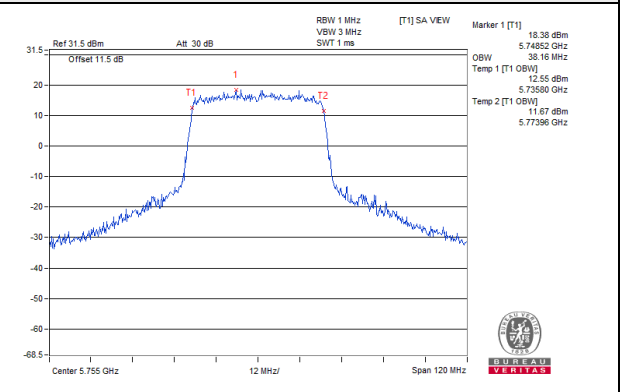
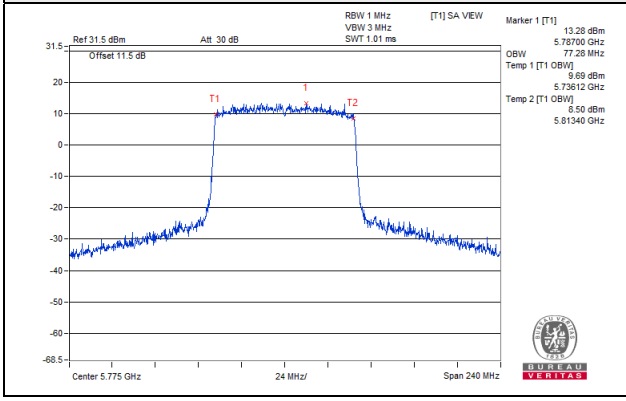
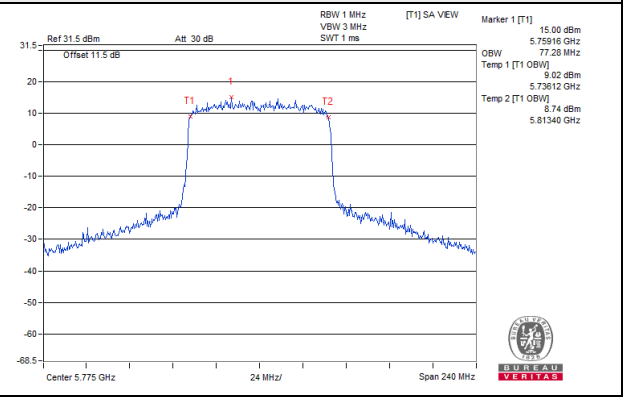
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	38.16	37.92
46	5230	38.16	37.92
151	5755	38.16	38.16
159	5795	38.16	38.16

802.11ax (HE80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	77.28	77.28
155	5775	77.28	77.28

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

Spectrum Plot for near By DFS Band	
802.11a / Chain 0 / CH 48	802.11a / Chain 1 / CH 48
	
802.11ax (HT20) / Chain 0 / CH 48	802.11ax (HT20) / Chain 1 / CH 48
	
802.11ax (HT40) / Chain 0 / CH 46	802.11ax (HT40) / Chain 1 / CH 46
	
802.11ax (HE80) / Chain 0 / CH 42	802.11ax (HE80) / Chain 1 / CH 42
	

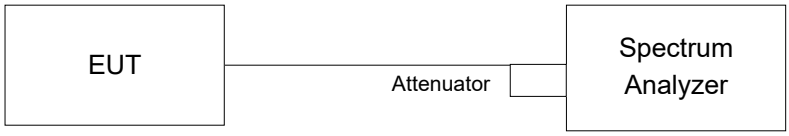
Spectrum Plot for near By DFS Band	
802.11a / Chain 0 / CH 149	802.11a / Chain 1 / CH 149
	
802.11ax (HT20) / Chain 0 / CH 149	802.11ax (HT20) / Chain 1 / CH 149
	
802.11ax (HT40) / Chain 0 / CH 151	802.11ax (HT40) / Chain 1 / CH 151
	
802.11ax (HE80) / Chain 0 / CH 155	802.11ax (HE80) / Chain 1 / CH 155
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1 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)

For U-NII-3 band:

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

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

c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.

d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz)

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

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

For U-NII-1 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				
36	5180	-0.71	-1.14	0.28	2.37	14.87	Pass
40	5200	-0.46	-0.56	0.28	2.78	14.87	Pass
48	5240	-0.76	-0.89	0.28	2.47	14.87	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.13 - 6) = 14.87dBi.
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				
36	5180	-1.33	-1.63	0.23	1.76	14.87	Pass
40	5200	-1.19	-1.10	0.23	2.10	14.87	Pass
48	5240	-1.56	-1.17	0.23	1.88	14.87	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.13 - 6) = 14.87dBi.
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				
38	5190	-4.06	-4.18	0.23	-0.88	14.87	Pass
46	5230	-3.79	-3.92	0.23	-0.61	14.87	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.13 - 6) = 14.87dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

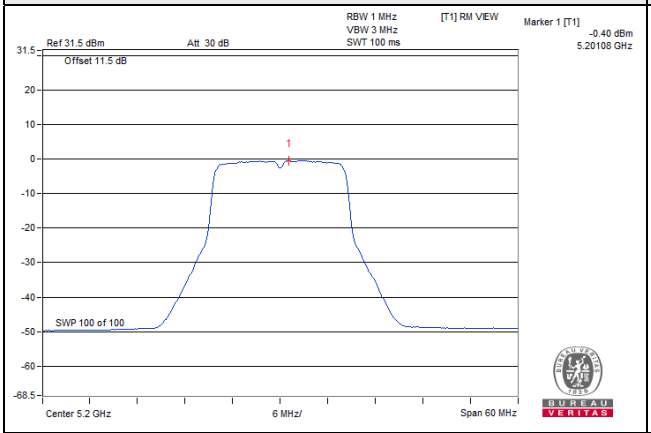
802.11ax (HE80)

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				
42	5210	-7.47	-7.60	0.15	-4.37	14.87	Pass

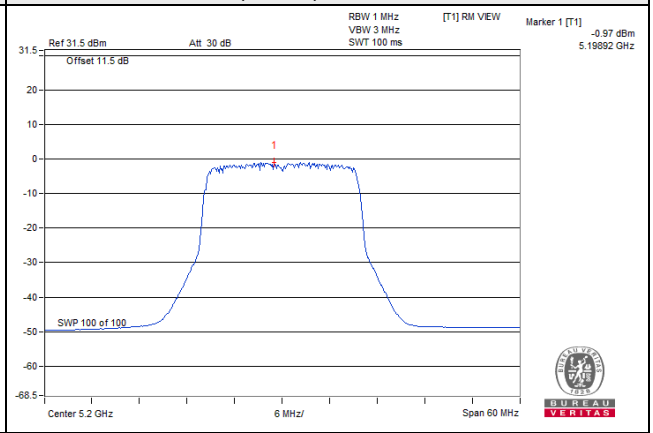
Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.12dBi + 10log(2) = 8.13dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.13 - 6) = 14.87dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

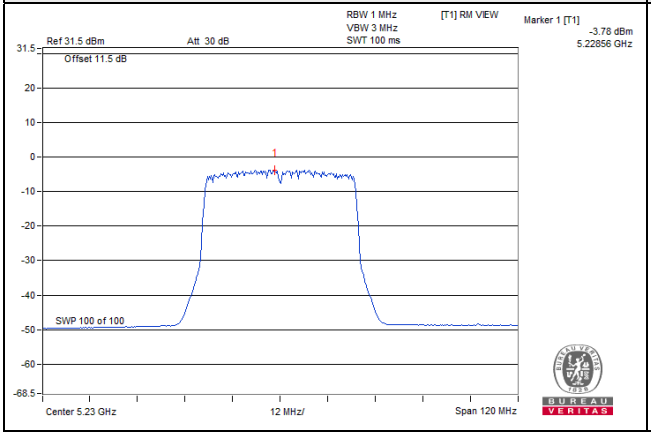
802.11a / Chain 0 / CH 40



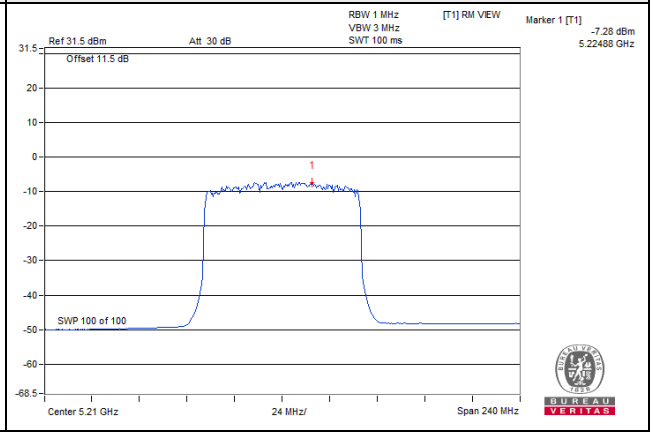
802.11ax (HE20) / Chain 1 / CH 40



802.11ax (HE40) / Chain 0 / CH 46



802.11ax (HE80) / Chain 0 / CH 42



For U-NII-3 band:

802.11a

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	1.21	3.43	3.01	0.28	6.72	27.82	Pass
	157	5785	0.46	2.68	3.01	0.28	5.97	27.82	Pass
	165	5825	0.78	3	3.01	0.28	6.29	27.82	Pass
1	149	5745	1.47	3.69	3.01	0.28	6.98	27.82	Pass
	157	5785	0.78	3	3.01	0.28	6.29	27.82	Pass
	165	5825	1.24	3.46	3.01	0.28	6.75	27.82	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power density limit shall be reduced to 30 - (8.18 - 6) = 27.82dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	-0.94	1.28	3.01	0.23	4.52	27.82	Pass
	157	5785	-1.63	0.59	3.01	0.23	3.83	27.82	Pass
	165	5825	-1.23	0.99	3.01	0.23	4.23	27.82	Pass
1	149	5745	-0.47	1.75	3.01	0.23	4.99	27.82	Pass
	157	5785	-1.01	1.21	3.01	0.23	4.45	27.82	Pass
	165	5825	-0.87	1.35	3.01	0.23	4.59	27.82	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power density limit shall be reduced to 30 - (8.18 - 6) = 27.82dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

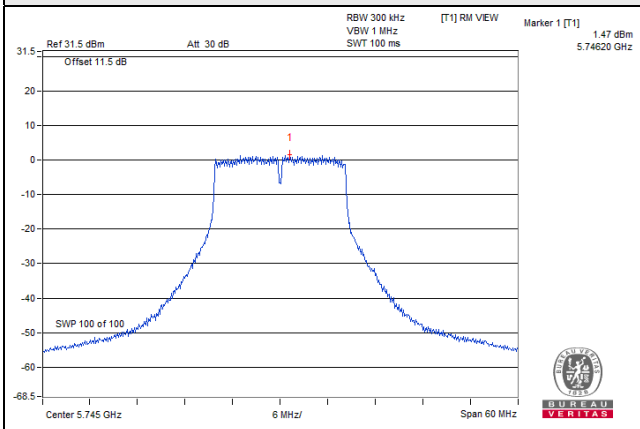
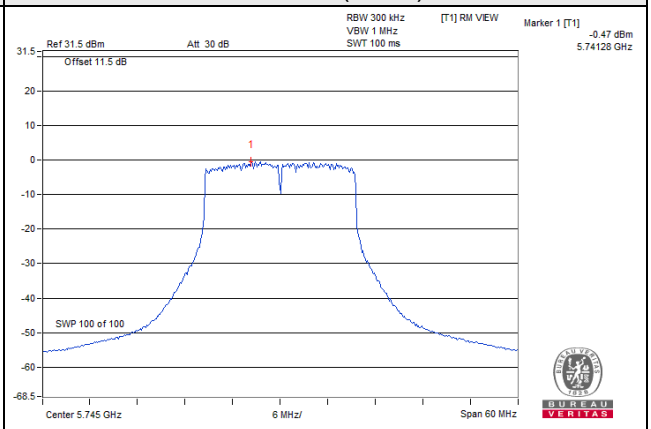
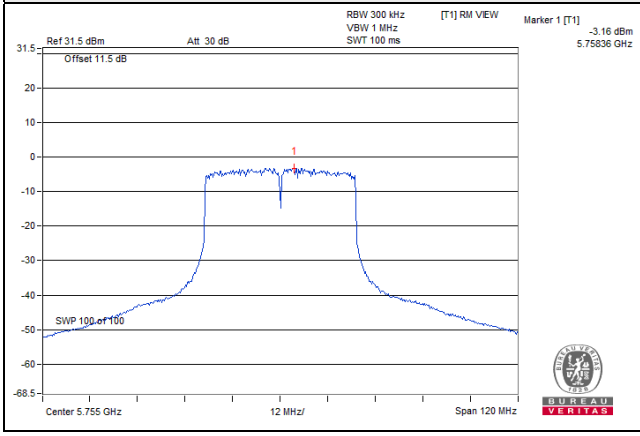
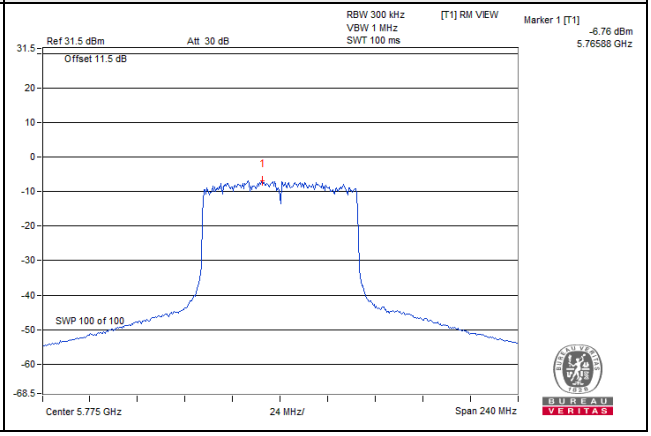
TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-3.16	-0.94	3.01	0.23	2.3	27.82	Pass
	159	5795	-4.03	-1.81	3.01	0.23	1.43	27.82	Pass
1	151	5755	-3.19	-0.97	3.01	0.23	2.27	27.82	Pass
	159	5795	-3.36	-1.14	3.01	0.23	2.1	27.82	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power density limit shall be reduced to 30 - (8.18 - 6) = 27.82dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-7.39	-5.17	3.01	0.15	-2.01	27.82	Pass
1	155	5775	-6.76	-4.54	3.01	0.15	-1.38	27.82	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.17dBi + 10log(2) = 8.18dBi > 6dBi, so the power density limit shall be reduced to 30 - (8.18 - 6) = 27.82dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

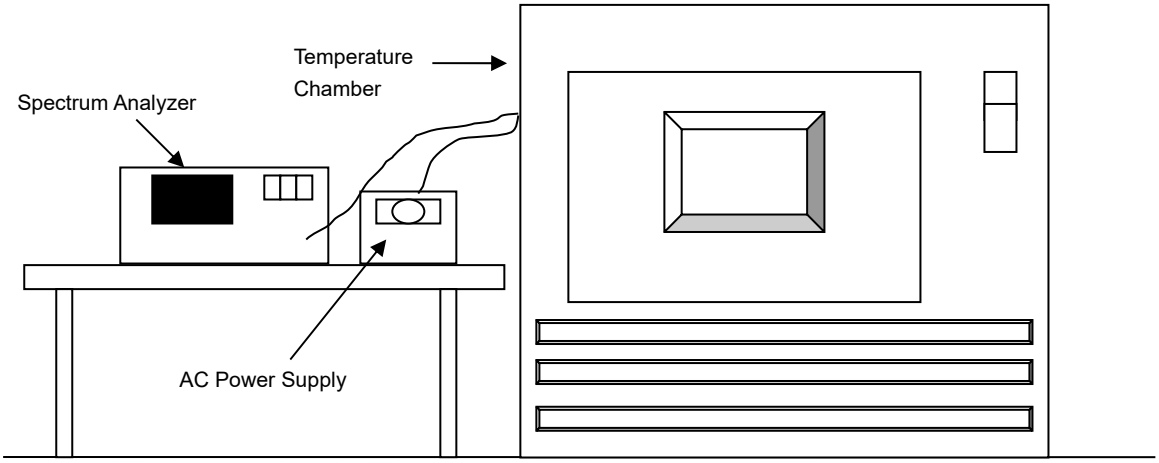
Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

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	100269	Jun. 01, 2022	May 31, 2023
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	May 30, 2022	May 29, 2023
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2022	Jun. 22, 2023
AC Power Supply Extech	CFW-105	E000603	NA	NA

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

4.6.4 Test Procedure

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

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

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

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

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

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
60	120	5180.0048	Pass	5180.0064	Pass	5180.0067	Pass	5180.0018	Pass
50	120	5180.0169	Pass	5180.0184	Pass	5180.0177	Pass	5180.0161	Pass
40	120	5180.0185	Pass	5180.0154	Pass	5180.0182	Pass	5180.0187	Pass
30	120	5179.9971	Pass	5179.9940	Pass	5179.9953	Pass	5179.9940	Pass
20	120	5180.0136	Pass	5180.0158	Pass	5180.0157	Pass	5180.0133	Pass
10	120	5180.0191	Pass	5180.0229	Pass	5180.0181	Pass	5180.0207	Pass
0	120	5179.9751	Pass	5179.9744	Pass	5179.9763	Pass	5179.9760	Pass
-10	120	5180.0183	Pass	5180.0208	Pass	5180.0200	Pass	5180.0196	Pass
-20	120	5180.0116	Pass	5180.0131	Pass	5180.0152	Pass	5180.0140	Pass

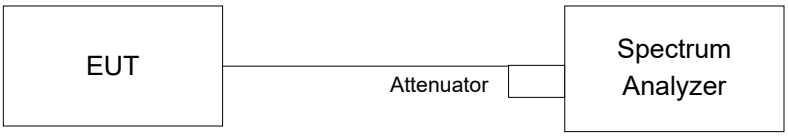
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5180.0168	Pass	5180.0163	Pass	5180.0192	Pass	5180.0194	Pass
	120	5180.0136	Pass	5180.0158	Pass	5180.0157	Pass	5180.0133	Pass
	102	5180.0109	Pass	5180.0114	Pass	5180.0084	Pass	5180.0073	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.57	16.06	0.5	Pass
157	5785	16.03	15.40	0.5	Pass
165	5825	15.59	15.20	0.5	Pass

802.11ax (HE20)

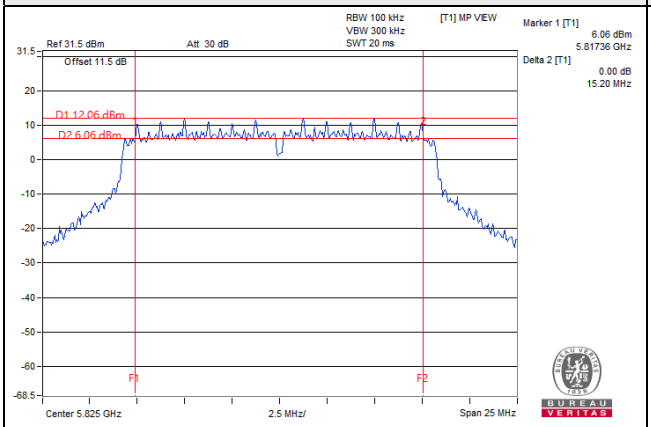
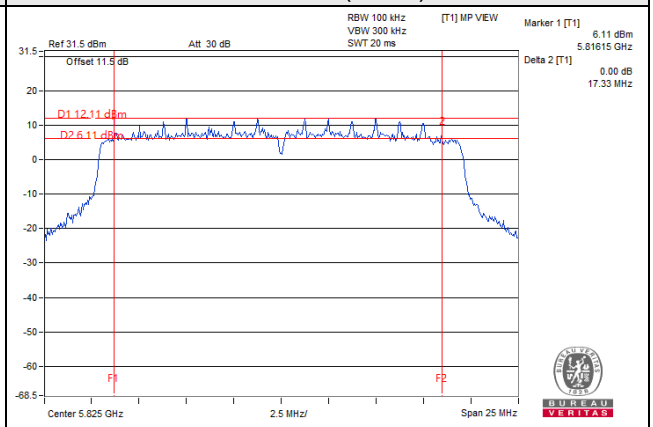
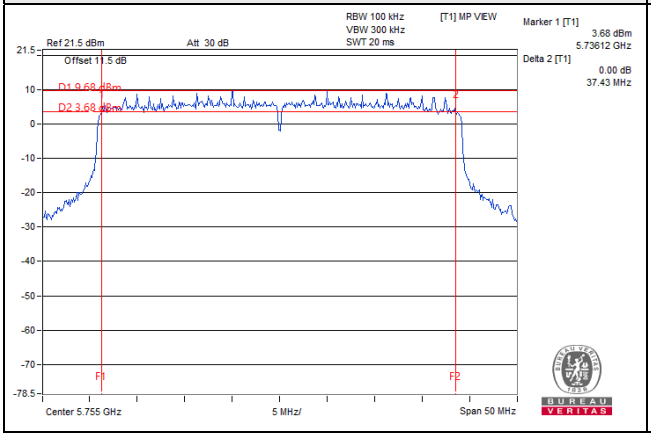
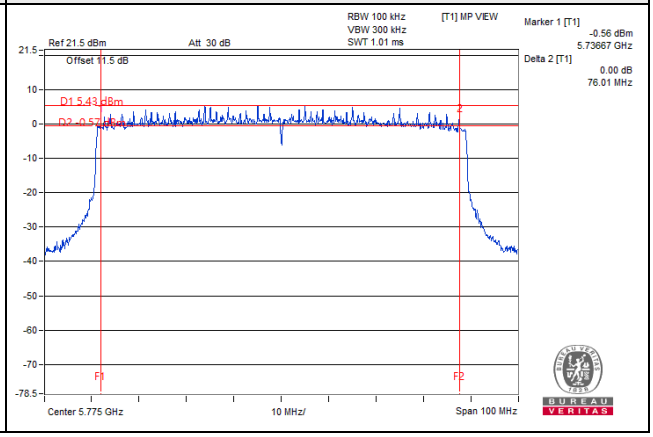
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	18.45	18.08	0.5	Pass
157	5785	18.52	18.42	0.5	Pass
165	5825	17.33	18.20	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	37.91	37.43	0.5	Pass
159	5795	37.91	37.67	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.01	76.38	0.5	Pass

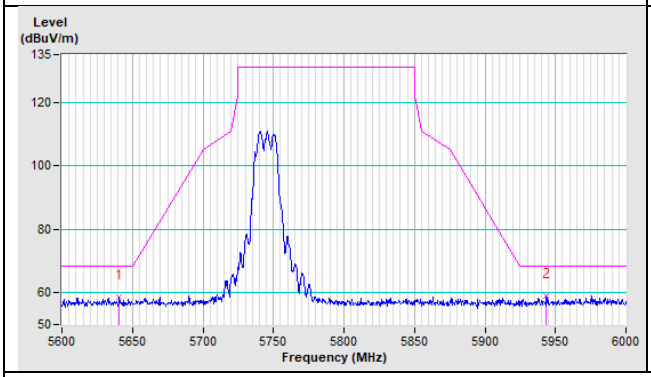
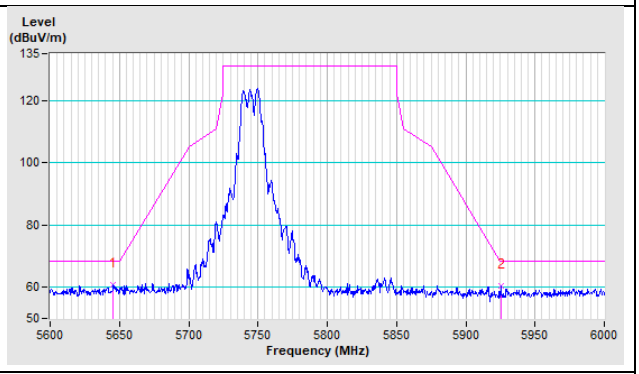
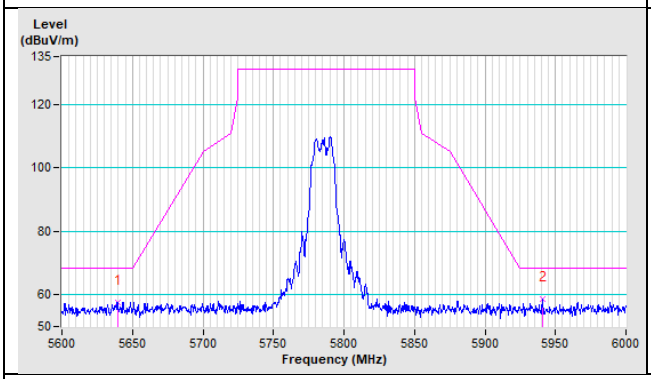
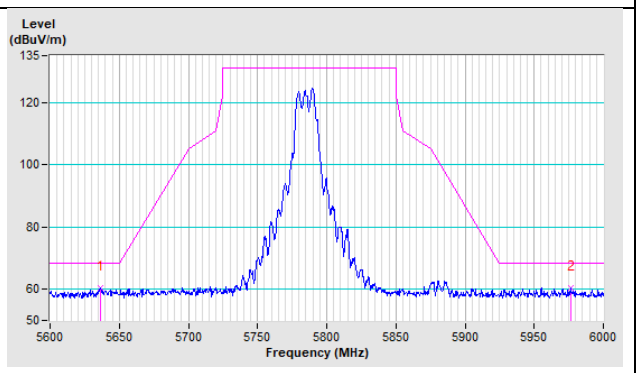
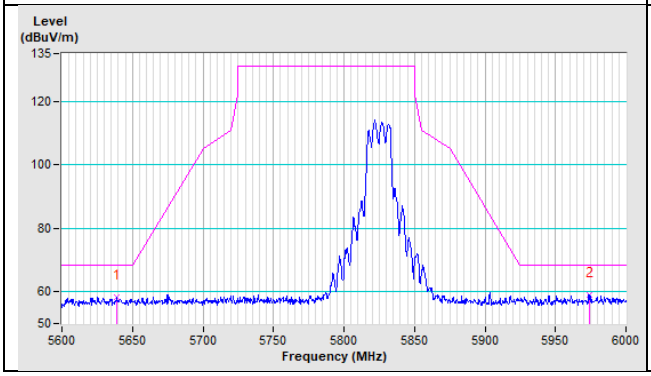
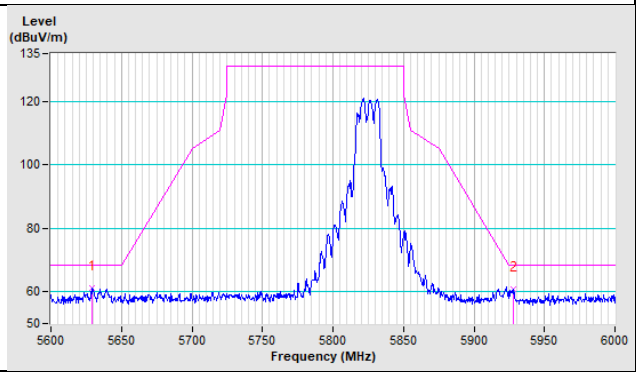
Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

5 Pictures of Test Arrangements

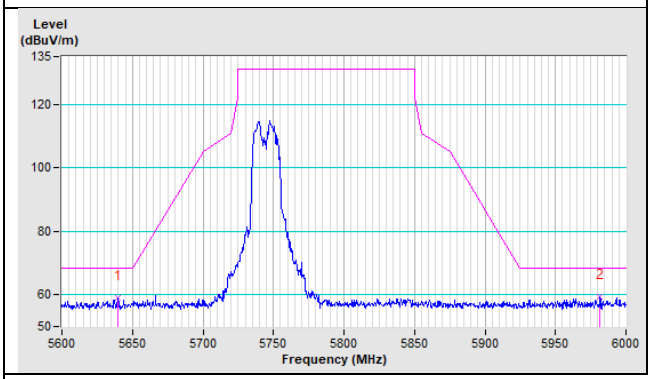
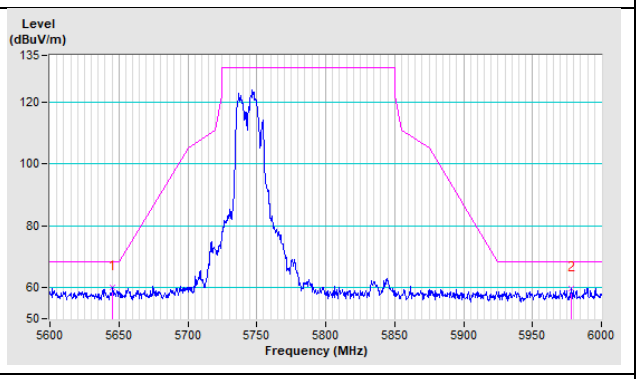
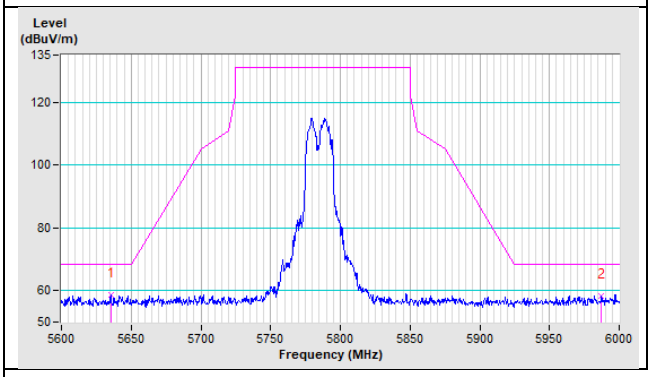
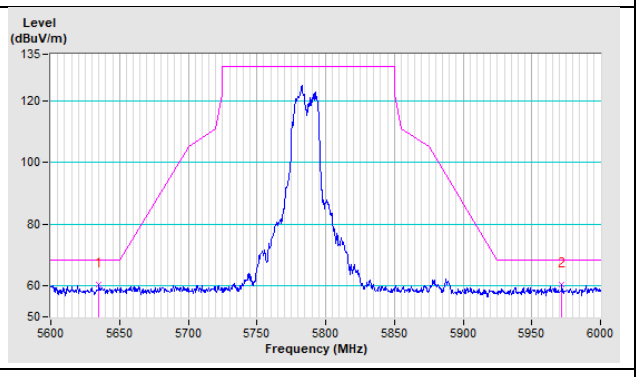
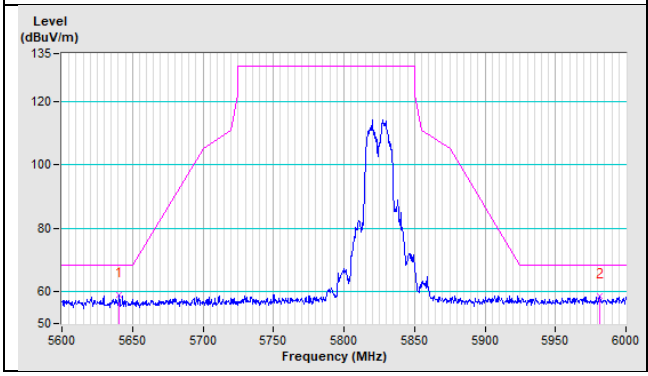
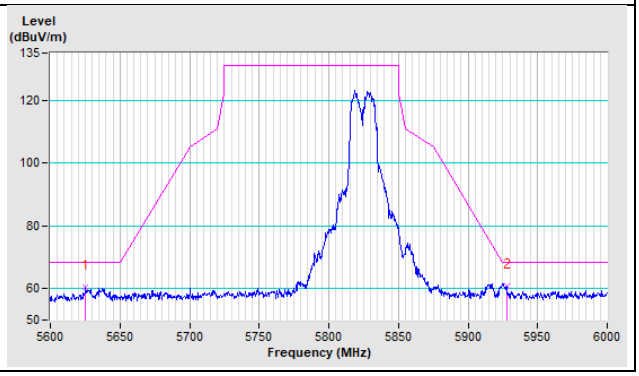
Please refer to the attached file (Test Setup Photo).

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

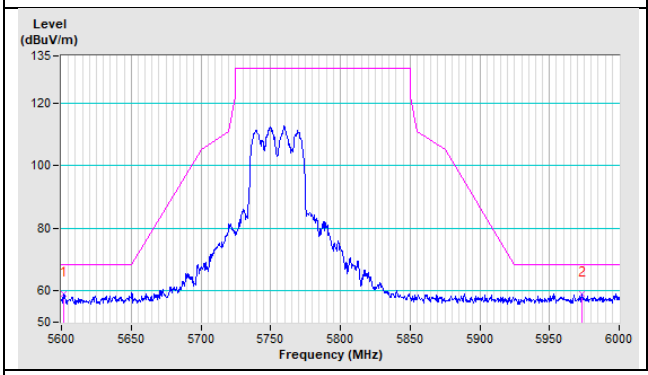
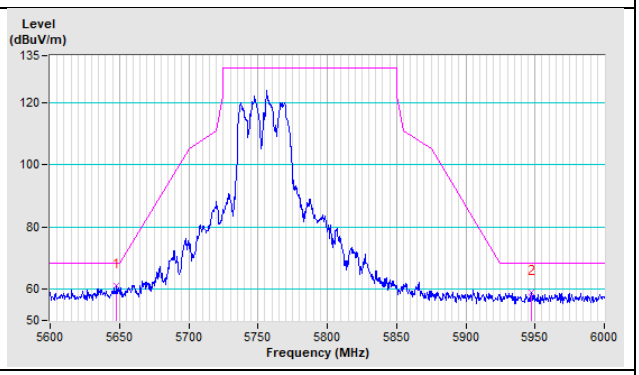
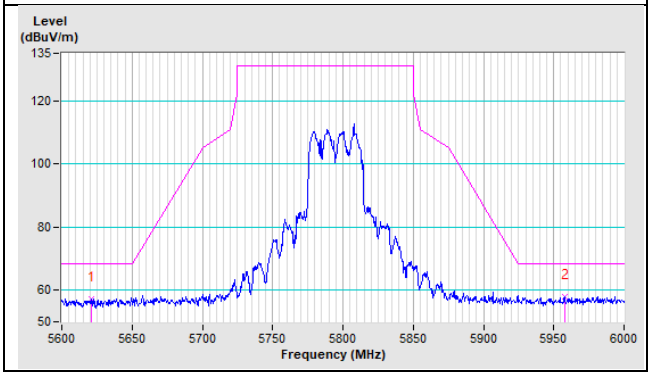
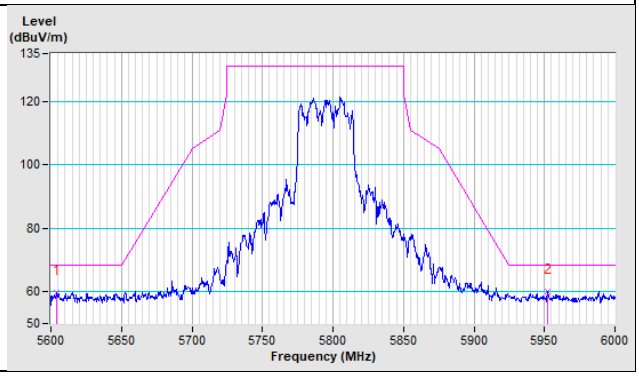
802.11a

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

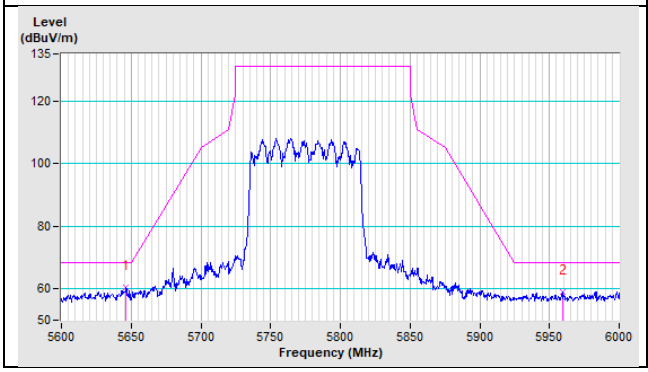
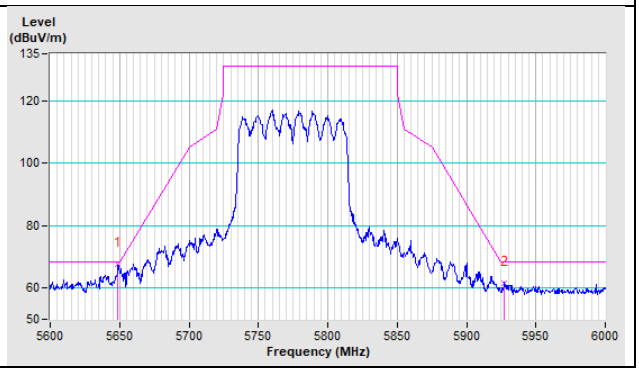
802.11ax (HE20)

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

802.11ax (HE40)

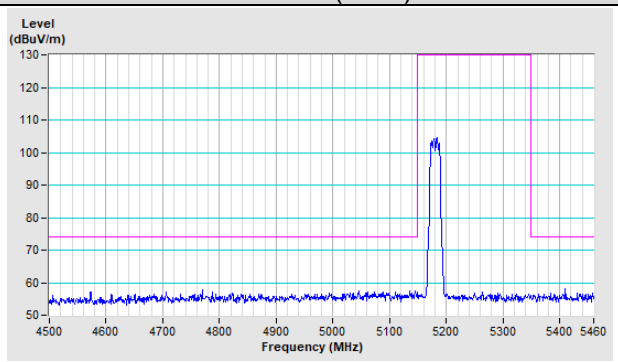
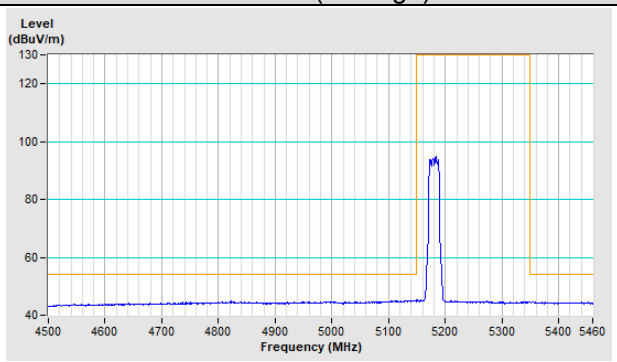
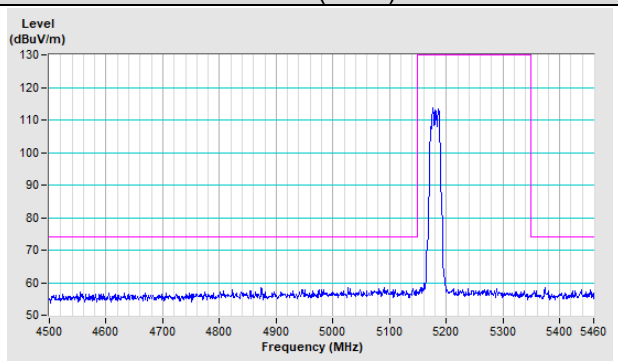
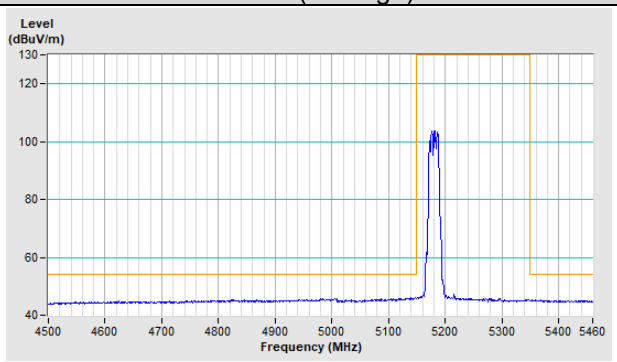
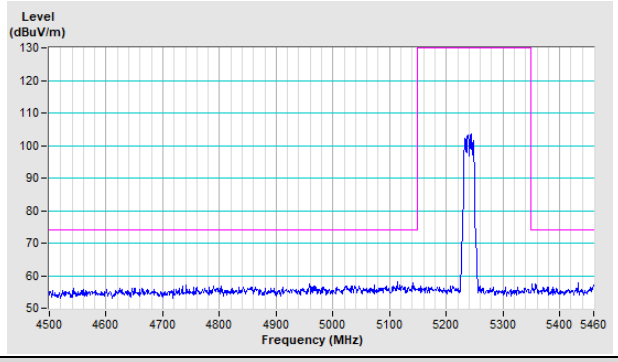
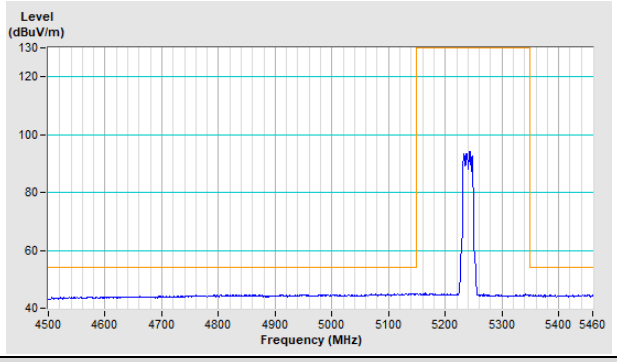
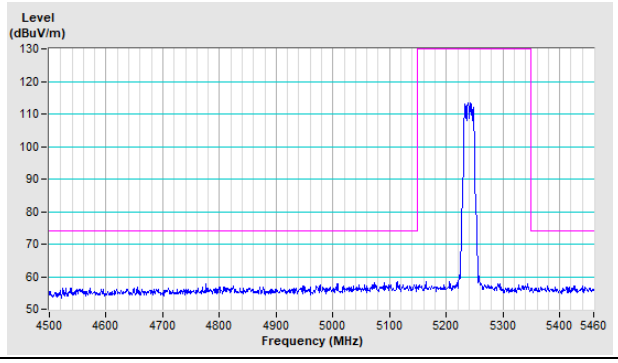
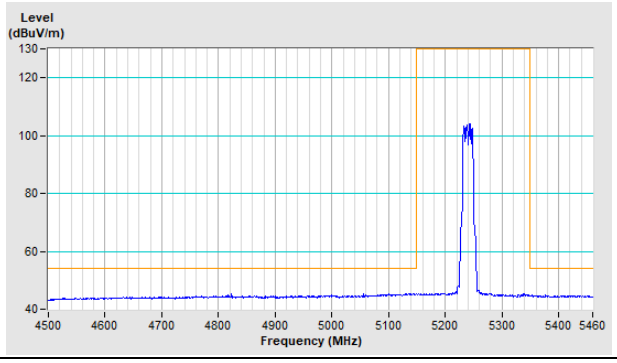
CH 151 5755 MHz	
Horizontal	Vertical
	
CH 159 5795 MHz	
Horizontal	Vertical
	

802.11ax (HE80)

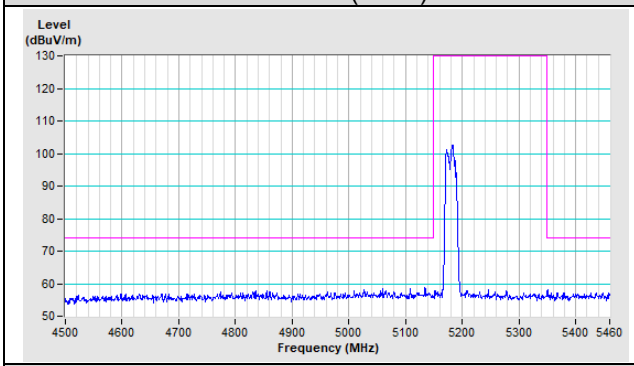
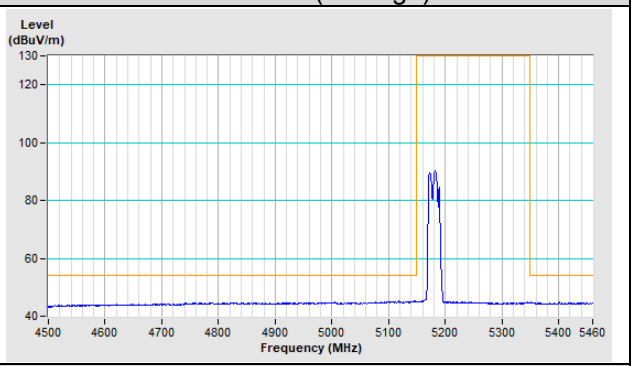
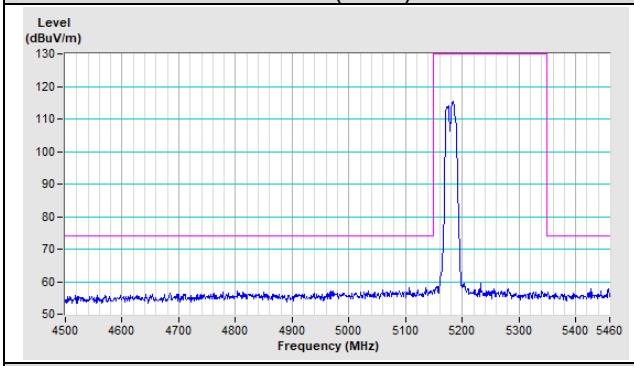
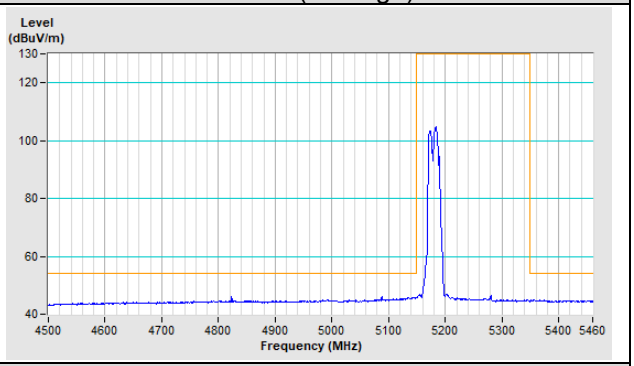
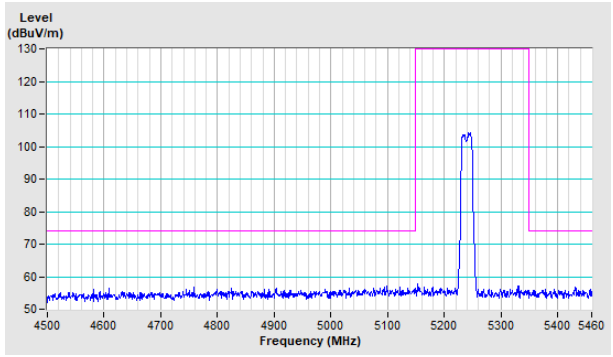
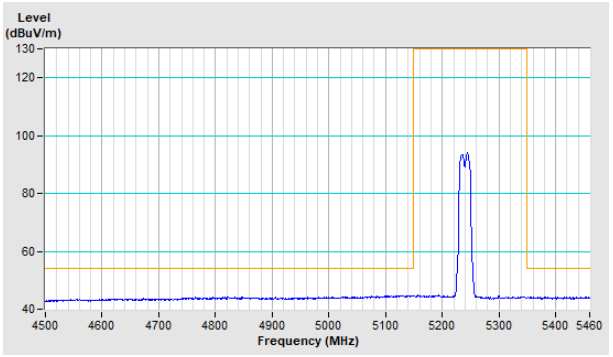
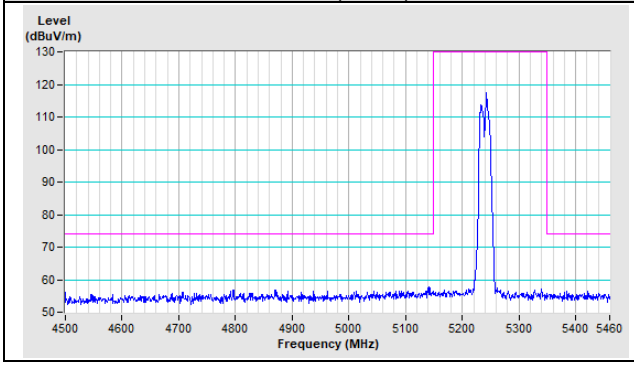
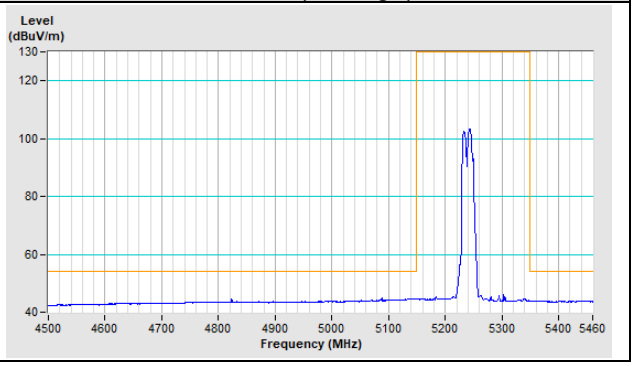
CH 155 5775 MHz	
Horizontal	Vertical
	

Annex B - Band Edge Measurement

802.11a

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

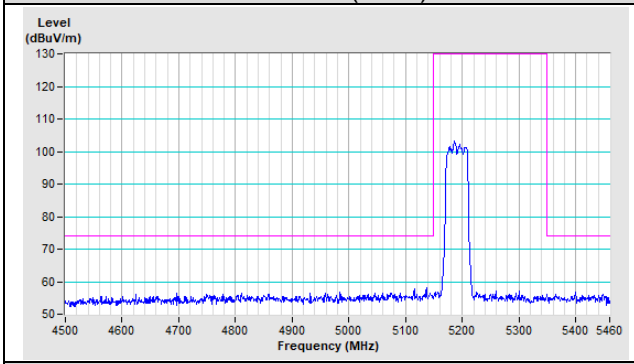
802.11ax (HE20)

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

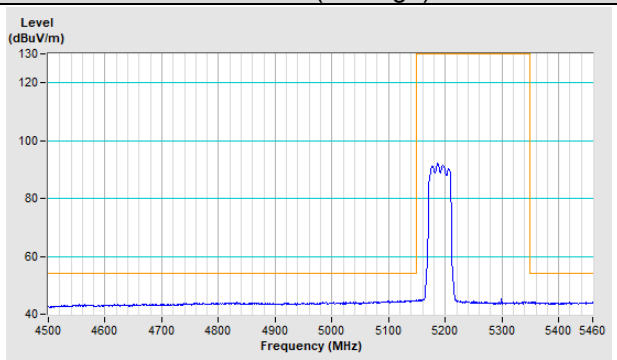
802.11ax (HE40)

Channel 38

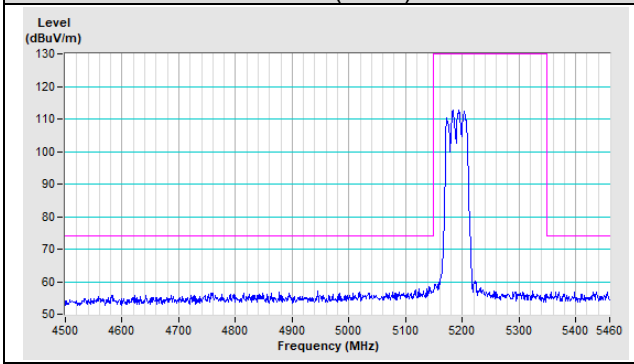
Horizontal (Peak)



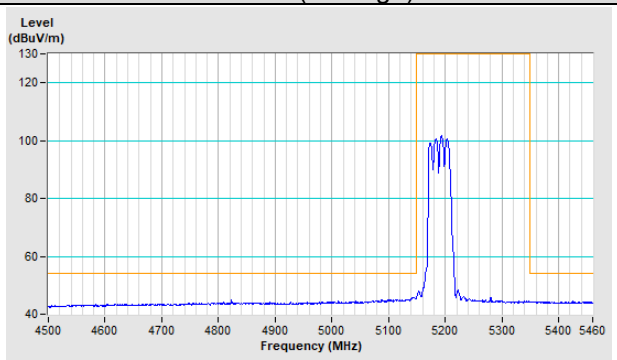
Horizontal (Average)



Vertical (Peak)

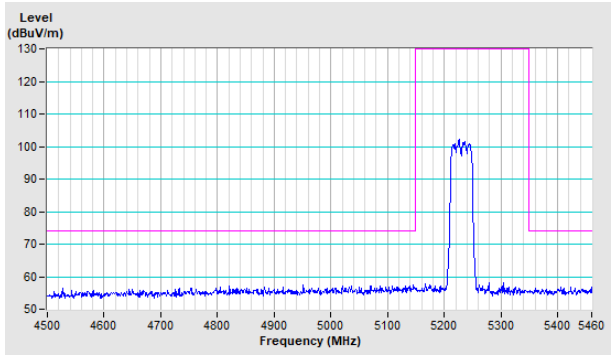


Vertical (Average)

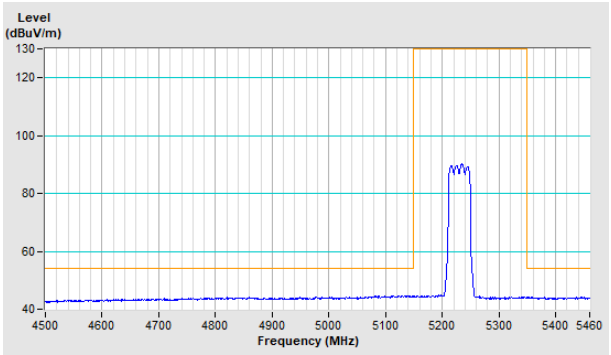


Channel 46

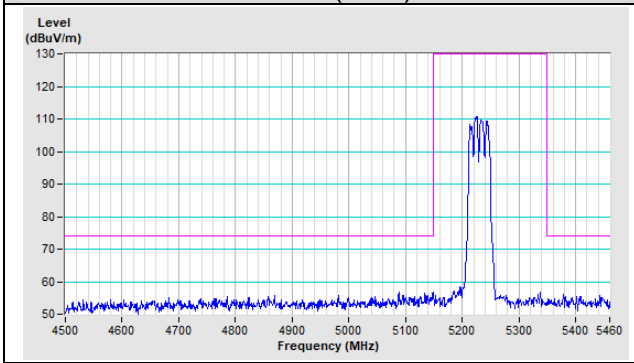
Horizontal (Peak)



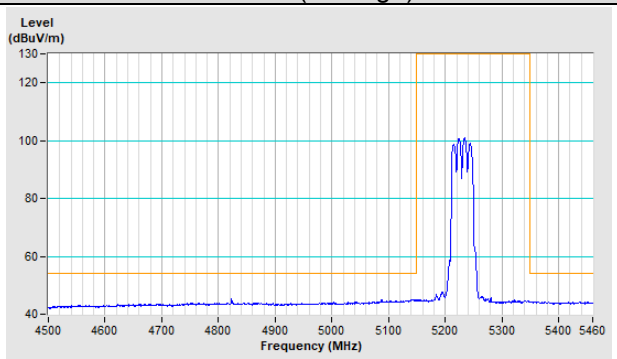
Horizontal (Average)



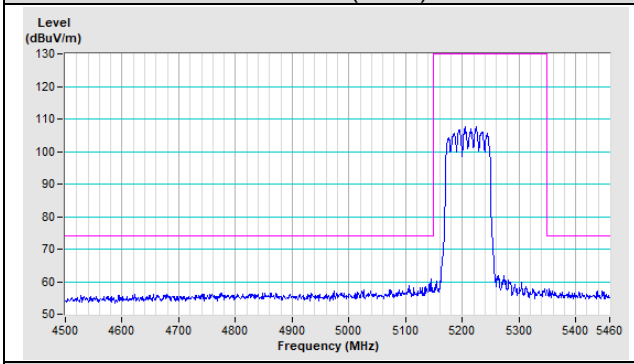
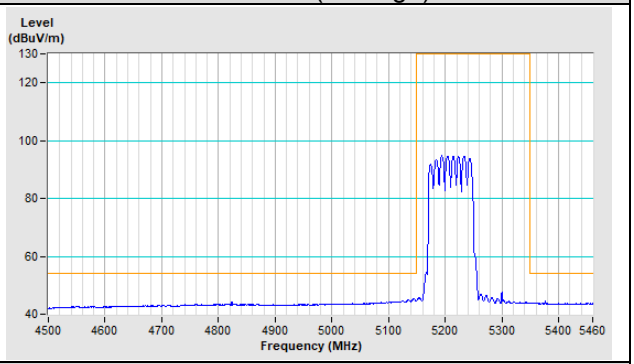
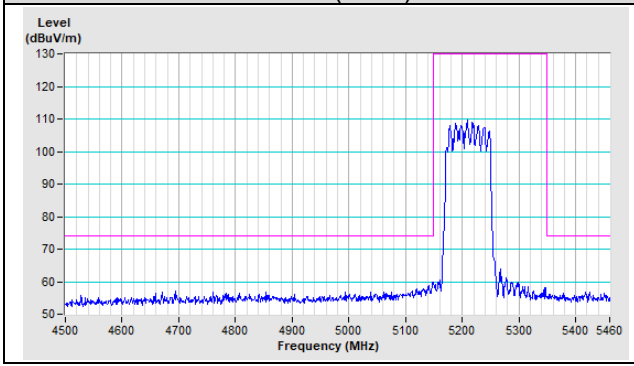
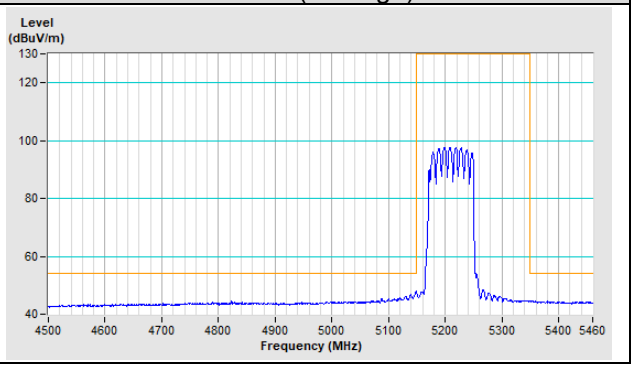
Vertical (Peak)



Vertical (Average)



802.11ax (HE80)

Channel 42	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Appendix – Information of the Testing Laboratories

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

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

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

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

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

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

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

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