

## FCC Test Report

**Report No.:** RFBCWK-WTW-P21050819-1

**FCC ID:** MSQ-RTAX8E00

**Test Model:** RT-AX1800S

**Received Date:** May 21, 2021

**Test Date:** Jul. 14 ~ Aug. 05, 2021

**Issued Date:** Aug. 30, 2021

**Applicant:** ASUSTeK COMPUTER INC.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

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33383, TAIWAN

**FCC Registration /  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
RFBCWK-WTW-P21050819-1	Original release	Aug. 30, 2021

## 1 Certificate of Conformity

**Product:** Wireless-AX1800 Dual Band WiFi 6 Router

**Brand:** ASUS

**Test Model:** RT-AX1800S

**Sample Status:** Engineering sample

**Applicant:** ASUSTeK COMPUTER INC.

**Test Date:** Jul. 14 ~ Aug. 05, 2021

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

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

**Prepared by :** Celine Chou , **Date:** Aug. 30, 2021  
Celine Chou / Senior Specialist

**Approved by :** Bruce Chen , **Date:** Aug. 30, 2021  
Bruce Chen / Senior 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 -4.96dB at 0.39000MHz.
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 -0.4dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	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 are Soldering or IPEX not a standard connector.

### Note:

1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB 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	3.04 dB
	30MHz ~ 200MHz	3.63 dB
	200MHz ~ 1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

Product	Wireless-AX1800 Dual Band WiFi 6 Router
Brand	ASUS
Test Model	RT-AX1800S
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps 802.11ax: up to 1201Mbps
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: 628.641mW 5745 ~ 5825MHz: 807.197mW Beamforming Mode: 5180 ~ 5240MHz: 619.806mW 5745 ~ 5825MHz: 789.837mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Adapter
Cable Supplied	1m non-shielded LAN 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/VHT80 on 802.11ac mode and HE20/HE40/HE80 on 802.11ax mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)

\* For 802.11n 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.

2. The EUT consumes power from the following Adapter & Battery.

Adapter 1	
Brand	Shenzhen Gongjin Electronics Co.,Ltd.
Model	S18B22-120A150-C4
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 1.5A
Power Line	1.43m cable without core attached on adapter

Adapter 2	
Brand	Shenzhen Gongjin Electronics Co.,Ltd.
Model	S18B22-120A150-CJ
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 1.5A
Power Line	1.47m cable without core attached on adapter

\* Adapter 2 was chosen for final test and presented in the test report.

3. The following antennas were provided to the EUT.

No.	Brand	Model	Type	Connector	Gain (dBi)	
					2.4G	5G
1	RF-link	RF21C05435A	Dipole	Soldering	1.81	-
2	RF-link	RF21C05434A	Dipole	Soldering	1.81	-
3	RF-link	U18T01S039N00139	Dipole	I-PEX	-	2.43
4	RF-link	U18T01S039N00140	Dipole	I-PEX	-	2.27

\* 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.

4. 2.4GHz & 5GHz technology can transmit at same time.
5. Spurious emission of the simultaneous operation 2.4GHz & 5GHz has been evaluated and no non-compliance was found.

### 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:

- The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
- 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)
-	802.11a	5180-5240	36 to 48	149	OFDM	6.0
-	802.11a	5745-5825	149 to 165		OFDM	6.0

#### **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)
-	802.11a	5180-5240	36 to 48	149	OFDM	6.0
-	802.11a	5745-5825	149 to 165		OFDM	6.0

**Bandwidth, Power Spectral Density and Frequency Stability Measurement:**

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	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

**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	6.5
	802.11n (HT40)		38 to 46	38, 46	OFDM	13.5
	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	MCS0
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	MCS0
	802.11ac (VHT80)		42	42	OFDM	MCS0
	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	6.5
	802.11n (HT40)		151 to 159	151, 159	OFDM	13.5
	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	MCS0
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	MCS0
	802.11ac (VHT80)		155	155	OFDM	MCS0
	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	Tested by
RE≥1G	25 deg. C, 70% RH	120Vac, 60Hz	Han Wu
RE<1G	25 deg. C, 70% RH	120Vac, 60Hz	Han Wu
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Han Wu
APCM	25 deg. C, 76% RH	120Vac, 60Hz	Startaly Wu, Jisyong Wang

**3.3 Duty Cycle of Test Signal**

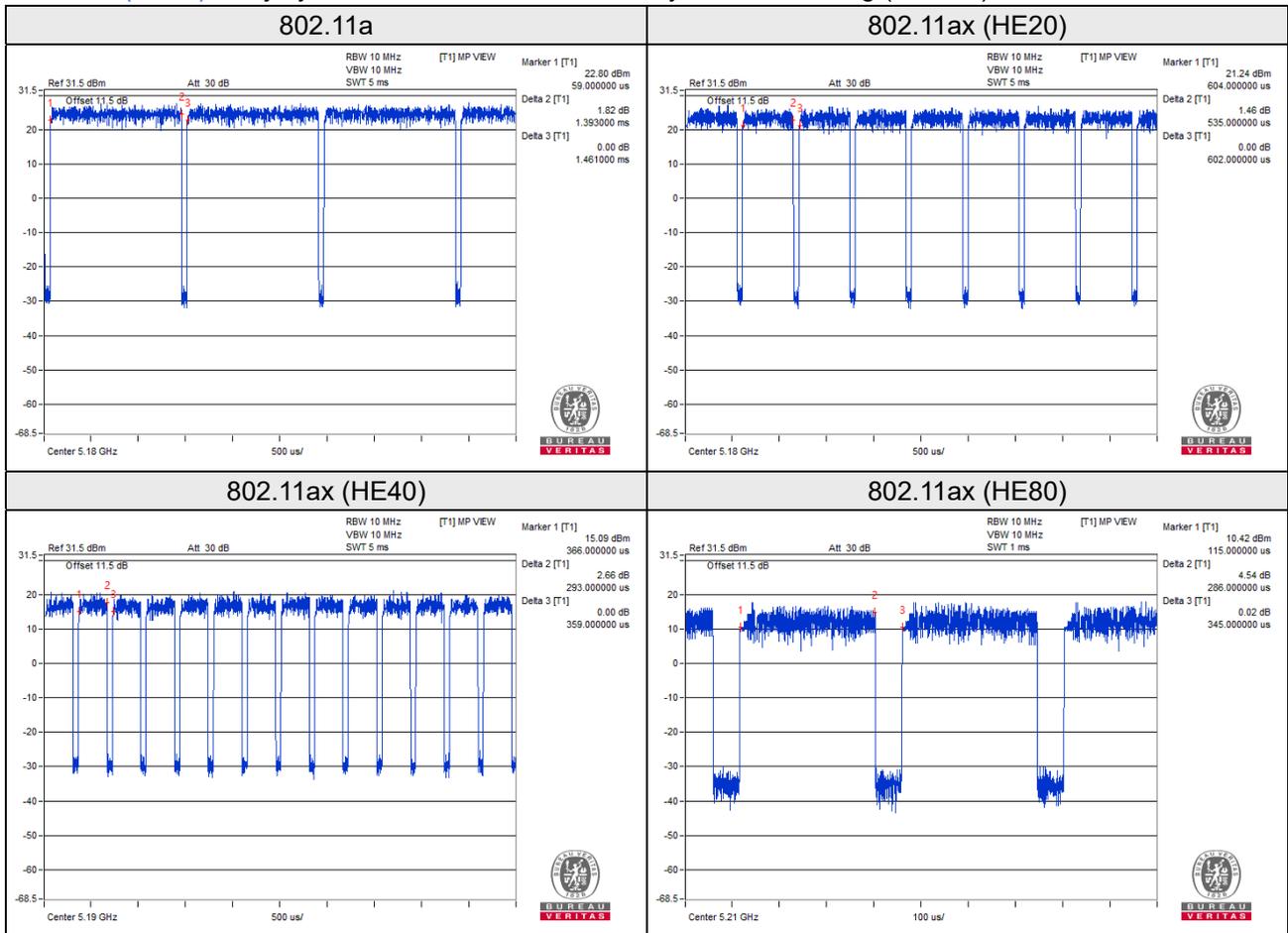
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 1.393/1.461 = 0.953, Duty factor = 10 \* log (1/0.953) = 0.21

802.11ax (HE20): Duty cycle = 0.535/0.602 = 0.889, Duty factor = 10 \* log (1/0.889) = 0.51

802.11ax (HE40): Duty cycle = 0.293/0.359 = 0.816, Duty factor = 10 \* log (1/0.816) = 0.88

802.11ax (HE80): Duty cycle = 0.286/0.345 = 0.829, Duty factor = 10 \* log (1/0.829) = 0.81



### 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.

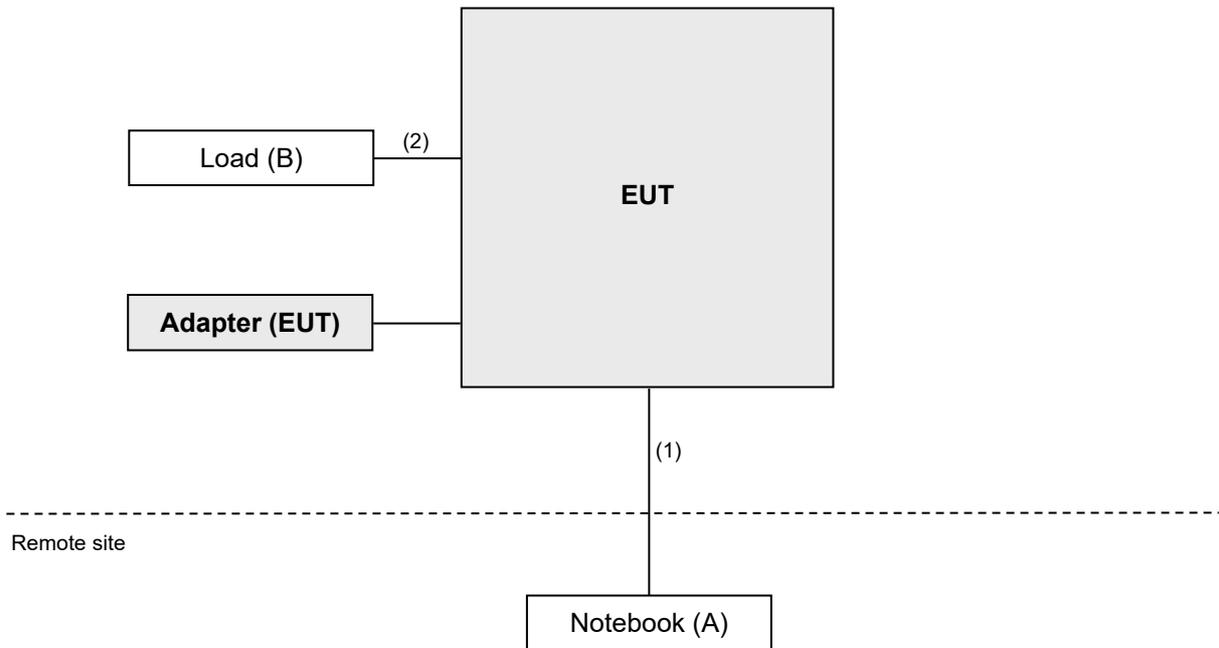
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-

Note:

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	7.0	N	0	RJ45, Cat5e
2.	LAN	4	1.5	N	0	RJ45, Cat5e

#### 3.4.1 Configuration of System under Test



### **3.5 General Description of Applied Standards and References**

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

**Test standard:**

**FCC Part 15, Subpart E (15.407)**

ANSI C63.10:2013

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

**References Test Guidance:**

**KDB 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

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

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

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

#### 4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Dec. 31, 2020	Dec. 30, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 03, 2020	Nov. 02, 2021
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna EMCI	EM-6879	269	Sep. 17, 2020	Sep. 16, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jun. 05, 2021	Jun. 04, 2022
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 05, 2021	Jun. 04, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH4-01	Aug. 16, 2020	Aug. 15, 2021
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Aug. 16, 2020	Aug. 15, 2021
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jun. 05, 2021	Jun. 04, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jun. 05, 2021	Jun. 04, 2022
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 04, 2020	Sep. 03, 2021
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 12, 2021	Jul. 11, 2022
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 19, 2021	Jan. 18, 2022

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The test was performed in HwaYa Chamber 4.

### 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:

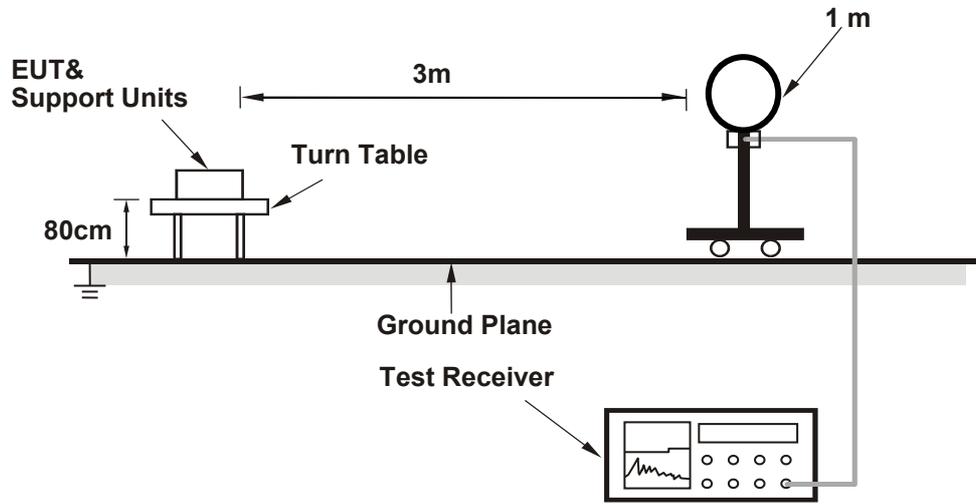
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

### 4.1.4 Deviation from Test Standard

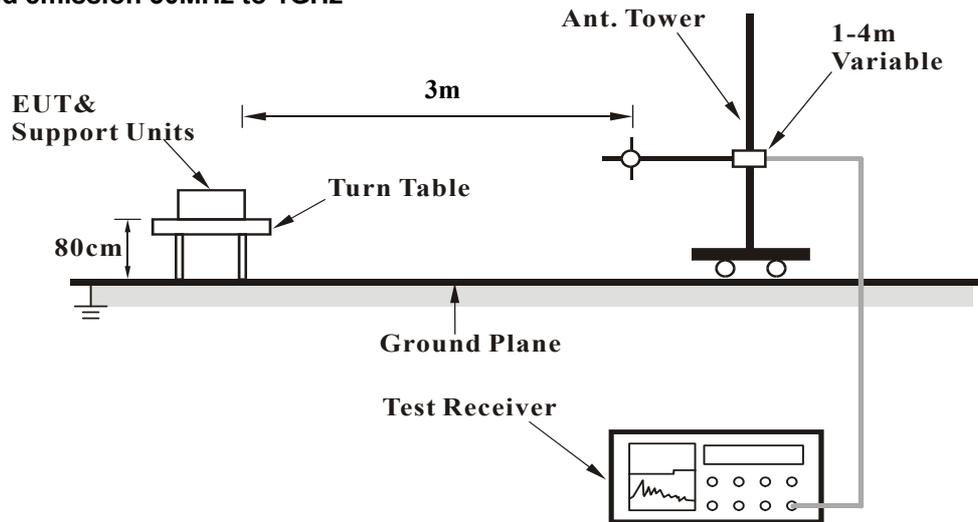
No deviation.

#### 4.1.5 Test Setup

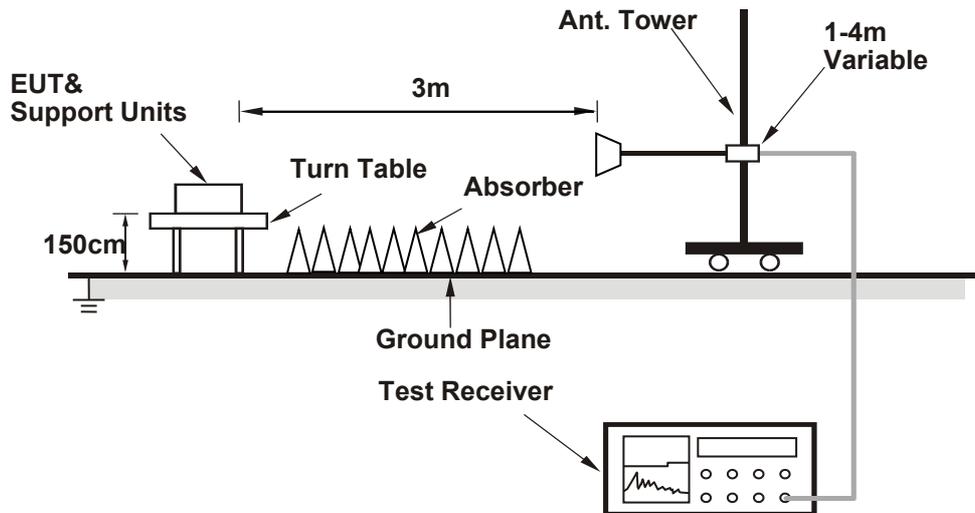
##### For Radiated emission below 30MHz



##### For Radiated emission 30MHz to 1GHz



### For Radiated emission above 1GHz



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

#### 4.1.6 EUT Operating Conditions

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

#### 4.1.7 Test Results

Above 1GHz data:

RF Mode	TX 802.11a	Channel	CH 36 : 5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	60.2 PK	74.0	-13.8	1.48 H	72	47.2	13.0
2	5150.00	49.2 AV	54.0	-4.8	1.48 H	72	36.2	13.0
3	*5180.00	111.5 PK			1.48 H	72	69.0	42.5
4	*5180.00	103.2 AV			1.48 H	72	60.7	42.5
5	#10360.00	60.5 PK	68.2	-7.7	2.31 H	142	38.0	22.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.9 PK	74.0	-8.1	1.57 V	340	52.9	13.0
2	5150.00	52.7 AV	54.0	-1.3	1.57 V	340	39.7	13.0
3	*5180.00	118.7 PK			1.57 V	340	76.2	42.5
4	*5180.00	109.6 AV			1.57 V	340	67.1	42.5
5	#10360.00	60.6 PK	68.2	-7.6	1.66 V	243	38.1	22.5

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.

RF Mode	TX 802.11a	Channel	CH 40 : 5200 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	114.4 PK			1.48 H	71	72.0	42.4
2	*5200.00	105.4 AV			1.48 H	71	63.0	42.4
3	#10400.00	60.7 PK	68.2	-7.5	2.35 H	142	37.9	22.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	122.1 PK			1.69 V	340	79.7	42.4
2	*5200.00	112.5 AV			1.69 V	340	70.1	42.4
3	#10400.00	61.0 PK	68.2	-7.2	1.75 V	232	38.2	22.8

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 48 : 5240 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	113.4 PK			1.39 H	69	71.0	42.4
2	*5240.00	104.4 AV			1.39 H	69	62.0	42.4
3	5350.00	59.0 PK	74.0	-15.0	1.39 H	69	45.9	13.1
4	5350.00	48.3 AV	54.0	-5.7	1.39 H	69	35.2	13.1
5	#10480.00	61.1 PK	68.2	-7.1	2.68 H	155	38.3	22.8

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	120.8 PK			1.44 V	340	78.4	42.4
2	*5240.00	112.2 AV			1.44 V	340	69.8	42.4
3	5350.00	58.5 PK	74.0	-15.5	1.44 V	340	45.4	13.1
4	5350.00	48.6 AV	54.0	-5.4	1.44 V	340	35.5	13.1
5	#10480.00	61.6 PK	68.2	-6.6	1.73 V	228	38.8	22.8

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 149 : 5745 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5604.40	62.6 PK	68.2	-5.6	1.74 H	263	49.0	13.6
2	*5745.00	116.3 PK			1.74 H	263	72.6	43.7
3	*5745.00	108.2 AV			1.74 H	263	64.5	43.7
4	#5938.00	64.2 PK	68.2	-4.0	1.74 H	263	49.8	14.4
5	11490.00	62.7 PK	74.0	-11.3	1.34 H	189	37.6	25.1
6	11490.00	51.6 AV	54.0	-2.4	1.34 H	189	26.5	25.1

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5627.60	63.2 PK	68.2	-5.0	1.40 V	348	49.5	13.7
2	*5745.00	124.0 PK			1.40 V	348	80.3	43.7
3	*5745.00	115.6 AV			1.40 V	348	71.9	43.7
4	#5995.20	63.8 PK	68.2	-4.4	1.40 V	348	49.3	14.5
5	11490.00	63.5 PK	74.0	-10.5	2.63 V	100	38.4	25.1
6	11490.00	51.8 AV	54.0	-2.2	2.63 V	100	26.7	25.1

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 157 : 5785 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5649.60	63.6 PK	68.2	-4.6	1.75 H	266	50.0	13.6
2	*5785.00	116.1 PK			1.75 H	266	72.1	44.0
3	*5785.00	108.0 AV			1.75 H	266	64.0	44.0
4	#5989.60	64.0 PK	68.2	-4.2	1.75 H	266	49.5	14.5
5	11570.00	62.5 PK	74.0	-11.5	1.42 H	215	37.5	25.0
6	11570.00	51.4 AV	54.0	-2.6	1.42 H	215	26.4	25.0

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5634.40	62.9 PK	68.2	-5.3	1.38 V	338	49.2	13.7
2	*5785.00	124.0 PK			1.38 V	338	80.0	44.0
3	*5785.00	115.0 AV			1.38 V	338	71.0	44.0
4	#5978.40	64.3 PK	68.2	-3.9	1.38 V	338	49.8	14.5
5	11570.00	63.6 PK	74.0	-10.4	2.43 V	115	38.6	25.0
6	11570.00	51.5 AV	54.0	-2.5	2.43 V	115	26.5	25.0

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 165 : 5825 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5621.60	63.5 PK	68.2	-4.7	1.64 H	266	49.8	13.7
2	*5825.00	115.5 PK			1.64 H	266	71.5	44.0
3	*5825.00	107.3 AV			1.64 H	266	63.3	44.0
4	#5963.20	63.2 PK	68.2	-5.0	1.64 H	266	48.7	14.5
5	11650.00	62.3 PK	74.0	-11.7	1.50 H	196	37.6	24.7
6	11650.00	51.3 AV	54.0	-2.7	1.50 H	196	26.6	24.7

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5613.60	64.9 PK	68.2	-3.3	1.42 V	354	51.3	13.6
2	*5825.00	123.7 PK			1.42 V	354	79.7	44.0
3	*5825.00	114.8 AV			1.42 V	354	70.8	44.0
4	#5957.60	65.0 PK	68.2	-3.2	1.42 V	354	50.5	14.5
5	11650.00	63.0 PK	74.0	-11.0	2.54 V	87	38.3	24.7
6	11650.00	51.5 AV	54.0	-2.5	2.54 V	87	26.8	24.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 36 : 5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	60.9 PK	74.0	-13.1	1.43 H	70	47.9	13.0
2	5150.00	48.4 AV	54.0	-5.6	1.43 H	70	35.4	13.0
3	*5180.00	111.4 PK			1.43 H	70	68.9	42.5
4	*5180.00	101.3 AV			1.43 H	70	58.8	42.5
5	#10360.00	60.7 PK	68.2	-7.5	1.42 H	353	38.2	22.5

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.6 PK	74.0	-7.4	1.47 V	339	53.6	13.0
2	5150.00	52.9 AV	54.0	-1.1	1.47 V	339	39.9	13.0
3	*5180.00	116.7 PK			1.47 V	339	74.2	42.5
4	*5180.00	107.3 AV			1.47 V	339	64.8	42.5
5	#10360.00	61.1 PK	68.2	-7.1	1.73 V	235	38.6	22.5

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 40 : 5200 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	114.2 PK			1.46 H	71	71.8	42.4
2	*5200.00	104.2 AV			1.46 H	71	61.8	42.4
3	#10400.00	61.2 PK	68.2	-7.0	1.62 H	4	38.4	22.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	121.0 PK			1.49 V	354	78.6	42.4
2	*5200.00	110.9 AV			1.49 V	354	68.5	42.4
3	#10400.00	61.5 PK	68.2	-6.7	1.69 V	232	38.7	22.8

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 48 : 5240 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	115.4 PK			1.38 H	70	73.0	42.4
2	*5240.00	104.7 AV			1.38 H	70	62.3	42.4
3	5350.00	59.6 PK	74.0	-14.4	1.38 H	70	46.5	13.1
4	5350.00	48.1 AV	54.0	-5.9	1.38 H	70	35.0	13.1
5	#10480.00	60.5 PK	68.2	-7.7	1.50 H	358	37.7	22.8

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	121.2 PK			1.53 V	339	78.8	42.4
2	*5240.00	111.6 AV			1.53 V	339	69.2	42.4
3	5350.00	58.3 PK	74.0	-15.7	1.53 V	339	45.2	13.1
4	5350.00	48.5 AV	54.0	-5.5	1.53 V	339	35.4	13.1
5	#10480.00	61.4 PK	68.2	-6.8	1.71 V	225	38.6	22.8

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 149 : 5745 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5634.80	61.8 PK	68.2	-6.4	1.65 H	262	48.1	13.7
2	*5745.00	116.2 PK			1.65 H	262	72.5	43.7
3	*5745.00	107.1 AV			1.65 H	262	63.4	43.7
4	#5940.00	62.6 PK	68.2	-5.6	1.65 H	262	48.1	14.5
5	11490.00	62.9 PK	74.0	-11.1	1.53 H	204	37.8	25.1
6	11490.00	51.8 AV	54.0	-2.2	1.53 H	204	26.7	25.1

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5629.20	63.0 PK	68.2	-5.2	1.39 V	351	49.3	13.7
2	*5745.00	123.8 PK			1.39 V	351	80.1	43.7
3	*5745.00	113.5 AV			1.39 V	351	69.8	43.7
4	#5982.40	64.0 PK	68.2	-4.2	1.39 V	351	49.5	14.5
5	11490.00	63.3 PK	74.0	-10.7	2.41 V	106	38.2	25.1
6	11490.00	51.7 AV	54.0	-2.3	2.41 V	106	26.6	25.1

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 157 : 5785 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5644.00	62.9 PK	68.2	-5.3	1.71 H	264	49.2	13.7
2	*5785.00	117.0 PK			1.71 H	264	73.0	44.0
3	*5785.00	106.7 AV			1.71 H	264	62.7	44.0
4	#5970.80	63.5 PK	68.2	-4.7	1.71 H	264	49.0	14.5
5	11570.00	62.8 PK	74.0	-11.2	1.44 H	193	37.8	25.0
6	11570.00	51.8 AV	54.0	-2.2	1.44 H	193	26.8	25.0

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5640.80	62.2 PK	68.2	-6.0	1.33 V	354	48.5	13.7
2	*5785.00	123.4 PK			1.33 V	354	79.4	44.0
3	*5785.00	114.6 AV			1.33 V	354	70.6	44.0
4	#5971.60	62.9 PK	68.2	-5.3	1.33 V	354	48.4	14.5
5	11570.00	63.5 PK	74.0	-10.5	2.45 V	112	38.5	25.0
6	11570.00	51.8 AV	54.0	-2.2	2.45 V	112	26.8	25.0

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 165 : 5825 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5635.20	63.1 PK	68.2	-5.1	1.71 H	265	49.4	13.7
2	*5825.00	116.2 PK			1.71 H	265	72.2	44.0
3	*5825.00	106.5 AV			1.71 H	265	62.5	44.0
4	#5941.20	63.5 PK	68.2	-4.7	1.71 H	265	49.0	14.5
5	11650.00	63.1 PK	74.0	-10.9	1.56 H	202	38.4	24.7
6	11650.00	51.2 AV	54.0	-2.8	1.56 H	202	26.5	24.7

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5639.60	63.4 PK	68.2	-4.8	1.36 V	348	49.7	13.7
2	*5825.00	123.0 PK			1.36 V	348	79.0	44.0
3	*5825.00	113.6 AV			1.36 V	348	69.6	44.0
4	#5948.80	64.7 PK	68.2	-3.5	1.36 V	348	50.2	14.5
5	11650.00	62.5 PK	74.0	-11.5	2.37 V	103	37.8	24.7
6	11650.00	51.1 AV	54.0	-2.9	2.37 V	103	26.4	24.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 38 : 5190 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	59.3 PK	74.0	-14.7	1.45 H	70	46.3	13.0
2	5150.00	48.5 AV	54.0	-5.5	1.45 H	70	35.5	13.0
3	*5190.00	104.5 PK			1.45 H	70	62.0	42.5
4	*5190.00	94.8 AV			1.45 H	70	52.3	42.5
5	#10380.00	60.2 PK	68.2	-8.0	1.61 H	7	37.5	22.7

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	72.7 PK	74.0	-1.3	1.43 V	338	59.7	13.0
2	5150.00	51.3 AV	54.0	-2.7	1.43 V	338	38.3	13.0
3	*5190.00	113.4 PK			1.43 V	338	70.9	42.5
4	*5190.00	102.5 AV			1.43 V	338	60.0	42.5
5	#10380.00	60.3 PK	68.2	-7.9	1.60 V	238	37.6	22.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 46 : 5230 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	63.5 PK	74.0	-10.5	1.44 H	70	50.5	13.0
2	5150.00	49.7 AV	54.0	-4.3	1.44 H	70	36.7	13.0
3	*5230.00	110.4 PK			1.44 H	70	68.0	42.4
4	*5230.00	100.8 AV			1.44 H	70	58.4	42.4
5	5350.00	59.7 PK	74.0	-14.3	1.44 H	70	46.6	13.1
6	5350.00	48.3 AV	54.0	-5.7	1.44 H	70	35.2	13.1
7	#10460.00	61.4 PK	68.2	-6.8	1.47 H	358	38.5	22.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	72.7 PK	74.0	-1.3	1.41 V	337	59.7	13.0
2	5150.00	52.8 AV	54.0	-1.2	1.41 V	337	39.8	13.0
3	*5230.00	118.6 PK			1.41 V	337	76.2	42.4
4	*5230.00	107.5 AV			1.41 V	337	65.1	42.4
5	5350.00	60.6 PK	74.0	-13.4	1.41 V	337	47.5	13.1
6	5350.00	48.4 AV	54.0	-5.6	1.41 V	337	35.3	13.1
7	#10460.00	61.4 PK	68.2	-6.8	1.70 V	245	38.5	22.9

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 151 : 5755 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.00	62.5 PK	68.2	-5.7	1.58 H	267	48.9	13.6
2	*5755.00	113.5 PK			1.58 H	267	69.7	43.8
3	*5755.00	103.8 AV			1.58 H	267	60.0	43.8
4	#5946.40	63.1 PK	68.2	-5.1	1.58 H	267	48.6	14.5
5	11510.00	62.6 PK	74.0	-11.4	1.43 H	199	37.6	25.0
6	11510.00	51.4 AV	54.0	-2.6	1.43 H	199	26.4	25.0

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5649.20	66.0 PK	68.2	-2.2	1.53 V	351	52.4	13.6
2	*5755.00	120.2 PK			1.53 V	351	76.4	43.8
3	*5755.00	111.7 AV			1.53 V	351	67.9	43.8
4	#5982.00	63.3 PK	68.2	-4.9	1.53 V	351	48.8	14.5
5	11510.00	62.9 PK	74.0	-11.1	2.28 V	78	37.9	25.0
6	11510.00	51.7 AV	54.0	-2.3	2.28 V	78	26.7	25.0

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 159 : 5795 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5640.80	63.0 PK	68.2	-5.2	1.53 H	261	49.3	13.7
2	*5795.00	115.1 PK			1.53 H	261	71.1	44.0
3	*5795.00	104.0 AV			1.53 H	261	60.0	44.0
4	#5991.60	63.9 PK	68.2	-4.3	1.53 H	261	49.4	14.5
5	11590.00	62.6 PK	74.0	-11.4	1.52 H	187	37.7	24.9
6	11590.00	51.5 AV	54.0	-2.5	1.52 H	187	26.6	24.9

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5634.40	63.3 PK	68.2	-4.9	1.29 V	349	49.6	13.7
2	*5795.00	121.1 PK			1.29 V	349	77.1	44.0
3	*5795.00	111.2 AV			1.29 V	349	67.2	44.0
4	#5970.40	63.0 PK	68.2	-5.2	1.29 V	349	48.5	14.5
5	11590.00	63.0 PK	74.0	-11.0	2.43 V	127	38.1	24.9
6	11590.00	51.7 AV	54.0	-2.3	2.43 V	127	26.8	24.9

Remarks:

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

RF Mode	TX 802.11ax (HE80)	Channel	CH 42 : 5210 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	59.6 PK	74.0	-14.4	1.47 H	72	46.6	13.0
2	5150.00	49.9 AV	54.0	-4.1	1.47 H	72	36.9	13.0
3	*5210.00	100.8 PK			1.47 H	72	58.4	42.4
4	*5210.00	91.9 AV			1.47 H	72	49.5	42.4
5	#10420.00	60.5 PK	68.2	-7.7	1.63 H	353	37.6	22.9

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.6 PK	74.0	-8.4	1.43 V	338	52.6	13.0
2	<b>5150.00</b>	<b>53.6 AV</b>	<b>54.0</b>	<b>-0.4</b>	<b>1.43 V</b>	<b>338</b>	<b>40.6</b>	<b>13.0</b>
3	*5210.00	109.0 PK			1.43 V	338	66.6	42.4
4	*5210.00	98.5 AV			1.43 V	338	56.1	42.4
5	#10420.00	61.1 PK	68.2	-7.1	1.95 V	231	38.2	22.9

Remarks:

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

RF Mode	TX 802.11ax (HE80)	Channel	CH 155 : 5775 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5617.60	63.5 PK	68.2	-4.7	1.72 H	265	49.9	13.6
2	*5775.00	109.6 PK			1.72 H	265	65.8	43.8
3	*5775.00	98.5 AV			1.72 H	265	54.7	43.8
4	#5988.40	65.2 PK	68.2	-3.0	1.72 H	265	50.7	14.5
5	11550.00	62.9 PK	74.0	-11.1	1.46 H	203	37.9	25.0
6	11550.00	51.8 AV	54.0	-2.2	1.46 H	203	26.8	25.0

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5650.00	66.6 PK	68.2	-1.6	1.27 V	332	53.0	13.6
2	*5775.00	116.6 PK			1.27 V	332	72.8	43.8
3	*5775.00	106.7 AV			1.27 V	332	62.9	43.8
4	#5940.80	63.9 PK	68.2	-4.3	1.27 V	332	49.4	14.5
5	11550.00	62.3 PK	74.0	-11.7	2.43 V	114	37.3	25.0
6	11550.00	51.2 AV	54.0	-2.8	2.43 V	114	26.2	25.0

Remarks:

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

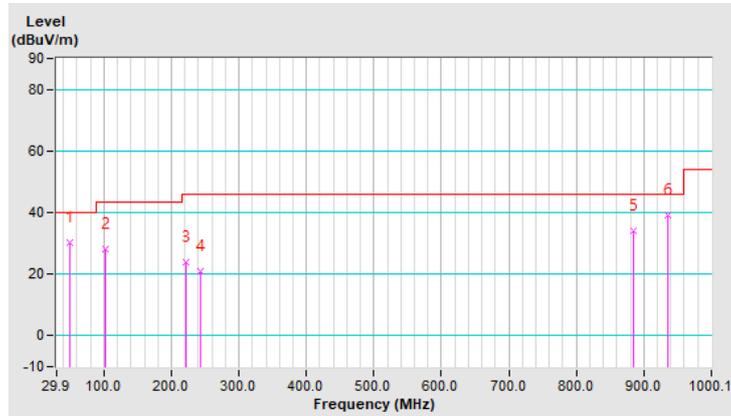
Below 1GHz Worst-Case Data:

RF Mode	TX 802.11a	Channel	CH 149 : 5745 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	49.30	30.3 QP	40.0	-9.7	2.00 H	54	38.9	-8.6
2	101.69	28.0 QP	43.5	-15.5	1.50 H	346	41.1	-13.1
3	221.03	23.8 QP	46.0	-22.2	1.00 H	13	35.2	-11.4
4	243.34	21.0 QP	46.0	-25.0	1.50 H	28	30.7	-9.7
5	885.62	33.9 QP	46.0	-12.1	2.00 H	169	28.6	5.3
6	935.10	39.0 QP	46.0	-7.0	1.00 H	289	32.2	6.8

Remarks:

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

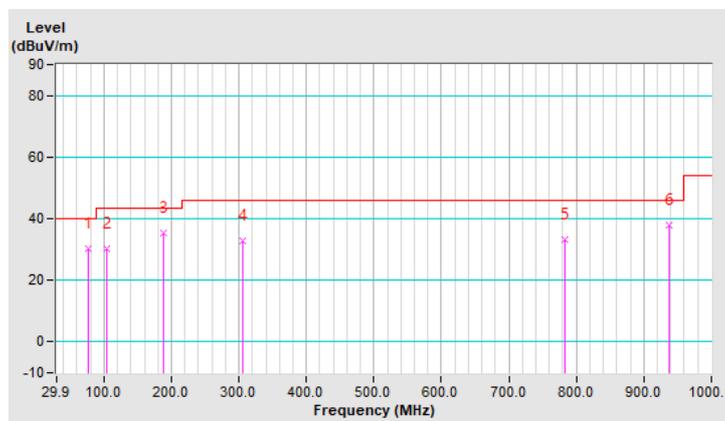


RF Mode	TX 802.11a	Channel	CH 149 : 5745 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	77.44	30.2 QP	40.0	-9.8	1.50 V	358	42.7	-12.5
2	104.61	30.1 QP	43.5	-13.4	1.00 V	322	42.7	-12.6
3	188.04	35.3 QP	43.5	-8.2	1.50 V	7	46.3	-11.0
4	306.41	32.8 QP	46.0	-13.2	1.00 V	230	40.0	-7.2
5	783.75	33.4 QP	46.0	-12.6	2.00 V	178	29.6	3.8
6	938.01	37.7 QP	46.0	-8.3	1.50 V	283	31.0	6.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. 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. 04, 2020	Dec. 03, 2021
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 16, 2021	Jan. 15, 2022
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 25, 2021	Feb. 24, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 28, 2020	Aug. 27, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

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

2. The test was performed in HwaYa Shielded Room 1 (Conduction 1).

3. The VCCI Site Registration No. is C-12040.

#### 4.2.3 Test Procedures

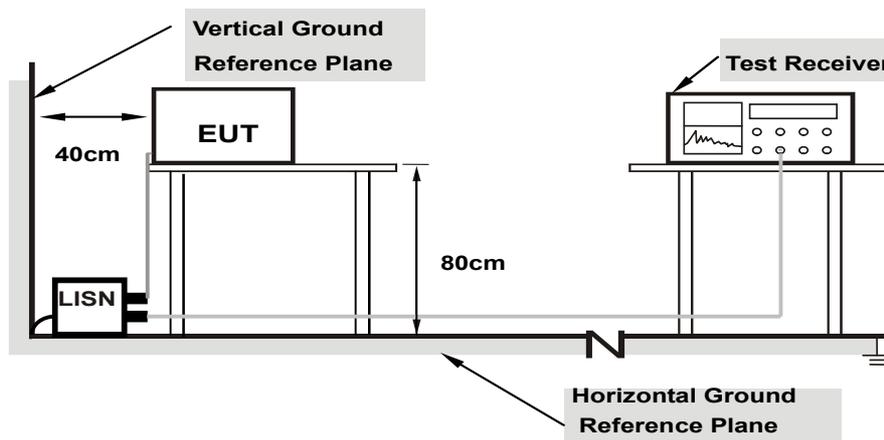
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

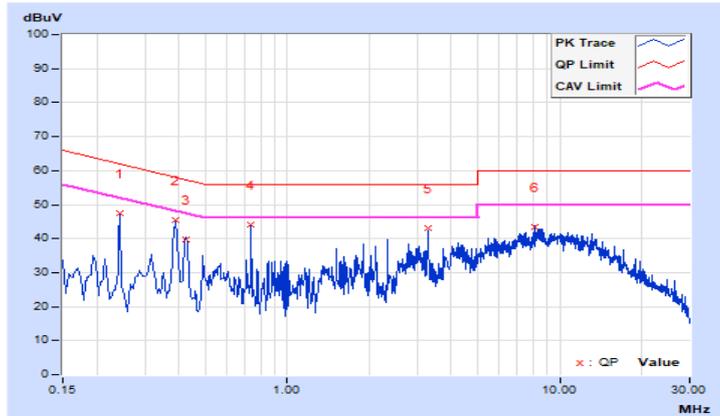
802.11a

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.24200	9.78	37.62	11.66	47.40	21.44	62.03
<b>2</b>	<b>0.39000</b>	<b>9.83</b>	<b>35.47</b>	<b>33.27</b>	<b>45.30</b>	<b>43.10</b>	<b>58.06</b>	<b>48.06</b>	<b>-12.76</b>	<b>-4.96</b>
3	0.42577	9.83	30.00	28.40	39.83	38.23	57.33	47.33	-17.50	-9.10
4	0.73800	9.88	34.24	14.74	44.12	24.62	56.00	46.00	-11.88	-21.38
5	3.27800	9.97	33.24	15.76	43.21	25.73	56.00	46.00	-12.79	-20.27
6	8.15400	10.04	33.42	21.28	43.46	31.32	60.00	50.00	-16.54	-18.68

Remarks:

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

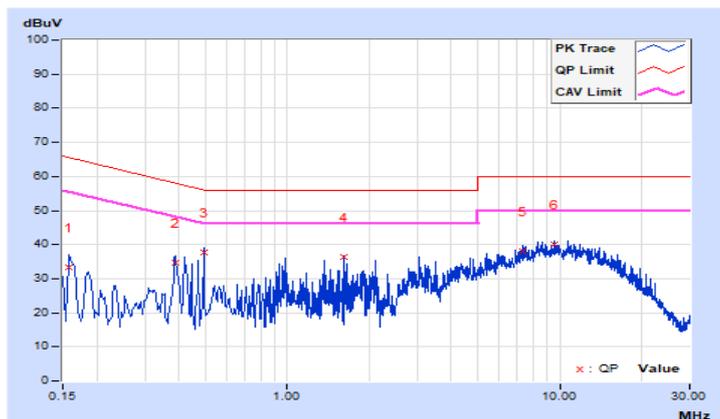


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15800	9.81	23.53	14.50	33.34	24.31	65.57
2	0.38725	9.90	24.85	22.80	34.75	32.70	58.12	48.12	-23.37	-15.42
3	0.49400	9.91	27.83	7.54	37.74	17.45	56.10	46.10	-18.36	-28.65
4	1.62200	9.98	26.51	10.85	36.49	20.83	56.00	46.00	-19.51	-25.17
5	7.29800	10.09	28.07	18.55	38.16	28.64	60.00	50.00	-21.84	-21.36
6	9.57000	10.13	29.81	20.14	39.94	30.27	60.00	50.00	-20.06	-19.73

Remarks:

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



### 4.3 Transmit Power Measurement

#### 4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 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  $\geq 40$  MHz for any  $N_{ANT}$ ;

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

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

#### 4.3.2 Test Setup



#### 4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

#### 4.3.4 Test Procedure

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

#### 4.3.5 Deviation from Test Standard

No deviation.

#### 4.3.6 EUT Operating Conditions

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

#### 4.3.7 Test Result

CDD Mode

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	22.56	21.72	328.895	25.17	30.00	Pass
40	5200	25.15	24.79	<b>628.641</b>	27.98	30.00	Pass
48	5240	24.81	24.77	602.608	27.80	30.00	Pass
149	5745	26.40	25.69	<b>807.197</b>	29.07	30.00	Pass
157	5785	25.94	25.62	757.399	28.79	30.00	Pass
165	5825	25.81	25.97	776.432	28.90	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				
36	5180	20.65	20.26	222.314	23.47	30.00	Pass
40	5200	24.64	24.35	563.342	27.51	30.00	Pass
48	5240	24.78	24.16	561.223	27.49	30.00	Pass
149	5745	25.61	25.42	712.252	28.53	30.00	Pass
157	5785	25.54	25.41	705.633	28.49	30.00	Pass
165	5825	25.33	25.36	684.751	28.36	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				
38	5190	18.27	17.42	122.351	20.88	30.00	Pass
46	5230	23.64	23.34	446.981	26.50	30.00	Pass
151	5755	25.78	25.35	721.210	28.58	30.00	Pass
159	5795	25.51	25.18	685.241	28.36	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				
36	5180	20.83	20.44	231.722	23.65	30.00	Pass
40	5200	24.81	24.55	587.793	27.69	30.00	Pass
48	5240	24.96	24.33	584.348	27.67	30.00	Pass
149	5745	25.78	25.61	742.358	28.71	30.00	Pass
157	5785	25.73	25.60	737.189	28.68	30.00	Pass
165	5825	25.50	25.53	712.086	28.53	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				
38	5190	18.46	17.64	128.222	21.08	30.00	Pass
46	5230	23.85	23.56	469.647	26.72	30.00	Pass
151	5755	25.98	25.55	755.200	28.78	30.00	Pass
159	5795	25.72	25.40	719.987	28.57	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				
42	5210	16.72	18.05	110.816	20.45	30.00	Pass
155	5775	22.85	22.62	375.563	25.75	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				
36	5180	21.07	20.67	244.619	23.88	30.00	Pass
40	5200	25.05	24.77	619.806	27.92	30.00	Pass
48	5240	25.19	24.56	616.129	27.90	30.00	Pass
149	5745	26.02	25.83	782.769	28.94	30.00	Pass
157	5785	25.95	25.83	776.375	28.90	30.00	Pass
165	5825	25.73	25.77	751.683	28.76	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				
38	5190	18.66	17.82	133.985	21.27	30.00	Pass
46	5230	24.04	23.75	490.650	26.91	30.00	Pass
151	5755	26.17	25.75	789.837	28.98	30.00	Pass
159	5795	25.90	25.59	751.288	28.76	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				
42	5210	16.84	18.06	112.279	20.50	30.00	Pass
155	5775	22.98	22.68	383.963	25.84	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				
36	5180	20.65	20.26	222.314	23.47	30.00	Pass
40	5200	24.64	24.35	563.342	27.51	30.00	Pass
48	5240	24.78	24.16	561.223	27.49	30.00	Pass
149	5745	25.61	25.42	712.252	28.53	30.00	Pass
157	5785	25.54	25.41	705.633	28.49	30.00	Pass
165	5825	25.33	25.36	684.751	28.36	30.00	Pass

**Note:**

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.

#### 802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.27	17.42	122.351	20.88	30.00	Pass
46	5230	23.64	23.34	446.981	26.50	30.00	Pass
151	5755	25.78	25.35	721.210	28.58	30.00	Pass
159	5795	25.51	25.18	685.241	28.36	30.00	Pass

**Note:**

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.83	20.44	231.722	23.65	30.00	Pass
40	5200	24.81	24.55	587.793	27.69	30.00	Pass
48	5240	24.96	24.33	584.348	27.67	30.00	Pass
149	5745	25.78	25.61	742.358	28.71	30.00	Pass
157	5785	25.73	25.60	737.189	28.68	30.00	Pass
165	5825	25.50	25.53	712.086	28.53	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.46	17.64	128.222	21.08	30.00	Pass
46	5230	23.85	23.56	469.647	26.72	30.00	Pass
151	5755	25.98	25.55	755.200	28.78	30.00	Pass
159	5795	25.72	25.40	719.987	28.57	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.72	18.05	110.816	20.45	30.00	Pass
155	5775	22.85	22.62	375.563	25.75	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	21.07	20.67	244.619	23.88	30.00	Pass
40	5200	25.05	24.77	<b>619.806</b>	27.92	30.00	Pass
48	5240	25.19	24.56	616.129	27.90	30.00	Pass
149	5745	26.02	25.83	782.769	28.94	30.00	Pass
157	5785	25.95	25.83	776.375	28.90	30.00	Pass
165	5825	25.73	25.77	751.683	28.76	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.66	17.82	133.985	21.27	30.00	Pass
46	5230	24.04	23.75	490.650	26.91	30.00	Pass
151	5755	26.17	25.75	<b>789.837</b>	28.98	30.00	Pass
159	5795	25.90	25.59	751.288	28.76	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.

802.11ax (HE80)

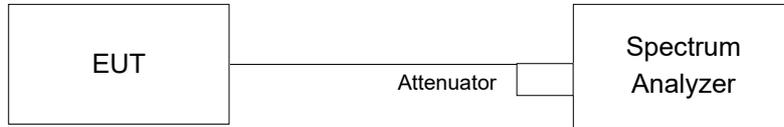
Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.84	18.06	112.279	20.50	30.00	Pass
155	5775	22.98	22.68	383.963	25.84	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.
2. 5745-5825MHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 5.36dBi < 6dBi, so the power limit not need to reduce.

## 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	16.68	16.68
40	5200	16.68	16.68
48	5240	16.56	16.56
149	5745	24.26	24.80
157	5785	24.00	23.80
165	5825	24.50	24.60

##### 802.11ax (HE20)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	19.08	19.08
40	5200	19.08	19.08
48	5240	18.84	18.84
149	5745	19.39	19.40
157	5785	19.20	19.20
165	5825	19.20	19.20

##### 802.11ax (HE40)

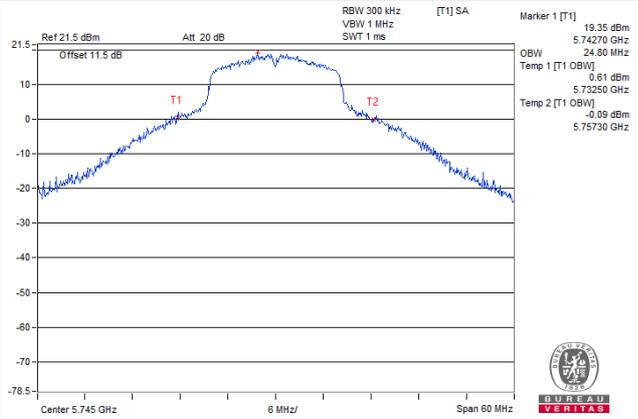
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.60	37.40
46	5230	37.80	37.80
151	5755	37.83	37.83
159	5795	37.83	37.83

##### 802.11ax (HE80)

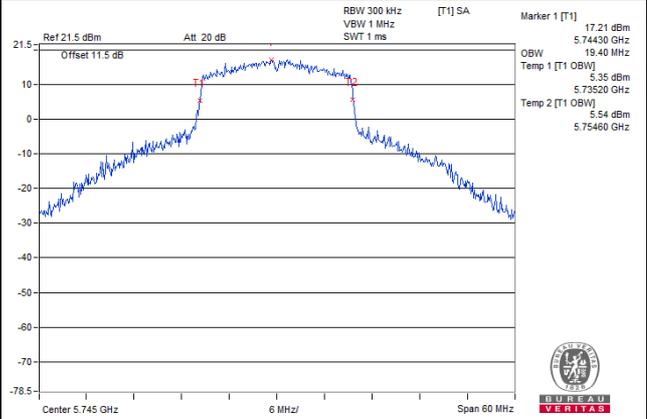
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	77.04	76.80
155	5775	77.30	77.00

### Spectrum Plot of Worst Value

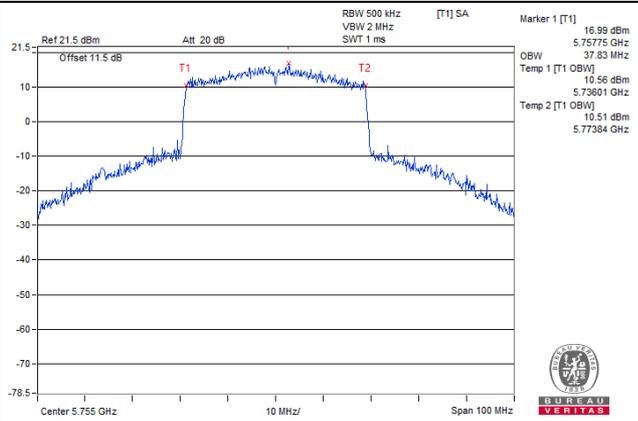
#### 802.11a



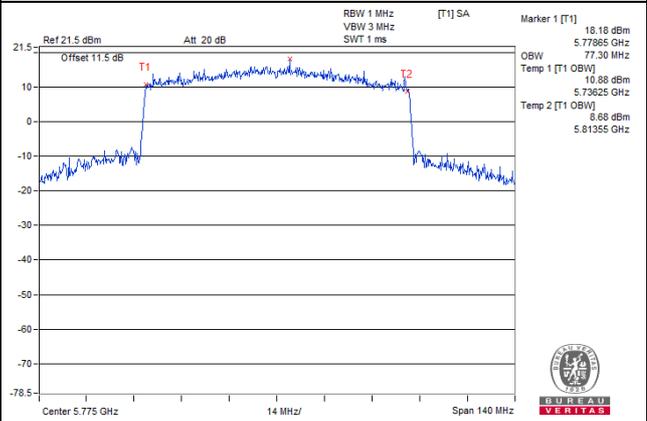
#### 802.11ax (HE20)



#### 802.11ax (HE40)

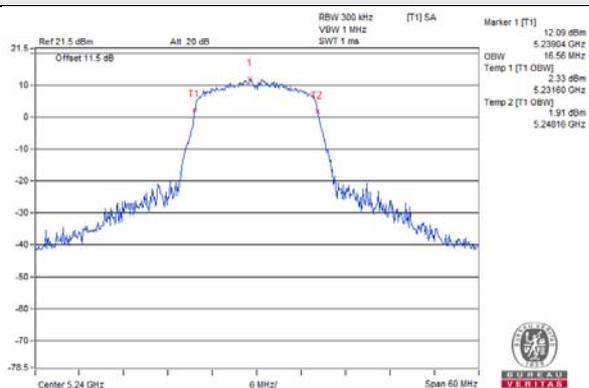


#### 802.11ax (HE80)

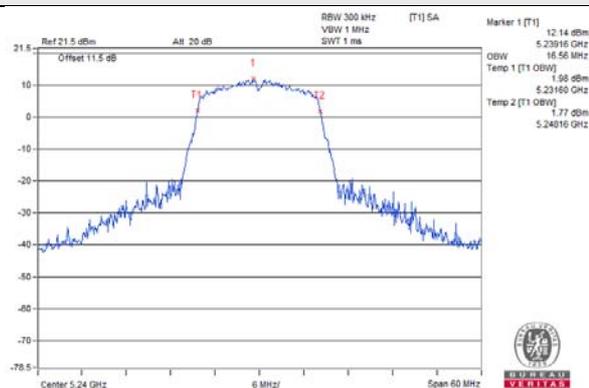


### Spectrum Plot for near By DFS Band

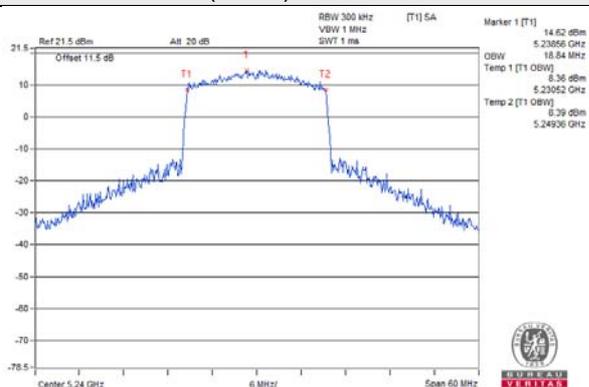
**802.11a / Chain 0 / CH 48**



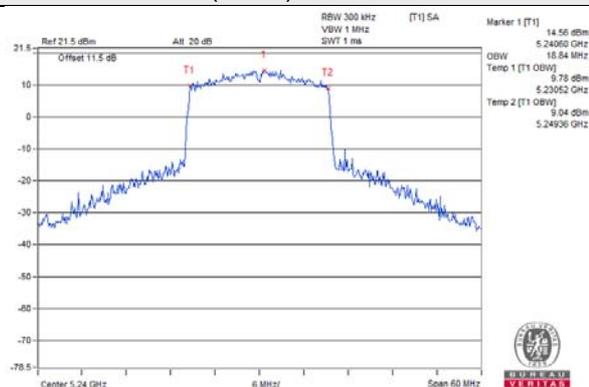
**802.11a / Chain 1 / CH 48**



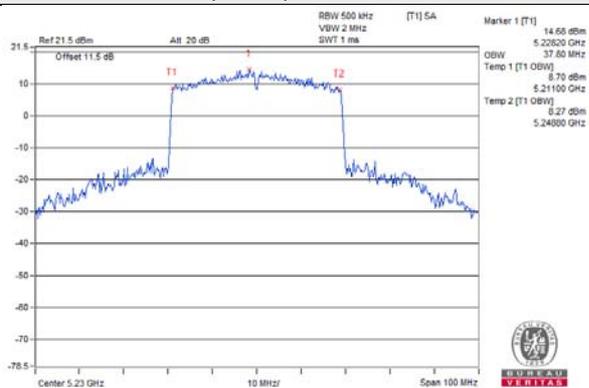
**802.11ax (HE20) / Chain 0 / CH 48**



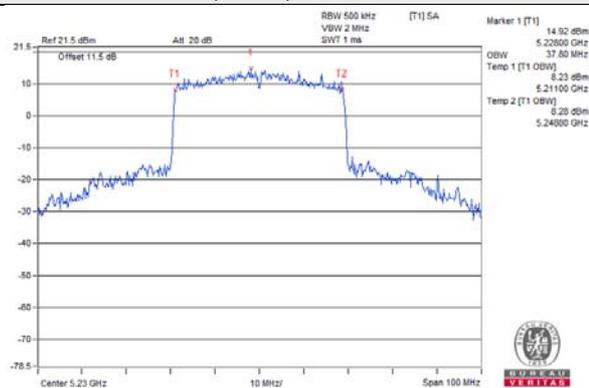
**802.11ax (HE20) / Chain 1 / CH 48**



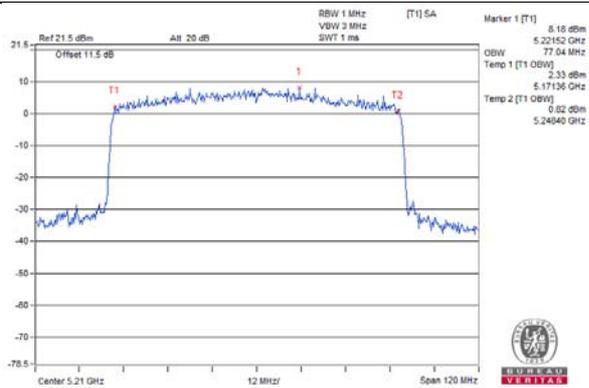
**802.11ax (HE40) / Chain 0 / CH 46**



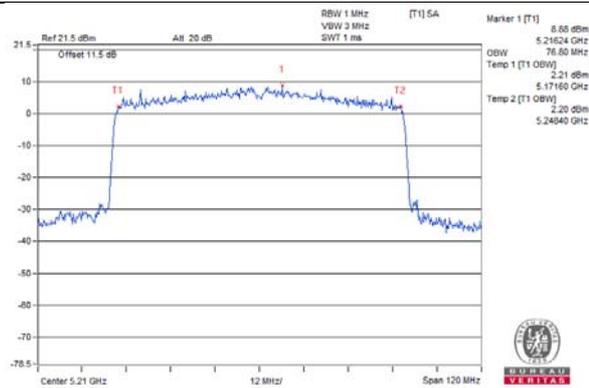
**802.11ax (HE40) / Chain 1 / CH 46**



**802.11ax (HE80) / Chain 0 / CH 42**

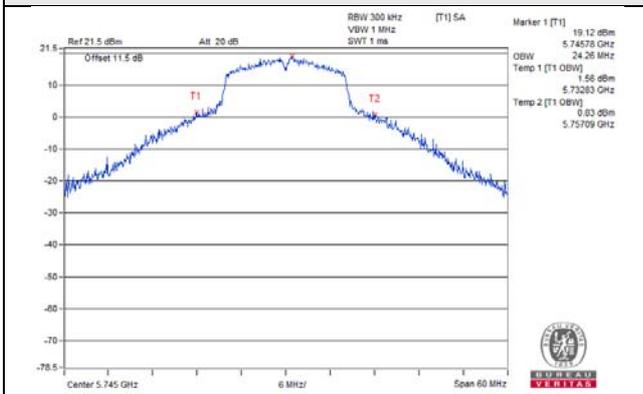


**802.11ax (HE80) / Chain 1 / CH 42**

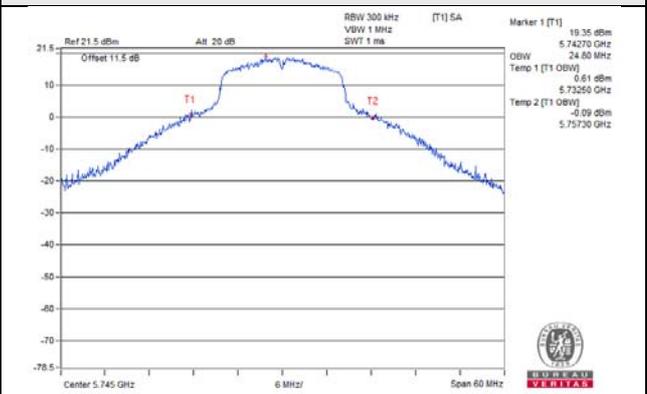


### Spectrum Plot for near By DFS Band

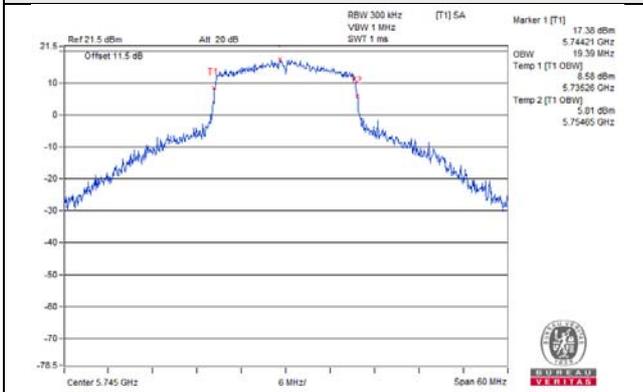
802.11a / Chain 0 / CH 149



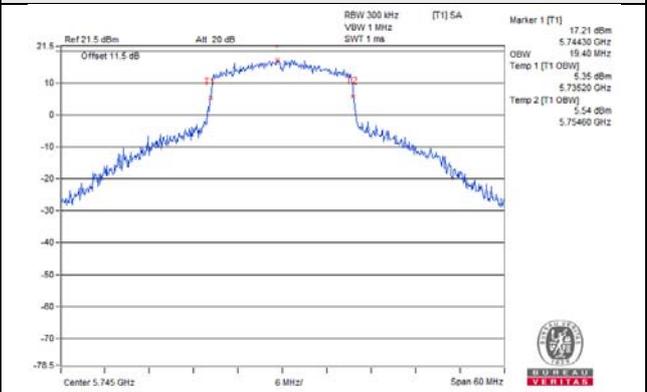
802.11a / Chain 1 / CH 149



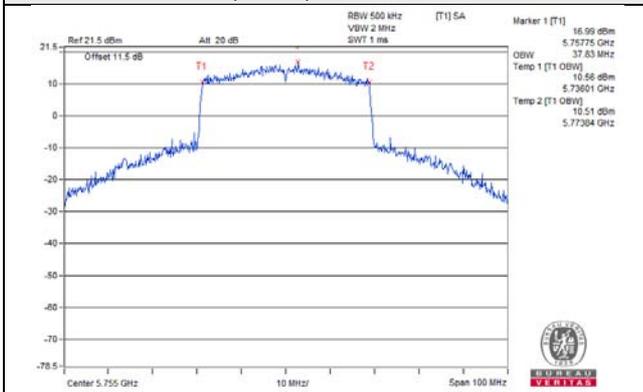
802.11ax (HE20) / Chain 0 / CH 149



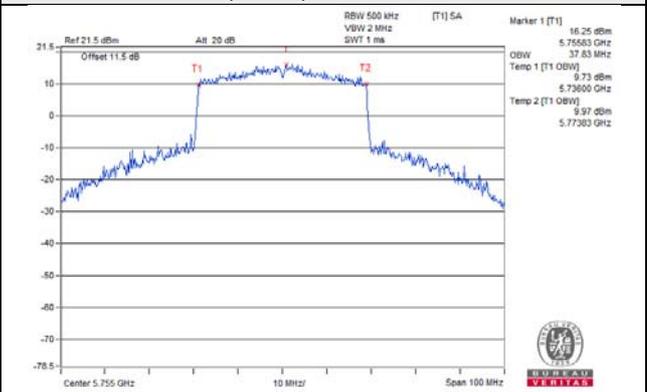
802.11ax (HE20) / Chain 1 / CH 149



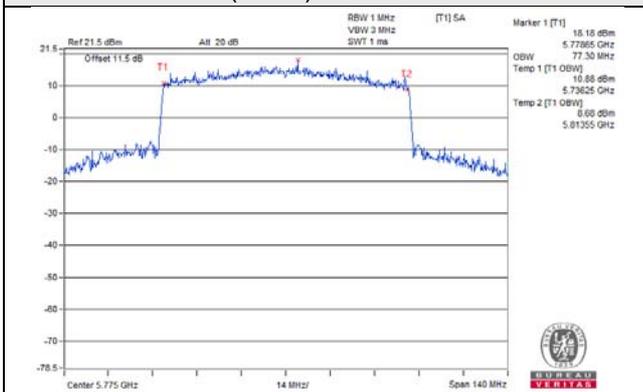
802.11ax (HE40) / Chain 0 / CH 151



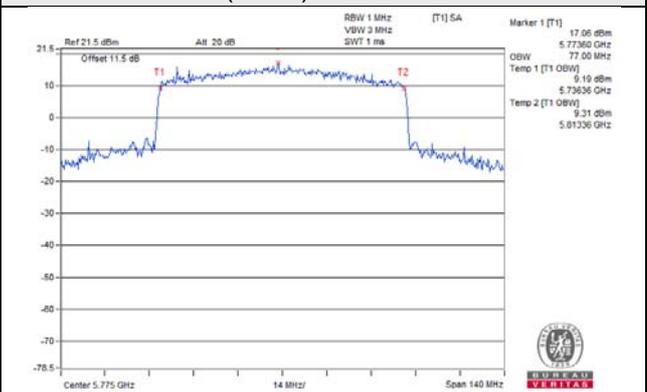
802.11ax (HE40) / Chain 1 / CH 151



802.11ax (HE80) / Chain 0 / CH 155



802.11ax (HE80) / Chain 1 / CH 155

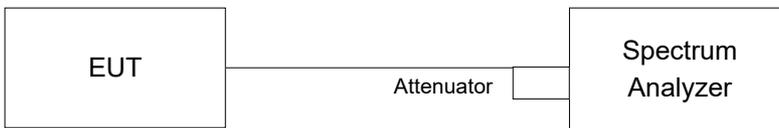


## 4.5 Peak Power Spectral Density Measurement

### 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

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1MHz, Set VBW  $\geq$  3 MHz, Detector = RMS
- Set Channel power measure = 1MHz
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 500 kHz, Set VBW  $\geq$  1.5 MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- 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	9.93	10.04	0.21	13.20	17.00	Pass
40	5200	9.90	9.97	0.21	13.15	17.00	Pass
48	5240	7.59	7.95	0.21	10.99	17.00	Pass

Note:

- 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.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
- 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	7.72	7.98	0.51	11.37	17.00	Pass
40	5200	9.17	9.05	0.51	12.63	17.00	Pass
48	5240	8.94	8.97	0.51	12.48	17.00	Pass

Note:

- 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.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
- 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	2.01	1.88	0.88	5.84	17.00	Pass
46	5230	5.92	5.85	0.88	9.78	17.00	Pass

Note:

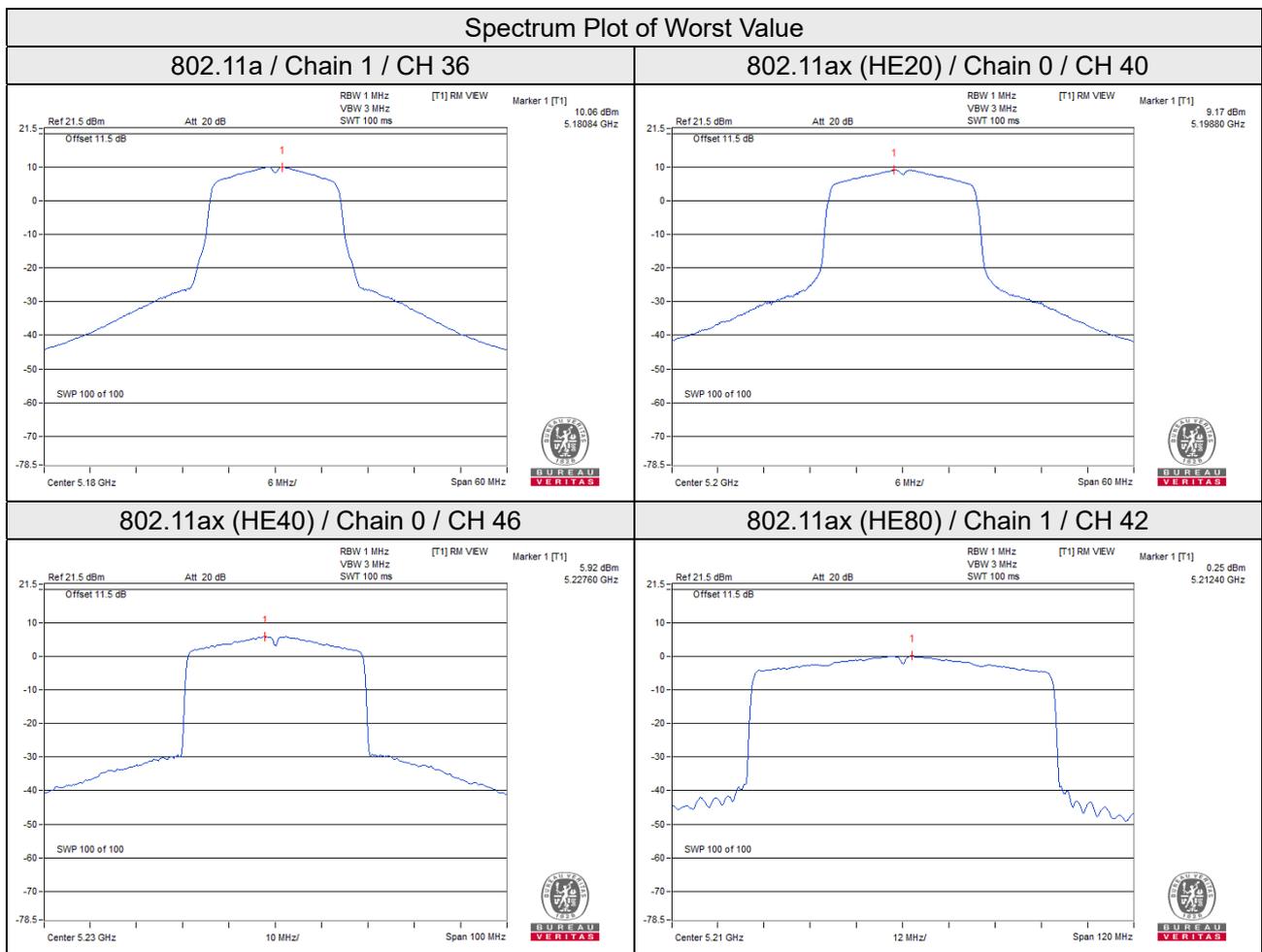
- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
- 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	-1.09	0.25	0.81	3.46	17.00	Pass

Note:

- 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.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
- Refer to section 3.3 for duty cycle spectrum plot.



For U-NII-3 band:

802.11a

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	6.14	3.01	0.21	9.36	30.00	Pass
	157	5785	5.95	3.01	0.21	9.17	30.00	Pass
	165	5825	6.11	3.01	0.21	9.33	30.00	Pass
1	149	5745	6.05	3.01	0.21	9.27	30.00	Pass
	157	5785	6.01	3.01	0.21	9.23	30.00	Pass
	165	5825	5.97	3.01	0.21	9.19	30.00	Pass

Note:

- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add 10 log (N<sub>ANT</sub>) dB.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	2.99	3.01	0.51	6.51	30.00	Pass
	157	5785	2.15	3.01	0.51	5.67	30.00	Pass
	165	5825	2.65	3.01	0.51	6.17	30.00	Pass
1	149	5745	3.02	3.01	0.51	6.54	30.00	Pass
	157	5785	1.88	3.01	0.51	5.40	30.00	Pass
	165	5825	2.48	3.01	0.51	6.00	30.00	Pass

Note:

- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add 10 log (N<sub>ANT</sub>) dB.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	151	5755	-1.28	3.01	0.88	2.61	30.00	Pass
	159	5795	-0.72	3.01	0.88	3.17	30.00	Pass
1	151	5755	-1.46	3.01	0.88	2.43	30.00	Pass
	159	5795	-0.95	3.01	0.88	2.94	30.00	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add 10 log (N<sub>ANT</sub>) dB.
2. Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

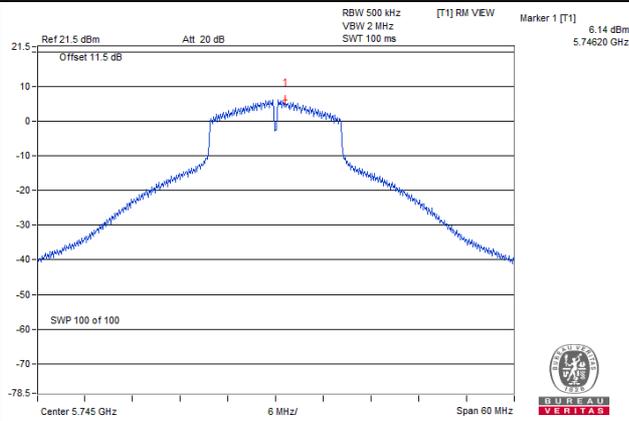
TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	155	5775	-17.67	3.01	0.81	-13.85	30.00	Pass
1	155	5775	-16.00	3.01	0.81	-12.18	30.00	Pass

Note:

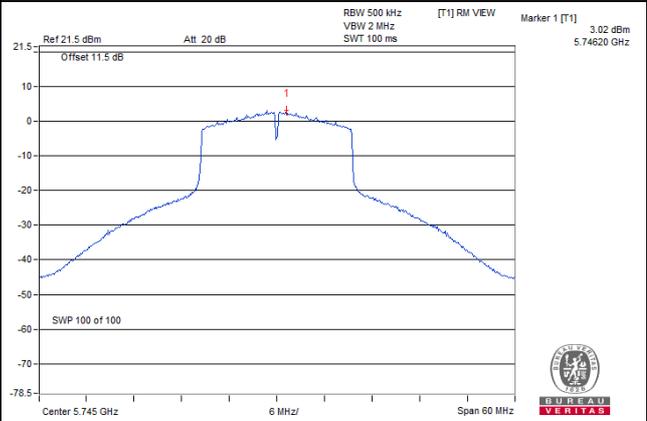
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add 10 log (N<sub>ANT</sub>) dB.
2. Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.36\text{dBi} < 6\text{dBi}$ , so the power limit not need to reduce.
3. Refer to section 3.3 for duty cycle spectrum plot.

### Spectrum Plot of Worst Value

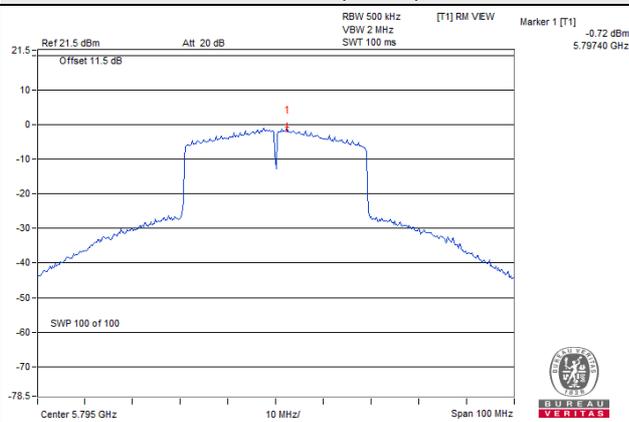
#### 802.11a



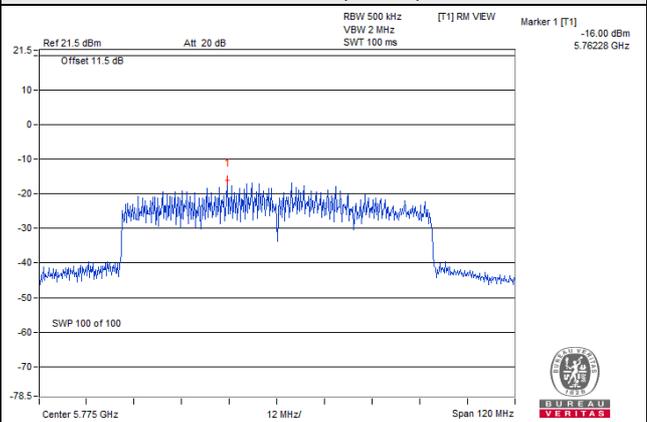
#### 802.11ax (HE20)



#### 802.11ax (HE40)



#### 802.11ax (HE80)

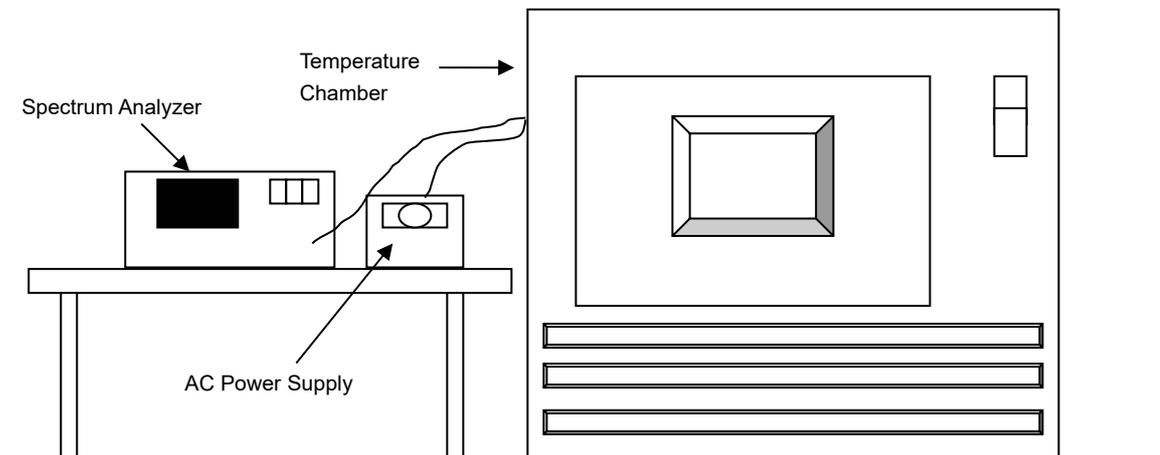


## 4.6 Frequency Stability

### 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	100040	Sep. 16, 2020	Sep. 15, 2021
Standard Temperature And Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 24, 2020	Dec. 23, 2021
Digital Multimeter Fluke	87-III	70360755	Jul. 08, 2021	Jul. 07, 2022
AC Power Supply Extech	CFW-105	E000603	NA	NA

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

### 4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step d with every 10 degrees reduction until the lowest temperature achieved.
- 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. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result						
40	120	5179.9866	Pass	5179.9875	Pass	5179.9872	Pass	5179.9845	Pass
30	120	5180.0266	Pass	5180.0265	Pass	5180.0239	Pass	5180.0249	Pass
20	120	5180.02	Pass	5180.0227	Pass	5180.0194	Pass	5180.0216	Pass
10	120	5179.9858	Pass	5179.9871	Pass	5179.986	Pass	5179.9879	Pass
0	120	5180.0222	Pass	5180.0177	Pass	5180.021	Pass	5180.0197	Pass

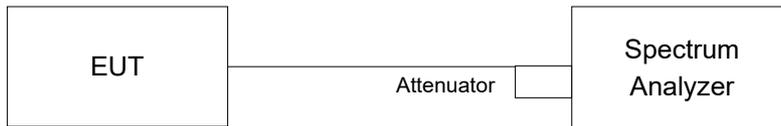
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result						
20	138	5180.0194	Pass	5180.0232	Pass	5180.0199	Pass	5180.0226	Pass
	120	5180.02	Pass	5180.0227	Pass	5180.0194	Pass	5180.0216	Pass
	102	5180.0205	Pass	5180.0227	Pass	5180.02	Pass	5180.0211	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

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

### 4.7.5 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	15.16	15.16	0.50	Pass
157	5785	15.16	15.16	0.50	Pass
165	5825	15.16	15.14	0.50	Pass

##### 802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.32	15.18	0.50	Pass
157	5785	17.01	16.86	0.50	Pass
165	5825	15.83	16.66	0.50	Pass

##### 802.11ax (HE40)

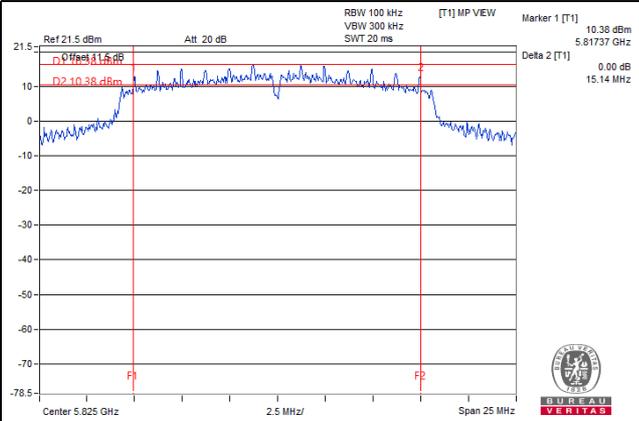
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.20	36.20	0.50	Pass
159	5795	35.64	35.22	0.50	Pass

##### 802.11ax (HE80)

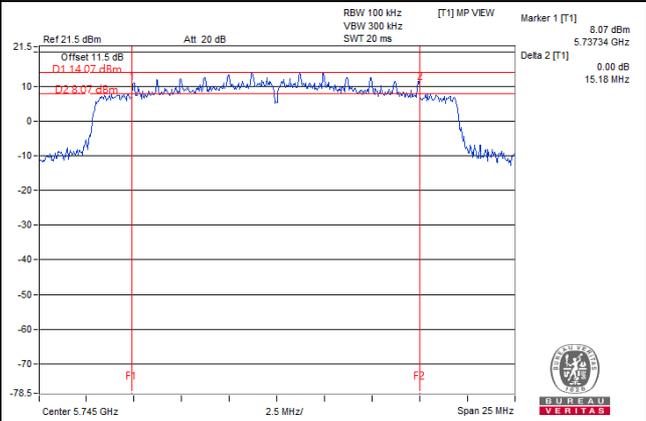
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.25	75.34	0.50	Pass

### Spectrum Plot of Worst Value

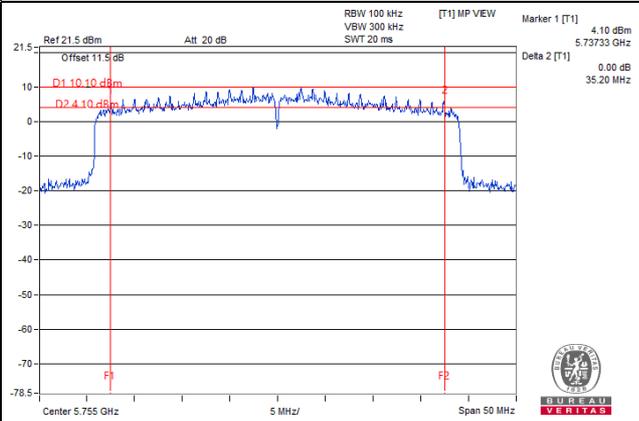
#### 802.11a



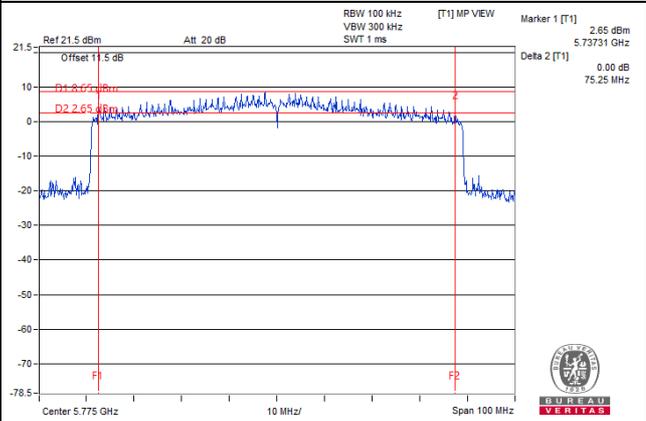
#### 802.11ax (HE20)



#### 802.11ax (HE40)



#### 802.11ax (HE80)

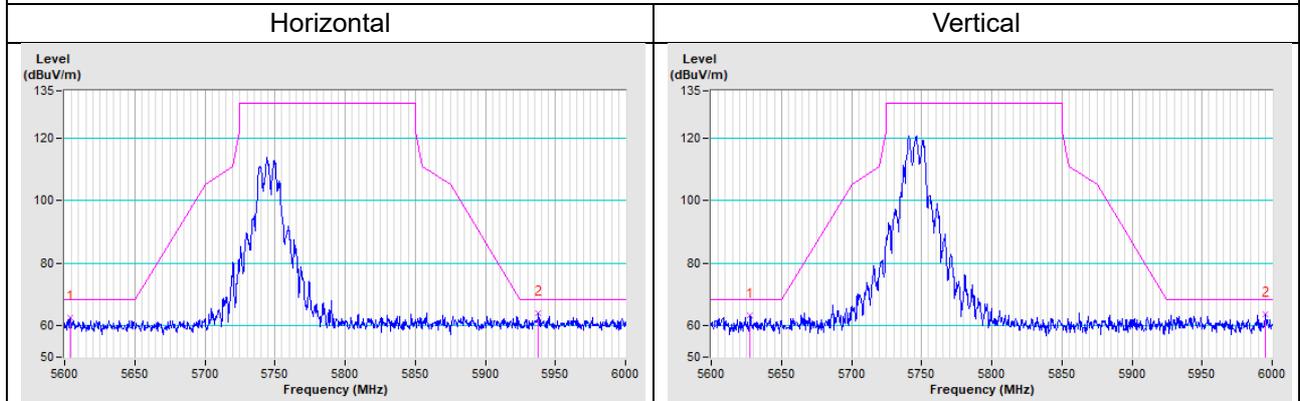


## 5 Pictures of Test Arrangements

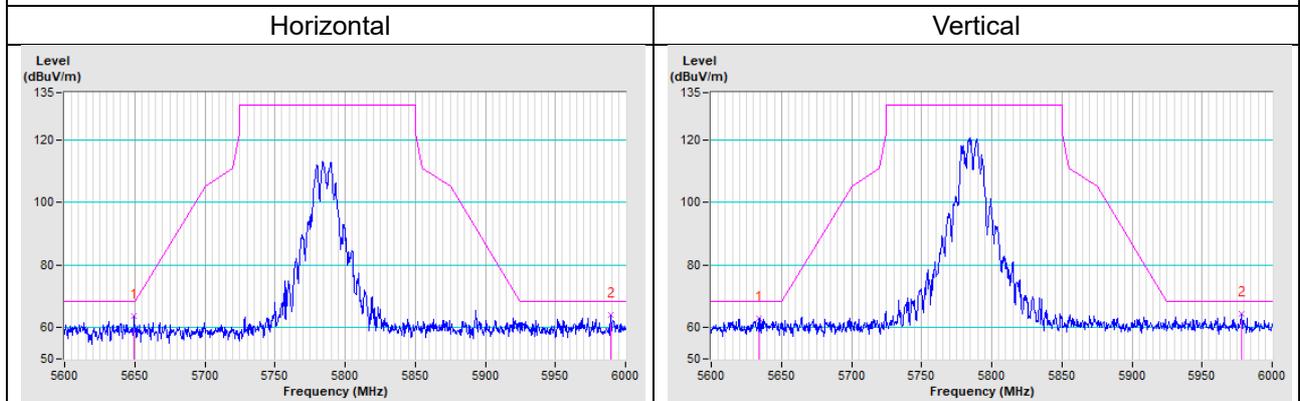
Please refer to the attached file (Test Setup Photo).

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

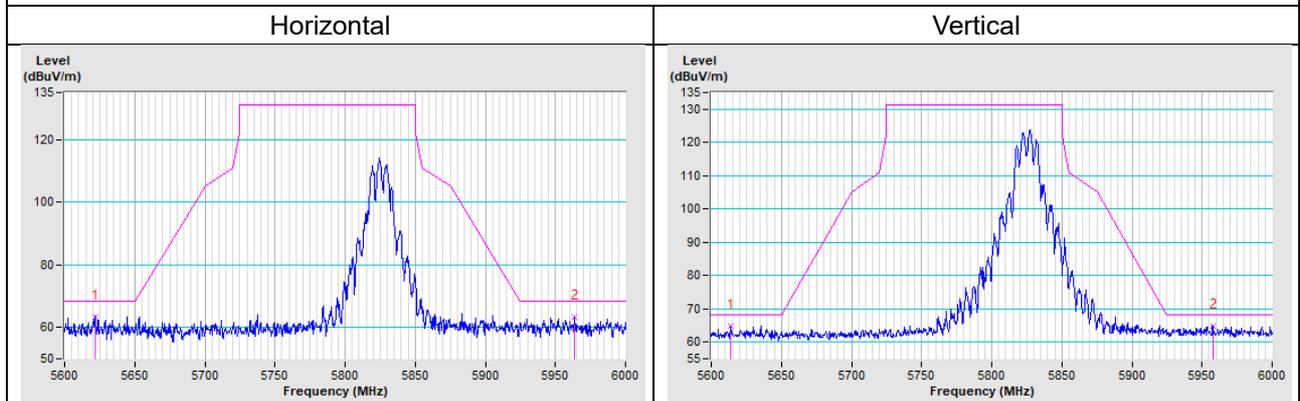
802.11a CH 149 : 5745 MHz



802.11a CH 157 : 5785 MHz

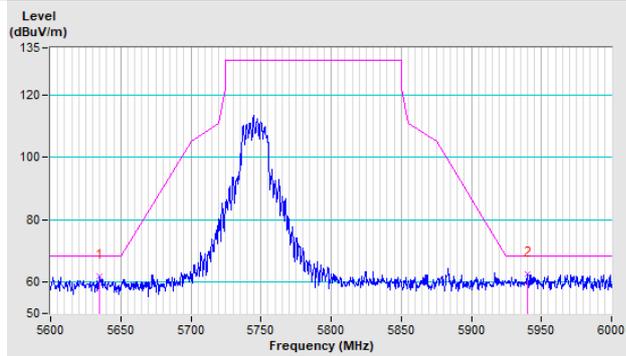


802.11a CH 165 : 5825 MHz

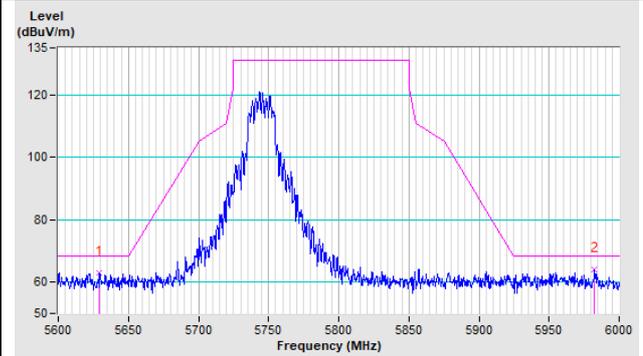


802.11ax (HE20) CH 149 : 5745 MHz

Horizontal

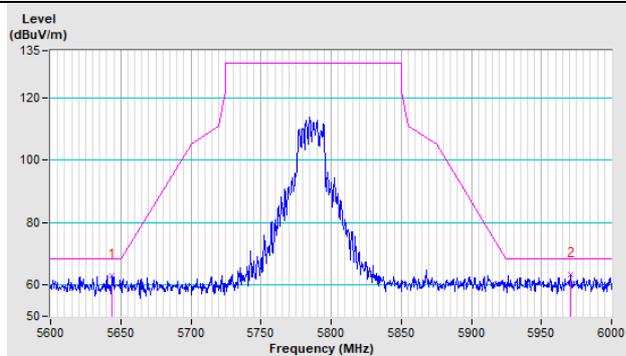


Vertical

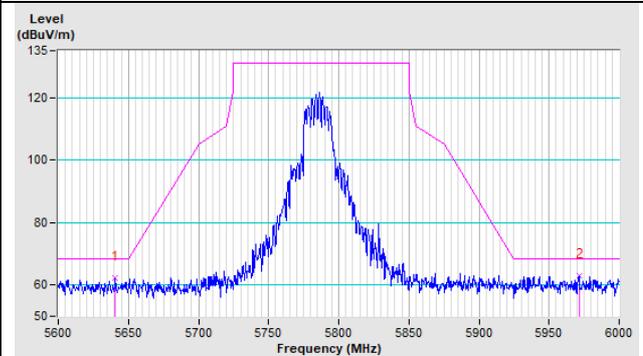


802.11ax (HE20) CH 157 : 5785 MHz

Horizontal

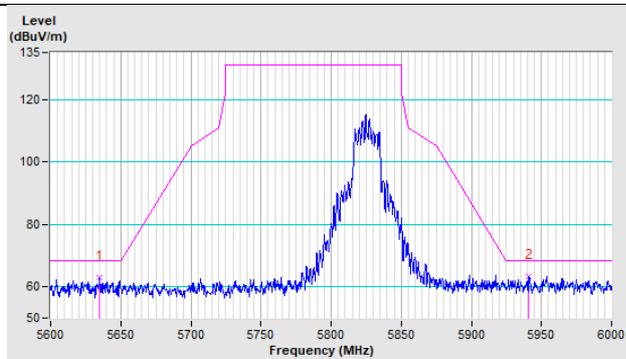


Vertical

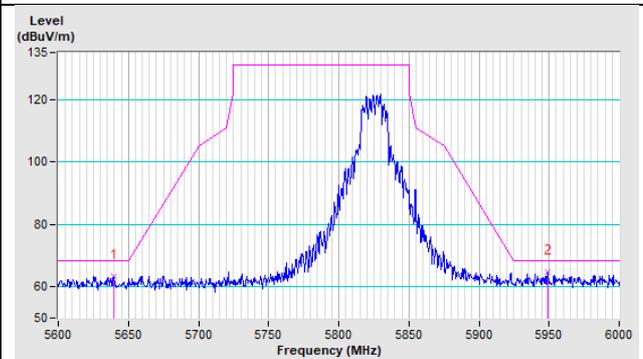


802.11ax (HE20) CH 165 : 5825 MHz

Horizontal

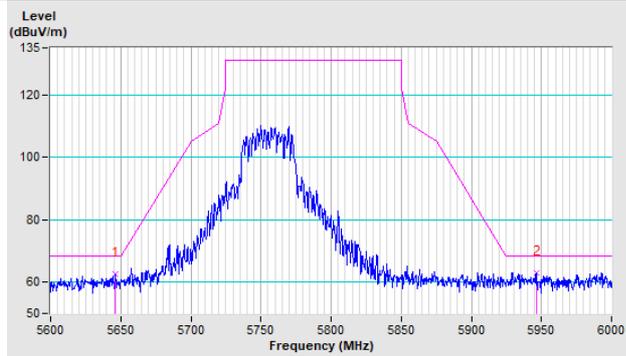


Vertical

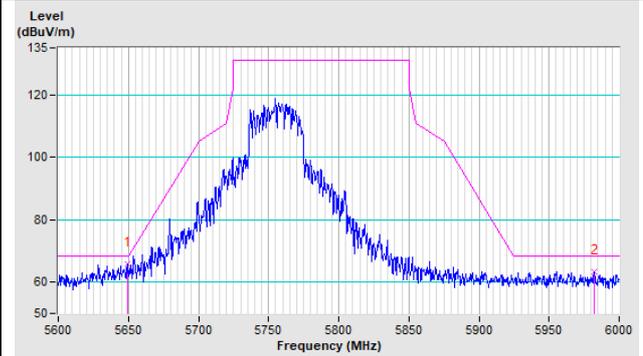


802.11ax (HE40) CH 151 : 5755 MHz

Horizontal

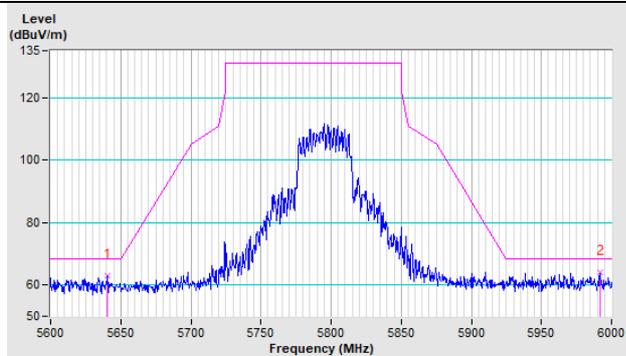


Vertical

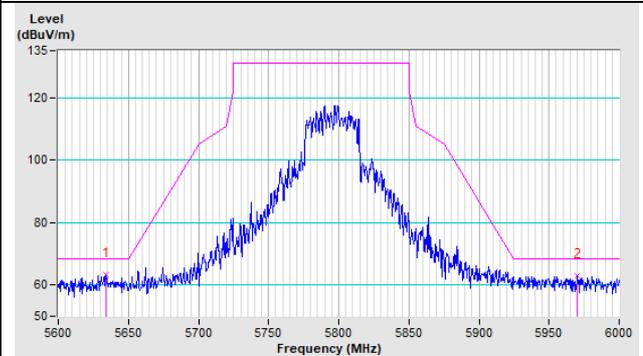


802.11ax (HE40) CH 159 : 5795 MHz

Horizontal

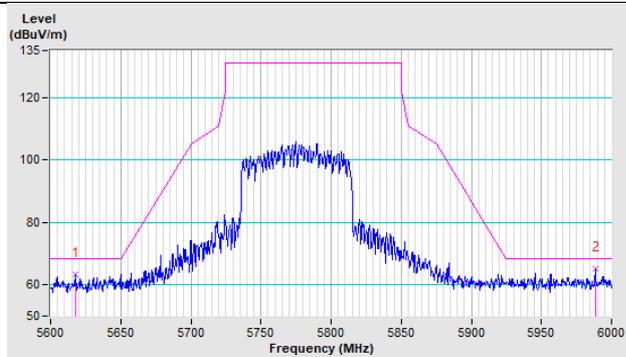


Vertical

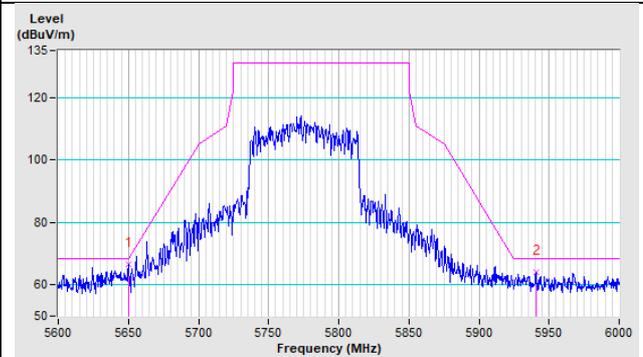


802.11ax (HE80) CH 155 : 5775 MHz

Horizontal



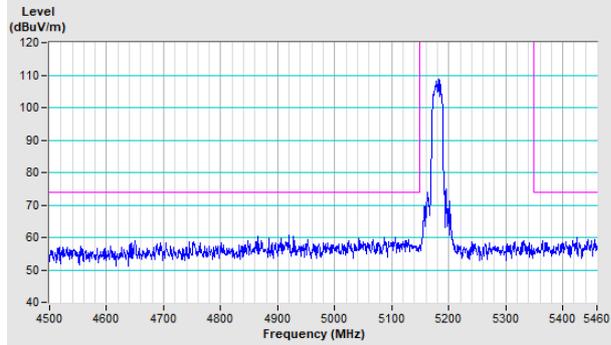
Vertical



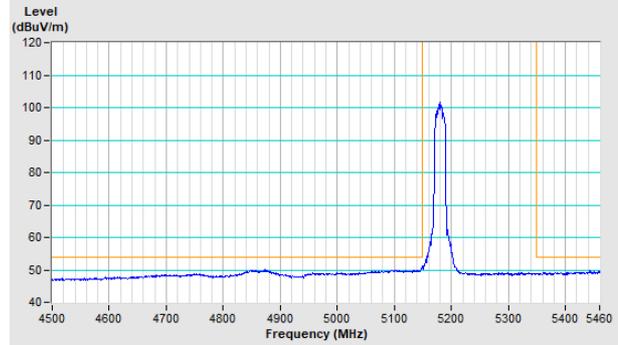
## Annex B - Band Edge Measurement

### 802.11a Channel 36

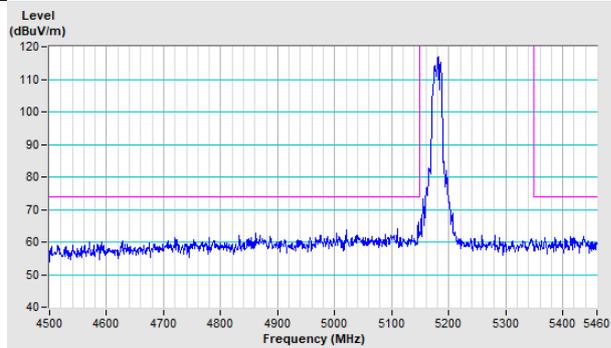
Horizontal (Peak)



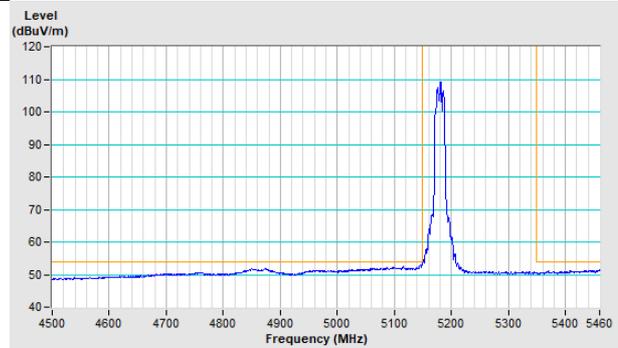
Horizontal (Average)



Vertical (Peak)

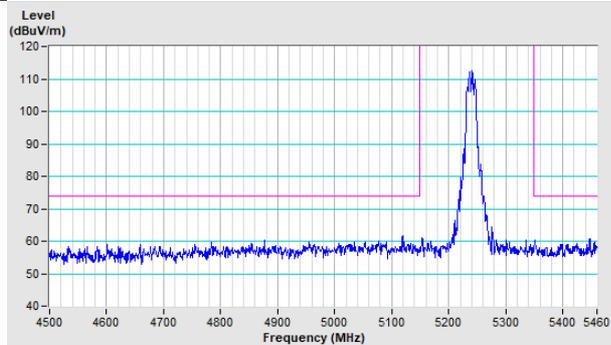


Vertical (Average)

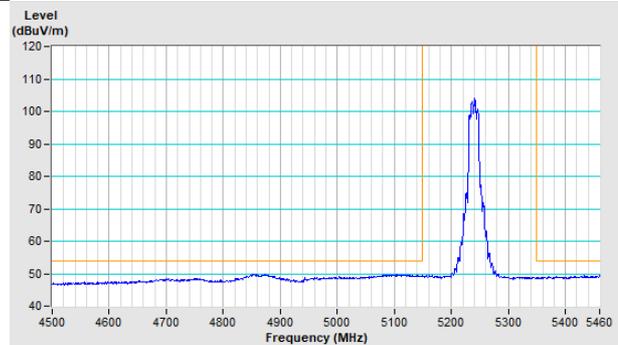


### 802.11a Channel 48

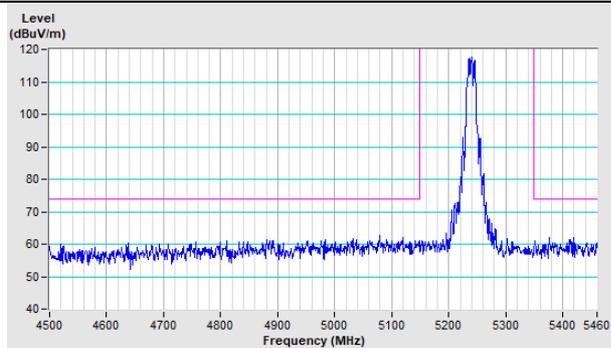
Horizontal (Peak)



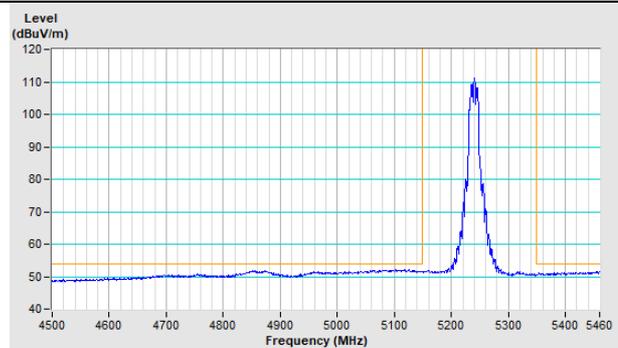
Horizontal (Average)



Vertical (Peak)

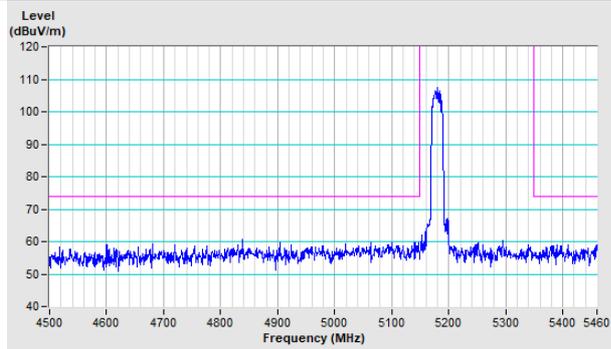


Vertical (Average)

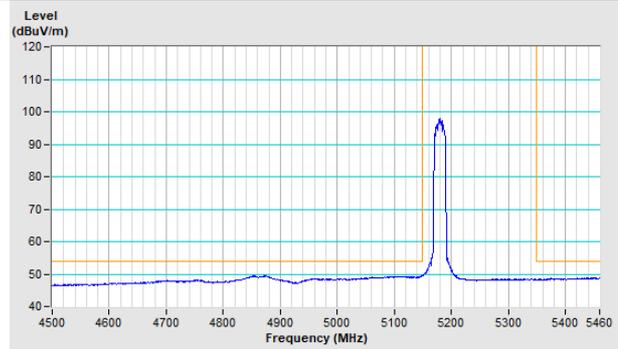


### 802.11ax (HE20) Channel 36

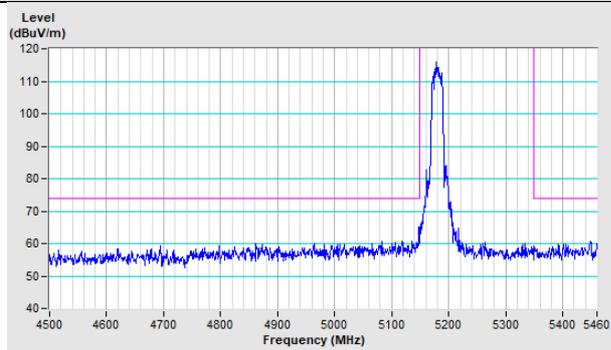
Horizontal (Peak)



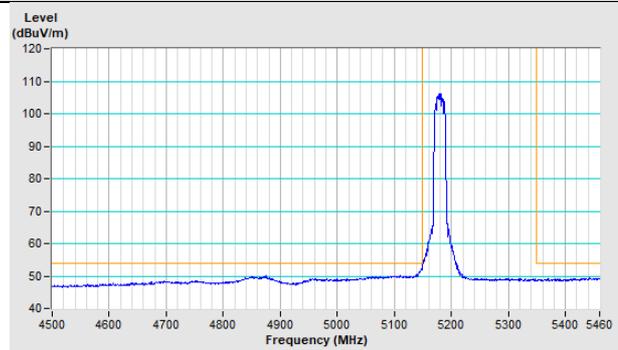
Horizontal (Average)



Vertical (Peak)

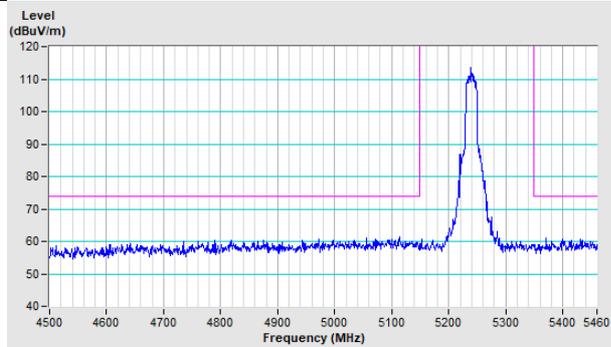


Vertical (Average)

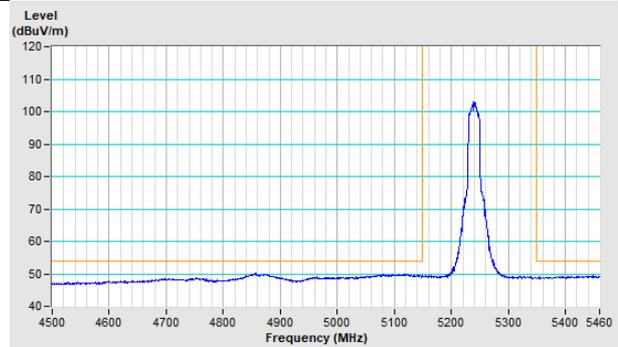


### 802.11ax (HE20) Channel 48

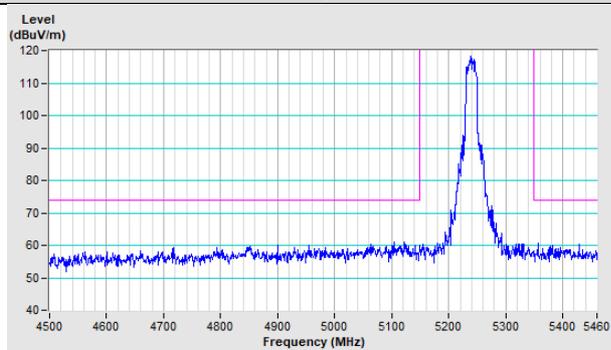
Horizontal (Peak)



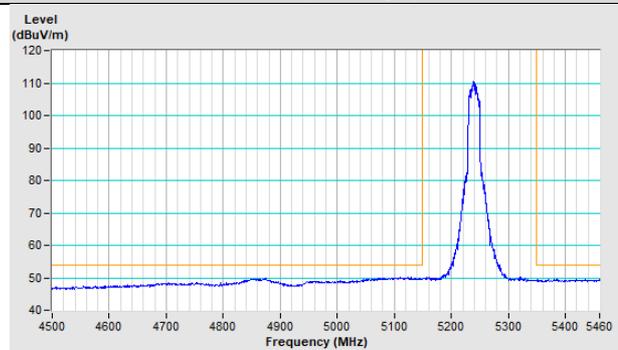
Horizontal (Average)



Vertical (Peak)

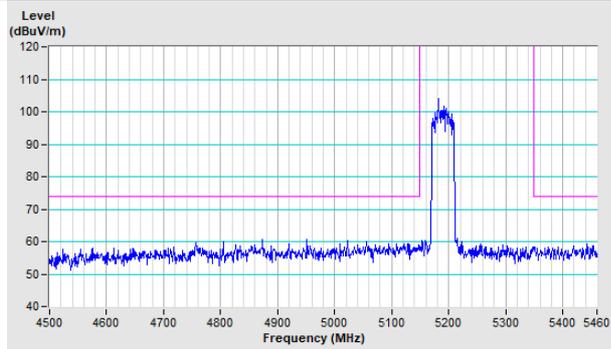


Vertical (Average)

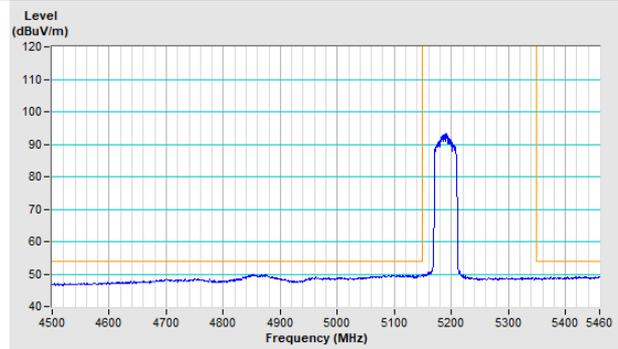


### 802.11ax (HE40) Channel 38

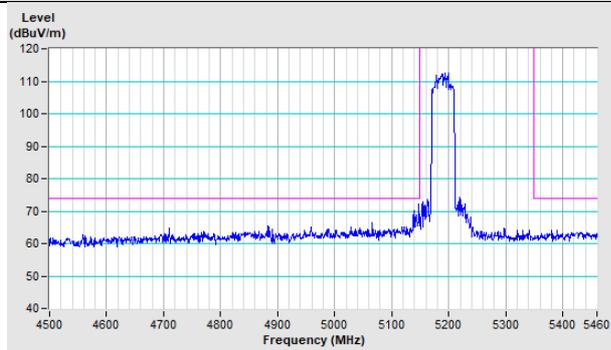
Horizontal (Peak)



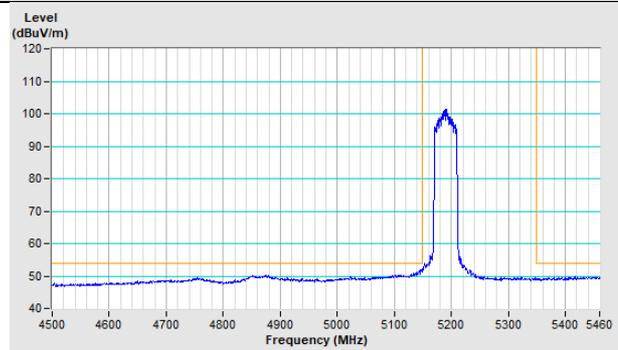
Horizontal (Average)



Vertical (Peak)

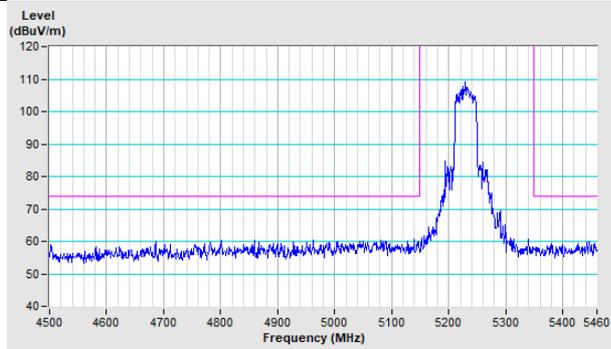


Vertical (Average)

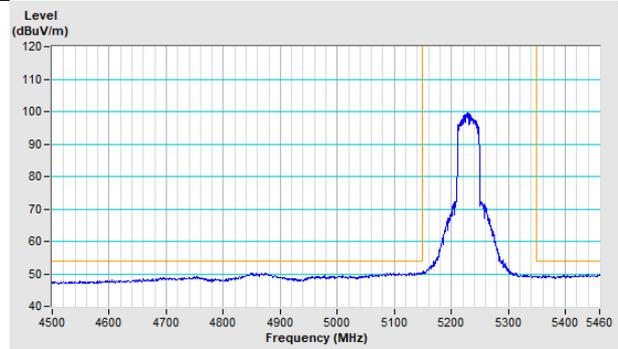


### 802.11ax (HE40) Channel 46

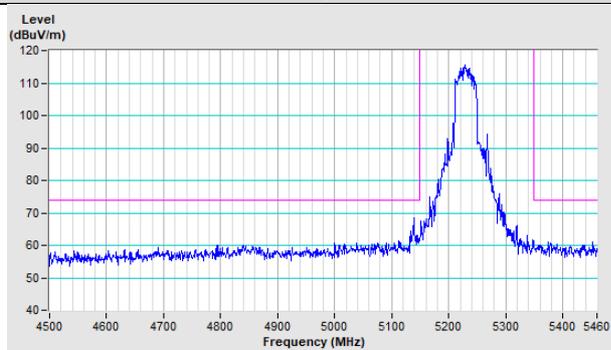
Horizontal (Peak)



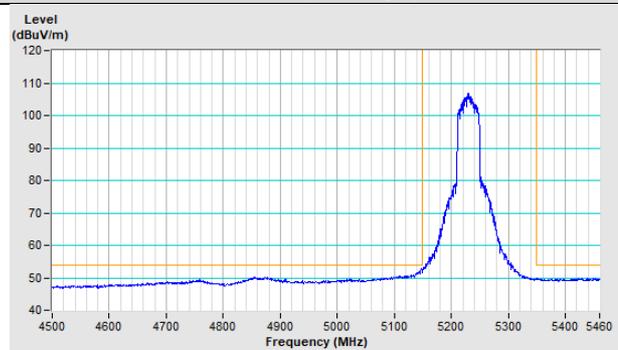
Horizontal (Average)



Vertical (Peak)

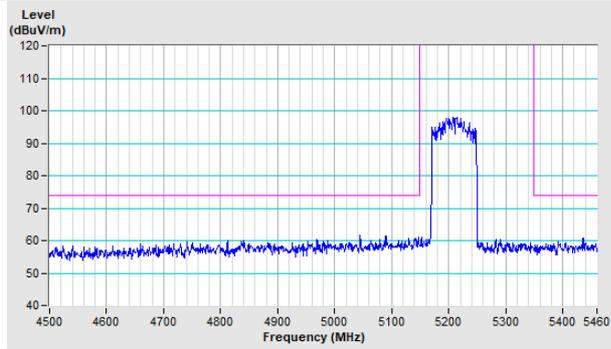


Vertical (Average)

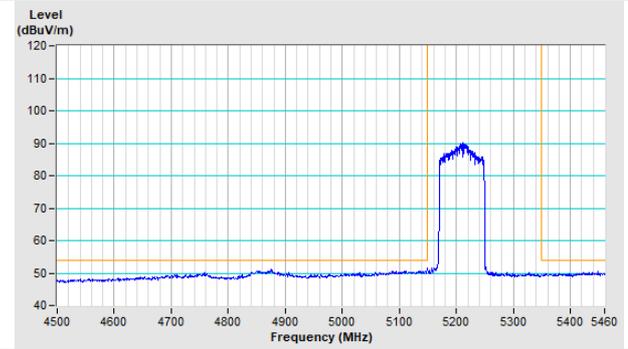


802.11ax (HE80) Channel 42

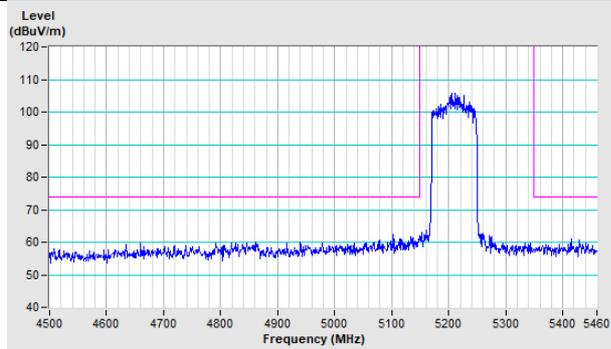
Horizontal (Peak)



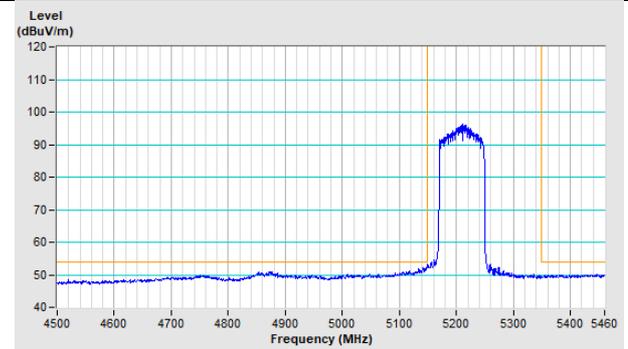
Horizontal (Average)



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.

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**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://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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