# FCC Test Report

| | |
|---|---|
| **Report No.:** | RFBDUI-WTW-P20110876-1 |
| **FCC ID:** | KA2R15A1 |
| **Test Model:** | R15 |
| **Received Date:** | Feb. 20, 2021 |
| **Test Date:** | Feb. 26 ~ Jun. 25, 2021 |
| **Issued Date:** | Jun. 25, 2021 |
| **Applicant:** | D-Link Corporation |
| **Address:** | 14420 Myford Road Suite 100 Irvine California United States 92606 |
| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch<br>Lin Kou Laboratories |
| **Lab Address:** | No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan |
| **Test Location:** | No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan |
| **FCC Registration / Designation Number:** | 788550 / TW0003 |

Testing Laboratory
2021

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RFBDUI-WTW-P20110876-1 | Original Release | Jun. 25, 2021 |

## 1 Certificate of Conformity

| | |
|---|---|
| **Product:** | AX1500 Wi-Fi 6 AI Router, AX1500 SMART ROUTER (refer to item 3.1 for more details) |
| **Brand:** | D-Link |
| **Test Model:** | R15 |
| **Sample Status:** | Engineering Sample |
| **Applicant:** | D-Link Corporation |
| **Test Date:** | Feb. 26 ~ Jun. 25, 2021 |
| **Standards:** | 47 CFR FCC Part 15, Subpart E (Section 15.407)<br>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 :** Lena Wang , **Date:** Jun. 25, 2021

Lena Wang / Specialist

**Approved by :** , **Date:** Jun. 25, 2021

Dylan Chiou / Senior Project Engineer

## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart E (Section 15.407) | | | |
|---|---|---|---|
| **FCC Clause** | **Test Item** | **Result** | **Remarks** |
| 15.407(b)(8) | AC Power Conducted Emissions | Pass | Meet the requirement of limit. Minimum passing margin is -9.54 dB at 0.43370 MHz. |
| 15.407(b) (1/2/3/4(i/ii)/8) | Radiated Emissions & Band Edge Measurement | Pass | Meet the requirement of limit. Minimum passing margin is -0.8 dB at 5150.00 MHz. |
| 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) | 6 dB 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 | No antenna connector is used. |

Note:

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

### 2.1 Measurement Uncertainty

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

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|---|---|---|
| Conducted Emissions at mains ports | 150 kHz ~ 30 MHz | 2.79 dB |
| Radiated Emissions up to 1 GHz | 9 kHz ~ 30 MHz | 3.04 dB |
| | 30 MHz ~ 200 MHz | 2.93 dB |
| | 200 MHz ~ 1000 MHz | 2.95 dB |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz | 2.26 dB |
| | 18 GHz ~ 40 GHz | 1.94 dB |

### 2.2 Modification Record

There were no modifications required for compliance.

## 3 General Information

### 3.1 General Description of EUT

| | |
|---|---|
| **Product** | AX1500 Wi-Fi 6 AI Router, AX1500 SMART ROUTER |
| **Product Difference** | For Marketing purpose |
| **Brand** | D-Link |
| **Test Model** | R15 |
| **Status of EUT** | Engineering Sample |
| **Power Supply Rating** | 12.0 Vdc, 1A (adapter or host equipment) |
| **Modulation Type** | 1024 QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK |
| **Modulation Technology** | OFDM, OFDMA |
| **Transfer Rate** | 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps<br>802.11n: up to 300 Mbps<br>802.11ac: up to 866.7 Mbps<br>802.11ax: up to 1201.0 Mbps |
| **Operating Frequency** | 5180 ~ 5240 MHz, 5745 ~ 5825 MHz |
| **Number of Channel** | 5180 ~ 5240 MHz:<br>4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)<br>2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)<br>1 for 802.11ac (VHT80), 802.11ax (HE80)<br>5745 ~ 5825 MHz:<br>5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)<br>2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)<br>1 for 802.11ac (VHT80), 802.11ax (HE80) |
| **Output Power** | CDD Mode:<br>241.797 mW for 5180 ~ 5240 MHz<br>253.102 mW for 5745 ~ 5825 MHz<br>Beamforming Mode:<br>117.66 mW for 5180 ~ 5240 MHz<br>126.56 mW for 5745 ~ 5825 MHz |
| **Antenna Type** | Refer to Note as below |
| **Antenna Connector** | N/A |
| **Accessory Device** | Refer to Note as below |
| **Data Cable Supplied** | N/A |

**Note:**

1. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

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

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

2. The EUT contains following accessory devices.

| 3. Product | Brand | Model | Description |
|---|---|---|---|
| Adapter 1 | Amigo | AMS159A-1201000FU (US) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 2 | YOUNGHOPE | YHSW-120100UA (US) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 3 | Amigo | AMS159A-1201000FV (EU) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 4 | Amigo | AMS159A-1201000F (US+ UK)<br>AMS159A-1201000F (EU+ UK) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 5 | Amigo | AMS159A-1201000FS (AU) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 6 | Amigo | AMS195-1201000FY (IN) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 7 | Amigo | AMS195-1201000FK (KR) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 8 | Amigo | AMS159A-1201000FX (BR) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 9 | Amigo | AMS159A-1201000FB (UK) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 10 | YOUNGHOPE | YHSW-120100VA (EU) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 11 | YOUNGHOPE | YHSW-120100BA (UK) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 12 | YOUNGHOPE | YHSW120100SA (AU) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 13 | YOUNGHOPE | YHSW-120100BZA (BR) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 14 | YOUNGHOPE | YHSW-120100IA (IN) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| Adapter 15 | YOUNGHOPE | YHSW-120100KA (KR) | I/P: 100-240 Vac, 50/60 Hz, 0.5 A<br>O/P: 12 Vdc, 1 A |
| CAT5E 24AWG CCA BLACK CABLE | Nienyi | NYS4709 REV.0 | 1M |

* Adapter 1, 3-9 and Adapter 2, 10-15 only different in plug. Therefore, use US Type as a representative for test.

4. The following antennas were provided to the EUT.

| **Ant. Type** | Router External Antenna |
|---|---|
| **Connecter Type** | MHF compatible |
| **Antenna Gain (dBi)** | |
| **Model** | **4900 ~ 5825 MHz** |
| AOX20X-091050-00 | 5.3 |
| AOX20X-091051-00 | 4.9 |

5. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
6. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
7. WLAN 2.4GHz and WLAN 5GHz can transmit at same time.
8. Spurious emission of the simultaneous operation (WLAN 2.4GHz, 5GHz) has been evaluated and no non-compliance was found.

### 3.2 Description of Test Modes

**For 5180 ~ 5240 MHz**

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

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 36 | 5180 | 44 | 5220 |
| 40 | 5200 | 48 | 5240 |

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

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 38 | 5190 | 46 | 5230 |

1 channel is provided for 802.11ac (VHT80):

| Channel | Frequency (MHz) |
|---|---|
| 42 | 5210 |

**For 5745 ~ 5825 MHz:**

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

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 149 | 5745 | 161 | 5805 |
| 153 | 5765 | 165 | 5825 |
| 157 | 5785 | | |

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

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 151 | 5755 | 159 | 5795 |

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

| Channel | Frequency (MHz) |
|---|---|
| 155 | 5775 |

### 3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT Configure Mode | Applicable To | | | | Description |
|---|---|---|---|---|---|
| | RE≥1G | RE<1G | PLC | APCM | |
| A | √ | √ | √ | √ | Adapter 1 |
| B | - | √ | √ | - | Adapter 2 |

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

**Note:**
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
2. "-" means no effect.

**Radiated Emission Test (Above 1 GHz):**

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

**Radiated Emission Test (Below 1 GHz):**

☒ 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 | Frequency Band (MHz) | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|---|
| A, B | 5180-5240 | 802.11ax (HE40) | 38 to 46 | 38 | OFDMA | BPSK | MCS0 |

**Power Line Conducted Emission Test:**

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

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

| EUT Configure Mode | Frequency Band (MHz) | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|---|
| A, B | 5180-5240 | 802.11ax (HE40) | 38 to 46 | 38 | OFDM | BPSK | MCS0 |

**Antenna Port Conducted Measurement:**

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates 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 | Frequency Band (MHz) | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|---|
| A | 5180-5240 | 802.11a | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 6.0 |
| | | 802.11ax (HE20) | 36 to 48 | 36, 40, 48 | OFDMA | BPSK | MCS0 |
| | | 802.11ax (HE40) | 38 to 46 | 38, 46 | OFDMA | BPSK | MCS0 |
| | | 802.11ax (HE80) | 42 | 42 | OFDMA | BPSK | MCS0 |
| A | 5745-5825 | 802.11a | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6.0 |
| | | 802.11ax (HE20) | 149 to 165 | 149, 157, 165 | OFDMA | BPSK | MCS0 |
| | | 802.11ax (HE40) | 151 to 159 | 151, 159 | OFDMA | BPSK | MCS0 |
| | | 802.11ax (HE80) | 155 | 155 | OFDMA | BPSK | MCS0 |

**Test Condition:**

| Applicable To | Environmental Conditions | Input Power | Tested by |
|---|---|---|---|
| RE≥1G | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Greg Lin |
| RE<1G | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Greg Lin, Han Wu |
| PLC | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Greg Lin, Han Wu |
| APCM | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Jisyong Wang |

### 3.3 Duty Cycle of Test Signal

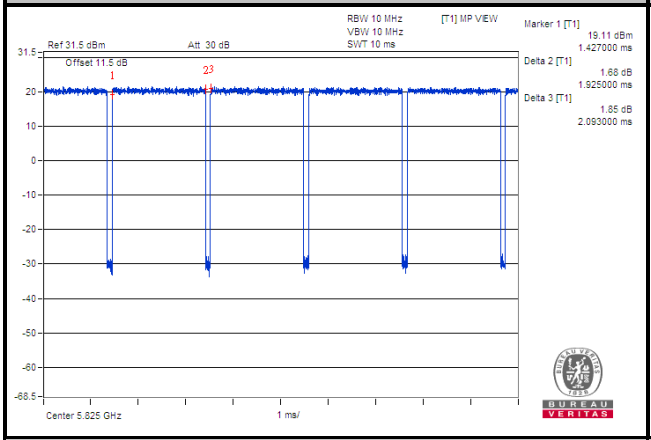
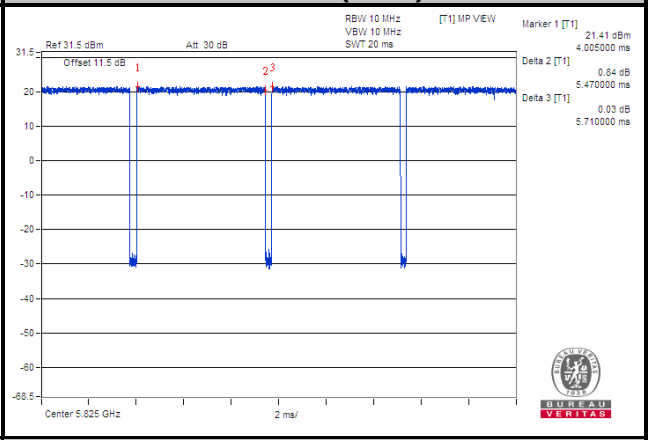
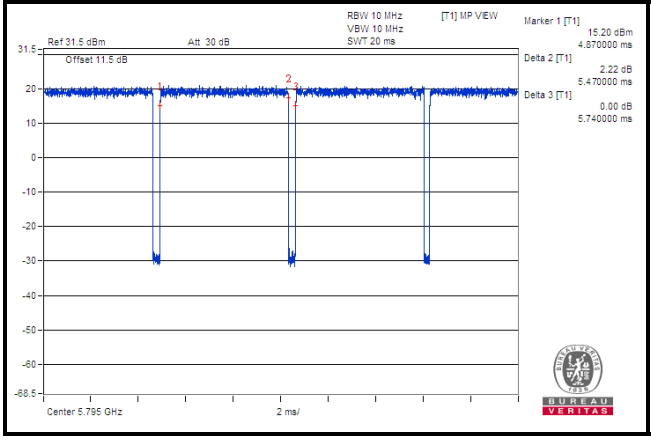
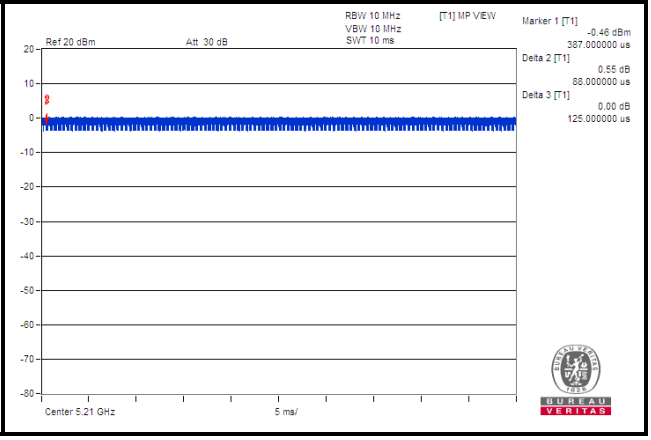
Duty cycle of test signal is < 98 %, duty factor is required.

**802.11a**: Duty cycle = 1.925/2.093 = 0.92, Duty factor = 10 * log(1/0.92) = 0.36

**802.11ax (HT20):** Duty cycle = 5.47/5.71 = 0.958, Duty factor = 10 * log(1/0.958) = 0.19

**802.11ax (HE40):** Duty cycle = 5.47/5.74 = 0.953, Duty factor = 10 * log(1/0.953) = 0.21

**802.11ax (HE80):** Duty cycle of test signal is 100 %, duty factor is not required.

| 802.11a | 802.11ax (HE20) |
|---|---|
|  |  |
| **802.11ax (HE40)** | **802.11ax (HE80)** |
|  |  |

### 3.4 Description of Support Units

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

| No. | Product | Brand | Model No. | Serial No. | FCC ID |
|---|---|---|---|---|---|
| A | Load | N/A | N/A | N/A | N/A |
| B | Notebook | DELL | E5420 | 33MJMQ1 | N/A |
| C | Adapter 1 | Amigo | AMS159A-1201000FU | N/A | N/A |
| D | Adapter 2 | Amigo | AMS159A-1201000FV | N/A | N/A |

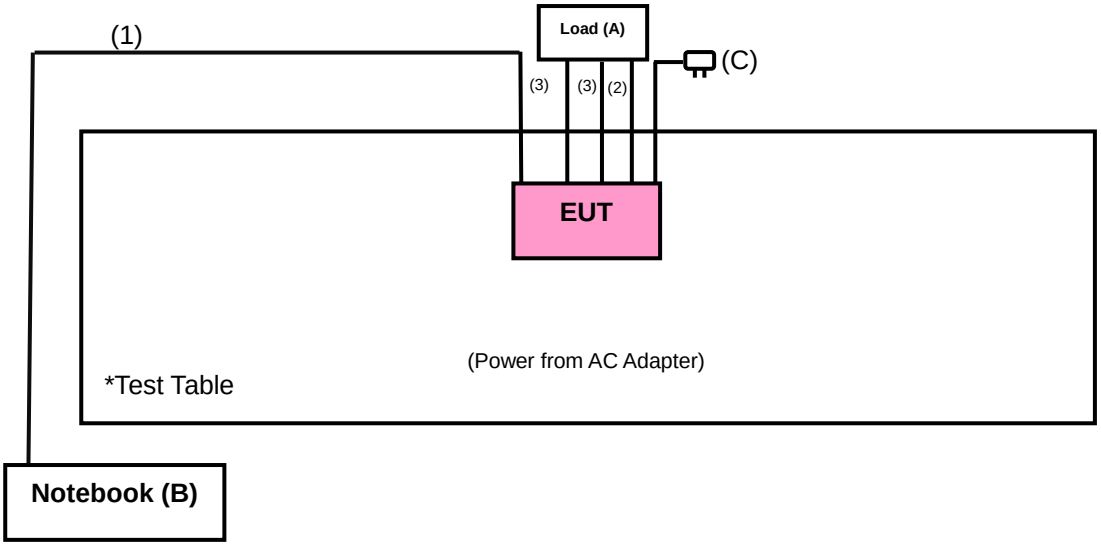
| No. | Signal Cable Description of The Above Support Units |
|---|---|
| 1. | LAN Cable: 10m |
| 2. | CAT5E 24AWG CCA BLACK CABLE: 1m |
| 3. | LAN Cable: 1.2m*2 |

Note:

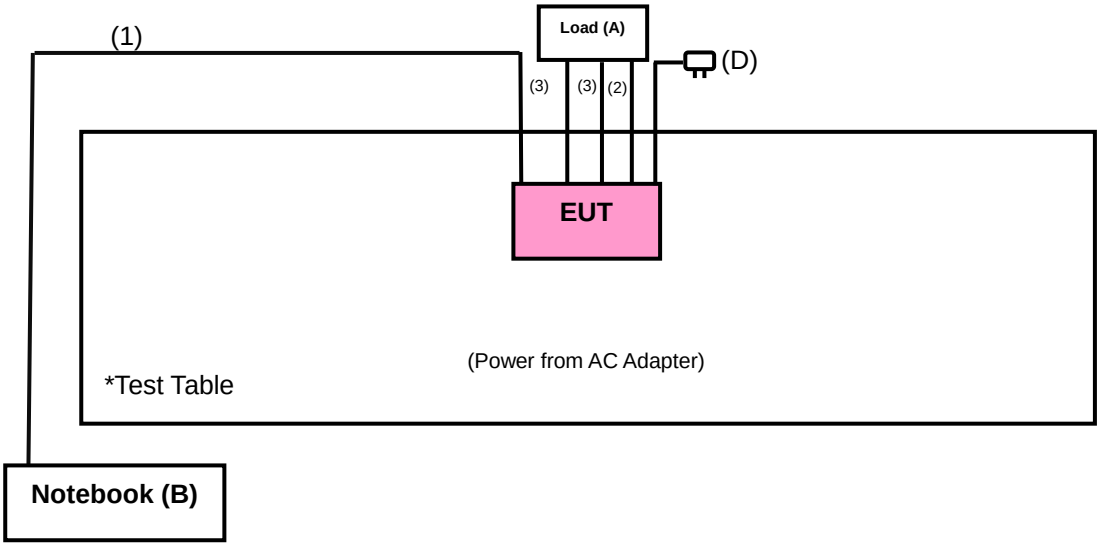
1. All power cords of the above support units are non-shielded (1.8m).
2. Items B acted as communication partners to transfer data.

#### 3.4.1 Configuration of System under Test

**Mode A**



**Mode B**




### 3.5 General Description of Applied Standards and References

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

**Test Standard:**

**FCC Part 15, Subpart E (15.407)**
ANSI C63.10-2013

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

**References Test Guidance:**

**KDB 789033 D02 General UNII Test Procedures 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 1000 MHz, 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 20 dB under any condition of modulation.

Limits of Unwanted Emission Out of the Restricted Bands

| Applicable To | | | Limit | |
|---|---|---|---|---|
| 789033 D02 General UNII Test Procedures New Rules v02r01 | | | Field Strength at 3 m | |
| | | | PK: 74 (dBμV/m) | AV: 54 (dBμV/m) |
| **Frequency Band** | **Applicable To** | | **EIRP Limit** | **Equivalent Field Strength at 3 m** |
| 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) *1<br>PK:10 (dBm/MHz) *2<br>PK:15.6 (dBm/MHz) *3<br>PK:27 (dBm/MHz) *4 | PK: 68.2 (dBμV/m) *1<br>PK:105.2 (dBμV/m) *2<br>PK: 110.8 (dBμV/m) *3<br>PK:122.2 (dBμV/m) *4 |
| | ☐ | 15.407(b)(4)(ii) | Emission limits in section 15.247(d) | |

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

**Note:**

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

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

4.1.2 Test Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|---|---|---|---|---|
| Test Receiver KEYSIGHT | N9038A | MY55420137 | Apr. 22, 2020 | Apr. 21, 2021 |
| | | | Apr. 09, 2021 | Apr. 08, 2022 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSP40 | 100040 | Sep. 16, 2020 | Sep. 15, 2021 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-160 | Nov. 06, 2020 | Nov. 05, 2021 |
| HORN Antenna SCHWARZBECK | BBHA 9120 D | 9120D-1169 | Nov. 22, 2020 | Nov. 21, 2021 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | BBHA9170241 | Nov. 22, 2020 | Nov. 21, 2021 |
| Preamplifier Agilent (Below 1GHz) | 8447D | 2944A10638 | Jun. 08, 2020 | Jun. 07, 2021 |
| | | | Jun. 05, 2021 | Jun. 04, 2022 |
| Preamplifier Agilent (Above 1GHz) | 8449B | 3008A02367 | Feb. 17, 2021 | Feb. 16, 2022 |
| RF signal cable HUBER+SUHNER&EMCI | SUCOFLEX 104 & EMC104-SM-SM8000 | CABLE-CH9-02 (248780+171006) | Jan. 16, 2021 | Jan. 15, 2022 |
| RF signal cable HUBER+SUHNER | SUCOFLEX 104 | CABLE-CH9-(250795/4) | Jan. 16, 2021 | Jan. 15, 2022 |
| RF signal cable Woken | 8D-FB | Cable-CH9-01 | Jun. 08, 2020 | Jun. 07, 2021 |
| | | | Jun. 05, 2021 | Jun. 04, 2022 |
| Software BV ADT | ADT_Radiated_ V7.6.15.9.5 | NA | NA | NA |
| Antenna Tower &Turn BV ADT | AT100 | AT93021705 | NA | NA |
| Turn Table BV ADT | TT100 | TT93021705 | NA | NA |
| Turn Table Controller BV ADT | SC100 | SC93021705 | 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. 13, 2020 | Jul. 12, 2021 |

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

4.1.3 Test Procedures

**For Radiated Emission below 30 MHz**

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 9 kHz at frequency below 30 MHz.

**For Radiated Emission above 30 MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:**

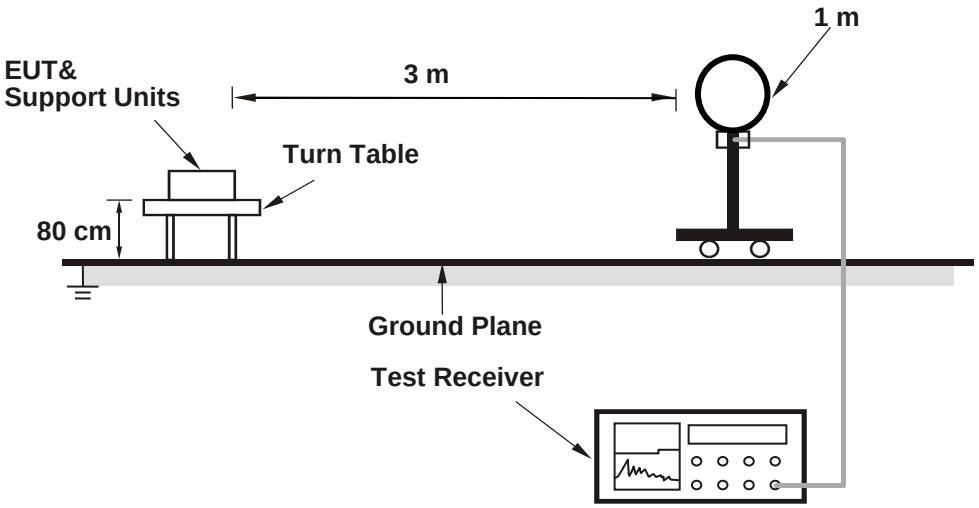
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
   (11a: RBW = 1 MHz, VBW = 10 kHz ; 11ax (HE20): RBW = 1 MHz, VBW = 10 kHz ;
   11ax (HE40): RBW = 1 MHz, VBW = 10 kHz ; 11ax (HE80): RBW = 1 MHz, VBW = 10 Hz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

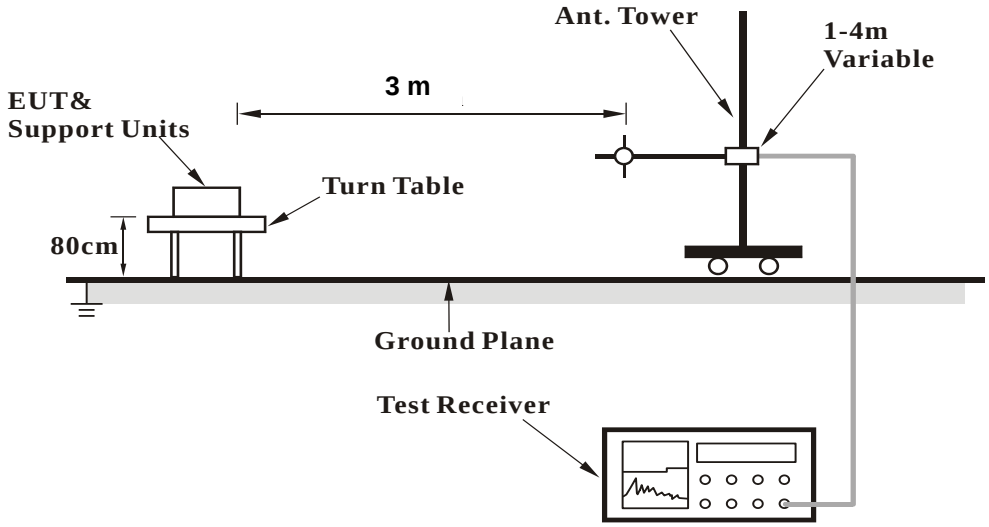
No deviation.

4.1.5 Test Setup

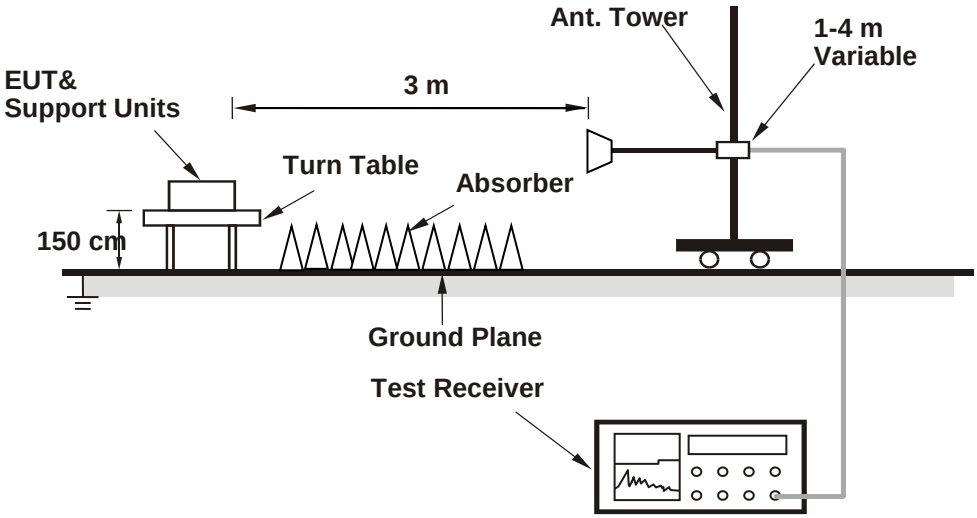
**<Radiated Emission below 30 MHz>**




**<Radiated Emission 30 MHz to 1 GHz>**



**<Radiated Emission above 1 GHz>**




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 a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

**Above 1 GHz Data：**

**802.11a**

| **RF Mode** | TX 802.11a | **Channel** | CH 36：5180 MHz |
|---|---|---|---|
| **Frequency Range** | 1GHz ~ 40GHz | **Detector Function** | Peak (PK)<br>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 | 56.3 PK | 74.0 | -17.7 | 2.05 H | 315 | 54.2 | 2.1 |
| 2 | 5150.00 | 43.8 AV | 54.0 | -10.2 | 2.05 H | 315 | 41.7 | 2.1 |
| 3 | *5180.00 | 104.0 PK | | | 2.05 H | 315 | 67.6 | 36.4 |
| 4 | *5180.00 | 93.9 AV | | | 2.05 H | 315 | 57.5 | 36.4 |
| 5 | #10360.00 | 56.2 PK | 68.2 | -12.0 | 1.72 H | 224 | 41.4 | 14.8 |
| **Antenna Polarity & Test Distance : Vertical at 3 m** | | | | | | | | |
| **No** | **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (m)** | **Table Angle (Degree)** | **Raw Value (dBuV)** | **Correction Factor (dB/m)** |
| 1 | 5150.00 | 67.6 PK | 74.0 | -6.4 | 1.24 V | 134 | 65.5 | 2.1 |
| 2 | 5150.00 | 52.8 AV | 54.0 | -1.2 | 1.24 V | 134 | 50.7 | 2.1 |
| 3 | *5180.00 | 116.3 PK | | | 1.24 V | 134 | 79.9 | 36.4 |
| 4 | *5180.00 | 106.2 AV | | | 1.24 V | 134 | 69.8 | 36.4 |
| 5 | #10360.00 | 57.4 PK | 68.2 | -10.8 | 1.57 V | 334 | 42.6 | 14.8 |

**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 40：5200 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | 104.9 PK | | | 2.13 H | 319 | 68.5 | 36.4 |
| 2 | *5200.00 | 94.8 AV | | | 2.13 H | 319 | 58.4 | 36.4 |
| 3 | #10400.00 | 56.8 PK | 68.2 | -11.4 | 1.68 H | 212 | 41.9 | 14.9 |
| **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 | *5200.00 | 116.7 PK | | | 1.28 V | 137 | 80.3 | 36.4 |
| 2 | *5200.00 | 106.7 AV | | | 1.28 V | 137 | 70.3 | 36.4 |
| 3 | #10400.00 | 57.7 PK | 68.2 | -10.5 | 1.60 V | 325 | 42.8 | 14.9 |

**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 802.11a | Channel | CH 48：5240 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | 104.8 PK | | | 2.11 H | 309 | 68.5 | 36.3 |
| 2 | *5240.00 | 94.6 AV | | | 2.11 H | 309 | 58.3 | 36.3 |
| 3 | 5350.00 | 52.2 PK | 74.0 | -21.8 | 2.11 H | 309 | 50.2 | 2.0 |
| 4 | 5350.00 | 39.4 AV | 54.0 | -14.6 | 2.11 H | 309 | 37.4 | 2.0 |
| 5 | #10480.00 | 56.1 PK | 68.2 | -12.1 | 1.72 H | 217 | 41.2 | 14.9 |
| **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 | *5240.00 | 116.6 PK | | | 1.20 V | 190 | 80.3 | 36.3 |
| 2 | *5240.00 | 106.5 AV | | | 1.20 V | 190 | 70.2 | 36.3 |
| 3 | 5350.00 | 52.9 PK | 74.0 | -21.1 | 1.20 V | 190 | 50.9 | 2.0 |
| 4 | 5350.00 | 40.1 AV | 54.0 | -13.9 | 1.20 V | 190 | 38.1 | 2.0 |
| 5 | #10480.00 | 57.5 PK | 68.2 | -10.7 | 1.57 V | 319 | 42.6 | 14.9 |

**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 802.11a | Channel | CH 149：5745 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | #5624.40 | 54.1 PK | 68.2 | -14.1 | 1.94 H | 309 | 51.4 | 2.7 |
| 2 | *5745.00 | 106.5 PK | | | 1.94 H | 309 | 69.2 | 37.3 |
| 3 | *5745.00 | 96.7 AV | | | 1.94 H | 309 | 59.4 | 37.3 |
| 4 | #5942.80 | 55.7 PK | 68.2 | -12.5 | 1.94 H | 309 | 52.2 | 3.5 |
| 5 | 11490.00 | 57.1 PK | 74.0 | -16.9 | 1.93 H | 226 | 40.9 | 16.2 |
| 6 | 11490.00 | 43.3 AV | 54.0 | -10.7 | 1.93 H | 226 | 27.1 | 16.2 |
| **Antenna Polarity & Test Distance : Vertical at 3 m** | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | #5620.00 | 53.5 PK | 68.2 | -14.7 | 1.60 V | 232 | 50.8 | 2.7 |
| 2 | *5745.00 | 118.1 PK | | | 1.60 V | 232 | 80.8 | 37.3 |
| 3 | *5745.00 | 108.5 AV | | | 1.60 V | 232 | 71.2 | 37.3 |
| 4 | #5974.80 | 54.6 PK | 68.2 | -13.6 | 1.60 V | 232 | 51.2 | 3.4 |
| 5 | 11490.00 | 57.8 PK | 74.0 | -16.2 | 1.82 V | 326 | 41.6 | 16.2 |
| 6 | 11490.00 | 43.9 AV | 54.0 | -10.1 | 1.82 V | 326 | 27.7 | 16.2 |

**Remarks:**

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

| RF Mode | TX 802.11a | Channel | CH 157：5785 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | #5608.00 | 52.1 PK | 68.2 | -16.1 | 1.92 H | 300 | 49.3 | 2.8 |
| 2 | *5785.00 | 106.8 PK | | | 1.92 H | 300 | 69.3 | 37.5 |
| 3 | *5785.00 | 97.1 AV | | | 1.92 H | 300 | 59.6 | 37.5 |
| 4 | #5945.60 | 53.0 PK | 68.2 | -15.2 | 1.92 H | 300 | 49.5 | 3.5 |
| 5 | 11570.00 | 57.3 PK | 74.0 | -16.7 | 1.78 H | 236 | 41.3 | 16.0 |
| 6 | 11570.00 | 43.4 AV | 54.0 | -10.6 | 1.78 H | 236 | 27.4 | 16.0 |
| **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 | #5643.60 | 54.2 PK | 68.2 | -14.0 | 1.69 V | 234 | 51.4 | 2.8 |
| 2 | *5785.00 | 118.5 PK | | | 1.69 V | 234 | 81.0 | 37.5 |
| 3 | *5785.00 | 108.8 AV | | | 1.69 V | 234 | 71.3 | 37.5 |
| 4 | #5974.40 | 55.5 PK | 68.2 | -12.7 | 1.69 V | 234 | 52.1 | 3.4 |
| 5 | 11570.00 | 57.8 PK | 74.0 | -16.2 | 2.32 V | 307 | 41.8 | 16.0 |
| 6 | 11570.00 | 44.0 AV | 54.0 | -10.0 | 2.32 V | 307 | 28.0 | 16.0 |

**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)<br>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 | #5646.40 | 54.2 PK | 68.2 | -14.0 | 1.91 H | 301 | 51.4 | 2.8 |
| 2 | *5825.00 | 106.9 PK | | | 1.91 H | 301 | 69.3 | 37.6 |
| 3 | *5825.00 | 97.1 AV | | | 1.91 H | 301 | 59.5 | 37.6 |
| 4 | #5990.40 | 54.2 PK | 68.2 | -14.0 | 1.91 H | 301 | 50.8 | 3.4 |
| 5 | 11650.00 | 56.8 PK | 74.0 | -17.2 | 1.72 H | 237 | 40.8 | 16.0 |
| 6 | 11650.00 | 43.1 AV | 54.0 | -10.9 | 1.72 H | 237 | 27.1 | 16.0 |
| **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 | #5622.80 | 54.4 PK | 68.2 | -13.8 | 1.80 V | 196 | 51.7 | 2.7 |
| 2 | *5825.00 | 118.2 PK | | | 1.80 V | 196 | 80.6 | 37.6 |
| 3 | *5825.00 | 108.8 AV | | | 1.80 V | 196 | 71.2 | 37.6 |
| 4 | #5935.20 | 54.7 PK | 68.2 | -13.5 | 1.80 V | 196 | 51.2 | 3.5 |
| 5 | 11650.00 | 57.4 PK | 74.0 | -16.6 | 2.03 V | 319 | 41.4 | 16.0 |
| 6 | 11650.00 | 43.5 AV | 54.0 | -10.5 | 2.03 V | 319 | 27.5 | 16.0 |

**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.

### 802.11ax (HE20)

| RF Mode | TX 802.11ax (HE20) | Channel | CH 36：5180 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | 64.0 PK | 74.0 | -10.0 | 2.13 H | 304 | 61.9 | 2.1 |
| 2 | 5150.00 | 46.6 AV | 54.0 | -7.4 | 2.13 H | 304 | 44.5 | 2.1 |
| 3 | *5180.00 | 103.1 PK | | | 2.13 H | 304 | 66.7 | 36.4 |
| 4 | *5180.00 | 93.2 AV | | | 2.13 H | 304 | 56.8 | 36.4 |
| 5 | #10360.00 | 55.7 PK | 68.2 | -12.5 | 1.72 H | 224 | 40.9 | 14.8 |
| **Antenna Polarity & Test Distance : Vertical at 3 m** | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 5150.00 | 73.0 PK | 74.0 | -1.0 | 1.33 V | 147 | 70.9 | 2.1 |
| 2 | 5150.00 | 52.2 AV | 54.0 | -1.8 | 1.33 V | 147 | 50.1 | 2.1 |
| 3 | *5180.00 | 114.4 PK | | | 1.33 V | 147 | 78.0 | 36.4 |
| 4 | *5180.00 | 105.0 AV | | | 1.33 V | 147 | 68.6 | 36.4 |
| 5 | #10360.00 | 57.4 PK | 68.2 | -10.8 | 1.56 V | 321 | 42.6 | 14.8 |

**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 40：5200 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | 104.6 PK | | | 2.13 H | 327 | 68.2 | 36.4 |
| 2 | *5200.00 | 94.3 AV | | | 2.13 H | 327 | 57.9 | 36.4 |
| 3 | #10400.00 | 56.0 PK | 68.2 | -12.2 | 1.77 H | 221 | 41.1 | 14.9 |
| **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 | *5200.00 | 116.7 PK | | | 1.28 V | 136 | 80.3 | 36.4 |
| 2 | *5200.00 | 106.3 AV | | | 1.28 V | 136 | 69.9 | 36.4 |
| 3 | #10400.00 | 56.9 PK | 68.2 | -11.3 | 1.75 V | 307 | 42.0 | 14.9 |

**Remarks:**

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

| RF Mode | TX 802.11ax (HE20) | Channel | CH 48：5240 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | 103.9 PK | | | 1.92 H | 304 | 67.6 | 36.3 |
| 2 | *5240.00 | 94.1 AV | | | 1.92 H | 304 | 57.8 | 36.3 |
| 3 | 5350.00 | 52.2 PK | 74.0 | -21.8 | 1.92 H | 304 | 50.2 | 2.0 |
| 4 | 5350.00 | 39.4 AV | 54.0 | -14.6 | 1.92 H | 304 | 37.4 | 2.0 |
| 5 | #10480.00 | 56.1 PK | 68.2 | -12.1 | 1.79 H | 226 | 41.2 | 14.9 |
| **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 | *5240.00 | 115.7 PK | | | 1.06 V | 132 | 79.4 | 36.3 |
| 2 | *5240.00 | 106.0 AV | | | 1.06 V | 132 | 69.7 | 36.3 |
| 3 | 5350.00 | 52.8 PK | 74.0 | -21.2 | 1.06 V | 132 | 50.8 | 2.0 |
| 4 | 5350.00 | 39.9 AV | 54.0 | -14.1 | 1.06 V | 132 | 37.9 | 2.0 |
| 5 | #10480.00 | 57.7 PK | 68.2 | -10.5 | 1.57 V | 332 | 42.8 | 14.9 |

**Remarks:**

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

| RF Mode | TX 802.11ax (HE20) | Channel | CH 149：5745 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | #5621.20 | 51.6 PK | 68.2 | -16.6 | 1.98 H | 306 | 48.9 | 2.7 |
| 2 | *5745.00 | 105.9 PK | | | 1.98 H | 306 | 68.6 | 37.3 |
| 3 | *5745.00 | 96.2 AV | | | 1.98 H | 306 | 58.9 | 37.3 |
| 4 | #5963.20 | 53.1 PK | 68.2 | -15.1 | 1.98 H | 306 | 49.7 | 3.4 |
| 5 | 11490.00 | 56.9 PK | 74.0 | -17.1 | 1.91 H | 221 | 40.7 | 16.2 |
| 6 | 11490.00 | 43.1 AV | 54.0 | -10.9 | 1.91 H | 221 | 26.9 | 16.2 |
| **Antenna Polarity & Test Distance : Vertical at 3 m** | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | #5645.20 | 54.3 PK | 68.2 | -13.9 | 1.63 V | 226 | 51.5 | 2.8 |
| 2 | *5745.00 | 117.5 PK | | | 1.63 V | 226 | 80.2 | 37.3 |
| 3 | *5745.00 | 107.9 AV | | | 1.63 V | 226 | 70.6 | 37.3 |
| 4 | #5939.20 | 55.3 PK | 68.2 | -12.9 | 1.63 V | 226 | 51.8 | 3.5 |
| 5 | 11490.00 | 57.5 PK | 74.0 | -16.5 | 2.93 V | 274 | 41.3 | 16.2 |
| 6 | 11490.00 | 43.4 AV | 54.0 | -10.6 | 2.93 V | 274 | 27.2 | 16.2 |

**Remarks:**

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

| RF Mode | TX 802.11ax (HE20) | Channel | CH 157：5785 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | #5622.80 | 54.4 PK | 68.2 | -13.8 | 2.86 H | 297 | 51.7 | 2.7 |
| 2 | *5785.00 | 107.0 PK | | | 1.86 H | 297 | 69.5 | 37.5 |
| 3 | *5785.00 | 97.3 AV | | | 1.86 H | 297 | 59.8 | 37.5 |
| 4 | #6000.00 | 54.5 PK | 68.2 | -13.7 | 1.86 H | 297 | 51.1 | 3.4 |
| 5 | 11570.00 | 56.3 PK | 74.0 | -17.7 | 1.77 H | 231 | 40.3 | 16.0 |
| 6 | 11570.00 | 42.8 AV | 54.0 | -11.2 | 1.77 H | 231 | 26.8 | 16.0 |
| **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 | #5648.40 | 54.5 PK | 68.2 | -13.7 | 1.81 V | 195 | 51.7 | 2.8 |
| 2 | *5785.00 | 118.9 PK | | | 1.81 V | 195 | 81.4 | 37.5 |
| 3 | *5785.00 | 109.1 AV | | | 1.81 V | 195 | 71.6 | 37.5 |
| 4 | #5990.80 | 55.0 PK | 68.2 | -13.2 | 1.81 V | 195 | 51.6 | 3.4 |
| 5 | 11570.00 | 56.6 PK | 74.0 | -17.4 | 2.36 V | 315 | 40.6 | 16.0 |
| 6 | 11570.00 | 43.5 AV | 54.0 | -10.5 | 2.36 V | 315 | 27.5 | 16.0 |

**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)<br>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 | 52.6 PK | 68.2 | -15.6 | 1.90 H | 301 | 49.8 | 2.8 |
| 2 | *5825.00 | 106.0 PK | | | 1.90 H | 301 | 68.4 | 37.6 |
| 3 | *5825.00 | 96.3 AV | | | 1.90 H | 301 | 58.7 | 37.6 |
| 4 | #5994.00 | 53.4 PK | 68.2 | -14.8 | 1.90 H | 301 | 50.0 | 3.4 |
| 5 | 11650.00 | 56.8 PK | 74.0 | -17.2 | 1.76 H | 238 | 40.8 | 16.0 |
| 6 | 11650.00 | 43.0 AV | 54.0 | -11.0 | 1.76 H | 238 | 27.0 | 16.0 |
| **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 | #5606.00 | 54.6 PK | 68.2 | -13.6 | 1.82 V | 196 | 51.8 | 2.8 |
| 2 | *5825.00 | 117.8 PK | | | 1.82 V | 196 | 80.2 | 37.6 |
| 3 | *5825.00 | 108.0 AV | | | 1.82 V | 196 | 70.4 | 37.6 |
| 4 | #5928.80 | 54.6 PK | 68.2 | -13.6 | 1.82 V | 196 | 51.2 | 3.4 |
| 5 | 11650.00 | 57.2 PK | 74.0 | -16.8 | 2.73 V | 279 | 41.2 | 16.0 |
| 6 | 11650.00 | 43.4 AV | 54.0 | -10.6 | 2.73 V | 279 | 27.4 | 16.0 |

**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.

### 802.11ax (HE40)

| RF Mode | TX 802.11ax (HE40) | Channel | CH 38：5190 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | 54.5 PK | 74.0 | -19.5 | 2.02 H | 318 | 52.4 | 2.1 |
| 2 | 5150.00 | 42.5 AV | 54.0 | -11.5 | 2.02 H | 318 | 40.4 | 2.1 |
| 3 | *5190.00 | 98.1 PK | | | 2.02 H | 318 | 61.7 | 36.4 |
| 4 | *5190.00 | 88.4 AV | | | 2.02 H | 318 | 52.0 | 36.4 |
| 5 | #10380.00 | 55.7 PK | 68.2 | -12.5 | 1.62 H | 204 | 40.8 | 14.9 |
| **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 | 69.0 PK | 74.0 | -5.0 | 1.36 V | 133 | 66.9 | 2.1 |
| 2 | 5150.00 | 53.2 AV | 54.0 | -0.8 | 1.36 V | 133 | 51.1 | 2.1 |
| 3 | *5190.00 | 109.0 PK | | | 1.36 V | 133 | 72.6 | 36.4 |
| 4 | *5190.00 | 99.5 AV | | | 1.36 V | 133 | 63.1 | 36.4 |
| 5 | #10380.00 | 57.3 PK | 68.2 | -10.9 | 1.54 V | 328 | 42.4 | 14.9 |

**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 46：5230 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | *5230.00 | 104.6 PK | | | 2.18 H | 306 | 68.3 | 36.3 |
| 2 | *5230.00 | 94.1 AV | | | 2.18 H | 306 | 57.8 | 36.3 |
| 3 | 5350.00 | 52.3 PK | 74.0 | -21.7 | 2.18 H | 306 | 50.3 | 2.0 |
| 4 | 5350.00 | 39.6 AV | 54.0 | -14.4 | 2.18 H | 306 | 37.6 | 2.0 |
| 5 | #10460.00 | 55.6 PK | 68.2 | -12.6 | 1.64 H | 225 | 40.7 | 14.9 |
| **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 | *5230.00 | 115.8 PK | | | 1.39 V | 131 | 79.5 | 36.3 |
| 2 | *5230.00 | 104.7 AV | | | 1.39 V | 131 | 68.4 | 36.3 |
| 3 | 5350.00 | 54.9 PK | 74.0 | -19.1 | 1.39 V | 131 | 52.9 | 2.0 |
| 4 | 5350.00 | 41.4 AV | 54.0 | -12.6 | 1.39 V | 131 | 39.4 | 2.0 |
| 5 | #10460.00 | 57.1 PK | 68.2 | -11.1 | 2.84 V | 261 | 42.2 | 14.9 |

**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)<br>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 | #5603.20 | 52.1 PK | 68.2 | -16.1 | 1.93 H | 311 | 49.3 | 2.8 |
| 2 | *5755.00 | 103.5 PK | | | 1.83 H | 311 | 66.2 | 37.3 |
| 3 | *5755.00 | 93.7 AV | | | 1.83 H | 311 | 56.4 | 37.3 |
| 4 | #5953.20 | 52.8 PK | 68.2 | -15.4 | 1.83 H | 311 | 49.3 | 3.5 |
| 5 | 11510.00 | 56.8 PK | 74.0 | -17.2 | 1.76 H | 224 | 40.7 | 16.1 |
| 6 | 11510.00 | 42.9 AV | 54.0 | -11.1 | 1.76 H | 224 | 26.8 | 16.1 |
| **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 | #5646.80 | 59.1 PK | 68.2 | -9.1 | 1.86 V | 198 | 56.3 | 2.8 |
| 2 | *5755.00 | 114.8 PK | | | 1.86 V | 198 | 77.5 | 37.3 |
| 3 | *5755.00 | 105.2 AV | | | 1.86 V | 198 | 67.9 | 37.3 |
| 4 | #5966.40 | 54.9 PK | 68.2 | -13.3 | 1.86 V | 198 | 51.5 | 3.4 |
| 5 | 11510.00 | 57.2 PK | 74.0 | -16.8 | 2.84 V | 277 | 41.1 | 16.1 |
| 6 | 11510.00 | 43.4 AV | 54.0 | -10.6 | 2.84 V | 277 | 27.3 | 16.1 |

**Remarks:**

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

| RF Mode | TX 802.11ax (HE40) | Channel | CH 159：5795 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | #5627.20 | 51.7 PK | 68.2 | -16.5 | 1.97 H | 300 | 49.0 | 2.7 |
| 2 | *5795.00 | 103.9 PK | | | 1.97 H | 300 | 66.3 | 37.6 |
| 3 | *5795.00 | 94.1 AV | | | 1.97 H | 300 | 56.5 | 37.6 |
| 4 | #5930.40 | 52.7 PK | 68.2 | -15.5 | 1.97 H | 300 | 49.3 | 3.4 |
| 5 | 11590.00 | 34.7 PK | 74.0 | -39.3 | 1.77 H | 221 | 18.7 | 16.0 |
| 6 | 11590.00 | 20.5 AV | 54.0 | -33.5 | 1.77 H | 221 | 4.5 | 16.0 |
| **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 | #5640.40 | 55.0 PK | 68.2 | -13.2 | 1.82 V | 206 | 52.2 | 2.8 |
| 2 | *5795.00 | 115.7 PK | | | 1.82 V | 206 | 78.1 | 37.6 |
| 3 | *5795.00 | 105.7 AV | | | 1.82 V | 206 | 68.1 | 37.6 |
| 4 | #5925.20 | 60.4 PK | 68.2 | -7.8 | 1.82 V | 206 | 57.0 | 3.4 |
| 5 | 11590.00 | 57.2 PK | 74.0 | -16.8 | 2.82 V | 274 | 41.2 | 16.0 |
| 6 | 11590.00 | 43.0 AV | 54.0 | -11.0 | 2.82 V | 274 | 27.0 | 16.0 |

**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.

## 802.11ax (HE80)

| RF Mode | TX 802.11ax (HE80) | Channel | CH 42：5210 MHz |
|---|---|---|---|
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK)<br>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 | 54.4 PK | 74.0 | -19.6 | 2.02 H | 318 | 52.3 | 2.1 |
| 2 | 5150.00 | 41.4 AV | 54.0 | -12.6 | 2.02 H | 318 | 39.3 | 2.1 |
| 3 | *5210.00 | 96.2 PK | | | 2.02 H | 318 | 59.8 | 36.4 |
| 4 | *5210.00 | 86.1 AV | | | 2.02 H | 318 | 49.7 | 36.4 |
| 5 | 5350.00 | 52.3 PK | 74.0 | -21.7 | 2.02 H | 318 | 50.3 | 2.0 |
| 6 | 5350.00 | 39.8 AV | 54.0 | -14.2 | 2.02 H | 318 | 37.8 | 2.0 |
| 7 | #10420.00 | 55.5 PK | 68.2 | -12.7 | 1.74 H | 223 | 40.6 | 14.9 |
| **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 | 69.0 PK | 74.0 | -5.0 | 1.38 V | 133 | 66.9 | 2.1 |
| 2 | 5150.00 | 53.2 AV | 54.0 | -0.8 | 1.38 V | 133 | 51.1 | 2.1 |
| 3 | *5210.00 | 106.3 PK | | | 1.38 V | 133 | 69.9 | 36.4 |
| 4 | *5210.00 | 96.2 AV | | | 1.38 V | 133 | 59.8 | 36.4 |
| 5 | 5350.00 | 53.9 PK | 74.0 | -20.1 | 1.38 V | 133 | 51.9 | 2.0 |
| 6 | 5350.00 | 40.9 AV | 54.0 | -13.1 | 1.38 V | 133 | 38.9 | 2.0 |
| 7 | #10420.00 | 56.7 PK | 68.2 | -11.5 | 1.53 V | 316 | 41.8 | 14.9 |

**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)<br>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 | #5618.00 | 54.8 PK | 68.2 | -13.4 | 1.89 H | 297 | 52.1 | 2.7 |
| 2 | *5775.00 | 99.2 PK | | | 1.89 H | 297 | 61.7 | 37.5 |
| 3 | *5775.00 | 89.5 AV | | | 1.89 H | 297 | 52.0 | 37.5 |
| 4 | #5926.80 | 55.7 PK | 68.2 | -12.5 | 1.89 H | 297 | 52.3 | 3.4 |
| 5 | 11550.00 | 56.8 PK | 74.0 | -17.2 | 1.77 H | 221 | 40.7 | 16.1 |
| 6 | 11550.00 | 42.5 AV | 54.0 | -11.5 | 1.77 H | 221 | 26.4 | 16.1 |
| **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 | #5647.20 | 66.6 PK | 68.2 | -1.6 | 1.76 V | 205 | 63.8 | 2.8 |
| 2 | *5775.00 | 110.9 PK | | | 1.76 V | 205 | 73.4 | 37.5 |
| 3 | *5775.00 | 100.9 AV | | | 1.76 V | 205 | 63.4 | 37.5 |
| 4 | #5925.20 | 67.3 PK | 68.2 | -0.9 | 1.76 V | 205 | 63.9 | 3.4 |
| 5 | 11550.00 | 57.2 PK | 74.0 | -16.8 | 2.84 V | 278 | 41.1 | 16.1 |
| 6 | 11550.00 | 43.0 AV | 54.0 | -11.0 | 2.84 V | 278 | 26.9 | 16.1 |

**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.

### 9 kHz ~ 30 MHz Data:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

### 30 MHz ~ 1 GHz Worst-Case Data:

### 802.11ax (HE40)

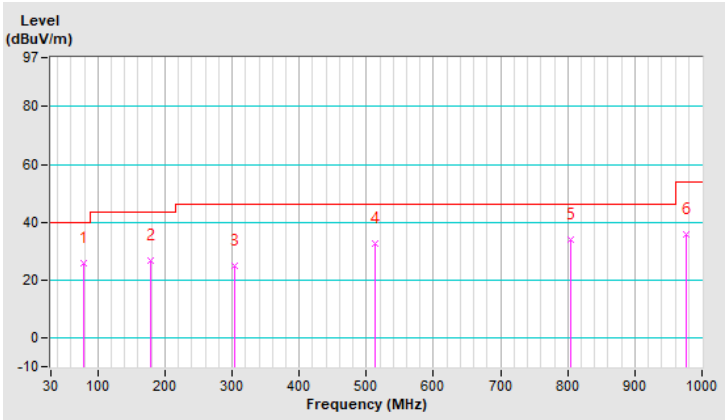
### Mode A

| RF Mode | TX 802.11ax (HE40) | Channel | CH 38：5190 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 | 78.50 | 25.7 QP | 40.0 | -14.3 | 1.00 H | 349 | 38.8 | -13.1 |
| 2 | 178.41 | 26.6 QP | 43.5 | -16.9 | 1.25 H | 68 | 36.4 | -9.8 |
| 3 | 303.54 | 25.1 QP | 46.0 | -20.9 | 1.50 H | 213 | 31.7 | -6.6 |
| 4 | 512.09 | 32.5 QP | 46.0 | -13.5 | 1.25 H | 163 | 34.4 | -1.9 |
| 5 | 805.03 | 34.0 QP | 46.0 | -12.0 | 1.00 H | 101 | 30.5 | 3.5 |
| 6 | 976.72 | 35.9 QP | 54.0 | -18.1 | 1.00 H | 248 | 29.3 | 6.6 |

**Remarks:**

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

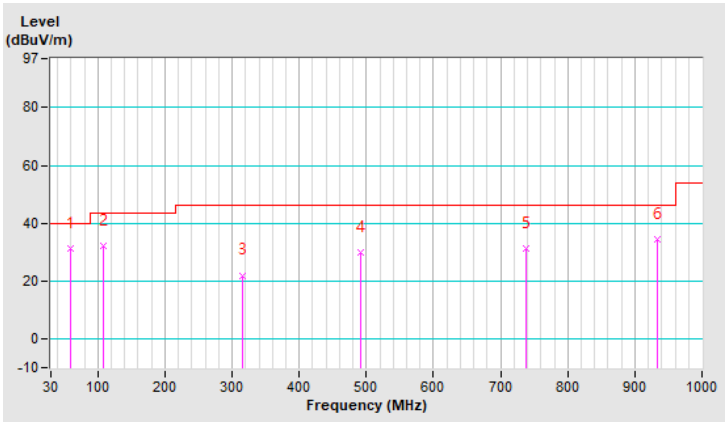


| RF Mode | TX 802.11ax (HE40) | Channel | CH 38：5190 MHz |
|---|---|---|---|
| Frequency Range | 30MHz ~ 1GHz | Detector Function | Quasi-Peak (QP) |

| 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 | 60.07 | 31.4 QP | 40.0 | -8.6 | 1.25 V | 11 | 40.8 | -9.4 |
| 2 | 108.57 | 32.3 QP | 43.5 | -11.2 | 1.25 V | 84 | 44.3 | -12.0 |
| 3 | 316.15 | 22.0 QP | 46.0 | -24.0 | 1.00 V | 288 | 28.3 | -6.3 |
| 4 | 491.72 | 29.7 QP | 46.0 | -16.3 | 1.00 V | 326 | 32.2 | -2.5 |
| 5 | 737.13 | 31.1 QP | 46.0 | -14.9 | 1.00 V | 120 | 29.1 | 2.0 |
| 6 | 933.07 | 34.4 QP | 46.0 | -11.6 | 1.50 V | 279 | 28.1 | 6.3 |

**Remarks:**

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



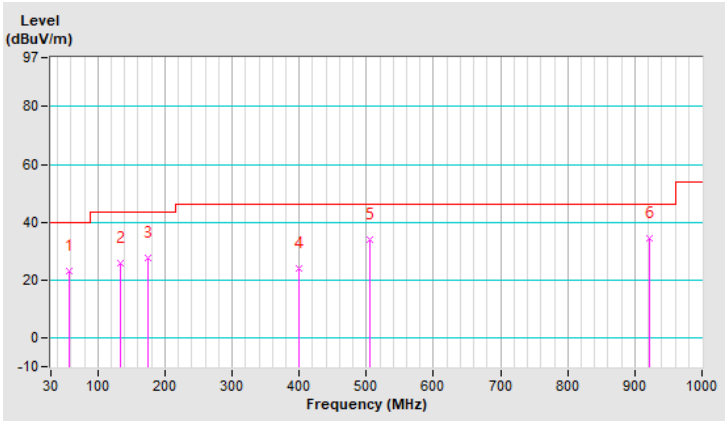
## Mode B

| RF Mode | TX 802.11ax (HE40) | Channel | CH 38：5190 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 | 57.16 | 23.2 QP | 40.0 | -16.8 | 1.00 H | 244 | 32.6 | -9.4 |
| 2 | 132.82 | 25.9 QP | 43.5 | -17.6 | 1.25 H | 271 | 35.6 | -9.7 |
| 3 | 174.53 | 27.6 QP | 43.5 | -15.9 | 1.00 H | 271 | 36.9 | -9.3 |
| 4 | 400.54 | 24.1 QP | 46.0 | -21.9 | 1.00 H | 286 | 28.8 | -4.7 |
| 5 | 504.33 | 34.1 QP | 46.0 | -11.9 | 1.50 H | 157 | 36.3 | -2.2 |
| 6 | 922.40 | 34.3 QP | 46.0 | -11.7 | 1.25 H | 314 | 28.1 | 6.2 |

**Remarks:**

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

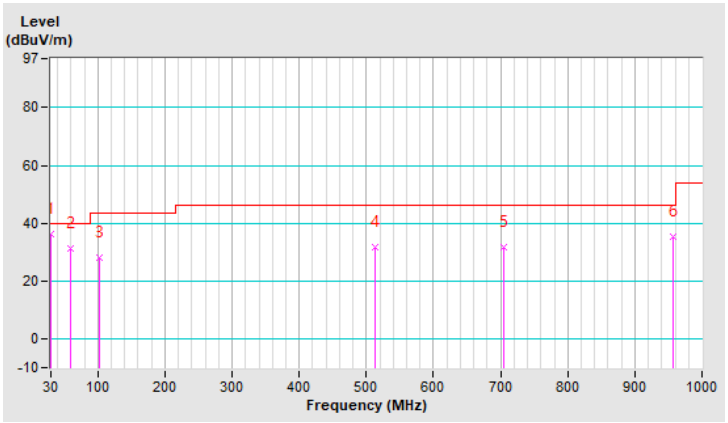


| RF Mode | TX 802.11ax (HE40) | Channel | CH 38：5190 MHz |
|---|---|---|---|
| Frequency Range | 30MHz ~ 1GHz | Detector Function | Quasi-Peak (QP) |

| 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 | 30.97 | 36.2 QP | 40.0 | -3.8 | 1.25 V | 16 | 46.7 | -10.5 |
| 2 | 60.07 | 31.4 QP | 40.0 | -8.6 | 1.25 V | 11 | 40.8 | -9.4 |
| 3 | 102.75 | 27.9 QP | 43.5 | -15.6 | 1.00 V | 84 | 40.9 | -13.0 |
| 4 | 513.06 | 31.7 QP | 46.0 | -14.3 | 1.00 V | 17 | 33.6 | -1.9 |
| 5 | 705.12 | 31.6 QP | 46.0 | -14.4 | 1.50 V | 267 | 30.2 | 1.4 |
| 6 | 956.35 | 35.5 QP | 46.0 | -10.5 | 1.00 V | 5 | 29.0 | 6.5 |

**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 of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



## 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 4.2.2 Test Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|---|---|---|---|---|
| Test Receiver ROHDE & SCHWARZ | ESR3 | 102783 | Dec. 21, 2020 | Dec. 20, 2021 |
| RF signal cable (with 10dB PAD) Woken | 5D-FB | Cable-cond2-01 | Sep. 04, 2020 | Sep. 03, 2021 |
| LISN/AMN ROHDE & SCHWARZ (EUT) | ESH2-Z5 | 100100 | Jan. 28, 2021 | Jan. 27, 2022 |
| LISN/AMN ROHDE & SCHWARZ (Peripheral) | ESH3-Z5 | 100312 | Aug. 18, 2020 | Aug. 17, 2021 |
| Software ADT | BV ADT_Cond_ V7.3.7.4 | NA | NA | NA |

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

4.2.3 Test Procedures

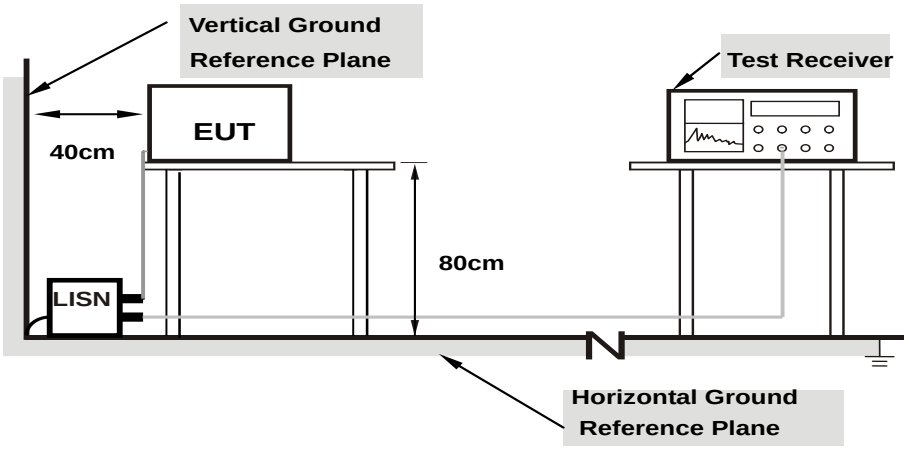
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup




**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

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

4.2.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.2.7 Test Results

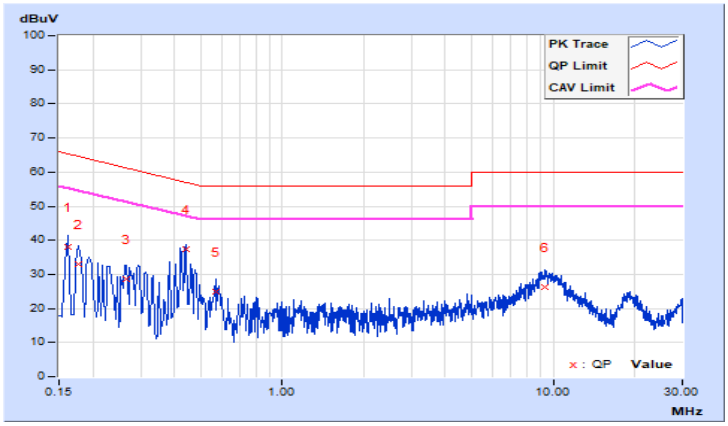
**Mode A**

| | | | |
|---|---|---|---|
| **Frequency Range** | 150kHz ~ 30MHz | **Detector Function & Resolution Bandwidth** | Quasi-Peak (QP) / Average (AV), 9kHz |
| **Input Power** | 120Vac, 60Hz | **Environmental Conditions** | 25℃, 75%RH |
| **Tested by** | Greg Lin | **Test Date** | 2021/6/22 |

| Phase Of Power : Line (L) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Frequency (MHz)** | **Correction Factor (dB)** | **Reading Value (dBuV)** | | **Emission Level (dBuV)** | | **Limit (dBuV)** | | **Margin (dB)** | |
| | | | **Q.P.** | **AV.** | **Q.P.** | **AV.** | **Q.P.** | **AV.** | **Q.P.** | **AV.** |
| 1 | 0.16200 | 10.09 | 28.03 | 11.48 | 38.12 | 21.57 | 65.36 | 55.36 | -27.24 | -33.79 |
| 2 | 0.17800 | 10.10 | 22.82 | 6.44 | 32.92 | 16.54 | 64.58 | 54.58 | -31.66 | -38.04 |
| 3 | 0.26569 | 10.14 | 18.33 | 3.89 | 28.47 | 14.03 | 61.25 | 51.25 | -32.78 | -37.22 |
| 4 | 0.44177 | 10.19 | 27.19 | 15.22 | 37.38 | 25.41 | 57.03 | 47.03 | -19.65 | -21.62 |
| 5 | 0.56600 | 10.20 | 14.66 | 3.99 | 24.86 | 14.19 | 56.00 | 46.00 | -31.14 | -31.81 |
| 6 | 9.33400 | 10.48 | 15.73 | 3.07 | 26.21 | 13.55 | 60.00 | 50.00 | -33.79 | -36.45 |

**Remarks:**

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

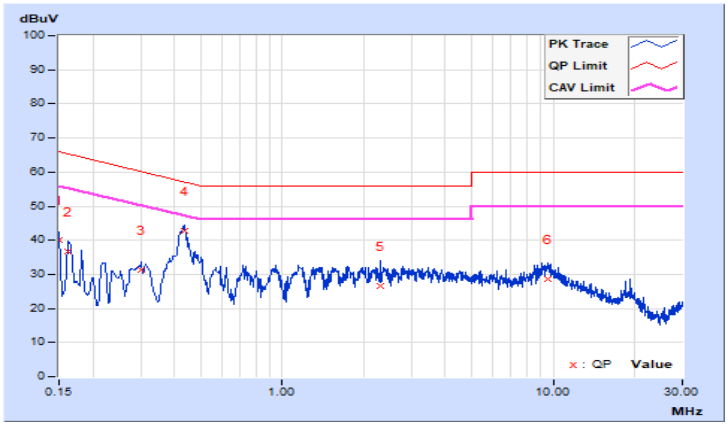


| | | | |
|---|---|---|---|
| **Frequency Range** | 150kHz ~ 30MHz | **Detector Function & Resolution Bandwidth** | Quasi-Peak (QP) / Average (AV), 9kHz |
| **Input Power** | 120Vac, 60Hz | **Environmental Conditions** | 25℃, 75%RH |
| **Tested by** | Greg Lin | **Test Date** | 2021/6/22 |

| **Phase Of Power : Neutral (N)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Frequency (MHz)** | **Correction Factor (dB)** | **Reading Value (dBuV)** | | **Emission Level (dBuV)** | | **Limit (dBuV)** | | **Margin (dB)** | |
| | | | **Q.P.** | **AV.** | **Q.P.** | **AV.** | **Q.P.** | **AV.** | **Q.P.** | **AV.** |
| 1 | 0.15000 | 10.10 | 30.06 | 18.95 | 40.16 | 29.05 | 66.00 | 56.00 | -25.84 | -26.95 |
| 2 | 0.16200 | 10.10 | 26.47 | 14.68 | 36.57 | 24.78 | 65.36 | 55.36 | -28.79 | -30.58 |
| 3 | 0.30200 | 10.16 | 21.09 | 14.21 | 31.25 | 24.37 | 60.19 | 50.19 | -28.94 | -25.82 |
| **4** | **0.43370** | **10.20** | **32.71** | **27.44** | **42.91** | **37.64** | **57.18** | **47.18** | **-14.27** | **-9.54** |
| 5 | 2.31000 | 10.34 | 16.39 | 9.99 | 26.73 | 20.33 | 56.00 | 46.00 | -29.27 | -25.67 |
| 6 | 9.53000 | 10.59 | 18.12 | 10.24 | 28.71 | 20.83 | 60.00 | 50.00 | -31.29 | -29.17 |

**Remarks:**

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



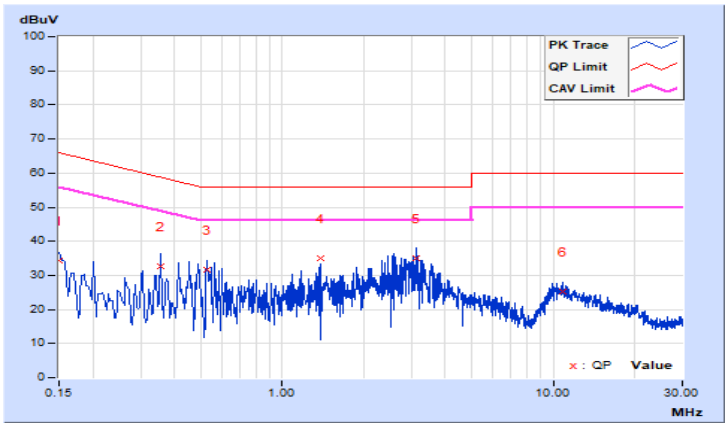
## Mode B

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

| Phase Of Power : Line (L) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV) | | Limit (dBuV) | | Margin (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15000 | 10.09 | 24.40 | 12.18 | 34.49 | 22.27 | 66.00 | 56.00 | -31.51 | -33.73 |
| 2 | 0.35723 | 10.17 | 22.64 | 10.71 | 32.81 | 20.88 | 58.79 | 48.79 | -25.98 | -27.91 |
| 3 | 0.52927 | 10.20 | 21.44 | 13.80 | 31.64 | 24.00 | 56.00 | 46.00 | -24.36 | -22.00 |
| 4 | 1.37774 | 10.27 | 24.74 | 12.76 | 35.01 | 23.03 | 56.00 | 46.00 | -20.99 | -22.97 |
| 5 | 3.12551 | 10.34 | 24.65 | 11.94 | 34.99 | 22.28 | 56.00 | 46.00 | -21.01 | -23.72 |
| 6 | 10.85167 | 10.50 | 14.86 | 3.24 | 25.36 | 13.74 | 60.00 | 50.00 | -34.64 | -36.26 |

**Remarks:**

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

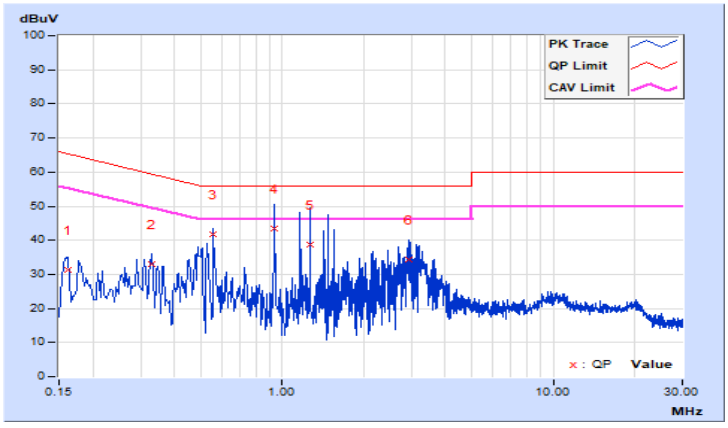


| | | | |
|---|---|---|---|
| **Frequency Range** | 150kHz ~ 30MHz | **Detector Function & Resolution Bandwidth** | Quasi-Peak (QP) / Average (AV), 9kHz |
| **Input Power** | 120Vac, 60Hz | **Environmental Conditions** | 25℃, 75%RH |
| **Tested by** | Greg Lin | **Test Date** | 2021/6/25 |

| Phase Of Power : Neutral (N) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Frequency (MHz)** | **Correction Factor (dB)** | **Reading Value (dBuV)** | | **Emission Level (dBuV)** | | **Limit (dBuV)** | | **Margin (dB)** | |
| | | | **Q.P.** | **AV.** | **Q.P.** | **AV.** | **Q.P.** | **AV.** | **Q.P.** | **AV.** |
| 1 | 0.16096 | 10.10 | 21.11 | 15.26 | 31.21 | 25.36 | 65.41 | 55.41 | -34.20 | -30.05 |
| 2 | 0.32959 | 10.17 | 22.88 | 11.02 | 33.05 | 21.19 | 59.46 | 49.46 | -26.41 | -28.27 |
| 3 | 0.55664 | 10.22 | 31.43 | 5.27 | 41.65 | 15.49 | 56.00 | 46.00 | -14.35 | -30.51 |
| 4 | 0.93591 | 10.27 | 33.13 | 7.16 | 43.40 | 17.43 | 56.00 | 46.00 | -12.60 | -28.57 |
| 5 | 1.26826 | 10.29 | 28.49 | 3.89 | 38.78 | 14.18 | 56.00 | 46.00 | -17.22 | -31.82 |
| 6 | 2.92219 | 10.37 | 23.94 | 8.24 | 34.31 | 18.61 | 56.00 | 46.00 | -21.69 | -27.39 |

**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)<br>(Max. e.i.r.p ≦ 125 mW (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 | 250 mW (24 dBm) |
| U-NII-2A | | | 250 mW (24 dBm) or 11 dBm + 10 log B* |
| U-NII-2C | | | 250 mW (24 dBm) or 11 dBm + 10 log B* |
| U-NII-3 | √ | | 1 Watt (30 dBm) |

*B is the 26 dB emission bandwidth in megahertz

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

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

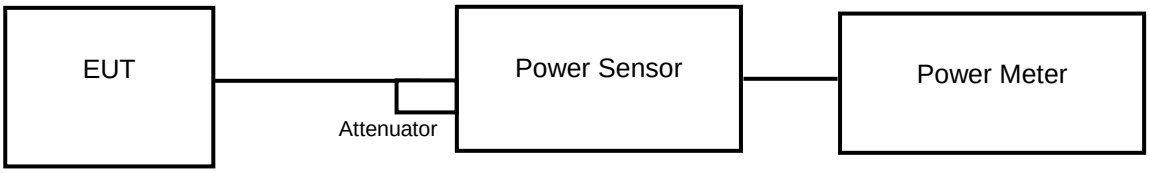
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any $N_{ANT}$;

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

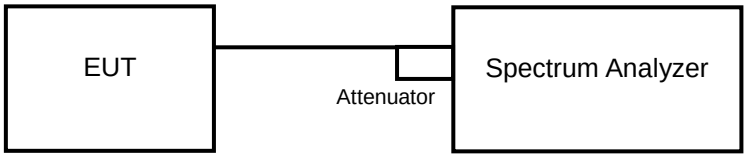
For power measurements on all other devices: Array Gain = 10 log($N_{ANT}/N_{SS}$) dB.

### 4.3.2 Test Setup

**<Power Output Measurement>**




**<26 dB Bandwidth>**



### 4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.3.4 Test Procedure

**Average Power Measurement**

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

**26 dB Bandwidth**

a. Set RBW = approximately 1 % of the emission bandwidth.
b. Set the VBW ≥ 3 x RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

### 4.3.5 Deviation from Test Standard

No deviation.

### 4.3.6 EUT Operating Conditions

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

4.3.7 Test Results

**Power Output:**

**CDD Mode**

**802.11a**

| Channel | Frequency (MHz) | Maximum Conducted Power (dBm) | | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 36 | 5180 | 21.35 | 20.06 | 237.849 | 23.76 | 30 | Pass |
| 40 | 5200 | 21.43 | 20.12 | 241.797 | 23.83 | 30 | Pass |
| 48 | 5240 | 21.14 | 19.86 | 226.845 | 23.56 | 30 | Pass |
| 149 | 5745 | 21.72 | 19.92 | 246.768 | 23.92 | 30 | Pass |
| 157 | 5785 | 21.71 | 19.84 | 244.635 | 23.89 | 30 | Pass |
| 165 | 5825 | 21.85 | 19.93 | 251.51 | 24.01 | 30 | Pass |

**802.11ax (HE20)**

| Channel | Frequency (MHz) | Maximum Conducted Power (dBm) | | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 36 | 5180 | 21.23 | 20.11 | 235.305 | 23.72 | 30 | Pass |
| 40 | 5200 | 21.21 | 20.12 | 234.931 | 23.71 | 30 | Pass |
| 48 | 5240 | 21.04 | 20.02 | 227.519 | 23.57 | 30 | Pass |
| 149 | 5745 | 21.56 | 19.73 | 237.191 | 23.75 | 30 | Pass |
| 157 | 5785 | 21.54 | 19.62 | 234.183 | 23.70 | 30 | Pass |
| 165 | 5825 | 21.67 | 19.74 | 241.082 | 23.82 | 30 | Pass |

**802.11ax (HE40)**

| Channel | Frequency (MHz) | Maximum Conducted Power (dBm) | | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 38 | 5190 | 16.56 | 15.29 | 79.096 | 18.98 | 30 | Pass |
| 46 | 5230 | 21.04 | 19.82 | 222.997 | 23.48 | 30 | Pass |
| 151 | 5755 | 21.79 | 20.09 | 253.102 | 24.03 | 30 | Pass |
| 159 | 5795 | 21.75 | 20.11 | 252.189 | 24.02 | 30 | Pass |

**802.11ax (HE80)**

| Channel | Frequency (MHz) | Maximum Conducted Power (dBm) | | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 42 | 5210 | 15.72 | 14.63 | 66.365 | 18.22 | 30 | Pass |
| 155 | 5775 | 19.56 | 17.72 | 149.521 | 21.75 | 30 | Pass |

## Beamforming Mode

### 802.11ax (HE20)

| Channel | Frequency (MHz) | Maximum Conducted Power (dBm) | | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 36 | 5180 | 18.22 | 17.10 | 117.66 | 20.71 | 27.69 | Pass |
| 40 | 5200 | 18.20 | 17.11 | 117.474 | 20.70 | 27.69 | Pass |
| 48 | 5240 | 18.03 | 17.01 | 113.767 | 20.56 | 27.69 | Pass |
| 149 | 5745 | 18.55 | 16.72 | 118.604 | 20.74 | 27.69 | Pass |
| 157 | 5785 | 18.53 | 16.61 | 117.099 | 20.69 | 27.69 | Pass |
| 165 | 5825 | 18.66 | 16.73 | 120.549 | 20.81 | 27.69 | Pass |

**Note:**

**For U-NII-1 Band & For U-NII-3 Band:**

Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)$^2$ /$N_{ANT}$]= 8.31 > 6 dBi , so the power density limit shall be reduced to 30-(8.31-6) = 27.69 dBm.

### 802.11ax (HE40)

| Channel | Frequency (MHz) | Maximum Conducted Power (dBm) | | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 38 | 5190 | 13.55 | 12.28 | 39.551 | 15.97 | 27.69 | Pass |
| 46 | 5230 | 18.03 | 16.81 | 111.506 | 20.47 | 27.69 | Pass |
| 151 | 5755 | 18.78 | 17.08 | 126.56 | 21.02 | 27.69 | Pass |
| 159 | 5795 | 18.74 | 17.10 | 126.103 | 21.01 | 27.69 | Pass |

**Note:**

**For U-NII-1 Band & For U-NII-3 Band:**

Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)$^2$ /$N_{ANT}$]= 8.31 > 6 dBi , so the power density limit shall be reduced to 30-(8.31-6) = 27.69 dBm.

### 802.11ax (HE80)

| Channel | Frequency (MHz) | Maximum Conducted Power (dBm) | | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 42 | 5210 | 12.71 | 11.62 | 33.185 | 15.21 | 27.69 | Pass |
| 155 | 5775 | 16.55 | 14.71 | 74.766 | 18.74 | 27.69 | Pass |

**Note:**

**For U-NII-1 Band & For U-NII-3 Band:**

Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)$^2$ /$N_{ANT}$]= 8.31 > 6 dBi , so the power density limit shall be reduced to 30-(8.31-6) = 27.69 dBm.

**26 dB Bandwidth:**

**802.11a**

| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 36 | 5180 | 30.17 | 23.26 |
| 40 | 5200 | 32.84 | 29.02 |
| 48 | 5240 | 32.09 | 25.35 |

**802.11ax (HE20)**

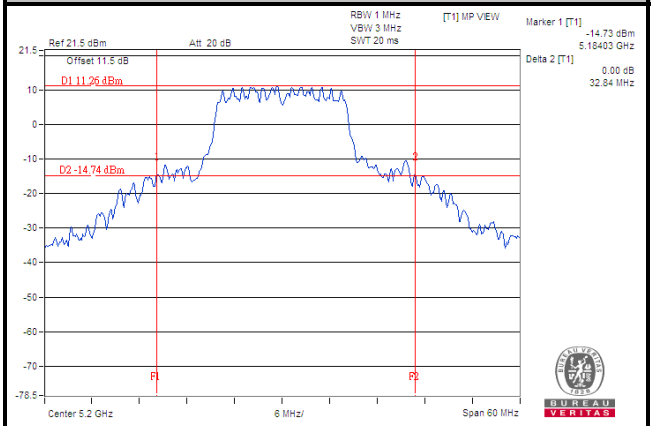
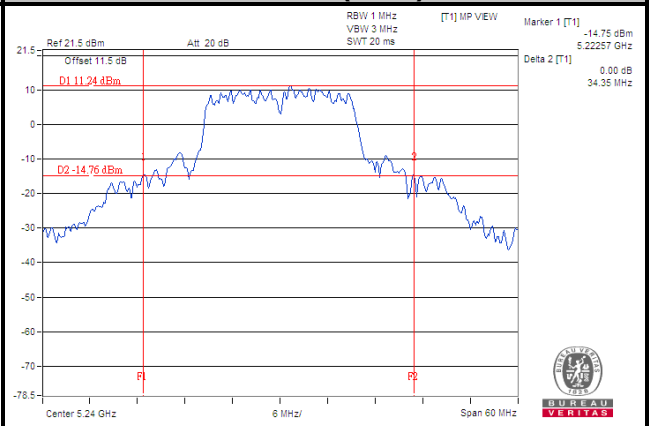
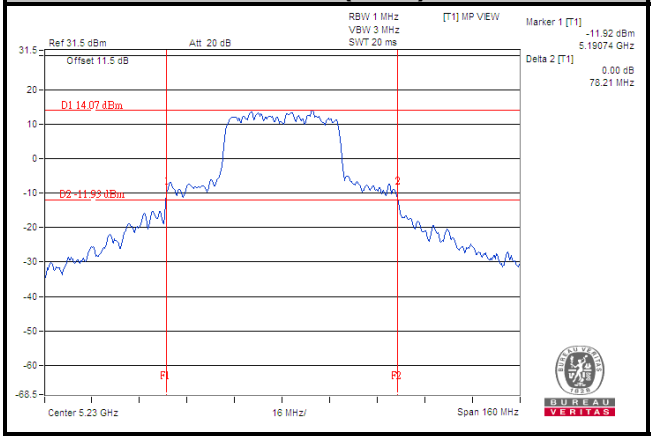
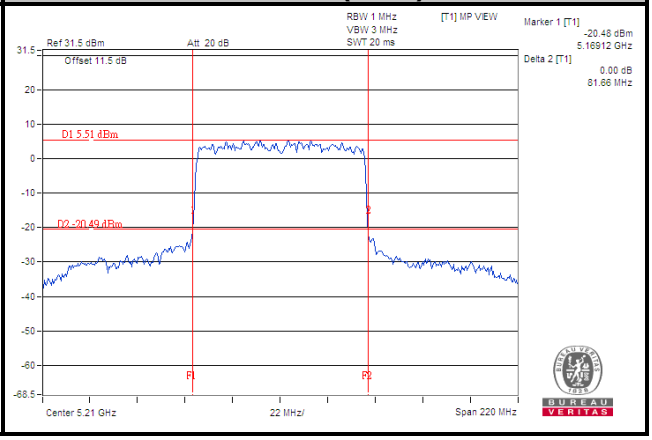
| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 36 | 5180 | 34.04 | 28.87 |
| 40 | 5200 | 34.22 | 31.93 |
| 48 | 5240 | 34.35 | 28.11 |

**802.11ax (HE40)**

| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 38 | 5190 | 46.91 | 45.60 |
| 46 | 5230 | 78.21 | 77.62 |

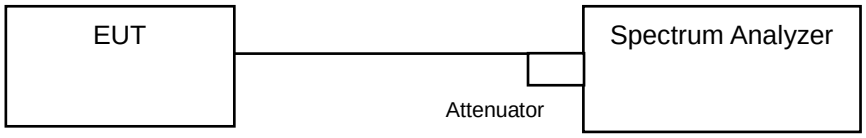
**802.11ax (HE80)**

| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 42 | 5210 | 80.91 | 81.66 |

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

## 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 SAMPLE. 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 Results

**802.11a**

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 36 | 5180 | 17.28 | 16.68 |
| 40 | 5200 | 17.40 | 16.68 |
| 48 | 5240 | 17.16 | 16.68 |
| 149 | 5745 | 18.72 | 16.80 |
| 157 | 5785 | 16.80 | 17.04 |
| 165 | 5825 | 17.76 | 17.04 |

**802.11ax (HE20)**

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 36 | 5180 | 19.80 | 19.08 |
| 40 | 5200 | 19.68 | 19.20 |
| 48 | 5240 | 19.68 | 19.08 |
| 149 | 5745 | 19.92 | 19.08 |
| 157 | 5785 | 19.68 | 19.92 |
| 165 | 5825 | 19.92 | 20.28 |

**802.11ax (HE40)**

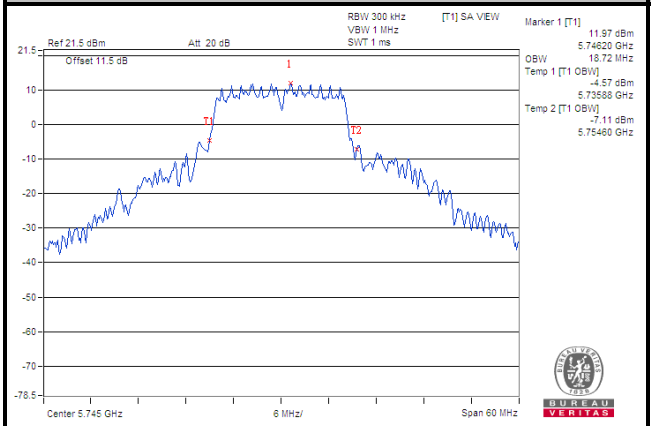
| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 38 | 5190 | 38.40 | 38.40 |
| 46 | 5230 | 38.99 | 39.36 |
| 151 | 5755 | 47.76 | 41.28 |
| 159 | 5795 | 47.76 | 40.56 |

**802.11ax (HE80)**

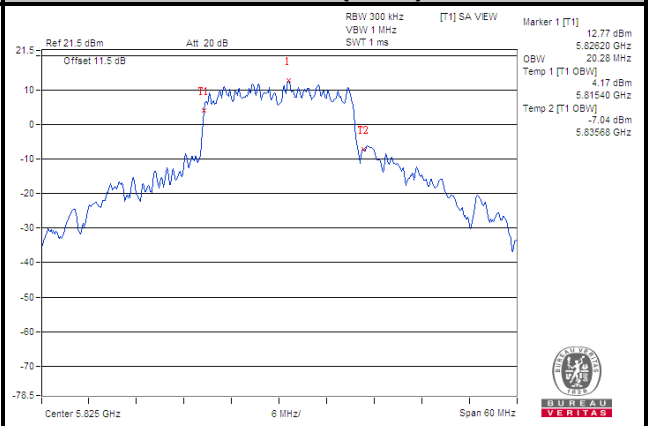
| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) | |
|---|---|---|---|
| | | Chain 0 | Chain 1 |
| 42 | 5210 | 77.28 | 76.80 |
| 155 | 5775 | 77.76 | 77.28 |

## Spectrum Plot of Worst Value

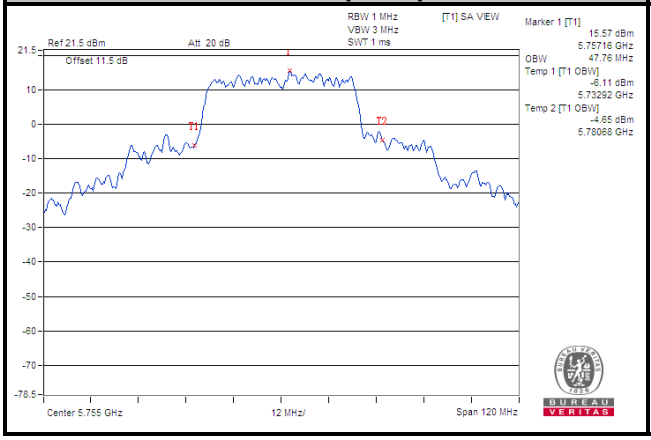
### 802.11a



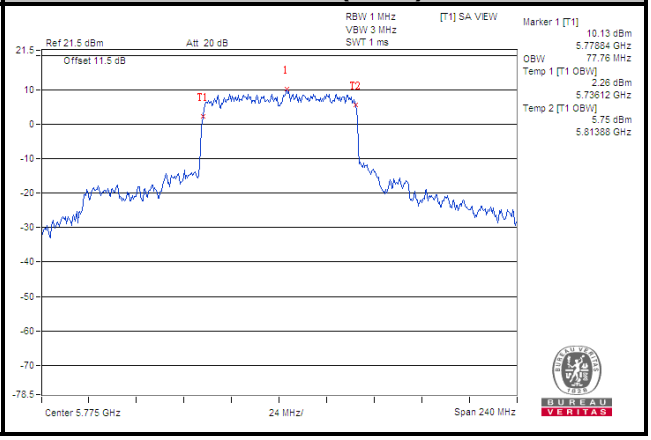

### 802.11ax (HE20)




### 802.11ax (HE40)




### 802.11ax (HE80)

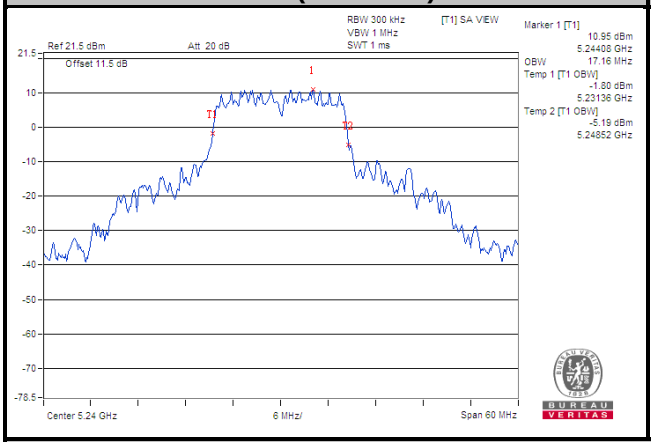


## Chain 0

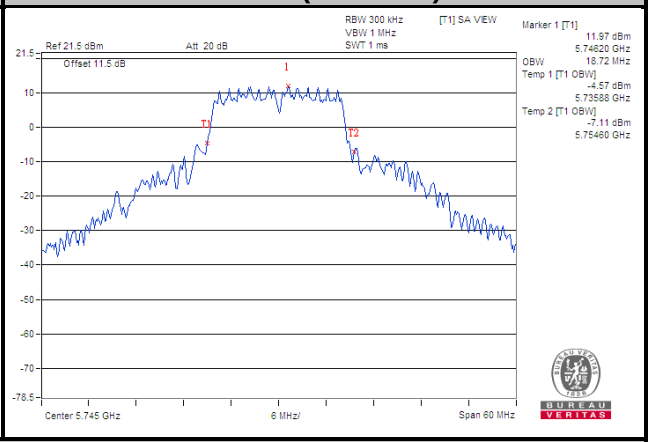
### Spectrum Plot for Nearby DFS Band

#### 802.11a

**Ch 48 (5240 MHz)**

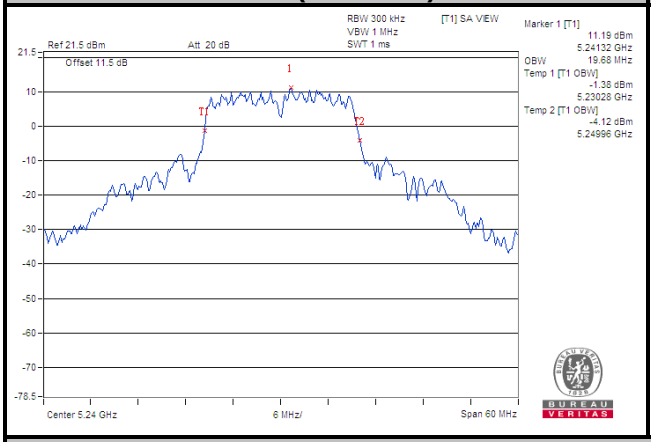



**Ch 149 (5745 MHz)**

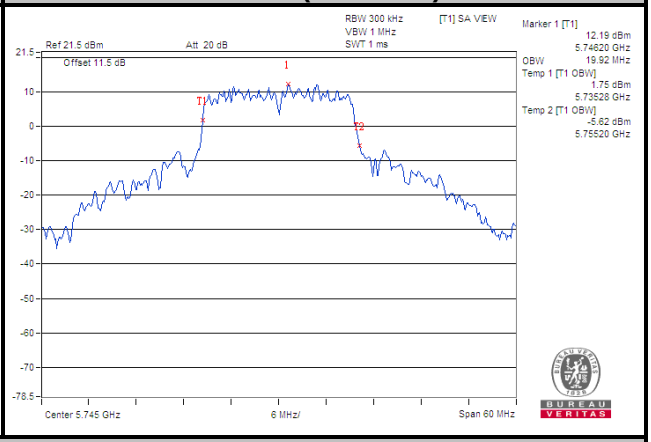



#### 802.11ax (HE20)

**Ch 48 (5240 MHz)**

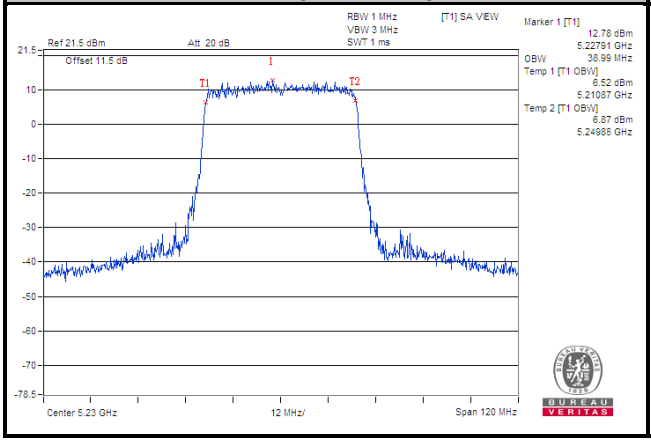



**Ch 149 (5745 MHz)**

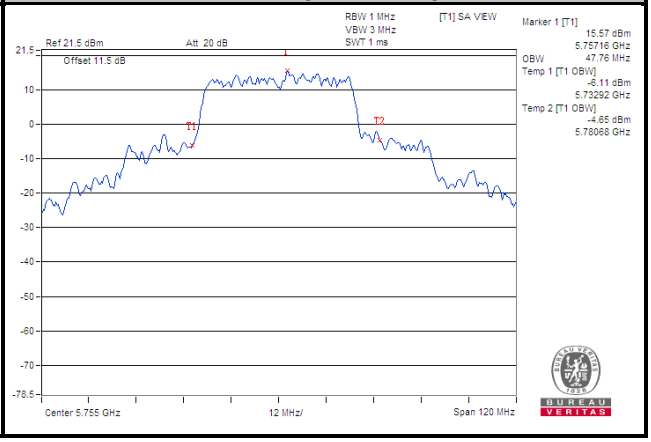


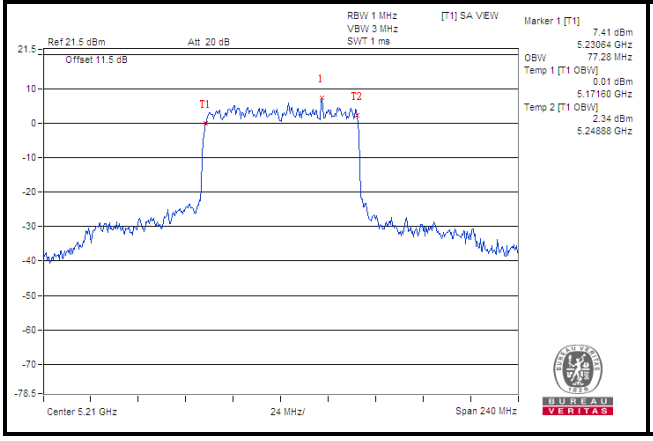
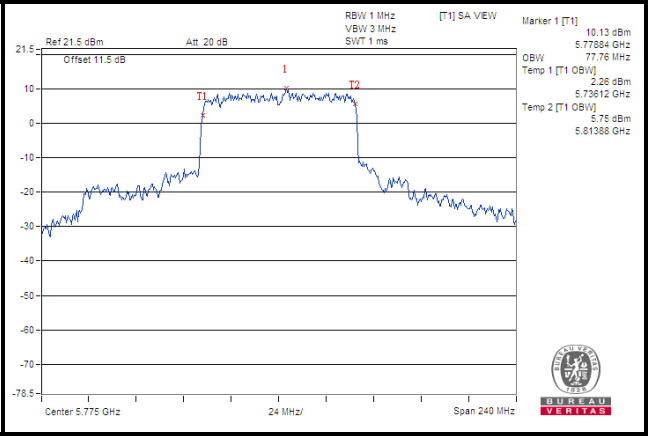

#### 802.11ax (HE40)

**Ch 46 (5230 MHz)**

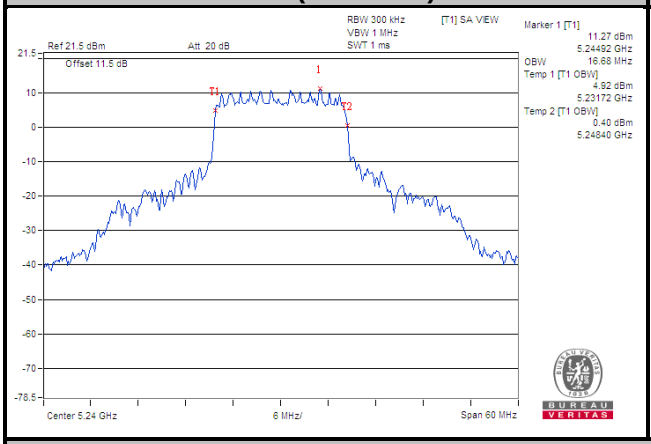
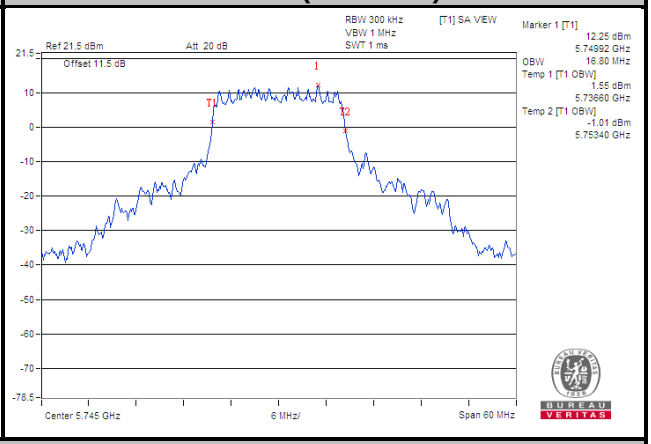
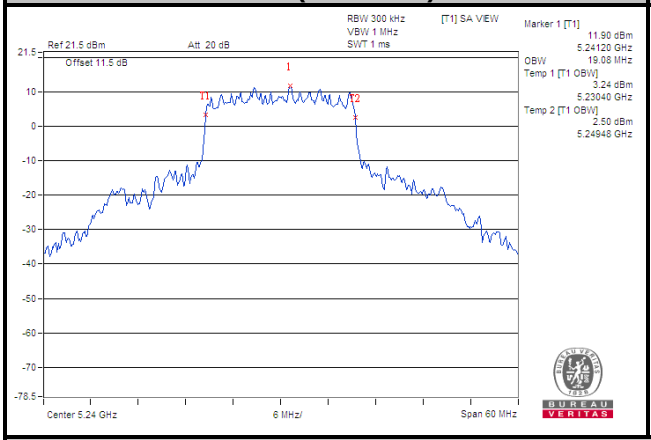
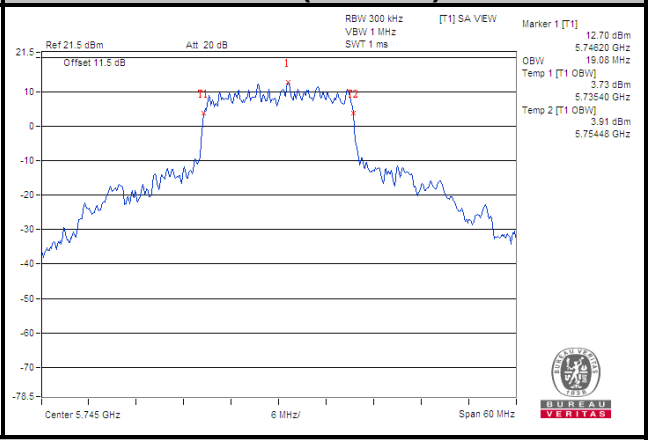
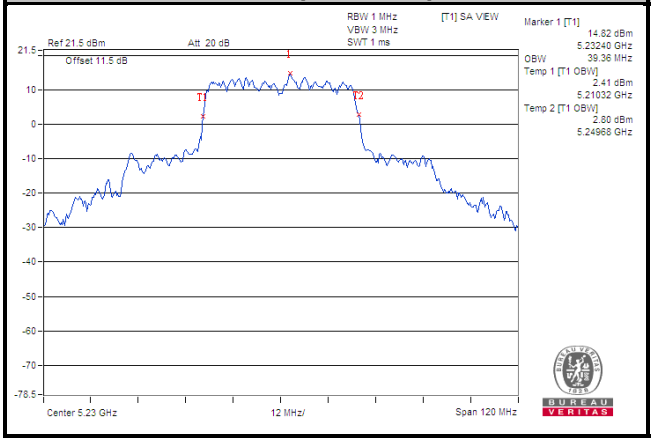
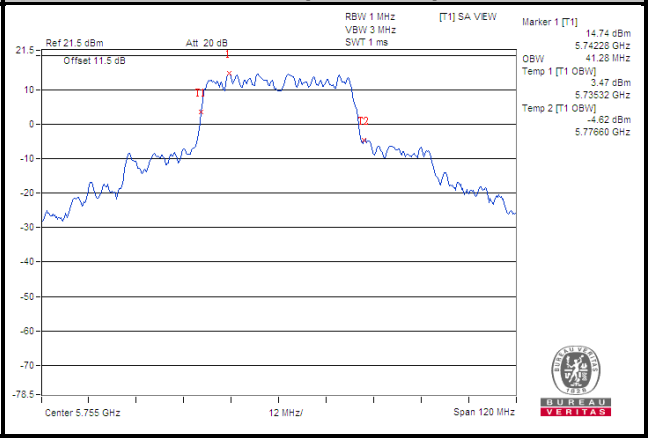


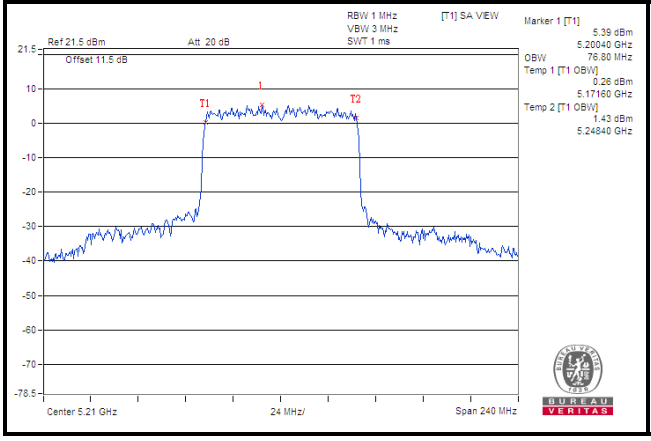
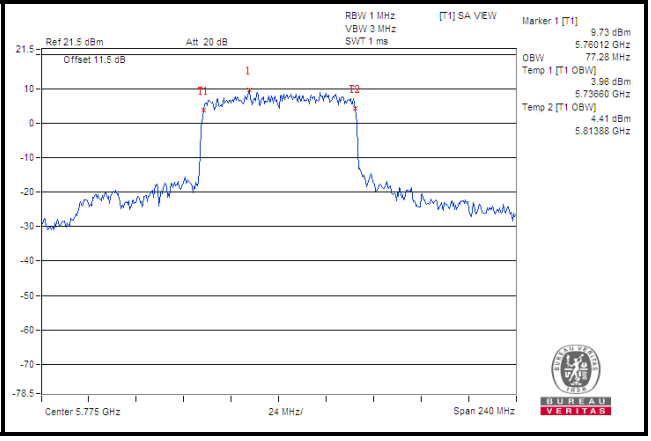

**Ch 151 (5755 MHz)**



| 802.11ax (HE80) | |
|---|---|
| Ch 42 (5210 MHz) | Ch 155 (5775 MHz) |
|  |  |

**Chain 1**

| Spectrum Plot for Nearby DFS Band | |
|---|---|
| **802.11a** | |
| **Ch 48 (5240 MHz)** | **Ch 149 (5745 MHz)** |
|  |  |
| **802.11ax (HE20)** | |
| **Ch 48 (5240 MHz)** | **Ch 149 (5745 MHz)** |
|  |  |
| **802.11ax (HE40)** | |
| **Ch 46 (5230 MHz)** | **Ch 151 (5755 MHz)** |
|  |  |

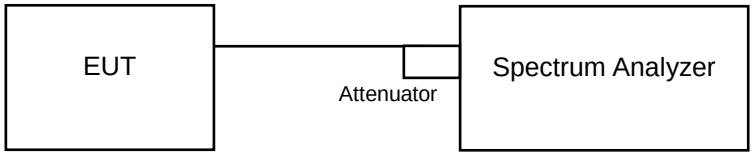
| 802.11ax (HE80) | |
|---|---|
| Ch 42 (5210 MHz) | Ch 155 (5775 MHz) |
|  |  |

## 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 | 17 dBm/MHz |
| | | Fixed point-to-point Access Point | |
| | √ | Indoor Access Point | |
| | | Mobile and Portable client device | 11 dBm/MHz |
| U-NII-2A | | | 11 dBm/MHz |
| U-NII-2C | | | 11 dBm/MHz |
| U-NII-3 | √ | | 30 dBm/500 kHz |

### 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 Duty cycle <98%

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

※**For U-NII-3:** without duty cycle & Duty cycle >98 %

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz).
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

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

4.5.7 Test Results

**For U-NII-1 Band**

**802.11a**

| Channel | Frequency (MHz) | PSD (dBm/MHz) | | Duty Factor (dB) | Total PSD with Duty Factor (dBm/MHz) | Max. Limit (dBm/MHz) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 36 | 5180 | 8.56 | 7.29 | 0.36 | 11.34 | 14.69 | Pass |
| 40 | 5200 | 8.60 | 8.48 | 0.36 | 11.91 | 14.69 | Pass |
| 48 | 5240 | 8.40 | 8.59 | 0.36 | 11.87 | 14.69 | Pass |

**Note:**

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 8.31$ dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.31-6) = 14.69 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

**802.11ax (HE20)**

| Channel | Frequency (MHz) | PSD (dBm/MHz) | | Duty Factor (dB) | Total PSD with Duty Factor (dBm/MHz) | Max. Limit (dBm/MHz) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 36 | 5180 | 8.20 | 8.85 | 0.19 | 11.73 | 14.69 | Pass |
| 40 | 5200 | 8.23 | 8.72 | 0.19 | 11.68 | 14.69 | Pass |
| 48 | 5240 | 8.10 | 8.57 | 0.19 | 11.54 | 14.69 | Pass |

**Note:**

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 8.31$ dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.31-6) = 14.69 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE40)

| Channel | Frequency (MHz) | PSD (dBm/MHz) | | Duty Factor (dB) | Total PSD with Duty Factor (dBm/MHz) | Max. Limit (dBm/MHz) | Pass / Fail |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | | |
| 38 | 5190 | 0.54 | 0.01 | 0.21 | 3.50 | 14.69 | Pass |
| 46 | 5230 | 5.17 | 4.73 | 0.21 | 8.17 | 14.69 | Pass |

**Note:**

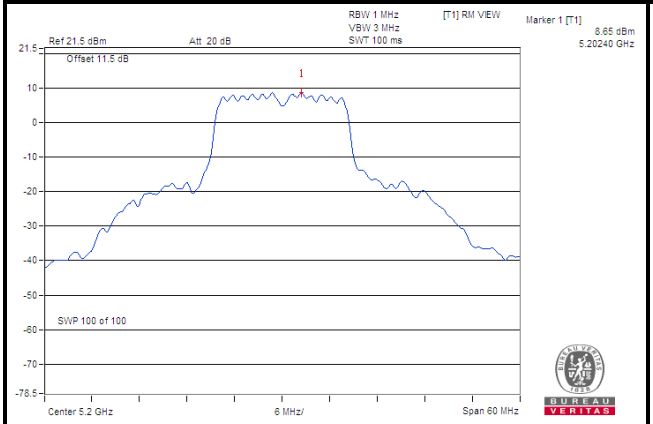
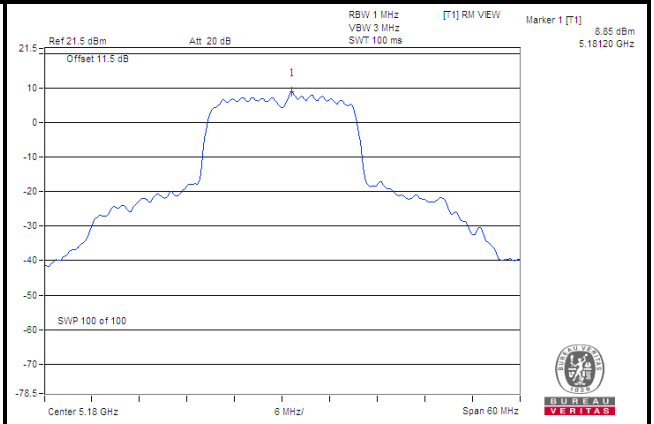
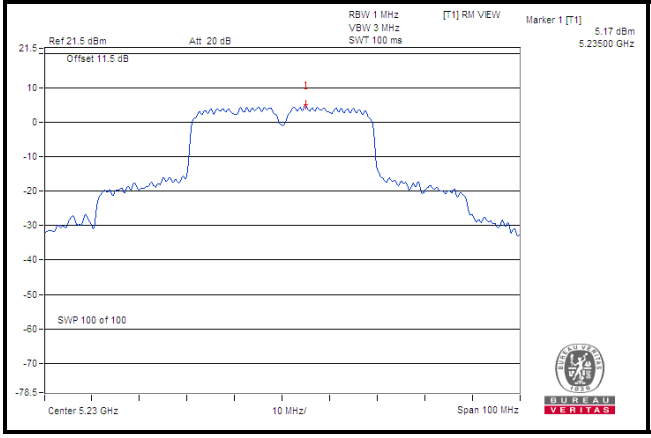
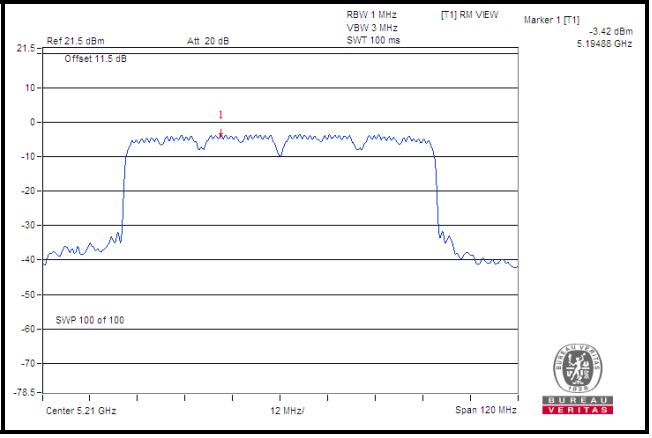
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 8.31$ dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.31-6) = 14.69 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE80)

| Channel | Frequency (MHz) | PSD (dBm/MHz) | | Total Power Density (dBm/MHz) | Max. Limit (dBm/MHz) | Pass / Fail |
|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | | |
| 42 | 5210 | -3.42 | -3.44 | -0.42 | 14.69 | Pass |

**Note:**

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 8.31$ dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.31-6) = 14.69 dBm.

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

## For U-NII-3 Band

### 802.11a

| TX Chain | Channel | Frequency (MHz) | PSD w/o Duty Factor | | 10 log (N=2) dB | Duty Factor (dB) | Total PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---|---|---|---|---|---|---|---|---|---|
| | | | (dBm/300 kHz) | (dBm/500 kHz) | | | | | |
| 0 | 149 | 5745 | 4.9 | 7.12 | 3.01 | 0.36 | 10.49 | 27.69 | Pass |
| | 157 | 5785 | 3.86 | 6.08 | 3.01 | 0.36 | 9.45 | 27.69 | Pass |
| | 165 | 5825 | 4.67 | 6.89 | 3.01 | 0.36 | 10.26 | 27.69 | Pass |
| 1 | 149 | 5745 | 4.31 | 6.53 | 3.01 | 0.36 | 9.9 | 27.69 | Pass |
| | 157 | 5785 | 3.43 | 5.65 | 3.01 | 0.36 | 9.02 | 27.69 | Pass |
| | 165 | 5825 | 4.55 | 6.77 | 3.01 | 0.36 | 10.14 | 27.69 | Pass |

**Note:**

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}$]= 8.31 > 6 dBi , so the power density limit shall be reduced to 30-(8.31-6) = 27.69 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE20)

| TX Chain | Channel | Frequency (MHz) | PSD | | 10 log (N=2) dB | Duty Factor (dB) | Total PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---|---|---|---|---|---|---|---|---|---|
| | | | (dBm/300 kHz) | (dBm/500 kHz) | | | | | |
| 0 | 149 | 5745 | 3.26 | 5.48 | 3.01 | 0.19 | 8.68 | 27.69 | Pass |
| | 157 | 5785 | 3.35 | 5.57 | 3.01 | 0.19 | 8.77 | 27.69 | Pass |
| | 165 | 5825 | 3.51 | 5.73 | 3.01 | 0.19 | 8.93 | 27.69 | Pass |
| 1 | 149 | 5745 | 3.8 | 6.02 | 3.01 | 0.19 | 9.22 | 27.69 | Pass |
| | 157 | 5785 | 4 | 6.22 | 3.01 | 0.19 | 9.42 | 27.69 | Pass |
| | 165 | 5825 | 4.25 | 6.47 | 3.01 | 0.19 | 9.67 | 27.69 | Pass |

**Note:**

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}$]= 8.31 > 6 dBi , so the power density limit shall be reduced to 30-(8.31-6) = 27.69 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE40)

| TX Chain | Channel | Frequency (MHz) | PSD | | 10 log (N=2) dB | Duty Factor (dB) | Total PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---|---|---|---|---|---|---|---|---|---|
| | | | (dBm/300 kHz) | (dBm/500 kHz) | | | | | |
| 0 | 151 | 5755 | -1.24 | 0.98 | 3.01 | 0.21 | 4.2 | 27.69 | Pass |
| | 159 | 5795 | -1.26 | 0.96 | 3.01 | 0.21 | 4.18 | 27.69 | Pass |
| 1 | 151 | 5755 | -1.66 | 0.56 | 3.01 | 0.21 | 3.78 | 27.69 | Pass |
| | 159 | 5795 | -1.56 | 0.66 | 3.01 | 0.21 | 3.88 | 27.69 | Pass |

**Note:**

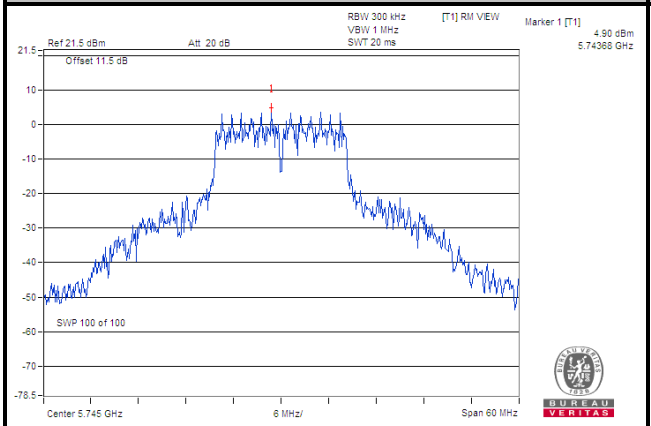
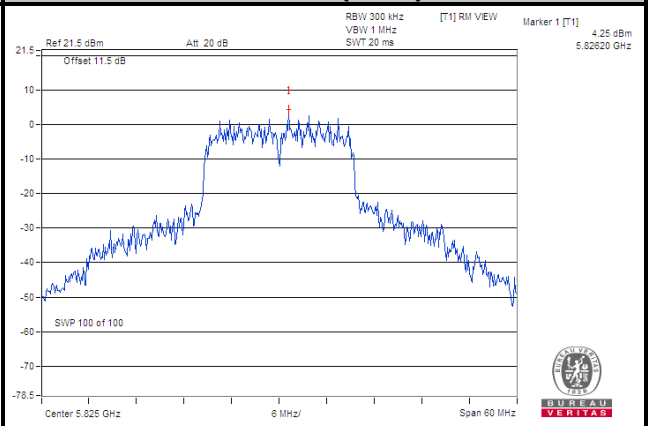
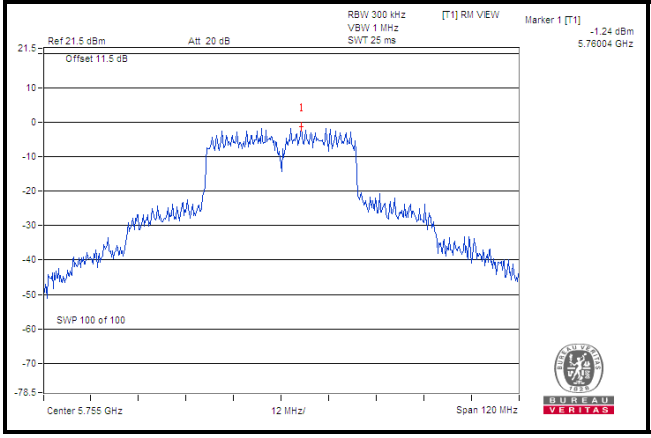
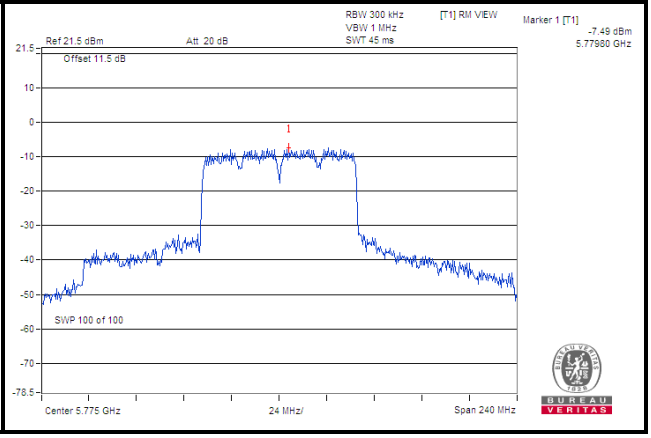
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}$]= 8.31 > 6 dBi , so the power density limit shall be reduced to 30-(8.31-6) = 27.69 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE80)

| TX Chain | Channel | Freq. (MHz) | PSD | | 10 log (N=2) dB | Total PSD (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---|---|---|---|---|---|---|---|---|
| | | | (dBm/300 kHz) | (dBm/500 kHz) | | | | |
| 0 | 155 | 5775 | -7.49 | -5.27 | 3.01 | -2.26 | 27.69 | Pass |
| 1 | 155 | 5775 | -8.03 | -5.81 | 3.01 | -2.8 | 27.69 | Pass |

**Note:**

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}$]= 8.31 > 6 dBi , so the power density limit shall be reduced to 30-(8.31-6) = 27.69 dBm.

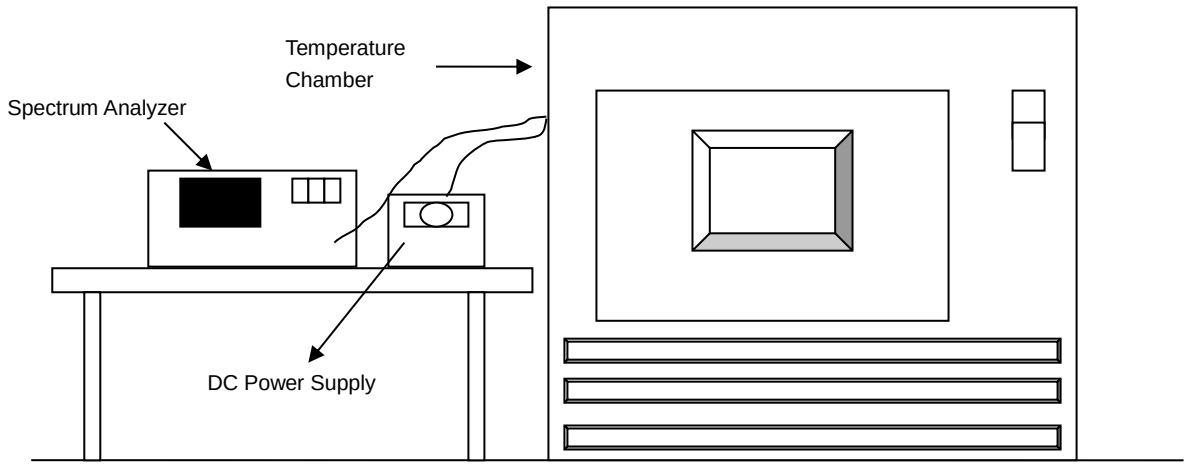
| Spectrum Plot of Worst Value | |
|---|---|
| 802.11a | 802.11ax (HE20) |
|  |  |
| 802.11ax (HE40) | 802.11ax (HE80) |
|  |  |

## 4.6 Frequency Stability

### 4.6.1 Limit of Frequency Stability Measurement

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

### 4.6.2 Test Setup




### 4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 Test Procedure

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

### 4.6.5 Deviation from Test Standard

No deviation.

### 4.6.6 EUT Operating Condition

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

4.6.7 Test Results

| Frequency Stability Versus Temp. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Frequency: 5180 MHz | | | | | | | | | |
| Temp. (℃) | Power Supply (Vac) | 0 Minute | | 2 Minute | | 5 Minute | | 10 Minute | |
| | | Measured Frequency (MHz) | Result | Measured Frequency (MHz) | Result | Measured Frequency (MHz) | Result | Measured Frequency (MHz) | Result |
| 40 | 120 | 5180.0236 | PASS | 5180.0219 | PASS | 5180.0246 | PASS | 5180.0221 | PASS |
| 30 | 120 | 5179.9892 | PASS | 5179.9847 | PASS | 5179.9889 | PASS | 5179.9881 | PASS |
| 20 | 120 | 5180.0022 | PASS | 5180.0027 | PASS | 5180.0036 | PASS | 5180.005 | PASS |
| 10 | 120 | 5180.0183 | PASS | 5180.0155 | PASS | 5180.0182 | PASS | 5180.0194 | PASS |
| 0 | 120 | 5180.0032 | PASS | 5180.0052 | PASS | 5180.0047 | PASS | 5180.0035 | PASS |

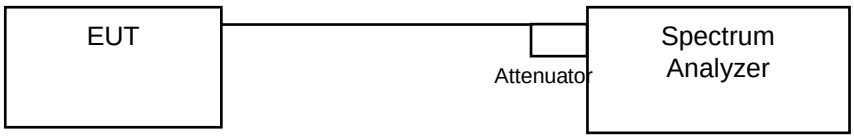
| Frequency Stability Versus Voltage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Frequency: 5180 MHz | | | | | | | | | |
| Temp. (℃) | Power Supply (Vac) | 0 Minute | | 2 Minute | | 5 Minute | | 10 Minute | |
| | | Measured Frequency (MHz) | Result | Measured Frequency (MHz) | Result | Measured Frequency (MHz) | Result | Measured Frequency (MHz) | Result |
| 20 | 138 | 5180.0032 | PASS | 5180.0021 | PASS | 5180.0027 | PASS | 5180.0056 | PASS |
| | 120 | 5180.0022 | PASS | 5180.0027 | PASS | 5180.0036 | PASS | 5180.005 | PASS |
| | 102 | 5180.0016 | PASS | 5180.0033 | PASS | 5180.0033 | PASS | 5180.0041 | PASS |

## 4.7 6 dB Bandwidth Measurement

### 4.7.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

### 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

**MEASUREMENT PROCEDURE REF**

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

### 4.7.5 Deviation from Test Standard

No deviation.

### 4.7.6 EUT Operating Condition

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

4.7.7 Test Results

**802.11a**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | | Minimum Limit (MHz) | Pass / Fail |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | |
| 149 | 5745 | 15.24 | 15.23 | 0.5 | Pass |
| 157 | 5785 | 15.24 | 15.23 | 0.5 | Pass |
| 165 | 5825 | 15.57 | 15.24 | 0.5 | Pass |

**802.11ax (HE20)**

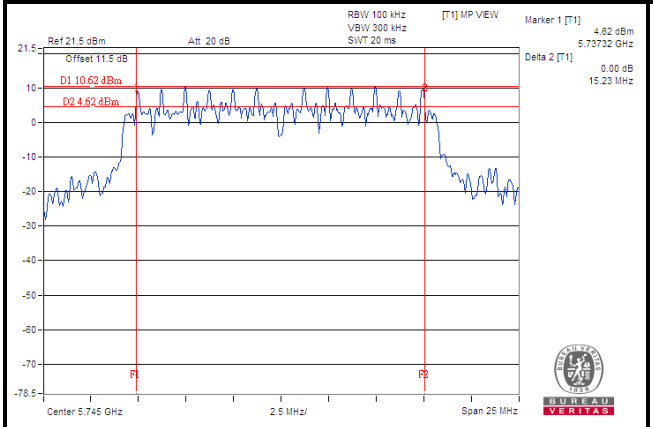
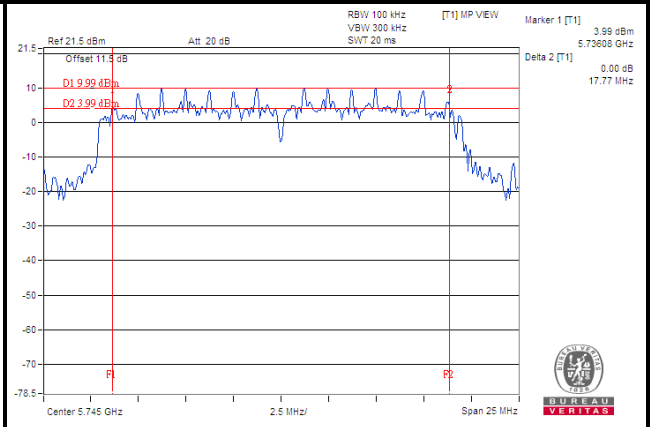
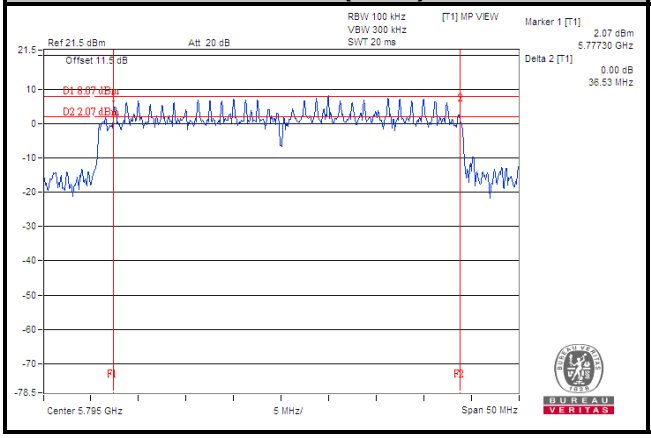
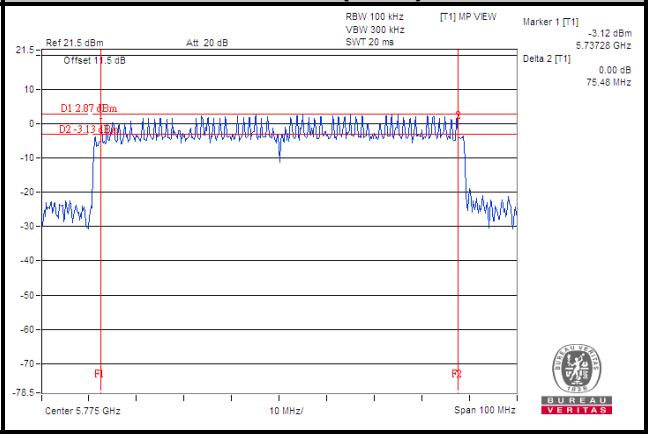
| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | | Minimum Limit (MHz) | Pass / Fail |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | |
| 149 | 5745 | 17.77 | 17.90 | 0.5 | Pass |
| 157 | 5785 | 17.79 | 17.91 | 0.5 | Pass |
| 165 | 5825 | 17.79 | 17.91 | 0.5 | Pass |

**802.11ax (HE40)**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | | Minimum Limit (MHz) | Pass / Fail |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | |
| 151 | 5755 | 36.54 | 36.61 | 0.5 | Pass |
| 159 | 5795 | 36.53 | 36.54 | 0.5 | Pass |

**802.11ax (HE80)**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | | Minimum Limit (MHz) | Pass / Fail |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | | |
| 155 | 5775 | 75.48 | 75.62 | 0.5 | Pass |

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

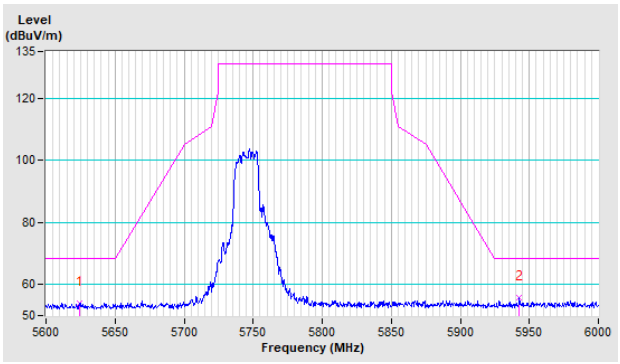
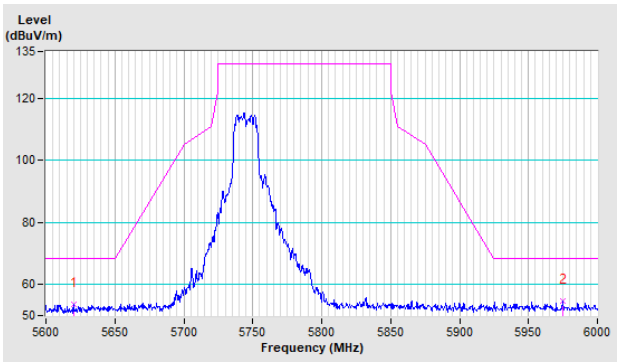
## 5 Pictures of Test Arrangements

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

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

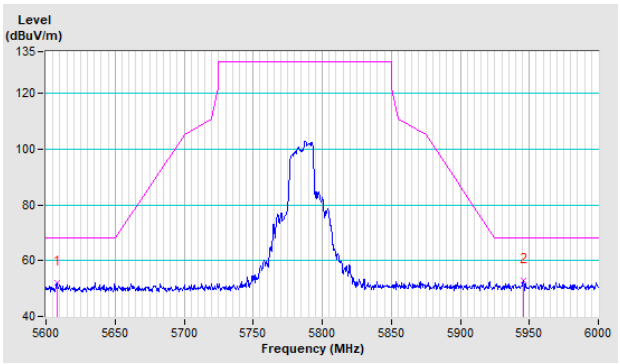
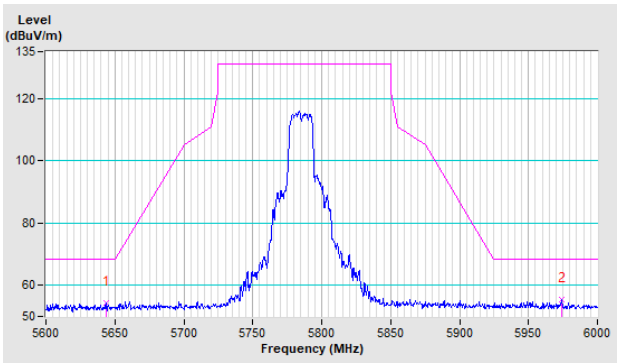
### 802.11a

#### CH 149 5745 MHz

| Horizontal | Vertical |
|---|---|
|  |  |

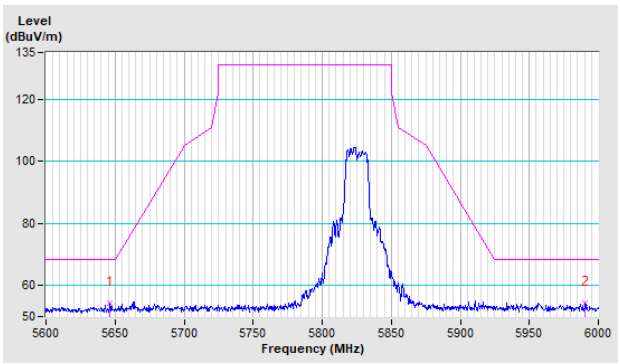
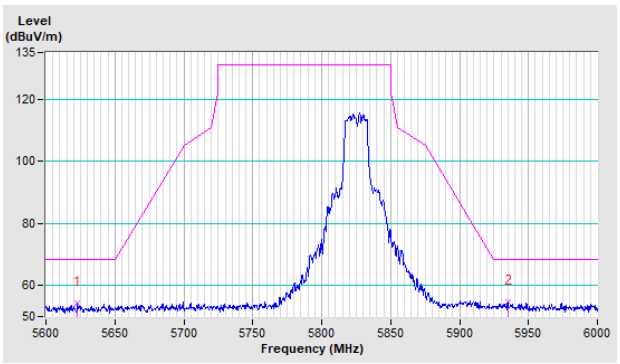


#### CH 157 5785 MHz

| Horizontal | Vertical |
|---|---|
|  |  |

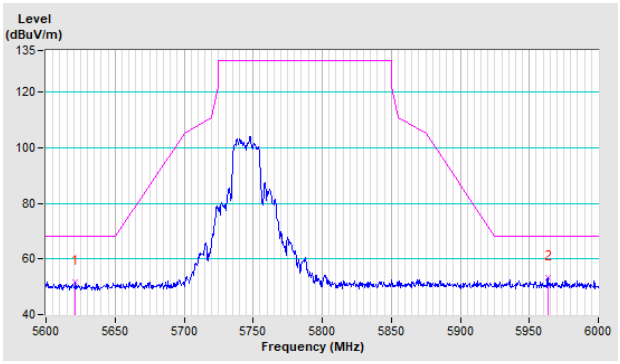
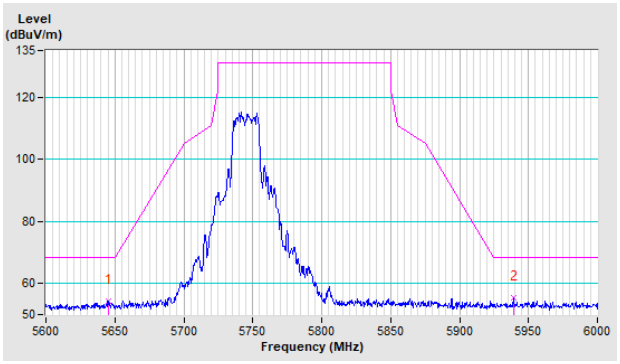


#### CH 165 5825 MHz

| Horizontal | Vertical |
|---|---|
|  |  |

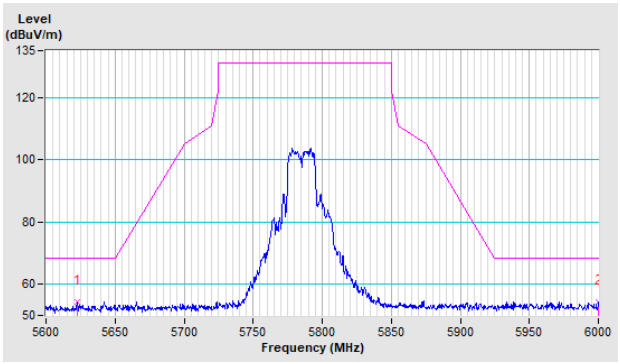
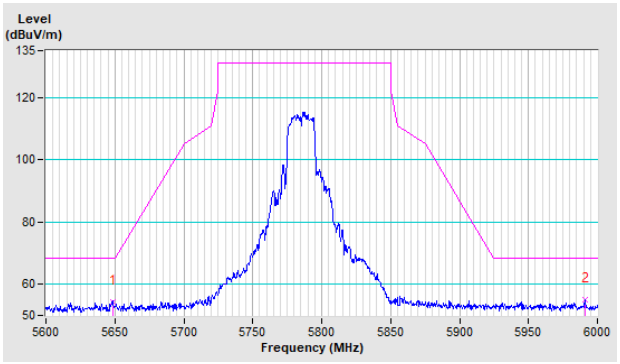
## 802.11ax (HE20)

### CH 149 5745 MHz

| Horizontal | Vertical |
|---|---|
|  |  |

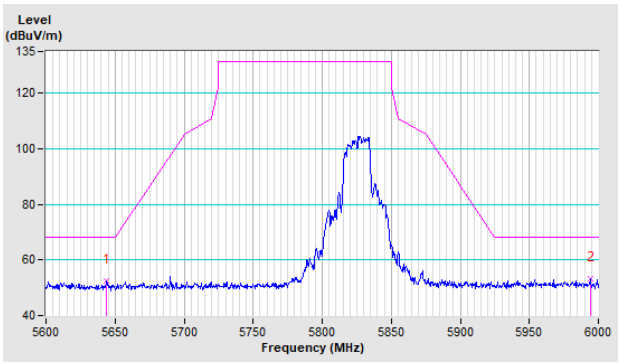
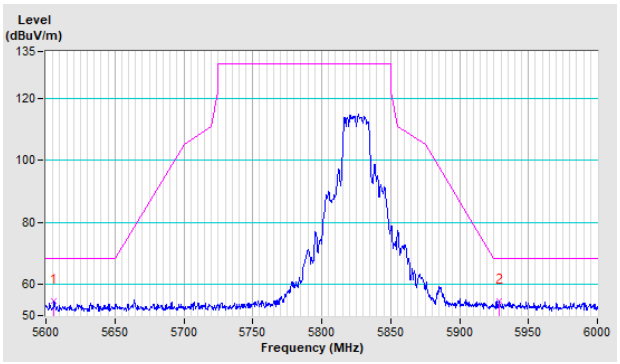


### CH 157 5785 MHz

| Horizontal | Vertical |
|---|---|
|  |  |

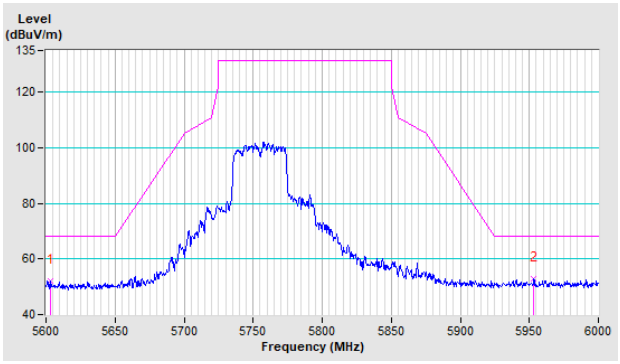
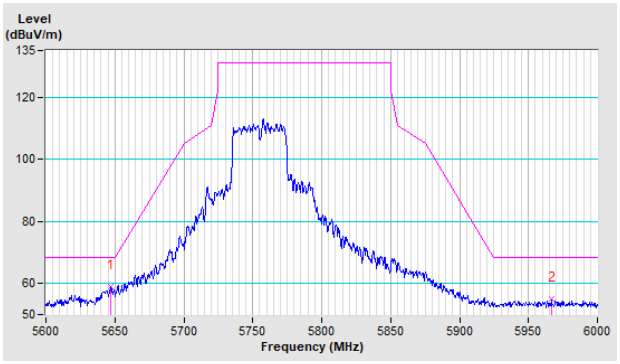


### CH 165 5825 MHz

| Horizontal | Vertical |
|---|---|
|  |  |

## 802.11ax (HE40)

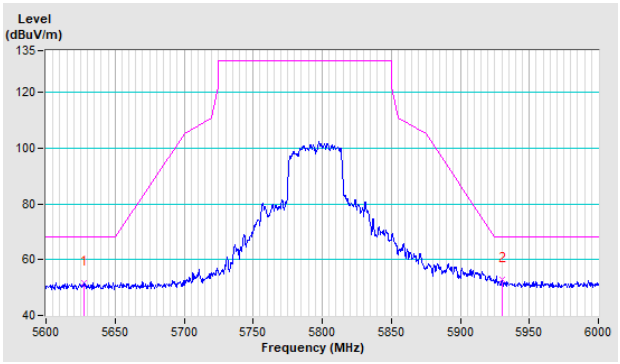
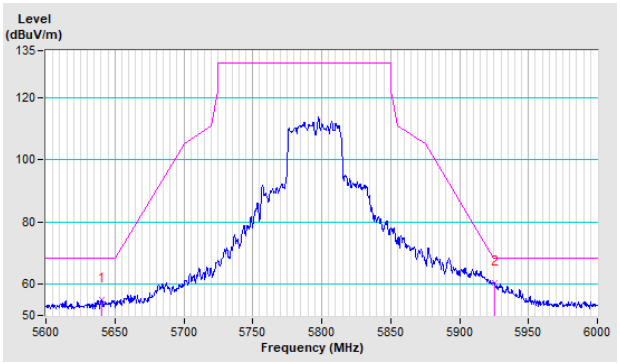
### CH 151 5755 MHz

| Horizontal | Vertical |
|---|---|
|  |  |





### CH 159 5795 MHz

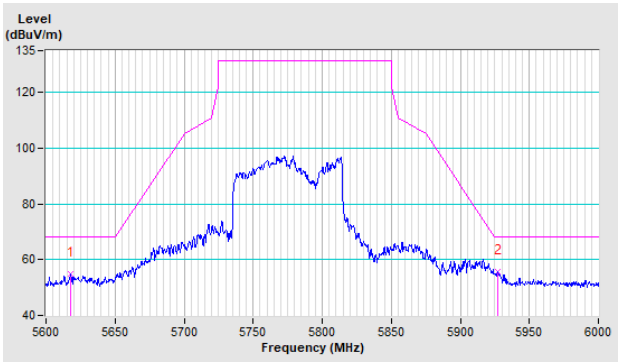
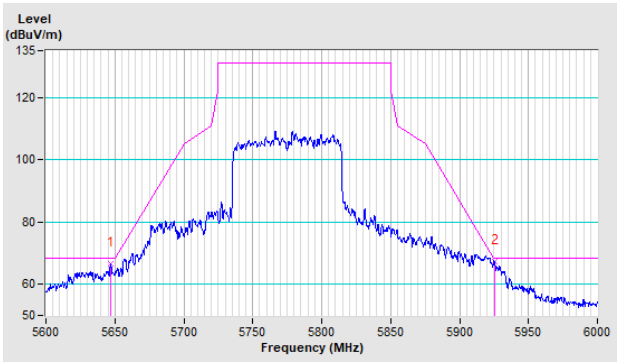
| Horizontal | Vertical |
|---|---|
|  |  |





## 802.11ax (HE80)

### CH 155 5775 MHz

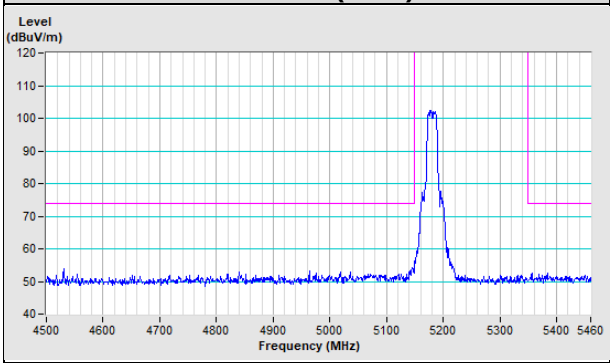
| Horizontal | Vertical |
|---|---|
|  |  |

## Annex B- Band Edge Measurement

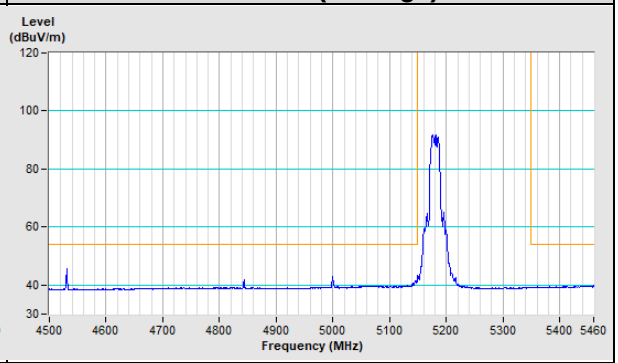
### 802.11a

**802.11a Channel 36**

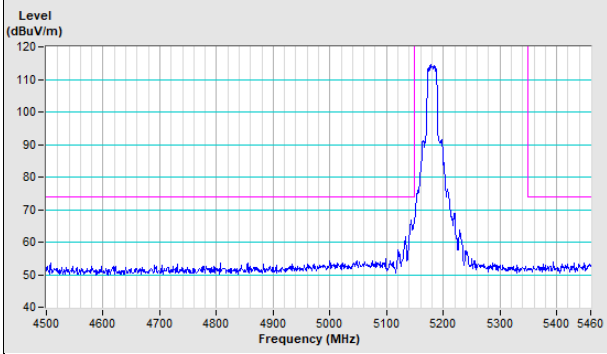
**Horizontal (Peak)**



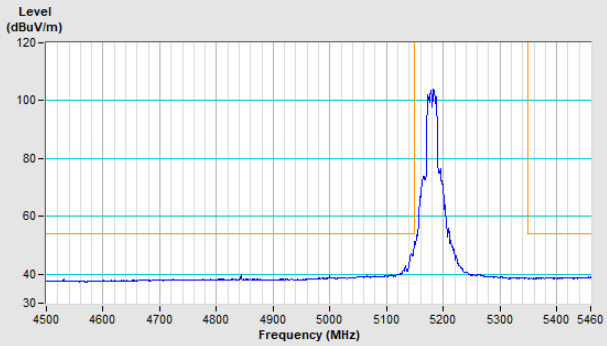

**Horizontal (Average)**




**Vertical (Peak)**

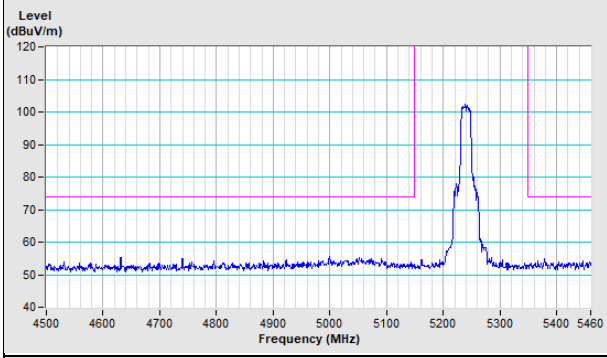



**Vertical (Average)**

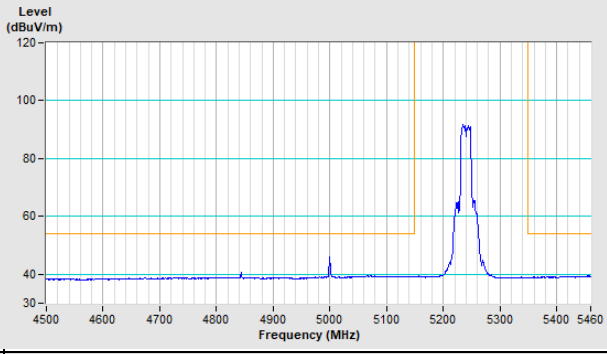



**802.11a Channel 48**

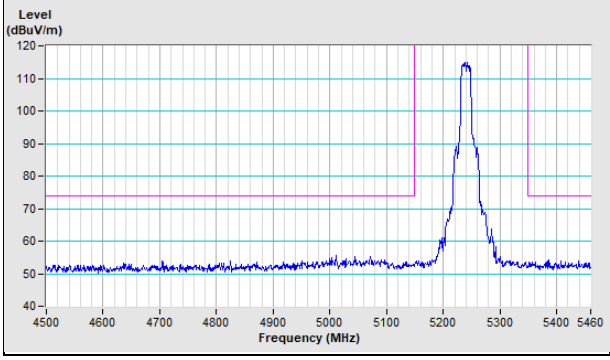
**Horizontal (Peak)**



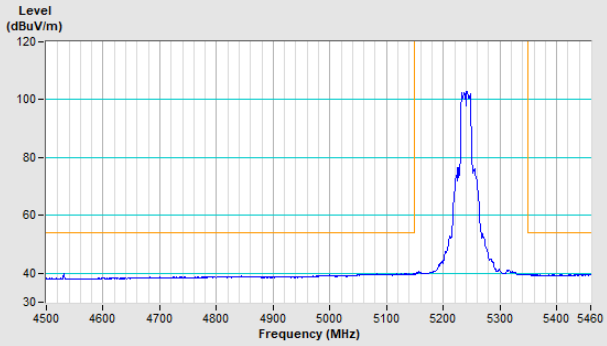

**Horizontal (Average)**




**Vertical (Peak)**



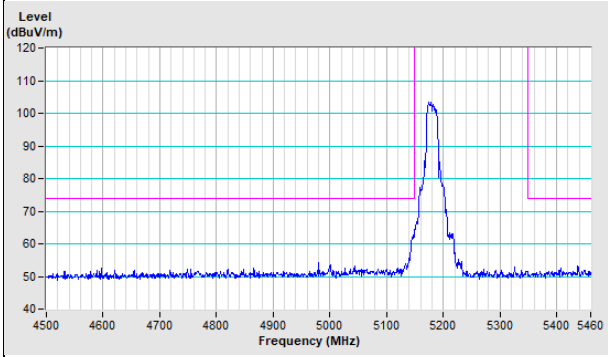

**Vertical (Average)**



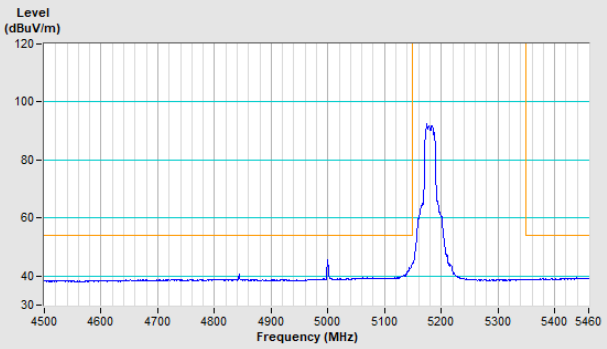
## 802.11ax (HE20)

### 802.11ax (HE20) Channel 36

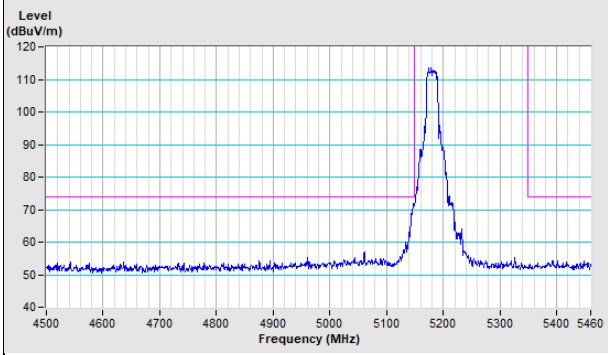
#### Horizontal (Peak)



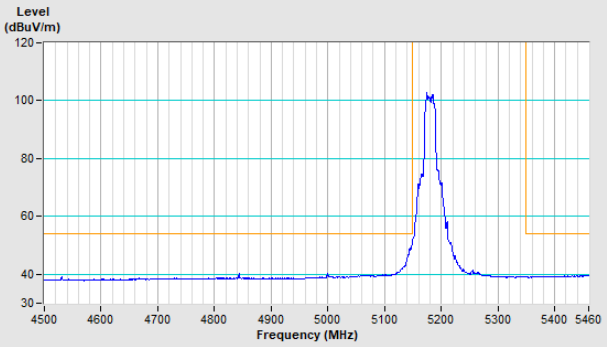

#### Horizontal (Average)




#### Vertical (Peak)

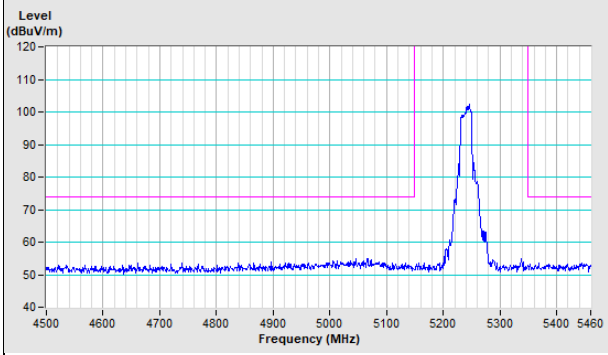



#### Vertical (Average)

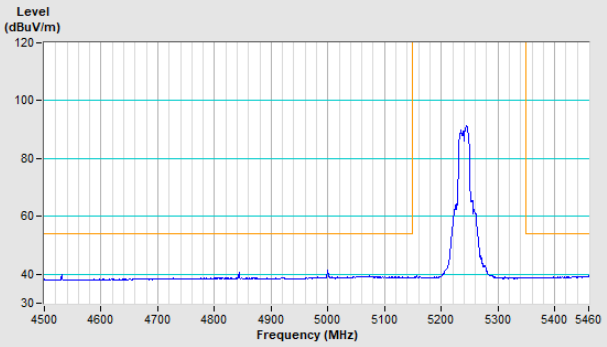



### 802.11ax (HE20) Channel 48

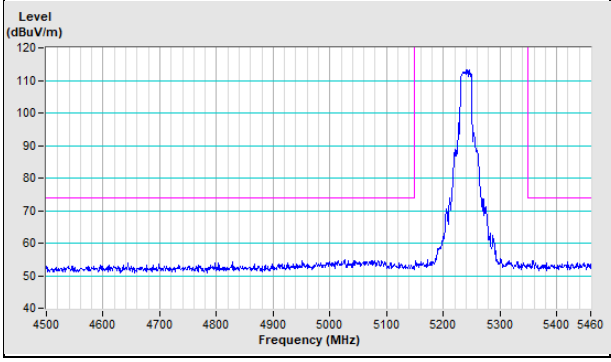
#### Horizontal (Peak)



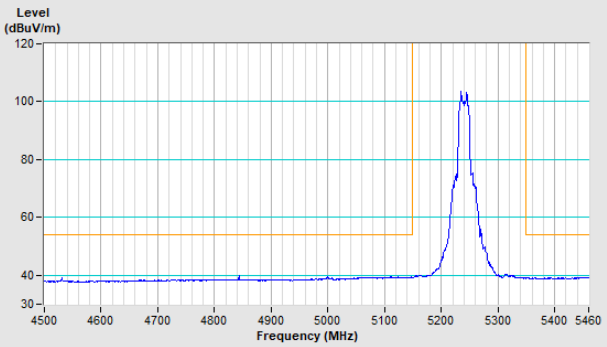

#### Horizontal (Average)




#### Vertical (Peak)



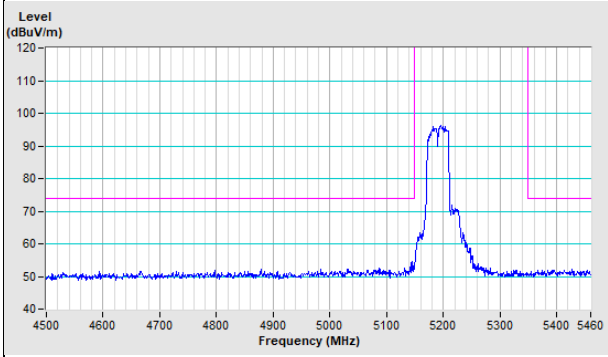

#### Vertical (Average)



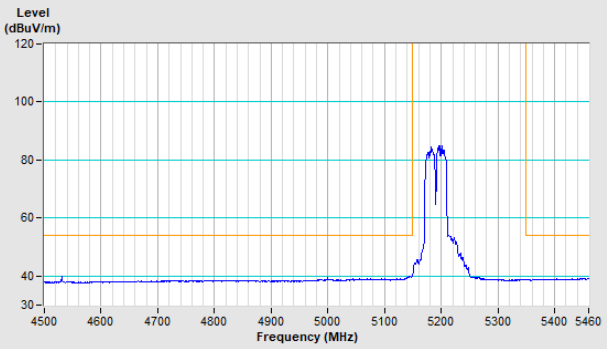
## 802.11ax (HE40)

### 802.11ax (HE40) Channel 38

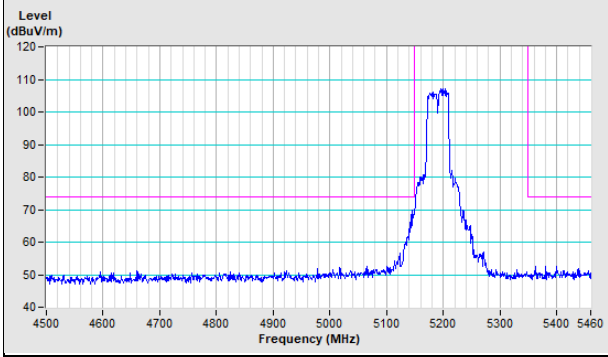
#### Horizontal (Peak)



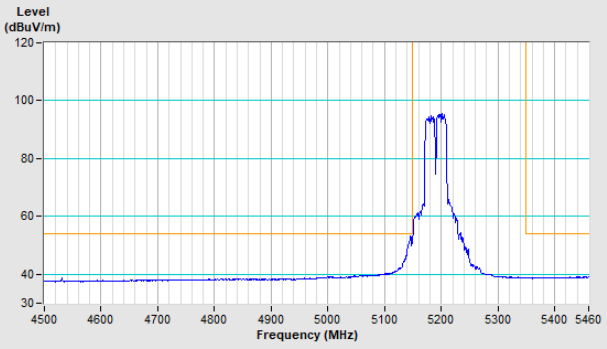

#### Horizontal (Average)




#### Vertical (Peak)

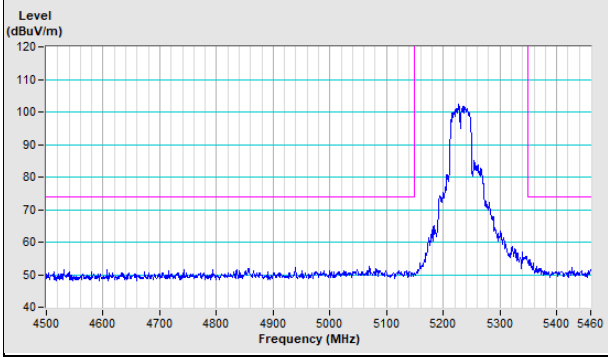



#### Vertical (Average)

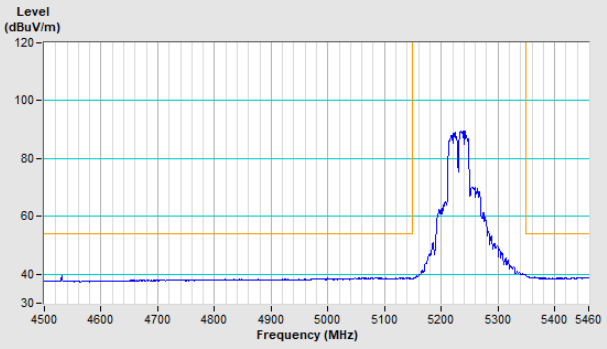



### 802.11ax (HE40) Channel 46

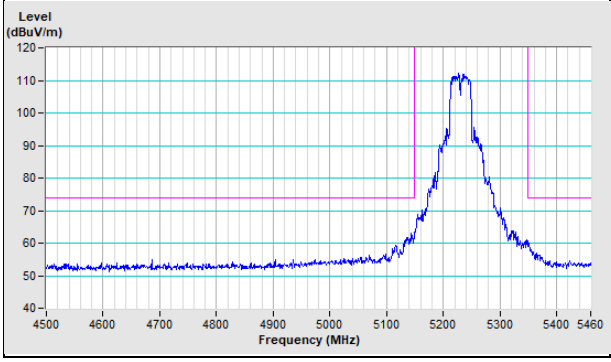
#### Horizontal (Peak)



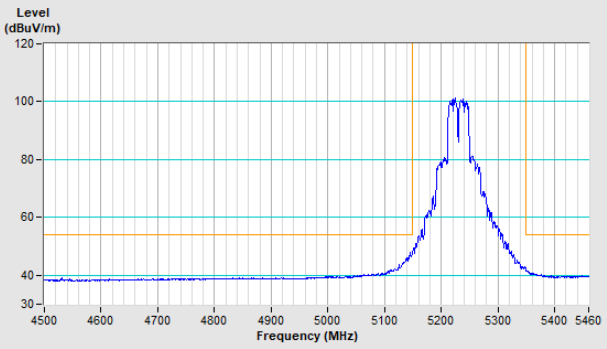

#### Horizontal (Average)



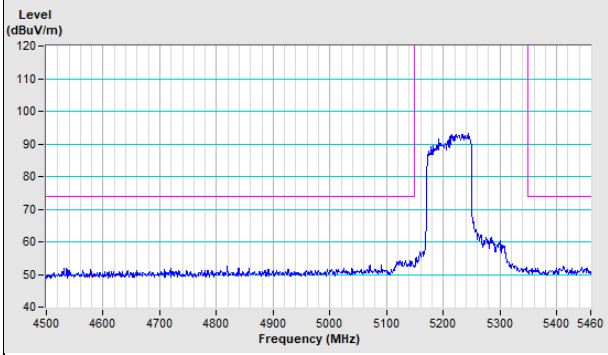
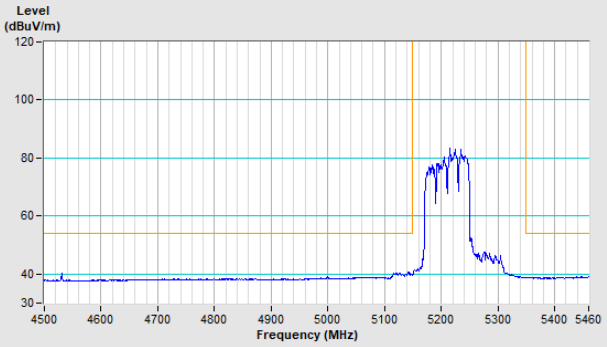
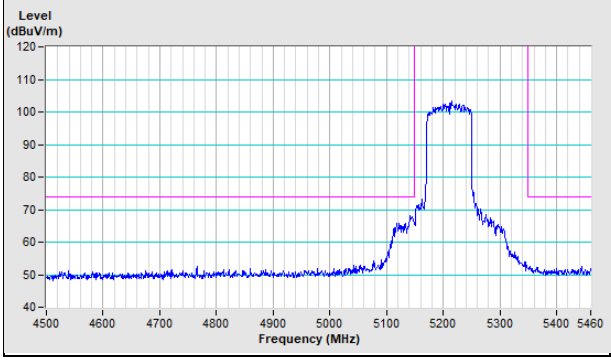
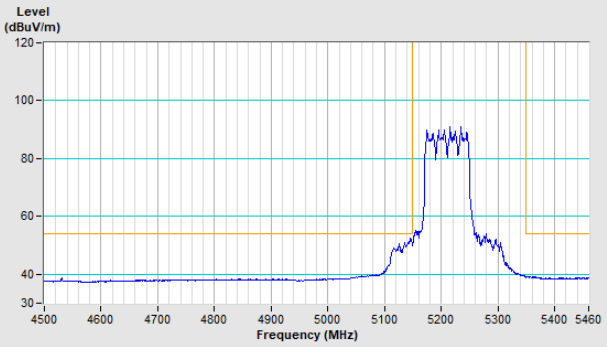

#### Vertical (Peak)




#### Vertical (Average)



## 802.11ax (HE80)

| 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 according to ISO/IEC 17025.

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**Web Site:** www.bureauveritas-adt.com


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

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