# FCC RADIO TEST REPORT

| | | |
|---|---|---|
| **FCC ID** | : | **UZ7ET45CA** |
| **Equipment** | : | **Tablet** |
| **Brand Name** | : | **Zebra** |
| **Model Name** | : | **ET45CA** |
| **Applicant** | : | **Zebra Technologies Corporation<br>1 Zebra Plaza, Holtsville, NY 11742** |
| **Manufacturer** | : | **Zebra Technologies Corporation<br>1 Zebra Plaza, Holtsville, NY 11742** |
| **Standard** | : | **FCC Part 15 Subpart E §15.407** |

**The product was received on Jun. 10, 2022 and testing was performed from Jun. 15, 2022 to Jul. 18, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.**

Louis Wu

**Approved by: Louis Wu**

***Sporton International Inc. Wensan Laboratory***
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# History of this test report

| Report No. | Version | Description | Issue Date |
|---|---|---|---|
| FR1N2541E | 01 | Initial issue of report | Aug. 16, 2022 |
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# Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---|---|---|---|---|
| 3.1 | 15.403(i) | 26dB Bandwidth | Pass | - |
| 3.1 | 2.1049 | 99% Occupied Bandwidth | Reporting only | - |
| 3.2 | 15.407(a) | Maximum Conducted Output Power | Pass | - |
| 3.3 | 15.407(a) | Power Spectral Density | Pass | - |
| 3.4 | 15.407(b) | Unwanted Emissions | Pass | 1.10 dB under the limit at 5149.500 MHz |
| 3.5 | 15.207 | AC Conducted Emission | Pass | 19.83 dB under the limit at 0.258 MHz |
| 3.6 | 15.203<br>15.407(a) | Antenna Requirement | Pass | - |

**Declaration of Conformity:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
   It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

**Comments and Explanations:**

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Keven Cheng**

**Report Producer: Ming Chen**

# 1 General Description

## 1.1 Product Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | Tablet |
| **Brand Name** | Zebra |
| **Model Name** | ET45CA |
| **FCC ID** | UZ7ET45CA |
| **EUT supports Radios application** | GSM/EGPRS/WCDMA/HSPA/LTE/5G NR/NFC/GNSS<br>WLAN 11b/g/n HT20<br>WLAN 11a/n HT20/HT40<br>WLAN 11ac VHT20/VHT40/VHT80<br>WLAN 11ax HE20/HE40/HE80<br>Bluetooth BR/EDR/LE<br>Note: 2.4G doesn't support BW 40/80. |
| **HW Version** | EV2-2 |
| **SW Version** | ET45-userdebug 11 11-10-12.00-RG-U00-PRD-GSE MXJ release-keys |
| **MFD** | 10MAY22 |
| **EUT Stage** | Identical Prototype |

**Remark:** The above EUT's information was declared by manufacturer.

| Specification of Accessories | | | | |
|---|---|---|---|---|
| **Battery** | **Brand Name** | Zebra | **Model Name** | BT-000455 |

| Supported Unit Used in Test Configuration and System | | | | |
|---|---|---|---|---|
| **AC Adapter** | **Brand Name** | Zebra | **Part Number** | PWR-WUA5V12W0US |
| **Earphone 1** | **Brand Name** | Zebra | **Part Number** | HDST-35MM-PTVP-01 |
| **Earphone 2** | **Brand Name** | Zebra | **Part Number** | HDST-USBC-PTT1-01 |
| **USB Cable (Type C to Type A)** | **Brand Name** | Zebra | **Part Number** | CBL-TC5X-USBC2A-01 |
| **Type C-Audio Cable (Type C to 3.5mm)** | **Brand Name** | Zebra | **Part Number** | ADP-USBC-35MM1-01 |

## 1.2 Product Specification of Equipment Under Test

| Product Specification is subject to this standard | |
|---|---|
| **Tx/Rx Frequency Range** | 5180 MHz ~ 5240 MHz<br>5260 MHz ~ 5320 MHz<br>5500 MHz ~ 5720 MHz |
| **Maximum Output Power to Antenna <CDD Mode>** | **<5180 MHz ~ 5240 MHz>**<br>**MIMO <Ant. 6+7>**<br>802.11a: 20.58 dBm / 0.1143 W<br>802.11n HT20: 20.48 dBm / 0.1117 W<br>802.11n HT40: 22.83 dBm / 0.1919 W<br>802.11ac VHT20: 20.48 dBm / 0.1117 W<br>802.11ac VHT40:22.83 dBm / 0.1919 W<br>802.11ac VHT80: 18.63 dBm / 0.0729 W<br>802.11ax HE20: 20.58 dBm / 0.1143 W<br>802.11ax HE40: 22.93 dBm / 0.1963 W<br>802.11ax HE80: 18.73 dBm / 0.0746 W<br>**<5260 MHz ~ 5320 MHz>**<br>**MIMO <Ant. 6+7>**<br>802.11a: 20.53 dBm / 0.1130 W<br>802.11n HT20: 20.67 dBm / 0.1167 W<br>802.11n HT40: 22.97 dBm / 0.1982 W<br>802.11ac VHT20:20.67 dBm / 0.1167 W<br>802.11ac VHT40:22.97 dBm / 0.1982 W<br>802.11ac VHT80: 19.17 dBm / 0.0826 W<br>802.11ax HE20: 20.77 dBm / 0.1194 W<br>802.11ax HE40: 23.07 dBm / 0.2028 W<br>802.11ax HE80: 19.27 dBm / 0.0845 W<br>**<5500 MHz ~ 5720 MHz>**<br>**MIMO <Ant. 6+7>**<br>802.11a: 20.98 dBm / 0.1205 W<br>802.11n HT20: 20.68 dBm / 0.1164 W<br>802.11n HT40: 23.36 dBm / 0.2168 W<br>802.11ac VHT20: 20.68 dBm / 0.1164 W<br>802.11ac VHT40: 23.36 dBm / 0.2168 W<br>802.11ac VHT80: 22.87dBm / 0.1936 W<br>802.11ax HE20: 20.78 dBm / 0.1191 W<br>802.11ax HE40: 23.46 dBm / 0.2218 W<br>802.11ax HE80: 22.97 dBm / 0.1982 W |

| Product Specification is subject to this standard | |
|---|---|
| **Maximum Output Power to Antenna <TXBF Mode>** | **<5180 MHz ~ 5240 MHz>**<br>**MIMO <Ant. 6+7>**<br>802.11n HT20: 20.40 dBm / 0.1096 W<br>802.11n HT40: 22.70 dBm / 0.1862 W<br>802.11ax HE20: 20.50 dBm / 0.1122 W<br>802.11ax HE40: 22.80 dBm / 0.1905 W<br>802.11ax HE80: 15.54 dBm / 0.0358 W<br>**<5260 MHz ~ 5320 MHz>**<br>**MIMO <Ant. 6+7>**<br>802.11n HT20: 20.73 dBm / 0.1183 W<br>802.11n HT40: 22.87 dBm / 0.1936 W<br>802.11ax HE20: 20.83 dBm / 0.1211 W<br>802.11ax HE40: 22.97 dBm / 0.1982 W<br>802.11ax HE80: 18.13 dBm / 0.0650 W<br>**<5500 MHz ~ 5720 MHz>**<br>**MIMO <Ant. 6+7>**<br>802.11n HT20: 20.57 dBm / 0.1140 W<br>802.11n HT40: 23.01 dBm / 0.2000 W<br>802.11ax HE20: 20.80 dBm / 0.1167 W<br>802.11ax HE40: 23.11 dBm / 0.2046 W<br>802.11ax HE80: 23.04 dBm / 0.1663 W |
| **99% Occupied Bandwidth <CDD Mode>** | **MIMO <Ant. 6>**<br>802.11a: 17.03 MHz<br>802.11ax HE20: 18.98 MHz<br>802.11ax HE40: 37.96 MHz<br>802.11ax HE80: 77.20 MHz<br>**MIMO <Ant. 7>**<br>802.11a: 16.93 MHz<br>802.11ax HE20: 18.98 MHz<br>802.11ax HE40: 38.56MHz<br>802.11ax HE80: 77.44 MHz |
| **99% Occupied Bandwidth <TXBF Mode>** | **MIMO <Ant. 6>**<br>802.11ax HE20: 18.98 MHz<br>802.11ax HE40: 37.96 MHz<br>802.11ax HE80: 77.20 MHz<br>**MIMO <Ant. 7>**<br>802.11ax HE20: 18.98 MHz<br>802.11ax HE40: 41.35 MHz<br>802.11ax HE80: 77.44 MHz |

| Product Specification is subject to this standard | |
|---|---|
| **Antenna Type** | **Ant. 6:** IFIA Antenna<br>**Ant. 7:** IFIA Antenna |
| **Antenna Gain** | **<5180 MHz ~ 5240 MHz>**<br>Ant. 6: 1.68 dBi<br>Ant. 7: 0.87 dBi |
| | **<5260 MHz ~ 5320 MHz>**<br>Ant. 6: 1.68 dBi<br>Ant. 7: 1.35 dBi |
| | **<5500 MHz ~ 5720 MHz>**<br>Ant. 6: 1.22 dBi<br>Ant. 7: 2.34 dBi |
| **Type of Modulation** | 802.11a/n: OFDM (BPSK/QPSK/16QAM/64QAM)<br>802.11ac: OFDM (BPSK/QPSK/16QAM/64QAM/256QAM)<br>802.11ax: OFDMA (BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM) |
| **Antenna Function Description** | |

| | Ant. 6 | Ant. 7 |
|---|---|---|
| 802.11 a/n/ac/ax MIMO | V | V |
| 802.11 n/ax TXBF | V | V |

**Remark:**

1. MIMO Ant. 6+7 Directional Gain is a calculated result from MIMO Ant. 6 and MIMO Ant. 7. The formula used in calculation is documented in section 3.6.
2. MIMO Ant. 6+7 is a calculated result from sum of the power MIMO Ant. 6 and MIMO Ant. 7.
3. The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.

## 1.3 Modification of EUT

No modifications made to the EUT during the testing.

## 1.4 Testing Location

| | |
|---|---|
| **Test Site** | Sporton International Inc. Wensan Laboratory |
| **Test Site Location** | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist.,<br>Taoyuan City 333010, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| **Test Site No.** | **Sporton Site No.** |
| | TH05-HY, 03CH13-HY, CO07-HY |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW3786

## 1.5 Applicable Standards

According to the specifications declared by the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

**Remark:**

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

# 2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find X plane as worst plane.

b. AC power line Conducted Emission was tested under maximum output power.

## 2.1 Carrier Frequency and Channel

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5150-5250 MHz Band 1 (U-NII-1) | 36 | 5180 | 44 | 5220 |
| | 38* | 5190 | 46* | 5230 |
| | 40 | 5200 | 48 | 5240 |
| | 42# | 5210 | | |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5250-5350 MHz Band 2 (U-NII-2A) | 52 | 5260 | 60 | 5300 |
| | 54* | 5270 | 62* | 5310 |
| | 56 | 5280 | 64 | 5320 |
| | 58# | 5290 | | |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5470-5725 MHz Band 3 (U-NII-2C) | 100 | 5500 | 112 | 5560 |
| | 102* | 5510 | 116 | 5580 |
| | 104 | 5520 | 132 | 5660 |
| | 106# | 5530 | 134* | 5670 |
| | 108 | 5540 | 136 | 5680 |
| | 110* | 5550 | 140 | 5700 |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| TDWR Channel | 118* | 5590 | 124 | 5620 |
| | 120 | 5600 | 126* | 5630 |
| | 122# | 5610 | 128 | 5640 |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| Straddle Channel | 138# | 5690 | 144 | 5720 |
| | 142* | 5710 | | |

**Note:**

1. The above Frequency and Channel with "*" are 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.
2. The above Frequency and Channel with "#" are 802.11ac VHT80 and 802.11ax HE80.

## 2.2 Test Mode

The 802.11ax mode is investigated among different tones, full resource units (RU), partial resource units. The partial RU has no higher power than full RU's, thus the full RU is chosen as main test configuration.

The CDD mode is chosen as worst case configuration for all test cases due to higher power than SISO mode.

The 802.11n/ac mode has no higher power and PSD than 802.11ax mode, thus the 802.11ax mode is chosen as main test configuration, and the 802.11n/ac mode is verified the power.

**The final test modes consider the modulation and the worst data rates as shown in the table below.**

**CDD Mode**

| Modulation | Data Rate |
|---|---|
| 802.11a | 6 Mbps |
| 802.11n HT20 (Covered by HE20) | MCS0 |
| 802.11n HT40 (Covered by HE40) | MCS0 |
| 802.11ac VHT20 (Covered by HE20) | MCS0 |
| 802.11ac VHT40 (Covered by HE40) | MCS0 |
| 802.11ac VHT80 (Covered by HE80) | MCS0 |
| 802.11ax HE20 | MCS0 |
| 802.11ax HE40 | MCS0 |
| 802.11ax HE80 | MCS0 |

**Remark:** The conducted power level of each chain in MIMO mode is equal or higher than SISO mode.

**TXBF Mode**

| Modulation | Data Rate |
|---|---|
| 802.11n HT20 (Covered by HE20) | MCS0 |
| 802.11n HT40 (Covered by HE40) | MCS0 |
| 802.11ax HE20 | MCS0 |
| 802.11ax HE40 | MCS0 |
| 802.11ax HE80 | MCS0 |

**Remark:** The conducted power level of each chain in MIMO mode is equal or higher than SISO mode.

| Test Cases | |
|---|---|
| AC Conducted Emission | Mode 1 : WLAN (5GHz) Link + Bluetooth Link + USB Cable (Type C to Type A) (Charging from AC Adapter) |

| Ch. # | | Band I : 5150-5250 MHz | Band II : 5250-5350 MHz | Band III : 5470-5725MHz |
|---|---|---|---|---|
| | | 802.11a | 802.11a | 802.11a |
| L | Low | 36 | 52 | 100 |
| M | Middle | 44 | 60 | 116 |
| H | High | 48 | 64 | 140 |
| Straddle | | - | - | 144 |

| Ch. # | | Band I : 5150-5250 MHz | Band II : 5250-5350 MHz | Band III : 5470-5725MHz |
|---|---|---|---|---|
| | | 802.11ax HE20 | 802.11ax HE20 | 802.11ax HE20 |
| L | Low | 36 | 52 | 100 |
| M | Middle | 44 | 60 | 116 |
| H | High | 48 | 64 | 140 |
| Straddle | | - | - | 144 |

| Ch. # | | Band I : 5150-5250 MHz | Band II : 5250-5350 MHz | Band III : 5470-5725MHz |
|---|---|---|---|---|
| | | 802.11ax HE40 | 802.11ax HE40 | 802.11ax HE40 |
| L | Low | 38 | 54 | 102 |
| M | Middle | - | - | 110 |
| H | High | 46 | 62 | 134 |
| Straddle | | - | - | 142 |

| Ch. # | | Band I : 5150-5250 MHz | Band II : 5250-5350 MHz | Band III : 5470-5725MHz |
|---|---|---|---|---|
| | | 802.11ax HE80 | 802.11ax HE80 | 802.11ax HE80 |
| L | Low | - | - | 106 |
| M | Middle | 42 | 58 | - |
| H | High | - | - | 122 |
| Straddle | | - | - | 138 |

**Remark:** For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

**<CDD Mode>**

**MIMO <Ant. 6+7>**

| 802.11a RF Output Power (dBm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | |
| | | MCS0 | | 9M | 12M | 18M | 24M | 36M | 48M | 54M |
| Duty Cycle (%) | | | | | | | | | | |
| CH 036 | 5180 | 20.54 | CH 048 | 20.48 | 20.48 | 20.48 | 20.38 | 20.38 | 20.38 | 20.38 |
| CH 044 | 5220 | 20.48 | | | | | | | | |
| CH 048 | 5240 | **20.58** | | | | | | | | |
| CH 052 | 5260 | 20.47 | CH 060 | 20.43 | 20.43 | 20.37 | 20.33 | 20.38 | 20.38 | 20.28 |
| CH 060 | 5300 | **20.53** | | | | | | | | |
| CH 064 | 5320 | 20.32 | | | | | | | | |
| CH 100 | 5500 | 20.81 | CH 144* | 20.88 | 20.88 | 20.88 | 20.84 | 20.84 | 20.78 | 20.78 |
| CH 116 | 5580 | 20.67 | | | | | | | | |
| CH 140 | 5700 | 20.20 | | | | | | | | |
| CH 144* | 5720 | **20.98** | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11n HT20 RF Output Power (dBm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 |
| Duty Cycle (%) | | | | | | | | | | |
| CH 036 | 5180 | 20.47 | CH 044 | 20.38 | 20.38 | 20.28 | 20.28 | 20.33 | 20.28 | 20.33 |
| CH 044 | 5220 | **20.48** | | | | | | | | |
| CH 048 | 5240 | 20.42 | | | | | | | | |
| CH 052 | 5260 | 20.27 | CH 060 | 20.57 | 20.57 | 20.57 | 20.47 | 20.47 | 20.47 | 20.47 |
| CH 060 | 5300 | **20.67** | | | | | | | | |
| CH 064 | 5320 | 20.52 | | | | | | | | |
| CH 100 | 5500 | 20.66 | CH 144* | 20.58 | 20.58 | 20.54 | 20.48 | 20.53 | 20.48 | 20.48 |
| CH 116 | 5580 | 20.62 | | | | | | | | |
| CH 140 | 5700 | 19.50 | | | | | | | | |
| CH 144* | 5720 | **20.68** | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11n HT40 RF Output Power (dBm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 |
| Duty Cycle (%) | | | | | | | | | | |
| CH 038 | 5190 | 19.98 | CH 046 | 22.73 | 22.73 | 22.68 | 22.68 | 22.63 | 22.63 | 22.63 |
| CH 046 | 5230 | **22.83** | | | | | | | | |
| CH 054 | 5270 | **22.97** | CH 054 | 22.87 | 22.87 | 22.82 | 22.82 | 22.77 | 22.77 | 22.77 |
| CH 062 | 5310 | 20.67 | | | | | | | | |
| CH 102 | 5510 | 20.66 | CH 110 | 23.26 | 23.26 | 23.26 | 23.21 | 23.16 | 23.21 | 23.16 |
| CH 110 | 5550 | **23.36** | | | | | | | | |
| CH 134 | 5670 | 21.84 | | | | | | | | |
| CH 142* | 5710 | 23.03 | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11ac VHT20 RF Output Power (dBm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 |
| Duty Cycle (%) | | | | | | | | | | | |
| CH 036 | 5180 | 20.47 | CH 044 | 20.38 | 20.38 | 20.28 | 20.28 | 20.33 | 20.28 | 20.33 | 20.33 |
| CH 044 | 5220 | **20.48** | | | | | | | | | |
| CH 048 | 5240 | 20.42 | | | | | | | | | |
| CH 052 | 5260 | 20.27 | CH 060 | 20.57 | 20.57 | 20.57 | 20.47 | 20.47 | 20.47 | 20.47 | 20.47 |
| CH 060 | 5300 | **20.67** | | | | | | | | | |
| CH 064 | 5320 | 20.52 | | | | | | | | | |
| CH 100 | 5500 | 20.66 | CH 144* | 20.58 | 20.58 | 20.54 | 20.48 | 20.53 | 20.48 | 20.48 | 20.48 |
| CH 116 | 5580 | 20.62 | | | | | | | | | |
| CH 140 | 5700 | 19.50 | | | | | | | | | |
| CH 144* | 5720 | **20.68** | | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11ac VHT40 RF Output Power (dBm) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 |
| Duty Cycle (%) | | | | | | | | | | | | |
| CH 038 | 5190 | 19.98 | CH 046 | 22.73 | 22.73 | 22.68 | 22.68 | 22.63 | 22.63 | 22.63 | 22.53 | 22.53 |
| CH 046 | 5230 | **22.83** | | | | | | | | | | |
| CH 054 | 5270 | **22.97** | CH 054 | 22.87 | 22.87 | 22.82 | 22.82 | 22.77 | 22.77 | 22.77 | 22.67 | 22.67 |
| CH 062 | 5310 | 20.67 | | | | | | | | | | |
| CH 102 | 5510 | 20.66 | CH 110 | 23.26 | 23.26 | 23.26 | 23.21 | 23.16 | 23.21 | 23.16 | 23.06 | 23.06 |
| CH 110 | 5550 | **23.36** | | | | | | | | | | |
| CH 134 | 5670 | 21.84 | | | | | | | | | | |
| CH 142* | 5710 | 23.03 | | | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11ac VHT80 RF Output Power (dBm) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 |
| Duty Cycle (%) | | | | | | | | | | | | |
| CH 042 | 5210 | **18.63** | CH 042 | 18.53 | 18.53 | 18.53 | 18.53 | 18.48 | 18.43 | 18.43 | 18.43 | 18.43 |
| CH 058 | 5290 | **19.17** | CH 058 | 19.07 | 19.07 | 19.07 | 18.97 | 18.97 | 18.97 | 18.97 | 18.97 | 18.97 |
| CH 106 | 5530 | 19.91 | CH 122 | 22.77 | 22.77 | 22.67 | 22.67 | 22.72 | 22.72 | 22.72 | 22.67 | 22.67 |
| CH 122 | 5610 | **22.87** | | | | | | | | | | |
| CH 138* | 5690 | 22.84 | | | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

**<802.11ax Mode>**

| 802.11ax HE20 RF Output Power (dBm) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | | Power vs Data Rate | | | | | | | | | | |
| Channel | Frequency (MHz) | RU Config. | MCS Index | Channel | MCS Index | | | | | | | | | |
| | | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 | MCS10 | MCS11 |
| Duty Cycle (%) | | | | | | | | | | | | | | | |
| CH 036 | 5180 | Full | 20.57 | CH 044 | 20.48 | 20.48 | 20.48 | 20.44 | 20.38 | 20.38 | 20.44 | 20.38 | 20.38 | 20.38 | 20.38 |
| CH 036 | 5180 | 26/0 | 12.15 | | | | | | | | | | | | |
| CH 036 | 5180 | 52/37 | 15.40 | | | | | | | | | | | | |
| CH 036 | 5180 | 106/53 | 18.37 | | | | | | | | | | | | |
| CH 044 | 5220 | Full | **20.58** | | | | | | | | | | | | |
| CH 044 | 5220 | 26/4 | 12.74 | | | | | | | | | | | | |
| CH 044 | 5220 | 52/39 | 15.14 | | | | | | | | | | | | |
| CH 044 | 5220 | 106/53 | 18.17 | | | | | | | | | | | | |
| CH 048 | 5240 | Full | 20.52 | | | | | | | | | | | | |
| CH 048 | 5240 | 26/8 | 11.78 | | | | | | | | | | | | |
| CH 048 | 5240 | 52/40 | 14.73 | | | | | | | | | | | | |
| CH 048 | 5240 | 106/54 | 18.08 | | | | | | | | | | | | |
| CH 052 | 5260 | Full | 20.37 | CH 060 | 20.67 | 20.67 | 20.67 | 20.63 | 20.57 | 20.57 | 20.57 | 20.52 | 20.52 | 20.52 | 20.57 |
| CH 052 | 5260 | 26/0 | 11.92 | | | | | | | | | | | | |
| CH 052 | 5260 | 52/37 | 15.18 | | | | | | | | | | | | |
| CH 052 | 5260 | 106/53 | 18.04 | | | | | | | | | | | | |
| CH 060 | 5300 | Full | **20.77** | | | | | | | | | | | | |
| CH 060 | 5300 | 26/4 | 13.16 | | | | | | | | | | | | |
| CH 060 | 5300 | 52/39 | 14.98 | | | | | | | | | | | | |
| CH 060 | 5300 | 106/54 | 18.17 | | | | | | | | | | | | |
| CH 064 | 5320 | Full | 20.62 | | | | | | | | | | | | |
| CH 064 | 5320 | 26/8 | 12.37 | | | | | | | | | | | | |
| CH 064 | 5320 | 52/40 | 15.07 | | | | | | | | | | | | |
| CH 064 | 5320 | 106/54 | 18.47 | | | | | | | | | | | | |
| CH 100 | 5500 | Full | 20.76 | CH 144* | 20.68 | 20.68 | 20.63 | 20.63 | 20.58 | 20.64 | 20.68 | 20.58 | 20.58 | 20.53 | 20.53 |
| CH 100 | 5500 | 26/0 | 12.56 | | | | | | | | | | | | |
| CH 100 | 5500 | 52/37 | 15.46 | | | | | | | | | | | | |
| CH 100 | 5500 | 106/53 | 18.52 | | | | | | | | | | | | |
| CH 116 | 5580 | Full | 20.72 | | | | | | | | | | | | |
| CH 116 | 5580 | 26/4 | 13.32 | | | | | | | | | | | | |
| CH 116 | 5580 | 52/38 | 15.57 | | | | | | | | | | | | |
| CH 116 | 5580 | 106/53 | 18.57 | | | | | | | | | | | | |
| CH 140 | 5700 | Full | 19.60 | | | | | | | | | | | | |
| CH 140 | 5700 | 26/8 | 11.18 | | | | | | | | | | | | |
| CH 140 | 5700 | 52/40 | 14.17 | | | | | | | | | | | | |
| CH 140 | 5700 | 106/54 | 17.58 | | | | | | | | | | | | |
| CH 144* | 5720 | Full | **20.78** | | | | | | | | | | | | |
| CH 144* | 5720 | 26/8 | 12.51 | | | | | | | | | | | | |
| CH 144* | 5720 | 52/40 | 15.44 | | | | | | | | | | | | |
| CH 144* | 5720 | 106/54 | 18.67 | | | | | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11ax HE40 RF Output Power (dBm) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | | Power vs Data Rate | | | | | | | | | | |
| Channel | Frequency (MHz) | RU Config. | MCS Index | Channel | MCS Index | | | | | | | | | |
| | | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 | MCS10 | MCS11 |
| Duty Cycle (%) | | | | | | | | | | | | | | |
| CH 038 | 5190 | Full | 20.08 | CH 046 | 22.83 | 22.83 | 22.83 | 22.78 | 22.73 | 22.73 | 22.73 | 22.68 | 22.68 | 22.68 | 22.68 |
| CH 038 | 5190 | 242/61 | 17.27 | | | | | | | | | | | | |
| CH 046 | 5230 | Full | **22.93** | | | | | | | | | | | | |
| CH 046 | 5230 | 242/62 | 19.97 | | | | | | | | | | | | |
| CH 054 | 5270 | Full | **23.07** | CH 054 | 22.97 | 22.97 | 22.97 | 22.97 | 22.92 | 22.87 | 22.87 | 22.87 | 22.87 | 22.87 | 22.87 |
| CH 054 | 5270 | 242/61 | 20.48 | | | | | | | | | | | | |
| CH 062 | 5310 | Full | 20.77 | | | | | | | | | | | | |
| CH 062 | 5310 | 242/62 | 17.74 | | | | | | | | | | | | |
| CH 102 | 5510 | Full | 20.76 | CH 110 | 23.36 | 23.36 | 23.36 | 23.36 | 23.36 | 23.36 | 23.31 | 23.31 | 23.26 | 23.26 | 23.21 |
| CH 102 | 5510 | 242/61 | 18.01 | | | | | | | | | | | | |
| CH 110 | 5550 | Full | **23.46** | | | | | | | | | | | | |
| CH 110 | 5550 | 242/61 | 20.61 | | | | | | | | | | | | |
| CH 134 | 5670 | Full | 21.94 | | | | | | | | | | | | |
| CH 134 | 5670 | 242/62 | 19.15 | | | | | | | | | | | | |
| CH 142* | 5710 | Full | 23.13 | | | | | | | | | | | | |
| CH 142* | 5710 | 242/62 | 20.11 | | | | | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11ax HE80 RF Output Power (dBm) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | | Power vs Data Rate | | | | | | | | | | |
| Channel | Frequency (MHz) | RU Config. | MCS Index | Channel | MCS Index | | | | | | | | | |
| | | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 | MCS10 | MCS11 |
| Duty Cycle (%) | | | | | | | | | | | | | | |
| CH 042 | 5210 | Full | **18.73** | CH 042 | 18.63 | 18.63 | 18.63 | 18.58 | 18.57 | 18.53 | 18.58 | 18.53 | 18.53 | 18.53 | 18.53 |
| CH 042 | 5210 | 484/65 | 16.21 | | | | | | | | | | | | |
| CH 058 | 5290 | Full | **19.27** | CH 058 | 19.17 | 19.17 | 19.17 | 19.13 | 19.07 | 19.07 | 19.07 | 19.07 | 19.02 | 19.02 | 19.07 |
| CH 058 | 5290 | 484/66 | 16.00 | | | | | | | | | | | | |
| CH 106 | 5530 | Full | 20.01 | CH 122 | 22.87 | 22.87 | 22.87 | 22.77 | 22.77 | 22.77 | 22.77 | 22.72 | 22.72 | 22.72 | 22.72 |
| CH 106 | 5530 | 484/65 | 17.33 | | | | | | | | | | | | |
| CH 122 | 5610 | Full | **22.97** | | | | | | | | | | | | |
| CH 122 | 5610 | 484/66 | 20.13 | | | | | | | | | | | | |
| CH 138* | 5690 | Full | 22.94 | | | | | | | | | | | | |
| CH 138* | 5690 | 484/66 | 19.95 | | | | | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

**<TXBF Mode>**

**MIMO <Ant. 6+7>**

| 802.11n HT20 RF Output Power (dBm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 |
| Duty Cycle (%) | | | | | | | | | | |
| CH 036 | 5180 | 19.90 | CH 044 | 20.30 | 20.25 | 20.20 | 20.30 | 20.20 | 20.20 | 20.20 |
| CH 044 | 5220 | **20.40** | | | | | | | | |
| CH 048 | 5240 | **20.40** | | | | | | | | |
| CH 052 | 5260 | **20.73** | CH 060 | 20.63 | 20.63 | 20.53 | 20.58 | 20.63 | 20.53 | 20.53 |
| CH 060 | 5300 | 20.57 | | | | | | | | |
| CH 064 | 5320 | 20.14 | | | | | | | | |
| CH 100 | 5500 | 20.51 | CH 144* | 20.60 | 20.60 | 20.50 | 20.55 | 20.55 | 20.50 | 20.50 |
| CH 116 | 5580 | 20.57 | | | | | | | | |
| CH 140 | 5700 | 19.37 | | | | | | | | |
| CH 144* | 5720 | **20.70** | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11n HT40 RF Output Power (dBm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 |
| Duty Cycle (%) | | | | | | | | | | |
| CH 038 | 5190 | 16.67 | CH 046 | 22.60 | 22.60 | 22.50 | 22.50 | 22.54 | 22.50 | 22.50 |
| CH 046 | 5230 | **22.70** | | | | | | | | |
| CH 054 | 5270 | **22.87** | CH 054 | 22.77 | 22.77 | 22.73 | 22.67 | 22.67 | 22.67 | 22.62 |
| CH 062 | 5310 | 18.38 | | | | | | | | |
| CH 102 | 5510 | 18.47 | CH 110 | 22.91 | 22.91 | 22.86 | 22.81 | 22.81 | 22.81 | 22.81 |
| CH 110 | 5550 | **23.01** | | | | | | | | |
| CH 134 | 5670 | 20.48 | | | | | | | | |
| CH 142* | 5710 | 22.98 | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

**<802.11ax Mode>**

| 802.11ax HE20 RF Output Power (dBm) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | | Power vs Data Rate | | | | | | | | | | | |
| Channel | Frequency (MHz) | RU Config. | MCS Index | Channel | MCS Index | | | | | | | | | | |
| | | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 | MCS10 | MCS11 |
| Duty Cycle (%) | | | | | | | | | | | | | | | |
| CH 036 | 5180 | Full | 20.00 | CH 044 | 20.40 | 20.40 | 20.40 | 20.40 | 20.30 | 20.30 | 20.30 | 20.34 | 20.34 | 20.34 | 20.34 |
| CH 044 | 5220 | Full | **20.50** | | | | | | | | | | | | |
| CH 048 | 5240 | Full | **20.50** | | | | | | | | | | | | |
| CH 052 | 5260 | Full | **20.83** | CH 052 | 20.73 | 20.73 | 20.68 | 20.68 | 20.63 | 20.63 | 20.68 | 20.68 | 20.58 | 20.58 | 20.58 |
| CH 060 | 5300 | Full | 20.67 | | | | | | | | | | | | |
| CH 064 | 5320 | Full | 20.24 | | | | | | | | | | | | |
| CH 100 | 5500 | Full | 20.61 | CH 144* | 20.70 | 20.70 | 20.70 | 20.64 | 20.64 | 20.60 | 20.70 | 20.65 | 20.64 | 20.64 | 20.64 |
| CH 116 | 5580 | Full | 20.67 | | | | | | | | | | | | |
| CH 140 | 5700 | Full | 19.47 | | | | | | | | | | | | |
| CH 144* | 5720 | Full | **20.80** | | | | | | | | | | | | |

**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11ax HE40 RF Output Power (dBm) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | | Power vs Data Rate | | | | | | | | | | | |
| Channel | Frequency (MHz) | RU Config. | MCS Index | Channel | MCS Index | | | | | | | | | | |
| | | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 | MCS10 | MCS11 |
| Duty Cycle (%) | | | | | | | | | | | | | | | |
| CH 038 | 5190 | Full | 16.77 | CH 046 | 22.70 | 22.70 | 22.60 | 22.60 | 22.60 | 22.60 | 22.60 | 22.60 | 22.60 | 22.55 | 22.60 |
| CH 046 | 5230 | Full | **22.80** | | | | | | | | | | | | |
| CH 054 | 5270 | Full | **22.97** | CH 054 | 22.87 | 22.83 | 22.83 | 22.83 | 22.77 | 22.77 | 22.77 | 22.77 | 22.77 | 22.77 | 22.77 |
| CH 062 | 5310 | Full | 18.48 | | | | | | | | | | | | |
| CH 102 | 5510 | Full | 18.57 | CH 110 | 23.01 | 23.01 | 22.91 | 22.91 | 22.91 | 22.91 | 22.91 | 22.91 | 22.91 | 22.91 | 22.91 |
| CH 110 | 5550 | Full | **23.11** | | | | | | | | | | | | |
| CH 134 | 5670 | Full | 20.58 | | | | | | | | | | | | |
| CH 142* | 5710 | Full | 23.08 | | | | | | | | | | | | |

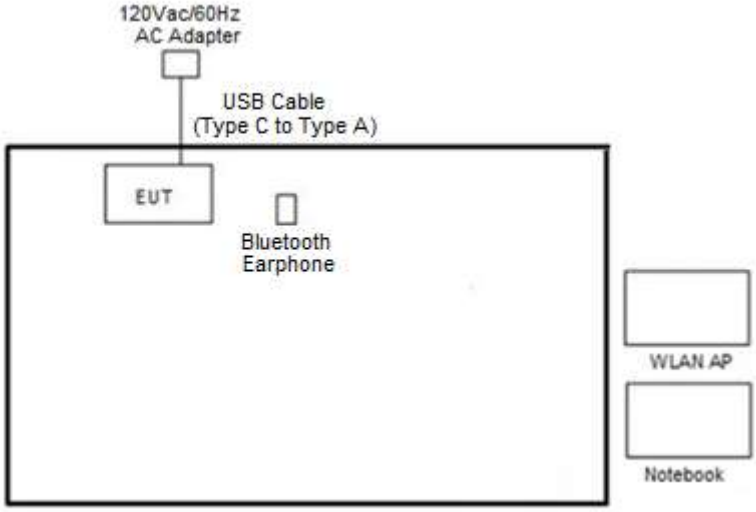
**Note:** The above Frequency and Channel in "*" were straddle Channel.

| 802.11ax HE80 RF Output Power (dBm) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power vs. Channel | | | | Power vs Data Rate | | | | | | | | | | | |
| Channel | Frequency (MHz) | RU Config. | MCS Index | Channel | MCS Index | | | | | | | | | | |
| | | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 | MCS10 | MCS11 |
| Duty Cycle (%) | | | | | | | | | | | | | | | |
| CH 042 | 5210 | Full | **15.54** | CH 042 | 15.44 | 15.44 | 15.44 | 15.44 | 15.34 | 15.34 | 15.34 | 15.40 | 15.40 | 15.40 | 15.40 |
| CH 058 | 5290 | Full | **18.13** | CH 058 | 18.03 | 18.03 | 18.03 | 17.96 | 17.93 | 17.93 | 17.93 | 17.96 | 17.96 | 17.90 | 17.86 |
| CH 106 | 5530 | Full | 18.66 | CH 138* | 22.94 | 22.94 | 22.94 | 22.84 | 22.84 | 22.84 | 22.90 | 22.90 | 22.84 | 22.84 | 22.84 |
| CH 122 | 5610 | Full | 22.21 | | | | | | | | | | | | |
| CH 138* | 5690 | Full | **23.04** | | | | | | | | | | | | |

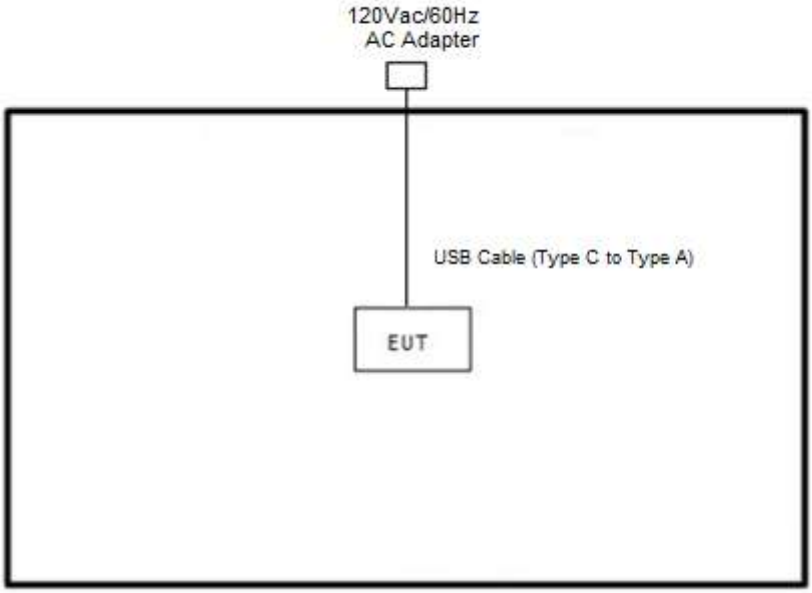
**Note:** The above Frequency and Channel in "*" were straddle Channel.

## 2.3 Connection Diagram of Test System

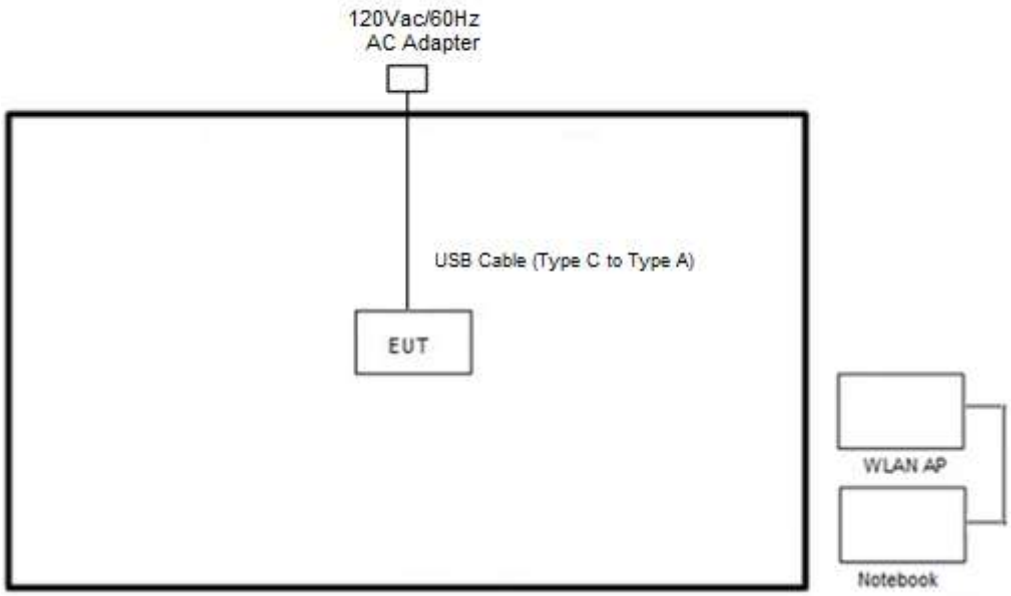
**<AC Conducted Emission Mode>**




**<WLAN Tx Mode>**



**<WLAN TXBF Mode>**




## 2.4 Support Unit used in test configuration and system

| Item | Equipment | Brand Name | Model Name | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | Bluetooth Earphone | Kinyo | BTE-3622 | N/A | N/A | N/A |
| 2. | WLAN AP | ASUS | RT-AC58 | N/A | N/A | Unshielded, 1.8m |
| 3. | WLAN AP | ASUS | RT-AX88U | LCITHP000236 | N/A | Unshielded, 1.8m |
| 4. | Notebook | Dell | P74G | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 5. | Notebook | Acer | N18Q13 | PD9AX201NG | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |

## 2.5 EUT Operation Test Setup

The RF test items, utility “cmd.exe (10.0.17763.1577)” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

For TXBF mode, the modulation modes and data rates manipulated by the command lines in the engineering program made the EUT link to another EUT by power under the normal operation. The “cmd.exe (10.0.17763.1577)” software tool was used to enable the EUT to transmit signals continuously.

## 2.6 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*

= 4.2 + 10 = 14.2 (dB)

# 3 Test Result

## 3.1 26dB & 99% Occupied Bandwidth Measurement

### 3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

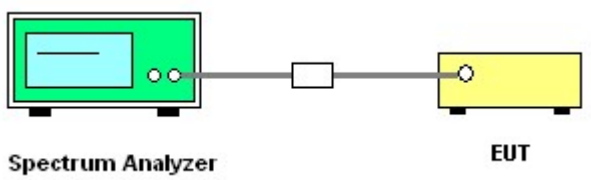
### 3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. 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%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
8. Measure and record the results in the test report.

### 3.1.4 Test Setup



### 3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

| Test Engineer : | Eason Huang | Temperature : | 21~25℃ |
|---|---|---|---|
| | | Relative Humidity : | 51~54% |

**<CDD Mode>**

| Band I MIMO | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Bandwidth (MHz) | | 26 dB Bandwidth (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | - | Note |
| | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 36 | 5180 | **16.98** | 16.83 | 21.60 | 21.25 | - | | 22.26 | | - | - |
| 11a | 6Mbps | 2 | 44 | 5220 | **16.98** | 16.83 | 21.60 | **21.55** | - | | 22.26 | | | - |
| 11a | 6Mbps | 2 | 48 | 5240 | **16.98** | **16.88** | **21.70** | 21.30 | - | | 22.27 | | | - |

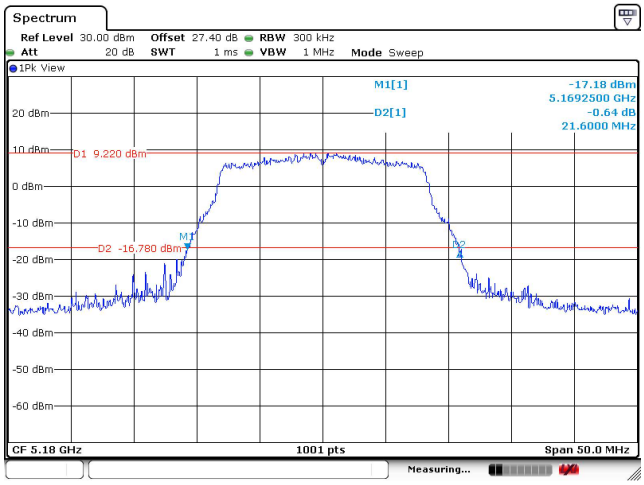
| Band II MIMO | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Bandwidth (MHz) | | 26 dB Bandwidth (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | Note |
| | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | |
| 11a | 6Mbps | 2 | 52 | 5260 | **17.03** | **16.83** | **21.80** | 21.30 | 23.26 | | 29.26 | | 23.98 | | - |
| 11a | 6Mbps | 2 | 60 | 5300 | 16.98 | **16.83** | 21.70 | **21.85** | 23.26 | | 29.26 | | 23.98 | | - |
| 11a | 6Mbps | 2 | 64 | 5320 | 16.98 | **16.83** | 21.65 | 21.50 | 23.26 | | 29.26 | | 23.98 | | - |

| Band III MIMO | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Bandwidth In U-NII 2C (MHz) | | 26 dB Bandwidth In U-NII 2C (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | 6 dB Bandwidth for Straddle Channel (MHz) | |
| | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 |
| 11a | 6Mbps | 2 | 100 | 5500 | **17.03** | **16.93** | 21.65 | 21.75 | 23.29 | | 29.29 | | 23.98 | | ---- | ---- |
| 11a | 6Mbps | 2 | 116 | 5580 | 16.98 | 16.88 | **21.80** | **22.30** | 23.27 | | 29.27 | | 23.98 | | ---- | ---- |
| 11a | 6Mbps | 2 | 140 | 5700 | 16.98 | 16.88 | 21.65 | 21.90 | 23.27 | | 29.27 | | 23.98 | | ---- | ---- |

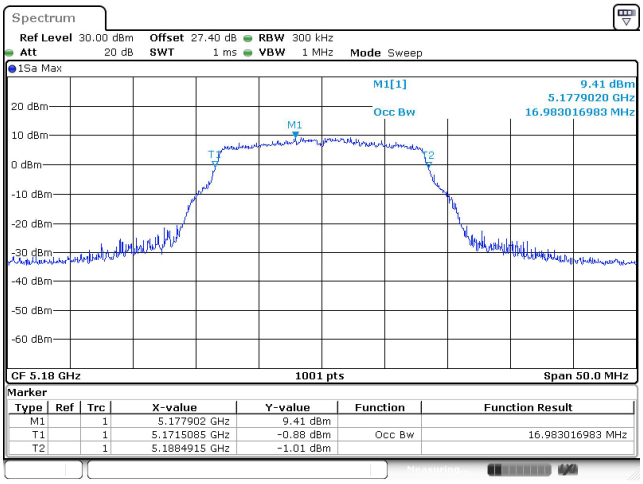
| Band III straddle channel MIMO | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Bandwidth In U-NII 2C (MHz) | | 26 dB Bandwidth In U-NII 2C (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | 6 dB Bandwidth for Straddle Channel (MHz) | |
| | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 |
| 11a | 6Mbps | 2 | 144 | 5720 | 13.59 | 13.44 | 15.85 | 15.75 | 22.28 | | 28.28 | | 22.97 | | 3.2 | 3.2 |

**<802.11a>**

**26dB Bandwidth**




**99% Occupied Bandwidth**




**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

**<802.11ax Mode>**

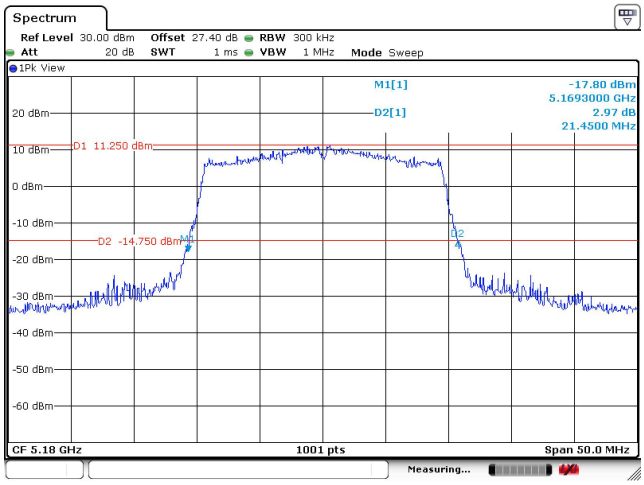
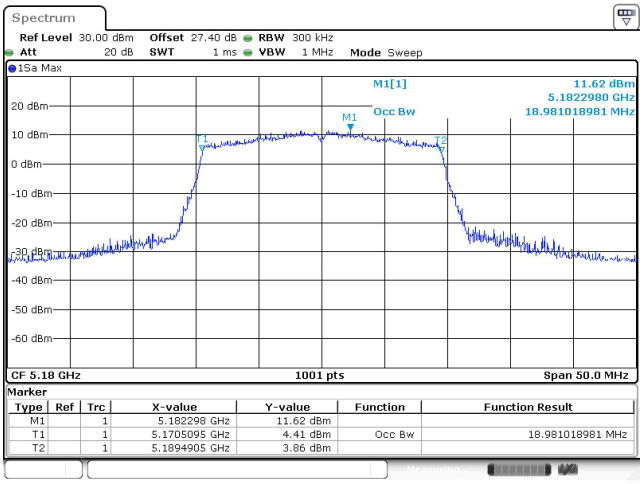
| Band I MIMO | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth (MHz) | | 26 dB Bandwidth (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | - | Note |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 36 | 5180 | Full | 18.98 | 18.93 | 21.45 | 21.30 | - | | 22.77 | | - | - |
| HE20 | MCS0 | 2 | 44 | 5220 | Full | 18.98 | 18.98 | 21.55 | 21.35 | - | | 22.78 | | | - |
| HE20 | MCS0 | 2 | 48 | 5240 | Full | 18.93 | 18.98 | 21.60 | 21.30 | - | | 22.77 | | | - |
| HE40 | MCS0 | 2 | 38 | 5190 | Full | 37.76 | 37.86 | 39.87 | 39.78 | - | | 23.01 | | | - |
| HE40 | MCS0 | 2 | 46 | 5230 | Full | 37.96 | 38.06 | 39.87 | 43.83 | - | | 23.01 | | | - |
| HE80 | MCS0 | 2 | 42 | 5210 | Full | **77.20** | **77.20** | **82.24** | **82.24** | - | | 23.01 | | | - |

| Band II MIMO | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth (MHz) | | 26 dB Bandwidth (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | Note |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | |
| HE20 | MCS0 | 2 | 52 | 5260 | Full | 18.93 | 18.93 | 21.65 | 21.45 | 23.77 | | 29.77 | | 23.98 | | - |
| HE20 | MCS0 | 2 | 60 | 5300 | Full | 18.93 | 18.98 | 21.65 | 21.50 | 23.77 | | 29.77 | | 23.98 | | - |
| HE20 | MCS0 | 2 | 64 | 5320 | Full | 18.93 | 18.98 | 21.45 | 21.45 | 23.77 | | 29.77 | | 23.98 | | - |
| HE40 | MCS0 | 2 | 54 | 5270 | Full | 37.96 | 38.06 | 40.14 | 43.83 | 23.98 | | 30.00 | | 23.98 | | - |
| HE40 | MCS0 | 2 | 62 | 5310 | Full | 37.86 | 37.76 | 40.05 | 39.60 | 23.98 | | 30.00 | | 23.98 | | - |
| HE80 | MCS0 | 2 | 58 | 5290 | Full | **77.20** | **77.20** | **82.40** | **82.24** | 23.98 | | 30.00 | | 23.98 | | - |

| Band III MIMO | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth In U-NII 2C (MHz) | | 26 dB Bandwidth In U-NII 2C (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | 6 dB Bandwidth for Straddle Channel (MHz) | |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 |
| HE20 | MCS0 | 2 | 100 | 5500 | Full | 18.98 | 18.98 | 21.40 | 21.50 | 23.78 | | 29.78 | | 23.98 | | ---- | ---- |
| HE20 | MCS0 | 2 | 116 | 5580 | Full | 18.93 | 18.98 | 21.55 | 21.55 | 23.77 | | 29.77 | | 23.98 | | ---- | ---- |
| HE20 | MCS0 | 2 | 140 | 5700 | Full | 18.98 | 18.98 | 21.70 | 21.45 | 23.78 | | 29.78 | | 23.98 | | ---- | ---- |
| HE40 | MCS0 | 2 | 102 | 5510 | Full | 37.96 | 37.96 | 40.05 | 40.05 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE40 | MCS0 | 2 | 110 | 5550 | Full | 38.06 | 38.56 | 43.65 | 65.52 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE40 | MCS0 | 2 | 134 | 5670 | Full | 37.96 | 38.16 | 40.23 | 52.56 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE80 | MCS0 | 2 | 106 | 5530 | Full | 77.08 | 77.08 | **82.08** | 81.76 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE80 | MCS0 | 2 | 122 | 5610 | Full | 77.20 | 77.44 | 81.92 | 139.84 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |

| Band III straddle channel MIMO | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth In U-NII 2C (MHz) | | 26 dB Bandwidth In U-NII 2C (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | 6 dB Bandwidth for Straddle Channel (MHz) | |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 |
| HE20 | MCS0 | 2 | 144 | 5720 | Full | 14.49 | 14.49 | 15.75 | 15.65 | 22.61 | | 28.61 | | 22.95 | | 4.35 | 4.25 |
| HE40 | MCS0 | 2 | 142 | 5710 | Full | 33.98 | 34.18 | 35.25 | 39.30 | 23.98 | | 30.00 | | 23.98 | | 3.9899 | 3.9901 |
| HE80 | MCS0 | 2 | 138 | 5690 | Full | 73.72 | 73.72 | 75.96 | 94.04 | 23.98 | | 30.00 | | 23.98 | | 4.201 | **3.881** |

**<802.11ax HE20>**

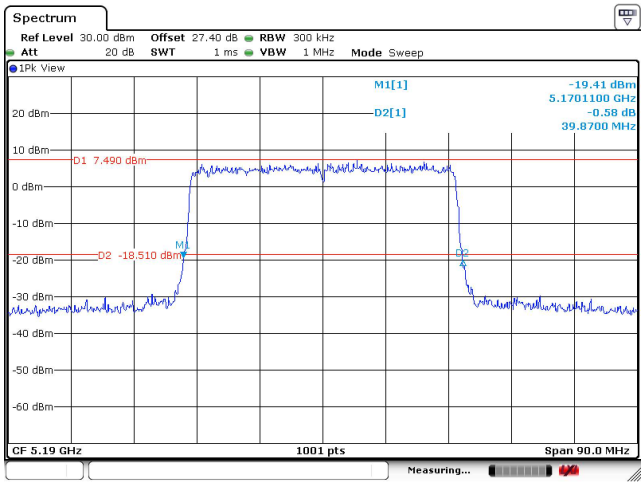
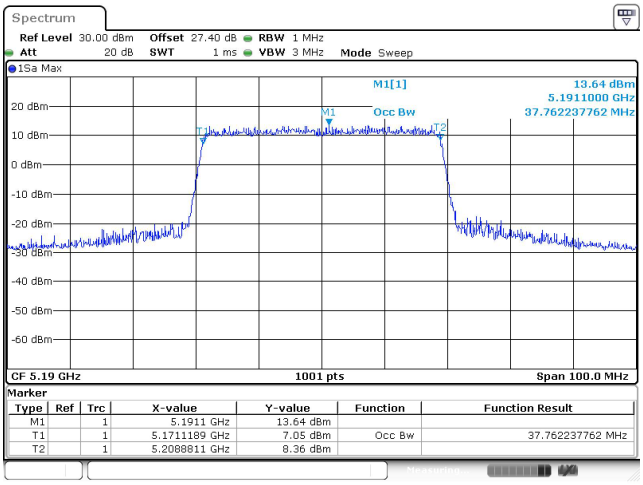
| 26dB Bandwidth | 99% Occupied Bandwidth |
|---|---|
|  |  |





**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

**<802.11ax HE40>**

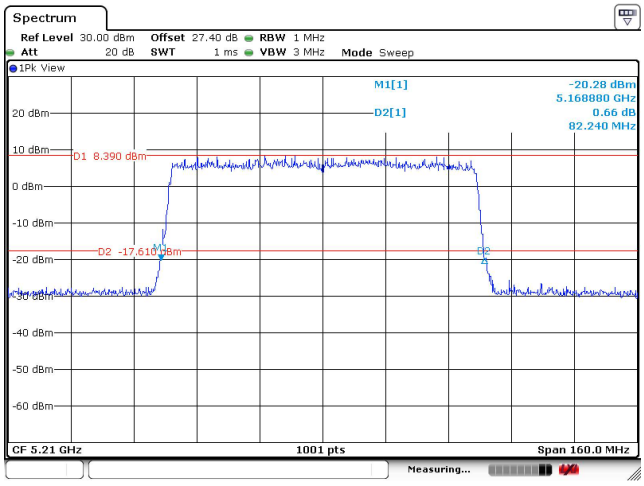
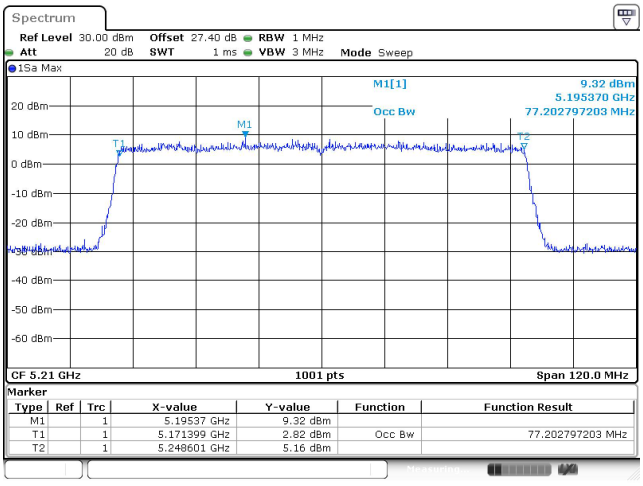
| 26dB Bandwidth | 99% Occupied Bandwidth |
|---|---|
|  |  |





**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

**<802.11ax HE80>**

| 26dB Bandwidth | 99% Occupied Bandwidth |
|---|---|
|  |  |





**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

**<TXBF Modes>**

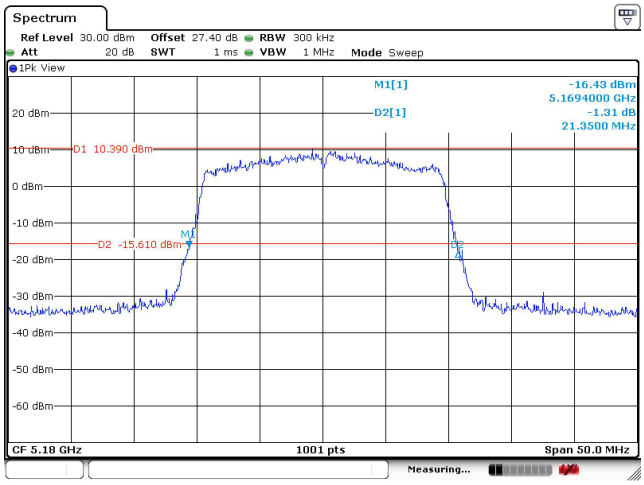
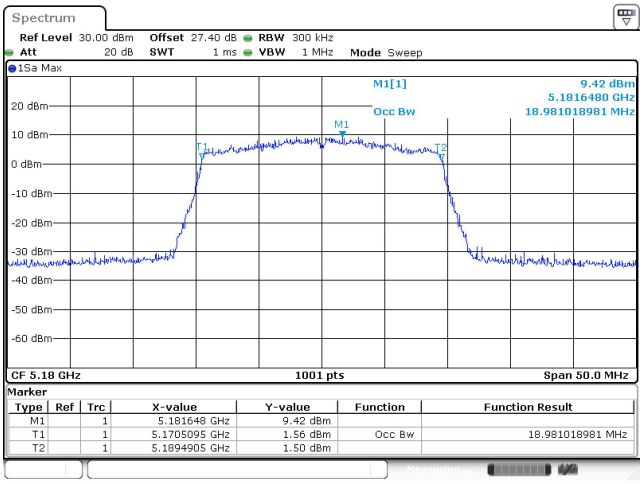
| Band I MIMO | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth (MHz) | | 26 dB Bandwidth (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | - | Note |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 36 | 5180 | Full | 18.98 | 18.98 | 21.35 | 21.45 | - | | 22.78 | | - | - |
| HE20 | MCS2 | 2 | 44 | 5220 | Full | 18.98 | 18.98 | 21.40 | 21.65 | - | | 22.78 | | | - |
| HE20 | MCS2 | 2 | 48 | 5240 | Full | 18.93 | 18.98 | 21.55 | 21.55 | - | | 22.77 | | | - |
| HE40 | MCS0 | 2 | 38 | 5190 | Full | 37.86 | 37.76 | 39.87 | 40.14 | - | | 23.01 | | | - |
| HE40 | MCS0 | 2 | 46 | 5230 | Full | 37.96 | 37.96 | 39.78 | 40.32 | - | | 23.01 | | | - |
| HE80 | MCS0 | 2 | 42 | 5210 | Full | **77.20** | **77.08** | **82.40** | **81.44** | - | | 23.01 | | | - |

| Band II MIMO | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth (MHz) | | 26 dB Bandwidth (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | Note |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | |
| HE20 | MCS2 | 2 | 52 | 5260 | Full | 18.93 | 18.98 | 21.65 | 21.50 | 23.77 | | 29.77 | | 23.98 | | - |
| HE20 | MCS2 | 2 | 60 | 5300 | Full | 18.93 | 18.98 | 21.45 | 21.50 | 23.77 | | 29.77 | | 23.98 | | - |
| HE20 | MCS2 | 2 | 64 | 5320 | Full | 18.98 | 18.88 | 21.65 | 21.30 | 23.76 | | 29.76 | | 23.98 | | - |
| HE40 | MCS0 | 2 | 54 | 5270 | Full | 37.96 | 41.35 | 39.69 | 78.66 | 23.98 | | 30.00 | | 23.98 | | - |
| HE40 | MCS0 | 2 | 62 | 5310 | Full | 37.86 | 37.76 | 40.23 | 39.78 | 23.98 | | 30.00 | | 23.98 | | - |
| HE80 | MCS0 | 2 | 58 | 5290 | Full | **77.20** | **76.96** | **81.76** | **82.08** | 23.98 | | 30.00 | | 23.98 | | - |

| Band III MIMO | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth In U-NII 2C (MHz) | | 26 dB Bandwidth In U-NII 2C (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | 6 dB Bandwidth for Straddle Channel (MHz) | |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 |
| HE20 | MCS2 | 2 | 100 | 5500 | Full | 18.98 | 18.98 | 21.60 | 21.35 | 23.78 | | 29.78 | | 23.98 | | ---- | ---- |
| HE20 | MCS2 | 2 | 116 | 5580 | Full | 18.93 | 18.98 | 21.45 | 21.60 | 23.77 | | 29.77 | | 23.98 | | ---- | ---- |
| HE20 | MCS2 | 2 | 140 | 5700 | Full | 18.98 | 18.88 | 21.75 | 21.45 | 23.76 | | 29.76 | | 23.98 | | ---- | ---- |
| HE40 | MCS0 | 2 | 102 | 5510 | Full | 37.86 | 37.76 | 40.05 | 40.05 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE40 | MCS0 | 2 | 110 | 5550 | Full | 37.96 | 38.16 | 39.78 | 54.09 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE40 | MCS0 | 2 | 134 | 5670 | Full | 37.96 | 37.96 | 40.23 | 39.96 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE80 | MCS0 | 2 | 106 | 5530 | Full | **77.20** | 77.08 | 81.92 | 81.92 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |
| HE80 | MCS0 | 2 | 122 | 5610 | Full | 77.20 | 77.44 | 82.24 | 111.36 | 23.98 | | 30.00 | | 23.98 | | ---- | ---- |

| Band III straddle channel MIMO | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | 99% Bandwidth In U-NII 2C (MHz) | | 26 dB Bandwidth In U-NII 2C (MHz) | | IC 99% Bandwidth Power Limit (dBm) | | IC 99% Bandwidth EIRP Limit (dBm) | | FCC 26dB Bandwidth Power Limit (dBm) | | 6 dB Bandwidth for Straddle Channel (MHz) | |
| | | | | | | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 | Ant 6 | Ant 7 |
| HE20 | MCS2 | 2 | 144 | 5720 | Full | 14.49 | 14.49 | 15.75 | 15.75 | 22.61 | | 28.61 | | 22.97 | | 4.25 | 4.499 |
| HE40 | MCS0 | 2 | 142 | 5710 | Full | 33.98 | 34.18 | 34.98 | 44.43 | 23.98 | | 30.00 | | 23.98 | | 3.99 | 4.014 |
| HE80 | MCS0 | 2 | 138 | 5690 | Full | 73.84 | 73.72 | 76.12 | 88.32 | 23.98 | | 30.00 | | 23.98 | | 4.04 | **3.88** |

**<802.11ax HE20>**

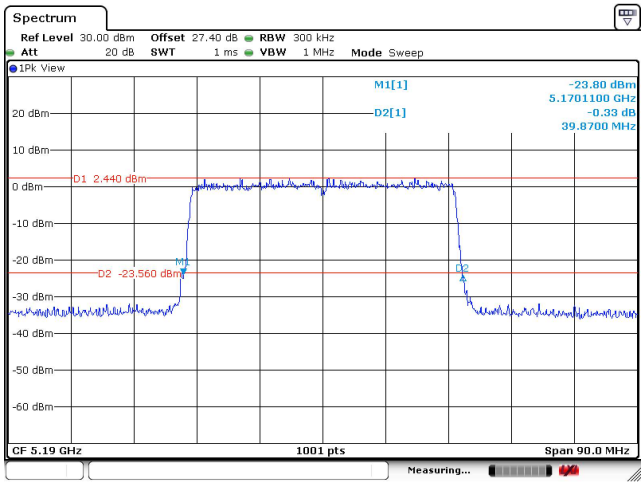
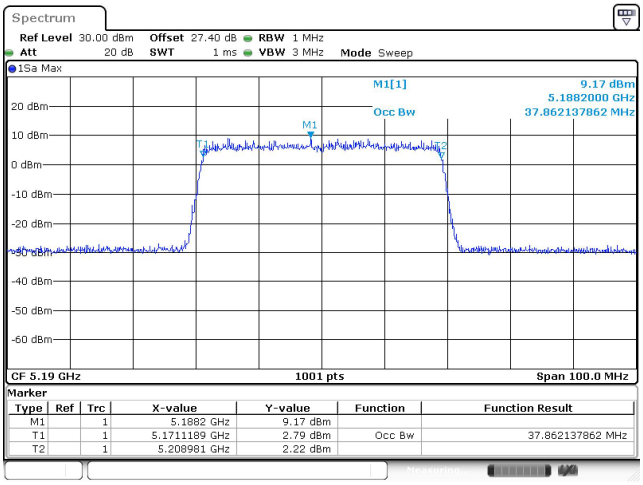
| 26dB Bandwidth | 99% Occupied Bandwidth |
|---|---|
|  |  |





**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

**<802.11ax HE40>**

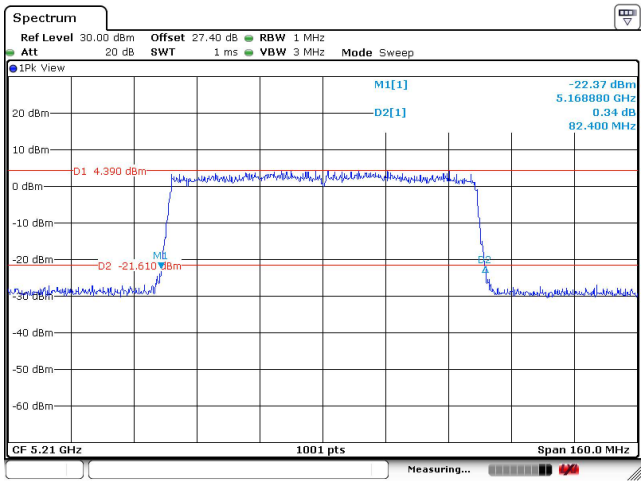
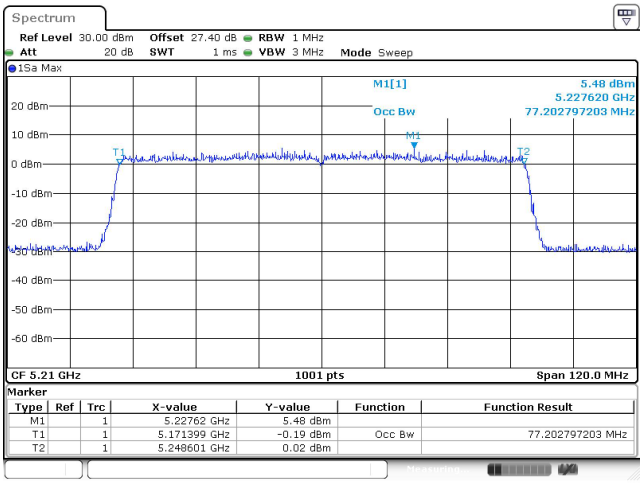
| 26dB Bandwidth | 99% Occupied Bandwidth |
|---|---|
|  |  |





**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

**<802.11ax HE80>**

| 26dB Bandwidth | 99% Occupied Bandwidth |
|---|---|
|  |  |





**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

## 3.2 Maximum Conducted Output Power Measurement

### 3.2.1 Limit of Maximum Conducted Output Power

**<FCC 14-30 CFR 15.407>**

**For the 5.15–5.25 GHz bands:**

■ For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

**For the 5.25–5.725 GHz bands:**

■ The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

### 3.2.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.2.3 Test Procedures

**<CDD Modes>**

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01

**<TXBF Modes>**

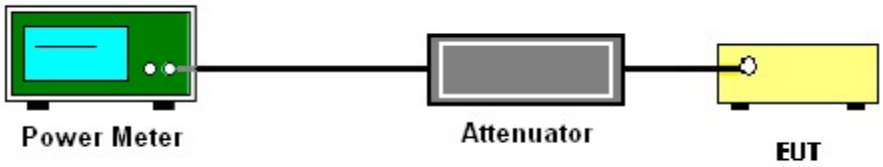
The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Maximum Conducted Output Power

| Test Engineer : | Hank Hsu | Temperature : | 21~25℃ |
|---|---|---|---|
| | | Relative Humidity : | 51~54% |

**<CDD Mode>**

| FCC Band I MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | - | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 36 | 5180 | 17.00 | 18.00 | 20.54 | 24.00 | | 1.68 | | | Pass |
| 11a | 6Mbps | 2 | 44 | 5220 | 17.00 | 17.90 | 20.48 | 24.00 | | 1.68 | | | Pass |
| 11a | 6Mbps | 2 | 48 | 5240 | 17.10 | 18.00 | 20.58 | 24.00 | | 1.68 | | | Pass |
| HT20 | MCS0 | 2 | 36 | 5180 | 17.10 | 17.80 | 20.47 | 24.00 | | 1.68 | | | Pass |
| HT20 | MCS0 | 2 | 44 | 5220 | 17.00 | 17.90 | 20.48 | 24.00 | | 1.68 | | | Pass |
| HT20 | MCS0 | 2 | 48 | 5240 | 17.10 | 17.70 | 20.42 | 24.00 | | 1.68 | | | Pass |
| HT40 | MCS0 | 2 | 38 | 5190 | 16.50 | 17.40 | 19.98 | 24.00 | | 1.68 | | | Pass |
| HT40 | MCS0 | 2 | 46 | 5230 | 19.40 | 20.20 | **22.83** | 24.00 | | 1.68 | | - | Pass |
| VHT20 | MCS0 | 2 | 36 | 5180 | 17.10 | 17.80 | 20.47 | 24.00 | | 1.68 | | | Pass |
| VHT20 | MCS0 | 2 | 44 | 5220 | 17.00 | 17.90 | 20.48 | 24.00 | | 1.68 | | | Pass |
| VHT20 | MCS0 | 2 | 48 | 5240 | 17.10 | 17.70 | 20.42 | 24.00 | | 1.68 | | | Pass |
| VHT40 | MCS0 | 2 | 38 | 5190 | 16.50 | 17.40 | 19.98 | 24.00 | | 1.68 | | | Pass |
| VHT40 | MCS0 | 2 | 46 | 5230 | 19.40 | 20.20 | **22.83** | 24.00 | | 1.68 | | | Pass |
| VHT80 | MCS0 | 2 | 42 | 5210 | 15.20 | 16.00 | 18.63 | 24.00 | | 1.68 | | | Pass |

| FCC Band II MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 52 | 5260 | 17.10 | 17.80 | 20.47 | 23.98 | | 1.68 | | 30 | Pass |
| 11a | 6Mbps | 2 | 60 | 5300 | 17.10 | 17.90 | 20.53 | 23.98 | | 1.68 | | 30 | Pass |
| 11a | 6Mbps | 2 | 64 | 5320 | 17.00 | 17.60 | 20.32 | 23.98 | | 1.68 | | 30 | Pass |
| HT20 | MCS0 | 2 | 52 | 5260 | 16.90 | 17.60 | 20.27 | 23.98 | | 1.68 | | 30 | Pass |
| HT20 | MCS0 | 2 | 60 | 5300 | 17.30 | 18.00 | 20.67 | 23.98 | | 1.68 | | 30 | Pass |
| HT20 | MCS0 | 2 | 64 | 5320 | 17.20 | 17.80 | 20.52 | 23.98 | | 1.68 | | 30 | Pass |
| HT40 | MCS0 | 2 | 54 | 5270 | 19.70 | 20.20 | **22.97** | 23.98 | | 1.68 | | 30 | Pass |
| HT40 | MCS0 | 2 | 62 | 5310 | 17.40 | 17.90 | 20.67 | 23.98 | | 1.68 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 52 | 5260 | 16.90 | 17.60 | 20.27 | 23.98 | | 1.68 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 60 | 5300 | 17.30 | 18.00 | 20.67 | 23.98 | | 1.68 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 64 | 5320 | 17.20 | 17.80 | 20.52 | 23.98 | | 1.68 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 54 | 5270 | 19.70 | 20.20 | **22.97** | 23.98 | | 1.68 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 62 | 5310 | 17.40 | 17.90 | 20.67 | 23.98 | | 1.68 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 58 | 5290 | 15.80 | 16.50 | 19.17 | 23.98 | | 1.68 | | 30 | Pass |

| FCC Band III MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 100 | 5500 | 17.60 | 18.00 | 20.81 | 23.98 | | 2.34 | | 30 | Pass |
| 11a | 6Mbps | 2 | 116 | 5580 | 17.40 | 17.90 | 20.67 | 23.98 | | 2.34 | | 30 | Pass |
| 11a | 6Mbps | 2 | 140 | 5700 | 16.60 | 17.70 | 20.20 | 23.98 | | 2.34 | | 30 | Pass |
| HT20 | MCS0 | 2 | 100 | 5500 | 17.50 | 17.80 | 20.66 | 23.98 | | 2.34 | | 30 | Pass |
| HT20 | MCS0 | 2 | 116 | 5580 | 17.30 | 17.90 | 20.62 | 23.98 | | 2.34 | | 30 | Pass |
| HT20 | MCS0 | 2 | 140 | 5700 | 15.90 | 17.00 | 19.50 | 23.98 | | 2.34 | | 30 | Pass |
| HT40 | MCS0 | 2 | 102 | 5510 | 17.50 | 17.80 | 20.66 | 23.98 | | 2.34 | | 30 | Pass |
| HT40 | MCS0 | 2 | 110 | 5550 | 20.30 | 20.40 | **23.36** | 23.98 | | 2.34 | | 30 | Pass |
| HT40 | MCS0 | 2 | 134 | 5670 | 18.30 | 19.30 | 21.84 | 23.98 | | 2.34 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 100 | 5500 | 17.50 | 17.80 | 20.66 | 23.98 | | 2.34 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 116 | 5580 | 17.30 | 17.90 | 20.62 | 23.98 | | 2.34 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 140 | 5700 | 15.90 | 17.00 | 19.50 | 23.98 | | 2.34 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 102 | 5510 | 17.50 | 17.80 | 20.66 | 23.98 | | 2.34 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 110 | 5550 | 20.30 | 20.40 | **23.36** | 23.98 | | 2.34 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 134 | 5670 | 18.30 | 19.30 | 21.84 | 23.98 | | 2.34 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 106 | 5530 | 16.70 | 17.10 | 19.91 | 23.98 | | 2.34 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 122 | 5610 | 19.60 | 20.10 | 22.87 | 23.98 | | 2.34 | | 30 | Pass |

| FCC Band III straddle channel MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 144 | 5720 | 17.50 | 18.40 | 20.98 | 22.97 | | 2.34 | | 30 | Pass |
| HT20 | MCS0 | 2 | 144 | 5720 | 17.20 | 18.10 | 20.68 | 23.98 | | 2.34 | | 30 | Pass |
| HT40 | MCS0 | 2 | 142 | 5710 | 19.60 | 20.40 | 23.03 | 23.98 | | 2.34 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 144 | 5720 | 17.20 | 18.10 | 20.68 | 23.98 | | 2.34 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 142 | 5710 | 19.60 | 20.40 | 23.03 | 23.98 | | 2.34 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 138 | 5690 | 19.30 | 20.30 | 22.84 | 23.98 | | 2.34 | | 30 | Pass |

**<802.11ax Mode>**

| FCC Band I MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | - | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 36 | 5180 | Full | 17.20 | 17.90 | 20.57 | 24.00 | | 1.68 | | - | Pass |
| HE20 | MCS0 | 2 | 44 | 5220 | Full | 17.10 | 18.00 | 20.58 | 24.00 | | 1.68 | | | Pass |
| HE20 | MCS0 | 2 | 48 | 5240 | Full | 17.20 | 17.80 | 20.52 | 24.00 | | 1.68 | | | Pass |
| HE40 | MCS0 | 2 | 38 | 5190 | Full | 16.60 | 17.50 | 20.08 | 24.00 | | 1.68 | | | Pass |
| HE40 | MCS0 | 2 | 46 | 5230 | Full | 19.50 | 20.30 | **22.93** | 24.00 | | 1.68 | | | Pass |
| HE80 | MCS0 | 2 | 42 | 5210 | Full | 15.30 | 16.10 | 18.73 | 24.00 | | 1.68 | | | Pass |

| FCC Band II MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 52 | 5260 | Full | 17.00 | 17.70 | 20.37 | 23.98 | | 1.68 | | 30 | Pass |
| HE20 | MCS0 | 2 | 60 | 5300 | Full | 17.40 | 18.10 | 20.77 | 23.98 | | 1.68 | | 30 | Pass |
| HE20 | MCS0 | 2 | 64 | 5320 | Full | 17.30 | 17.90 | 20.62 | 23.98 | | 1.68 | | 30 | Pass |
| HE40 | MCS0 | 2 | 54 | 5270 | Full | 19.80 | 20.30 | **23.07** | 23.98 | | 1.68 | | 30 | Pass |
| HE40 | MCS0 | 2 | 62 | 5310 | Full | 17.50 | 18.00 | 20.77 | 23.98 | | 1.68 | | 30 | Pass |
| HE80 | MCS0 | 2 | 58 | 5290 | Full | 15.90 | 16.60 | 19.27 | 23.98 | | 1.68 | | 30 | Pass |

| FCC Band III MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 100 | 5500 | Full | 17.70 | 17.80 | 20.76 | 23.98 | | 2.34 | | 30 | Pass |
| HE20 | MCS0 | 2 | 116 | 5580 | Full | 17.40 | 18.00 | 20.72 | 23.98 | | 2.34 | | 30 | Pass |
| HE20 | MCS0 | 2 | 140 | 5700 | Full | 16.00 | 17.10 | 19.60 | 23.98 | | 2.34 | | 30 | Pass |
| HE40 | MCS0 | 2 | 102 | 5510 | Full | 17.60 | 17.90 | 20.76 | 23.98 | | 2.34 | | 30 | Pass |
| HE40 | MCS0 | 2 | 110 | 5550 | Full | 20.40 | 20.50 | **23.46** | 23.98 | | 2.34 | | 30 | Pass |
| HE40 | MCS0 | 2 | 134 | 5670 | Full | 18.40 | 19.40 | 21.94 | 23.98 | | 2.34 | | 30 | Pass |
| HE80 | MCS0 | 2 | 106 | 5530 | Full | 16.80 | 17.20 | 20.01 | 23.98 | | 2.34 | | 30 | Pass |
| HE80 | MCS0 | 2 | 122 | 5610 | Full | 19.70 | 20.20 | 22.97 | 23.98 | | 2.34 | | 30 | Pass |

| FCC Band III straddle channel MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 144 | 5720 | Full | 17.30 | 18.20 | 20.78 | 22.95 | | 2.34 | | 30 | Pass |
| HE40 | MCS0 | 2 | 142 | 5710 | Full | 19.70 | 20.50 | 23.13 | 23.98 | | 2.34 | | 30 | Pass |
| HE80 | MCS0 | 2 | 138 | 5690 | Full | 19.40 | 20.40 | 22.94 | 23.98 | | 2.34 | | 30 | Pass |

**<TXBF Modes>**

| FCC Band I MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | - | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HT20 | MCS2 | 2 | 36 | 5180 | 16.30 | 17.40 | 19.90 | 24.00 | | 4.29 | | | Pass |
| HT20 | MCS2 | 2 | 44 | 5220 | 16.80 | 17.90 | 20.40 | 24.00 | | 4.29 | | | Pass |
| HT20 | MCS2 | 2 | 48 | 5240 | 16.80 | 17.90 | 20.40 | 24.00 | | 4.29 | | - | Pass |
| HT40 | MCS0 | 2 | 38 | 5190 | 12.90 | 14.30 | 16.67 | 24.00 | | 4.29 | | | Pass |
| HT40 | MCS0 | 2 | 46 | 5230 | 19.10 | 20.20 | **22.70** | 24.00 | | 4.29 | | | Pass |

| FCC Band II MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HT20 | MCS2 | 2 | 52 | 5260 | 17.30 | 18.10 | 20.73 | 23.98 | | 4.53 | | 30 | Pass |
| HT20 | MCS2 | 2 | 60 | 5300 | 17.20 | 17.90 | 20.57 | 23.98 | | 4.53 | | 30 | Pass |
| HT20 | MCS2 | 2 | 64 | 5320 | 16.60 | 17.60 | 20.14 | 23.98 | | 4.53 | | 30 | Pass |
| HT40 | MCS0 | 2 | 54 | 5270 | 19.50 | 20.20 | **22.87** | 23.98 | | 4.53 | | 30 | Pass |
| HT40 | MCS0 | 2 | 62 | 5310 | 14.90 | 15.80 | 18.38 | 23.98 | | 4.53 | | 30 | Pass |

| FCC Band III MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HT20 | MCS2 | 2 | 100 | 5500 | 17.30 | 17.70 | 20.51 | 23.98 | | 4.81 | | 30 | Pass |
| HT20 | MCS2 | 2 | 116 | 5580 | 17.20 | 17.90 | 20.57 | 23.98 | | 4.81 | | 30 | Pass |
| HT20 | MCS2 | 2 | 140 | 5700 | 15.60 | 17.00 | 19.37 | 23.98 | | 4.81 | | 30 | Pass |
| HT40 | MCS0 | 2 | 102 | 5510 | 15.20 | 15.70 | 18.47 | 23.98 | | 4.81 | | 30 | Pass |
| HT40 | MCS0 | 2 | 110 | 5550 | 19.90 | 20.10 | **23.01** | 23.98 | | 4.81 | | 30 | Pass |
| HT40 | MCS0 | 2 | 134 | 5670 | 17.00 | 17.90 | 20.48 | 23.98 | | 4.81 | | 30 | Pass |

| FCC Band III straddle channel MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HT20 | MCS2 | 2 | 144 | 5720 | 17.10 | 18.20 | 20.70 | 23.98 | | 4.81 | | 30 | Pass |
| HT40 | MCS0 | 2 | 142 | 5710 | 19.50 | 20.40 | 22.98 | 23.98 | | 4.81 | | 30 | Pass |

**<802.11ax Mode>**

| FCC Band I MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | - | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 36 | 5180 | Full | 16.40 | 17.50 | 20.00 | 24.00 | | 4.29 | | | Pass |
| HE20 | MCS2 | 2 | 44 | 5220 | Full | 16.90 | 18.00 | 20.50 | 24.00 | | 4.29 | | | Pass |
| HE20 | MCS2 | 2 | 48 | 5240 | Full | 16.90 | 18.00 | 20.50 | 24.00 | | 4.29 | | | Pass |
| HE40 | MCS0 | 2 | 38 | 5190 | Full | 13.00 | 14.40 | 16.77 | 24.00 | | 4.29 | | - | Pass |
| HE40 | MCS0 | 2 | 46 | 5230 | Full | 19.20 | 20.30 | **22.80** | 24.00 | | 4.29 | | | Pass |
| HE80 | MCS0 | 2 | 42 | 5210 | Full | 12.00 | 13.00 | 15.54 | 24.00 | | 4.29 | | | Pass |

| FCC Band II MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 52 | 5260 | Full | 17.40 | 18.20 | 20.83 | 23.98 | | 4.53 | | 30 | Pass |
| HE20 | MCS2 | 2 | 60 | 5300 | Full | 17.30 | 18.00 | 20.67 | 23.98 | | 4.53 | | 30 | Pass |
| HE20 | MCS2 | 2 | 64 | 5320 | Full | 16.70 | 17.70 | 20.24 | 23.98 | | 4.53 | | 30 | Pass |
| HE40 | MCS0 | 2 | 54 | 5270 | Full | 19.60 | 20.30 | **22.97** | 23.98 | | 4.53 | | 30 | Pass |
| HE40 | MCS0 | 2 | 62 | 5310 | Full | 15.00 | 15.90 | 18.48 | 23.98 | | 4.53 | | 30 | Pass |
| HE80 | MCS0 | 2 | 58 | 5290 | Full | 13.30 | 16.40 | 18.13 | 23.98 | | 4.53 | | 30 | Pass |

| FCC Band III MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 100 | 5500 | Full | 17.40 | 17.80 | 20.61 | 23.98 | | 4.81 | | 30 | Pass |
| HE20 | MCS2 | 2 | 116 | 5580 | Full | 17.30 | 18.00 | 20.67 | 23.98 | | 4.81 | | 30 | Pass |
| HE20 | MCS2 | 2 | 140 | 5700 | Full | 15.70 | 17.10 | 19.47 | 23.98 | | 4.81 | | 30 | Pass |
| HE40 | MCS0 | 2 | 102 | 5510 | Full | 15.30 | 15.80 | 18.57 | 23.98 | | 4.81 | | 30 | Pass |
| HE40 | MCS0 | 2 | 110 | 5550 | Full | 20.00 | 20.20 | **23.11** | 23.98 | | 4.81 | | 30 | Pass |
| HE40 | MCS0 | 2 | 134 | 5670 | Full | 17.10 | 18.00 | 20.58 | 23.98 | | 4.81 | | 30 | Pass |
| HE80 | MCS0 | 2 | 106 | 5530 | Full | 15.50 | 15.80 | 18.66 | 23.98 | | 4.81 | | 30 | Pass |
| HE80 | MCS0 | 2 | 122 | 5610 | Full | 19.00 | 19.40 | 22.21 | 23.98 | | 4.81 | | 30 | Pass |

| FCC Band III straddle channel MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 144 | 5720 | Full | 17.20 | 18.30 | 20.80 | 22.97 | | 4.81 | | 30 | Pass |
| HE40 | MCS0 | 2 | 142 | 5710 | Full | 19.60 | 20.50 | 23.08 | 23.98 | | 4.81 | | 30 | Pass |
| HE80 | MCS0 | 2 | 138 | 5690 | Full | 19.50 | 20.50 | 23.04 | 23.98 | | 4.81 | | 30 | Pass |

## 3.3 Power Spectral Density Measurement

### 3.3.1 Limit of Power Spectral Density

**<FCC 14-30 CFR 15.407>**

**For the 5.15–5.25 GHz bands:**

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1.0 MHz band. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1.0 MHz band.

**For the 5.25–5.725 GHz bands:**

The maximum power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 3.3.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

**<CDD Modes>**

**# Method SA-3 #**

(power averaging (rms) detection with max hold):

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time ≤ (number of points in sweep) × T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
  Detector = power averaging (rms).
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

**<TXBF Modes>**

**# Method SA-3 #**

(power averaging (rms) detection with max hold):

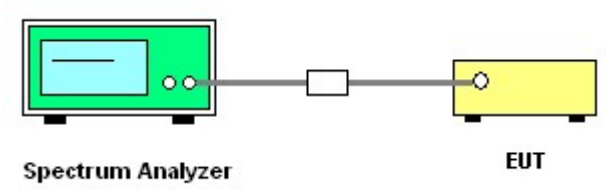
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time ≤ (number of points in sweep) × T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
- Detector = power averaging (rms).
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

1. The RF output of EUT is connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

   Method (a): Measure and sum the spectra across the outputs.

   The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points; the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

### 3.3.4 Test Setup




### 3.3.5 Test Result of Power Spectral Density

| Test Engineer : | Eason Huang | Temperature : | 21~25℃ |
|---|---|---|---|
| | | Relative Humidity : | 51~54% |

**<CDD Mode>**

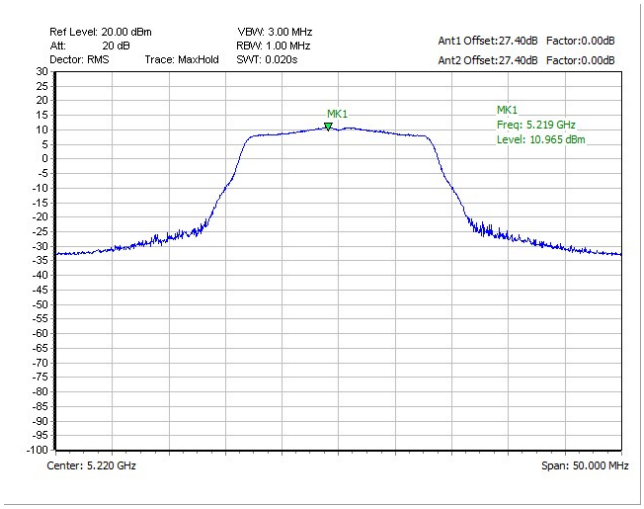
| FCC Band I MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Power Density with Duty Factor (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 36 | 5180 | - | | 10.95 | 11.00 | | 4.29 | | - | Pass |
| 11a | 6Mbps | 2 | 44 | 5220 | | | **10.97** | 11.00 | | 4.29 | | | Pass |
| 11a | 6Mbps | 2 | 48 | 5240 | | | 10.95 | 11.00 | | 4.29 | | | Pass |

| Band II MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Power Density with Duty Factor (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 52 | 5260 | - | | 10.73 | 11.00 | | 4.53 | | - | Pass |
| 11a | 6Mbps | 2 | 60 | 5300 | | | **10.86** | 11.00 | | 4.53 | | | Pass |
| 11a | 6Mbps | 2 | 64 | 5320 | | | 10.73 | 11.00 | | 4.53 | | | Pass |

| Band III MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Power Density with Duty Factor (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 100 | 5500 | - | | 10.88 | 11.00 | | 4.81 | | - | Pass |
| 11a | 6Mbps | 2 | 116 | 5580 | | | 10.93 | 11.00 | | 4.81 | | | Pass |
| 11a | 6Mbps | 2 | 140 | 5700 | | | 10.32 | 11.00 | | 4.81 | | | Pass |

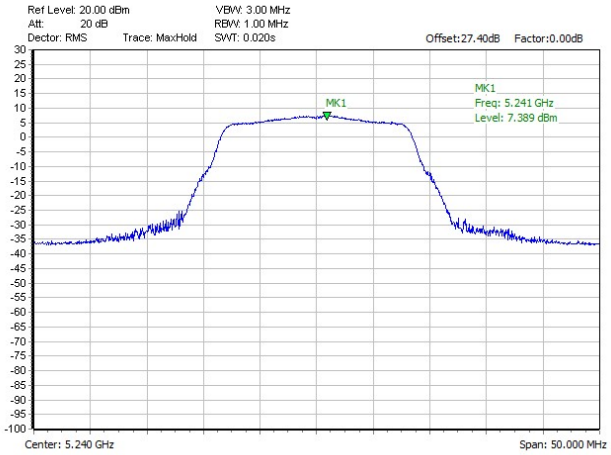
| Band III straddle channel MIMO | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Power Density (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| 11a | 6Mbps | 2 | 144 | 5720 | - | | **10.96** | 11.00 | | 4.81 | | - | Pass |

**Maximum Power Density Plot (dBm/MHz)**

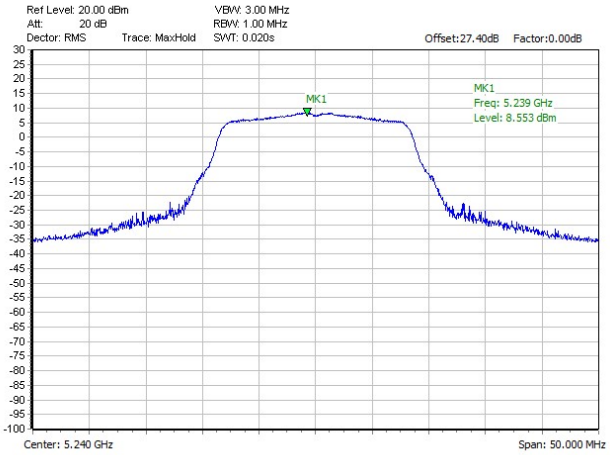



**Remark:** The test plot is showing a bin by bin combined result mathematically adds two traces.

**Maximum Power Density Plot Trace 1 (Ant 6)**




**Maximum Power Density Plot Trace 2 (Ant 7)**



**<802.11ax Mode>**

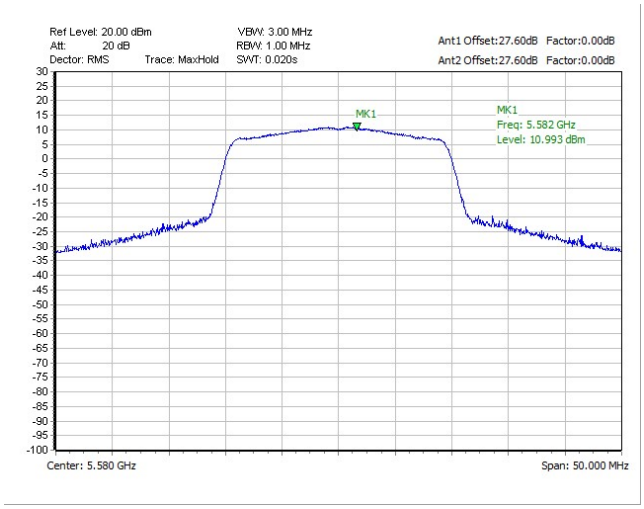
| FCC Band I MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density with Duty Factor (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 36 | 5180 | Full | - | | 10.70 | 11.00 | | 4.29 | | - | Pass |
| HE20 | MCS0 | 2 | 36 | 5180 | 26/0 | | | 10.39 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 36 | 5180 | 52/37 | | | 10.43 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 36 | 5180 | 106/53 | | | 10.69 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 44 | 5220 | Full | | | 10.77 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 44 | 5220 | 26/4 | | | 10.72 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 44 | 5220 | 52/39 | | | 10.52 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 44 | 5220 | 106/53 | | | 10.70 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 48 | 5240 | Full | | | **10.80** | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 48 | 5240 | 26/8 | | | 10.69 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 48 | 5240 | 52/40 | | | 10.64 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS0 | 2 | 48 | 5240 | 106/54 | | | 10.77 | 11.00 | | 4.29 | | | Pass |
| HE40 | MCS0 | 2 | 38 | 5190 | Full | | | 6.29 | 11.00 | | 4.29 | | | Pass |
| HE40 | MCS0 | 2 | 38 | 5190 | 242/61 | | | 6.11 | 11.00 | | 4.29 | | | Pass |
| HE40 | MCS0 | 2 | 46 | 5230 | Full | | | 8.97 | 11.00 | | 4.29 | | | Pass |
| HE40 | MCS0 | 2 | 46 | 5230 | 242/62 | | | 8.95 | 11.00 | | 4.29 | | | Pass |
| HE80 | MCS0 | 2 | 42 | 5210 | Full | | | 2.37 | 11.00 | | 4.29 | | | Pass |
| HE80 | MCS0 | 2 | 42 | 5210 | 484/65 | | | 2.33 | 11.00 | | 4.29 | | | Pass |

| Band II MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density with Duty Factor (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 52 | 5260 | Full | - | | 10.73 | 11.00 | | 4.53 | | - | Pass |
| HE20 | MCS0 | 2 | 52 | 5260 | 26/0 | | | 10.60 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 52 | 5260 | 52/37 | | | 10.54 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 52 | 5260 | 106/53 | | | 10.53 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 60 | 5300 | Full | | | **10.89** | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 60 | 5300 | 26/4 | | | 10.79 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 60 | 5300 | 52/39 | | | 10.60 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 60 | 5300 | 106/54 | | | 10.72 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 64 | 5320 | Full | | | 10.87 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 64 | 5320 | 26/8 | | | 10.79 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 64 | 5320 | 52/40 | | | 10.73 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS0 | 2 | 64 | 5320 | 106/54 | | | 10.78 | 11.00 | | 4.53 | | | Pass |
| HE40 | MCS0 | 2 | 54 | 5270 | Full | | | 9.53 | 11.00 | | 4.53 | | | Pass |
| HE40 | MCS0 | 2 | 54 | 5270 | 242/61 | | | 9.26 | 11.00 | | 4.53 | | | Pass |
| HE40 | MCS0 | 2 | 62 | 5310 | Full | | | 7.04 | 11.00 | | 4.53 | | | Pass |
| HE40 | MCS0 | 2 | 62 | 5310 | 242/62 | | | 6.61 | 11.00 | | 4.53 | | | Pass |
| HE80 | MCS0 | 2 | 58 | 5290 | Full | | | 2.56 | 11.00 | | 4.53 | | | Pass |
| HE80 | MCS0 | 2 | 58 | 5290 | 484/66 | | | 2.17 | 11.00 | | 4.53 | | | Pass |

| Band III MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density with Duty Factor (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 100 | 5500 | Full | - | | 10.95 | 11.00 | | 4.81 | | - | Pass |
| HE20 | MCS0 | 2 | 100 | 5500 | 26/0 | | | 10.82 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 100 | 5500 | 52/37 | | | 10.67 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 100 | 5500 | 106/53 | | | 10.88 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 116 | 5580 | Full | | | 10.99 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 116 | 5580 | 26/4 | | | 10.72 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 116 | 5580 | 52/38 | | | 10.83 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 116 | 5580 | 106/53 | | | 10.97 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 140 | 5700 | Full | | | 9.99 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 140 | 5700 | 26/8 | | | 9.62 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 140 | 5700 | 52/40 | | | 9.68 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS0 | 2 | 140 | 5700 | 106/54 | | | 9.90 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 102 | 5510 | Full | | | 6.95 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 102 | 5510 | 242/61 | | | 6.87 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 110 | 5550 | Full | | | 9.70 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 110 | 5550 | 242/61 | | | 9.43 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 134 | 5670 | Full | | | 8.08 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 134 | 5670 | 242/62 | | | 7.81 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 106 | 5530 | Full | | | 3.50 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 106 | 5530 | 484/65 | | | 3.30 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 122 | 5610 | Full | | | 6.47 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 122 | 5610 | 484/66 | | | 6.32 | 11.00 | | 4.81 | | | Pass |

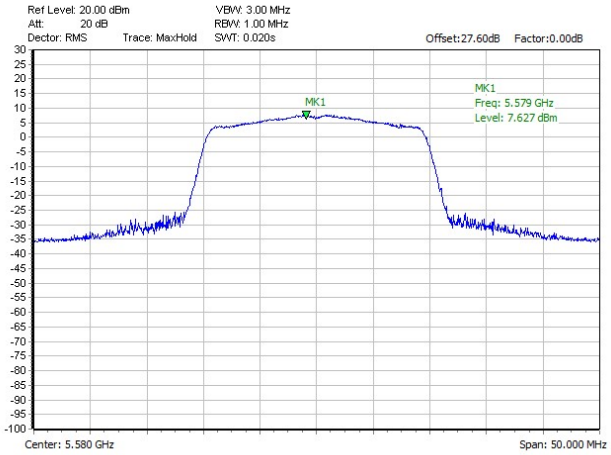
| Band III straddle channel MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS0 | 2 | 144 | 5720 | Full | - | | 10.90 | 11.00 | | 4.81 | | - | Pass |
| HE40 | MCS0 | 2 | 144 | 5720 | 26/8 | | | 10.89 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 144 | 5720 | 52/40 | | | 10.68 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 144 | 5720 | 106/54 | | | 10.79 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 142 | 5710 | Full | | | 8.96 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 142 | 5710 | 242/62 | | | 8.73 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 138 | 5690 | Full | | | 6.10 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 138 | 5690 | 484/66 | | | 6.05 | 11.00 | | 4.81 | | | Pass |

**Maximum Power Density Plot (dBm/MHz)**

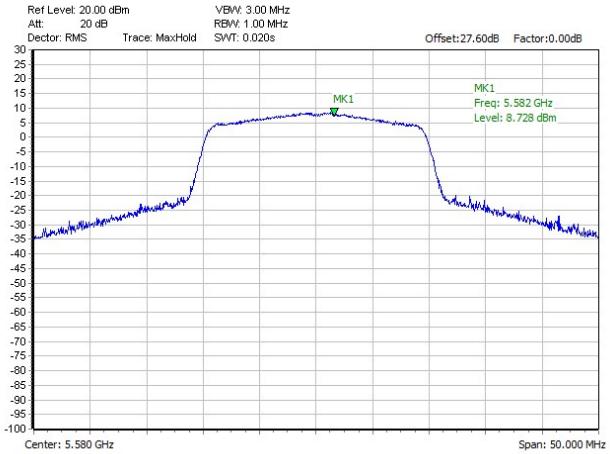



**Remark:** The test plot is showing a bin by bin combined result mathematically adds two traces.

**Maximum Power Density Plot Trace 1 (Ant 6)**




**Maximum Power Density Plot Trace 2 (Ant 7)**



**<TXBF Modes>**

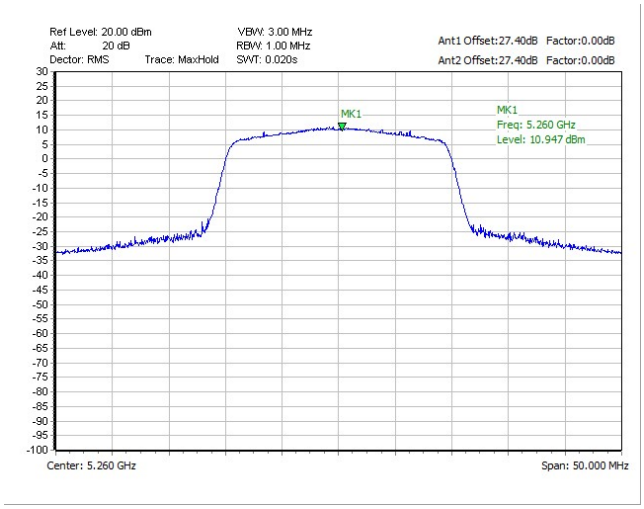
| FCC Band I MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 36 | 5180 | Full | - | | 10.17 | 11.00 | | 4.29 | | - | Pass |
| HE20 | MCS2 | 2 | 44 | 5220 | Full | | | 10.59 | 11.00 | | 4.29 | | | Pass |
| HE20 | MCS2 | 2 | 48 | 5240 | Full | | | **10.74** | 11.00 | | 4.29 | | | Pass |
| HE40 | MCS0 | 2 | 38 | 5190 | Full | | | 2.96 | 11.00 | | 4.29 | | | Pass |
| HE40 | MCS0 | 2 | 46 | 5230 | Full | | | 9.08 | 11.00 | | 4.29 | | | Pass |
| HE80 | MCS0 | 2 | 42 | 5210 | Full | | | -1.08 | 11.00 | | 4.29 | | | Pass |

| Band II MIMO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 52 | 5260 | Full | - | | **10.95** | 11.00 | | 4.53 | | - | Pass |
| HE20 | MCS2 | 2 | 60 | 5300 | Full | | | 10.86 | 11.00 | | 4.53 | | | Pass |
| HE20 | MCS2 | 2 | 64 | 5320 | Full | | | 10.32 | 11.00 | | 4.53 | | | Pass |
| HE40 | MCS0 | 2 | 54 | 5270 | Full | | | 10.88 | 11.00 | | 4.53 | | | Pass |
| HE40 | MCS0 | 2 | 62 | 5310 | Full | | | 4.61 | 11.00 | | 4.53 | | | Pass |
| HE80 | MCS0 | 2 | 58 | 5290 | Full | | | 1.72 | 11.00 | | 4.53 | | | Pass |

| Band III MIMO | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 100 | 5500 | Full | - | | 10.86 | 11.00 | | 4.81 | | - | Pass |
| HE20 | MCS2 | 2 | 116 | 5580 | Full | | | 10.64 | 11.00 | | 4.81 | | | Pass |
| HE20 | MCS2 | 2 | 140 | 5700 | Full | | | 9.46 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 102 | 5510 | Full | | | 5.47 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 110 | 5550 | Full | | | 9.35 | 11.00 | | 4.81 | | | Pass |
| HE40 | MCS0 | 2 | 134 | 5670 | Full | | | 6.44 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 106 | 5530 | Full | | | 2.04 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 122 | 5610 | Full | | | 5.58 | 11.00 | | 4.81 | | | Pass |

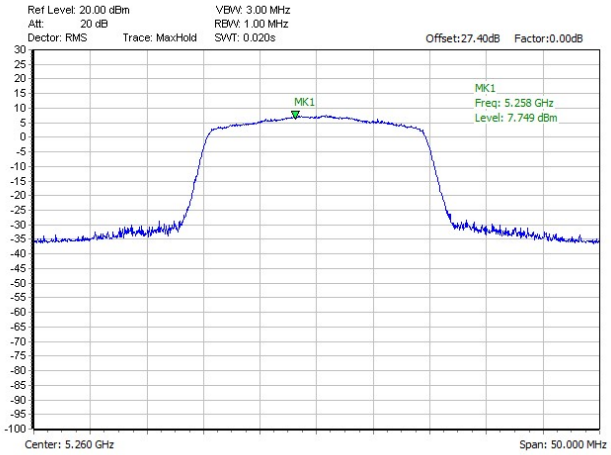
| Band III straddle channel MIMO | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | RU Config. | Average Power Density (dBm/MHz) | | | Average PSD Limit (dBm/MHz) | | DG (dBi) | | - | Pass /Fail |
| | | | | | | Ant 6 | Ant 7 | SUM | Ant 6 | Ant 7 | Ant 6 | Ant 7 | | |
| HE20 | MCS2 | 2 | 144 | 5720 | Full | - | | 10.73 | 11.00 | | 4.81 | | - | Pass |
| HE40 | MCS0 | 2 | 142 | 5710 | Full | | | 9.35 | 11.00 | | 4.81 | | | Pass |
| HE80 | MCS0 | 2 | 138 | 5690 | Full | | | 6.01 | 11.00 | | 4.81 | | | Pass |

**Maximum Power Density Plot (dBm/MHz)**

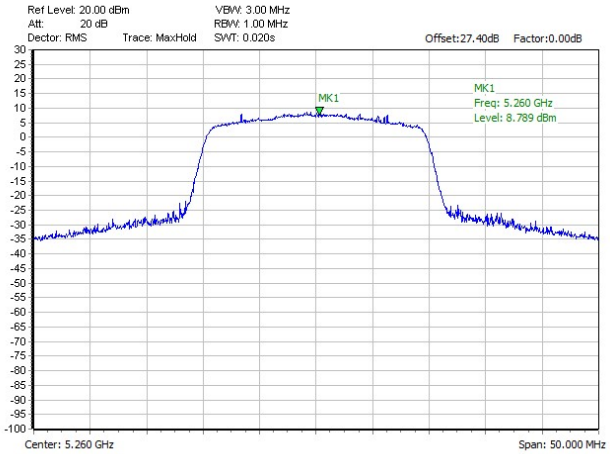



**Remark:** The test plot is showing a bin by bin combined result mathematically adds two traces.

**Maximum Power Density Plot Trace 1 (Ant 6)**




**Maximum Power Density Plot Trace 2 (Ant 7)**



## 3.4 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

### 3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) Unwanted spurious emissions falls in restricted bands shall comply with the general field strength limits as below table:

| Frequency (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:** The following formula is used to convert the EIRP to field strength.

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

| EIRP (dBm) | Field Strength at 3m (dBμV/m) |
|---|---|
| - 27 | 68.3 |

(3) KDB789033 D02 v02r01 G)2)c)

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of −27 dBm/MHz.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

### 3.4.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000 MHz

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

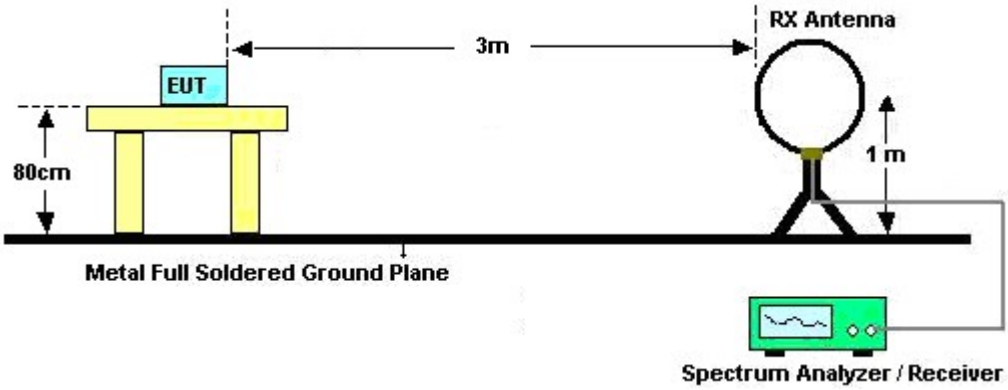
(3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT is arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as "-".
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as "-".

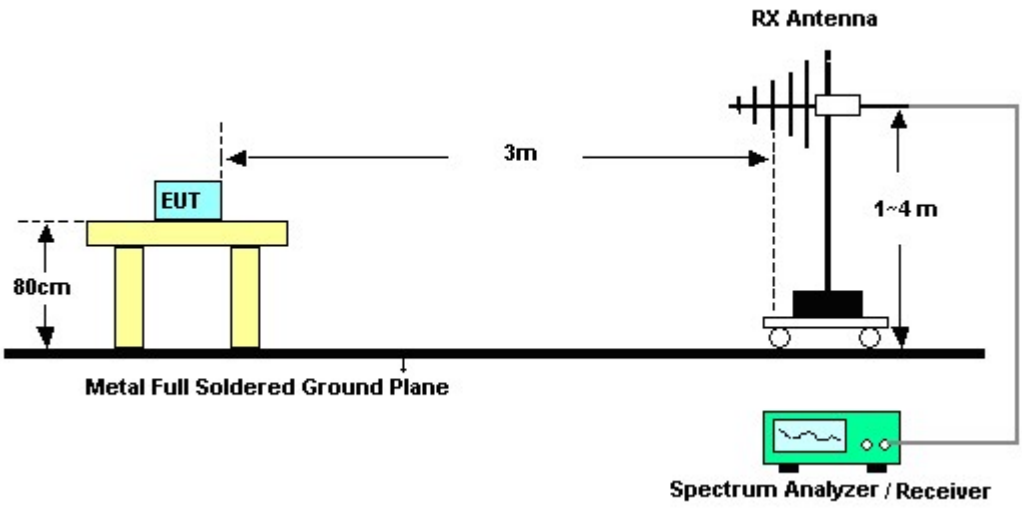
### 3.4.4 Test Setup

**For radiated emissions below 30MHz**

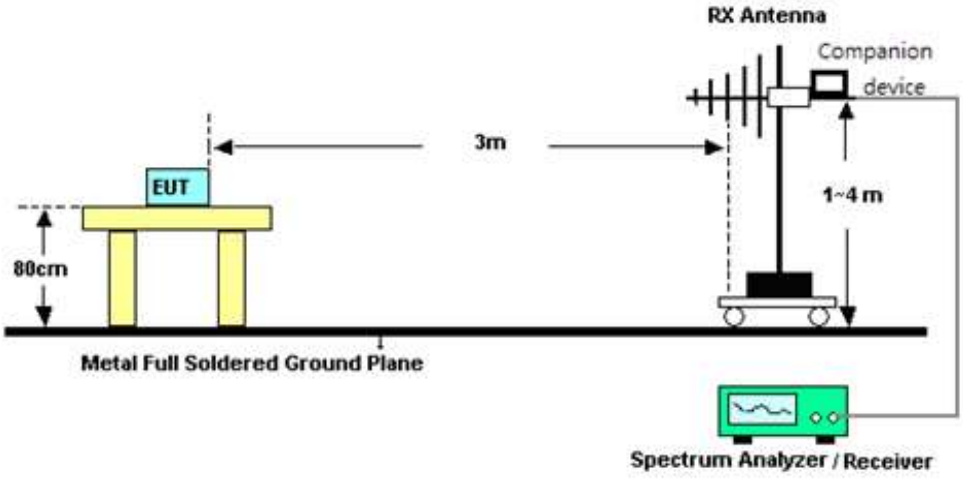


**For radiated emissions from 30MHz to 1GHz**

**<CDD Mode>**

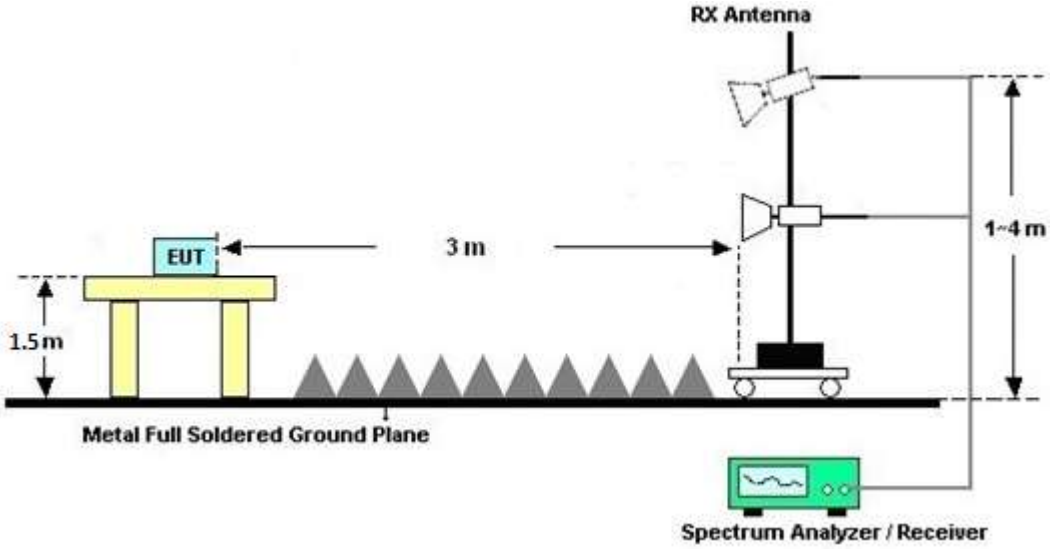



**<TXBF Modes>**

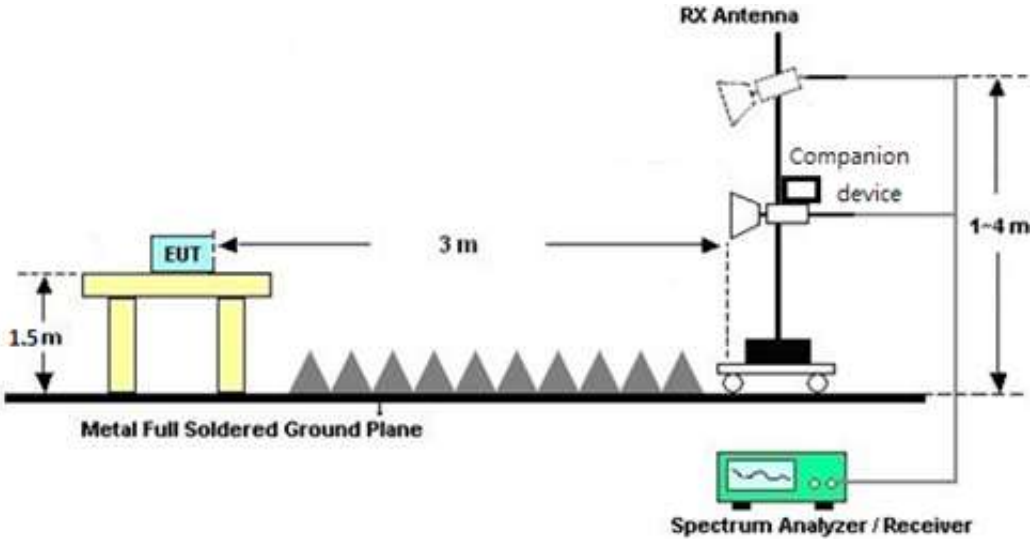


**For radiated test from 1GHz to 18GHz**

**<CDD Mode>**

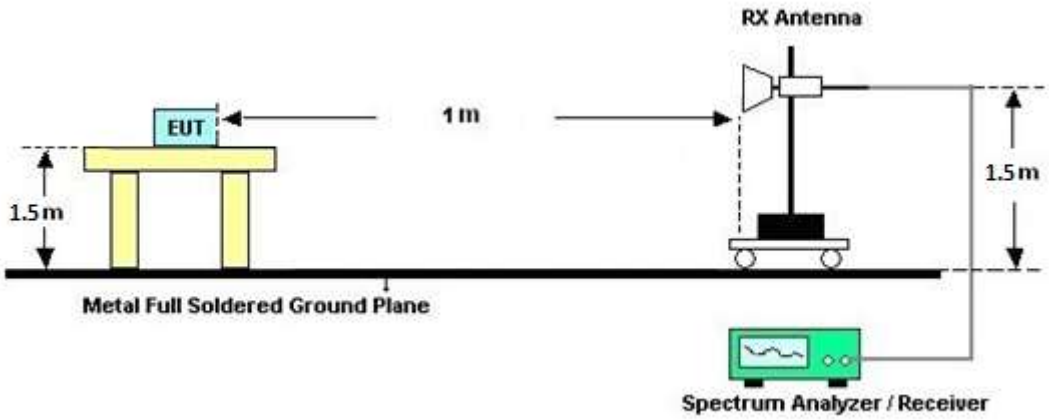



**<TXBF Modes>**

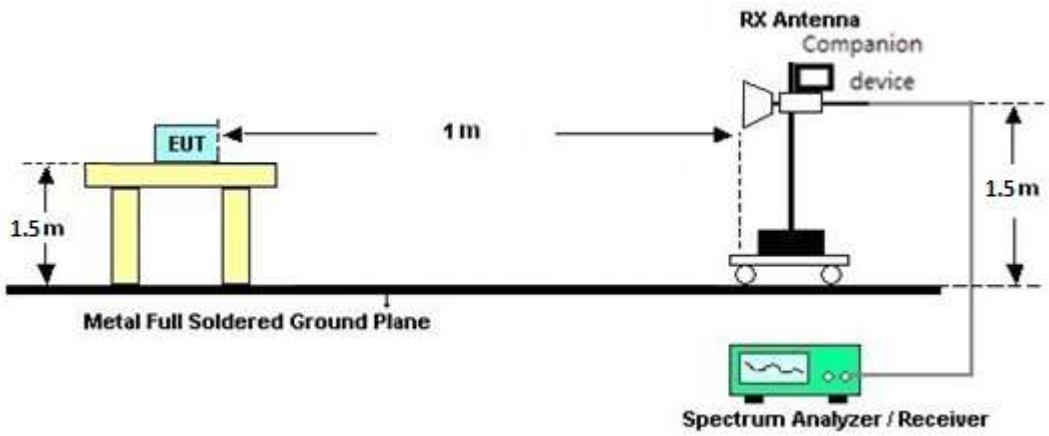


**For radiated test above 18GHz**

**<CDD Mode>**




**<TXBF Modes>**



### 3.4.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

### 3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

### 3.4.7 Duty Cycle

Please refer to Appendix D.

### 3.4.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix B and C.

## 3.5 AC Conducted Emission Measurement

### 3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Frequency of emission (MHz) | Conducted limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

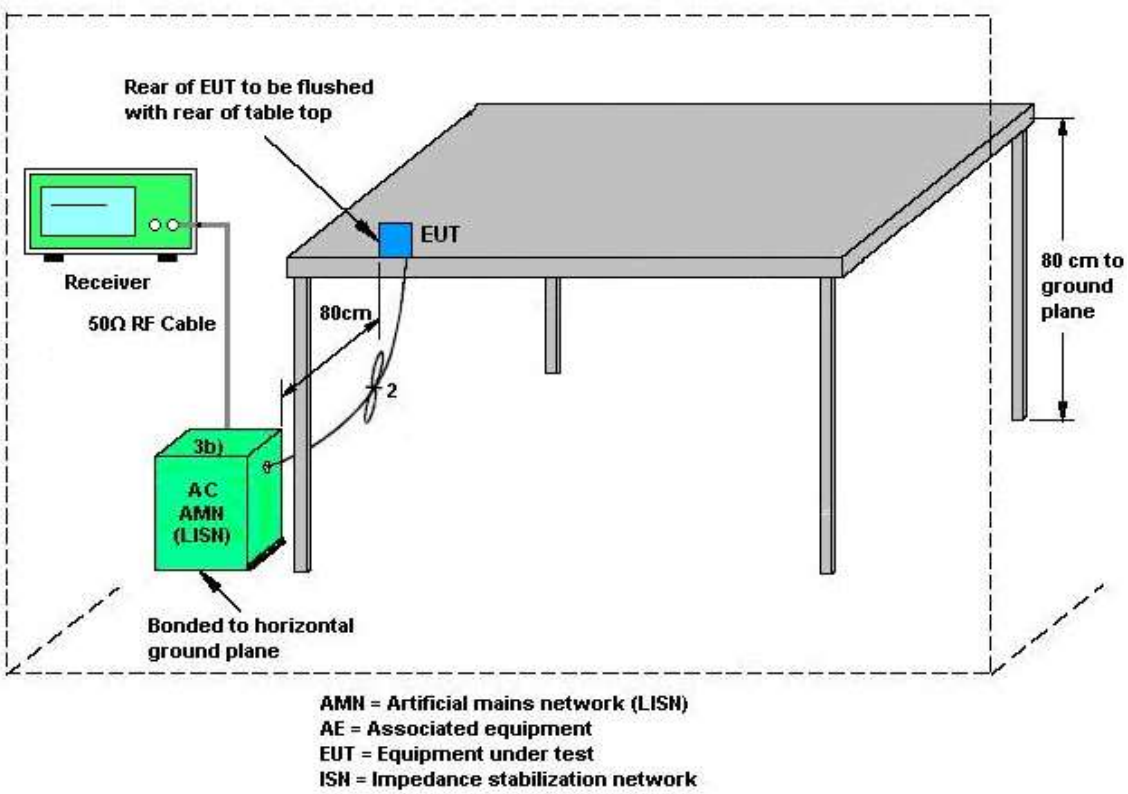
### 3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.5.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

### 3.5.4 Test Setup




### 3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

## 3.6 Antenna Requirements

### 3.6.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

### 3.6.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = $G_{ANT}$ + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log($N_{ANT}/N_{SS}$=1) dB.

For power measurements on IEEE 802.11 devices,

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

Directional gain may be calculated by using the formulas applicable to equal gain antennas with $G_{ANT}$ set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain $G_{ANT}$ is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

**<CDD Modes>**

| | Ant. 6 (dBi) | Ant. 7 (dBi) | DG for Power (dBi) | DG for PSD (dBi) | Power Limit Reduction (dB) | PSD Limit Reduction (dB) |
|---|---|---|---|---|---|---|
| **Band I** | 1.68 | 0.87 | 1.68 | 4.29 | 0.00 | 0.00 |
| **Band II** | 1.68 | 1.35 | 1.68 | 4.53 | 0.00 | 0.00 |
| **Band III** | 1.22 | 2.34 | 2.34 | 4.81 | 0.00 | 0.00 |

*Power limit reduction = Composite gain – 6dBi, ( min = 0 )*

*PSD limit reduction = Composite gain + PSD Array gain – 6dBi, ( min = 0 )*

**TXBF modes**

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

$$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

*where*

Each antenna is driven by no more than one spatial stream;

$N_{SS}$ = the number of independent spatial streams of data;

$N_{ANT}$ = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the $k$th antenna is being fed by spatial stream $j$, or zero if it is not;

$G_k$ is the gain in dBi of the kth antenna.

The EUT supports beamforming for 802.11ac modes.

The directional gain calculation is following F)2)e)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

| | Ant 6 (dBi) | Ant 7 (dBi) | DG for Power (dBi) | DG for PSD (dBi) | Power Limit Reduction (dB) | PSD Limit Reduction (dB) |
|---|---|---|---|---|---|---|
| **Band I** | 1.68 | 0.87 | 4.29 | 4.29 | 0.00 | 0.00 |
| **Band II** | 1.68 | 1.35 | 4.53 | 4.53 | 0.00 | 0.00 |
| **Band III** | 1.22 | 2.34 | 4.81 | 4.81 | 0.00 | 0.00 |

*Power Limit Reduction = DG(Power) – 6dBi, ( min = 0 )*

*PSD Limit Reduction = DG(PSD) – 6dBi, ( min = 0 )*

# 4 List of Measuring Equipment

| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100488 | 9kHz~30MHz | Sep. 07, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Sep. 06, 2022 | Radiation (03CH13-HY) |
| Bilog Antenna | TESEQ | CBL 6111D & 00800N1D01N -06 | 40103 & 07 | 30MHz~1GHz | Apr. 24, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Apr. 23, 2023 | Radiation (03CH13-HY) |
| Horn Antenna | SCHWARZBE CK | BBHA 9120 D | 9120D-1241 | 1GHz~18GHz | Jul. 13, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Jul. 12, 2022 | Radiation (03CH13-HY) |
| SHF-EHF Horn Antenna | SCHWARZBE CK | BBHA 9170 | 00994 | 18GHz~40GHz | Nov. 04, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Nov. 03, 2022 | Radiation (03CH13-HY) |
| Amplifier | Sonoma-Instru ment | 310 N | 187282 | 9kHz~1GHz | Dec. 15, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Dec. 14, 2022 | Radiation (03CH13-HY) |
| Preamplifier | MITEQ | AMF-7D-0010 1800-30-10P | 1590074 | 1GHz~18GHz | May 17, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | May 16, 2023 | Radiation (03CH13-HY) |
| Preamplifier | Keysight | 83017A | MY53270147 | 1GHz~26.5GHz | Oct. 26, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Oct. 25, 2022 | Radiation (03CH13-HY) |
| Preamplifier | EMEC | EM18G40G | 060715 | 18GHz~40GHz | Dec. 24, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Dec. 23, 2022 | Radiation (03CH13-HY) |
| Spectrum Analyzer | Keysight | N9010A | MY55370526 | 10Hz~44GHz | Mar. 18, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Mar. 17, 2023 | Radiation (03CH13-HY) |
| Hygrometer | TECPEL | DTM-303B | TP200889 | N/A | Sep. 30, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Sep. 29, 2022 | Radiation (03CH13-HY) |
| Antenna Mast | EMEC | AM-BS-4500-B | N/A | 1m~4m | N/A | Jun. 25, 2022~ Jun. 30, 2022 | N/A | Radiation (03CH13-HY) |
| Turn Table | EMEC | TT2000 | N/A | 0~360 Degree | N/A | Jun. 25, 2022~ Jun. 30, 2022 | N/A | Radiation (03CH13-HY) |
| Software | Audix | E3 6.2009-8-24 | RK-000992 | N/A | N/A | Jun. 25, 2022~ Jun. 30, 2022 | N/A | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 126E | 0030/126E | 30MHz~18GHz | Feb. 09, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Feb. 08, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | 804793/4 | 30MHz~18GHz | Feb. 09, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Feb. 08, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY24961/4 | 30MHz~18GHz | Feb. 09, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Feb. 08, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 804011/2, 804012/2 | 18GHz~40GHz | Jan. 04, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Jan. 03, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY9837/4PE | 9kHz~30MHz | Mar. 10, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Mar. 09, 2023 | Radiation (03CH13-HY) |
| Filter | Wainwright | WLK4-1000-15 30-8000-40SS | SN12 | 1.53GHz Low Pass Filter | Sep. 14, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Sep. 13, 2022 | Radiation (03CH13-HY) |
| Filter | Wainwright | WHKX8-5872. 5-6750-18000- 40ST | SN5 | 6.75GHz High Pass Filter | Mar. 10, 2022 | Jun. 25, 2022~ Jun. 30, 2022 | Mar. 09, 2023 | Radiation (03CH13-HY) |
| Filter | Wainwright | WHKX12-2700 -3000-18000-6 0SS | SN2 | 3GHz High Pass Filter | Jul. 12, 2021 | Jun. 25, 2022~ Jun. 30, 2022 | Jul. 11, 2022 | Radiation (03CH13-HY) |
| AC Power Source | ACPOWER | AFC-11003G | F317040033 | N/A | N/A | Jul. 04, 2022 | N/A | Conduction (CO07-HY) |
| Software | Rohde & Schwarz | EMC32 V10.30 | N/A | N/A | N/A | Jul. 04, 2022 | N/A | Conduction (CO07-HY) |
| Pulse Limiter | SCHWARZBE CK | VTSD 9561-F N | 9561-F N00373 | 9kHz-200MHz | Oct. 29, 2021 | Jul. 04, 2022 | Oct. 28, 2022 | Conduction (CO07-HY) |
| RF Cable | HUBER + SUHNER | RG 214/U | 1358175 | 9kHz~30MHz | Mar. 16, 2022 | Jul. 04, 2022 | Mar. 15, 2023 | Conduction (CO07-HY) |
| Two-Line V-Network | TESEQ | NNB 51 | 45051 | N/A | Feb. 16, 2022 | Jul. 04, 2022 | Feb. 15, 2023 | Conduction (CO07-HY) |
| EMI Test Receiver | Rohde & Schwarz | ESCI7 | 100724 | 9kHz~7GHz | Feb. 24, 2022 | Jul. 04, 2022 | Feb. 23, 2023 | Conduction (CO07-HY) |

| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Hygrometer | TECPEL | DTM-303A | TP201996 | N/A | Nov. 16, 2021 | Jun. 15, 2022~ Jul. 18, 2022 | Nov. 15, 2022 | Conducted (TH05-HY) |
| Power Sensor | DARE | RPR3006W | 16I00054SNO 12 (NO:113) | 10MHz~6GHz | Dec. 16, 2021 | Jun. 15, 2022~ Jul. 18, 2022 | Dec. 15, 2022 | Conducted (TH05-HY) |
| Signal Analyzer | Rohde & Schwarz | FSV40 | 101566 | 10Hz~40GHz | Aug. 30, 2021 | Jun. 15, 2022~ Jul. 18, 2022 | Aug. 29, 2022 | Conducted (TH05-HY) |
| Switch Control Mainframe | E-IUSTRUME NT | ETF-1405-0 | EC1900067 (BOX7) | N/A | Aug. 12, 2021 | Jun. 15, 2022~ Jul. 18, 2022 | Aug. 11, 2022 | Conducted (TH05-HY) |

# 5 Uncertainty of Evaluation

**Uncertainty of Conducted Emission Measurement (150 kHz ~ 3 0MHz)**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 2.3 dB |

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 6.0 dB |

**Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 5.2 dB |

**Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)**

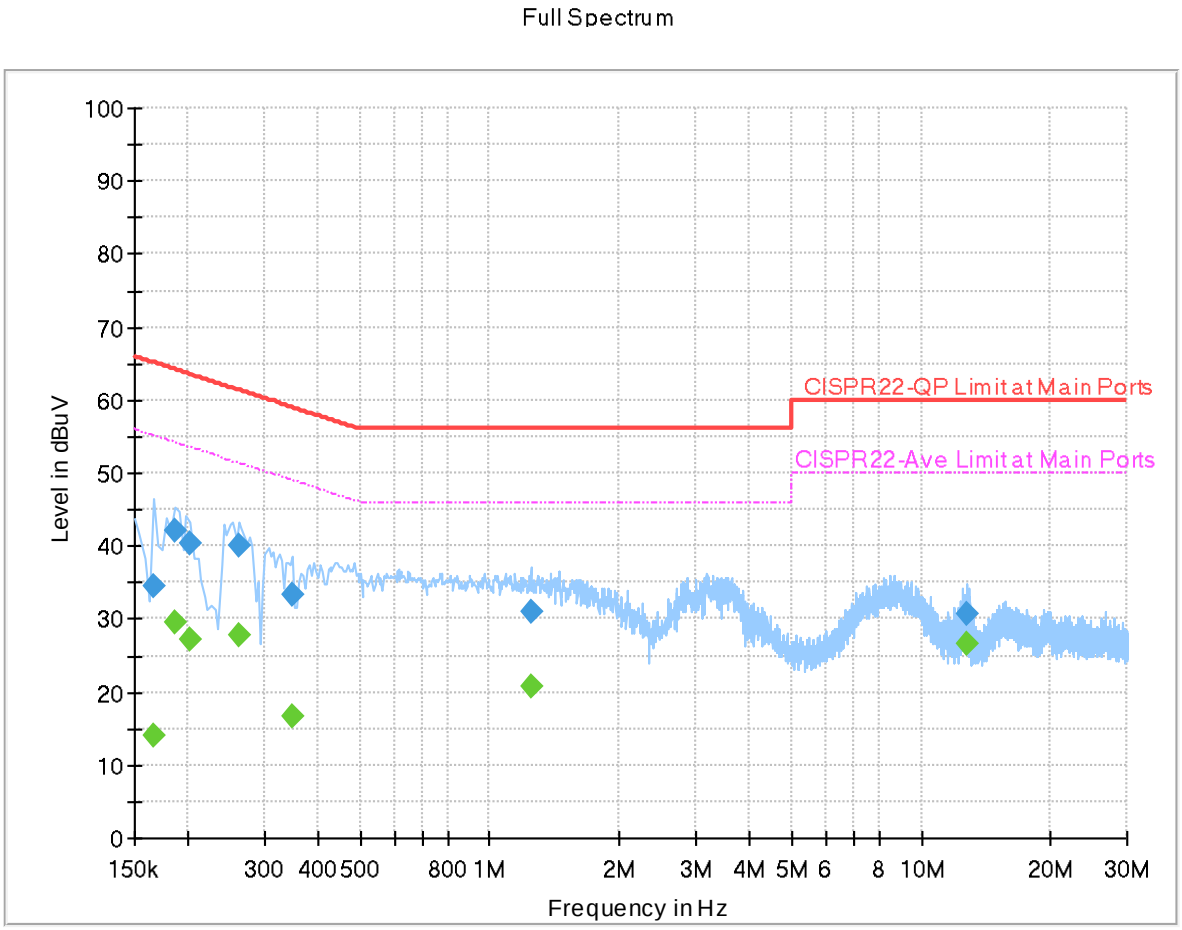
| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 5.9 dB |

# Appendix A. AC Conducted Emission Test Results

| | | | |
|---|---|---|---|
| **Test Engineer :** | Louis Chung | **Temperature :** | 22.2~26.3℃ |
| | | **Relative Humidity :** | 48.2~58.7% |

## EUT Information

| | |
|---|---|
| Report NO : | 1N2541 |
| Test Mode : | Mode 1 |
| Test Voltage : | 120Vac/60Hz |
| Phase : | Line |

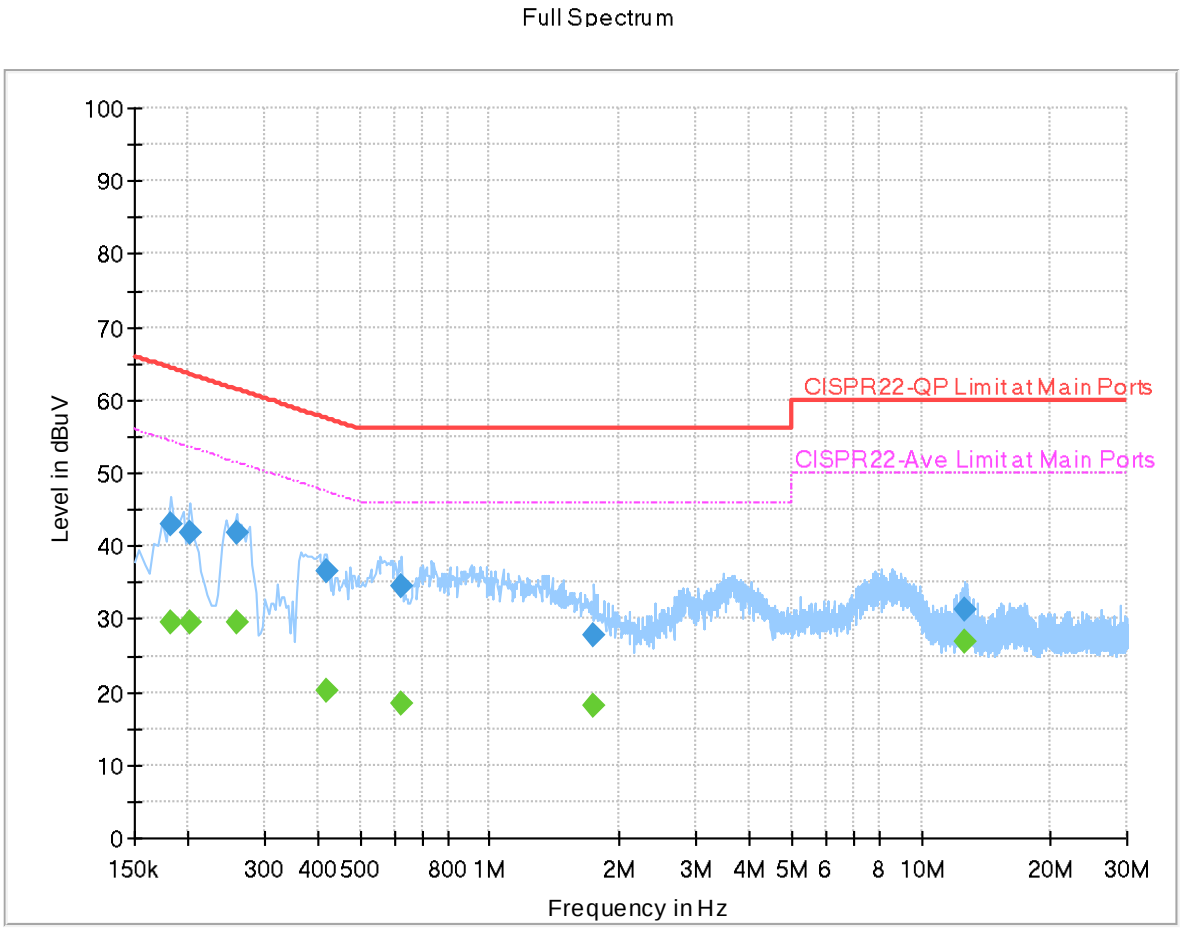



## Final_Result

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|---|
| 0.166000 | --- | 13.90 | 55.16 | 41.26 | L1 | OFF | 20.0 |
| 0.166000 | 34.57 | --- | 65.16 | 30.59 | L1 | OFF | 20.0 |
| 0.186000 | --- | 29.51 | 54.21 | 24.70 | L1 | OFF | 20.0 |
| 0.186000 | 42.02 | --- | 64.21 | 22.19 | L1 | OFF | 20.0 |
| 0.202000 | --- | 27.31 | 53.53 | 26.22 | L1 | OFF | 20.0 |
| 0.202000 | 40.33 | --- | 63.53 | 23.20 | L1 | OFF | 20.0 |
| 0.262000 | --- | 27.72 | 51.37 | 23.65 | L1 | OFF | 20.0 |
| 0.262000 | 40.06 | --- | 61.37 | 21.31 | L1 | OFF | 20.0 |
| 0.350000 | --- | 16.59 | 48.96 | 32.37 | L1 | OFF | 20.0 |
| 0.350000 | 33.41 | --- | 58.96 | 25.55 | L1 | OFF | 20.0 |
| 1.242000 | --- | 20.67 | 46.00 | 25.33 | L1 | OFF | 20.0 |
| 1.242000 | 30.93 | --- | 56.00 | 25.07 | L1 | OFF | 20.0 |
| 12.706000 | --- | 26.61 | 50.00 | 23.39 | L1 | OFF | 20.2 |
| 12.706000 | 30.76 | --- | 60.00 | 29.24 | L1 | OFF | 20.2 |

## EUT Information

| | |
|---|---|
| Report NO : | 1N2541 |
| Test Mode : | Mode 1 |
| Test Voltage : | 120Vac/60Hz |
| Phase : | Neutral |




## Final_Result

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|---|
| 0.182000 | --- | 29.64 | 54.39 | 24.75 | N | OFF | 20.0 |
| 0.182000 | 42.99 | --- | 64.39 | 21.40 | N | OFF | 20.0 |
| 0.202000 | --- | 29.47 | 53.53 | 24.06 | N | OFF | 20.0 |
| 0.202000 | 41.74 | --- | 63.53 | 21.79 | N | OFF | 20.0 |
| 0.258000 | --- | 29.53 | 51.50 | 21.97 | N | OFF | 20.0 |
| 0.258000 | 41.67 | --- | 61.50 | 19.83 | N | OFF | 20.0 |
| 0.418000 | --- | 20.32 | 47.49 | 27.17 | N | OFF | 20.0 |
| 0.418000 | 36.43 | --- | 57.49 | 21.06 | N | OFF | 20.0 |
| 0.626000 | --- | 18.47 | 46.00 | 27.53 | N | OFF | 20.0 |
| 0.626000 | 34.47 | --- | 56.00 | 21.53 | N | OFF | 20.0 |
| 1.746000 | --- | 18.21 | 46.00 | 27.79 | N | OFF | 20.0 |
| 1.746000 | 27.82 | --- | 56.00 | 28.18 | N | OFF | 20.0 |
| 12.614000 | --- | 26.94 | 50.00 | 23.06 | N | OFF | 20.2 |
| 12.614000 | 31.41 | --- | 60.00 | 28.59 | N | OFF | 20.2 |

# Appendix B. Radiated Spurious Emission

| Test Engineer : | Mancy Chou , Jacky Hong and Rain Lee | Temperature : | 20~25°C |
|---|---|---|---|
| | | Relative Humidity : | 40~60% |

**<CDD Mode>**

**Band 1 - 5150~5250MHz**

**WIFI 802.11a (Band Edge @ 3m)**

| WIFI Ant. 6+7 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Margin ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11a CH 36 5180MHz | | 5148.72 | 61.74 | -12.26 | 74 | 49.84 | 32.2 | 6.21 | 26.51 | 100 | 349 | P | H |
| | | 5149.5 | 52.9 | -1.1 | 54 | 41 | 32.2 | 6.21 | 26.51 | 100 | 349 | A | H |
| | * | 5180 | 114.59 | - | - | 102.78 | 32.08 | 6.25 | 26.52 | 100 | 349 | P | H |
| | * | 5180 | 107.89 | - | - | 96.08 | 32.08 | 6.25 | 26.52 | 100 | 349 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5147.94 | 59.73 | -14.27 | 74 | 47.83 | 32.2 | 6.21 | 26.51 | 100 | 108 | P | V |
| | | 5150 | 50.17 | -3.83 | 54 | 38.26 | 32.2 | 6.22 | 26.51 | 100 | 108 | A | V |
| | * | 5180 | 110.93 | - | - | 99.12 | 32.08 | 6.25 | 26.52 | 100 | 108 | P | V |
| | * | 5180 | 102.68 | - | - | 90.87 | 32.08 | 6.25 | 26.52 | 100 | 108 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11a CH 44 5220MHz | | 5142.48 | 61.34 | -12.66 | 74 | 49.46 | 32.18 | 6.21 | 26.51 | 107 | 356 | P | H |
| | | 5150 | 52.61 | -1.39 | 54 | 40.7 | 32.2 | 6.22 | 26.51 | 107 | 356 | A | H |
| | * | 5220 | 118.9 | - | - | 107.22 | 31.92 | 6.28 | 26.52 | 107 | 356 | P | H |
| | * | 5220 | 111.62 | - | - | 99.94 | 31.92 | 6.28 | 26.52 | 107 | 356 | A | H |
| | | 5353.6 | 55.38 | -18.62 | 74 | 43.98 | 31.62 | 6.32 | 26.54 | 107 | 356 | P | H |
| | | 5350 | 46.32 | -7.68 | 54 | 34.94 | 31.6 | 6.32 | 26.54 | 107 | 356 | A | H |
| | | 5150 | 57.73 | -16.27 | 74 | 45.82 | 32.2 | 6.22 | 26.51 | 352 | 328 | P | V |
| | | 5149.76 | 48.67 | -5.33 | 54 | 36.77 | 32.2 | 6.21 | 26.51 | 352 | 328 | A | V |
| | * | 5220 | 113.74 | - | - | 102.06 | 31.92 | 6.28 | 26.52 | 352 | 328 | P | V |
| | * | 5220 | 106.66 | - | - | 94.98 | 31.92 | 6.28 | 26.52 | 352 | 328 | A | V |
| | | 5380.48 | 53.29 | -20.71 | 74 | 41.73 | 31.78 | 6.32 | 26.54 | 352 | 328 | P | V |
| | | 5352.48 | 44.63 | -9.37 | 54 | 33.24 | 31.61 | 6.32 | 26.54 | 352 | 328 | A | V |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11a CH 48 5240MHz | | 5143.52 | 59.72 | -14.28 | 74 | 47.83 | 32.19 | 6.21 | 26.51 | 100 | 356 | P | H |
| | | 5150 | 50.73 | -3.27 | 54 | 38.82 | 32.2 | 6.22 | 26.51 | 100 | 356 | A | H |
| | * | 5240 | 118.74 | - | - | 107.14 | 31.84 | 6.28 | 26.52 | 100 | 356 | P | H |
| | * | 5240 | 111.64 | - | - | 100.04 | 31.84 | 6.28 | 26.52 | 100 | 356 | A | H |
| | | 5353.6 | 56.63 | -17.37 | 74 | 45.23 | 31.62 | 6.32 | 26.54 | 100 | 356 | P | H |
| | | 5350.8 | 47.9 | -6.1 | 54 | 36.52 | 31.6 | 6.32 | 26.54 | 100 | 356 | A | H |
| | | 5129.22 | 55.32 | -18.68 | 74 | 43.48 | 32.16 | 6.19 | 26.51 | 355 | 353 | P | V |
| | | 5148.72 | 47.12 | -6.88 | 54 | 35.22 | 32.2 | 6.21 | 26.51 | 355 | 353 | A | V |
| | * | 5240 | 113.89 | - | - | 102.29 | 31.84 | 6.28 | 26.52 | 355 | 353 | P | V |
| | * | 5240 | 106.84 | - | - | 95.24 | 31.84 | 6.28 | 26.52 | 355 | 353 | A | V |
| | | 5357.52 | 53.29 | -20.71 | 74 | 41.86 | 31.65 | 6.32 | 26.54 | 355 | 353 | P | V |
| | | 5353.04 | 45.03 | -8.97 | 54 | 33.63 | 31.62 | 6.32 | 26.54 | 355 | 353 | A | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**Band 1 5150~5250MHz**

**WIFI 802.11a (Harmonic @ 3m)**

| WIFI Ant. 6+7 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Margin ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11a CH 36 5180MHz | | 10360 | 47.01 | -21.19 | 68.2 | 53.86 | 39.94 | 9.78 | 56.57 | - | - | P | H |
| | | 15540 | 44.96 | -29.04 | 74 | 50 | 39.44 | 12.05 | 56.53 | - | - | P | H |
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| | | | | | | | | | | | | | H |
| | | 10360 | 47.1 | -21.1 | 68.2 | 53.95 | 39.94 | 9.78 | 56.57 | - | - | P | V |
| | | 15540 | 44.76 | -29.24 | 74 | 49.8 | 39.44 | 12.05 | 56.53 | - | - | P | V |
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| WIFI Ant. 6+7 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Margin ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10440 | 46.6 | -21.6 | 68.2 | 53.03 | 40.22 | 9.82 | 56.47 | - | - | P | H |
| | | 15660 | 45.99 | -28.01 | 74 | 51.42 | 38.9 | 12.04 | 56.37 | - | - | P | H |
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| 802.11a CH 44 5220MHz | | 10440 | 46.16 | -22.04 | 68.2 | 52.59 | 40.22 | 9.82 | 56.47 | - | - | P | V |
| | | 15660 | 44.93 | -29.07 | 74 | 50.36 | 38.9 | 12.04 | 56.37 | - | - | P | V |
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| WIFI Ant. 6+7 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Margin ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11a CH 48 5240MHz | | 10480 | 48.27 | -19.93 | 68.2 | 54.5 | 40.34 | 9.85 | 56.42 | - | - | P | H |
| | | 15720 | 45.29 | -28.71 | 74 | 50.85 | 38.68 | 12.05 | 56.29 | - | - | P | H |
| | | | | | | | | | | | | | H |
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| | | | | | | | | | | | | | H |
| | | 10480 | 47.05 | -21.15 | 68.2 | 53.28 | 40.34 | 9.85 | 56.42 | - | - | P | V |
| | | 15720 | 44.36 | -29.64 | 74 | 49.92 | 38.68 | 12.05 | 56.29 | - | - | P | V |
| | | | | | | | | | | | | | V |
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| | | | | | | | | | | | | | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line.<br>3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. | | | | | | | | | | | | |

**Band 1 5150~5250MHz**

**WIFI 802.11ax HE20 Full (Band Edge @ 3m)**

| WIFI Ant. 6+7 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Margin ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11ax HE20 Full CH 36 5180MHz | | 5148.2 | 62.43 | -11.57 | 74 | 50.53 | 32.2 | 6.21 | 26.51 | 100 | 355 | P | H |
| | | 5150 | 52.52 | -1.48 | 54 | 40.61 | 32.2 | 6.22 | 26.51 | 100 | 355 | A | H |
| | * | 5180 | 117.16 | - | - | 105.35 | 32.08 | 6.25 | 26.52 | 100 | 355 | P | H |
| | * | 5180 | 106.51 | - | - | 94.7 | 32.08 | 6.25 | 26.52 | 100 | 355 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5149.76 | 58.81 | -15.19 | 74 | 46.91 | 32.2 | 6.21 | 26.51 | 100 | 108 | P | V |
| | | 5149.24 | 50.4 | -3.6 | 54 | 38.5 | 32.2 | 6.21 | 26.51 | 100 | 108 | A | V |
| | * | 5180 | 113.27 | - | - | 101.46 | 32.08 | 6.25 | 26.52 | 100 | 108 | P | V |
| | * | 5180 | 102.47 | - | - | 90.66 | 32.08 | 6.25 | 26.52 | 100 | 108 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11ax HE20 Full CH 44 5220MHz | | 5145.34 | 60.31 | -13.69 | 74 | 48.42 | 32.19 | 6.21 | 26.51 | 100 | 357 | P | H |
| | | 5149.76 | 50.78 | -3.22 | 54 | 38.88 | 32.2 | 6.21 | 26.51 | 100 | 357 | A | H |
| | * | 5220 | 119.49 | - | - | 107.81 | 31.92 | 6.28 | 26.52 | 100 | 357 | P | H |
| | * | 5220 | 110.23 | - | - | 98.55 | 31.92 | 6.28 | 26.52 | 100 | 357 | A | H |
| | | 5350.52 | 55.6 | -18.4 | 74 | 44.22 | 31.6 | 6.32 | 26.54 | 100 | 357 | P | H |
| | | 5350.52 | 46.79 | -7.21 | 54 | 35.41 | 31.6 | 6.32 | 26.54 | 100 | 357 | A | H |
| | | 5105.82 | 55.68 | -18.32 | 74 | 43.9 | 32.11 | 6.17 | 26.5 | 350 | 329 | P | V |
| | | 5150 | 46.77 | -7.23 | 54 | 34.86 | 32.2 | 6.22 | 26.51 | 350 | 329 | A | V |
| | * | 5220 | 114.78 | - | - | 103.1 | 31.92 | 6.28 | 26.52 | 350 | 329 | P | V |
| | * | 5220 | 105.69 | - | - | 94.01 | 31.92 | 6.28 | 26.52 | 350 | 329 | A | V |
| | | 5373.2 | 53.18 | -20.82 | 74 | 41.66 | 31.74 | 6.32 | 26.54 | 350 | 329 | P | V |
| | | 5357.52 | 44.3 | -9.7 | 54 | 32.87 | 31.65 | 6.32 | 26.54 | 350 | 329 | A | V |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11ax HE20 Full CH 48 5240MHz | | 5147.94 | 58.16 | -15.84 | 74 | 46.26 | 32.2 | 6.21 | 26.51 | 100 | 356 | P | H |
| | | 5150 | 49.23 | -4.77 | 54 | 37.32 | 32.2 | 6.22 | 26.51 | 100 | 356 | A | H |
| | * | 5240 | 120.35 | - | - | 108.75 | 31.84 | 6.28 | 26.52 | 100 | 356 | P | H |
| | * | 5240 | 110.4 | - | - | 98.8 | 31.84 | 6.28 | 26.52 | 100 | 356 | A | H |
| | | 5419.68 | 55.77 | -18.23 | 74 | 44.08 | 31.9 | 6.34 | 26.55 | 100 | 356 | P | H |
| | | 5350 | 47.14 | -6.86 | 54 | 35.76 | 31.6 | 6.32 | 26.54 | 100 | 356 | A | H |
| | | 5075.92 | 55.36 | -18.64 | 74 | 43.63 | 32.1 | 6.13 | 26.5 | 353 | 352 | P | V |
| | | 5149.5 | 45.84 | -8.16 | 54 | 33.94 | 32.2 | 6.21 | 26.51 | 353 | 352 | A | V |
| | * | 5240 | 115.12 | - | - | 103.52 | 31.84 | 6.28 | 26.52 | 353 | 352 | P | V |
| | * | 5240 | 106.18 | - | - | 94.58 | 31.84 | 6.28 | 26.52 | 353 | 352 | A | V |
| | | 5384.68 | 54.07 | -19.93 | 74 | 42.47 | 31.81 | 6.33 | 26.54 | 353 | 352 | P | V |
| | | 5351.08 | 44.3 | -9.7 | 54 | 32.91 | 31.61 | 6.32 | 26.54 | 353 | 352 | A | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**Band 1 5150~5250MHz**

**WIFI 802.11ax HE20 Full (Harmonic @ 3m)**

| WIFI Ant. 6+7 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Margin ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10360 | 45.98 | -22.22 | 68.2 | 52.83 | 39.94 | 9.78 | 56.57 | - | - | P | H |
| | | 15540 | 44.86 | -29.14 | 74 | 49.9 | 39.44 | 12.05 | 56.53 | - | - | P | H |
| | | | | | | | | | | | | | H |
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| 802.11ax | | | | | | | | | | | | | H |
| HE20 Full | | | | | | | | | | | | | H |
| CH 36 | | 10360 | 46.62 | -21.58 | 68.2 | 53.47 | 39.94 | 9.78 | 56.57 | - | - | P | V |
| 5180MHz | | 15540 | 45.3 | -28.7 | 74 | 50.34 | 39.44 | 12.05 | 56.53 | - | - | P | V |
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| WIFI Ant. 6+7 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Margin ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10440 | 46.71 | -21.49 | 68.2 | 53.14 | 40.22 | 9.82 | 56.47 | - | - | P | H |
| | | 15660 | 44.49 | -29.51 | 74 | 49.92 | 38.9 | 12.04 | 56.37 | - | - | P | H |
| | | | | | | | | | | | | | H |
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| 802.11ax | | | | | | | | | | | | | H |
| HE20 Full | | | | | | | | | | | | | H |
| CH 44 | | 10440 | 46.02 | -22.18 | 68.2 | 52.45 | 40.22 | 9.82 | 56.47 | - | - | P | V |
| 5220MHz | | 15660 | 46.18 | -27.82 | 74 | 51.61 | 38.9 | 12.04 | 56.37 | - | - | P | V |
| | | | | | | | | | | | | | V |
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