# RF TEST REPORT

## FCC / ISED

APPLICANT

**Hewlett Packard Enterprise Company**

MODEL NAME

**APINH505**

FCC ID

**Q9DAPINH505**

ISED ID

**4675A-APINH505**

REPORT NUMBER

**HA200204-HPE-001-R16**

# TEST REPORT

**Date of Issue**
June 4, 2020

**Test Site**
Hyundai C-Tech, Inc. dba HCT America, Inc.
1726 Ringwood Ave, San Jose, CA 95131, USA

| | |
|---|---|
| **Applicant** | Hewlett Packard Enterprise Company |
| **Applicant Address** | 3333 Scott Blvd, Santa Clara, CA 95054, USA |
| **FCC ID** | Q9DAPINH505 |
| **ISED ID** | 4675A-APINH505 |
| **Model Name** | APINH505 |
| **EUT Type** | Access Point |
| **Modulation Type** | OFDM / OFDM-A |
| **FCC Classification** | Unlicensed National Information Infrastructure (NII) |
| **FCC Rule Part(s)** | Part 15.407 |
| **ISED Rule Part(s)** | RSS-247 Issue 2 (February 2017), RSS-Gen Issue 5 (March 2019) |
| **Test Procedure** | ANSI C63.10-2013, KDB 789033 D02 v02r01 |

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures required. The results of testing in this report apply only to the product which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Hyundai C-Tech, Inc. dba HCT America, Inc. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

| **Tested By** | **Reviewed By** |
|---|---|
| Steve In | Sunwoo Kim |
| Test Engineer | Technical Manager |


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# REVISION HISTORY

*The revision history for this document is shown in table.*

| TEST REPORT NO. | DATE | DESCRIPTION |
|---|---|---|
| HA200204-HPE-001-R16 | June 4, 2020 | Initial Release |
| | | |
| | | |
| | | |


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# 1. GENERAL INFORMATION

## EUT DESCRIPTION

| | |
|---|---|
| **Model** | APINH505 |
| **EUT Type** | Access Point |
| **Power Supply** | AC Adapter : 100 – 240 VAC, 1.3 A, 50 – 60 Hz / PoE : 57 VDC |
| **RF Specification** | WIFI 2.4 GHz : IEEE 802.11b/g/n/ax HE40 (2x2 MIMO)<br>WIFI 5 GHz : IEEE 802.11a/n/ac/ax HE80 (2x2 MIMO)<br>Bluetooth 5.0 LE<br>ZigBee : IEEE 802.15.4 |
| **Transmitter Chain** | 2x2 MIMO |
| **Operating Environment** | Indoor |
| **Operating Temperature** | 0 °C – 40 °C |

## RF SPECIFICATION SUBJECT TO THE REPORT

| | | |
|---|---|---|
| **RF Specification** | 802.11a / 802.11n HT20 / 802.11ac VHT20 / 802.11ax HE20<br>802.11n HT40 / 802.11ac VHT40 / 802.11ax HE40<br>802.11ac VHT80 / 802.11ax HE80 | |
| **Frequency Range 1)** | U-NII 2a | 20 MHz BW : 5260 MHz – 5320 MHz<br>40 MHz BW : 5270 MHz – 5310 MHz<br>80 MHz BW : 5290 MHz |
| | U-NII 2c | 20 MHz BW : 5500 MHz – 5720 MHz<br>40 MHz BW : 5510 MHz – 5710 MHz<br>80 MHz BW : 5530 MHz – 5690 MHz |
| **Max. RF Output Power** | U-NII 2a | 22.24 dBm (167.49 mW) : CDD |
| | U-NII 2c | 21.77 dBm (150.31 mW) : CDD |
| **Modulation Type** | OFDM : 802.11a/n/ac<br>OFDM-A : 802.11ax | |
| **Antenna Specification 2)** | Integrated Antenna<br>Peak Gain : 2.85 dBi uncorrelated / 5.36 dBi correlated | |
| **Firmware Version 3)** | bcm947622EAP_nand_cferom_fs_image_128_ubi.w | |
| **Hardware Version 3)** | P2C | |
| **Date(s) of Tests** | March 7, 2020 ~ March 28, 2020 | |

**Note :**
1. The device is configured not to operate in the frequency range 5600-5650 MHz for Canada
2. Antenna information is based on the document provided.
3. Firmware and Hardware Version are as received by the client.


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## ANTENNA CONFIGURATION

The device employs 2x2 MIMO technologies with possible configurations below.

| Frequency | Configuration | SDM | CDD |
|---|---|---|---|
| | | ANT1 + ANT2 | ANT1 + ANT2 |
| 2.4 GHz | 802.11b | X | O |
| | 802.11g | X | O |
| | 802.11n | O | O |
| | 802.11ax | O | O |
| 5 GHz | 802.11a | X | O |
| | 802.11n | O | O |
| | 802.11ac | O | O |
| | 802.11ax | O | O |

The equipment under test supports Cyclic Diversity mode (CDD signals can be correlated).
CDD mode was picked as worst case for testing even though the device support both CDD and SDM

## ANTENNA DIRECTIONAL GAIN

| Antenna Type | Type | RF Technology | Frequency | Uncorrelated Gain | CDD Correlated Gain |
|---|---|---|---|---|---|
| | | | | ANT1 + ANT2 | ANT1 + ANT2 |
| PCB | Dipole | 802.11b/g/n/ax | 2.4 GHz | 3.28 dBi | 6.27 dBi |
| PCB | Dipole | 802.11a/n/ac/ax | 5 GHz | 2.85 dBi | 5.36 dBi |
| Metal | Monopole | BLE, ZigBee | 2.4 GHz | 1.29 dBi | |

In accordance with KDB 662911 D01 v02r01, uncorrelated directional gain was applied for calculating max conducted output power limit and correlated directional gain was applied for calculating PSD limit.

**Note :**
The directional gains, uncorrelated and correlated gains were provided by the manufacturer.


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## 2. METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E" and ANSI C63.10(Version : 2013) 'the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices' were used in the measurement.

### EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E. / RSS-Gen issue 5, RSS-247 issue 2.

### GENERAL TEST PROCEDURES

**Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

**Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

### DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program is used to control the channel management, continuous Tx mode and Rx mode of the equipment under test.

## 3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).


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## 4. FACILITIES AND ACCREDITATIONS

### FACILITIES

The SAC (Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at 1726 Ringwood Avenue, San Jose, California 95131, USA.
The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

ilac-MRA A2LA

**Accredited Laboratory**

A2LA has accredited

**HYUNDAI C-TECH, INC. DBA HCT AMERICA, INC.**

*San Jose, CA*

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Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

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Presented this 25th day of November 2019.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4201.01
Valid to July 31, 2021

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

### EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."


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## 5. ANTENNA REQUIREMENTS

**According to FCC 47 CFR §15.203:**

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

(1) The antenna of this E.U.T is permanently attached and there is no provision for connection to an external antenna.
(2) The E.U.T Complies with the requirement of §15.203


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## 6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k$ = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the $U_{CISPR}$ measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Parameter | Expanded Uncertainty (±dB) |
|---|---|
| Conducted Disturbance (150 kHz ~ 30 MHz) | 2.55 |
| Radiated Disturbance (9 kHz ~ 30 MHz) | 3.20 |
| Radiated Disturbance (30 MHz ~ 1 GHz) | 4.73 |
| Radiated Disturbance (1 GHz ~ 18 GHz) | 5.21 |
| Radiated Disturbance (18 GHz ~ 40 GHz) | 5.18 |


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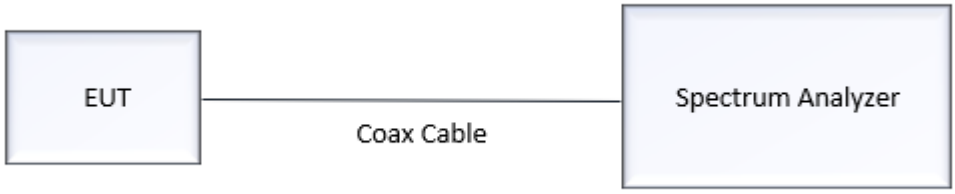
# 7. DESCRIPTION OF TESTS

## 7.1. Duty Cycle

**Test Configuration**




**Test Procedure**

The transmitter output is connected to the Spectrum Analyzer.
Measurement is performed in accordance with the procedure B.2 in KDB 789033 D02 v02r01.

1) RBW = 8 MHz (the largest available value)
2) VBW = 8 MHz (≥ RBW)
3) SPAN = 0 Hz
4) Detector = Peak
5) Number of points in sweep > 100
6) Trace mode = Clear write
7) Measure $T_{total}$ and $T_{on}$
8) Calculate Duty Cycle = $T_{on}$/ $T_{total}$ and Duty Cycle Factor = 10*log(1/Duty Cycle)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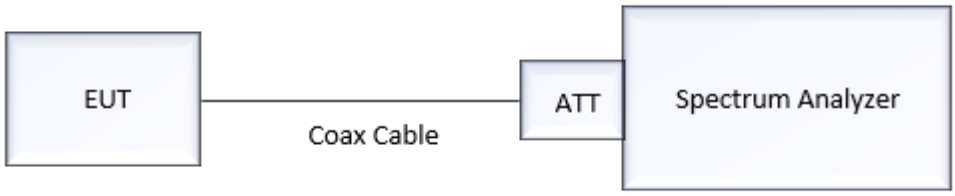
## 7.2. 6 dB Bandwidth / 26 dB Bandwidth / 99% Bandwidth

**Limit**

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

**Test Configuration**




**Test Procedure (26dB Bandwidth)**

The transmitter output is connected to the Spectrum Analyzer.
Testing was performed according to the procedure C.1 in KDB 789033 D02 v02r01.

1) RBW = approximately 1 % of the emission bandwidth
2) VBW > RBW
3) Detector = Peak
4) Trace mode = Max hold
5) Measure the maximum width of the emission that is 26 dB down from the maximum 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 %.

**Test Procedure (6dB Bandwidth)**

The transmitter output is connected to the Spectrum Analyzer.
Testing was performed according to the procedure C.1 in KDB 789033 D02 v02r01.

1) RBW = 100 kHz
2) VBW ≥ 3*RBW
3) Detector = Peak
4) Trace mode = Max hold
5) Allow the trace to stabilize
6) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum lever measured in the fundamental emission.

**Note:**

1. The automatic bandwidth measurement capability of a spectrum analyzer is used to measure X dB bandwidth.
2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.
3. 26 dB bandwidth is used to determine the conducted power limits.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**Test Procedure (99 % Bandwidth measurement)**

The 99 % bandwidth is used to determine the conducted power limits(for ISED).

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied /
x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized. (6.9.3 in ANSI 63.10-2013)

1) RBW = 1% ~ 5% of the occupied bandwidth
2) VBW ≥ 3 x RBW
3) Detector = Peak
4) Trace mode = max hold
5) Sweep = auto couple
6) Allow the trace to stabilize


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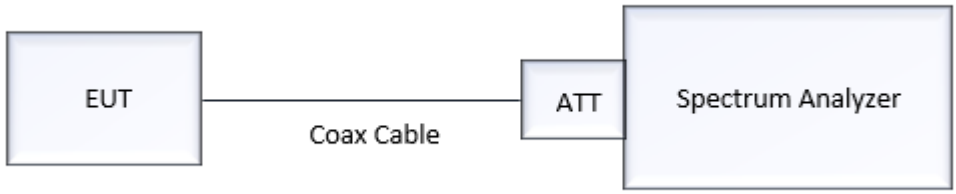
## 7.3. Output Power

**Limit**

| Band | | FCC Limit | | IC Limit |
|---|---|---|---|---|
| U-NII 1 | ☐ | Master (Outdoor) | ≤ 1 W (= 30dBm)<br>≤ 125 mW (= 21dBm) EIRP at max elevation angle (30°) from horizon | Indoor only for LE LAN devices<br><br>≤ 200 mW EIRP or ≤ 10 + 10 log B EIRP in dBm whichever power is less, where B is 99% BW in MHz |
| | ☐ | Master (Indoor) | ≤ 1 W (= 30dBm) | |
| | ☐ | Client | ≤ 250 mW (= 24 dBm) | |
| U-NII 2a | ☒ | ≤ 250 mW or ≤ 11 dBm + 10 log B whichever is less (where B is the 26 dB Emission BW in MHz) | | ≤ 250 mW or ≤ 11 dBm + 10 log B<br>≤ 1W EIRP or ≤ 17 dBm + 10 log B EIRP<br>Whichever power is less, where B is 99% BW in MHz |
| U-NII 2c | ☒ | | | |
| U-NII 3 | ☐ | ≤ 1 W (= 30dBm) | | ≤ 1 W (= 30dBm) |

**Test Configuration**




**Test Procedure**

The transmitter output is connected to the Spectrum Analyzer.
We use the spectrum analyzer's integrated band power measurement function.
We tested according to Procedure E.2.d) in KDB 789033 D02 v02r01.

1) Measure the duty cycle.
2) Set span to encompass the 26 dB EBW of the signal.
3) RBW = 1 MHz
4) VBW ≥ 3 MHz
5) Number of points in sweep ≥ 2*span/RBW.
6) Sweep time = auto.
7) Detector = RMS.
8) Do not use sweep triggering. Allow the sweep to "free run".
9) Trace average at least 100 traces in power averaging (RMS) mode
10) Integrated bandwidth = OBW

Add 10log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times

**Sample Calculation**

- Conducted Output Power (Peak) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB)
- Conducted Output Power (Average) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)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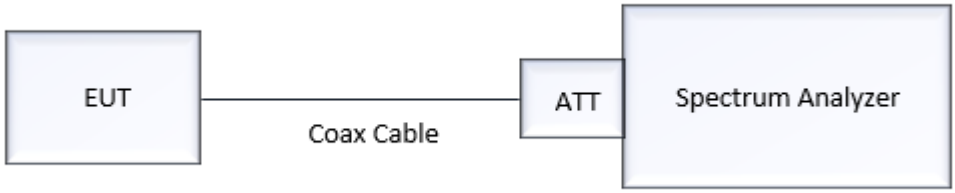
## 7.4. Power Spectral Density

**Limit**

| Band | | FCC Limit | | IC Limit |
|---|---|---|---|---|
| U-NII 1 | ☐ | Master Device | ≤ 17 dBm/MHz | Indoor only for LE LAN devices |
| | ☐ | Client Device | ≤ 11 dBm/MHz | ≤ 10 dBm/MHz EIRP |
| U-NII 2a | ☒ | ≤ 11 dBm/MHz | | ≤ 11 dBm/MHz |
| U-NII 2c | ☒ | ≤ 11 dBm/MHz | | ≤ 11 dBm/MHz |
| U-NII 3 | ☐ | ≤ 30 dBm/500 kHz | | ≤ 30 dBm/500 kHz |

**Test Configuration**




**Test Procedure**

We tested according to Procedure F in KDB 789033 D02 v02r01.

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) RBW = 1 MHz (510 kHz for UNII 3)
3) VBW ≥ 3 MHz
4) Number of points in sweep ≥ 2*span/RBW.
5) Sweep time = auto.
6) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
7) Do not use sweep triggering. Allow the sweep to “free run”.
8) Trace average at least 100 traces in power averaging (RMS) mode
9) Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10) If Method SA-2 was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.

**Sample Calculation**

Total PSD(dBm) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)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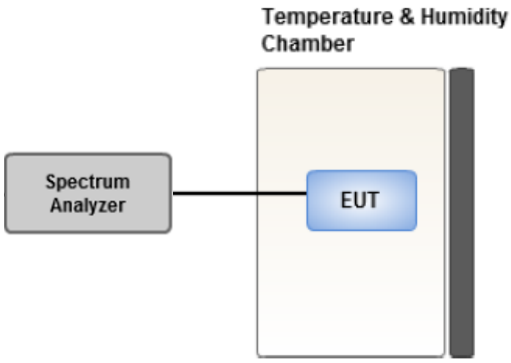
## 7.5. Frequency Stability

**Limit**

Fundamental emissions of the radio devices should be kept within at least the central 80% of its permitted operating frequency band to minimize the possibility of out of band operation.

**Test Configuration**




**Test Procedure**

1) The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 ℃ and 50 ℃.

2) The temperature was incremented by 10 ℃ intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

3) The primary supply voltage is varied from 85% to 115% of the nominal value for non-hand carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

4) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.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## 7.6. Radiated Test

**Undesirable Emission Limits**

| Frequency Band | | Limit |
|---|---|---|
| U-NII 1 [1)] | ☐ | In accordance with **47 CFR § 15.407(b)(1) / RSS-247, 6.2.1.2**<br>All emissions outside the 5.15-5.35 GHz band shall not exceed an −27 dBm/MHz e.i.r.p. |
| U-NII 2a | ☒ | In accordance with **47 CFR § 15.407(b)(2) / RSS-247, 6.2.2.2**<br>All emissions outside the 5.15-5.35 GHz band shall not exceed an −27 dBm/MHz e.i.r.p. |
| U-NII 2c | ☒ | In accordance with **47 CFR § 15.407(b)(3) / RSS-247, 6.2.3.2**<br>All emissions outside the 5.47-5.725 GHz band shall not exceed an −27 dBm/MHz e.i.r.p. |
| U-NII 3 | ☐ | In accordance with **47 CFR § 15.407(b)(4) / RSS-247, 6.2.4.2**<br>All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. |

**Note :**
For ISED, The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.


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**Radiated Emission Limits**

| FCC : 47 CFR § 15.209 | | |
|---|---|---|
| **Frequency (MHz)** | **Field Strength (uV/m)** | **Measurement Distance (m)** |
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

| ISED : RSS-GEN Section 8.9 | | |
|---|---|---|
| **Frequency (MHz)** | **Field Strength (uV/m)** | **Measurement Distance (m)** |
| 0.009 – 0.490 | 6.37/F(kHz) | 300 |
| 0.490 – 1.705 | 63.7/F(kHz) | 30 |
| 1.705 – 30 | 0.08 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

**Receiver Radiated Emission Limits**

| ISED : RSS-GEN Section 7.3 | | |
|---|---|---|
| **Frequency (MHz)** | **Field Strength (uV/m)** | **Measurement Distance (m)** |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |


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**Restricted Bands of Operation**

| FCC : 47 CFR § 15.205(a) | | | | |
|---|---|---|---|---|
| **Frequency (MHz)** | **Frequency (MHz)** | **Frequency (MHz)** | **Frequency (MHz)** | **Frequency (MHz)** |
| 0.090 – 0.110 | 12.29-12.293 | 149.9 - 150.05 | 1660.0 - 1710.0 | 8025 – 8500 |
| 0.495 - 0.505 | 12.51975-12.52025 | 156.52475 - 156.52525 | 1718.8 - 1722.2 | 9000 – 9200 |
| 2.1735 – 2.1905 | 12.57675-12.57725 | 156.7 - 156.9 | 2200.0 - 2300.0 | 9300 – 9500 |
| 4.125 - 4.128 | 13.36-13.41 | 162.0125 - 167.17 | 2310.0 - 2390.0 | 10600 - 12700 |
| 4.17725-4.17775 | 16.42-16.423 | 167.72 - 173.2 | 2483.5 – 2500.0 | 13250 – 13400 |
| 4.20725-4.20775 | 16.69475-16.69525 | 240.0 - 285.0 | 2690.0 - 2900.0 | 14470 – 14500 |
| 6.215-6.218 | 16.80425-16.80475 | 322.0 - 335.4 | 3260.0 – 3267.0 | 15350 – 16200 |
| 6.26775-6.26825 | 25.5-25.67 | 399.9 - 410.0 | 3332.0 – 3339.0 | 17700 – 21400 |
| 6.31175-6.31225 | 37.5-38.25 | 608.0 - 614.0 | 3345.8 – 3358.0 | 22010 – 23120 |
| 8.291-8.294 | 73 - 74.6 | 960.0 - 1240.0 | 3600.0 – 4400.0 | 23600 – 24000 |
| 8.362-8.366 | 74.8 - 75.2 | 1300.0 - 1427.0 | 4500.0 – 5150.0 | 31200 – 31800 |
| 8.37625-8.38675 | 108 - 121.94 | 1435.0 - 1626.5 | 5350.0 – 5460.0 | 36430 – 36500 |
| 8.41425-8.41475 | 123 - 138 | 1645.5 - 1646.5 | 7250.0 – 7750.0 | Above 38600 |

| ISED : RSS-GEN Section 8.10 | | | | |
|---|---|---|---|---|
| **Frequency (MHz)** | **Frequency (MHz)** | **Frequency (MHz)** | **Frequency (MHz)** | **Frequency (MHz)** |
| 0.090 - 0.110 | 8.37625 - 8.38675 | 108 – 138 | 1660 - 1710 | 8025 – 8500 |
| 0.495 - 0.505 | 8.41425 - 8.41475 | 149.9 - 150.05 | 1718.8 - 1722.2 | 9000 - 9200 |
| 2.1735 - 2.1905 | 12.29 - 12.293 | 156.52475 - 156.52525 | 2200 - 2300 | 9300 - 9500 |
| 3.020 - 3.026 | 12.51975 - 12.52025 | 156.7 - 156.9 | 2310 - 2390 | 10600 - 12700 |
| 4.125 - 4.128 | 12.57675 - 12.57725 | 162.0125 - 167.17 | 2483.5 - 2500 | 13250 – 13400 |
| 4.17725 - 4.17775 | 13.36 - 13.41 | 167.72 - 173.2 | 2655 - 2900 | 14470 – 14500 |
| 4.20725 - 4.20775 | 16.42 - 16.423 | 240 – 285 | 3260 – 3267 | 15350 – 16200 |
| 5.677 - 5.683 | 16.69475 - 16.69525 | 322 - 335.4 | 3332 - 3339 | 17700 – 21400 |
| 6.215 - 6.218 | 16.80425 - 16.80475 | 399.9 - 410 | 3345.8 - 3358 | 22010 – 23120 |
| 6.26775 - 6.26825 | 25.5 - 25.67 | 608 - 614 | 3500 - 4400 | 23600 – 24000 |
| 6.31175 - 6.31225 | 37.5 - 38.25 | 960 - 1427 | 4500 - 5150 | 31200 – 31800 |
| 8.291 - 8.294 | 73 - 74.6 | 1435 - 1626.5 | 5350 - 5460 | 36430 – 36500 |
| 8.362 - 8.366 | 74.8 - 75.2 | 1645.5 - 1646.5 | 7250 - 7750 | Above 38600 |


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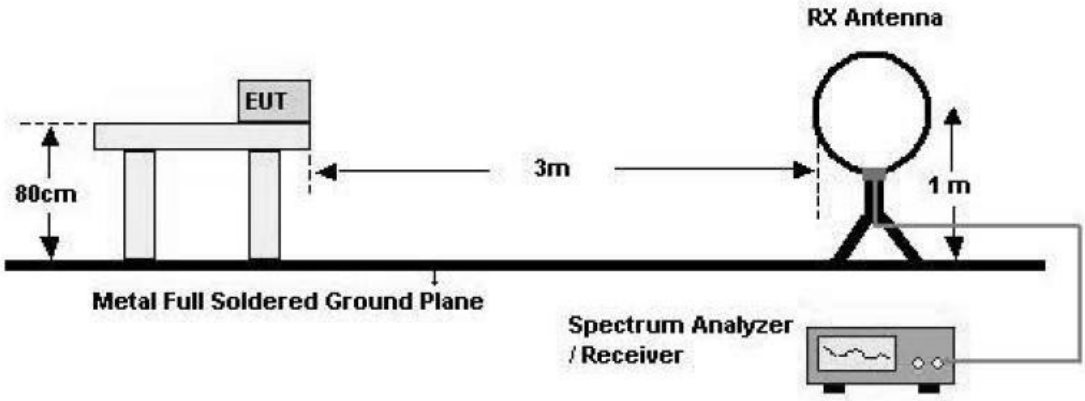
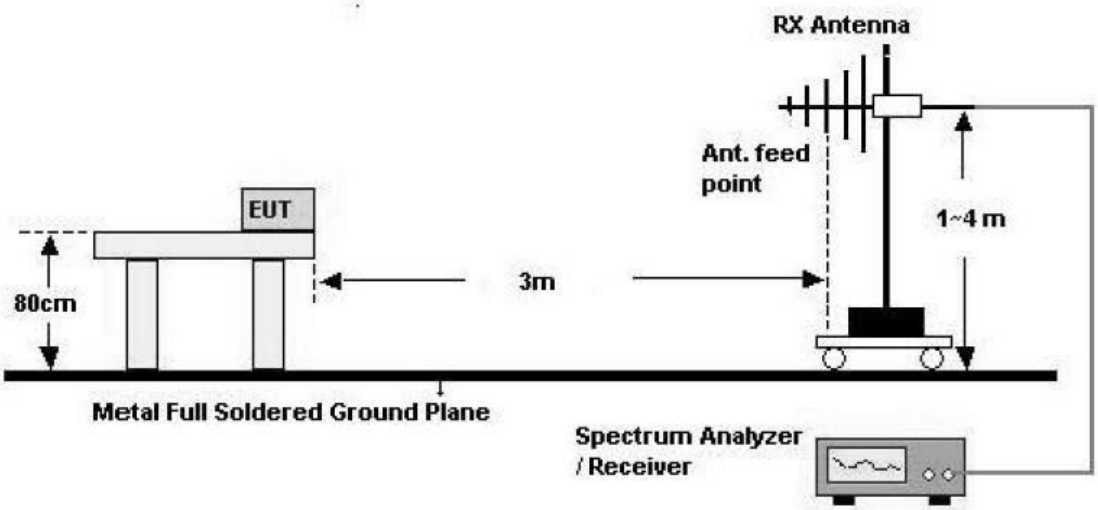
**Test Configuration**

**Below 30 MHz**




**30 MHz - 1 GHz**





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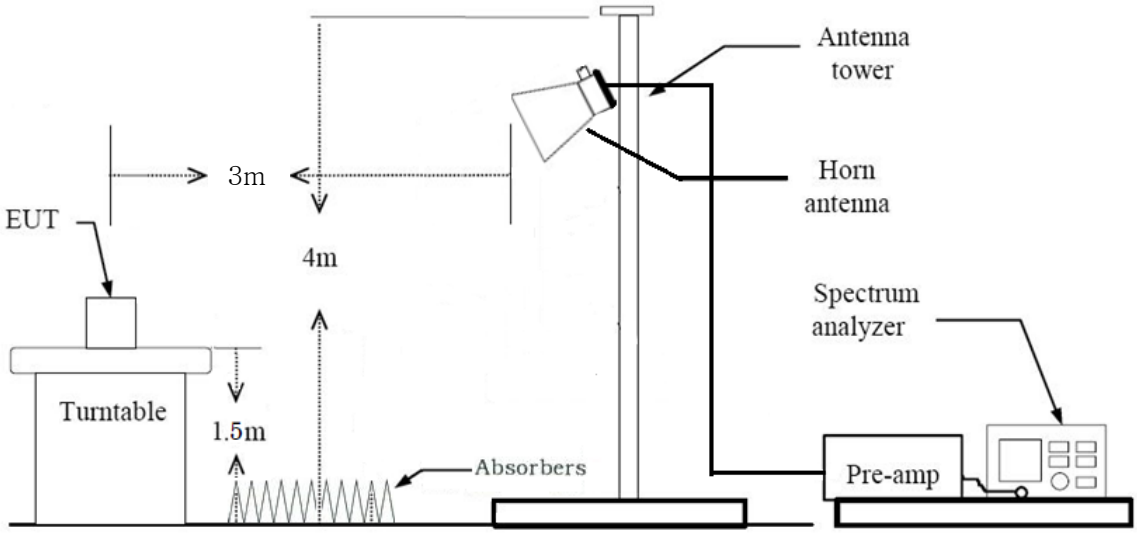
**Above 1 GHz**




**<u>Test Procedure of Radiated spurious emissions (Below 30 MHz)</u>**

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor (0.009 MHz – 0.490 MHz) = 40*log(3 m/300 m) = - 80 dB
   Measurement Distance: 3 m
7. Distance Correction Factor (0.490 MHz – 30 MHz) = 40*log(3 m/30 m) = - 40 dB
   Measurement Distance: 3 m
8. Spectrum Setting

   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Max hold
   - RBW = 9 kHz
   - VBW ≥ 3*RBW

9. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L) + Distance Factor (D.F)
10. There is a comparison data both open-field test site and alternative test site – semi-Anechoic chamber according to 414788 D01. And the results are properly calibrated.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**Test Procedure of Radiated spurious emissions (Below 1GHz)**

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Spectrum Setting

(1) Measurement Type (Peak):

- Measured Frequency Range: 30 MHz – 1 GHz
- Detector = Peak
- Trace = Max hold
- RBW = 100 kHz
- VBW ≥ 3*RBW

(2) Measurement Type(Quasi-peak):

- Measured Frequency Range: 30 MHz – 1 GHz
- Detector = Quasi-Peak
- RBW = 120 kHz

In general, the method (1) is mainly used

6. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L)


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**Test Procedure of Radiated spurious emissions (Above 1 GHz)**

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting

(1) Measurement Type(Peak, G.5 in KDB 789033 v02r01):
- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max hold
- Allow sweeps to continue until the trace stabilizes.
- Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

(2) Measurement Type(Average, G.6.d in KDB 789033 v02r01):
- RBW = 1 MHz
- VBW(Duty cycle ≥ 98 percent) = VBW ≤ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW ≥ 1/T, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max hold.
- Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.

9. Measurement value only up to 6 maximum emissions noted or would be lesser if no specific emissions from the EUT are recorded (i.e.: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor
10. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency or upto 40 GHz, whichever comes less.
11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G)


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**Test Procedure of Radiated Restricted Band Edge**

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting

(1) Measurement Type(Peak, G.5 in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max hold
- Allow sweeps to continue until the trace stabilizes.
- Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

(2) Measurement Type(Average, G.6.d in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW(Duty cycle ≥ 98 percent) = VBW ≤ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW ≥ 1/T, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max hold.
- Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.

9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G)


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## 7.7. AC Power line Conducted Emissions

**Limit**

47 CFR § 15.207, RSS-GEN Section 8.8

For an intentional radiator 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, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN).

| Frequency Range (MHz) | Limits (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56* | 56 to 46* |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

**Test Configuration**

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

**Test Procedure**

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

**Sample Calculation**

Quasi-peak(Final Result) = Reading Value + Correction Factor


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## 7.8. Worst case configuration and mode

**Radiated test**

1. All modes of operation were investigated, and the worst-case configuration results are reported.
   - PSU mode : AC powered mode / PoE powered mode
   - Worst case: AC powered mode

2. EUT Axis
   - Radiated Spurious Emissions: Z
   - Radiated Restricted Band Edge: Z

   All X, Y, and Z positions were investigated to find the worst-case position. Typical installation recommended is in right up position (Z) on the wall or placed on the desk using cradle.

3. Operations with all the data rates available were investigated. And the worst-case test result was evaluated for each different channel BW

4. Tx mode
   - The device support 2x2 MIMO with SDM and CDD.
   - Worst-case : 2 x TX CDD mode

5. All positions of loop antenna were investigated, but no critical peak was found

**Conducted test**

1. Operations with all the data rates available were investigated and the worst-case result was reported based on the worst-case data rate found.


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## 8. SUMMARY OF TEST RESULTS

| Test Description | FCC Part Section(s) | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| 26dB Bandwidth | §15.407 | N/A<br>(For power measurement) | Conducted | PASS |
| Maximum Conducted Output Power | §15.407(a)(2) | ≤ 250 mW or 11dBm+10log(B)<br>Whichever is less (B: Emission BW) | | PASS |
| Power Spectral Density | §15.407(a)(2) | ≤ 11 dBm/MHz | | PASS |
| Frequency Stability | §15.407(g)<br>§2.1055 | Maintained within the band | | PASS |
| AC Power line Conducted Emissions | §15.407(b)(6)<br>§15.207 | cf. Section 7.7 | | PASS |
| Undesirable Emissions | §15.407(b)(2), (3) | cf. Section 7.6 | Radiated | PASS |
| Radiated Spurious Emissions | §15.407(b)(6)<br>§15.209 | cf. Section 7.6 | | PASS |
| Radiated Restricted Band Edge | §15.407(b)(7)<br>§15.205(a) | cf. Section 7.6 | | PASS |


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| Test Description | ISED Rule Parts | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| 99% Bandwidth | RSS-GEN, 6.7 | N/A | Conducted | PASS |
| Maximum Conducted Output Power | RSS-247, 6.2.2 1 a<br>RSS-247, 6.2.3.1 a | ≤ 250 mW or ≤ 11 dBm + 10 log B<br>Whichever is less (B : 99% BW in MHz) | | PASS |
| Maximum e.i.r.p. | RSS-247, 6.2.2.1 b<br>RSS-247, 6.2.3.1 b | ≤ 1W e.i.r.p. or ≤ 17 dBm + 10 log B e.i.r.p.<br>Whichever is less (B : 99% BW in MHz) | | PASS |
| Power Spectral Density | RSS-247, 6.2.2.1<br>RSS-247, 6.2.3.1 | ≤ 11 dBm/ MHz EIRP | | PASS |
| Frequency Stability | RSS-GEN 8.11 | should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation. | | PASS |
| AC Power line Conducted Emissions | RSS-GEN, 8.8 | cf. Section 7.7 | | PASS |
| Undesirable Emissions | RSS-247, 6.2.2.2<br>RSS-247, 6.2.3 2 | cf. Section 7.6 | Radiated | PASS |
| Radiated Spurious Emissions | RSS-Gen, 8.9 | cf. Section 7.6 | | PASS |
| Radiated Restricted Band Edge | RSS-Gen, 8.10 | cf. Section 7.6 | | PASS |
| Receiver Spurious Emissions | RSS-GEN, 7.3 | cf. Section 7.6 | | PASS |

**Note :**
The device does not operate in the frequency range 5600 – 5650 MHz in Canada


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## SUMMARY OF OUTPUT POWER AND SETTING

### Output Power Summary

| Mode | U-NII 2A (CDD) | | | U-NII 2C (CDD) | | |
|---|---|---|---|---|---|---|
| | Max Output Power (dBm) | Max Output Power (mW) | Channel Frequency (MHz) | Max Output Power (dBm) | Max Output Power (mW) | Channel Frequency (MHz) |
| 802.11a | 21.37 | 137.09 | 5260 | 21.07 | 127.94 | 5580 |
| 802.11n HT20 | 21.28 | 134.28 | 5260 | 21.03 | 126.77 | 5580 |
| 802.11n HT40 | 21.89 | 154.53 | 5270 | 21.45 | 139.64 | 5550 |
| 802.11ac VHT20 | 21.30 | 134.90 | 5260 | 21.03 | 126.77 | 5580 |
| 802.11ac VHT40 | 21.89 | 154.53 | 5270 | 21.58 | 143.88 | 5550 |
| 802.11ac VHT80 | 18.11 | 64.71 | 5290 | 21.19 | 131.52 | 5690 |
| 802.11ax HE20 | 21.73 | 148.94 | 5260 | 21.42 | 138.68 | 5580 |
| 802.11ax HE40 | 22.24 | **167.49** | 5270 | 21.77 | **150.31** | 5550 |
| 802.11ax HE80 | 18.28 | 67.30 | 5290 | 21.43 | 139.00 | 5690 |


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**Output Power Setting**

| Frequency (MHz) | 802.11a (2TX CDD) | 802.11n HT20 (2TX CDD) | 802.11ac VHT20 (2TX CDD) | 802.11ax HE20 (2TX CDD) |
|---|---|---|---|---|
| 5260 | 74 | 74 | 74 | 74 |
| 5300 | 74 | 74 | 74 | 74 |
| 5320 | 74 | 74 | 74 | 74 |
| 5500 | 68 | 68 | 68 | 68 |
| 5580 | 74 | 74 | 74 | 74 |
| 5700 | 62 | 62 | 62 | 62 |
| 5720* | 74 | 74 | 74 | 74 |

| Frequency (MHz) | 802.11n HT40 (2TX CDD) | 802.11ac VHT40 (2TX CDD) | 802.11ax HE40 (2TX CDD) |
|---|---|---|---|
| 5270 | 74 | 74 | 74 |
| 5310 | 60 | 60 | 60 |
| 5510 | 60 | 60 | 60 |
| 5550 | 74 | 74 | 74 |
| 5670 | 68 | 68 | 68 |
| 5710* | 74 | 74 | 74 |

| Frequency (MHz) | 802.11ac VHT80 (2TX CDD) | 802.11ax HE80 (2TX CDD) |
|---|---|---|
| 5290 | 74 | 74 |
| 5530 | 62 | 62 |
| 5610 (1) | 74 | 74 |
| 5690* | 74 | 74 |

'*' Straddle Bands

**Note :**

1. The device cannot operate in the band 5600 – 5650 MHz in Canada
2. Power setting value shown on the table above is based on quadruple number from M-Tool 3.1.0.5 used for RF testing.


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# 9. TEST RESULT

## 9.1 DUTY CYCLE

| Mode | Data Rate (Mbps) | $T_{onn}$ (ms) | $T_{totaln}$ (ms) | Duty Cycle | Duty Factor (dB) | VBW(1/T) (Hz) |
|---|---|---|---|---|---|---|
| 802.11a | 6 Mbps | 2.07 | 2.17 | 0.95 | 0.22 | 484.06 |
| | 9 Mbps | 1.38 | 1.49 | 0.93 | 0.33 | 723.24 |
| | 12 Mbps | 1.05 | 1.15 | 0.91 | 0.42 | 956.82 |
| | 18 Mbps | 0.70 | 0.81 | 0.86 | 0.63 | 1421.40 |
| | 24 Mbps | 0.53 | 0.64 | 0.83 | 0.81 | 1877.11 |
| | 36 Mbps | 0.37 | 0.47 | 0.78 | 1.10 | 2732.24 |
| | 48 Mbps | 0.28 | 0.38 | 0.72 | 1.41 | 3616.20 |
| | 54 Mbps | 0.25 | 0.35 | 0.70 | 1.54 | 4031.17 |
| 802.11n (HT20) | MCS0 | 1.93 | 2.03 | 0.95 | 0.21 | 517.69 |
| | MCS1 | 0.98 | 1.08 | 0.91 | 0.41 | 1016.12 |
| | MCS2 | 0.67 | 0.77 | 0.87 | 0.62 | 1499.40 |
| | MCS3 | 0.51 | 0.61 | 0.83 | 0.79 | 1951.60 |
| | MCS4 | 0.35 | 0.45 | 0.77 | 1.11 | 2859.32 |
| | MCS5 | 0.28 | 0.37 | 0.74 | 1.31 | 3616.20 |
| | MCS6 | 0.25 | 0.35 | 0.72 | 1.44 | 4031.17 |
| | MCS7 | 0.23 | 0.33 | 0.70 | 1.55 | 4391.11 |
| 802.11n (HT40) | MCS0 | 0.95 | 1.05 | 0.90 | 0.44 | 1055.37 |
| | MCS1 | 0.49 | 0.59 | 0.83 | 0.82 | 2032.24 |
| | MCS2 | 0.34 | 0.44 | 0.77 | 1.14 | 2962.67 |
| | MCS3 | 0.26 | 0.37 | 0.72 | 1.41 | 3783.11 |
| | MCS4 | 0.19 | 0.29 | 0.65 | 1.88 | 5345.68 |
| | MCS5 | 0.15 | 0.25 | 0.61 | 2.13 | 6471.11 |
| | MCS6 | 0.14 | 0.24 | 0.59 | 2.27 | 7025.78 |
| | MCS7 | 0.13 | 0.23 | 0.55 | 2.57 | 7932.29 |


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| Mode | Data Rate (Mbps) | $T_{onn}$ (ms) | $T_{totaln}$ (ms) | Duty Cycle | Duty Factor (dB) | VBW(1/T) (Hz) |
|---|---|---|---|---|---|---|
| 802.11ac (VHT20) | MCS0 | 1.93 | 1.96 | 0.98 | 0.07 | 518.78 |
| | MCS1 | 0.98 | 1.01 | 0.97 | 0.12 | 1016.12 |
| | MCS2 | 0.67 | 0.70 | 0.95 | 0.21 | 1490.31 |
| | MCS3 | 0.51 | 0.54 | 0.95 | 0.23 | 1951.60 |
| | MCS4 | 0.35 | 0.38 | 0.93 | 0.34 | 2826.46 |
| | MCS5 | 0.28 | 0.31 | 0.89 | 0.48 | 3616.20 |
| | MCS6 | 0.25 | 0.28 | 0.89 | 0.53 | 3966.16 |
| | MCS7 | 0.23 | 0.26 | 0.88 | 0.57 | 4314.06 |
| | MCS8 | 0.20 | 0.23 | 0.88 | 0.58 | 5018.39 |
| 802.11ac (VHT40) | MCS0 | 0.95 | 0.98 | 0.97 | 0.13 | 1050.86 |
| | MCS1 | 0.50 | 0.53 | 0.94 | 0.28 | 2015.59 |
| | MCS2 | 0.34 | 0.37 | 0.92 | 0.35 | 2927.40 |
| | MCS3 | 0.27 | 0.30 | 0.90 | 0.44 | 3725.78 |
| | MCS4 | 0.19 | 0.22 | 0.87 | 0.60 | 5231.96 |
| | MCS5 | 0.15 | 0.19 | 0.83 | 0.83 | 6471.11 |
| | MCS6 | 0.15 | 0.17 | 0.84 | 0.77 | 6830.60 |
| | MCS7 | 0.13 | 0.16 | 0.82 | 0.86 | 7684.45 |
| | MCS8 | 0.11 | 0.15 | 0.78 | 1.09 | 8782.18 |
| | MCS9 | 0.11 | 0.14 | 0.79 | 1.00 | 9107.47 |
| 802.11ac (VHT80) | MCS0 | 0.46 | 0.49 | 0.94 | 0.26 | 2157.03 |
| | MCS1 | 0.25 | 0.28 | 0.90 | 0.46 | 3966.16 |
| | MCS2 | 0.18 | 0.21 | 0.85 | 0.73 | 5588.68 |
| | MCS3 | 0.15 | 0.18 | 0.84 | 0.75 | 6645.98 |
| | MCS4 | 0.11 | 0.14 | 0.79 | 1.00 | 9107.47 |
| | MCS5 | 0.10 | 0.13 | 0.77 | 1.11 | 10245.90 |
| | MCS6 | 0.09 | 0.12 | 0.76 | 1.20 | 11177.34 |
| | MCS7 | 0.09 | 0.11 | 0.75 | 1.25 | 11709.60 |
| | MCS8 | 0.07 | 0.11 | 0.69 | 1.60 | 13661.20 |
| | MCS9 | 0.07 | 0.10 | 0.71 | 1.50 | 14464.81 |


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| Mode | Data Rate (Mbps) | $T_{onn}$ (ms) | $T_{totaln}$ (ms) | Duty Cycle | Duty Factor (dB) | VBW(1/T) (Hz) |
|---|---|---|---|---|---|---|
| 802.11ax (HE20) | MCS0 | 1.49 | 1.52 | 0.98 | 0.09 | 671.86 |
| | MCS1 | 0.77 | 0.81 | 0.96 | 0.18 | 1294.22 |
| | MCS2 | 0.53 | 0.57 | 0.94 | 0.26 | 1877.11 |
| | MCS3 | 0.41 | 0.45 | 0.93 | 0.33 | 2410.80 |
| | MCS4 | 0.30 | 0.33 | 0.90 | 0.45 | 3368.51 |
| | MCS5 | 0.24 | 0.27 | 0.88 | 0.56 | 4239.68 |
| | MCS6 | 0.22 | 0.25 | 0.87 | 0.61 | 4639.66 |
| | MCS7 | 0.20 | 0.23 | 0.86 | 0.66 | 5018.39 |
| | MCS8 | 0.18 | 0.21 | 0.86 | 0.64 | 5588.68 |
| | MCS9 | 0.17 | 0.20 | 0.84 | 0.77 | 5997.61 |
| | MCS10 | 0.15 | 0.19 | 0.83 | 0.83 | 6471.11 |
| | MCS11 | 0.15 | 0.18 | 0.80 | 0.97 | 6830.60 |
| 802.11ax (HE40) | MCS0 | 0.78 | 0.81 | 0.96 | 0.18 | 1287.44 |
| | MCS1 | 0.41 | 0.45 | 0.93 | 0.33 | 2410.80 |
| | MCS2 | 0.30 | 0.33 | 0.90 | 0.45 | 3323.00 |
| | MCS3 | 0.24 | 0.27 | 0.88 | 0.56 | 4239.68 |
| | MCS4 | 0.18 | 0.21 | 0.87 | 0.63 | 5464.48 |
| | MCS5 | 0.15 | 0.18 | 0.82 | 0.85 | 6645.98 |
| | MCS6 | 0.14 | 0.17 | 0.81 | 0.92 | 7232.38 |
| | MCS7 | 0.13 | 0.17 | 0.80 | 0.94 | 7451.56 |
| | MCS8 | 0.12 | 0.15 | 0.78 | 1.06 | 8479.39 |
| | MCS9 | 0.11 | 0.15 | 0.78 | 1.09 | 8782.18 |
| | MCS10 | 0.11 | 0.14 | 0.77 | 1.13 | 9107.47 |
| | MCS11 | 0.10 | 0.13 | 0.78 | 1.07 | 9836.03 |
| 802.11ax (HE80) | MCS0 | 0.41 | 0.44 | 0.94 | 0.29 | 2410.80 |
| | MCS1 | 0.24 | 0.27 | 0.88 | 0.56 | 4239.68 |
| | MCS2 | 0.17 | 0.21 | 0.84 | 0.74 | 5718.63 |
| | MCS3 | 0.15 | 0.18 | 0.82 | 0.87 | 6830.60 |
| | MCS4 | 0.12 | 0.15 | 0.78 | 1.06 | 8479.39 |
| | MCS5 | 0.10 | 0.13 | 0.76 | 1.21 | 9836.03 |
| | MCS6 | 0.10 | 0.13 | 0.75 | 1.25 | 10245.90 |
| | MCS7 | 0.09 | 0.13 | 0.74 | 1.30 | 10691.38 |
| | MCS8 | 0.09 | 0.12 | 0.72 | 1.40 | 11709.60 |
| | MCS9 | 0.09 | 0.12 | 0.76 | 1.20 | 11177.34 |
| | MCS10 | 0.08 | 0.11 | 0.74 | 1.30 | 12295.09 |
| | MCS11 | 0.09 | 0.11 | 0.75 | 1.46 | 11709.60 |


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## 9.2 26 dB BANDWIDTH / 99% BANDWIDTH / 6 dB BANDWIDTH

**U-NII 2A Band**

| UNII 2A Band | | | 99% Bandwidth [MHz] | | 26 dB Bandwidth [MHz] | |
|---|---|---|---|---|---|---|
| **Mode** | **Frequency [MHz]** | **Channel No.** | **ANT1** | **ANT2** | **ANT1** | **ANT2** |
| 802.11a | 5260 | 52 | 17.22 | 17.09 | 21.11 | **21.74** |
| | 5300 | 60 | **17.34** | 17.06 | 21.14 | 21.26 |
| | 5320 | 64 | 17.24 | 17.06 | 21.04 | 21.50 |
| 802.11n HT20 | 5260 | 52 | 18.39 | 18.13 | **21.62** | 21.51 |
| | 5300 | 60 | 18.36 | 18.11 | 21.54 | 21.29 |
| | 5320 | 64 | **18.41** | 18.08 | 21.49 | 21.49 |
| 802.11ac VHT20 | 5260 | 52 | **18.32** | 18.01 | 21.39 | **21.90** |
| | 5300 | 60 | 18.24 | 18.05 | 21.44 | 21.76 |
| | 5320 | 64 | 18.29 | 18.08 | 21.52 | 21.38 |
| 802.11ax HE20 | 5260 | 52 | 19.18 | 19.20 | 21.42 | **21.99** |
| | 5300 | 60 | **19.23** | 19.21 | 21.44 | 21.31 |
| | 5320 | 64 | 19.19 | 19.17 | 21.30 | 21.32 |

| UNII 2A Band | | | 99% Bandwidth [MHz] | | 26 dB Bandwidth [MHz] | |
|---|---|---|---|---|---|---|
| **Mode** | **Frequency [MHz]** | **Channel No.** | **ANT1** | **ANT2** | **ANT1** | **ANT2** |
| 802.11n HT40 | 5270 | 54 | **36.61** | 36.61 | **39.99** | 39.42 |
| | 5310 | 62 | 36.58 | 36.49 | 39.87 | 39.41 |
| 802.11ac VHT40 | 5270 | 54 | **36.65** | 36.61 | 39.77 | **39.89** |
| | 5310 | 62 | 36.55 | 36.45 | 39.85 | 39.42 |
| 802.11ax HE40 | 5270 | 54 | **37.72** | 37.70 | 39.89 | 39.57 |
| | 5310 | 62 | 37.63 | 37.57 | **39.99** | 39.68 |

| UNII 2A Band | | | 99% Bandwidth [MHz] | | 26 dB Bandwidth [MHz] | |
|---|---|---|---|---|---|---|
| **Mode** | **Frequency [MHz]** | **Channel No.** | **ANT1** | **ANT2** | **ANT1** | **ANT2** |
| 802.11ac VHT80 | 5290 | 58 | **75.71** | 75.56 | **81.52** | 80.91 |
| 802.11ax HE80 | 5290 | 58 | **76.83** | 76.78 | **81.23** | 80.61 |


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**U-NII 2C Band**

| UNII 2C Band | | | 99% Bandwidth [MHz] | | 26 dB Bandwidth [MHz] | |
|---|---|---|---|---|---|---|
| Mode | Frequency [MHz] | Channel No. | ANT1 | ANT2 | ANT1 | ANT2 |
| 802.11a | 5500 | 100 | 17.19 | 17.04 | 21.14 | 21.16 |
| | 5580 | 116 | 17.20 | 17.05 | 21.09 | 21.16 |
| | 5700 | 140 | **17.23** | 16.95 | 21.16 | **21.29** |
| 802.11n HT20 | 5500 | 100 | 18.31 | 18.04 | 21.53 | 21.28 |
| | 5580 | 116 | 18.32 | 18.07 | 21.54 | 21.34 |
| | 5700 | 140 | **18.34** | 18.06 | **21.55** | 21.27 |
| 802.11ac VHT20 | 5500 | 100 | **18.23** | 18.02 | **21.62** | 21.25 |
| | 5580 | 116 | 18.21 | 18.06 | 21.44 | 21.52 |
| | 5700 | 140 | 18.25 | 18.03 | 21.57 | 21.35 |
| 802.11ax HE20 | 5500 | 100 | 19.12 | **19.14** | 21.36 | **21.46** |
| | 5580 | 116 | 19.22 | 19.13 | 21.23 | 21.45 |
| | 5700 | 140 | 19.15 | 19.16 | 21.35 | 21.26 |

| UNII 2C Band | | | 99% Bandwidth [MHz] | | 26 dB Bandwidth [MHz] | |
|---|---|---|---|---|---|---|
| Mode | Frequency [MHz] | Channel No. | ANT1 | ANT2 | ANT1 | ANT2 |
| 802.11n HT40 | 5510 | 102 | 36.62 | 36.47 | **40.00** | 39.35 |
| | 5550 | 110 | 36.68 | 36.56 | 39.92 | 39.50 |
| | 5670 | 134 | **36.76** | 36.50 | 39.69 | 39.53 |
| 802.11ac VHT40 | 5510 | 102 | 36.49 | 36.46 | 39.80 | 39.59 |
| | 5550 | 110 | 36.65 | 36.57 | 39.89 | 39.52 |
| | 5670 | 134 | **36.66** | 36.57 | **39.90** | 39.61 |
| 802.11ax HE40 | 5510 | 102 | **37.65** | 37.63 | **40.04** | 39.75 |
| | 5550 | 110 | 37.61 | 37.67 | 39.88 | 39.70 |
| | 5670 | 134 | 37.62 | 37.64 | 39.95 | 39.82 |

| UNII 2C Band | | | 99% Bandwidth [MHz] | | 26 dB Bandwidth [MHz] | |
|---|---|---|---|---|---|---|
| Mode | Frequency [MHz] | Channel No. | ANT1 | ANT2 | ANT1 | ANT2 |
| 802.11ac VHT80 | 5530 | 106 | 75.70 | 75.70 | 81.83 | 80.56 |
| | 5610 (1) | 122 | **75.74** | 75.74 | **82.17** | 80.64 |
| | 5690 | 138 | 75.73 | 75.73 | 81.63 | 80.66 |
| 802.11ax HE80 | 5530 | 106 | 76.83 | 76.77 | 80.95 | 80.63 |
| | 5610 (1) | 122 | **76.83** | 76.81 | **81.08** | 80.75 |
| | 5690 | 138 | 76.80 | 76.84 | 81.08 | 80.62 |

**Note :**

1. The frequency channel at 5610 MHz does not operate in Canada


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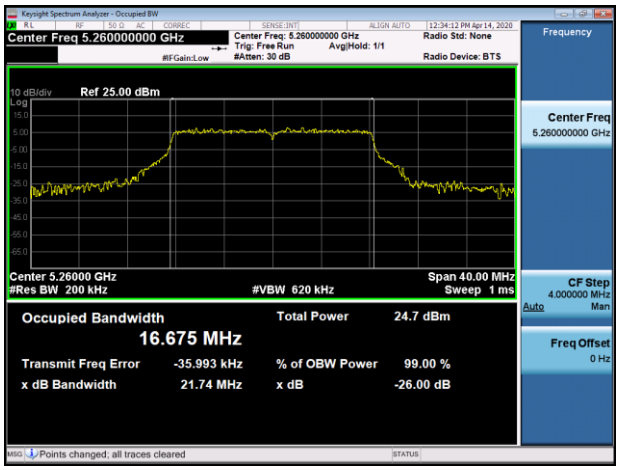
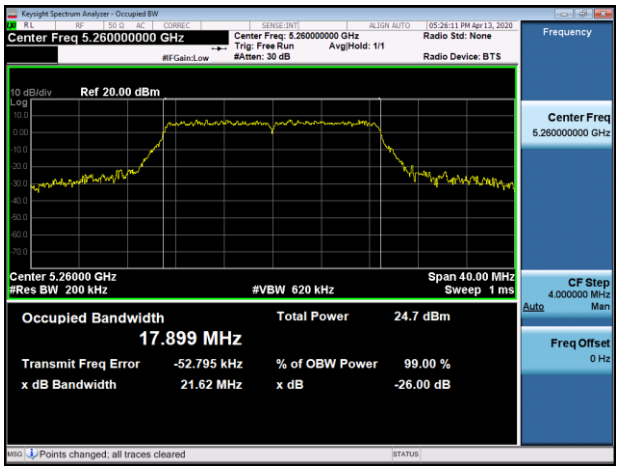
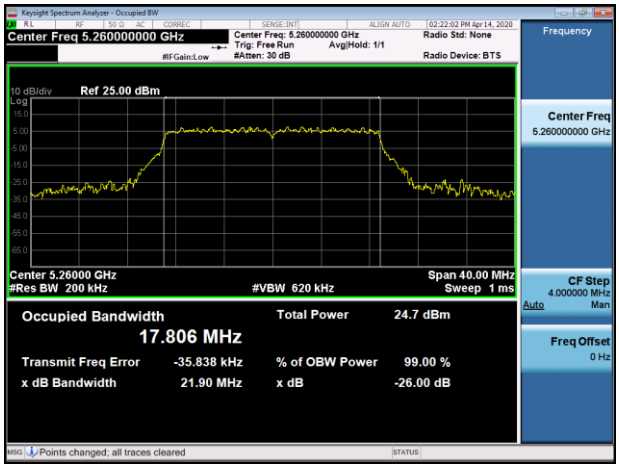
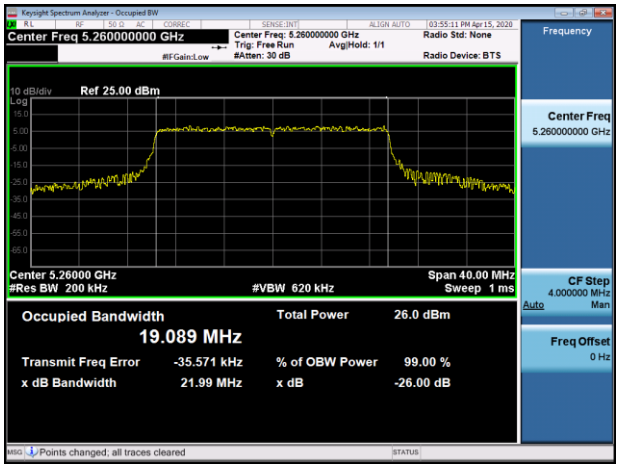
## ▣ TEST PLOT : 26 dB Bandwidth (U-NII 2A Band)

| 802.11a UNII 2A (CH 52) – ANT2 | 802.11n HT20 UNII 2A (CH 52) – ANT1 |
|---|---|
|  |  |
| **802.11ac VHT20 UNII 2A (CH 52) – ANT2** | **802.11ax HE20 UNII 2A (CH 52) – ANT2** |
|  |  |

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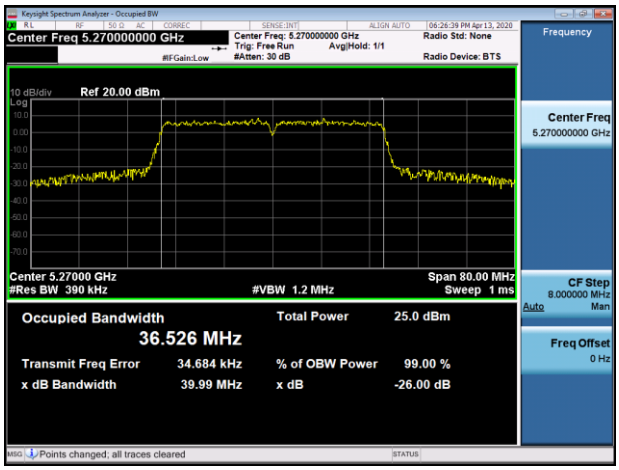
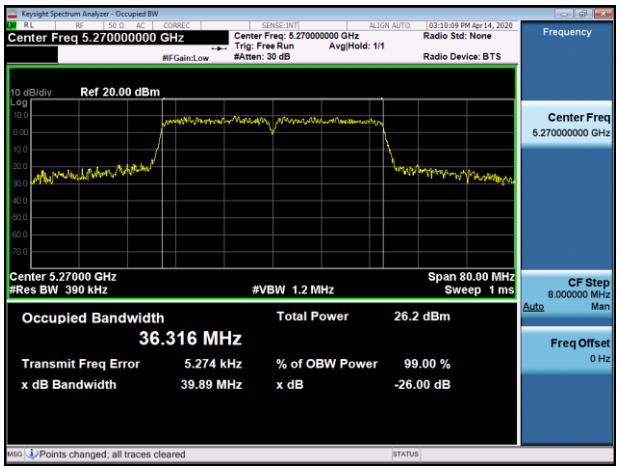
## ▣ TEST PLOT : 26 dB Bandwidth (U-NII 2A Band)

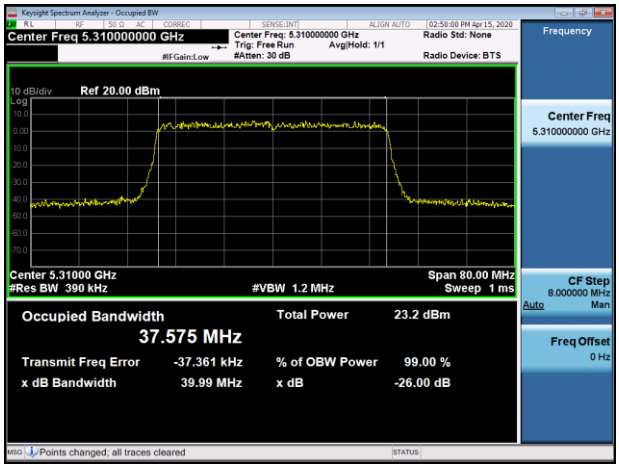
### 802.11n HT40 UNII 2A (CH 54) – ANT1



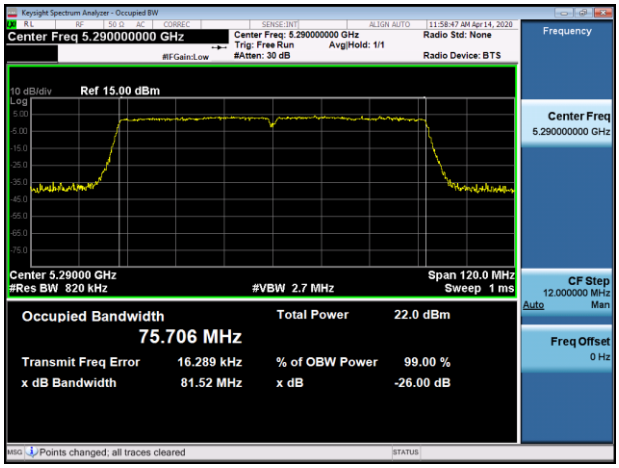

### 802.11ac VHT40 UNII 2A (CH 54) – ANT2



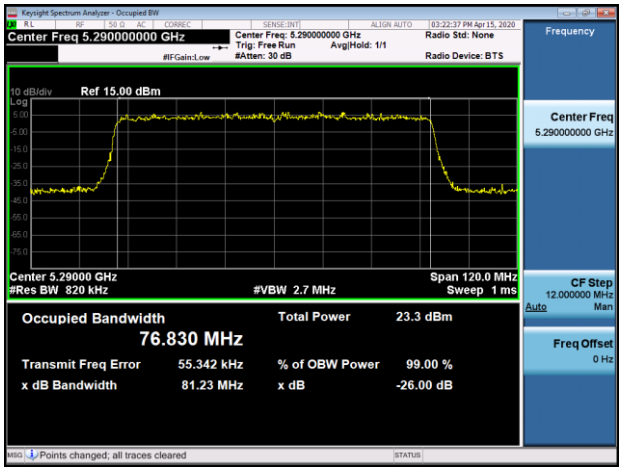

### 802.11ax HE40 UNII 2A (CH 62) – ANT1




### 802.11ac VHT80 UNII 2A (CH 58) – ANT1




### 802.11ax HE80 UNII 2A (CH 58) – ANT1





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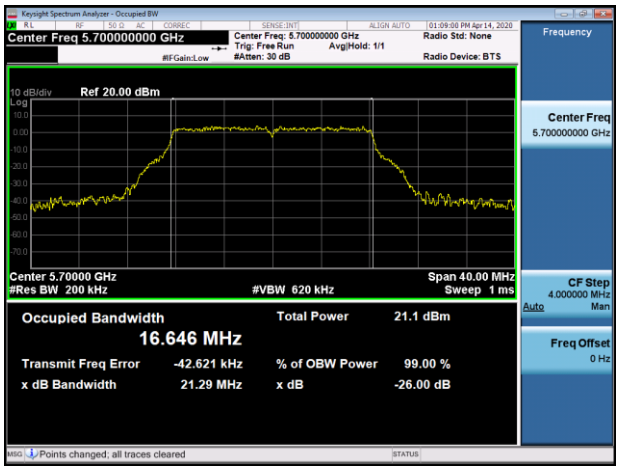
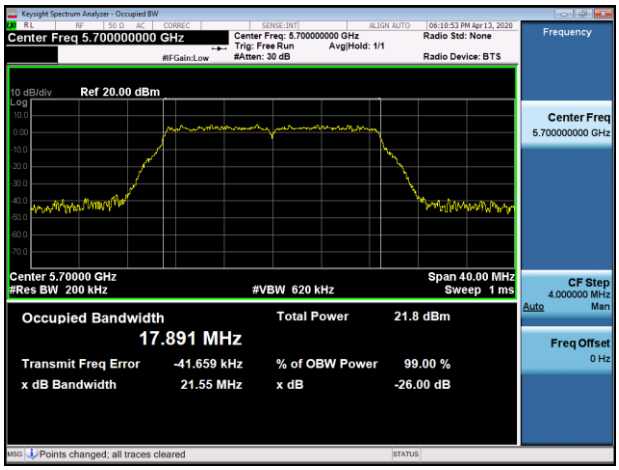
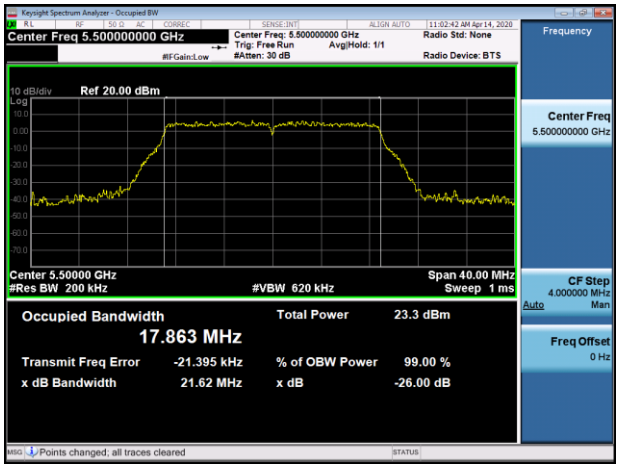
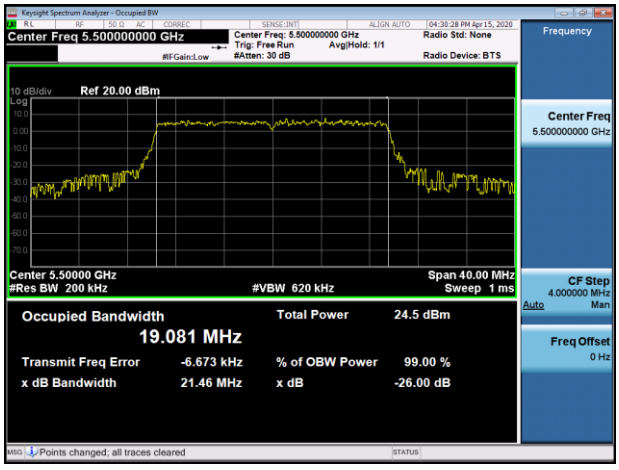
## ▣ TEST PLOT : 26 dB Bandwidth (U-NII 2C Band)

| 802.11a UNII 2C (CH 140) – ANT2 | 802.11n HT20 UNII 2C (CH 140) – ANT1 |
|---|---|
|  |  |
| **802.11ac VHT20 UNII 2C (CH 100) – ANT1** | **802.11ax HE20 UNII 2C (CH 100) – ANT2** |
|  |  |

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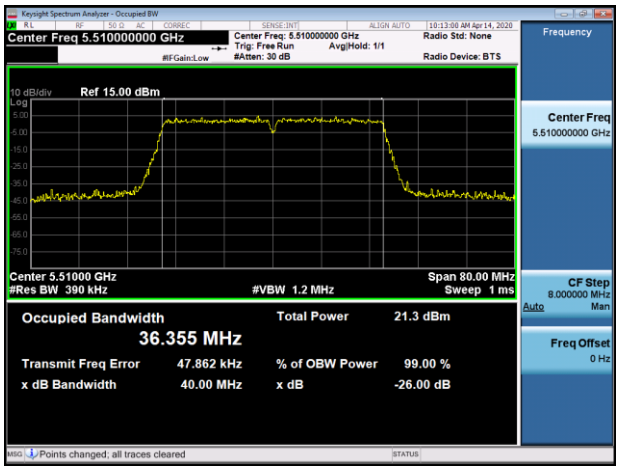
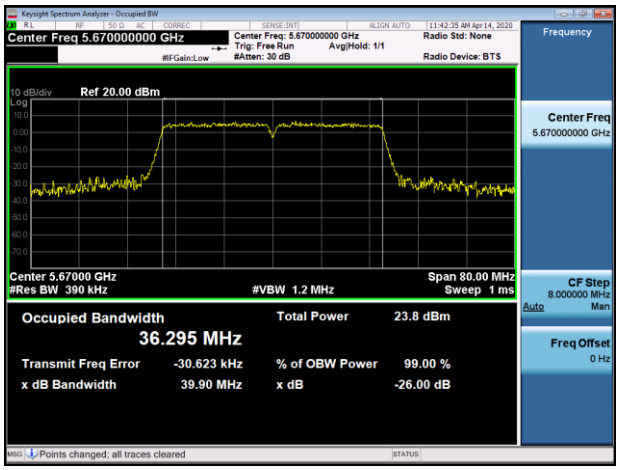
## ▣ TEST PLOT : 26 dB Bandwidth (U-NII 2C Band)

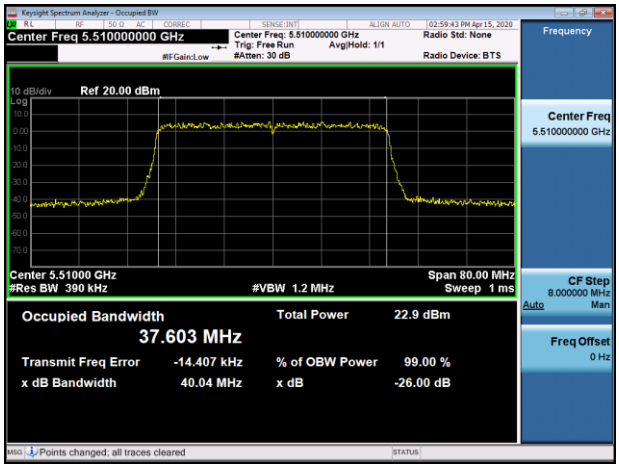
### 802.11n HT40 UNII 2C (CH 104) – ANT1



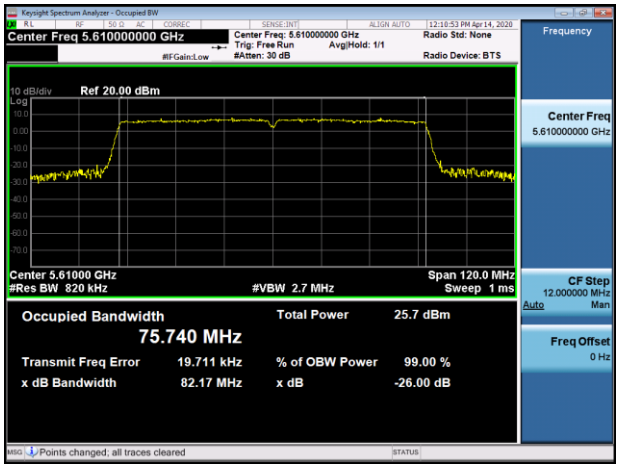

### 802.11ac VHT40 UNII 2C (CH 134) – ANT1



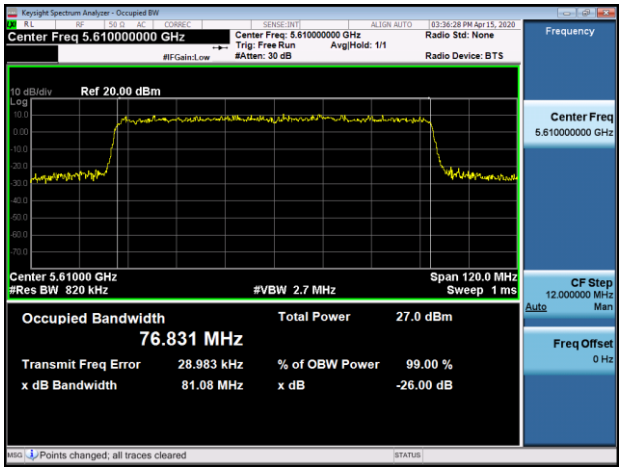

### 802.11ax HE40 UNII 2C (CH 102) – ANT1




### 802.11ac VHT80 UNII 2C (CH 122) – ANT1




### 802.11ax HE80 UNII 2C (CH 122) – ANT1





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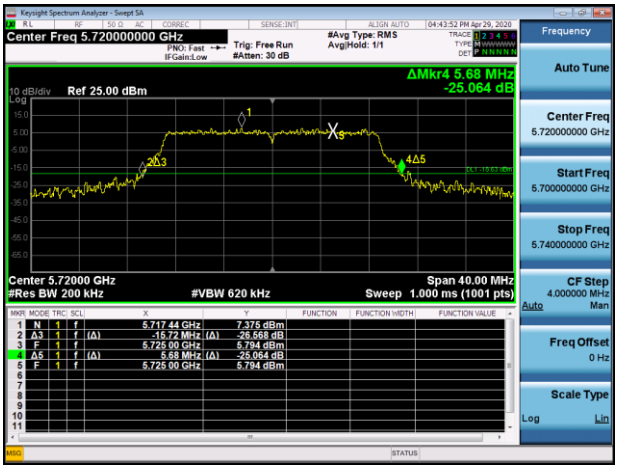
## Emission Bandwidth (EBW) within a Band for Band-Crossing Signals

### 802.11a UNII 2C (CH 144)

### 802.11n HT20 UNII 2C (CH 144)




### 802.11ac VHT20 UNII 2C (CH 144)

### 802.11ax HE20 UNII 2C (CH 144)

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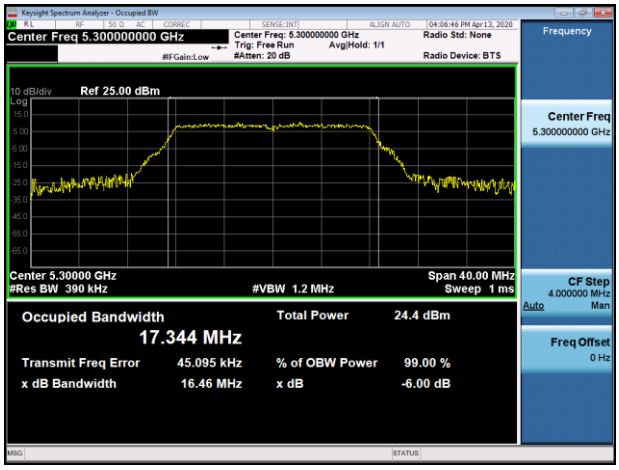
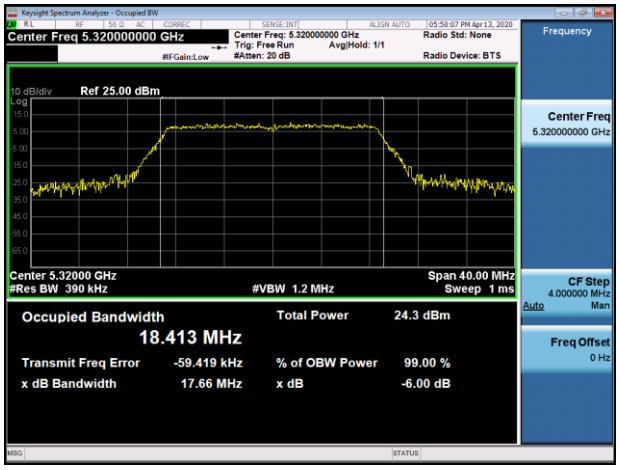
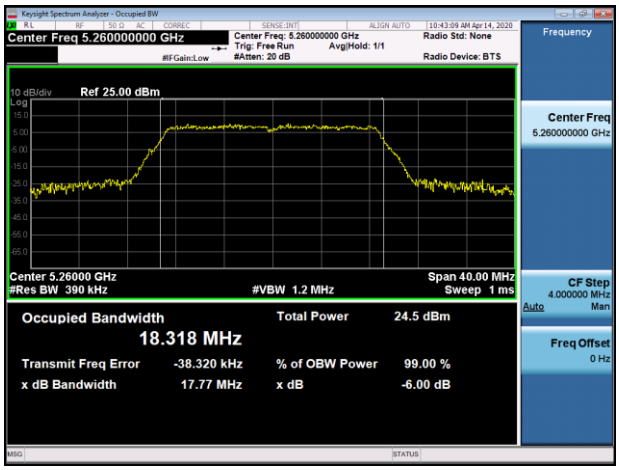
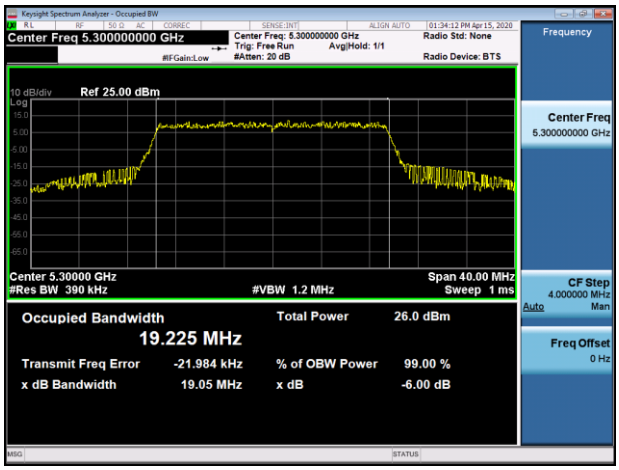
## ▣ TEST PLOT : 99% Bandwidth (U-NII 2A Band)

| 802.11a UNII 2A (CH 60) – ANT1 | 802.11n HT20 UNII 2A (CH 64) – ANT1 |
|---|---|
|  |  |
| **802.11ac VHT20 UNII 2A (CH 52) – ANT1** | **802.11ax HE20 UNII 2A (CH 60) – ANT1** |
|  |  |

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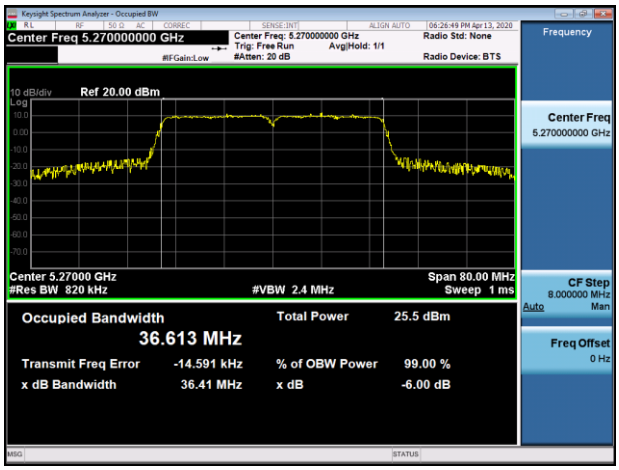
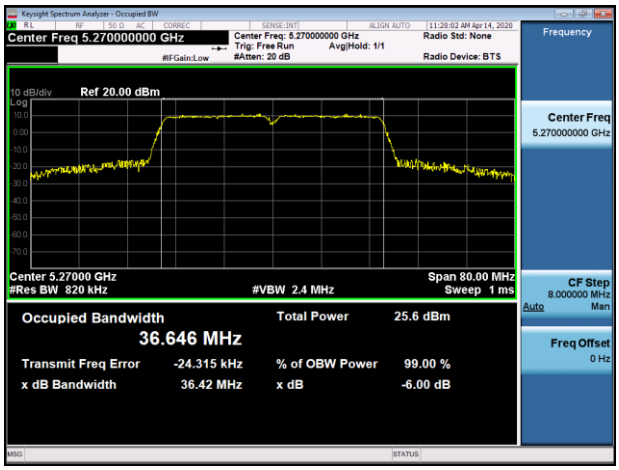
## ▣ TEST PLOT : 99% Bandwidth (U-NII 2A Band)

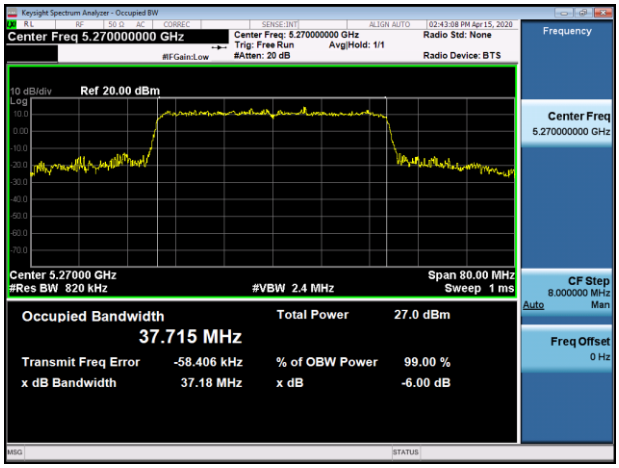
### 802.11n HT40 UNII 2A (CH 54) – ANT1



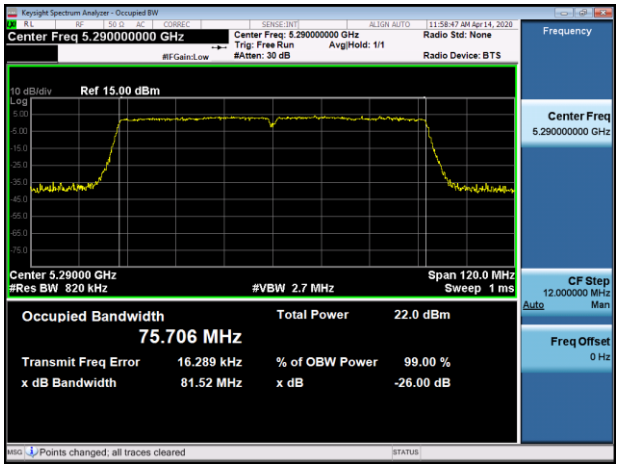

### 802.11ac VHT40 UNII 2A (CH 54) – ANT1



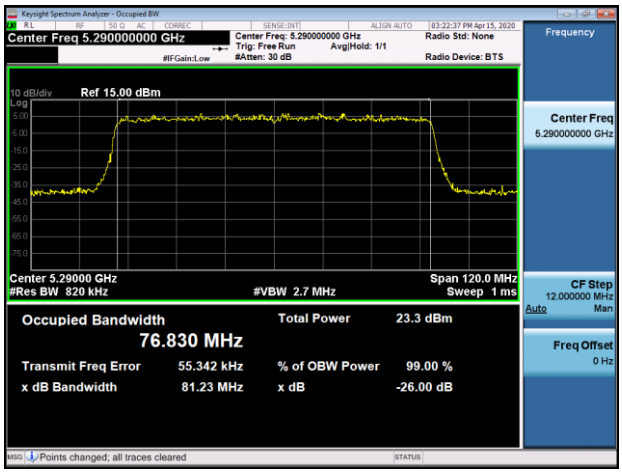

### 802.11ax HE40 UNII 2A (CH 54) – ANT1




### 802.11ac VHT80 UNII 2A (CH 58) – ANT1




### 802.11ax HE80 UNII 2A (CH 58) – ANT1





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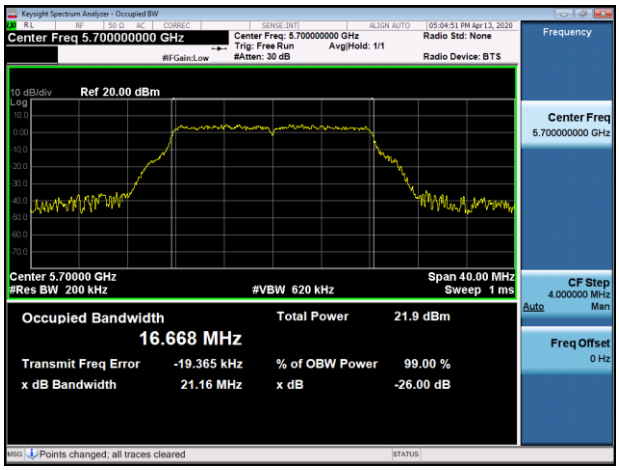
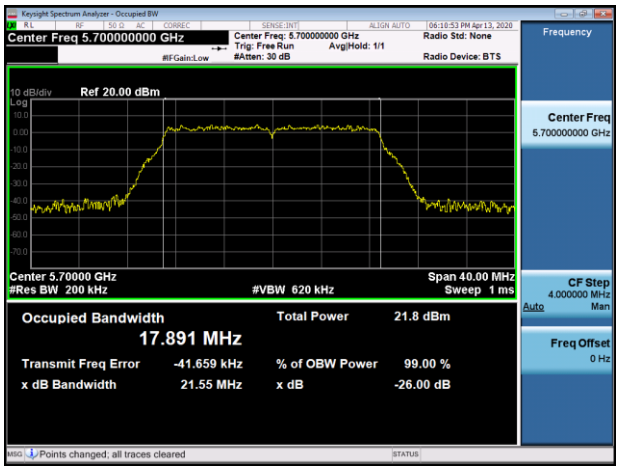
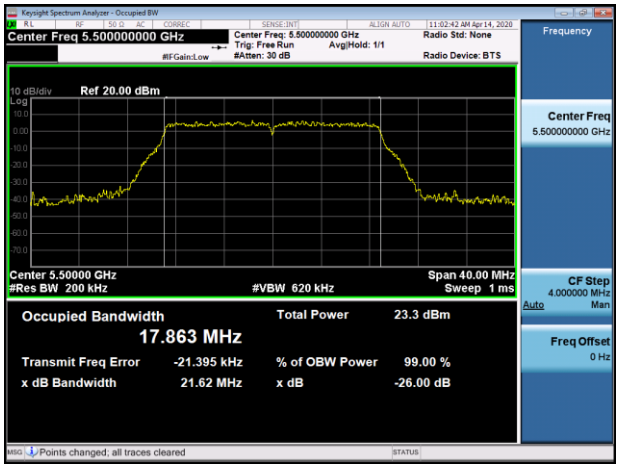
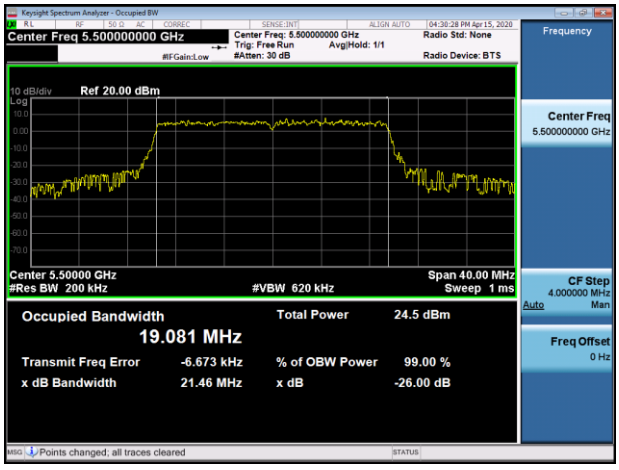
## ▣ TEST PLOT : 99% Bandwidth (U-NII 2C Band)

| 802.11a UNII 2C (CH 140) – ANT1 | 802.11n HT20 UNII 2C (CH 140) – ANT1 |
|---|---|
|  |  |
| **802.11ac VHT20 UNII 2C (CH 100) – ANT1** | **802.11ax HE20 UNII 2C (CH 100) – ANT2** |
|  |  |







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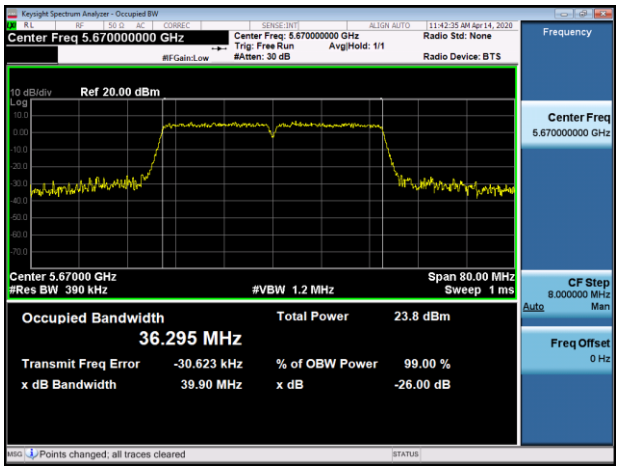
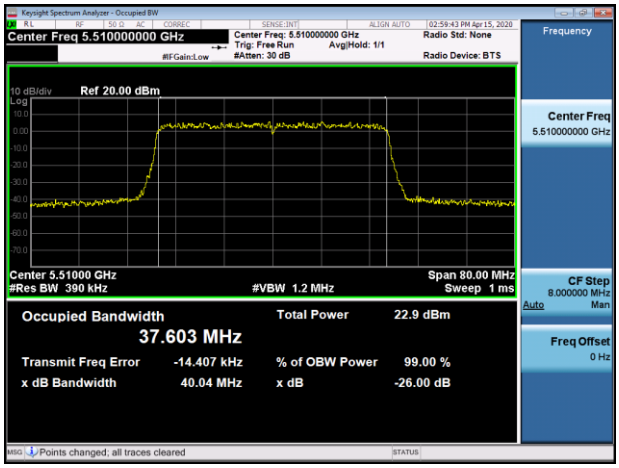
## ▣ TEST PLOT : 99% Bandwidth (U-NII 2C Band)

### 802.11n HT40 UNII 2C (CH 134) – ANT1

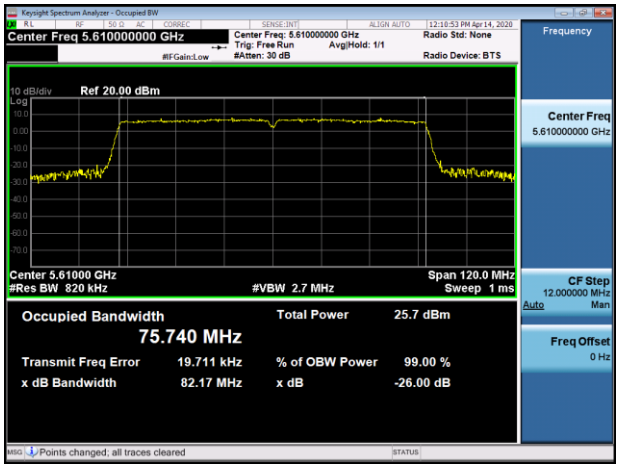
### 802.11ac VHT40 UNII 2C (CH 134) – ANT1



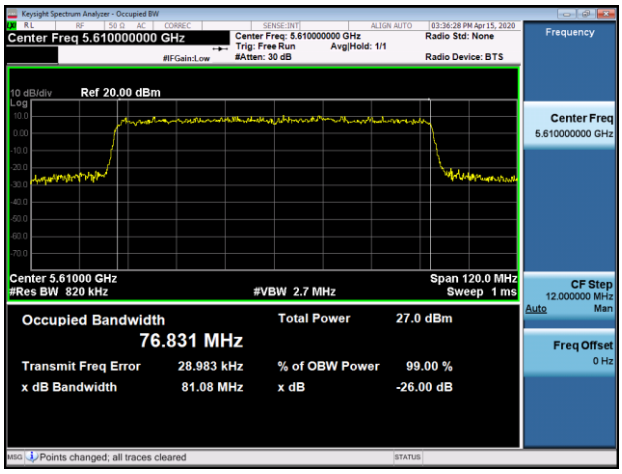

### 802.11ax HE40 UNII 2C (CH 104) – ANT1




### 802.11ac VHT80 UNII 2C (CH 122) – ANT1




### 802.11ax HE80 UNII 2C (CH 122) – ANT1





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## 9.3 OUTPUT POWER

### U-NII 2A Band

| 802.11a UNII 2A | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5260 | 52 | 6 | 18.29 | 18.43 | 21.37 | 24 | 23.36 (26.51) | 18.5 |
| | | 9 | 18.28 | 18.30 | 21.30 | | | |
| | | 12 | 18.21 | 18.32 | 21.28 | | | |
| | | 18 | 18.21 | 18.31 | 21.27 | | | |
| | | 24 | 18.15 | 18.19 | 21.18 | | | |
| | | 36 | 18.20 | 18.35 | 21.29 | | | |
| | | 48 | 18.18 | 18.27 | 21.24 | | | |
| | | 54 | 18.05 | 18.21 | 21.14 | | | |
| 5300 | 60 | 6 | 18.06 | 18.30 | 21.19 | 24 | 23.39 (26.54) | 18.5 |
| | | 9 | 18.15 | 18.23 | 21.20 | | | |
| | | 12 | 18.08 | 18.16 | 21.13 | | | |
| | | 18 | 18.13 | 18.30 | 21.23 | | | |
| | | 24 | 18.14 | 18.20 | 21.18 | | | |
| | | 36 | 18.18 | 18.26 | 21.23 | | | |
| | | 48 | 18.04 | 18.25 | 21.16 | | | |
| | | 54 | 17.91 | 18.13 | 21.03 | | | |
| 5320 | 64 | 6 | 18.06 | 18.21 | 21.15 | 24 | 23.36 (26.51) | 18.5 |
| | | 9 | 18.05 | 18.21 | 21.14 | | | |
| | | 12 | 18.02 | 18.27 | 21.16 | | | |
| | | 18 | 18.09 | 18.35 | 21.23 | | | |
| | | 24 | 17.97 | 18.21 | 21.10 | | | |
| | | 36 | 17.98 | 18.29 | 21.15 | | | |
| | | 48 | 17.99 | 18.26 | 21.14 | | | |
| | | 54 | 17.92 | 18.11 | 21.03 | | | |

**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5260 MHz) = 11 + 10log(B) = 11 + 10log(17.22) = 23.36 dBm
Limit (5300 MHz) = 11 + 10log(B) = 11 + 10log(17.34) = 23.39 dBm
Limit (5320 MHz) = 11 + 10log(B) = 11 + 10log(17.24) = 23.36 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5260 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(17.22) – 2.85 = 26.51 dBm
Limit (5300 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(17.34) – 2.85 = 26.54 dBm
Limit (5320 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(17.24) – 2.85 = 26.51 dBm


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| 802.11n HT20 UNII 2A | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5260 | 52 | MCS0 | 18.16 | 18.19 | 21.19 | 24 | 23.64 (26.79) | 18.5 |
| | | MCS1 | 18.09 | 18.24 | 21.18 | | | |
| | | MCS2 | 18.26 | 18.27 | 21.28 | | | |
| | | MCS3 | 18.09 | 18.30 | 21.21 | | | |
| | | MCS4 | 18.11 | 18.31 | 21.22 | | | |
| | | MCS5 | 18.10 | 18.33 | 21.23 | | | |
| | | MCS6 | 18.16 | 18.37 | 21.28 | | | |
| | | MCS7 | 18.09 | 18.36 | 21.24 | | | |
| 5300 | 60 | MCS0 | 17.95 | 18.14 | 21.06 | 24 | 23.63 (26.78) | 18.5 |
| | | MCS1 | 18.01 | 18.26 | 21.15 | | | |
| | | MCS2 | 18.01 | 18.14 | 21.09 | | | |
| | | MCS3 | 18.01 | 18.22 | 21.13 | | | |
| | | MCS4 | 18.06 | 18.31 | 21.20 | | | |
| | | MCS5 | 18.04 | 18.26 | 21.16 | | | |
| | | MCS6 | 18.08 | 18.25 | 21.18 | | | |
| | | MCS7 | 18.09 | 18.37 | 21.24 | | | |
| 5320 | 64 | MCS0 | 18.07 | 18.15 | 21.12 | 24 | 23.65 (26.80) | 18.5 |
| | | MCS1 | 17.99 | 18.17 | 21.09 | | | |
| | | MCS2 | 17.78 | 18.18 | 20.99 | | | |
| | | MCS3 | 17.88 | 18.26 | 21.08 | | | |
| | | MCS4 | 17.95 | 18.27 | 21.12 | | | |
| | | MCS5 | 18.01 | 18.26 | 21.15 | | | |
| | | MCS6 | 18.05 | 18.36 | 21.22 | | | |
| | | MCS7 | 17.98 | 18.31 | 21.16 | | | |

**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5260 MHz) = 11 + 10log(B) = 11 + 10log(18.39) = 23.64 dBm
Limit (5300 MHz) = 11 + 10log(B) = 11 + 10log(18.36) = 23.63 dBm
Limit (5320 MHz) = 11 + 10log(B) = 11 + 10log(18.41) = 23.65 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5260 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.39) – 2.85 = 26.79 dBm
Limit (5300 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.36) – 2.85 = 26.78 dBm
Limit (5320 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.41) – 2.85 = 26.80 dBm


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| 802.11ac VHT20 UNII 2A | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5260 | 52 | MCS0 | 18.02 | 18.30 | 21.17 | 24 | 23.60 (26.75) | 18.5 |
| | | MCS1 | 18.04 | 18.31 | 21.19 | | | |
| | | MCS2 | 18.08 | 18.32 | 21.21 | | | |
| | | MCS3 | 18.13 | 18.34 | 21.25 | | | |
| | | MCS4 | 18.13 | 18.36 | 21.26 | | | |
| | | MCS5 | 18.12 | 18.45 | 21.30 | | | |
| | | MCS6 | 18.05 | 18.31 | 21.19 | | | |
| | | MCS7 | 18.13 | 18.38 | 21.27 | | | |
| | | MCS8 | 18.15 | 18.30 | 21.24 | | | |
| 5300 | 60 | MCS0 | 18.08 | 18.27 | 21.19 | 24 | 23.61 (26.76) | 18.5 |
| | | MCS1 | 18.07 | 18.27 | 21.18 | | | |
| | | MCS2 | 18.15 | 18.32 | 21.25 | | | |
| | | MCS3 | 18.10 | 18.32 | 21.22 | | | |
| | | MCS4 | 18.17 | 18.35 | 21.27 | | | |
| | | MCS5 | 18.05 | 18.38 | 21.23 | | | |
| | | MCS6 | 18.07 | 18.31 | 21.20 | | | |
| | | MCS7 | 18.05 | 18.39 | 21.23 | | | |
| | | MCS8 | 18.00 | 18.33 | 21.18 | | | |
| 5320 | 64 | MCS0 | 18.01 | 18.25 | 21.14 | 24 | 23.61 (26.76) | 18.5 |
| | | MCS1 | 17.98 | 18.24 | 21.12 | | | |
| | | MCS2 | 18.07 | 18.27 | 21.18 | | | |
| | | MCS3 | 18.02 | 18.27 | 21.16 | | | |
| | | MCS4 | 17.96 | 18.31 | 21.15 | | | |
| | | MCS5 | 18.03 | 18.36 | 21.21 | | | |
| | | MCS6 | 17.94 | 18.26 | 21.11 | | | |
| | | MCS7 | 18.03 | 18.36 | 21.21 | | | |
| | | MCS8 | 17.92 | 18.33 | 21.14 | | | |

**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5260 MHz) = 11 + 10log(B) = 11 + 10log(18.23) = 23.60 dBm
Limit (5300 MHz) = 11 + 10log(B) = 11 + 10log(18.26) = 23.61 dBm
Limit (5320 MHz) = 11 + 10log(B) = 11 + 10log(18.25) = 23.61 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5260 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.23) – 2.85 = 26.75 dBm
Limit (5300 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.26) – 2.85 = 26.76 dBm
Limit (5320 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.25) – 2.85 = 26.76 dBm


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| 802.11ax HE20 UNII 2A | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5260 | 52 | MCS0 | 18.48 | 18.76 | 21.63 | 24 | 23.81 (26.96) | 18.5 |
| | | MCS1 | 18.48 | 18.77 | 21.64 | | | |
| | | MCS2 | 18.51 | 18.75 | 21.64 | | | |
| | | MCS3 | 18.50 | 18.77 | 21.65 | | | |
| | | MCS4 | 18.49 | 18.75 | 21.63 | | | |
| | | MCS5 | 18.52 | 18.76 | 21.65 | | | |
| | | MCS6 | 18.54 | 18.78 | 21.67 | | | |
| | | MCS7 | 18.51 | 18.75 | 21.64 | | | |
| | | MCS8 | 18.57 | 18.87 | 21.73 | | | |
| | | MCS9 | 18.57 | 18.75 | 21.67 | | | |
| | | MCS10 | 18.52 | 18.78 | 21.66 | | | |
| | | MCS11 | 18.57 | 18.73 | 21.66 | | | |
| 5300 | 60 | MCS0 | 18.34 | 18.61 | 21.49 | 24 | 23.83 (26.98) | 18.5 |
| | | MCS1 | 18.36 | 18.62 | 21.50 | | | |
| | | MCS2 | 18.40 | 18.62 | 21.52 | | | |
| | | MCS3 | 18.37 | 18.62 | 21.51 | | | |
| | | MCS4 | 18.33 | 18.62 | 21.49 | | | |
| | | MCS5 | 18.38 | 18.63 | 21.52 | | | |
| | | MCS6 | 18.39 | 18.66 | 21.54 | | | |
| | | MCS7 | 18.40 | 18.62 | 21.52 | | | |
| | | MCS8 | 18.43 | 18.73 | 21.59 | | | |
| | | MCS9 | 18.43 | 18.70 | 21.58 | | | |
| | | MCS10 | 18.39 | 18.68 | 21.55 | | | |
| | | MCS11 | 18.43 | 18.72 | 21.59 | | | |
| 5320 | 64 | MCS0 | 18.46 | 18.68 | 21.58 | 24 | 23.95 (27.10) | 18.5 |
| | | MCS1 | 18.49 | 18.72 | 21.62 | | | |
| | | MCS2 | 18.50 | 18.68 | 21.60 | | | |
| | | MCS3 | 18.48 | 18.64 | 21.57 | | | |
| | | MCS4 | 18.50 | 18.63 | 21.58 | | | |
| | | MCS5 | 18.52 | 18.65 | 21.60 | | | |
| | | MCS6 | 18.53 | 18.67 | 21.61 | | | |
| | | MCS7 | 18.53 | 18.63 | 21.59 | | | |
| | | MCS8 | 18.57 | 18.73 | 21.66 | | | |
| | | MCS9 | 18.55 | 18.70 | 21.64 | | | |
| | | MCS10 | 18.47 | 18.64 | 21.57 | | | |
| | | MCS11 | 18.48 | 18.70 | 21.60 | | | |

**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5260 MHz) = 11 + 10log(B) = 11 + 10log(19.14) = 23.81 dBm
Limit (5300 MHz) = 11 + 10log(B) = 11 + 10log(19.23) = 23.83 dBm
Limit (5320 MHz) = 11 + 10log(B) = 11 + 10log(19.16) = 23.95 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5260 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(19.14) – 2.85 = 26.96 dBm
Limit (5300 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(19.23) – 2.85 = 26.98 dBm
Limit (5320 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(19.16) – 2.85 = 27.10 dBm


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| 802.11n HT40 UNII 2A | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5270 | 54 | MCS0 | 18.53 | 19.09 | 21.83 | 24 | 18.5 |
| | | MCS1 | 18.50 | 18.98 | 21.76 | | |
| | | MCS2 | 18.59 | 18.94 | 21.78 | | |
| | | MCS3 | 18.46 | 18.77 | 21.63 | | |
| | | MCS4 | 18.67 | 19.00 | 21.85 | | |
| | | MCS5 | 18.58 | 18.81 | 21.71 | | |
| | | MCS6 | 18.59 | 18.88 | 21.75 | | |
| | | MCS7 | 18.75 | 19.00 | 21.89 | | |
| 5310 | 62 | MCS0 | 14.98 | 15.76 | 18.40 | 24 | 15 |
| | | MCS1 | 14.99 | 15.83 | 18.44 | | |
| | | MCS2 | 15.10 | 15.90 | 18.53 | | |
| | | MCS3 | 14.99 | 15.83 | 18.44 | | |
| | | MCS4 | 15.19 | 15.85 | 18.54 | | |
| | | MCS5 | 15.05 | 15.69 | 18.39 | | |
| | | MCS6 | 15.03 | 15.77 | 18.43 | | |
| | | MCS7 | 15.02 | 15.96 | 18.53 | | |

| 802.11ac VHT40 UNII 2A | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5270 | 54 | MCS0 | 18.54 | 18.95 | 21.76 | 24 | 18.5 |
| | | MCS1 | 18.54 | 19.06 | 21.82 | | |
| | | MCS2 | 18.49 | 18.93 | 21.73 | | |
| | | MCS3 | 18.49 | 18.93 | 21.73 | | |
| | | MCS4 | 18.58 | 18.99 | 21.80 | | |
| | | MCS5 | 18.62 | 19.07 | 21.86 | | |
| | | MCS6 | 18.45 | 18.88 | 21.68 | | |
| | | MCS7 | 18.43 | 18.87 | 21.67 | | |
| | | MCS8 | 18.70 | 19.06 | 21.89 | | |
| | | MCS9 | 18.57 | 18.99 | 21.80 | | |
| 5310 | 62 | MCS0 | 15.01 | 15.86 | 18.47 | 24 | 15 |
| | | MCS1 | 14.87 | 15.90 | 18.43 | | |
| | | MCS2 | 14.82 | 15.87 | 18.39 | | |
| | | MCS3 | 14.84 | 15.85 | 18.38 | | |
| | | MCS4 | 14.91 | 15.85 | 18.42 | | |
| | | MCS5 | 14.99 | 15.83 | 18.55 | | |
| | | MCS6 | 14.81 | 15.72 | 18.30 | | |
| | | MCS7 | 14.81 | 15.72 | 18.30 | | |
| | | MCS8 | 15.06 | 15.90 | 18.51 | | |
| | | MCS9 | 14.93 | 15.82 | 18.41 | | |

**Note :**

1. The output power results in the table include the spectrum offset, which is a combination loss of the attenuator and the cable used for testing


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| 802.11ax HE40 UNII 2A | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5270 | 54 | MCS0 | 18.92 | 19.29 | 22.12 | 24 | 18.5 |
| | | MCS1 | 18.91 | 19.30 | 22.12 | | |
| | | MCS2 | 18.89 | 19.29 | 22.10 | | |
| | | MCS3 | 19.05 | 19.39 | 22.23 | | |
| | | MCS4 | 18.97 | 19.26 | 22.13 | | |
| | | MCS5 | 19.04 | 19.41 | 22.24 | | |
| | | MCS6 | 19.01 | 19.29 | 22.16 | | |
| | | MCS7 | 18.96 | 19.28 | 22.13 | | |
| | | MCS8 | 18.80 | 19.22 | 22.03 | | |
| | | MCS9 | 19.05 | 19.40 | 22.24 | | |
| | | MCS10 | 18.86 | 19.28 | 22.09 | | |
| | | MCS11 | 18.86 | 19.18 | 22.03 | | |
| 5310 | 62 | MCS0 | 15.31 | 16.12 | 18.74 | 24 | 15 |
| | | MCS1 | 15.32 | 16.22 | 18.80 | | |
| | | MCS2 | 15.34 | 16.14 | 18.77 | | |
| | | MCS3 | 15.39 | 16.25 | 18.85 | | |
| | | MCS4 | 15.33 | 16.13 | 18.76 | | |
| | | MCS5 | 15.46 | 16.33 | 18.93 | | |
| | | MCS6 | 15.38 | 16.19 | 18.81 | | |
| | | MCS7 | 15.39 | 16.18 | 18.81 | | |
| | | MCS8 | 15.32 | 16.14 | 18.76 | | |
| | | MCS9 | 15.43 | 16.27 | 18.88 | | |
| | | MCS10 | 15.29 | 16.18 | 18.77 | | |
| | | MCS11 | 15.24 | 16.13 | 18.72 | | |

**Note :**

1. The output power results in the table a include the spectrum offset, which is a combination loss of the attenuator and the cable used for testing


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| 802.11ac VHT80 UNII 2A | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5290 | 58 | MCS0 | 14.80 | 14.95 | 17.89 | 24 | 18.5 |
| | | MCS1 | 14.81 | 15.16 | 18.00 | | |
| | | MCS2 | 14.91 | 15.07 | 18.00 | | |
| | | MCS3 | 14.79 | 14.95 | 17.88 | | |
| | | MCS4 | 14.81 | 14.97 | 17.90 | | |
| | | MCS5 | 14.65 | 14.90 | 17.79 | | |
| | | MCS6 | 14.73 | 14.91 | 17.83 | | |
| | | MCS7 | 14.70 | 14.99 | 17.86 | | |
| | | MCS8 | 14.95 | 15.25 | 18.11 | | |
| | | MCS9 | 14.82 | 15.09 | 17.97 | | |

| 802.11ax HE80 UNII 2A | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5290 | 58 | MCS0 | 15.07 | 15.29 | 18.19 | 24 | 18.5 |
| | | MCS1 | 15.15 | 15.28 | 18.23 | | |
| | | MCS2 | 15.07 | 15.26 | 18.18 | | |
| | | MCS3 | 15.15 | 15.27 | 18.22 | | |
| | | MCS4 | 15.02 | 15.19 | 18.12 | | |
| | | MCS5 | 15.07 | 15.27 | 18.18 | | |
| | | MCS6 | 14.98 | 15.13 | 18.07 | | |
| | | MCS7 | 15.01 | 15.19 | 18.11 | | |
| | | MCS8 | 15.22 | 15.38 | 18.31 | | |
| | | MCS9 | 15.22 | 15.31 | 18.28 | | |
| | | MCS10 | 15.09 | 15.34 | 18.23 | | |
| | | MCS11 | 15.17 | 15.36 | 18.28 | | |

**Note :**

1. The output power results in the table a include the spectrum offset, which is a combination loss of the attenuator and the cable used for testing


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## U-NII 2C Band

| 802.11a UNII 2C | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5500 | 100 | 6 | 16.74 | 16.78 | 19.77 | 24 | 23.35 (26.50) | 17 |
| | | 9 | 16.92 | 16.87 | 19.91 | | | |
| | | 12 | 16.78 | 16.87 | 19.84 | | | |
| | | 18 | 16.91 | 16.97 | 19.95 | | | |
| | | 24 | 16.88 | 16.93 | 19.92 | | | |
| | | 36 | 16.94 | 16.95 | 19.96 | | | |
| | | 48 | 16.98 | 16.96 | 19.98 | | | |
| | | 54 | 16.90 | 16.77 | 19.85 | | | |
| 5580 | 116 | 6 | 18.00 | 17.42 | 20.91 | 24 | 23.38 (26.53) | 18.5 |
| | | 9 | 18.11 | 17.56 | 21.05 | | | |
| | | 12 | 18.01 | 17.46 | 21.02 | | | |
| | | 18 | 18.12 | 17.58 | 21.07 | | | |
| | | 24 | 17.97 | 17.49 | 21.03 | | | |
| | | 36 | 18.00 | 17.53 | 21.05 | | | |
| | | 48 | 18.03 | 17.47 | 21.01 | | | |
| | | 54 | 17.98 | 17.44 | 20.94 | | | |
| 5700 | 140 | 6 | 15.38 | 14.85 | 18.13 | 24 | 23.36 (26.51) | 15.5 |
| | | 9 | 15.50 | 14.76 | 18.16 | | | |
| | | 12 | 15.40 | 14.80 | 18.12 | | | |
| | | 18 | 15.46 | 14.84 | 18.17 | | | |
| | | 24 | 15.49 | 14.86 | 18.20 | | | |
| | | 36 | 15.36 | 14.90 | 18.15 | | | |
| | | 48 | 15.27 | 14.95 | 18.12 | | | |
| | | 54 | 15.24 | 14.81 | 18.04 | | | |
| 5720* | 144* | 6 | 18.11 | 17.41 | 20.78 | 22.92 | 22.92 (26.07) | 18.5 |
| | | 9 | 18.06 | 17.39 | 20.75 | | | |
| | | 12 | 18.06 | 17.58 | 20.84 | | | |
| | | 18 | 18.10 | 17.49 | 20.82 | | | |
| | | 24 | 18.09 | 17.45 | 20.79 | | | |
| | | 36 | 18.10 | 17.53 | 20.83 | | | |
| | | 48 | 18.18 | 17.56 | 20.89 | | | |
| | | 54 | 18.00 | 17.45 | 20.74 | | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.

**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5500 MHz) = 11 + 10log(B) = 11 + 10log(17.19) = 23.35 dBm
Limit (5580 MHz) = 11 + 10log(B) = 11 + 10log(17.30) = 23.38 dBm
Limit (5700 MHz) = 11 + 10log(B) = 11 + 10log(17.23) = 23.36 dBm
Limit (5720 MHz) = 11 + 10log(B) = 11 + 10log(15.56) = 22.92 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5500 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(17.19) – 2.85 = 26.50 dBm
Limit (5580 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(17.30) – 2.85 = 26.53 dBm
Limit (5700 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(17.23) – 2.85 = 26.51 dBm
Limit (5720 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(15.56) – 2.85 = 26.07 dBm


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| 802.11n HT20 UNII 2C | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5500 | 100 | MCS0 | 16.90 | 16.78 | 19.85 | 24 | 23.62 (26.77) | 17 |
| | | MCS1 | 16.93 | 16.80 | 19.88 | | | |
| | | MCS2 | 17.00 | 16.85 | 19.94 | | | |
| | | MCS3 | 16.93 | 16.78 | 19.87 | | | |
| | | MCS4 | 16.86 | 16.81 | 19.85 | | | |
| | | MCS5 | 16.87 | 16.82 | 19.86 | | | |
| | | MCS6 | 16.74 | 16.82 | 19.79 | | | |
| | | MCS7 | 16.77 | 16.88 | 19.84 | | | |
| 5580 | 116 | MCS0 | 18.40 | 17.49 | 20.98 | 24 | 23.63 (26.78) | 18.5 |
| | | MCS1 | 18.35 | 17.42 | 20.92 | | | |
| | | MCS2 | 18.48 | 17.44 | 21.00 | | | |
| | | MCS3 | 18.45 | 17.40 | 20.97 | | | |
| | | MCS4 | 18.46 | 17.48 | 21.01 | | | |
| | | MCS5 | 18.55 | 17.41 | 21.03 | | | |
| | | MCS6 | 18.39 | 17.43 | 20.95 | | | |
| | | MCS7 | 18.41 | 17.32 | 20.91 | | | |
| 5700 | 140 | MCS0 | 15.26 | 14.78 | 18.04 | 24 | 23.63 (26.78) | 15.5 |
| | | MCS1 | 15.27 | 14.83 | 18.07 | | | |
| | | MCS2 | 15.32 | 14.94 | 18.14 | | | |
| | | MCS3 | 15.36 | 14.93 | 18.16 | | | |
| | | MCS4 | 15.37 | 14.95 | 18.18 | | | |
| | | MCS5 | 15.37 | 14.88 | 18.14 | | | |
| | | MCS6 | 15.38 | 14.90 | 18.16 | | | |
| | | MCS7 | 15.36 | 14.84 | 18.12 | | | |
| 5720* | 144* | MCS0 | 17.94 | 17.57 | 20.77 | 22.96 | 22.96 (26.11) | 18.5 |
| | | MCS1 | 17.92 | 17.56 | 20.75 | | | |
| | | MCS2 | 18.03 | 17.55 | 20.81 | | | |
| | | MCS3 | 18.05 | 17.56 | 20.82 | | | |
| | | MCS4 | 18.07 | 17.53 | 20.82 | | | |
| | | MCS5 | 18.09 | 17.49 | 20.81 | | | |
| | | MCS6 | 18.10 | 17.54 | 20.84 | | | |
| | | MCS7 | 18.15 | 17.48 | 20.84 | | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.

**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5500 MHz) = 11 + 10log(B) = 11 + 10log(18.31) = 23.62 dBm
Limit (5580 MHz) = 11 + 10log(B) = 11 + 10log(18.35) = 23.63 dBm
Limit (5700 MHz) = 11 + 10log(B) = 11 + 10log(18.34) = 23.63 dBm
Limit (5720 MHz) = 11 + 10log(B) = 11 + 10log(15.72) = 22.96 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5500 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.31) – 2.85 = 26.77 dBm
Limit (5580 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.35) – 2.85 = 26.78 dBm
Limit (5700 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.34) – 2.85 = 26.78 dBm
Limit (5720 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(15.72) – 2.85 = 26.11 dBm


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| 802.11ac VHT20 UNII 2C | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5500 | 100 | MCS0 | 16.82 | 16.89 | 19.87 | 24 | 23.60 (26.75) | 17 |
| | | MCS1 | 16.84 | 16.89 | 19.88 | | | |
| | | MCS2 | 16.89 | 16.79 | 19.85 | | | |
| | | MCS3 | 16.88 | 16.90 | 19.90 | | | |
| | | MCS4 | 16.92 | 16.85 | 19.90 | | | |
| | | MCS5 | 16.94 | 16.88 | 19.92 | | | |
| | | MCS6 | 16.86 | 16.82 | 19.85 | | | |
| | | MCS7 | 16.95 | 16.90 | 19.94 | | | |
| | | MCS8 | 16.90 | 16.85 | 19.89 | | | |
| 5580 | 116 | MCS0 | 18.33 | 17.43 | 20.91 | 24 | 23.61 (26.76) | 18.5 |
| | | MCS1 | 18.35 | 17.41 | 20.92 | | | |
| | | MCS2 | 18.41 | 17.44 | 20.96 | | | |
| | | MCS3 | 18.38 | 17.46 | 20.95 | | | |
| | | MCS4 | 18.42 | 17.50 | 20.99 | | | |
| | | MCS5 | 18.41 | 17.53 | 21.00 | | | |
| | | MCS6 | 18.36 | 17.43 | 20.93 | | | |
| | | MCS7 | 18.45 | 17.55 | 21.03 | | | |
| | | MCS8 | 18.39 | 17.51 | 20.98 | | | |
| 5700 | 140 | MCS0 | 15.38 | 15.03 | 18.22 | 24 | 23.61 (26.76) | 15.5 |
| | | MCS1 | 15.42 | 14.82 | 18.14 | | | |
| | | MCS2 | 15.49 | 14.84 | 18.19 | | | |
| | | MCS3 | 15.43 | 14.86 | 18.16 | | | |
| | | MCS4 | 15.47 | 14.88 | 18.20 | | | |
| | | MCS5 | 15.52 | 14.95 | 18.25 | | | |
| | | MCS6 | 15.33 | 14.83 | 18.10 | | | |
| | | MCS7 | 15.39 | 14.93 | 18.18 | | | |
| | | MCS8 | 15.34 | 14.88 | 18.13 | | | |
| 5720* | 144* | MCS0 | 18.05 | 17.52 | 20.80 | 22.97 | 22.97 (26.12) | 18.5 |
| | | MCS1 | 18.05 | 17.54 | 20.81 | | | |
| | | MCS2 | 18.21 | 17.54 | 20.90 | | | |
| | | MCS3 | 18.06 | 17.55 | 20.82 | | | |
| | | MCS4 | 18.14 | 17.60 | 20.89 | | | |
| | | MCS5 | 18.16 | 17.65 | 20.92 | | | |
| | | MCS6 | 18.06 | 17.56 | 20.83 | | | |
| | | MCS7 | 18.13 | 17.66 | 20.91 | | | |
| | | MCS8 | 18.03 | 17.59 | 20.83 | | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.

**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5500 MHz) = 11 + 10log(B) = 11 + 10log(18.23) = 23.60 dBm
Limit (5580 MHz) = 11 + 10log(B) = 11 + 10log(18.26) = 23.61 dBm
Limit (5700 MHz) = 11 + 10log(B) = 11 + 10log(18.25) = 23.61 dBm
Limit (5720 MHz) = 11 + 10log(B) = 11 + 10log(15.76) = 22.97 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5500 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.23) – 2.85 = 26.75 dBm
Limit (5580 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.26) – 2.85 = 26.76 dBm
Limit (5700 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(18.25) – 2.85 = 26.76 dBm
Limit (5720 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(15.76) – 2.85 = 26.12 dBm


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| 802.11ax HE20 UNII 2C | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | FCC Limit (dBm) | ISED Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | | |
| 5500 | 100 | MCS0 | 17.29 | 17.13 | 20.22 | 24 | 23.81 (26.96) | 17 |
| | | MCS1 | 17.37 | 17.18 | 20.29 | | | |
| | | MCS2 | 17.28 | 17.15 | 20.23 | | | |
| | | MCS3 | 17.26 | 17.15 | 20.22 | | | |
| | | MCS4 | 17.28 | 17.15 | 20.23 | | | |
| | | MCS5 | 17.29 | 17.15 | 20.23 | | | |
| | | MCS6 | 17.33 | 17.19 | 20.27 | | | |
| | | MCS7 | 17.32 | 17.16 | 20.25 | | | |
| | | MCS8 | 17.38 | 17.25 | 20.33 | | | |
| | | MCS9 | 17.37 | 17.23 | 20.31 | | | |
| | | MCS10 | 17.34 | 17.18 | 20.27 | | | |
| | | MCS11 | 17.41 | 17.23 | 20.33 | | | |
| 5580 | 116 | MCS0 | 18.75 | 17.77 | 21.30 | 24 | 23.83 (26.98) | 18.5 |
| | | MCS1 | 18.74 | 17.79 | 21.30 | | | |
| | | MCS2 | 18.80 | 17.79 | 21.33 | | | |
| | | MCS3 | 18.77 | 17.80 | 21.32 | | | |
| | | MCS4 | 18.75 | 17.78 | 21.30 | | | |
| | | MCS5 | 18.79 | 17.83 | 21.35 | | | |
| | | MCS6 | 18.81 | 17.84 | 21.36 | | | |
| | | MCS7 | 18.78 | 17.83 | 21.34 | | | |
| | | MCS8 | 18.85 | 17.91 | 21.42 | | | |
| | | MCS9 | 18.86 | 17.88 | 21.41 | | | |
| | | MCS10 | 18.82 | 17.85 | 21.37 | | | |
| | | MCS11 | 16.65 | 15.95 | 19.32 | | | |
| 5700 | 140 | MCS0 | 15.81 | 15.13 | 18.49 | 24 | 23.82 (26.97) | 15.5 |
| | | MCS1 | 15.85 | 15.11 | 18.51 | | | |
| | | MCS2 | 15.82 | 15.14 | 18.50 | | | |
| | | MCS3 | 15.76 | 15.07 | 18.44 | | | |
| | | MCS4 | 15.74 | 15.14 | 18.46 | | | |
| | | MCS5 | 15.91 | 15.18 | 18.57 | | | |
| | | MCS6 | 15.77 | 15.19 | 18.50 | | | |
| | | MCS7 | 15.88 | 15.31 | 18.61 | | | |
| | | MCS8 | 15.73 | 15.17 | 18.47 | | | |
| | | MCS9 | 15.72 | 15.18 | 18.47 | | | |
| | | MCS10 | 15.83 | 15.25 | 18.56 | | | |
| | | MCS11 | 15.77 | 15.26 | 18.53 | | | |
| 5720* | 144* | MCS0 | 18.36 | 17.72 | 21.06 | 22.95 | 22.95 (26.10) | 18.5 |
| | | MCS1 | 18.37 | 17.73 | 21.07 | | | |
| | | MCS2 | 18.37 | 17.73 | 21.07 | | | |
| | | MCS3 | 18.31 | 17.70 | 21.03 | | | |
| | | MCS4 | 18.37 | 17.73 | 21.07 | | | |
| | | MCS5 | 18.45 | 17.79 | 21.14 | | | |
| | | MCS6 | 18.44 | 17.78 | 21.13 | | | |
| | | MCS7 | 18.53 | 17.94 | 21.26 | | | |
| | | MCS8 | 18.37 | 17.77 | 21.09 | | | |
| | | MCS9 | 18.41 | 17.79 | 21.12 | | | |
| | | MCS10 | 18.49 | 18.02 | 21.27 | | | |
| | | MCS11 | 18.40 | 17.94 | 21.19 | | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.


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**Note :**

1. ISED Limit Calculation :

**Conducted Output Power Limit**

Limit (5500 MHz) = 11 + 10log(B) = 11 + 10log(19.14) = 23.81 dBm
Limit (5580 MHz) = 11 + 10log(B) = 11 + 10log(19.23) = 23.83 dBm
Limit (5700 MHz) = 11 + 10log(B) = 11 + 10log(19.16) = 23.82 dBm
Limit (5720 MHz) = 11 + 10log(B) = 11 + 10log(15.68) = 22.95 dBm

**Reduced Conducted Power Limit** : shown inside the parenthesis in the table above

Limit (5500 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(19.14) – 2.85 = 26.96 dBm
Limit (5580 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(19.23) – 2.85 = 26.98 dBm
Limit (5700 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(19.16) – 2.85 = 26.97 dBm
Limit (5720 MHz) = e.i.r.p. Limit – $G_{ANT}$ = 17 + 10log(15.68) – 2.85 = 26.10 dBm


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| 802.11n HT40 UNII 2C | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5510 | 102 | MCS0 | 14.86 | 15.05 | 17.97 | 24 | 15 |
| | | MCS1 | 14.83 | 15.07 | 17.96 | | |
| | | MCS2 | 14.87 | 15.10 | 18.00 | | |
| | | MCS3 | 14.76 | 15.04 | 17.91 | | |
| | | MCS4 | 14.94 | 14.98 | 17.97 | | |
| | | MCS5 | 14.83 | 14.93 | 17.89 | | |
| | | MCS6 | 14.82 | 14.96 | 17.90 | | |
| | | MCS7 | 15.07 | 15.06 | 18.08 | | |
| 5550 | 110 | MCS0 | 18.31 | 18.26 | 21.30 | 24 | 18.5 |
| | | MCS1 | 18.30 | 18.25 | 21.29 | | |
| | | MCS2 | 18.33 | 18.29 | 21.32 | | |
| | | MCS3 | 18.31 | 18.26 | 21.30 | | |
| | | MCS4 | 18.43 | 18.29 | 21.37 | | |
| | | MCS5 | 18.34 | 18.06 | 21.21 | | |
| | | MCS6 | 18.34 | 18.15 | 21.26 | | |
| | | MCS7 | 18.56 | 18.31 | 21.45 | | |
| 5670 | 134 | MCS0 | 17.05 | 16.46 | 19.78 | 24 | 17 |
| | | MCS1 | 16.99 | 16.43 | 19.73 | | |
| | | MCS2 | 17.13 | 16.44 | 19.81 | | |
| | | MCS3 | 17.04 | 16.38 | 19.73 | | |
| | | MCS4 | 17.13 | 16.57 | 19.87 | | |
| | | MCS5 | 17.06 | 16.37 | 19.74 | | |
| | | MCS6 | 17.10 | 16.44 | 19.79 | | |
| | | MCS7 | 17.28 | 16.60 | 19.96 | | |
| 5710* | 142* | MCS0 | 18.38 | 17.77 | 21.10 | 24 | 18.5 |
| | | MCS1 | 18.35 | 17.78 | 21.08 | | |
| | | MCS2 | 18.24 | 17.85 | 21.06 | | |
| | | MCS3 | 18.20 | 17.75 | 20.99 | | |
| | | MCS4 | 18.39 | 18.00 | 21.21 | | |
| | | MCS5 | 18.23 | 17.87 | 21.06 | | |
| | | MCS6 | 18.27 | 17.95 | 21.12 | | |
| | | MCS7 | 18.46 | 18.08 | 21.28 | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.

**Note :**

1. The output power results in the table include the spectrum offset, which is a combination loss of the attenuator and the cable used for testing


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| 802.11ac VHT40 UNII 2C | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5510 | 102 | MCS0 | 14.92 | 15.09 | 18.02 | 24 | 15 |
| | | MCS1 | 14.97 | 15.10 | 18.05 | | |
| | | MCS2 | 14.93 | 15.08 | 18.02 | | |
| | | MCS3 | 14.95 | 15.14 | 18.06 | | |
| | | MCS4 | 15.03 | 15.12 | 18.09 | | |
| | | MCS5 | 15.08 | 15.24 | 18.17 | | |
| | | MCS6 | 14.89 | 15.05 | 17.98 | | |
| | | MCS7 | 14.87 | 15.02 | 17.96 | | |
| | | MCS8 | 15.12 | 15.20 | 18.17 | | |
| | | MCS9 | 15.03 | 15.05 | 18.05 | | |
| 5550 | 110 | MCS0 | 18.50 | 18.28 | 21.40 | 24 | 18.5 |
| | | MCS1 | 18.50 | 18.30 | 21.41 | | |
| | | MCS2 | 18.45 | 18.32 | 21.40 | | |
| | | MCS3 | 18.46 | 18.29 | 21.39 | | |
| | | MCS4 | 18.54 | 18.35 | 21.46 | | |
| | | MCS5 | 18.63 | 18.42 | 21.54 | | |
| | | MCS6 | 18.43 | 18.25 | 21.35 | | |
| | | MCS7 | 18.43 | 18.26 | 21.36 | | |
| | | MCS8 | 18.68 | 18.46 | 21.58 | | |
| | | MCS9 | 18.58 | 18.37 | 21.49 | | |
| 5670 | 134 | MCS0 | 17.09 | 16.50 | 19.82 | 24 | 17 |
| | | MCS1 | 17.14 | 16.49 | 19.84 | | |
| | | MCS2 | 17.11 | 16.50 | 19.83 | | |
| | | MCS3 | 17.14 | 16.51 | 19.85 | | |
| | | MCS4 | 17.19 | 16.54 | 19.89 | | |
| | | MCS5 | 17.19 | 16.65 | 19.94 | | |
| | | MCS6 | 16.98 | 16.45 | 19.73 | | |
| | | MCS7 | 16.97 | 16.46 | 19.73 | | |
| | | MCS8 | 17.24 | 16.68 | 19.98 | | |
| | | MCS9 | 17.11 | 16.58 | 19.86 | | |
| 5710* | 142* | MCS0 | 18.29 | 17.42 | 20.89 | 24 | 18.5 |
| | | MCS1 | 18.32 | 17.45 | 20.92 | | |
| | | MCS2 | 18.30 | 17.41 | 20.89 | | |
| | | MCS3 | 18.29 | 17.42 | 20.89 | | |
| | | MCS4 | 18.37 | 17.40 | 20.92 | | |
| | | MCS5 | 18.42 | 17.47 | 20.98 | | |
| | | MCS6 | 18.28 | 17.29 | 20.82 | | |
| | | MCS7 | 18.26 | 17.24 | 20.79 | | |
| | | MCS8 | 18.51 | 17.45 | 21.02 | | |
| | | MCS9 | 18.41 | 17.41 | 20.95 | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.

**Note :**

1. The output power results in the table include the spectrum offset, which is a combination loss of the attenuator and the cable used for testing


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| 802.11ax HE40 UNII 2C | | Rate | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5510 | 102 | MCS0 | 15.20 | 15.36 | 18.29 | 24 | 15 |
| | | MCS1 | 15.18 | 15.27 | 18.24 | | |
| | | MCS2 | 15.18 | 15.28 | 18.24 | | |
| | | MCS3 | 15.25 | 15.37 | 18.32 | | |
| | | MCS4 | 15.21 | 15.28 | 18.26 | | |
| | | MCS5 | 15.33 | 15.47 | 18.41 | | |
| | | MCS6 | 15.21 | 15.31 | 18.27 | | |
| | | MCS7 | 15.21 | 15.31 | 18.27 | | |
| | | MCS8 | 15.18 | 15.28 | 18.24 | | |
| | | MCS9 | 15.28 | 15.41 | 18.36 | | |
| | | MCS10 | 15.16 | 15.32 | 18.25 | | |
| | | MCS11 | 15.22 | 15.26 | 18.25 | | |
| 5550 | 110 | MCS0 | 18.70 | 18.54 | 21.63 | 24 | 18.5 |
| | | MCS1 | 18.73 | 18.54 | 21.65 | | |
| | | MCS2 | 18.71 | 18.54 | 21.64 | | |
| | | MCS3 | 18.77 | 18.61 | 21.70 | | |
| | | MCS4 | 18.71 | 18.53 | 21.63 | | |
| | | MCS5 | 18.83 | 18.69 | 21.77 | | |
| | | MCS6 | 18.73 | 18.56 | 21.66 | | |
| | | MCS7 | 18.69 | 18.55 | 21.63 | | |
| | | MCS8 | 18.69 | 18.50 | 21.61 | | |
| | | MCS9 | 18.85 | 18.62 | 21.75 | | |
| | | MCS10 | 18.70 | 18.59 | 21.66 | | |
| | | MCS11 | 18.67 | 18.52 | 21.61 | | |
| 5670 | 134 | MCS0 | 17.38 | 16.85 | 20.13 | 24 | 17 |
| | | MCS1 | 17.37 | 16.72 | 20.07 | | |
| | | MCS2 | 17.37 | 16.70 | 20.06 | | |
| | | MCS3 | 17.44 | 16.81 | 20.15 | | |
| | | MCS4 | 17.37 | 16.70 | 20.06 | | |
| | | MCS5 | 17.46 | 16.84 | 20.17 | | |
| | | MCS6 | 17.41 | 16.75 | 20.10 | | |
| | | MCS7 | 17.39 | 16.74 | 20.09 | | |
| | | MCS8 | 17.37 | 16.71 | 20.06 | | |
| | | MCS9 | 17.49 | 16.85 | 20.19 | | |
| | | MCS10 | 17.35 | 16.79 | 20.09 | | |
| | | MCS11 | 17.38 | 16.70 | 20.06 | | |
| 5710* | 142* | MCS0 | 18.78 | 17.76 | 21.31 | 24 | 18.5 |
| | | MCS1 | 18.78 | 17.78 | 21.32 | | |
| | | MCS2 | 18.68 | 17.77 | 21.26 | | |
| | | MCS3 | 18.78 | 17.87 | 21.36 | | |
| | | MCS4 | 18.67 | 17.75 | 21.24 | | |
| | | MCS5 | 18.71 | 17.81 | 21.29 | | |
| | | MCS6 | 18.66 | 17.81 | 21.27 | | |
| | | MCS7 | 18.61 | 17.79 | 21.23 | | |
| | | MCS8 | 18.58 | 17.81 | 21.22 | | |
| | | MCS9 | 18.64 | 17.82 | 21.26 | | |
| | | MCS10 | 18.54 | 17.65 | 21.13 | | |
| | | MCS11 | 18.50 | 17.60 | 21.08 | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.

**Note :**
1. The output power results in the table a include the spectrum offset, which is a combination loss of the attenuator and the cable used for testing


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| 802.11ac VHT80 UNII 2C | | Rate (Mbps) | ANT1 Measured Power(dBm) | ANT2 Measured Power(dBm) | CCD Measured Power(dBm) | Limit (dBm) | Power Level Setting |
|---|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | | |
| 5530 | 106 | MCS0 | 14.56 | 15.61 | 18.13 | 24 | 15.5 |
| | | MCS1 | 14.58 | 15.64 | 18.15 | | |
| | | MCS2 | 14.50 | 15.71 | 18.16 | | |
| | | MCS3 | 14.57 | 15.58 | 18.11 | | |
| | | MCS4 | 14.35 | 15.54 | 18.00 | | |
| | | MCS5 | 14.44 | 15.51 | 18.02 | | |
| | | MCS6 | 14.28 | 15.47 | 17.93 | | |
| | | MCS7 | 14.38 | 15.54 | 18.01 | | |
| | | MCS8 | 14.59 | 15.79 | 18.24 | | |
| | | MCS9 | 14.45 | 15.59 | 18.07 | | |
| 5610 (1) | 122 | MCS0 | 18.29 | 17.52 | 20.93 | 24 | 18.5 |
| | | MCS1 | 18.32 | 17.57 | 20.97 | | |
| | | MCS2 | 18.38 | 17.59 | 21.01 | | |
| | | MCS3 | 18.13 | 17.56 | 20.86 | | |
| | | MCS4 | 18.29 | 17.57 | 20.96 | | |
| | | MCS5 | 18.06 | 17.45 | 20.78 | | |
| | | MCS6 | 18.09 | 17.46 | 20.80 | | |
| | | MCS7 | 18.10 | 17.50 | 20.82 | | |
| | | MCS8 | 18.35 | 17.74 | 21.07 | | |
| | | MCS9 | 18.22 | 17.63 | 20.95 | | |
| 5690* | 138* | MCS0 | 18.22 | 17.47 | 20.87 | 24 | 18.5 |
| | | MCS1 | 18.22 | 17.51 | 20.89 | | |
| | | MCS2 | 18.39 | 17.60 | 21.02 | | |
| | | MCS3 | 18.29 | 17.50 | 20.92 | | |
| | | MCS4 | 18.32 | 17.51 | 20.94 | | |
| | | MCS5 | 18.25 | 17.49 | 20.90 | | |
| | | MCS6 | 18.13 | 17.51 | 20.84 | | |
| | | MCS7 | 18.30 | 17.53 | 20.94 | | |
| | | MCS8 | 18.52 | 17.81 | 21.19 | | |
| | | MCS9 | 18.38 | 17.65 | 21.04 | | |

'*' Straddle Channel
The result in the band is total power integrated across an entire U-NII band without regard to 26 dB points.

**Note :**
1. The frequency channel at 5610 MHz does not operate in Canada
2. The output power results in the table include the spectrum offset, which is a combination loss of the attenuator and the cable used for testing


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