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

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

TABLE OF CONTENTS

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) WIFI 5 GHz : IEEE 802.11a/n/ac/ax HE80 (2x2 MIMO) Bluetooth 5.0 LE 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 802.11n HT40 / 802.11ac VHT40 / 802.11ax HE40 802.11ac VHT80 / 802.11ax HE80	
Frequency Range [1)]	U-NII 2a	20 MHz BW : 5260 MHz – 5320 MHz 40 MHz BW : 5270 MHz – 5310 MHz 80 MHz BW : 5290 MHz
	U-NII 2c	20 MHz BW : 5500 MHz – 5720 MHz 40 MHz BW : 5510 MHz – 5710 MHz 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 OFDM-A : 802.11ax	
Antenna Specification [2)]	Integrated Antenna 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.

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.

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).

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.

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.”

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

6. MEASUREMENT UNCERTAINTY

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

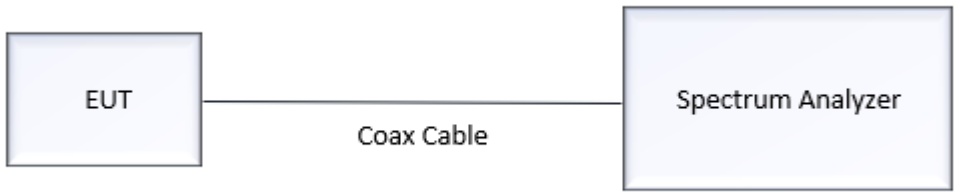
All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine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

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.

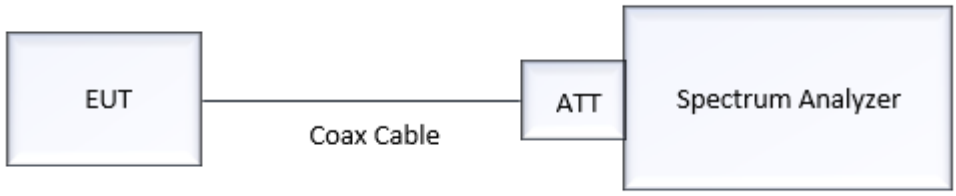
1) RBW = 8 MHz (the largest available value)
2) VBW = 8 MHz (≥ RBW)
3) SPAN = 0 Hz
4) Detector = Peak
5) Number of points in sweep > 100
6) Trace mode = Clear write
7) Measure T_{total} and T_{on}
8) Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10*log(1/Duty Cycle)

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.

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)

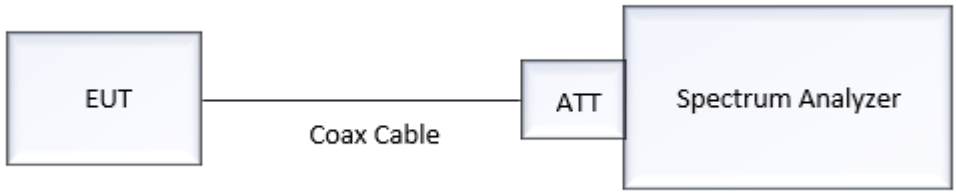
1) RBW = 1% ~ 5% of the occupied bandwidth
2) VBW ≥ 3 x RBW
3) Detector = Peak
4) Trace mode = max hold
5) Sweep = auto couple
6) Allow the trace to stabilize

7.3. Output Power

Limit

Band		FCC Limit		IC Limit
U-NII 1	☐	Master (Outdoor)	≤ 1 W (= 30dBm) ≤ 125 mW (= 21dBm) EIRP at max elevation angle (30°) from horizon	Indoor only for LE LAN devices ≤ 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 ≤ 1W EIRP or ≤ 17 dBm + 10 log B EIRP 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

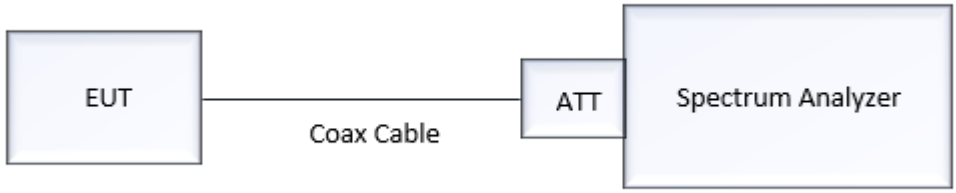
▪ Conducted Output Power (Peak) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB)
▪ Conducted Output Power (Average) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

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

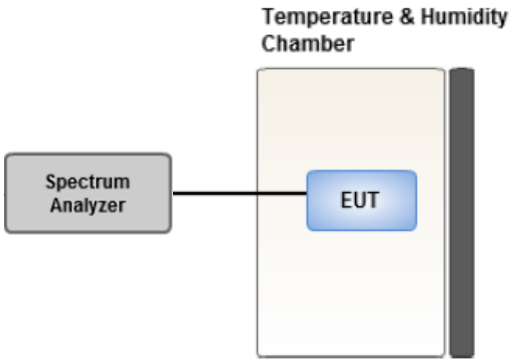
Total PSD(dBm) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

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.

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** 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** 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** 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** 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.

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

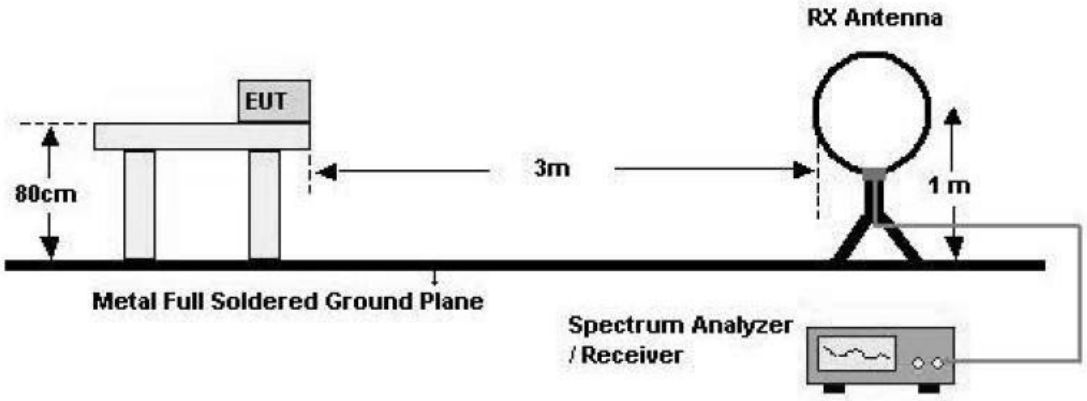
Restricted Bands of Operation

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

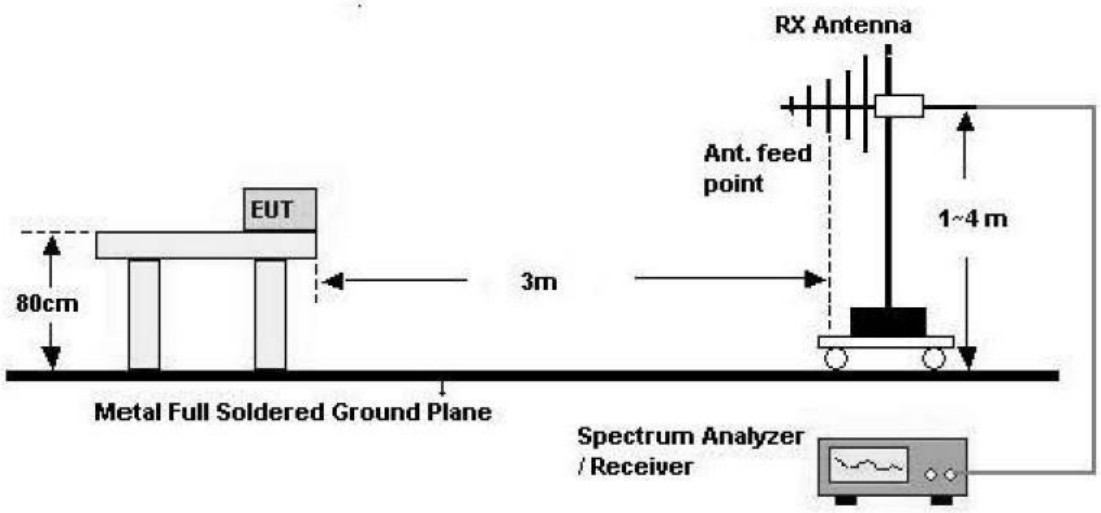
ISED : RSS-GEN Section 8.10				
Frequency (MHz)	**Frequency (MHz)**	**Frequency (MHz)**	**Frequency (MHz)**	**Frequency (MHz)**
0.090 - 0.110	8.37625 - 8.38675	108 – 138	1660 - 1710	8025 – 8500
0.495 - 0.505	8.41425 - 8.41475	149.9 - 150.05	1718.8 - 1722.2	9000 - 9200
2.1735 - 2.1905	12.29 - 12.293	156.52475 - 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

Test Configuration

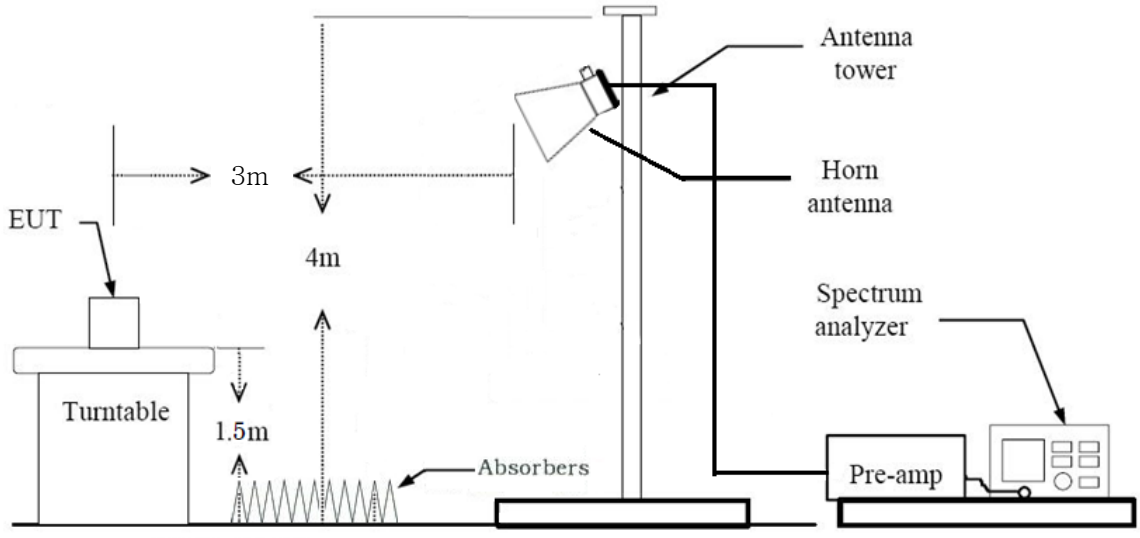
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions (Below 30 MHz)

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.

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)

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)

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)

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

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.

8. SUMMARY OF TEST RESULTS

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

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 RSS-247, 6.2.3.1 a	≤ 250 mW or ≤ 11 dBm + 10 log B Whichever is less (B : 99% BW in MHz)		PASS
Maximum e.i.r.p.	RSS-247, 6.2.2.1 b RSS-247, 6.2.3.1 b	≤ 1W e.i.r.p. or ≤ 17 dBm + 10 log B e.i.r.p. Whichever is less (B : 99% BW in MHz)		PASS
Power Spectral Density	RSS-247, 6.2.2.1 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 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

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

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.

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

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

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

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

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

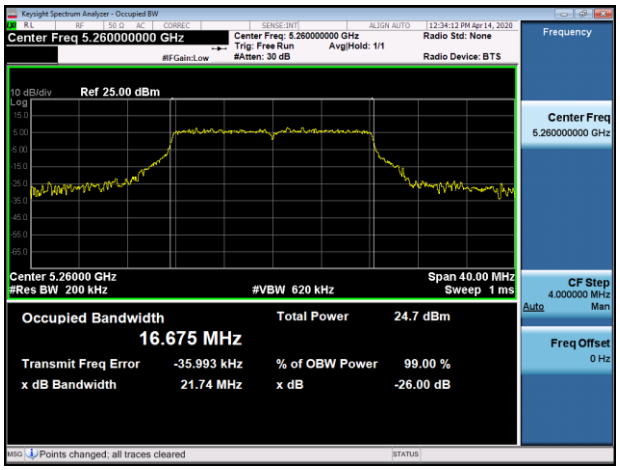
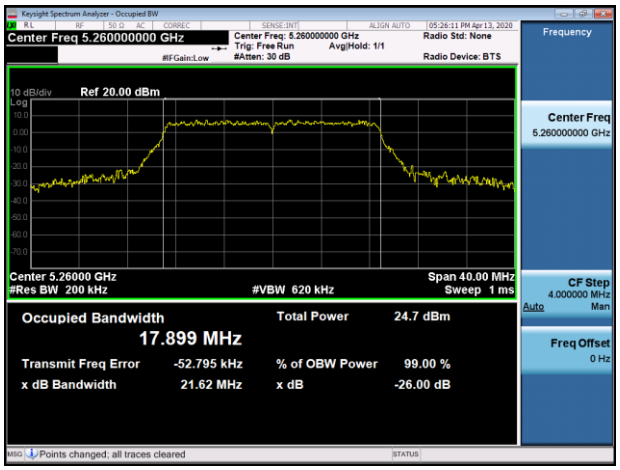
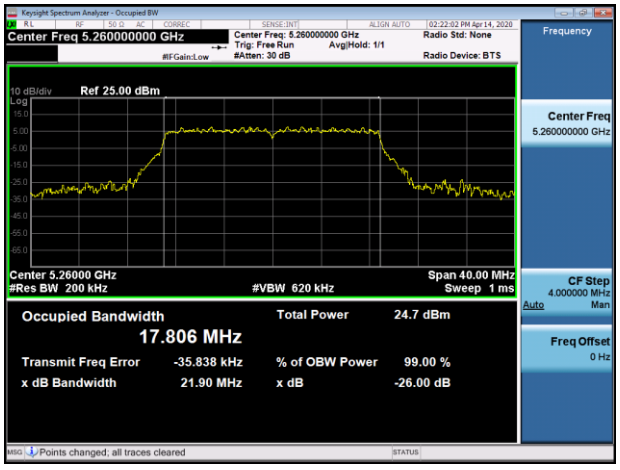
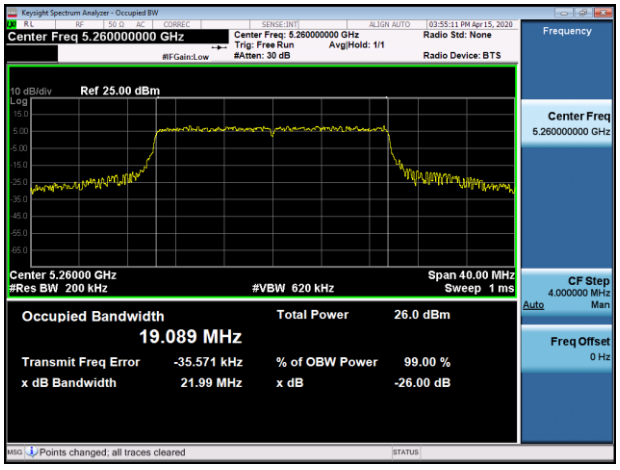
UNII 2C Band			99% Bandwidth [MHz]		26 dB Bandwidth [MHz]	
Mode	Frequency [MHz]	Channel No.	ANT1	ANT2	ANT1	ANT2
802.11n HT40	5510	102	36.62	36.47	**40.00**	39.35
	5550	110	36.68	36.56	39.92	39.50
	5670	134	**36.76**	36.50	39.69	39.53
802.11ac VHT40	5510	102	36.49	36.46	39.80	39.59
	5550	110	36.65	36.57	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

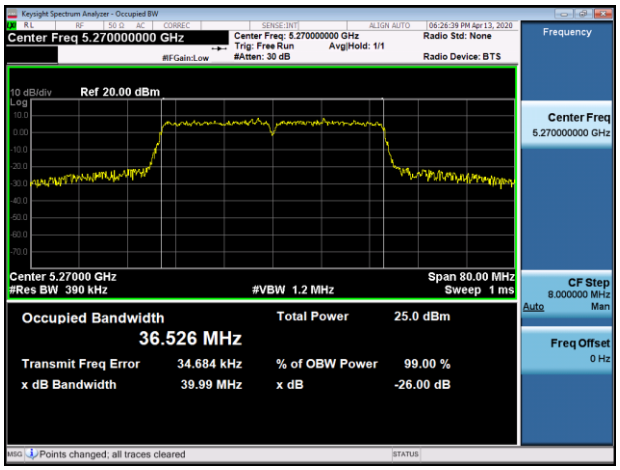
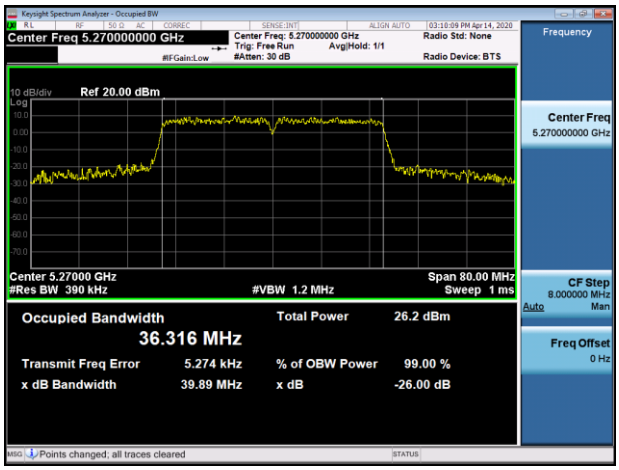
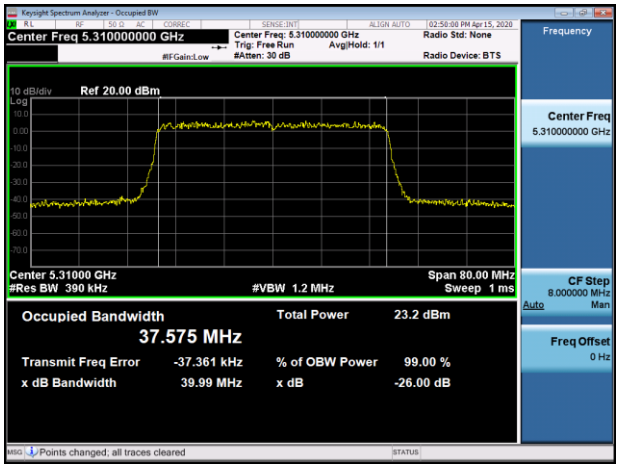
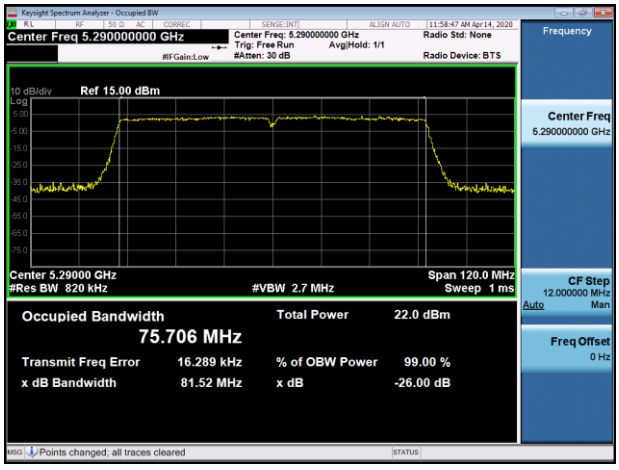
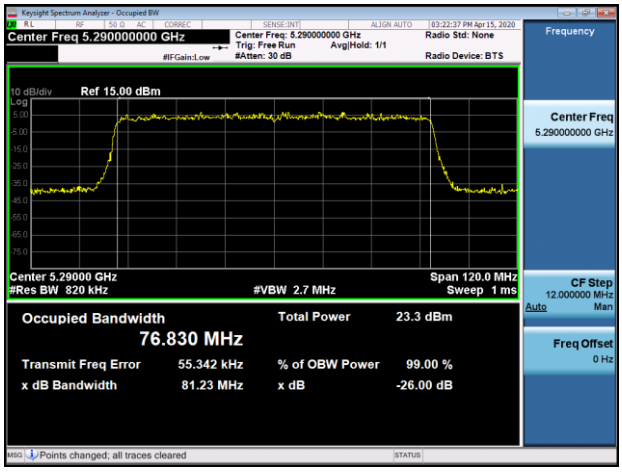
Note :

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

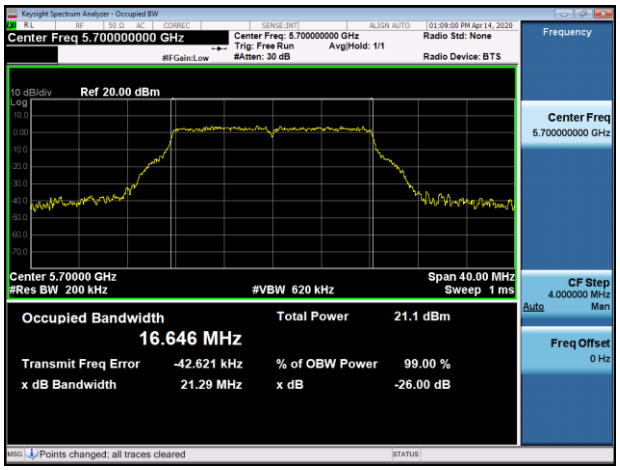
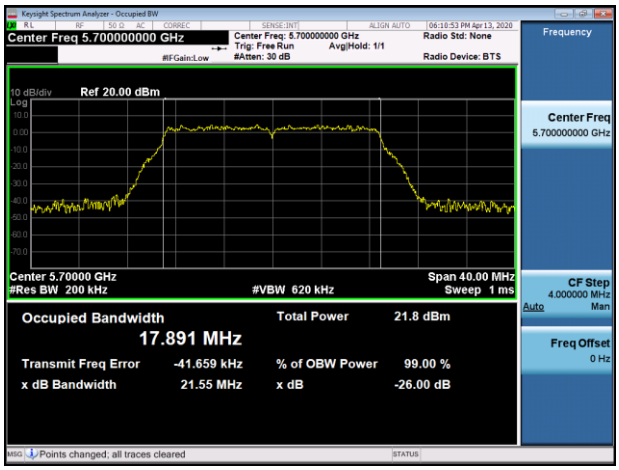
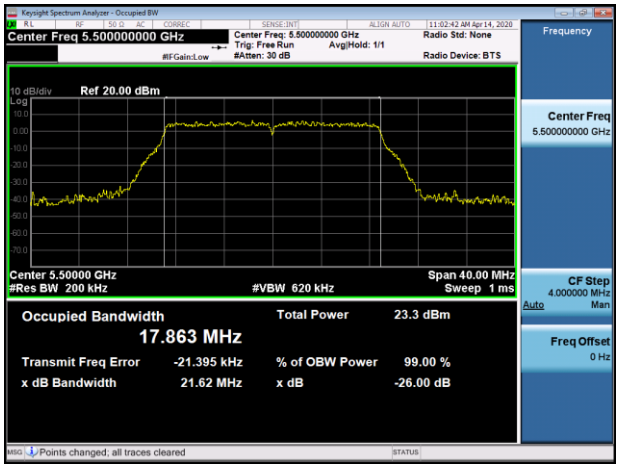
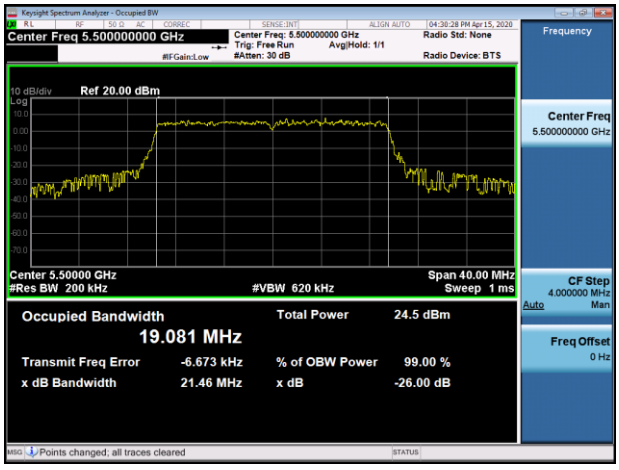
▣ TEST PLOT : 26 dB Bandwidth (U-NII 2A Band)

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**
	

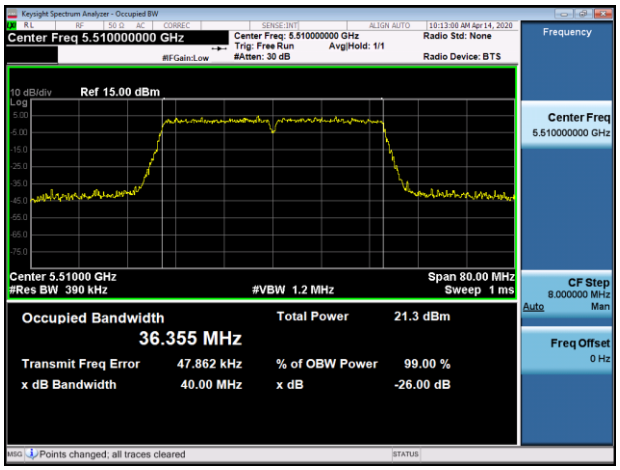
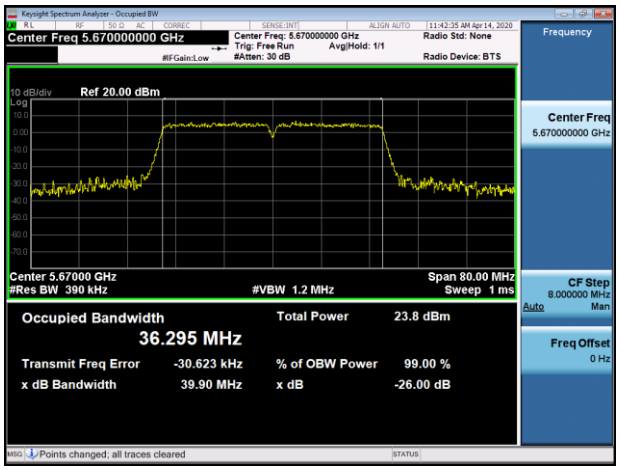
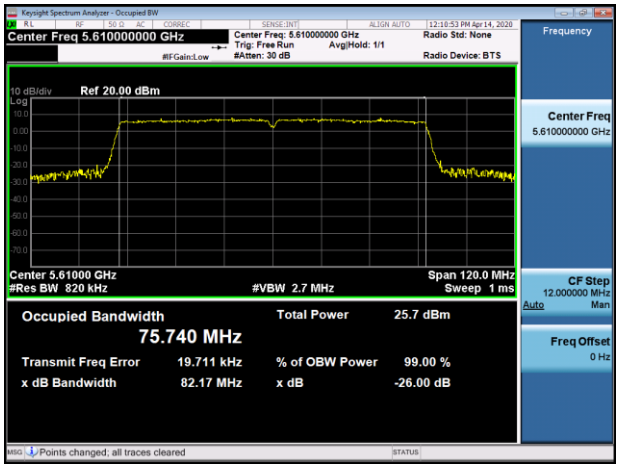
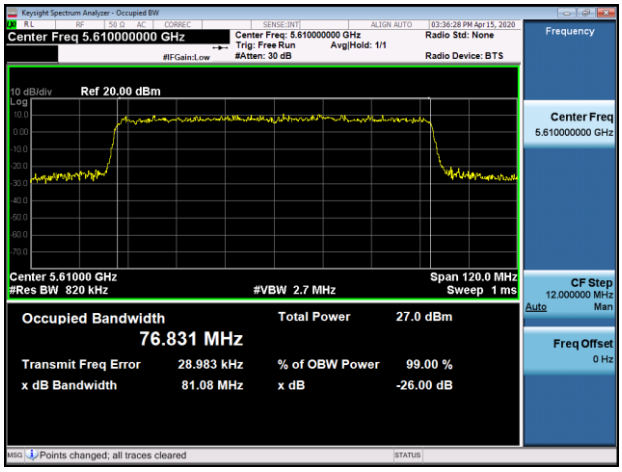
▣ TEST PLOT : 26 dB Bandwidth (U-NII 2A Band)

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	
	

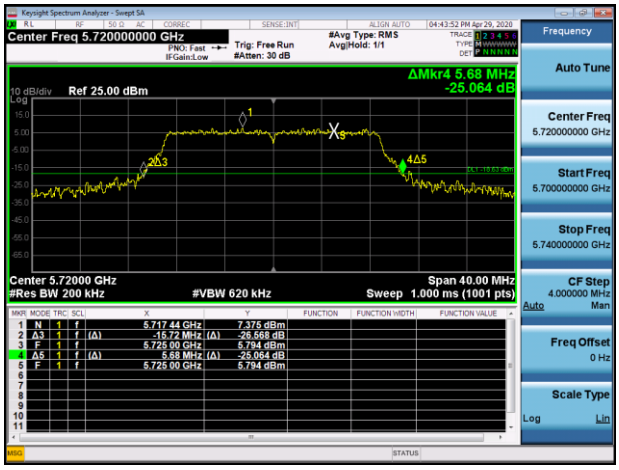
▣ TEST PLOT : 26 dB Bandwidth (U-NII 2C Band)

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**
	

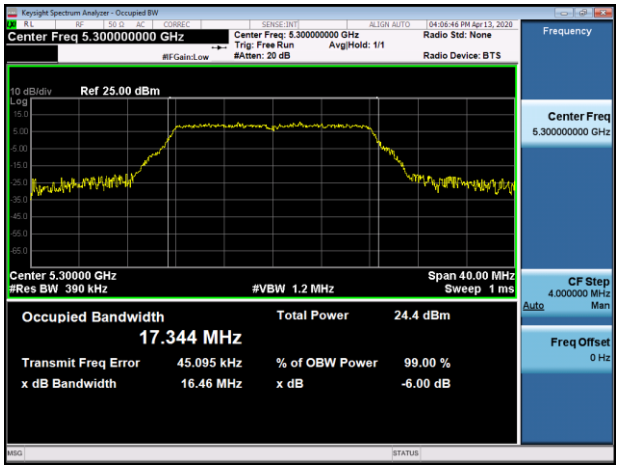
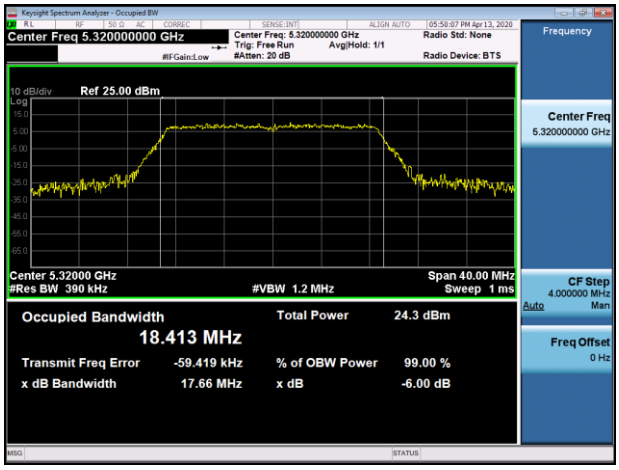
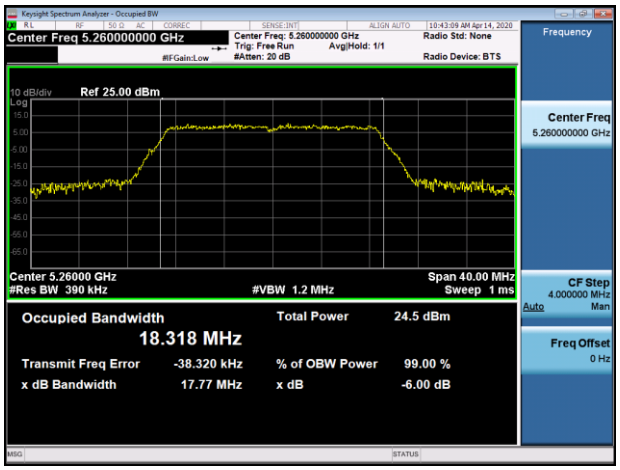
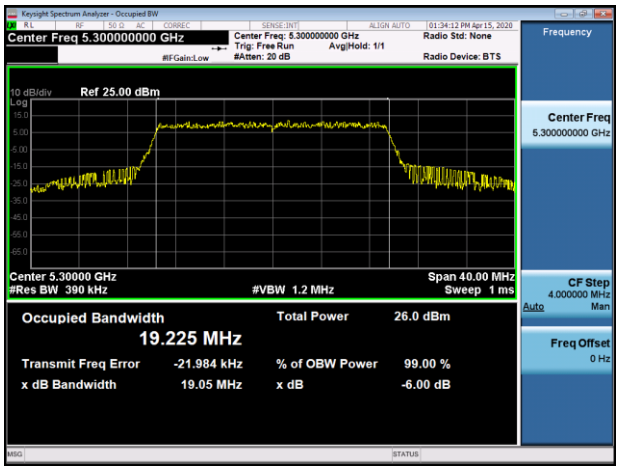
▣ TEST PLOT : 26 dB Bandwidth (U-NII 2C Band)

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	
	

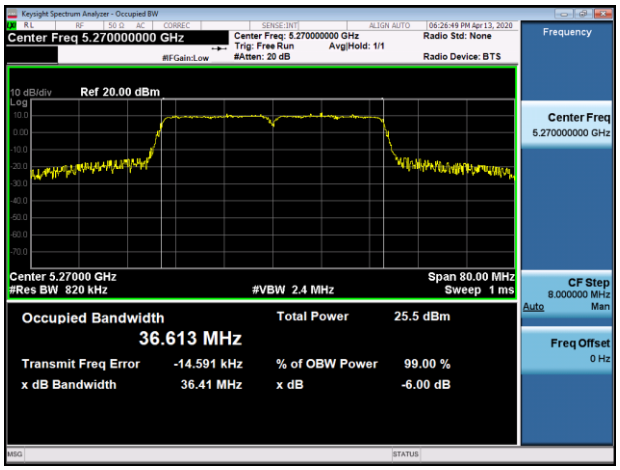
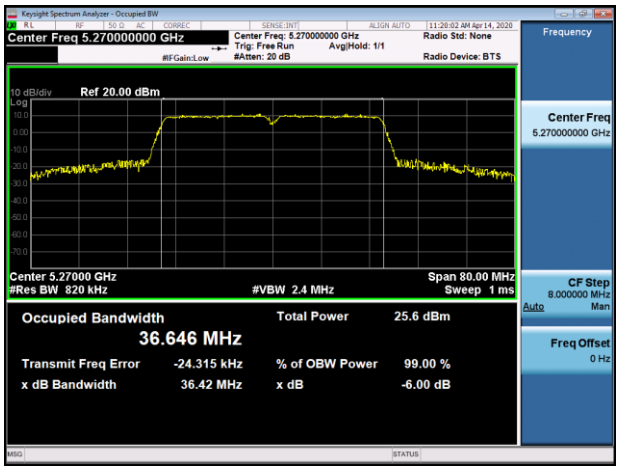
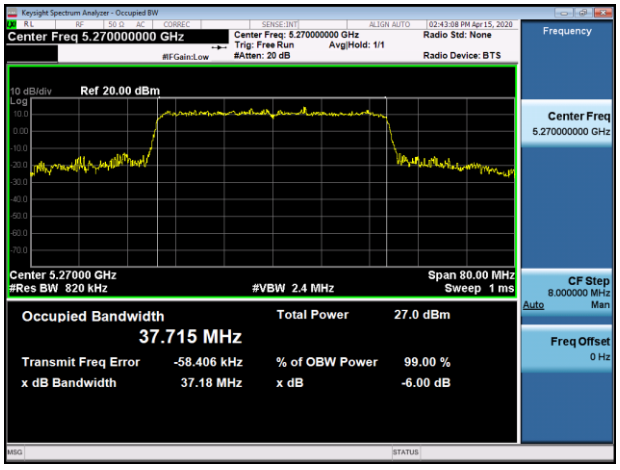
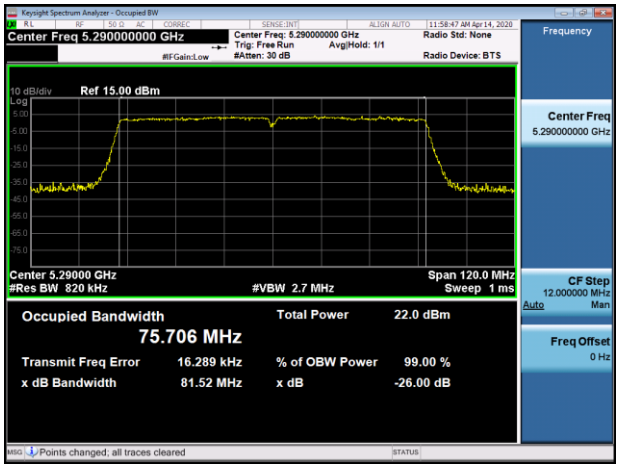
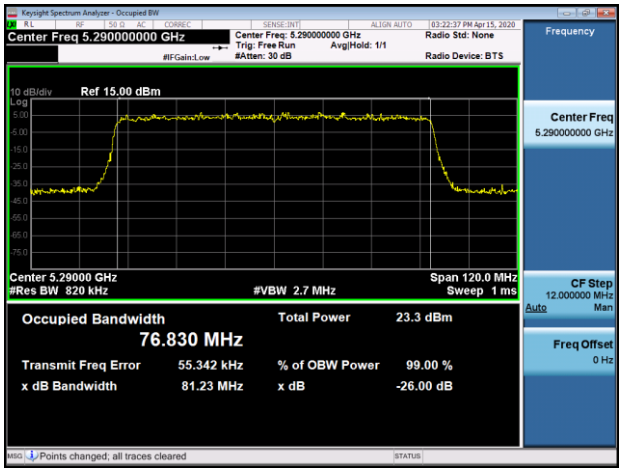
Emission Bandwidth (EBW) within a Band for Band-Crossing Signals

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)**
	

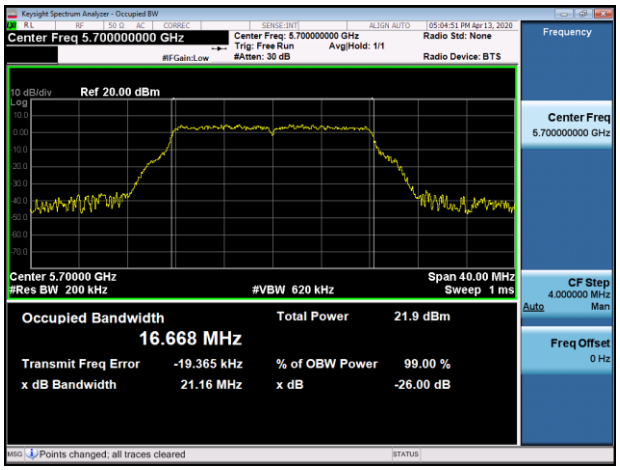
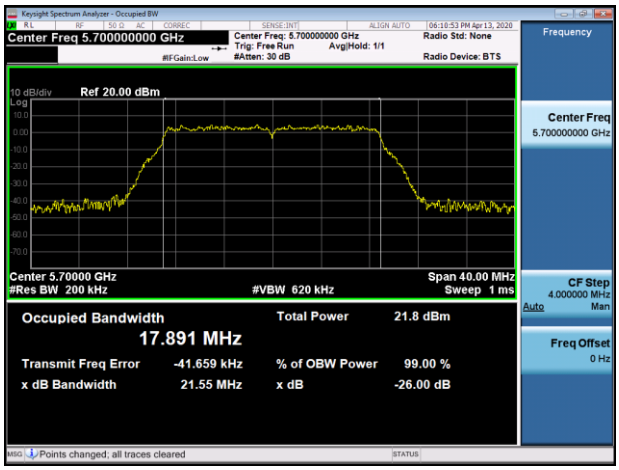
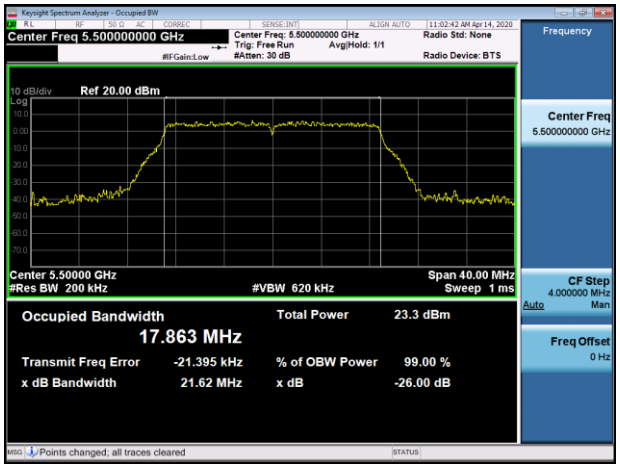
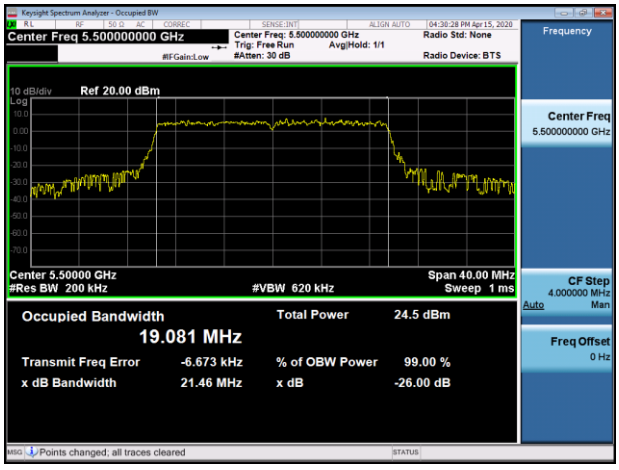
▣ TEST PLOT : 99% Bandwidth (U-NII 2A Band)

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**
	

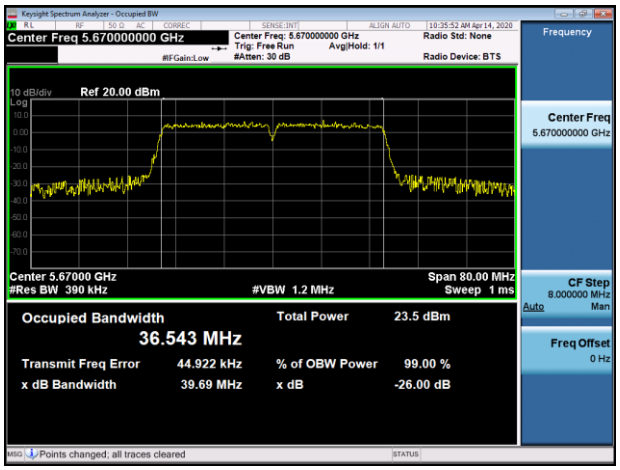
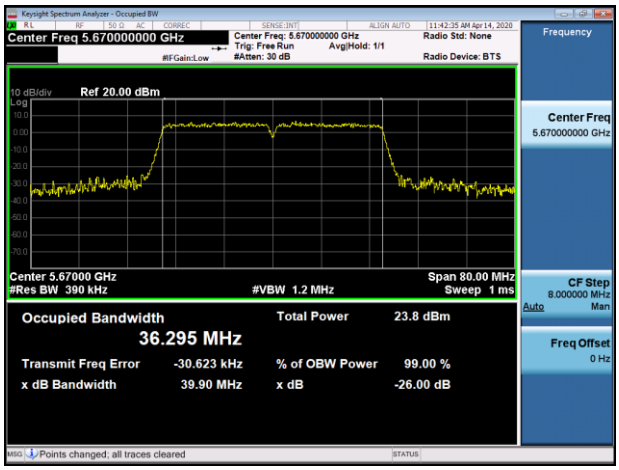
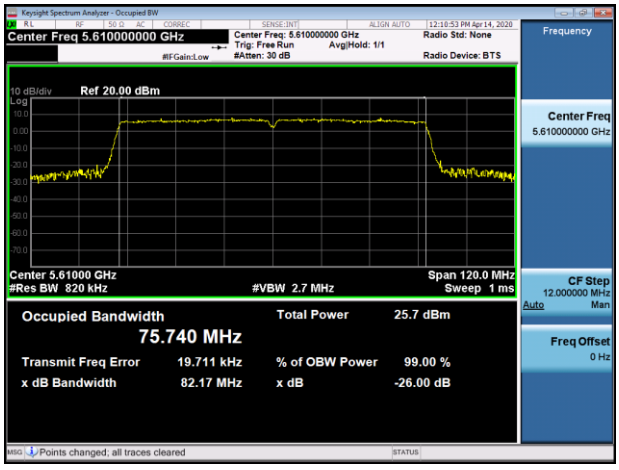
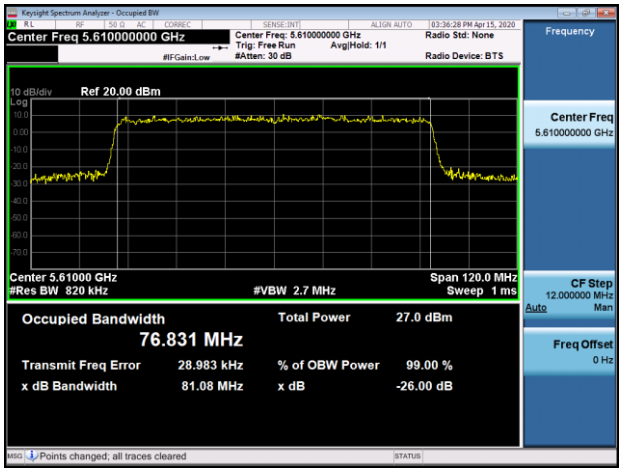
▣ TEST PLOT : 99% Bandwidth (U-NII 2A Band)

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	
	

▣ 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**
	

▣ 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	
	

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

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

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

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

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

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

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

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

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

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

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.

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

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

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

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

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