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FCC UNII REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
July 15, 2020

Test Site/Location:
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2007-FC011

FCC ID:	**A3LSMT878U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**
Model:	SM-T878U
EUT Type:	Tablet
Modulation type	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(NII)
FCC Rule Part(s):	Part 15.407

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

REVIEWED BY

Report prepared by : Jeong Ho Kim
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2007-FC011	July 15, 2020	- First Approval Report

Table of Contents

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	SM-T878U	
Additional Model	-	
EUT Type	Tablet	
Power Supply	DC 3.85 V	
Battery Information	Model: EB-BT875ABY Type: Li-ion Battery	
Travel Adapter Information	Model : EP-TA200 Manufacture: RFTech	
Data Cable Information	Model : EP-DT725BBE Manufacture: KSDCO	
Ear-jack Information	Model : GHSS028-K8 Manufacture: BUJEON	
S-PEN Information	Model : EJ-PT870 Manufacture: WACOM	
Keyboard Information	Model : EF-DT870 Manufacture: SAMSUNG	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20MHz BW : 5180 - 5240 40MHz BW : 5190 - 5230 80MHz BW : 5210
	U-NII-2A	20MHz BW : 5260 - 5320 40MHz BW : 5270 - 5310 80MHz BW : 5290
	U-NII-2C	20MHz BW : 5500 - 5720 40MHz BW : 5510 - 5710 80MHz BW : 5530 – 5690
	U-NII-3	20MHz BW : 5745 - 5825 40MHz BW : 5755 - 5795 80MHz BW : 5775
Antenna Specification	Antenna type: Metal Peak Gain : Ant.1: UNII 1: 0.80 dBi / UNII 2A: -0.30 dBi UNII 2C: -3.10 dBi / UNII 3: -2.10 dBi Ant.2: UNII 1: -5.60 dBi / UNII 2A: -5.30 dBi UNII 2C: -5.90 dBi / UNII 3: -5.50 dBi	
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	May 28, 2020 ~ July 01, 2020	

ANTENNA CONFIGURATIONS

1. The device employs MIMO technology. Below are the possible configurations

Configurations	SISO		SDM	CDD
	Ant.1	Ant.2	Ant.1 + Ant.2	Ant.1 + Ant.2
802.11a	O	O	X	O
802.11n	O	O	O	O
802.11ac	O	O	O	O

Note:

(1) O = Support, X = Not Support

(2) SISO = Single Input Single Output

(3) SDM = Spatial Diversity Multiplexing

(4) CDD = Cyclic Delay Diversity

2. This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 2.4GHz and 5GHz bands simultaneously on each antenna.

	2.4GHz WIFI		5GHz WIFI		Test case
	Ant.1	Ant.2	Ant.1	Ant.2	
2.4 GHz + 5 GHz RSDB Only	B			C	O
		B	C		O
	B		C		-
		B		C	-
2.4 GHz + 5 GHz RSDB & MIMO	B	B	C		-
	B	B		C	-
	B		C	C	-
		B	C	C	-
2.4 GHz + 5 GHz RSDB MIMO	B	B	B	B	O

Not RSDB	2.4G/5GHz WIFI		2.4GHz Bluetooth		Test case
	Ant1	Ant2	Ant1	Ant2	
Bluetooth + 5 GHz	C	B/C	A		-
	C	C	A		-
	C	C		A	O

3. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) f) (ii)

Directional gain =

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

Band	Ant Gain (dBi)		N_{ANT}/ N_{ss}	Directional Gain (dBi)
UNII 1	ANT.1	0.8	2 / 2	1.19
	ANT.2	-5.6		
UNII 2A	ANT.1	-0.3	2 / 2	0.57
	ANT.2	-5.3		
UNII 2C	ANT.1	-3.1	2 / 2	-1.38
	ANT.2	-5.9		
UNII 3	ANT.1	-2.1	2 / 2	-0.62
	ANT.2	-5.5		

2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Band	Mode	SISO				MIMO	
		Ant.1 Power		Ant.2 Power		Ant.1 + Ant.2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	16.62	0.046	17.74	0.059	20.23	0.105
	802.11n (HT20)	15.70	0.037	16.79	0.048	19.28	0.085
	802.11n (HT40)	15.15	0.033	16.19	0.042	18.67	0.074
	802.11ac (VHT20)	15.70	0.037	16.79	0.048	19.29	0.085
	802.11ac (VHT40)	13.92	0.025	14.53	0.028	17.25	0.053
	802.11ac (VHT80)	12.51	0.018	13.30	0.021	15.94	0.039
UNII2A	802.11a	16.66	0.046	17.57	0.057	20.15	0.103
	802.11n (HT20)	15.79	0.038	16.62	0.046	19.23	0.084
	802.11n (HT40)	15.13	0.033	16.04	0.040	18.62	0.073
	802.11ac (VHT20)	15.71	0.037	16.62	0.046	19.20	0.083
	802.11ac (VHT40)	13.99	0.025	14.43	0.028	17.23	0.053
	802.11ac (VHT80)	12.52	0.018	13.31	0.021	15.95	0.039
UNII2C	802.11a	16.76	0.047	17.48	0.056	20.06	0.101
	802.11n (HT20)	15.80	0.038	16.52	0.045	19.15	0.082
	802.11n (HT40)	15.81	0.038	16.14	0.041	18.77	0.075
	802.11ac (VHT20)	15.87	0.039	16.48	0.044	19.15	0.082
	802.11ac (VHT40)	13.71	0.024	14.52	0.028	17.15	0.052
	802.11ac (VHT80)	12.48	0.018	13.18	0.021	15.86	0.039
UNII3	802.11a	17.36	0.055	16.87	0.049	19.99	0.100
	802.11n (HT20)	16.24	0.042	15.95	0.039	19.00	0.079
	802.11n (HT40)	15.44	0.035	16.36	0.043	18.82	0.076
	802.11ac (VHT20)	16.14	0.041	15.91	0.039	18.99	0.079
	802.11ac (VHT40)	14.37	0.027	14.62	0.029	17.10	0.051
	802.11ac (VHT80)	12.91	0.020	12.39	0.017	15.67	0.037

3. TEST 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.

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 used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

4. 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).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.
Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

5.2 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."

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203, §15.407:

"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 antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of §15.203, §15.407

7. 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.

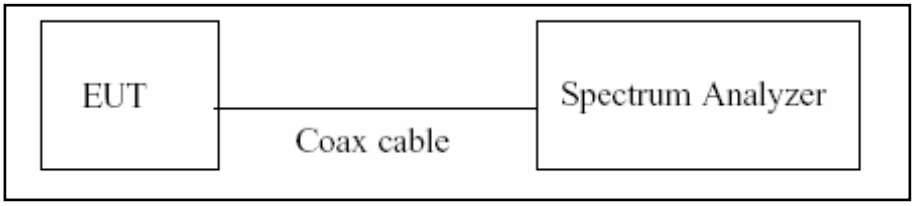
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

8. DESCRIPTION OF TESTS

8.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure B.2 in KDB 789033 D02 v02r01.

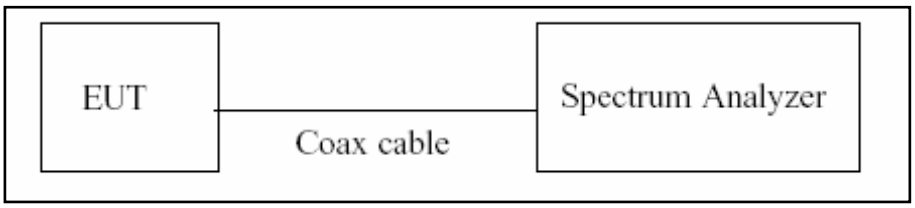
1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

8.2. 6dB Bandwidth & 26dB 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.

We tested according to 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.

We tested according to Procedure C.2 in KDB 789033 D02 v02r01.

1. RBW = 100 kHz
2. VBW ≥ 3 x 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. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.
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. The 26 dB bandwidth is used to determine the conducted power limits.

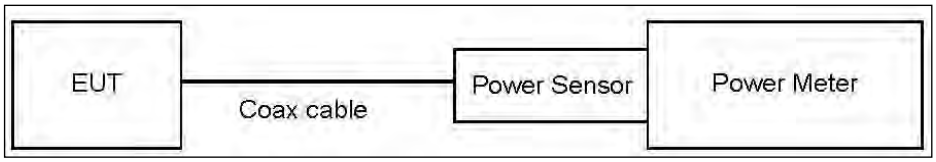
8.3. Output Power Measurement

Limit

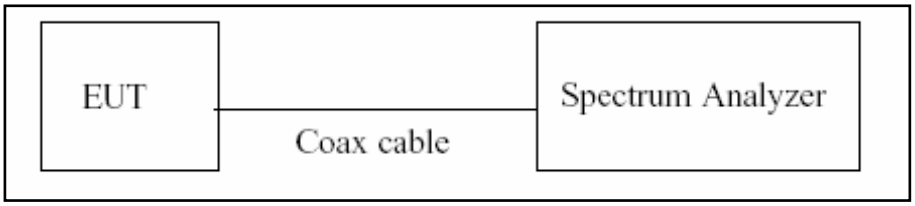
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

We tested according to Procedure E.3.a in KDB 789033 D02 v02r01.

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Test Procedure(Spectrum Analyzer)

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 x 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
11. 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

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

Note

1. Spectrum reading values are not plot data.
   The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(10 dB) + Cable loss + EUT Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	11.36
UNII 2A	11.36
UNII 2C	11.36
UNII 3	11.36

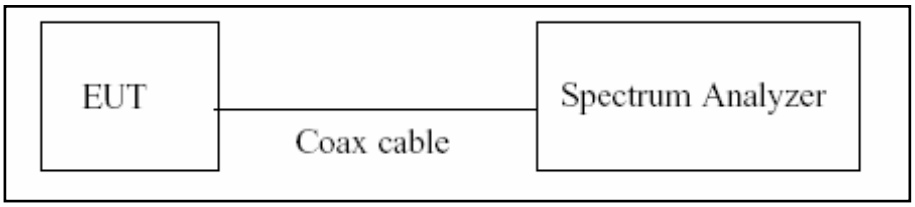
(Actual value of loss for the attenuator and cable combination)

8.4. Power Spectral Density

Limit

Band	Limit
UNII 1	11 dBm/MHz
UNII 2A, 2C	11 dBm/MHz
UNII 3	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 x 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)

Note

1. Spectrum reading values are not plot data.
   The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(10 dB) + Cable loss + EUT Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	11.36
UNII 2A	11.36
UNII 2C	11.36
UNII 3	11.36

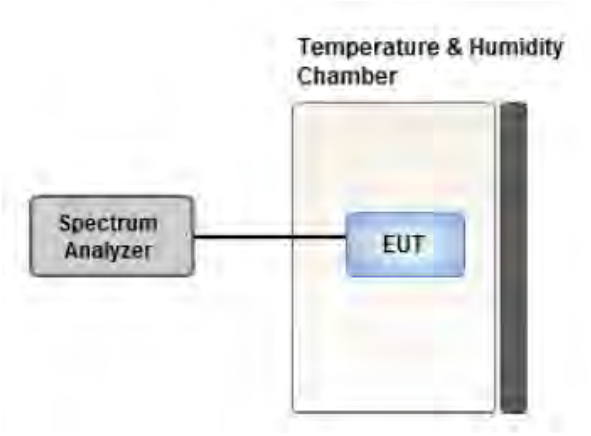
(Actual value of loss for the attenuator and cable combination)

8.5. Frequency Stability

Limit

Maintained within the band

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 battety 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.

8.6. AC Power line Conducted Emissions

Limit

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[a]	56 to 46[a]
0.50 to 5	56	46
5 to 30	60	50

[a]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

8.7. Radiated Test

Limit

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz.

2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

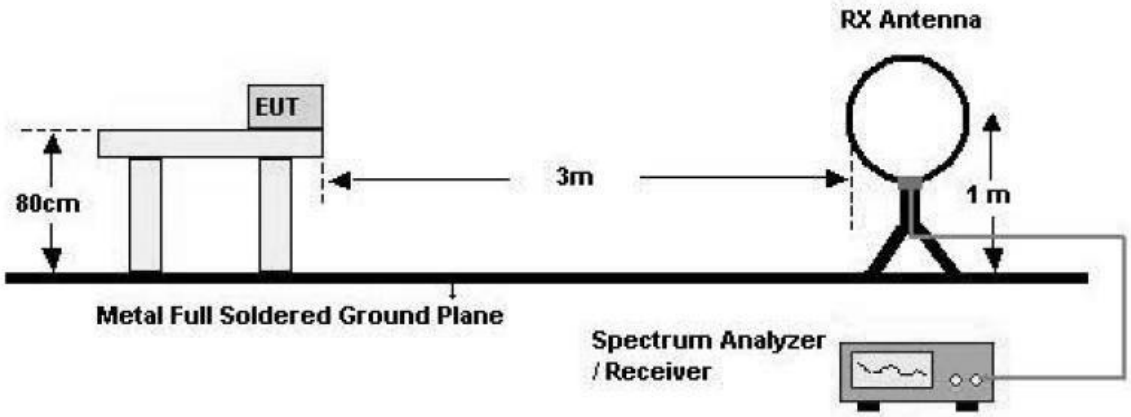
3. UNII 3: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below 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.

4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

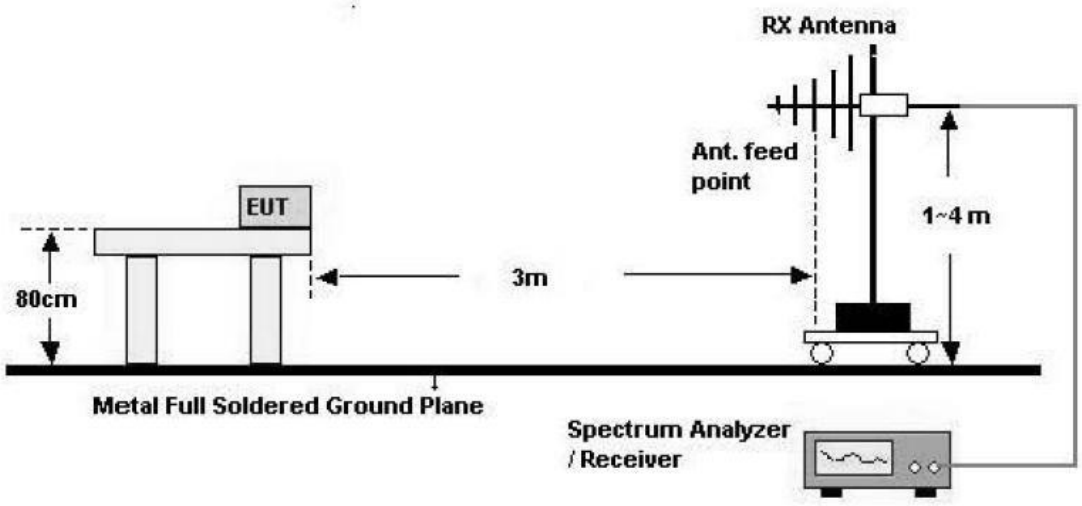
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

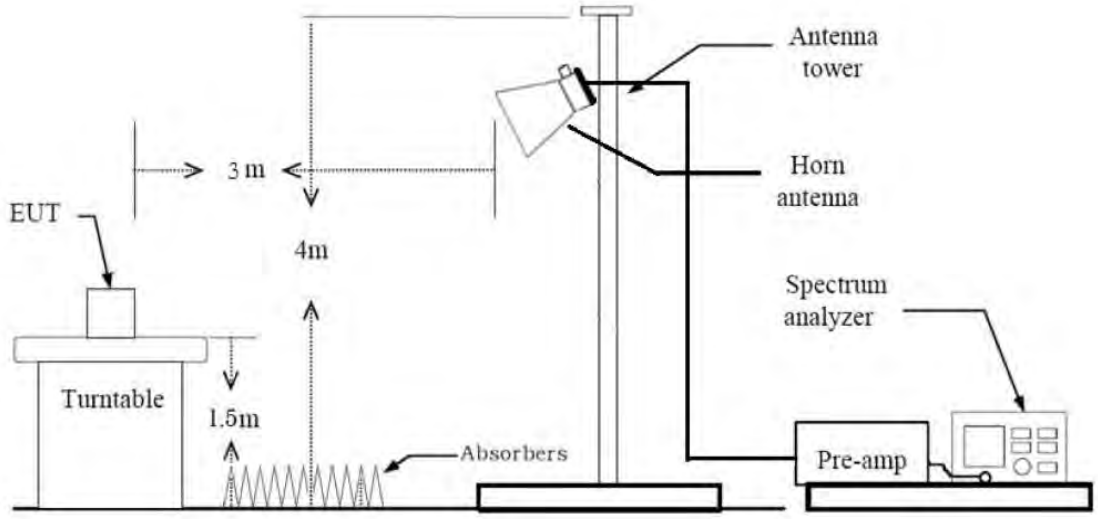
Below 30 MHz



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 and Parallel to the ground plane 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) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making
measurements in the near field.
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
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. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz

   ※ In general, (1) is used mainly
7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

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 minimym 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 (ie: 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
11. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
12. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

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 minimym number of traces by a factor of 1/x, where x is the duty cycle.

9. Measured Frequency Range :
   - 4 500 MHz ~ 5 150 MHz
   - 5 350 MHz ~ 5 460 MHz
   - 5 460 MHz ~ 5 470 MHz
   - (75 MHz or more below the 5 725 MHz) ~ 5 725 MHz
   - 5 850 MHz ~ (75 MHz or more above the 5 850 MHz)
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Attenuator + Distance Factor(D.F)

The actual setting value of VBW

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6	0.992	0.035	1000
802.11n(HT20)	MCS 0	0.997	0.015	1000
802.11n(HT40)	MCS 0	0.997	0.012	1000
802.11ac(VHT20)	MCS 0	0.997	0.015	1000
802.11ac(VHT40)	MCS 0	0.997	0.012	1000
802.11ac(VHT80)	MCS 0	0.997	0.014	1000

8.8. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
   - Worstcase : Stand alone
2. EUT Axis
   - Radiated Spurious Emissions : X,Z
   - Radiated Restricted Band Edge : Z
3. All datarate of operation were investigated and the worst case datarate results are reported
   - Mode : Ant.1(SISO), Ant.2(SISO), Ant.1+Ant.2(SDM), Ant.1+Ant.2(CDD)
   - Worstcase : Ant.1+Ant.2(CDD)
4. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
   - Position : Horizontal, Vertical, Parallel to the ground plane
5. Radiated Spurious Emission

   : : All band of operation were investigated and the worst case band results are reported.
   - Worstcase band : UNII 3

Radiated test(DBS)

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
   - Worstcase : Stand alone
2. Please refer to the SM-T878U [UNII] 802.11ax Test Report.

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone + External accessories(Earphone, etc)+Travel Adapter,
     Stand alone + Travel Adapter
   - Worstcase : Stand alone + Travel Adapter

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported

9. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	N/A	Conducted	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§15.407(a)(1)	< 250 mW(5150-5250 MHz) < 250 mW or 11+10log$_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10log$_{10}$ (BW) dBm (5470-5725 MHz) <1 W(5725-5850 MHz)		PASS
Peak Power Spectral Density	§15.407(a)(1),(5)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS
Frequency Stability	§15.407(g) §2.1055	Maintained within the band		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207	<FCC 15.207 limits		PASS
Undesirable Emissions	§15.407(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.7 (UNII 3)	Radiated	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(5), (6)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

10. TEST RESULT

10.1 DUTY CYCLE

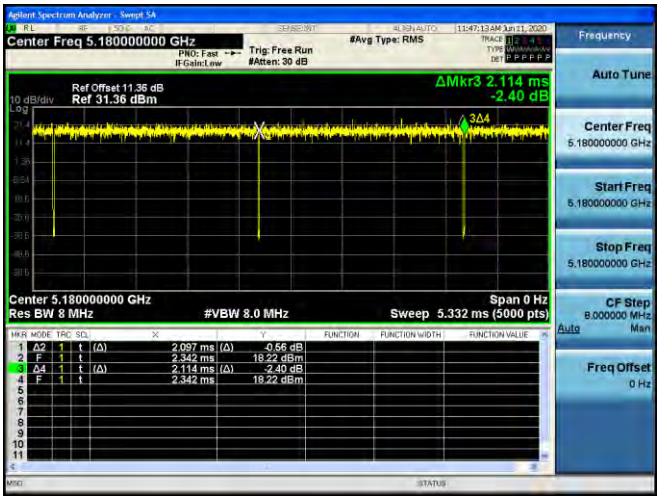
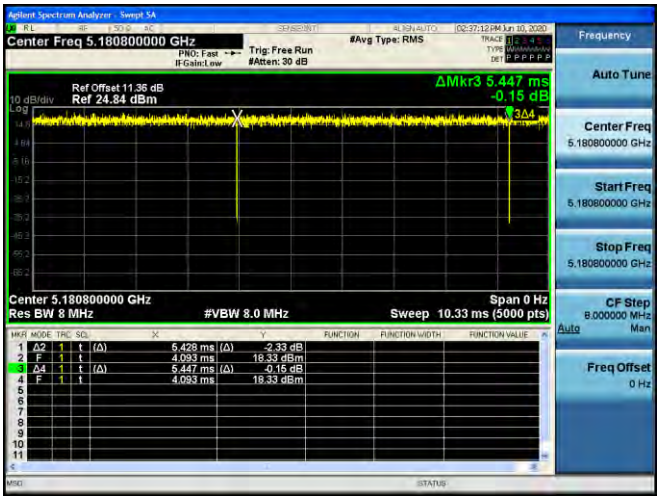
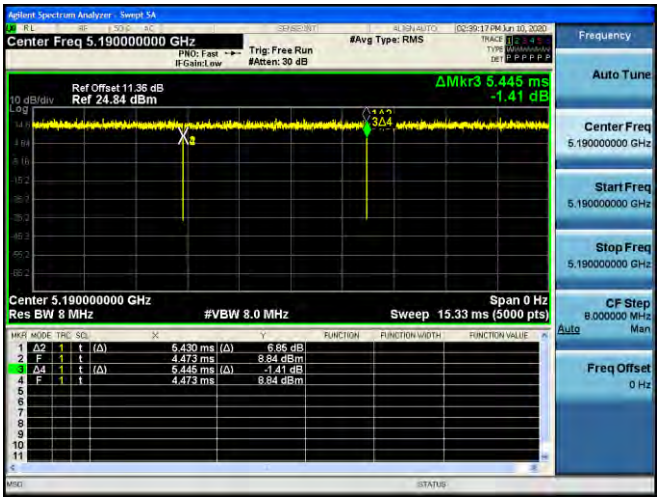
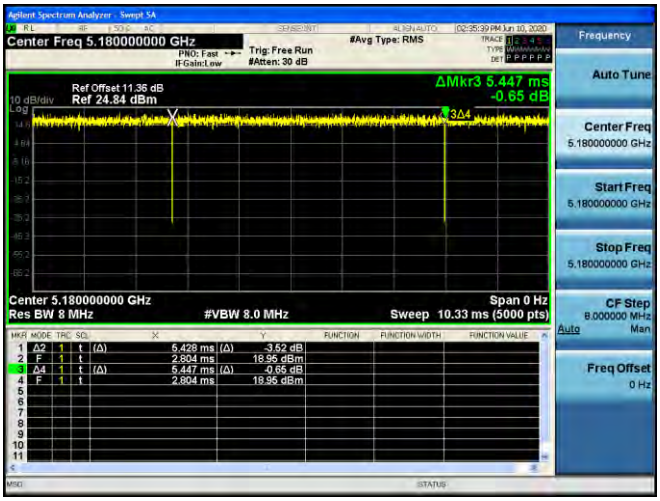
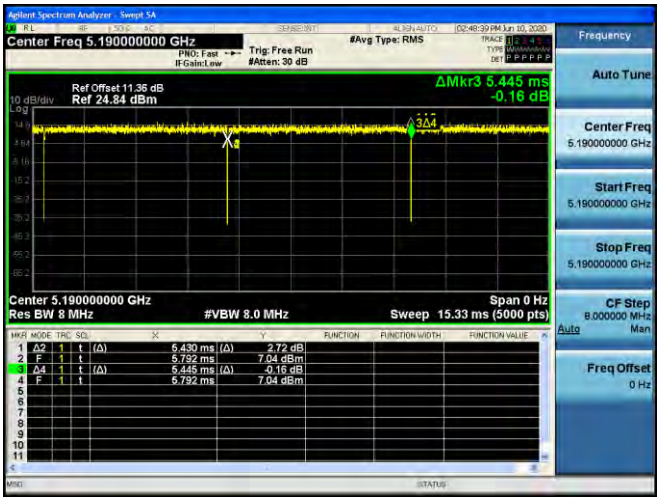
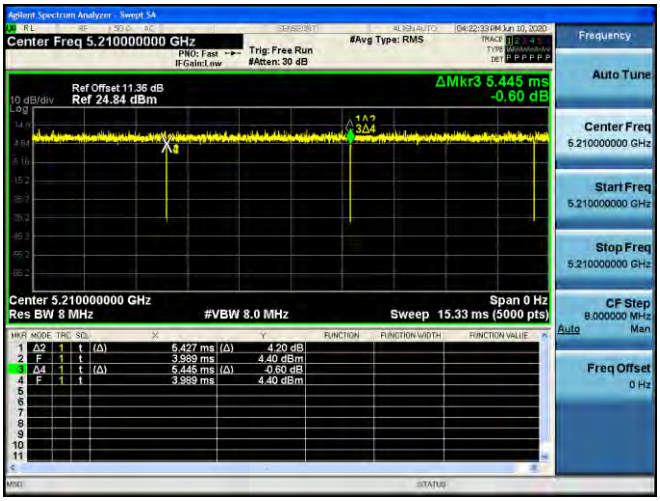
Mode	Data Rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	2.097	2.114	0.992	0.035
	9	1.405	1.422	0.988	0.052
	12	1.060	1.078	0.983	0.073
	18	0.712	0.730	0.976	0.104
	24	0.540	0.557	0.969	0.136
	36	0.368	0.386	0.955	0.201
	48	0.280	0.297	0.941	0.262
	54	0.252	0.269	0.935	0.290

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	5.428	5.447	0.997	0.015
	1	5.428	5.444	0.997	0.013
	2	5.428	5.445	0.997	0.014
	3	5.428	5.447	0.997	0.015
	4	5.428	5.447	0.997	0.015
	5	5.430	5.447	0.997	0.014
	6	5.428	5.447	0.997	0.015
	7	5.426	5.443	0.997	0.014
802.11n (HT40)	0	5.430	5.445	0.997	0.012
	1	5.427	5.445	0.997	0.014
	2	5.400	5.415	0.997	0.012
	3	5.430	5.445	0.997	0.012
	4	5.430	5.445	0.997	0.012
	5	5.427	5.445	0.997	0.014
	6	5.430	5.445	0.997	0.012
	7	5.427	5.445	0.997	0.014

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	5.428	5.447	0.997	0.015
	1	5.430	5.447	0.997	0.014
	2	5.426	5.445	0.997	0.015
	3	5.428	5.447	0.997	0.015
	4	5.428	5.447	0.997	0.015
	5	5.428	5.447	0.997	0.015
	6	5.428	5.447	0.997	0.015
	7	5.428	5.447	0.997	0.015
	8	5.428	5.447	0.997	0.015
802.11ac (VHT40)	0	5.430	5.445	0.997	0.012
	1	5.430	5.445	0.997	0.012
	2	5.430	5.445	0.997	0.012
	3	5.430	5.445	0.997	0.012
	4	5.430	5.448	0.997	0.014
	5	5.430	5.445	0.997	0.012
	6	5.430	5.445	0.997	0.012
	7	5.427	5.445	0.997	0.014
	8	5.427	5.445	0.997	0.014
	9	5.427	5.442	0.997	0.012
802.11ac (VHT80)	0	5.427	5.445	0.997	0.014
	1	5.427	5.442	0.997	0.012
	2	5.430	5.445	0.997	0.012
	3	5.427	5.445	0.997	0.014
	4	5.430	5.445	0.997	0.012
	5	5.427	5.445	0.997	0.014
	6	5.430	5.445	0.997	0.012
	7	5.427	5.445	0.997	0.014
	8	5.430	5.448	0.997	0.014
	9	5.430	5.445	0.997	0.012

Note:

In order to simplify the report, attached plots were only lowest datarate.

802.11a	802.11n(HT20)
	
802.11n(HT40)	**802.11ac(VHT20)**
	
802.11ac(VHT40)	**802.11ac(VHT80)**
	

10.2 26 dB BANDWIDTH

Straddle channel data in the table below are for reporting purposes only.

Straddle channel data were added in section 10.7.1.

[ANT.1]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.89	16.370
5200	40	19.82	16.360
5240	48	19.76	16.372
5260	52	20.27	16.387
5300	60	19.67	16.372
5320	64	19.84	16.371
5500	100	19.89	16.378
5600	120	20.11	16.383
5720	144	20.33	16.385
5745	149	19.98	16.369
5785	157	19.84	16.379
5825	165	20.03	16.386

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.68	17.562
5200	40	20.70	17.542
5240	48	20.41	17.561
5260	52	20.57	17.550
5300	60	20.25	17.559
5320	64	20.44	17.577
5500	100	20.34	17.558
5600	120	20.34	17.549
5720	144	20.25	17.557
5745	149	20.36	17.553
5785	157	20.85	17.567
5825	165	20.41	17.555

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.51	35.982
5230	46	39.43	35.965
5270	54	39.38	35.959
5310	62	39.96	36.000
5510	102	39.36	36.015
5590	118	39.38	35.962
5710	142	39.62	36.038
5755	151	39.43	35.976
5795	159	39.57	35.999

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.68	17.567
5200	40	19.82	17.552
5240	48	20.34	17.577
5260	52	20.33	17.553
5300	60	20.51	17.551
5320	64	20.58	17.541
5500	100	20.38	17.554
5600	120	20.55	17.553
5720	144	20.70	17.575
5745	149	20.45	17.556
5785	157	20.42	17.565
5825	165	20.35	17.560

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.48	36.011
5230	46	39.42	36.002
5270	54	39.47	35.982
5310	62	39.60	35.937
5510	102	39.64	35.964
5590	118	39.52	35.957
5710	142	39.32	36.005
5755	151	39.71	36.005
5795	159	39.58	35.976

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.66	75.239
5290	58	81.68	75.292
5530	106	81.88	75.324
5610	122	81.00	75.277
5690	138	82.05	75.318
5775	155	81.47	75.275

[ANT.2]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.47	16.365
5200	40	19.64	16.374
5240	48	19.58	16.374
5260	52	19.95	16.360
5300	60	19.90	16.361
5320	64	19.47	16.376
5500	100	20.23	16.371
5600	120	20.47	16.370
5720	144	20.08	16.378
5745	149	19.74	16.372
5785	157	19.77	16.373
5825	165	19.84	16.378

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.65	17.561
5200	40	20.57	17.553
5240	48	20.15	17.554
5260	52	21.03	17.575
5300	60	20.47	17.552
5320	64	20.36	17.556
5500	100	20.44	17.563
5600	120	20.69	17.590
5720	144	20.29	17.579
5745	149	20.00	17.552
5785	157	20.70	17.554
5825	165	20.59	17.571

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.46	35.976
5230	46	39.34	35.954
5270	54	39.80	35.984
5310	62	39.45	35.957
5510	102	39.74	36.003
5590	118	39.64	35.969
5710	142	39.45	35.965
5755	151	39.50	35.980
5795	159	39.42	36.010

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.53	17.544
5200	40	20.33	17.549
5240	48	20.31	17.543
5260	52	20.23	17.552
5300	60	20.46	17.548
5320	64	20.60	17.547
5500	100	20.72	17.569
5600	120	20.85	17.551
5720	144	20.43	17.554
5745	149	20.38	17.561
5785	157	20.72	17.536
5825	165	20.68	17.566

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.33	35.992
5230	46	39.60	36.001
5270	54	39.70	35.946
5310	62	39.46	35.957
5510	102	39.51	36.005
5590	118	39.35	35.989
5710	142	39.74	36.006
5755	151	39.46	35.970
5795	159	39.54	36.003

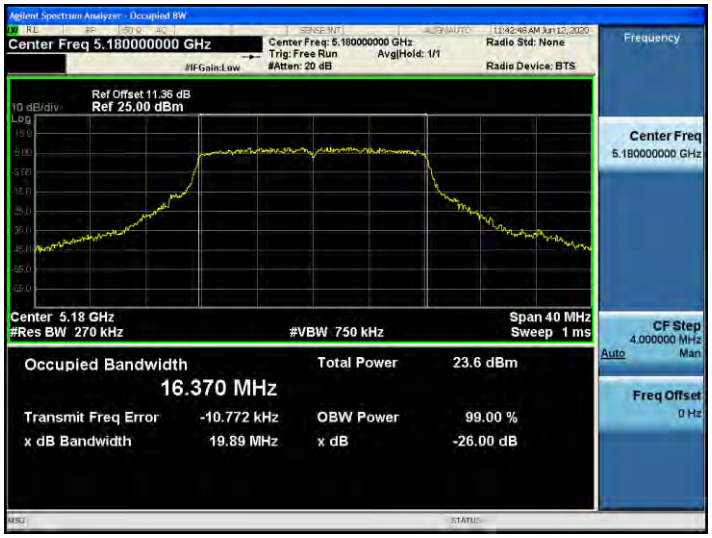
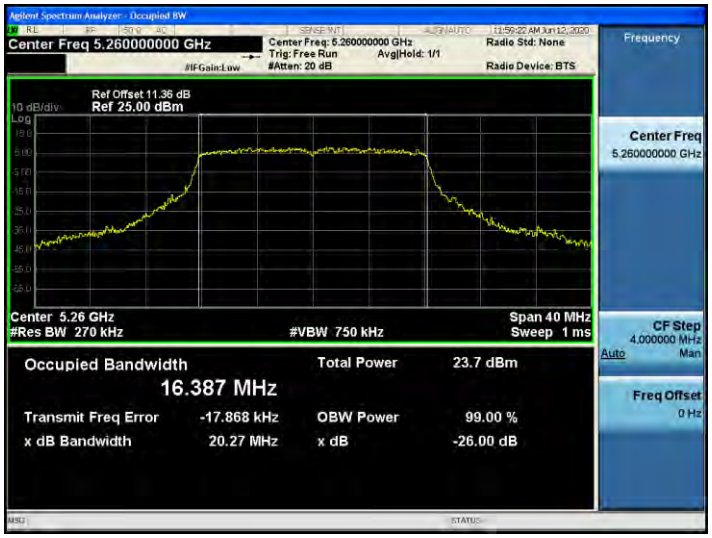
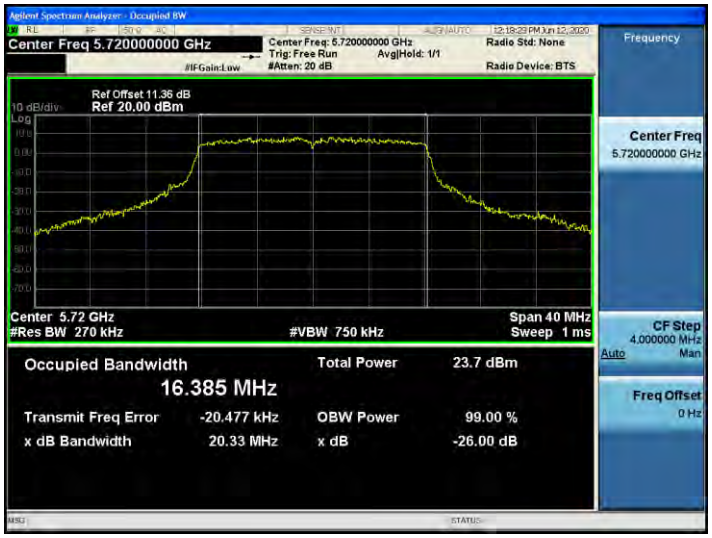
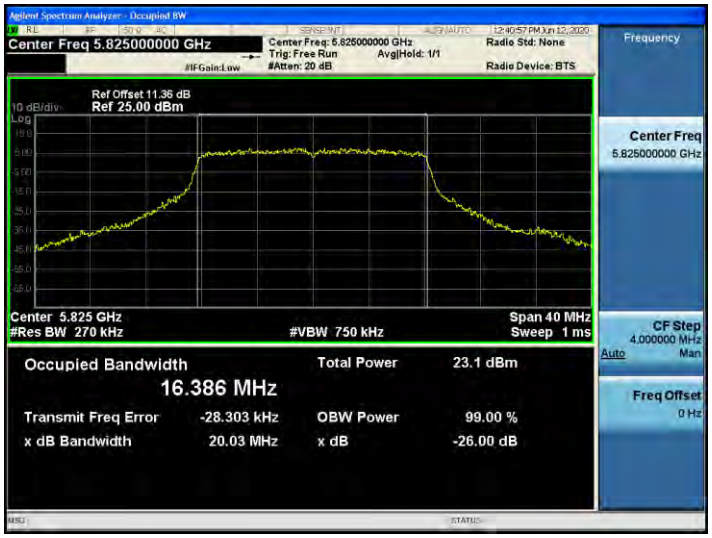
802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.33	75.245
5290	58	81.31	75.250
5530	106	81.81	75.316
5610	122	81.79	75.279
5690	138	81.91	75.350
5775	155	81.71	75.237

[ANT.1]

▣ Test Plots(802.11a)

Note:

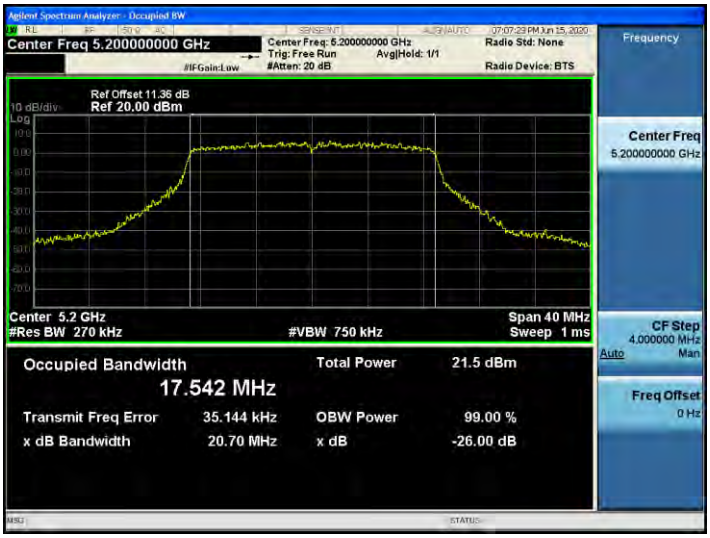
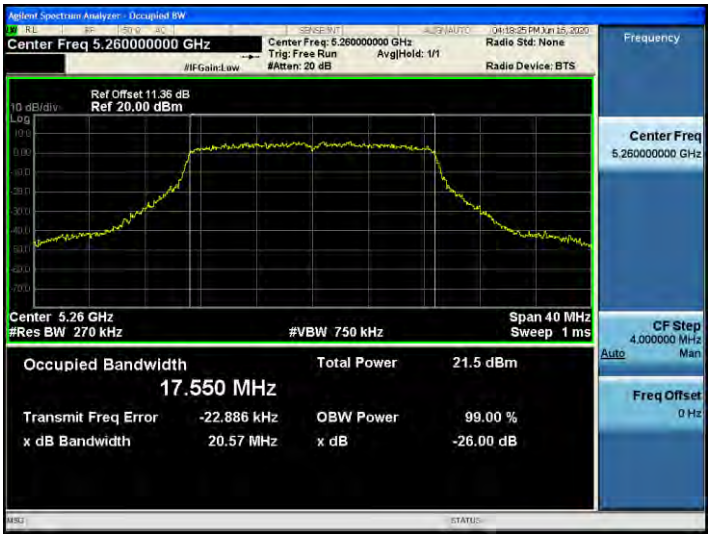
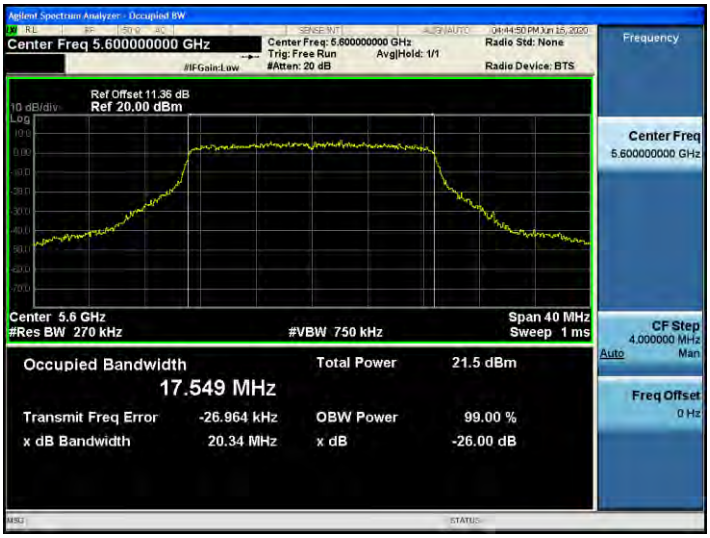
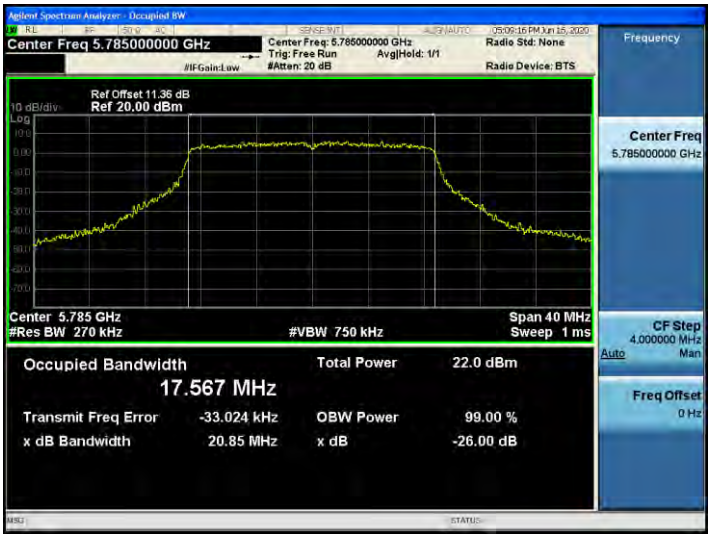
In order to simplify the report, attached plots were only the most wide channel.

802.11a UNII 1 BAND 26dB Bandwidth (CH 36)	802.11a UNII 2A BAND 26dB Bandwidth (CH 52)
	
802.11a UNII 2C BAND 26dB Bandwidth (CH 144)	**802.11a UNII 3 BAND 26dB Bandwidth (CH 165)**
	

▣ Test Plots(802.11n(HT20))

Note:

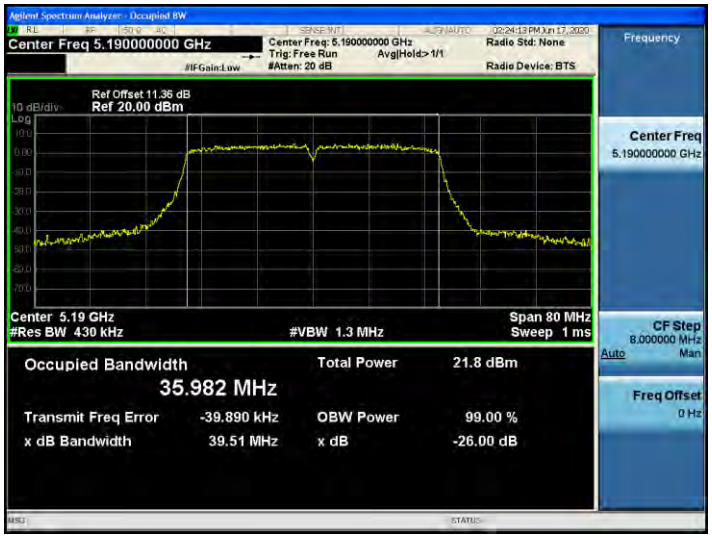
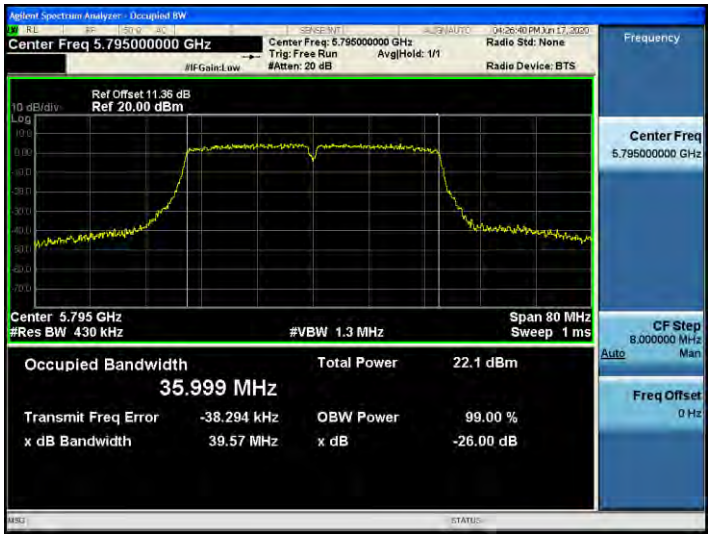
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 40)	802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 52)
	
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 120)	**802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)**
	

▣ Test Plots(802.11n(HT40))

Note:

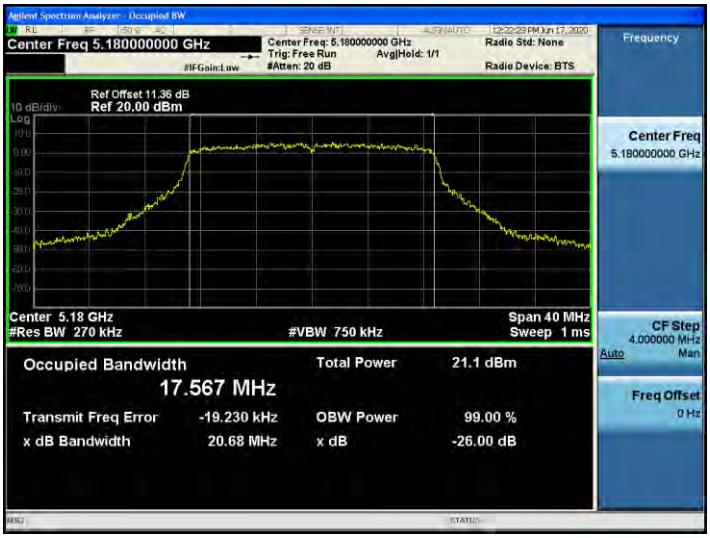
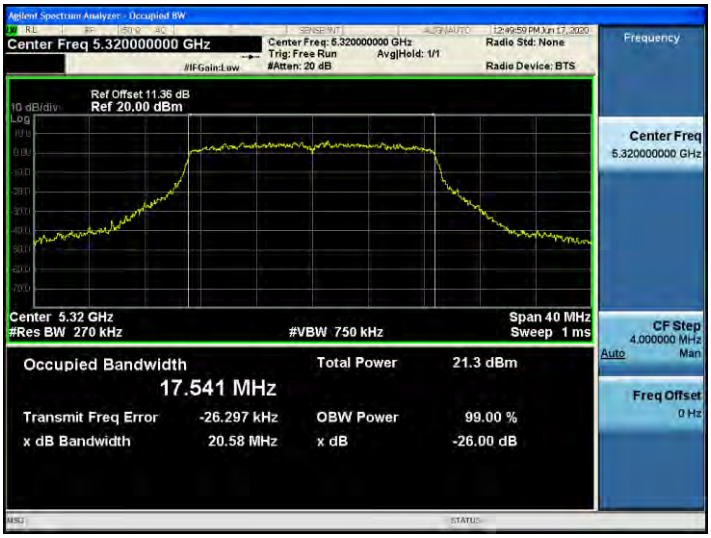
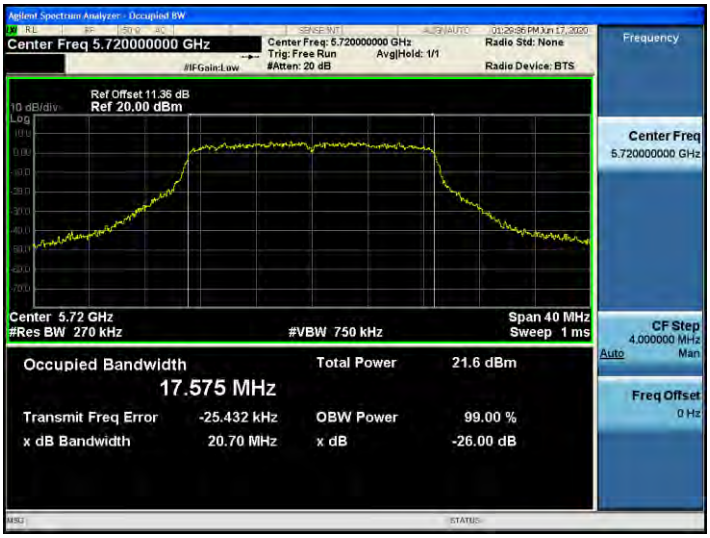
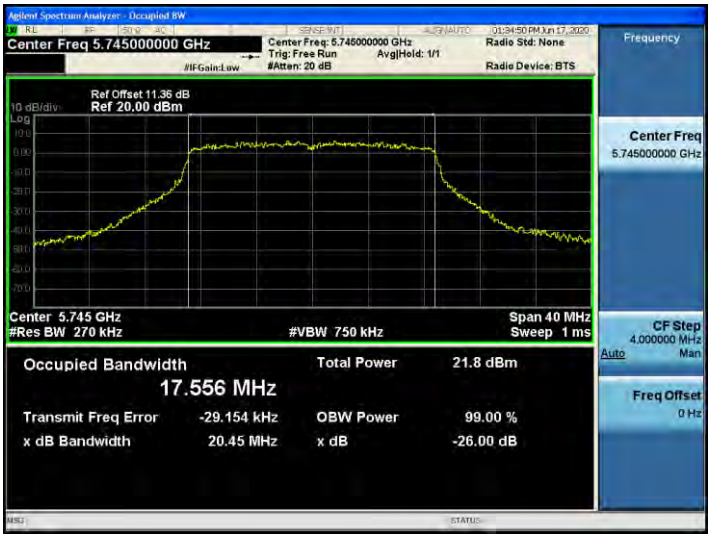
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 142)	**802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)**
	

▣ Test Plots(802.11ac(VHT20))

Note:

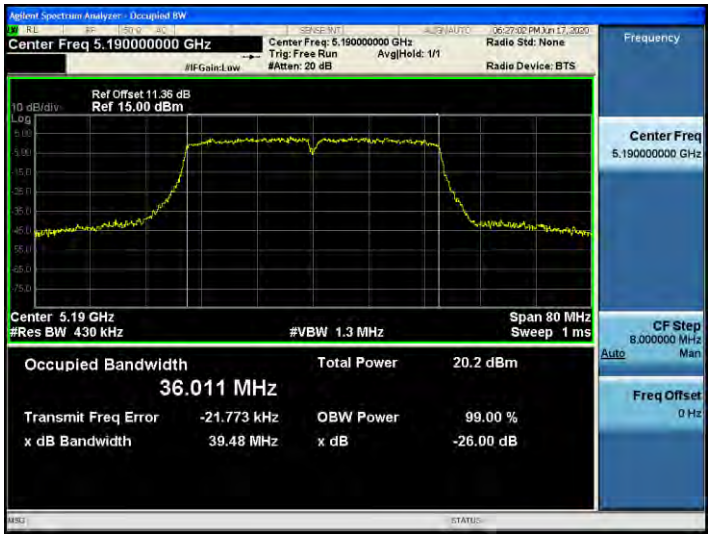
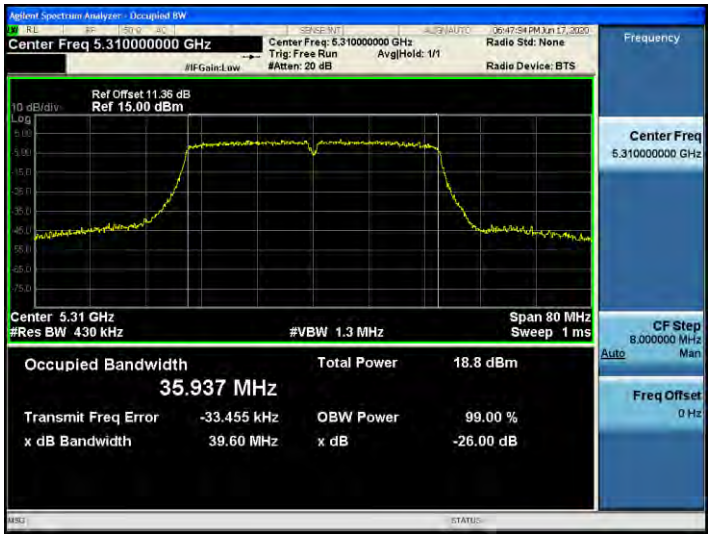
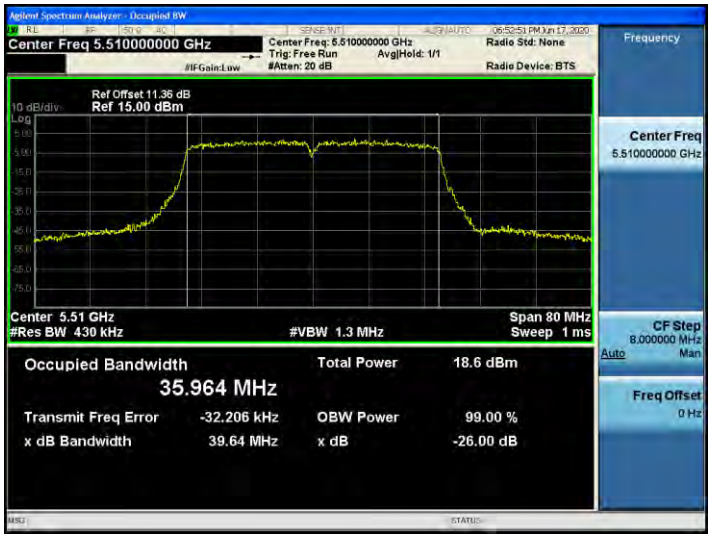
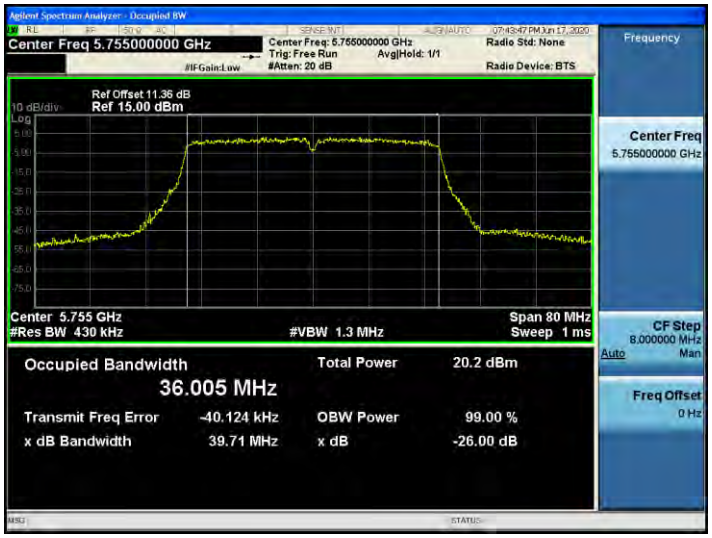
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 36)	802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)
	
802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)	**802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 149)**
	

▣ Test Plots(802.11ac(VHT40))

Note:

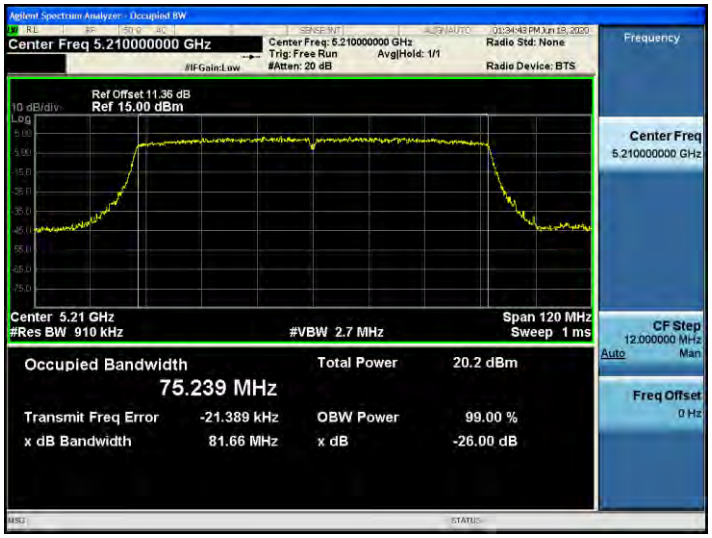
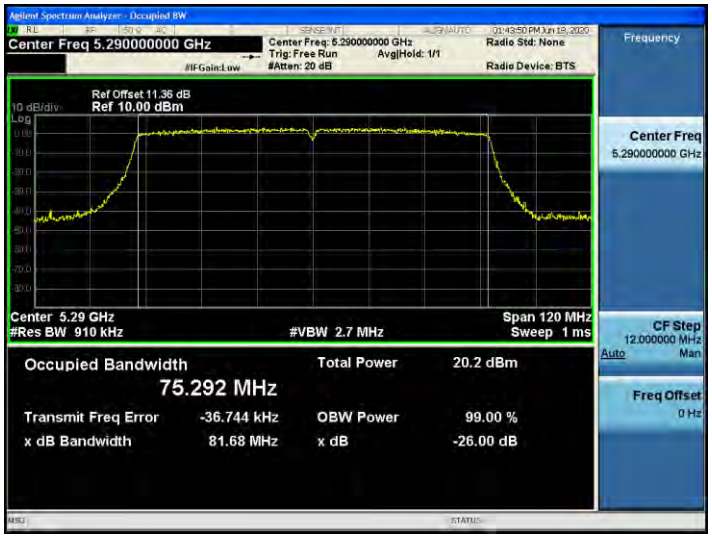
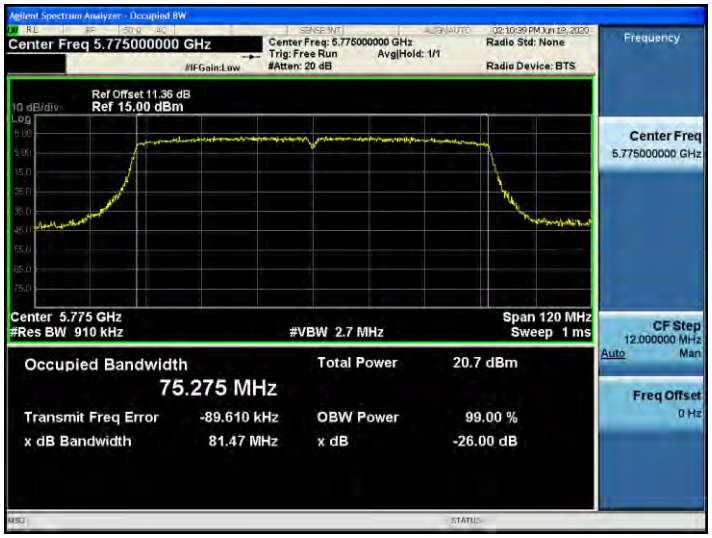
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)	**802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)**
	

▣ Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only the most wide channel.

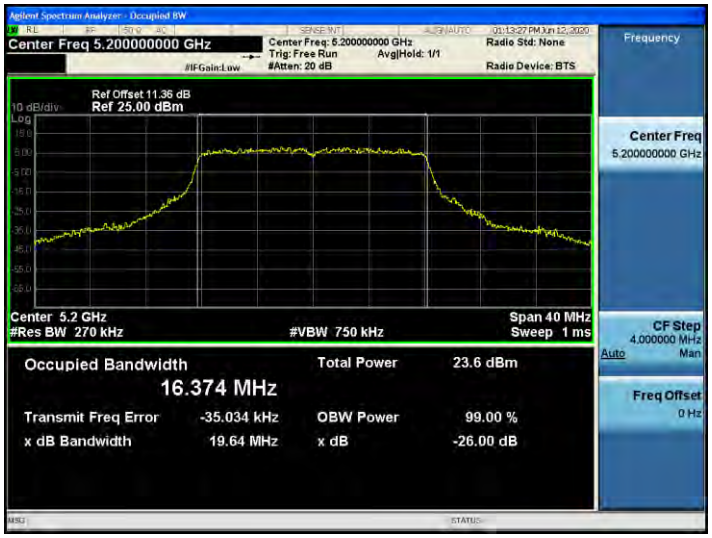
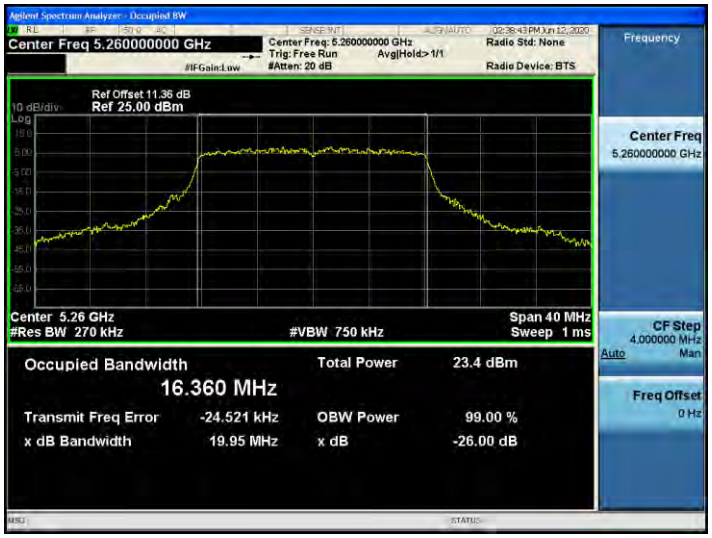
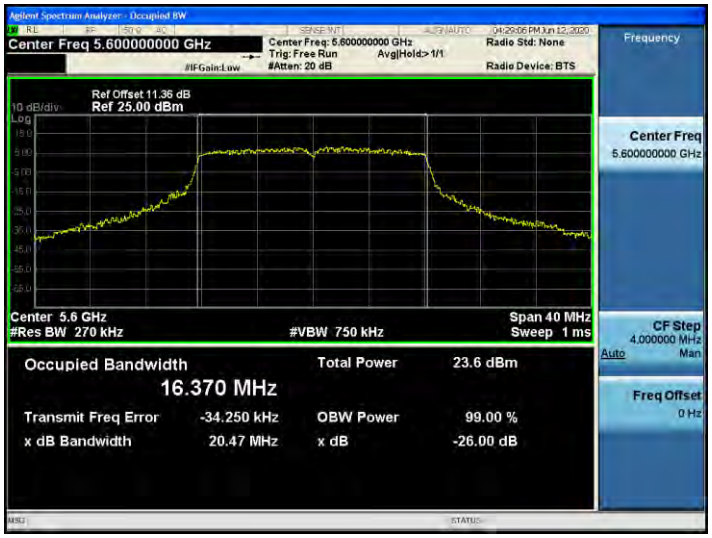
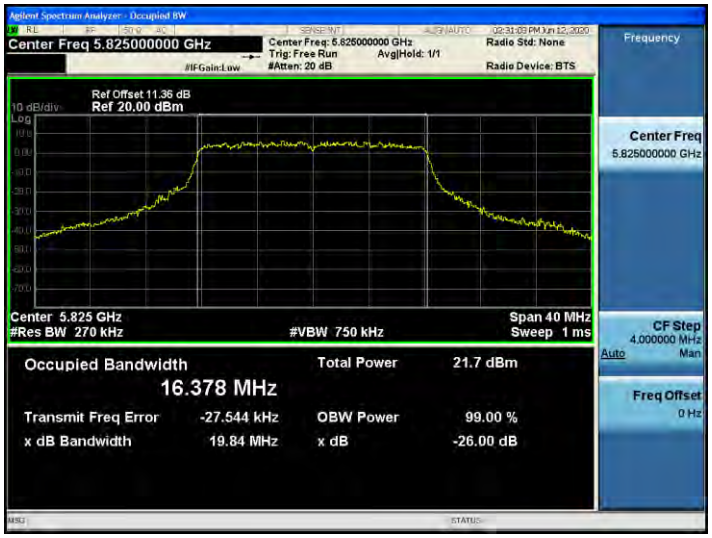
802.11ac_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)	802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)
	
802.11ac_VHT80 UNII 2C BAND 26dB Bandwidth(CH 138)	**802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)**
	

[ANT.2]

▣ Test Plots(802.11a)

Note:

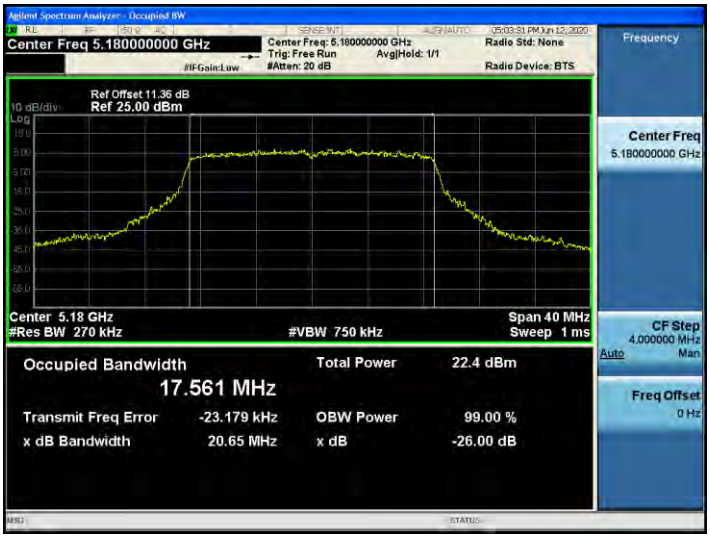
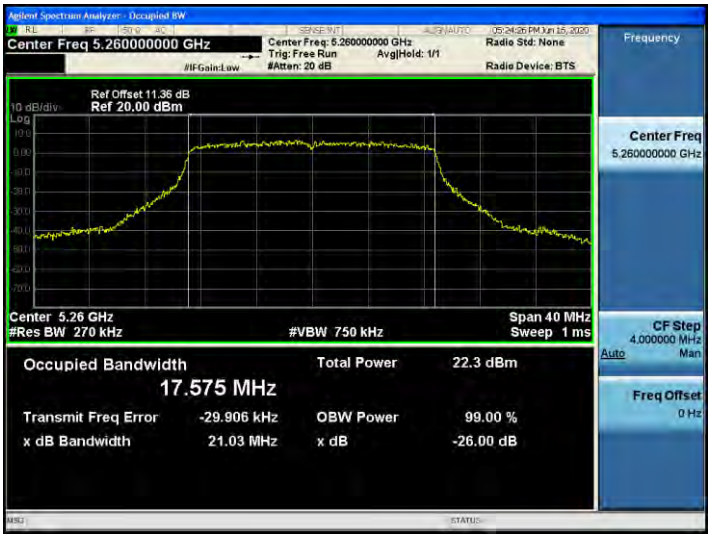
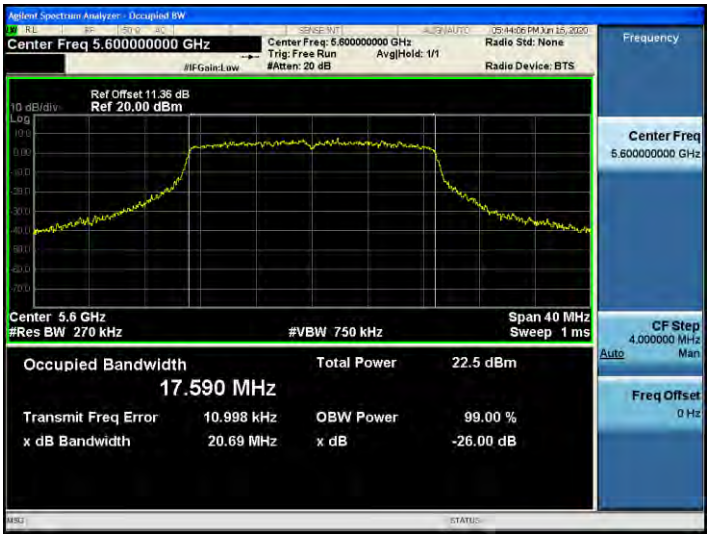
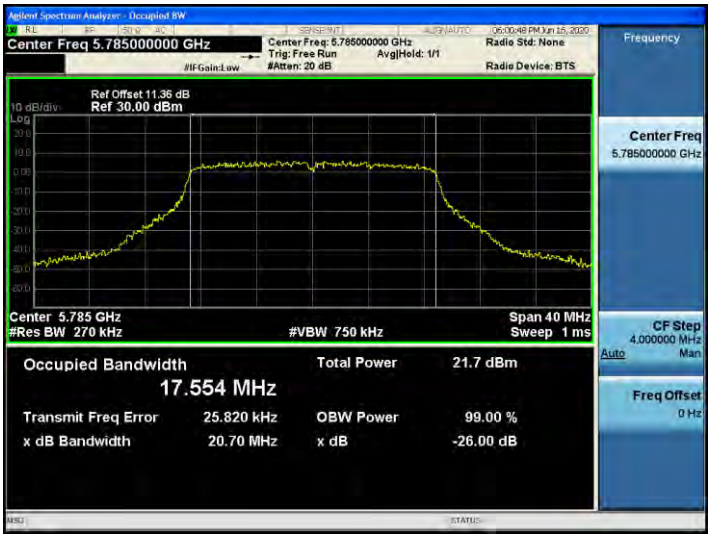
In order to simplify the report, attached plots were only the most wide channel.

802.11a UNII 1 BAND 26dB Bandwidth (CH 40)	802.11a UNII 2A BAND 26dB Bandwidth (CH 52)
	
802.11a UNII 2C BAND 26dB Bandwidth (CH 120)	**802.11a UNII 3 BAND 26dB Bandwidth (CH 165)**
	

▣ Test Plots(802.11n(HT20))

Note:

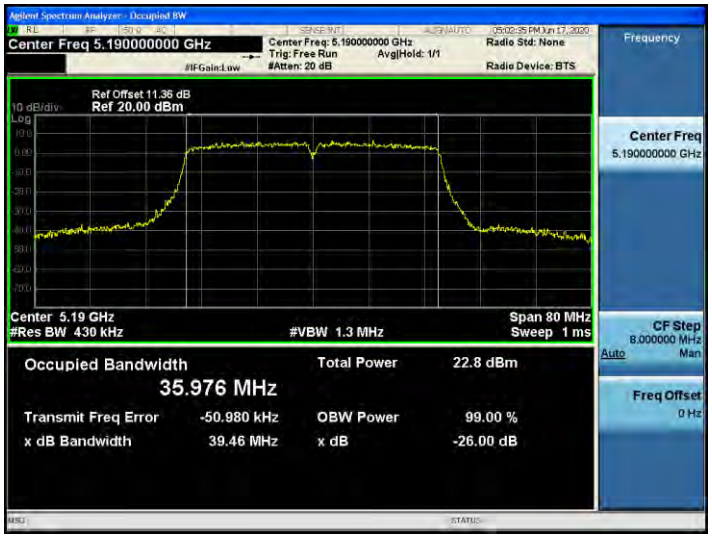
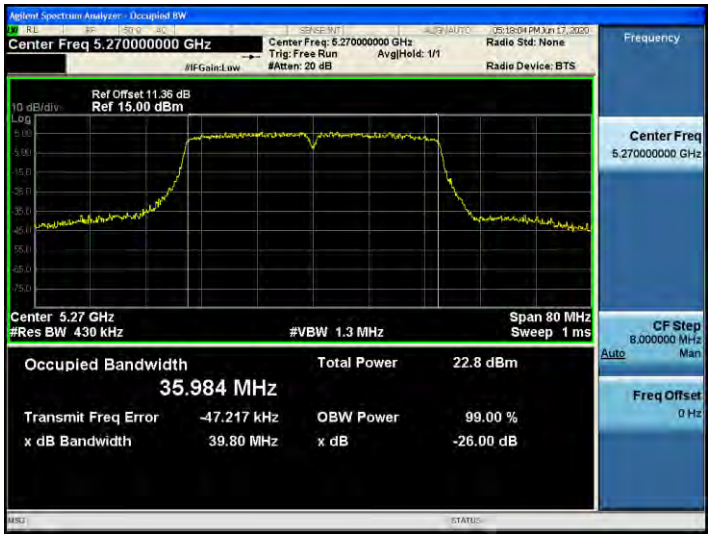
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)	802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 52)
	
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 120)	**802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)**
	

▣ Test Plots(802.11n(HT40))

Note:

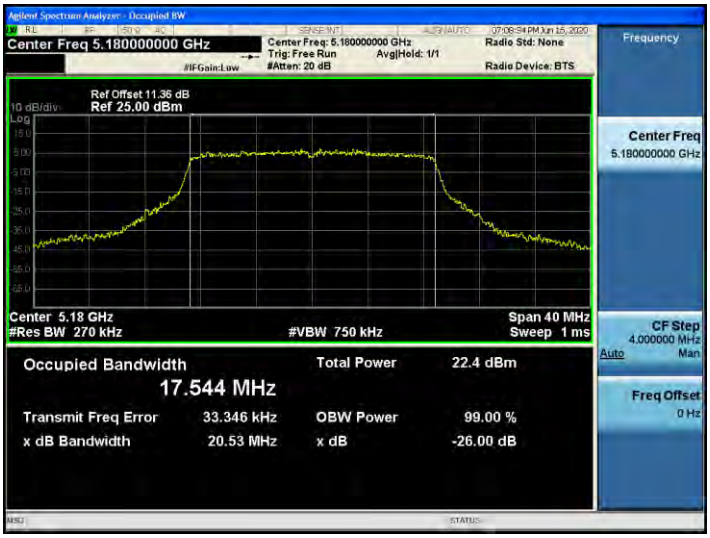
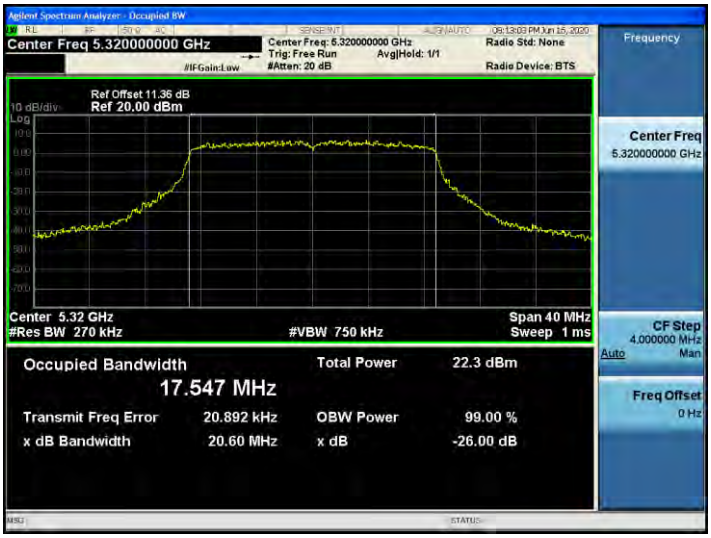
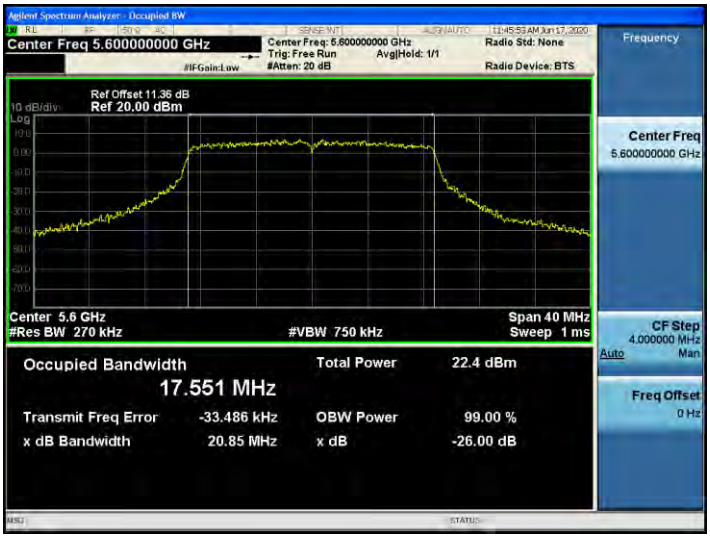
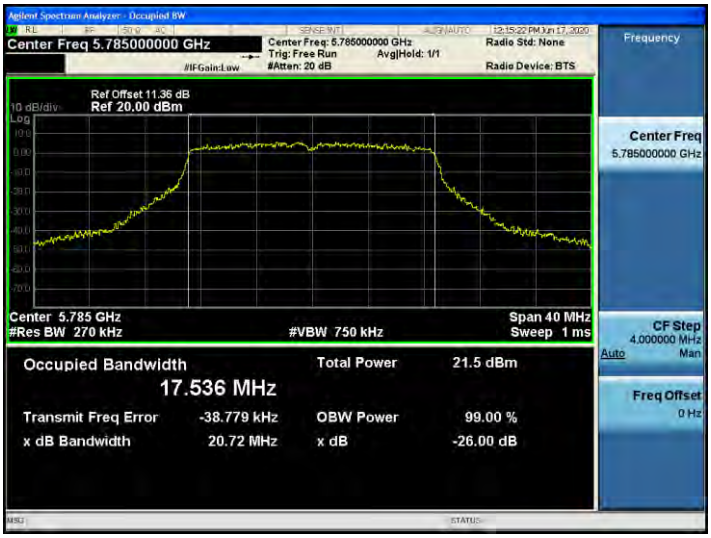
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 54)
	
802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 102)	**802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 151)**
	

▣ Test Plots(802.11ac(VHT20))

Note:

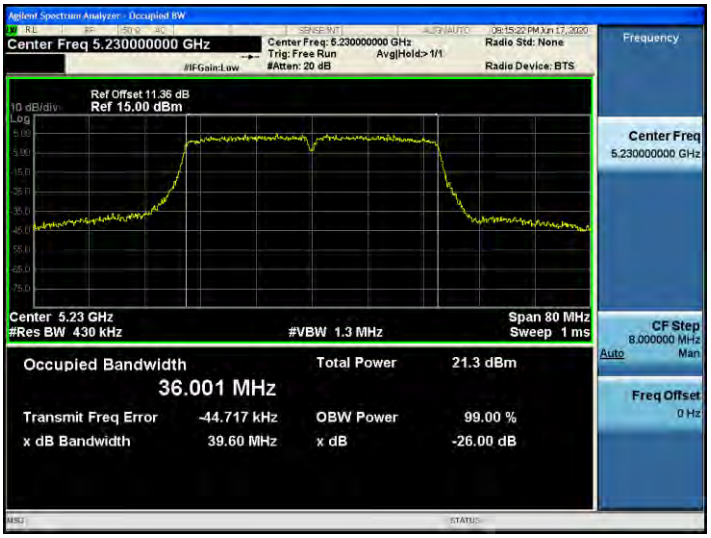
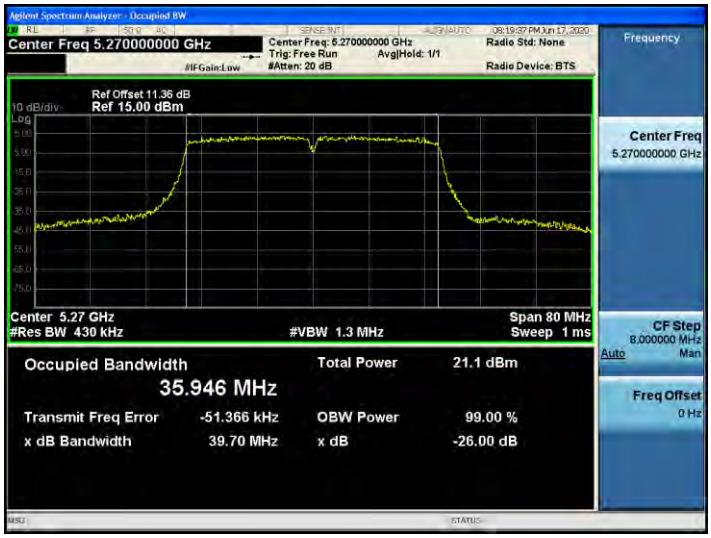
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 36)	802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)
	
802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 120)	**802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)**
	

▣ Test Plots(802.11ac(VHT40))

Note:

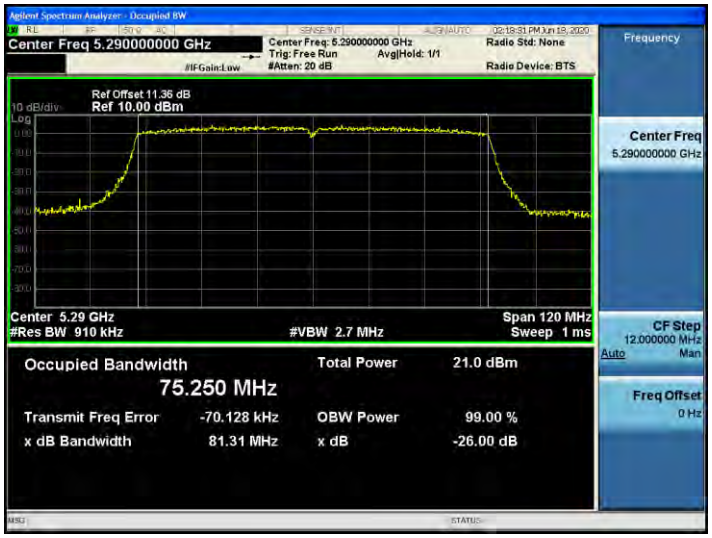
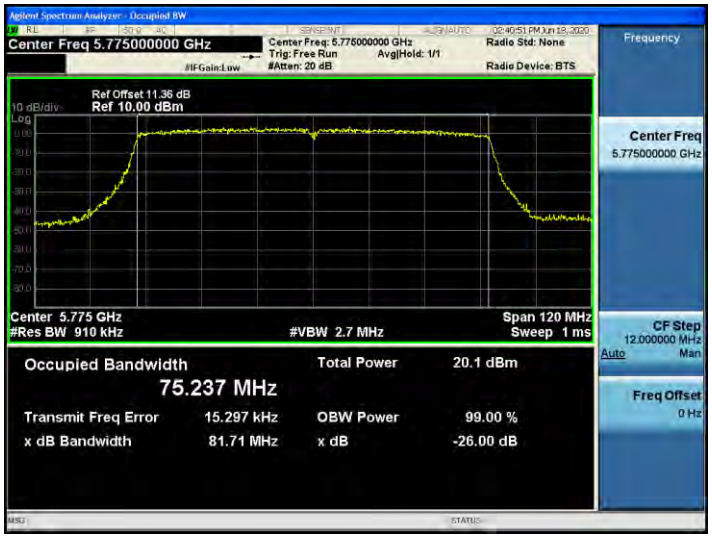
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 46)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)
	
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 142)	**802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)**
	

▣ Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)	802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)
	
802.11ac_VHT80 UNII 2C BAND 26dB Bandwidth(CH 138)	**802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)**
	

10.3 6dB BANDWIDTH

[ANT.1]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.63	> 0.5	Pass
5785	157	16.29	> 0.5	Pass
5825	165	15.77	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.58	> 0.5	Pass
5785	157	16.68	> 0.5	Pass
5825	165	17.15	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.38	> 0.5	Pass
5795	159	35.34	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.82	> 0.5	Pass
5785	157	16.32	> 0.5	Pass
5825	165	17.32	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.71	> 0.5	Pass
5795	159	35.62	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.37	> 0.5	Pass

[ANT.2]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.09	> 0.5	Pass
5785	157	15.70	> 0.5	Pass
5825	165	15.79	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.33	> 0.5	Pass
5785	157	15.07	> 0.5	Pass
5825	165	16.59	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.39	> 0.5	Pass
5795	159	35.13	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.34	> 0.5	Pass
5785	157	16.49	> 0.5	Pass
5825	165	17.19	> 0.5	Pass

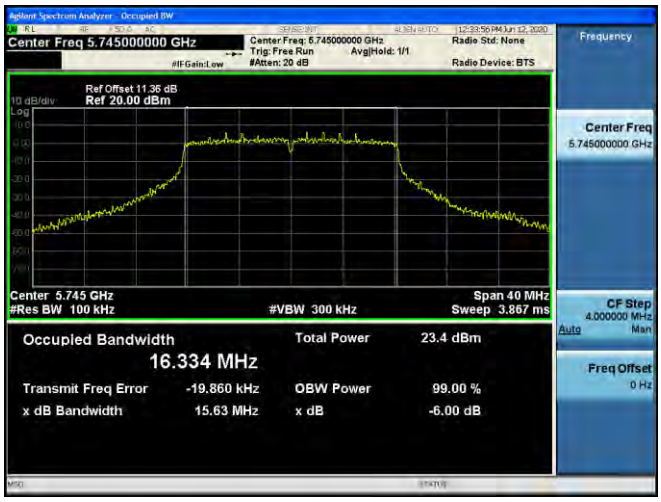
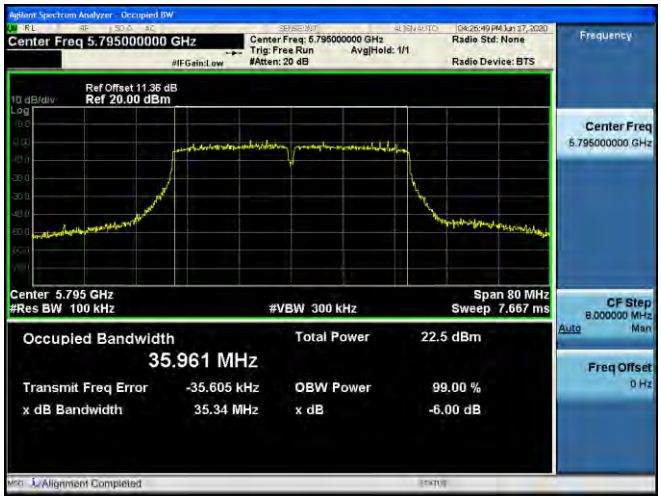
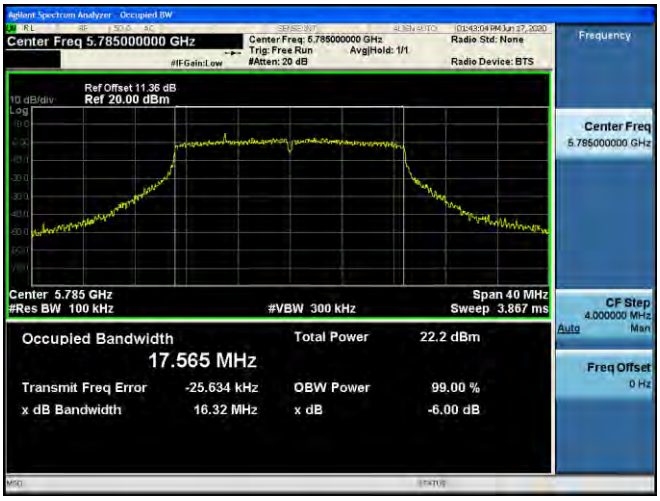
802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.73	> 0.5	Pass
5795	159	35.56	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.13	> 0.5	Pass

[ANT.1]

▣ Test Plots

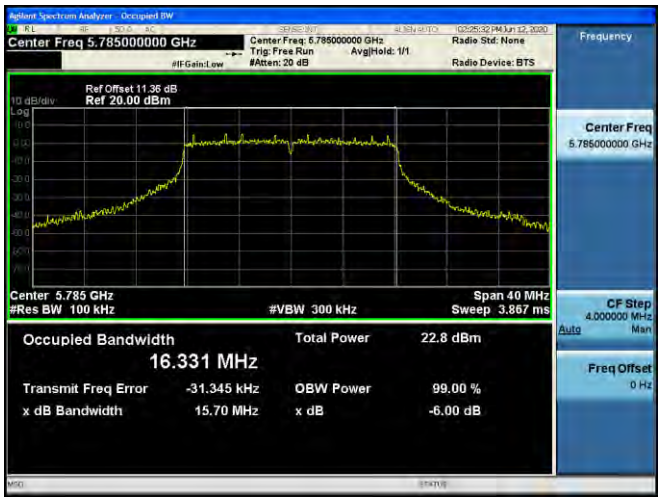
Note: In order to simplify the report, attached plots were only the most narrow channel.

802.11a (CH.149)	802.11n(HT20) (CH.149)
	
802.11n(HT40) (CH.159)	**802.11ac(VHT20) (CH.157)**
	
802.11ac(VHT40) (CH.159)	**802.11ac(VHT80) (CH.155)**
	

[ANT.2]

▣ Test Plots

Note: In order to simplify the report, attached plots were only the most narrow channel.

802.11a (CH.157)	802.11n(HT20) (CH.157)
	
802.11n(HT40) (CH.159)	**802.11ac(VHT20) (CH.149)**
	
802.11ac(VHT40) (CH.159)	**802.11ac(VHT80) (CH.155)**
	

10.4 OUTPUT POWER MEASUREMENT

Straddle channel data in the table below are for reporting purposes only.

Straddle channel data were added in section 10.7.3.

[ANT.1]

802.11a Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	16.00	16.29	0.104	16.39	23.98
5200	40	16.00	16.32	0.104	16.42	23.98
5240	48	16.00	16.52	0.104	16.62	23.98
5260	52	16.00	16.53	0.104	16.64	23.98
5300	60	16.00	16.55	0.104	16.66	23.98
5320	64	16.00	16.40	0.104	16.50	23.98
5500	100	16.00	16.41	0.104	16.52	23.98
5600	120	16.00	16.47	0.104	16.58	23.98
5720	144	16.00	16.65	0.104	16.76	23.98
5745	149	16.00	16.99	0.104	17.09	30.00
5785	157	16.00	17.26	0.104	17.36	30.00
5825	165	16.00	17.01	0.104	17.12	30.00

802.11n(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	15.00	15.51	0.015	15.53	23.98
5200	40	15.00	15.61	0.015	15.63	23.98
5240	48	15.00	15.68	0.015	15.70	23.98
5260	52	15.00	15.70	0.015	15.72	23.98
5300	60	15.00	15.77	0.015	15.79	23.98
5320	64	15.00	15.56	0.015	15.58	23.98
5500	100	15.00	15.62	0.015	15.64	23.98
5600	120	15.00	15.71	0.015	15.73	23.98
5720	144	15.00	15.78	0.015	15.80	23.98
5745	149	15.00	16.02	0.015	16.04	30.00
5785	157	15.00	16.22	0.015	16.24	30.00
5825	165	15.00	15.90	0.015	15.92	30.00

802.11n(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	15.00	15.02	0.014	15.03	23.98
5230	46	15.00	15.14	0.014	15.15	23.98
5270	54	15.00	15.12	0.014	15.13	23.98
5310	62	11.00	11.84	0.014	11.85	23.98
5510	102	11.00	11.75	0.014	11.76	23.98
5590	118	15.00	15.06	0.014	15.07	23.98
5710	142	16.00	15.80	0.014	15.81	23.98
5755	151	16.00	15.17	0.014	15.18	30.00
5795	159	15.00	15.43	0.014	15.44	30.00

802.11ac(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	15.00	15.32	0.015	15.34	23.98
5200	40	15.00	15.52	0.015	15.54	23.98
5240	48	15.00	15.68	0.015	15.70	23.98
5260	52	15.00	15.68	0.015	15.70	23.98
5300	60	15.00	15.69	0.015	15.71	23.98
5320	64	15.00	15.47	0.015	15.49	23.98
5500	100	15.00	15.61	0.015	15.63	23.98
5600	120	15.00	15.76	0.015	15.78	23.98
5720	144	15.00	15.85	0.015	15.87	23.98
5745	149	15.00	16.04	0.015	16.06	30.00
5785	157	15.00	16.12	0.015	16.14	30.00
5825	165	15.00	15.86	0.015	15.88	30.00

802.11ac(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	13.00	13.47	0.012	13.48	23.98
5230	46	13.00	13.91	0.012	13.92	23.98
5270	54	13.00	13.98	0.012	13.99	23.98
5310	62	11.00	11.98	0.012	11.99	23.98
5510	102	11.00	11.84	0.012	11.85	23.98
5590	118	13.00	13.70	0.012	13.71	23.98
5710	142	13.00	13.56	0.012	13.57	23.98
5755	151	14.00	13.48	0.012	13.49	30.00
5795	159	13.00	14.36	0.012	14.37	30.00

802.11ac(80MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	13.00	12.50	0.012	12.51	23.98
5290	58	13.00	12.51	0.012	12.52	23.98
5530	106	13.00	12.47	0.012	12.48	23.98
5610	122	13.00	12.08	0.012	12.09	23.98
5690	138	14.00	12.33	0.012	12.34	23.98
5775	155	13.00	12.90	0.012	12.91	30.00

[ANT.2]

802.11a Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	16.00	17.49	0.104	17.60	23.98
5200	40	16.00	17.63	0.104	17.73	23.98
5240	48	16.00	17.64	0.104	17.74	23.98
5260	52	16.00	17.43	0.104	17.53	23.98
5300	60	16.00	17.47	0.104	17.57	23.98
5320	64	16.00	17.39	0.104	17.50	23.98
5500	100	16.00	16.90	0.104	17.00	23.98
5600	120	16.00	17.38	0.104	17.48	23.98
5720	144	16.00	16.80	0.104	16.90	23.98
5745	149	16.00	16.77	0.104	16.87	30.00
5785	157	16.00	16.43	0.104	16.54	30.00
5825	165	16.00	15.68	0.104	15.79	30.00

802.11n(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	15.00	16.60	0.015	16.62	23.98
5200	40	15.00	16.72	0.015	16.74	23.98
5240	48	15.00	16.77	0.015	16.79	23.98
5260	52	15.00	16.53	0.015	16.55	23.98
5300	60	15.00	16.60	0.015	16.62	23.98
5320	64	15.00	16.58	0.015	16.60	23.98
5500	100	15.00	16.04	0.015	16.06	23.98
5600	120	15.00	16.50	0.015	16.52	23.98
5720	144	15.00	15.85	0.015	15.87	23.98
5745	149	15.00	15.93	0.015	15.95	30.00
5785	157	15.00	15.64	0.015	15.66	30.00
5825	165	15.00	14.89	0.015	14.91	30.00

802.11n(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	15.00	16.18	0.014	16.19	23.98
5230	46	15.00	16.09	0.014	16.10	23.98
5270	54	15.00	16.03	0.014	16.04	23.98
5310	62	11.00	12.43	0.014	12.44	23.98
5510	102	11.00	12.67	0.014	12.68	23.98
5590	118	15.00	16.13	0.014	16.14	23.98
5710	142	16.00	15.69	0.014	15.70	23.98
5755	151	16.00	16.35	0.014	16.36	30.00
5795	159	15.00	14.74	0.014	14.75	30.00

802.11ac(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	15.00	16.61	0.015	16.63	23.98
5200	40	15.00	16.77	0.015	16.79	23.98
5240	48	15.00	16.77	0.015	16.79	23.98
5260	52	15.00	16.54	0.015	16.56	23.98
5300	60	15.00	16.60	0.015	16.62	23.98
5320	64	15.00	16.52	0.015	16.54	23.98
5500	100	15.00	15.96	0.015	15.98	23.98
5600	120	15.00	16.46	0.015	16.48	23.98
5720	144	15.00	15.80	0.015	15.82	23.98
5745	149	15.00	15.89	0.015	15.91	30.00
5785	157	15.00	15.61	0.015	15.63	30.00
5825	165	15.00	14.92	0.015	14.94	30.00

802.11ac(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	13.00	14.48	0.012	14.49	23.98
5230	46	13.00	14.52	0.012	14.53	23.98
5270	54	13.00	14.42	0.012	14.43	23.98
5310	62	11.00	12.39	0.012	12.40	23.98
5510	102	11.00	12.62	0.012	12.63	23.98
5590	118	13.00	14.51	0.012	14.52	23.98
5710	142	13.00	13.32	0.012	13.33	23.98
5755	151	14.00	14.61	0.012	14.62	30.00
5795	159	13.00	13.45	0.012	13.46	30.00

802.11ac(80MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	13.00	13.29	0.012	13.30	23.98
5290	58	13.00	13.30	0.012	13.31	23.98
5530	106	13.00	13.17	0.012	13.18	23.98
5610	122	13.00	13.10	0.012	13.11	23.98
5690	138	14.00	12.94	0.012	12.95	23.98
5775	155	13.00	12.38	0.012	12.39	30.00

[MIMO]

802.11a Mode		Power Level Setting	Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	16.00	16.39	17.60	20.04	23.98
5200	40	16.00	16.42	17.73	20.14	23.98
5240	48	16.00	16.62	17.74	20.23	23.98
5260	52	16.00	16.64	17.53	20.12	23.98
5300	60	16.00	16.66	17.57	20.15	23.98
5320	64	16.00	16.50	17.50	20.04	23.98
5500	100	16.00	16.52	17.00	19.78	23.98
5600	120	16.00	16.58	17.48	20.06	23.98
5720	144	16.00	16.76	16.90	19.84	23.98
5745	149	16.00	17.09	16.87	19.99	30.00
5785	157	16.00	17.36	16.54	19.98	30.00
5825	165	16.00	17.12	15.79	19.51	30.00

802.11n(20MHz) Mode		Power Level Setting	Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	15.00	15.53	16.62	19.11	23.98
5200	40	15.00	15.63	16.74	19.23	23.98
5240	48	15.00	15.70	16.79	19.28	23.98
5260	52	15.00	15.72	16.55	19.16	23.98
5300	60	15.00	15.79	16.62	19.23	23.98
5320	64	15.00	15.58	16.60	19.13	23.98
5500	100	15.00	15.64	16.06	18.86	23.98
5600	120	15.00	15.73	16.52	19.15	23.98
5720	144	15.00	15.80	15.87	18.84	23.98
5745	149	15.00	16.04	15.95	19.00	30.00
5785	157	15.00	16.24	15.66	18.97	30.00
5825	165	15.00	15.92	14.91	18.45	30.00

802.11n(40MHz) Mode		Power Level Setting	Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	15.00	15.03	16.19	18.66	23.98
5230	46	15.00	15.15	16.10	18.67	23.98
5270	54	15.00	15.13	16.04	18.62	23.98
5310	62	11.00	11.85	12.44	15.17	23.98
5510	102	11.00	11.76	12.68	15.26	23.98
5590	118	15.00	15.07	16.14	18.65	23.98
5710	142	16.00	15.81	15.70	18.77	23.98
5755	151	16.00	15.18	16.36	18.82	30.00
5795	159	15.00	15.44	14.75	18.12	30.00

802.11ac(20MHz) Mode		Power Level Setting	Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	15.00	15.34	16.63	19.04	23.98
5200	40	15.00	15.54	16.79	19.22	23.98
5240	48	15.00	15.70	16.79	19.29	23.98
5260	52	15.00	15.70	16.56	19.16	23.98
5300	60	15.00	15.71	16.62	19.20	23.98
5320	64	15.00	15.49	16.54	19.05	23.98
5500	100	15.00	15.63	15.98	18.81	23.98
5600	120	15.00	15.78	16.48	19.15	23.98
5720	144	15.00	15.87	15.82	18.85	23.98
5745	149	15.00	16.06	15.91	18.99	30.00
5785	157	15.00	16.14	15.63	18.90	30.00
5825	165	15.00	15.88	14.94	18.44	30.00

802.11ac(40MHz) Mode		Power Level Setting	Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	13.00	13.48	14.49	17.03	23.98
5230	46	13.00	13.92	14.53	17.25	23.98
5270	54	13.00	13.99	14.43	17.23	23.98
5310	62	11.00	11.99	12.40	15.21	23.98
5510	102	11.00	11.85	12.63	15.27	23.98
5590	118	13.00	13.71	14.52	17.15	23.98
5710	142	13.00	13.57	13.33	16.46	23.98
5755	151	14.00	13.49	14.62	17.10	30.00
5795	159	13.00	14.37	13.46	16.95	30.00

802.11ac(80MHz) Mode		Power Level Setting	Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	13.00	12.51	13.30	15.94	23.98
5290	58	13.00	12.52	13.31	15.95	23.98
5530	106	13.00	12.48	13.18	15.86	23.98
5610	122	13.00	12.09	13.11	15.64	23.98
5690	138	14.00	12.34	12.95	15.67	23.98
5775	155	13.00	12.91	12.39	15.67	30.00

10.5 POWER SPECTRAL DENSITY

[ANT.1]

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	5.716	0.104	5.820	11 dBm/MHz
5200	40	5.617	0.104	5.721	
5240	48	5.664	0.104	5.768	
5260	52	5.678	0.104	5.782	
5300	60	5.747	0.104	5.851	
5320	64	5.645	0.104	5.749	
5500	100	5.679	0.104	5.783	
5600	120	5.624	0.104	5.728	
5720	144	5.945	0.104	6.049	
5745	149	3.233	0.104	3.337	30 dBm/500kHz
5785	157	3.440	0.104	3.544	
5825	165	3.254	0.104	3.358	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	4.025	0.015	4.040	11 dBm/MHz
5200	40	4.224	0.015	4.239	
5240	48	4.225	0.015	4.240	
5260	52	4.324	0.015	4.339	
5300	60	4.450	0.015	4.465	
5320	64	4.137	0.015	4.152	
5500	100	4.310	0.015	4.325	
5600	120	4.212	0.015	4.227	
5720	144	4.262	0.015	4.277	
5745	149	1.749	0.015	1.764	30 dBm/500kHz
5785	157	1.885	0.015	1.900	
5825	165	1.645	0.015	1.660	

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	0.857	0.014	0.871	11 dBm/MHz
5230	46	1.020	0.014	1.034	
5270	54	1.060	0.014	1.074	
5310	62	-2.413	0.014	-2.399	
5510	102	-2.437	0.014	-2.423	
5590	118	0.872	0.014	0.886	
5710	142	1.670	0.014	1.684	
5755	151	-1.904	0.014	-1.890	30 dBm /500kHz
5795	159	-1.430	0.014	-1.416	

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	4.158	0.015	4.173	11 dBm/MHz
5200	40	4.204	0.015	4.219	
5240	48	4.202	0.015	4.217	
5260	52	4.200	0.015	4.215	
5300	60	4.341	0.015	4.356	
5320	64	4.084	0.015	4.099	
5500	100	4.224	0.015	4.239	
5600	120	4.302	0.015	4.317	
5720	144	4.253	0.015	4.268	
5745	149	1.697	0.015	1.712	30 dBm/500kHz
5785	157	1.840	0.015	1.855	
5825	165	1.546	0.015	1.561	

802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-0.893	0.012	-0.881	11 dBm/MHz
5230	46	-0.226	0.012	-0.214	
5270	54	-0.415	0.012	-0.403	
5310	62	-2.343	0.012	-2.331	
5510	102	-2.404	0.012	-2.392	
5590	118	-0.747	0.012	-0.735	
5710	142	-0.754	0.012	-0.742	
5755	151	-3.709	0.012	-3.697	30 dBm/500kHz
5795	159	-2.754	0.012	-2.742	

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-4.798	0.012	-4.786	11 dBm/MHz
5290	58	-4.716	0.012	-4.704	
5530	106	-4.999	0.012	-4.987	
5610	122	-5.210	0.012	-5.198	
5690	138	-5.033	0.012	-5.021	
5775	155	-7.274	0.012	-7.262	30 dBm/500kHz

[ANT.2]

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	6.981	0.104	7.085	11 dBm/MHz
5200	40	6.949	0.104	7.053	
5240	48	7.149	0.104	7.253	
5260	52	6.860	0.104	6.964	
5300	60	7.051	0.104	7.155	
5320	64	7.029	0.104	7.133	
5500	100	6.338	0.104	6.442	
5600	120	6.632	0.104	6.736	
5720	144	6.020	0.104	6.124	
5745	149	3.169	0.104	3.273	30 dBm/500kHz
5785	157	2.770	0.104	2.874	
5825	165	2.044	0.104	2.148	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	5.292	0.015	5.307	11 dBm/MHz
5200	40	5.318	0.015	5.333	
5240	48	5.317	0.015	5.332	
5260	52	5.206	0.015	5.221	
5300	60	5.303	0.015	5.318	
5320	64	5.168	0.015	5.183	
5500	100	4.515	0.015	4.530	
5600	120	5.153	0.015	5.168	
5720	144	4.378	0.015	4.393	
5745	149	1.579	0.015	1.594	30 dBm/500kHz
5785	157	1.390	0.015	1.405	
5825	165	0.592	0.015	0.607	

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	2.048	0.014	2.062	11 dBm/MHz
5230	46	1.986	0.014	2.000	
5270	54	1.982	0.014	1.996	
5310	62	-1.605	0.014	-1.591	
5510	102	-1.447	0.014	-1.433	
5590	118	1.822	0.014	1.836	
5710	142	1.498	0.014	1.512	
5755	151	-0.546	0.014	-0.532	30 dBm /500kHz
5795	159	-2.193	0.014	-2.179	

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	5.306	0.015	5.321	11 dBm/MHz
5200	40	5.631	0.015	5.646	
5240	48	5.282	0.015	5.297	
5260	52	5.254	0.015	5.269	
5300	60	5.407	0.015	5.422	
5320	64	5.273	0.015	5.288	
5500	100	4.599	0.015	4.614	
5600	120	5.084	0.015	5.099	
5720	144	4.394	0.015	4.409	
5745	149	1.666	0.015	1.681	30 dBm/500kHz
5785	157	1.370	0.015	1.385	
5825	165	0.486	0.015	0.501	

802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	0.281	0.012	0.293	11 dBm/MHz
5230	46	0.246	0.012	0.258	
5270	54	0.174	0.012	0.186	
5310	62	-1.688	0.012	-1.676	
5510	102	-1.508	0.012	-1.496	
5590	118	0.287	0.012	0.299	
5710	142	-1.177	0.012	-1.165	
5755	151	-2.710	0.012	-2.698	30 dBm/500kHz
5795	159	-3.606	0.012	-3.594	

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-3.965	0.012	-3.953	11 dBm/MHz
5290	58	-4.037	0.012	-4.025	
5530	106	-4.159	0.012	-4.147	
5610	122	-4.373	0.012	-4.361	
5690	138	-4.629	0.012	-4.617	
5775	155	-7.725	0.012	-7.713	30 dBm/500kHz

[MIMO]

802.11a Mode		ANT.1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT.2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	5.820	7.085	9.508	11 dBm/MHz
5200	40	5.721	7.053	9.448	
5240	48	5.768	7.253	9.584	
5260	52	5.782	6.964	9.423	
5300	60	5.851	7.155	9.562	
5320	64	5.749	7.133	9.506	
5500	100	5.783	6.442	9.135	
5600	120	5.728	6.736	9.271	
5720	144	6.049	6.124	9.097	
5745	149	3.337	3.273	6.315	30 dBm/500kHz
5785	157	3.544	2.874	6.232	
5825	165	3.358	2.148	5.805	

802.11n(20MHz) Mode		ANT.1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT.2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	4.040	5.307	7.730	11 dBm/MHz
5200	40	4.239	5.333	7.831	
5240	48	4.240	5.332	7.831	
5260	52	4.339	5.221	7.813	
5300	60	4.465	5.318	7.923	
5320	64	4.152	5.183	7.708	
5500	100	4.325	4.530	7.439	
5600	120	4.227	5.168	7.733	
5720	144	4.277	4.393	7.346	
5745	149	1.764	1.594	4.690	30 dBm/500kHz
5785	157	1.900	1.405	4.670	
5825	165	1.660	0.607	4.176	

802.11n(40MHz) Mode		ANT.1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT.2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	0.871	2.062	4.518	11 dBm/MHz
5230	46	1.034	2.000	4.554	
5270	54	1.074	1.996	4.570	
5310	62	-2.399	-1.591	1.034	
5510	102	-2.423	-1.433	1.111	
5590	118	0.886	1.836	4.398	
5710	142	1.684	1.512	4.610	
5755	151	-1.890	-0.532	1.853	30 dBm /500kHz
5795	159	-1.416	-2.179	1.230	

802.11ac(20MHz) Mode		ANT.1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT.2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	4.173	5.321	7.795	11 dBm/MHz
5200	40	4.219	5.646	8.001	
5240	48	4.217	5.297	7.801	
5260	52	4.215	5.269	7.784	
5300	60	4.356	5.422	7.932	
5320	64	4.099	5.288	7.745	
5500	100	4.239	4.614	7.441	
5600	120	4.317	5.099	7.736	
5720	144	4.268	4.409	7.350	
5745	149	1.712	1.681	4.707	30 dBm/500kHz
5785	157	1.855	1.385	4.637	
5825	165	1.561	0.501	4.074	

802.11ac(40MHz) Mode		ANT.1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT.2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	-0.881	0.293	2.756	11 dBm/MHz
5230	46	-0.214	0.258	3.039	
5270	54	-0.403	0.186	2.912	
5310	62	-2.331	-1.676	1.019	
5510	102	-2.392	-1.496	1.089	
5590	118	-0.735	0.299	2.823	
5710	142	-0.742	-1.165	2.062	
5755	151	-3.697	-2.698	-0.159	30 dBm /500kHz
5795	159	-2.742	-3.594	-0.137	

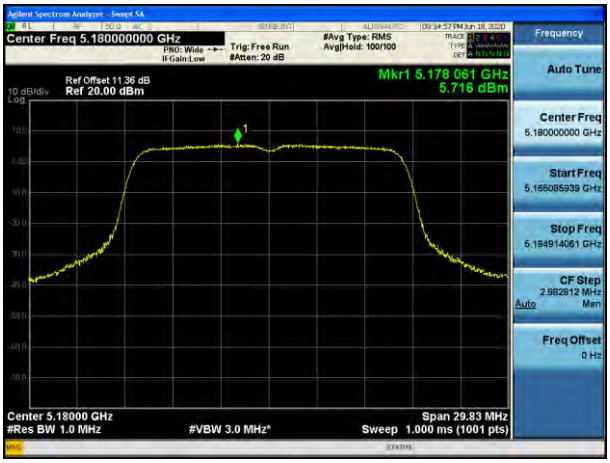
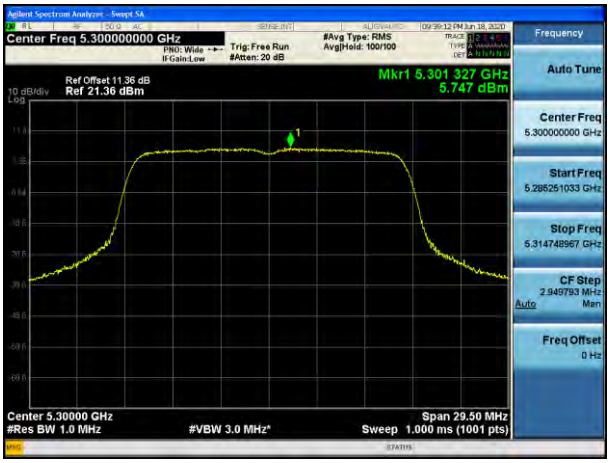
802.11ac(80MHz) Mode		ANT.1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT.2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5210	42	-4.786	-3.953	-1.339	11 dBm/MHz
5290	58	-4.704	-4.025	-1.341	
5530	106	-4.987	-4.147	-1.536	
5610	122	-5.198	-4.361	-1.749	
5690	138	-5.021	-4.617	-1.804	
5775	155	-7.262	-7.713	-4.471	30 dBm /500kHz

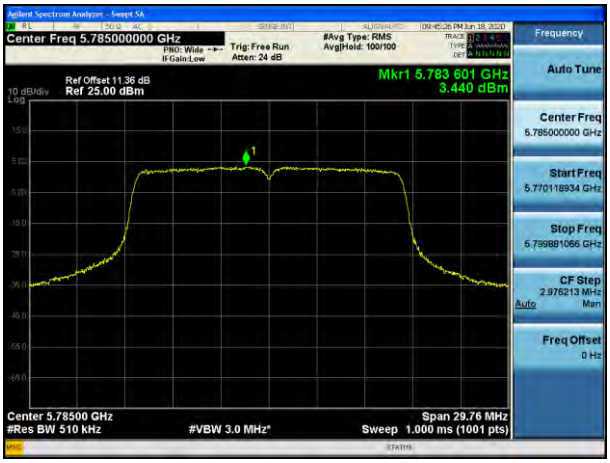
[ANT.1]

▣ Test Plots(802.11a)

Note:

In order to simplify the report, attached plots were only channel of highest power.

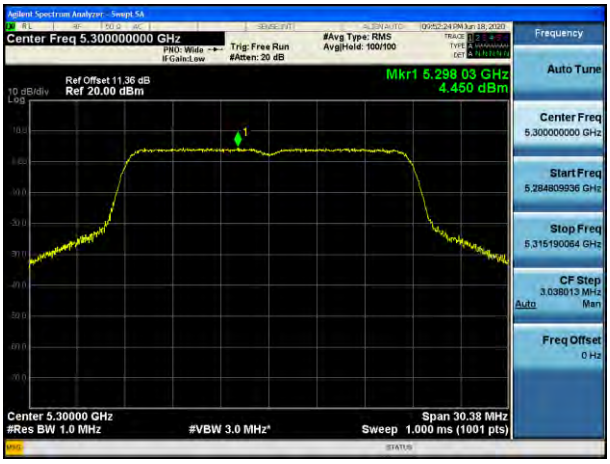
UNII 1 (Ch. 36)	UNII 2A (Ch. 60)
	

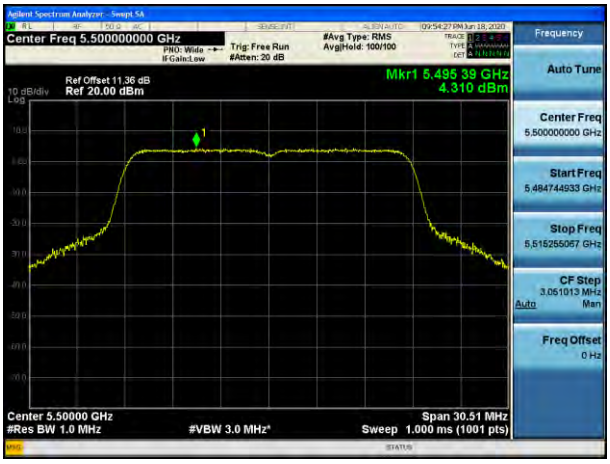
UNII 2C (Ch. 144)	UNII 3 (Ch. 157)
	

▣ Test Plots(802.11n(HT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 48)	UNII 2A (Ch. 60)
	

UNII 2C (Ch. 100)	UNII 3 (Ch. 157)
	

▣ Test Plots(802.11n(HT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

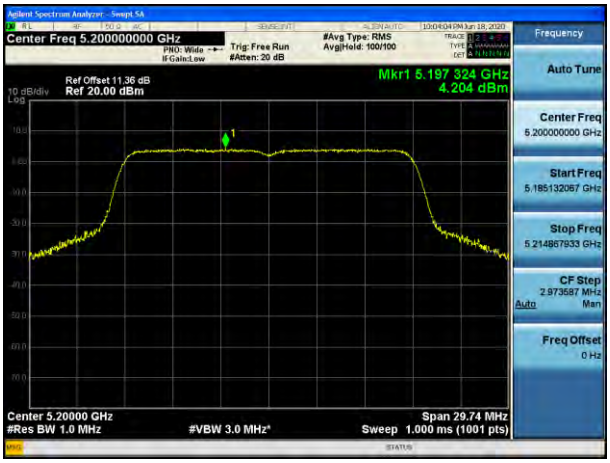
UNII 1 (Ch. 46)	UNII 2A (Ch. 54)
	

UNII 2C (Ch. 142)	UNII 3 (Ch. 159)
	

▣ Test Plots(802.11ac(VHT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 40)	UNII 2A (Ch. 60)
	

UNII 2C (Ch. 120)	UNII 3 (Ch. 157)
	

▣ Test Plots(802.11ac(VHT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

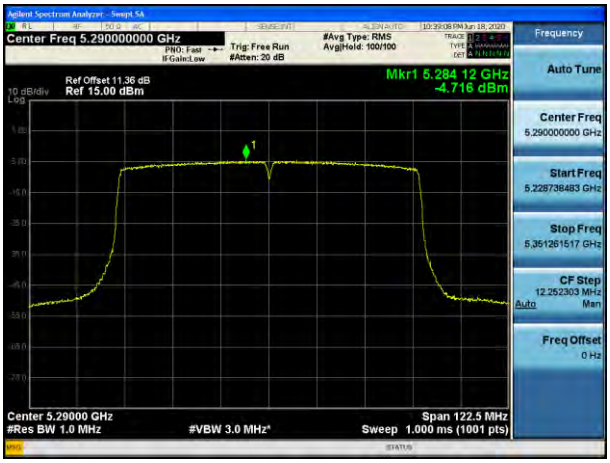
UNII 1 (Ch. 46)	UNII 2A (Ch. 54)
	

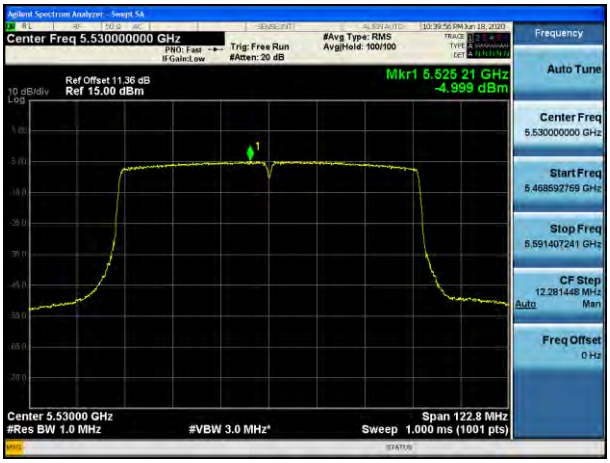
UNII 2C (Ch. 118)	UNII 3 (Ch. 159)
	

▣ Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 42)	UNII 2A (Ch. 58)
	

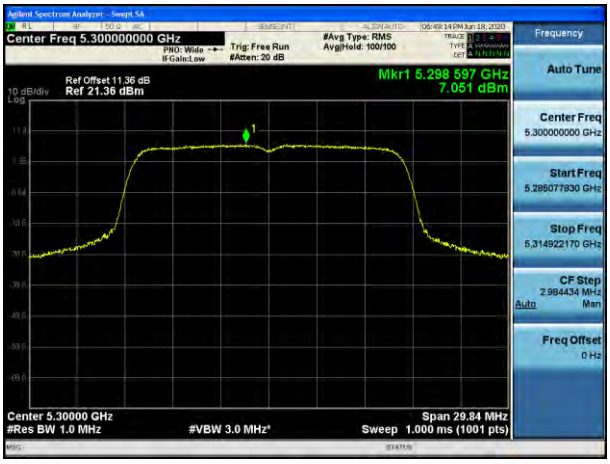
UNII 2C (Ch. 106)	UNII 3 (Ch. 155)
	

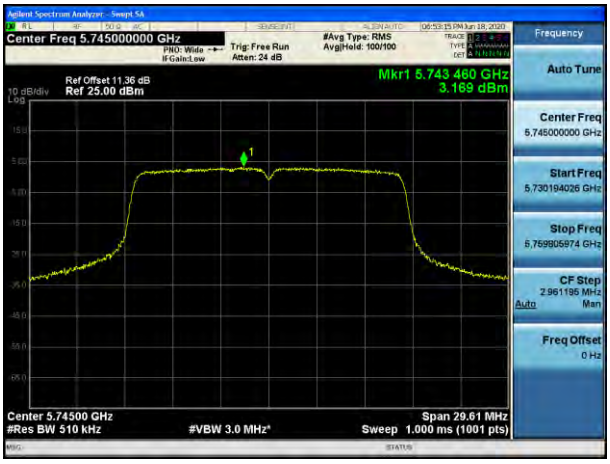
[ANT.2]

▣ Test Plots(802.11a)

Note:

In order to simplify the report, attached plots were only channel of highest power.

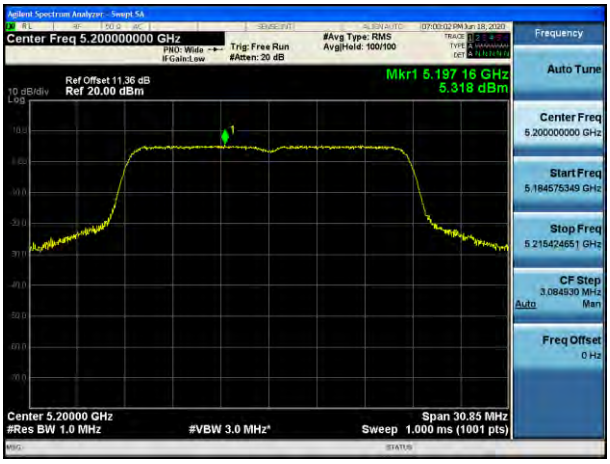
UNII 1 (Ch. 48)	UNII 2A (Ch. 60)
	

UNII 2C (Ch. 120)	UNII 3 (Ch. 149)
	

▣ Test Plots(802.11n(HT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

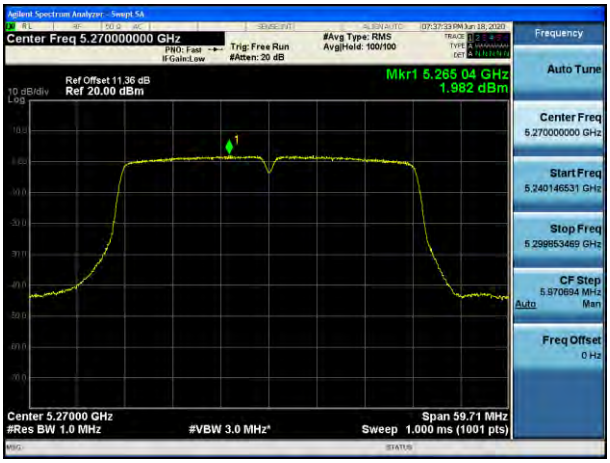
UNII 1 (Ch. 40)	UNII 2A (Ch. 60)
	

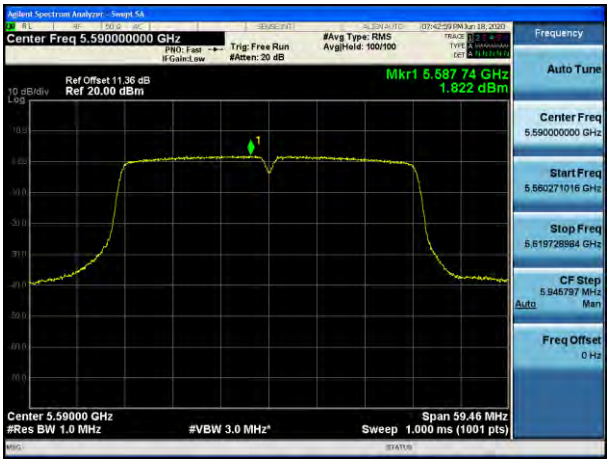
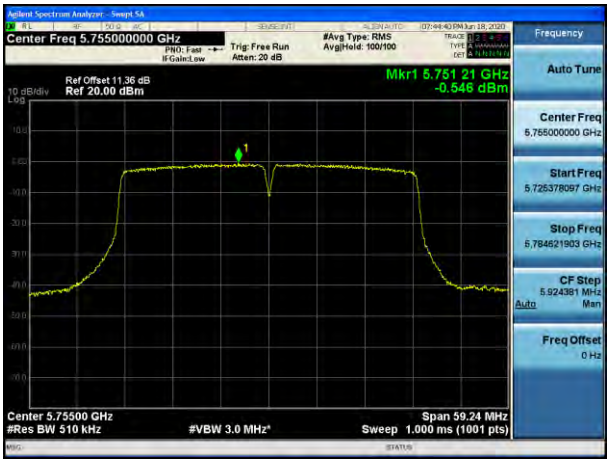
UNII 2C (Ch. 120)	UNII 3 (Ch. 149)
	

▣ Test Plots(802.11n(HT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)	UNII 2A (Ch. 54)
	

UNII 2C (Ch. 118)	UNII 3 (Ch. 151)
	

▣ Test Plots(802.11ac(VHT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

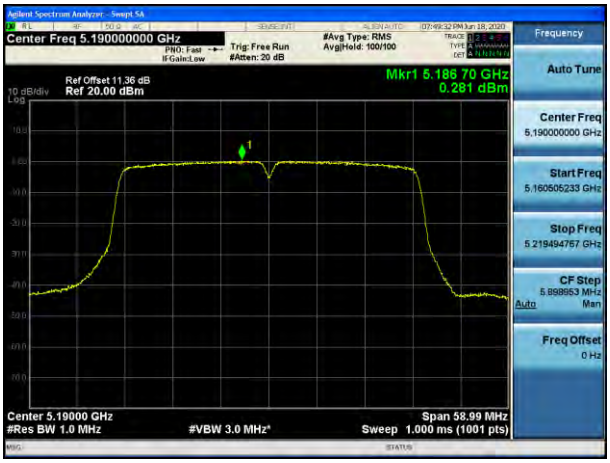
UNII 1 (Ch. 40)	UNII 2A (Ch. 60)
	

UNII 2C (Ch. 120)	UNII 3 (Ch. 149)
	

▣ Test Plots(802.11ac(VHT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)	UNII 2A (Ch. 54)
	

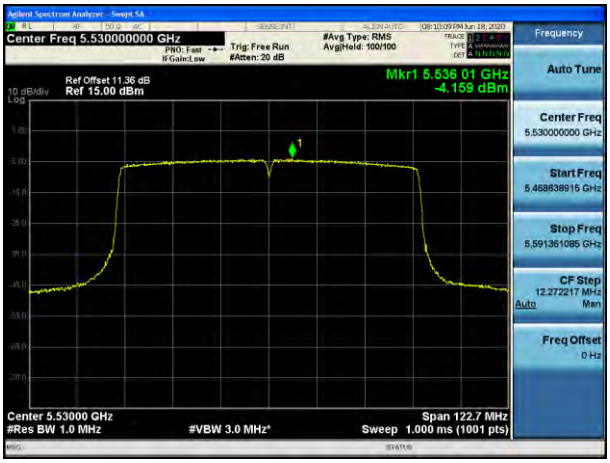
UNII 2C (Ch. 118)	UNII 3 (Ch. 151)
	

▣ Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 42)	UNII 2A (Ch. 58)
	

UNII 2C (Ch. 106)	UNII 3 (Ch. 155)
	

10.6 FREQUENCY STABILITY.

10.6.1 80MHz BW

[ANT.1]

Startup after the EUT is energized

OPERATING BAND: UNII Band 1
OPERATING FREQUENCY: 5,210,000,000 Hz
CHANNEL: 42
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5210037.52	37.52
100%		-30	5210052.85	52.85
100%		-20	5210046.68	46.68
100%		-10	5210040.84	40.84
100%		0	5210036.24	36.24
100%		+10	5210033.66	33.66
100%		+30	5210030.80	30.80
100%		+40	5210039.93	39.93
100%		+50	5210043.47	43.47
HIGH	4.40	+20	5210043.71	43.71
LOW	3.65	+20	5210048.12	48.12

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A
OPERATING FREQUENCY: 5,290,000,000 Hz
CHANNEL: 58
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5290036.19	36.19
100%		-30	5290052.32	52.32
100%		-20	5290045.91	45.91
100%		-10	5290040.32	40.32
100%		0	5290036.08	36.08
100%		+10	5290033.53	33.53
100%		+30	5290030.92	30.92
100%		+40	5290038.89	38.89
100%		+50	5290044.76	44.76
HIGH	4.40	+20	5290046.04	46.04
LOW	3.65	+20	5290046.77	46.77

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C
OPERATING FREQUENCY: 5,530,000,000 Hz
CHANNEL: 106
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5530037.40	37.40
100%		-30	5530052.20	52.20
100%		-20	5530044.18	44.18
100%		-10	5530038.57	38.57
100%		0	5530034.64	34.64
100%		+10	5530032.27	32.27
100%		+30	5530031.37	31.37
100%		+40	5530040.23	40.23
100%		+50	5530045.38	45.38
HIGH	4.40	+20	5530045.32	45.32
LOW	3.65	+20	5530046.17	46.17

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3
OPERATING FREQUENCY: 5,775,000,000 Hz
CHANNEL: 155
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5775040.13	40.13
100%		-30	5775053.36	53.36
100%		-20	5775046.86	46.86
100%		-10	5775041.14	41.14
100%		0	5775036.09	36.09
100%		+10	5775032.55	32.55
100%		+30	5775031.94	31.94
100%		+40	5775042.46	42.46
100%		+50	5775045.97	45.97
HIGH	4.40	+20	5775043.68	43.68
LOW	3.65	+20	5775046.82	46.82

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5210039.68	39.68
100%		-30	5210052.63	52.63
100%		-20	5210045.46	45.46
100%		-10	5210039.32	39.32
100%		0	5210035.59	35.59
100%		+10	5210033.29	33.29
100%		+30	5210032.52	32.52
100%		+40	5210041.26	41.26
100%		+50	5210044.98	44.98
HIGH	4.40	+20	5210043.89	43.89
LOW	3.65	+20	5210047.11	47.11

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A
OPERATING FREQUENCY: 5,290,000,000 Hz
CHANNEL: 58
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5290041.77	41.77
100%		-30	5290052.26	52.26
100%		-20	5290044.17	44.17
100%		-10	5290037.80	37.80
100%		0	5290033.07	33.07
100%		+10	5290029.82	29.82
100%		+30	5290031.68	31.68
100%		+40	5290040.77	40.77
100%		+50	5290046.63	46.63
HIGH	4.40	+20	5290046.03	46.03
LOW	3.65	+20	5290045.94	45.94

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C
OPERATING FREQUENCY: 5,530,000,000 Hz
CHANNEL: 106
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5530040.61	40.61
100%		-30	5530053.20	53.20
100%		-20	5530046.51	46.51
100%		-10	5530040.30	40.30
100%		0	5530036.12	36.12
100%		+10	5530032.91	32.91
100%		+30	5530032.70	32.70
100%		+40	5530041.33	41.33
100%		+50	5530045.05	45.05
HIGH	4.40	+20	5530043.89	43.89
LOW	3.65	+20	5530046.38	46.38

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3
OPERATING FREQUENCY: 5,775,000,000 Hz
CHANNEL: 155
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5775038.57	38.57
100%		-30	5775051.67	51.67
100%		-20	5775044.03	44.03
100%		-10	5775037.70	37.70
100%		0	5775033.11	33.11
100%		+10	5775030.57	30.57
100%		+30	5775032.08	32.08
100%		+40	5775041.23	41.23
100%		+50	5775044.42	44.42
HIGH	4.40	+20	5775043.36	43.36
LOW	3.65	+20	5775046.45	46.45

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

5 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5210042.24	42.24
100%		-30	5210052.64	52.64
100%		-20	5210046.15	46.15
100%		-10	5210040.24	40.24
100%		0	5210035.32	35.32
100%		+10	5210031.41	31.41
100%		+30	5210031.64	31.64
100%		+40	5210042.34	42.34
100%		+50	5210046.81	46.81
HIGH	4.40	+20	5210044.64	44.64
LOW	3.65	+20	5210046.13	46.13

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A
OPERATING FREQUENCY: 5,290,000,000 Hz
CHANNEL: 58
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5290040.63	40.63
100%		-30	5290052.73	52.73
100%		-20	5290044.84	44.84
100%		-10	5290039.10	39.10
100%		0	5290035.60	35.60
100%		+10	5290032.80	32.80
100%		+30	5290031.21	31.21
100%		+40	5290040.70	40.70
100%		+50	5290046.17	46.17
HIGH	4.40	+20	5290045.64	45.64
LOW	3.65	+20	5290048.04	48.04

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C
OPERATING FREQUENCY: 5,530,000,000 Hz
CHANNEL: 106
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5530038.89	38.89
100%		-30	5530052.82	52.82
100%		-20	5530046.33	46.33
100%		-10	5530039.47	39.47
100%		0	5530036.00	36.00
100%		+10	5530031.92	31.92
100%		+30	5530031.05	31.05
100%		+40	5530039.37	39.37
100%		+50	5530044.10	44.10
HIGH	4.40	+20	5530044.90	44.90
LOW	3.65	+20	5530047.75	47.75

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3
OPERATING FREQUENCY: 5,775,000,000 Hz
CHANNEL: 155
REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5775043.58	43.58
100%		-30	5775053.24	53.24
100%		-20	5775047.06	47.06
100%		-10	5775040.70	40.70
100%		0	5775037.21	37.21
100%		+10	5775034.23	34.23
100%		+30	5775031.40	31.40
100%		+40	5775041.15	41.15
100%		+50	5775045.86	45.86
HIGH	4.40	+20	5775044.88	44.88
LOW	3.65	+20	5775048.02	48.02

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

10 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5210042.07	42.07
100%		-30	5210051.75	51.75
100%		-20	5210044.36	44.36
100%		-10	5210037.26	37.26
100%		0	5210034.01	34.01
100%		+10	5210031.75	31.75
100%		+30	5210031.05	31.05
100%		+40	5210038.95	38.95
100%		+50	5210044.12	44.12
HIGH	4.40	+20	5210045.34	45.34
LOW	3.65	+20	5210046.52	46.52

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.