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TEST REPORT

FCC/ISED UNII Test for ETPFFRPP01

APPLICANT
LG Innotek Co., Ltd.

REPORT NO.
HCT-RF-2101-FI003

DATE OF ISSUE
January 21, 2021

Tested by
Jeong Ho Kim

Technical Manager
Jong Seok Lee

HCT CO., LTD.
Soo Chan Lee
SooChan Lee / CEO

HCT CO., LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Tel. +82 31 634 6300 F ax. +82 31 645 6401

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Additional Model
-

Applicant	**LG Innotek Co., Ltd.** 26, Hanamsandan 5beon-ro Gwangsan-gu, Gwangju, 506-731, South Korea
Eut Type Model Name	4PPoE WLAN Bridge ETPFFRPP01
FCC ID IC	YZP-ETPFFRPP01 7414C-ETPFFRPP01
Modulation type	OFDM
FCC Classification	Unlicensed National Information Infrastructure(NII)
FCC Rule Part(s)	Part 15.407
ISED Rule Part(s)	RSS-247 Issue 2 (February 2017) RSS-Gen Issue 5_Amendment 1 (March 2019)

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	January 21, 2021	Initial Release

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 / ISED Rules under normal use and maintenance.

CONTENTS

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	ETPFFRPP01	
Additional Model	-	
EUT Type	4PPoE WLAN Bridge	
Power Supply	AC 110 [V] (Input : 100-130 [V]) / Operating Voltage : DC 52[V])	
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 type	Ant.A: PCB printed antenna Ant.B: Dipole antenna	
Antenna Peak Gain	Ant.A: 1.47 dBi(UNII 1), 1.50 dBi(UNII 2A)/ 1.50 dBi(UNII 2C)/ 1.44 dBi(UNII 3) Ant.B: 3.53 dBi(UNII 1), 3.35 dBi(UNII 2A)/ 3.35 dBi(UNII 2C)/ 3.72 dBi(UNII 3)	
Straddle channel	Supported	
TDWR Band	FCC : Supported / ISED : Not Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	November 23, 2020 ~ January 21, 2021	
PMN (Product Marketing Number)	4PPoE WLAN Bridge	
HVIN (Hardware Version Identification Number)	ETPFFRPP01	
FVIN (Firmware Version Identification Number)	v1.0	
HMN (Host Marketing Name)	N/A	
EUT serial numbers	Radiated: ETPFFRPP01_001 Conducted: ETPFFRPP01_002	

ANTENNA CONFIGURATIONS

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

Configurations	SISO (Antenna Selection)		MIMO(SDM)
	Ant A(Printed)	Ant B (External)	Ant A + Ant B
802.11a	O	O	X
802.11n(HT20)	O	O	O
802.11n(HT40)	O	O	O
802.11ac(VHT20)	O	O	O
802.11ac(VHT40)	O	O	O
802.11ac(VHT80)	O	O	O

Note:

1. O = Support, X = Not Support
2. SISO = Single Input Single Output
3. MIMO = Multiple Input Multiple Output
4. SDM = Spatial Diversity Multiplexing
5. ANT A= PCB Printed Antenna(internal) / ANT B= Dipole Antenna(external)

2. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) e) (iii)

- ✓ Directional gain(Spatial Multiplexing) = $G_{ANT\ MAX}$ -10*log(N_{ANT}/N_{SS})

Band	Ant Gain (dBi)		N_{ANT}/ N_{ss}	Directional Gain (dBi)
UNII 1	ANT A	1.47	2 / 2	3.53
	ANT B	3.53		
UNII 2A	ANT A	1.50	2 / 2	3.35
	ANT B	3.35		
UNII 2C	ANT A	1.50	2 / 2	3.35
	ANT B	3.35		
UNII 3	ANT A	1.44	2 / 2	3.72
	ANT B	3.72		

2. MAXIMUM OUTPUT POWER

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

Band	Mode	SISO				MIMO	
		Ant.A(Only) Power		Ant.B(Only) Power		Ant.A + Ant.B (ANT ALL_SDM) Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	16.85	0.048	15.75	0.038	-	-
	802.11n (HT20)	17.06	0.051	15.24	0.033	15.36	0.034
	802.11n (HT40)	17.40	0.055	17.70	0.059	16.94	0.049
	802.11ac (VHT20)	17.22	0.053	15.43	0.035	15.43	0.035
	802.11ac (VHT40)	17.32	0.054	17.88	0.061	16.78	0.048
	802.11ac (VHT80)	13.12	0.021	12.73	0.019	13.48	0.022
UNII2A	802.11a	16.96	0.050	16.84	0.048	-	-
	802.11n (HT20)	17.07	0.051	17.68	0.059	16.58	0.045
	802.11n (HT40)	17.20	0.053	18.04	0.064	17.02	0.050
	802.11ac (VHT20)	17.46	0.056	18.19	0.066	16.75	0.047
	802.11ac (VHT40)	17.27	0.053	17.87	0.061	17.03	0.050
	802.11ac (VHT80)	13.65	0.023	13.30	0.021	13.51	0.022
UNII2C	802.11a	17.30	0.054	18.32	0.068	-	-
	802.11n (HT20)	17.47	0.056	18.99	0.079	17.61	0.058
	802.11n (HT40)	19.58	0.091	19.95	0.099	19.15	0.082
	802.11ac (VHT20)	17.93	0.062	18.95	0.079	17.77	0.060
	802.11ac (VHT40)	19.74	0.094	20.03	0.101	19.36	0.086
	802.11ac (VHT80)	19.23	0.084	19.19	0.083	18.95	0.079
UNII3	802.11a	19.53	0.090	19.45	0.088	-	-
	802.11n (HT20)	19.73	0.094	19.04	0.080	18.69	0.074
	802.11n (HT40)	19.83	0.096	19.43	0.088	19.12	0.082
	802.11ac (VHT20)	19.93	0.099	19.59	0.091	18.60	0.072
	802.11ac (VHT40)	20.17	0.104	19.95	0.099	19.38	0.087
	802.11ac (VHT80)	19.04	0.080	18.43	0.070	18.59	0.072

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. / RSS-Gen issue 5, RSS-247 issue 2.

GENERAL TEST PROCEDURES

Conducted Emissions

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

Radiated Emissions

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

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program 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).
For ISED, test facility was accepted dated February 14, 2019 (CAB identifier: 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 / RSS-Gen (Issue 5) Section 8:

"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.

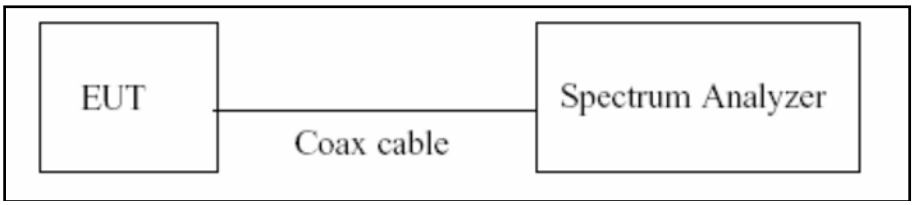
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance

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.

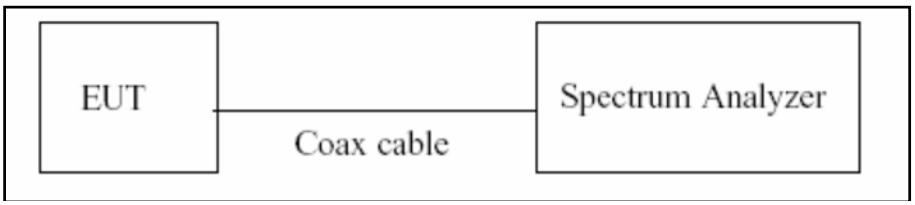
1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

8.2. 6dB Bandwidth & 26dB Bandwidth & 99 % Bandwidth

Limit

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

Test Configuration



Test Procedure(26dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

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.

Test Procedure (99 % Bandwidth for ISED)

The transmitter output is connected to the spectrum analyzer.

RBW = 1% ~ 5% of the occupied bandwidth

VBW ≒ 3 x RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

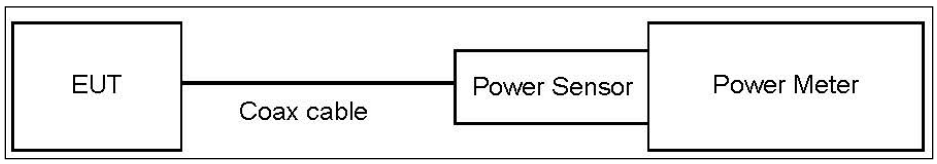
8.3. Output Power Measurement

Limit

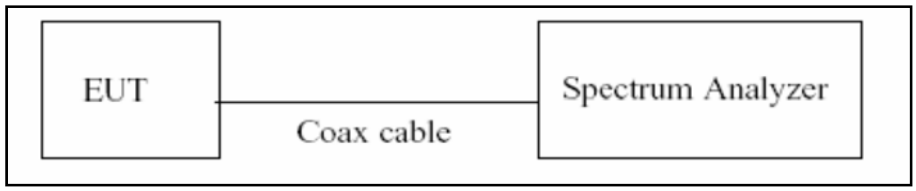
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

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(20 dB) + Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	23.28
UNII 2A	23.28
UNII 2C	23.28
UNII 3	23.28

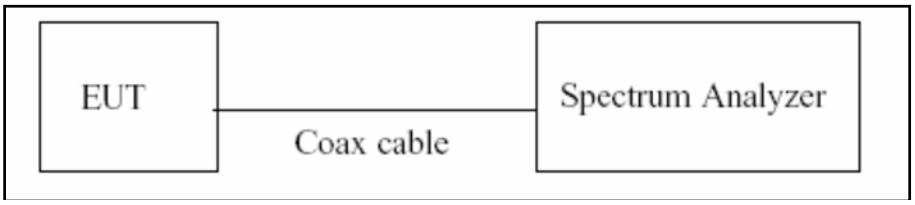
(Actual value of loss for the attenuator and cable combination)

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(20 dB) + Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	23.28
UNII 2A	23.28
UNII 2C	23.28
UNII 3	23.28

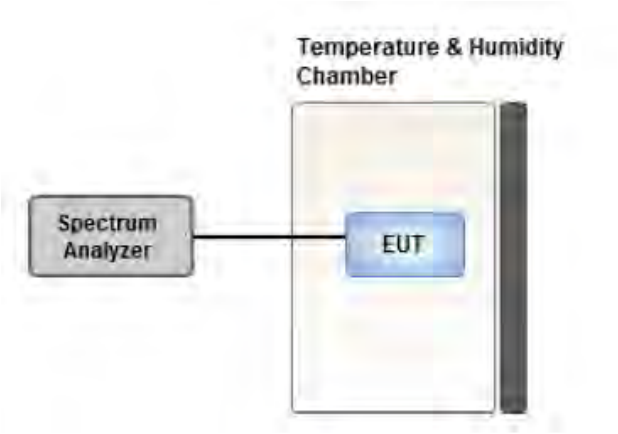
(Actual value of loss for the attenuator and cable combination)

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.

FCC

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

ISED

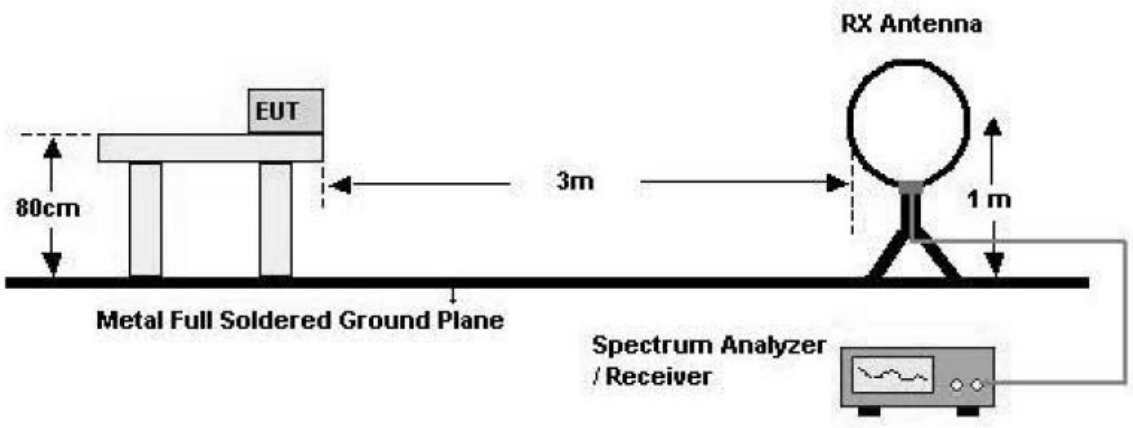
Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	6.37/F(kHz)	300
0.490 – 1.705	63.7/F(kHz)	30
1.705 – 30	0.08	30

FCC&ISED

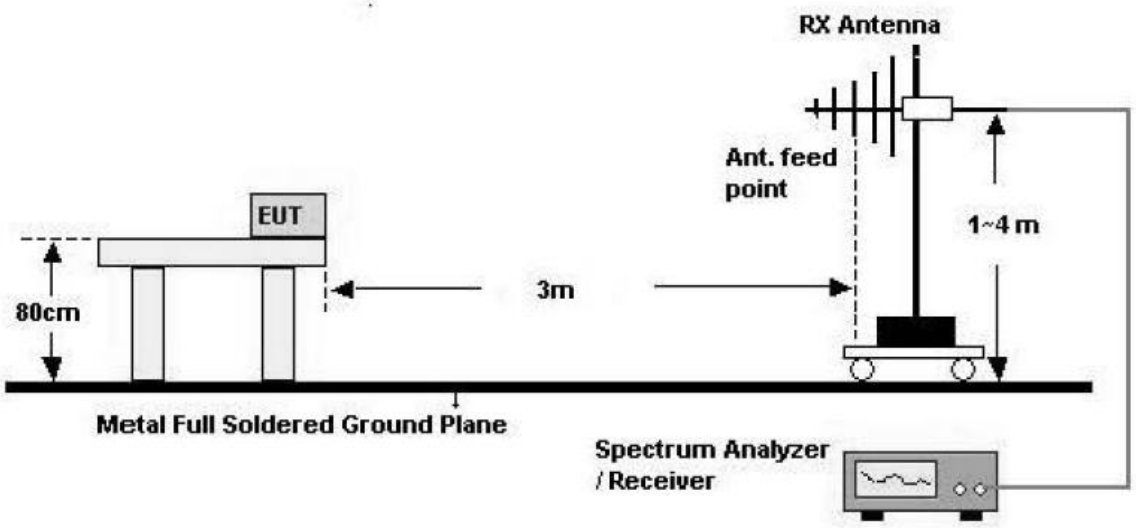
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

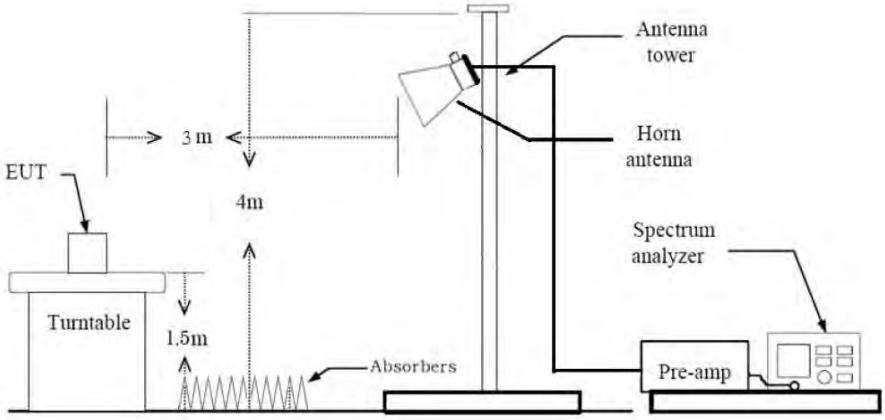
Below 30 MHz



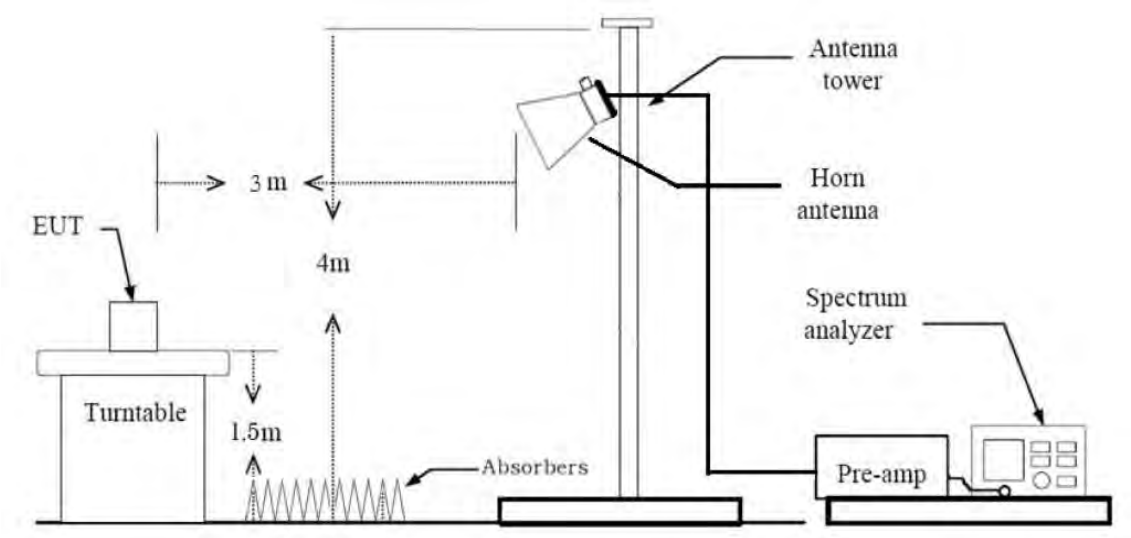
30 MHz - 1 GHz



Above 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

[SISO]

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6	0.729	1.372	1000
802.11n(HT20)	MCS 0(6.5)	0.717	1.444	1000
802.11n(HT40)	MCS 0(13.5)	0.557	2.542	3000
802.11ac(VHT20)	MCS 0(6.5)	0.718	1.442	1000
802.11ac(VHT40)	MCS 0(13.5)	0.558	2.535	3000
802.11ac(VHT80)	MCS 0(29.3)	0.385	4.146	10000

[MIMO]

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11n(HT20)	MCS 8(13)	0.568	2.455	3000
802.11n(HT40)	MCS 8(27)	0.402	3.953	3000
802.11ac(VHT20)	MCS 0(13)	0.570	2.441	3000
802.11ac(VHT40)	MCS 0(27)	0.407	3.905	3000
802.11ac(VHT80)	MCS 0(58.5)	0.267	5.729	10000

8.8. Receiver Spurious Emissions

Limit

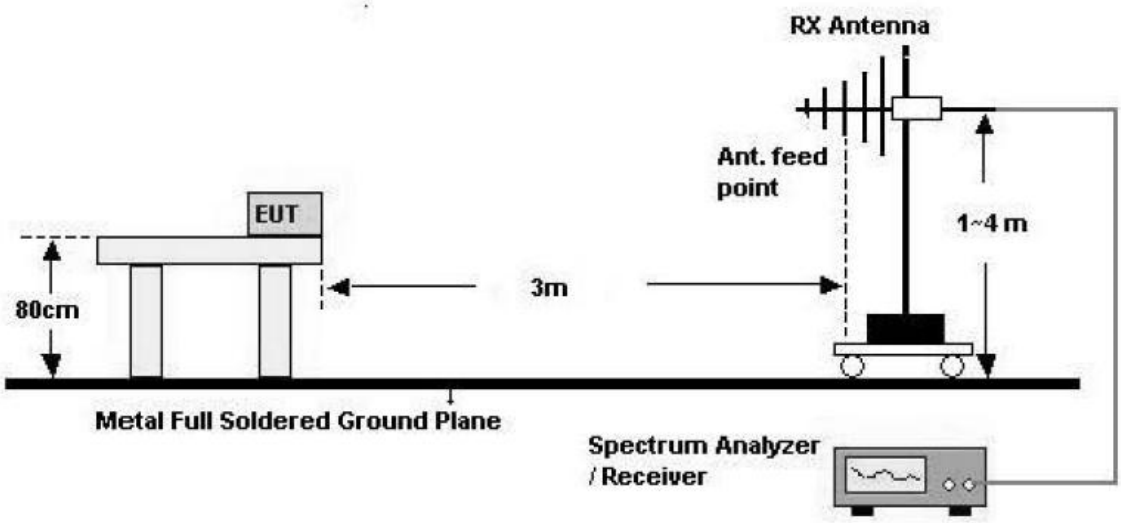
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

Measurements for compliance with the limits in table may be performed at distances other than 3 metres.

Test Configuration

30 MHz - 1 GHz



Test Procedure of Receiver 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):

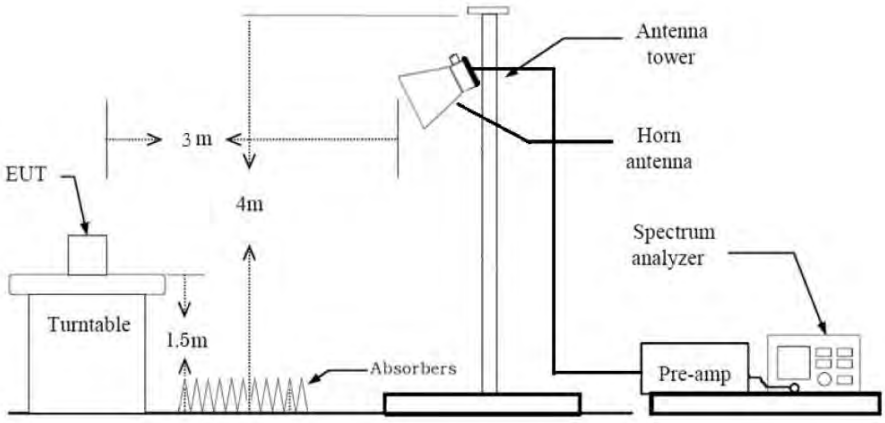
- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW ≥ 3 x RBW

(2) Measurement Type(Quasi-peak):

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

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

Above 1 GHz



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):

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 3 x RBW

(2) Measurement Type(Average):

- We performed using a reduced video BW method was done with the analyzer in linear mode
- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 1/τ Hz, where τ = pulse width in seconds

The actual setting value of VBW = 1 kHz

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. Distance extrapolation factor = 20log (test distance / specific distance) (dB)

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

8.9. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
2. All configurations of antenna were investigated and the worst case configuration results are reported.

Mode	Test Description	Worstcase
SISO (Antenna Selection)	RADIATED SPURIOUS EMISSIONS	SISO Ant B (External): UNII 1, 2A, 2C, 3 : 802.11a
Ant A + Ant B(MIMO(SDM))		UNII 1, 2A, 2C, 3 : 802.11n(HT20),(116 ch)
SISO (Antenna Selection)	RADIATED RESTRICTED BAND EDGE	SISO Ant B (External)
Ant A + Ant B(MIMO(SDM))		UNII 1, 2A, 2C : 802.11ac(VHT80),(42 ch, 106 ch)

3. EUT Axis
   - Radiated Spurious Emissions : Y
   - Radiated Restricted Band Edge : X
4. All datarate of operation were investigated and the worst case datarate results are reported
   - 802.11a : 6Mbps
   - 802.11n : MCS0
   - 802.11ac : MCS0
   - 802.11n(MIMO_SDM) : MCS8
   - 802.11ac(MIMO_SDM) : MCS0

5. 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

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone + Notebook

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.
2. SISO & MIMO were tested and the all case results are reported.
   - Mode : Ant.A(SISO), Ant.B(SISO), Ant A + Ant B(MIMO(SDM))

9. SUMMARY OF TEST RESULTS

FCC

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

ISED

Test Description	ISED Part Section(s)	Test Limit	Test Condition	Test Result
99% Bandwidth	RSS-GEN, 6.7	N/A	CONDUCTED	PASS
6 dB Bandwidth	RSS-247, 6.2.4.1	> 500 kHz (5725~5850 MHz)		PASS
Maximum Conducted Output Power,	RSS-247, 6.2	< 250 mW or 11+10 log $_{10}$ (BW) dBm (5250-5350 MHz, 5470-5600 MHz and 5650-5725 MHz) Whichever power is less		PASS
	RSS-247, 6.2.4 1	<1 W (5725-5850 MHz)		
Maximum e.i.r.p	RSS-247, 6.2	< 200 mW or 10+10 log $_{10}$ (BW) dBm (5150-5250 MHz) < 1 W or 17+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 1 W or 17+10 log $_{10}$ (BW) dBm (5470-5600 MHz and 5650- 5725 MHz) Whichever power is less		PASS
Power Spectral Density	RSS-247 6.2	<10 dBm/ MHz(e.i.r.p.) (5150-5250 MHz) <11 dBm/MHz(Conducted) (5250-5350 MHz, 5470-5600 MHz and 5650-5725 MHz)		PASS
	RSS-247, 6.2.4 1	<30 dBm/500 kHz(Conducted) (5725-5850 MHz)		
Frequency Stability	RSS-GEN 8.11	should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation.		PASS
AC Conducted Emissions 150 kHz-30 MHz	RSS-GEN, 8.8	RSS-GEN section 8.8 table 4		PASS
Undesirable Emissions	RSS-247, 6.2.1 2	26 dBc at 5250~5350 MHz (5150~5350 MHz)		PASS
	RSS-247, 6.2	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)	RADIATED	PASS
	RSS-247, 6.2.4 2	cf. Section 8.7 (UNII 3)		
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	RSS-Gen, 8.9 RSS-Gen, 8.10	RSS-Gen section 8.9 table 5, 6 section 8.10 table 7		PASS
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3		PASS

10. TEST RESULT

10.1 DUTY CYCLE

[SISO]

Mode	Data Rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	1.360	1.866	0.729	1.372
	9	0.912	1.416	0.644	1.911
	12	0.692	1.193	0.580	2.369
	18	0.469	0.973	0.482	3.172
	24	0.355	0.860	0.413	3.837
	36	0.244	0.747	0.327	4.853
	48	0.187	0.692	0.271	5.675
	54	0.173	0.676	0.256	5.911

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.272	1.774	0.717	1.444
	1	0.658	1.159	0.567	2.462
	2	0.449	0.950	0.472	3.259
	3	0.349	0.851	0.410	3.875
	4	0.243	0.747	0.325	4.875
	5	0.192	0.696	0.276	5.593
	6	0.176	0.678	0.259	5.860
	7	0.160	0.662	0.242	6.170
802.11n (HT40)	0	0.632	1.136	0.557	2.542
	1	0.336	0.839	0.400	3.975
	2	0.236	0.739	0.320	4.955
	3	0.189	0.692	0.273	5.643
	4	0.135	0.639	0.212	6.736
	5	0.112	0.615	0.182	7.400
	6	0.103	0.607	0.170	7.683
	7	0.096	0.598	0.160	7.947

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.276	1.778	0.718	1.442
	1	0.660	1.164	0.567	2.464
	2	0.451	0.955	0.472	3.257
	3	0.353	0.857	0.412	3.854
	4	0.248	0.750	0.330	4.808
	5	0.197	0.699	0.281	5.506
	6	0.179	0.682	0.263	5.802
	7	0.163	0.667	0.245	6.115
	8	0.144	0.646	0.223	6.521
802.11ac (VHT40)	0	0.635	1.138	0.558	2.535
	1	0.341	0.843	0.404	3.934
	2	0.240	0.742	0.323	4.904
	3	0.192	0.694	0.276	5.583
	4	0.140	0.643	0.217	6.630
	5	0.116	0.619	0.188	7.260
	6	0.108	0.611	0.176	7.538
	7	0.100	0.604	0.166	7.797
	8	0.092	0.594	0.154	8.114
	9	0.087	0.591	0.148	8.297
802.11ac (VHT80)	0	0.315	0.818	0.385	4.146
	1	0.180	0.683	0.263	5.794
	2	0.132	0.635	0.207	6.833
	3	0.112	0.615	0.182	7.410
	4	0.088	0.592	0.149	8.256
	5	0.076	0.579	0.131	8.823
	6	0.071	0.576	0.124	9.065
	7	0.068	0.571	0.119	9.243
	8	0.063	0.567	0.112	9.508
	9	0.063	0.566	0.111	9.543

[MIMO(SDM)]

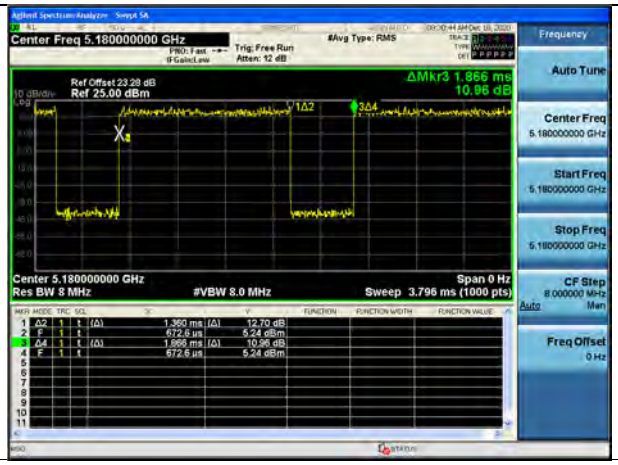
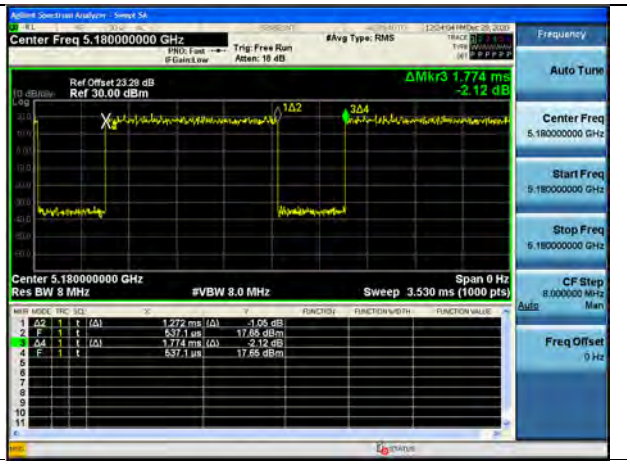
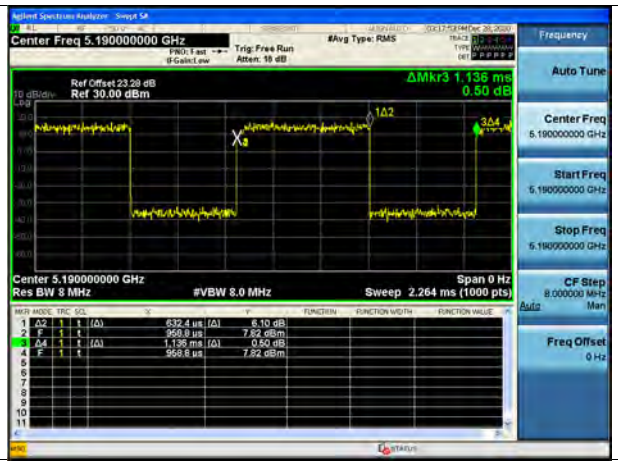
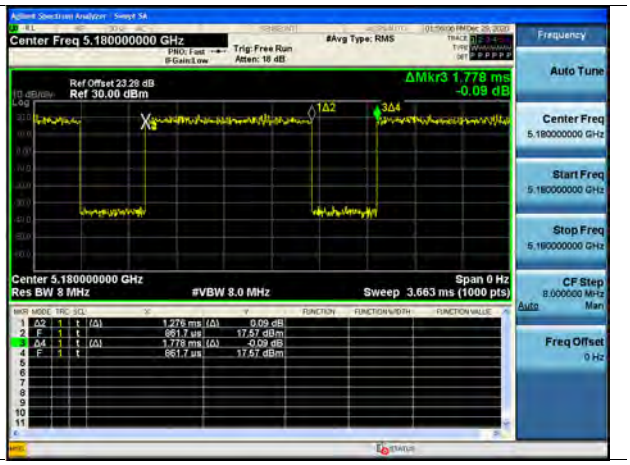
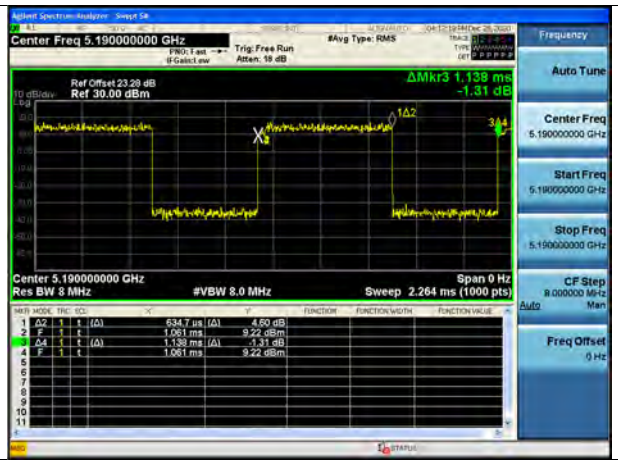
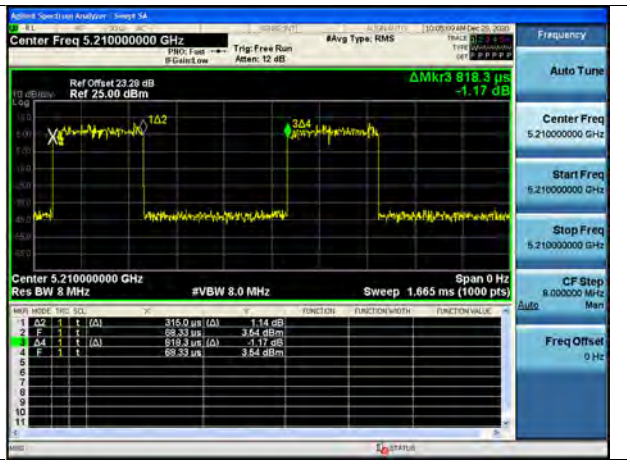
Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	8	0.660	1.162	0.568	2.455
	9	0.352	0.856	0.411	3.859
	10	0.248	0.752	0.330	4.818
	11	0.195	0.698	0.280	5.531
	12	0.144	0.646	0.223	6.521
	13	0.120	0.624	0.192	7.160
	14	0.112	0.616	0.182	7.404
	15	0.105	0.607	0.172	7.639
802.11n (HT40)	8	0.340	0.844	0.402	3.953
	9	0.193	0.695	0.277	5.570
	10	0.139	0.643	0.217	6.637
	11	0.117	0.620	0.188	7.252
	12	0.092	0.595	0.154	8.117
	13	0.080	0.584	0.138	8.605
	14	0.076	0.579	0.131	8.823
	15	0.073	0.576	0.126	8.997
802.11ac (VHT20)	0	0.665	1.167	0.570	2.441
	1	0.355	0.859	0.413	3.836
	2	0.253	0.755	0.335	4.753
	3	0.200	0.702	0.285	5.456
	4	0.148	0.651	0.228	6.423
	5	0.124	0.627	0.197	7.049
	6	0.116	0.619	0.188	7.260
	7	0.108	0.611	0.176	7.538
	8	0.096	0.598	0.160	7.947

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT40)	0	0.345	0.848	0.407	3.905
	1	0.196	0.699	0.280	5.522
	2	0.144	0.647	0.223	6.526
	3	0.120	0.623	0.193	7.151
	4	0.096	0.600	0.161	7.940
	5	0.084	0.587	0.143	8.451
	6	0.079	0.583	0.136	8.659
	7	0.076	0.578	0.131	8.815
	8	0.071	0.575	0.124	9.057
	9	0.068	0.571	0.119	9.243
802.11ac (VHT80)	0	0.183	0.686	0.267	5.729
	1	0.116	0.619	0.188	7.263
	2	0.092	0.595	0.155	8.088
	3	0.080	0.584	0.137	8.643
	4	0.069	0.571	0.120	9.205
	5	0.064	0.567	0.113	9.451
	6	0.060	0.563	0.106	9.741
	7	0.060	0.563	0.106	9.741
	8	0.056	0.559	0.100	9.993
	9	0.056	0.559	0.100	9.993

Note:

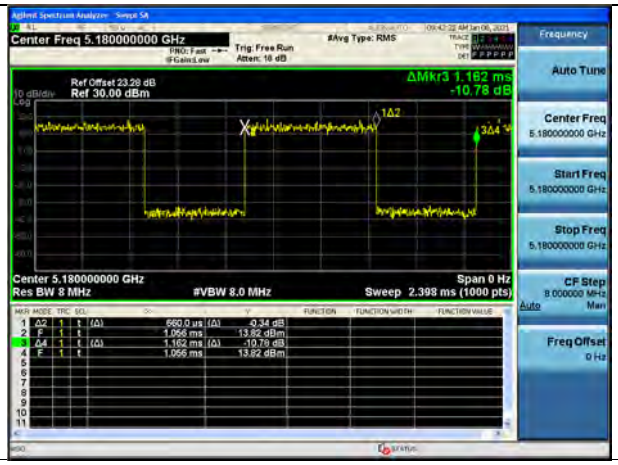
In order to simplify the report, attached plots were only lowest datarate.

[SISO]

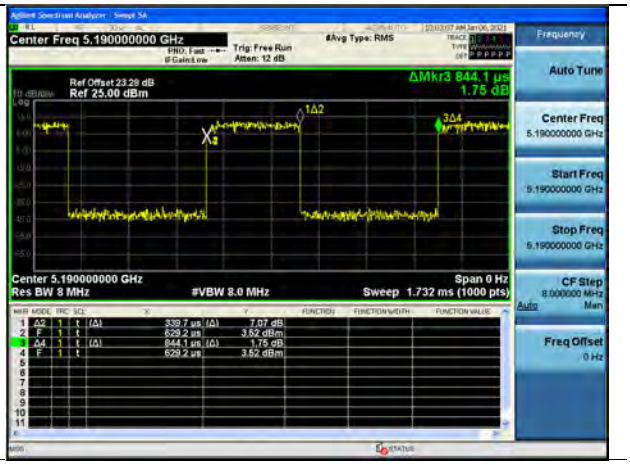
802.11a	802.11n(HT20)
	
802.11n(HT40)	**802.11ac(VHT20)**
	
802.11ac(VHT40)	**802.11ac(VHT80)**
	

[MIMO(SDM)]

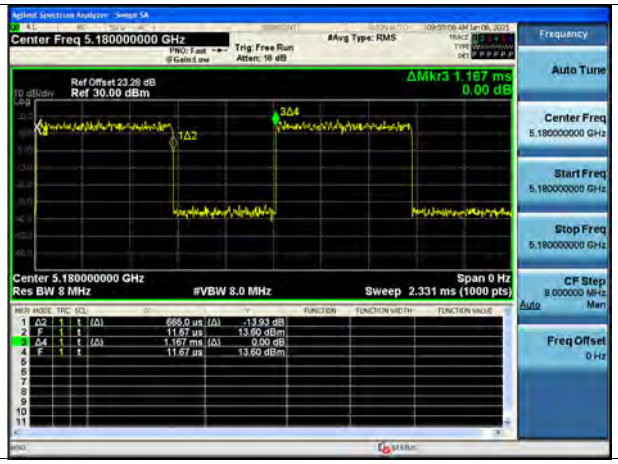
802.11n(HT20)



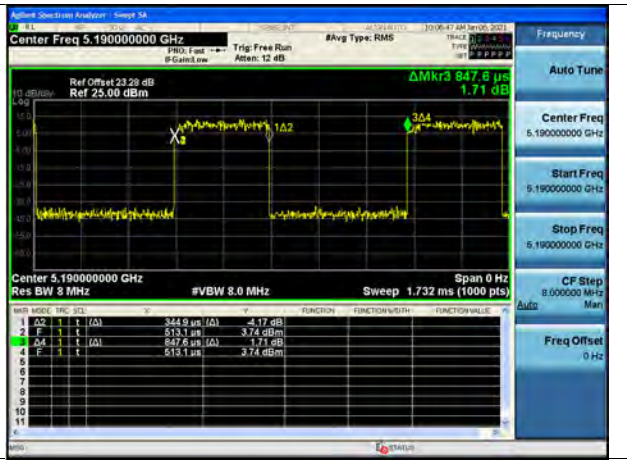
802.11n(HT40)



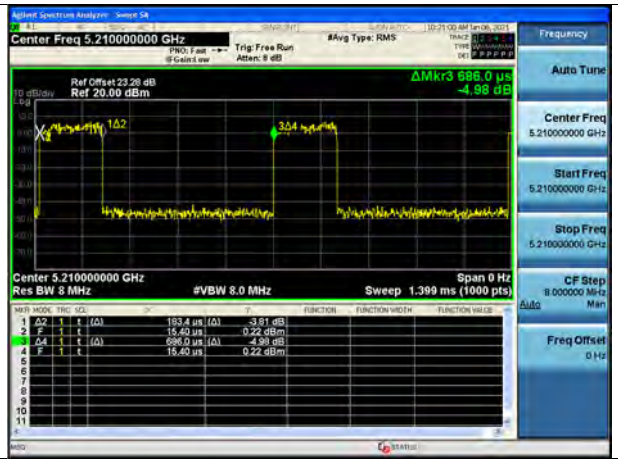
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



10.2 26dB BANDWIDTH & 99 % BANDWIDTH

FCC

[ANT.A]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	18.38	16.364
5200	40	18.50	16.375
5240	48	18.44	16.359
5260	52	18.52	16.383
5300	60	18.47	16.380
5320	64	18.50	16.369
5500	100	18.45	16.363
5580	116	18.32	16.373
5720	144	18.45	16.357
5745	149	18.48	16.364
5785	157	18.52	16.365
5825	165	18.42	16.361

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.31	17.548
5200	40	19.39	17.554
5240	48	19.16	17.545
5260	52	19.32	17.547
5300	60	19.32	17.563
5320	64	19.33	17.554
5500	100	19.43	17.549
5580	116	19.40	17.568
5720	144	19.37	17.568
5745	149	19.43	17.552
5785	157	19.44	17.563
5825	165	19.46	17.580

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.66	36.122
5230	46	40.54	36.151
5270	54	40.73	36.068
5310	62	40.46	36.172
5510	102	40.80	36.140
5550	110	40.48	36.187
5710	142	40.94	36.118
5755	151	41.07	36.235
5795	159	41.22	36.169

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.37	17.561
5200	40	19.31	17.565
5240	48	19.35	17.558
5260	52	19.41	17.565
5300	60	19.31	17.557
5320	64	19.37	17.551
5500	100	19.31	17.560
5580	116	19.31	17.571
5720	144	19.32	17.573
5745	149	19.36	17.559
5785	157	19.39	17.572
5825	165	19.36	17.566

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.72	36.153
5230	46	40.48	36.129
5270	54	41.01	36.169
5310	62	40.77	36.122
5510	102	41.47	36.139
5550	110	40.80	36.135
5710	142	40.51	36.152
5755	151	41.45	36.180
5795	159	40.91	36.159

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.37	75.314
5290	58	81.26	75.247
5530	106	81.82	75.272
5690	138	95.05	75.268
5775	155	86.66	75.283

[ANT.B]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	18.45	16.359
5200	40	18.42	16.351
5240	48	18.42	16.362
5260	52	18.39	16.368
5300	60	18.37	16.365
5320	64	18.49	16.367
5500	100	18.41	16.372
5580	116	18.44	16.382
5720	144	18.47	16.374
5745	149	18.52	16.363
5785	157	18.40	16.378
5825	165	18.36	16.353

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.35	17.540
5200	40	19.41	17.555
5240	48	19.40	17.545
5260	52	19.33	17.546
5300	60	19.37	17.548
5320	64	19.40	17.554
5500	100	19.37	17.564
5580	116	19.23	17.537
5720	144	19.36	17.566
5745	149	19.44	17.564
5785	157	19.41	17.557
5825	165	19.34	17.564

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.54	36.178
5230	46	40.83	36.134
5270	54	40.73	36.149
5310	62	40.93	36.159
5510	102	40.92	36.167
5550	110	40.76	36.128
5710	142	40.97	36.228
5755	151	40.90	36.120
5795	159	41.07	36.243

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.42	17.555
5200	40	19.30	17.576
5240	48	19.30	17.552
5260	52	19.30	17.557
5300	60	19.33	17.554
5320	64	19.32	17.564
5500	100	19.43	17.566
5580	116	19.42	17.563
5720	144	19.45	17.564
5745	149	19.35	17.569
5785	157	19.38	17.553
5825	165	19.37	17.560

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.82	36.123
5230	46	40.65	36.090
5270	54	40.47	36.056
5310	62	41.12	36.129
5510	102	40.69	36.127
5550	110	40.75	36.154
5710	142	40.67	36.152
5755	151	41.25	36.133
5795	159	40.95	36.177

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.33	75.030
5290	58	81.09	74.981
5530	106	81.81	75.113
5690	138	108.01	75.542
5775	155	81.49	75.238

[MIMO_ANT.A]

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.34	17.546
5200	40	19.32	17.566
5240	48	19.24	17.567
5260	52	19.26	17.562
5300	60	19.43	17.552
5320	64	19.43	17.570
5500	100	19.34	17.559
5580	116	19.36	17.559
5720	144	19.37	17.562
5745	149	19.30	17.558
5785	157	19.37	17.553
5825	165	19.34	17.556

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.94	36.111
5230	46	40.70	36.083
5270	54	41.22	36.085
5310	62	40.87	36.061
5510	102	40.44	36.054
5550	110	40.92	36.123
5710	142	40.87	36.094
5755	151	40.52	36.051
5795	159	41.04	36.152

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.21	17.552
5200	40	19.27	17.563
5240	48	19.23	17.549
5260	52	19.28	17.548
5300	60	19.32	17.548
5320	64	19.35	17.552
5500	100	19.36	17.565
5580	116	19.23	17.552
5720	144	19.14	17.554
5745	149	19.26	17.552
5785	157	19.34	17.548
5825	165	19.30	17.567

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.71	36.113
5230	46	39.97	36.084
5270	54	40.45	36.103
5310	62	40.64	36.144
5510	102	40.91	36.083
5550	110	40.51	36.071
5710	142	40.37	36.055
5755	151	40.12	36.118
5795	159	40.12	36.121

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.71	75.224
5290	58	81.68	75.198
5530	106	80.59	74.562
5690	138	81.27	75.010
5775	155	81.64	75.168

[MIMO_ANT.B]

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.19	17.571
5200	40	19.15	17.563
5240	48	19.17	17.565
5260	52	19.22	17.579
5300	60	19.18	17.546
5320	64	19.13	17.574
5500	100	19.20	17.570
5580	116	19.18	17.560
5720	144	19.11	17.573
5745	149	19.21	17.568
5785	157	19.23	17.569
5825	165	19.20	17.574

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.56	36.141
5230	46	40.29	36.188
5270	54	40.05	36.109
5310	62	40.39	36.119
5510	102	40.35	36.127
5550	110	40.27	36.226
5710	142	40.38	36.139
5755	151	40.84	36.208
5795	159	39.99	36.247

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.20	17.587
5200	40	19.25	17.574
5240	48	19.15	17.578
5260	52	19.23	17.565
5300	60	19.25	17.570
5320	64	19.17	17.561
5500	100	19.22	17.556
5580	116	19.17	17.556
5720	144	19.19	17.565
5745	149	19.22	17.581
5785	157	19.22	17.571
5825	165	19.24	17.582

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.07	36.112
5230	46	40.21	36.077
5270	54	40.39	36.153
5310	62	40.58	36.107
5510	102	40.53	36.070
5550	110	40.37	36.048
5710	142	40.18	36.164
5755	151	40.68	36.112
5795	159	40.15	36.129

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	80.88	75.143
5290	58	81.16	75.311
5530	106	80.12	74.543
5690	138	80.64	74.952
5775	155	80.53	75.146

[ANT.A]

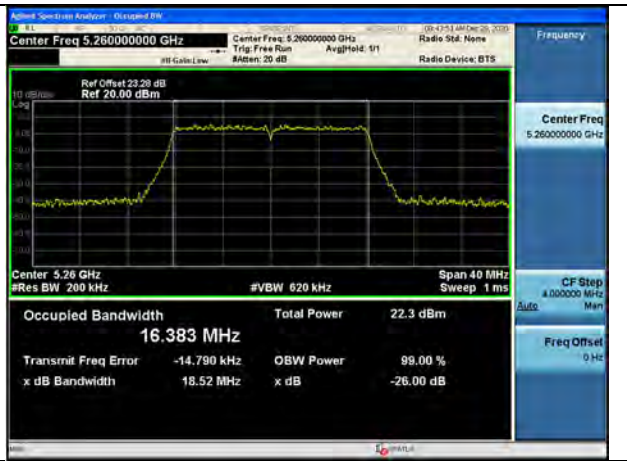
▣ Test Plots(802.11a)

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 (CH100)

802.11a UNII 3 BAND 26dB Bandwidth (CH 157)

▣ Test Plots(802.11n(HT20))

Note:

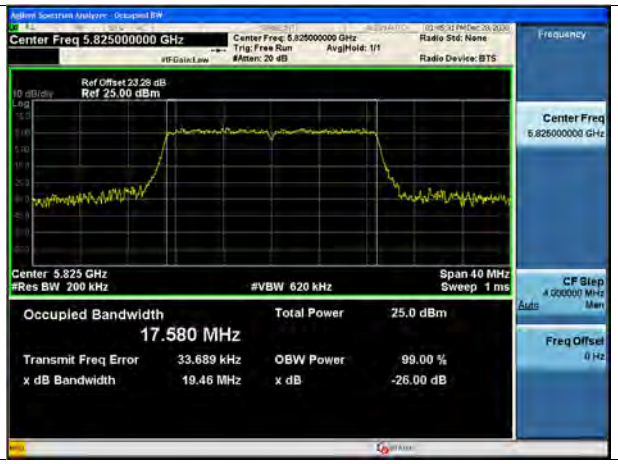
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 40)

802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 64)

802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 100)

802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 165)



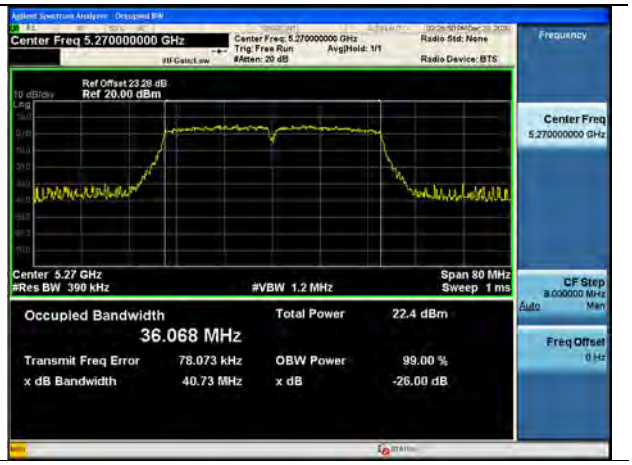
▣ Test Plots(802.11n(HT40))

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 142)

802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)

▣ Test Plots(802.11ac(VHT20))

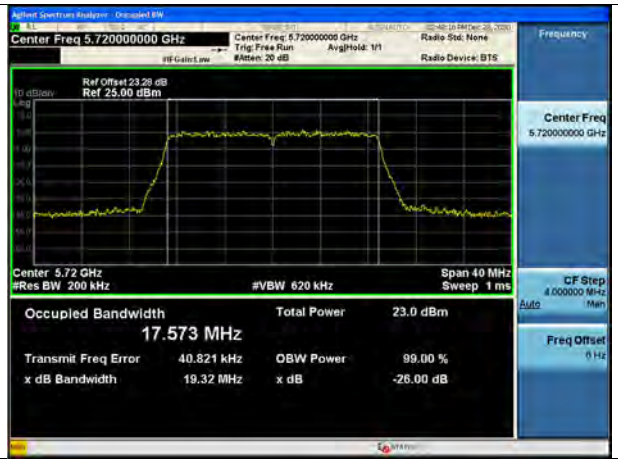
Note:

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

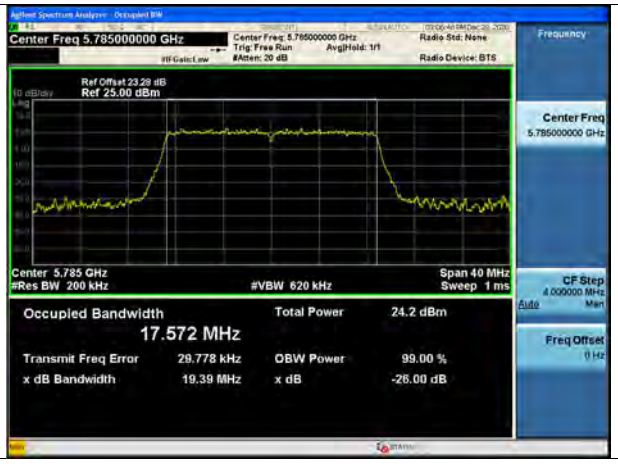
802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 36)

802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 52)

802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)



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 38)

802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)

802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)

802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)

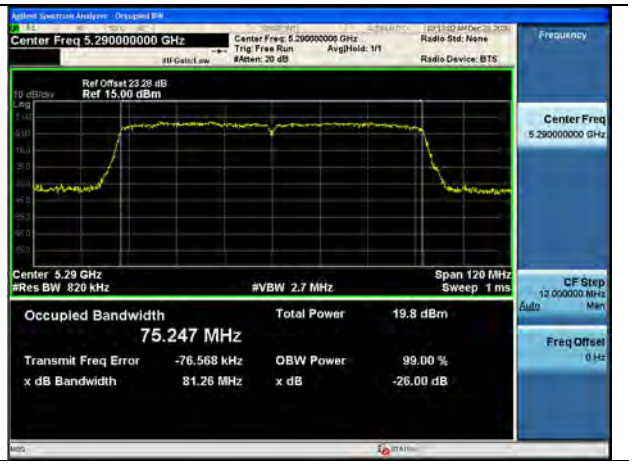
▣ Test Plots(802.11ac(VHT80))

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.B]

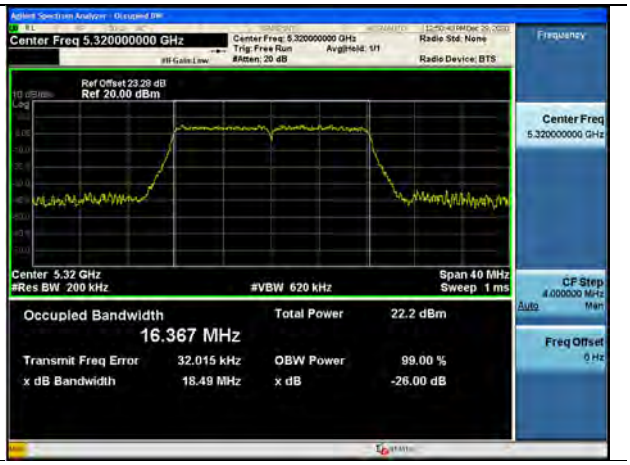
▣ Test Plots(802.11a)

Note:

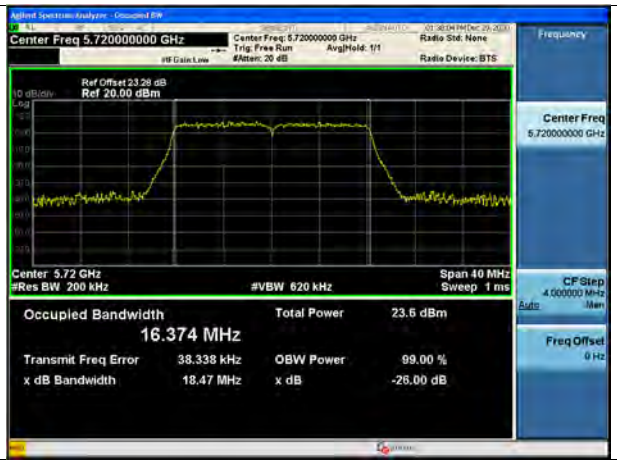
In order to simplify the report, attached plots were only the most wide channel.

802.11a UNII 1 BAND 26dB Bandwidth (CH 36)

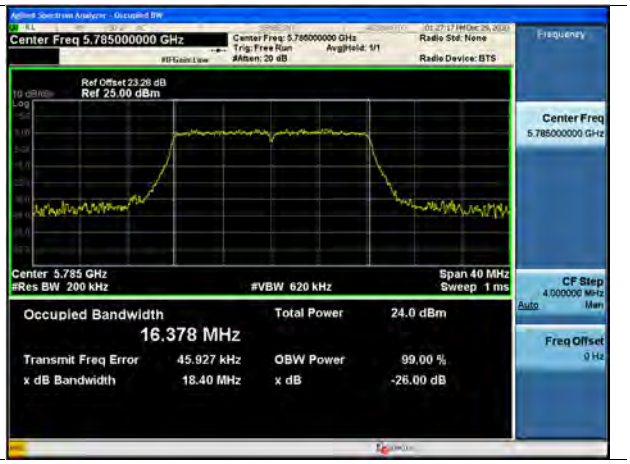
802.11a UNII 2A BAND 26dB Bandwidth (CH 64)



802.11a UNII 2C BAND 26dB Bandwidth (CH144)



802.11a UNII 3 BAND 26dB Bandwidth (CH 157)



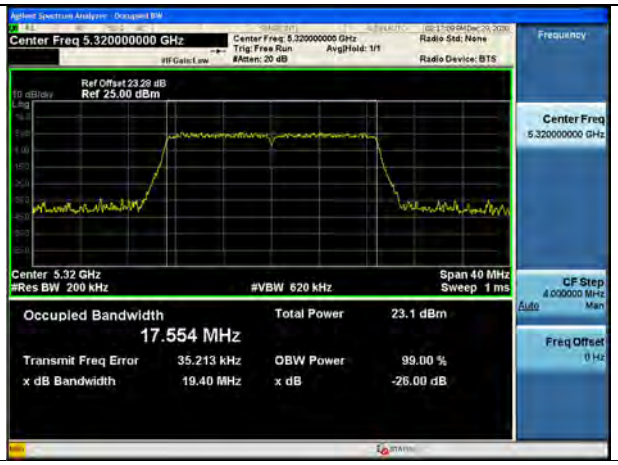
▣ Test Plots(802.11n(HT20))

Note:

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

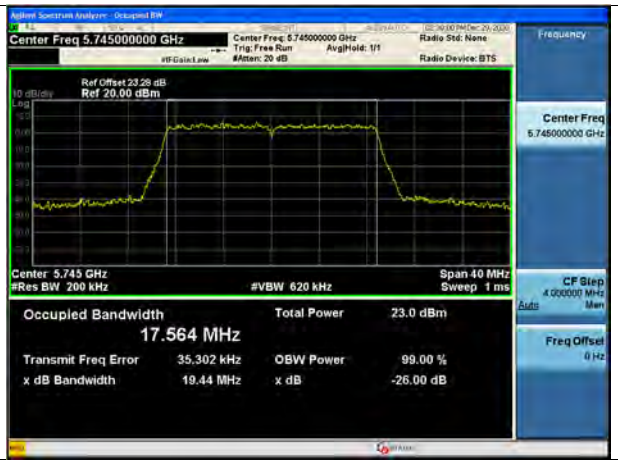
802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 40)

802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 64)



802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 100)

802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 149)



▣ 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 46)

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:

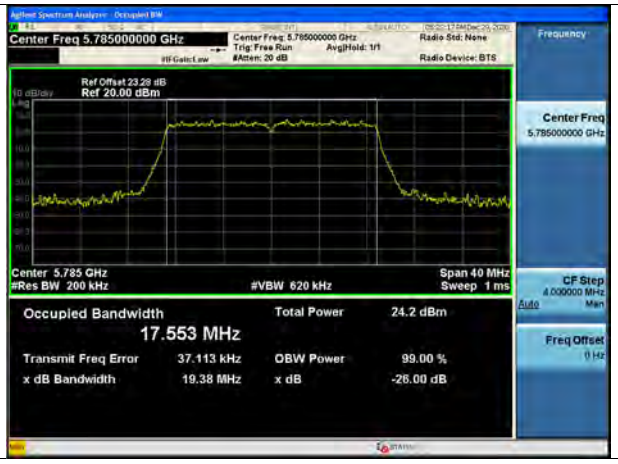
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 36)

802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 60)

802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)

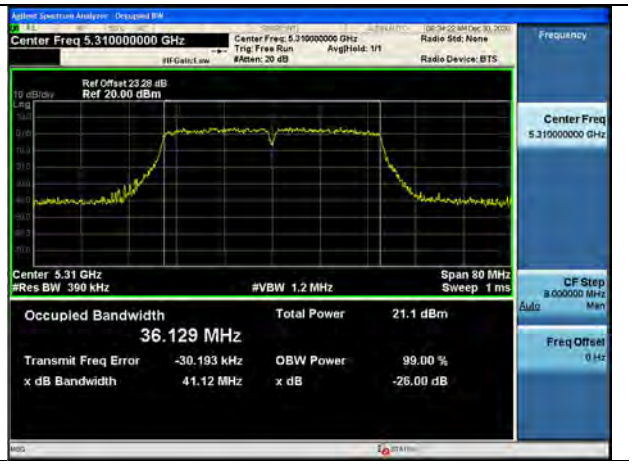
802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)



▣ 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 38)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 110)	802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)
	

▣ Test Plots(802.11ac(VHT80))

Note:

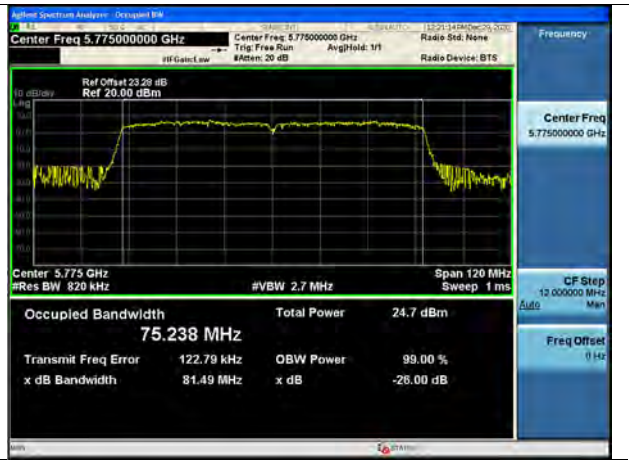
In order to simplify the report, attached plots were only the most wide channel.

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)



[MIMO_ANT.A]

▣ 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 64)
	
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 144)	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 110)

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 40)

802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)

802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 100)

802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)

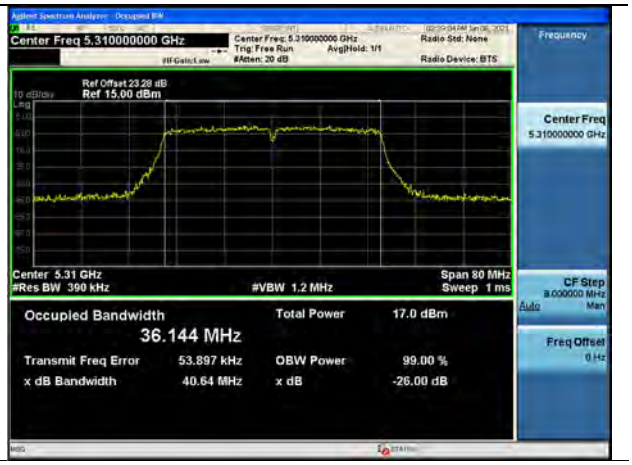
▣ Test Plots(802.11ac(VHT40))

Note:

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

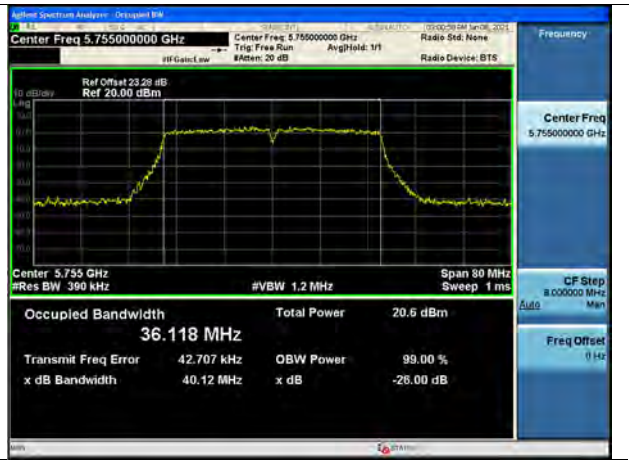
802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)

802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 62)



802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)

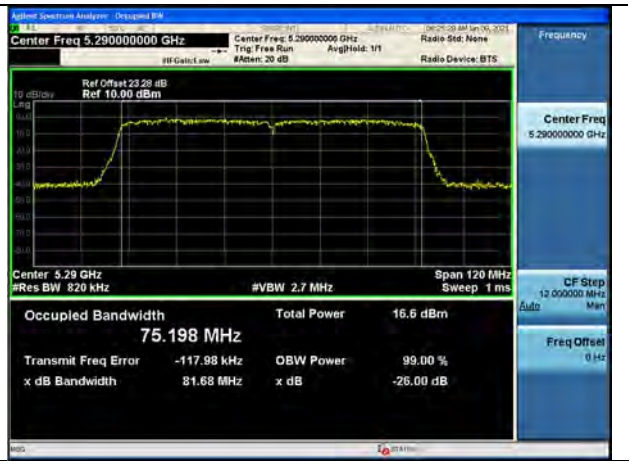
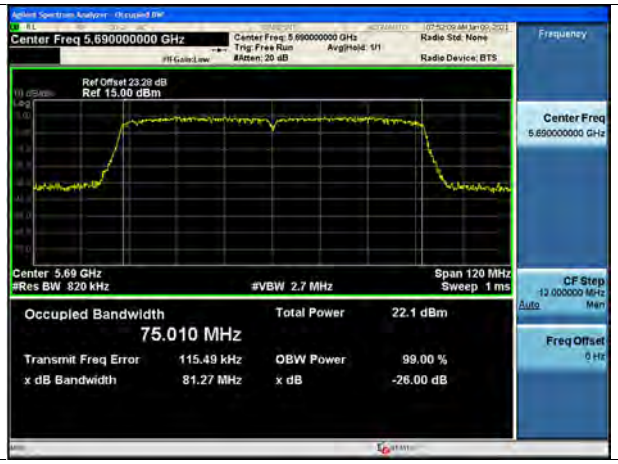
802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)



▣ 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)
	

[MIMO_ANT.B]

▣ Test Plots(802.11n(HT20))

Note:

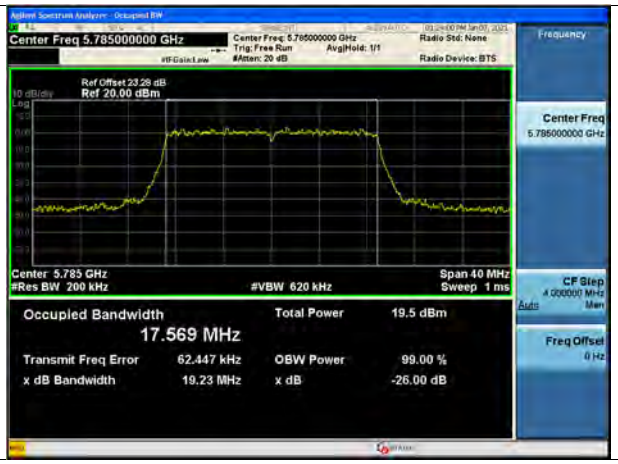
In order to simplify the report, attached plots were only the most wide channel.

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 100)

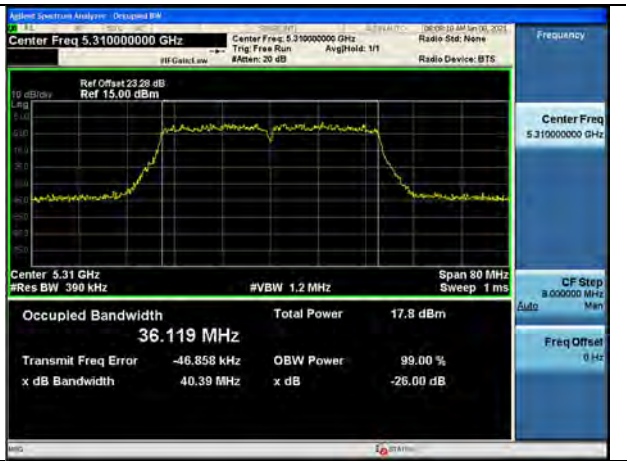
802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)



▣ 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 151)
	

▣ Test Plots(802.11ac(VHT20))

Note:

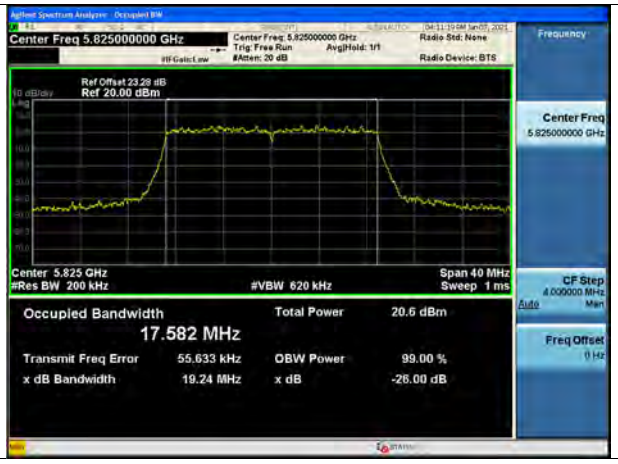
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 40)

802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 60)

802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 100)

802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 165)



▣ 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 62)

802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)

802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)

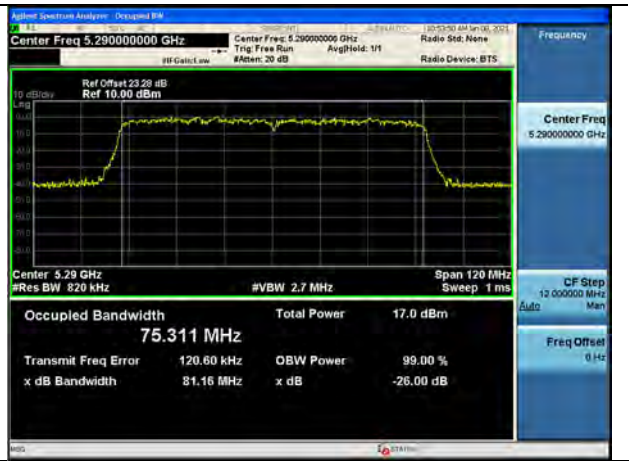
▣ Test Plots(802.11ac(VHT80))

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)

99% bandwidth UNII-3 (ISED)

[ANT.A]

802.11a Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	16.483
5785	157	16.501
5825	165	16.510

802.11n(HT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.630
5785	157	17.648
5825	165	17.678

802.11n(HT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.603
5795	159	36.590

802.11ac(VHT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.637
5785	157	17.643
5825	165	17.650

802.11ac(VHT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.318
5795	159	36.416

802.11ac(VHT80) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	75.283

[ANT.B]

802.11a Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	16.487
5785	157	16.494
5825	165	16.512

802.11n(HT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.656
5785	157	17.650
5825	165	17.648

802.11n(HT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.596
5795	159	36.657

802.11ac(VHT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.632
5785	157	17.629
5825	165	17.641

802.11ac(VHT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.444
5795	159	36.295

802.11ac(VHT80) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	75.238

[MIMO_ANT.A]

802.11n(HT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.654
5785	157	17.660
5825	165	17.645

802.11n(HT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.224
5795	159	36.187

802.11ac(VHT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.621
5785	157	17.620
5825	165	17.619

802.11ac(VHT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.137
5795	159	36.180

802.11ac(VHT80) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	75.168

[MIMO_ANT.B]

802.11n(HT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.632
5785	157	17.627
5825	165	17.631

802.11n(HT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.223
5795	159	36.265

802.11ac(VHT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.636
5785	157	17.641
5825	165	17.659

802.11ac(VHT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.206
5795	159	36.179

802.11ac(VHT80) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	75.146

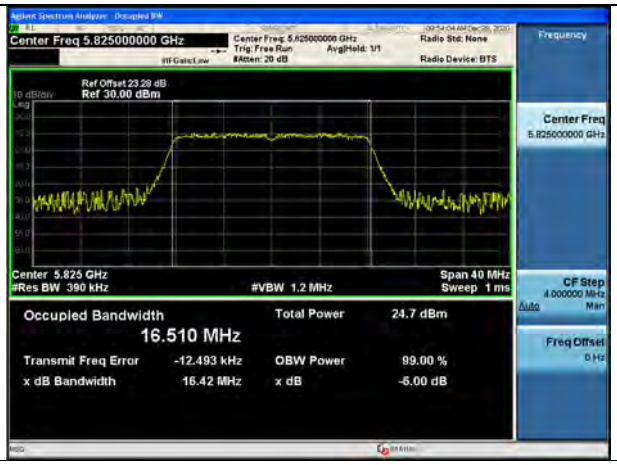
[ANT.A]

▣ Test Plots

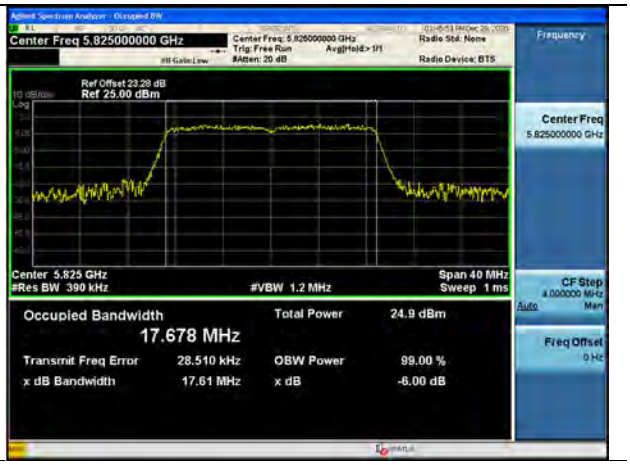
Note:

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

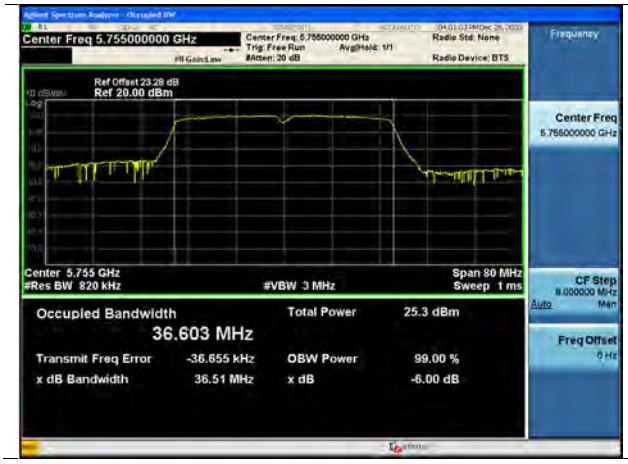
802.11a UNII 3 BAND 26dB Bandwidth (CH 165)



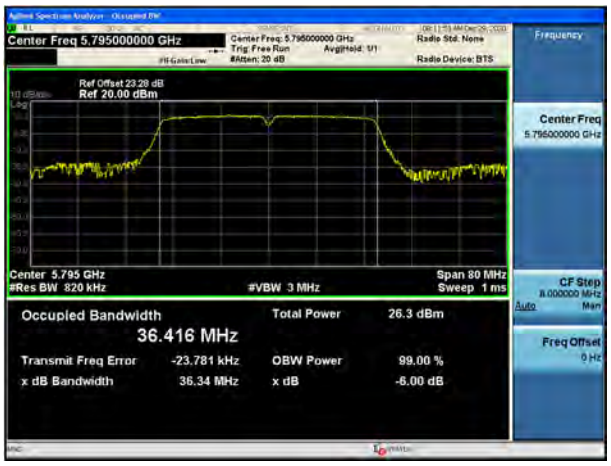
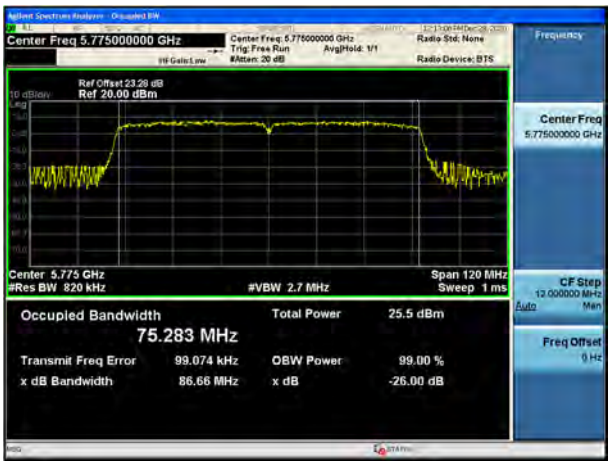
802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 165)



802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 151)



802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 165)

802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)	802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)
	

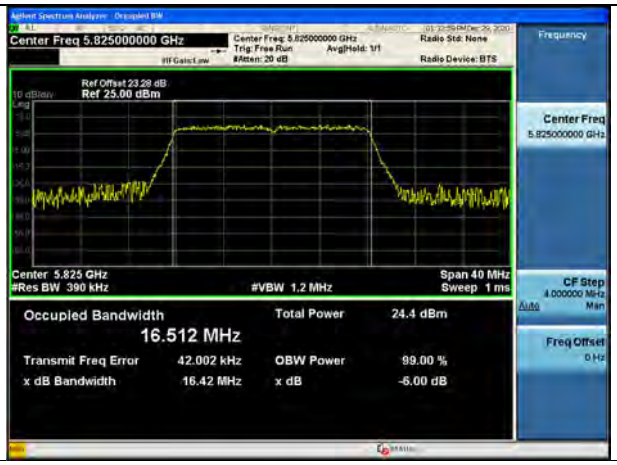
[ANT.B]

▣ Test Plots

Note:

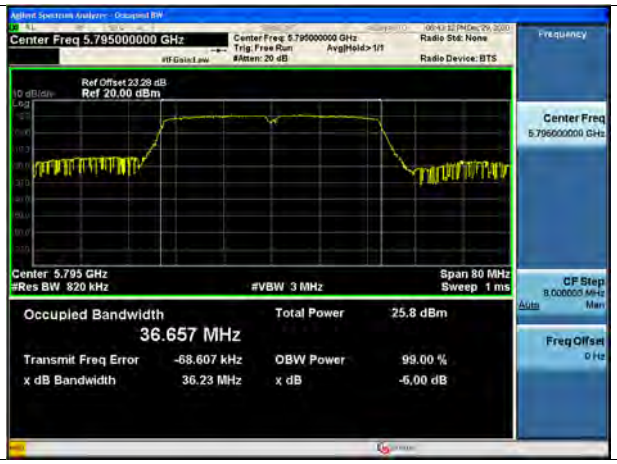
In order to simplify the report, attached plots were only the most wide channel.

802.11a UNII 3 BAND 26dB Bandwidth (CH 165)

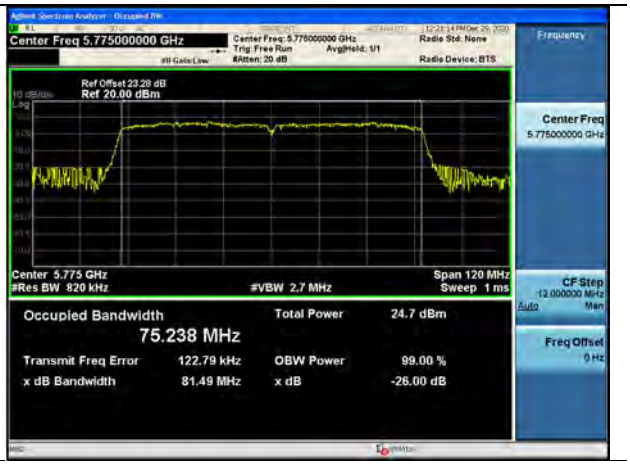


802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 149)

802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)



802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 165)

802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)	802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)
	

[MIMO_ANT.A]

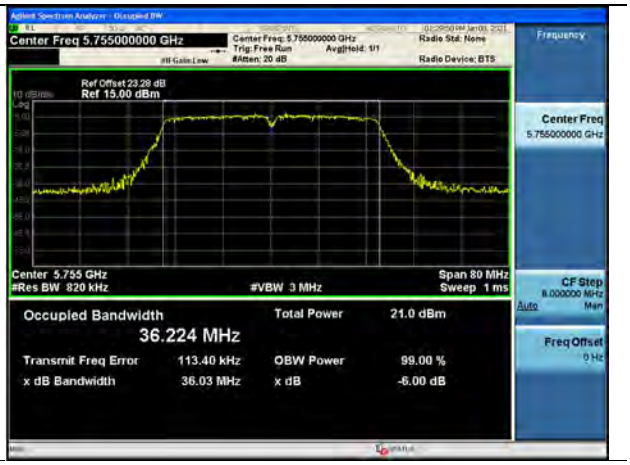
▣ Test Plots

Note:

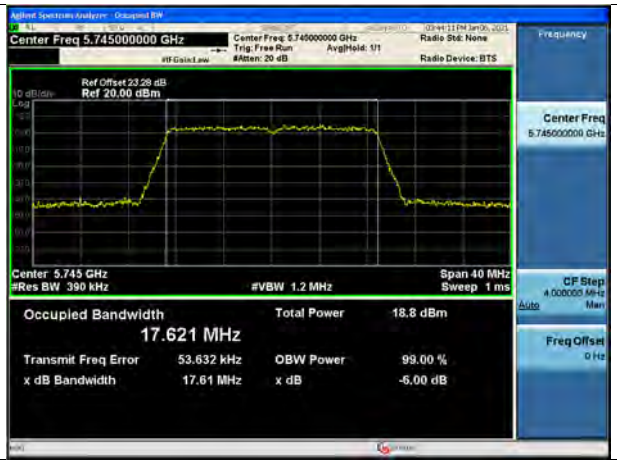
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)

802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 151)

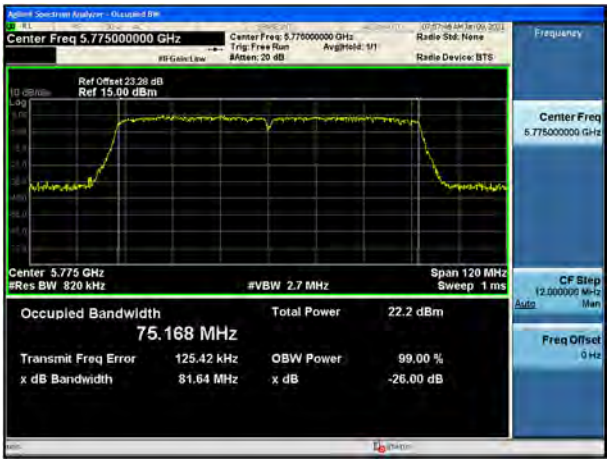


802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 149)



802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)

802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)



[MIMO_ANT.B]

▣ Test Plots

Note:

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

802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 149)

802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)

802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 165)

802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)

802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)

10.3 6DB BANDWIDTH

[ANT.A]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.34	> 0.5	Pass
5785	157	16.35	> 0.5	Pass
5825	165	16.35	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.57	> 0.5	Pass
5785	157	17.61	> 0.5	Pass
5825	165	17.61	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.16	> 0.5	Pass
5795	159	35.38	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.60	> 0.5	Pass
5785	157	17.60	> 0.5	Pass
5825	165	17.61	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.45	> 0.5	Pass
5795	159	35.43	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.29	> 0.5	Pass

[ANT.B]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.36	> 0.5	Pass
5785	157	16.37	> 0.5	Pass
5825	165	16.34	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.60	> 0.5	Pass
5785	157	17.60	> 0.5	Pass
5825	165	17.60	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.21	> 0.5	Pass
5795	159	35.26	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.56	> 0.5	Pass
5785	157	17.60	> 0.5	Pass
5825	165	17.60	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.14	> 0.5	Pass
5795	159	35.12	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.28	> 0.5	Pass

[MIMO_ANT.A]

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.60	> 0.5	Pass
5785	157	17.39	> 0.5	Pass
5825	165	17.59	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.23	> 0.5	Pass
5795	159	35.23	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.38	> 0.5	Pass
5785	157	17.58	> 0.5	Pass
5825	165	17.58	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.37	> 0.5	Pass
5795	159	35.26	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.25	> 0.5	Pass

[MIMO_ANT.B]

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.58	> 0.5	Pass
5785	157	17.59	> 0.5	Pass
5825	165	17.55	> 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	35.24	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.60	> 0.5	Pass
5785	157	17.61	> 0.5	Pass
5825	165	17.59	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.38	> 0.5	Pass
5795	159	35.57	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.27	> 0.5	Pass

[ANT.A]

▣ Test Plots

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

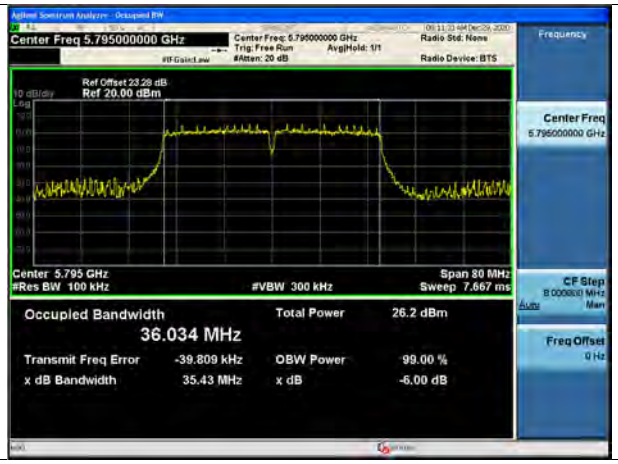
802.11a (CH.149)

802.11n(HT20) (CH.149)

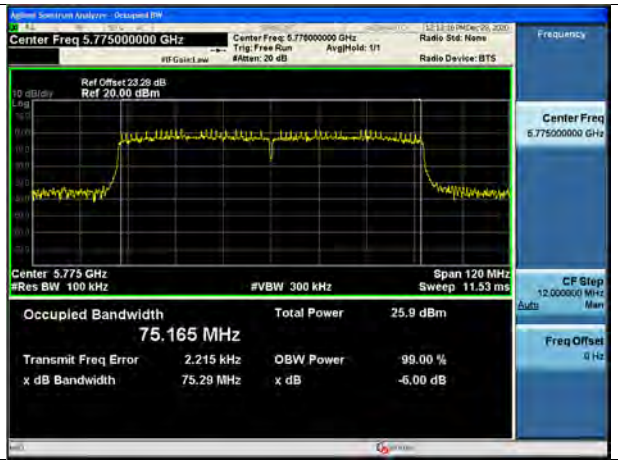
802.11n(HT40) (CH.151)

802.11ac(VHT20) (CH.157)

802.11ac(VHT40) (CH.159)



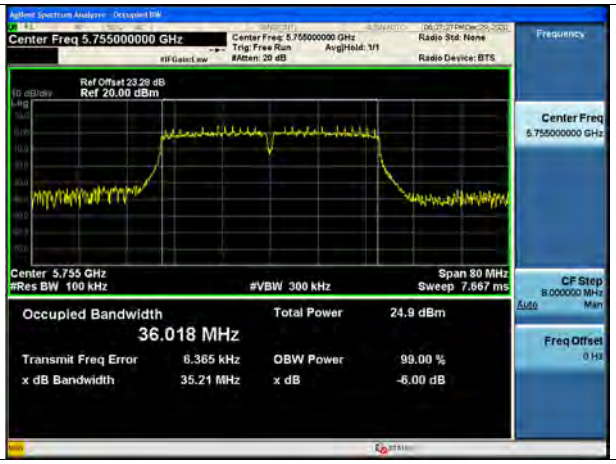
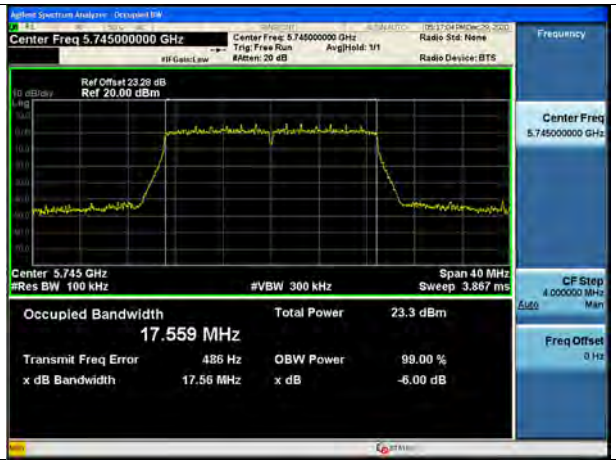
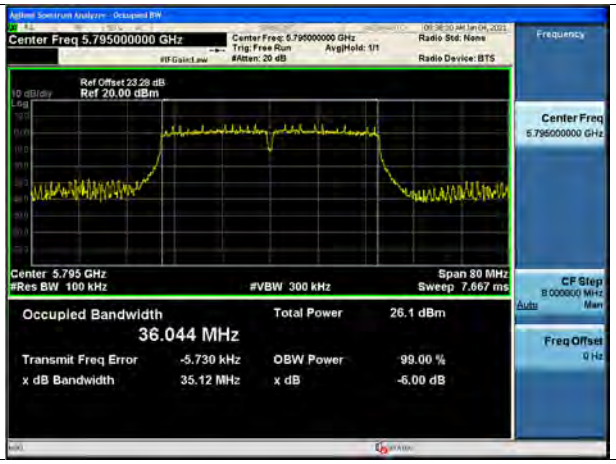
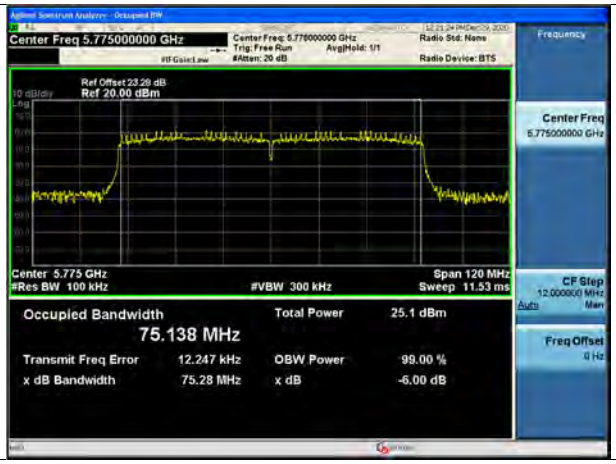
802.11ac(VHT80) (CH.155)



[ANT.B]

▣ Test Plots

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

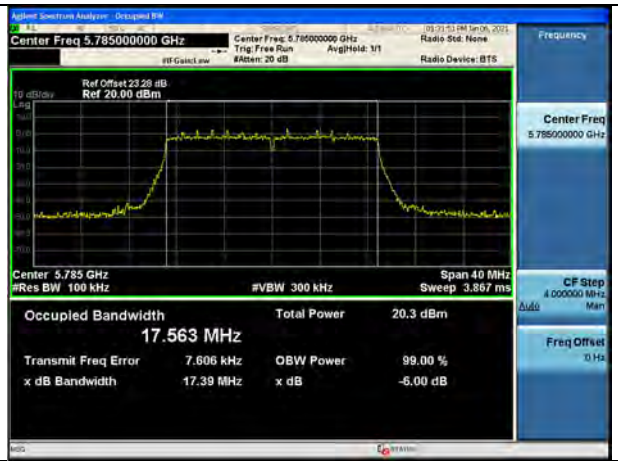
802.11a (CH.165)	802.11n(HT20) (CH.149)
	
802.11n(HT40) (CH.151)	**802.11ac(VHT20) (CH.149)**
	
802.11ac(VHT40) (CH.159)	**802.11ac(VHT80) (CH.155)**
	

[MIMO_ANT.A]

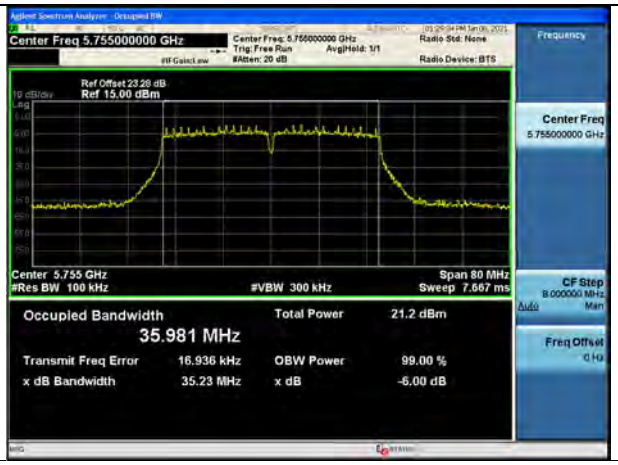
▣ Test Plots

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

802.11n(HT20) (CH.157)

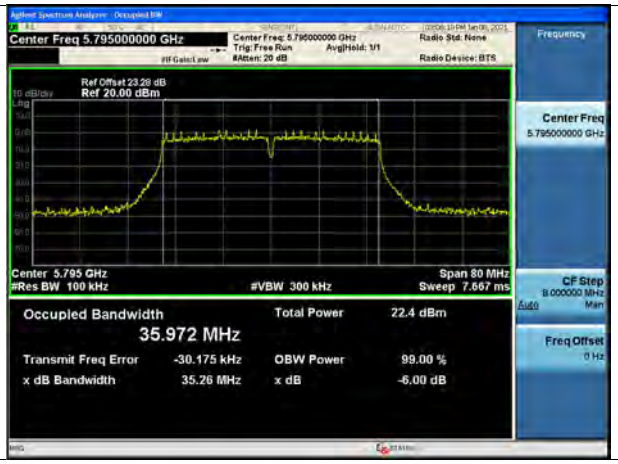


802.11n(HT40) (CH.151)

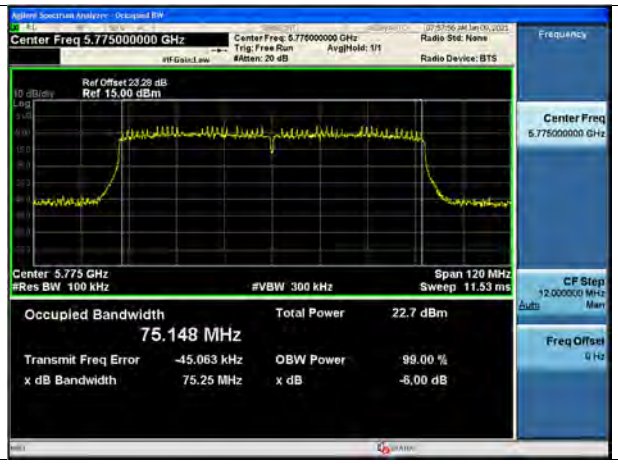


802.11ac(VHT20) (CH.149)

802.11ac(VHT40) (CH.159)



802.11ac(VHT80) (CH.155)



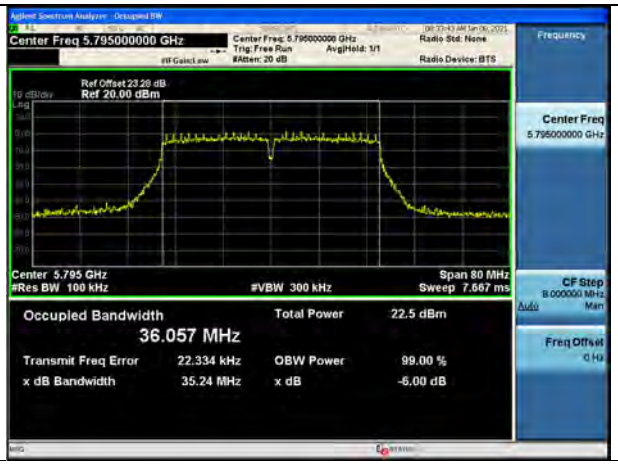
[MIMO_ANT.B]

▣ Test Plots

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

802.11n(HT20) (CH.165)

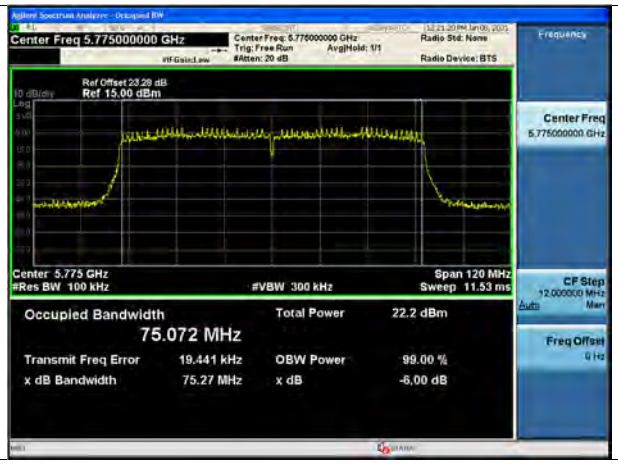
802.11n(HT40) (CH.159)



802.11ac(VHT20) (CH.165)

802.11ac(VHT40) (CH.151)

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.

Power Level Setting(SISO)

802.11a		Frequency [MHz]	Channel No.	Ant.A	Ant.B
				6 Mbps ~ 54 Mbps	
UNII 1	Low	5180	36	95	85
	Mid	5200	40	95	85
	High	5240	48	95	85
UNII 2A	Low	5260	52	95	95
	Mid	5300	60	95	95
	High	5320	64	95	95
UNII 2C	Low	5500	100	85	85
	Mid	5580	116	90	90
	High	5720	144	87	87
UNII 3	Low	5745	149	80	80
	Mid	5785	157	85	85
	High	5825	165	90	90

802.11n(HT20)		Frequency [MHz]	Channel No.	Ant.A	Ant.B
				MCS0 ~ MCS7	
UNII 1	Low	5180	36	95	85
	Mid	5200	40	95	85
	High	5240	48	95	85
UNII 2A	Low	5260	52	95	95
	Mid	5300	60	95	95
	High	5320	64	95	95
UNII 2C	Low	5500	100	85	85
	Mid	5580	116	90	90
	High	5720	144	87	87
UNII 3	Low	5745	149	80	80
	Mid	5785	157	85	85
	High	5825	165	90	90

802.11n(HT40)		Frequency [MHz]	Channel No.	Ant.A	Ant.B
				MCS0 ~ MCS7	
UNII 1	Low	5190	38	92	92
	High	5230	46	95	95
UNII 2A	Low	5270	54	95	95
	High	5310	62	86	86
UNII 2C	Low	5510	102	65	65
	Mid	5590	118	90	90
	High	5710	142	95	95
UNII 3	Low	5755	151	85	85
	High	5795	159	90	90

802.11ac(VHT20)		Frequency [MHz]	Channel No.	Ant.A	Ant.B
				MCS0 ~ MCS8	
UNII 1	Low	5180	36	95	85
	Mid	5200	40	95	85
	High	5240	48	95	85
UNII 2A	Low	5260	52	95	95
	Mid	5300	60	95	95
	High	5320	64	95	95
UNII 2C	Low	5500	100	85	85
	Mid	5580	116	90	90
	High	5720	144	87	87
UNII 3	Low	5745	149	80	80
	Mid	5785	157	85	85
	High	5825	165	90	90

802.11ac(VHT40)		Frequency [MHz]	Channel No.	Ant.A	Ant.B
				MCS0 ~ MCS9	
UNII 1	Low	5190	38	92	92
	High	5230	46	95	95
UNII 2A	Low	5270	54	95	95
	High	5310	62	86	86
UNII 2C	Low	5510	102	73	73
	Mid	5590	118	90	90
	High	5710	142	95	95
UNII 3	Low	5755	151	85	85
	High	5795	159	90	90

802.11ac(VHT80)		Frequency [MHz]	Channel No.	Ant.A	Ant.B
				MCS0 ~ MCS9	
UNII 1	Mid	5210	42	80	80
UNII 2A	Mid	5290	58	80	80
UNII 2C	Low	5530	106	65	65
	High	5690	138	95	95
UNII 3	Mid	5775	155	88	88

[Ant.A]

802.11a Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	10.71	5.68	16.38	1.47	17.85	22.14	23.98
5200	40	10.94	5.91	16.85	1.47	18.32		
5240	48	11.14	5.68	16.81	1.47	18.28		
5260	52	11.12	5.68	16.79	-	-	23.14	23.14
5300	60	12.02	4.85	16.87	-	-		
5320	64	11.04	5.91	16.96	-	-		
5500	100	9.74	5.91	15.65	-	-	23.14	23.14
5580	116	11.54	5.68	17.21	-	-		
5720	144	11.39	5.91	17.30	-	-		
5745	149	11.72	5.68	17.39	-	-	30.00	30.00
5785	157	12.34	5.91	18.25	-	-		
5825	165	14.68	4.85	19.53	-	-		

802.11n(HT20) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	11.55	4.87	16.43	1.47	17.90	22.44	23.98
5200	40	11.87	4.87	16.74	1.47	18.21		
5240	48	10.89	6.17	17.06	1.47	18.53		
5260	52	10.82	6.17	16.99	-	-	23.44	23.44
5300	60	11.15	5.86	17.01	-	-		
5320	64	11.48	5.59	17.07	-	-		
5500	100	9.82	6.17	15.99	-	-	23.44	23.44
5580	116	11.61	5.86	17.47	-	-		
5720	144	11.22	6.17	17.39	-	-		
5745	149	11.29	6.17	17.46	-	-	30.00	30.00
5785	157	12.52	6.17	18.69	-	-		
5825	165	13.56	6.17	19.73	-	-		

802.11ac(VHT20) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	10.12	6.12	16.24	1.47	17.71	22.44	23.44
5200	40	10.85	5.80	16.65	1.47	18.12		
5240	48	10.70	6.52	17.22	1.47	18.69		
5260	52	10.53	6.52	17.05	-	-	23.44	23.44
5300	60	11.24	5.80	17.04	-	-		
5320	64	11.66	5.80	17.46	-	-		
5500	100	9.70	6.52	16.22	-	-	23.45	23.45
5580	116	11.40	6.52	17.93	-	-		
5720	144	11.11	6.52	17.63	-	-		
5745	149	11.15	6.52	17.68	-	-	30.00	30.00
5785	157	12.47	6.52	18.99	-	-		
5825	165	15.13	4.81	19.93	-	-		

802.11n(HT40) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	8.31	7.68	16.00	1.47	17.47	23.01	23.98
5230	46	9.71	7.68	17.40	1.47	18.87		
5270	54	9.52	7.68	17.20	-	-	23.98	23.98
5310	62	7.22	7.95	15.17	-	-		
5510	102	4.23	7.40	11.63	-	-	23.98	23.98
5550	110	9.34	7.95	17.29	-	-		
5710	142	11.90	7.68	19.58	-	-		
5755	151	13.02	5.64	18.66	-	-	30.00	30.00
5795	159	11.88	7.95	19.83	-	-		

802.11ac(VHT40) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	8.67	7.26	15.93	1.47	17.40	23.01	23.98
5230	46	9.02	8.30	17.32	1.47	18.79		
5270	54	9.47	7.80	17.27	-	-	23.98	23.98
5310	62	6.96	7.80	14.76	-	-		
5510	102	6.67	7.26	13.93	-	-	23.98	23.98
5550	110	9.85	8.30	18.15	-	-		
5710	142	11.63	8.11	19.74	-	-		
5755	151	11.14	7.80	18.94	-	-	30.00	30.00
5795	159	11.87	8.30	20.17	-	-		

802.11ac(VHT80) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5210	42	3.58	9.54	13.12	1.47	14.59	23.01	23.98
5290	58	4.11	9.54	13.65	-	-	23.98	23.98
5530	106	2.15	9.54	11.69	-	-	23.98	23.98
5690	138	9.99	9.24	19.23	-	-	23.98	23.98
5775	155	9.80	9.24	19.04	-	-	30.00	30.00

[Ant.B]

802.11a Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	8.91	5.91	14.82	3.53	18.35	22.14	23.98
5200	40	9.28	5.68	14.96	3.53	18.49		
5240	48	11.91	3.84	15.75	3.53	19.28		
5260	52	10.07	5.91	15.98	-	-	23.14	23.14
5300	60	11.99	4.85	16.84	-	-		
5320	64	11.15	5.68	16.82	-	-		
5500	100	9.43	5.91	15.34	-	-	23.14	23.14
5580	116	11.14	5.91	17.05	-	-		
5720	144	13.46	4.85	18.32	-	-		
5745	149	13.63	3.84	17.47	-	-	30.00	30.00
5785	157	14.47	3.84	18.31	-	-		
5825	165	14.60	4.85	19.45	-	-		

802.11n(HT20) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	8.86	5.86	14.72	3.53	18.25	22.44	23.98
5200	40	8.90	5.86	14.76	3.53	18.29		
5240	48	9.07	6.17	15.24	3.53	18.77		
5260	52	12.60	4.87	17.48	-	-	23.44	23.44
5300	60	11.51	6.17	17.68	-	-		
5320	64	11.50	6.17	17.67	-	-		
5500	100	10.20	6.17	16.37	-	-	23.44	23.44
5580	116	12.82	6.17	18.99	-	-		
5720	144	12.56	5.59	18.15	-	-		
5745	149	11.90	5.59	17.49	-	-	30.00	30.00
5785	157	14.81	3.87	18.69	-	-		
5825	165	13.18	5.86	19.04	-	-		

802.11ac(VHT20) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	8.47	6.12	14.59	3.53	18.12	22.44	23.98
5200	40	8.57	6.52	15.10	3.53	18.63		
5240	48	9.93	5.51	15.43	3.53	18.96		
5260	52	11.67	6.52	18.19	-	-	23.44	23.44
5300	60	11.82	6.12	17.93	-	-		
5320	64	11.74	6.12	17.86	-	-		
5500	100	10.28	6.52	16.80	-	-	23.45	23.45
5580	116	12.43	6.52	18.95	-	-		
5720	144	12.78	5.51	18.29	-	-		
5745	149	11.32	6.52	17.84	-	-	30.00	30.00
5785	157	13.15	5.51	18.65	-	-		
5825	165	13.07	6.52	19.59	-	-		

802.11n(HT40) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	8.91	7.68	16.60	3.53	20.13	23.01	23.98
5230	46	9.75	7.95	17.70	3.53	21.23		
5270	54	10.10	7.95	18.04	-	-	23.98	23.98
5310	62	8.29	7.40	15.69	-	-		
5510	102	4.09	7.95	12.04	-	-	23.98	23.98
5550	110	10.12	7.68	17.81	-	-		
5710	142	12.27	7.68	19.95	-	-		
5755	151	10.61	7.95	18.56	-	-	30.00	30.00
5795	159	11.48	7.95	19.43	-	-		

802.11ac(VHT40) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	8.81	7.80	16.60	3.53	20.13	23.01	23.98
5230	46	10.62	7.26	17.88	3.53	21.41		
5270	54	10.08	7.80	17.87	-	-	23.98	23.98
5310	62	8.06	7.80	15.85	-	-		
5510	102	6.16	7.80	13.96	-	-	23.98	23.98
5550	110	10.98	7.80	18.78	-	-		
5710	142	12.23	7.80	20.03	-	-		
5755	151	11.38	7.26	18.64	-	-	30.00	30.00
5795	159	12.69	7.26	19.95	-	-		

802.11ac(VHT80) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5210	42	3.49	9.24	12.73	3.53	16.26	23.01	23.98
5290	58	3.76	9.54	13.30	-	-	23.98	23.98
5530	106	1.98	9.54	11.53	-	-	23.98	23.98
5690	138	13.39	5.79	19.19	-	-	23.98	23.98
5775	155	8.89	9.54	18.43	-	-	30.00	30.00

Power Level Setting(MIMO)

802.11n(HT20)		Frequency [MHz]	Channel No.	MIMO (SDM)
				MCS8 ~ MCS15
UNII 1	Low	5180	36	75
	Mid	5200	40	75
	High	5240	48	75
UNII 2A	Low	5260	52	80
	Mid	5300	60	80
	High	5320	64	80
UNII 2C	Low	5500	100	70
	Mid	5580	116	75
	High	5720	144	72
UNII 3	Low	5745	149	65
	Mid	5785	157	70
	High	5825	165	75

802.11n(HT40)		Frequency [MHz]	Channel No.	MIMO (SDM)
				MCS8 ~ MCS15
UNII 1	Low	5190	38	77
	High	5230	46	80
UNII 2A	Low	5270	54	80
	High	5310	62	71
UNII 2C	Low	5510	102	50
	Mid	5590	118	75
	High	5710	142	80
UNII 3	Low	5755	151	70
	High	5795	159	75

802.11ac(VHT20)		Frequency [MHz]	Channel No.	MIMO (SDM)
				MCS0 ~ MCS8
UNII 1	Low	5180	36	75
	Mid	5200	40	75
	High	5240	48	75
UNII 2A	Low	5260	52	80
	Mid	5300	60	80
	High	5320	64	80
UNII 2C	Low	5500	100	70
	Mid	5580	116	75
	High	5720	144	72
UNII 3	Low	5745	149	65
	Mid	5785	157	70
	High	5825	165	75

802.11ac(VHT40)		Frequency [MHz]	Channel No.	MIMO (SDM)
				MCS0 ~ MCS9
UNII 1	Low	5190	38	77
	High	5230	46	80
UNII 2A	Low	5270	54	80
	High	5310	62	71
UNII 2C	Low	5510	102	58
	Mid	5590	118	75
	High	5710	142	80
UNII 3	Low	5755	151	70
	High	5795	159	75

802.11ac(VHT80)		Frequency [MHz]	Channel No.	MIMO (SDM)
				MCS0 ~ MCS9
UNII 1	Mid	5210	42	65
UNII 2A	Mid	5290	58	65
UNII 2C	Low	5530	106	50
	High	5690	138	80
UNII 3	Mid	5775	155	73

[MIMO_SDM(ANT ALL)]

Note:

- ✓ ANT.A Measured Power(dBm) = ANT.A(ANT ALL_SDM) Measured Power Avg + Duty Cycle Factor
- ✓ ANT.B Measured Power(dBm) = ANT.B(ANT ALL_SDM) Measured Power Avg + Duty Cycle Factor
- ✓ MIMO Power(Avg) $= 10 * \log(\left(10^{\frac{ANT\ A}{10}}\right) + \left(10^{\frac{ANT\ B}{10}}\right))$ ➔ ANT.A(mW) +ANT.B(mW)=MIMO(dBm)

802.11n(HT20) Mode		ANT A Measured Powe [dBm]	ANT B Measured Powe [dBm]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	12.13	11.58	14.88	3.53	18.41	22.45	23.98
5200	40	12.11	12.17	15.15	3.53	18.68		
5240	48	11.96	12.70	15.36	3.53	18.86		
5260	52	13.35	13.59	16.48	-	-	23.46	23.46
5300	60	13.19	13.65	16.43	-	-		
5320	64	13.39	13.73	16.58	-	-		
5500	100	12.21	12.97	15.62	-	-	23.47	23.47
5580	116	13.93	15.18	17.61	-	-		
5720	144	13.48	14.26	16.90	-	-		
5745	149	13.89	13.58	16.75	-	-	30.00	30.00
5785	157	14.99	14.62	17.82	-	-		
5825	165	15.89	15.46	18.69	-	-		

802.11ac(VHT20) Mode		ANT A Measured Powe [dBm]	ANT B Measured Powe [dBm]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	11.57	12.04	14.82	3.53	18.35	22.45	23.98
5200	40	12.07	11.99	15.04	3.53	18.57		
5240	48	12.53	12.30	15.43	3.53	18.96		
5260	52	13.48	13.77	16.63	-	-	23.46	23.46
5300	60	13.57	13.91	16.75	-	-		
5320	64	13.66	13.81	16.75	-	-		
5500	100	12.17	13.11	15.68	-	-	23.46	23.46
5580	116	14.25	15.23	17.77	-	-		
5720	144	13.66	14.46	17.09	-	-		
5745	149	13.86	13.85	16.87	-	-	30.00	30.00
5785	157	14.97	14.76	17.88	-	-		
5825	165	15.82	15.34	18.60	-	-		

802.11n(HT40) Mode		ANT A Measured Powe [dBm]	ANT B Measured Powe [dBm]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	12.49	13.56	16.07	3.53	19.60	23.01	23.98
5230	46	13.56	14.27	16.94	3.53	20.47		
5270	54	13.48	14.48	17.02	-	-	23.98	23.98
5310	62	11.46	12.48	15.01	-	-		
5510	102	7.58	8.81	11.25	-	-	23.98	23.98
5550	110	13.34	14.74	17.11	-	-		
5710	142	15.53	16.68	19.15	-	-		
5755	151	15.13	15.19	18.17	-	-	30.00	30.00
5795	159	16.02	16.20	19.12	-	-		

802.11ac(VHT40) Mode		ANT A Measured Powe [dBm]	ANT B Measured Powe [dBm]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	12.15	13.02	15.61	3.53	19.14	23.01	23.98
5230	46	13.41	14.09	16.78	3.53	20.31		
5270	54	13.62	14.40	17.03	-	-	23.98	23.98
5310	62	11.64	12.45	15.07	-	-		
5510	102	9.95	10.55	13.27	-	-	23.98	23.98
5550	110	14.45	15.35	17.93	-	-		
5710	142	15.96	16.71	19.36	-	-		
5755	151	15.32	15.14	18.24	-	-	30.00	30.00
5795	159	16.44	16.29	19.38	-	-		

802.11ac(VHT80) Mode		ANT A Measured Powe [dBm]	ANT B Measured Powe [dBm]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5210	42	10.64	10.30	13.48	3.53	17.01	23.01	23.98
5290	58	10.42	10.59	13.51	-	-	23.98	23.98
5530	106	8.16	8.16	11.17	-	-	23.98	23.98
5690	138	15.80	16.07	18.95	-	-	23.98	23.98
5775	155	15.83	15.32	18.59	-	-	30.00	30.00

10.5 POWER SPECTRAL DENSITY

FCC

[ANT.A]

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	0.601	5.675	6.276	11 dBm/MHz
5200	40	0.475	5.911	6.386	
5240	48	1.574	5.675	7.249	
5260	52	0.907	5.675	6.582	
5300	60	1.463	4.853	6.316	
5320	64	1.008	5.911	6.919	
5500	100	-0.510	5.911	5.401	
5580	116	1.608	5.675	7.283	
5720	144	1.517	5.911	7.428	
5745	149	-1.105	5.675	4.570	30 dBm/500kHz
5785	157	-0.295	5.911	5.616	
5825	165	1.258	4.853	6.111	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	1.079	4.875	5.954	11 dBm/MHz
5200	40	1.173	4.875	6.048	
5240	48	0.675	6.170	6.845	
5260	52	0.515	6.170	6.685	
5300	60	0.420	5.860	6.280	
5320	64	1.768	5.593	7.361	
5500	100	-0.805	6.170	5.365	
5580	116	1.378	5.860	7.238	
5720	144	0.997	6.170	7.167	
5745	149	-1.241	6.170	4.929	30 dBm/500kHz
5785	157	-0.521	6.170	5.649	
5825	165	0.567	6.170	6.737	

802.11n(40MHz) Mode		Measured	Duty Cycle	Total PSD	Limit
Frequency [MHz]	Channel No.	PSD [dBm]	Factor (dB)	[dBm]	
5190	38	-4.211	7.683	3.472	11 dBm/MHz
5230	46	-3.105	7.683	4.578	
5270	54	-3.161	7.683	4.522	
5310	62	-5.777	7.947	2.170	
5510	102	-8.306	7.400	-0.906	
5500	110	-3.661	7.947	4.286	
5710	142	-1.081	7.683	6.602	
5755	151	-2.701	5.643	2.942	30 dBm /500kHz
5795	159	-3.322	7.947	4.625	

802.11ac(20MHz) Mode		Measured	Duty Cycle	Total PSD	Limit
Frequency [MHz]	Channel No.	PSD [dBm]	Factor (dB)	[dBm]	
5180	36	0.311	6.115	6.426	11 dBm/MHz
5200	40	0.620	5.802	6.422	
5240	48	0.326	6.521	6.847	
5260	52	0.291	6.521	6.812	
5300	60	0.931	5.802	6.733	
5320	64	1.274	5.802	7.076	
5500	100	-0.222	6.521	6.299	
5580	116	1.378	6.521	7.899	
5720	144	0.814	6.521	7.335	
5745	149	-1.362	6.521	5.159	30 dBm/500kHz
5785	157	-0.981	6.521	5.540	
5825	165	1.701	4.808	6.509	

802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-3.957	7.260	3.303	11 dBm/MHz
5230	46	-3.549	8.297	4.748	
5270	54	-2.764	7.797	5.033	
5310	62	-5.406	7.797	2.391	
5510	102	-5.856	7.260	1.404	
5500	110	-2.714	8.297	5.583	
5710	142	-1.566	8.114	6.548	
5755	151	-3.923	7.797	3.874	30 dBm/500kHz
5795	159	-2.838	8.297	5.459	

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-11.568	9.543	-2.025	11 dBm/MHz
5290	58	-11.631	9.543	-2.088	
5530	106	-12.612	9.543	-3.069	
5690	138	-5.162	9.243	4.081	
5775	155	-7.805	9.243	1.438	30 dBm/500kHz

EIRP(UNII-1) *NOTE : Only UNII1 bands were calculated as EIRP.

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	0.601	5.675	6.276	1.47	7.746	10 dBm/MHz
5200	40	0.475	5.911	6.386	1.47	7.856	
5240	48	1.574	5.675	7.249	1.17	8.419	

802.11n(HT20) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	1.079	4.875	5.954	1.47	7.424	10 dBm/MHz
5200	40	1.173	4.875	6.048	1.47	7.518	
5240	48	0.675	6.170	6.845	1.17	8.015	

802.11n(HT40) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	-4.211	7.683	3.472	1.47	4.942	10 dBm/MHz
5230	46	-3.105	7.683	4.578	1.47	6.048	

802.11ac(VHT20)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	0.311	6.115	6.426	1.47	7.896	10 dBm/MHz
5200	40	0.620	5.802	6.422	1.47	7.892	
5240	48	0.326	6.521	6.847	1.17	8.017	

802.11ac(VHT40)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	-3.957	7.260	3.303	1.47	4.773	10 dBm/MHz
5230	46	-3.549	8.297	4.748	1.47	6.218	

802.11ac(VHT80)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5210	42	-11.568	9.543	-2.025	1.47	-0.555	10 dBm/MHz

[ANT.B]

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	-0.632	5.911	5.279	11 dBm/MHz
5200	40	-0.759	5.675	4.916	
5240	48	1.100	3.837	4.937	
5260	52	-0.324	5.911	5.587	
5300	60	2.129	4.853	6.982	
5320	64	1.623	5.675	7.298	
5500	100	-0.314	5.911	5.597	
5580	116	1.296	5.911	7.207	
5720	144	2.885	4.853	7.738	
5745	149	0.127	3.837	3.964	30 dBm/500kHz
5785	157	1.326	3.837	5.163	
5825	165	1.327	4.853	6.180	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	-1.263	5.860	4.597	11 dBm/MHz
5200	40	-1.563	5.860	4.297	
5240	48	-1.122	6.170	5.048	
5260	52	2.274	4.875	7.149	
5300	60	0.765	6.170	6.935	
5320	64	1.125	6.170	7.295	
5500	100	0.237	6.170	6.407	
5580	116	2.137	6.170	8.307	
5720	144	2.117	5.593	7.710	
5745	149	-1.739	5.593	3.854	30 dBm/500kHz
5785	157	0.801	3.875	4.676	
5825	165	0.751	5.860	6.611	

802.11n(40MHz) Mode		Measured	Duty Cycle	Total PSD	Limit
Frequency [MHz]	Channel No.	PSD [dBm]	Factor (dB)	[dBm]	
5190	38	-4.222	7.683	3.461	11 dBm/MHz
5230	46	-3.184	7.947	4.763	
5270	54	-3.363	7.947	4.584	
5310	62	-4.503	7.400	2.897	
5510	102	-9.021	7.947	-1.074	
5500	110	-2.699	7.683	4.984	
5710	142	0.387	7.683	8.070	
5755	151	-4.244	7.947	3.703	30 dBm /500kHz
5795	159	-3.451	7.947	4.496	

802.11ac(20MHz) Mode		Measured	Duty Cycle	Total PSD	Limit
Frequency [MHz]	Channel No.	PSD [dBm]	Factor (dB)	[dBm]	
5180	36	-2.125	6.115	3.990	11 dBm/MHz
5200	40	-1.510	6.521	5.011	
5240	48	-0.743	5.506	4.763	
5260	52	1.465	6.521	7.986	
5300	60	1.411	6.115	7.526	
5320	64	1.520	6.115	7.635	
5500	100	0.484	6.521	7.005	
5580	116	2.241	6.521	8.762	
5720	144	2.375	5.506	7.881	
5745	149	-1.489	6.521	5.032	30 dBm/500kHz
5785	157	-0.273	5.506	5.233	
5825	165	0.474	6.521	6.995	

802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-4.298	7.797	3.499	11 dBm/MHz
5230	46	-2.007	7.260	5.253	
5270	54	-2.833	7.797	4.964	
5310	62	-4.677	7.797	3.120	
5510	102	-6.311	7.797	1.486	
5500	110	-2.273	7.797	5.524	
5710	142	-0.956	7.797	6.841	
5755	151	-4.243	7.260	3.017	30 dBm/500kHz
5795	159	-3.432	7.260	3.828	

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-12.174	9.243	-2.931	11 dBm/MHz
5290	58	-11.182	9.543	-1.639	
5530	106	-13.027	9.543	-3.484	
5690	138	-3.220	5.794	2.574	
5775	155	-9.065	9.543	0.478	30 dBm/500kHz

EIRP(UNII-1) *NOTE : Only UNII1 bands were calculated as EIRP.

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	-0.632	5.911	5.279	3.53	8.809	10 dBm/MHz
5200	40	-0.759	5.675	4.916	3.53	8.446	
5240	48	1.100	3.837	4.937	3.53	8.467	

802.11n(HT20) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	-1.263	5.860	4.597	3.53	8.127	10 dBm/MHz
5200	40	-1.563	5.860	4.297	3.53	7.827	
5240	48	-1.122	6.170	5.048	3.53	8.578	

802.11n(HT40) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	-4.222	7.683	3.461	3.53	6.991	10 dBm/MHz
5230	46	-3.184	7.947	4.763	3.53	8.293	

802.11ac(VHT20)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	-2.125	6.115	3.990	3.53	7.520	10 dBm/MHz
5200	40	-1.510	6.521	5.011	3.53	8.541	
5240	48	-0.743	5.506	4.763	3.53	8.293	

802.11ac(VHT40)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	-4.298	7.797	3.499	3.53	7.029	10 dBm/MHz
5230	46	-2.007	7.260	5.253	3.53	8.783	

802.11ac(VHT80)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5210	42	-12.174	9.243	-2.931	3.53	0.599	10 dBm/MHz

[MIMO_SDM]

Note:

- ✓ ANT.A Measured PSD = ANT.A(ANT ALL_SDM) Measured Power density + Duty Cycle Factor
- ✓ ANT.B Measured PSD = ANT.B(ANT ALL_SDM) Measured Power density + Duty Cycle Factor
- ✓ MIMO PSD $= 10 * \log(\left(10^{\frac{ANT\ A}{10}}\right) + \left(10^{\frac{ANT\ B}{10}}\right))$ ➔ ANT.A(mW) +ANT.B(mW)=MIMO(dBm)

802.11n(20MHz) Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	2.141	2.753	5.468	11 dBm/MHz
5200	40	3.147	3.401	6.286	
5240	48	3.304	3.735	6.535	
5260	52	3.072	3.945	6.541	
5300	60	2.733	4.019	6.434	
5320	64	3.782	3.984	6.894	
5500	100	2.087	3.548	5.889	
5580	116	4.552	5.186	7.891	
5720	144	3.511	3.834	6.686	
5745	149	1.591	0.951	4.293	30 dBm/500kHz
5785	157	3.006	2.231	5.646	
5825	165	3.310	3.789	6.566	

802.11n(40MHz) Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	0.720	0.183	3.470	11 dBm/MHz
5230	46	0.594	1.531	4.098	
5270	54	1.134	1.287	4.221	
5310	62	-1.450	0.674	2.751	
5510	102	-4.363	-3.547	-0.926	
5500	110	1.217	2.271	4.786	
5710	142	2.839	4.109	6.531	
5755	151	0.499	0.648	3.584	30 dBm /500kHz
5795	159	1.244	1.504	4.386	

802.11ac(20MHz) Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	2.616	2.923	5.783	11 dBm/MHz
5200	40	2.857	4.055	6.508	
5240	48	3.725	4.034	6.893	
5260	52	4.663	4.900	7.794	
5300	60	3.825	3.952	6.899	
5320	64	3.814	3.980	6.908	
5500	100	3.090	3.836	6.489	
5580	116	4.551	5.360	7.985	
5720	144	3.273	4.382	6.873	
5745	149	1.661	0.962	4.336	30 dBm/500kHz
5785	157	2.465	2.510	5.498	
5825	165	4.095	3.189	6.676	

802.11ac(40MHz) Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-0.360	0.215	2.947	11 dBm/MHz
5230	46	1.010	1.012	4.021	
5270	54	1.167	1.813	4.512	
5310	62	-0.660	-0.246	2.562	
5510	102	-3.116	-2.222	0.364	
5500	110	2.487	2.453	5.480	
5710	142	3.320	4.202	6.794	
5755	151	0.636	0.378	3.519	30 dBm/500kHz
5795	159	1.463	1.735	4.611	

802.11ac(80MHz) Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-6.131	-4.695	-2.344	11 dBm/MHz
5290	58	-5.514	-4.973	-2.225	
5530	106	-5.721	-7.605	-3.551	
5690	138	1.172	1.428	4.312	
5775	155	0.398	-2.929	2.056	30 dBm/500kHz

EIRP(UNII-1) *NOTE : Only UNII1 bands were calculated as EIRP.

802.11n(HT20) Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	1.762	1.157	4.481	3.53	8.011	10 dBm/MHz
5200	40	2.302	2.247	5.285	3.53	8.815	
5240	48	2.765	2.057	5.436	3.53	8.966	

802.11n(HT40) Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	0.720	0.183	3.470	3.53	7.000	10 dBm/MHz
5230	46	0.594	1.531	4.098	3.53	7.628	

802.11ac(VHT20)Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	1.570	1.798	4.696	3.53	8.226	10 dBm/MHz
5200	40	2.085	2.982	5.567	3.53	9.097	
5240	48	2.723	2.560	5.653	3.53	9.183	

802.11ac(VHT40)Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	-0.360	0.215	2.947	3.53	6.477	10 dBm/MHz
5230	46	1.010	1.012	4.021	3.53	7.551	

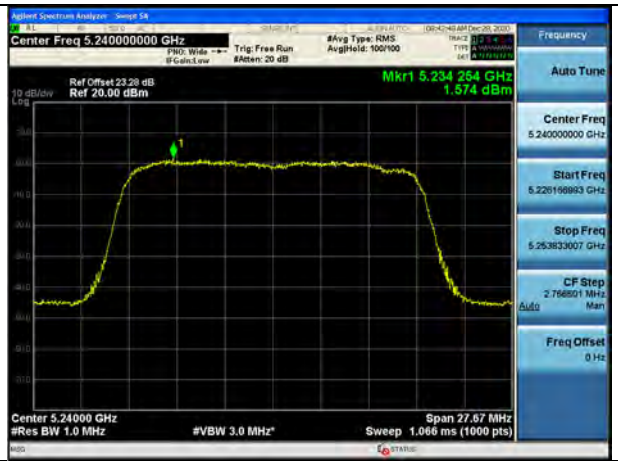
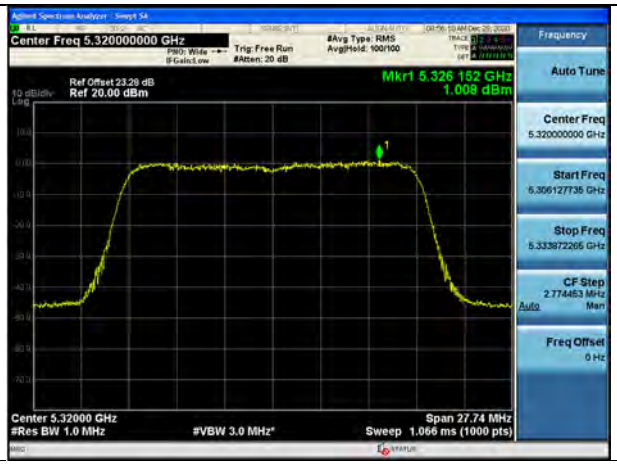
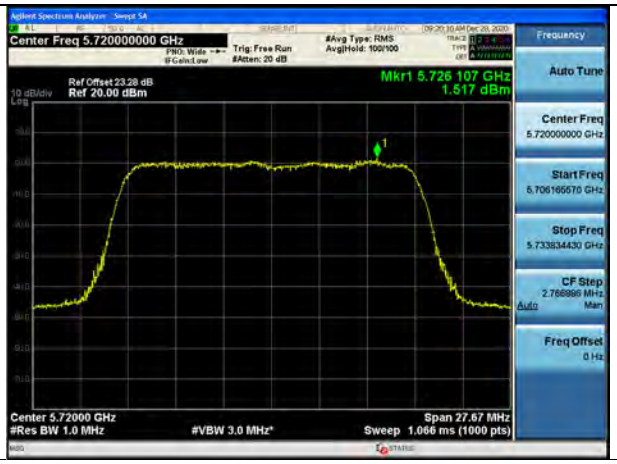
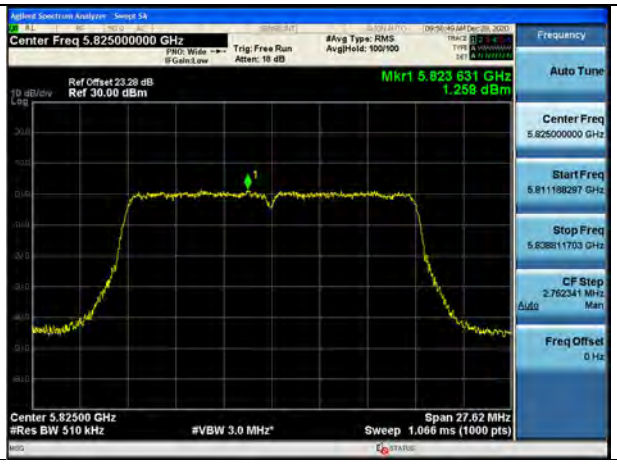
802.11ac(VHT80)Mode		Ant.A Measured PSD [dBm]	Ant.B Measured PSD [dBm]	MIMO PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5210	42	-6.131	-4.695	-2.344	3.53	1.186	10 dBm/MHz

[Ant.A]

▣ 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. 64)
	
UNII 2C (Ch. 144)	UNII 3 (Ch. 165)
	

▣ 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. 64)
	

UNII 2C (Ch. 116)	UNII 3 (Ch. 165)
	

▣ 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)
	

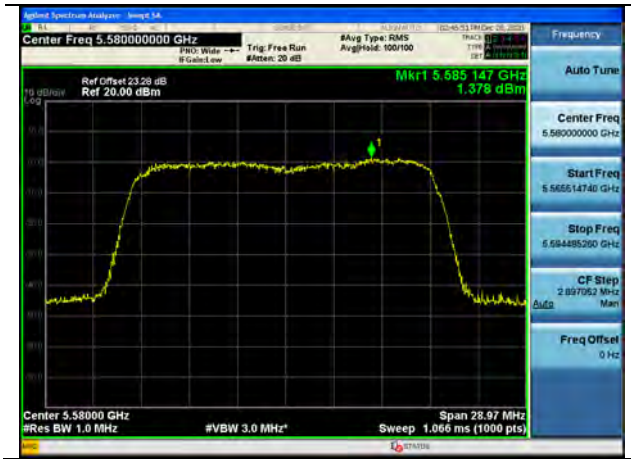
UNII 2C (Ch. 142)	UNII 3 (Ch. 159)
	

▣ Test Plots(802.11ac(VHT20))

Note:

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

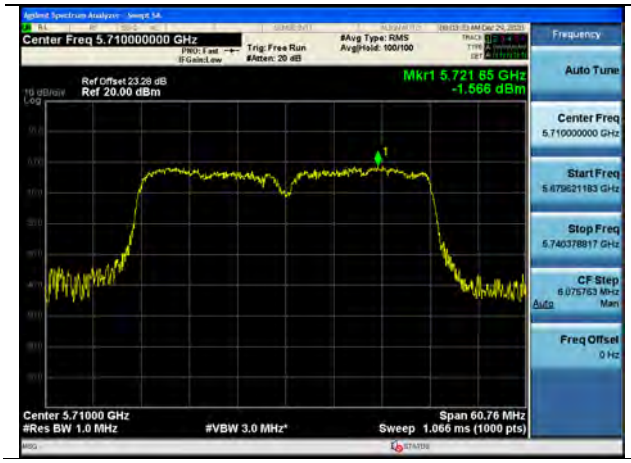
UNII 1 (Ch. 48)	UNII 2A (Ch. 64)
	

UNII 2C (Ch. 116)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11ac(VHT40))

Note:

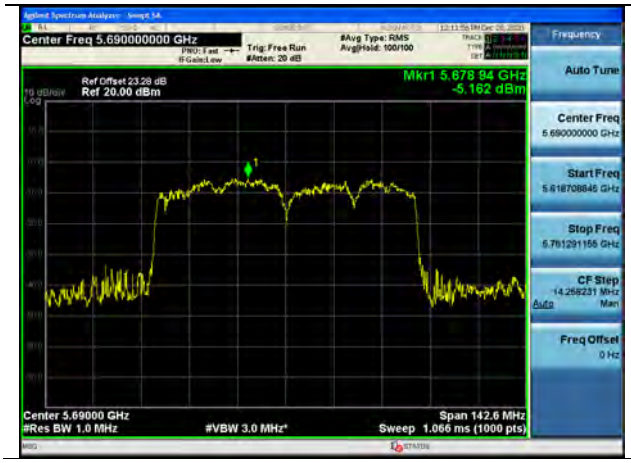
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 46)	UNII 2A (Ch. 54)
	
UNII 2C (Ch. 142)	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. 138)	**UNII 3 (Ch. 155)**
	

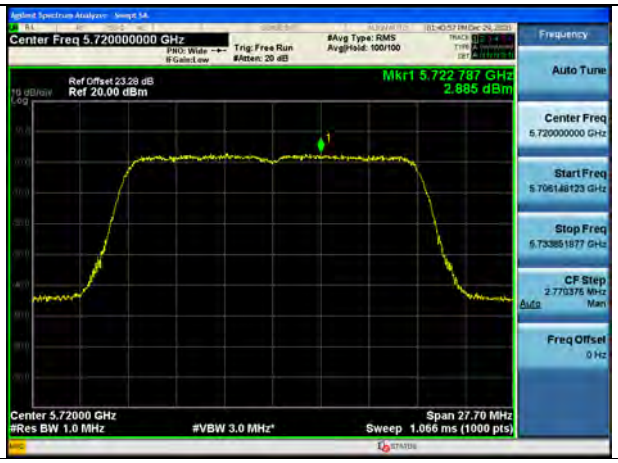
[Ant.B]

▣ Test Plots(802.11a)

Note:

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

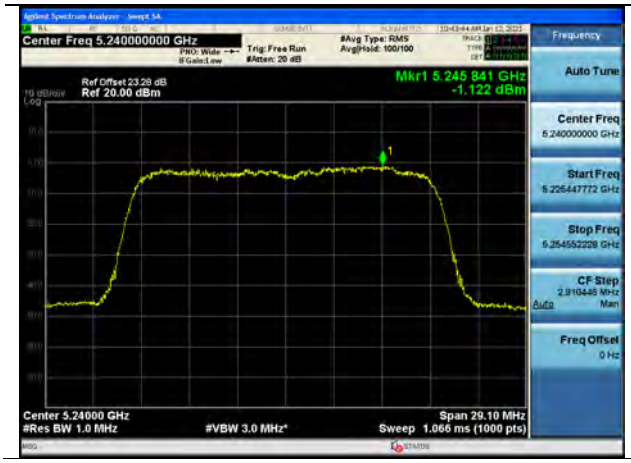
UNII 1 (Ch. 36)	UNII 2A (Ch. 64)
	

UNII 2C (Ch. 144)	UNII 3 (Ch. 165)
	

▣ 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. 64)
	

UNII 2C (Ch. 116)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11n(HT40))

Note:

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

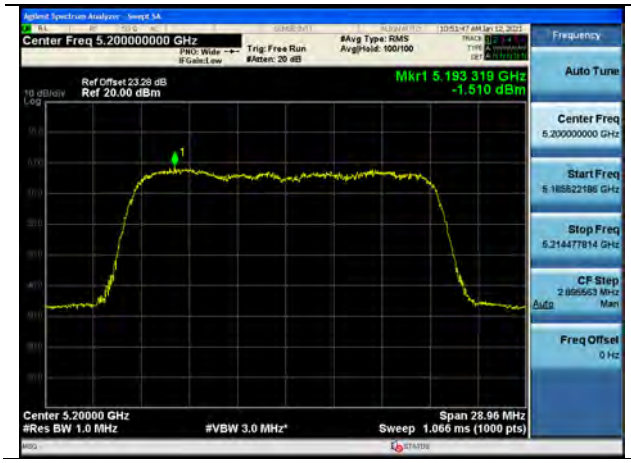
UNII 1 (Ch. 46)	UNII 2A (Ch. 54)
	

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. 52)
	
UNII 2C (Ch. 116)	**UNII 3 (Ch. 165)**
	

▣ 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. 142)	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. 138)	**UNII 3 (Ch. 155)**
	

[MIMO_ANT.A]

▣ 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. 64)
	

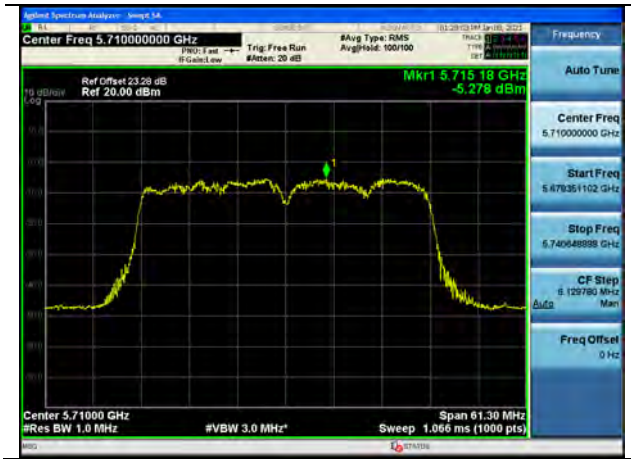
UNII 2C (Ch. 116)	UNII 3 (Ch. 165)
	

▣ 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. 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.

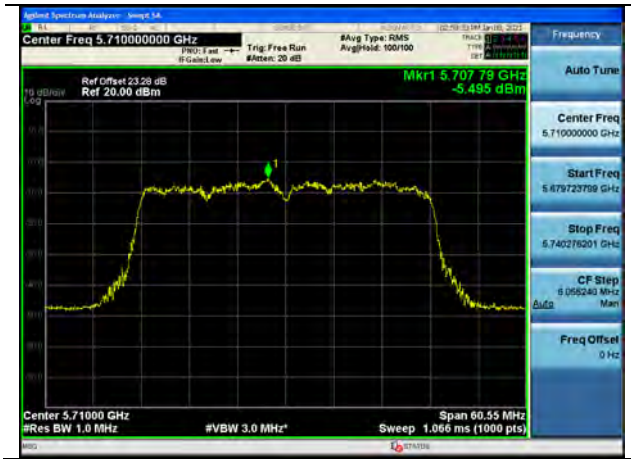
UNII 1 (Ch. 48)	UNII 2A (Ch. 52)
	

UNII 2C (Ch. 116)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11ac(VHT40))

Note:

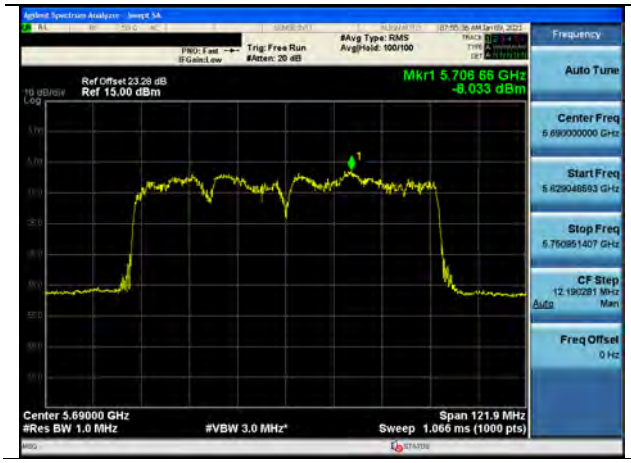
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 46)	UNII 2A (Ch. 54)
	
UNII 2C (Ch. 142)	**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. 138)	UNII 3 (Ch. 155)
	

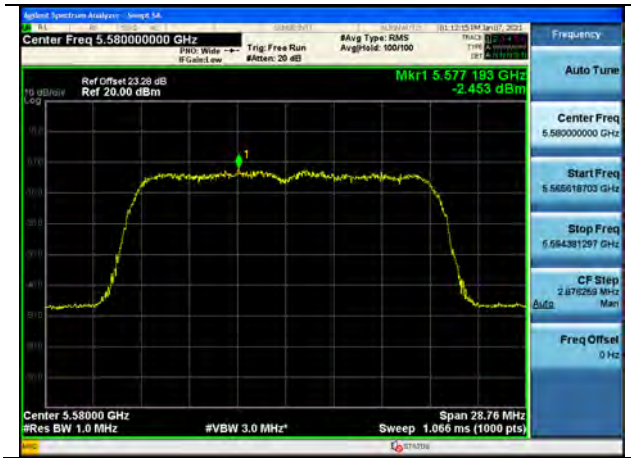
[MIMO_ANT.B]

▣ Test Plots(802.11n(HT20))

Note:

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

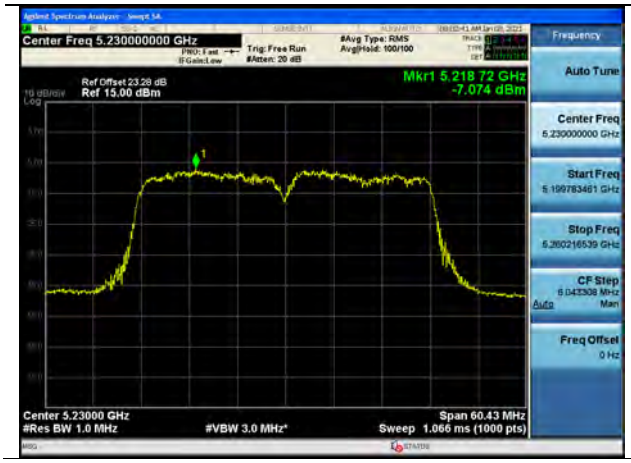
UNII 1 (Ch. 48)	UNII 2A (Ch. 60)
	

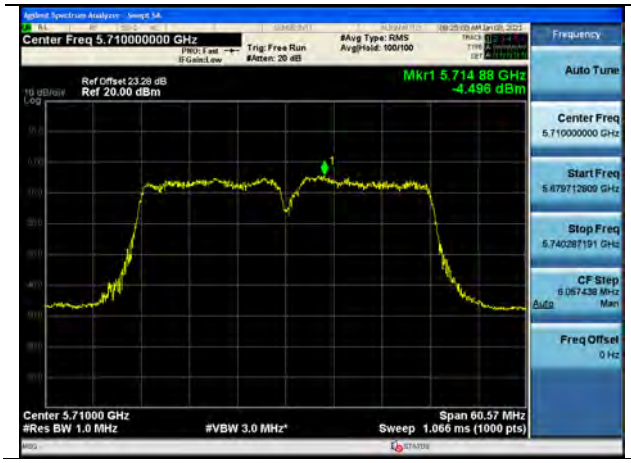
UNII 2C (Ch. 116)	UNII 3 (Ch. 165)
	

▣ 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. 52)
	

UNII 2C (Ch. 116)	UNII 3 (Ch. 165)
	

▣ 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. 142)	**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. 138)	**UNII 3 (Ch. 155)**
	

10.6 FREQUENCY STABILITY.

10.6.1 80MHz BW

[ANT.A]

Startup after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	110 AC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	110.00	+20(Ref)	5210022.61	22.61
100%		-30	5210053.45	53.45
100%		-20	5210046.17	46.17
100%		-10	5210040.70	40.70
100%		0	5210035.83	35.83
100%		+10	5210033.64	33.64
100%		+30	5210031.69	31.69
100%		+40	5210039.34	39.34
100%		+50	5210045.37	45.37
LOW	100.00	+20	5210045.64	45.64
HIGH	130.00	+20	5210043.04	43.04

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 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	110 AC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	110.00	+20(Ref)	5290011.65	11.65
100%		-30	5290051.78	51.78
100%		-20	5290044.56	44.56
100%		-10	5290038.19	38.19
100%		0	5290034.12	34.12
100%		+10	5290031.97	31.97
100%		+30	5290031.01	31.01
100%		+40	5290041.03	41.03
100%		+50	5290046.47	46.47
LOW	100.00	+20	5290046.23	46.23
HIGH	130.00	+20	5290043.15	43.15

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:	110 AC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	110.00	+20(Ref)	5530042.91	42.91
100%		-30	5530051.90	51.90
100%		-20	5530044.00	44.00
100%		-10	5530036.93	36.93
100%		0	5530032.17	32.17
100%		+10	5530028.95	28.95
100%		+30	5530031.37	31.37
100%		+40	5530040.95	40.95
100%		+50	5530045.37	45.37
LOW	100.00	+20	5530047.25	47.25
HIGH	130.00	+20	5530042.70	42.70

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:	110 AC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	110.00	+20(Ref)	5775026.13	26.13
100%		-30	5775053.00	53.00
100%		-20	5775045.11	45.11
100%		-10	5775038.75	38.75
100%		0	5775034.18	34.18
100%		+10	5775030.76	30.76
100%		+30	5775031.82	31.82
100%		+40	5775042.19	42.19
100%		+50	5775045.42	45.42
LOW	100.00	+20	5775048.44	48.44
HIGH	130.00	+20	5775042.04	42.04

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.

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	110 AC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	110.00	+20(Ref)	5210016.52	16.52
100%		-30	5210053.24	53.24
100%		-20	5210045.85	45.85
100%		-10	5210040.22	40.22
100%		0	5210035.53	35.53
100%		+10	5210031.94	31.94
100%		+30	5210031.28	31.28
100%		+40	5210040.71	40.71
100%		+50	5210046.71	46.71
LOW	100.00	+20	5210045.67	45.67
HIGH	130.00	+20	5210043.00	43.00

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:	110 AC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	110	+20(Ref)	5290031.24	31.24
100%		-30	5290052.23	52.23
100%		-20	5290046.11	46.11
100%		-10	5290040.69	40.69
100%		0	5290035.79	35.79
100%		+10	5290033.68	33.68
100%		+30	5290032.69	32.69
100%		+40	5290041.61	41.61
100%		+50	5290044.73	44.73
LOW	100.00	+20	5290048.55	48.55
HIGH	130.00	+20	5290043.07	43.07

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:	110 AC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	110	+20(Ref)	5530085.32	85.32
100%		-30	5530052.23	52.23
100%		-20	5530044.91	44.91
100%		-10	5530038.50	38.50
100%		0	5530033.81	33.81
100%		+10	5530031.39	31.39
100%		+30	5530032.24	32.24
100%		+40	5530040.55	40.55
100%		+50	5530045.93	45.93
LOW	100.00	+20	5530046.29	46.29
HIGH	130.00	+20	5530043.00	43.00

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:	110 AC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	110	+20(Ref)	5775012.76	12.76
100%		-30	5775052.80	52.80
100%		-20	5775044.71	44.71
100%		-10	5775039.40	39.40
100%		0	5775034.99	34.99
100%		+10	5775031.46	31.46
100%		+30	5775031.42	31.42
100%		+40	5775041.66	41.66
100%		+50	5775046.85	46.85
LOW	100.00	+20	5775046.48	46.48
HIGH	130.00	+20	5775042.23	42.23

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.