

FCC UNII REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: January 16, 2023
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	Report No.: HCT-RF-2301-FC024-R1

FCC ID:	A3LSMM546B
APPLICANT:	SAMSUNG Electronics Co., Ltd.
Model:	SM-M546B/DS
Additional Model:	-
EUT Type:	Mobile Phone
Modulation type	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(NII)
FCC Rule Part(s):	Part 15.407

Engineering Statement:

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

Report No.: HCT-RF-2301-FC024-R1

REVIEWED BY



Report prepared by : Chang Hee Hwang
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
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This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.

The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2301-FC024	January 11, 2023	- First Approval Report
HCT-RF-2301-FC024-R1	January 16, 2023	- Revised Typo (Page.8, 67)

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1. GENERAL INFORMATION

EUT DESCRIPTION

Model	SM-M546B/DS	
Additional Model	-	
EUT Type	Mobile Phone	
Power Supply	DC 3.88 V	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20 MHz BW : 5180 - 5240 40 MHz BW : 5190 - 5230 80 MHz BW : 5210
	U-NII-2A	20 MHz BW : 5260 - 5320 40 MHz BW : 5270 - 5310 80 MHz BW : 5290
	U-NII-2C	20 MHz BW : 5500 - 5720 40 MHz BW : 5510 - 5710 80 MHz BW : 5530 - 5690
	U-NII-3	20 MHz BW : 5745 - 5825 40 MHz BW : 5755 - 5795 80 MHz BW : 5775
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	November 30, 2022 ~ January 10, 2023	
Serial number	Radiated: R3CTB05MEGZ Conducted: R3CTB05MEDJ	

ANTENNA CONFIGURATIONS

1. Antenna configuration

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

Note:

- (1) O = Support, X = Not Support
- (2) SISO = Single Input Single Output
- (3) SDM = Spatial Diversity Multiplexing
- (4) CDD = Cyclic Delay Diversity

3. Directional Gain Calculation

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

$$\text{Directional gain} = G_{\max} + 10 \cdot \text{LOG}(N_{\text{ANT}} / N_{\text{SS}})$$

Band	Ant Gain (dBi)		N _{ANT} / N _{SS}	Directional Gain (dBi)
	ANT1	ANT2		
UNII 1	ANT1	-6.30	2 / 2	-6.30
	ANT2	-6.50		
UNII 2A	ANT1	-5.80	2 / 2	-5.80
	ANT2	-6.60		
UNII 2C	ANT1	-5.70	2 / 2	-5.70
	ANT2	-5.70		
UNII 3	ANT1	-6.30	2 / 2	-6.30
	ANT2	-6.40		

Note

According to Ansi C63.10-2013 section 14.4.3, the directional gain is calculated using the formula, where G_N is the gain of the nth antenna and N_{ANT} is the total number of antennas used.

$$\text{Directional gain} = G_{\max} + 10 \cdot \text{LOG}(N_{\text{ANT}} / N_{\text{SS}})$$

Sample MIMO Calculation:

Ex) Ant 1 : 11.58 dBm Ant 2 : 12.08 dBm

$$\text{Ant1} + \text{Ant 2} = \text{MIMO}$$

$$(11.58 \text{ dBm} + 12.08 \text{ dBm}) = (14.387 \text{ mW} + 16.143 \text{ mW}) = 30.53 \text{ mW} = 14.88 \text{ dBm}$$

2. MAXIMUM OUTPUT POWER

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

Band	Mode	SISO		MIMO					
		Ant.2 Power		Ant.1 Power		Ant.2 Power		Ant.1 + Ant.2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	16.45	0.044	-	-	-	-	-	-
	802.11n (HT20)	16.78	0.048	13.58	0.023	13.23	0.021	16.42	0.044
	802.11n (HT40)	14.81	0.030	11.88	0.015	11.80	0.015	14.85	0.031
	802.11ac (VHT20)	16.44	0.044	13.10	0.020	12.80	0.019	15.96	0.039
	802.11ac (VHT40)	14.82	0.030	11.96	0.016	11.95	0.016	14.97	0.031
	802.11ac (VHT80)	11.97	0.016	8.92	0.008	8.99	0.008	11.97	0.016
UNII2A	802.11a	16.75	0.047	-	-	-	-	-	-
	802.11n (HT20)	16.76	0.047	13.34	0.022	13.52	0.022	16.29	0.043
	802.11n (HT40)	14.98	0.031	12.07	0.016	12.00	0.016	14.91	0.031
	802.11ac (VHT20)	16.74	0.047	13.17	0.021	13.29	0.021	16.10	0.041
	802.11ac (VHT40)	14.95	0.031	12.10	0.016	12.20	0.017	14.87	0.031
	802.11ac (VHT80)	11.98	0.016	8.86	0.008	8.98	0.008	11.93	0.016
UNII2C	802.11a	15.87	0.039	-	-	-	-	-	-
	802.11n (HT20)	16.00	0.040	13.35	0.022	12.91	0.020	15.92	0.039
	802.11n (HT40)	14.64	0.029	11.98	0.016	11.46	0.014	14.57	0.029
	802.11ac (VHT20)	16.04	0.040	13.25	0.021	12.63	0.018	15.78	0.038
	802.11ac (VHT40)	14.43	0.028	12.09	0.016	11.52	0.014	14.63	0.029
	802.11ac (VHT80)	11.71	0.015	8.55	0.007	8.51	0.007	11.54	0.014
UNII3	802.11a	16.33	0.043	-	-	-	-	-	-
	802.11n (HT20)	16.42	0.044	13.44	0.022	12.85	0.019	16.13	0.041
	802.11n (HT40)	14.02	0.025	11.90	0.015	11.13	0.013	14.51	0.028
	802.11ac (VHT20)	16.44	0.044	13.46	0.022	12.58	0.018	15.99	0.040
	802.11ac (VHT40)	14.13	0.026	11.92	0.016	11.21	0.013	14.59	0.029
	802.11ac (VHT80)	11.05	0.013	8.22	0.007	7.87	0.006	11.06	0.013

3. TEST METHODOLOGY

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

EUT CONFIGURATION

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

EUT EXERCISE

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

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz 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 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

5.2 EQUIPMENT

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

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

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

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203, §15.407:

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

- (1) The antennas of this E.U.T are permanently attached.
- (2) The E.U.T Complies with the requirement of §15.203, §15.407

7. MEASUREMENT UNCERTAINTY

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

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

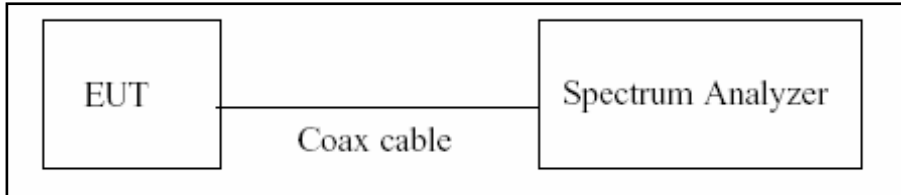
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	2.00 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.40 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.51 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.92 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.48 (Confidence level about 95 %, $k=2$)

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.

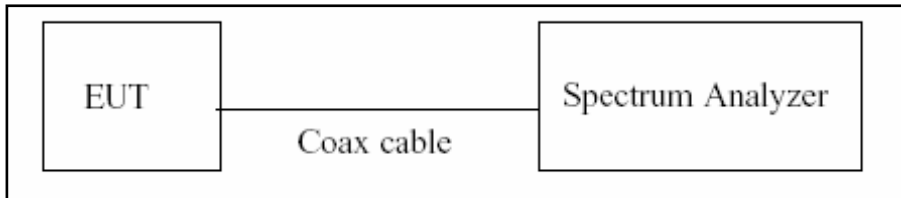
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (\geq RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10\log(1/\text{Duty Cycle})$

8.2. 6 dB Bandwidth & 26 dB 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(26 dB 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 (6 dB 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 $\geq 3 \times$ 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 level measured in the fundamental emission.

Note:

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

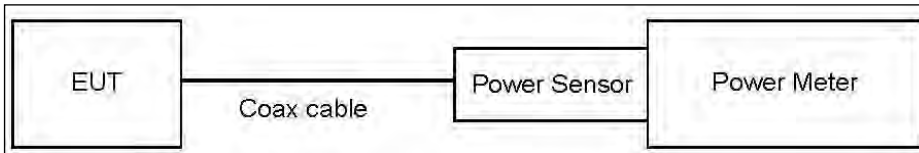
8.3. Output Power Measurement

Limit

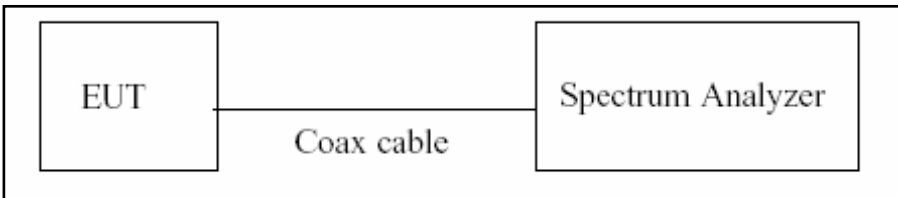
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30 dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

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

Sample Calculation

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

Note

1. Spectrum Measured Levels 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 Loss: Attenuator loss(10 dB) + Cable loss

3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	10.80
UNII 2A	10.80
UNII 2C	10.80
UNII 3	10.80

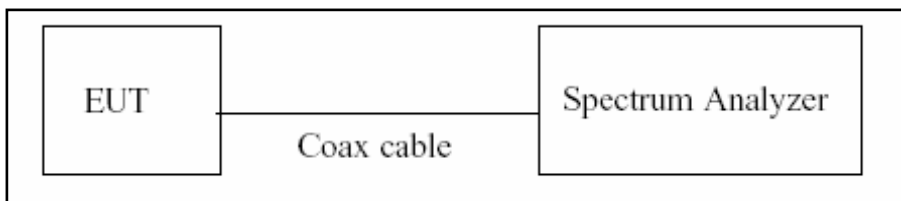
(Actual value of loss for the attenuator and cable combination)

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 \geq 3 MHz
4. Number of points in sweep \geq 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) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels 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 Loss: Attenuator loss(10 dB) + Cable loss

3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	10.80
UNII 2A	10.80
UNII 2C	10.80
UNII 3	10.80

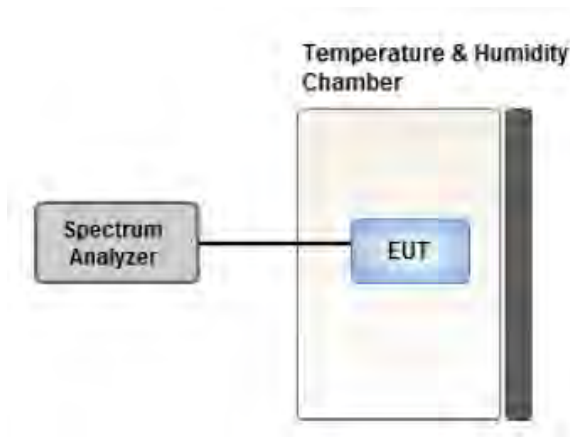
(Actual value of loss for the attenuator and cable combination)

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 $-30\text{ }^{\circ}\text{C}$ and $50\text{ }^{\circ}\text{C}$.
2. The temperature was incremented by $10\text{ }^{\circ}\text{C}$ intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.
3. The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.
4. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	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) = Measured Value + Correction Factor

8.7. Radiated Test

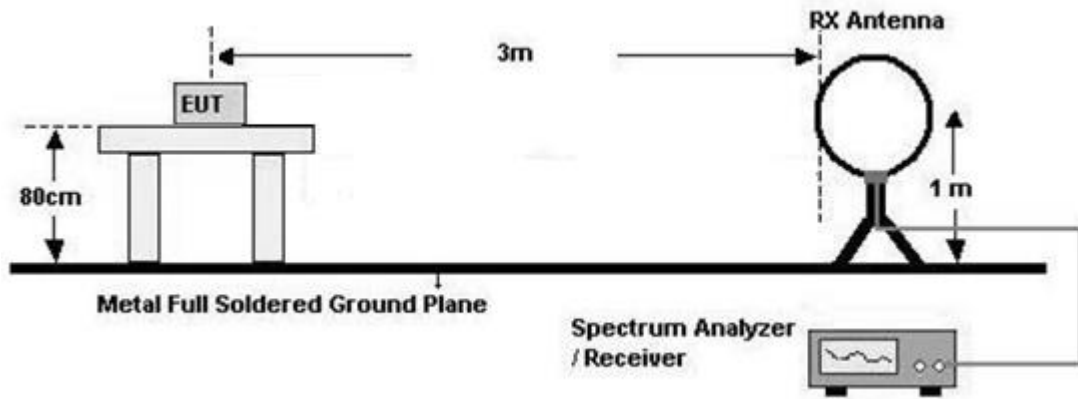
Limit

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
3. UNII 3: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

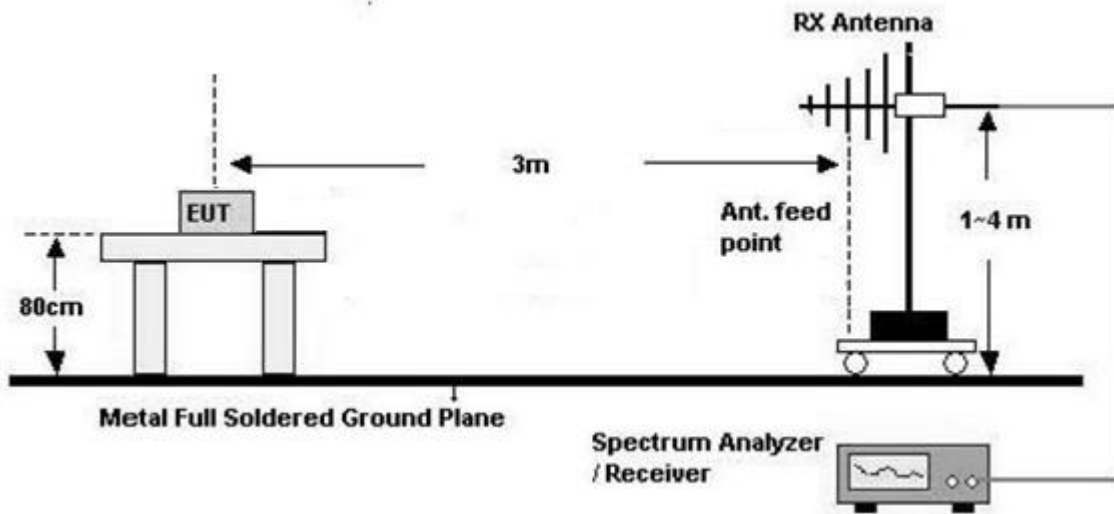
Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

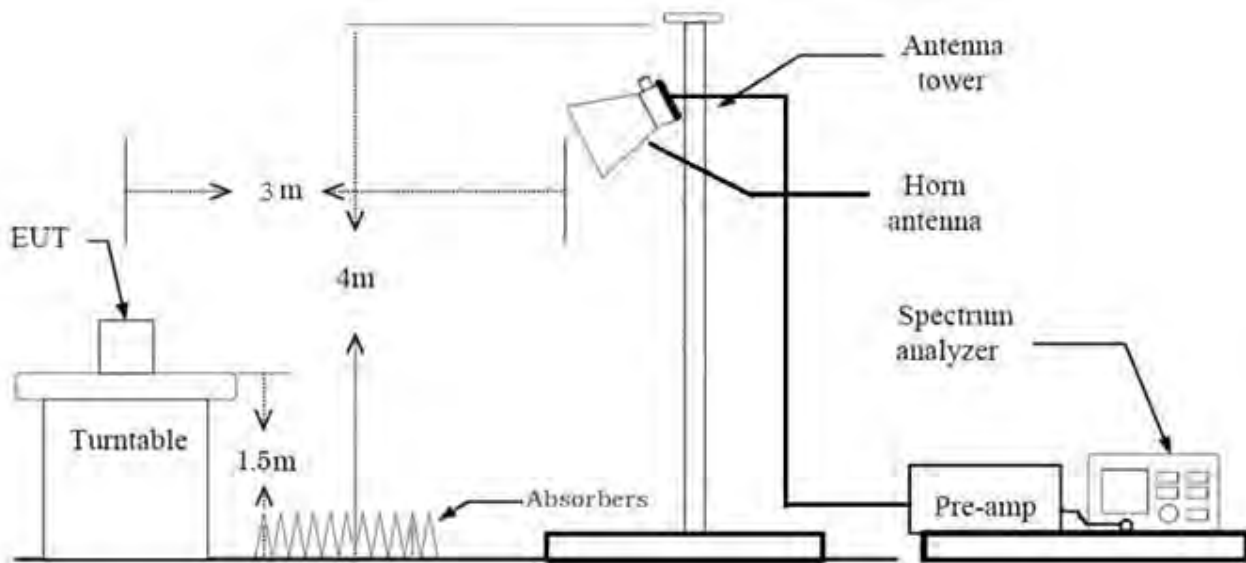
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz

**Test Procedure of Radiated spurious emissions(Below 30 MHz)**

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8 m 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) = $40\log(3 \text{ m}/300 \text{ m}) = - 80 \text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3 \text{ m}/30 \text{ m}) = - 40 \text{ dB}$
Measurement Distance : 3 m
8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ RBW
9. Total = Measured 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 1 GHz)

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 0.8 m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m 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 \geq 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 = Measured 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 1 m to 4 m 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 \geq 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 \geq 98 %) = $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is $<$ 98 %) = $VBW \geq 1/T$, 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 % duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (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 = $20\log(\text{test distance} / \text{specific distance})$ (dB)
12. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.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 1 m to 4 m 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 \geq 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 \geq 98 %) = $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 %) = $VBW \geq 1/T$, 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 % duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

9. 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 = $20\log(\text{test distance} / \text{specific distance})$ (dB)

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

The actual setting value of VBW

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6	0.929	0.320	1000
802.11n(HT20)	MCS0	0.925	0.340	1000
802.11n(HT40)	MCS0	0.859	0.660	3000
802.11ac(VHT20)	MCS0	0.925	0.338	1000
802.11ac(VHT40)	MCS0	0.848	0.714	3000
802.11ac(VHT80)	MCS0	0.740	1.307	5000

8.8. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
 - Worstcase : Stand alone
2. EUT Axis
 - Radiated Spurious Emissions : X, Y
 - Radiated Restricted Band Edge : Y
3. All datarate of operation were investigated and the worst case datarate results are reported.
 - Mode : Ant.2(SISO), Ant.1+Ant.2(SDM)
 - Worstcase : Ant.2(SISO)
 - 802.11a : 6 Mbps
 - 802.11n_HT20 : MCS0
 - 802.11n_HT40 : MCS0
 - 802.11ac_VHT20 : MCS0
 - 802.11ac_VHT40 : MCS0
 - 802.11ac_VHT80 : MCS0
4. Radiated Spurious Emission
 - All modulation of operation were investigated and the worst case modulation results are reported.
(Worstcase : 802.11a_6Mbps(SISO))
5. Radiated Spurious Emission
 - All Antenna of operation were investigated and the worst case results are reported
 - Antenna Operation Type : Ant.2(SISO), Ant.1+Ant.2(MIMO_SDM)
 - Worst case : Ant.2(SISO)
6. 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 + External accessories(Earphone,etc) + Travel Adapter,
Stand alone + Travel Adapter
 - Worstcase : Stand alone + Travel Adapter

Conducted test

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

9. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26 dB Bandwidth	§15.407 (for Power Measurement)	N/A	Conducted	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)(UNII-3) (5850-5895 MHz)(UNII-4)		PASS
Maximum Conducted Output Power	§15.407(a)(1),(2),(3)	< 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
Maximum EIRP Output Power	§15.407(a)(1)(3)(iii)	< EIRP 30dBm (5850-5925 MHz)		
Maximum Power Spectral Density	§15.407(a)(1),(2),(3)	<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) < EIRP 14 dBm/MHz(5850-5895 MHz)		PASS
AC Conducted Emissions	15.207 15.407(b)(9)	<FCC 15.207 limits		PASS
Undesirable Emissions	§15.407(b) (1),(2),(3),(4) §15.407(b)(5)(ii),(iii) §15.35(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.6 (UNII 3&4)		PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(9),(10)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		Radiated

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	1.426	1.535	0.929	0.320
	9	0.960	1.069	0.898	0.467
	12	0.725	0.826	0.877	0.569
	18	0.494	0.600	0.823	0.847
	24	0.372	0.481	0.774	1.114
	36	0.256	0.365	0.701	1.540
	48	0.195	0.304	0.642	1.927
	54	0.180	0.289	0.623	2.056

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.338	1.447	0.925	0.340
	1	0.687	0.795	0.863	0.640
	2	0.471	0.580	0.812	0.903
	3	0.365	0.474	0.770	1.135
	4	0.256	0.372	0.687	1.630
	5	0.200	0.299	0.669	1.743
	6	0.182	0.274	0.667	1.761
	7	0.170	0.269	0.632	1.992
802.11n (HT40)	0	0.664	0.773	0.859	0.660
	1	0.352	0.451	0.781	1.074
	2	0.248	0.350	0.710	1.487
	3	0.195	0.304	0.642	1.927
	4	0.144	0.251	0.576	2.398
	5	0.117	0.215	0.541	2.667
	6	0.106	0.215	0.494	3.062
	7	0.099	0.208	0.476	3.227

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.345	1.454	0.925	0.338
	1	0.692	0.801	0.864	0.635
	2	0.474	0.583	0.813	0.899
	3	0.367	0.469	0.784	1.058
	4	0.258	0.377	0.685	1.646
	5	0.203	0.322	0.630	2.007
	6	0.187	0.289	0.649	1.877
	7	0.170	0.289	0.588	2.308
	8	0.152	0.271	0.561	2.512
802.11ac (VHT40)	0	0.666	0.785	0.848	0.714
	1	0.357	0.466	0.766	1.156
	2	0.251	0.360	0.697	1.567
	3	0.200	0.319	0.627	2.027
	4	0.147	0.256	0.574	2.409
	5	0.122	0.238	0.511	2.919
	6	0.111	0.231	0.484	3.156
	7	0.106	0.223	0.477	3.212
	8	0.096	0.213	0.452	3.445
	9	0.089	0.187	0.473	3.252
802.11ac (VHT80)	0	0.332	0.448	0.740	1.307
	1	0.187	0.307	0.612	2.136
	2	0.142	0.241	0.589	2.295
	3	0.117	0.225	0.517	2.866
	4	0.091	0.208	0.439	3.574
	5	0.081	0.208	0.390	4.086
	6	0.076	0.193	0.395	4.036
	7	0.071	0.180	0.394	4.042
	8	0.068	0.175	0.391	4.075
	9	0.063	0.172	0.367	4.349

Note:

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

[MIMO]

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	8	0.692	0.808	0.856	0.68
	9	0.367	0.476	0.771	1.13
	10	0.261	0.377	0.691	1.60
	11	0.205	0.322	0.638	1.95
	12	0.152	0.279	0.545	2.63
	13	0.124	0.241	0.516	2.88
	14	0.117	0.225	0.517	2.87
	15	0.109	0.225	0.483	3.16
802.11n (HT40)	8	0.357	0.474	0.754	1.23
	9	0.200	0.319	0.627	2.03
	10	0.149	0.248	0.602	2.20
	11	0.119	0.246	0.485	3.15
	12	0.096	0.215	0.447	3.50
	13	0.081	0.180	0.451	3.46
	14	0.076	0.193	0.395	4.04
	15	0.073	0.190	0.387	4.13

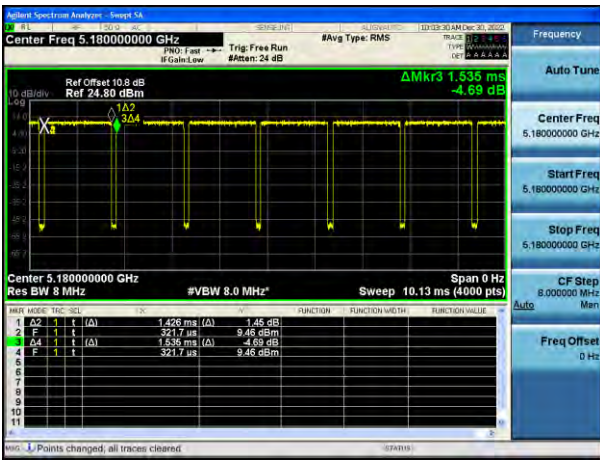
Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	0.697	0.816	0.854	0.69
	1	0.372	0.489	0.762	1.18
	2	0.263	0.383	0.689	1.62
	3	0.208	0.324	0.641	1.93
	4	0.155	0.263	0.587	2.32
	5	0.127	0.246	0.515	2.88
	6	0.119	0.246	0.485	3.15
	7	0.111	0.231	0.484	3.16
	8	0.101	0.218	0.465	3.32
802.11ac (VHT40)	0	0.360	0.497	0.724	1.40
	1	0.205	0.322	0.638	1.95
	2	0.152	0.269	0.566	2.47
	3	0.124	0.251	0.495	3.05
	4	0.099	0.225	0.438	3.58
	5	0.086	0.213	0.405	3.93
	6	0.081	0.170	0.478	3.21
	7	0.076	0.195	0.390	4.09
	8	0.071	0.190	0.373	4.28
	9	0.070	0.189	0.370	4.31
802.11ac (VHT80)	0	0.193	0.312	0.618	2.09
	1	0.119	0.228	0.522	2.82
	2	0.096	0.223	0.432	3.65
	3	0.084	0.200	0.418	3.79
	4	0.073	0.200	0.367	4.35
	5	0.066	0.172	0.382	4.18
	6	0.063	0.182	0.347	4.59
	7	0.062	0.180	0.344	4.63
	8	0.061	0.177	0.343	4.65
	9	0.056	0.165	0.338	4.70

Note:

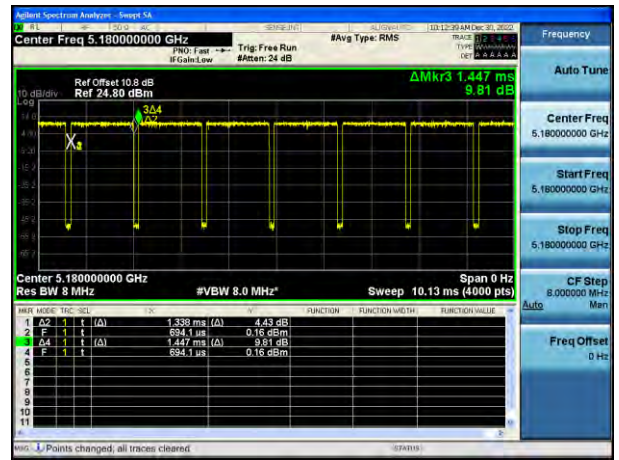
In order to simplify the report, attached plots were only the lowest datarate.

[SISO]

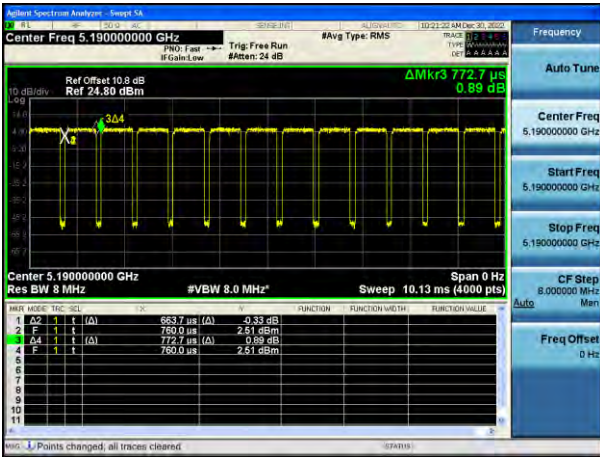
802.11a



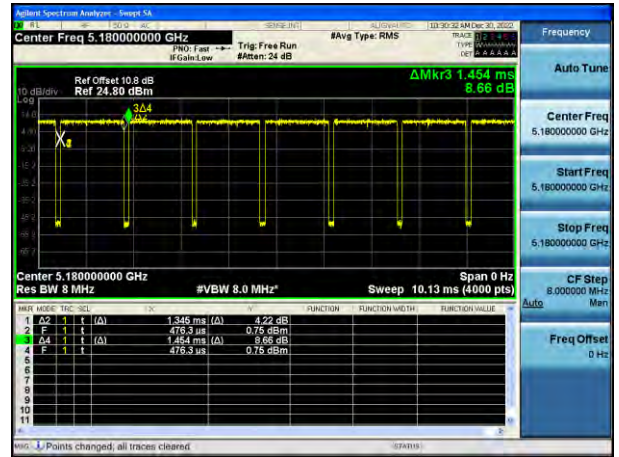
802.11n(HT20)



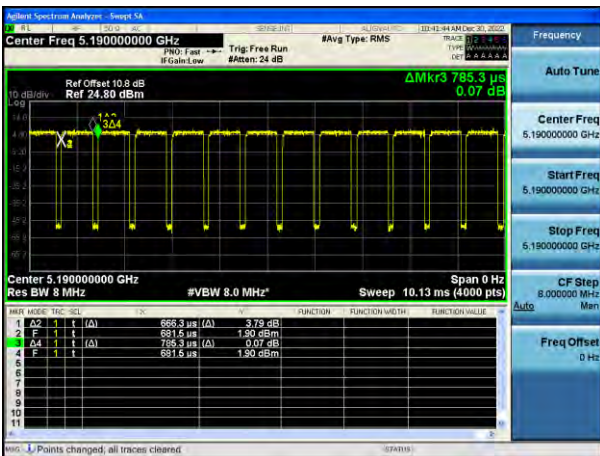
802.11n(HT40)



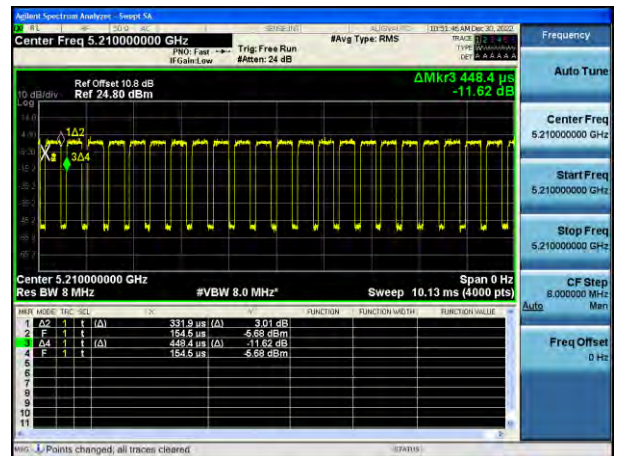
802.11ac(VHT20)



802.11ac(VHT40)

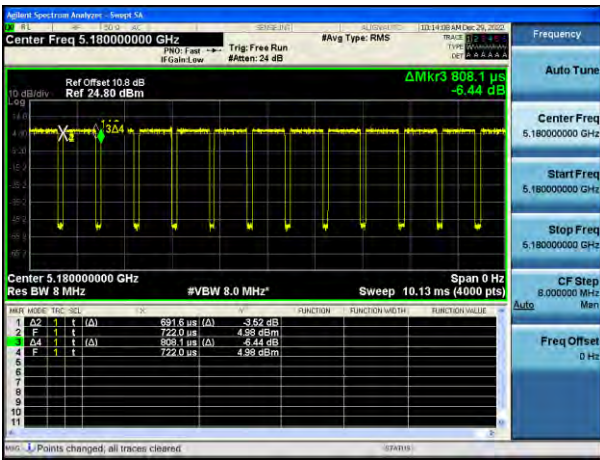


802.11ac(VHT80)

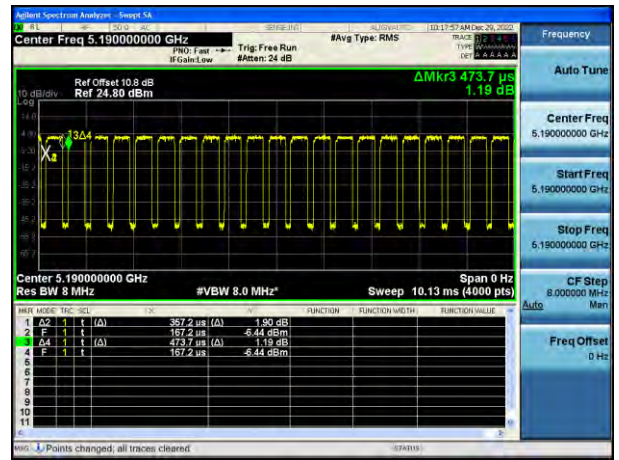


[MIMO]

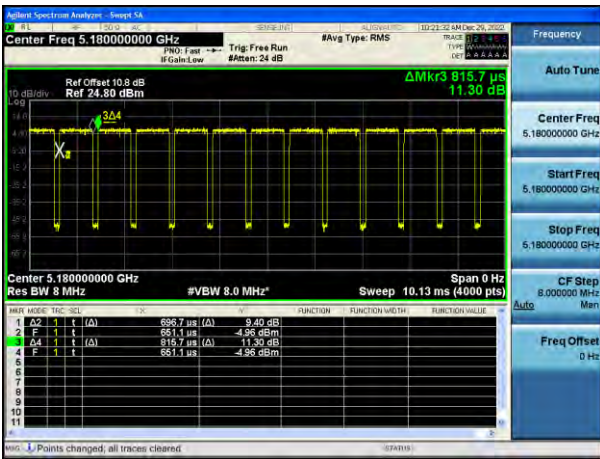
802.11n(HT20)



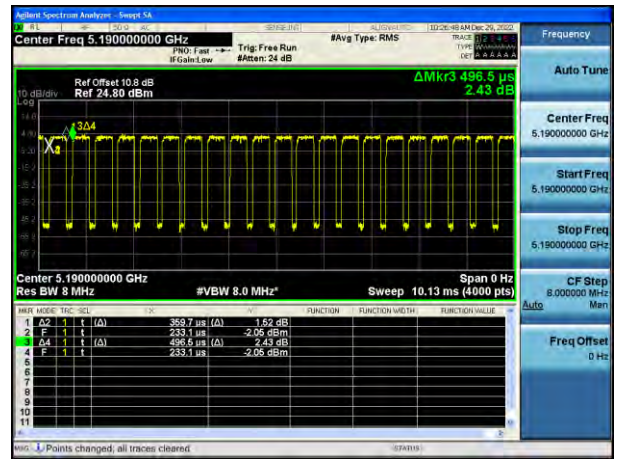
802.11n(HT40)



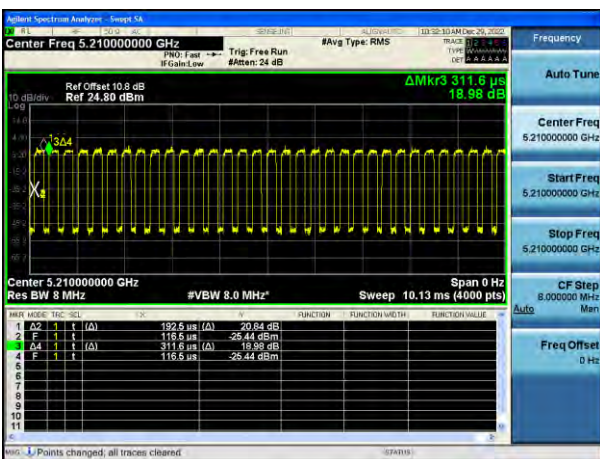
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



10.2 26 dB Bandwidth

Straddle channel data in the table below are for reporting purposes only. Straddle channel data were added in section 10.7.1.

[SISO Ant.2]

802.11a Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.30	16.480
5200	40	24.58	17.887
5240	48	24.65	17.869
5260	52	24.41	17.868
5300	60	24.70	17.972
5320	64	20.29	16.484
5500	100	20.23	16.428
5600	120	24.54	17.720
5720	144	24.24	17.722
5745	149	24.63	17.815
5785	157	23.88	17.705
5825	165	24.30	17.831

802.11n(HT20) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	22.47	17.979
5200	40	30.72	19.783
5240	48	30.49	19.697
5260	52	30.50	19.798
5300	60	30.40	19.584
5320	64	22.57	17.834
5500	100	21.55	17.742
5600	120	30.25	19.607
5720	144	30.81	19.359
5745	149	30.73	19.611
5785	157	30.08	19.387
5825	165	30.64	19.650

802.11n(HT40) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	63.13	39.498
5230	46	63.22	39.241
5270	54	63.14	39.478
5310	62	63.17	39.445
5510	102	41.95	37.130
5590	118	63.23	39.376
5710	142	63.17	39.462
5755	151	63.12	39.503
5795	159	63.03	39.472

802.11ac(VHT20) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	22.14	18.004
5200	40	30.85	19.619
5240	48	30.71	19.525
5260	52	30.52	19.686
5300	60	30.67	19.794
5320	64	21.56	17.881
5500	100	21.55	17.859
5600	120	30.83	19.624
5720	144	30.36	19.268
5745	149	30.65	19.654
5785	157	30.73	19.490
5825	165	30.53	19.428

802.11ac(VHT40) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	62.83	39.063
5230	46	63.02	38.902
5270	54	63.13	39.108
5310	62	63.01	39.064
5510	102	42.52	36.727
5590	118	62.94	39.145
5710	142	62.84	39.037
5755	151	63.13	39.002
5795	159	63.25	39.235

802.11ac(VHT80) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	105.4	78.712
5290	58	106.3	78.713
5530	106	81.92	77.359
5610	122	102.9	78.750
5690	138	100.7	78.659
5775	155	106.9	78.794

[MIMO Ant.1]

802.11n(HT20) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.79	17.518
5200	40	29.63	18.835
5240	48	30.02	18.744
5260	52	29.88	18.659
5300	60	29.69	18.752
5320	64	20.72	17.531
5500	100	21.04	17.571
5600	120	30.34	18.972
5720	144	28.77	18.671
5745	149	30.27	18.943
5785	157	29.60	18.777
5825	165	29.94	18.952

802.11n(HT40) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	63.24	39.007
5230	46	63.06	39.109
5270	54	62.94	39.241
5310	62	63.13	39.365
5510	102	41.78	37.113
5590	118	62.62	39.287
5710	142	63.11	39.221
5755	151	63.00	39.355
5795	159	63.19	39.382

802.11ac(VHT20) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.45	17.514
5200	40	29.47	18.738
5240	48	30.00	18.686
5260	52	29.52	18.695
5300	60	30.48	18.612
5320	64	20.68	17.536
5500	100	20.56	17.502
5600	120	29.98	18.770
5720	144	29.73	18.644
5745	149	29.84	18.631
5785	157	30.24	18.538
5825	165	30.45	18.538

802.11ac(VHT40) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	56.02	37.700
5230	46	55.80	37.446
5270	54	58.99	37.560
5310	62	55.59	37.513
5510	102	40.87	36.192
5590	118	57.19	37.454
5710	142	60.59	37.516
5755	151	58.16	37.531
5795	159	60.47	37.532

802.11ac(VHT80) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	104.1	77.821
5290	58	99.83	78.314
5530	106	81.07	76.301
5610	122	100.6	78.181
5690	138	103.3	78.215
5775	155	102.9	78.018

[MIMO Ant.2]

802.11n(HT20) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	22.14	17.799
5200	40	30.44	19.746
5240	48	30.55	19.342
5260	52	30.13	19.447
5300	60	30.35	19.392
5320	64	21.91	17.638
5500	100	22.23	17.587
5600	120	30.52	19.513
5720	144	30.27	19.565
5745	149	30.46	19.335
5785	157	30.33	19.610
5825	165	30.85	19.204

802.11n(HT40) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	62.85	38.927
5230	46	62.70	39.119
5270	54	62.79	39.296
5310	62	62.88	38.905
5510	102	41.82	37.071
5590	118	62.43	39.057
5710	142	62.82	38.944
5755	151	62.80	39.167
5795	159	63.10	39.171

802.11ac(VHT20) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.86	17.564
5200	40	30.25	18.956
5240	48	29.74	19.050
5260	52	29.60	18.730
5300	60	29.77	18.695
5320	64	20.53	17.536
5500	100	20.78	17.511
5600	120	28.80	18.823
5720	144	29.48	18.746
5745	149	29.97	18.932
5785	157	30.24	18.863
5825	165	30.25	18.936

802.11ac(VHT40) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	55.44	37.996
5230	46	61.07	37.846
5270	54	58.97	37.838
5310	62	58.64	38.072
5510	102	40.60	36.220
5590	118	58.77	37.976
5710	142	58.26	37.779
5755	151	61.73	37.826
5795	159	58.75	37.885

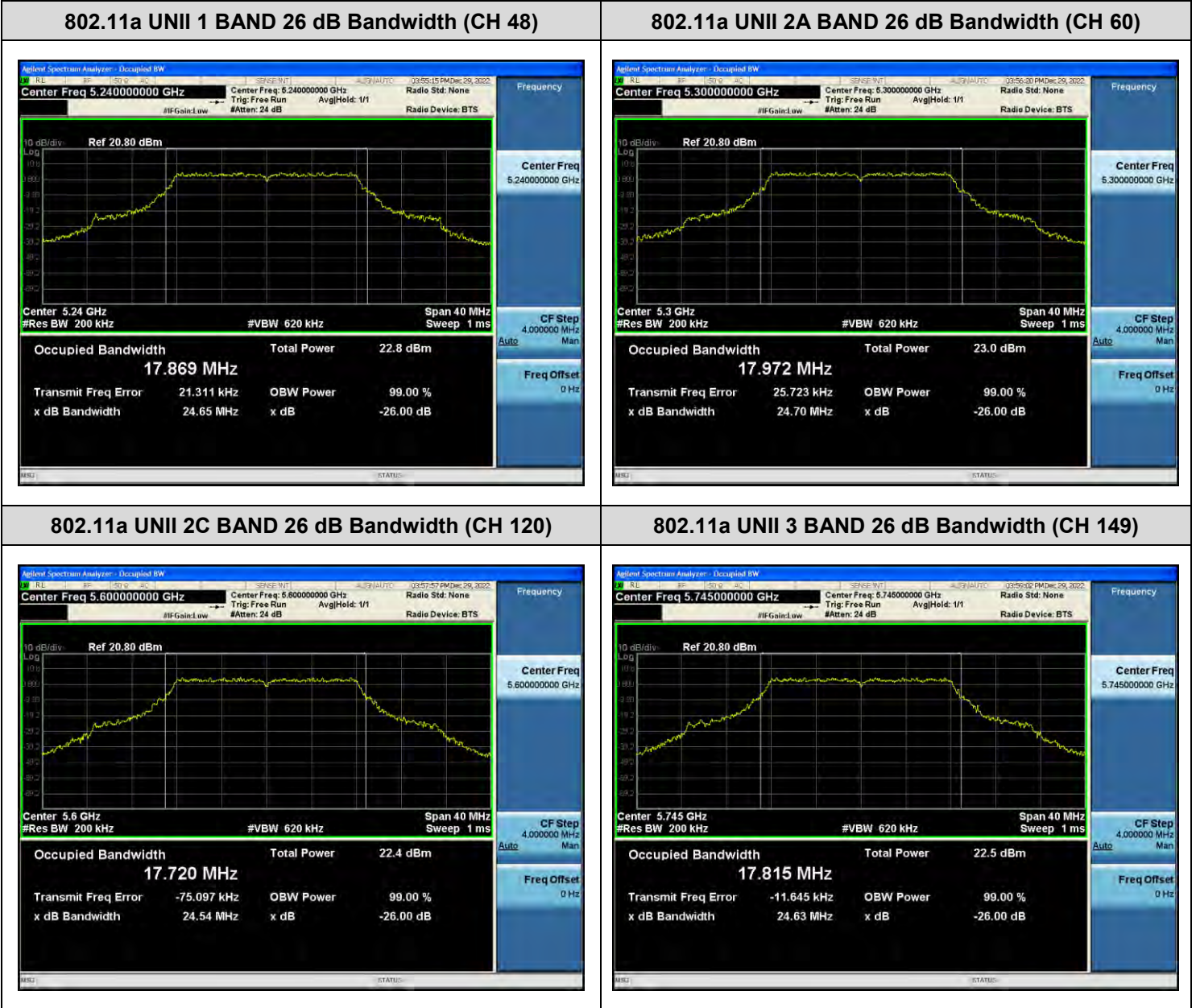
802.11ac(VHT80) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	97.13	77.399
5290	58	104.0	77.420
5530	106	80.93	75.664
5610	122	100.9	77.501
5690	138	98.60	77.501
5775	155	101.5	77.747

[SISO Ant.2]

☑ Test Plots(802.11a)

Note:

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

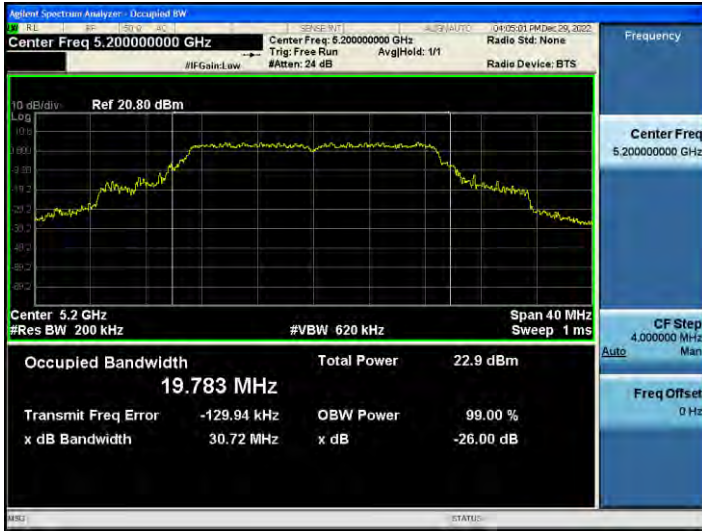


☐ Test Plots(802.11n(HT20))

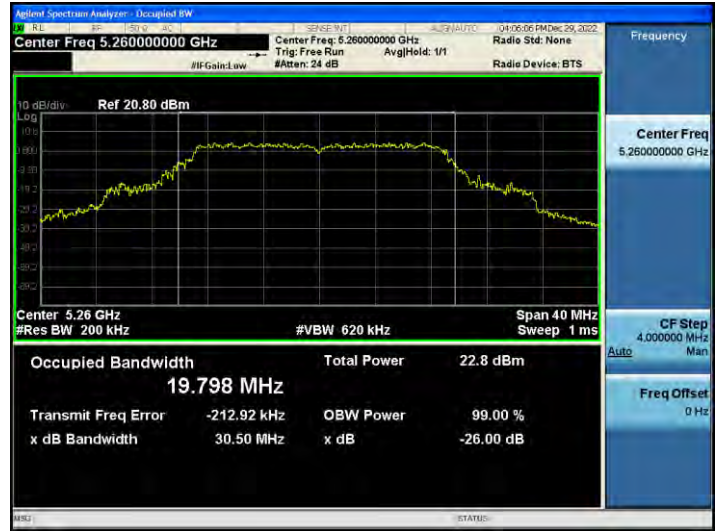
Note:

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

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



802.11n_HT20 UNII 2A BAND 26 dB Bandwidth(CH 52)



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



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



☐ Test Plots(802.11n(HT40))

Note:

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

802.11n_HT40 UNII 1 BAND 26 dB Bandwidth(CH 46)



802.11n_HT40 UNII 2A BAND 26 dB Bandwidth (CH 62)



802.11n_HT40 UNII 2C BAND 26 dB Bandwidth(CH 118)



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



☐ Test Plots(802.11ac(VHT20))

Note:

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

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



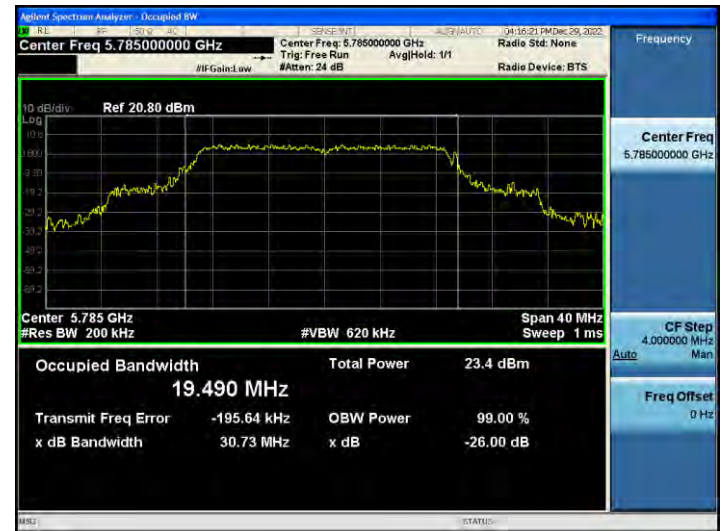
802.11ac_VHT20 UNII 2A BAND 26 dB Bandwidth(CH 60)



802.11ac_VHT20 UNII 2C BAND 26 dB Bandwidth(CH 120)



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

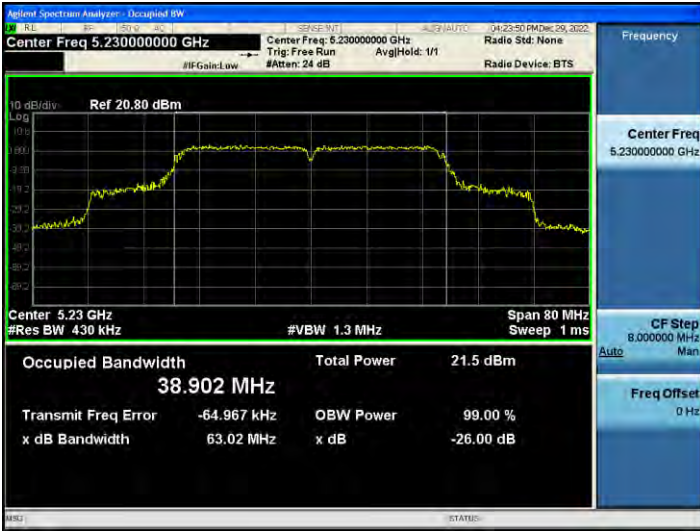


☐ Test Plots(802.11ac(VHT40))

Note:

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

802.11ac_VHT40 UNII 1 BAND 26 dB Bandwidth(CH 46)



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



802.11ac_VHT40 UNII 2C BAND 26 dB Bandwidth(CH 118)



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

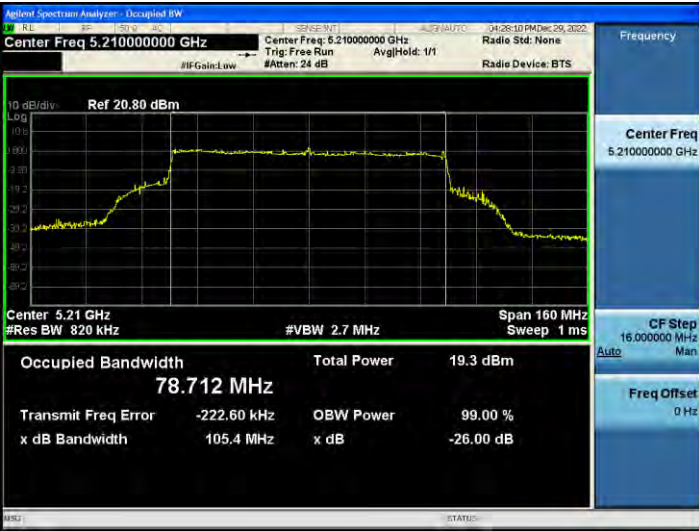


☐ Test Plots(802.11ac(VHT80))

Note:

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

802.11ac_VHT80 UNII 1 BAND 26 dB Bandwidth(CH 42)



802.11ac_VHT80 UNII 2A BAND 26 dB Bandwidth (CH 58)



802.11ac_VHT80 UNII 2C BAND 26 dB Bandwidth(CH 122)



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



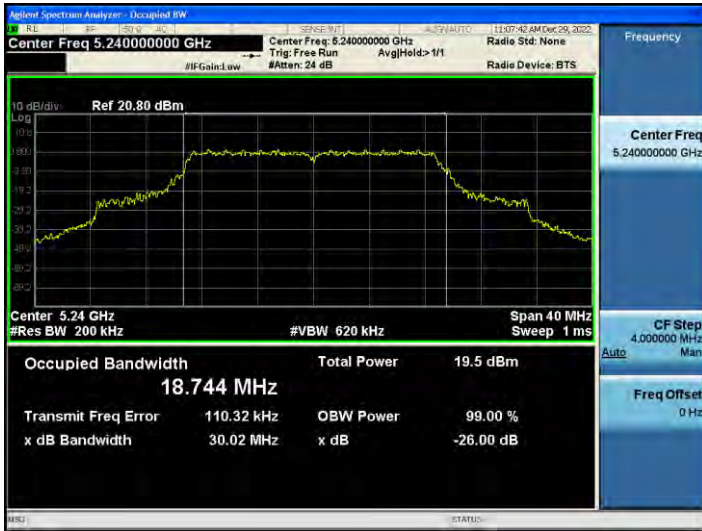
[MIMO Ant.1]

☑ Test Plots(802.11n(HT20))

Note:

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

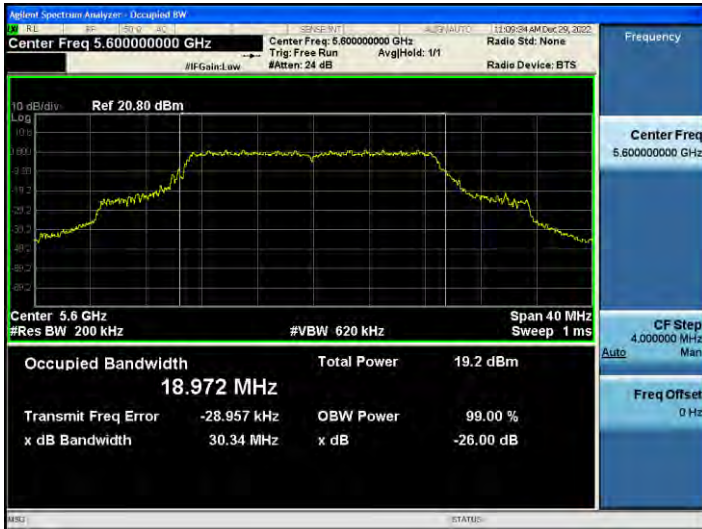
802.11n_HT20 UNII 1 BAND 26 dB Bandwidth(CH 48)



802.11n_HT20 UNII 2A BAND 26 dB Bandwidth(CH 52)



802.11n_HT20 UNII 2C BAND 26 dB Bandwidth(CH 120)



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

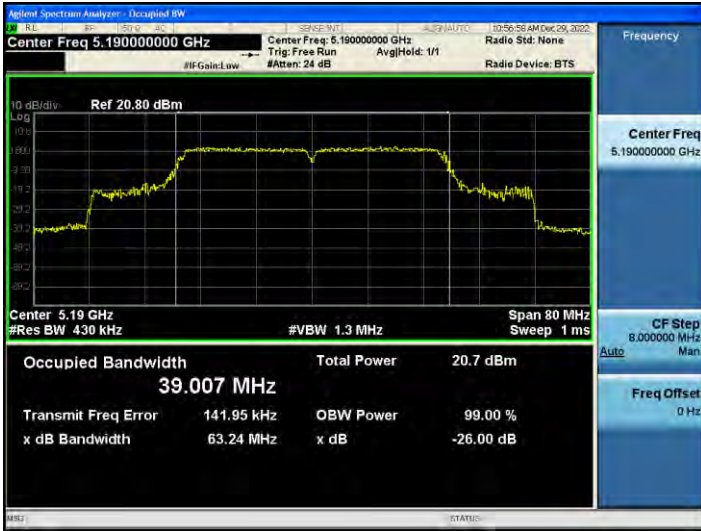


☐ Test Plots(802.11n(HT40))

Note:

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

802.11n_HT40 UNII 1 BAND 26 dB Bandwidth(CH 38)



802.11n_HT40 UNII 2A BAND 26 dB Bandwidth (CH 62)



802.11n_HT40 UNII 2C BAND 26 dB Bandwidth(CH 142)



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

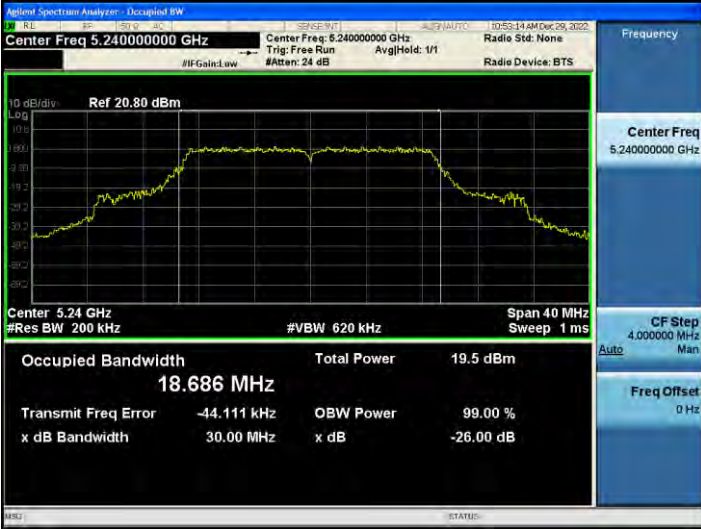


☐ Test Plots(802.11ac(VHT20))

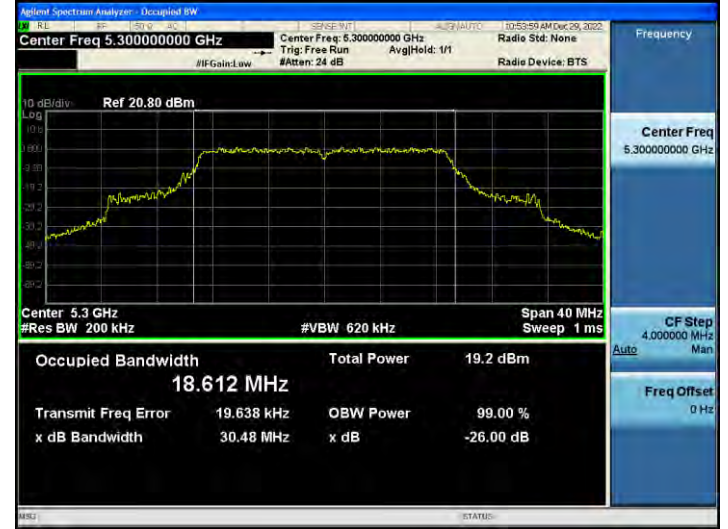
Note:

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

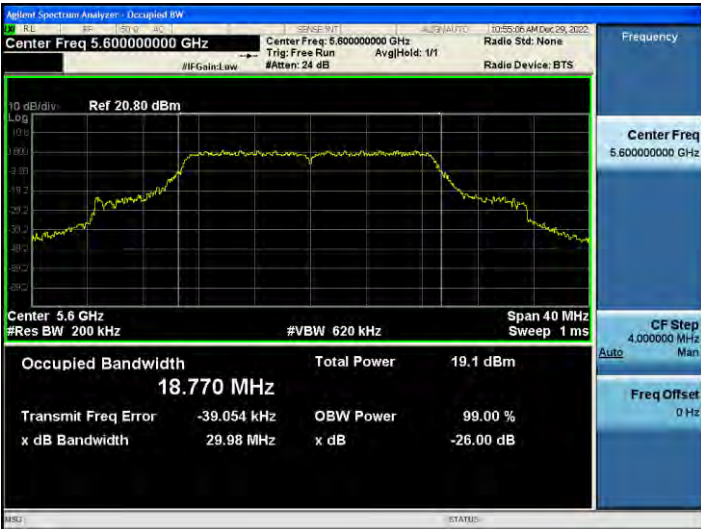
802.11ac_VHT20 UNII 1 BAND 26 dB Bandwidth(CH 48)



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



802.11ac_VHT20 UNII 2C BAND 26 dB Bandwidth(CH 120)



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

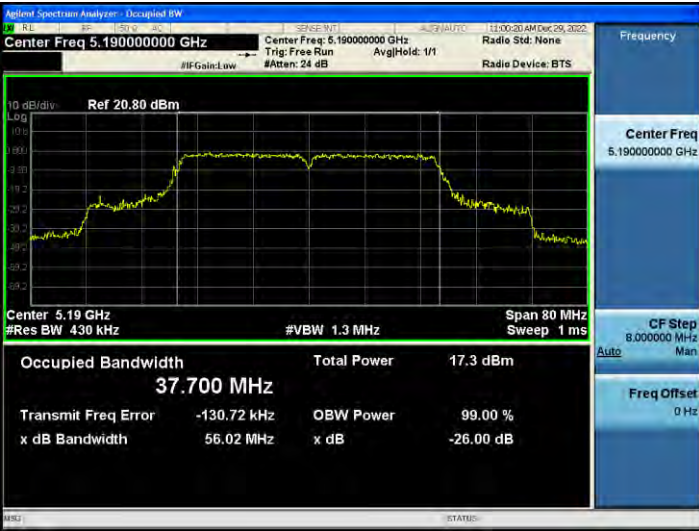


☐ Test Plots(802.11ac(VHT40))

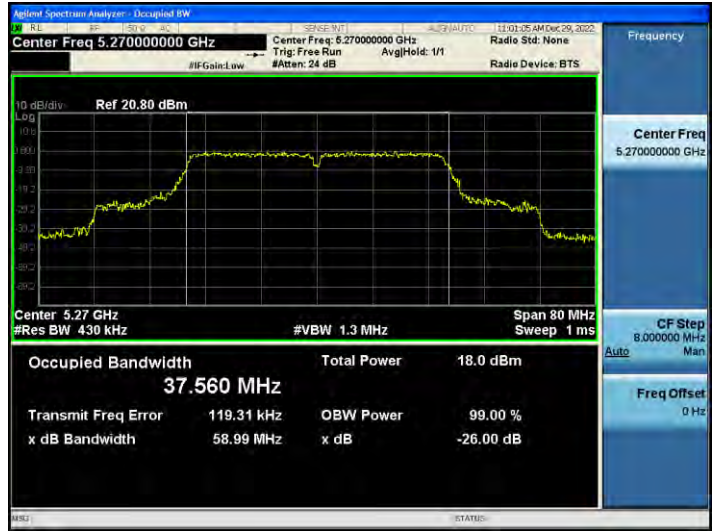
Note:

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

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



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



802.11ac_VHT40 UNII 2C BAND 26 dB Bandwidth(CH 142)



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



☐ Test Plots(802.11ac(VHT80))

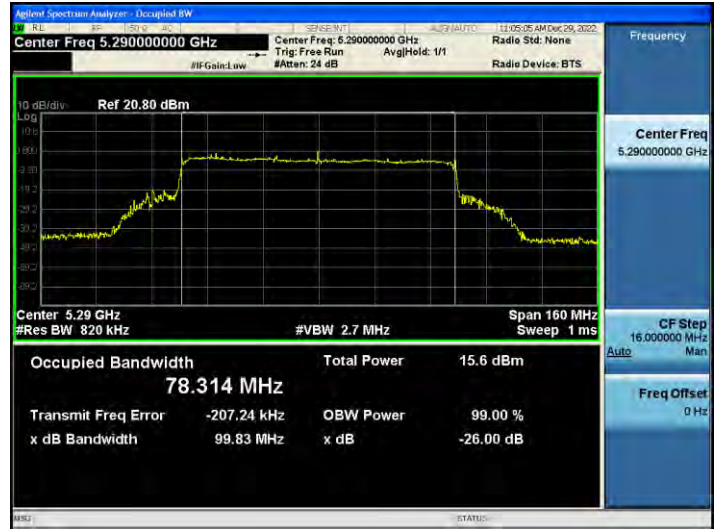
Note:

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

802.11ac_VHT80 UNII 1 BAND 26 dB Bandwidth(CH 42)



802.11ac_VHT80 UNII 2A BAND 26 dB Bandwidth (CH 58)



802.11ac_VHT80 UNII 2C BAND 26 dB Bandwidth(CH 138)



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



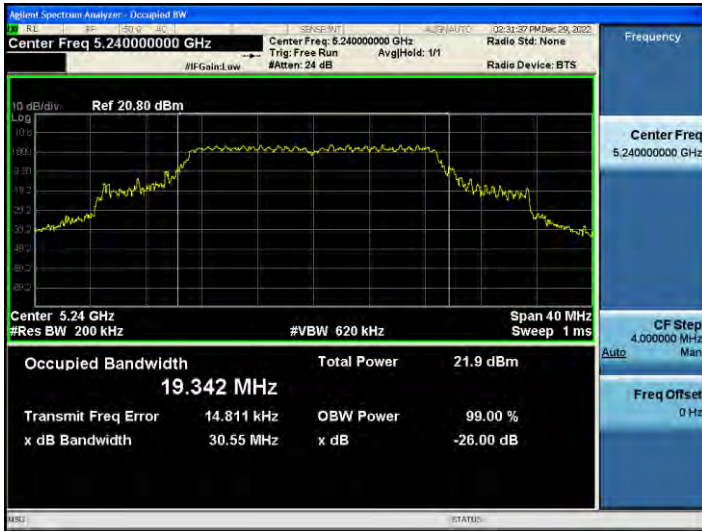
[MIMO Ant.2]

☑ Test Plots(802.11n(HT20))

Note:

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

802.11n_HT20 UNII 1 BAND 26 dB Bandwidth(CH 48)



802.11n_HT20 UNII 2A BAND 26 dB Bandwidth(CH 60)



802.11n_HT20 UNII 2C BAND 26 dB Bandwidth(CH 120)



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

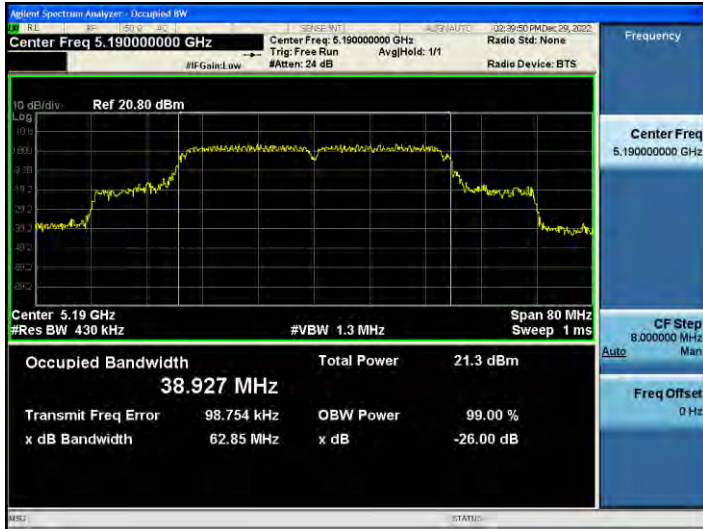


☐ Test Plots(802.11n(HT40))

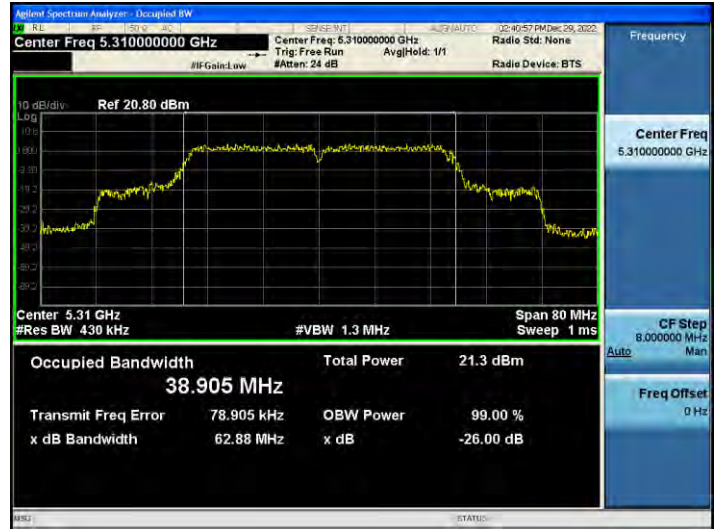
Note:

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

802.11n_HT40 UNII 1 BAND 26 dB Bandwidth(CH 38)



802.11n_HT40 UNII 2A BAND 26 dB Bandwidth (CH 62)



802.11n_HT40 UNII 2C BAND 26 dB Bandwidth(CH 142)



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



☐ Test Plots(802.11ac(VHT20))

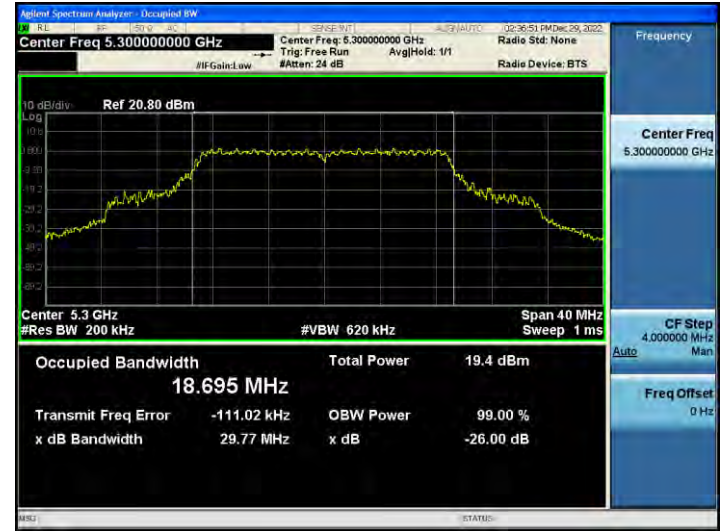
Note:

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

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



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



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



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



☐ Test Plots(802.11ac(VHT40))

Note:

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

802.11ac_VHT40 UNII 1 BAND 26 dB Bandwidth(CH 46)



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



802.11ac_VHT40 UNII 2C BAND 26 dB Bandwidth(CH 118)



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

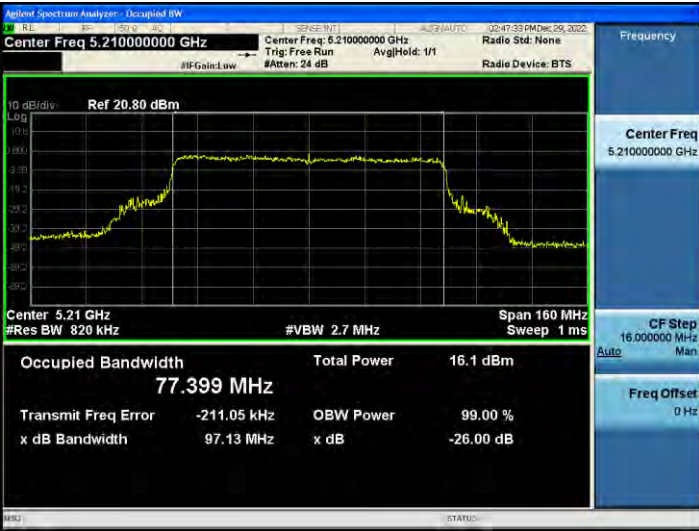


☐ Test Plots(802.11ac(VHT80))

Note:

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

802.11ac_VHT80 UNII 1 BAND 26 dB Bandwidth(CH 42)



802.11ac_VHT80 UNII 2A BAND 26 dB Bandwidth (CH 58)



802.11ac_VHT80 UNII 2C BAND 26 dB Bandwidth(CH 122)



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



10.3 6 dB BANDWIDTH

[SISO Ant.2]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.48	> 0.5	Pass
5785	157	16.42	> 0.5	Pass
5825	165	16.44	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.86	> 0.5	Pass
5785	157	17.68	> 0.5	Pass
5825	165	17.69	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.80	> 0.5	Pass
5795	159	36.81	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.93	> 0.5	Pass
5785	157	17.95	> 0.5	Pass
5825	165	17.70	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.72	> 0.5	Pass
5795	159	36.69	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	77.89	> 0.5	Pass

[MIMO Ant.1]

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.93	> 0.5	Pass
5785	157	17.65	> 0.5	Pass
5825	165	17.94	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.74	> 0.5	Pass
5795	159	36.78	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.65	> 0.5	Pass
5785	157	17.65	> 0.5	Pass
5825	165	17.64	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.42	> 0.5	Pass
5795	159	36.42	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	77.82	> 0.5	Pass

[MIMO Ant.2]

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.68	> 0.5	Pass
5785	157	17.68	> 0.5	Pass
5825	165	17.68	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.74	> 0.5	Pass
5795	159	36.73	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.67	> 0.5	Pass
5785	157	17.66	> 0.5	Pass
5825	165	17.67	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.48	> 0.5	Pass
5795	159	36.48	> 0.5	Pass

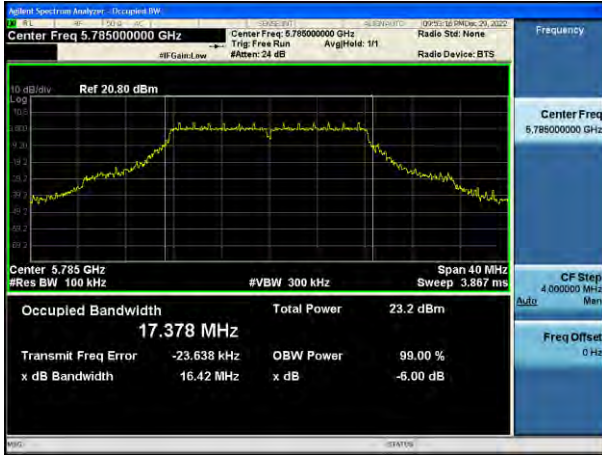
802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	76.48	> 0.5	Pass

[SISO Ant.2]

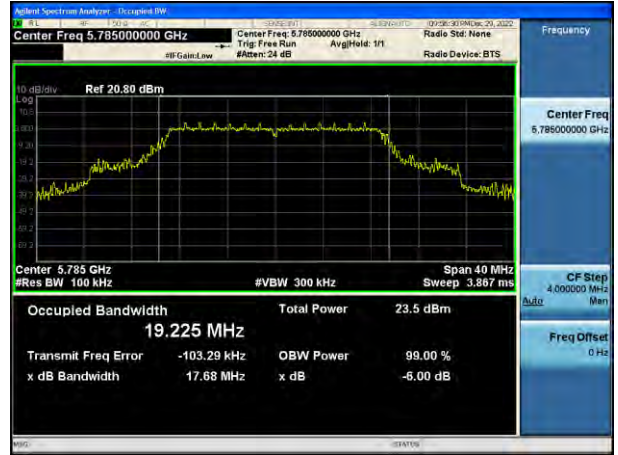
☑ Test Plots

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

802.11a (CH.157)



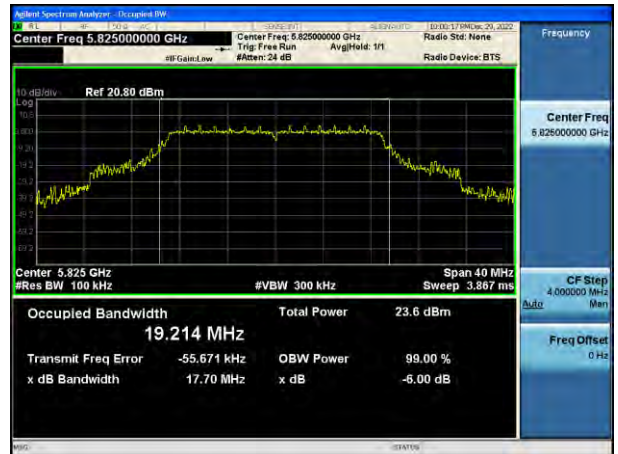
802.11n(HT20) (CH.157)



802.11n(HT40) (CH.151)



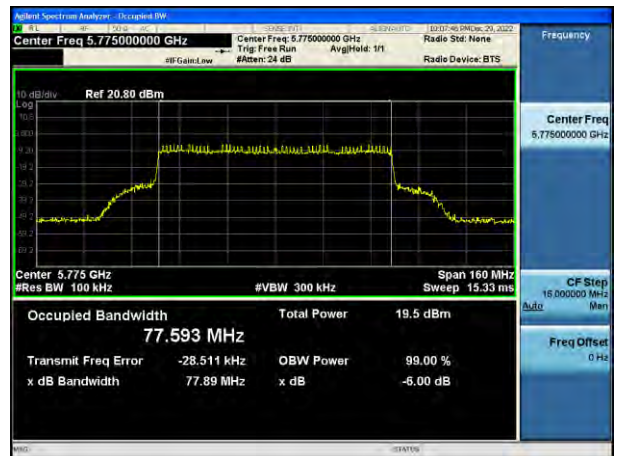
802.11ac(VHT20) (CH.165)



802.11ac(VHT40) (CH.159)



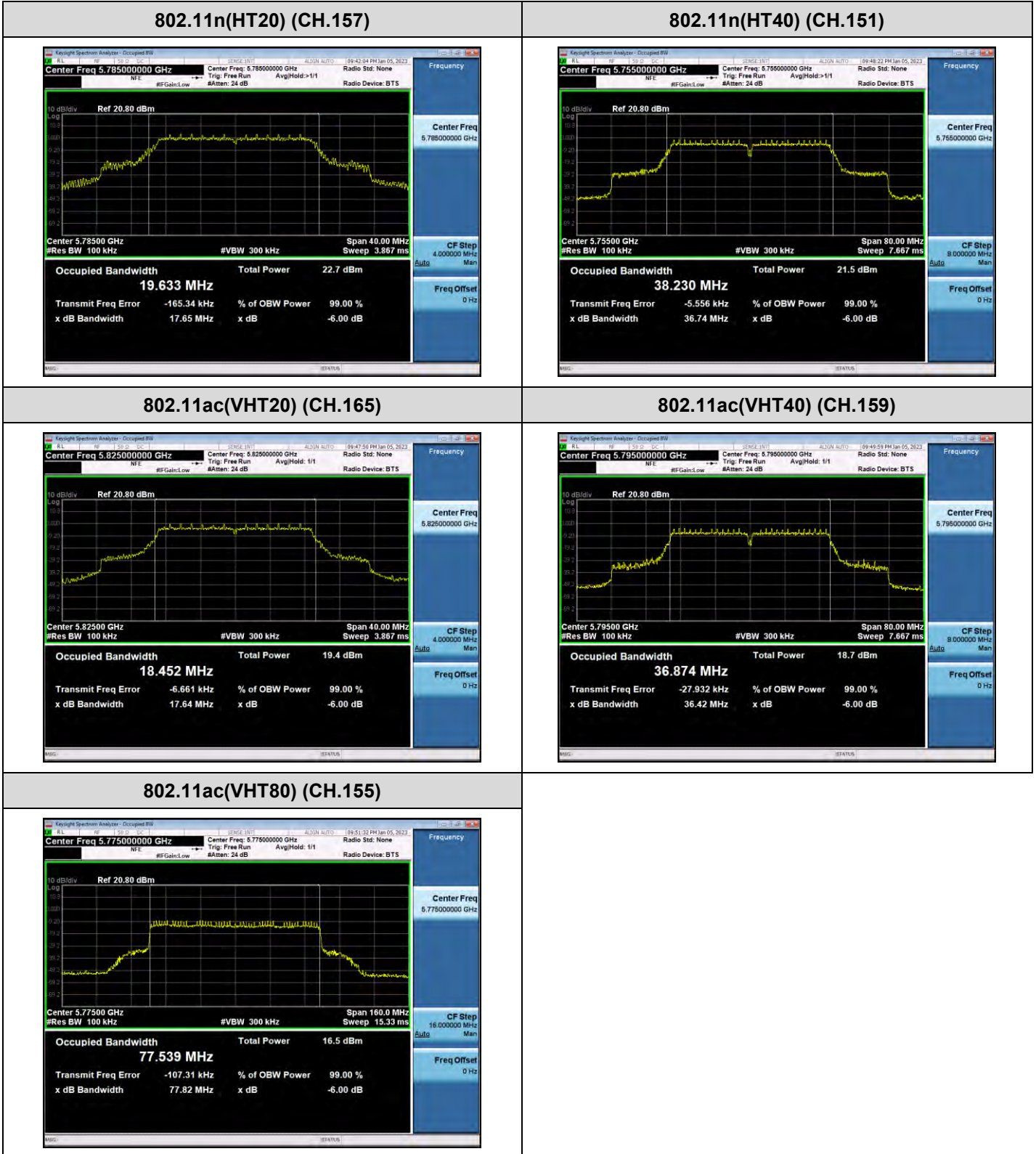
802.11ac(VHT80) (CH.155)



[MIMO Ant.1]

☑ Test Plots

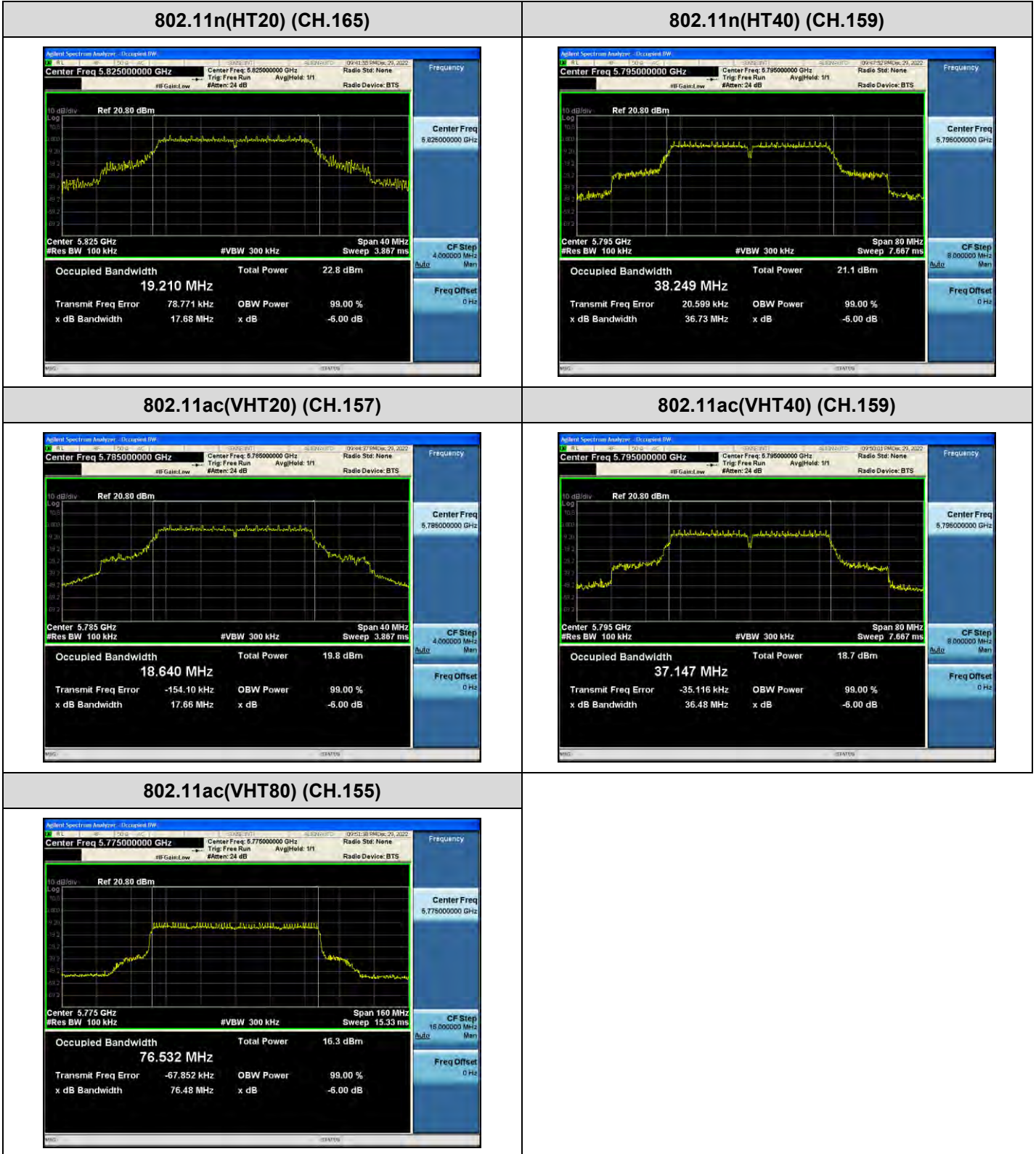
Note: In order to simplify the report, attached plots were only the narrowest channel.



[MIMO Ant.2]

☑ Test Plots

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



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.

Limit

(UNII 1) : 23.98 dBm

(UNII 2A, 2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)

(UNII 3) : 30.00 dBm

[SISO Ant.2]

802.11a Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase Datarate (Mbps)
Frequency [MHz]	Channel No.					
5180	36	14.44	1.540	15.98	23.98	36M
5200	40	14.53	1.540	16.07	23.98	36M
5240	48	14.91	1.540	16.45	23.98	36M
5260	52	14.41	1.540	15.95	23.98	36M
5300	60	15.21	1.540	16.75	23.98	36M
5320	64	14.45	1.540	15.99	23.98	36M
5500	100	13.69	1.540	15.23	23.98	36M
5600	120	14.25	1.540	15.79	23.98	36M
5720	144	14.33	1.540	15.87	23.98	36M
5745	149	14.23	1.540	15.77	30.00	36M
5785	157	14.72	1.540	16.26	30.00	36M
5825	165	14.79	1.540	16.33	30.00	36M

802.11n(20 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit [dBm]	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5180	36	14.33	1.630	15.96	23.98	MCS4
5200	40	14.48	1.630	16.11	23.98	MCS4
5240	48	15.15	1.630	16.78	23.98	MCS4
5260	52	14.48	1.630	16.11	23.98	MCS4
5300	60	15.13	1.630	16.76	23.98	MCS4
5320	64	14.56	1.630	16.19	23.98	MCS4
5500	100	13.59	1.630	15.22	23.98	MCS4
5600	120	14.26	1.630	15.89	23.98	MCS4
5720	144	14.37	1.630	16.00	23.98	MCS4
5745	149	14.21	1.630	15.84	30.00	MCS4
5785	157	14.79	1.630	16.42	30.00	MCS4
5825	165	14.79	1.630	16.42	30.00	MCS4

802.11n(40 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5190	38	12.36	2.398	14.76	23.98	MCS4
5230	46	12.41	2.398	14.81	23.98	MCS4
5270	54	12.22	2.398	14.62	23.98	MCS4
5310	62	12.58	2.398	14.98	23.98	MCS4
5510	102	11.73	2.398	14.13	23.98	MCS4
5590	118	12.24	2.398	14.64	23.98	MCS4
5710	142	11.55	2.398	13.95	23.98	MCS4
5755	151	11.39	2.398	13.79	30.00	MCS4
5795	159	11.63	2.398	14.02	30.00	MCS4

802.11ac(20 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5180	36	14.60	1.646	16.25	23.98	MCS4
5200	40	14.60	1.646	16.25	23.98	MCS4
5240	48	14.80	1.646	16.44	23.98	MCS4
5260	52	14.44	1.646	16.09	23.98	MCS4
5300	60	15.09	1.646	16.74	23.98	MCS4
5320	64	14.57	1.646	16.22	23.98	MCS4
5500	100	13.61	1.646	15.26	23.98	MCS4
5600	120	14.31	1.646	15.96	23.98	MCS4
5720	144	14.40	1.646	16.04	23.98	MCS4
5745	149	14.36	1.646	16.00	30.00	MCS4
5785	157	14.79	1.646	16.44	30.00	MCS4
5825	165	14.77	1.646	16.42	30.00	MCS4

802.11ac(40 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5190	38	12.37	2.409	14.78	23.98	MCS4
5230	46	12.41	2.409	14.82	23.98	MCS4
5270	54	12.35	2.409	14.76	23.98	MCS4
5310	62	12.54	2.409	14.95	23.98	MCS4
5510	102	11.80	2.409	14.21	23.98	MCS4
5590	118	12.02	2.409	14.43	23.98	MCS4
5710	142	11.61	2.409	14.02	23.98	MCS4
5755	151	11.62	2.409	14.03	30.00	MCS4
5795	159	11.72	2.409	14.13	30.00	MCS4

802.11ac(80 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5210	42	7.88	4.086	11.97	23.98	MCS5
5290	58	7.89	4.086	11.98	23.98	MCS5
5530	106	7.62	4.086	11.71	23.98	MCS5
5610	122	7.58	4.086	11.67	23.98	MCS5
5690	138	6.76	4.086	10.85	23.98	MCS5
5775	155	6.96	4.086	11.05	30.00	MCS5

[MIMO Ant.1]

802.11n(20 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit [dBm]	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5180	36	9.55	2.632	12.18	23.98	MCS12
5200	40	10.32	2.632	12.95	23.98	MCS12
5240	48	10.95	2.632	13.58	23.98	MCS12
5260	52	10.71	2.632	13.34	23.98	MCS12
5300	60	10.40	2.632	13.04	23.98	MCS12
5320	64	9.93	2.632	12.56	23.98	MCS12
5500	100	10.15	2.632	12.78	23.98	MCS12
5600	120	10.28	2.632	12.91	23.98	MCS12
5720	144	10.71	2.632	13.35	23.98	MCS12
5745	149	10.81	2.632	13.44	30.00	MCS12
5785	157	10.74	2.632	13.37	30.00	MCS12
5825	165	10.51	2.632	13.14	30.00	MCS12

802.11n(40 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5190	38	8.34	3.147	11.49	23.98	MCS11
5230	46	8.73	3.147	11.88	23.98	MCS11
5270	54	8.92	3.147	12.07	23.98	MCS11
5310	62	8.23	3.147	11.38	23.98	MCS11
5510	102	8.37	3.147	11.51	23.98	MCS11
5590	118	8.05	3.147	11.20	23.98	MCS11
5710	142	8.84	3.147	11.98	23.98	MCS11
5755	151	8.75	3.147	11.90	30.00	MCS11
5795	159	8.63	3.147	11.78	30.00	MCS11

802.11ac(20 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5180	36	9.93	2.317	12.25	23.98	MCS4
5200	40	10.66	2.317	12.98	23.98	MCS4
5240	48	10.78	2.317	13.10	23.98	MCS4
5260	52	10.85	2.317	13.17	23.98	MCS4
5300	60	10.56	2.317	12.88	23.98	MCS4
5320	64	10.06	2.317	12.38	23.98	MCS4
5500	100	10.08	2.317	12.40	23.98	MCS4
5600	120	10.45	2.317	12.77	23.98	MCS4
5720	144	10.93	2.317	13.25	23.98	MCS4
5745	149	11.14	2.317	13.46	30.00	MCS4
5785	157	10.83	2.317	13.15	30.00	MCS4
5825	165	10.48	2.317	12.80	30.00	MCS4

802.11ac(40 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5190	38	7.87	3.583	11.46	23.98	MCS4
5230	46	8.37	3.583	11.96	23.98	MCS4
5270	54	8.51	3.583	12.10	23.98	MCS4
5310	62	7.92	3.583	11.50	23.98	MCS4
5510	102	7.96	3.583	11.55	23.98	MCS4
5590	118	7.89	3.583	11.47	23.98	MCS4
5710	142	8.51	3.583	12.09	23.98	MCS4
5755	151	8.33	3.583	11.92	30.00	MCS4
5795	159	8.15	3.583	11.73	30.00	MCS4

802.11ac(80 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5210	42	4.33	4.594	8.92	23.98	MCS6
5290	58	4.26	4.594	8.86	23.98	MCS6
5530	106	3.96	4.594	8.55	23.98	MCS6
5610	122	3.62	4.594	8.21	23.98	MCS6
5690	138	3.62	4.594	8.22	23.98	MCS6
5775	155	3.63	4.594	8.22	30.00	MCS6

[MIMO Ant.2]

802.11n(20 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit [dBm]	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5180	36	10.10	2.632	12.73	23.98	MCS12
5200	40	10.54	2.632	13.17	23.98	MCS12
5240	48	10.60	2.632	13.23	23.98	MCS12
5260	52	10.28	2.632	12.91	23.98	MCS12
5300	60	10.89	2.632	13.52	23.98	MCS12
5320	64	10.31	2.632	12.94	23.98	MCS12
5500	100	9.57	2.632	12.21	23.98	MCS12
5600	120	10.28	2.632	12.91	23.98	MCS12
5720	144	9.80	2.632	12.43	23.98	MCS12
5745	149	10.08	2.632	12.71	30.00	MCS12
5785	157	10.22	2.632	12.85	30.00	MCS12
5825	165	10.06	2.632	12.69	30.00	MCS12

802.11n(40 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5190	38	8.43	3.147	11.58	23.98	MCS11
5230	46	8.65	3.147	11.80	23.98	MCS11
5270	54	8.58	3.147	11.73	23.98	MCS11
5310	62	8.85	3.147	12.00	23.98	MCS11
5510	102	8.16	3.147	11.30	23.98	MCS11
5590	118	8.32	3.147	11.46	23.98	MCS11
5710	142	7.94	3.147	11.08	23.98	MCS11
5755	151	7.93	3.147	11.07	30.00	MCS11
5795	159	7.98	3.147	11.13	30.00	MCS11

802.11ac(20 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5180	36	10.12	2.317	12.44	23.98	MCS4
5200	40	10.36	2.317	12.68	23.98	MCS4
5240	48	10.48	2.317	12.80	23.98	MCS4
5260	52	10.33	2.317	12.65	23.98	MCS4
5300	60	10.97	2.317	13.29	23.98	MCS4
5320	64	10.48	2.317	12.80	23.98	MCS4
5500	100	9.68	2.317	12.00	23.98	MCS4
5600	120	10.31	2.317	12.63	23.98	MCS4
5720	144	9.92	2.317	12.24	23.98	MCS4
5745	149	10.12	2.317	12.44	30.00	MCS4
5785	157	10.26	2.317	12.58	30.00	MCS4
5825	165	10.13	2.317	12.45	30.00	MCS4

802.11ac(40 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5190	38	8.16	3.583	11.74	23.98	MCS4
5230	46	8.37	3.583	11.95	23.98	MCS4
5270	54	7.94	3.583	11.52	23.98	MCS4
5310	62	8.61	3.583	12.20	23.98	MCS4
5510	102	7.81	3.583	11.39	23.98	MCS4
5590	118	7.94	3.583	11.52	23.98	MCS4
5710	142	7.50	3.583	11.08	23.98	MCS4
5755	151	7.62	3.583	11.20	30.00	MCS4
5795	159	7.62	3.583	11.21	30.00	MCS4

802.11ac(80 MHz) Mode		Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.					
5210	42	4.40	4.594	8.99	23.98	MCS6
5290	58	4.39	4.594	8.98	23.98	MCS6
5530	106	3.92	4.594	8.51	23.98	MCS6
5610	122	3.86	4.594	8.45	23.98	MCS6
5690	138	3.35	4.594	7.94	23.98	MCS6
5775	155	3.28	4.594	7.87	30.00	MCS6

[MIMO]

802.11n(20 MHz) Mode		Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)	Worstcase Datarate (Mbps)
Frequency [MHz]	Channel No.					
5180	36	12.18	12.73	15.47	23.98	MCS12
5200	40	12.95	13.17	16.08	23.98	MCS12
5240	48	13.58	13.23	16.42	23.98	MCS12
5260	52	13.34	12.91	16.14	23.98	MCS12
5300	60	13.04	13.52	16.29	23.98	MCS12
5320	64	12.56	12.94	15.77	23.98	MCS12
5500	100	12.78	12.21	15.51	23.98	MCS12
5600	120	12.91	12.91	15.92	23.98	MCS12
5720	144	13.35	12.43	15.92	23.98	MCS12
5745	149	13.44	12.71	16.10	30.00	MCS12
5785	157	13.37	12.85	16.13	30.00	MCS12
5825	165	13.14	12.69	15.93	30.00	MCS12

802.11n(40 MHz) Mode		Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)	Worstcase Datarate (Mbps)
Frequency [MHz]	Channel No.					
5190	38	11.49	11.58	14.54	23.98	MCS11
5230	46	11.88	11.80	14.85	23.98	MCS11
5270	54	12.07	11.73	14.91	23.98	MCS11
5310	62	11.38	12.00	14.71	23.98	MCS11
5510	102	11.51	11.30	14.42	23.98	MCS11
5590	118	11.20	11.46	14.34	23.98	MCS11
5710	142	11.98	11.08	14.57	23.98	MCS11
5755	151	11.90	11.07	14.51	30.00	MCS11
5795	159	11.78	11.13	14.48	30.00	MCS11

802.11ac(20 MHz) Mode		Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)	Worstcase Datarate (Mbps)
Frequency [MHz]	Channel No.					
5180	36	12.25	12.44	15.35	23.98	MCS4
5200	40	12.98	12.68	15.84	23.98	MCS4
5240	48	13.10	12.80	15.96	23.98	MCS4
5260	52	13.17	12.65	15.93	23.98	MCS4
5300	60	12.88	13.29	16.10	23.98	MCS4
5320	64	12.38	12.80	15.60	23.98	MCS4
5500	100	12.40	12.00	15.21	23.98	MCS4
5600	120	12.77	12.63	15.71	23.98	MCS4
5720	144	13.25	12.24	15.78	23.98	MCS4
5745	149	13.46	12.44	15.99	30.00	MCS4
5785	157	13.15	12.58	15.88	30.00	MCS4
5825	165	12.80	12.45	15.64	30.00	MCS4

802.11ac(40 MHz) Mode		Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)	Worstcase Datarate (Mbps)
Frequency [MHz]	Channel No.					
5190	38	11.46	11.74	14.61	23.98	MCS4
5230	46	11.96	11.95	14.97	23.98	MCS4
5270	54	12.10	11.52	14.83	23.98	MCS4
5310	62	11.50	12.20	14.87	23.98	MCS4
5510	102	11.55	11.39	14.48	23.98	MCS4
5590	118	11.47	11.52	14.51	23.98	MCS4
5710	142	12.09	11.08	14.63	23.98	MCS4
5755	151	11.92	11.20	14.59	30.00	MCS4
5795	159	11.73	11.21	14.49	30.00	MCS4

802.11ac(80 MHz) Mode		Ant.1 Measured Power (dBm) + Duty Cycle Factor	Ant.2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)	Worstcase Datarate (Mbps)
Frequency [MHz]	Channel No.					
5210	42	8.92	8.99	11.97	23.98	MCS6
5290	58	8.86	8.98	11.93	23.98	MCS6
5530	106	8.55	8.51	11.54	23.98	MCS6
5610	122	8.21	8.45	11.34	23.98	MCS6
5690	138	8.22	7.94	11.09	23.98	MCS6
5775	155	8.22	7.87	11.06	30.00	MCS6

10.5 POWER SPECTRAL DENSITY

[SISO Ant.2]

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase Datarate [Mbps]	Limit
Frequency [MHz]	Channel No.					
5180	36	4.282	1.540	5.822	36M	11 dBm/MHz
5200	40	3.891	1.540	5.431	36M	
5240	48	3.862	1.540	5.402	36M	
5260	52	3.197	1.540	4.737	36M	
5300	60	3.999	1.540	5.539	36M	
5320	64	4.508	1.540	6.048	36M	
5500	100	3.668	1.540	5.208	36M	
5600	120	3.277	1.540	4.817	36M	
5720	144	3.486	1.540	5.026	36M	
5745	149	0.248	1.540	1.788	36M	30 dBm/500 kHz
5785	157	0.679	1.540	2.219	36M	
5825	165	0.863	1.540	2.403	36M	

802.11n(20 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	4.160	1.630	5.790	MCS4	11 dBm/MHz
5200	40	3.176	1.630	4.806	MCS4	
5240	48	4.033	1.630	5.663	MCS4	
5260	52	2.992	1.630	4.622	MCS4	
5300	60	3.613	1.630	5.243	MCS4	
5320	64	4.508	1.630	6.138	MCS4	
5500	100	3.617	1.630	5.247	MCS4	
5600	120	2.676	1.630	4.306	MCS4	
5720	144	3.441	1.630	5.071	MCS4	
5745	149	0.089	1.630	1.719	MCS4	30 dBm/500 kHz
5785	157	0.590	1.630	2.220	MCS4	
5825	165	0.731	1.630	2.361	MCS4	

802.11n(40 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-1.895	2.398	0.503	MCS4	11 dBm/MHz
5230	46	-1.871	2.398	0.527	MCS4	
5270	54	-1.913	2.398	0.485	MCS4	
5310	62	-1.654	2.398	0.744	MCS4	
5510	102	-1.824	2.398	0.574	MCS4	
5590	118	-2.136	2.398	0.262	MCS4	
5710	142	-2.694	2.398	-0.296	MCS4	
5755	151	-4.931	2.398	-2.533	MCS4	30 dBm /500 kHz
5795	159	-5.277	2.398	-2.879	MCS4	

802.11ac(20 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	4.398	1.646	6.044	MCS4	11 dBm/MHz
5200	40	3.655	1.646	5.301	MCS4	
5240	48	3.491	1.646	5.137	MCS4	
5260	52	2.999	1.646	4.645	MCS4	
5300	60	3.638	1.646	5.284	MCS4	
5320	64	4.499	1.646	6.145	MCS4	
5500	100	3.597	1.646	5.243	MCS4	
5600	120	2.817	1.646	4.463	MCS4	
5720	144	2.975	1.646	4.621	MCS4	
5745	149	0.361	1.646	2.007	MCS4	30 dBm/500 kHz
5785	157	0.576	1.646	2.222	MCS4	
5825	165	0.810	1.646	2.456	MCS4	

802.11ac(40 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-2.056	2.409	0.353	MCS4	11 dBm/MHz
5230	46	-1.842	2.409	0.567	MCS4	
5270	54	-1.956	2.409	0.453	MCS4	
5310	62	-1.996	2.409	0.413	MCS4	
5510	102	-2.253	2.409	0.156	MCS4	
5590	118	-2.195	2.409	0.214	MCS4	
5710	142	-2.587	2.409	-0.178	MCS4	
5755	151	-5.357	2.409	-2.948	MCS4	30 dBm/500 kHz
5795	159	-4.831	2.409	-2.422	MCS4	

802.11ac(80 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5210	42	-8.330	4.086	-4.244	MCS5	11 dBm/MHz
5290	58	-8.322	4.086	-4.236	MCS5	
5530	106	-8.699	4.086	-4.613	MCS5	
5610	122	-8.543	4.086	-4.457	MCS5	
5690	138	-9.157	4.086	-5.071	MCS5	
5775	155	-11.377	4.086	-7.291	MCS5	30 dBm/500 kHz

[MIMO Ant.1]

802.11n(20 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	0.044	2.632	2.676	MCS12	11 dBm/MHz
5200	40	-0.393	2.632	2.239	MCS12	
5240	48	-0.335	2.632	2.297	MCS12	
5260	52	-0.450	2.632	2.182	MCS12	
5300	60	-0.664	2.632	1.968	MCS12	
5320	64	-0.080	2.632	2.552	MCS12	
5500	100	-0.015	2.632	2.617	MCS12	
5600	120	-0.383	2.632	2.249	MCS12	
5720	144	0.030	2.632	2.662	MCS12	
5745	149	-3.104	2.632	-0.472	MCS12	30 dBm/500 kHz
5785	157	-3.252	2.632	-0.620	MCS12	
5825	165	-3.326	2.632	-0.694	MCS12	

802.11n(40 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-5.378	3.147	-2.231	MCS11	11 dBm/MHz
5230	46	-5.549	3.147	-2.402	MCS11	
5270	54	-4.978	3.147	-1.831	MCS11	
5310	62	-6.041	3.147	-2.894	MCS11	
5510	102	-4.937	3.147	-1.790	MCS11	
5590	118	-5.848	3.147	-2.701	MCS11	
5710	142	-5.318	3.147	-2.171	MCS11	
5755	151	-7.901	3.147	-4.754	MCS11	30 dBm /500 kHz
5795	159	-7.848	3.147	-4.701	MCS11	

802.11ac(20 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	0.291	2.317	2.608	MCS4	11 dBm/MHz
5200	40	-0.651	2.317	1.666	MCS4	
5240	48	-0.443	2.317	1.874	MCS4	
5260	52	-0.351	2.317	1.966	MCS4	
5300	60	-0.750	2.317	1.567	MCS4	
5320	64	0.190	2.317	2.507	MCS4	
5500	100	-0.178	2.317	2.139	MCS4	
5600	120	-0.646	2.317	1.671	MCS4	
5720	144	-0.214	2.317	2.103	MCS4	
5745	149	-2.943	2.317	-0.626	MCS4	30 dBm/500 kHz
5785	157	-2.966	2.317	-0.649	MCS4	
5825	165	-3.536	2.317	-1.219	MCS4	

802.11ac(40 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-5.707	3.583	-2.124	MCS4	11 dBm/MHz
5230	46	-5.606	3.583	-2.023	MCS4	
5270	54	-5.693	3.583	-2.110	MCS4	
5310	62	-5.676	3.583	-2.093	MCS4	
5510	102	-5.528	3.583	-1.945	MCS4	
5590	118	-5.864	3.583	-2.281	MCS4	
5710	142	-5.672	3.583	-2.089	MCS4	
5755	151	-8.253	3.583	-4.670	MCS4	30 dBm/500 kHz
5795	159	-8.335	3.583	-4.752	MCS4	

802.11ac(80 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5210	42	-11.407	4.594	-6.813	MCS6	11 dBm/MHz
5290	58	-11.590	4.594	-6.996	MCS6	
5530	106	-12.544	4.594	-7.950	MCS6	
5610	122	-13.001	4.594	-8.407	MCS6	
5690	138	-11.860	4.594	-7.266	MCS6	
5775	155	-14.722	4.594	-10.128	MCS6	30 dBm/500 kHz

[MIMO Ant.2]

802.11n(20 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	-0.386	2.632	2.246	MCS12	11 dBm/MHz
5200	40	-0.743	2.632	1.889	MCS12	
5240	48	-0.622	2.632	2.010	MCS12	
5260	52	-1.127	2.632	1.505	MCS12	
5300	60	0.076	2.632	2.708	MCS12	
5320	64	0.061	2.632	2.693	MCS12	
5500	100	-0.281	2.632	2.351	MCS12	
5600	120	-0.893	2.632	1.739	MCS12	
5720	144	-1.258	2.632	1.374	MCS12	
5745	149	-3.802	2.632	-1.170	MCS12	30 dBm/500 kHz
5785	157	-3.396	2.632	-0.764	MCS12	
5825	165	-3.693	2.632	-1.061	MCS12	

802.11n(40 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-5.324	3.147	-2.177	MCS11	11 dBm/MHz
5230	46	-5.398	3.147	-2.251	MCS11	
5270	54	-5.853	3.147	-2.706	MCS11	
5310	62	-5.331	3.147	-2.184	MCS11	
5510	102	-5.469	3.147	-2.322	MCS11	
5590	118	-5.970	3.147	-2.823	MCS11	
5710	142	-6.393	3.147	-3.246	MCS11	
5755	151	-8.804	3.147	-5.657	MCS11	30 dBm /500 kHz
5795	159	-8.261	3.147	-5.114	MCS11	

802.11ac(20 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	0.292	2.317	2.609	MCS4	11 dBm/MHz
5200	40	-0.783	2.317	1.534	MCS4	
5240	48	-0.332	2.317	1.985	MCS4	
5260	52	-0.869	2.317	1.448	MCS4	
5300	60	-0.069	2.317	2.248	MCS4	
5320	64	-0.145	2.317	2.172	MCS4	
5500	100	-0.194	2.317	2.123	MCS4	
5600	120	-0.719	2.317	1.598	MCS4	
5720	144	-1.358	2.317	0.959	MCS4	
5745	149	-3.633	2.317	-1.316	MCS4	30 dBm/500 kHz
5785	157	-3.229	2.317	-0.912	MCS4	
5825	165	-3.620	2.317	-1.303	MCS4	

802.11ac(40 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-5.265	3.583	-1.682	MCS4	11 dBm/MHz
5230	46	-5.573	3.583	-1.990	MCS4	
5270	54	-5.806	3.583	-2.223	MCS4	
5310	62	-5.675	3.583	-2.092	MCS4	
5510	102	-6.144	3.583	-2.561	MCS4	
5590	118	-6.231	3.583	-2.648	MCS4	
5710	142	-6.577	3.583	-2.994	MCS4	
5755	151	-8.298	3.583	-4.715	MCS4	30 dBm/500 kHz
5795	159	-9.141	3.583	-5.558	MCS4	

802.11ac(80 MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5210	42	-11.348	4.594	-6.754	MCS6	11 dBm/MHz
5290	58	-11.318	4.594	-6.724	MCS6	
5530	106	-12.469	4.594	-7.875	MCS6	
5610	122	-12.573	4.594	-7.979	MCS6	
5690	138	-13.286	4.594	-8.692	MCS6	
5775	155	-14.401	4.594	-9.807	MCS6	30 dBm/500 kHz

[MIMO]

802.11n(20 MHz) Mode		ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	2.676	2.246	5.477	MCS12	11 dBm/MHz
5200	40	2.239	1.889	5.078	MCS12	
5240	48	2.297	2.010	5.167	MCS12	
5260	52	2.182	1.505	4.867	MCS12	
5300	60	1.968	2.708	5.364	MCS12	
5320	64	2.552	2.693	5.634	MCS12	
5500	100	2.617	2.351	5.497	MCS12	
5600	120	2.249	1.739	5.012	MCS12	
5720	144	2.662	1.374	5.076	MCS12	
5745	149	-0.472	-1.170	2.204	MCS12	30 dBm/500 kHz
5785	157	-0.620	-0.764	2.319	MCS12	
5825	165	-0.694	-1.061	2.137	MCS12	

802.11n(40 MHz) Mode		ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-2.231	-2.177	0.806	MCS11	11 dBm/MHz
5230	46	-2.402	-2.251	0.684	MCS11	
5270	54	-1.831	-2.706	0.764	MCS11	
5310	62	-2.894	-2.184	0.486	MCS11	
5510	102	-1.790	-2.322	0.962	MCS11	
5590	118	-2.701	-2.823	0.248	MCS11	
5710	142	-2.171	-3.246	0.335	MCS11	
5755	151	-4.754	-5.657	-2.172	MCS11	30 dBm/500 kHz
5795	159	-4.701	-5.114	-1.893	MCS11	

802.11ac(20 MHz) Mode		ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	2.608	2.609	5.619	MCS4	11 dBm/MHz
5200	40	1.666	1.534	4.611	MCS4	
5240	48	1.874	1.985	4.940	MCS4	
5260	52	1.966	1.448	4.725	MCS4	
5300	60	1.567	2.248	4.931	MCS4	
5320	64	2.507	2.172	5.353	MCS4	
5500	100	2.139	2.123	5.141	MCS4	
5600	120	1.671	1.598	4.645	MCS4	
5720	144	2.103	0.959	4.579	MCS4	
5745	149	-0.626	-1.316	2.053	MCS4	30 dBm/500 kHz
5785	157	-0.649	-0.912	2.232	MCS4	
5825	165	-1.219	-1.303	1.750	MCS4	

802.11ac(40 MHz) Mode		ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-2.124	-1.682	1.113	MCS4	11 dBm/MHz
5230	46	-2.023	-1.990	1.004	MCS4	
5270	54	-2.110	-2.223	0.844	MCS4	
5310	62	-2.093	-2.092	0.918	MCS4	
5510	102	-1.945	-2.561	0.768	MCS4	
5590	118	-2.281	-2.648	0.550	MCS4	
5710	142	-2.089	-2.994	0.493	MCS4	
5755	151	-4.670	-4.715	-1.682	MCS4	30 dBm/500 kHz
5795	159	-4.752	-5.558	-2.126	MCS4	

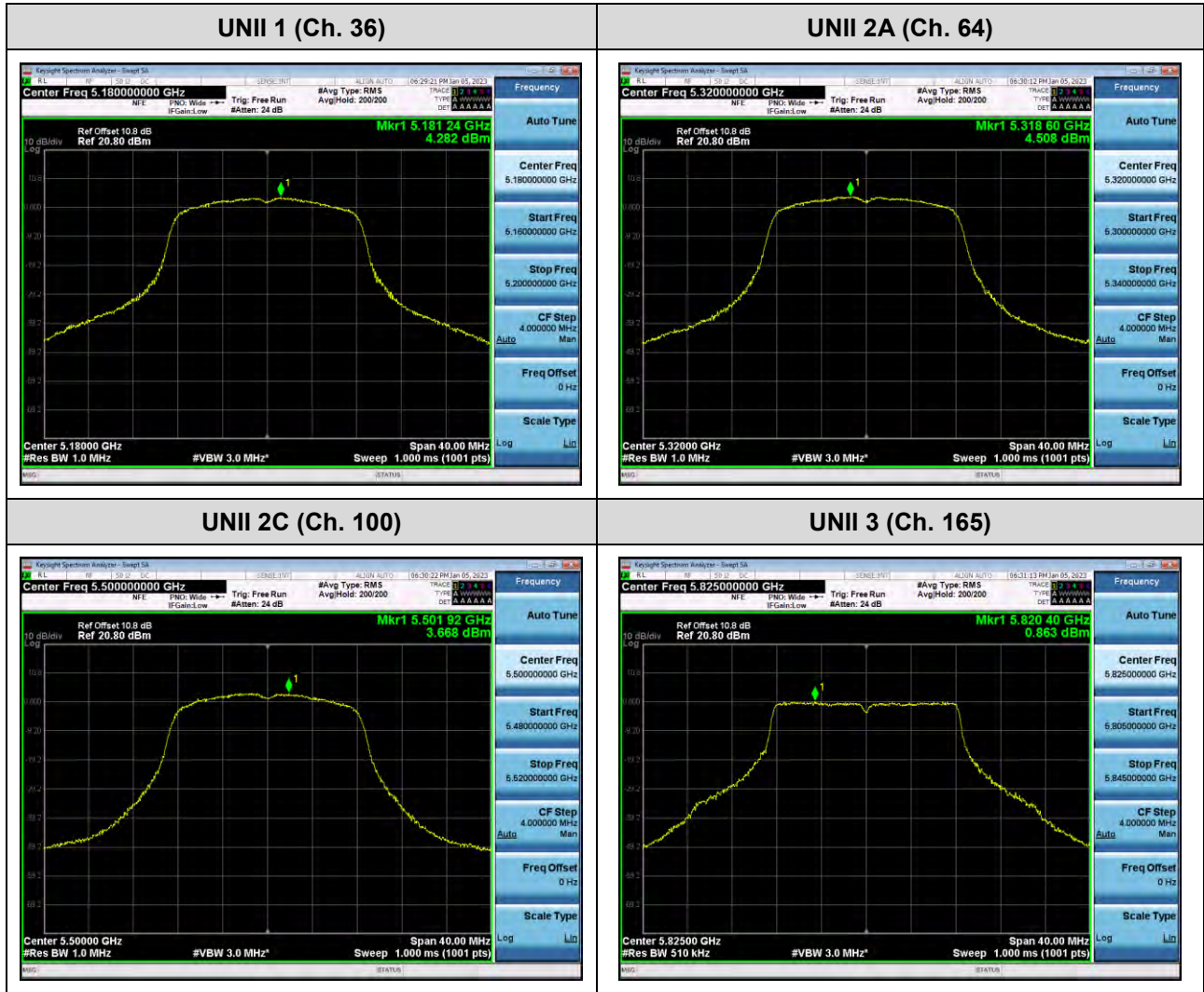
802.11ac(80 MHz) Mode		ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5210	42	-6.813	-6.754	-3.773	MCS6	11 dBm/MHz
5290	58	-6.996	-6.724	-3.848	MCS6	
5530	106	-7.950	-7.875	-4.902	MCS6	
5610	122	-8.407	-7.979	-5.178	MCS6	
5690	138	-7.266	-8.692	-4.911	MCS6	
5775	155	-10.128	-9.807	-6.954	MCS6	30 dBm/500 kHz

[SISO Ant.2]

☑ Test Plots(802.11a)

Note:

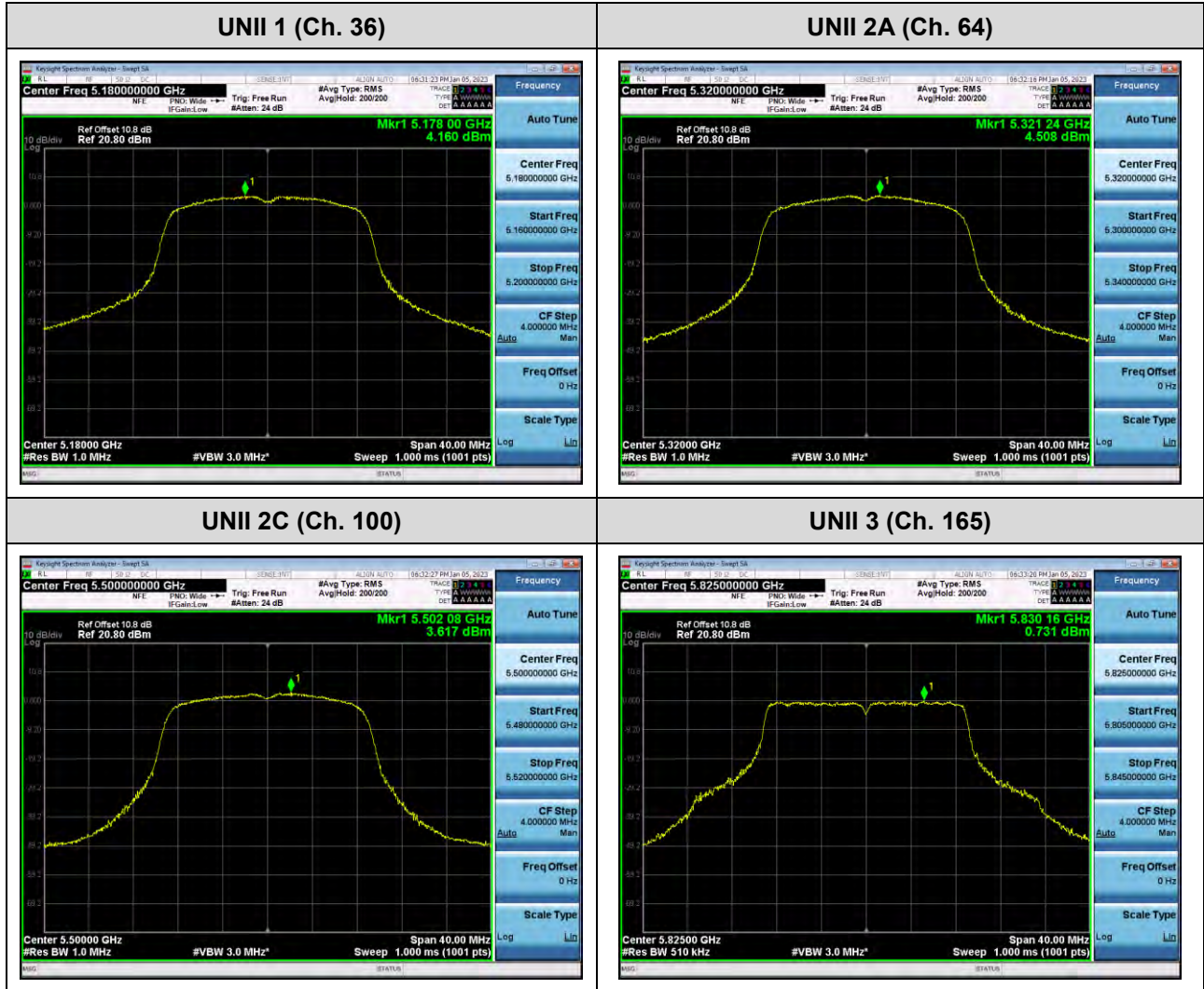
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11n(HT20))

Note:

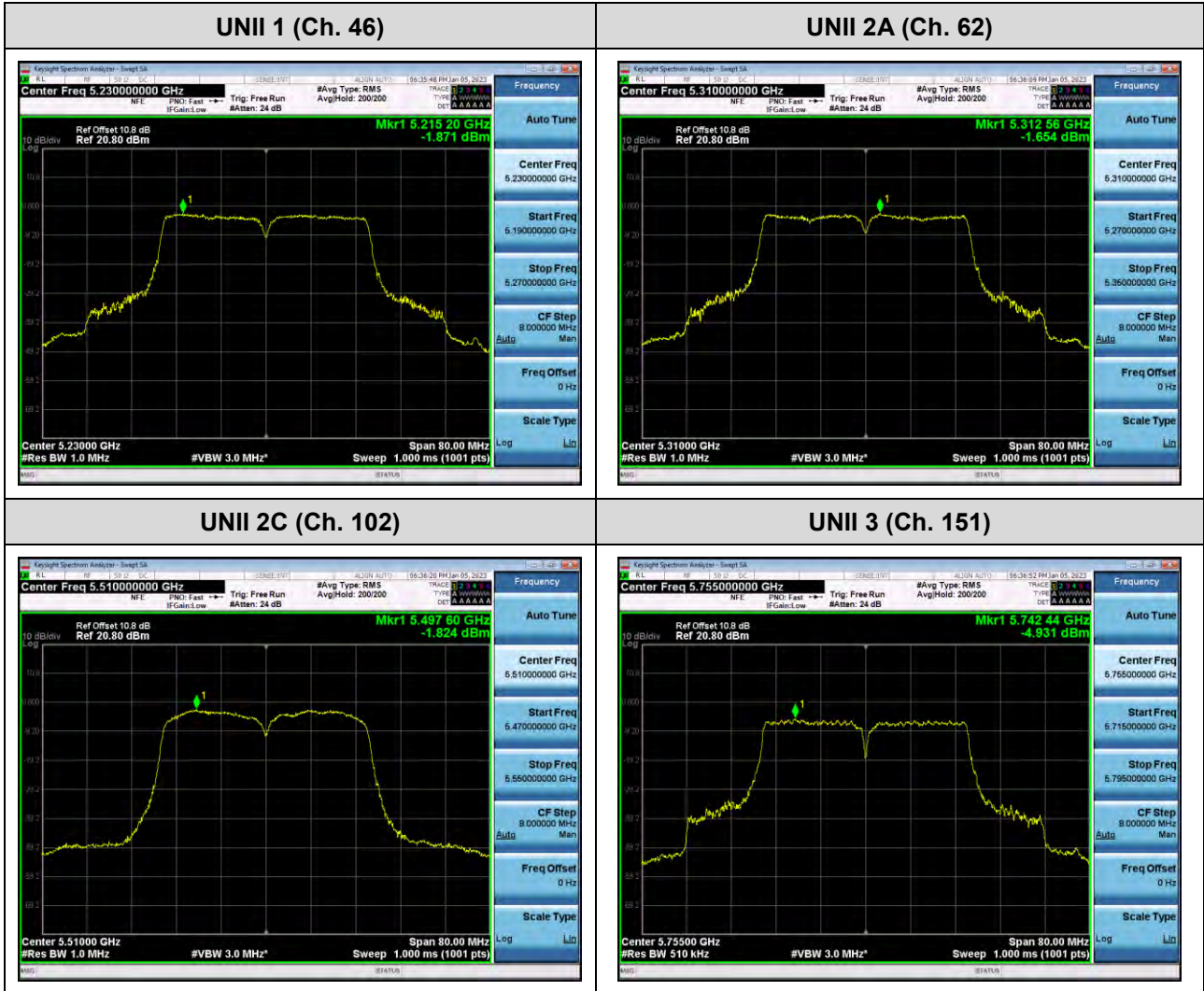
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11n(HT40))

Note:

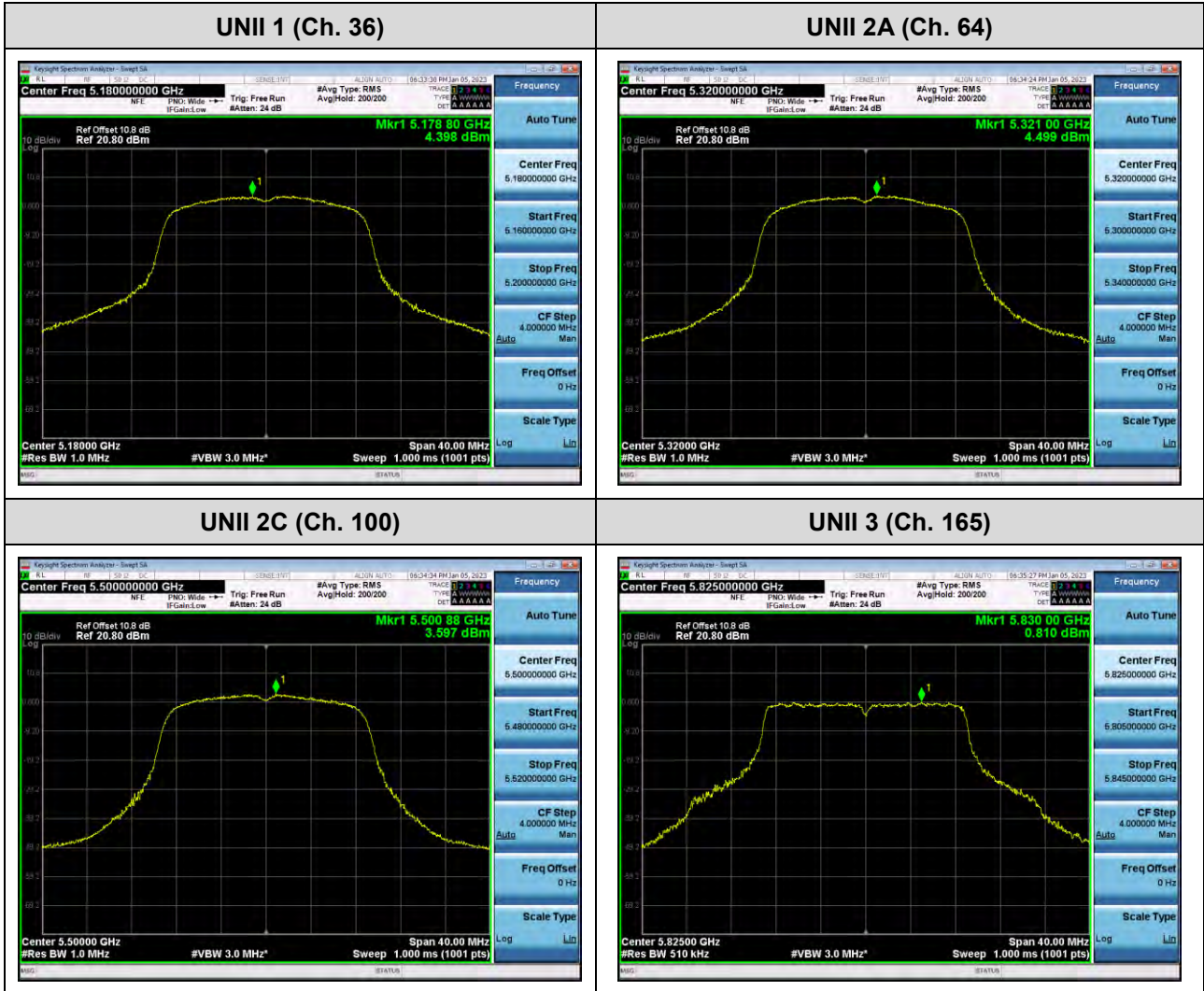
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11ac(VHT20))

Note:

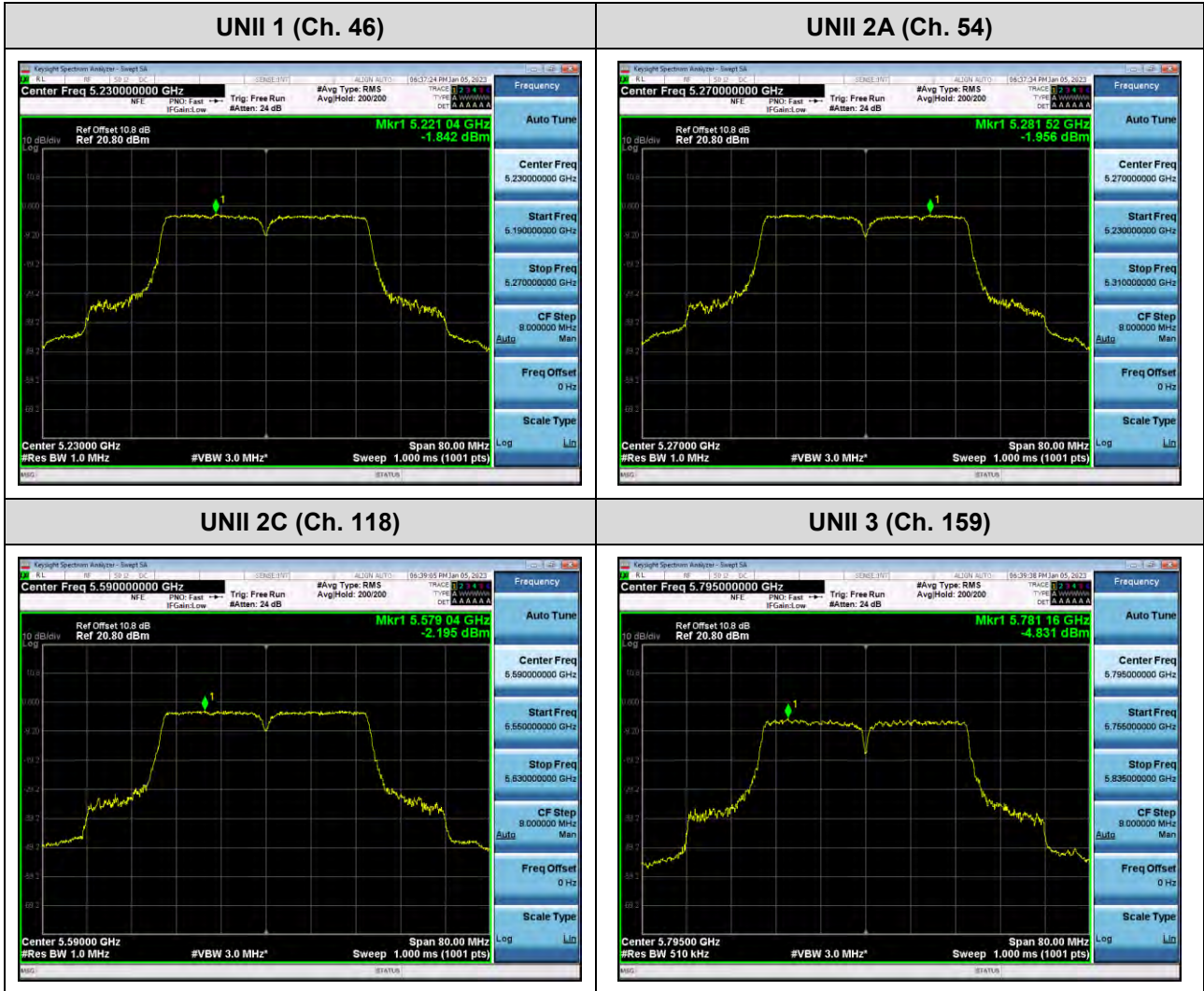
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11ac(VHT40))

Note:

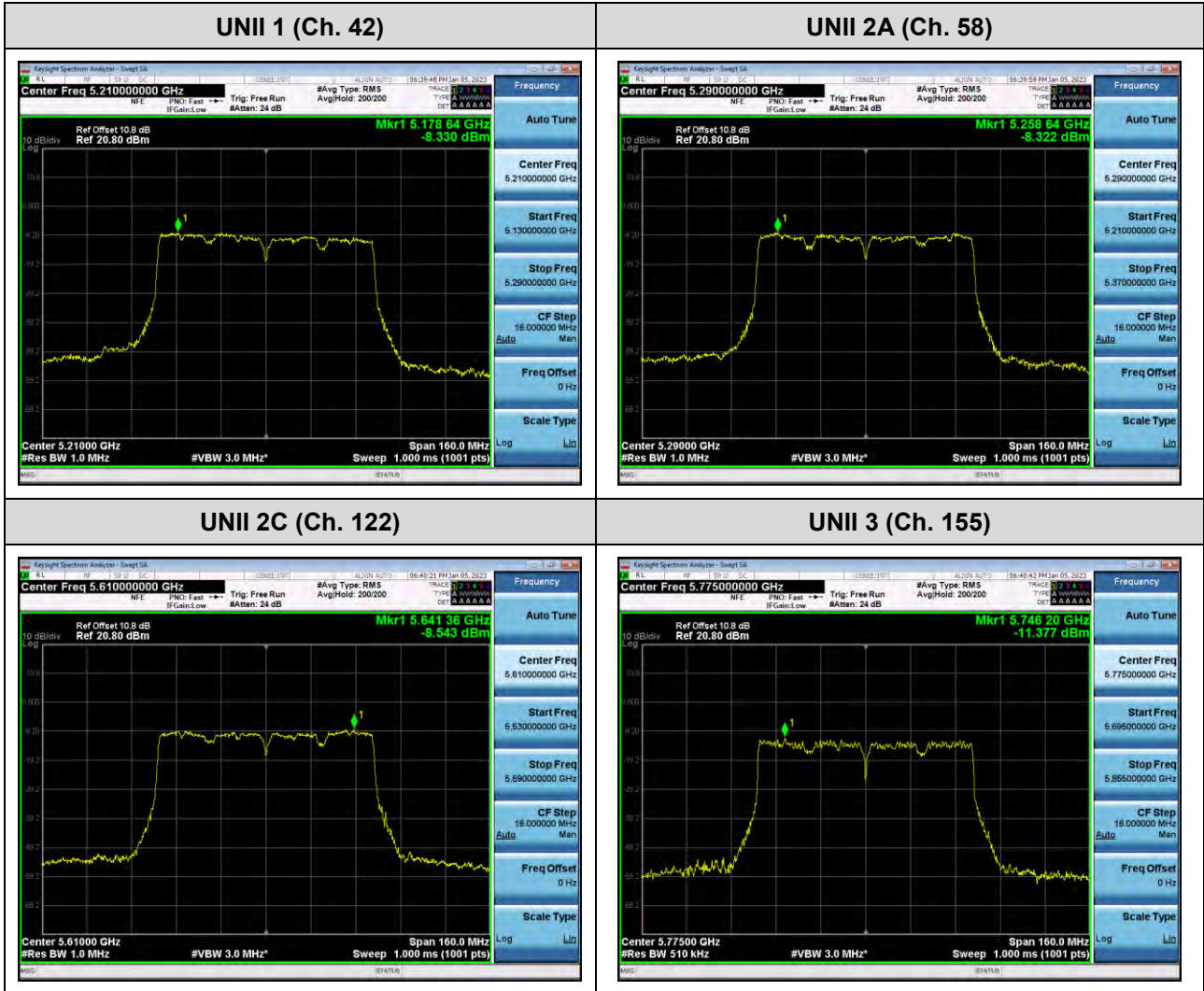
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11ac(VHT80))

Note:

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

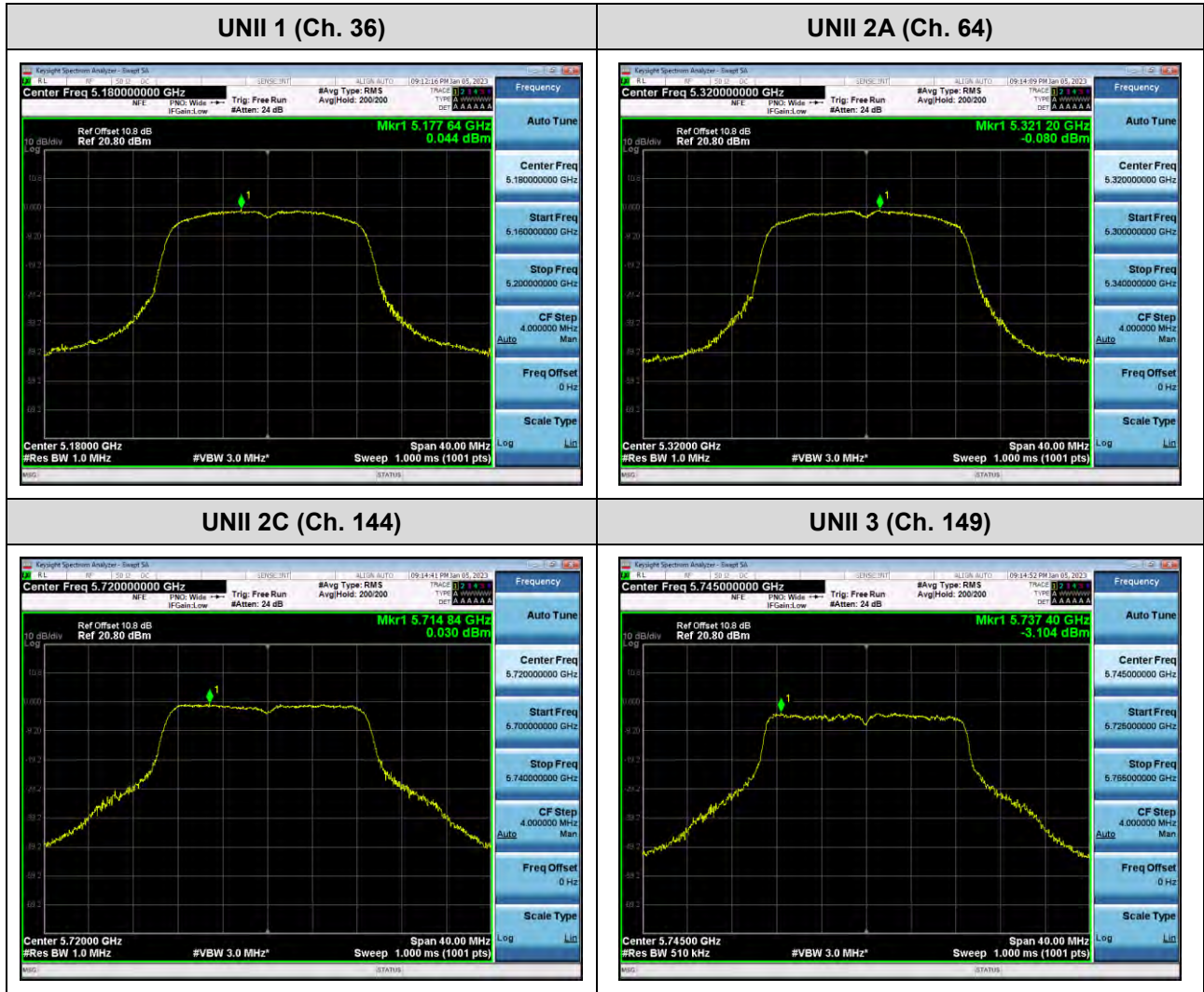


[MIMO Ant.1]

☐ Test Plots(802.11n(HT20))

Note:

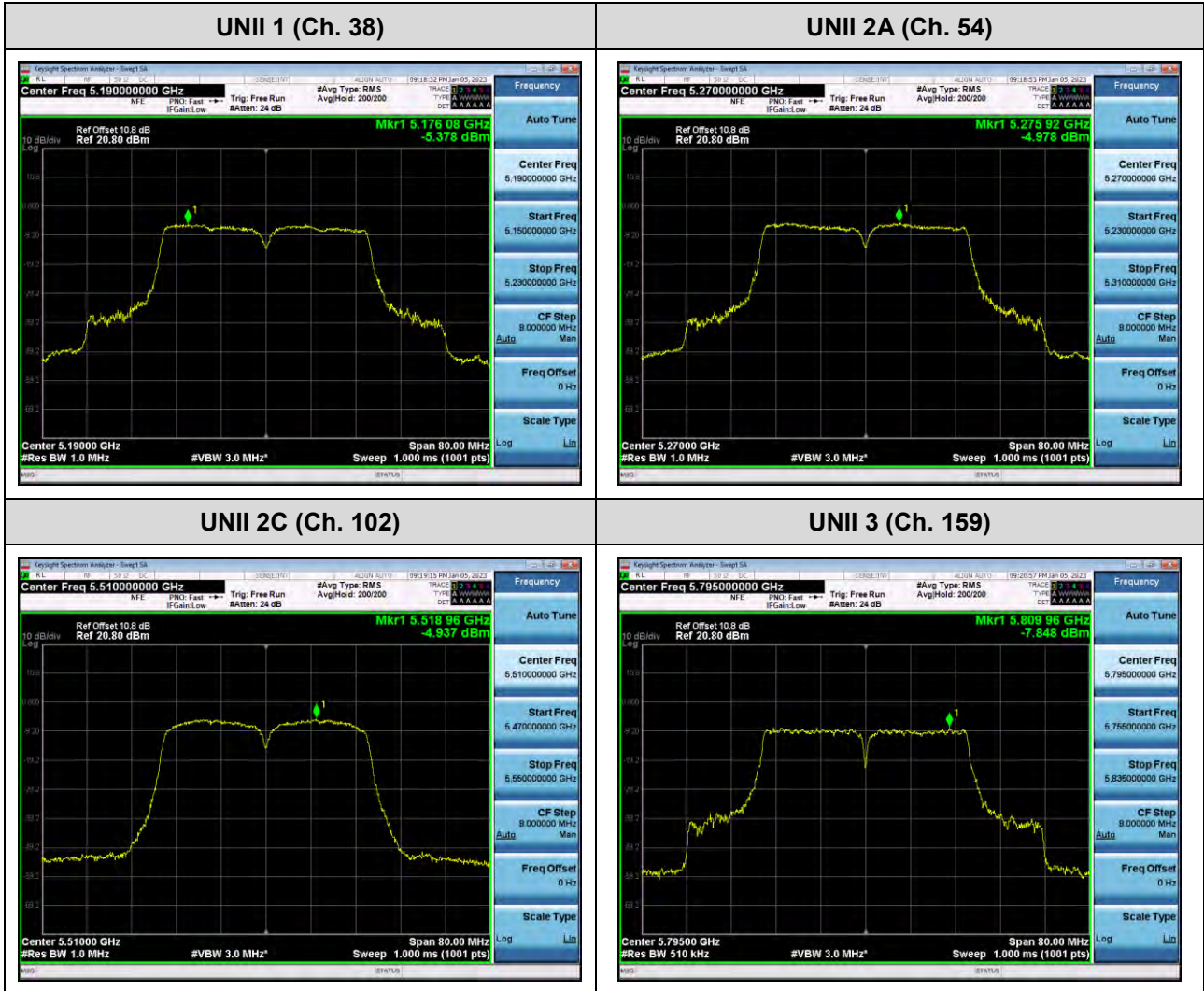
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11n(HT40))

Note:

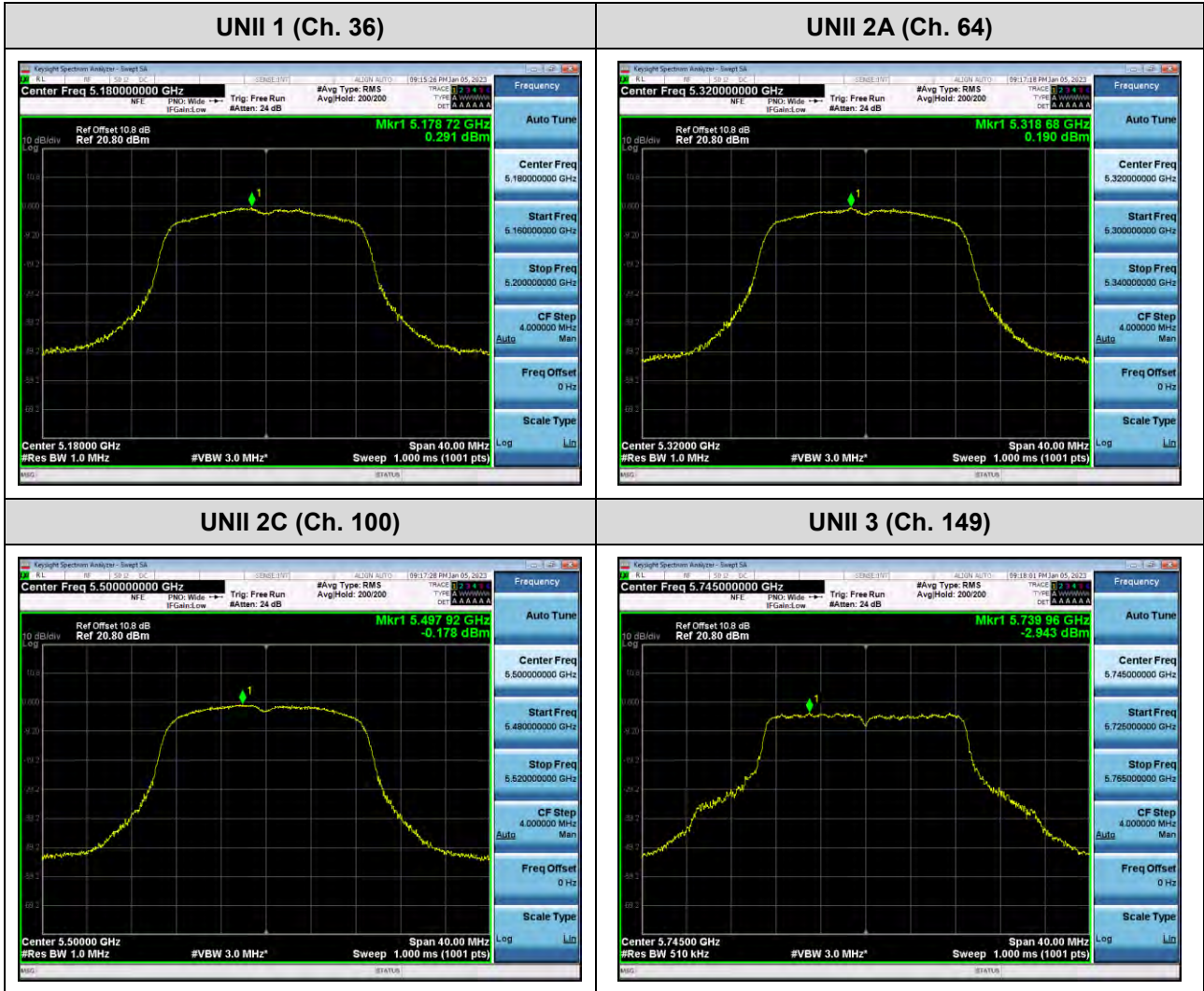
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11ac(VHT20))

Note:

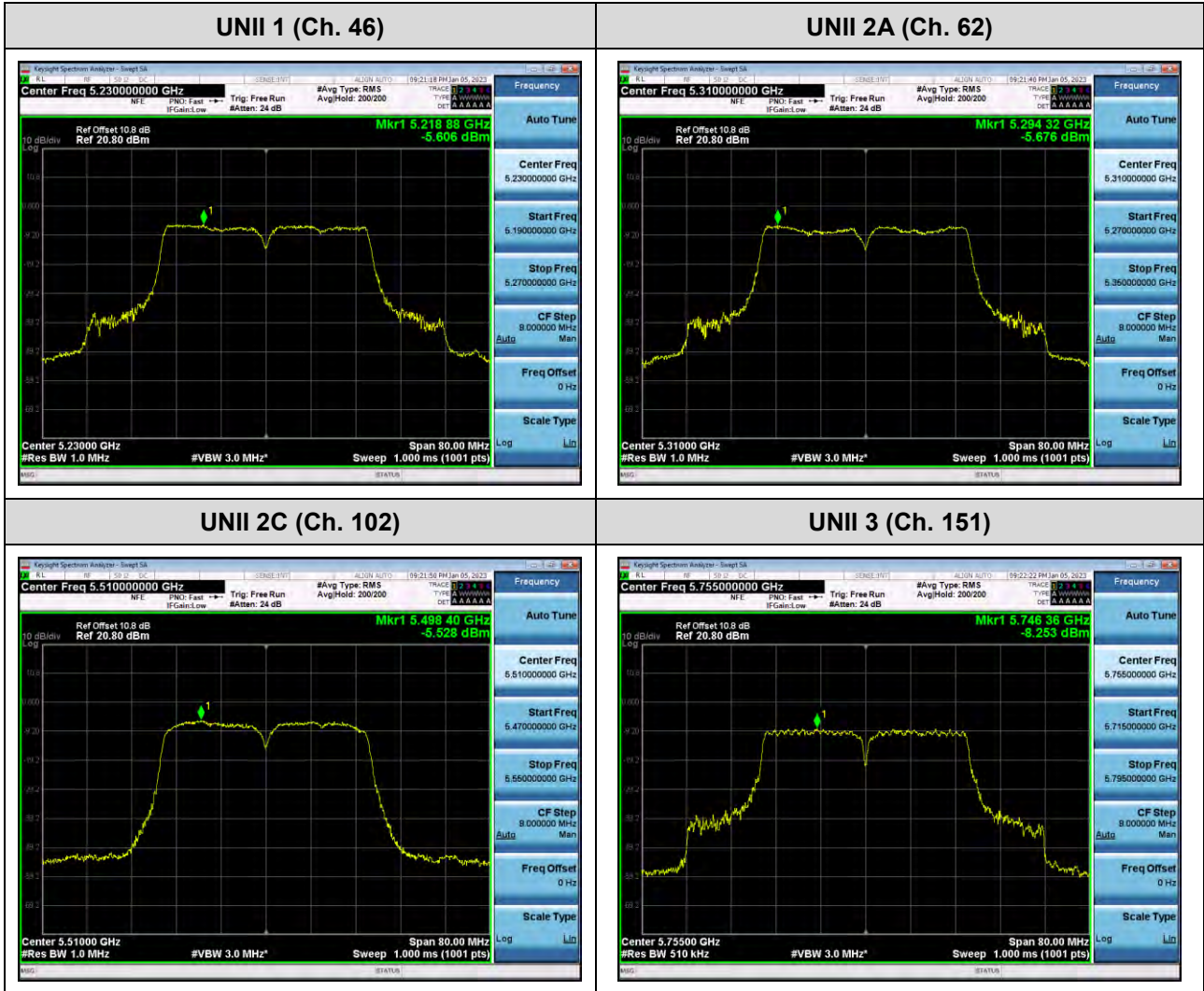
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11ac(VHT40))

Note:

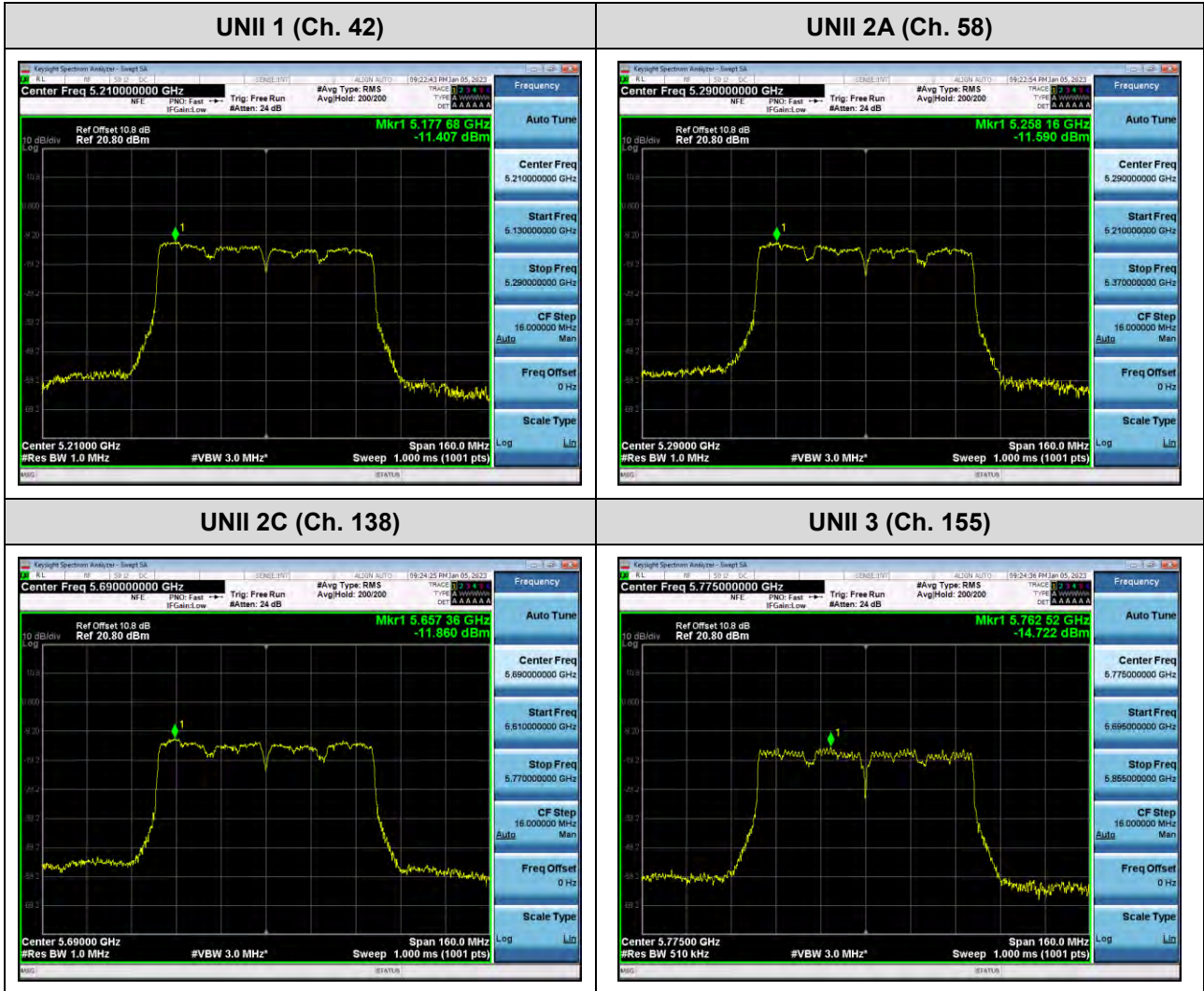
In order to simplify the report, attached plots were only channel of the highest power.



☐ Test Plots(802.11ac(VHT80))

Note:

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

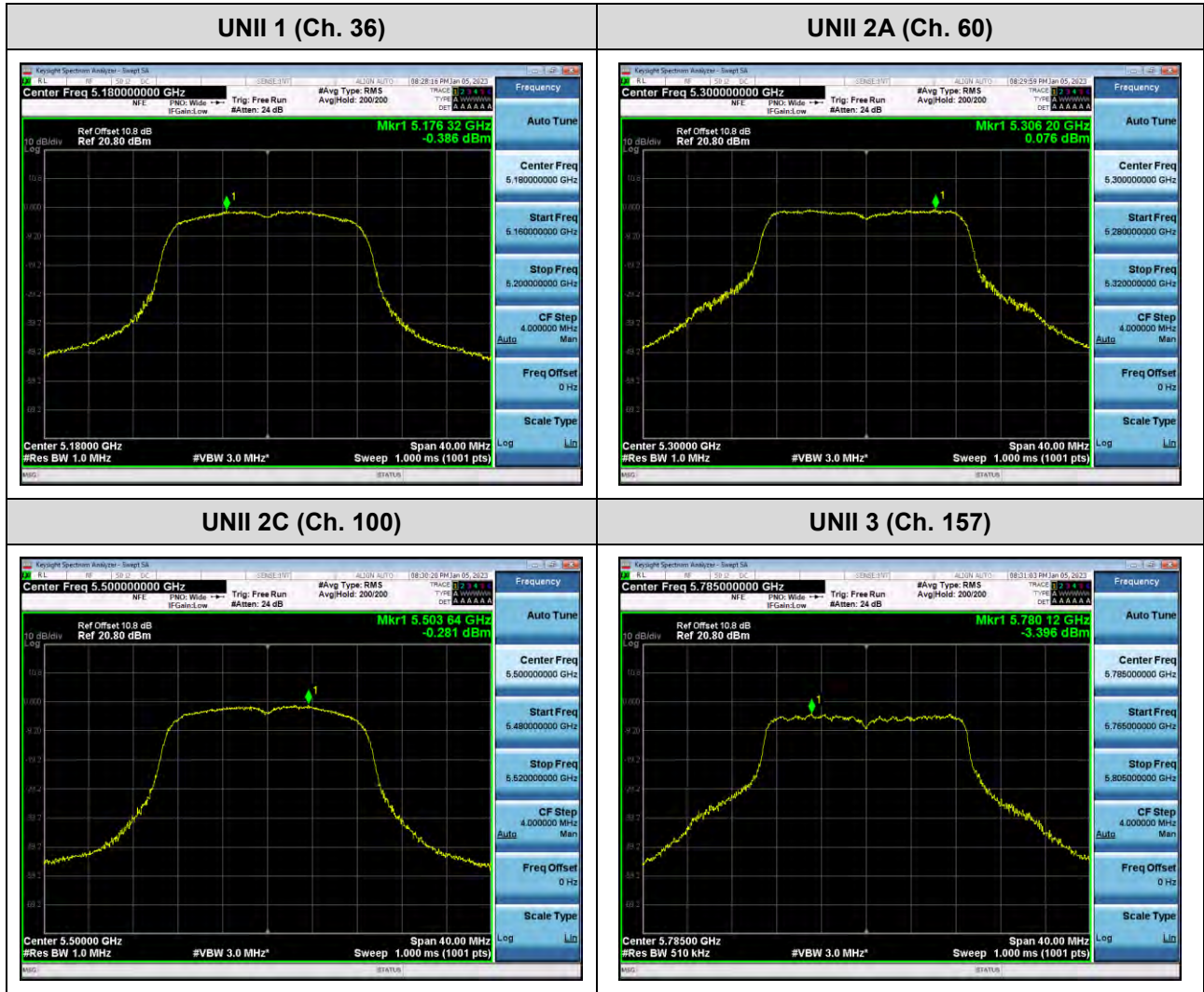


[MIMO Ant.2]

☑ Test Plots(802.11n(HT20))

Note:

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



☐ Test Plots(802.11n(HT40))

Note:

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

