

FCC UNII REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Date of Issue:
30 September 2019

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Report No.: HCT-RF-1909-FC014

FCC ID: A3LSMW767U

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model: SM-W767V, SM-W767P, SM-W767A, SM-W767W, SM-W767U

EUT Type: Note PC

Modulation type OFDM

FCC Classification: Unlicensed National Information Infrastructure(UNII)

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.



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Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1909-FC014	30 September 2019	- First Approval Report

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

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

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

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1. GENERAL INFORMATION

EUT DESCRIPTION

Model	SM-W767V, SM-W767P, SM-W767A, SM-W767W, SM-W767U	
Additional Model	-	
EUT Type	Note PC	
Power Supply	DC 7.70 V	
Battery Information	Model: EB-BW767ABY Type: Li-ion Battery	
Travel Adapter Information	Model : EP-TA800 Manufacture: DONGYANG E&P	
Data Cable Information	Model : EP-DW767JBZ Manufacture: RFTECH	
Ear-jack Information	Model : EHS64AVFBE Manufacture: ALMUS	
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: LDS Ant.1 Peak Gain : -1.51 dBi(UNII 1, 2A, 2C, 3) Ant.2 Peak Gain : -1.84 dBi(UNII 1, 2A, 2C, 3)	
Antenna Specification		
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	30 August 2019 ~ 23 September 2019	

ANTENNA CONFIGURATIONS

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

Configurations	SISO		SDM	CDD
	Ant1	Ant2	Ant1 + Ant2	Ant1 + Ant2
802.11a	O	O	X	O
802.11n	O	O	O	O
802.11ac	O	O	O	O

Note:

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

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

Frequency	Supported
2.4 GHz Ant 1 + 5 GHz Ant 2	O
2.4 GHz Ant 2 + 5 GHz Ant 1	X
2.4 GHz Ant 1 + 5 GHz Ant 1	X
2.4 GHz Ant 2 + 5 GHz Ant 2	X

3. Directional Gain Calculation

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

Directional gain = $G_{ANT\ MAX} + 10 \log(N_{ANT}/N_{SS})$ dBi

($N_{ANT} = 2$, $N_{SS} = 2$, $G_{ANT\ MAX}$ is the gain of the antenna having the highest gain)

Band	Ant Gain (dBi)		N_{ANT}/N_{SS}	Directional Gain (= $G_{ANT\ MAX} + 10 \log(N_{ANT}/N_{SS})$) (dBi)
UNII 1,2A,2C,3	ANT1	-1.51	2 / 2	1.34
	ANT2	-1.84		

2. MAXIMUM OUTPUT POWER

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

Band	Mode	SISO				MIMO	
		Ant1 Power		Ant2 Power		Ant 1 + Ant 2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	13.99	0.025	13.46	0.022	16.74	0.047
	802.11n (HT20)	13.98	0.025	13.27	0.021	16.65	0.046
	802.11n (HT40)	12.96	0.020	11.99	0.016	15.51	0.036
	802.11ac (VHT20)	12.98	0.020	12.05	0.016	15.55	0.036
	802.11ac (VHT40)	11.97	0.016	11.06	0.013	14.55	0.028
	802.11ac (VHT80)	10.92	0.012	9.97	0.010	13.48	0.022
UNII2A	802.11a	13.99	0.025	13.26	0.021	16.65	0.046
	802.11n (HT20)	13.81	0.024	13.04	0.020	16.45	0.044
	802.11n (HT40)	12.82	0.019	11.97	0.016	15.43	0.035
	802.11ac (VHT20)	12.73	0.019	11.89	0.015	15.34	0.034
	802.11ac (VHT40)	11.80	0.015	10.81	0.012	14.34	0.027
	802.11ac (VHT80)	10.72	0.012	9.96	0.010	13.37	0.022
UNII2C	802.11a	13.90	0.025	13.76	0.024	16.84	0.048
	802.11n (HT20)	13.73	0.024	13.56	0.023	16.66	0.046
	802.11n (HT40)	12.49	0.018	12.30	0.017	15.41	0.035
	802.11ac (VHT20)	12.69	0.019	12.44	0.018	15.58	0.036
	802.11ac (VHT40)	11.48	0.014	11.24	0.013	14.37	0.027
	802.11ac (VHT80)	10.45	0.011	10.21	0.010	13.34	0.022
UNII3	802.11a	13.65	0.023	13.45	0.022	16.56	0.045
	802.11n (HT20)	13.48	0.022	13.25	0.021	16.38	0.043
	802.11n (HT40)	12.34	0.017	12.26	0.017	15.31	0.034
	802.11ac (VHT20)	12.47	0.018	12.28	0.017	15.39	0.035
	802.11ac (VHT40)	11.26	0.013	10.89	0.012	14.09	0.026
	802.11ac (VHT80)	10.11	0.010	9.67	0.009	12.91	0.020

3. TEST METHODOLOGY

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

EUT CONFIGURATION

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

EUT EXERCISE

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

GENERAL TEST PROCEDURES

Conducted Emissions

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

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3.75 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

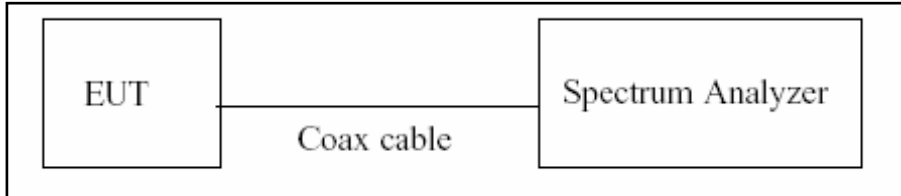
7. MEASUREMENT UNCERTAINTY

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 ($\pm$ 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.

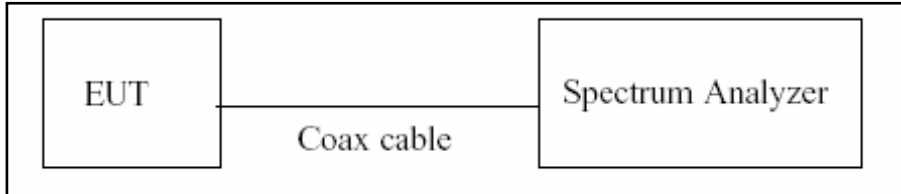
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10\log(1/\text{Duty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

8.2. 6dB Bandwidth & 26dB Bandwidth

Limit

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

Test Configuration



Test Procedure(26dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure C.1 in KDB 789033 D02 v02r01.

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.
Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Test Procedure (6dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

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

1. RBW = 100 kHz
2. VBW $\geq 3 \times$ 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.

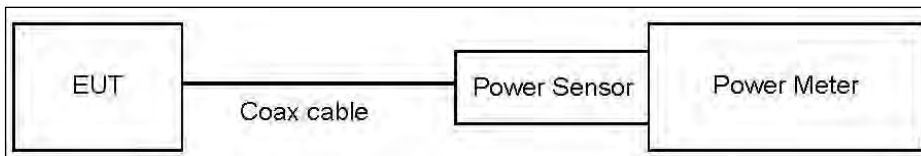
8.3. Output Power Measurement

Limit

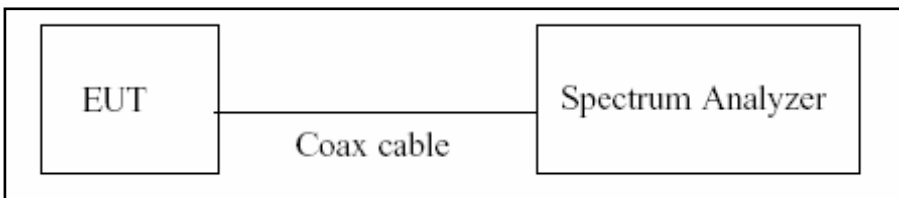
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

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 $\geq$ 3 MHz.
5. Number of points in sweep $\geq 2 \times \text{span}/\text{RBW}$.
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) = 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	11.1
UNII 2A	11.1
UNII 2C	11.1
UNII 3	11.1

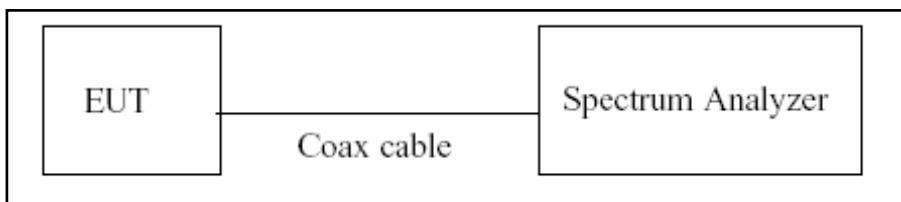
(Actual value of loss for the attenuator and cable combination)

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) = 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	11.1
UNII 2A	11.1
UNII 2C	11.1
UNII 3	11.1

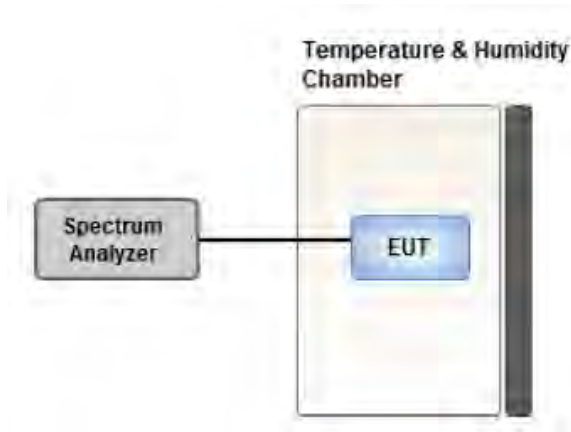
(Actual value of loss for the attenuator and cable combination)

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 °C and 50 °C.
2. The temperature was incremented by 10 °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) = Reading Value + Correction Factor

8.7. Radiated Test

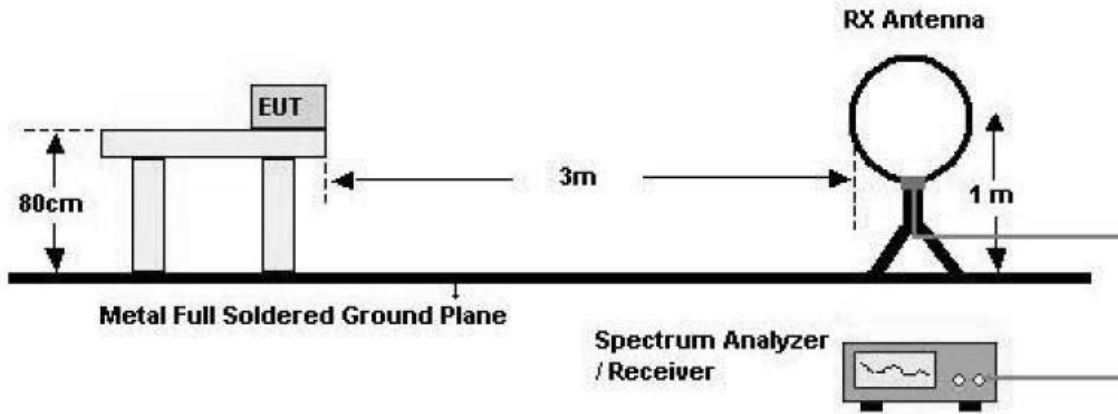
Limit

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

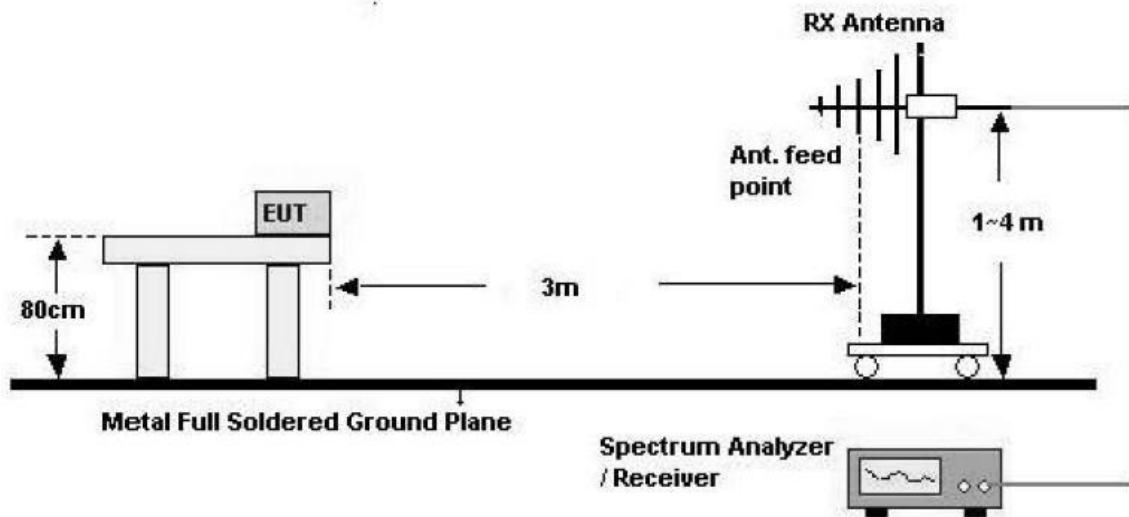
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

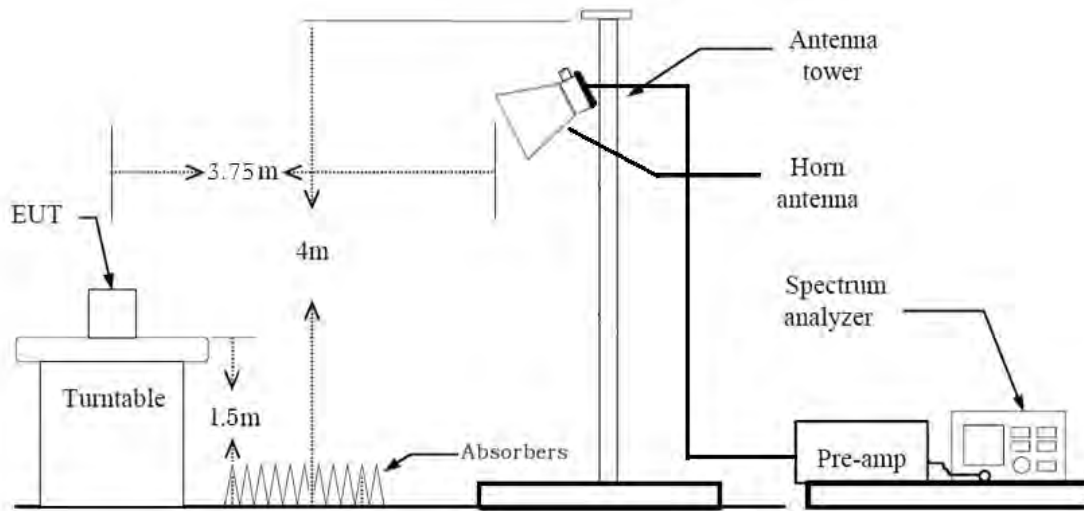
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

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

(1) Measurement Type(Peak):

- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW $\geq 3 \times$ 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

6. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
7. 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 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
 - ◆ Distance extrapolation factor = $20\log(\text{test distance} / \text{specific distance})$ (dB)
6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
8. The unit was tested with its standard battery.
9. 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 percent) = $\text{VBW} \leq \text{RBW}/100$ (i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = $\text{VBW} \geq 1/T$, 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 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

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
11. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
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 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
 - ◆ Distance extrapolation factor = $20\log(\text{test distance} / \text{specific distance})$ (dB)
6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
8. The unit was tested with its standard battery.
9. 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 percent) = $\text{VBW} \leq \text{RBW}/100$ (i.e., 10 kHz) but not less than 10 Hz.
 - VBW(Duty cycle is < 98 percent) = $\text{VBW} \geq 1/T$, 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 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.
10. Measured Frequency Range :
 - 4500MHz ~ 5150MHz
 - 5350MHz ~ 5460MHz
 - 5460MHz ~ 5470MHz
 - (75 MHz or more below the 5725MHz) ~ 5725MHz
 - 5850MHz ~ (75 MHz or more above the 5850MHz)
11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + 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	0.975	0.111	1000
802.11n(HT20)	MCS 0	0.974	0.113	1000
802.11n(HT40)	MCS 0	0.948	0.233	3000
802.11ac(VHT20)	MCS 0	0.973	0.121	1000
802.11ac(VHT40)	MCS 0	0.950	0.222	3000
802.11ac(VHT80)	MCS 0	0.900	0.456	10000

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 : Y
 - Radiated Restricted Band Edge : Y
3. All datarate of operation were investigated and the worst case datarate results are reported
 - Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(SDM), Ant1+Ant2(CDD)
 - Worstcase : Ant1+Ant2(CDD)
4. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
 - Position : Horizontal, Vertical, Parallel to the ground plane

Radiated test(DBS)

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
 - Worstcase : Stand alone
2. EUT Axis
 - Radiated Spurious Emissions : X
3. The following tables show the worst case configurations determined during testing.

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	2
Channel	1, 6, 11	36, 100, 165
Data Rate	1 Mbps	6 Mbps
Mode	802.11b	802.11a

AC Power line Conducted Emissions

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

Conducted test

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

9. SUMMARY OF TEST RESULTS

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

10. TEST RESULT

10.1 DUTY CYCLE

Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	1.433	1.471	0.975	0.111
	9	0.961	0.998	0.963	0.163
	12	0.728	0.765	0.951	0.217
	18	0.492	0.529	0.929	0.318
	24	0.376	0.413	0.910	0.410
	36	0.256	0.293	0.876	0.573
	48	0.200	0.236	0.847	0.722
	54	0.180	0.216	0.833	0.795

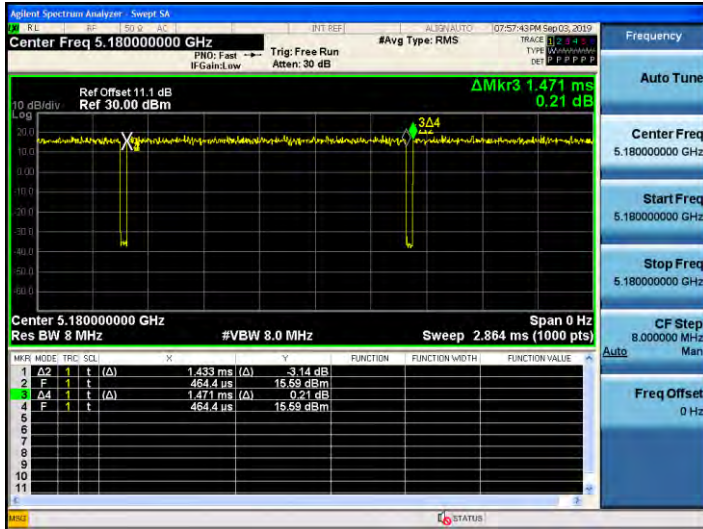
Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.340	1.376	0.974	0.113
	1	0.688	0.725	0.950	0.224
	2	0.472	0.509	0.928	0.326
	3	0.364	0.401	0.908	0.418
	4	0.256	0.292	0.877	0.571
	5	0.200	0.236	0.847	0.719
	6	0.184	0.220	0.835	0.785
	7	0.168	0.204	0.824	0.843
802.11n (HT40)	0	0.664	0.701	0.948	0.233
	1	0.351	0.388	0.905	0.431
	2	0.248	0.284	0.873	0.589
	3	0.196	0.232	0.843	0.742
	4	0.143	0.180	0.794	0.999
	5	0.115	0.152	0.757	1.211
	6	0.107	0.144	0.743	1.290
	7	0.100	0.136	0.735	1.335

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.348	1.386	0.973	0.121
	1	0.695	0.733	0.948	0.232
	2	0.477	0.513	0.929	0.322
	3	0.368	0.405	0.909	0.416
	4	0.260	0.296	0.878	0.567
	5	0.204	0.240	0.850	0.705
	6	0.188	0.224	0.839	0.761
	7	0.172	0.208	0.827	0.824
	8	0.152	0.188	0.809	0.923
802.11ac (VHT40)	0	0.672	0.707	0.950	0.222
	1	0.355	0.392	0.907	0.424
	2	0.252	0.289	0.874	0.587
	3	0.200	0.236	0.846	0.726
	4	0.148	0.184	0.803	0.954
	5	0.120	0.156	0.769	1.141
	6	0.112	0.148	0.755	1.221
	7	0.104	0.140	0.741	1.302
	8	0.096	0.132	0.725	1.395
	9	0.088	0.124	0.706	1.514
	10	0.080	0.116	0.687	1.629
802.11ac (VHT80)	0	0.331	0.368	0.900	0.456
	1	0.188	0.224	0.840	0.759
	2	0.140	0.176	0.794	1.001
	3	0.116	0.152	0.762	1.183
	4	0.092	0.128	0.717	1.446
	5	0.080	0.116	0.687	1.629
	6	0.076	0.112	0.678	1.690
	7	0.071	0.108	0.657	1.822
	8	0.067	0.104	0.644	1.910
	9	0.063	0.100	0.630	2.007
	10	0.060	0.096	0.615	2.100

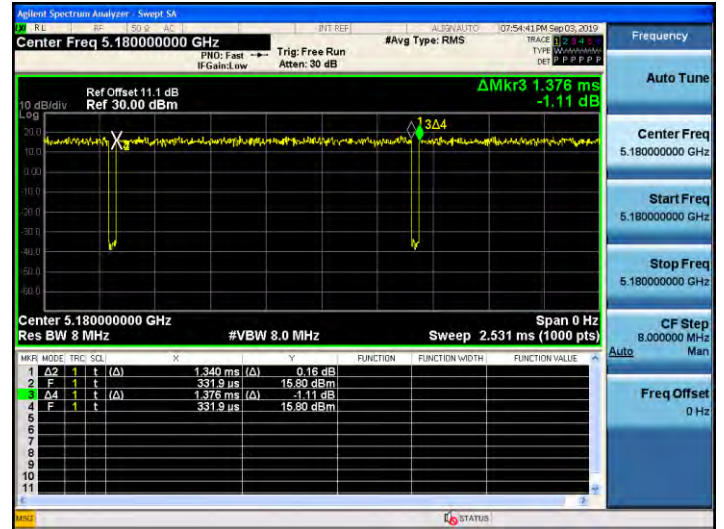
Note:

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

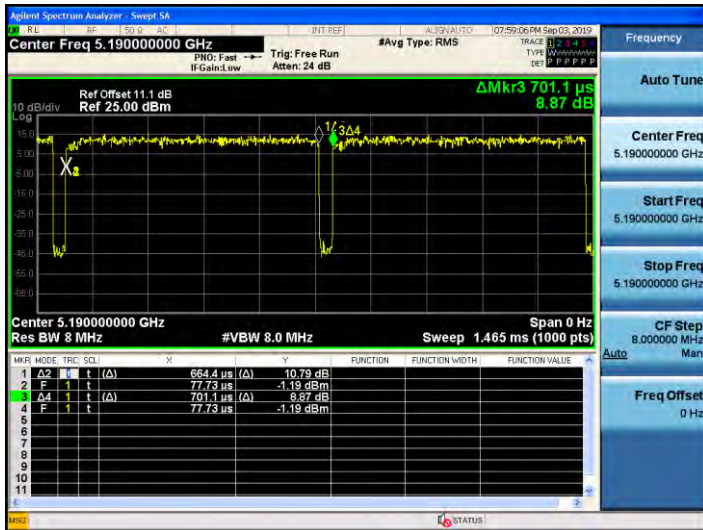
802.11a



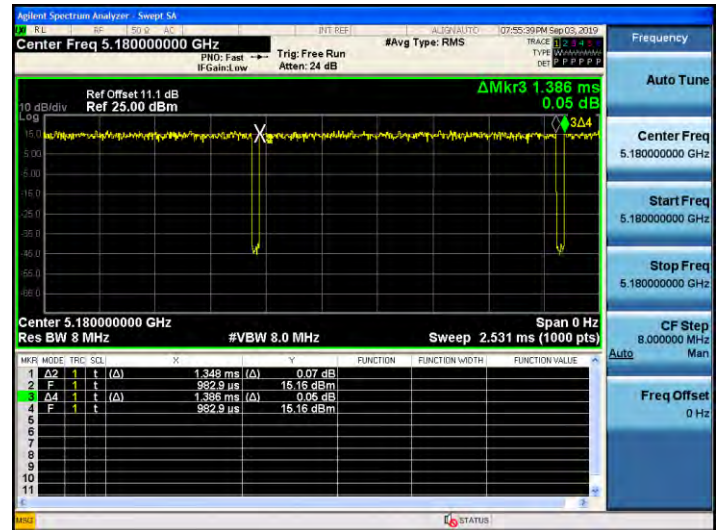
802.11n(HT20)



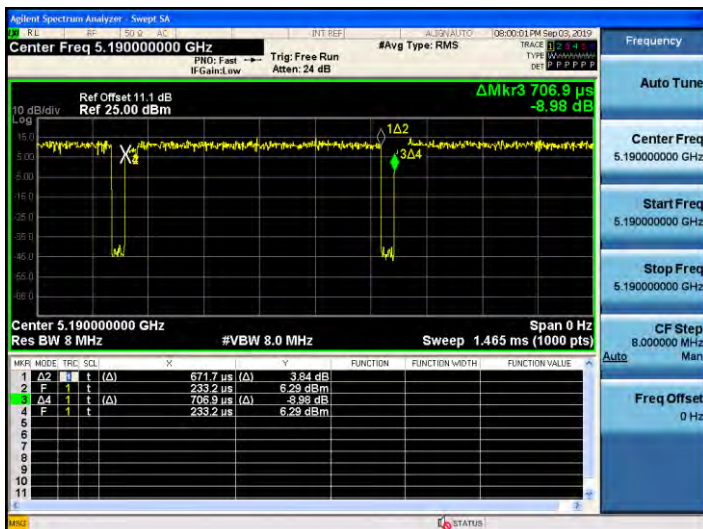
802.11n(HT40)



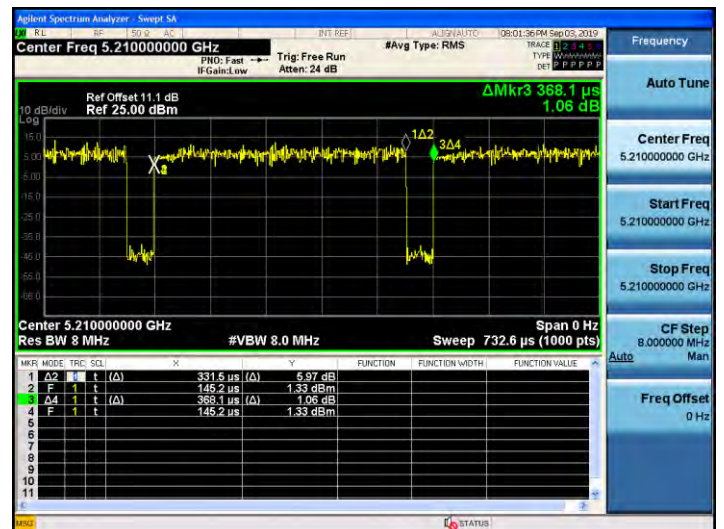
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



10.2 26DB BANDWIDTH

[ANT1]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.89	16.340
5200	40	19.83	16.313
5240	48	20.68	16.331
5260	52	20.55	16.322
5300	60	20.67	16.352
5320	64	20.56	16.321
5500	100	20.28	16.318
5600	120	19.84	16.326
5720	144	20.16	16.320
5745	149	20.82	16.347
5785	157	20.86	16.326
5825	165	21.03	16.343

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.06	17.559
5200	40	19.75	17.557
5240	48	19.70	17.552
5260	52	19.81	17.550
5300	60	19.66	17.535
5320	64	19.74	17.530
5500	100	19.70	17.558
5600	120	19.89	17.551
5720	144	19.84	17.541
5745	149	20.70	17.572
5785	157	19.78	17.544
5825	165	20.19	17.565

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.87	35.937
5230	46	39.87	35.977
5270	54	40.05	35.894
5310	62	39.71	35.938
5510	102	40.66	35.926
5590	118	39.82	35.897
5710	142	39.99	35.886
5755	151	40.01	35.902
5795	159	39.84	35.915

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.77	17.539
5200	40	19.68	17.549
5240	48	20.64	17.562
5260	52	19.84	17.570
5300	60	19.77	17.542
5320	64	19.87	17.534
5500	100	20.02	17.548
5600	120	19.89	17.561
5720	144	20.67	17.563
5745	149	20.27	17.551
5785	157	19.72	17.538
5825	165	19.86	17.528

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.22	35.901
5230	46	40.06	35.907
5270	54	40.13	35.947
5310	62	39.87	35.945
5510	102	40.14	35.919
5590	118	39.99	35.893
5710	142	39.86	35.904
5755	151	40.15	35.930
5795	159	39.89	35.958

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	80.93	75.205
5290	58	81.16	75.216
5530	106	81.37	75.222
5610	122	82.38	75.184
5690	138	81.45	75.186
5775	155	81.01	75.246

[ANT2]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.61	16.336
5200	40	20.09	16.347
5240	48	20.67	16.335
5260	52	20.35	16.320
5300	60	20.86	16.329
5320	64	20.97	16.359
5500	100	20.30	16.335
5600	120	20.61	16.330
5720	144	20.94	16.353
5745	149	20.11	16.337
5785	157	20.68	16.327
5825	165	20.86	16.363

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.85	17.565
5200	40	19.72	17.539
5240	48	19.80	17.547
5260	52	19.85	17.547
5300	60	19.69	17.531
5320	64	19.76	17.539
5500	100	19.70	17.542
5600	120	19.82	17.536
5720	144	19.82	17.558
5745	149	19.62	17.532
5785	157	20.58	17.569
5825	165	20.03	17.553

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.04	35.936
5230	46	40.59	35.929
5270	54	39.74	35.914
5310	62	39.79	35.878
5510	102	40.29	35.958
5590	118	39.97	35.893
5710	142	40.12	35.891
5755	151	40.03	35.910
5795	159	39.68	35.951

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.74	17.541
5200	40	19.87	17.561
5240	48	19.90	17.536
5260	52	19.80	17.554
5300	60	19.60	17.555
5320	64	19.77	17.566
5500	100	20.28	17.570
5600	120	19.64	17.533
5720	144	19.84	17.546
5745	149	19.81	17.535
5785	157	19.72	17.569
5825	165	19.88	17.553

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.83	35.899
5230	46	40.00	35.934
5270	54	39.63	35.894
5310	62	40.26	35.939
5510	102	39.71	35.913
5590	118	39.75	35.898
5710	142	40.09	35.927
5755	151	39.83	35.895
5795	159	40.12	35.883

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.66	75.202
5290	58	81.20	75.222
5530	106	81.44	75.225
5610	122	81.38	75.205
5690	138	81.57	75.184
5775	155	81.91	75.232

[ANT1]

☐ 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 60)



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



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

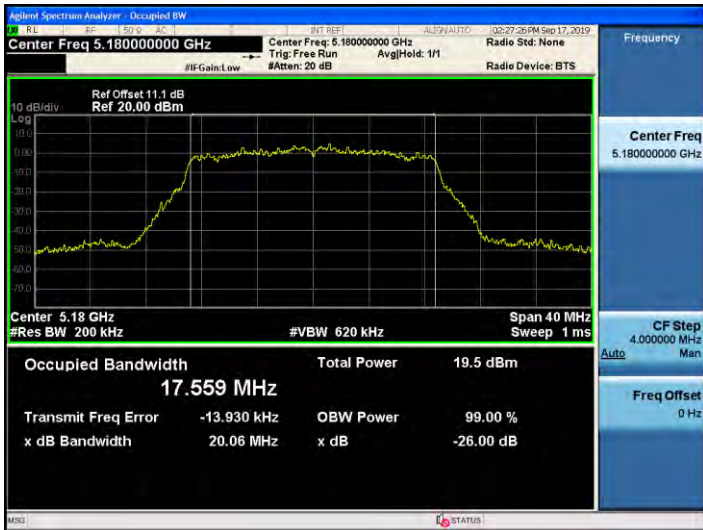


▣ Test Plots(802.11n(HT20))

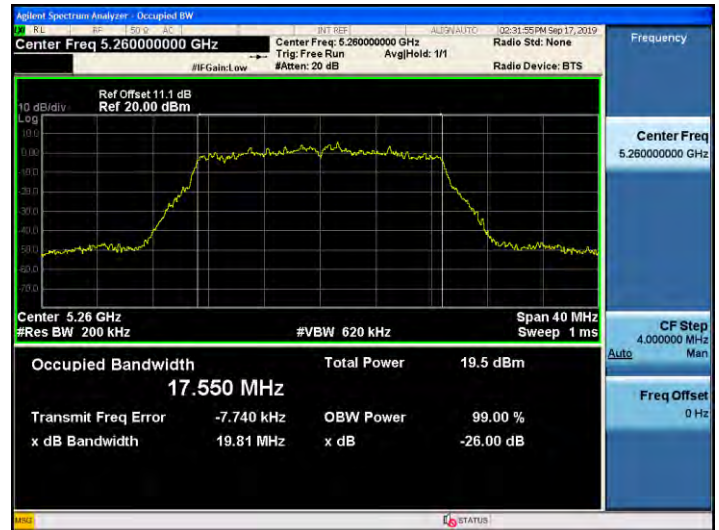
Note:

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

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)



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



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



802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 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 38)



802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 54)



802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 102)



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



☐ Test Plots(802.11ac(VHT20))

Note:

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

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



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



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



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

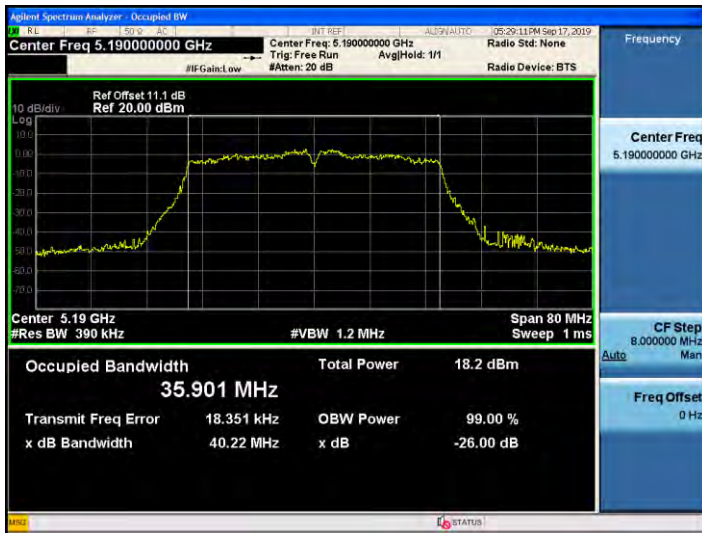


☐ Test Plots(802.11ac(VHT40))

Note:

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

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



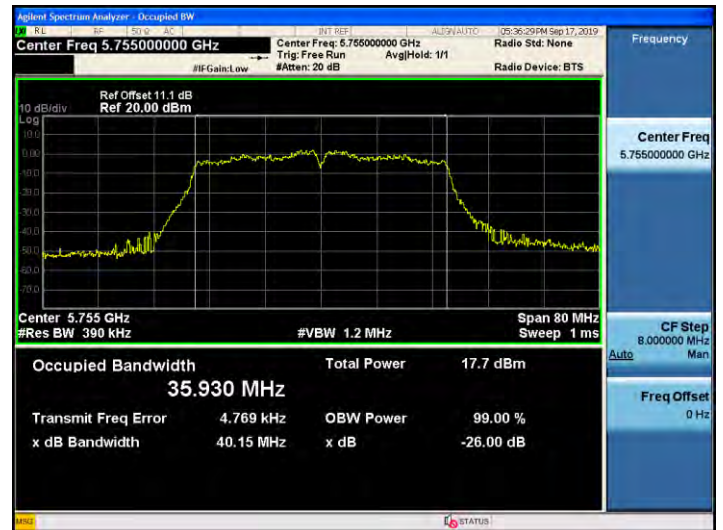
802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)



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 122)



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



[ANT2]

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 48)



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



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



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

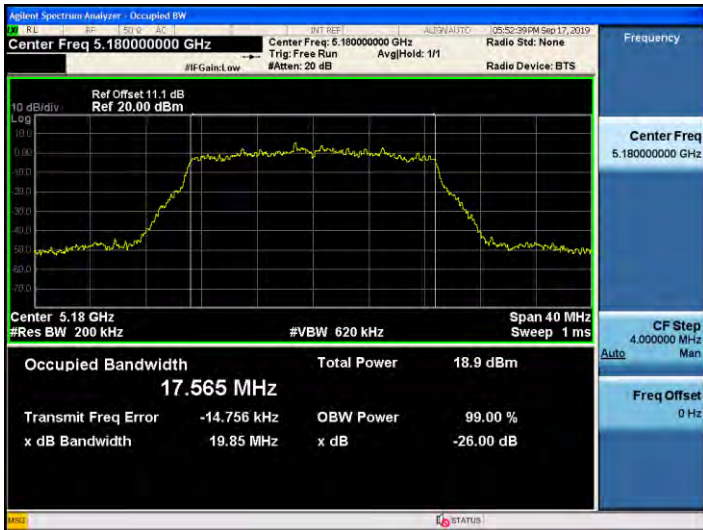


Test Plots(802.11n(HT20))

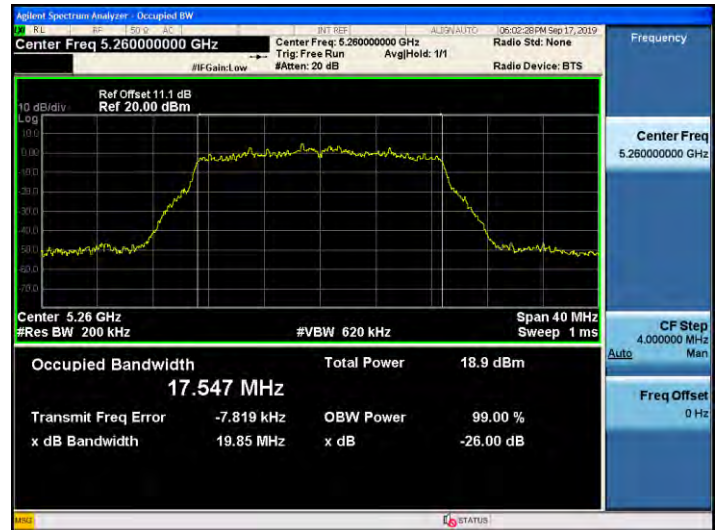
Note:

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

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)



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



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



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



☐ Test Plots(802.11n(HT40))

Note:

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

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



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



802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 102)



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



☐ Test Plots(802.11ac(VHT20))

Note:

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

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



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



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



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

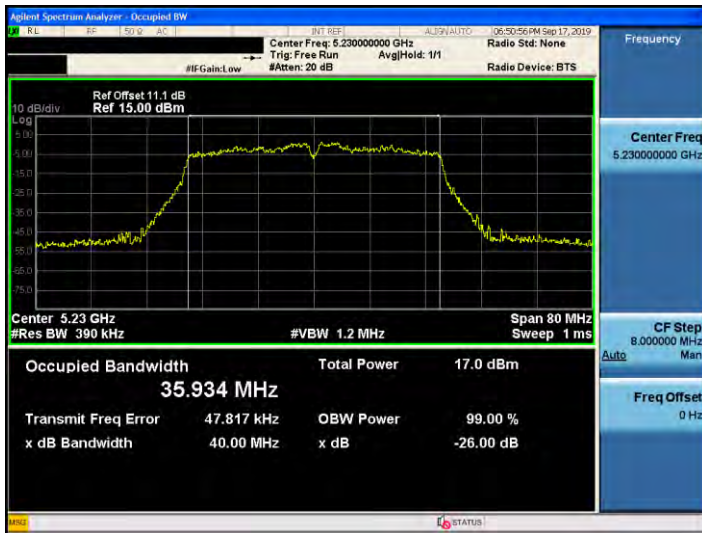


☐ Test Plots(802.11ac(VHT40))

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)



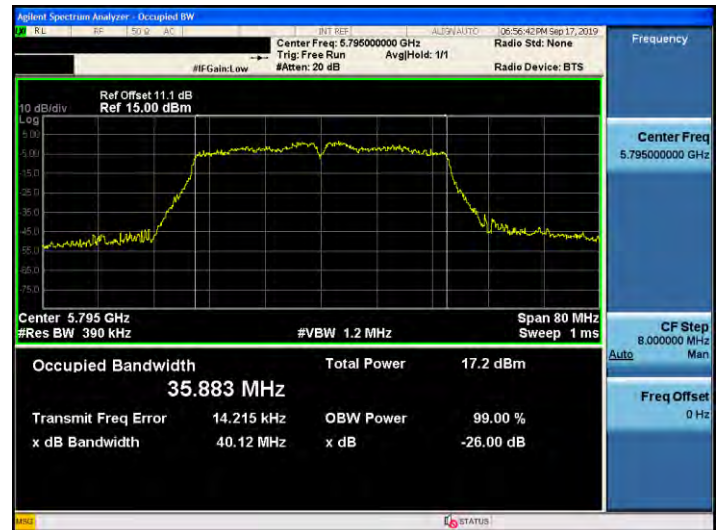
802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 62)



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



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



Test Plots(802.11ac(VHT80))

Note:

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

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



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



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



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



10.3 6DB BANDWIDTH

[ANT1]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	13.84	> 0.5	Pass
5785	157	10.70	> 0.5	Pass
5825	165	12.59	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	11.72	> 0.5	Pass
5785	157	13.90	> 0.5	Pass
5825	165	15.08	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	33.87	> 0.5	Pass
5795	159	32.59	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.04	> 0.5	Pass
5785	157	11.63	> 0.5	Pass
5825	165	12.61	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	33.86	> 0.5	Pass
5795	159	33.79	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	70.14	> 0.5	Pass

[ANT2]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	12.62	> 0.5	Pass
5785	157	12.56	> 0.5	Pass
5825	165	12.58	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.13	> 0.5	Pass
5785	157	13.86	> 0.5	Pass
5825	165	13.82	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.07	> 0.5	Pass
5795	159	34.99	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	13.85	> 0.5	Pass
5785	157	11.40	> 0.5	Pass
5825	165	12.63	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.06	> 0.5	Pass
5795	159	35.06	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	70.13	> 0.5	Pass

[ANT1]

Test Plots

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

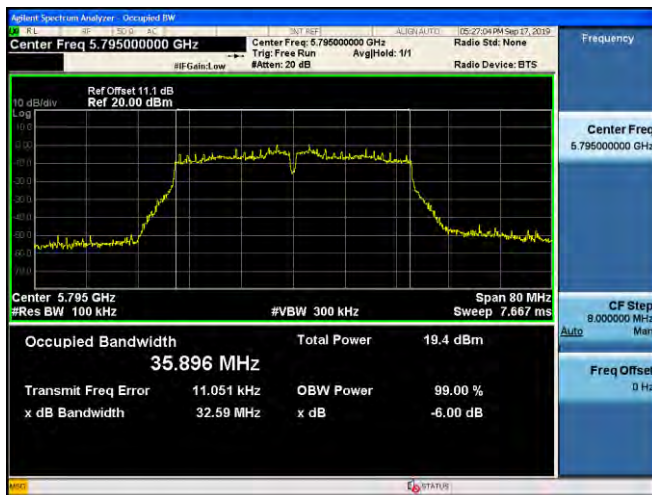
802.11a (CH.157)



802.11n(HT20) (CH.149)



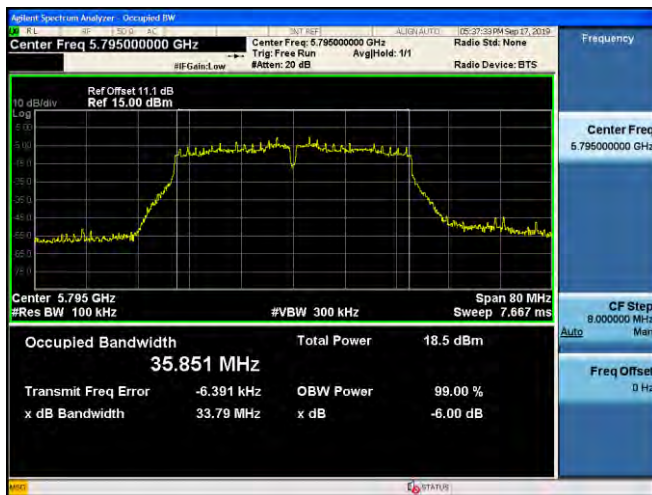
802.11n(HT40) (CH.159)



802.11ac(VHT20) (CH.157)



802.11ac(VHT40) (CH.159)



802.11ac(VHT80) (CH.155)



[ANT2]

Test Plots

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

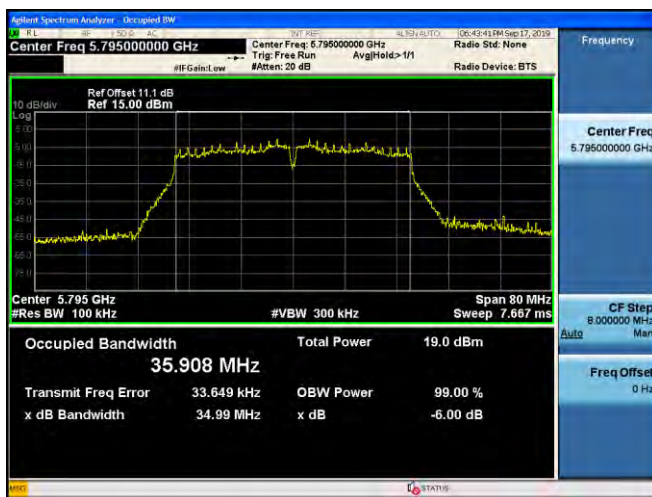
802.11a (CH.157)



802.11n(HT20) (CH.165)



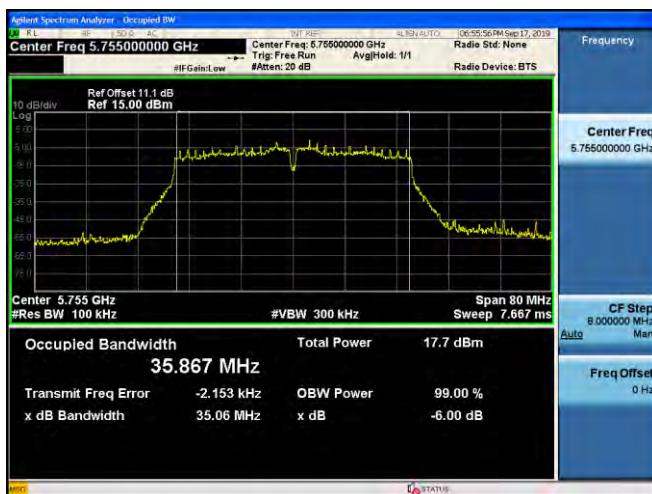
802.11n(HT40) (CH.159)



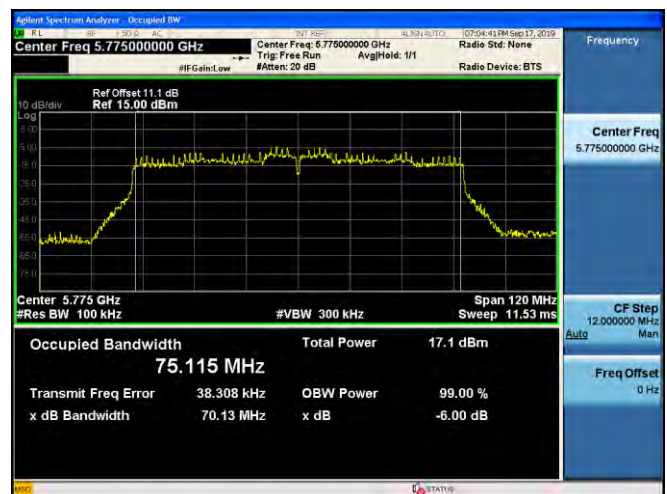
802.11ac(VHT20) (CH.157)



802.11ac(VHT40) (CH.151)



802.11ac(VHT80) (CH.155)



10.4 OUTPUT POWER MEASUREMENT

[ANT1]

802.11a Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	13	13.66	0.318	13.98	23.98
5200	40	13	13.67	0.318	13.99	23.98
5240	48	13	13.66	0.318	13.98	23.98
5260	52	13	13.44	0.318	13.76	23.98
5300	60	13	13.67	0.318	13.99	23.98
5320	64	13	13.50	0.318	13.82	23.98
5500	100	13	13.58	0.318	13.90	23.98
5600	120	13	13.22	0.318	13.54	23.98
5720	144	13	13.39	0.318	13.71	23.98
5745	149	13	13.14	0.318	13.46	30.00
5785	157	13	13.16	0.318	13.48	30.00
5825	165	13	13.33	0.318	13.65	30.00

802.11n(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	13	13.48	0.326	13.81	23.98
5200	40	13	13.58	0.326	13.91	23.98
5240	48	13	13.65	0.326	13.98	23.98
5260	52	13	13.25	0.326	13.58	23.98
5300	60	13	13.48	0.326	13.81	23.98
5320	64	13	13.32	0.326	13.65	23.98
5500	100	13	13.40	0.326	13.73	23.98
5600	120	13	13.02	0.326	13.35	23.98
5720	144	13	13.22	0.326	13.55	23.98
5745	149	13	12.94	0.326	13.27	30.00
5785	157	13	12.98	0.326	13.31	30.00
5825	165	13	13.15	0.326	13.48	30.00

802.11n(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	12	12.14	0.589	12.73	23.98
5230	46	12	12.37	0.589	12.96	23.98
5270	54	12	12.23	0.589	12.82	23.98
5310	62	12	12.14	0.589	12.73	23.98
5510	102	12	11.90	0.589	12.49	23.98
5590	118	12	11.68	0.589	12.27	23.98
5710	142	12	11.81	0.589	12.40	23.98
5755	151	12	11.71	0.589	12.30	30.00
5795	159	12	11.75	0.589	12.34	30.00

802.11ac(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	12	12.54	0.322	12.86	23.98
5200	40	12	12.65	0.322	12.97	23.98
5240	48	12	12.66	0.322	12.98	23.98
5260	52	12	12.32	0.322	12.64	23.98
5300	60	12	12.41	0.322	12.73	23.98
5320	64	12	12.32	0.322	12.64	23.98
5500	100	12	12.27	0.416	12.69	23.98
5600	120	12	12.01	0.322	12.33	23.98
5720	144	12	12.16	0.322	12.48	23.98
5745	149	12	12.01	0.322	12.33	30.00
5785	157	12	12.00	0.322	12.32	30.00
5825	165	12	12.15	0.322	12.47	30.00

802.11ac(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	11	11.24	0.587	11.83	23.98
5230	46	11	11.38	0.587	11.97	23.98
5270	54	11	11.21	0.587	11.80	23.98
5310	62	11	11.10	0.587	11.69	23.98
5510	102	11	10.89	0.587	11.48	23.98
5590	118	11	10.65	0.587	11.24	23.98
5710	142	11	10.63	0.587	11.22	23.98
5755	151	11	10.59	0.587	11.18	30.00
5795	159	11	10.67	0.587	11.26	30.00

802.11ac(80MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	10	9.92	1.001	10.92	23.98
5290	58	10	9.72	1.001	10.72	23.98
5530	106	10	9.45	1.001	10.45	23.98
5610	122	10	9.34	1.001	10.34	23.98
5690	138	10	9.25	1.001	10.25	23.98
5775	155	10	9.11	1.001	10.11	30.00

[ANT2]

802.11a Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	13	13.14	0.318	13.46	23.98
5200	40	13	12.83	0.318	13.15	23.98
5240	48	13	12.57	0.318	12.89	23.98
5260	52	13	12.94	0.318	13.26	23.98
5300	60	13	12.61	0.318	12.93	23.98
5320	64	13	12.75	0.318	13.07	23.98
5500	100	13	13.44	0.318	13.76	23.98
5600	120	13	13.00	0.318	13.32	23.98
5720	144	13	13.06	0.318	13.38	23.98
5745	149	13	13.13	0.318	13.45	30.00
5785	157	13	12.93	0.318	13.25	30.00
5825	165	13	12.92	0.318	13.24	30.00

802.11n(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	13	12.94	0.326	13.27	23.98
5200	40	13	12.65	0.326	12.98	23.98
5240	48	13	12.37	0.326	12.70	23.98
5260	52	13	12.71	0.326	13.04	23.98
5300	60	13	12.41	0.326	12.74	23.98
5320	64	13	12.54	0.326	12.87	23.98
5500	100	13	13.23	0.326	13.56	23.98
5600	120	13	12.78	0.326	13.11	23.98
5720	144	13	12.88	0.326	13.21	23.98
5745	149	13	12.92	0.326	13.25	30.00
5785	157	13	12.71	0.326	13.04	30.00
5825	165	13	12.72	0.326	13.05	30.00

802.11n(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	12	11.40	0.589	11.99	23.98
5230	46	12	11.39	0.589	11.98	23.98
5270	54	12	11.01	0.589	11.60	23.98
5310	62	12	11.38	0.589	11.97	23.98
5510	102	12	11.55	0.589	12.14	23.98
5590	118	12	11.63	0.589	12.22	23.98
5710	142	12	11.71	0.589	12.30	23.98
5755	151	12	11.67	0.589	12.26	30.00
5795	159	12	11.48	0.589	12.07	30.00

802.11ac(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	12	11.73	0.322	12.05	23.98
5200	40	12	11.64	0.322	11.96	23.98
5240	48	12	11.38	0.322	11.70	23.98
5260	52	12	11.54	0.322	11.86	23.98
5300	60	12	11.42	0.322	11.74	23.98
5320	64	12	11.47	0.416	11.89	23.98
5500	100	12	12.12	0.322	12.44	23.98
5600	120	12	11.83	0.322	12.15	23.98
5720	144	12	11.89	0.322	12.21	23.98
5745	149	12	11.96	0.322	12.28	30.00
5785	157	12	11.58	0.322	11.90	30.00
5825	165	12	11.76	0.322	12.08	30.00

802.11ac(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	11	10.47	0.587	11.06	23.98
5230	46	11	10.33	0.587	10.92	23.98
5270	54	11	10.12	0.587	10.71	23.98
5310	62	11	10.22	0.587	10.81	23.98
5510	102	11	10.28	0.587	10.87	23.98
5590	118	11	10.58	0.587	11.17	23.98
5710	142	11	10.65	0.587	11.24	23.98
5755	151	11	10.30	0.587	10.89	30.00
5795	159	11	10.26	0.587	10.85	30.00

802.11ac(80MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	10	8.97	1.001	9.97	23.98
5290	58	10	8.96	1.001	9.96	23.98
5530	106	10	8.94	1.001	9.94	23.98
5610	122	10	8.94	1.001	9.94	23.98
5690	138	10	9.21	1.001	10.21	23.98
5775	155	10	8.67	1.001	9.67	30.00

[MIMO]

802.11a Mode		Power Level Setting	Ant 1 Measured Power (dBm) + Duty Cycle Factor	Ant 2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	13	13.98	13.46	16.74	23.98
5200	40	13	13.99	13.15	16.60	23.98
5240	48	13	13.98	12.89	16.48	23.98
5260	52	13	13.76	13.26	16.53	23.98
5300	60	13	13.99	12.93	16.50	23.98
5320	64	13	13.82	13.07	16.47	23.98
5500	100	13	13.9	13.76	16.84	23.98
5600	120	13	13.54	13.32	16.44	23.98
5720	144	13	13.71	13.38	16.56	23.98
5745	149	13	13.46	13.45	16.47	30.00
5785	157	13	13.48	13.25	16.38	30.00
5825	165	13	13.65	13.24	16.46	30.00

802.11n(20MHz) Mode		Power Level Setting	Ant 1 Measured Power (dBm) + Duty Cycle Factor	Ant 2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	13	13.81	13.27	16.56	23.98
5200	40	13	13.91	12.98	16.48	23.98
5240	48	13	13.98	12.7	16.40	23.98
5260	52	13	13.58	13.04	16.33	23.98
5300	60	13	13.81	12.74	16.32	23.98
5320	64	13	13.65	12.87	16.29	23.98
5500	100	13	13.73	13.56	16.66	23.98
5600	120	13	13.35	13.11	16.24	23.98
5720	144	13	13.55	13.21	16.39	23.98
5745	149	13	13.27	13.25	16.27	30.00
5785	157	13	13.31	13.04	16.19	30.00
5825	165	13	13.48	13.05	16.28	30.00

802.11n(40MHz) Mode		Power Level Setting	Ant 1 Measured Power (dBm) + Duty Cycle Factor	Ant 2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	12	12.73	11.99	15.39	23.98
5230	46	12	12.96	11.98	15.51	23.98
5270	54	12	12.82	11.6	15.26	23.98
5310	62	12	12.73	11.97	15.38	23.98
5510	102	12	12.49	12.14	15.33	23.98
5590	118	12	12.27	12.22	15.26	23.98
5710	142	12	12.4	12.3	15.36	23.98
5755	151	12	12.3	12.26	15.29	30.00
5795	159	12	12.34	12.07	15.22	30.00

802.11ac(20MHz) Mode		Power Level Setting	Ant 1 Measured Power (dBm) + Duty Cycle Factor	Ant 2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	12	12.86	12.05	15.48	23.98
5200	40	12	12.97	11.96	15.50	23.98
5240	48	12	12.98	11.7	15.40	23.98
5260	52	12	12.64	11.86	15.28	23.98
5300	60	12	12.73	11.74	15.27	23.98
5320	64	12	12.64	11.89	15.29	23.98
5500	100	12	12.69	12.44	15.58	23.98
5600	120	12	12.33	12.15	15.25	23.98
5720	144	12	12.48	12.21	15.36	23.98
5745	149	12	12.33	12.28	15.32	30.00
5785	157	12	12.32	11.9	15.13	30.00
5825	165	12	12.47	12.08	15.29	30.00

802.11ac(40MHz) Mode		Power Level Setting	Ant 1 Measured Power (dBm) + Duty Cycle Factor	Ant 2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	11	11.83	11.06	14.47	23.98
5230	46	11	11.97	10.92	14.49	23.98
5270	54	11	11.8	10.71	14.30	23.98
5310	62	11	11.69	10.81	14.28	23.98
5510	102	11	11.48	10.87	14.20	23.98
5590	118	11	11.24	11.17	14.22	23.98
5710	142	11	11.22	11.24	14.24	23.98
5755	151	11	11.18	10.89	14.05	30.00
5795	159	11	11.26	10.85	14.07	30.00

802.11ac(80MHz) Mode		Power Level Setting	Ant 1 Measured Power (dBm) + Duty Cycle Factor	Ant 2 Measured Power (dBm) + Duty Cycle Factor	MIMO Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	10	10.92	9.97	13.48	23.98
5290	58	10	10.72	9.96	13.37	23.98
5530	106	10	10.45	9.94	13.21	23.98
5610	122	10	10.34	9.94	13.15	23.98
5690	138	10	10.25	10.21	13.24	23.98
5775	155	10	10.11	9.67	12.91	30.00

10.5 POWER SPECTRAL DENSITY

[ANT1]

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	4.711	0.318	5.029	11
5200	40	4.897	0.318	5.215	11
5240	48	5.154	0.318	5.472	11
5260	52	4.796	0.318	5.114	11
5300	60	5.012	0.318	5.330	11
5320	64	4.890	0.318	5.208	11
5500	100	4.613	0.318	4.931	11
5600	120	4.367	0.318	4.685	11
5720	144	4.591	0.318	4.909	11
5745	149	1.567	0.318	1.885	30
5785	157	1.798	0.318	2.116	30
5825	165	2.280	0.318	2.598	30

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	3.807	0.326	4.133	11
5200	40	4.120	0.326	4.446	11
5240	48	4.386	0.326	4.712	11
5260	52	4.074	0.326	4.400	11
5300	60	4.199	0.326	4.525	11
5320	64	4.242	0.326	4.568	11
5500	100	3.932	0.326	4.258	11
5600	120	3.537	0.326	3.863	11
5720	144	3.789	0.326	4.115	11
5745	149	1.010	0.326	1.336	30
5785	157	1.041	0.326	1.367	30
5825	165	1.251	0.326	1.577	30

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	0.262	0.589	0.851	11
5230	46	0.721	0.589	1.310	11
5270	54	0.511	0.589	1.100	11
5310	62	0.068	0.589	0.657	11
5510	102	0.193	0.589	0.782	11
5590	118	-0.194	0.589	0.395	11
5710	142	-0.134	0.589	0.455	11
5755	151	-2.611	0.589	-2.022	30
5795	159	-2.691	0.589	-2.102	30

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	3.205	0.322	3.527	11
5200	40	3.452	0.322	3.774	11
5240	48	3.412	0.322	3.734	11
5260	52	3.219	0.322	3.541	11
5300	60	3.281	0.322	3.603	11
5320	64	3.052	0.322	3.374	11
5500	100	2.705	0.416	3.121	11
5600	120	2.588	0.322	2.910	11
5720	144	2.689	0.322	3.011	11
5745	149	-0.339	0.322	-0.017	30
5785	157	0.326	0.322	0.648	30
5825	165	0.441	0.322	0.763	30

802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	-0.771	0.587	-0.184	11
5230	46	-0.468	0.587	0.119	11
5270	54	-0.818	0.587	-0.231	11
5310	62	-0.863	0.587	-0.276	11
5510	102	-0.717	0.587	-0.130	11
5590	118	-1.422	0.587	-0.835	11
5710	142	-1.092	0.587	-0.505	11
5755	151	-3.952	0.587	-3.365	30
5795	159	-3.597	0.587	-3.010	30

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5210	42	-4.680	1.001	-3.679	11
5290	58	-5.041	1.001	-4.040	11
5530	106	-5.280	1.001	-4.279	11
5610	122	-5.578	1.001	-4.577	11
5690	138	-5.380	1.001	-4.379	11
5775	155	-8.070	1.001	-7.069	30

[ANT2]

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	3.691	0.318	4.009	11
5200	40	3.662	0.318	3.980	11
5240	48	3.559	0.318	3.877	11
5260	52	4.101	0.318	4.419	11
5300	60	3.903	0.318	4.221	11
5320	64	3.831	0.318	4.149	11
5500	100	4.380	0.318	4.698	11
5600	120	3.992	0.318	4.310	11
5720	144	4.170	0.318	4.488	11
5745	149	1.680	0.318	1.998	30
5785	157	1.531	0.318	1.849	30
5825	165	1.532	0.318	1.850	30

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	3.356	0.326	3.682	11
5200	40	3.033	0.326	3.359	11
5240	48	3.064	0.326	3.390	11
5260	52	3.285	0.326	3.611	11
5300	60	3.151	0.326	3.477	11
5320	64	3.128	0.326	3.454	11
5500	100	3.673	0.326	3.999	11
5600	120	3.315	0.326	3.641	11
5720	144	3.414	0.326	3.740	11
5745	149	0.735	0.326	1.061	30
5785	157	0.598	0.326	0.924	30
5825	165	0.903	0.326	1.229	30

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	-0.249	0.589	0.340	11
5230	46	-0.427	0.589	0.162	11
5270	54	-0.996	0.589	-0.407	11
5310	62	-0.680	0.589	-0.091	11
5510	102	-0.271	0.589	0.318	11
5590	118	-0.194	0.589	0.395	11
5710	142	-0.155	0.589	0.434	11
5755	151	-2.901	0.589	-2.312	30
5795	159	-2.737	0.589	-2.148	30

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	2.300	0.322	2.622	11
5200	40	2.224	0.322	2.546	11
5240	48	2.119	0.322	2.441	11
5260	52	2.193	0.322	2.515	11
5300	60	2.122	0.322	2.444	11
5320	64	2.259	0.416	2.675	11
5500	100	2.631	0.322	2.953	11
5600	120	2.506	0.322	2.828	11
5720	144	2.244	0.322	2.566	11
5745	149	-0.160	0.322	0.162	30
5785	157	-0.370	0.322	-0.048	30
5825	165	-0.156	0.322	0.166	30

802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	-1.740	0.587	-1.153	11
5230	46	-1.912	0.587	-1.325	11
5270	54	-1.913	0.587	-1.326	11
5310	62	-1.928	0.587	-1.341	11
5510	102	-1.916	0.587	-1.329	11
5590	118	-1.660	0.587	-1.073	11
5710	142	-1.372	0.587	-0.785	11
5755	151	-4.496	0.587	-3.909	30
5795	159	-4.362	0.587	-3.775	30

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.				
5210	42	-5.840	1.001	-4.839	11
5290	58	-6.046	1.001	-5.045	11
5530	106	-5.943	1.001	-4.942	11
5610	122	-5.853	1.001	-4.852	11
5690	138	-5.532	1.001	-4.531	11
5775	155	-8.455	1.001	-7.454	30

[MIMO]

802.11a Mode		ANT 1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT 2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	5.029	4.009	7.559	11
5200	40	5.215	3.980	7.651	11
5240	48	5.472	3.877	7.757	11
5260	52	5.114	4.419	7.790	11
5300	60	5.330	4.221	7.821	11
5320	64	5.208	4.149	7.721	11
5500	100	4.931	4.698	7.826	11
5600	120	4.685	4.310	7.511	11
5720	144	4.909	4.488	7.714	11
5745	149	1.885	1.998	4.952	30
5785	157	2.116	1.849	4.994	30
5825	165	2.598	1.850	5.250	30

802.11n(20MHz) Mode		ANT 1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT 2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	4.133	3.682	6.924	11
5200	40	4.446	3.359	6.947	11
5240	48	4.712	3.390	7.111	11
5260	52	4.400	3.611	7.034	11
5300	60	4.525	3.477	7.043	11
5320	64	4.568	3.454	7.057	11
5500	100	4.258	3.999	7.141	11
5600	120	3.863	3.641	6.764	11
5720	144	4.115	3.740	6.942	11
5745	149	1.336	1.061	4.211	30
5785	157	1.367	0.924	4.161	30
5825	165	1.631	1.229	4.445	30

802.11n(40MHz) Mode		ANT 1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT 2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	0.851	0.340	3.613	11
5230	46	1.310	0.162	3.784	11
5270	54	1.100	-0.407	3.422	11
5310	62	0.657	-0.091	3.309	11
5510	102	0.782	0.318	3.566	11
5590	118	0.395	0.395	3.405	11
5710	142	0.455	0.434	3.454	11
5755	151	-2.022	-2.312	0.845	30
5795	159	-2.102	-2.148	0.885	30

802.11ac(20MHz) Mode		ANT 1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT 2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5180	36	3.527	2.622	6.108	11
5200	40	3.774	2.546	6.213	11
5240	48	3.734	2.441	6.146	11
5260	52	3.541	2.515	6.068	11
5300	60	3.603	2.444	6.072	11
5320	64	3.374	2.675	6.049	11
5500	100	3.121	2.953	6.048	11
5600	120	2.910	2.828	5.879	11
5720	144	3.011	2.566	5.804	11
5745	149	-0.017	0.162	3.084	30
5785	157	0.648	-0.048	3.324	30
5825	165	0.763	0.166	3.485	30

802.11ac(40MHz) Mode		ANT 1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT 2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5190	38	-0.184	-1.153	2.369	11
5230	46	0.119	-1.325	2.467	11
5270	54	-0.231	-1.326	2.266	11
5310	62	-0.276	-1.341	2.234	11
5510	102	-0.130	-1.329	2.322	11
5590	118	-0.835	-1.073	2.058	11
5710	142	-0.505	-0.785	2.368	11
5755	151	-3.365	-3.909	-0.618	30
5795	159	-3.010	-3.775	-0.365	30

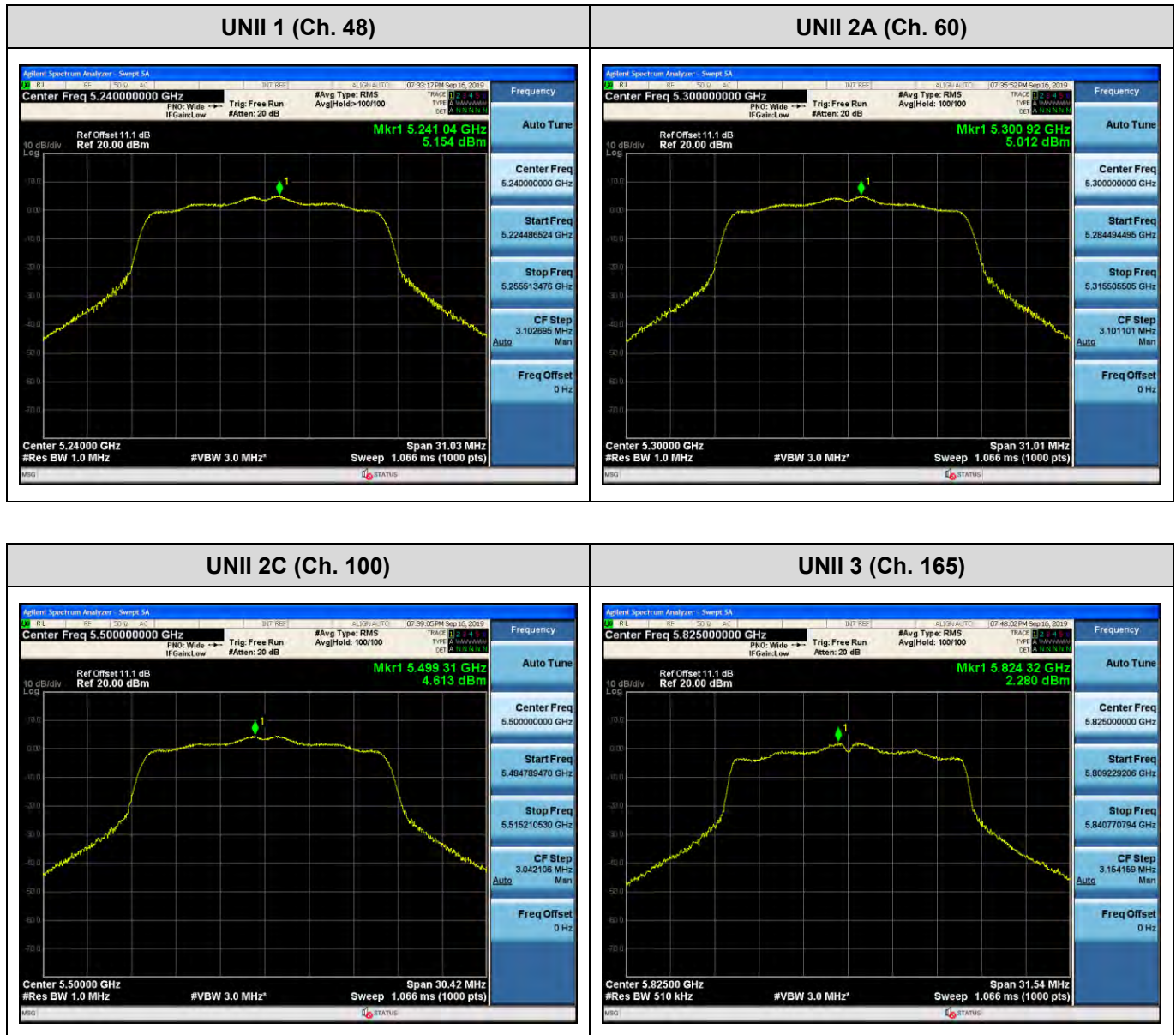
802.11ac(80MHz) Mode		ANT 1 Measured Power(dBm) + Duty Cycle Factor (dB)	ANT 2 Measured Power(dBm) + Duty Cycle Factor (dB)	MIMO Result (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.				
5210	42	-3.679	-4.839	-1.210	11
5290	58	-4.040	-5.045	-1.503	11
5530	106	-4.279	-4.942	-1.587	11
5610	122	-4.577	-4.852	-1.702	11
5690	138	-4.379	-4.531	-1.444	11
5775	155	-7.069	-7.454	-4.247	30

[ANT1]

☐ Test Plots(802.11a)

Note:

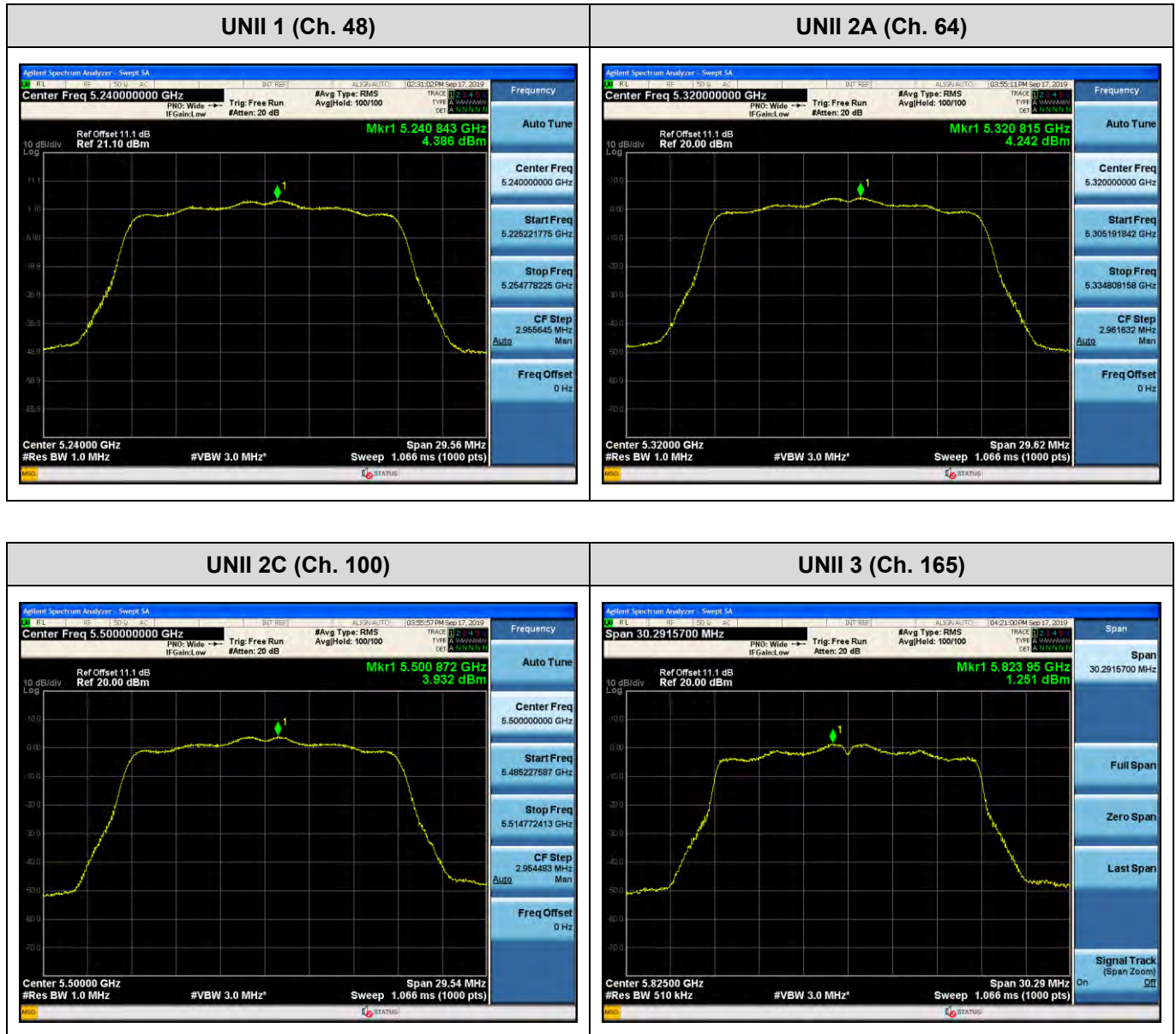
In order to simplify the report, attached plots were only channel of highest power.



□ Test Plots(802.11n(HT20))

Note:

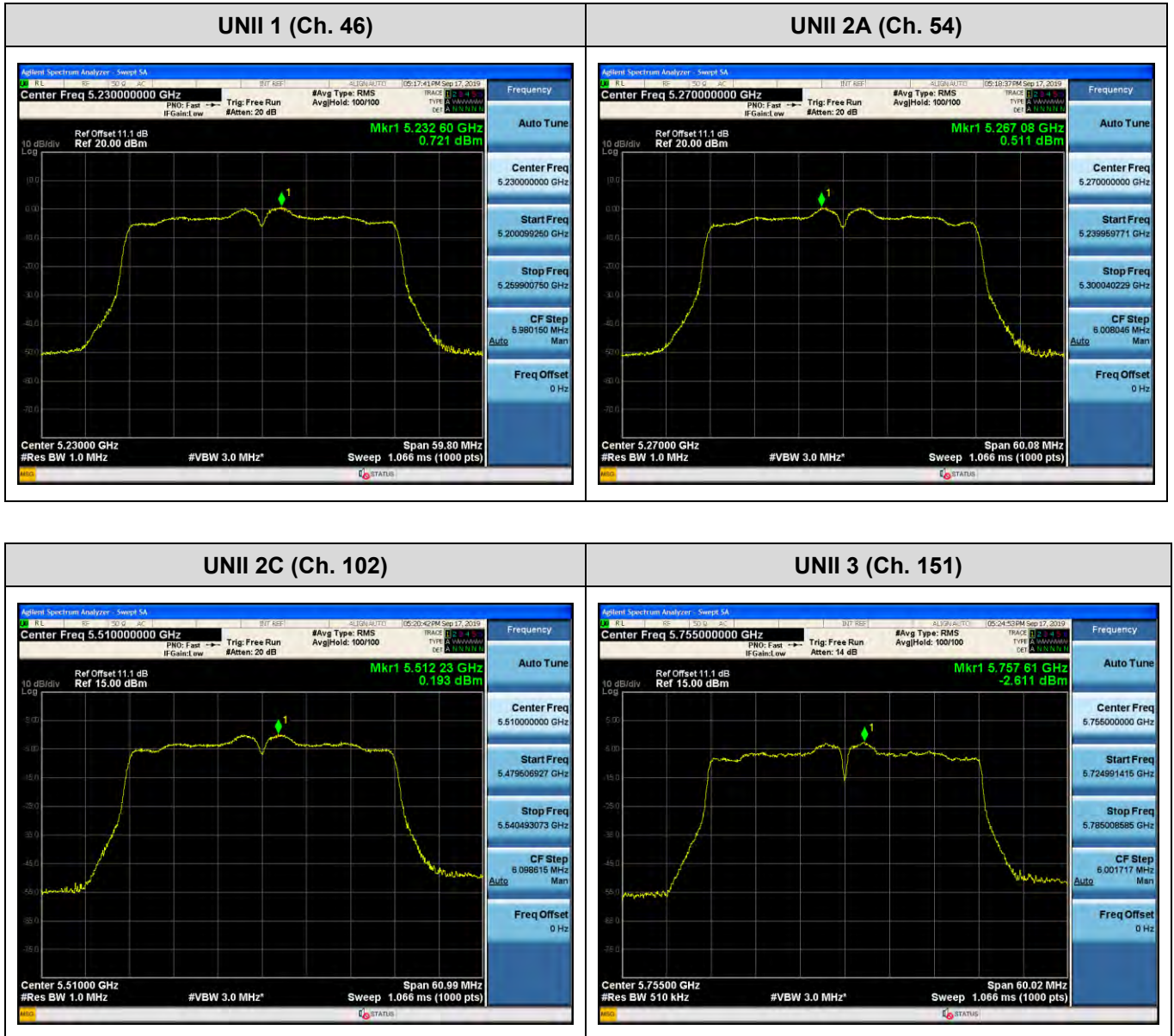
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11n(HT40))

Note:

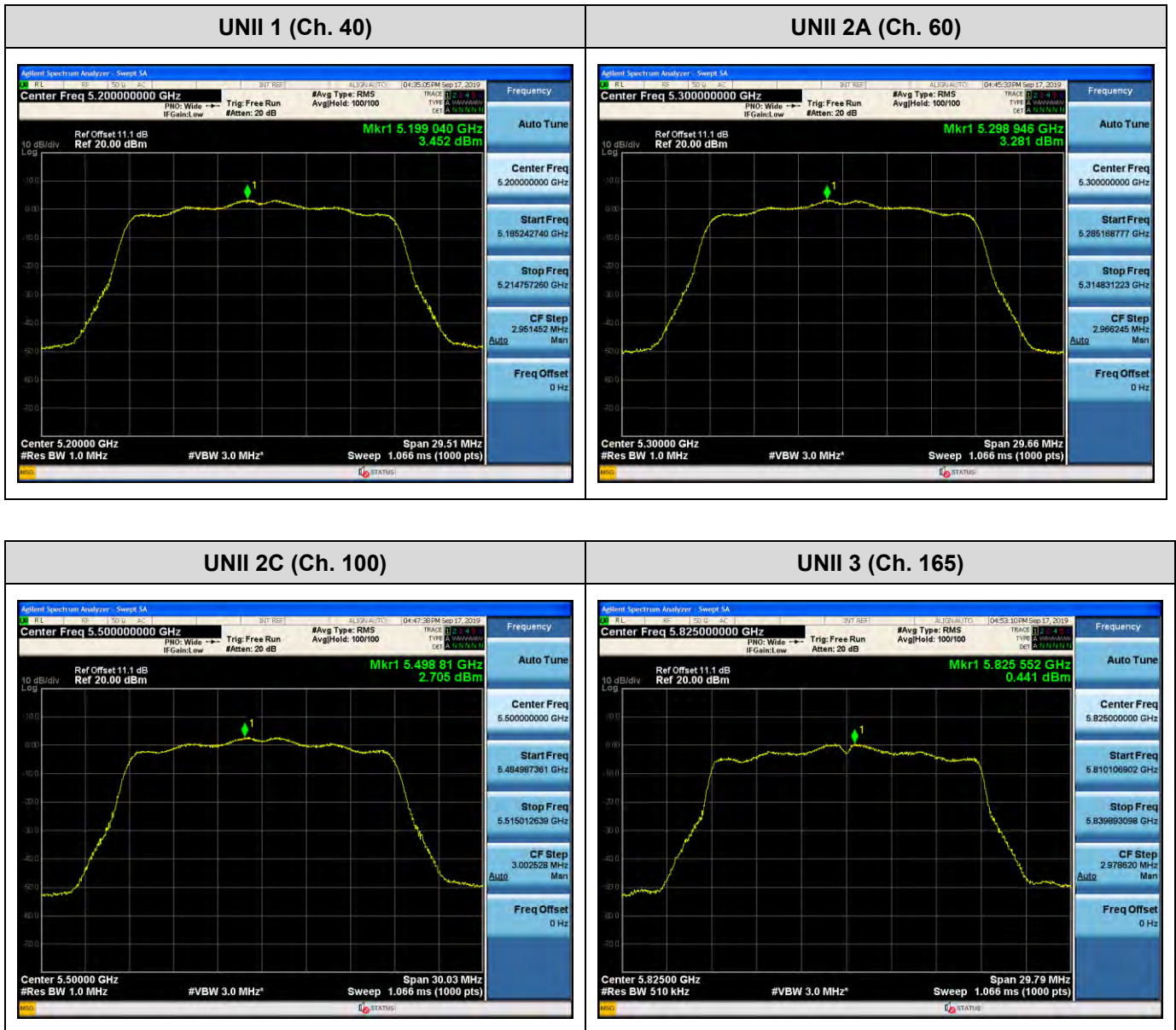
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11ac(VHT20))

Note:

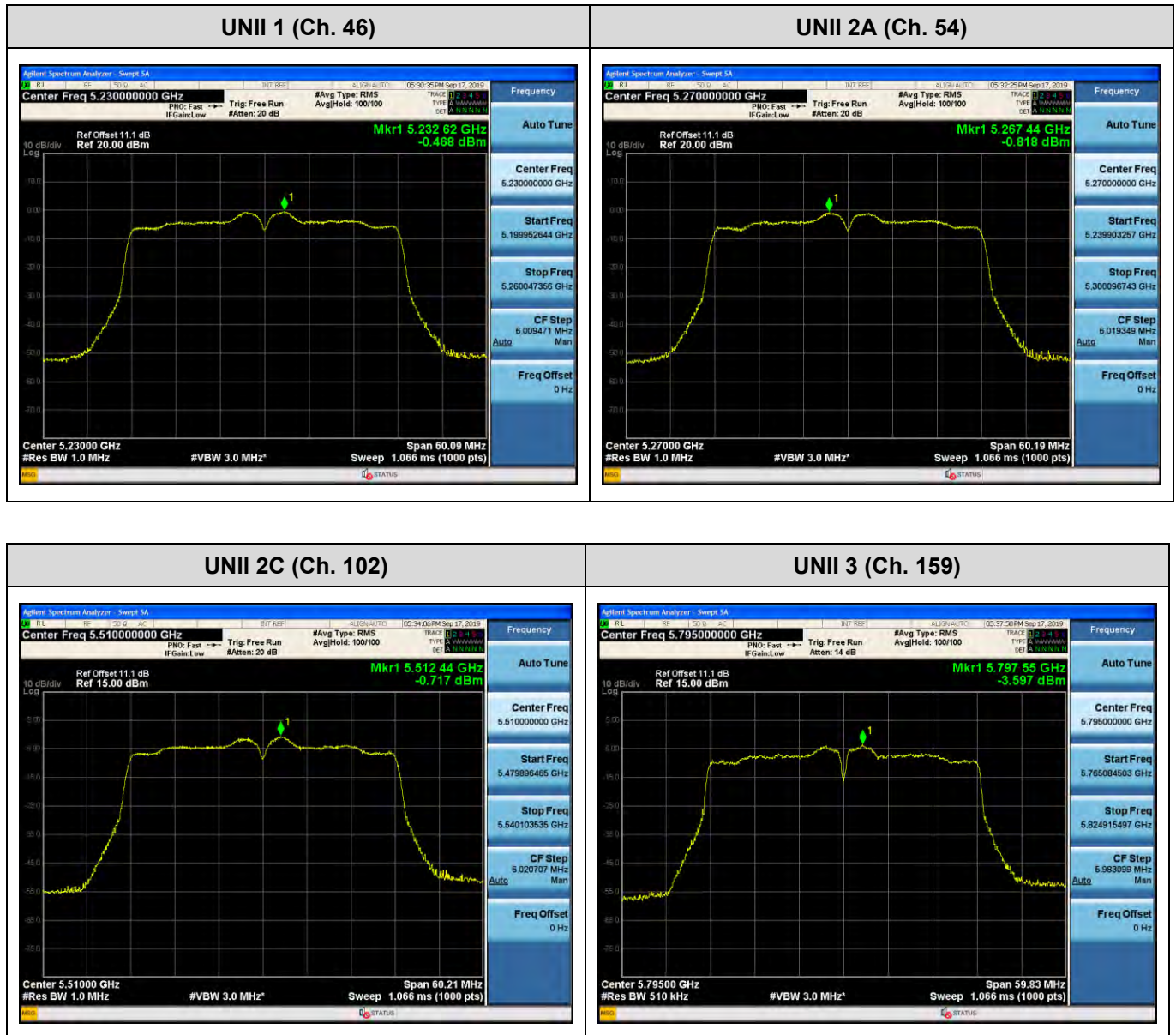
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11ac(VHT40))

Note:

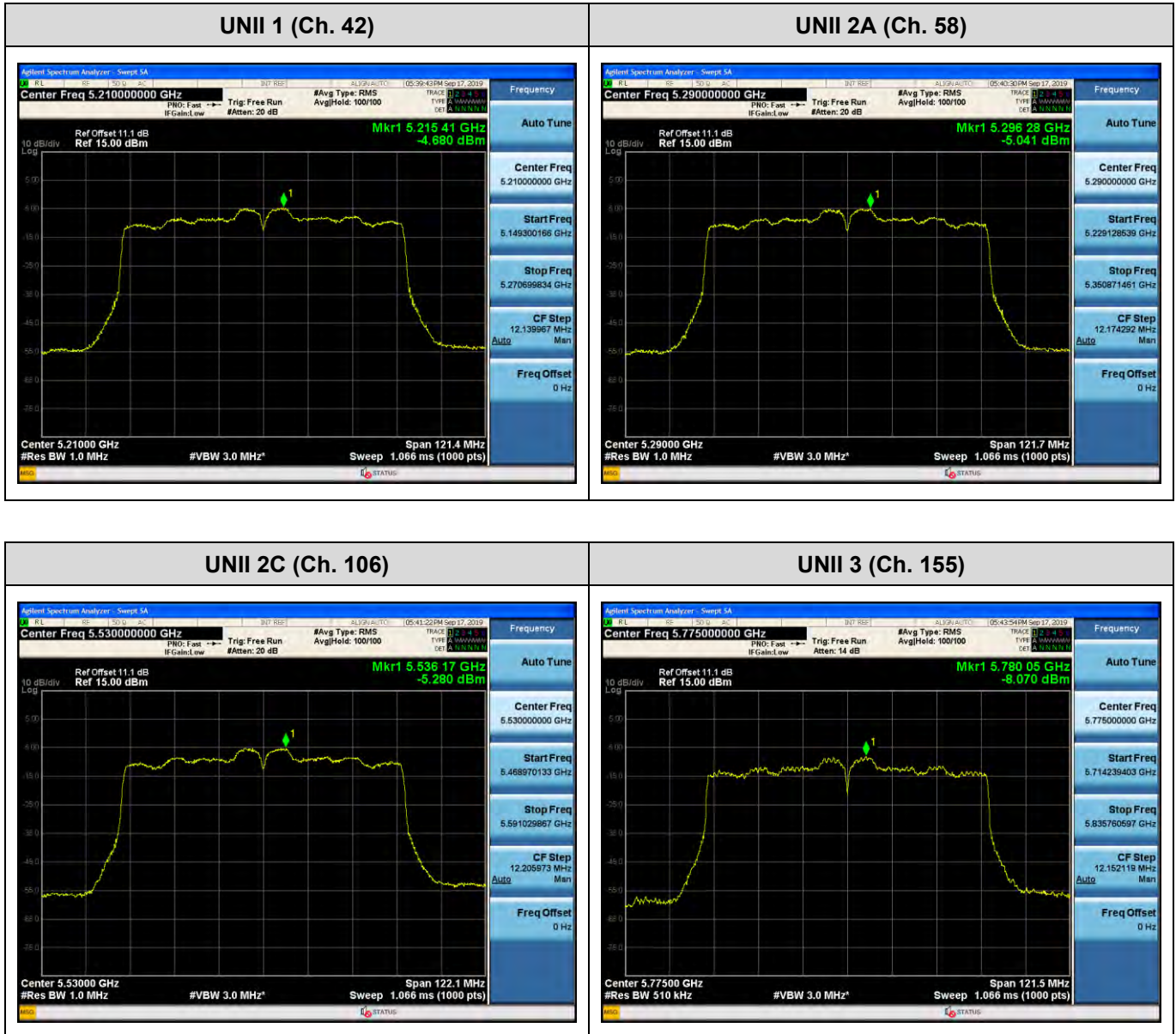
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11ac(VHT80))

Note:

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

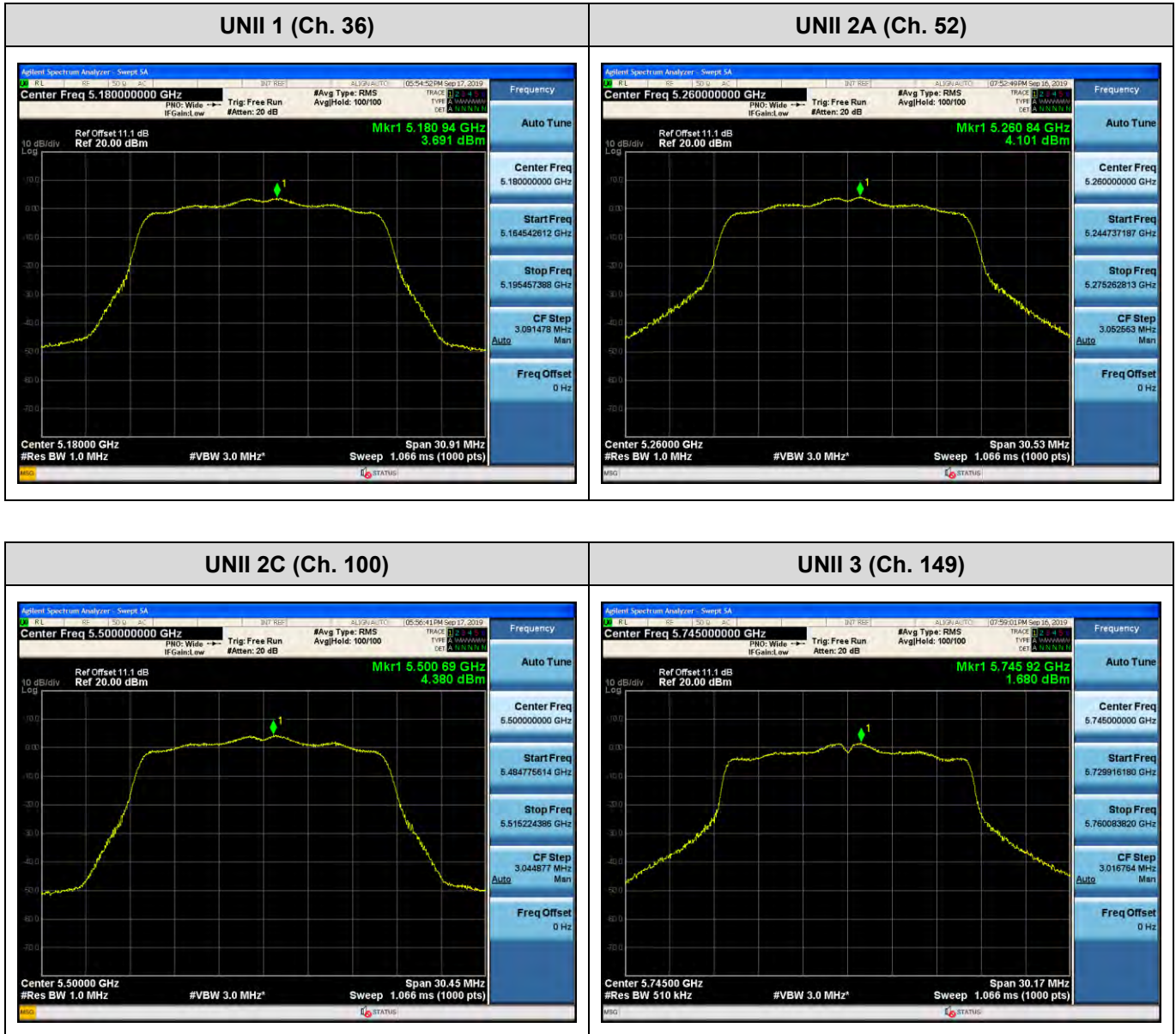


[ANT2]

☐ Test Plots(802.11a)

Note:

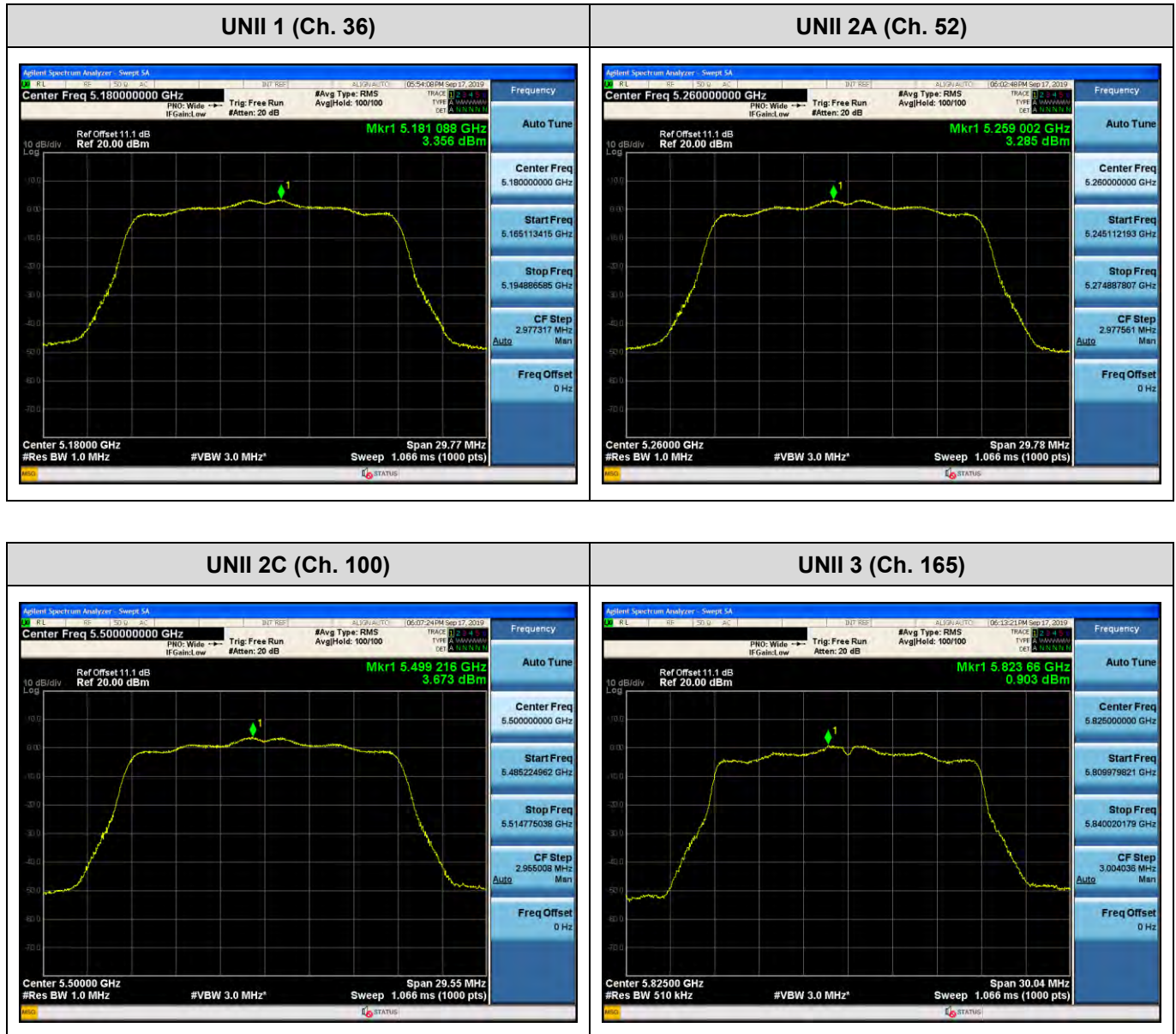
In order to simplify the report, attached plots were only channel of highest power.



□ Test Plots(802.11n(HT20))

Note:

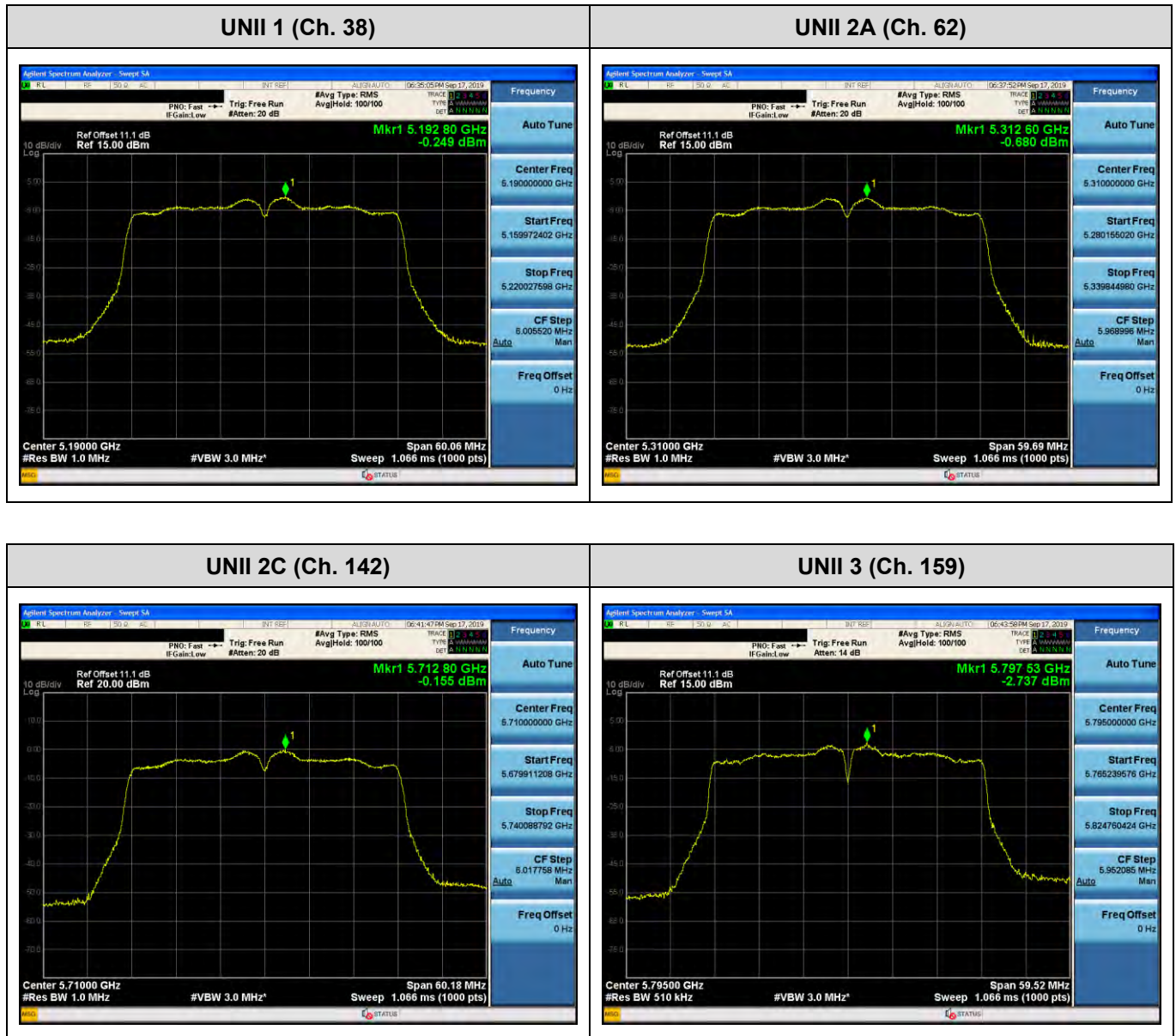
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11n(HT40))

Note:

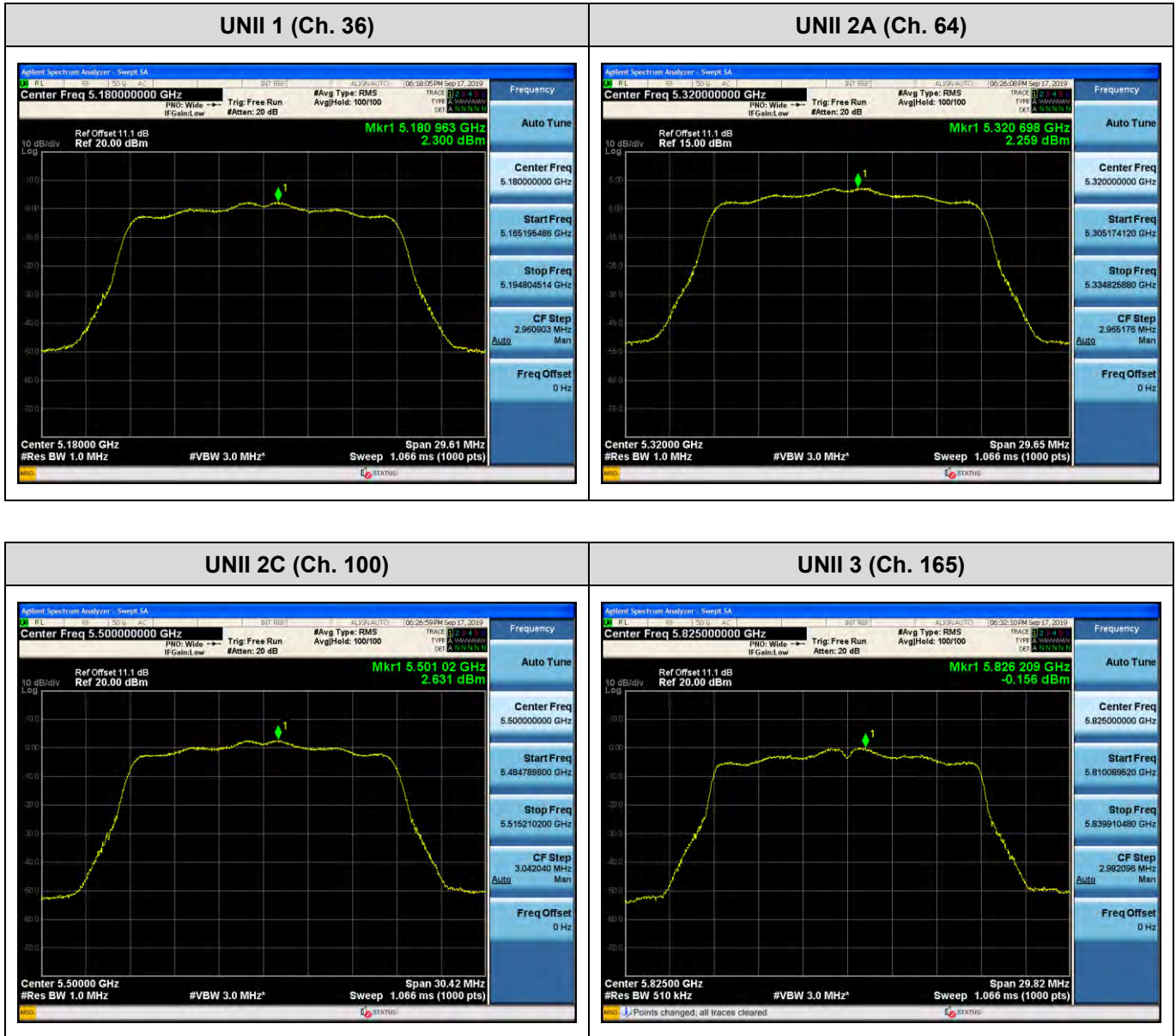
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11ac(VHT20))

Note:

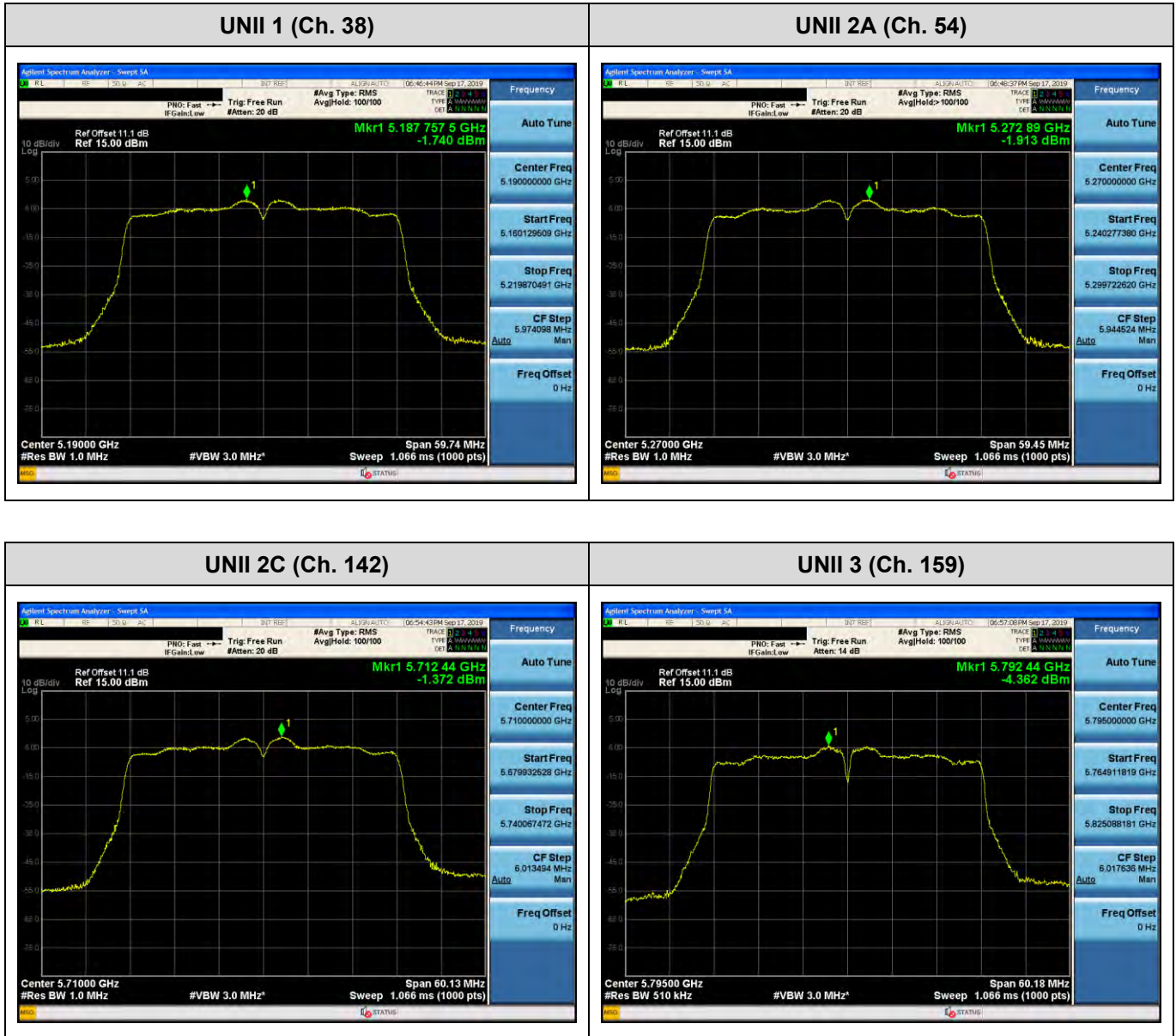
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11ac(VHT40))

Note:

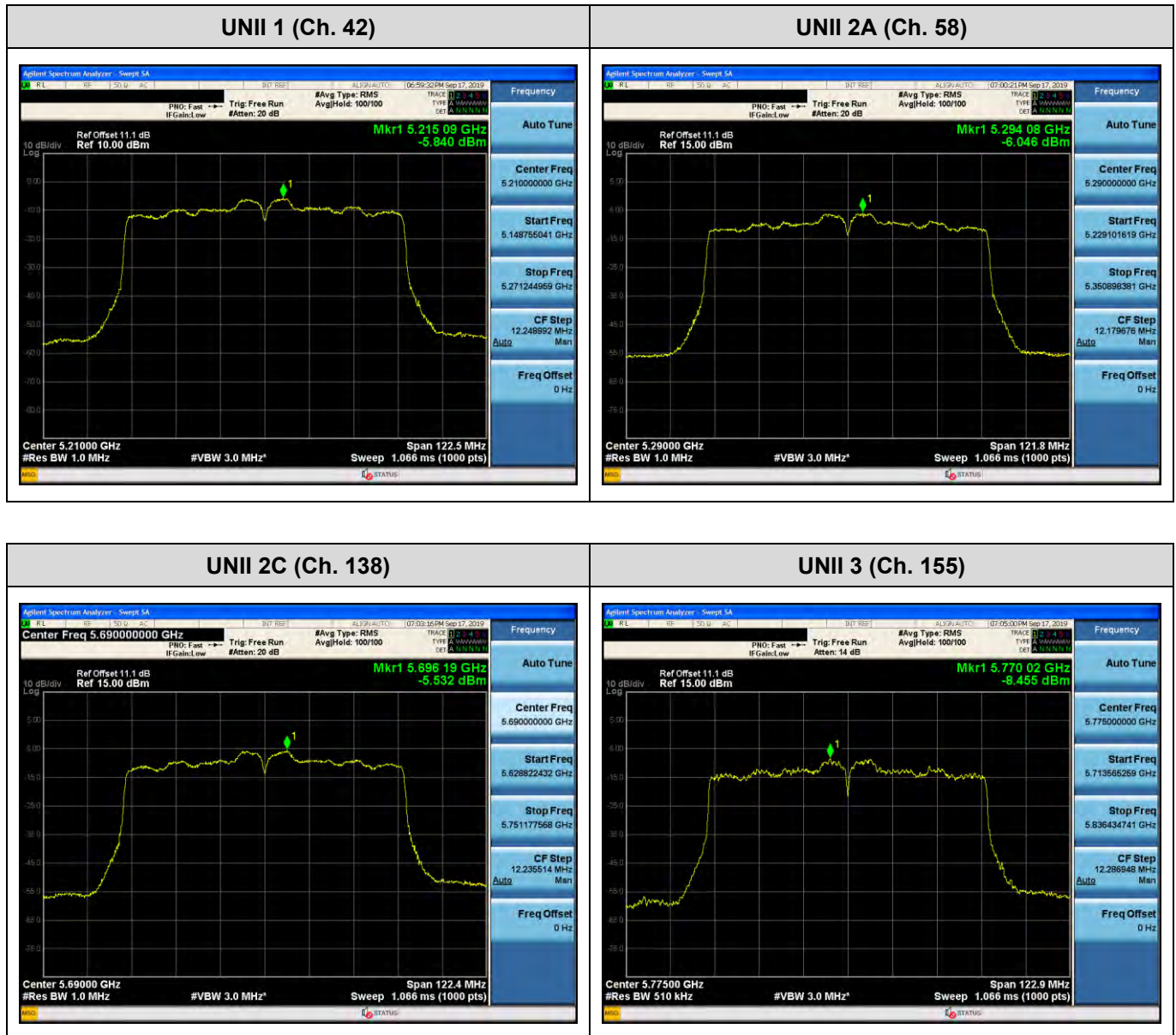
In order to simplify the report, attached plots were only channel of highest power.



☐ Test Plots(802.11ac(VHT80))

Note:

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



10.6 FREQUENCY STABILITY.

10.6.1 80MHz BW

[ANT1]

Startup after the EUT is energized

OPERATING BAND: UNII Band 1
 OPERATING FREQUENCY: 5,210,000,000 Hz
 CHANNEL: 42
 REFERENCE VOLTAGE: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5210026.48	26.48
100%		-30	5210008.35	8.35
100%		-20	5210003.54	3.54
100%		-10	5210005.15	5.15
100%		0	5210082.99	82.99
100%		+10	5210052.91	52.91
100%		+30	5210071.71	71.71
100%		+40	5210078.80	78.80
100%		+50	5210030.71	30.71
End.Point	7.3	+20	5210076.05	76.05

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5290084.17	84.17
100%		-30	5290090.96	90.96
100%		-20	5290076.66	76.66
100%		-10	5290046.40	46.4
100%		0	5290097.53	97.53
100%		+10	5290039.04	39.04
100%		+30	5290073.15	73.15
100%		+40	5290037.76	37.76
100%		+50	5290001.88	1.88
End.Point	7.3	+20	5290086.88	86.88

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5530038.02	38.02
100%		-30	5530001.43	1.43
100%		-20	5530063.42	63.42
100%		-10	5530046.17	46.17
100%		0	5530056.49	56.49
100%		+10	5530073.43	73.43
100%		+30	5530097.50	97.50
100%		+40	5530076.06	76.06
100%		+50	5530076.35	76.35
End.Point	7.3	+20	5530002.08	2.08

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5775042.45	42.45
100%		-30	5775032.29	32.29
100%		-20	5775011.11	11.11
100%		-10	5775068.60	68.60
100%		0	5775029.17	29.17
100%		+10	5775077.38	77.38
100%		+30	5775042.30	42.30
100%		+40	5775040.18	40.18
100%		+50	5775094.20	94.20
End.Point	7.3	+20	5775014.22	14.22

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5210012.52	12.52
100%		-30	5210016.25	16.25
100%		-20	5210032.84	32.84
100%		-10	5210034.96	34.96
100%		0	5210015.46	15.46
100%		+10	5210082.79	82.79
100%		+30	5210067.81	67.81
100%		+40	5210025.34	25.34
100%		+50	5210066.69	66.69
End.Point	7.3	+20	5210064.57	64.57

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5290059.53	59.53
100%		-30	5290021.52	21.52
100%		-20	5290071.89	71.89
100%		-10	5290062.38	62.38
100%		0	5290095.63	95.63
100%		+10	5290032.60	32.60
100%		+30	5290005.66	5.66
100%		+40	5290058.93	58.93
100%		+50	5290083.91	83.91
End.Point	7.3	+20	5290095.35	95.35

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5530058.27	58.27
100%		-30	5530022.72	22.72
100%		-20	5530016.29	16.29
100%		-10	5530002.65	2.65
100%		0	5530026.33	26.33
100%		+10	5530094.45	94.45
100%		+30	5530010.51	10.51
100%		+40	5530060.28	60.28
100%		+50	5530079.48	79.48
End.Point	7.3	+20	5530008.86	8.86

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5775042.24	42.24
100%		-30	5775011.60	11.60
100%		-20	5775064.12	64.12
100%		-10	5775026.13	26.13
100%		0	5775008.83	8.83
100%		+10	5775028.93	28.93
100%		+30	5775081.42	81.42
100%		+40	5775032.64	32.64
100%		+50	5775074.35	74.35
End.Point	7.3	+20	5775008.16	8.16

Note:

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

5 minutes after the EUT is energized

OPERATING BAND: UNII Band 1
OPERATING FREQUENCY: 5,210,000,000 Hz
CHANNEL: 42
REFERENCE VOLTAGE: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5210011.18	11.18
100%		-30	5210061.14	61.14
100%		-20	5210050.04	50.04
100%		-10	5210090.09	90.09
100%		0	5210018.75	18.75
100%		+10	5210079.50	79.50
100%		+30	5210037.78	37.78
100%		+40	5210002.79	2.79
100%		+50	5210014.60	14.60
End.Point	7.3	+20	5210018.16	18.16

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5290050.59	50.59
100%		-30	5290055.69	55.69
100%		-20	5290095.86	95.86
100%		-10	5290064.48	64.48
100%		0	5290073.32	73.32
100%		+10	5290016.99	16.99
100%		+30	5290089.20	89.20
100%		+40	5290025.64	25.64
100%		+50	5290040.75	40.75
End.Point	7.3	+20	5290064.38	64.38

Note:

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

OPERATING BAND: UNII Band 2C
 OPERATING FREQUENCY: 5,530,000,000 Hz
 CHANNEL: 106
 REFERENCE VOLTAGE: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5530080.61	80.61
100%		-30	5530009.14	9.14
100%		-20	5530019.21	19.21
100%		-10	5530062.23	62.23
100%		0	5530064.73	64.73
100%		+10	5530071.15	71.15
100%		+30	5530022.09	22.09
100%		+40	5530078.47	78.47
100%		+50	5530015.99	15.99
End.Point	7.3	+20	5530065.76	65.76

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5775095.98	95.98
100%		-30	5775053.95	53.95
100%		-20	5775054.55	54.55
100%		-10	5775084.23	84.23
100%		0	5775091.97	91.97
100%		+10	5775087.16	87.16
100%		+30	5775025.54	25.54
100%		+40	5775040.86	40.86
100%		+50	5775069.33	69.33
End.Point	7.3	+20	5775010.90	10.90

Note:

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

10 minutes after the EUT is energized

OPERATING BAND: UNII Band 1
OPERATING FREQUENCY: 5,210,000,000 Hz
CHANNEL: 42
REFERENCE VOLTAGE: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5210013.53	13.53
100%		-30	5210090.51	90.51
100%		-20	5210065.08	65.08
100%		-10	5210042.50	42.50
100%		0	5210038.36	38.36
100%		+10	5210007.76	7.76
100%		+30	5210014.06	14.06
100%		+40	5210014.86	14.86
100%		+50	5210096.74	96.74
End.Point	7.3	+20	5210064.16	64.16

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5290072.26	72.26
100%		-30	5290076.45	76.45
100%		-20	5290052.93	52.93
100%		-10	5290090.92	90.92
100%		0	5290065.27	65.27
100%		+10	5290013.15	13.15
100%		+30	5290001.33	1.33
100%		+40	5290084.35	84.35
100%		+50	5290025.36	25.36
End.Point	7.3	+20	5290092.82	92.82

Note:

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

OPERATING BAND: UNII Band 2C
OPERATING FREQUENCY: 5,530,000,000 Hz
CHANNEL: 106
REFERENCE VOLTAGE: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5530011.14	11.14
100%		-30	5530064.22	64.22
100%		-20	5530060.13	60.13
100%		-10	5530088.60	88.60
100%		0	5530039.03	39.03
100%		+10	5530054.24	54.24
100%		+30	5530018.63	18.63
100%		+40	5530068.02	68.02
100%		+50	5530061.46	61.46
End.Point	7.3	+20	5530039.30	39.30

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5775044.02	44.02
100%		-30	5775062.87	62.87
100%		-20	5775079.39	79.39
100%		-10	5775029.97	29.97
100%		0	5775066.43	66.43
100%		+10	5775073.34	73.34
100%		+30	5775066.60	66.60
100%		+40	5775002.41	2.41
100%		+50	5775004.51	4.51
End.Point	7.3	+20	5775018.32	18.32

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.

[ANT2]

Startup after the EUT is energized

OPERATING BAND: UNII Band 1
OPERATING FREQUENCY: 5,210,000,000 Hz
CHANNEL: 42
REFERENCE VOLTAGE: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5210091.11	91.11
100%		-30	5210029.09	29.09
100%		-20	5210005.63	5.63
100%		-10	5210045.28	45.28
100%		0	5210041.13	41.13
100%		+10	5210074.44	74.44
100%		+30	5210059.02	59.02
100%		+40	5210015.74	15.74
100%		+50	5210040.33	40.33
End.Point	7.3	+20	5210085.16	85.16

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5290050.75	50.75
100%		-30	5290057.28	57.28
100%		-20	5290001.37	1.37
100%		-10	5290078.03	78.03
100%		0	5290065.48	65.48
100%		+10	5290030.77	30.77
100%		+30	5290075.93	75.93
100%		+40	5290029.23	29.23
100%		+50	5290076.98	76.98
End.Point	7.3	+20	5290077.22	77.22

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5530029.21	29.21
100%		-30	5530067.08	67.08
100%		-20	5530017.33	17.33
100%		-10	5530054.66	54.66
100%		0	5530065.67	65.67
100%		+10	5530024.69	24.69
100%		+30	5530070.36	70.36
100%		+40	5530055.11	55.11
100%		+50	5530036.58	36.58
End.Point	7.3	+20	5530007.09	7.09

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5775004.53	4.53
100%		-30	5775099.93	99.93
100%		-20	5775064.50	64.50
100%		-10	5775049.12	49.12
100%		0	5775020.98	20.98
100%		+10	5775040.85	40.85
100%		+30	5775036.98	36.98
100%		+40	5775063.55	63.55
100%		+50	5775085.38	85.38
End.Point	7.3	+20	5775048.76	48.76

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5210093.53	93.53
100%		-30	5210051.40	51.40
100%		-20	5210018.58	18.58
100%		-10	5210096.50	96.50
100%		0	5210004.33	4.33
100%		+10	5210010.57	10.57
100%		+30	5210096.72	96.72
100%		+40	5210095.15	95.15
100%		+50	5210040.88	40.88
End.Point	7.3	+20	5210022.22	22.22

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: 7.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	7.7	+20(Ref)	5290019.09	19.09
100%		-30	5290083.65	83.65
100%		-20	5290040.99	40.99
100%		-10	5290067.87	67.87
100%		0	5290058.34	58.34
100%		+10	5290061.55	61.55
100%		+30	5290070.55	70.55
100%		+40	5290029.59	29.59
100%		+50	5290062.16	62.16
End.Point	7.3	+20	5290069.07	69.07

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.