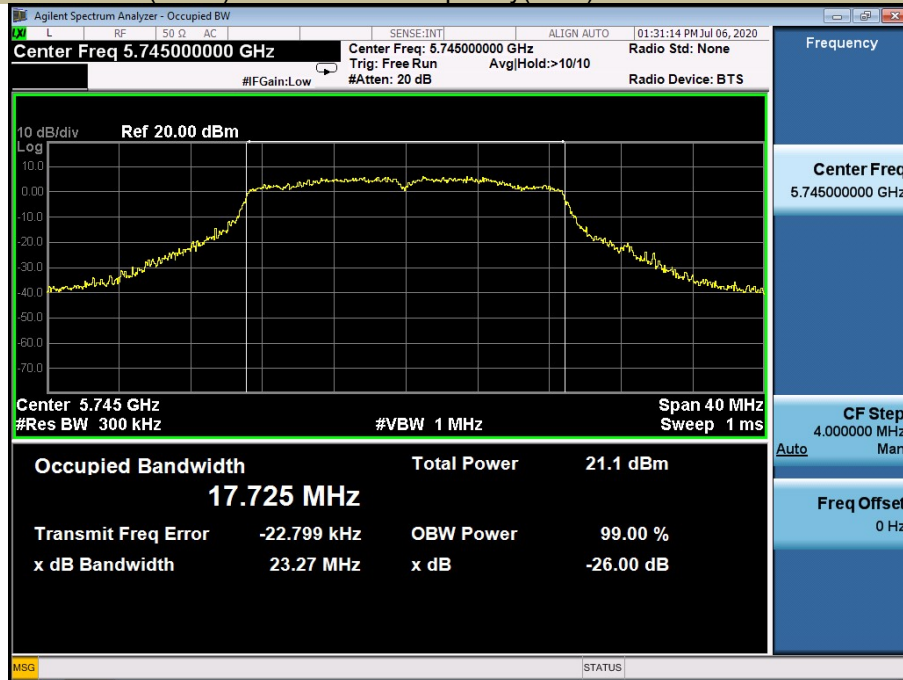
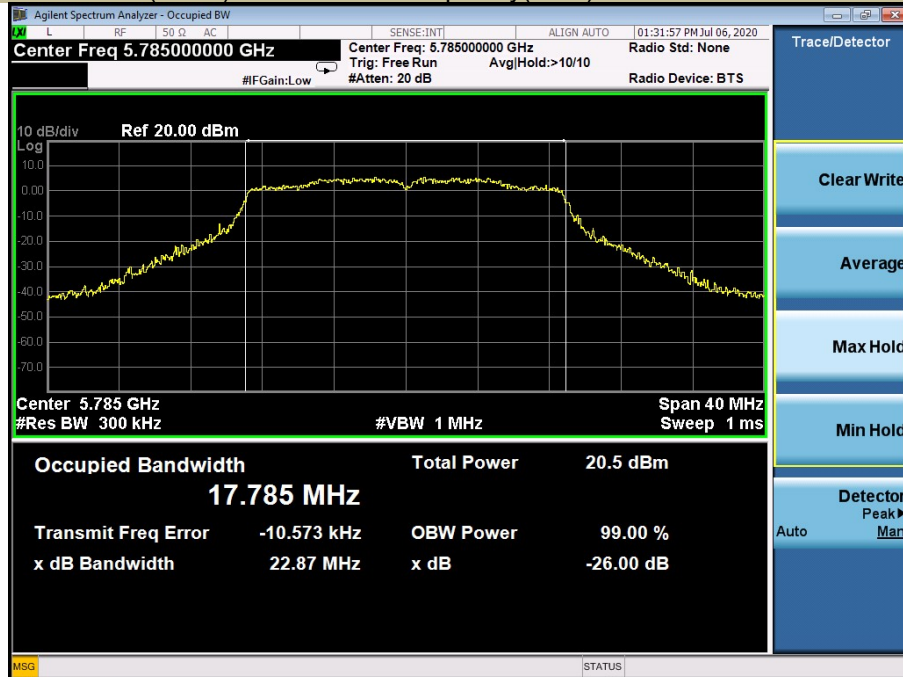


26dB&99% Bandwidth U-NII - 3
Test Model 802.11ac(HT20) Frequency(MHz) 5745



26dB&99% Bandwidth U-NII - 3
Test Model 802.11ac(HT20) Frequency(MHz) 5785



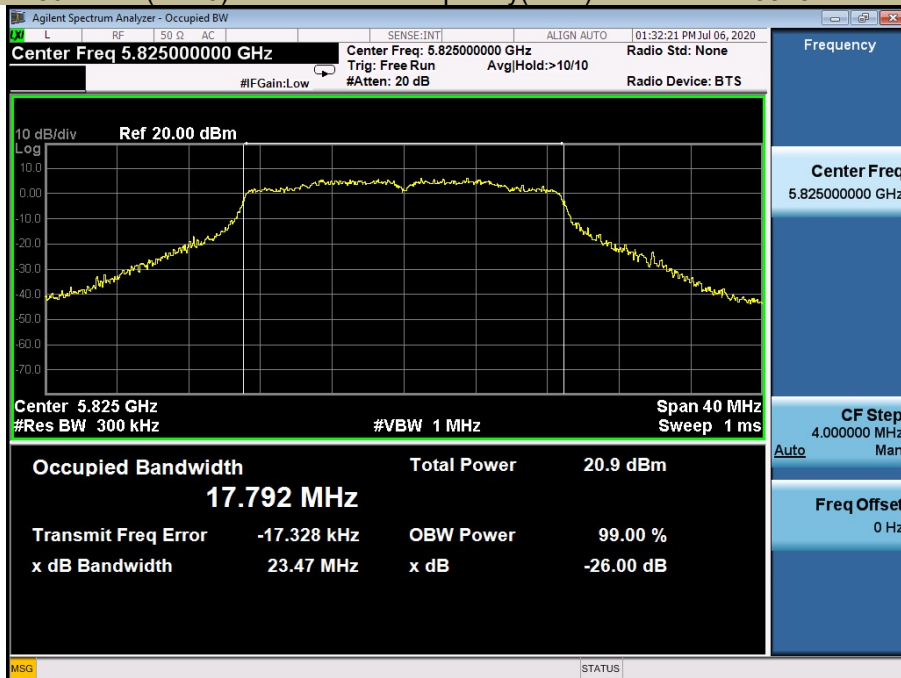
26dB&99% Bandwidth

Test Model 802.11ac(HT20)

U-NII - 3

Frequency(MHz)

5825



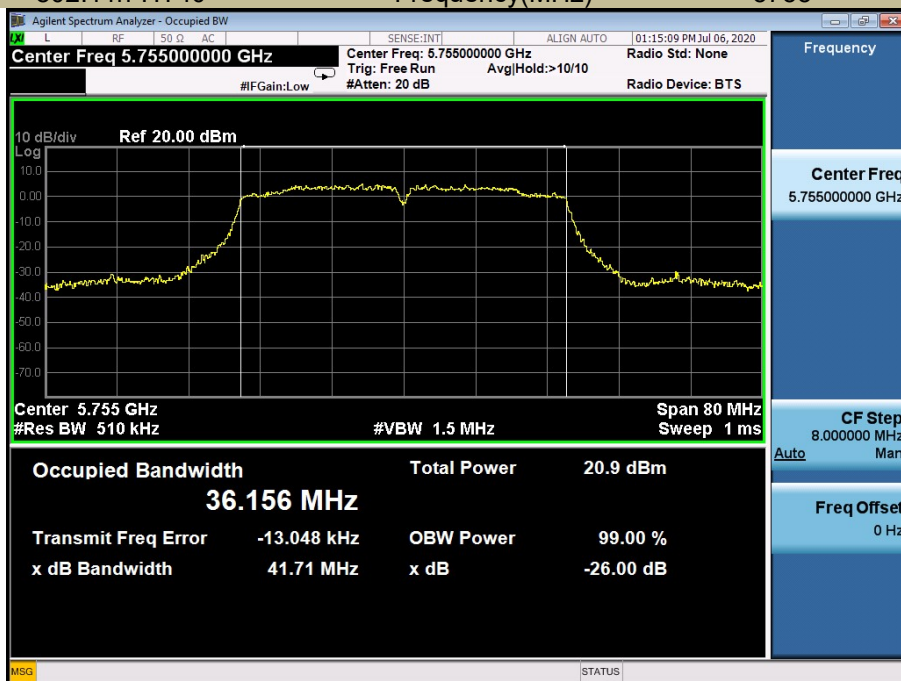
26dB&99% Bandwidth

Test Model 802.11n-HT40

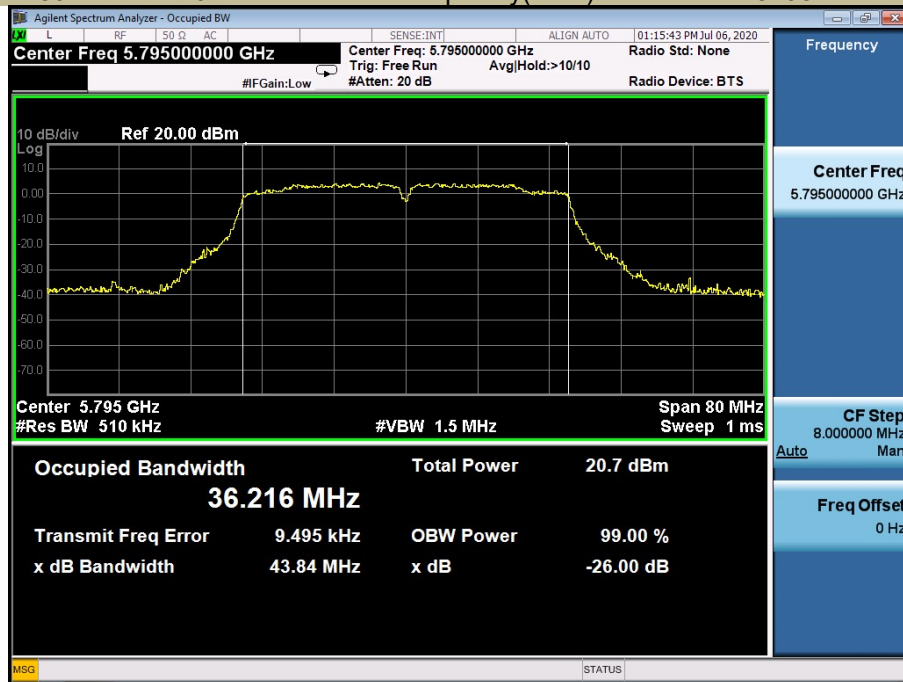
U-NII - 3

Frequency(MHz)

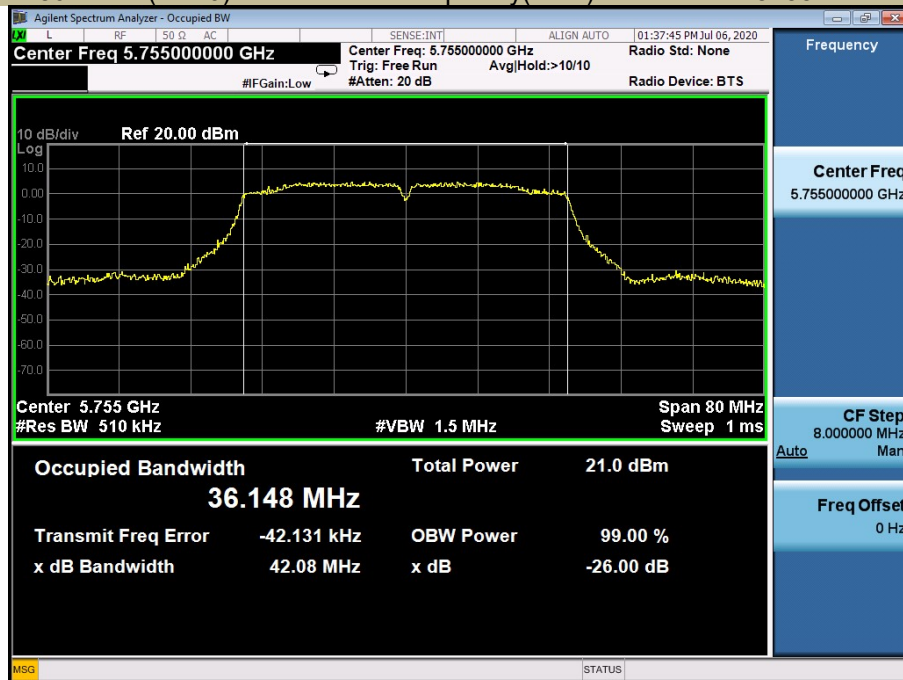
5755



26dB&99% Bandwidth U-NII - 3
Test Model 802.11n-HT40 Frequency(MHz) 5795



26dB&99% Bandwidth U-NII - 3
Test Model 802.11ac(HT40) Frequency(MHz) 5755



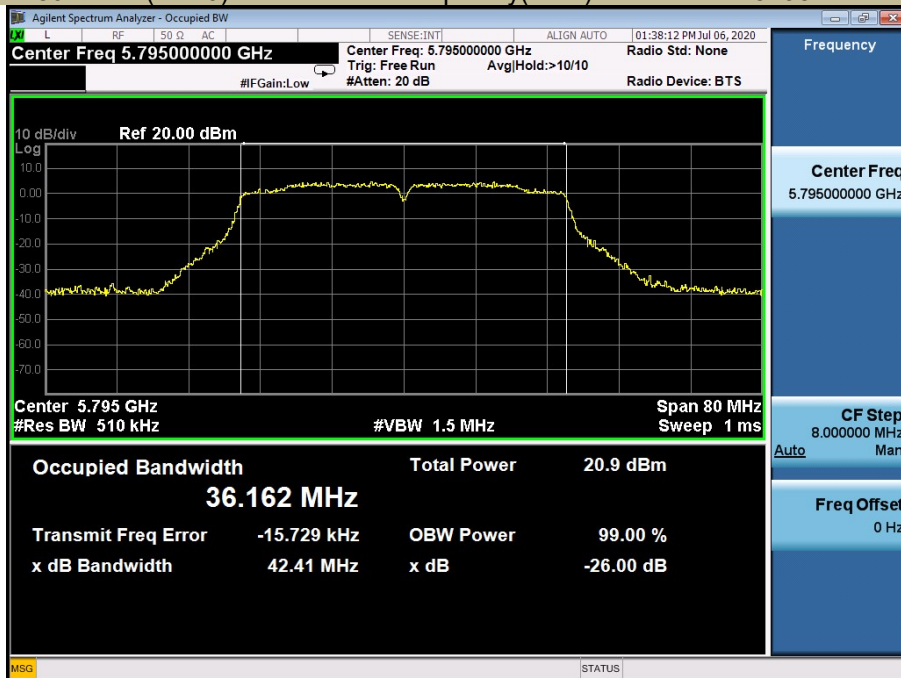
26dB&99% Bandwidth

U-NII - 3

Test Model 802.11ac(HT40)

Frequency(MHz)

5795



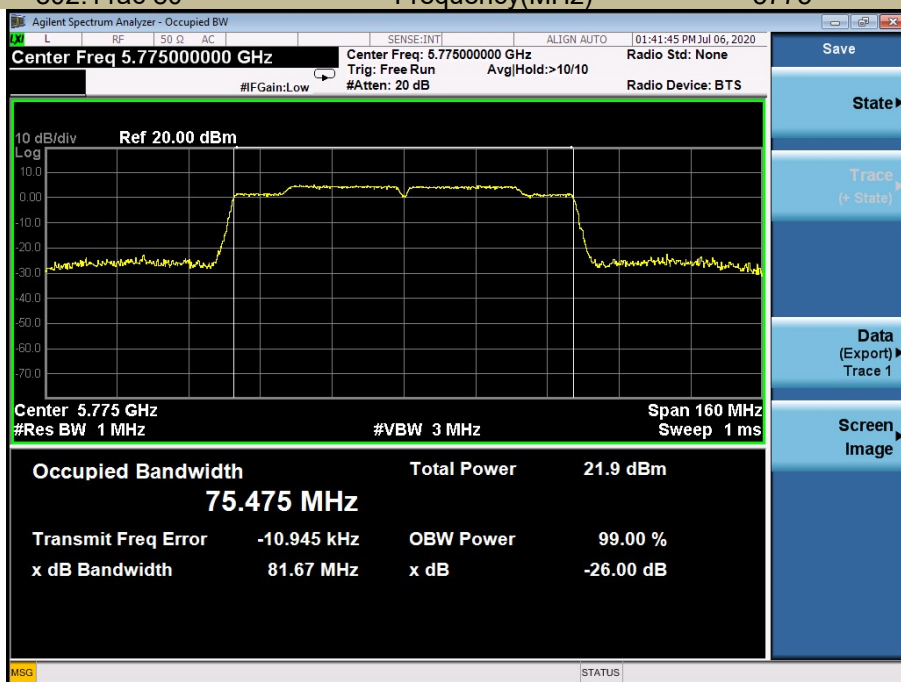
26dB&99% Bandwidth

U-NII - 3

Test Model 802.11ac 80

Frequency(MHz)

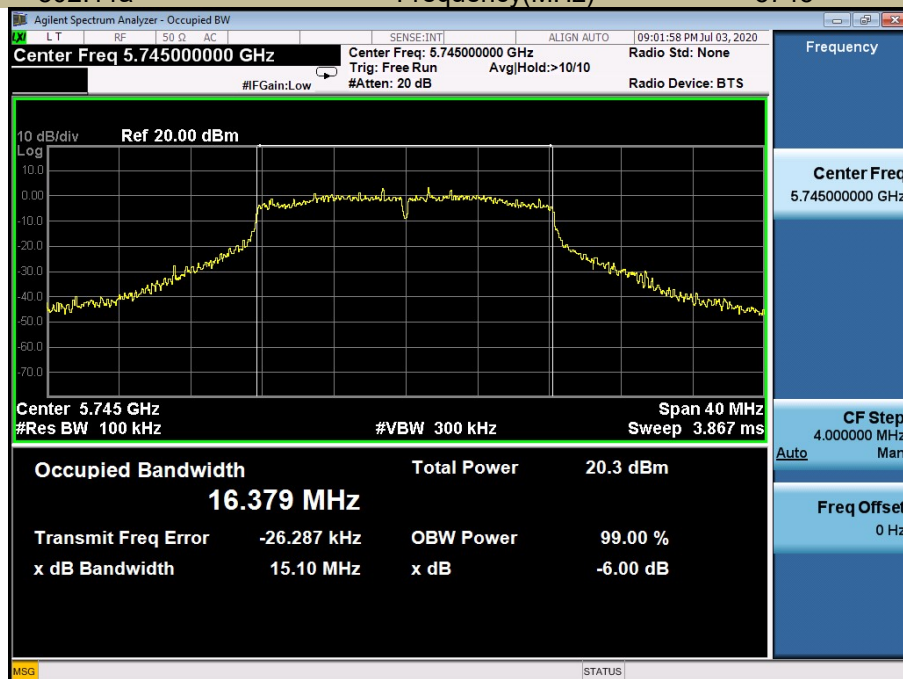
5775



6db Emission Bandwidth
Test Model 802.11a

U-NII - 3
Frequency(MHz)

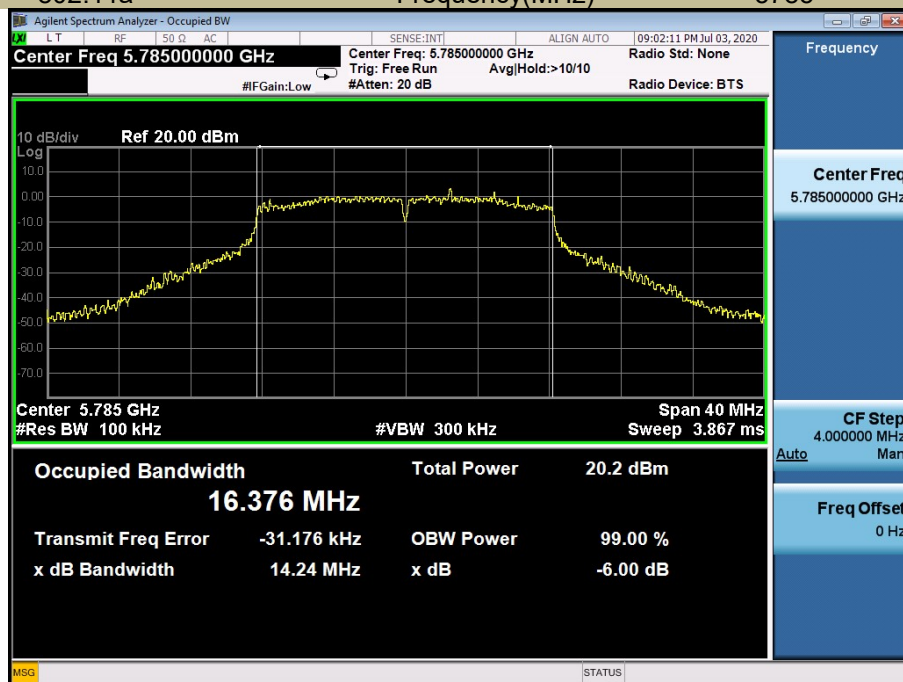
5745



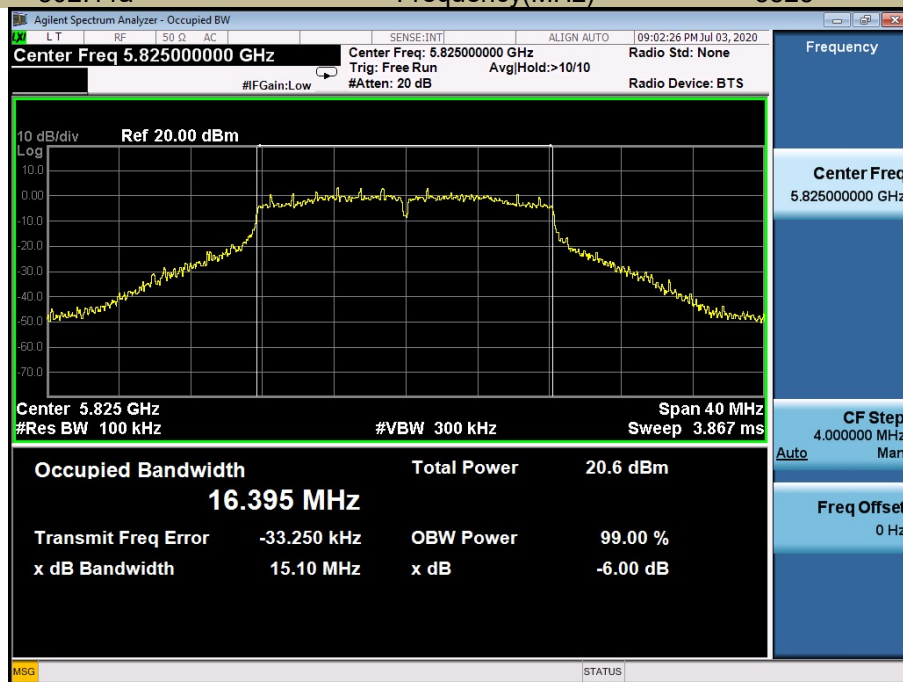
6db Emission Bandwidth
Test Model 802.11a

U-NII - 3
Frequency(MHz)

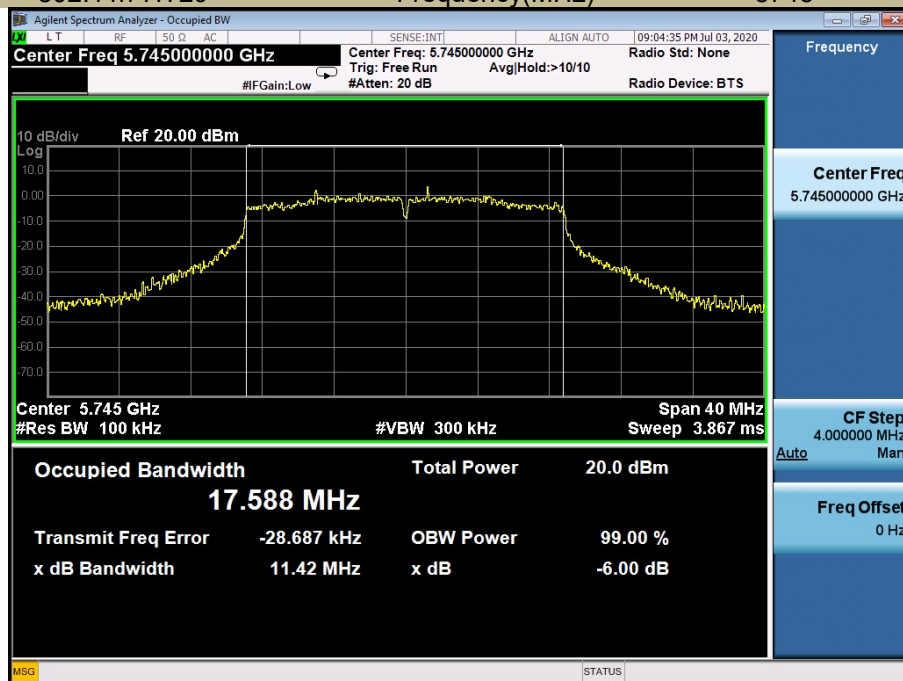
5785



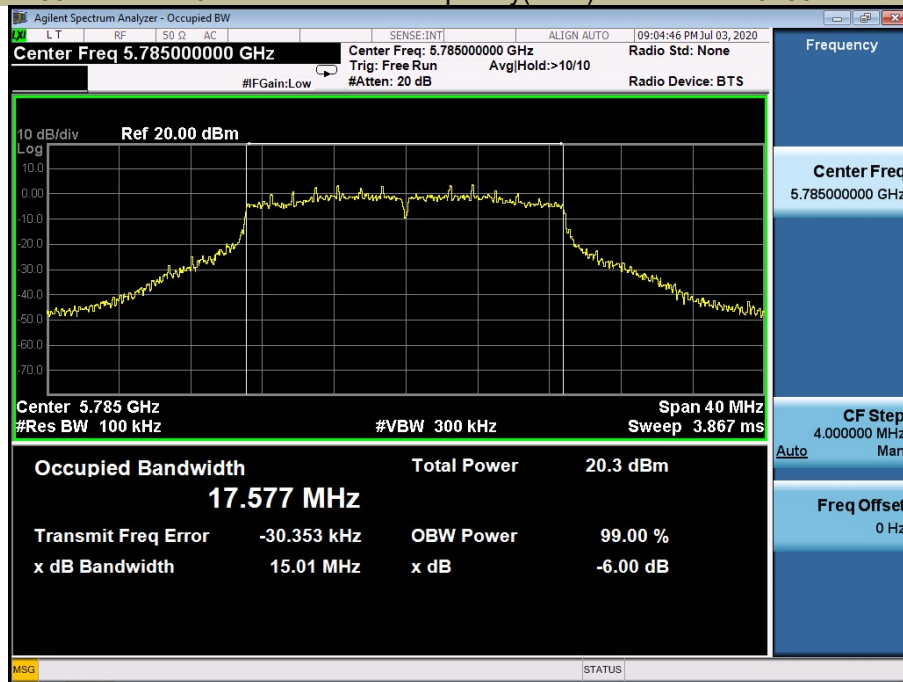
6db Emission Bandwidth U-NII - 3
Test Model 802.11a Frequency(MHz) 5825



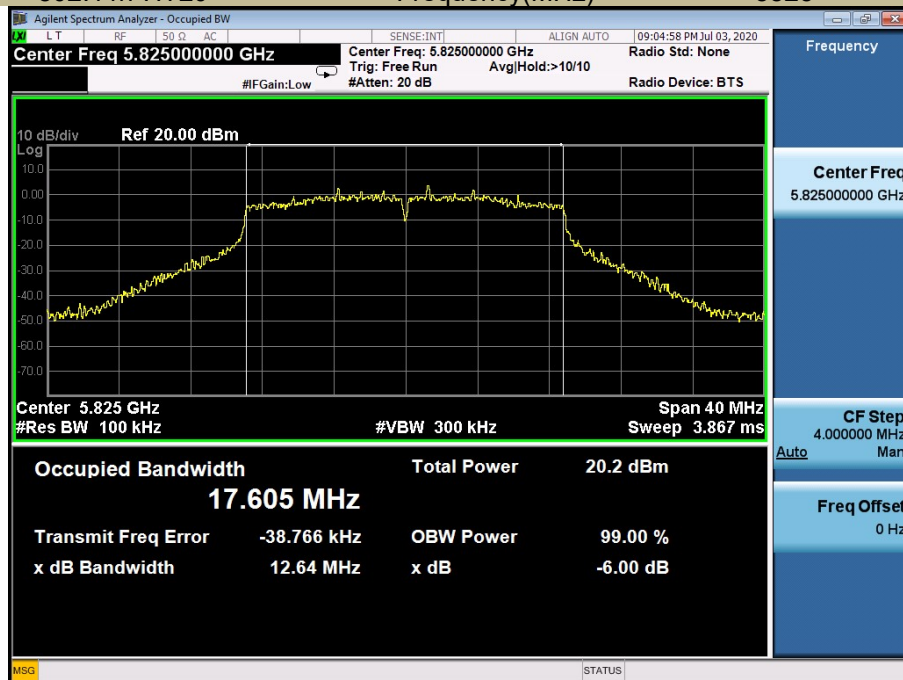
6db Emission Bandwidth U-NII - 3
Test Model 802.11n-HT20 Frequency(MHz) 5745



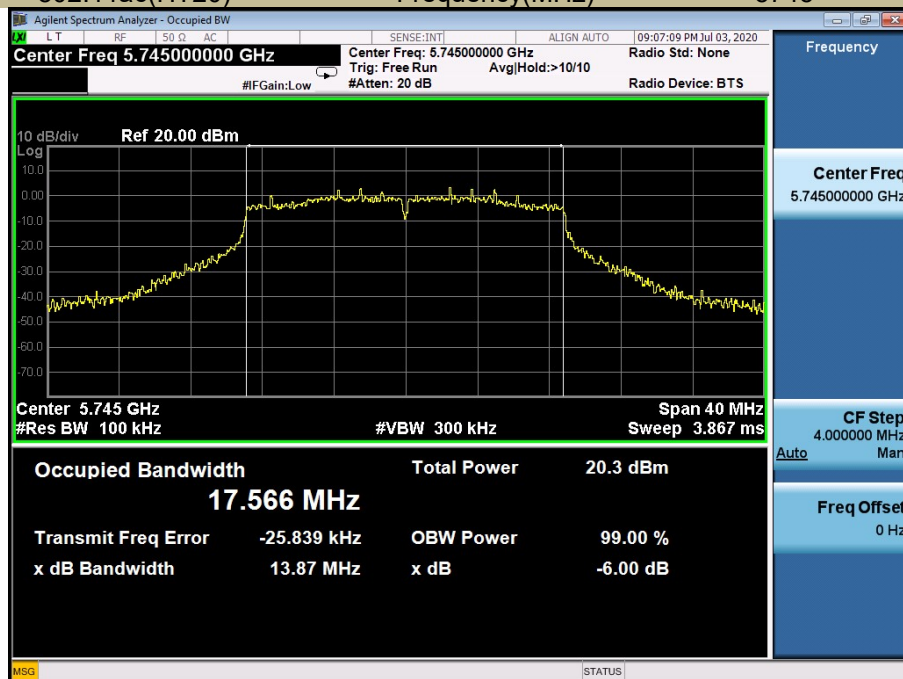
6db Emission Bandwidth U-NII - 3
Test Model 802.11n-HT20 Frequency(MHz) 5785



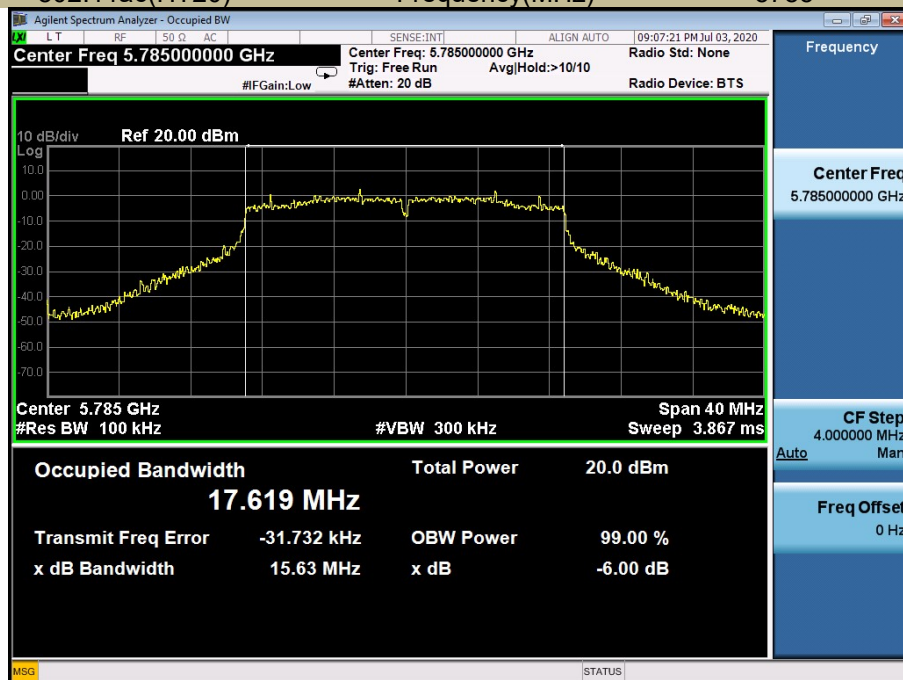
6db Emission Bandwidth U-NII - 3
Test Model 802.11n-HT20 Frequency(MHz) 5825



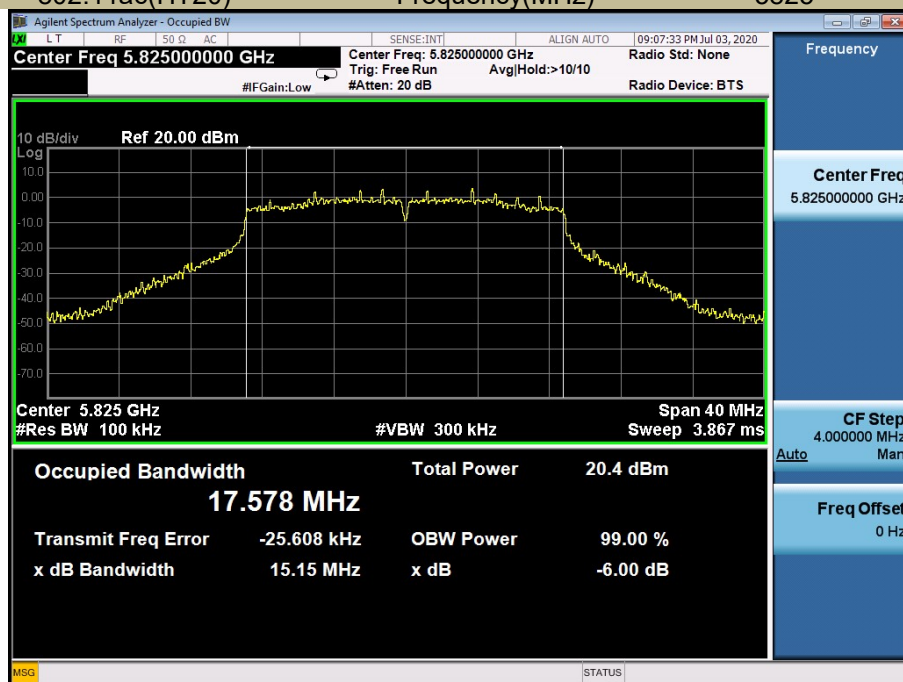
6db Emission Bandwidth U-NII - 3
Test Model 802.11ac(HT20) Frequency(MHz) 5745



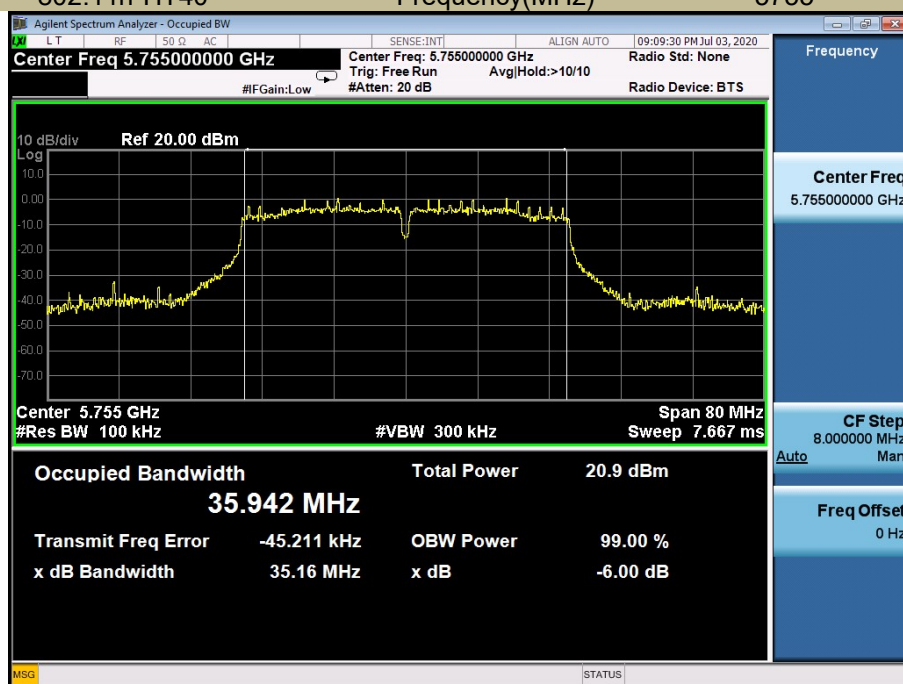
6db Emission Bandwidth U-NII - 3
Test Model 802.11ac(HT20) Frequency(MHz) 5785



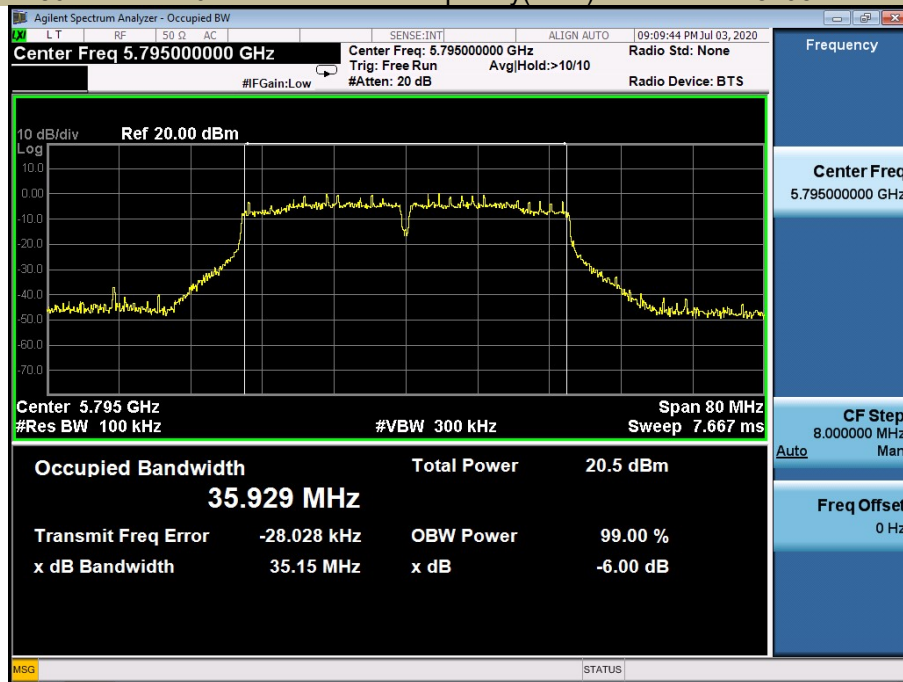
6db Emission Bandwidth U-NII - 3
Test Model 802.11ac(HT20) Frequency(MHz) 5825



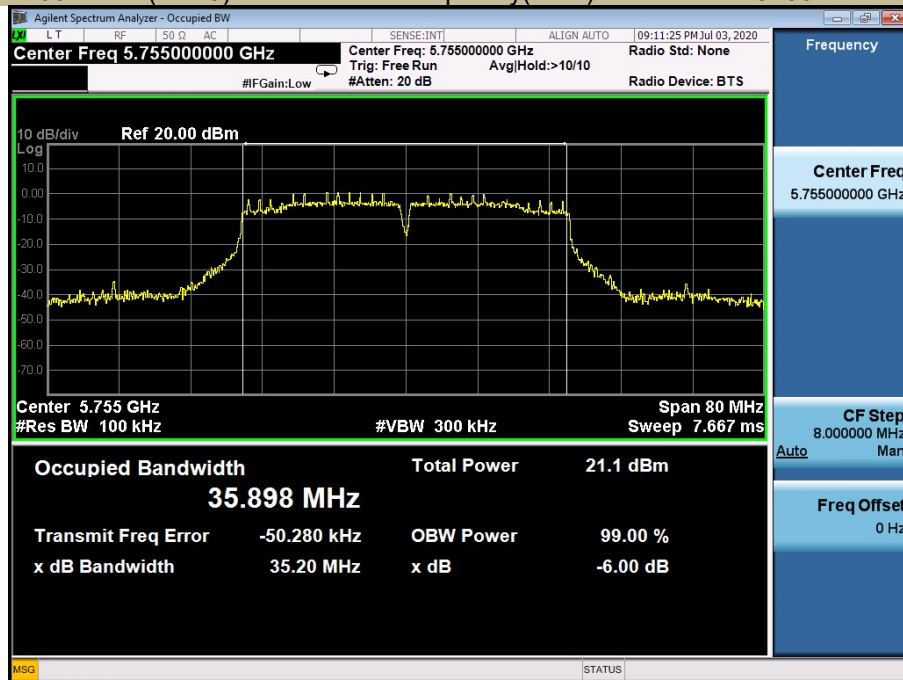
6db Emission Bandwidth U-NII - 3
Test Model 802.11n-HT40 Frequency(MHz) 5755



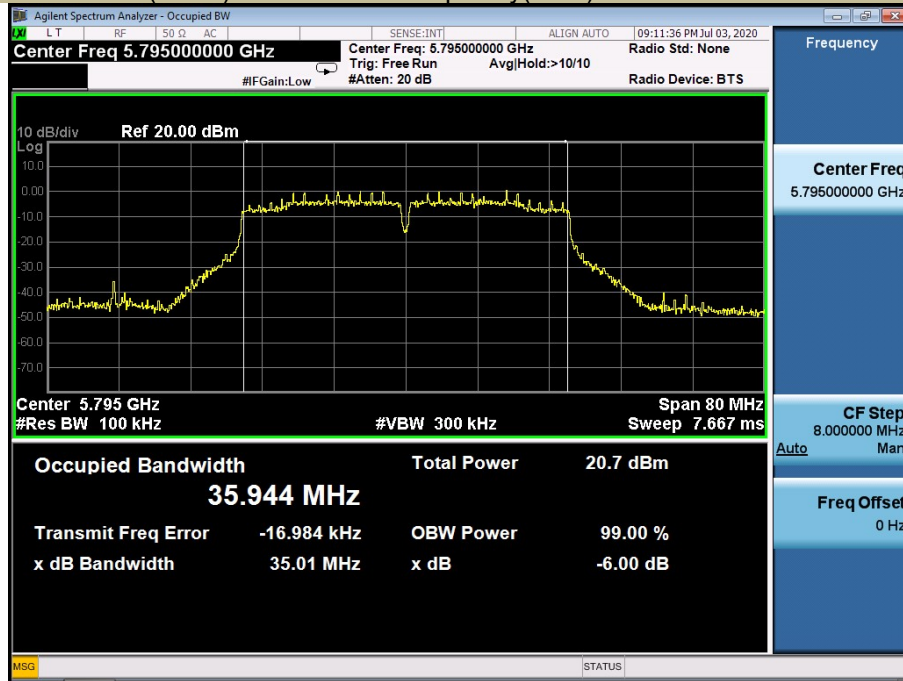
6db Emission Bandwidth U-NII - 3
Test Model 802.11n-HT40 Frequency(MHz) 5795



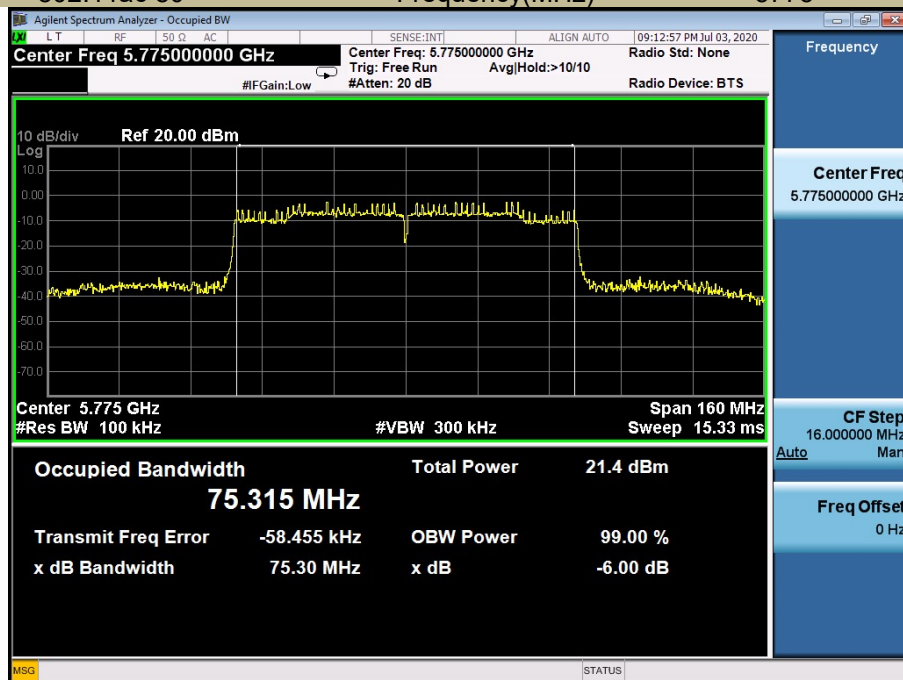
6db Emission Bandwidth U-NII - 3
Test Model 802.11ac(HT40) Frequency(MHz) 5755



6db Emission Bandwidth U-NII - 3
Test Model 802.11ac(HT40) Frequency(MHz) 5795



6db Emission Bandwidth U-NII - 3
Test Model 802.11ac 80 Frequency(MHz) 5775



8.2 MAXIMUM CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(E)

8.2.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(a) (1) (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(a) (2) the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the band 5.725-5.85 GHz

(a) (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.2.4 Test Procedure

The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

- a. The Transmitter output (antenna port) was connected to the power meter.
- b. Turn on the EUT and power meter and then record the power value.
- c. Repeat above procedures on all channels needed to be tested.

8.2.5 Test Results



☒ 802.11a mode

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII - 1	CH36	5180	13.89	24	Pass
	CH40	5200	13.61	24	Pass
	CH48	5240	13.57	24	Pass

☒ 802.11n-HT20

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII - 1	CH36	5180	13.17	24	Pass
	CH40	5200	13.29	24	Pass
	CH48	5240	13.55	24	Pass

☒ 802.11 ac (HT20)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII - 1	CH36	5180	13.22	24	Pass
	CH40	5200	13.27	24	Pass
	CH48	5240	13.47	24	Pass

☒ 802.11n-HT40

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII - 1	CH38	5190	13.00	24	Pass
	CH46	5230	13.24	24	Pass

☒ 802.11 ac (HT40)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII - 1	CH38	5190	13.14	24	Pass
	CH46	5230	12.87	24	Pass

☒ 802.11 ac (HT80)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII - 1	CH42	5210	12.93	24	Pass

☒ 802.11a mode

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII - 2A	CH52	5260	13.68	24	24.5	Pass
	CH56	5280	14.01	24	24.5	Pass

	CH64	5320	13.75	24	24.5	Pass
--	------	------	-------	----	------	------

☒ 802.11n-HT20

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2A	CH52	5260	13.94	24	24.5	Pass
	CH56	5280	13.63	24	24.5	Pass
	CH64	5320	13.48	24	24.6	Pass

☒ 802.11 ac (HT20)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2A	CH52	5260	13.91	24	24.6	Pass
	CH56	5280	13.62	24	24.6	Pass
	CH64	5320	13.95	24	24.7	Pass

☒ 802.11n-HT40

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2A	CH54	5270	13.69	24	27.2	Pass
	CH62	5310	13.70	24	27.2	Pass

☒ 802.11 ac (HT40)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2A	CH54	5270	13.66	24	27.2	Pass
	CH62	5310	13.75	24	27.2	Pass

☒ 802.11 ac (HT80)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2A	CH58	5290	13.47	24	30.1	Pass

☑ 802.11a mode

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2C	CH100	5500	11.96	24	24.9	Pass
	CH116	5600	12.86	24	24.5	Pass
	CH140	5700	13.29	24	24.5	Pass

☑ 802.11n-HT20

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2C	CH100	5500	12.08	24	25.2	Pass
	CH116	5600	12.75	24	24.8	Pass
	CH140	5700	13.15	24	24.7	Pass

☑ 802.11 ac (HT20)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2C	CH100	5500	12.13	24	25.2	Pass
	CH116	5600	12.72	24	24.8	Pass
	CH140	5700	13.14	24	24.6	Pass

☑ 802.11n-HT40

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2C	CH102	5510	12.03	24	27.8	Pass
	CH134	5670	12.84	24	27.2	Pass

☑ 802.11 ac (HT40)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2C	CH102	5510	12.34	24	27.6	Pass
	CH134	5670	12.22	24	27.2	Pass

☑ 802.11 ac (HT80)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Limit (11 dBm + 10 log B)	Verdict
U-NII – 2C	CH106	5530	12.87	24	31.5	Pass

☑ 802.11a mode

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII – 3	CH149	5745	14.26	30	Pass
	CH157	5785	13.42	30	Pass
	CH165	5825	13.82	30	Pass

☑ 802.11n-HT20

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII – 3	CH149	5745	14.13	30	Pass
	CH157	5785	13.67	30	Pass
	CH165	5825	13.70	30	Pass

☑ 802.11 ac (HT20)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII – 3	CH149	5745	14.14	30	Pass
	CH157	5785	13.32	30	Pass
	CH165	5825	13.73	30	Pass

☑ 802.11n-HT40

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII – 3	CH151	5755	13.54	30	Pass
	CH159	5795	13.53	30	Pass

☑ 802.11 ac (HT40)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII – 3	CH151	5755	13.87	30	Pass
	CH159	5795	13.46	30	Pass

☑ 802.11 ac (HT80)

Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
U-NII – 3	CH155	5775	13.53	30	Pass

8.3 MAXIMUM PEAK POWER DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(F)

8.3.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(a) (1) (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(b) (2) the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the band 5.725-5.85 GHz

(a) (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.3.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.3.4 Test Procedure

Methods refer to FCC KDB 789033

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ KHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

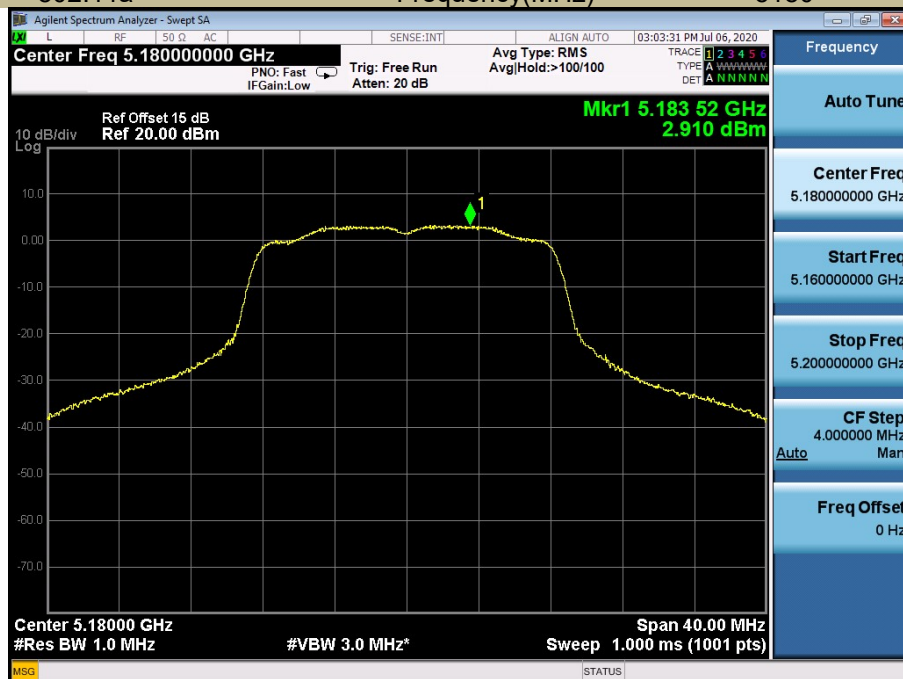
Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHz}$ is available on nearly all spectrum analyzers.

8.3.5 Test Results

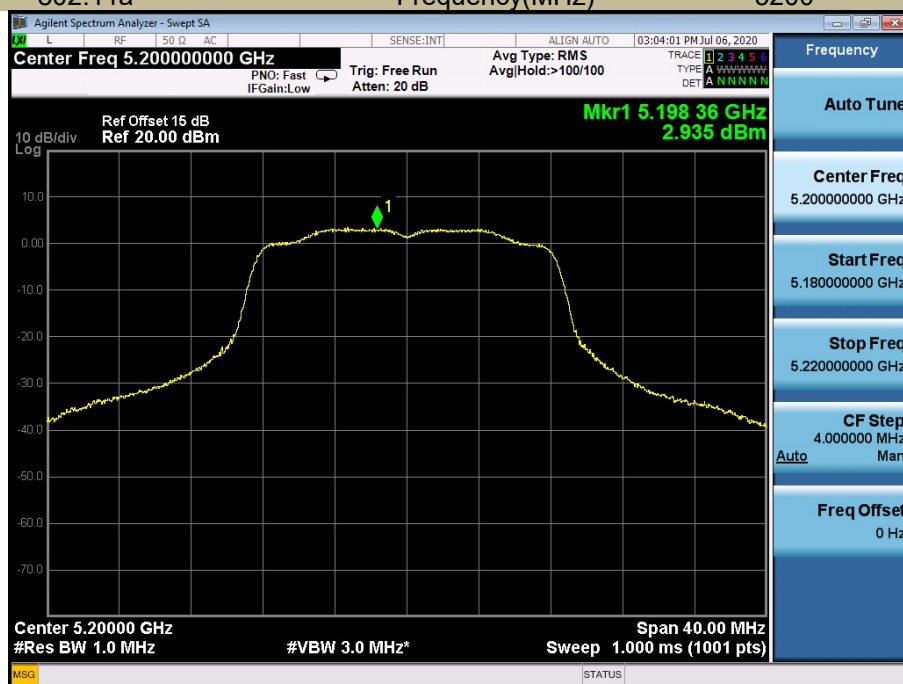
5150-5250MHz

Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	2.91	11
	5200	2.94	11
	5240	3.30	11
802.11n-HT20	5180	1.99	11
	5200	2.84	11
	5240	2.78	11
802.11ac(HT20)	5180	2.45	11
	5200	3.16	11
	5240	3.16	11
802.11n-HT40	5190	-0.73	11
	5230	-0.25	11
802.11ac(HT40)	5190	-0.54	11
	5230	-1.09	11
802.11ac(HT80)	5210	-3.30	11

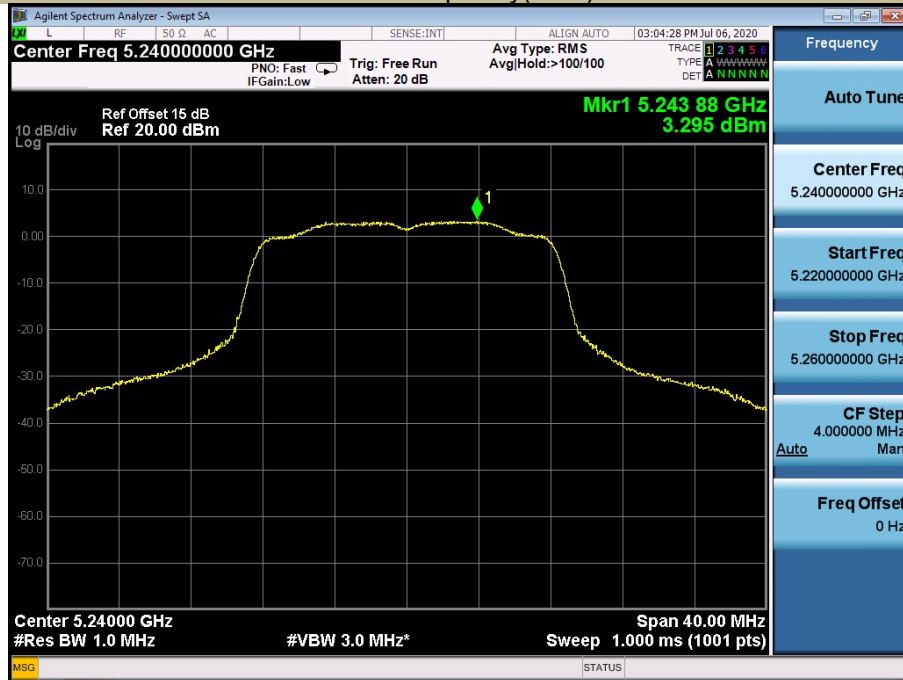
Power Spectral Density U-NII - 1
Test Model 802.11a Frequency(MHz) 5180



Power Spectral Density U-NII - 1
Test Model 802.11a Frequency(MHz) 5200



Power Spectral Density U-NII - 1
Test Model 802.11a Frequency(MHz) 5240



Power Spectral Density U-NII - 1
Test Model 802.11n-HT20 Frequency(MHz) 5180

