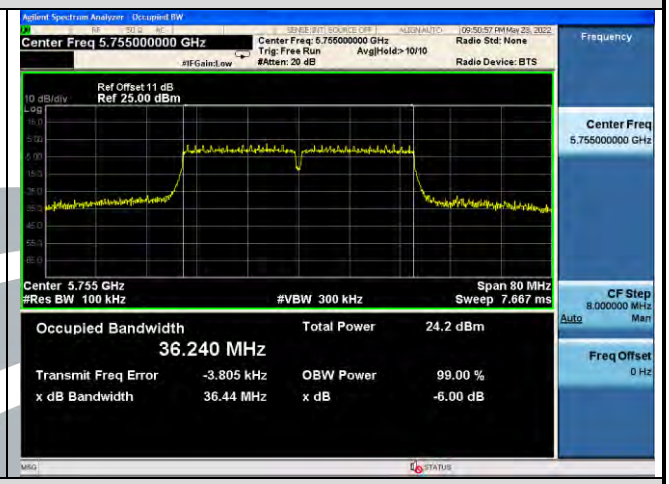
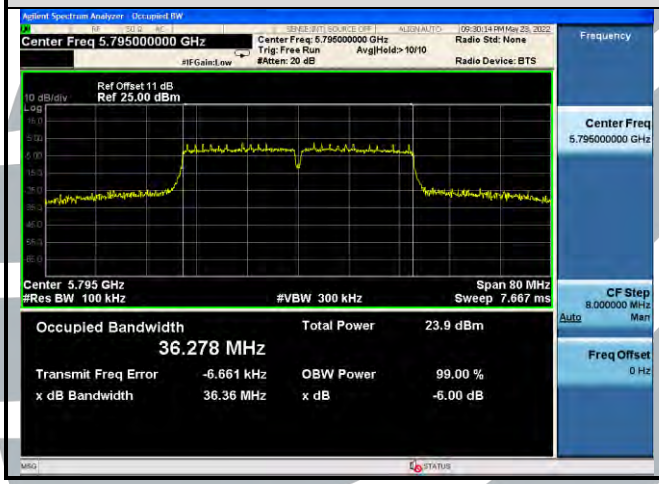
IEEE 802.11ac-VHT40

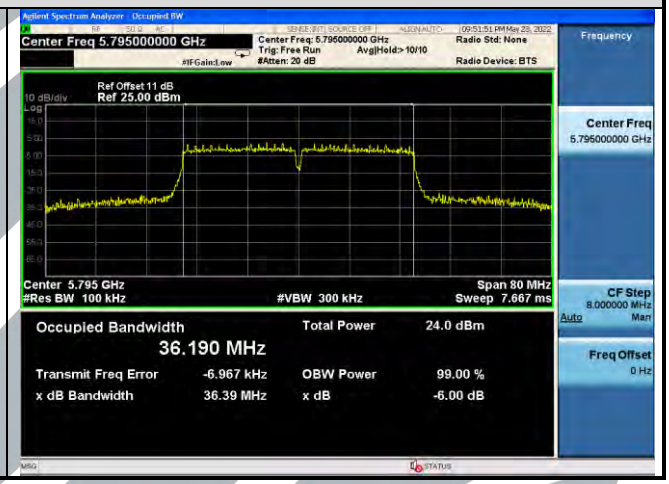
Chain 0	Chain 1

Channel 151



Channel 159

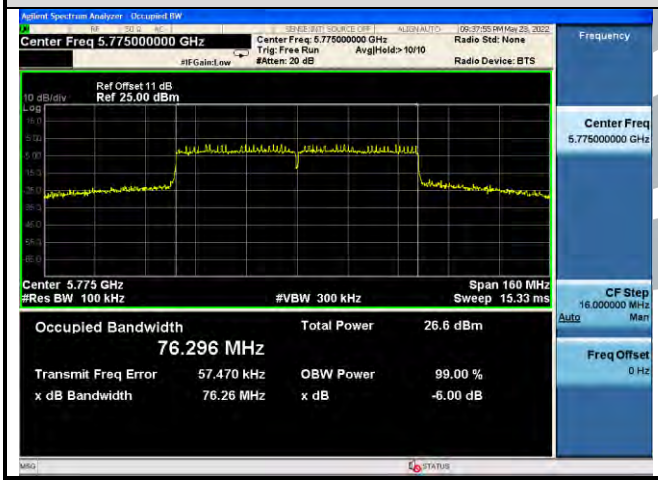


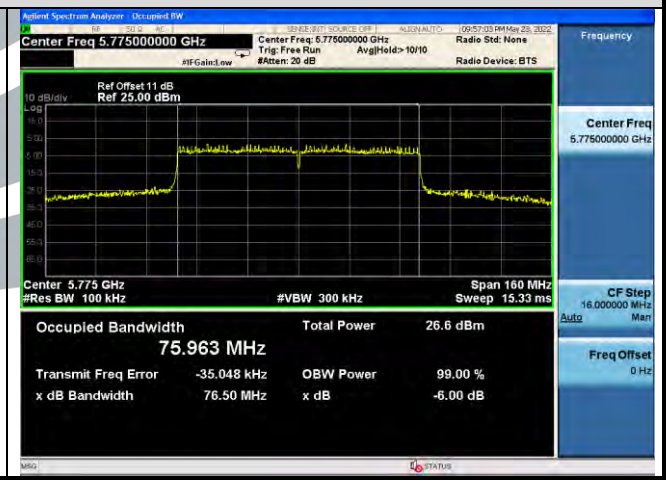


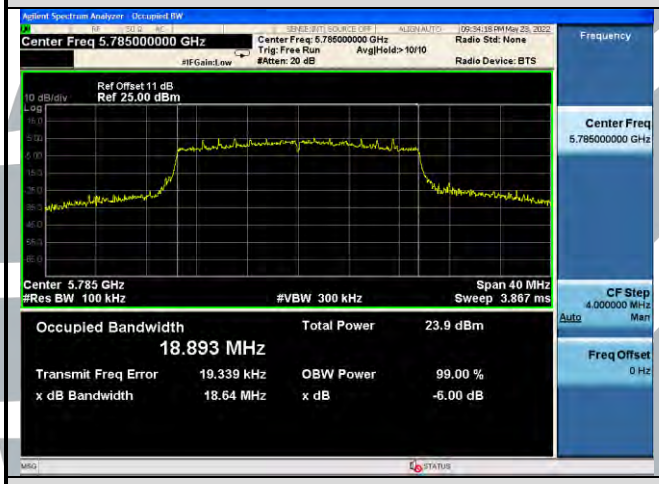
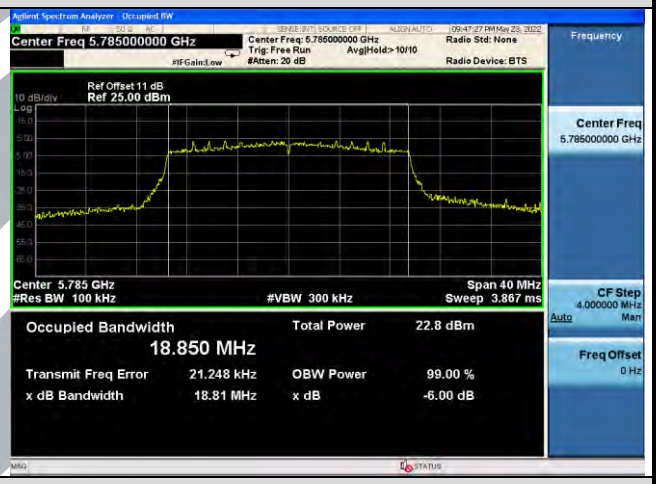
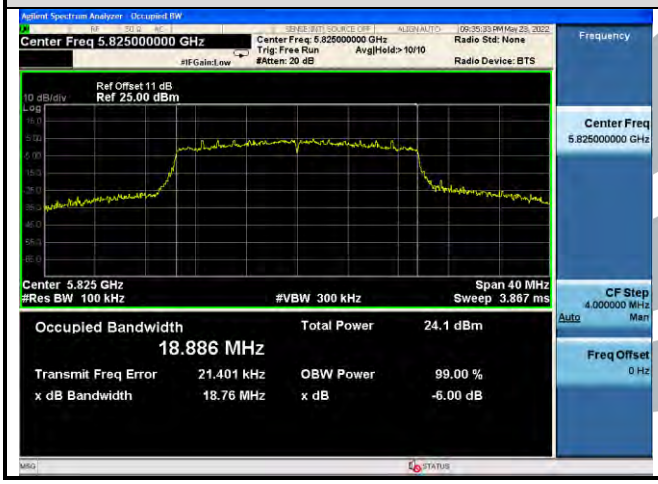
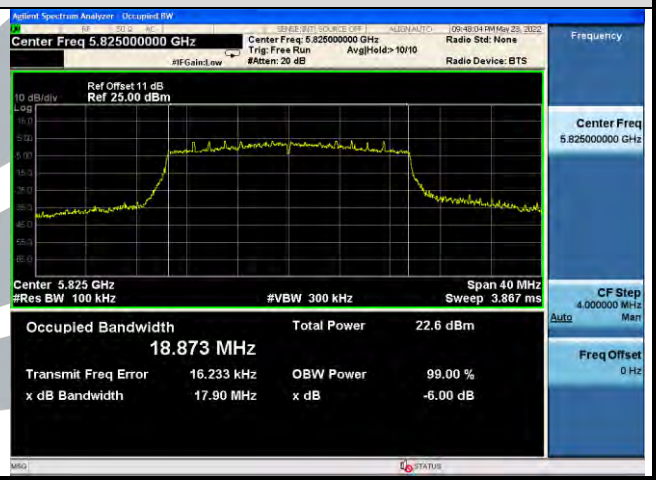
IEEE 802.11ac-VHT80

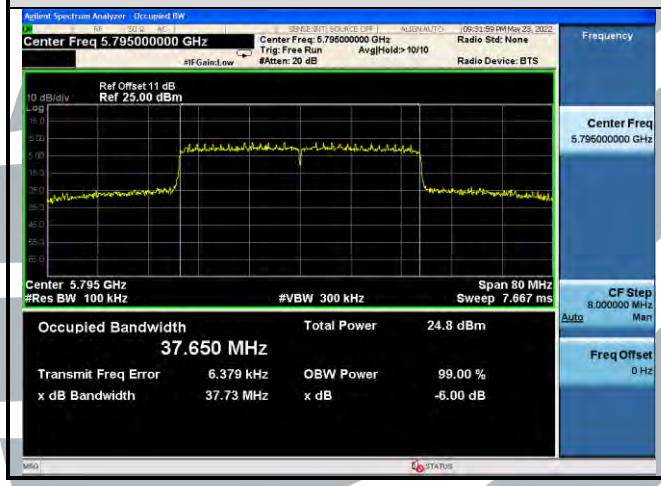
Chain 0	Chain 1

Channel 155



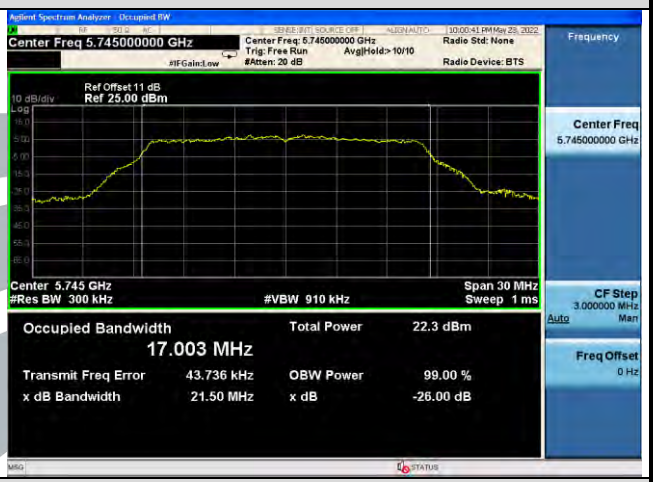
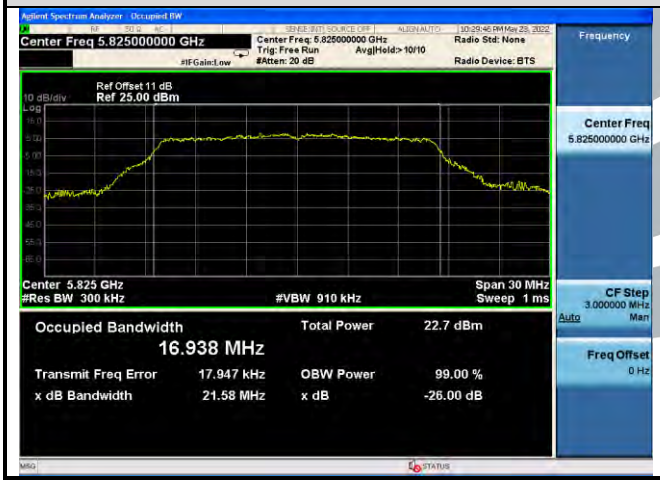
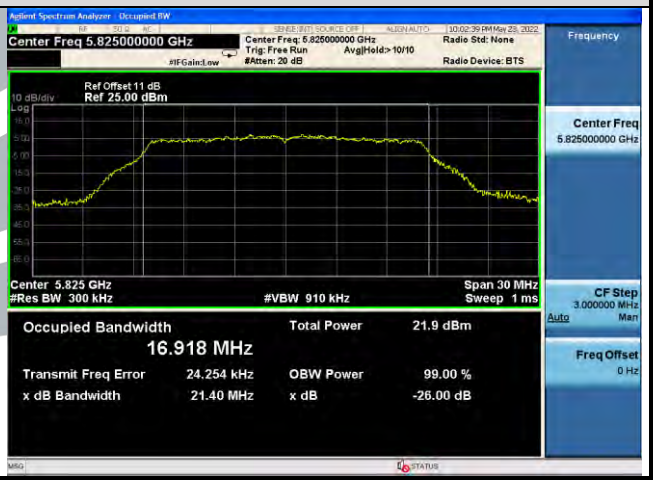


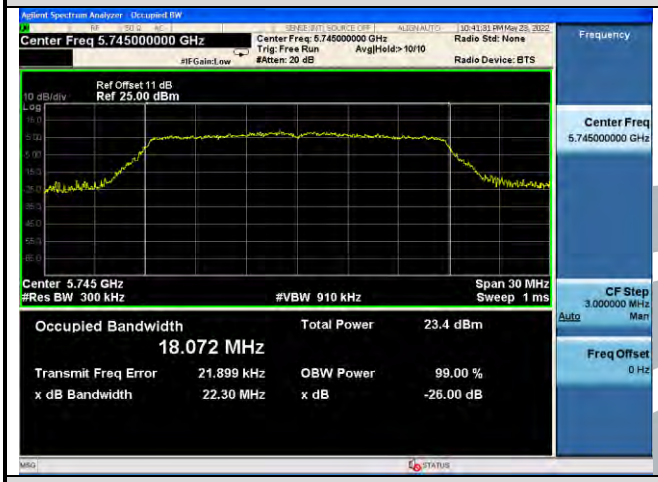
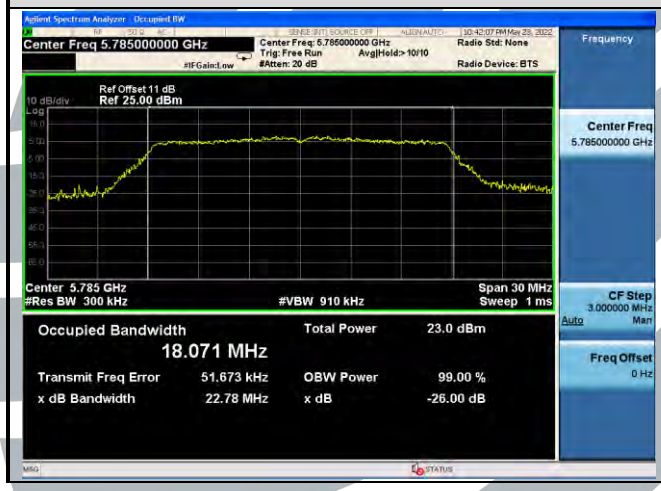
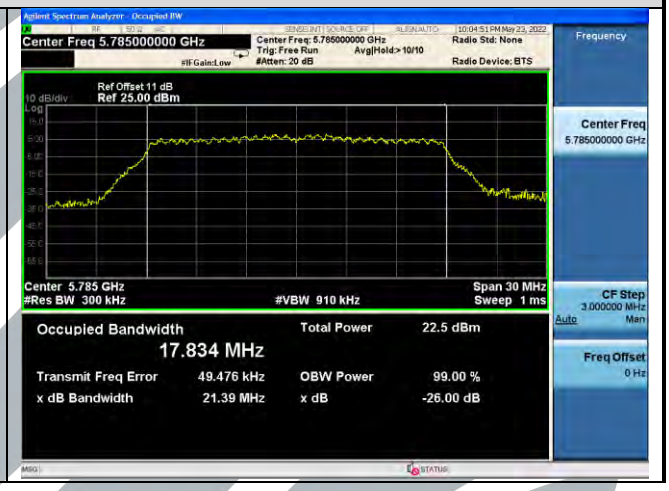
IEEE 802.11ax-HE20	
Chain 0	Chain 1
Channel 149	
Channel 157	
	
Channel 165	
	

IEEE 802.11ax-HE40	
Chain 0	Chain 1
Channel 151	
Channel 159	
	

IEEE 802.11ax-HE80	
Chain 0	Chain 1
Channel 155	

Occupied Bandwidth

IEEE 802.11a	
Chain 0	Chain 1
Channel 149	
	
Channel 157	
Channel 165	
	

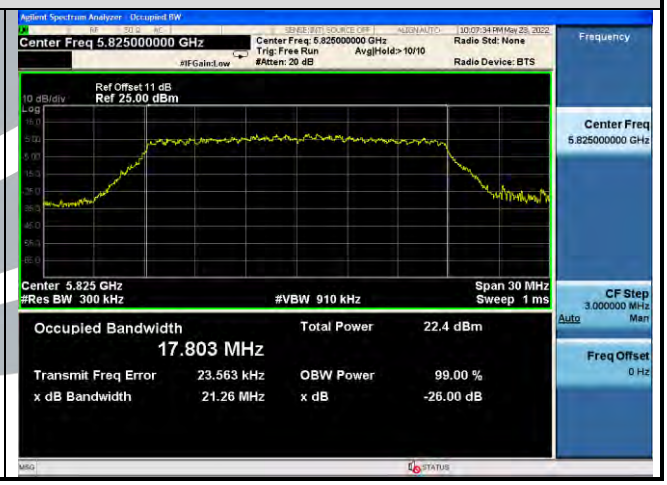
IEEE 802.11n-HT20	
Chain 0	Chain 1
Channel 149	
	
Channel 157	
	

Channel 165

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 11 dB
10 dB/div
Ref 25.00 dBm
Center Freq
5.825000000 GHz
Center 5.825 GHz
#Res BW 300 kHz
#VBW 910 kHz
Span 30 MHz
Sweep 1 ms
CF Step
3.000000 MHz
Auto
Man
Occupied Bandwidth
18.013 MHz
Total Power 22.5 dBm
Transmit Freq Error 36.389 kHz
OBW Power 99.00 %
x dB Bandwidth 25.25 MHz
x dB -26.00 dB
Freq Offset
0 Hz

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 11 dB
10 dB/div
Ref 25.00 dBm
Center Freq
5.825000000 GHz
Center 5.825 GHz
#Res BW 300 kHz
#VBW 910 kHz
Span 30 MHz
Sweep 1 ms
CF Step
3.000000 MHz
Auto
Man
Occupied Bandwidth
17.812 MHz
Total Power 22.3 dBm
Transmit Freq Error 44.887 kHz
OBW Power 99.00 %
x dB Bandwidth 21.43 MHz
x dB -26.00 dB
Freq Offset
0 Hz

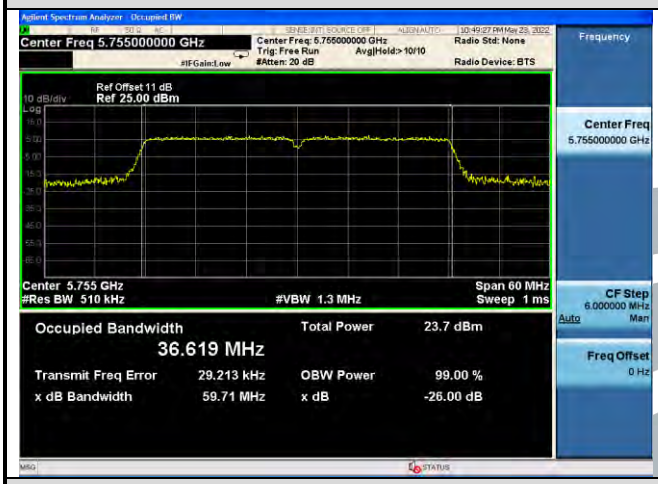
IEEE 802.11n-HT40	
Chain 0	Chain 1
Channel 151	
Channel 159	

IEEE 802.11ac-VHT20	
Chain 0	Chain 1
Channel 149	
Channel 157	
Channel 165	
	

IEEE 802.11ac-VHT40

Chain 0

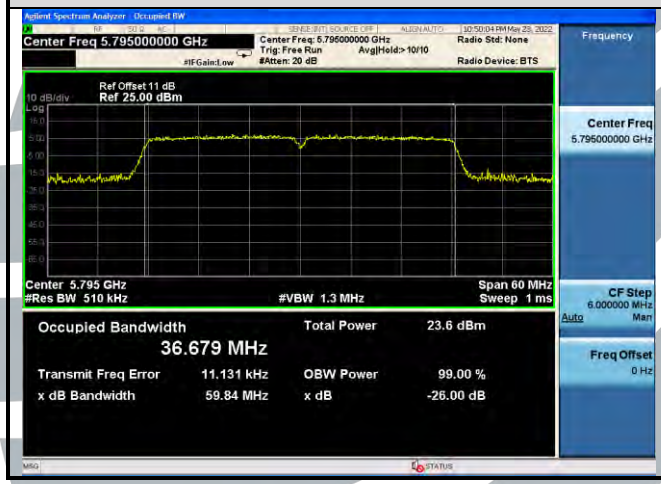
Channel 151



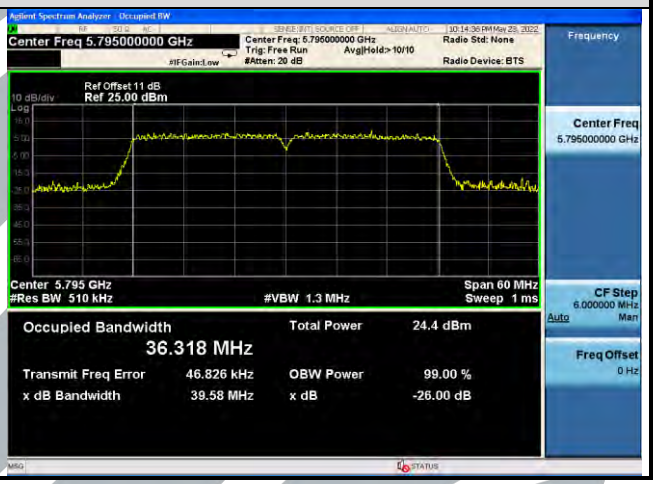
Chain 1

Channel 151

Channel 159



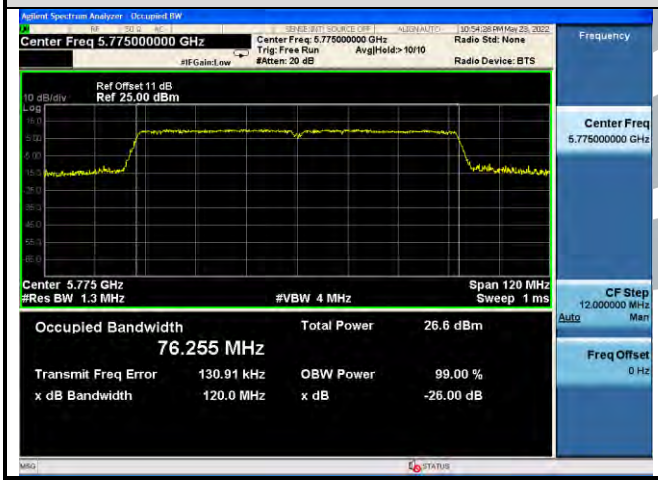
Channel 159



IEEE 802.11ac-VHT80

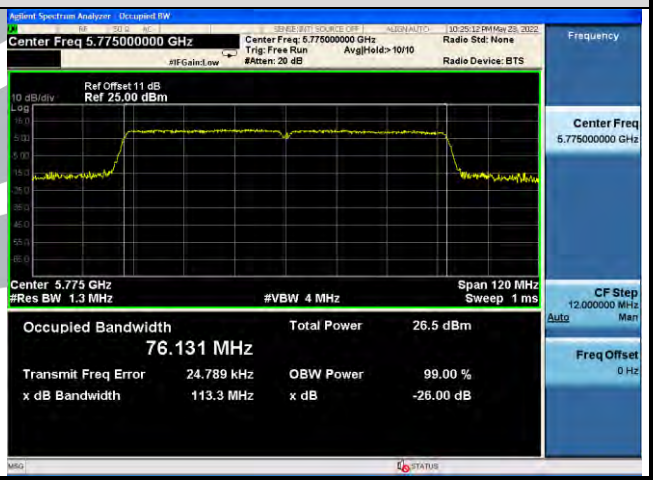
Chain 0

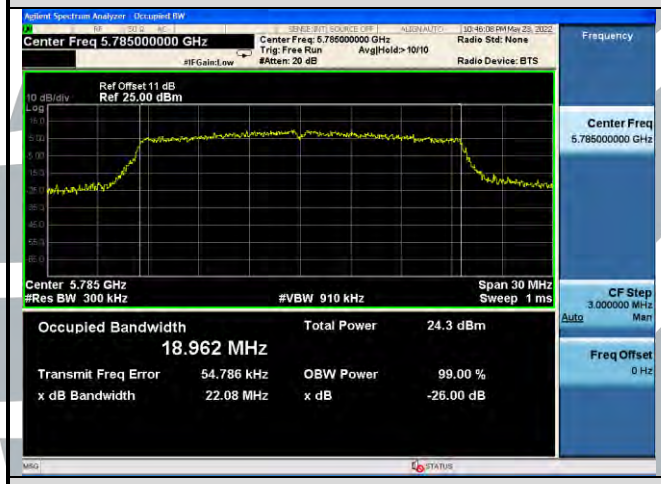
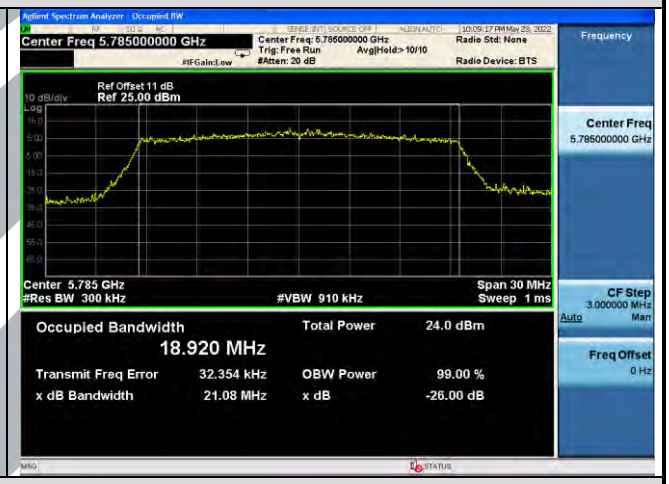
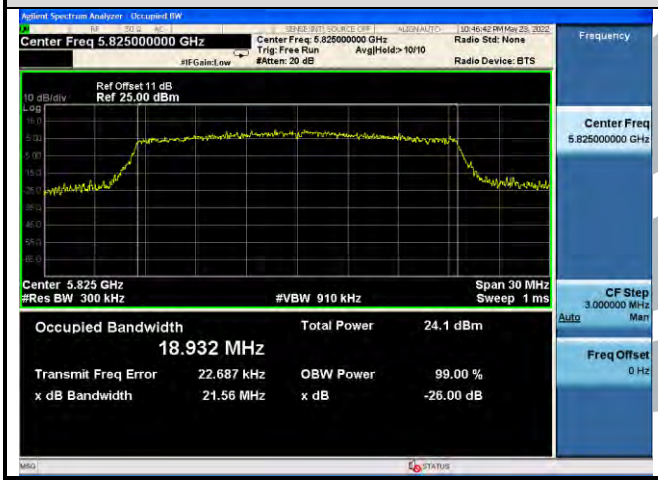
Channel 155

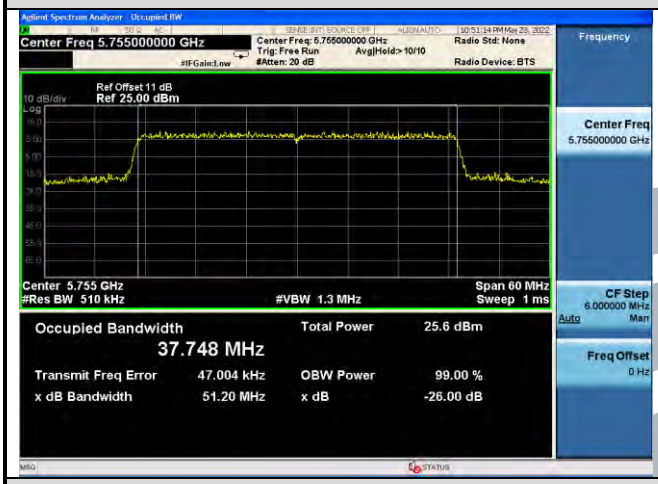
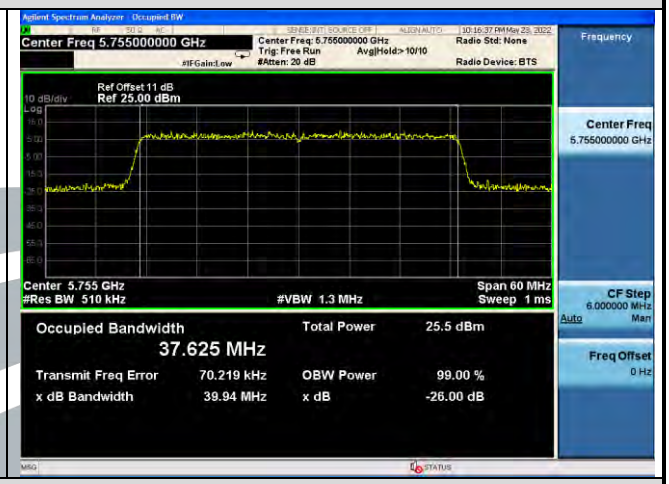
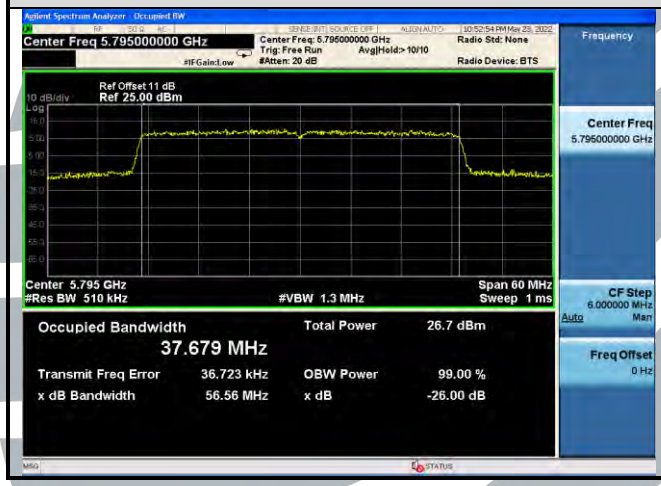


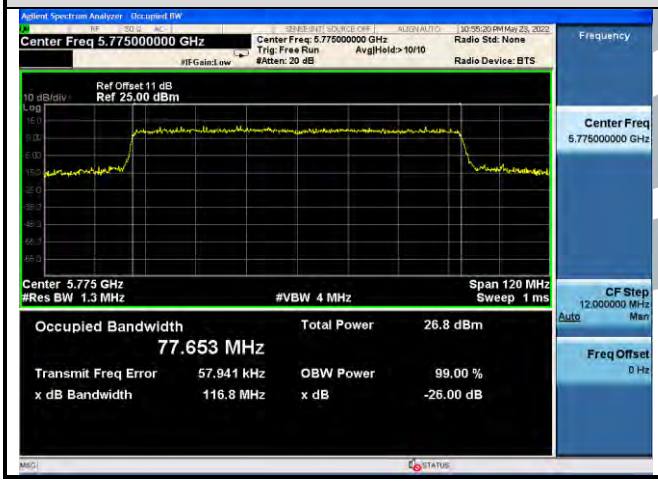
Chain 1

Channel 155



IEEE 802.11ax-HE20	
Chain 0	Chain 1
Channel 149	
Channel 157	
	
Channel 165	
	

IEEE 802.11ax-HE40	
Chain 0	Chain 1
Channel 151	
	
Channel 159	
	

IEEE 802.11ax-HE80	
Chain 0	Chain 1
Channel 155	
	

5.5 MAXIMUM CONDUCTED OUTPUT POWER OR E.I.R.P

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)
RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1

Test Method: KDB 789033 D02 v02r01 Section E.3.a (Method PM)

Limits: FCC 47 CFR Part 15 Subpart E

1. For the band 5.15-5.25 GHz.
   (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. In addition, the maximum power spectral density shall not exceed 17 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. 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).

   (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. In addition, the maximum power spectral density shall not exceed 17 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.

   (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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

   (iv) For 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. 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.

2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 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.

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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. 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.

Limits: RSS-247 Issue 2

1. **Frequency band 5150-5250 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

2. **Frequency band 5250-5350 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Additional requirements
In addition to the above requirements, devices shall comply with the following, where applicable:

a) Outdoor fixed devices with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:

i. -13 dBW/MHz for $0^o \leq \theta < 8^o$

ii. -13 − 0.716 (θ-8) dBW/MHz for $8^o \leq \theta < 40^o$

iii. -35.9 − 1.22 (θ-40) dBW/MHz for $40^o \leq \theta \leq 45^o$

iv. -42 dBW/MHz for $\theta > 45^o$

The measurement procedure defined in Annex A of this document shall be used to verify the compliance to the e.i.r.p. at different elevations.

b) Devices, other than outdoor fixed devices, having an e.i.r.p. greater than 200 mW shall comply with either i. or ii. below:

i. devices shall comply with the e.i.r.p. elevation mask in 6.2.2.3(a); or

ii. devices shall implement a method to permanently reduce their e.i.r.p. via a firmwarefeature in the event that the Department requires it. The test report must demonstratehow the device's power table can be updated to meet this firmware requirement. Themanufacturer shall provide this firmware to update all systems automatically incompliance with the directions received from the Department.

3. **Frequency bands 5470-5600 MHz and 5650-5725 MHz**
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

4. **Frequency band 5725-5850 MHz**
The maximum conducted output power shall not exceed 1 W. The output 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 output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices

operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

Test Procedure:

1. Connected the EUT's antenna port to measure device by 10dB attenuator.
2. Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of Tx on burst.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

Directional gain and the maximum output power limit.

RSS-247 Issue 2

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Peak Power Limits (dBm)
U-NII-1	4.0	5.0	7.52	21.48
U-NII-2A	4.0	5.0	7.52	22.48
U-NII-2C	4.0	5.0	7.52	22.48
U-NII-3	4.0	5.0	7.52	28.48
Unequal antenna gains, with equal transmit powers. Directional gain is to be computed as follows:				
If transmit signals are correlated, then				
Directional gain = 10 log[(10^G1 /20 + 10^G2 /20 + … + 10^GN /20)^2 /NANT] dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels				

FCC 47 CFR Part 15 Subpart E

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Peak Power Limits (dBm)
U-NII-1	4.0	5.0	7.52	22.48
U-NII-2A	4.0	5.0	7.52	22.48
U-NII-2C	4.0	5.0	7.52	22.48
U-NII-3	4.0	5.0	7.52	28.48
Unequal antenna gains, with equal transmit powers. Directional gain is to be computed as follows:				
If transmit signals are correlated, then				
Directional gain = 10 log[(10^G1 /20 + 10^G2 /20 + … + 10^GN /20)^2 /NANT] dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels				

Frequency band 5150-5250 MHz
RSS-247 Issue 2:
For IEEE 802.11 a, the minimum 99% emission bandwidth is 16.816 MHz
10 dBm + $10\log_{10}$ (16.816) = 22.26 dBm < 23 dBm
So the 22.26 dB limit applicable

For IEEE 802.11 n-HT20/ac-VHT20/ax-HE20, the minimum 99% emission bandwidth is 17.848 MHz
10 dBm + $10\log_{10}$ (17.848) = 22.52 dBm > 21.48 dBm
So the 21.48 dB limit applicable

For IEEE 802.11 n-HT40/ac-VHT40/ax-HE40/ac-VHT80/ax-HE80, the minimum 99% emission bandwidth is 36.362 MHz
10 dBm + $10\log_{10}$ (36.362) = 25.61 dBm > 21.48 dBm
So the 21.48 dB limit applicable

Mode	Channel/ Frequency (MHz)	Maximum e.i.r.p (dBm)		Total e.i.r.p MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		SISO				
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	17.96	18.32	N/A	22.26	Pass
	44 (5220)	18.13	18.29	N/A	22.26	Pass
	48 (5240)	18.37	18.39	N/A	22.26	Pass
IEEE 802.11n-HT20	36 (5180)	10.65	10.48	16.64	21.48	Pass
	44 (5220)	10.86	10.76	16.88	21.48	Pass
	48 (5240)	10.99	10.82	16.98	21.48	Pass
IEEE 802.11n-HT40	38 (5190)	14.98	14.82	20.96	21.48	Pass
	46 (5230)	15.12	15.13	21.18	21.48	Pass
IEEE 802.11ac-VHT20	36 (5180)	10.66	10.35	16.58	21.48	Pass
	44 (5220)	10.92	10.24	16.69	21.48	Pass
	48 (5240)	10.78	10.63	16.77	21.48	Pass
IEEE 802.11ac-VHT40	38 (5190)	15.00	14.88	21.01	21.48	Pass
	46 (5230)	15.14	14.85	21.07	21.48	Pass
IEEE 802.11ac-VHT80	42 (5210)	14.18	14.27	20.28	21.48	Pass
IEEE 802.11ax-HE20	36 (5180)	11.05	10.64	16.93	21.48	Pass
	44 (5220)	10.96	11.15	17.10	21.48	Pass
	48 (5240)	11.10	11.20	17.20	21.48	Pass
IEEE 802.11ax-HE40	38 (5190)	15.22	15.21	21.27	21.48	Pass
	46 (5230)	15.46	15.36	21.47	21.48	Pass
IEEE 802.11ax-HE80	42 (5210)	14.22	14.46	20.39	21.48	Pass

Remark:
1. Maximum e.i.r.p = Maximum conducted output power + Antenna Gain
2. Total e.i.r.p (Chain 0+1) = $10*\log[(10^{\text{Chain 0}/10})+(10^{\text{Chain 1}/10})]$ + Directional gain

FCC 47 CFR Part 15 Subpart E:

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm) SISO		Total Power MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	13.96	13.32	N/A	30	Pass
	44 (5220)	14.13	13.29	N/A	30	Pass
	48 (5240)	14.37	13.39	N/A	30	Pass
IEEE 802.11n-HT20	36 (5180)	6.65	5.48	9.12	22.48	Pass
	44 (5220)	6.86	5.76	9.36	22.48	Pass
	48 (5240)	6.99	5.82	9.46	22.48	Pass
IEEE 802.11n-HT40	38 (5190)	10.98	9.82	13.44	22.48	Pass
	46 (5230)	11.12	10.13	13.66	22.48	Pass
IEEE 802.11ac-VHT20	36 (5180)	6.66	5.35	9.06	22.48	Pass
	44 (5220)	6.92	5.24	9.17	22.48	Pass
	48 (5240)	6.78	5.63	9.25	22.48	Pass
IEEE 802.11ac-VHT40	38 (5190)	11.00	9.88	13.49	22.48	Pass
	46 (5230)	11.14	9.85	13.55	22.48	Pass
IEEE 802.11ac-VHT80	42 (5210)	10.18	9.27	12.76	22.48	Pass
IEEE 802.11ax-HE20	36 (5180)	7.05	5.64	9.41	22.48	Pass
	44 (5220)	6.96	6.15	9.58	22.48	Pass
	48 (5240)	7.10	6.20	9.68	22.48	Pass
IEEE 802.11ax-HE40	38 (5190)	11.22	10.21	13.75	22.48	Pass
	46 (5230)	11.46	10.36	13.95	22.48	Pass
IEEE 802.11ax-HE80	42 (5210)	10.22	9.46	12.87	22.48	Pass

Remark:

1. Maximum conducted output power = Conducted output power + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$

Frequency band 5250-5350 MHz
RSS-247 Issue 2:
For IEEE 802.11 a/n-HT20/ac-VHT20/ax-HE20, the minimum 99% emission bandwidth is 16.761 MHz
11 dBm + $10\log_{10}$ (16.761) =23.24 dBm
22.48 dBm < 23.24 dBm < 24dBm
So the 22.48 dB limit applicable

For IEEE 802.11 n-HT40/ac-VHT40/ax-HE40/ac-VHT80/ax-HE80, the minimum 99% emission bandwidth is 36.273 MHz
11 dBm + $10\log_{10}$ (36.273) = 26.60 dBm > 22.48 dBm
So the 22.48 dB limit applicable

FCC 47 CFR Part 15 Subpart E:
For IEEE 802.11 a/n/ac/ax, the minimum 26 dB emission bandwidth is 19.64 MHz
11 dBm + $10\log_{10}$ (20.77) = 24.17 dBm > 22.48 dBm
So the 22.48 dB limit applicable

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm) SISO		Total Power MIMO_ Chain 0+1 (dBm)	Limit (dBm)		Pass / Fail
		Chain 0	Chain 1		FCC Part 15E	RSS-247	
IEEE 802.11a	52 (5260)	13.81	12.88	N/A	24	24	Pass
	60 (5300)	13.97	13.02	N/A	24	24	Pass
	64 (5320)	14.04	13.05	N/A	24	24	Pass
IEEE 802.11n-HT20	52 (5260)	13.48	12.91	16.22	22.48	22.48	Pass
	60 (5300)	13.72	13.07	16.42	22.48	22.48	Pass
	64 (5320)	13.79	13.20	16.52	22.48	22.48	Pass
IEEE 802.11n-HT40	54 (5270)	15.10	13.70	17.46	22.48	22.48	Pass
	62 (5310)	15.23	13.71	17.54	22.48	22.48	Pass
IEEE 802.11ac-VHT20	52 (5260)	13.51	13.01	16.28	22.48	22.48	Pass
	60 (5300)	13.89	13.04	16.50	22.48	22.48	Pass
	64 (5320)	13.86	13.15	16.53	22.48	22.48	Pass
IEEE 802.11ac-VHT40	54 (5270)	14.51	13.80	17.18	22.48	22.48	Pass
	62 (5310)	14.58	13.72	17.18	22.48	22.48	Pass
IEEE 802.11ac-VHT80	58 (5290)	17.24	16.95	20.10	22.48	22.48	Pass
IEEE 802.11ax-HE20	52 (5260)	13.98	13.10	16.57	22.48	22.48	Pass
	60 (5300)	13.94	13.13	16.56	22.48	22.48	Pass
	64 (5320)	13.94	13.33	16.66	22.48	22.48	Pass
IEEE 802.11ax-HE40	54 (5270)	14.72	14.17	17.46	22.48	22.48	Pass
	62 (5310)	14.77	14.02	17.42	22.48	22.48	Pass
IEEE 802.11ax-HE80	58 (5290)	17.32	17.15	20.25	22.48	22.48	Pass

Remark:
1. Maximum conducted output power = Conducted output power + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$

Frequency band 5250-5350 MHz
RSS-247 Issue 2:
For IEEE 802.11 a/n-HT20/ac-VHT20, the minimum 99% emission bandwidth is 16.761MHz
17 dBm + $10\log_{10}$ (16.761) =29.24 dBm
29.24 dBm < 30dBm
So the 29.24 dB limit applicable

For IEEE 802.11 n-HT40/ac-VHT40/ac-VHT80, the minimum 99% emission bandwidth is 35.987 MHz
17 dBm + $10\log_{10}$ (36.273) = 32.60 dBm > 30 dBm
So the 30 dB limit applicable

Mode	Channel/ Frequency (MHz)	Maximum e.i.r.p (dBm)		Total e.i.r.p MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		SISO				
		Chain 0	Chain 1		RSS-247	
IEEE 802.11a	52 (5260)	17.81	17.88	N/A	30	Pass
	60 (5300)	17.97	18.02	N/A	30	Pass
	64 (5320)	18.04	18.05	N/A	30	Pass
IEEE 802.11n-HT20	52 (5260)	17.48	17.91	23.74	29.24	Pass
	60 (5300)	17.72	18.07	23.94	29.24	Pass
	64 (5320)	17.79	18.20	24.04	29.24	Pass
IEEE 802.11n-HT40	54 (5270)	19.10	18.70	24.98	30	Pass
	62 (5310)	19.23	18.71	25.06	30	Pass
IEEE 802.11ac-VHT20	52 (5260)	17.51	18.01	23.80	29.24	Pass
	60 (5300)	17.89	18.04	24.02	29.24	Pass
	64 (5320)	17.86	18.15	24.05	29.24	Pass
IEEE 802.11ac-VHT40	54 (5270)	18.51	18.80	24.70	30	Pass
	62 (5310)	18.58	18.72	24.70	30	Pass
IEEE 802.11ac-VHT80	58 (5290)	21.24	21.95	27.62	30	Pass
IEEE 802.11ax-HE20	52 (5260)	17.98	18.10	24.09	29.24	Pass
	60 (5300)	17.94	18.13	24.08	29.24	Pass
	64 (5320)	17.94	18.33	24.18	29.24	Pass
IEEE 802.11ax-HE40	54 (5270)	18.72	19.17	24.98	30	Pass
	62 (5310)	18.77	19.02	24.94	30	Pass
IEEE 802.11ax-HE80	58 (5290)	21.32	22.15	27.77	30	Pass

Remark:
1. Maximum e.i.r.p = Maximum conducted output power + Antenna Gain
2. Total e.i.r.p (Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$ + Directional gain
3. The maximum EIRP is calculated from max output power and antenna gain, the antenna gain provided by the customer, and the customer takes all the responsibilities for the accuracy of antenna gain.

Frequency bands 5470-5725 MHz (RSS-247 Issue 2 Not including 5600-5650 MHz)
RSS-247 Issue 2:
For IEEE 802.11 a/n-HT20/ac-VHT20/ax-HE20, the minimum 99% emission bandwidth is 16.809 MHz
11 dBm + $10\log_{10}$ (16.809) = 23.26 dBm
22.48< 23.26 dBm < 24 dBm
So the 22.48 dB limit applicable

For IEEE 802.11 n-HT40/ac-VHT40/ax-HE40/ac-VHT80/ax-HE80, the minimum 99% emission bandwidth is 36.284 MHz
11 dBm + $10\log_{10}$ (36.284) = 26.60 dBm > 22.48 dBm
So the 22.48 dB limit applicable

FCC 47 CFR Part 15 Subpart E:
For IEEE 802.11 a/n/ac/ax, the minimum 26 dB emission bandwidth is 21.01 MHz
11 dBm + $10\log_{10}$ (21.01) = 24.22 dBm < 22.48 dBm
So the 22.48 dB limit applicable

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm) SISO		Total Power MIMO_ Chain 0+1 (dBm)	Limit (dBm)		Pass / Fail
		Chain 0	Chain 1		FCC Part 15E	RSS-247	
IEEE 802.11a	100 (5500)	13.84	12.85	N/A	24	24	Pass
	116 (5580)	13.86	12.56	N/A	24	24	Pass
	140 (5700)	14.03	13.09	N/A	24	24	Pass
IEEE 802.11n-HT20	100 (5500)	13.79	12.72	16.30	22.48	22.48	Pass
	116 (5580)	13.94	12.80	16.42	22.48	22.48	Pass
	140 (5700)	14.05	13.09	16.61	22.48	22.48	Pass
IEEE 802.11n-HT40	102 (5510)	15.07	13.63	17.42	22.48	22.48	Pass
	110 (5550)	14.78	13.61	17.24	22.48	22.48	Pass
	134 (5670)	15.09	13.72	17.47	22.48	22.48	Pass
IEEE 802.11ac-VHT20	100 (5500)	13.91	12.76	16.38	22.48	22.48	Pass
	116 (5580)	13.79	12.74	16.31	22.48	22.48	Pass
	140 (5700)	14.00	13.21	16.63	22.48	22.48	Pass
IEEE 802.11ac-VHT40	102 (5510)	14.39	13.66	17.05	22.48	22.48	Pass
	110 (5550)	14.31	13.58	16.97	22.48	22.48	Pass
	134 (5670)	14.49	13.80	17.17	22.48	22.48	Pass
IEEE 802.11ac-VHT80	106 (5530)	16.44	15.57	19.03	22.48	22.48	Pass
IEEE 802.11ax-HE20	100 (5500)	13.76	12.98	16.40	22.48	22.48	Pass
	116 (5580)	13.78	12.87	16.36	22.48	22.48	Pass
	140 (5700)	14.06	13.29	16.70	22.48	22.48	Pass
IEEE 802.11ax-HE40	102 (5510)	14.31	13.90	17.12	22.48	22.48	Pass
	110 (5550)	14.48	13.94	17.22	22.48	22.48	Pass
	134 (5670)	14.62	14.15	17.40	22.48	22.48	Pass
IEEE 802.11ax-HE80	106 (5530)	16.50	15.83	19.19	22.48	22.48	Pass

Remark:
1. Maximum conducted output power = Conducted output power + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{\text{Chain 0}/10})+(10^{\text{Chain 1}/10})]$

Frequency bands 5470-5725 MHz (RSS-247 Issue 2 Not including 5600-5650 MHz)
RSS-247 Issue 2:
For IEEE 802.11 a/n-HT20/ac-VHT20, the minimum 99% emission bandwidth is 16.809 MHz
17 dBm + $10\log_{10}$ (16.809) = 29.26 dBm
29.26 dBm < 30 dBm
So the 29.26 dB limit applicable

For IEEE 802.11 n-HT40/ac-VHT40 /ac-VHT80, the minimum 99% emission bandwidth is 36.284 MHz
17 dBm + $10\log_{10}$ (36.284) = 32.60 dBm > 30 dBm
So the 30 dB limit applicable

Mode	Channel/ Frequency (MHz)	Maximum e.i.r.p (dBm) SISO		Total e.i.r.p MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1		RSS-247	
IEEE 802.11a	100 (5500)	17.84	17.85	N/A	30	Pass
	116 (5580)	17.86	17.56	N/A	30	Pass
	140 (5700)	18.03	18.09	N/A	30	Pass
IEEE 802.11n-HT20	100 (5500)	17.79	17.72	23.82	29.26	Pass
	116 (5580)	17.94	17.80	23.94	29.26	Pass
	140 (5700)	18.05	18.09	24.13	29.26	Pass
IEEE 802.11n-HT40	102 (5510)	19.07	18.63	24.94	30	Pass
	110 (5550)	18.78	18.61	24.76	30	Pass
	134 (5670)	19.09	18.72	24.99	30	Pass
IEEE 802.11ac-VHT20	100 (5500)	17.91	17.76	23.90	29.26	Pass
	116 (5580)	17.79	17.74	23.83	29.26	Pass
	140 (5700)	18.00	18.21	24.15	29.26	Pass
IEEE 802.11ac-VHT40	102 (5510)	18.39	18.66	24.57	30	Pass
	110 (5550)	18.31	18.58	24.49	30	Pass
	134 (5670)	18.49	18.80	24.69	30	Pass
IEEE 802.11ac-VHT80	106 (5530)	20.44	20.57	26.55	30	Pass
IEEE 802.11ax-HE20	100 (5500)	17.76	17.98	23.92	29.26	Pass
	116 (5580)	17.78	17.87	23.88	29.26	Pass
	140 (5700)	18.06	18.29	24.22	29.26	Pass
IEEE 802.11ax-HE40	102 (5510)	18.31	18.90	24.64	30	Pass
	110 (5550)	18.48	18.94	24.74	30	Pass
	134 (5670)	18.62	19.15	24.92	30	Pass
IEEE 802.11ax-HE80	106 (5530)	20.50	20.83	26.71	30	Pass

Remark:
1. Maximum e.i.r.p = Maximum conducted output power + Antenna Gain
2. Total e.i.r.p (Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$ + Directional gain
3. The maximum EIRP is calculated from max output power and antenna gain, the antenna gain provided by the customer, and the customer takes all the responsibilities for the accuracy of antenna gain.

Frequency band 5725-5850 MHz

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm) SISO		Total Power MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	149 (5745)	14.02	12.46	N/A	30	Pass
	157 (5785)	13.77	12.59	N/A	30	Pass
	165 (5825)	13.60	12.82	N/A	30	Pass
IEEE 802.11n-HT20	149 (5745)	13.88	12.37	16.20	28.48	Pass
	157 (5785)	13.78	12.65	16.26	28.48	Pass
	165 (5825)	13.55	12.98	16.29	28.48	Pass
IEEE 802.11n-HT40	151 (5755)	15.01	13.42	17.29	28.48	Pass
	159 (5795)	14.99	13.74	17.42	28.48	Pass
IEEE 802.11ac-VHT20	149 (5745)	13.94	12.39	16.24	28.48	Pass
	157 (5785)	13.75	12.70	16.27	28.48	Pass
	165 (5825)	13.56	12.91	16.26	28.48	Pass
IEEE 802.11ac-VHT40	151 (5755)	14.35	13.54	16.97	28.48	Pass
	159 (5795)	14.31	13.66	17.01	28.48	Pass
IEEE 802.11ac-VHT80	155 (5775)	16.23	15.76	19.01	28.48	Pass
IEEE 802.11ax-HE20	149 (5745)	13.93	12.62	16.33	28.48	Pass
	157 (5785)	13.70	12.80	16.28	28.48	Pass
	165 (5825)	13.54	13.10	16.34	28.48	Pass
IEEE 802.11ax-HE40	151 (5755)	14.48	13.87	17.19	28.48	Pass
	159 (5795)	14.39	14.02	17.22	28.48	Pass
IEEE 802.11ax-HE80	155 (5775)	16.28	15.98	19.15	28.48	Pass

Remark:

1. Maximum conducted output power = Conducted output power + Duty Cycle Factor
2. Total Power(Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$

Information				Maximum conducted output power (dBm)			Total e.i.r.p MIMO_ Chain 0+1 (dBm)	FCC Part 15E	RSS-247	Pass/Fail
Mode	RU Size	RU Index	Frequency (MHz)	SISO Chain 0	SISO Chain 1	MIMO Chain 0+1		Limit (dBm)		
802.11ax-HE20	26	0	5180	0.54	-1.24	2.75	10.27	22.48	21.48	Pass
			5220	0.71	-0.98	2.96	10.48	22.48	21.48	Pass
			5240	1	-1.1	3.09	10.61	22.48	21.48	Pass
			5260	7.27	5.53	9.50	17.02	22.48	22.48	Pass
			5300	6.89	4.74	8.96	16.48	22.48	22.48	Pass
			5320	6.87	4.75	8.95	16.47	22.48	22.48	Pass
			5500	5.74	4.53	8.19	15.71	22.48	22.48	Pass
			5580	6.3	5.12	8.76	16.28	22.48	22.48	Pass
			5700	6.73	5.09	9.00	16.52	22.48	22.48	Pass
			5745	2.8	1.46	5.19	-	28.48	28.48	Pass
			5785	2.96	1.15	5.16	-	28.48	28.48	Pass
			5825	2.98	1.38	5.26	-	28.48	28.48	Pass
	26	4	5180	1.04	-0.87	3.20	10.72	22.48	21.48	Pass
			5220	0.97	-0.75	3.20	10.72	22.48	21.48	Pass
			5240	1.33	-0.55	3.50	11.02	22.48	21.48	Pass
			5260	7.32	5.61	9.56	17.08	22.48	22.48	Pass
			5300	7.06	4.82	9.09	16.61	22.48	22.48	Pass
			5320	7	4.89	9.08	16.60	22.48	22.48	Pass
			5500	5.69	4.66	8.22	15.74	22.48	22.48	Pass
			5580	6.46	5.22	8.89	16.41	22.48	22.48	Pass
			5700	6.79	5.12	9.05	16.57	22.48	22.48	Pass
			5745	2.89	1.39	5.21	-	28.48	28.48	Pass
			5785	3.06	1.26	5.26	-	28.48	28.48	Pass
			5825	3.11	1.49	5.39	-	28.48	28.48	Pass
	26	8	5180	0.65	-0.96	2.93	10.45	22.48	21.48	Pass
			5220	0.84	-0.88	3.07	10.59	22.48	21.48	Pass
			5240	1.21	-0.94	3.28	10.80	22.48	21.48	Pass
			5260	7.31	5.69	9.59	17.11	22.48	22.48	Pass
			5300	6.94	4.66	8.96	16.48	22.48	22.48	Pass
			5320	6.82	4.84	8.95	16.47	22.48	22.48	Pass
			5500	5.71	4.61	8.21	15.73	22.48	22.48	Pass
			5580	6.37	5.09	8.79	16.31	22.48	22.48	Pass
			5700	6.69	5.12	8.99	16.51	22.48	22.48	Pass
			5745	2.94	1.54	5.31	-	28.48	28.48	Pass
			5785	3.02	1.33	5.27	-	28.48	28.48	Pass
			5825	3.16	1.49	5.42	-	28.48	28.48	Pass

Remark:

1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$

5.6 PEAK POWER SPECTRAL DENSITY

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)
RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1

Test Method: KDB 789033 D02 v02r01 Section F

Limits: FCC 47 CFR Part 15 Subpart E

1. For the band 5.15-5.25 GHz.
   (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. In addition, the maximum power spectral density shall not exceed 17 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. 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).

   (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. In addition, the maximum power spectral density shall not exceed 17 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.

   (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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

   (iv) For 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. 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.

2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 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.

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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. 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.

Limits: RSS-247 Issue 2

1. **Frequency band 5150-5250 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

2. **Frequency band 5250-5350 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Additional requirements
In addition to the above requirements, devices shall comply with the following, where applicable:

a) Outdoor fixed devices with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:

i. -13 dBW/MHz for $0^o \leq \theta < 8^o$

ii. -13 − 0.716 (θ-8) dBW/MHz for $8^o \leq \theta < 40^o$

iii. -35.9 − 1.22 (θ-40) dBW/MHz for $40^o \leq \theta \leq 45^o$

iv. -42 dBW/MHz for $\theta > 45^o$

The measurement procedure defined in Annex A of this document shall be used to verify the compliance to the e.i.r.p. at different elevations.

b) Devices, other than outdoor fixed devices, having an e.i.r.p. greater than 200 mW shall comply with either i. or ii. below:

iii. devices shall comply with the e.i.r.p. elevation mask in 6.2.2.3(a); or

iv. devices shall implement a method to permanently reduce their e.i.r.p. via a firmwarefeature in the event that the Department requires it. The test report must demonstratehow the device's power table can be updated to meet this firmware requirement. Themanufacturer shall provide this firmware to update all systems automatically incompliance with the directions received from the Department.

3. **Frequency bands 5470-5600 MHz and 5650-5725 MHz**
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

4. **Frequency band 5725-5850 MHz**
The maximum conducted output power shall not exceed 1 W. The output 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 output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices

operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer.

Spectrum analyzer according to the following Settings:

1. For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
b) Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
c) Sweep time = auto, trigger set to “free run”.
d) Trace average at least 100 traces in power averaging mode.
e) Record the max value and add 10 log (1/duty cycle)

2. For U-NII-3 band:

a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
b) Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
c) Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
d) Sweep time = auto, trigger set to “free run”.
e) Trace average at least 100 traces in power averaging mode.
f) Record the max value and add 10 log (1/duty cycle)

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

Directional gain and the maximum output power limit.

RSS-247 Issue 2:

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	PSD Limits (dBm/MHz or dBm/500kHz)
U-NII-1	4.0	5.0	7.52	8.48
U-NII-2A	4.0	5.0	7.52	9.48
U-NII-2C	4.0	5.0	7.52	9.48
U-NII-3	4.0	5.0	7.52	28.48
Unequal antenna gains, with equal transmit powers. Directional gain is to be computed as follows:				
If transmit signals are correlated, then				
Directional gain = 10 log[(10^G1 /20 + 10^G2 /20 + … + 10^GN /20)^2 /NANT] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels				

FCC 47 CFR Part 15 Subpart E:

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	PSD Limits (dBm/MHz or dBm/500kHz)
U-NII-1	4.0	5.0	7.52	9.48
U-NII-2A	4.0	5.0	7.52	9.48
U-NII-2C	4.0	5.0	7.52	9.48
U-NII-3	4.0	5.0	7.52	28.48
Unequal antenna gains, with equal transmit powers. Directional gain is to be computed as follows:				
If transmit signals are correlated, then				
Directional gain = 10 log[(10^G1 /20 + 10^G2 /20 + … + 10^GN /20)^2 /NANT] dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels				

Frequency band 5150-5250 MHz
RSS-247 Issue 2

Mode	Channel/ Frequency (MHz)	e.i.r.p. spectral density (dBm/MHz) SISO		Total e.i.r.p. spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	8.094	8.155	N/A	10	Pass
	44 (5220)	8.195	8.297	N/A	10	Pass
	48 (5240)	8.365	8.504	N/A	10	Pass
IEEE 802.11n-HT20	36 (5180)	0.894	2.618	7.801	8.48	Pass
	44 (5220)	1.109	0.880	7.068	8.48	Pass
	48 (5240)	0.836	1.015	6.975	8.48	Pass
IEEE 802.11n-HT40	38 (5190)	1.332	1.482	7.458	8.48	Pass
	46 (5230)	1.704	1.508	7.677	8.48	Pass
IEEE 802.11ac-VHT20	36 (5180)	0.838	1.039	6.987	8.48	Pass
	44 (5220)	1.235	0.603	7.026	8.48	Pass
	48 (5240)	0.873	0.895	6.942	8.48	Pass
IEEE 802.11ac-VHT40	38 (5190)	1.033	1.130	7.135	8.48	Pass
	46 (5230)	1.288	1.357	7.378	8.48	Pass
IEEE 802.11ac-VHT80	42 (5210)	-2.730	-2.570	3.401	8.48	Pass
IEEE 802.11ax-HE20	36 (5180)	1.355	2.219	7.818	8.48	Pass
	44 (5220)	1.268	1.551	7.455	8.48	Pass
	48 (5240)	1.398	2.007	7.737	8.48	Pass
IEEE 802.11ax-HE40	38 (5190)	1.368	1.675	7.566	8.48	Pass
	46 (5230)	1.549	1.753	7.700	8.48	Pass
IEEE 802.11ax-HE80	42 (5210)	-1.141	-0.781	5.081	8.48	Pass

Remark:

1. e.i.r.p. spectral density = Power spectral density + Duty Cycle Factor + Antenna Gain
2. Total e.i.r.p. spectral density (Chain 0+1) = 10*log[($10^{Chain\ 0/10}$)+($10^{Chain\ 1/10}$)] + Directional gain

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Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz) SISO		Total power spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	4.094	3.155	N/A	11	Pass
	44 (5220)	4.195	3.297	N/A	11	Pass
	48 (5240)	4.365	3.504	N/A	11	Pass
IEEE 802.11n-HT20	36 (5180)	-3.106	-2.382	0.281	9.48	Pass
	44 (5220)	-2.891	-4.120	-0.452	9.48	Pass
	48 (5240)	-3.164	-3.985	-0.545	9.48	Pass
IEEE 802.11n-HT40	38 (5190)	-2.668	-3.518	-0.062	9.48	Pass
	46 (5230)	-2.296	-3.492	0.157	9.48	Pass
IEEE 802.11ac-VHT20	36 (5180)	-3.162	-3.961	-0.533	9.48	Pass
	44 (5220)	-2.765	-4.397	-0.494	9.48	Pass
	48 (5240)	-3.127	-4.105	-0.578	9.48	Pass
IEEE 802.11ac-VHT40	38 (5190)	-2.967	-3.870	-0.385	9.48	Pass
	46 (5230)	-2.712	-3.643	-0.142	9.48	Pass
IEEE 802.11ac-VHT80	42 (5210)	-6.730	-7.570	-4.119	9.48	Pass
IEEE 802.11ax-HE20	36 (5180)	-2.645	-2.781	0.298	9.48	Pass
	44 (5220)	-2.732	-3.449	-0.065	9.48	Pass
	48 (5240)	-2.602	-2.993	0.217	9.48	Pass
IEEE 802.11ax-HE40	38 (5190)	-2.632	-3.325	0.046	9.48	Pass
	46 (5230)	-2.451	-3.247	0.180	9.48	Pass
IEEE 802.11ax-HE80	42 (5210)	-5.141	-5.781	-2.439	9.48	Pass

Remark:

1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$

Frequency band 5250-5350 MHz

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz) SISO		Total power spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	52 (5260)	3.708	2.881	N/A	11	Pass
	60 (5300)	3.516	2.953	N/A	11	Pass
	64 (5320)	3.914	2.899	N/A	11	Pass
IEEE 802.11n-HT20	52 (5260)	3.882	3.613	6.760	9.48	Pass
	60 (5300)	4.315	3.467	6.922	9.48	Pass
	64 (5320)	4.783	3.767	7.315	9.48	Pass
IEEE 802.11n-HT40	54 (5270)	0.447	-0.133	3.177	9.48	Pass
	62 (5310)	0.229	-0.486	2.896	9.48	Pass
IEEE 802.11ac-VHT20	52 (5260)	3.965	3.423	6.713	9.48	Pass
	60 (5300)	4.237	3.636	6.957	9.48	Pass
	64 (5320)	4.062	3.686	6.888	9.48	Pass
IEEE 802.11ac-VHT40	54 (5270)	0.191	-0.327	2.950	9.48	Pass
	62 (5310)	-0.001	-0.705	2.672	9.48	Pass
IEEE 802.11ac-VHT80	58 (5290)	-0.072	-0.134	2.907	9.48	Pass
IEEE 802.11ax-HE20	52 (5260)	4.350	3.742	7.067	9.48	Pass
	60 (5300)	4.455	3.763	7.133	9.48	Pass
	64 (5320)	4.490	3.936	7.232	9.48	Pass
IEEE 802.11ax-HE40	54 (5270)	0.386	0.095	3.253	9.48	Pass
	62 (5310)	0.315	-0.510	2.932	9.48	Pass
IEEE 802.11ax-HE80	58 (5290)	0.312	0.403	3.368	9.48	Pass

Remark:

1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$

Frequency bands 5470-5725 MHz (RSS-247 Issue 2 Not including 5600-5650 MHz)

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz) SISO Chain 0	Power spectral density (dBm/MHz) SISO Chain 1	Total power spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/MHz)	Pass / Fail
IEEE 802.11a	100 (5500)	4.001	2.729	N/A	11	Pass
	116 (5580)	3.839	3.005	N/A	11	Pass
	140 (5700)	4.700	3.814	N/A	11	Pass
IEEE 802.11n-HT20	100 (5500)	3.409	2.318	5.908	9.48	Pass
	116 (5580)	4.045	2.511	6.356	9.48	Pass
	140 (5700)	4.178	3.450	6.840	9.48	Pass
IEEE 802.11n-HT40	102 (5510)	-0.687	-1.517	1.928	9.48	Pass
	110 (5550)	-0.921	-1.659	1.736	9.48	Pass
	134 (5670)	-0.086	-0.595	2.677	9.48	Pass
IEEE 802.11ac-VHT20	100 (5500)	3.303	2.235	5.812	9.48	Pass
	116 (5580)	3.813	2.643	6.278	9.48	Pass
	140 (5700)	4.188	3.245	6.752	9.48	Pass
IEEE 802.11ac-VHT40	102 (5510)	-0.976	-1.628	1.721	9.48	Pass
	110 (5550)	-1.162	-1.570	1.649	9.48	Pass
	134 (5670)	-0.419	-0.830	2.391	9.48	Pass
IEEE 802.11ac-VHT80	106 (5530)	-1.763	-2.372	0.953	9.48	Pass
IEEE 802.11ax-HE20	100 (5500)	5.623	4.787	8.235	9.48	Pass
	116 (5580)	5.995	4.981	8.528	9.48	Pass
	140 (5700)	6.096	5.634	8.881	9.48	Pass
IEEE 802.11ax-HE40	102 (5510)	-0.890	-1.208	1.964	9.48	Pass
	110 (5550)	-0.714	-1.030	2.141	9.48	Pass
	134 (5670)	-0.293	-0.644	2.545	9.48	Pass
IEEE 802.11ax-HE80	106 (5530)	-1.424	-2.134	1.246	9.48	Pass

Remark:

1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{\text{Chain 0}/10})+(10^{\text{Chain 1}/10})]$

Frequency band 5725-5850 MHz

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz) SISO		Total power spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/500KHz)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	149 (5745)	3.706	1.973	N/A	30	Pass
	157 (5785)	3.483	2.233	N/A	30	Pass
	165 (5825)	3.288	2.082	N/A	30	Pass
IEEE 802.11n-HT20	149 (5745)	3.415	2.019	5.783	28.48	Pass
	157 (5785)	2.987	2.054	5.556	28.48	Pass
	165 (5825)	2.539	1.949	5.264	28.48	Pass
IEEE 802.11n-HT40	151 (5755)	-0.457	-1.172	2.210	28.48	Pass
	159 (5795)	-0.591	-1.124	2.161	28.48	Pass
IEEE 802.11ac-VHT20	149 (5745)	3.247	1.862	5.620	28.48	Pass
	157 (5785)	3.125	1.902	5.567	28.48	Pass
	165 (5825)	2.816	2.061	5.465	28.48	Pass
IEEE 802.11ac-VHT40	151 (5755)	-0.610	-1.313	2.063	28.48	Pass
	159 (5795)	-0.718	-1.207	2.055	28.48	Pass
IEEE 802.11ac-VHT80	155 (5775)	-1.936	-2.098	0.994	28.48	Pass
IEEE 802.11ax-HE20	149 (5745)	3.460	1.967	5.788	28.48	Pass
	157 (5785)	3.221	2.131	5.720	28.48	Pass
	165 (5825)	2.663	2.116	5.408	28.48	Pass
IEEE 802.11ax-HE40	151 (5755)	-0.440	-1.046	2.278	28.48	Pass
	159 (5795)	-0.454	-1.013	2.286	28.48	Pass
IEEE 802.11ax-HE80	155 (5775)	-1.732	-1.791	1.249	28.48	Pass

Remark:

1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{Chain\ 0/10})+(10^{Chain\ 1/10})]$

Information				Power spectral density (dBm/MHz)			Total e.i.r.p. spectral density	FCC Part 15E	RSS-247	
Mode	RU Size	RU Index	Frequency (MHz)	SISO Chain 0	SISO Chain 1	MIMO Chain 0+1	MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/MHz) / (dBm/500KHz)		Pass/Fail
802.11ax-HE20	26	0	5180	-1.220	-3.300	0.874	8.394	9.48	8.48	Pass
			5220	-1.395	-3.546	0.672	8.192	9.48	8.48	Pass
			5240	-1.313	-3.388	0.783	8.303	9.48	8.48	Pass
			5260	6.061	4.039	8.177	-	9.48	9.48	Pass
			5300	6.192	4.604	8.480	-	9.48	9.48	Pass
			5320	6.246	4.447	8.449	-	9.48	9.48	Pass
			5500	5.974	4.892	8.477	-	9.48	9.48	Pass
			5580	7.137	5.462	9.390	-	9.48	9.48	Pass
			5700	7.244	5.387	9.424	-	9.48	9.48	Pass
			5745	3.410	1.495	5.568	-	28.48	28.48	Pass
			5785	3.268	1.657	5.547	-	28.48	28.48	Pass
			5825	3.062	1.450	5.341	-	28.48	28.48	Pass
	26	4	5180	-2.159	-3.799	0.108	7.628	9.48	8.48	Pass
			5220	-2.126	-4.275	-0.059	7.461	9.48	8.48	Pass
			5240	-2.146	-3.940	0.059	7.579	9.48	8.48	Pass
			5260	5.507	3.743	7.724	-	9.48	9.48	Pass
			5300	5.427	3.696	7.657	-	9.48	9.48	Pass
			5320	5.752	3.802	7.896	-	9.48	9.48	Pass
			5500	5.377	4.938	8.173	-	9.48	9.48	Pass
			5580	6.864	5.433	9.217	-	9.48	9.48	Pass
			5700	6.687	4.632	8.790	-	9.48	9.48	Pass
			5745	3.326	1.730	5.611	-	28.48	28.48	Pass
			5785	3.268	1.814	5.612	-	28.48	28.48	Pass
			5825	2.705	2.083	5.415	-	28.48	28.48	Pass
	26	8	5180	-1.166	-3.322	0.899	8.419	9.48	8.48	Pass
			5220	-1.113	-3.416	0.897	8.417	9.48	8.48	Pass
			5240	-1.335	-3.300	0.803	8.323	9.48	8.48	Pass
			5260	6.052	4.546	8.374	-	9.48	9.48	Pass
			5300	6.455	4.586	8.631	-	9.48	9.48	Pass
			5320	6.234	4.461	8.448	-	9.48	9.48	Pass
			5500	6.313	5.055	8.740	-	9.48	9.48	Pass
			5580	7.337	5.337	9.461	-	9.48	9.48	Pass
			5700	7.249	5.402	9.433	-	9.48	9.48	Pass
			5745	3.388	1.289	5.474	-	28.48	28.48	Pass
			5785	2.642	1.990	5.339	-	28.48	28.48	Pass
			5825	2.768	1.898	5.365	-	28.48	28.48	Pass

Remark:

1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$
3. e.i.r.p. spectral density = Power spectral density + Duty Cycle Factor + Antenna Gain
4. Total e.i.r.p. spectral density (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$ + Directional gain

The test plots as follows:

IEEE 802.11a	
Chain 0	**Chain 1**
Channel 36	
Channel 44	
Channel 48	

IEEE 802.11a

Channel 52

Channel 60

Channel 64

IEEE 802.11a

Channel 100

Channel 116

Channel 140

IEEE 802.11a

Channel 149

Channel 157

Channel 165

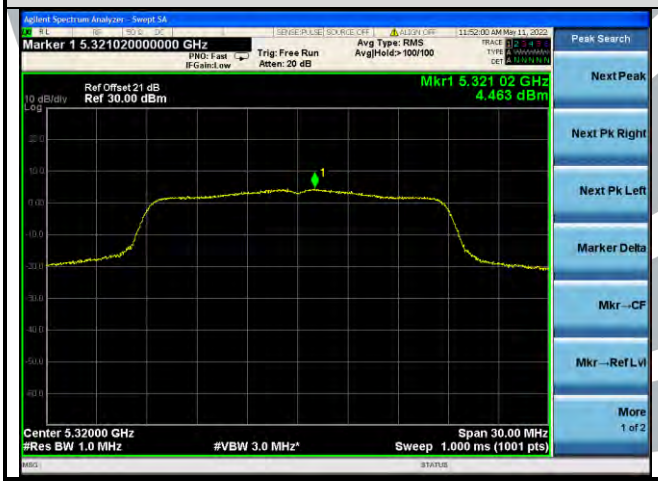
IEEE 802.11n-HT20	
Chain 0	Chain 1
Channel 36	
Channel 44	
Channel 48	

IEEE 802.11n-HT20

Channel 52

Channel 60

Channel 64



IEEE 802.11n-HT20

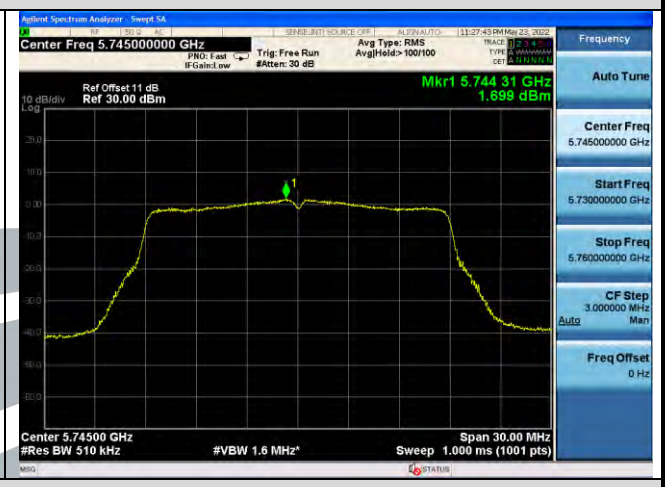
Channel 100

Channel 116

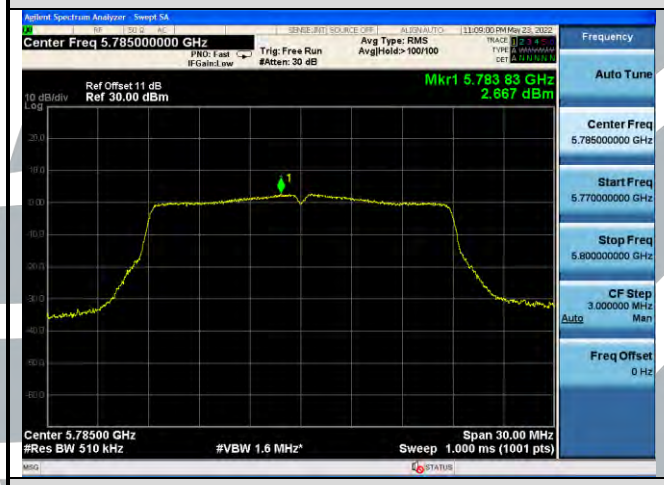
Channel 140

IEEE 802.11n-HT20

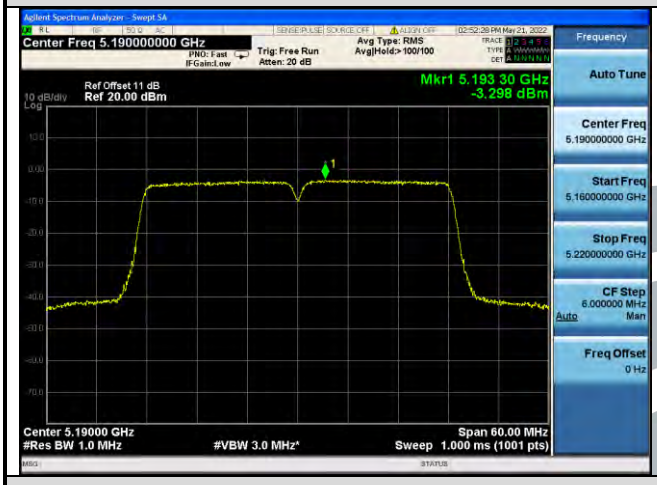
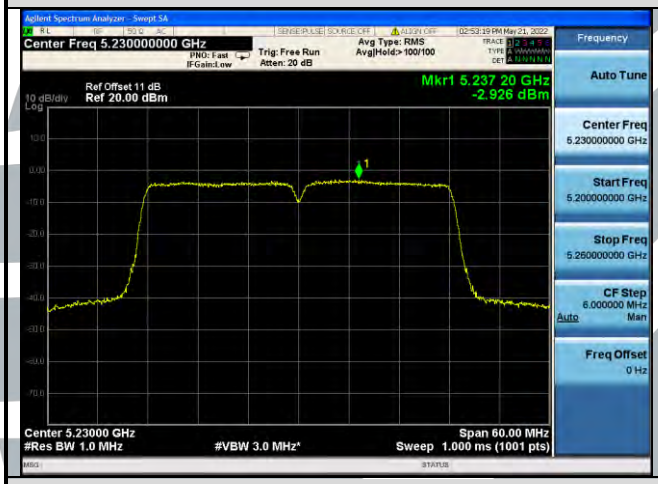
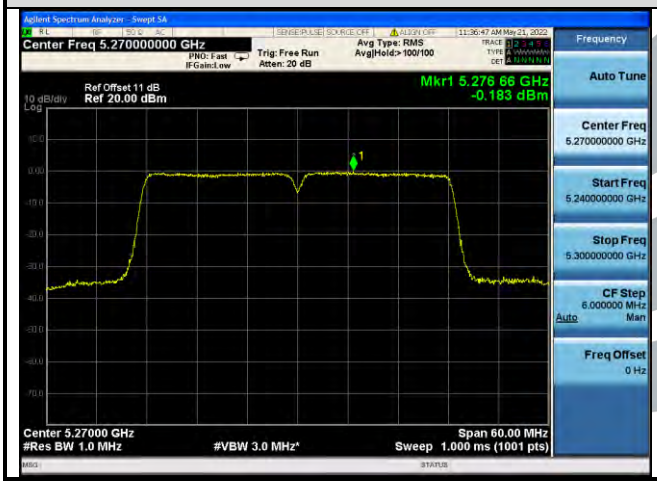
Channel 149



Channel 157

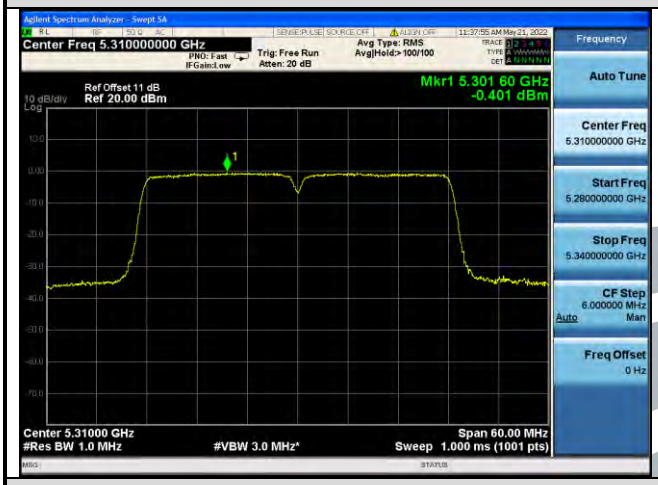


Channel 165

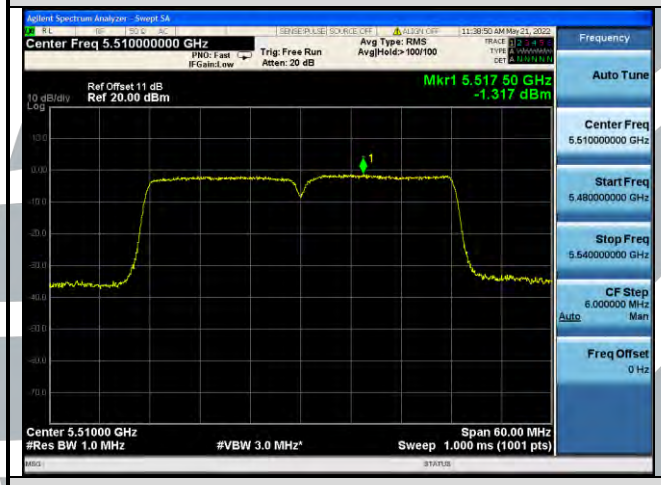
IEEE 802.11n-HT40	
Chain 0	Chain 1
Channel 38	
	
Channel 46	
	
Channel 54	
	

IEEE 802.11n-HT40

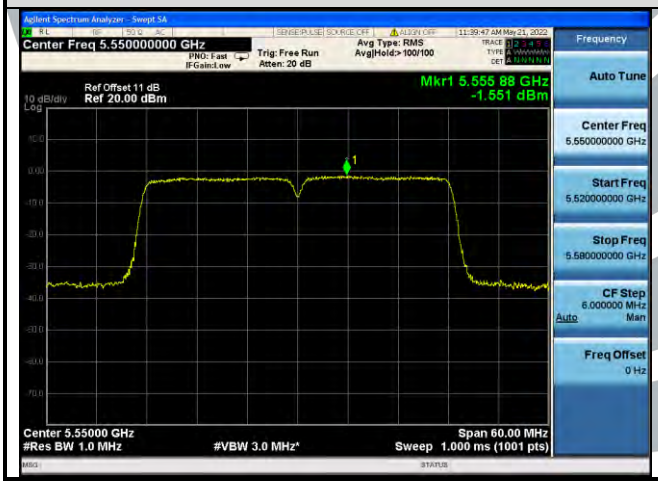
Channel 62



Channel 102

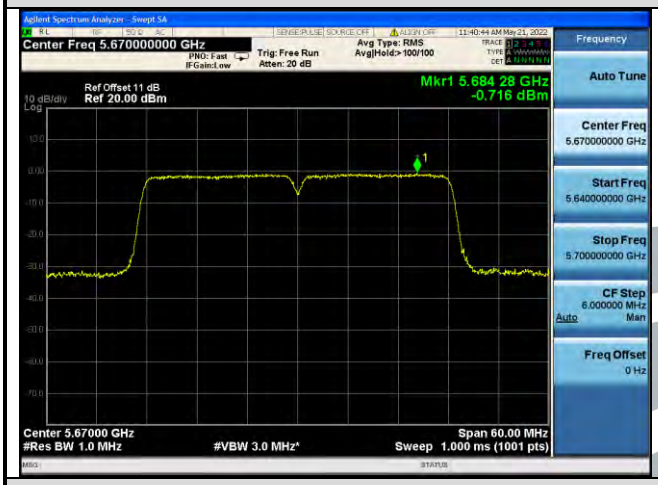


Channel 110

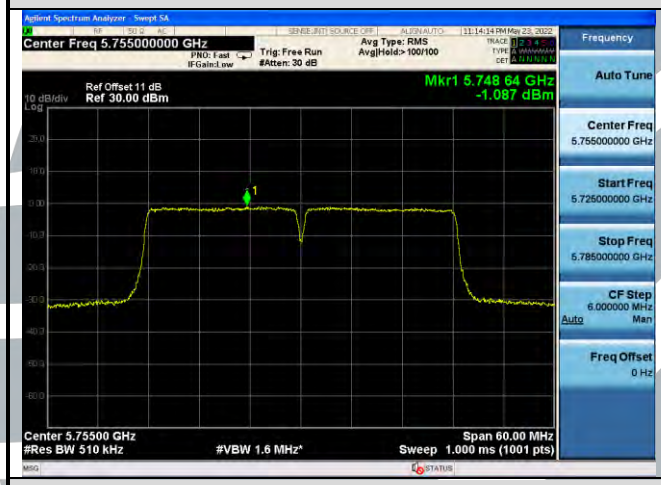


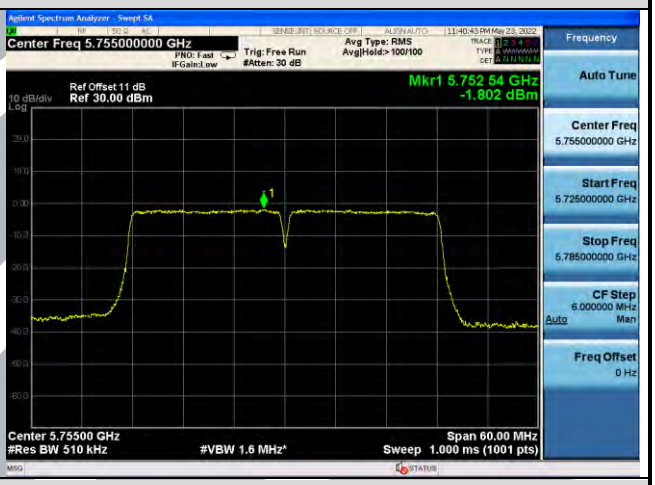
IEEE 802.11n-HT40

Channel 134



Channel 151





Channel 159

IEEE 802.11ac-VHT20	
Chain 0	Chain 1
Channel 36	
Channel 44	
Channel 48	

IEEE 802.11ac-VHT20

Channel 52

Channel 60

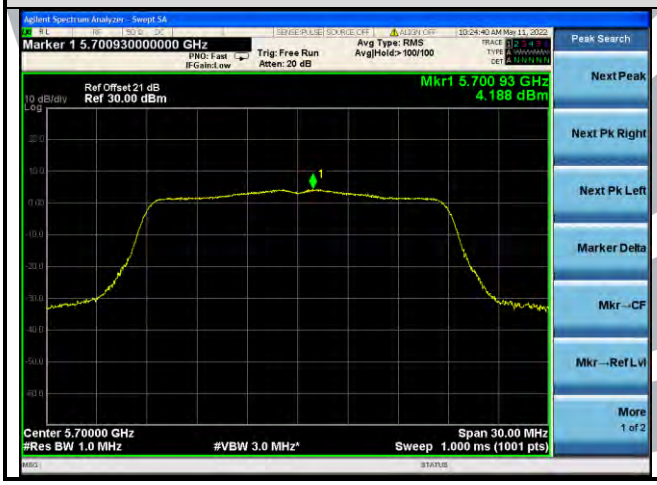
Channel 64

IEEE 802.11ac-VHT20

Channel 100

Channel 116

Channel 140

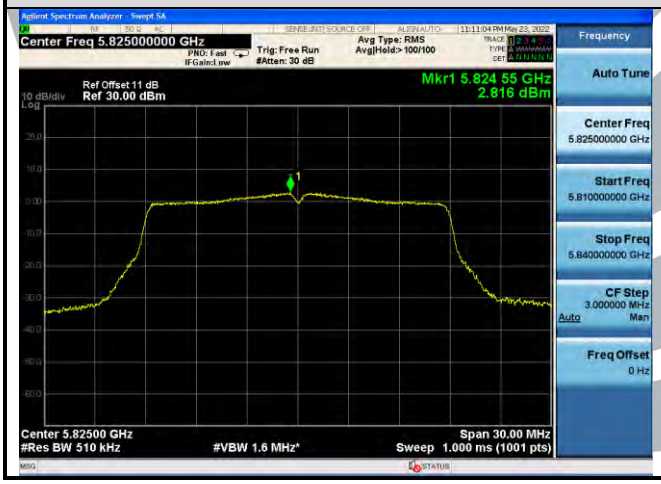


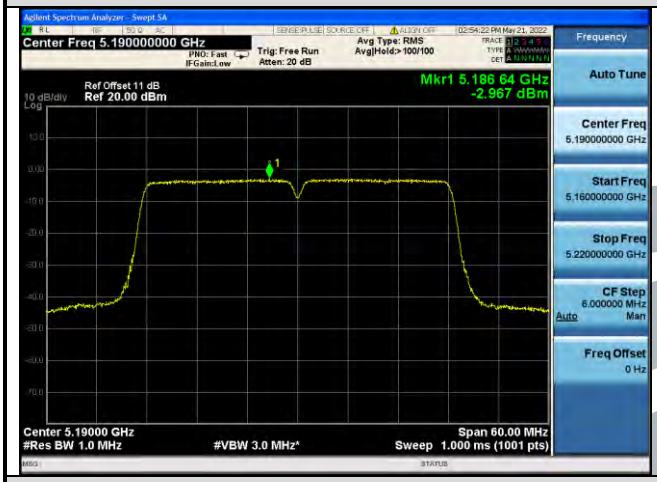
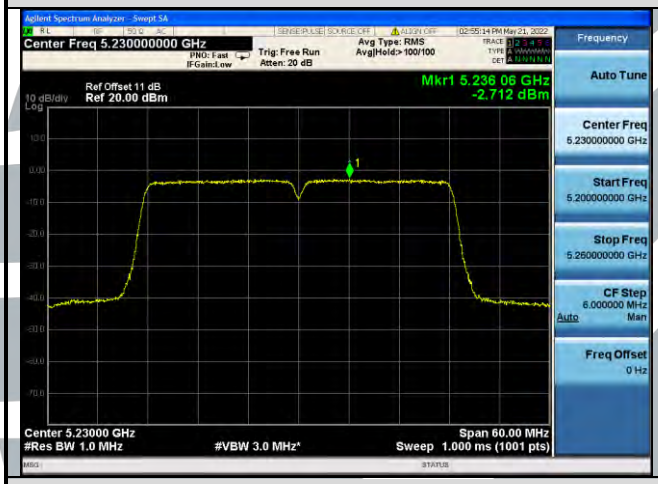
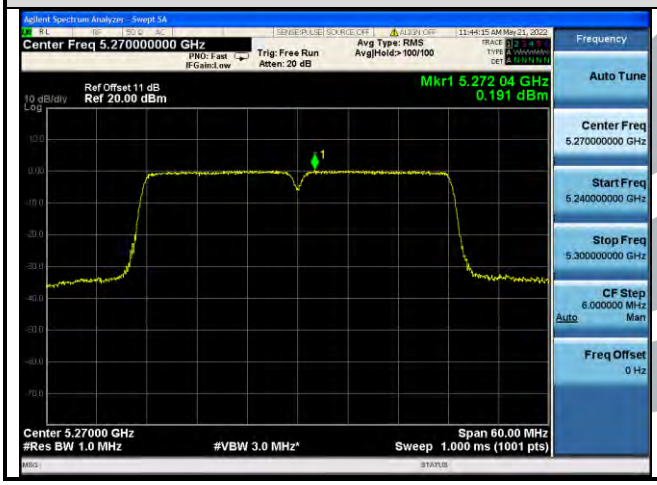
IEEE 802.11ac-VHT20

Channel 149

Channel 157

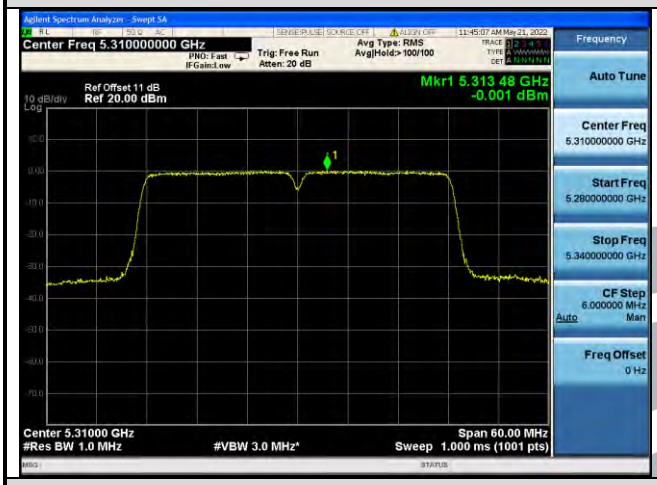
Channel 165



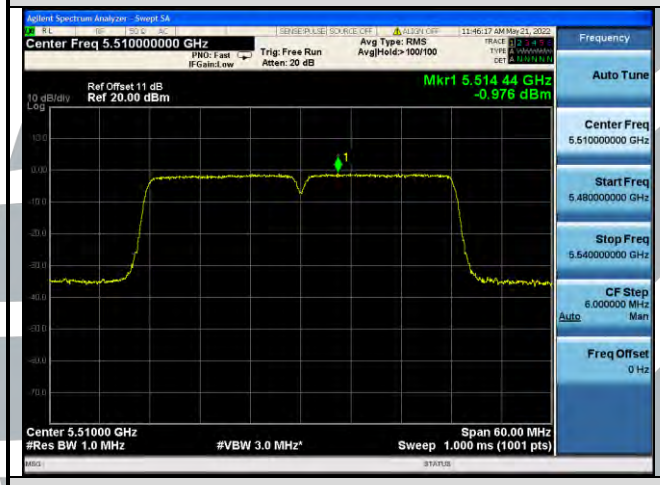
IEEE 802.11ac-VHT40	
Chain 0	Chain 1
Channel 38	
	
Channel 46	
	
Channel 54	
	

IEEE 802.11ac-VHT40

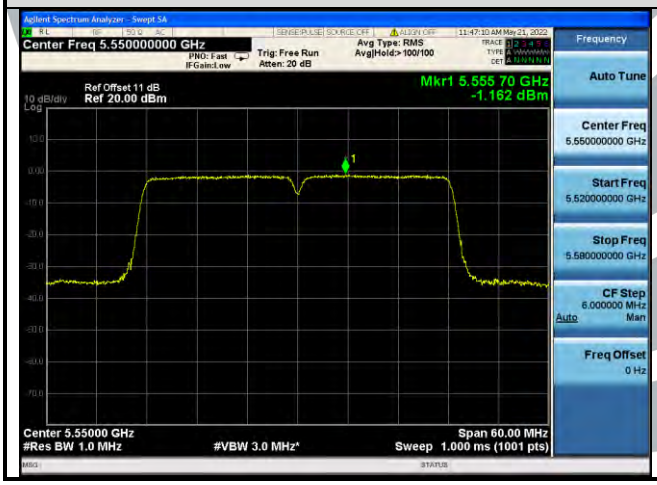
Channel 62



Channel 102

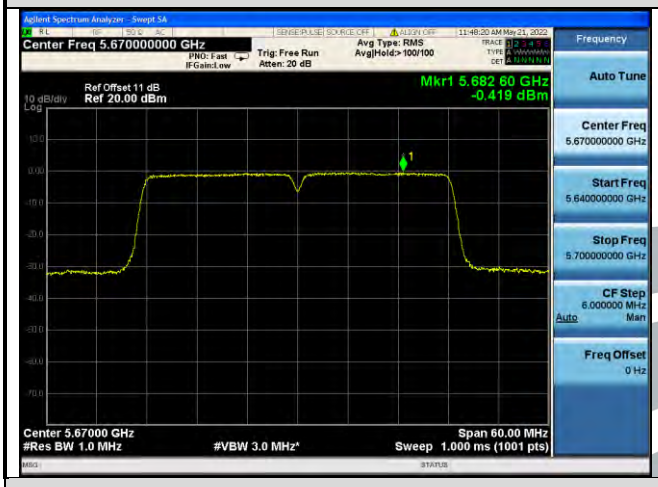


Channel 110

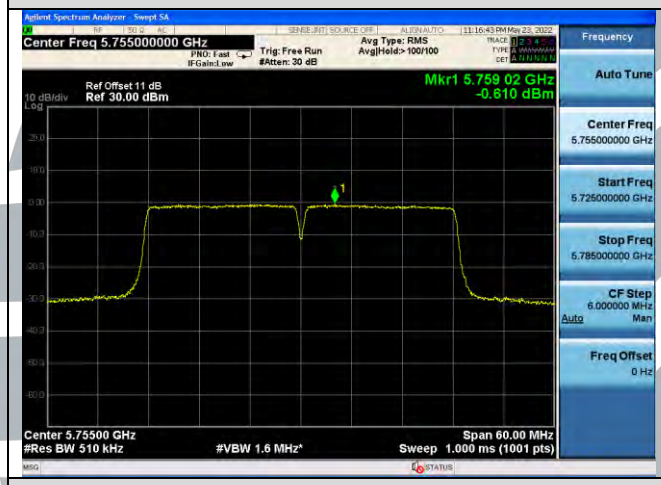


IEEE 802.11ac-VHT40

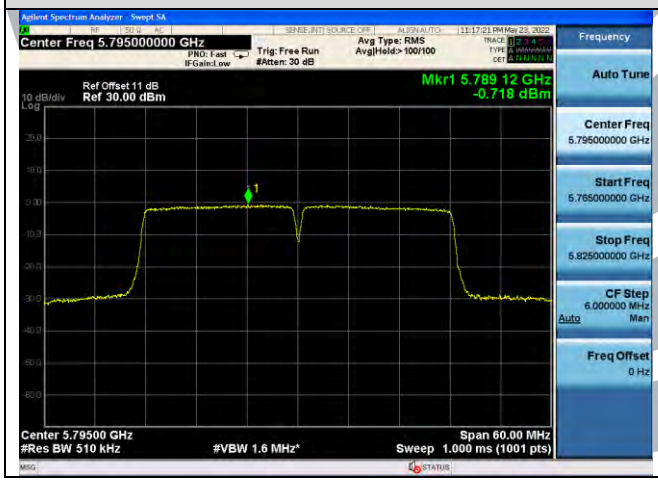
Channel 134



Channel 151



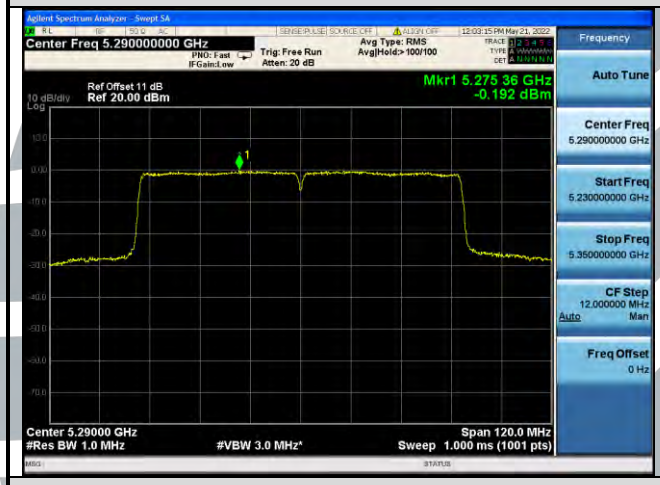
Channel 159



IEEE 802.11ac-VHT80

Channel 42

Channel 58



Channel 106

IEEE 802.11ac-VHT80	
Channel 155	

IEEE 802.11ax-HE20	
Chain 0	Chain 1
Channel 36	
Channel 44	
Channel 48	