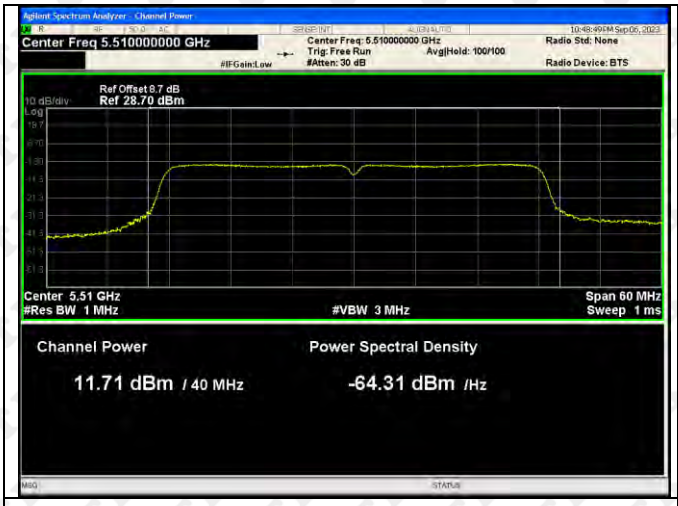
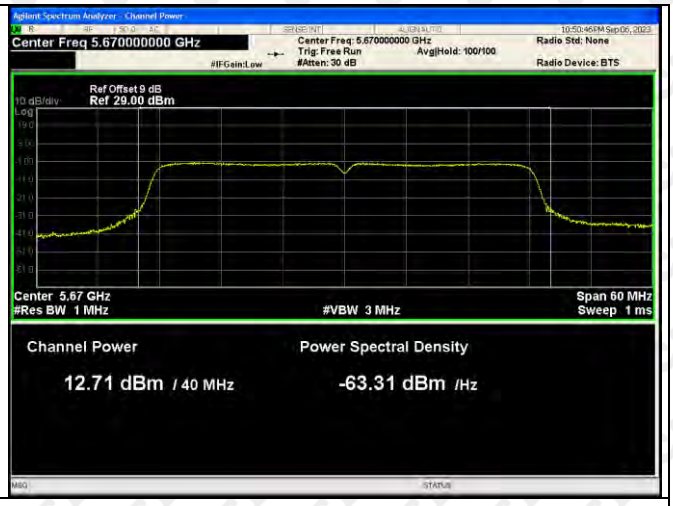
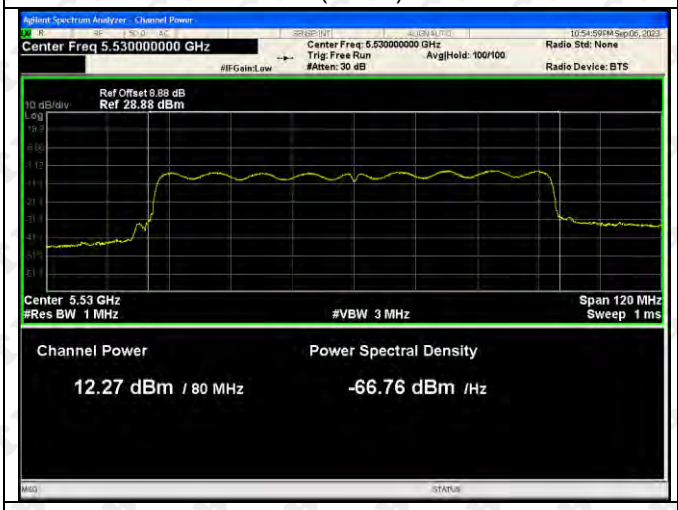


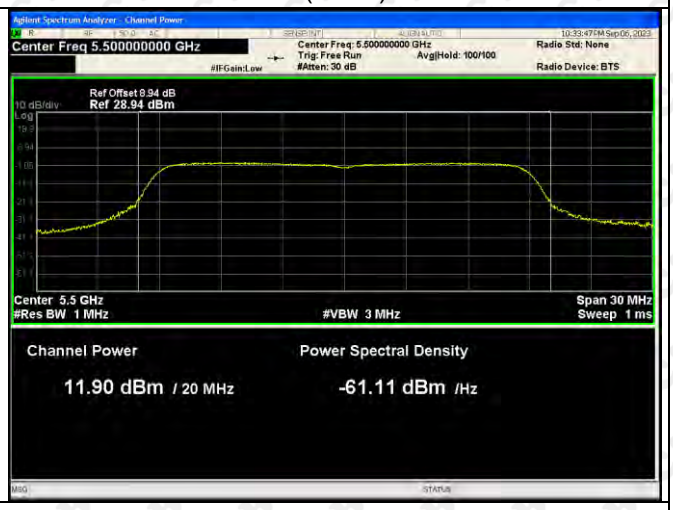
802.11ac(VH80)-5530



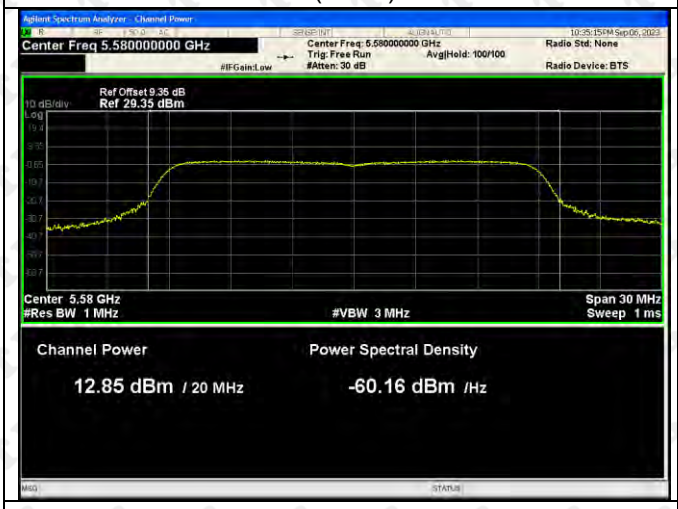
802.11n(HT20)-5500



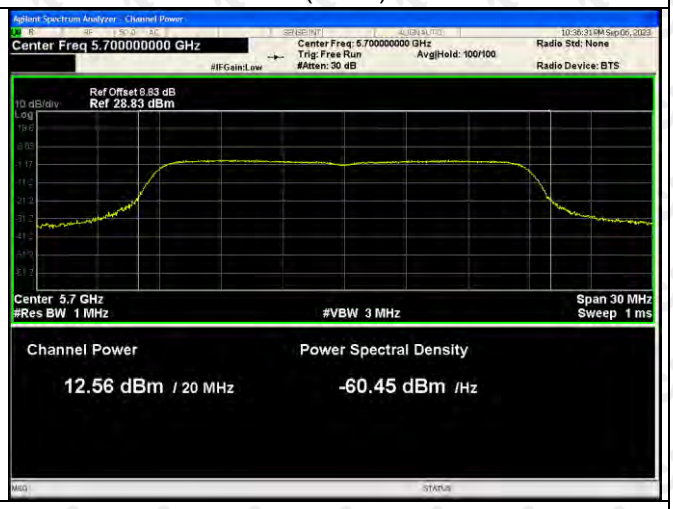
802.11n(HT20)-5580



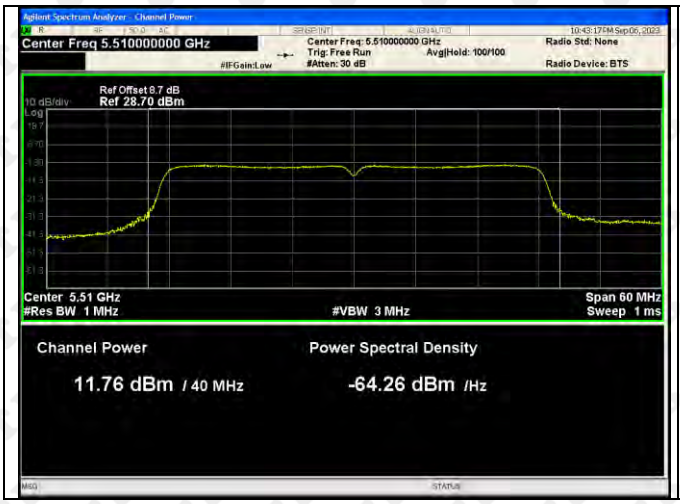
802.11n(HT20)-5700

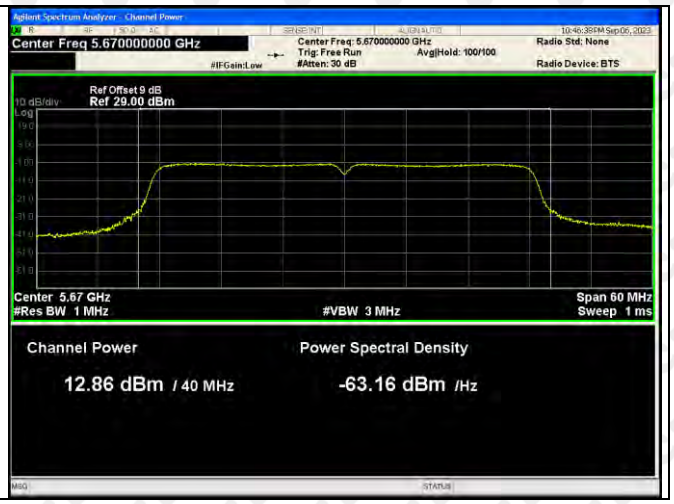


802.11n(HT40)-5510



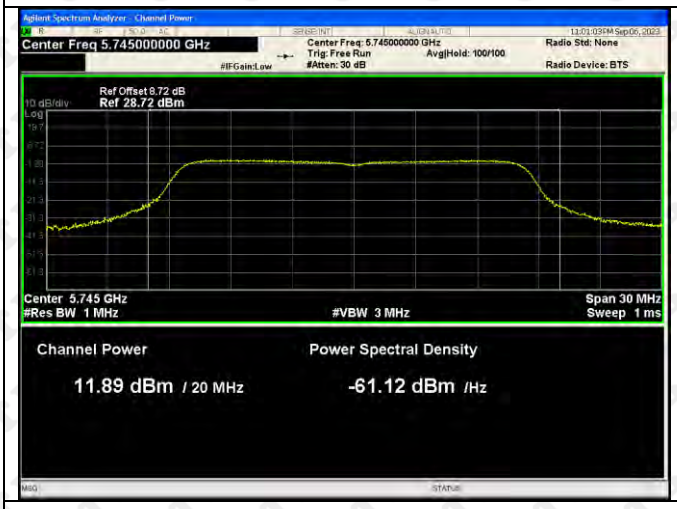
802.11n(HT40)-5670


Agilent Spectrum Analyzer - Channel Power
Center Freq 5.510000000 GHz
Center Freq: 5.510000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 8.7 dB
10 dB/div
Ref 28.70 dBm
Center 5.51 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Channel Power
11.76 dBm / 40 MHz
Power Spectral Density
-64.26 dBm /Hz

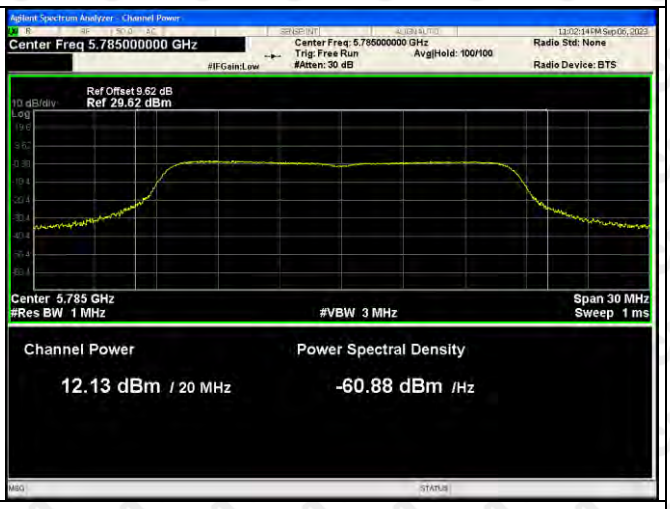

Agilent Spectrum Analyzer - Channel Power
Center Freq 5.670000000 GHz
Center Freq: 5.670000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 9 dB
10 dB/div
Ref 29.00 dBm
Center 5.67 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Channel Power
12.86 dBm / 40 MHz
Power Spectral Density
-63.16 dBm /Hz

5725-5850MHz-Power

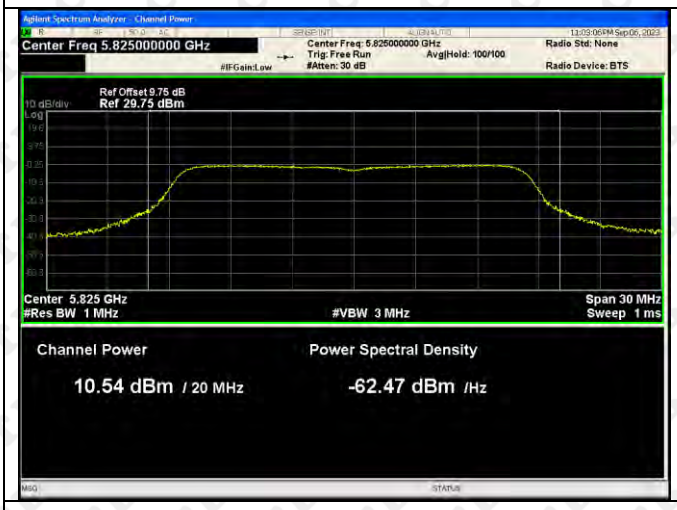
802.11a-5745



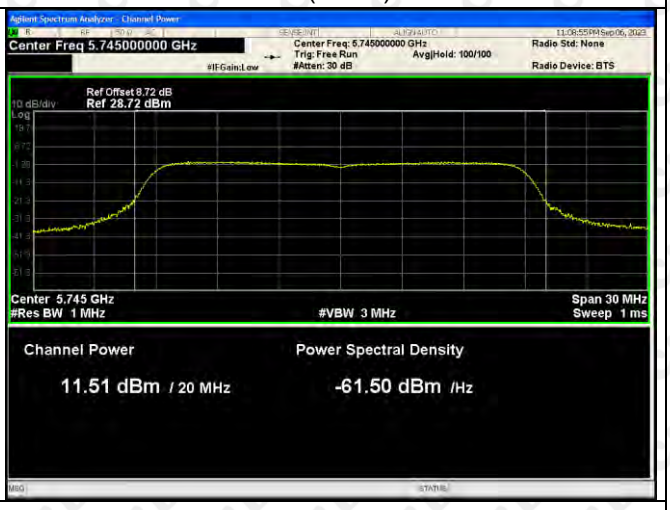
802.11a-5785



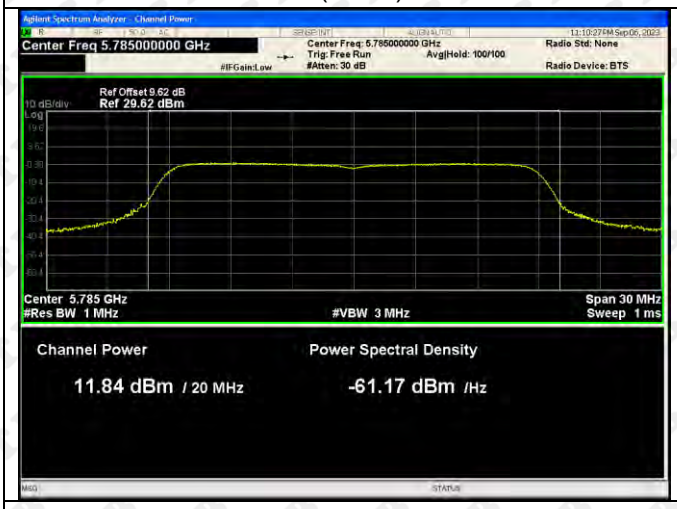
802.11a-5825



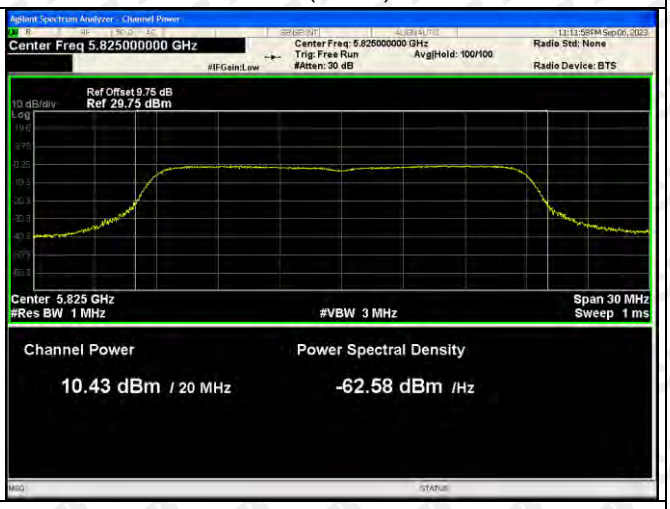
802.11ac(VH20)-5745



802.11ac(VH20)-5785

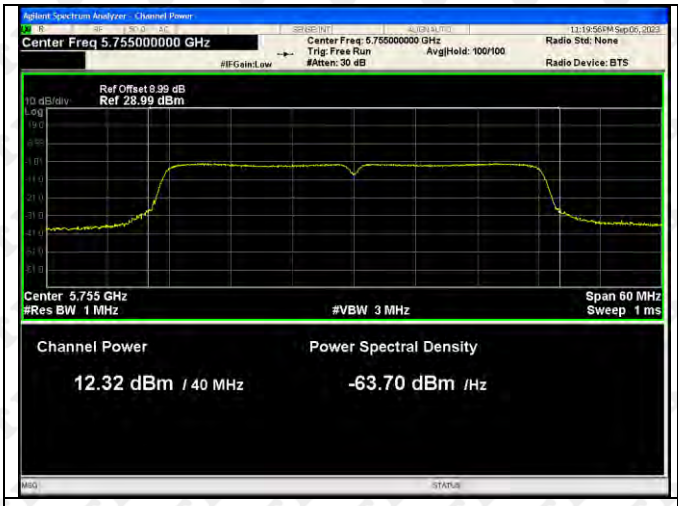


802.11ac(VH20)-5825

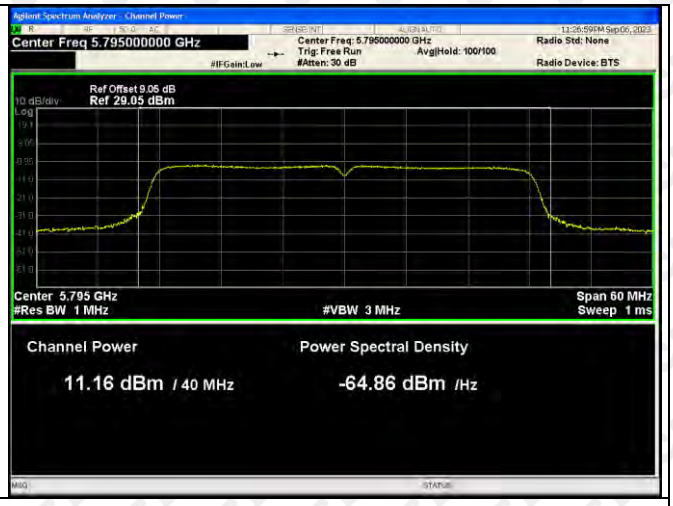


802.11ac(VH40)-5755

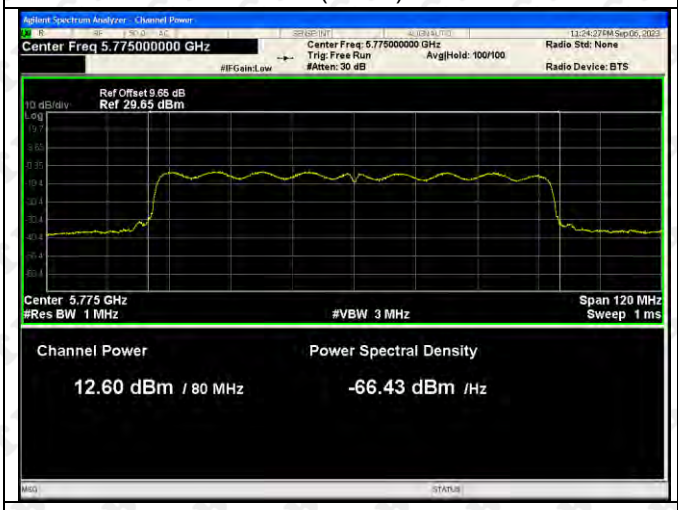
802.11ac(VH40)-5795



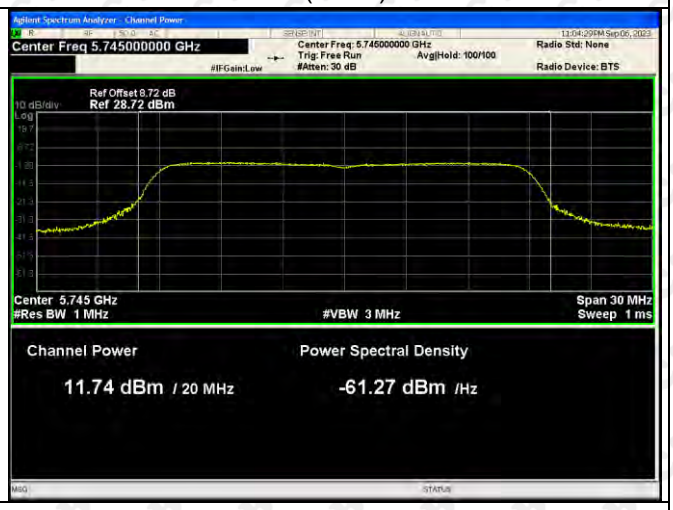
802.11ac(VH80)-5775



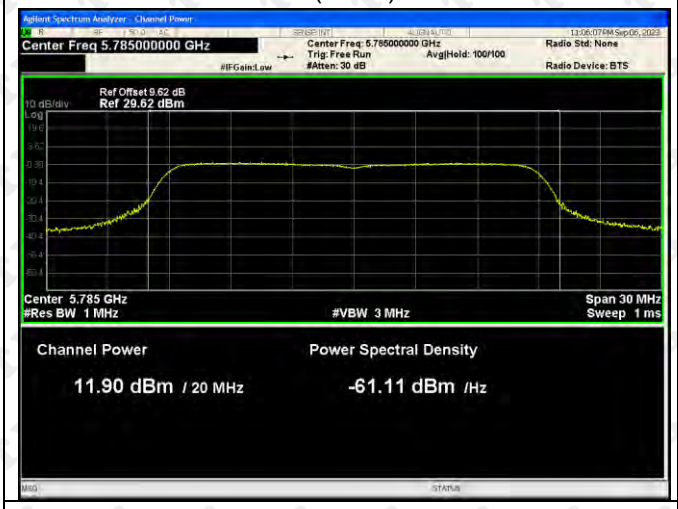
802.11n(HT20)-5745



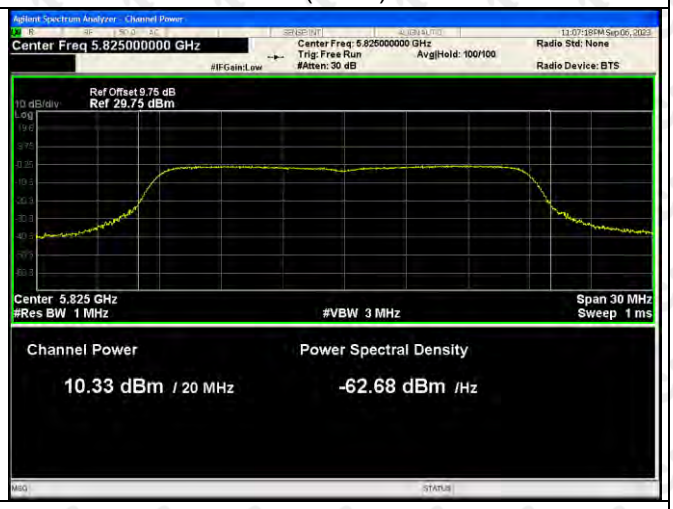
802.11n(HT20)-5785



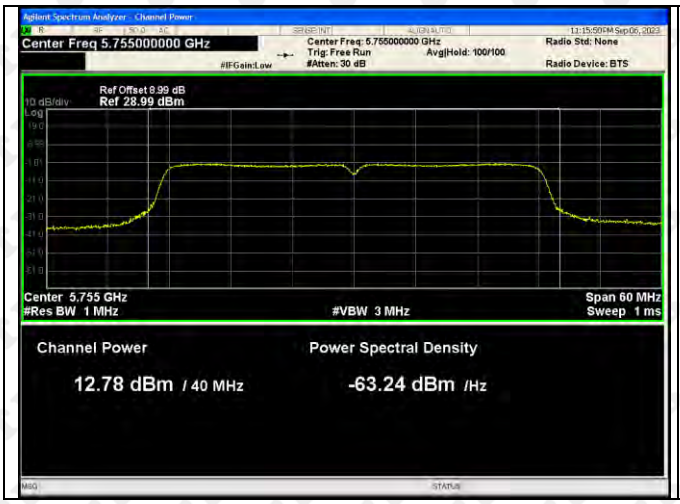
802.11n(HT20)-5825

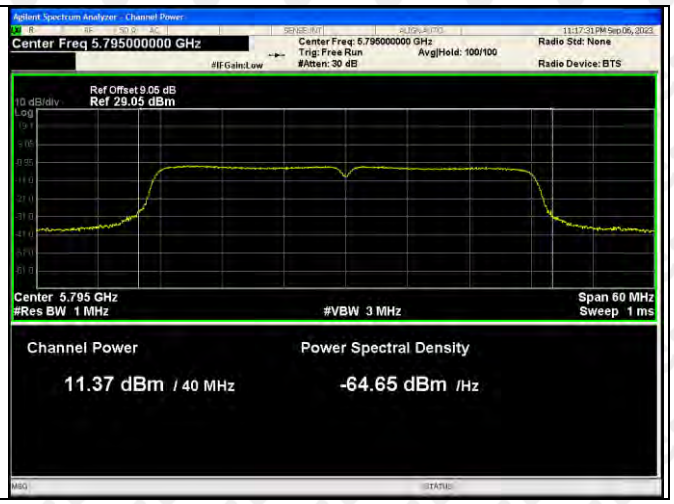


802.11n(HT40)-5795



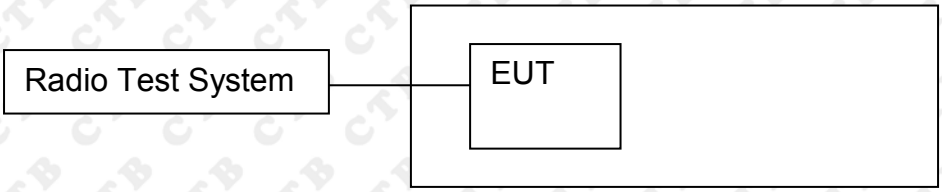
802.11n(HT40)-5825


Agilent Spectrum Analyzer - Channel Power
Center Freq 5.755000000 GHz
Center Freq: 5.755000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 8.99 dB
10 dB/div
Ref 28.99 dBm
Center 5.755 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Channel Power
12.78 dBm / 40 MHz
Power Spectral Density
-63.24 dBm /Hz


Agilent Spectrum Analyzer - Channel Power
Center Freq 5.795000000 GHz
Center Freq: 5.795000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 9.05 dB
10 dB/div
Ref 29.05 dBm
Center 5.795 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Channel Power
11.37 dBm / 40 MHz
Power Spectral Density
-64.65 dBm /Hz

10. EMISSION BANDWIDTH& OCCUPIED BANDWIDTH

10.1 Block Diagram Of Test Setup



10.2 Limits

(1) For the band 5.15-5.25 GHz.

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

10.3 Test Procedure

According to KDB789033 D02v02r01 sectionE, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) 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%.
2. Minimum Emission Bandwidth for the band 5.725−5.85 GHz
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725−5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 * RBW.
c) Detector = Peak.

d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described in this section. For devices that use channel aggregation refer to III.A and III.C for determining emission bandwidth.

D. 99% Occupied Bandwidth

The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. Measurement of the 99% occupied bandwidth is *required* only as a condition for using the optional band-edge measurement techniques described in II.G.3.d). Measurements of 99% occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the 789033 D02 General UNII Test Procedures New Rules v02r01 Page 4 spectrum is integrated when measuring maximum conducted output power as described in II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with Section 15.407(a).
The following procedure shall be used for measuring (99%) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1% to 5% of the OBW

4. Set VBW ≥ 3 * RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6. Use the 99% power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

10.4 Test Results

5150-5250MHz:

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	21.083
	5200	21.185
	5240	20.949
802.11ac20	5180	21.75
	5200	21.573
	5240	21.801
802.11ac40	5190	41.504
	5230	41.048
802.11ac80	5210	80.425
802.11n(HT20)	5180	21.703
	5200	21.579
	5240	21.699
802.11n(HT40)	5190	41.281
	5230	40.799

5250-5350 MHz

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5260	21.334
	5280	21.067
	5320	21.337
802.11ac20	5260	22.012
	5280	21.878
	5320	21.735
802.11ac40	5270	41.466
	5310	41.533
802.11ac80	5290	80.571
802.11n(HT20)	5260	21.806
	5280	21.761
	5320	21.704
802.11n(HT40)	5270	41.28
	5310	41.835

5470-5725MHz:

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5500	28.007
	5580	25.151
	5700	22.019
802.11ac20	5500	23.291
	5580	22.788
	5700	22.014
802.11ac40	5510	41.194
	5670	41.853
802.11ac80	5530	88.521
802.11n(HT20)	5500	22.017
	5580	21.913
	5700	21.969
802.11n(HT40)	5510	41.426
	5670	41.775

5725-5850MHz

Test mode	Test Channel (MHz)	6dB Bandwidth (MHz)
802.11a	5745	16.575
	5785	16.564
	5825	16.554
802.11ac20	5745	17.735
	5785	17.695
	5825	17.786
802.11ac40	5755	36.519
	5795	36.465
802.11ac80	5775	76.039
802.11n(HT20)	5745	17.719
	5785	17.743
	5825	17.769
802.11n(HT40)	5755	36.522
	5795	36.458

Test Graph

5150-5250MHz

802.11a-5180

802.11a-5200

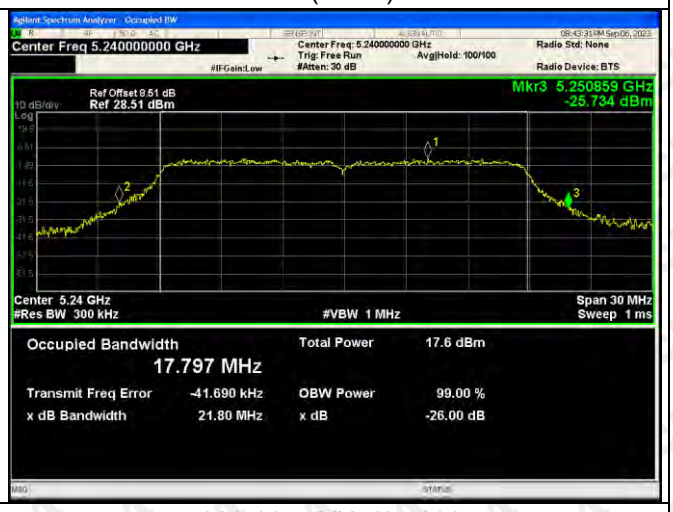
802.11a-5240

802.11ac(VH20)-5180

802.11ac(VH20)-5200

802.11ac(VH20)-5240

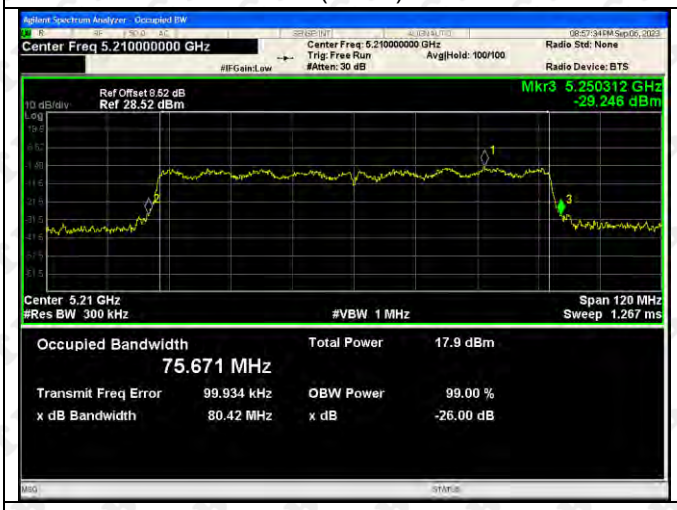
802.11ac(VH40)-5190



802.11ac(VH40)-5230

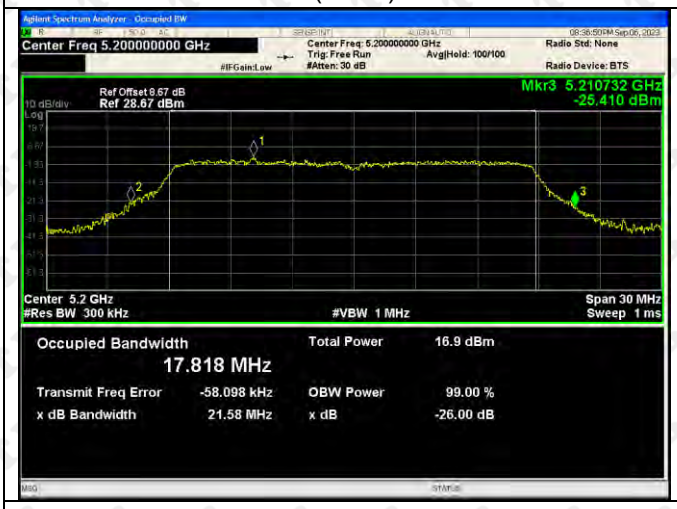
802.11ac(VH80)-5210

802.11n(HT20)-5180

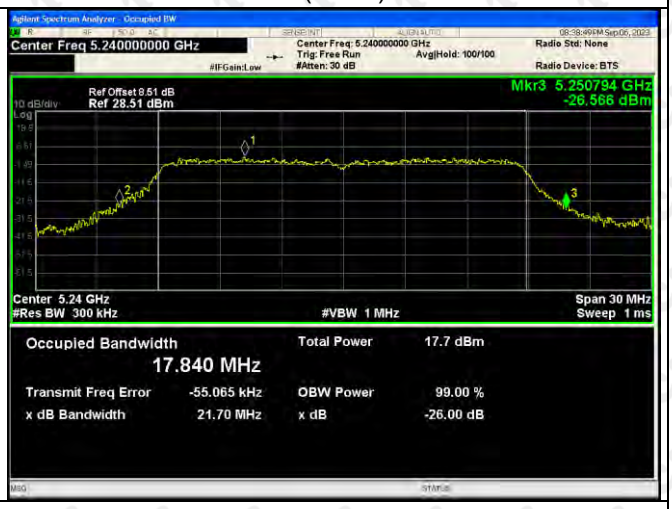


802.11n(HT20)-5200

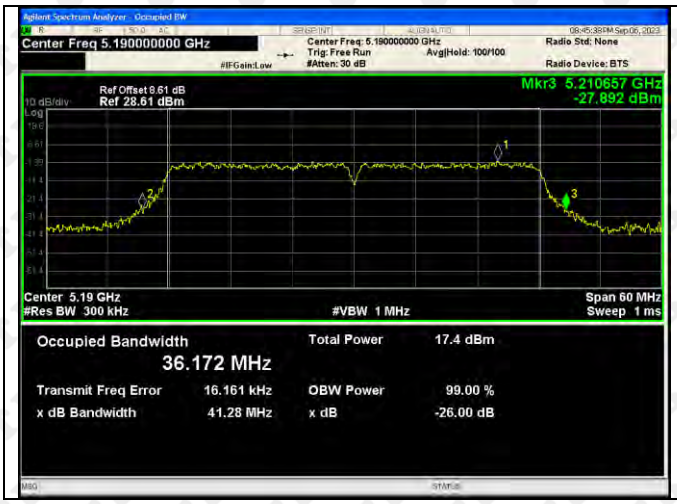
802.11n(HT20)-5240

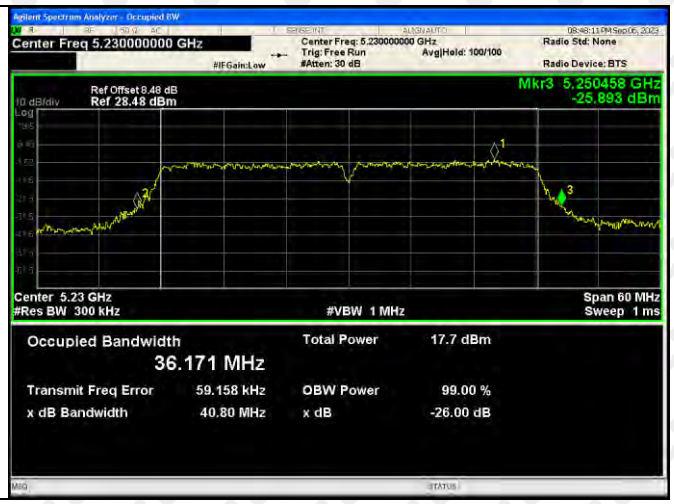


802.11n(HT40)-5190



802.11n(HT40)-5230

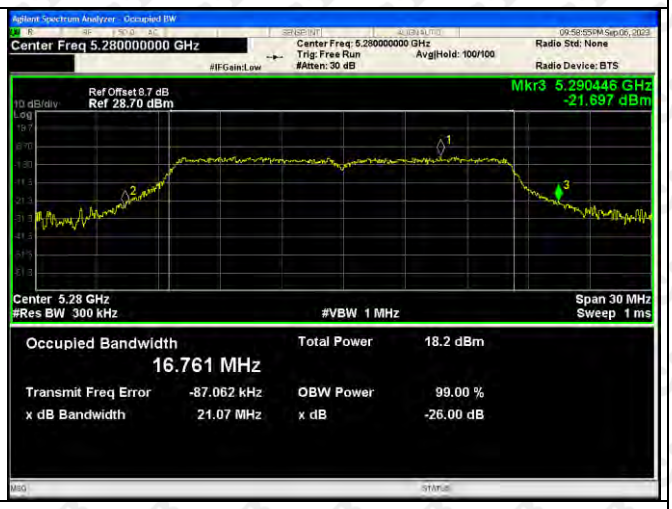

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.190000000 GHz
Center Freq: 5.190000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 8.61 dB
10 dB/div
Ref 28.61 dBm
Mkr3 5.210657 GHz
-27.892 dBm
Center 5.19 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.172 MHz
Total Power 17.4 dBm
Transmit Freq Error 16.161 kHz
OBW Power 99.00 %
x dB Bandwidth 41.28 MHz
x dB -26.00 dB


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.230000000 GHz
Center Freq: 5.230000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 8.48 dB
10 dB/div
Ref 28.48 dBm
Mkr3 5.250458 GHz
-25.893 dBm
Center 5.23 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.171 MHz
Total Power 17.7 dBm
Transmit Freq Error 59.158 kHz
OBW Power 99.00 %
x dB Bandwidth 40.80 MHz
x dB -26.00 dB

5250-5350MHz

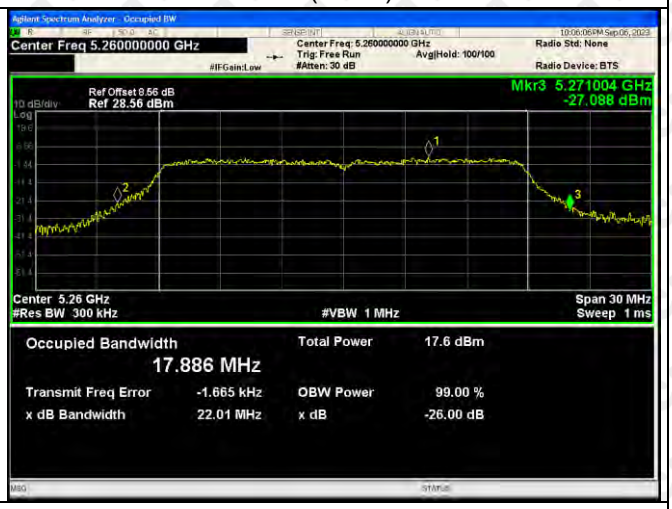
802.11a-5260

802.11a-5280



802.11a-5320

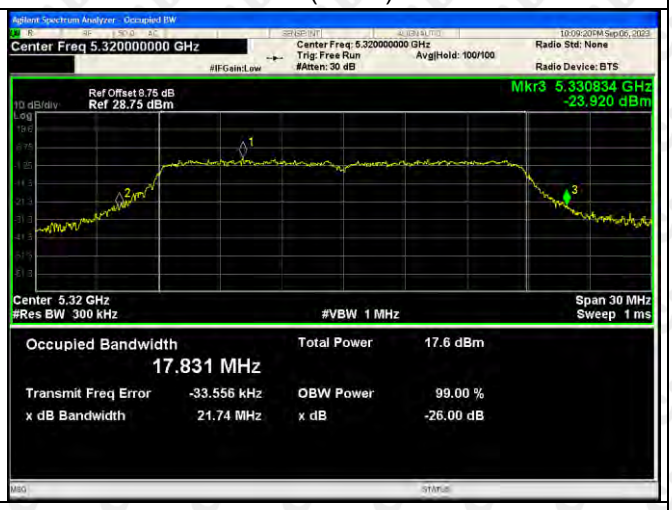
802.11ac(VH20)-5260



802.11ac(VH20)-5280

802.11ac(VH20)-5320

802.11ac(VH40)-5270

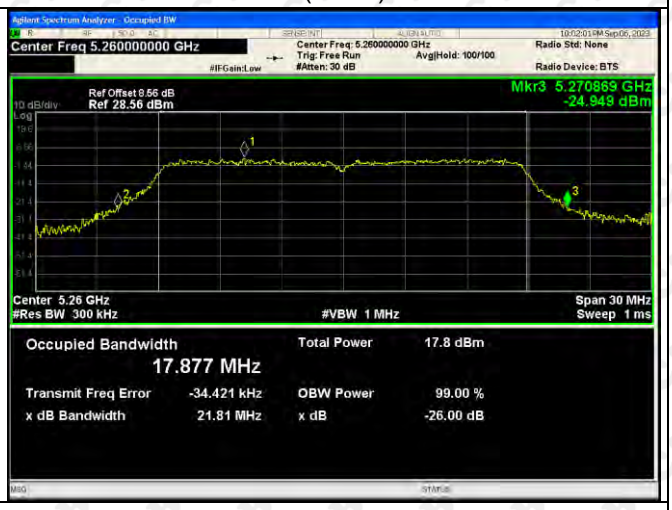


802.11ac(VH40)-5310

802.11ac(VH80)-5290

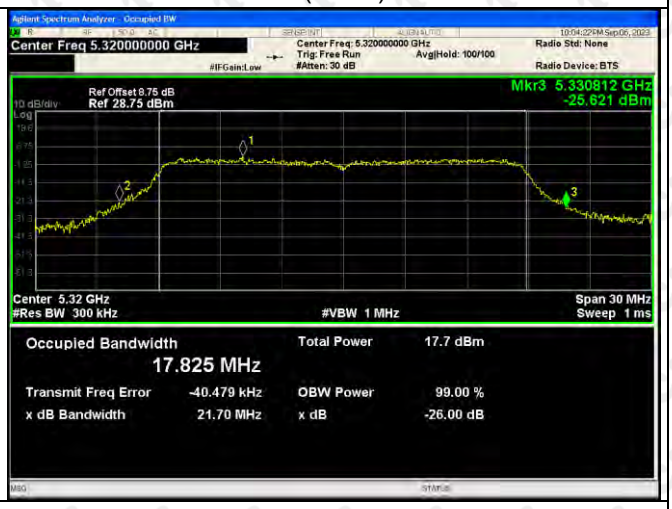
802.11n(HT20)-5260

802.11n(HT20)-5280

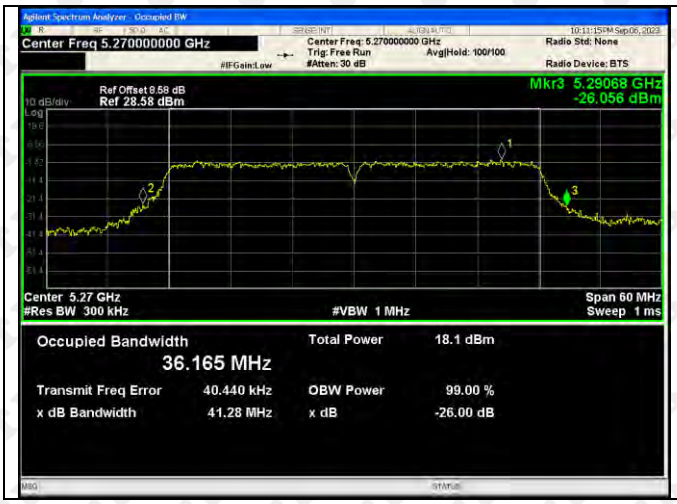


802.11n(HT20)-5320

802.11n(HT40)-5270



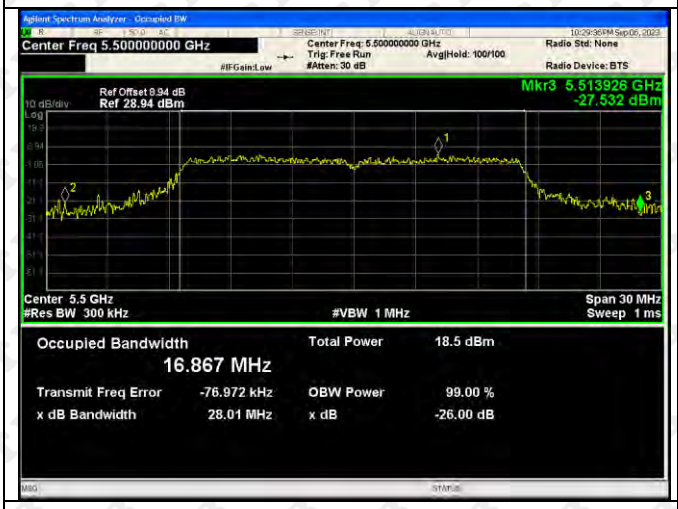
802.11n(HT40)-5310


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.270000000 GHz
Center Freq: 5.270000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 8.58 dB
10 dB/div
Ref 28.58 dBm
Mkr3 5.29068 GHz
-26.056 dBm
Center 5.27 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.165 MHz
Total Power 18.1 dBm
Transmit Freq Error 40.440 kHz
OBW Power 99.00 %
x dB Bandwidth 41.28 MHz
x dB -26.00 dB

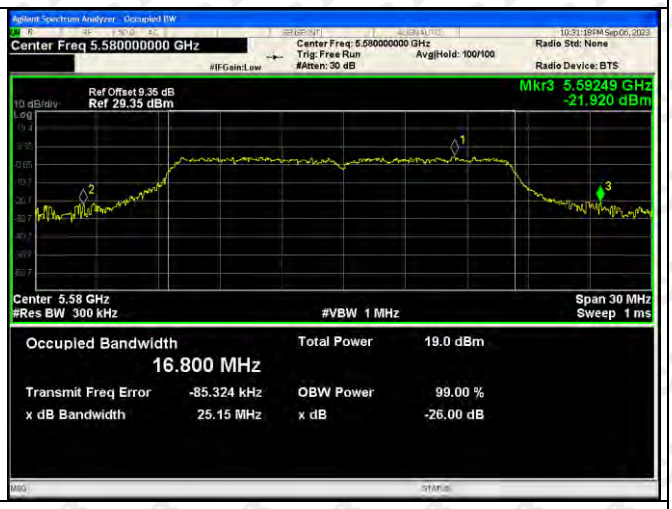

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.310000000 GHz
Center Freq: 5.310000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 8.93 dB
10 dB/div
Ref 28.93 dBm
Mkr3 5.330939 GHz
-27.168 dBm
Center 5.31 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.244 MHz
Total Power 18.4 dBm
Transmit Freq Error 20.873 kHz
OBW Power 99.00 %
x dB Bandwidth 41.84 MHz
x dB -26.00 dB

5470-5725MHz

802.11a-5500



802.11a-5580



802.11a-5700

802.11ac(VH20)-5500

802.11ac(VH20)-5580

802.11ac(VH20)-5700

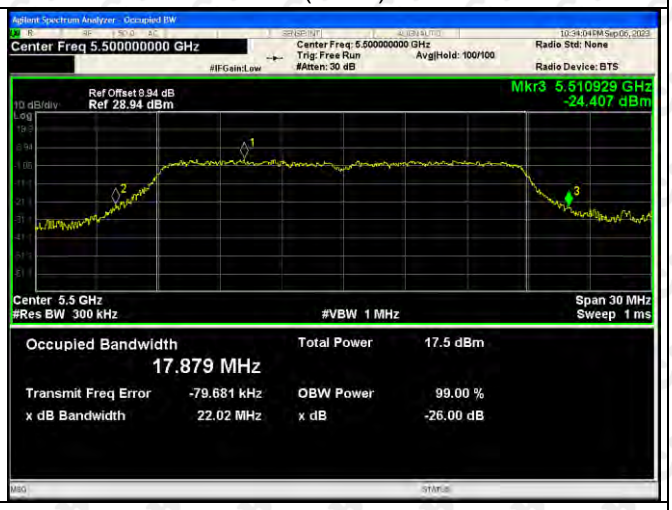
802.11ac(VH40)-5510

802.11ac(VH40)-5670

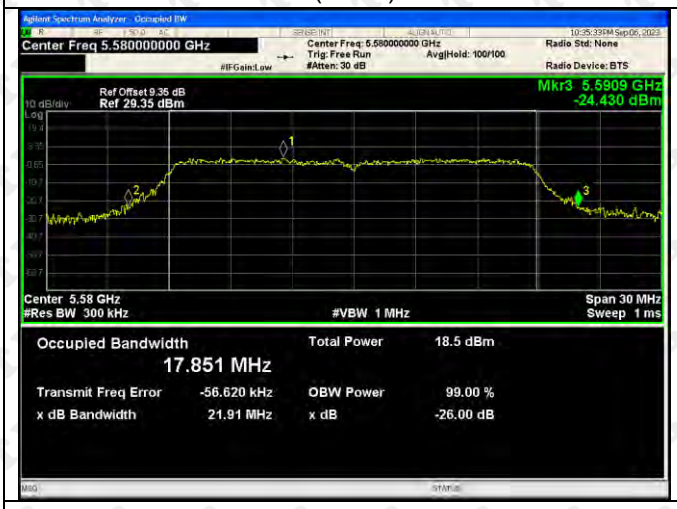
802.11ac(VH80)-5530

802.11n(HT20)-5500

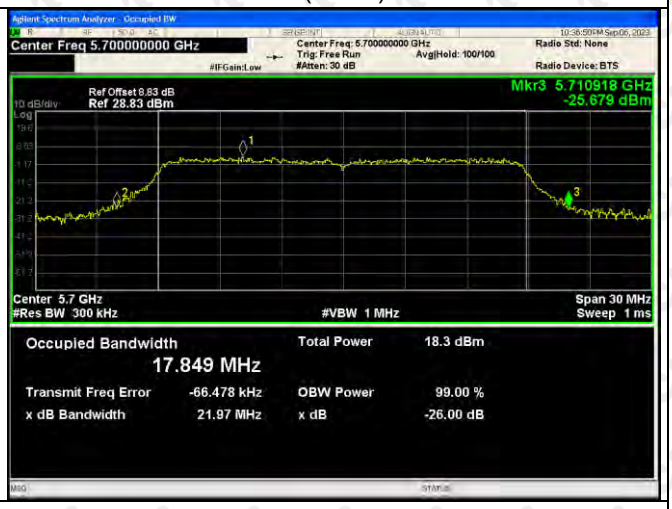
802.11n(HT20)-5580



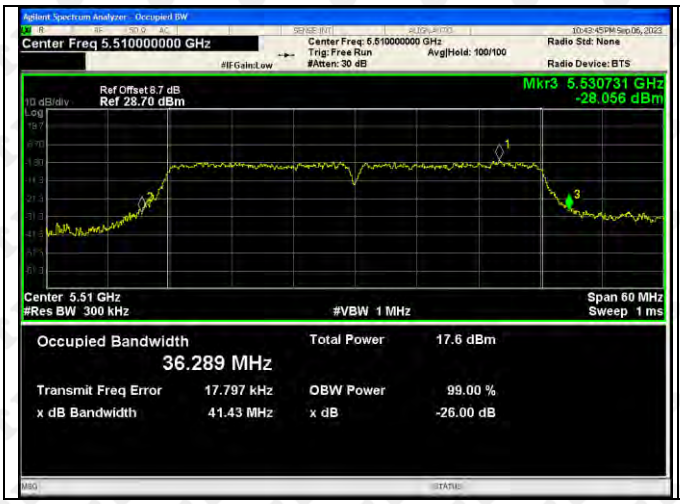
802.11n(HT20)-5700



802.11n(HT40)-5510



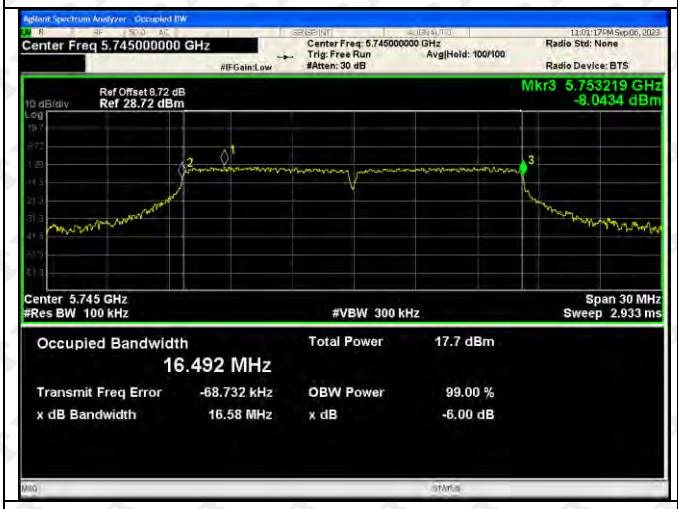
802.11n(HT40)-5670


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.510000000 GHz
Center Freq: 5.510000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 8.7 dB
10 dB/div
Ref 28.70 dBm
Mkr3 5.530731 GHz
-28.056 dBm
Center 5.51 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.289 MHz
Total Power 17.6 dBm
Transmit Freq Error 17.797 kHz
OBW Power 99.00 %
x dB Bandwidth 41.43 MHz
x dB -26.00 dB

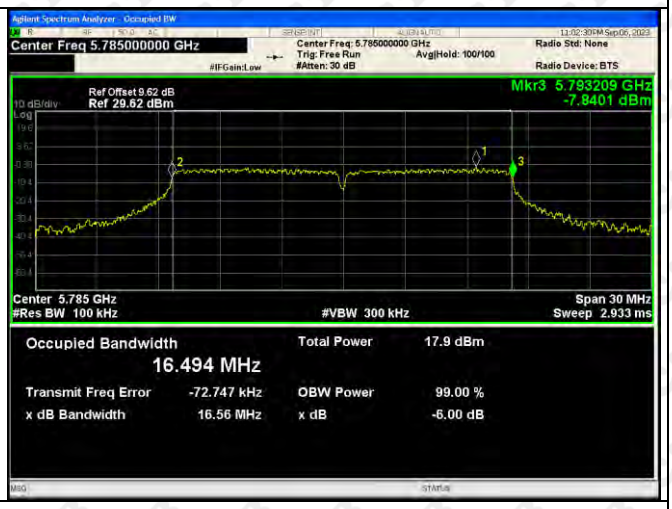

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.670000000 GHz
Center Freq: 5.670000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 9 dB
10 dB/div
Ref 29.00 dBm
Mkr3 5.690875 GHz
-28.755 dBm
Center 5.67 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.229 MHz
Total Power 18.6 dBm
Transmit Freq Error -12.996 kHz
OBW Power 99.00 %
x dB Bandwidth 41.78 MHz
x dB -26.00 dB

5725-5850MHz

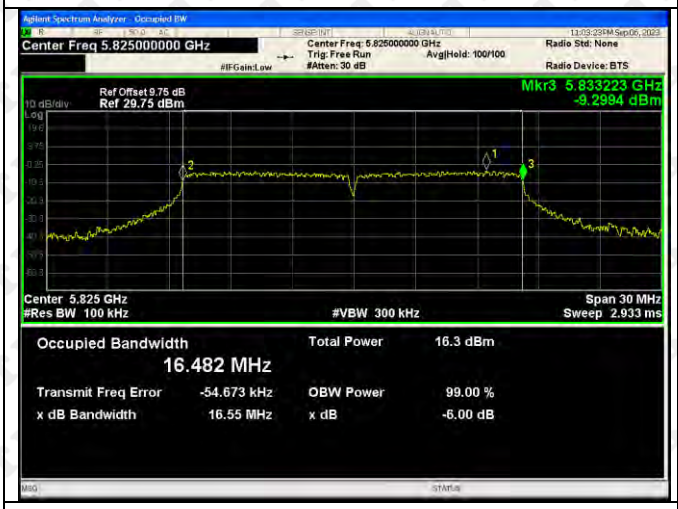
802.11a-5745



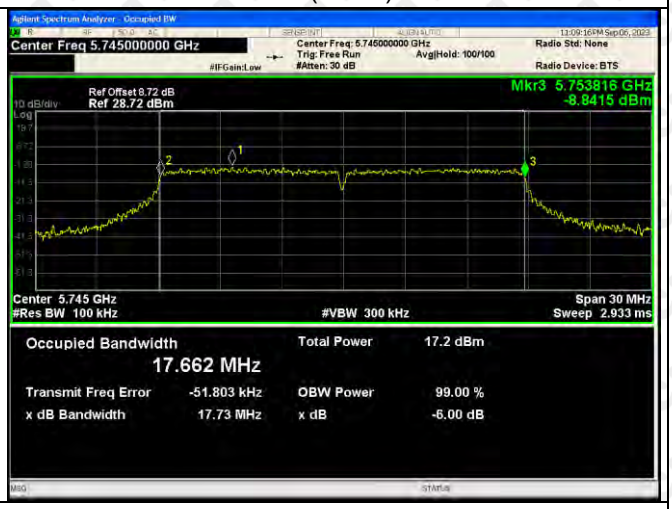
802.11a-5785



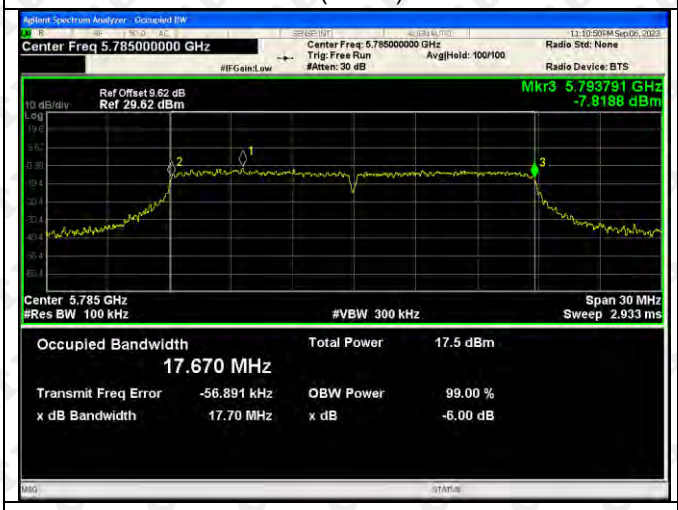
802.11a-5825



802.11ac(VH20)-5745



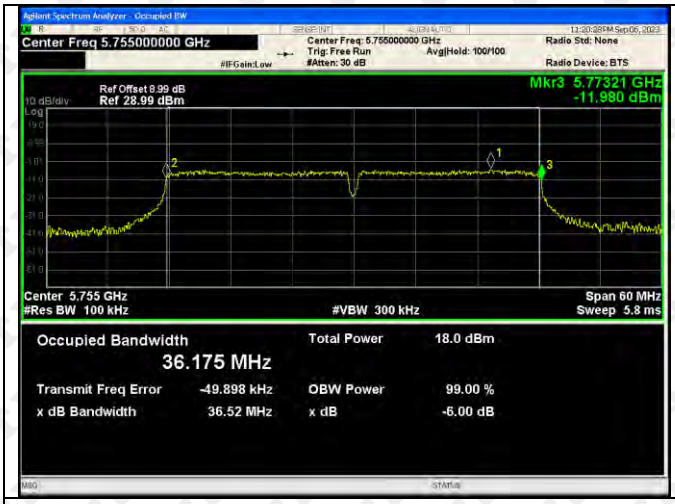
802.11ac(VH20)-5785



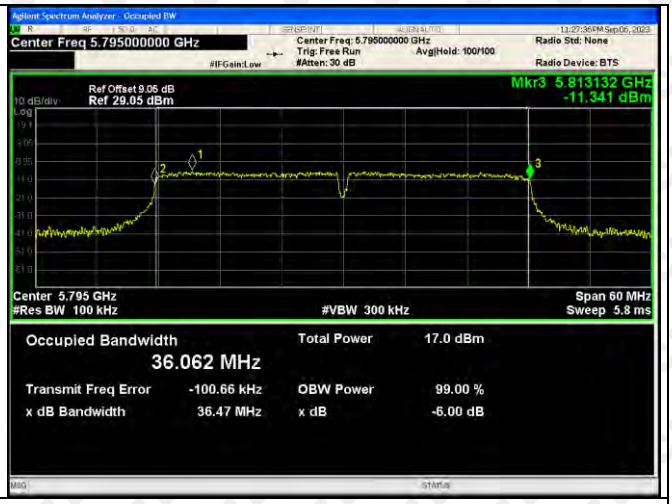
802.11ac(VH20)-5825

802.11ac(VH40)-5755

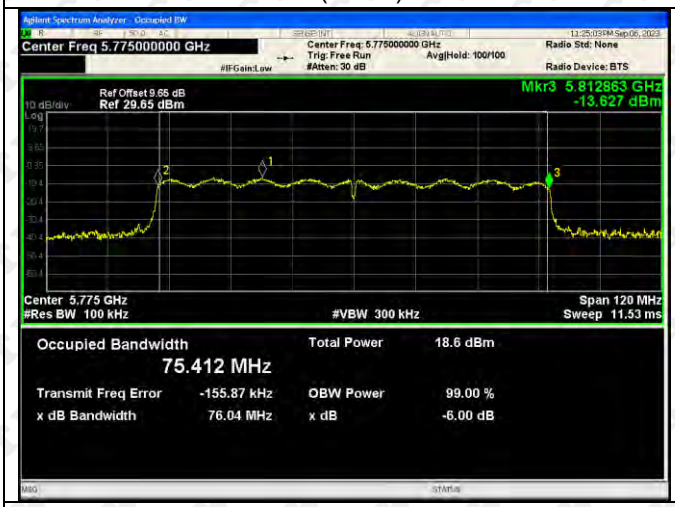
802.11ac(VH40)-5795



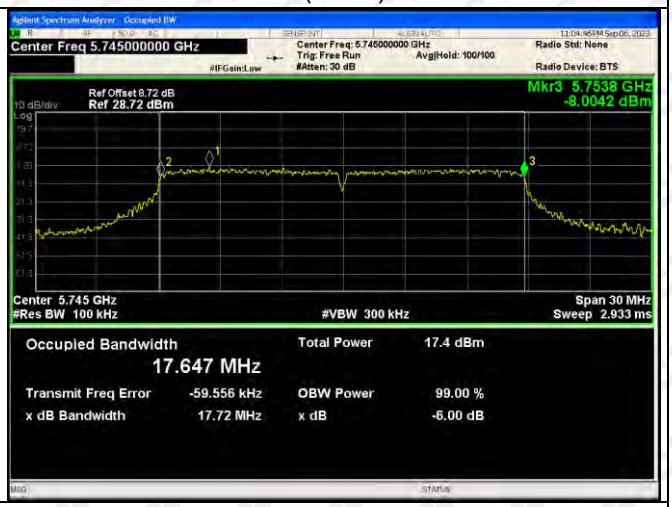
802.11ac(VH80)-5775



802.11n(HT20)-5745



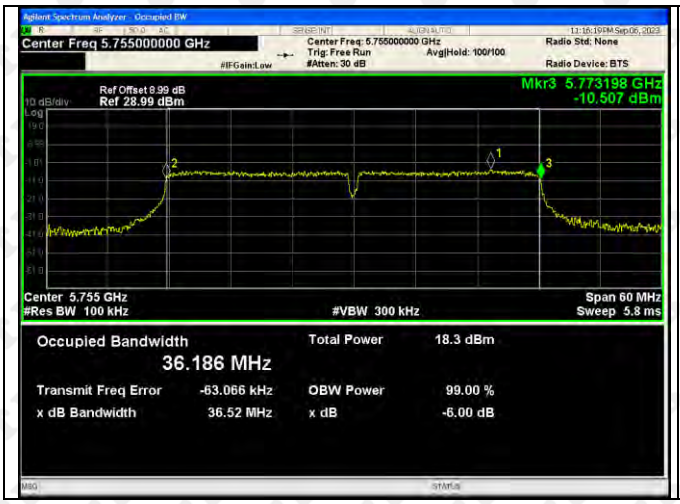
802.11n(HT20)-5785

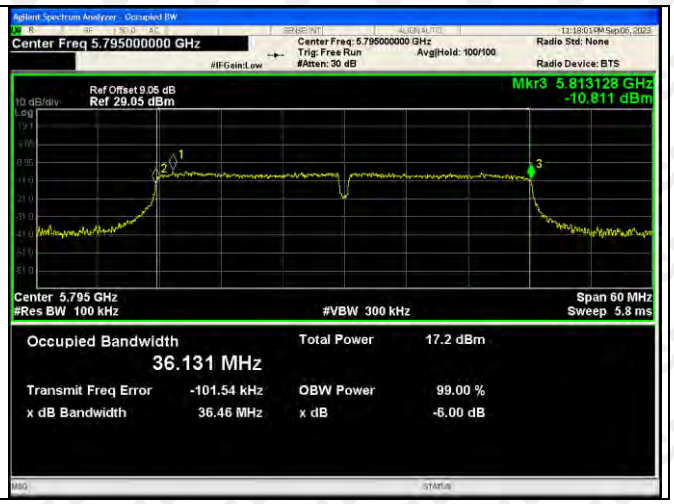


802.11n(HT20)-5825

802.11n(HT40)-5755

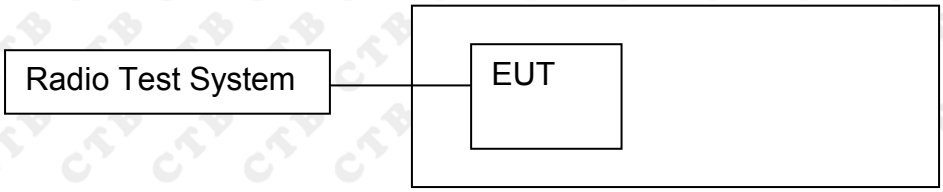
802.11n(HT40)-5795


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.755000000 GHz
Center Freq: 5.755000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 8.99 dB
10 dB/div
Ref 28.99 dBm
Mkr3 5.773198 GHz
-10.507 dBm
Center 5.755 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
Occupied Bandwidth
36.186 MHz
Total Power 18.3 dBm
Transmit Freq Error -63.066 kHz
OBW Power 99.00 %
x dB Bandwidth 36.52 MHz
x dB -6.00 dB


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.795000000 GHz
Center Freq: 5.795000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 9.05 dB
10 dB/div
Ref 29.05 dBm
Mkr3 5.813128 GHz
-10.811 dBm
Center 5.795 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
Occupied Bandwidth
36.131 MHz
Total Power 17.2 dBm
Transmit Freq Error -101.54 kHz
OBW Power 99.00 %
x dB Bandwidth 36.46 MHz
x dB -6.00 dB

11. POWER SPECTRAL DENSITY

11.1 Block Diagram Of Test Setup



11.2 Limit

(1) For the band 5.15-5.25 GHz.

(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. 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.

11.3 Test procedure

According to KDB789033 D02v02r01 sectionE, the following is the measurement procedure.

For devices operating in the bands 5.15−5.25 GHz, 5.25−5.35 GHz, and 5.47−5.725 GHz, the preceding procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 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 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 ≥ 1/*T*, where *T* is defined in II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 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 (1MHz/RBW) to the measured result, whereas RBW (< 1 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 II.F.5.c) and II.F.5.d), since RBW=100 kHz is available on nearly all spectrum analyzers.

11.4 Test Result

5150-5250MHz:

Test mode	Test Channel (MHz)	PSD [dBm/MHz]	Limit [dBm/MHz]	Result
802.11a	5180	0.438	11	Pass
	5200	0.934	11	Pass
	5240	1.105	11	Pass
802.11ac(VH20)	5180	-0.327	11	Pass
	5200	-0.108	11	Pass
	5240	0.61	11	Pass
802.11ac(VH40)	5190	-3.056	11	Pass
	5230	-2.623	11	Pass
802.11ac(VH80)	5210	-4.516	11	Pass
802.11n(HT20)	5180	-0.145	11	Pass
	5200	0.17	11	Pass
	5240	0.451	11	Pass
802.11n(HT40)	5190	-2.976	11	Pass
	5230	-2.501	11	Pass

5250-5350 MHz

Test mode	Test Channel (MHz)	PSD [dBm/MHz]	Limit [dBm/MHz]	Result
802.11a	5260	1.027	11	Pass
	5280	1.295	11	Pass
	5320	1.222	11	Pass
802.11ac(VH20)	5260	0.962	11	Pass
	5280	1.087	11	Pass
	5320	0.477	11	Pass
802.11ac(VH40)	5270	-1.935	11	Pass
	5310	-1.79	11	Pass
802.11ac(VH80)	5260	-3.649	11	Pass
802.11n(HT20)	5280	0.932	11	Pass
	5320	1.191	11	Pass
	5270	0.591	11	Pass
802.11n(HT40)	5310	-1.896	11	Pass
	5290	-1.772	11	Pass

5500-5700MHz

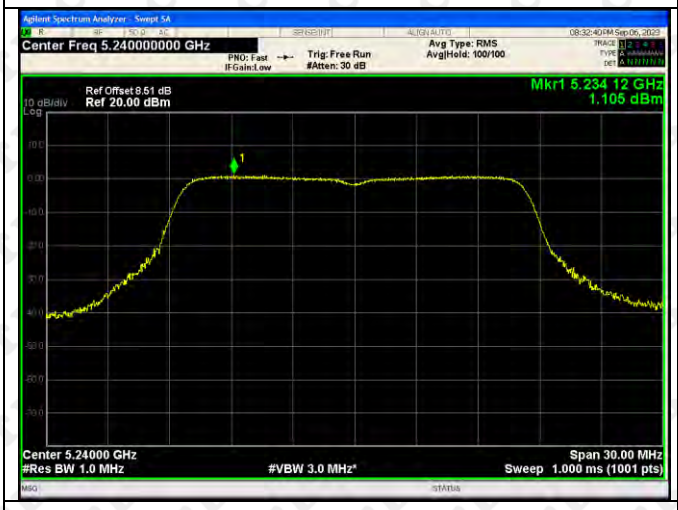
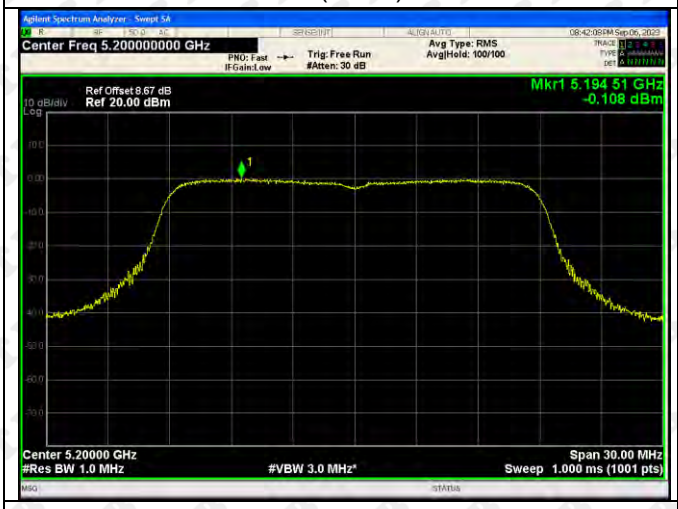
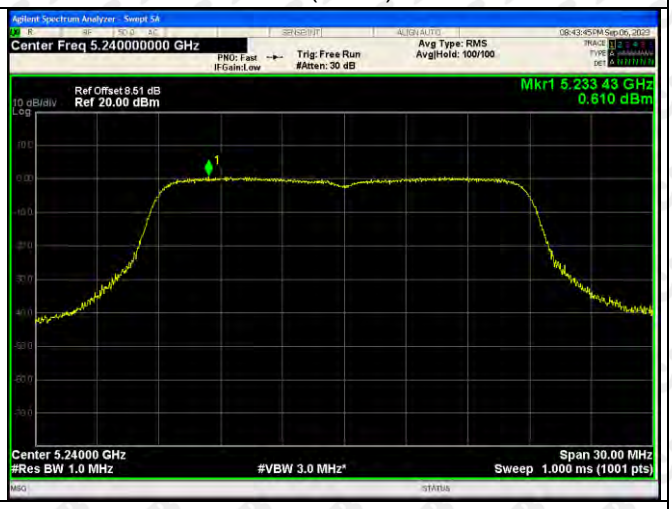
Test mode	Test Channel (MHz)	PSD [dBm/MHz]	Limit [dBm/MHz]	Result
802.11a	5500	2.246	11	Pass
	5580	2.42	11	Pass
	5700	1.686	11	Pass
802.11ac(VH20)	5500	1.532	11	Pass
	5580	1.881	11	Pass
	5700	1.979	11	Pass
802.11ac(VH40)	5510	-2.506	11	Pass
	5670	-1.652	11	Pass
802.11ac(VH80)	5530	-3.899	11	Pass
802.11n(HT20)	5500	0.528	11	Pass
	5580	1.54	11	Pass
	5700	1.413	11	Pass
802.11n(HT40)	5510	-2.716	11	Pass
	5670	-1.5	11	Pass

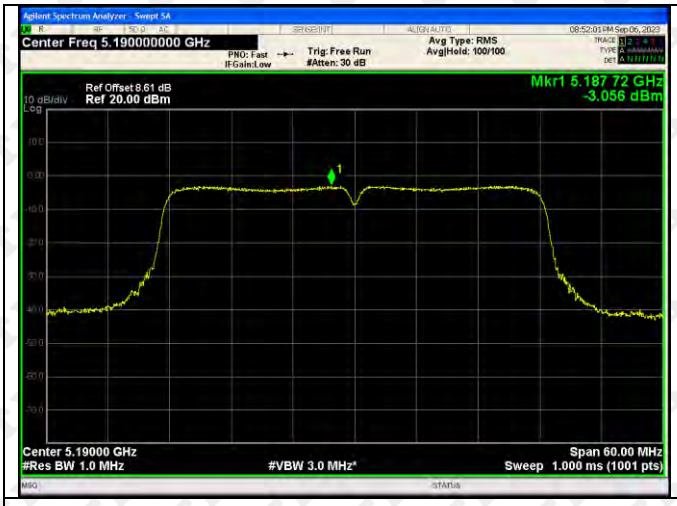
5725-5850 MHz

Test mode	Test Channel (MHz)	PSD [dBm/500kHz]	Limit [dBm/MHz]	Result
802.11a	5745	-1.986	30	Pass
	5785	-1.87	30	Pass
	5825	-3.182	30	Pass
802.11ac(VH20)	5745	-2.553	30	Pass
	5785	-2.035	30	Pass
	5825	-3.731	30	Pass
802.11ac(VH40)	5755	-4.862	30	Pass
	5795	-6.061	30	Pass
802.11ac(VH80)	5775	-6.677	30	Pass
802.11n(HT20)	5745	-2.316	30	Pass
	5785	-2.226	30	Pass
	5825	-3.833	30	Pass
802.11n(HT40)	5755	-4.831	30	Pass
	5795	-5.657	30	Pass

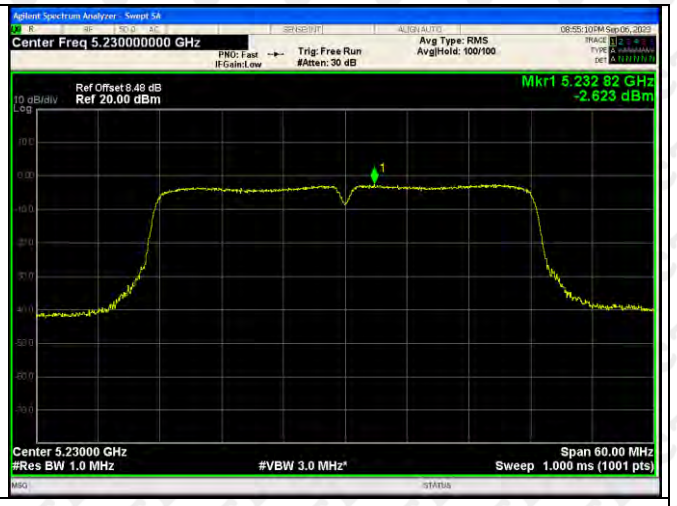
Test Graph

5150-5250MHz

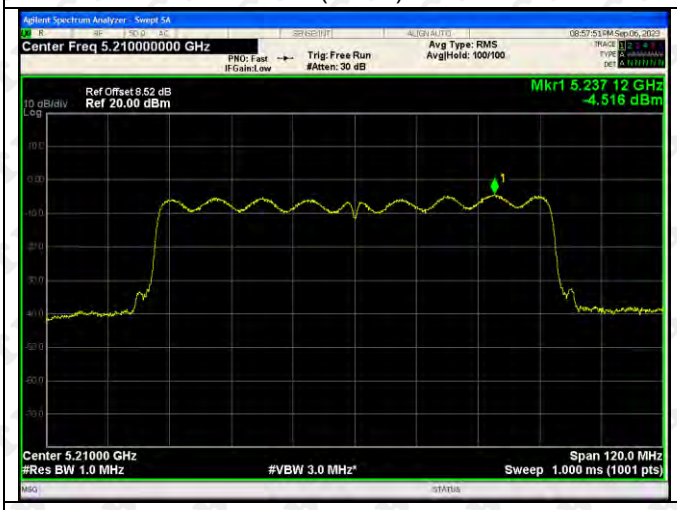
802.11a-5180	802.11a-5200
	
802.11a-5240	802.11ac(VH20)-5180
	
802.11ac(VH20)-5200	802.11ac(VH20)-5240
	
802.11ac(VH40)-5190	802.11ac(VH40)-5230



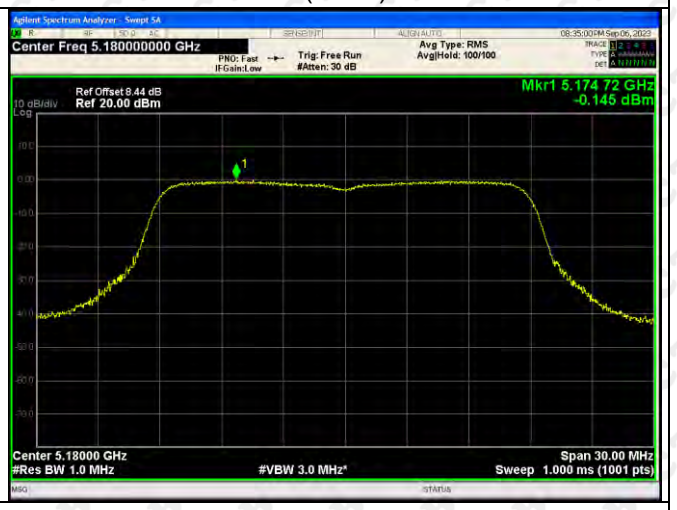
802.11ac(VH80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200

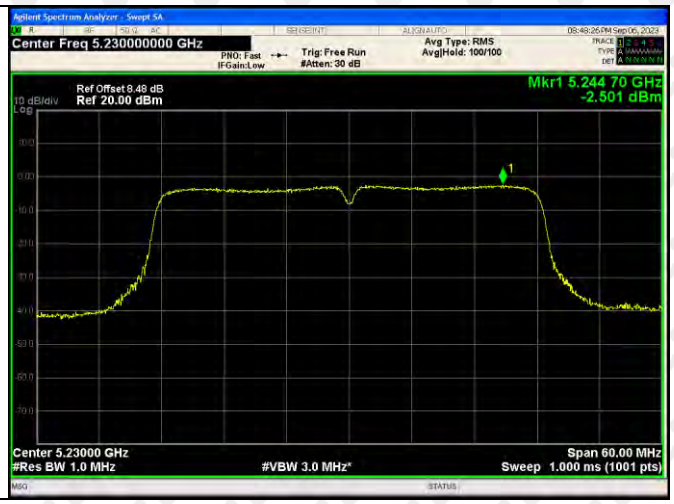


802.11n(HT20)-5240

802.11n(HT40)-5190

802.11n(HT40)-5230


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.190000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
Ref Offset 8.61 dB
10 dB/div
Ref 20.00 dBm
Mkr1 5.191 32 GHz
-2.976 dBm
Center 5.19000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)

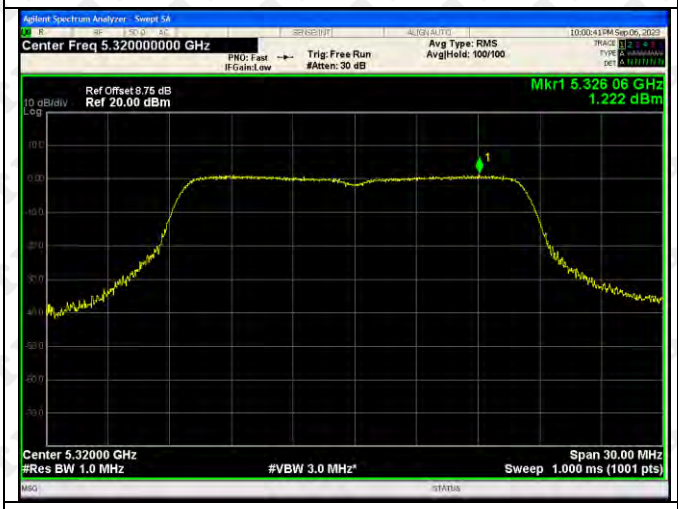

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.230000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
Ref Offset 8.48 dB
10 dB/div
Ref 20.00 dBm
Mkr1 5.244 70 GHz
-2.501 dBm
Center 5.23000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)

5250-5350MHz

802.11a-5260

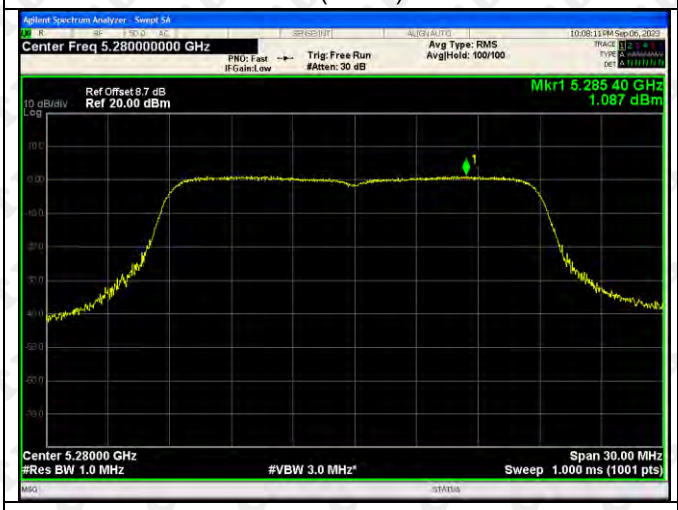
802.11a-5280

802.11a-5320



802.11ac(VH20)-5260

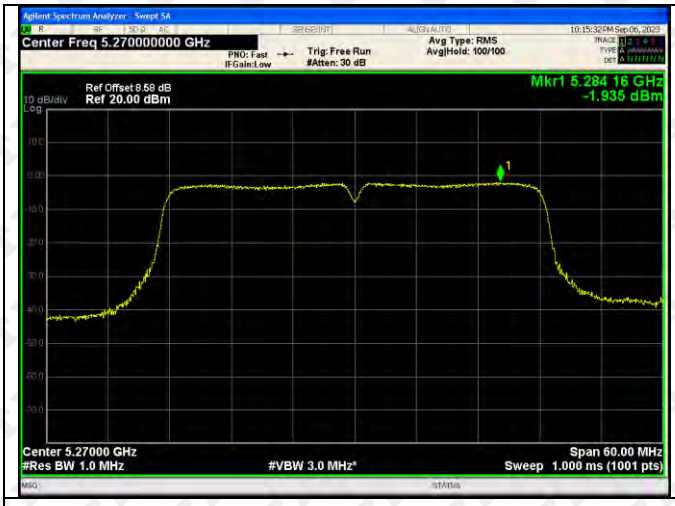
802.11ac(VH20)-5280



802.11ac(VH20)-5320

802.11ac(VH40)-5270

802.11ac(VH40)-5310

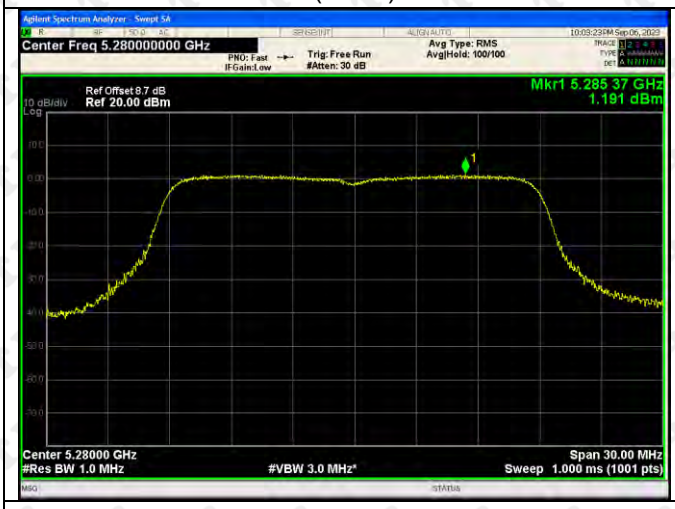


802.11ac(VH80)-5290

802.11n(HT20)-5260

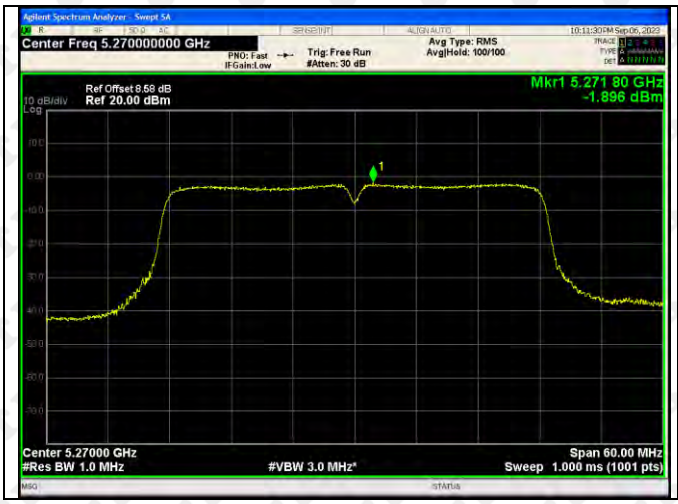
802.11n(HT20)-5280

802.11n(HT20)-5320



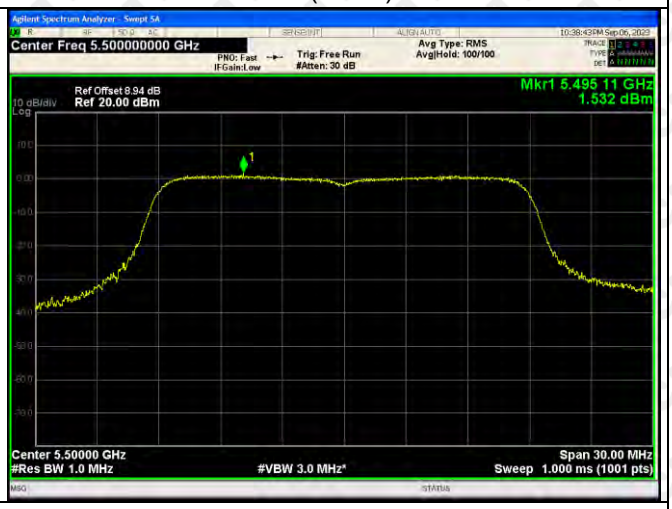
802.11n(HT40)-5270

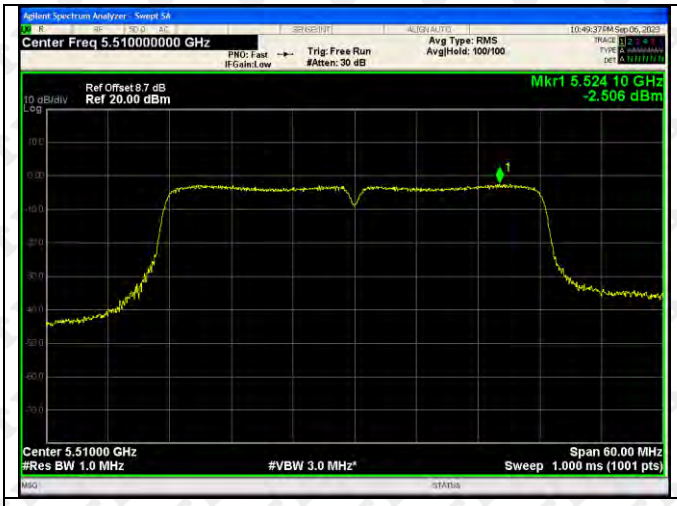
802.11n(HT40)-5310


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.270000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
10:11:30 PM Sep 06, 2023
Ref Offset 8.58 dB
10 dB/div
Ref 20.00 dBm
Mkr1 5.271 80 GHz
-1.896 dBm
Center 5.27000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.310000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
10:13:26 PM Sep 06, 2023
Ref Offset 8.93 dB
10 dB/div
Ref 20.00 dBm
Mkr1 5.295 66 GHz
-1.772 dBm
Center 5.31000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)

5470-5725MHz

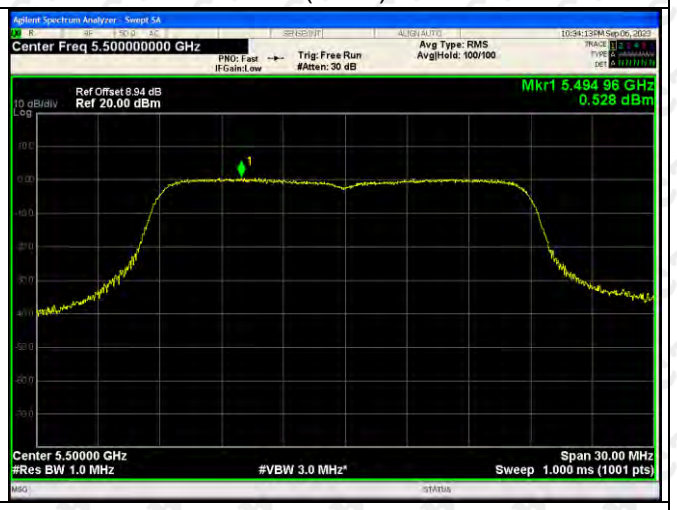
802.11a-5500	802.11a-5580
	
802.11a-5700	802.11ac(VH20)-5500
	
802.11ac(VH20)-5580	802.11ac(VH20)-5700
	
802.11ac(VH40)-5510	802.11ac(VH40)-5670



802.11ac(VH80)-5530

802.11n(HT20)-5500

802.11n(HT20)-5580



802.11n(HT20)-5700

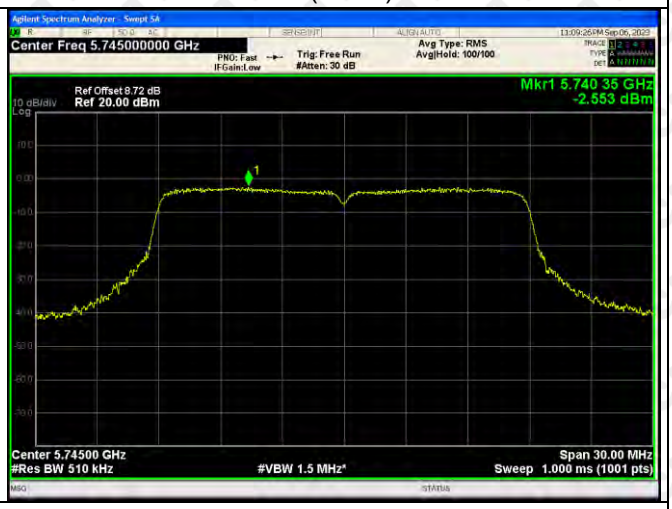
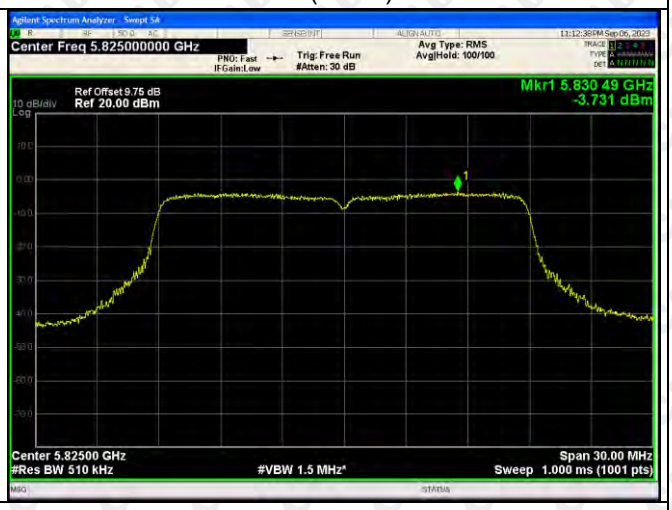
802.11n(HT40)-5510

802.11n(HT40)-5670


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.510000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
Ref Offset 8.7 dB
10 dB/div
Ref 20.00 dBm
Mkr1 5.526 02 GHz
-2.716 dBm
Center 5.51000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.670000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
Ref Offset 9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 5.656 56 GHz
-1.500 dBm
Center 5.67000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)

5725-5850MHz

802.11a-5745	802.11a-5785
	
802.11a-5825	802.11ac(VH20)-5745
	
802.11ac(VH20)-5785	802.11ac(VH20)-5825
	
802.11ac(VH40)-5755	802.11ac(VH40)-5795

802.11ac(VH80)-5775

802.11n(HT20)-5745

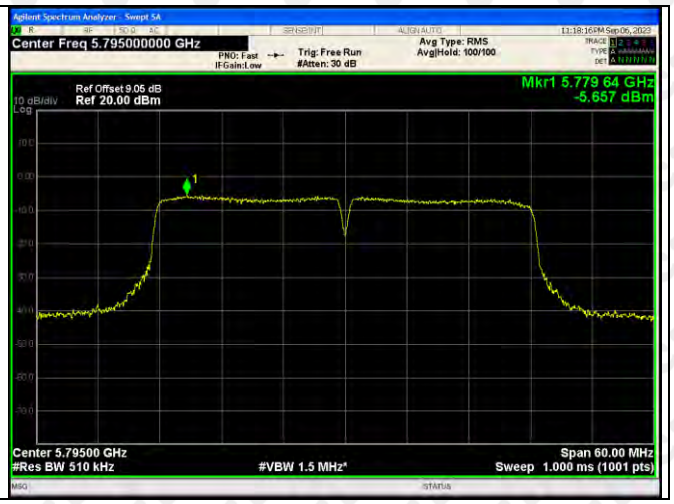
802.11n(HT20)-5785

802.11n(HT20)-5825

802.11n(HT40)-5755

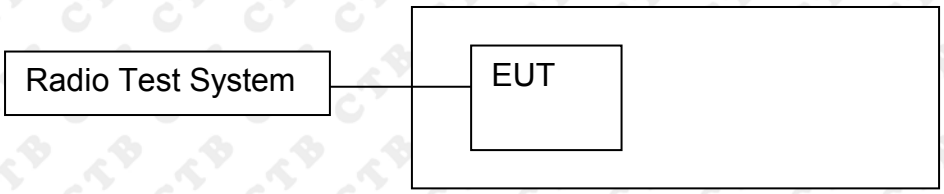
802.11n(HT40)-5795


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.755000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
11:16:34 PM Sep 06, 2023
Ref Offset 8.99 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 5.767 54 GHz
-4.831 dBm
Center 5.75500 GHz
#Res BW 510 kHz
#VBW 1.5 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.795000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
11:18:16 PM Sep 06, 2023
Ref Offset 9.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 5.779 64 GHz
-5.657 dBm
Center 5.79500 GHz
#Res BW 510 kHz
#VBW 1.5 MHz*
Span 60.00 MHz
Sweep 1.000 ms (1001 pts)

12. FREQUENCY STABILITY

12.1 Block Diagram Of Test Setup



12.2 Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

12.3 Test procedure

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.

2. Set EUT as normal operation.

3. Turn the EUT on and couple its output to spectrum.

4. Turn the EUT off and set the chamber to the highest temperature specified.

5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.

6. Repeat step with the temperature chamber set to the lowest temperature.

12.4 Test Result

Pass

13. OPERATION IN THE ABSENCE OF INFORMATION TO THE TRANSMIT

13.1 Requirement

15.407(c) requirement:
The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signal ling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

13.2 Test Results

Operation in the absence of information to the transmit:

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of WLAN message transmitting from remote device and verify whether it shall reconnect. (manufacturer declare)

14. ANTENNA REQUIREMENT

15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is FPC Antenna and no consideration of replacement. The best case gain of the antenna is WiFi (5.2G) : 2.71dBi, WiFi (5.3G) : 2.99dBi, WiFi (5.6G) : 2.27dBi, WiFi (5.8G) : 2.18dBi dBi.

15. EUT TEST SETUP PHOTOGRAPHS

Radiated Emission

Below 1G

Above 1G

Conducted Emission

※※※※※ END OF REPORT ※※※※※