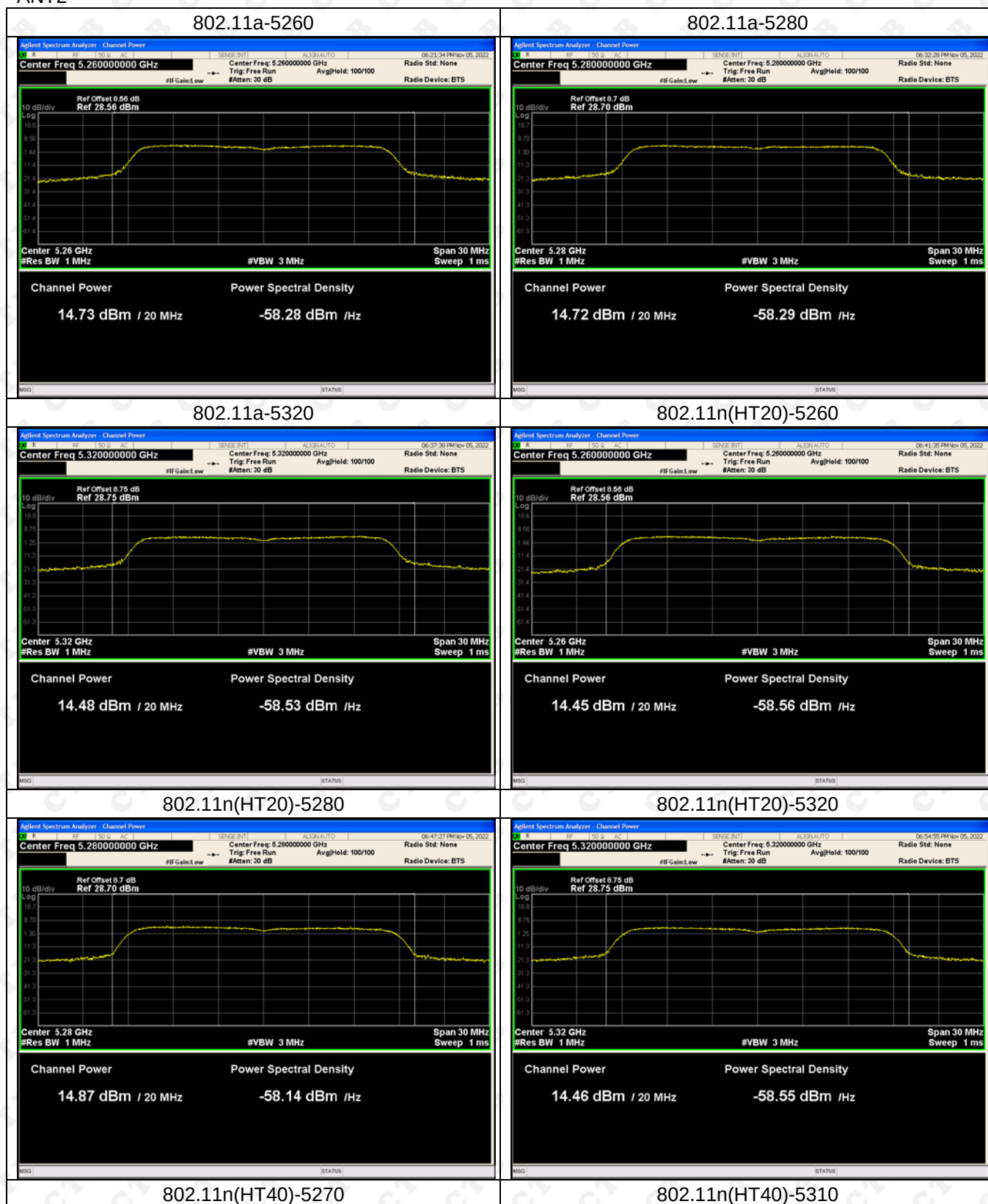
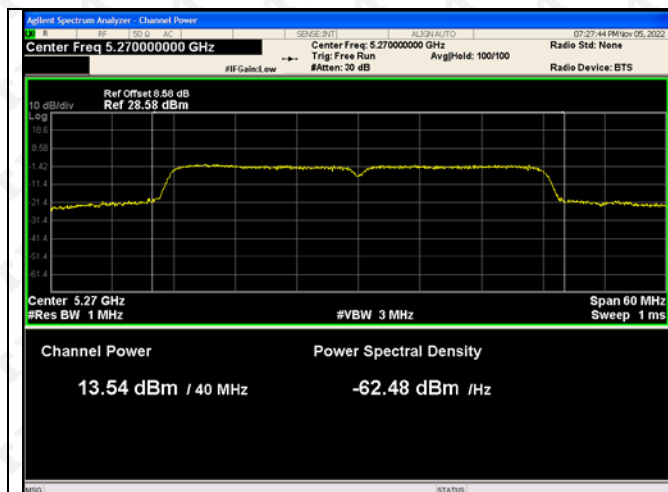
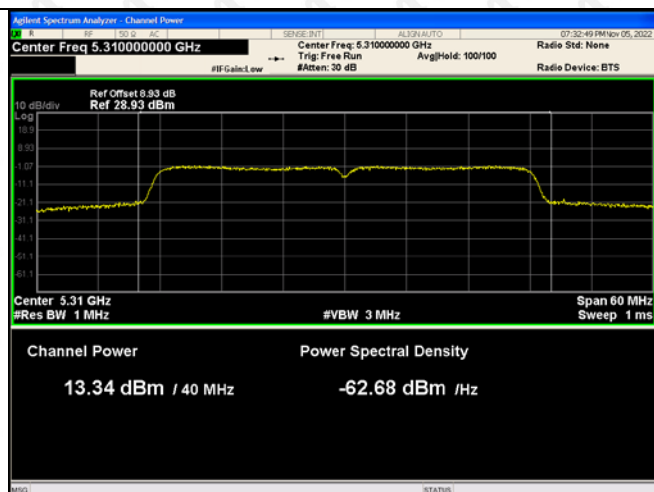


ANT2

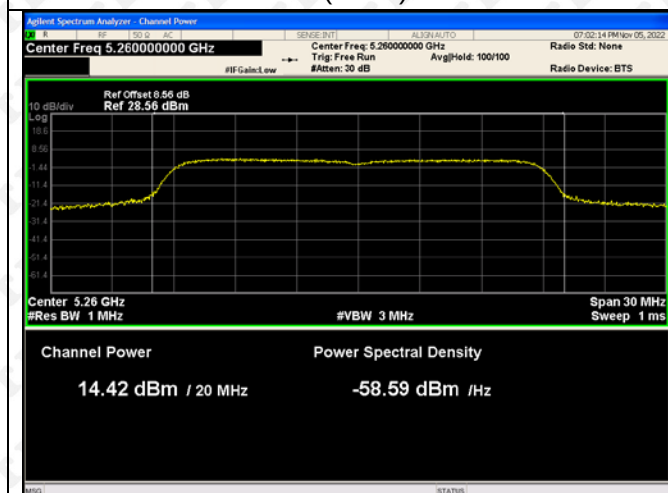




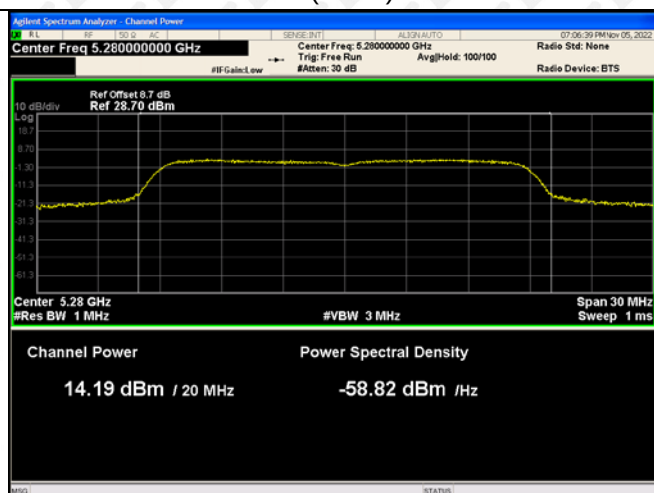
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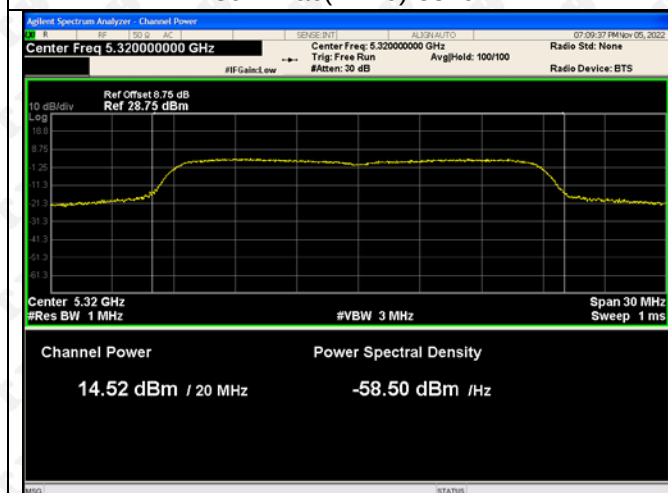
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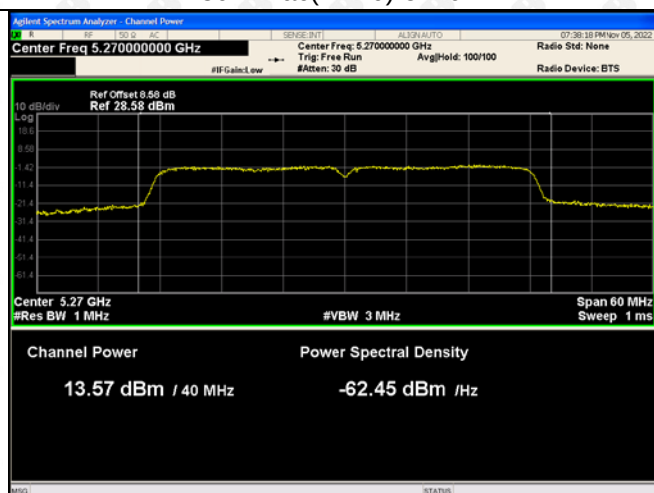
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802.11ac(VH40)-5270



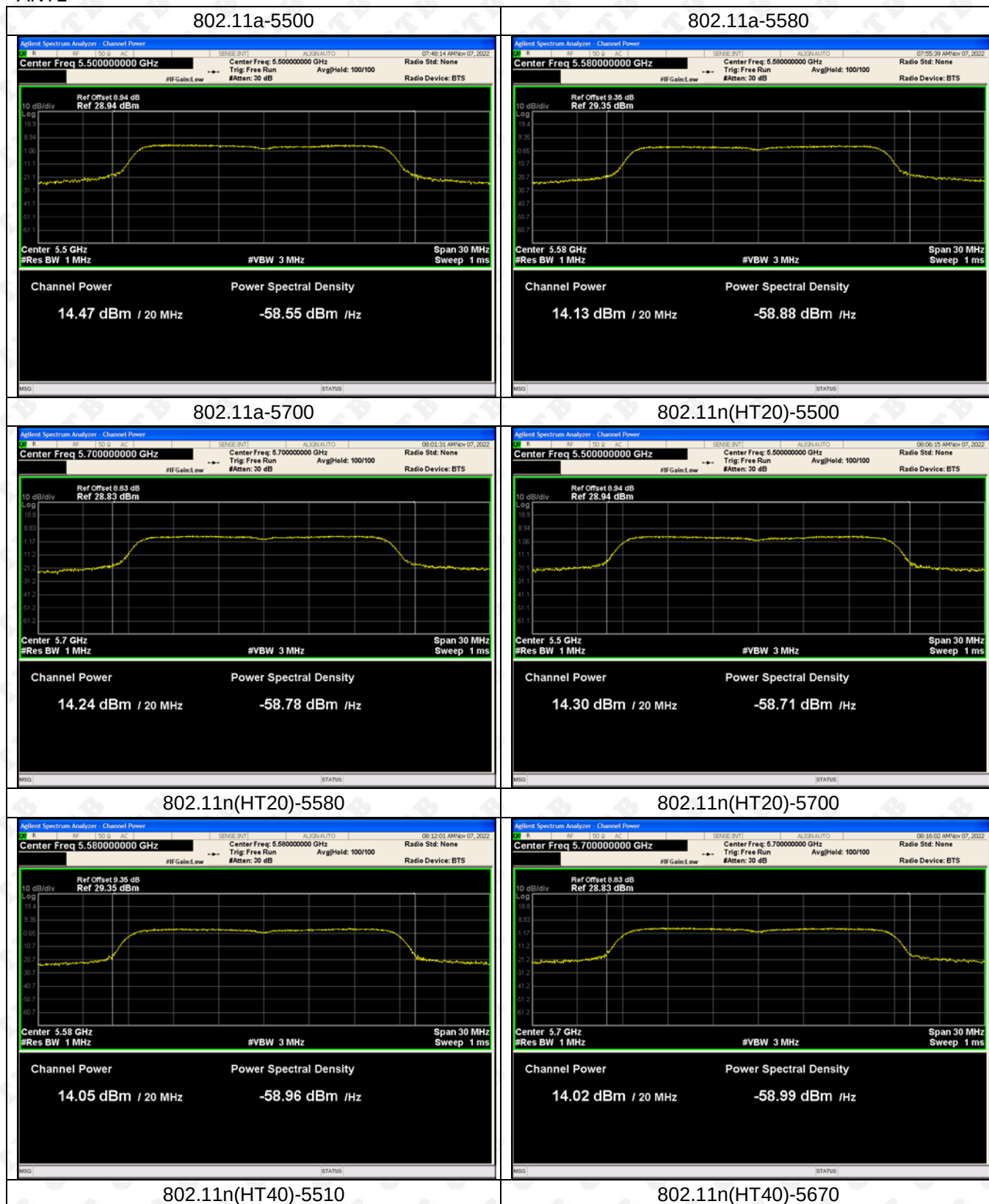
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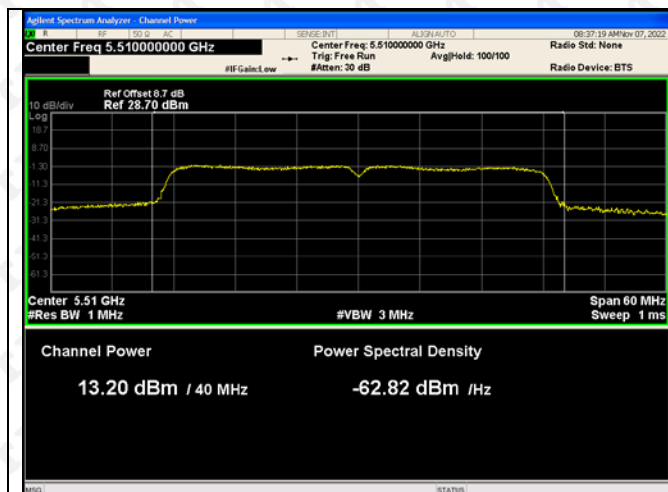


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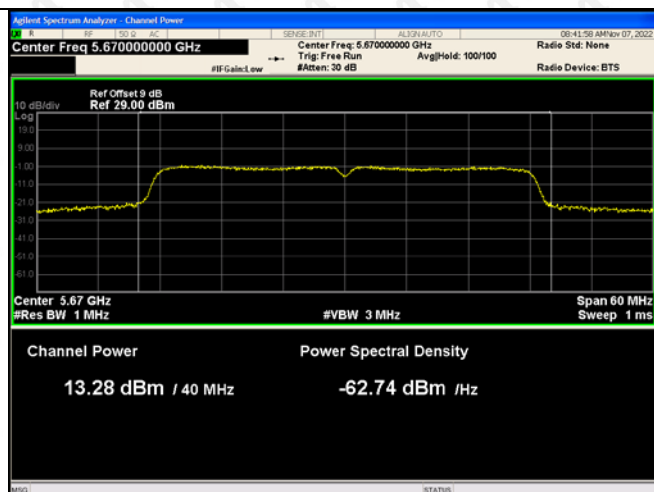


5500-5700MHz-Power ANT1

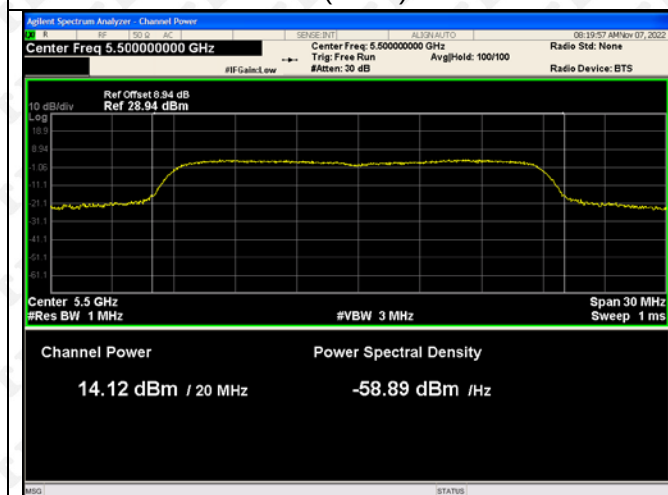




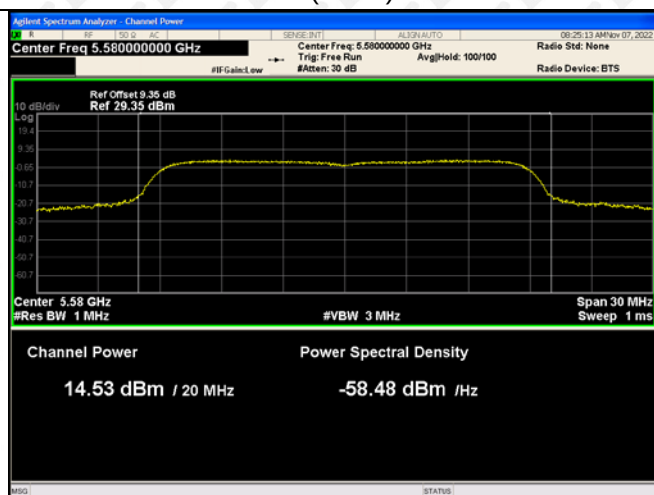
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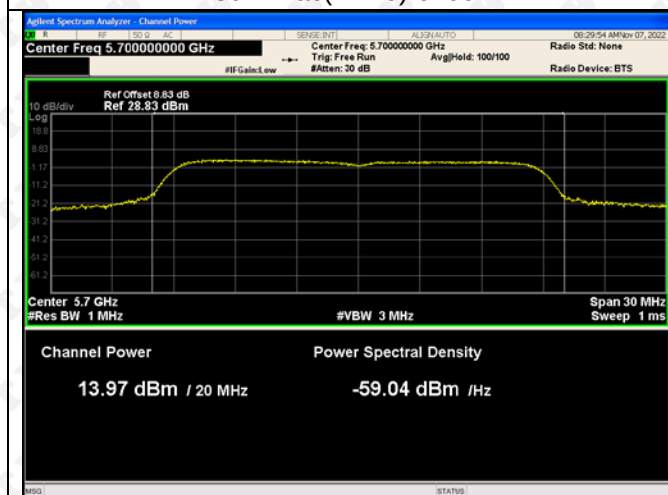
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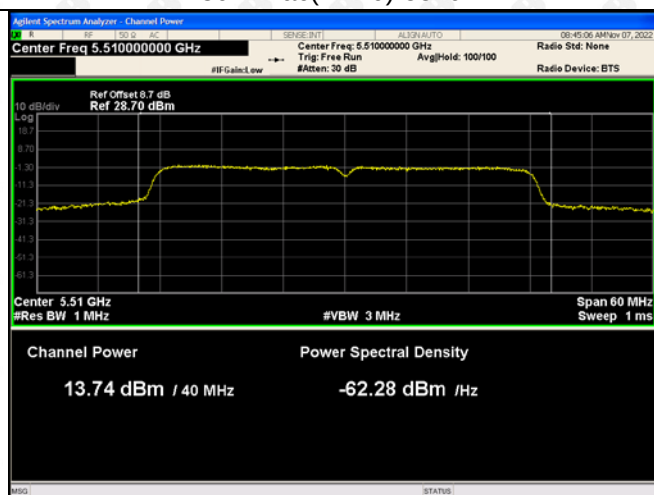
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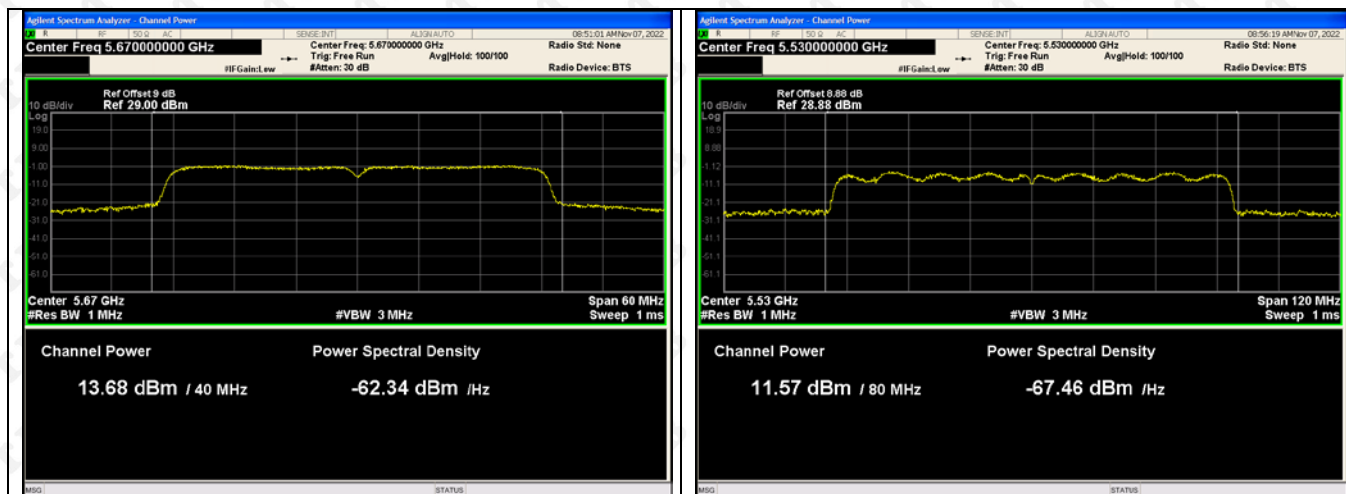
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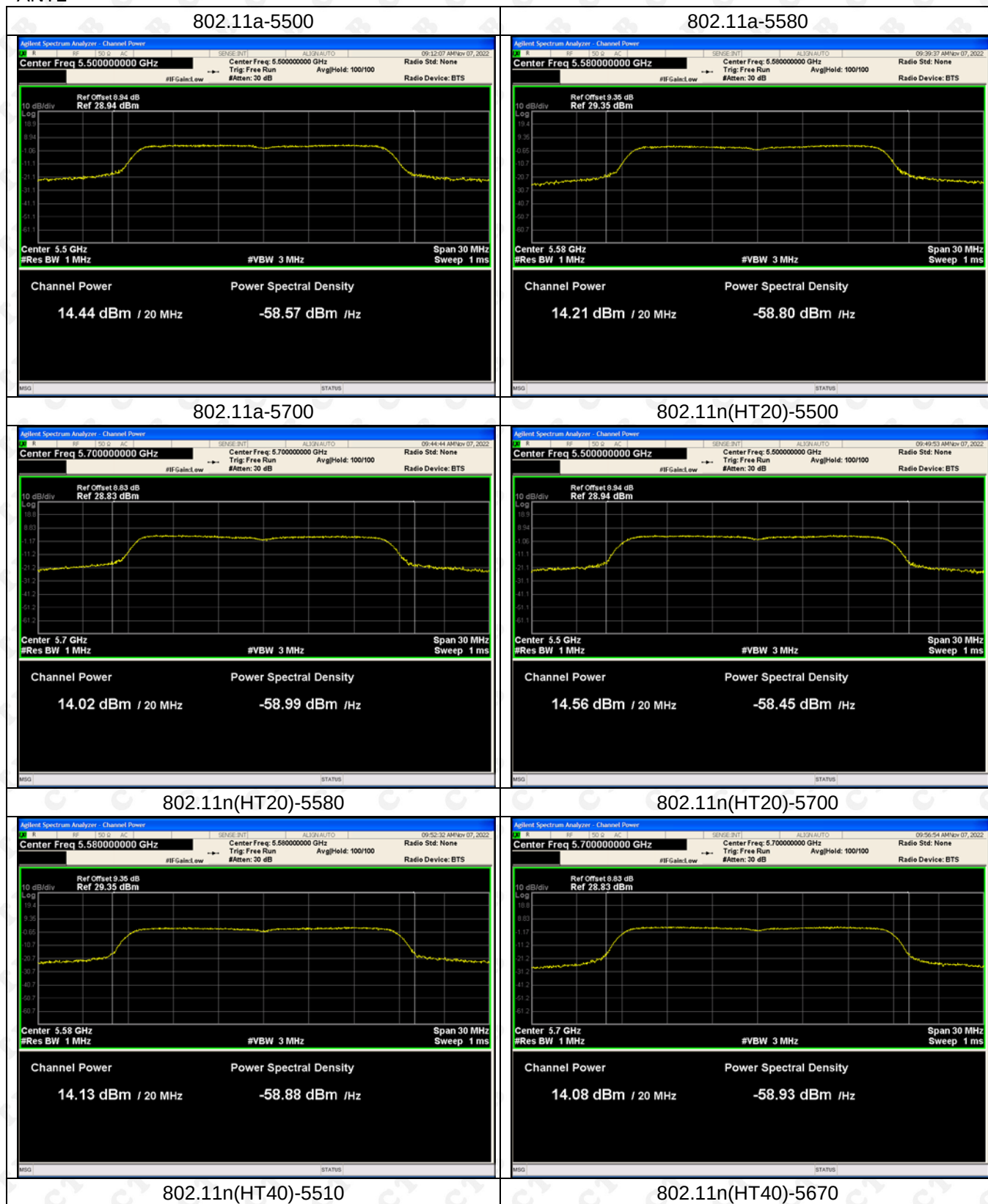
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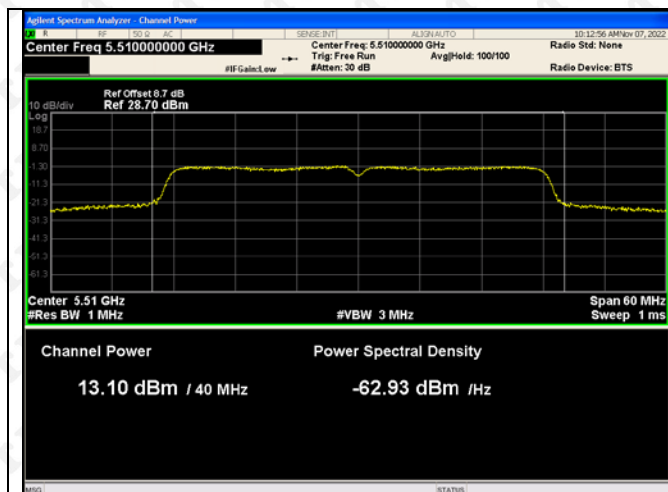


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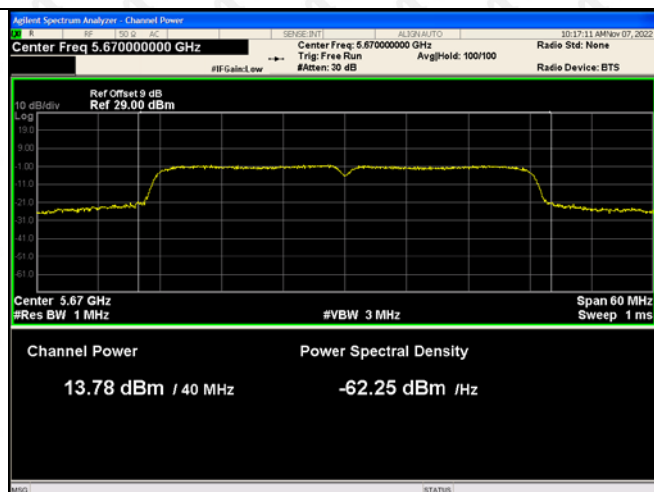


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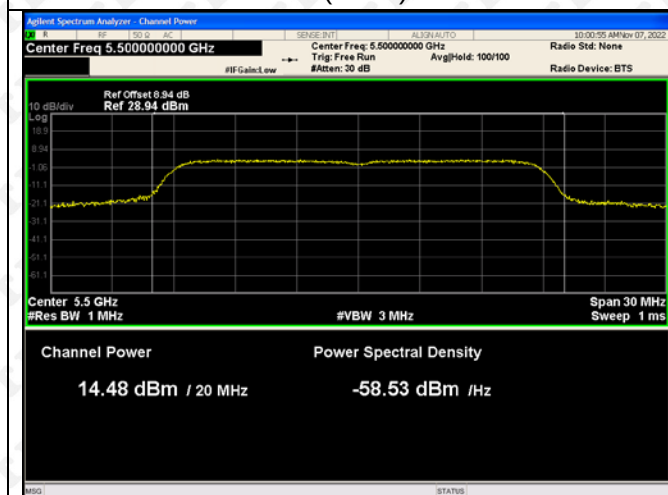




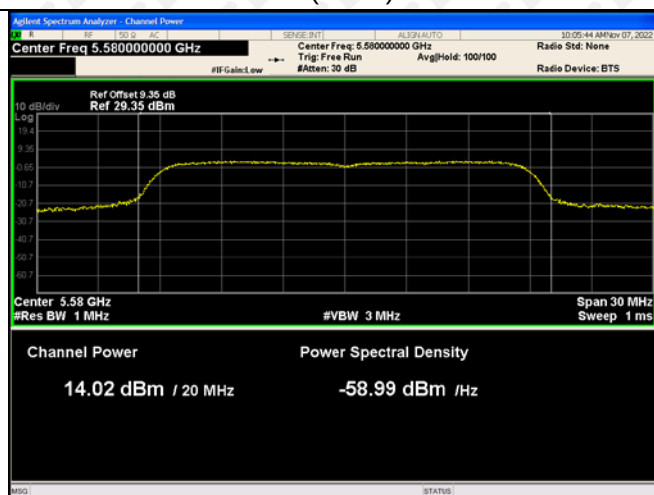
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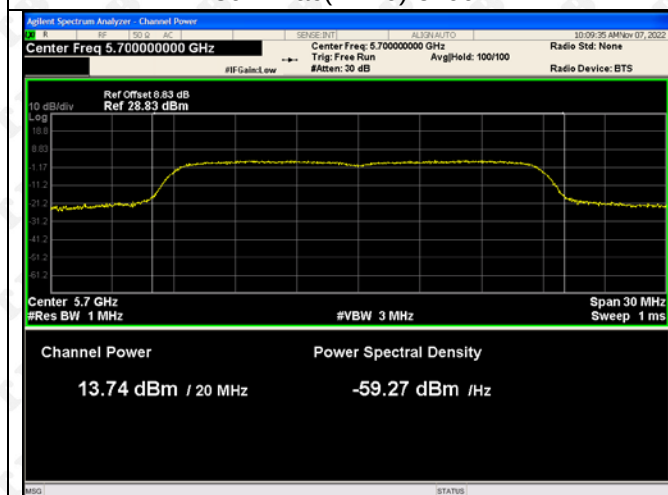
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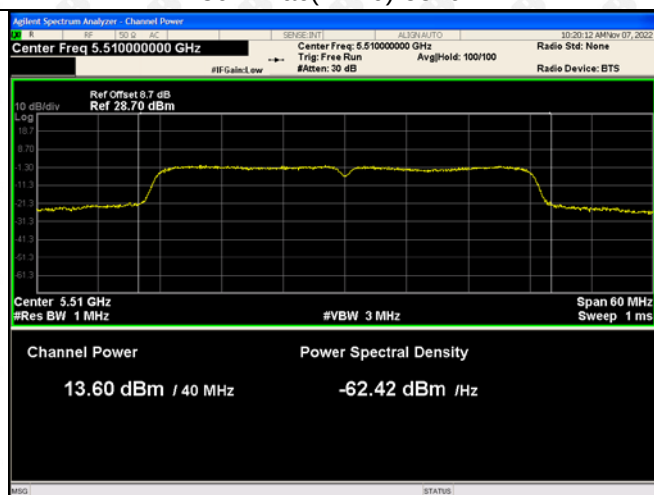
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802.11ac(VH40)-5510



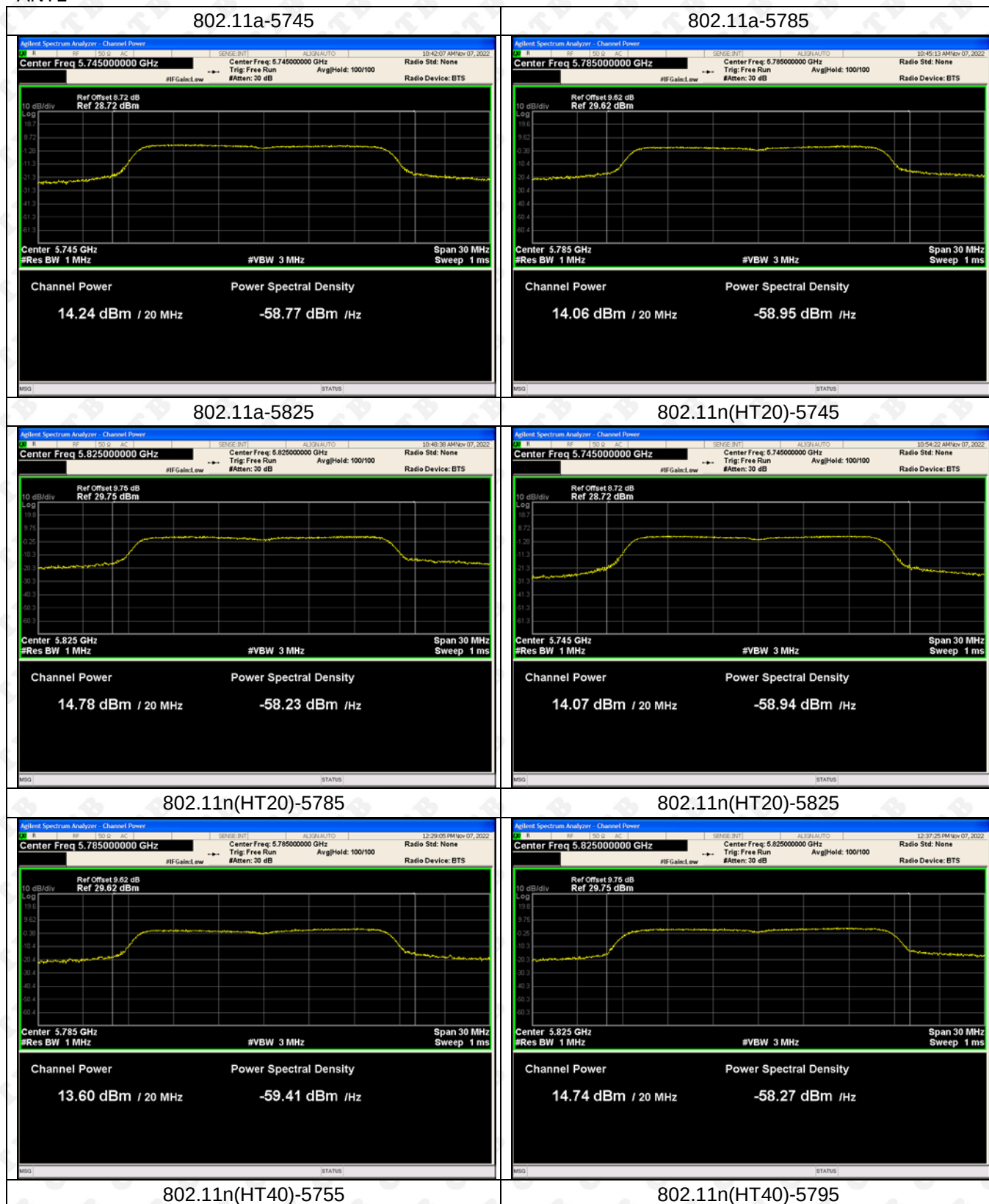
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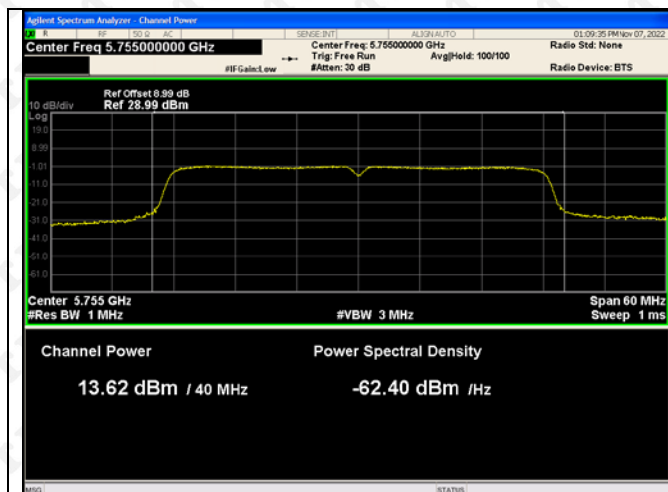


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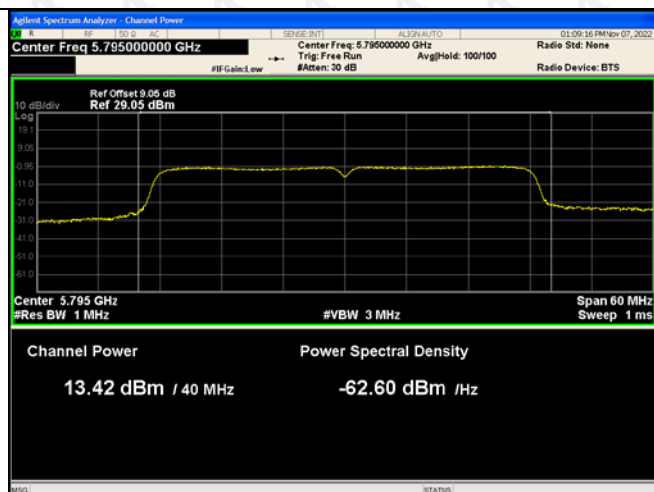


5745-5825MHz-Power ANT1

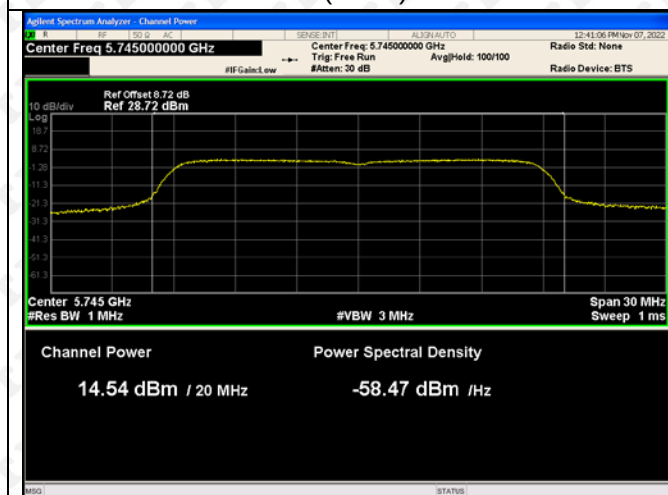




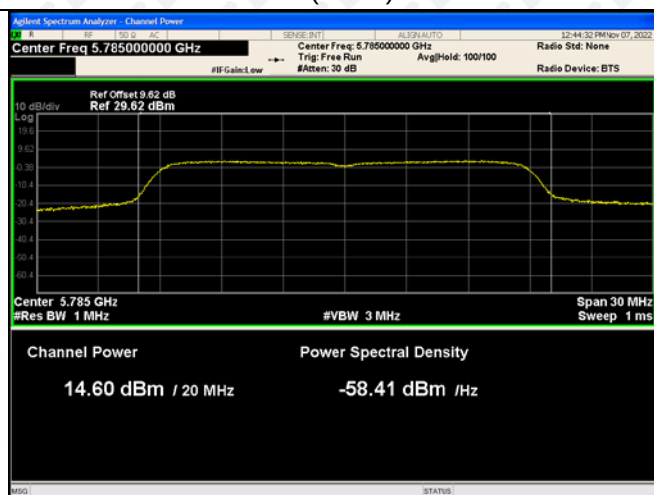
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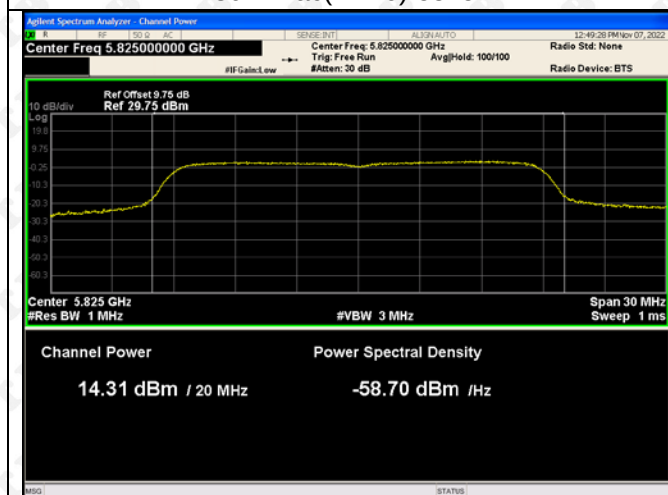
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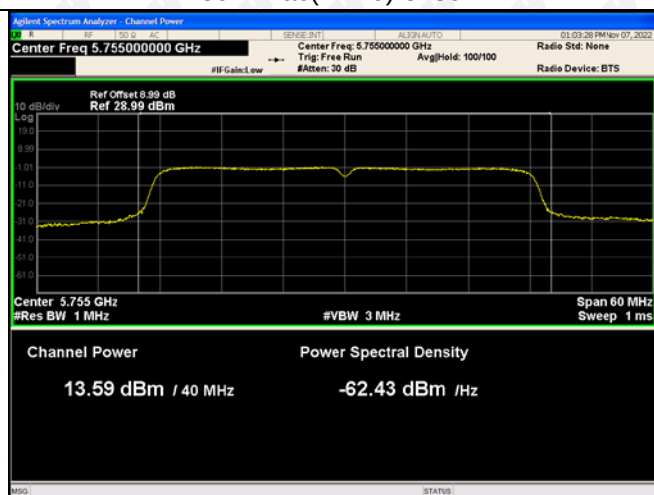
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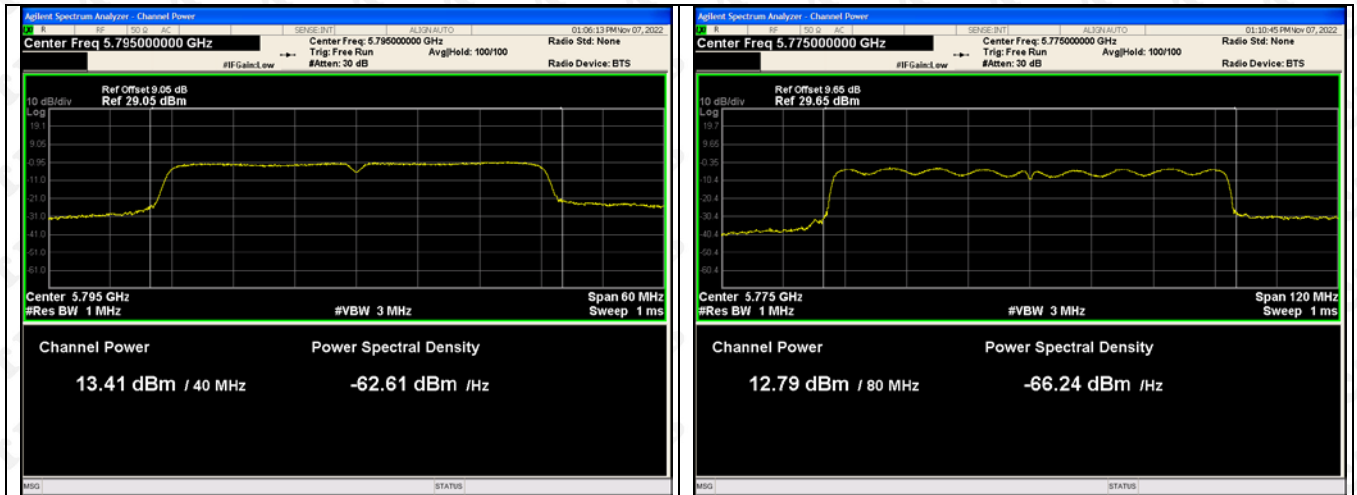
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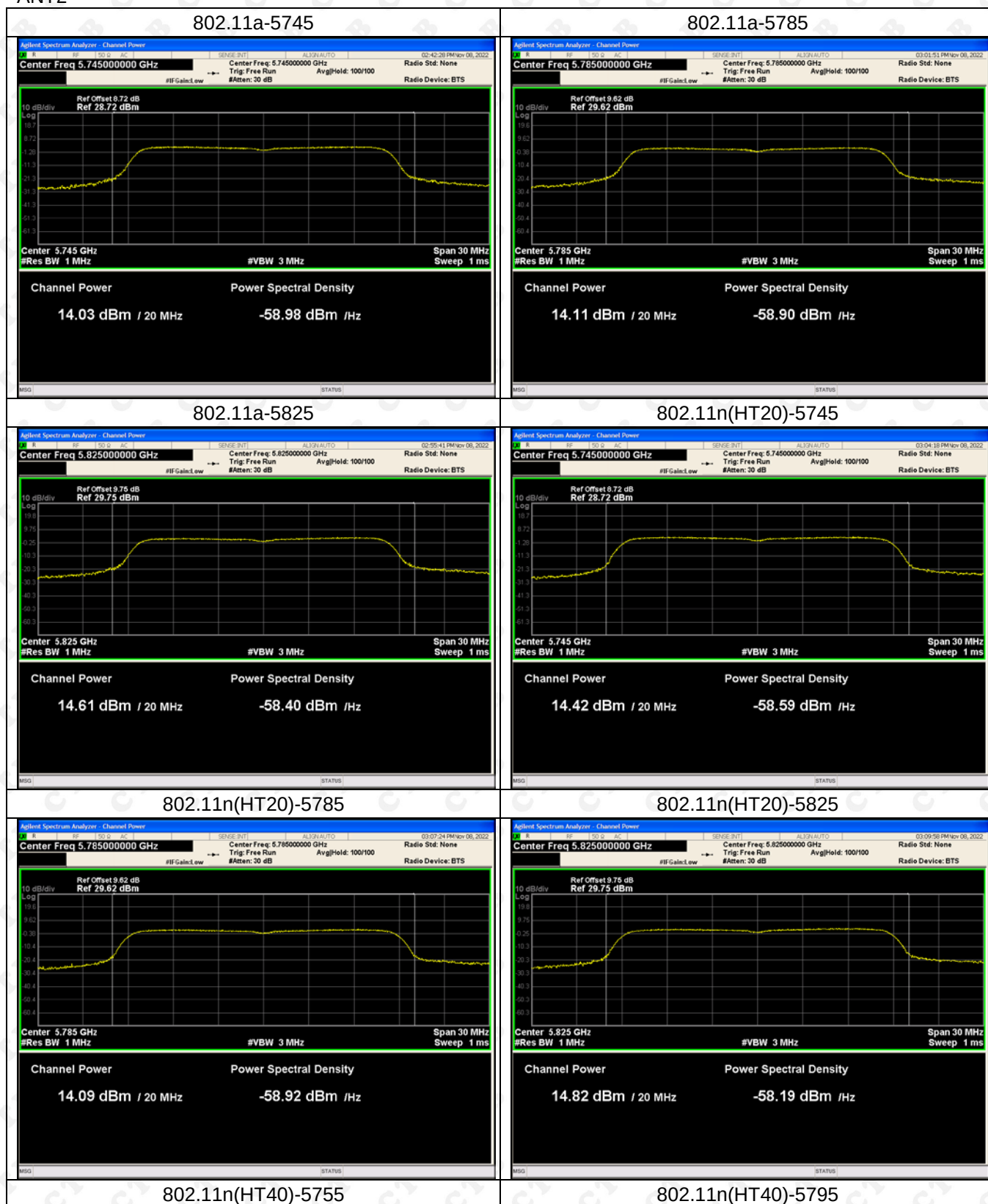
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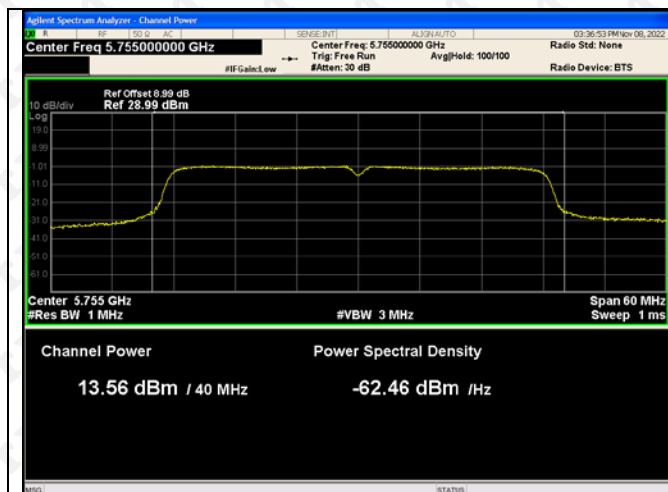


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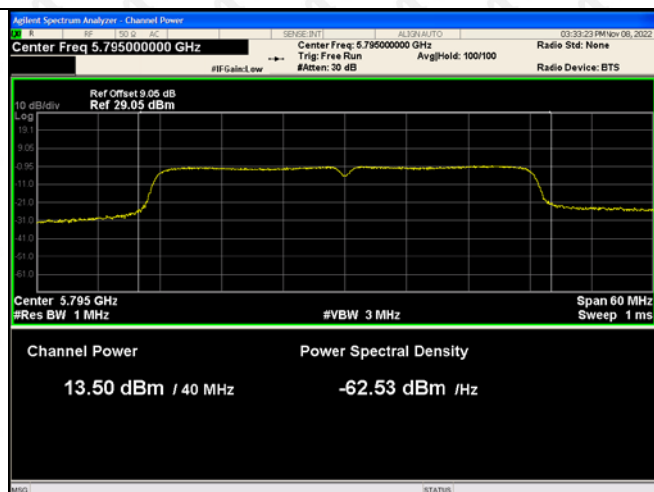


ANT2

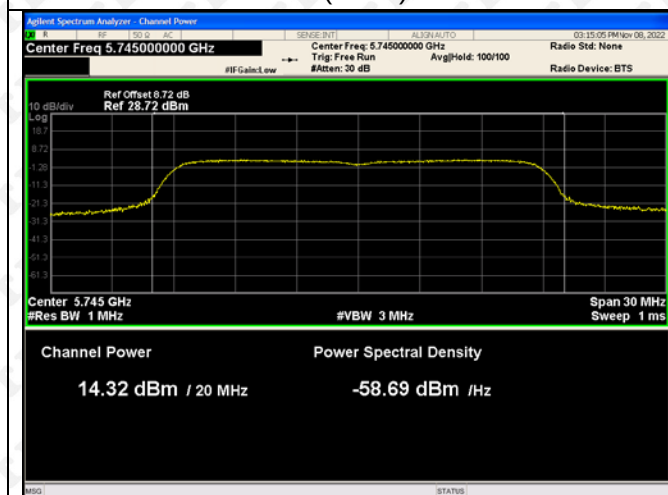




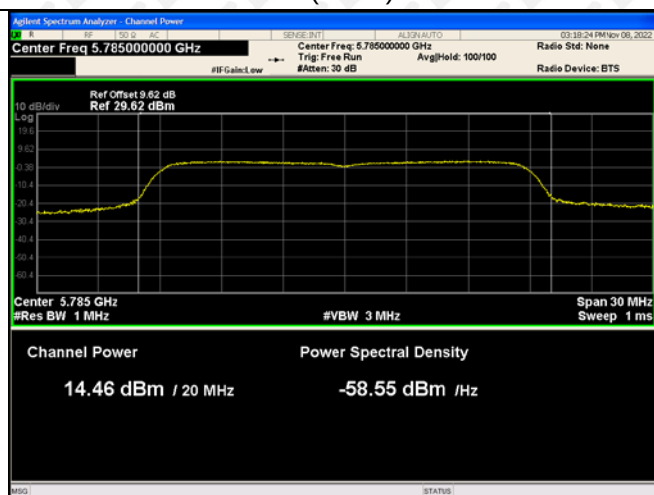
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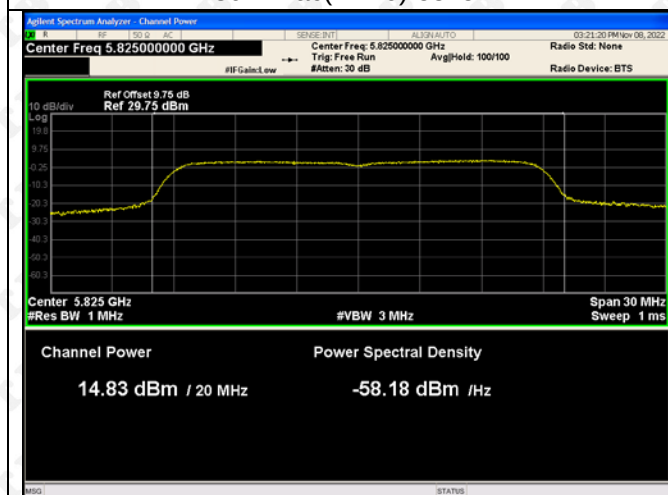
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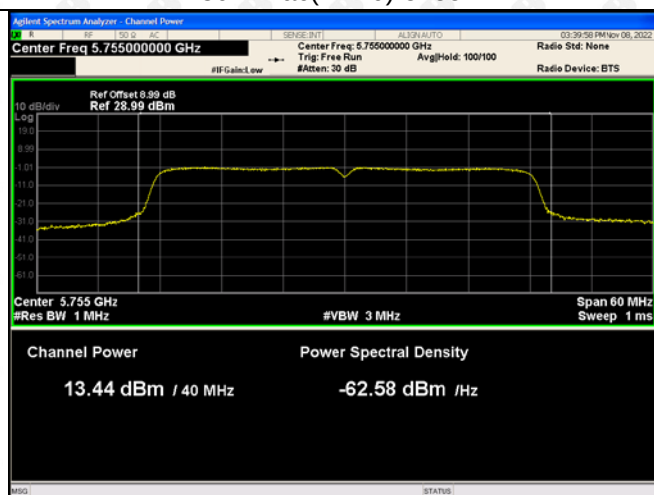
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802.11ac(VH40)-5755



802.11ac(VH40)-5795

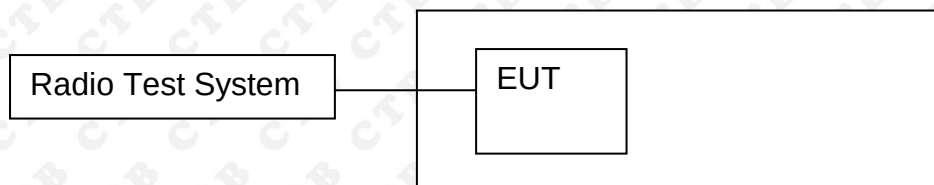


802.11ac(VH80)-5775



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

(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)

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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:

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 * \text{RBW}$.
- Detector = Peak.
- 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 $\geq 3 * RBW$
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

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)&ANT1	26dB Bandwidth (MHz)&ANT2
802.11a	5180	24.963	22.787
	5200	26.051	23.811
	5240	22.906	23.56
802.11ac20	5180	25.543	22.662
	5200	28.486	24.522
	5240	27.03	27.978
802.11ac40	5190	58.265	50.441
	5230	56.279	57.978
802.11ac80	5210	99.808	99.722
802.11n(HT20)	5180	23.946	21.854
	5200	25.726	25.367
	5240	25.494	22.994
802.11n(HT40)	5190	51.844	50.661
	5230	52.875	52.962

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)&ANT1	26dB Bandwidth (MHz)&ANT2
802.11a	5260	28.488	23.487
	5280	21.198	21.341
	5320	21.915	24.036
802.11ac20	5260	22.049	25.68
	5280	25.181	22.584
	5320	22.491	25
802.11ac40	5270	49.502	46.39
	5310	56.832	56.027
802.11ac80	5290	102.521	101.999
802.11n(HT20)	5260	22.758	22.039
	5280	21.581	25.45
	5320	24.279	21.507
802.11n(HT40)	5270	49.878	50.025
	5310	50.835	53.412

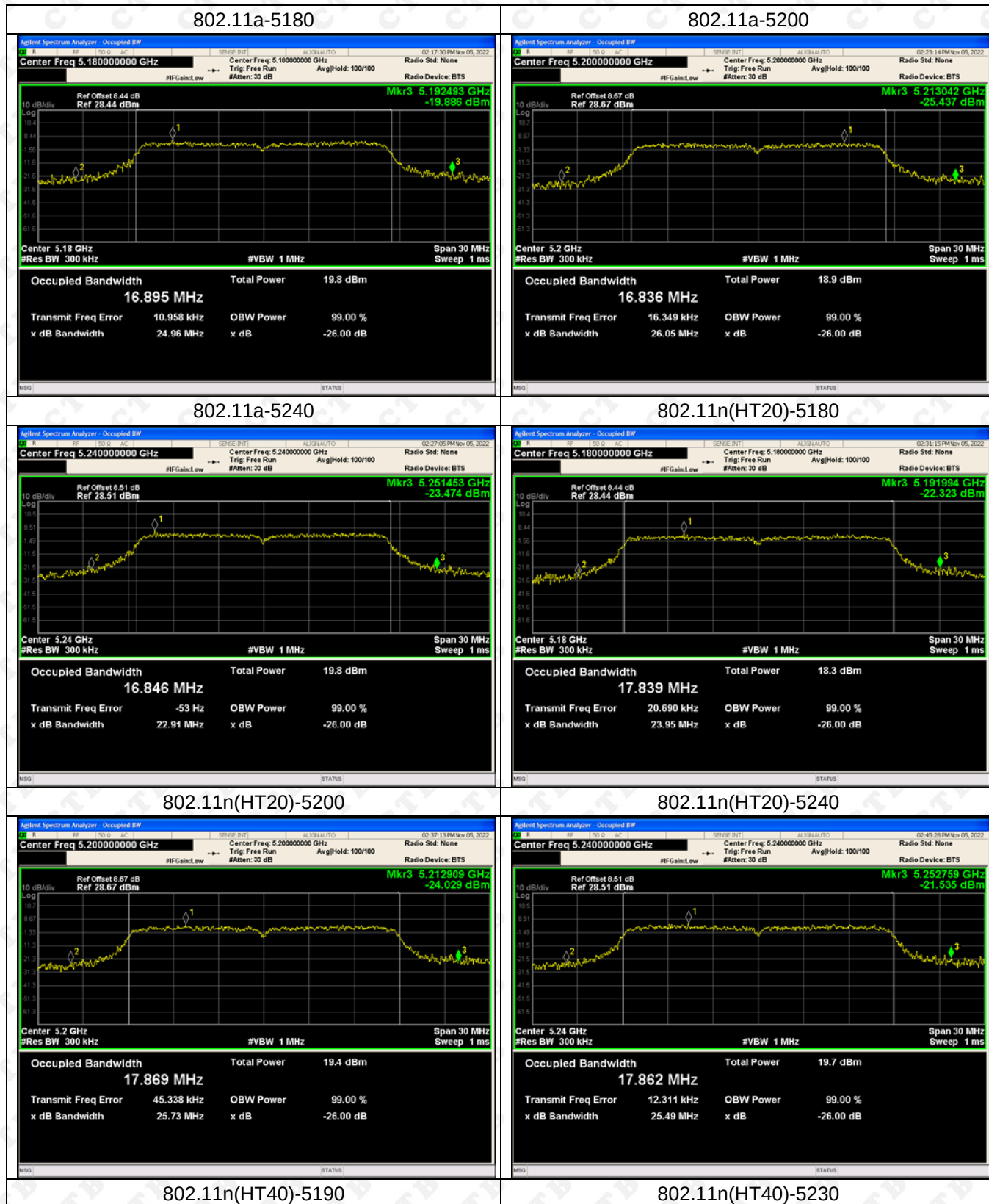
Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)&ANT1	26dB Bandwidth (MHz)&ANT2
802.11a	5500	21.065	21.379
	5580	21.353	21.17
	5700	21.038	20.881
802.11ac20	5500	21.306	21.72
	5580	21.454	21.835
	5700	21.909	21.67
802.11ac40	5510	42.731	40.951
	5670	41.589	41.046
802.11ac80	5530	88.953	90.785
802.11n(HT20)	5500	21.698	21.557
	5580	21.995	21.409
	5700	21.815	21.256
802.11n(HT40)	5510	42.437	41.317
	5670	42.375	41.033

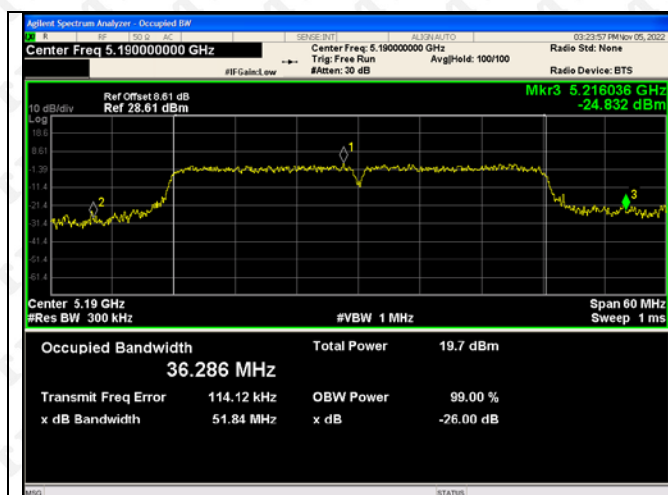
Test mode	Test Channel (MHz)	6dB Bandwidth (MHz)&ANT1	6dB Bandwidth (MHz)&ANT2
802.11a	5745	16.369	16.534
	5785	16.333	16.497
	5825	16.19	16.501
802.11ac20	5745	16.958	17.715
	5785	17.768	17.7
	5825	17.763	17.732
802.11ac40	5755	36.436	36.416
	5795	36.498	36.485
802.11ac80	5775	76.425	76.361
802.11n(HT20)	5745	16.349	17.767
	5785	16.402	17.772
	5825	16.426	17.758
802.11n(HT40)	5755	36.488	36.459
	5795	36.458	36.469

Test Graph

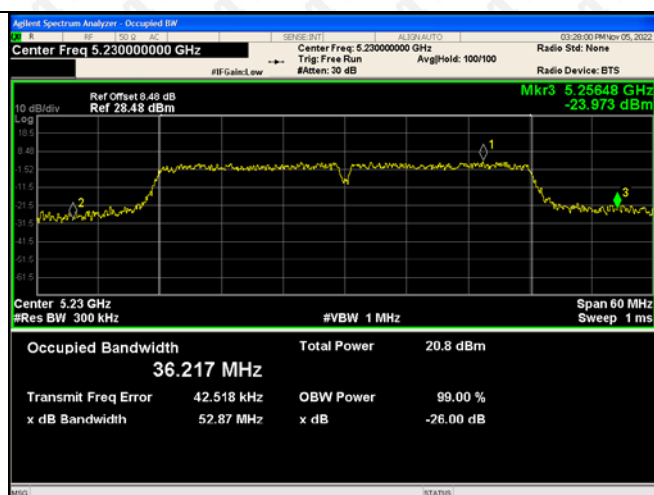
5180-5240MHz

ANT1

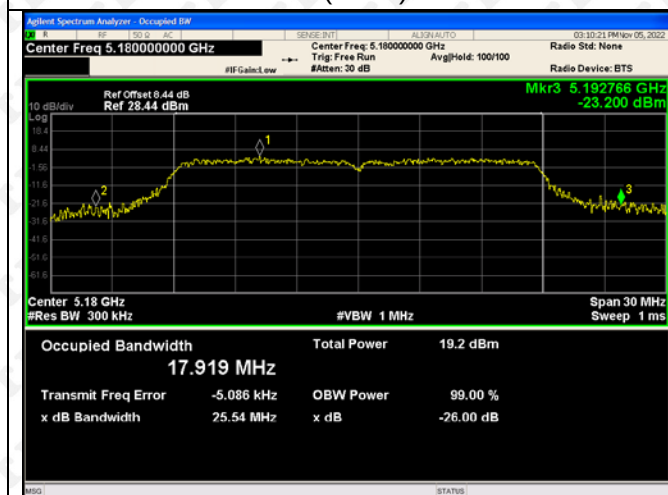




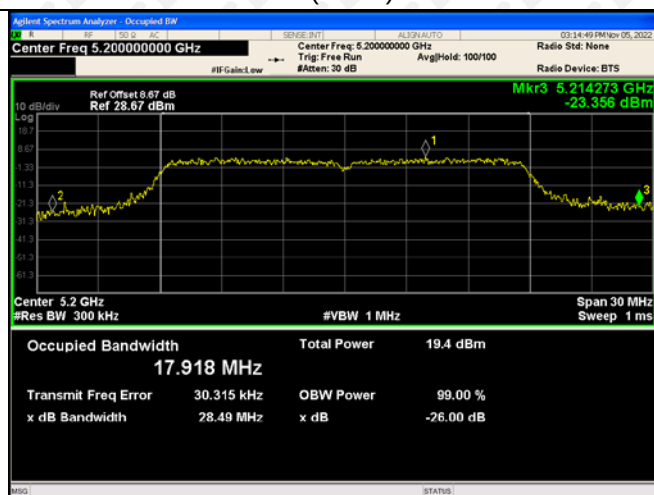
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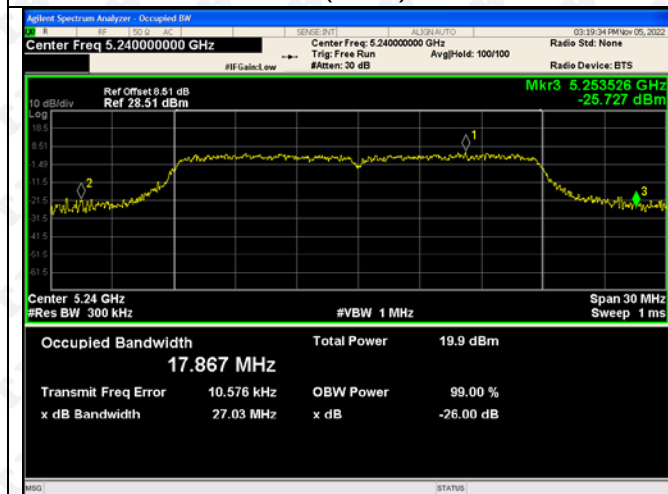
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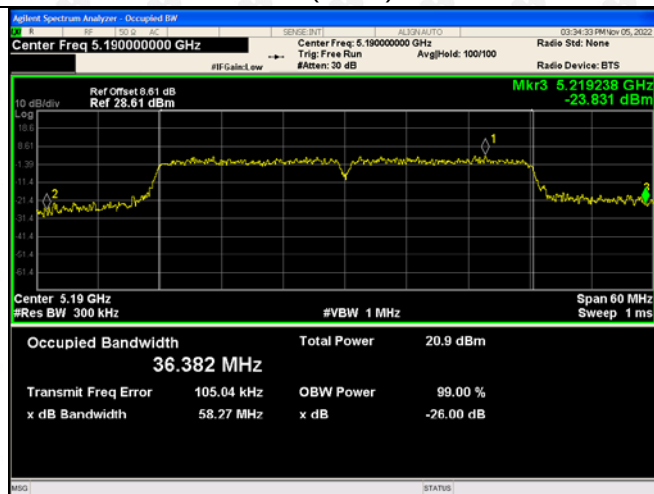
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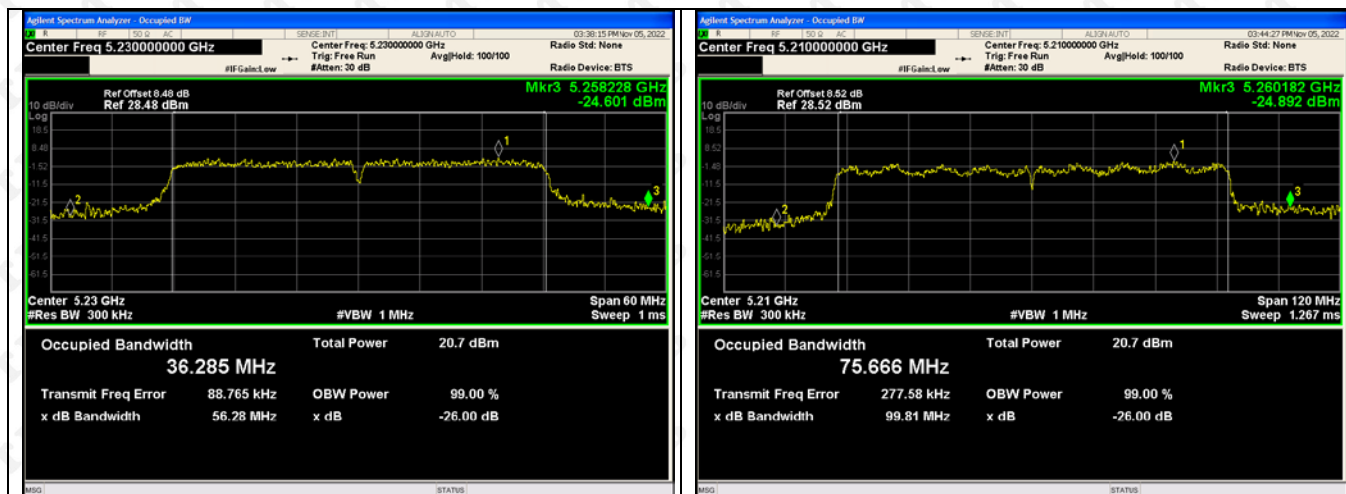
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802.11ac(VH40)-5230

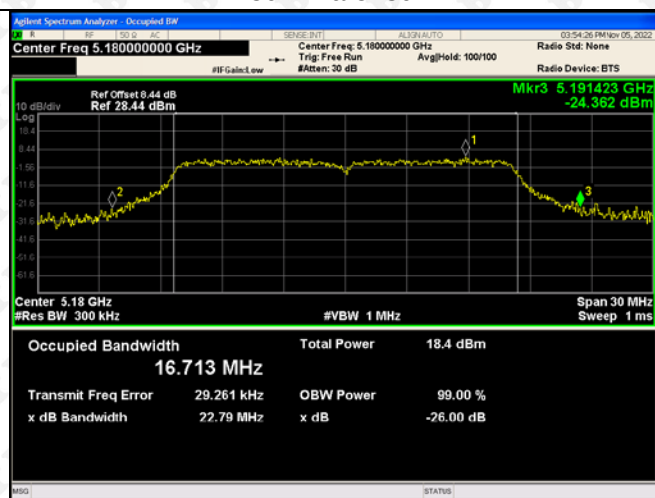


802.11ac(VH80)-5210

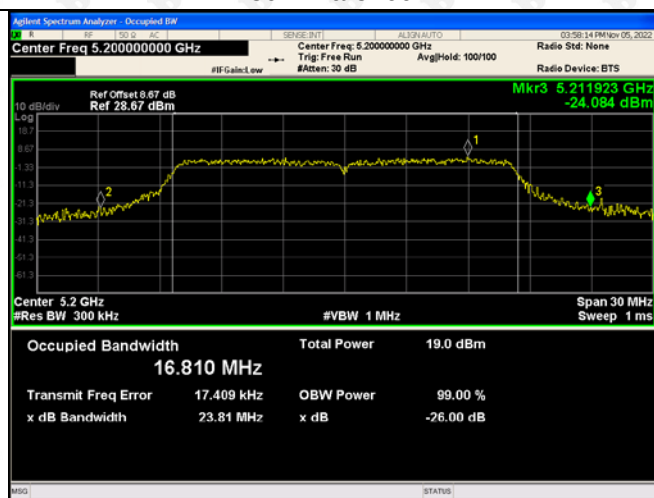


ANT2

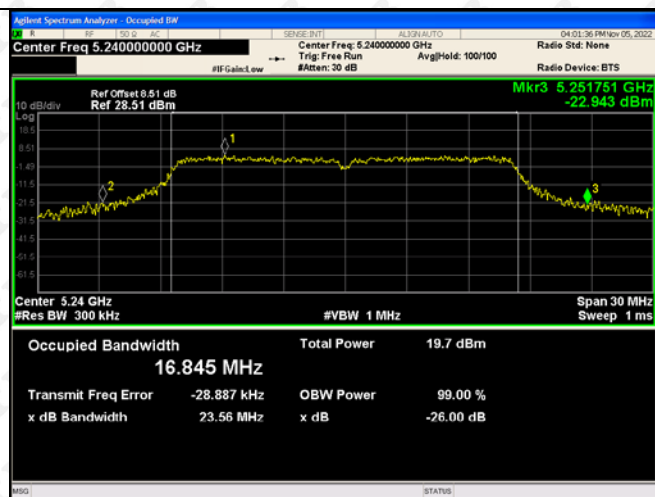
802.11a-5180



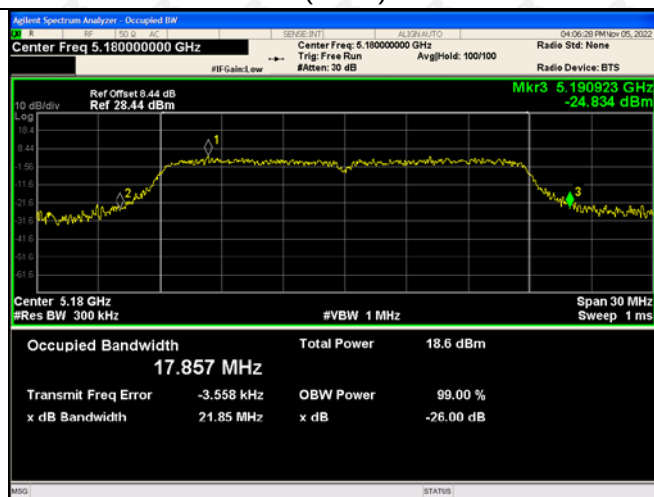
802.11a-5200



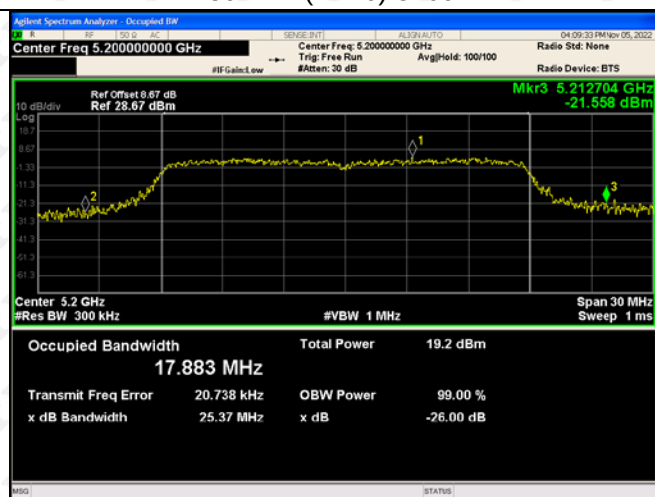
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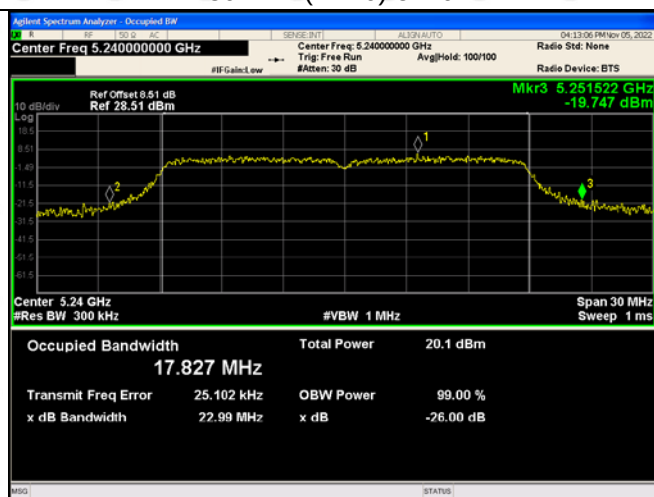
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802.11n(HT20)-5200

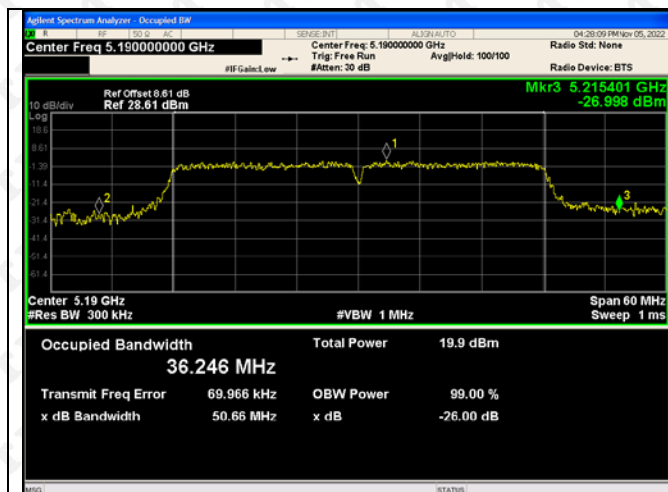


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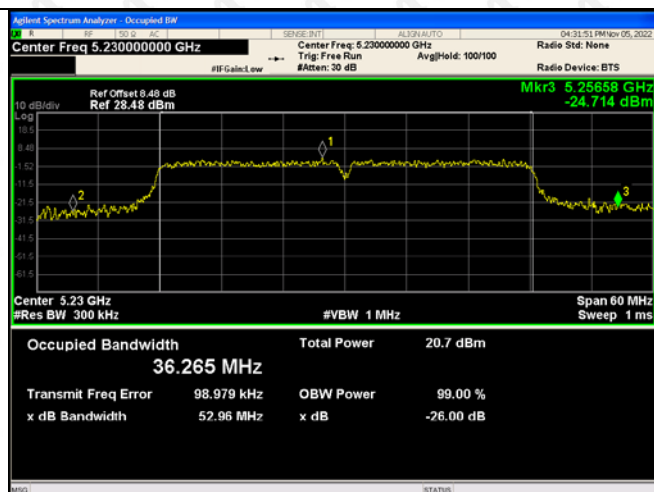


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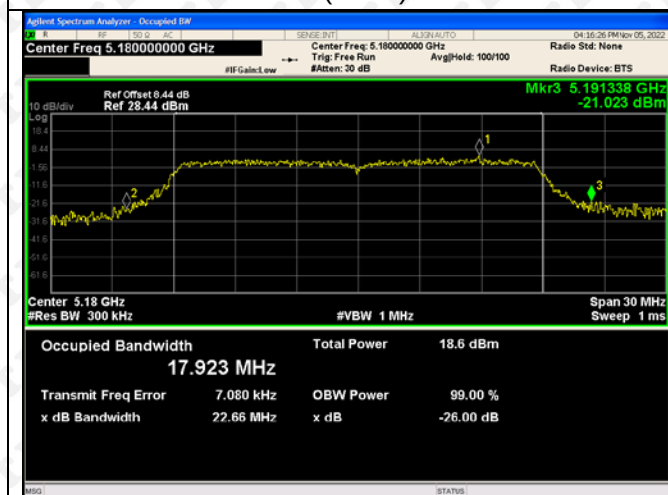
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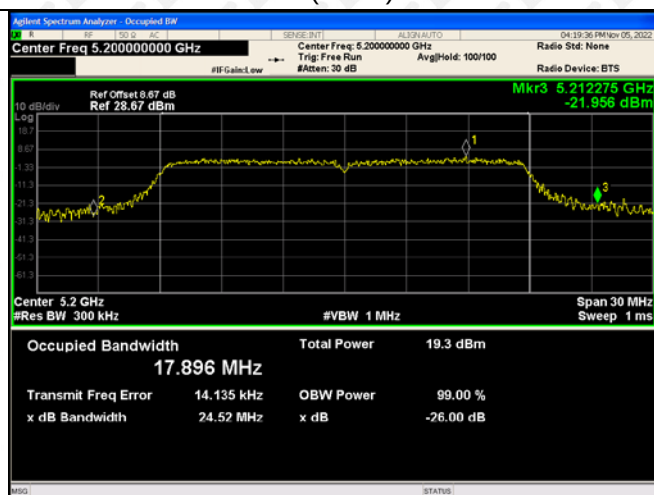
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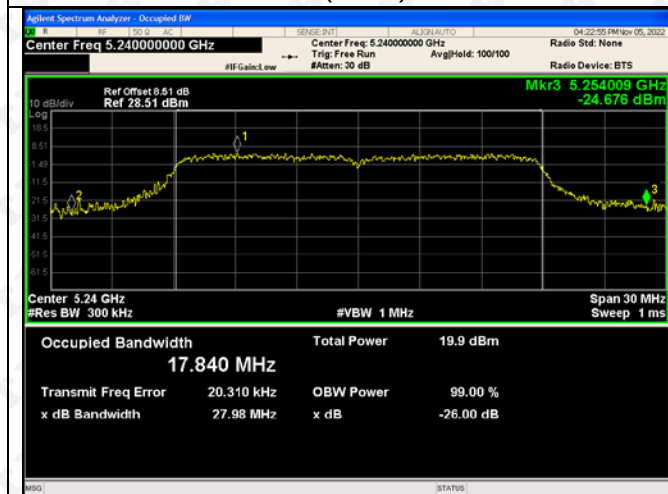
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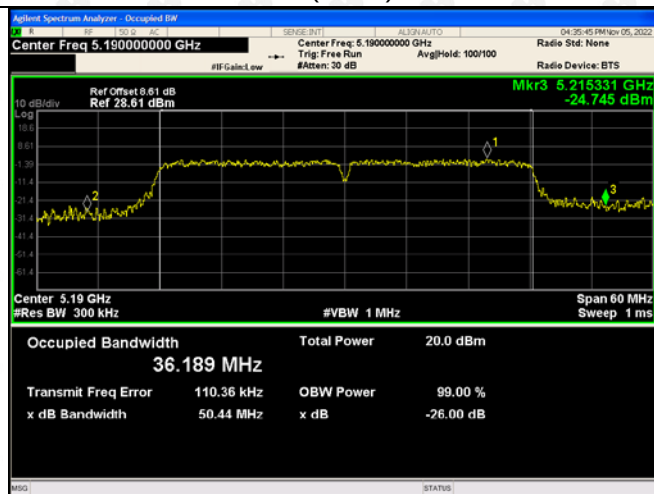
802.11ac(VH20)-5240



802.11ac(VH40)-5190



802.11ac(VH40)-5230



802.11ac(VH80)-5210