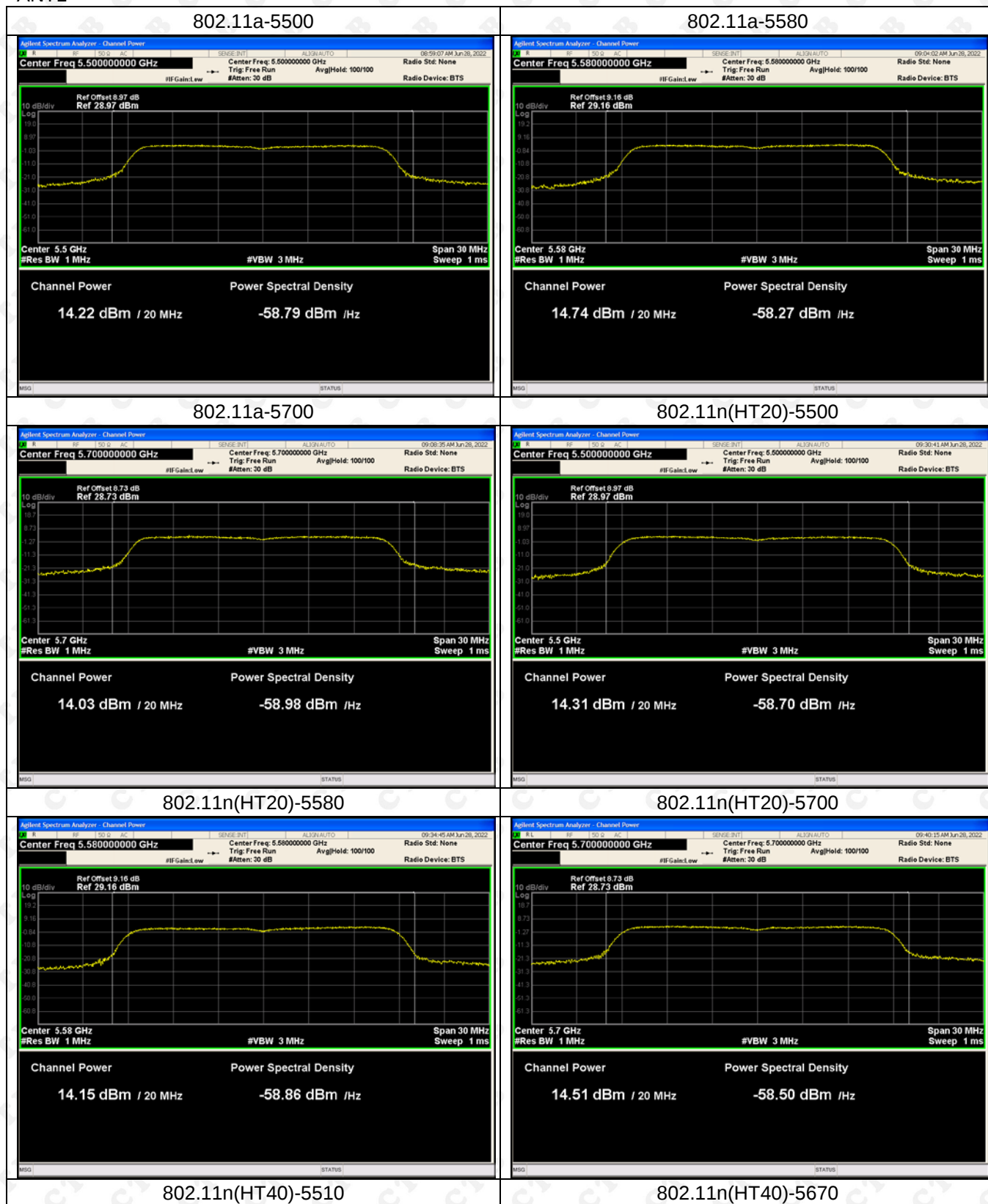
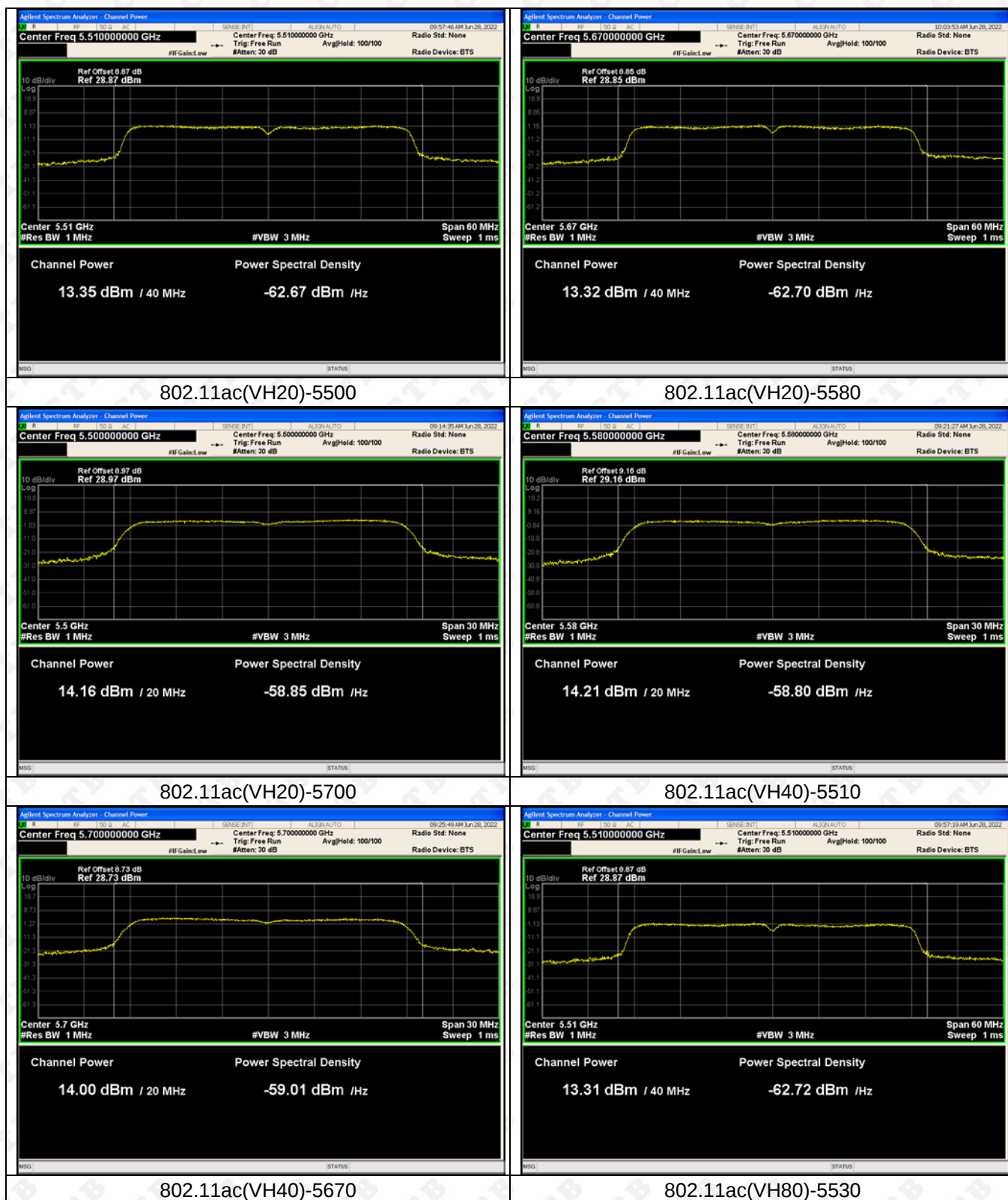


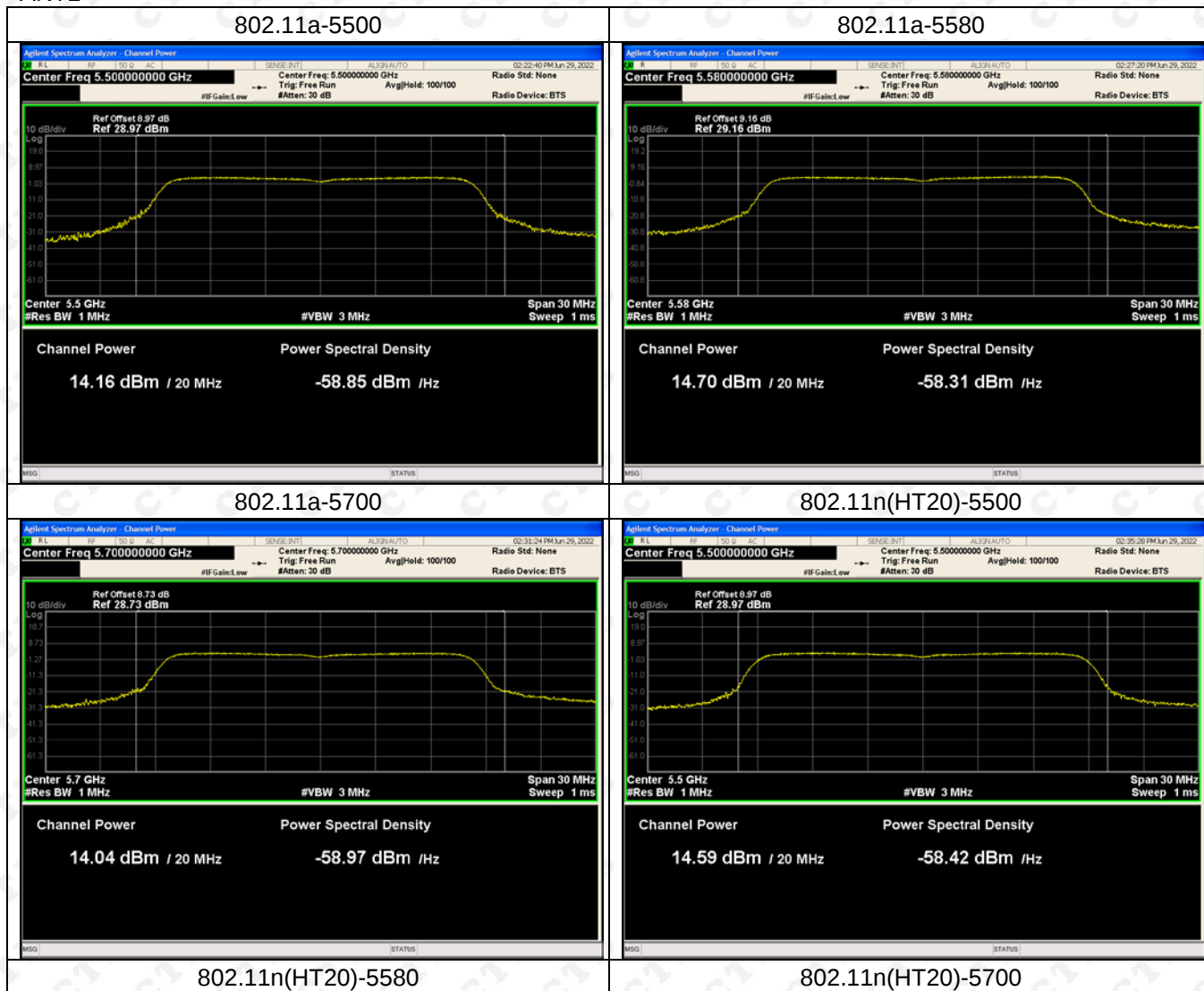


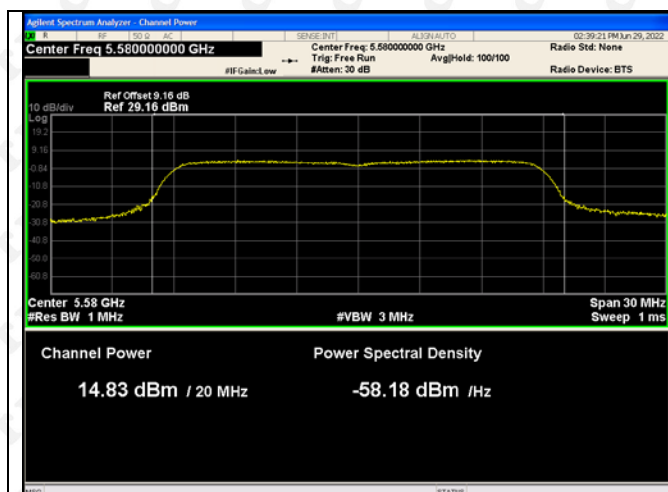
5470-5725MHz-Power
ANT1




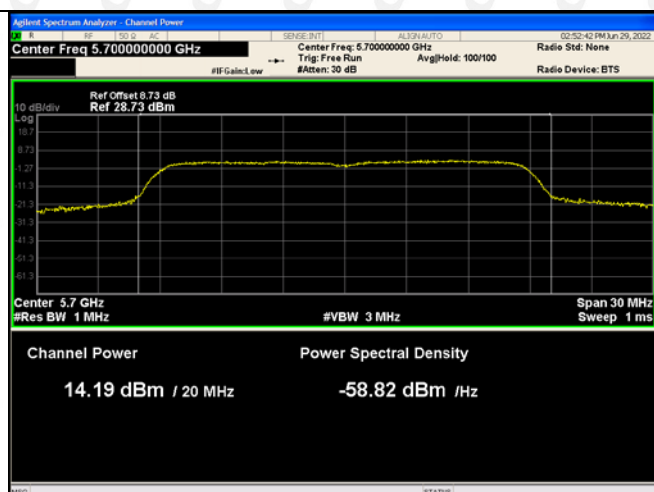


ANT2

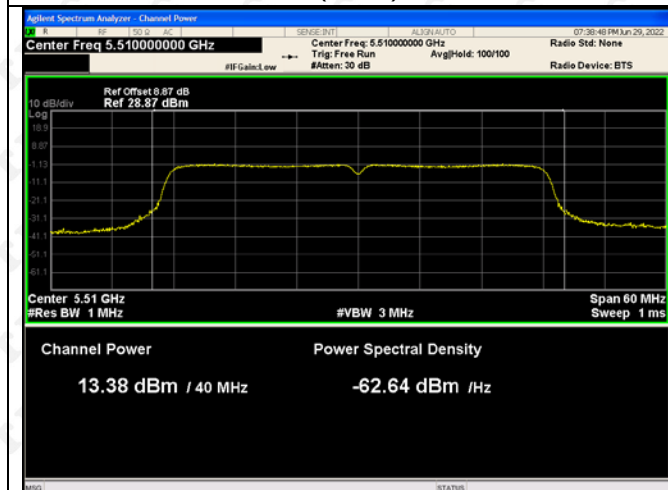




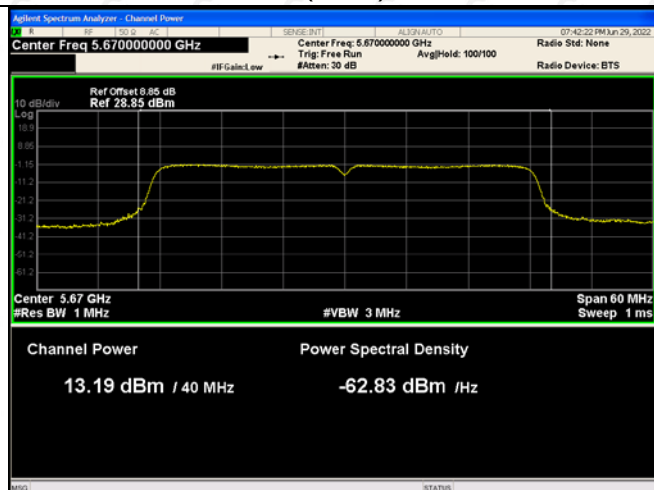
802.11n(HT40)-5510



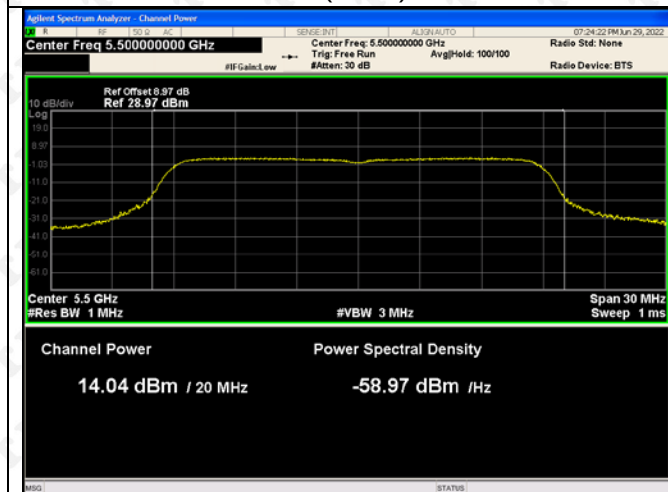
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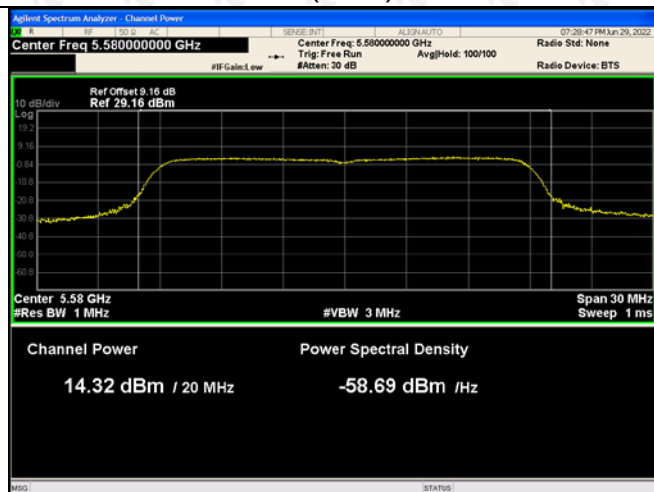
802.11ac(VH20)-5500



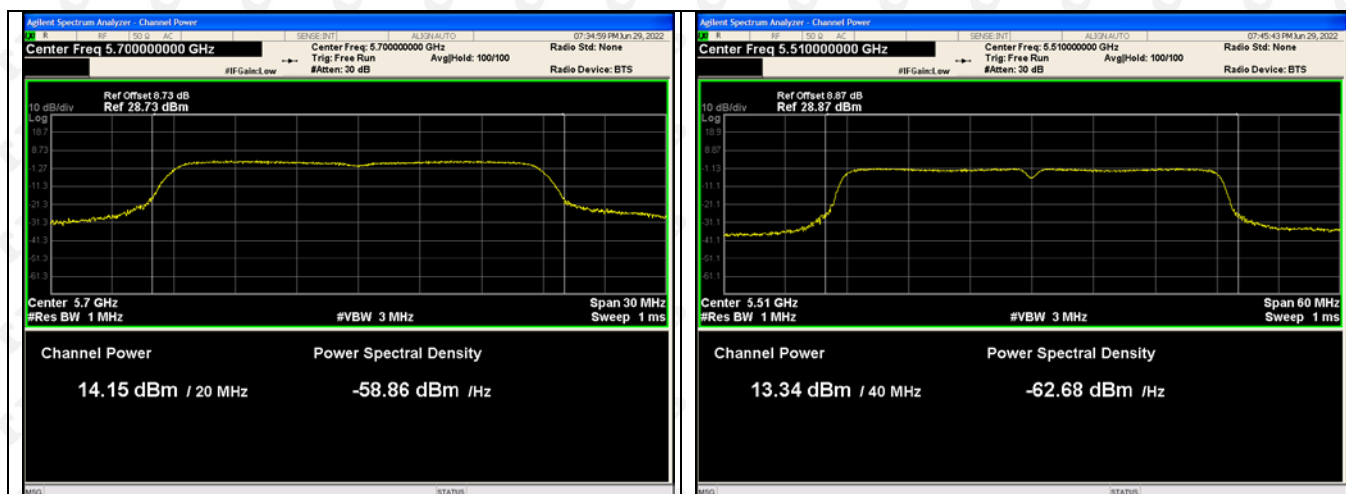
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802.11ac(VH20)-5700



802.11ac(VH40)-5510



802.11ac(VH40)-5670

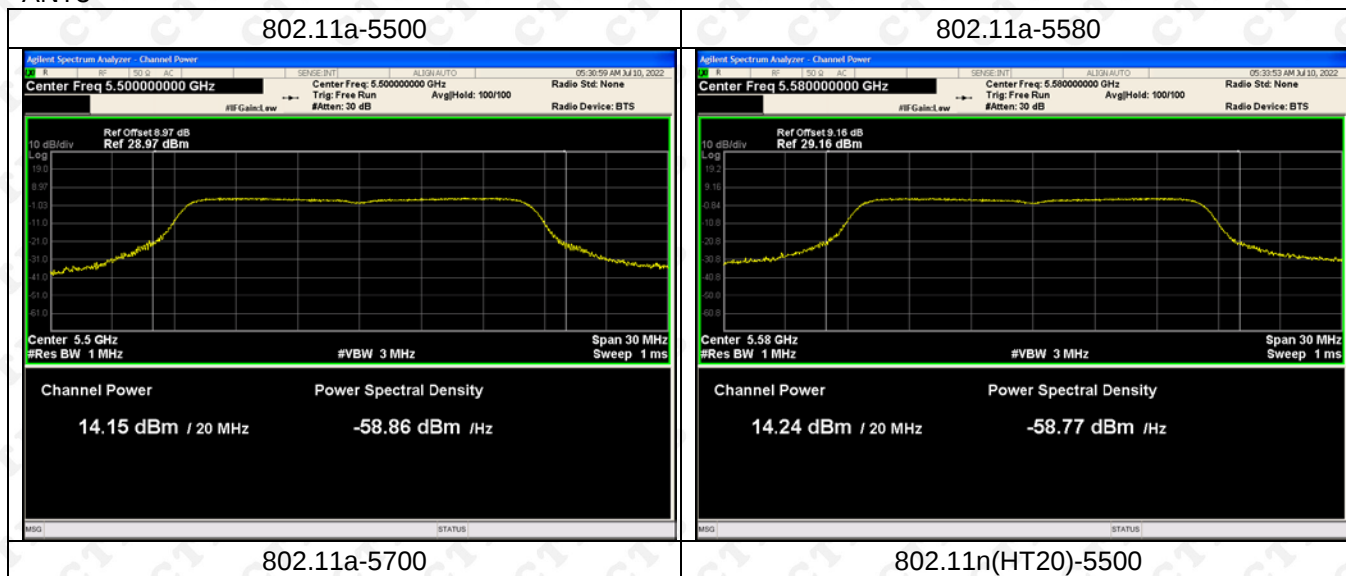
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802.11ac(VH40)-5670

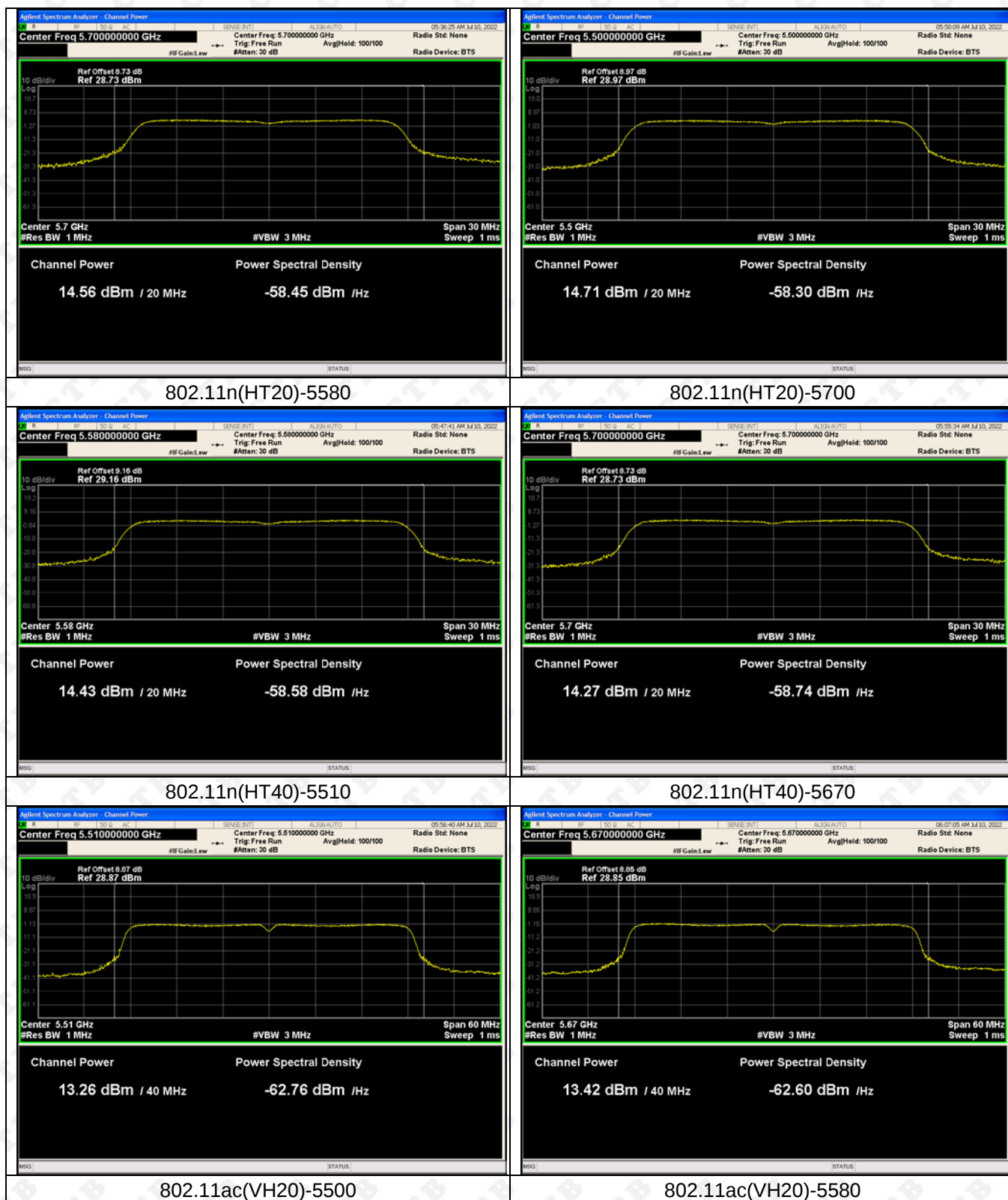
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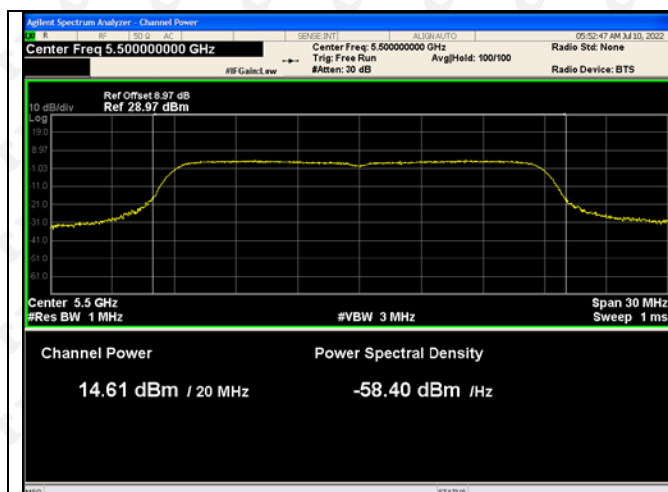
ANT3



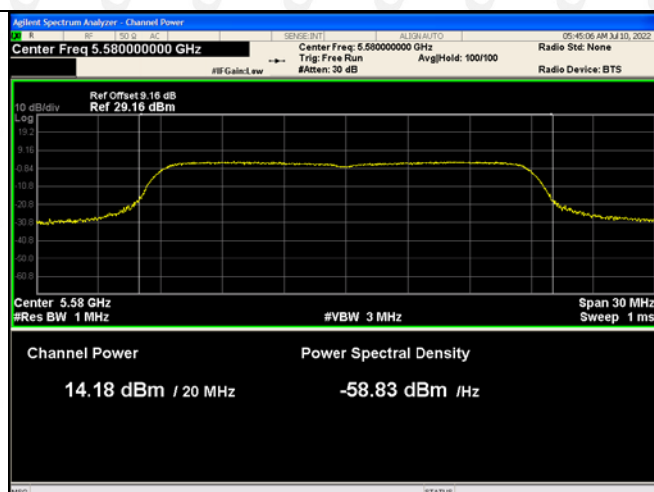
802.11a-5700

802.11n(HT20)-5500

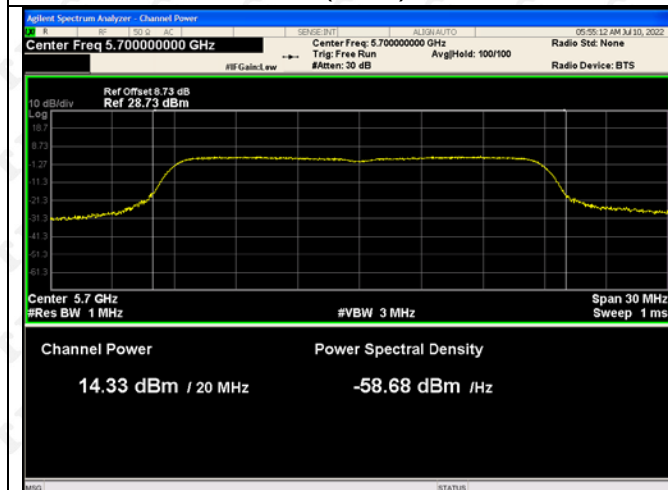




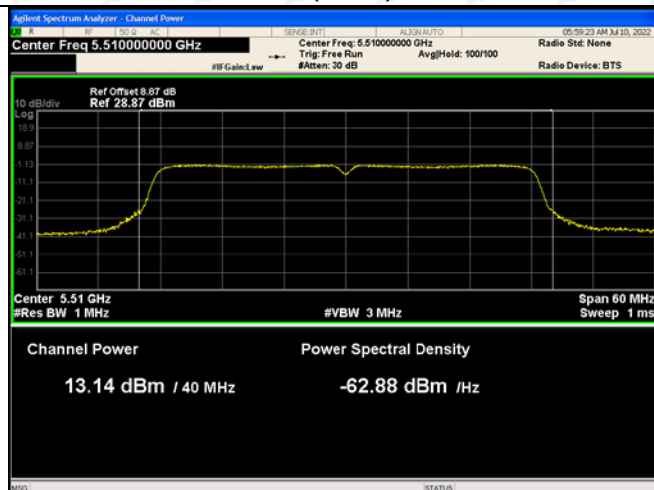
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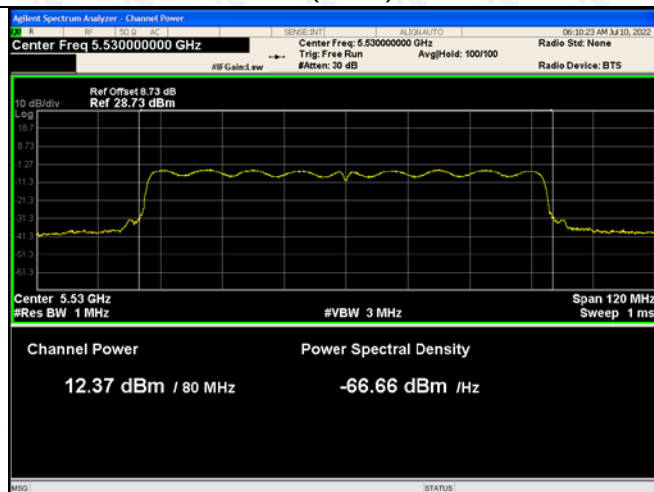
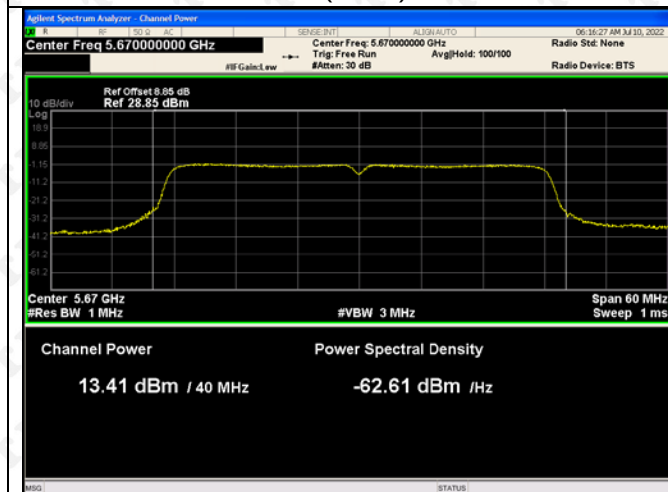
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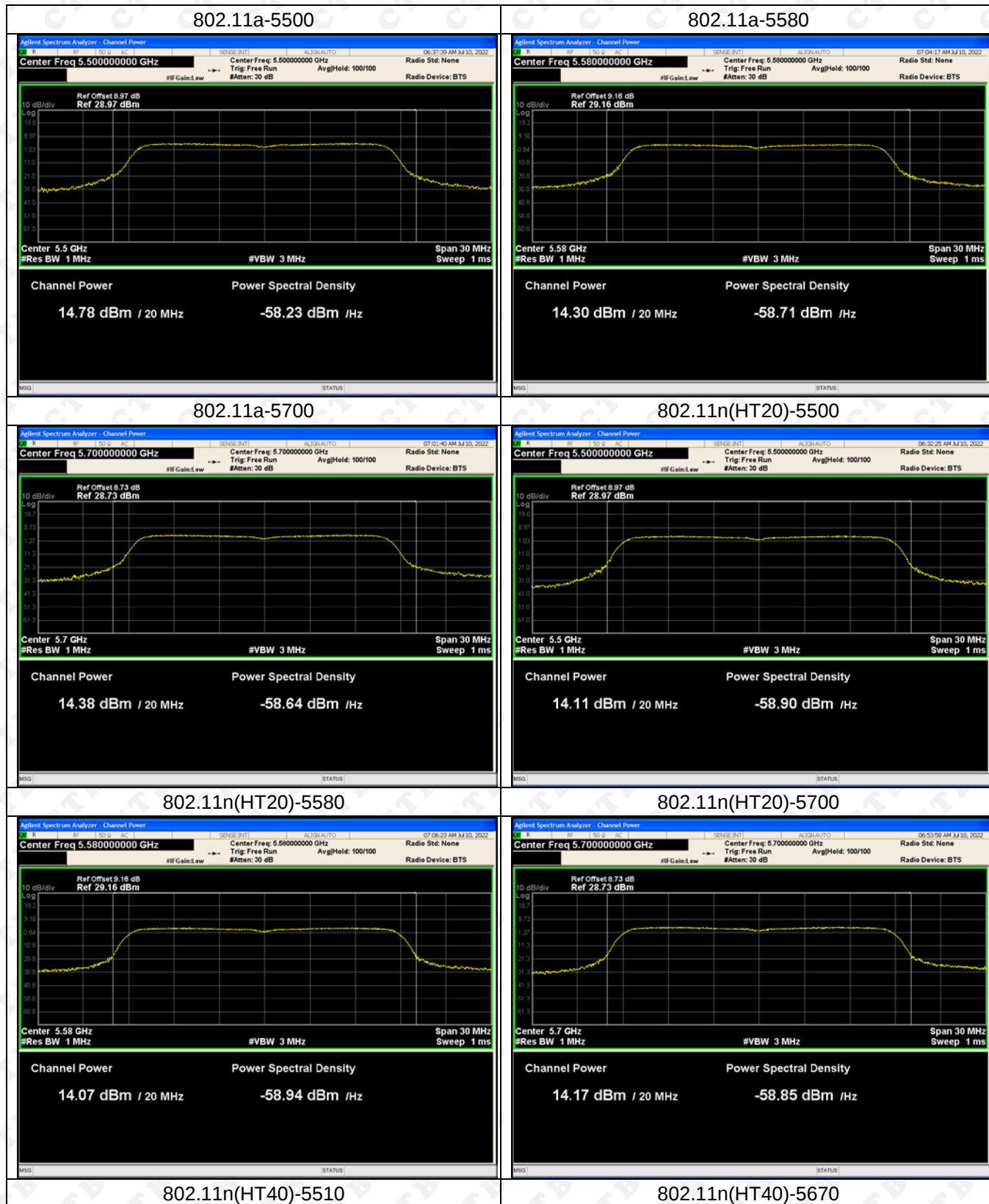
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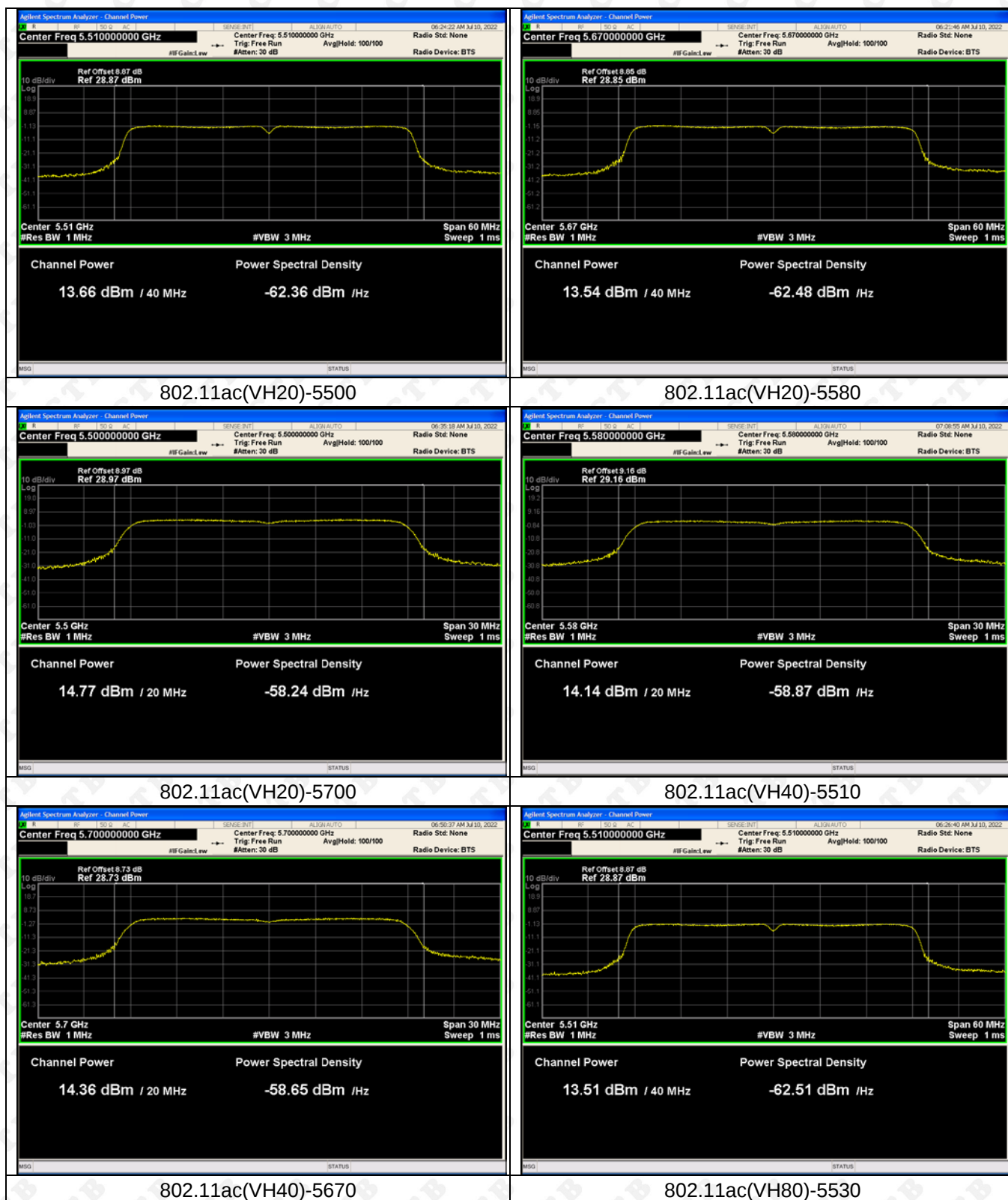


802.11ac(VH80)-5530

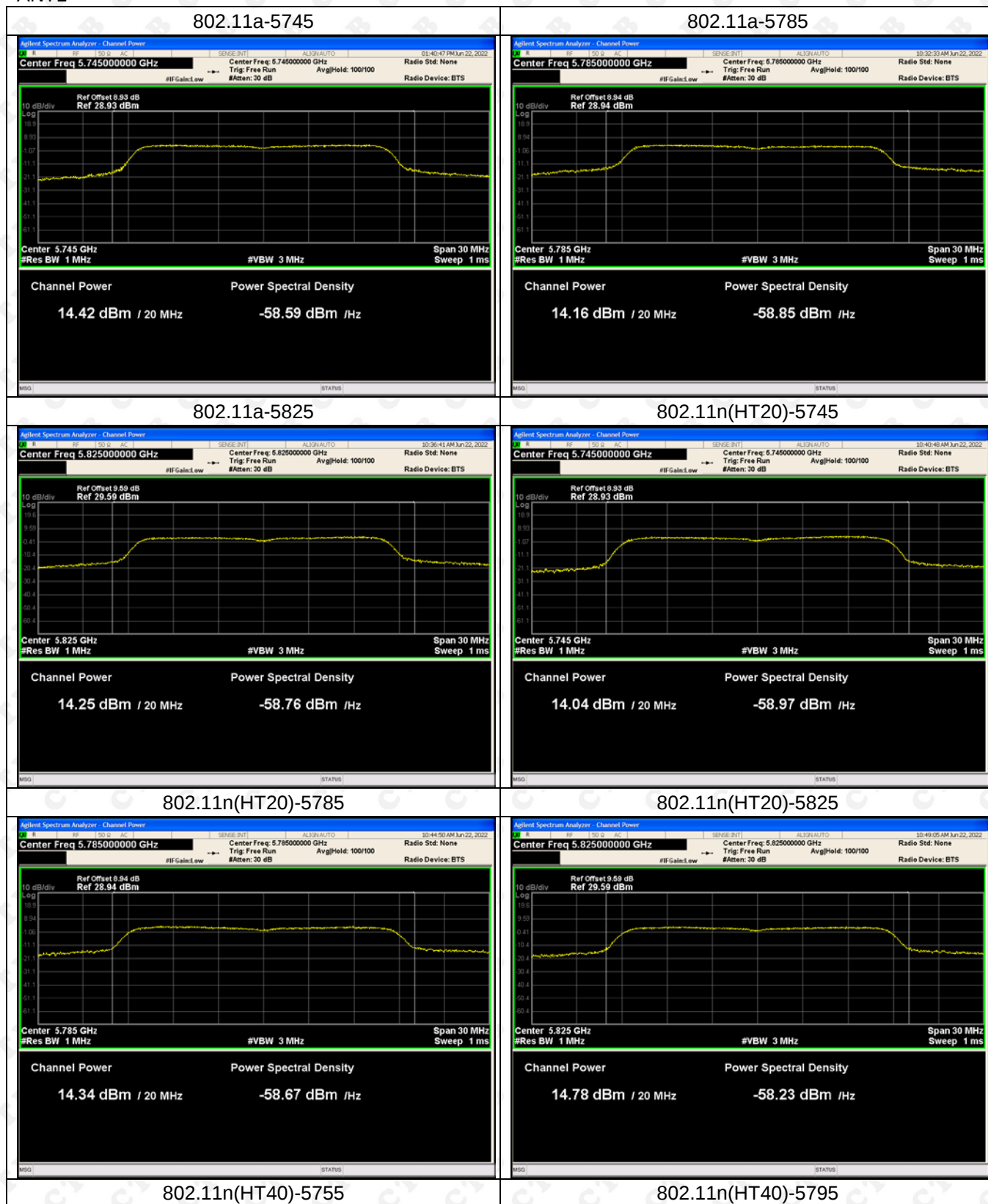


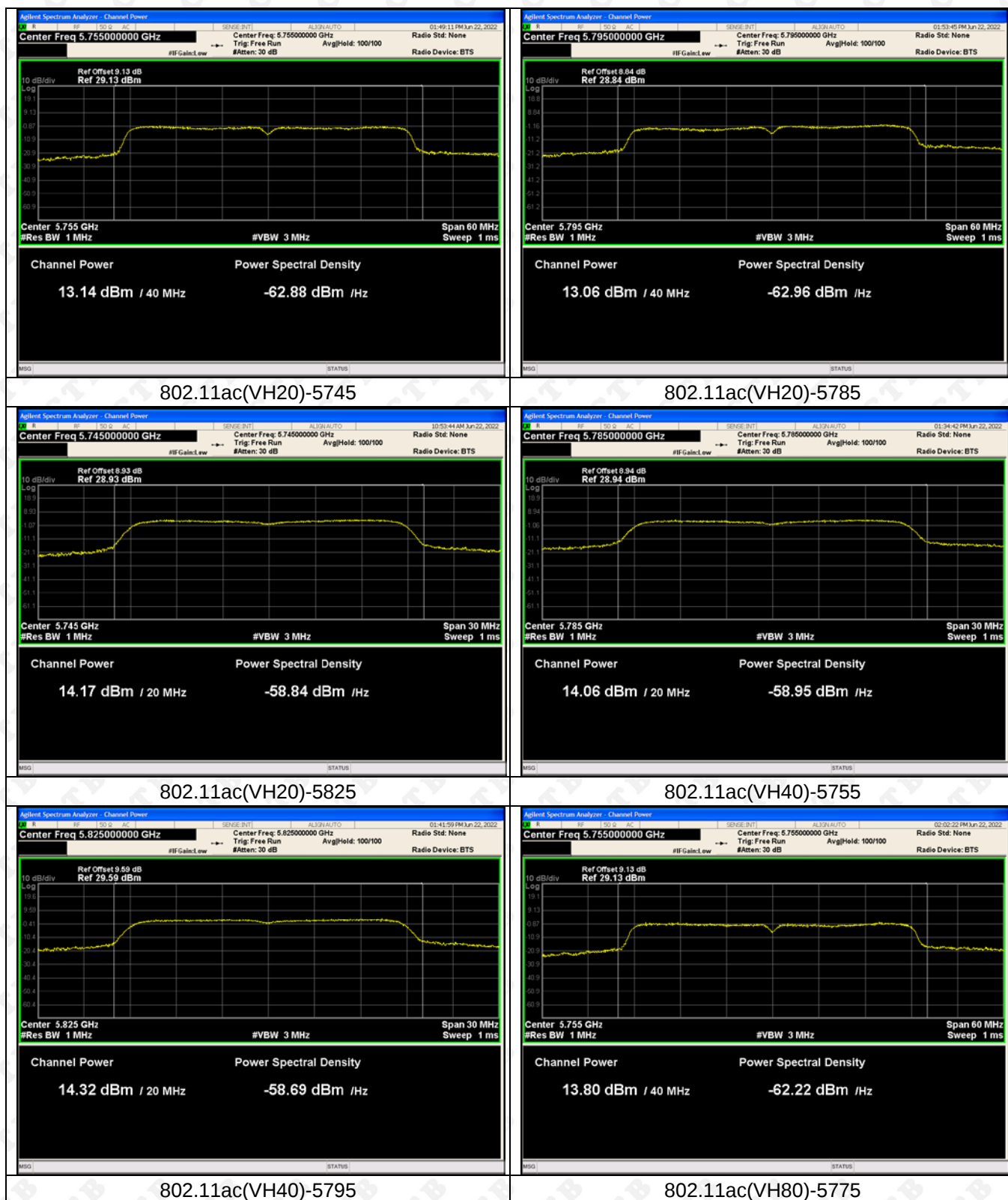
ANT4





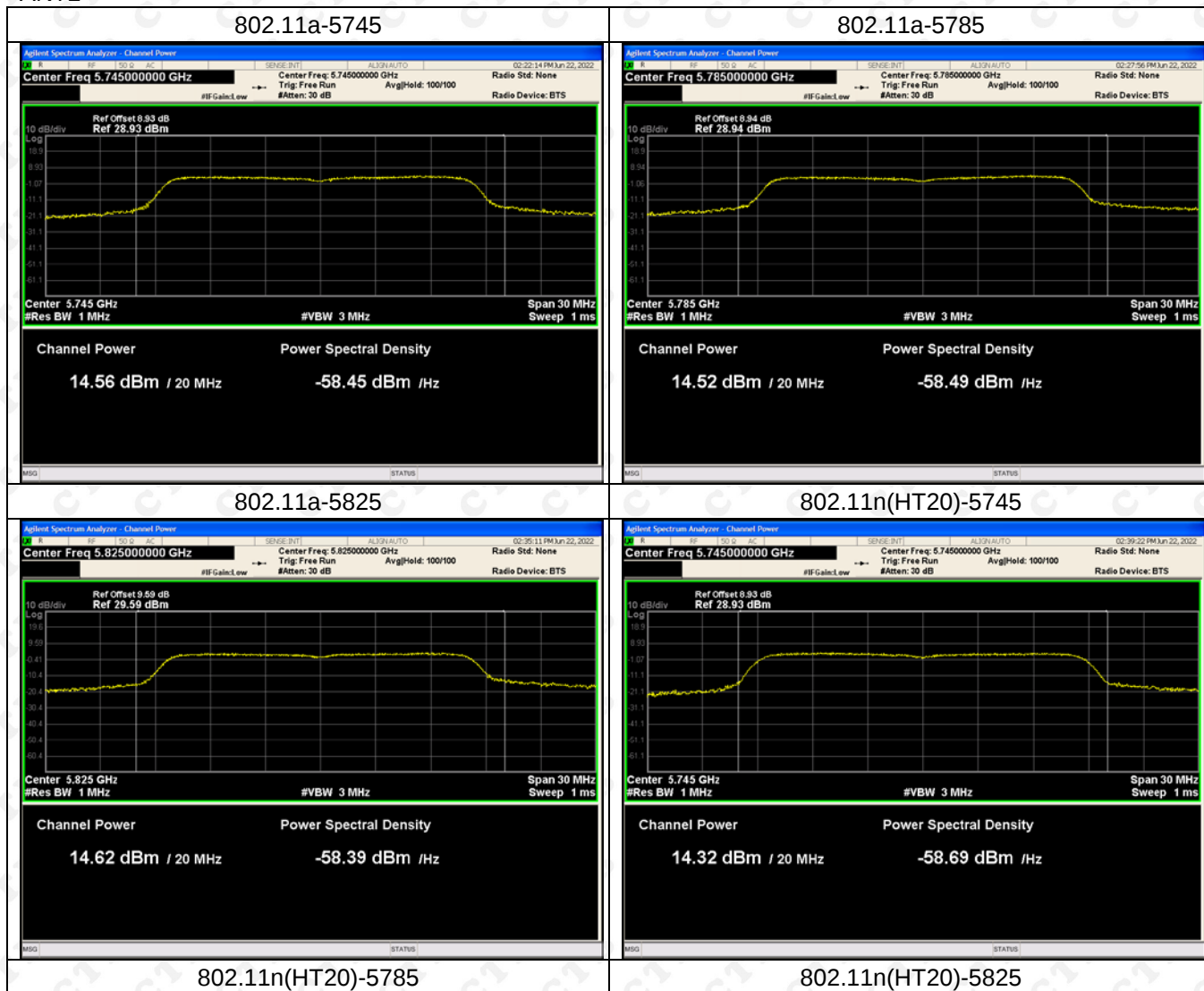


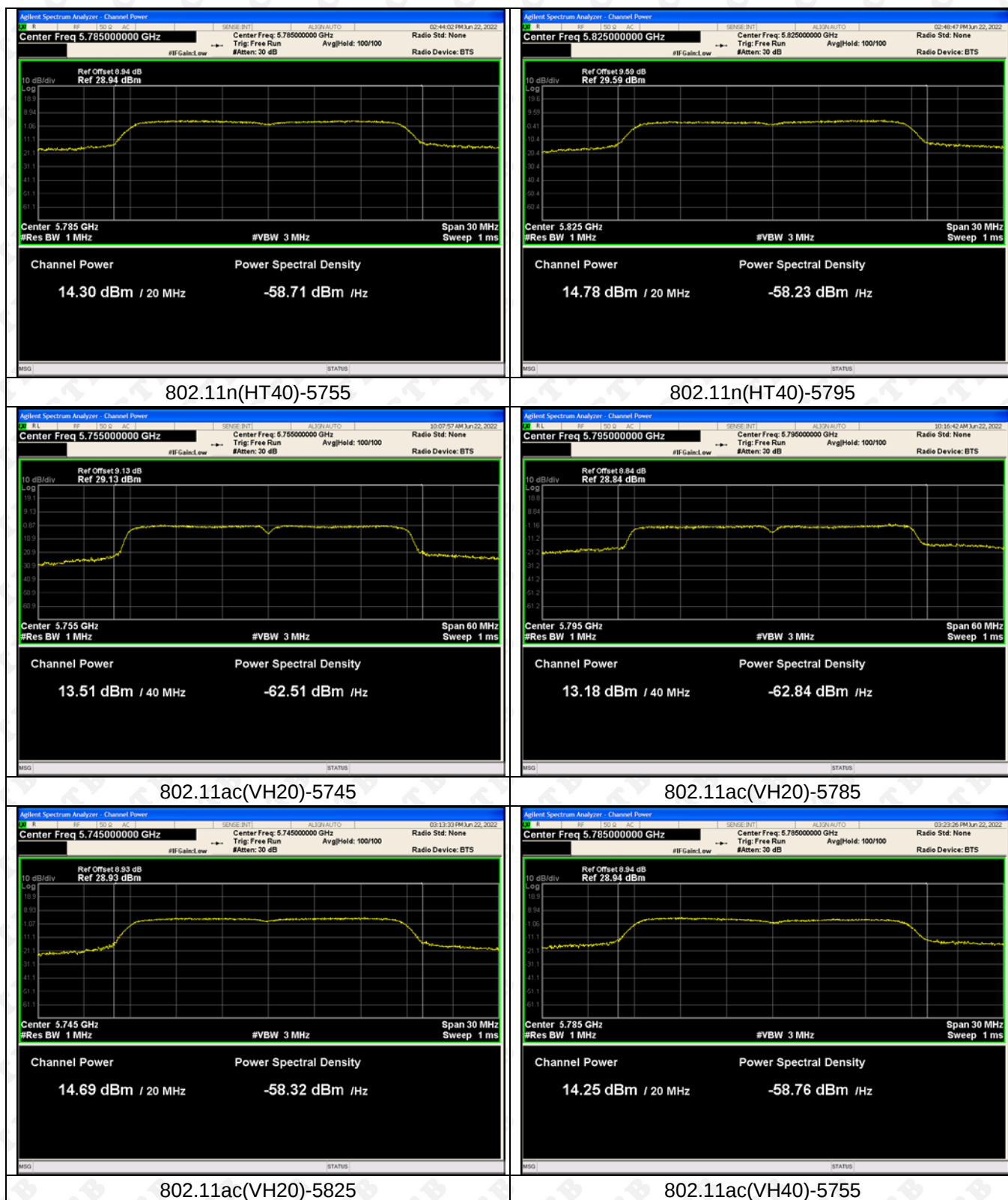
5745-5825MHz-Power
ANT1


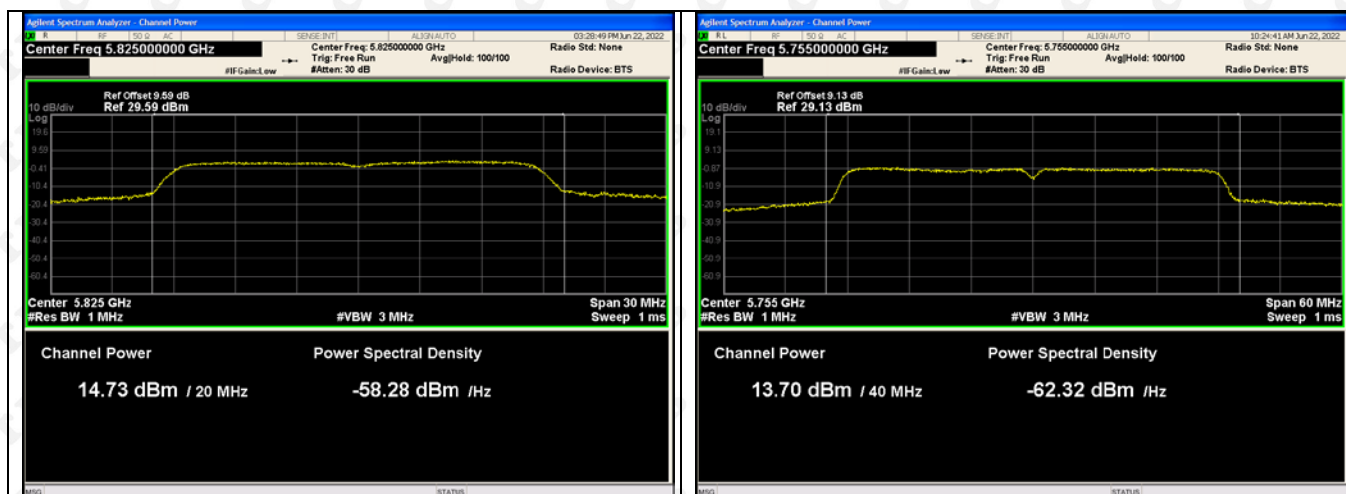




ANT2







802.11ac(VH40)-5795

802.11ac(VH80)-5775



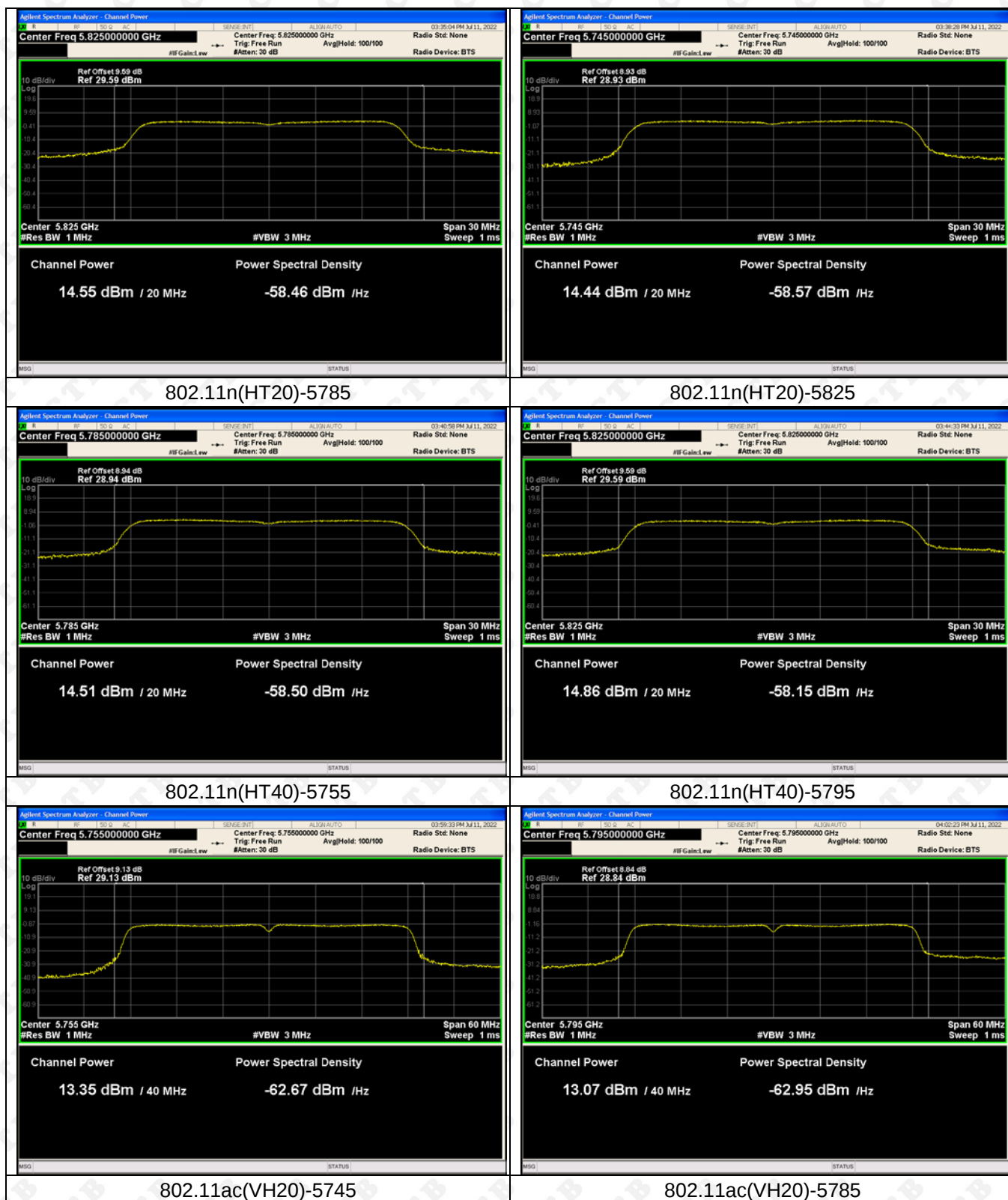
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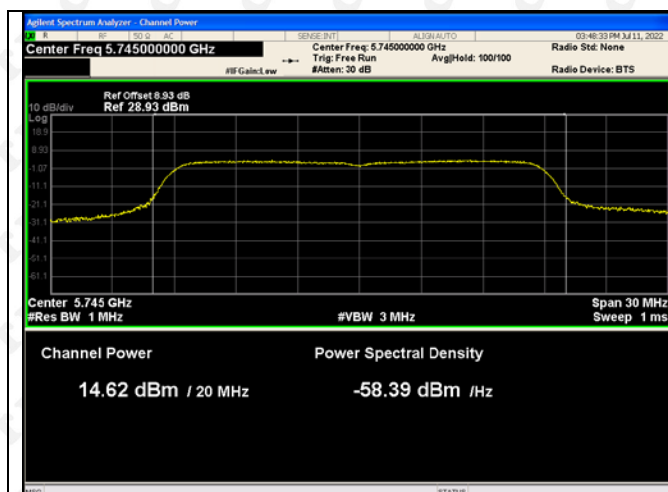
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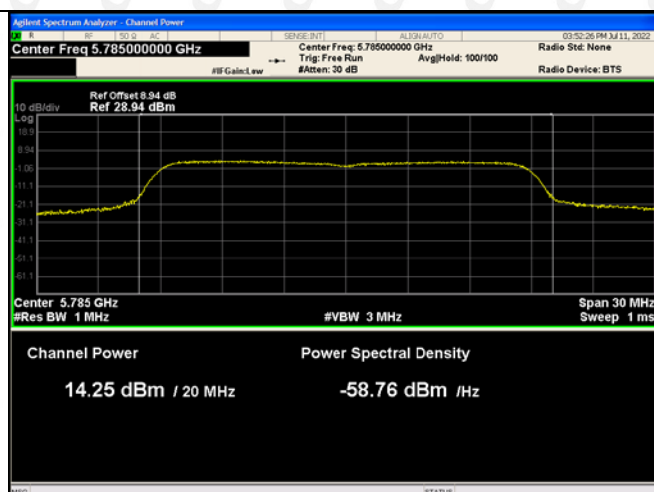
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802.11n(HT20)-5745

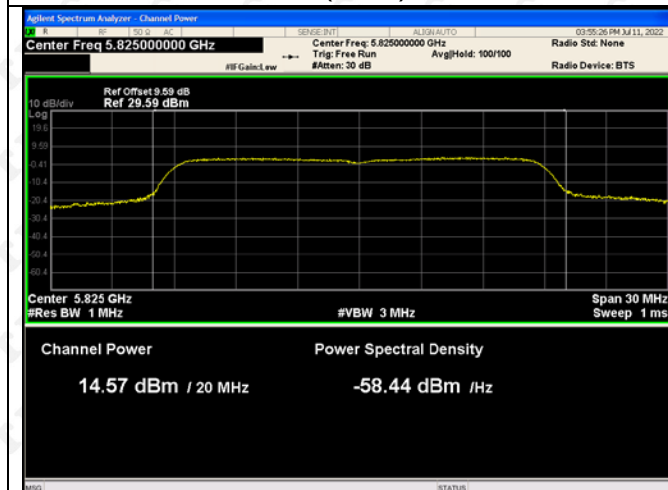




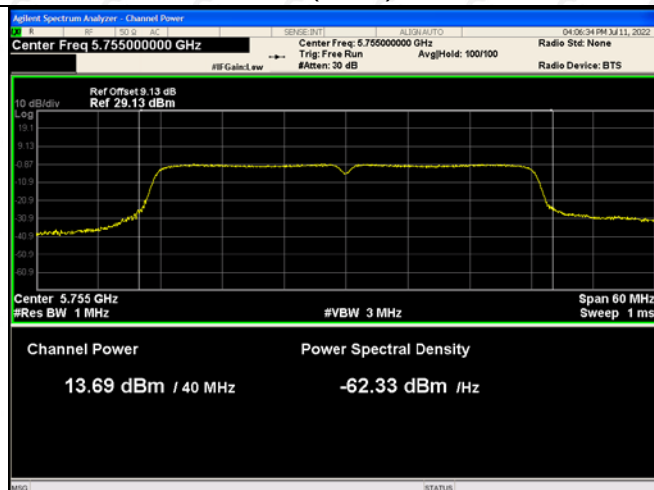
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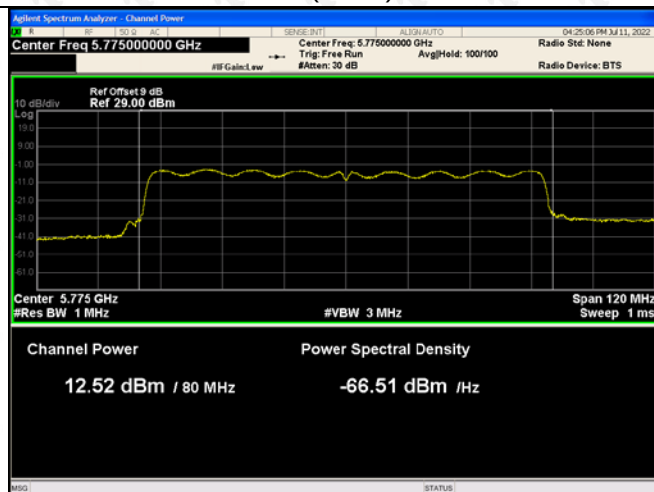
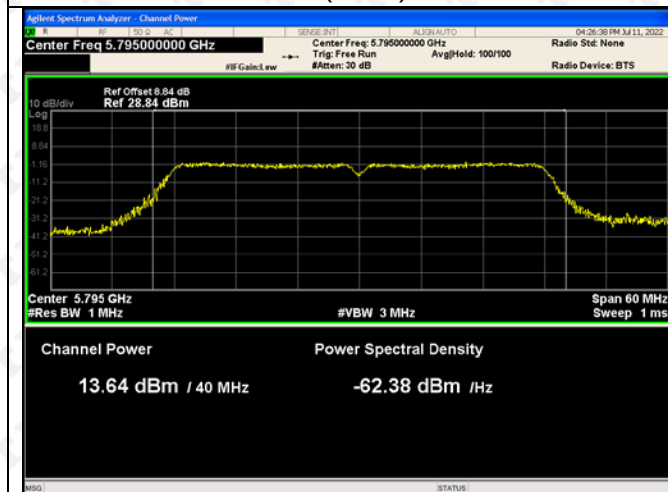
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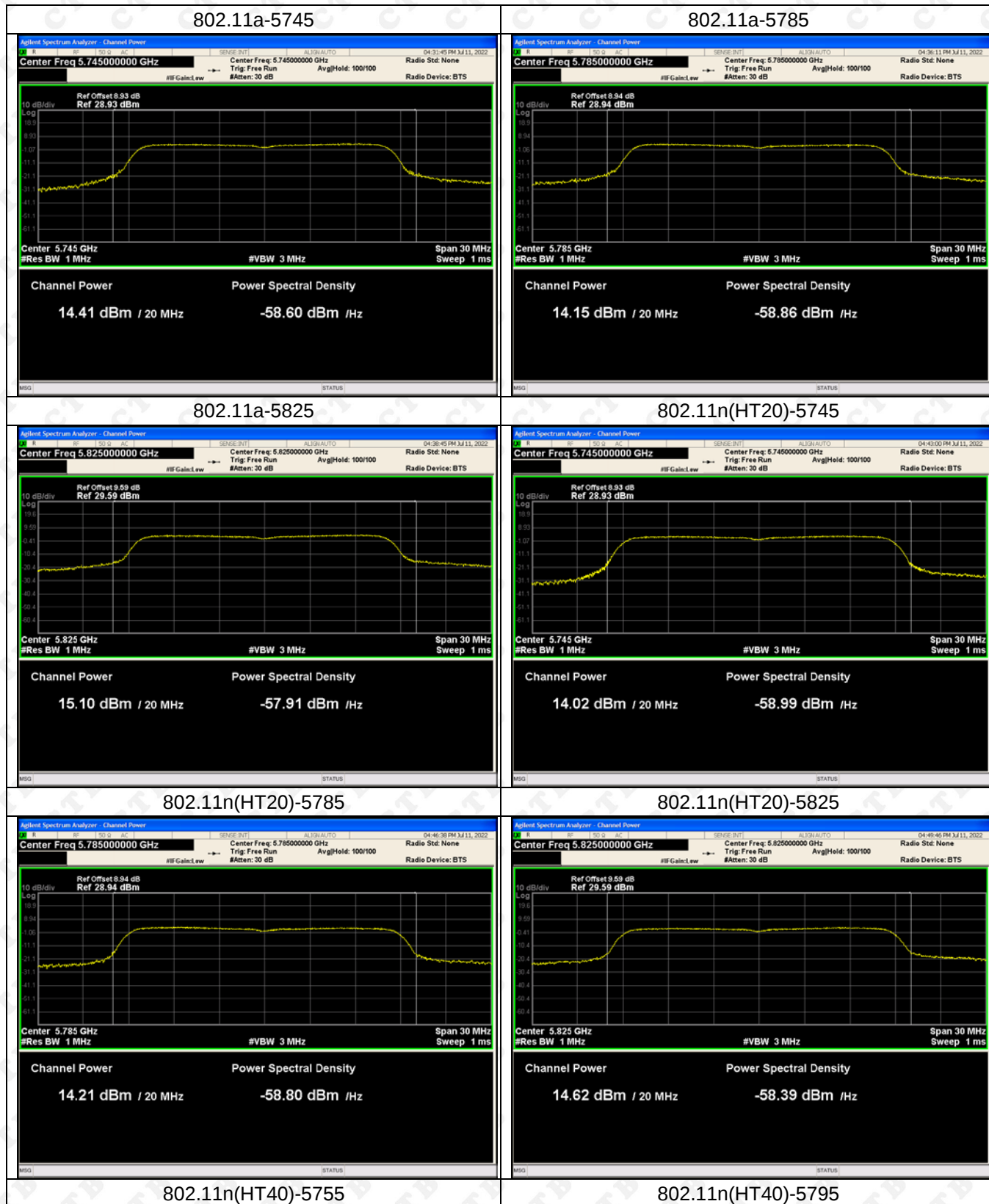
802.11ac(VH40)-5795

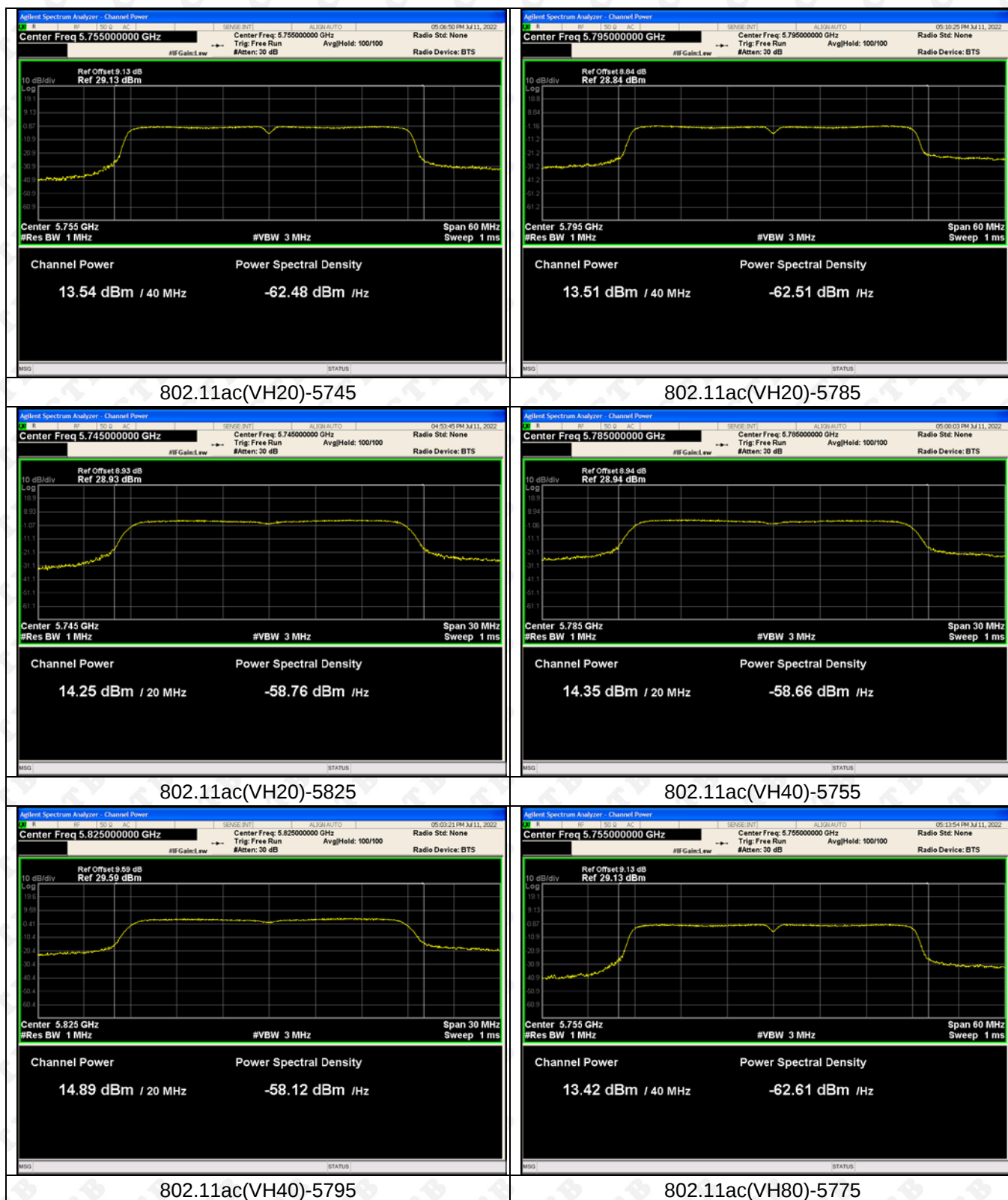


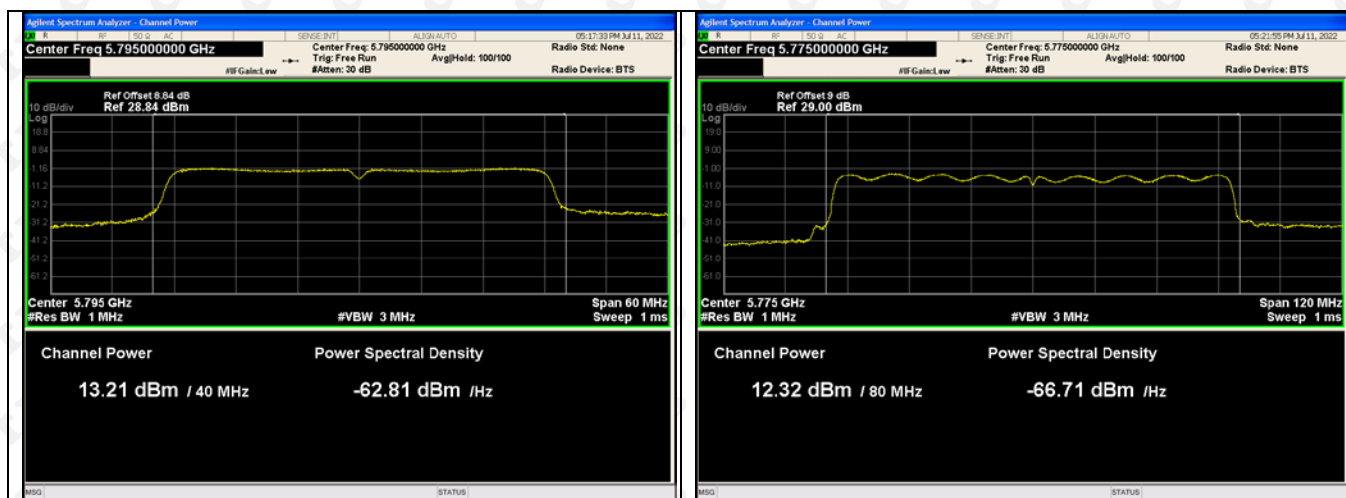
802.11ac(VH80)-5775



ANT4

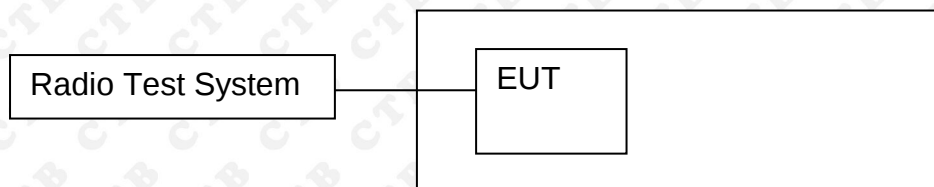






10. EMISSION BANDWIDTH& OCCUPIED BANDWIDTH

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	26dB Bandwidth (MHz)&ANT3	26dB Bandwidth (MHz)&ANT4
802.11a	5180	21.904	21.704	21.734	21.562
	5200	21.256	21.849	21.551	21.637
	5240	29.586	21.262	23.741	23.321
802.11ac20	5180	21.823	21.845	21.695	21.66
	5200	21.644	26.058	21.744	21.836
	5240	28.71	21.854	28.47	28.837
802.11ac40	5190	48.139	49.187	46.059	43.262
	5230	51.923	50.384	57.165	57.165
802.11ac80	5210	99.332	94.795	99.86	99.623
802.11n(HT20)	5180	21.633	21.713	21.154	21.732
	5200	25.346	22.067	21.675	21.79
	5240	25.114	29.291	21.815	26.755
802.11n(HT40)	5190	42.851	50.482	45.54	50.643
	5230	52.875	58.482	50.837	57.814

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)&ANT1	26dB Bandwidth (MHz)&ANT2	26dB Bandwidth (MHz)&ANT3	26dB Bandwidth (MHz)&ANT4
802.11a	5260	21.432	21.524	21.412	21.334
	5280	21.111	21.328	21.218	21.485
	5320	21.879	21.417	24.787	21.533
802.11ac20	5260	21.867	21.836	22.111	21.757
	5280	21.505	21.419	21.787	22.003
	5320	21.884	21.893	21.445	22.104
802.11ac40	5270	45.918	43.984	41.248	41.924
	5310	50.256	47.316	44.961	50.255
802.11ac80	5290	86.401	96.895	80.929	94.579
802.11n(HT20)	5260	21.578	21.753	21.747	21.758
	5280	22.083	21.502	21.607	21.445
	5320	23.006	22.104	21.842	22.213
802.11n(HT40)	5270	42.927	42.264	42.011	42.538
	5310	41.566	47.681	43.12	48.621

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)&ANT1	26dB Bandwidth (MHz)&ANT2	26dB Bandwidth (MHz)&ANT3	26dB Bandwidth (MHz)&ANT4
802.11a	5500	26.472	21.394	21.17	23.625
	5580	26.249	24.956	24.783	25.32
	5700	29.866	26.554	26.001	26.324
802.11ac20	5500	24.955	21.924	21.963	22.157
	5580	26.809	22.725	22.094	23.175
	5700	29.893	25.896	21.972	26.051
802.11ac40	5510	58.071	41.324	41.898	41.228
	5670	59.744	43.412	41.769	41.155
802.11ac80	5530	82.454	80.732	80.677	81.043
802.11n(HT20)	5500	29.578	22.11	21.815	21.805
	5580	28.091	25.981	25.939	25.992
	5700	29.742	22.087	21.964	22.562
802.11n(HT40)	5510	59.794	41.467	42.007	41.522
	5670	55.921	42.005	41.217	42.149

Test mode	Test Channel (MHz)	6dB Bandwidth (MHz)&ANT1	6dB Bandwidth (MHz)&ANT2	6dB Bandwidth (MHz)&ANT3	6dB Bandwidth (MHz)&ANT4
802.11a	5745	16.322	16.375	16.532	16.569
	5785	15.963	16.338	16.517	16.543
	5825	16.302	16.377	16.526	16.554
802.11ac20	5745	17.073	16.989	17.802	17.817
	5785	17.292	16.825	17.747	17.718
	5825	17.333	17.042	17.802	17.806
802.11ac40	5755	36.018	36.054	36.479	36.503
	5795	35.832	35.263	36.529	36.53
802.11ac80	5775	75.229	74.828	76.421	76.481
802.11n(HT20)	5745	17.297	16.995	17.763	17.721
	5785	16.562	16.971	17.696	17.76
	5825	17.321	17.17	17.777	17.756
802.11n(HT40)	5755	36.033	35.213	36.496	36.504
	5795	36.077	35.739	36.538	36.51