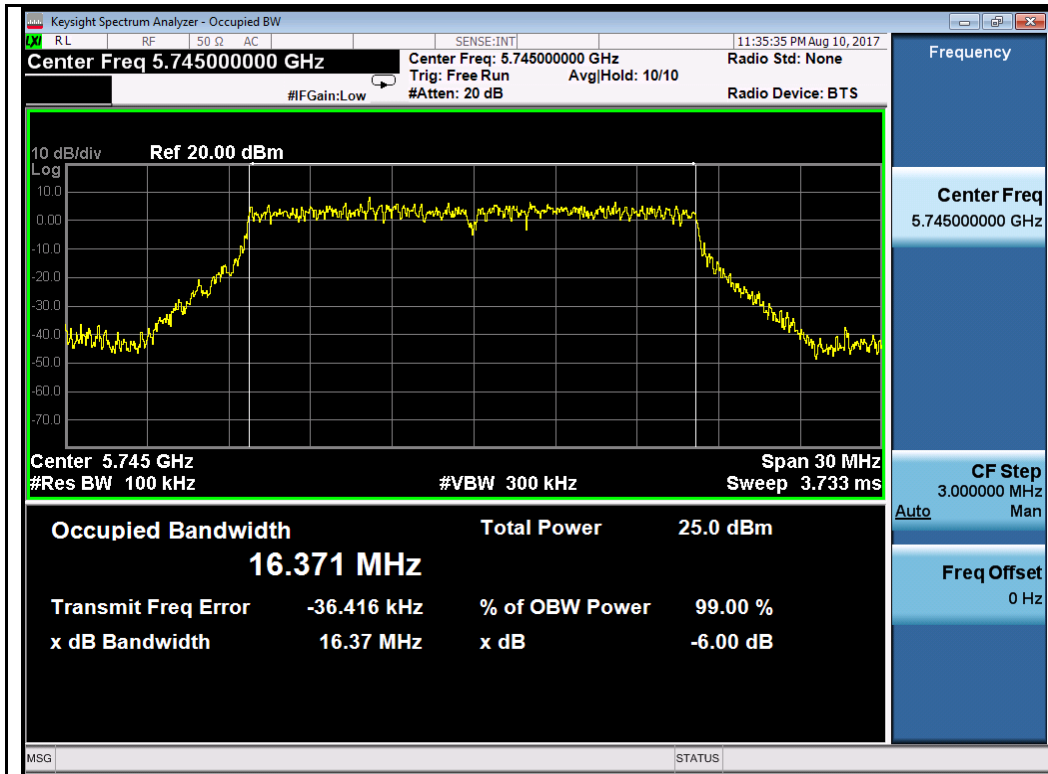
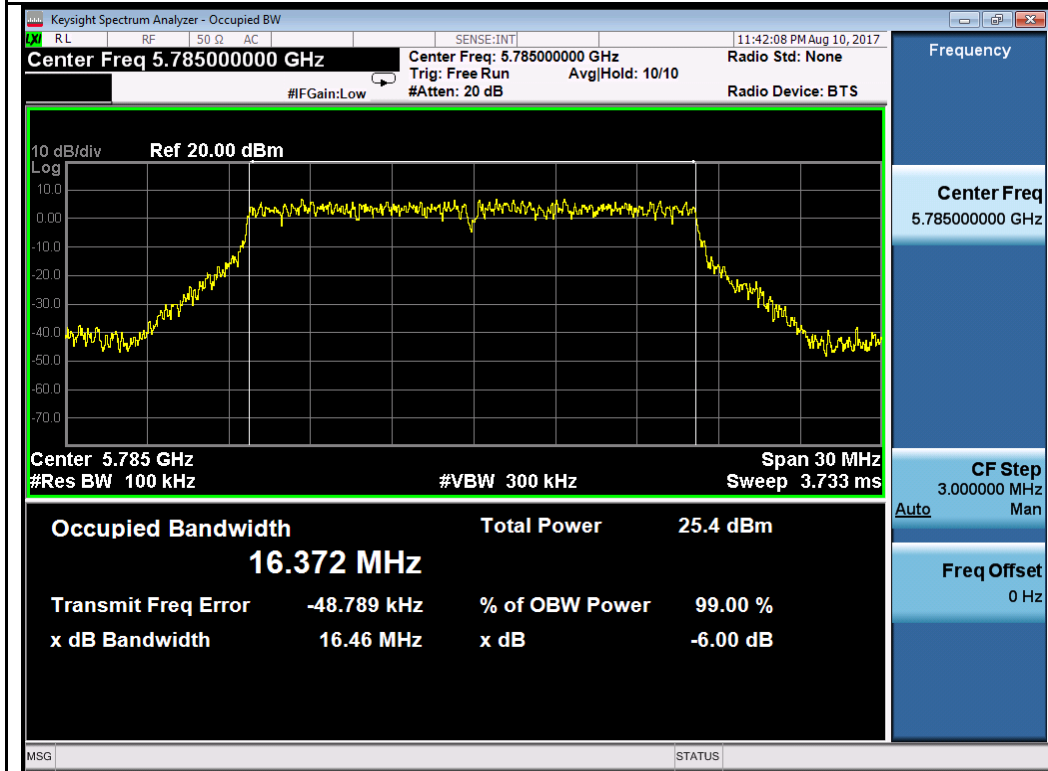


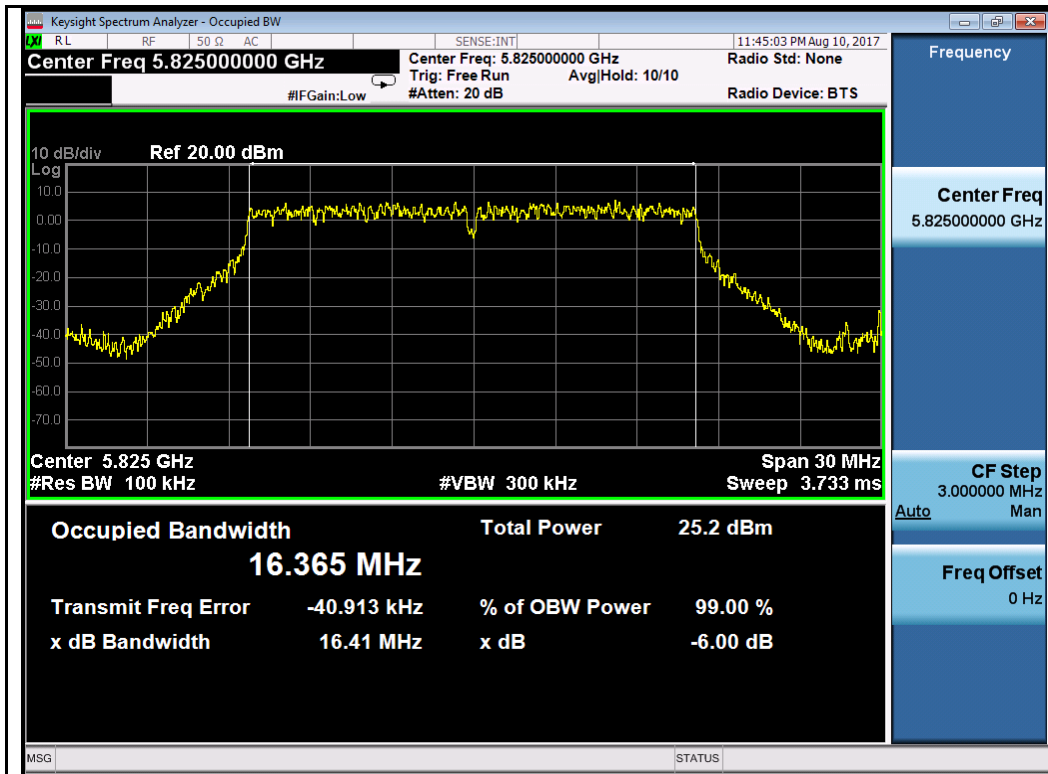
6dB Bandwidth Test Plots
W58:



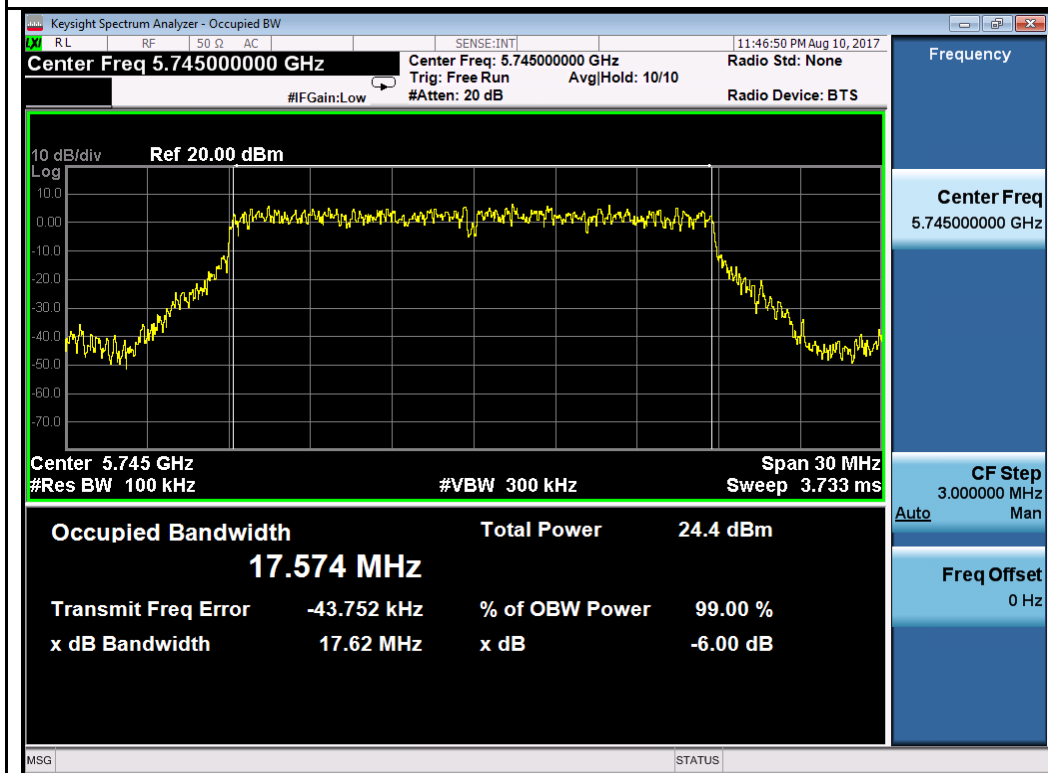
802.11a-5745MHz



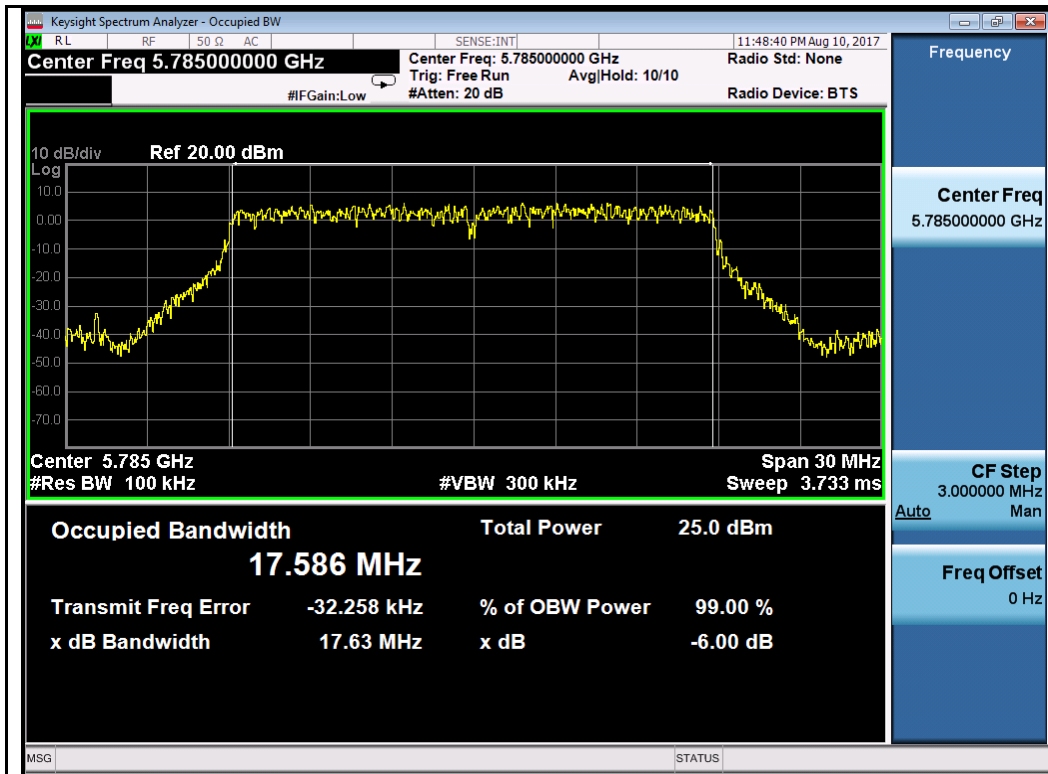
802.11a-5785MHz



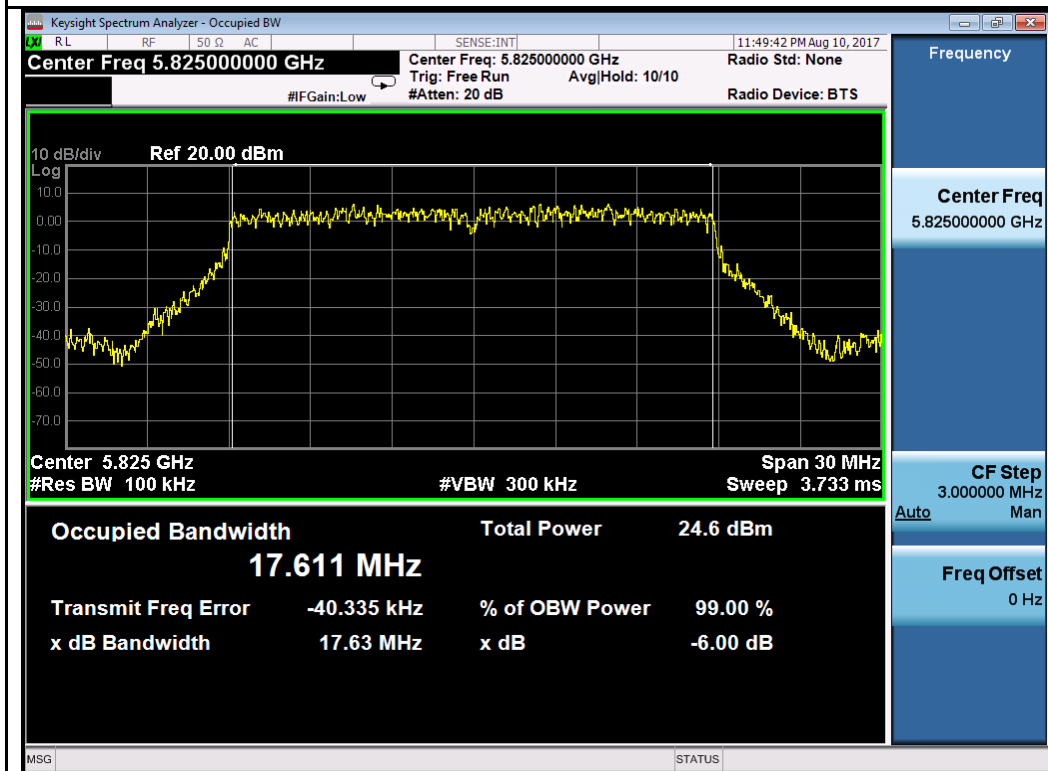
802.11a-5825MHz



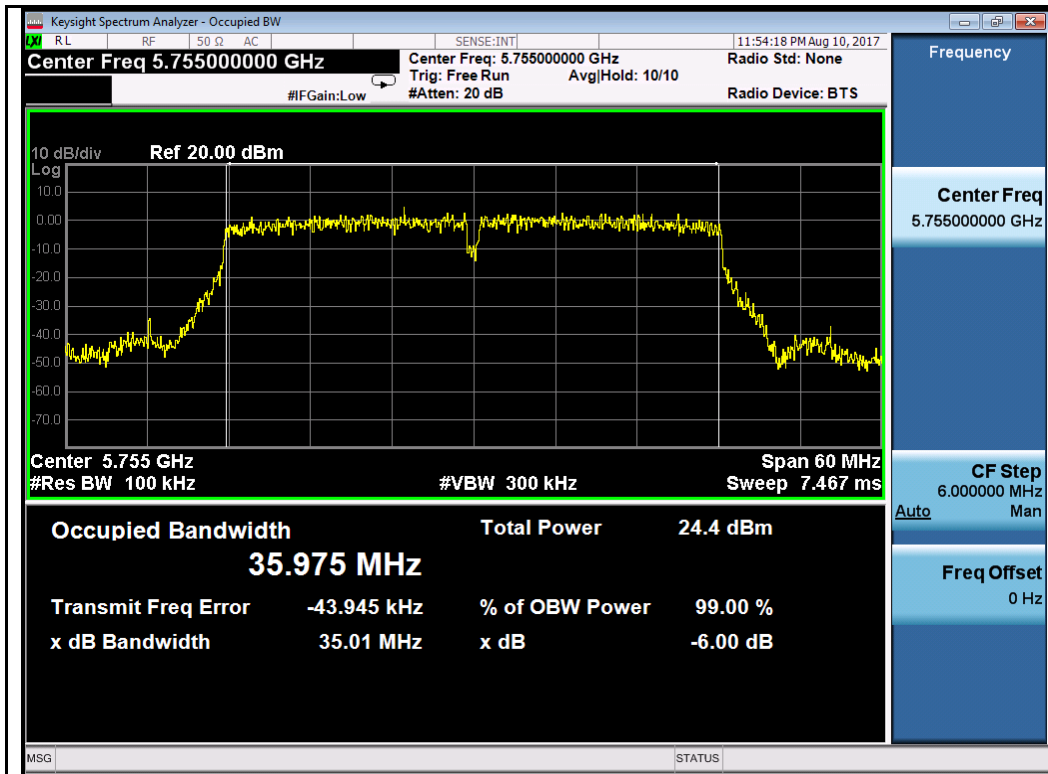
802.11n-HT20-5745MHz



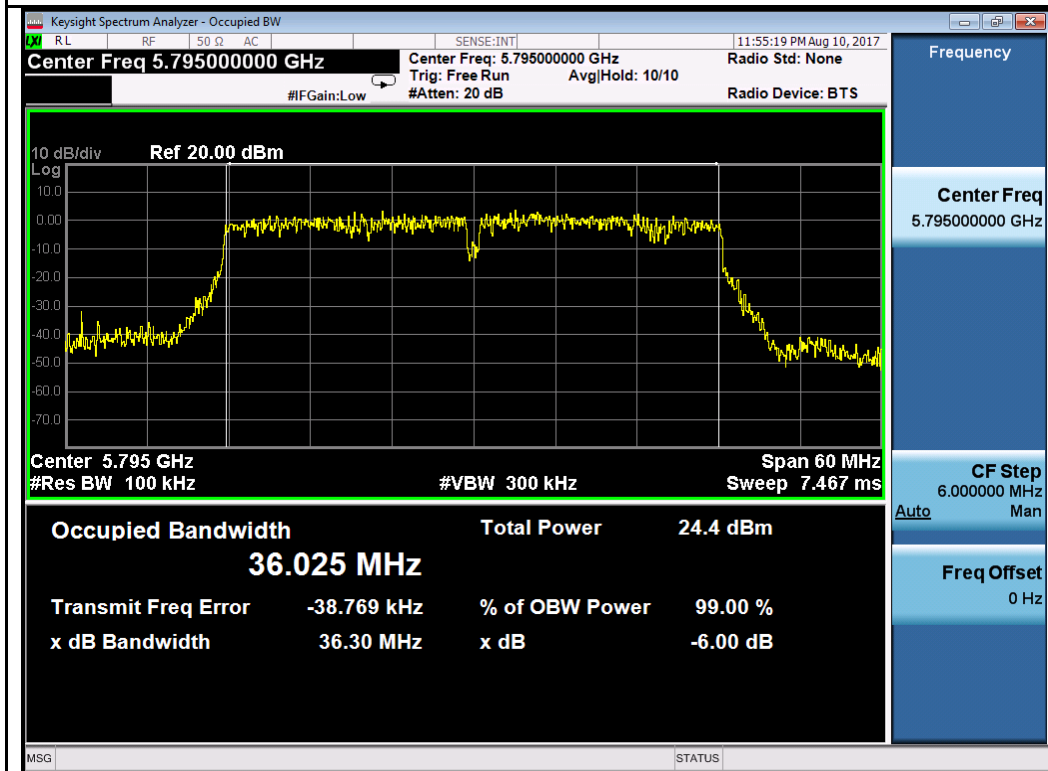
802.11n-HT20-5785MHz



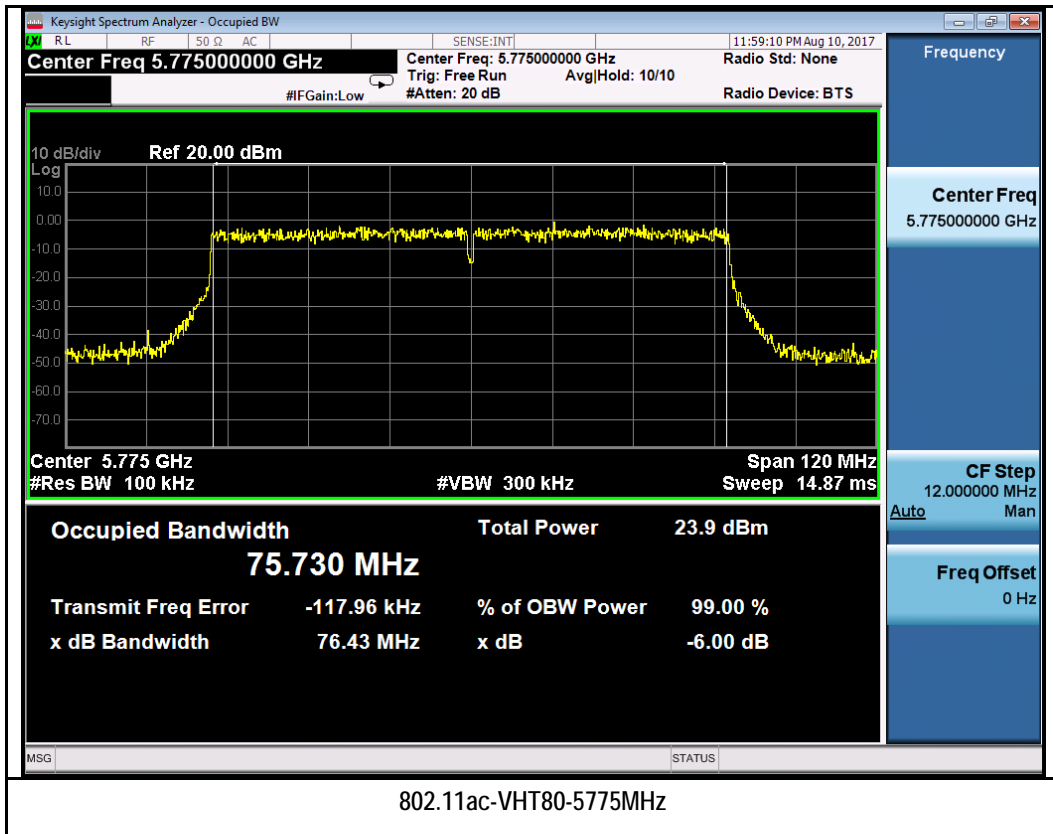
802.11n-HT20-5825MHz



802.11n-HT40-5755MHz



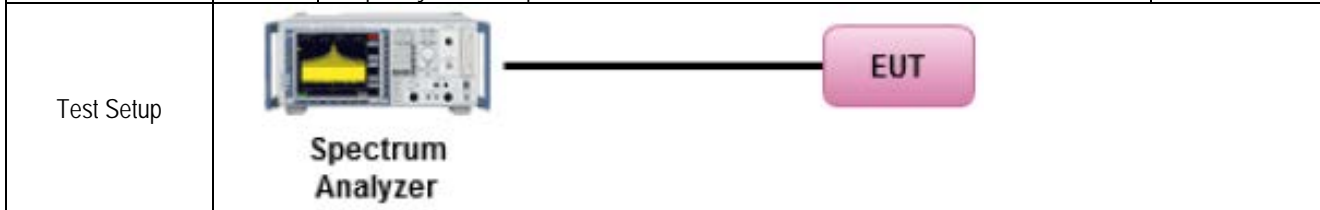
802.11n-HT40-5795MHz



10.3 Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.	<input checked="" type="checkbox"/>
	a)(3)	For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.	<input checked="" type="checkbox"/>



Test Procedure	<p>789033 D02 General UNII Test Procedures New Rules v01r02</p> <p><u>Measurement using a Spectrum Analyzer or EMI Receiver (SA)</u> Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep):</p> <ul style="list-style-type: none"> (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. (ii) Set RBW = 1 MHz (iii) Set VBW = 3 MHz (iv) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.) (v) Sweep time = auto. (vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode. (vii) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run." (viii) Trace average at least 100 traces in power averaging (rms) mode. (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum. 		
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Test Date	08/10/2017 – 09/20/2017	Environmental condition	Temperature 21°C Relative Humidity 40% Atmospheric Pressure 1019mbar
Remark	Per KDB 662911 D01 Multiple Transmitter Output v02r01, the direction gain for horizontal polarization and vertical polarization is calculated separately. For 5GHz band, peak antenna gain = 4.5 dBi, directional gain = 3 dB, total gain = 7.5 dBi. Highest of total gain is 7.5 dBi. The power limit and PSD limit will be reduced by amount of 1.5 dB.		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test was done by Rachana Khanduri at RF test site.

Output Power measurement result for 5.2GHz

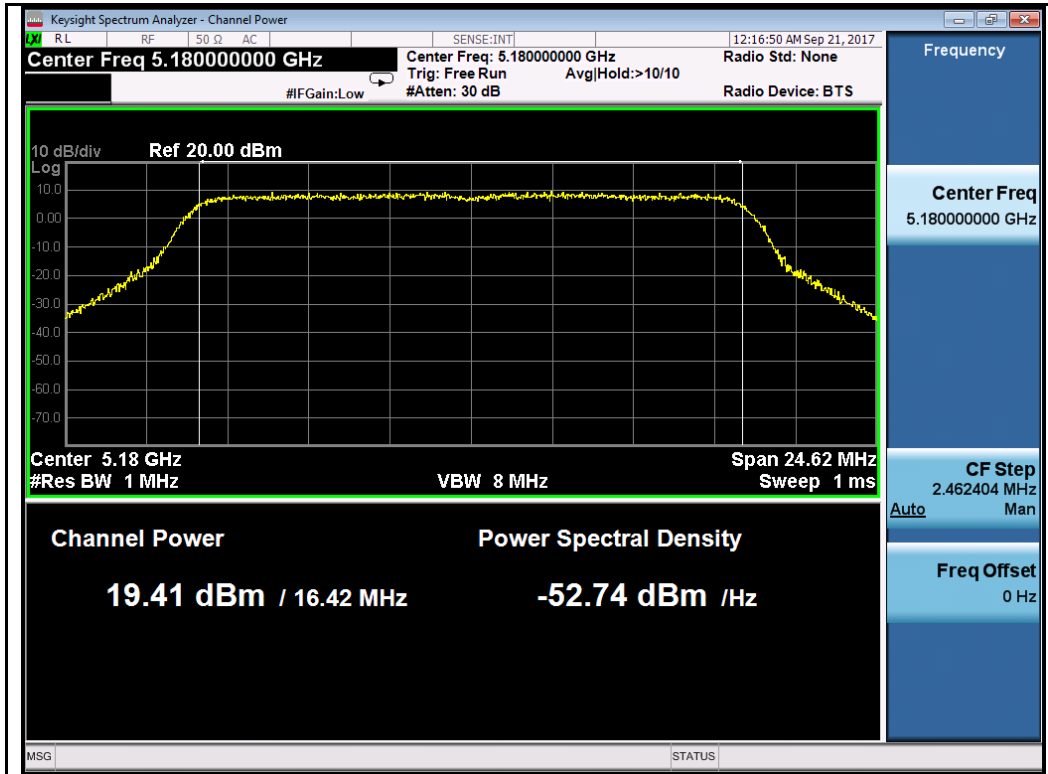
Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)					Limit (dBm)	Result
				Chain 0	Chain 1	Chain 2	Chain 3	Combined Power		
Output Power	802.11a	5180	Low	19.41	19.65	19.59	19.84	25.65	28.5	Pass
		5200	Mid	19.55	20.00	19.99	19.84	25.87	28.5	Pass
		5240	High	19.42	19.74	19.61	19.65	25.63	28.5	Pass
	802.11n-20	5180	Low	19.81	20.23	19.78	19.73	25.91	28.5	Pass
		5200	Mid	19.11	19.53	19.73	19.66	25.53	28.5	Pass
		5240	High	19.56	19.83	19.69	20.00	25.79	28.5	Pass
	802.11n-40	5190	Low	18.94	18.95	18.99	18.97	24.98	28.5	Pass
		5230	High	19.64	20.04	19.47	20.05	25.83	28.5	Pass
	802.11ac-80	5210	Mid	16.90	17.17	16.88	16.75	22.95	28.5	Pass

Output Power measurement result for 5.8GHz

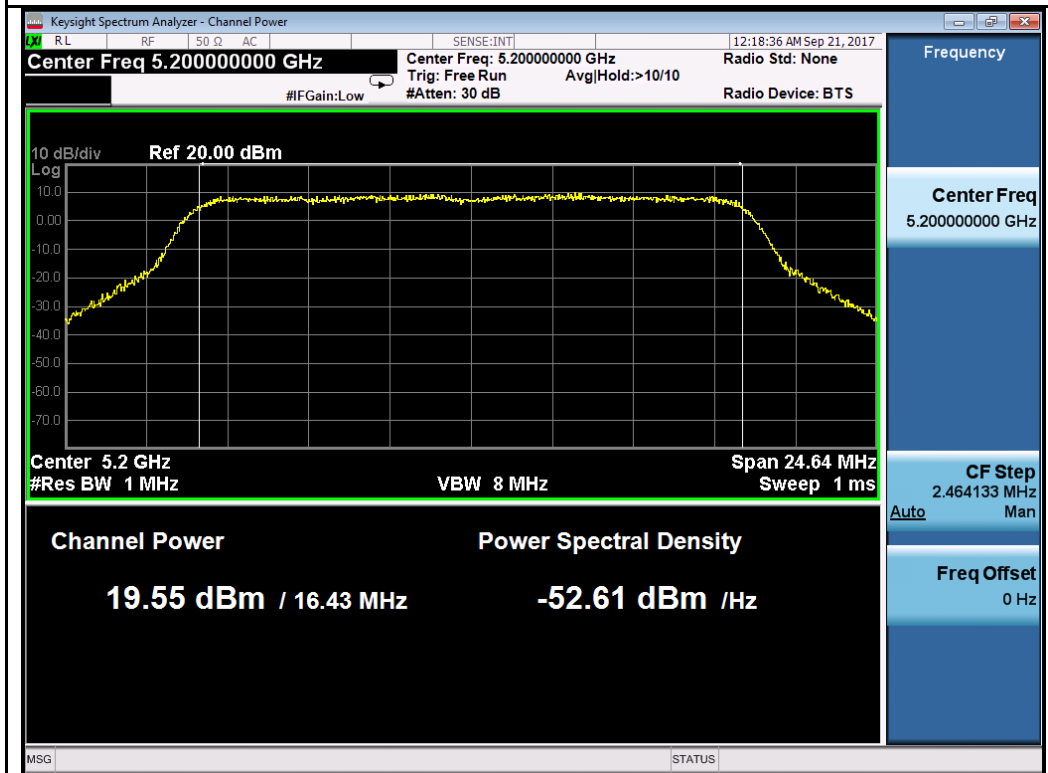
Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)					Limit (dBm)	Result
				Chain 0	Chain 1	Chain 2	Chain3	Combined Power		
Output Power	802.11a	5745	Low	21.36	21.51	21.89	20.94	27.46	28.5	Pass
		5785	Mid	21.55	22.04	21.95	21.46	27.78	28.5	Pass
		5825	High	21.40	21.90	22.11	21.48	27.75	28.5	Pass
	802.11n-20	5745	Low	21.20	21.02	21.39	20.93	27.16	28.5	Pass
		5785	Mid	21.65	21.76	21.76	21.45	27.68	28.5	Pass
		5825	High	21.17	21.69	21.86	21.35	27.55	28.5	Pass
	802.11n-40	5755	Low	21.28	21.44	21.51	20.96	27.32	28.5	Pass
		5795	High	21.61	22.04	22.02	21.19	27.75	28.5	Pass
	802.11ac-80	5775	Mid	21.16	21.12	21.32	20.85	27.14	28.5	Pass

Test Plot for W52:

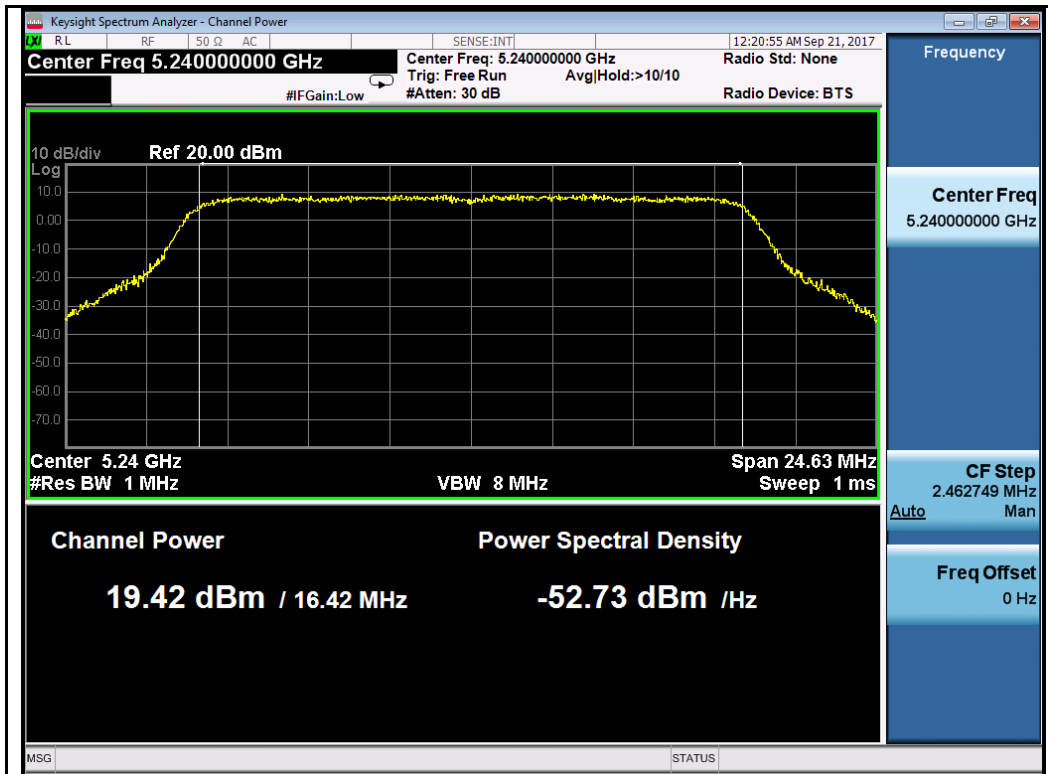
Chain 0:



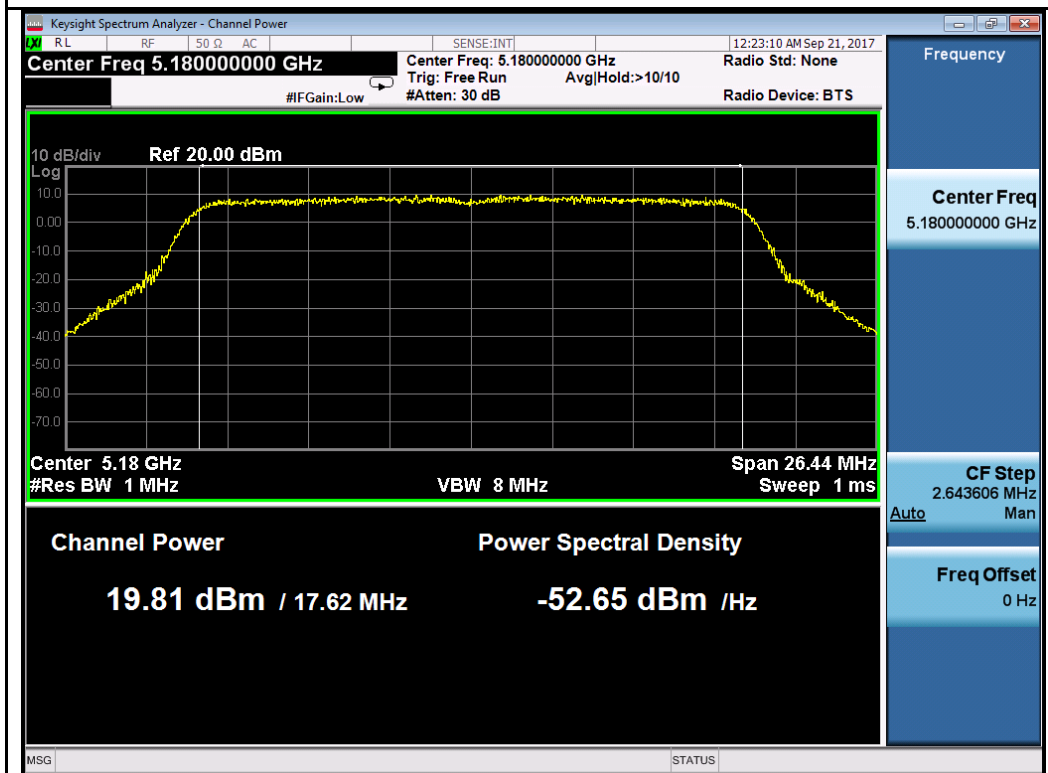
802.11a-5180MHz



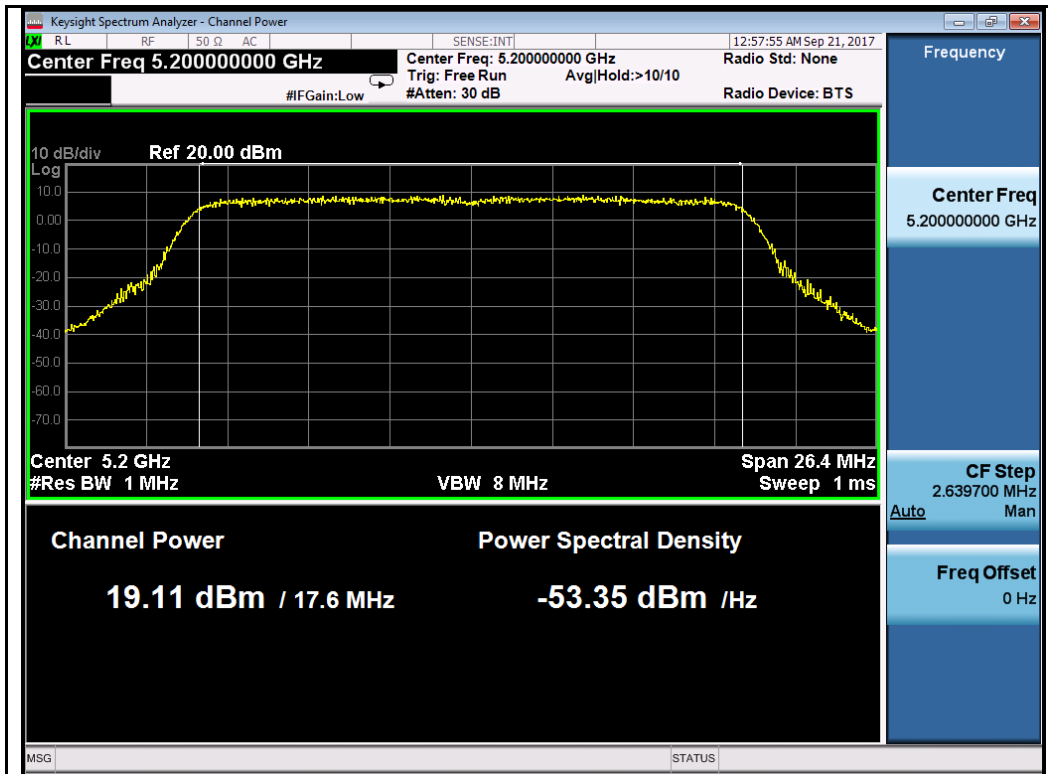
802.11a-5200MHz



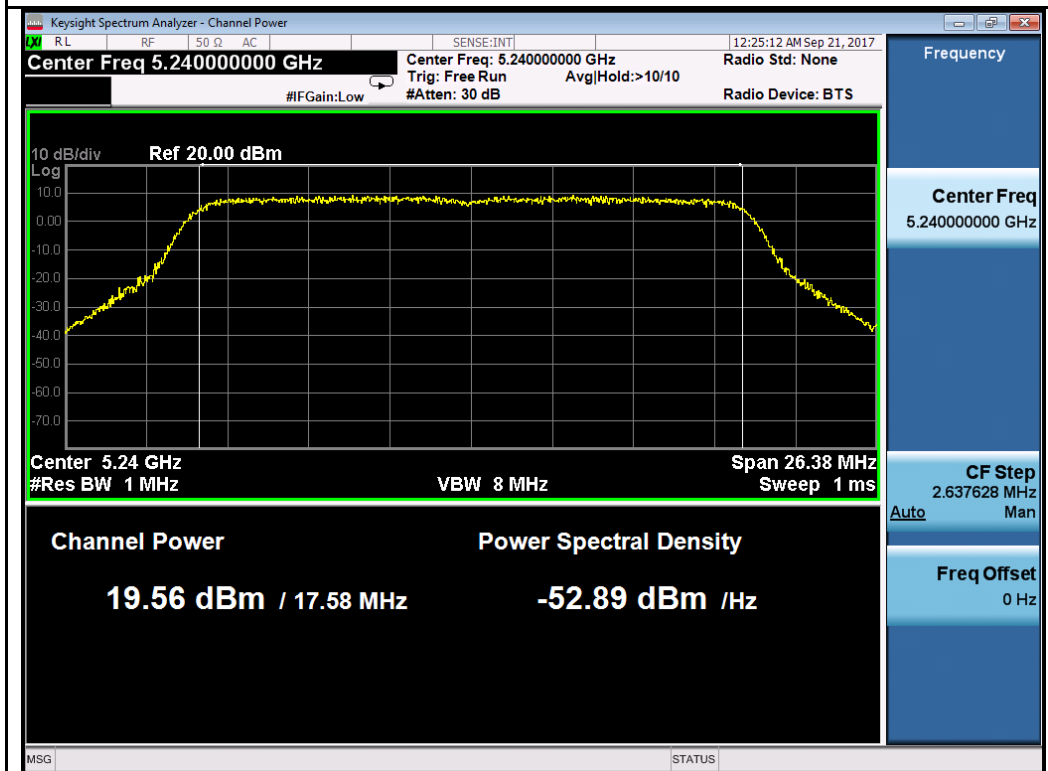
802.11a-5240MHz



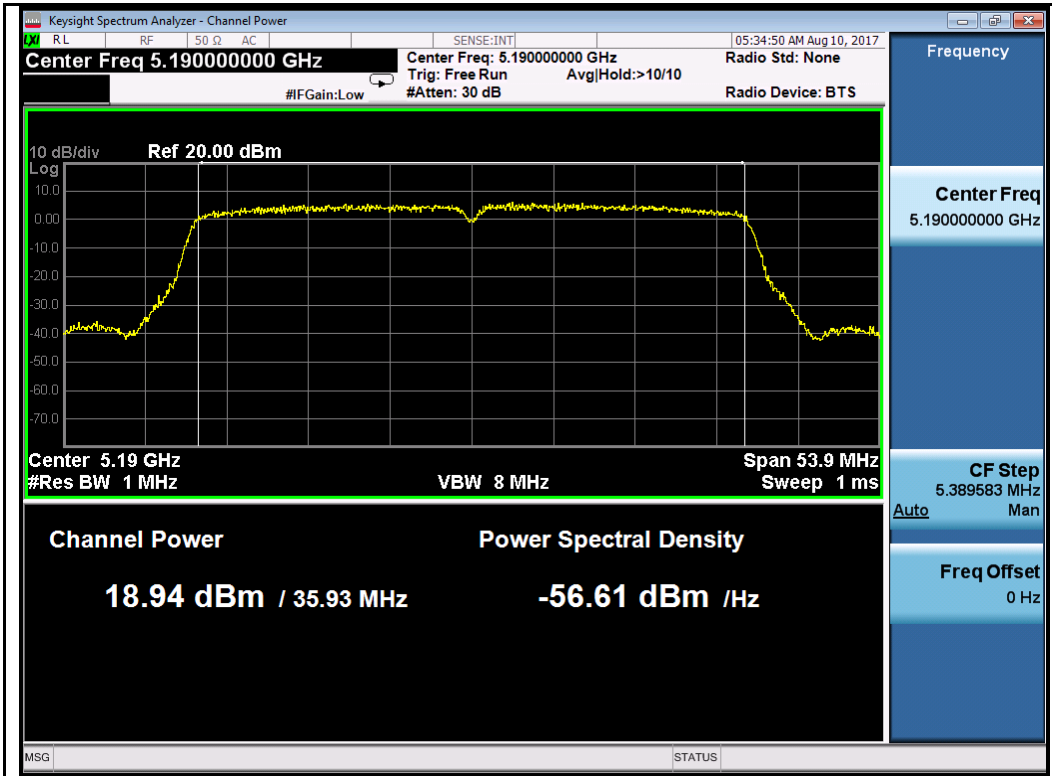
802.11n-HT20-5180MHz



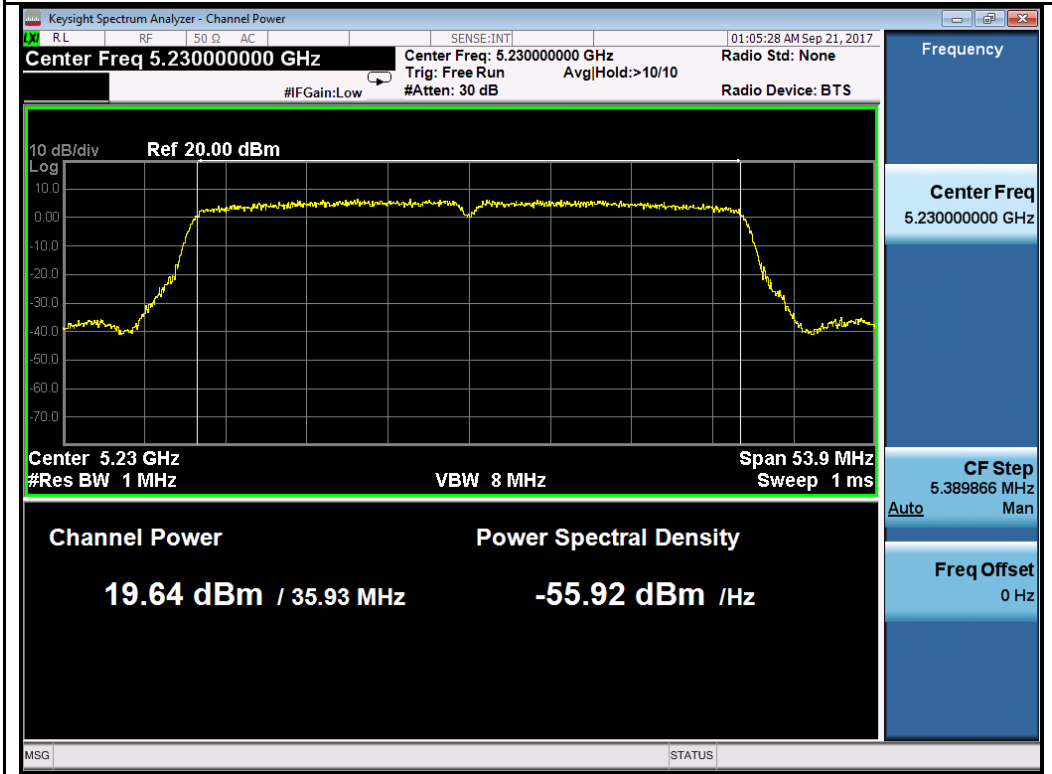
802.11n-HT20-5200MHz



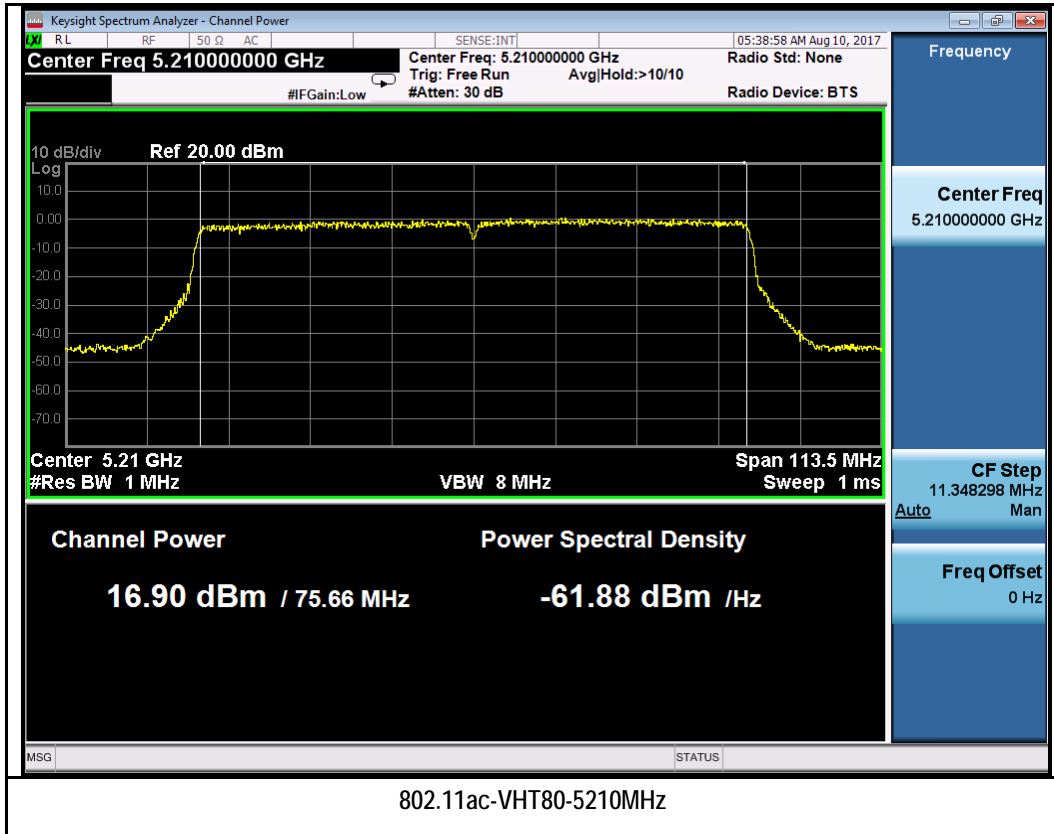
802.11n-HT20-5240MHz



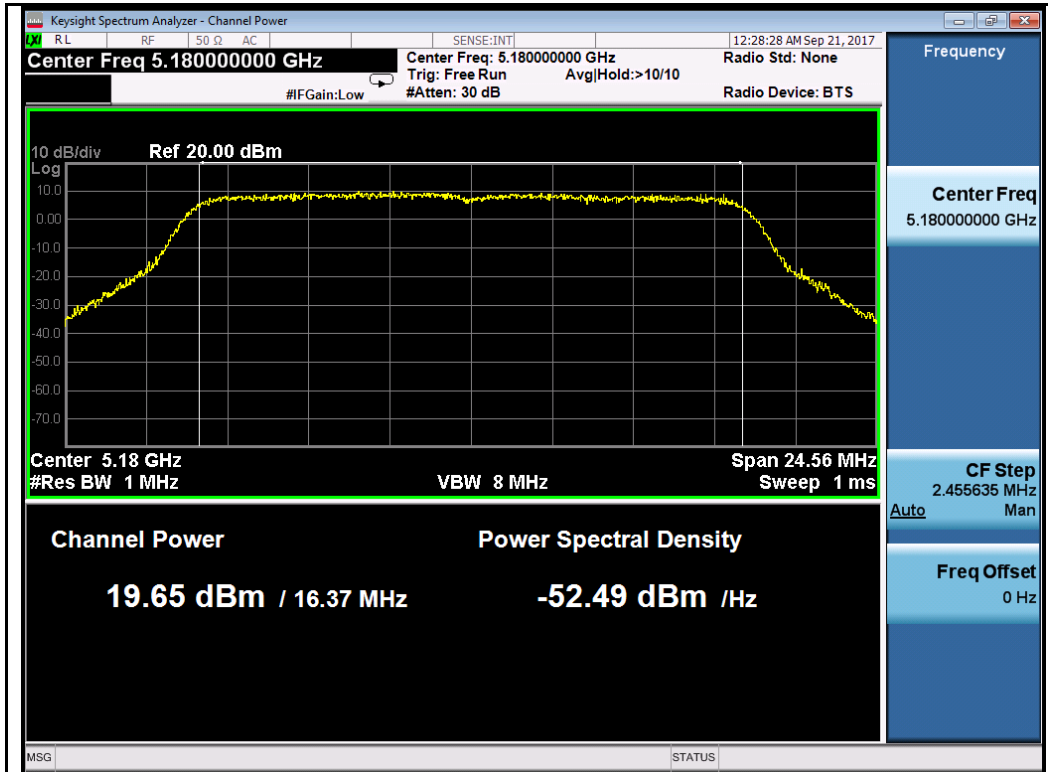
802.11n-HT40-5190MHz



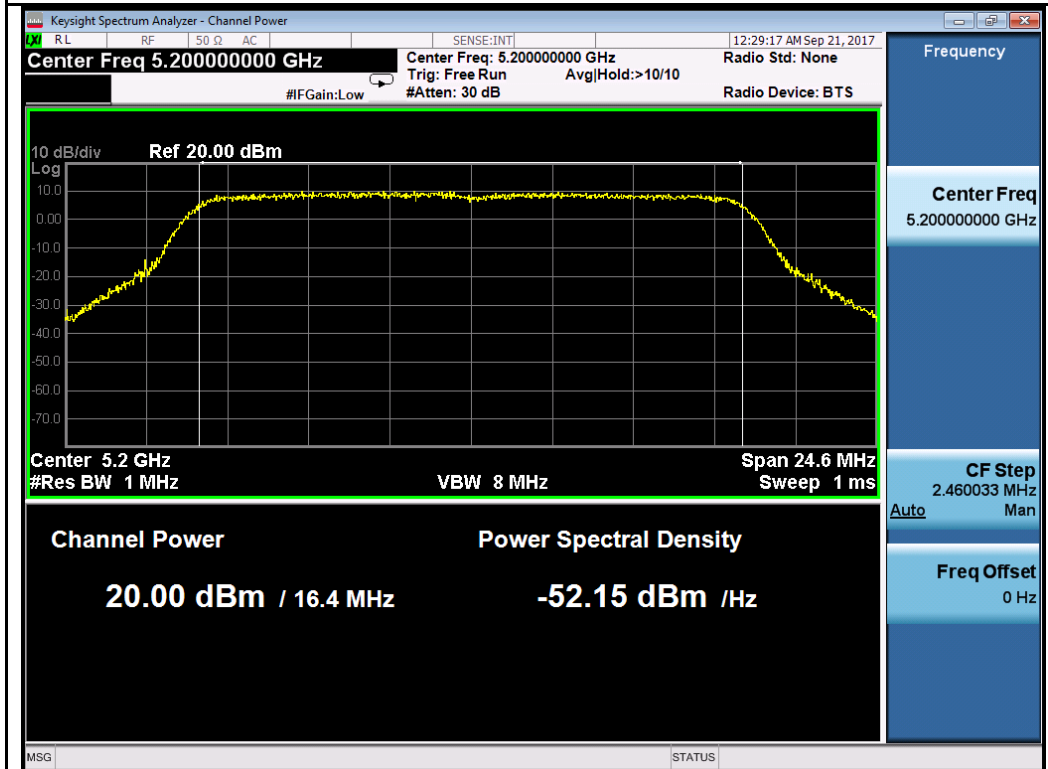
802.11n-HT40-5230MHz



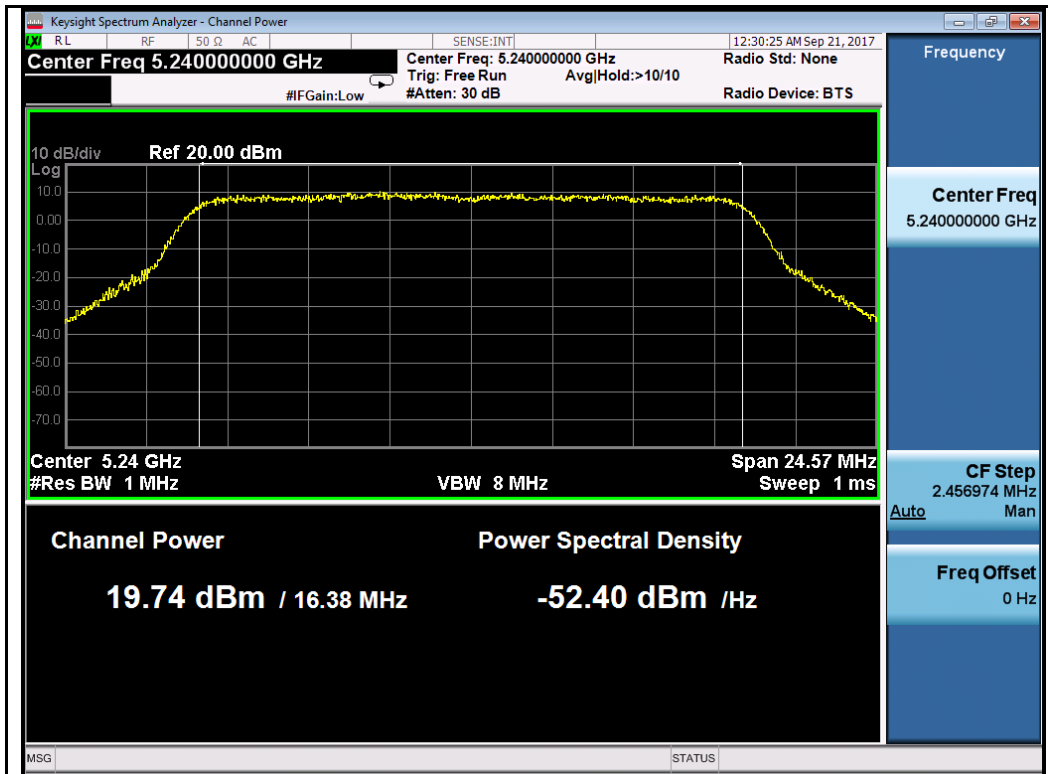
Chain 1:



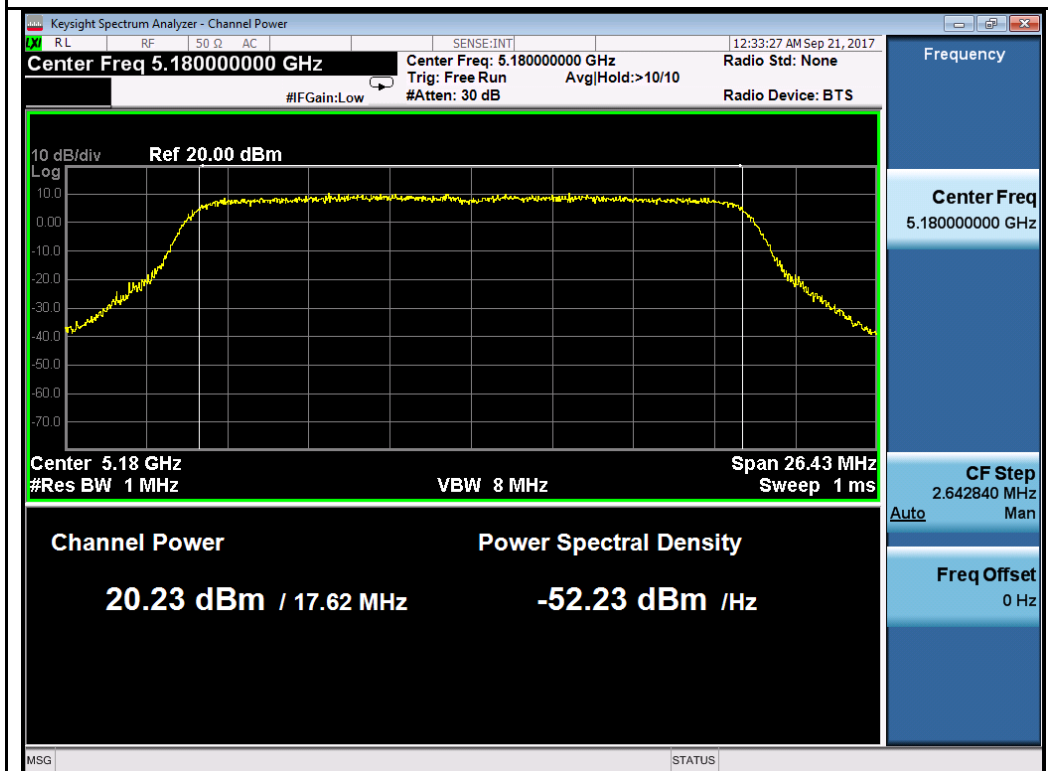
802.11a-5180MHz



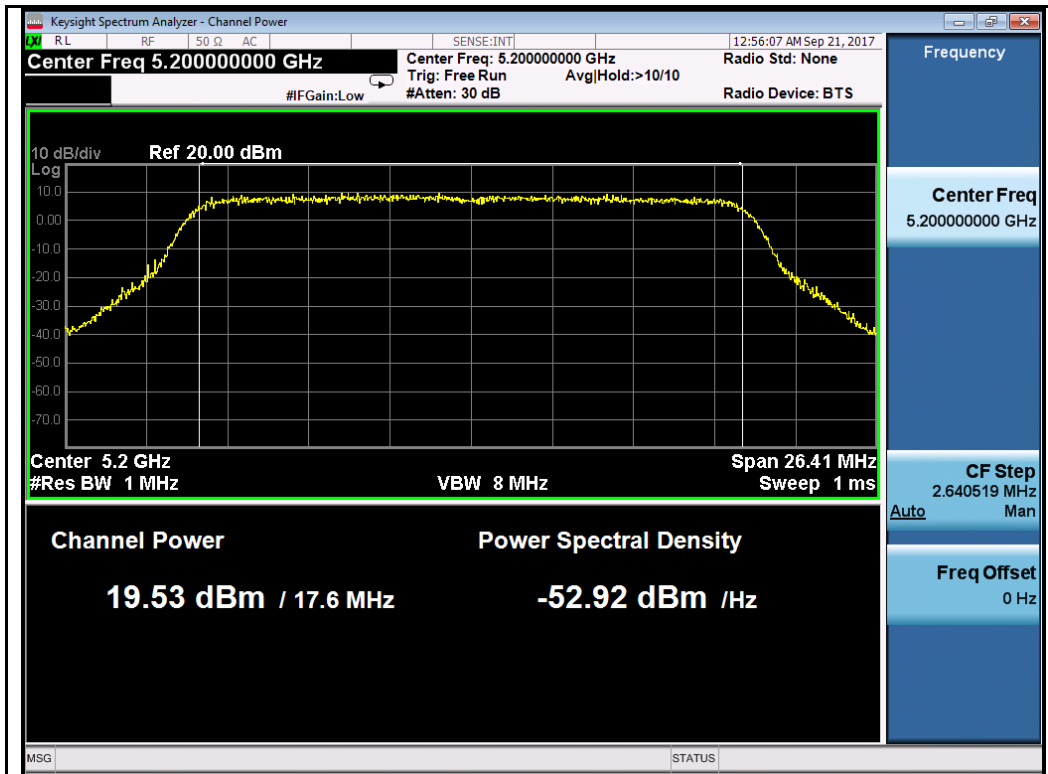
802.11a-5200MHz



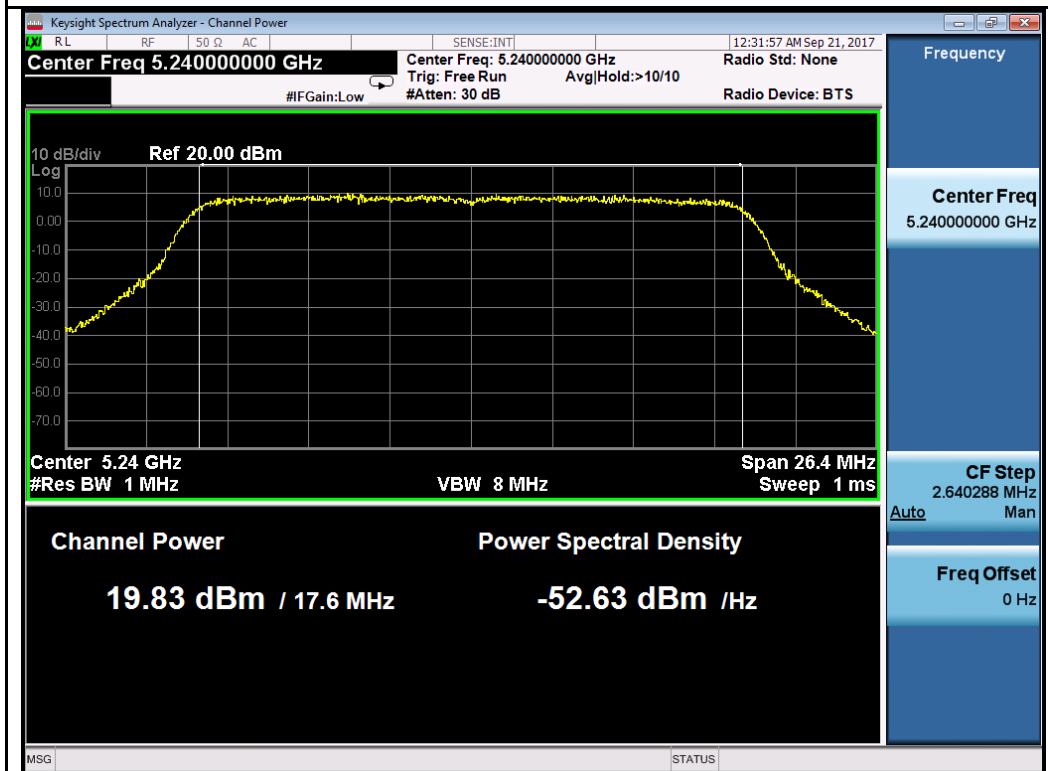
802.11a-5240MHz



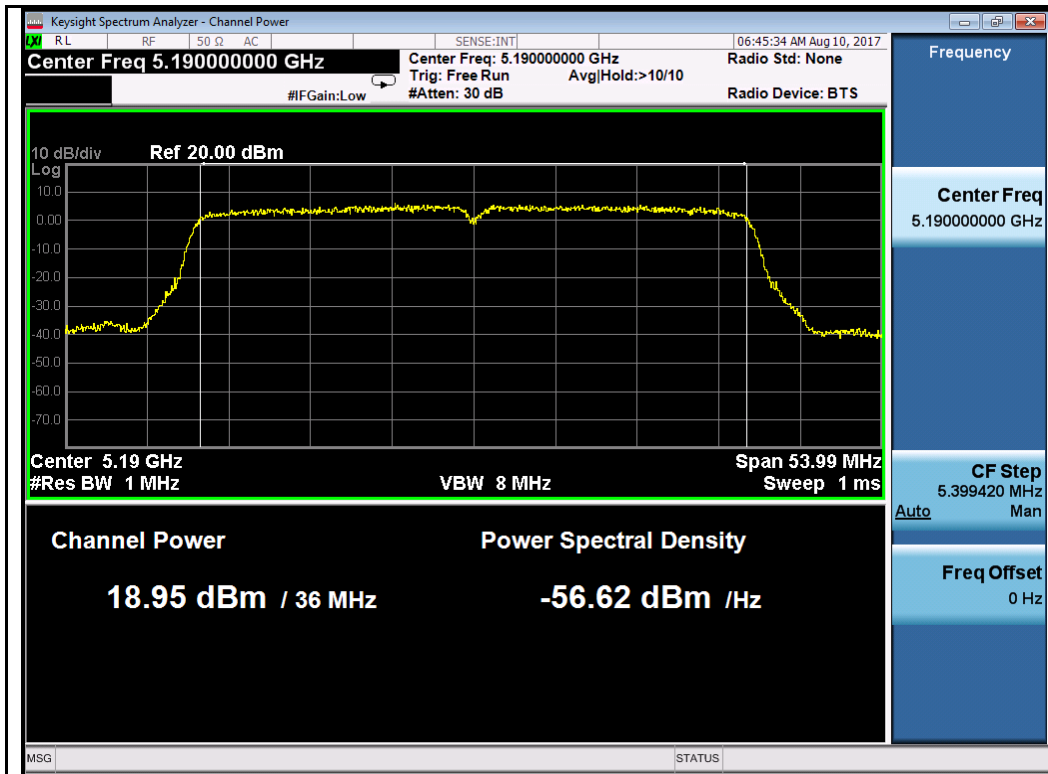
802.11n-HT20-5180MHz



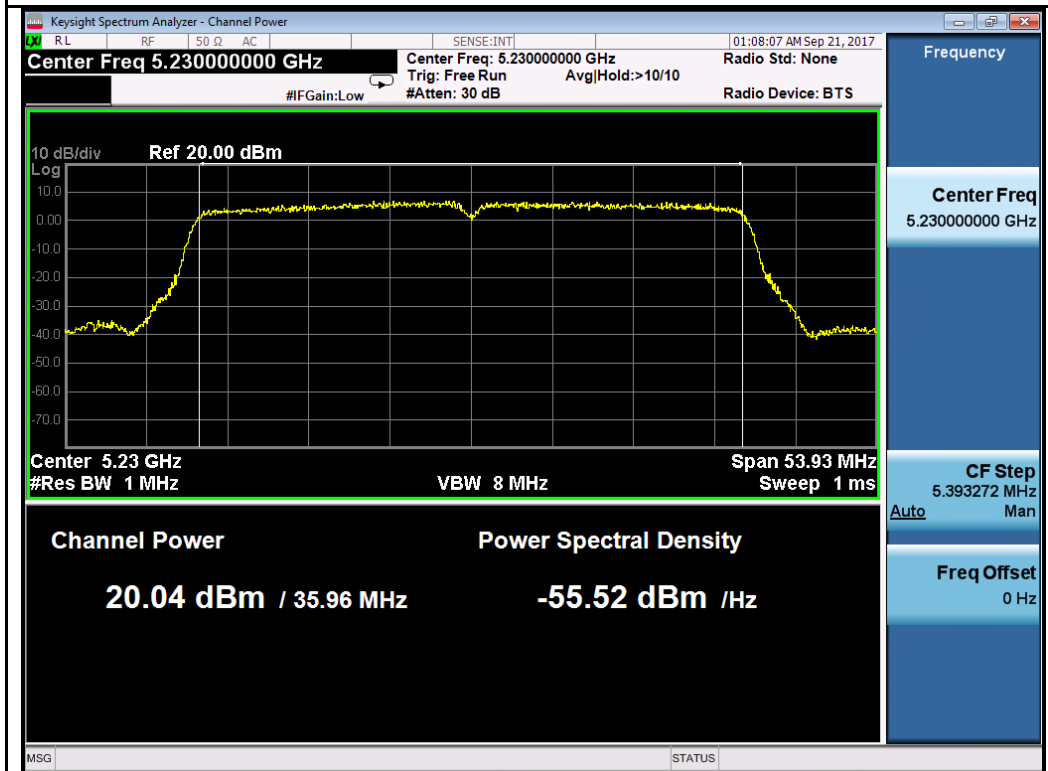
802.11n-HT20-5200MHz



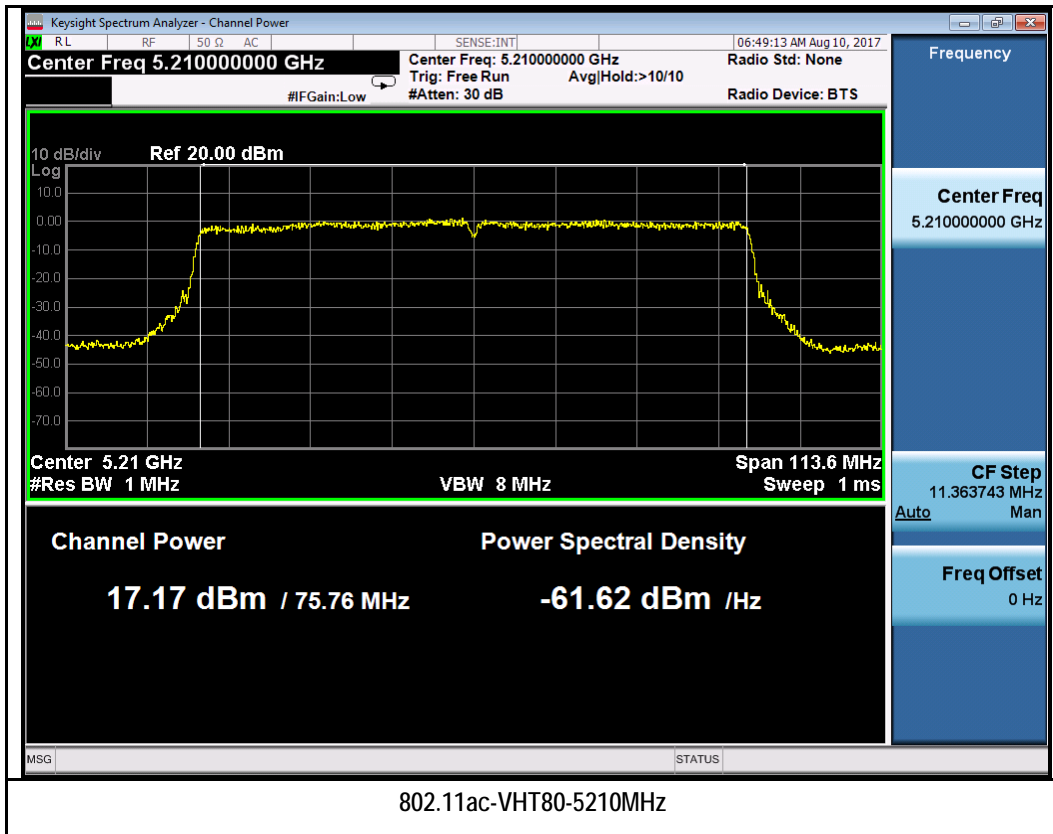
802.11n-HT20-5240MHz



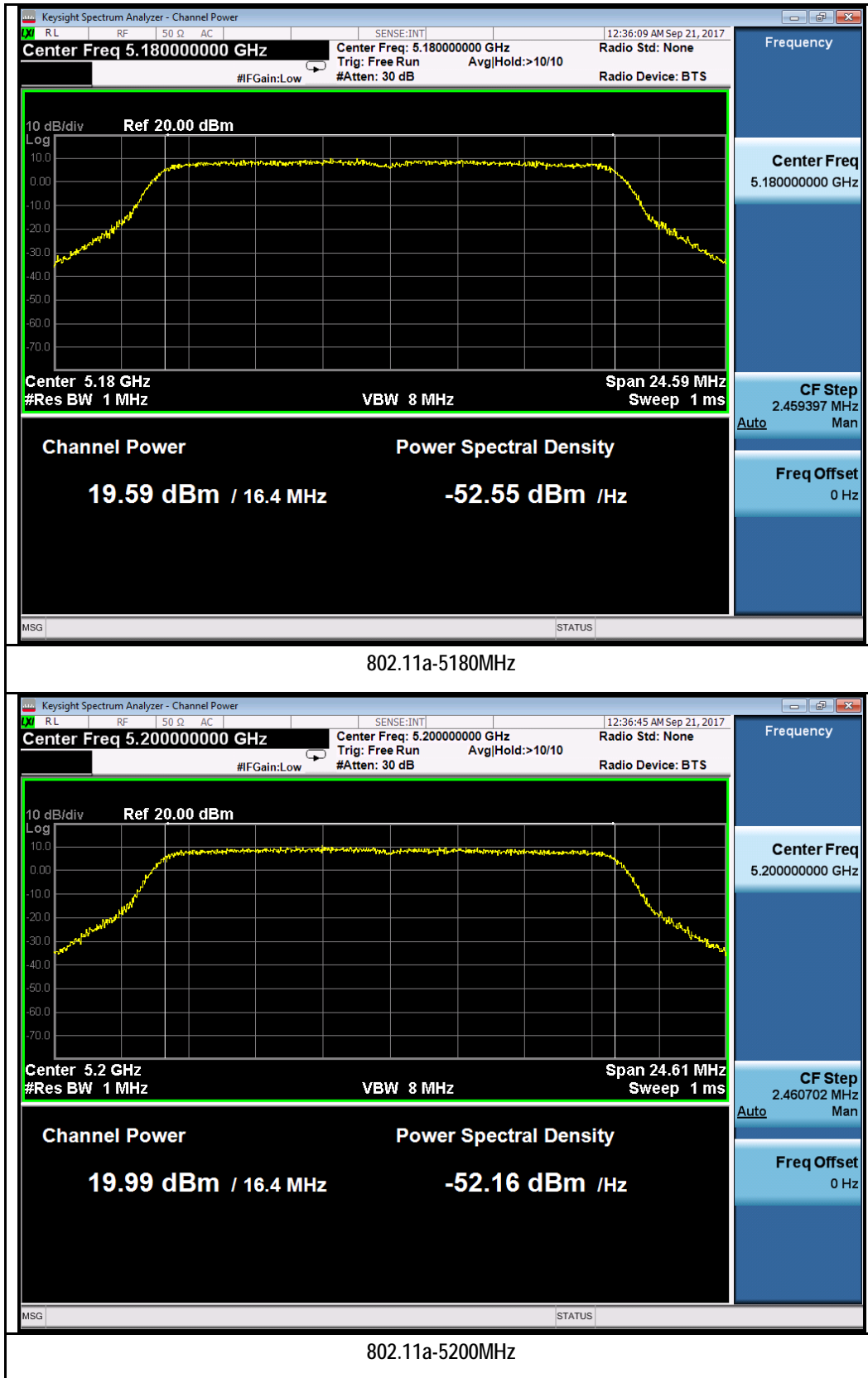
802.11n-HT40-5190MHz

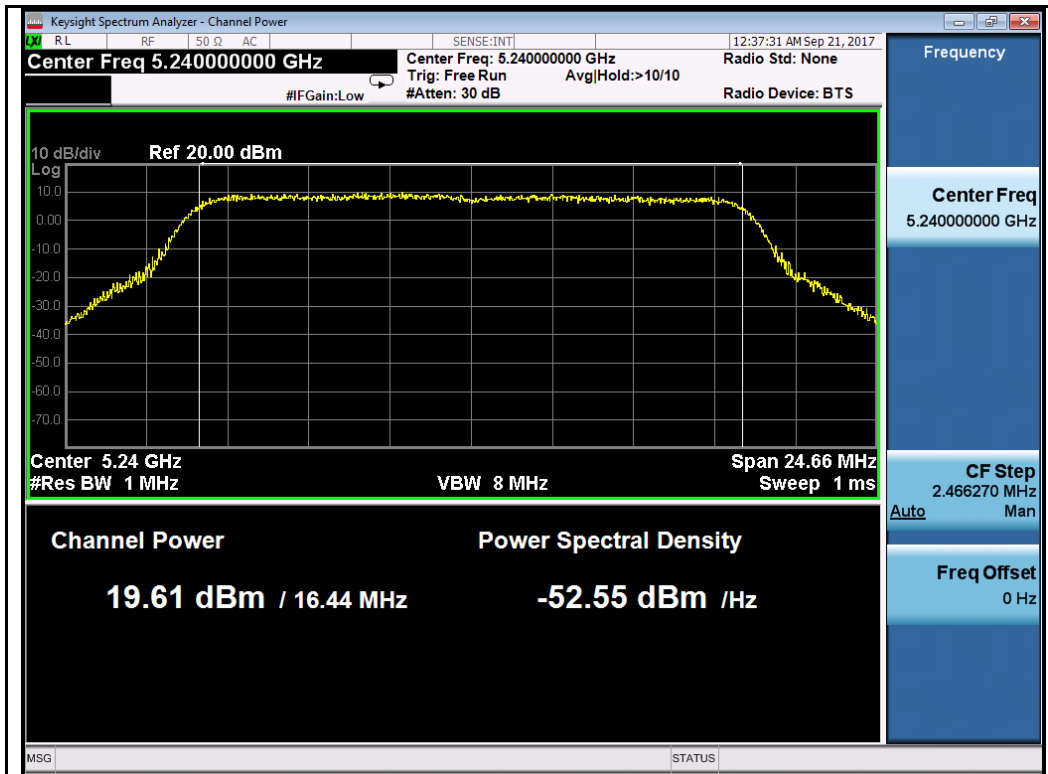


802.11n-HT40-5230MHz

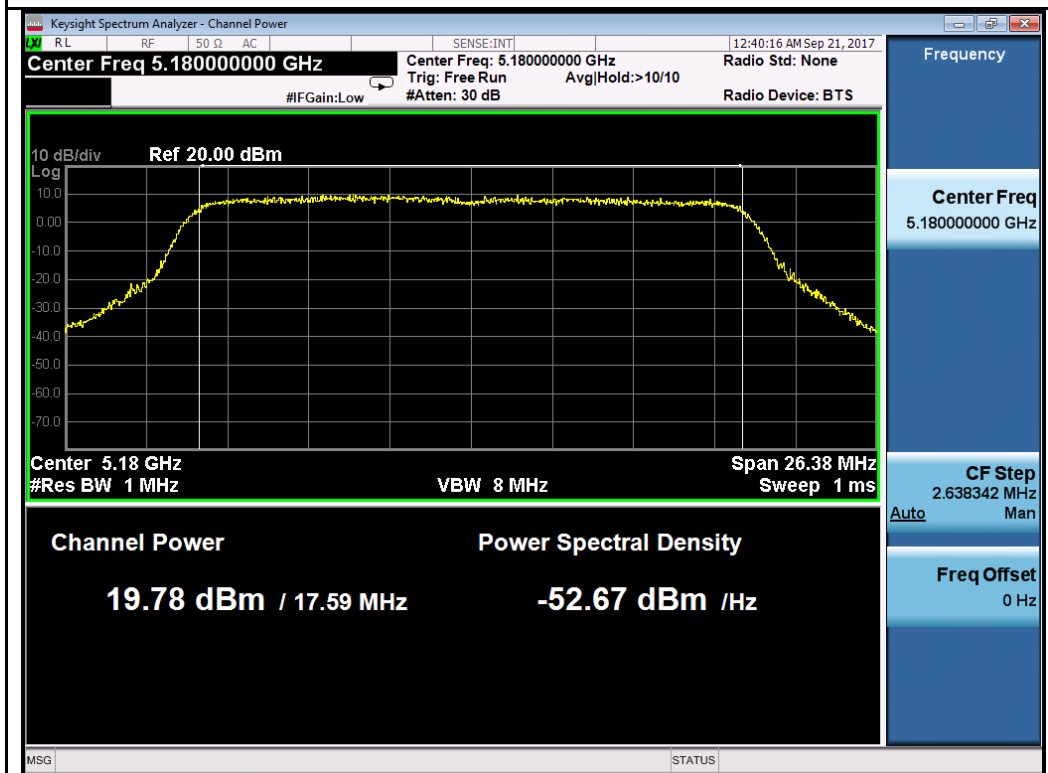


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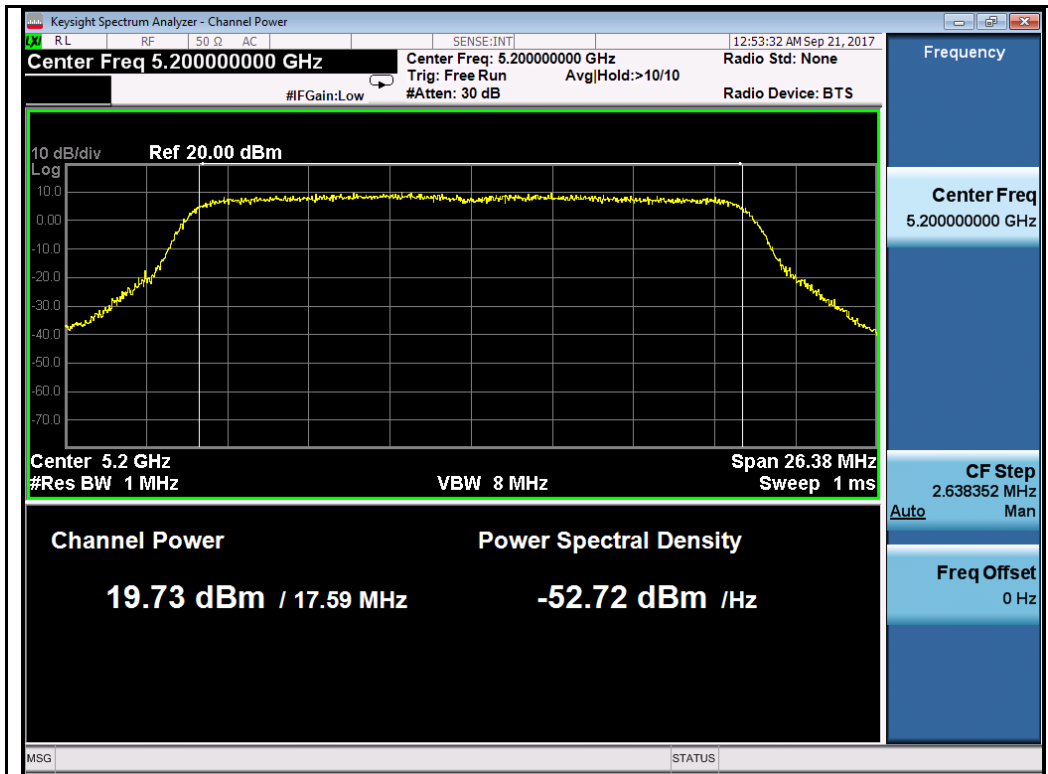




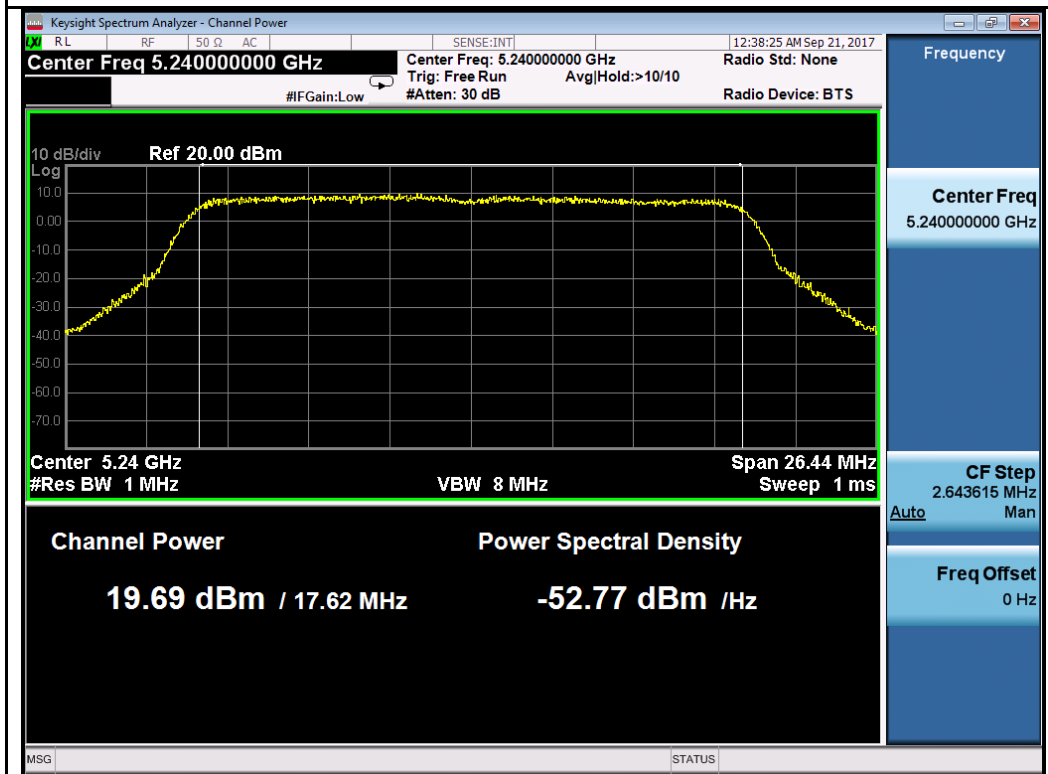
802.11a-5240MHz



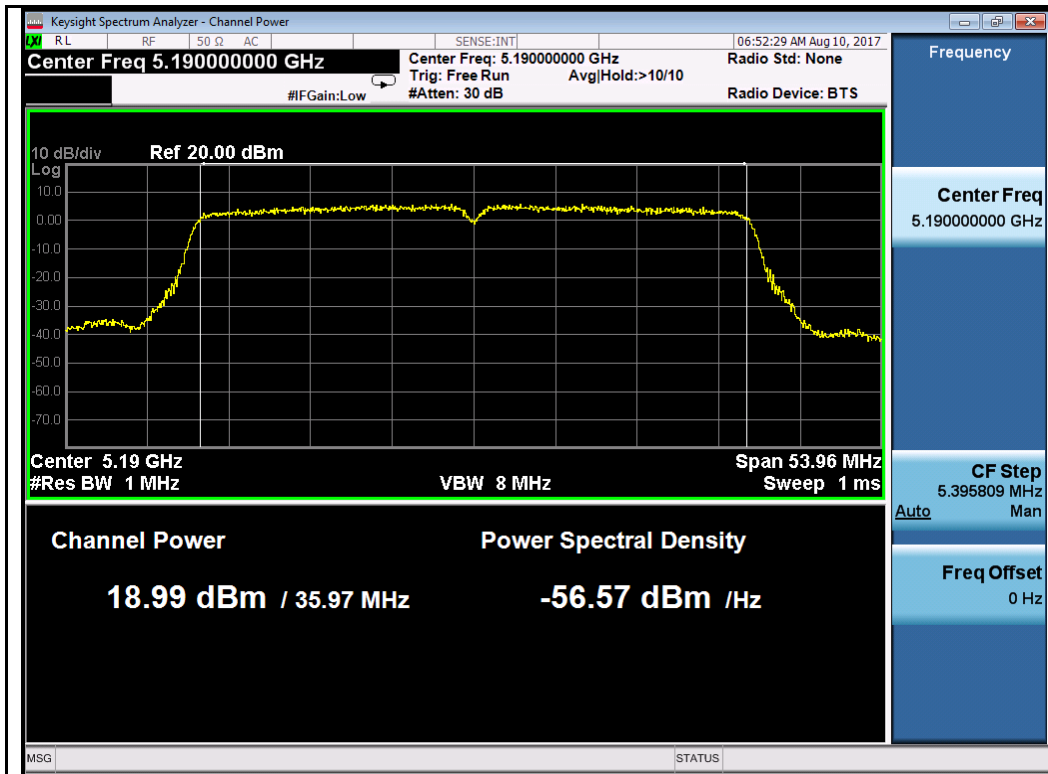
802.11n-HT20-5180MHz



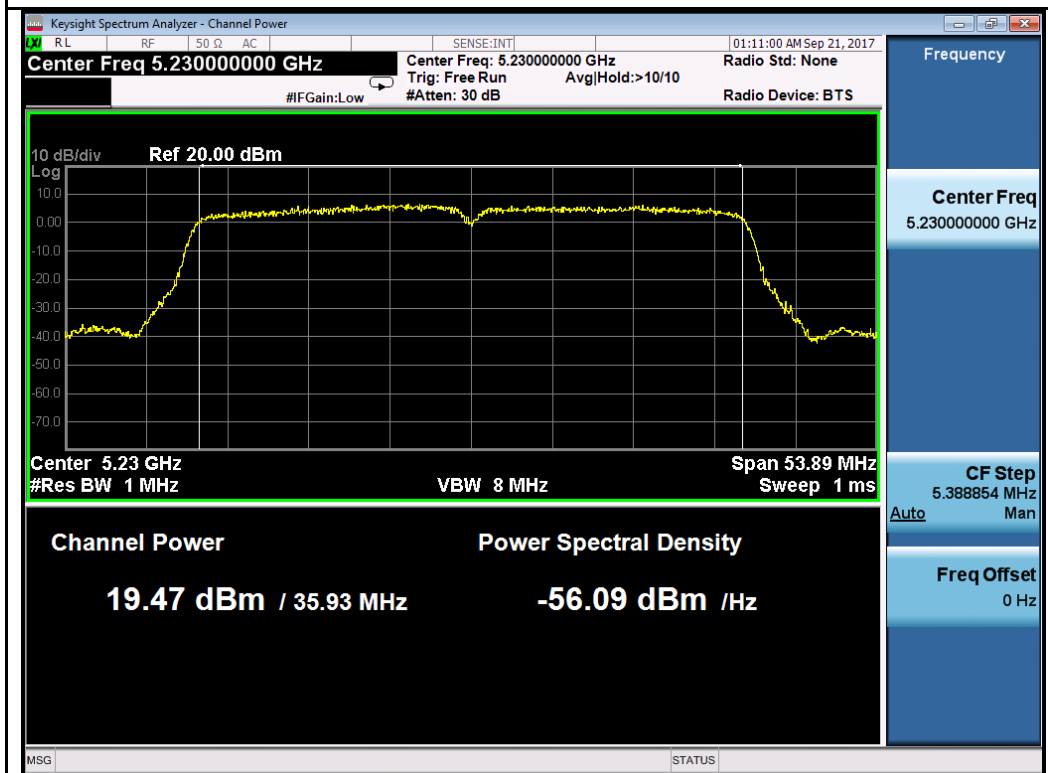
802.11n-HT20-5200MHz



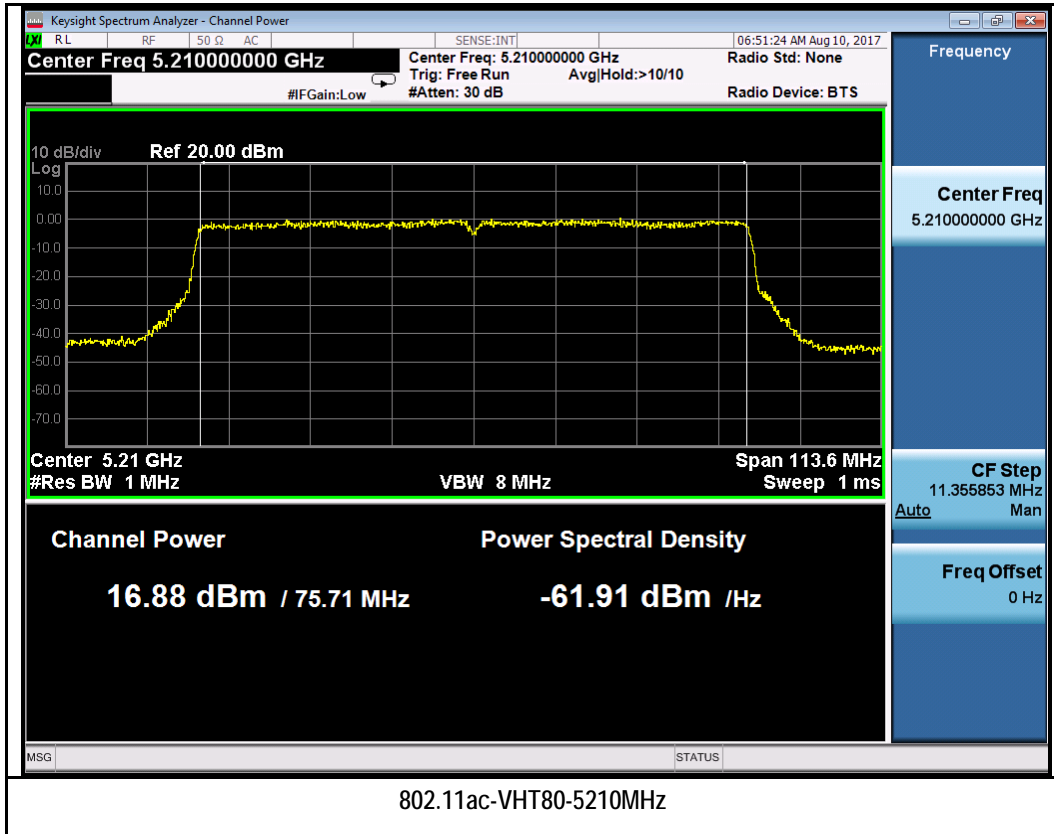
802.11n-HT20-5240MHz



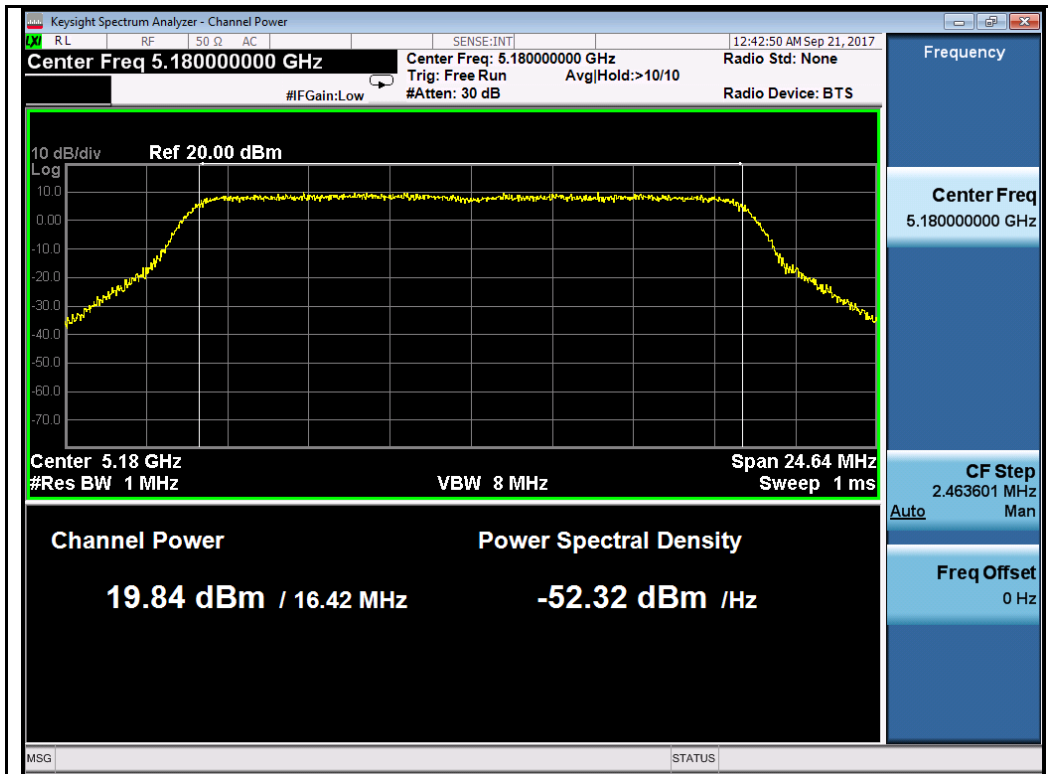
802.11n-HT40-5190MHz



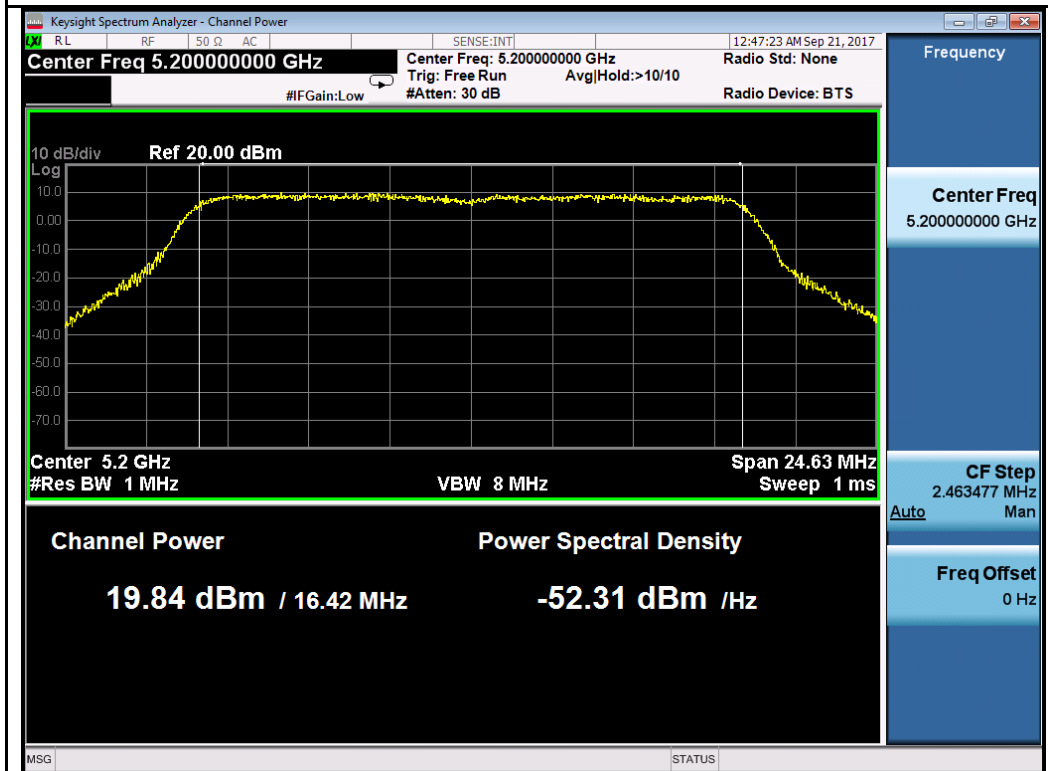
802.11n-HT40-5230MHz



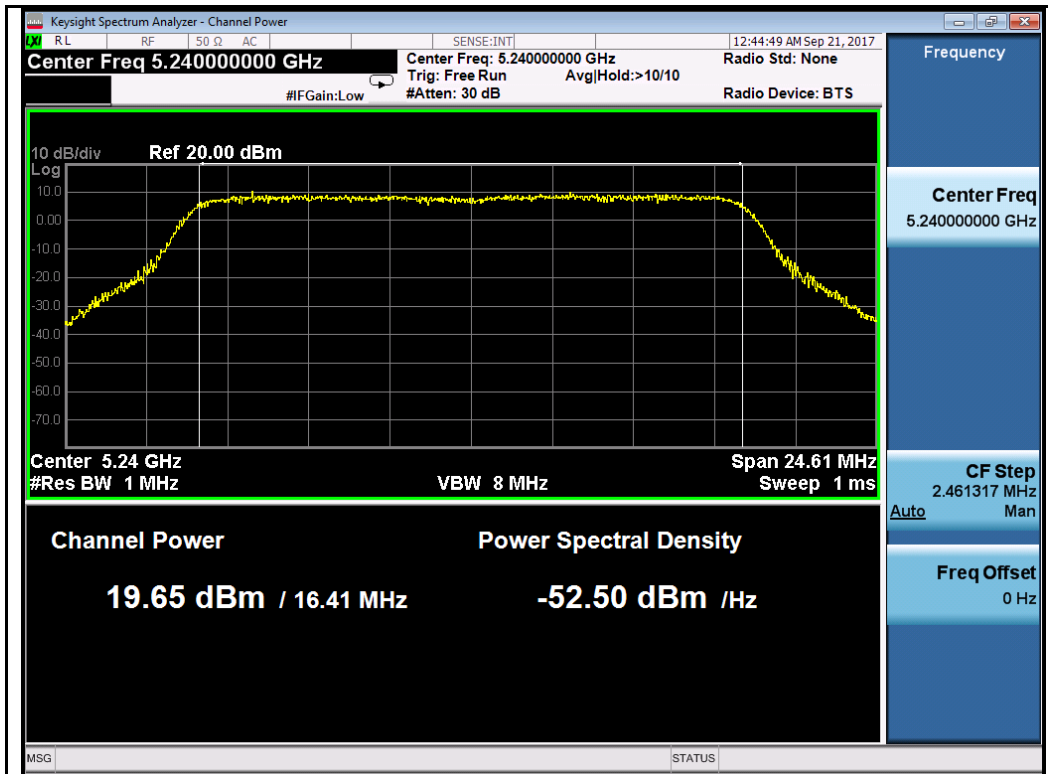
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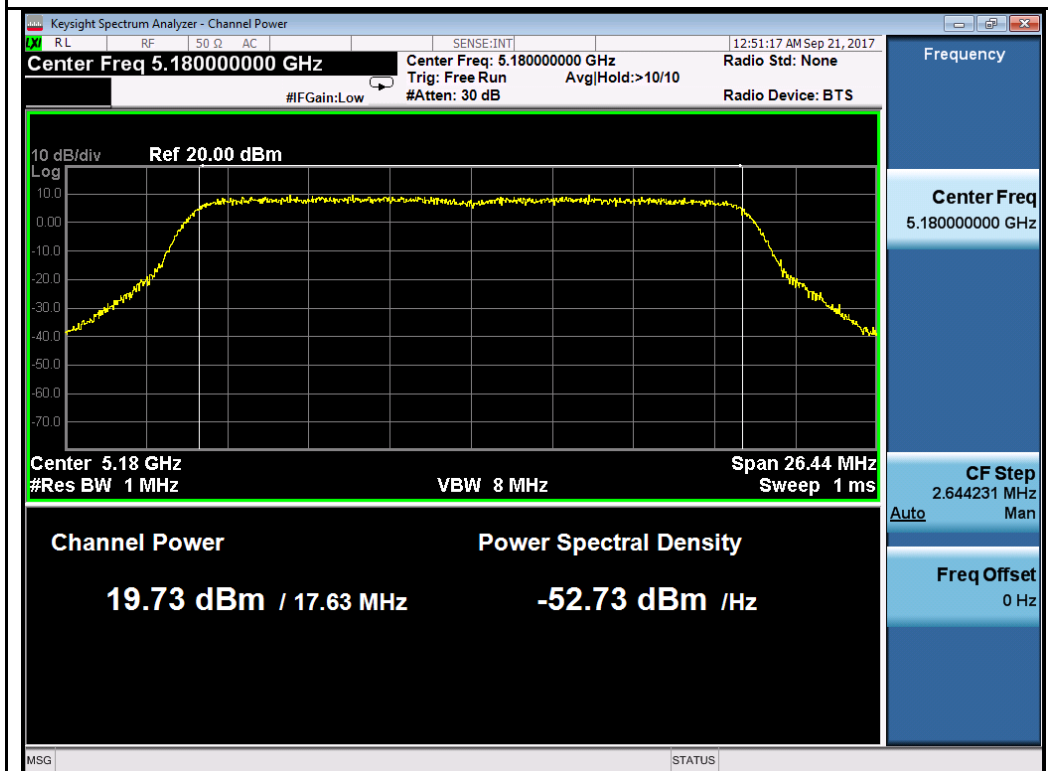
802.11a-5180MHz



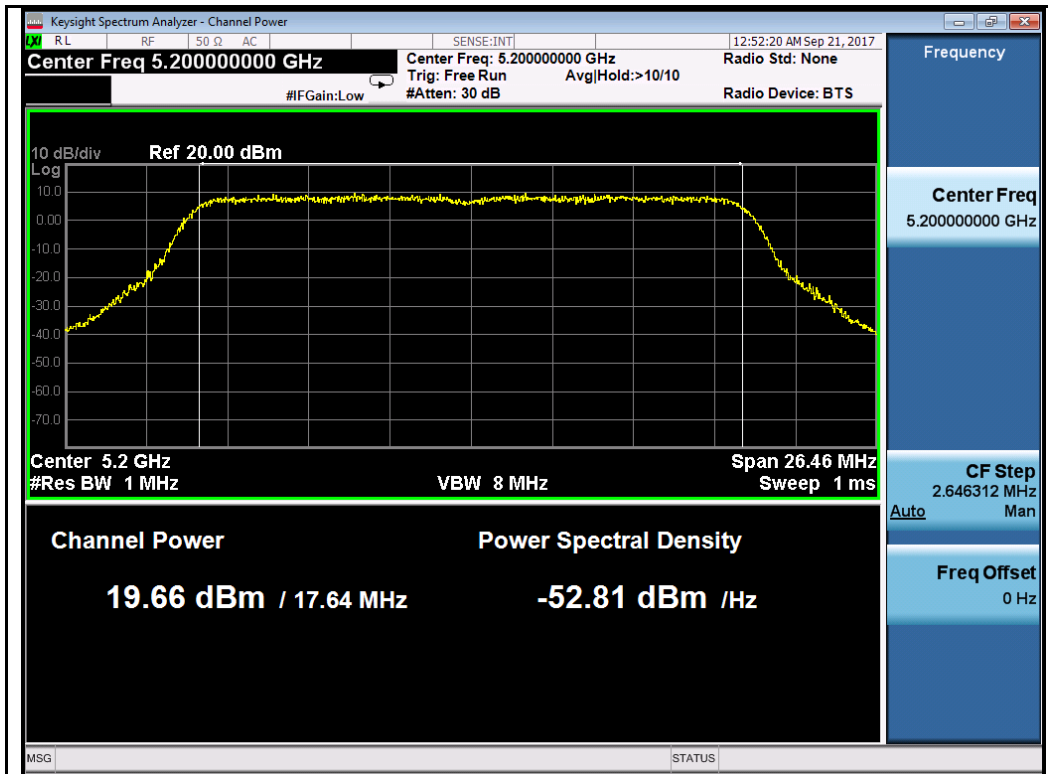
802.11a-5200MHz



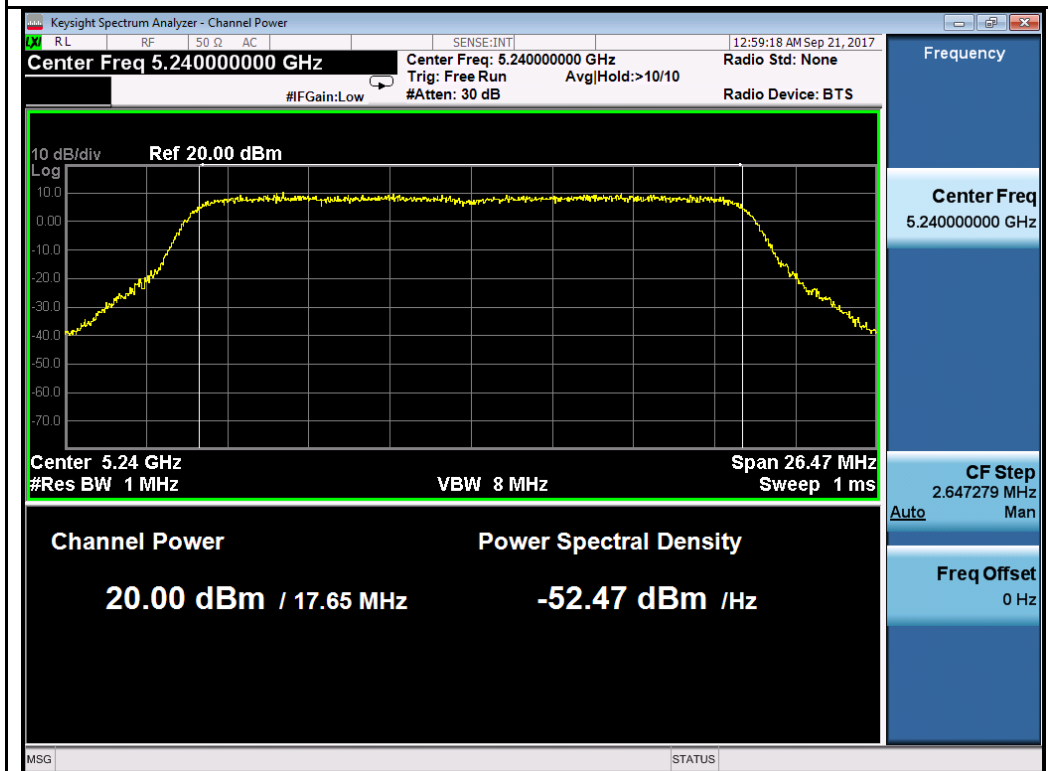
802.11a-5240MHz



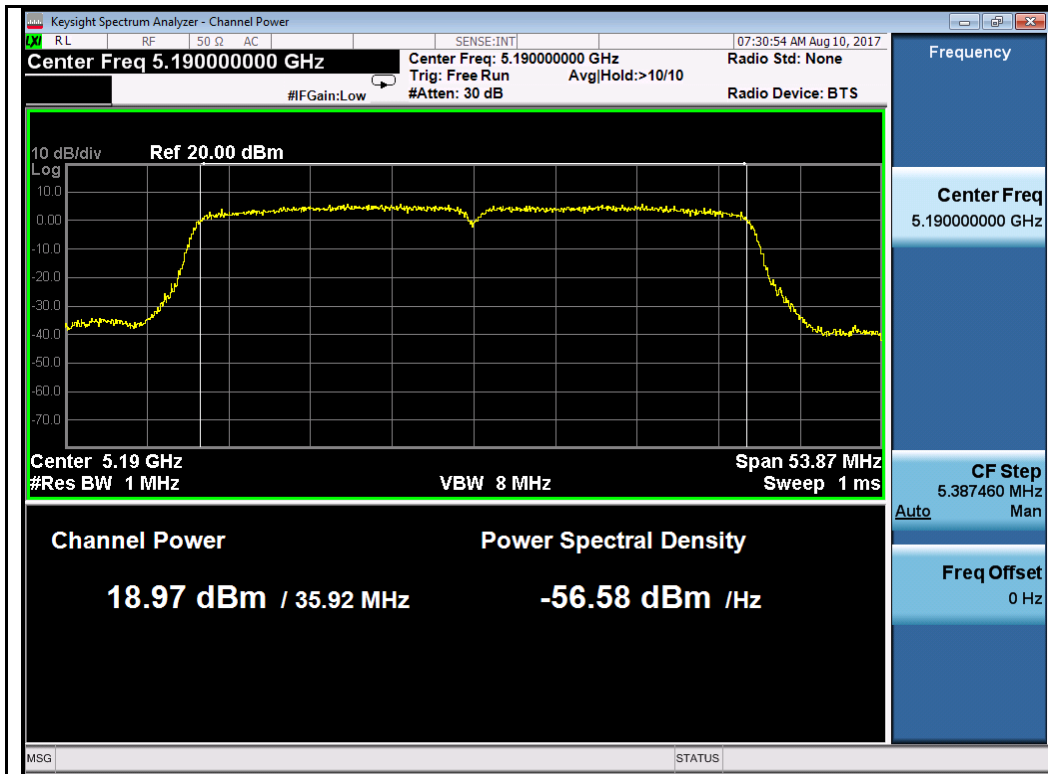
802.11n-HT20-5180MHz



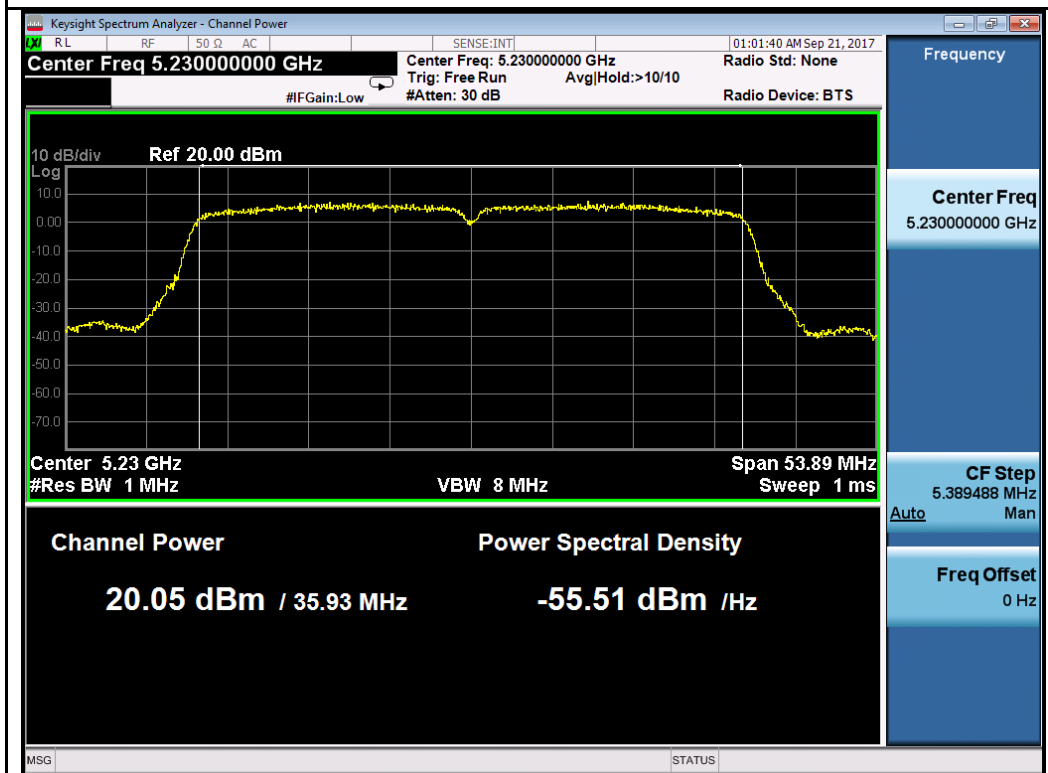
802.11n-HT20-5200MHz



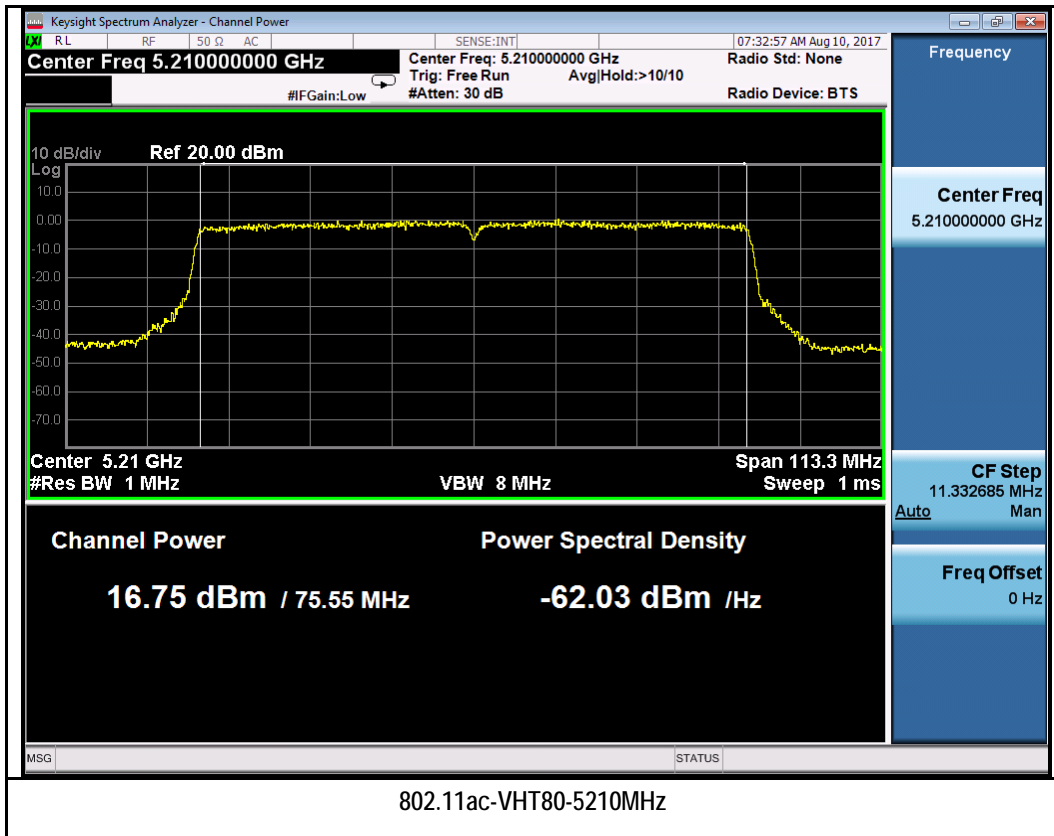
802.11n-HT20-5240MHz



802.11n-HT40-5190MHz

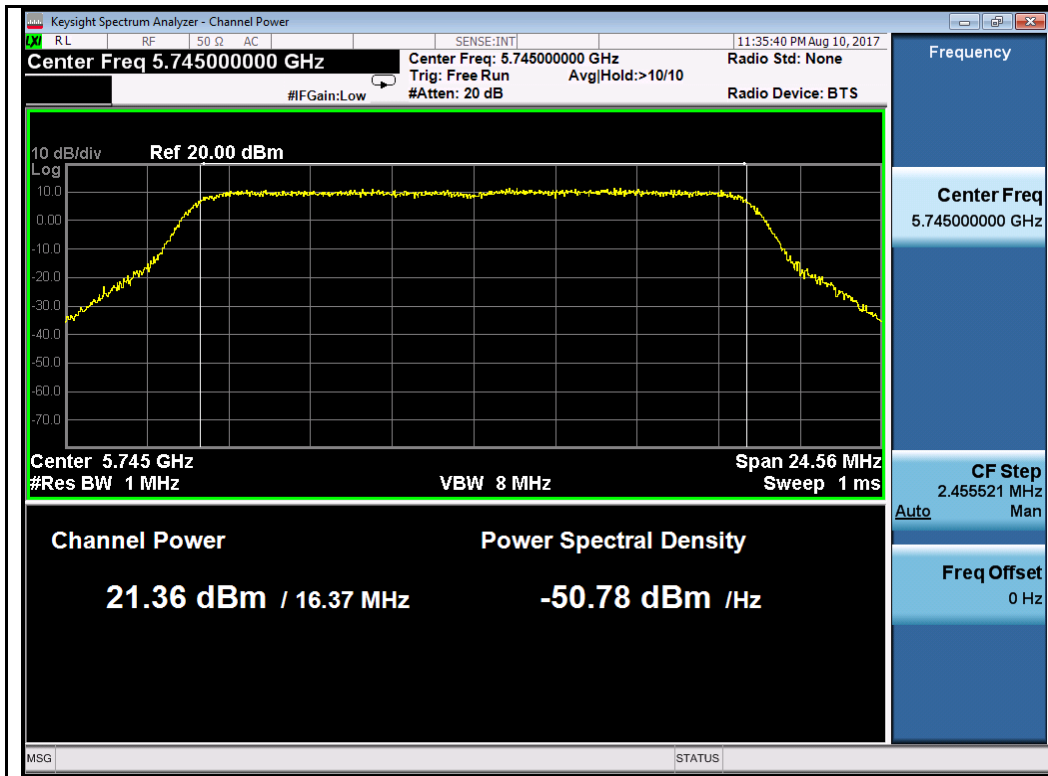


802.11n-HT40-5230MHz

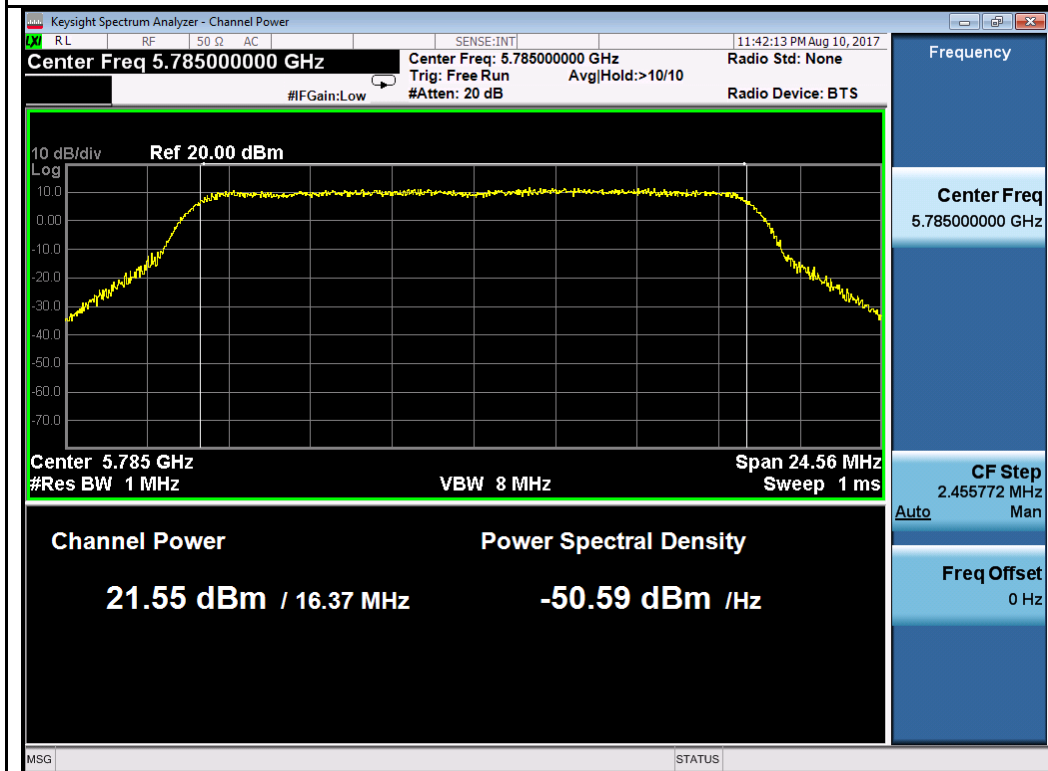


Test Plot for W58:

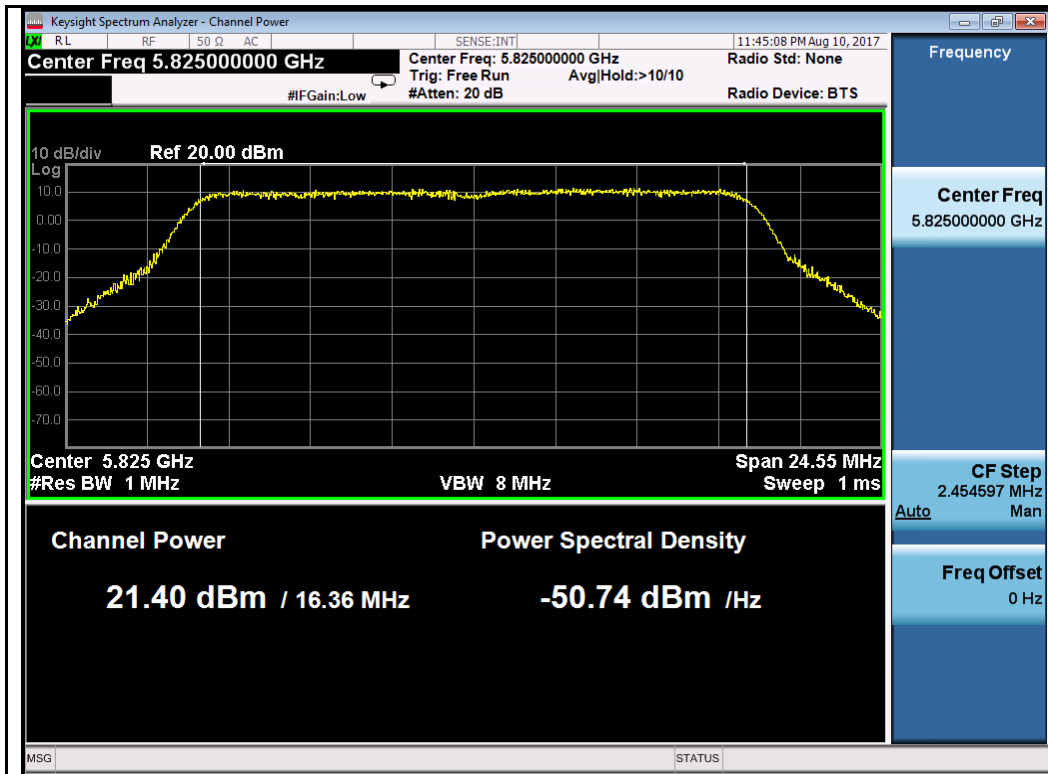
Chain 0:



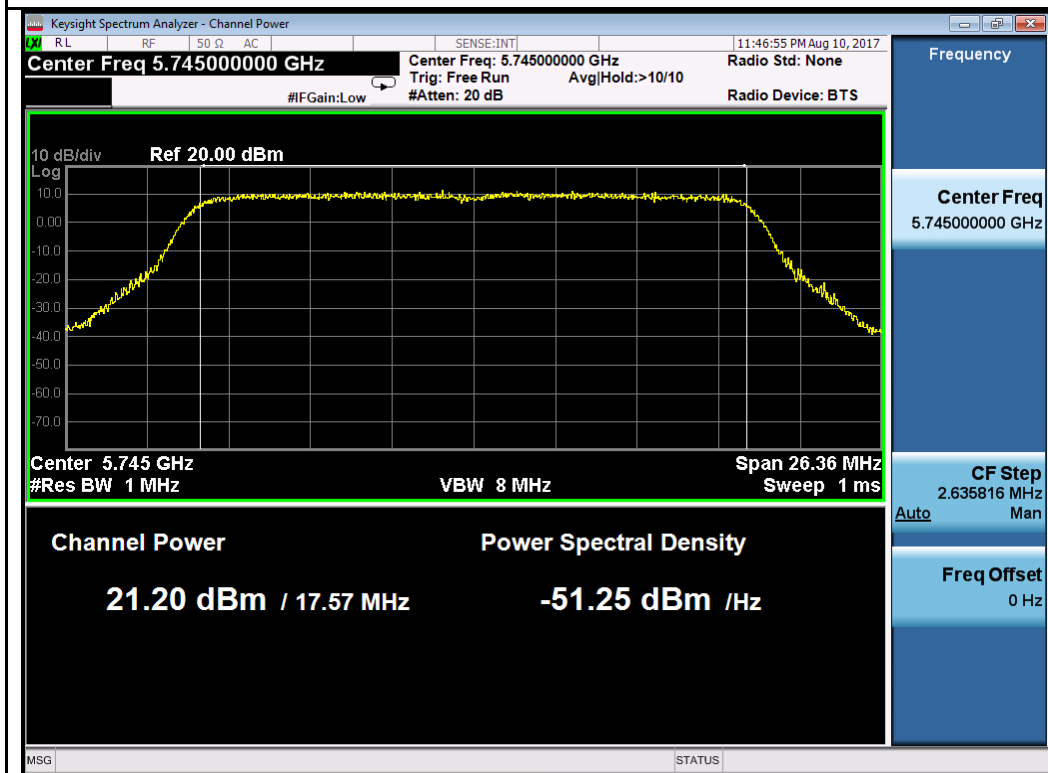
802.11a-5745MHz



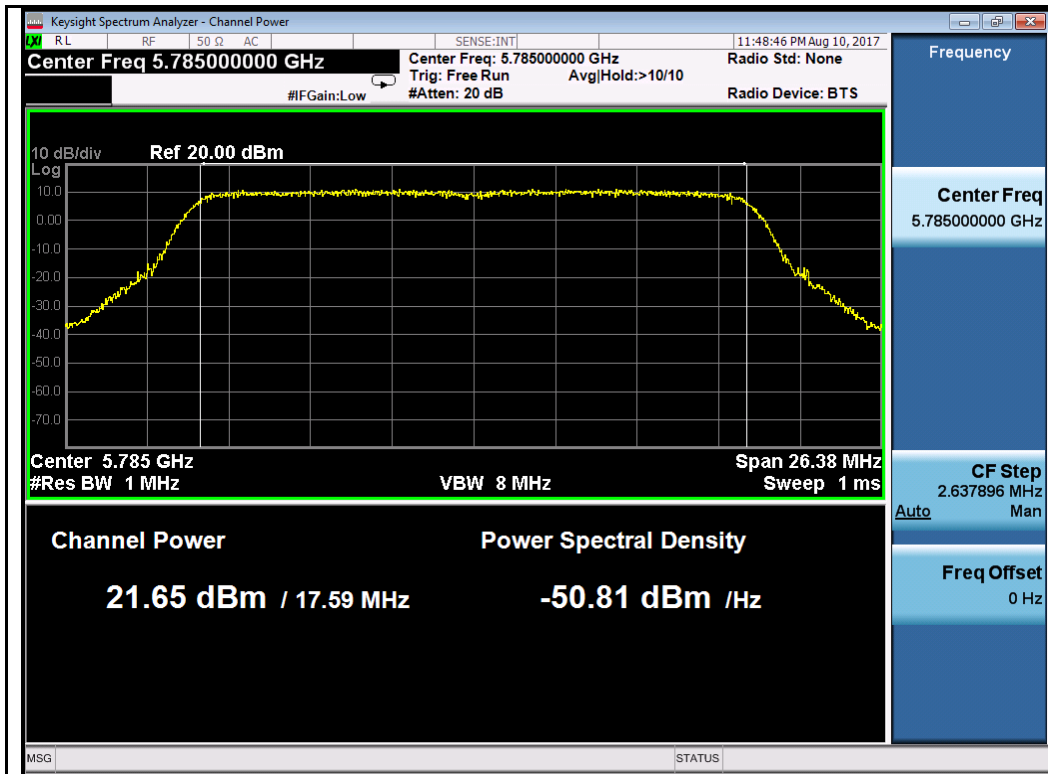
802.11a-5785MHz



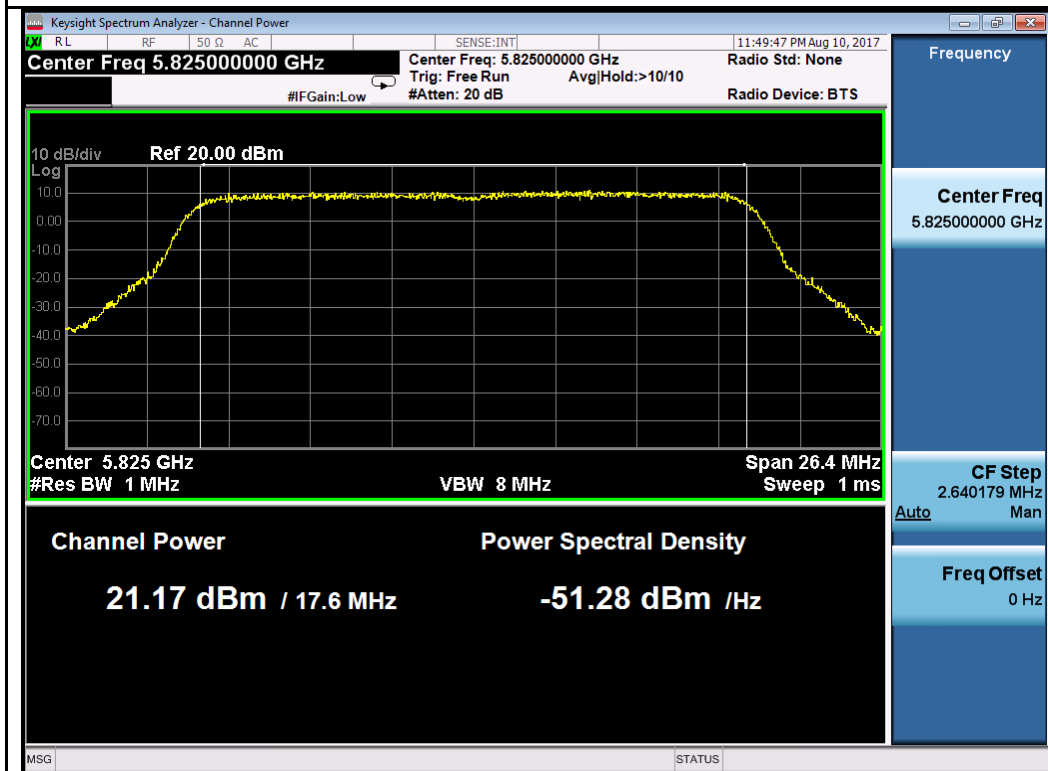
802.11a-5825MHz



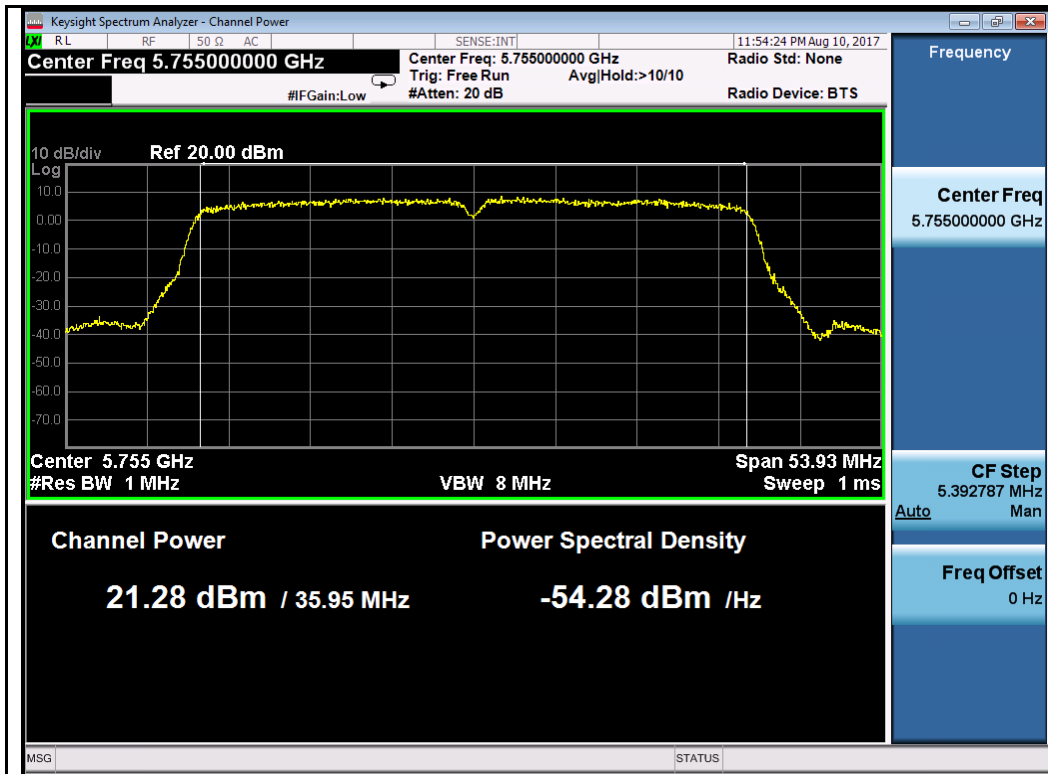
802.11n-HT20-5745MHz



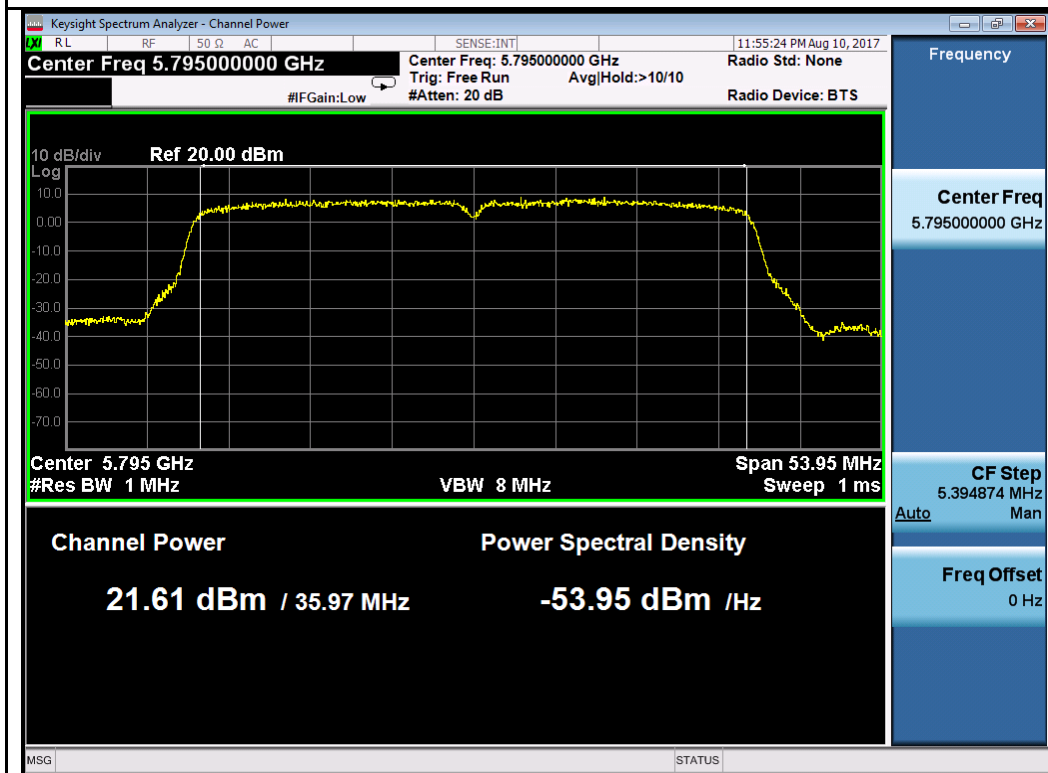
802.11n-HT20-5785MHz



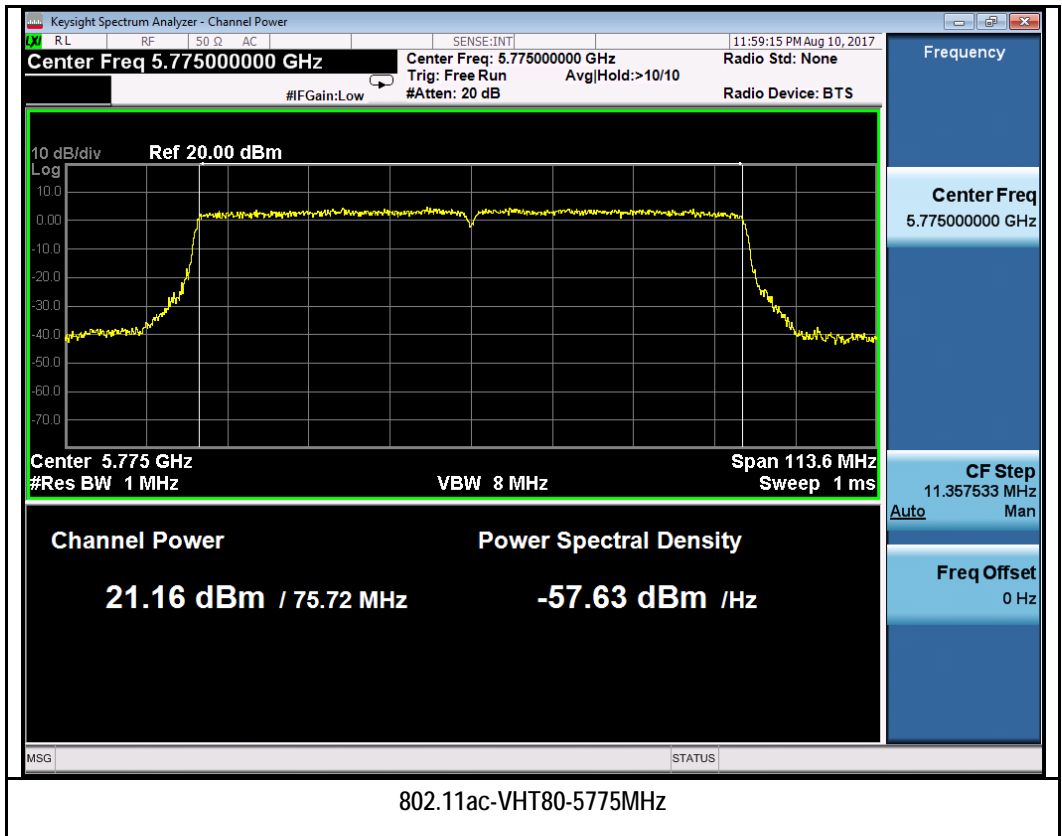
802.11n-HT20-5825MHz



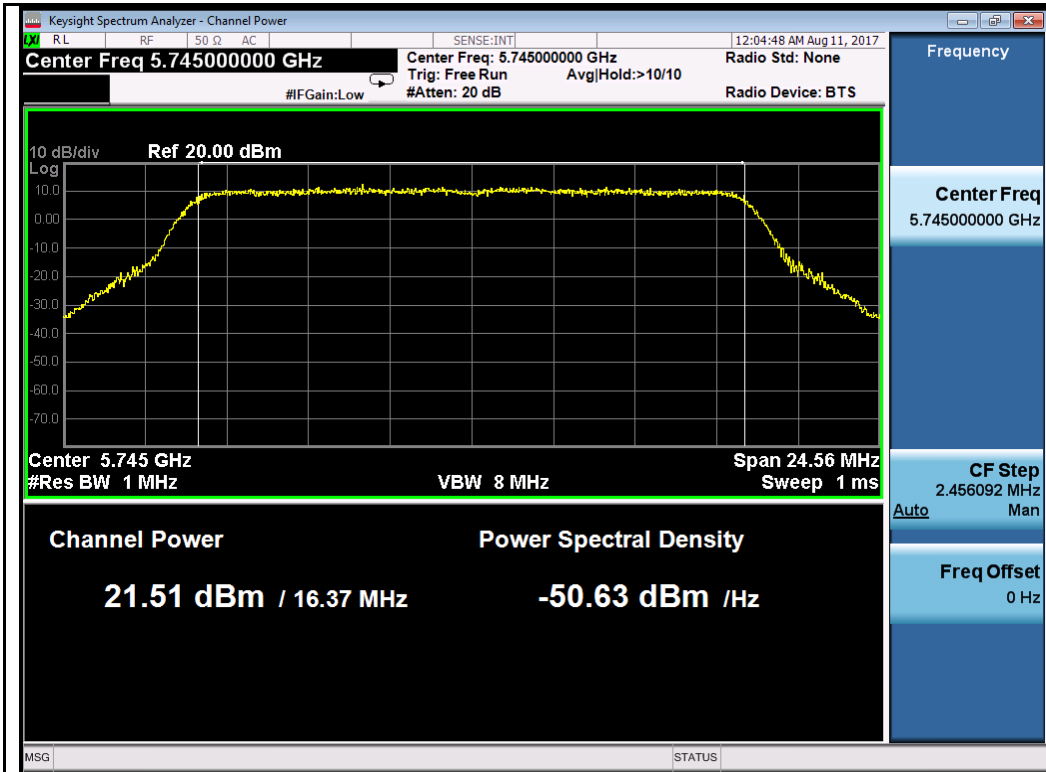
802.11n-HT40-5755MHz



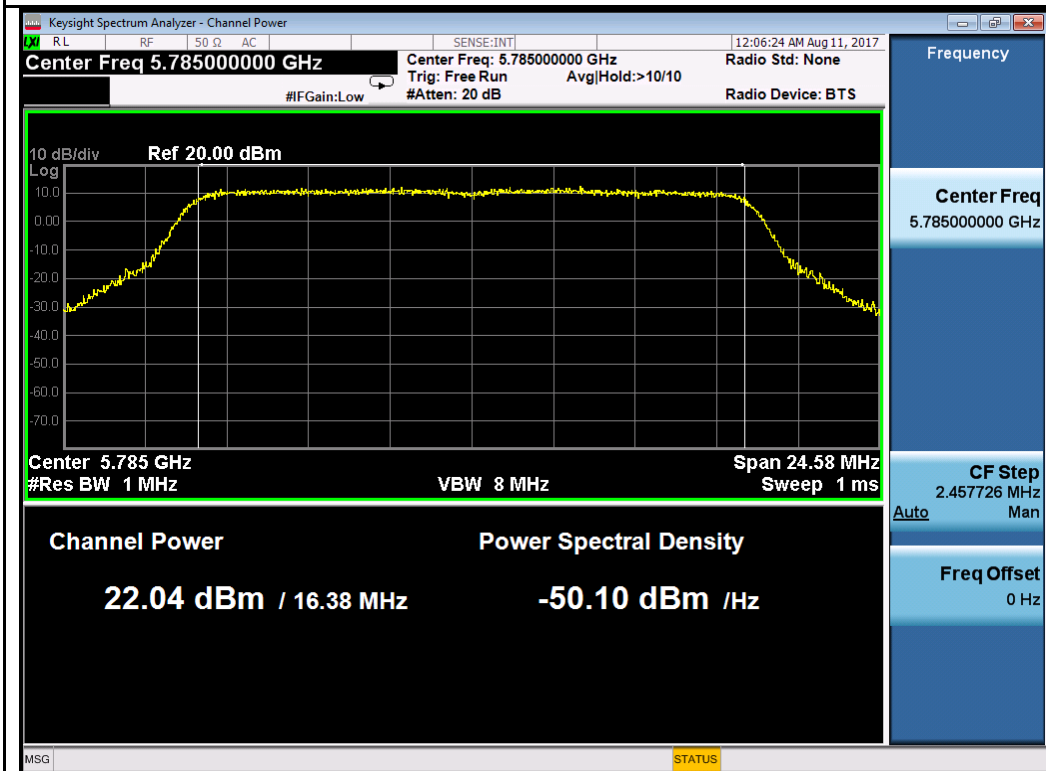
802.11n-HT40-5795MHz



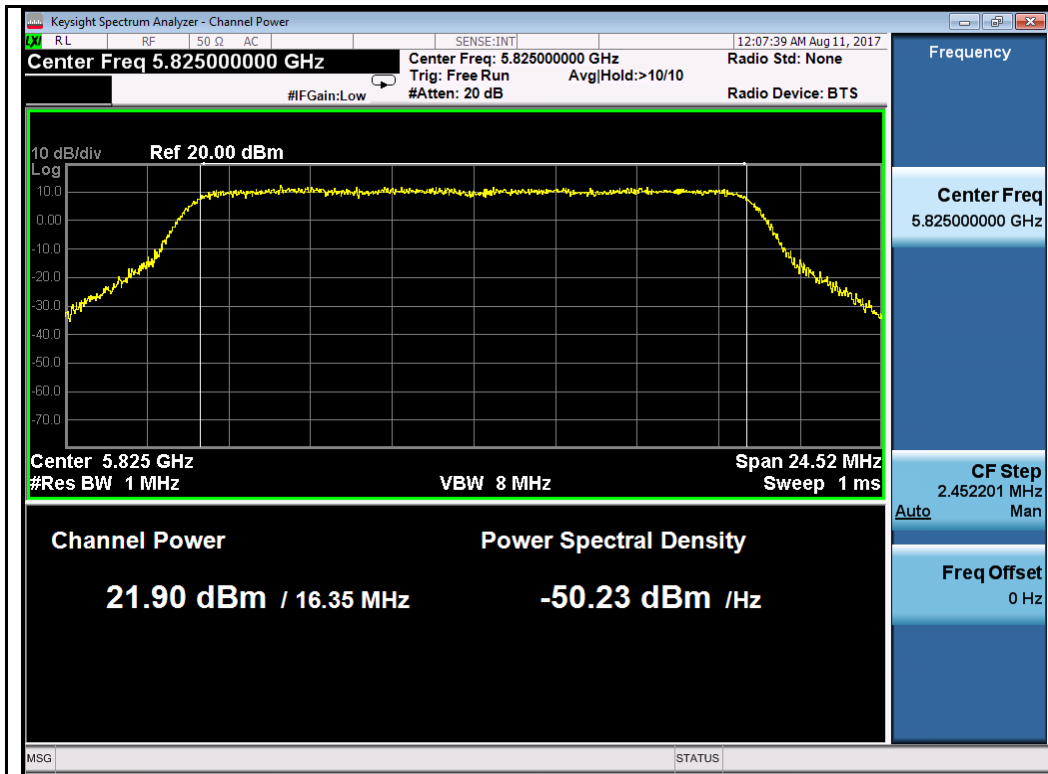
Chain 1:



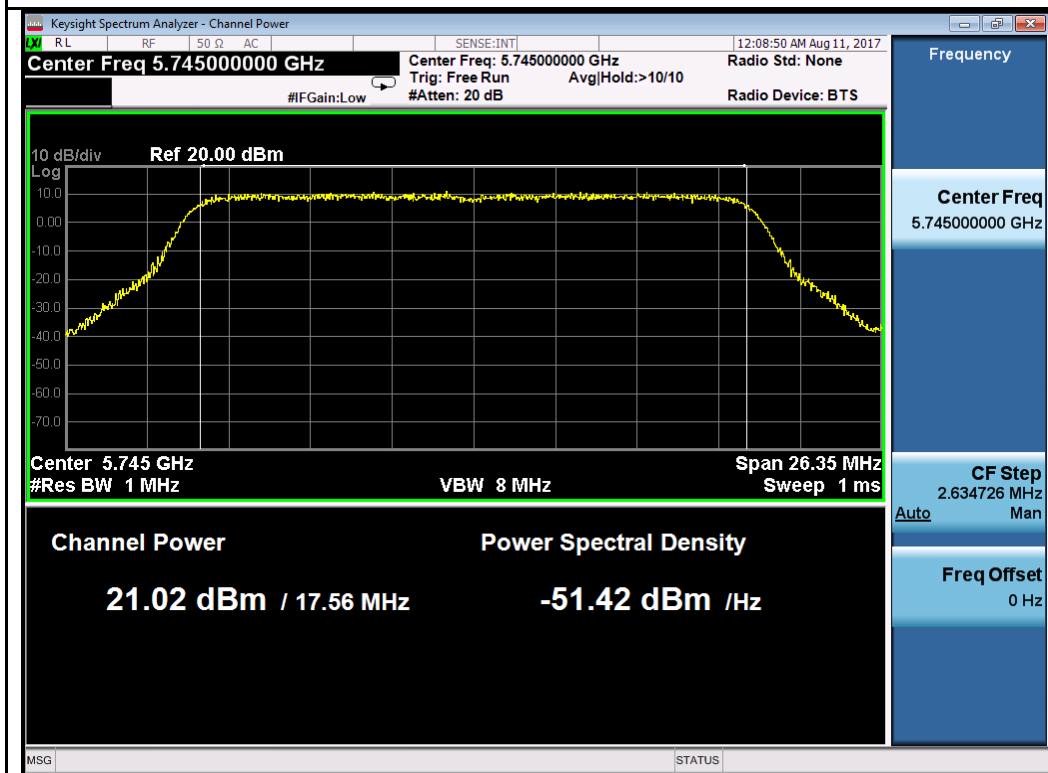
802.11a-5745MHz



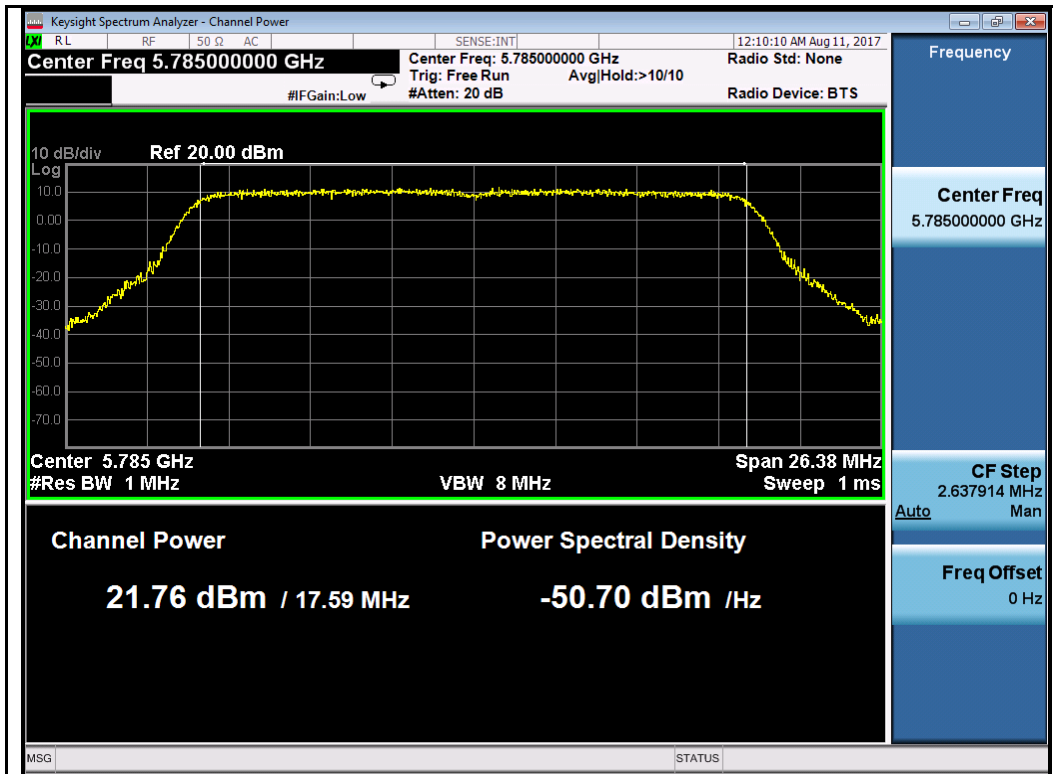
802.11a-5785MHz



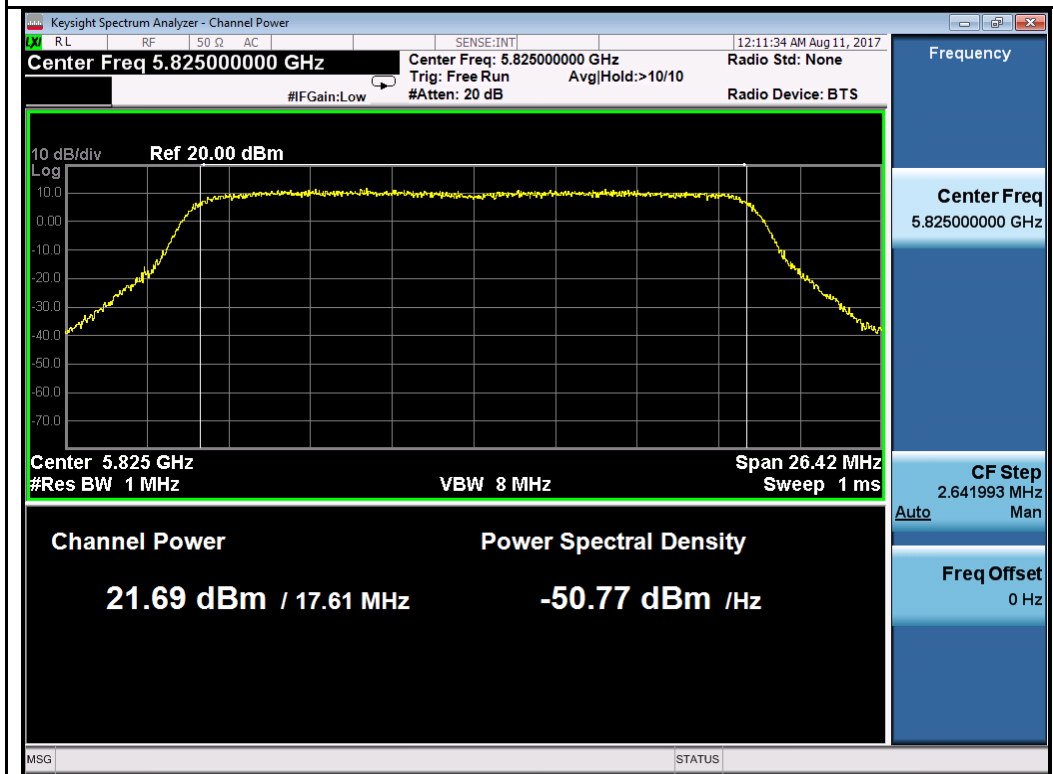
802.11a-5825MHz



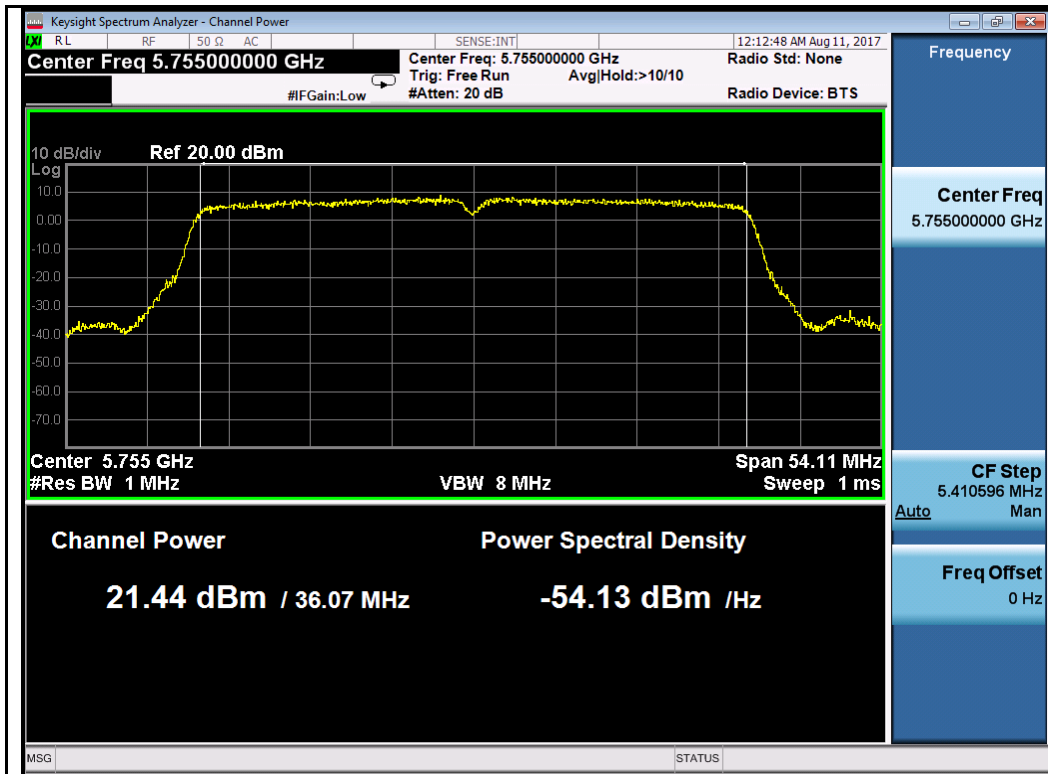
802.11n-HT20-5745MHz



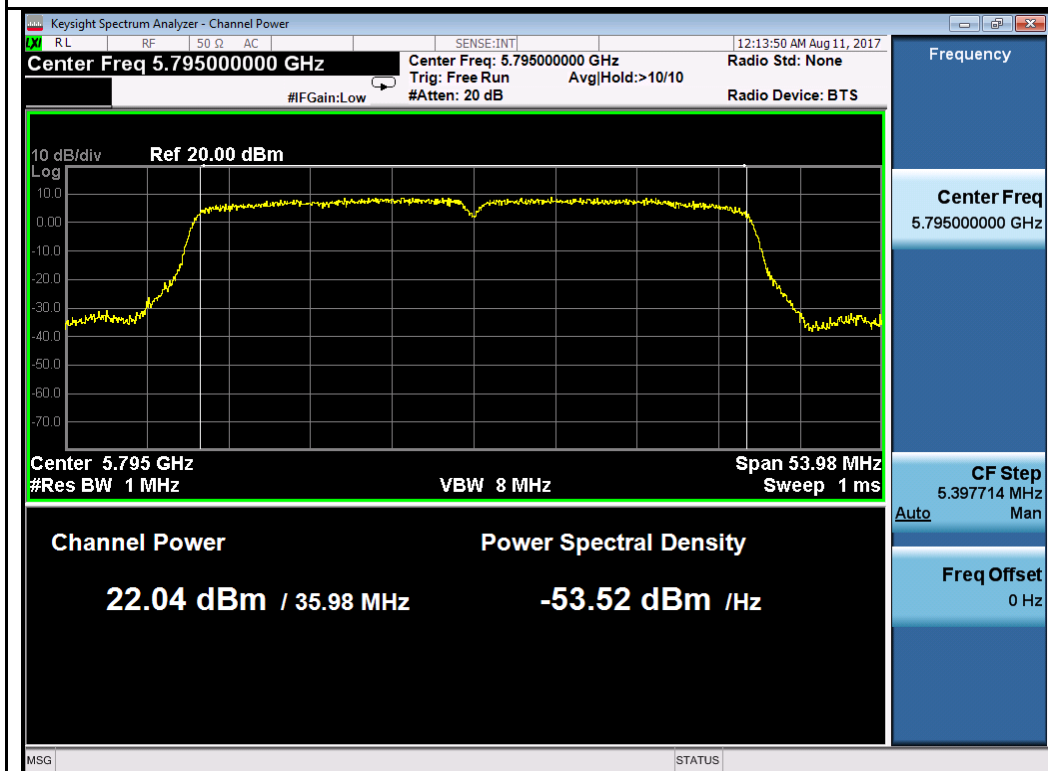
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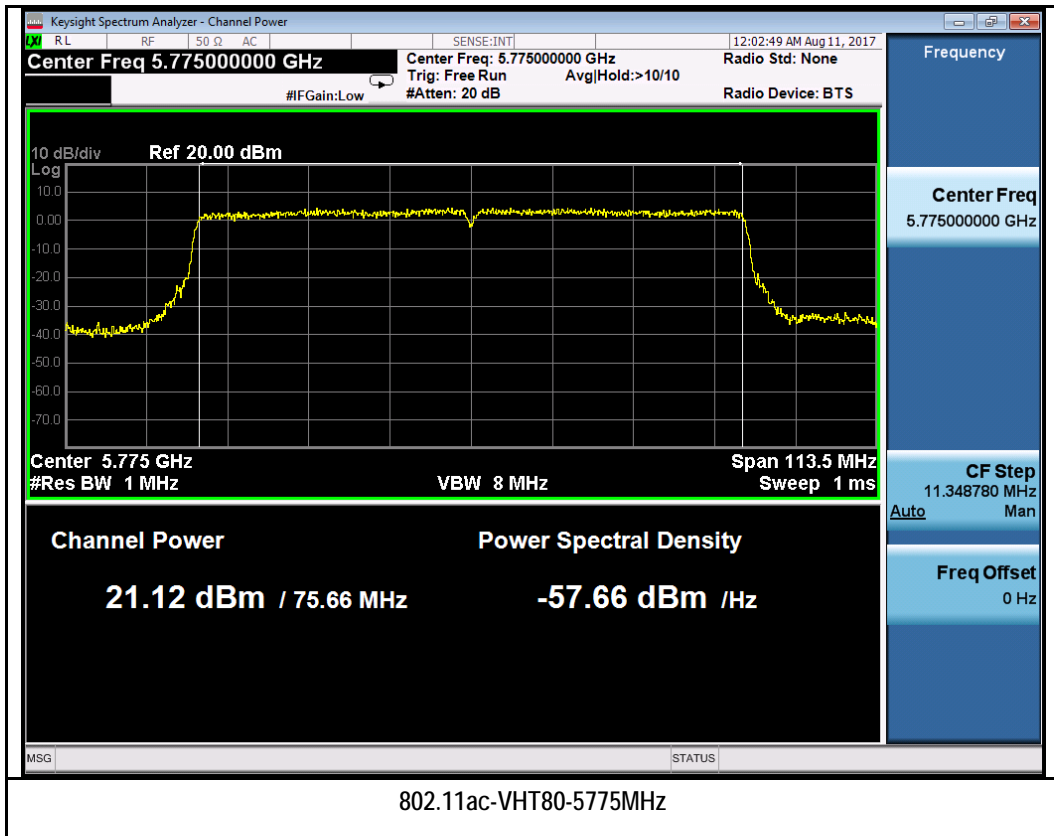
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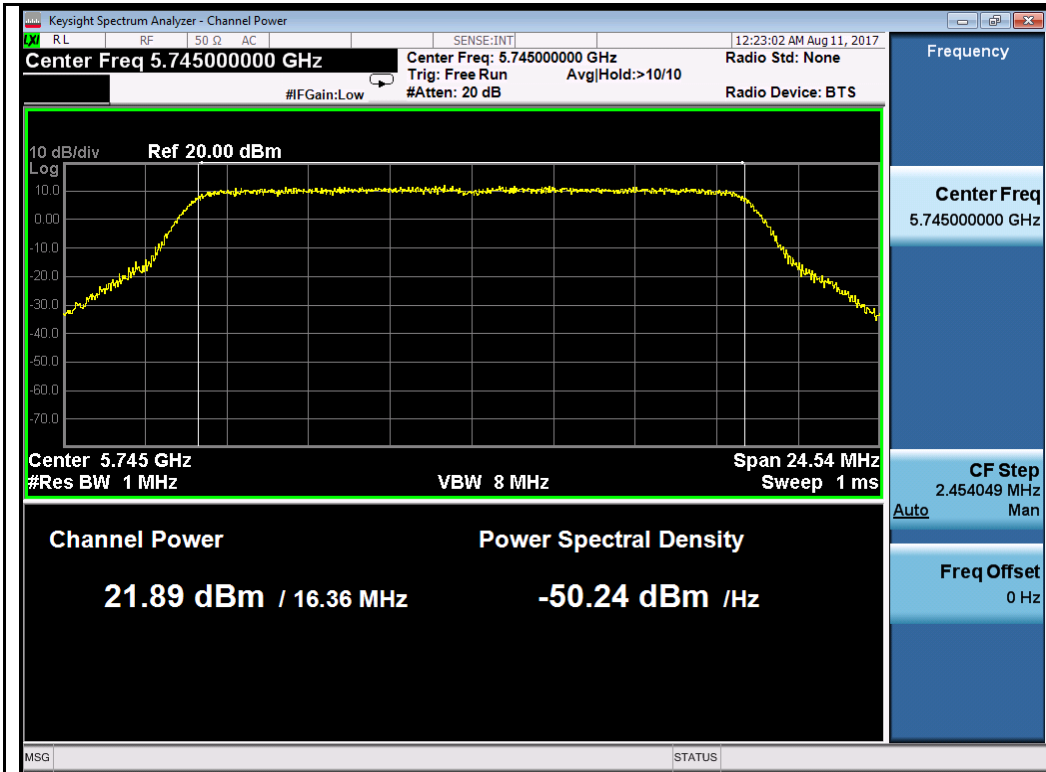
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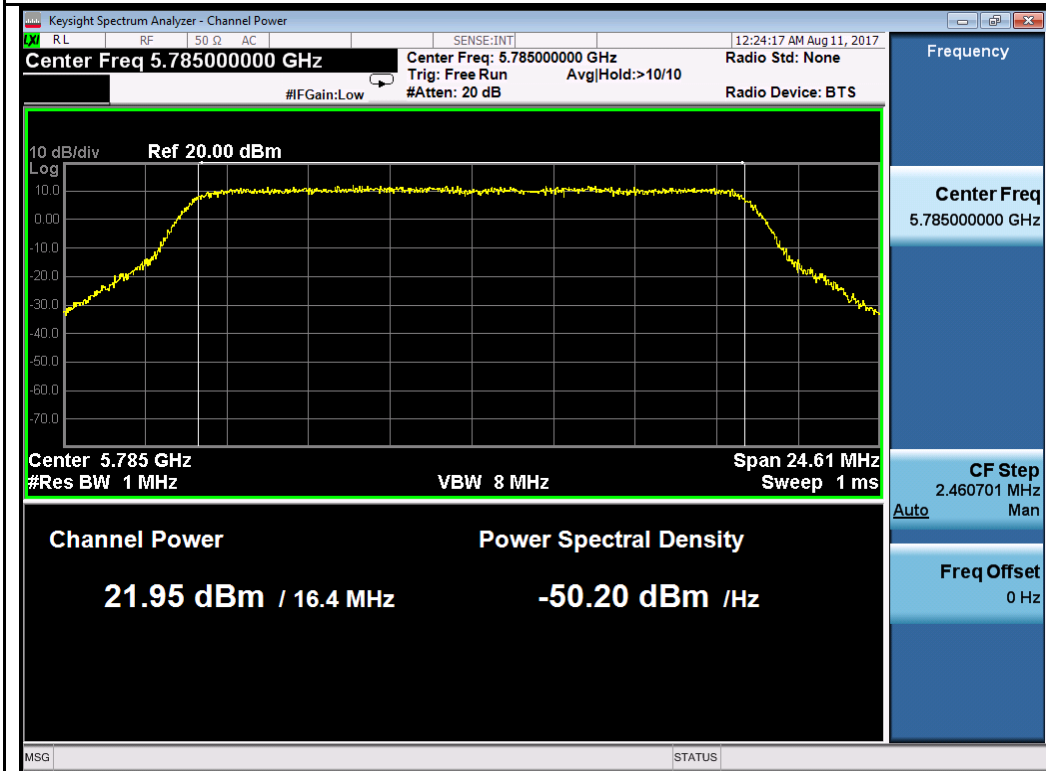
802.11n-HT40-5795MHz



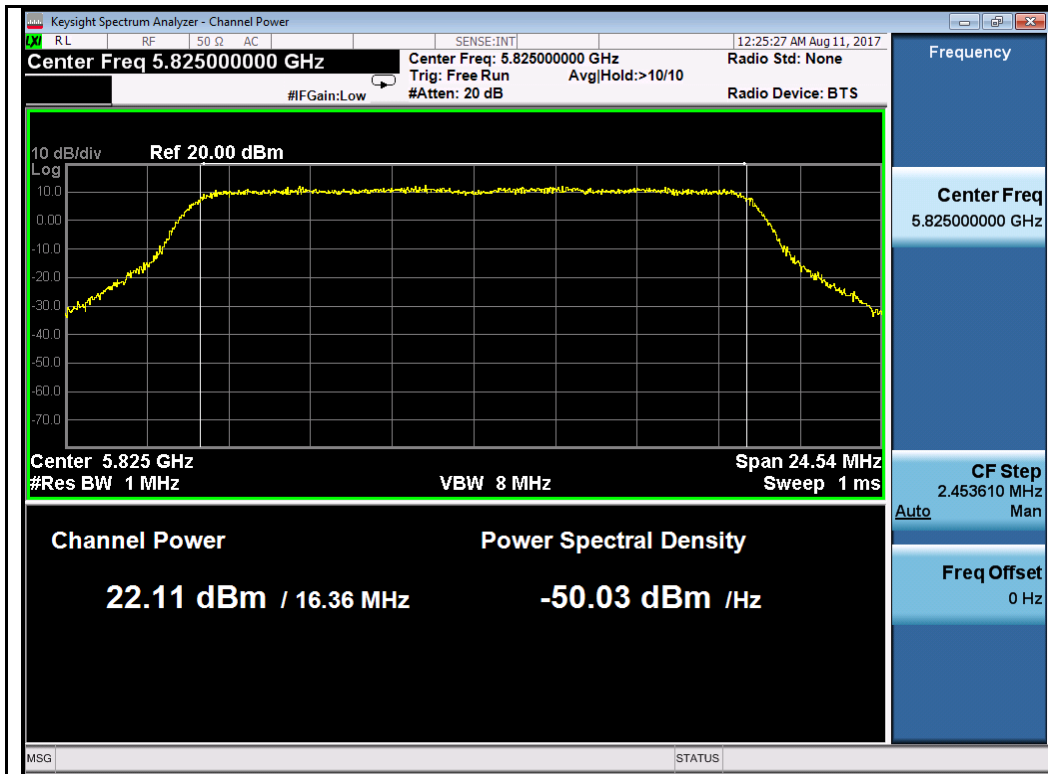
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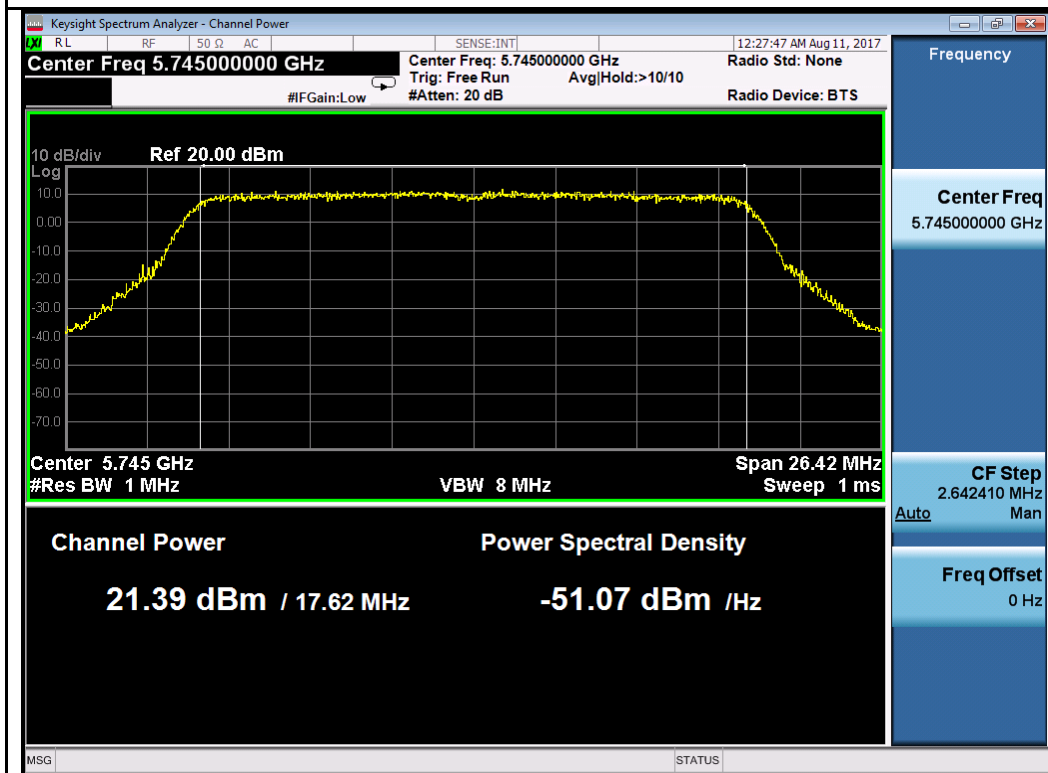
802.11a-5745MHz



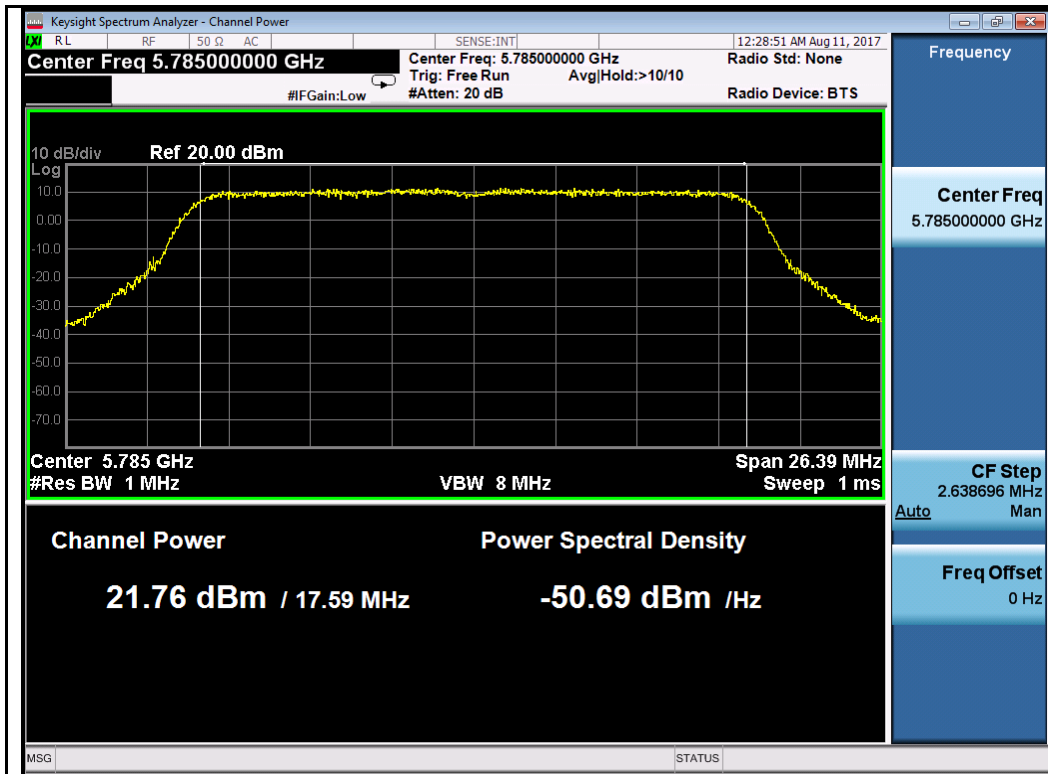
802.11a-5785MHz



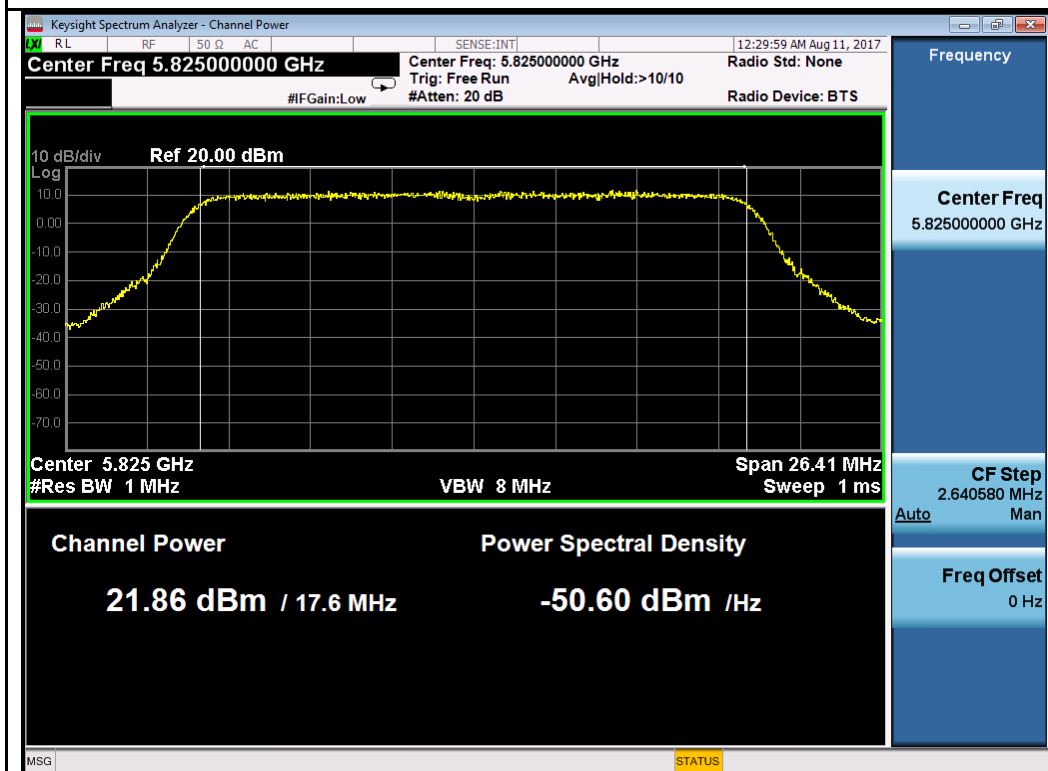
802.11a-5825MHz



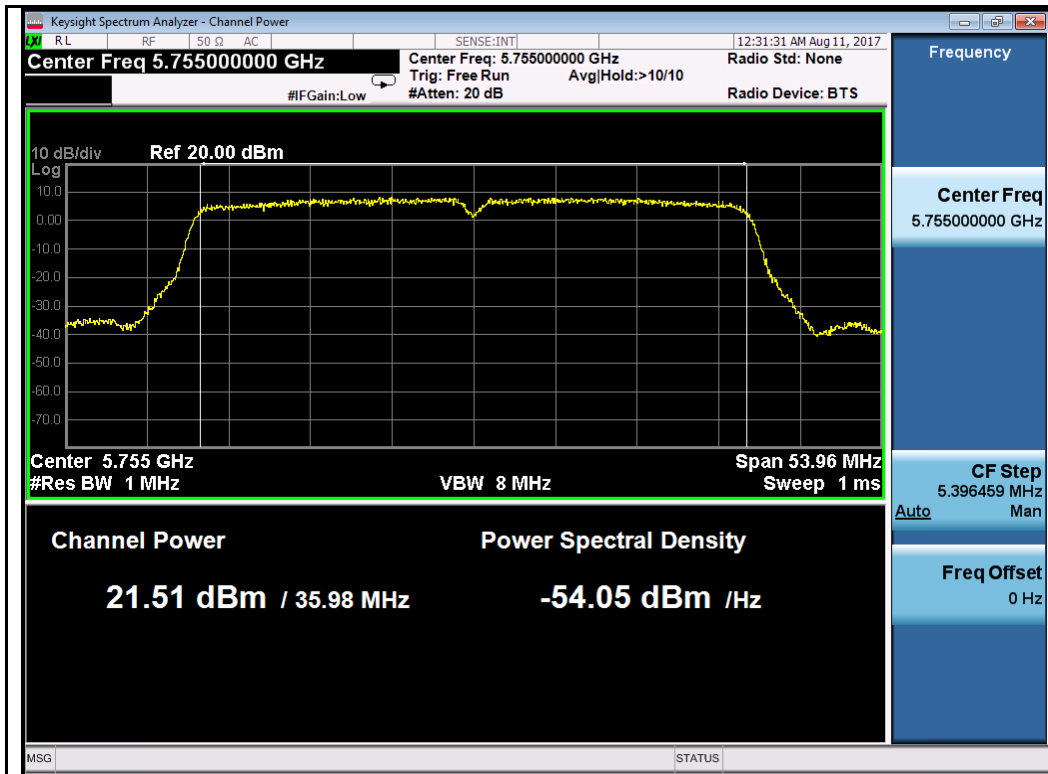
802.11n-HT20-5745MHz



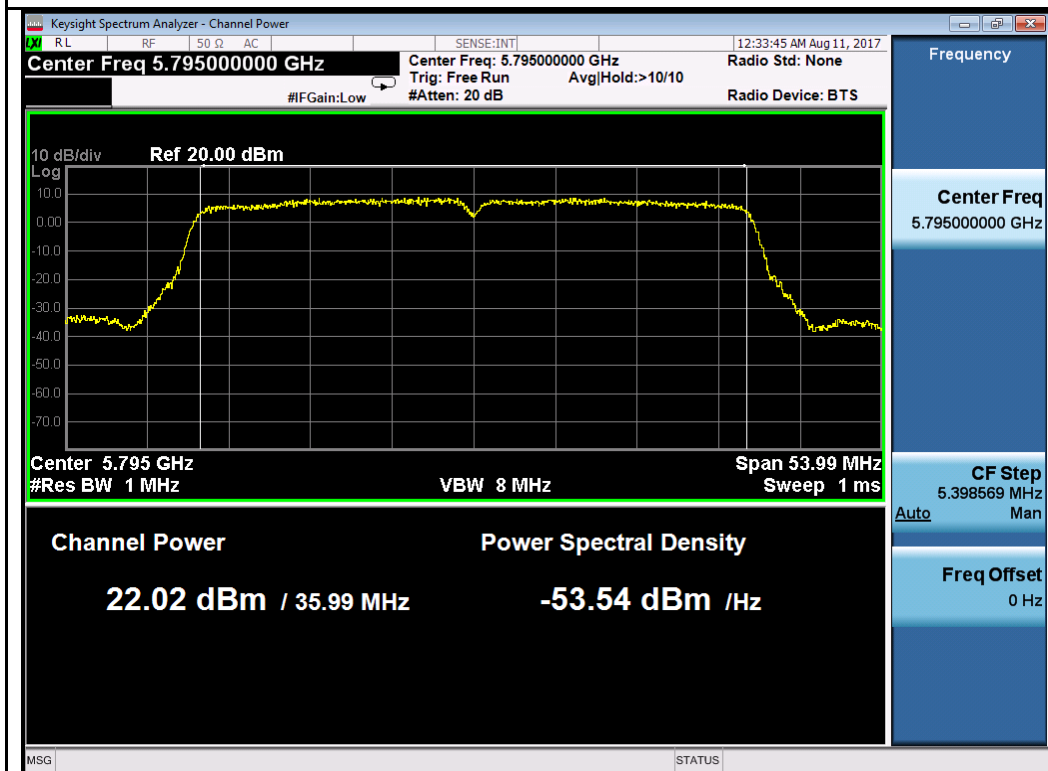
802.11n-HT20-5785MHz



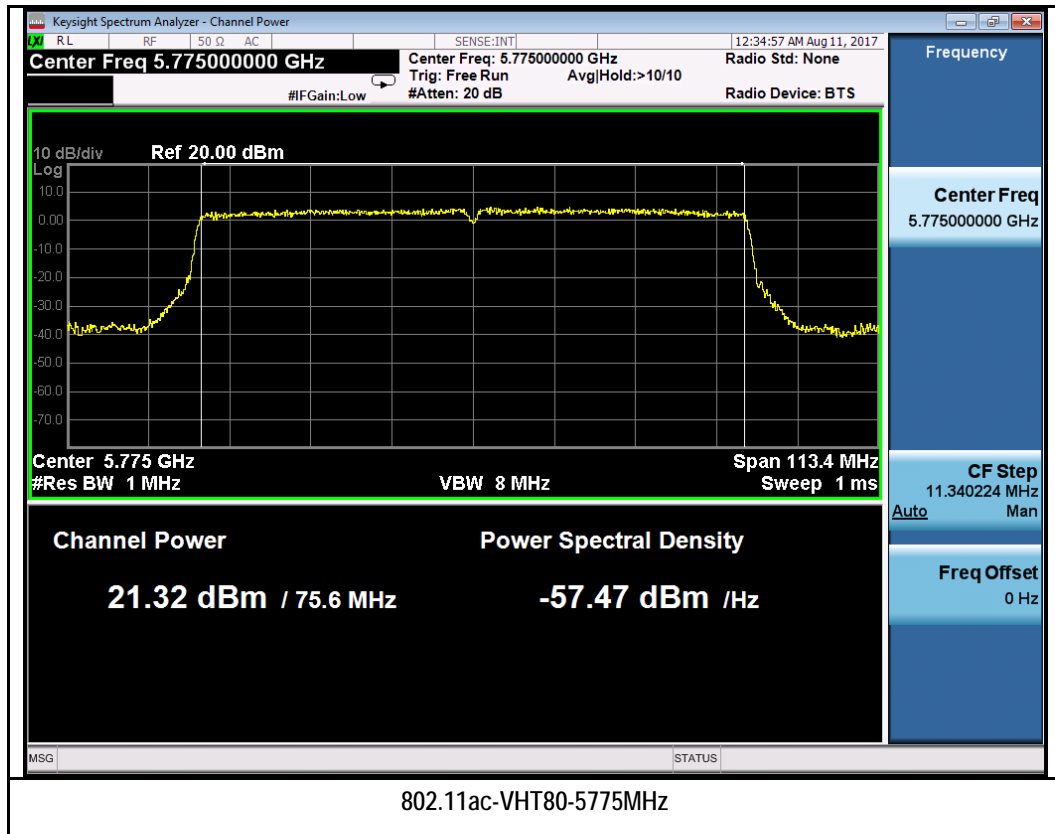
802.11n-HT20-5825MHz



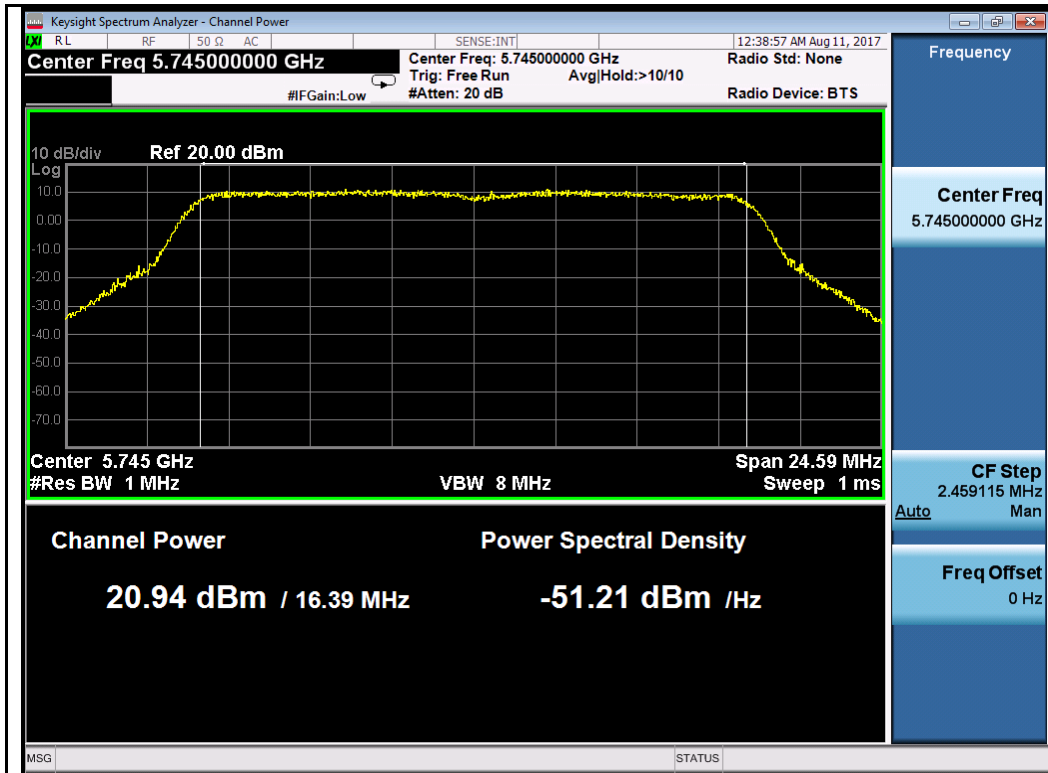
802.11n-HT40-5755MHz



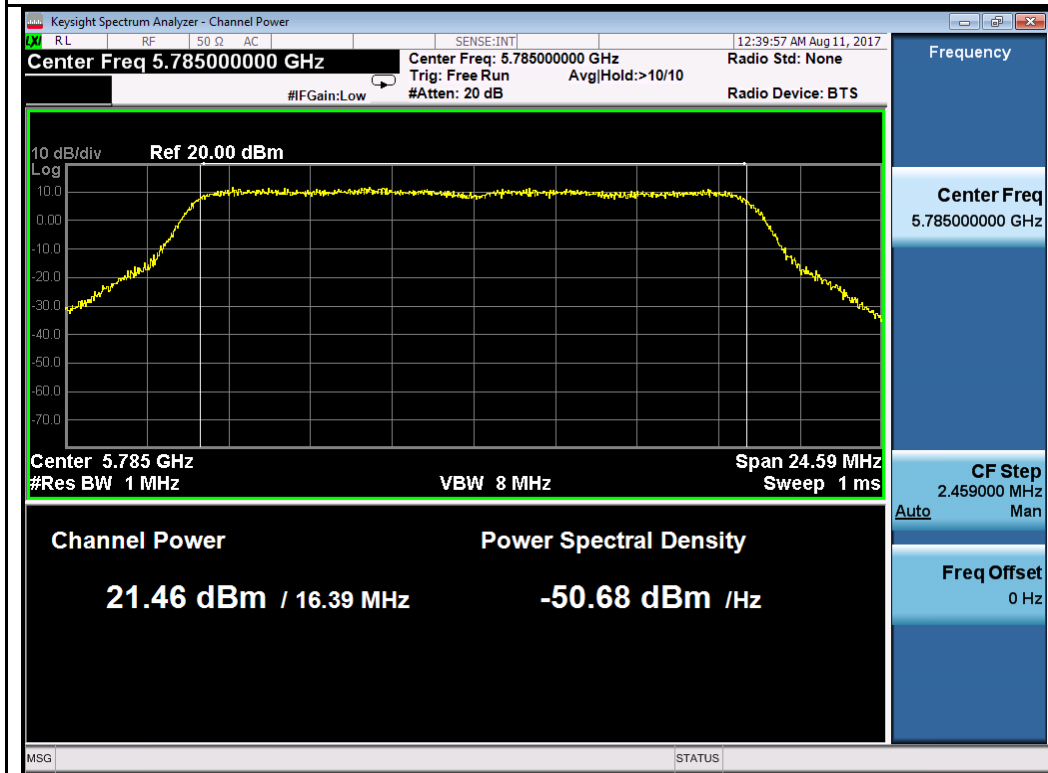
802.11n-HT40-5795MHz



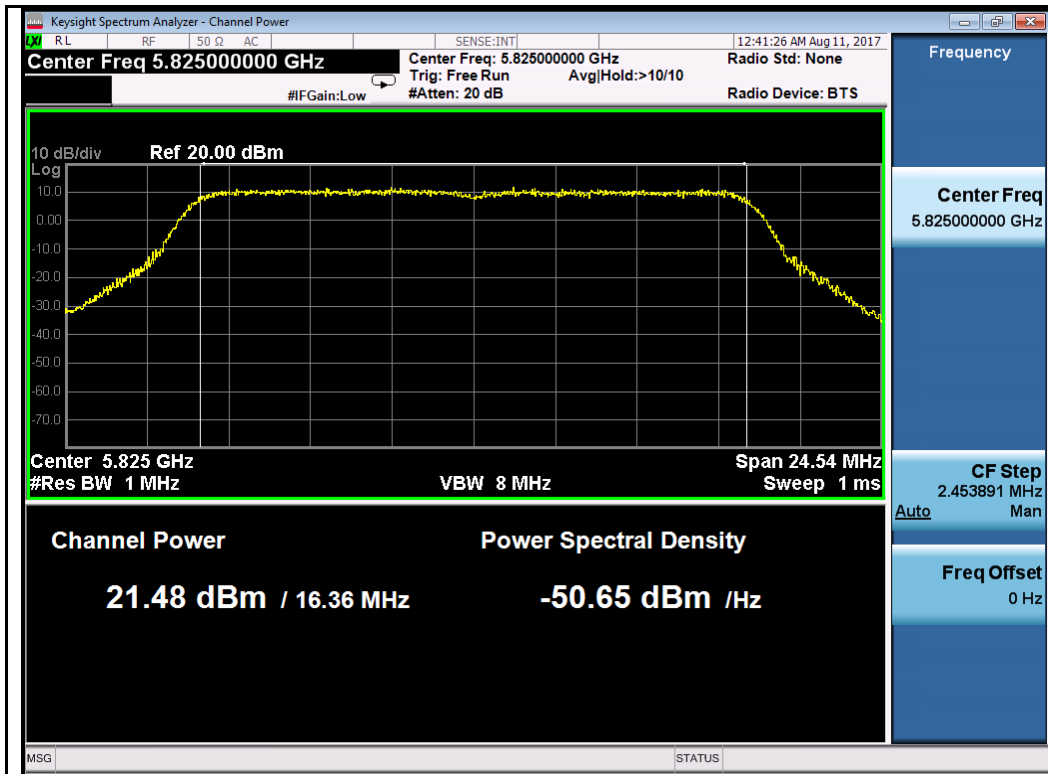
Chain 3:



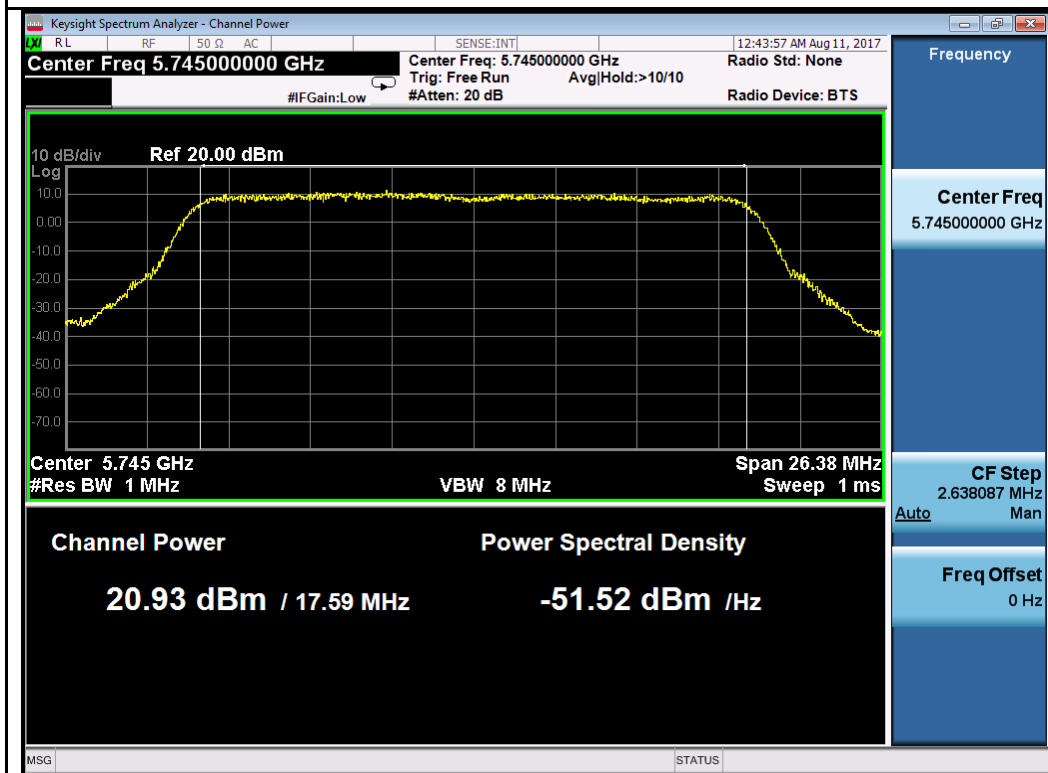
802.11a-5745MHz



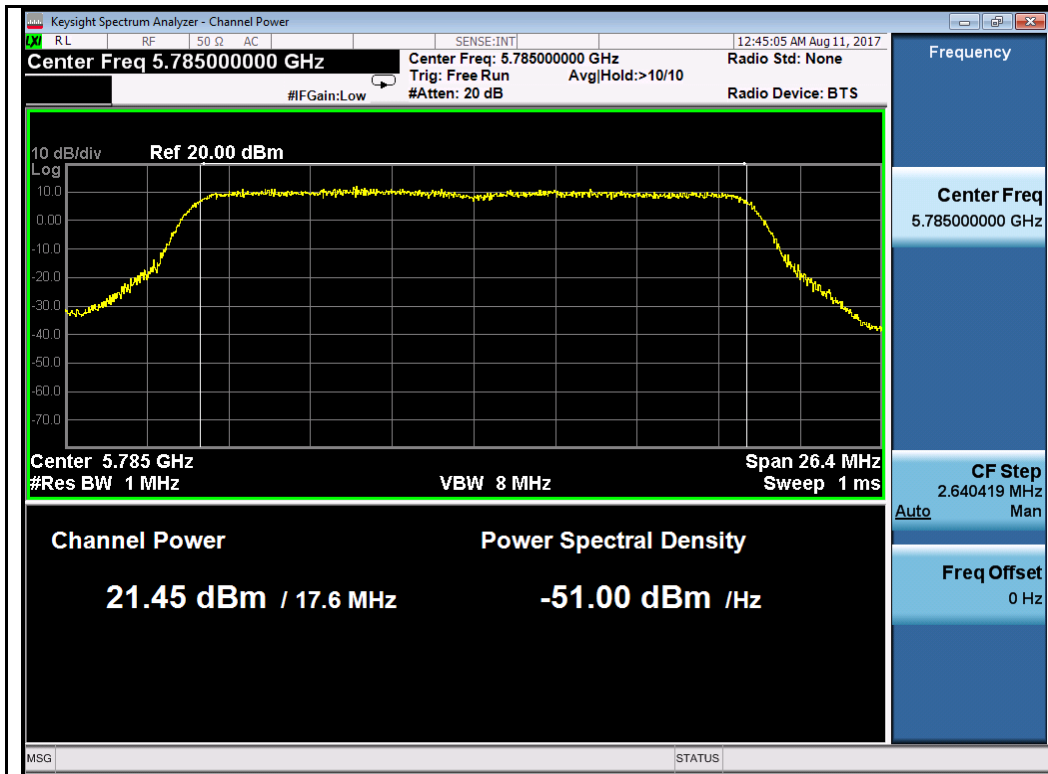
802.11a-5785MHz



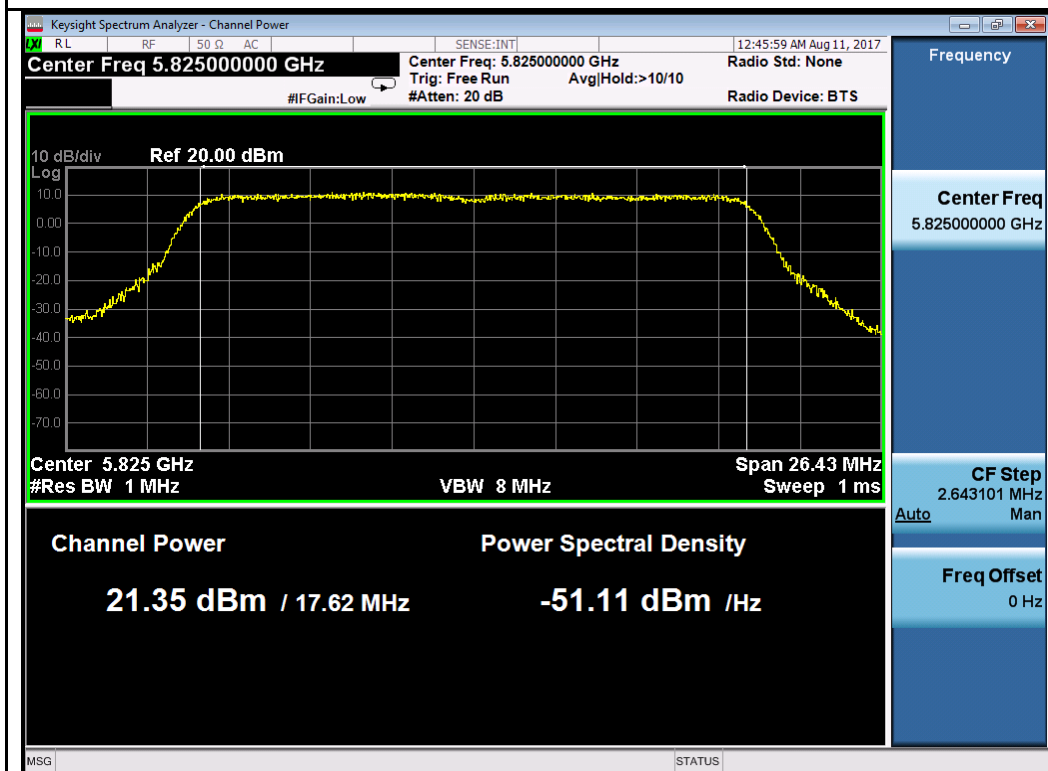
802.11a-5825MHz



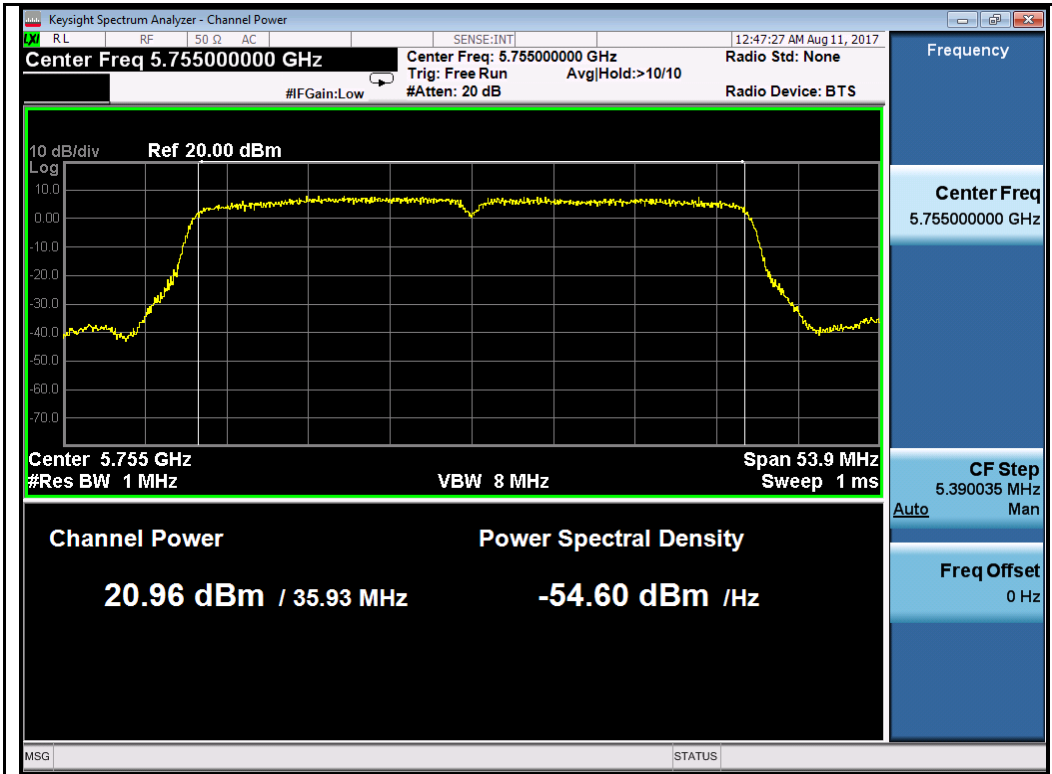
802.11n-HT20-5745MHz



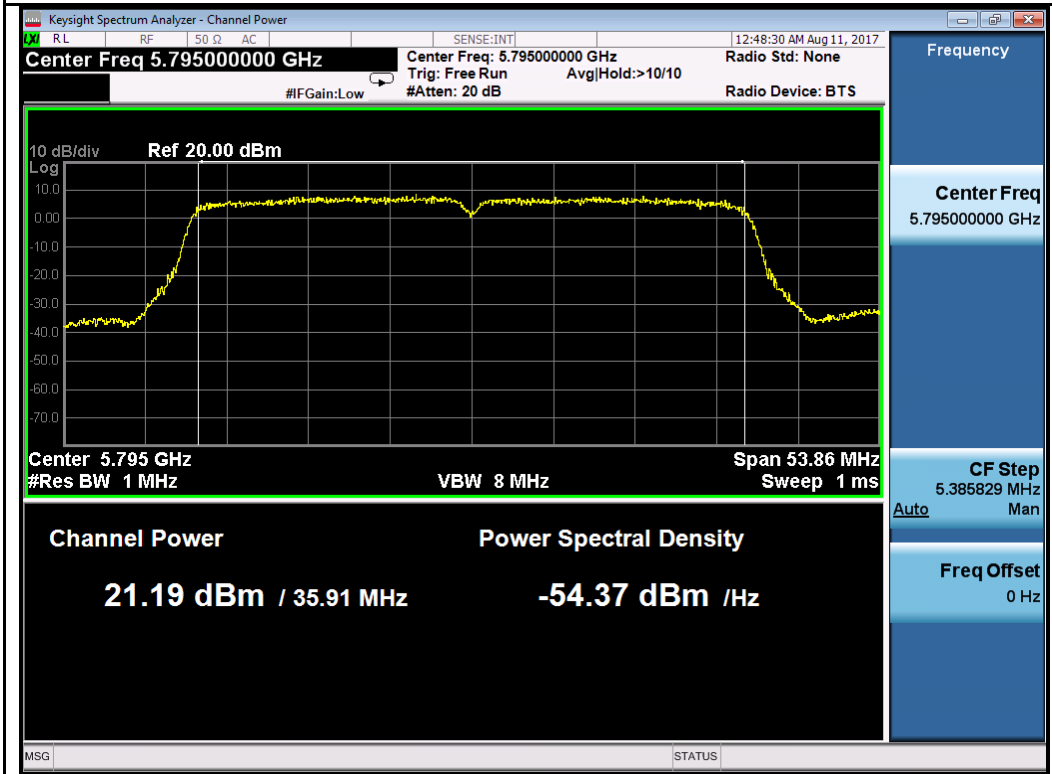
802.11n-HT20-5785MHz



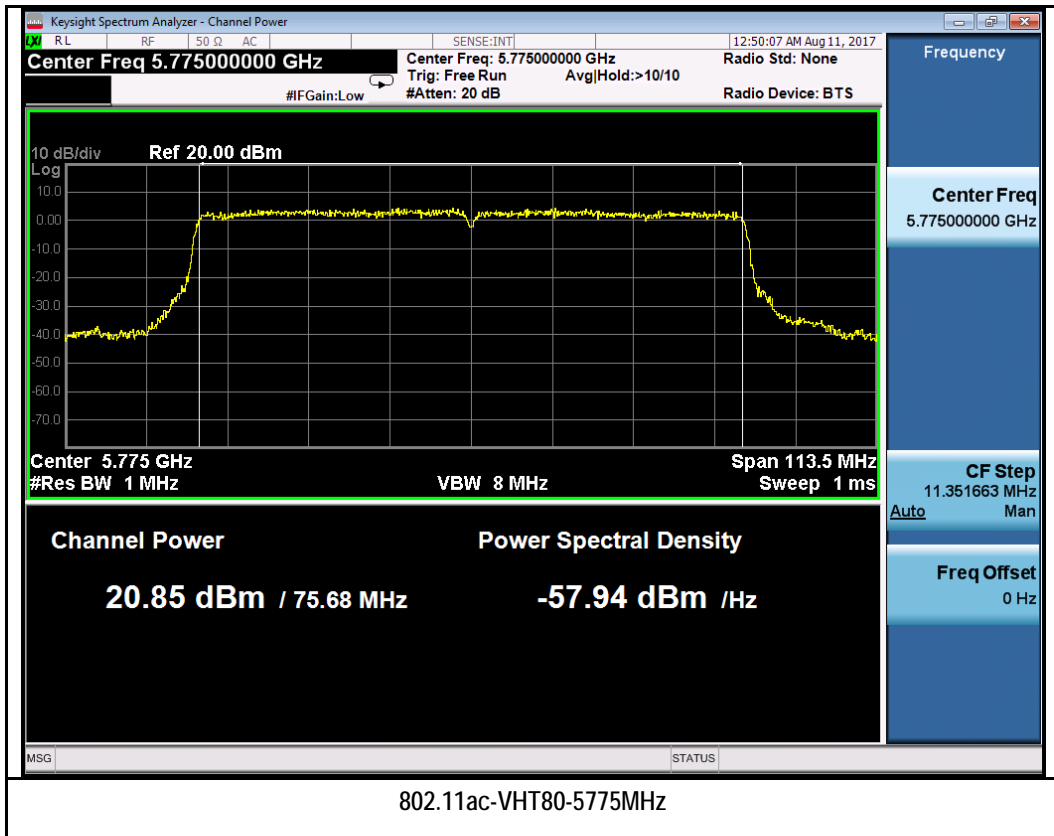
802.11n-HT20-5825MHz



802.11n-HT40-5755MHz

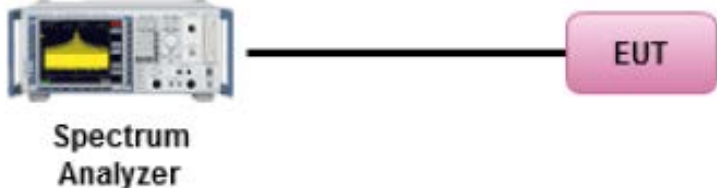


802.11n-HT40-5795MHz



10.4 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	<input checked="" type="checkbox"/>
	a)(3)	For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;">Spectrum Analyzer EUT</p>		
Test Procedure	<p>789033 D02 General UNII Test Procedures New Rules v01r02, II.F. Method SA-1</p> <p><u>Maximum spectral density measurement procedure</u></p> <ul style="list-style-type: none"> - Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. - Set RBW = 1 MHz - Set VBW ≥ 3 MHz - Detector = RMS. - Sweep time = auto couple. - Trace mode = max hold. - Trace average at least 100 traces in power averaging - Use the peak marker function to determine the maximum amplitude level within the RBW. <p>Apply correction to the result if different RBW is used.</p>		
Test Date	08/10/2017 – 09/20/2017	Environmental condition	Temperature 22°C Relative Humidity 42% Atmospheric Pressure 1020mbar
Remark	Per KDB 662911 D01 Multiple Transmitter Output v02r01, the direction gain for horizontal polarization and vertical polarization is calculated separately. For 5GHz band, peak antenna gain = 4.5 dBi, directional gain = 3 dB, total gain = 7.5 dBi. Highest of total gain is 7.5 dBi. The power limit and PSD limit will be reduced by amount of 1.5 dB.		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test was done by Rachana Khanduri at RF test site.

PSD measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)					Limit (dBm/MHz)	Result
				Chain0	Chain1	Chain2	Chain3	Combined		
PSD	802.11a	5180	Low	8.05	8.74	8.90	8.83	14.66	15.5	Pass
		5200	Mid	8.72	8.91	8.84	8.70	14.81	15.5	Pass
		5240	High	8.23	8.64	8.60	8.38	14.49	15.5	Pass
	802.11n-20	5180	Low	8.28	8.78	8.94	8.53	14.66	15.5	Pass
		5200	Mid	7.64	8.31	8.43	8.29	14.20	15.5	Pass
		5240	High	8.39	8.54	8.45	8.50	14.49	15.5	Pass
	802.11n-40	5190	Low	4.58	4.80	4.77	4.55	10.70	15.5	Pass
		5230	High	5.57	5.76	5.57	5.79	11.69	15.5	Pass
	802.11ac-80	5210	Mid	-0.75	-0.14	-0.40	-0.97	5.47	15.5	Pass

PSD measurement result for 5.8GHz

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz)					Correction factor (dB)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
			Chain0	Chain1	Chain2	Chain3	Combined				
802.11a	5745	Low	1.32	1.85	2.06	1.11	7.62	6.99	14.61	28.5	Pass
	5785	Mid	2.11	1.87	1.95	1.42	7.87	6.99	14.86	28.5	Pass
	5825	High	1.89	1.92	1.90	1.33	7.79	6.99	14.78	28.5	Pass
802.11n-20	5745	Low	1.25	1.19	1.71	1.23	7.37	6.99	14.36	28.5	Pass
	5785	Mid	1.30	1.42	1.51	1.52	7.46	6.99	14.45	28.5	Pass
	5825	High	0.92	1.21	1.39	1.35	7.24	6.99	14.23	28.5	Pass
802.11n-40	5755	Low	-2.35	-1.78	-1.64	-2.13	4.05	6.99	11.04	28.5	Pass
	5795	High	-1.66	-1.79	-1.00	-2.03	4.42	6.99	11.41	28.5	Pass
802.11ac-80	5775	Mid	-6.03	-5.82	-5.57	-6.26	0.11	6.99	7.10	28.5	Pass
Note	BW correction factor = 10log(500kHz/RBW), RBW was set to 100kHz during test.										