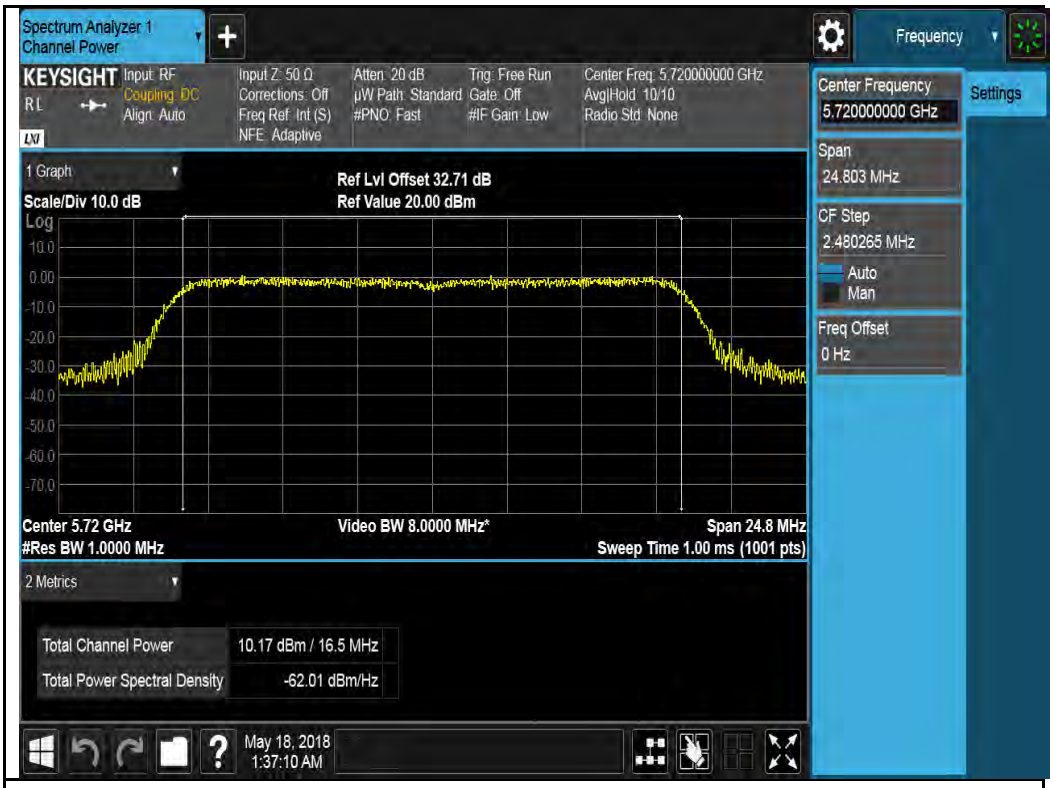
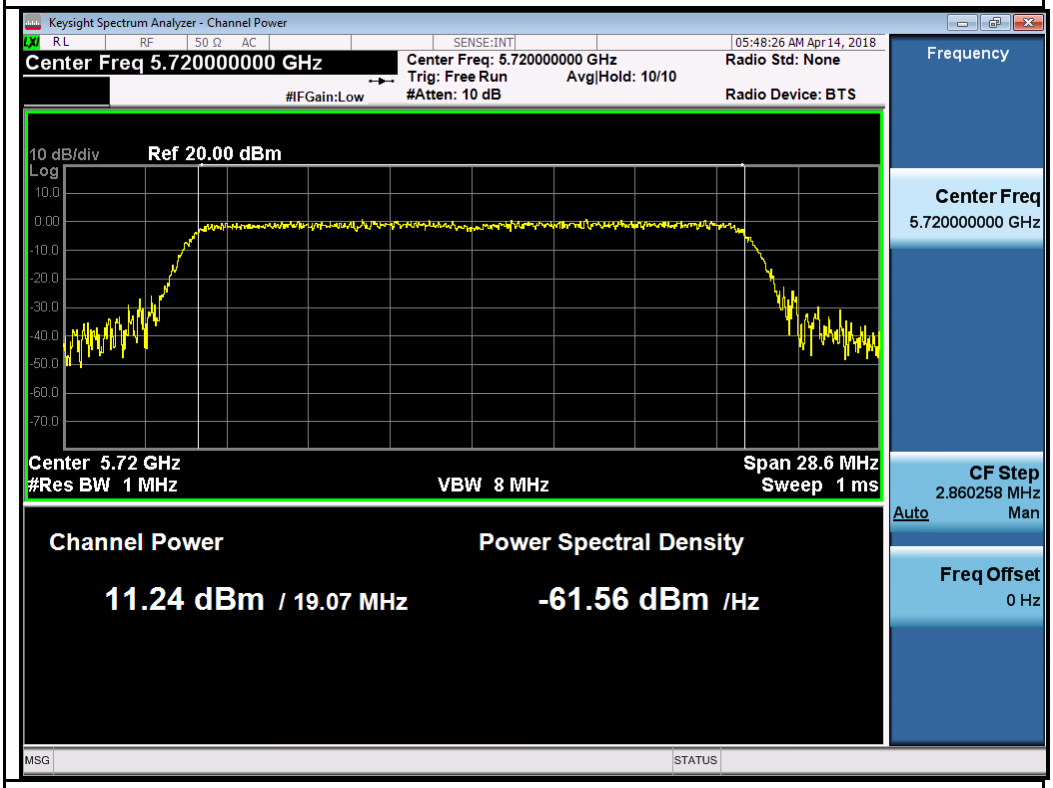
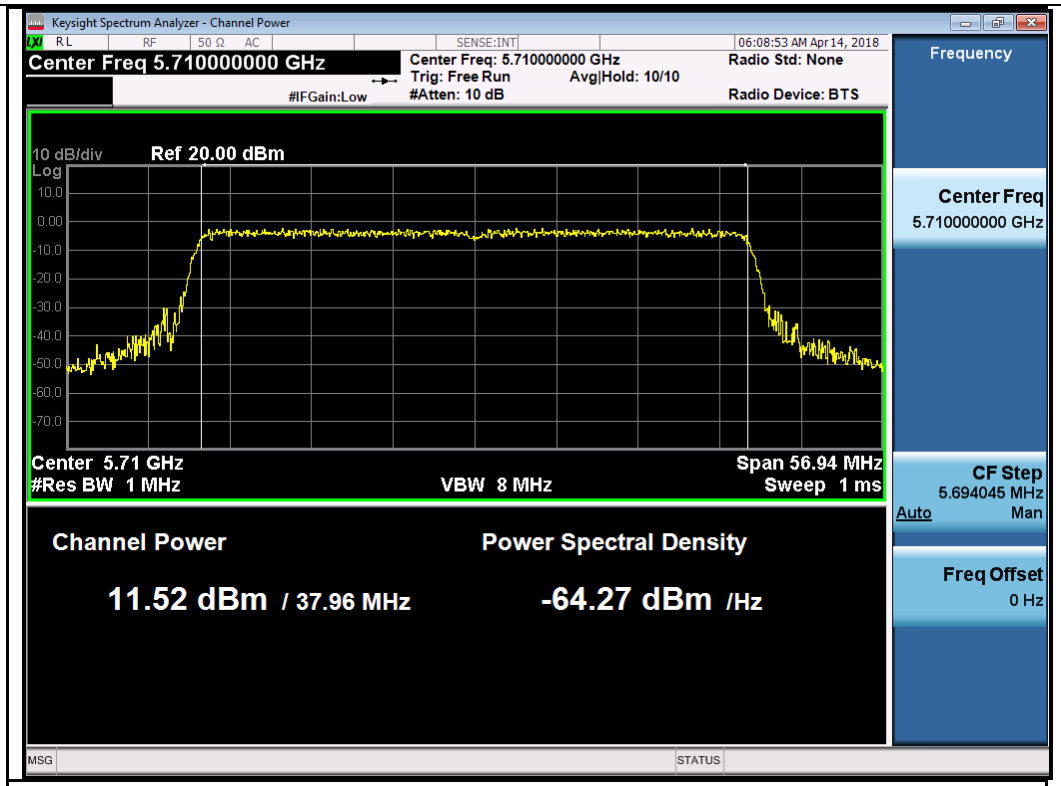
Chain 7:



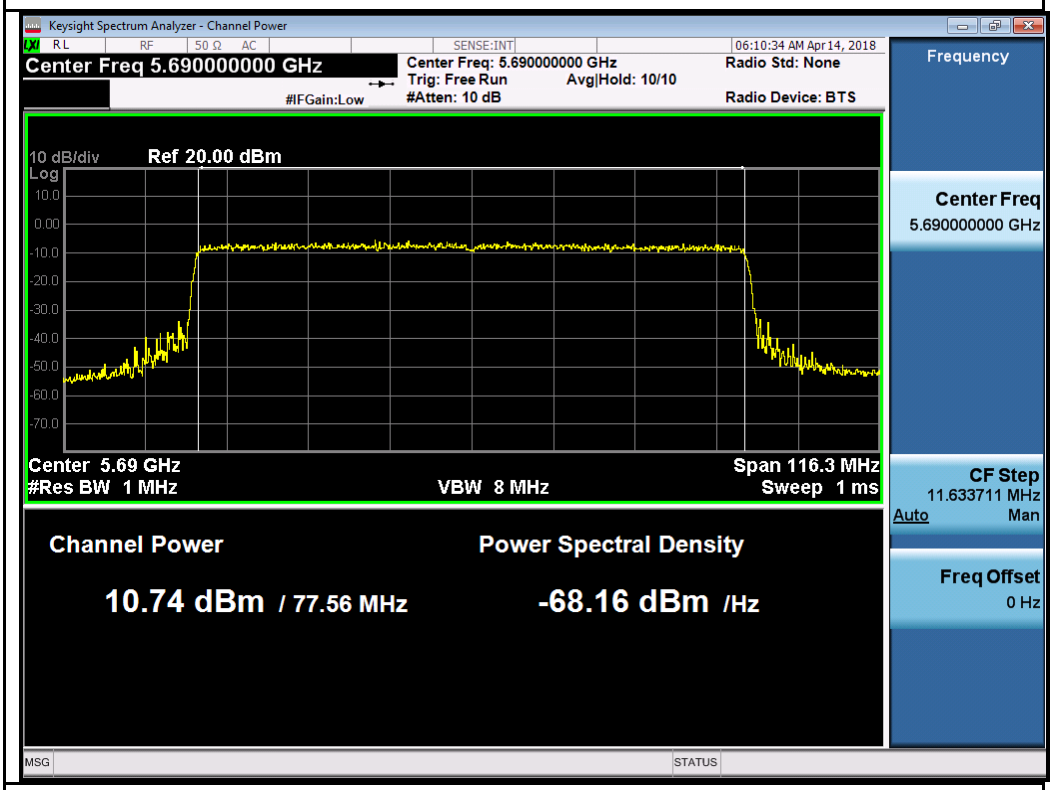
802.11a-5720M



802.11ax20 5720M



802.11ax40 5710M



802.11ax80 5690M

Output Power measurement result for 4x4 mode 5.3GHz

Test mode	Freq (MHz)	CH	Conducted Power (dBm) Chain No.					Limit (dBm)	Result
			0	1	2	3	Total		
802.11a	5260	Low	15.90	15.70	16.03	17.28	22.29	23.73	Pass
	5280	Mid	15.60	15.40	15.93	17.01	22.05	23.73	Pass
	5320	High	15.77	15.87	16.02	16.81	22.15	23.73	Pass
802.11ax-20	5260	Low	15.83	15.24	16.47	17.82	22.47	23.73	Pass
	5280	Mid	14.95	14.96	15.51	16.49	21.54	23.73	Pass
	5320	High	15.84	15.33	15.33	16.07	21.67	23.73	Pass
802.11ax-40	5270	Low	17.07	16.46	17.02	18.06	23.21	23.73	Pass
	5310	Mid	16.07	15.62	16.70	18.04	22.73	23.73	Pass
802.11ax-80	5290	High	17.05	16.27	16.89	18.09	23.15	23.73	Pass

Output Power measurement result for 4x4 mode 5.5GHz

Test mode	Freq (MHz)	CH	Conducted Power (dBm) Chain No.					Limit (dBm)	Result
			0	1	2	3	Total		
802.11a	5500	Low	15.75	16.19	15.49	16.66	22.07	23.73	Pass
	5580	Mid	14.98	16.07	13.98	15.82	21.30	23.73	Pass
	5700	High	15.01	14.67	15.13	15.89	21.22	23.73	Pass
802.11ax-20	5500	Low	15.88	17.19	15.34	17.20	22.50	23.73	Pass
	5580	Mid	16.30	16.74	15.39	17.70	22.63	23.73	Pass
	5700	High	15.94	14.65	15.67	16.26	21.69	23.73	Pass
802.11ax-40	5510	Low	17.16	17.54	16.67	18.42	23.51	23.73	Pass
	5550	Mid	17.32	17.70	16.48	18.49	23.58	23.73	Pass
	5670	High	16.49	18.33	15.41	18.17	23.28	23.73	Pass
802.11ax-80	5530	Low	16.32	17.29	15.09	17.02	22.53	23.73	Pass
	5610	High	17.26	16.40	16.87	18.25	23.27	23.73	Pass

Output Power measurement result for 4x4 mode CROSS channels (in band 5470-5725MHz)

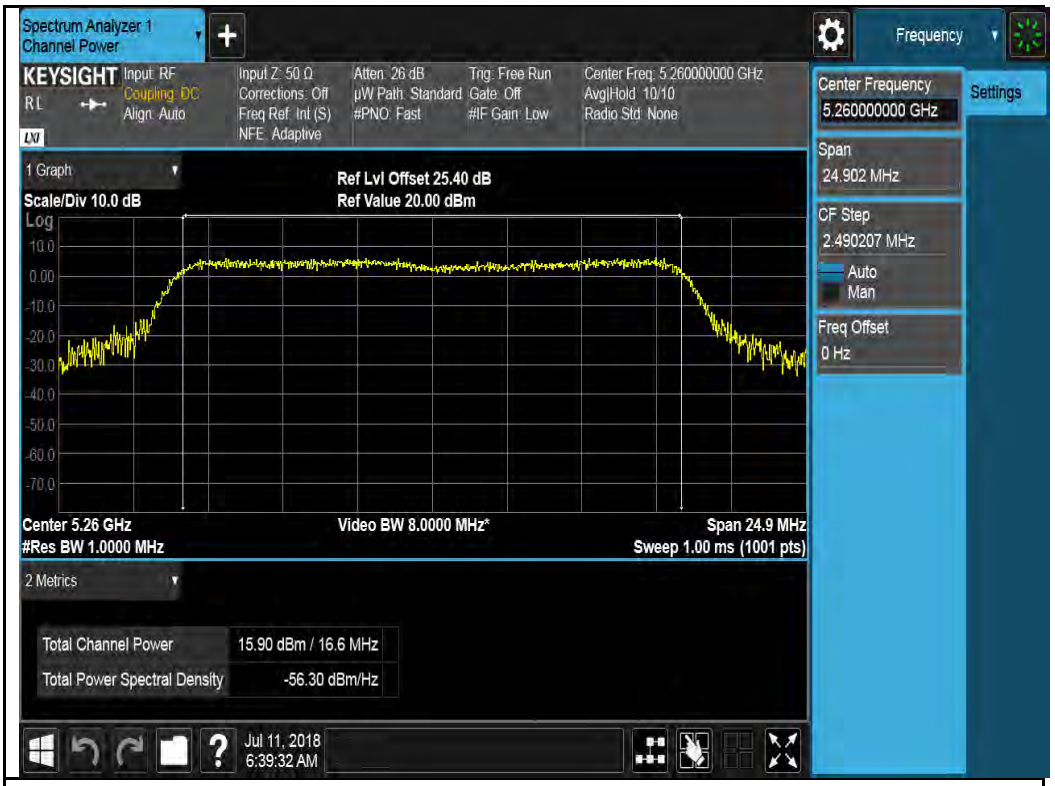
Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)					Limit (dBm)	Result
				Chain1	Chain2	Chain3	Chain4	Combined Power		
Output	802.11a	5720	CROSS	14.49	14.48	14.72	15.49	20.84	23.73	Pass
Output	802.11n-20M	5720	CROSS	15.34	15.71	15.56	15.90	21.65	23.73	Pass
Output	802.11n-40M	5710	CROSS	16.89	17.24	17.09	17.99	23.34	23.73	Pass
Output	802.11ac-	5690	CROSS	15.75	17.05	15.80	17.85	22.72	23.73	Pass

Output Power measurement result for 4x4 mode CROSS channels (in band 5725-5850MHz)

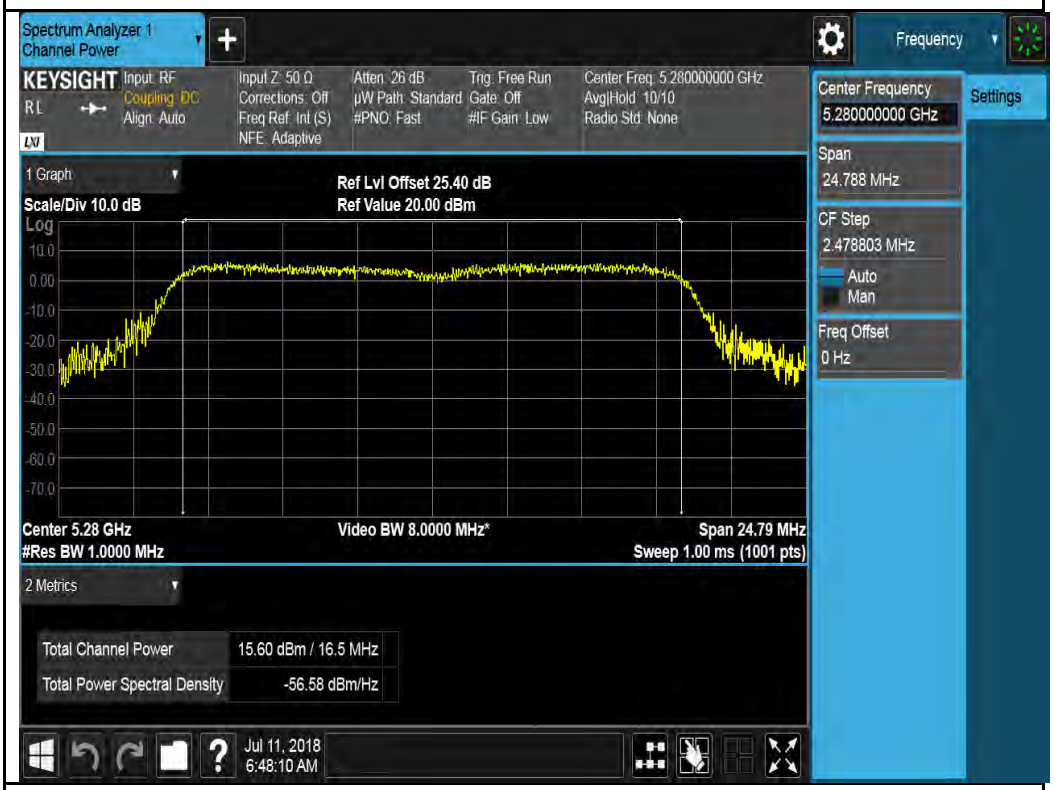
Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)					Limit (dBm)	Result
				Chain1	Chain2	Chain3	Chain4	Combined Power		
Output	802.11a	5720	CROSS	14.49	14.48	14.72	15.49	20.84	23.73	Pass
Output	802.11n-20M	5720	CROSS	15.34	15.71	15.56	15.90	21.65	23.73	Pass
Output	802.11n-40M	5710	CROSS	16.89	17.24	17.09	17.99	23.34	23.73	Pass
Output	802.11ac-	5690	CROSS	15.75	17.05	15.80	17.85	22.72	23.73	Pass

Test Plot for 4x4 mode W53:

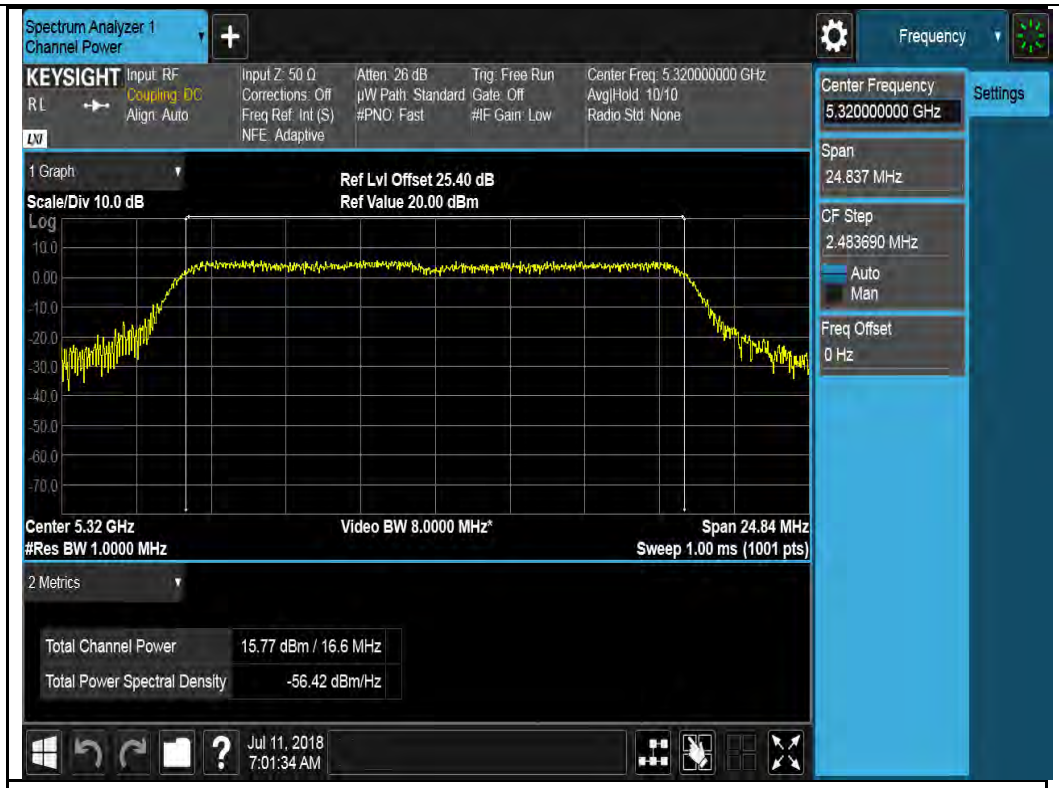
Chain 0:



802.11a-5260M

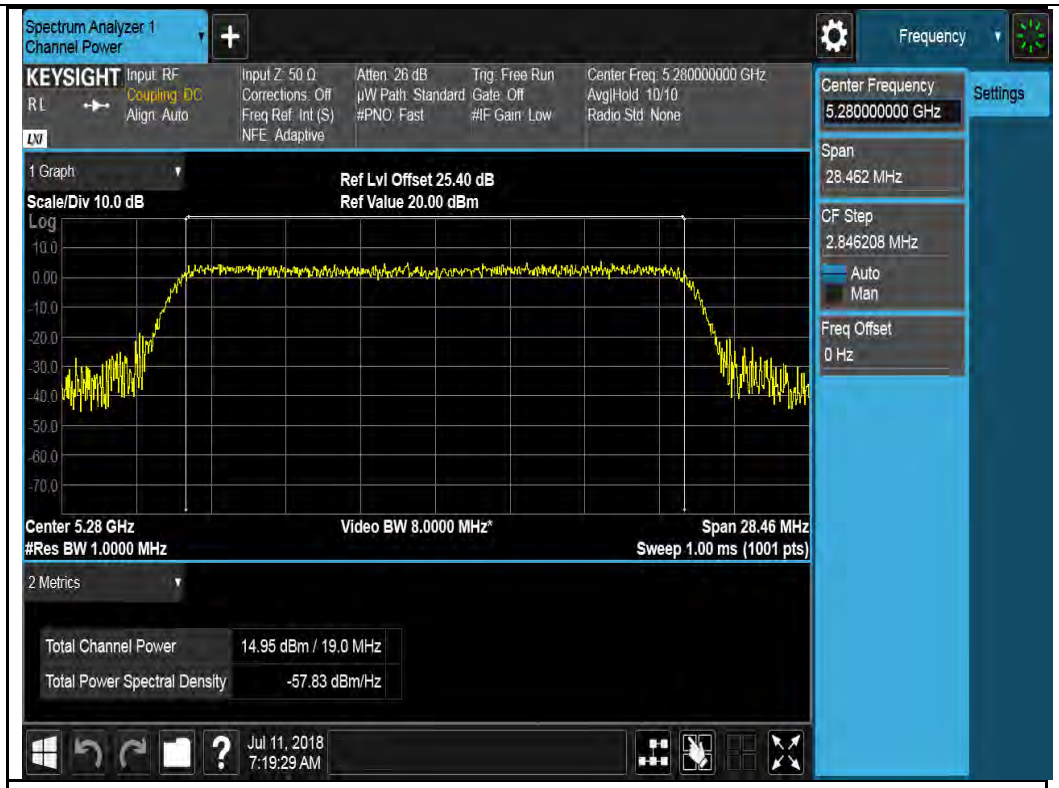


802.11a-5280M



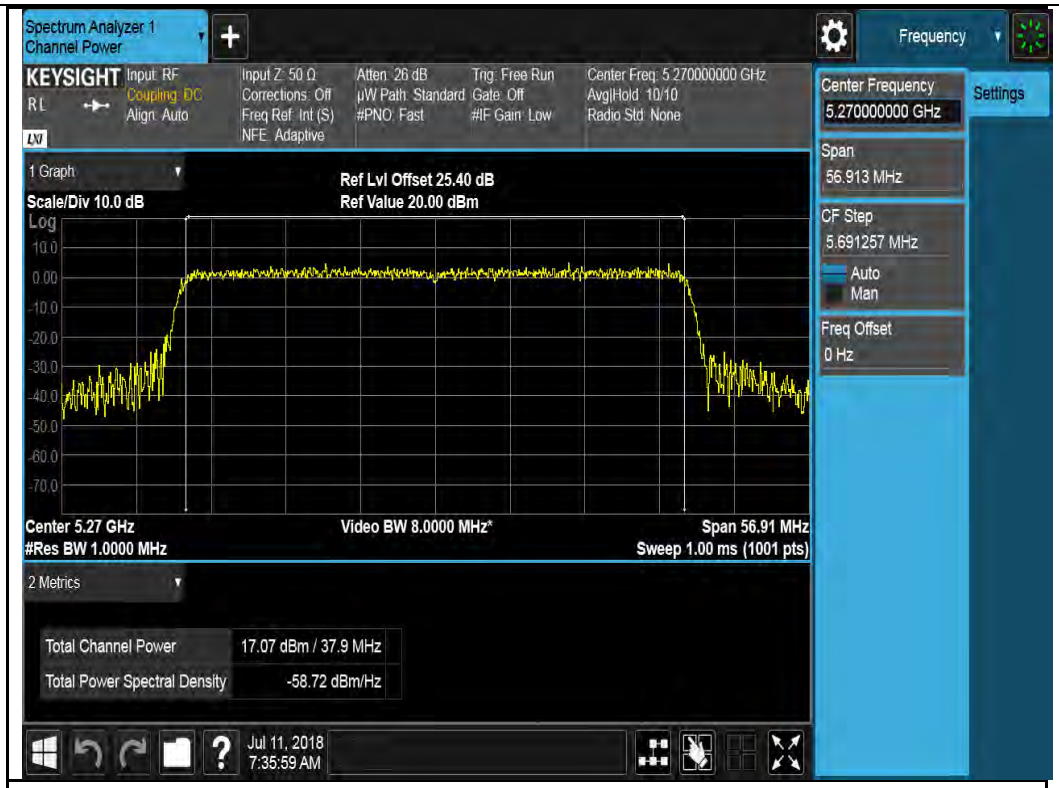
802.11a-5320M

802.11n-HT20 5260M

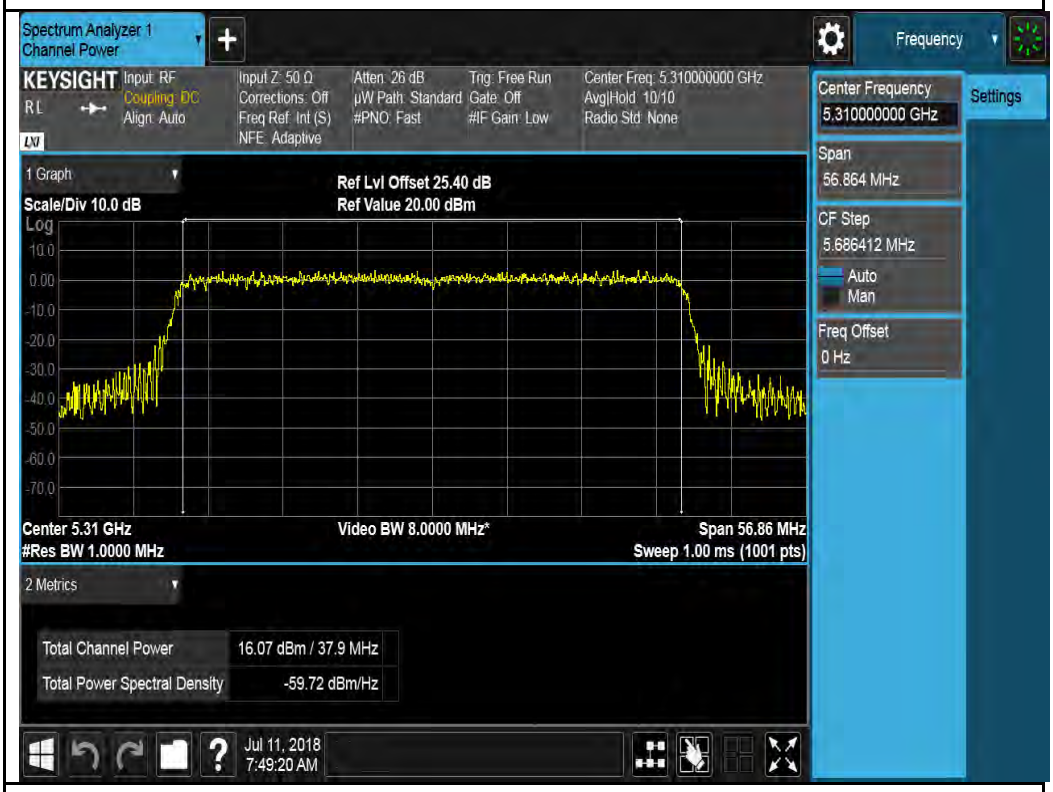


802.11n-HT20 5280M

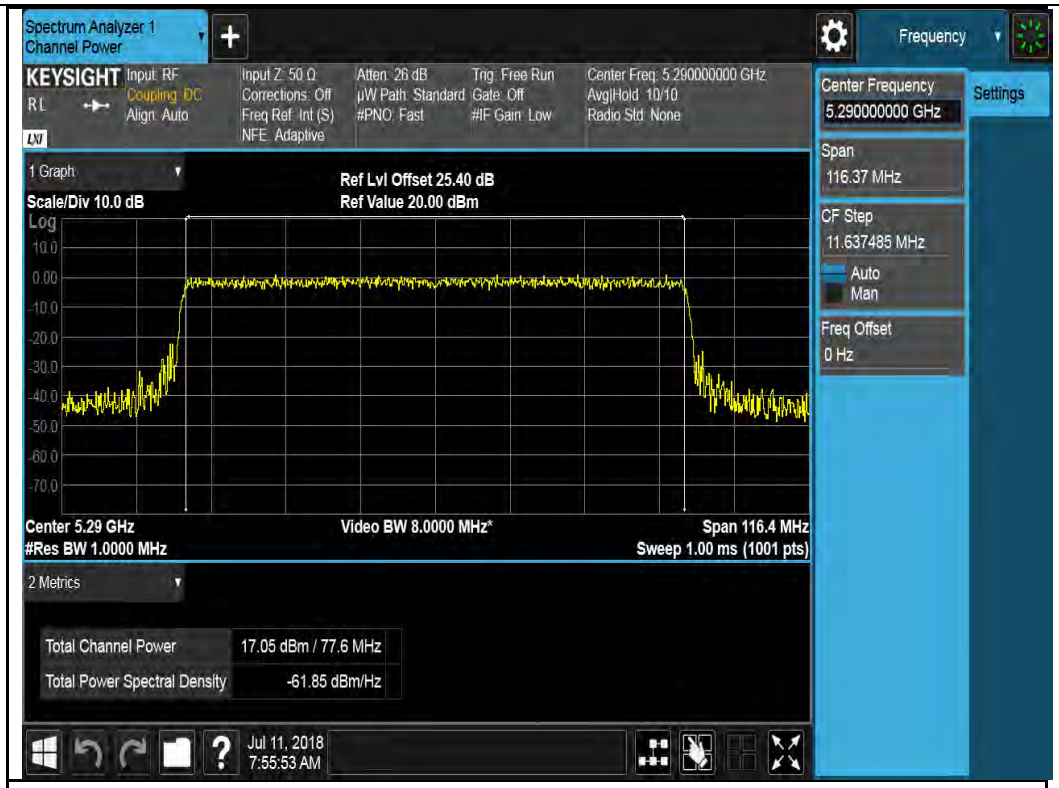
802.11n-HT20 5320M



802.11n-HT40 5270M



802.11n-HT40 5310M

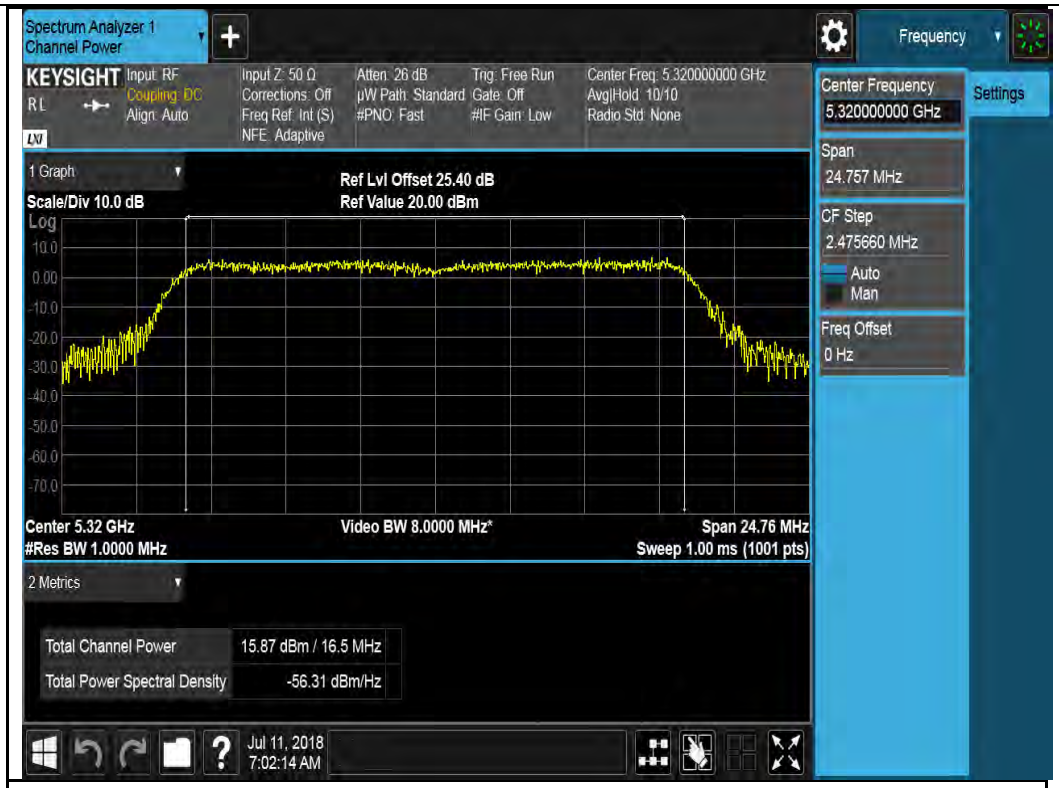


802.11ac-VHT80 5290M

Chain 1:

802.11a-5260M

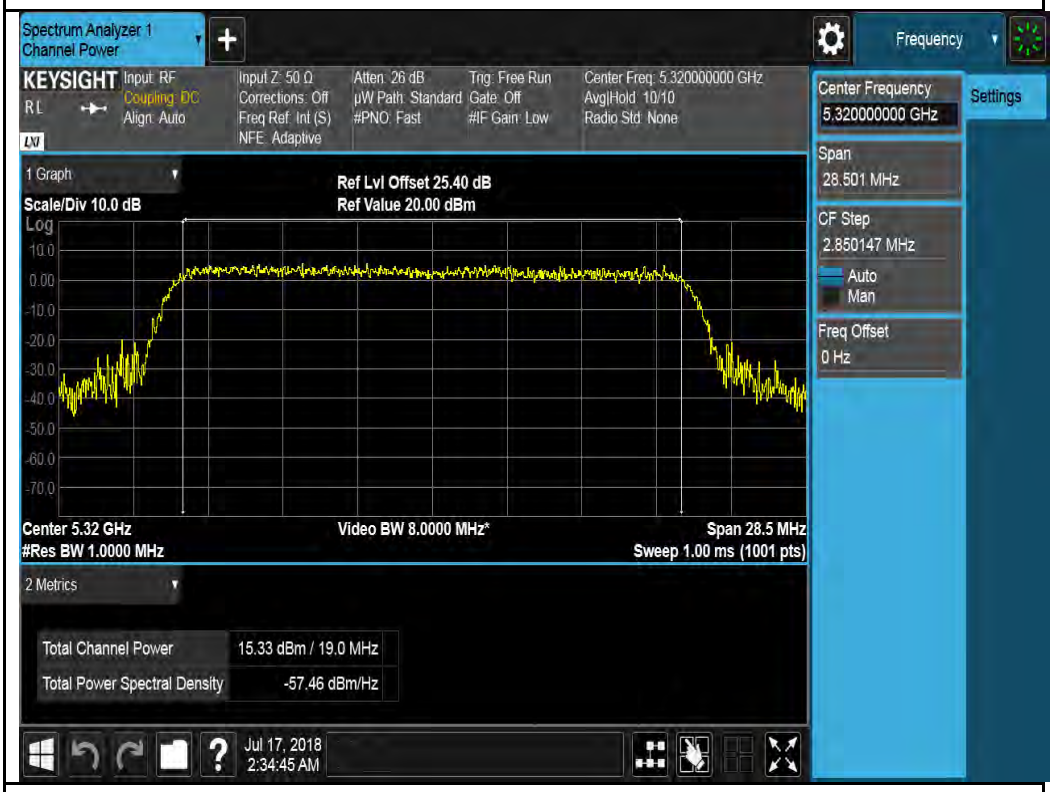
802.11a-5280M



802.11a-5320M

802.11n-HT20 5260M

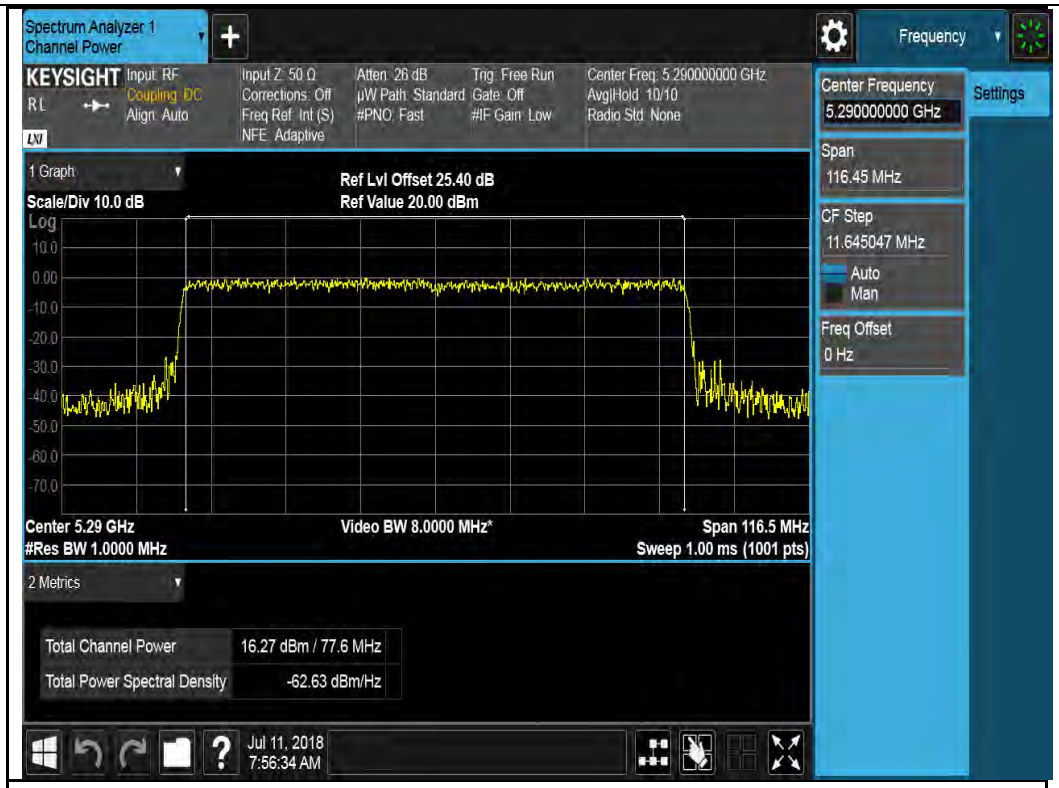
802.11n-HT20 5280M



802.11n-HT20 5320M

802.11n-HT40 5270M

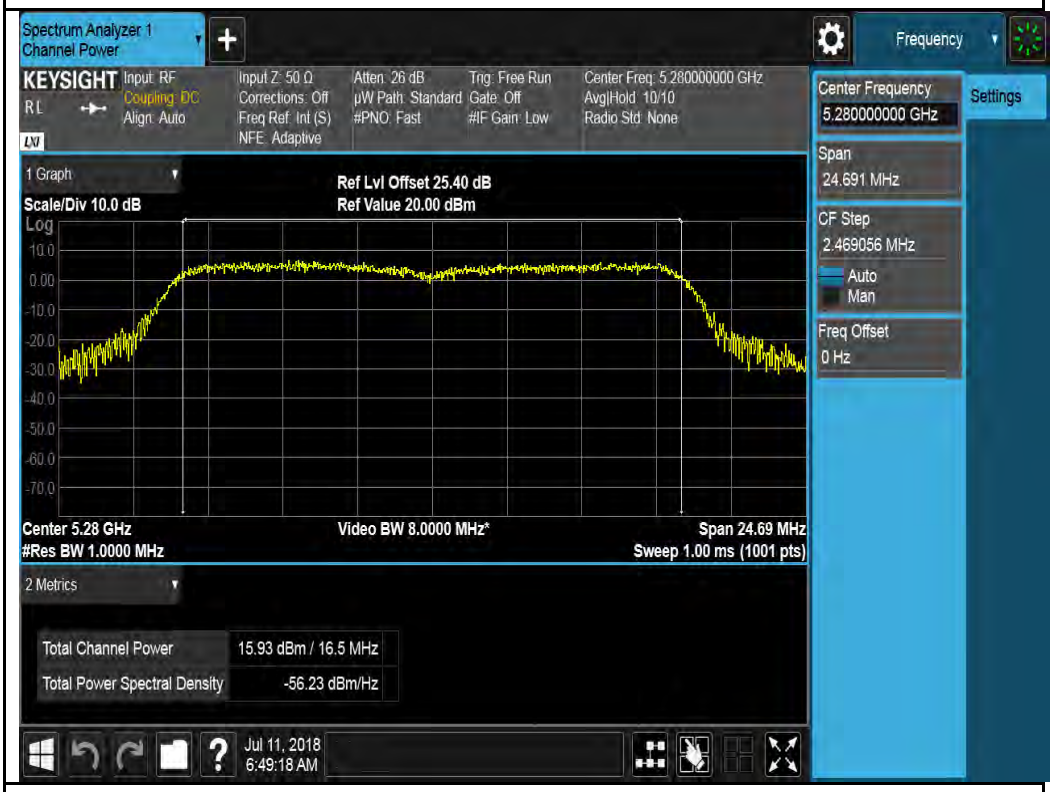
802.11n-HT40 5310M



802.11ac-VHT80 5290M

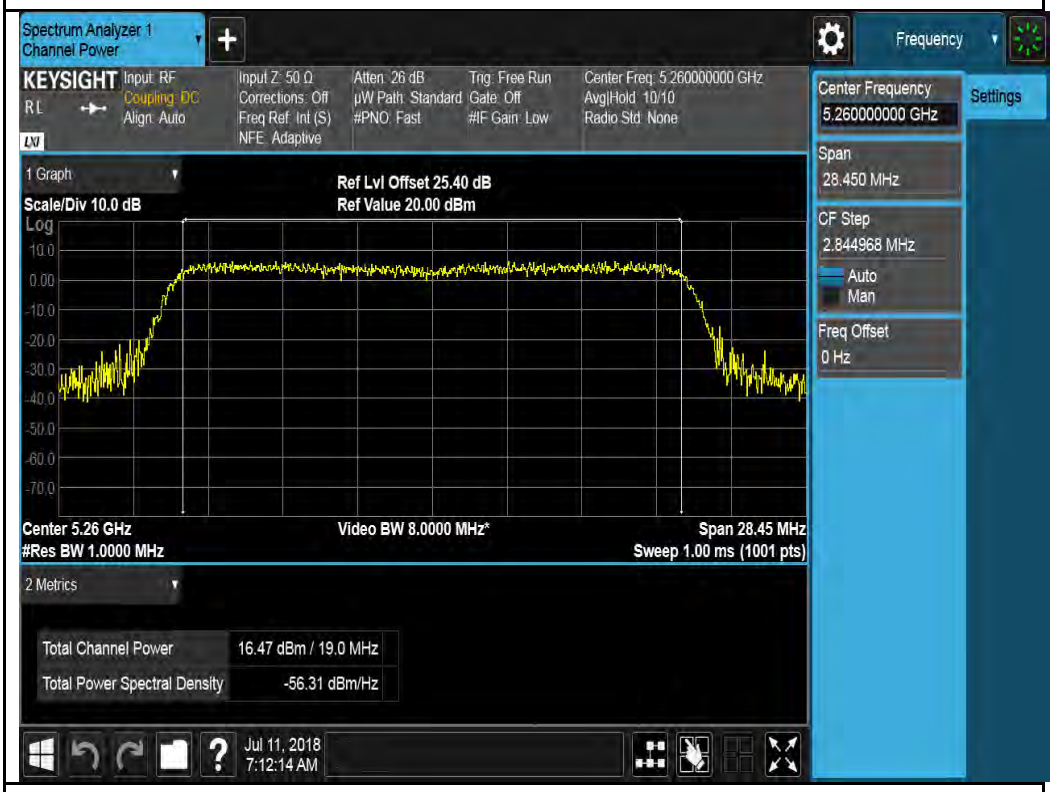
Chain 2:

802.11a-5260M



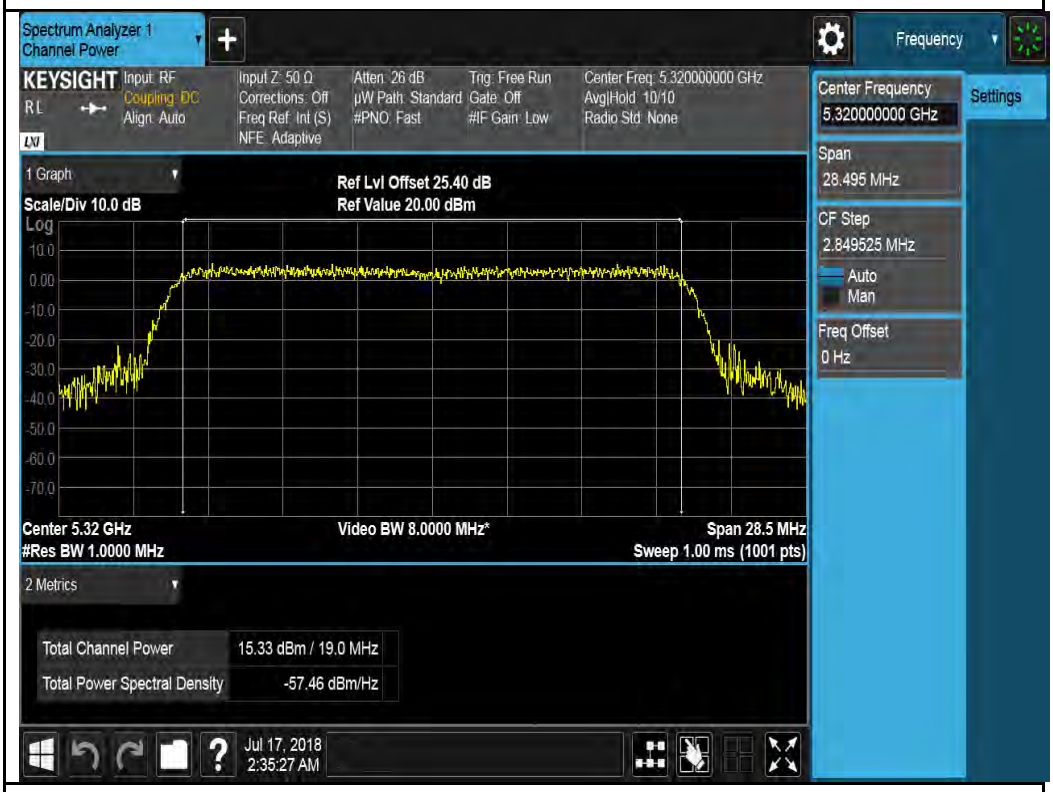
802.11a-5280M

802.11a-5320M

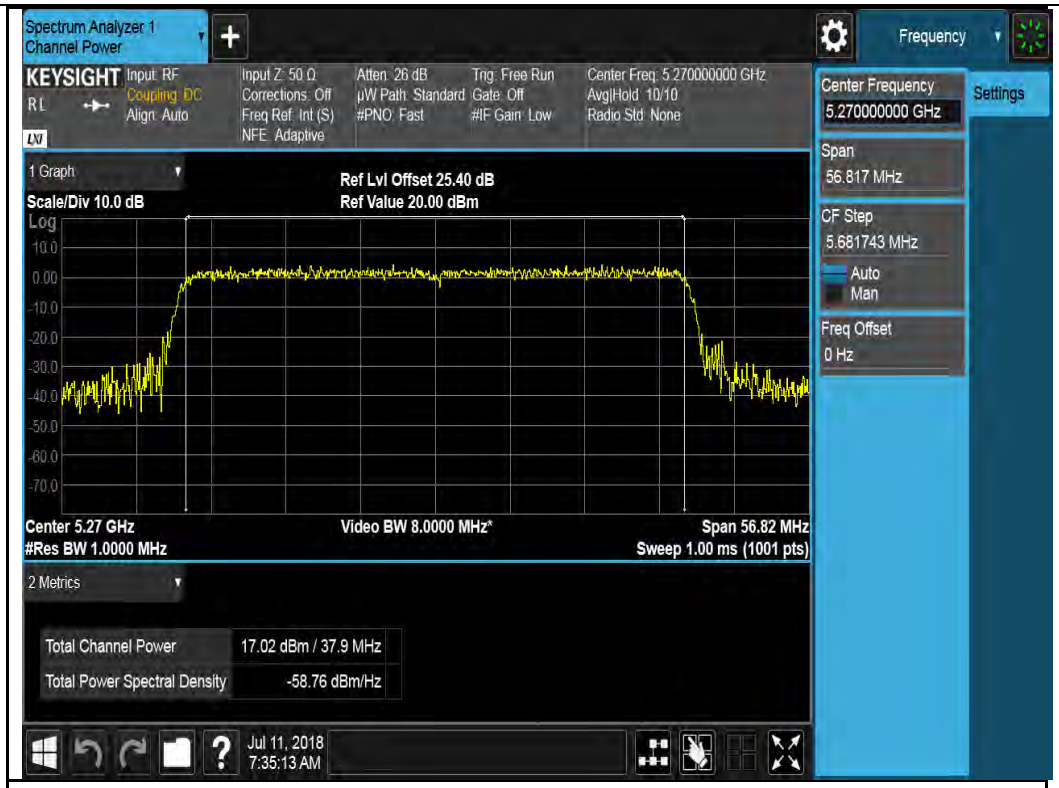


802.11n-HT20 5260M

802.11n-HT20 5280M

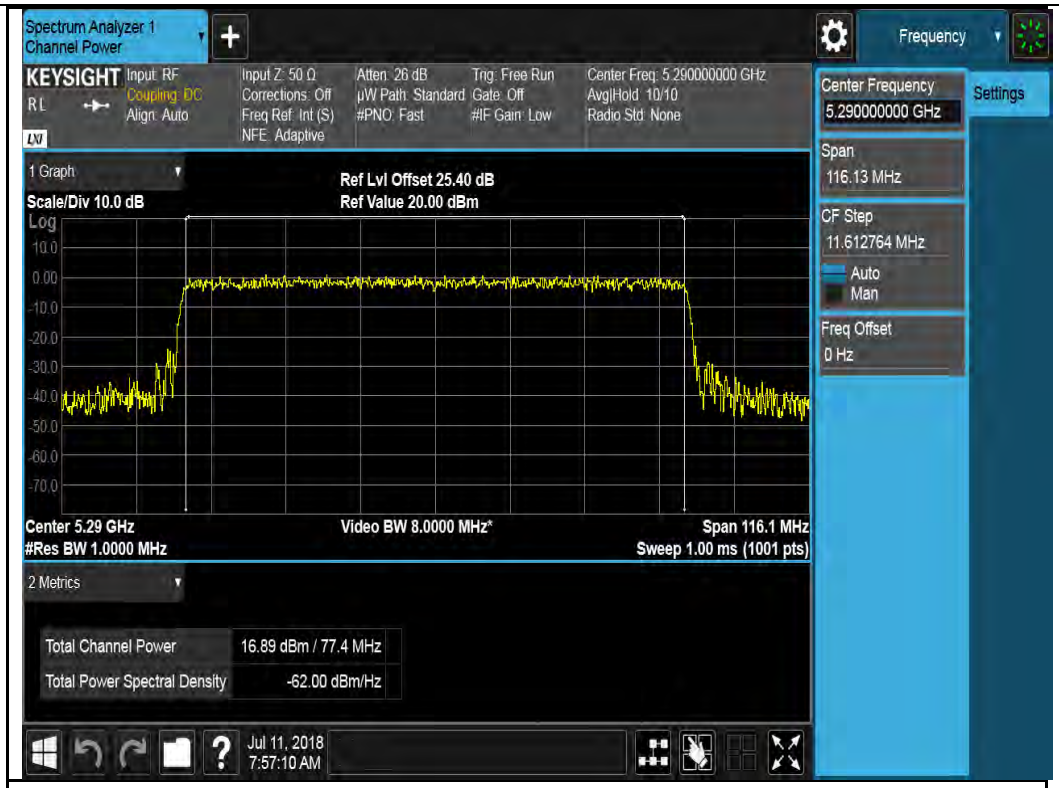


802.11n-HT20 5320M



802.11n-HT40 5270M

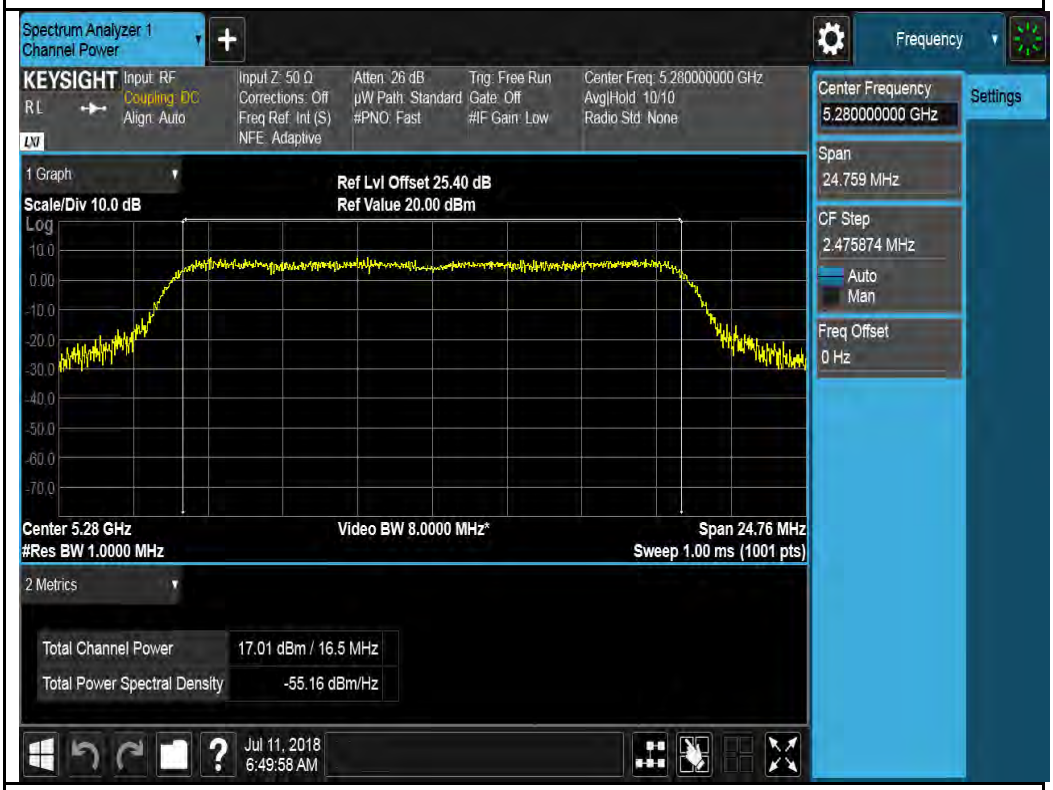
802.11n-HT40 5310M



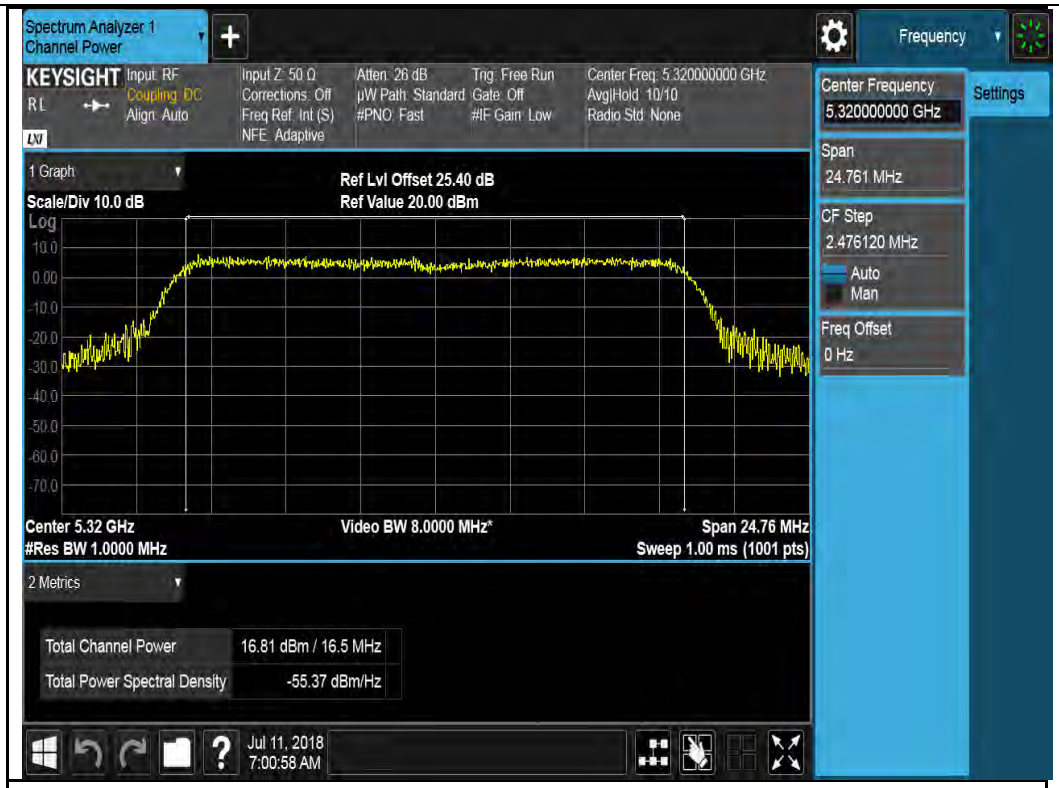
802.11ac-VHT80 5290M

Chain 3:

802.11a-5260M

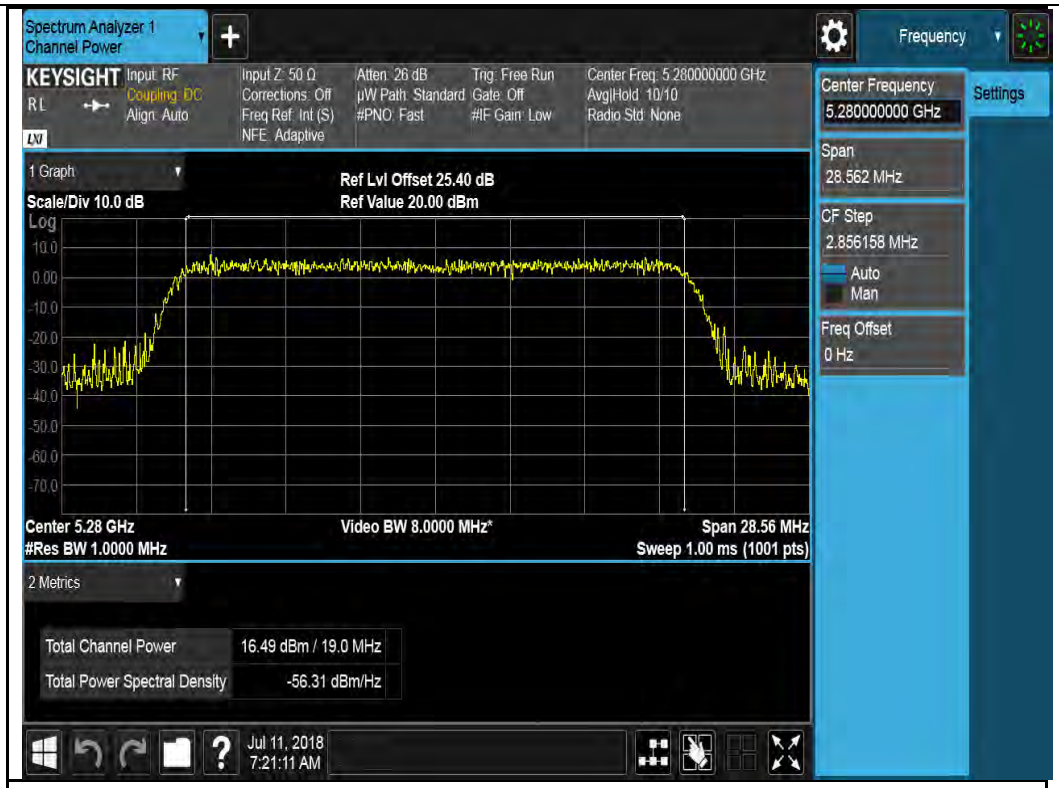


802.11a-5280M

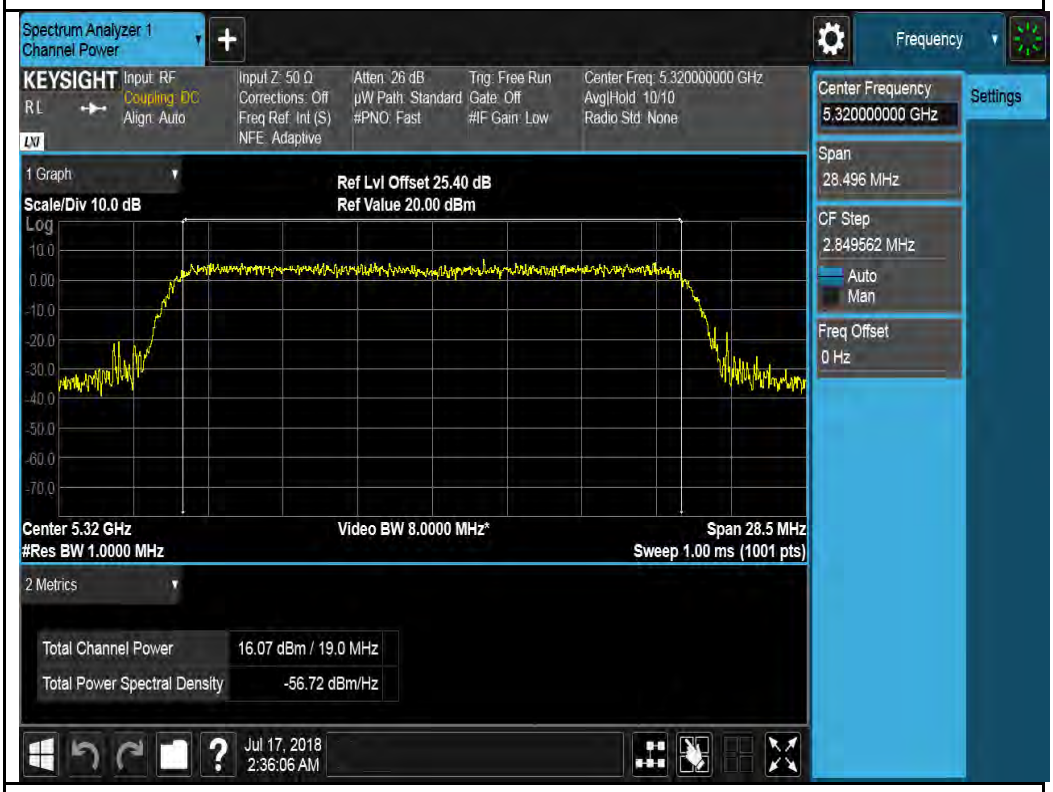


802.11a-5320M

802.11n-HT20 5260M



802.11n-HT20 5280M



802.11n-HT20 5320M

802.11n-HT40 5270M

802.11n-HT40 5310M

802.11ac-VHT80 5290M

Test Plot for 4x4 mode W56:

Chain 0:

802.11a-5500M

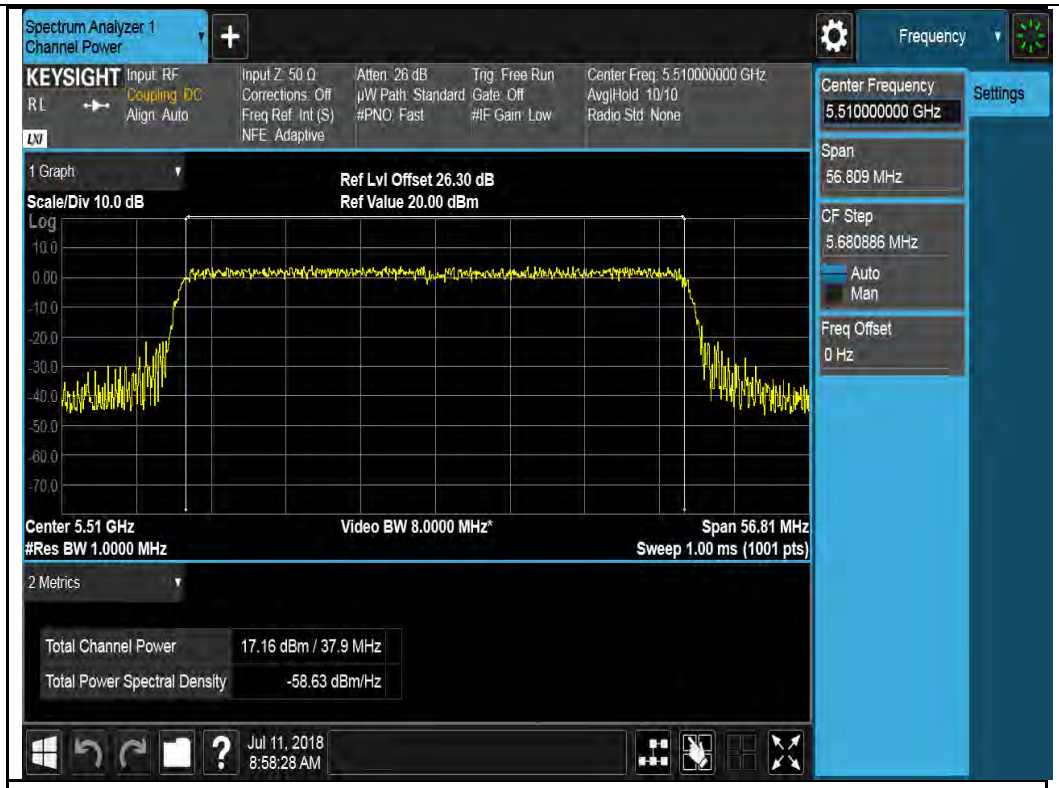
802.11a-5580M

802.11a-5700M

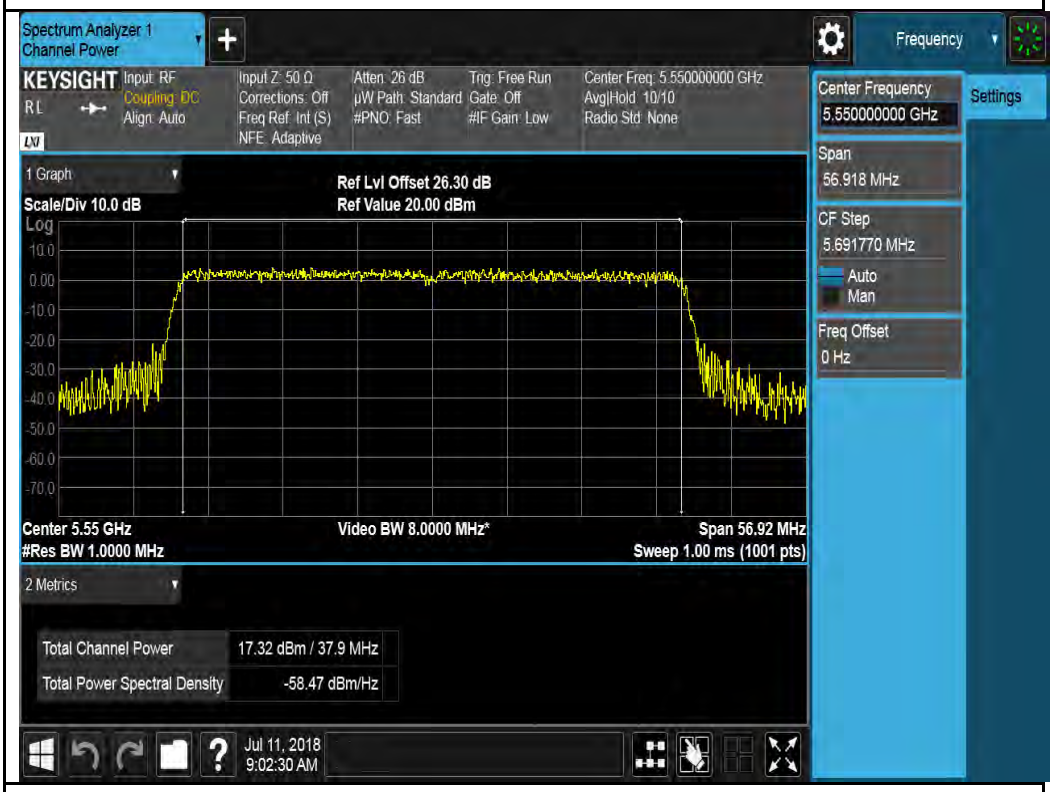
802.11n-HT20 5500M

802.11n-HT20 5580M

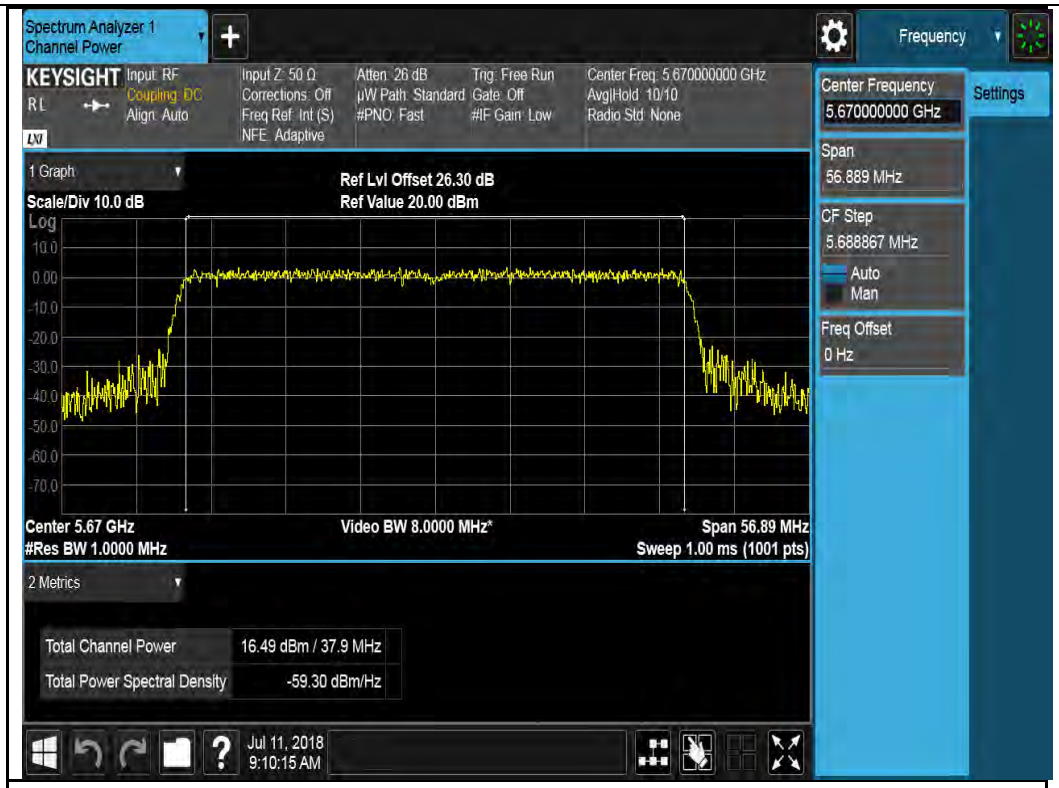
802.11n-HT20 5700M



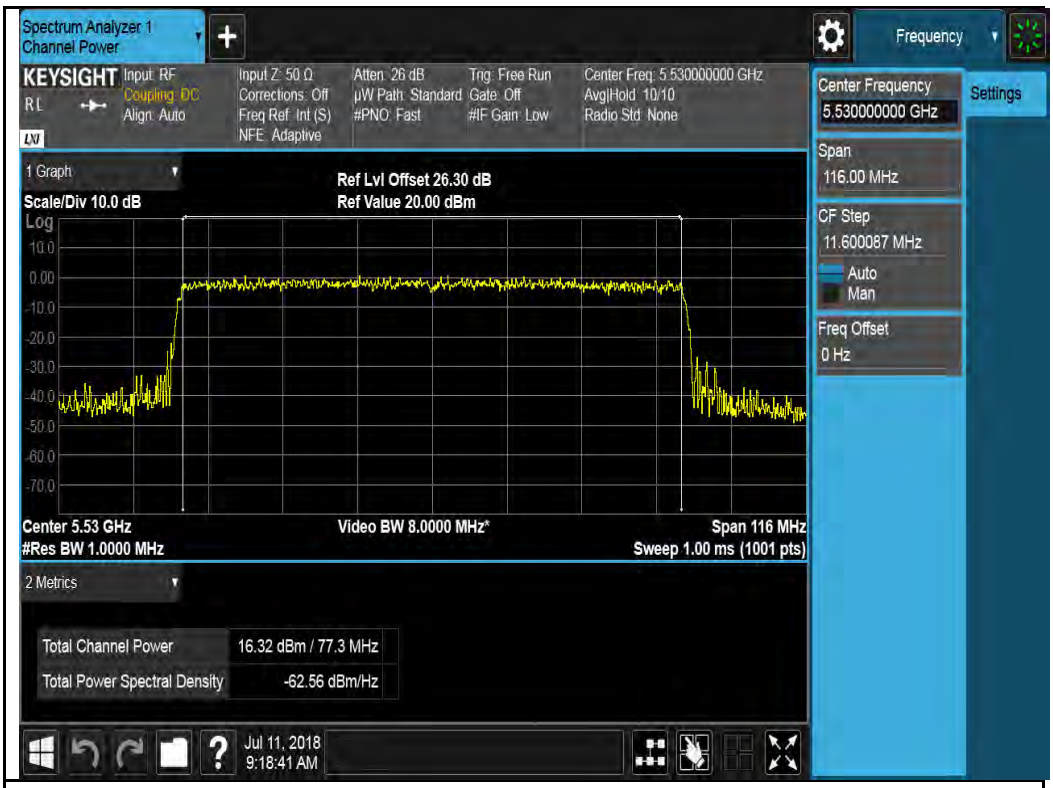
802.11n-HT40 5510M



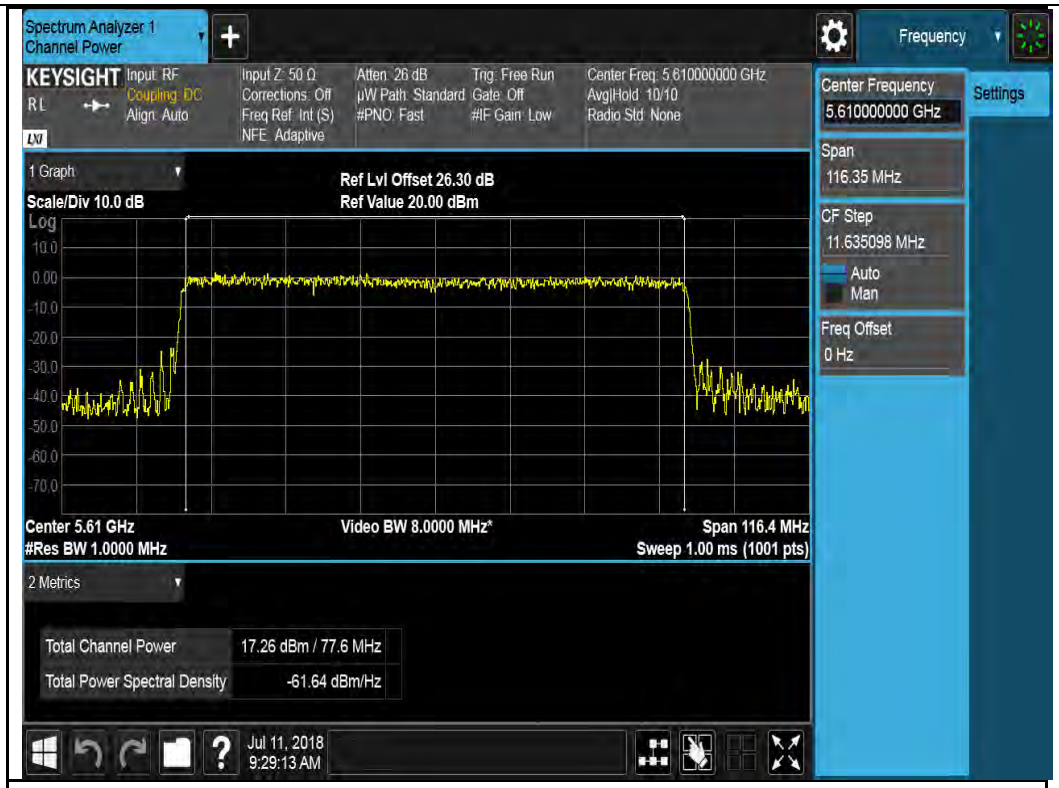
802.11n-HT40 5550M



802.11n-HT40 5670M

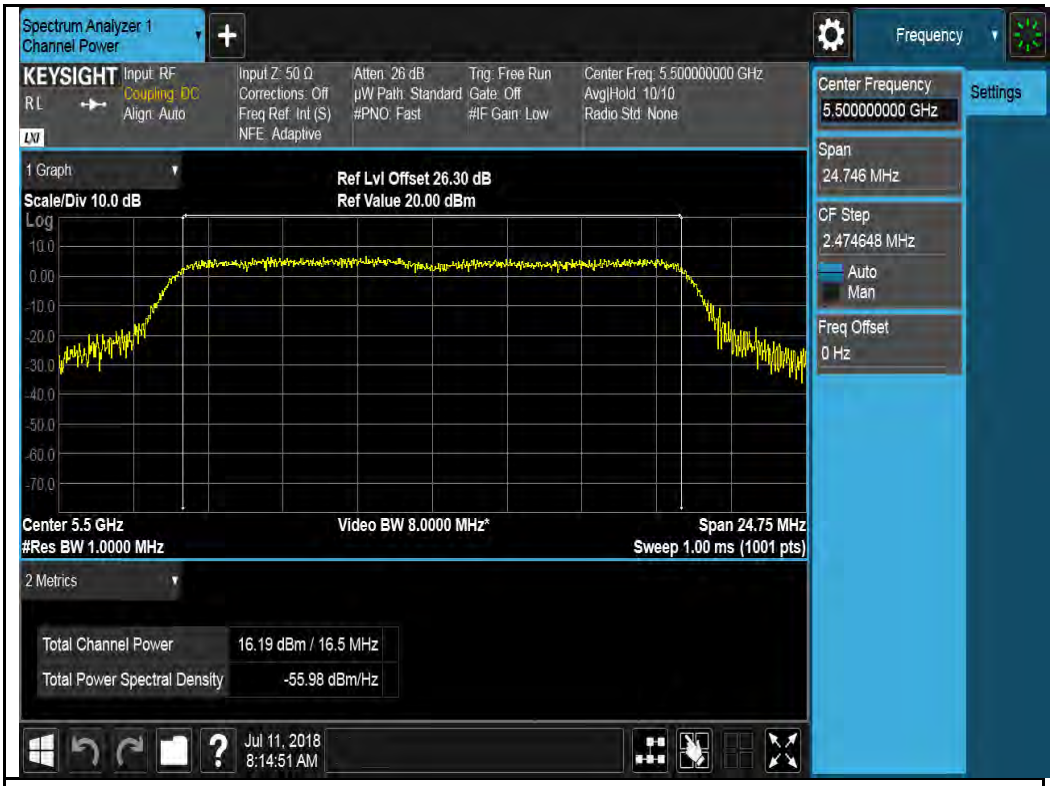


802.11ac-VHT80 5530M

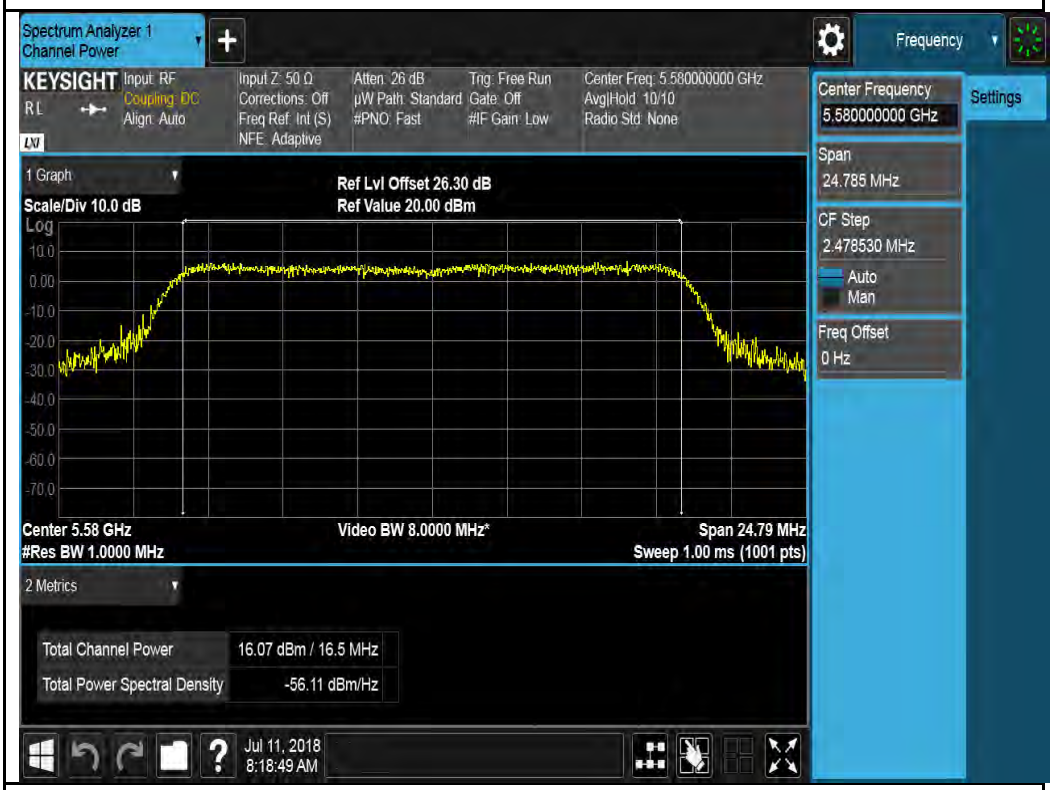


802.11ac-VHT80 5610M

Chain 1:

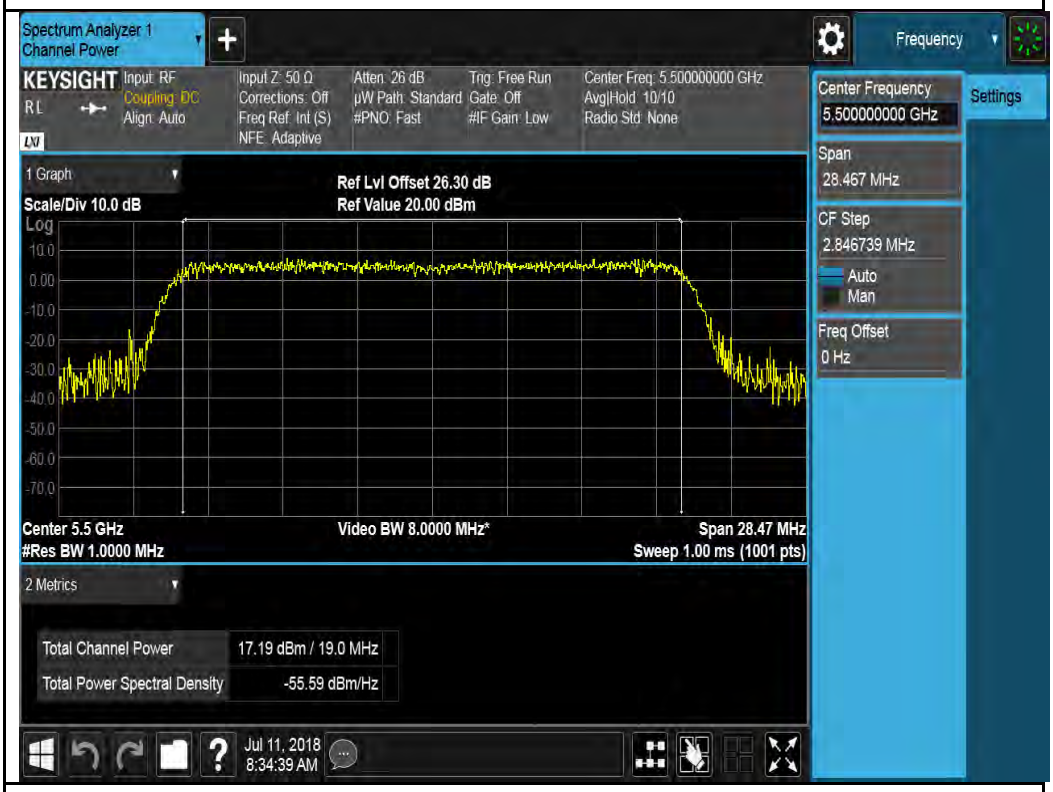


802.11a-5500M



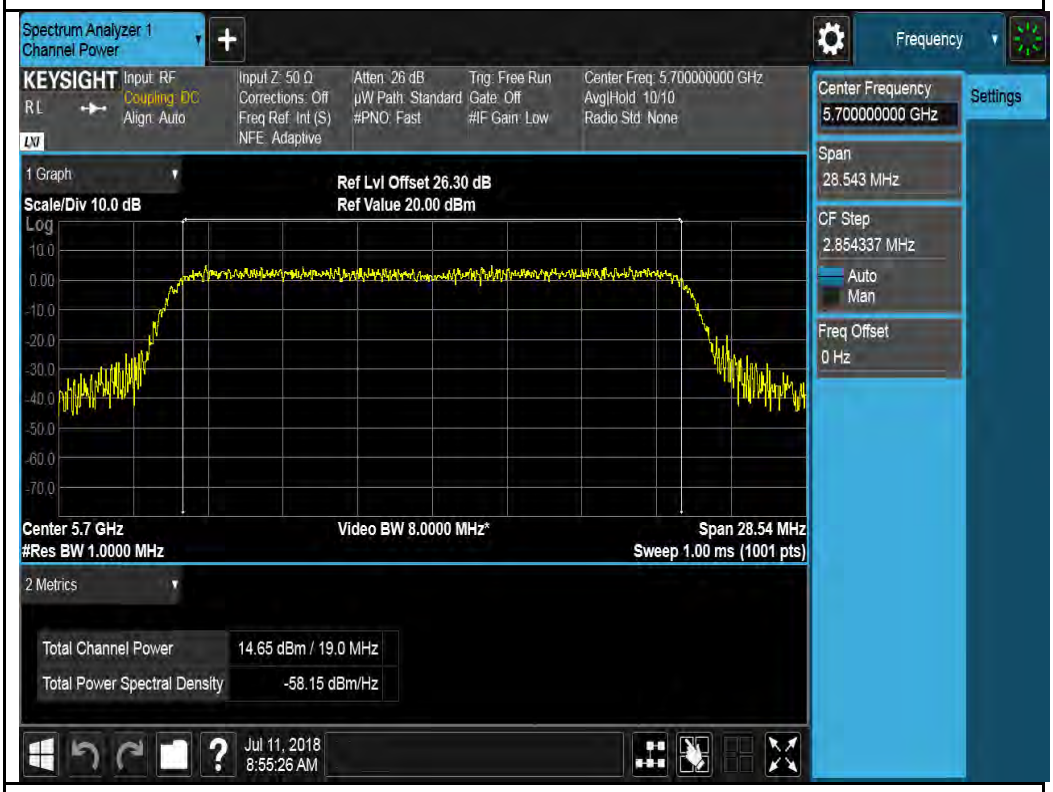
802.11a-5580M

802.11a-5700M



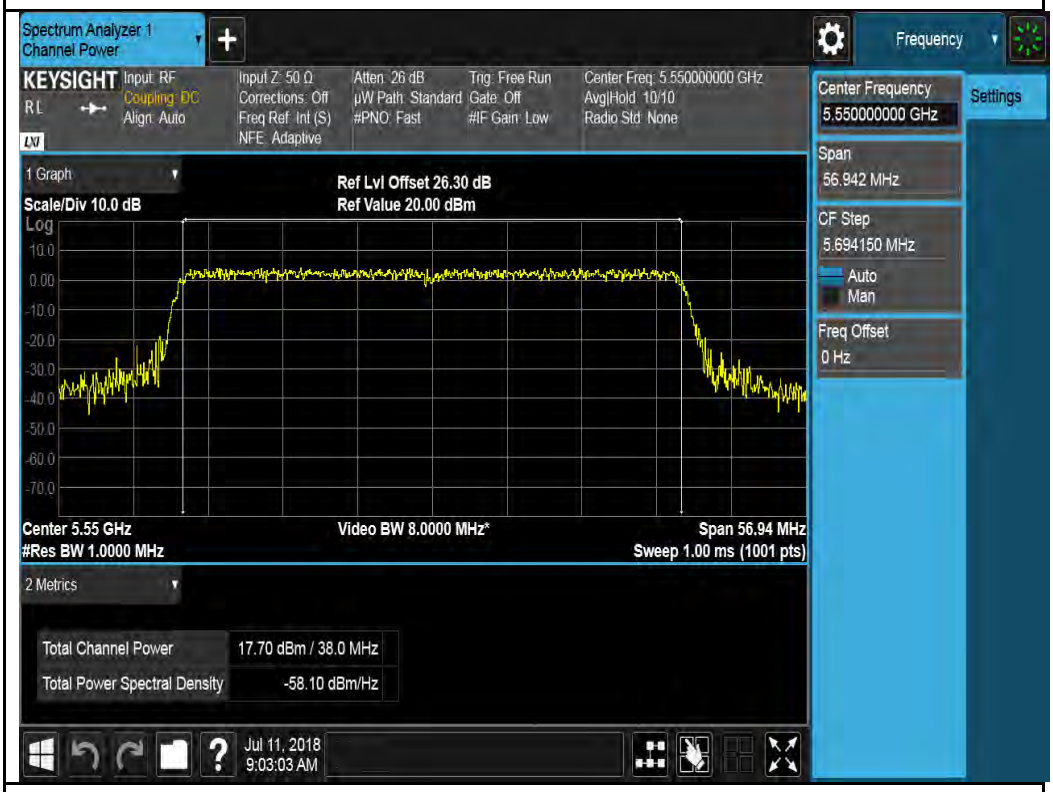
802.11n-HT20 5500M

802.11n-HT20 5580M



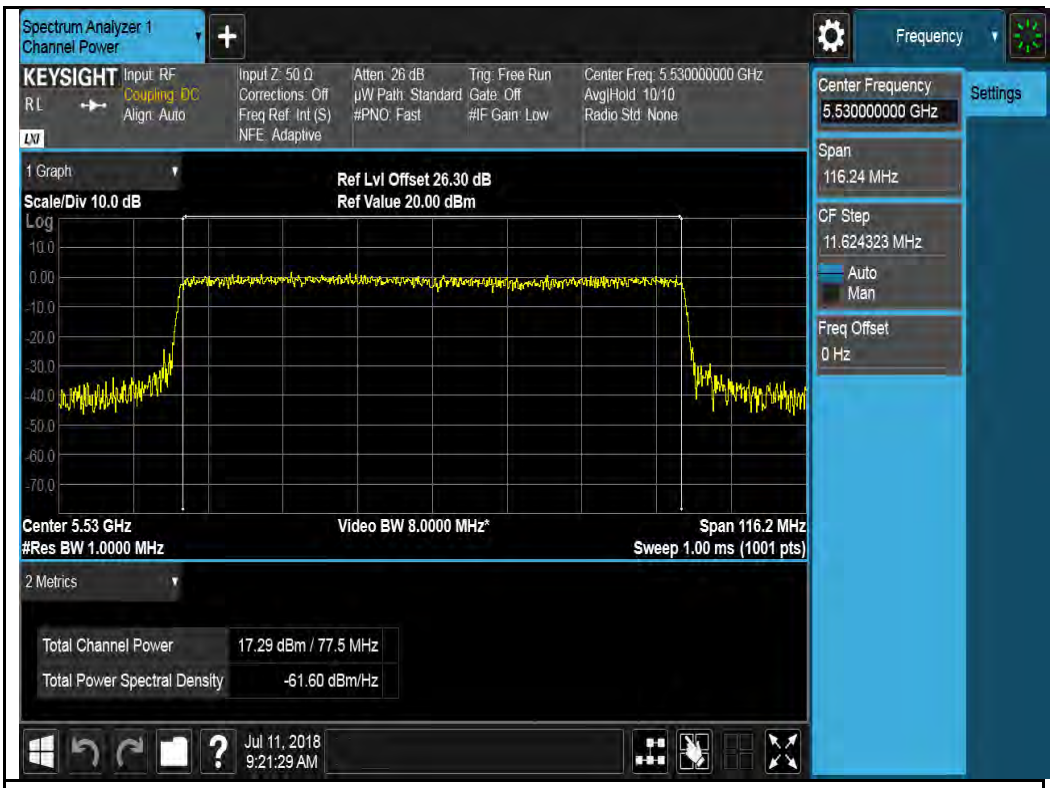
802.11n-HT20 5700M

802.11n-HT40 5510M

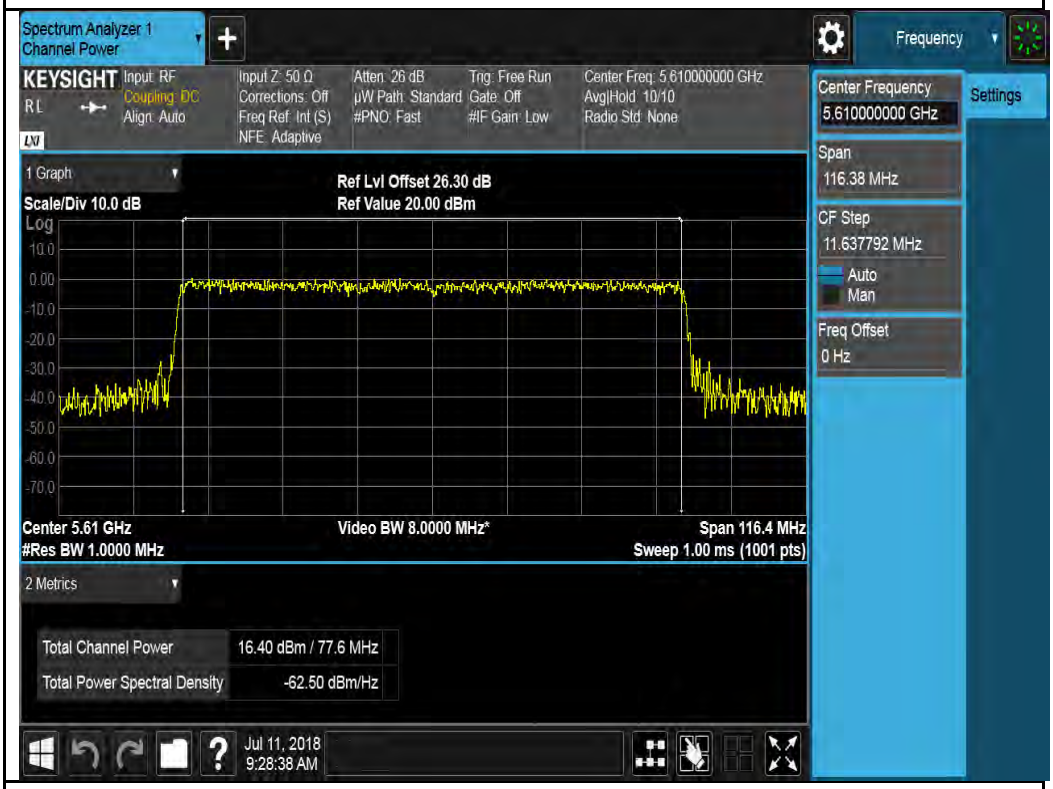


802.11n-HT40 5550M

802.11n-HT40 5670M



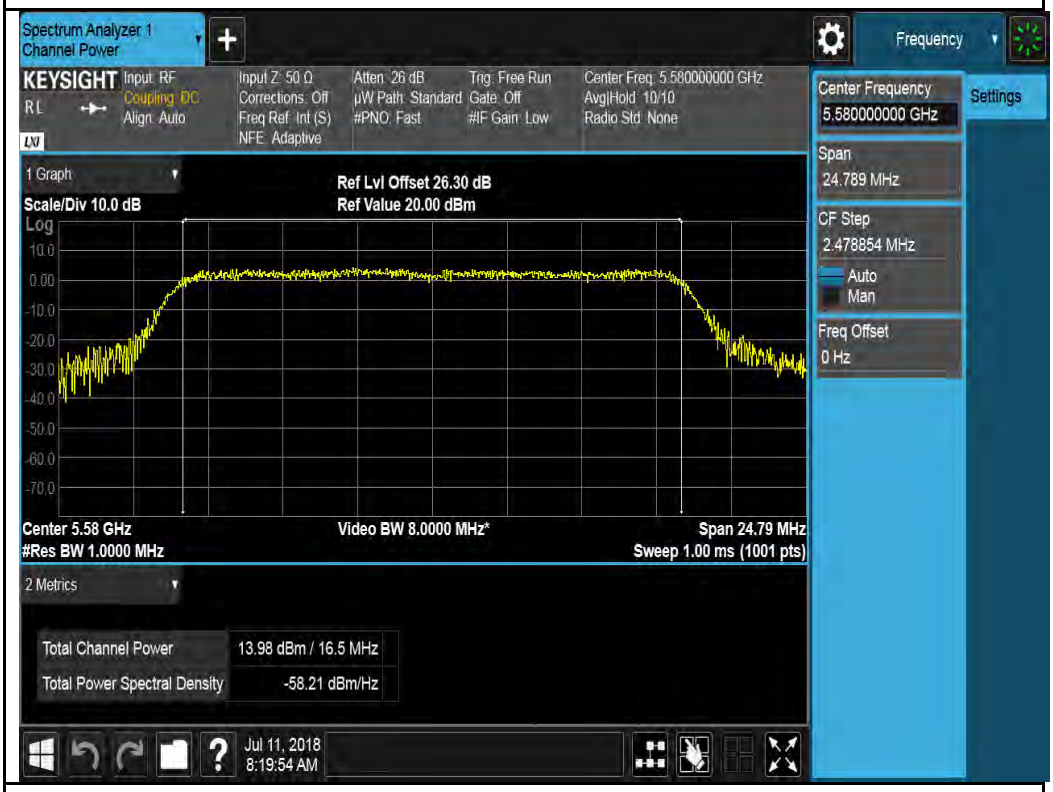
802.11ac-VHT80 5530M



802.11ac-VHT80 5610M

Chain 2:

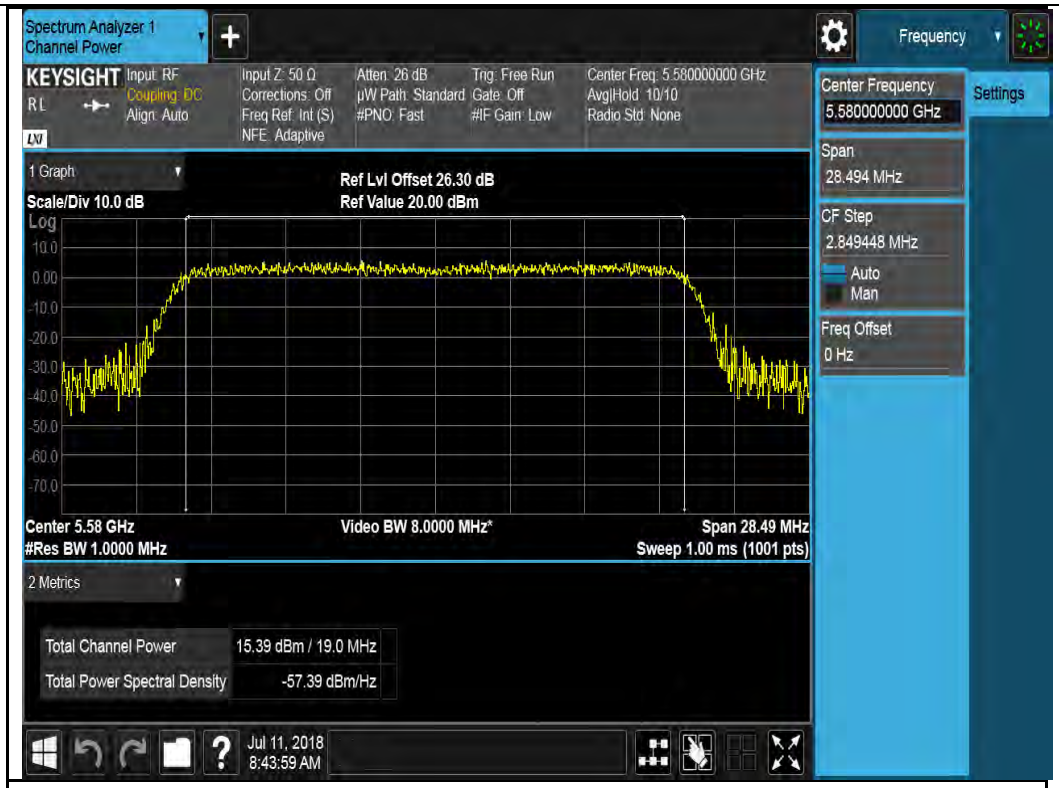
802.11a-5500M



802.11a-5580M

802.11a-5700M

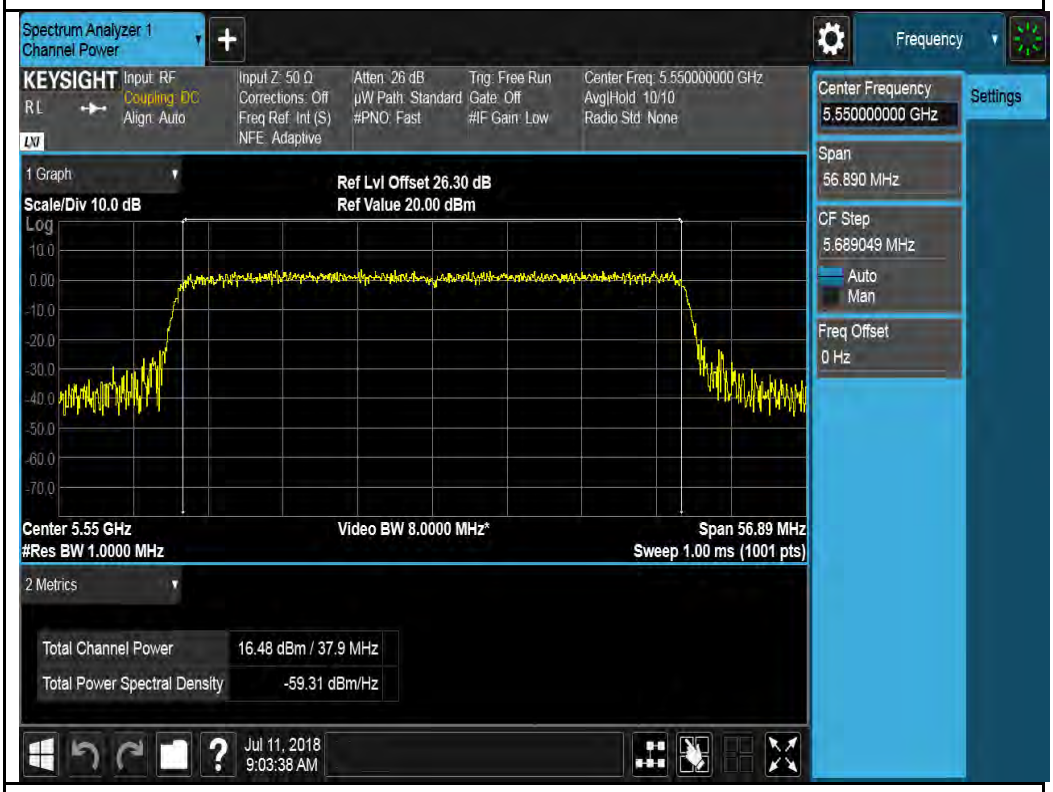
802.11n-HT20 5500M



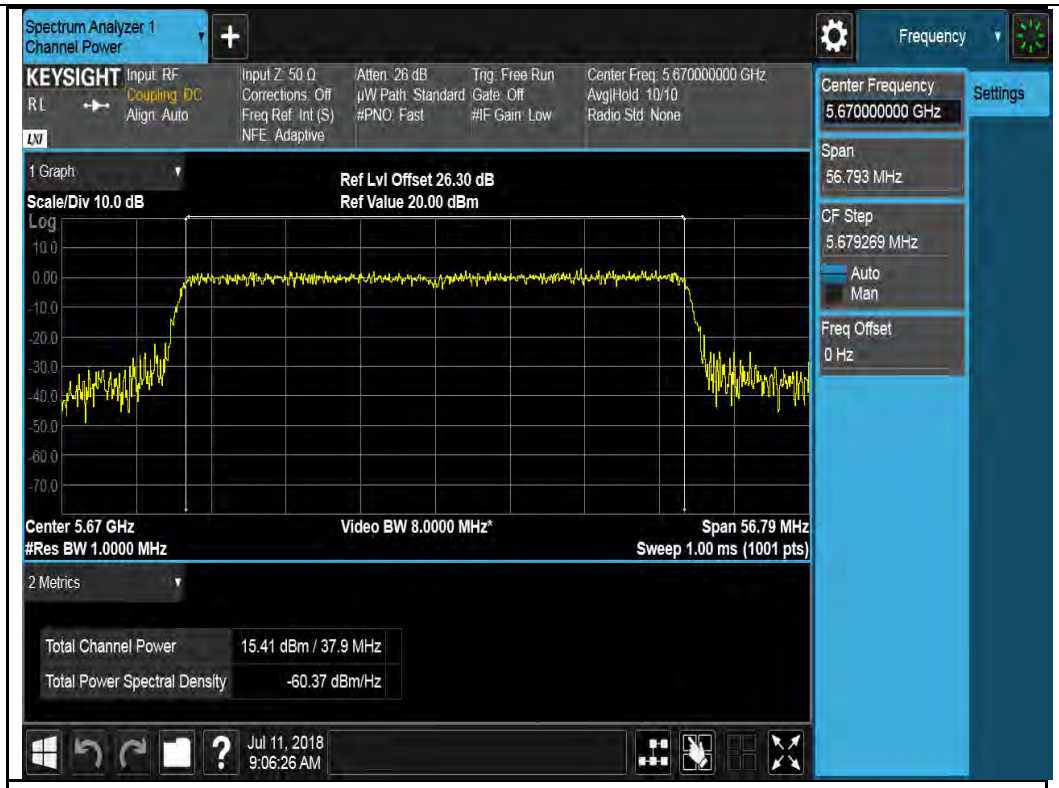
802.11n-HT20 5580M

802.11n-HT20 5700M

802.11n-HT40 5510M

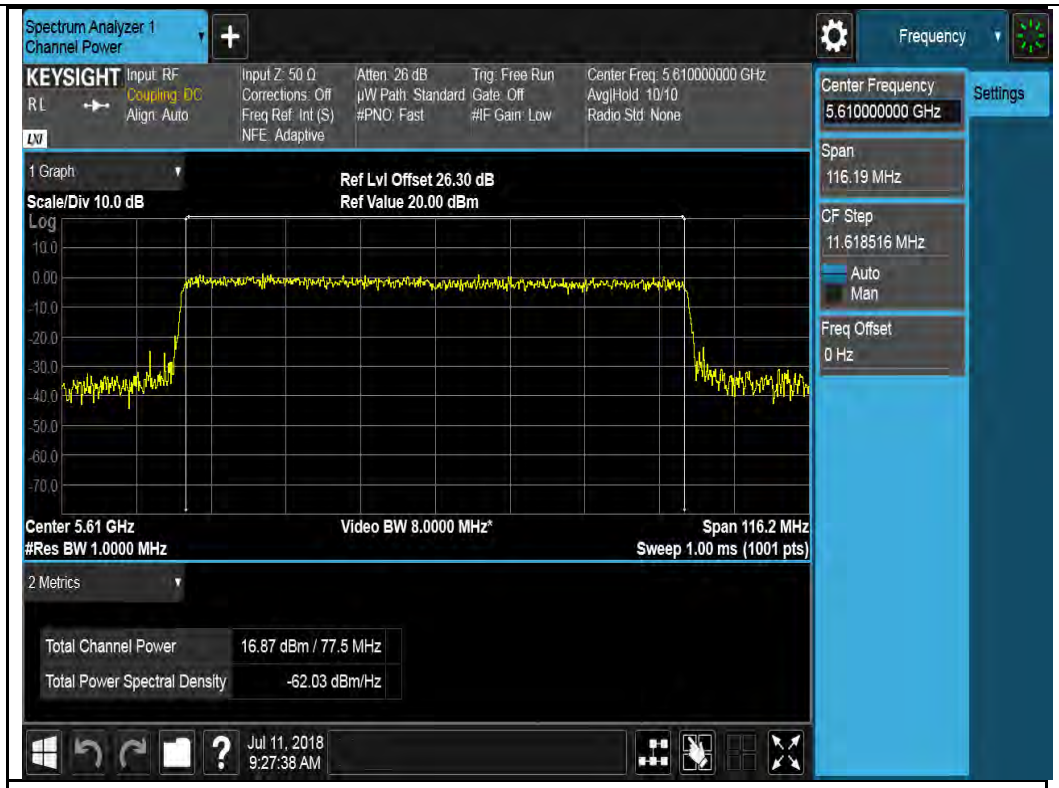


802.11n-HT40 5550M



802.11n-HT40 5670M

802.11ac-VHT80 5530M

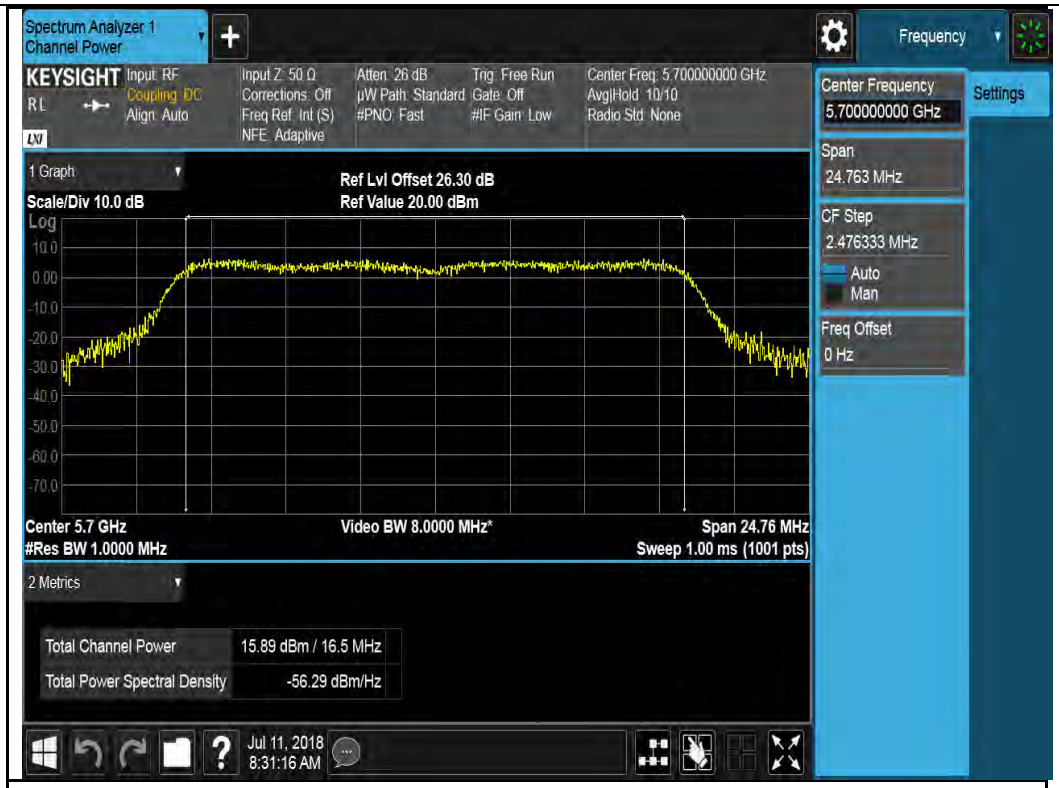


802.11ac-VHT80 5610M

Chain 3:

802.11a-5500M

802.11a-5580M

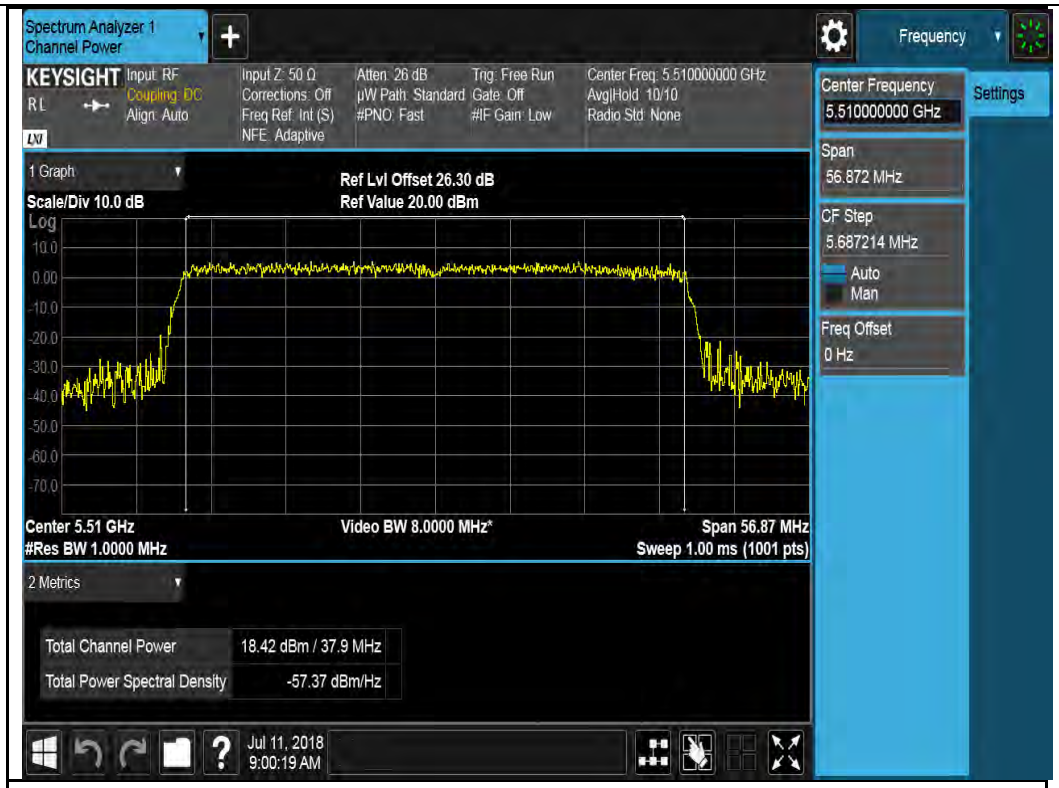


802.11a-5700M

802.11n-HT20 5500M

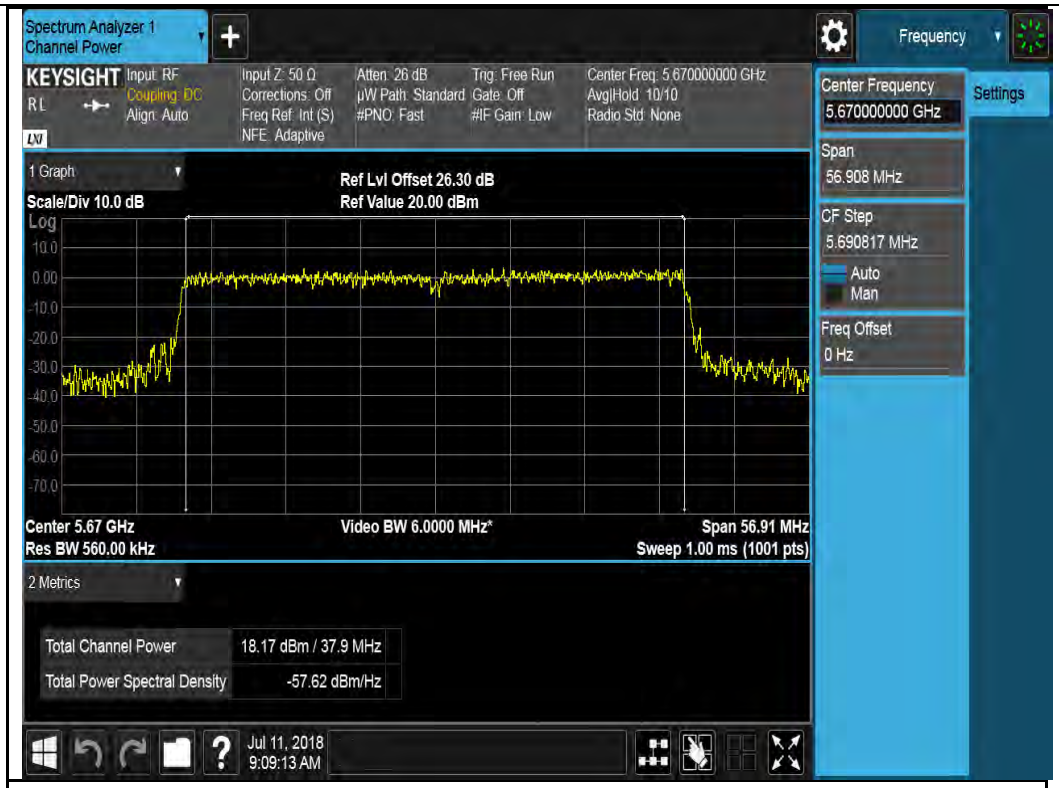
802.11n-HT20 5580M

802.11n-HT20 5700M

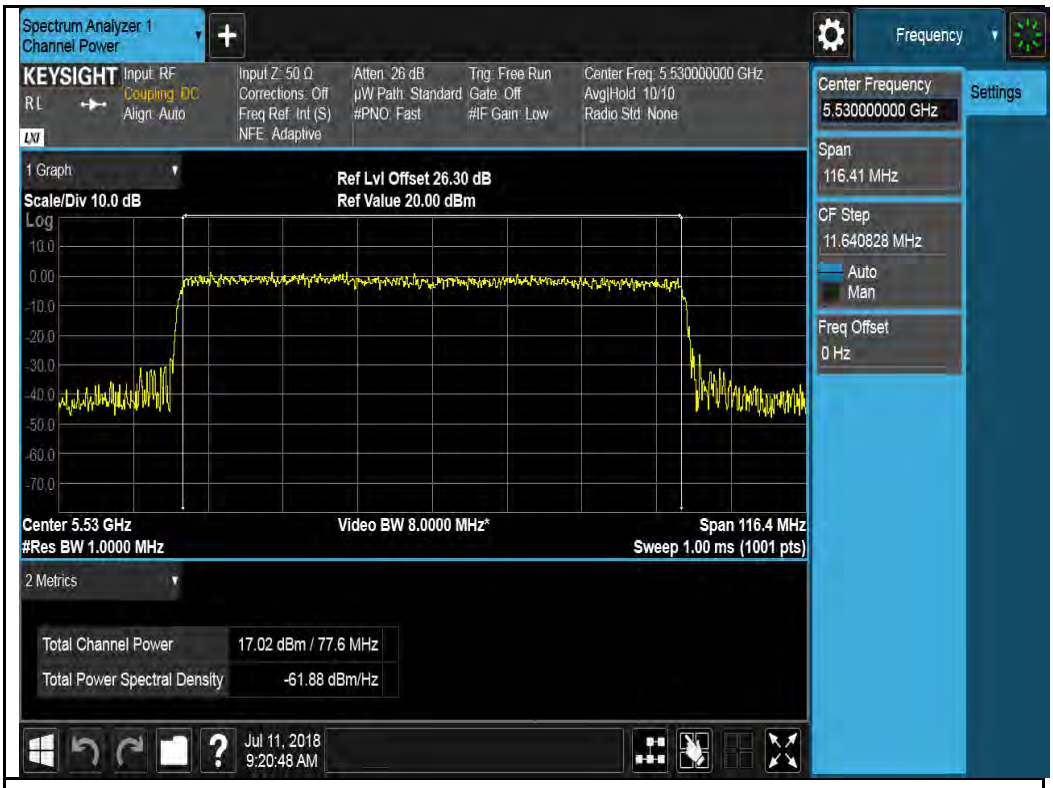


802.11n-HT40 5510M

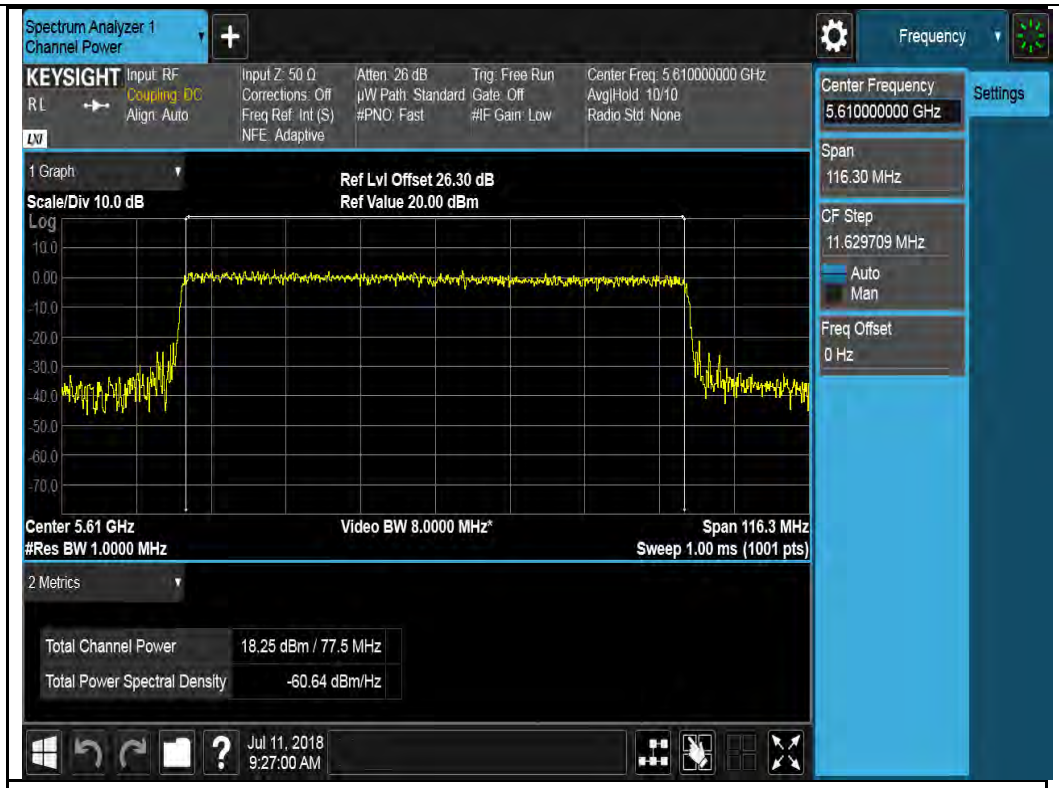
802.11n-HT40 5550M



802.11n-HT40 5670M



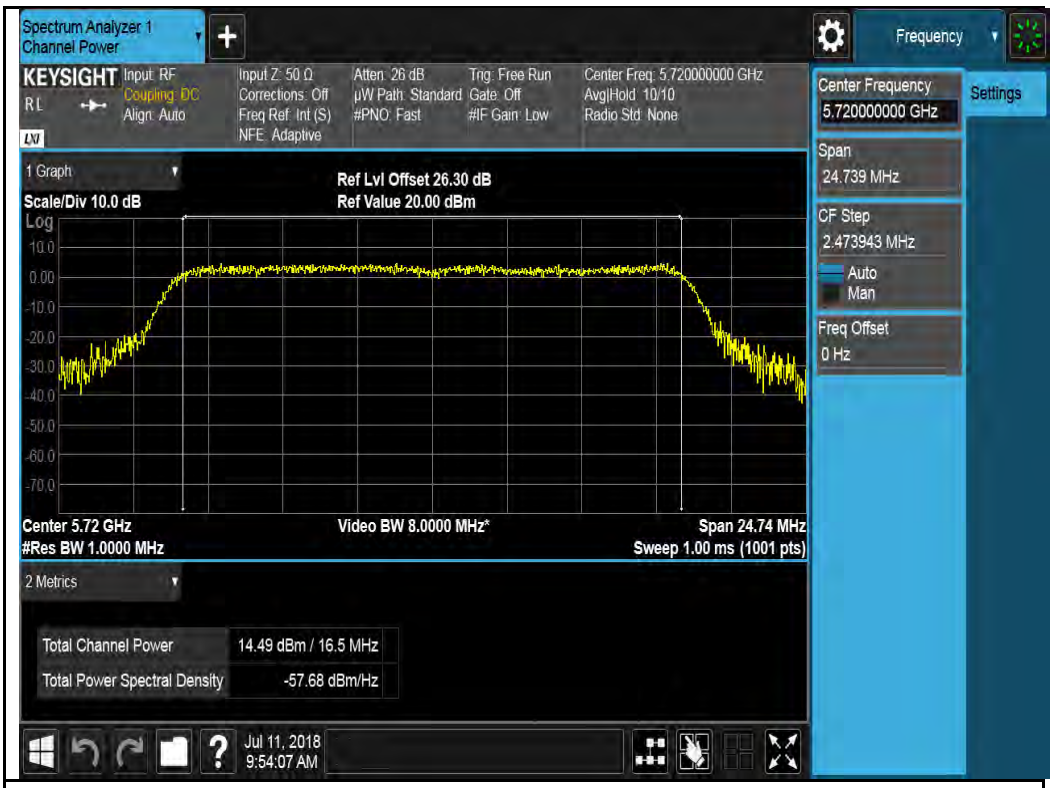
802.11ac-VHT80 5530M



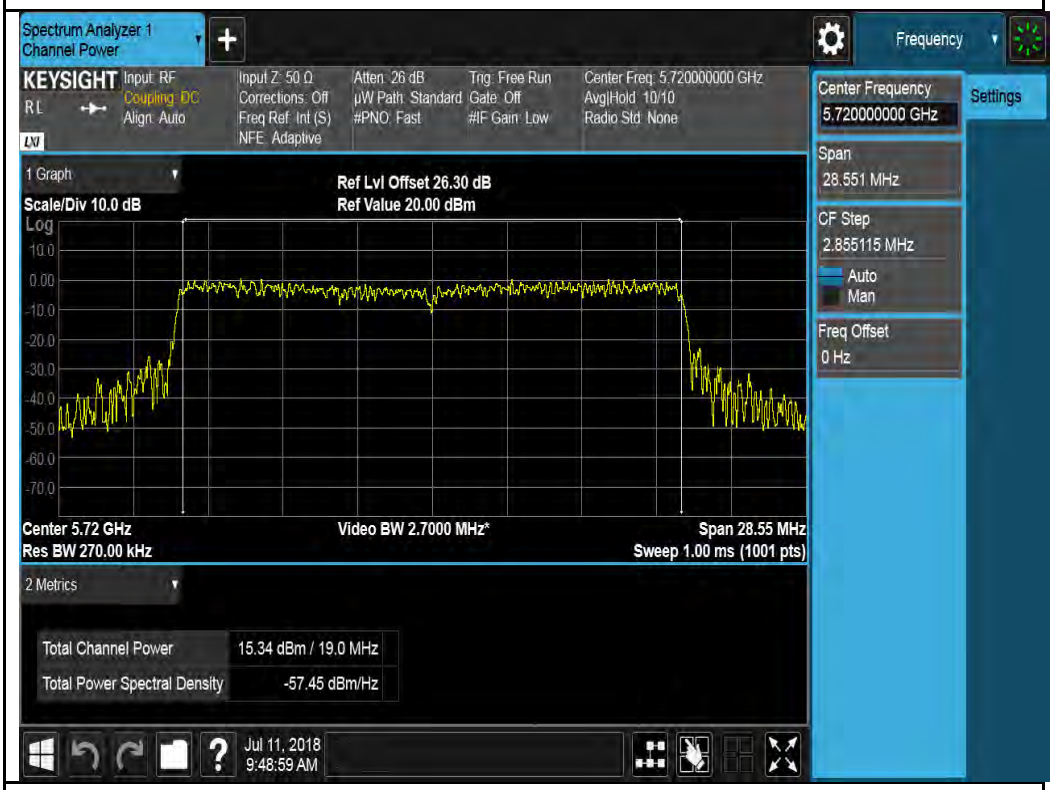
802.11ac-VHT80 5610M

Test Plot for 4x4 mode Crossband (W56 procedure):

Chain 0:

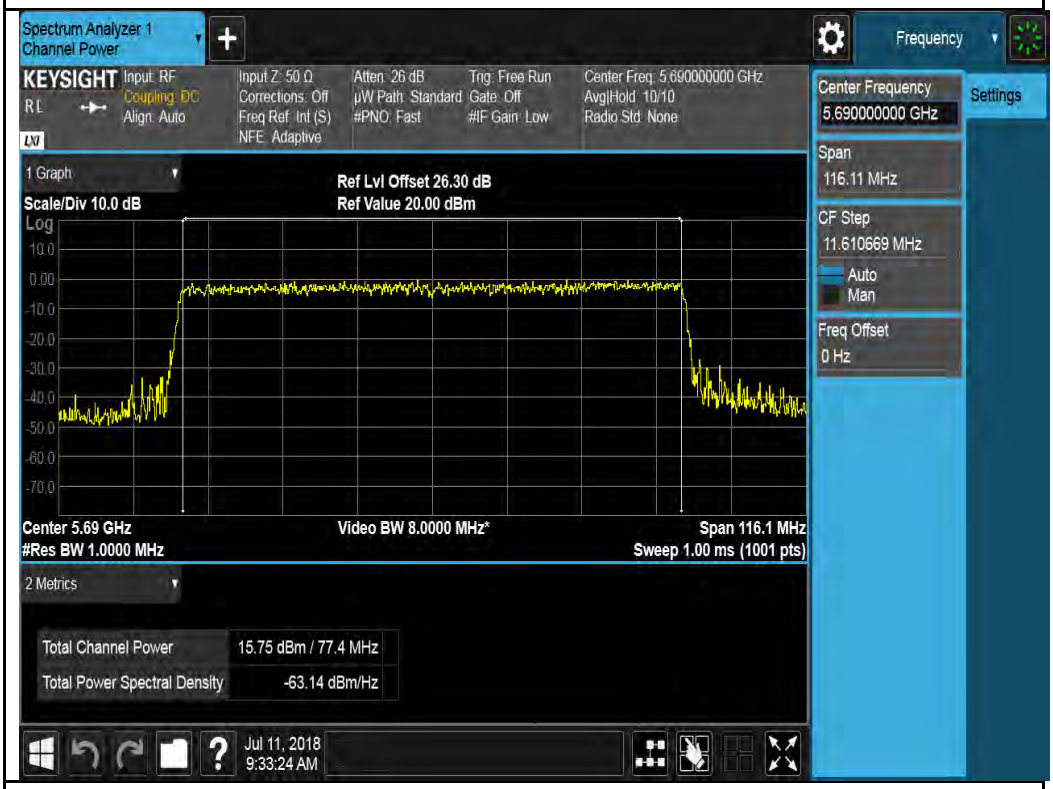


802.11a-5720M



802.11n-HT20 5720M

802.11n-HT40 5710M

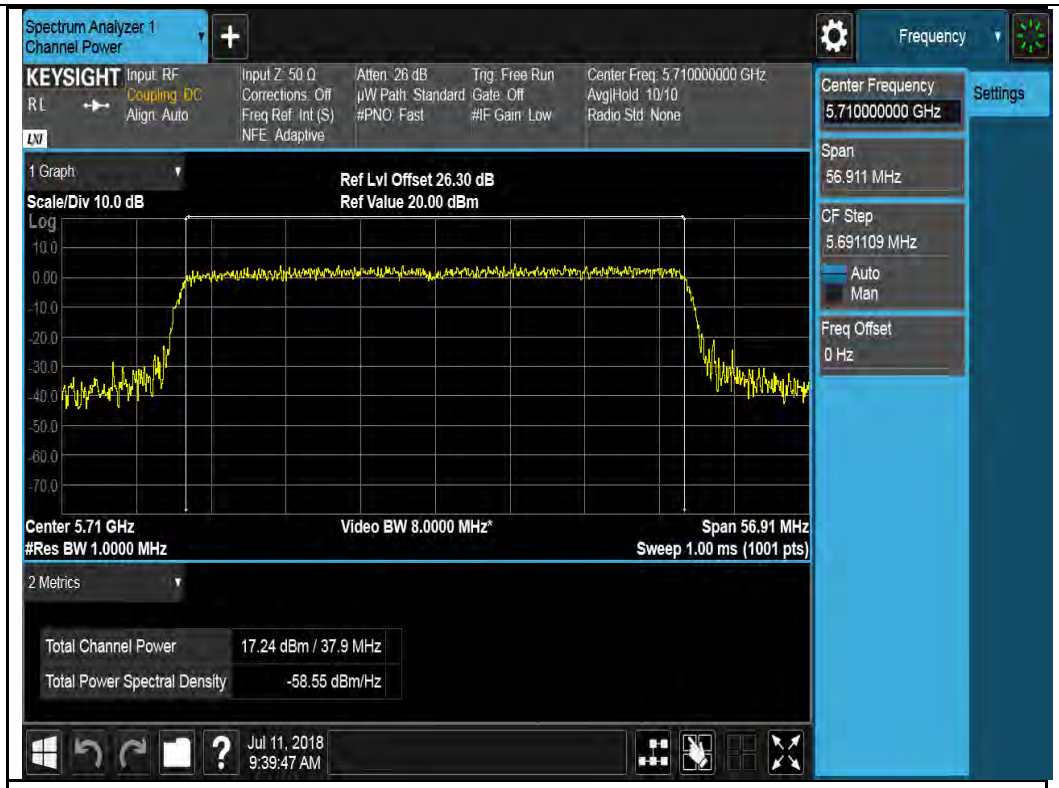


802.11ac-VHT80 5690M

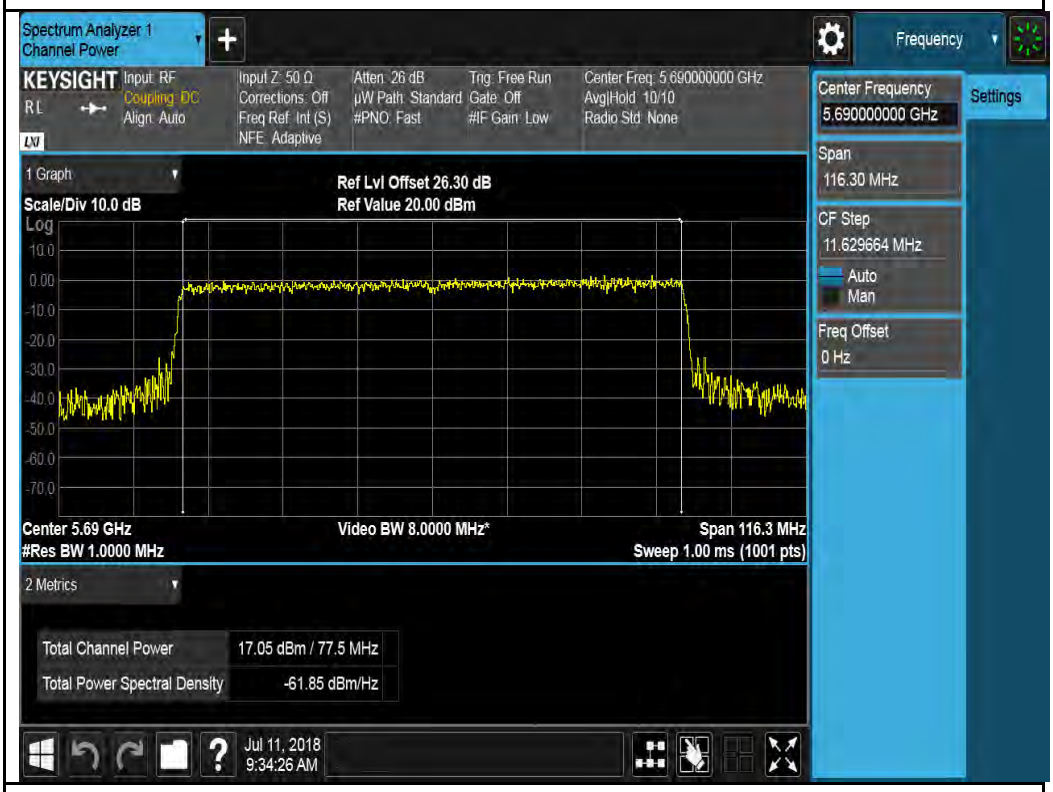
Chain 1:

802.11a-5720M

802.11n-HT20 5720M

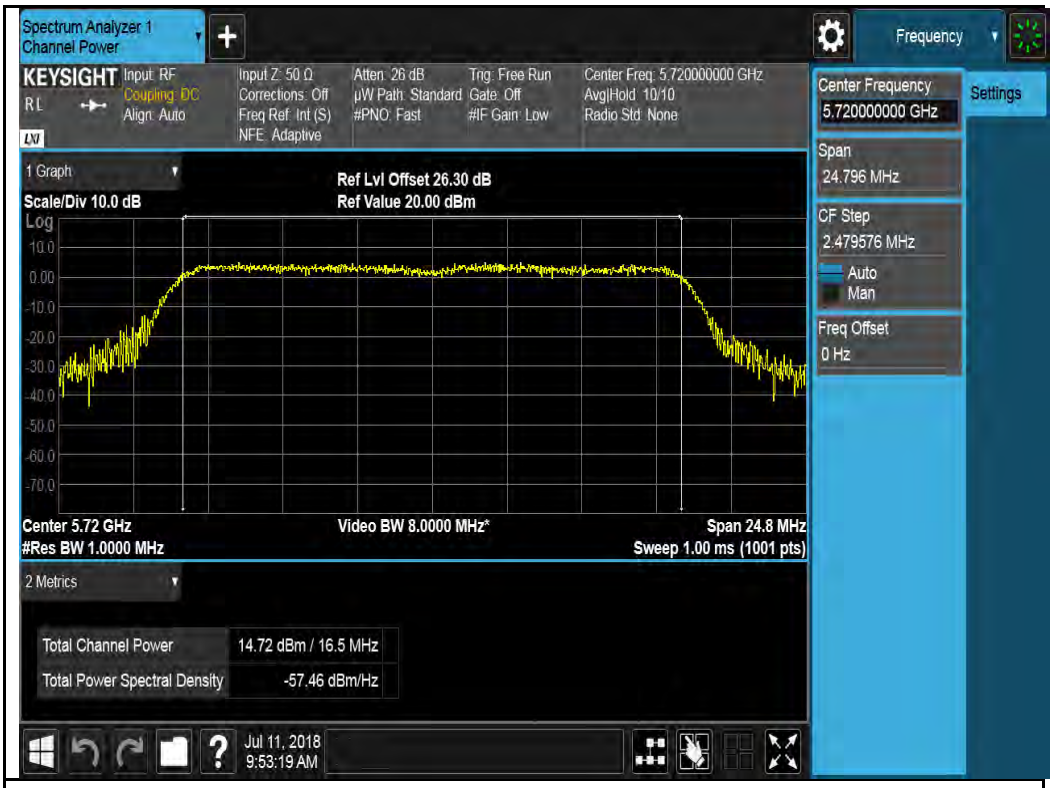


802.11n-HT40 5710M

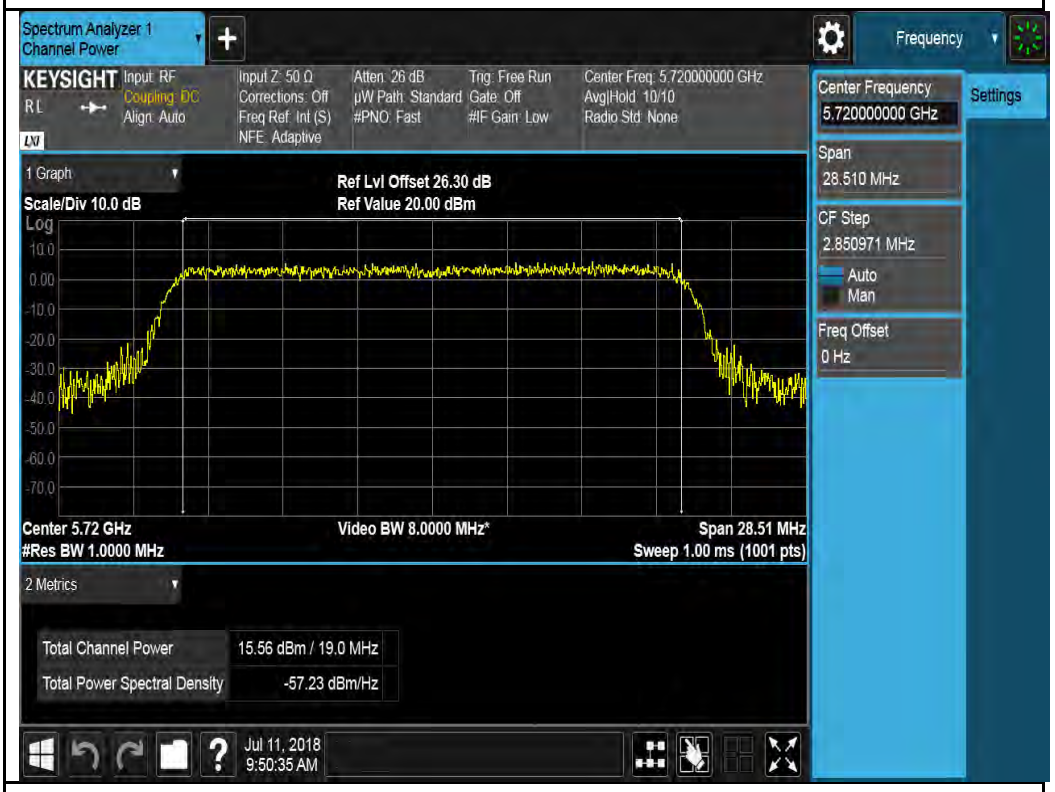


802.11ac-VHT80 5690M

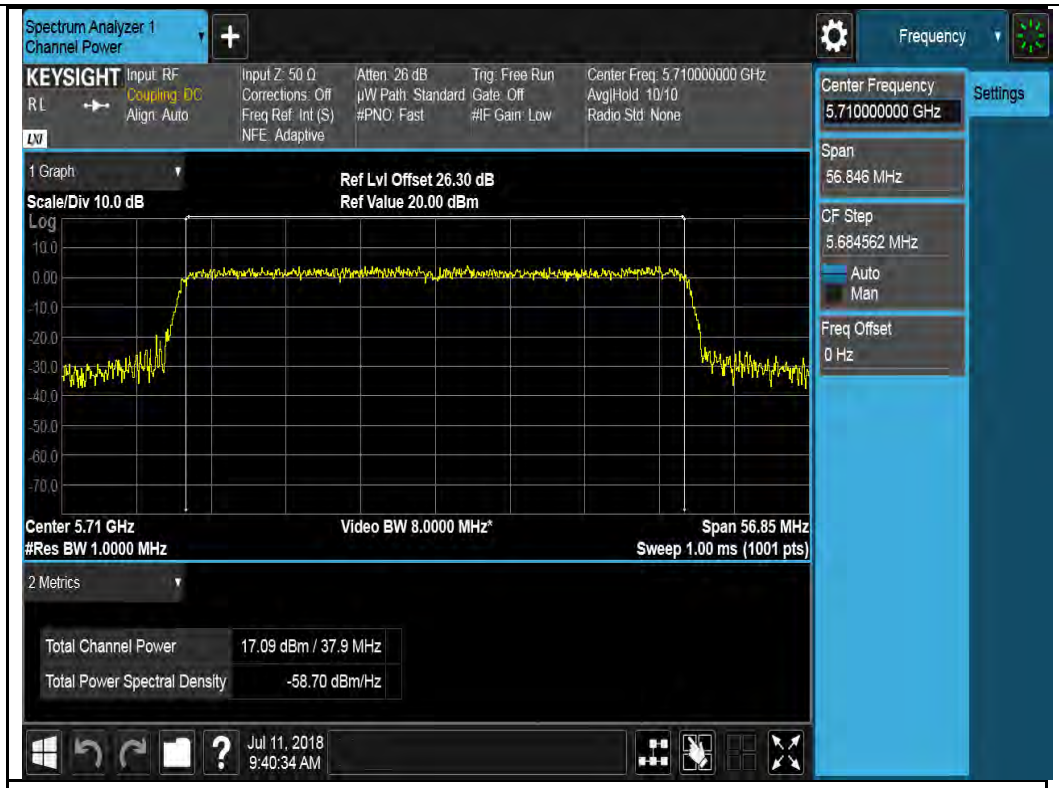
Chain 2:



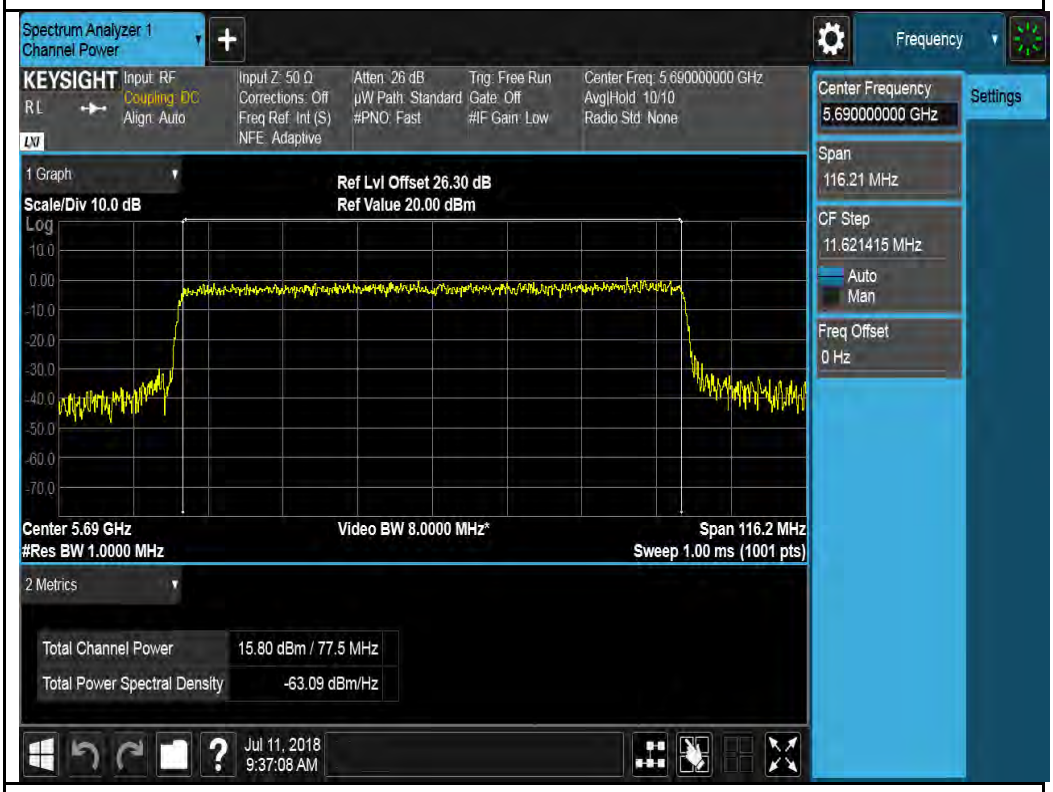
802.11a-5720M



802.11n-HT20 5720M

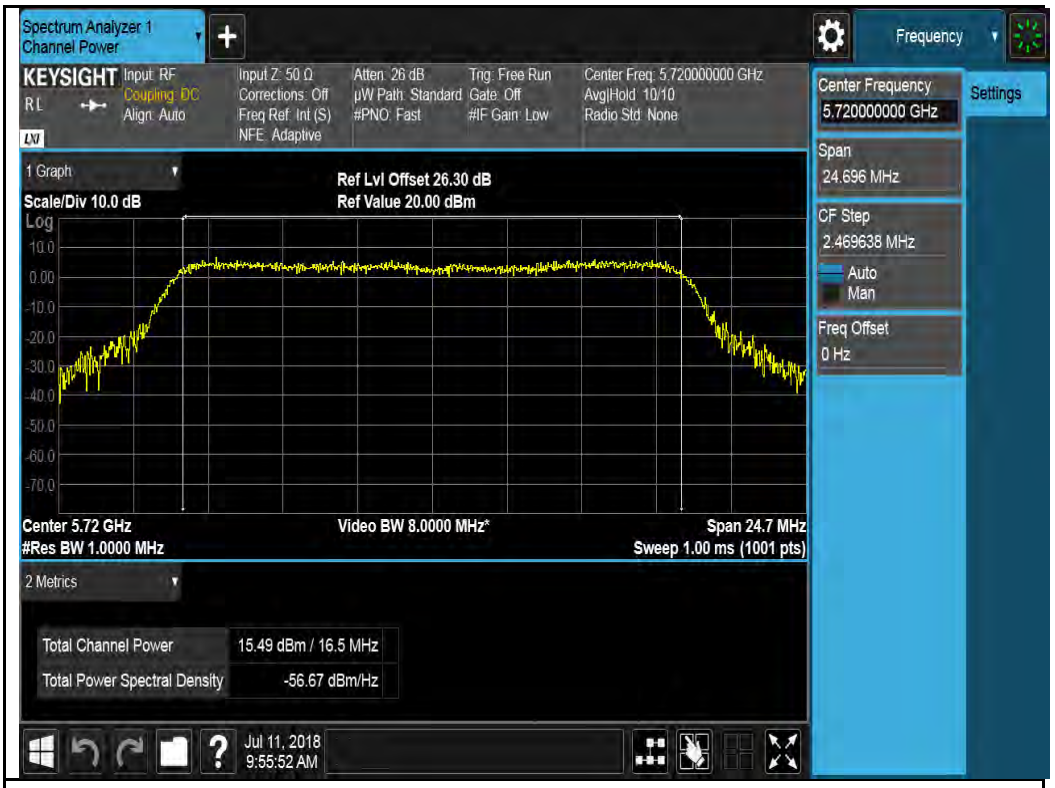


802.11n-HT40 5710M



802.11ac-VHT80 5690M

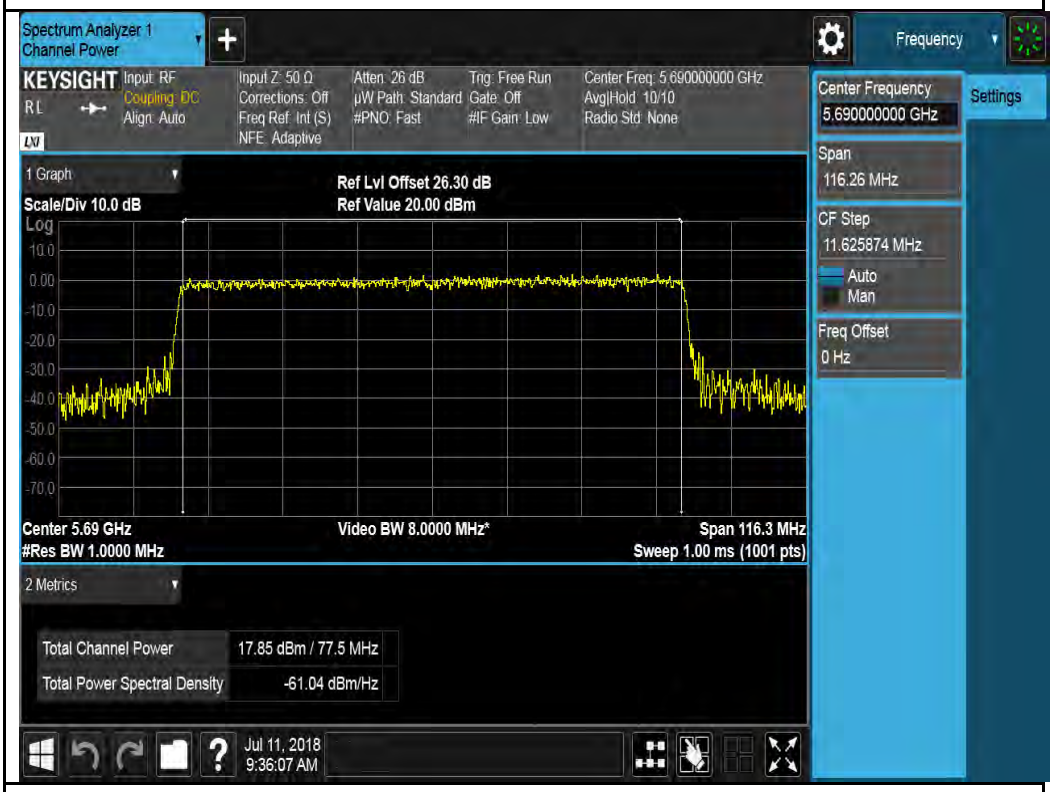
Chain 3:



802.11a-5720M

802.11n-HT20 5720M

802.11n-HT40 5710M

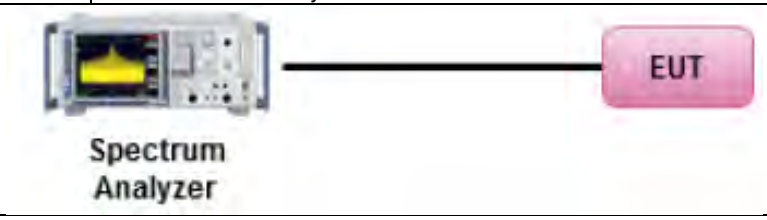


802.11ac-VHT80 5690M

10.4 Peak Power Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407 RSS 247	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.	☐
	a)(1)(ii)	For an indoor 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.	☐
	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.	☒
	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.	☒

Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01, II.F. Method SA-1 Maximum spectral density measurement procedure - 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. Apply correction to the result if different RBW is used.		
Test Date	05/17/2018 – 07/11/2018	Environmental condition	Temperature 22ºC Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	8x8 mode: The EUT has 8 antennas with 6 vertical and 2 horizontal, individual gain = 1.5dBi, the directional gain = 1.5 + 10 *log(6) = 9.3, therefore, the power and psd limit should decrease by 9.3 - 6 = 3.3dB. 4x4 mode: The EUT has 4 antennas with 3 vertical and 1 horizontal, individual gain = 1.5dBi, the directional gain = 1.5 + 10 *log(3) = 6.27, therefore, the power and psd limit should decrease by 6.27 - 6 = 0.27dB.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at RF test site.

PSD measurement result for 5.3GHz

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz) Chain No.									Limit (dBm/MHz)	Result
			0	1	2	3	4	5	6	7	Total		
802.11a	5260	Low	-2.24	-3.02	-1.34	0.21	-1.72	-2.02	-2.14	-1.84	7.36	7.7	Pass
	5280	Mid	-1.68	-2.23	-1.57	-0.50	-1.84	-2.23	-2.04	-1.92	7.32	7.7	Pass
	5320	High	-2.11	-1.44	-1.97	-0.15	-1.07	-1.81	-1.80	-1.94	7.54	7.7	Pass
802.11ax-20	5260	Low	-1.38	-1.94	-1.16	0.15	-0.95	-1.21	-1.71	-1.53	7.86	7.7	Pass
	5280	Mid	-2.27	-1.98	-1.83	-0.35	-1.81	-1.70	-2.30	-1.97	7.30	7.7	Pass
	5320	High	-1.45	-1.79	-1.01	-0.92	-1.16	-0.90	-1.62	-1.72	7.72	7.7	Pass
802.11ax-40	5270	Low	-4.78	-5.56	-4.35	-2.97	-4.67	-5.01	-4.83	-4.61	4.49	7.7	Pass
	5310	Mid	-5.33	-4.80	-4.76	-3.34	-4.53	-4.28	-5.02	-4.64	4.48	7.7	Pass
802.11ax-80	5290	High	-8.03	-7.71	-7.51	-6.17	-7.20	-7.50	-8.07	-7.61	1.60	7.7	Pass

PSD measurement result for 5.5GHz

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz) Chain No.									Limit (dBm/MHz)	Result
			0	1	2	3	4	5	6	7	Total		
802.11a	5500	Low	-1.40	-1.47	-1.84	-0.98	-1.34	-1.34	-1.23	-1.78	7.62	7.7	Pass
	5580	Mid	-2.79	-2.07	-3.77	-2.40	-2.90	-2.05	-2.76	-2.86	6.36	7.7	Pass
	5700	High	-1.14	-1.83	-2.04	-0.66	-1.23	-1.59	-1.82	-1.54	7.57	7.7	Pass
802.11ax-20	5500	Low	-1.51	-1.25	-1.92	-0.79	-1.56	-1.14	-1.86	-1.76	7.57	7.7	Pass
	5580	Mid	-1.58	-0.84	-2.72	-1.06	-2.19	-1.17	-2.06	-2.05	7.36	7.7	Pass
	5700	High	-1.78	-1.77	-1.16	-0.81	-0.94	-1.18	-1.67	-1.65	7.68	7.7	Pass
802.11ax-40	5510	Low	-4.39	-4.27	-4.79	-3.75	-4.55	-4.72	-4.52	-4.66	4.59	7.7	Pass
	5550	Mid	-4.33	-4.32	-5.06	-4.01	-4.80	-3.96	-5.28	-4.90	4.47	7.7	Pass
	5670	High	-4.63	-4.03	-5.17	-3.65	-4.90	-4.35	-5.01	-5.43	4.42	7.7	Pass
802.11ax-80	5530	Low	-7.88	-7.32	-8.44	-6.86	-7.69	-7.73	-8.17	-7.53	1.35	7.7	Pass
	5610	High	-7.44	-7.50	-7.28	-6.63	-7.82	-8.06	-7.49	-7.94	1.53	7.7	Pass

PSD measurement result for cross channels (in band 5470-5725MHz)

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz) Chain No.									Limit (dBm/MHz)	Result
			0	1	2	3	4	5	6	7	Total		
802.11a	5720	Low	-1.99	-1.85	-2.43	-0.66	-1.70	-1.41	-1.94	-1.87	7.33	7.7	Pass
802.11ax-20	5720	Low	-1.46	-1.35	-1.40	-0.14	-1.14	-1.28	-1.73	-1.62	7.79	7.7	Pass
802.11ax-40	5710	Low	-3.94	-4.18	-4.15	-3.30	-4.12	-4.19	-4.78	-4.42	4.92	7.7	Pass
802.11ax-80	5690	High	-7.87	-6.97	-8.45	-6.69	-8.29	-7.77	-7.94	-8.23	1.30	7.7	Pass

PSD measurement result for cross channels (in band 5725-5850MHz)

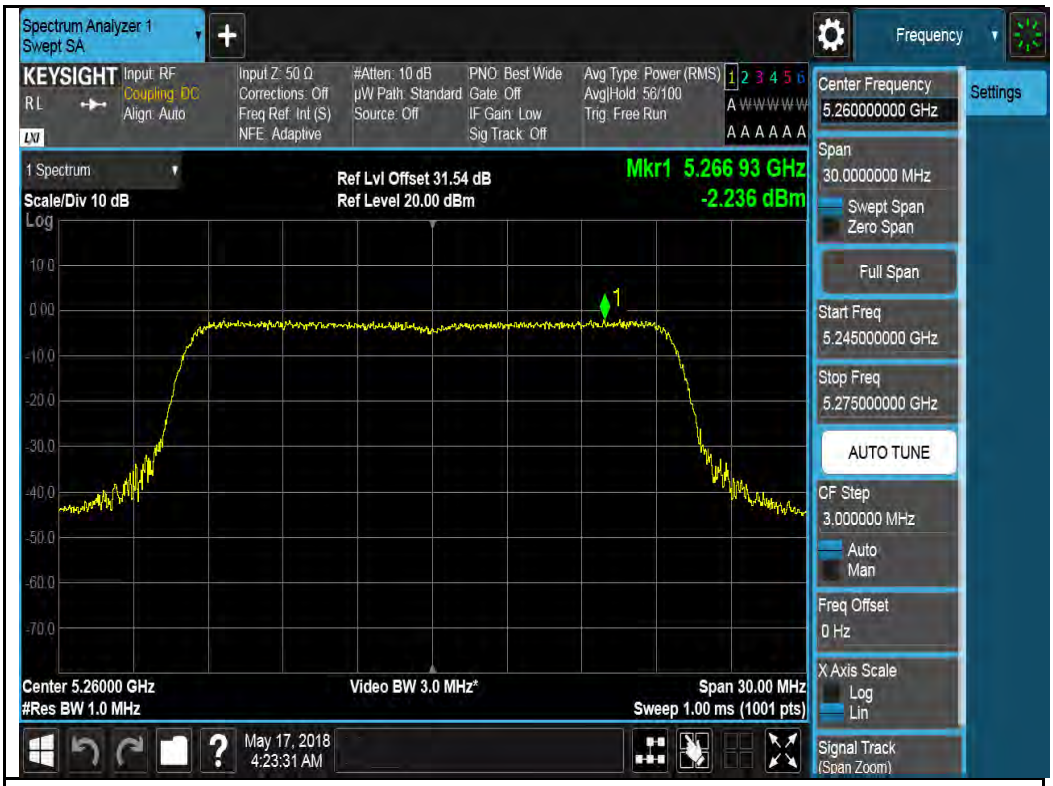
Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz) Chain No.								
			0	1	2	3	4	5	6	7	Total
802.11a	5720	CROSS	-10.11	-10.05	-9.50	-9.17	-9.56	-9.38	-9.29	-9.77	-0.56
802.11ax-20	5720	CROSS	-10.42	-10.33	-10.23	-9.06	-9.94	-10.14	-10.64	-10.17	-1.06
802.11ax-40	5710	CROSS	-12.76	-13.03	-13.06	-12.27	-13.02	-12.92	-13.64	-13.12	-3.93
802.11ax-80	5690	CROSS	-16.46	-15.66	-17.15	-15.30	-16.89	-16.23	-16.50	-16.86	-7.31

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz)	Conducted PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11a	5720	CROSS	-0.56	6.43	26.7	Pass
802.11ax-20	5720	CROSS	-1.06	5.93	26.7	Pass
802.11ax-40	5710	CROSS	-3.93	3.06	26.7	Pass
802.11ax-80	5690	CROSS	-7.31	-0.32	26.7	Pass

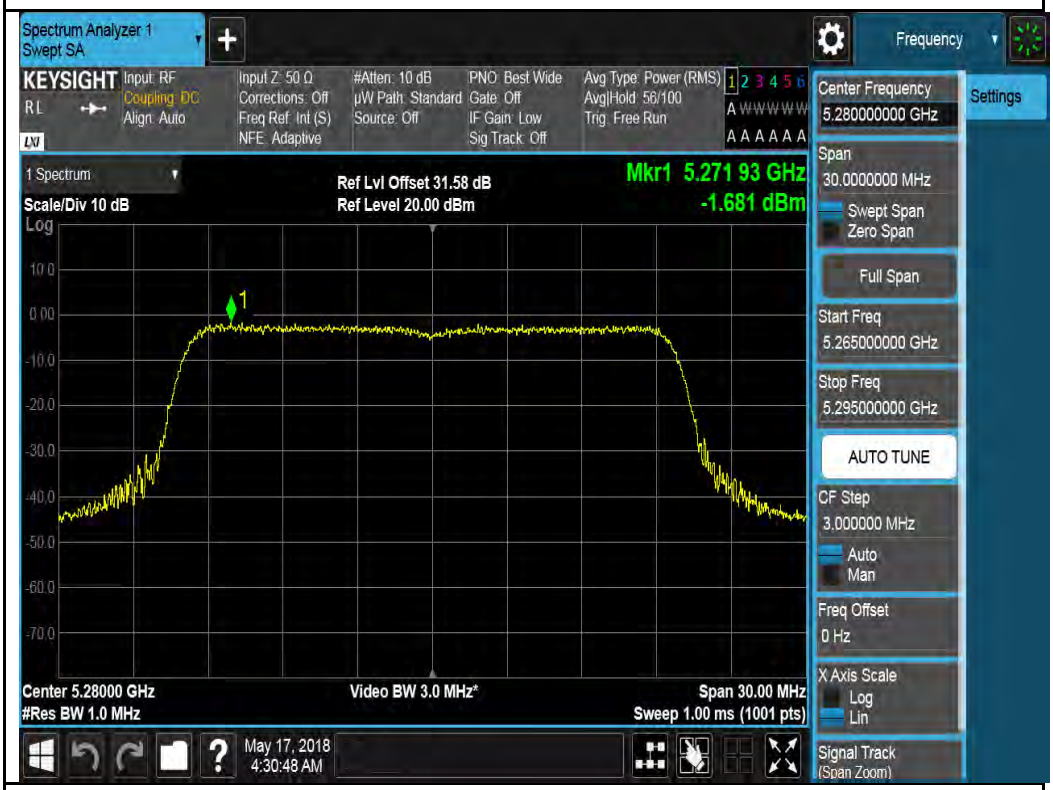
Correction factor=10*log(500/100)=6.99

Test Plot for W53:

Chain 0:

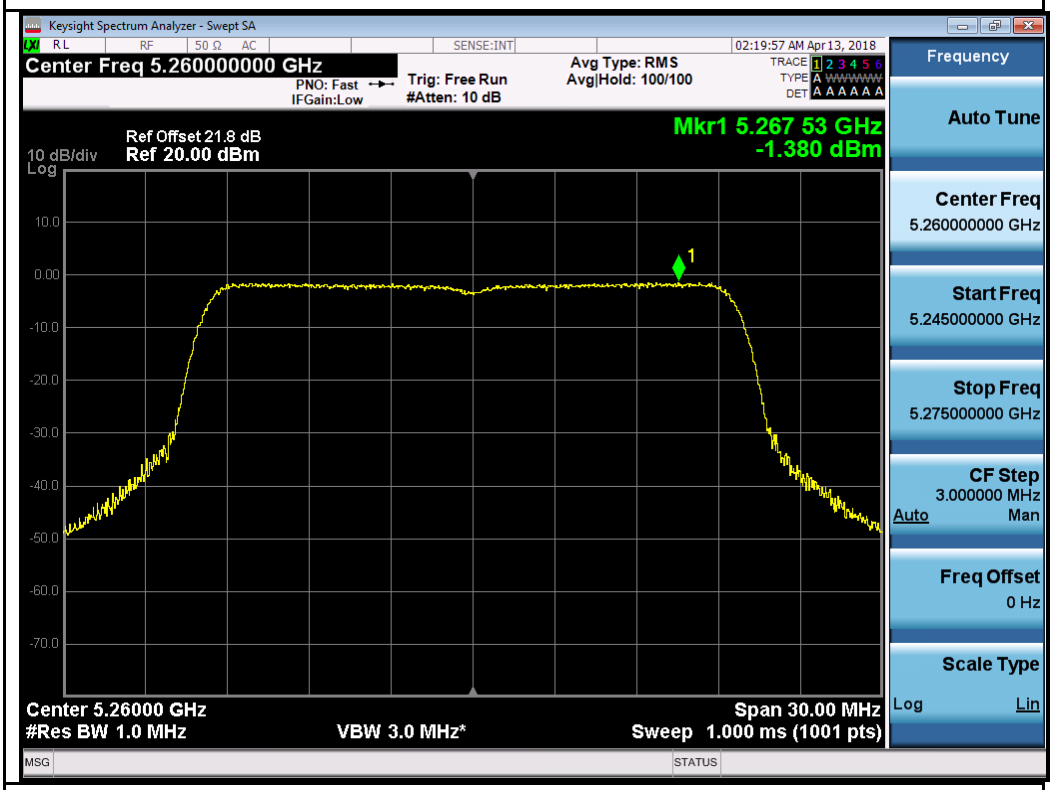


802.11a-5260M

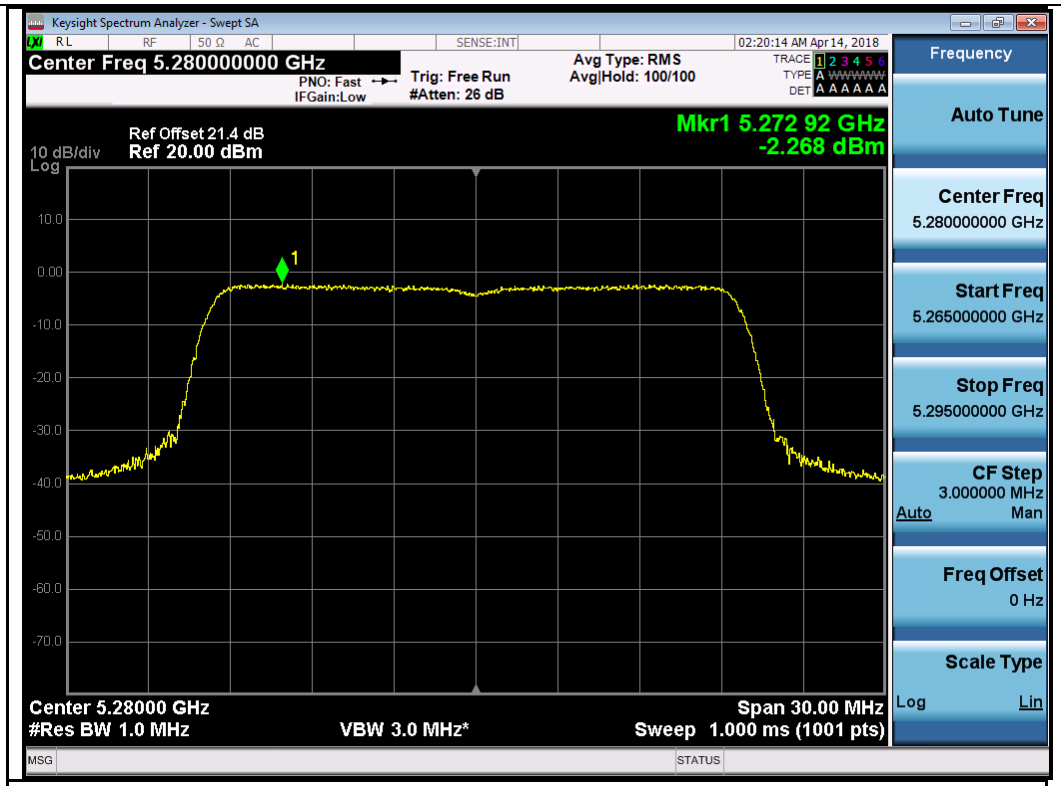


802.11a-5280M

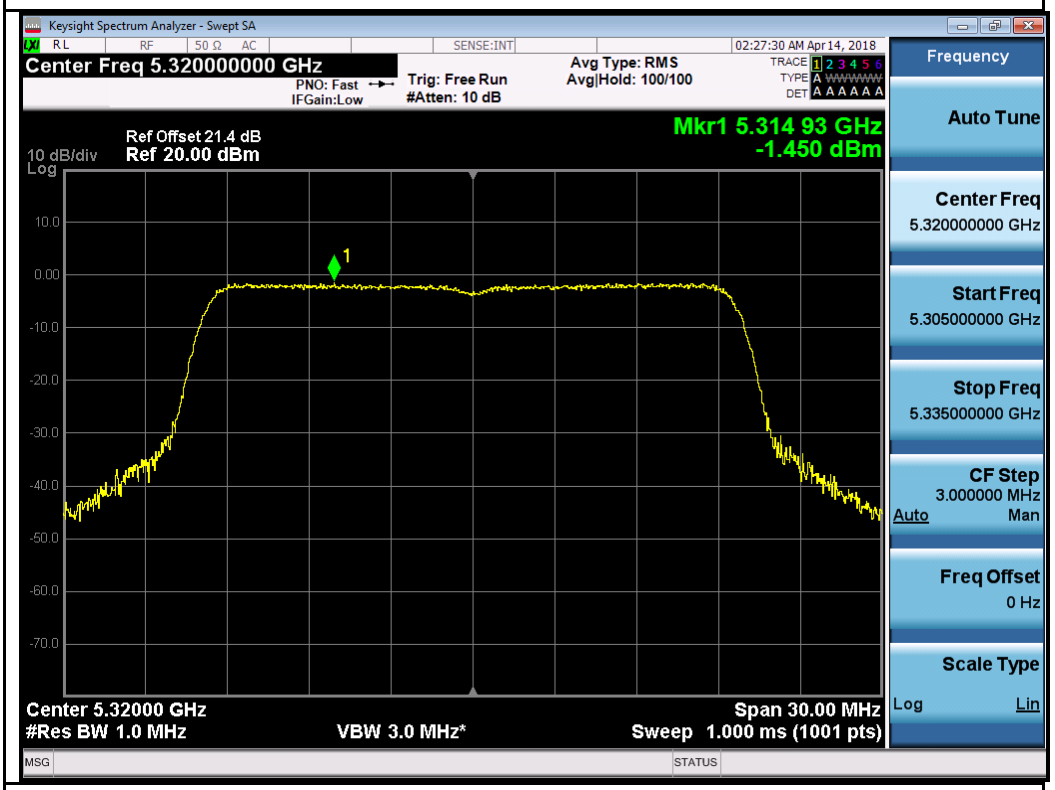
802.11a-5320M



802.11ax20 5260M



802.11ax20 5280M



802.11ax20 5320M