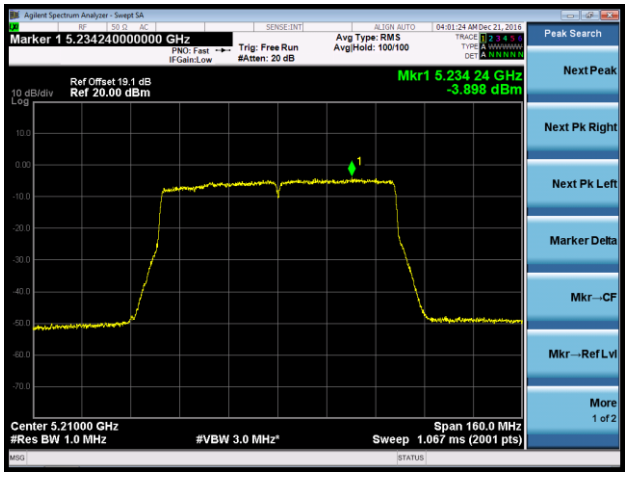
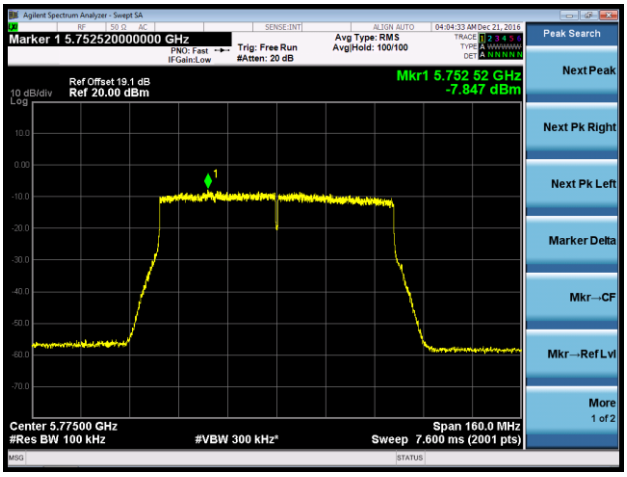
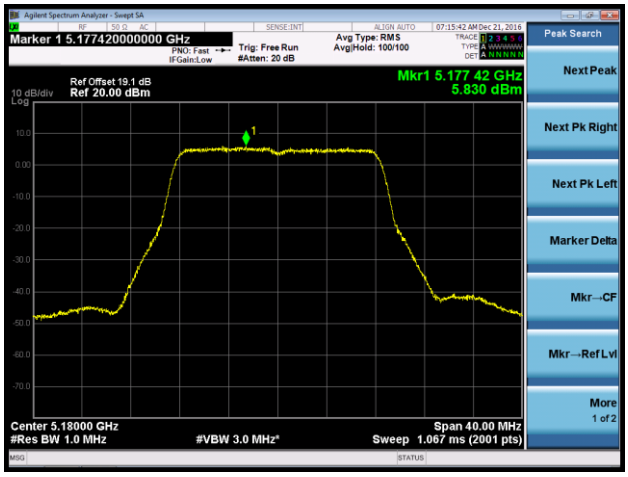
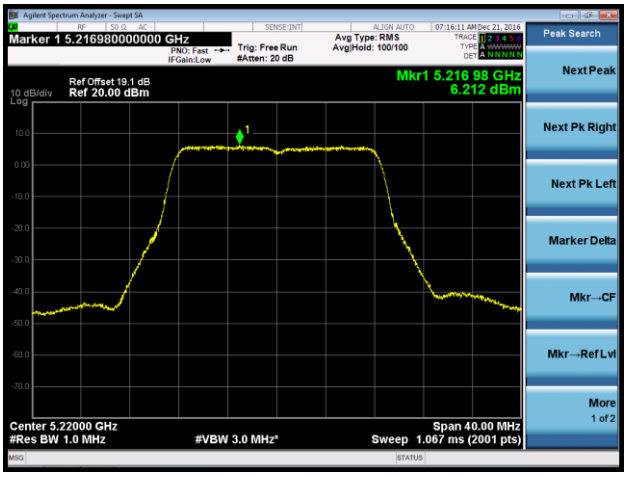
802.11ac-VHT80 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3	
Channel 42 (5210MHz)	**Channel 155 (5775MHz)**
	

802.11a Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

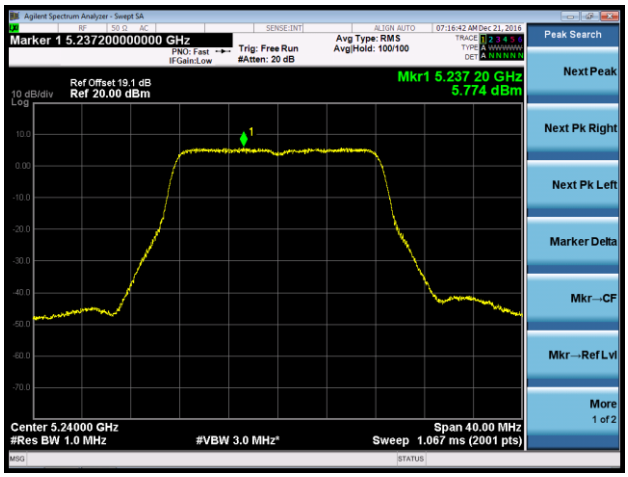
Channel 36 (5180MHz)



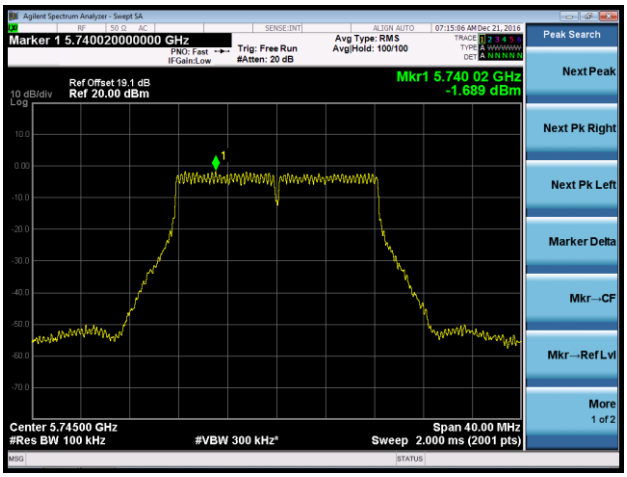
Channel 44 (5220MHz)



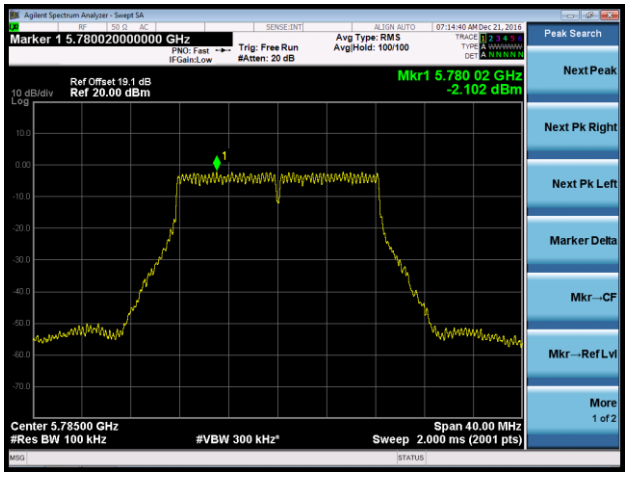
Channel 48 (5240MHz)



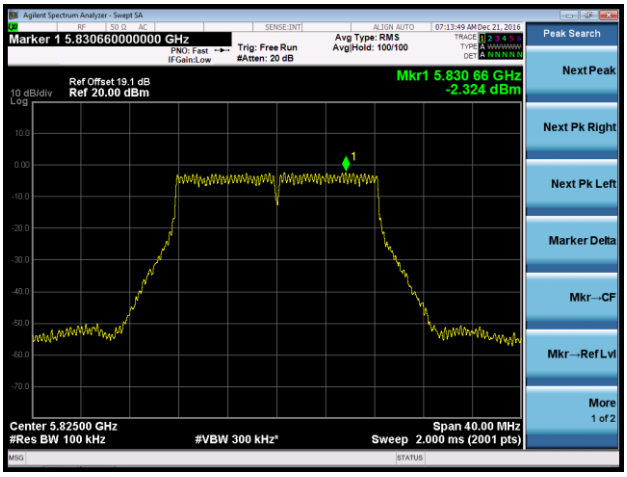
Channel 149 (5745MHz)



Channel 157 (5785MHz)

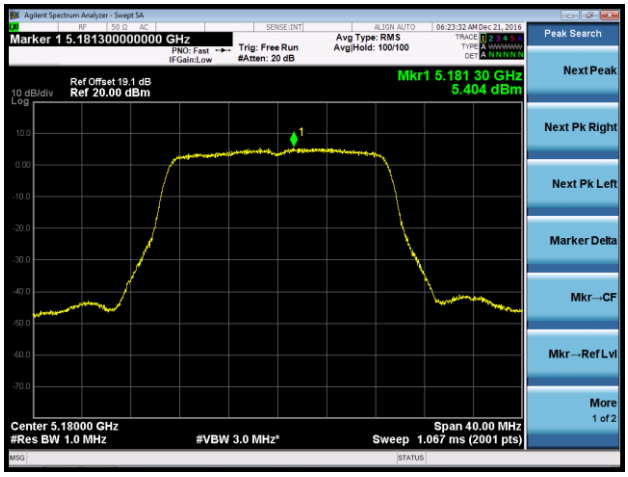


Channel 165 (5825MHz)

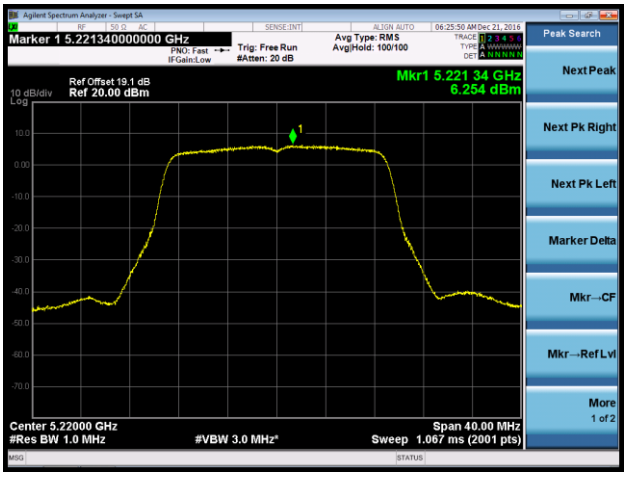


802.11n-HT20 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

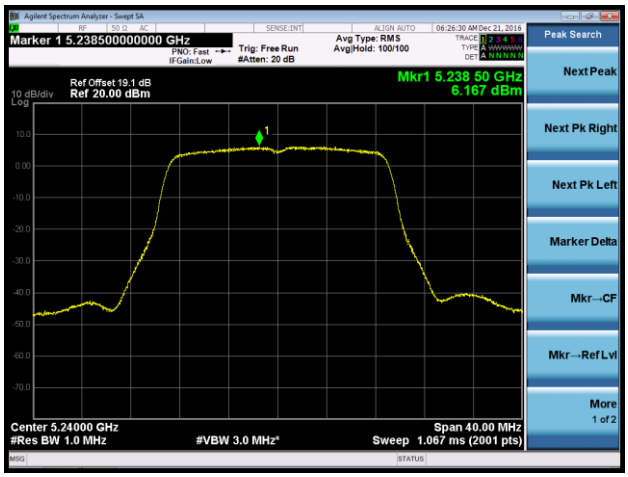
Channel 36 (5180MHz)



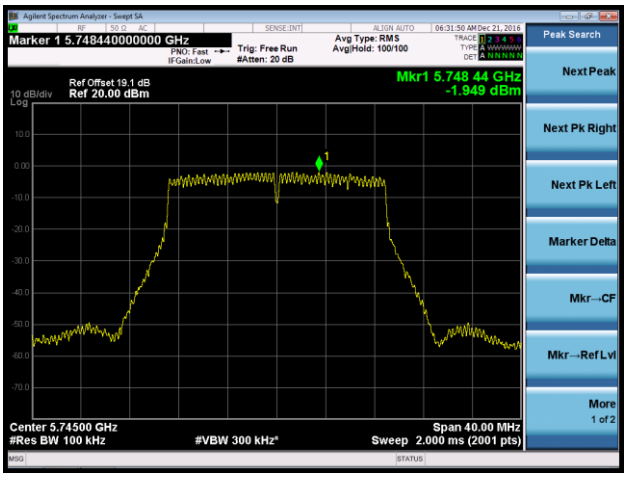
Channel 44 (5220MHz)



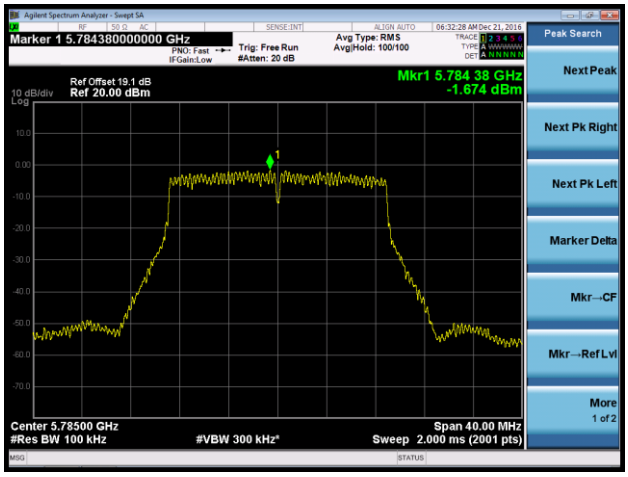
Channel 48 (5240MHz)



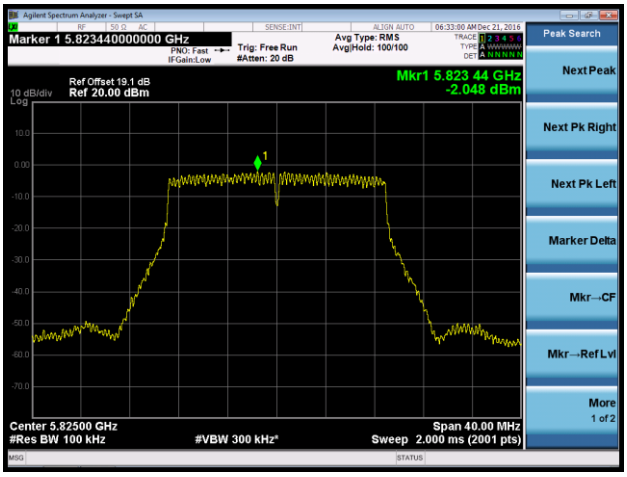
Channel 149 (5745MHz)



Channel 157 (5785MHz)

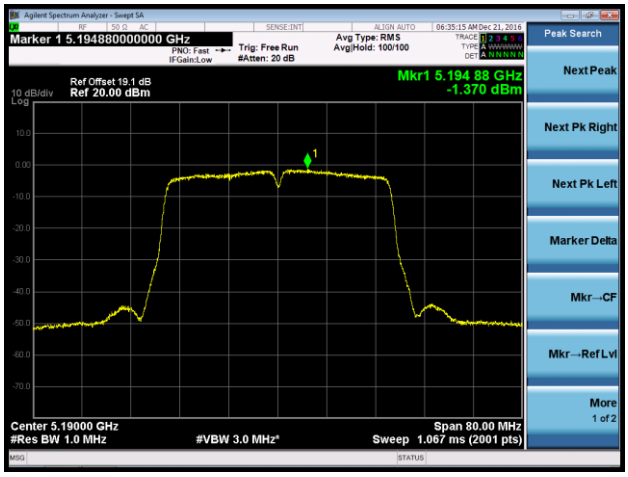


Channel 165 (5825MHz)

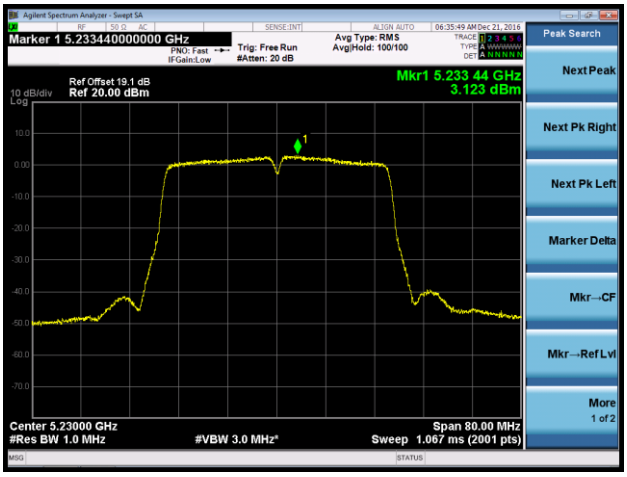


802.11n-HT40 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

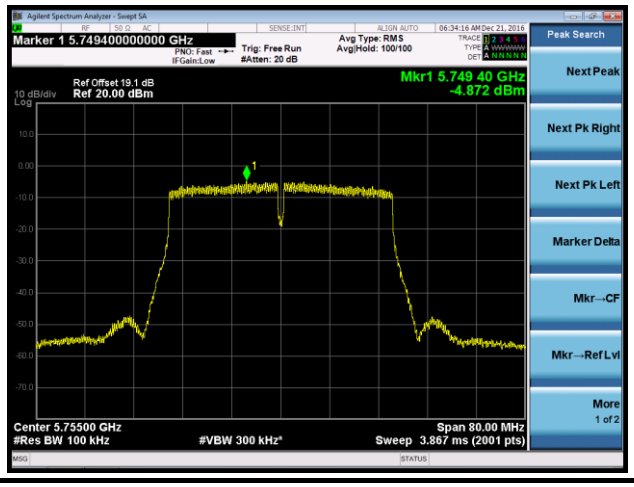
Channel 38 (5190MHz)



Channel 46 (5230MHz)



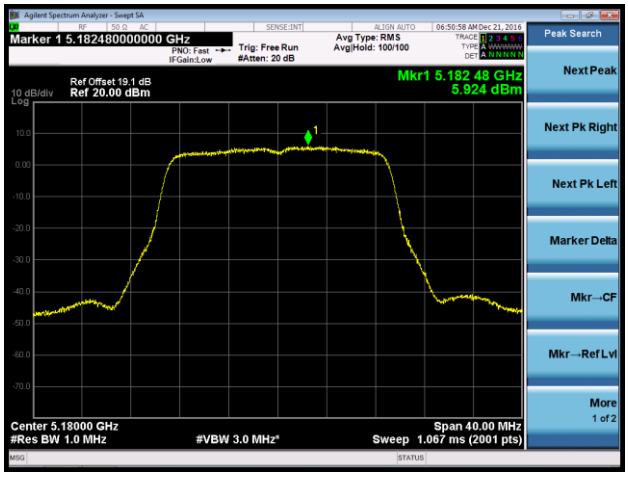
Channel 151 (5755MHz)



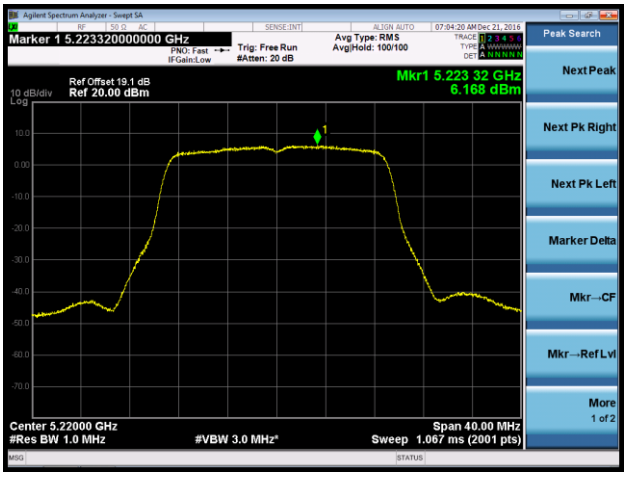
Channel 159 (5795MHz)

802.11ac-VHT20 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

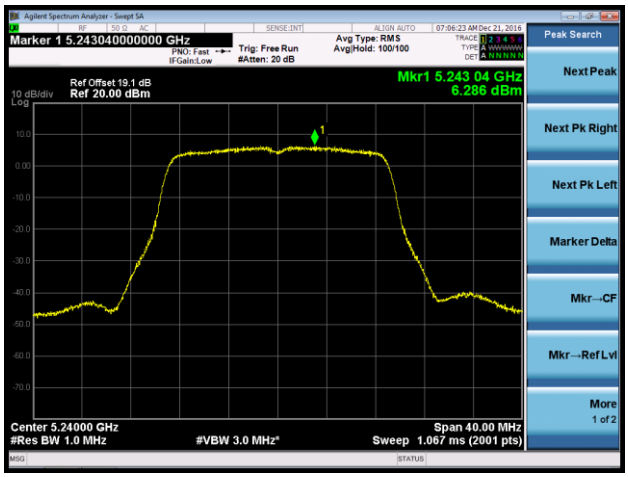
Channel 36 (5180MHz)



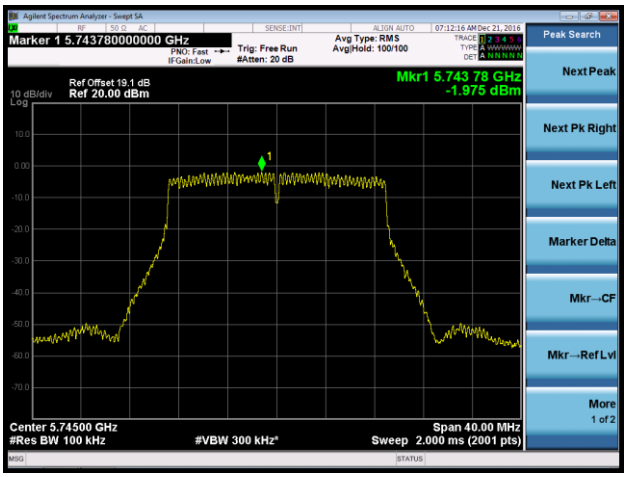
Channel 44 (5220MHz)



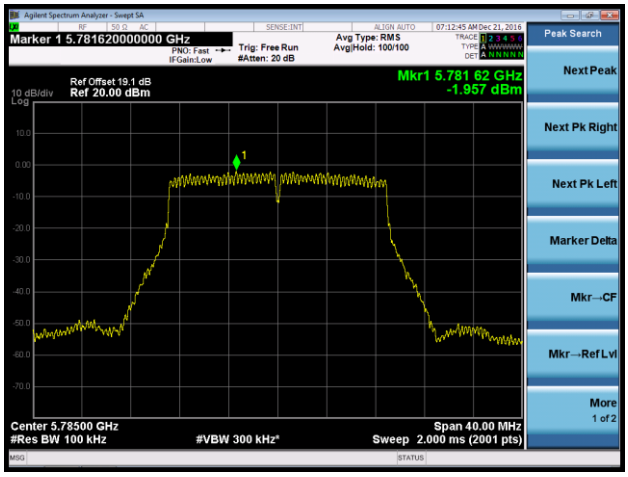
Channel 48 (5240MHz)



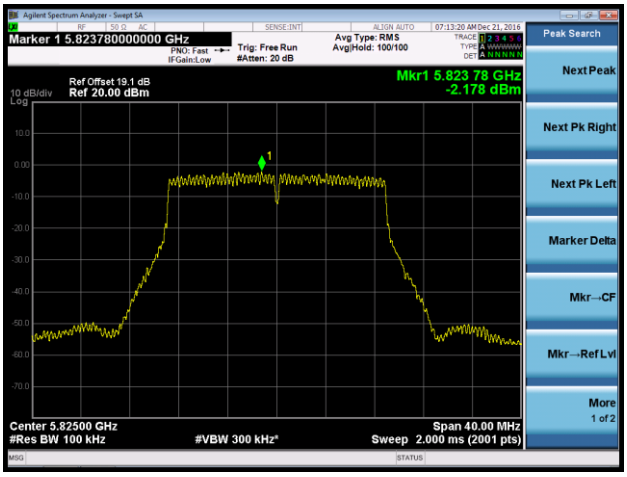
Channel 149 (5745MHz)



Channel 157 (5785MHz)

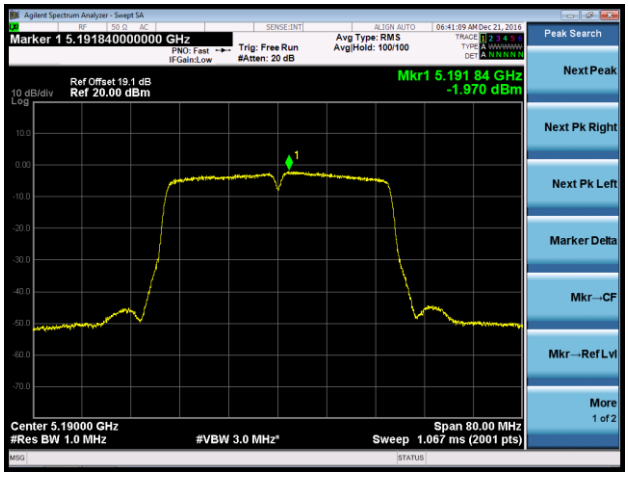


Channel 165 (5825MHz)

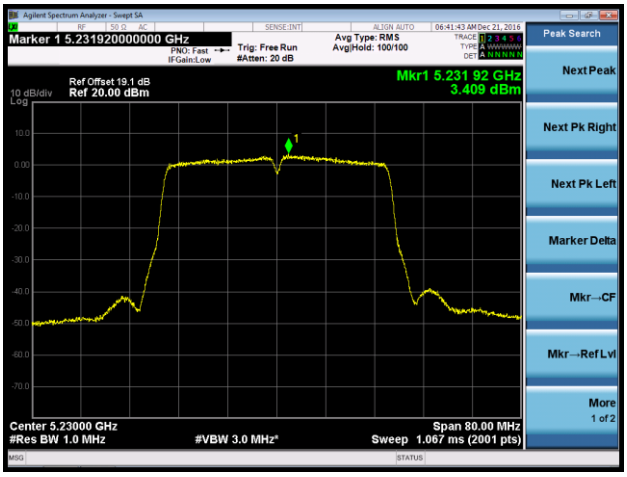


802.11ac-VHT40 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

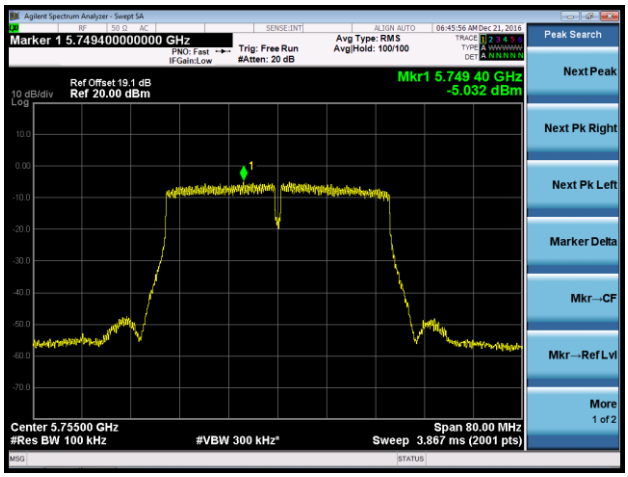
Channel 38 (5190MHz)



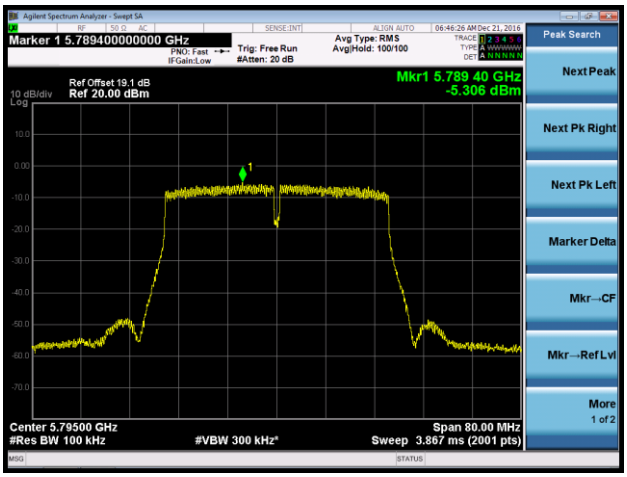
Channel 46 (5230MHz)

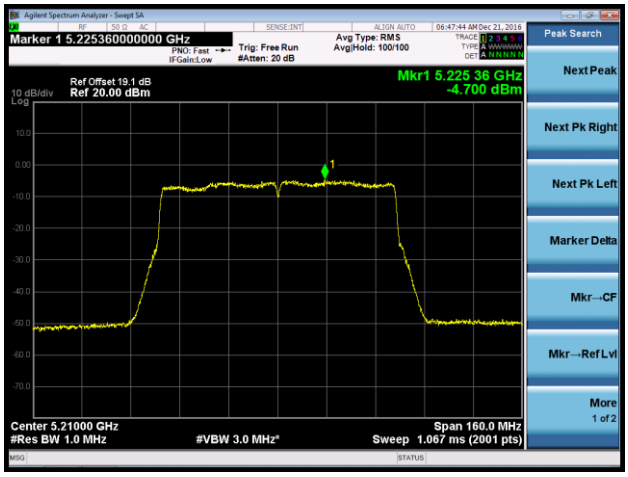
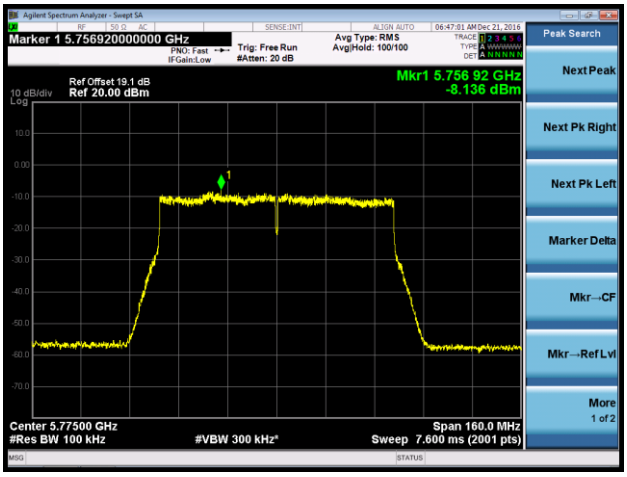


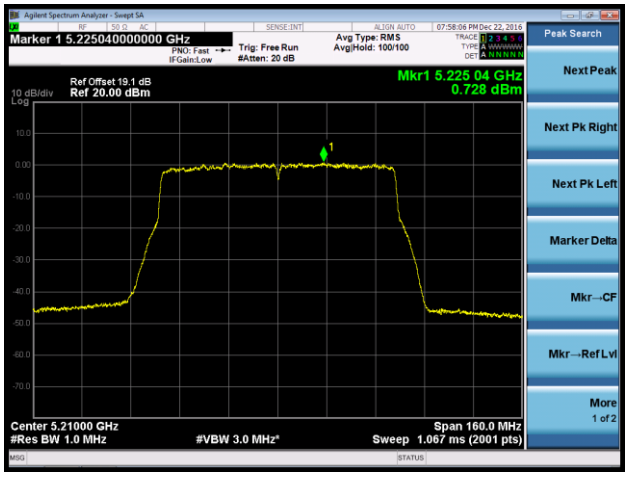
Channel 151 (5755MHz)

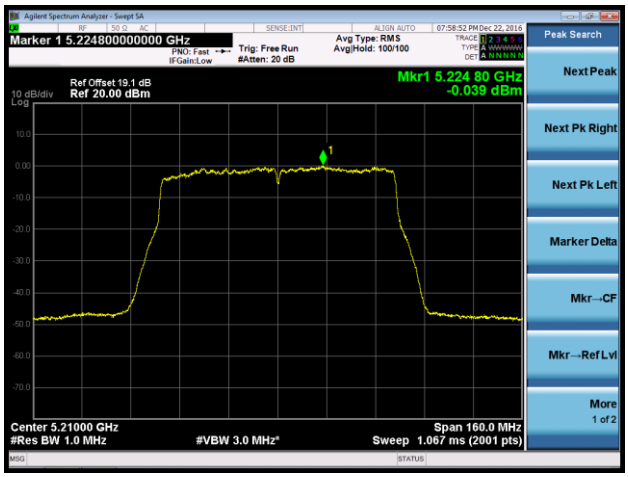


Channel 159 (5795MHz)

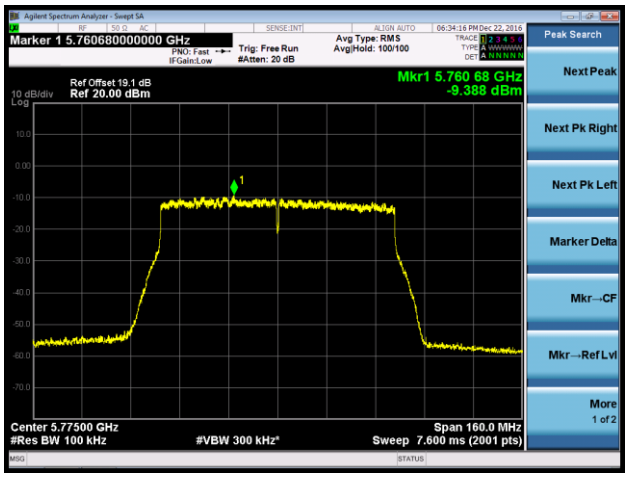


802.11ac-VHT80 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3	
Channel 42 (5210MHz)	**Channel 155 (5775MHz)**
	

802.11ac-VHT 80 + 80 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 42 (5210MHz)	
	

802.11ac-VHT 80 + 80 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3	
Channel 42 (5210MHz)	
	

802.11ac-VHT 80 + 80 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3	
Channel 155 (5775MHz)	

802.11ac-VHT 80 + 80 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3	
Channel 155 (5775MHz)	
	

Power Spectral Density Measurement Limit of Directional Antenna 1356.17.0077

Frequency Band (MHz)	Per Chain Max Antenna Gain (dBi)				CDD & Beam Forming Directional Gain (dBi)	Limit of SISO (dBm/MHz)				Limit of MIMO (dBm/MHz)
	Ant 0	Ant 1	Ant 2	Ant 3		Ant 0	Ant 1	Ant 2	Ant 3	Ant 0+1+2+3
5150 ~ 5250	14.00	14.00	14.00	14.00	N/A	9.00	9.00	9.00	9.00	9.00
Frequency Band (MHz)	Per Chain Max Antenna Gain (dBi)				CDD & Beam Forming Directional Gain (dBi)	Limit of SISO (dBm/500kHz)				Limit of MIMO (dBm/500kHz)
	Ant 0	Ant 1	Ant 2	Ant 3		Ant 0	Ant 1	Ant 2	Ant 3	Ant 0+1+2+3
5725 ~ 5850	14.00	14.00	14.00	14.00	N/A	22.00	22.00	22.00	22.00	22.00

Product	US WI-FI AP 4X4 OD ext. antenna	Temperature	25°C
Test Engineer	Johnson Liao	Relative Humidity	50 ~ 58%
Test Site	SR2	Test Date	2016/11/08
Test Item	Power Spectral Density	Antenna Model No.	Directional Antenna 1356.17.0077

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
Ant 0								
11a	6	36	5180	8.13	97.18	8.26	≤ 9.00	Pass
11a	6	44	5220	8.22	97.18	8.34	≤ 9.00	Pass
11a	6	48	5240	8.38	97.18	8.51	≤ 9.00	Pass
11n-HT20	6.5	36	5180	7.80	98.81	7.85	≤ 9.00	Pass
11n-HT20	6.5	44	5220	8.34	98.81	8.39	≤ 9.00	Pass
11n-HT20	6.5	48	5240	7.99	98.81	8.04	≤ 9.00	Pass
11n-HT40	13.5	38	5190	4.40	97.55	4.51	≤ 9.00	Pass
11n-HT40	13.5	46	5230	5.28	97.55	5.39	≤ 9.00	Pass
11ac-VHT20	6.5	36	5180	7.83	98.82	7.88	≤ 9.00	Pass
11ac-VHT20	6.5	44	5220	8.28	98.82	8.33	≤ 9.00	Pass
11ac-VHT20	6.5	48	5240	8.00	98.82	8.05	≤ 9.00	Pass
11ac-VHT40	13.5	38	5190	3.10	97.40	3.21	≤ 9.00	Pass
11ac-VHT40	13.5	46	5230	5.12	97.40	5.24	≤ 9.00	Pass
11ac-VHT80	29.3	42	5210	0.85	94.30	1.11	≤ 9.00	Pass

Note: Total PSD (dBm/MHz) = Ant PSD (dBm/MHz) + 10*log(1/duty cycle)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
Ant 1								
11a	6	36	5180	8.54	97.18	8.66	≤ 9.00	Pass
11a	6	44	5220	8.37	97.18	8.50	≤ 9.00	Pass
11a	6	48	5240	8.61	97.18	8.73	≤ 9.00	Pass
11n-HT20	6.5	36	5180	8.09	98.81	8.14	≤ 9.00	Pass
11n-HT20	6.5	44	5220	8.49	98.81	8.54	≤ 9.00	Pass
11n-HT20	6.5	48	5240	8.70	98.81	8.75	≤ 9.00	Pass
11n-HT40	13.5	38	5190	3.88	97.55	3.99	≤ 9.00	Pass
11n-HT40	13.5	46	5230	5.89	97.55	6.00	≤ 9.00	Pass
11ac-VHT20	6.5	36	5180	8.27	98.82	8.32	≤ 9.00	Pass
11ac-VHT20	6.5	44	5220	8.51	98.82	8.56	≤ 9.00	Pass
11ac-VHT20	6.5	48	5240	8.80	98.82	8.85	≤ 9.00	Pass
11ac-VHT40	13.5	38	5190	5.48	97.40	5.59	≤ 9.00	Pass
11ac-VHT40	13.5	46	5230	6.04	97.40	6.15	≤ 9.00	Pass
11ac-VHT80	29.3	42	5210	2.62	94.30	2.88	≤ 9.00	Pass

Note: Total PSD (dBm/MHz) = Ant PSD (dBm/MHz) + 10*log(1/duty cycle)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
Ant 2								
11a	6	36	5180	8.22	97.18	8.34	≤ 9.00	Pass
11a	6	44	5220	8.46	97.18	8.59	≤ 9.00	Pass
11a	6	48	5240	8.37	97.18	8.50	≤ 9.00	Pass
11n-HT20	6.5	36	5180	7.96	98.81	8.01	≤ 9.00	Pass
11n-HT20	6.5	44	5220	8.43	98.81	8.48	≤ 9.00	Pass
11n-HT20	6.5	48	5240	8.36	98.81	8.41	≤ 9.00	Pass
11n-HT40	13.5	38	5190	5.29	97.55	5.40	≤ 9.00	Pass
11n-HT40	13.5	46	5230	5.35	97.55	5.45	≤ 9.00	Pass
11ac-VHT20	6.5	36	5180	6.97	98.82	7.02	≤ 9.00	Pass
11ac-VHT20	6.5	44	5220	7.57	98.82	7.62	≤ 9.00	Pass
11ac-VHT20	6.5	48	5240	8.68	98.82	8.74	≤ 9.00	Pass
11ac-VHT40	13.5	38	5190	5.56	97.40	5.67	≤ 9.00	Pass
11ac-VHT40	13.5	46	5230	5.63	97.40	5.74	≤ 9.00	Pass
11ac-VHT80	29.3	42	5210	2.29	94.30	2.55	≤ 9.00	Pass
Ant 3								
11a	6	36	5180	7.94	97.18	8.06	≤ 9.00	Pass
11a	6	44	5220	8.46	97.18	8.58	≤ 9.00	Pass
11a	6	48	5240	8.62	97.18	8.75	≤ 9.00	Pass
11n-HT20	6.5	36	5180	7.59	98.81	7.64	≤ 9.00	Pass
11n-HT20	6.5	44	5220	8.12	98.81	8.17	≤ 9.00	Pass
11n-HT20	6.5	48	5240	8.54	98.81	8.59	≤ 9.00	Pass
11n-HT40	13.5	38	5190	5.06	97.55	5.17	≤ 9.00	Pass
11n-HT40	13.5	46	5230	5.80	97.55	5.91	≤ 9.00	Pass
11ac-VHT20	6.5	36	5180	7.70	98.82	7.75	≤ 9.00	Pass
11ac-VHT20	6.5	44	5220	8.01	98.82	8.07	≤ 9.00	Pass
11ac-VHT20	6.5	48	5240	8.26	98.82	8.31	≤ 9.00	Pass
11ac-VHT40	13.5	38	5190	5.09	97.40	5.20	≤ 9.00	Pass
11ac-VHT40	13.5	46	5230	5.47	97.40	5.58	≤ 9.00	Pass
11ac-VHT80	29.3	42	5210	2.26	94.30	2.51	≤ 9.00	Pass

Note: Total PSD (dBm/MHz) = Ant PSD (dBm/MHz) + 10*log(1/duty cycle)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ MHz)	Ant 1 PSD (dBm/ MHz)	Ant 2 PSD (dBm/ MHz)	Ant 3 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	Result
Ant 0 + 1 + 2 + 3											
11a	6	36	5180	6.14	5.56	5.48	5.76	97.18	6.26	≤ 9.00	Pass
11a	6	44	5220	6.54	6.07	5.62	6.48	97.18	6.66	≤ 9.00	Pass
11a	6	48	5240	6.37	6.21	5.92	6.15	97.18	6.49	≤ 9.00	Pass
11n-HT20	13	36	5180	5.19	5.09	4.73	4.79	98.81	5.24	≤ 9.00	Pass
11n-HT20	13	44	5220	6.21	5.65	5.61	6.03	98.81	6.26	≤ 9.00	Pass
11n-HT20	13	48	5240	6.47	6.38	5.57	5.82	98.81	6.52	≤ 9.00	Pass
11n-HT40	27	38	5190	5.33	4.80	4.55	4.90	97.55	5.43	≤ 9.00	Pass
11n-HT40	27	46	5230	5.46	5.07	4.93	4.87	97.55	5.57	≤ 9.00	Pass
11ac-VHT20	13	36	5180	5.64	5.68	5.19	5.47	98.82	5.73	≤ 9.00	Pass
11ac-VHT20	13	44	5220	6.24	5.73	5.41	6.04	98.82	6.29	≤ 9.00	Pass
11ac-VHT20	13	48	5240	6.34	6.41	5.82	5.79	98.82	6.46	≤ 9.00	Pass
11ac-VHT40	27	38	5190	5.25	4.86	4.66	4.76	97.40	5.36	≤ 9.00	Pass
11ac-VHT40	27	46	5230	5.37	5.00	4.85	5.18	97.40	5.49	≤ 9.00	Pass
11ac-VHT80	58.6	42	5210	2.25	2.02	1.34	1.50	94.30	2.51	≤ 9.00	Pass

Note 1: The result of the Max Total PSD has been selected the max PSD from each antenna

Note 2: Total Max PSD (dBm/MHz) = Ant PSD (dBm/MHz) + 10*log(1/duty cycle)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ MHz)	Ant 1 PSD (dBm/ MHz)	Ant 2 PSD (dBm/ MHz)	Ant 3 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	Result
Ant 0 + 1 + 2 + 3											
11ac-VHT80+80	58.6	42	5210	-0.68	-1.34	--	--	94.30	-0.43	≤ 9.00	Pass

Note 1: The result of the Max Total PSD has been selected the max PSD from each antenna

Note 2: Total Max PSD (dBm/MHz) = Ant PSD (dBm/MHz) + 10*log(1/duty cycle)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Ant 0									
11a	6	149	5745	0.68	97.18	6.99	7.79	≤ 22.00	Pass
11a	6	157	5785	0.93	97.18	6.99	8.05	≤ 22.00	Pass
11a	6	165	5825	1.25	97.18	6.99	8.36	≤ 22.00	Pass
11n-HT20	6.5	149	5745	0.65	98.81	6.99	7.69	≤ 22.00	Pass
11n-HT20	6.5	157	5785	0.70	98.81	6.99	7.74	≤ 22.00	Pass
11n-HT20	6.5	165	5825	0.46	98.81	6.99	7.50	≤ 22.00	Pass
11n-HT40	13.5	151	5755	-2.10	97.55	6.99	5.00	≤ 22.00	Pass
11n-HT40	13.5	159	5795	-2.46	97.55	6.99	4.64	≤ 22.00	Pass
11ac-VHT20	6.5	149	5745	0.86	98.82	6.99	7.90	≤ 22.00	Pass
11ac-VHT20	6.5	157	5785	0.59	98.82	6.99	7.63	≤ 22.00	Pass
11ac-VHT20	6.5	165	5825	0.63	98.82	6.99	7.68	≤ 22.00	Pass
11ac-VHT40	13.5	151	5755	-2.09	97.40	6.99	5.02	≤ 22.00	Pass
11ac-VHT40	13.5	159	5795	-2.36	97.40	6.99	4.75	≤ 22.00	Pass
11ac-VHT80	29.3	155	5775	-5.22	94.30	6.99	2.03	≤ 22.00	Pass
Ant 1									
11a	6	149	5745	1.24	97.18	6.99	8.36	≤ 22.00	Pass
11a	6	157	5785	1.29	97.18	6.99	8.41	≤ 22.00	Pass
11a	6	165	5825	1.28	97.18	6.99	8.40	≤ 22.00	Pass
11n-HT20	6.5	149	5745	0.92	98.81	6.99	7.96	≤ 22.00	Pass
11n-HT20	6.5	157	5785	1.50	98.81	6.99	8.54	≤ 22.00	Pass
11n-HT20	6.5	165	5825	0.80	98.81	6.99	7.85	≤ 22.00	Pass
11n-HT40	13.5	151	5755	-1.74	97.55	6.99	5.35	≤ 22.00	Pass
11n-HT40	13.5	159	5795	-1.71	97.55	6.99	5.39	≤ 22.00	Pass
11ac-VHT20	6.5	149	5745	0.86	98.82	6.99	7.90	≤ 22.00	Pass
11ac-VHT20	6.5	157	5785	1.13	98.82	6.99	8.17	≤ 22.00	Pass
11ac-VHT20	6.5	165	5825	1.03	98.82	6.99	8.07	≤ 22.00	Pass
11ac-VHT40	13.5	151	5755	-1.81	97.40	6.99	5.29	≤ 22.00	Pass
11ac-VHT40	13.5	159	5795	-2.02	97.40	6.99	5.09	≤ 22.00	Pass
11ac-VHT80	29.3	155	5775	-4.51	94.30	6.99	2.74	≤ 22.00	Pass

Note: Total PSD (dBm/500kHz) = Ant 2 PSD (dBm/100kHz) + 10*log(1/duty cycle) + Constant Factor.

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Ant 2									
11a	6	149	5745	1.20	97.18	6.99	8.32	≤ 22.00	Pass
11a	6	157	5785	1.26	97.18	6.99	8.37	≤ 22.00	Pass
11a	6	165	5825	1.79	97.18	6.99	8.90	≤ 22.00	Pass
11n-HT20	6.5	149	5745	0.67	98.81	6.99	7.71	≤ 22.00	Pass
11n-HT20	6.5	157	5785	0.64	98.81	6.99	7.68	≤ 22.00	Pass
11n-HT20	6.5	165	5825	1.06	98.81	6.99	8.10	≤ 22.00	Pass
11n-HT40	13.5	151	5755	-1.91	97.55	6.99	5.19	≤ 22.00	Pass
11n-HT40	13.5	159	5795	-1.83	97.55	6.99	5.26	≤ 22.00	Pass
11ac-VHT20	6.5	149	5745	1.18	98.82	6.99	8.22	≤ 22.00	Pass
11ac-VHT20	6.5	157	5785	0.74	98.82	6.99	7.78	≤ 22.00	Pass
11ac-VHT20	6.5	165	5825	0.91	98.82	6.99	7.96	≤ 22.00	Pass
11ac-VHT40	13.5	151	5755	-2.03	97.40	6.99	5.07	≤ 22.00	Pass
11ac-VHT40	13.5	159	5795	-1.81	97.40	6.99	5.30	≤ 22.00	Pass
11ac-VHT80	29.3	155	5775	-5.10	94.30	6.99	2.14	≤ 22.00	Pass
Ant 3									
11a	6	149	5745	1.39	97.18	6.99	8.51	≤ 22.00	Pass
11a	6	157	5785	1.18	97.18	6.99	8.29	≤ 22.00	Pass
11a	6	165	5825	1.98	97.18	6.99	9.09	≤ 22.00	Pass
11n-HT20	6.5	149	5745	0.93	98.81	6.99	7.97	≤ 22.00	Pass
11n-HT20	6.5	157	5785	1.23	98.81	6.99	8.27	≤ 22.00	Pass
11n-HT20	6.5	165	5825	1.12	98.81	6.99	8.16	≤ 22.00	Pass
11n-HT40	13.5	151	5755	-2.13	97.55	6.99	4.97	≤ 22.00	Pass
11n-HT40	13.5	159	5795	-1.66	97.55	6.99	5.43	≤ 22.00	Pass
11ac-VHT20	6.5	149	5745	0.64	98.82	6.99	7.68	≤ 22.00	Pass
11ac-VHT20	6.5	157	5785	0.91	98.82	6.99	7.95	≤ 22.00	Pass
11ac-VHT20	6.5	165	5825	0.85	98.82	6.99	7.89	≤ 22.00	Pass
11ac-VHT40	13.5	151	5755	-2.09	97.40	6.99	5.02	≤ 22.00	Pass
11ac-VHT40	13.5	159	5795	-2.25	97.40	6.99	4.86	≤ 22.00	Pass
11ac-VHT80	29.3	155	5775	-5.14	94.30	6.99	2.10	≤ 22.00	Pass

Note: Total PSD (dBm/500kHz) = Ant 2 PSD (dBm/100kHz) + 10*log(1/duty cycle) + Constant Factor.

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 100kHz)	Ant 1 PSD (dBm/ 100kHz)	Ant 2 PSD (dBm/ 100kHz)	Ant 3 PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Total Max PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Ant 0 + 1 + 2 + 3												
11a	6	149	5745	1.25	1.04	1.21	0.85	97.18	6.99	8.36	≤ 22.00	Pass
11a	6	157	5785	0.95	0.57	0.69	0.51	97.18	6.99	8.06	≤ 22.00	Pass
11a	6	165	5825	1.29	0.71	0.57	0.38	97.18	6.99	8.40	≤ 22.00	Pass
11n-HT20	13	149	5745	0.89	0.24	0.70	1.09	98.81	6.99	8.13	≤ 22.00	Pass
11n-HT20	13	157	5785	1.02	0.41	0.70	0.84	98.81	6.99	8.06	≤ 22.00	Pass
11n-HT20	13	165	5825	1.36	0.43	0.64	1.38	98.81	6.99	8.42	≤ 22.00	Pass
11n-HT40	27	151	5755	-2.15	-2.56	-1.79	-2.47	97.55	6.99	5.31	≤ 22.00	Pass
11n-HT40	27	159	5795	-2.05	-2.53	-2.60	-3.03	97.55	6.99	5.04	≤ 22.00	Pass
11ac-VHT20	13	149	5745	1.27	0.34	0.69	0.66	98.82	6.99	8.31	≤ 22.00	Pass
11ac-VHT20	13	157	5785	0.92	0.59	0.84	0.93	98.82	6.99	7.97	≤ 22.00	Pass
11ac-VHT20	13	165	5825	1.03	0.56	0.52	1.04	98.82	6.99	8.08	≤ 22.00	Pass
11ac-VHT40	27	151	5755	-1.96	-2.55	-2.39	-2.77	97.40	6.99	5.14	≤ 22.00	Pass
11ac-VHT40	27	159	5795	-2.24	-2.77	-2.75	-2.67	97.40	6.99	4.87	≤ 22.00	Pass
11ac-VHT80	58.6	155	5775	-4.78	-5.11	-5.10	-5.27	94.30	6.99	2.46	≤ 22.00	Pass

Note 1: The result of the Max Total PSD has been selected the max PSD from each antenna + Constant Factor

Note 2: Total Max PSD (dBm/MHz) = Ant PSD (dBm/MHz) + 10*log(1/duty cycle) + Constant Factor

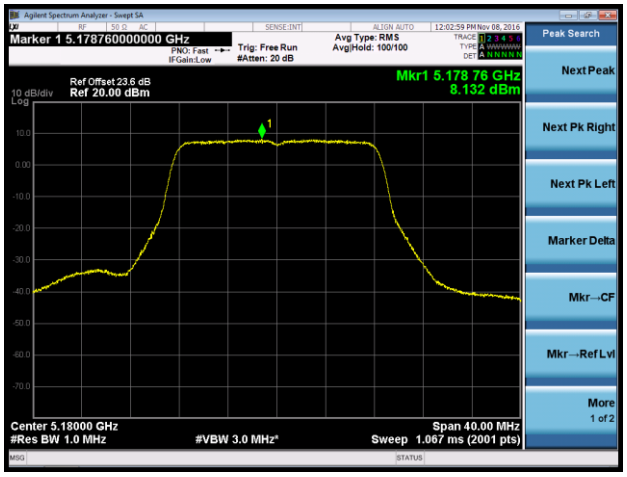
Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 100kHz)	Ant 1 PSD (dBm/ 100kHz)	Ant 2 PSD (dBm/ 100kHz)	Ant 3 PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Total Max PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Ant 0 + 1 + 2 + 3												
11ac-VHT80+80	58.6	155	5775	--	--	-10.81	-10.98	94.30	6.99	-3.57	≤ 22.00	Pass

Note 1: The result of the Max Total PSD has been selected the max PSD from each antenna + Constant Factor

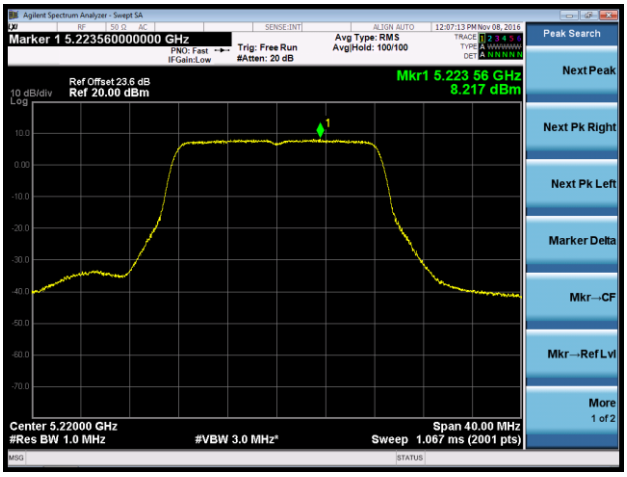
Note 2: Total Max PSD (dBm/MHz) = Ant PSD (dBm/MHz) + 10*log(1/duty cycle) + Constant Factor

802.11a Power Spectral Density - Ant 0

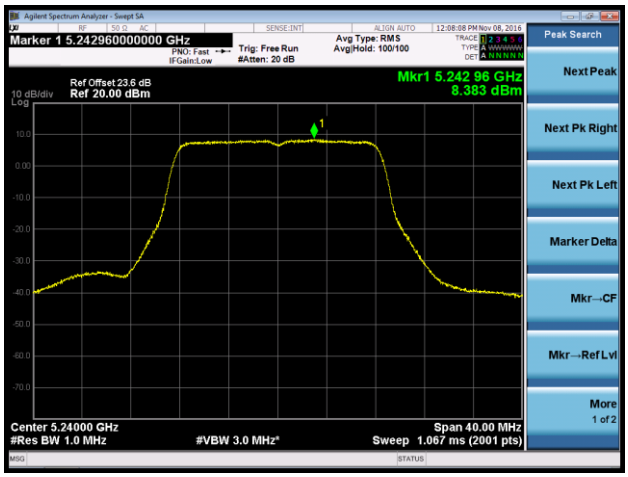
Channel 36 (5180MHz)



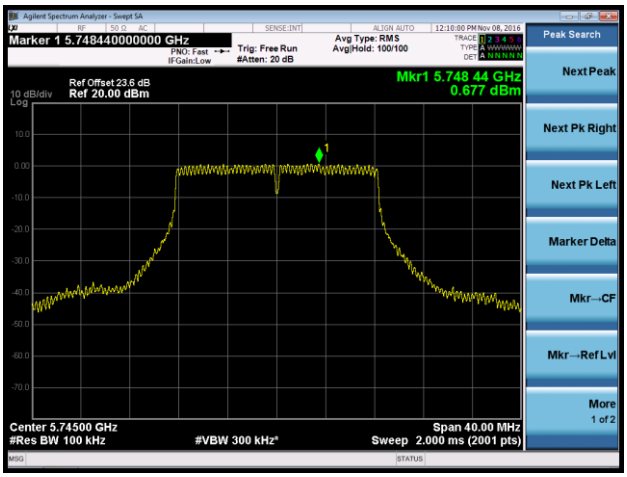
Channel 44 (5220MHz)



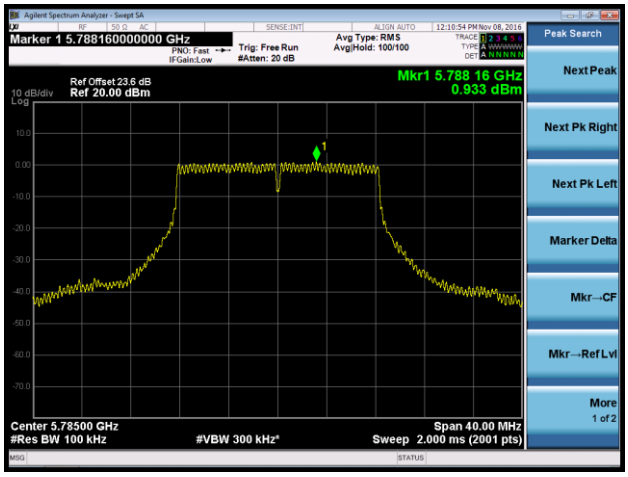
Channel 48 (5240MHz)



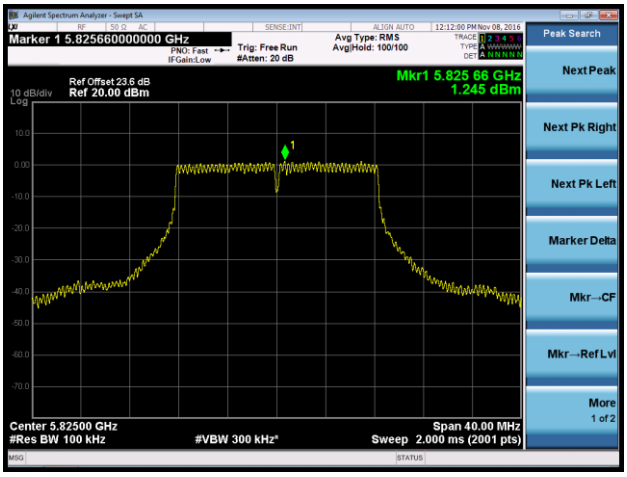
Channel 149 (5745MHz)



Channel 157 (5785MHz)

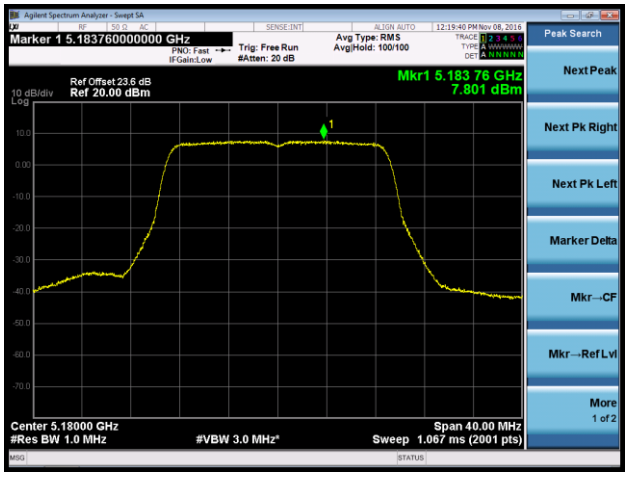


Channel 165 (5825MHz)

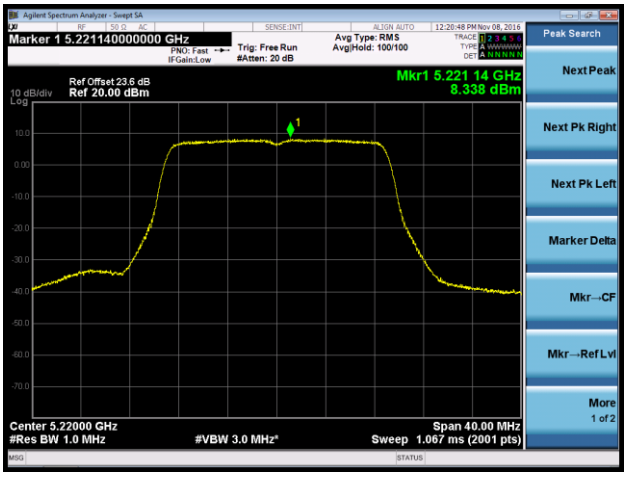


802.11n-HT20 Power Spectral Density - Ant 0

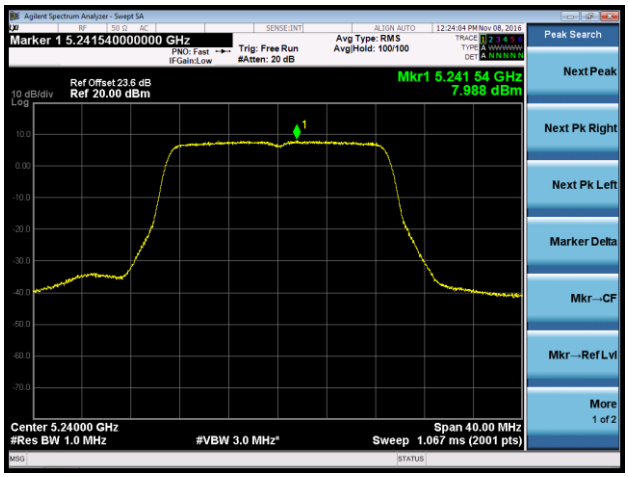
Channel 36 (5180MHz)



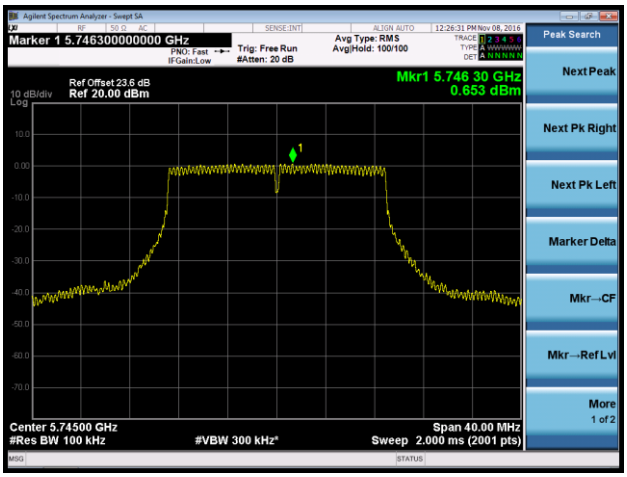
Channel 44 (5220MHz)



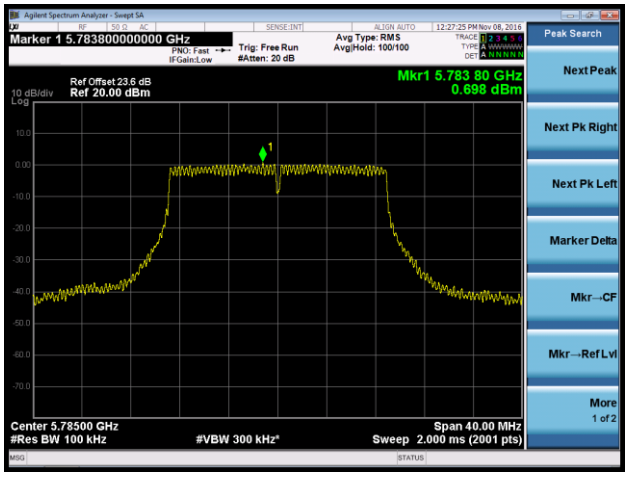
Channel 48 (5240MHz)



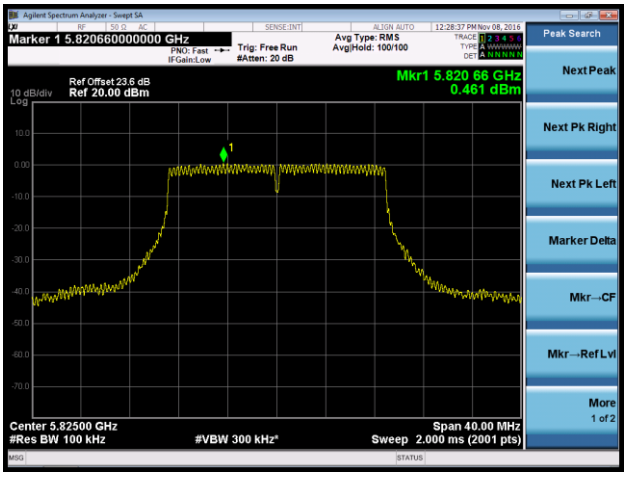
Channel 149 (5745MHz)



Channel 157 (5785MHz)

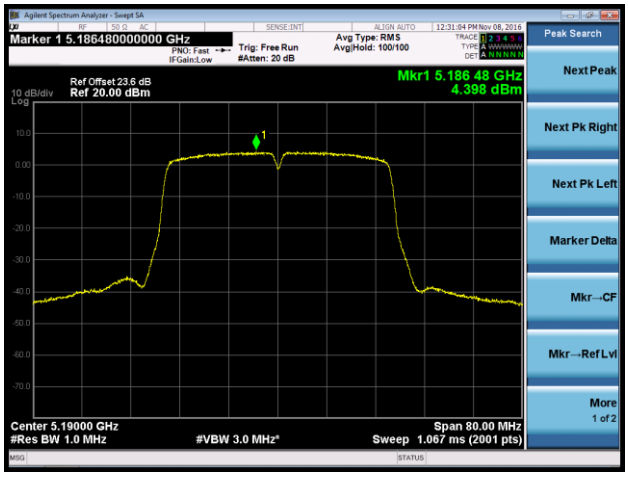


Channel 165 (5825MHz)

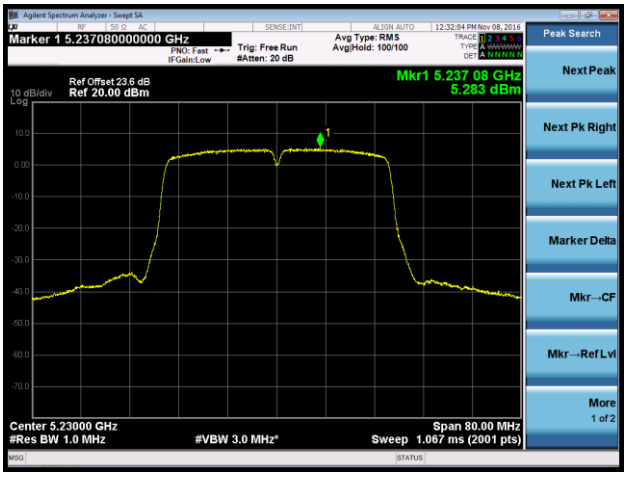


802.11n-HT40 Power Spectral Density - Ant 0

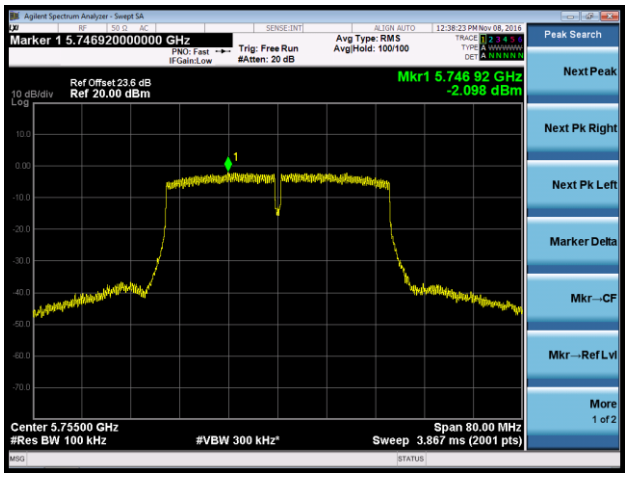
Channel 38 (5190MHz)



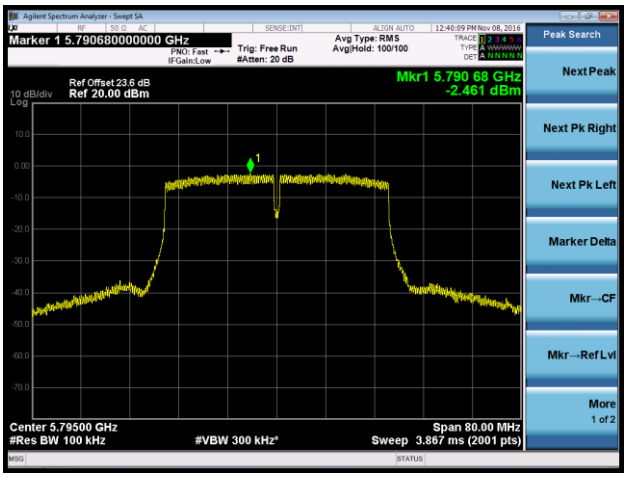
Channel 46 (5230MHz)



Channel 151 (5755MHz)

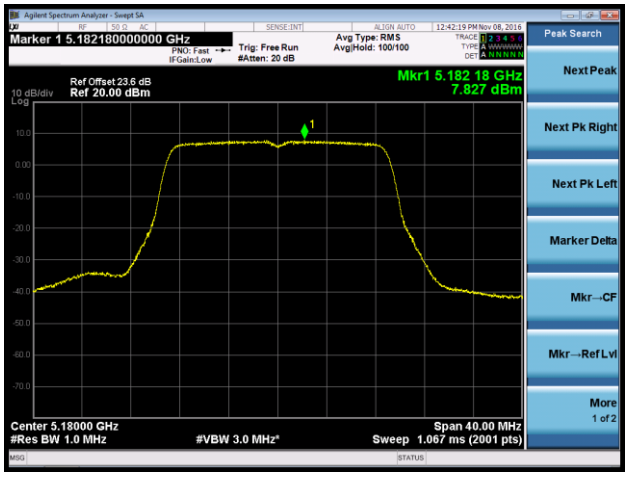


Channel 159 (5795MHz)

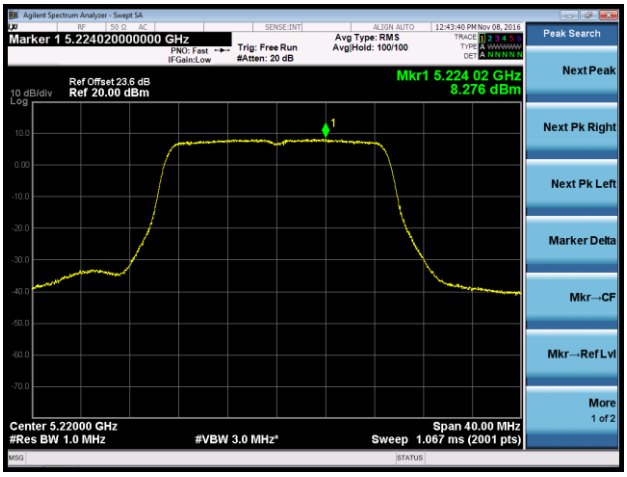


802.11ac-VHT20 Power Spectral Density - Ant 0

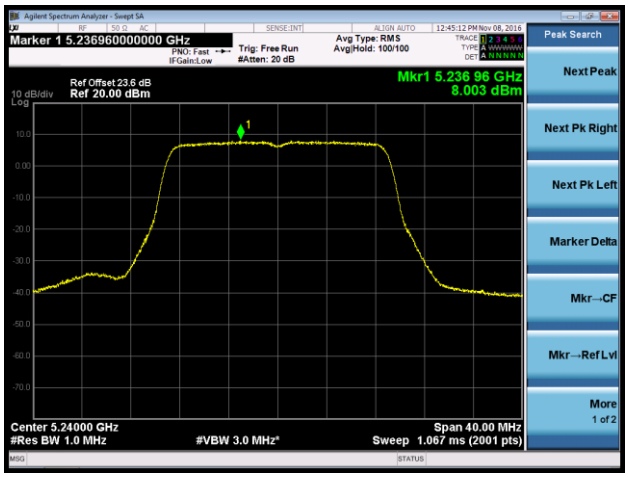
Channel 36 (5180MHz)



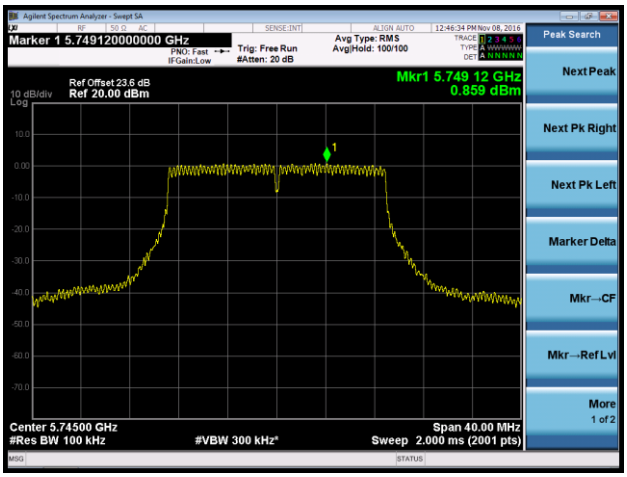
Channel 44 (5220MHz)



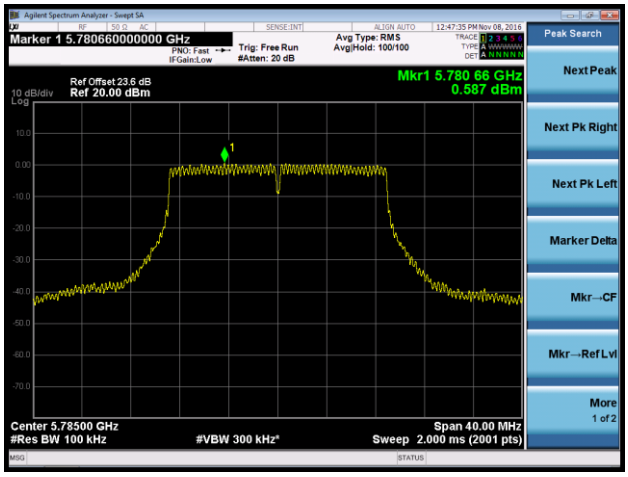
Channel 48 (5240MHz)



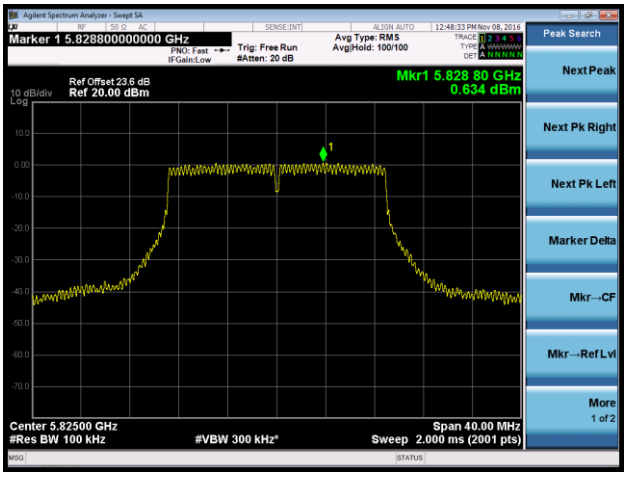
Channel 149 (5745MHz)



Channel 157 (5785MHz)

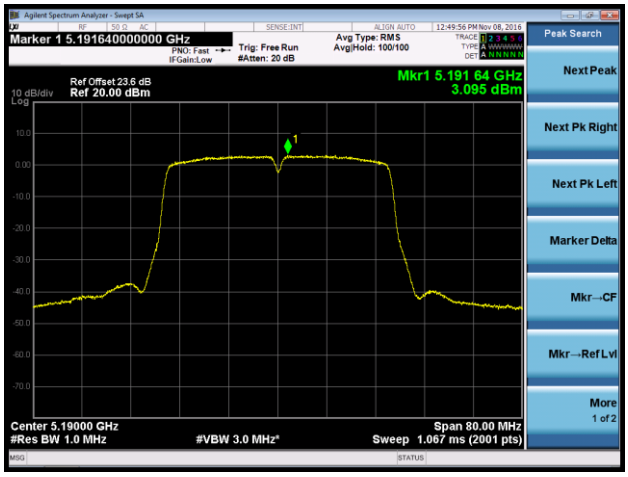


Channel 165 (5825MHz)

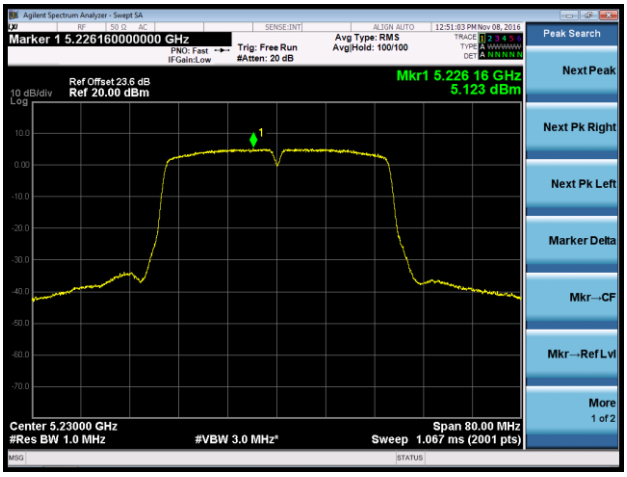


802.11ac-VHT40 Power Spectral Density - Ant 0

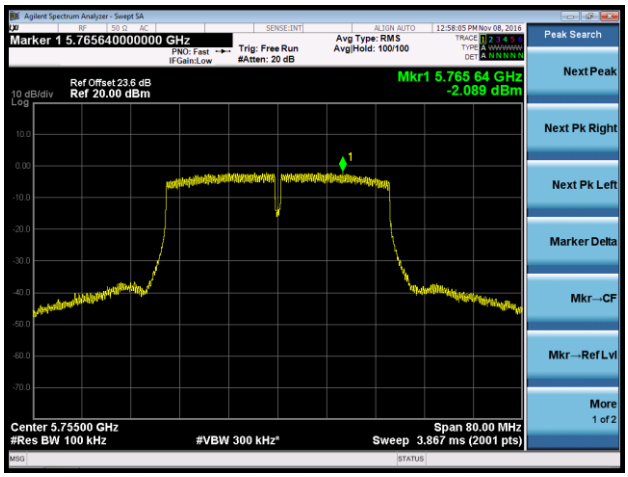
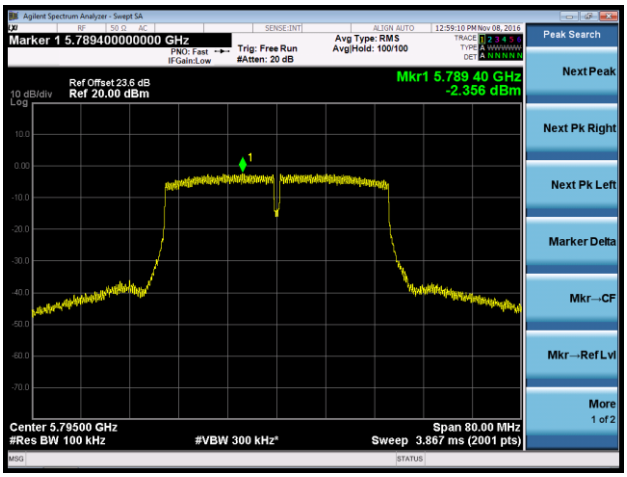
Channel 38 (5190MHz)



Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)