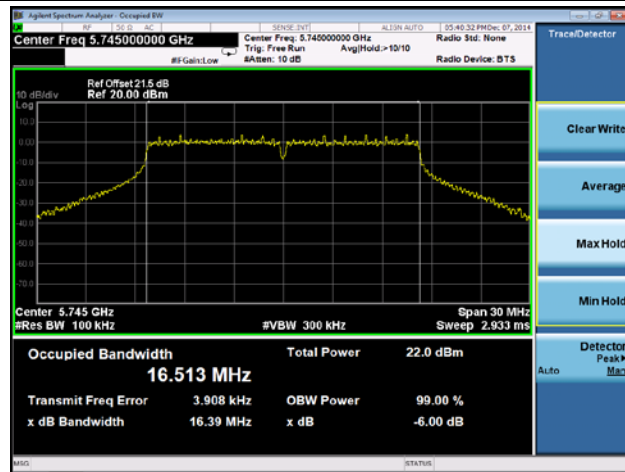
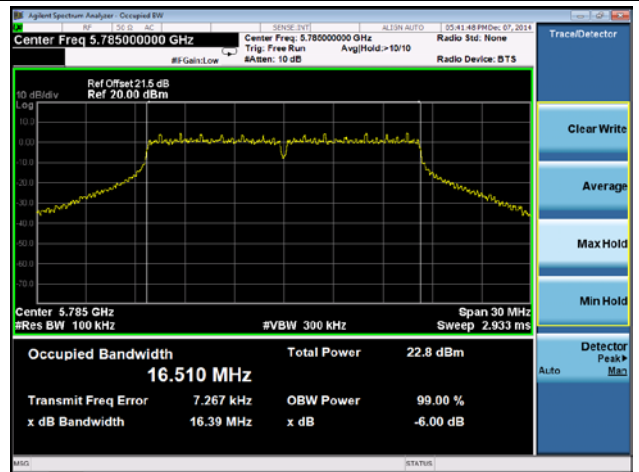


802.11a 6dB Bandwidth - Ant 3 / Ant 0 + 1 + 2 + 3

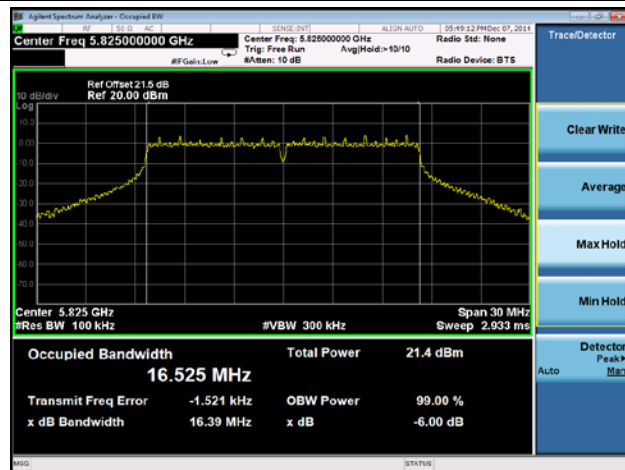
Channel 149 (5745MHz)



Channel 157 (5785MHz)

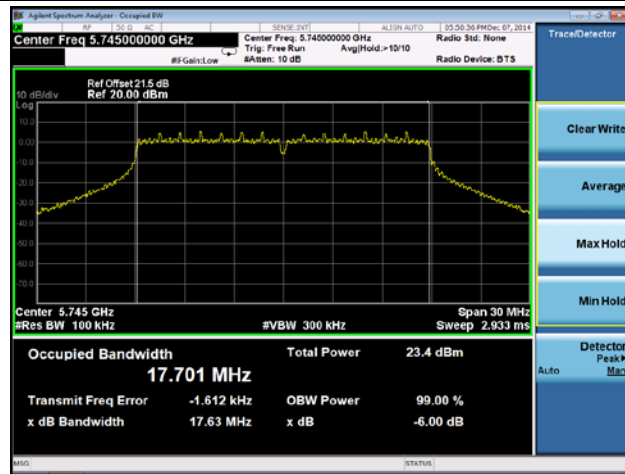


Channel 165 (5825MHz)

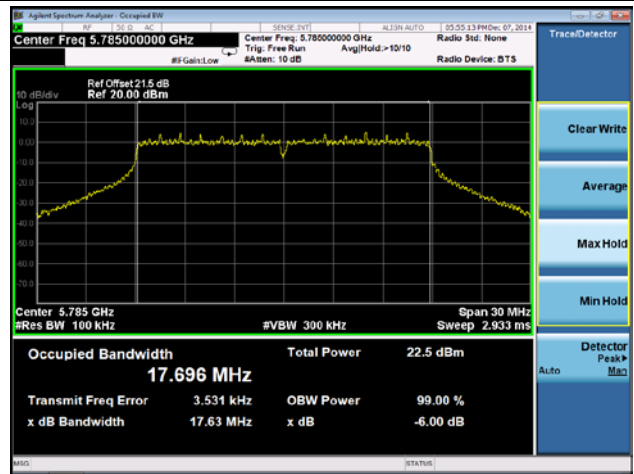


802.11n-HT20 6dB Bandwidth - Ant 3 / Ant 0 + 1 + 2 + 3

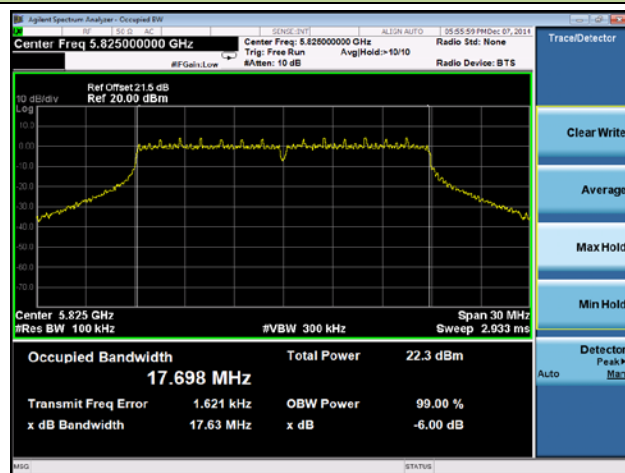
Channel 149 (5745MHz)



Channel 157 (5785MHz)

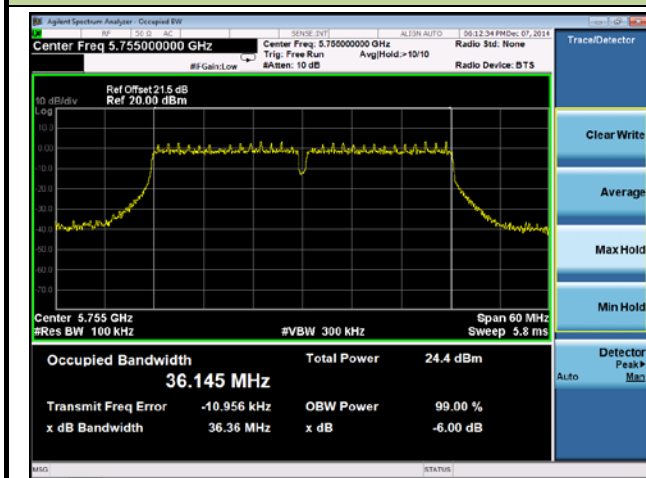


Channel 165 (5825MHz)

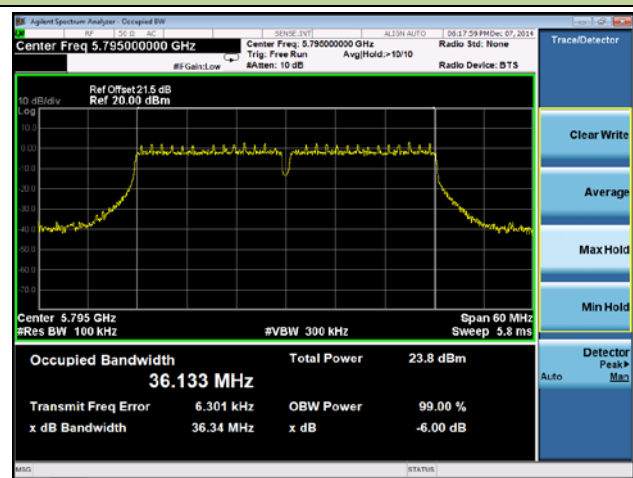


802.11n-HT40 6dB Bandwidth - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 151 (5755MHz)

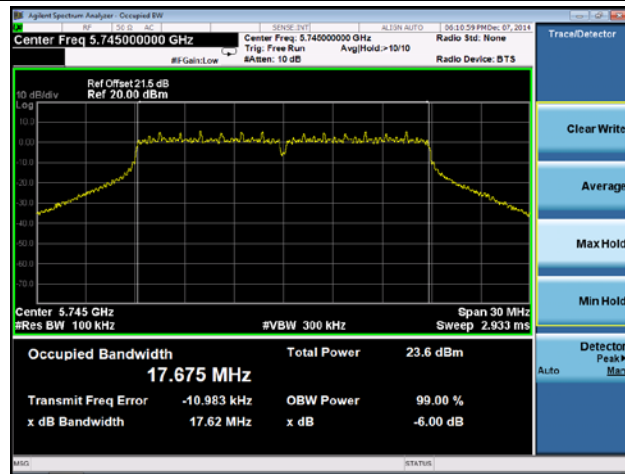


Channel 159 (5795MHz)

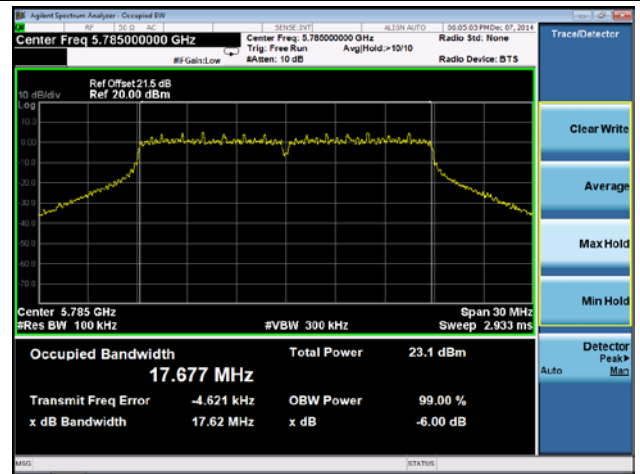


802.11ac-VHT20 6dB Bandwidth - Ant 3 / Ant 0 + 1 + 2 + 3

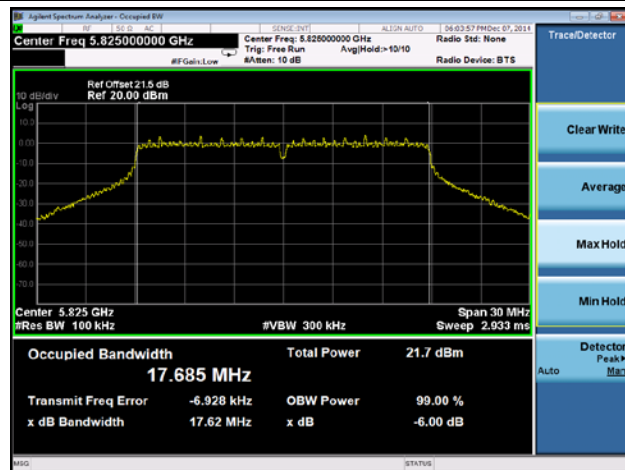
Channel 149 (5745MHz)



Channel 157 (5785MHz)

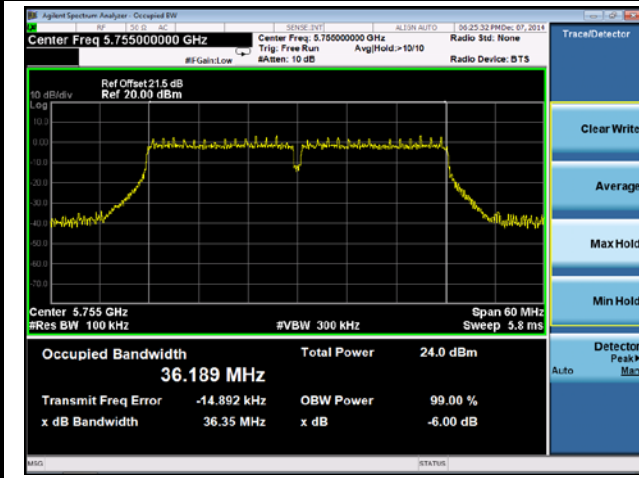


Channel 165 (5825MHz)

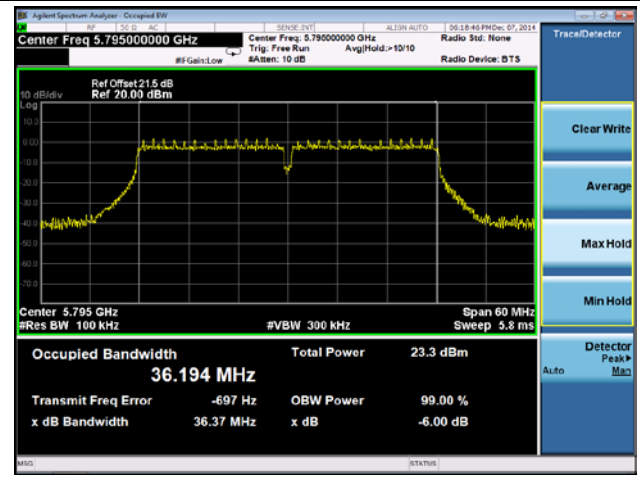


802.11ac-VHT40 6dB Bandwidth - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 151 (5755MHz)

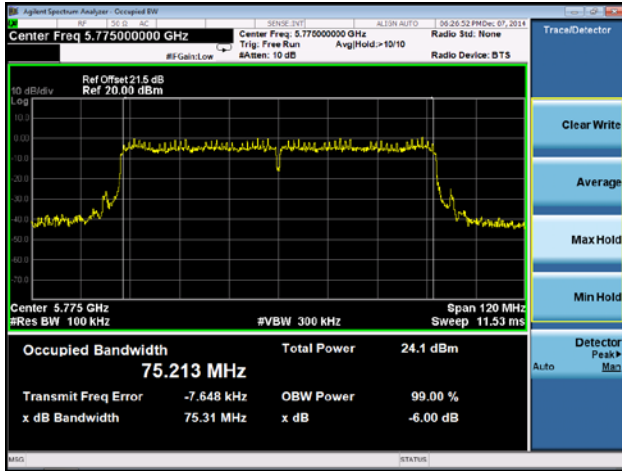


Channel 159 (5795MHz)



802.11ac-VHT80 6dB Bandwidth - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 155 (5775MHz)



7.4. Output Power Measurement

7.4.1. Test Limit

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 (30dBm).

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.15-5.25GHz: Limit (dBm) = 30dBm - (6.92dBi - 6dBi) = 29.08dBm

5.725-5.85GHz: Limit (dBm) = 30dBm - (7.39dBi - 6dBi) = 28.61dBm

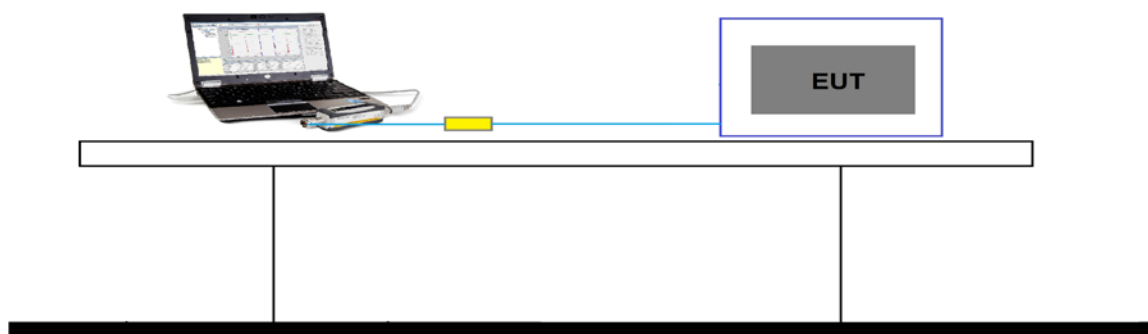
7.4.2. Test Procedure Used

KDB 789033 D02v01 - Section E) 3) b) Method PM-G

7.4.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.4.4. Test Setup



7.4.5. Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (yellow marker) for final test of each channel.

N _{Tx}	a	MCS Index for 802.11n	Data Rate (Mbps)			
			20MHz Bandwidth		40MHz Bandwidth	
			800ns GI	400ns GI	800ns GI	400ns GI
4	6	24	26.0	28.8	54.0	60.0
4	9	25	52.0	57.6	108.0	120.0
4	12	26	78.0	86.8	162.0	180.0
4	18	27	104.0	115.6	216.0	240.0
4	24	28	156.0	173.2	324.0	360.0
4	36	29	208.0	231.2	342.0	480.0
4	48	30	234.0	260.0	486.0	540.0
4	54	31	260.0	288.8	540.0	600.0

N _{Tx}	MCS Index for 802.11ac	Data Rate (Mbps)					
		20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
		800ns GI	400ns GI	800ns GI	400ns GI	800ns GI	400ns GI
4	0	26.0	28.9	54.0	60.0	117.0	130.0
4	1	52.0	57.8	108.0	120.0	234.0	260.0
4	2	78.0	86.7	162.0	180.0	351.0	390.0
4	3	104.0	115.6	216.0	240.0	468.0	520.0
4	4	156.0	173.3	324.0	360.0	702.0	780.0
4	5	208.0	231.1	432.0	480.0	936.0	1040.0
4	6	234.0	260.0	486.0	540.0	1053.0	1170.0
4	7	260.0	288.9	540.0	600.0	1170.0	1300.0
4	8	312.0	246.7	648.0	720.0	1404.0	1560.0
4	9	--	--	720.0	800.0	1560.0	1733.3

Note: Power output test was verified over all data rates of each mode shown as above, and then choose the maximum power output (yellow marker) for final test of each channel.

Output power at various data rates for Ant 0 /Ant 0 + 1 + 2 + 3:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate (Mbps)	RMS Power (dBm)
802.11a	20	60	5180	6	20.744
				24	20.132
				54	19.898
802.11n	20	60	5180	26	20.713
				156	20.225
				260	19.991
802.11n	40	62	5190	54	20.669
				324	20.108
				540	19.877
802.11ac	20	60	5180	26	20.247
				156	19.889
				312	19.562
802.11ac	40	62	5190	54	16.183
				324	15.766
				720	15.212
802.11ac	80	58	5210	117	16.104
				702	15.767
				1560	15.421

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 RMS Power (dBm)	Ant 1 RMS Power (dBm)	Ant 2 RMS Power (dBm)	Ant 3 RMS Power (dBm)	Total RMS Power (dBm)	Limit (dBm)	Result
11a	6	36	5180	20.74	22.11	21.46	20.83	27.34	≤29.08	Pass
11a	6	44	5220	20.70	21.82	21.32	20.90	27.23	≤29.08	Pass
11a	6	48	5240	20.56	21.54	21.17	20.91	27.08	≤29.08	Pass
11a	6	149	5745	19.41	20.02	18.71	18.90	25.31	≤28.61	Pass
11a	6	157	5785	20.43	20.80	19.46	19.53	26.11	≤28.61	Pass
11a	6	165	5825	19.43	19.87	18.59	18.87	25.24	≤28.61	Pass
11n-HT20	26	36	5180	20.71	21.78	20.93	20.45	27.02	≤29.08	Pass
11n-HT20	26	44	5220	20.50	21.64	20.62	20.74	26.92	≤29.08	Pass
11n-HT20	26	48	5240	20.45	21.41	20.28	20.80	26.78	≤29.08	Pass
11n-HT20	26	149	5745	20.05	20.37	19.32	19.73	25.91	≤28.61	Pass
11n-HT20	26	157	5785	20.06	20.33	19.21	19.60	25.84	≤28.61	Pass
11n-HT20	26	165	5825	20.08	20.64	19.34	19.82	26.01	≤28.61	Pass
11n-HT40	54	38	5190	17.07	18.16	17.90	17.57	23.71	≤29.08	Pass
11n-HT40	54	46	5230	20.35	21.89	21.67	21.35	27.37	≤29.08	Pass
11n-HT40	54	151	5755	20.58	20.62	20.11	20.01	26.36	≤28.61	Pass
11n-HT40	54	159	5795	20.54	20.92	19.70	20.02	26.34	≤28.61	Pass
11ac-VHT20	26	36	5180	20.67	21.82	21.00	21.35	27.25	≤29.08	Pass
11ac-VHT20	26	44	5220	19.89	21.46	20.51	22.48	27.22	≤29.08	Pass
11ac-VHT20	26	48	5240	19.54	21.44	21.03	22.56	27.29	≤29.08	Pass
11ac-VHT20	26	149	5745	20.25	20.71	19.45	19.76	26.09	≤28.61	Pass
11ac-VHT20	26	157	5785	20.25	20.77	19.48	20.01	26.17	≤28.61	Pass
11ac-VHT20	26	165	5825	19.37	19.84	18.48	19.81	25.43	≤28.61	Pass
11ac-VHT40	54	38	5190	16.18	17.32	16.57	17.39	22.91	≤29.08	Pass
11ac-VHT40	54	46	5230	19.76	21.70	21.73	22.95	27.70	≤29.08	Pass
11ac-VHT40	54	151	5755	20.65	20.74	19.82	19.94	26.32	≤28.61	Pass
11ac-VHT40	54	159	5795	20.56	20.50	19.60	20.54	26.34	≤28.61	Pass
11ac-VHT80	117	42	5210	16.10	17.91	17.38	17.90	23.40	≤29.08	Pass
11ac-VHT80	117	155	5775	19.99	20.28	19.33	19.81	25.89	≤28.61	Pass

Note: The Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

7.5. Transmit Power Control

7.5.1. Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

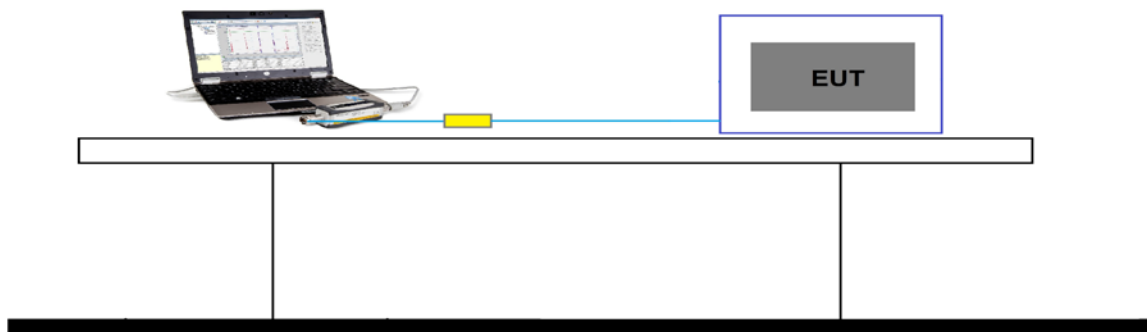
7.5.2. Test Procedure Used

KDB 789033 D02v01 - Section E) 3) b) Method PM-G

7.5.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.5.4. Test Setup



7.5.5. Test Result

The device operating in the 5150 ~ 5250MHz & 5725 ~ 5850MHz band shall not employ the TPC mechanism, so not assessed this test.

7.6. Power Spectral Density Measurement

7.6.1. Test Limit

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.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.15-5.25GHz: Limit (dBm/MHz) = 17dBm/MHz - (6.92dBi - 6dBi) = 16.08dBm/MHz

5.725-5.85GHz: Limit (dBm/500kHz) = 30dBm/500kHz - (7.39dBi - 6dBi) = 28.61dBm/500kHz

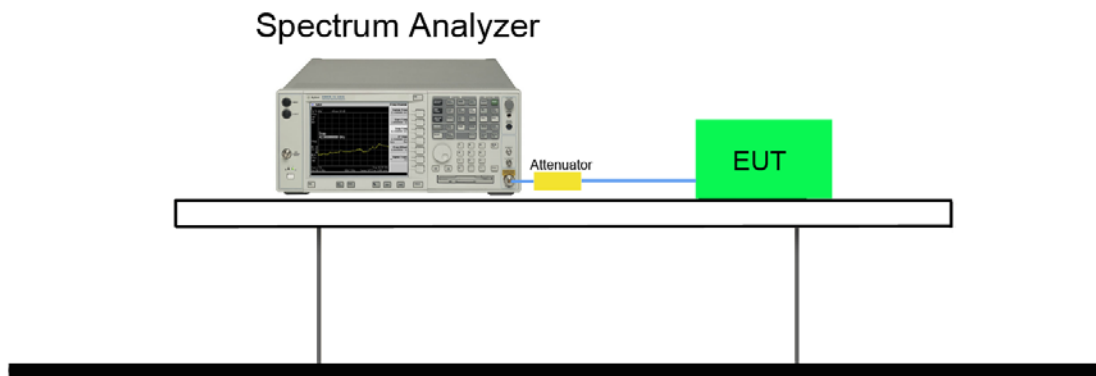
7.6.2. Test Procedure Used

KDB 789033 D02v01 - Section F

7.6.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz,
RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points $\geq 2 \times (\text{span} / \text{RBW})$
6. Detector = power averaging (RMS)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add $10 \cdot \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \cdot \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor $10 \cdot \log(500\text{kHz}/100\text{kHz}) = 7$ dB to the measured result

7.6.4. Test Setup



7.6.5. Test Result

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)	Limit (dBm/MHz)	Result
11a	6	36	5180	5.732	6.699	6.194	6.193	99.1	12.239	≤16.08	Pass
11a	6	44	5220	5.721	6.616	6.217	6.053	99.1	12.184	≤16.08	Pass
11a	6	48	5240	5.552	6.360	5.777	5.412	99.1	11.811	≤16.08	Pass
11n-HT20	26	36	5180	4.876	6.137	5.221	5.314	97.0	11.565	≤16.08	Pass
11n-HT20	26	44	5220	4.961	6.179	5.404	4.744	97.0	11.510	≤16.08	Pass
11n-HT20	26	48	5240	4.876	5.701	4.935	4.754	97.0	11.236	≤16.08	Pass
11n-HT40	54	38	5190	-1.714	-0.017	-1.096	-1.290	90.7	5.462	≤16.08	Pass
11n-HT40	54	46	5230	2.717	3.756	3.142	2.129	90.7	9.421	≤16.08	Pass
11ac-VHT20	26	36	5180	5.395	6.318	4.984	5.345	97.9	11.652	≤16.08	Pass
11ac-VHT20	26	44	5220	5.224	6.017	5.284	4.626	97.9	11.429	≤16.08	Pass
11ac-VHT20	26	48	5240	4.709	5.720	5.069	4.167	97.9	11.066	≤16.08	Pass
11ac-VHT40	54	38	5190	-2.597	-0.965	-1.959	-2.319	95.3	4.315	≤16.08	Pass
11ac-VHT40	54	46	5230	2.297	3.688	2.532	1.940	95.3	8.895	≤16.08	Pass
11ac-VHT80	117	42	5210	-4.329	-2.677	-3.733	-4.058	89.5	2.850	≤16.08	Pass

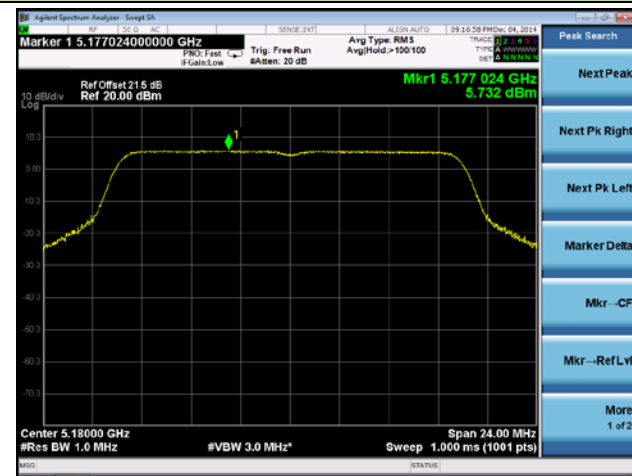
Note: When EUT duty cycle < 98%, the total PSD = $10 \cdot \log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\} + 10 \cdot \log(1/\text{duty cycle})$

Test Mode	Data Rate (Mbps)	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 PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
11a	6	5745	-4.012	-2.899	-4.058	-3.750	99.1	7	9.367	≤28.61	Pass
11a	6	5785	-3.959	-2.711	-4.387	-3.982	99.1	7	9.308	≤28.61	Pass
11a	6	5825	-4.498	-3.833	-5.079	-4.795	99.1	7	8.494	≤28.61	Pass
11n-HT20	26	5745	-3.344	-3.039	-4.064	-4.042	97.0	7	9.553	≤28.61	Pass
11n-HT20	26	5785	-3.899	-3.429	-4.680	-4.613	97.0	7	9.029	≤28.61	Pass
11n-HT20	26	5825	-3.990	-3.351	-5.081	-4.795	97.0	7	8.902	≤28.61	Pass
11n-HT40	54	5755	-6.225	-5.457	-6.303	-6.078	90.7	7	7.442	≤28.61	Pass
11n-HT40	54	5795	-6.300	-5.763	-6.814	-6.498	90.7	7	7.118	≤28.61	Pass
11ac-VHT20	26	5745	-3.819	-2.567	-4.437	-4.302	97.9	7	9.397	≤28.61	Pass
11ac-VHT20	26	5785	-4.244	-3.094	-4.814	-4.035	97.9	7	9.111	≤28.61	Pass
11ac-VHT20	26	5825	-5.343	-4.480	-5.773	-5.232	97.9	7	7.931	≤28.61	Pass
11ac-VHT40	54	5755	-6.170	-5.008	-6.679	-6.492	95.3	7	7.193	≤28.61	Pass
11ac-VHT40	54	5795	-6.722	-6.357	-7.412	-7.142	95.3	7	6.340	≤28.61	Pass
11ac-VHT80	117	5775	-9.931	-8.342	-9.908	-9.637	89.5	7	4.100	≤28.61	Pass

Note: When EUT duty cycle < 98%, the total PSD = $10 \cdot \log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\} + 10 \cdot \log(1/\text{duty cycle}) + \text{Constant Factor}$.

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

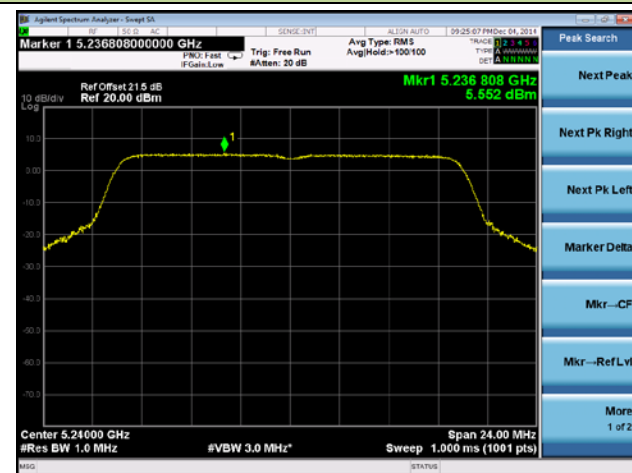
Channel 36 (5180MHz)



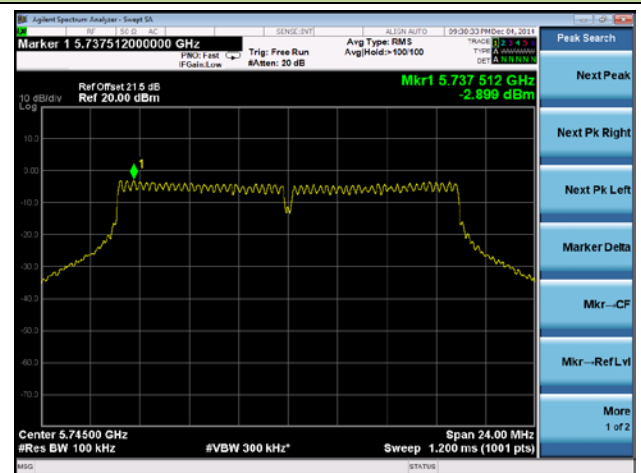
Channel 44 (5220MHz)



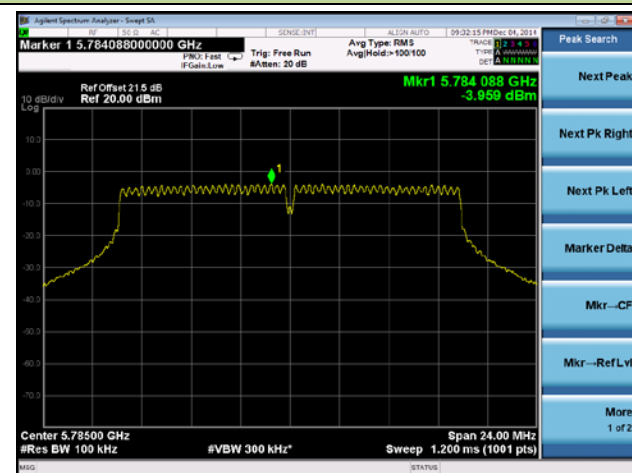
Channel 48 (5240MHz)



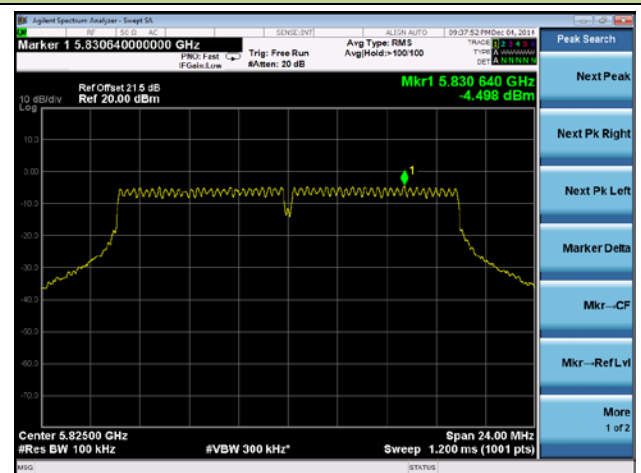
Channel 149 (5745MHz)



Channel 157 (5785MHz)

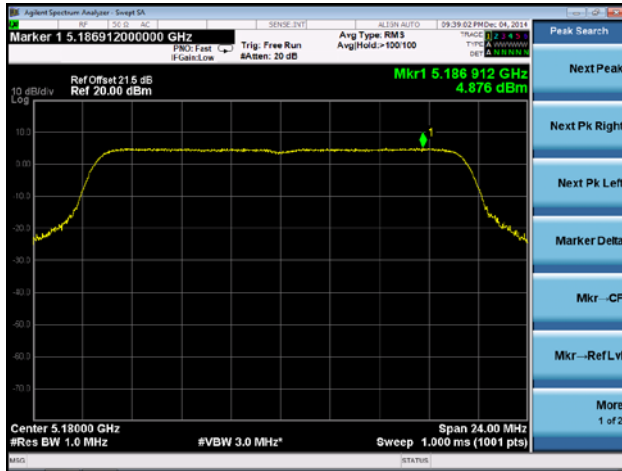


Channel 165 (5825MHz)

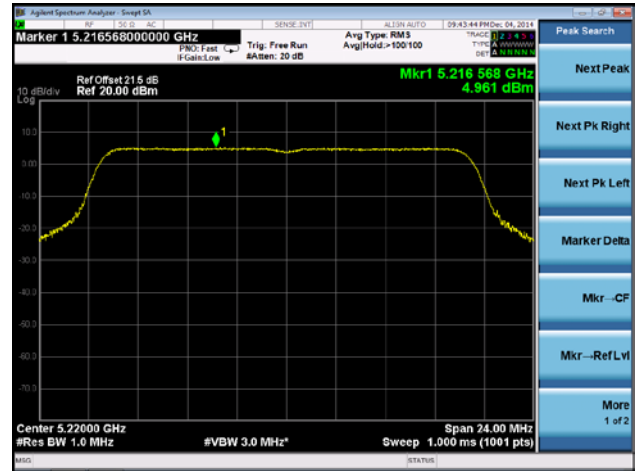


802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3

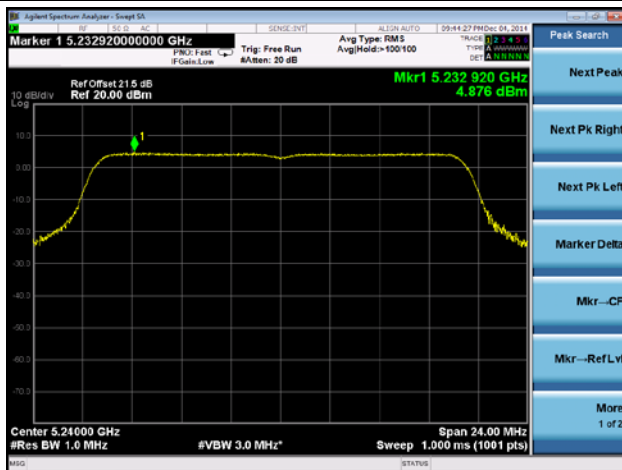
Channel 36 (5180MHz)



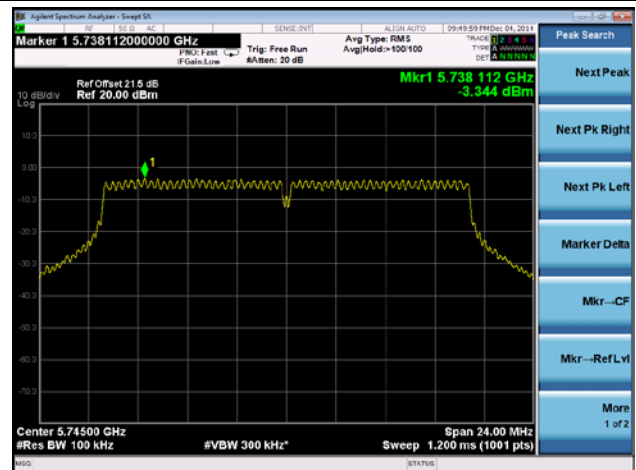
Channel 44 (5220MHz)



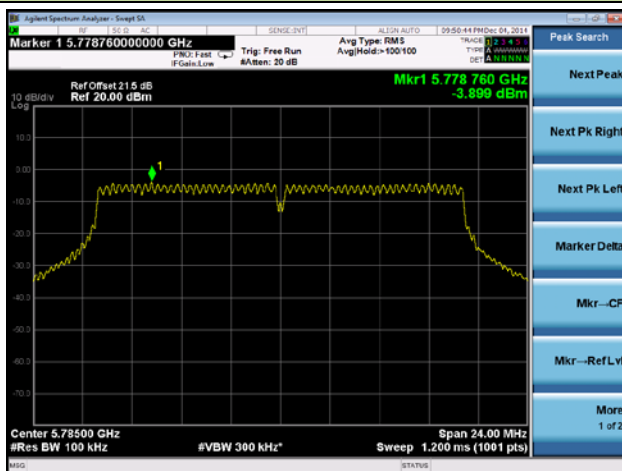
Channel 48 (5240MHz)



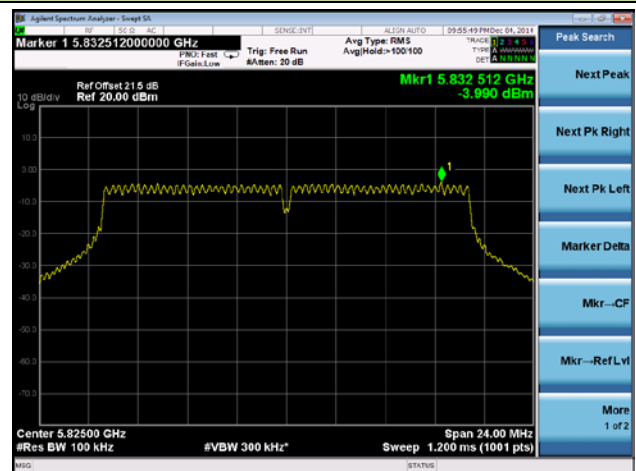
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



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

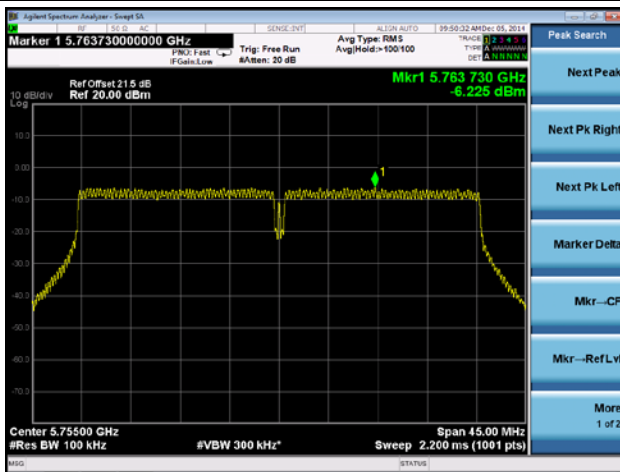
Channel 38 (5190MHz)



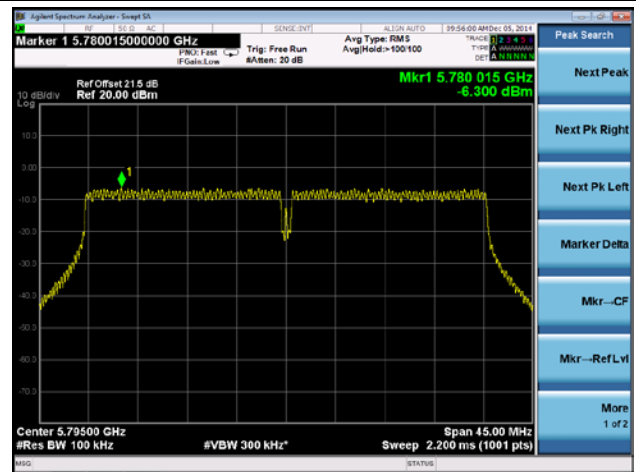
Channel 46 (5230MHz)



Channel 151 (5755MHz)

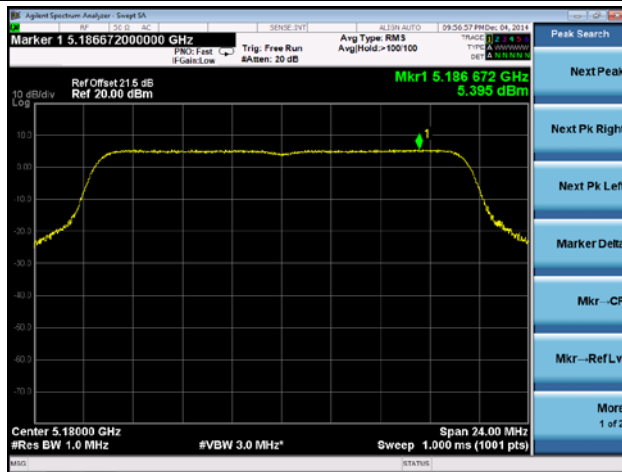


Channel 159 (5795MHz)

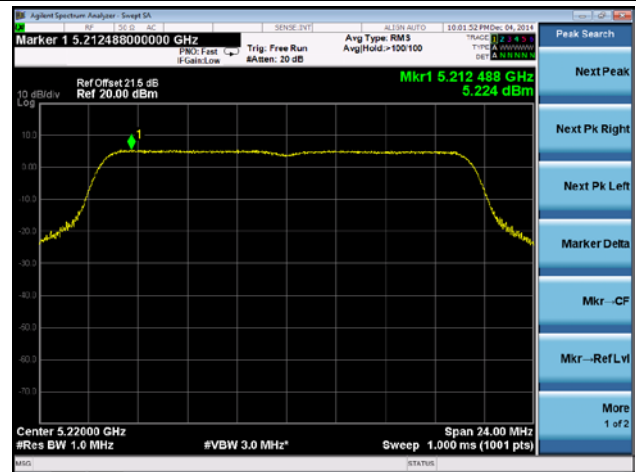


802.11ac-VHT20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3

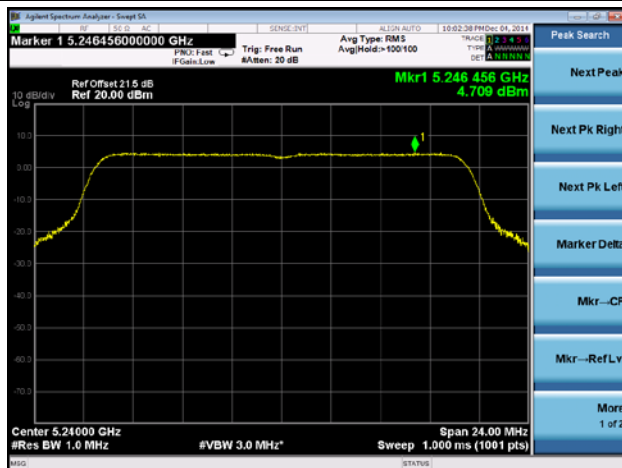
Channel 36 (5180MHz)



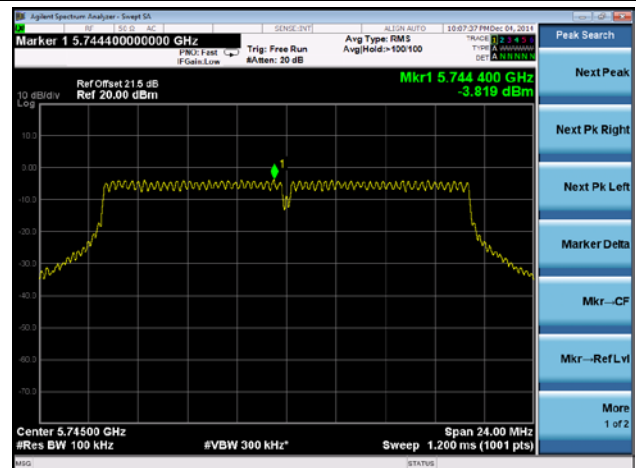
Channel 44 (5220MHz)



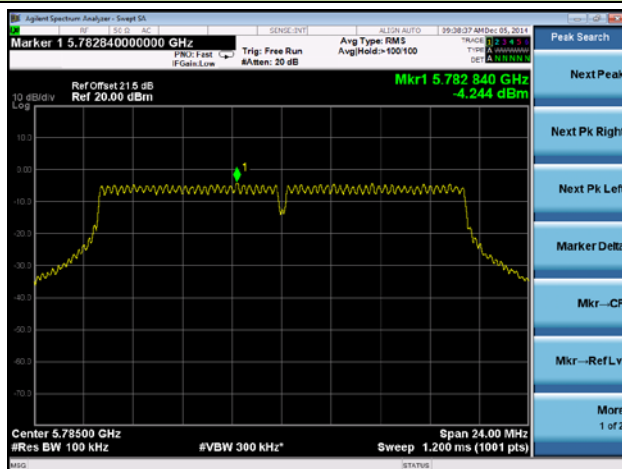
Channel 48 (5240MHz)



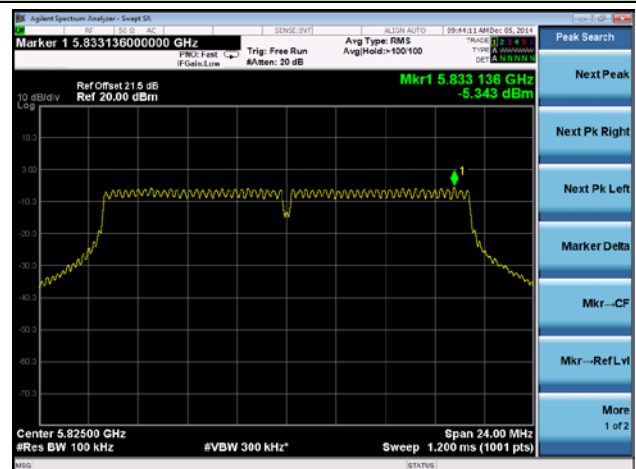
Channel 149 (5745MHz)



Channel 157 (5785MHz)

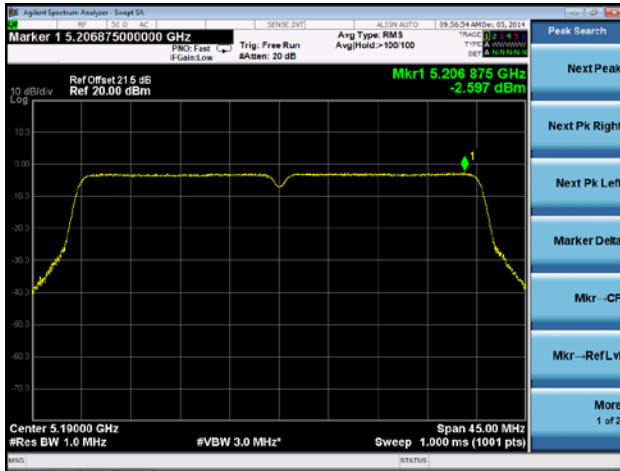


Channel 165 (5825MHz)

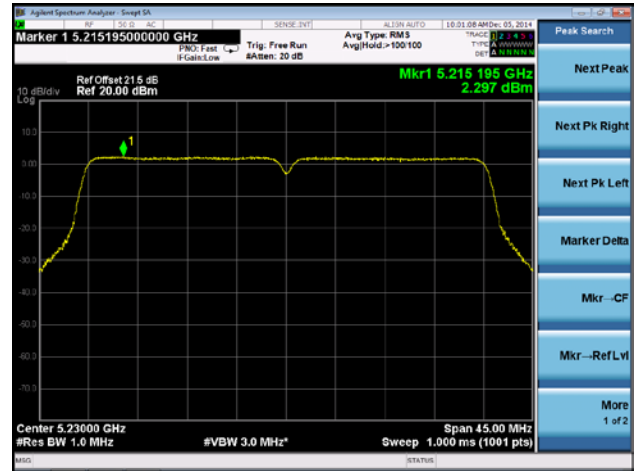


802.11ac-VHT40 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3

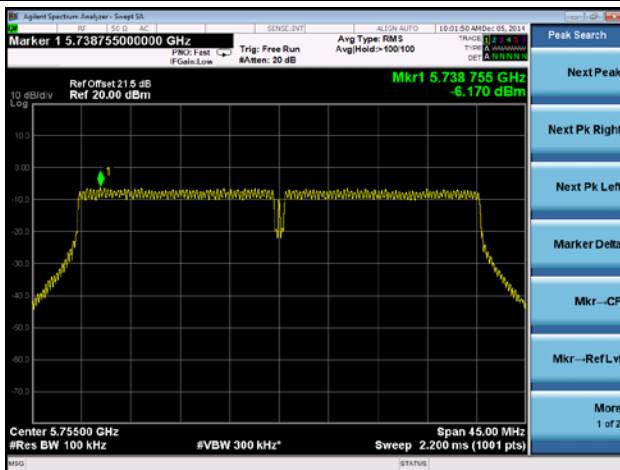
Channel 38 (5190MHz)



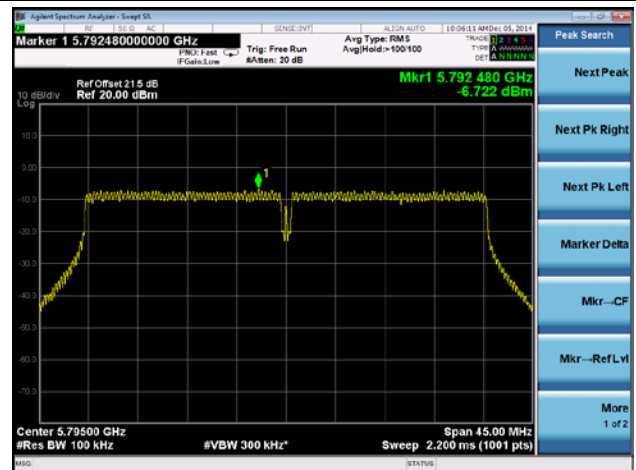
Channel 46 (5230MHz)



Channel 151 (5755MHz)

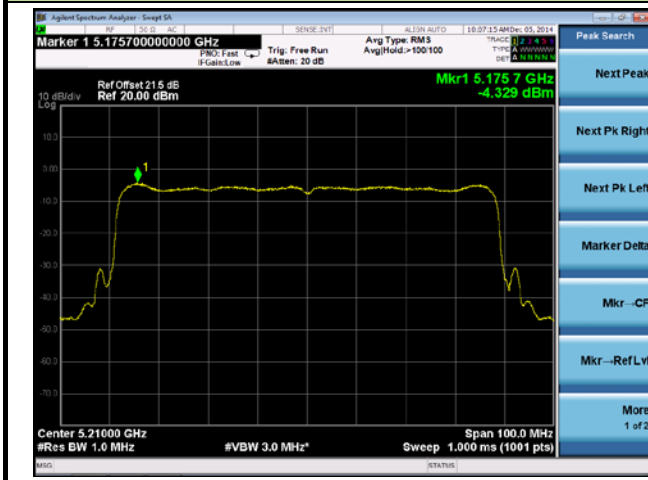


Channel 159 (5795MHz)



802.11ac-VHT80 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 42 (5210MHz)

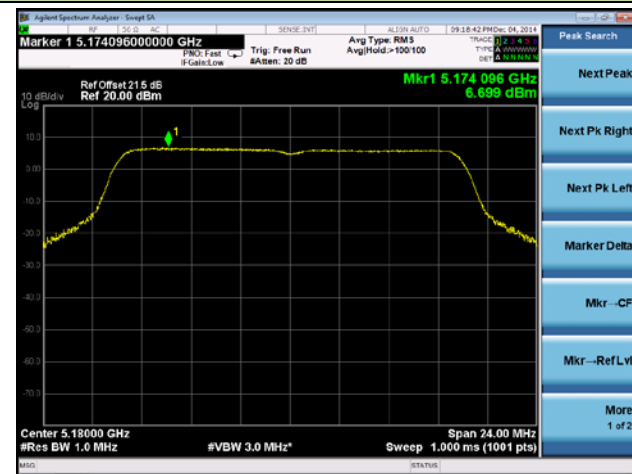


Channel 155 (5775MHz)

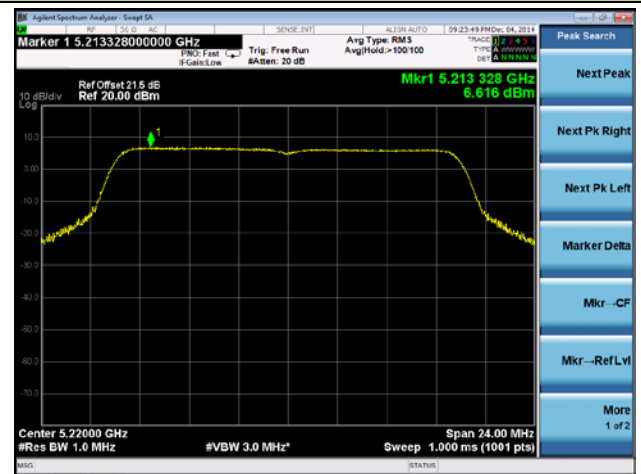


802.11a Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

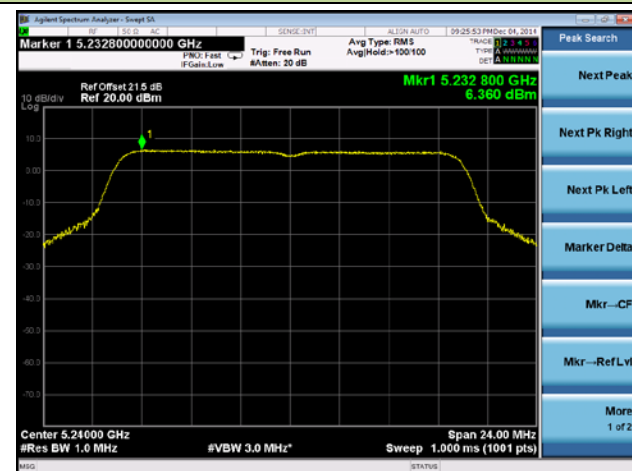
Channel 36 (5180MHz)



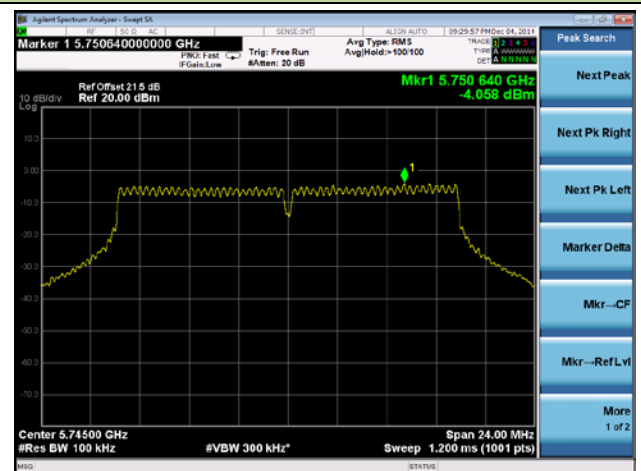
Channel 44 (5220MHz)



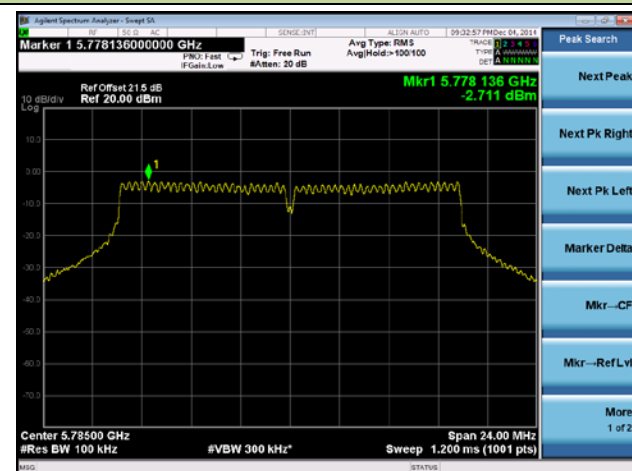
Channel 48 (5240MHz)



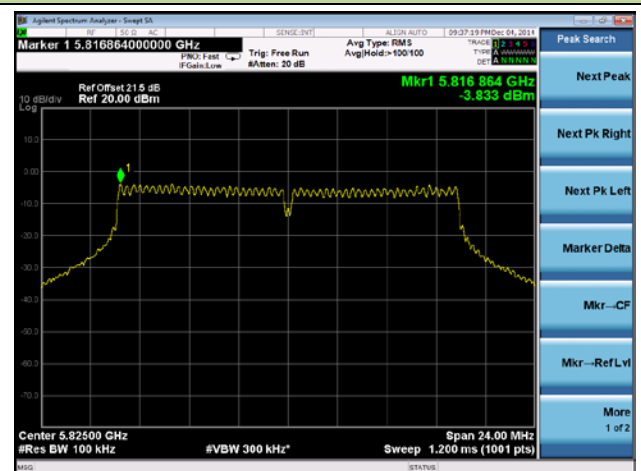
Channel 149 (5745MHz)



Channel 157 (5785MHz)

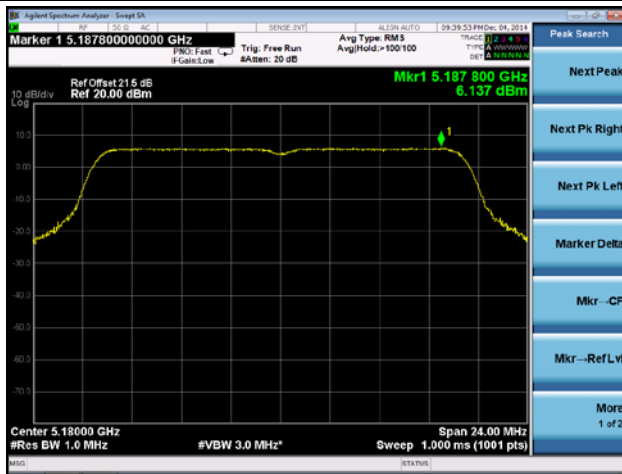


Channel 165 (5825MHz)

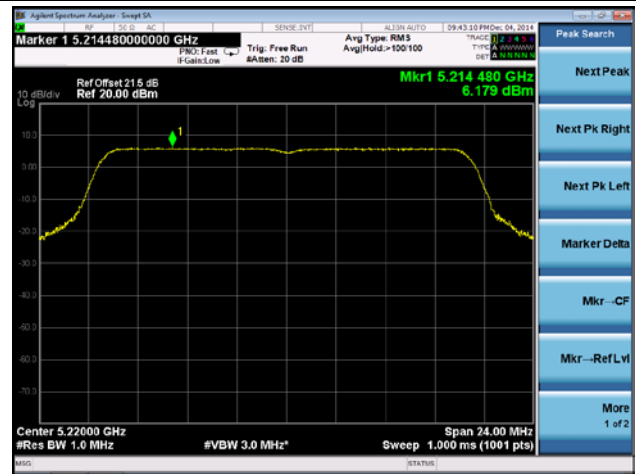


802.11n-HT20 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

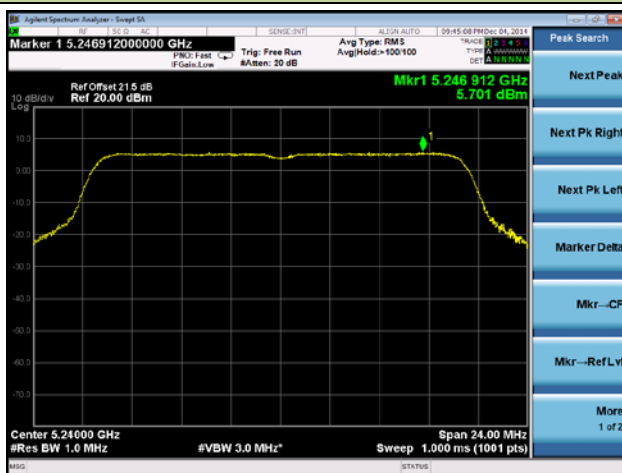
Channel 36 (5180MHz)



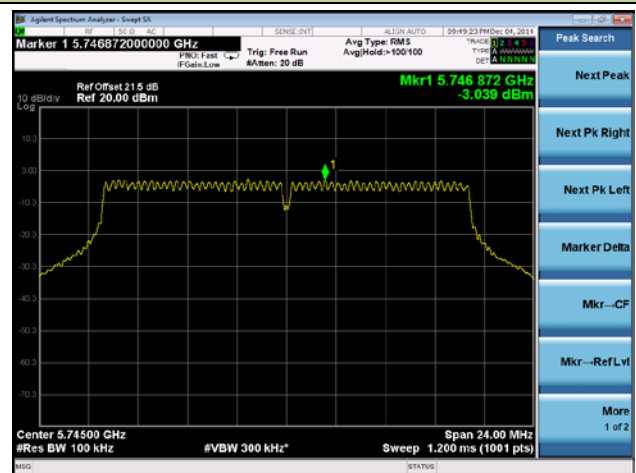
Channel 44 (5220MHz)



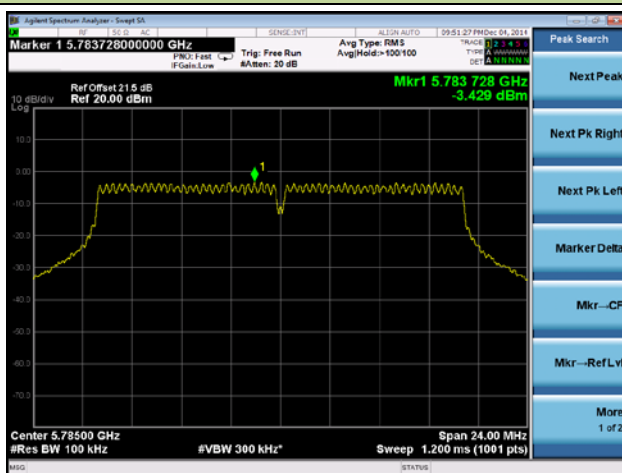
Channel 48 (5240MHz)



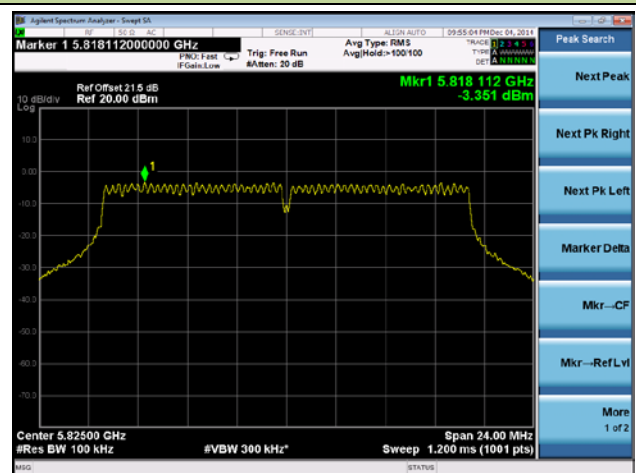
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)

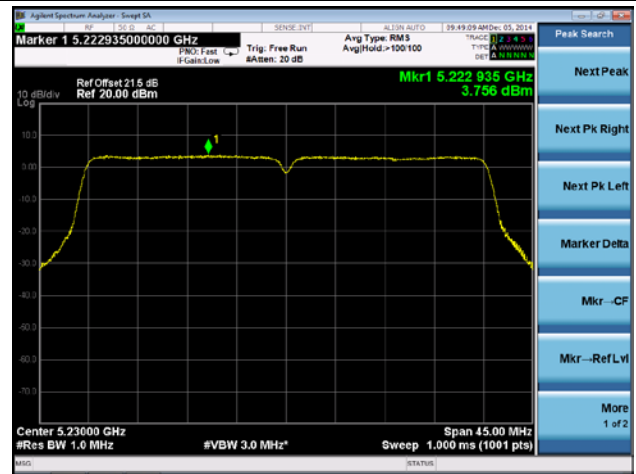


802.11n-HT40 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

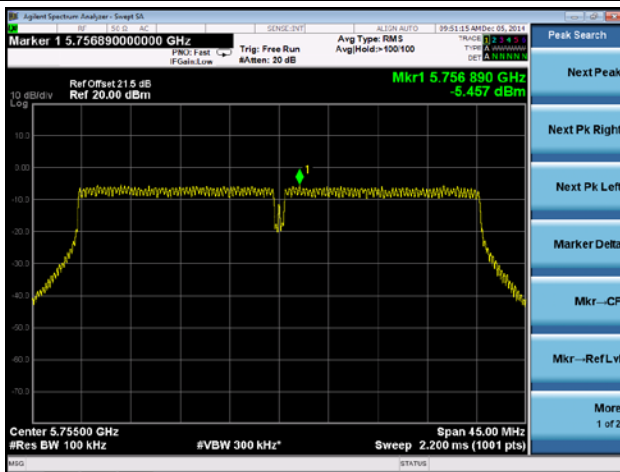
Channel 38 (5190MHz)



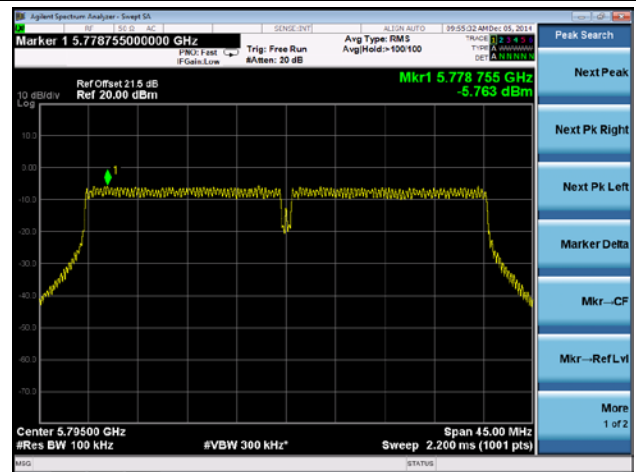
Channel 46 (5230MHz)



Channel 151 (5755MHz)

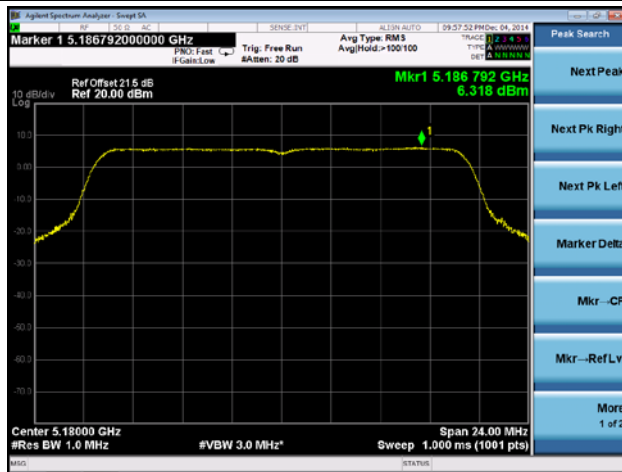


Channel 159 (5795MHz)

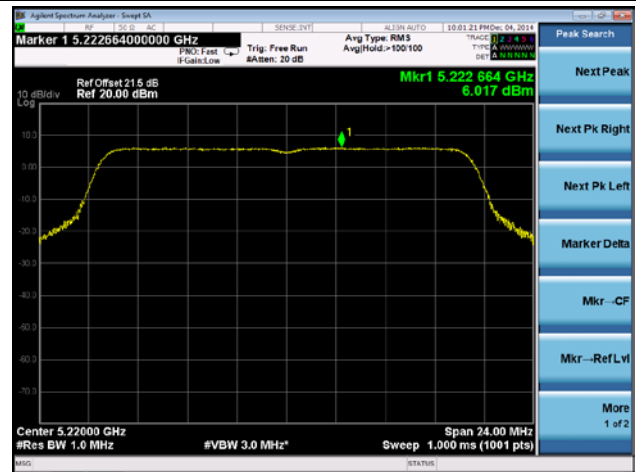


802.11ac-VHT20 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

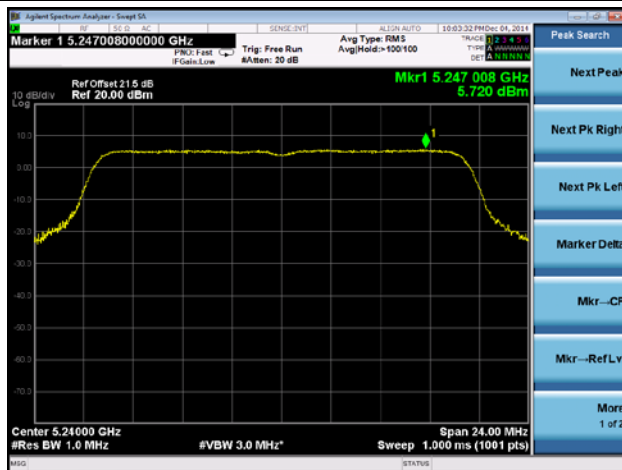
Channel 36 (5180MHz)



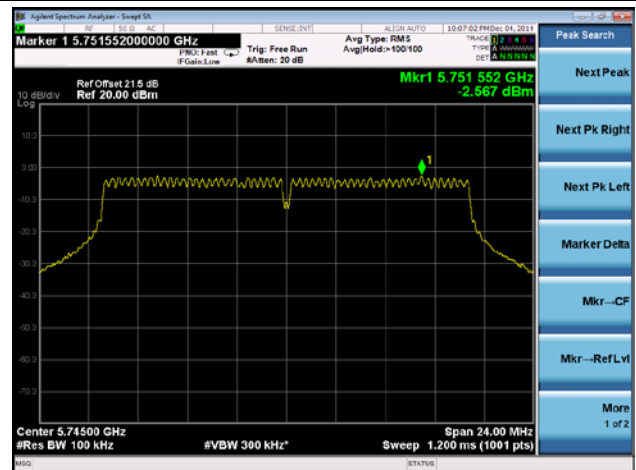
Channel 44 (5220MHz)



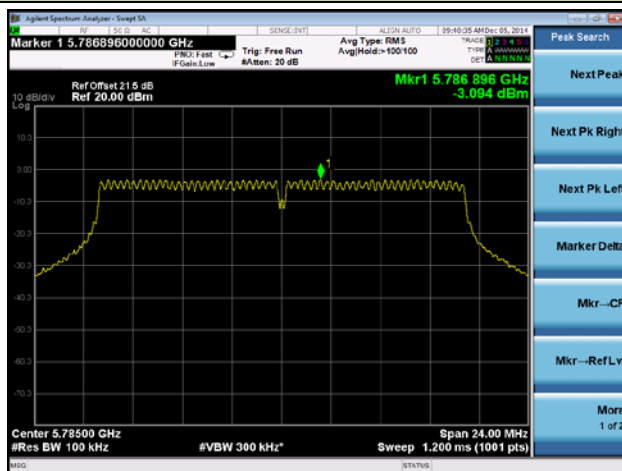
Channel 48 (5240MHz)



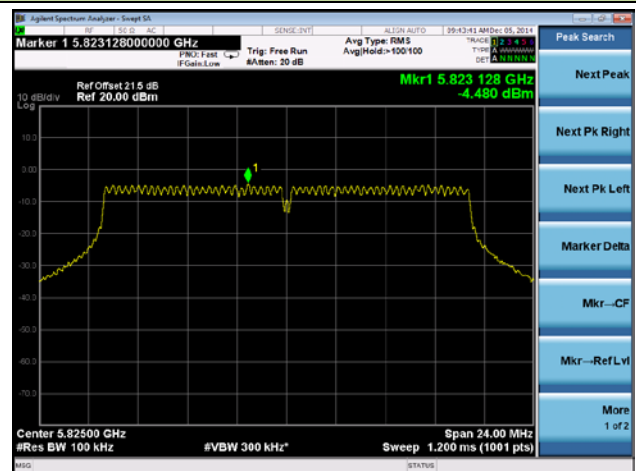
Channel 149 (5745MHz)



Channel 157 (5785MHz)

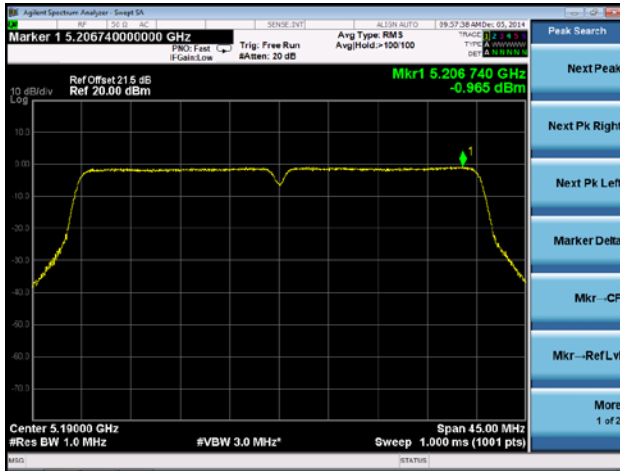


Channel 165 (5825MHz)



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

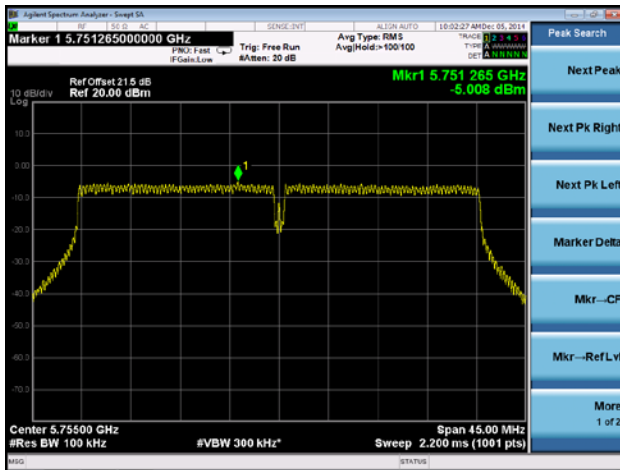
Channel 38 (5190MHz)



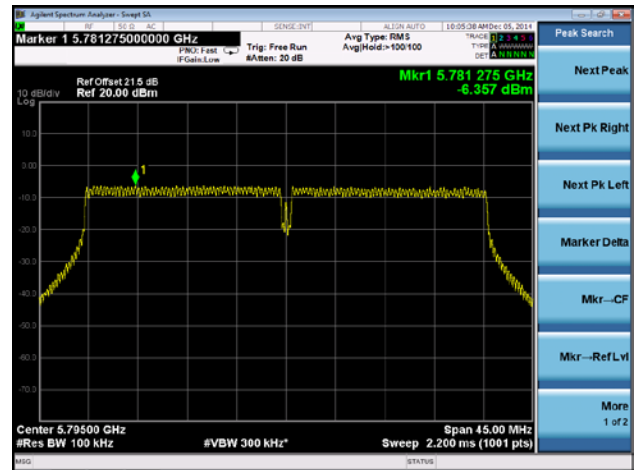
Channel 46 (5230MHz)



Channel 151 (5755MHz)

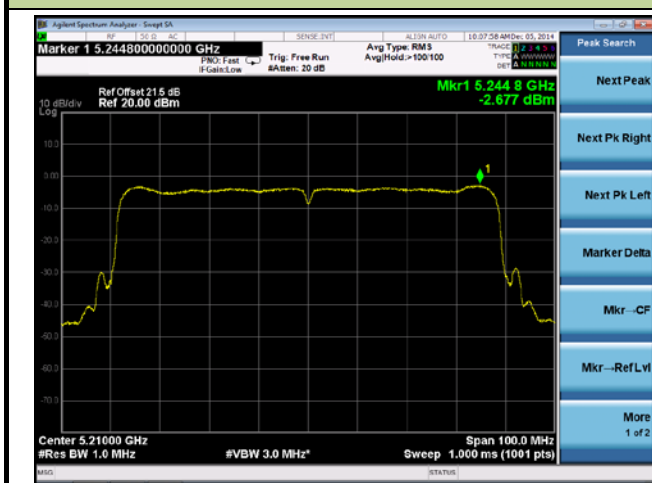


Channel 159 (5795MHz)

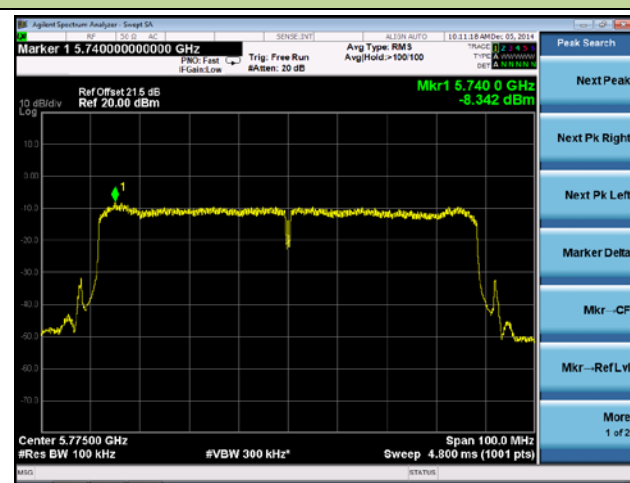


802.11ac-VHT80 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

Channel 42 (5210MHz)

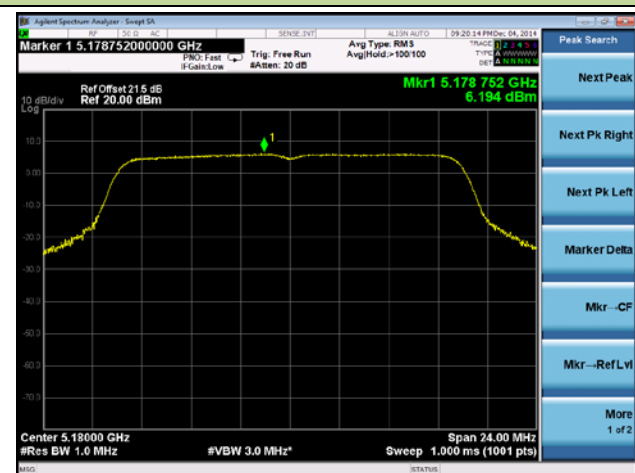


Channel 155 (5775MHz)

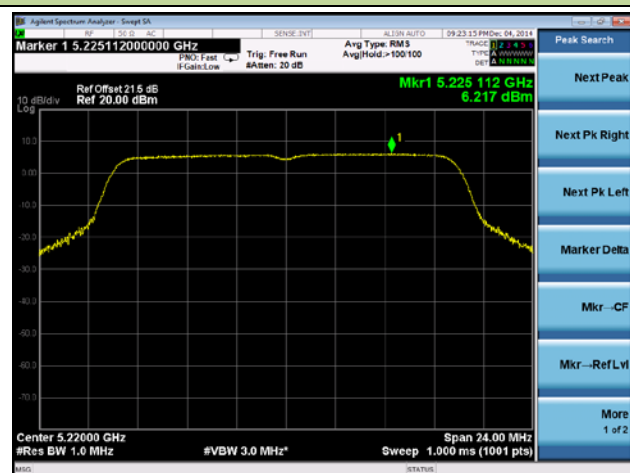


802.11a Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

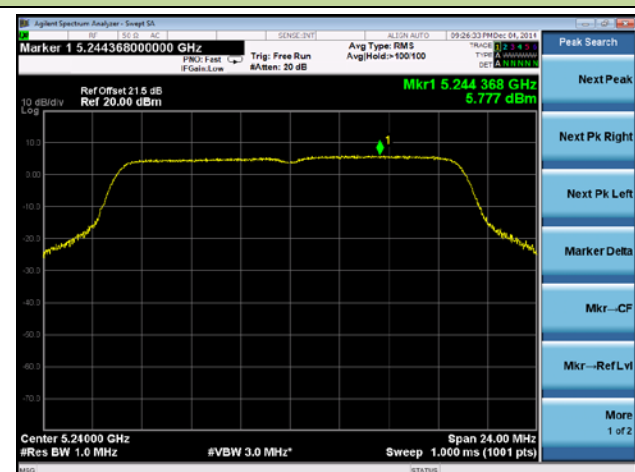
Channel 36 (5180MHz)



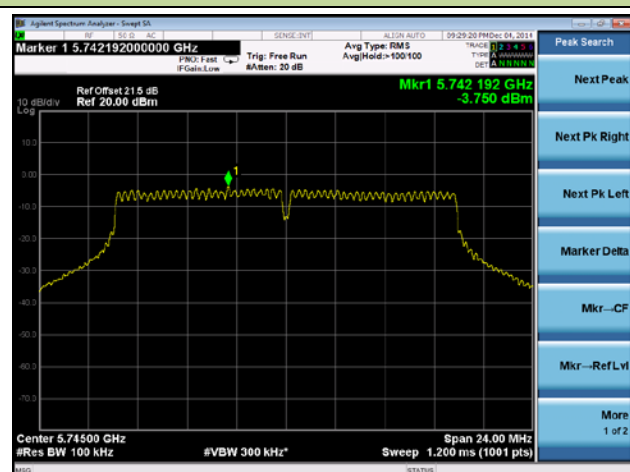
Channel 44 (5220MHz)



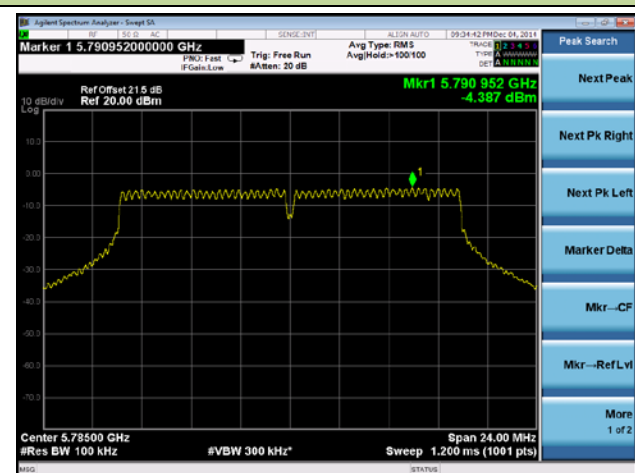
Channel 48 (5240MHz)



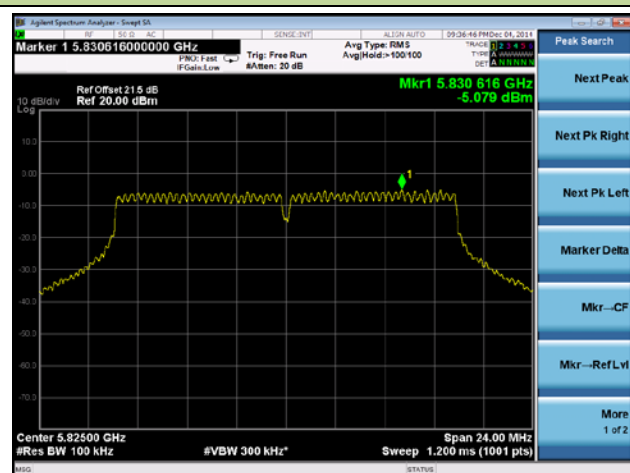
Channel 149 (5745MHz)



Channel 157 (5785MHz)

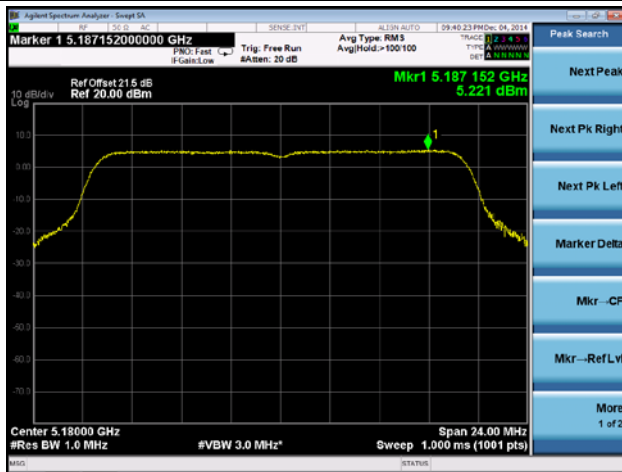


Channel 165 (5825MHz)

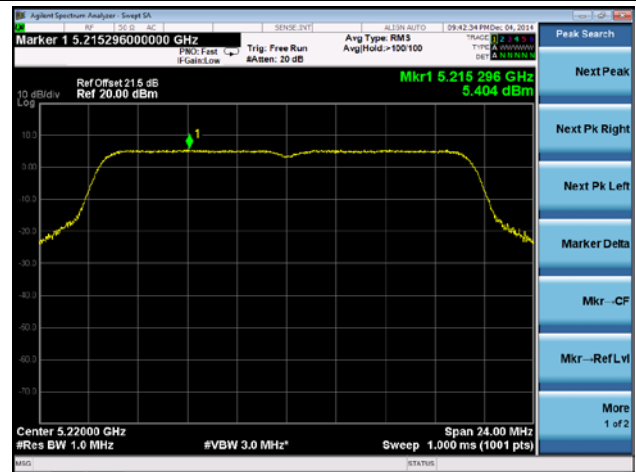


802.11n-HT20 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

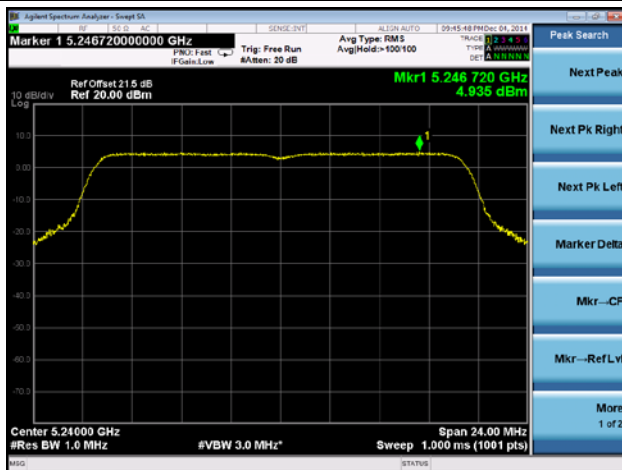
Channel 36 (5180MHz)



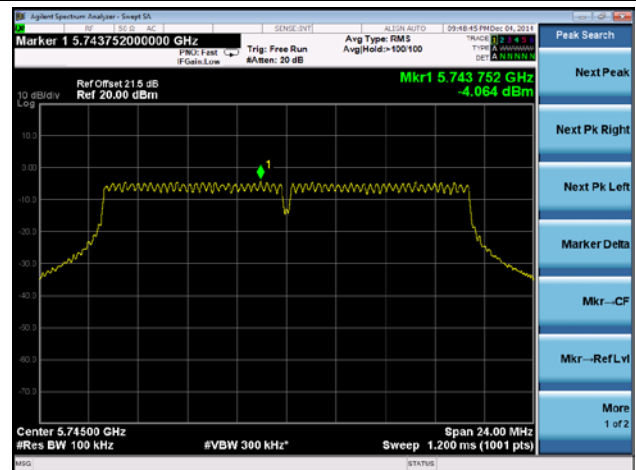
Channel 44 (5220MHz)



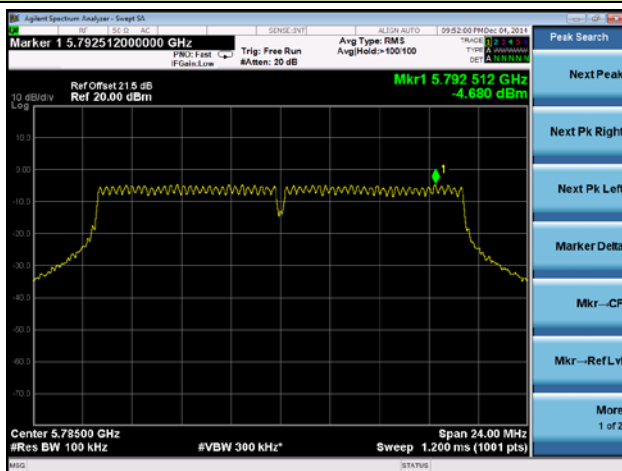
Channel 48 (5240MHz)



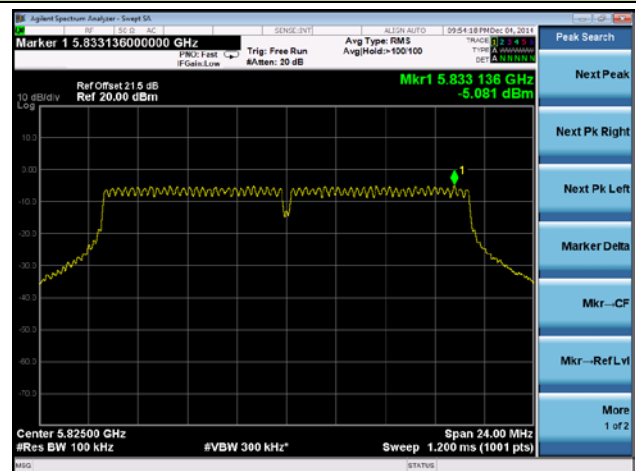
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)

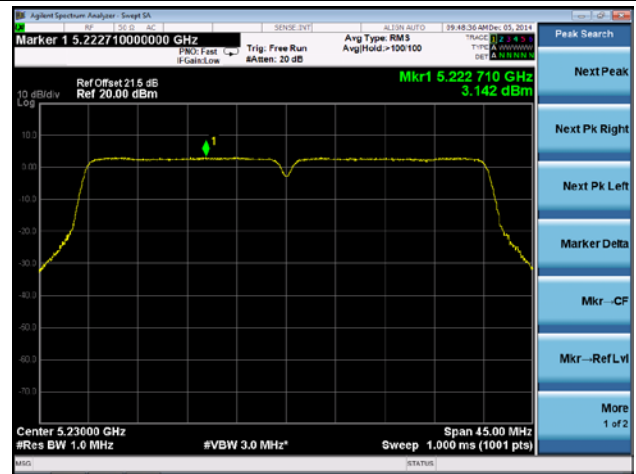


802.11n-HT40 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

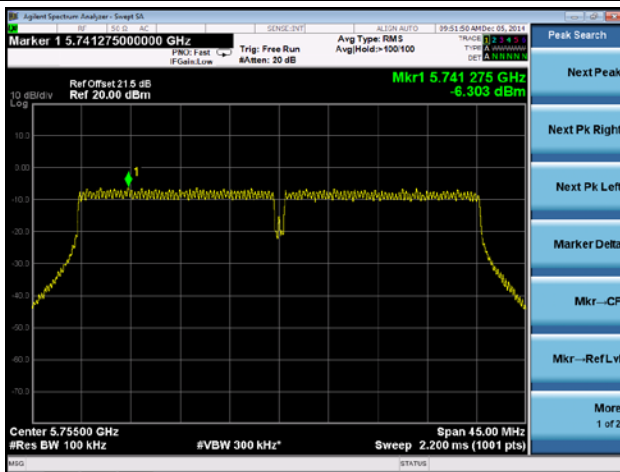
Channel 38 (5190MHz)



Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)

