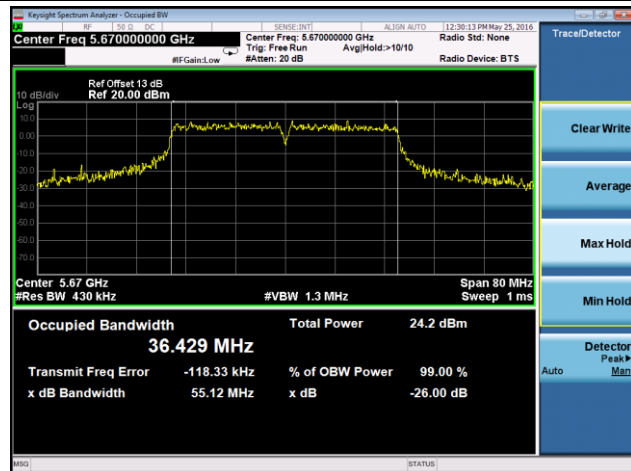
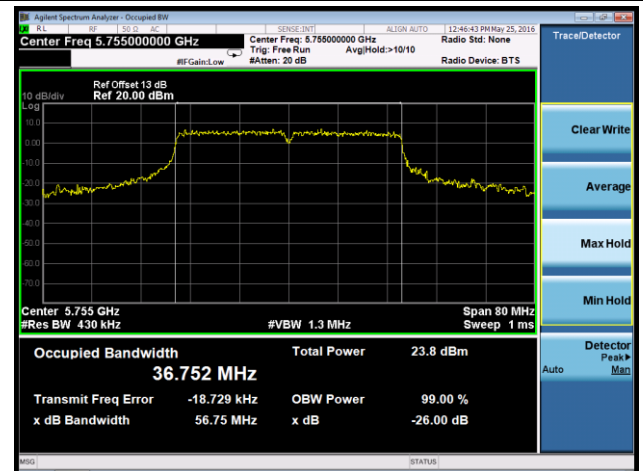


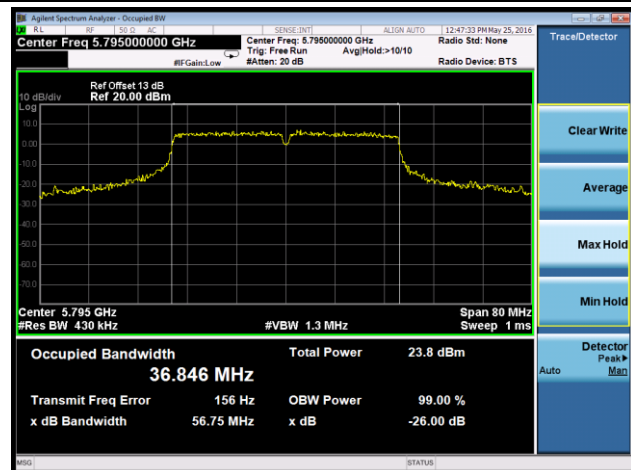
Channel 134 (5670MHz)



Channel 151 (5755MHz)

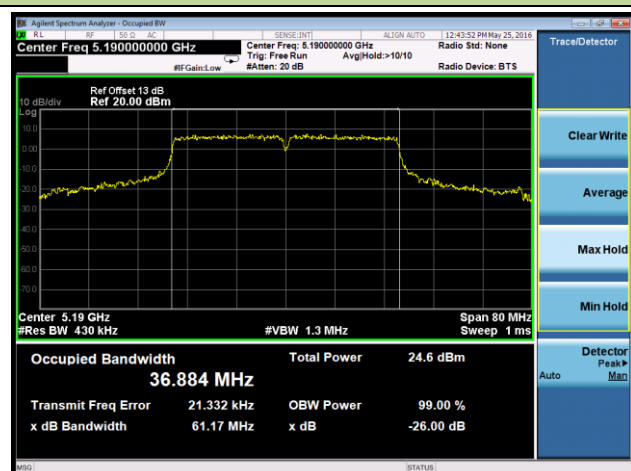


Channel 159 (5795MHz)

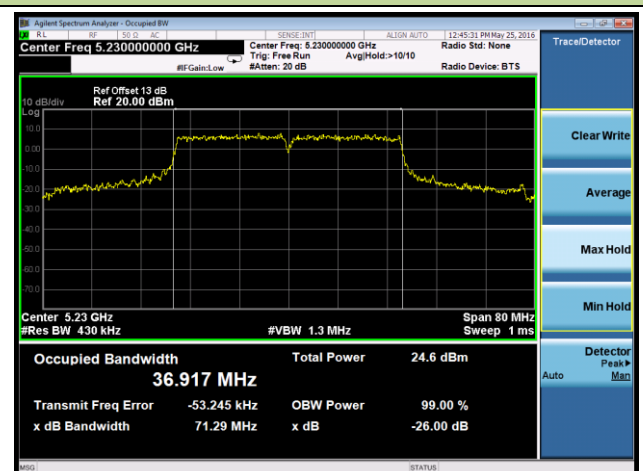


802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 1 / Ant 0 + 1

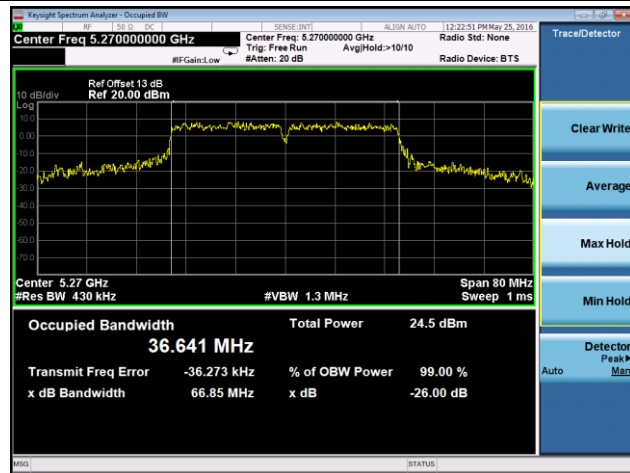
Channel 38 (5190MHz)



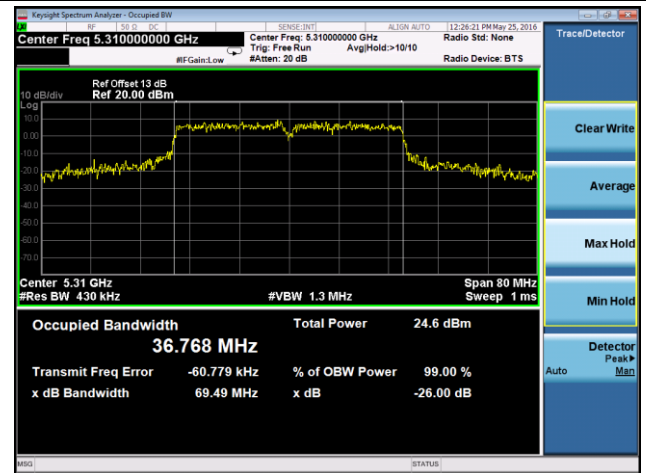
Channel 46 (5230MHz)



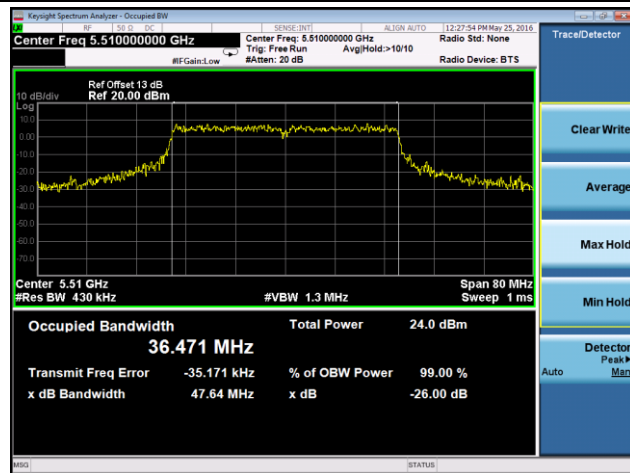
Channel 54 (5270MHz)



Channel 62 (5310MHz)



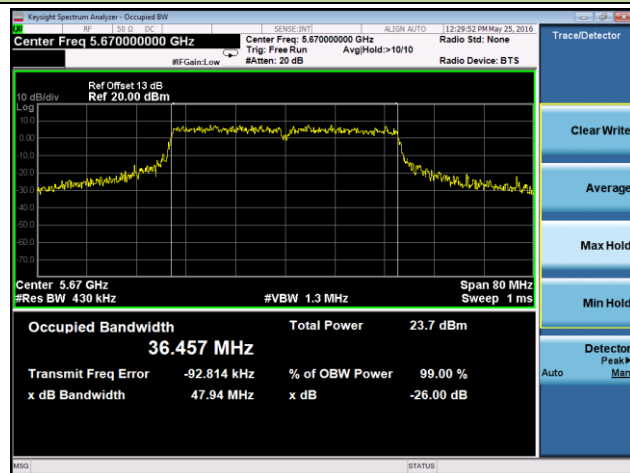
Channel 102 (5510MHz)



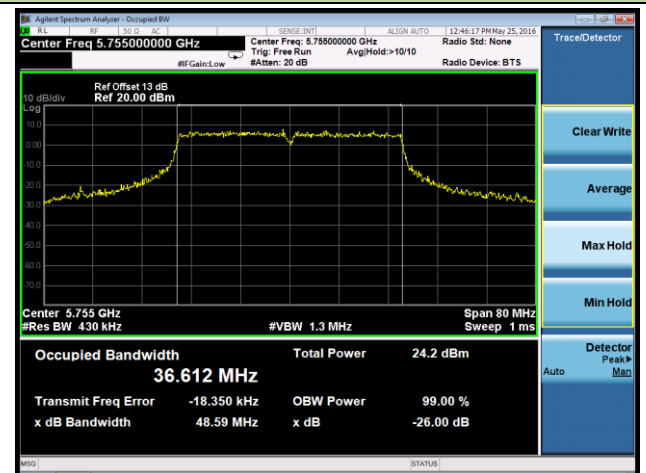
Channel 118 (5590MHz)



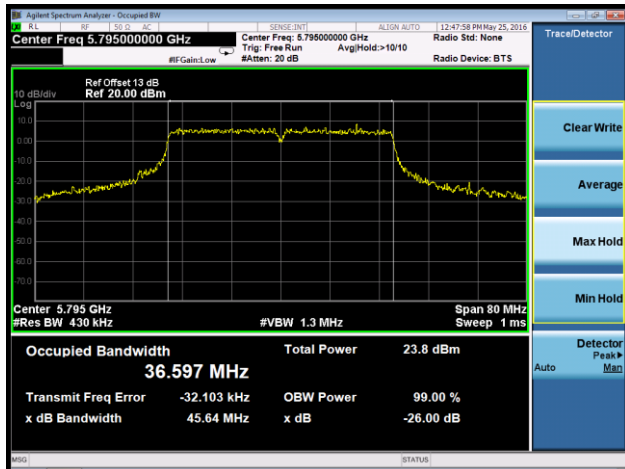
Channel 134 (5670MHz)



Channel 151 (5755 MHz)



Channel 159 (5795 MHz)



7.3. 6dB Bandwidth Measurement

7.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

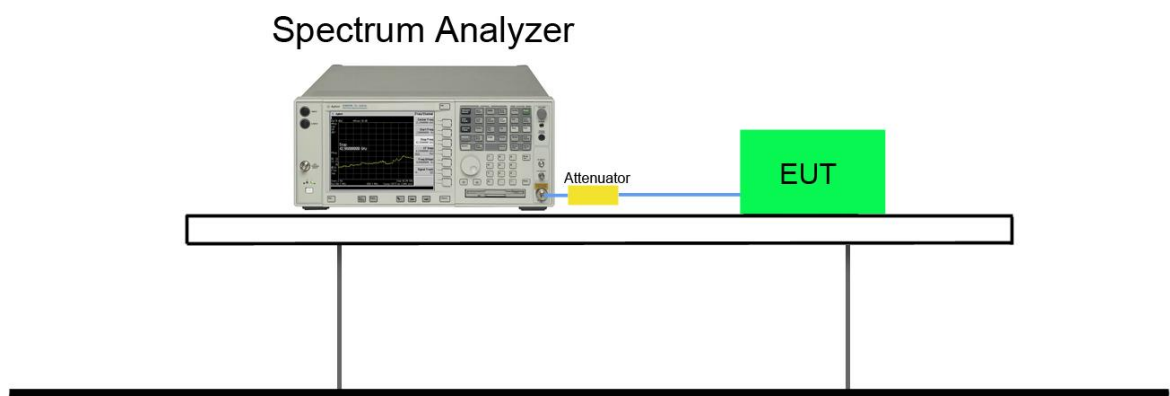
7.3.2. Test Procedure used

KDB 789033 D02v01r02 – Section C.2

7.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3.4. Test Setup

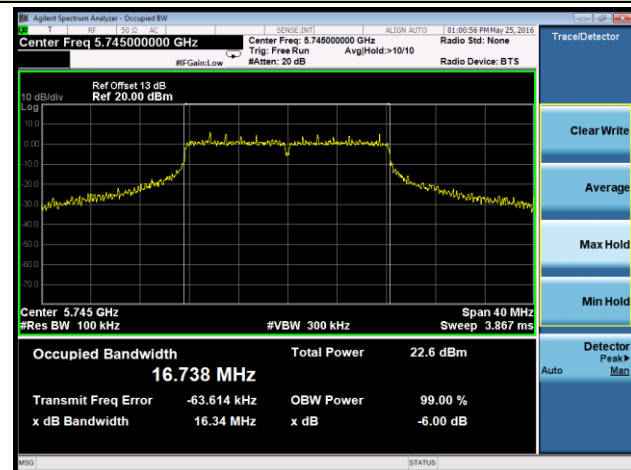


7.3.5. Test Result

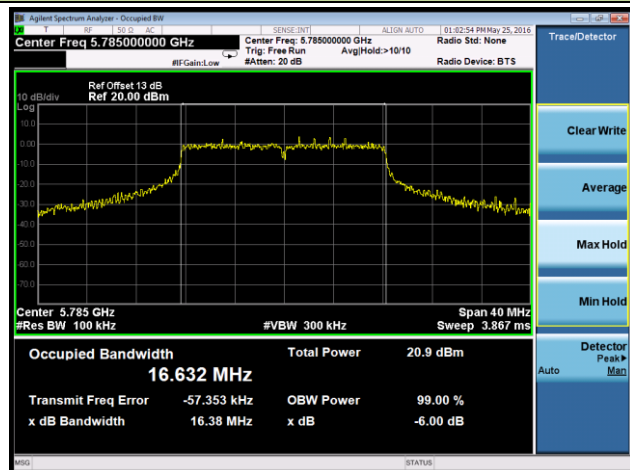
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11a	6	149	5745	16.34	≥ 0.5	Pass
802.11a	6	157	5785	16.38	≥ 0.5	Pass
802.11a	6	165	5825	16.36	≥ 0.5	Pass
802.11n-HT20	13	149	5745	17.65	≥ 0.5	Pass
802.11n-HT20	13	157	5785	17.65	≥ 0.5	Pass
802.11n-HT20	13	165	5825	17.63	≥ 0.5	Pass
802.11n-HT40	27	151	5755	36.41	≥ 0.5	Pass
802.11n-HT40	27	159	5795	36.48	≥ 0.5	Pass
Ant 1 / Ant 0 + 1						
802.11a	6	149	5745	16.33	≥ 0.5	Pass
802.11a	6	157	5785	16.41	≥ 0.5	Pass
802.11a	6	165	5825	16.40	≥ 0.5	Pass
802.11n-HT20	13	149	5745	17.60	≥ 0.5	Pass
802.11n-HT20	13	157	5785	17.60	≥ 0.5	Pass
802.11n-HT20	13	165	5825	17.61	≥ 0.5	Pass
802.11n-HT40	27	151	5755	36.46	≥ 0.5	Pass
802.11n-HT40	27	159	5795	36.38	≥ 0.5	Pass

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

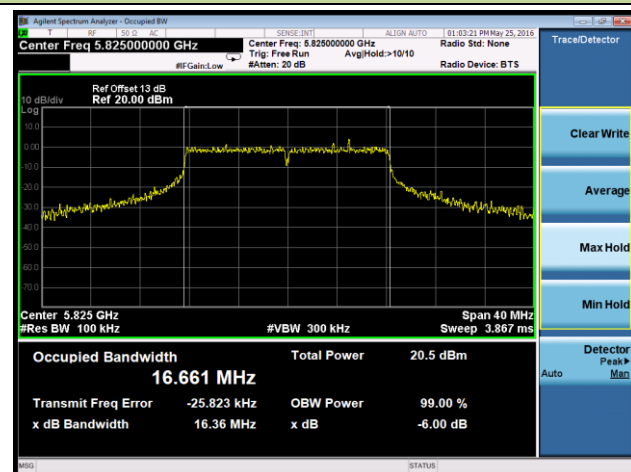
Channel 149 (5745MHz)



Channel 157 (5785MHz)

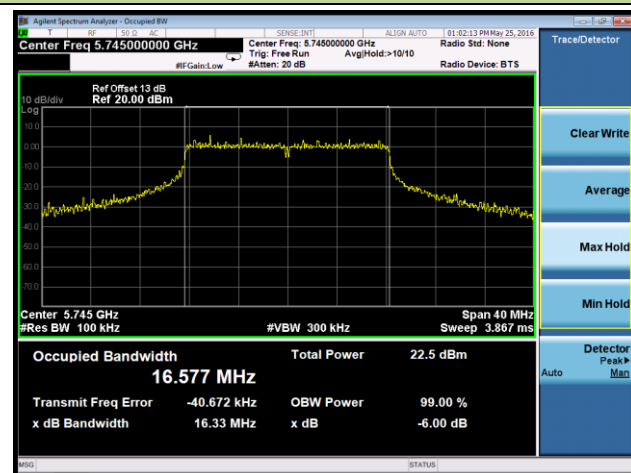


Channel 165 (5825MHz)

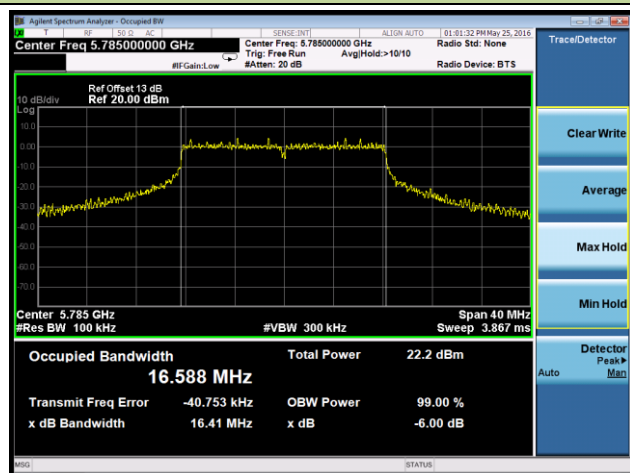


802.11a 6dB Bandwidth - Ant 1 / Ant 0 + 1

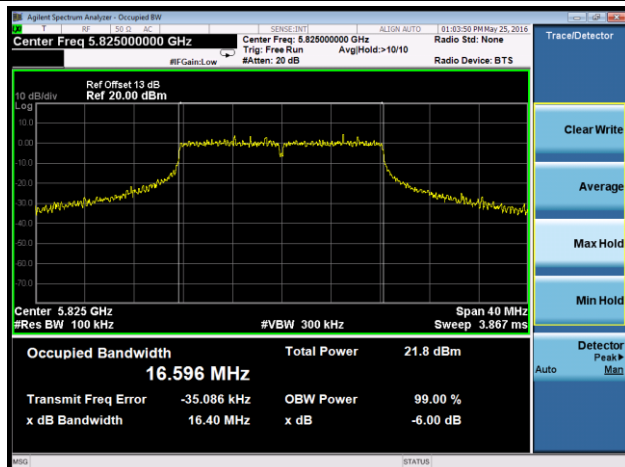
Channel 149 (5745MHz)



Channel 157 (5785MHz)

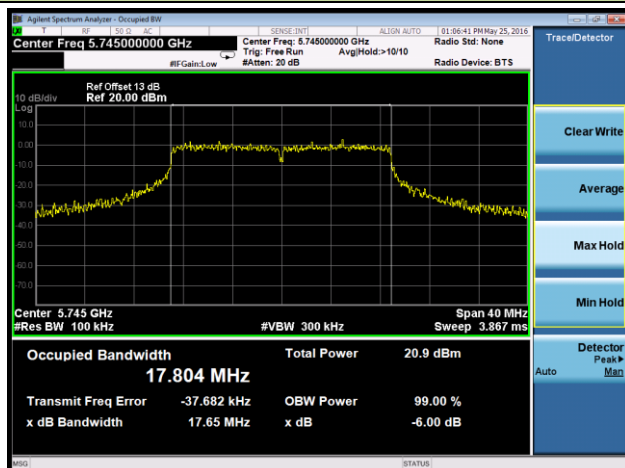


Channel 165 (5825MHz)

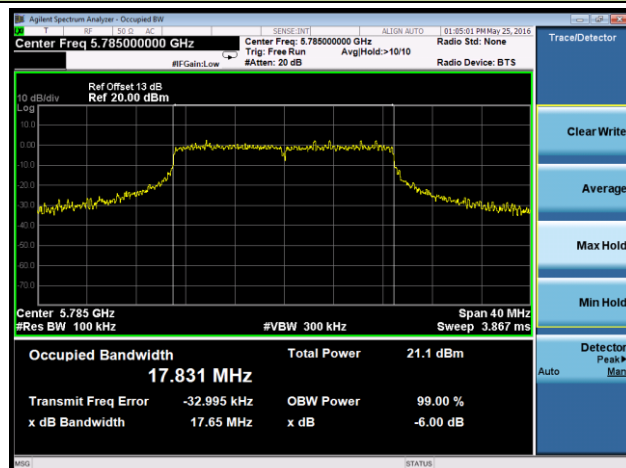


802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

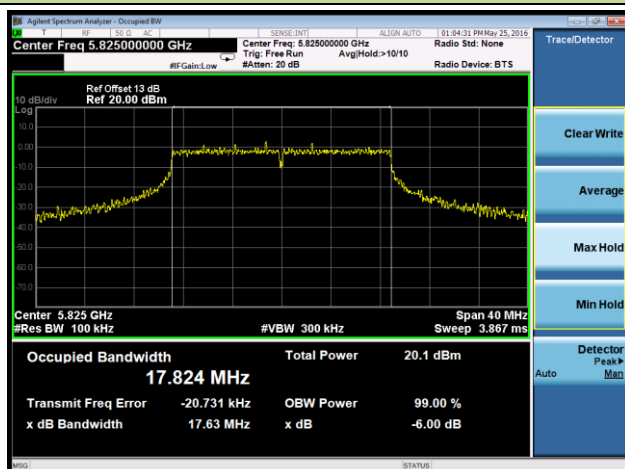
Channel 149 (5745MHz)



Channel 157 (5785MHz)

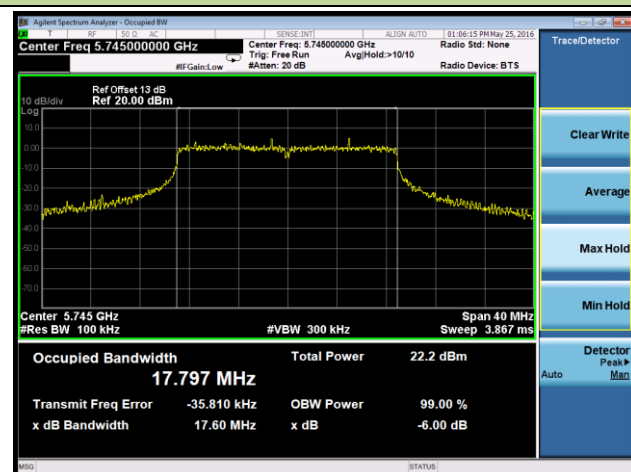


Channel 165 (5825MHz)

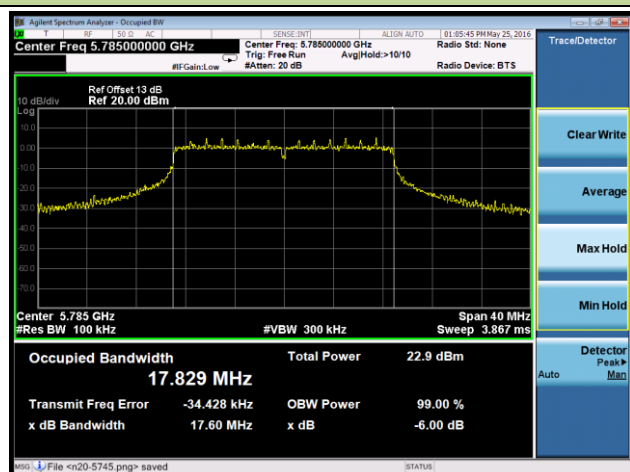


802.11n-HT20 6dB Bandwidth - Ant 1 / Ant 0 + 1

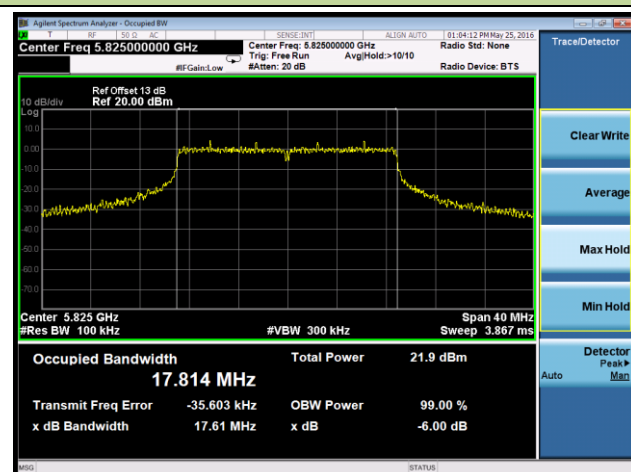
Channel 149 (5745MHz)



Channel 157 (5785MHz)

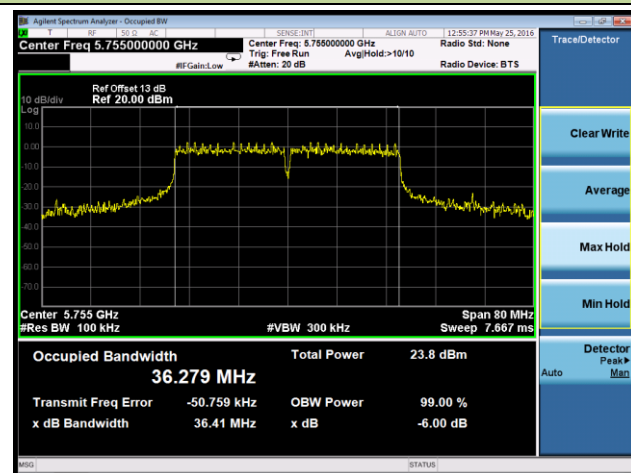


Channel 165 (5825MHz)

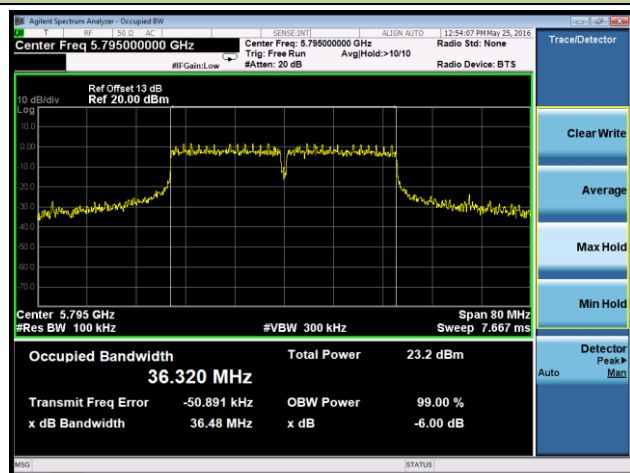


802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 151 (5755MHz)

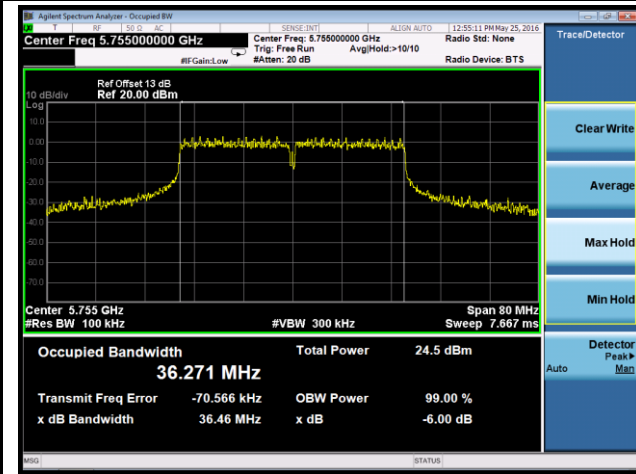


Channel 159 (5795MHz)

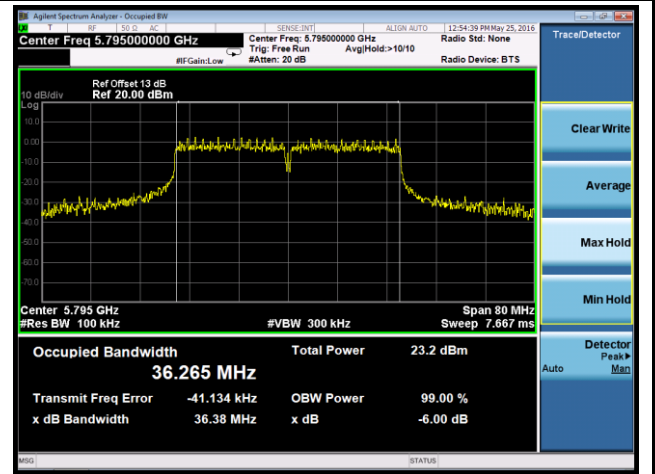


802.11n-HT40 6dB Bandwidth - Ant 1 / Ant 0 + 1

Channel 151 (5755MHz)



Channel 159 (5795MHz)



7.4. Output Power Measurement

7.4.1. Test Limit

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (23.98dBm) or 11 dBm $10 \log(26\text{dB BW}) = 11\text{dBm} + 10\log_{10}(22.63) = 24.55\text{dBm}$.

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

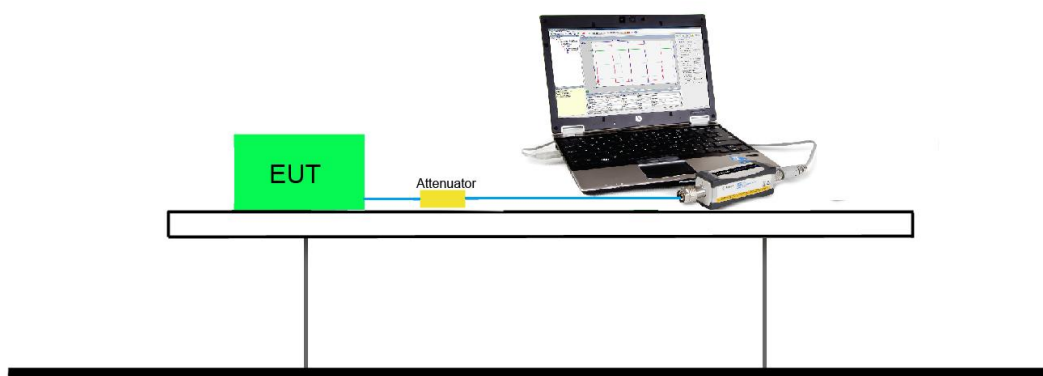
7.4.2. Test Procedure Used

KDB 789033 D02v01r02 - 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
2	6	8	13.0	14.4	27.0	30.0
2	9	9	26.0	28.9	54.0	60.0
2	12	10	39.0	43.3	81.0	90.0
2	18	11	52.0	57.8	108.0	120.0
2	24	12	78.0	86.7	162.0	180.0
2	36	13	104.0	115.6	216.0	240.0
2	48	14	117.0	130.0	243.0	270.0
2	54	15	130.0	144.0	270.0	300.0

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:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate (Mbps)	RMS Power (dBm)
802.11a	20	60	5300	6	18.96
				24	18.84
				54	18.72
802.11n	20	60	5300	13	18.45
				14.4	18.39
				78	18.33
				86.7	18.21
				130	18.10
				144	18.02
802.11n	40	62	5310	27	15.29
				30	15.26
				162	15.17
				180	15.12
				270	14.89
				300	14.82

Test Mode	N _{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
11a	2	6	36	5180	17.32	17.02	20.18	≤ 23.98	Pass
11a	2	6	44	5220	19.17	17.78	21.54	≤ 23.98	Pass
11a	2	6	48	5240	19.96	18.03	22.11	≤ 23.98	Pass
11a	2	6	52	5260	20.38	17.75	22.27	≤ 23.98	Pass
11a	2	6	60	5300	18.96	17.18	21.17	≤ 23.98	Pass
11a	2	6	64	5320	17.75	16.18	20.05	≤ 23.98	Pass
11a	2	6	100	5500	15.57	15.98	18.79	≤ 23.98	Pass
11a	2	6	120	5600	17.22	16.83	20.04	≤ 23.98	Pass
11a	2	6	140	5700	14.62	14.80	17.72	≤ 23.98	Pass
11a	2	6	149	5745	20.26	17.65	22.16	≤ 30.00	Pass
11a	2	6	157	5785	19.78	17.67	21.86	≤ 30.00	Pass
11a	2	6	165	5825	19.28	17.76	21.60	≤ 30.00	Pass
11n-HT20	2	13	36	5180	16.88	16.48	19.69	≤ 23.98	Pass
11n-HT20	2	13	44	5220	19.17	17.85	21.57	≤ 23.98	Pass
11n-HT20	2	13	48	5240	20.42	17.61	22.25	≤ 23.98	Pass
11n-HT20	2	13	52	5260	19.94	18.01	22.09	≤ 23.98	Pass
11n-HT20	2	13	60	5300	18.45	17.12	20.85	≤ 23.98	Pass
11n-HT20	2	13	64	5320	17.21	15.81	19.58	≤ 23.98	Pass
11n-HT20	2	13	100	5500	16.73	17.01	19.88	≤ 23.98	Pass
11n-HT20	2	13	120	5600	17.18	16.81	20.01	≤ 23.98	Pass
11n-HT20	2	13	140	5700	14.46	14.73	17.61	≤ 23.98	Pass
11n-HT20	2	13	149	5745	19.08	17.89	21.54	≤ 30.00	Pass
11n-HT20	2	13	157	5785	19.84	17.21	21.73	≤ 30.00	Pass
11n-HT20	2	13	165	5825	19.08	17.72	21.46	≤ 30.00	Pass
11n-HT40	2	27	38	5190	15.06	14.84	17.96	≤ 23.98	Pass
11n-HT40	2	27	46	5230	15.65	14.46	18.11	≤ 23.98	Pass
11n-HT40	2	27	54	5270	15.27	14.03	17.70	≤ 23.98	Pass
11n-HT40	2	27	62	5310	15.29	13.32	17.43	≤ 23.98	Pass
11n-HT40	2	27	102	5510	14.22	14.26	17.25	≤ 23.98	Pass
11n-HT40	2	27	118	5590	15.51	15.42	18.48	≤ 23.98	Pass
11n-HT40	2	27	134	5670	15.84	16.25	19.06	≤ 23.98	Pass
11n-HT40	2	27	151	5755	19.43	17.55	21.60	≤ 30.00	Pass
11n-HT40	2	27	159	5795	19.55	17.33	21.59	≤ 30.00	Pass

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.

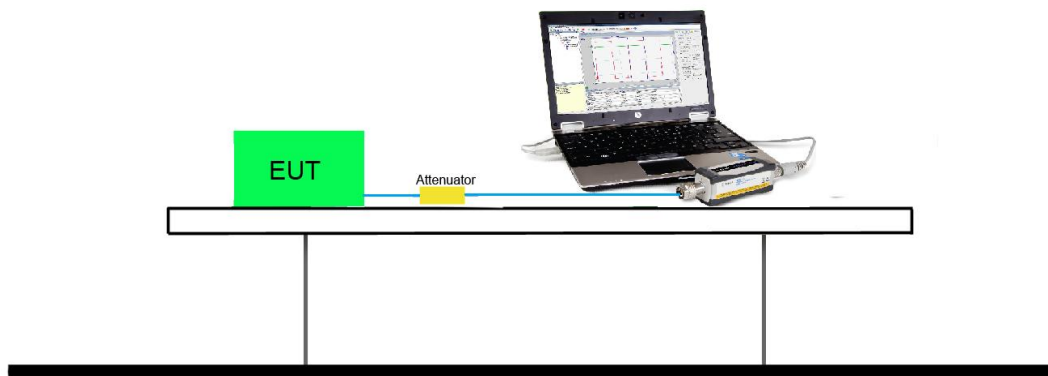
7.5.2. Test Procedure Used

KDB 789033 D02v01r02 - 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 test item is not required for the EIRP less than 500mW.

7.6. Power Spectral Density Measurement

7.6.1. Test Limit

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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.

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.

7.6.2. Test Procedure Used

KDB 789033 D02v01r02 - Section F

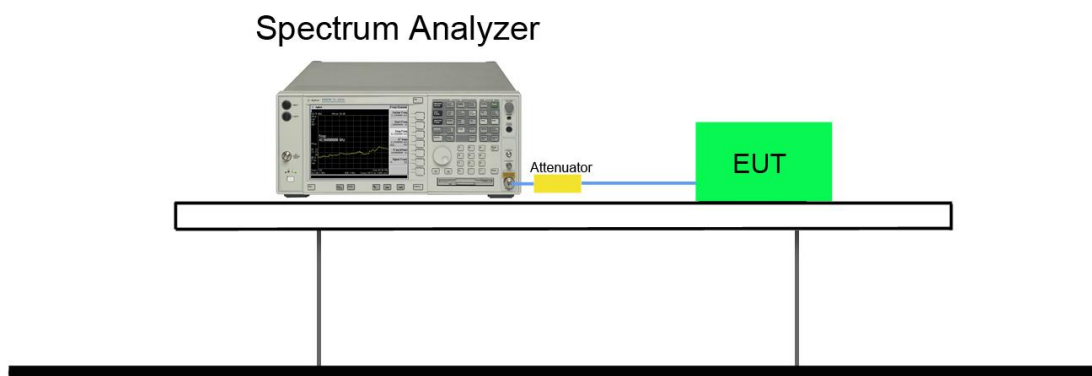
7.6.3. Test Setting

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 $10 \cdot \log(500\text{kHz}/100\text{kHz}) = 7 \text{ dB}$ to the measured result

7.6.4. Test Setup



7.6.5. Test Result

Test Mode	N _{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ MHz)	Ant 1 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	Limit (dBm /MHz)	Result
11a	2	6	36	5180	5.43	5.25	99.0	8.35	≤ 11.00	Pass
11a	2	6	44	5220	7.11	5.88	99.0	9.55	≤ 11.00	Pass
11a	2	6	48	5240	8.14	5.73	99.0	10.11	≤ 11.00	Pass
11a	2	6	52	5260	8.52	5.72	99.0	10.35	≤ 11.00	Pass
11a	2	6	60	5300	7.09	5.36	99.0	9.32	≤ 11.00	Pass
11a	2	6	64	5320	5.92	4.28	99.0	8.19	≤ 11.00	Pass
11a	2	6	100	5500	4.35	4.44	99.0	7.41	≤ 11.00	Pass
11a	2	6	120	5600	6.7	6.46	99.0	9.59	≤ 11.00	Pass
11a	2	6	140	5700	4.24	4.20	99.0	7.23	≤ 11.00	Pass
11n-HT20	2	13	36	5180	5.89	5.72	99.1	8.82	≤ 11.00	Pass
11n-HT20	2	13	44	5220	7.71	6.40	99.1	10.11	≤ 11.00	Pass
11n-HT20	2	13	48	5240	8.79	6.03	99.1	10.64	≤ 11.00	Pass
11n-HT20	2	13	52	5260	8.06	6.22	99.1	10.25	≤ 11.00	Pass
11n-HT20	2	13	60	5300	6.87	5.58	99.1	9.28	≤ 11.00	Pass
11n-HT20	2	13	64	5320	5.68	4.33	99.1	8.07	≤ 11.00	Pass
11n-HT20	2	13	100	5500	5.66	5.38	99.1	8.53	≤ 11.00	Pass
11n-HT20	2	13	120	5600	6.36	5.88	99.1	9.14	≤ 11.00	Pass
11n-HT20	2	13	140	5700	3.44	3.64	99.1	6.55	≤ 11.00	Pass
11n-HT40	2	27	38	5190	-1.05	-1.12	97.6	2.03	≤ 11.00	Pass
11n-HT40	2	27	46	5230	1.51	0.50	97.6	4.15	≤ 11.00	Pass
11n-HT40	2	27	54	5270	1.15	-0.42	97.6	3.55	≤ 11.00	Pass
11n-HT40	2	27	62	5310	-0.4	-2.31	97.6	1.86	≤ 11.00	Pass
11n-HT40	2	27	102	5510	-1.31	-1.14	97.6	1.89	≤ 11.00	Pass
11n-HT40	2	27	118	5590	1.96	1.84	97.6	5.02	≤ 11.00	Pass
11n-HT40	2	27	134	5670	2.16	2.27	97.6	5.33	≤ 11.00	Pass

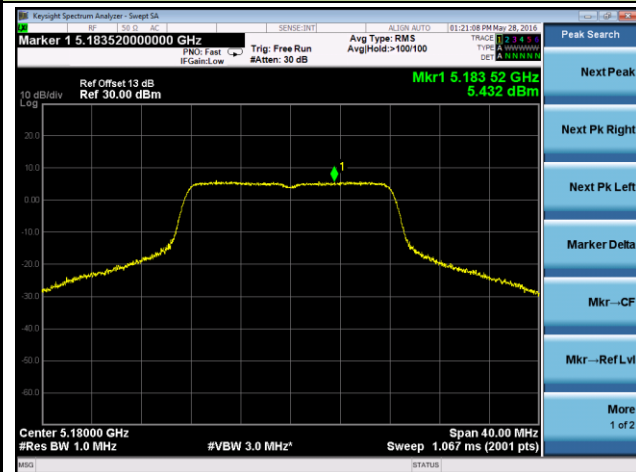
Note: When EUT duty cycle < 98%, the total PSD = $10 \cdot \log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\} + 10 \cdot \log(1/\text{duty cycle})$.

Test Mode	N _{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 500kHz)	Ant 1 PSD (dBm/ 500kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
11a	2	6	149	5745	-3.45	-5.79	99.0	7	5.55	≤ 30.00	Pass
11a	2	6	157	5785	-3.12	-5.53	99.0	7	5.85	≤ 30.00	Pass
11a	2	6	165	5825	-3.83	-6.53	99.0	7	5.04	≤ 30.00	Pass
11n-HT20	2	13	149	5745	-3.31	-5.57	99.1	7	5.72	≤ 30.00	Pass
11n-HT20	2	13	157	5785	-3.28	-6.31	99.1	7	5.47	≤ 30.00	Pass
11n-HT20	2	13	165	5825	-3.65	-6.50	99.1	7	5.17	≤ 30.00	Pass
11n-HT40	2	27	151	5755	-5.21	-9.13	97.6	7	3.37	≤ 30.00	Pass
11n-HT40	2	27	159	5795	-5.16	-8.50	97.6	7	3.60	≤ 30.00	Pass

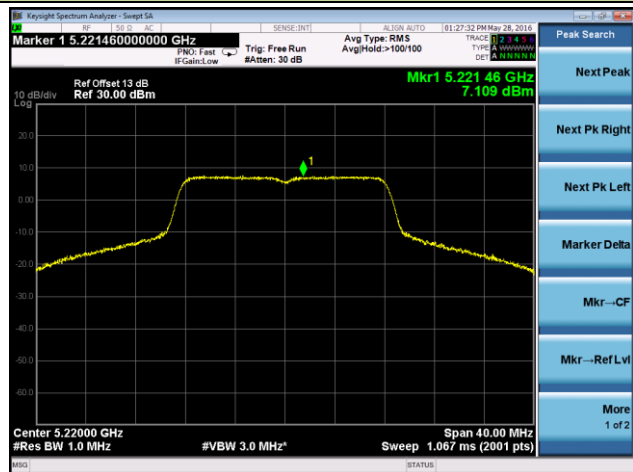
Note: When EUT duty cycle < 98%, the total PSD = $10 \cdot \log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\} + 10 \cdot \log(1/\text{duty cycle}) + \text{Constant Factor}$.

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

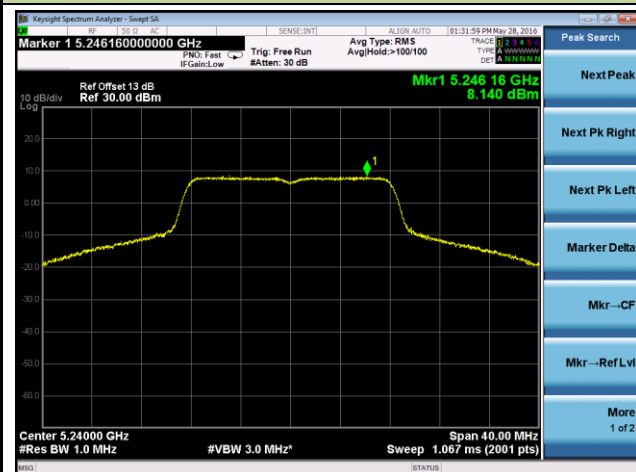
Channel 36 (5180MHz)



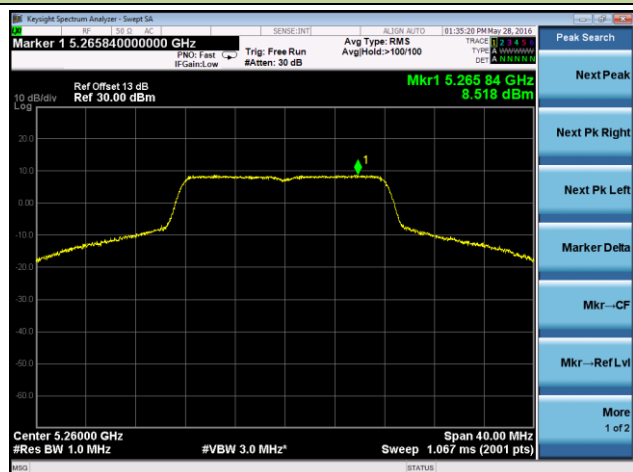
Channel 44 (5220MHz)



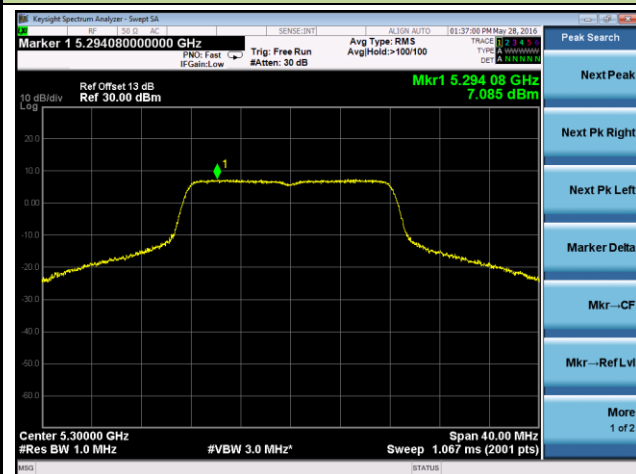
Channel 48 (5240MHz)



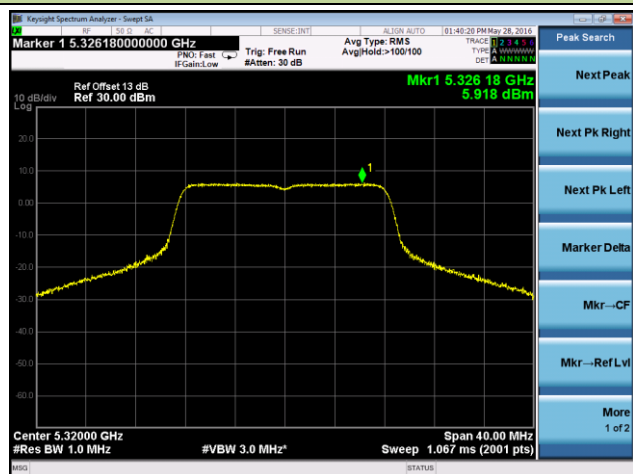
Channel 52 (5260MHz)



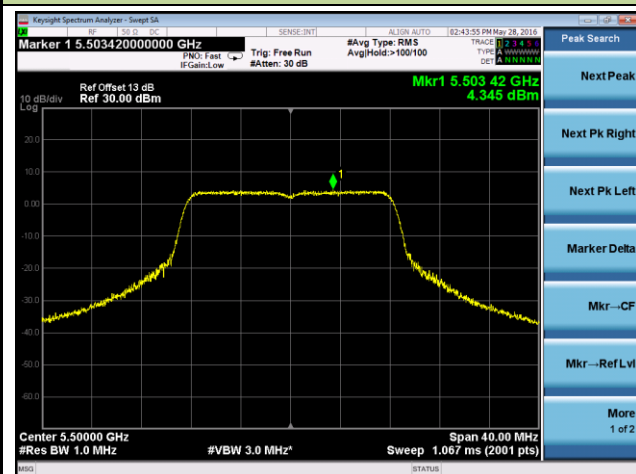
Channel 60 (5300MHz)



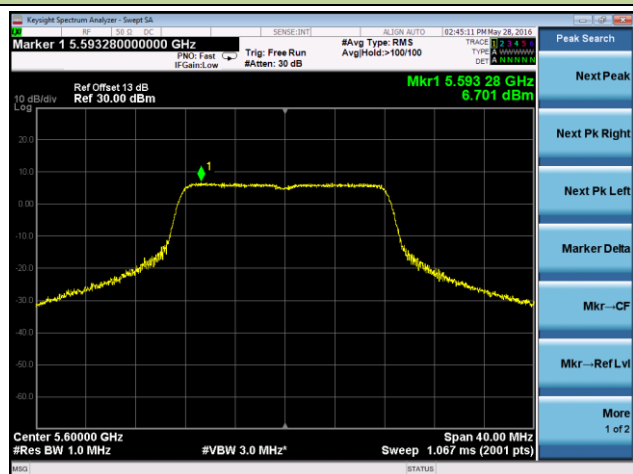
Channel 64 (5320MHz)



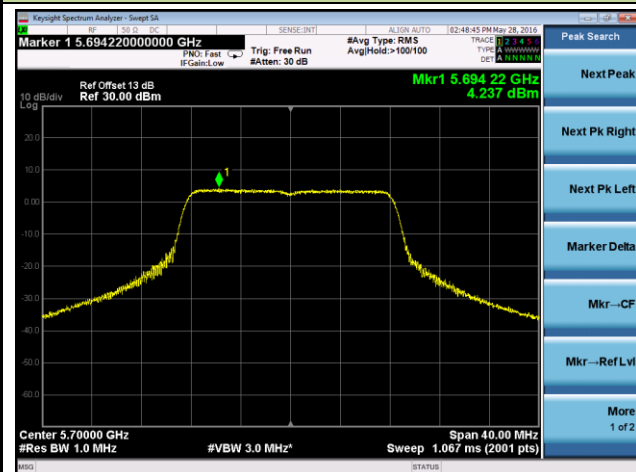
Channel 100 (5500MHz)



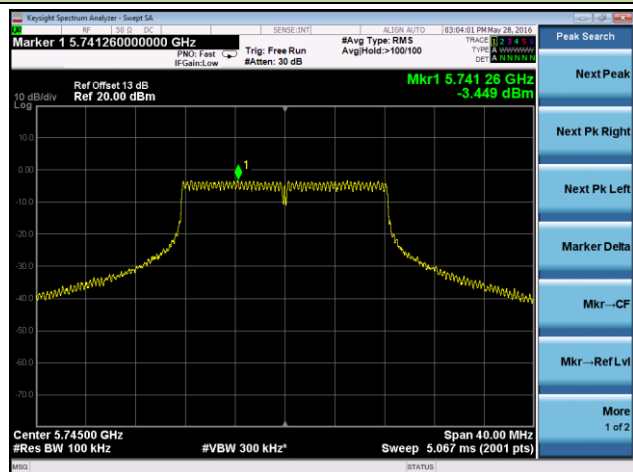
Channel 120 (5600MHz)



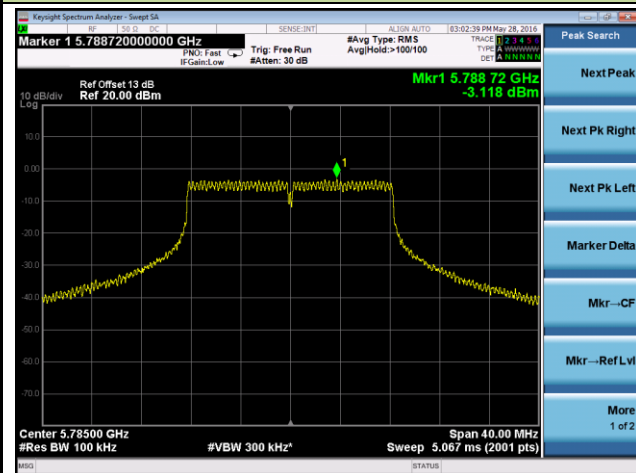
Channel 140 (5700MHz)



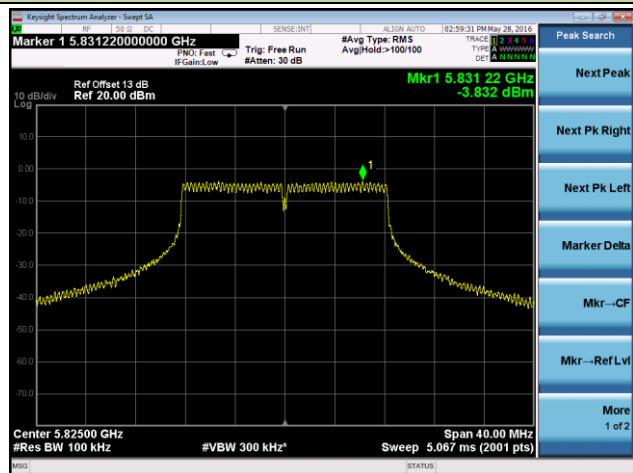
Channel 149 (5745MHz)



Channel 157 (5785MHz)

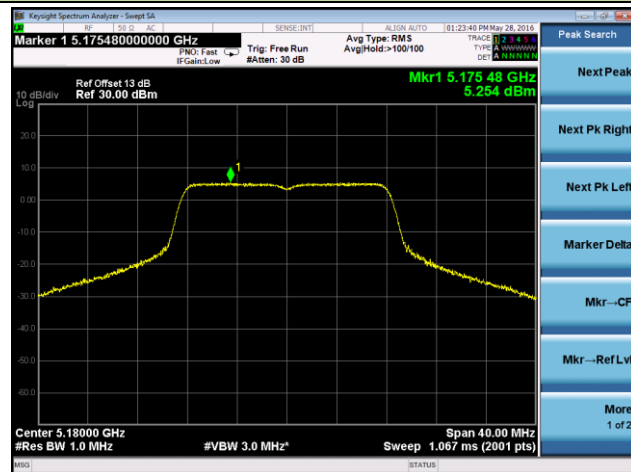


Channel 165 (5825MHz)

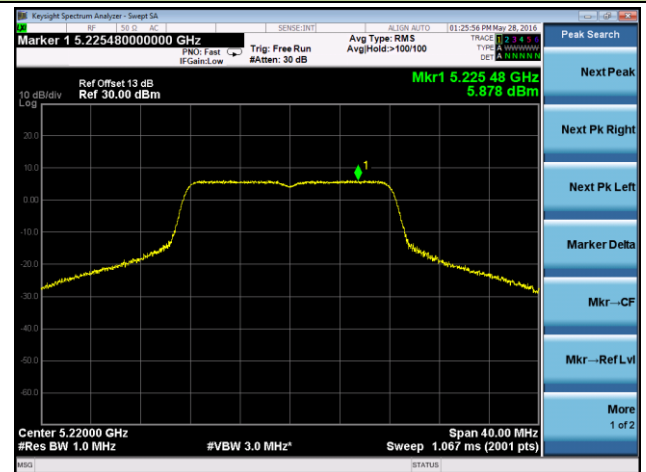


802.11a Power Spectral Density - Ant 1 / Ant 0 + 1

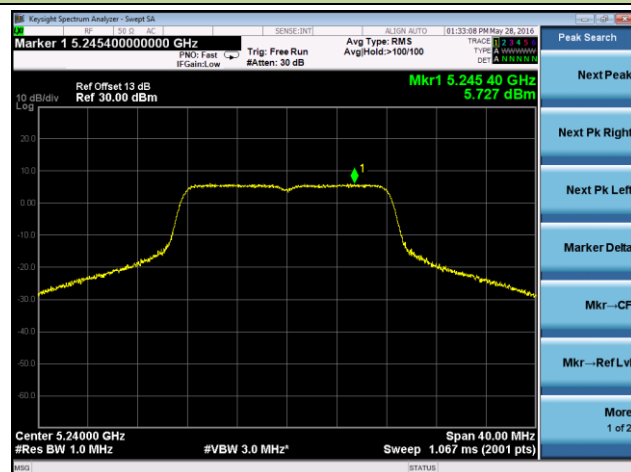
Channel 36 (5180MHz)



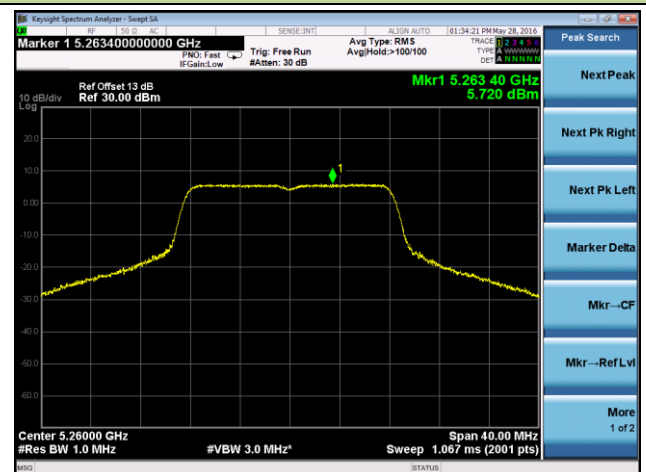
Channel 44 (5220MHz)



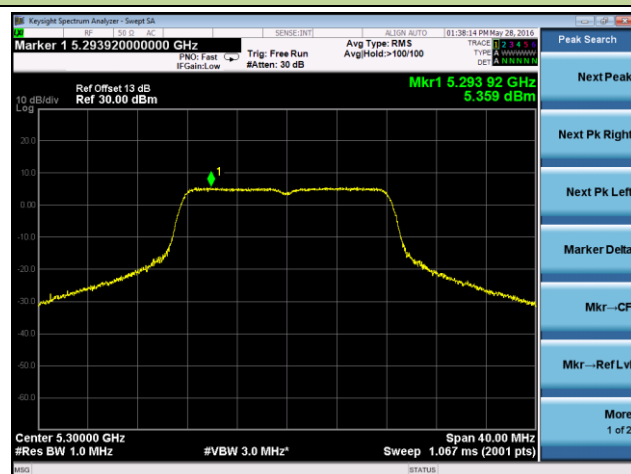
Channel 48 (5240MHz)



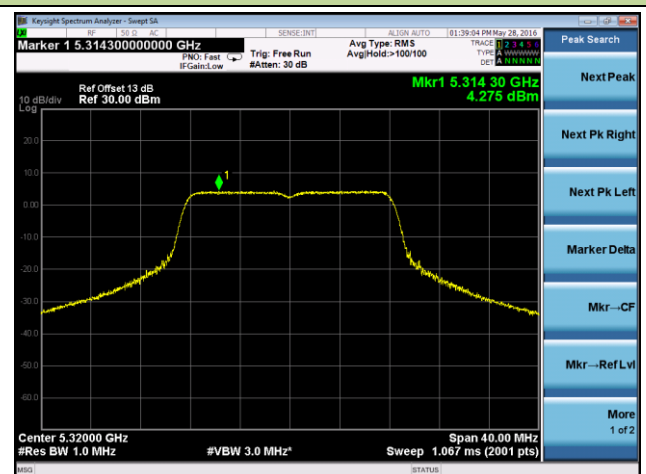
Channel 52 (5260MHz)



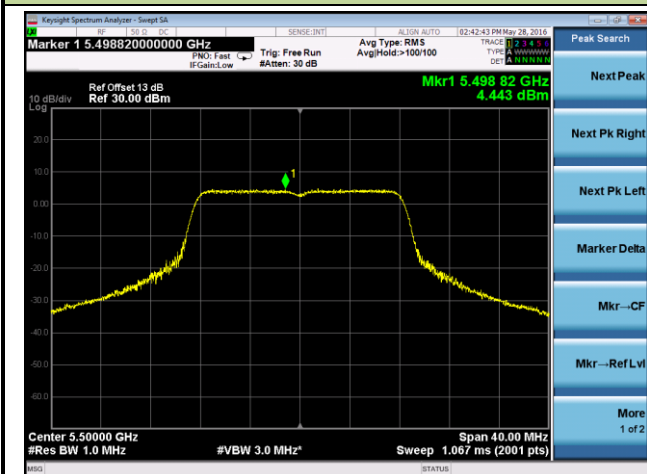
Channel 60 (5300MHz)



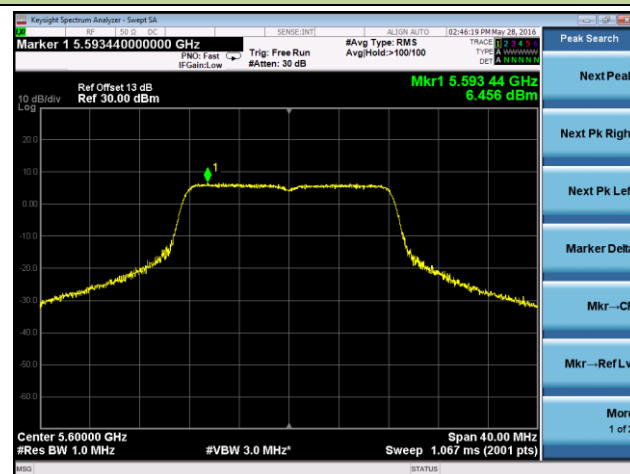
Channel 64 (5320MHz)



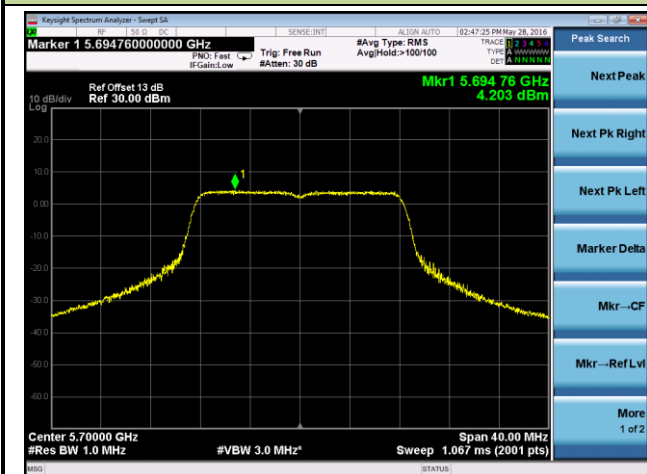
Channel 100 (5500MHz)



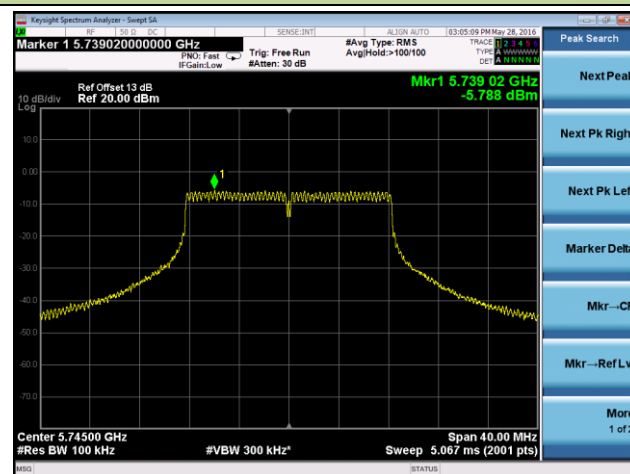
Channel 120 (5600MHz)



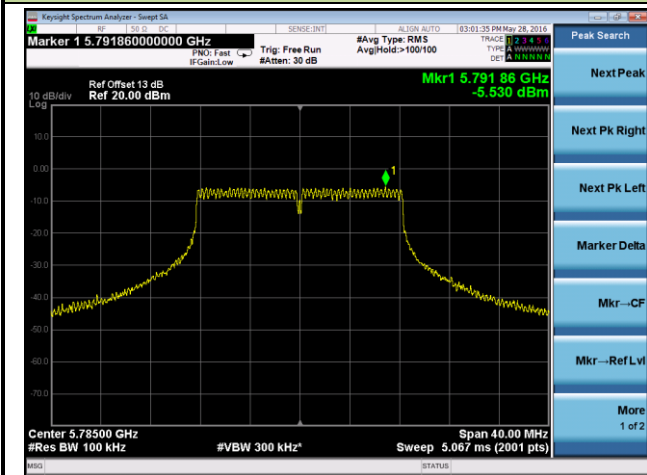
Channel 140 (5700MHz)



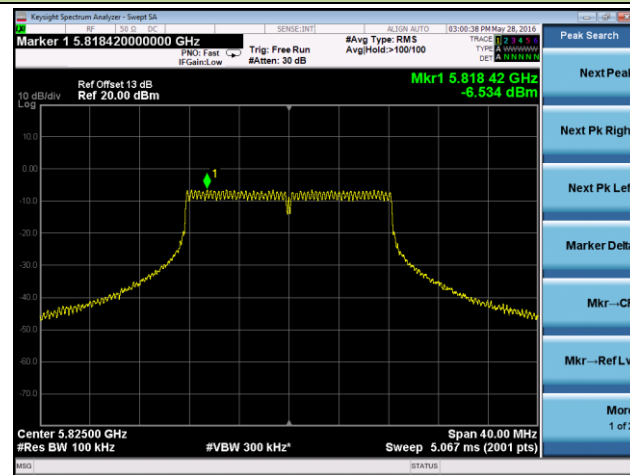
Channel 149 (5745MHz)



Channel 157 (5785MHz)

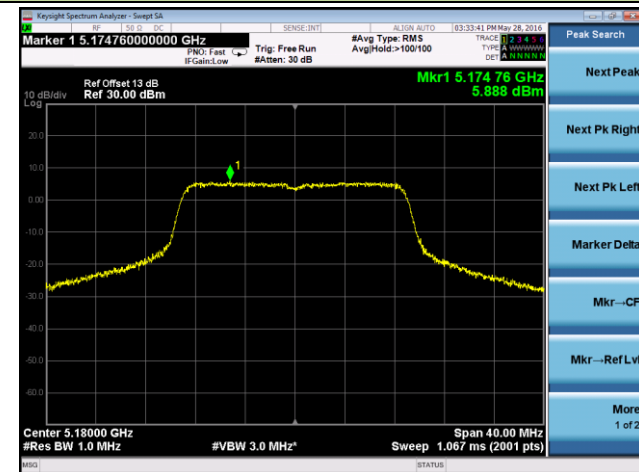


Channel 165 (5825MHz)

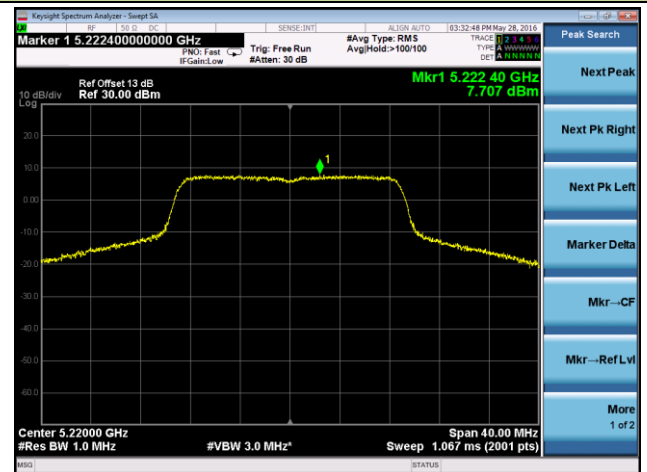


802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1

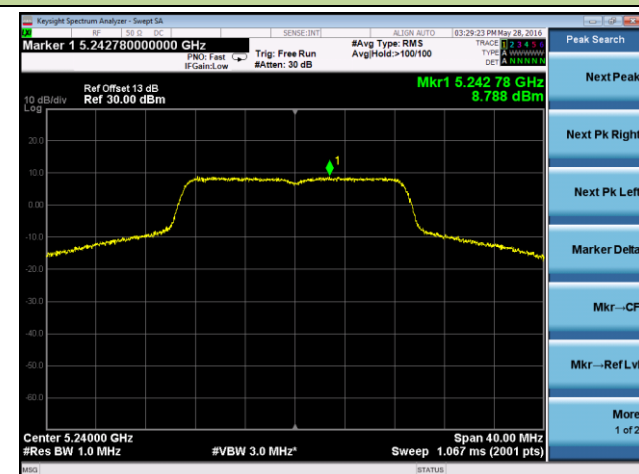
Channel 36 (5180MHz)



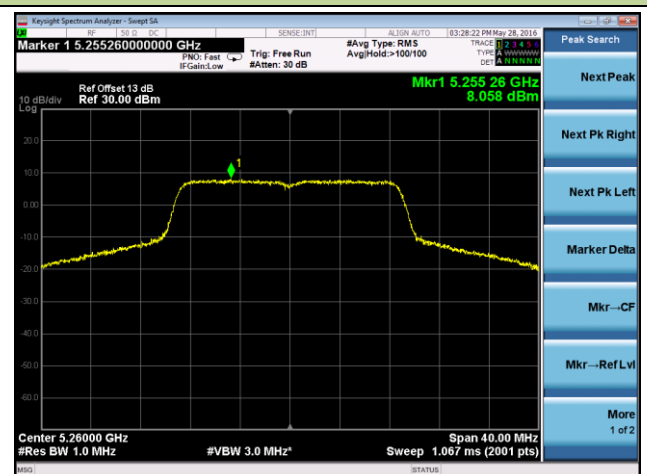
Channel 44 (5220MHz)



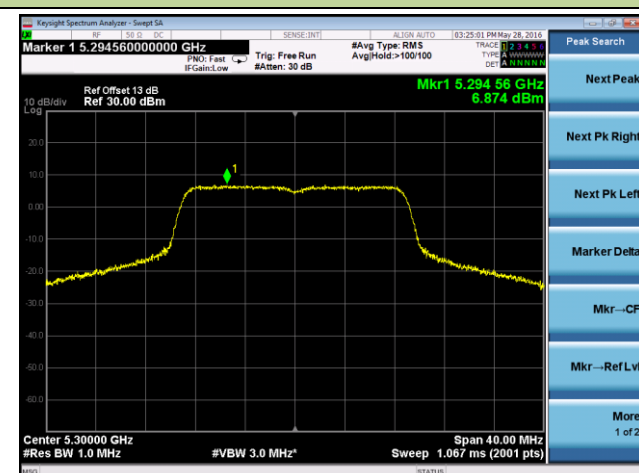
Channel 48 (5240MHz)



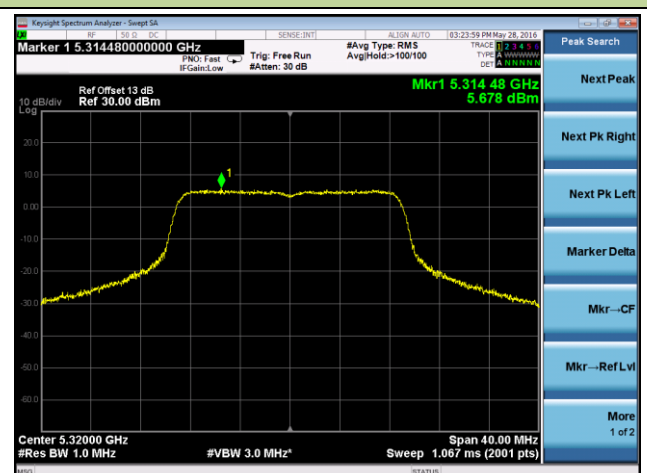
Channel 52 (5260MHz)



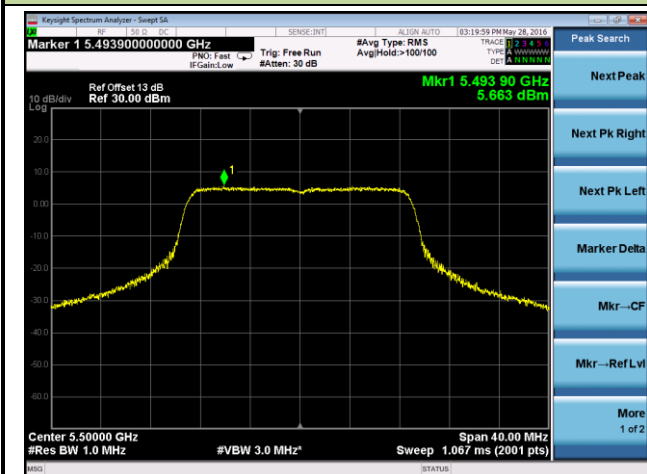
Channel 60 (5300MHz)



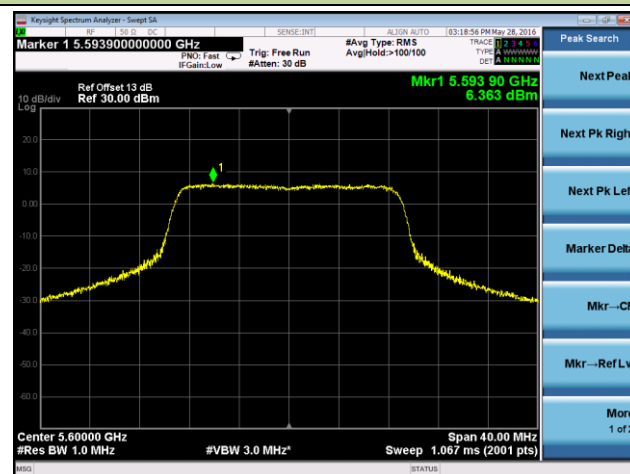
Channel 64 (5320MHz)



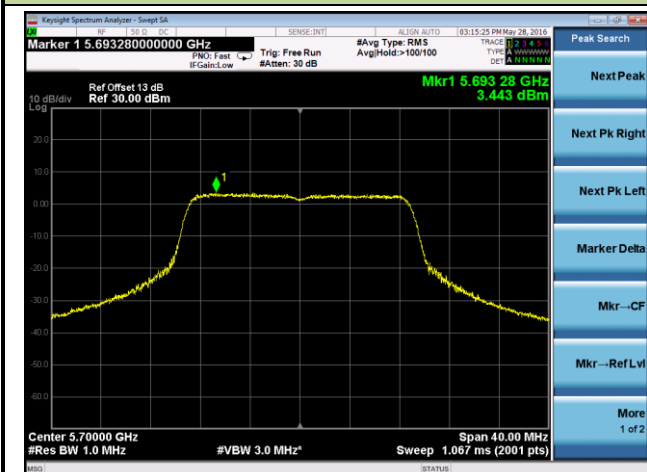
Channel 100 (5500MHz)



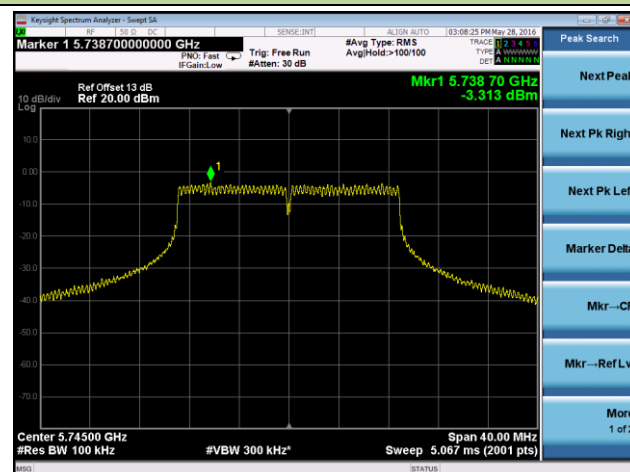
Channel 120 (5600MHz)



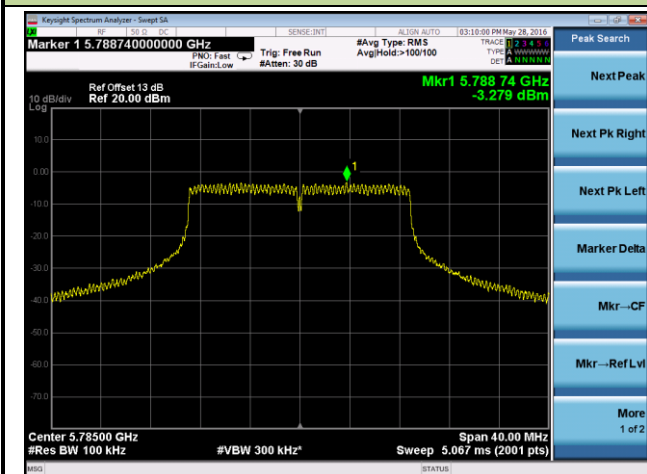
Channel 140 (5700MHz)



Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)

