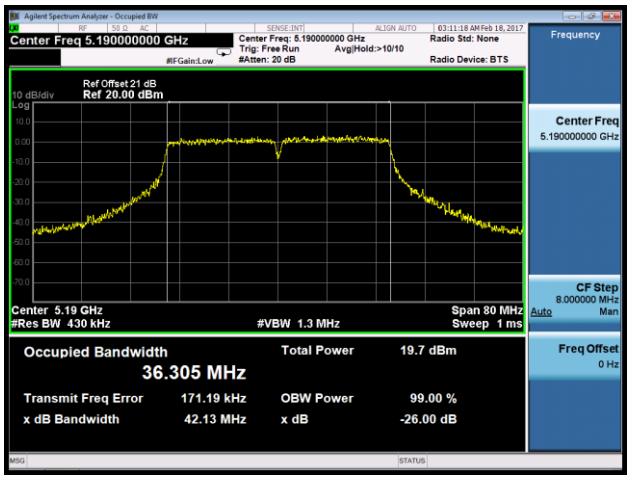
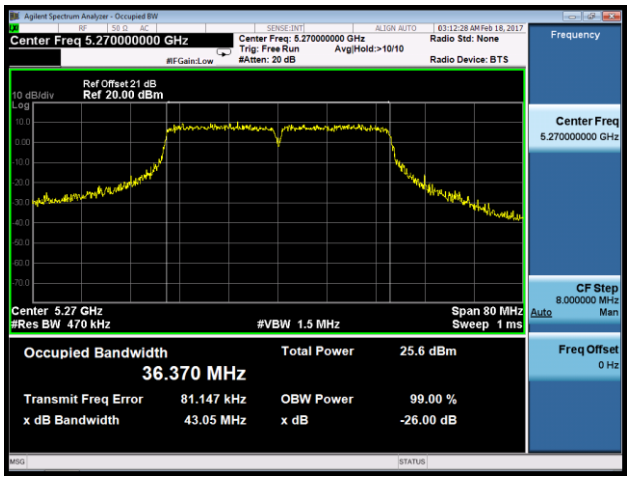
802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 2

Channel 38 (5190MHz)

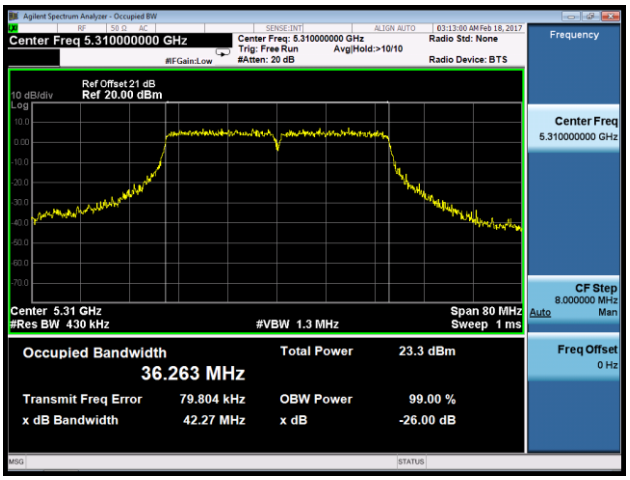


Channel 46 (5230MHz)

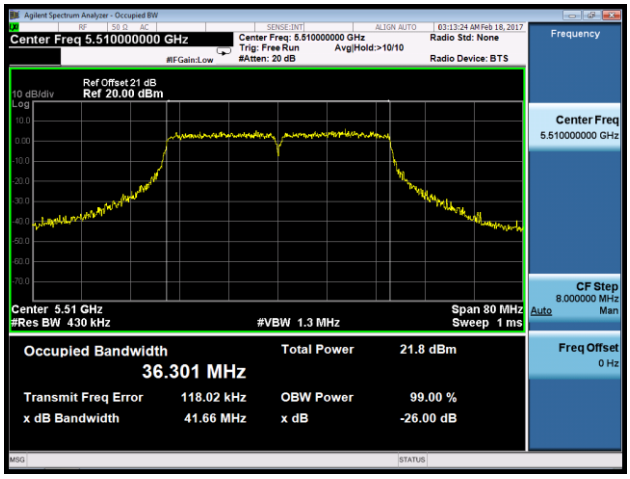
Channel 54 (5270MHz)



Channel 62 (5310MHz)

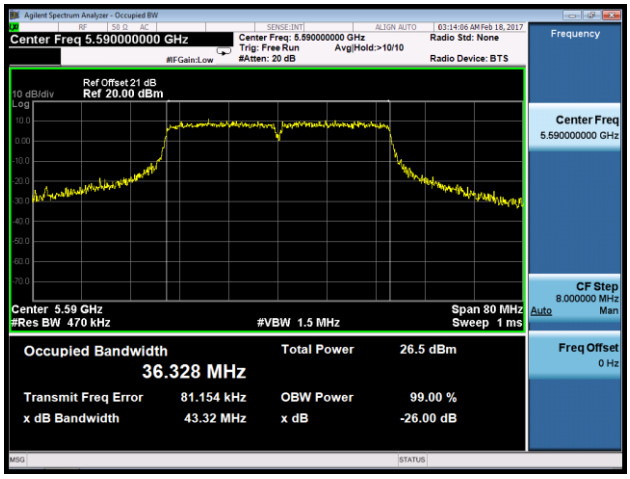


Channel 102 (5510MHz)

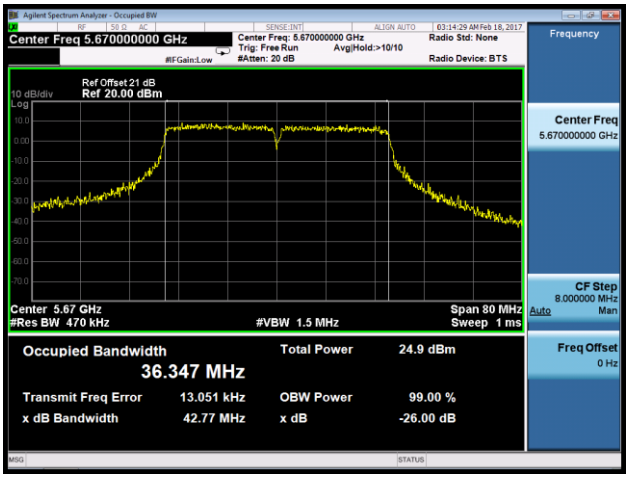


Channel 110 (5550MHz)

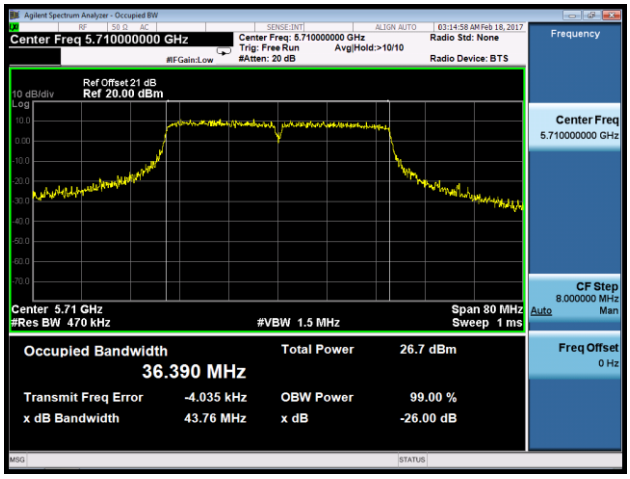
Channel 118 (5590MHz)



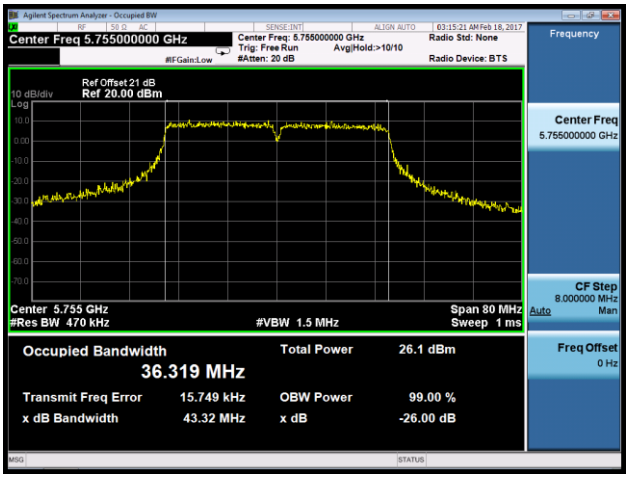
Channel 134 (5670MHz)



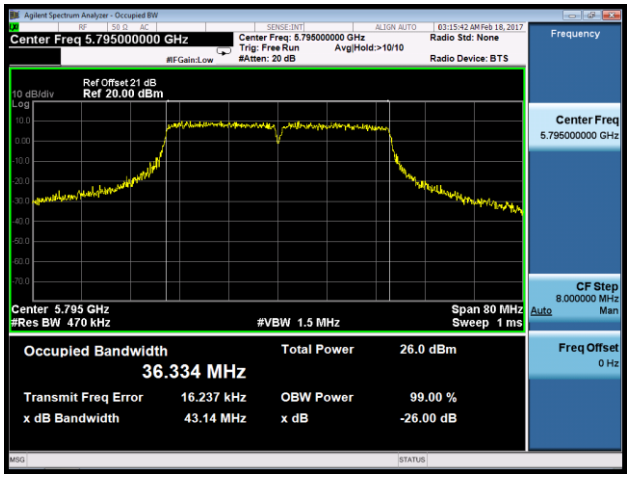
Channel 142 (5710MHz)



Channel 151 (5755MHz)

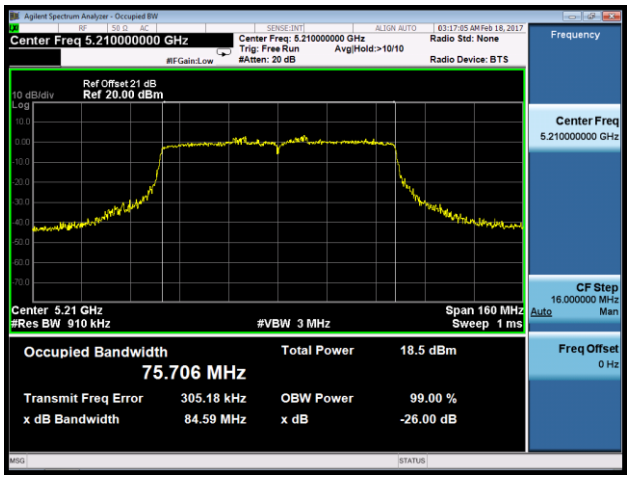


Channel 159 (5795MHz)

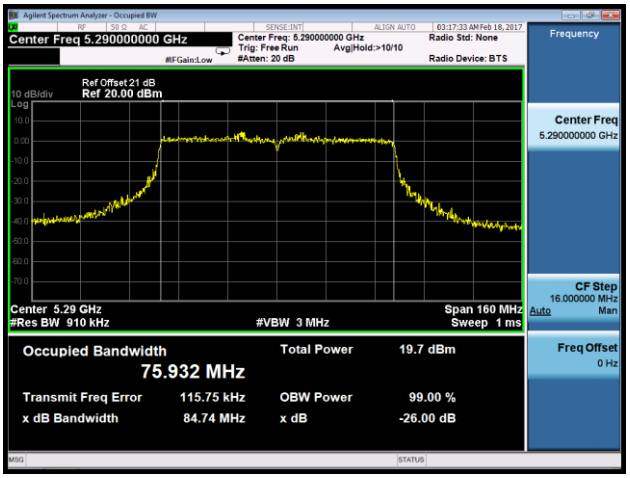


802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 2

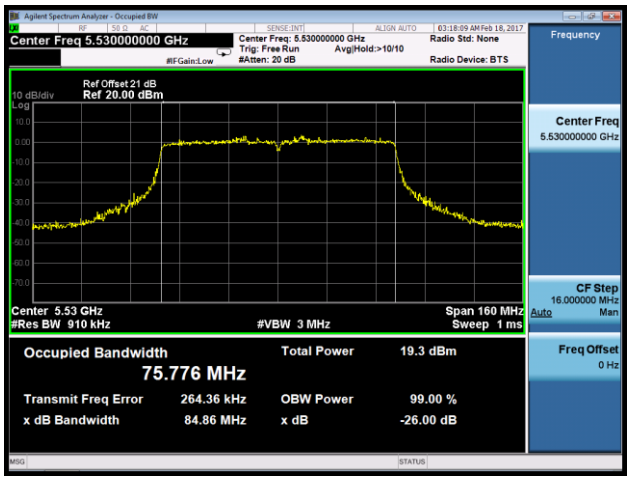
Channel 42 (5210MHz)



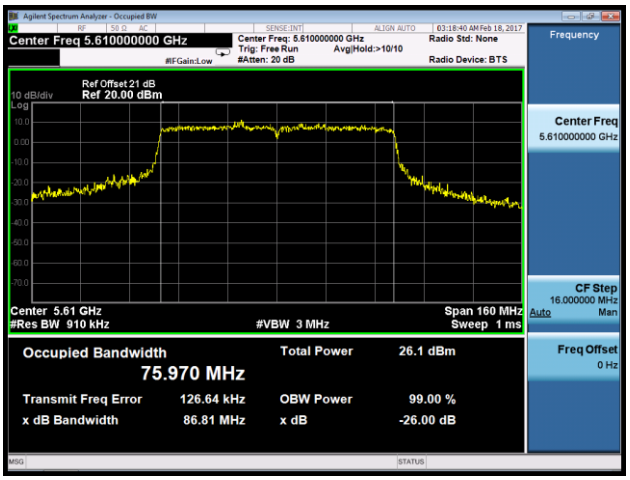
Channel 58 (5290MHz)



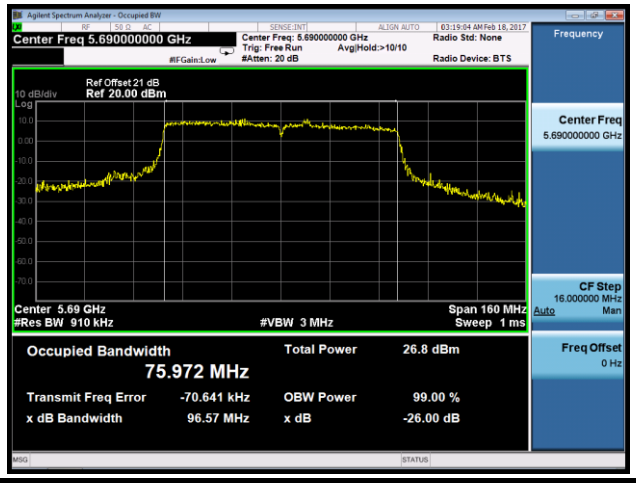
Channel 106 (5530MHz)



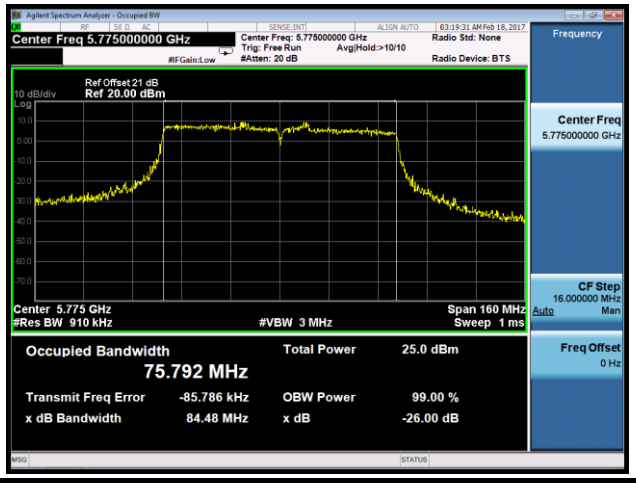
Channel 122 (5610MHz)



Channel 138 (5690MHz)



Channel 155 (5775MHz)



7.3. 6dB Bandwidth Measurement

7.3.1. Test Limit

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

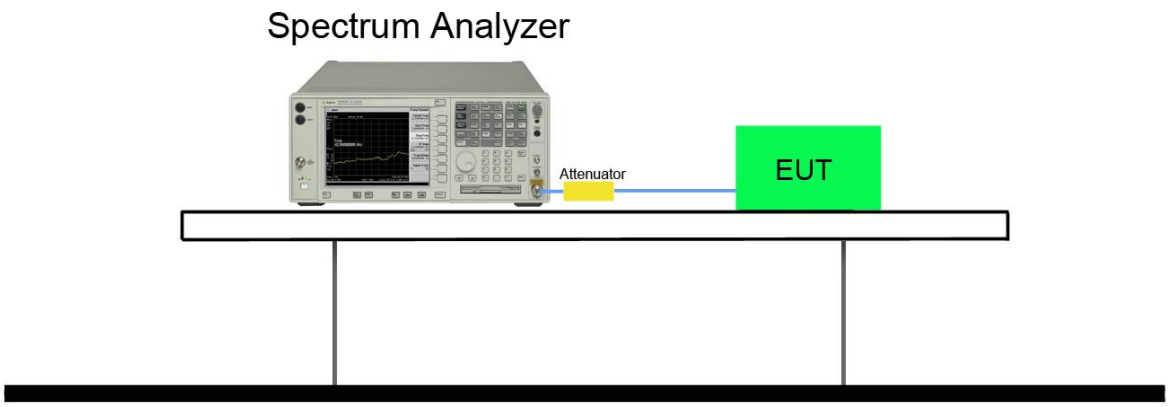
7.3.2. Test Procedure used

KDB 789033 D02v01r03 - 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 ≧ 3 × 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

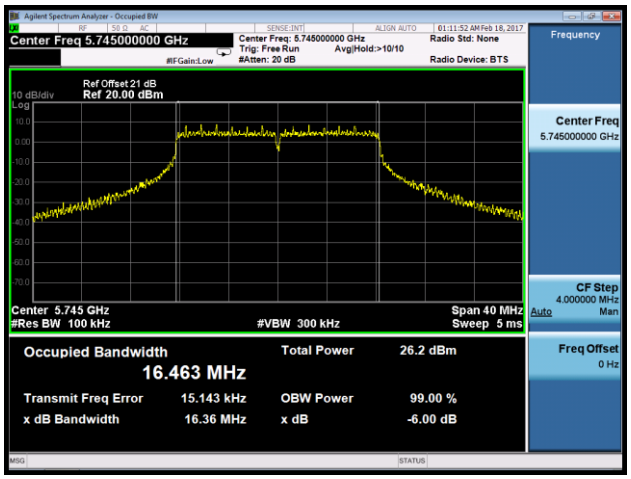
Product	US Wi-Fi AP 2x2 OD ext. antenna	Test Engineer	Johnson Liao
Test Site	SR2	Test Date	2017/02/18
Test Item	6dB Bandwidth	Antenna Model No.	WiFi Omni Ant

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 1						
802.11a	6	149	5745	16.36	≥ 0.5	Pass
802.11a	6	157	5785	16.35	≥ 0.5	Pass
802.11a	6	165	5825	16.34	≥ 0.5	Pass
802.11n-HT20	6.5	149	5745	17.56	≥ 0.5	Pass
802.11n-HT20	6.5	157	5785	17.57	≥ 0.5	Pass
802.11n-HT20	6.5	165	5825	17.57	≥ 0.5	Pass
802.11n-HT40	13.5	151	5755	36.36	≥ 0.5	Pass
802.11n-HT40	13.5	159	5795	36.35	≥ 0.5	Pass
802.11ac-VHT20	6.5	149	5745	17.60	≥ 0.5	Pass
802.11ac-VHT20	6.5	157	5785	17.58	≥ 0.5	Pass
802.11ac-VHT20	6.5	165	5825	17.58	≥ 0.5	Pass
802.11ac-VHT40	13.5	151	5755	36.36	≥ 0.5	Pass
802.11ac-VHT40	13.5	159	5795	36.37	≥ 0.5	Pass
802.11ac-VHT80	29.3	155	5775	76.39	≥ 0.5	Pass

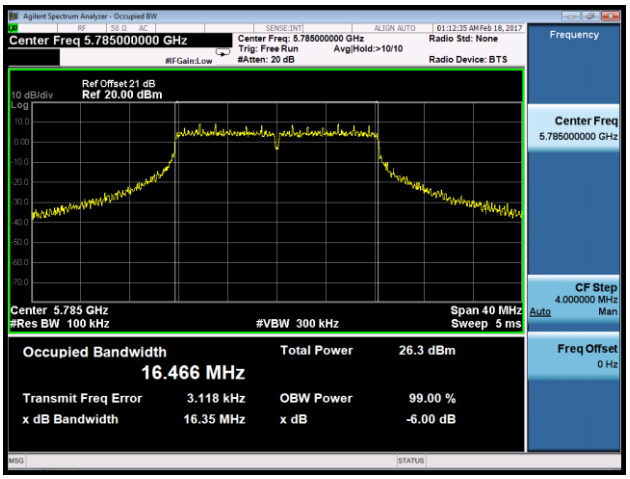
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 2						
802.11a	6	149	5745	16.35	≥ 0.5	Pass
802.11a	6	157	5785	16.34	≥ 0.5	Pass
802.11a	6	165	5825	16.35	≥ 0.5	Pass
802.11n-HT20	6.5	149	5745	17.57	≥ 0.5	Pass
802.11n-HT20	6.5	157	5785	17.57	≥ 0.5	Pass
802.11n-HT20	6.5	165	5825	17.57	≥ 0.5	Pass
802.11n-HT40	13.5	151	5755	35.78	≥ 0.5	Pass
802.11n-HT40	13.5	159	5795	35.78	≥ 0.5	Pass
802.11ac-VHT20	6.5	149	5745	17.56	≥ 0.5	Pass
802.11ac-VHT20	6.5	157	5785	17.56	≥ 0.5	Pass
802.11ac-VHT20	6.5	165	5825	17.57	≥ 0.5	Pass
802.11ac-VHT40	13.5	151	5755	35.97	≥ 0.5	Pass
802.11ac-VHT40	13.5	159	5795	36.04	≥ 0.5	Pass
802.11ac-VHT80	29.3	155	5775	75.74	≥ 0.5	Pass

802.11a 6dB Bandwidth - Ant 1

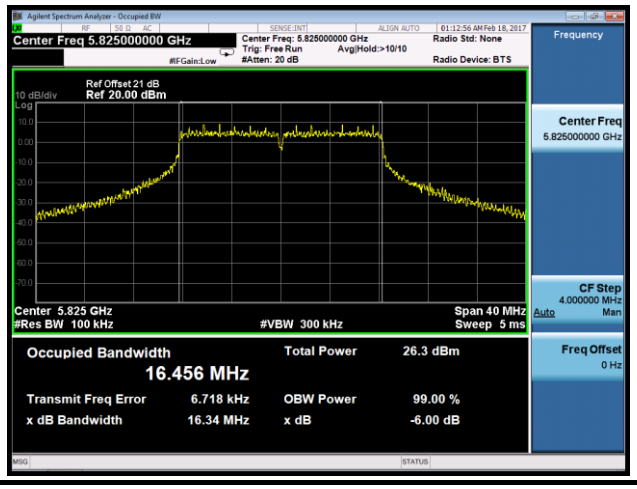
Channel 149 (5745MHz)



Channel 157 (5785MHz)

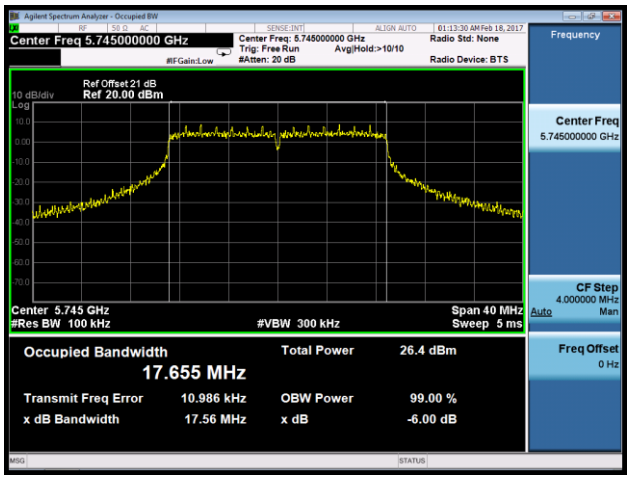


Channel 165 (5825MHz)

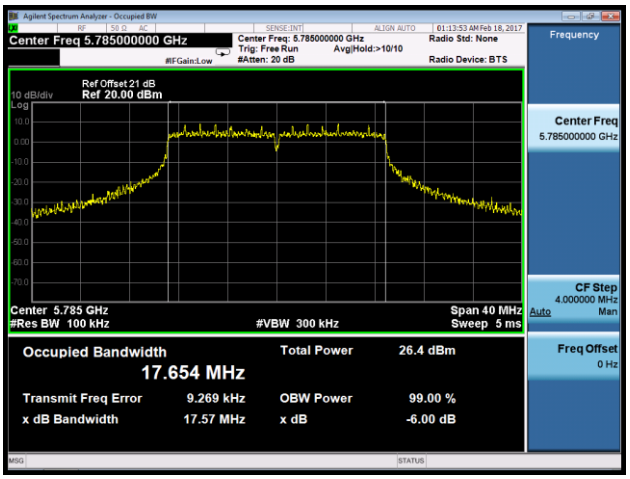


802.11n-HT20 6dB Bandwidth - Ant 1

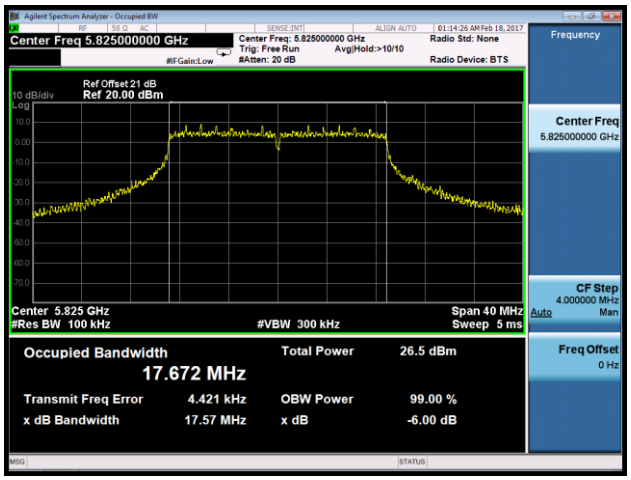
Channel 149 (5745MHz)



Channel 157 (5785MHz)

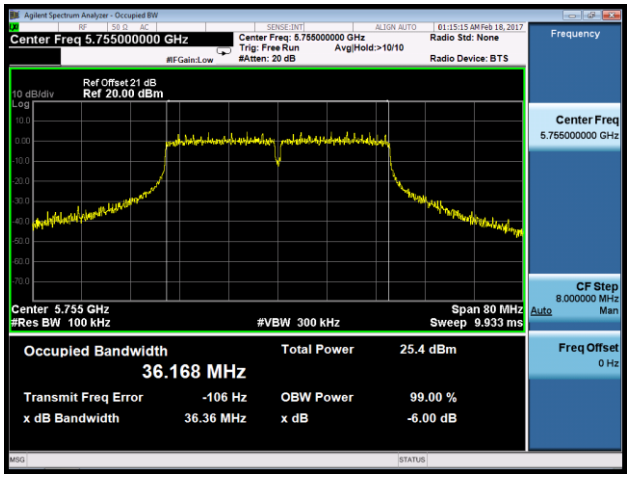


Channel 165 (5825MHz)

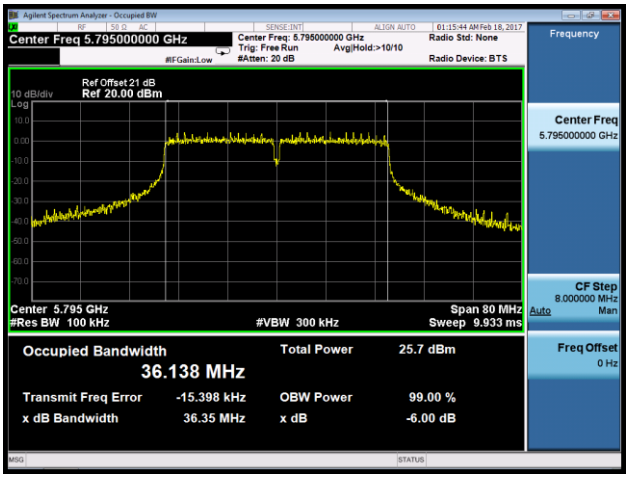


802.11n-HT40 6dB Bandwidth - Ant 1

Channel 151 (5755MHz)

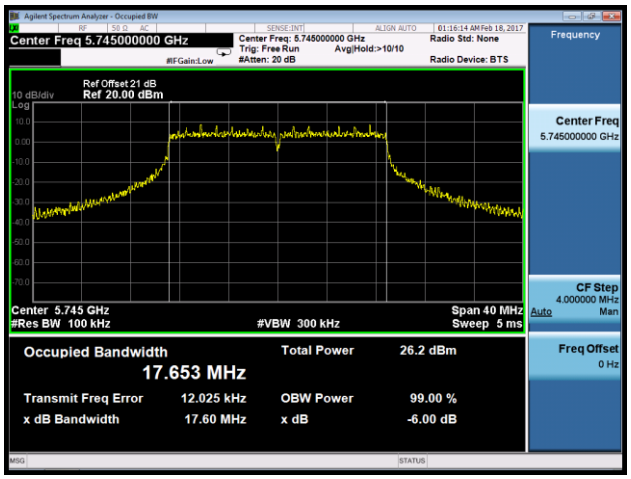


Channel 159 (5795MHz)

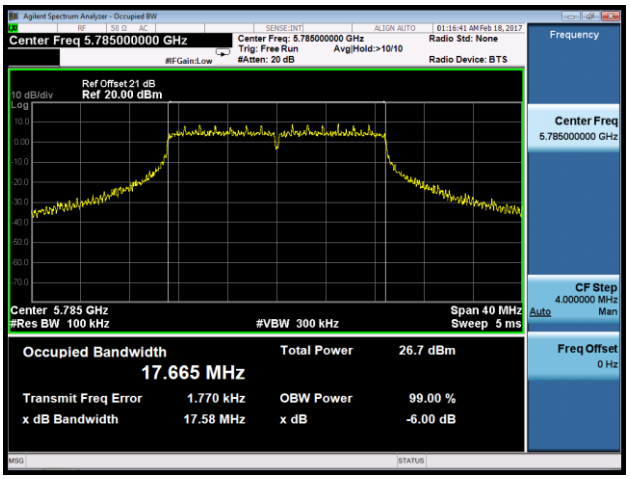


802.11ac-VHT20 6dB Bandwidth - Ant 1

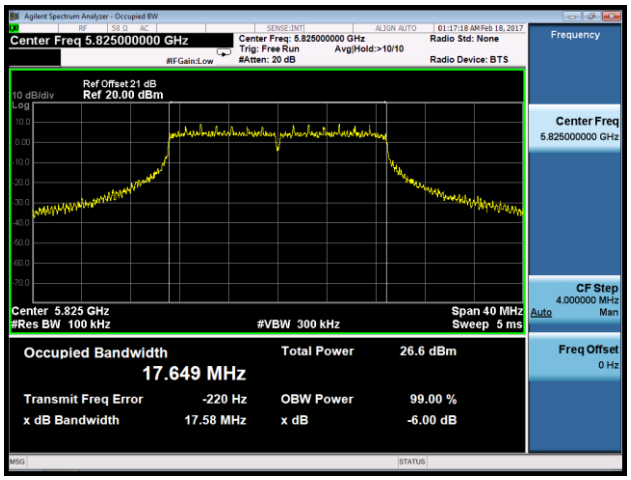
Channel 149 (5745MHz)



Channel 157 (5785MHz)

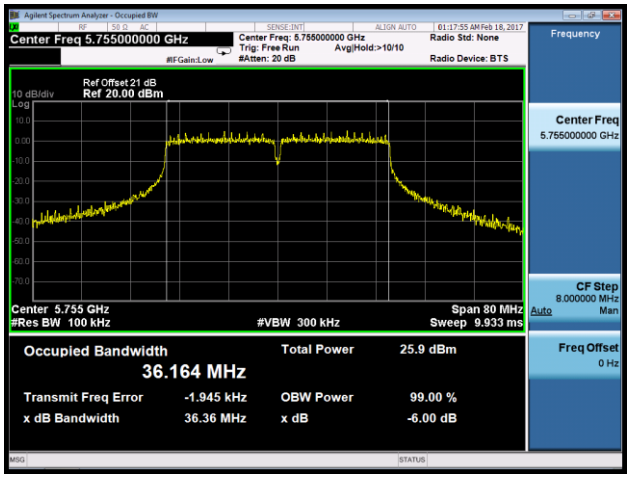


Channel 165 (5825MHz)

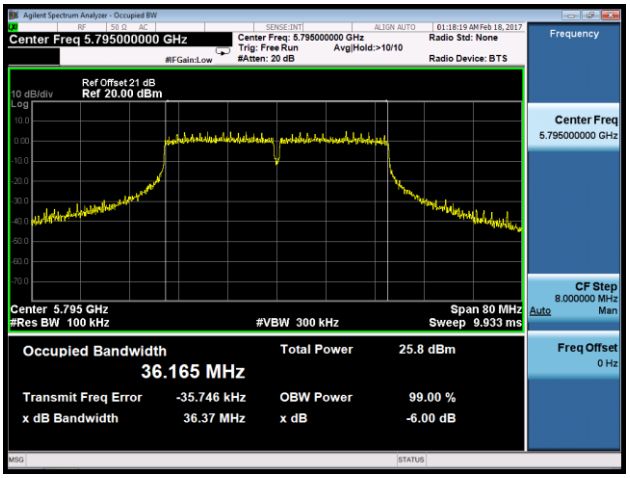


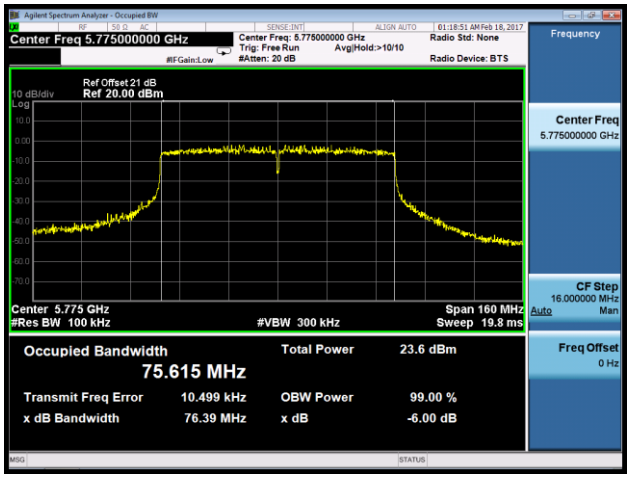
802.11ac-VHT40 6dB Bandwidth - Ant 1

Channel 151 (5755MHz)



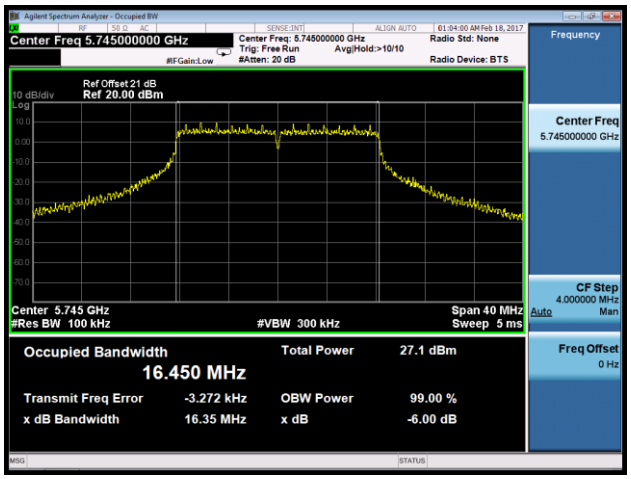
Channel 159 (5795MHz)



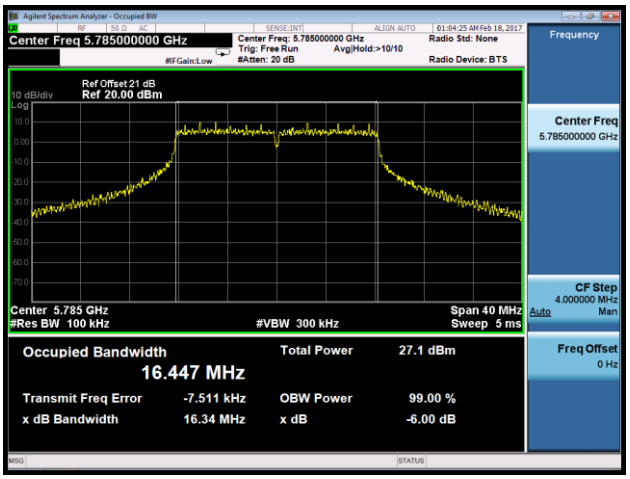
802.11ac-VHT80 6dB Bandwidth - Ant 1	
Channel 155 (5775MHz)	
	

802.11a 6dB Bandwidth - Ant 2

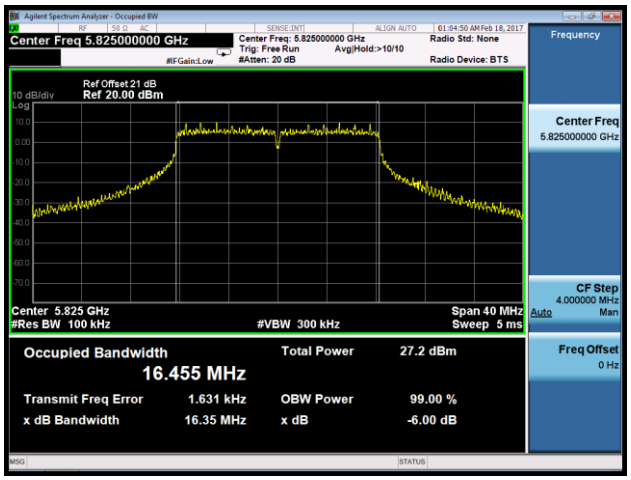
Channel 149 (5745MHz)



Channel 157 (5785MHz)

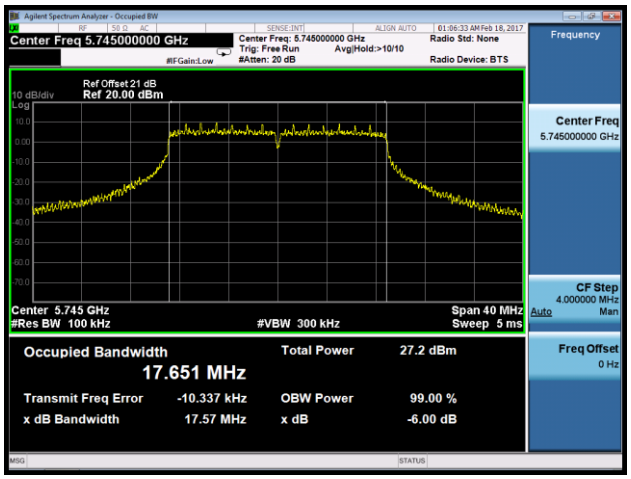


Channel 165 (5825MHz)

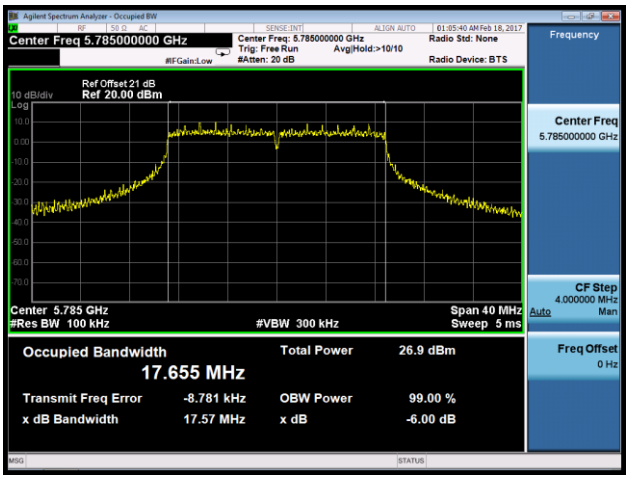


802.11n-HT20 6dB Bandwidth - Ant 2

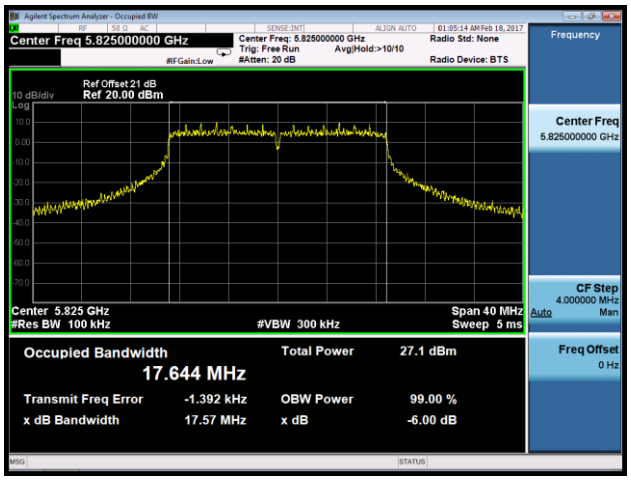
Channel 149 (5745MHz)



Channel 157 (5785MHz)

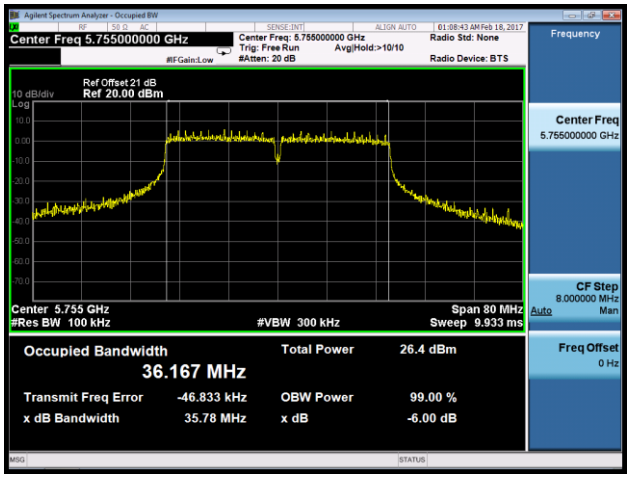


Channel 165 (5825MHz)

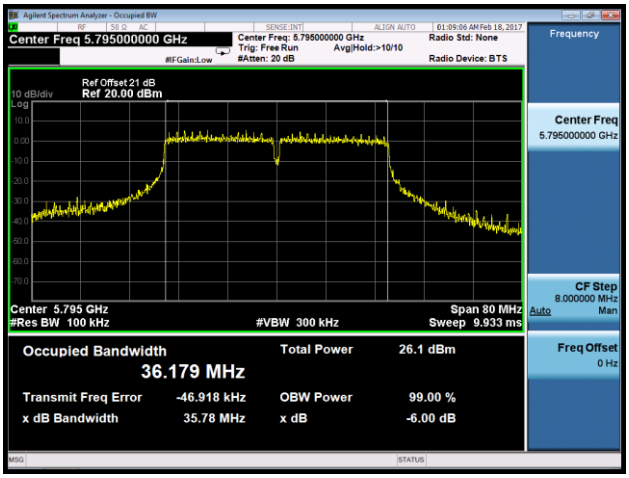


802.11n-HT40 6dB Bandwidth - Ant 2

Channel 151 (5755MHz)

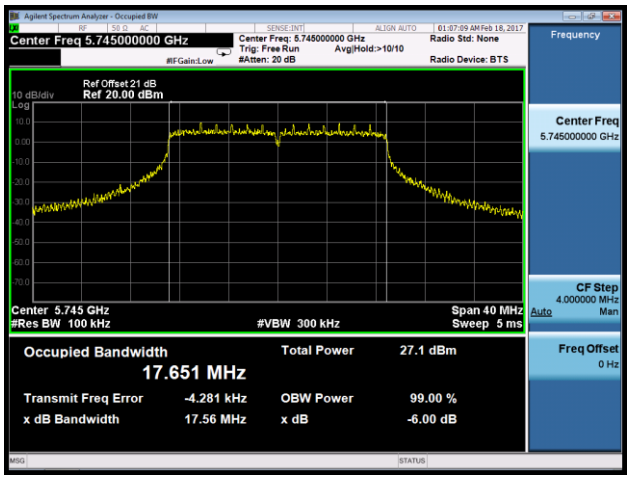


Channel 159 (5795MHz)

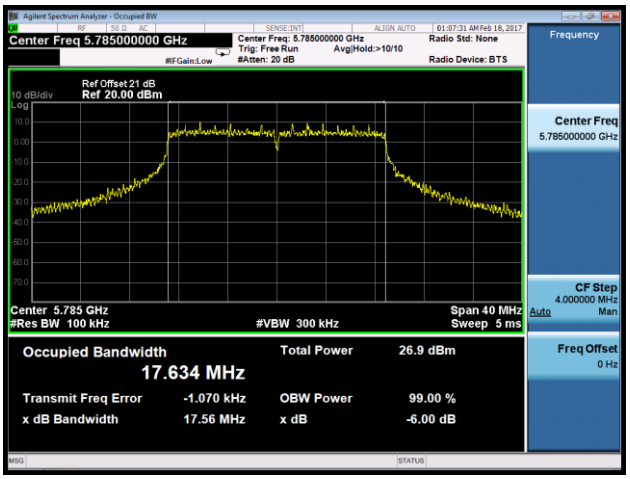


802.11ac-VHT20 6dB Bandwidth - Ant 2

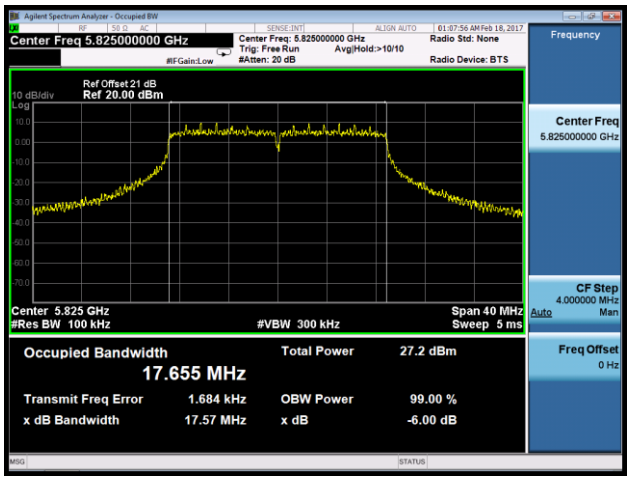
Channel 149 (5745MHz)



Channel 157 (5785MHz)

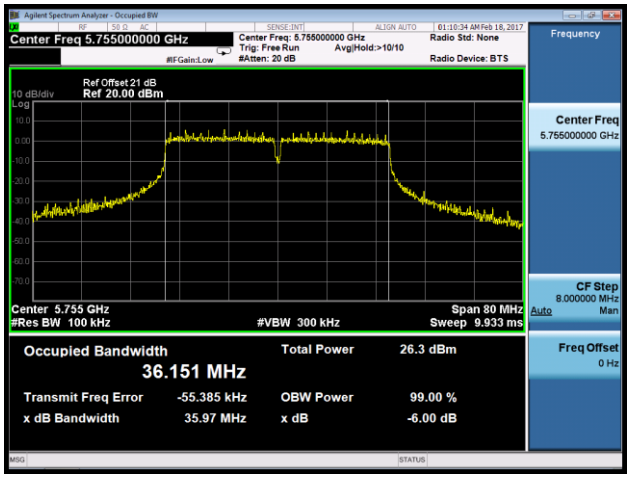


Channel 165 (5825MHz)

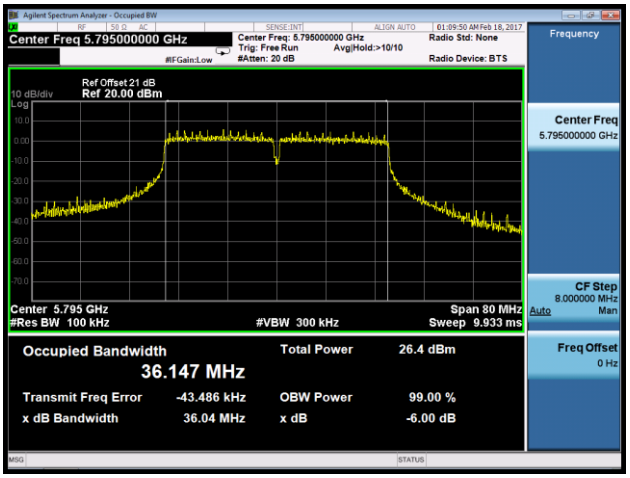


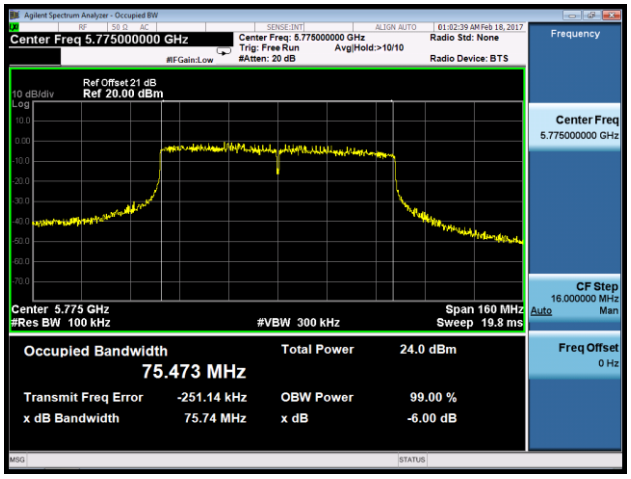
802.11ac-VHT40 6dB Bandwidth - Ant 2

Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT80 6dB Bandwidth - Ant 2	
Channel 155 (5775MHz)	
	

7.4. Operation Frequency Range of 26dBc Bandwidth Measurement

7.4.1.Test Limit

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz.

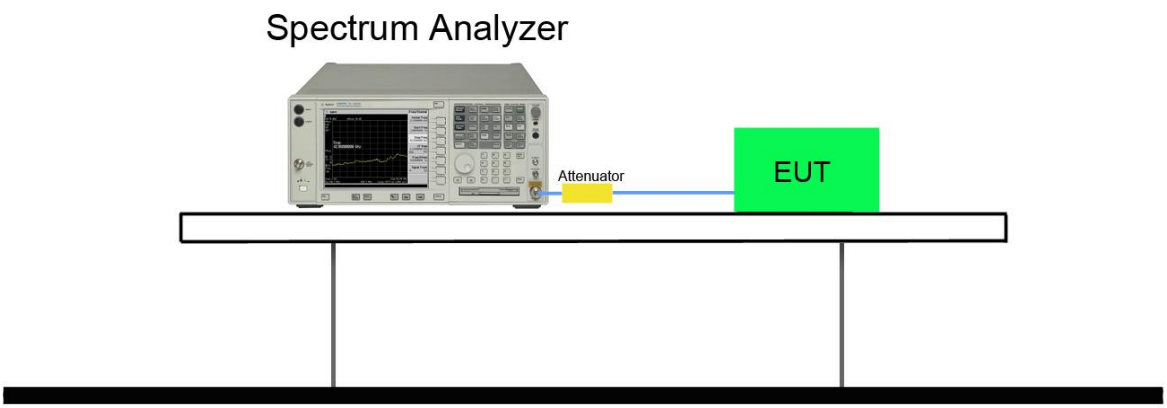
7.4.2.Test Procedure used

N/A

7.4.3.Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. Span = 1.5 times to 5.0 times the OBW.
3. RBW = 1 % to 5 % of the OBW.
4. VBW ≥ 3 × RBW.
5. Detector = Peak.
6. Trace mode = max hold.
7. Allow the trace to stabilize and set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
8. Determine the "−26 dB down amplitude" using [(reference value) − 26].
9. Using the marker function of the instrument to show 5250MHz frequency level.

7.4.4. Test Setup



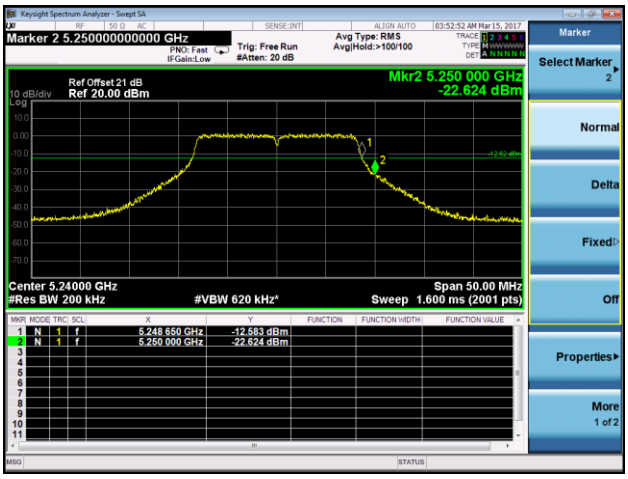
7.4.5. Test Result

Product	US Wi-Fi AP 2x2 OD ext. antenna	Test Engineer	Johnson Liao
Test Site	SR2	Test Date	2017/03/15
Test Item	Operation Frequency Range of 26dBc Bandwidth Measurement		

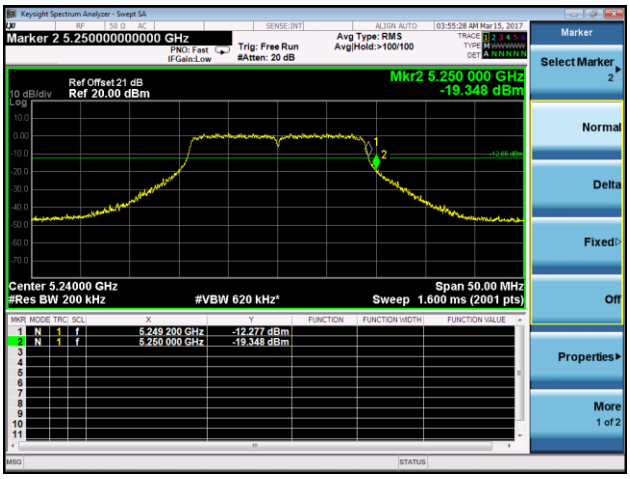
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Result
Ant 1				
802.11a	6	48	5240	Pass
802.11n-HT20	6.5	48	5240	Pass
802.11n-HT40	13.5	46	5230	Pass
802.11ac-VHT20	6.5	48	5240	Pass
802.11ac-VHT40	13.5	46	5230	Pass
802.11ac-VHT80	29.3	42	5210	Pass

Operation Frequency Range of 26dBc Bandwidth - Ant 1

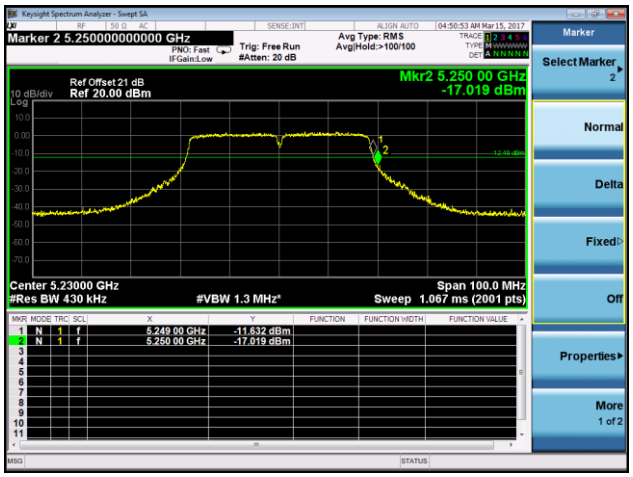
802.11a - Channel 48 (5240MHz)



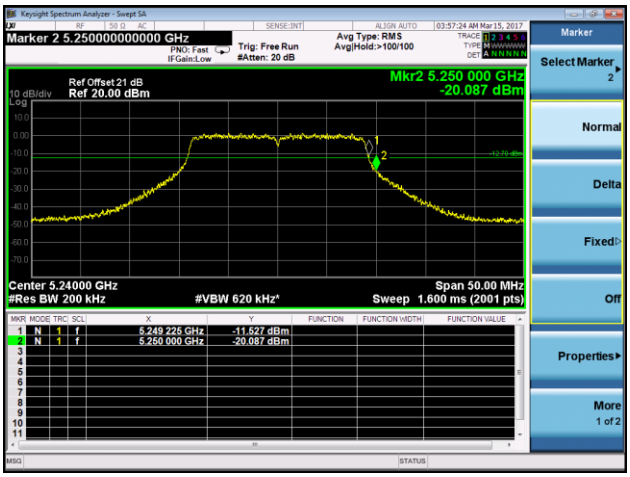
802.11n-HT20 - Channel 48 (5240MHz)



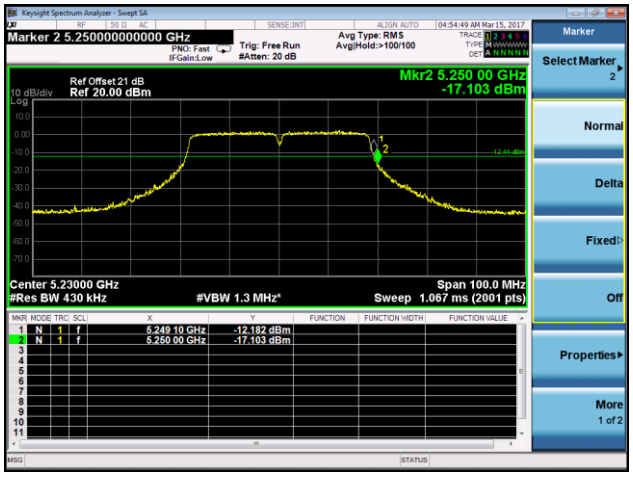
802.11n-HT40 - Channel 46 (5230MHz)



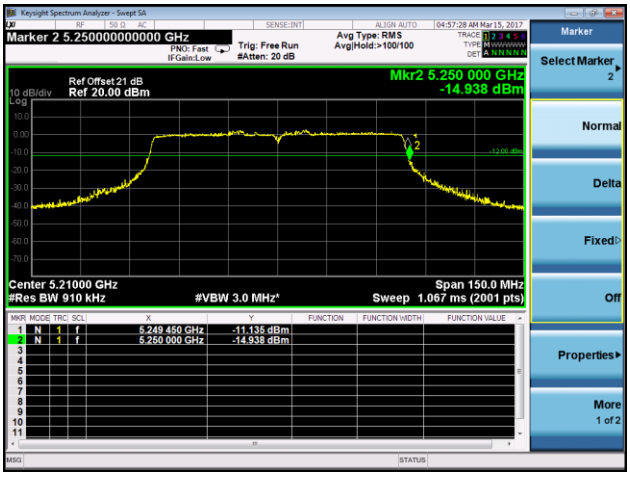
802.11ac-VHT20 - Channel 48 (5240MHz)



802.11ac-VHT40 - Channel 46 (5230MHz)



802.11ac-VHT80 - Channel 42 (5210MHz)



7.5. Output Power Measurement

7.5.1. Test Limit

For FCC Power Measurement Limit

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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 11dBm +10 log (26dB BW).

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.

For IC Power Measurement Limit

For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW (23.01dBm) or 10 + 10*log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW (23.98dBm) or 11 + 10 log10 B, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W (30dBm) or 17 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the 5.725-5.85 GHz band, the maximum conducted output power shall not exceed 1 W.

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.

EIRP Limit Calculation as below:

For 5150-5250MHz

802.11a: 10 + 10 log10 (16.88MHz) = 22.27dBm < 23.01dBm;

802.11n-HT20: 10 + 10 log10 (17.94MHz) = 22.54dBm < 23.01dBm;

802.11ac-VHT20: 10 + 10 log10 (17.90MHz) = 22.53dBm < 23.01dBm;

802.11n-HT40/ac-VHT40/ac-VHT80: 10 + 10 log10 B > 23.01dBm;

For 5250-5350MHz, 5470-5725MHz

802.11a: 17 + 10 log10 (16.88MHz) = 29.27dBm < 30dBm;

802.11n-HT20: 17 + 10 log10 (17.94MHz) = 29.54dBm < 30dBm;

802.11ac-VHT20: 17 + 10 log10 (17.90MHz) = 29.53dBm < 30dBm;

802.11n-HT40/ac-VHT40/ac-VHT80: 10 + 10 log10 B > 30dBm;

Max Conducted Output Power Limit Calculation as below:

For 5250-5350MHz, 5470-5725MHz

802.11a: 11 + 10 log10 (16.88MHz) = 23.27dBm < 23.98dBm;

802.11n-HT20: 11 + 10 log10 (17.94MHz) = 23.54dBm < 23.98dBm;

802.11ac-VHT20: 11 + 10 log10 (17.90MHz) = 23.53dBm < 23.98dBm;

802.11n-HT40/ac-VHT40/ac-VHT80: 11 + 10 log10 B > 23.98dBm;

Frequency Band (MHz)	Per Chain Max Antenna Gain (dBi)		CDD & Beam Forming Directional Gain (dBi)	Limit of SISO (dBm)		Limit of MIMO (dBm)
	Ant 1	Ant 2		Ant 1	Ant 2	Ant 1 + 2
WiFi Omni Ant						
5150 ~ 5250	7.00	7.00	10.01	29.00	29.00	25.99
30°elevation angle	7.00	7.00	N/A	N/A	N/A	N/A
5250 ~ 5350	7.00	7.00	10.01	22.98	22.98	19.97
5470 ~ 5725	7.00	7.00	10.01	22.98	22.98	19.97
5725 ~ 5850	7.00	7.00	10.01	29.00	29.00	25.99

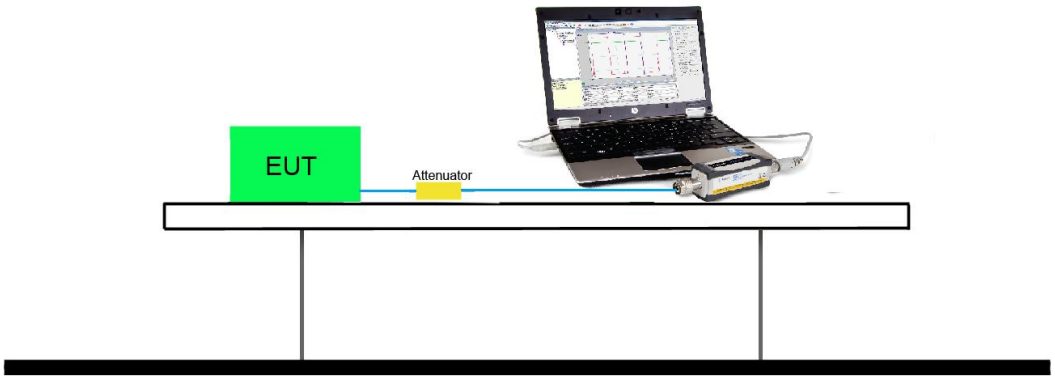
7.5.2. Test Procedure Used

KDB 789033 D02v01r03 - Section E) 3) b) Method PM-G

7.5.3. Test Setting

Average power measurements were perform 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 Rate Assessment

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}	802.11a	MCS Index for 802.11n	Data Rate (Mbps)			
			20MHz Bandwidth		40MHz Bandwidth	
			800ns GI	400ns GI	800ns GI	400ns GI
1	6	0	6.5	7.2	13.5	15.0
1	9	1	13.0	14.4	27.0	30.0
1	12	2	19.5	21.7	40.5	45.0
1	18	3	26.0	28.9	54.0	60.0
1	24	4	39.0	43.3	81.0	90.0
1	36	5	52.0	57.8	108.0	120.0
1	48	6	58.5	65.0	121.5	135.0
1	54	7	65.0	72.2	135.0	150.0

N_{Tx}	802.11a	MCS Index for 802.11n	Data Rate (Mbps)			
			20MHz Bandwidth		40MHz Bandwidth	
			800ns GI	400ns GI	800ns GI	400ns GI
2	6	12	13	14.4	27	30
2	9	12.5	26	28.9	54	60
2	12	13	39	43.3	81	90
2	18	13.5	52	57.8	108	120
2	24	14	78	86.7	162	180
2	36	14.5	104	115.6	216	240
2	48	15	117	130	243	270
2	54	15.5	130	144	270	300

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
1	0	6.5	7.2	13.5	15.0	29.3	32.5
1	1	13.0	14.4	27.0	30.0	58.5	65.0
1	2	19.5	21.7	40.5	45.0	87.8	97.5
1	3	26.0	28.9	54.0	60.0	117.0	130.0
1	4	39.0	43.3	81.0	90.0	175.5	195.0
1	5	52.0	57.8	108.0	120.0	234.0	260.0
1	6	58.5	65.0	121.5	135.0	263.3	292.5
1	7	65.0	72.2	135.0	150.0	292.5	325.0
1	8	78.0	86.7	162.0	180.0	351.0	390.0
1	9	--	--	180.0	200.0	390.0	433.3

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
2	0	13	14.4	27	30	58.6	65
2	1	26	28.8	54	60	117	130
2	2	39	43.4	81	90	175.6	195
2	3	52	57.8	108	120	234	260
2	4	78	86.6	162	180	351	390
2	5	104	115.6	216	240	468	520
2	6	117	130	243	270	526.6	585
2	7	130	144.4	270	300	585	650
2	8	156	173.4	324	360	702	780
2	9	--	--	360	400	780	866.6

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 1:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)
802.11a	20	36	5180	6	13.37
				24	13.11
				54	12.98
802.11n	20	36	5180	6.5	13.31
				7.2	13.19
				26	12.88
				28.9	12.90
				65	12.56
				72.2	12.52
802.11n	40	38	5190	13.5	13.55
				15	13.50
				54	13.26
				60	13.22
				135	13.03
				150	12.99
802.11ac	20	36	5180	6.5	13.32
				7.2	13.28
				39	13.09
				78	13.11
				81	12.90
				86.7	12.92
802.11ac	40	38	5190	13.5	13.61
				15	13.57
				108	13.36
				120	13.33
				180	13.10
				200	13.06

802.11ac	80	42	5210	29.3	13.48
				32.5	13.44
				260	13.28
				234	13.26
				390	13.04
				433.3	13.01

7.5.6. Test Result

Product	US Wi-Fi AP 2x2 OD ext. antenna	Test Engineer	Johnson Liao
Test Site	SR2	Test Date	2017/02/03
Test Item	Output Power		

For FCC Bands (UNII-2A & UNII-2C & UNII-3) & IC Bands (UNII-1 & UNII-2A & UNII-2C & UNII-3)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 1									
11a	6	36	5180	14.82	14.82	--	21.82	≤ 22.27	Pass
11a	6	44	5220	15.16	15.16	--	22.16	≤ 22.27	Pass
11a	6	48	5240	15.04	15.04	--	22.04	≤ 22.27	Pass
11a	6	52	5260	21.52	21.52	≤ 22.98	28.52	≤ 29.27	Pass
11a	6	60	5300	21.57	21.57	≤ 22.98	28.57	≤ 29.27	Pass
11a	6	64	5320	21.54	21.54	≤ 22.98	28.54	≤ 29.27	Pass
11a	6	100	5500	19.89	19.89	≤ 22.98	26.89	≤ 29.27	Pass
11a	6	116	5580	20.45	20.45	≤ 22.98	27.45	≤ 29.27	Pass
11a	6	120	5600	20.35	20.35	≤ 22.98	27.35	≤ 29.27	Pass
11a	6	140	5700	19.85	19.85	≤ 22.98	26.85	≤ 29.27	Pass
11a	6	149	5745	20.68	20.68	≤ 29.00	--	--	Pass
11a	6	157	5785	20.87	20.87	≤ 29.00	--	--	Pass
11a	6	165	5825	20.75	20.75	≤ 29.00	--	--	Pass
11n-HT20	6.5	36	5180	15.33	15.33	--	22.33	≤ 22.54	Pass
11n-HT20	6.5	44	5220	15.16	15.16	--	22.16	≤ 22.54	Pass
11n-HT20	6.5	48	5240	14.96	14.96	--	21.96	≤ 22.54	Pass
11n-HT20	6.5	52	5260	21.52	21.52	≤ 22.98	28.52	≤ 29.54	Pass
11n-HT20	6.5	60	5300	21.55	21.55	≤ 22.98	28.55	≤ 29.54	Pass
11n-HT20	6.5	64	5320	21.47	21.47	≤ 22.98	28.47	≤ 29.54	Pass
11n-HT20	6.5	100	5500	19.86	19.86	≤ 22.98	26.86	≤ 29.54	Pass
11n-HT20	6.5	116	5580	20.12	20.12	≤ 22.98	27.12	≤ 29.54	Pass
11n-HT20	6.5	120	5600	20.29	20.29	≤ 22.98	27.29	≤ 29.54	Pass
11n-HT20	6.5	140	5700	19.27	19.27	≤ 22.98	26.27	≤ 29.54	Pass
11n-HT20	6.5	149	5745	20.62	20.62	≤ 29.00	--	--	Pass
11n-HT20	6.5	157	5785	20.79	20.79	≤ 29.00	--	--	Pass
11n-HT20	6.5	165	5825	20.71	20.71	≤ 29.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 1									
11n-HT40	13.5	38	5190	15.56	15.56	--	22.56	≤ 23.01	Pass
11n-HT40	13.5	46	5230	15.24	15.24	--	22.24	≤ 23.01	Pass
11n-HT40	13.5	54	5270	22.19	22.19	≤ 22.98	29.19	≤ 30.00	Pass
11n-HT40	13.5	62	5310	21.82	21.82	≤ 22.98	28.82	≤ 30.00	Pass
11n-HT40	13.5	102	5510	17.51	17.51	≤ 22.98	24.51	≤ 30.00	Pass
11n-HT40	13.5	110	5550	21.86	21.86	≤ 22.98	28.16	≤ 30.00	Pass
11n-HT40	13.5	118	5590	21.08	21.08	≤ 22.98	28.08	≤ 30.00	Pass
11n-HT40	13.5	134	5670	19.43	19.43	≤ 22.98	26.43	≤ 30.00	Pass
11n-HT40	13.5	151	5755	20.19	20.19	≤ 29.00	--	--	Pass
11n-HT40	13.5	159	5795	20.34	20.34	≤ 29.00	--	--	Pass
11ac-VHT20	6.5	36	5180	15.34	15.34	--	22.34	≤ 22.53	Pass
11ac-VHT20	6.5	44	5220	15.16	15.16	--	22.16	≤ 22.53	Pass
11ac-VHT20	6.5	48	5240	15.01	15.01	--	22.01	≤ 22.53	Pass
11ac-VHT20	6.5	52	5260	21.47	21.47	≤ 22.98	28.47	≤ 29.53	Pass
11ac-VHT20	6.5	60	5300	21.51	21.51	≤ 22.98	28.51	≤ 29.53	Pass
11ac-VHT20	6.5	64	5320	21.45	21.45	≤ 22.98	28.45	≤ 29.53	Pass
11ac-VHT20	6.5	100	5500	20.37	20.37	≤ 22.98	27.37	≤ 29.53	Pass
11ac-VHT20	6.5	116	5580	20.26	20.26	≤ 22.98	27.26	≤ 29.53	Pass
11ac-VHT20	6.5	120	5600	20.33	20.33	≤ 22.98	27.33	≤ 29.53	Pass
11ac-VHT20	6.5	140	5700	19.35	19.35	≤ 22.98	26.35	≤ 29.53	Pass
11ac-VHT20	6.5	144	5720	19.77	19.77	≤ 22.98	26.77	≤ 29.53	Pass
11ac-VHT20	6.5	149	5745	20.66	20.66	≤ 29.00	--	--	Pass
11ac-VHT20	6.5	157	5785	20.80	20.80	≤ 29.00	--	--	Pass
11ac-VHT20	6.5	165	5825	20.72	20.72	≤ 29.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 1									
11ac-VHT40	13.5	38	5190	15.62	15.62	--	22.62	≤ 23.01	Pass
11ac-VHT40	13.5	46	5230	15.24	15.24	--	22.24	≤ 23.01	Pass
11ac-VHT40	13.5	54	5270	22.26	22.26	≤ 22.98	29.26	≤ 30.00	Pass
11ac-VHT40	13.5	62	5310	21.82	21.82	≤ 22.98	28.82	≤ 30.00	Pass
11ac-VHT40	13.5	102	5510	17.03	17.03	≤ 22.98	24.03	≤ 30.00	Pass
11ac-VHT40	13.5	110	5550	21.98	21.98	≤ 22.98	28.98	≤ 30.00	Pass
11ac-VHT40	13.5	118	5590	21.17	21.17	≤ 22.98	28.17	≤ 30.00	Pass
11ac-VHT40	13.5	134	5670	18.93	18.93	≤ 22.98	25.93	≤ 30.00	Pass
11ac-VHT40	13.5	142	5710	20.31	20.31	≤ 22.98	27.31	≤ 30.00	Pass
11ac-VHT40	13.5	151	5755	20.29	20.29	≤ 29.00	--	--	Pass
11ac-VHT40	13.5	159	5795	20.38	20.38	≤ 29.00	--	--	Pass
11ac-VHT80	29.3	42	5210	15.63	15.63	--	22.63	≤ 23.01	Pass
11ac-VHT80	29.3	58	5290	19.44	19.44	≤ 22.98	26.44	≤ 30.00	Pass
11ac-VHT80	29.3	106	5530	16.49	16.49	≤ 22.98	23.49	≤ 30.00	Pass
11ac-VHT80	29.3	122	5610	20.89	20.89	≤ 22.98	27.89	≤ 30.00	Pass
11ac-VHT80	29.3	138	5690	20.19	20.19	≤ 22.98	27.19	≤ 30.00	Pass
11ac-VHT80	29.3	155	5775	19.96	19.96	≤ 29.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 2									
11a	6	36	5180	14.95	14.95	--	21.95	≤ 22.27	Pass
11a	6	44	5220	14.64	14.64	--	21.64	≤ 22.27	Pass
11a	6	48	5240	14.82	14.82	--	21.82	≤ 22.27	Pass
11a	6	52	5260	21.03	21.03	≤ 22.98	28.03	≤ 29.27	Pass
11a	6	60	5300	21.47	21.47	≤ 22.98	28.47	≤ 29.27	Pass
11a	6	64	5320	21.48	21.48	≤ 22.98	28.48	≤ 29.27	Pass
11a	6	100	5500	20.89	20.89	≤ 22.98	27.89	≤ 29.27	Pass
11a	6	116	5580	20.11	20.11	≤ 22.98	27.11	≤ 29.27	Pass
11a	6	120	5600	20.43	20.43	≤ 22.98	27.43	≤ 29.27	Pass
11a	6	140	5700	19.48	19.48	≤ 22.98	26.48	≤ 29.27	Pass
11a	6	149	5745	20.54	20.54	≤ 29.00	--	--	Pass
11a	6	157	5785	21.15	21.15	≤ 29.00	--	--	Pass
11a	6	165	5825	20.75	20.75	≤ 29.00	--	--	Pass
11n-HT20	6.5	36	5180	14.98	14.98	--	21.98	≤ 22.54	Pass
11n-HT20	6.5	44	5220	15.04	15.04	--	22.04	≤ 22.54	Pass
11n-HT20	6.5	48	5240	15.23	15.23	--	22.23	≤ 22.54	Pass
11n-HT20	6.5	52	5260	21.89	21.89	≤ 22.98	28.89	≤ 29.54	Pass
11n-HT20	6.5	60	5300	21.42	21.42	≤ 22.98	28.42	≤ 29.54	Pass
11n-HT20	6.5	64	5320	21.45	21.45	≤ 22.98	28.45	≤ 29.54	Pass
11n-HT20	6.5	100	5500	20.36	20.36	≤ 22.98	27.36	≤ 29.54	Pass
11n-HT20	6.5	116	5580	19.98	19.98	≤ 22.98	26.98	≤ 29.54	Pass
11n-HT20	6.5	120	5600	20.33	20.33	≤ 22.98	27.33	≤ 29.54	Pass
11n-HT20	6.5	140	5700	18.41	18.41	≤ 22.98	25.41	≤ 29.54	Pass
11n-HT20	6.5	149	5745	20.45	20.45	≤ 29.00	--	--	Pass
11n-HT20	6.5	157	5785	21.01	21.01	≤ 29.00	--	--	Pass
11n-HT20	6.5	165	5825	20.66	20.66	≤ 29.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 2									
11n-HT40	13.5	38	5190	15.43	15.43	--	22.43	≤ 23.01	Pass
11n-HT40	13.5	46	5230	15.54	15.54	--	22.54	≤ 23.01	Pass
11n-HT40	13.5	54	5270	21.95	21.95	≤ 22.98	28.95	≤ 30.00	Pass
11n-HT40	13.5	62	5310	20.72	20.72	≤ 22.98	27.72	≤ 30.00	Pass
11n-HT40	13.5	102	5510	18.52	18.52	≤ 22.98	25.52	≤ 30.00	Pass
11n-HT40	13.5	110	5550	21.74	21.74	≤ 22.98	28.74	≤ 30.00	Pass
11n-HT40	13.5	118	5590	21.78	21.78	≤ 22.98	28.78	≤ 30.00	Pass
11n-HT40	13.5	134	5670	19.75	19.75	≤ 22.98	26.75	≤ 30.00	Pass
11n-HT40	13.5	151	5755	20.47	20.47	≤ 29.00	--	--	Pass
11n-HT40	13.5	159	5795	20.54	20.54	≤ 29.00	--	--	Pass
11ac-VHT20	6.5	36	5180	14.96	14.96	--	21.96	≤ 22.53	Pass
11ac-VHT20	6.5	44	5220	15.06	15.06	--	22.06	≤ 22.53	Pass
11ac-VHT20	6.5	48	5240	15.28	15.28	--	22.28	≤ 22.53	Pass
11ac-VHT20	6.5	52	5260	21.88	21.88	≤ 22.98	28.88	≤ 29.53	Pass
11ac-VHT20	6.5	60	5300	21.42	21.42	≤ 22.98	28.42	≤ 29.53	Pass
11ac-VHT20	6.5	64	5320	21.44	21.44	≤ 22.98	28.44	≤ 29.53	Pass
11ac-VHT20	6.5	100	5500	20.82	20.82	≤ 22.98	27.82	≤ 29.53	Pass
11ac-VHT20	6.5	116	5580	20.24	20.24	≤ 22.98	27.24	≤ 29.53	Pass
11ac-VHT20	6.5	120	5600	20.37	20.37	≤ 22.98	27.37	≤ 29.53	Pass
11ac-VHT20	6.5	140	5700	18.45	18.45	≤ 22.98	25.45	≤ 29.53	Pass
11ac-VHT20	6.5	144	5720	19.90	19.90	≤ 22.98	26.90	≤ 29.53	Pass
11ac-VHT20	6.5	149	5745	20.45	20.45	≤ 29.00	--	--	Pass
11ac-VHT20	6.5	157	5785	21.01	21.01	≤ 29.00	--	--	Pass
11ac-VHT20	6.5	165	5825	20.66	20.66	≤ 29.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 2									
11ac-VHT40	13.5	38	5190	15.47	15.47	--	22.47	≤ 23.01	Pass
11ac-VHT40	13.5	46	5230	15.58	15.58	--	22.58	≤ 23.01	Pass
11ac-VHT40	13.5	54	5270	21.73	21.73	≤ 22.98	28.73	≤ 30.00	Pass
11ac-VHT40	13.5	62	5310	21.17	21.17	≤ 22.98	28.17	≤ 30.00	Pass
11ac-VHT40	13.5	102	5510	18.47	18.47	≤ 22.98	25.47	≤ 30.00	Pass
11ac-VHT40	13.5	110	5550	21.92	21.92	≤ 22.98	28.92	≤ 30.00	Pass
11ac-VHT40	13.5	118	5590	21.76	21.76	≤ 22.98	28.76	≤ 30.00	Pass
11ac-VHT40	13.5	134	5670	19.70	19.70	≤ 22.98	26.70	≤ 30.00	Pass
11ac-VHT40	13.5	142	5710	20.96	20.96	≤ 22.98	27.96	≤ 30.00	Pass
11ac-VHT40	13.5	151	5755	20.45	20.45	≤ 29.00	--	--	Pass
11ac-VHT40	13.5	159	5795	20.47	20.47	≤ 29.00	--	--	Pass
11ac-VHT80	29.3	42	5210	15.63	15.63	--	22.63	≤ 23.01	Pass
11ac-VHT80	29.3	58	5290	17.99	17.99	≤ 22.98	24.99	≤ 30.00	Pass
11ac-VHT80	29.3	106	5530	17.17	17.17	≤ 22.98	24.17	≤ 30.00	Pass
11ac-VHT80	29.3	122	5610	21.29	21.29	≤ 22.98	28.29	≤ 30.00	Pass
11ac-VHT80	29.3	138	5690	21.05	21.05	≤ 22.98	28.05	≤ 30.00	Pass
11ac-VHT80	29.3	155	5775	20.21	20.21	≤ 29.00	--	--	Pass

Note: EIRP (dBm) = Total Average Power + Antenna Gain.

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 1 + 2										
11a	6	36	5180	9.01	8.93	11.98	--	18.98	≤ 22.27	Pass
11a	6	44	5220	8.94	9.06	12.01	--	19.01	≤ 22.27	Pass
11a	6	48	5240	9.13	8.88	12.02	--	19.02	≤ 22.27	Pass
11a	6	52	5260	15.53	15.62	18.59	≤ 19.97	28.60	≤ 29.27	Pass
11a	6	60	5300	16.35	16.02	19.20	≤ 19.97	29.21	≤ 29.27	Pass
11a	6	64	5320	16.03	16.06	19.06	≤ 19.97	29.07	≤ 29.27	Pass
11a	6	100	5500	15.01	15.53	18.29	≤ 19.97	28.30	≤ 29.27	Pass
11a	6	116	5580	14.88	15.03	17.97	≤ 19.97	27.98	≤ 29.27	Pass
11a	6	120	5600	14.42	15.11	17.79	≤ 19.97	27.80	≤ 29.27	Pass
11a	6	140	5700	14.43	15.15	17.82	≤ 19.97	27.83	≤ 29.27	Pass
11a	6	149	5745	20.67	20.64	23.67	≤ 29.00	--	--	Pass
11a	6	157	5785	20.82	21.17	24.01	≤ 29.00	--	--	Pass
11a	6	165	5825	20.76	20.88	23.83	≤ 29.00	--	--	Pass
11n-HT20	13	36	5180	8.78	8.57	11.69	--	21.70	≤ 22.54	Pass
11n-HT20	13	44	5220	8.77	9.07	11.93	--	21.94	≤ 22.54	Pass
11n-HT20	13	48	5240	9.23	9.11	12.18	--	22.19	≤ 22.54	Pass
11n-HT20	13	52	5260	16.35	15.88	19.13	≤ 19.97	29.14	≤ 29.54	Pass
11n-HT20	13	60	5300	16.25	16.09	19.18	≤ 19.97	29.19	≤ 29.54	Pass
11n-HT20	13	64	5320	16.03	15.98	19.02	≤ 19.97	29.03	≤ 29.54	Pass
11n-HT20	13	100	5500	15.11	15.65	18.40	≤ 19.97	28.41	≤ 29.54	Pass
11n-HT20	13	116	5580	14.86	15.25	18.07	≤ 19.97	28.08	≤ 29.54	Pass
11n-HT20	13	120	5600	14.24	15.03	17.66	≤ 19.97	27.67	≤ 29.54	Pass
11n-HT20	13	140	5700	14.03	14.99	17.55	≤ 19.97	27.56	≤ 29.54	Pass
11n-HT20	13	149	5745	20.67	20.71	23.70	≤ 25.99	--	--	Pass
11n-HT20	13	157	5785	20.84	21.22	24.04	≤ 25.99	--	--	Pass
11n-HT20	13	165	5825	20.74	20.85	23.81	≤ 25.99	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 1 + 2										
11n-HT40	27	38	5190	9.56	9.57	12.58	--	22.59	≤ 23.01	Pass
11n-HT40	27	46	5230	9.33	9.62	12.49	--	22.50	≤ 23.01	Pass
11n-HT40	27	54	5270	16.53	16.58	19.57	≤ 19.97	29.58	≤ 30.00	Pass
11n-HT40	27	62	5310	16.63	16.03	19.35	≤ 19.97	29.36	≤ 30.00	Pass
11n-HT40	27	102	5510	16.39	16.18	19.30	≤ 19.97	29.31	≤ 30.00	Pass
11n-HT40	27	110	5550	16.36	16.79	19.59	≤ 19.97	29.60	≤ 30.00	Pass
11n-HT40	27	118	5590	16.25	16.88	19.59	≤ 19.97	29.60	≤ 30.00	Pass
11n-HT40	27	134	5670	15.98	16.75	19.39	≤ 19.97	29.40	≤ 30.00	Pass
11n-HT40	27	151	5755	20.30	20.73	23.53	≤ 25.99	--	--	Pass
11n-HT40	27	159	5795	20.42	20.69	23.57	≤ 25.99	--	--	Pass
11ac-VHT20	13	36	5180	9.45	9.33	12.40	--	22.41	≤ 22.53	Pass
11ac-VHT20	13	44	5220	8.76	9.11	11.95	--	21.96	≤ 22.53	Pass
11ac-VHT20	13	48	5240	9.21	9.08	12.16	--	22.17	≤ 22.53	Pass
11ac-VHT20	13	52	5260	16.35	15.85	19.12	≤ 19.97	29.13	≤ 29.53	Pass
11ac-VHT20	13	60	5300	16.07	16.15	19.12	≤ 19.97	29.13	≤ 29.53	Pass
11ac-VHT20	13	64	5320	16.25	15.98	19.13	≤ 19.97	29.14	≤ 29.53	Pass
11ac-VHT20	13	100	5500	15.43	15.54	18.50	≤ 19.97	28.51	≤ 29.53	Pass
11ac-VHT20	13	116	5580	15.38	15.86	18.64	≤ 19.97	28.65	≤ 29.53	Pass
11ac-VHT20	13	120	5600	15.03	15.35	18.20	≤ 19.97	28.21	≤ 29.53	Pass
11ac-VHT20	13	140	5700	14.75	15.35	18.07	≤ 19.97	28.08	≤ 29.53	Pass
11ac-VHT20	13	144	5720	14.68	15.03	17.87	≤ 19.97	27.88	≤ 29.53	Pass
11ac-VHT20	13	149	5745	20.70	20.72	23.72	≤ 25.99	--	--	Pass
11ac-VHT20	13	157	5785	20.85	21.21	24.04	≤ 25.99	--	--	Pass
11ac-VHT20	13	165	5825	20.72	20.86	23.80	≤ 25.99	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 1 + 2										
11ac-VHT40	27	38	5190	9.58	9.68	12.64	--	22.65	≤ 23.01	Pass
11ac-VHT40	27	46	5230	9.31	9.57	12.45	--	22.46	≤ 23.01	Pass
11ac-VHT40	27	54	5270	16.46	16.41	19.45	≤ 19.97	29.46	≤ 30.00	Pass
11ac-VHT40	27	62	5310	16.59	16.08	19.35	≤ 19.97	29.36	≤ 30.00	Pass
11ac-VHT40	27	102	5510	16.09	16.38	19.25	≤ 19.97	29.26	≤ 30.00	Pass
11ac-VHT40	27	110	5550	15.98	16.75	19.39	≤ 19.97	29.40	≤ 30.00	Pass
11ac-VHT40	27	118	5590	15.95	16.86	19.44	≤ 19.97	29.45	≤ 30.00	Pass
11ac-VHT40	27	134	5670	15.56	16.56	19.10	≤ 19.97	29.11	≤ 30.00	Pass
11ac-VHT40	27	142	5710	15.86	16.73	19.33	≤ 19.97	29.34	≤ 30.00	Pass
11ac-VHT40	27	151	5755	20.29	20.69	23.50	≤ 25.99	--	--	Pass
11ac-VHT40	27	159	5795	20.45	20.75	23.61	≤ 25.99	--	--	Pass
11ac-VHT80	58.6	42	5210	9.15	9.73	12.46	--	22.47	≤ 23.01	Pass
11ac-VHT80	58.6	58	5290	16.85	16.24	19.57	≤ 19.97	29.58	≤ 30.00	Pass
11ac-VHT80	58.6	106	5530	15.62	15.99	18.82	≤ 19.97	28.83	≤ 30.00	Pass
11ac-VHT80	58.6	122	5610	16.05	16.75	19.42	≤ 19.97	29.43	≤ 30.00	Pass
11ac-VHT80	58.6	138	5690	16.03	17.01	19.56	≤ 19.97	29.57	≤ 30.00	Pass
11ac-VHT80	58.6	155	5775	20.07	20.49	23.30	≤ 25.99	--	--	Pass

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

Note 2: The EIRP (dBm) = Total Average Power + Directional Gain.

For FCC Band (UNII-1)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP of 30° Elevation Angle (dBm)	EIRP Limit of 30° Elevation Angle (dBm)	Result
Ant 1									
11a	6	36	5180	13.37	13.37	≤ 29.00	20.37	≤ 21.00	Pass
11a	6	44	5220	13.62	13.62	≤ 29.00	20.62	≤ 21.00	Pass
11a	6	48	5240	13.49	13.49	≤ 29.00	20.49	≤ 21.00	Pass
11n-HT20	6.5	36	5180	13.31	13.31	≤ 29.00	20.31	≤ 21.00	Pass
11n-HT20	6.5	44	5220	13.57	13.57	≤ 29.00	20.57	≤ 21.00	Pass
11n-HT20	6.5	48	5240	13.45	13.45	≤ 29.00	20.45	≤ 21.00	Pass
11n-HT40	13.5	38	5190	13.55	13.55	≤ 29.00	20.55	≤ 21.00	Pass
11n-HT40	13.5	46	5230	13.32	13.32	≤ 29.00	20.32	≤ 21.00	Pass
11ac-VHT20	6.5	36	5180	13.32	13.32	≤ 29.00	20.32	≤ 21.00	Pass
11ac-VHT20	6.5	44	5220	13.61	13.61	≤ 29.00	20.61	≤ 21.00	Pass
11ac-VHT20	6.5	48	5240	13.48	13.48	≤ 29.00	20.48	≤ 21.00	Pass
11ac-VHT40	13.5	38	5190	13.61	13.61	≤ 29.00	20.61	≤ 21.00	Pass
11ac-VHT40	13.5	46	5230	13.29	13.29	≤ 29.00	20.29	≤ 21.00	Pass
11ac-VHT80	29.3	42	5210	13.48	13.48	≤ 29.00	20.48	≤ 21.00	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP of 30° Elevation Angle (dBm)	EIRP Limit of 30° Elevation Angle (dBm)	Result
Ant 2									
11a	6	36	5180	13.59	13.59	≤ 29.00	20.59	≤ 21.00	Pass
11a	6	44	5220	13.39	13.39	≤ 29.00	20.39	≤ 21.00	Pass
11a	6	48	5240	13.49	13.49	≤ 29.00	20.49	≤ 21.00	Pass
11n-HT20	6.5	36	5180	13.58	13.58	≤ 29.00	20.58	≤ 21.00	Pass
11n-HT20	6.5	44	5220	13.36	13.36	≤ 29.00	20.36	≤ 21.00	Pass
11n-HT20	6.5	48	5240	13.51	13.51	≤ 29.00	20.51	≤ 21.00	Pass
11n-HT40	13.5	38	5190	13.63	13.63	≤ 29.00	20.63	≤ 21.00	Pass
11n-HT40	13.5	46	5230	13.43	13.43	≤ 29.00	20.43	≤ 21.00	Pass
11ac-VHT20	6.5	36	5180	13.64	13.64	≤ 29.00	20.64	≤ 21.00	Pass
11ac-VHT20	6.5	44	5220	13.39	13.39	≤ 29.00	20.39	≤ 21.00	Pass
11ac-VHT20	6.5	48	5240	13.48	13.48	≤ 29.00	20.48	≤ 21.00	Pass
11ac-VHT40	13.5	38	5190	13.66	13.66	≤ 29.00	20.66	≤ 21.00	Pass
11ac-VHT40	13.5	46	5230	13.42	13.42	≤ 29.00	20.42	≤ 21.00	Pass
11ac-VHT80	29.3	42	5210	13.44	13.44	≤ 29.00	20.44	≤ 21.00	Pass

Note: EIRP of 30° Elevation Angle (dBm) = Total Average Power (dBm) + 30° Elevation Angle Gain (dBi).

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	EIRP of 30° Elevation Angle (dBm)	EIRP Limit of 30° Elevation Angle (dBm)	Result
Ant 1 + 2										
11a	6	36	5180	10.86	10.43	13.66	≤ 29.00	20.66	≤ 21.00	Pass
11a	6	44	5220	10.16	10.63	13.41	≤ 29.00	20.41	≤ 21.00	Pass
11a	6	48	5240	10.35	10.76	13.57	≤ 29.00	20.57	≤ 21.00	Pass
11n-HT20	27	36	5180	7.48	7.43	10.47	≤ 25.99	20.48	≤ 21.00	Pass
11n-HT20	27	44	5220	7.31	7.62	10.48	≤ 25.99	20.49	≤ 21.00	Pass
11n-HT20	27	48	5240	7.29	7.51	10.41	≤ 25.99	20.42	≤ 21.00	Pass
11n-HT40	54	38	5190	7.69	7.38	10.55	≤ 25.99	20.56	≤ 21.00	Pass
11n-HT40	54	46	5230	7.09	7.26	10.19	≤ 25.99	20.20	≤ 21.00	Pass
11ac-VHT20	27	36	5180	7.52	7.05	10.30	≤ 25.99	20.31	≤ 21.00	Pass
11ac-VHT20	27	44	5220	7.32	7.59	10.47	≤ 25.99	20.48	≤ 21.00	Pass
11ac-VHT20	27	48	5240	7.30	7.41	10.37	≤ 25.99	20.38	≤ 21.00	Pass
11ac-VHT40	54	38	5190	7.74	7.38	10.57	≤ 25.99	20.58	≤ 21.00	Pass
11ac-VHT40	54	46	5230	7.47	7.69	10.59	≤ 25.99	20.60	≤ 21.00	Pass
11ac-VHT80	117.2	42	5210	7.21	7.17	10.20	≤ 25.99	20.21	≤ 21.00	Pass

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

Note 2: Max EIRP of 30° Elevation Angle (dBm) = $10*\log\{10^{(\text{Ant 1 Average Power + Ant 1 30° Elevation Angle Gain) /10}} + 10^{(\text{Ant 2 Average Power + Ant 2 30° Elevation Angle Gain) /10}}\}$.

7.6. Transmit Power Control

7.6.1. 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.

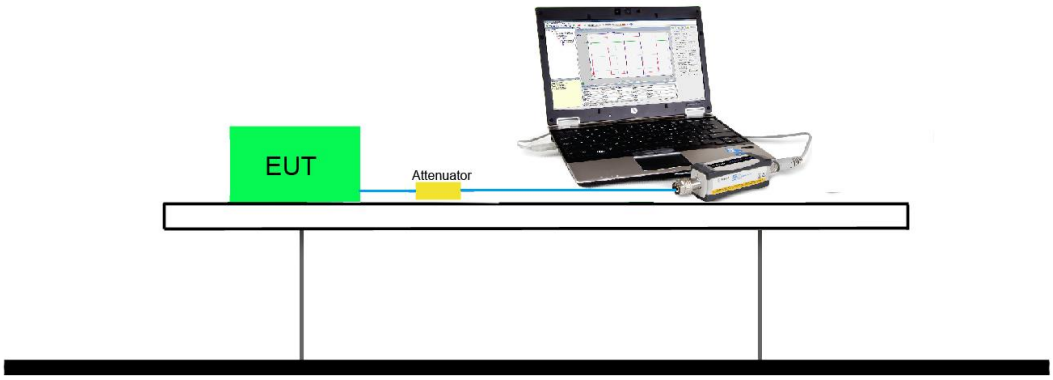
7.6.2. Test Procedure Used

KDB 789033 D02v01r03 - Section E) 3) b) Method PM-G

7.6.3. Test Setting

Average power measurements were perform 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.

7.6.4. Test Setup



7.6.5. Test Result

Product	US Wi-Fi AP 2x2 OD ext. antenna	Temperature	25°C
Test Engineer	Johnson Liao	Relative Humidity	50 ~ 58%
Test Site	SR2	Test Date	2017/02/27
Test Item	TPC		

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	TPC Power (dBm)	EIRP TPC (dBm)	EIRP TPC Limit (dBm)	Result
Ant 1							
11a	6	52	5260	15.45	22.45	≤ 24.00	Pass
11a	6	60	5300	15.39	22.39	≤ 24.00	Pass
11a	6	64	5320	15.53	22.53	≤ 24.00	Pass
11a	6	100	5500	13.76	20.76	≤ 24.00	Pass
11a	6	116	5580	14.32	21.32	≤ 24.00	Pass
11a	6	120	5600	14.16	21.16	≤ 24.00	Pass
11a	6	140	5700	13.65	20.65	≤ 24.00	Pass
11n-HT20	6.5	52	5260	15.47	22.47	≤ 24.00	Pass
11n-HT20	6.5	60	5300	15.40	22.40	≤ 24.00	Pass
11n-HT20	6.5	64	5320	15.44	22.44	≤ 24.00	Pass
11n-HT20	6.5	100	5500	13.77	20.77	≤ 24.00	Pass
11n-HT20	6.5	116	5580	14.10	21.10	≤ 24.00	Pass
11n-HT20	6.5	120	5600	14.12	21.12	≤ 24.00	Pass
11n-HT20	6.5	140	5700	13.13	20.13	≤ 24.00	Pass
11n-HT40	13.5	54	5270	16.17	23.17	≤ 24.00	Pass
11n-HT40	13.5	62	5310	15.81	22.81	≤ 24.00	Pass
11n-HT40	13.5	102	5510	11.43	18.43	≤ 24.00	Pass
11n-HT40	13.5	110	5550	15.75	22.75	≤ 24.00	Pass
11n-HT40	13.5	118	5590	14.99	21.99	≤ 24.00	Pass
11n-HT40	13.5	134	5670	13.26	20.26	≤ 24.00	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	TPC Power (dBm)	EIRP TPC (dBm)	EIRP TPC Limit (dBm)	Result
Ant 1							
11ac-VHT20	6.5	52	5260	15.42	22.42	≤ 24.00	Pass
11ac-VHT20	6.5	60	5300	15.44	22.44	≤ 24.00	Pass
11ac-VHT20	6.5	64	5320	15.34	22.34	≤ 24.00	Pass
11ac-VHT20	6.5	100	5500	14.20	21.20	≤ 24.00	Pass
11ac-VHT20	6.5	116	5580	14.17	21.17	≤ 24.00	Pass
11ac-VHT20	6.5	120	5600	14.15	21.15	≤ 24.00	Pass
11ac-VHT20	6.5	140	5700	13.18	20.18	≤ 24.00	Pass
11ac-VHT20	6.5	144	5720	13.62	20.62	≤ 24.00	Pass
11ac-VHT40	13.5	54	5270	16.11	23.11	≤ 24.00	Pass
11ac-VHT40	13.5	62	5310	15.78	22.78	≤ 24.00	Pass
11ac-VHT40	13.5	102	5510	11.03	18.03	≤ 24.00	Pass
11ac-VHT40	13.5	110	5550	15.84	22.84	≤ 24.00	Pass
11ac-VHT40	13.5	118	5590	15.04	22.04	≤ 24.00	Pass
11ac-VHT40	13.5	134	5670	12.81	19.81	≤ 24.00	Pass
11ac-VHT40	13.5	142	5710	14.25	21.25	≤ 24.00	Pass
11ac-VHT80	29.3	58	5290	13.36	20.36	≤ 24.00	Pass
11ac-VHT80	29.3	106	5530	10.36	17.36	≤ 24.00	Pass
11ac-VHT80	29.3	122	5610	14.83	21.83	≤ 24.00	Pass
11ac-VHT80	29.3	138	5690	14.03	21.03	≤ 24.00	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	TPC Power (dBm)	EIRP TPC (dBm)	EIRP TPC Limit (dBm)	Result
Ant 2							
11a	6	52	5260	14.85	21.85	≤ 24.00	Pass
11a	6	60	5300	15.39	22.39	≤ 24.00	Pass
11a	6	64	5320	15.32	22.32	≤ 24.00	Pass
11a	6	100	5500	14.72	21.72	≤ 24.00	Pass
11a	6	116	5580	13.93	20.93	≤ 24.00	Pass
11a	6	120	5600	14.27	21.27	≤ 24.00	Pass
11a	6	140	5700	13.36	20.36	≤ 24.00	Pass
11n-HT20	6.5	52	5260	15.83	22.83	≤ 24.00	Pass
11n-HT20	6.5	60	5300	15.29	22.29	≤ 24.00	Pass
11n-HT20	6.5	64	5320	15.32	22.32	≤ 24.00	Pass
11n-HT20	6.5	100	5500	14.26	21.26	≤ 24.00	Pass
11n-HT20	6.5	116	5580	13.87	20.87	≤ 24.00	Pass
11n-HT20	6.5	120	5600	14.14	21.14	≤ 24.00	Pass
11n-HT20	6.5	140	5700	12.28	19.28	≤ 24.00	Pass
11n-HT40	13.5	54	5270	15.85	22.85	≤ 24.00	Pass
11n-HT40	13.5	62	5310	14.56	21.56	≤ 24.00	Pass
11n-HT40	13.5	102	5510	12.48	19.48	≤ 24.00	Pass
11n-HT40	13.5	110	5550	15.64	22.64	≤ 24.00	Pass
11n-HT40	13.5	118	5590	15.77	22.77	≤ 24.00	Pass
11n-HT40	13.5	134	5670	13.55	20.55	≤ 24.00	Pass
11ac-VHT20	6.5	52	5260	15.83	22.83	≤ 24.00	Pass
11ac-VHT20	6.5	60	5300	15.24	22.24	≤ 24.00	Pass
11ac-VHT20	6.5	64	5320	15.34	22.34	≤ 24.00	Pass
11ac-VHT20	6.5	100	5500	14.68	21.68	≤ 24.00	Pass
11ac-VHT20	6.5	116	5580	14.04	21.04	≤ 24.00	Pass
11ac-VHT20	6.5	120	5600	14.35	21.35	≤ 24.00	Pass
11ac-VHT20	6.5	140	5700	12.25	19.25	≤ 24.00	Pass
11ac-VHT20	6.5	144	5720	13.75	20.75	≤ 24.00	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 2 TPC Power (dBm)	EIRP TPC (dBm)	EIRP TPC Limit (dBm)	Result
Ant 2							
11ac-VHT40	13.5	54	5270	15.58	22.58	≤ 24.00	Pass
11ac-VHT40	13.5	62	5310	15.15	22.15	≤ 24.00	Pass
11ac-VHT40	13.5	102	5510	12.43	19.43	≤ 24.00	Pass
11ac-VHT40	13.5	110	5550	15.80	22.80	≤ 24.00	Pass
11ac-VHT40	13.5	118	5590	15.62	22.62	≤ 24.00	Pass
11ac-VHT40	13.5	134	5670	13.62	20.62	≤ 24.00	Pass
11ac-VHT40	13.5	142	5710	14.96	21.96	≤ 24.00	Pass
11ac-VHT80	29.3	58	5290	11.87	18.87	≤ 24.00	Pass
11ac-VHT80	29.3	106	5530	11.17	18.17	≤ 24.00	Pass
11ac-VHT80	29.3	122	5610	15.25	22.25	≤ 24.00	Pass
11ac-VHT80	29.3	138	5690	14.90	21.90	≤ 24.00	Pass

Note: EIRP TPC (dBm) = TPC Power (dBm) + Antenna Gain (dBi).

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 TPC Power (dBm)	Ant 2 TPC Power (dBm)	EIRP TPC (dBm)	EIRP TPC Limit (dBm)	Result
Ant 1 + 2								
11a	6	52	5260	9.33	9.61	19.48	≤ 24.00	Pass
11a	6	60	5300	10.22	9.87	20.06	≤ 24.00	Pass
11a	6	64	5320	9.86	9.98	19.93	≤ 24.00	Pass
11a	6	100	5500	8.86	9.38	19.14	≤ 24.00	Pass
11a	6	116	5580	8.81	8.98	18.91	≤ 24.00	Pass
11a	6	120	5600	8.38	8.94	18.68	≤ 24.00	Pass
11a	6	140	5700	8.42	9.01	18.74	≤ 24.00	Pass
11n-HT20	13	52	5260	10.31	9.72	23.05	≤ 24.00	Pass
11n-HT20	13	60	5300	10.05	9.92	23.01	≤ 24.00	Pass
11n-HT20	13	64	5320	9.84	9.82	22.85	≤ 24.00	Pass
11n-HT20	13	100	5500	8.99	9.56	22.30	≤ 24.00	Pass
11n-HT20	13	116	5580	8.67	9.20	21.96	≤ 24.00	Pass
11n-HT20	13	120	5600	8.14	8.84	21.52	≤ 24.00	Pass
11n-HT20	13	140	5700	7.88	8.99	21.49	≤ 24.00	Pass
11n-HT40	27	54	5270	10.44	10.50	23.49	≤ 24.00	Pass
11n-HT40	27	62	5310	10.60	9.93	23.30	≤ 24.00	Pass
11n-HT40	27	102	5510	10.33	9.99	23.18	≤ 24.00	Pass
11n-HT40	27	110	5550	10.17	10.63	23.43	≤ 24.00	Pass
11n-HT40	27	118	5590	10.11	10.82	23.50	≤ 24.00	Pass
11n-HT40	27	134	5670	9.93	10.74	23.37	≤ 24.00	Pass
11ac-VHT20	13	52	5260	10.28	9.74	23.04	≤ 24.00	Pass
11ac-VHT20	13	60	5300	9.94	10.08	23.03	≤ 24.00	Pass
11ac-VHT20	13	64	5320	10.13	9.96	23.07	≤ 24.00	Pass
11ac-VHT20	13	100	5500	9.38	9.36	22.39	≤ 24.00	Pass
11ac-VHT20	13	116	5580	9.23	9.73	22.51	≤ 24.00	Pass
11ac-VHT20	13	120	5600	9.01	9.18	22.12	≤ 24.00	Pass
11ac-VHT20	13	140	5700	8.71	9.15	21.96	≤ 24.00	Pass
11ac-VHT20	13	144	5720	8.55	9.00	21.80	≤ 24.00	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 TPC Power (dBm)	Ant 2 TPC Power (dBm)	EIRP TPC (dBm)	EIRP TPC Limit (dBm)	Result
Ant 1 + 2								
11ac-VHT40	27	54	5270	10.43	10.28	23.38	≤ 24.00	Pass
11ac-VHT40	27	62	5310	10.57	9.92	23.28	≤ 24.00	Pass
11ac-VHT40	27	102	5510	10.06	10.32	23.21	≤ 24.00	Pass
11ac-VHT40	27	110	5550	9.83	10.55	23.23	≤ 24.00	Pass
11ac-VHT40	27	118	5590	9.80	10.75	23.32	≤ 24.00	Pass
11ac-VHT40	27	134	5670	9.51	10.41	23.00	≤ 24.00	Pass
11ac-VHT40	27	142	5710	9.81	10.65	23.27	≤ 24.00	Pass
11ac-VHT80	58.6	58	5290	10.67	10.20	23.46	≤ 24.00	Pass
11ac-VHT80	58.6	106	5530	9.49	9.82	22.68	≤ 24.00	Pass
11ac-VHT80	58.6	122	5610	9.90	10.63	23.30	≤ 24.00	Pass
11ac-VHT80	58.6	138	5690	10.01	10.99	23.55	≤ 24.00	Pass

Note: The EIRP TPC (dBm) = $10*\log\{10^{(\text{Ant 1 TPC Power /10})} + 10^{(\text{Ant 2 TPC Power /10})}\}$ + Directional Gain (dBi)

7.7. Power Spectral Density Measurement

7.7.1. Test Limit

For FCC Power Spectral Density Limit

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.

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.

For IC Power Spectral Density Limit

For the band 5.15-5.25 GHz, the e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

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

Power Spectral Density Measurement Limit of WiFi Omni Ant

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 1	Ant 2		Ant 1	Ant 2	Ant 1 + 2
5150 ~ 5250	7.00	7.00	10.01	16.00	16.00	12.99
5250 ~ 5350	7.00	7.00	10.01	10.00	10.00	6.99
5470 ~ 5725	7.00	7.00	10.01	10.00	10.00	6.99
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 1	Ant 2		Ant 1	Ant 2	Ant 1 + 2
5725 ~ 5850	7.00	7.00	10.01	29.00	29.00	25.99

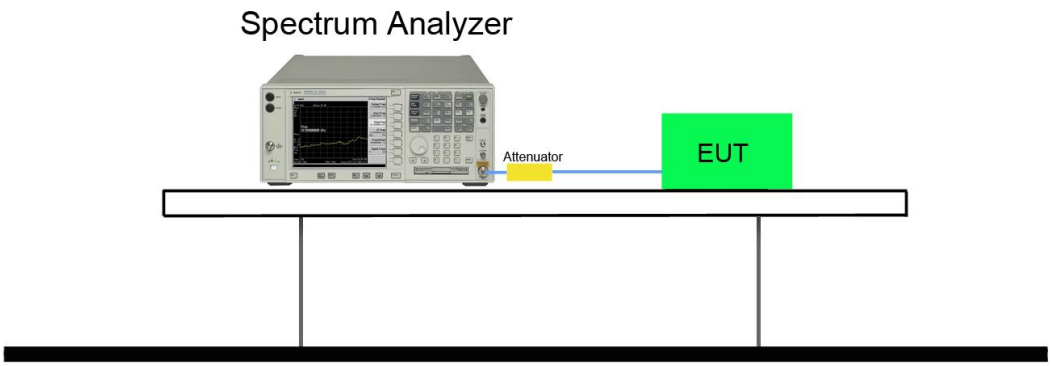
7.7.2. Test Procedure Used

KDB 789033 D02v01r03 - Section F

7.7.3. 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,
4. RBW = 100 kHz
5. VBW = 3MHz
6. Number of sweep points ≥ 2 × (span / RBW)
7. Detector = power averaging (Average)
8. Sweep time = auto
9. Trigger = free run
10. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
11. Add 10*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*log(1/0.25) = 6 dB if the duty cycle is 25 percent.
12. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor 10*log(500kHz/100kHz) = 7 dB to the measured result

7.7.4. Test Setup



7.7.5. Test Result

Product	US Wi-Fi AP 2x2 OD ext. antenna	Test Engineer	Johnson Liao
Test Site	SR2	Test Date	2017/02/17
Test Item	Power Spectral Density		

For FCC bands (UNII-2A & UNII-2C & UNII-3) & IC bands (UNII-1 & UNII-2A & UNII-2C & UNII-3)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	EIRP PSD (dBm /MHz)	EIRP PSD Limit (dBm /MHz)	Result
Ant 1										
11a	6	36	5180	2.35	95.10	2.57	--	9.57	≤ 10.00	Pass
11a	6	44	5220	2.12	95.10	2.34	--	9.34	≤ 10.00	Pass
11a	6	48	5240	2.14	95.10	2.36	--	9.36	≤ 10.00	Pass
11a	6	52	5260	9.09	95.10	9.31	≤ 10.00	--	--	Pass
11a	6	60	5300	9.31	95.10	9.53	≤ 10.00	--	--	Pass
11a	6	64	5320	9.21	95.10	9.43	≤ 10.00	--	--	Pass
11a	6	100	5500	8.13	95.10	8.35	≤ 10.00	--	--	Pass
11a	6	116	5580	9.15	95.10	9.37	≤ 10.00	--	--	Pass
11a	6	120	5600	8.96	95.10	9.18	≤ 10.00	--	--	Pass
11a	6	140	5700	9.39	95.10	9.61	≤ 10.00	--	--	Pass
11n-HT20	6.5	36	5180	2.09	90.24	2.54	--	9.54	≤ 10.00	Pass
11n-HT20	6.5	44	5220	1.86	90.24	2.31	--	9.31	≤ 10.00	Pass
11n-HT20	6.5	48	5240	2.01	90.24	2.46	--	9.46	≤ 10.00	Pass
11n-HT20	6.5	52	5260	8.72	90.24	9.17	≤ 10.00	--	--	Pass
11n-HT20	6.5	60	5300	9.00	90.24	9.45	≤ 10.00	--	--	Pass
11n-HT20	6.5	64	5320	9.14	90.24	9.59	≤ 10.00	--	--	Pass
11n-HT20	6.5	100	5500	7.88	90.24	8.33	≤ 10.00	--	--	Pass
11n-HT20	6.5	116	5580	9.09	90.24	9.54	≤ 10.00	--	--	Pass
11n-HT20	6.5	120	5600	8.89	90.24	9.34	≤ 10.00	--		Pass
11n-HT20	6.5	140	5700	8.40	90.24	8.85	≤ 10.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	EIRP PSD (dBm /MHz)	EIRP PSD Limit (dBm /MHz)	Result
Ant 1										
11n-HT40	13.5	38	5190	-0.83	81.66	0.05	--	7.05	≤ 10.00	Pass
11n-HT40	13.5	46	5230	-1.31	81.66	-0.43	--	6.57	≤ 10.00	Pass
11n-HT40	13.5	54	5270	6.51	81.66	7.39	≤ 10.00	--	--	Pass
11n-HT40	13.5	62	5310	6.17	81.66	7.05	≤ 10.00	--	--	Pass
11n-HT40	13.5	102	5510	2.76	81.66	3.64	≤ 10.00	--	--	Pass
11n-HT40	13.5	110	5550	6.75	81.66	7.63	≤ 10.00	--	--	Pass
11n-HT40	13.5	118	5590	6.57	81.66	7.45	≤ 10.00	--	--	Pass
11n-HT40	13.5	134	5670	5.13	81.66	6.01	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	36	5180	2.03	89.55	2.51	--	9.51	≤ 10.00	Pass
11ac-VHT20	6.5	44	5220	1.90	89.55	2.38	--	9.38	≤ 10.00	Pass
11ac-VHT20	6.5	48	5240	1.85	89.55	2.33	--	9.33	≤ 10.00	Pass
11ac-VHT20	6.5	52	5260	8.90	89.55	9.38	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	60	5300	9.32	89.55	9.80	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	64	5320	9.01	89.55	9.49	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	100	5500	8.51	89.55	8.99	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	116	5580	8.91	89.55	9.39	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	120	5600	9.16	89.55	9.64	≤ 10.00	--		Pass
11ac-VHT20	6.5	140	5700	8.53	89.55	9.01	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	144	5720	8.93	89.55	9.41	≤ 10.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	EIRP PSD (dBm /MHz)	EIRP PSD Limit (dBm /MHz)	Result
Ant 1										
11ac-VHT40	13.5	38	5190	-2.71	82.89	-1.90	--	5.10	≤ 10.00	Pass
11ac-VHT40	13.5	46	5230	-3.02	82.89	-2.21	--	4.79	≤ 10.00	Pass
11ac-VHT40	13.5	54	5270	6.58	82.89	7.39	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	62	5310	6.22	82.89	7.03	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	102	5510	1.93	82.89	2.74	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	110	5550	6.97	82.89	7.78	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	118	5590	6.23	82.89	7.04	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	134	5670	4.72	82.89	5.53	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	142	5710	6.38	82.89	7.19	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	42	5210	-4.09	72.78	-2.71	--	4.29	≤ 10.00	Pass
11ac-VHT80	29.3	58	5290	0.42	72.78	1.80	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	106	5530	-1.54	72.78	-0.16	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	122	5610	3.57	72.78	4.95	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	138	5690	2.67	72.78	4.05	≤ 10.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	EIRP PSD (dBm /MHz)	EIRP PSD Limit (dBm /MHz)	Result
Ant 2										
11a	6	36	5180	2.40	95.10	2.62	--	9.62	≤ 10.00	Pass
11a	6	44	5220	2.35	95.10	2.57	--	9.57	≤ 10.00	Pass
11a	6	48	5240	2.11	95.10	2.33	--	9.33	≤ 10.00	Pass
11a	6	52	5260	9.54	95.10	9.76	≤ 10.00	--	--	Pass
11a	6	60	5300	9.30	95.10	9.52	≤ 10.00	--	--	Pass
11a	6	64	5320	9.29	95.10	9.51	≤ 10.00	--	--	Pass
11a	6	100	5500	9.22	95.10	9.44	≤ 10.00	--	--	Pass
11a	6	116	5580	9.31	95.10	9.53	≤ 10.00	--	--	Pass
11a	6	120	5600	9.38	95.10	9.60	≤ 10.00	--	--	Pass
11a	6	140	5700	8.75	95.10	8.97	≤ 10.00	--	--	Pass
11n-HT20	6.5	36	5180	1.91	90.24	2.36	--	9.36	≤ 10.00	Pass
11n-HT20	6.5	44	5220	2.03	90.24	2.48	--	9.48	≤ 10.00	Pass
11n-HT20	6.5	48	5240	2.07	90.24	2.52	--	9.52	≤ 10.00	Pass
11n-HT20	6.5	52	5260	9.32	90.24	9.77	≤ 10.00	--	--	Pass
11n-HT20	6.5	60	5300	9.13	90.24	9.58	≤ 10.00	--	--	Pass
11n-HT20	6.5	64	5320	9.06	90.24	9.51	≤ 10.00	--	--	Pass
11n-HT20	6.5	100	5500	8.65	90.24	9.10	≤ 10.00	--	--	Pass
11n-HT20	6.5	116	5580	9.12	90.24	9.57	≤ 10.00	--	--	Pass
11n-HT20	6.5	120	5600	8.95	90.24	9.40	≤ 10.00	--		Pass
11n-HT20	6.5	140	5700	7.79	90.24	8.24	≤ 10.00	--	--	Pass
11n-HT40	13.5	38	5190	-0.29	81.66	0.59	--	7.59	≤ 10.00	Pass
11n-HT40	13.5	46	5230	-0.65	81.66	0.23	--	7.23	≤ 10.00	Pass
11n-HT40	13.5	54	5270	5.85	81.66	6.73	≤ 10.00	--	--	Pass
11n-HT40	13.5	62	5310	4.92	81.66	5.80	≤ 10.00	--	--	Pass
11n-HT40	13.5	102	5510	3.73	81.66	4.61	≤ 10.00	--	--	Pass
11n-HT40	13.5	110	5550	7.39	81.66	8.27	≤ 10.00	--	--	Pass
11n-HT40	13.5	118	5590	6.97	81.66	7.85	≤ 10.00	--	--	Pass
11n-HT40	13.5	134	5670	5.70	81.66	6.58	≤ 10.00	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	EIRP PSD (dBm /MHz)	EIRP PSD Limit (dBm /MHz)	Result
Ant 2										
11ac-VHT20	6.5	36	5180	1.90	89.55	2.38	--	9.38	≤ 10.00	Pass
11ac-VHT20	6.5	44	5220	2.16	89.55	2.64	--	9.64	≤ 10.00	Pass
11ac-VHT20	6.5	48	5240	1.98	89.55	2.46	--	9.46	≤ 10.00	Pass
11ac-VHT20	6.5	52	5260	9.14	89.55	9.62	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	60	5300	8.75	89.55	9.23	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	64	5320	8.84	89.55	9.32	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	100	5500	9.15	89.55	9.63	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	116	5580	9.12	89.55	9.60	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	120	5600	8.89	89.55	9.37	≤ 10.00	--		Pass
11ac-VHT20	6.5	140	5700	7.79	89.55	8.27	≤ 10.00	--	--	Pass
11ac-VHT20	6.5	144	5720	9.25	89.55	9.73	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	38	5190	-0.33	82.89	0.48	--	7.48	≤ 10.00	Pass
11ac-VHT40	13.5	46	5230	-0.67	82.89	0.14	--	7.14	≤ 10.00	Pass
11ac-VHT40	13.5	54	5270	5.89	82.89	6.70	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	62	5310	5.39	82.89	6.20	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	102	5510	3.63	82.89	4.44	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	110	5550	7.31	82.89	8.12	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	118	5590	6.74	82.89	7.55	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	134	5670	5.70	82.89	6.51	≤ 10.00	--	--	Pass
11ac-VHT40	13.5	142	5710	7.54	82.89	8.35	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	42	5210	-3.63	72.78	-2.25	--	4.75	≤ 10.00	Pass
11ac-VHT80	29.3	58	5290	-1.36	72.78	0.02	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	106	5530	0.77	72.78	2.15	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	122	5610	3.43	72.78	4.81	≤ 10.00	--	--	Pass
11ac-VHT80	29.3	138	5690	4.34	72.78	5.72	≤ 10.00	--	--	Pass

Note 1: When EUT duty cycle < 98%, the total PSD = Ant PSD (dBm/MHz) + 10*log(1/duty cycle),

Note 2: EIRP PSD (dBm/MHz) = Total PSD (dBm/MHz) + Antenna Gain (dBi)

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 PSD (dBm/ MHz)	Ant 2 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	EIRP PSD (dBm /MHz)	EIRP PSD Limit (dBm /MHz)	Result
Ant 1 + 2											
11a	6	36	5180	-3.52	-3.86	95.10	-0.46	--	9.55	≤ 10.00	Pass
11a	6	44	5220	-3.72	-3.67	95.10	-0.47	--	9.54	≤ 10.00	Pass
11a	6	48	5240	-3.83	-4.06	95.10	-0.71	--	9.30	≤ 10.00	Pass
11a	6	52	5260	3.49	2.77	95.10	6.37	≤ 6.99	--	--	Pass
11a	6	60	5300	3.56	3.33	95.10	6.68	≤ 6.99	--	--	Pass
11a	6	64	5320	3.65	3.12	95.10	6.62	≤ 6.99	--	--	Pass
11a	6	100	5500	3.73	3.16	95.10	6.68	≤ 6.99	--	--	Pass
11a	6	116	5580	2.85	3.90	95.10	6.64	≤ 6.99	--	--	Pass
11a	6	120	5600	2.95	3.77	95.10	6.61	≤ 6.99	--	--	Pass
11a	6	140	5700	2.48	3.64	95.10	6.33	≤ 6.99	--	--	Pass
11n-HT20	13	36	5180	-4.20	-4.17	90.24	-0.73	--	9.28	≤ 10.00	Pass
11n-HT20	13	44	5220	-4.04	-3.88	90.24	-0.50	--	9.51	≤ 10.00	Pass
11n-HT20	13	48	5240	-4.12	-4.10	90.24	-0.65	--	9.36	≤ 10.00	Pass
11n-HT20	13	52	5260	3.28	3.07	90.24	6.63	≤ 6.99	--	--	Pass
11n-HT20	13	60	5300	3.32	3.17	90.24	6.70	≤ 6.99	--	--	Pass
11n-HT20	13	64	5320	3.41	3.19	90.24	6.76	≤ 6.99	--	--	Pass
11n-HT20	13	100	5500	3.12	2.51	90.24	6.28	≤ 6.99	--	--	Pass
11n-HT20	13	116	5580	2.24	3.90	90.24	6.61	≤ 6.99	--	--	Pass
11n-HT20	13	120	5600	2.62	3.39	90.24	6.48	≤ 6.99	--	--	Pass
11n-HT20	13	140	5700	2.50	3.66	90.24	6.57	≤ 6.99	--	--	Pass
11n-HT40	27	38	5190	-6.21	-5.88	81.66	-3.03	--	6.98	≤ 10.00	Pass
11n-HT40	27	46	5230	-6.68	-5.84	81.66	-2.35	--	7.66	≤ 10.00	Pass
11n-HT40	27	54	5270	2.73	-0.23	81.66	5.39	≤ 6.99	--	--	Pass
11n-HT40	27	62	5310	0.30	-0.74	81.66	3.70	≤ 6.99	--	--	Pass
11n-HT40	27	102	5510	1.06	0.88	81.66	4.86	≤ 6.99	--	--	Pass
11n-HT40	27	110	5550	0.80	1.35	81.66	4.97	≤ 6.99	--	--	Pass
11n-HT40	27	118	5590	1.31	2.06	81.66	5.59	≤ 6.99	--	--	Pass
11n-HT40	27	134	5670	0.39	2.86	81.66	5.69	≤ 6.99	--	--	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 PSD (dBm/ MHz)	Ant 2 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	EIRP PSD (dBm /MHz)	EIRP PSD Limit (dBm /MHz)	Result
Ant 1 + 2											
11ac-VHT20	13	36	5180	-3.76	-3.87	89.55	-0.33	--	9.68	≤ 10.00	Pass
11ac-VHT20	13	44	5220	-4.23	-3.93	89.55	-0.59	--	9.42	≤ 10.00	Pass
11ac-VHT20	13	48	5240	-4.14	-4.12	89.55	-0.64	--	9.37	≤ 10.00	Pass
11ac-VHT20	13	52	5260	3.11	3.22	89.55	6.65	≤ 6.99	--	--	Pass
11ac-VHT20	13	60	5300	3.38	3.17	89.55	6.77	≤ 6.99	--	--	Pass
11ac-VHT20	13	64	5320	3.17	2.69	89.55	6.43	≤ 6.99	--	--	Pass
11ac-VHT20	13	100	5500	3.20	2.44	89.55	6.33	≤ 6.99	--	--	Pass
11ac-VHT20	13	116	5580	2.24	3.54	89.55	6.43	≤ 6.99	--	--	Pass
11ac-VHT20	13	120	5600	2.49	3.13	89.55	6.31	≤ 6.99	--		Pass
11ac-VHT20	13	140	5700	2.11	3.52	89.55	6.36	≤ 6.99	--	--	Pass
11ac-VHT20	13	144	5720	2.34	3.15	89.55	6.25	≤ 6.99	--	--	Pass
11ac-VHT40	27	38	5190	-6.86	-6.66	82.89	-2.93	--	7.08	≤ 10.00	Pass
11ac-VHT40	27	46	5230	-7.54	-6.80	82.89	-3.33	--	6.68	≤ 10.00	Pass
11ac-VHT40	27	54	5270	-0.35	-0.07	82.89	3.62	≤ 6.99	--	--	Pass
11ac-VHT40	27	62	5310	0.17	-0.38	82.89	3.73	≤ 6.99	--	--	Pass
11ac-VHT40	27	102	5510	0.96	0.65	82.89	4.63	≤ 6.99	--	--	Pass
11ac-VHT40	27	110	5550	0.76	1.46	82.89	4.95	≤ 6.99	--	--	Pass
11ac-VHT40	27	118	5590	1.37	1.96	82.89	5.50	≤ 6.99	--	--	Pass
11ac-VHT40	27	134	5670	0.58	2.53	82.89	5.49	≤ 6.99	--	--	Pass
11ac-VHT40	27	142	5710	1.30	2.23	82.89	5.62	≤ 6.99	--	--	Pass
11ac-VHT80	58.6	42	5210	-10.03	-9.96	72.78	-5.60	--	4.41	≤ 10.00	Pass
11ac-VHT80	58.6	58	5290	-2.34	-3.35	72.78	1.57	≤ 6.99	--	--	Pass
11ac-VHT80	58.6	106	5530	-2.44	-2.44	72.78	1.95	≤ 6.99	--	--	Pass
11ac-VHT80	58.6	122	5610	-2.10	-0.42	72.78	3.21	≤ 6.99	--	--	Pass
11ac-VHT80	58.6	138	5690	-2.06	0.35	72.78	3.70	≤ 6.99	--	--	Pass

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

Note 2: EIRP PSD (dBm/MHz) = Total PSD (dBm/MHz) + Antenna Gain(dBi)

For FCC bands (UNII-1)

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	0.50	95.10	0.72	≤ 16.00	Pass
11a	6	44	5220	0.65	95.10	0.87	≤ 16.00	Pass
11a	6	48	5240	0.74	95.10	0.96	≤ 16.00	Pass
11n-HT20	6.5	36	5180	0.63	90.24	1.08	≤ 16.00	Pass
11n-HT20	6.5	44	5220	0.38	90.24	0.83	≤ 16.00	Pass
11n-HT20	6.5	48	5240	0.46	90.24	0.91	≤ 16.00	Pass
11n-HT40	13.5	38	5190	-2.79	81.66	-1.91	≤ 16.00	Pass
11n-HT40	13.5	46	5230	-3.06	81.66	-2.18	≤ 16.00	Pass
11ac-VHT20	6.5	36	5180	0.24	89.55	0.72	≤ 16.00	Pass
11ac-VHT20	6.5	44	5220	0.52	89.55	1.00	≤ 16.00	Pass
11ac-VHT20	6.5	48	5240	0.28	89.55	0.76	≤ 16.00	Pass
11ac-VHT40	13.5	38	5190	-2.71	82.89	-1.90	≤ 16.00	Pass
11ac-VHT40	13.5	46	5230	-3.02	82.89	-2.21	≤ 16.00	Pass
11ac-VHT80	29.3	42	5210	-5.80	72.78	-4.42	≤ 16.00	Pass
Ant 2								
11a	6	36	5180	0.50	95.10	0.72	≤ 16.00	Pass
11a	6	44	5220	0.19	95.10	0.41	≤ 16.00	Pass
11a	6	48	5240	0.19	95.10	0.41	≤ 16.00	Pass
11n-HT20	6.5	36	5180	0.23	90.24	0.68	≤ 16.00	Pass
11n-HT20	6.5	44	5220	-0.20	90.24	0.25	≤ 16.00	Pass
11n-HT20	6.5	48	5240	0.14	90.24	0.59	≤ 16.00	Pass
11n-HT40	13.5	38	5190	-2.52	81.66	-1.64	≤ 16.00	Pass
11n-HT40	13.5	46	5230	-3.55	81.66	-2.67	≤ 16.00	Pass
11ac-VHT20	6.5	36	5180	0.25	89.55	0.73	≤ 16.00	Pass
11ac-VHT20	6.5	44	5220	-0.37	89.55	0.11	≤ 16.00	Pass
11ac-VHT20	6.5	48	5240	-0.27	89.55	0.21	≤ 16.00	Pass
11ac-VHT40	13.5	38	5190	-2.56	82.89	-1.75	≤ 16.00	Pass
11ac-VHT40	13.5	46	5230	-3.46	82.89	-2.65	≤ 16.00	Pass
11ac-VHT80	29.3	42	5210	-6.20	72.78	-4.82	≤ 16.00	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 1 PSD (dBm/ MHz)	Ant 2 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	Result
Ant 1 + 2									
11a	6	36	5180	-2.28	-2.28	95.10	0.95	≤ 12.99	Pass
11a	6	44	5220	-3.04	-2.41	95.10	0.51	≤ 12.99	Pass
11a	6	48	5240	-2.30	-2.38	95.10	0.89	≤ 12.99	Pass
11n-HT20	13	36	5180	-2.73	-2.71	90.24	0.74	≤ 12.99	Pass
11n-HT20	13	44	5220	-3.56	-2.71	90.24	0.34	≤ 12.99	Pass
11n-HT20	13	48	5240	-2.85	-2.79	90.24	0.64	≤ 12.99	Pass
11n-HT40	27	38	5190	-6.21	-5.88	81.66	-2.15	≤ 12.99	Pass
11n-HT40	27	46	5230	-6.68	-5.84	81.66	-2.35	≤ 12.99	Pass
11ac-VHT20	13	36	5180	-2.85	-2.73	89.55	0.70	≤ 12.99	Pass
11ac-VHT20	13	44	5220	-3.66	-2.67	89.55	0.35	≤ 12.99	Pass
11ac-VHT20	13	48	5240	-3.02	-2.76	89.55	0.60	≤ 12.99	Pass
11ac-VHT40	27	38	5190	-6.06	-5.72	82.89	-2.06	≤ 12.99	Pass
11ac-VHT40	27	46	5230	-6.53	-6.02	82.89	-2.44	≤ 12.99	Pass
11ac-VHT80	58.6	42	5210	-9.20	-8.86	72.78	-4.64	≤ 12.99	Pass

Note: Total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)}\} + 10*\log(1/\text{duty cycle})$

For FCC bands (UNII-4)

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 1									
11a	6	149	5745	1.17	95.10	6.99	8.38	≤ 29.00	Pass
11a	6	157	5785	1.41	95.10	6.99	8.62	≤ 29.00	Pass
11a	6	165	5825	1.55	95.10	6.99	8.76	≤ 29.00	Pass
11n-HT20	6.5	149	5745	0.50	90.24	6.99	7.94	≤ 29.00	Pass
11n-HT20	6.5	157	5785	0.64	90.24	6.99	8.08	≤ 29.00	Pass
11n-HT20	6.5	165	5825	0.51	90.24	6.99	7.95	≤ 29.00	Pass
11n-HT40	13.5	151	5755	-2.61	81.66	6.99	5.26	≤ 29.00	Pass
11n-HT40	13.5	159	5795	-2.60	81.66	6.99	5.27	≤ 29.00	Pass
11ac-VHT20	6.5	149	5745	0.69	89.55	6.99	8.16	≤ 29.00	Pass
11ac-VHT20	6.5	157	5785	0.84	89.55	6.99	8.31	≤ 29.00	Pass
11ac-VHT20	6.5	165	5825	1.04	89.55	6.99	8.51	≤ 29.00	Pass
11ac-VHT40	13.5	151	5755	-2.60	82.89	6.99	5.20	≤ 29.00	Pass
11ac-VHT40	13.5	159	5795	-2.69	82.89	6.99	5.11	≤ 29.00	Pass
11ac-VHT80	29.3	155	5775	-6.61	72.78	6.99	1.76	≤ 29.00	Pass
Ant 2									
11a	6	149	5745	0.90	95.10	6.99	8.11	≤ 29.00	Pass
11a	6	157	5785	1.61	95.10	6.99	8.82	≤ 29.00	Pass
11a	6	165	5825	1.13	95.10	6.99	8.34	≤ 29.00	Pass
11n-HT20	6.5	149	5745	0.83	90.24	6.99	8.27	≤ 29.00	Pass
11n-HT20	6.5	157	5785	1.40	90.24	6.99	8.84	≤ 29.00	Pass
11n-HT20	6.5	165	5825	0.82	90.24	6.99	8.26	≤ 29.00	Pass
11n-HT40	13.5	151	5755	-2.17	81.66	6.99	5.70	≤ 29.00	Pass
11n-HT40	13.5	159	5795	-1.60	81.66	6.99	6.27	≤ 29.00	Pass
11ac-VHT20	6.5	149	5745	1.27	89.55	6.99	8.74	≤ 29.00	Pass
11ac-VHT20	6.5	157	5785	1.46	89.55	6.99	8.93	≤ 29.00	Pass
11ac-VHT20	6.5	165	5825	0.98	89.55	6.99	8.45	≤ 29.00	Pass
11ac-VHT40	13.5	151	5755	-2.19	82.89	6.99	5.61	≤ 29.00	Pass
11ac-VHT40	13.5	159	5795	-2.21	82.89	6.99	5.59	≤ 29.00	Pass
11ac-VHT80	29.3	155	5775	-5.23	72.78	6.99	3.14	≤ 29.00	Pass

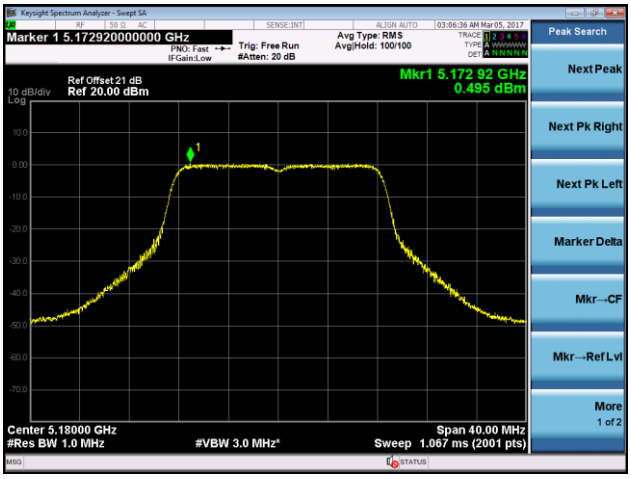
Note: Total PSD (dBm/500kHz) = Ant PSD (dBm/100kHz) + 10*log(1/duty cycle) + Constant Factor.

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 1 PSD (dBm/ 100kHz)	Ant 2 PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Ant 1 + 2										
11a	6	149	5745	1.28	0.92	95.10	6.99	11.32	≤ 25.99	Pass
11a	6	157	5785	1.59	1.99	95.10	6.99	12.01	≤ 25.99	Pass
11a	6	165	5825	1.08	1.19	95.10	6.99	11.35	≤ 25.99	Pass
11n-HT20	13	149	5745	1.17	1.51	90.24	6.99	11.79	≤ 25.99	Pass
11n-HT20	13	157	5785	0.84	1.47	90.24	6.99	11.61	≤ 25.99	Pass
11n-HT20	13	165	5825	0.83	1.34	90.24	6.99	11.54	≤ 25.99	Pass
11n-HT40	27	151	5755	-2.63	-1.46	81.66	6.99	8.87	≤ 25.99	Pass
11n-HT40	27	159	5795	-2.33	-2.66	81.66	6.99	8.39	≤ 25.99	Pass
11ac-VHT20	13	149	5745	1.03	1.90	89.55	6.99	11.97	≤ 25.99	Pass
11ac-VHT20	13	157	5785	1.33	1.97	89.55	6.99	12.14	≤ 25.99	Pass
11ac-VHT20	13	165	5825	1.15	1.25	89.55	6.99	11.68	≤ 25.99	Pass
11ac-VHT40	27	151	5755	-2.62	-1.84	82.89	6.99	8.60	≤ 25.99	Pass
11ac-VHT40	27	159	5795	-2.60	-2.05	82.89	6.99	8.50	≤ 25.99	Pass
11ac-VHT80	58.6	155	5775	-6.26	-4.80	72.78	6.99	5.91	≤ 25.99	Pass

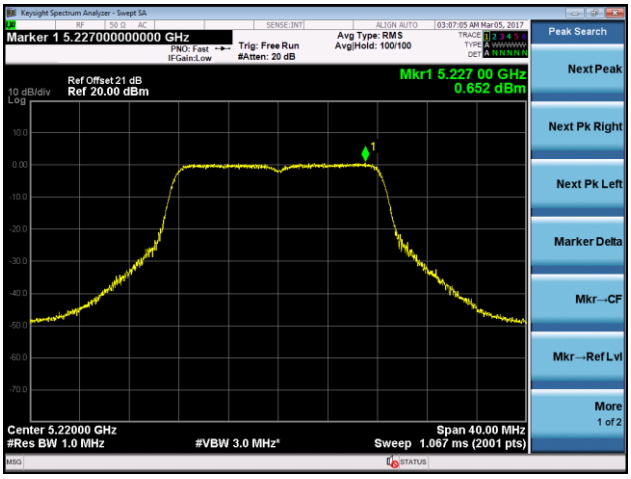
Note: Total PSD (dBm/500kHz) = $10*\log\{10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)}\}$ + 10*log(1/duty cycle) + Constant Factor.

802.11a Power Spectral Density - Ant 1

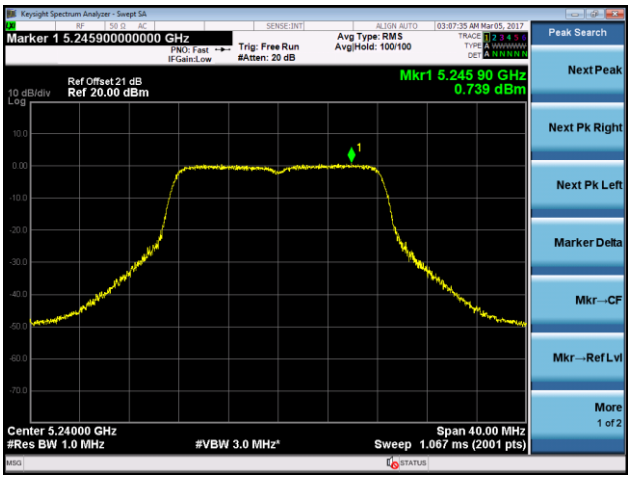
Channel 36 (5180MHz)



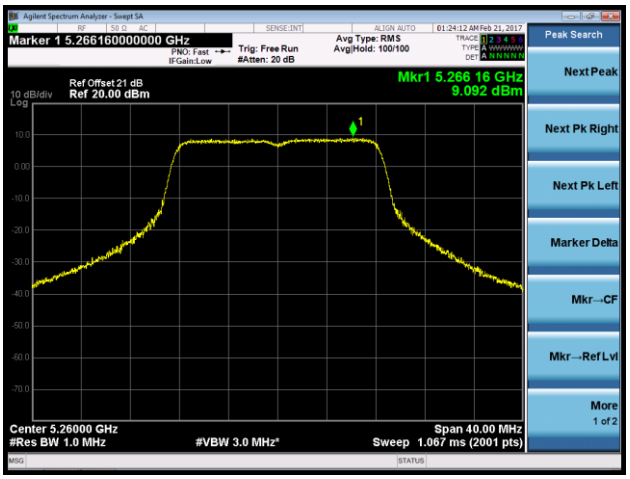
Channel 44 (5220MHz)



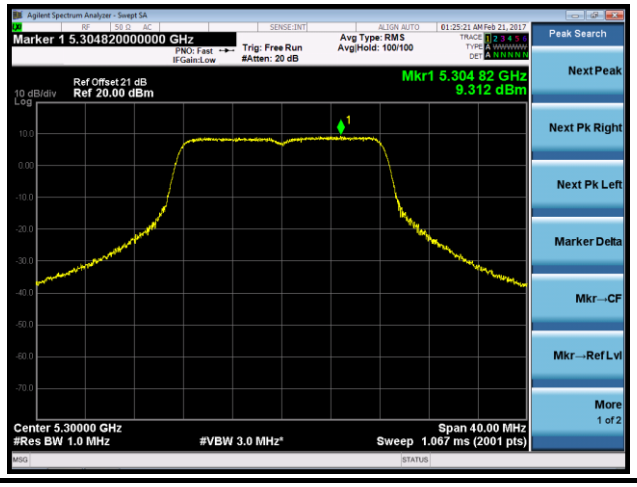
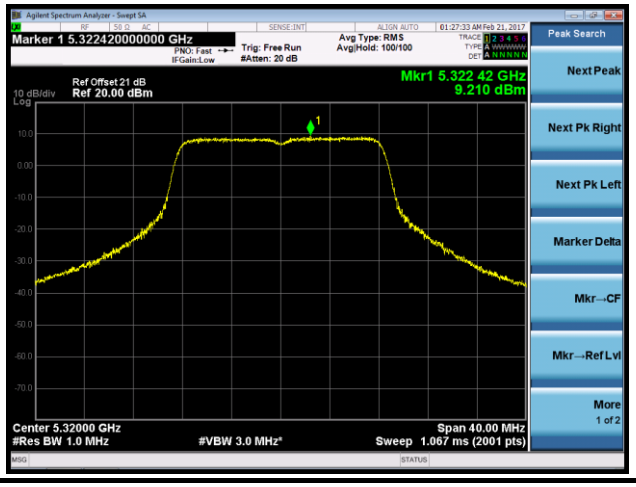
Channel 48 (5240MHz)



Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)