



# Annex D

## WLAN 802.11a/n/ac Test Result

Model No.: APEX0374

### 1. 26dB Bandwidth Measurement Test Result

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2017/08/29

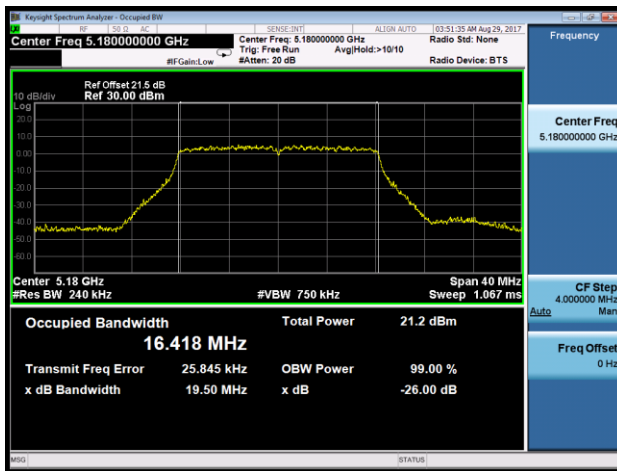
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant 0 / Ant 0 + 1 + 2 + 3					
802.11a	6Mbps	36	5180	19.50	16.42
802.11a	6Mbps	44	5220	19.40	16.41
802.11a	6Mbps	48	5240	19.61	16.42
802.11a	6Mbps	149	5745	19.96	16.47
802.11a	6Mbps	157	5785	20.22	16.50
802.11a	6Mbps	165	5825	20.18	16.50
802.11n-HT20	MCS0	36	5180	20.55	17.62
802.11n-HT20	MCS0	44	5220	20.42	17.60
802.11n-HT20	MCS0	48	5240	20.28	17.61
802.11n-HT20	MCS0	149	5745	20.58	17.64
802.11n-HT20	MCS0	157	5785	20.86	17.68
802.11n-HT20	MCS0	165	5825	21.06	17.70
802.11n-HT40	MCS0	38	5190	38.96	35.91
802.11n-HT40	MCS0	46	5230	39.40	35.91
802.11n-HT40	MCS0	151	5755	39.47	35.98
802.11n-HT40	MCS0	159	5795	39.59	35.90
802.11ac-VHT20	MCS0	36	5180	20.46	17.60
802.11ac-VHT20	MCS0	44	5220	20.46	17.61
802.11ac-VHT20	MCS0	48	5240	20.77	17.63
802.11ac-VHT20	MCS0	149	5745	20.75	17.65
802.11ac-VHT20	MCS0	157	5785	20.62	17.66
802.11ac-VHT20	MCS0	165	5825	21.31	17.67



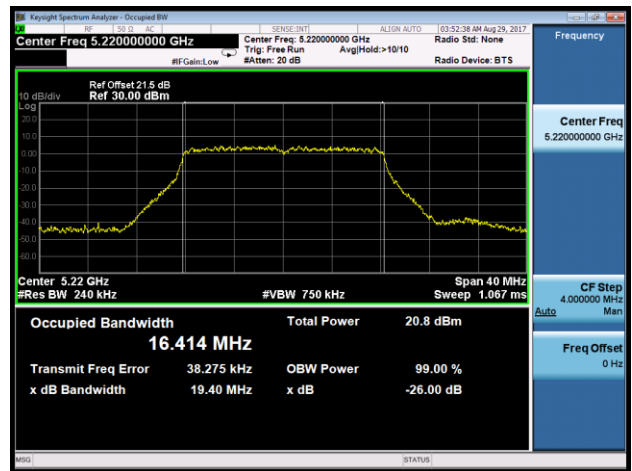
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11ac-VHT40	MCS0	38	5190	39.31	35.93
802.11ac-VHT40	MCS0	46	5230	39.15	35.88
802.11ac-VHT40	MCS0	151	5755	40.03	35.98
802.11ac-VHT40	MCS0	159	5795	39.56	35.86
802.11ac-VHT80	MCS0	42	5210	82.60	75.78
802.11ac-VHT80	MCS0	155	5775	82.39	75.75
Ant 0 / Ant 0 + 1 (Ant 0 + 1 + 2 + 3)					
802.11ac-VHT80+80	MCS0	42	5210	83.98	75.90
802.11ac-VHT80+80	MCS0	155	5775	83.80	75.80
Ant 3 / Ant 2 + 3 (Ant 0 + 1 + 2 + 3)					
802.11ac-VHT80+80	MCS0	42	5210	83.35	75.91
802.11ac-VHT80+80	MCS0	155	5775	82.75	75.65

**802.11a 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3**

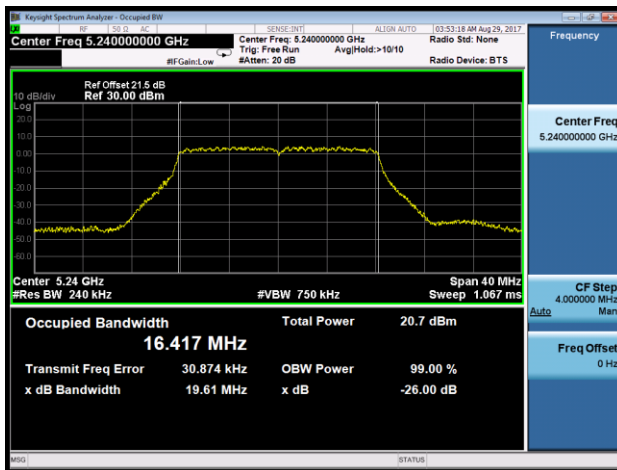
**Channel 36 (5180MHz)**



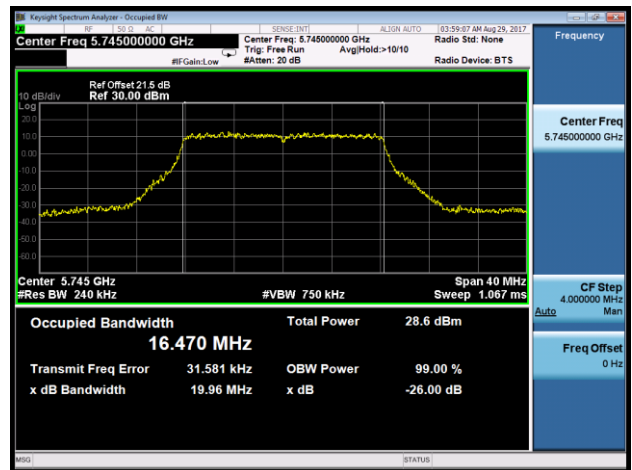
**Channel 44 (5220MHz)**



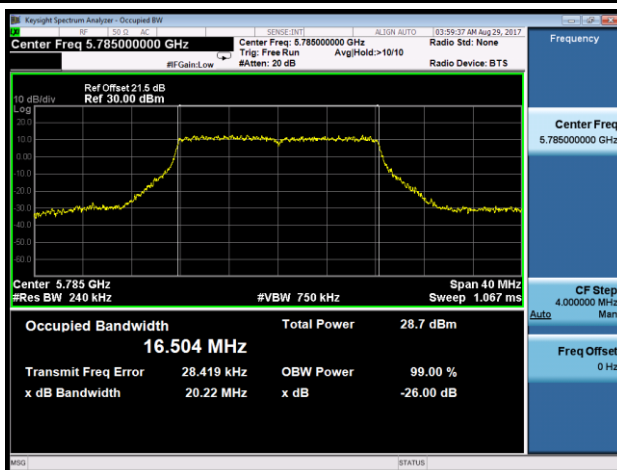
**Channel 48 (5240MHz)**



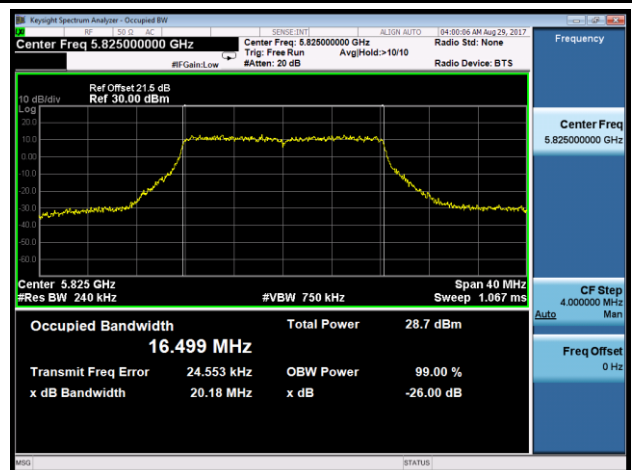
**Channel 149 (5745MHz)**



**Channel 157 (5785MHz)**

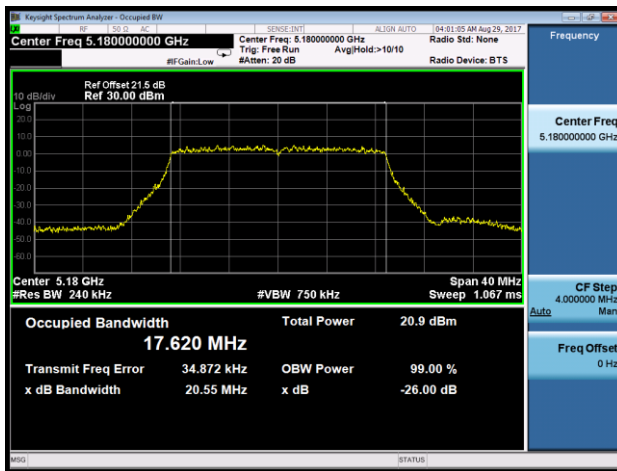


**Channel 165 (5825MHz)**

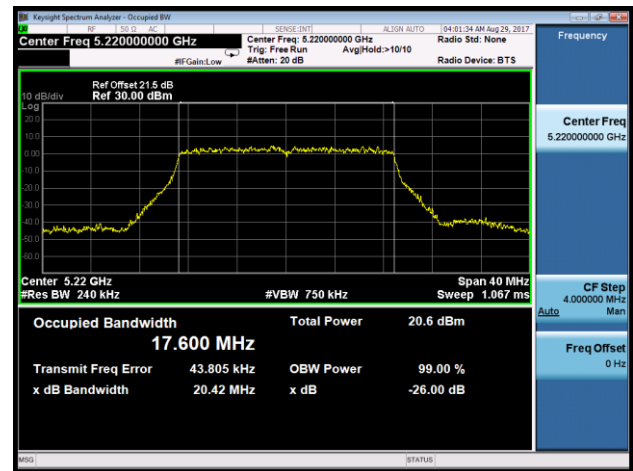


**802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3**

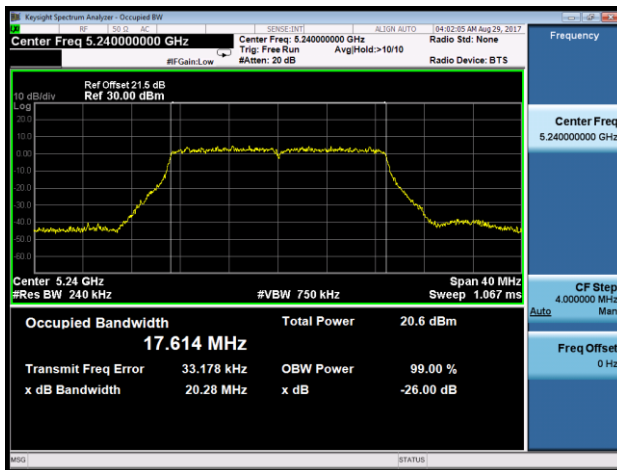
**Channel 36 (5180MHz)**



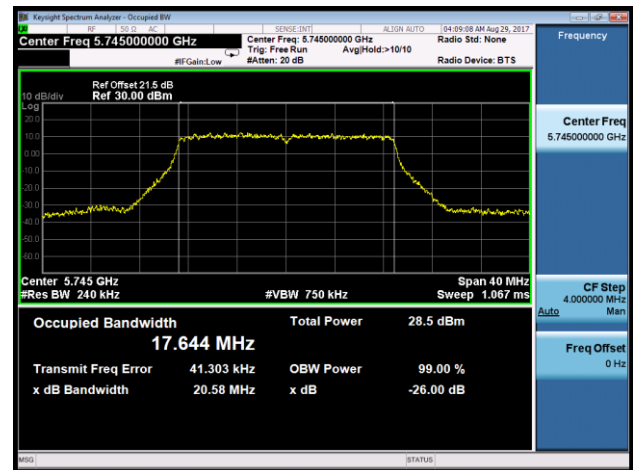
**Channel 44 (5220MHz)**



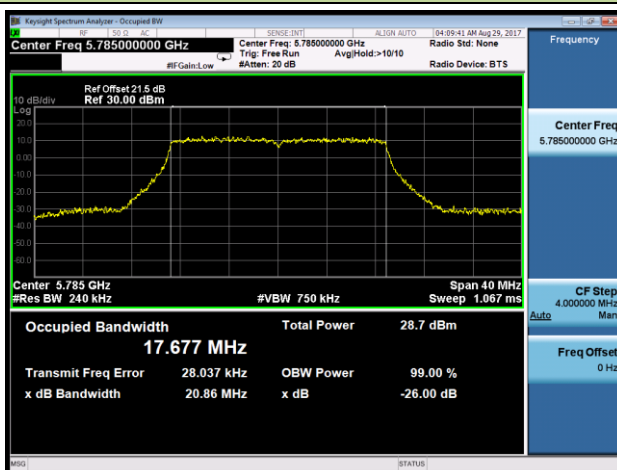
**Channel 48 (5240MHz)**



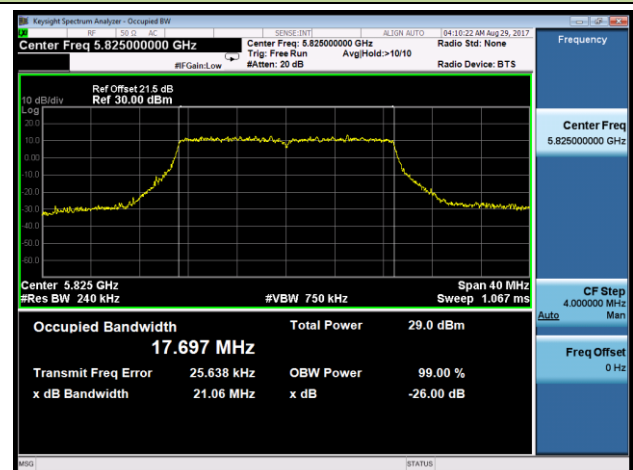
**Channel 149 (5745MHz)**



**Channel 157 (5785MHz)**

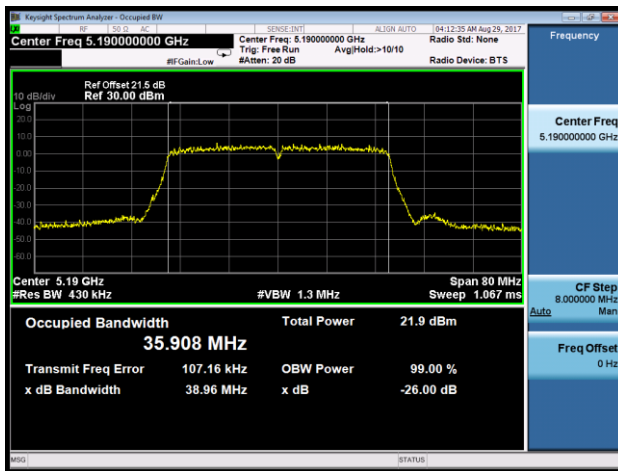


**Channel 165 (5825MHz)**

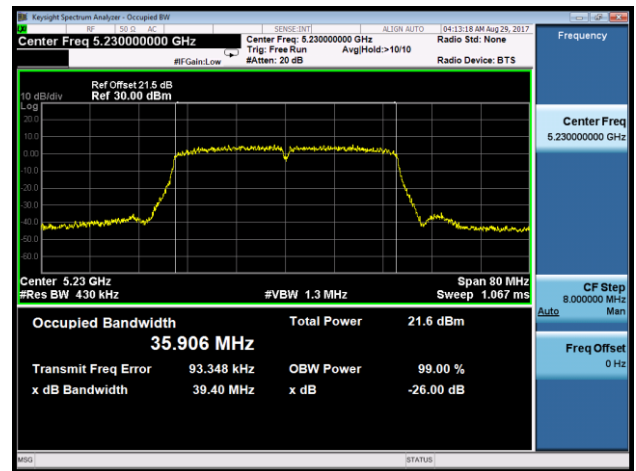


## 802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

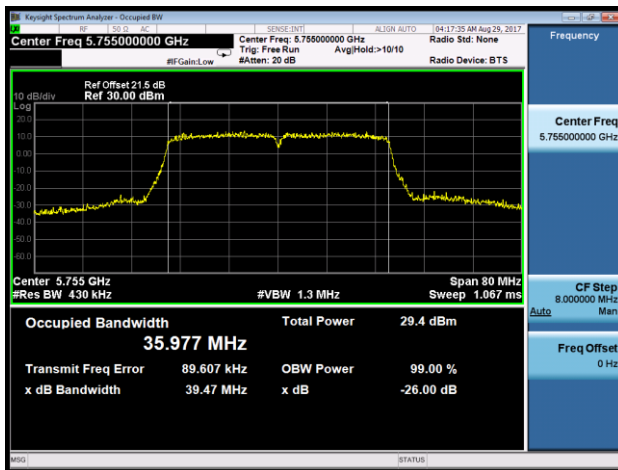
### Channel 38 (5190MHz)



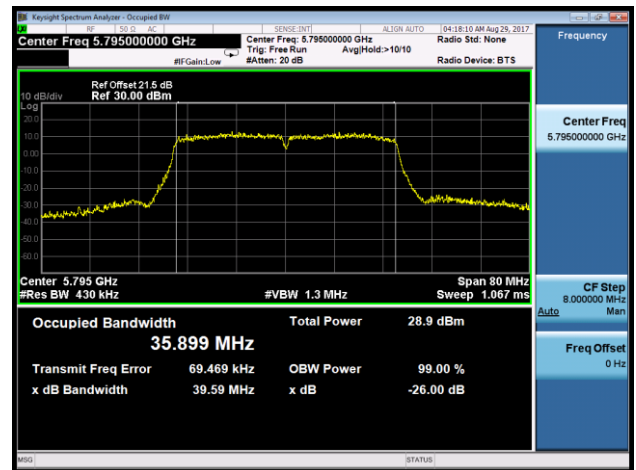
### Channel 46 (5230MHz)



### Channel 151 (5755MHz)

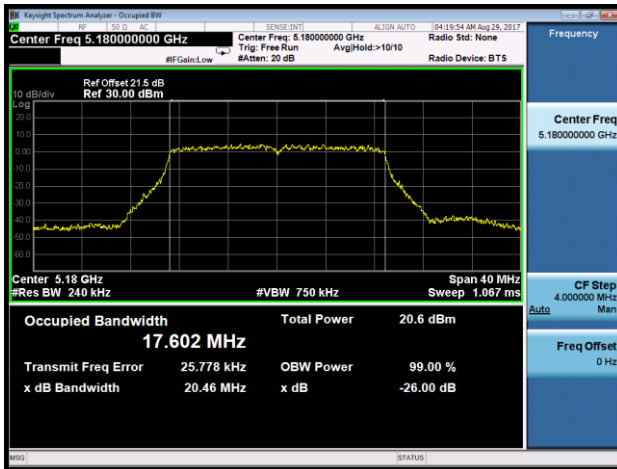


### Channel 159 (5795MHz)

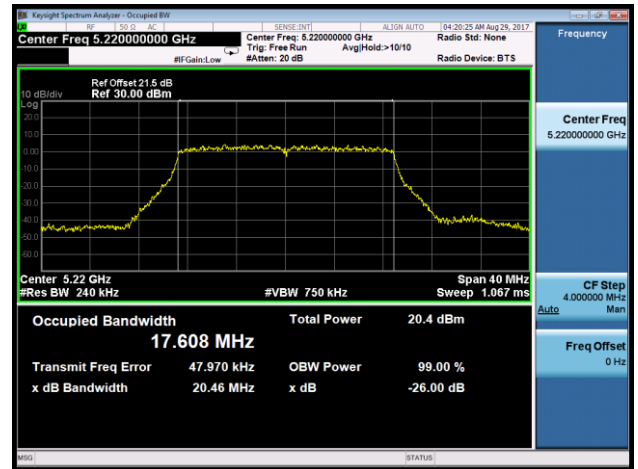


**802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3**

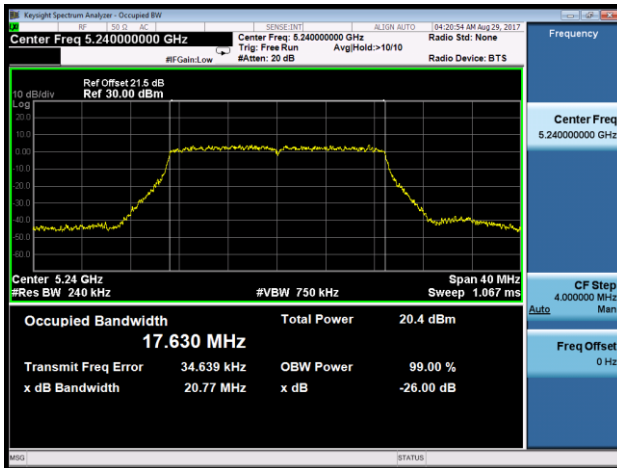
**Channel 36 (5180MHz)**



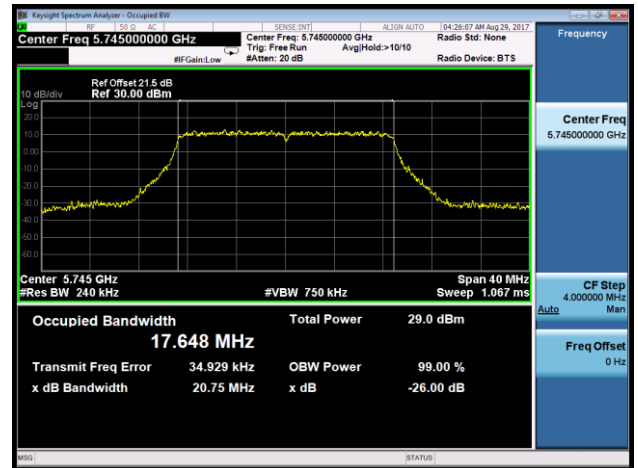
**Channel 44 (5220MHz)**



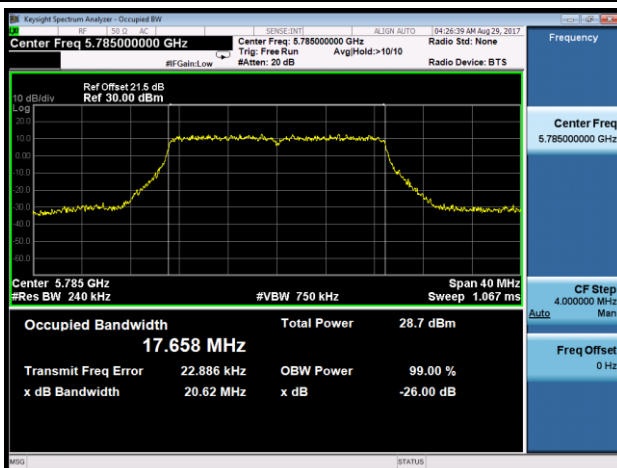
**Channel 48 (5240MHz)**



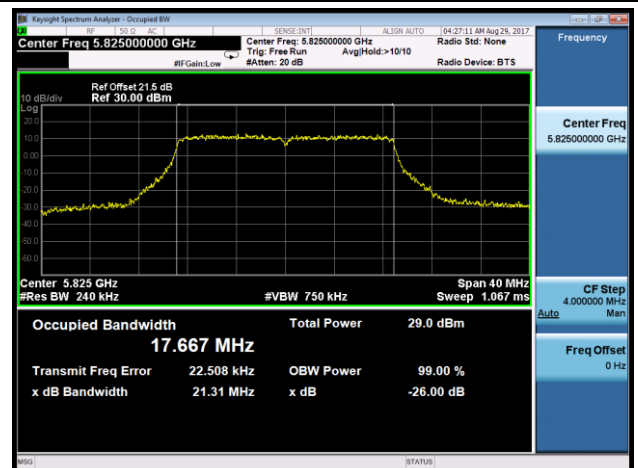
**Channel 149 (5745MHz)**



**Channel 157 (5785MHz)**

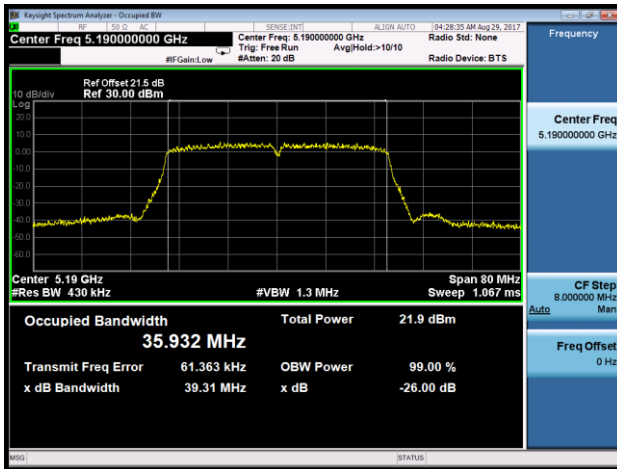


**Channel 165 (5825MHz)**

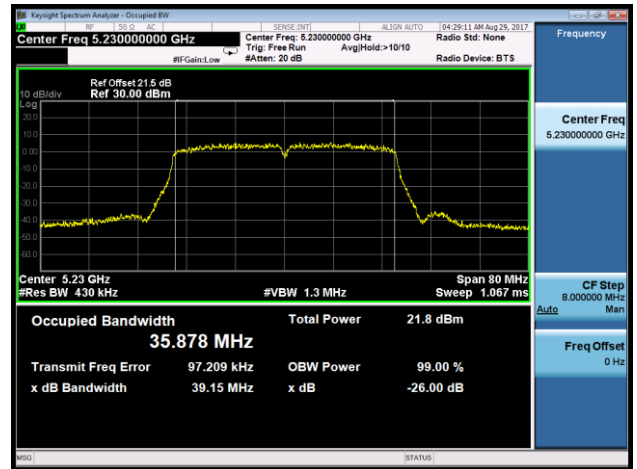


**802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3**

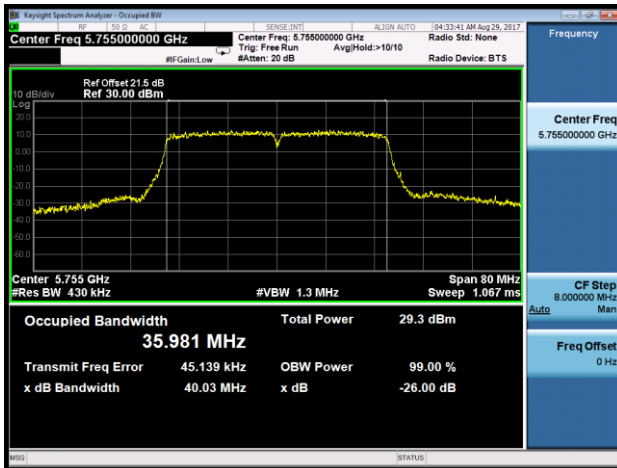
**Channel 38 (5190MHz)**



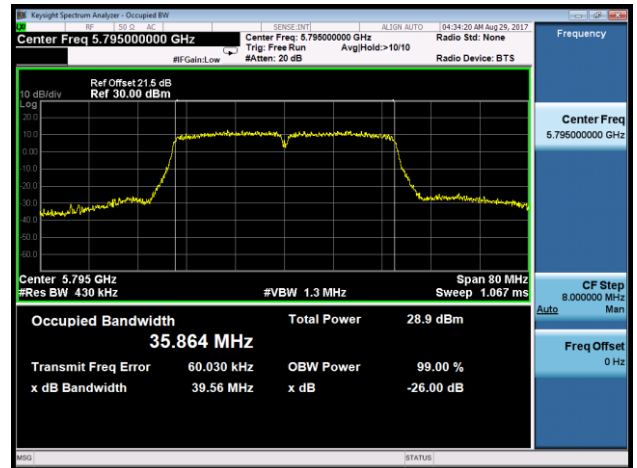
**Channel 46 (5230MHz)**



**Channel 151 (5755MHz)**

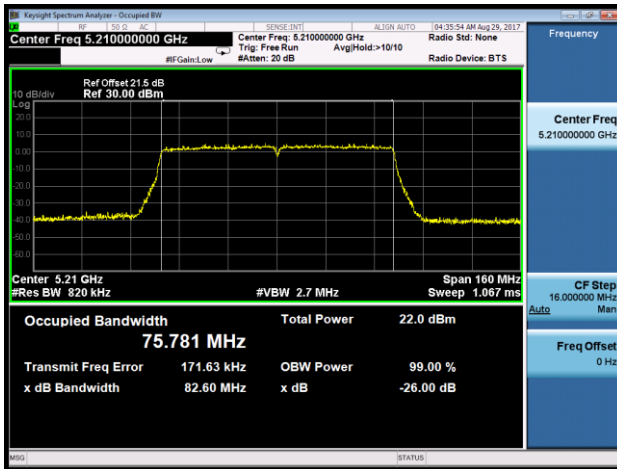


**Channel 159 (5795MHz)**

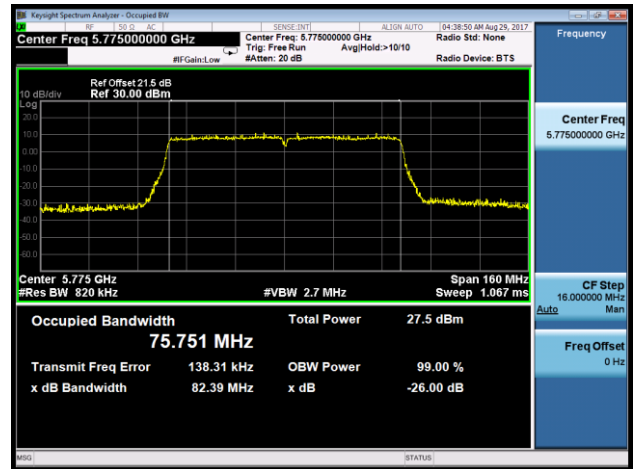


**802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3**

**Channel 42 (5210MHz)**

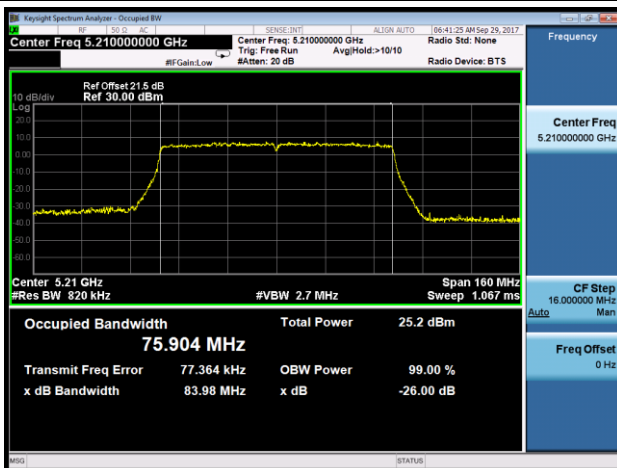


**Channel 155 (5775MHz)**

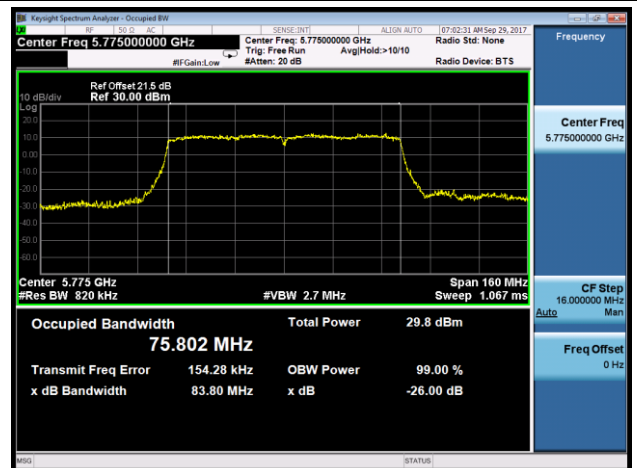


**802.11ac-VHT80+80 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 (Ant 0 + 1 + 2 + 3)**

**Channel 42 (5210MHz)**

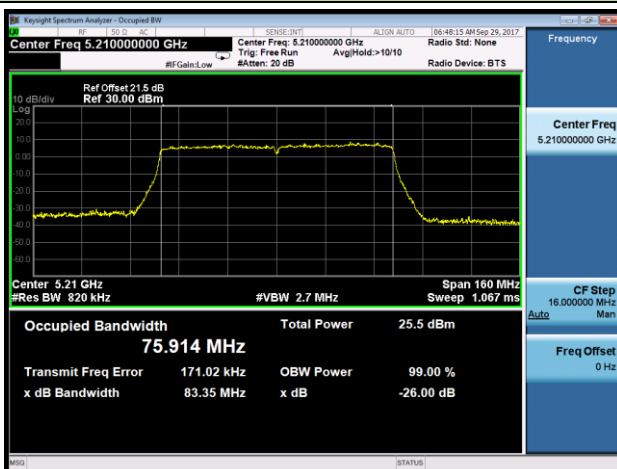


**Channel 155 (5775MHz)**

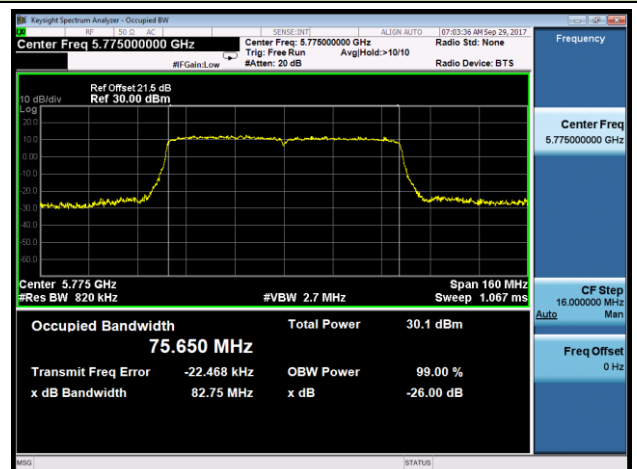


**802.11ac-VHT80+80 26dB Bandwidth & 99% Bandwidth - Ant 3 / Ant 2 + 3 (Ant 0 + 1 + 2 + 3)**

**Channel 42 (5210MHz)**



**Channel 155 (5775MHz)**







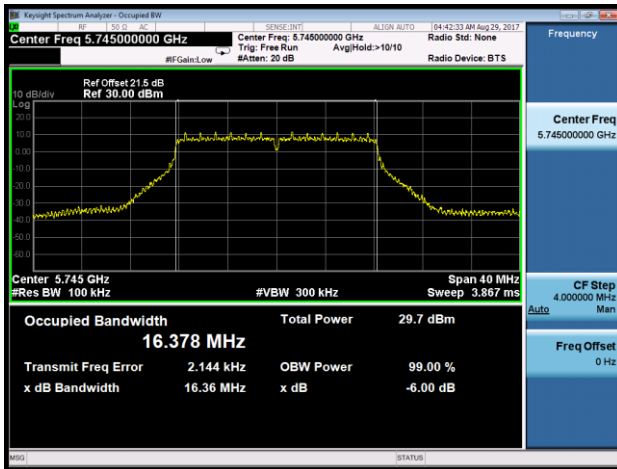
## 2. 6dB Bandwidth Measurement Test Result

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2017/08/29

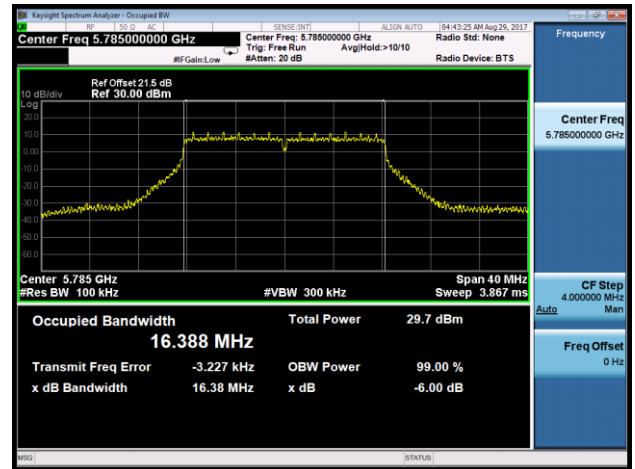
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
<b>Ant 0 / Ant 0 + 1 + 2 + 3</b>						
802.11a	6Mbps	149	5745	16.36	≥0.5	Pass
802.11a	6Mbps	157	5785	16.38	≥0.5	Pass
802.11a	6Mbps	165	5825	16.37	≥0.5	Pass
802.11n-HT20	MCS0	149	5745	17.60	≥0.5	Pass
802.11n-HT20	MCS0	157	5785	17.60	≥0.5	Pass
802.11n-HT20	MCS0	165	5825	17.60	≥0.5	Pass
802.11n-HT40	MCS0	151	5755	35.14	≥0.5	Pass
802.11n-HT40	MCS0	159	5795	35.12	≥0.5	Pass
802.11ac-VHT20	MCS0	149	5745	17.58	≥0.5	Pass
802.11ac-VHT20	MCS0	157	5785	17.60	≥0.5	Pass
802.11ac-VHT20	MCS0	165	5825	17.60	≥0.5	Pass
802.11ac-VHT40	MCS0	151	5755	35.07	≥0.5	Pass
802.11ac-VHT40	MCS0	159	5795	35.10	≥0.5	Pass
802.11ac-VHT80	MCS0	155	5775	76.34	≥0.5	Pass
<b>Ant 0 / Ant 0 + 1 (Ant 0 + 1 + 2 + 3)</b>						
802.11ac-VHT80+80	MCS0	155	5775	75.25	≥0.5	Pass
<b>Ant 3 / Ant 2 + 3 (Ant 0 + 1 + 2 + 3)</b>						
802.11ac-VHT80+80	MCS0	155	5775	75.18	≥0.5	Pass

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

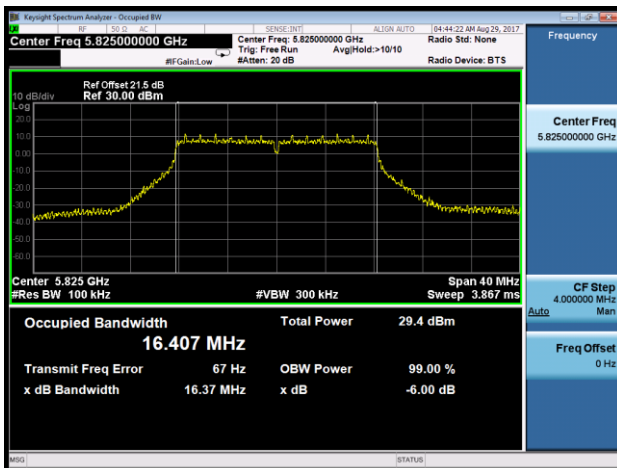
#### Channel 149 (5745MHz)



#### Channel 157 (5785MHz)

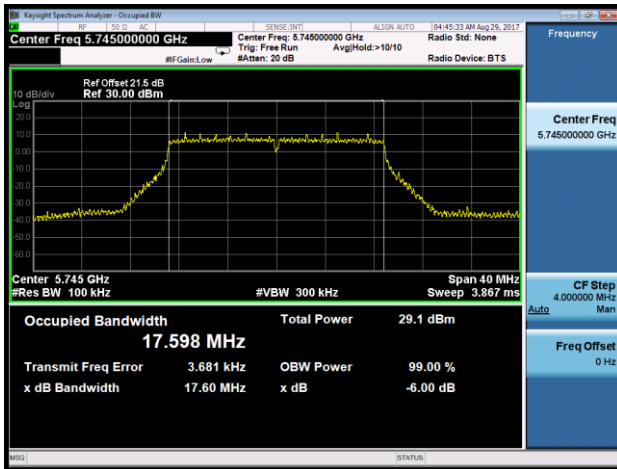


#### Channel 165 (5825MHz)

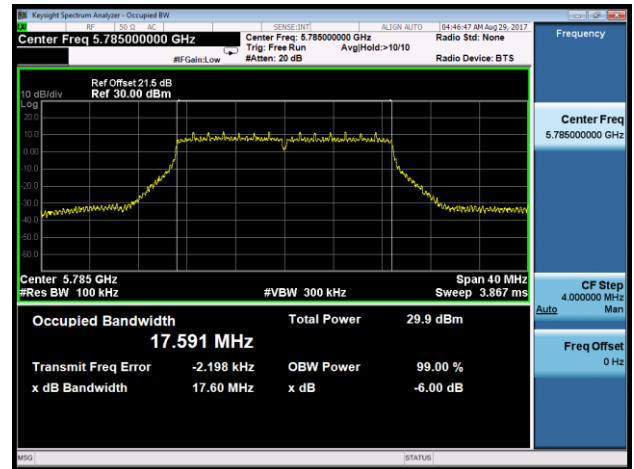


### 802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

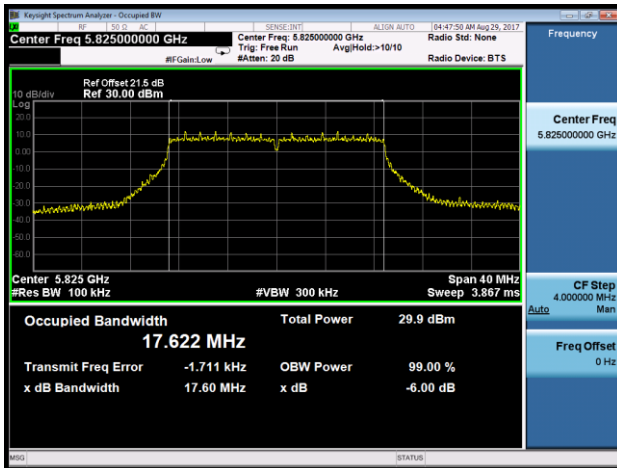
#### Channel 149 (5745MHz)



#### Channel 157 (5785MHz)

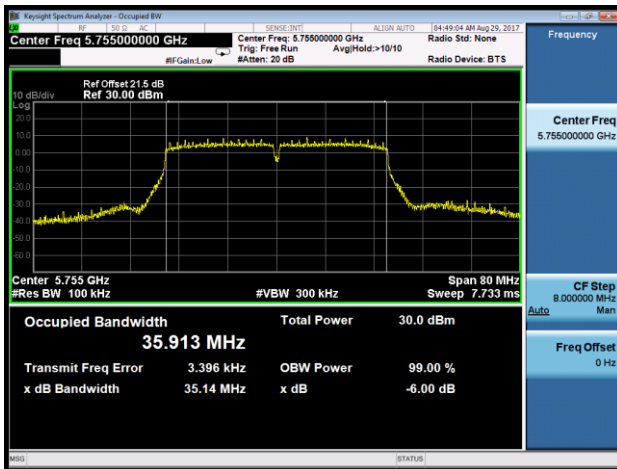


#### Channel 165 (5825MHz)

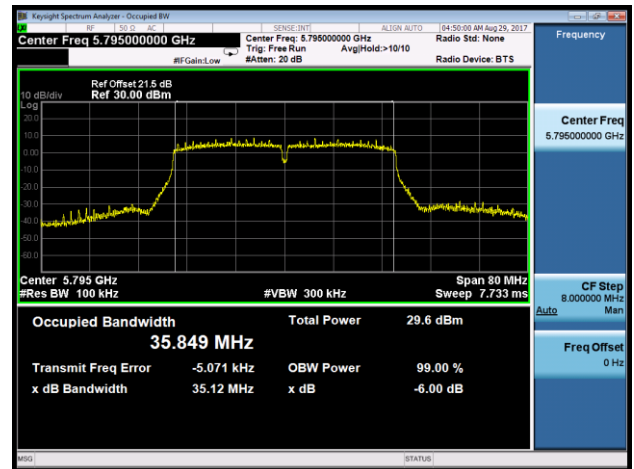


### 802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

#### Channel 151 (5755MHz)

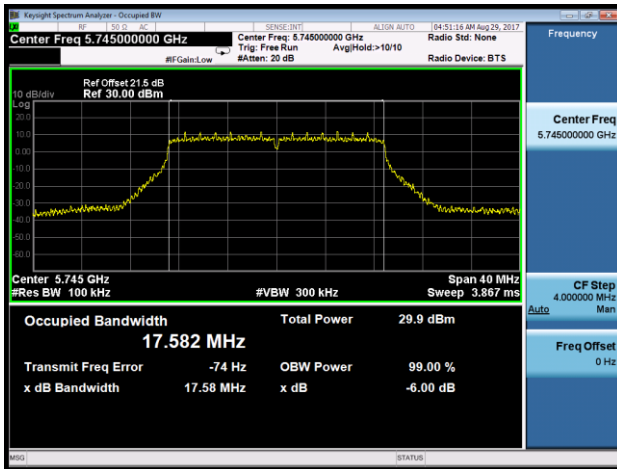


#### Channel 159 (5795MHz)

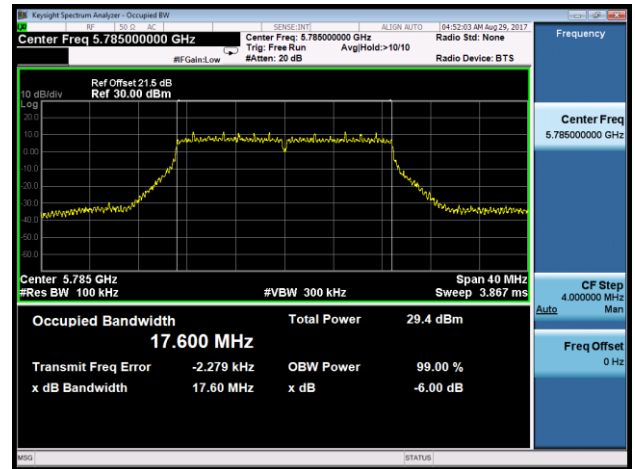


### 802.11ac-VHT20 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

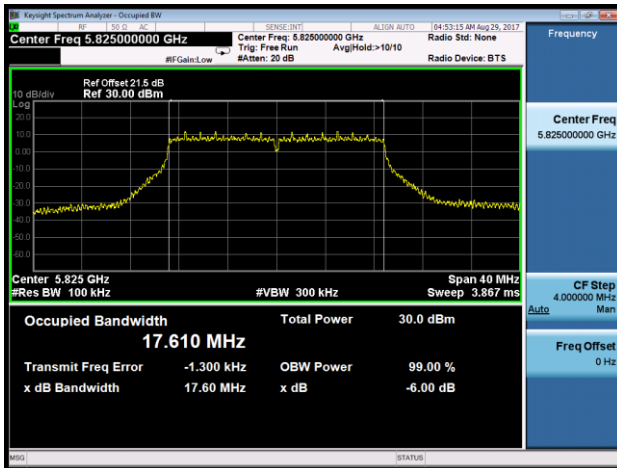
#### Channel 149 (5745MHz)



#### Channel 157 (5785MHz)

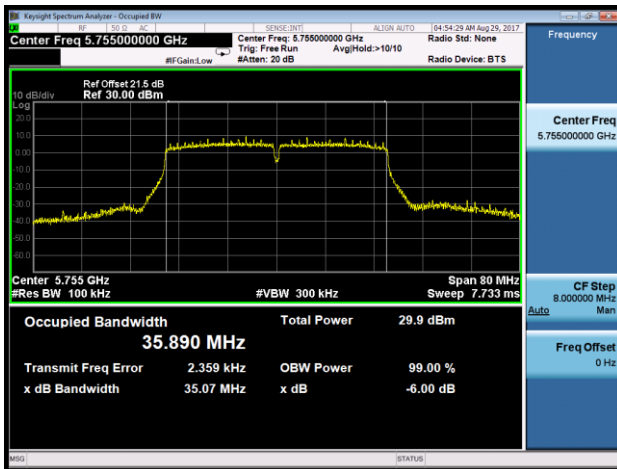


#### Channel 165 (5825MHz)

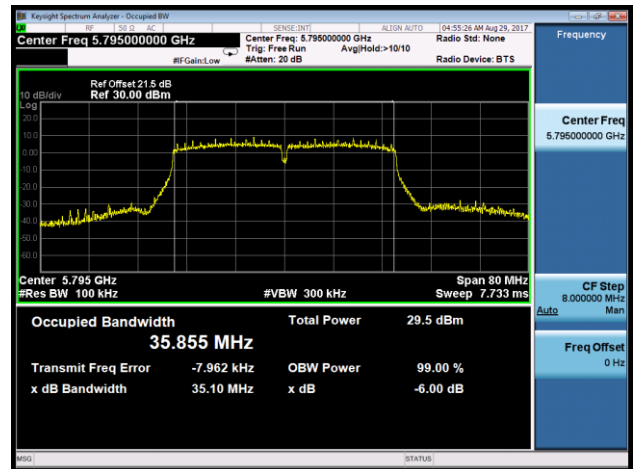


### 802.11ac-VHT40 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

#### Channel 151 (5755MHz)

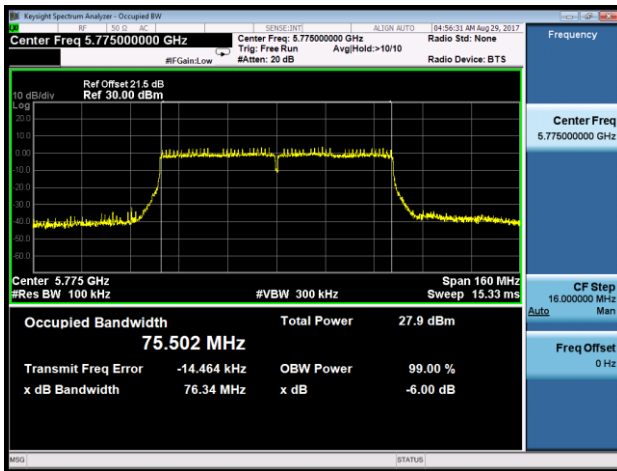


#### Channel 159 (5795MHz)



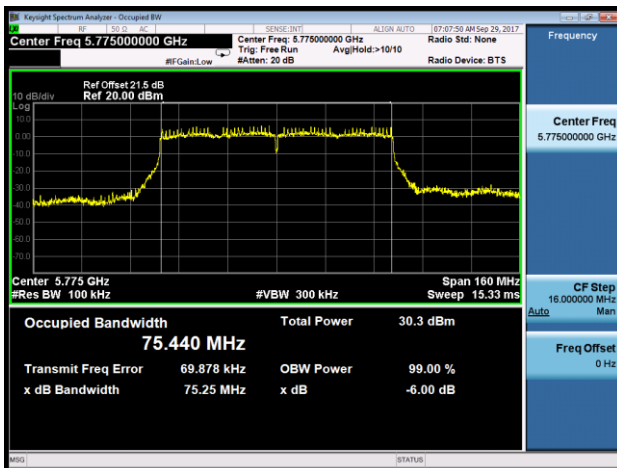
### 802.11ac-VHT80 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

#### Channel 155 (5775MHz)



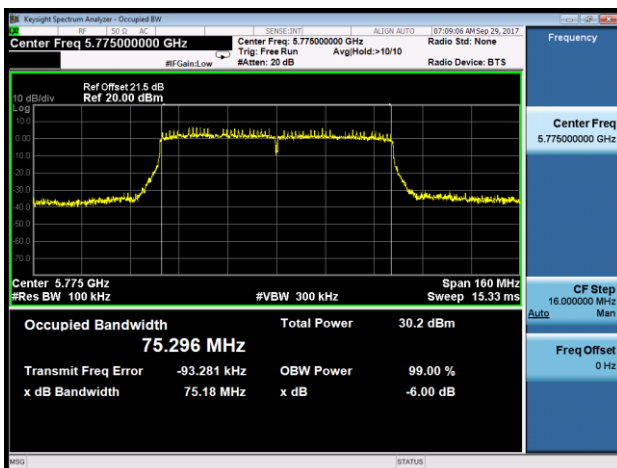
### 802.11ac-VHT80+80 6dB Bandwidth - Ant 0 / Ant 0 + 1 (Ant 0 + 1 + 2 + 3)

#### Channel 155 (5775MHz)



### 802.11ac-VHT80+80 6dB Bandwidth - Ant 3 / Ant 2 + 3 (Ant 0 + 1 + 2 + 3)

#### Channel 155 (5775MHz)





### 3. Output Power Measurement Test Result

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

For Ant 0 / Ant 0 + 1 + 2 + 3 port for Omni Antenna (ANT-2x2-5005):

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11a	20	36	5180	6Mbps	14.48
				24Mbps	14.23
				54Mbps	14.11
802.11n	20	36	5180	MCS0	14.65
				MCS3	14.43
				MCS7	14.21
802.11n	40	38	5190	MCS0	14.51
				MCS3	14.34
				MCS7	14.16
802.11ac	20	36	5180	MCS0	14.57
				MCS4	14.24
				MCS8	14.04
802.11ac	40	38	5190	MCS0	14.41
				MCS4	14.21
				MCS9	14.02
802.11ac	80	42	5210	MCS0	14.31
				MCS4	14.25
				MCS9	14.03
802.11ac	80+80	42	5210	MCS0	17.52
				MCS4	17.34
				MCS9	17.12



Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2017/08/15
Antenna Type	Omni Antenna (ANT-2x2-5005)	Test Item	Output Power

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	E.I.R.P. Above 30 Degree Angle (dBm)		Result
										Max	Limit	
										E.I.R.P.		
Ant 0 + 1 + 2 + 3 (CDD Mode)												
11a	6Mbps	36	5180	14.48	14.33	15.11	14.41	20.61	≤ 30.00	20.61	≤ 21.00	Pass
11a	6Mbps	44	5220	14.49	14.26	14.62	14.31	20.44	≤ 30.00	20.44	≤ 21.00	Pass
11a	6Mbps	48	5240	14.77	14.21	14.71	14.34	20.53	≤ 30.00	20.53	≤ 21.00	Pass
11a	6Mbps	149	5745	22.15	22.31	22.03	22.09	28.17	≤ 30.00	--	--	Pass
11a	6Mbps	157	5785	22.31	22.50	22.23	22.41	28.38	≤ 30.00	--	--	Pass
11a	6Mbps	165	5825	22.36	22.20	22.17	22.29	28.28	≤ 30.00	--	--	Pass
11n-HT20	MCS0	36	5180	14.65	14.44	15.12	14.72	20.76	≤ 30.00	20.76	≤ 21.00	Pass
11n-HT20	MCS0	44	5220	14.61	14.99	14.83	14.31	20.71	≤ 30.00	20.71	≤ 21.00	Pass
11n-HT20	MCS0	48	5240	14.48	14.68	14.92	14.73	20.73	≤ 30.00	20.73	≤ 21.00	Pass
11n-HT20	MCS0	149	5745	21.81	22.12	22.03	21.98	28.01	≤ 30.00	--	--	Pass
11n-HT20	MCS0	157	5785	22.11	22.36	22.04	22.17	28.19	≤ 30.00	--	--	Pass
11n-HT20	MCS0	165	5825	22.49	22.66	22.43	22.25	28.48	≤ 30.00	--	--	Pass
11n-HT40	MCS0	38	5190	14.51	14.43	14.98	14.78	20.70	≤ 30.00	20.70	≤ 21.00	Pass
11n-HT40	MCS0	46	5230	14.48	14.38	15.03	14.76	20.69	≤ 30.00	20.69	≤ 21.00	Pass
11n-HT40	MCS0	151	5755	22.58	22.54	22.35	22.34	28.47	≤ 30.00	--	--	Pass
11n-HT40	MCS0	159	5795	22.32	22.41	22.09	22.13	28.26	≤ 30.00	--	--	Pass
11ac-VHT20	MCS0	36	5180	14.57	14.40	15.01	14.62	20.68	≤ 30.00	20.68	≤ 21.00	Pass
11ac-VHT20	MCS0	44	5220	14.56	14.81	14.83	14.24	20.64	≤ 30.00	20.64	≤ 21.00	Pass
11ac-VHT20	MCS0	48	5240	14.43	14.60	14.78	14.72	20.66	≤ 30.00	20.66	≤ 21.00	Pass
11ac-VHT20	MCS0	149	5745	22.29	22.57	22.21	22.29	28.36	≤ 30.00	--	--	Pass
11ac-VHT20	MCS0	157	5785	22.16	22.32	22.11	22.21	28.22	≤ 30.00	--	--	Pass
11ac-VHT20	MCS0	165	5825	22.34	22.60	22.35	22.53	28.48	≤ 30.00	--	--	Pass
11ac-VHT40	MCS0	38	5190	14.41	14.39	14.86	14.62	20.59	≤ 30.00	20.59	≤ 21.00	Pass
11ac-VHT40	MCS0	46	5230	14.36	14.32	14.84	14.72	20.59	≤ 30.00	20.59	≤ 21.00	Pass
11ac-VHT40	MCS0	151	5755	22.50	22.64	22.24	22.32	28.45	≤ 30.00	--	--	Pass



11ac-VHT40	MCS0	159	5795	22.46	22.40	22.10	22.18	28.31	≤ 30.00	--	--	Pass
11ac-VHT80	MCS0	42	5210	14.31	14.19	14.19	13.93	20.18	≤ 30.00	20.18	≤ 21.00	Pass
11ac-VHT80	MCS0	155	5775	20.52	20.35	20.60	20.44	26.50	≤ 30.00	--	--	Pass
11ac-VHT80+80	MCS0	42	5210	17.52	17.90	--	--	20.72	≤ 30.00	20.72	≤ 21.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	17.62	17.90	20.77	≤ 30.00	20.77	≤ 21.00	Pass
11ac-VHT80+80	MCS0	155	5775	22.12	22.19	--	--	25.17	≤ 30.00	--	--	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	22.32	22.20	25.27	≤ 30.00	--	--	Pass

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

Note 2: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total Average Power (dBm) =  $10 \cdot \log \{ 10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} \}$  (dBm)

Ant 2 & Ant 3: Total Average Power (dBm) =  $10 \cdot \log \{ 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)} \}$  (dBm)

Note 3: Max EIRP (dBm) = Total Average Power (dBm) + 30 Degree Antenna Gain (dBi),

30 Degree Antenna Gain (dBi) = 0dBi.

Note 4: Average Power Limit (dBm) = 30dBm.





Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	E.I.R.P. Above 30 Degree Angle (dBm)		Result
										Max E.I.R.P.	Limit	
										Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)		
11n-HT20	MCS0	36	5180	11.62	11.52	11.68	11.34	17.56	≤ 28.00	20.56	≤ 21.00	Pass
11n-HT20	MCS0	44	5220	11.60	11.33	11.63	11.25	17.48	≤ 28.00	20.48	≤ 21.00	Pass
11n-HT20	MCS0	48	5240	11.76	11.62	11.69	11.54	17.67	≤ 28.00	20.67	≤ 21.00	Pass
11n-HT20	MCS0	149	5745	21.11	21.54	21.40	21.39	27.38	≤ 28.00	--	--	Pass
11n-HT20	MCS0	157	5785	21.68	21.84	21.38	21.73	27.68	≤ 28.00	--	--	Pass
11n-HT20	MCS0	165	5825	22.05	22.10	21.76	21.76	27.94	≤ 28.00	--	--	Pass
11n-HT40	MCS0	38	5190	11.59	11.64	11.67	11.51	17.62	≤ 28.00	20.62	≤ 21.00	Pass
11n-HT40	MCS0	46	5230	11.65	11.33	11.58	11.30	17.49	≤ 28.00	20.49	≤ 21.00	Pass
11n-HT40	MCS0	151	5755	21.89	21.89	21.69	22.13	27.92	≤ 28.00	--	--	Pass
11n-HT40	MCS0	159	5795	21.63	21.94	21.45	21.84	27.74	≤ 28.00	--	--	Pass
11ac-VHT20	MCS0	36	5180	11.54	11.41	11.64	11.32	17.50	≤ 28.00	20.50	≤ 21.00	Pass
11ac-VHT20	MCS0	44	5220	11.56	11.26	11.66	11.28	17.46	≤ 28.00	20.46	≤ 21.00	Pass
11ac-VHT20	MCS0	48	5240	11.74	11.68	11.59	11.42	17.63	≤ 28.00	20.63	≤ 21.00	Pass
11ac-VHT20	MCS0	149	5745	21.65	22.16	21.58	21.56	27.77	≤ 28.00	--	--	Pass
11ac-VHT20	MCS0	157	5785	21.61	21.67	21.81	21.96	27.79	≤ 28.00	--	--	Pass
11ac-VHT20	MCS0	165	5825	21.87	21.92	21.65	21.63	27.79	≤ 28.00	--	--	Pass
11ac-VHT40	MCS0	38	5190	11.67	11.55	11.67	11.44	17.60	≤ 28.00	20.60	≤ 21.00	Pass
11ac-VHT40	MCS0	46	5230	11.61	11.35	11.65	11.32	17.51	≤ 28.00	20.51	≤ 21.00	Pass
11ac-VHT40	MCS0	151	5755	21.76	21.81	21.67	21.60	27.73	≤ 28.00	--	--	Pass
11ac-VHT40	MCS0	159	5795	21.45	21.51	21.31	21.33	27.42	≤ 28.00	--	--	Pass
11ac-VHT80	MCS0	42	5210	11.76	11.61	11.82	11.63	17.73	≤ 28.00	20.73	≤ 21.00	Pass
11ac-VHT80	MCS0	155	5775	20.52	20.35	20.60	20.44	26.50	≤ 28.00	--	--	Pass
11ac-VHT80+80	MCS0	42	5210	17.52	17.90	--	--	20.72	≤ 30.00	20.72	≤ 21.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	17.62	17.90	20.77	≤ 30.00	20.77	≤ 21.00	Pass
11ac-VHT80+80	MCS0	155	5775	22.12	22.19	--	--	25.17	≤ 30.00	--	--	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	22.32	22.20	25.27	≤ 30.00	--	--	Pass

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

Note 2: For 802.11ac-VHT80+80:

$$\text{Ant 0 \& Ant 1: Total Average Power (dBm) = } 10 \cdot \log \{ 10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} \} \text{ (dBm)}$$



$$\text{Ant 2 \& Ant 3: Total Average Power (dBm) = } 10 \cdot \log \left\{ 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)} \right\} \text{ (dBm)}$$

Note 3: Max EIRP (dBm) = Total Average Power (dBm) + 30 Degree Antenna Gain (dBi) + Beam-Forming Gain (dBi), 30 Degree Antenna Gain = 0dBi, Beam-Forming Gain (dBi) = 3.0 dBi.

Note 4: Average Power Limit (dBm) = 30dBm - (5dBi + 3dBi - 6dBi) = 28dBm,

For 802.11ac-VHT80+80: Average Power Limit (dBm) = 30dBm.



Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2017/08/15
Antenna Type	Directional Antenna (MT-484052/NVH)	Test Item	Output Power

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	E.I.R.P. Above 30 Degree Angle (dBm)		Result
										Max E.I.R.P.	Limit	
Ant 0 + 1 + 2 + 3 (CDD Mode)												
11a	6Mbps	36	5180	9.32	8.95	8.35	8.68	14.86	≤ 20.00	20.86	≤ 21.00	Pass
11a	6Mbps	44	5220	8.88	8.71	8.52	8.76	14.74	≤ 20.00	20.74	≤ 21.00	Pass
11a	6Mbps	48	5240	8.82	8.57	8.51	8.81	14.70	≤ 20.00	20.70	≤ 21.00	Pass
11a	6Mbps	149	5745	13.78	13.88	13.75	13.28	19.70	≤ 20.00	--	--	Pass
11a	6Mbps	157	5785	14.04	13.89	13.74	13.65	19.85	≤ 20.00	--	--	Pass
11a	6Mbps	165	5825	14.08	13.55	13.66	13.44	19.71	≤ 20.00	--	--	Pass
11n-HT20	MCS0	36	5180	8.97	8.67	8.45	9.01	14.80	≤ 20.00	20.80	≤ 21.00	Pass
11n-HT20	MCS0	44	5220	8.67	8.77	8.94	8.74	14.80	≤ 20.00	20.80	≤ 21.00	Pass
11n-HT20	MCS0	48	5240	8.61	8.54	8.84	8.67	14.69	≤ 20.00	20.69	≤ 21.00	Pass
11n-HT20	MCS0	149	5745	13.86	13.77	13.82	13.56	19.77	≤ 20.00	--	--	Pass
11n-HT20	MCS0	157	5785	14.12	13.69	13.48	13.77	19.79	≤ 20.00	--	--	Pass
11n-HT20	MCS0	165	5825	13.79	13.29	13.55	13.37	19.52	≤ 20.00	--	--	Pass
11n-HT40	MCS0	38	5190	8.35	8.59	8.96	8.43	14.61	≤ 20.00	20.61	≤ 21.00	Pass
11n-HT40	MCS0	46	5230	8.46	8.52	8.78	8.45	14.58	≤ 20.00	20.58	≤ 21.00	Pass
11n-HT40	MCS0	151	5755	13.62	13.42	13.89	13.12	19.54	≤ 20.00	--	--	Pass
11n-HT40	MCS0	159	5795	14.05	13.45	13.66	13.54	19.70	≤ 20.00	--	--	Pass
11ac-VHT20	MCS0	36	5180	8.44	8.57	8.91	8.44	14.61	≤ 20.00	20.61	≤ 21.00	Pass
11ac-VHT20	MCS0	44	5220	8.51	8.61	8.96	8.51	14.67	≤ 20.00	20.67	≤ 21.00	Pass
11ac-VHT20	MCS0	48	5240	8.49	8.56	8.94	8.46	14.64	≤ 20.00	20.64	≤ 21.00	Pass
11ac-VHT20	MCS0	149	5745	13.88	13.44	13.56	13.44	19.60	≤ 20.00	--	--	Pass
11ac-VHT20	MCS0	157	5785	14.16	13.39	13.62	13.35	19.66	≤ 20.00	--	--	Pass
11ac-VHT20	MCS0	165	5825	13.65	13.28	13.35	13.78	19.54	≤ 20.00	--	--	Pass
11ac-VHT40	MCS0	38	5190	8.57	8.61	8.91	8.71	14.72	≤ 20.00	20.72	≤ 21.00	Pass
11ac-VHT40	MCS0	46	5230	8.62	8.45	8.84	8.66	14.67	≤ 20.00	20.67	≤ 21.00	Pass
11ac-VHT40	MCS0	151	5755	13.81	13.74	13.88	13.42	19.74	≤ 20.00	--	--	Pass



11ac-VHT40	MCS0	159	5795	13.82	13.68	13.56	13.34	19.62	≤ 20.00	--	--	Pass
11ac-VHT80	MCS0	42	5210	8.56	8.64	8.81	8.71	14.70	≤ 20.00	20.70	≤ 21.00	Pass
11ac-VHT80	MCS0	155	5775	13.84	13.51	13.56	13.62	19.65	≤ 20.00	--	--	Pass
11ac-VHT80+80	MCS0	42	5210	11.66	11.41	--	--	14.55	≤ 20.00	20.55	≤ 21.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	11.52	11.71	14.63	≤ 20.00	20.63	≤ 21.00	Pass
11ac-VHT80+80	MCS0	155	5775	16.93	16.84	--	--	19.90	≤ 20.00	--	--	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	16.40	16.90	19.67	≤ 20.00	--	--	Pass

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

Note 2: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total Average Power (dBm) =  $10 \cdot \log \left\{ 10^{\frac{\text{Ant 0 Average Power}}{10}} + 10^{\frac{\text{Ant 1 Average Power}}{10}} \right\}$  (dBm)

Ant 2 & Ant 3: Total Average Power (dBm) =  $10 \cdot \log \left\{ 10^{\frac{\text{Ant 2 Average Power}}{10}} + 10^{\frac{\text{Ant 3 Average Power}}{10}} \right\}$  (dBm)

Note 3: Max EIRP (dBm) = Total Average Power (dBm) + 30 Degree Antenna Gain (dBi), 30 Degree Antenna Gain (dBi) = 6 dBi

Note 4: Average Power Limit (dBm) = 30dBm - (16dBi - 6dBi) = 20dBm.



Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	E.I.R.P. Above 30 Degree Angle (dBm)		Result
										Max	Limit	
										E.I.R.P.		
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)												
11n-HT20	MCS0	36	5180	5.57	5.48	5.34	5.36	11.46	≤ 17.00	20.46	≤ 21.00	Pass
11n-HT20	MCS0	44	5220	6.03	5.80	5.69	5.66	11.82	≤ 17.00	20.82	≤ 21.00	Pass
11n-HT20	MCS0	48	5240	5.82	5.55	5.45	5.39	11.58	≤ 17.00	20.58	≤ 21.00	Pass
11n-HT20	MCS0	149	5745	10.62	10.45	10.10	10.37	16.41	≤ 17.00	--	--	Pass
11n-HT20	MCS0	157	5785	10.55	10.92	10.31	10.55	16.61	≤ 17.00	--	--	Pass
11n-HT20	MCS0	165	5825	10.63	10.41	10.44	10.66	16.56	≤ 17.00	--	--	Pass
11n-HT40	MCS0	38	5190	5.56	5.56	5.31	5.40	11.48	≤ 17.00	20.48	≤ 21.00	Pass
11n-HT40	MCS0	46	5230	6.02	5.75	5.68	5.65	11.80	≤ 17.00	20.80	≤ 21.00	Pass
11n-HT40	MCS0	151	5755	10.45	11.16	10.45	10.36	16.64	≤ 17.00	--	--	Pass
11n-HT40	MCS0	159	5795	10.59	10.72	10.40	10.46	16.56	≤ 17.00	--	--	Pass
11ac-VHT20	MCS0	36	5180	5.92	5.86	5.71	5.77	11.84	≤ 17.00	20.84	≤ 21.00	Pass
11ac-VHT20	MCS0	44	5220	5.91	5.59	5.50	5.47	11.64	≤ 17.00	20.64	≤ 21.00	Pass
11ac-VHT20	MCS0	48	5240	5.72	5.45	5.38	5.25	11.47	≤ 17.00	20.47	≤ 21.00	Pass
11ac-VHT20	MCS0	149	5745	10.95	11.03	10.73	10.78	16.89	≤ 17.00	--	--	Pass
11ac-VHT20	MCS0	157	5785	10.56	10.68	10.31	10.46	16.53	≤ 17.00	--	--	Pass
11ac-VHT20	MCS0	165	5825	10.58	10.49	10.58	10.43	16.54	≤ 17.00	--	--	Pass
11ac-VHT40	MCS0	38	5190	5.94	6.02	5.62	5.86	11.88	≤ 17.00	20.88	≤ 21.00	Pass
11ac-VHT40	MCS0	46	5230	5.96	5.80	5.67	5.78	11.82	≤ 17.00	20.82	≤ 21.00	Pass
11ac-VHT40	MCS0	151	5755	10.59	10.56	10.46	10.62	16.58	≤ 17.00	--	--	Pass
11ac-VHT40	MCS0	159	5795	10.84	10.86	10.65	10.73	16.79	≤ 17.00	--	--	Pass
11ac-VHT80	MCS0	42	5210	5.74	5.66	5.54	5.43	11.61	≤ 17.00	20.61	≤ 21.00	Pass
11ac-VHT80	MCS0	155	5775	10.33	10.56	10.45	10.48	16.48	≤ 17.00	--	--	Pass
11ac-VHT80+80	MCS0	42	5210	11.66	11.41	--	--	14.55	≤ 20.00	20.55	≤ 21.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	11.52	11.71	14.63	≤ 20.00	20.63	≤ 21.00	Pass
11ac-VHT80+80	MCS0	155	5775	16.93	16.84	--	--	19.90	≤ 20.00	--	--	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	16.40	16.90	19.67	≤ 20.00	--	--	Pass

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

Note 2: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total Average Power (dBm) =  $10 \cdot \log\{10^{(\text{Ant 0 Average Power}/10)} + 10^{(\text{Ant 1 Average Power}/10)}\}$  (dBm)



$$\text{Ant 2 \& Ant 3: Total Average Power (dBm)} = 10 \cdot \log\{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\} \text{ (dBm)}$$

Note 3: Max EIRP (dBm) = Total Average Power (dBm) + 30 Degree Antenna Gain (dBi) + Beam-Forming Gain (dBi), 30 Degree Antenna Gain (dBi) = 6dBi

Note 4: Average Power Limit (dBm) = 30dBm - (16dBi + 3dBi - 6dBi) = 17dBm.

For 802.11ac-VHT80+80: Average Power Limit (dBm) = 30dBm - (16dBi - 6dBi) = 20dBm.



#### 4. Power Spectral Density Measurement Test Result

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2017/08/27
Test Item	Power Spectral Density (UNII-Band 1)		
Antenna Type	Omin Antenna (ANT-2x2-5005)		

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/MHz)	Ant 1 PSD (dBm/MHz)	Ant 2 PSD (dBm/MHz)	Ant 3 PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)											
11a	6Mbps	36	5180	3.58	2.76	3.71	2.54	97.08	9.33	≤ 14.99	Pass
11a	6Mbps	44	5220	3.20	3.53	3.10	3.19	97.08	9.41	≤ 14.99	Pass
11a	6Mbps	48	5240	3.04	3.07	3.23	2.89	97.08	9.21	≤ 14.99	Pass
11n-HT20	MCS0	36	5180	2.36	2.56	2.96	2.65	98.80	8.66	≤ 14.99	Pass
11n-HT20	MCS0	44	5220	2.28	3.02	3.16	2.92	98.80	8.88	≤ 14.99	Pass
11n-HT20	MCS0	48	5240	2.08	3.54	2.64	2.57	98.80	8.76	≤ 14.99	Pass
11n-HT40	MCS0	38	5190	-0.31	-0.17	0.39	-0.31	96.95	6.06	≤ 14.99	Pass
11n-HT40	MCS0	46	5230	-0.04	0.13	0.31	0.13	96.95	6.29	≤ 14.99	Pass
11ac-VHT20	MCS0	36	5180	2.13	2.60	3.61	2.62	98.80	8.79	≤ 14.99	Pass
11ac-VHT20	MCS0	44	5220	2.74	2.87	2.60	2.82	98.80	8.78	≤ 14.99	Pass
11ac-VHT20	MCS0	48	5240	2.39	3.07	2.87	3.47	98.80	8.99	≤ 14.99	Pass
11ac-VHT40	MCS0	38	5190	-0.31	-0.16	-0.05	-0.43	96.98	5.92	≤ 14.99	Pass
11ac-VHT40	MCS0	46	5230	-0.17	-0.06	0.11	-0.12	96.98	6.10	≤ 14.99	Pass
11ac-VHT80	MCS0	42	5210	-3.44	-3.18	-3.30	-3.36	94.67	2.94	≤ 14.99	Pass
11ac-VHT80+80	MCS0	42	5210	-0.41	-0.88	--	--	94.67	2.61	≤ 17.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	-0.39	-0.70	94.67	2.71	≤ 17.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/MHz).

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Ant 2 & Ant 3: Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 4: PSD Limit (dBm/MHz) = 17dBm/MHz - (8.01dBi - 6dBi) = 14.99dBm/MHz.

For 802.11ac-VHT80+80: PSD Limit (dBm/MHz) = 17dBm/MHz.



Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/MHz)	Ant 1 PSD (dBm/MHz)	Ant 2 PSD (dBm/MHz)	Ant 3 PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)											
11n-HT20	MCS0	36	5180	-0.16	-0.24	-0.02	-0.16	98.80	5.88	≤ 15.00	Pass
11n-HT20	MCS0	44	5220	-0.48	-0.53	-0.33	-0.41	98.80	5.58	≤ 15.00	Pass
11n-HT20	MCS0	48	5240	-0.31	-0.46	-0.33	-0.40	98.80	5.65	≤ 15.00	Pass
11n-HT40	MCS0	38	5190	-3.03	-2.97	-2.99	-2.86	96.95	3.19	≤ 15.00	Pass
11n-HT40	MCS0	46	5230	-3.17	-2.77	-2.91	-3.33	96.95	3.12	≤ 15.00	Pass
11ac-VHT20	MCS0	36	5180	-0.31	-0.27	-0.12	-0.13	98.80	5.81	≤ 15.00	Pass
11ac-VHT20	MCS0	44	5220	-0.61	-0.44	-0.37	-0.76	98.80	5.48	≤ 15.00	Pass
11ac-VHT20	MCS0	48	5240	-0.18	-0.34	-0.40	-0.22	98.80	5.74	≤ 15.00	Pass
11ac-VHT40	MCS0	38	5190	-2.98	-2.59	-2.72	-3.34	96.98	3.26	≤ 15.00	Pass
11ac-VHT40	MCS0	46	5230	-3.15	-3.56	-3.33	-3.57	96.98	2.75	≤ 15.00	Pass
11ac-VHT80	MCS0	42	5210	-6.38	-6.78	-6.61	-6.68	94.67	-0.35	≤ 15.00	Pass
11ac-VHT80+80	MCS0	42	5210	-0.41	-0.88	--	--	94.67	2.61	≤ 17.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	-0.39	-0.70	94.67	2.71	≤ 17.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/MHz).

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Ant 2 & Ant 3: Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 4: PSD Limit (dBm/MHz) = 17dBm/MHz - (5dBi + 3dBi - 6dBi) = 15.00dBm/MHz.

For 802.11ac-VHT80+80: PSD Limit (dBm/MHz) = 17dBm/MHz.





Product	ACCESS POINT	Temperature	22°C
Test Engineer	Kevin Ker	Relative Humidity	54%
Test Site	SR2	Test Date	2017/08/27
Test Item	Power Spectral Density (UNII-Band 3)		
Antenna Type	Omin Antenna (ANT-2x2-5005)		

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/100kHz)	Ant 1 PSD (dBm/100kHz)	Ant 2 PSD (dBm/100kHz)	Ant 3 PSD (dBm/100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)												
11a	6Mbps	149	5745	2.75	2.83	2.29	2.59	97.08	6.99	15.76	≤ 27.99	Pass
11a	6Mbps	157	5785	2.60	3.05	2.66	2.73	97.08	6.99	15.90	≤ 27.99	Pass
11a	6Mbps	165	5825	2.03	2.87	2.79	2.38	97.08	6.99	15.67	≤ 27.99	Pass
11n-HT20	MCS0	149	5745	1.78	2.39	1.87	1.71	98.80	6.99	14.96	≤ 27.99	Pass
11n-HT20	MCS0	157	5785	2.10	2.26	2.12	1.93	98.80	6.99	15.11	≤ 27.99	Pass
11n-HT20	MCS0	165	5825	2.48	2.58	2.02	1.98	98.80	6.99	15.28	≤ 27.99	Pass
11n-HT40	MCS0	151	5755	-0.43	0.14	-0.14	-0.03	96.95	6.99	13.04	≤ 27.99	Pass
11n-HT40	MCS0	159	5795	-0.31	-0.61	-0.93	-0.42	96.95	6.99	12.58	≤ 27.99	Pass
11ac-VHT20	MCS0	149	5745	2.05	2.42	2.65	2.35	98.80	6.99	15.38	≤ 27.99	Pass
11ac-VHT20	MCS0	157	5785	1.98	2.86	1.95	1.82	98.80	6.99	15.18	≤ 27.99	Pass
11ac-VHT20	MCS0	165	5825	2.29	2.51	2.13	2.17	98.80	6.99	15.29	≤ 27.99	Pass
11ac-VHT40	MCS0	151	5755	-0.29	-0.58	-0.76	-0.45	96.98	6.99	12.63	≤ 27.99	Pass
11ac-VHT40	MCS0	159	5795	-0.81	-0.65	-0.70	-0.88	96.98	6.99	12.38	≤ 27.99	Pass
11ac-VHT80	MCS0	155	5775	-7.03	-6.07	-6.45	-5.78	94.67	6.99	6.94	≤ 27.99	Pass
11ac-VHT80+80	MCS0	155	5775	-4.85	-4.77	--	--	94.67	6.99	5.43	≤ 30.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	-4.61	-4.93	94.67	6.99	5.47	≤ 30.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor.

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Ant 2 & Ant 3: Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 4: PSD Limit (dBm/500kHz) = 30dBm/500kHz - (8.01dBi - 6dBi) = 27.99dBm/500kHz.



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For 802.11ac-VHT80+80: PSD Limit (dBm/500kHz) = 30dBm/500kHz.



Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/100kHz)	Ant 1 PSD (dBm/100kHz)	Ant 2 PSD (dBm/100kHz)	Ant 3 PSD (dBm/100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)												
11n-HT20	MCS0	149	5745	1.53	1.17	0.77	1.20	98.80	6.99	14.19	≤ 28.00	Pass
11n-HT20	MCS0	157	5785	1.25	1.80	1.31	1.31	98.80	6.99	14.43	≤ 28.00	Pass
11n-HT20	MCS0	165	5825	1.90	1.71	1.42	1.24	98.80	6.99	14.59	≤ 28.00	Pass
11n-HT40	MCS0	151	5755	-1.09	-0.91	-1.23	-0.95	96.95	6.99	12.10	≤ 28.00	Pass
11n-HT40	MCS0	159	5795	-1.53	-1.15	-1.21	-1.46	96.95	6.99	11.81	≤ 28.00	Pass
11ac-VHT20	MCS0	149	5745	1.36	1.61	1.40	1.54	98.80	6.99	14.49	≤ 28.00	Pass
11ac-VHT20	MCS0	157	5785	1.65	1.56	0.92	1.38	98.80	6.99	14.40	≤ 28.00	Pass
11ac-VHT20	MCS0	165	5825	0.90	1.34	1.24	0.81	98.80	6.99	14.09	≤ 28.00	Pass
11ac-VHT40	MCS0	151	5755	-1.92	-1.62	-1.71	-1.55	96.98	6.99	11.45	≤ 28.00	Pass
11ac-VHT40	MCS0	159	5795	-1.84	-1.82	-2.31	-1.98	96.98	6.99	11.16	≤ 28.00	Pass
11ac-VHT80	MCS0	155	5775	-7.03	-6.07	-6.45	-5.78	94.67	6.99	6.94	≤ 28.00	Pass
11ac-VHT80+80	MCS0	155	5775	-4.85	-4.77	--	--	94.67	6.99	5.43	≤ 30.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	-4.61	-4.93	94.67	6.99	5.47	≤ 30.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor.

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Ant 2 & Ant 3: Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 4: PSD Limit (dBm/500kHz) = 30dBm/500kHz - (5dBi + 3dBi - 6dBi) = 28.00dBm/500kHz.

For 802.11ac-VHT80+80: PSD Limit (dBm/500kHz) = 30dBm/500kHz.



Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2017/08/27
Test Item	Power Spectral Density (UNII-Band 1)		
Antenna Type	Directional Antenna (MT-484052/NVH)		

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/MHz)	Ant 1 PSD (dBm/MHz)	Ant 2 PSD (dBm/MHz)	Ant 3 PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)											
11a	6Mbps	36	5180	-2.67	-2.58	-1.99	-2.08	97.08	3.83	≤ 3.99	Pass
11a	6Mbps	44	5220	-2.16	-2.33	-2.43	-2.22	97.08	3.87	≤ 3.99	Pass
11a	6Mbps	48	5240	-2.63	-2.76	-2.48	-2.61	97.08	3.53	≤ 3.99	Pass
11n-HT20	MCS0	36	5180	-2.47	-2.31	-2.13	-2.43	98.80	3.69	≤ 3.99	Pass
11n-HT20	MCS0	44	5220	-2.64	-2.68	-2.31	-2.53	98.80	3.48	≤ 3.99	Pass
11n-HT20	MCS0	48	5240	-2.73	-2.46	-2.37	-2.59	98.80	3.49	≤ 3.99	Pass
11n-HT40	MCS0	38	5190	-6.20	-6.58	-5.69	-6.46	96.95	-0.06	≤ 3.99	Pass
11n-HT40	MCS0	46	5230	-5.85	-5.87	-5.98	-5.95	96.95	0.24	≤ 3.99	Pass
11ac-VHT20	MCS0	36	5180	-2.19	-2.46	-2.09	-2.22	98.80	3.78	≤ 3.99	Pass
11ac-VHT20	MCS0	44	5220	-2.54	-2.66	-2.61	-2.59	98.80	3.42	≤ 3.99	Pass
11ac-VHT20	MCS0	48	5240	-2.69	-2.80	-2.67	-2.28	98.80	3.42	≤ 3.99	Pass
11ac-VHT40	MCS0	38	5190	-6.45	-6.05	-5.96	-6.26	96.98	-0.02	≤ 3.99	Pass
11ac-VHT40	MCS0	46	5230	-6.01	-6.05	-6.00	-6.16	96.98	0.10	≤ 3.99	Pass
11ac-VHT80	MCS0	42	5210	-9.32	-9.15	-9.10	-9.58	94.67	-3.03	≤ 3.99	Pass
11ac-VHT80+80	MCS0	42	5210	-6.52	-7.26	--	--	94.67	-3.63	≤ 7.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	-6.26	-7.18	94.67	-3.45	≤ 7.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/MHz) =  $10^{\log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)} + 10^{(Ant\ 2\ PSD/10)} + 10^{(Ant\ 3\ PSD/10)}\}}$  (dBm/MHz).

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/MHz) =  $10^{\log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)} + 10^{(Ant\ 2\ PSD/10)} + 10^{(Ant\ 3\ PSD/10)}\}}$  (dBm/MHz) +  $10^{\log (1/Duty\ Cycle)}$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/MHz) =  $10^{\log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)}\}}$  (dBm/MHz) +  $10^{\log (1/Duty\ Cycle)}$ .

Ant 2 & Ant 3: Total PSD (dBm/MHz) =  $10^{\log \{10^{(Ant\ 2\ PSD/10)} + 10^{(Ant\ 3\ PSD/10)}\}}$  (dBm/MHz) +  $10^{\log (1/Duty\ Cycle)}$ .

Note 4: PSD Limit (dBm/MHz) = 17dBm/MHz - (19.01dBi - 6dBi) = 3.99dBm/MHz.

For 802.11ac-VHT80+80: PSD Limit (dBm/MHz) = 17dBm/MHz - (16dBi - 6dBi) = 7.00dBm/MHz.



Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/MHz)	Ant 1 PSD (dBm/MHz)	Ant 2 PSD (dBm/MHz)	Ant 3 PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)											
11n-HT20	MCS0	36	5180	-6.56	-6.12	-6.53	-6.02	98.80	-0.28	≤ 4.00	Pass
11n-HT20	MCS0	44	5220	-6.70	-6.37	-6.62	-6.35	98.80	-0.49	≤ 4.00	Pass
11n-HT20	MCS0	48	5240	-6.55	-6.71	-6.83	-6.56	98.80	-0.64	≤ 4.00	Pass
11n-HT40	MCS0	38	5190	-9.19	-8.80	-9.76	-9.39	96.95	-3.12	≤ 4.00	Pass
11n-HT40	MCS0	46	5230	-9.08	-9.04	-9.11	-9.24	96.95	-2.96	≤ 4.00	Pass
11ac-VHT20	MCS0	36	5180	-5.86	-5.60	-6.58	-6.23	98.80	-0.03	≤ 4.00	Pass
11ac-VHT20	MCS0	44	5220	-6.50	-6.51	-6.90	-6.70	98.80	-0.63	≤ 4.00	Pass
11ac-VHT20	MCS0	48	5240	-6.72	-6.89	-7.08	-6.96	98.80	-0.89	≤ 4.00	Pass
11ac-VHT40	MCS0	38	5190	-9.29	-8.70	-9.46	-8.83	96.98	-2.90	≤ 4.00	Pass
11ac-VHT40	MCS0	46	5230	-9.18	-9.16	-9.51	-9.20	96.98	-3.11	≤ 4.00	Pass
11ac-VHT80	MCS0	42	5210	-12.59	-12.68	-13.15	-12.96	94.67	-6.58	≤ 4.00	Pass
11ac-VHT80+80	MCS0	42	5210	-6.52	-7.26	--	--	94.67	-3.63	≤ 7.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	-6.26	-7.18	94.67	-3.45	≤ 7.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant } 0 \text{ PSD}/10)} + 10^{(\text{Ant } 1 \text{ PSD}/10)} + 10^{(\text{Ant } 2 \text{ PSD}/10)} + 10^{(\text{Ant } 3 \text{ PSD}/10)} \}$  (dBm/MHz).

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant } 0 \text{ PSD}/10)} + 10^{(\text{Ant } 1 \text{ PSD}/10)} + 10^{(\text{Ant } 2 \text{ PSD}/10)} + 10^{(\text{Ant } 3 \text{ PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant } 0 \text{ PSD}/10)} + 10^{(\text{Ant } 1 \text{ PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Ant 2 & Ant 3: Total PSD (dBm/MHz) =  $10 \cdot \log \{ 10^{(\text{Ant } 2 \text{ PSD}/10)} + 10^{(\text{Ant } 3 \text{ PSD}/10)} \}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 4: PSD Limit (dBm/MHz) = 17dBm/MHz - (16dBi + 3dBi - 6dBi) = 4.00dBm/MHz.

For 802.11ac-VHT80+80: PSD Limit (dBm/MHz) = 17dBm/MHz - (16dBi - 6dBi) = 7.00dBm/MHz.



Product	ACCESS POINT	Temperature	22°C
Test Engineer	Kevin Ker	Relative Humidity	54%
Test Site	SR2	Test Date	2017/08/27
Test Item	Power Spectral Density (UNII-Band 3)		
Antenna Type	Directional Antenna (MT-484052/NVH)		

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/100kHz)	Ant 1 PSD (dBm/100kHz)	Ant 2 PSD (dBm/100kHz)	Ant 3 PSD (dBm/100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)												
11a	6Mbps	149	5745	-5.90	-6.65	-6.68	-6.87	97.08	6.99	6.63	≤ 16.99	Pass
11a	6Mbps	157	5785	-6.23	-6.57	-6.46	-6.72	97.08	6.99	6.65	≤ 16.99	Pass
11a	6Mbps	165	5825	-5.36	-5.30	-5.69	-5.21	97.08	6.99	7.75	≤ 16.99	Pass
11n-HT20	MCS0	149	5745	-7.36	-7.56	-7.38	-7.61	98.80	6.99	5.53	≤ 16.99	Pass
11n-HT20	MCS0	157	5785	-7.04	-6.82	-7.29	-6.90	98.80	6.99	6.00	≤ 16.99	Pass
11n-HT20	MCS0	165	5825	-7.37	-7.36	-7.18	-7.08	98.80	6.99	5.76	≤ 16.99	Pass
11n-HT40	MCS0	151	5755	-10.26	-9.69	-9.95	-9.85	96.95	6.99	3.21	≤ 16.99	Pass
11n-HT40	MCS0	159	5795	-9.98	-9.59	-9.86	-9.67	96.95	6.99	3.37	≤ 16.99	Pass
11ac-VHT20	MCS0	149	5745	-7.65	-7.48	-7.61	-7.17	98.80	6.99	5.54	≤ 16.99	Pass
11ac-VHT20	MCS0	157	5785	-6.98	-7.39	-6.98	-6.64	98.80	6.99	6.02	≤ 16.99	Pass
11ac-VHT20	MCS0	165	5825	-7.31	-7.10	-7.58	-7.27	98.80	6.99	5.70	≤ 16.99	Pass
11ac-VHT40	MCS0	151	5755	-10.33	-9.95	-10.10	-10.01	96.98	6.99	3.05	≤ 16.99	Pass
11ac-VHT40	MCS0	159	5795	-10.07	-9.56	-9.86	-9.56	96.98	6.99	3.39	≤ 16.99	Pass
11ac-VHT80	MCS0	155	5775	-13.22	-13.29	-13.26	-12.85	94.67	6.99	0.10	≤ 16.99	Pass
11ac-VHT80+80	MCS0	155	5775	-11.00	-10.62	--	--	94.67	6.99	-0.57	≤ 20.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	-10.65	-10.53	94.67	6.99	-0.35	≤ 20.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor.

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Ant 2 & Ant 3: Total PSD (dBm/500kHz) =  $10 \cdot \log \{ 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} \}$  (dBm/100kHz) + Constant Factor +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 4: PSD Limit (dBm/500kHz) = 30dBm/500kHz - (19.01dBi - 6dBi) = 16.99dBm/500kHz.



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For 802.11ac-VHT80+80: PSD Limit (dBm/500kHz) = 30dBm/500kHz - (16dBi - 6dBi) = 20.00dBm/500kHz.



Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/100kHz)	Ant 1 PSD (dBm/100kHz)	Ant 2 PSD (dBm/100kHz)	Ant 3 PSD (dBm/100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)												
11n-HT20	MCS0	149	5745	-9.51	-9.29	-10.01	-9.73	98.80	6.99	3.38	≤ 17.00	Pass
11n-HT20	MCS0	157	5785	-9.98	-9.28	-9.77	-9.27	98.80	6.99	3.45	≤ 17.00	Pass
11n-HT20	MCS0	165	5825	-9.83	-9.74	-9.70	-9.60	98.80	6.99	3.29	≤ 17.00	Pass
11n-HT40	MCS0	151	5755	-12.24	-11.42	-11.81	-11.83	96.95	6.99	1.33	≤ 17.00	Pass
11n-HT40	MCS0	159	5795	-12.25	-11.65	-12.07	-11.86	96.95	6.99	1.19	≤ 17.00	Pass
11ac-VHT20	MCS0	149	5745	-9.41	-8.79	-9.52	-9.08	98.80	6.99	3.82	≤ 17.00	Pass
11ac-VHT20	MCS0	157	5785	-9.77	-9.54	-9.86	-9.46	98.80	6.99	3.36	≤ 17.00	Pass
11ac-VHT20	MCS0	165	5825	-9.81	-9.85	-10.13	-10.08	98.80	6.99	3.05	≤ 17.00	Pass
11ac-VHT40	MCS0	151	5755	-12.46	-12.46	-12.40	-12.43	96.98	6.99	0.71	≤ 17.00	Pass
11ac-VHT40	MCS0	159	5795	-12.48	-12.12	-12.41	-12.26	96.98	6.99	0.83	≤ 17.00	Pass
11ac-VHT80	MCS0	155	5775	-16.43	-15.62	-16.04	-16.19	94.67	6.99	-2.81	≤ 17.00	Pass
11ac-VHT80+80	MCS0	155	5775	-11.00	-10.62	--	--	94.67	6.99	-0.57	≤ 20.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	-10.65	-10.53	94.67	6.99	-0.35	≤ 20.00	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/500kHz) =  $10^{\log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)} + 10^{(Ant\ 2\ PSD/10)} + 10^{(Ant\ 3\ PSD/10)}\}}$  (dBm/100kHz) + Constant Factor.

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/500kHz) =  $10^{\log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)} + 10^{(Ant\ 2\ PSD/10)} + 10^{(Ant\ 3\ PSD/10)}\}}$  (dBm/100kHz) + Constant Factor +  $10^{\log (1/Duty\ Cycle)}$ .

Note 3: For 802.11ac-VHT80+80:

Ant 0 & Ant 1: Total PSD (dBm/500kHz) =  $10^{\log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)}\}}$  (dBm/100kHz) + Constant Factor +  $10^{\log (1/Duty\ Cycle)}$ .

Ant 2 & Ant 3: Total PSD (dBm/500kHz) =  $10^{\log \{10^{(Ant\ 2\ PSD/10)} + 10^{(Ant\ 3\ PSD/10)}\}}$  (dBm/100kHz) + Constant Factor +  $10^{\log (1/Duty\ Cycle)}$ .

Note 4: PSD Limit (dBm/500kHz) = 30dBm/500kHz - (16dBi + 3dBi - 6dBi) = 17.00dBm/500kHz.

For 802.11ac-VHT80+80: PSD Limit (dBm/500kHz) = 30dBm/500kHz - (16dBi - 6dBi) = 20.00dBm/500kHz.

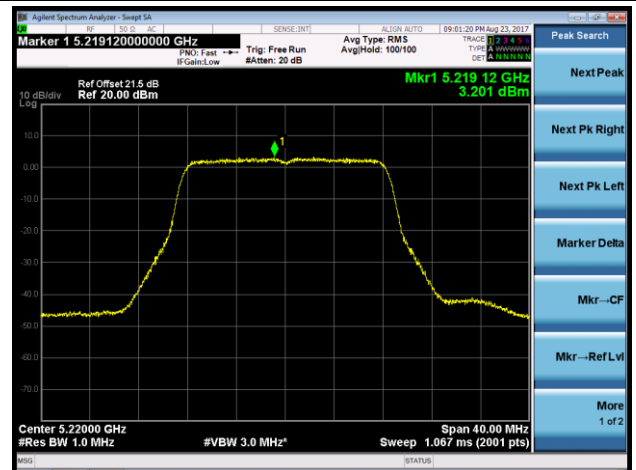
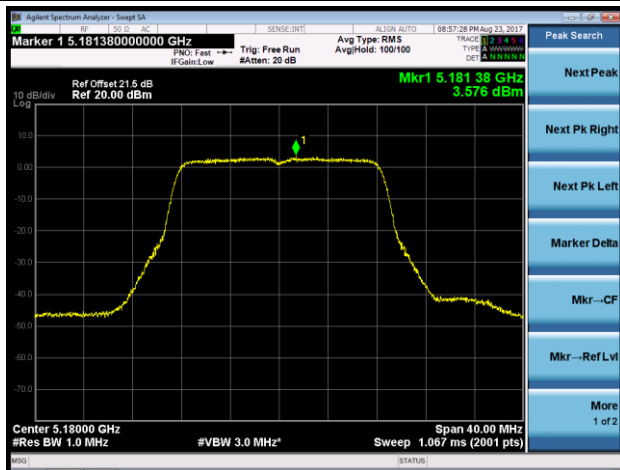




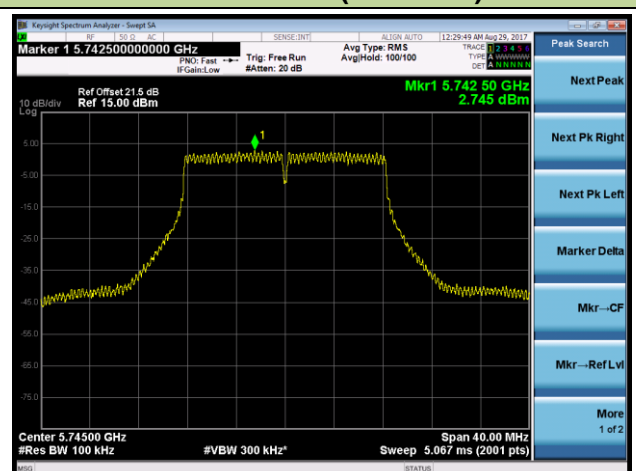
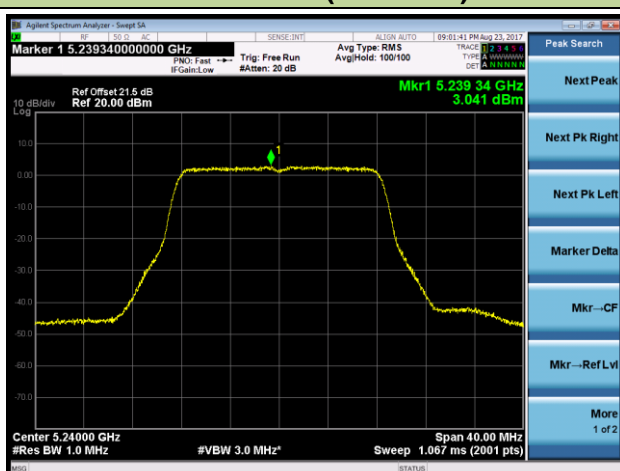
Product	ACCESS POINT	Temperature	22°C
Test Engineer	Kevin Ker	Test Date	2017/08/23
Antenna Type	Omin Antenna (ANT-2x2-5005)		

### 802.11a Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (CDD Mode)

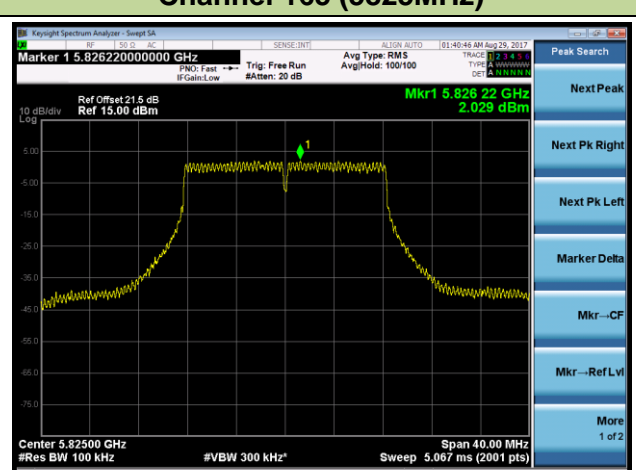
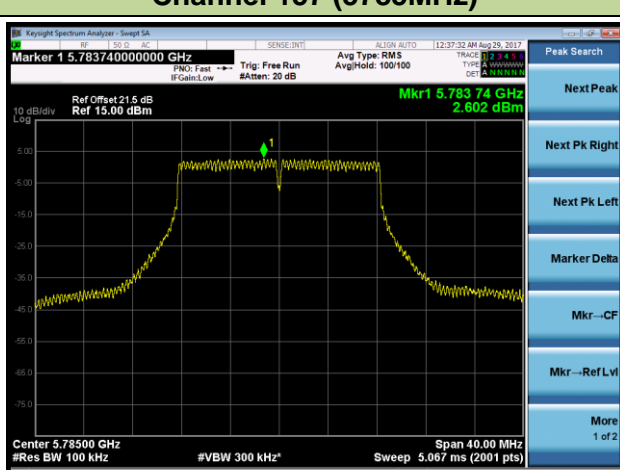
<b>Channel 36 (5180MHz)</b>	<b>Channel 44 (5220MHz)</b>
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<b>Channel 48 (5240MHz)</b>	<b>Channel 149 (5745MHz)</b>
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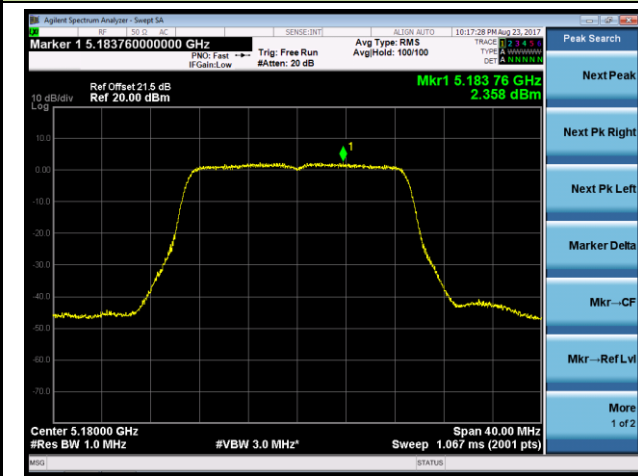


<b>Channel 157 (5785MHz)</b>	<b>Channel 165 (5825MHz)</b>
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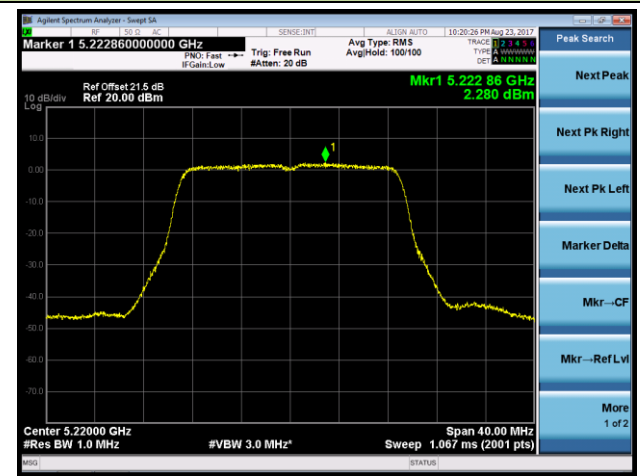


## 802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (CDD Mode)

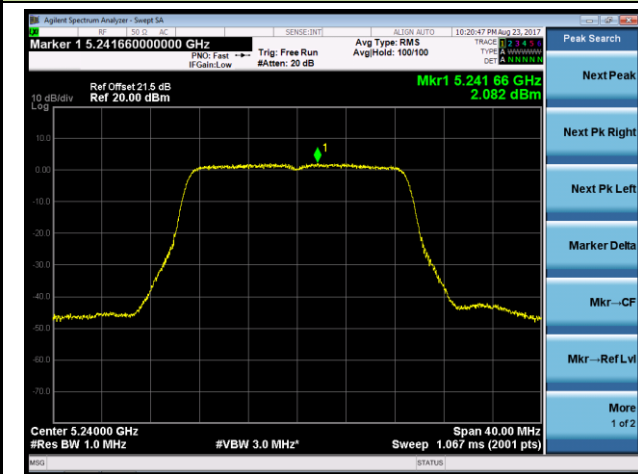
### Channel 36 (5180MHz)



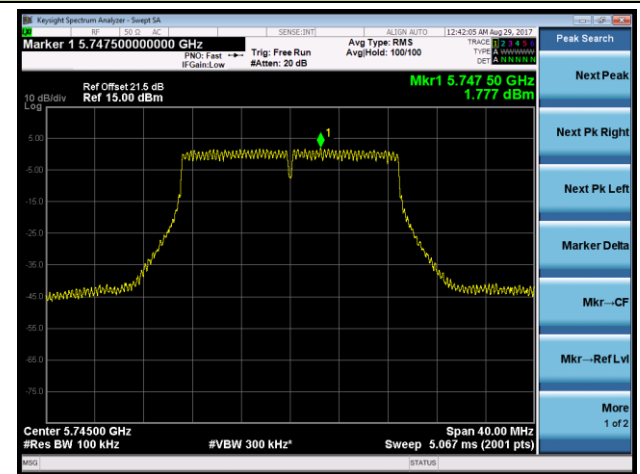
### Channel 44 (5220MHz)



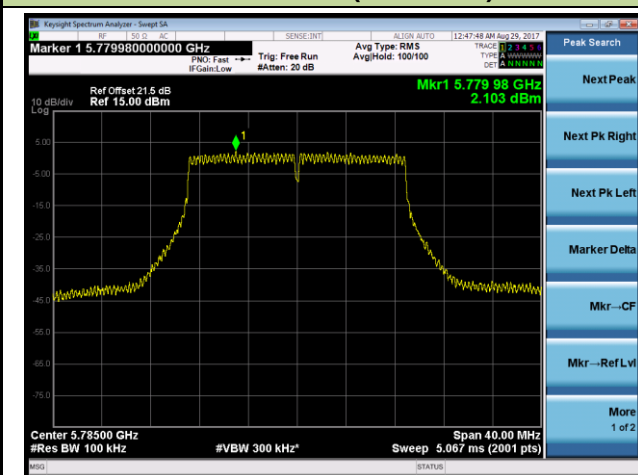
### Channel 48 (5240MHz)



### Channel 149 (5745MHz)



### Channel 157 (5785MHz)



### Channel 165 (5825MHz)

