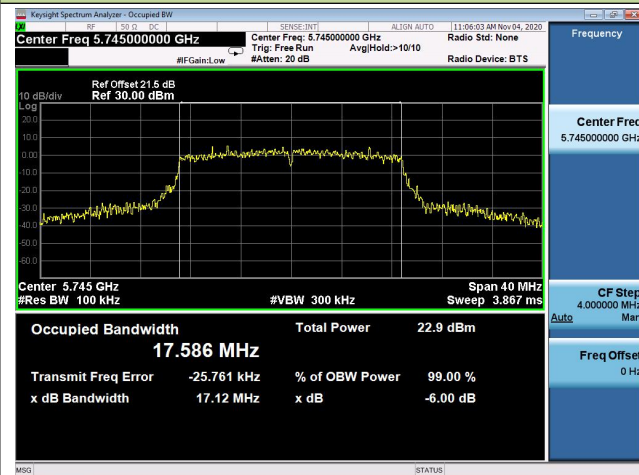


802.11n-HT20 6dB Bandwidth

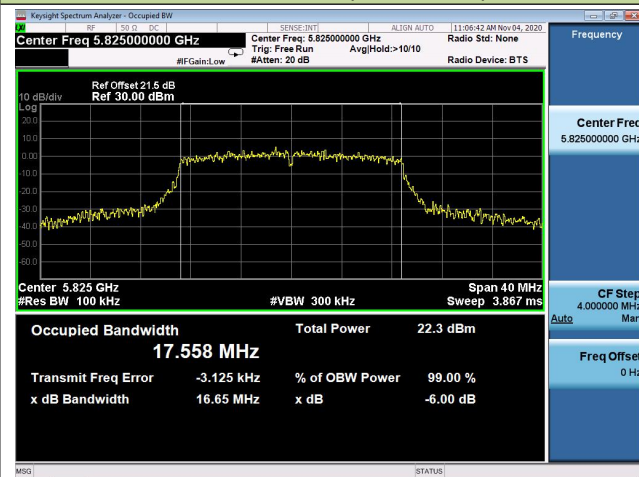
Channel 149 (5745MHz)



Channel 157 (5785MHz)

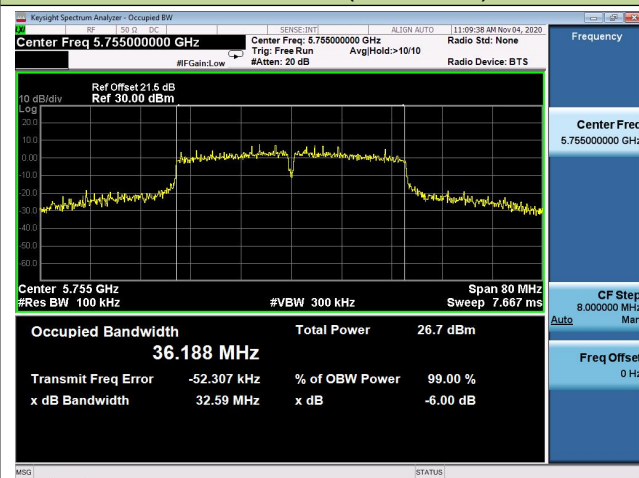


Channel 165 (5825MHz)

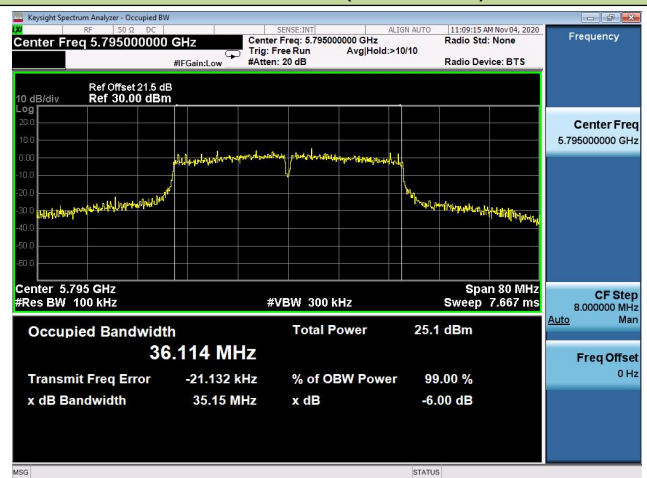


802.11n-HT40 6dB Bandwidth

Channel 151 (5755MHz)

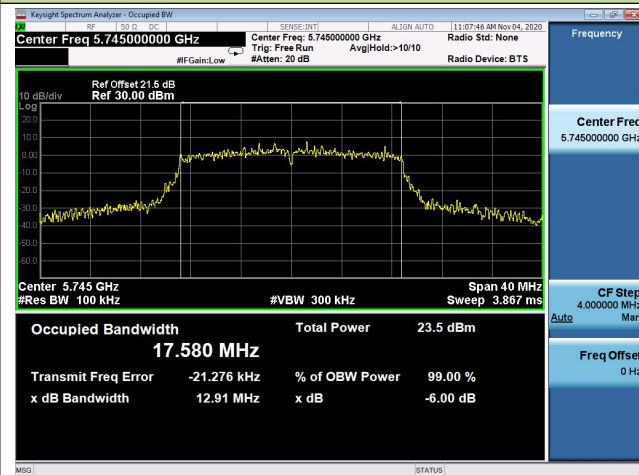


Channel 159 (5795MHz)

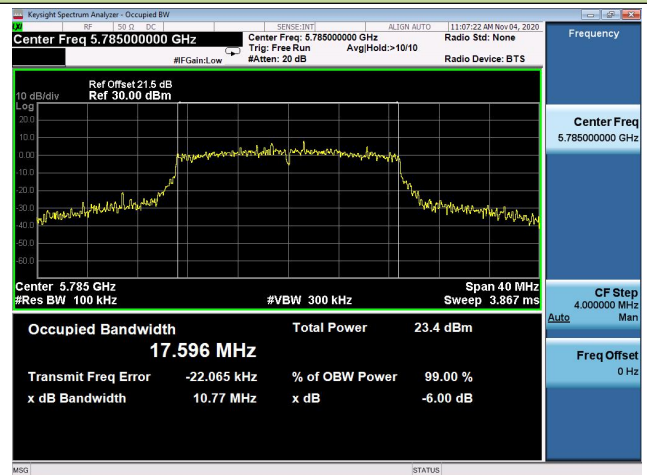


802.11ac-VHT20 6dB Bandwidth

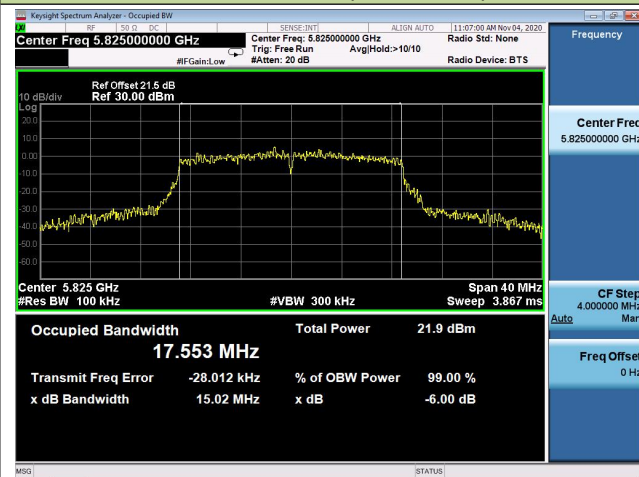
Channel 149 (5745MHz)



Channel 157 (5785MHz)

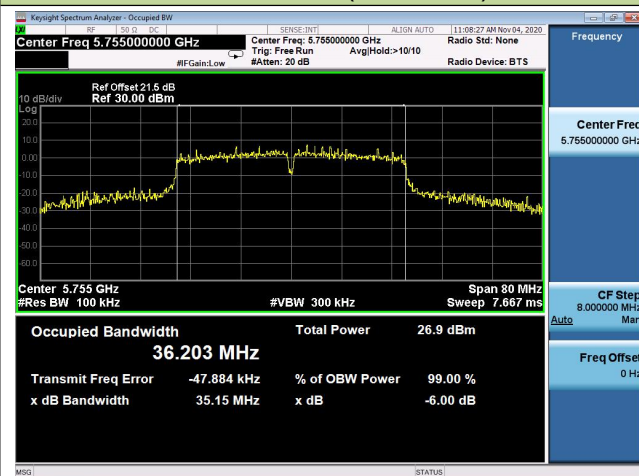


Channel 165 (5825MHz)

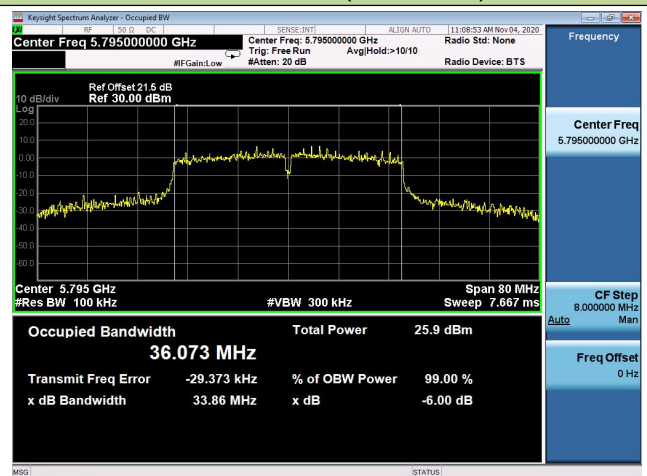


802.11ac-VHT40 6dB Bandwidth

Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT80 6dB Bandwidth

Channel 155 (5775MHz)



6.4. Output Power Measurement

6.4.1. Test Limit

For client devices in the 5.15-5.25 GHz band, 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.

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.

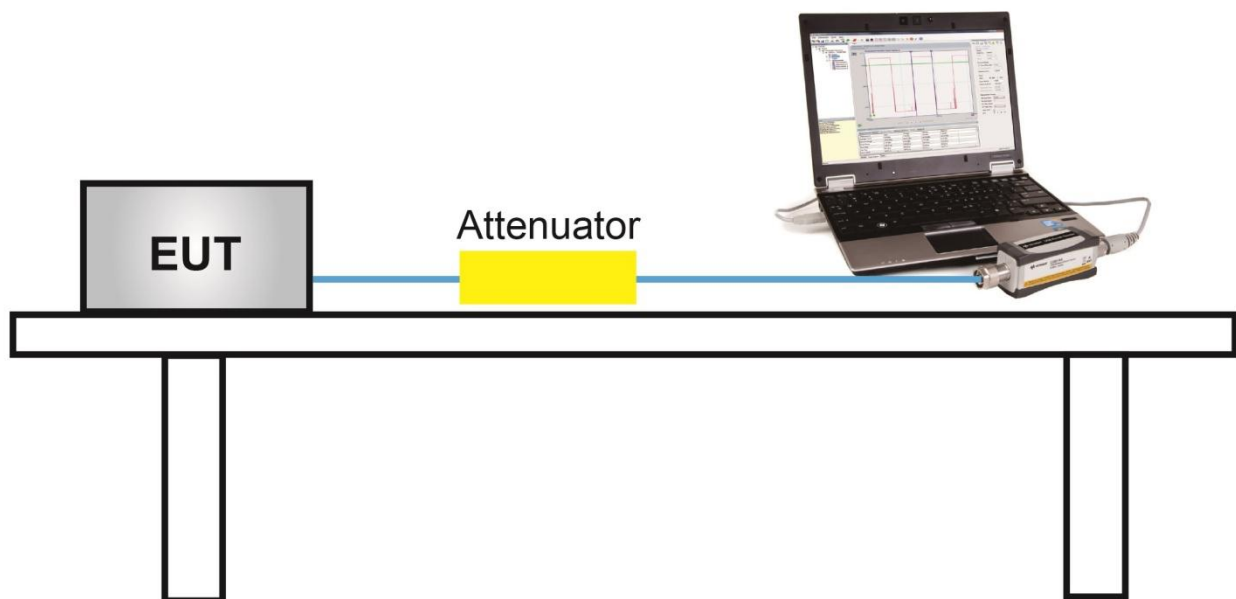
6.4.2. Test Procedure Used

KDB 789033D02v02r01- Section E)3)b) Method PM-G

6.4.3. Test Setting

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

6.4.4. Test Setup



6.4.5. TestResult

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

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

Test Mode	Bandwidth	Channel No.	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11a	20	36	5180	6Mbps	17.60
				24Mbps	16.83
				54Mbps	16.46
802.11n	20	36	5180	MCS0	18.22
				MCS4	17.84
				MCS7	17.05
802.11n	40	38	5190	MCS0	15.34
				MCS4	15.15
				MCS7	14.76
802.11ac	20	36	5180	MCS0	18.67
				MCS4	17.33
				MCS9	15.02
802.11ac	40	38	5190	MCS0	16.12
				MCS4	15.52
				MCS9	14.06
802.11ac	80	42	5210	MCS0	12.14
				MCS4	11.61
				MCS9	10.84

Product	MESH AP Product	Test Engineer	Selina Zhang
Test Site	NS-SR2	Test Date	2020/11/02

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Average Power (dBm)	Limit (dBm)	Result
				Ant 0	Ant 1			
802.11a	6Mbps	36	5180	17.60	17.20	20.41	≤ 30.00	Pass
802.11a	6Mbps	44	5220	17.03	16.79	19.92	≤ 30.00	Pass
802.11a	6Mbps	48	5240	18.16	17.67	20.93	≤ 30.00	Pass
802.11a	6Mbps	149	5745	19.67	20.43	23.08	≤ 30.00	Pass
802.11a	6Mbps	157	5785	16.67	17.59	20.16	≤ 30.00	Pass
802.11a	6Mbps	165	5825	14.05	15.17	17.66	≤ 30.00	Pass
802.11n-HT20	MCS0	36	5180	18.22	18.02	21.13	≤ 30.00	Pass
802.11n-HT20	MCS0	44	5220	18.19	17.96	21.09	≤ 30.00	Pass
802.11n-HT20	MCS0	48	5240	18.78	18.42	21.61	≤ 30.00	Pass
802.11n-HT20	MCS0	149	5745	15.91	16.84	19.41	≤ 30.00	Pass
802.11n-HT20	MCS0	157	5785	15.87	16.80	19.37	≤ 30.00	Pass
802.11n-HT20	MCS0	165	5825	15.47	16.21	18.87	≤ 30.00	Pass
802.11n-HT40	MCS0	38	5190	15.34	14.95	18.16	≤ 30.00	Pass
802.11n-HT40	MCS0	46	5230	18.72	18.36	21.55	≤ 30.00	Pass
802.11n-HT40	MCS0	151	5755	18.86	19.75	22.34	≤ 30.00	Pass
802.11n-HT40	MCS0	159	5795	17.64	18.29	20.99	≤ 30.00	Pass
802.11ac-VHT20	MCS0	36	5180	18.67	18.15	21.43	≤ 30.00	Pass
802.11ac-VHT20	MCS0	44	5220	18.15	17.82	21.00	≤ 30.00	Pass
802.11ac-VHT20	MCS0	48	5240	18.10	18.70	21.42	≤ 30.00	Pass
802.11ac-VHT20	MCS0	149	5745	16.42	17.30	19.89	≤ 30.00	Pass
802.11ac-VHT20	MCS0	157	5785	16.39	17.23	19.84	≤ 30.00	Pass
802.11ac-VHT20	MCS0	165	5825	14.78	15.76	18.31	≤ 30.00	Pass
802.11ac-VHT40	MCS0	38	5190	16.12	15.65	18.90	≤ 30.00	Pass
802.11ac-VHT40	MCS0	46	5230	19.52	19.17	22.36	≤ 30.00	Pass
802.11ac-VHT40	MCS0	151	5755	18.72	19.55	22.17	≤ 30.00	Pass
802.11ac-VHT40	MCS0	159	5795	17.92	18.59	21.28	≤ 30.00	Pass
802.11ac-VHT80	MCS0	42	5210	12.14	11.48	14.83	≤ 30.00	Pass
802.11ac-VHT80	MCS0	155	5775	18.01	18.99	21.54	≤ 30.00	Pass

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

6.5. Transmit Power Control

6.5.1. Test Limit

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

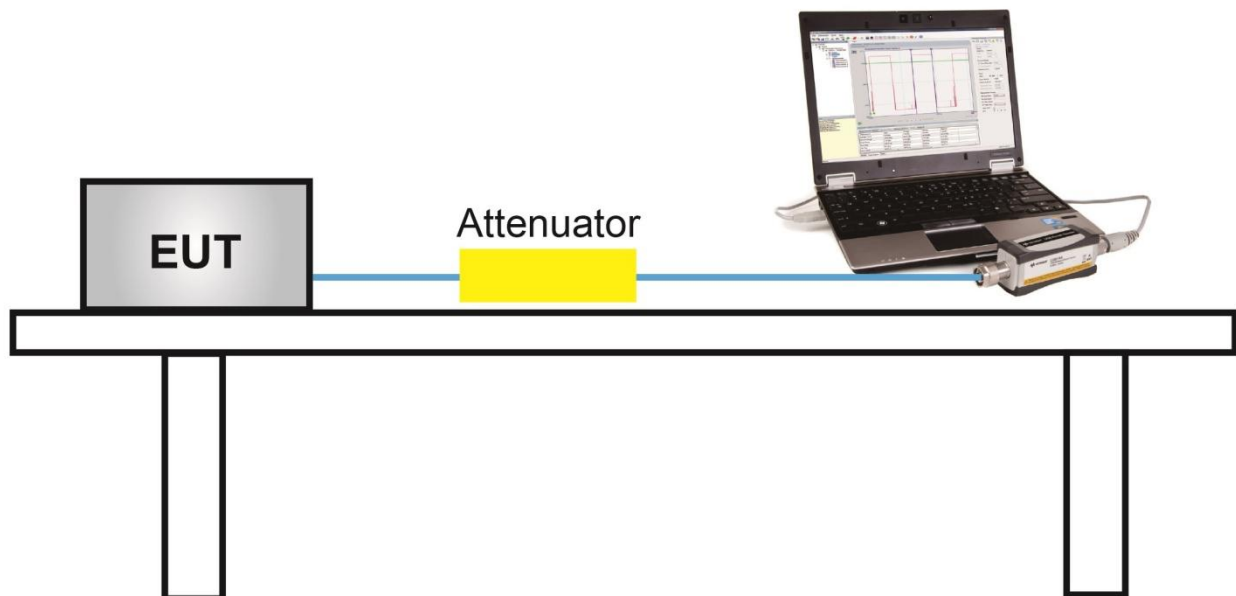
6.5.2. Test Procedure Used

ANSI C63.10-2013- Section 12.3.3.2 Method PM-G

6.5.3. Test Setting

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

6.5.4. Test Setup



6.5.5. TestResult

A TPC mechanism is not required for U-NII devices operating in the 5.15-5.25 GHz band and the 5.745-5.825 GHz band.

6.6. Power Spectral Density Measurement

6.6.1. TestLimit

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

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

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

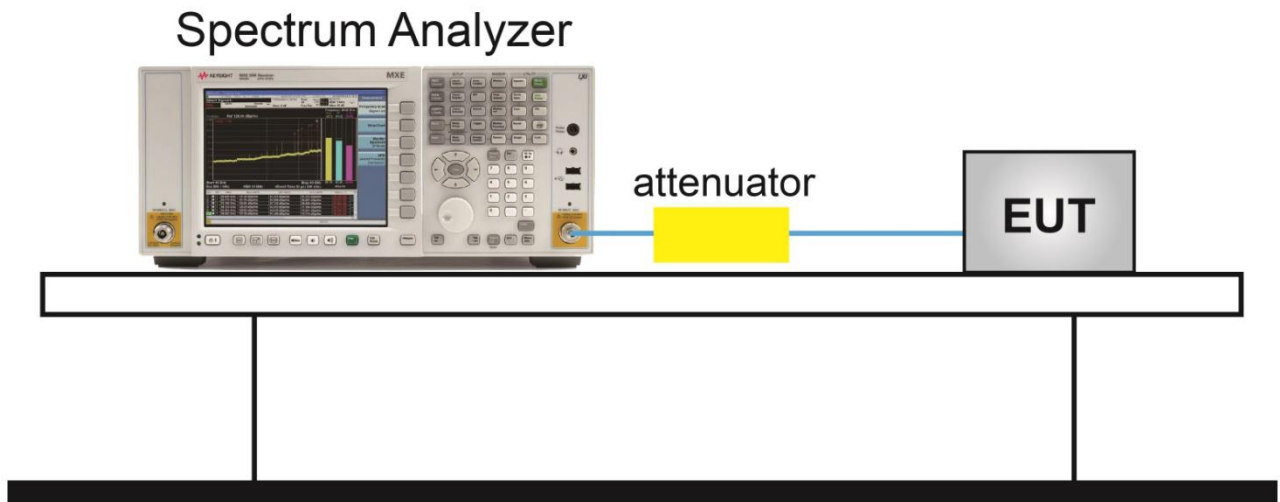
6.6.2. Test Procedure Used

KDB 789033 D02v02r01 - Section F

6.6.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz
If measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 510kHz
4. VBW = 3MHz
5. Number of sweep points $\geq 2 \times (\text{span} / \text{RBW})$
6. Detector = Power averaging (Average)
7. Trace average at least 100 traces in power averaging (rms) mode
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 $10 \cdot \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \cdot \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.

6.6.4. Test Setup



6.6.5. Test Result

Product	MESH AP Product	Test Engineer	Selina Zhang
Test Site	NS-SR2	Test Date	2020/11/04
Test Item	Power Spectral Density (UNII-Band 1)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)		Duty Cycle (%)	Final PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
				Ant 0	Ant 1				
11a	6Mbps	36	5180	7.94	7.27	95.61	10.82	≤15.79	Pass
11a	6Mbps	44	5220	7.32	6.79	95.61	10.27	≤15.79	Pass
11a	6Mbps	48	5240	8.25	7.66	95.61	11.17	≤15.79	Pass
11n-HT20	MCS0	36	5180	8.82	7.69	94.90	11.53	≤15.79	Pass
11n-HT20	MCS0	44	5220	8.48	8.03	94.90	11.50	≤15.79	Pass
11n-HT20	MCS0	48	5240	9.05	8.59	94.90	12.06	≤15.79	Pass
11n-HT40	MCS0	38	5190	2.40	2.13	89.69	5.75	≤15.79	Pass
11n-HT40	MCS0	46	5230	5.94	5.55	89.69	9.23	≤15.79	Pass
11ac-VHT20	MCS0	36	5180	8.75	8.16	89.59	11.95	≤15.79	Pass
11ac-VHT20	MCS0	44	5220	8.12	7.80	89.59	11.45	≤15.79	Pass
11ac-VHT20	MCS0	48	5240	8.81	8.42	89.59	12.11	≤15.79	Pass
11ac-VHT40	MCS0	38	5190	3.35	2.67	84.82	6.75	≤15.79	Pass
11ac-VHT40	MCS0	46	5230	6.79	6.14	84.82	10.20	≤15.79	Pass
11ac-VHT80	MCS0	42	5210	-4.19	-5.26	75.51	-0.46	≤15.79	Pass

Note 1:

When EUT duty cycle > 98%, Final PSD (dBm / MHz) = $10 \cdot \log \{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\}$.

When EUT duty cycle < 98%, Final PSD (dBm / MHz) = $10 \cdot \log \{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\} + 10 \cdot \log(1/Duty\ cycle)$.

Note 2: PSD Limit Calculation as below:

For 5150-5250MHz: PSD Limit = 17 - (7.21 - 6) = 15.79dBm/MHz;

Product	MESH AP Product	Test Engineer	Selina Zhang
Test Site	NS-SR2	Test Date	2020/11/04
Test Item	Power Spectral Density (UNII-Band 3)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PSD(dBm/ 500kHz)		Duty Cycle (%)	Final PSD(dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
				Ant 0	Ant 1				
11a	6Mbps	149	5745	0.28	1.70	95.61	11.24	≤28.79	Pass
11a	6Mbps	157	5785	-2.52	-1.53	95.61	8.20	≤28.79	Pass
11a	6Mbps	165	5825	-5.08	-3.91	95.61	5.74	≤28.79	Pass
11n-HT20	MCS0	149	5745	-3.17	-2.01	94.90	7.68	≤28.79	Pass
11n-HT20	MCS0	157	5785	-3.25	-2.18	94.90	7.55	≤28.79	Pass
11n-HT20	MCS0	165	5825	-3.88	-2.63	94.90	7.02	≤28.79	Pass
11n-HT40	MCS0	151	5755	-3.35	-2.28	89.69	7.69	≤28.79	Pass
11n-HT40	MCS0	159	5795	-4.81	-2.77	89.69	6.80	≤28.79	Pass
11ac-VHT20	MCS0	149	5745	-2.75	-1.91	89.59	8.17	≤28.79	Pass
11ac-VHT20	MCS0	157	5785	-2.42	-0.98	89.59	8.83	≤28.79	Pass
11ac-VHT20	MCS0	165	5825	-4.32	-3.06	89.59	6.83	≤28.79	Pass
11ac-VHT40	MCS0	151	5755	-3.16	-3.06	84.82	7.61	≤28.79	Pass
11ac-VHT40	MCS0	159	5795	-3.99	-2.90	84.82	7.30	≤28.79	Pass
11ac-VHT80	MCS0	155	5775	-5.91	-4.63	75.51	6.00	≤28.79	Pass

Note 1:

When EUT duty cycle > 98%, Final PSD (dBm / 510kHz) = $10 \cdot \log\{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\}$.

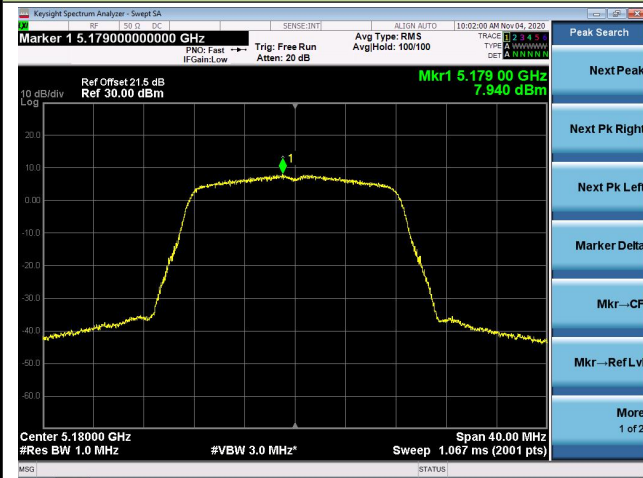
When EUT duty cycle < 98%, Final PSD (dBm / 510kHz) = $10 \cdot \log\{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\} + 10 \cdot \log(1/Duty\ cycle)$.

Note 2: PSD Limit Calculation as below:

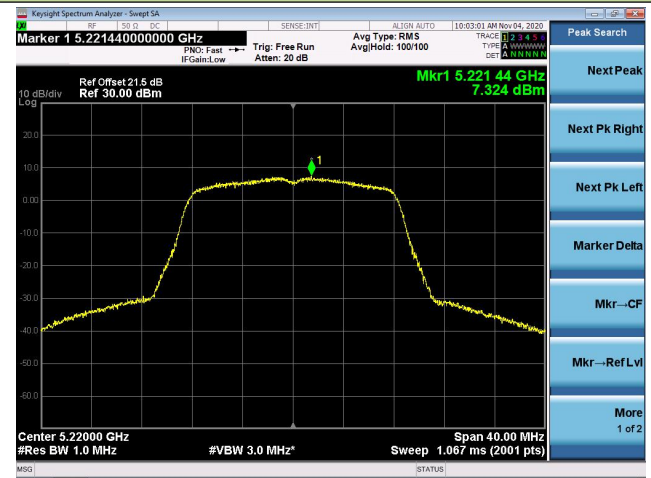
For 5725-5850MHz: PSD Limit = 30 - (7.21 - 6) = 28.79dBm/500KHz;

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

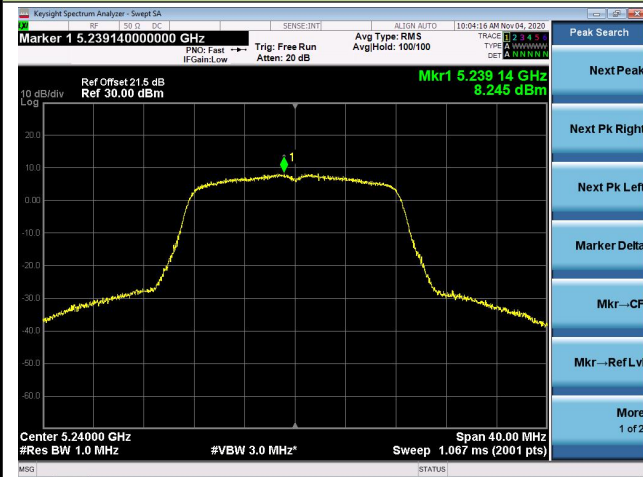
Channel 36 (5180MHz)



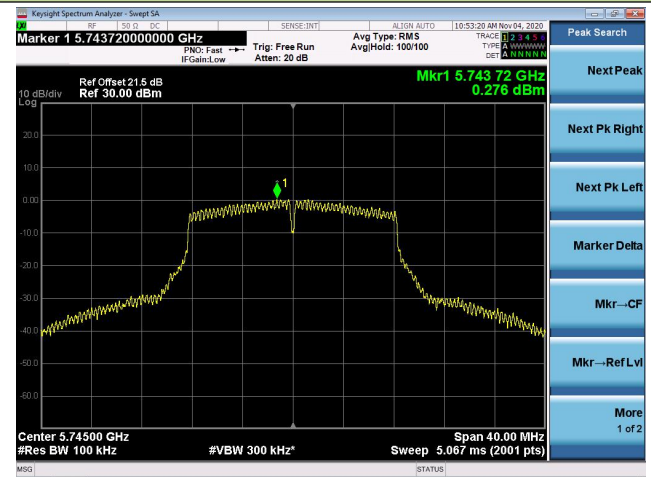
Channel 44 (5220MHz)



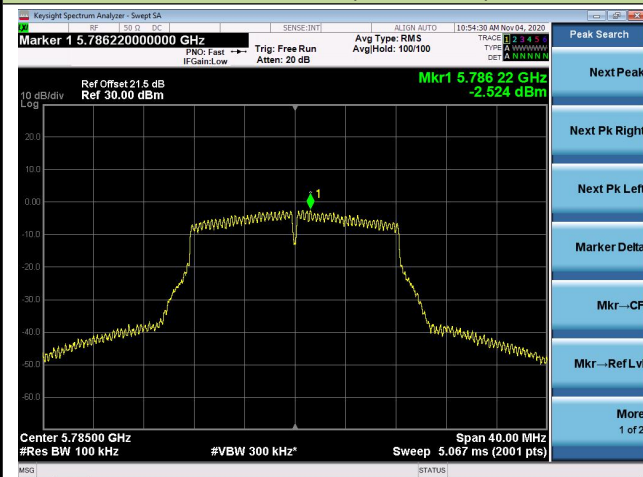
Channel 48 (5240MHz)



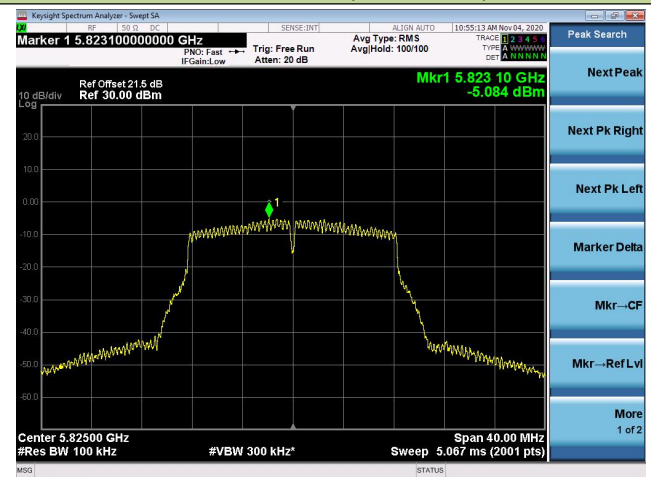
Channel 149 (5745MHz)



Channel 157 (5785MHz)

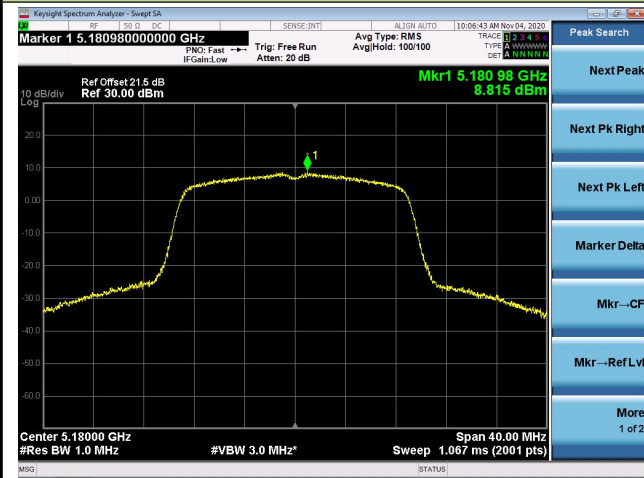


Channel 165 (5825MHz)

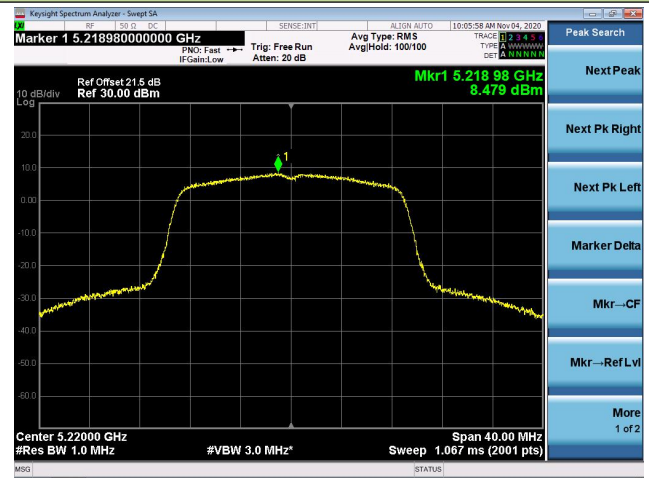


802.11n-HT20 Power Spectral Density- Ant 0 / Ant 0 + 1

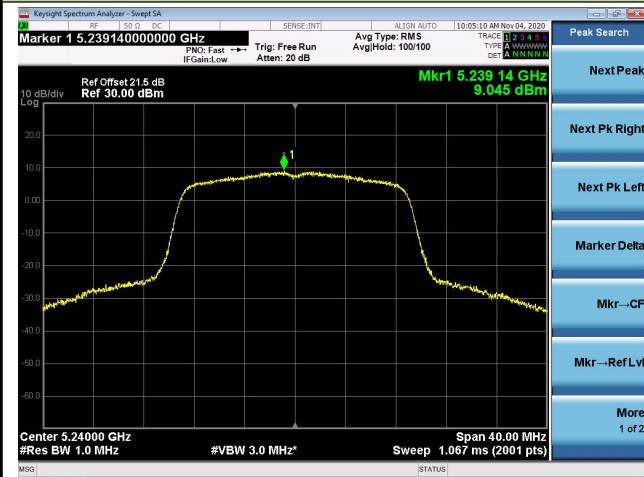
Channel 36 (5180MHz)



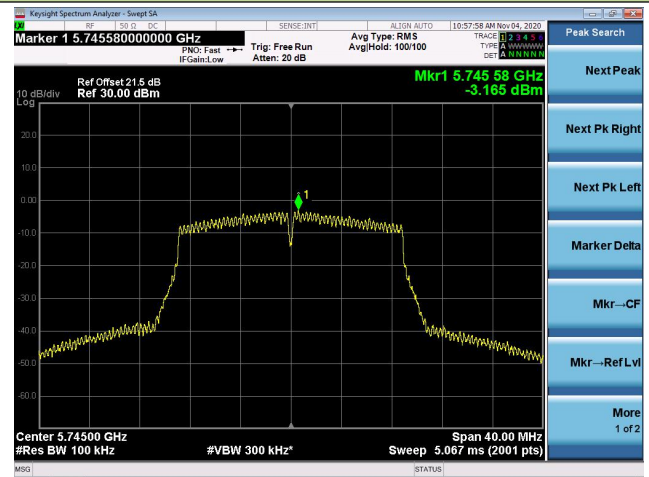
Channel 44 (5220MHz)



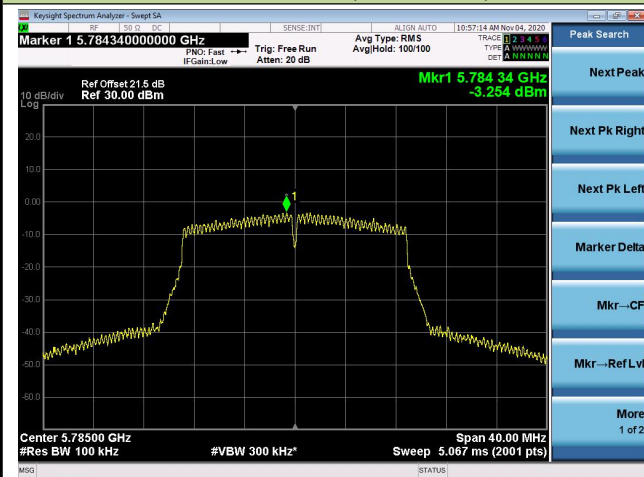
Channel 48 (5240MHz)



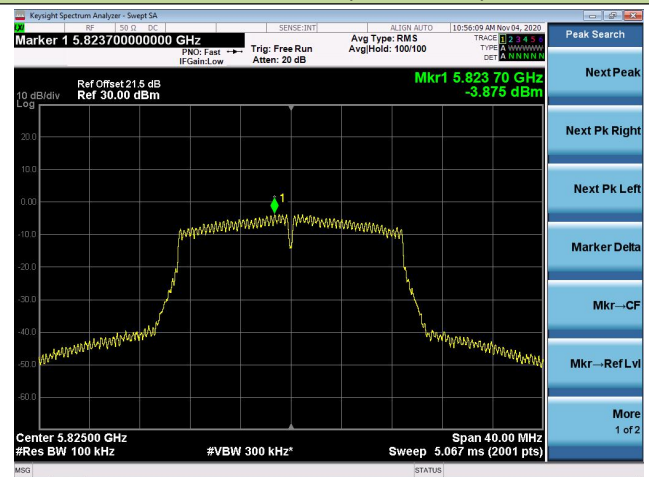
Channel 149 (5745MHz)



Channel 157 (5785MHz)

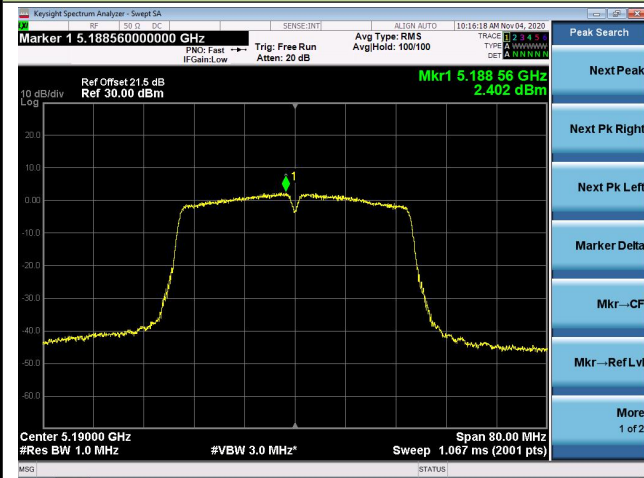


Channel 165 (5825MHz)



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

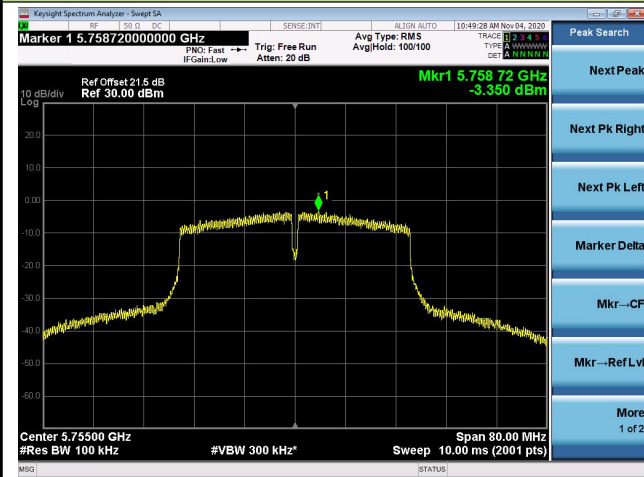
Channel 38 (5190MHz)



Channel 46 (5230MHz)



Channel 151 (5755MHz)

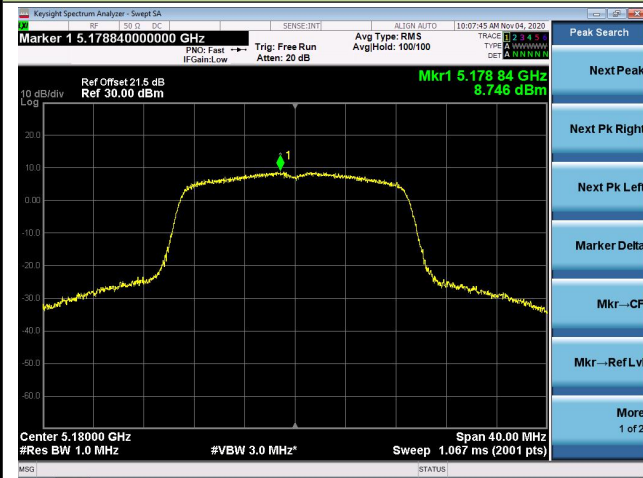


Channel 159 (5795MHz)

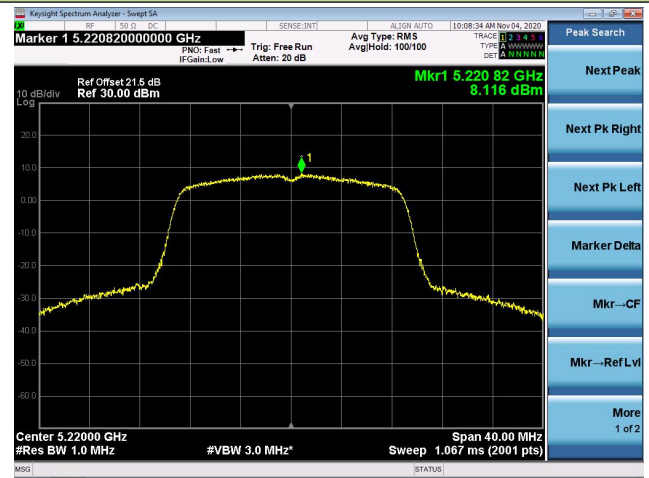


802.11ac-VHT20 Power Spectral Density- Ant 0 / Ant 0 + 1

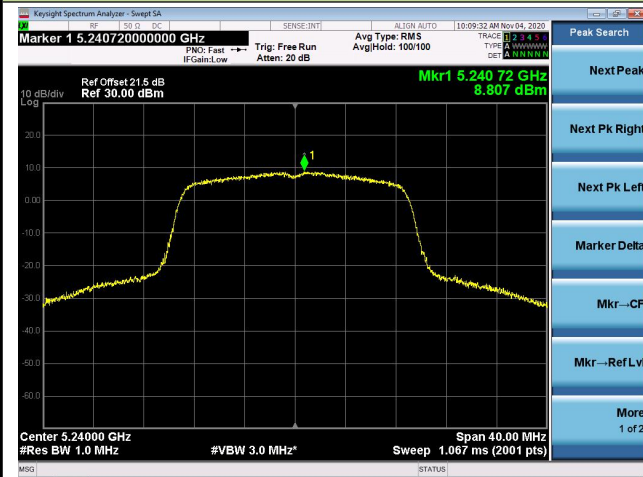
Channel 36 (5180MHz)



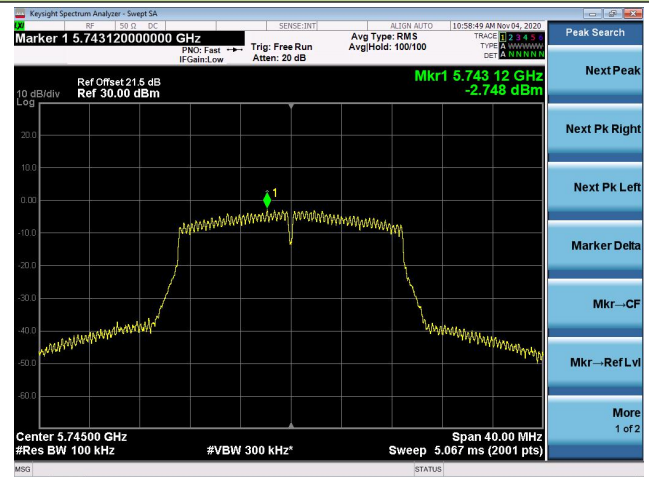
Channel 44 (5220MHz)



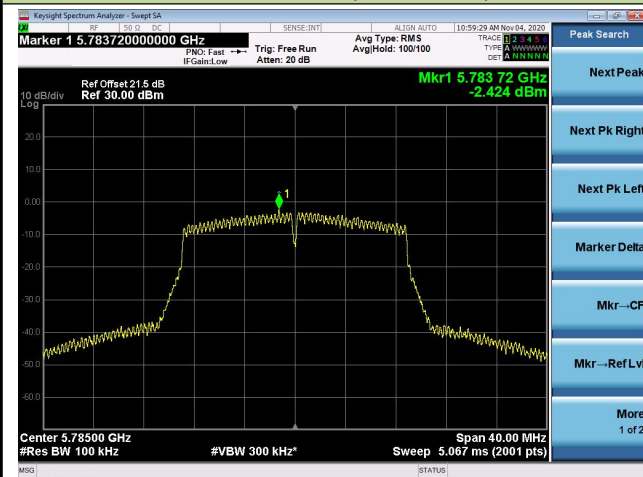
Channel 48 (5240MHz)



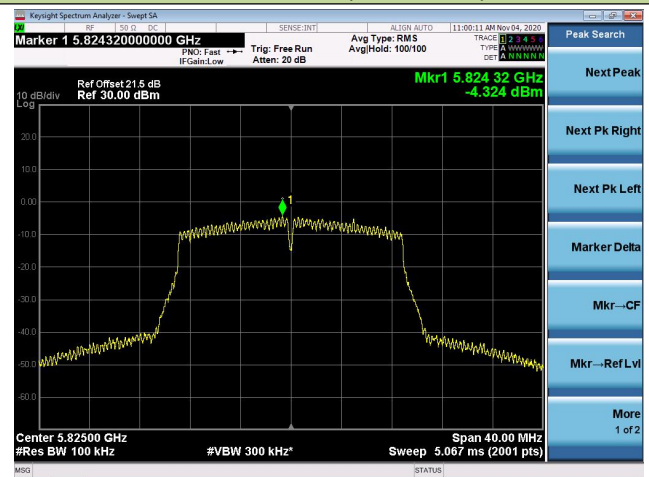
Channel 149 (5745MHz)



Channel 157 (5785MHz)

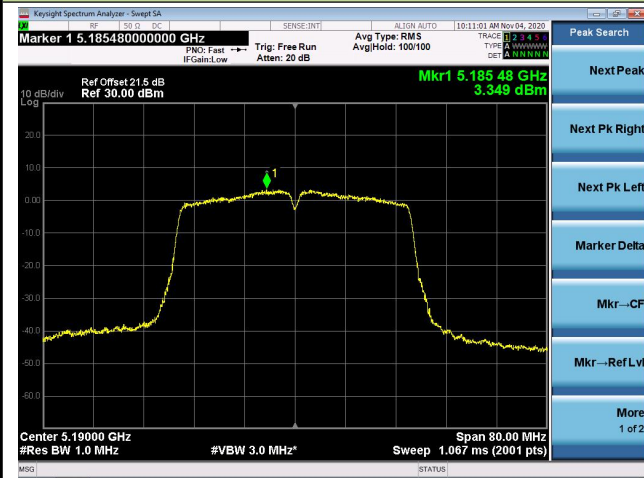


Channel 165 (5825MHz)

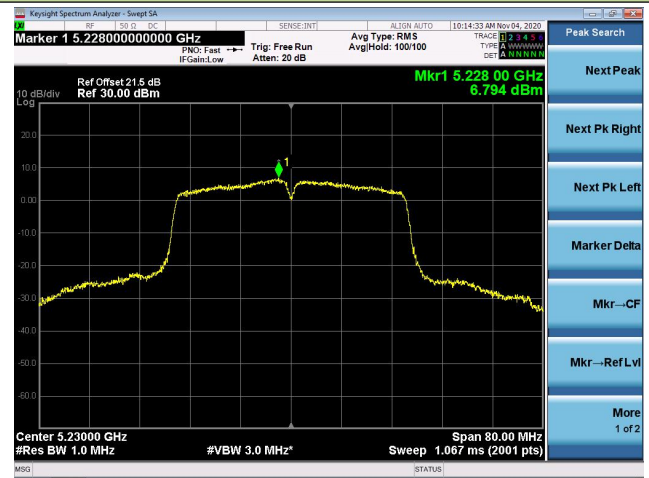


802.11ac-VHT40 Power Spectral Density- Ant 0 / Ant 0 + 1

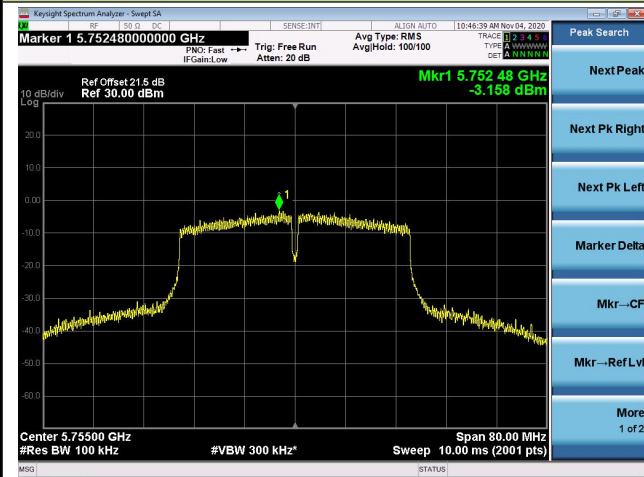
Channel 38 (5190MHz)



Channel 46 (5230MHz)



Channel 151 (5755MHz)

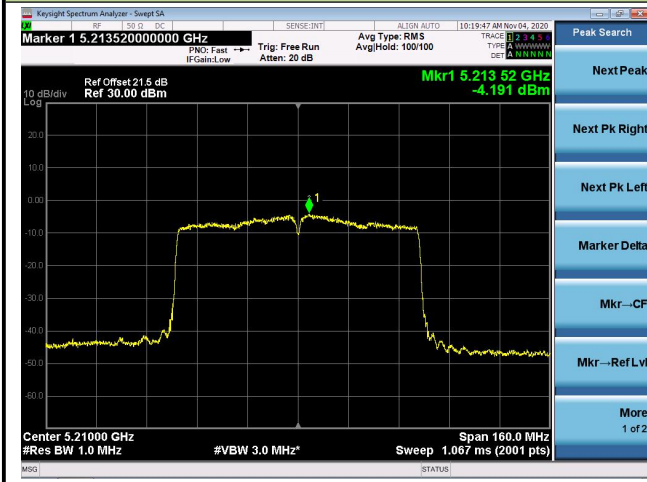


Channel 159 (5795MHz)



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

Channel 42 (5210MHz)



Channel 155 (5775MHz)

