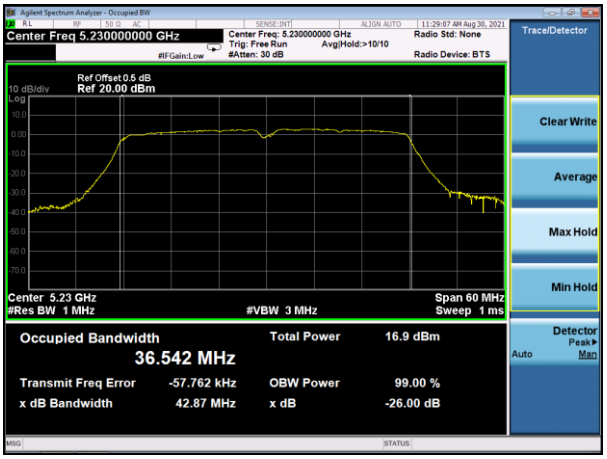
Test plot

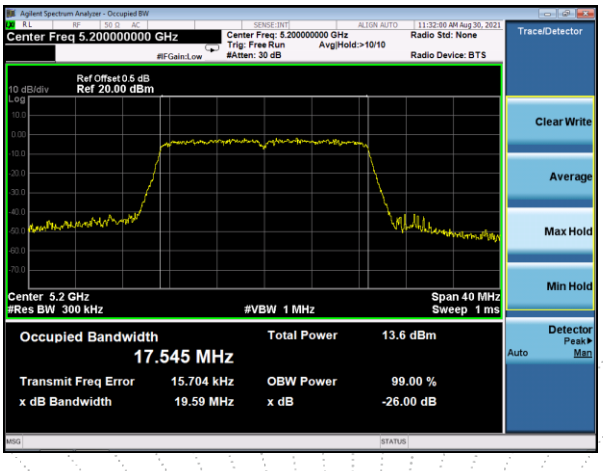
(802.11 n40) 26dB&99%Bandwidth plot on channel 38

(802.11 AC20) 26dB&99%Bandwidth plot on channel 36

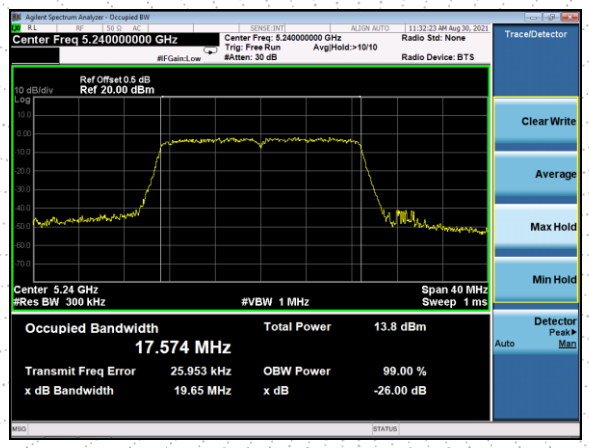
(802.11 n40) 26dB&99%Bandwidth plot on channel 46



(802.11 AC20) 26dB&99%Bandwidth plot on channel 40

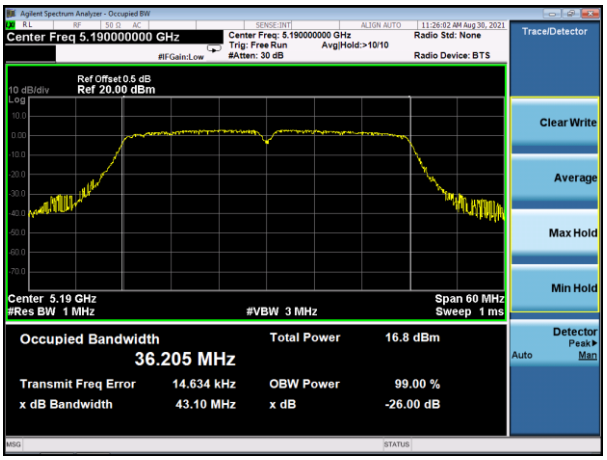


(802.11 AC20) 26dB&99%Bandwidth plot on channel 40

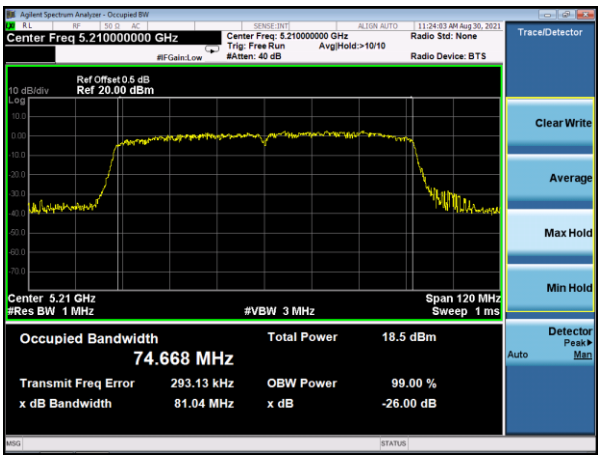


Test plot

(802.11 AC40) 26dB&99%Bandwidth plot on channel 38



(802.11 AC80) 26dB&99%Bandwidth plot on channel 42



(802.11 AC40) 26dB&99%Bandwidth plot on channel 46

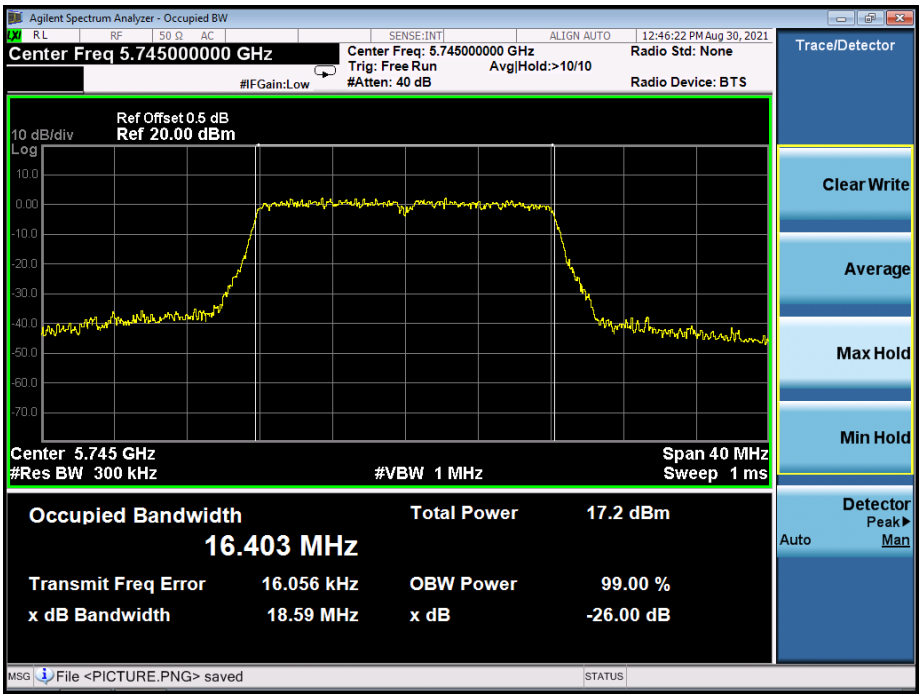
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V/60Hz
Test Mode ：	TX Frequency U-NII-3(5745-5825MHz)		

Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A Plot.

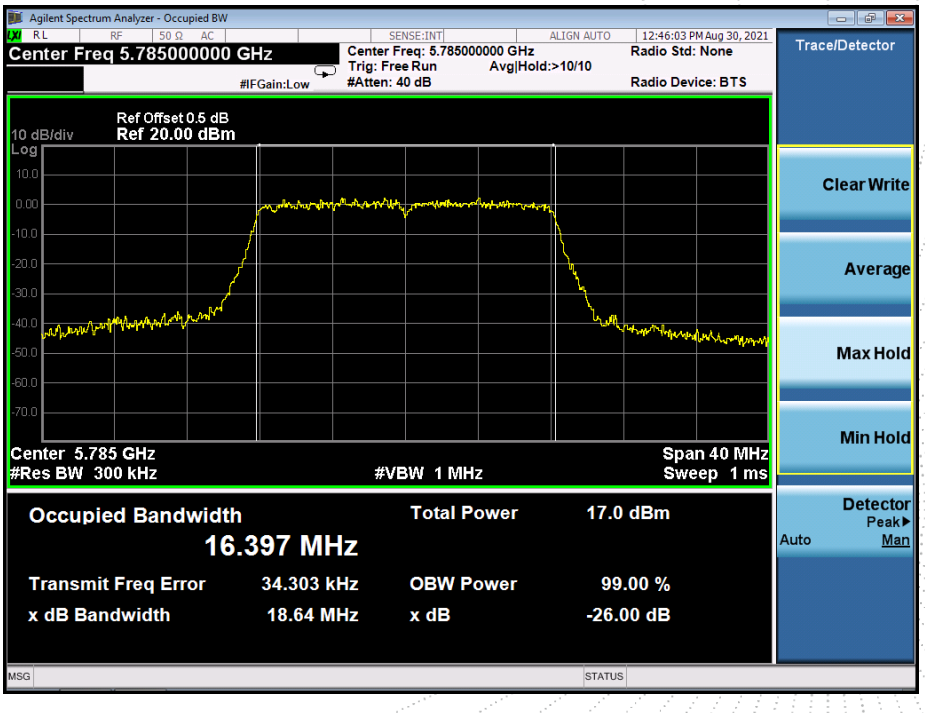
Mode	Channel	Frequency (MHz)	99% bandwidth (MHz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT A	ANT A		
802.11a	CH149	5745	16.403	16.03	≥500	Pass
	CH157	5785	16.397	16.36	≥500	Pass
	CH165	5825	16.389	16.37	≥500	Pass
802.11 n20	CH149	5745	17.573	17.55	≥500	Pass
	CH157	5785	17.554	16.98	≥500	Pass
	CH165	5825	17.583	16.92	≥500	Pass
802.11 n40	CH151	5755	36.202	35.50	≥500	Pass
	CH159	5795	36.227	35.17	≥500	Pass
802.11 ac20	CH149	5745	17.603	17.58	≥500	Pass
	CH157	5785	17.579	17.56	≥500	Pass
	CH165	5825	17.567	17.57	≥500	Pass
802.11 ac40	CH151	5755	36.264	33.85	≥500	Pass
	CH159	5795	36.271	35.21	≥500	Pass
802.11 AC80	CH155	5775	74.860	75.21	≥500	Pass

Mode	Channel	Frequency (MHz)	99% bandwidth (MHz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT B	ANT B		
802.11a	CH149	5745	16.412	16.31	≥500	Pass
	CH157	5785	16.407	16.37	≥500	Pass
	CH165	5825	16.402	16.37	≥500	Pass
802.11 n20	CH149	5745	17.560	17.60	≥500	Pass
	CH157	5785	17.586	17.66	≥500	Pass
	CH165	5825	17.572	17.53	≥500	Pass
802.11 n40	CH151	5755	36.436	35.13	≥500	Pass
	CH159	5795	36.348	35.40	≥500	Pass
802.11 ac20	CH149	5745	17.563	17.55	≥500	Pass
	CH157	5785	17.567	17.54	≥500	Pass
	CH165	5825	17.556	17.23	≥500	Pass
802.11 ac40	CH151	5755	36.156	34.98	≥500	Pass
	CH159	5795	36.152	35.22	≥500	Pass
802.11 AC80	CH155	5775	74.776	74.01	≥500	Pass

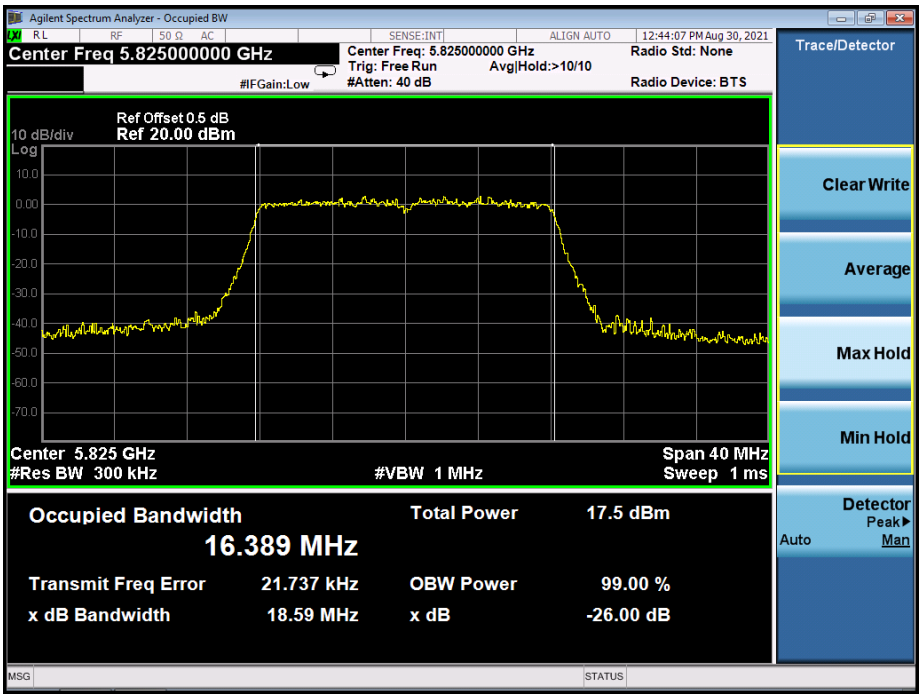
802.11a 5745MHz 99% bandwidth



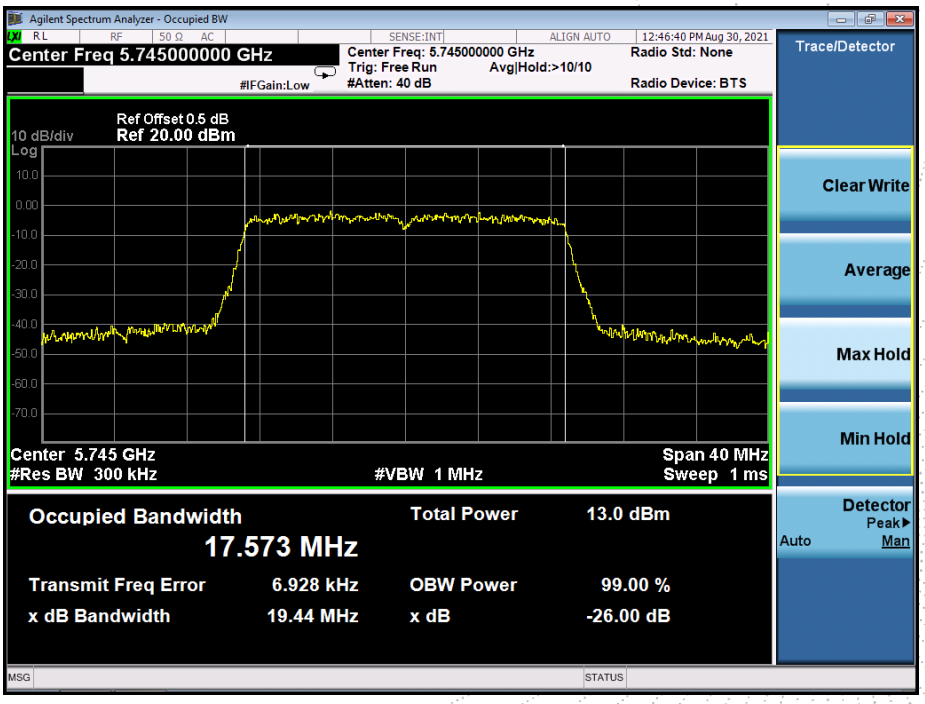
802.11a 5785MHz 99% bandwidth



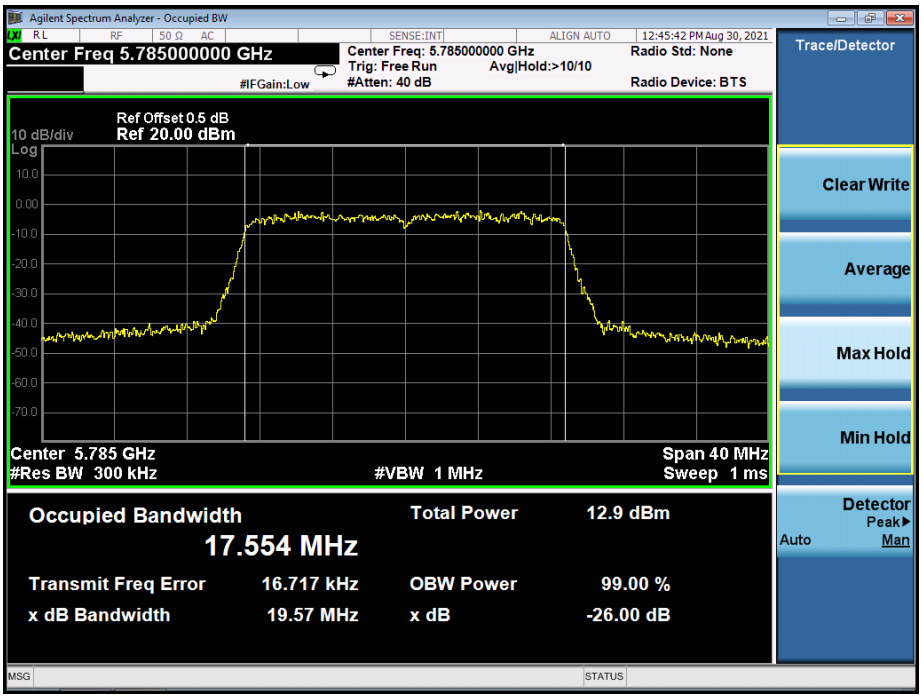
802.11a 5825MHz 99% bandwidth



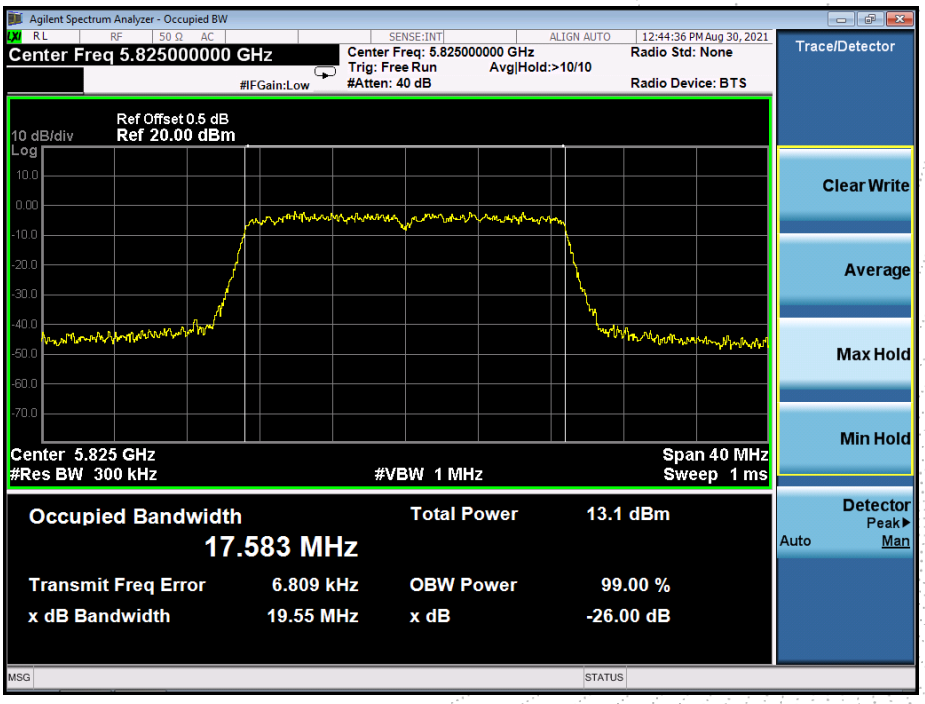
802.11n20 5745MHz 99% bandwidth



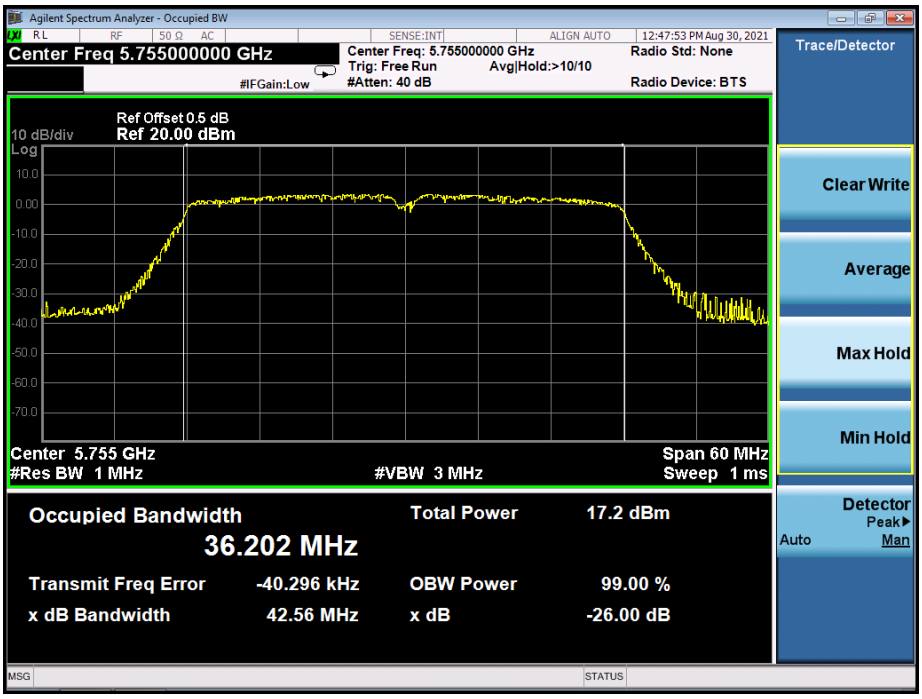
802.11n20 5785MHz 99% bandwidth



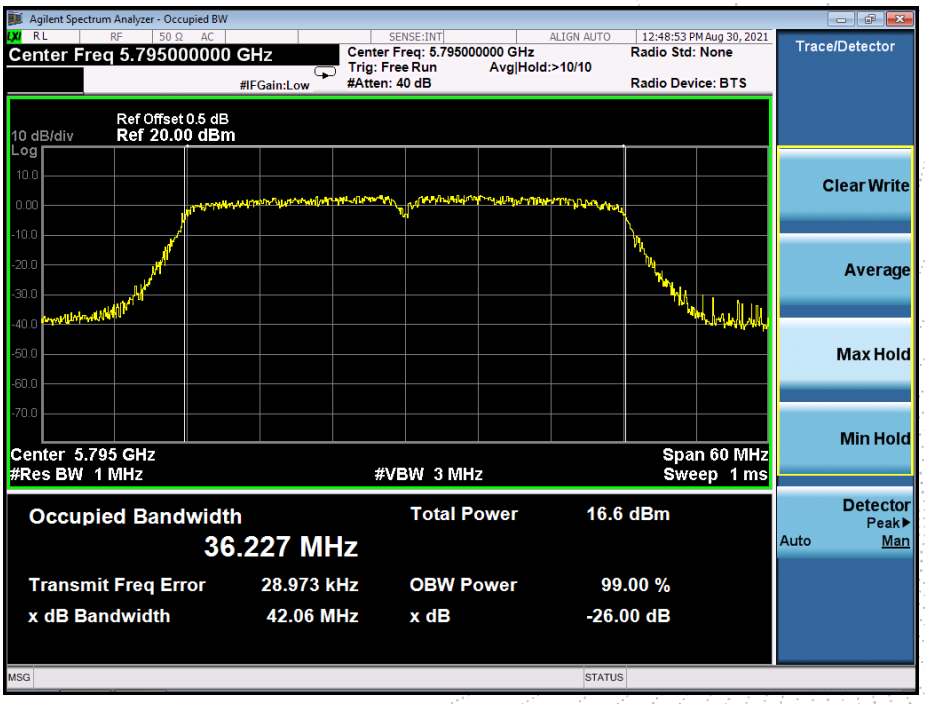
802.11n20 5825MHz 99% bandwidth



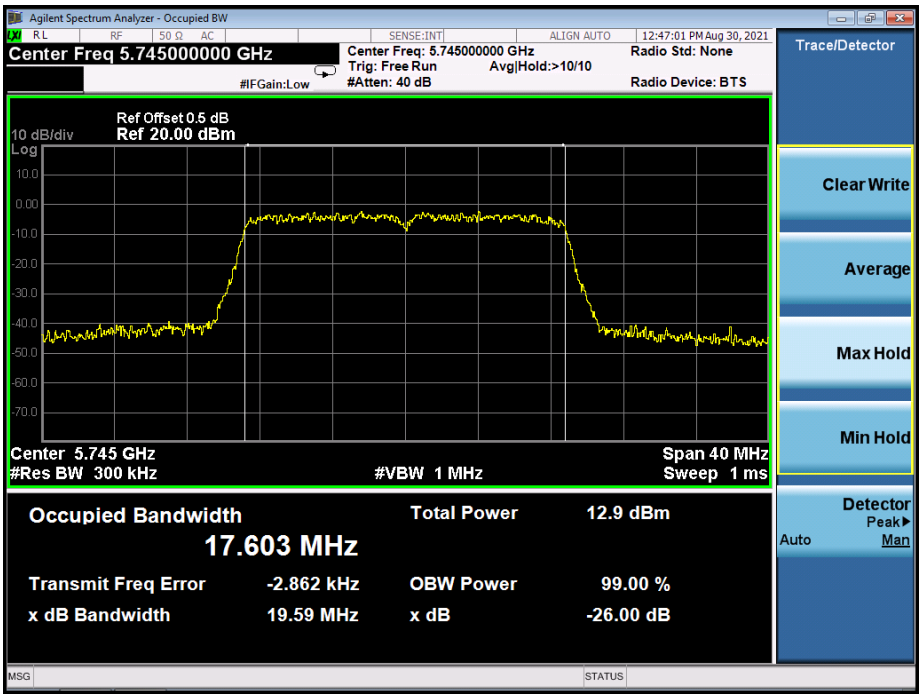
802.11 n40 5755MHz 99% bandwidth



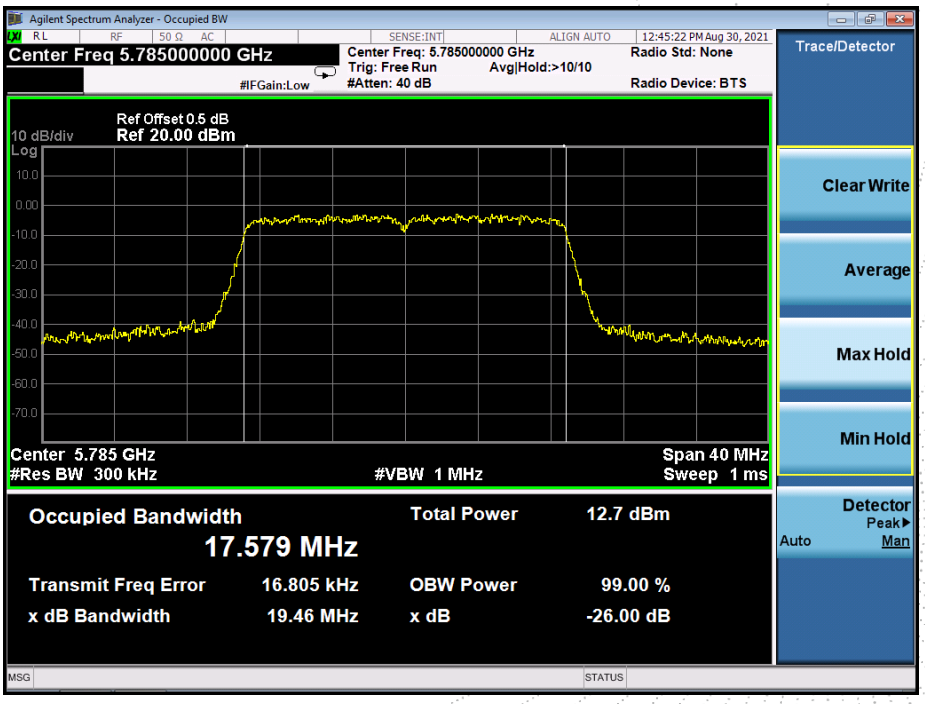
802.11 n40 5795MHz 99% bandwidth



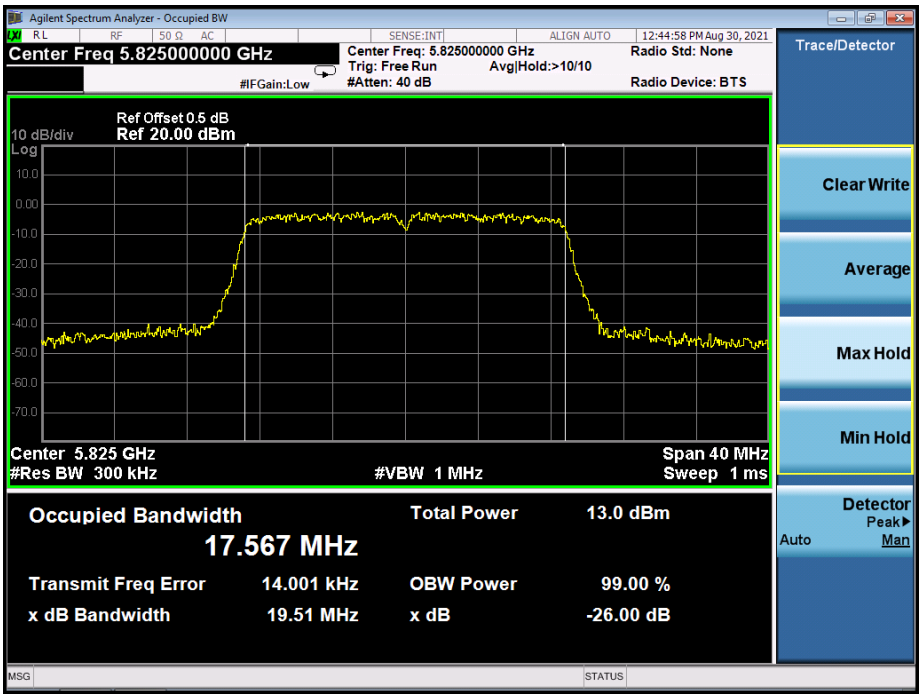
802.11ac20 5745MHz 99% bandwidth



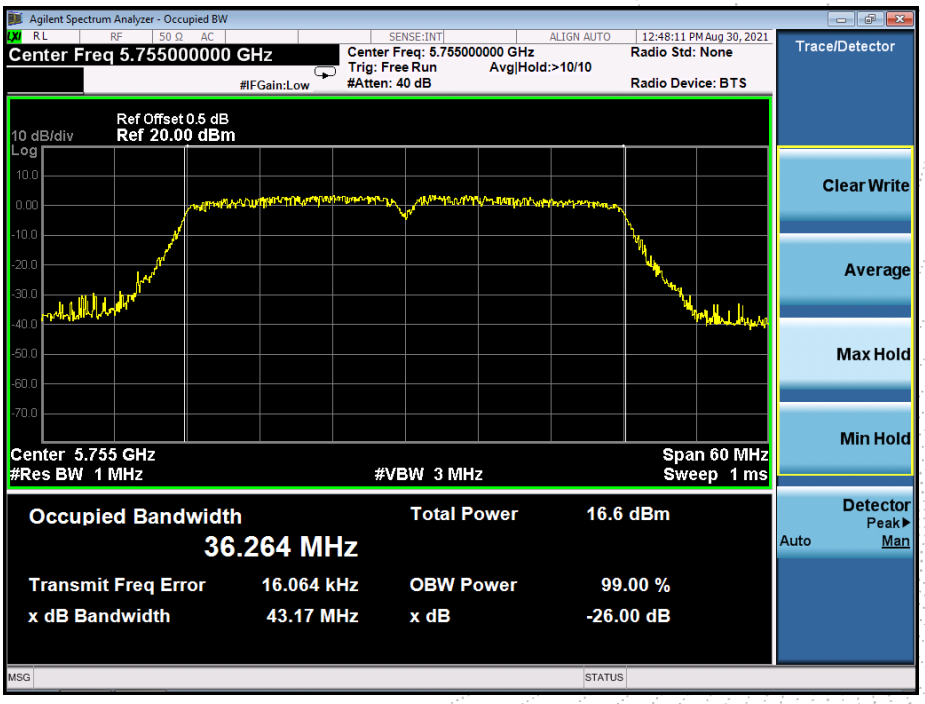
802.11ac20 5785MHz 99% bandwidth



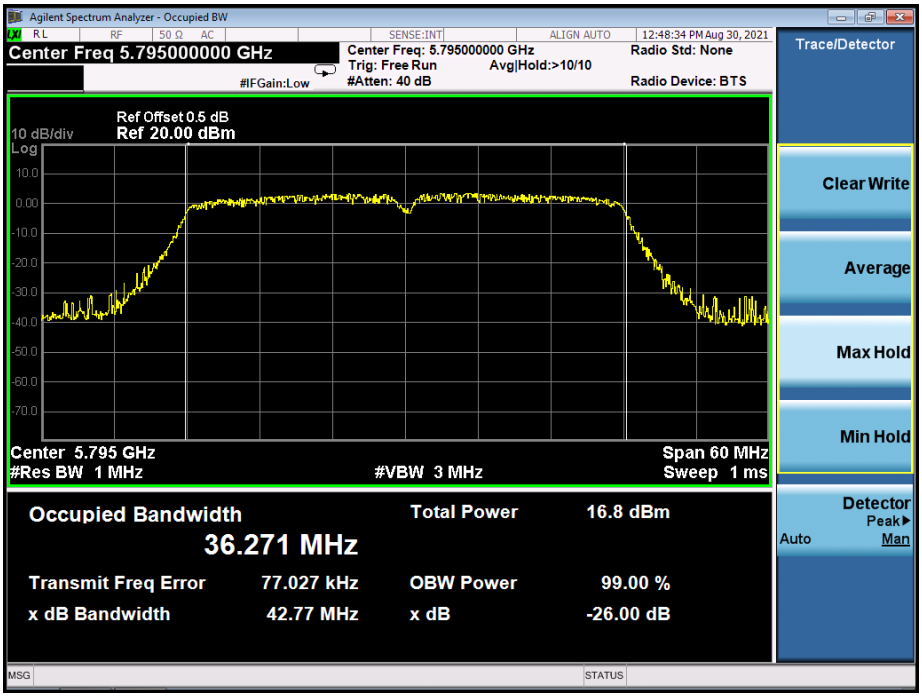
802.11ac20 5825MHz 99% bandwidth



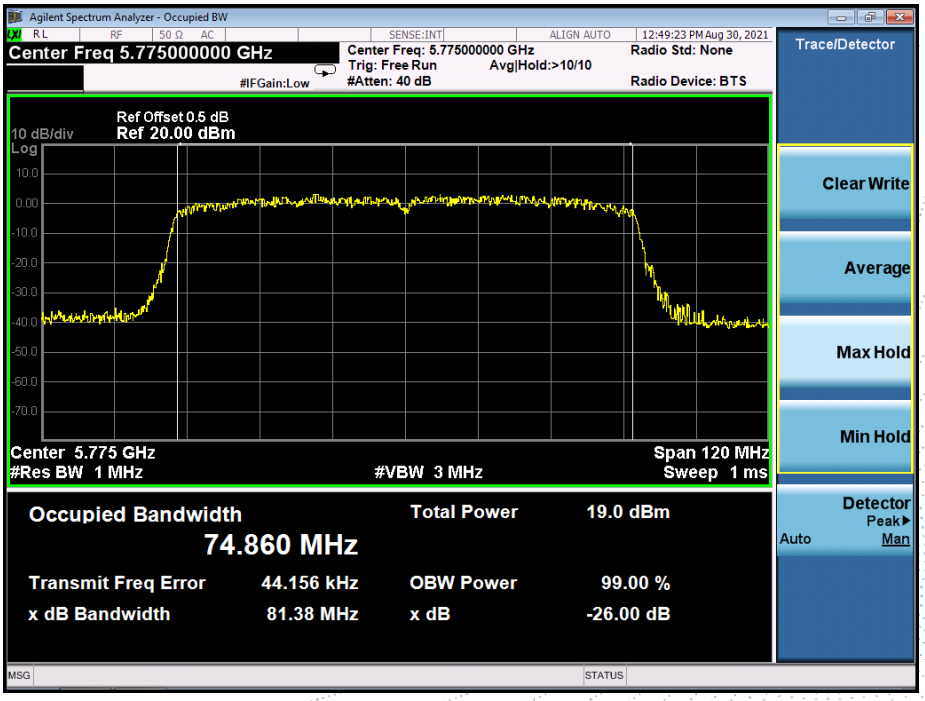
802.11 ac40 5755MHz 99% bandwidth



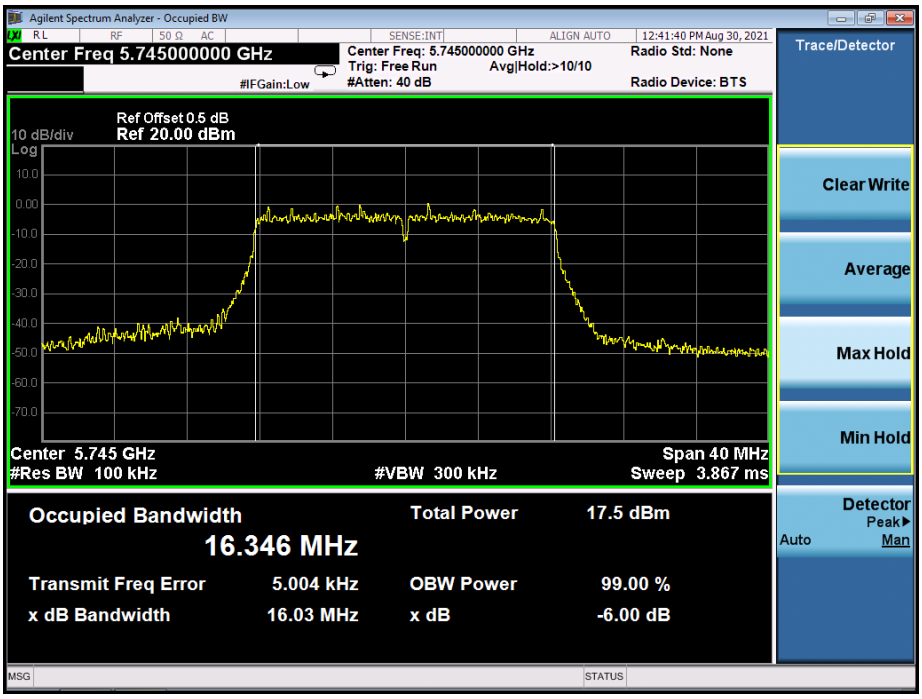
802.11 ac40 5795MHz 99% bandwidth



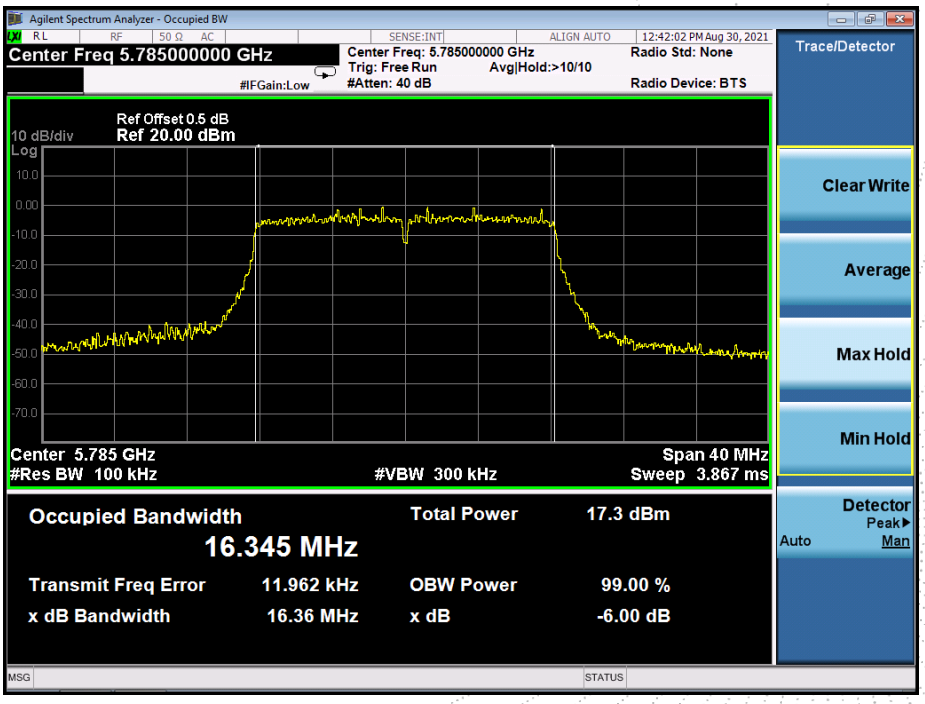
802.11 ac80 5775MHz 99% bandwidth



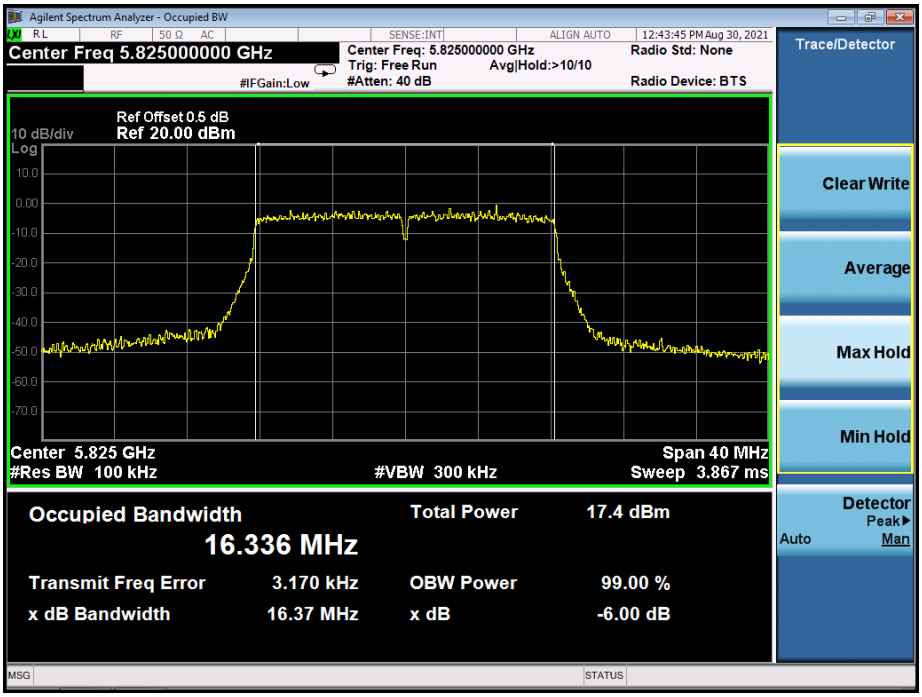
802.11a 5745MHz 6dB bandwidth



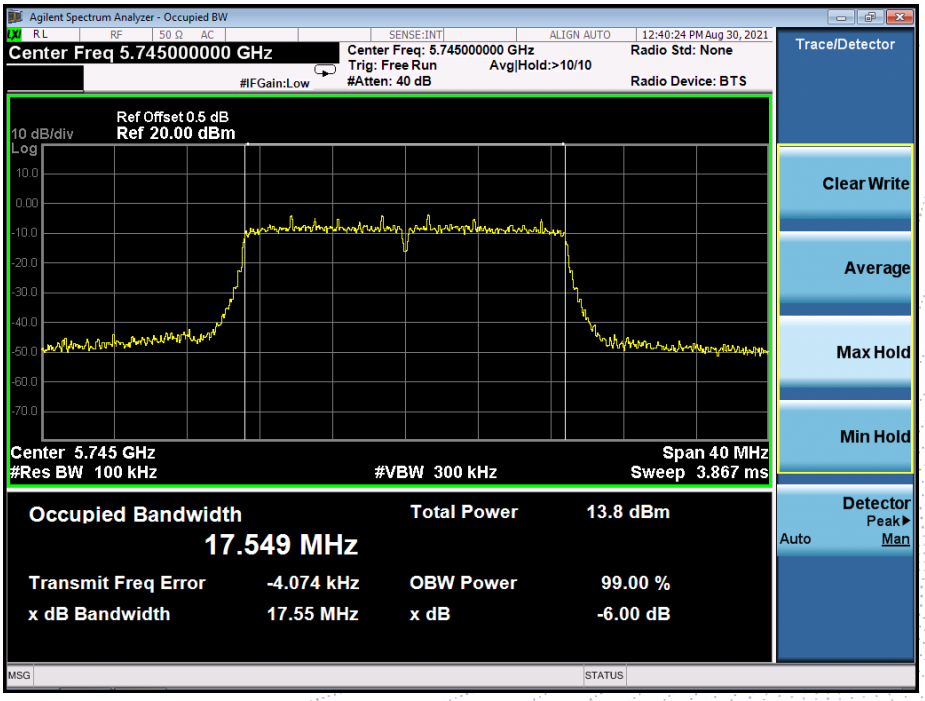
802.11a 5785MHz 6dB bandwidth



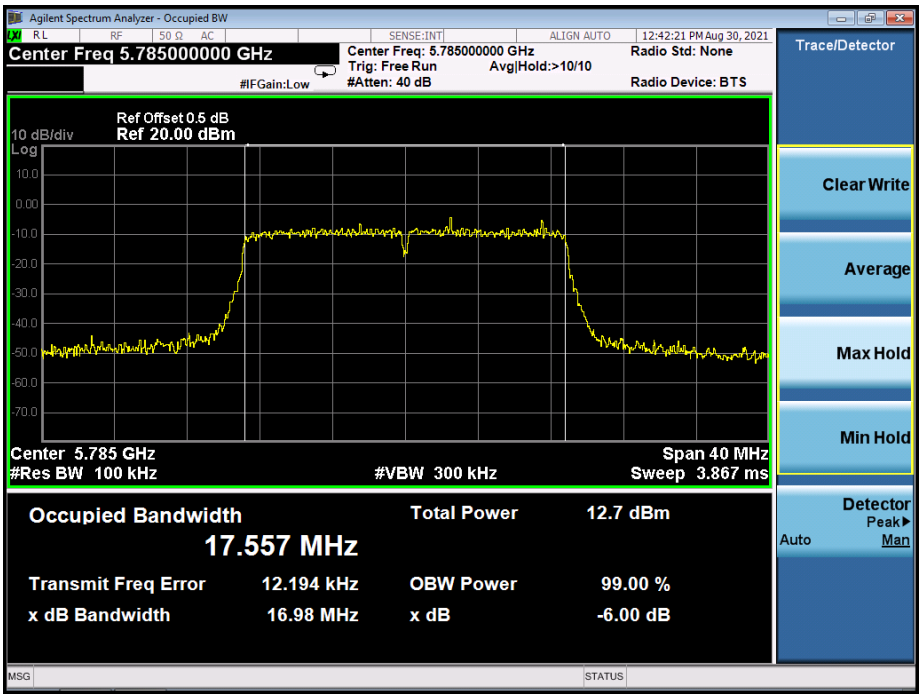
802.11a 5825MHz 6dB bandwidth



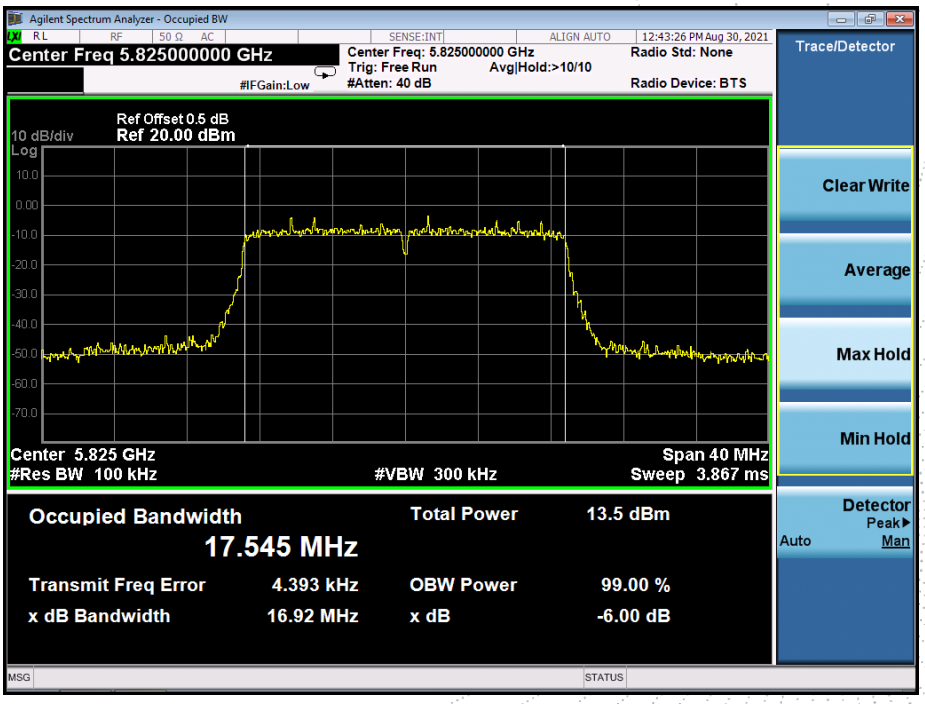
802.11n20 5745MHz 6dB bandwidth



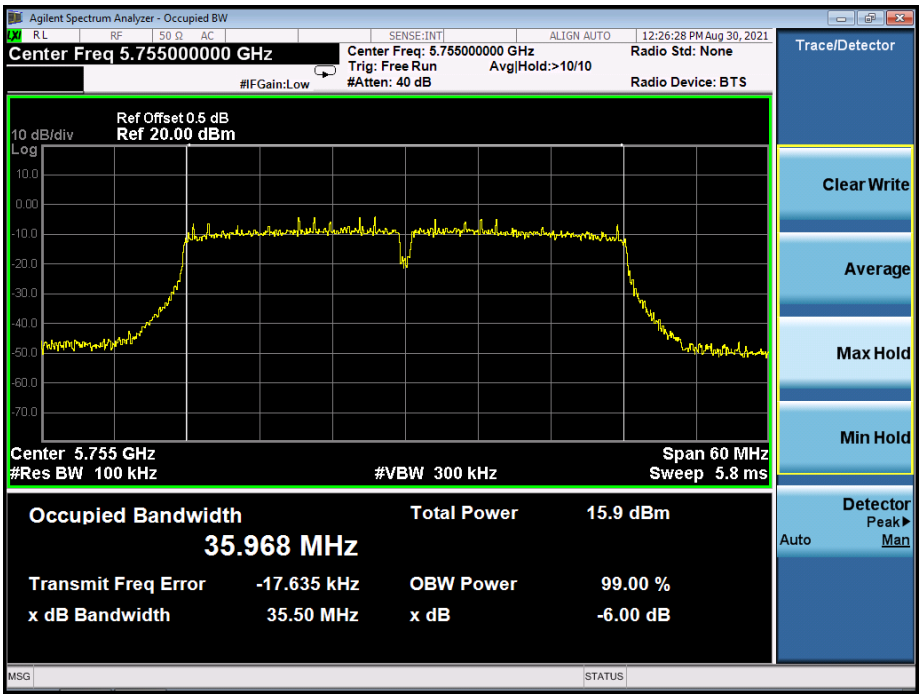
802.11n20 5785MHz 6dB bandwidth



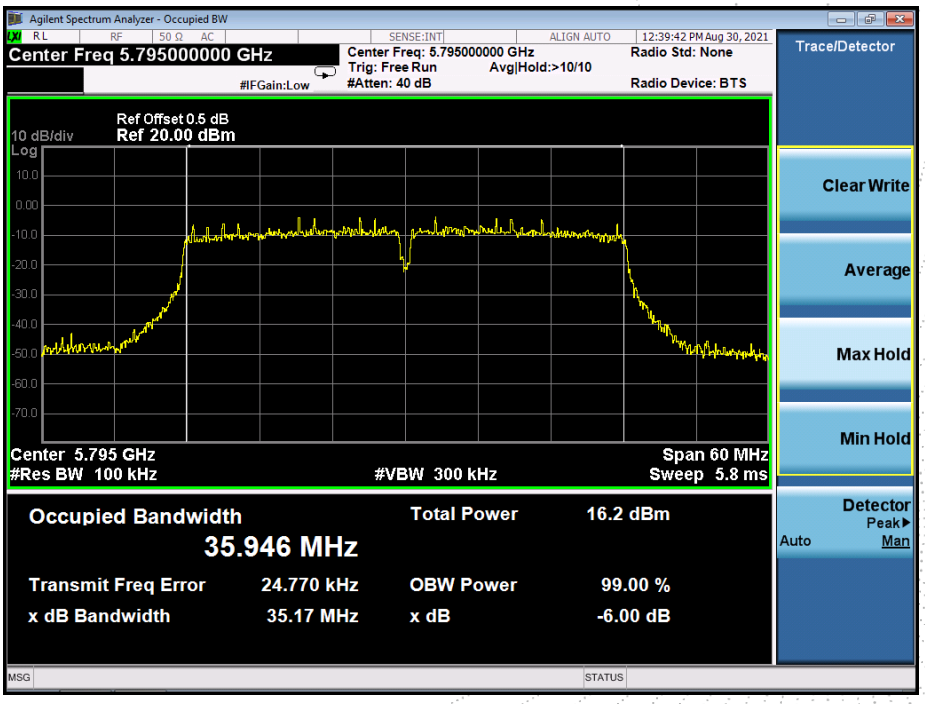
802.11n20 5825MHz 6dB bandwidth



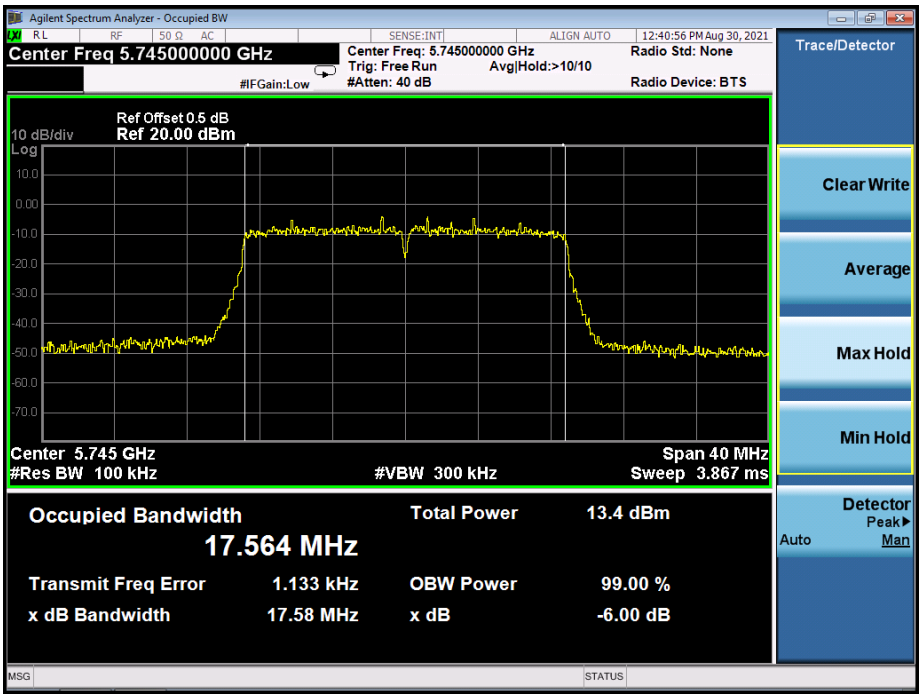
802.11 n40 5755MHz 6dB bandwidth



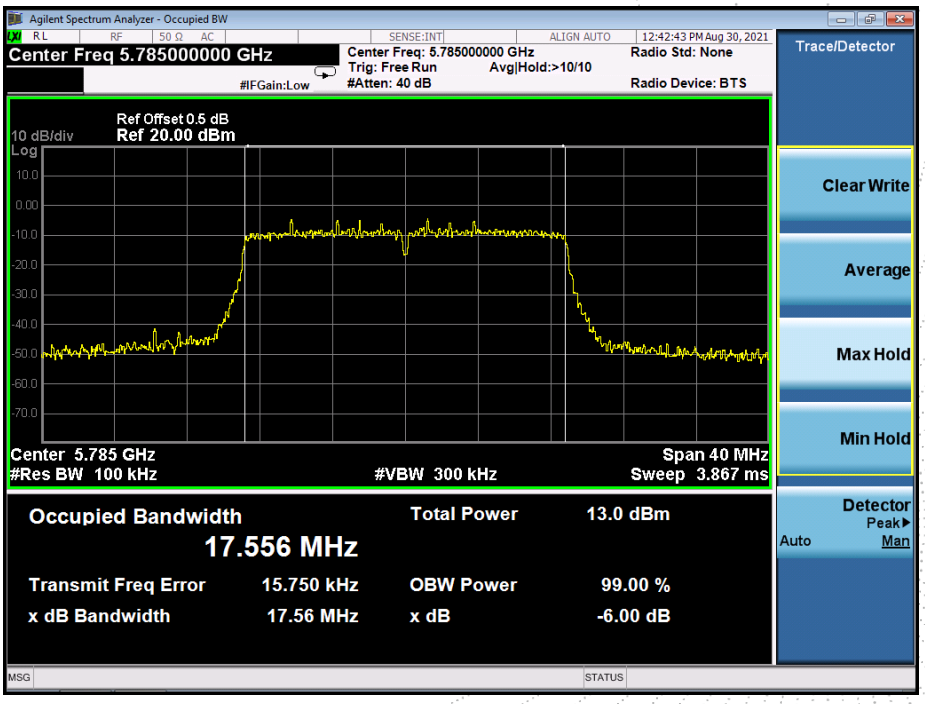
802.11 n40 5795MHz 6dB bandwidth



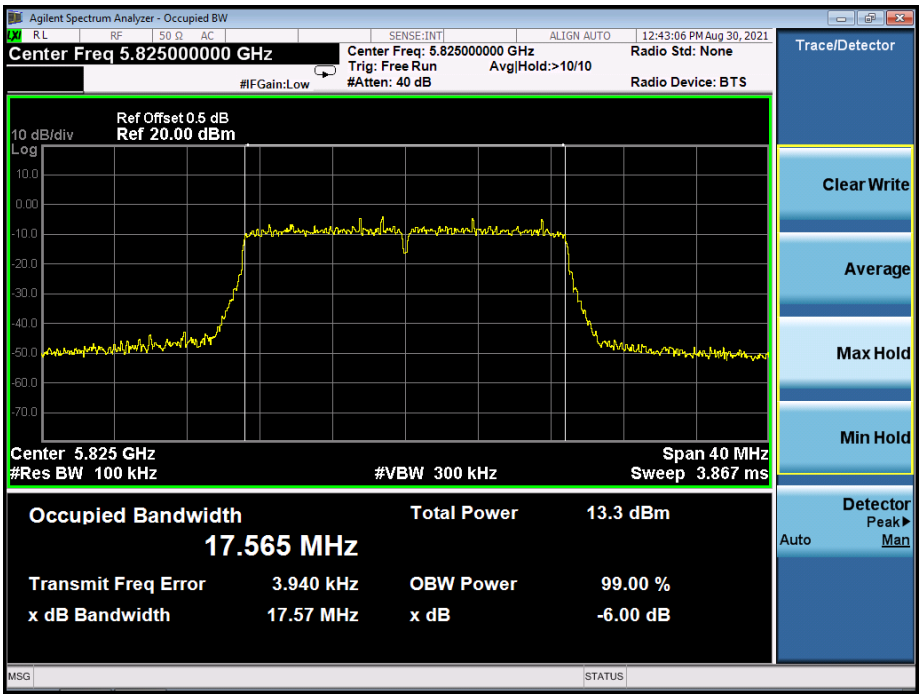
802.11ac20 5745MHz 6dB bandwidth



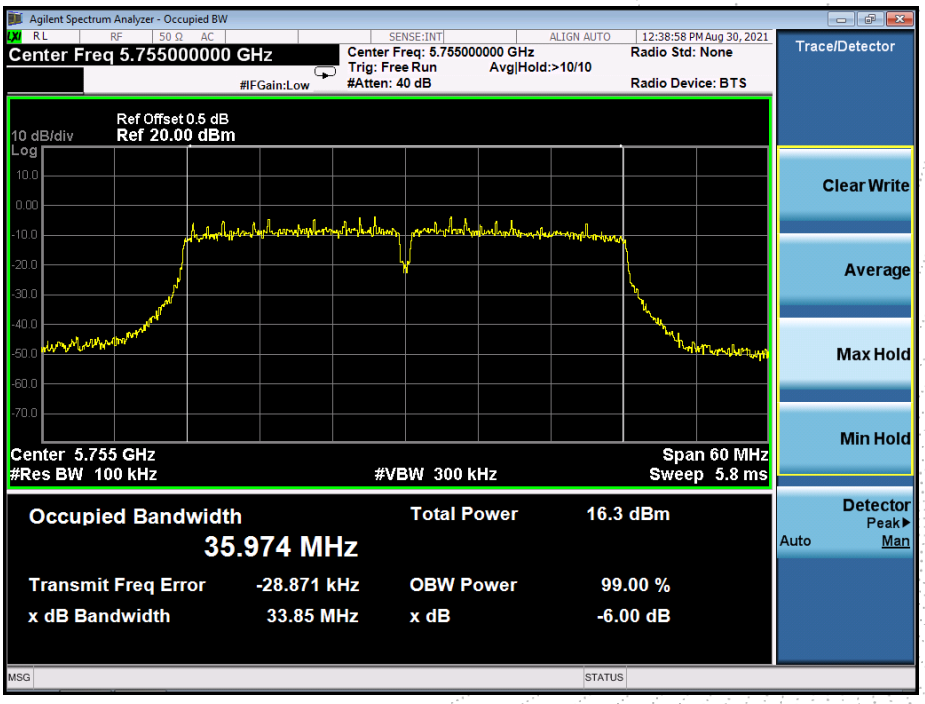
802.11ac20 5785MHz 6dB bandwidth



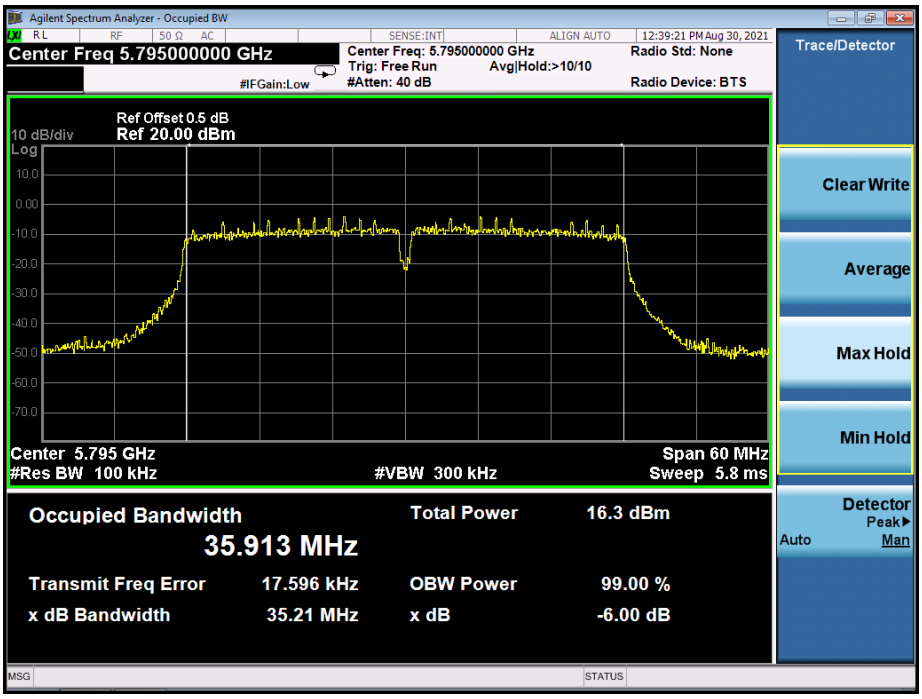
802.11ac20 5825MHz 6dB bandwidth



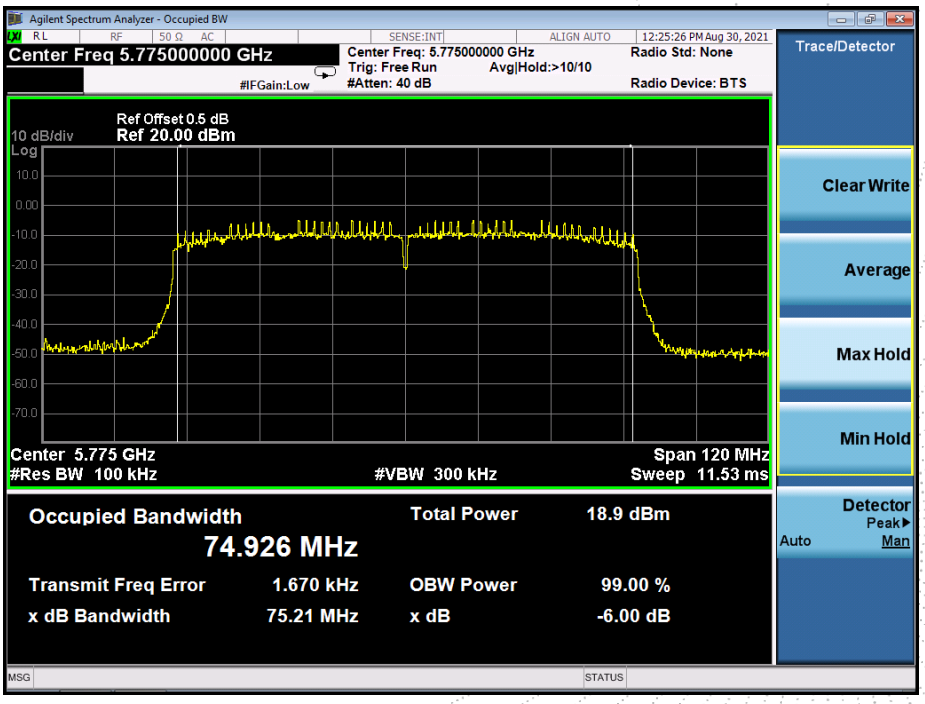
802.11 ac40 5755MHz 6dB bandwidth



802.11 ac40 5795MHz 6dB bandwidth

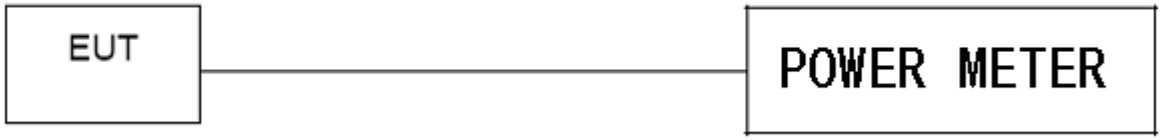


802.11 ac80 5775MHz 6dB bandwidth



10. MAXIMUM CONDUCTED OUTPUT POWER

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407
The maximum conduced output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	0.125W
5725~5850	1W

10.3 Test procedure

Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration
If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)
Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle ≥ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at

the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

10.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

10.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V/60Hz
Test Mode ：	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

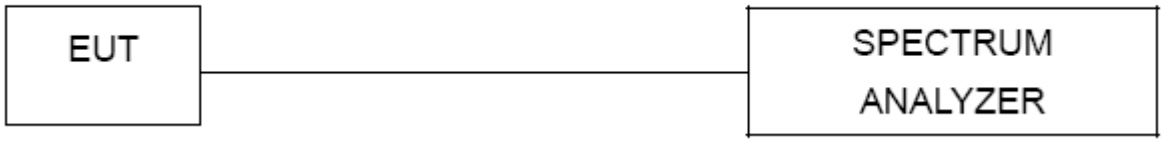
Test Channel	Frequency	Maximum output power. Antenna port (AV)			LIMIT	Result
	(MHz)	ANT A(dBm)	ANT B(dBm)	Total(dBm)	dBm	
TX 802.11a Mode						
CH36	5180	13.143	13.558	/	21	Pass
CH40	5200	12.793	13.826	/	21	Pass
CH48	5240	14.422	13.660	/	21	Pass
TX 802.11 n20M Mode						
CH36	5180	10.329	10.215	13.283	21	Pass
CH40	5200	9.847	10.131	13.002	21	Pass
CH48	5240	10.847	10.669	13.769	21	Pass
TX 802.11 n40M Mode						
CH38	5190	8.757	8.708	11.743	21	Pass
CH46	5230	8.738	8.626	11.693	21	Pass
TX 802.11 AC20M Mode						
CH36	5180	9.688	9.390	12.552	21	Pass
CH40	5200	9.191	9.440	12.328	21	Pass
CH48	5240	10.517	9.592	13.089	21	Pass
TX 802.11 AC40M Mode						
CH38	5190	9.434	9.457	12.456	21	Pass
CH46	5230	9.181	9.028	12.115	21	Pass
TX 802.11 AC80M Mode						
CH42	5210	7.769	7.135	10.474	21	Pass

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V/60Hz
Test Mode ：	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Test Channel	Frequency	Maximum output power. Antenna port (AV)			LIMIT	Result
	(MHz)	ANT A(dBm)	ANT B(dBm)	Total(dBm)	dBm	
TX 802.11a Mode						
CH 149	5745	14.116	13.870	/	30	Pass
CH 157	5785	13.680	12.559	/	30	Pass
CH 165	5825	14.099	13.478	/	30	Pass
TX 802.11 n20M Mode						
CH 149	5745	10.358	10.174	13.277	30	Pass
CH 157	5785	10.040	8.956	12.542	30	Pass
CH 165	5825	10.300	9.934	13.131	30	Pass
TX 802.11 n40M Mode						
CH 151	5755	9.400	8.576	12.018	30	Pass
CH 159	5795	9.452	8.357	11.949	30	Pass
TX 802.11 AC20M Mode						
CH 149	5745	10.342	9.199	12.818	30	Pass
CH 157	5785	10.150	8.201	12.294	30	Pass
CH 165	5825	10.479	9.183	12.889	30	Pass
TX 802.11 AC40M Mode						
CH 151	5755	9.411	9.677	12.556	30	Pass
CH 159	5795	9.194	8.789	12.007	30	Pass
TX 802.11 AC80M Mode						
CH 155	5775	8.441	8.181	11.323	30	Pass

11. OUT OF BAND EMISSIONS

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

11.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect
its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

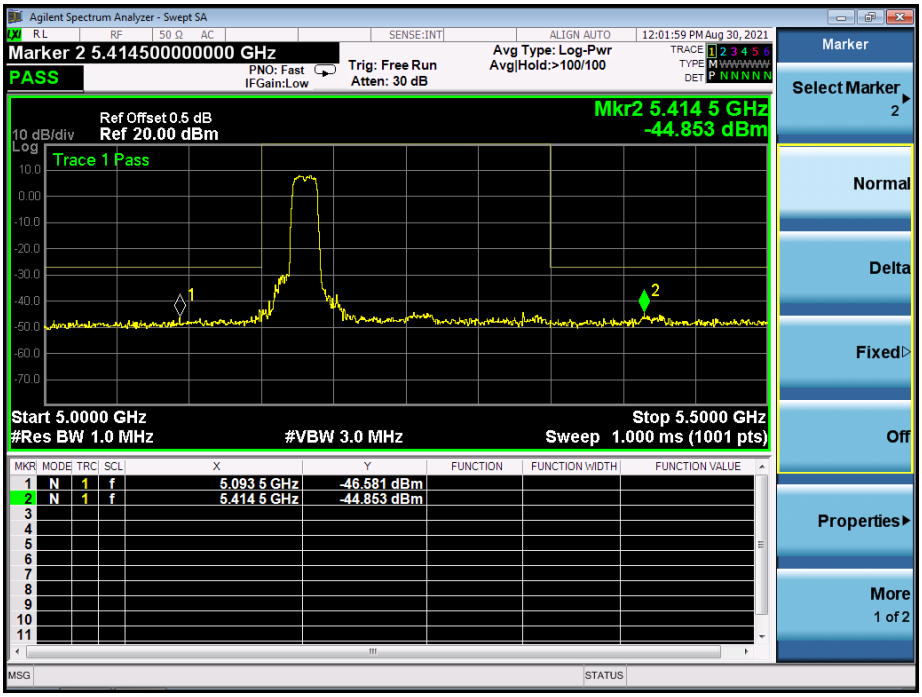
11.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V/60Hz

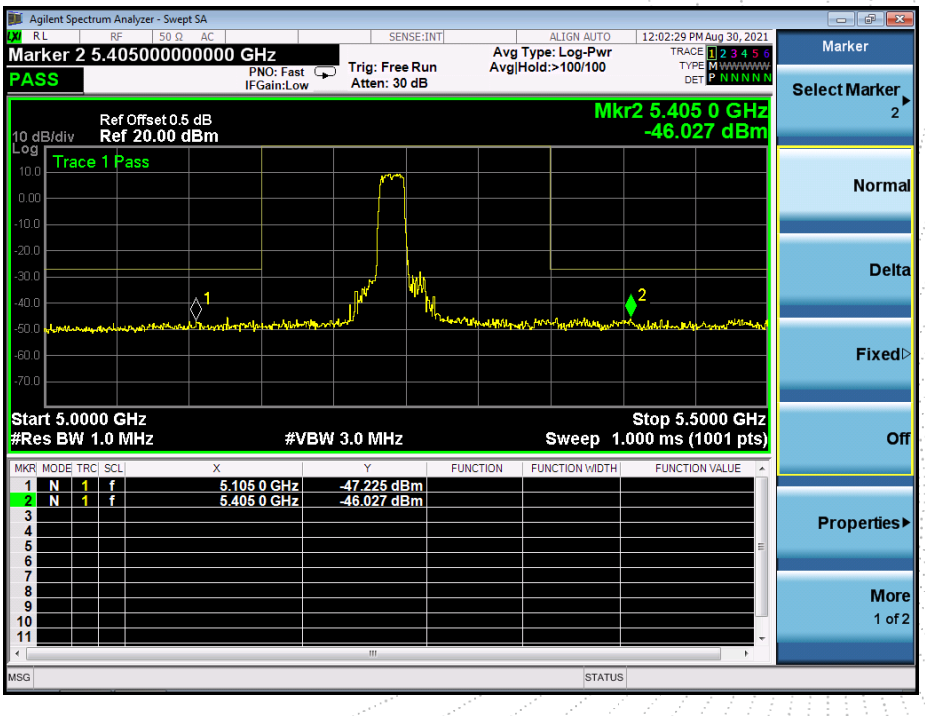
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A,only shown Antenna A Plot.

5.180~5.240 GHz

(802.11a) Band Edge, Left Side

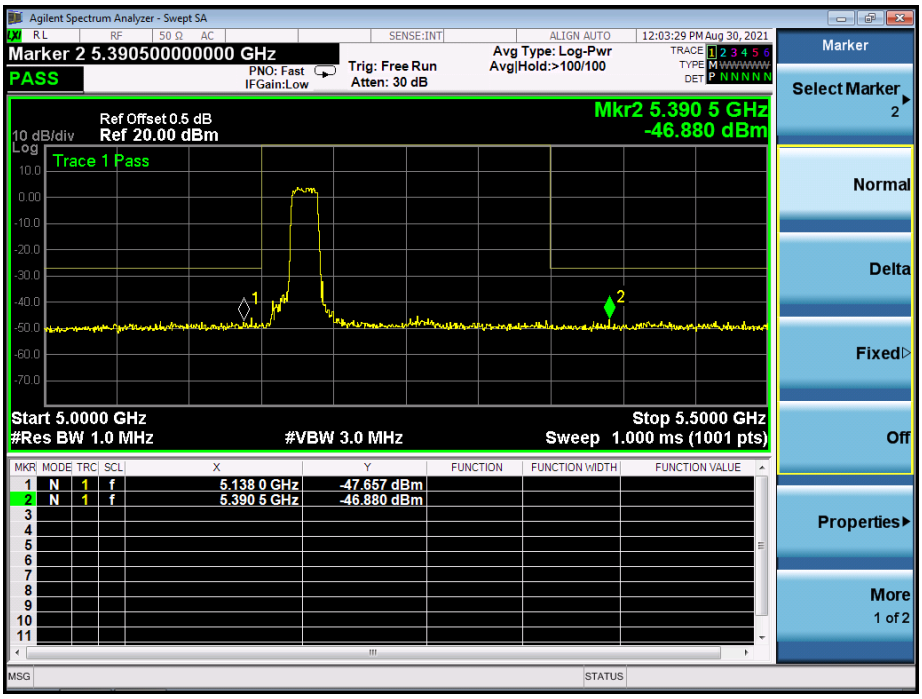


(802.11a) Band Edge, Right Side

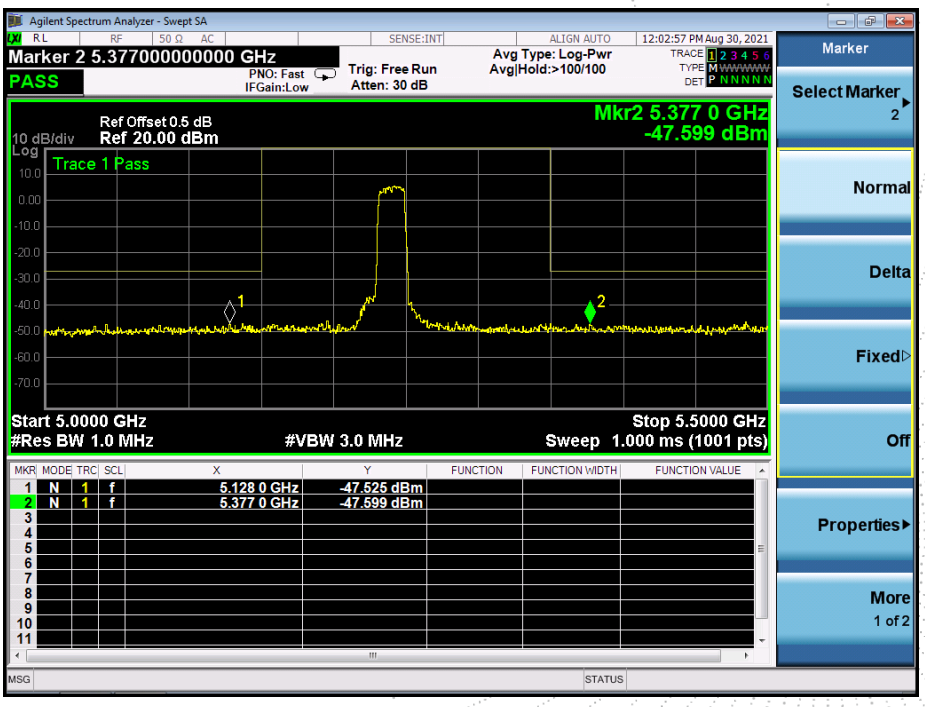


5.180~5.240 GHz

(802.11n20) Band Edge, Left Side

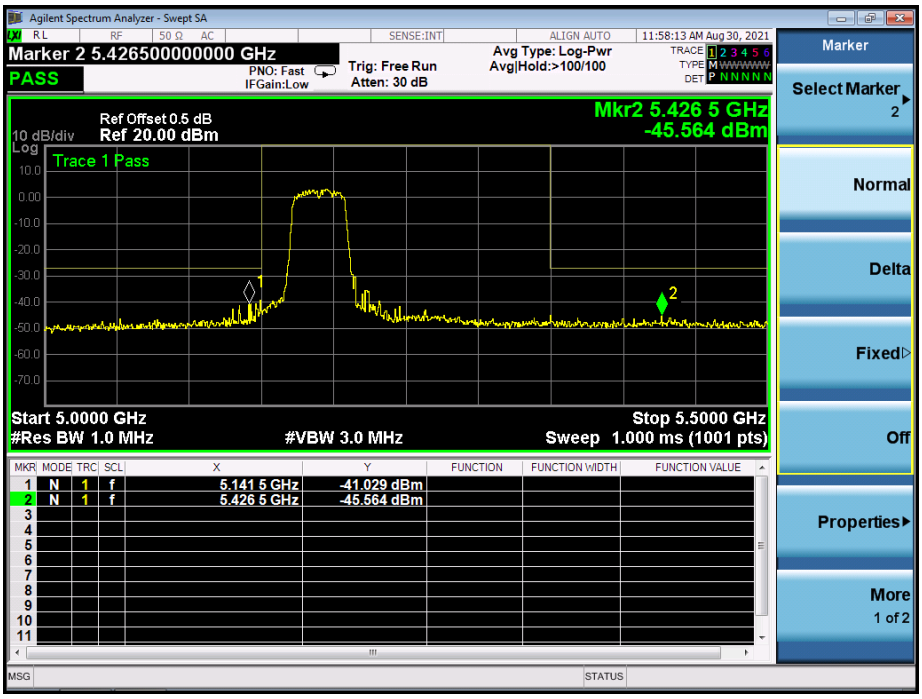


(802.11n20) Band Edge, Right Side

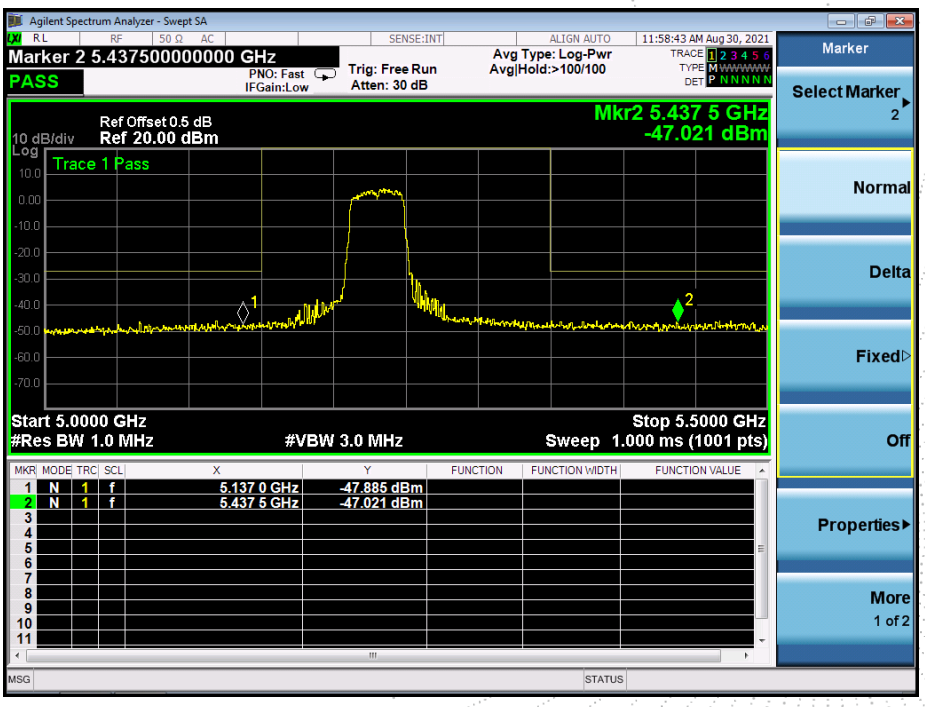


5.180~5.240 GHz

(802.11n40) Band Edge, Left Side

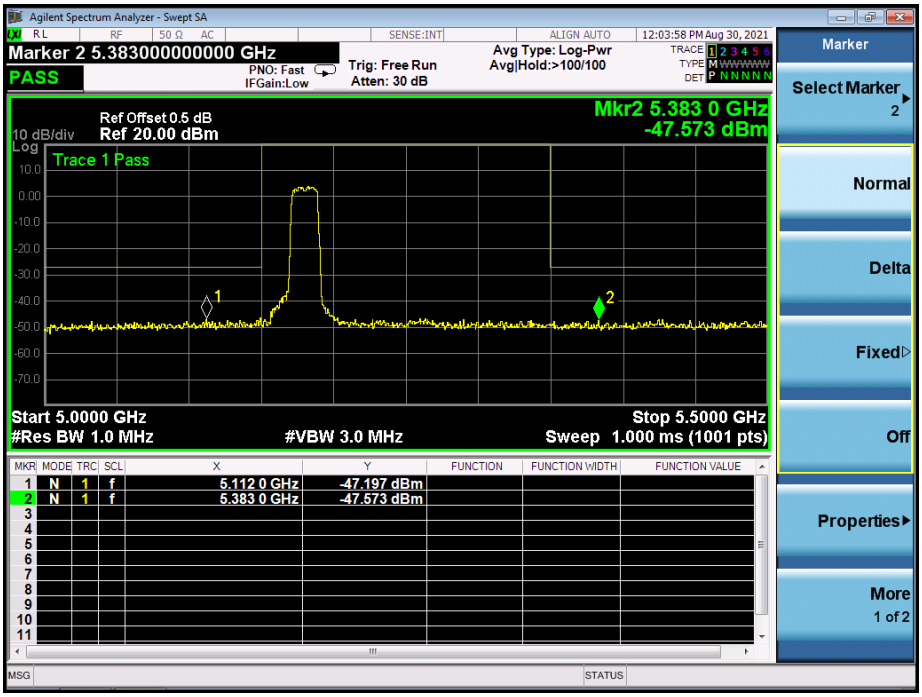


(802.11n40) Band Edge, Right Side

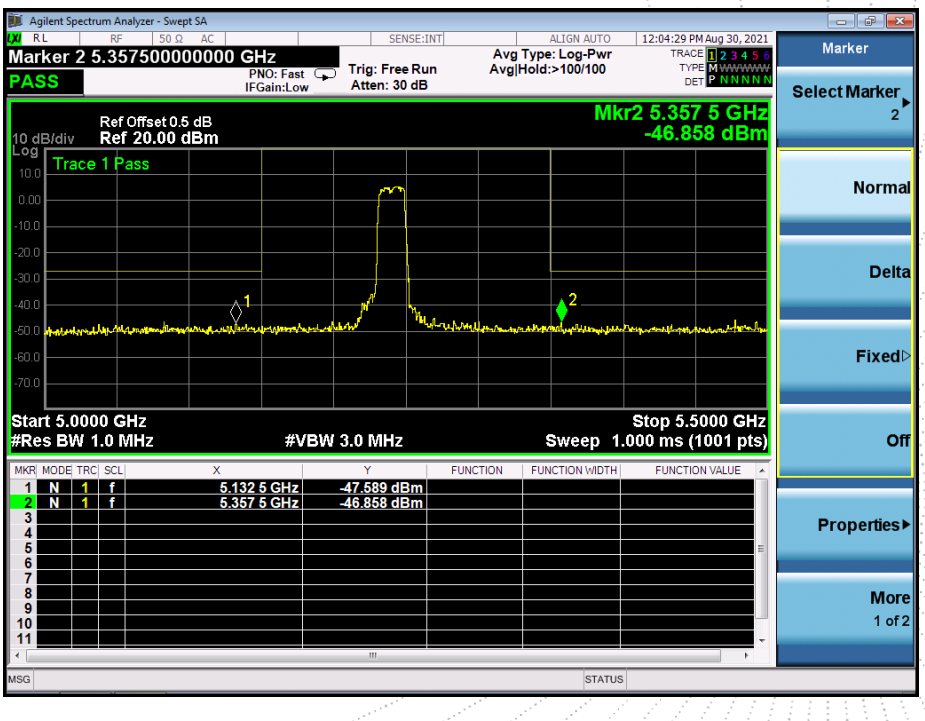


5.180~5.240 GHz

(802.11ac20) Band Edge, Left Side

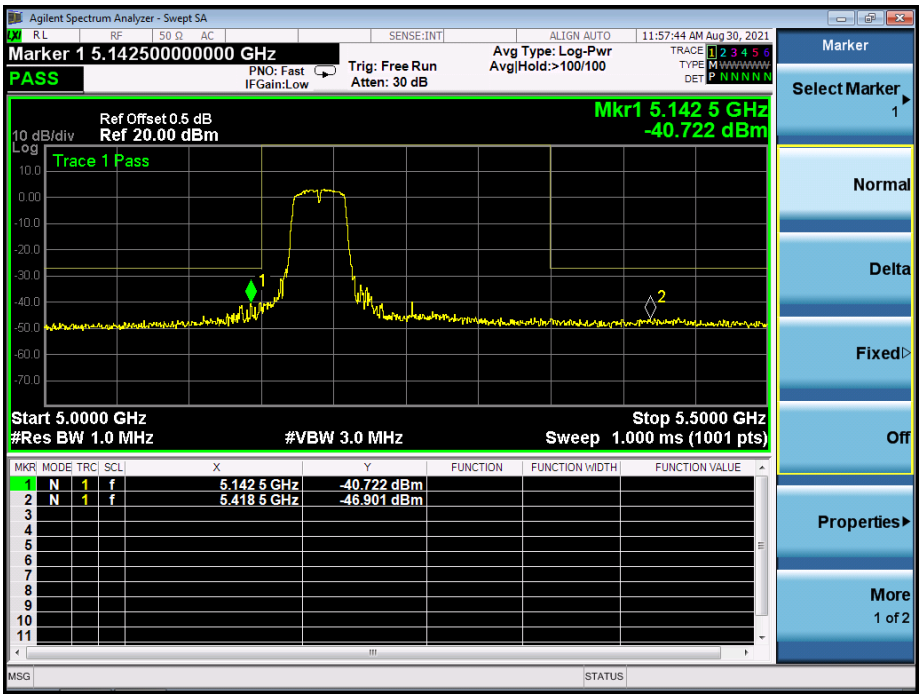


(802.11ac20) Band Edge, Right Side

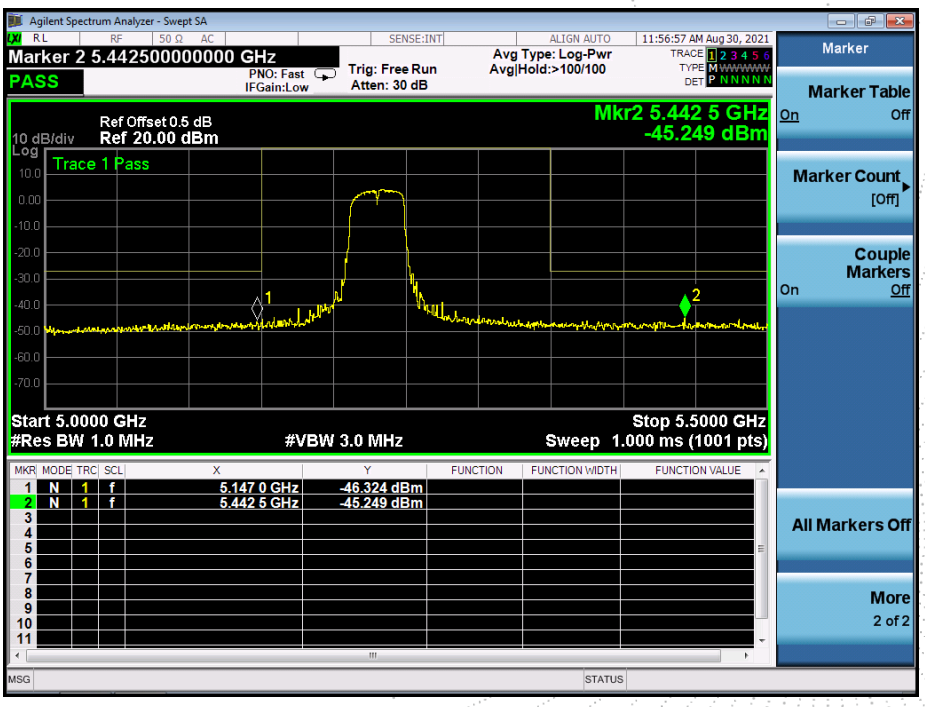


5.180~5.240 GHz

(802.11ac40) Band Edge, Left Side

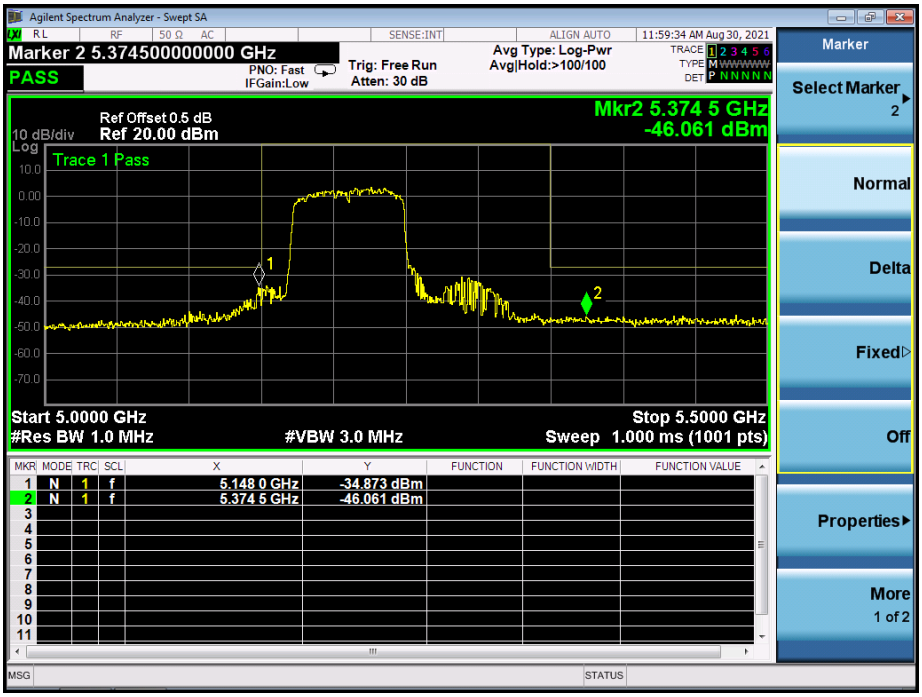


(802.11ac40) Band Edge, Right Side

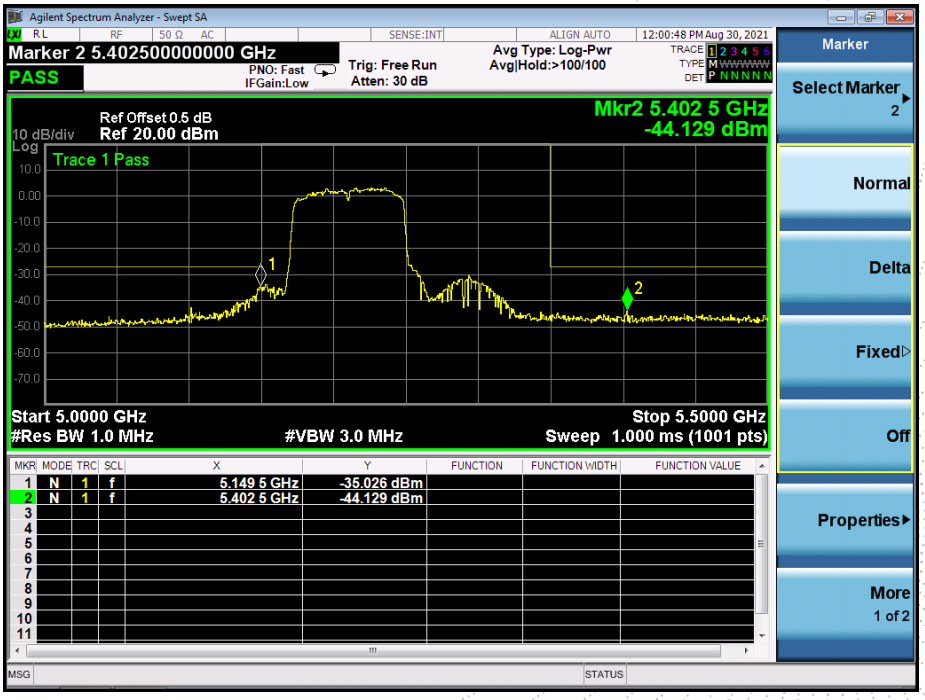


5.180~5.240 GHz

(802.11ac80) Band Edge, Left Side

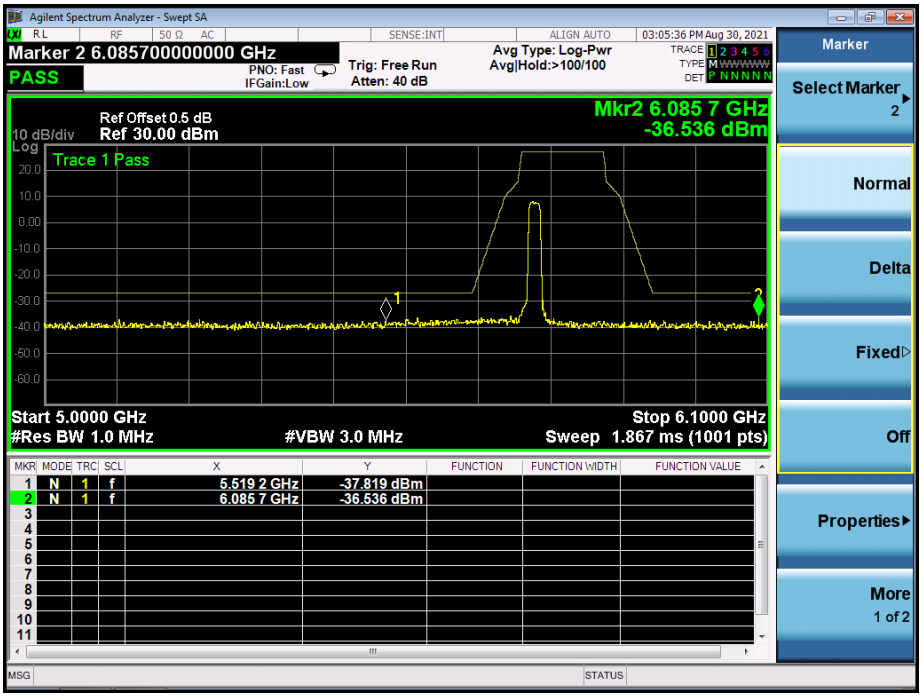


(802.11ac80) Band Edge, Right Side

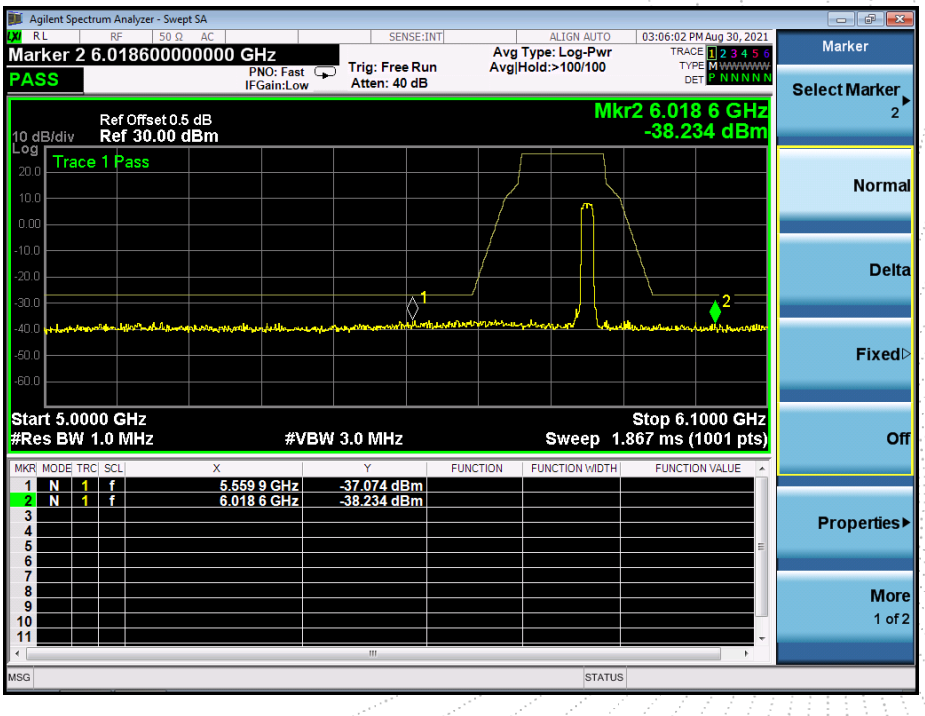


5.745~5.825 GHz

(802.11a) Band Edge, Left Side

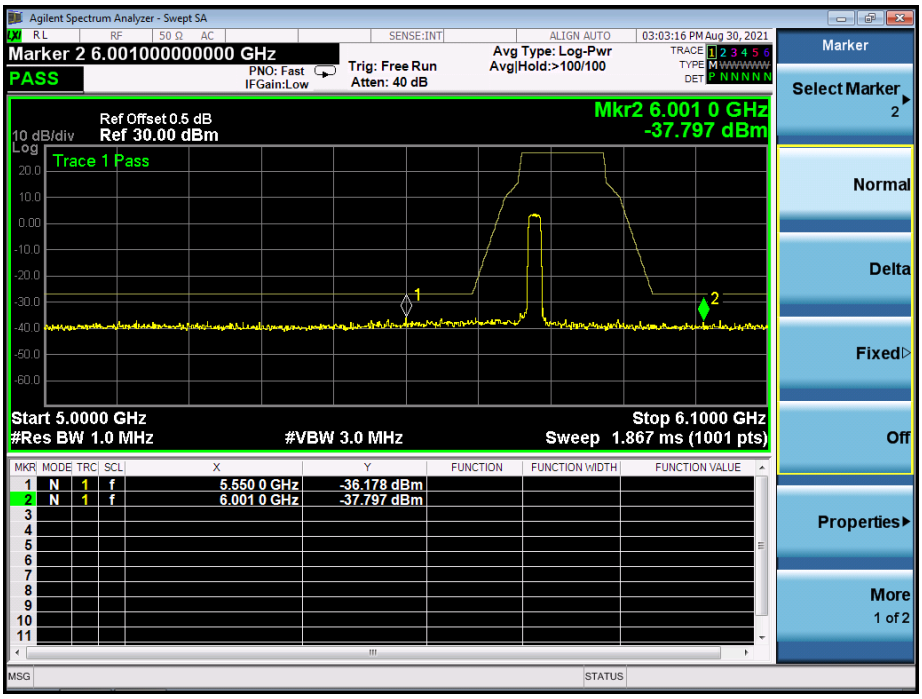


(802.11a) Band Edge, Right Side

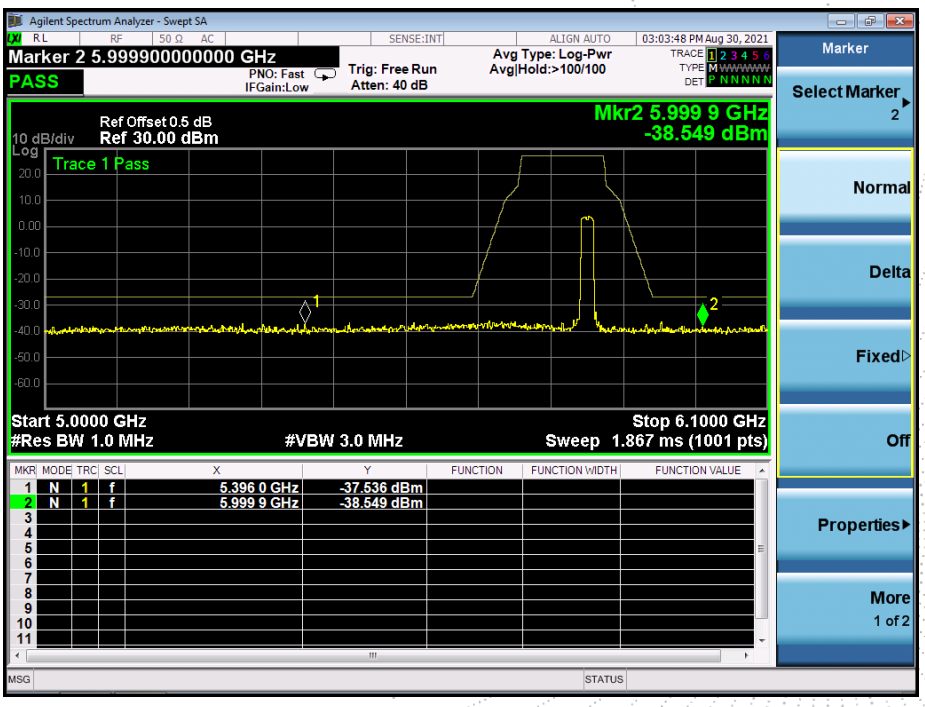


5.745~5.825 GHz

(802.11n20) Band Edge, Left Side

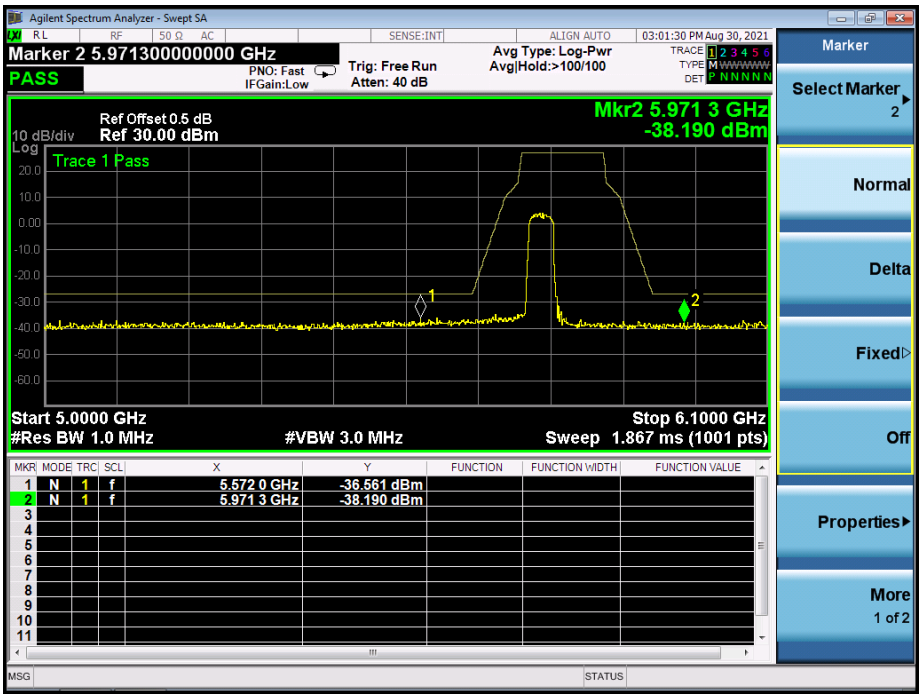


(802.11n20) Band Edge, Right Side

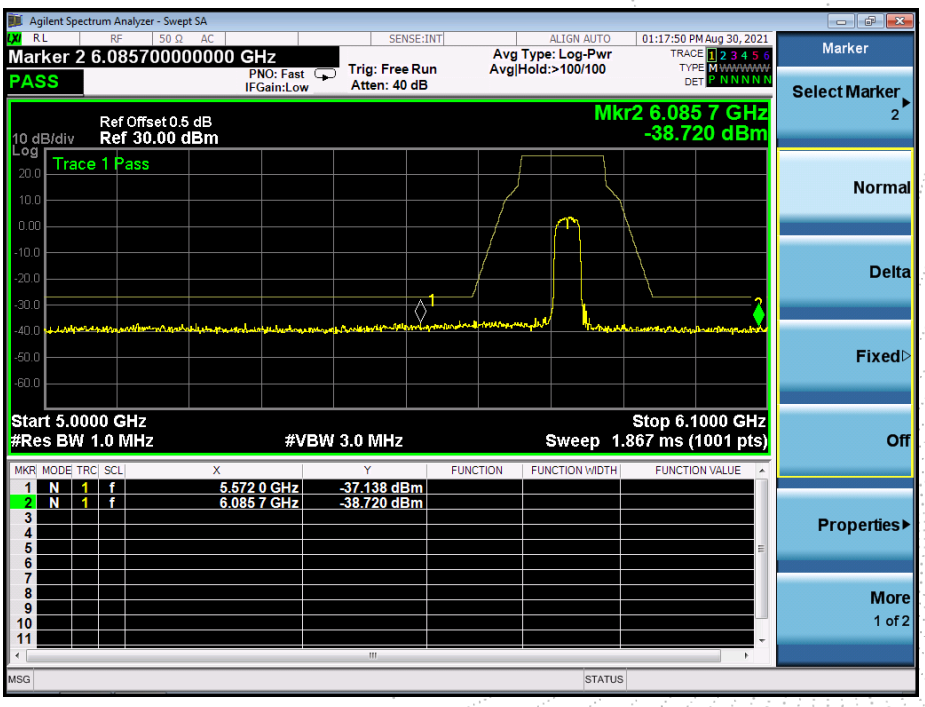


5.745~5.825 GHz

(802.11n40) Band Edge, Left Side

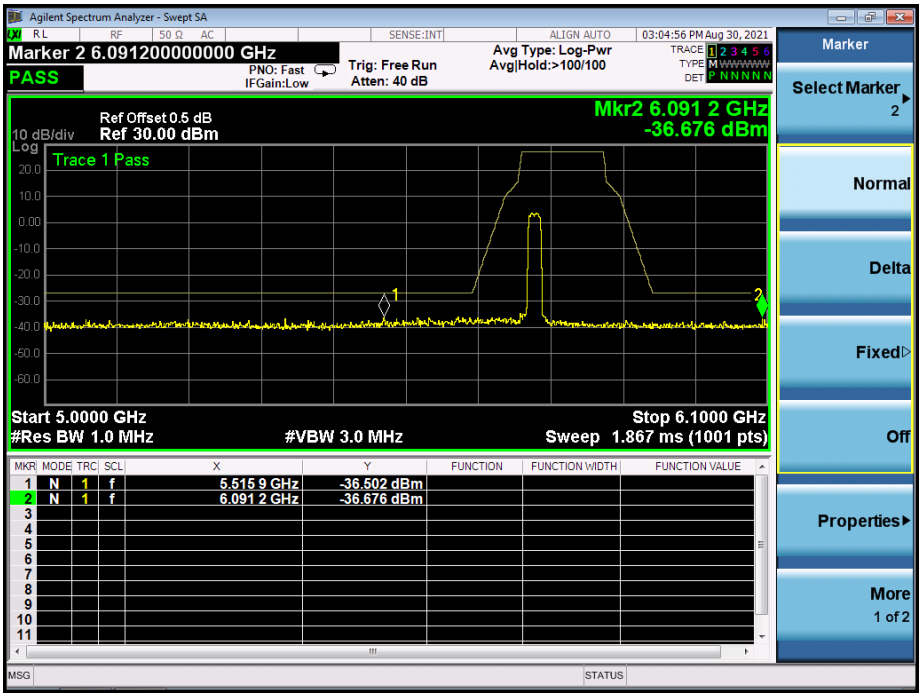


(802.11n40) Band Edge, Right Side

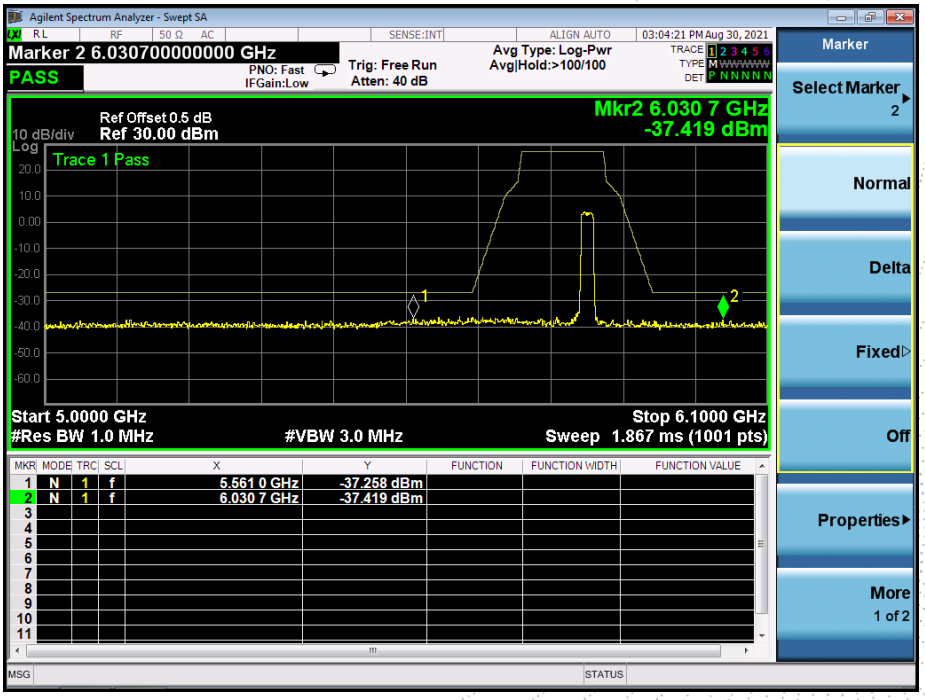


5.745~5.825 GHz

(802.11ac20) Band Edge, Left Side

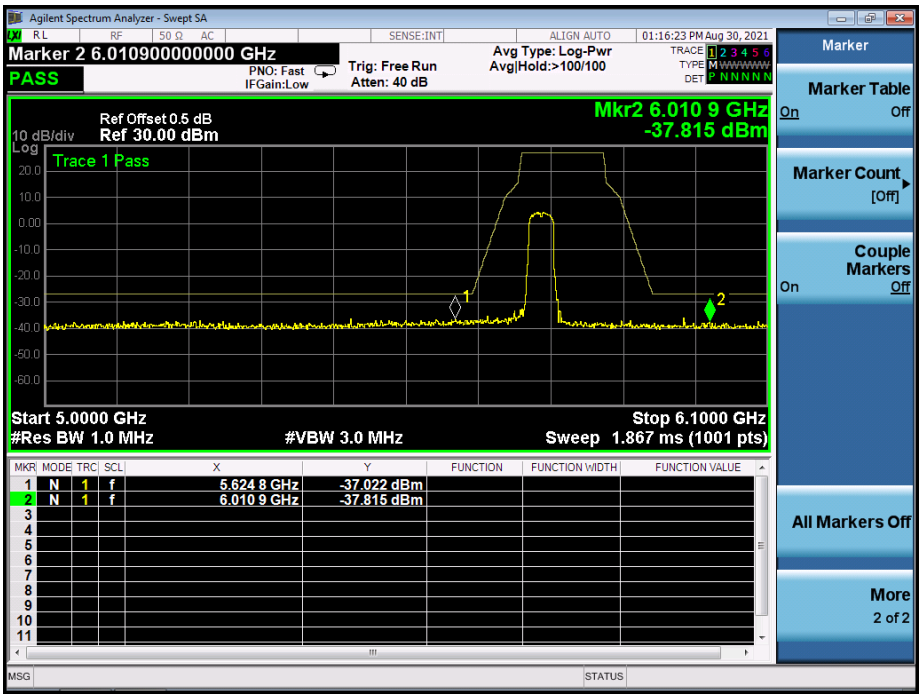


(802.11ac20) Band Edge, Right Side

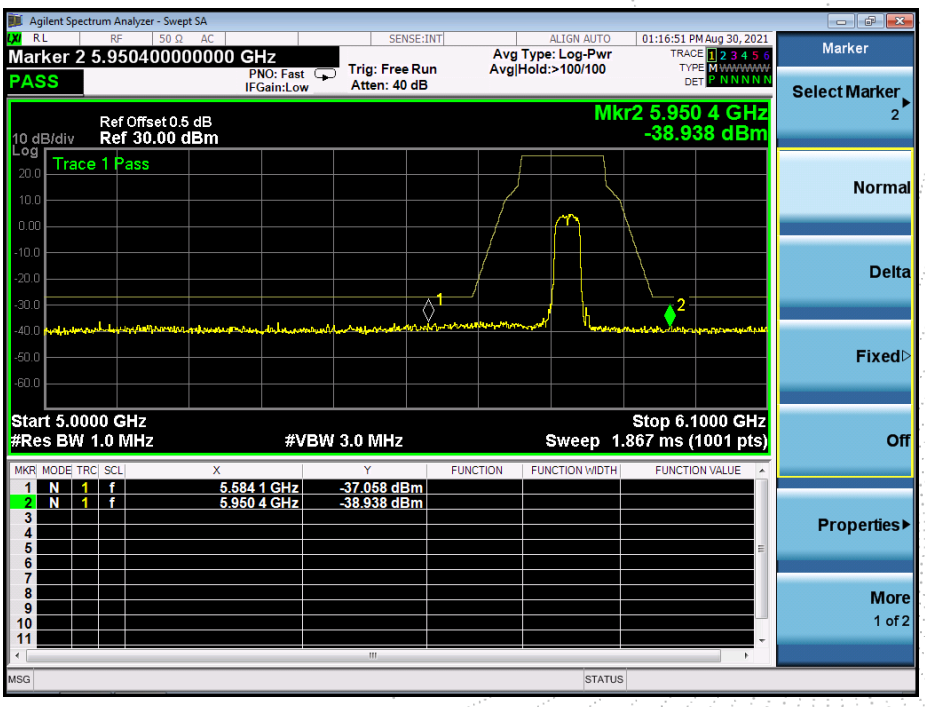


5.745~5.825 GHz

(802.11ac40) Band Edge, Left Side

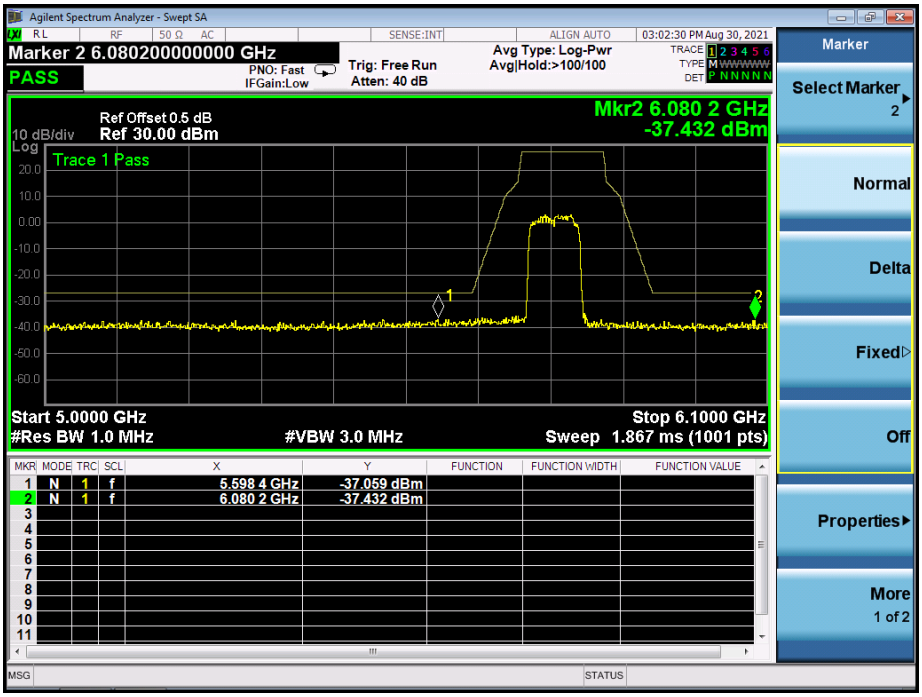


(802.11ac40) Band Edge, Right Side

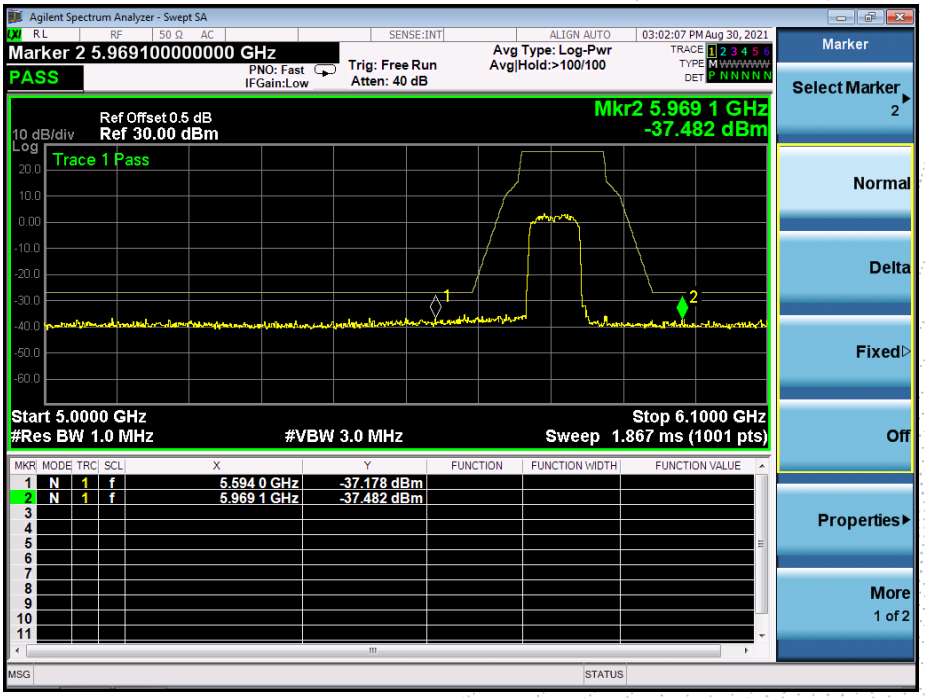


5.745~5.825 GHz

(802.11ac80) Band Edge, Left Side



(802.11ac80) Band Edge, Right Side



12. SPURIOUS RF CONDUCTED EMISSIONS

12.1 Block Diagram Of Test Setup

12.2 Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1)For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2)For transmitters operating in the 5.725-5.85 GHz band(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

12.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect
its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

12.4 Test Result

Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

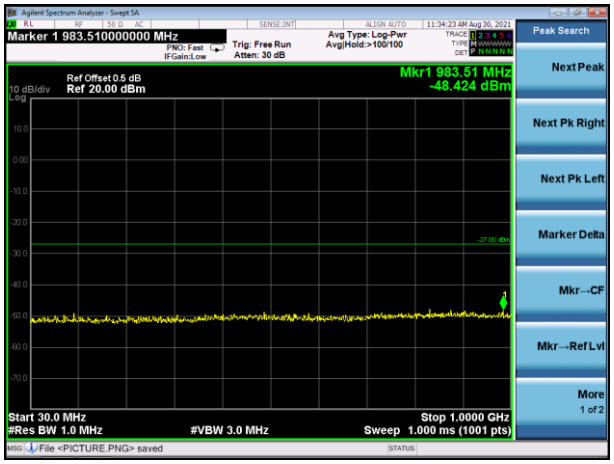
About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A Plot.

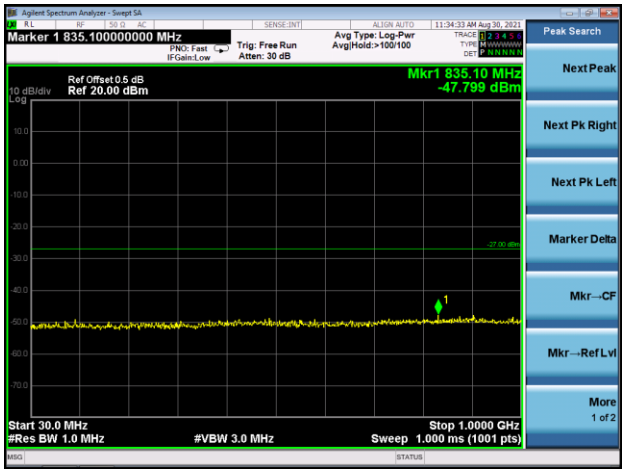
5.1G

Test Plot

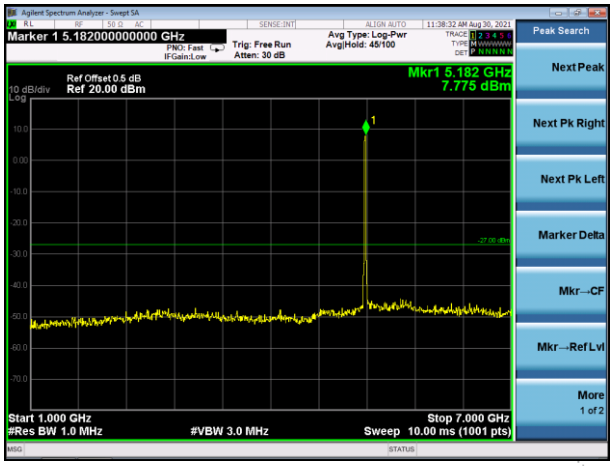
802.11a on channel 36



802.11a on channel 40



802.11a on channel 36



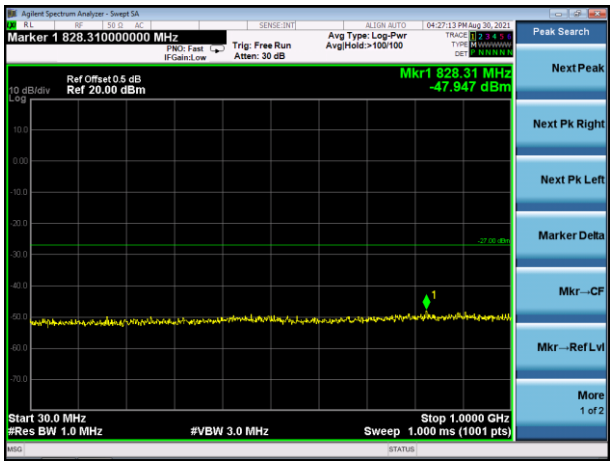
802.11a on channel 40

802.11a on channel 36

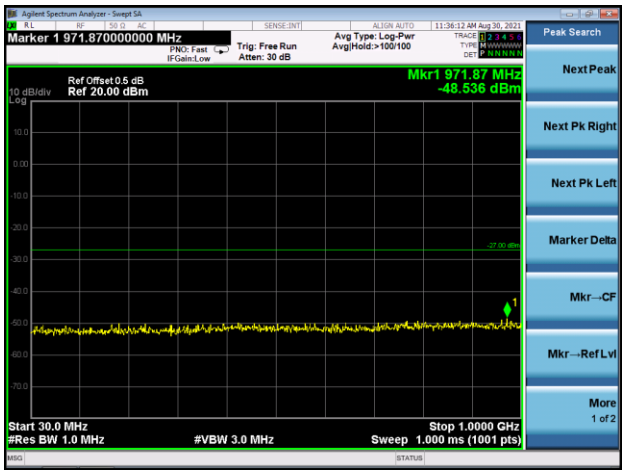
802.11a on channel 40

Test Plot

802.11a on channel 48

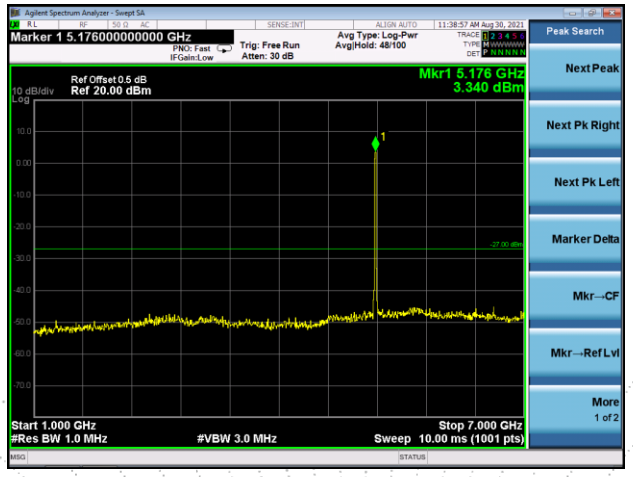


802.11n20 on channel 36



802.11a on channel 48

802.11n20 on channel 36

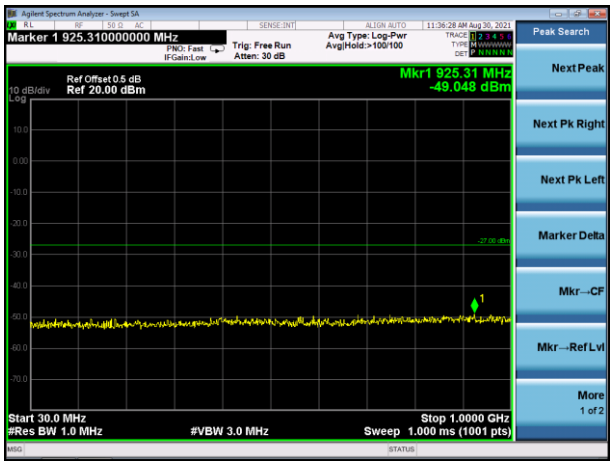


802.11a on channel 48

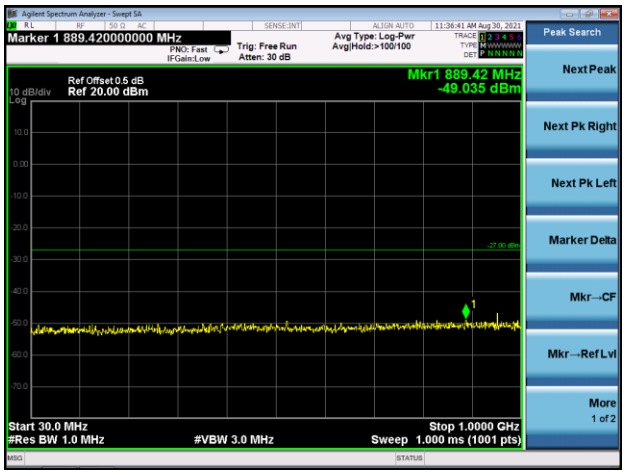
802.11n20 on channel 36

Test Plot

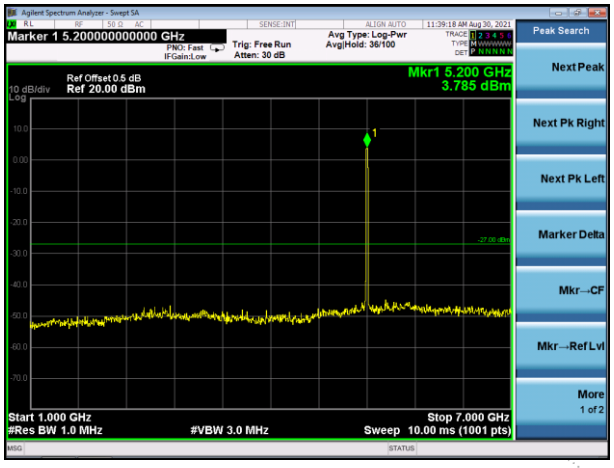
802.11n20 on channel 40



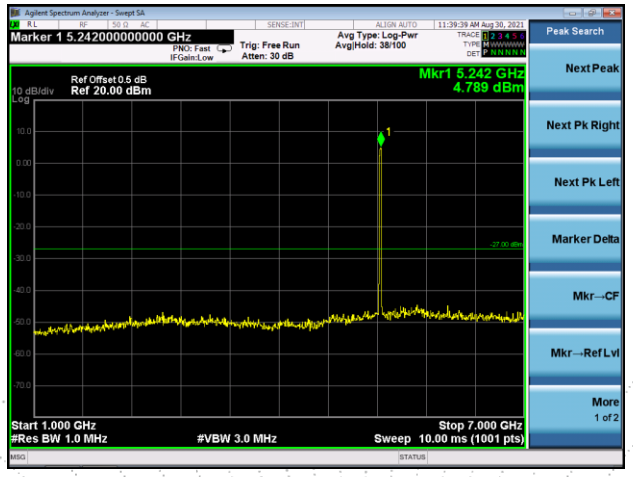
802.11n20 on channel 48



802.11n20 on channel 40



802.11n20 on channel 48



802.11n20 on channel 40

802.11n20 on channel 48