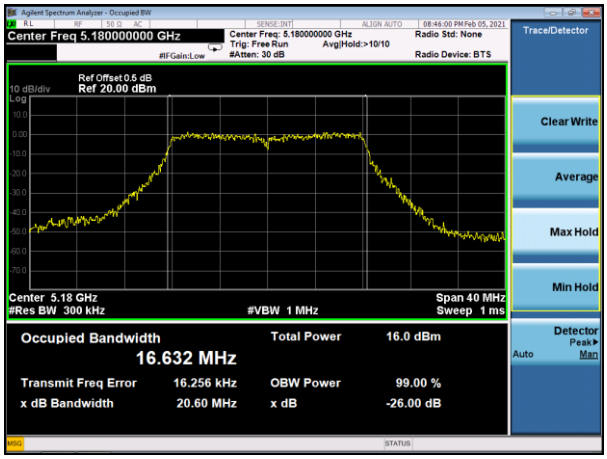
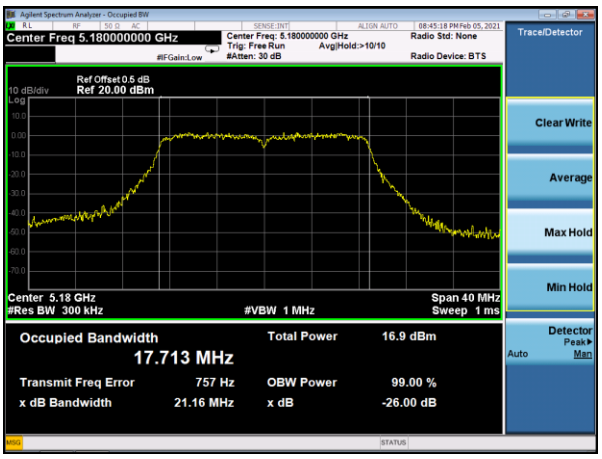
Test plot

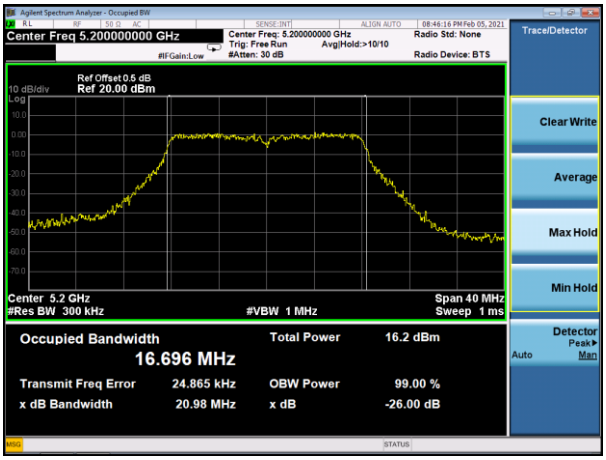
(802.11a) 26dB&99%Bandwidth plot on channel 36



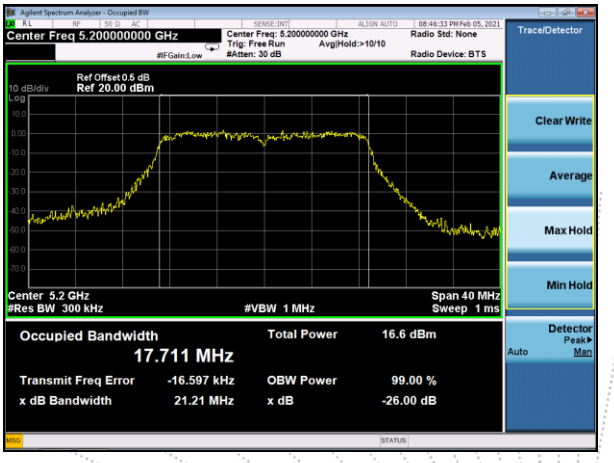
(802.11 n20) 26dB&99%Bandwidth plot on channel 36



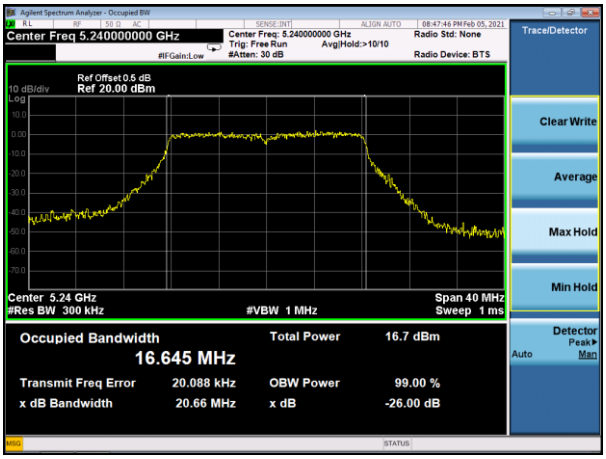
(802.11a) 26dB&99%Bandwidth plot on channel 40



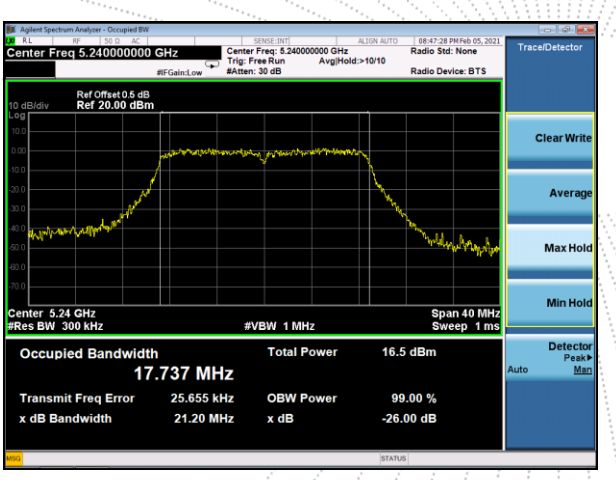
(802.11 n20) 26dB&99%Bandwidth plot on channel 40



(802.11a) 26dB&99%Bandwidth plot on channel 48



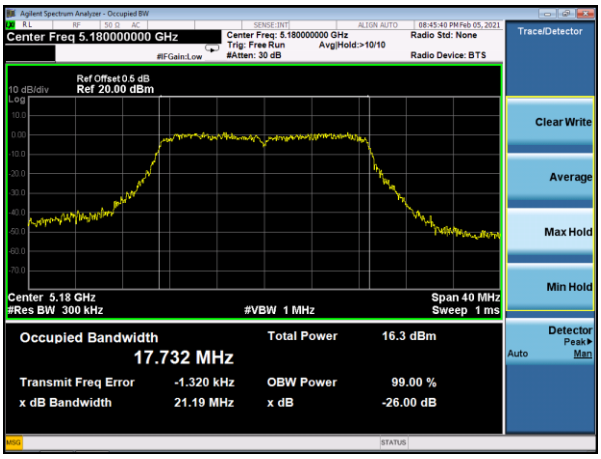
(802.11 n20) 26dB&99%Bandwidth plot on channel 48



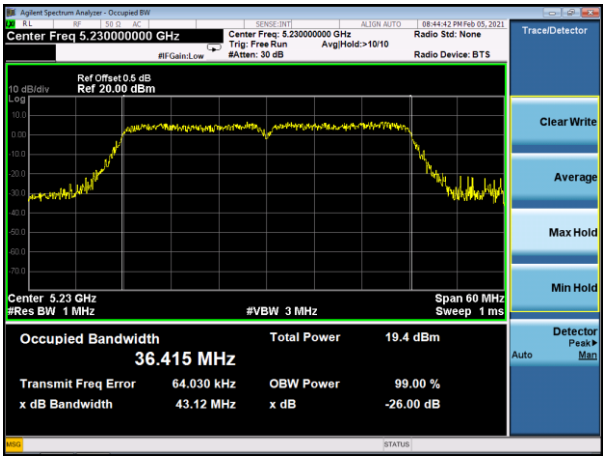
Test plot

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

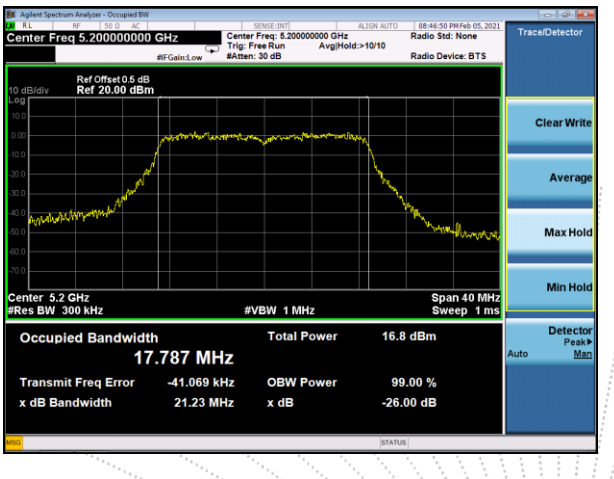
(802.11 AC20) -26dB&99%Bandwidth plot on channel 36



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



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

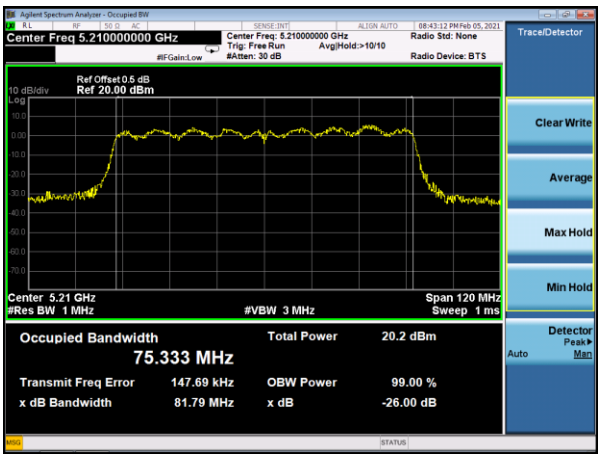


(802.11 AC20) -26dB&99%Bandwidth plot on channel 48

Test plot

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

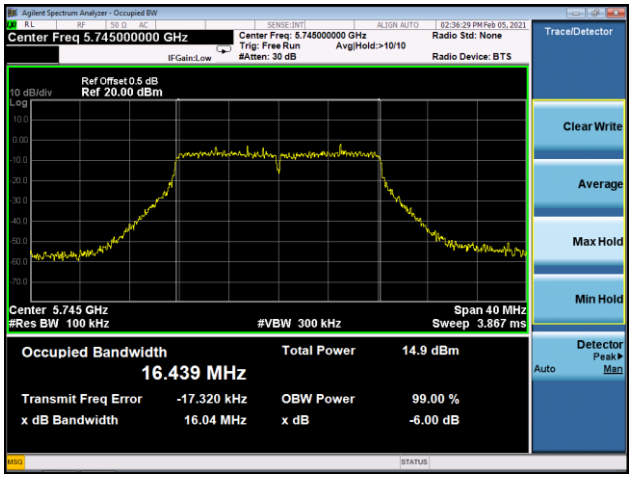
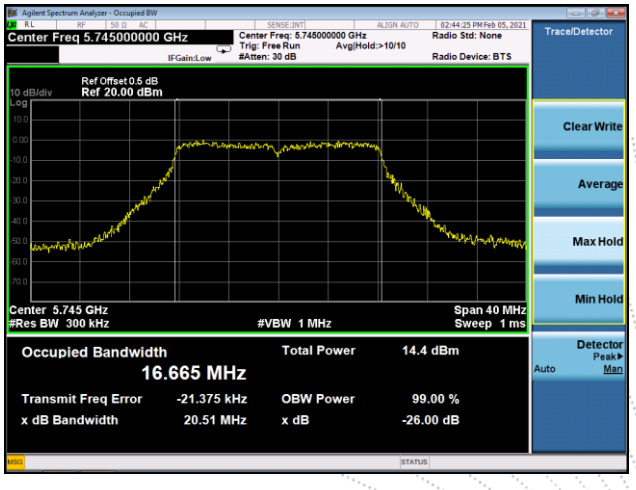
(802.11 AC80) -26dB&99%Bandwidth plot on channel 42

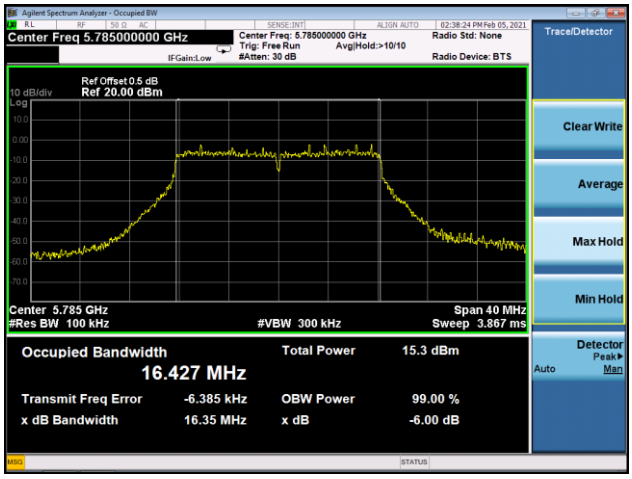
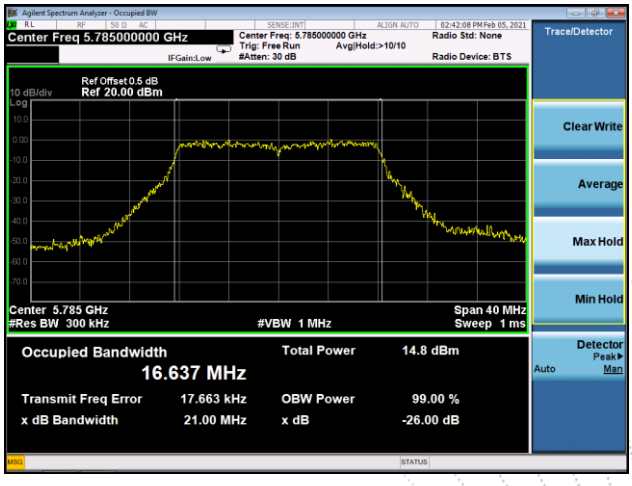
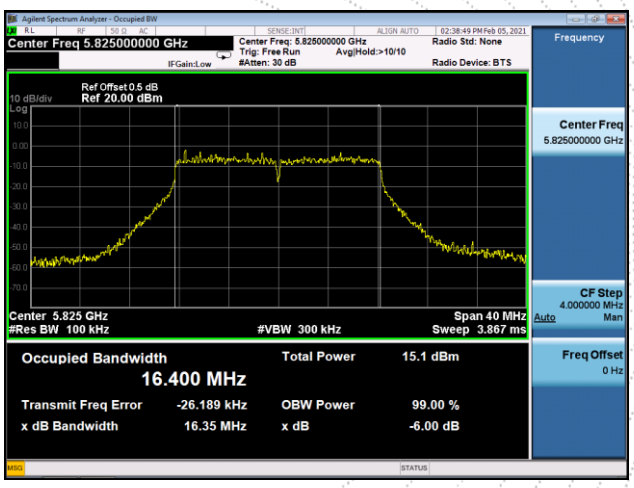


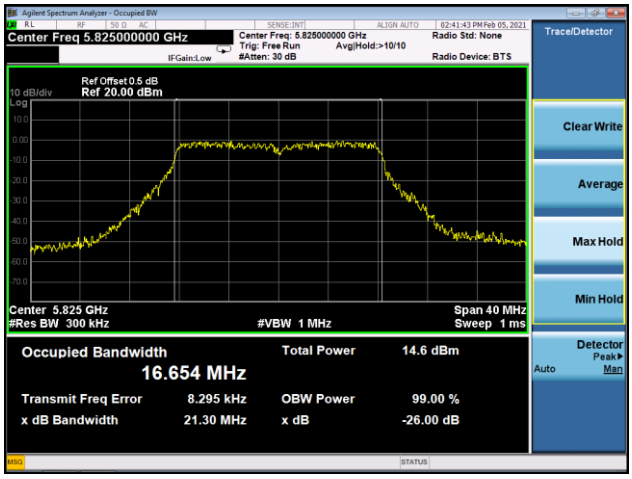
(802.11 AC40) -26dB&99%Bandwidth plot on channel 46

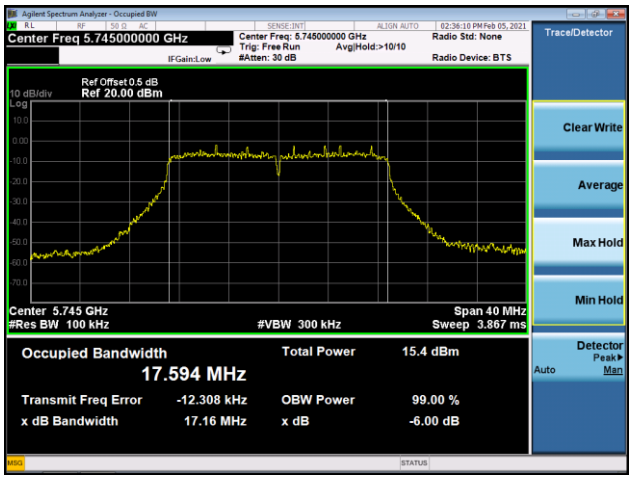
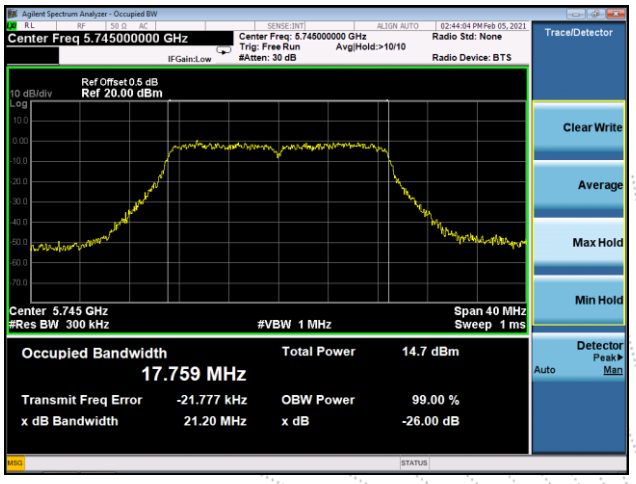
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V/60Hz
Test Mode ：	TX Frequency U-NII-3(5745-5825MHz)		

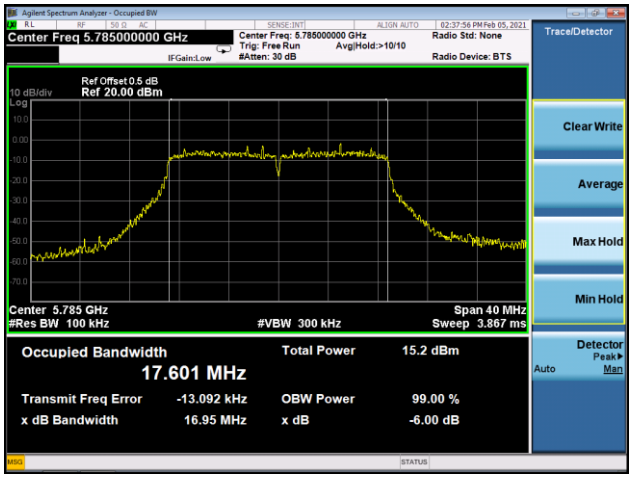
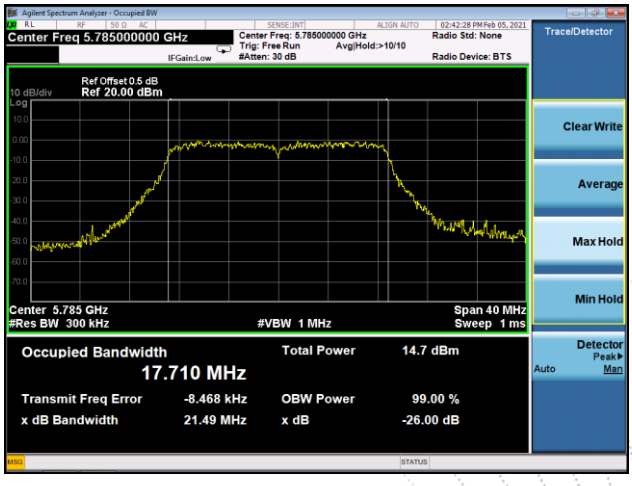
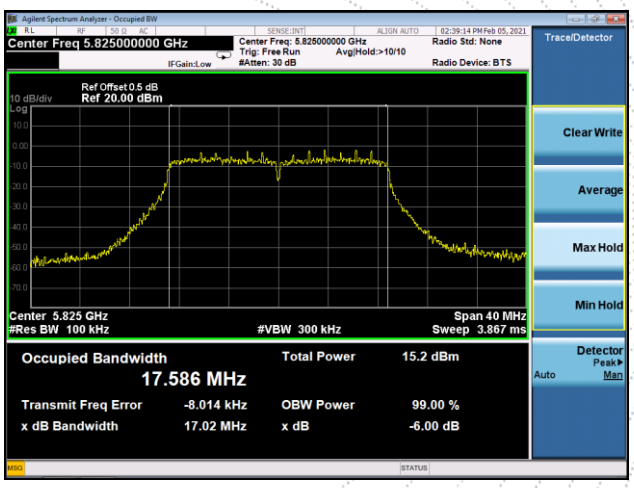
Mode	Channel	Frequency (MHz)	99% bandwidth (MHz)	6dB bandwidth (MHz)	Limit kHz	Result
802.11a	CH149	5745	16.665	16.04	≥500	Pass
	CH157	5785	16.637	16.35	≥500	Pass
	CH165	5825	16.654	16.35	≥500	Pass
802.11 n20	CH149	5745	17.759	17.16	≥500	Pass
	CH157	5785	17.710	16.95	≥500	Pass
	CH165	5825	17.743	17.02	≥500	Pass
802.11 n40	CH151	5755	36.604	35.31	≥500	Pass
	CH159	5795	36.710	35.15	≥500	Pass
802.11 AC20	CH149	5745	17.774	16.31	≥500	Pass
	CH157	5785	17.726	16.91	≥500	Pass
	CH165	5825	17.758	16.87	≥500	Pass
802.11 AC40	CH151	5755	36.684	35.61	≥500	Pass
	CH159	5795	36.491	35.35	≥500	Pass
802.11 AC80	CH155	5775	75.374	75.28	≥500	Pass

Mode:	802.11a
5745MHz **6dB bandwidth**	
5745MHz 99% bandwidth	

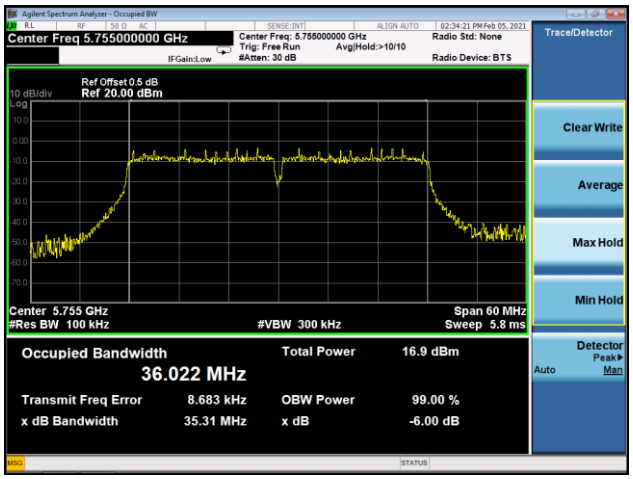
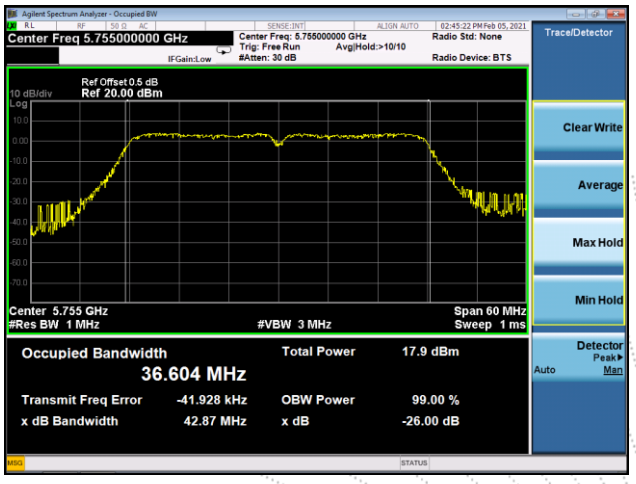
5785MHz **6dB bandwidth**	
5785MHz 99% bandwidth	
5825MHz **6dB bandwidth**	

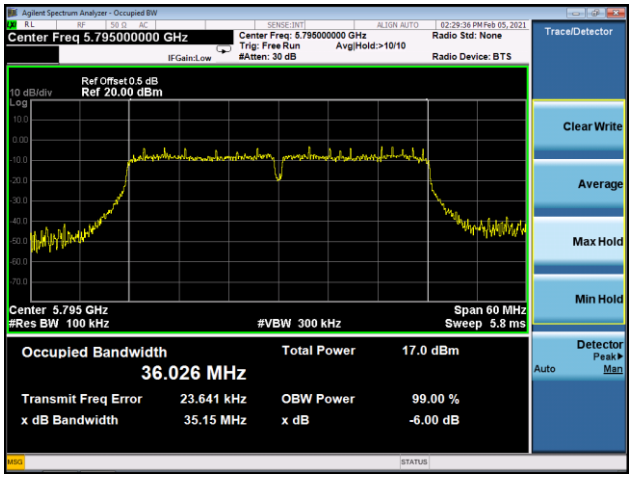
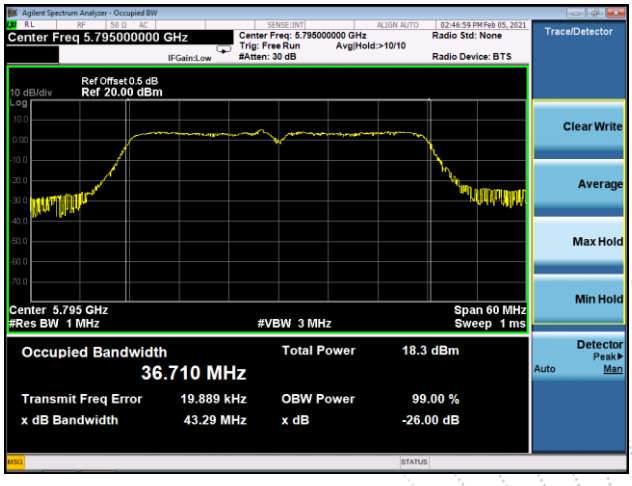
5825MHz 99% bandwidth	

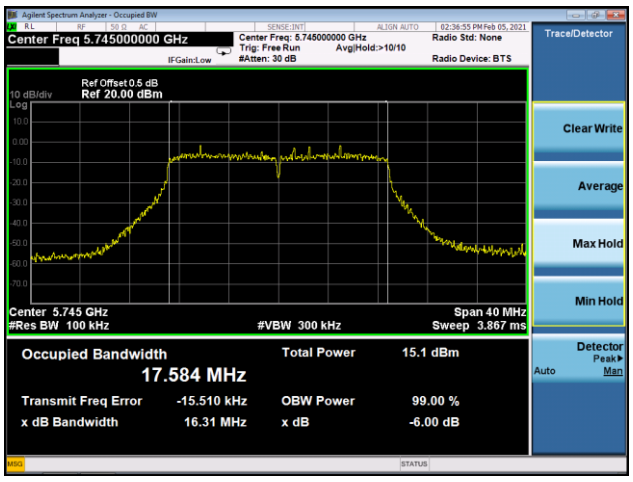
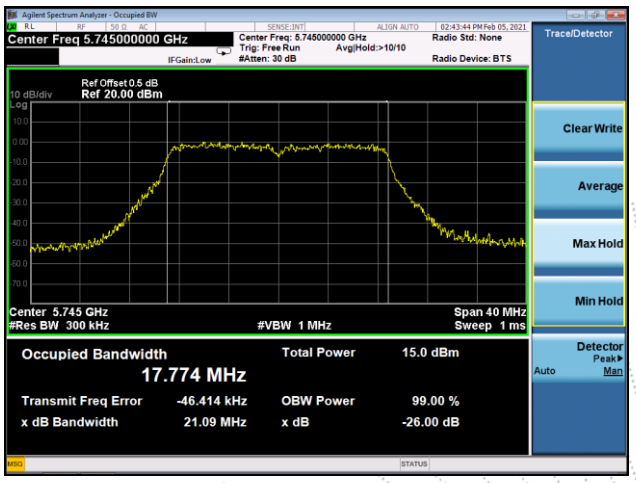
Mode:	802.11n-HT20
5745MHz **6dB bandwidth**	
5745MHz 99% bandwidth	

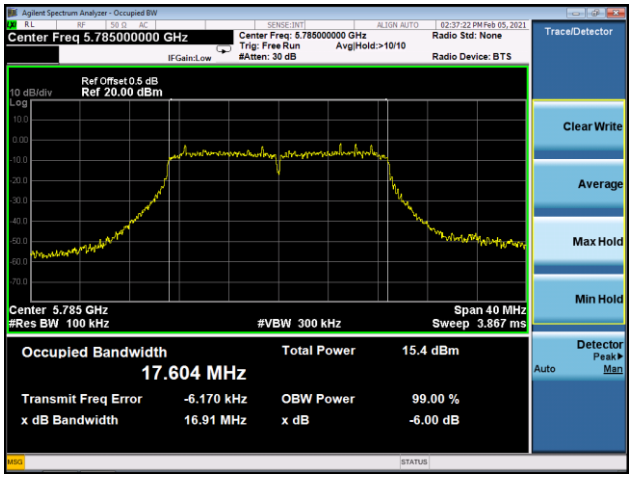
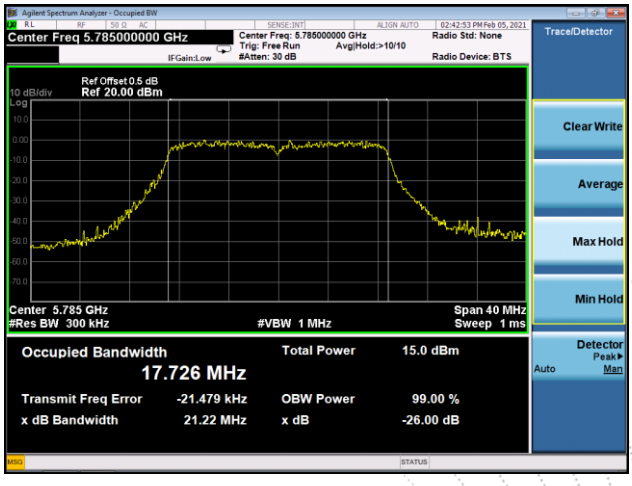
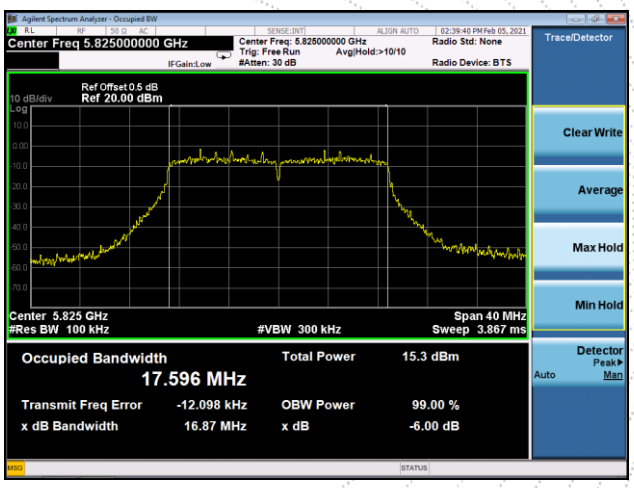
5785MHz **6dB bandwidth**	
5785MHz 99% bandwidth	
5825MHz **6dB bandwidth**	

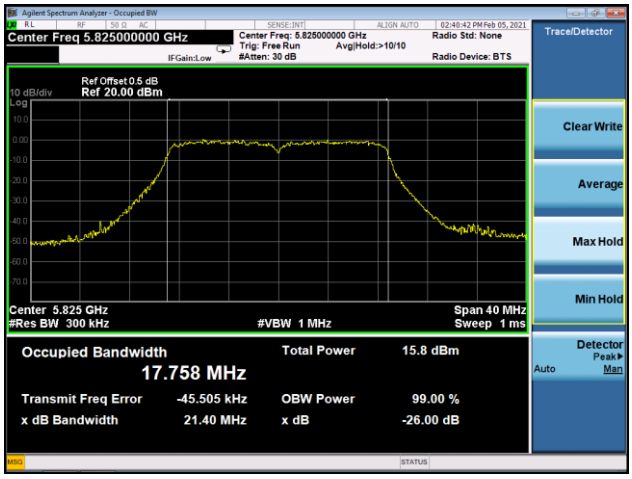
5825MHz 99% bandwidth	

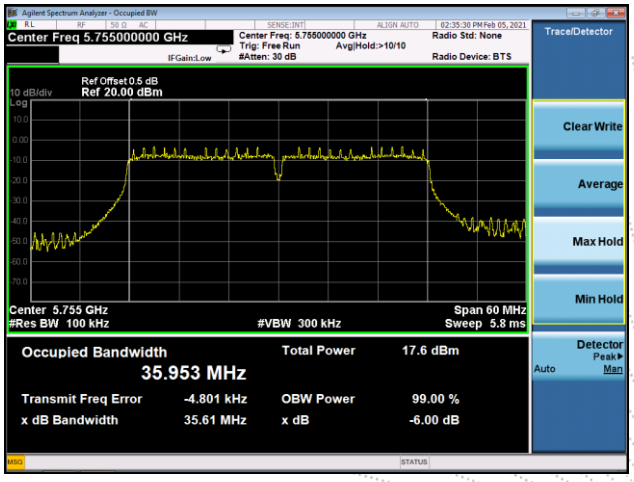
Mode:	802.11n-HT40
5755 MHz **6dB bandwidth**	
5755 MHz 99% bandwidth	

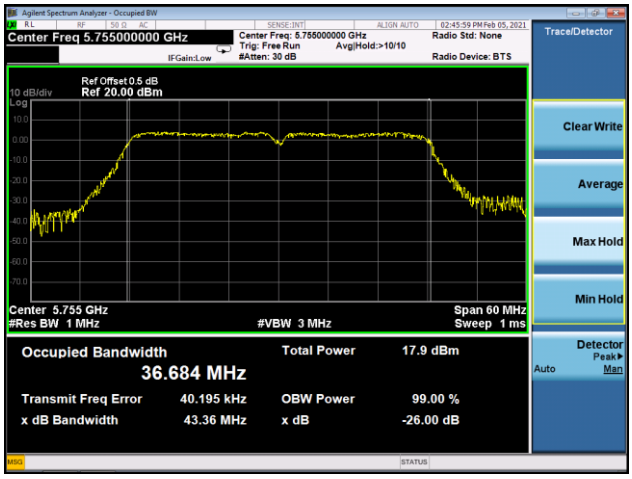
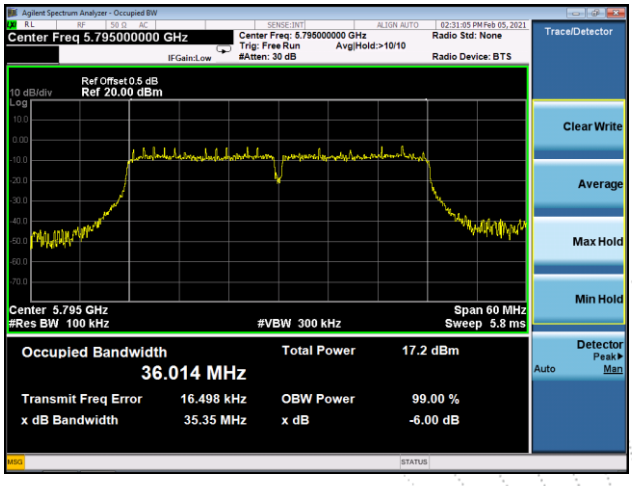
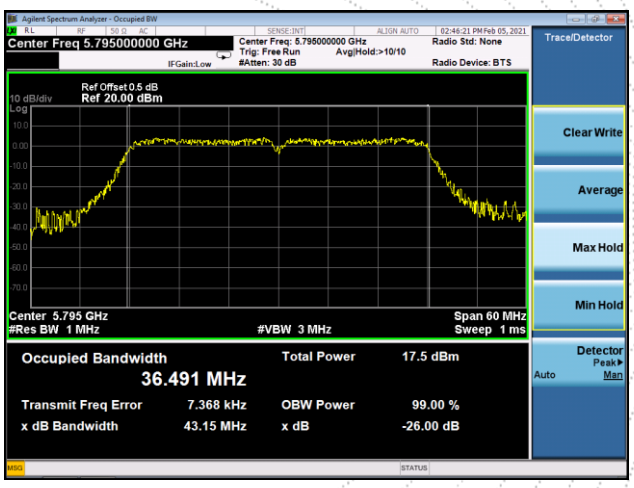
5795 MHz **6dB bandwidth**	
5795 MHz 99% bandwidth	

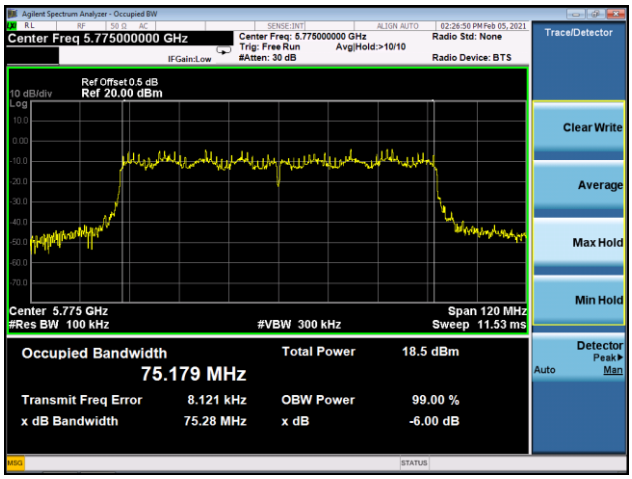
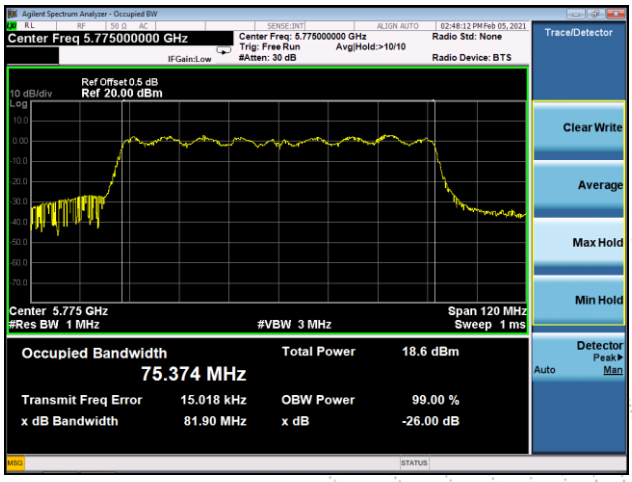
Mode:	802.11ac-HT20
5745MHz **6dB bandwidth**	
5745MHz 99% bandwidth	

5785MHz **6dB bandwidth**	
5785MHz 99% bandwidth	
5825MHz **6dB bandwidth**	

5825MHz 99% bandwidth	

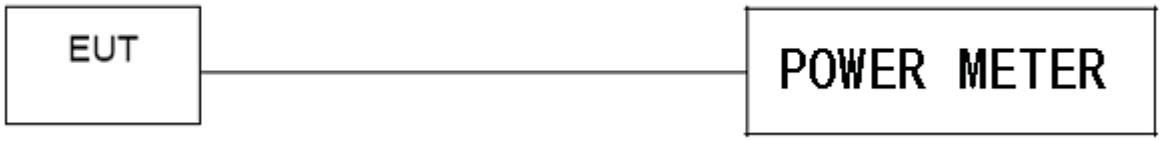
Mode:	**802.11ac-HT40**
5755 MHz **6dB bandwidth**	

5755 MHz 99% bandwidth	
5795 MHz **6dB bandwidth**	
5795 MHz 99% bandwidth	

Mode:	802.11ac-HT80
5775 MHz **6dB bandwidth**	
5775 MHz 99% 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	1W
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)		

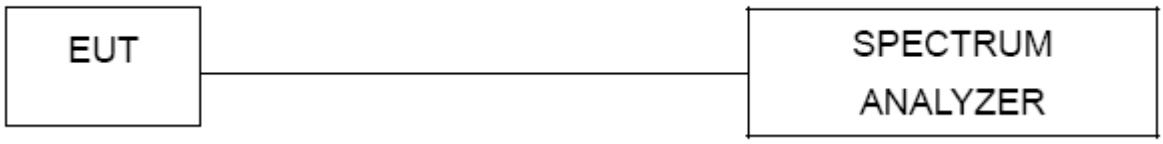
Test Channel	Frequency (MHz)	Maximum output power. Antenna port (AV) (dBm)	LIMIT dBm	Result
TX 802.11a Mode				
CH36	5180	14.515	30	Pass
CH40	5200	14.510	30	Pass
CH48	5240	14.919	30	Pass
TX 802.11 n20M Mode				
CH36	5180	13.172	30	Pass
CH40	5200	12.987	30	Pass
CH48	5240	13.769	30	Pass
TX 802.11 n40M Mode				
CH38	5190	12.785	30	Pass
CH46	5230	12.345	30	Pass
TX 802.11 AC20M Mode				
CH36	5180	13.195	30	Pass
CH40	5200	13.090	30	Pass
CH48	5240	13.578	30	Pass
TX 802.11 AC40M Mode				
CH38	5190	12.065	30	Pass
CH46	5230	12.674	30	Pass
TX 802.11 AC80M Mode				
CH42	5210	11.475	30	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 (MHz)	Maximum output power. Antenna port (AV) (dBm)	LIMIT dBm	Result
TX 802.11a Mode				
CH 149	5745	12.949	30	Pass
CH 157	5785	12.963	30	Pass
CH 165	5825	12.933	30	Pass
TX 802.11 n20M Mode				
CH 149	5745	11.364	30	Pass
CH 157	5785	11.606	30	Pass
CH 165	5825	11.785	30	Pass
TX 802.11 n40M Mode				
CH 151	5755	10.520	30	Pass
CH 159	5795	10.761	30	Pass
TX 802.11 AC20M Mode				
CH 149	5745	11.408	30	Pass
CH 157	5785	11.536	30	Pass
CH 165	5825	11.520	30	Pass
TX 802.11 AC40M Mode				
CH 151	5755	10.040	30	Pass
CH 159	5795	10.180	30	Pass
TX 802.11 AC80M Mode				
CH 155	5775	9.549	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

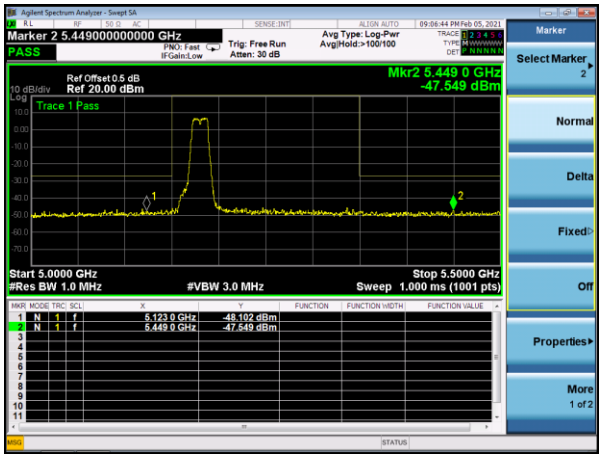
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

11.5 Test Result

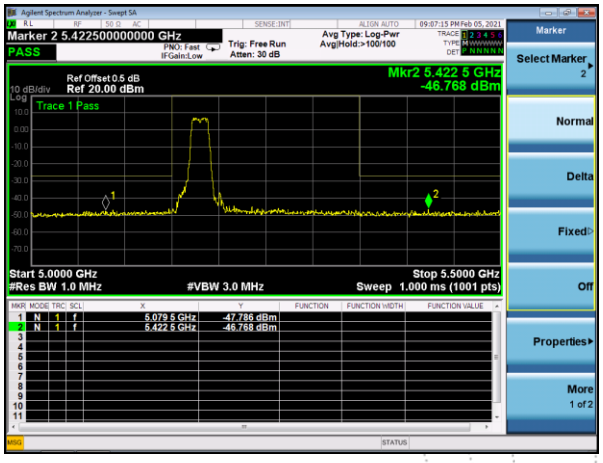
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V/60Hz

5.180~5.240 GHz

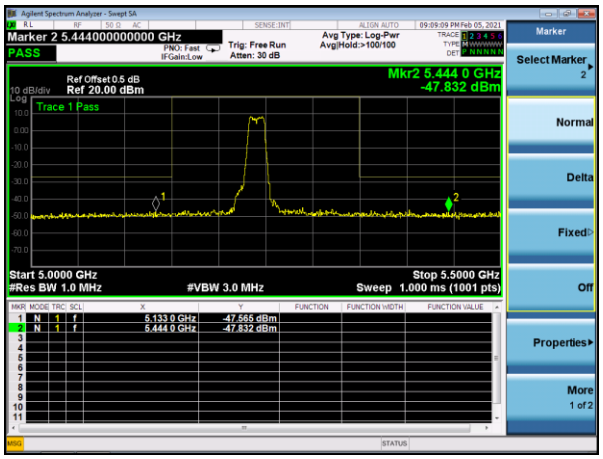
(802.11a) Band Edge, Left Side



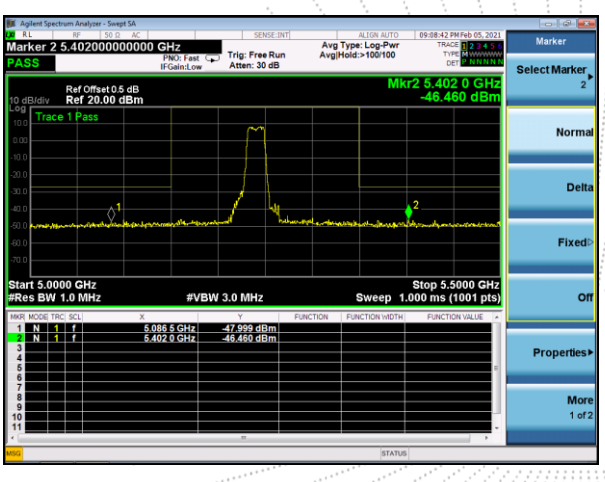
(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

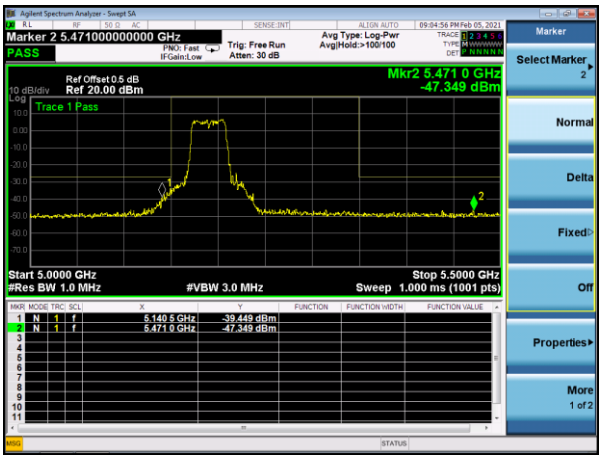


(802.11n20) Band Edge, Right Side

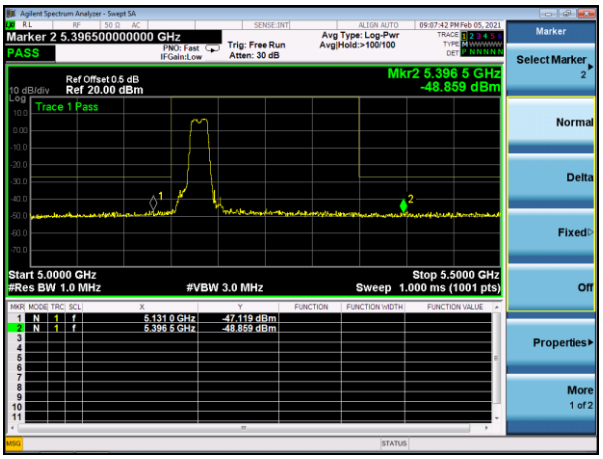


5.180~5.240 GHz

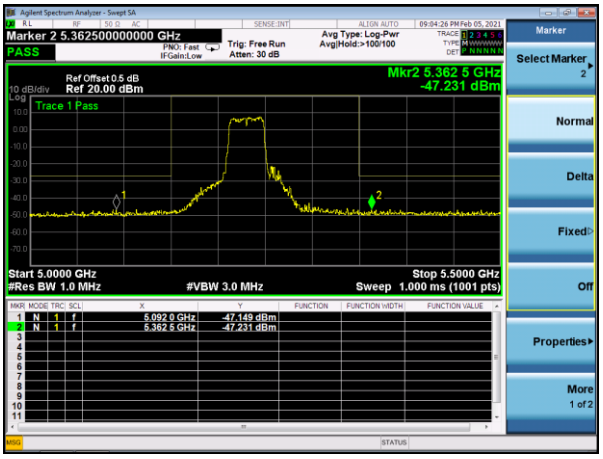
(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Right Side



(802.11ac20) Band Edge, Right Side