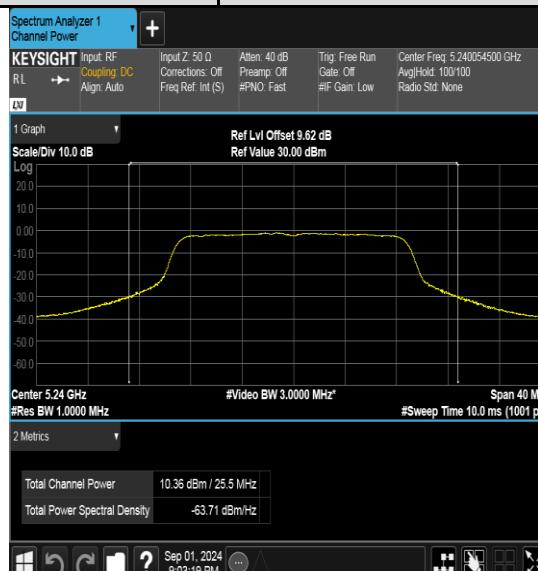
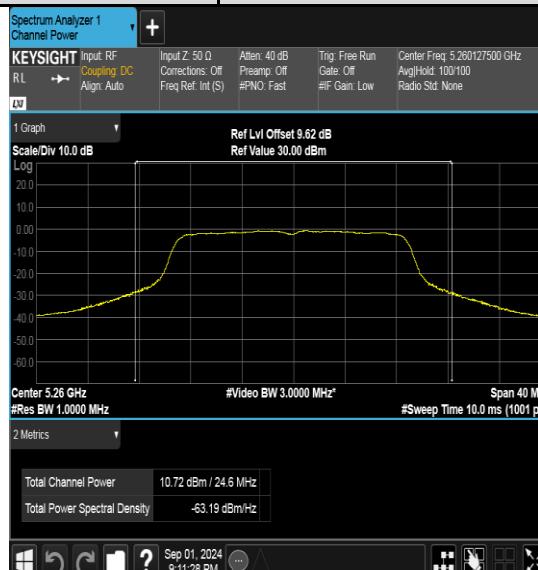
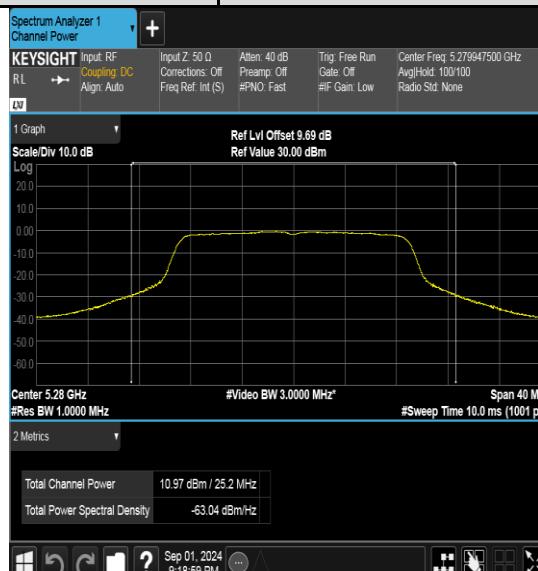
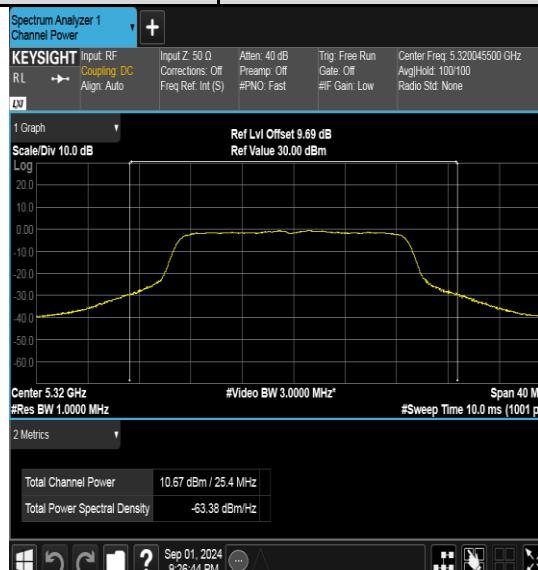
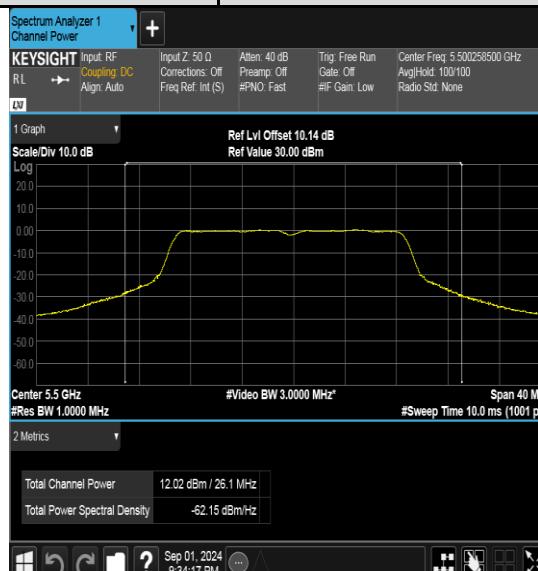


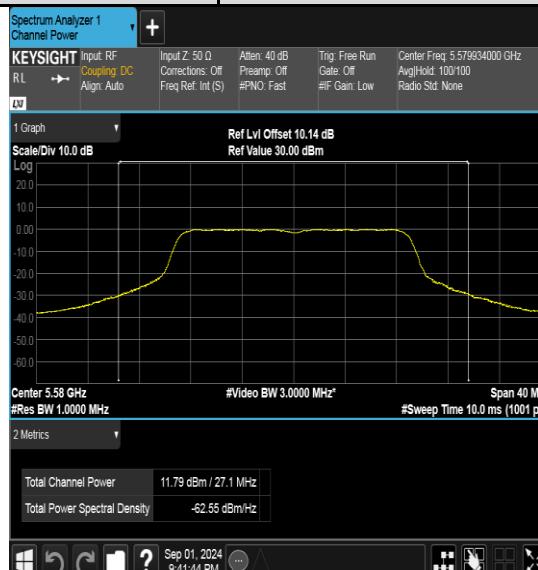
Test Mode	Test Channel	Verdict
11ac VHT20	5240	PASS
		

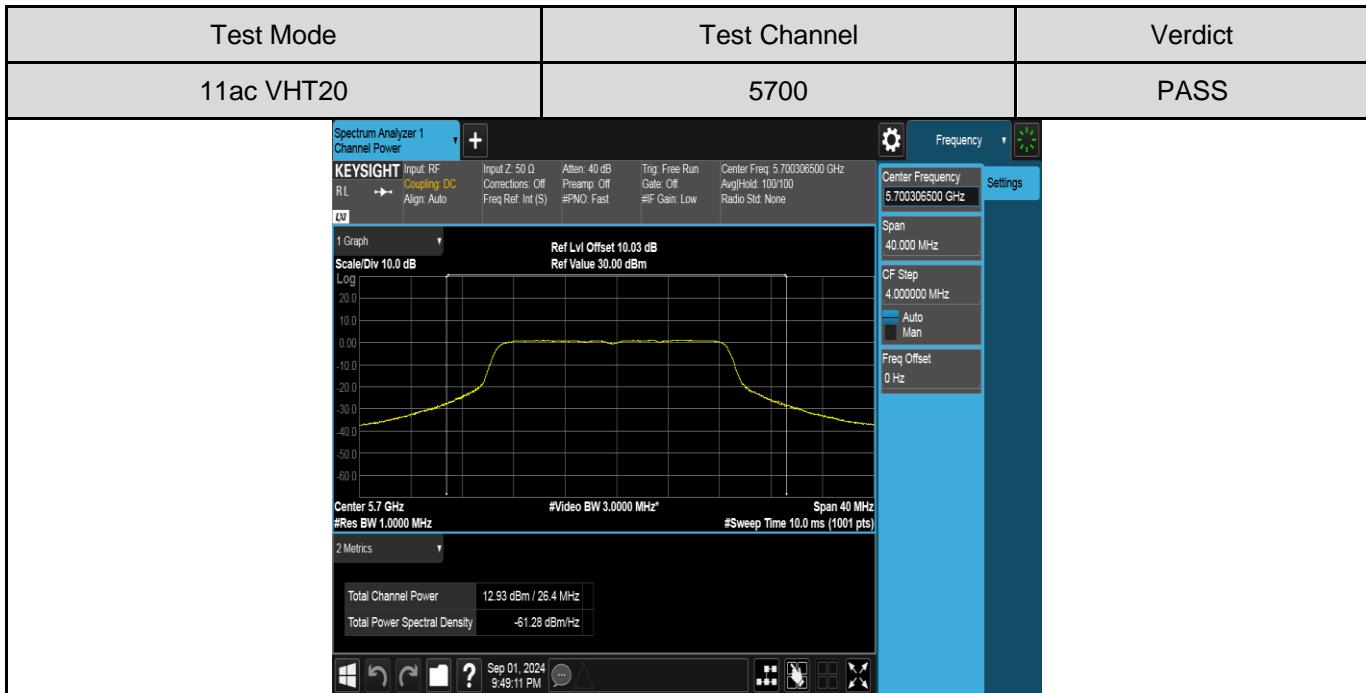
Test Mode	Test Channel	Verdict
11ac VHT20	5260	PASS
		

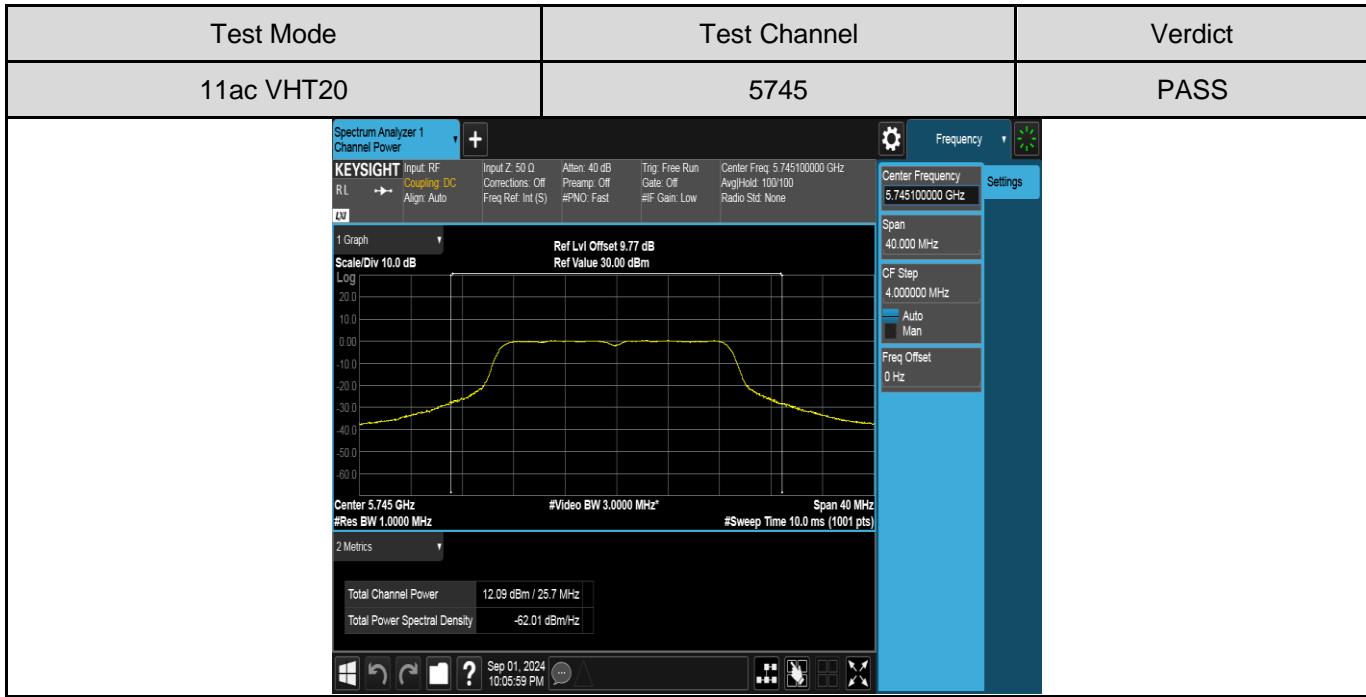
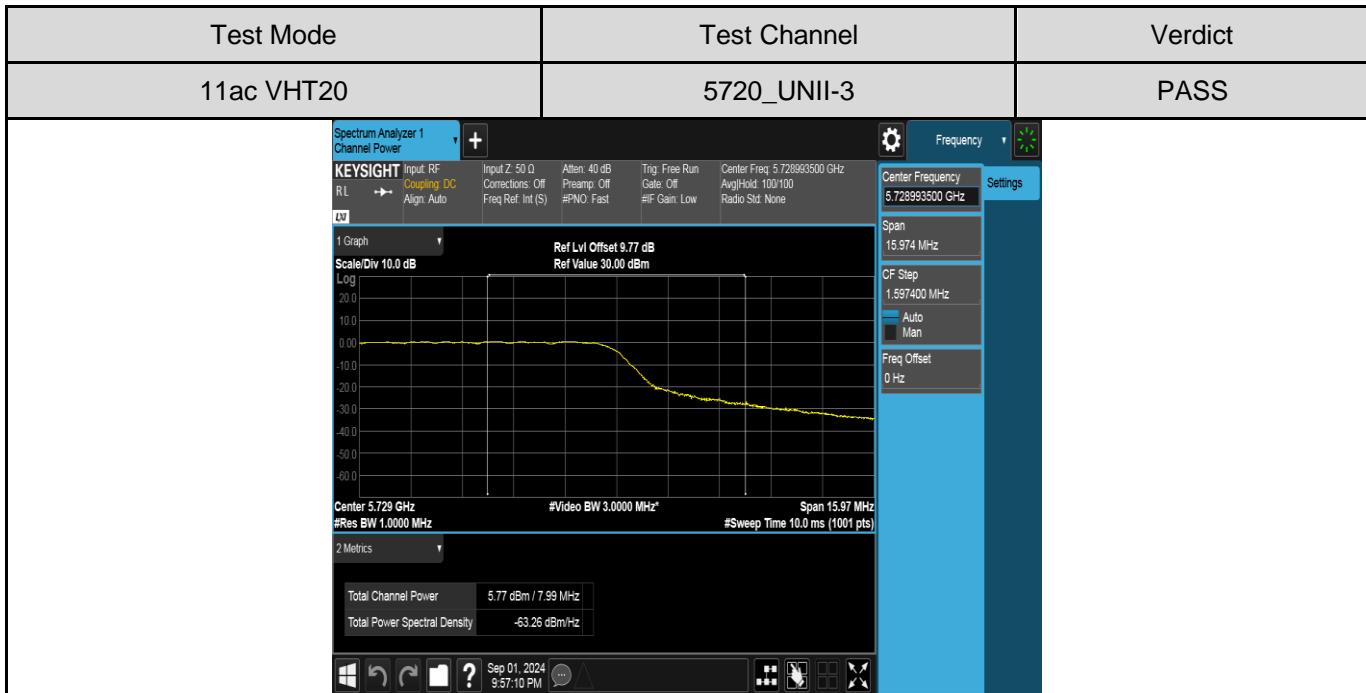
Test Mode	Test Channel	Verdict
11ac VHT20	5280	PASS
		

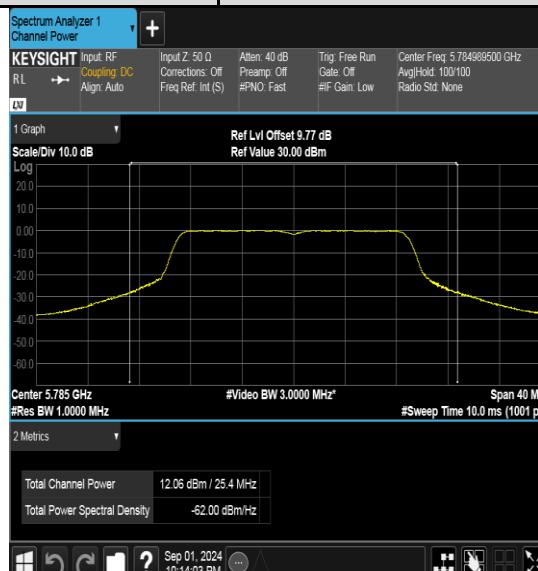
Test Mode	Test Channel	Verdict
11ac VHT20	5320	PASS
		

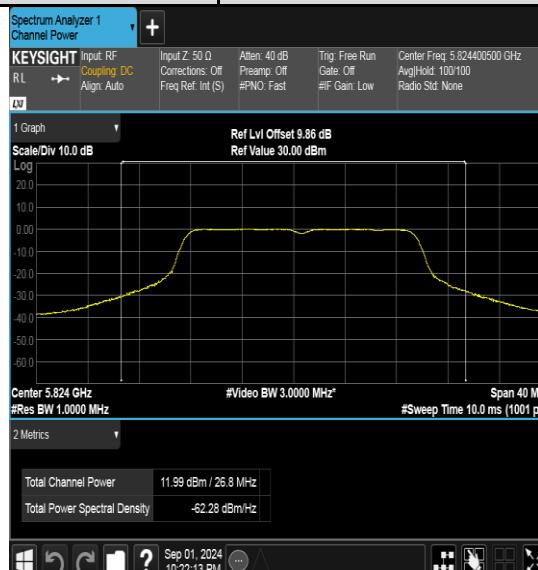
Test Mode	Test Channel	Verdict
11ac VHT20	5500	PASS
		

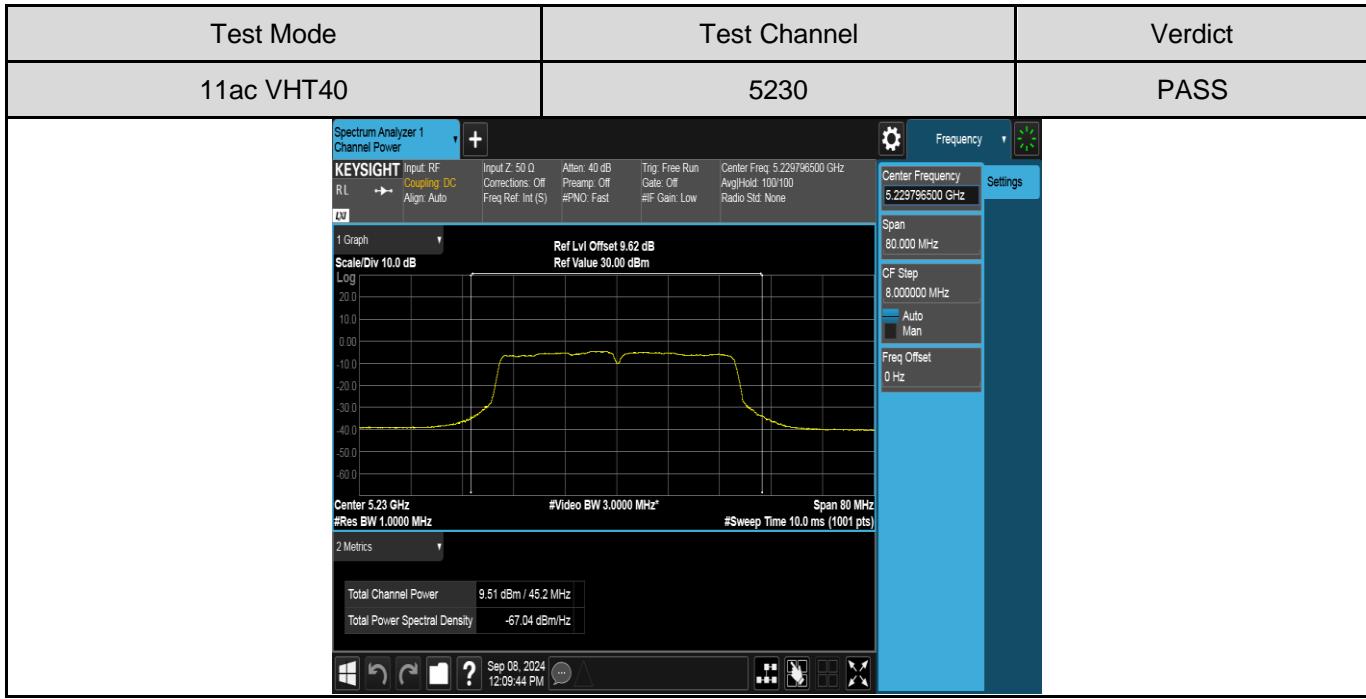
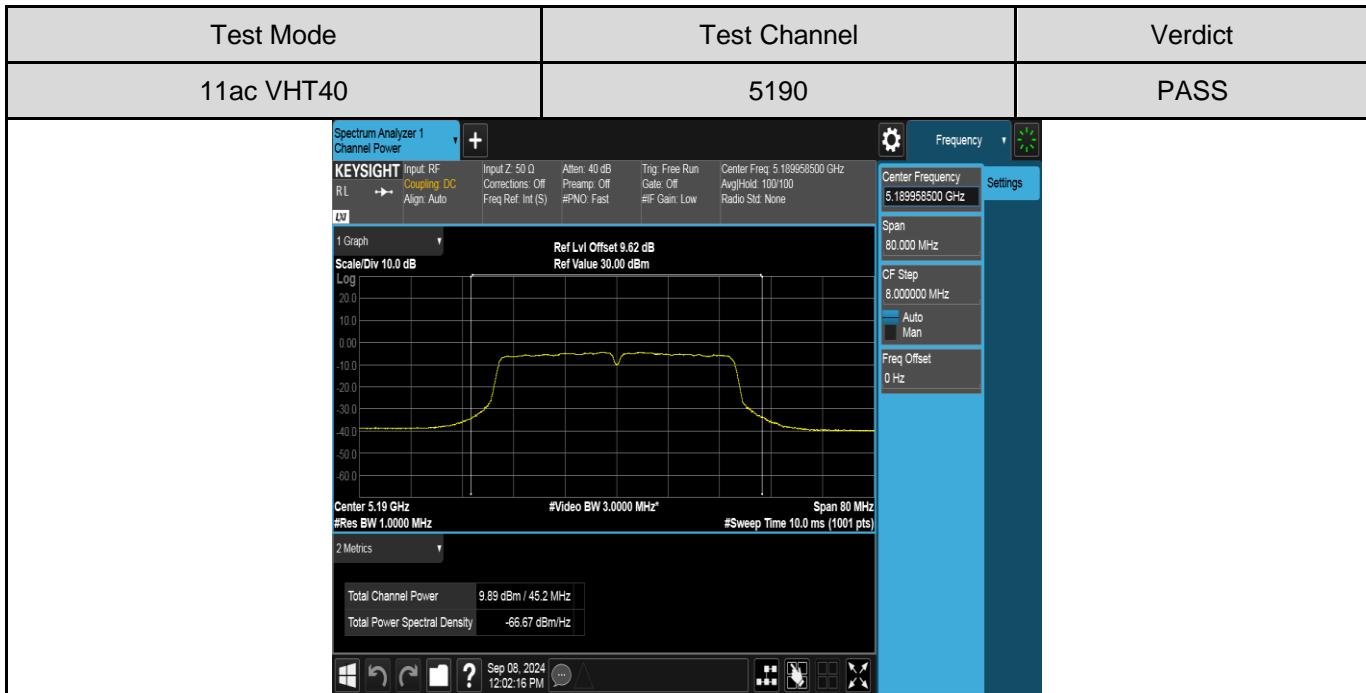
Test Mode	Test Channel	Verdict
11ac VHT20	5580	PASS
		

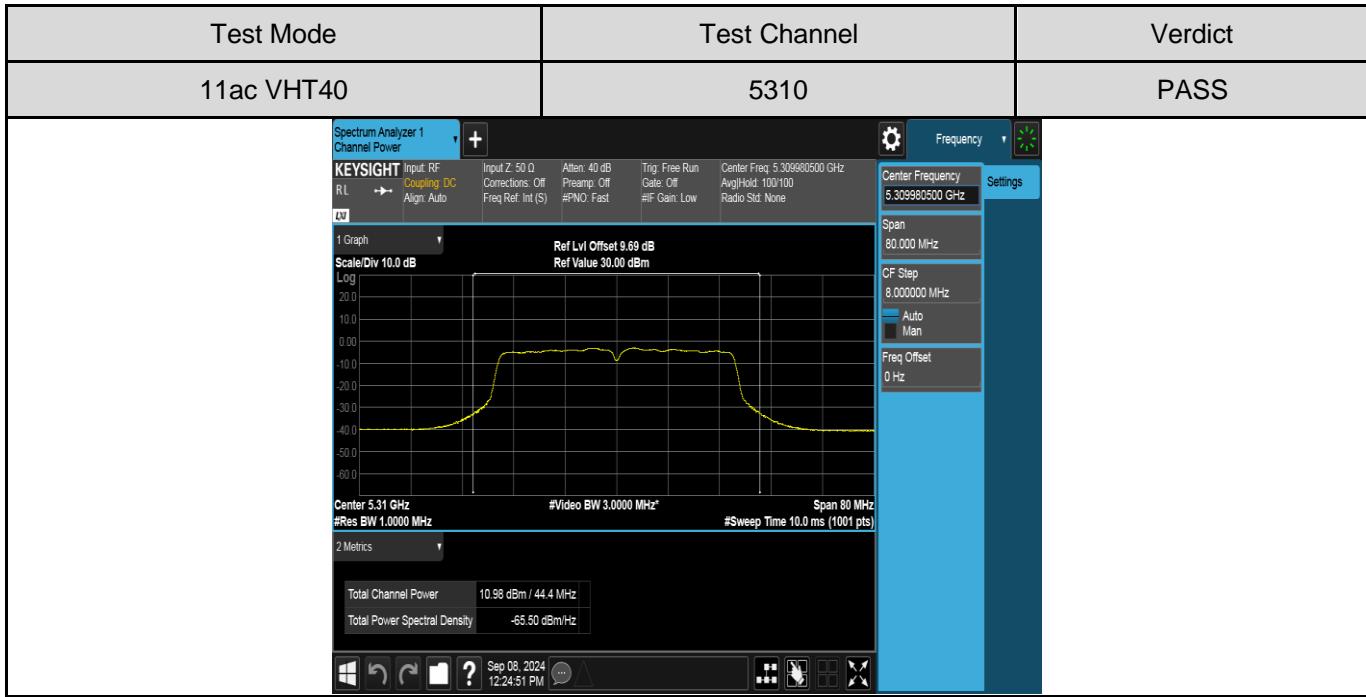
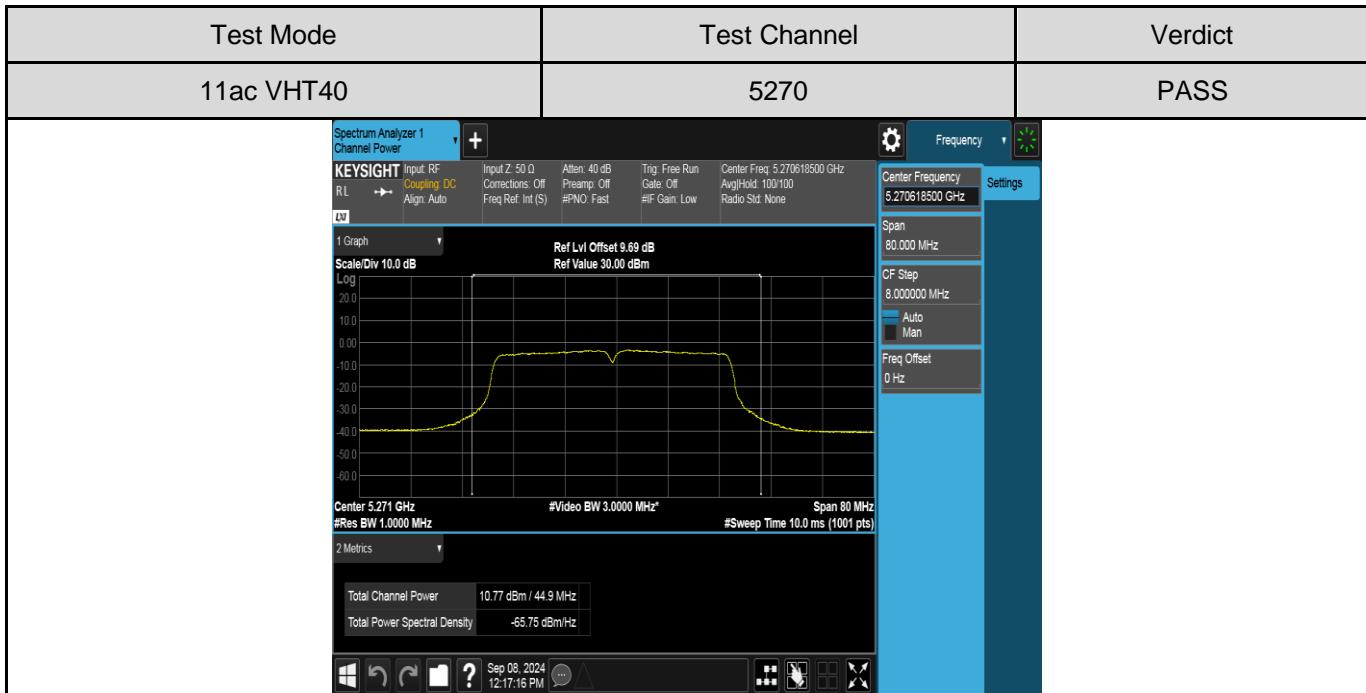


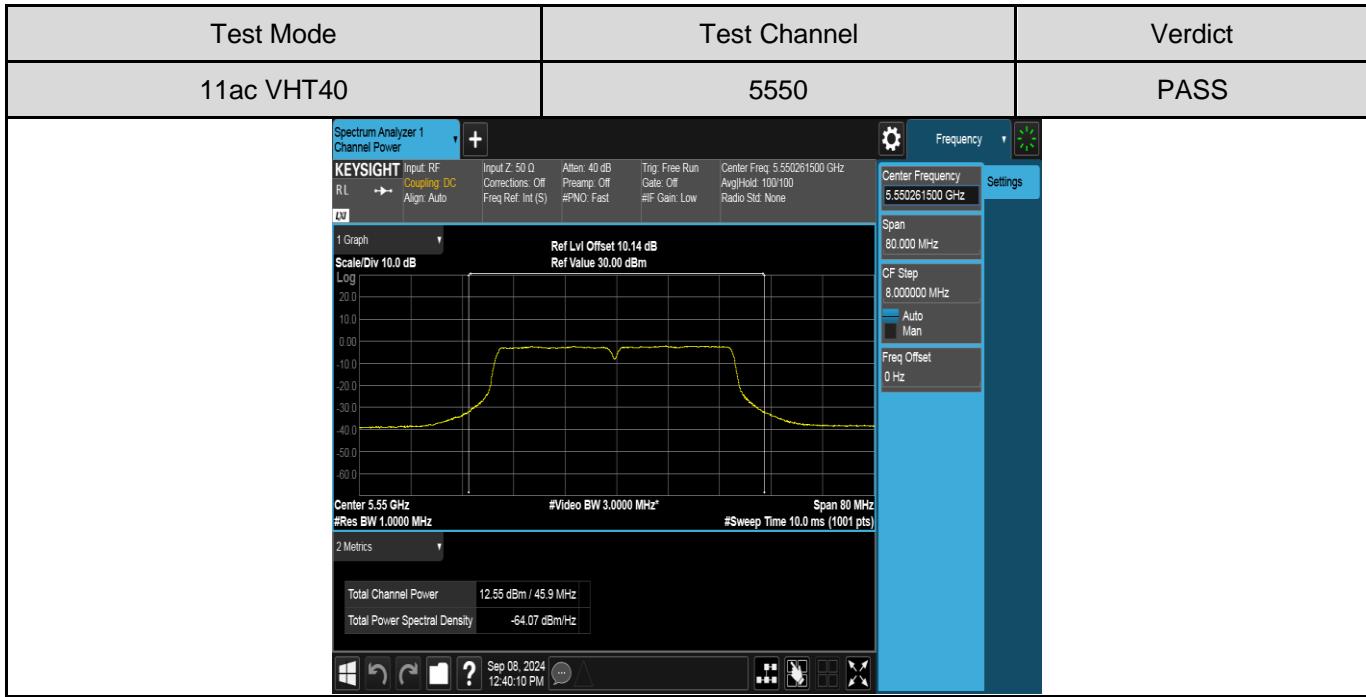
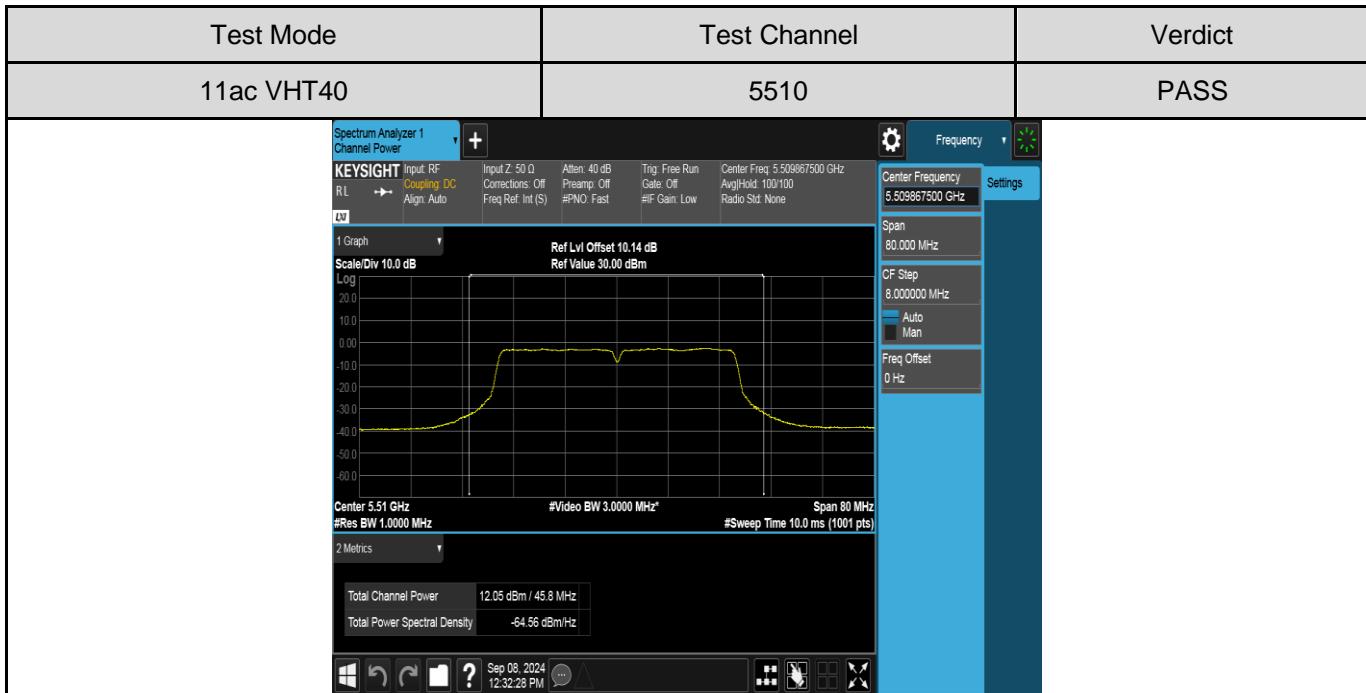


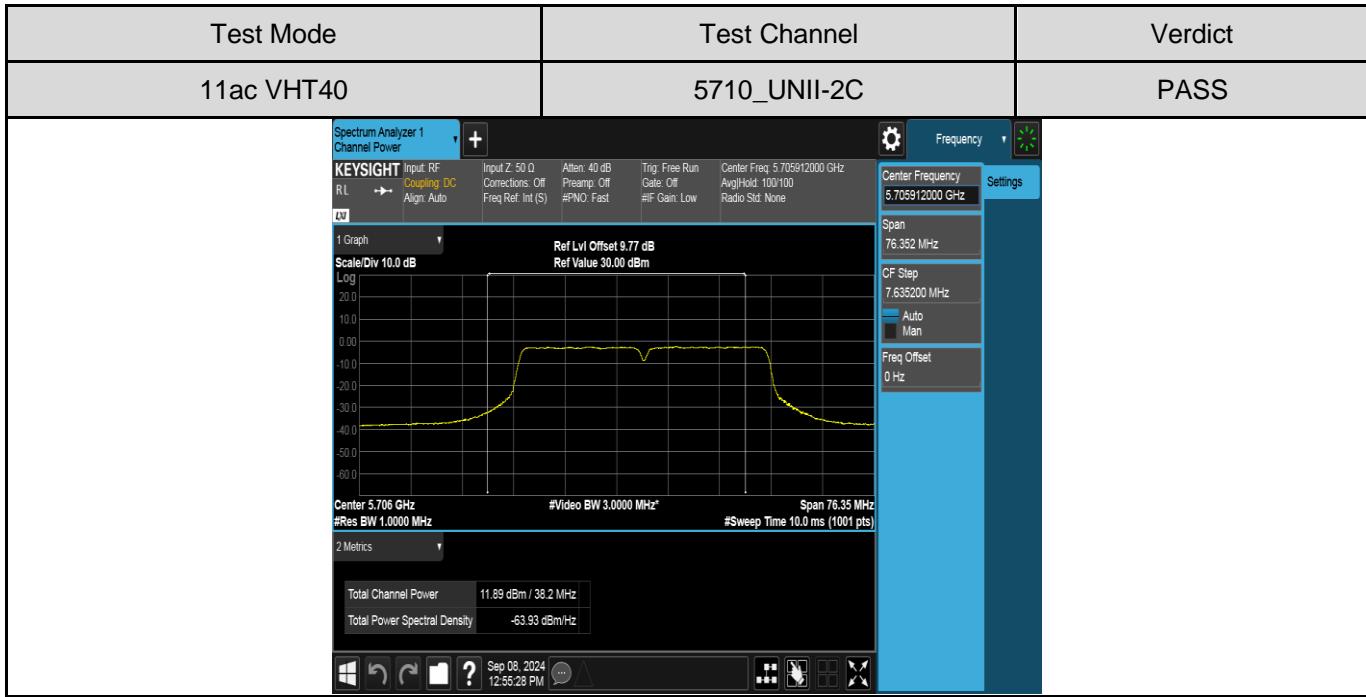
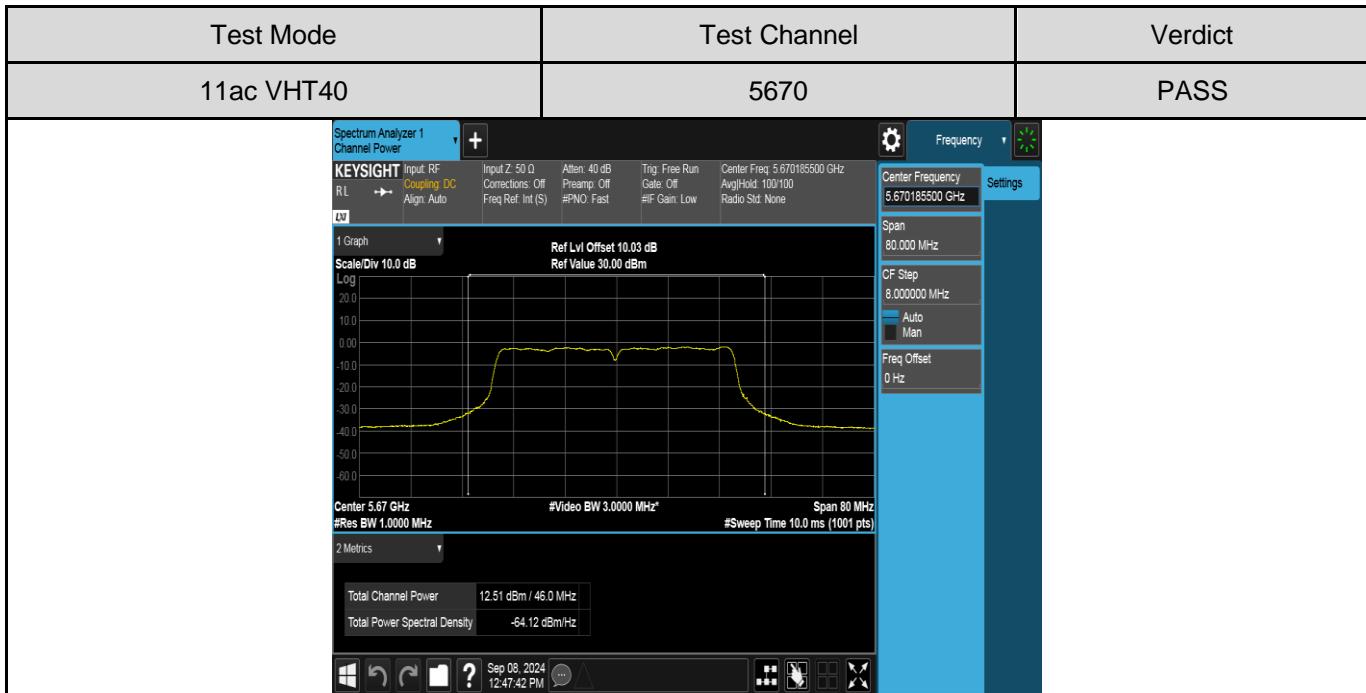
Test Mode	Test Channel	Verdict
11ac VHT20	5785	PASS
		

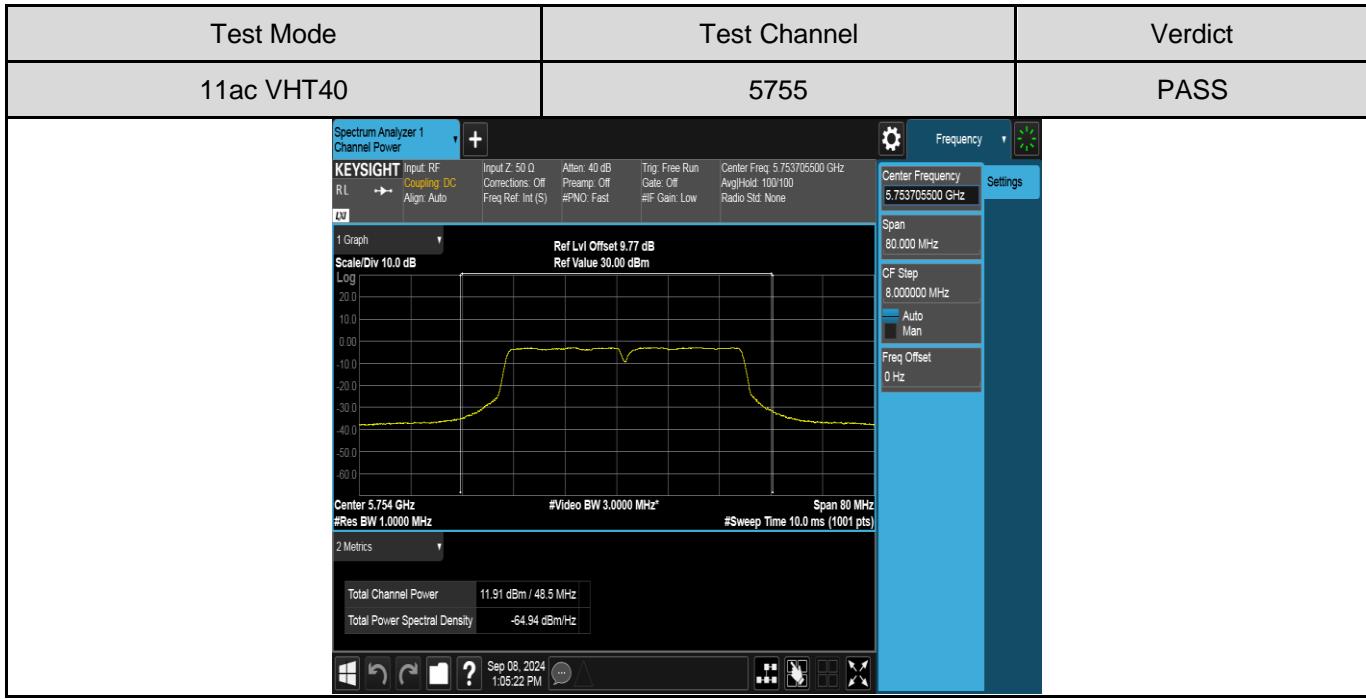
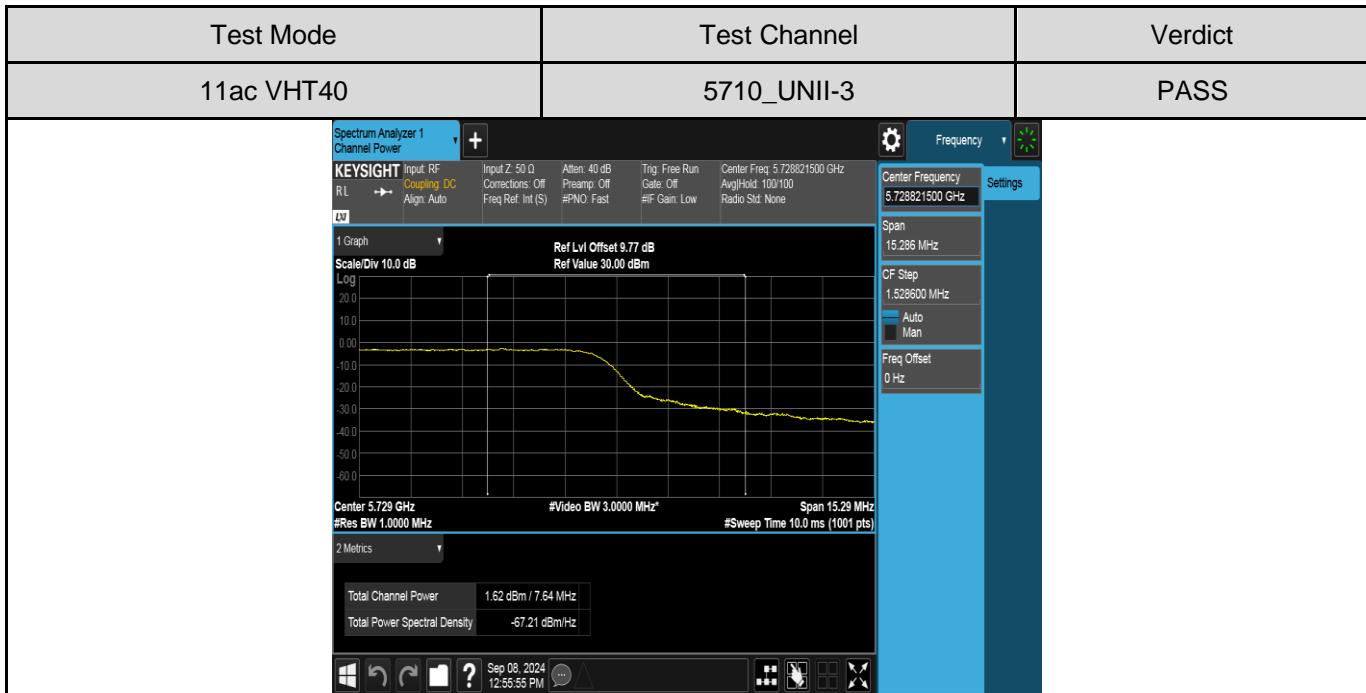
Test Mode	Test Channel	Verdict
11ac VHT20	5825	PASS
		

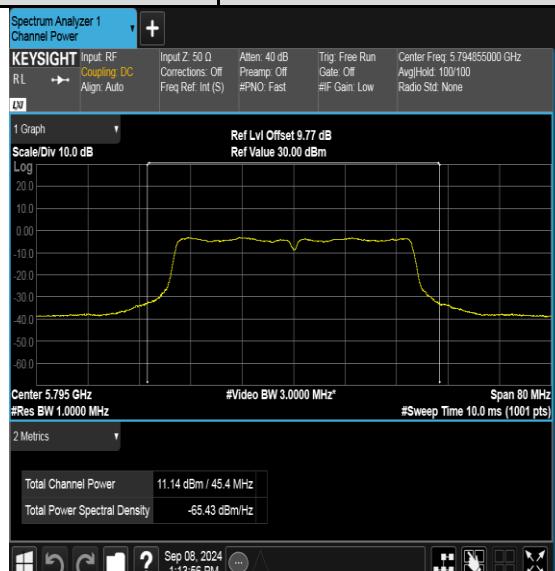




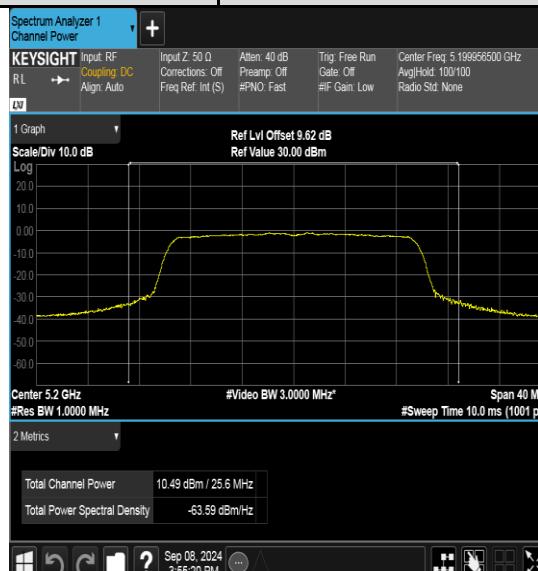


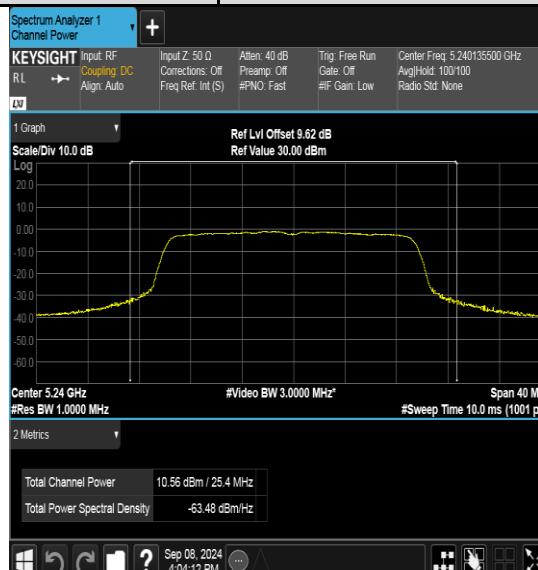


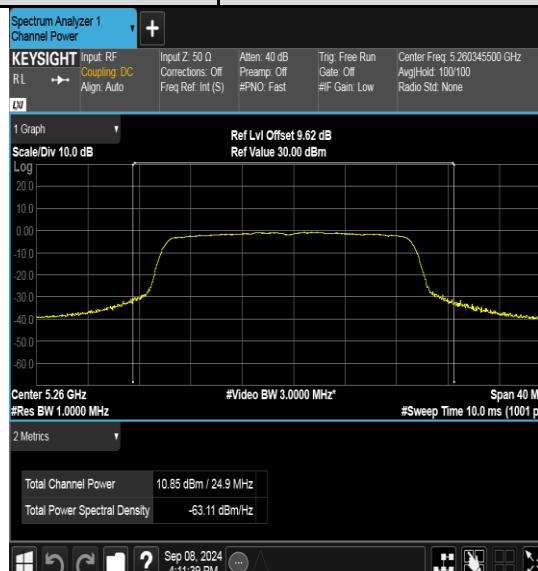


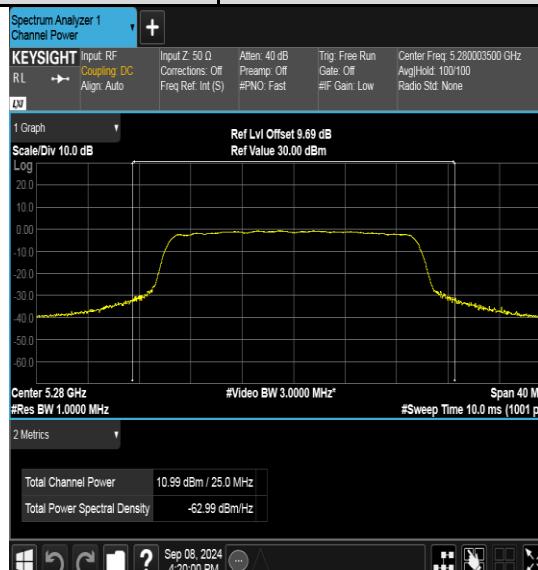
Test Mode	Test Channel	Verdict
11ac VHT40	5795	PASS
		

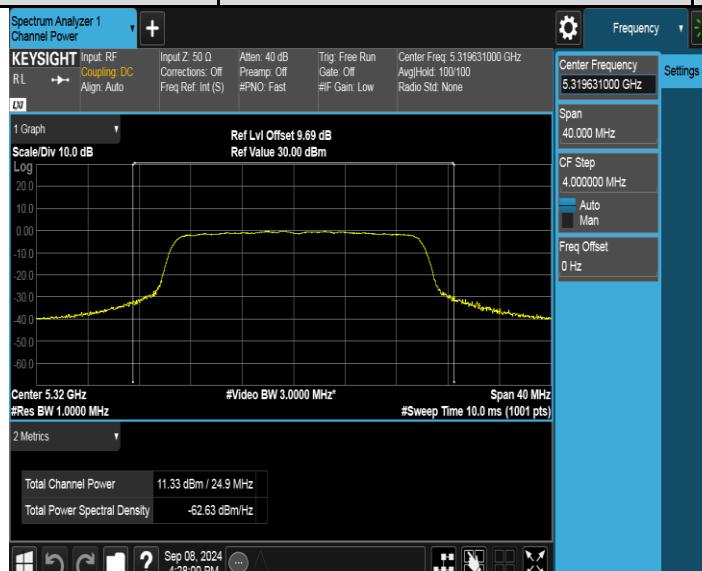
Test Mode	Test Channel	Verdict
11ax HE20	5180	PASS
		

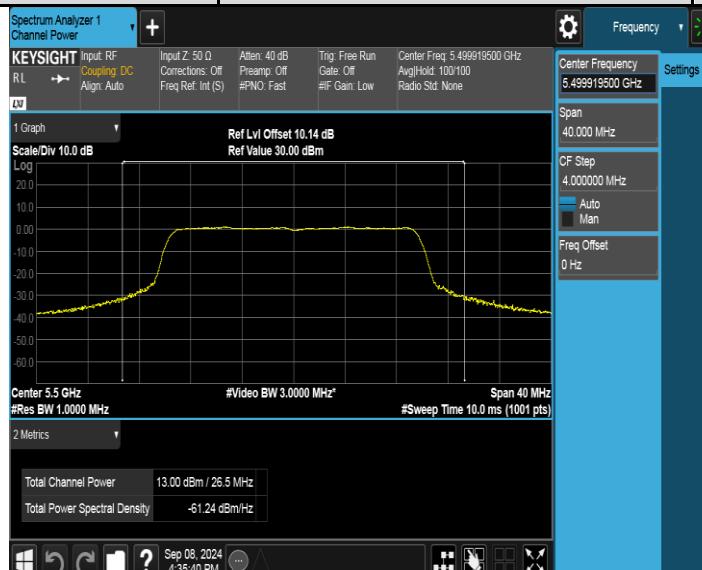
Test Mode	Test Channel	Verdict
11ax HE20	5200	PASS
		

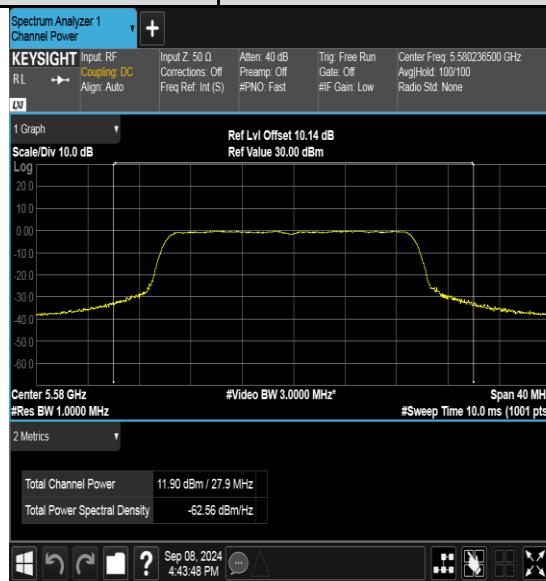
Test Mode	Test Channel	Verdict
11ax HE20	5240	PASS
		

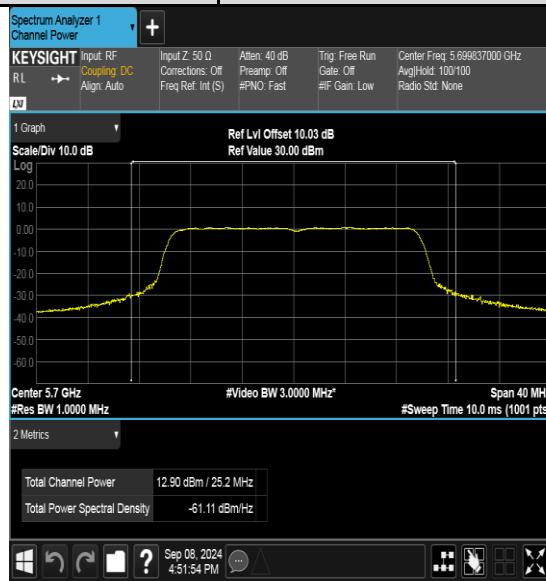
Test Mode	Test Channel	Verdict
11ax HE20	5260	PASS
		

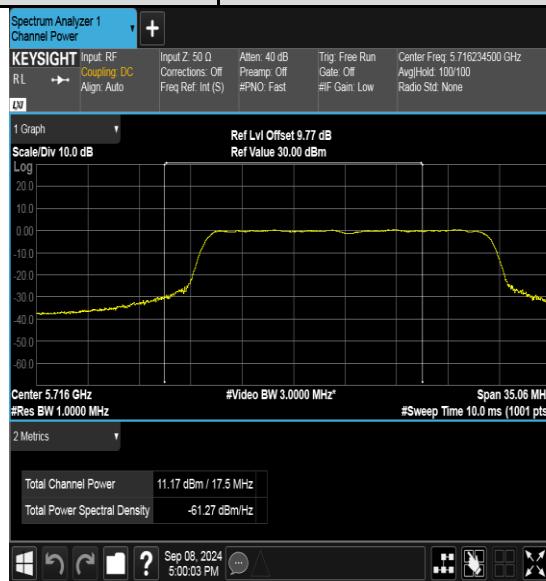
Test Mode	Test Channel	Verdict
11ax HE20	5280	PASS
		

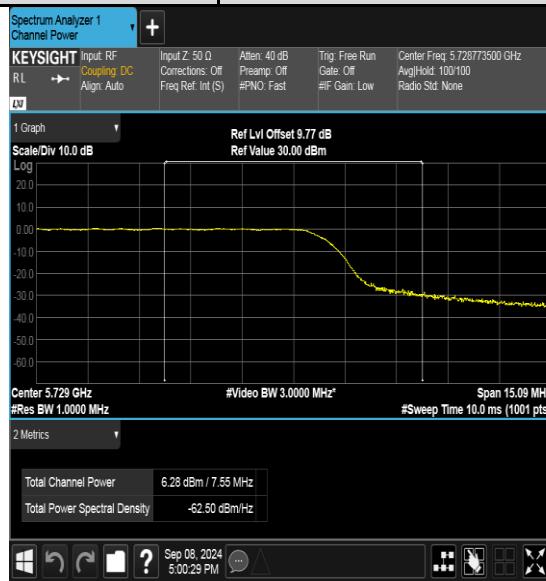
Test Mode	Test Channel	Verdict
11ax HE20	5320	PASS
 <p>The screenshot shows a Keysight Spectrum Analyzer interface. The main graph displays a signal spectrum with a center frequency of 5.319631000 GHz, a span of 40.000 MHz, and a video bandwidth of 3.0000 MHz. The signal power is centered around -9.69 dB, which is within the acceptable range. The graph shows a smooth transition from -40 dB to -10 dB, followed by a sharp drop-off. The right panel shows detailed settings for the spectrum analysis, including center frequency, span, and CF step. The bottom panel displays metrics such as total channel power (11.33 dBm) and total power spectral density (-62.63 dBm/Hz).</p>		

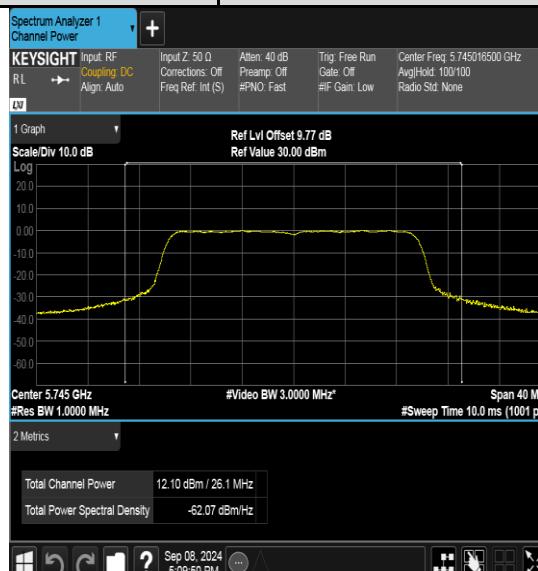
Test Mode	Test Channel	Verdict
11ax HE20	5500	PASS
 <p>The screenshot shows a Keysight Spectrum Analyzer interface. The main graph displays a signal spectrum with a center frequency of 5.499919500 GHz, a span of 40.000 MHz, and a video bandwidth of 3.0000 MHz. The signal power is centered around -10.14 dB, which is within the acceptable range. The graph shows a smooth transition from -40 dB to -10 dB, followed by a sharp drop-off. The right panel shows detailed settings for the spectrum analysis, including center frequency, span, and CF step. The bottom panel displays metrics such as total channel power (13.00 dBm) and total power spectral density (-61.24 dBm/Hz).</p>		

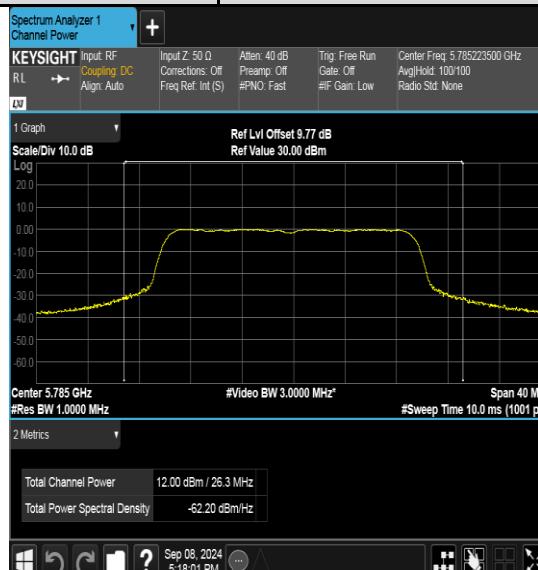
Test Mode	Test Channel	Verdict
11ax HE20	5580	PASS
		

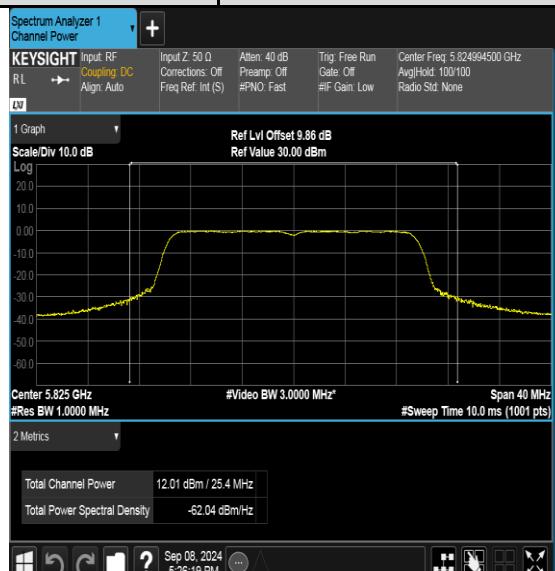
Test Mode	Test Channel	Verdict
11ax HE20	5700	PASS
		

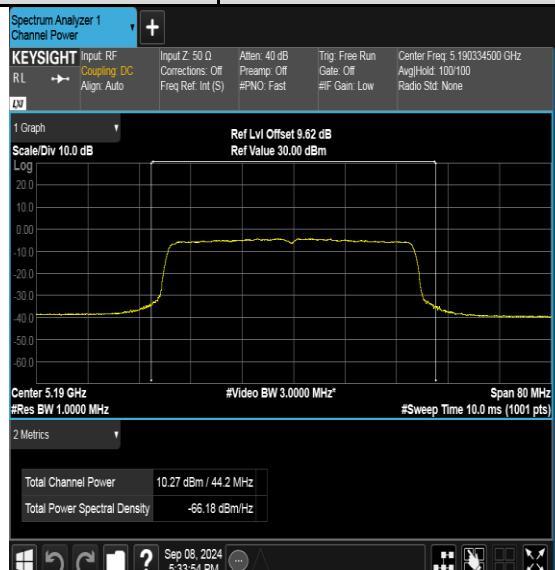
Test Mode	Test Channel	Verdict
11ax HE20	5720_UNII-2C	PASS
		

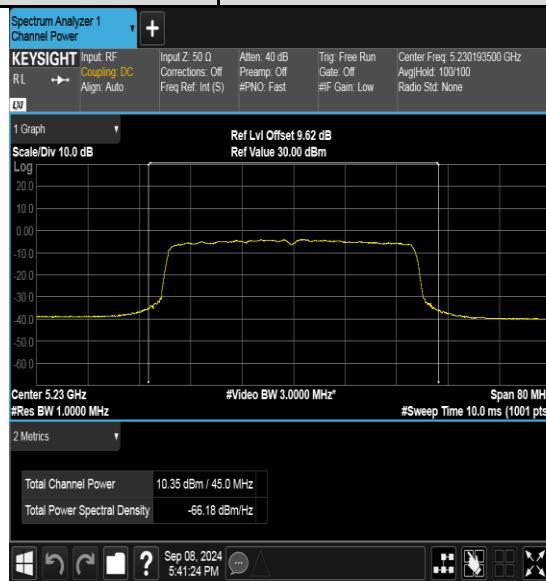
Test Mode	Test Channel	Verdict
11ax HE20	5720_UNII-3	PASS
		

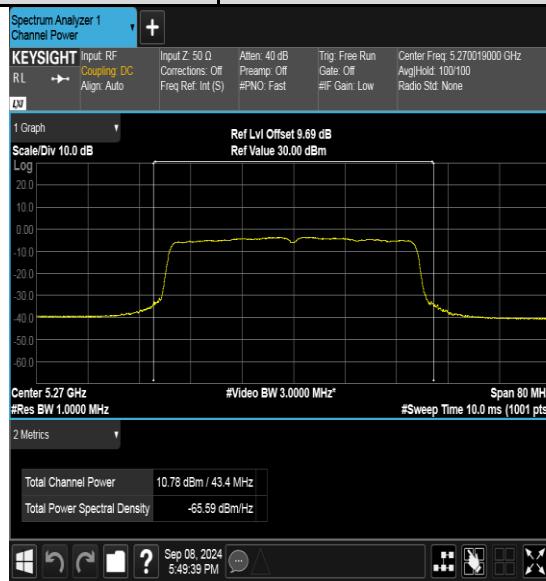
Test Mode	Test Channel	Verdict
11ax HE20	5745	PASS
		

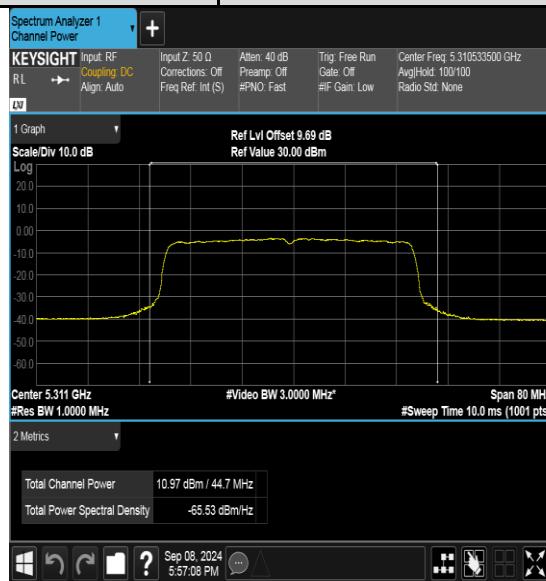
Test Mode	Test Channel	Verdict
11ax HE20	5785	PASS
		

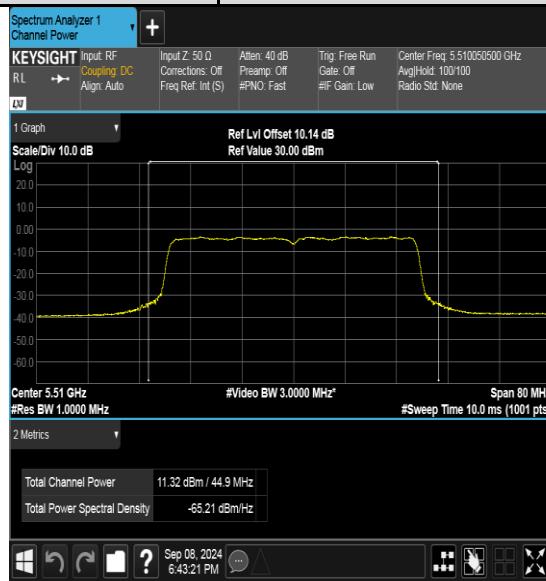
Test Mode	Test Channel	Verdict
11ax HE20	5825	PASS
		

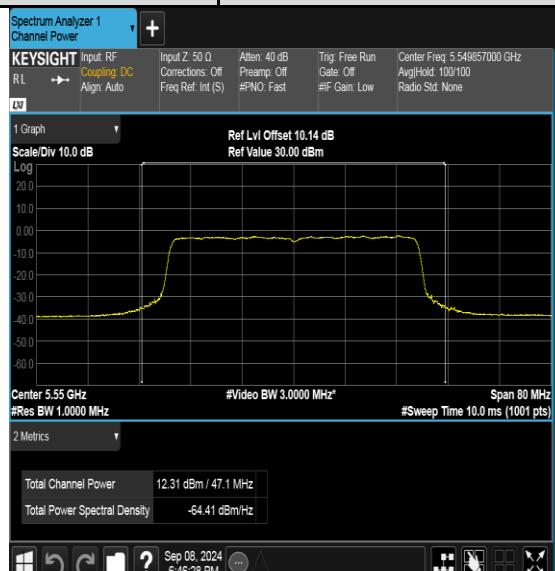
Test Mode	Test Channel	Verdict
11ax HE40	5190	PASS
		

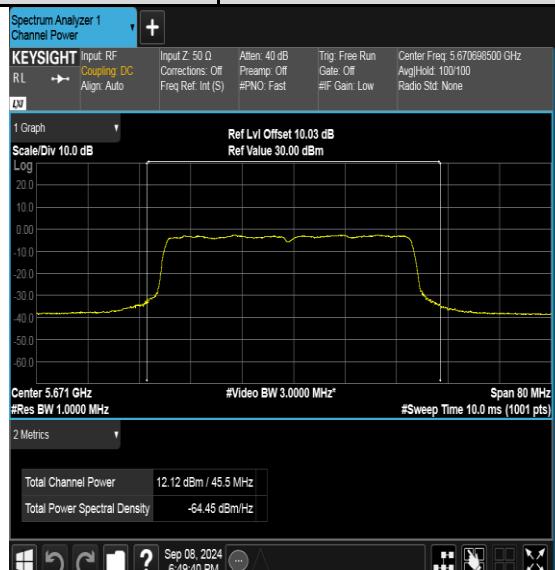
Test Mode	Test Channel	Verdict
11ax HE40	5230	PASS
		

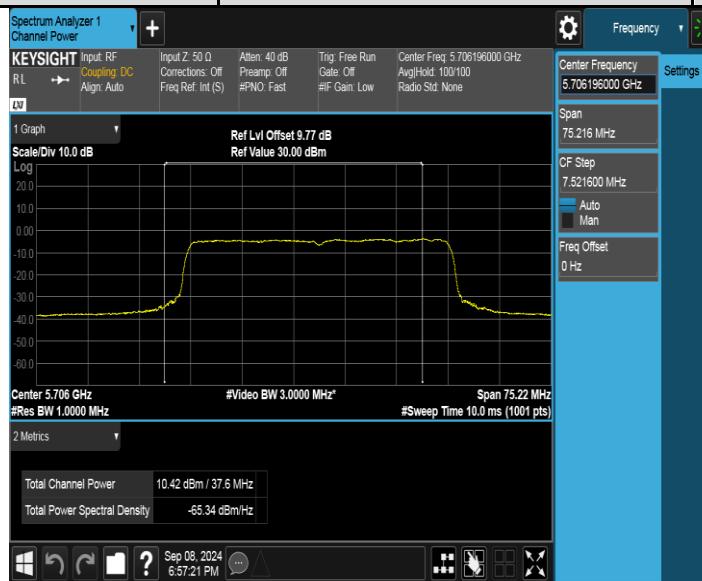
Test Mode	Test Channel	Verdict
11ax HE40	5270	PASS
		

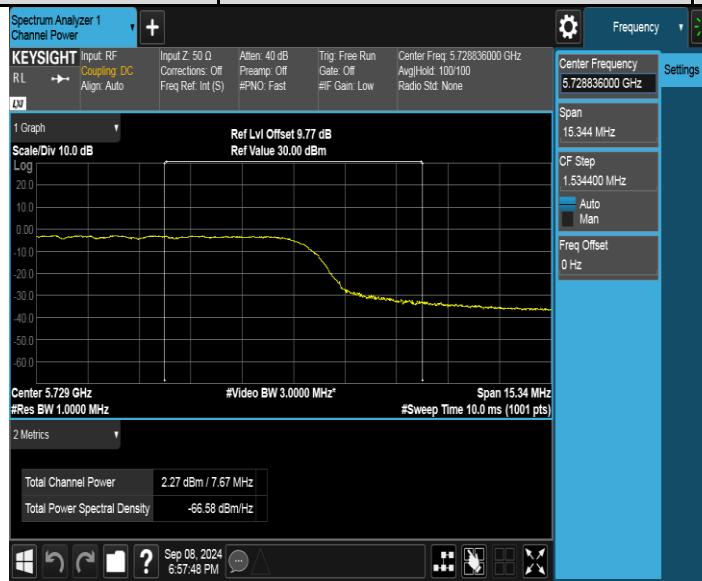
Test Mode	Test Channel	Verdict
11ax HE40	5310	PASS
		

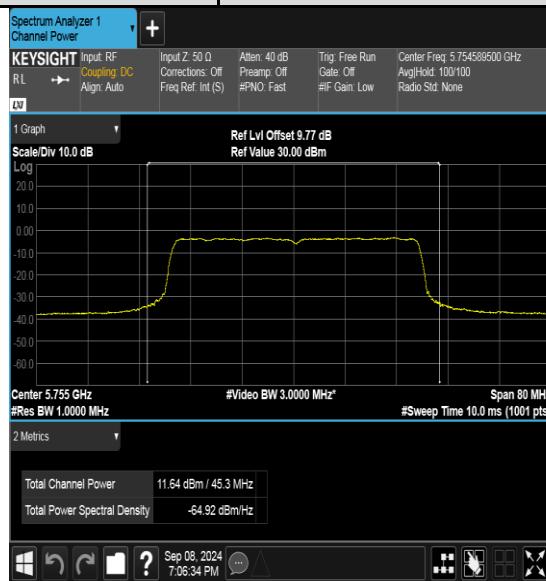
Test Mode	Test Channel	Verdict
11ax HE40	5510	PASS
		

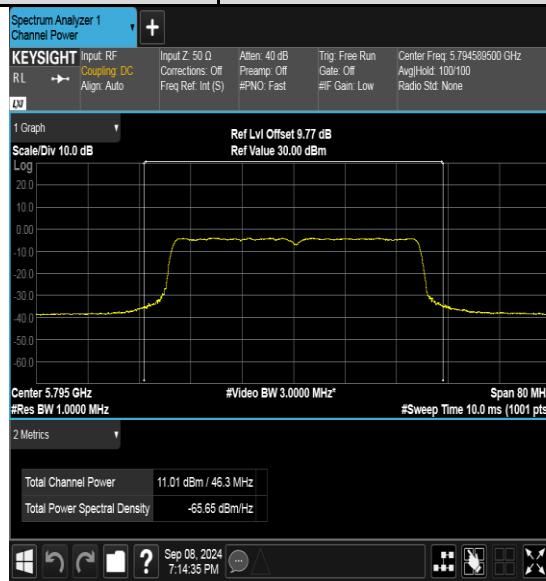
Test Mode	Test Channel	Verdict
11ax HE40	5550	PASS
 <p>The screenshot shows a Keysight Spectrum Analyzer interface. The main graph displays a signal spectrum with a center frequency of 5.549857000 GHz and a span of 80.000 MHz. The signal shows a sharp rise from -40 dB to approximately -10 dB, followed by a flat top and a sharp drop. The x-axis is labeled with 'Center 5.55 GHz', '#Video BW 3.0000 MHz*', and '#Sweep Time 10.0 ms (1001 pts)'. The y-axis is labeled with 'Scale/Div 10.0 dB' and 'Log'. The left panel shows 'Input RF Coupling: DC' and 'Align: Auto'. The right panel shows 'Center Frequency' set to 5.549857000 GHz, 'Span' set to 80.000 MHz, and 'Freq Offset' set to 0 Hz. The bottom panel shows 'Total Channel Power' at 12.31 dBm / 47.1 MHz and 'Total Power Spectral Density' at -64.41 dBm/Hz. The date and time are Sep 08, 2024, 6:46:28 PM.</p>		

Test Mode	Test Channel	Verdict
11ax HE40	5670	PASS
 <p>The screenshot shows a Keysight Spectrum Analyzer interface. The main graph displays a signal spectrum with a center frequency of 5.670698500 GHz and a span of 80.000 MHz. The signal shows a sharp rise from -40 dB to approximately -10 dB, followed by a flat top and a sharp drop. The x-axis is labeled with 'Center 5.671 GHz', '#Video BW 3.0000 MHz*', and '#Sweep Time 10.0 ms (1001 pts)'. The y-axis is labeled with 'Scale/Div 10.0 dB' and 'Log'. The left panel shows 'Input RF Coupling: DC' and 'Align: Auto'. The right panel shows 'Center Frequency' set to 5.670698500 GHz, 'Span' set to 80.000 MHz, and 'Freq Offset' set to 0 Hz. The bottom panel shows 'Total Channel Power' at 12.12 dBm / 45.5 MHz and 'Total Power Spectral Density' at -64.45 dBm/Hz. The date and time are Sep 08, 2024, 6:49:40 PM.</p>		

Test Mode	Test Channel	Verdict
11ax HE40	5710_UNII-2C	PASS
		

Test Mode	Test Channel	Verdict
11ax HE40	5710_UNII-3	PASS
		

Test Mode	Test Channel	Verdict
11ax HE40	5755	PASS
		

Test Mode	Test Channel	Verdict
11ax HE40	5795	PASS
		

6.4. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	<input type="checkbox"/> Outdoor Access Point: 17 dBm/MHz <input type="checkbox"/> Indoor Access Point: 17 dBm/MHz <input type="checkbox"/> Fixed Point-To-Point Access Points: 17 dBm/MHz <input checked="" type="checkbox"/> Client Devices: 11 dBm/MHz	5150 ~ 5250
	11 dBm/MHz	5250 ~ 5350 5470 ~ 5725
	30 dBm/500kHz	5725 ~ 5850

ISED RSS-247 ISSUE 3		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.	5150 ~ 5250
	The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.	5250 ~ 5350 5470 ~ 5600 5650 ~ 5725
	30 dBm / 500 kHz	5725 ~ 5850

Note:

The above limits are based upon the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.F.

Connect the EUT to the spectrum analyser and use the following settings:

For U-NII-1, U-NII-2A and U-NII-2C band:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	1 MHz
VBW	$\geq 3 \times$ RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

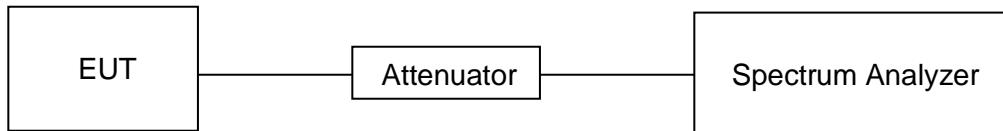
For U-NII-3:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	500 kHz
VBW	$\geq 3 \times$ RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

Allow trace to fully stabilize and Use the peak search function on the instrument to find the peak of the spectrum and record its value.

Add $10 \log (1/x)$, where x is the duty cycle, to the peak of the spectrum, the result is the Maximum PSD over 1 MHz / 500 kHz reference bandwidth.

TEST SETUP



TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests
Relative Humidity	60%
Atmospheric Pressure:	101kPa
Temperature	22.2°C
Test Voltage	AC 120V
Test Date	08/18/2024 - 09/08/2024

RESULTS

Band 1 & Band 2:

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD /MHz	FCC PSD Limit	ISED PSD Limit	Antenna Gain	EIRP PSD	ISED EIRP PSD Limit
	MHz	dBm	dB	dBm	dBm	dBm	dBi	dBm	dBm
11a	5180	0.61	0.34	0.95	11	/	3.40	4.35	10
	5200	-0.73	0.34	-0.39	11	/	3.40	3.01	10
	5240	-0.12	0.34	0.22	11	/	3.40	3.62	10
	5260	-0.02	0.34	0.32	11	11	3.40	3.72	/
	5280	0.53	0.34	0.87	11	11	3.40	4.27	/
	5320	0.61	0.34	0.95	11	11	3.40	4.35	/
	5500	2.22	0.34	2.56	11	11	3.40	5.96	/
	5580	0.50	0.34	0.84	11	11	3.40	4.24	/
	5700	1.45	0.34	1.79	11	11	3.40	5.19	/
	5720_UNII-2C	1.48	0.34	1.82	11	11	3.40	5.22	/

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD /MHz	FCC PSD Limit	ISED PSD Limit	Antenna Gain	EIRP PSD	ISED EIRP PSD Limit
	MHz	dBm	dB	dBm	dBm	dBm	dBi	dBm	dBm
11ac VHT20	5180	-0.96	0.23	-0.73	11	/	3.40	2.67	10
	5200	-0.88	0.23	-0.65	11	/	3.40	2.75	10
	5240	-0.21	0.23	0.02	11	/	3.40	3.42	10
	5260	0.60	0.23	0.83	11	11	3.40	4.23	/
	5280	0.45	0.23	0.68	11	11	3.40	4.08	/
	5320	0.32	0.23	0.55	11	11	3.40	3.95	/
	5500	1.34	0.23	1.57	11	11	3.40	4.97	/
	5580	0.51	0.23	0.74	11	11	3.40	4.14	/
	5700	1.86	0.23	2.09	11	11	3.40	5.49	/
	5720_UNII-2C	1.00	0.23	1.23	11	11	3.40	4.63	/

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD /MHz	FCC PSD Limit	ISED PSD Limit	Antenna Gain	EIRP PSD	ISED EIRP PSD Limit
	MHz	dBm	dB	dBm	dBm	dBm	dBi	dBm	dBm
11ac VHT40	5190	-3.35	0.45	-2.90	11	/	3.40	0.50	10
	5230	-3.34	0.45	-2.89	11	/	3.40	0.51	10
	5270	-2.19	0.45	-1.74	11	/	3.40	1.66	/
	5310	-1.87	0.45	-1.42	11	11	3.40	1.98	/
	5510	-1.04	0.45	-0.59	11	11	3.40	2.81	/
	5550	-1.94	0.45	-1.49	11	11	3.40	1.91	/
	5670	-0.98	0.45	-0.53	11	11	3.40	2.87	/
	5710_UNII-2C	-0.25	0.45	0.20	11	11	3.40	3.60	/

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD /MHz	FCC PSD Limit	ISED PSD Limit	Antenna Gain	EIRP PSD	ISED EIRP PSD Limit
	MHz	dBm	dB	dBm	dBm	dBm	dBi	dBm	dBm
11ax HE20	5180	-0.26	0.29	0.03	11	/	3.40	3.43	10
	5200	-0.07	0.29	0.22	11	/	3.40	3.62	10
	5240	-0.17	0.29	0.12	11	/	3.40	3.52	10
	5260	0.10	0.29	0.39	11	11	3.40	3.79	/
	5280	0.44	0.29	0.73	11	11	3.40	4.13	/
	5320	0.82	0.29	1.11	11	11	3.40	4.51	/
	5500	2.15	0.29	2.44	11	11	3.40	5.84	/
	5580	0.53	0.29	0.82	11	11	3.40	4.22	/
	5700	1.87	0.09	1.96	11	11	3.40	5.36	/
	5720_UNII-2C	1.35	0.29	1.64	11	11	3.40	5.04	/

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD /MHz	FCC PSD Limit	ISED PSD Limit	Antenna Gain	EIRP PSD	ISED EIRP PSD Limit
	MHz	dBm	dB	dBm	dBm	dBm	dBi	dBm	dBm
11ax HE40	5190	-2.69	0.54	-2.15	11	/	3.40	1.25	10
	5230	-2.69	0.54	-2.15	11	/	3.40	1.25	10
	5270	-2.15	0.54	-1.61	11	/	3.40	1.79	/
	5310	-1.85	0.54	-1.31	11	11	3.40	2.09	/
	5510	0.03	0.54	0.57	11	11	3.40	3.97	/
	5550	-2.29	0.54	-1.75	11	11	3.40	1.65	/
	5670	-1.69	0.54	-1.15	11	11	3.40	2.25	/
	5710_UNII-2C	-1.27	0.54	-0.73	11	11	3.40	2.67	/

Band 3:

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD/300 kHz	Correct Factor	PSD/500 kHz	Limit
	MHz	dBm	dBm	dBm	dB	dBm	dBm
11a	5720_UNII-3	-1.37	0.34	-1.03	3.40	2.37	30
	5745	-1.82	0.34	-1.48	3.40	1.92	30
	5785	-2.22	0.34	-1.88	3.40	1.52	30
	5825	-2.18	0.34	-1.84	3.40	1.56	30

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD/300 kHz	Correct Factor	PSD/500 kHz	Limit
	MHz	dBm	dBm	dBm	dB	dBm	dBm
11ac VHT20	5720_UNII-3	-1.67	0.23	-1.44	3.40	1.96	30
	5745	-1.86	0.23	-1.63	3.40	1.77	30
	5785	-1.82	0.23	-1.59	3.40	1.81	30
	5825	-1.70	0.23	-1.47	3.40	1.93	30

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD/300 kHz	Correct Factor	PSD/500 kHz	Limit
	MHz	dBm	dBm	dBm	dB	dBm	dBm
11ac VHT40	5710_UNII-3	-2.86	0.45	-2.41	3.40	0.99	30
	5755	-3.21	0.45	-2.76	3.40	0.64	30
	5795	-3.43	0.45	-2.98	3.40	0.42	30

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD/300 kHz	Correct Factor	PSD/500 kHz	Limit
	MHz	dBm	dBm	dBm	dB	dBm	dBm
11ax HE20	5720_UNII-3	-1.51	0.29	-1.22	3.40	2.18	30
	5745	-1.55	0.29	-1.26	3.40	2.14	30
	5785	-1.65	0.29	-1.36	3.40	2.04	30
	5825	-1.65	0.29	-1.36	3.40	2.04	30

Mode	Frequency	Measurement Value	Duty Cycle Correction Factor	PSD/300 kHz	Correct Factor	PSD/500 kHz	Limit
	MHz	dBm	dBm	dBm	dB	dBm	dBm
11ax HE40	5710_UNII-3	-4.42	0.54	-3.88	3.40	-0.48	30
	5755	-4.50	0.54	-3.96	3.40	-0.56	30
	5795	-3.90	0.54	-3.36	3.40	0.04	30

Note:

1. The Result and Limit Unit is dBm/500 kHz in the band 5.725 - 5.85 GHz.
2. PSD/500 kHz = $10^{\log((PSD/300\ kHz)/10)/300*500}}$
 $= PSD/300\ kHz + 2.2\ dB$