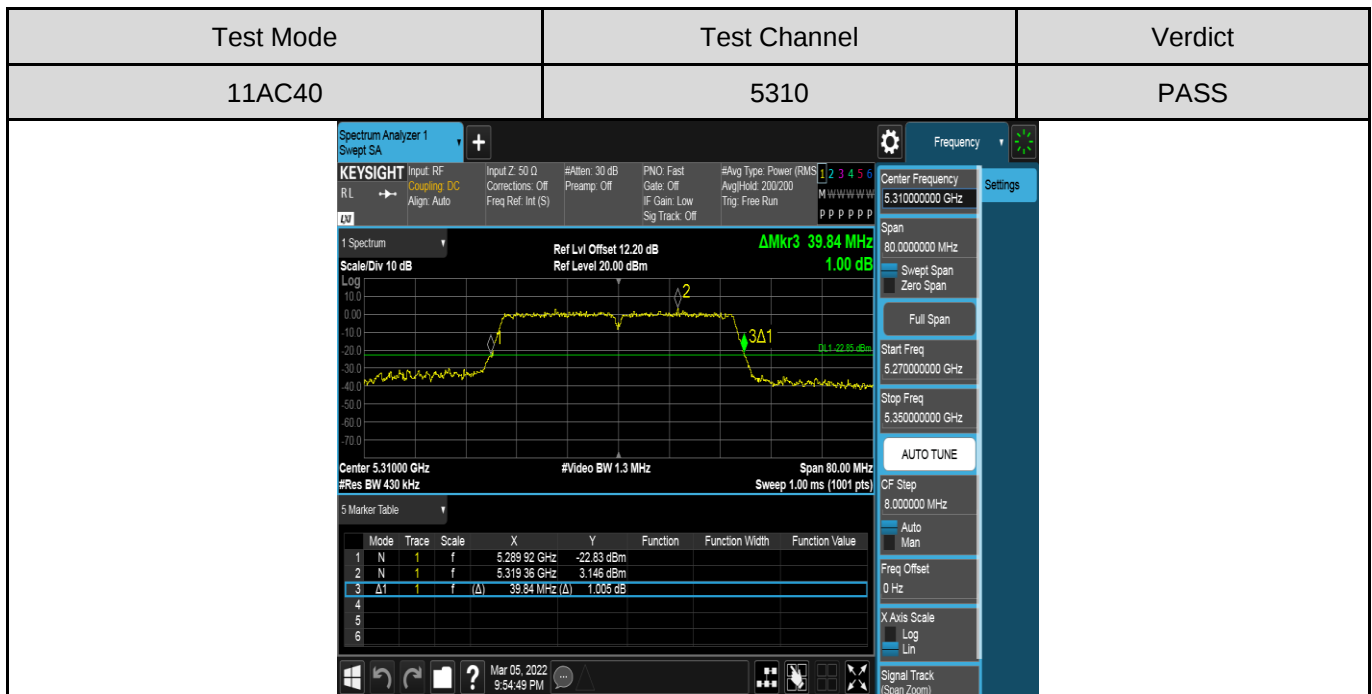
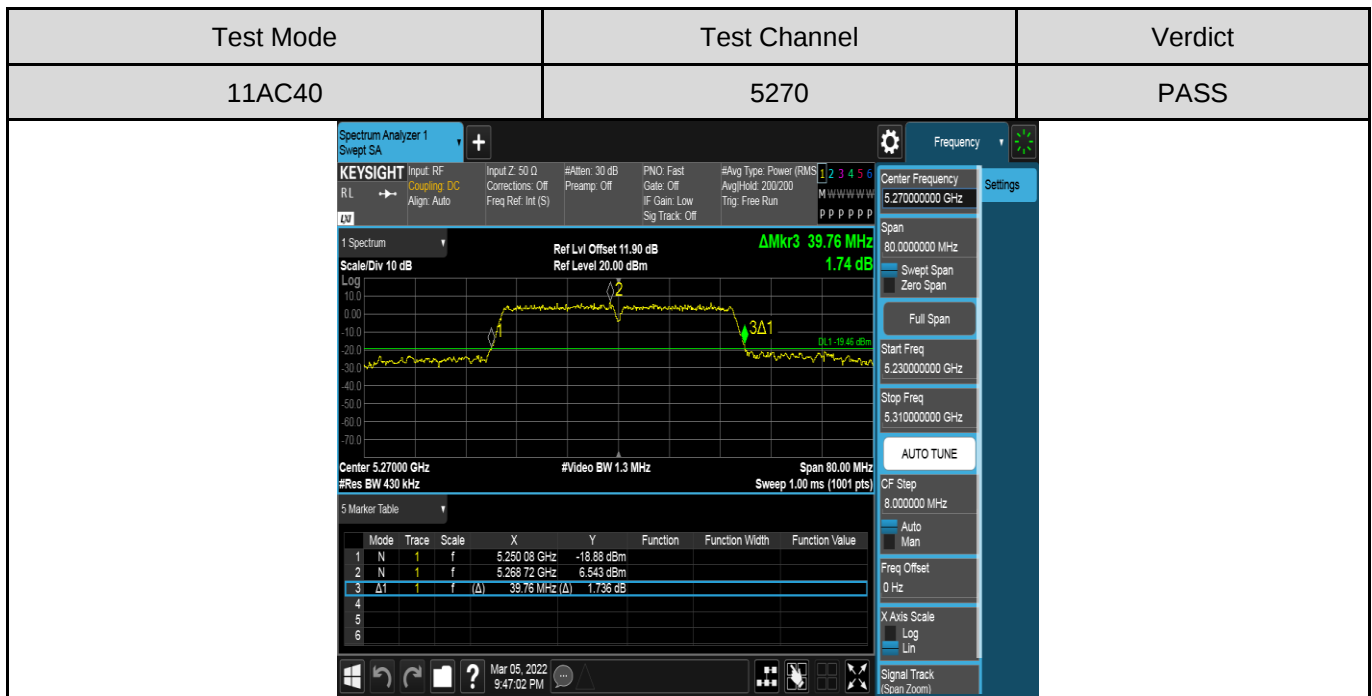
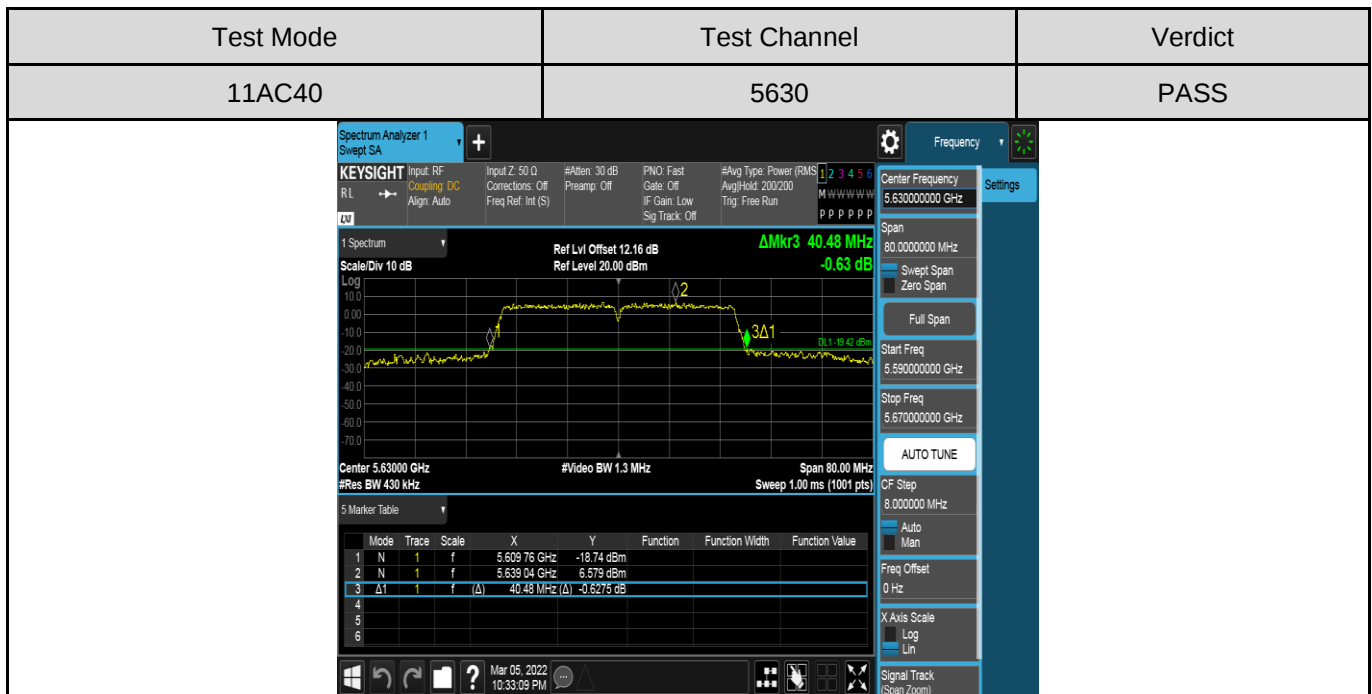
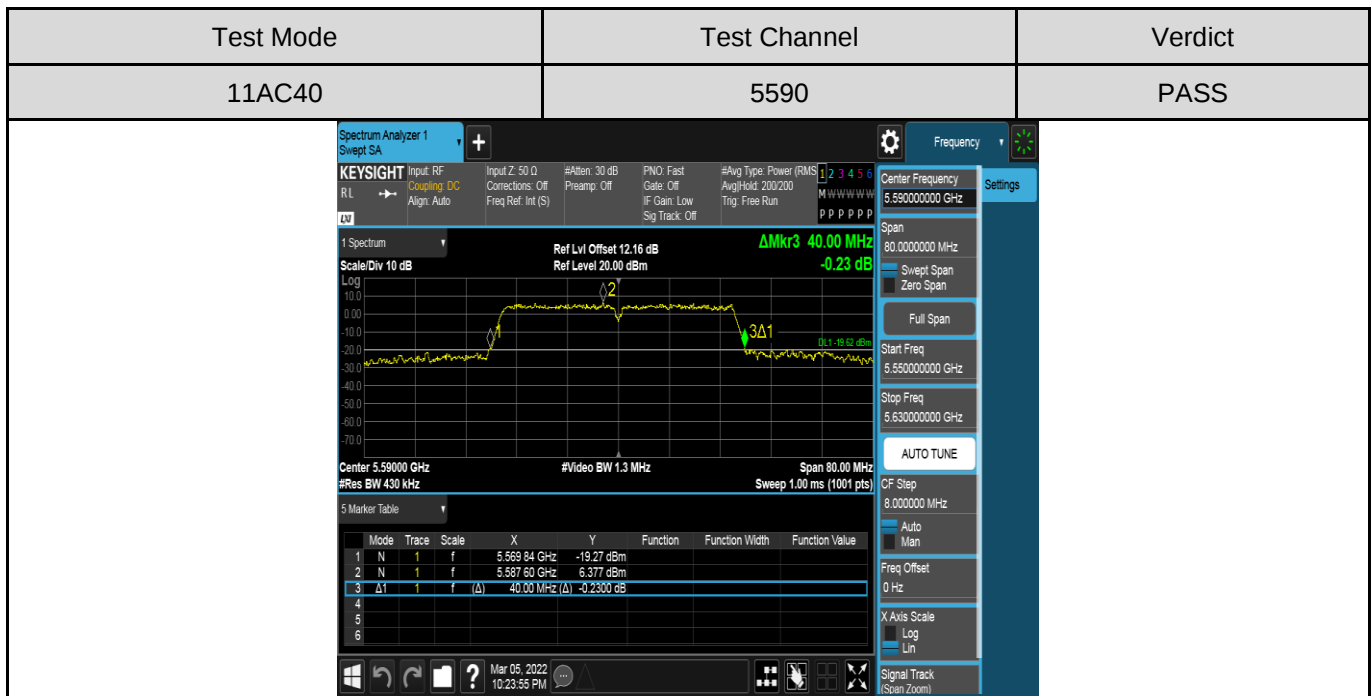
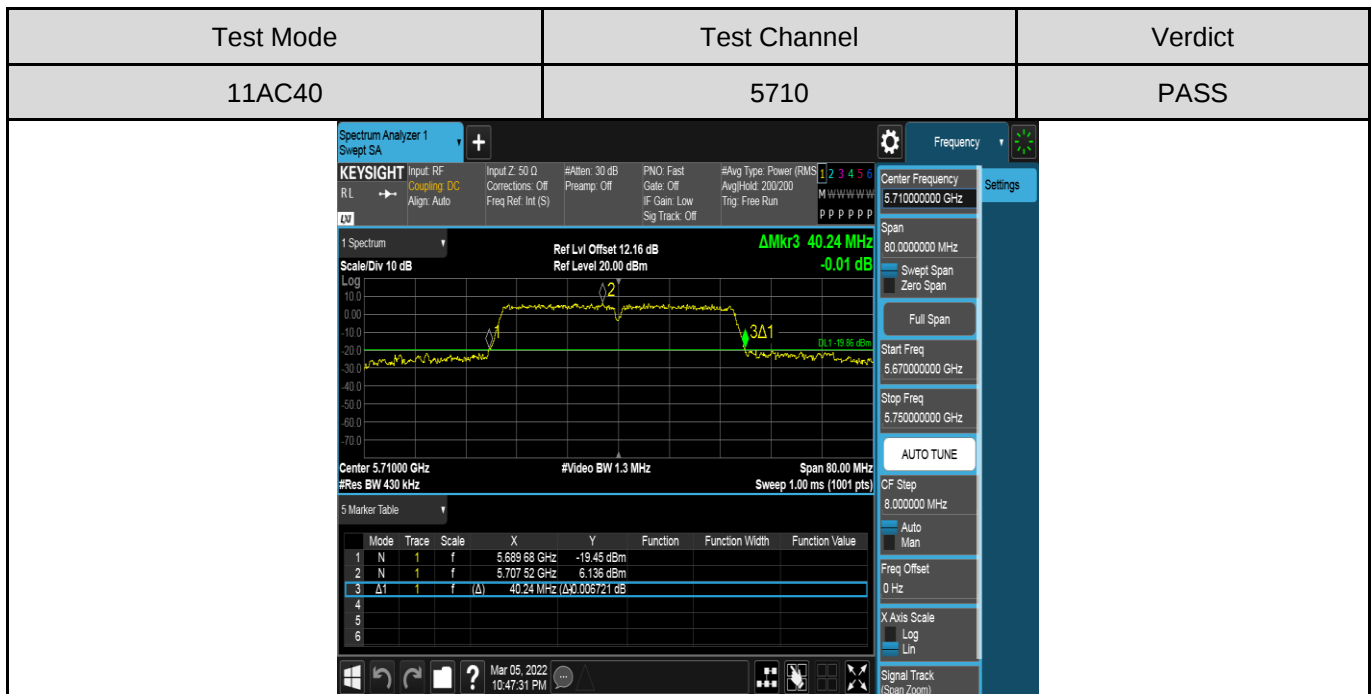
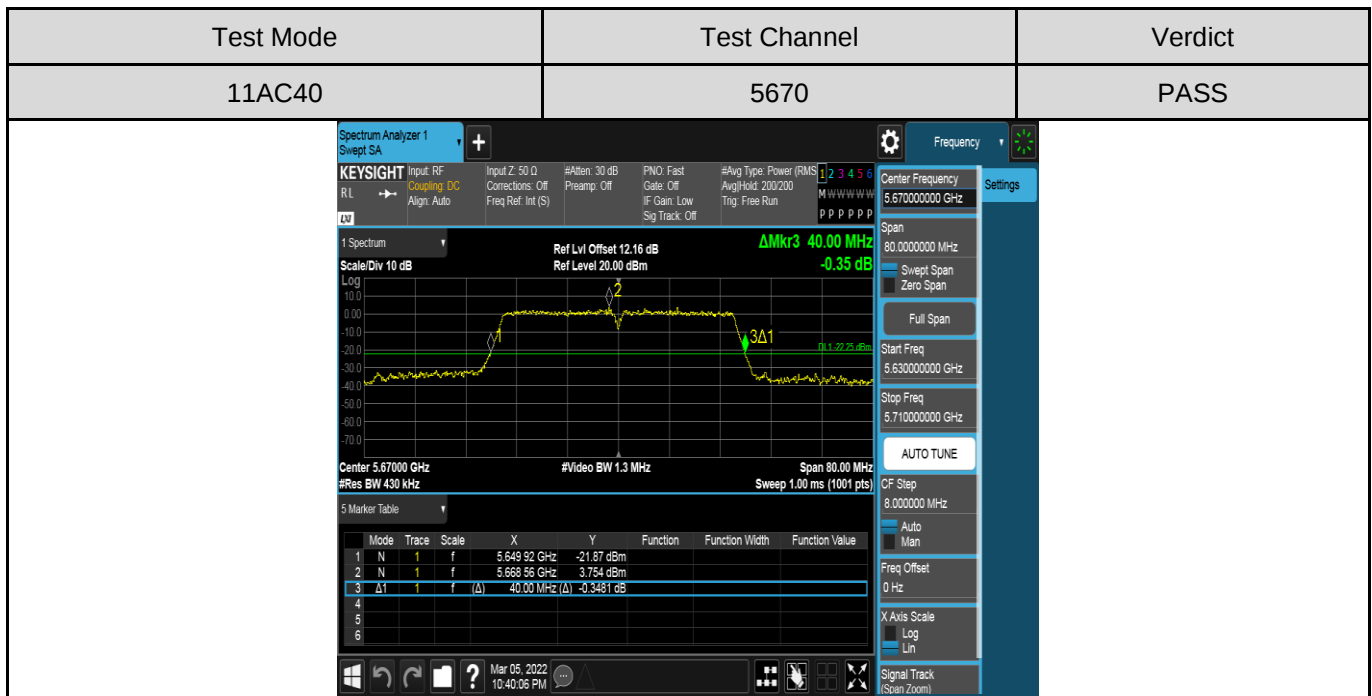
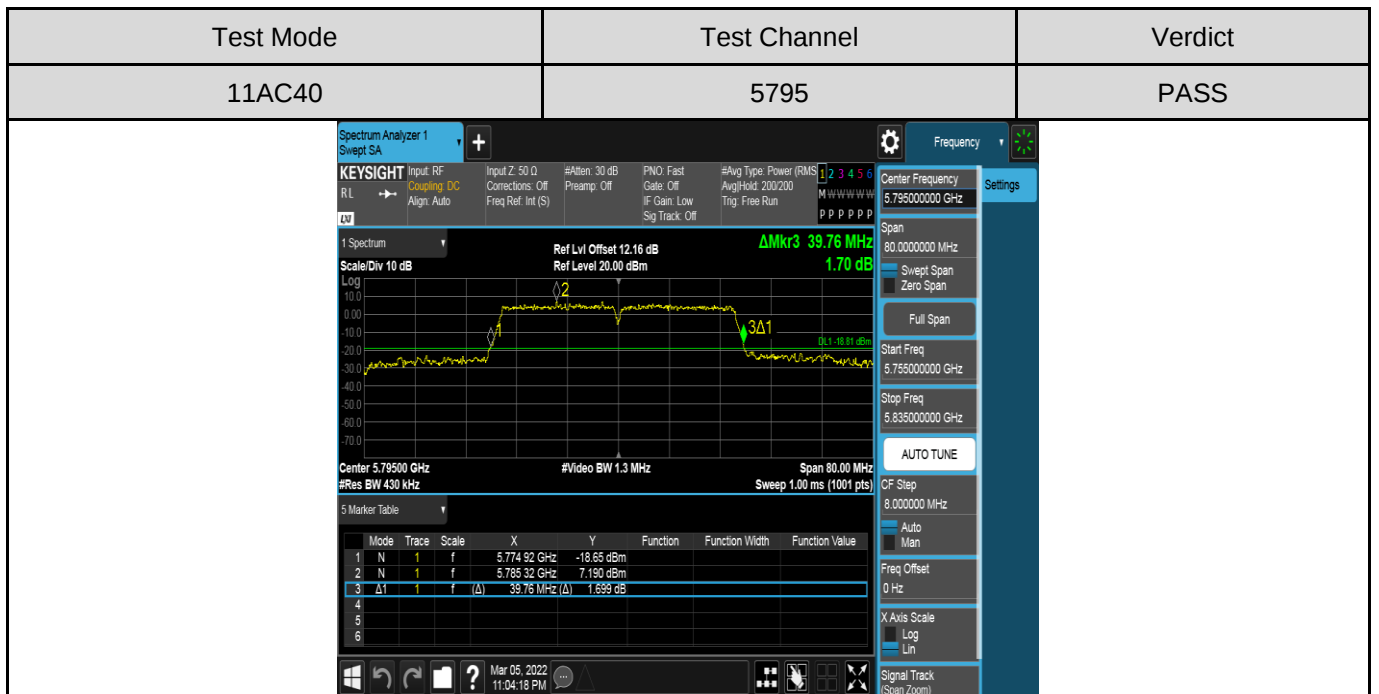
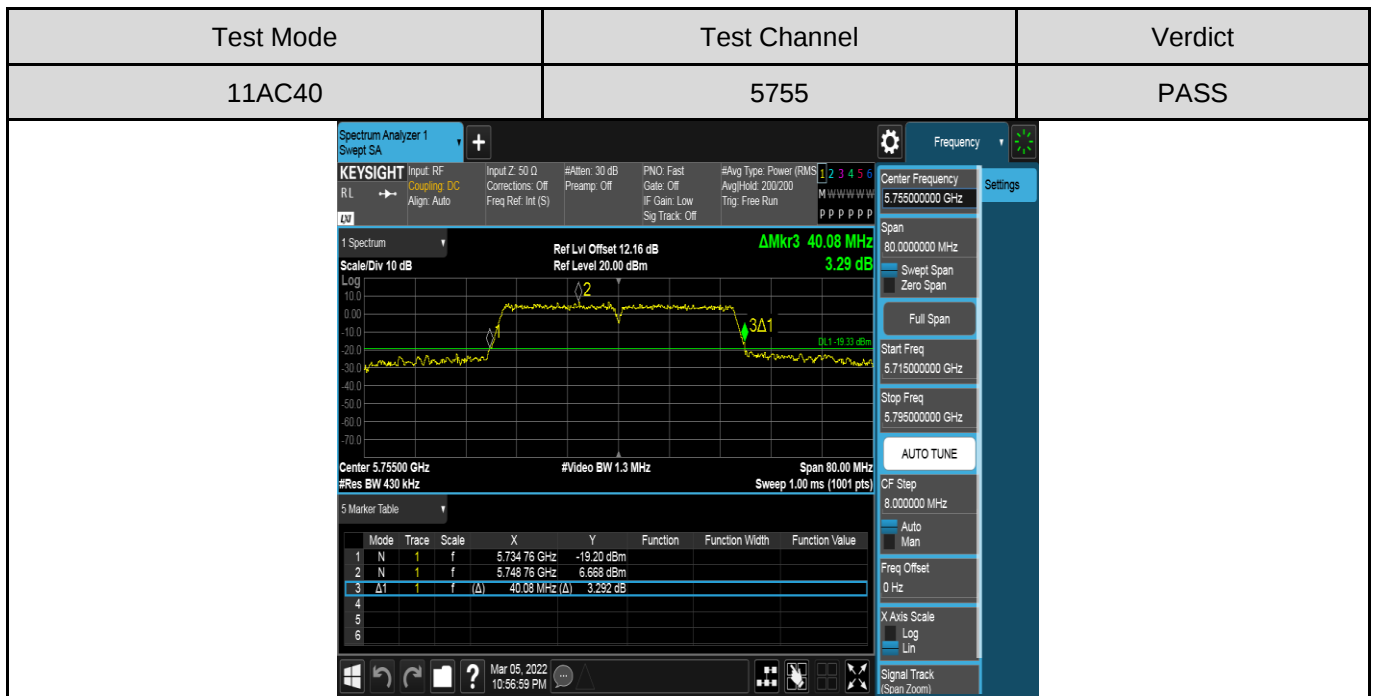
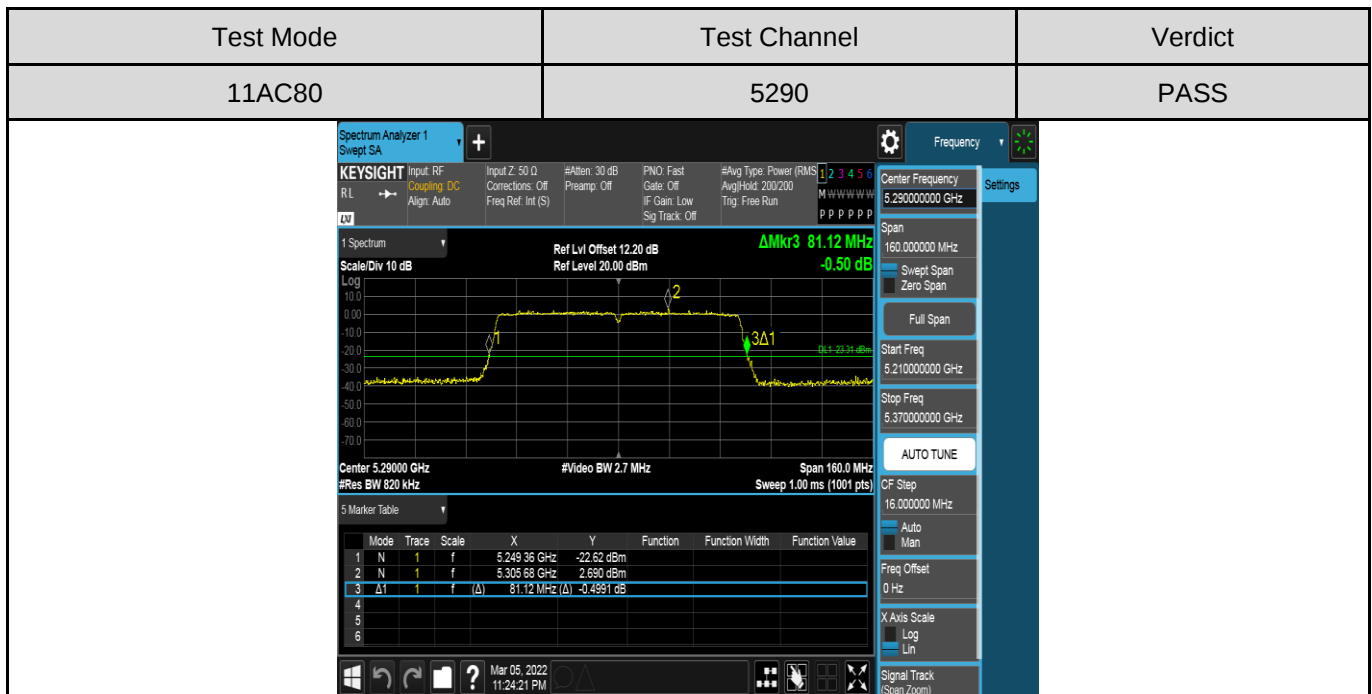
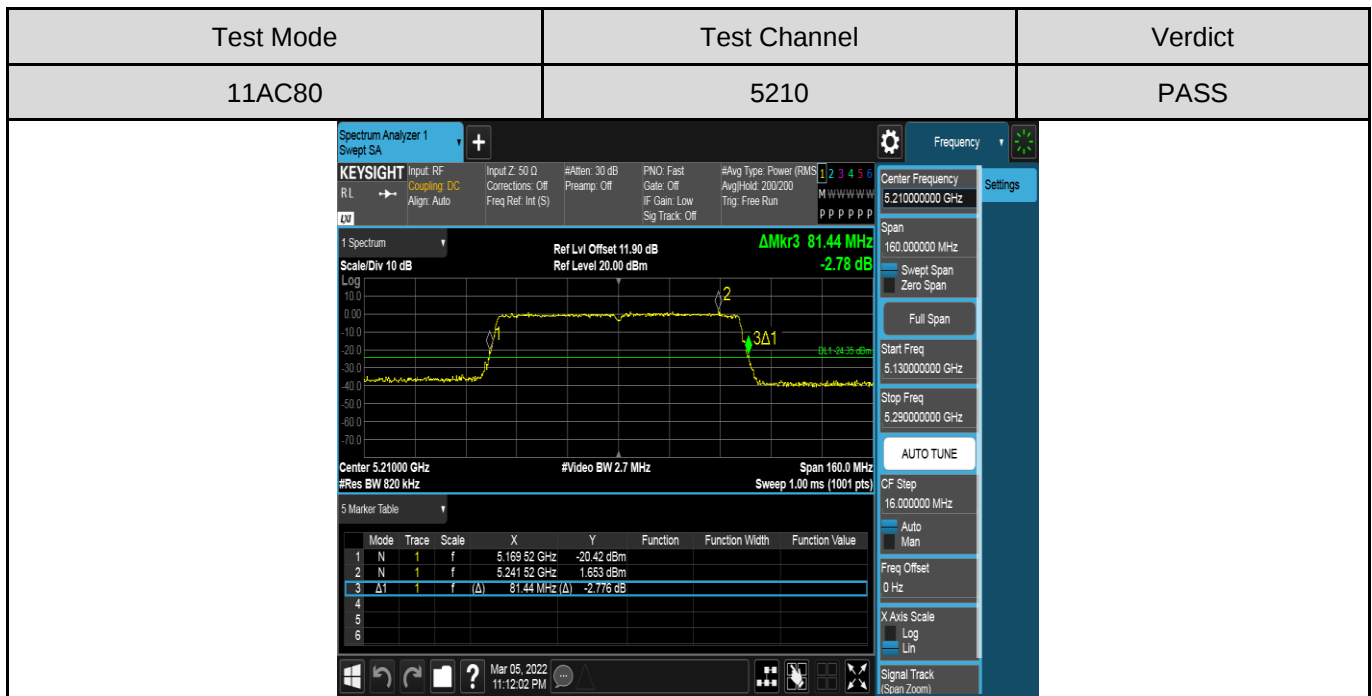


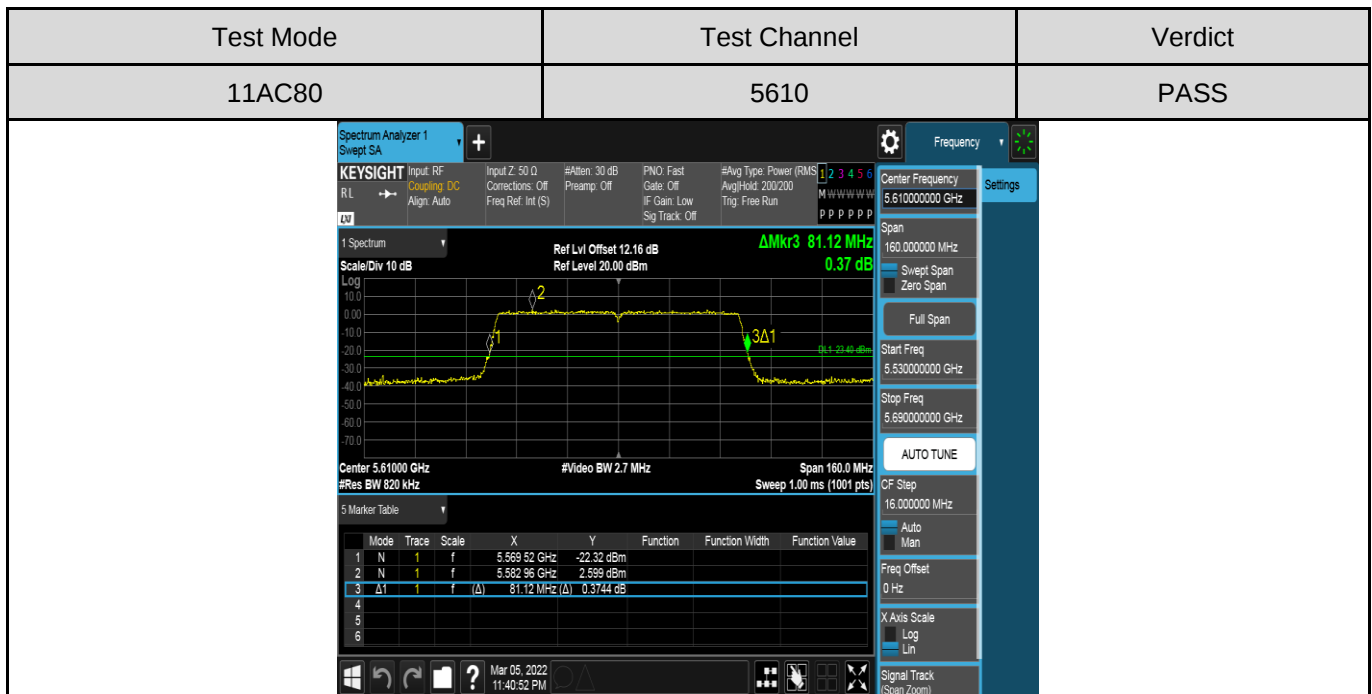
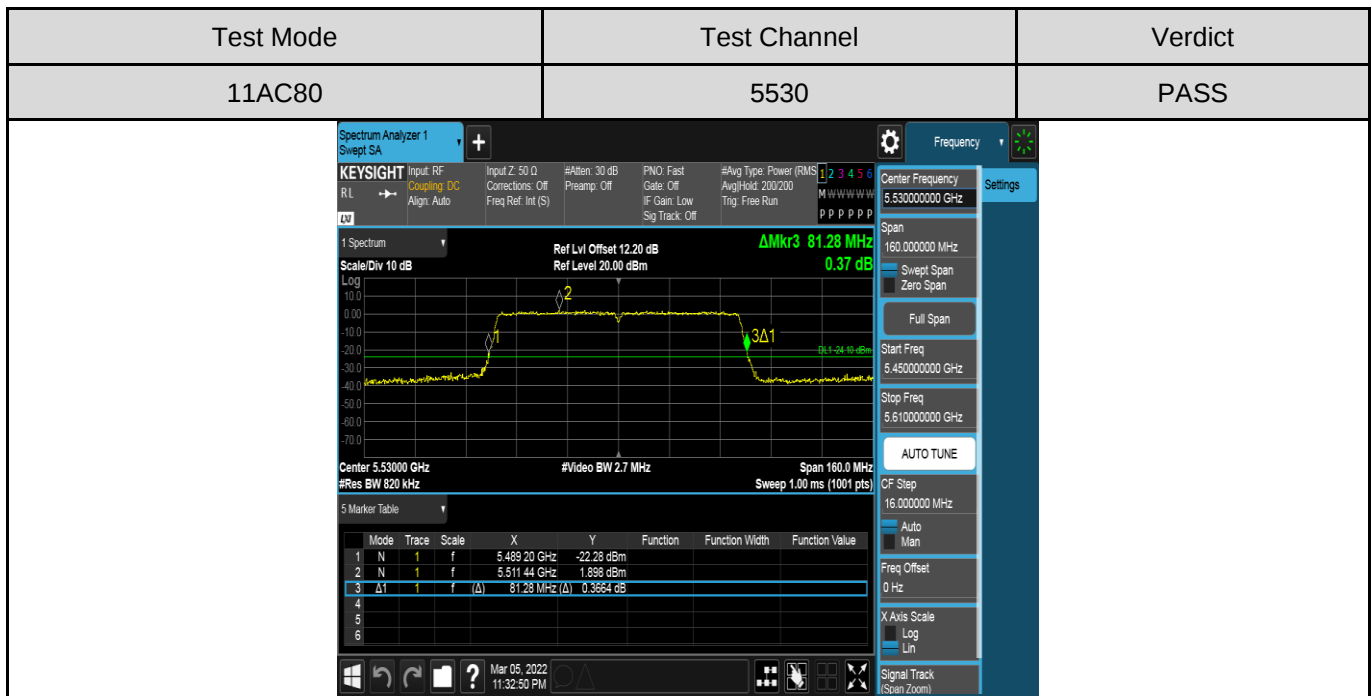


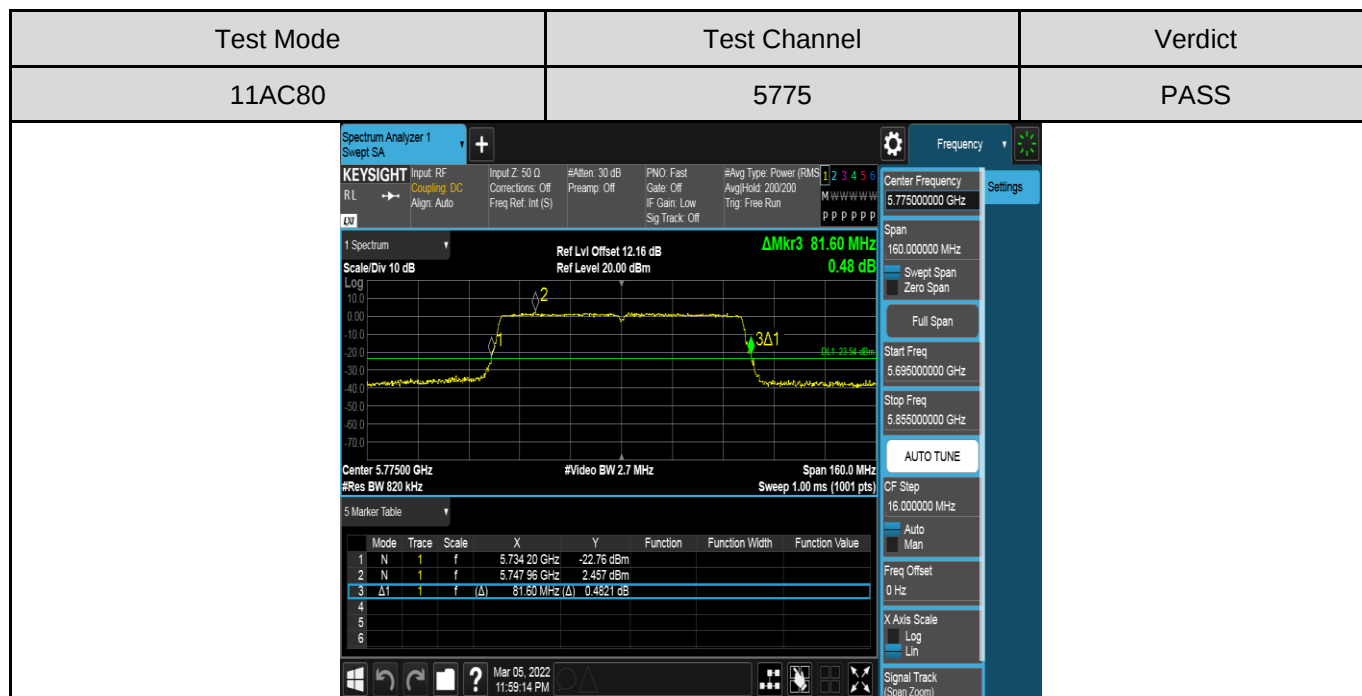
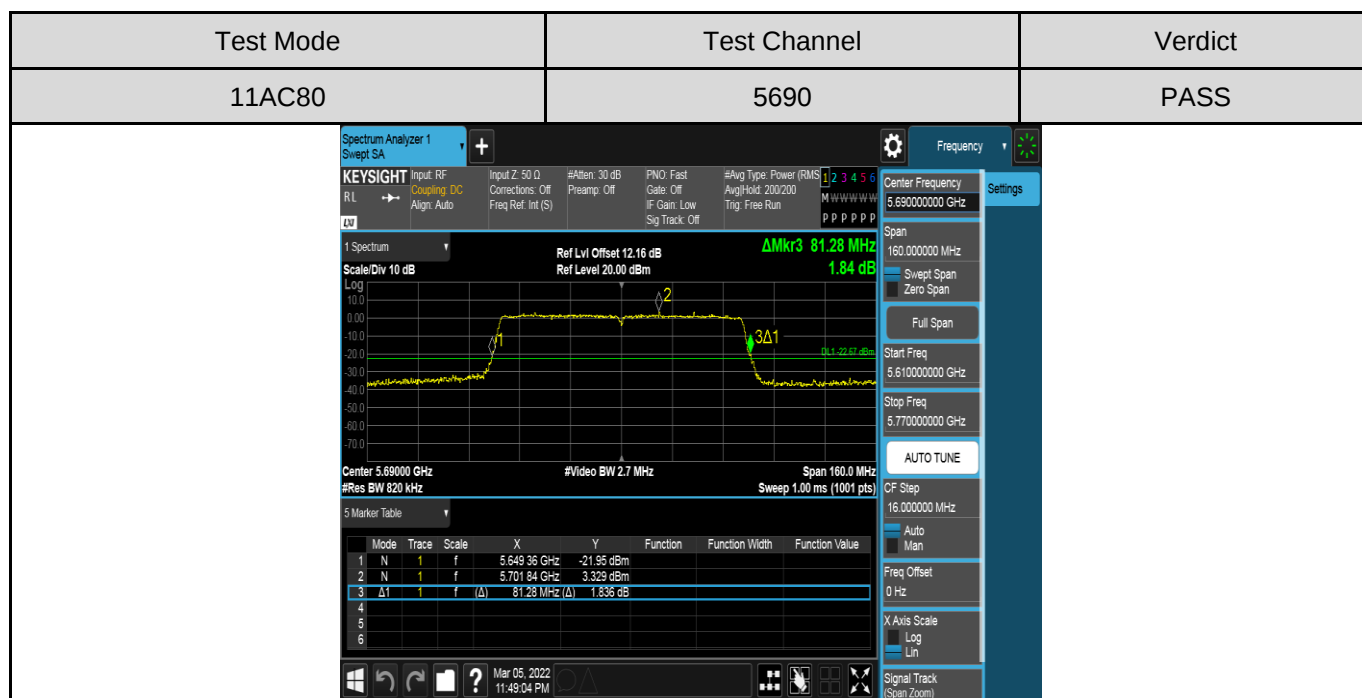
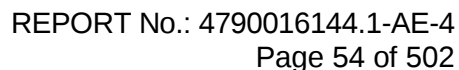














For 6 dB Emission Bandwidth Part:

Test Mode	Test Channel	Verdict																																																								
11A	5745	PASS																																																								
Spectrum Analyzer 1 Sweep SA + KEYSIGHT Input: RF Coupling: DC Align: Auto Input Z: 50 Ω Corrections: Off Freq Ref: Int (S) #Atten: 30 dB Preampl: Off PNO: Fast Gate: Off IF Gain: Low Sig Track: Off #Avg Type: Power (RMS) Avg/Hold: 71/100 Trig: Free Run 1 2 3 4 5 6 M W W W W W W W P P P P P P P P Center Frequency 5.745000000 GHz Span 40.0000000 MHz Sweep Span Zero Span Full Span Start Freq 5.725000000 GHz Stop Freq 5.765000000 GHz AUTO TUNE CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz X Axis Scale Log Lin Signal Track (Span Zoom) 1 Spectrum Ref Lvl Offset 12.16 dB Ref Level 20.00 dBm ΔMkr3 16.36 MHz -0.21 dB Scale/Div 10 dB Log 0.00 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0 Center 5.74500 GHz #Video BW 300 kHz Span 40.00 MHz #Res BW 100 kHz Sweep 3.87 ms (1001 pts) 5 Marker Table <table><tr><th>Mode</th><th>Trace</th><th>Scale</th><th>X</th><th>Y</th><th>Function</th><th>Function Width</th><th>Function Value</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>5.736 76 GHz</td><td>0.9179 dBm</td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.746 20 GHz</td><td>6.058 dBm</td><td></td><td></td></tr><tr><td>3</td><td>Δ1</td><td>1</td><td>f (Δ)</td><td>16.36 MHz (Δ)</td><td>-0.2050 dB</td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>			Mode	Trace	Scale	X	Y	Function	Function Width	Function Value	1	N	1	f	5.736 76 GHz	0.9179 dBm			2	N	1	f	5.746 20 GHz	6.058 dBm			3	Δ1	1	f (Δ)	16.36 MHz (Δ)	-0.2050 dB			4								5								6							
Mode	Trace	Scale	X	Y	Function	Function Width	Function Value																																																			
1	N	1	f	5.736 76 GHz	0.9179 dBm																																																					
2	N	1	f	5.746 20 GHz	6.058 dBm																																																					
3	Δ1	1	f (Δ)	16.36 MHz (Δ)	-0.2050 dB																																																					
4																																																										
5																																																										
6																																																										

Test Mode	Test Channel	Verdict
11A	5785	PASS

Spectrum Analyzer 1
Sweep SA

KEYSIGHT

Input: RF
Coupling: DC
Align: Auto

Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)

#Atten: 30 dB
Preamp: Off

PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off

#Avg Type: Power (RMS)
Avg/Hold: 71/100
Trig: Free Run

1 2 3 4 5 6
M P P P P P P P P P P P

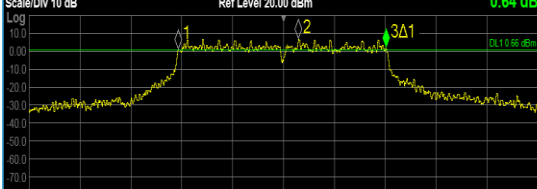
1 Spectrum

Ref Lvl Offset 12.16 dB
Ref Level 20.00 dBm

ΔMkr3 16.32 MHz
0.64 dB

Log

Scale/Div 10 dB



Center 5.78500 GHz
#Res BW 100 kHz

#Video BW 300 kHz

Span 40.00 MHz
Sweep 3.87 ms (1001 pts)

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	5.776 76 GHz	0.7825 dBm			
2	N	1	f	5.786 20 GHz	6.663 dBm			
3	Δ1	1	f (Δ)	16.32 MHz (Δ)	0.6388 dB			
4								
5								
6								

Frequency

Settings

Center Frequency
5.785000000 GHz

Span
40.0000000 MHz
Sweep Span
Zero Span

Full Span

Start Freq
5.765000000 GHz

Stop Freq
5.805000000 GHz

AUTO TUNE

CF Step
4.000000 MHz

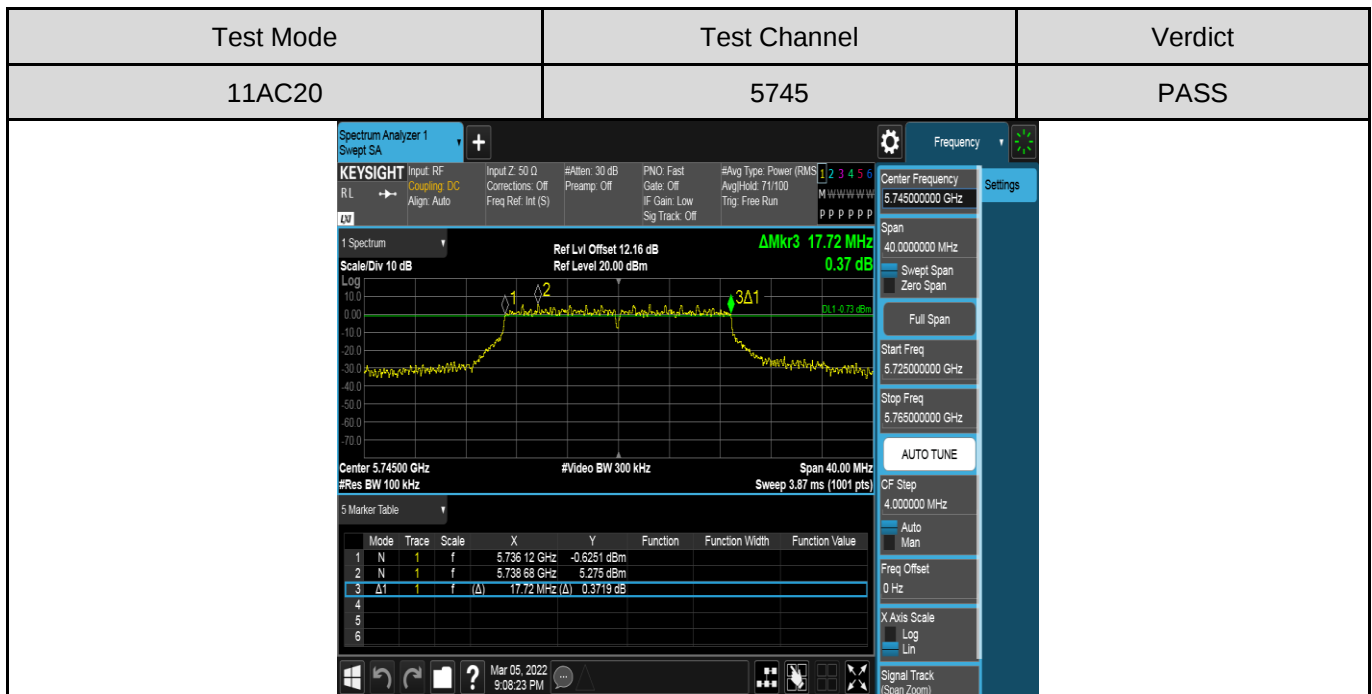
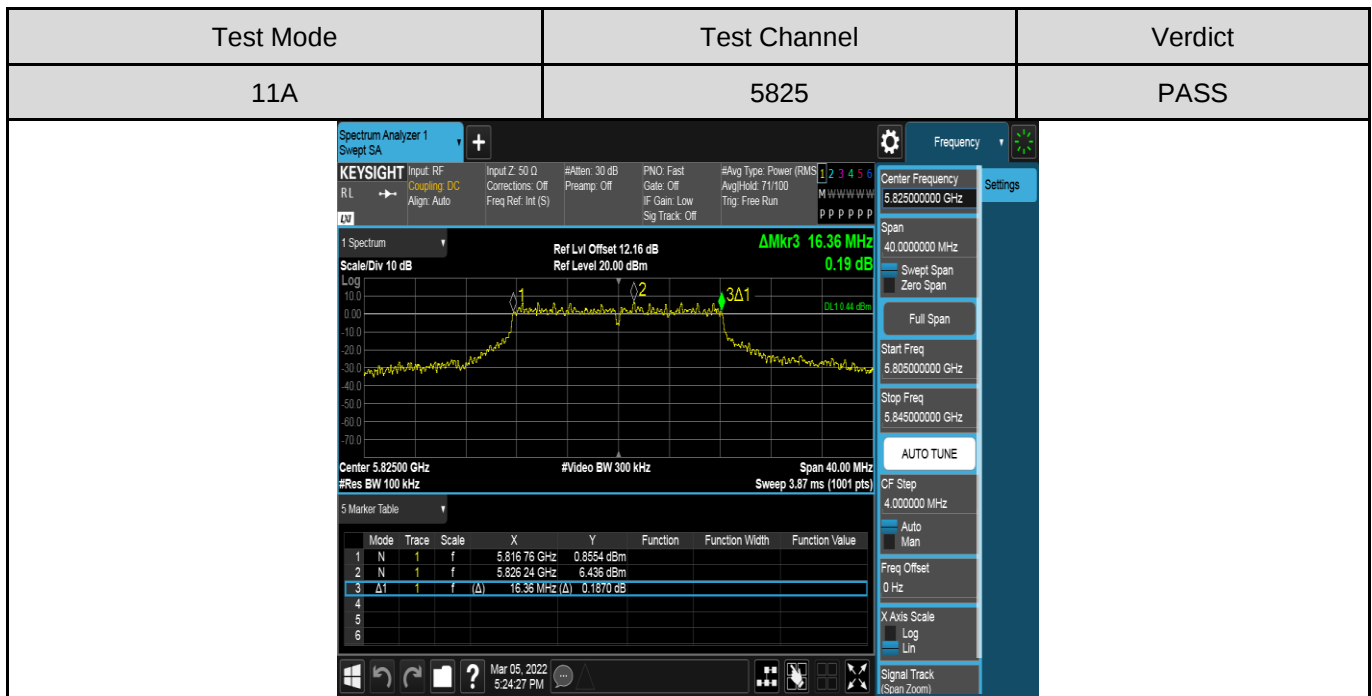
Auto
Man

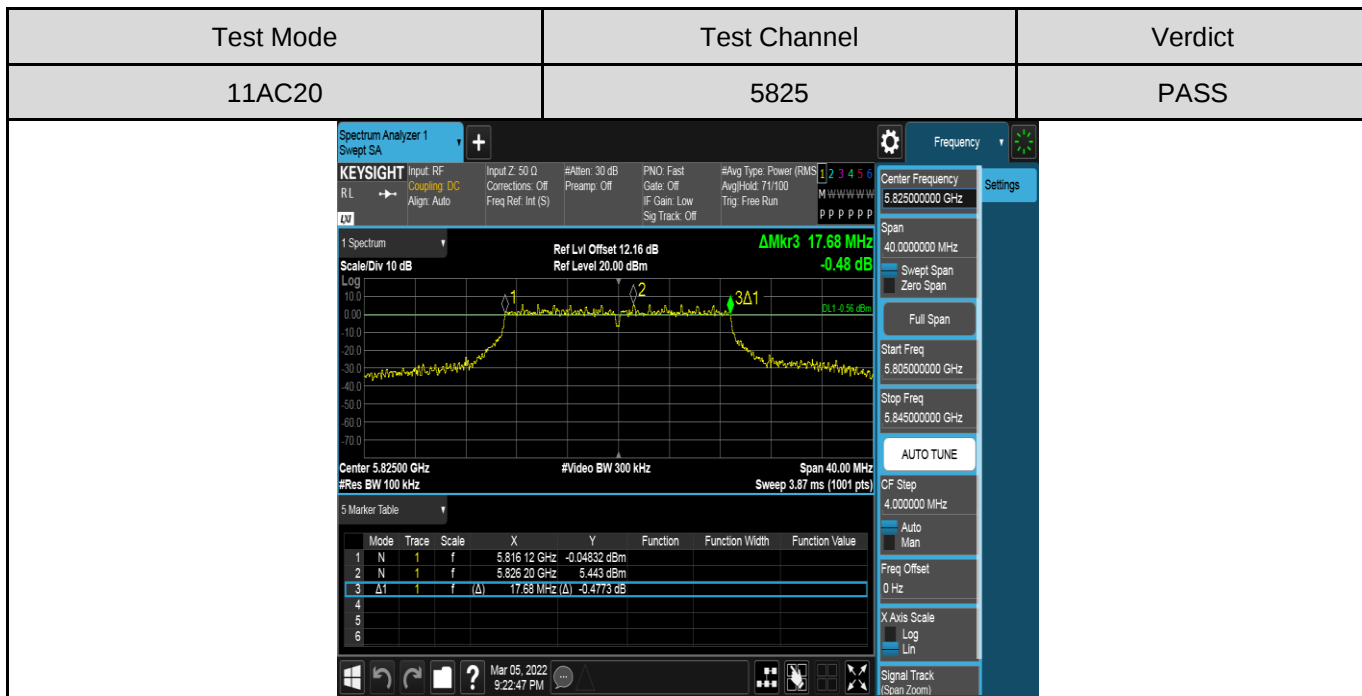
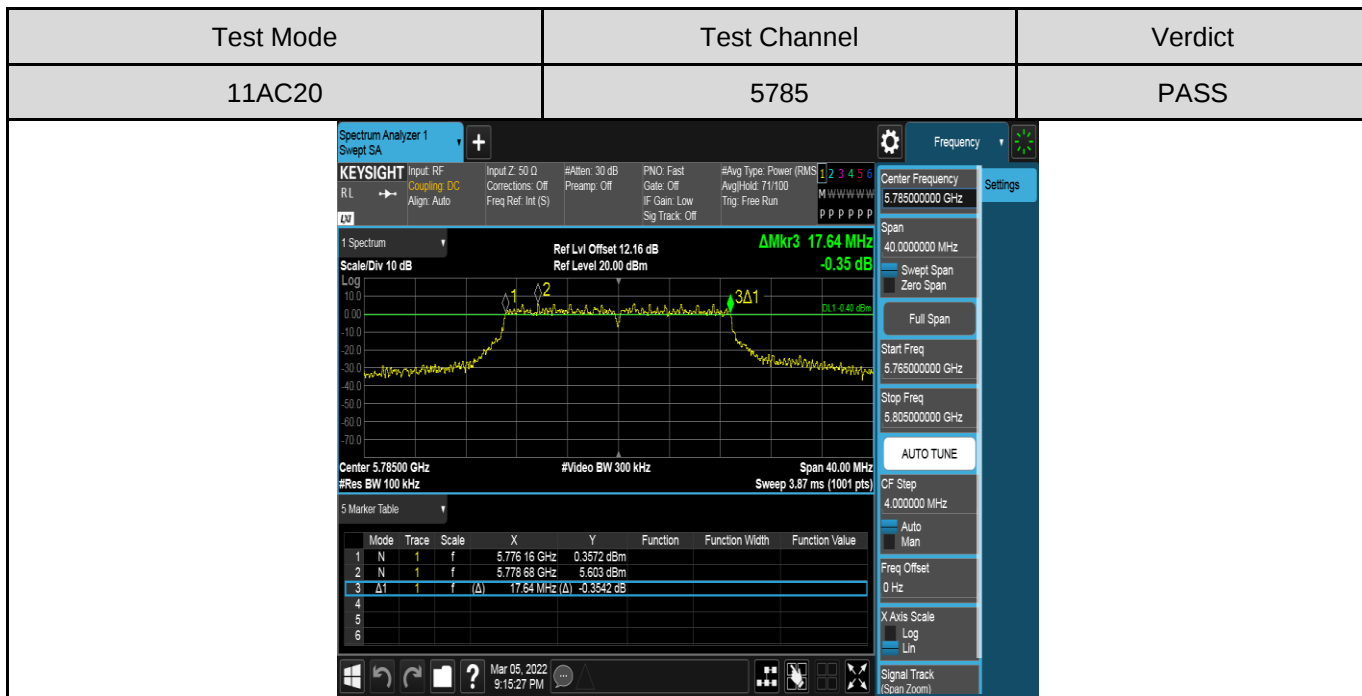
Freq Offset
0 Hz

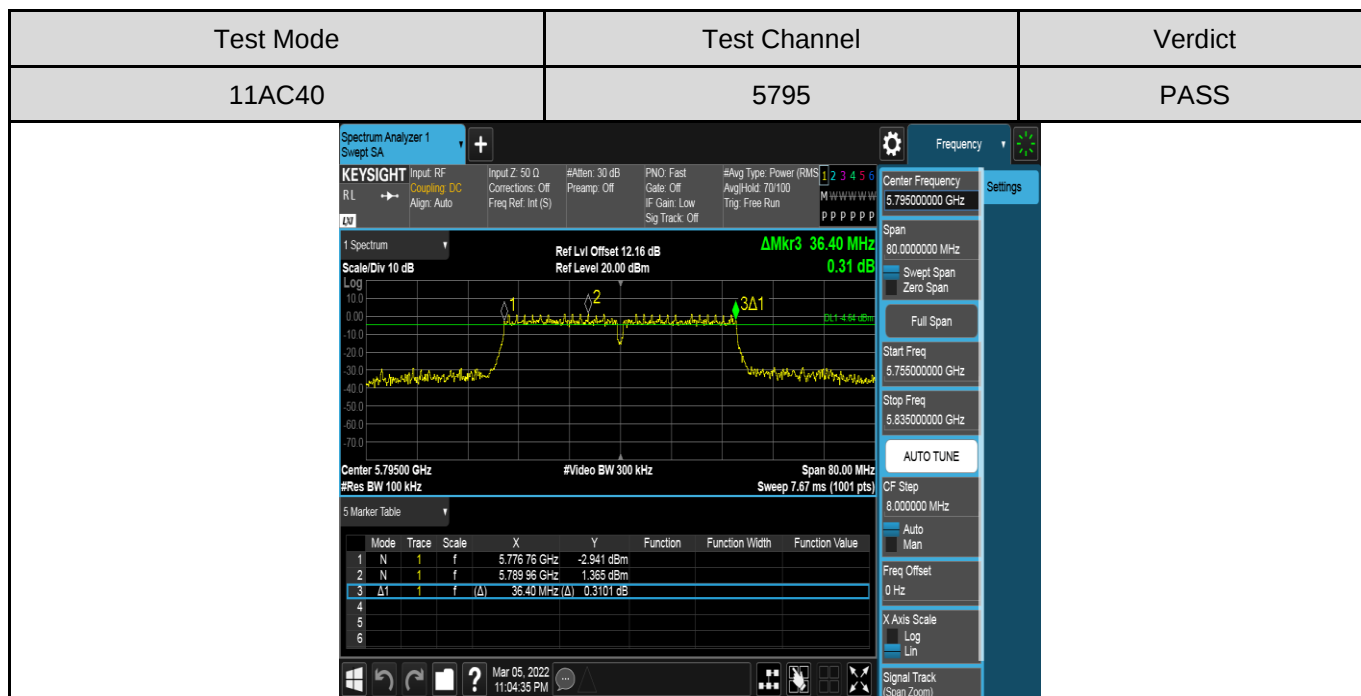
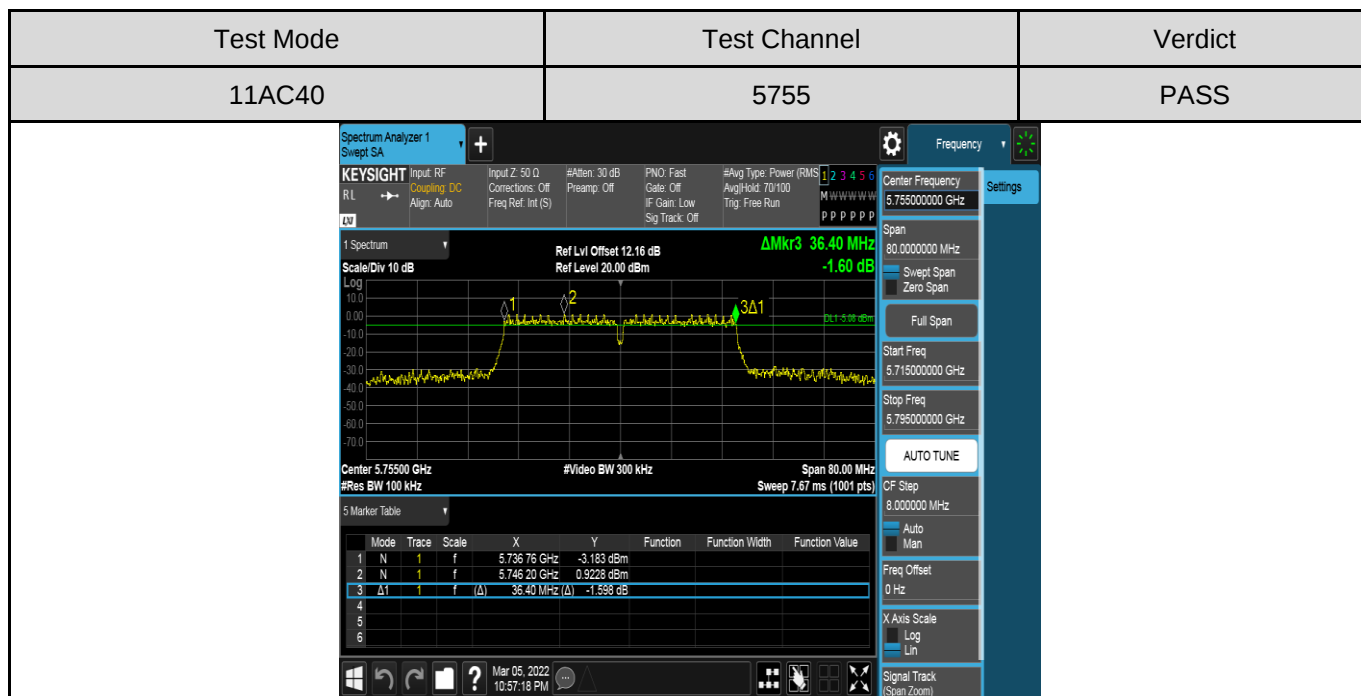
X Axis Scale
Log
Lin

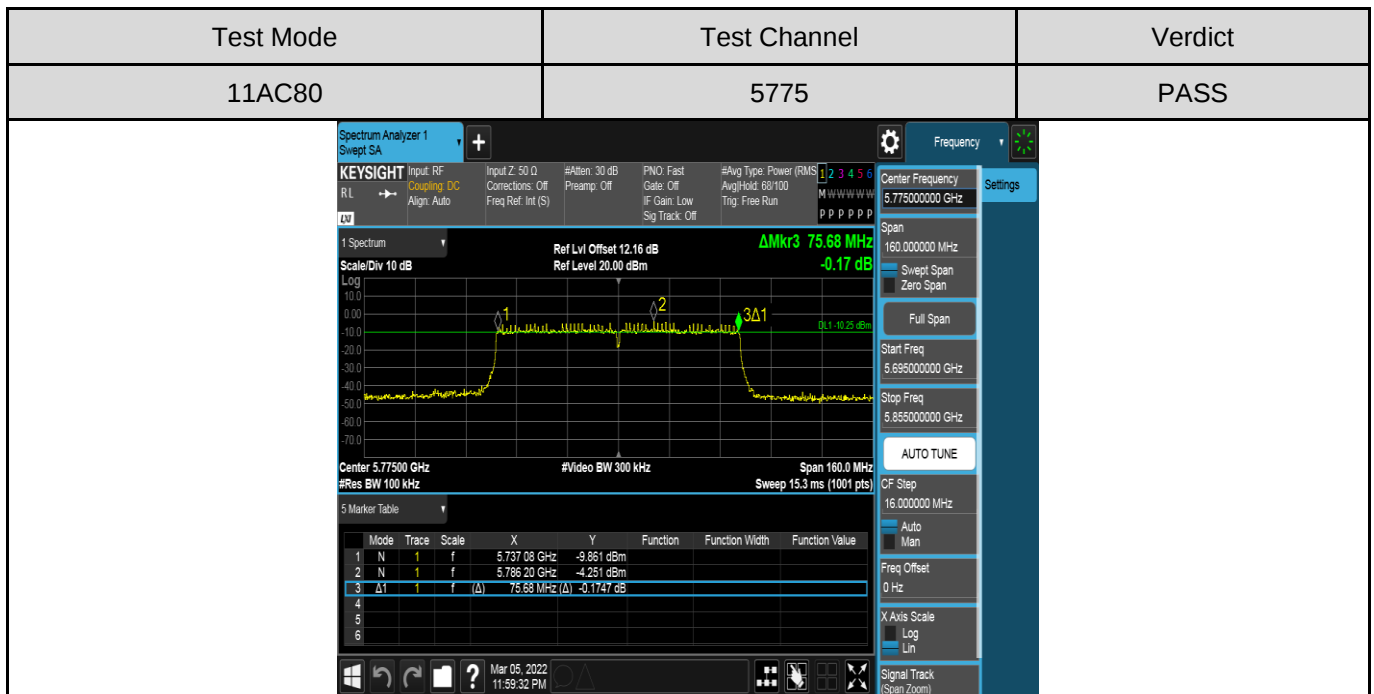
Signal Track
(Span Zoom)

Mar 05, 2022
5:16:06 PM











6.3. MAXIMUM CONDUCTED AVERAGE OUTPUT POWER

LIMITS

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	☐ Outdoor Access Point: 1 W (30 dBm) ☐ Indoor Access Point: 1 W (30 dBm) ☐ Fixed Point-To-Point Access Points: 1 W (30 dBm) ☒ Client Devices: 250 mW (24 dBm)	5150 ~ 5250
	Shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.	5250 ~ 5350 5470 ~ 5725
	Shall not exceed 1 Watt (30 dBm).	5725 ~ 5850

Remark:

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, the maximum conducted output power 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.E.

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 $\geq$ 3 MHz.
- (iv) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- (v) Sweep time = auto.
- (vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
- (vii) If transmit duty cycle $< 98\%$, 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 $\geq 98\%$, 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 (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 levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

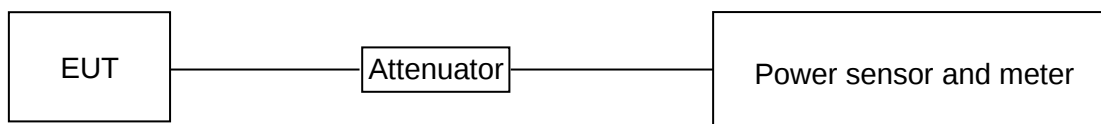
Method PM (Measurement using an RF average power meter):

- (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
 - a. The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
 - b. At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
 - c. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- (ii) If the transmitter does not transmit continuously, measure the duty cycle, x , of the transmitter output signal as described in II.B.
- (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- (iv) Adjust the measurement in dBm by adding $10 \log (1/x)$ where x is the duty cycle (e.g., $10 \log (1/0.25)$ if the duty cycle is 25 %).

Straddle channel power was measured using spectrum analyzer.



TEST SETUP



TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests
Relative Humidity	65%
Atmospheric Pressure:	101kPa
Temperature	21.5°C
Test Voltage	DC 3.3V
Test Date	05/05/2022

TEST RESULT TABLE

Mode	Frequency (MHz)	Average Conducted Output Power (dBm)	FCC Conducted Power Limit (dBm)
802.11a	5180	14.51	24
	5200	16.71	24
	5220	16.93	24
	5240	16.96	24
	5260	17.73	24
	5280	17.89	24
	5300	18.21	24
	5320	15.62	24
	5500	14.16	24
	5520	17.72	24
	5600	17.80	24
	5680	17.94	24
	5700	14.25	24
	5720_UNII-2C	16.40	24
	5720_UNII-3	9.76	30
	5745	17.15	30
	5785	17.65	30
	5825	17.38	30



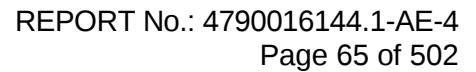
Mode	Frequency (MHz)	Average Conducted Output Power (dBm)	FCC Conducted Power Limit (dBm)
802.11 ac VHT20	5180	14.49	24
	5200	15.82	24
	5220	16.04	24
	5240	16.11	24
	5260	16.95	24
	5280	17.06	24
	5300	17.35	24
	5320	15.56	24
	5500	13.36	24
	5520	16.92	24
	5600	17.01	24
	5680	17.07	24
	5700	13.44	24
	5720_UNII-2C	15.60	24
	5720_UNII-3	9.10	30
	5745	16.38	30
	5785	16.80	30
	5825	16.42	30



Mode	Frequency (MHz)	Average Conducted Output Power (dBm)	FCC Conducted Power Limit (dBm)
802.11 ac VHT40	5190	10.55	24
	5230	14.44	24
	5270	15.83	24
	5310	11.88	24
	5510	11.42	24
	5550	15.38	24
	5590	15.52	24
	5630	15.38	24
	5670	11.98	24
	5710_UNII-2C	15.07	24
	5710_UNII-3	3.40	30
	5755	15.01	30
	5795	15.06	30

Mode	Frequency (MHz)	Average Conducted Output Power (dBm)	FCC Conducted Power Limit (dBm)
802.11 ac VHT80	5210	11.18	24
	5290	12.60	24
	5530	12.13	24
	5610	12.54	24
	5690_UNII-2C	12.28	24
	5690_UNII-3	-2.79	30
	5775	12.14	30

Note: The test results have already included the duty cycle correction factor. About correction Factor please refer to section 6.2.



For Straddle channel:

Test Mode	Test Channel	Verdict
11A	5720_UNII-3	PASS

Keysight Spectrum Analyzer 1 Channel Power

Input: RF
Corrections: Off
Align: Auto

Input Z: 50 Ω
Attenuation: 40 dB
Preamp: Off
Freq Ref. Int. (S): #PNO: Fast

Trig: Free Run
Gate: Off
#F Gain: Low

Center Freq: 5.730720000 GHz
Avlg/Hold: 100/100
Radio Std: None

Center Frequency: 5.730720000 GHz
Span: 22.880 MHz
CF Step: 2.2880000 MHz
Auto/Man: Auto
Freq Offset: 0 Hz

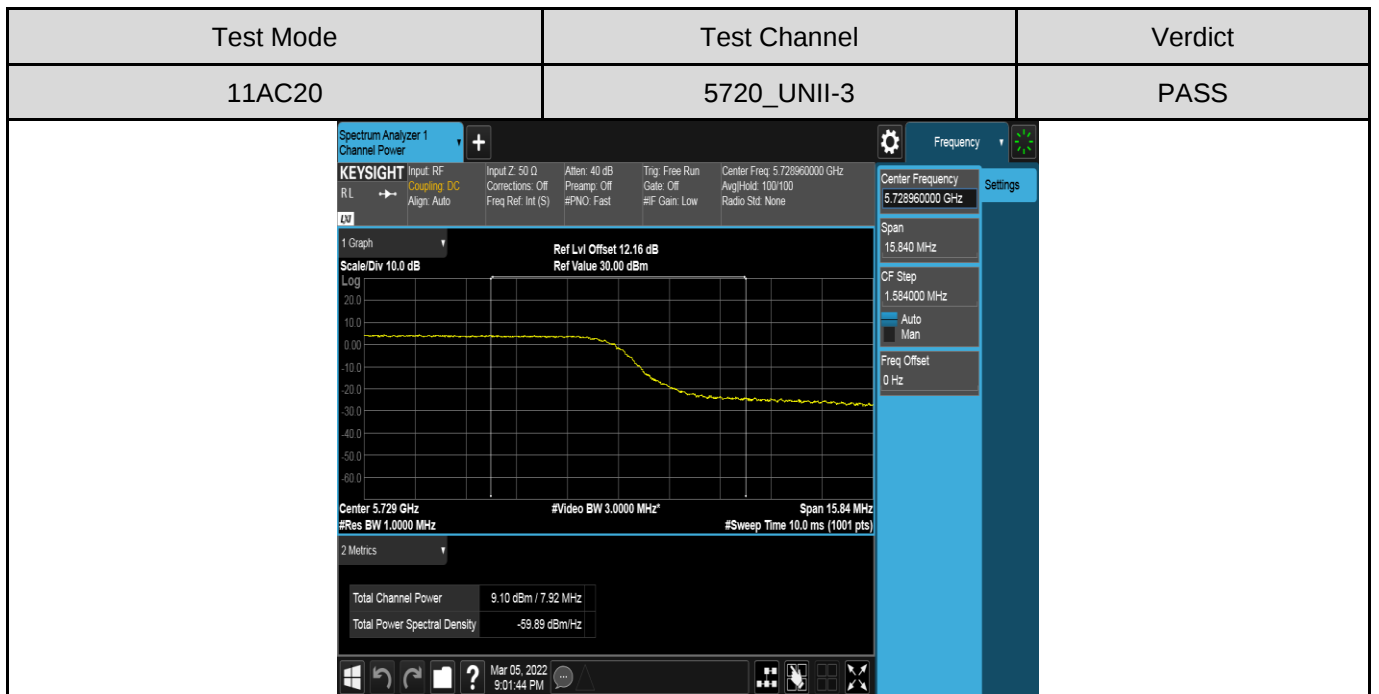
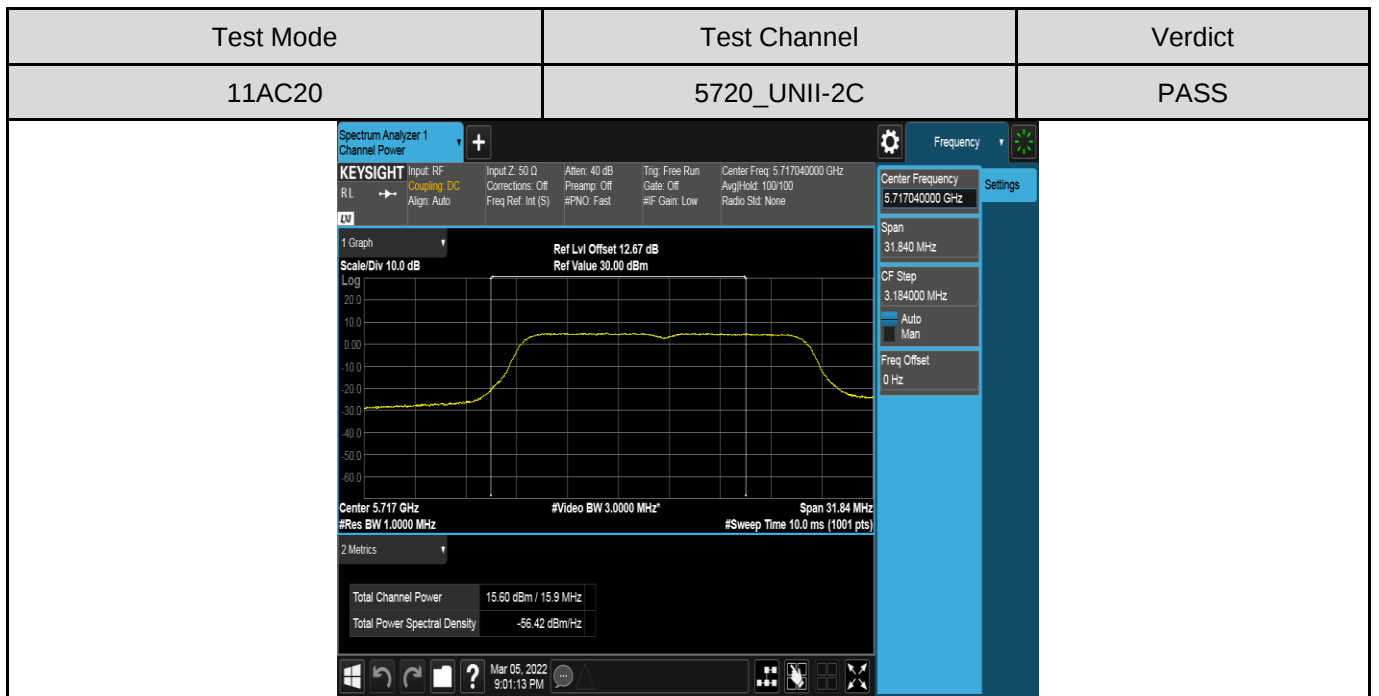
1 Graph
Scale/Div: 10.0 dB
Log
Ref Lvl Offset: 12.16 dB
Ref Value: 30.00 dBm

Center: 5.731 GHz
#Res BW: 1.0000 MHz
#Video BW: 3.0000 MHz
Span: 22.88 MHz
#Sweep Time: 10.0 ms (1001 pts)

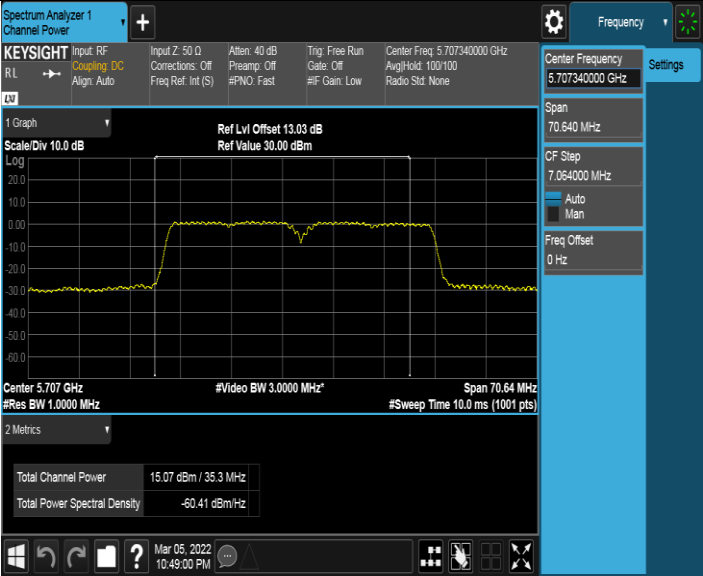
2 Metrics

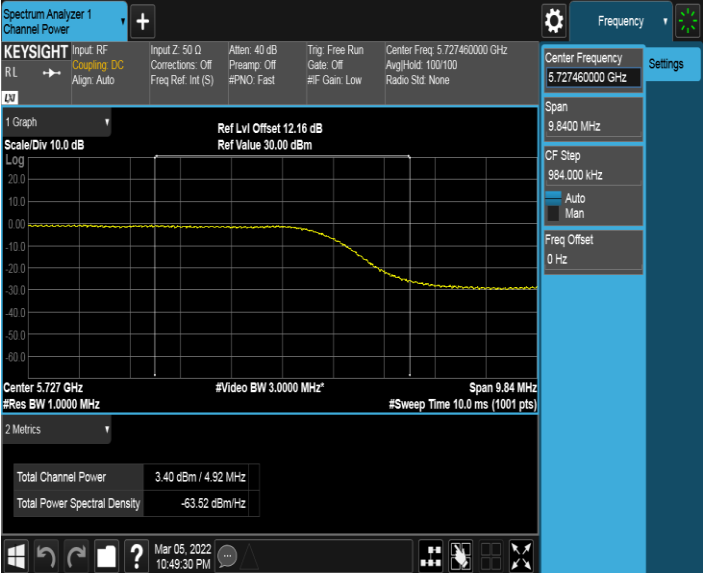
Metric	Value
Total Channel Power	9.76 dBm / 11.4 MHz
Total Power Spectral Density	-60.83 dBm/Hz

Status Bar: Mar 05, 2022 5:02:31 PM

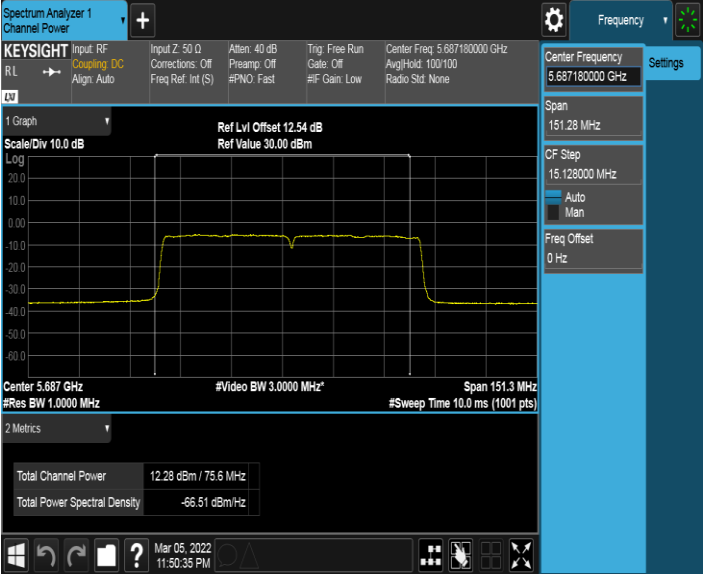


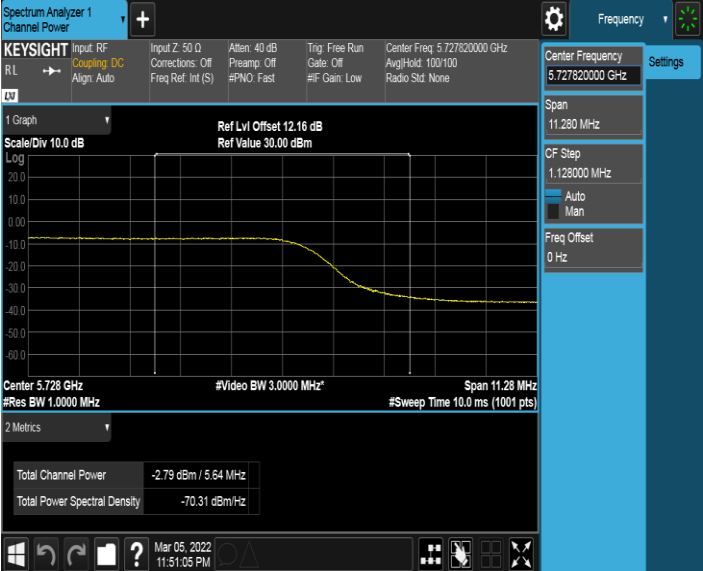


Test Mode	Test Channel	Verdict
11AC40	5710_UNII-2C	PASS
		

Test Mode	Test Channel	Verdict
11AC40	5710_UNII-3	PASS
		



Test Mode	Test Channel	Verdict
11AC80	5690_UNII-2C	PASS
		

Test Mode	Test Channel	Verdict
11AC80	5690_UNII-3	PASS
		



6.4. POWER SPECTRAL DENSITY

LIMITS

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

Remark:

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	$\geq 3 \times \text{RBW}$
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

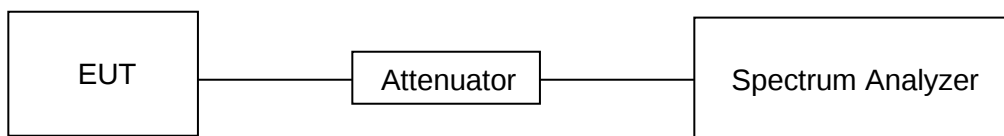
For U-NII-3:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	500 kHz
VBW	$\geq 3 \times \text{RBW}$
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	65%
Atmospheric Pressure:	101kPa
Temperature	21.5°C
Test Voltage	DC 3.3V
Test Date	05/05/2022



RESULTS

Test Mode	Channel	PSD	Limit	Verdict
802.11a	5180	3.308	11	PASS
	5200	5.301	11	PASS
	5220	5.679	11	PASS
	5240	5.494	11	PASS
	5260	6.453	11	PASS
	5280	6.591	11	PASS
	5300	6.870	11	PASS
	5320	4.173	11	PASS
	5500	2.944	11	PASS
	5520	6.360	11	PASS
	5600	6.330	11	PASS
	5680	6.470	11	PASS
	5700	2.838	11	PASS
	5720 UNII-2C	6.035	11	PASS
	5720 UNII-3	3.921	30	PASS
	5745	3.960	30	PASS
	5785	4.385	30	PASS
	5825	4.686	30	PASS

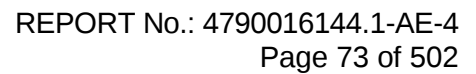
Test Mode	Channel	PSD	Limit	Verdict
802.11ac VHT20	5180	2.721	11	PASS
	5200	3.899	11	PASS
	5220	4.306	11	PASS
	5240	4.237	11	PASS
	5260	5.131	11	PASS
	5280	5.275	11	PASS
	5300	5.606	11	PASS
	5320	3.718	11	PASS
	5500	1.753	11	PASS
	5520	5.168	11	PASS
	5600	5.199	11	PASS
	5680	5.327	11	PASS
	5700	1.602	11	PASS
	5720 UNII-2C	4.863	11	PASS
	5720 UNII-3	2.995	30	PASS
	5745	2.746	30	PASS
	5785	3.450	30	PASS
	5825	3.458	30	PASS

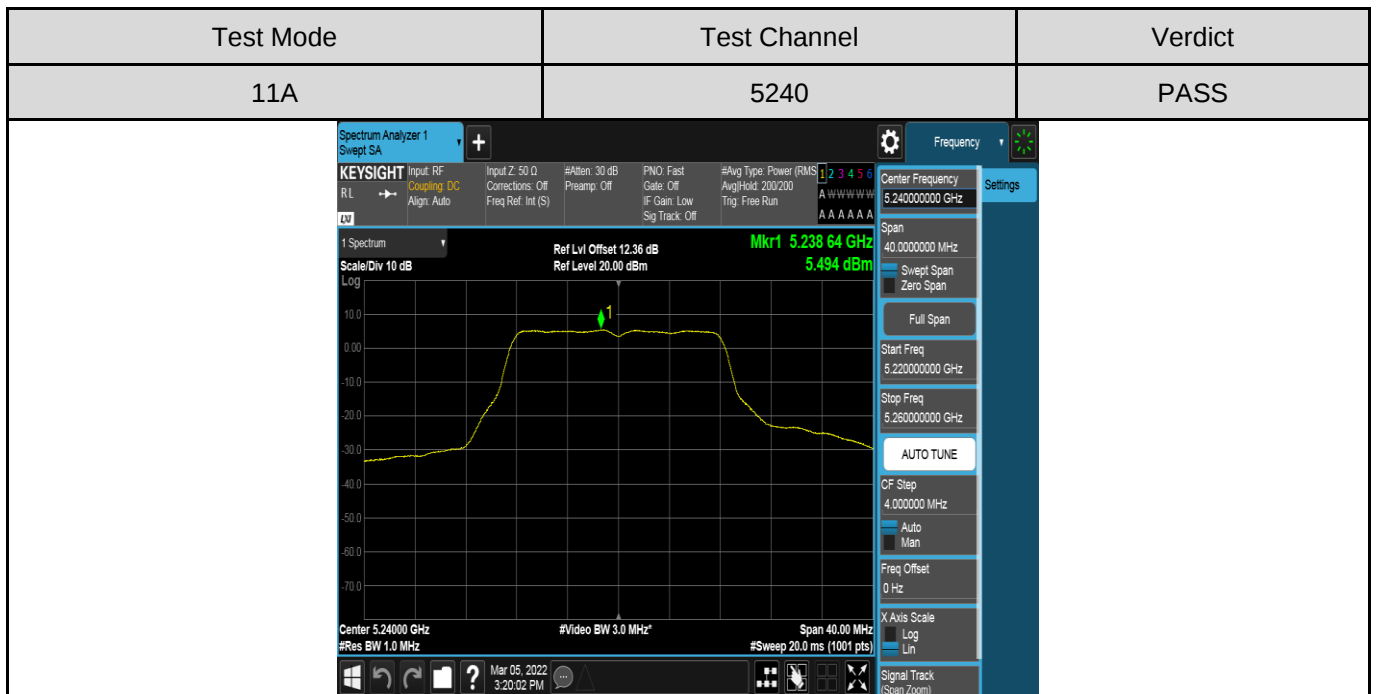
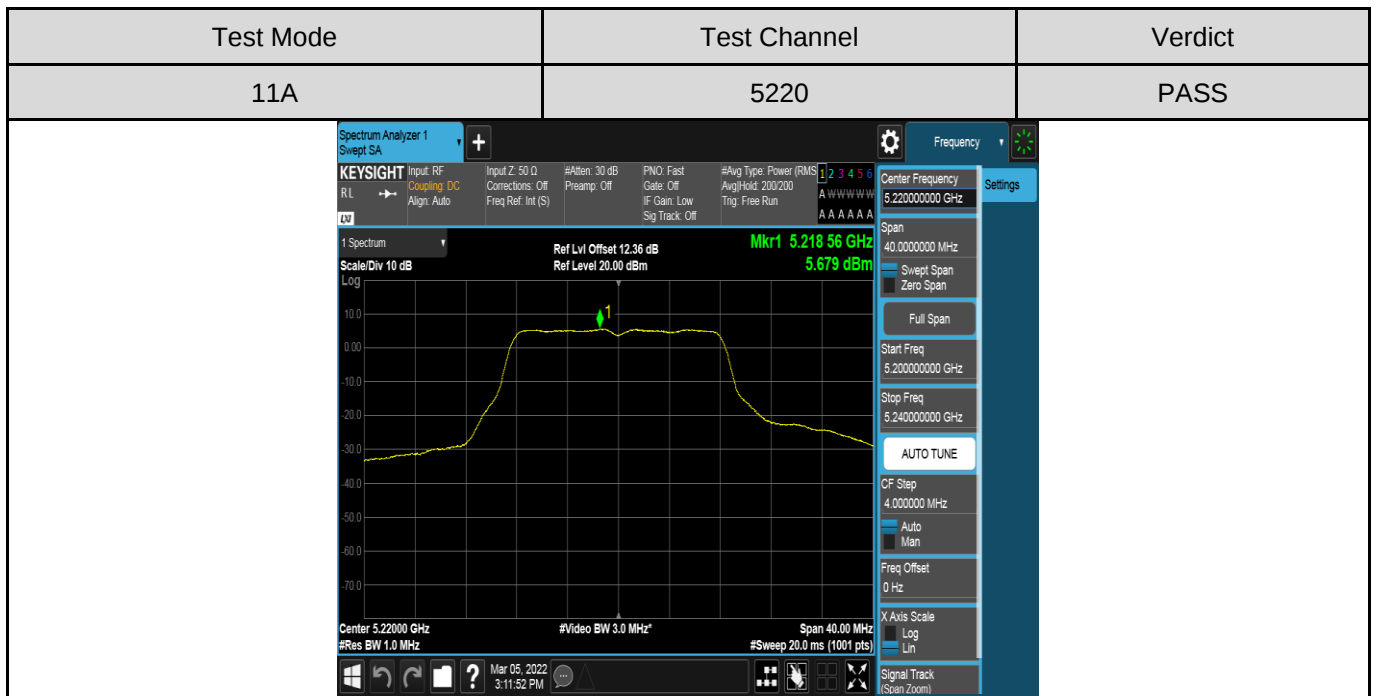


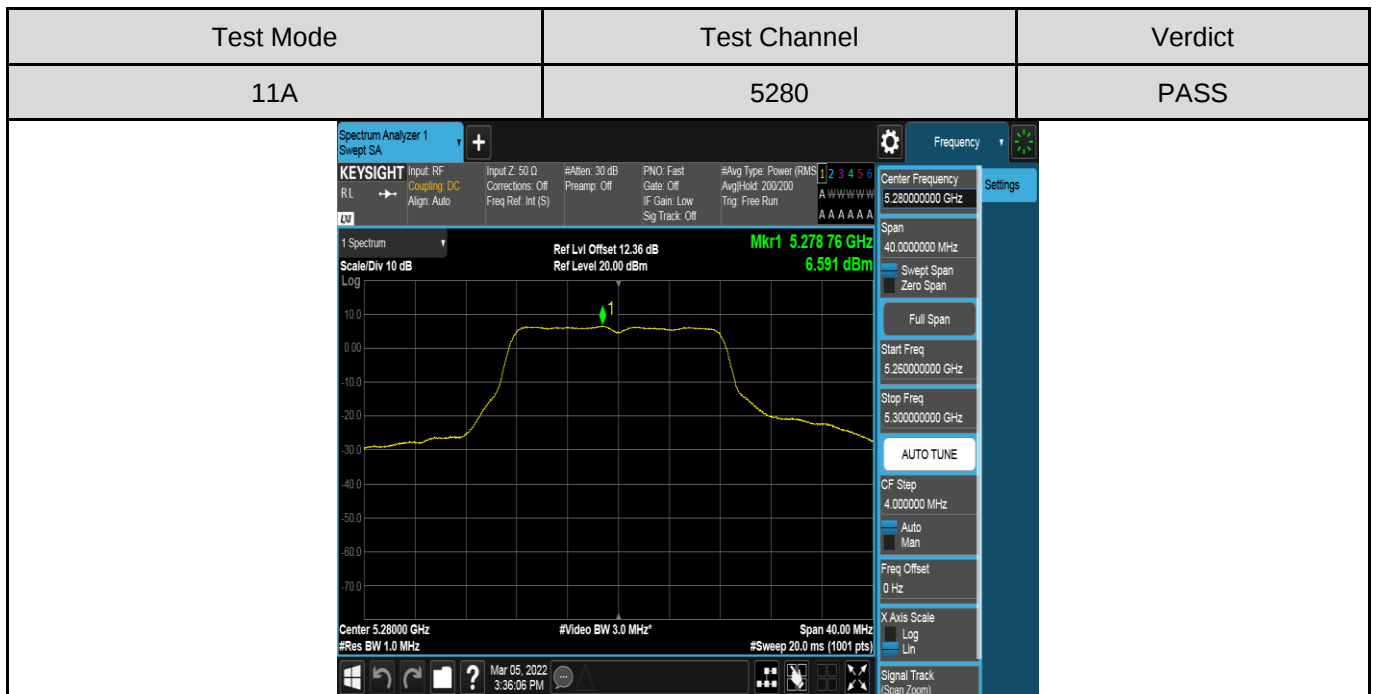
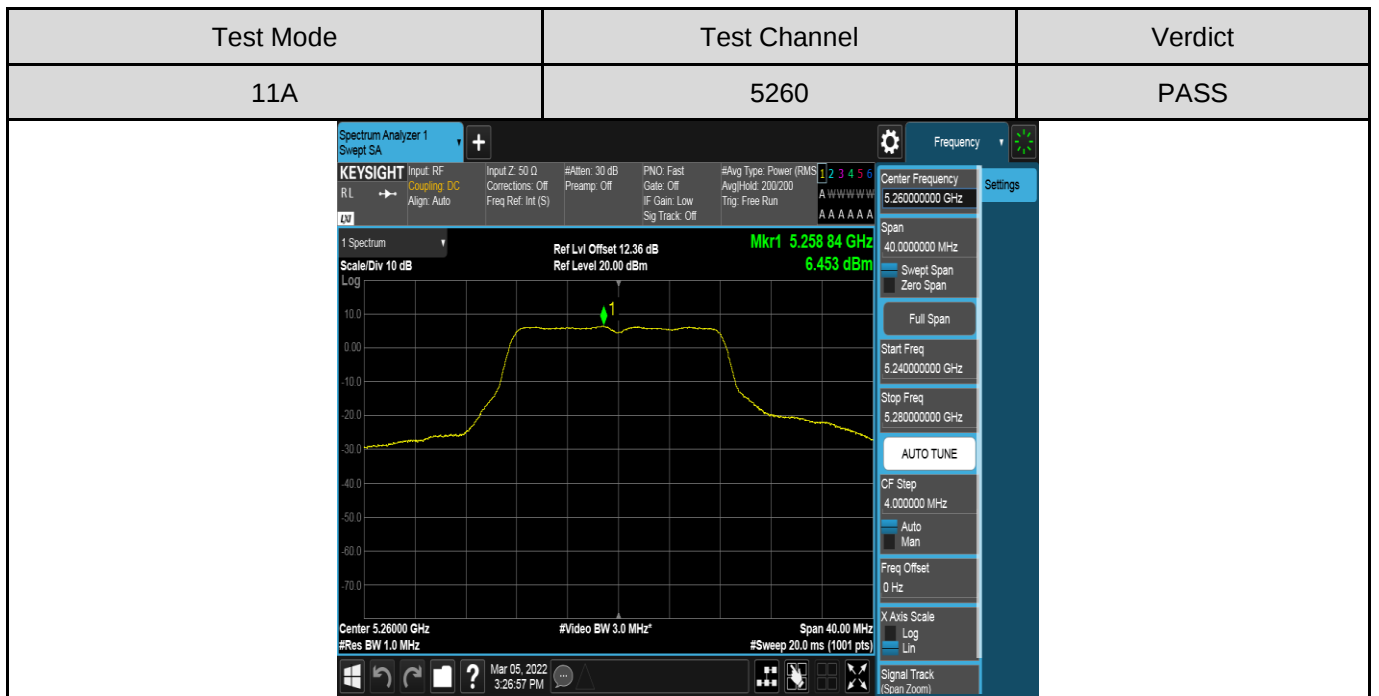
Test Mode	Channel	PSD	Limit	Verdict
802.11ac VHT40	5190	-4.097	11	PASS
	5230	-0.025	11	PASS
	5270	1.363	11	PASS
	5310	-2.663	11	PASS
	5510	-2.966	11	PASS
	5550	0.945	11	PASS
	5590	0.937	11	PASS
	5630	1.696	11	PASS
	5670	-2.577	11	PASS
	5710 UNII-2C	0.836	11	PASS
	5710 UNII-3	-1.605	30	PASS
	5755	-0.992	30	PASS
	5795	0.220	30	PASS

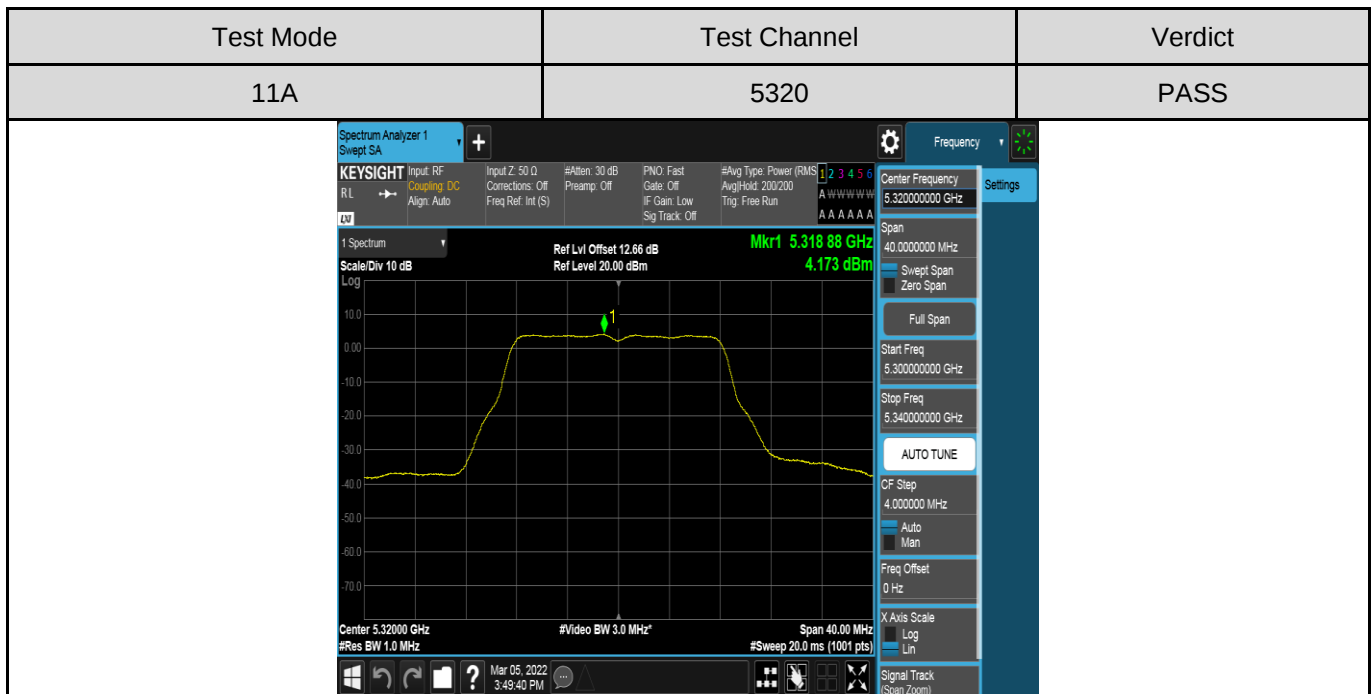
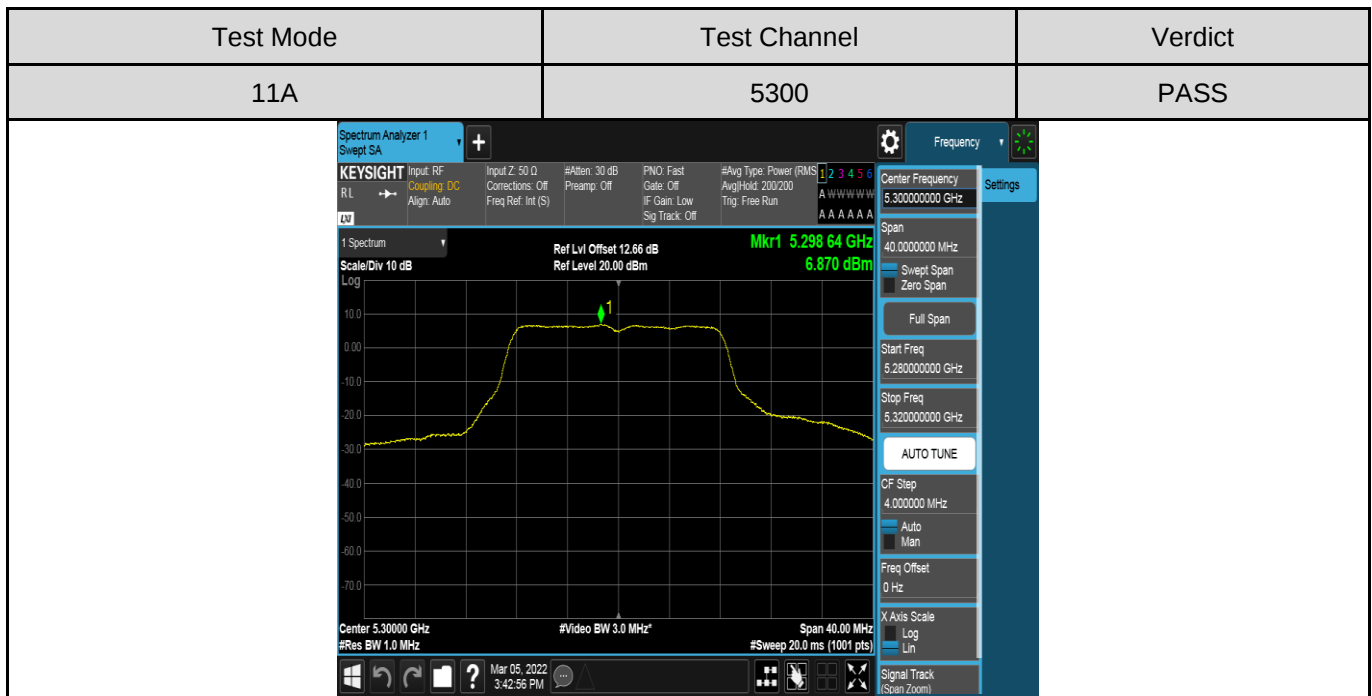
Test Mode	Channel	PSD	Limit	Verdict
802.11ac VHT80	5210	-6.521	11	PASS
	5290	-5.255	11	PASS
	5530	-5.814	11	PASS
	5610	-5.486	11	PASS
	5690 UNII-2C	-5.456	11	PASS
	5690 UNII-3	-7.650	30	PASS
	5775	-6.728	30	PASS

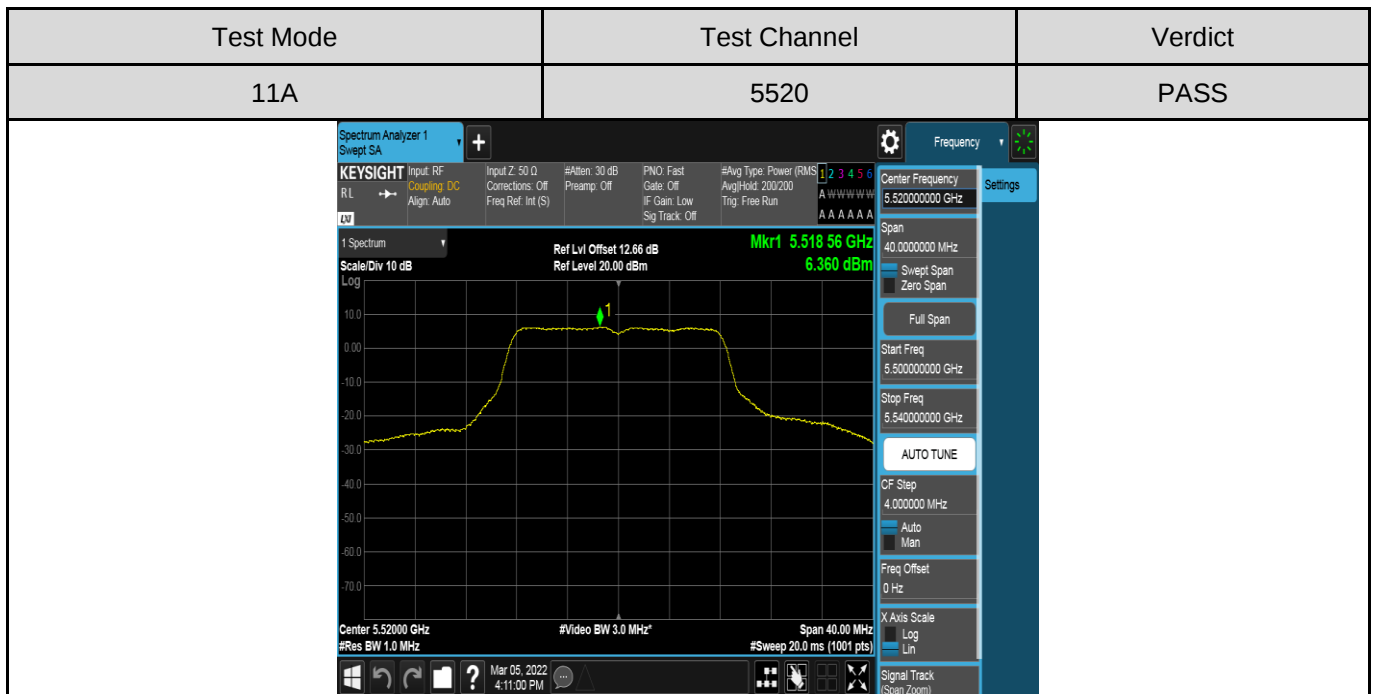
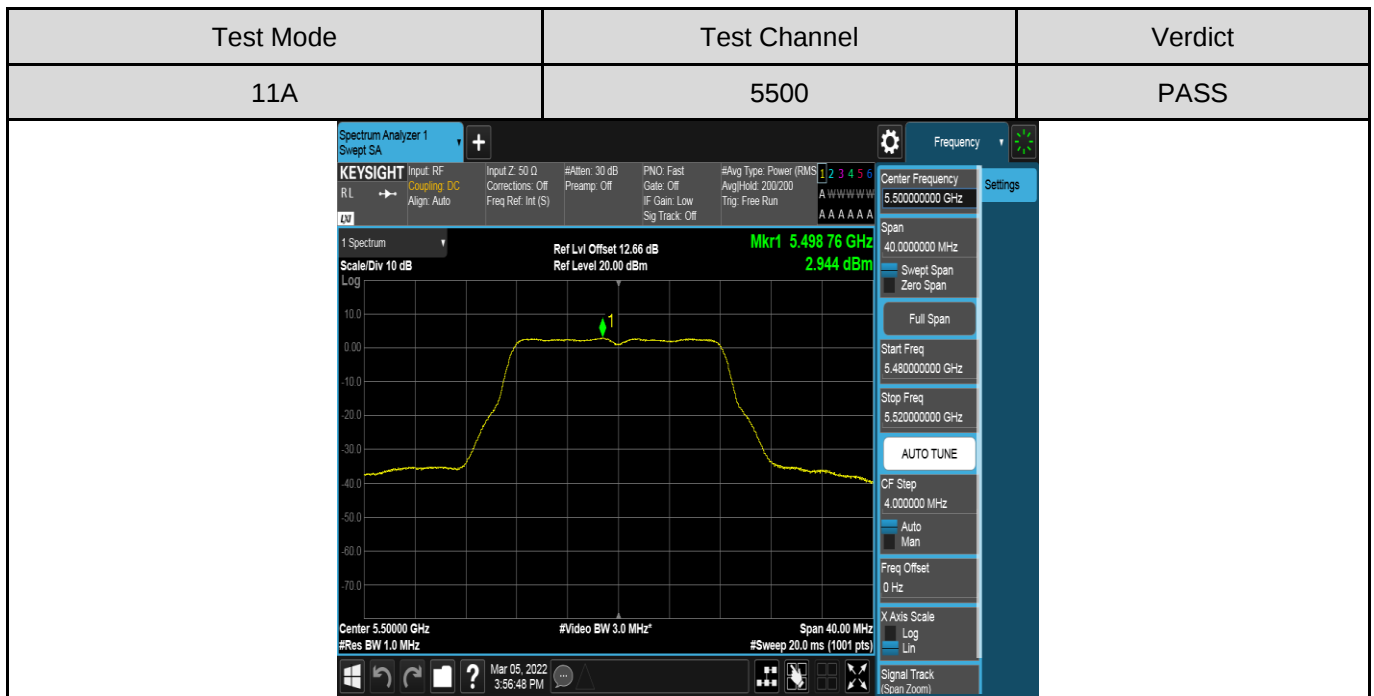
Remark : 1. The Result and Limit Unit is dBm/500 kHz in the band 5.725 ~ 5.85 GHz.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. All the modes had been teste, but only the worst data was recorded in the report.

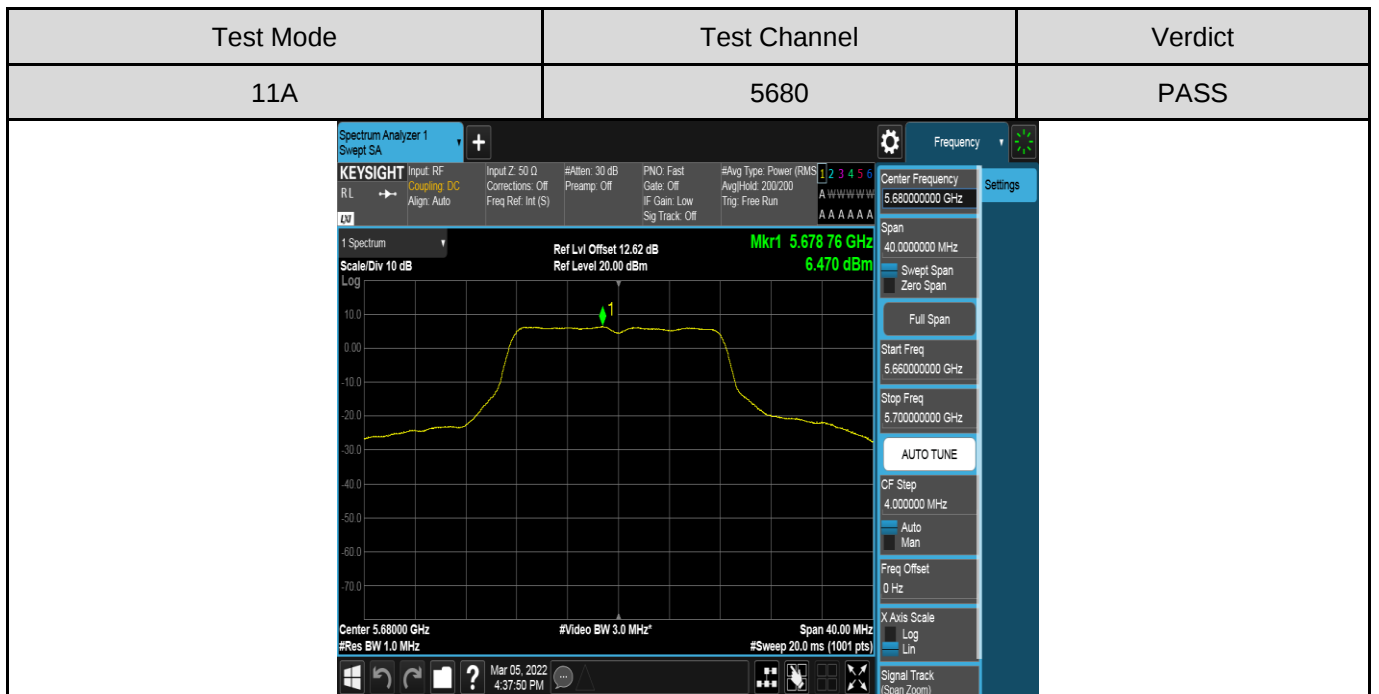
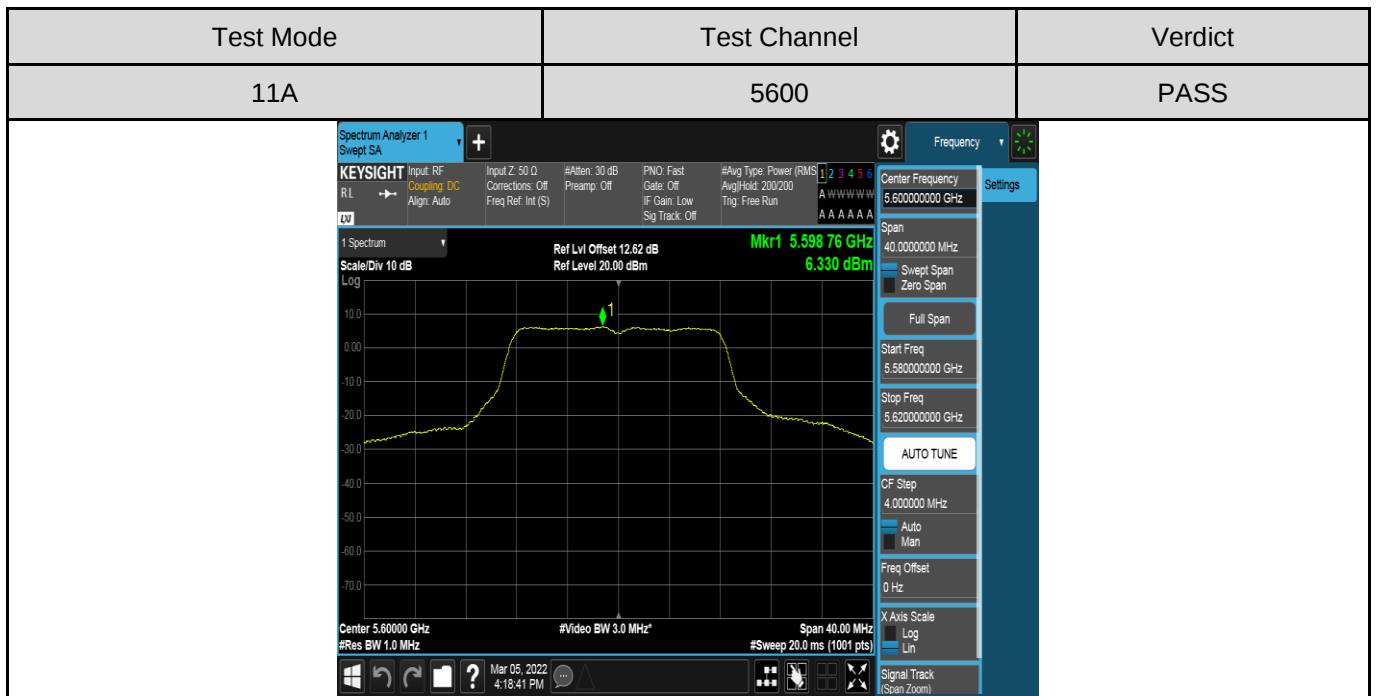




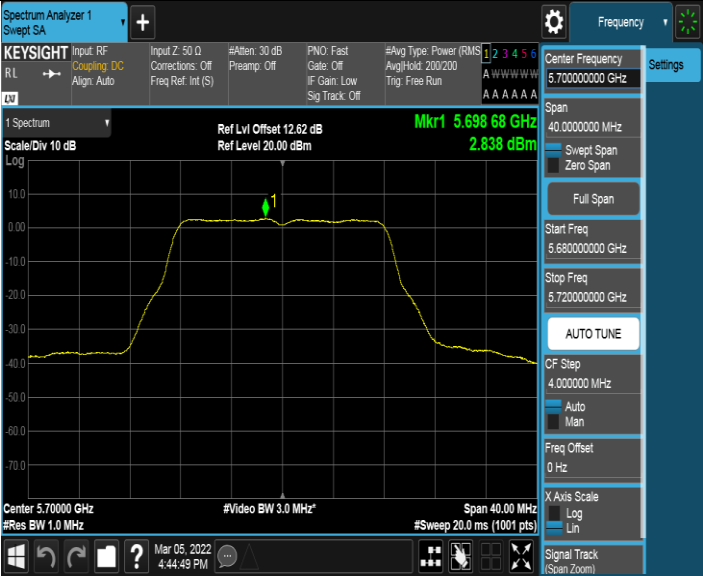










Test Mode	Test Channel	Verdict
11A	5700	PASS
		

Test Mode	Test Channel	Verdict
11A	5720_UNII-2C	PASS
