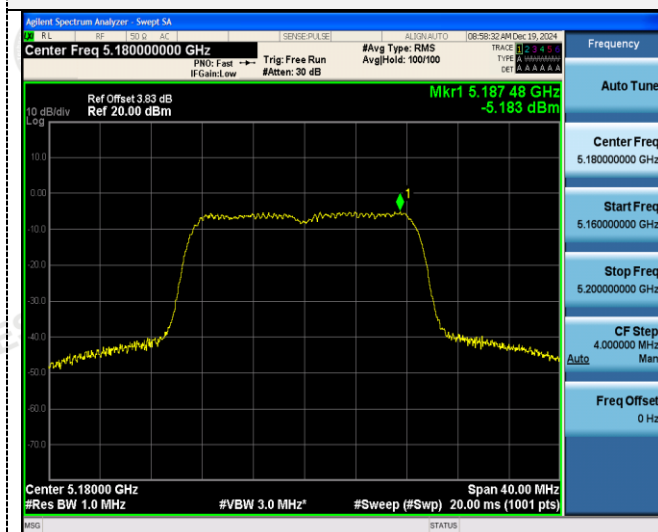
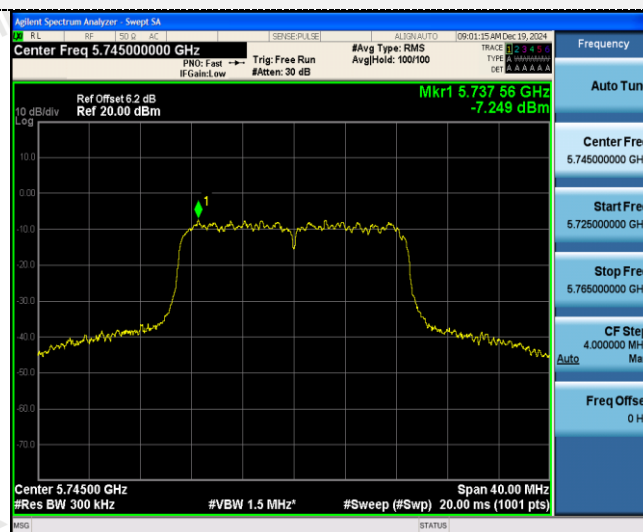


802.11ac(HT20)

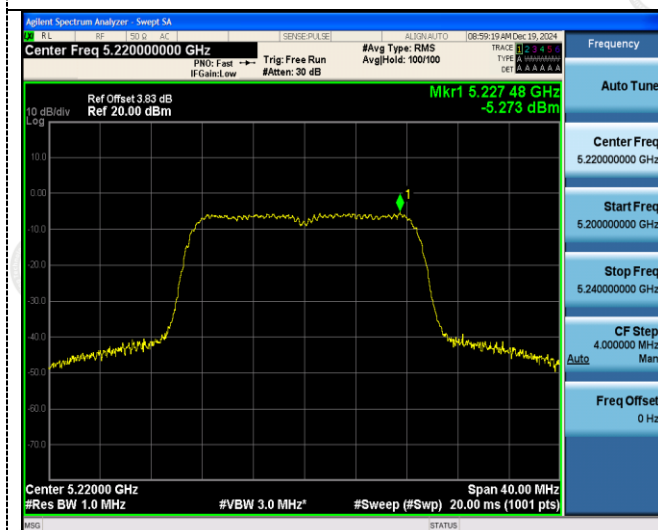
U-NII 1



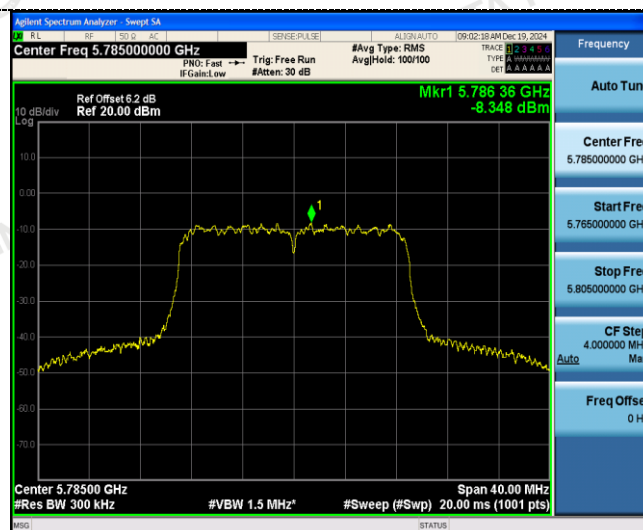
U-NII 3



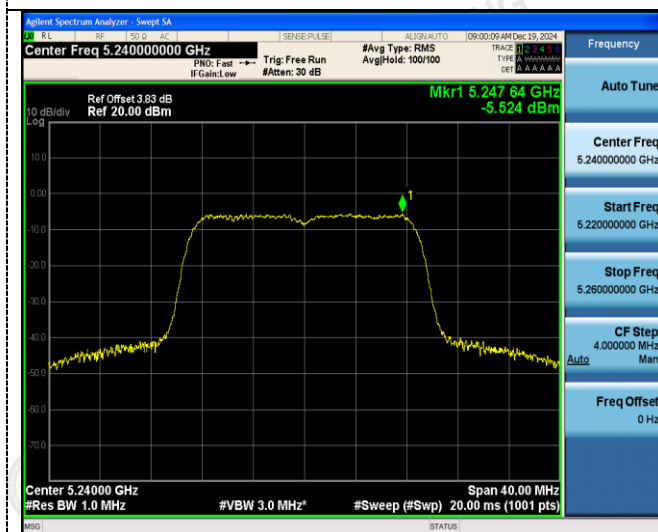
CH36



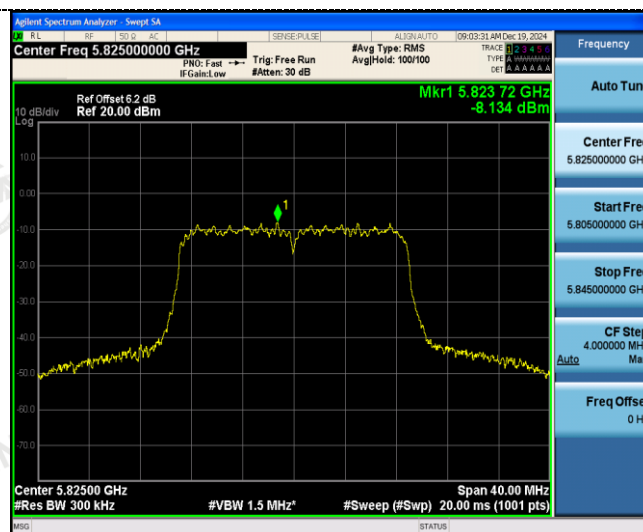
CH149



CH40



CH157

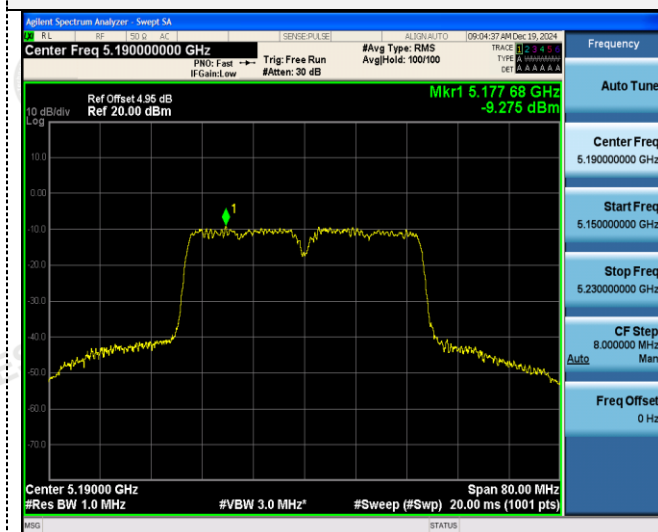


CH4

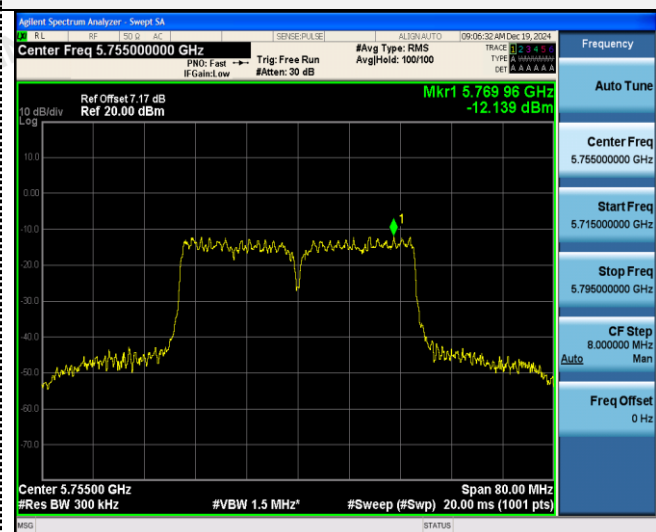
CH165

802.11ac(HT40)

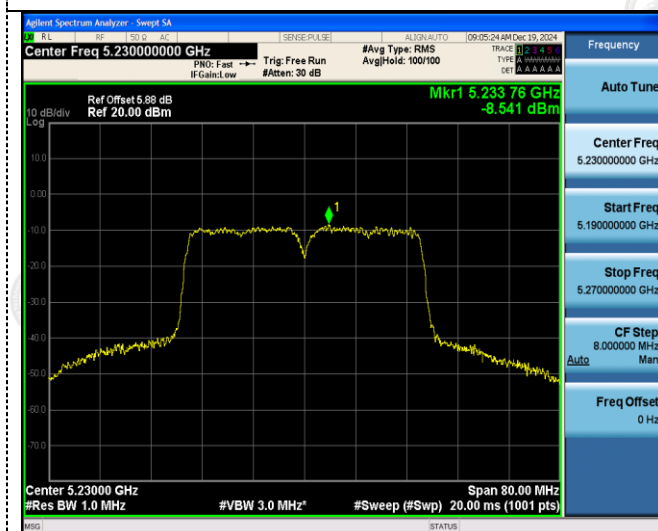
U-NII 1



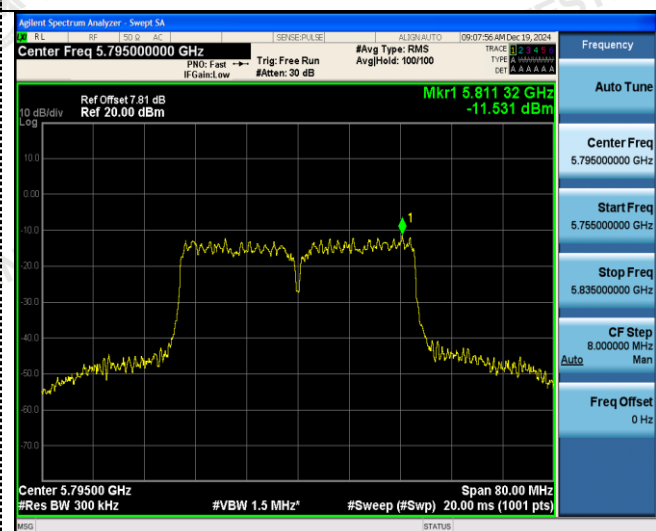
U-NII 3



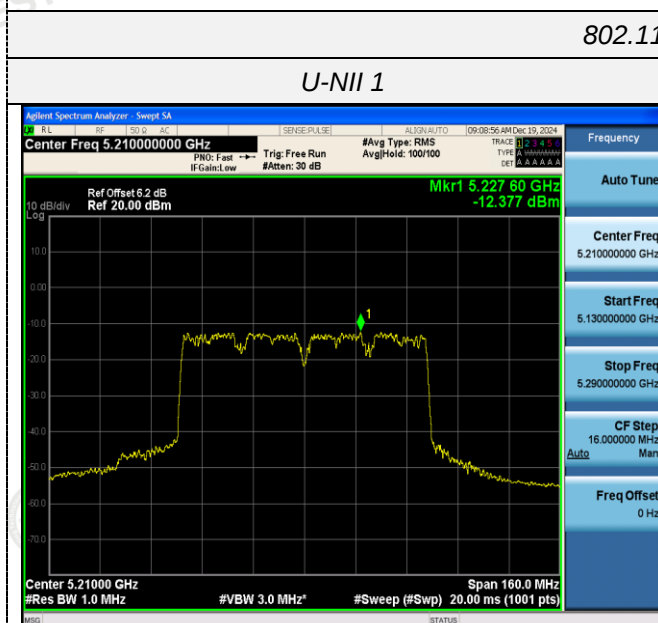
CH38



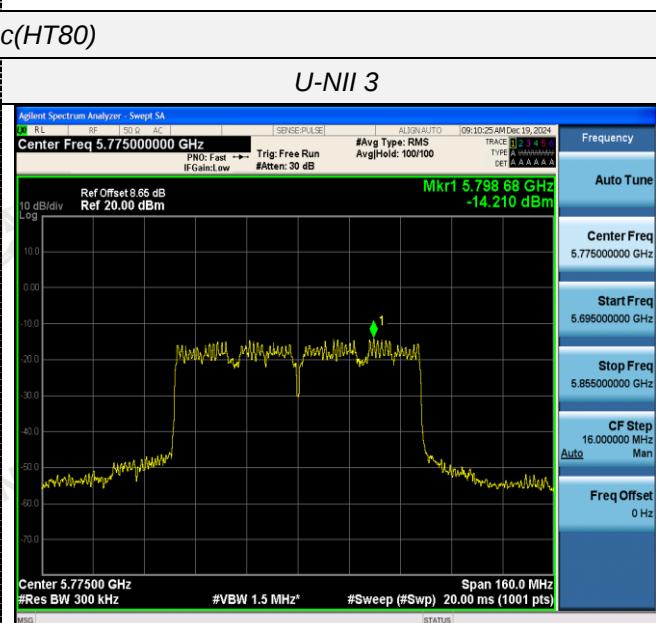
CH151



CH46



CH159

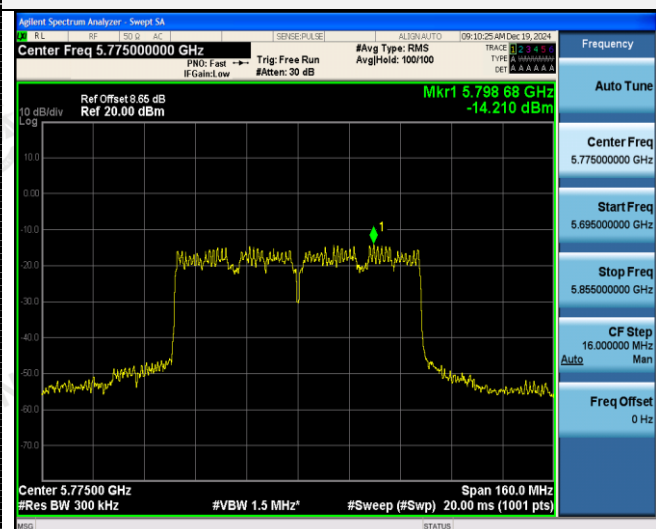


802.11ac(HT80)

U-NII 1



U-NII 3



CH42

CH155

4.5 Emission Bandwidth (26dB Bandwidth)

Limit

N/A

Test Procedure

1. Set resolution bandwidth (RBW) = approximately 1 % of the EBW.
2. Set the video bandwidth (VBW) > RBW.
3. Detector = Peak.
4. Trace mode = Max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW / EBW ratio is approximately 1 %.

Test Configuration

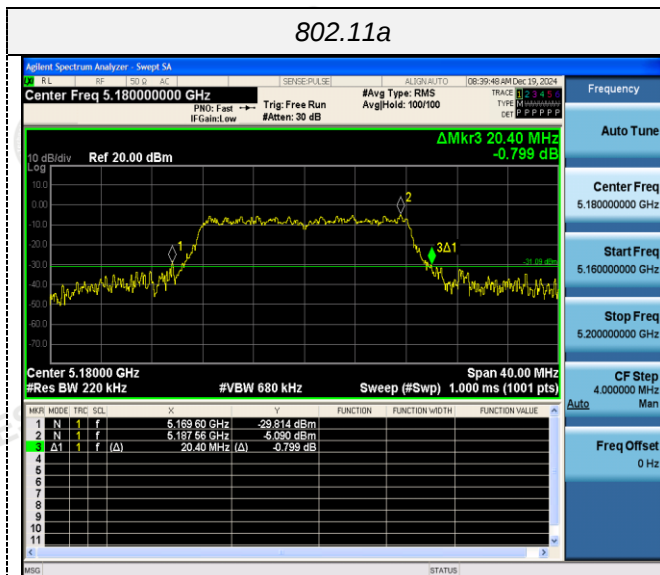


Test Results

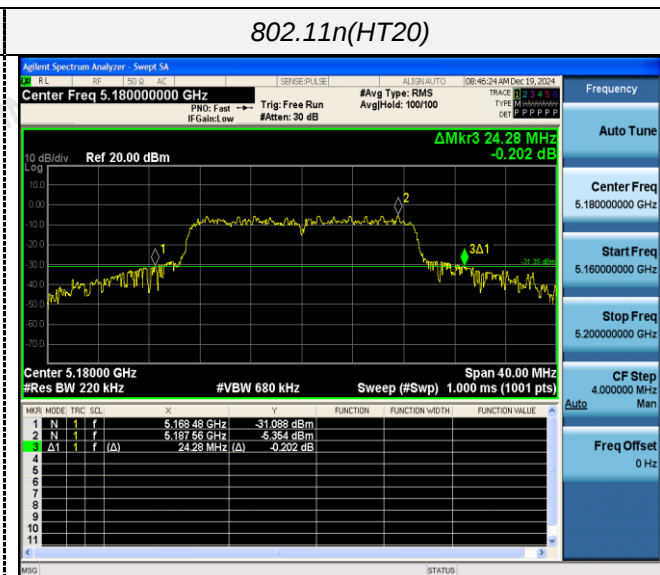
Type	Bands	Channel	26dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	U-NII 1	36	20.400	N/A	Pass
		40	25.400		
		48	22.800		
802.11n(HT20)	U-NII 1	36	24.280		
		40	25.000		
		48	25.240		
802.11n(HT40)	U-NII 1	38	48.000		
		46	42.640		
802.11ac(HT20)	U-NII 1	36	23.840		
		40	20.120		
		48	22.000		
802.11ac(HT40)	U-NII 1	38	41.440		
		46	43.760		
802.11ac(HT80)	U-NII 1	42	87.840		

Test plot as follows:

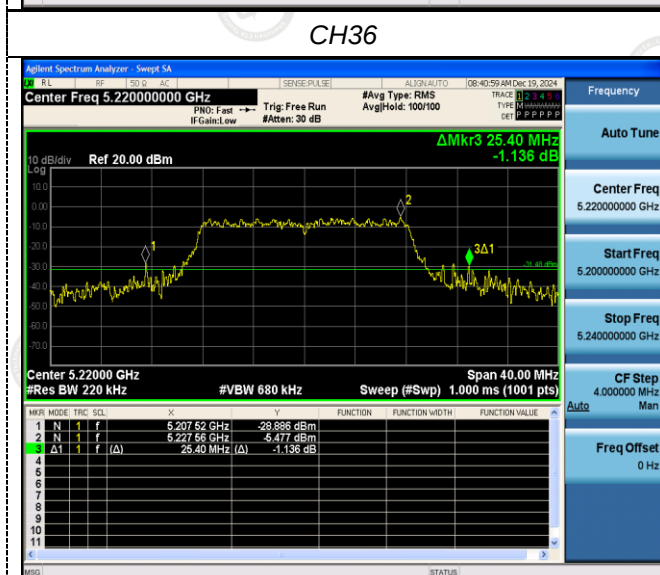
802.11a



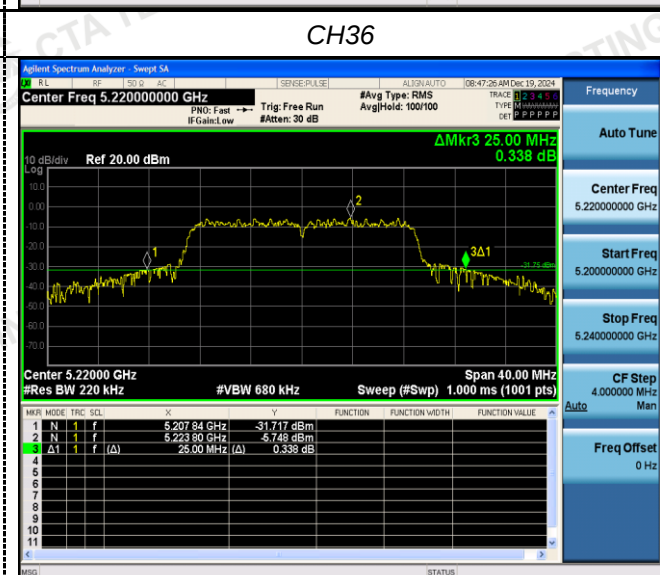
802.11n(HT20)



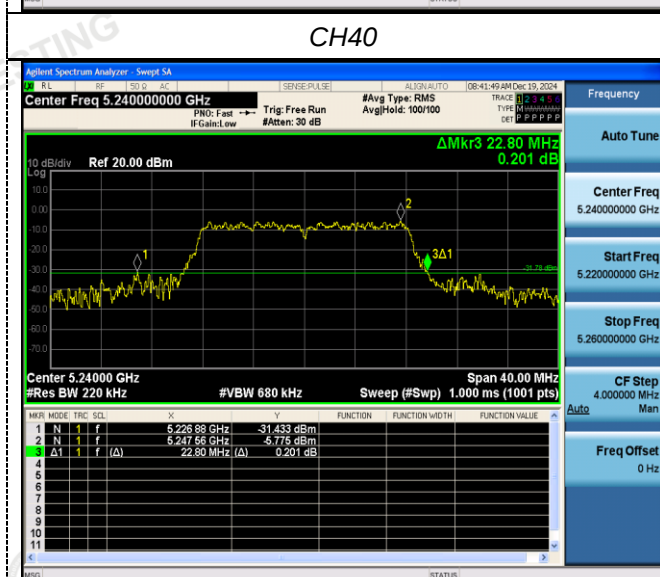
CH36



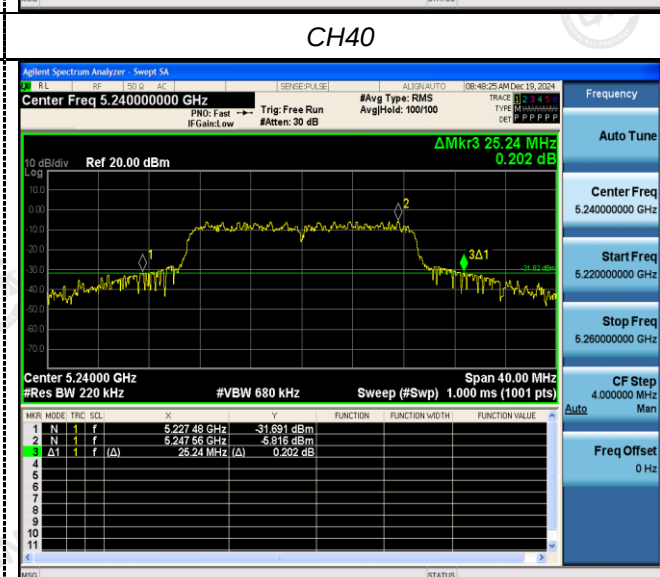
CH36



CH40



CH40



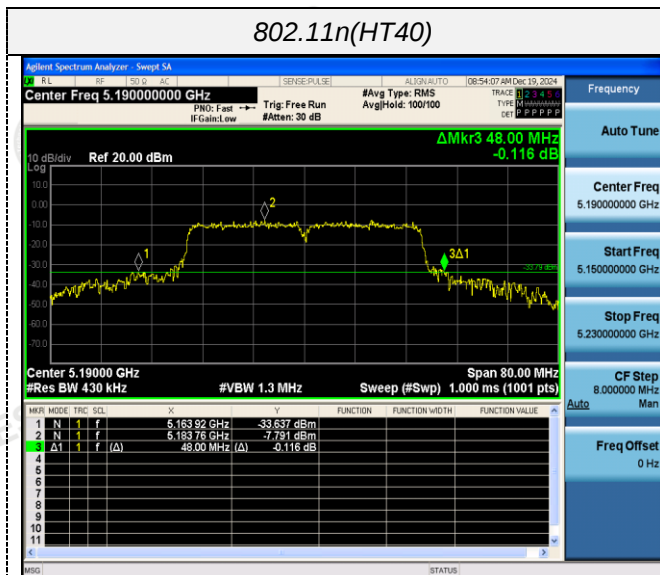
CH48



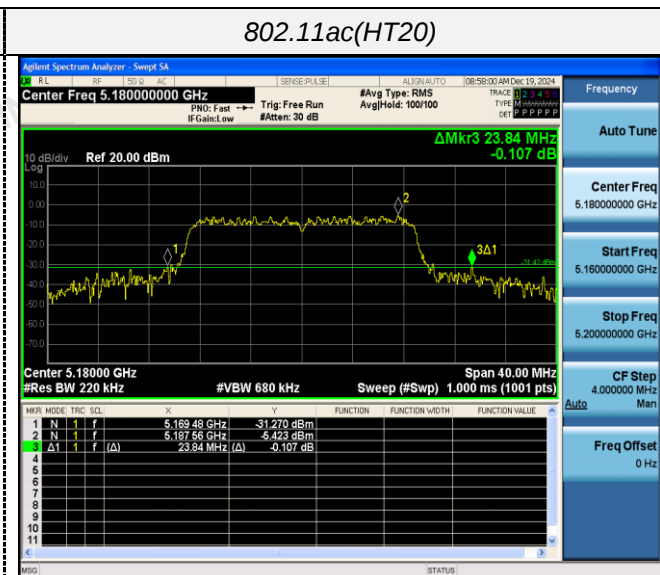
CH48



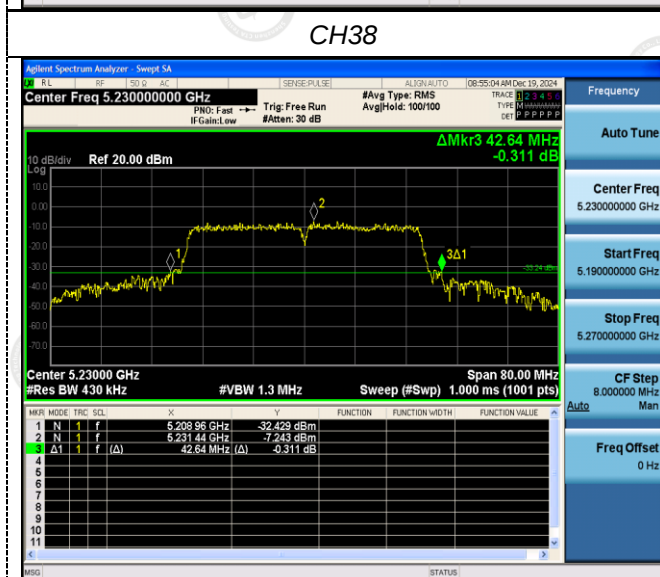
802.11n(HT40)



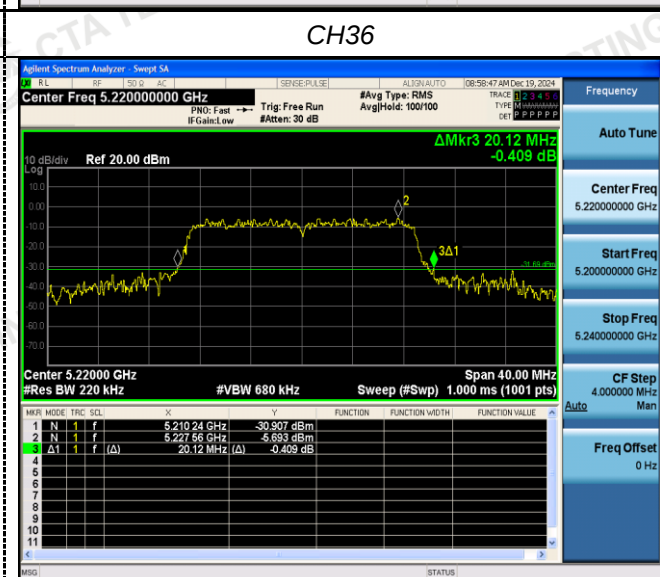
802.11ac(HT20)



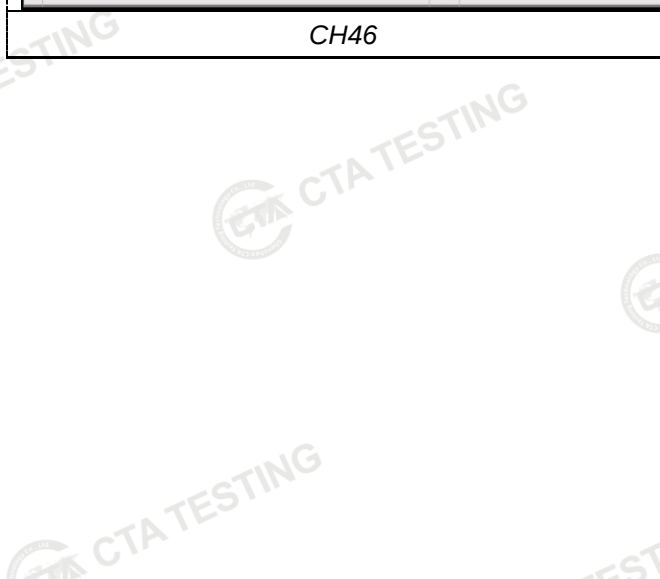
CH38



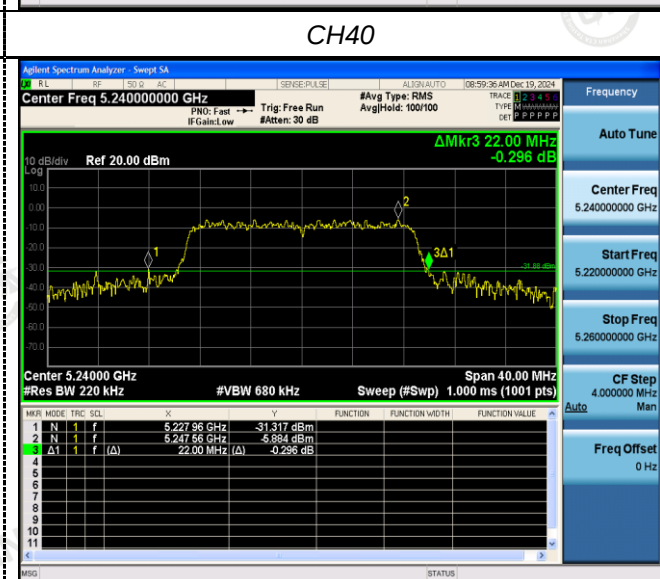
CH36



CH46

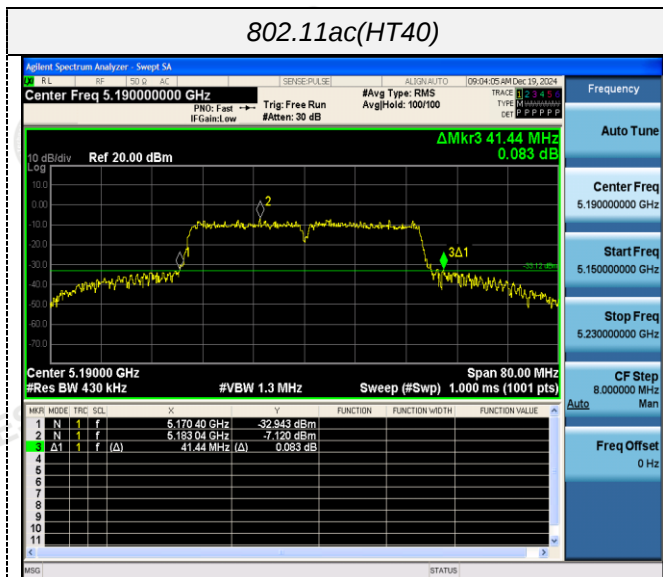


CH40

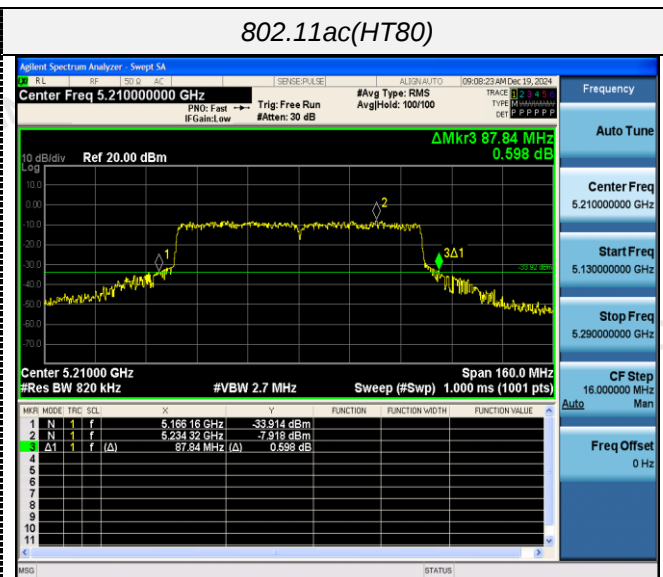


CH48

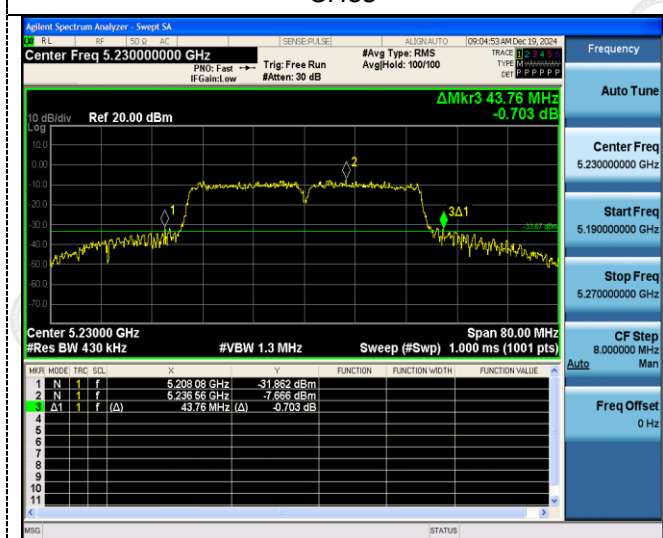
802.11ac(HT40)



802.11ac(HT80)



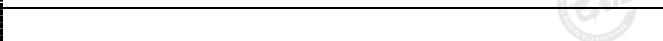
CH38



CH42



CH46



4.6 Minimum Emission Bandwidth (6dB Bandwidth)

Limit

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth 3 x RBW.
3. Detector = Peak.
4. Trace mode = Max hold.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Configuration

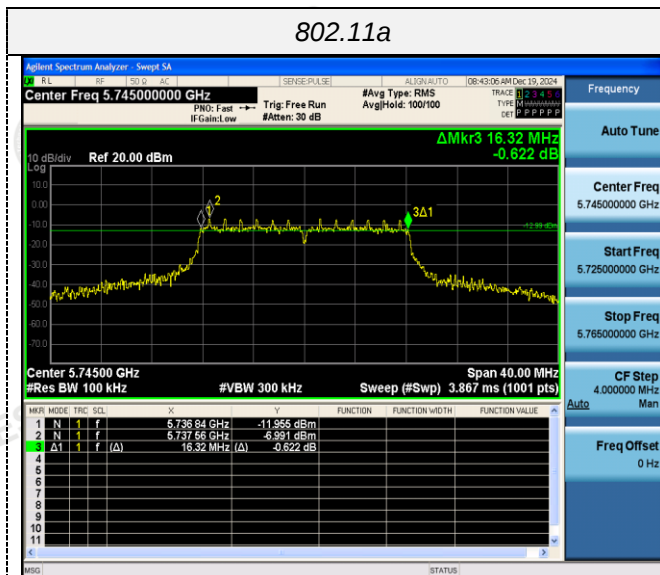


Test Results

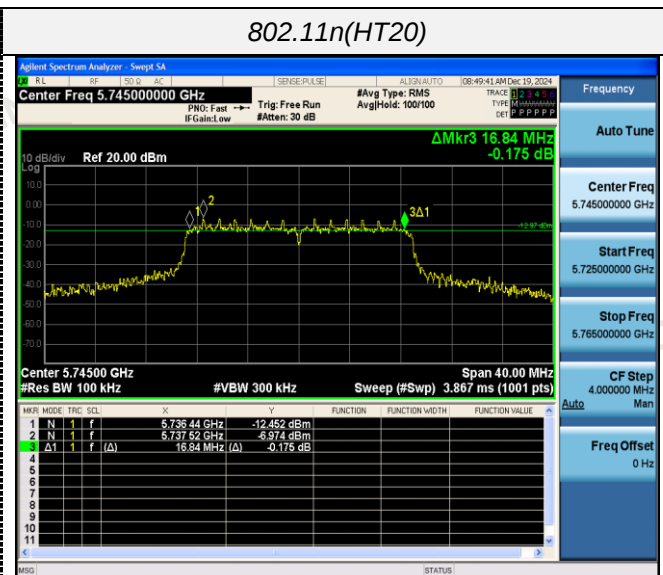
Type	Bands	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11a	U-NII 3	149	16.320	≥500KHz	Pass
		157	16.320		
		165	16.320		
802.11n(HT20)	U-NII 3	149	16.840		
		157	17.000		
		165	17.000		
802.11n(HT40)	U-NII 3	151	36.240		
		159	36.080		
802.11ac(HT20)	U-NII 3	149	16.880		
		157	16.880		
		165	17.240		
802.11ac(HT40)	U-NII 3	151	35.920		
		159	35.840		
802.11ac(HT80)	U-NII 3	155	75.200		

Test plot as follows:

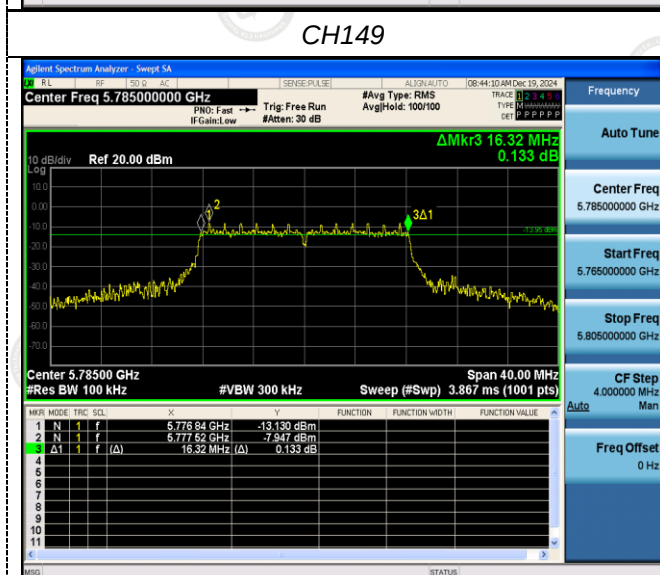
802.11a



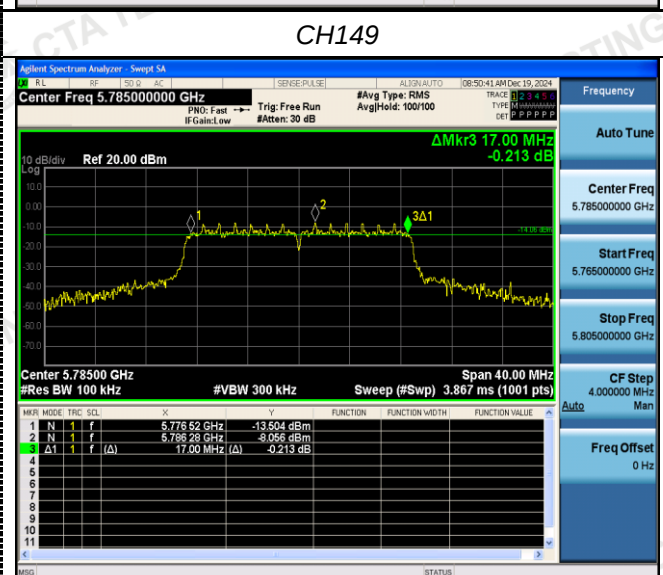
802.11n(HT20)



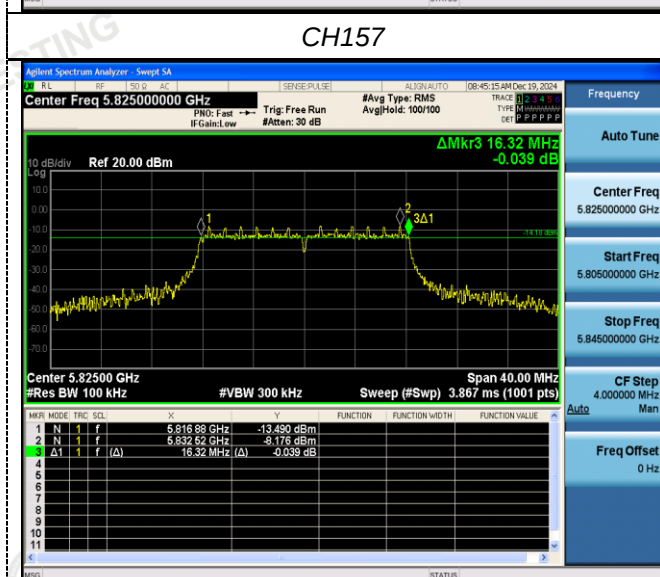
CH149



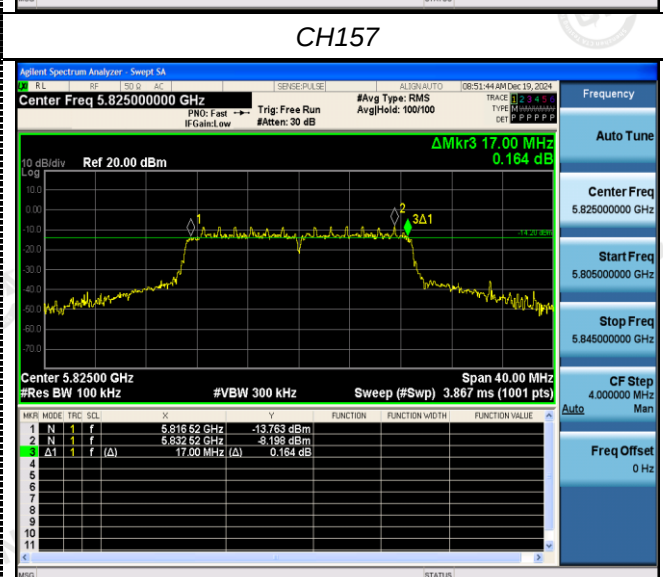
CH149



CH157



CH157



CH165



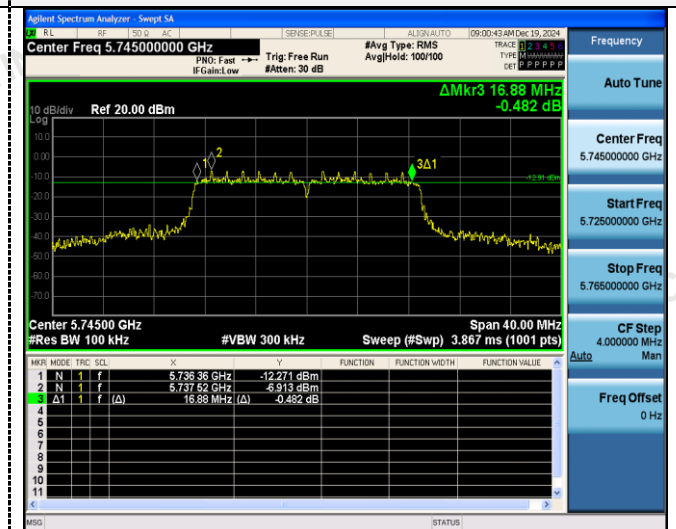
CH165



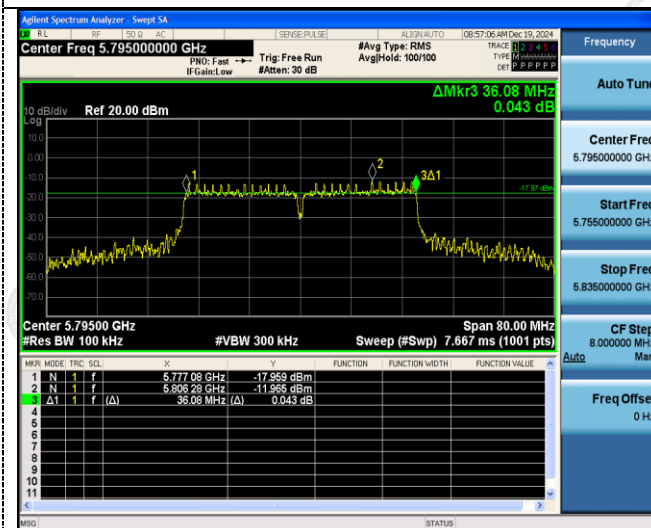
802.11n(HT40)



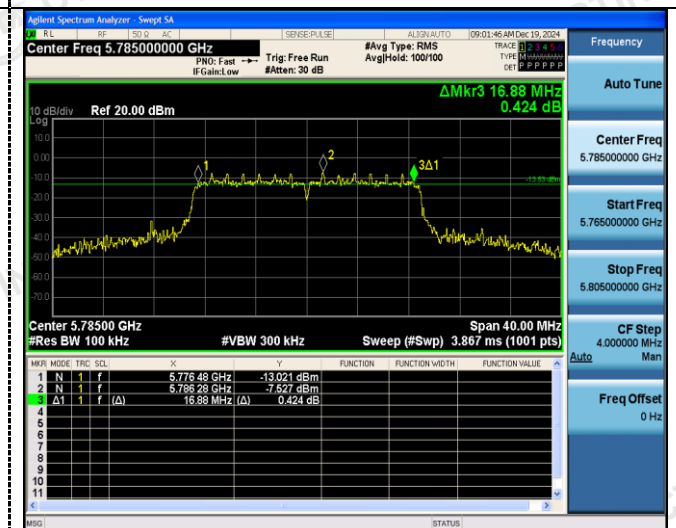
802.11ac(HT20)



CH151



CH149



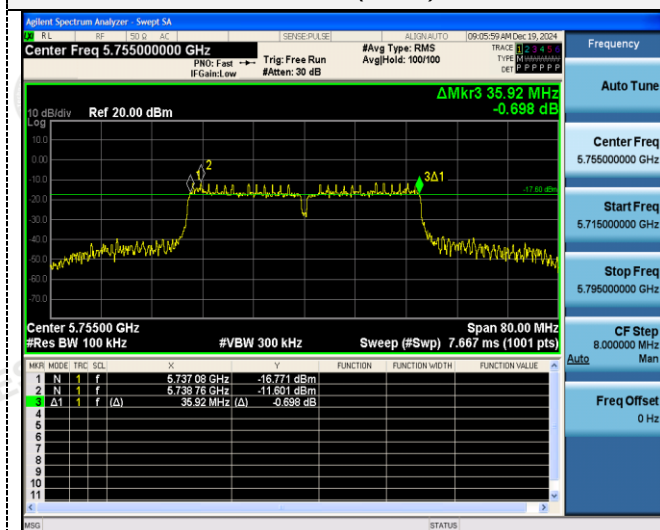
CH159

CH157



CH165

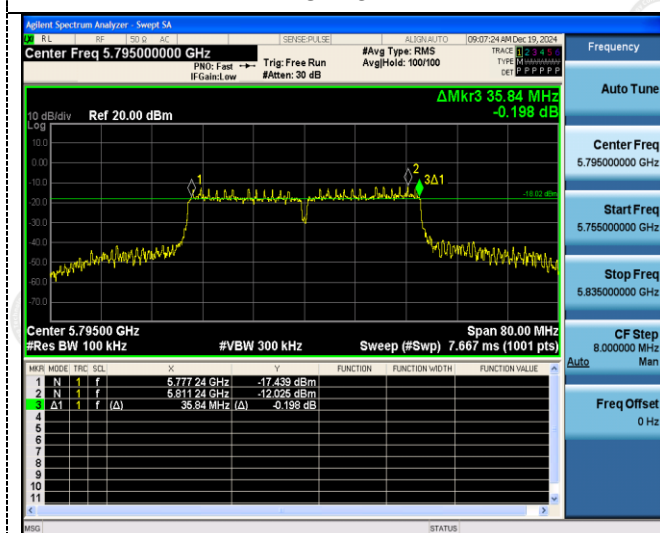
802.11ac(HT40)



802.11ac(HT80)



CH151



CH155

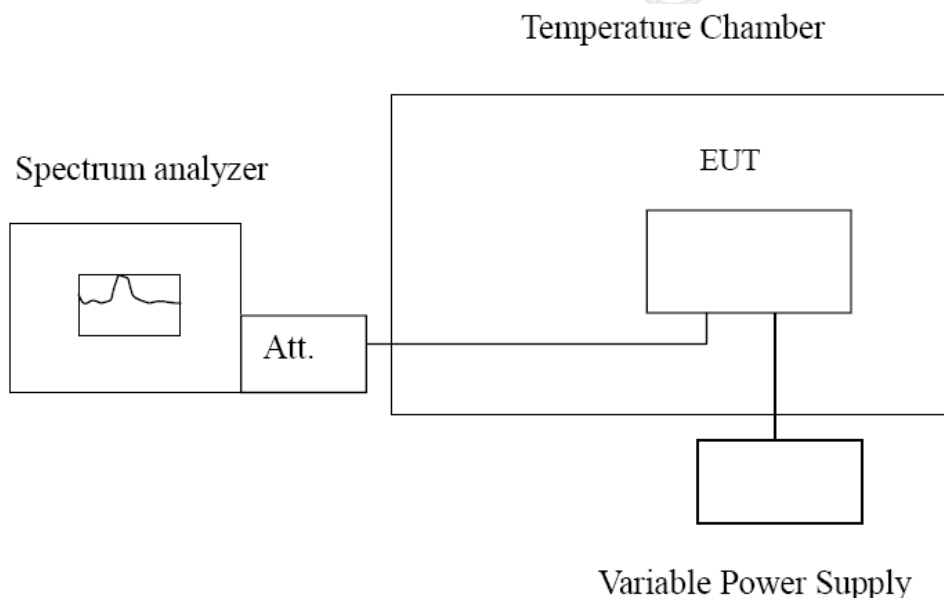


4.7 Frequency Stability

LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

TEST CONFIGURATION



TEST PROCEDURE

Frequency Stability under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

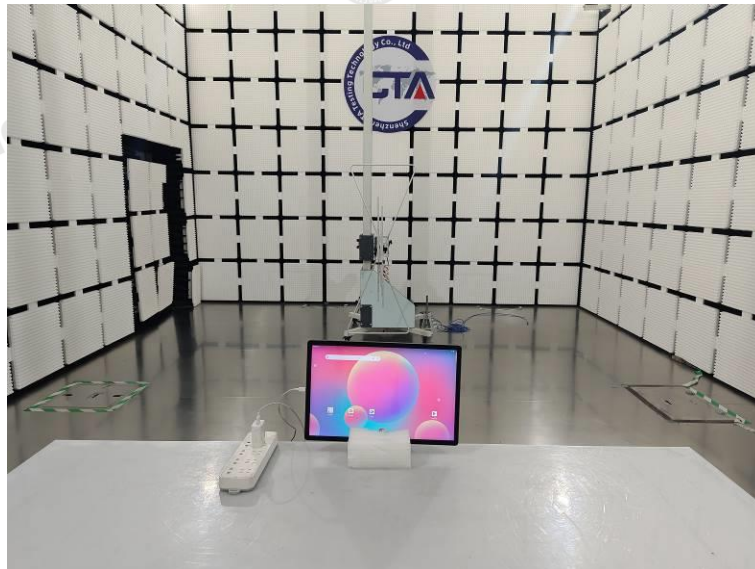
TEST RESULTS

Record worst case as below:

Reference Frequency: 802.11ac channel=36 frequency=5180MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
DC 7.6	-30	110.45	0.021322	Within the band of operation	Pass
	-20	174.67	0.033720		
	-10	145.29	0.028048		
	0	146.76	0.028332		
	10	145.84	0.028154		
	20	99.83	0.019272		
	30	167.37	0.032311		
	40	129.25	0.024952		
	50	128.67	0.024840		
DC 8.4	25	195.62	0.037764	Within the band of operation	Pass
DC 6.8	25	118.86	0.022946		

Reference Frequency: 802.11ac channel=149 frequency=5745MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
DC 7.6	-30	135.54	0.023593	Within the band of operation	Pass
	-20	129.63	0.022564		
	-10	167.16	0.029097		
	0	169.93	0.029579		
	10	136.50	0.023760		
	20	144.78	0.025201		
	30	116.43	0.020266		
	40	168.20	0.029278		
	50	160.52	0.027941		
DC 8.4	25	150.74	0.026238	Within the band of operation	Pass
DC 6.8	25	129.79	0.022592		

5 Test Setup Photos of the EUT



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6 Photos of the EUT

Reference to the test report No. CTA24121300401.

***** End of Report *****