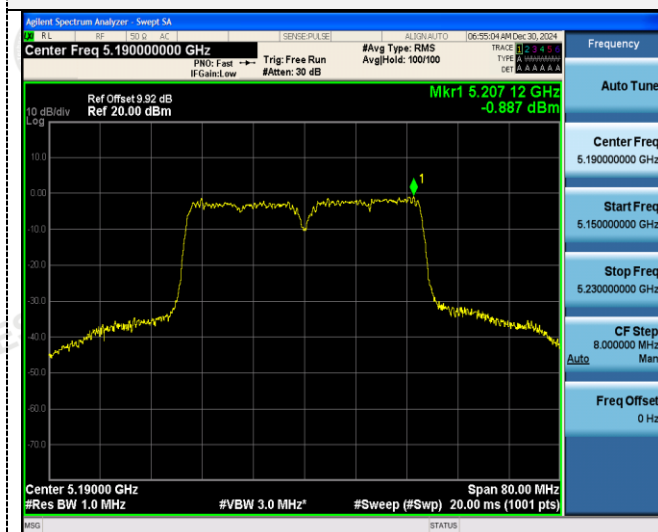
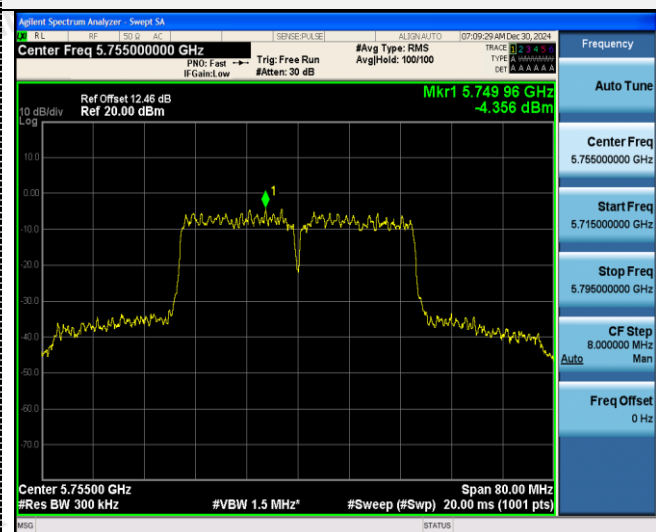


802.11ax(HT40)

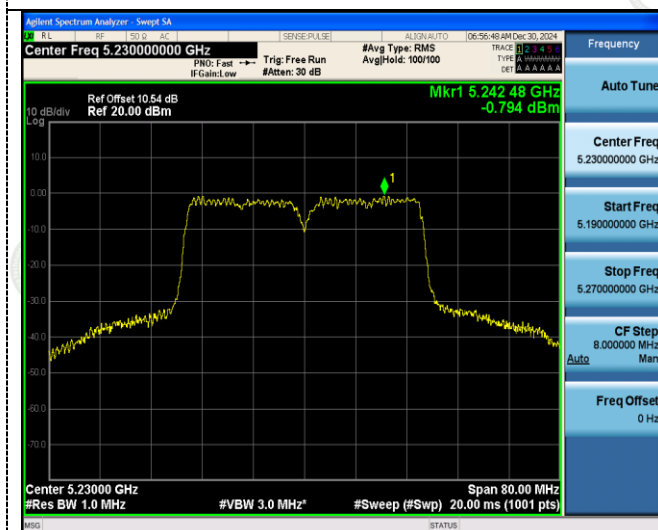
U-NII 1



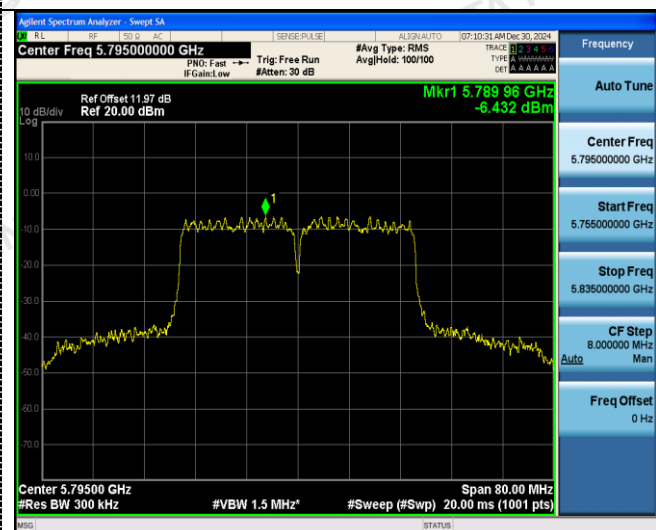
U-NII 3



CH38



CH151



CH46

CH159

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

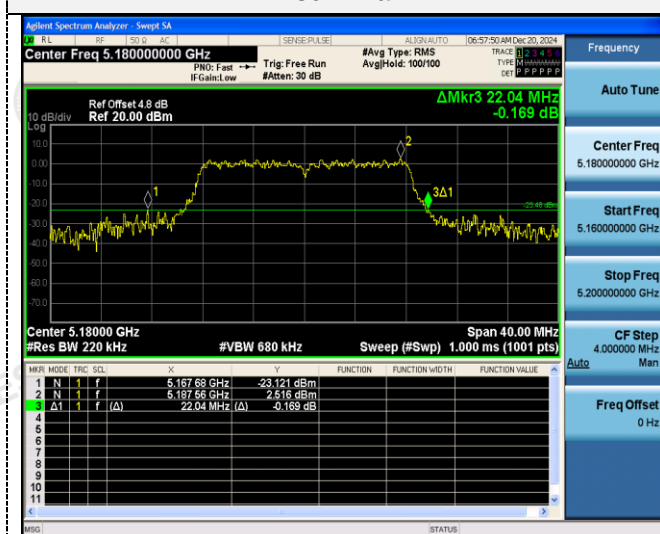


Test Results

Type	Bands	Channel	26dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	U-NII 1	36	22.040	N/A	Pass
		40	24.680		
		48	21.640		
802.11n(HT20)	U-NII 1	36	24.840		
		40	24.640		
		48	24.760		
802.11n(HT40)	U-NII 1	38	43.040		
		46	45.600		
802.11ac(HT20)	U-NII 1	36	24.160		
		40	27.000		
		48	23.640		
802.11ac(HT40)	U-NII 1	38	48.800		
		46	50.080		
802.11ax(HT20)	U-NII 1	36	20.480		
		40	24.040		
		48	26.480		
802.11ax(HT40)	U-NII 1	38	49.520		
		46	46.480		

Test plot as follows:

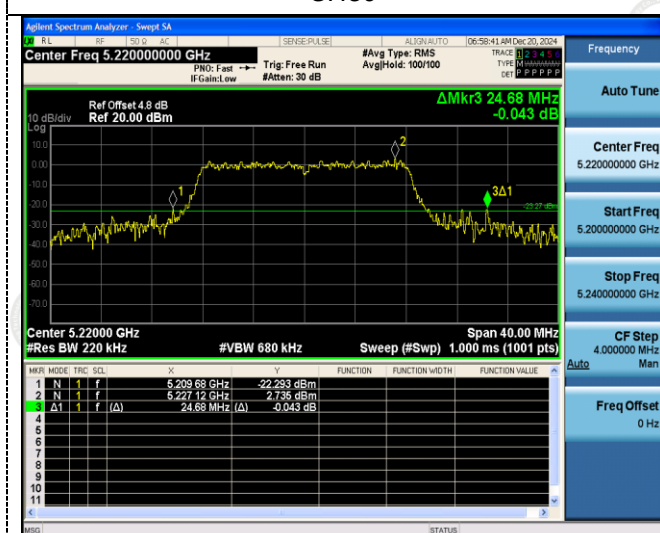
802.11a



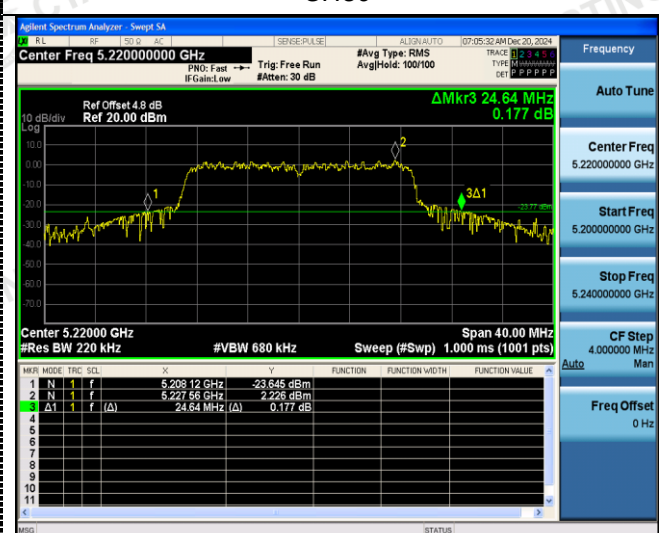
802.11n(HT20)



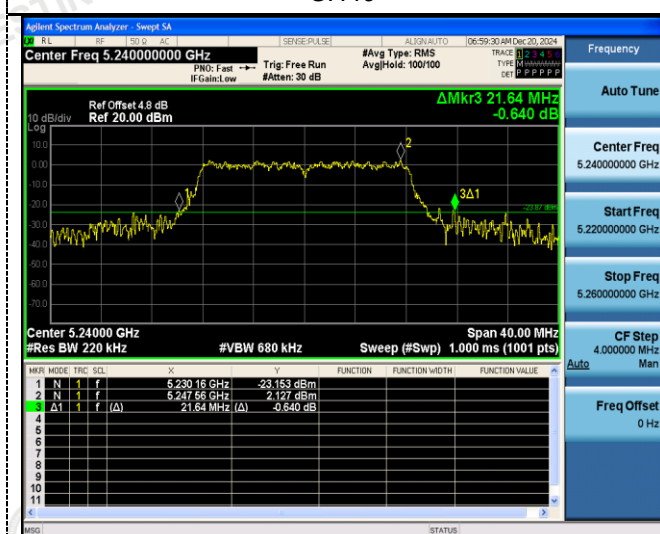
CH36



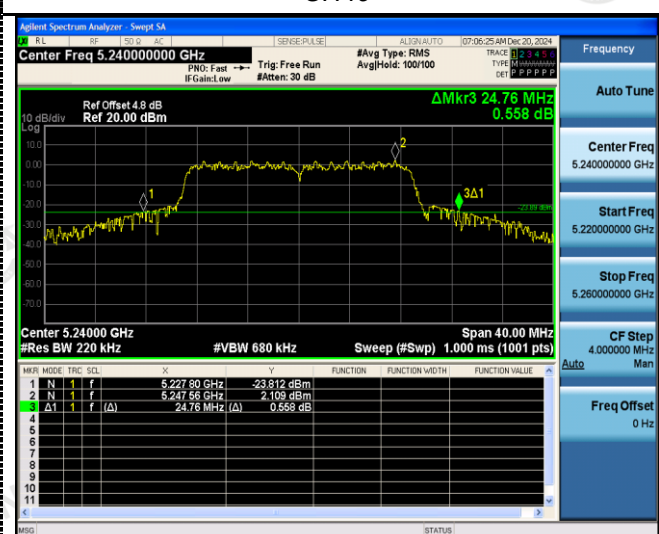
CH36



CH40



CH40



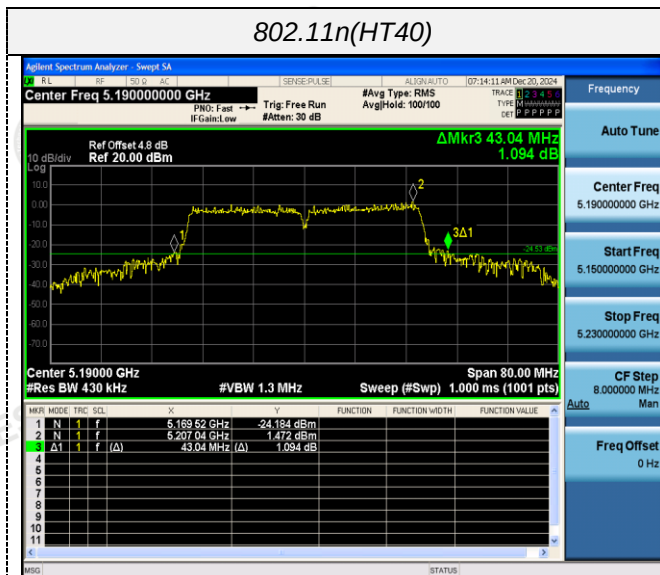
CH48



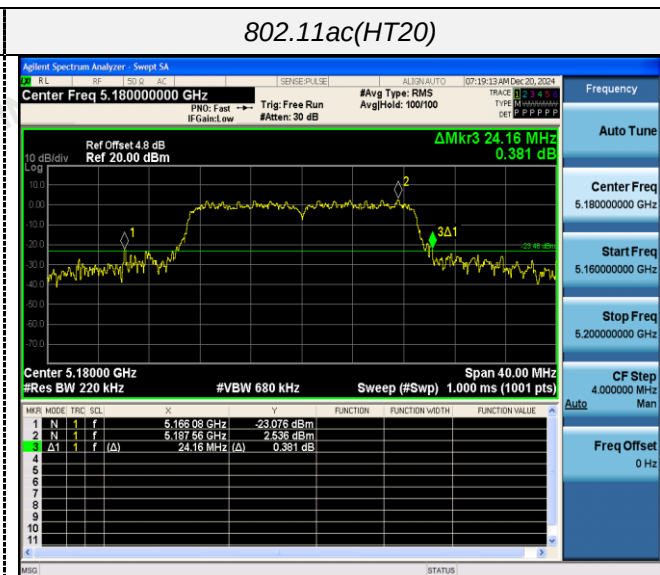
CH48



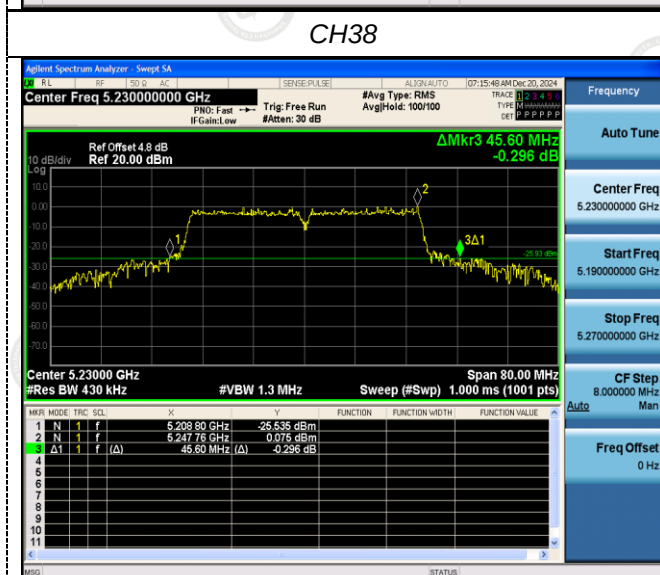
802.11n(HT40)



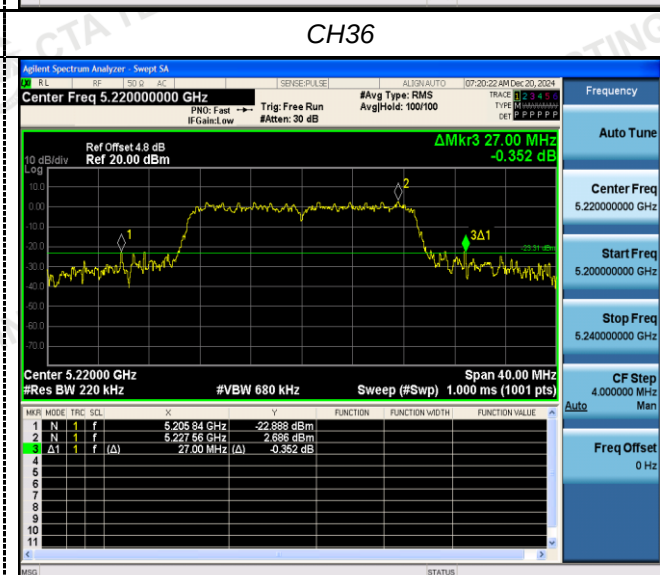
802.11ac(HT20)



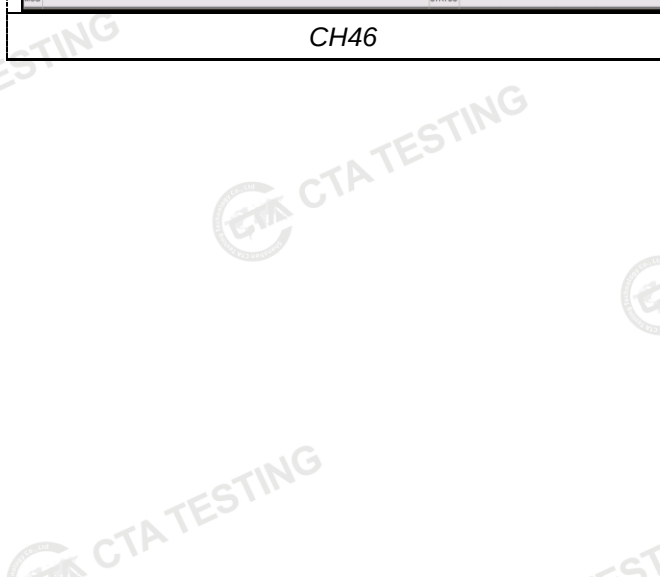
CH38



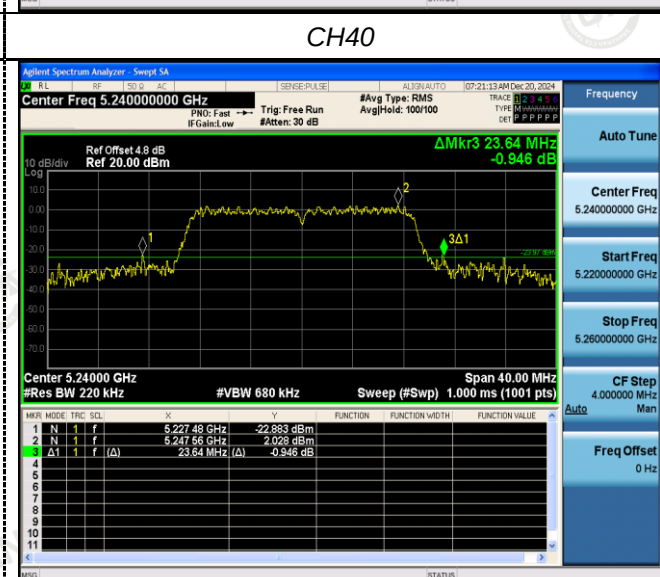
CH36



CH46

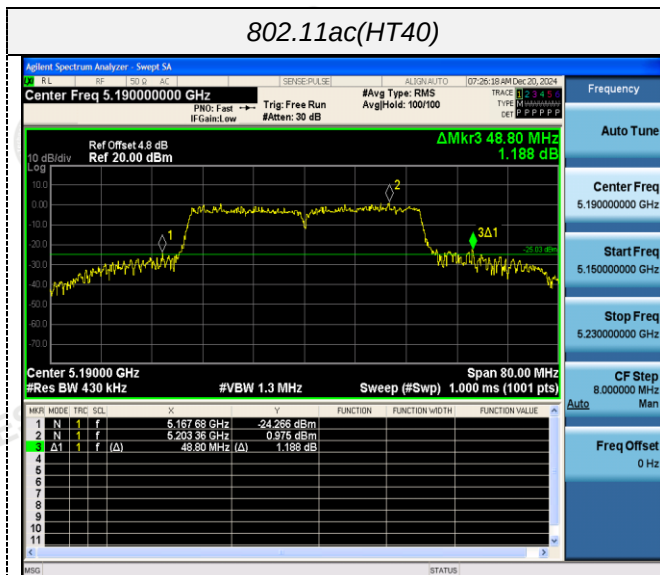


CH40

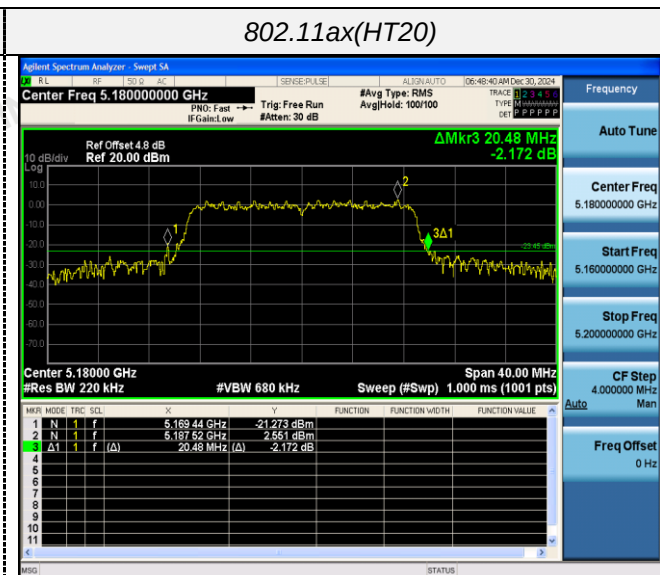


CH48

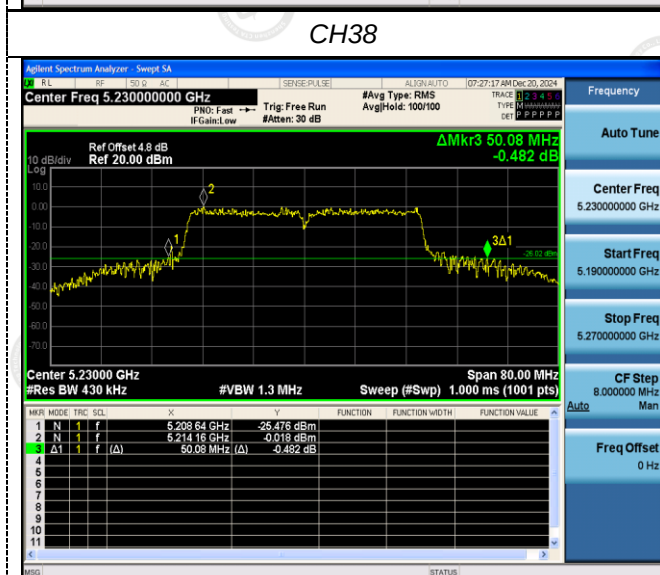
802.11ac(HT40)



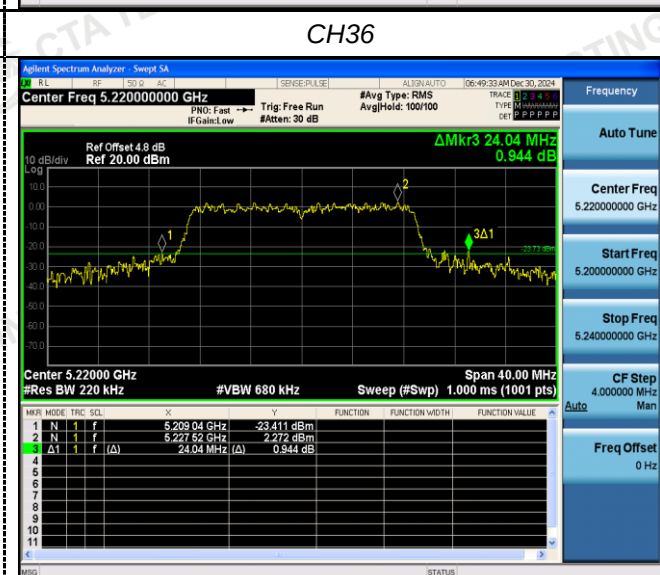
802.11ax(HT20)



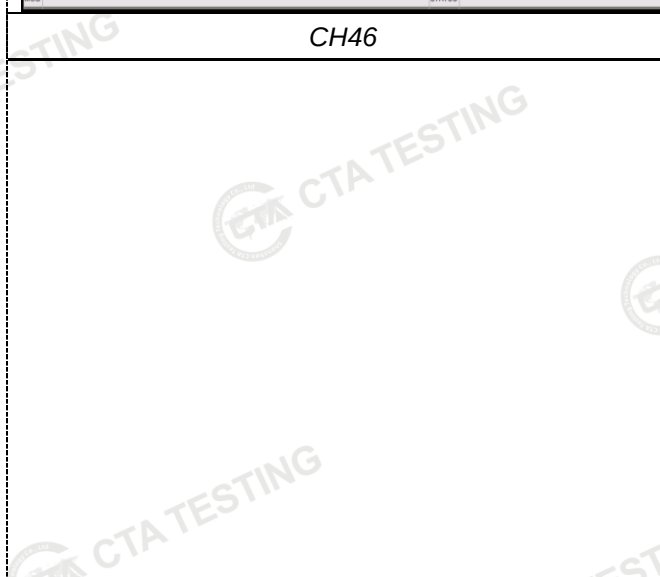
CH38



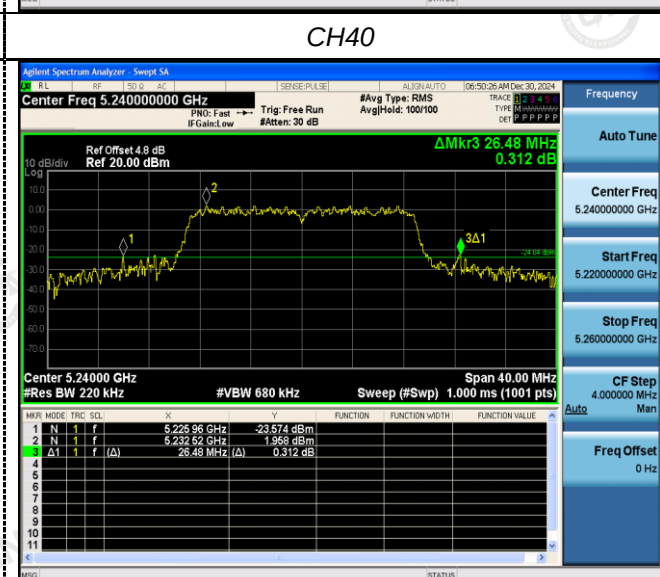
CH36



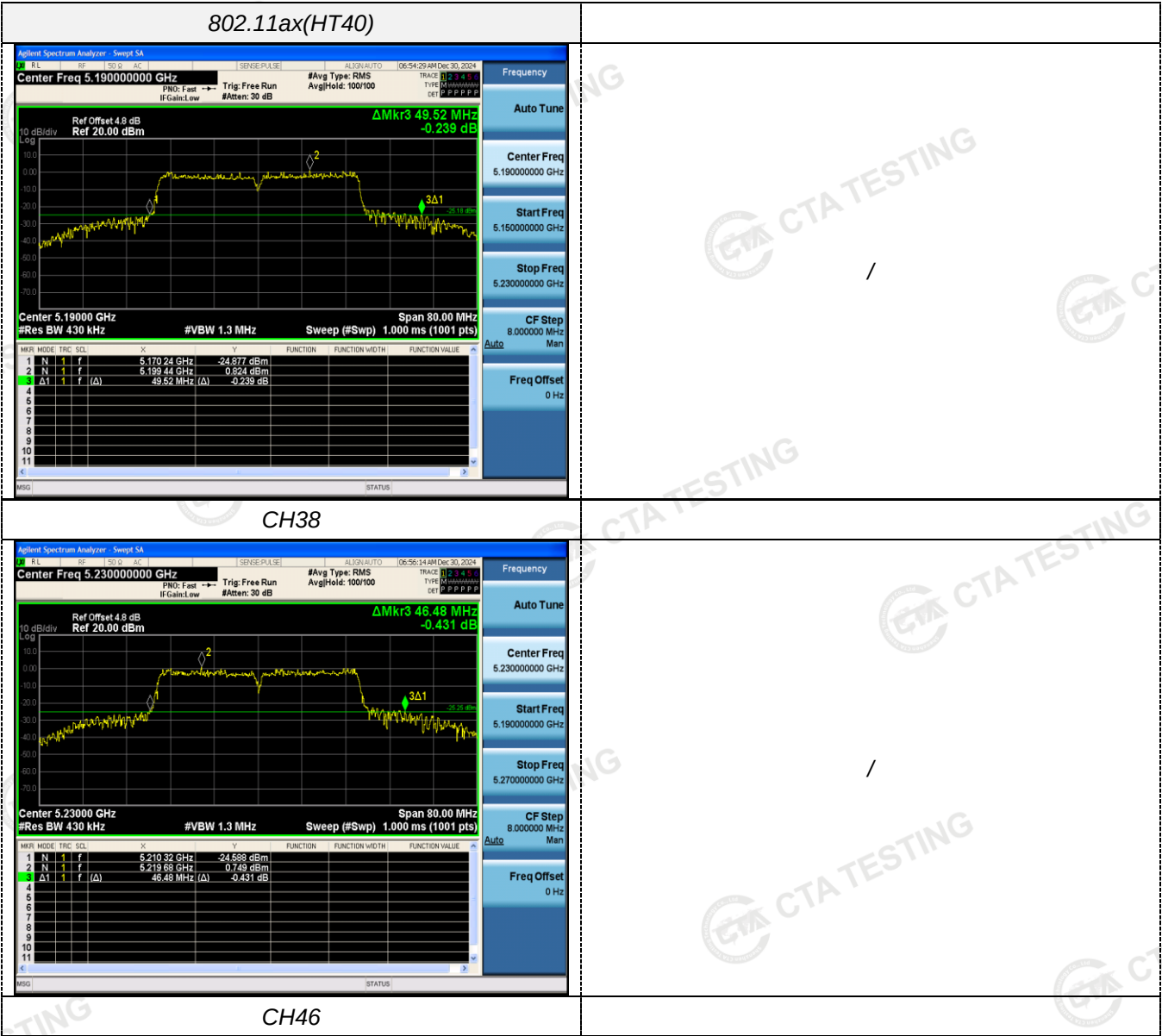
CH46



CH40



CH48



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

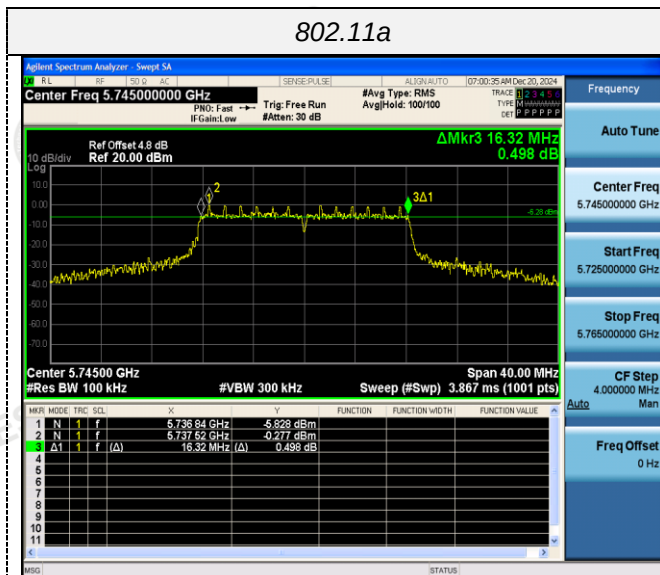


Test Results

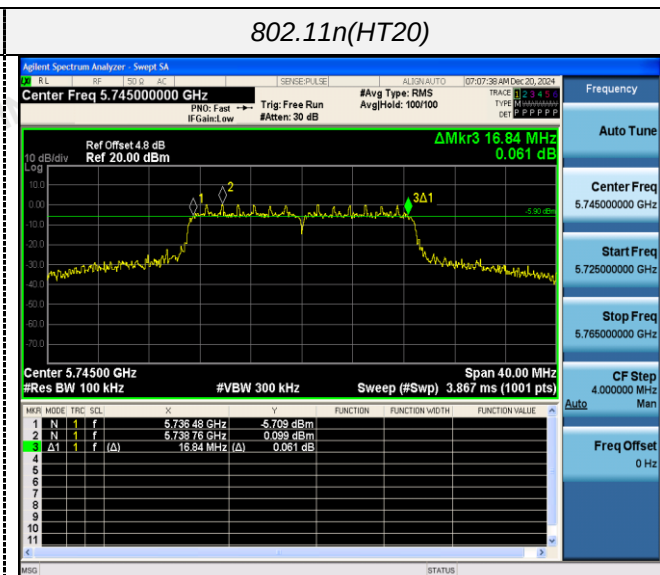
Type	Bands	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11a	U-NII 3	149	16.320	≥500KHz	Pass
		157	16.280		
		165	16.280		
802.11n(HT20)	U-NII 3	149	16.840		
		157	16.880		
		165	16.520		
802.11n(HT40)	U-NII 3	151	35.200		
		159	35.200		
802.11ac(HT20)	U-NII 3	149	16.800		
		157	16.840		
		165	16.880		
802.11ac(HT40)	U-NII 3	151	35.520		
		159	35.360		
802.11ax(HT20)	U-NII 3	149	17.000		
		157	17.240		
		165	17.280		
802.11ax(HT40)	U-NII 3	151	35.280		
		159	35.600		

Test plot as follows:

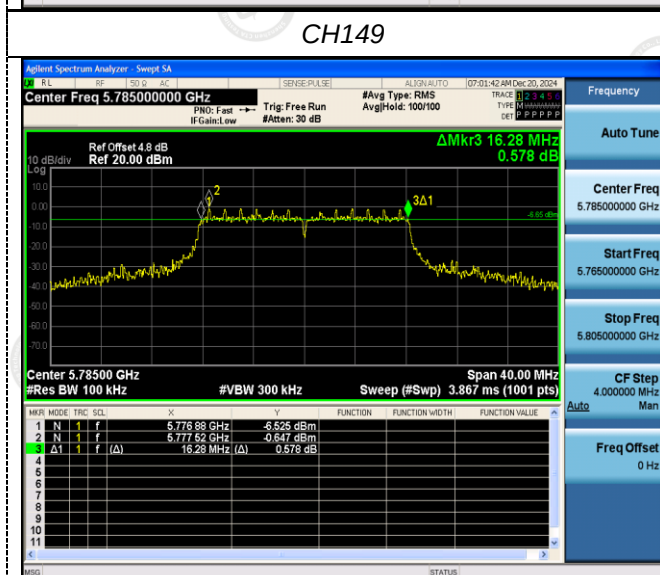
802.11a



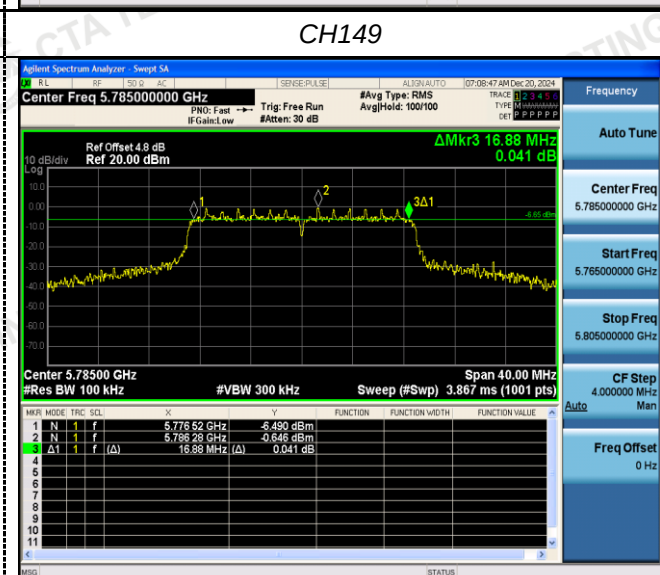
802.11n(HT20)



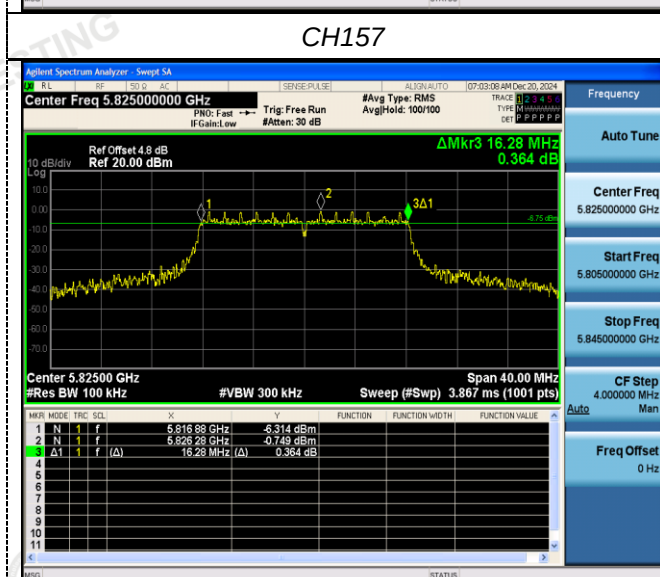
CH149



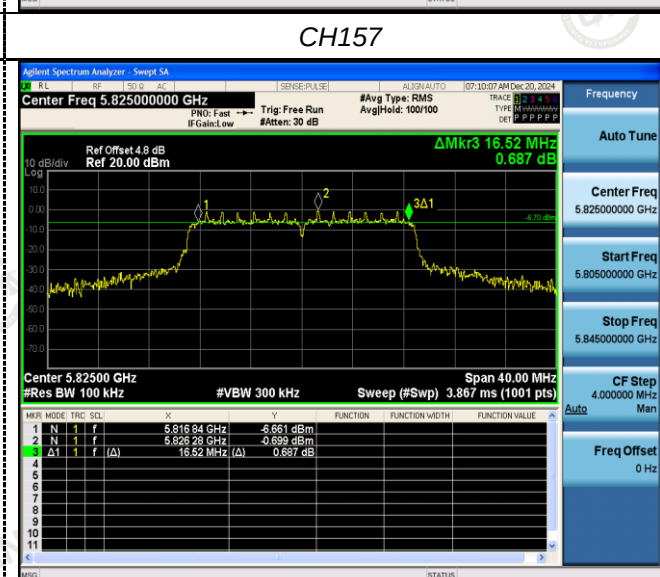
CH149



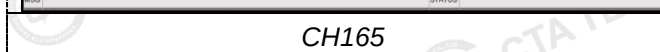
CH157



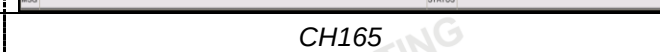
CH157



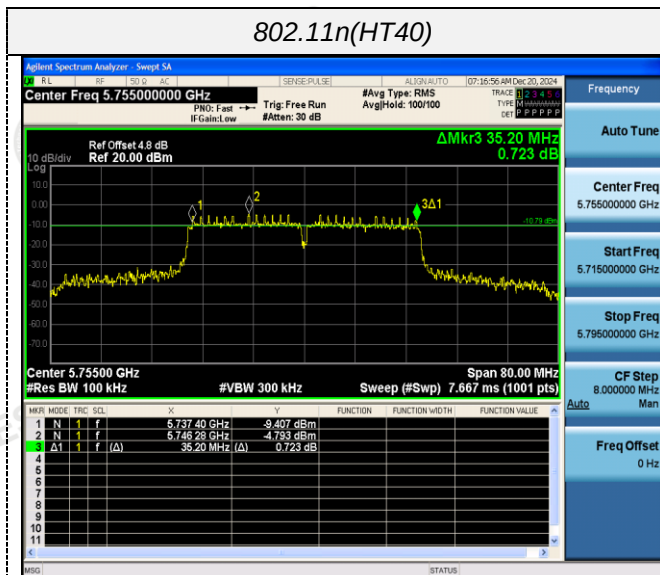
CH165



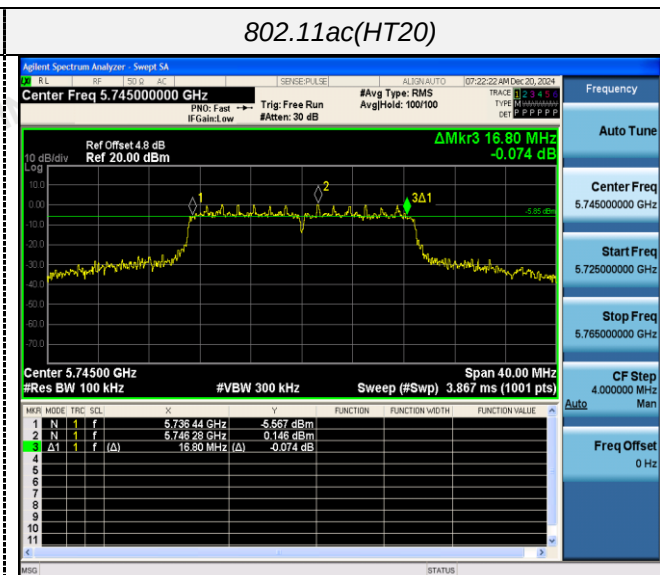
CH165



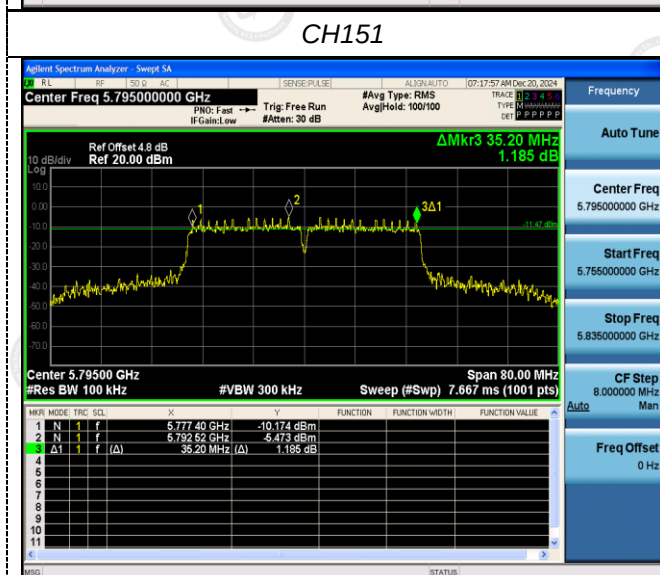
802.11n(HT40)



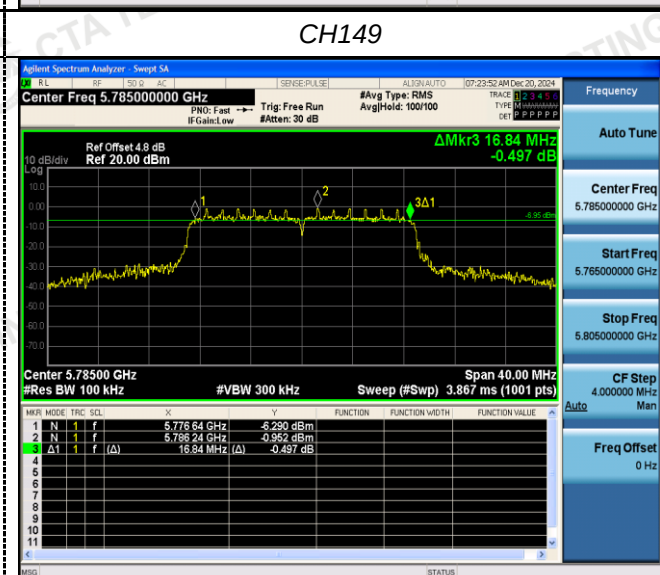
802.11ac(HT20)



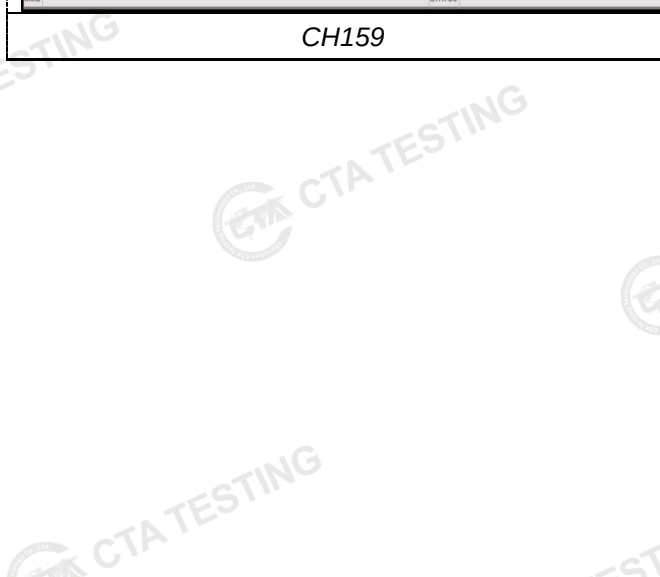
CH151



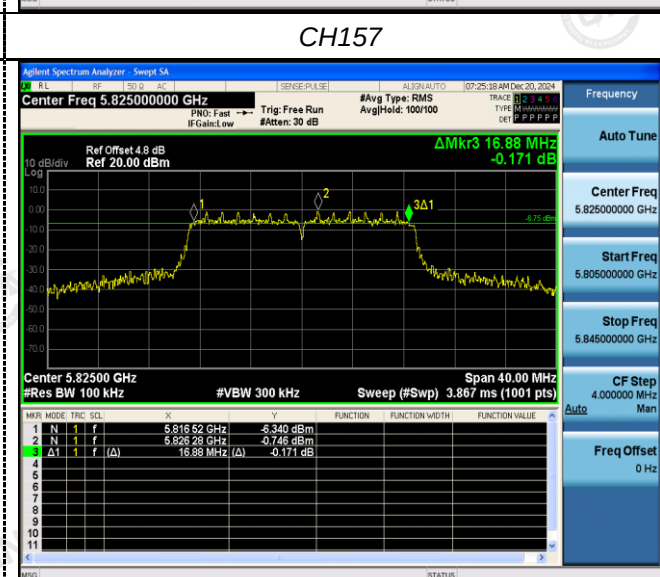
CH149



CH159

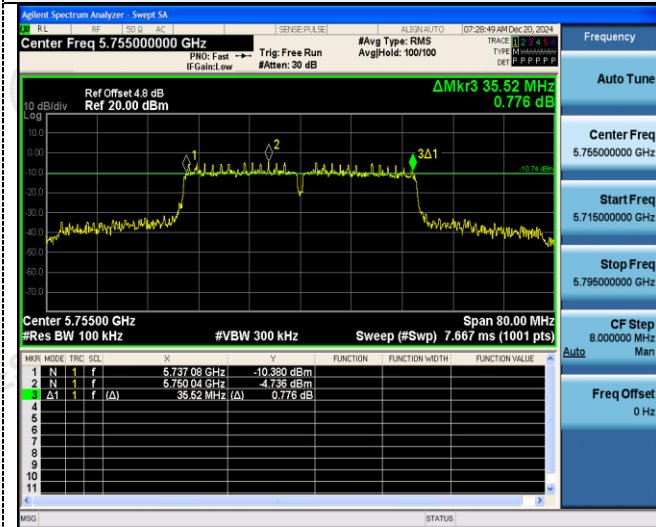


CH157

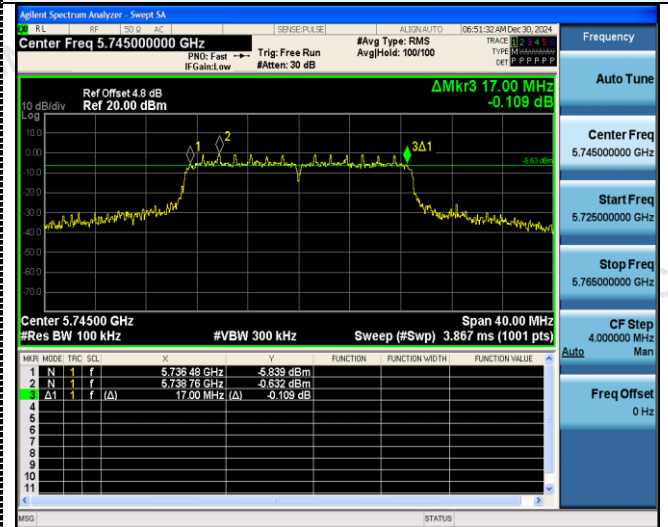


CH165

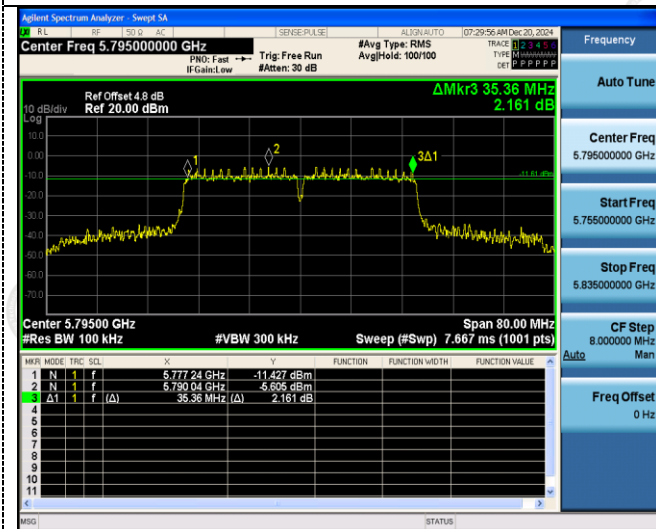
802.11ac(HT40)



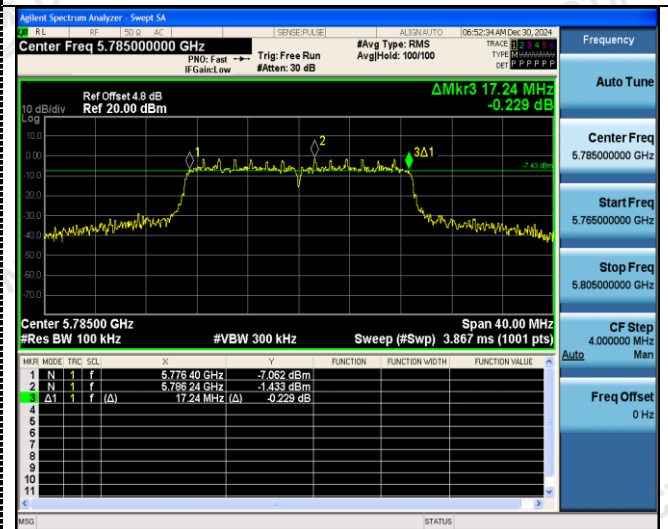
802.11ax(HT20)



CH151



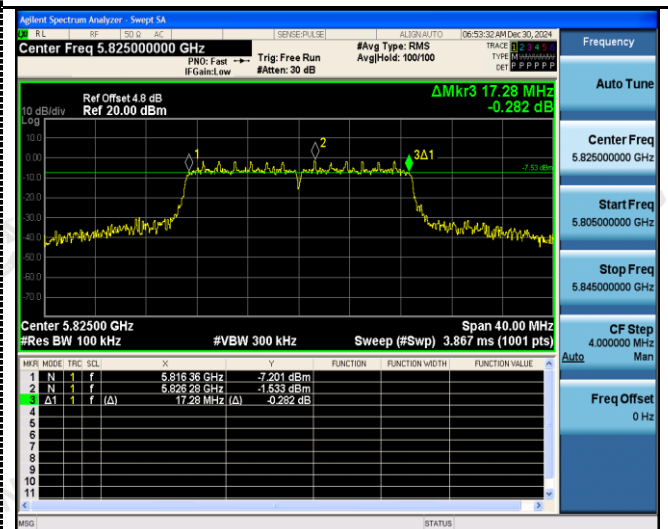
CH149



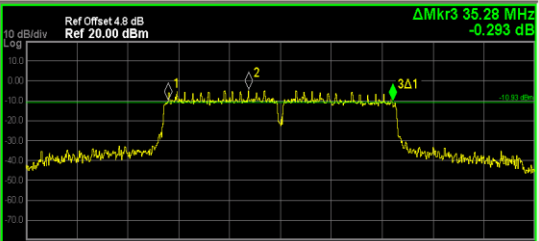
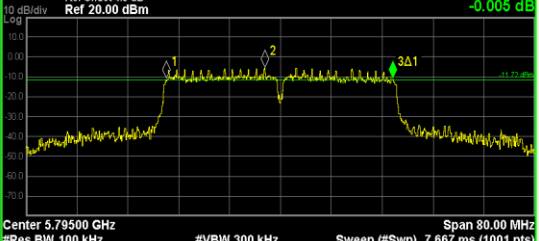
CH159



CH157



CH165

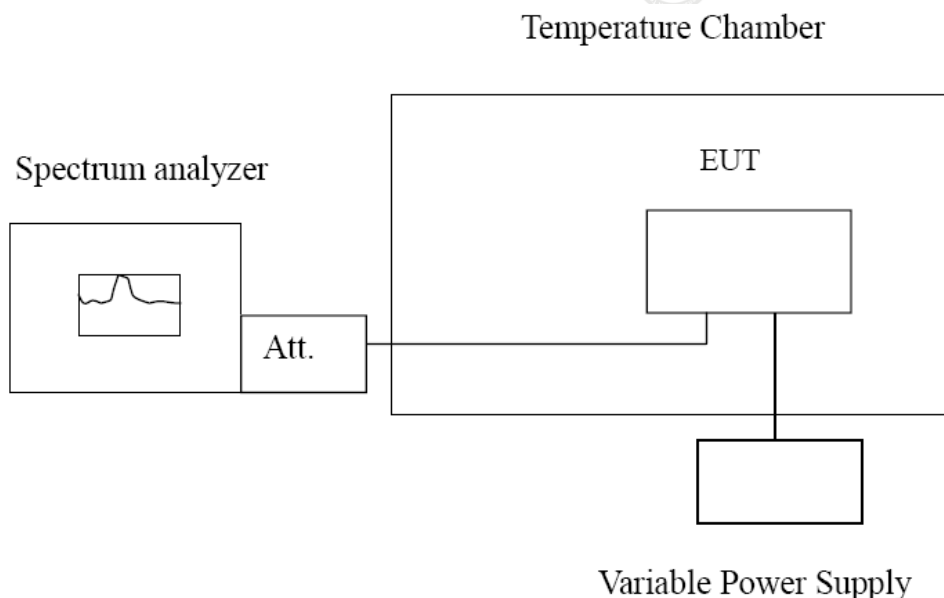
802.11ax(HT40)																																					
Agilent Spectrum Analyzer - Sweep SA Center Freq 5.755000000 GHz Ref Offset 4.8 dB Ref 20.00 dBm ΔMkr3 35.28 MHz -0.293 dB 10 dB/div Log  Center 5.755000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep (#Swp) 7.667 ms (1001 pts) Span 80.00 MHz <table><thead><tr><th>MARK</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>5.73732 GHz</td><td>-10.466 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.74998 GHz</td><td>-4.928 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>Δ1</td><td>1</td><td>f (Δ)</td><td>35.28 MHz (Δ)</td><td>-0.293 dB</td><td></td><td></td><td></td></tr></tbody></table> Frequency Auto Tune Center Freq 5.755000000 GHz Start Freq 5.715000000 GHz Stop Freq 5.795000000 GHz CF Step 8.000000 MHz Freq Offset 0 Hz	MARK	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	5.73732 GHz	-10.466 dBm				2	N	1	f	5.74998 GHz	-4.928 dBm				3	Δ1	1	f (Δ)	35.28 MHz (Δ)	-0.293 dB				
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CH159																																					

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.

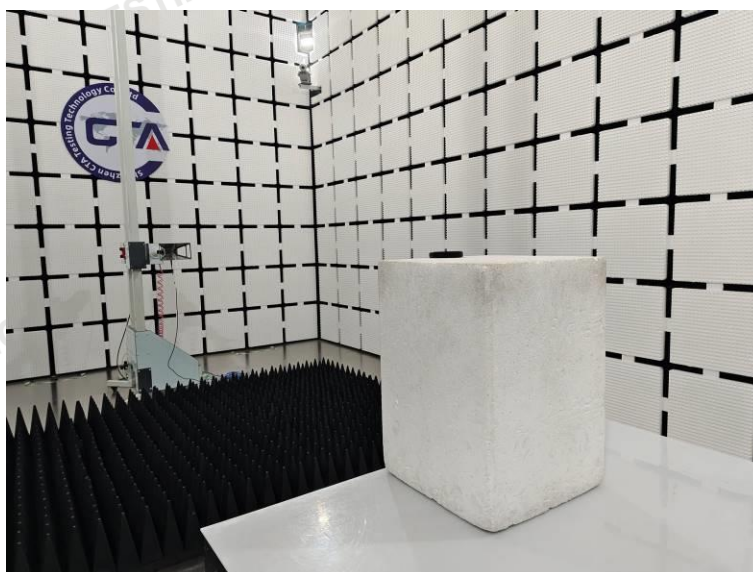
TEST RESULTS

Record worst case as below:

Reference Frequency: 802.11ac channel=36 frequency=5180MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
AC 120	-30	110.36	0.021305	Within the band of operation	Pass
	-20	174.59	0.033705		
	-10	145.15	0.028021		
	0	146.26	0.028236		
	10	145.99	0.028183		
	20	99.37	0.019183		
	30	167.18	0.032274		
	40	129.46	0.024992		
	50	128.68	0.024842		
AC 132	25	195.28	0.037699	Within the band of operation	Pass
AC 108	25	118.37	0.022851		

Reference Frequency: 802.11ac channel=149 frequency=5745MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
AC 120	-30	135.46	0.023579	Within the band of operation	Pass
	-20	129.30	0.022507		
	-10	167.38	0.029135		
	0	169.75	0.029547		
	10	136.35	0.023734		
	20	144.87	0.025217		
	30	116.49	0.020277		
	40	168.70	0.029365		
	50	160.48	0.027934		
AC 132	25	150.87	0.026261	Within the band of operation	Pass
AC 108	25	129.79	0.022592		

5 Test Setup Photos of the EUT



6 Photos of the EUT

Reference to the test report No. CTA24121202801.

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