

4.5 Emission Bandwidth (26dB Bandwidth)

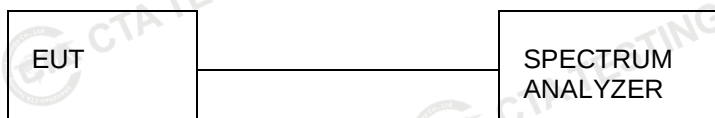
Limit

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 %.

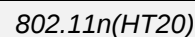
Test Configuration



Test Results

Type	Bands	Channel	26dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	U-NII 1	36	24.520	N/A	Pass
		44	25.320		
		48	24.560		
802.11n(HT20)	U-NII 1	36	24.480		
		44	26.120		
		48	24.440		
802.11n(HT40)	U-NII 1	38	44.240		
		46	47.200		
802.11ac(HT20)	U-NII 1	36	24.320		
		44	24.560		
		48	26.280		
802.11ac(HT40)	U-NII 1	38	46.320		
		46	46.000		
802.11ac(HT80)	U-NII 1	42	105.120		
802.11ax(HT20)	U-NII 1	36	25.240		
		44	24.320		
		48	24.360		
802.11ax(HT40)	U-NII 1	38	43.840		
		46	45.200		
802.11ax(HT80)	U-NII 1	42	85.600		

Test plot as follows:



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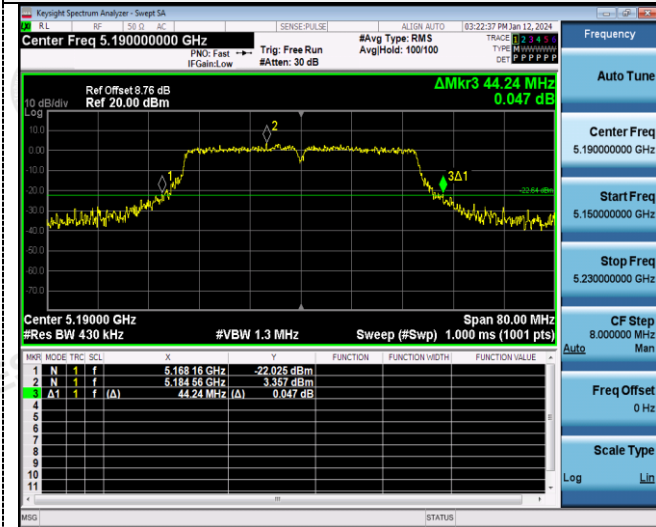


CH40



CH48

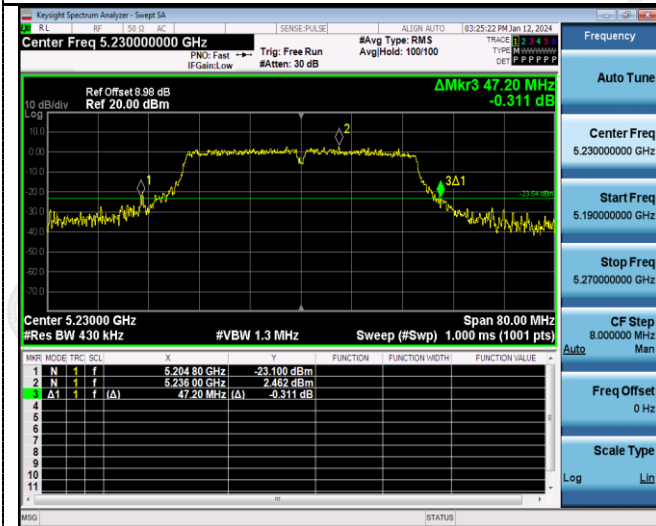
802.11n(HT40)



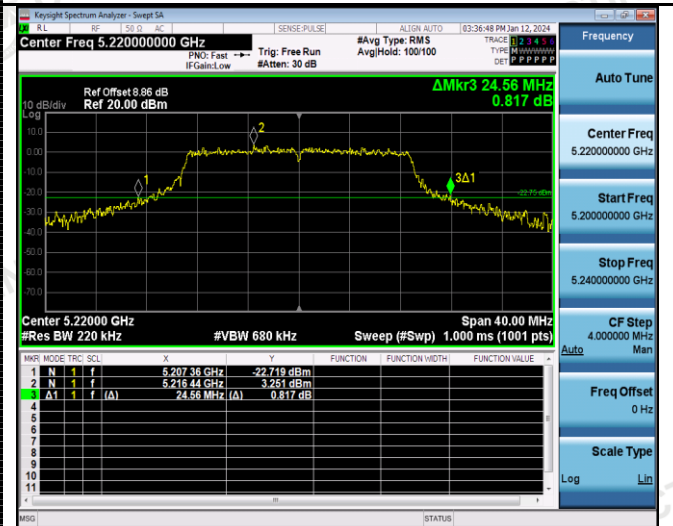
802.11ac(HT20)



CH38



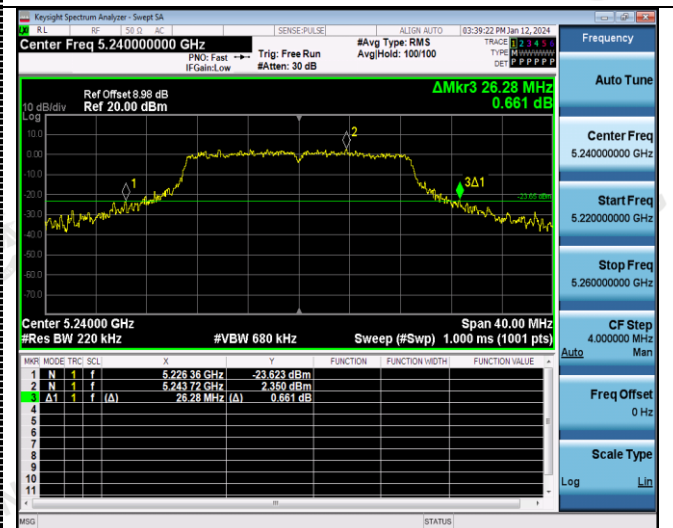
CH36



CH46



CH40



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802.11ac(HT40)



802.11ac(HT80)



CH38



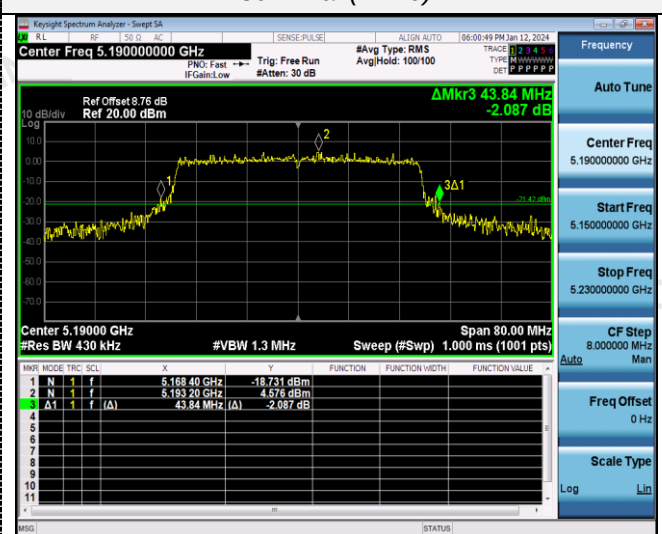
CH46

CH42

802.11ax(HT20)



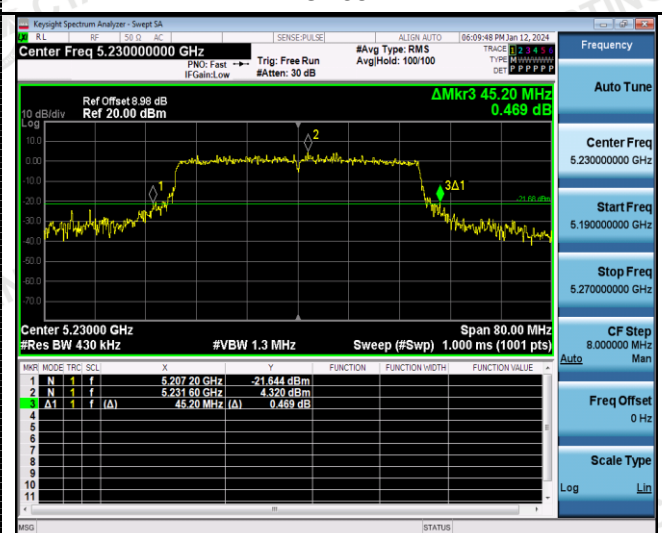
802.11ax(HT40)



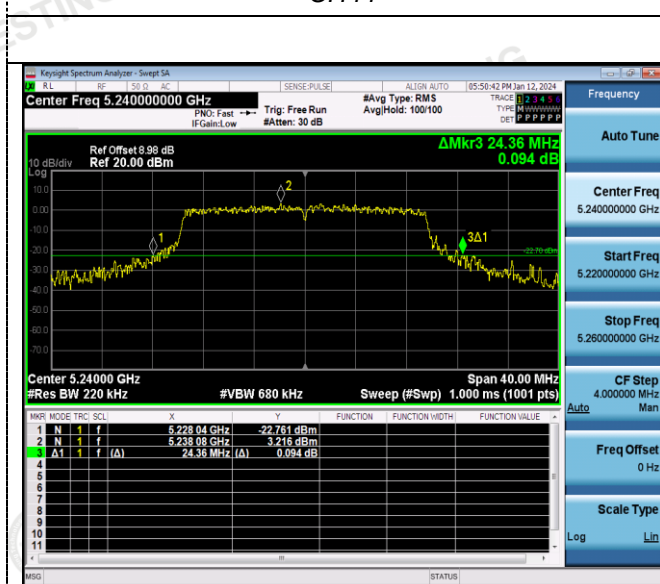
CH36



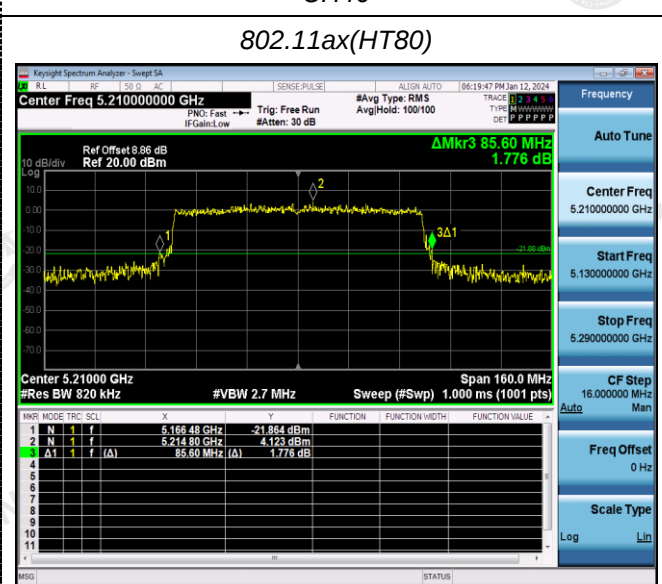
CH38



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CH48



CH42



4.6 Minimum Emission Bandwidth (6dB Bandwidth)

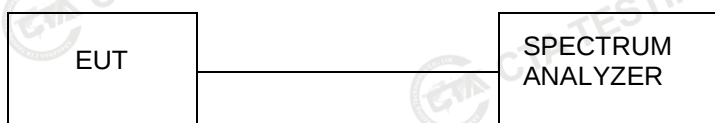
Limit

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

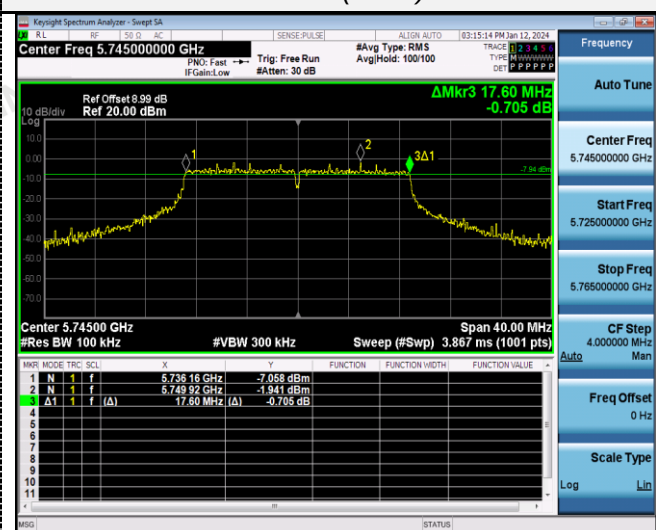
Type	Bands	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11a	U-NII 3	149	16.400	≥500KHz	Pass
		157	16.360		
		165	16.320		
802.11n(HT20)	U-NII 3	149	17.600		
		157	17.520		
		165	17.560		
802.11n(HT40)	U-NII 3	151	36.080		
		159	36.320		
802.11ac(HT20)	U-NII 3	149	17.680		
		157	17.560		
		165	17.600		
802.11ac(HT40)	U-NII 3	151	36.320		
		159	36.320		
802.11ac(HT80)	U-NII 3	155	75.840		
802.11ax(HT20)	U-NII 3	149	18.840		
		157	18.960		
		165	18.920		
802.11ax(HT40)	U-NII 3	151	37.920		
		159	37.840		
802.11ax(HT80)	U-NII 3	155	76.640		

Test plot as follows:

802.11a



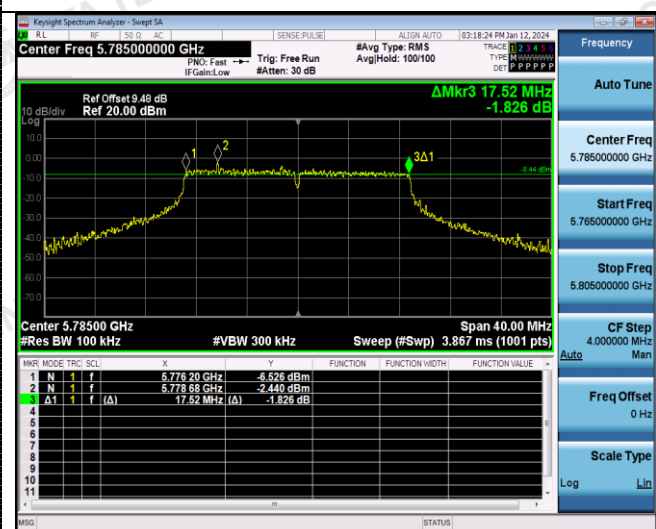
802.11n(HT20)



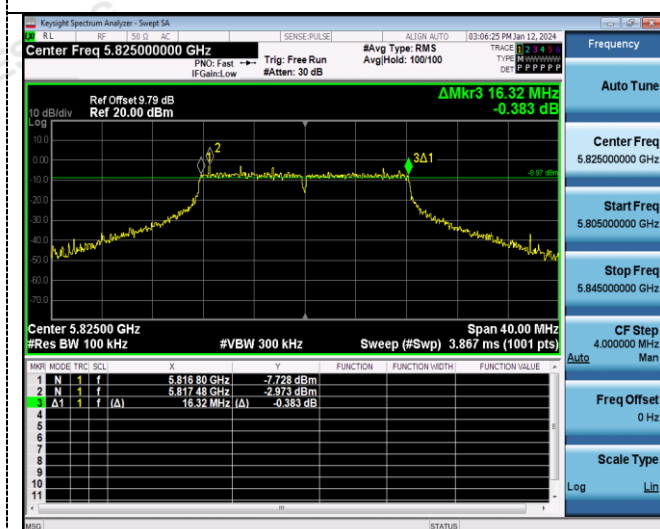
CH149



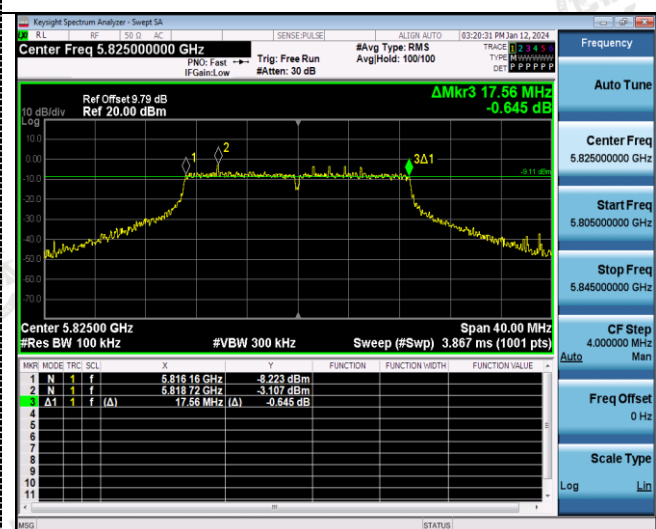
CH149



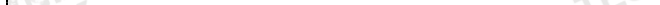
CH157



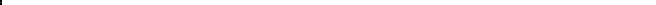
CH157



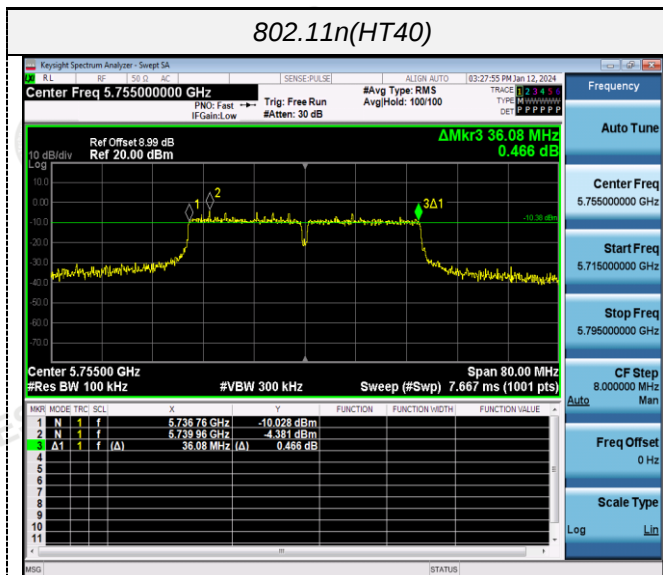
CH165



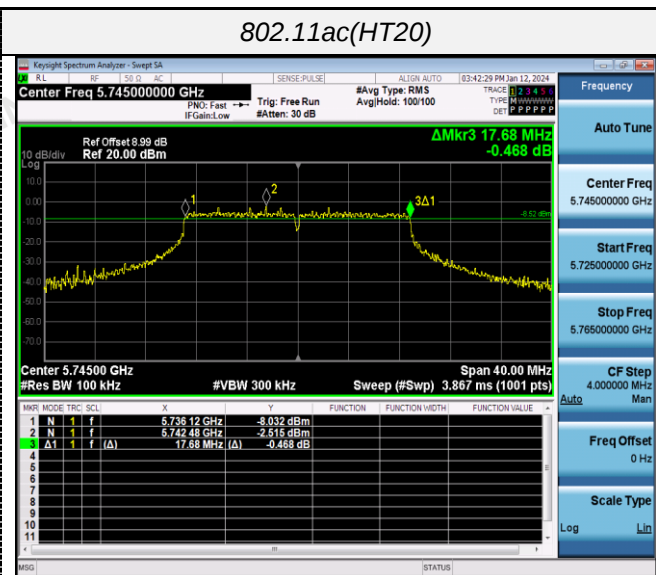
CH165



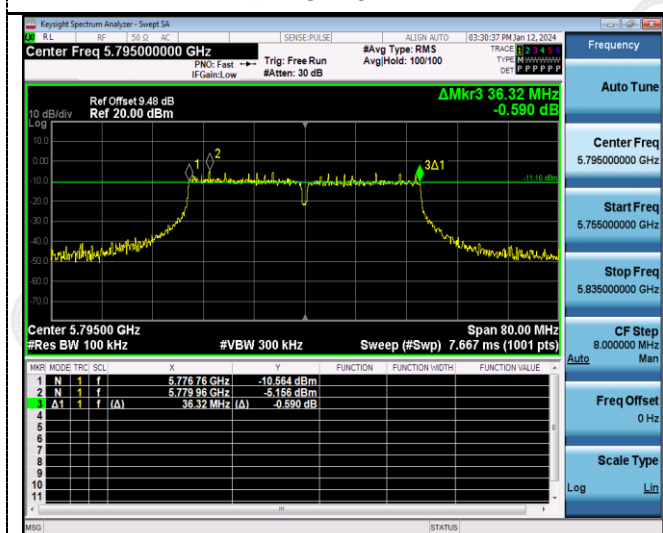
802.11n(HT40)



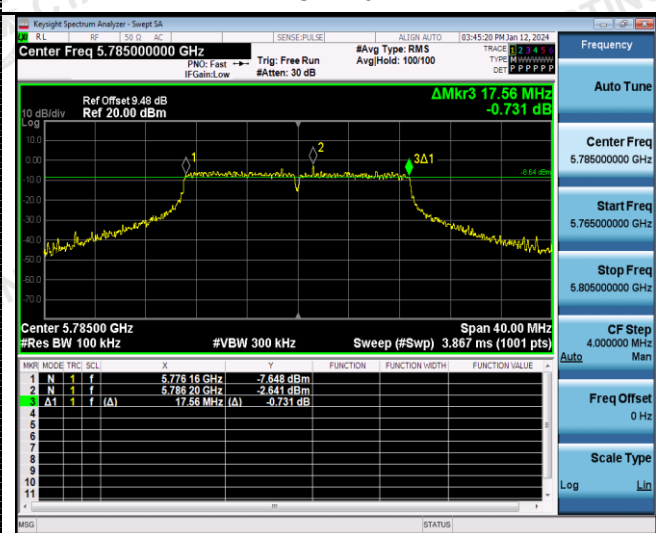
802.11ac(HT20)



CH151



CH149



CH159

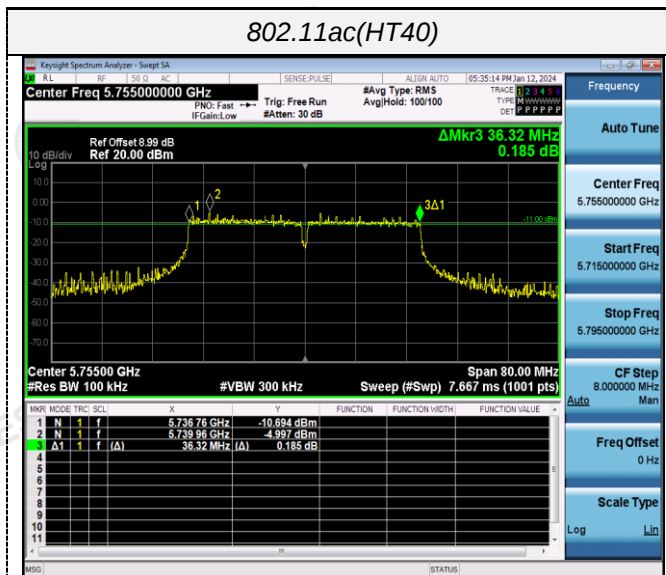


CH157



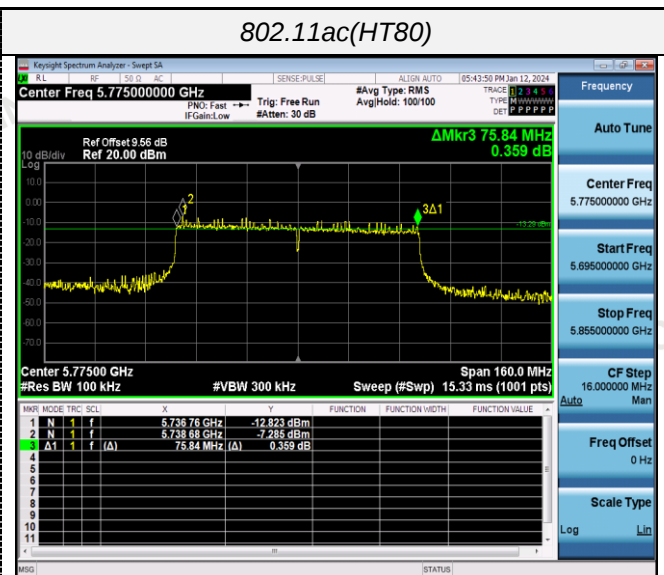
CH165

802.11ac(HT40)

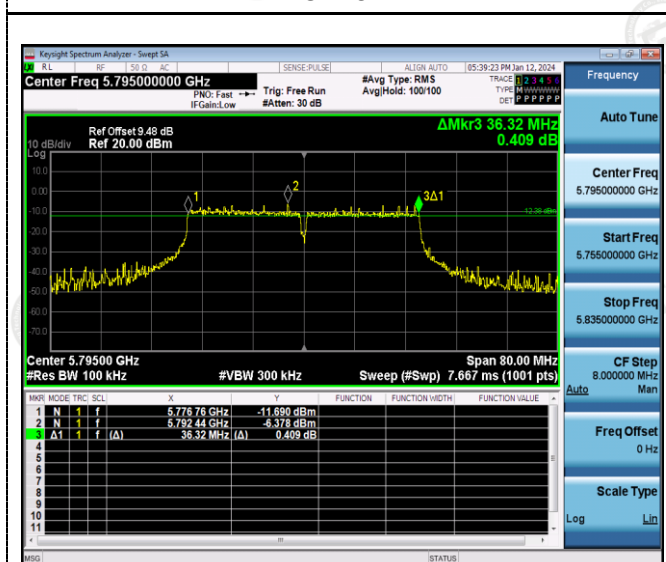


CH151

802.11ac(HT80)

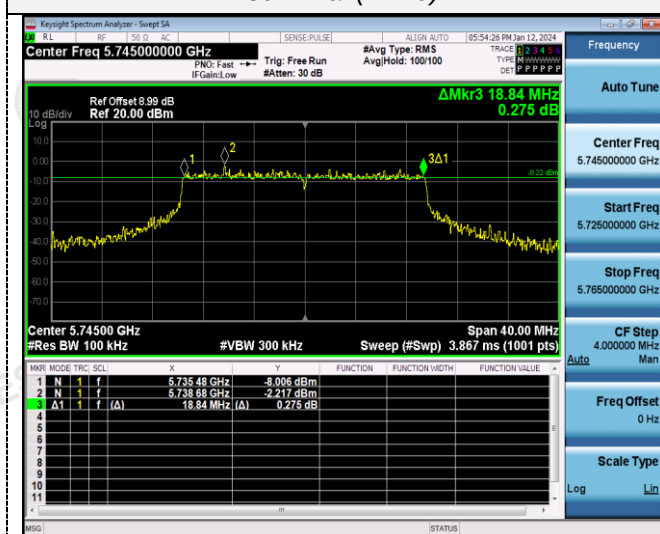


CH155

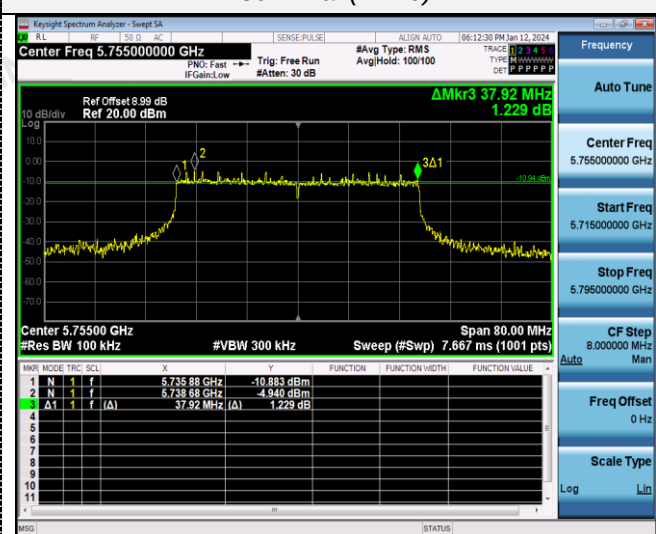


CH159

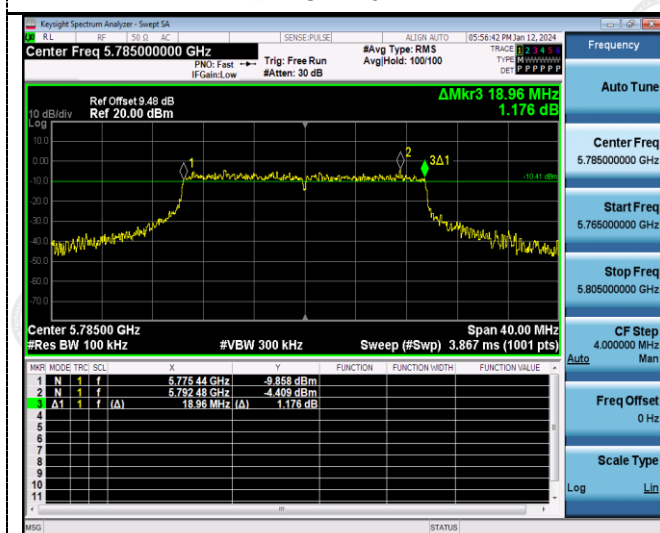
802.11ax(HT20)



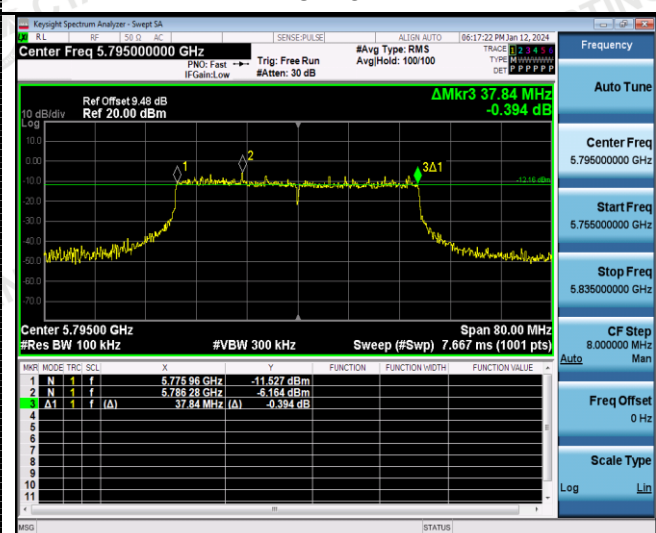
802.11ax(HT40)



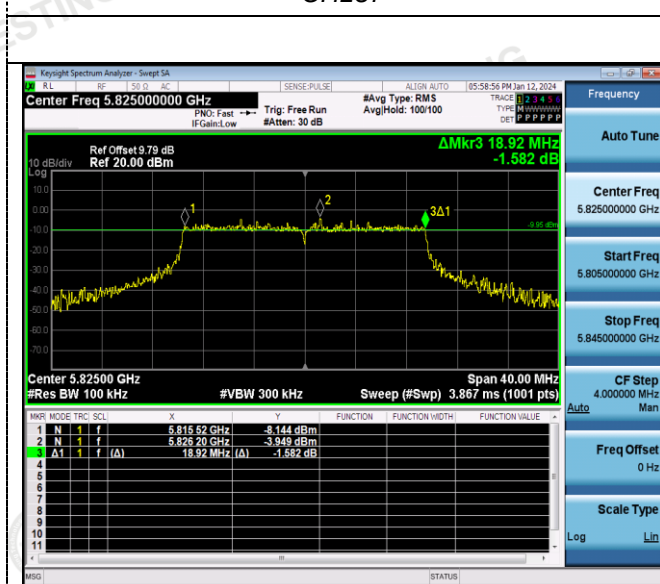
CH149



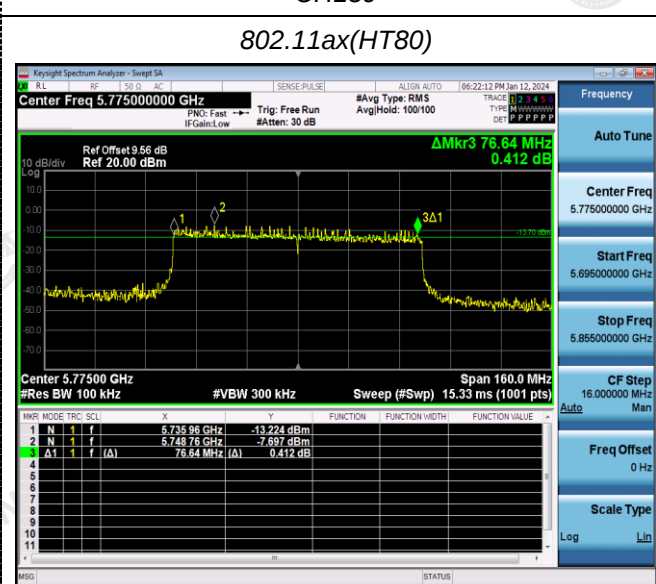
CH151



CH157



CH159



CH156

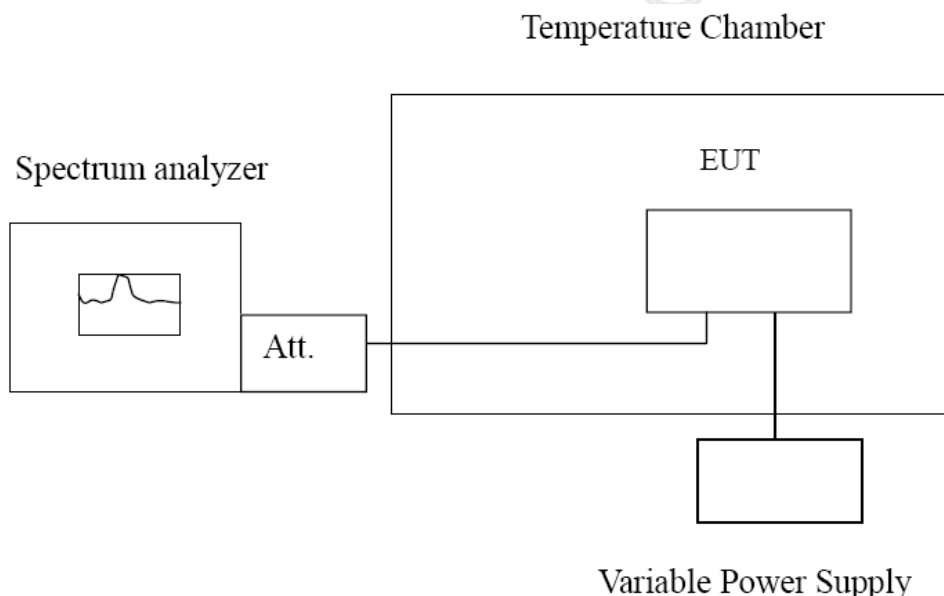
CH155

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 3.70V	-30	110.75	0.021380	Within the band of operation	Pass
	-20	174.60	0.033707		
	-10	145.19	0.028029		
	0	146.38	0.028259		
	10	146.10	0.028205		
	20	99.59	0.019226		
	30	167.61	0.032357		
	40	129.50	0.025000		
	50	128.83	0.024871		
DC 4.20V	25	195.35	0.037712	Within the band of operation	Pass
DC 3.40V	25	118.77	0.022929		

Reference Frequency: 802.11ac channel=149 frequency=5745MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
DC 3.70V	-30	135.80	0.023638	Within the band of operation	Pass
	-20	129.62	0.022562		
	-10	167.32	0.029124		
	0	169.85	0.029565		
	10	136.42	0.023746		
	20	144.51	0.025154		
	30	116.78	0.020327		
	40	168.20	0.029278		
	50	160.84	0.027997		
DC 4.20V	25	150.60	0.026214	Within the band of operation	Pass
DC 3.40V	25	129.86	0.022604		

5 Test Setup Photos of the EUT



6 Photos of the EUT

Reference to the test report No. CTA24010301401.

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