

802.11ac(HT40)

U-NII 1



U-NII 3



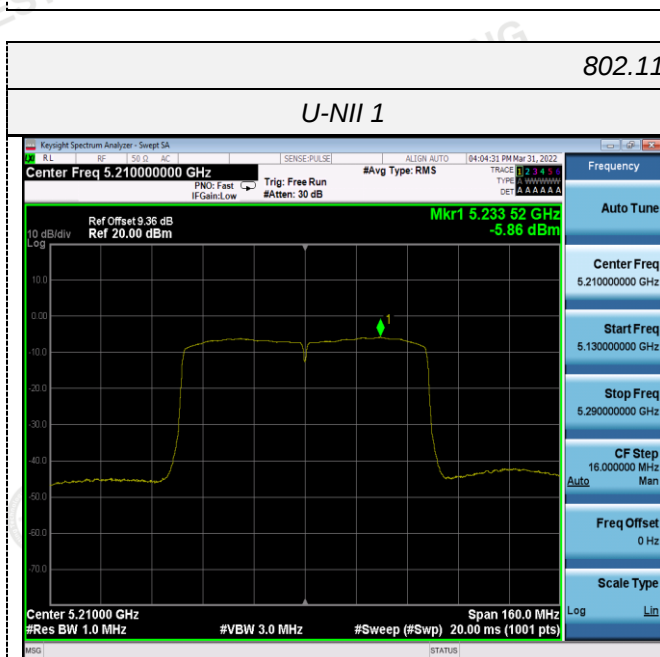
CH38



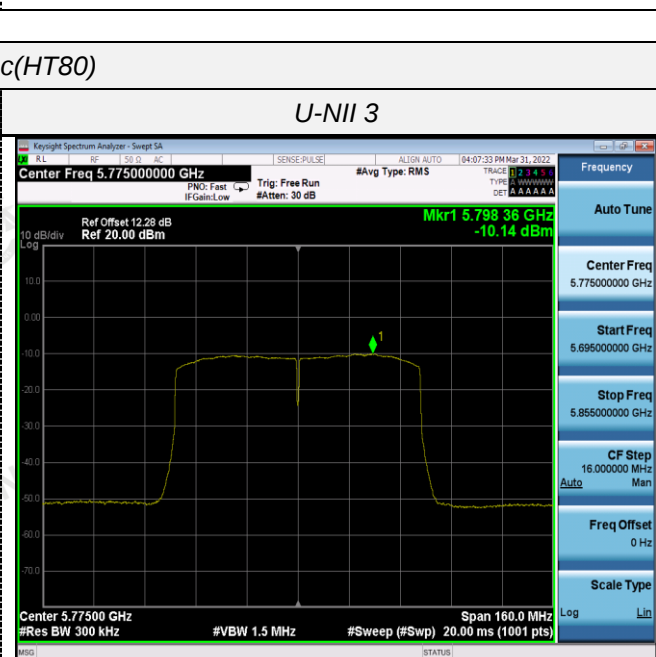
CH151



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CH159



802.11ac(HT80)

U-NII 1



U-NII 3



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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

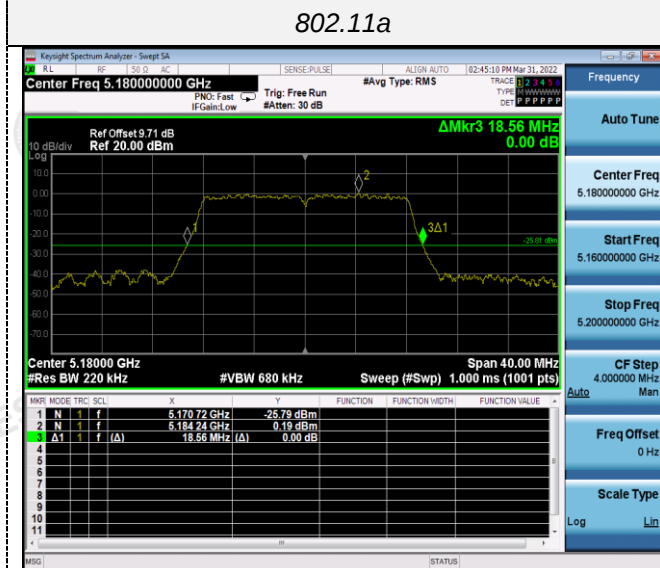


Test Results

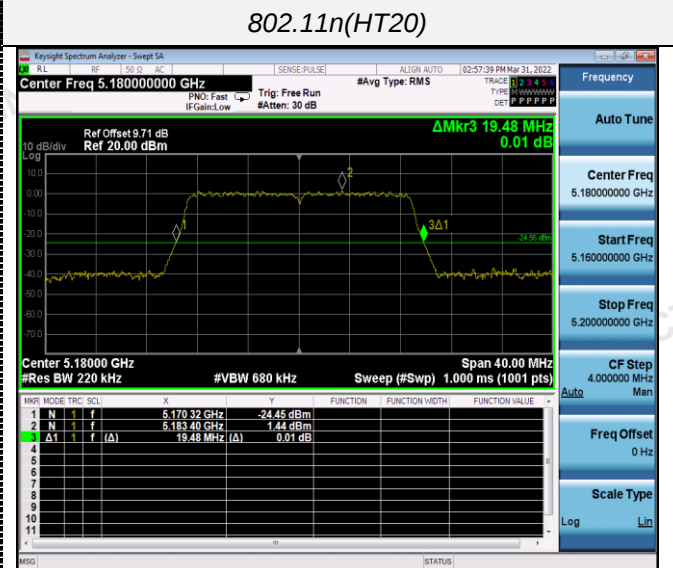
Type	Bands	Channel	26dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	U-NII 1	36	18.560	N/A	Pass
		40	18.520		
		48	18.520		
802.11n(HT20)	U-NII 1	36	19.480		
		40	19.440		
		48	19.520		
802.11n(HT40)	U-NII 1	38	41.040		
		46	41.360		
802.11ac(HT20)	U-NII 1	36	19.440		
		40	19.480		
		48	19.480		
802.11ac(HT40)	U-NII 1	38	41.200		
		46	41.040		
802.11ac(HT80)	U-NII 1	42	81.440		

Test plot as follows:

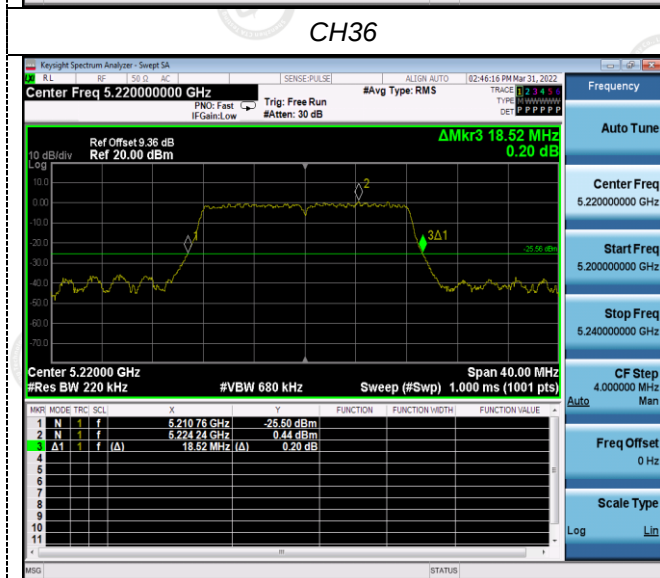
802.11a



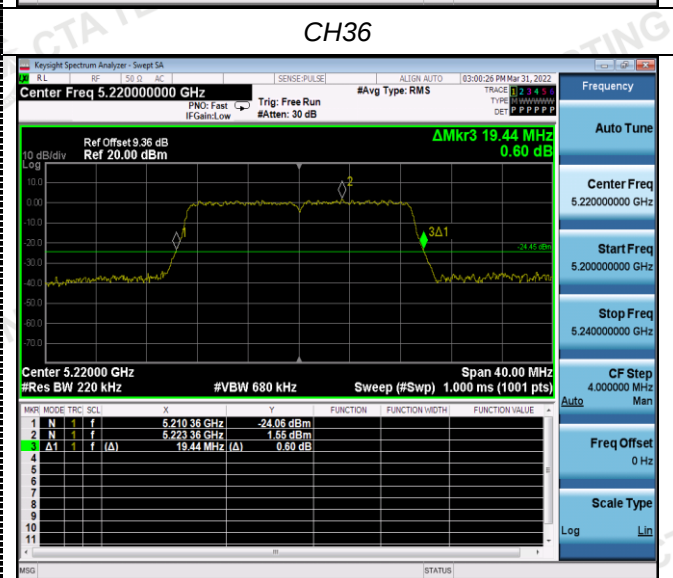
802.11n(HT20)



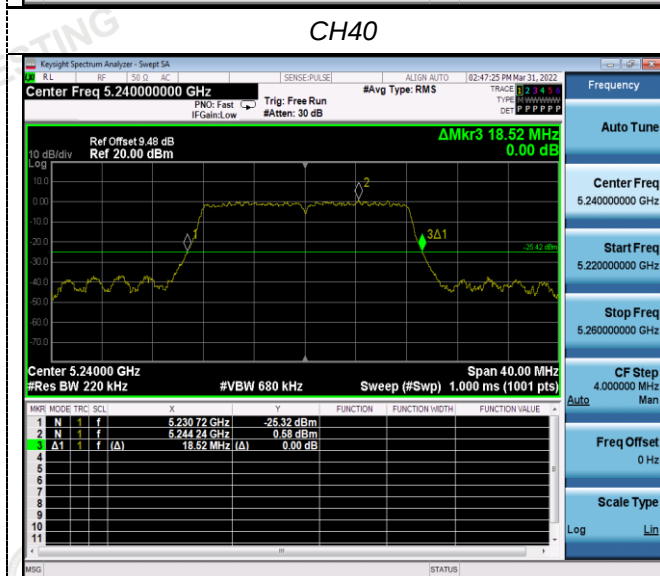
CH36



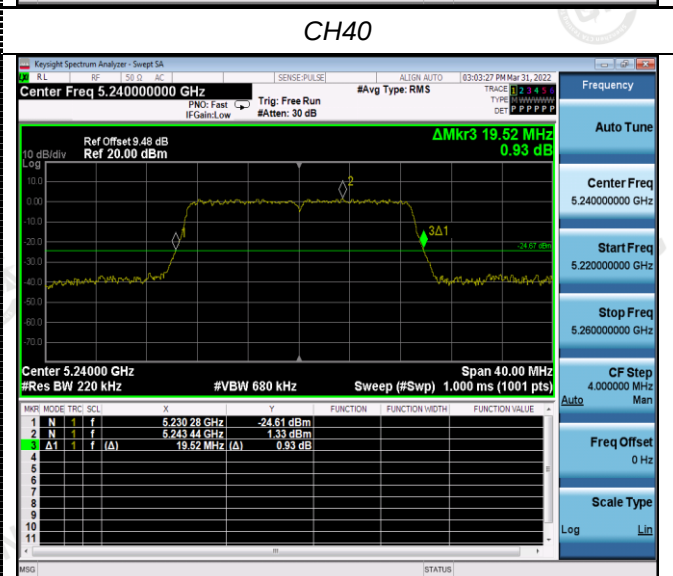
CH36



CH40



CH40



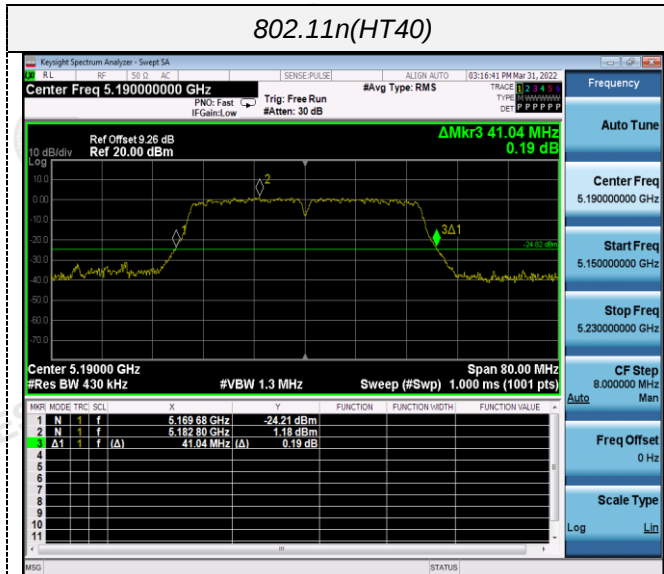
CH48



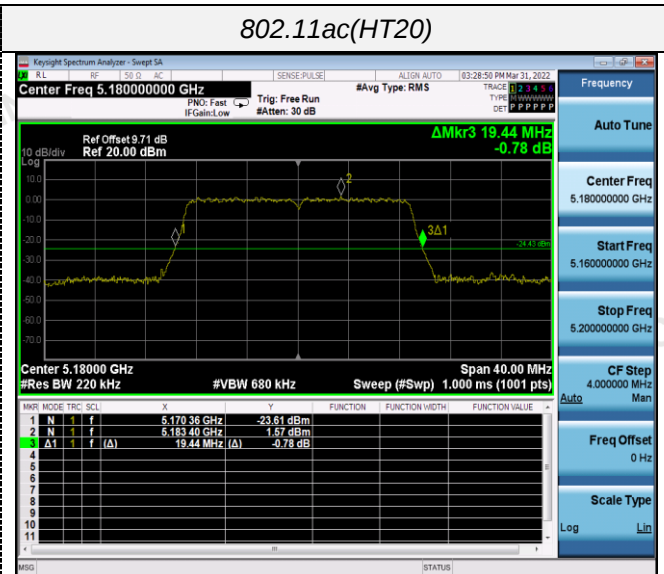
CH48



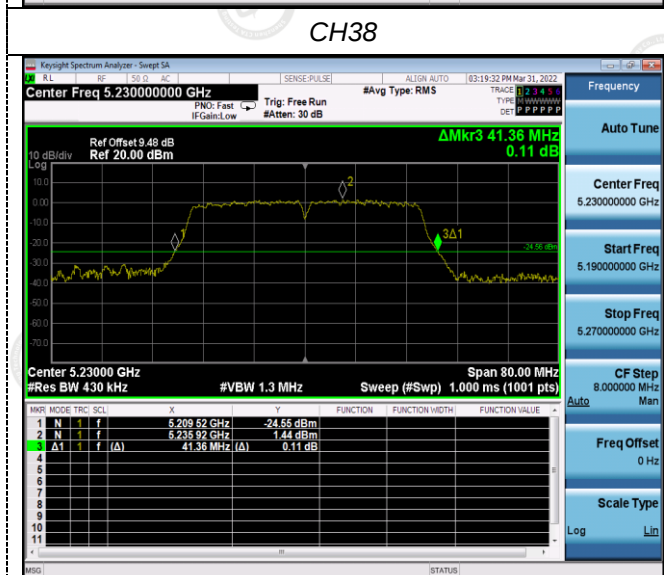
802.11n(HT40)



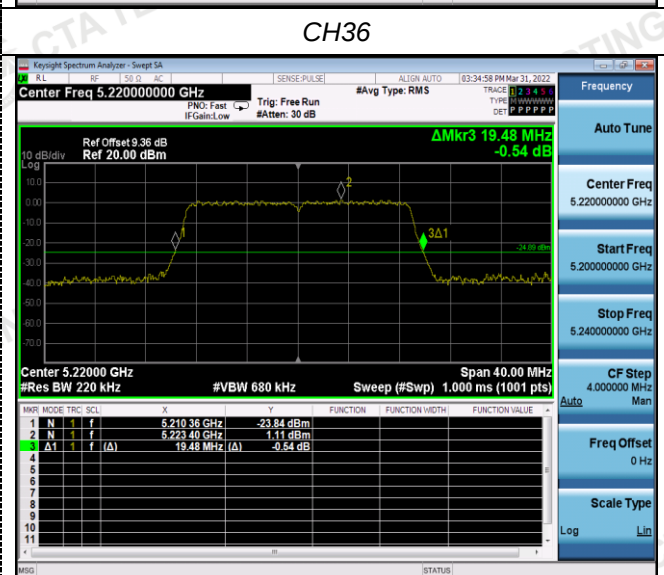
802.11ac(HT20)



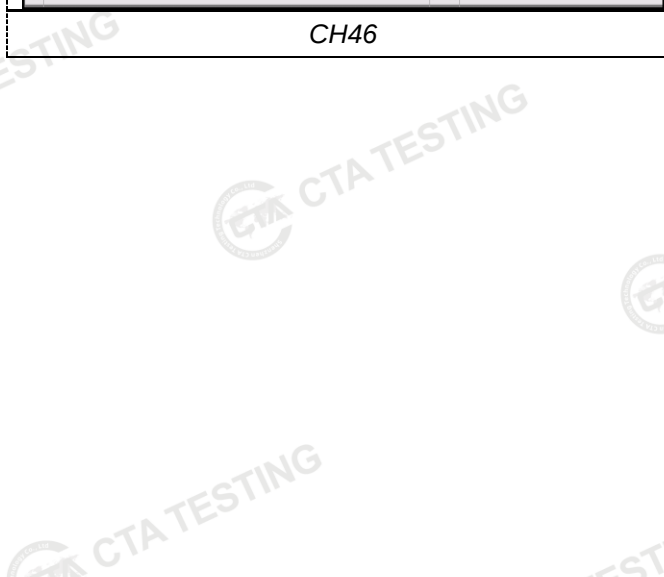
CH38



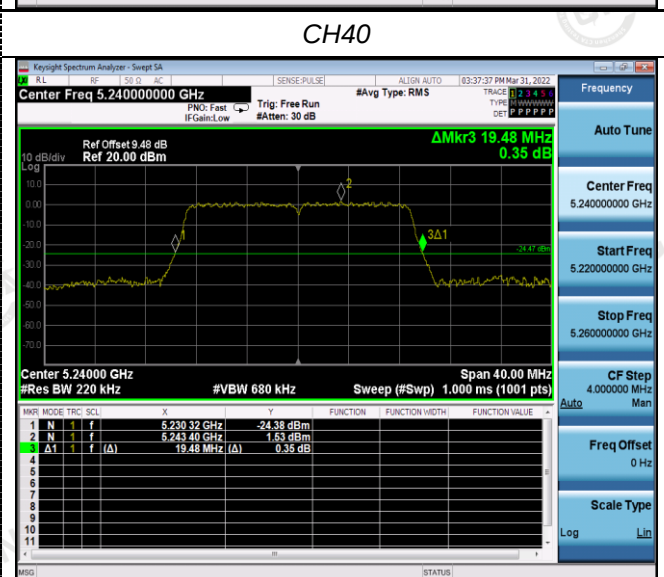
CH36



CH46

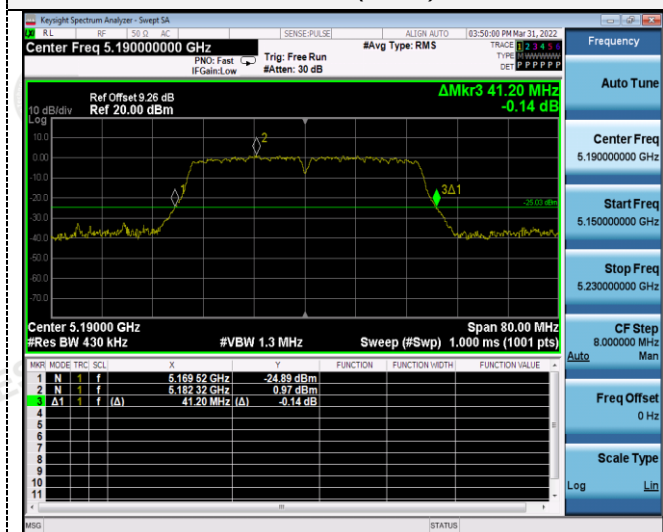


CH40

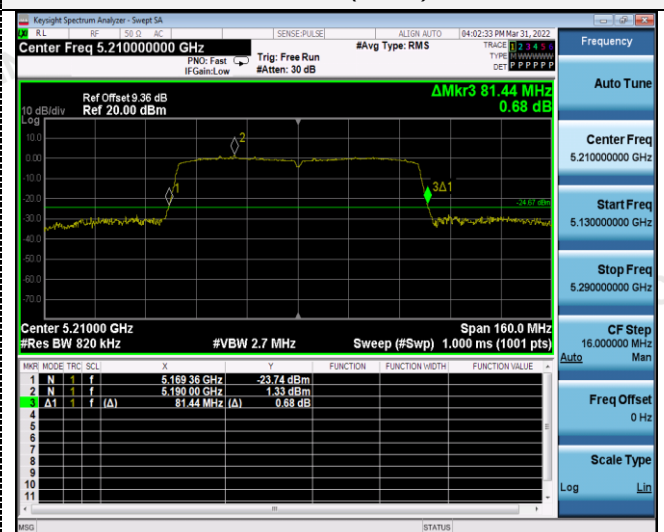


CH48

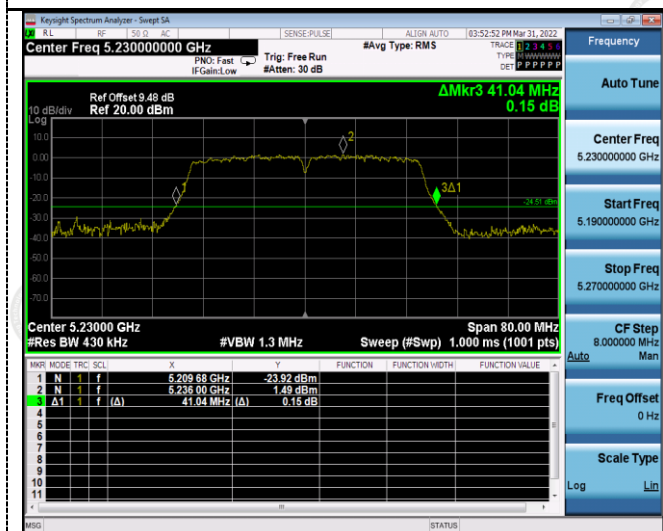
802.11ac(HT40)



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

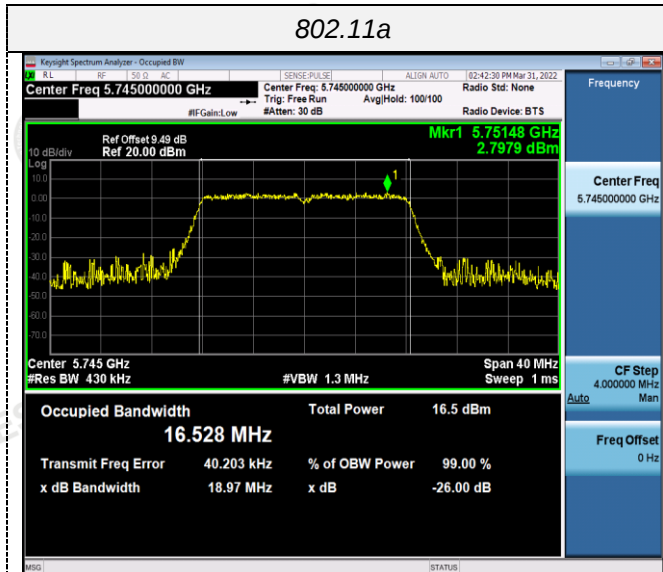


Test Results

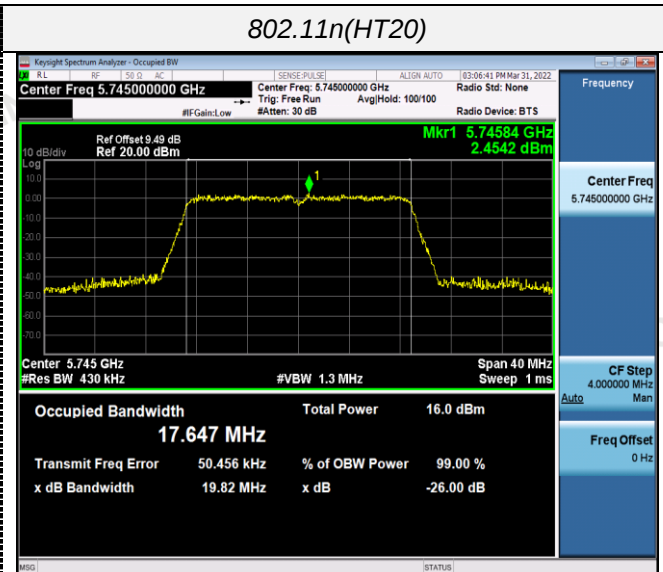
Type	Bands	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11a	U-NII 3	149	16.528	≥500KHz	Pass
		157	16.517		
		165	16.503		
802.11n(HT20)	U-NII 3	149	17.647		
		157	17.654		
		165	17.647		
802.11n(HT40)	U-NII 3	151	36.263		
		159	36.158		
802.11ac(HT20)	U-NII 3	149	17.651		
		157	17.629		
		165	17.662		
802.11ac(HT40)	U-NII 3	151	36.317		
		159	36.226		
802.11ac(HT80)	U-NII 3	155	75.158		

Test plot as follows:

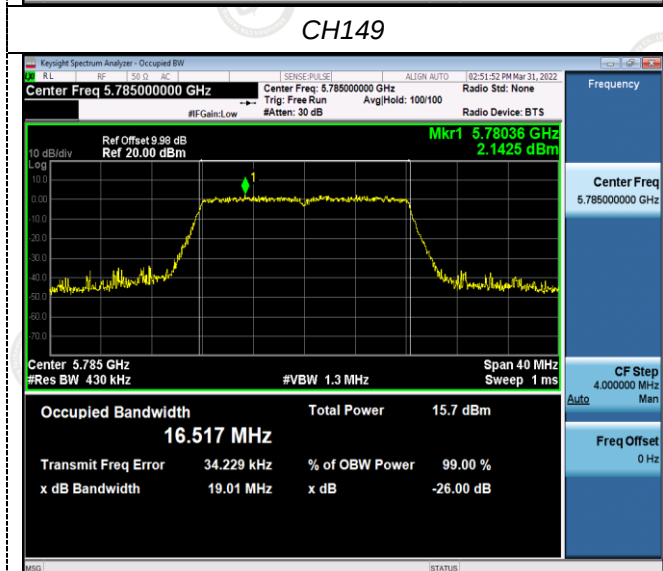
802.11a



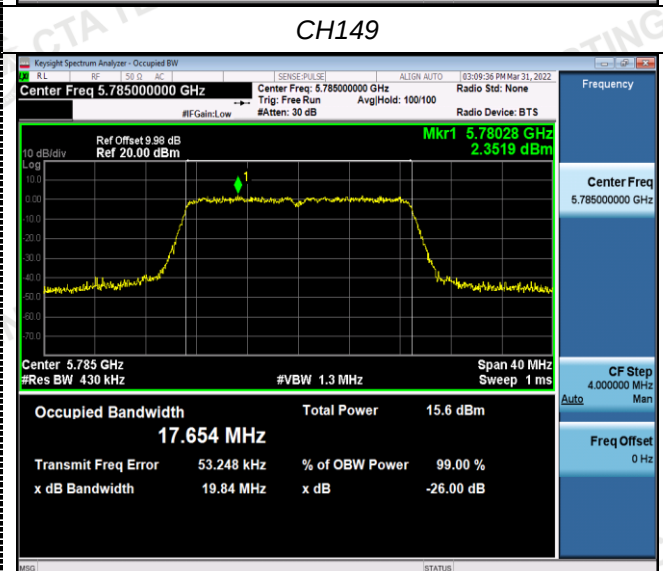
802.11n(HT20)



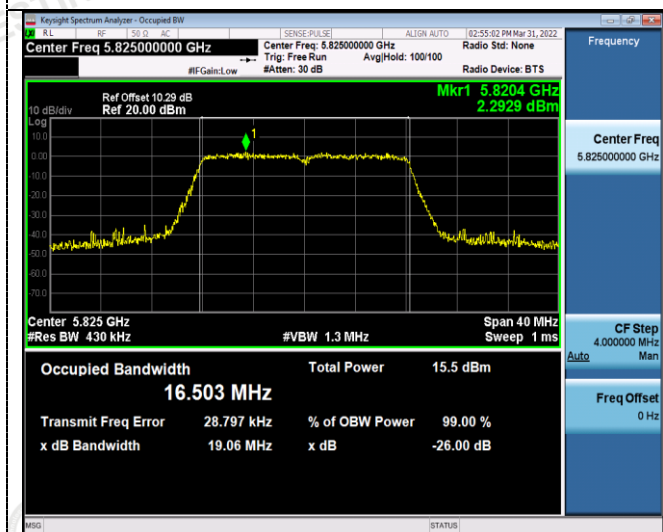
CH149



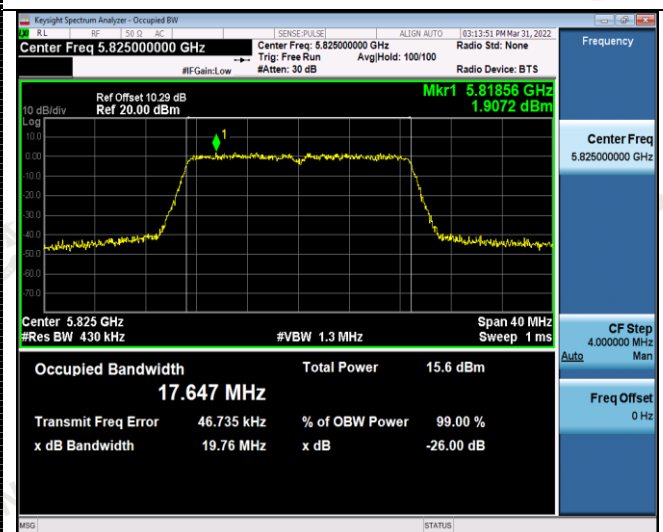
CH149



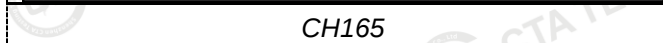
CH157



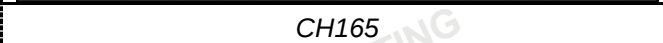
CH157

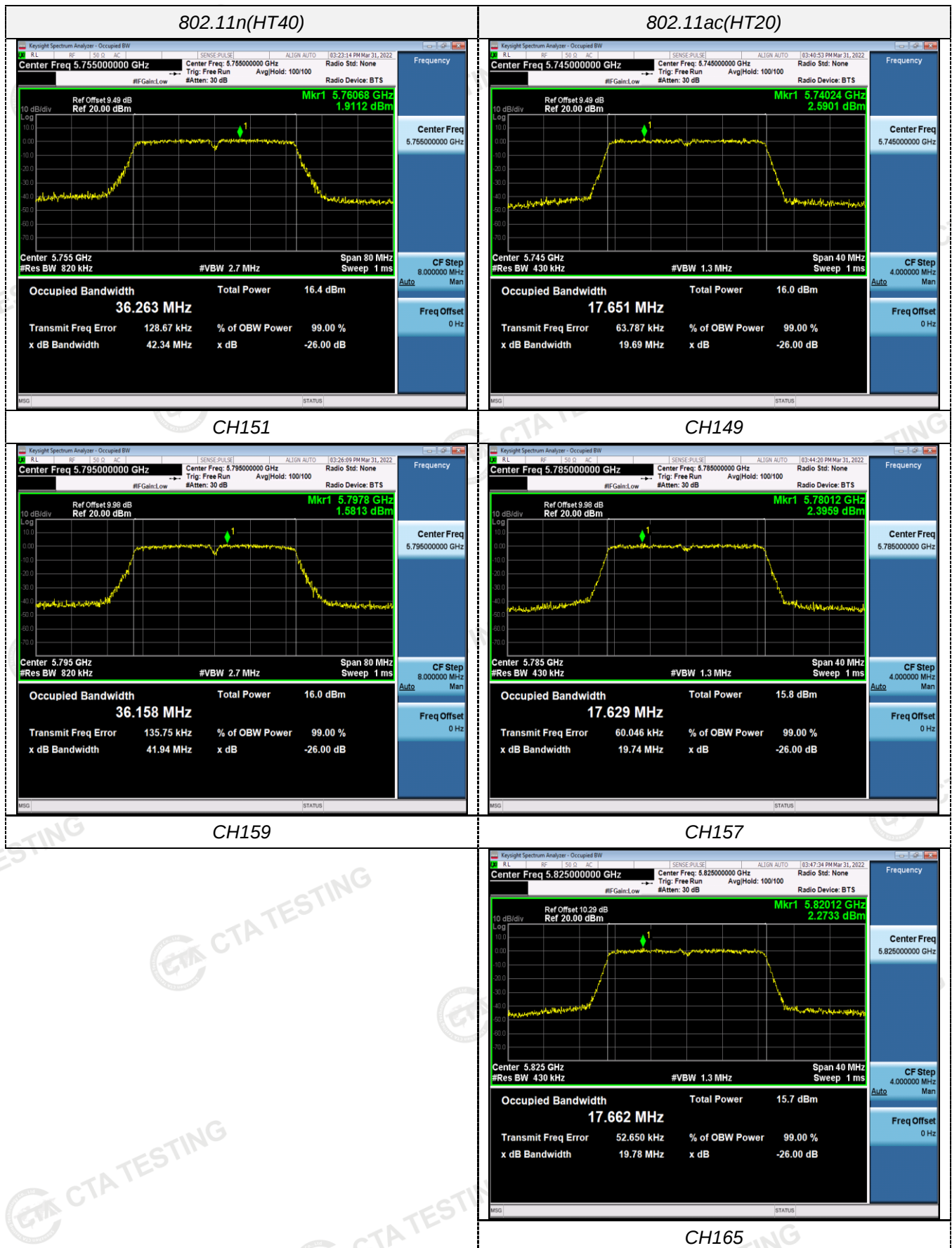


CH165

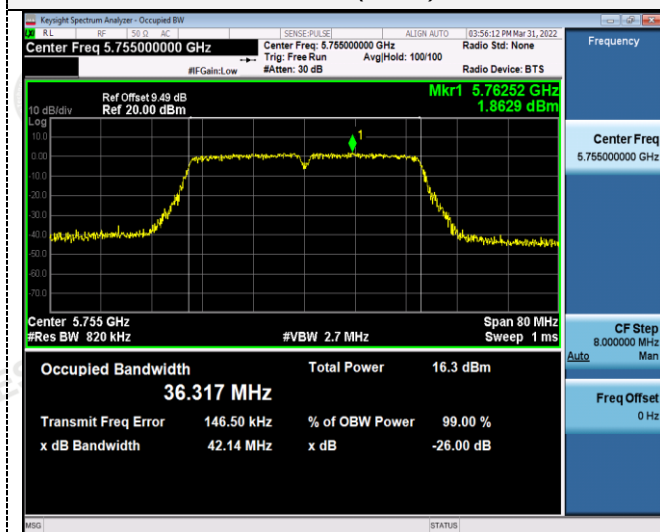


CH165

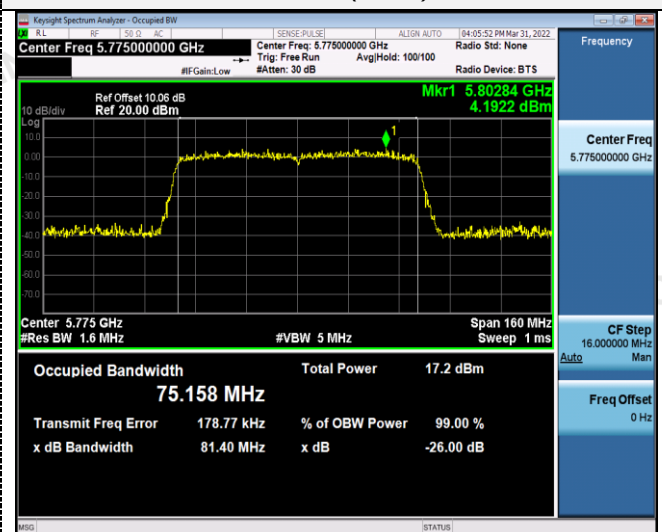




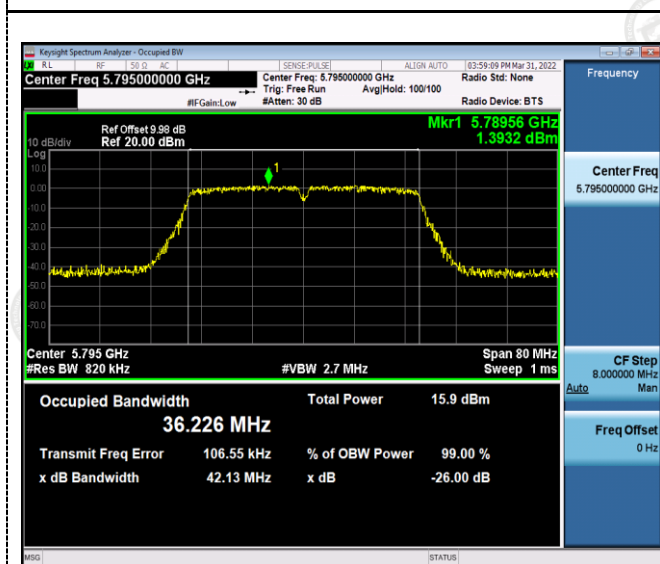
802.11ac(HT40)



802.11ac(HT80)



CH151



CH159

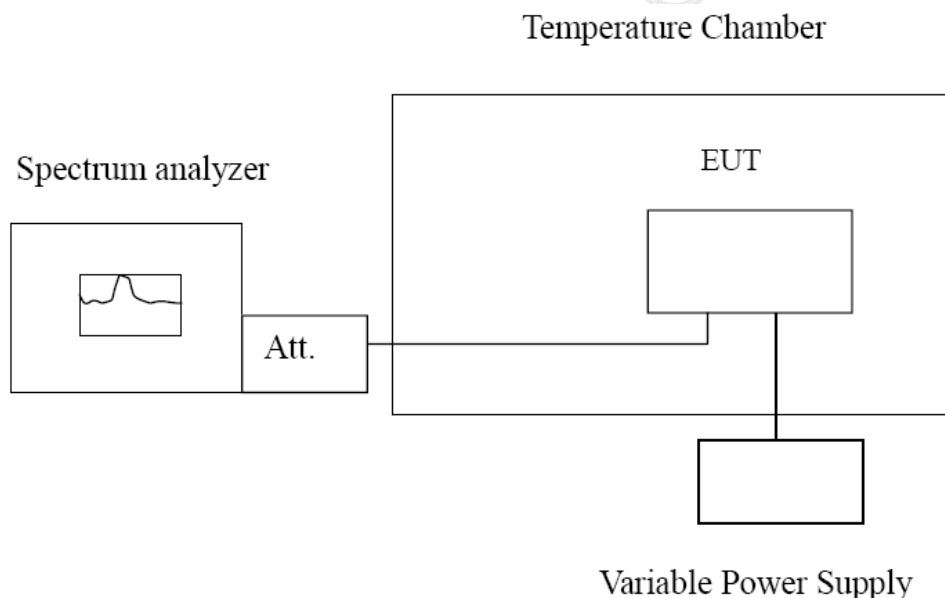
CH155

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.

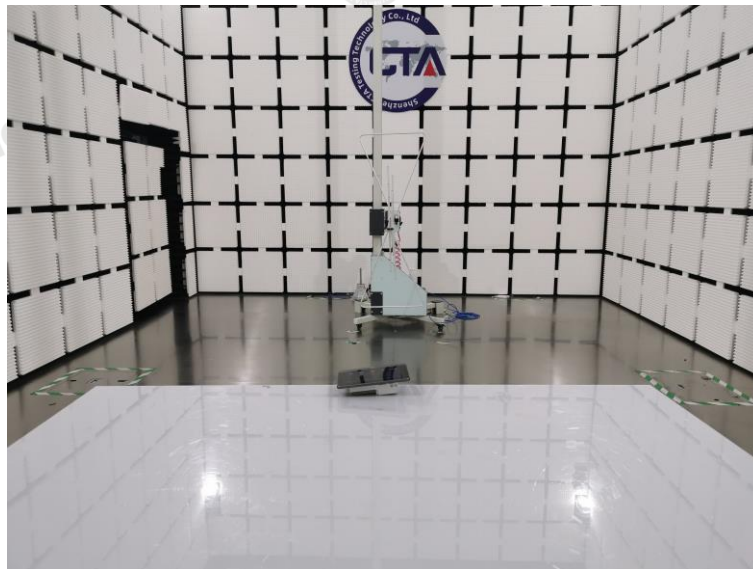
TEST RESULTS

Record worst case as below:

Reference Frequency: 802.11ac channel=36 frequency=5180MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
AC120	-30	101.84	0.01966	Within the band of operation	Pass
	-20	165.49	0.03195		
	-10	142.65	0.02754		
	0	112.84	0.02178		
	10	137.73	0.02659		
	20	108.21	0.02089		
	30	132.73	0.02562		
	40	141.52	0.02732		
	50	129.53	0.02501		
AC132	25	168.13	0.03246	Within the band of operation	Pass
AC108	25	129.32	0.02497		

Reference Frequency: 802.11ac channel=149 frequency=5745MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
AC120	-30	132.96	0.02314	Within the band of operation	Pass
	-20	145.12	0.02526		
	-10	157.47	0.02741		
	0	161.58	0.02813		
	10	131.72	0.02293		
	20	125.79	0.02190		
	30	110.58	0.01925		
	40	161.83	0.02817		
	50	150.32	0.02617		
AC132	25	145.83	0.02538	Within the band of operation	Pass
AC108	25	129.42	0.02253		

5 Test Setup Photos of the EUT



6 Photos of the EUT

Reference to the test report No. **CTA22033000401**

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