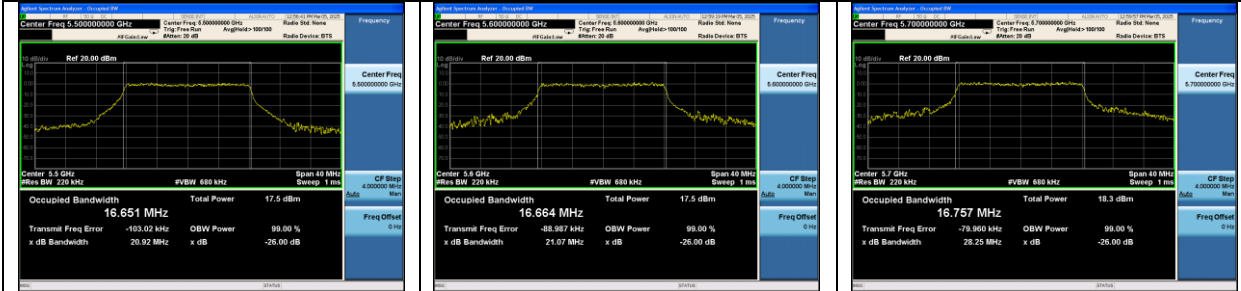


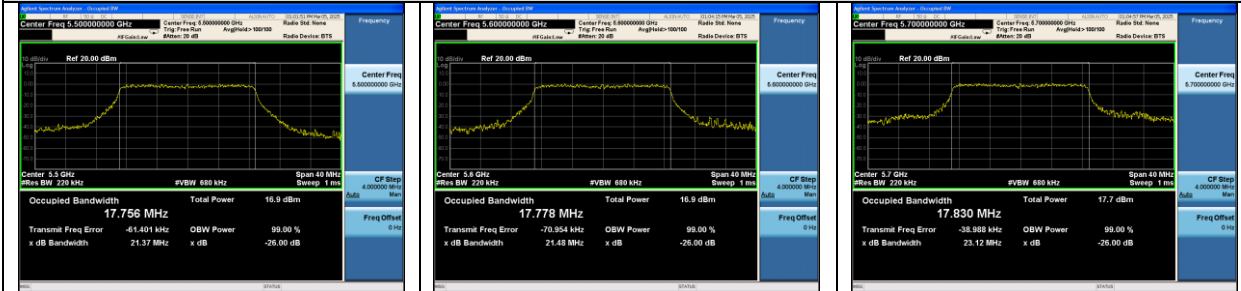
26dB bandwidth & 99% Occupied bandwidth

U-NII-2C Band

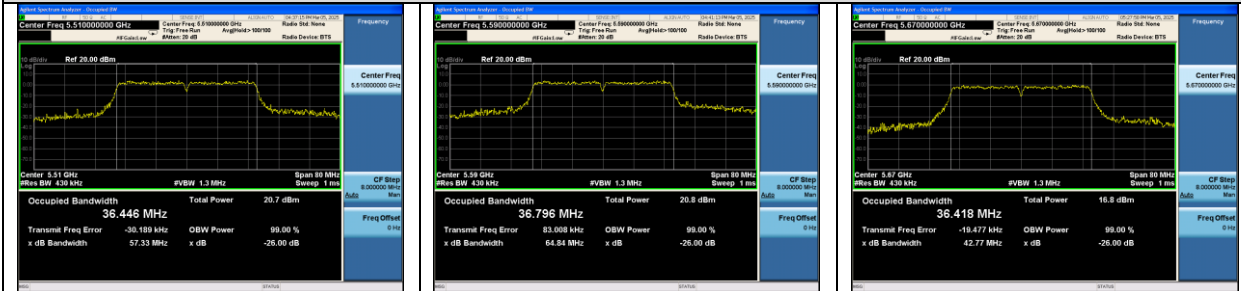
IEEE 802.11a



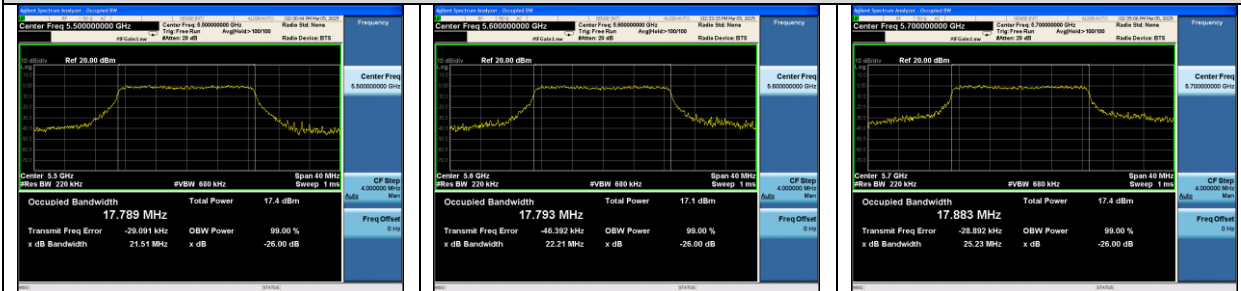
IEEE 802.11n HT20



IEEE 802.11n HT40

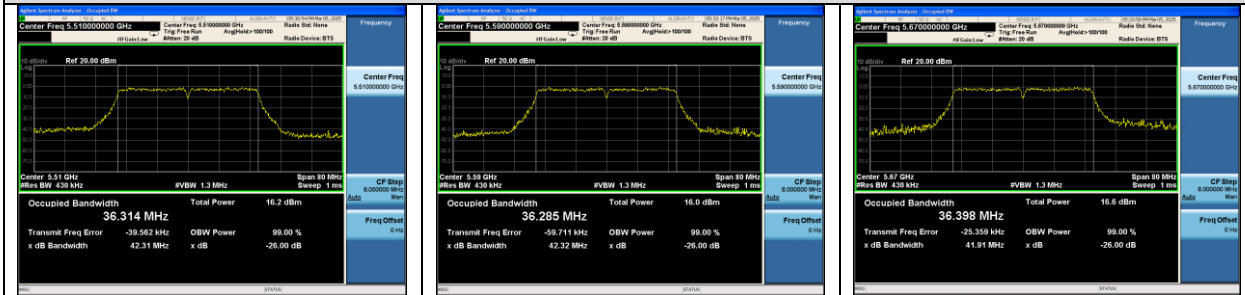


IEEE 802.11ac VHT20

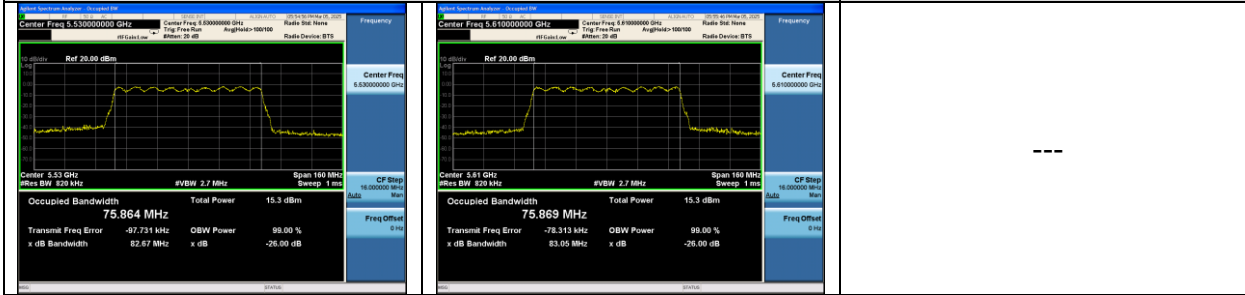


FCC ID: HLZN24G4

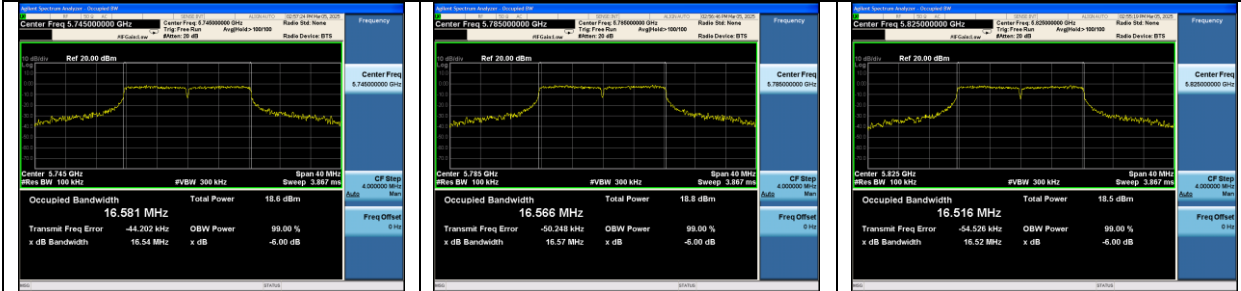
IEEE 802.11ac VHT40



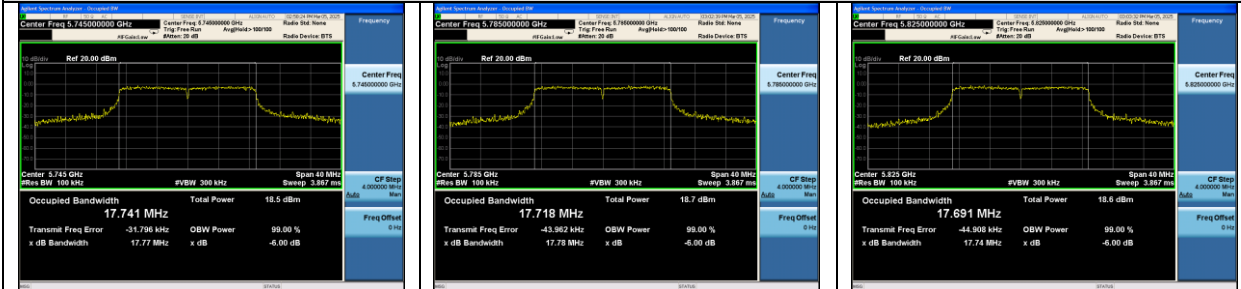
IEEE 802.11ac VHT80



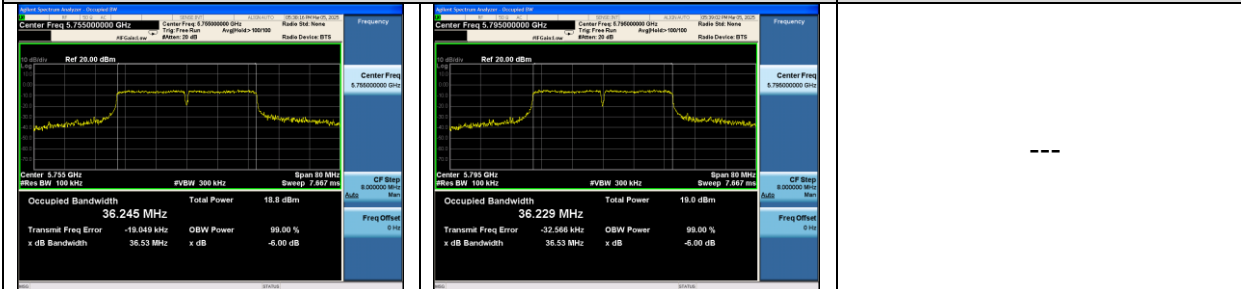
6dB bandwidth U-NII-3 Band IEEE 802.11a



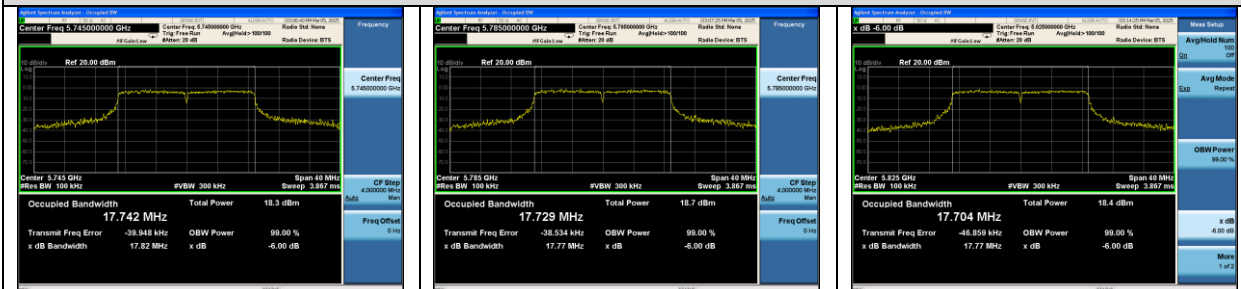
IEEE 802.11n HT20



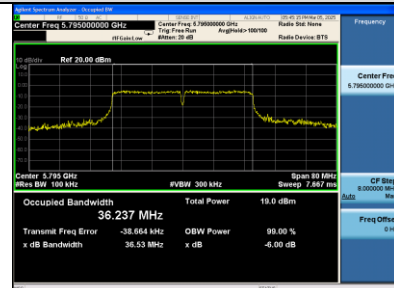
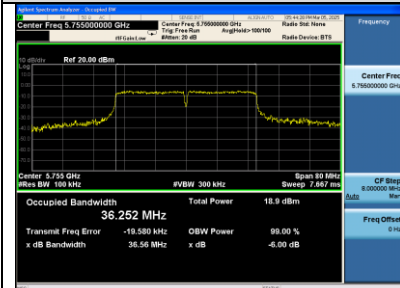
IEEE 802.11n HT40



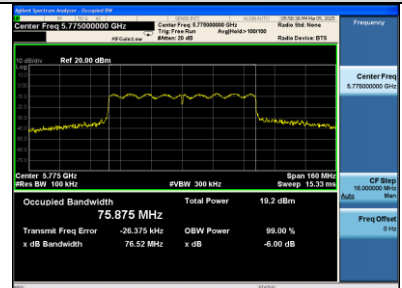
IEEE 802.11ac VHT20



IEEE 802.11ac VHT40



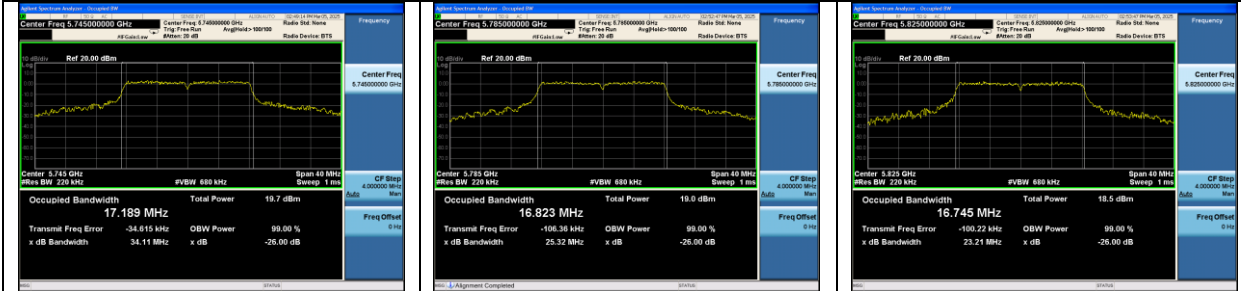
IEEE 802.11ac VHT80



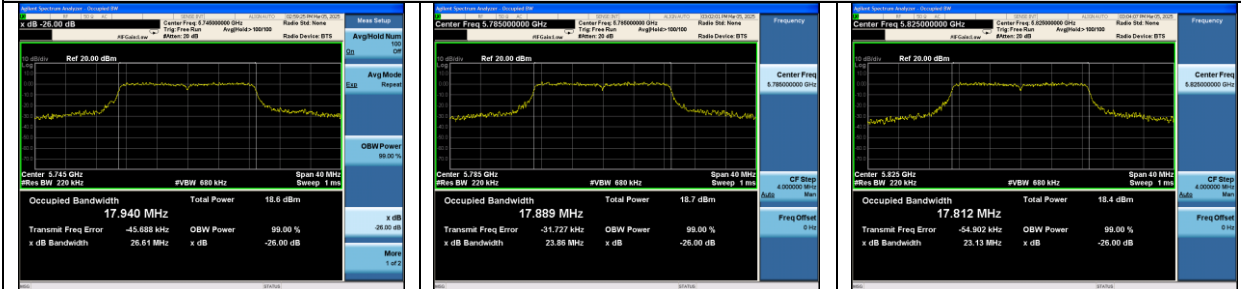
26dB bandwidth & 99% Occupied bandwidth

U-NII-3 Band

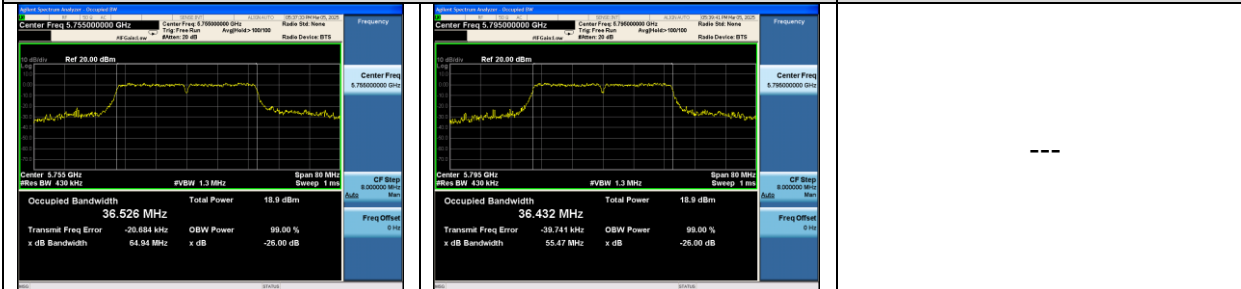
IEEE 802.11a



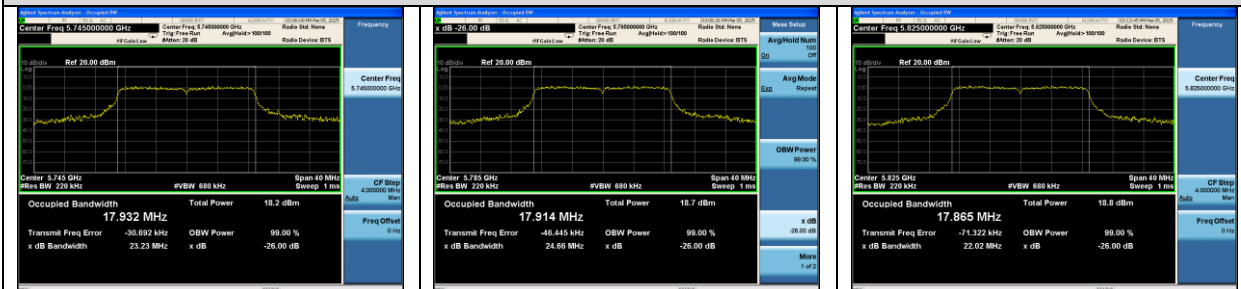
IEEE 802.11n HT20



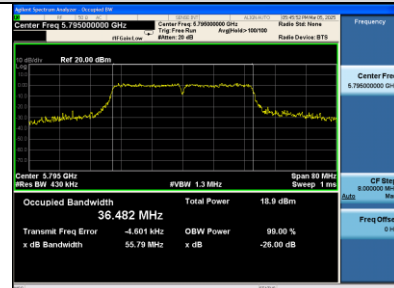
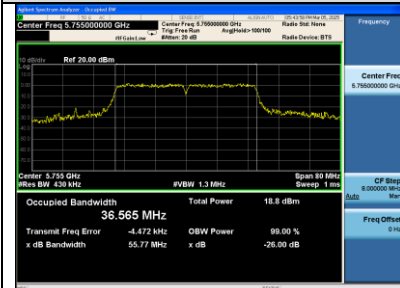
IEEE 802.11n HT40



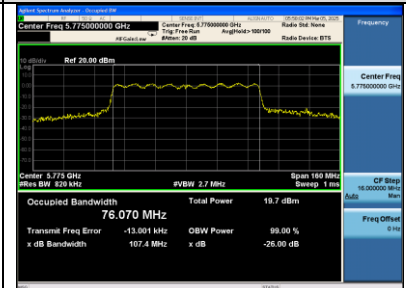
IEEE 802.11ac VHT20



IEEE 802.11ac VHT40



IEEE 802.11ac VHT80



7. OUTPUT POWER TEST

7.1.Limit

For the band 5.15–5.25 GHz.

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

7.2.Test Procedure

1. Connected the EUT's antenna port to measure device by 20dB attenuator.
2. Use the test method described in ANSI C63.10 clause 12.3 Method SA-1
 - 1) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
 - 2) Set RBW = 1 MHz.
 - 3) Set VBW $\geq$ 3 MHz.
 - 4) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$.
 - 5) Sweep time = auto.
 - 6) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
 - 7) 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."
 - 8) Trace average at least 100 traces in power averaging (rms) mode.
 - 9) 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.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

7.3.Test Results

EUT: Notebook Computer		
M/N: N24G4		
Test date: 2025-02-19	Pressure: 103.1±1.0 kpa	Humidity: 51.5±3.0%
Tested by: Epoch	Test site: RF site	Temperature: 22.5±0.6℃

U-NII-1 Band:

Test Mode	Frequency (MHz)	Channel Power	duty cycle factor (db)	Output Power (dBm)	Limit (dBm)
11a	5180	61	0	14.84	23.98
	5200	61	0	15.01	
	5240	61	0	15.66	
11n HT20	5180	59	0	13.77	23.98
	5200	59	0	14.20	
	5240	59	0	14.60	
11n HT40	5190	50	0	11.15	23.98
	5230	50	0	11.78	
11ac VHT20	5180	58	0	13.29	23.98
	5200	58	0	13.63	
	5240	58	0	14.09	
11ac VHT40	5190	50	0	10.72	23.98
	5230	50	0	11.48	
11ac VHT80	5210	50	0	11.26	23.98
Conclusion: Pass					

U-NII-2A Band:

Test Mode	Frequency (MHz)	Power Setting	duty cycle factor (db)	Output Power (dBm)	Limit (dBm)
11a	5260	56	0	14.29	23.98
	5300	56	0	14.62	
	5320	56	0	14.90	
11n HT20	5260	53	0	13.13	23.98
	5300	53	0	13.45	
	5320	53	0	13.63	
11n HT40	5270	45	0	9.83	23.98
	5310	45	0	10.40	
11ac VHT20	5260	54	0	13.44	23.98
	5300	54	0	13.72	
	5320	54	0	13.97	
11ac VHT40	5270	46	0	10.56	23.98
	5310	46	0	10.84	
11ac VHT80	5290	40	0	8.12	23.98
Conclusion: Pass					

U-NII-2C Band:

Test Mode	Frequency (MHz)	Power Setting	duty cycle factor (db)	Output Power (dBm)	Limit (dBm)
11a	5500	42	0	9.71	23.98
	5600	42	0	9.26	
	5700	42	0	9.82	
11n HT20	5500	41	0	9.00	23.98
	5600	41	0	8.43	
	5700	41	0	9.19	
11n HT40	5510	39	0	7.98	23.98
	5590	39	0	7.64	
	5670	39	0	8.05	
11ac VHT20	5500	41	0	8.89	23.98
	5600	41	0	8.39	
	5700	41	0	9.10	
11ac VHT40	5510	39	0	8.12	23.98
	5590	39	0	7.74	
	5670	39	0	7.96	
11ac VHT80	5530	35	0	6.25	23.98
	5610	35	0	5.71	

Conclusion: Pass

U-NII-3 Band:

Test Mode	Frequency (MHz)	Power Setting	duty cycle factor (db)	Output Power (dBm)	Limit (dBm)
11a	5475	56	0	15.36	23.98
	5485	56	0	15.54	
	5825	56	0	15.34	
11n HT20	5475	53	0	14.89	23.98
	5485	53	0	14.93	
	5825	53	0	14.92	
11n HT40	5755	53	0	13.75	23.98
	5795	53	0	13.70	
11ac VHT20	5475	49	0	13.30	23.98
	5485	49	0	13.42	
	5825	49	0	13.33	
11ac VHT40	5755	49	0	12.35	23.98
	5795	49	0	12.46	
11ac VHT80	5775	49	0	11.84	23.98
Conclusion: Pass					

U-NII-1 Band

IEEE 802.11a



IEEE 802.11n HT20



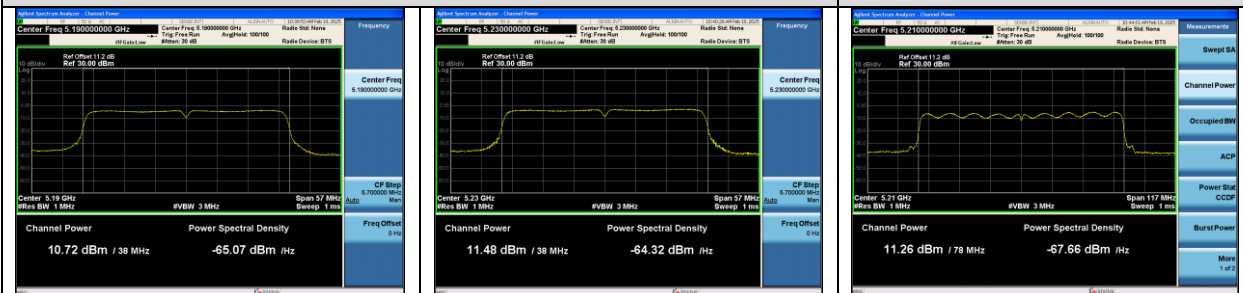
IEEE 802.11n HT40



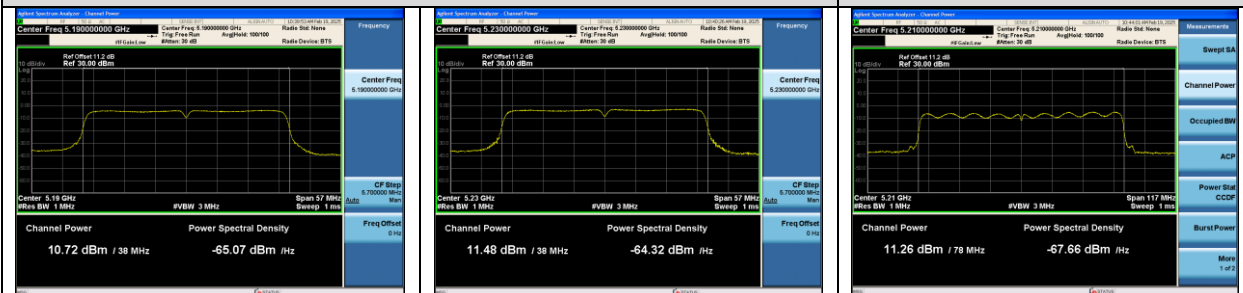
IEEE 802.11ac VHT20



IEEE 802.11ac VHT40



IEEE 802.11ac VHT80



U-NII-2A Band IEEE 802.11a



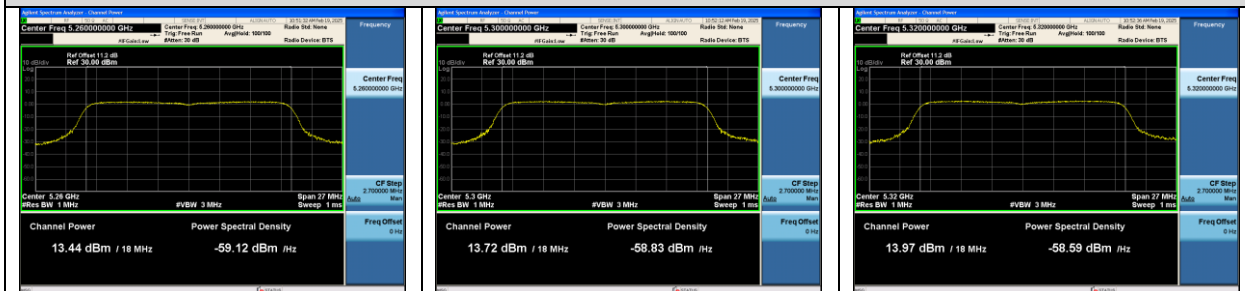
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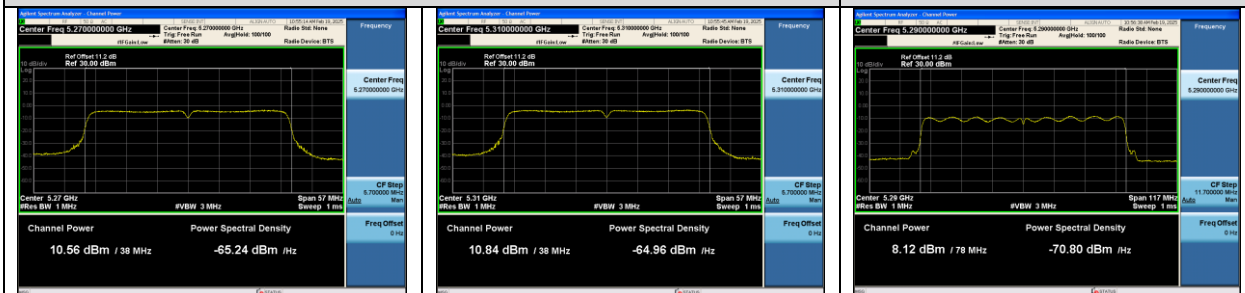
IEEE 802.11n HT40



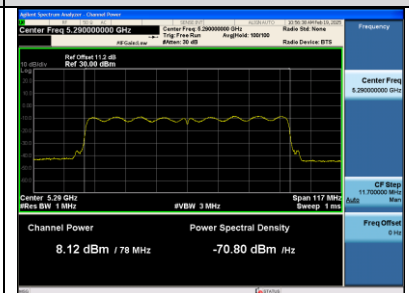
IEEE 802.11ac VHT20



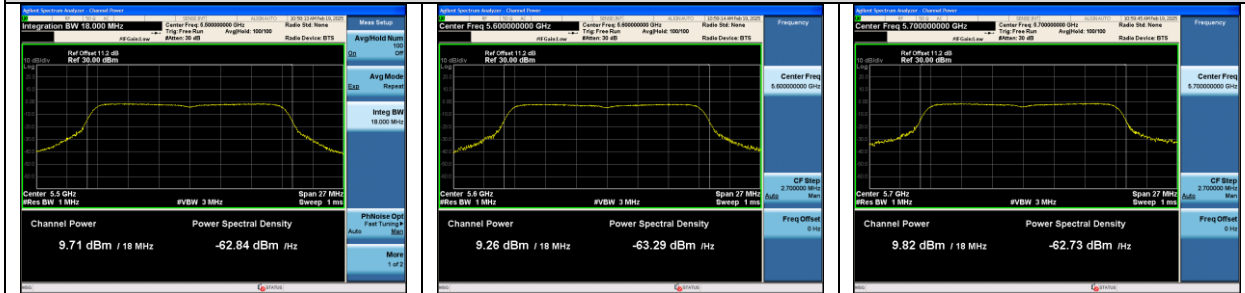
IEEE 802.11ac VHT40



IEEE 802.11ac VHT80



U-NII-2C IEEE 802.11a



IEEE 802.11n HT20



IEEE 802.11n HT40

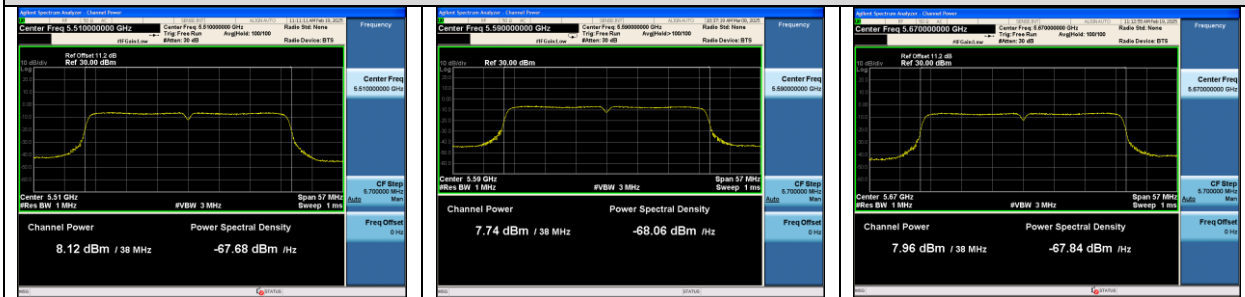


IEEE 802.11ac VHT20

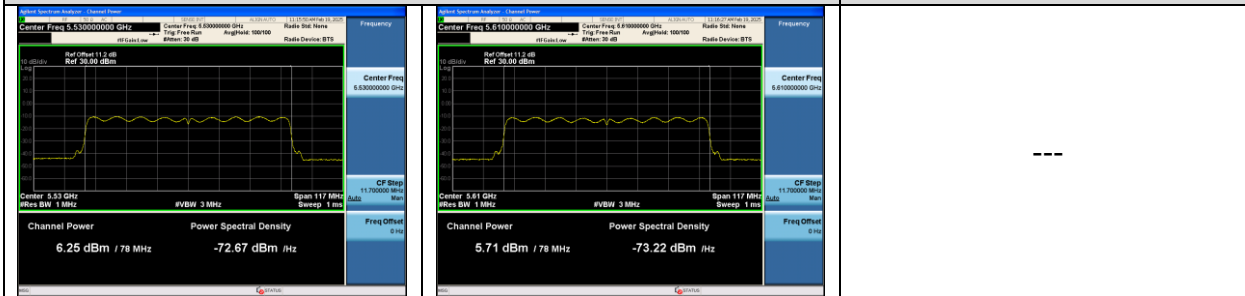


FCC ID: HLZN24G4

IEEE 802.11ac VHT40



IEEE 802.11ac VHT80



U-NII-3 Band

IEEE 802.11a



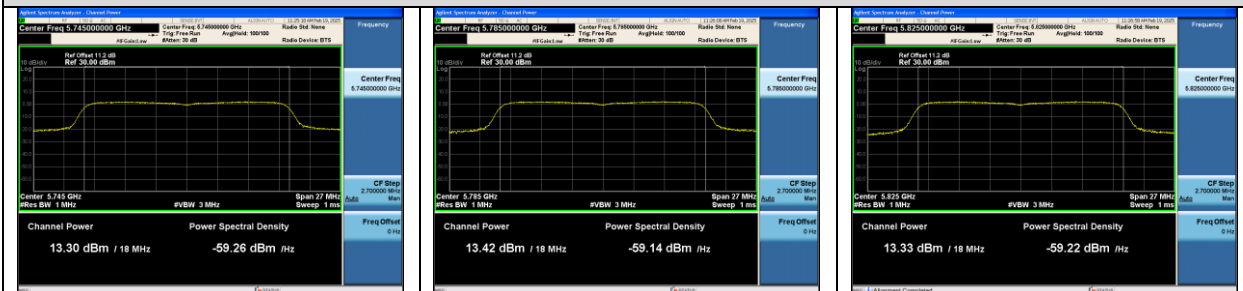
IEEE 802.11n HT20



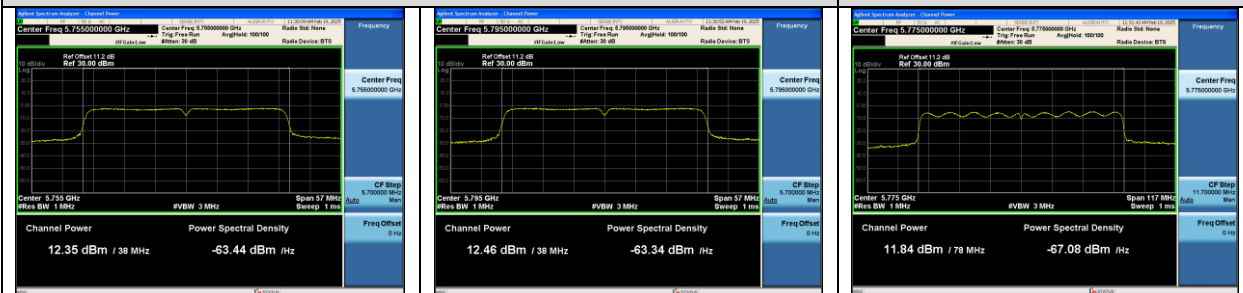
IEEE 802.11n HT40



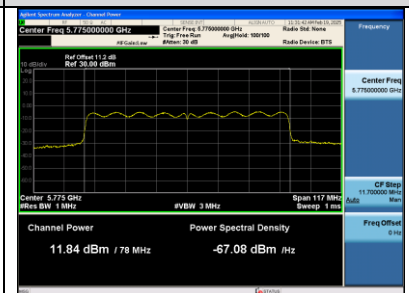
IEEE 802.11ac VHT20



IEEE 802.11ac VHT40



IEEE 802.11ac VHT80



8. SPECTRAL DENSITY TEST

8.1.Limit

Band 5150-5250 MHz:

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

Band 5250-5350 MHz:

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

Band 5470-5725 MHz:

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

Band 5725-5850 MHz:

The power spectral density shall not exceed 30 dBm in any 500 KHz band.

8.2.Test Procedure

Use the test method described in ANSI C63.10 clause 12.5:

For the Band 5.15-5.35GHz; 5.47-5.725 GHz:

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW; Detector: RMS mode.

For the band 5.725-5.85 GHz:

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW,RMS Detector.

So use the test method described in KDB789033 clause E

- 1) Set the RBW=100kHz and VBW =300kHz
- 2) Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- 3) Sweep time = auto
- 4) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- 5) Use the “peak search” function of spectrum analyzer find the max value, then add $10\log(500\text{kHz}/\text{RBW})$ to the measured result.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

8.3. Test Results

EUT: Notebook Computer		
M/N: N24G4		
Test date: 2025-03-05	Pressure: 103.1±1.0 kpa	Humidity: 51.5±3.0%
Tested by: Epoch	Test site: RF site	Temperature: 22.5±0.6℃

U-NII-1 Band:

Test Mode	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
11a	5180	5.229	11
	5200	6.020	
	5240	5.946	
11n HT20	5180	5.155	11
	5200	5.026	
	5240	5.371	
11n HT40	5190	-1.393	11
	5230	-0.852	
11ac VHT20	5180	4.683	11
	5200	4.867	
	5240	4.799	
11ac VHT40	5190	-1.430	11
	5230	-0.852	
11ac VHT80	5210	-2.873	11
Conclusion: Pass			

U-NII-2A Band:

Test Mode	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
11a	5260	4.590	11
	5300	5.344	
	5320	5.151	
11n HT20	5260	3.301	11
	5300	3.758	
	5320	3.835	
11n HT40	5270	-2.835	11
	5310	-2.568	
11ac VHT20	5260	3.568	11
	5300	3.882	
	5320	3.809	
11ac VHT40	5270	-2.341	11
	5310	-2.213	
11ac VHT80	5290	-7.057	11
Conclusion: Pass			

U-NII-2C Band:

Test Mode	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
11a	5500	0.450	11
	5600	0.613	
	5700	1.261	
11n HT20	5500	-0.066	11
	5600	-0.128	
	5700	0.394	
11n HT40	5510	0.532	11
	5590	0.311	
	5670	-3.843	
11ac VHT20	5500	-0.301	11
	5600	-0.239	
	5700	0.324	
11ac VHT40	5510	-4.079	11
	5590	-4.223	
	5670	-3.790	
11ac VHT80	5530	-7.976	11
	5610	-8.085	

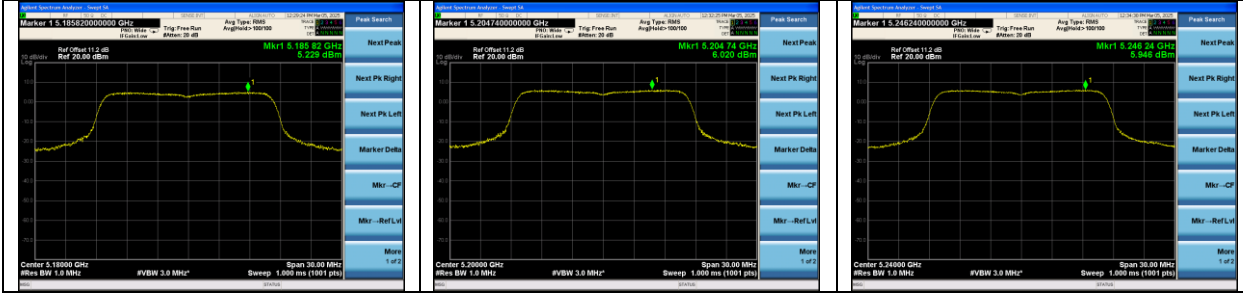
Conclusion: Pass

U-NII-3 Band:

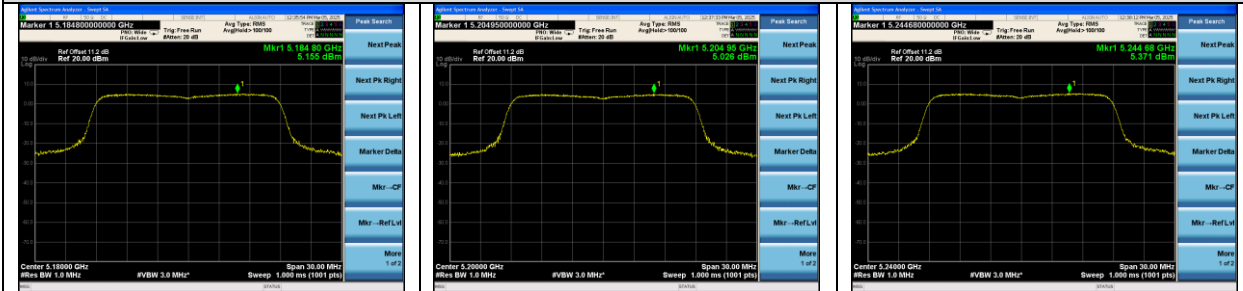
Test Mode	Frequency (MHz)	Power Spectral Density (dBm/500KHz)	Limit (dBm/500KHz)
11a	5745	3.817	30
	5785	4.763	
	5825	4.707	
11n HT20	5745	2.196	30
	5785	2.591	
	5825	2.009	
11n HT40	5755	0.265	30
	5795	0.353	
11ac VHT20	5745	3.706	30
	5785	2.105	
	5825	1.921	
11ac VHT40	5755	-0.615	30
	5795	-1.009	
11ac VHT80	5775	-3.317	30
Conclusion: Pass			

U-NII-1 Band

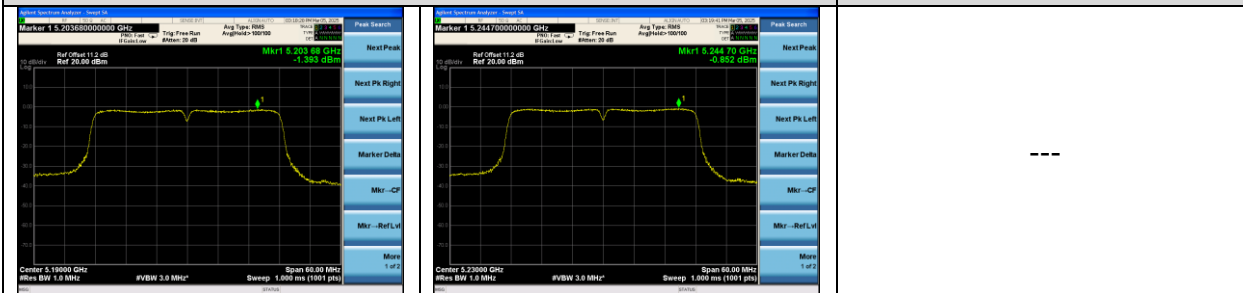
IEEE 802.11a



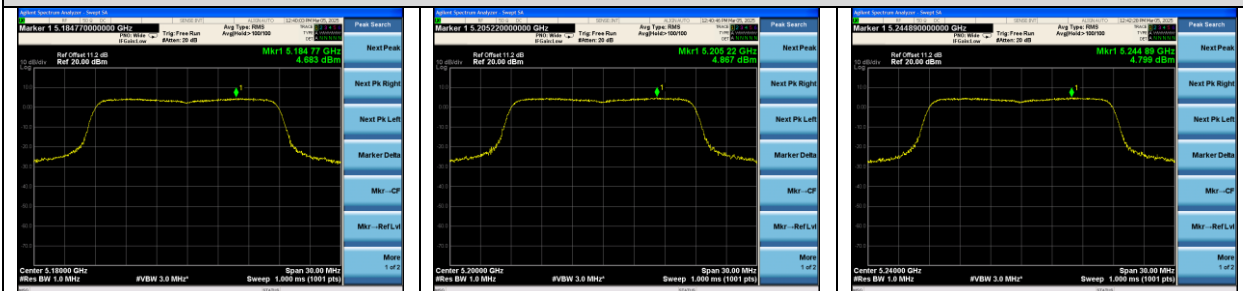
IEEE 802.11n HT20



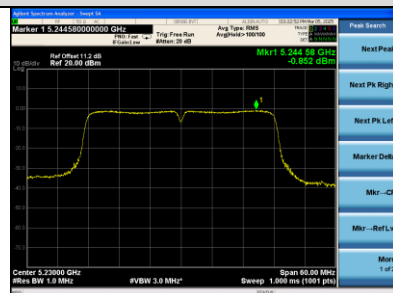
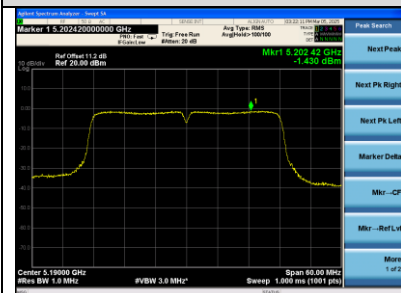
IEEE 802.11n HT40



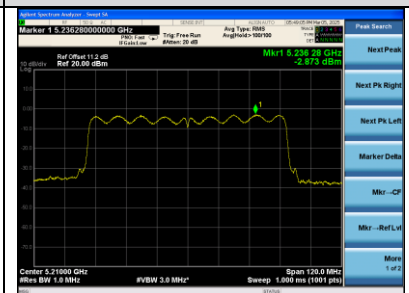
IEEE 802.11ac VHT20



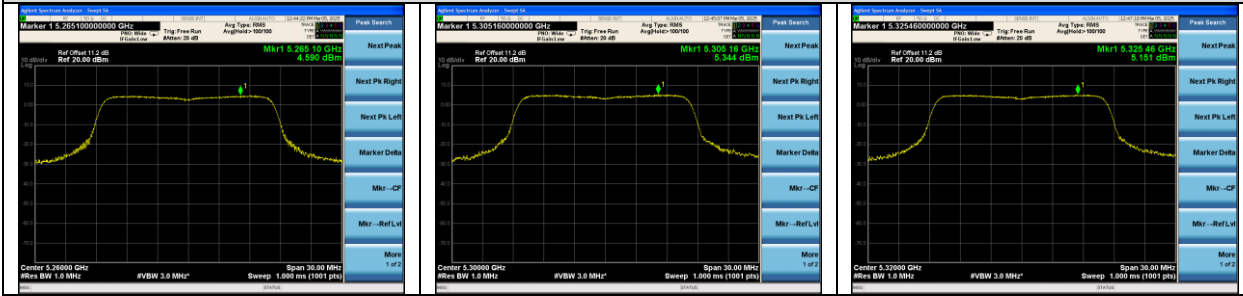
IEEE 802.11ac VHT40



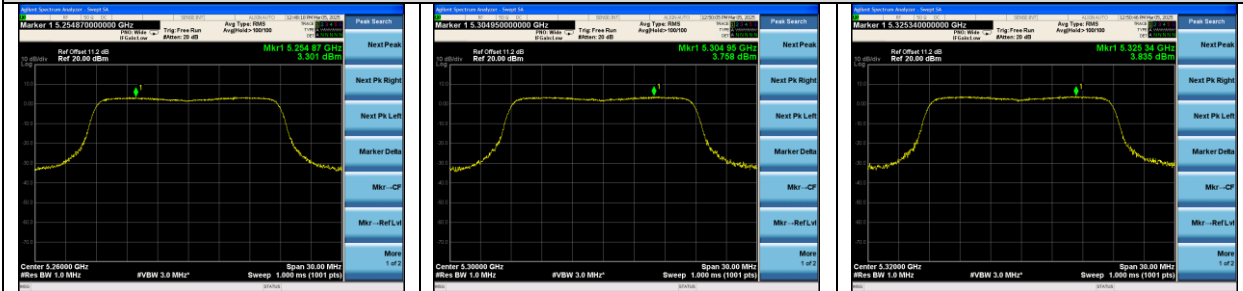
IEEE 802.11ac VHT80



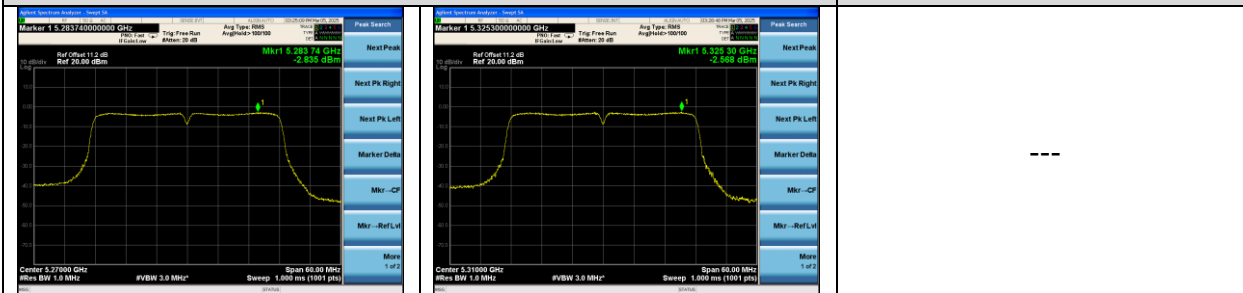
U-NII-2A Band: IEEE 802.11a



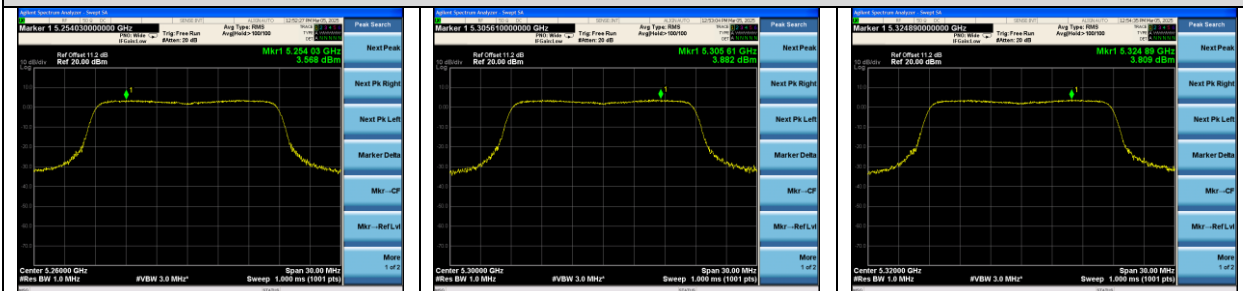
IEEE 802.11n HT20



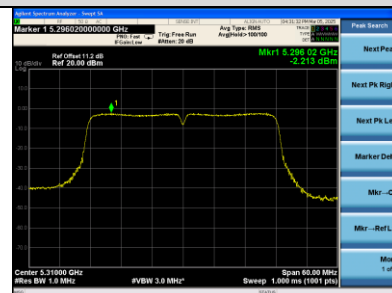
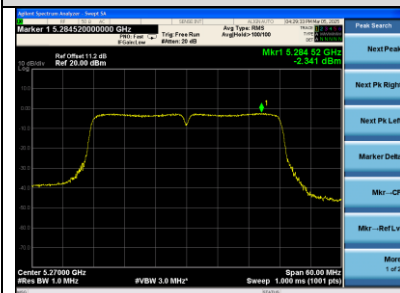
IEEE 802.11n HT40



IEEE 802.11ac VHT20



IEEE 802.11ac VHT40



IEEE 802.11ac VHT80

