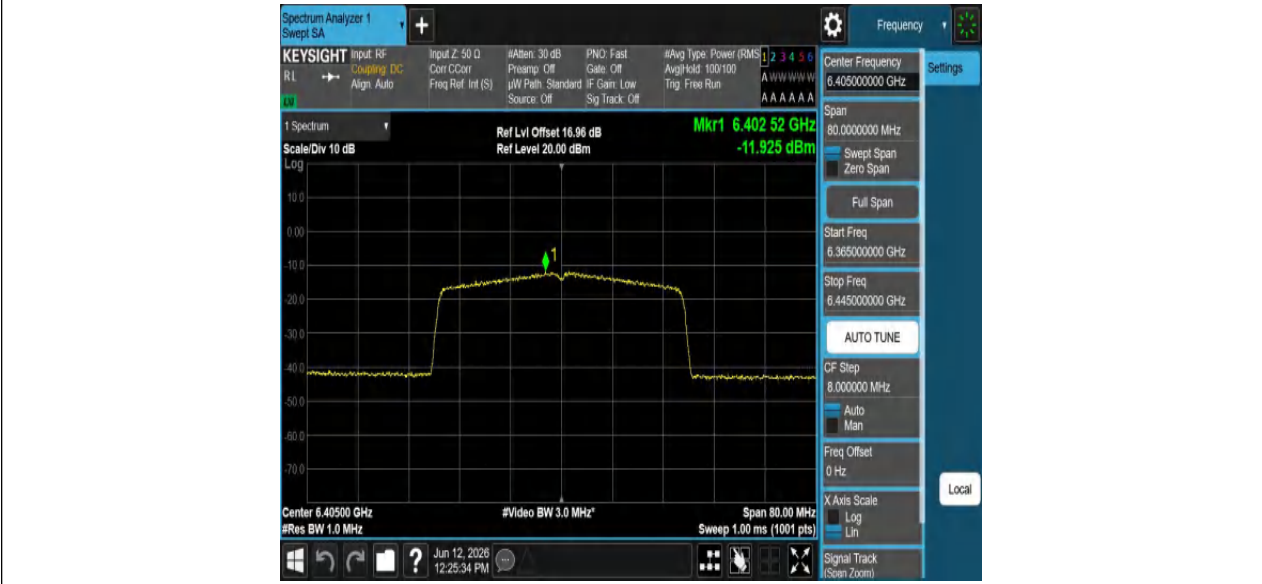




11AX40MIMO_Ant2_6405



11AX40MIMO_Ant1_6445



11AX40MIMO_Ant2_6445



11AX40MIMO_Ant1_6485



11AX40MIMO_Ant2_6485



11AX40MIMO_Ant1_6525



11AX40MIMO_Ant2_6525



11AX40MIMO_Ant1_6565



11AX40MIMO_Ant2_6565





11AX40MIMO_Ant2_6845



11AX40MIMO_Ant1_6885



11AX40MIMO_Ant2_6885



11AX40MIMO_Ant1_6925



11AX40MIMO_Ant2_6925



11AX40MIMO_Ant1_6965



11AX40MIMO_Ant2_6965



11AX40MIMO_Ant1_7085



11AX40MIMO_Ant2_7085



11AX80MIMO_Ant1_5985



11AX80MIMO_Ant2_5985



11AX80MIMO_Ant1_6145



11AX80MIMO_Ant2_6145



11AX80MIMO_Ant1_6385



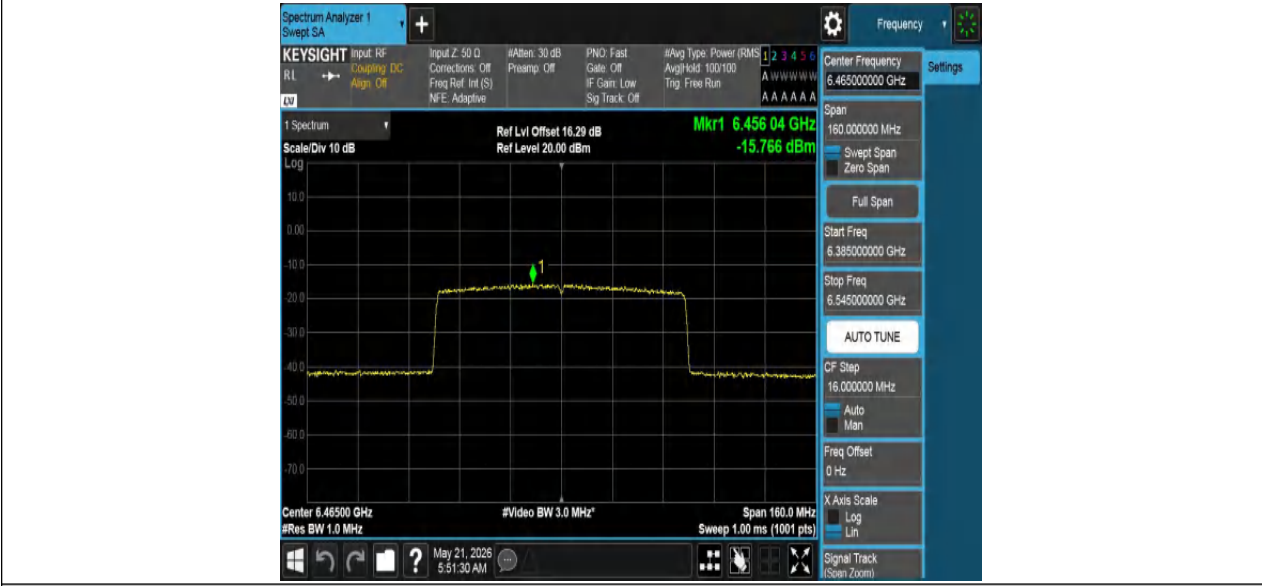
11AX80MIMO_Ant2_6385



11AX80MIMO_Ant1_6465



11AX80MIMO_Ant2_6465



11AX80MIMO_Ant1_6545



11AX80MIMO_Ant2_6545



11AX80MIMO_Ant1_6625



11AX80MIMO_Ant2_6625



11AX80MIMO_Ant1_6705



11AX80MIMO_Ant2_6705







11AX80MIMO_Ant1_6945



11AX80MIMO_Ant2_6945



11AX80MIMO_Ant1_7025



11AX80MIMO_Ant2_7025



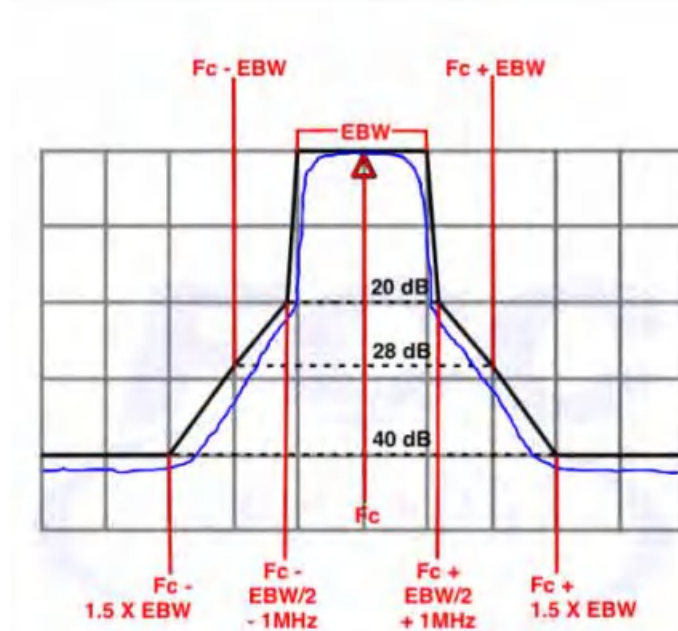
12. In-Band Emission (Emissions Mask)

12.1. Block diagram of test setup

Same as section 8.1

12.2. Limits

Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one-and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one-and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than one and one-half times the channel bandwidth must be suppressed by at least 40 dB.



12.3. Test Procedure

We tested according to Procedure J in KDB 987594 D02.

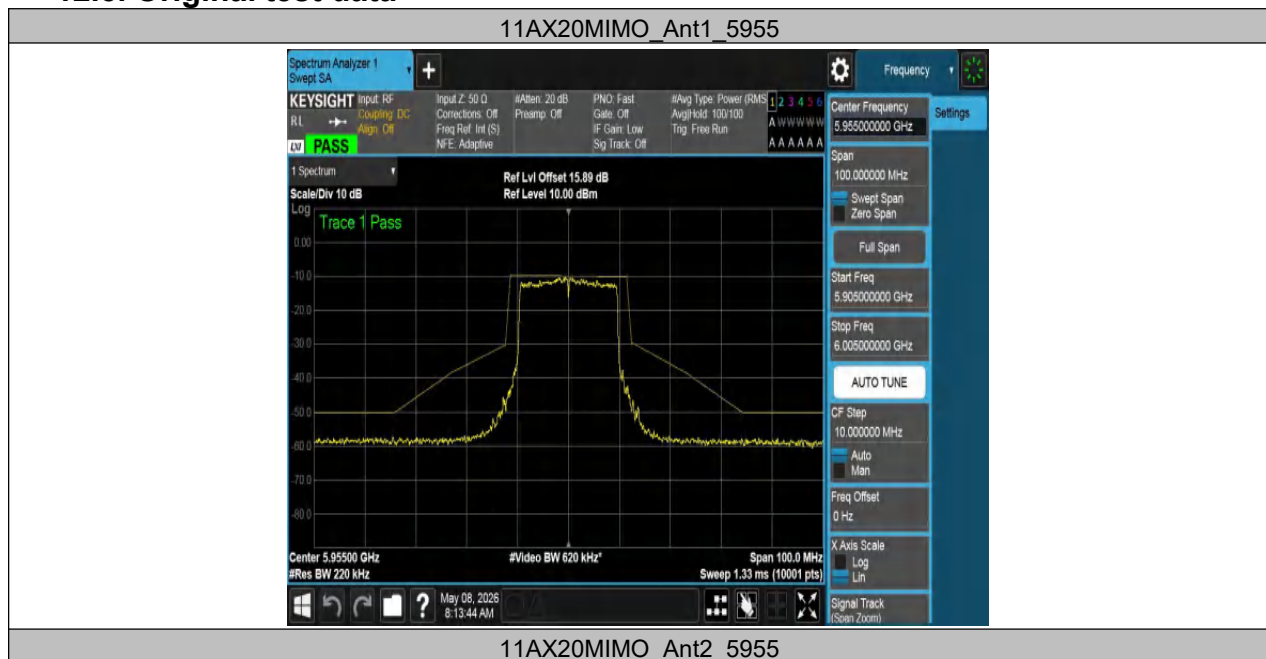
1. Connect output of the antenna port to a spectrum analyzer or EMI receiver, with appropriate attenuation, as to not damage the instrumentation.
2. Set the reference level of the measuring equipment in accordance with procedure 4.1.5.2 of ANSIC63.10-2013.
3. Measure the 26 dB EBW using the test procedure 12.4.1 of ANSI C63.10. (This will be used to determine the channel edge.)
4. Measure the power spectral density (which will be used for emissions mask reference) using the following procedure:
 - a. Set the span to encompass the entire 26 dB EBW of the signal.
 - b. Set RBW same RBW used for 26 dB EBW measurement.
 - c. Set VBW 23X RBW.
 - d. Number of points in sweep 2 (2 X span / RBW).
 - e. Sweep time = auto.
 - f. Detector = RMS (i.e., power averaging)
 - g. Trace average at least 100 traces in power averaging (rms) mode.
 - h. Use the peak search function on the instrument to find the peak of the spectrum.
5. For the purposes of developing the emission mask, the channel bandwidth is defined as the 26 dB EBW.
6. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
 - a. Suppressed by 20 dB at 1 MHz outside of the channel edge. (The channel edge is defined as the 26-dB point on either side of the carrier center frequency.)
 - b. Suppressed by 28 dB at one channel bandwidth from the channel center.
 - c. Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.
7. Adjust the span to encompass the entire mask as necessary.
8. Clear trace.
9. Trace average at least 100 traces in power averaging (rms) mode

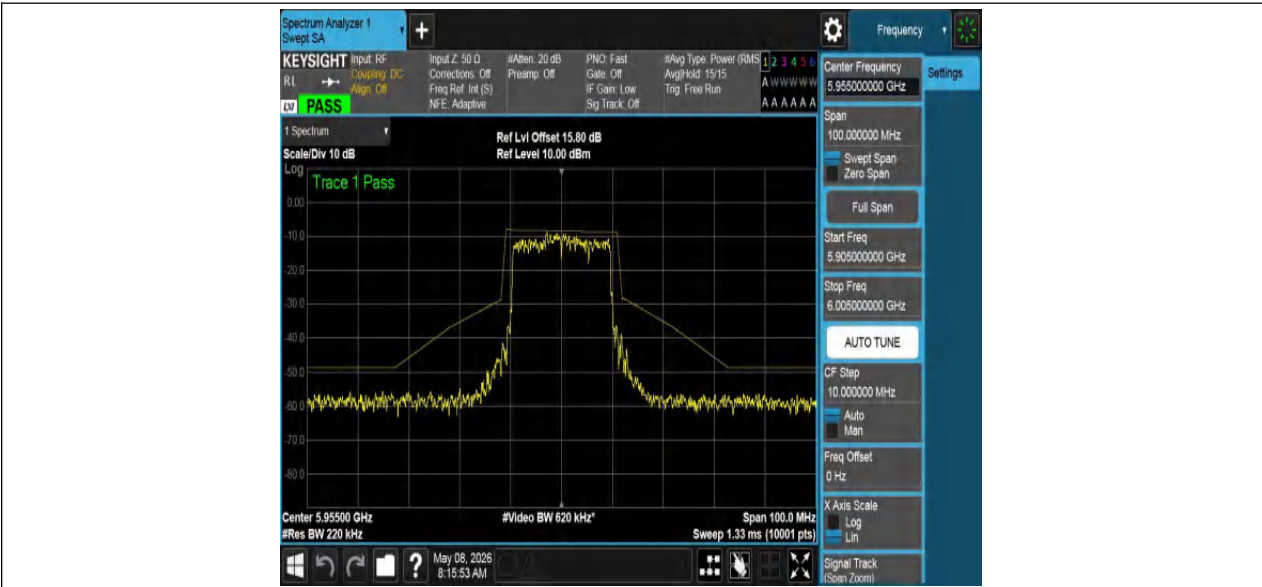
12.4. Test result

Test Mode	Antenna	Frequency(MHz)	Result	Limit	Verdict
11AX20MIMO	Ant1	5955	See test graph	See test graph	PASS
11AX20MIMO	Ant2	5955	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6175	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6175	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6415	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6415	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6435	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6435	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6475	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6475	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6515	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6515	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6535	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6535	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6695	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6695	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6855	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6855	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6875	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6875	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6895	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6895	See test graph	See test graph	PASS
11AX20MIMO	Ant1	6995	See test graph	See test graph	PASS
11AX20MIMO	Ant2	6995	See test graph	See test graph	PASS
11AX20MIMO	Ant1	7115	See test graph	See test graph	PASS
11AX20MIMO	Ant2	7115	See test graph	See test graph	PASS
11AX40MIMO	Ant1	5965	See test graph	See test graph	PASS
11AX40MIMO	Ant2	5965	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6165	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6165	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6405	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6405	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6445	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6445	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6485	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6485	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6525	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6525	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6565	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6565	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6685	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6685	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6845	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6845	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6885	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6885	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6925	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6925	See test graph	See test graph	PASS
11AX40MIMO	Ant1	6965	See test graph	See test graph	PASS
11AX40MIMO	Ant2	6965	See test graph	See test graph	PASS
11AX40MIMO	Ant1	7085	See test graph	See test graph	PASS
11AX40MIMO	Ant2	7085	See test graph	See test graph	PASS
11AX80MIMO	Ant1	5985	See test graph	See test graph	PASS

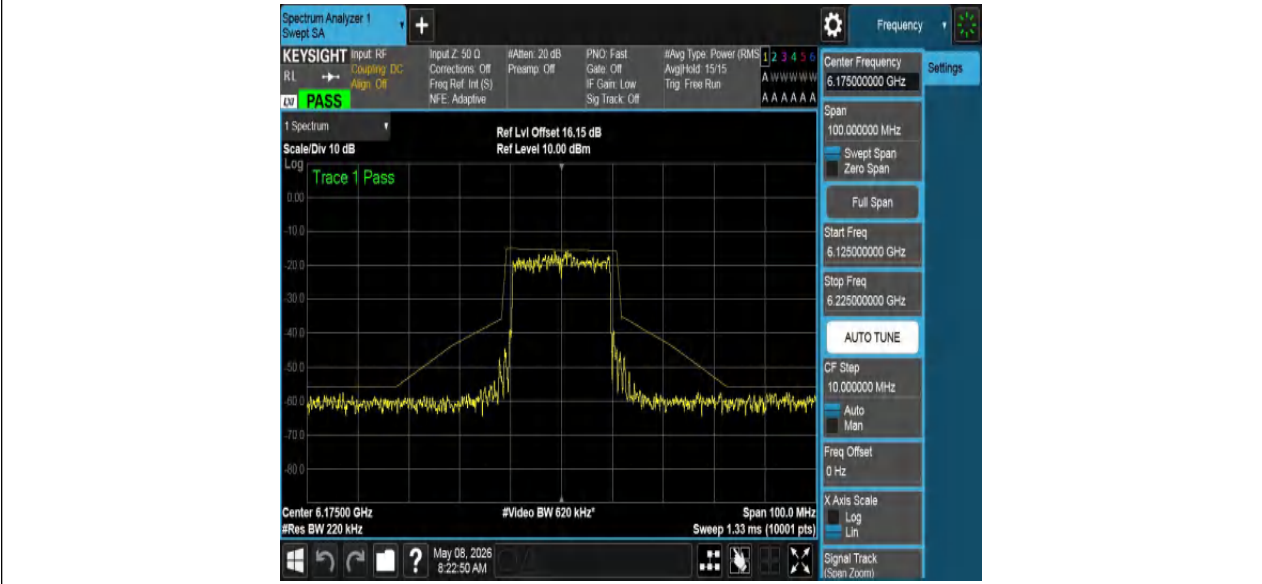
11AX80MIMO	Ant2	5985	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6145	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6145	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6385	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6385	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6465	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6465	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6545	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6545	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6625	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6625	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6705	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6705	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6785	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6785	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6865	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6865	See test graph	See test graph	PASS
11AX80MIMO	Ant1	6945	See test graph	See test graph	PASS
11AX80MIMO	Ant2	6945	See test graph	See test graph	PASS
11AX80MIMO	Ant1	7025	See test graph	See test graph	PASS
11AX80MIMO	Ant2	7025	See test graph	See test graph	PASS

12.5. Original test data

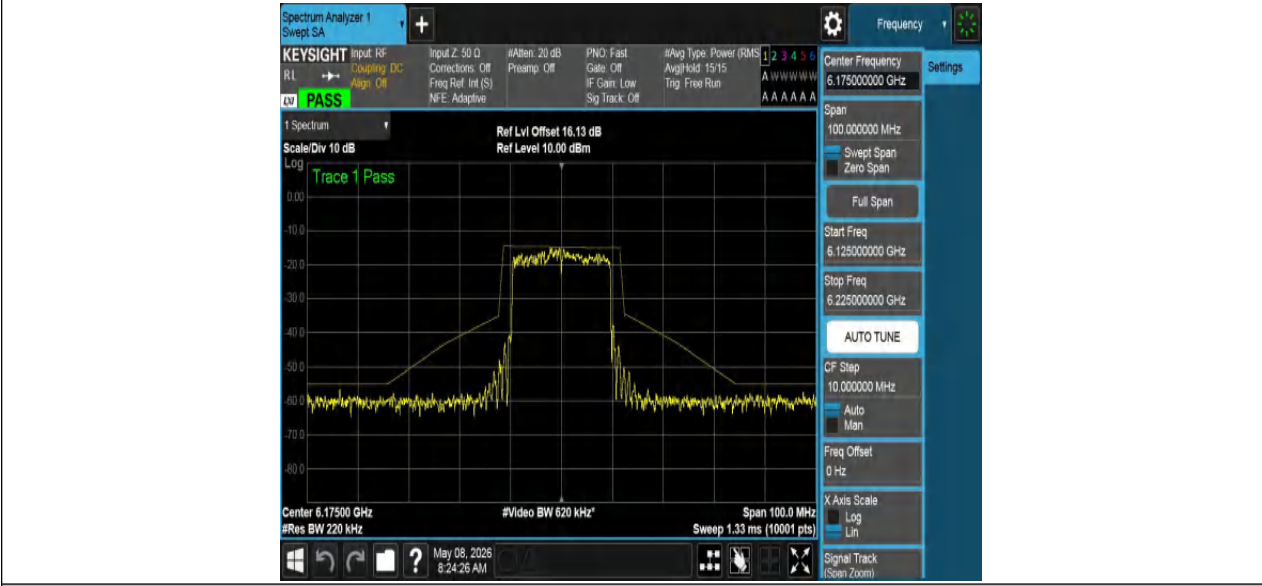




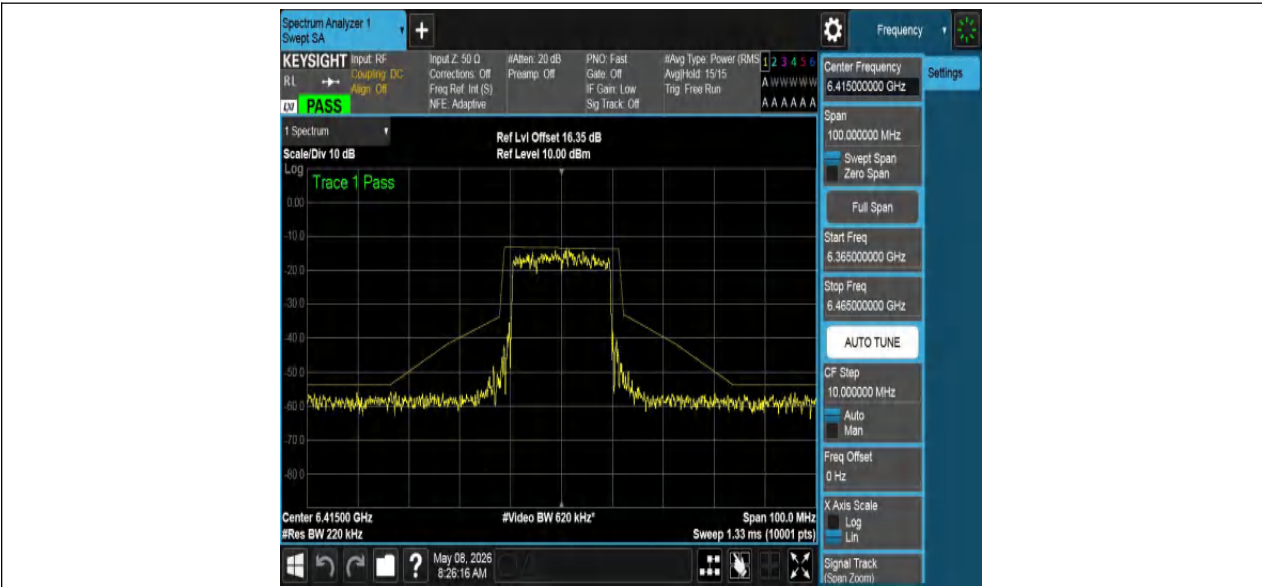
11AX20MIMO_Ant1_6175



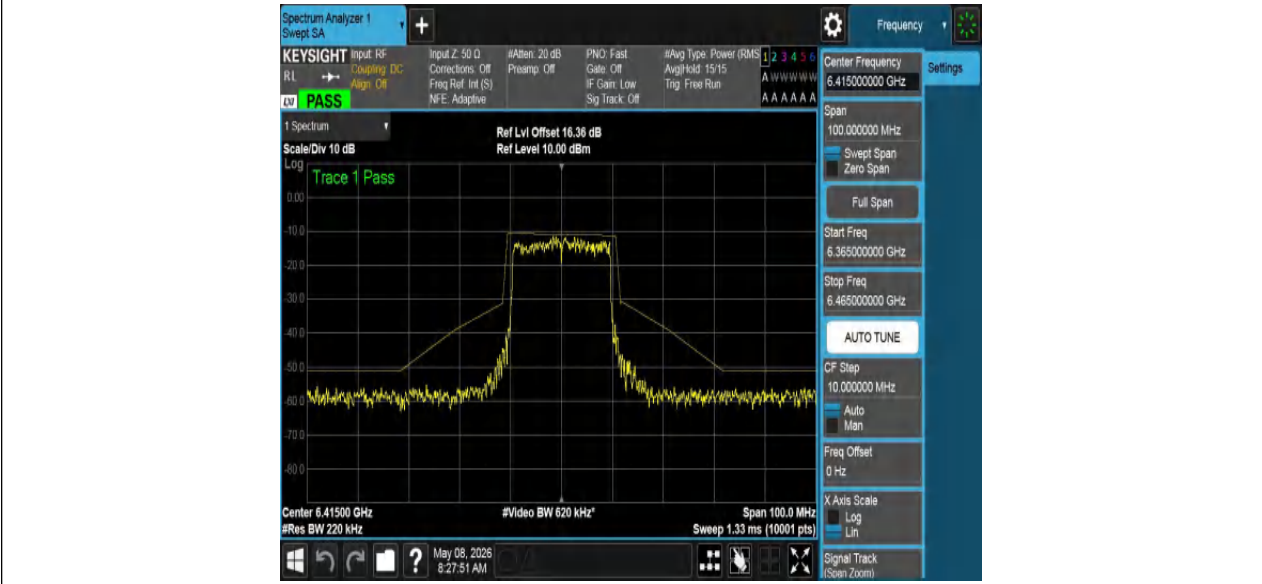
11AX20MIMO_Ant2_6175



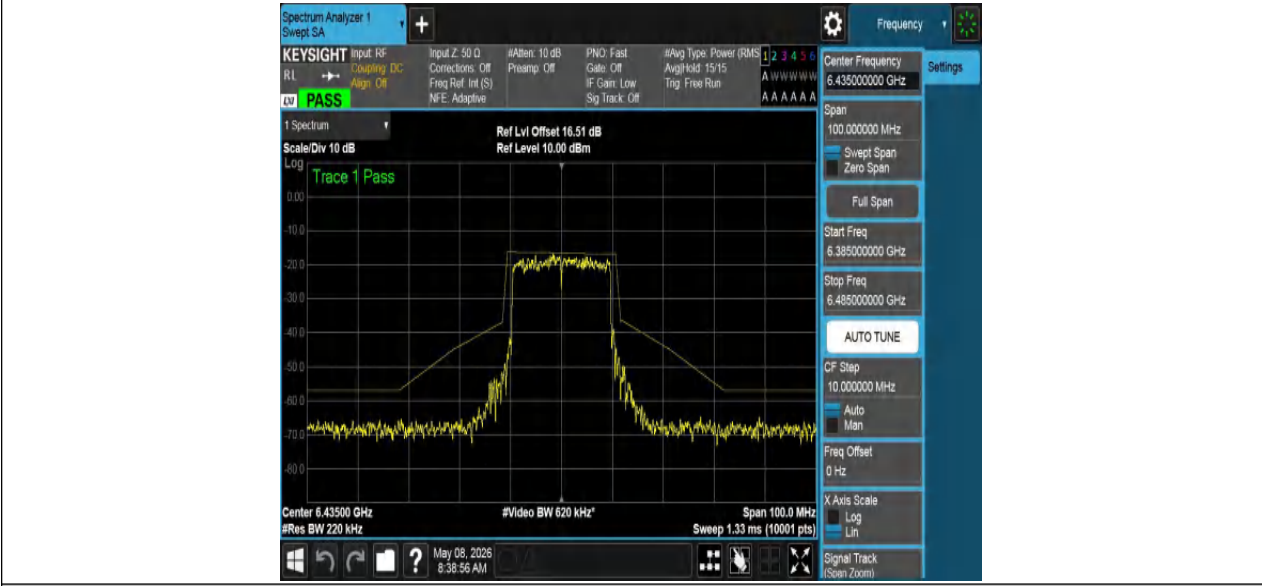
11AX20MIMO_Ant1_6415



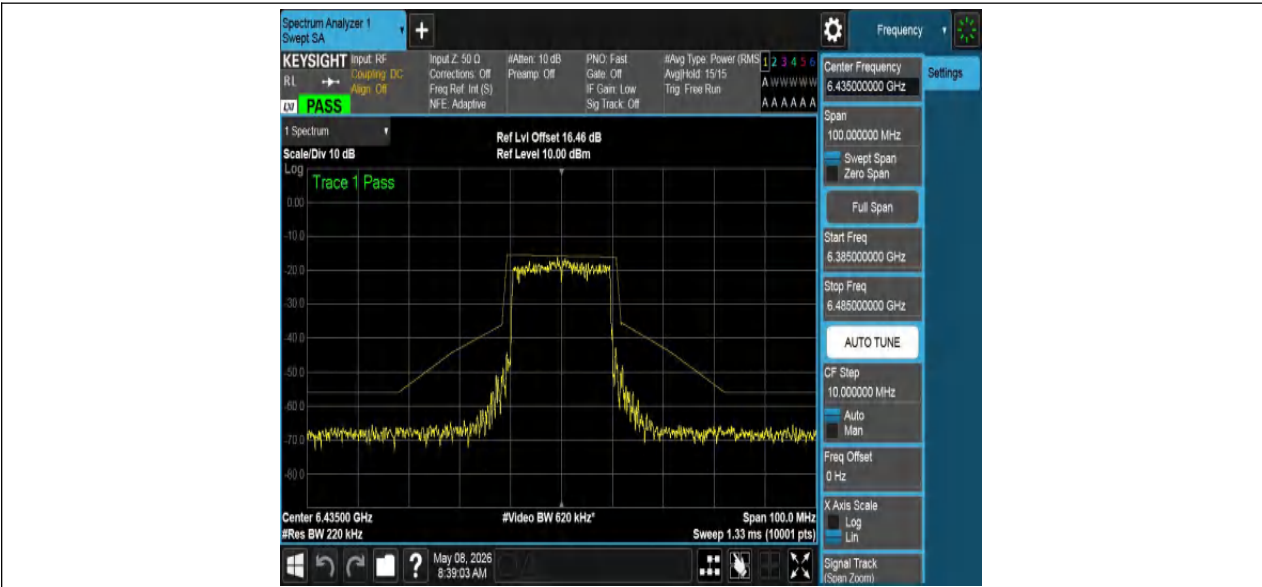
11AX20MIMO_Ant2_6415



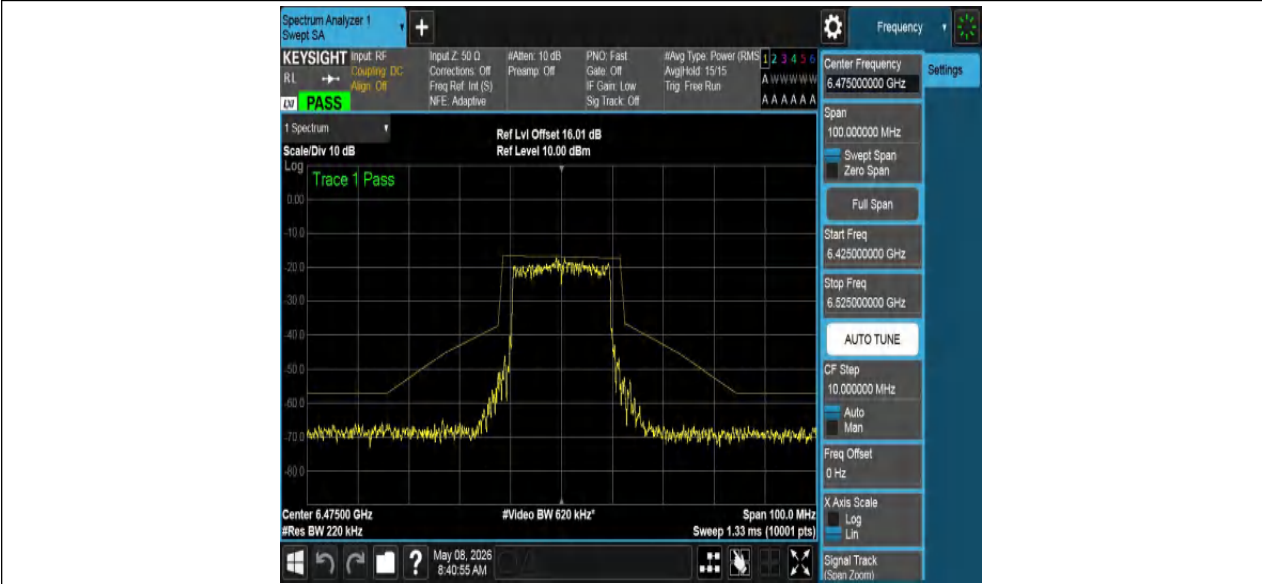
11AX20MIMO_Ant1_6435



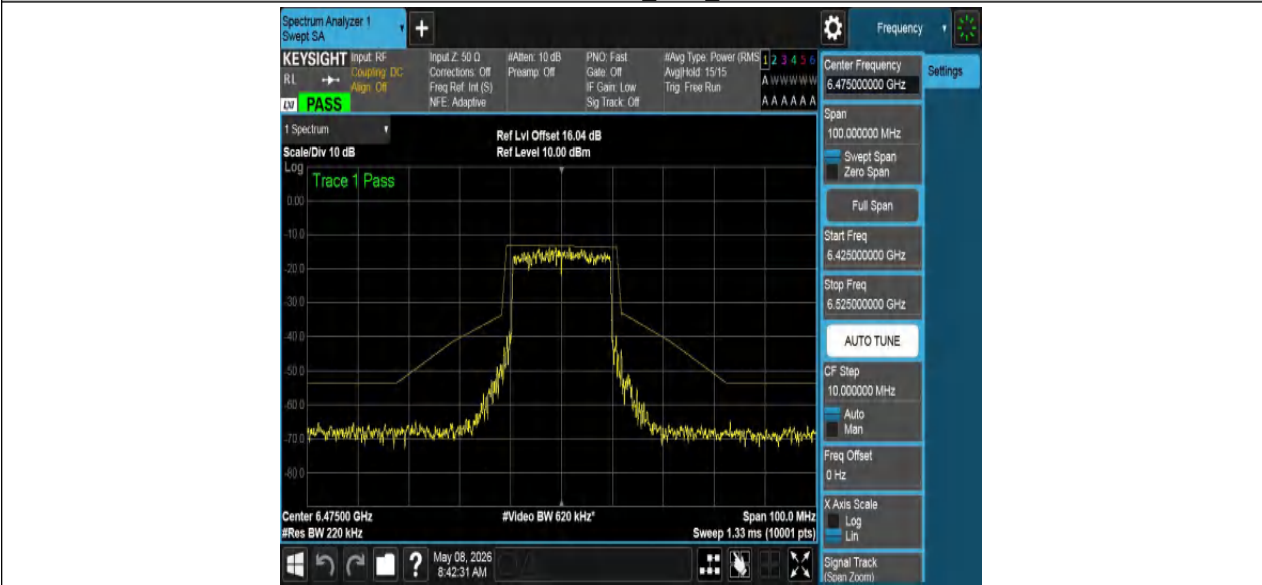
11AX20MIMO_Ant2_6435



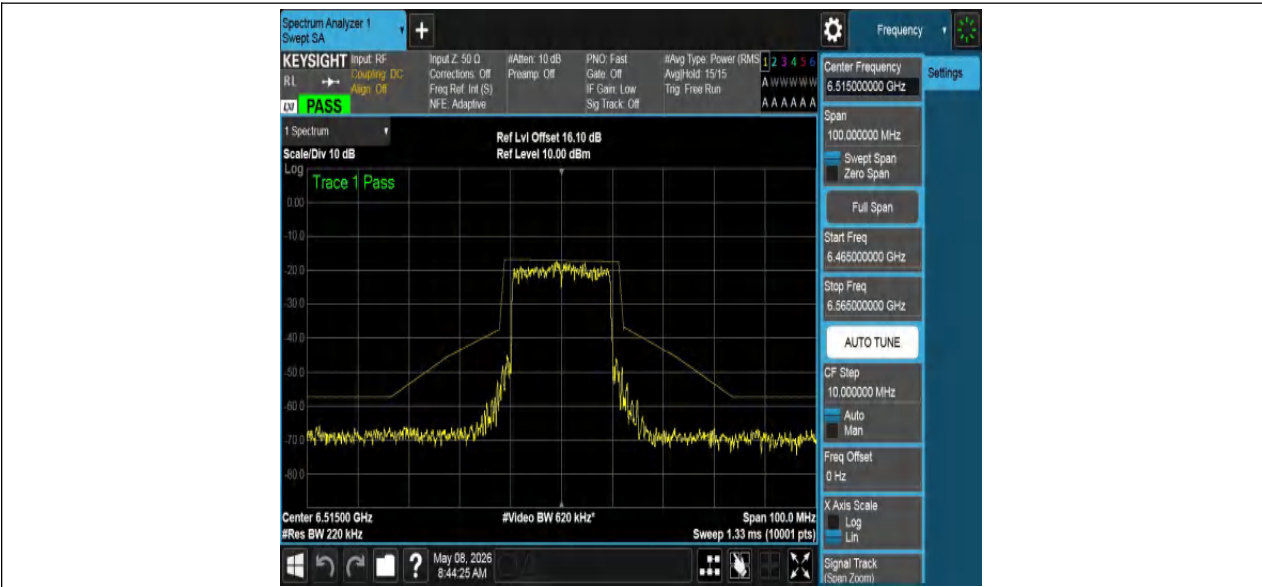
11AX20MIMO_Ant1_6475



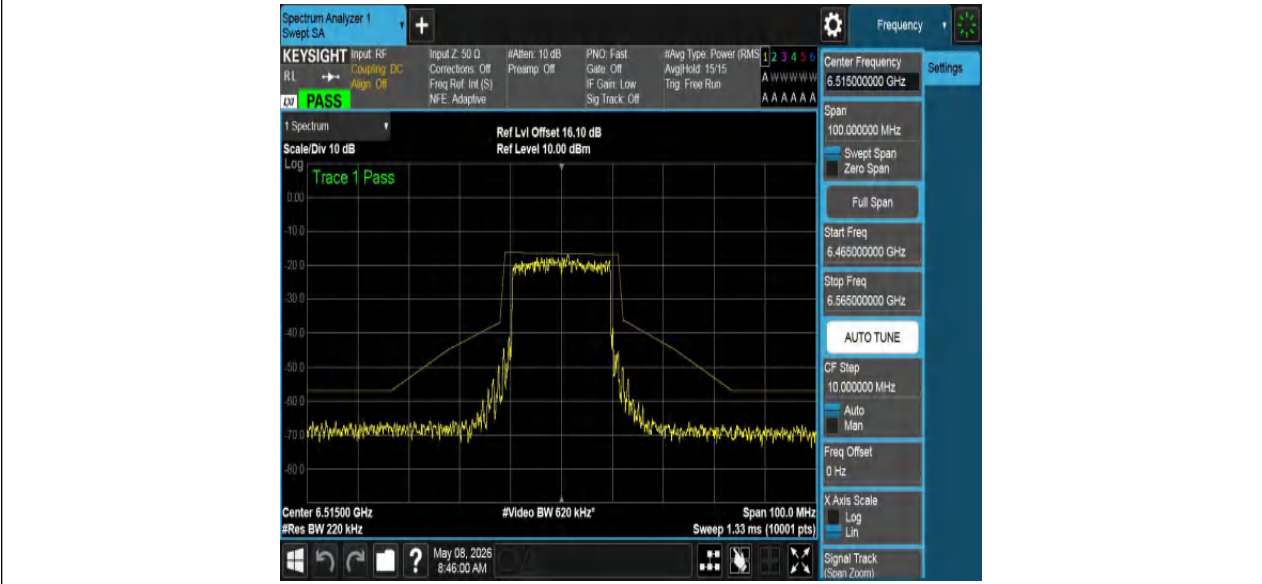
11AX20MIMO_Ant2_6475



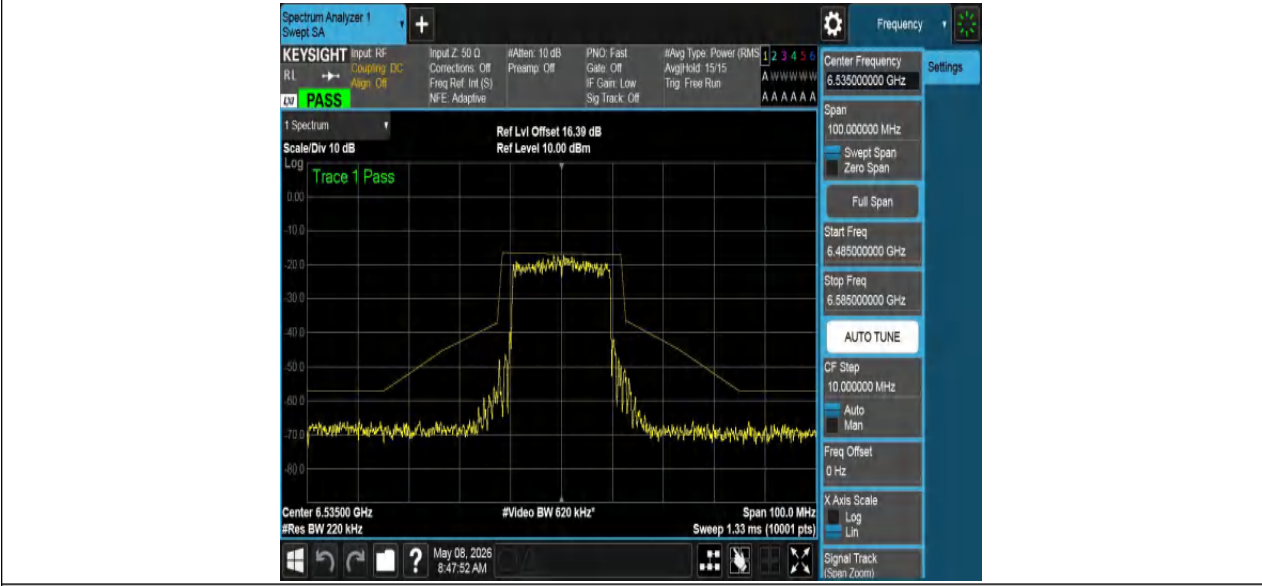
11AX20MIMO_Ant1_6515



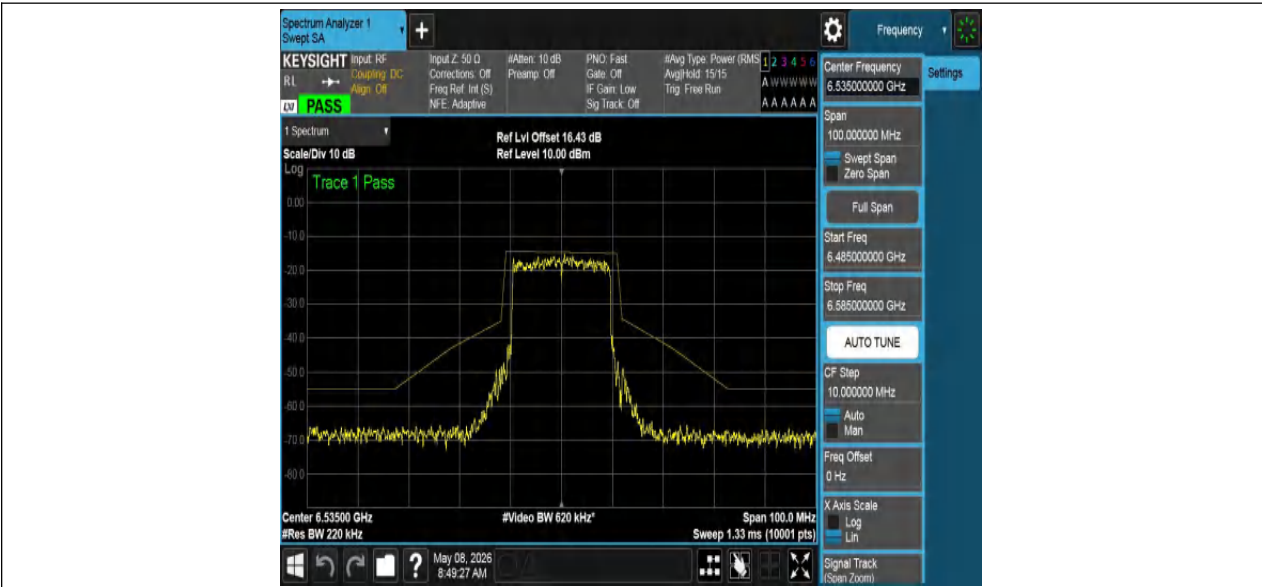
11AX20MIMO_Ant2_6515



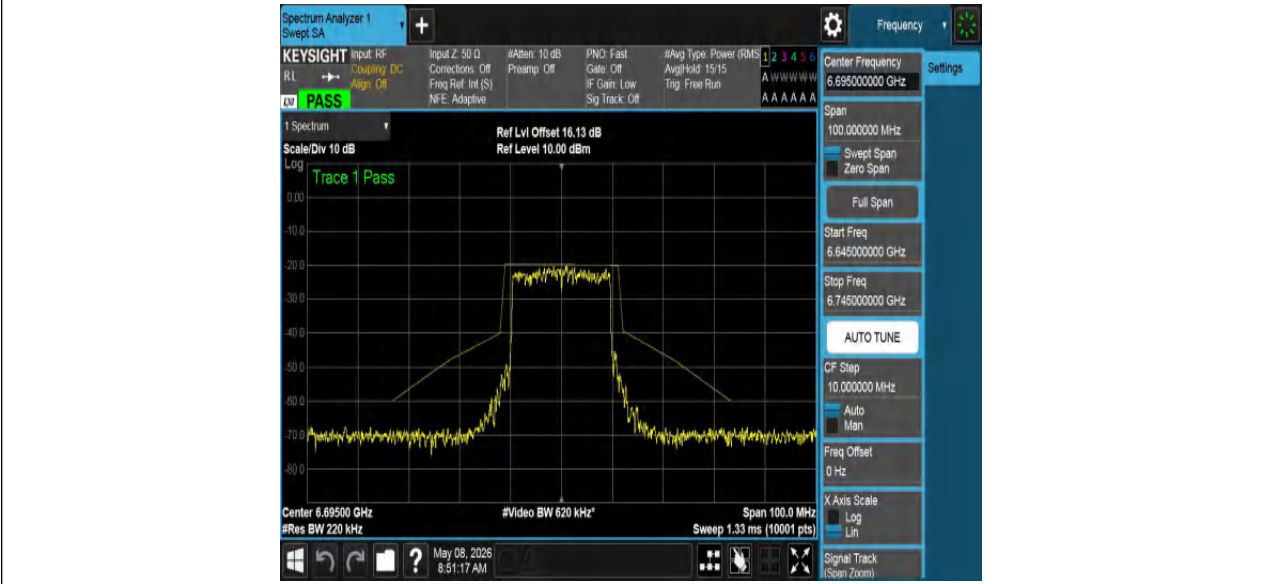
11AX20MIMO_Ant1_6535



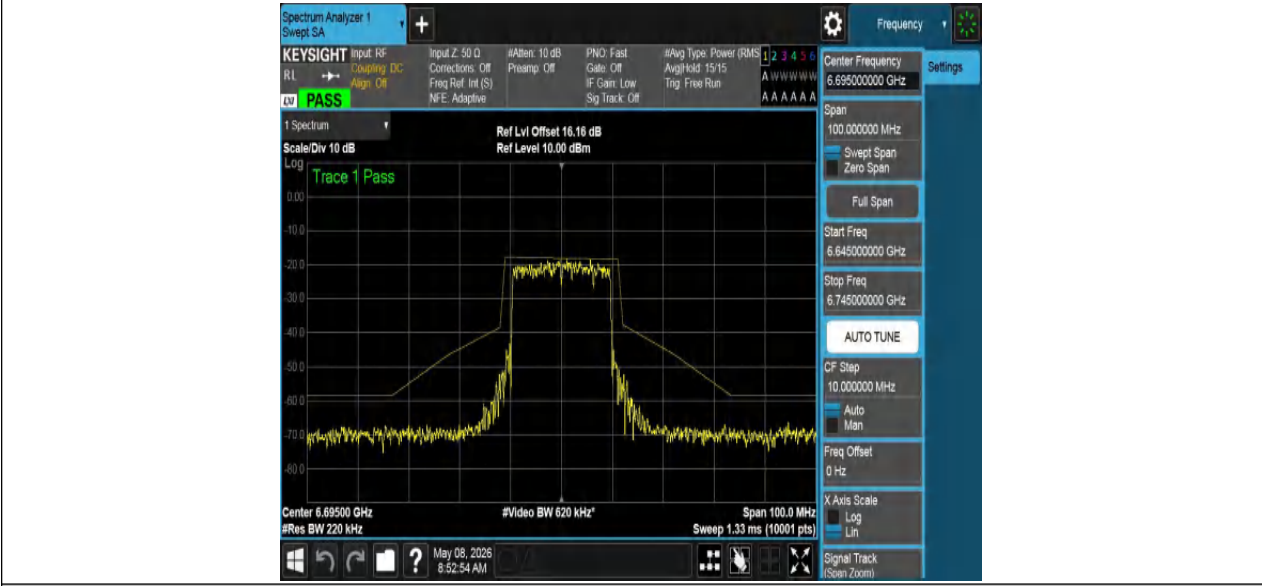
11AX20MIMO_Ant2_6535



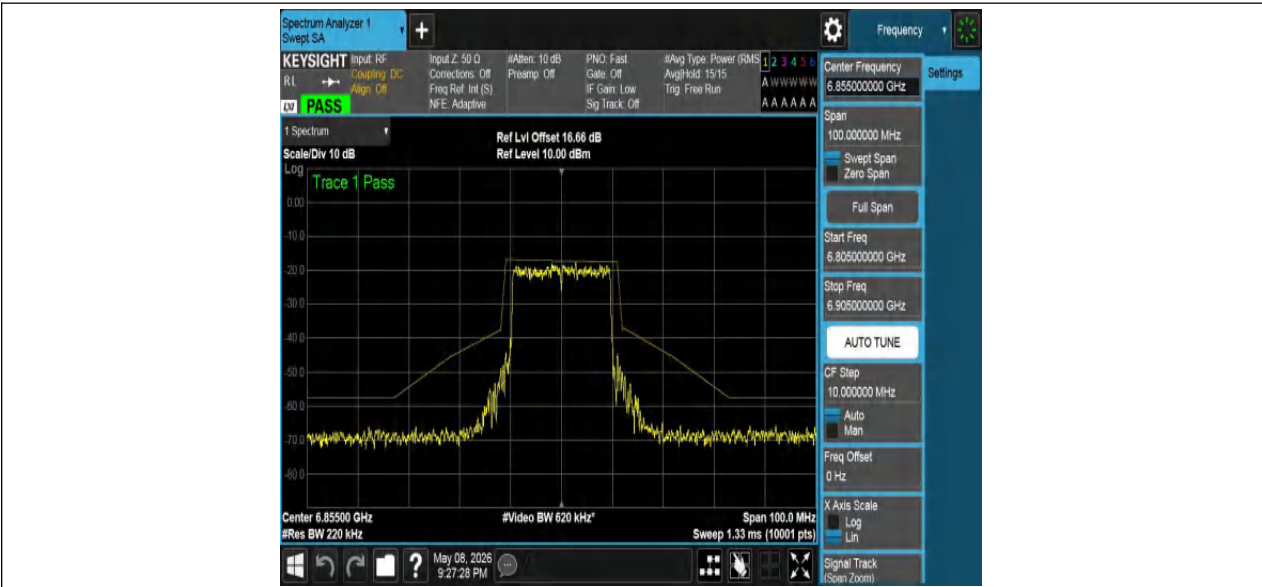
11AX20MIMO_Ant1_6695



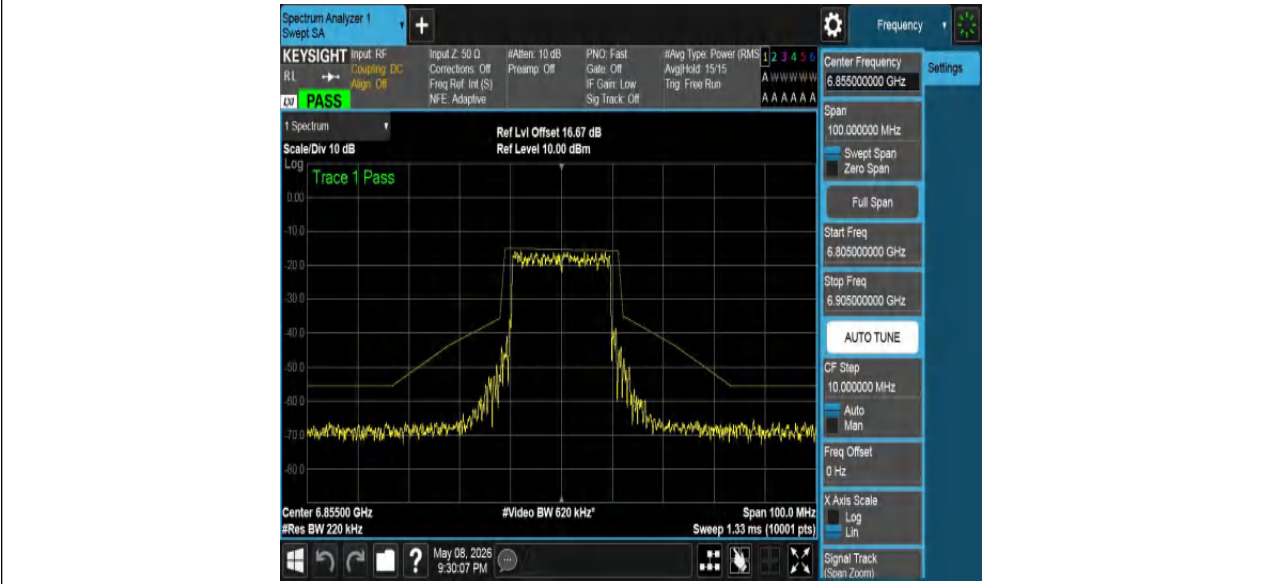
11AX20MIMO_Ant2_6695



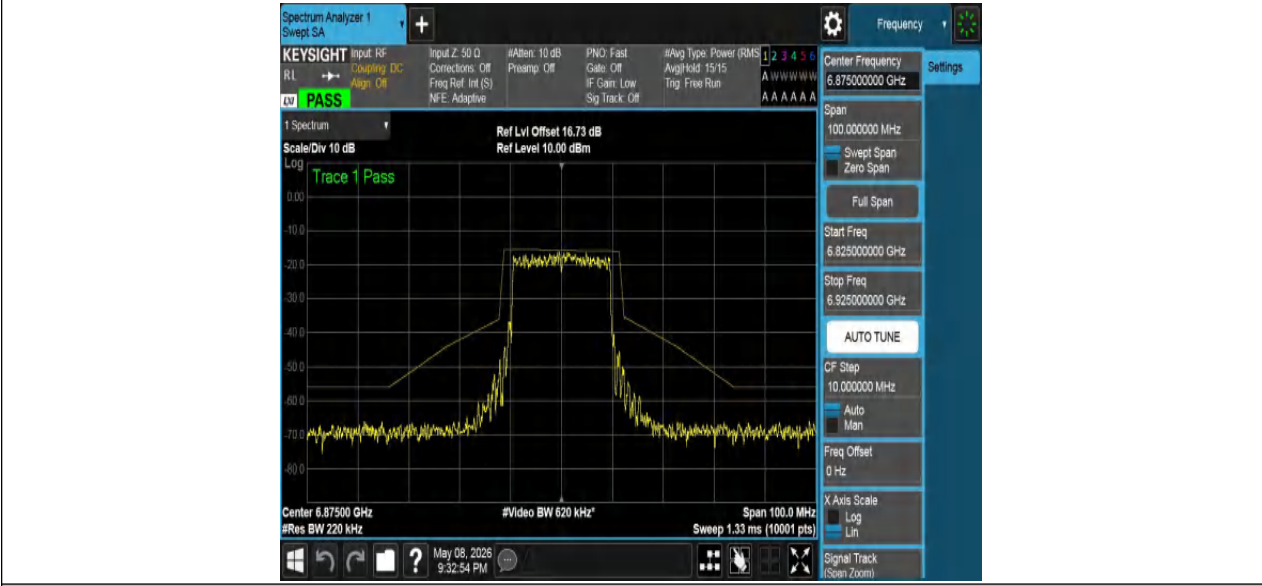
11AX20MIMO_Ant1_6855



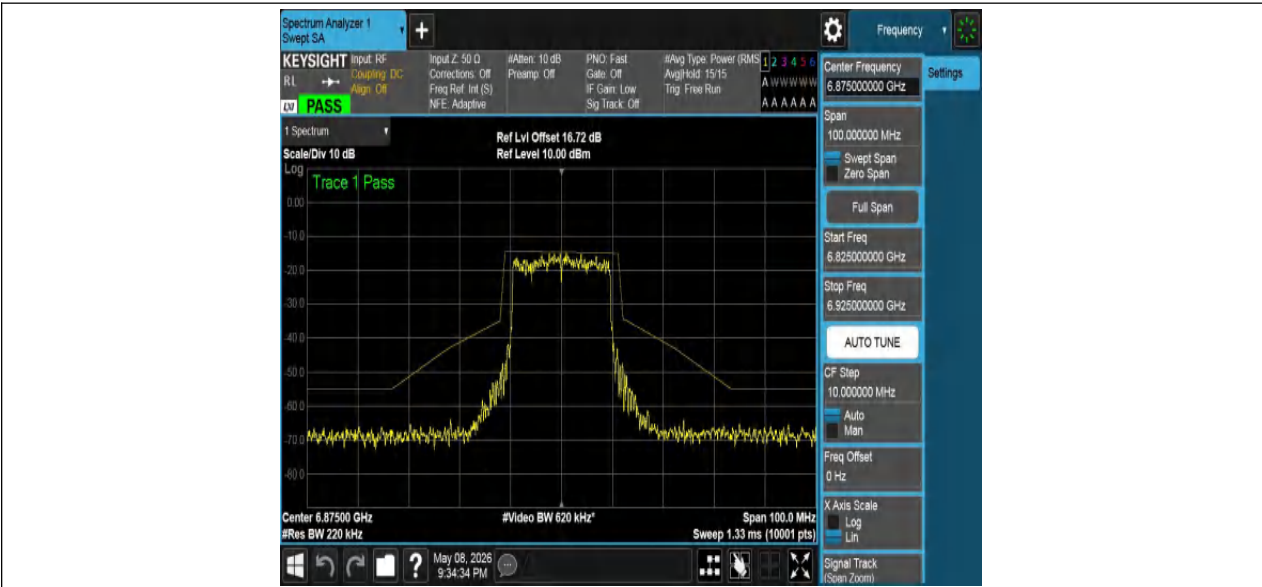
11AX20MIMO_Ant2_6855



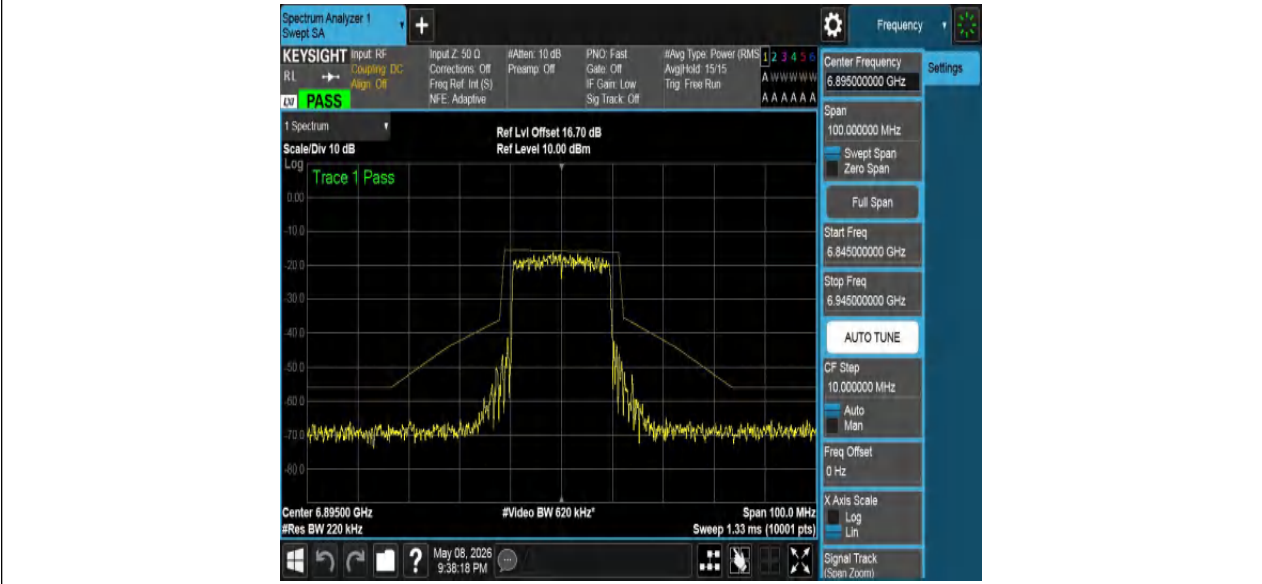
11AX20MIMO_Ant1_6875



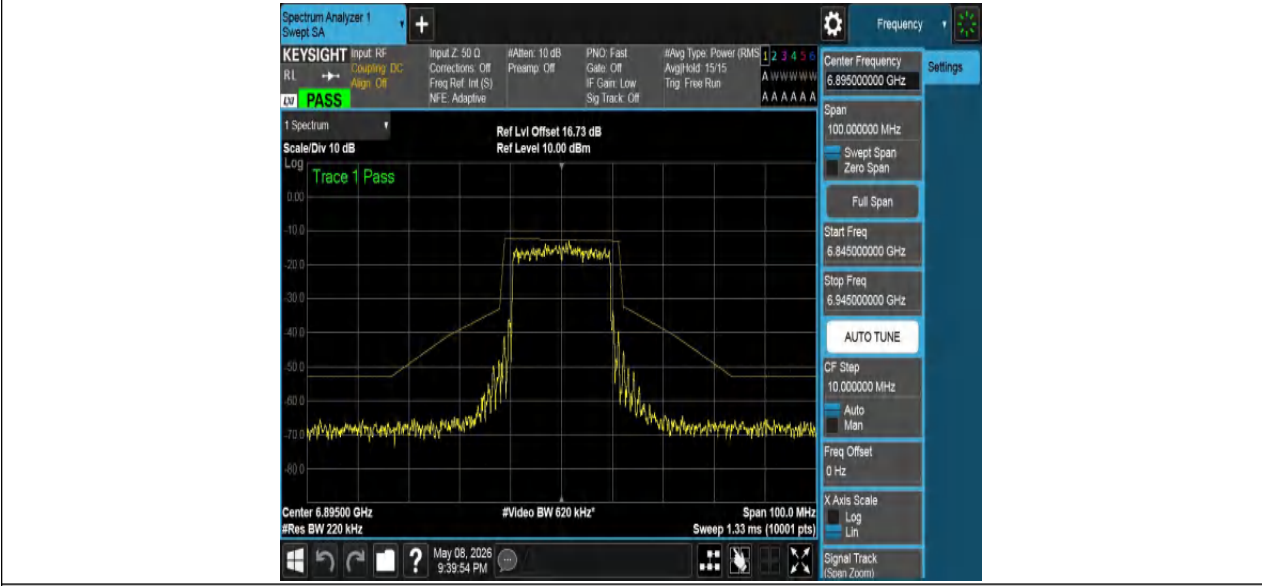
11AX20MIMO_Ant2_6875



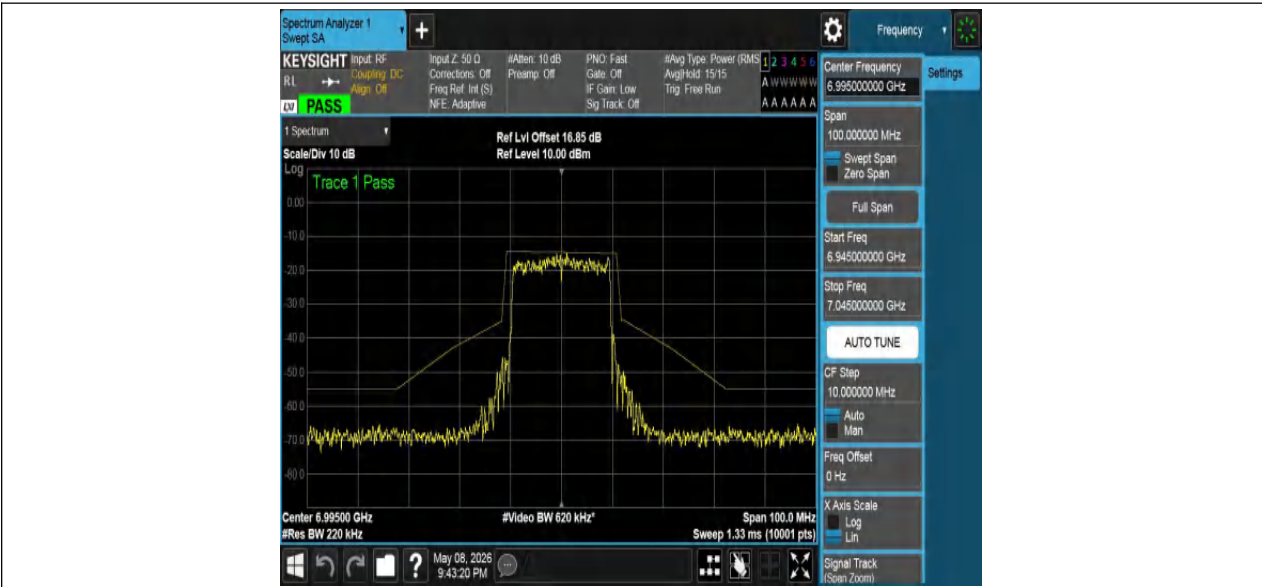
11AX20MIMO_Ant1_6895



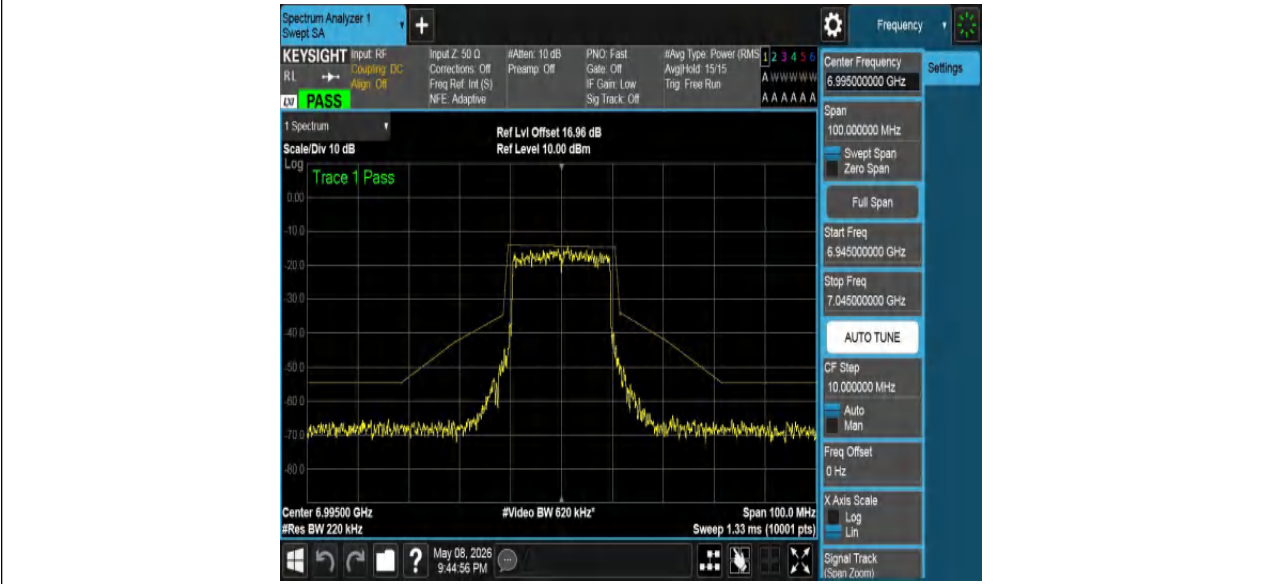
11AX20MIMO_Ant2_6895



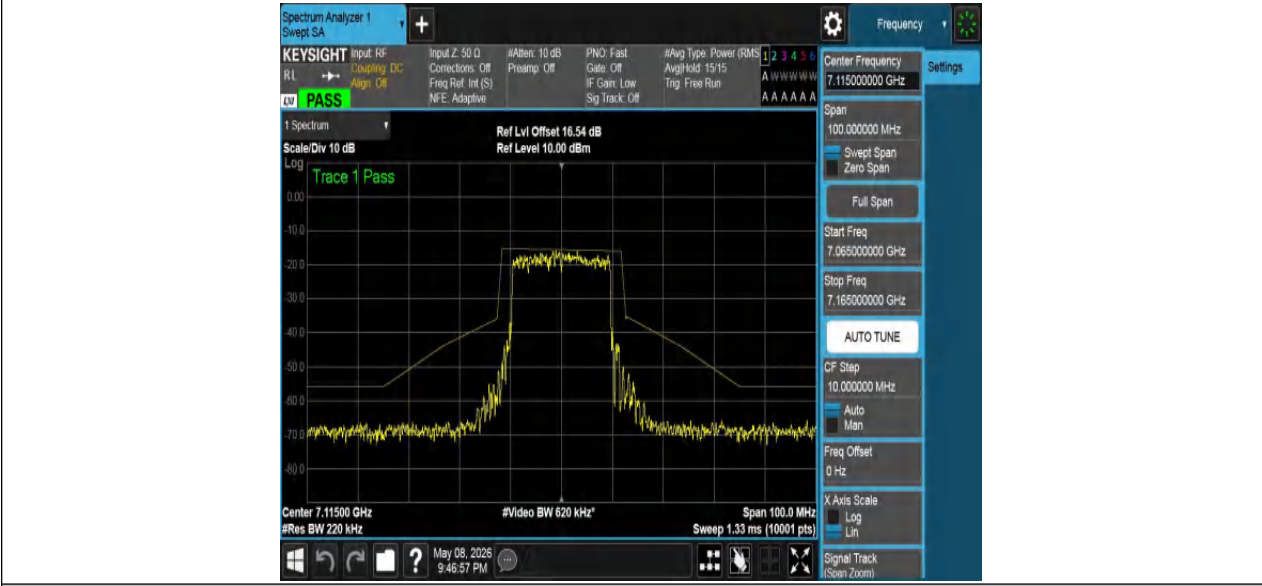
11AX20MIMO_Ant1_6995



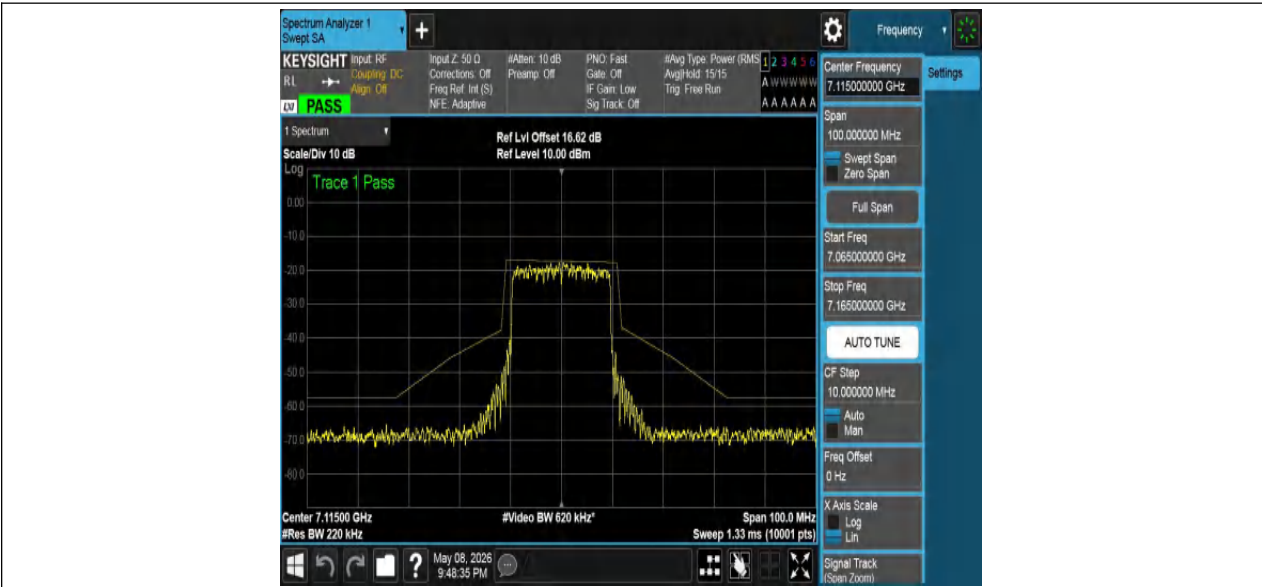
11AX20MIMO_Ant2_6995



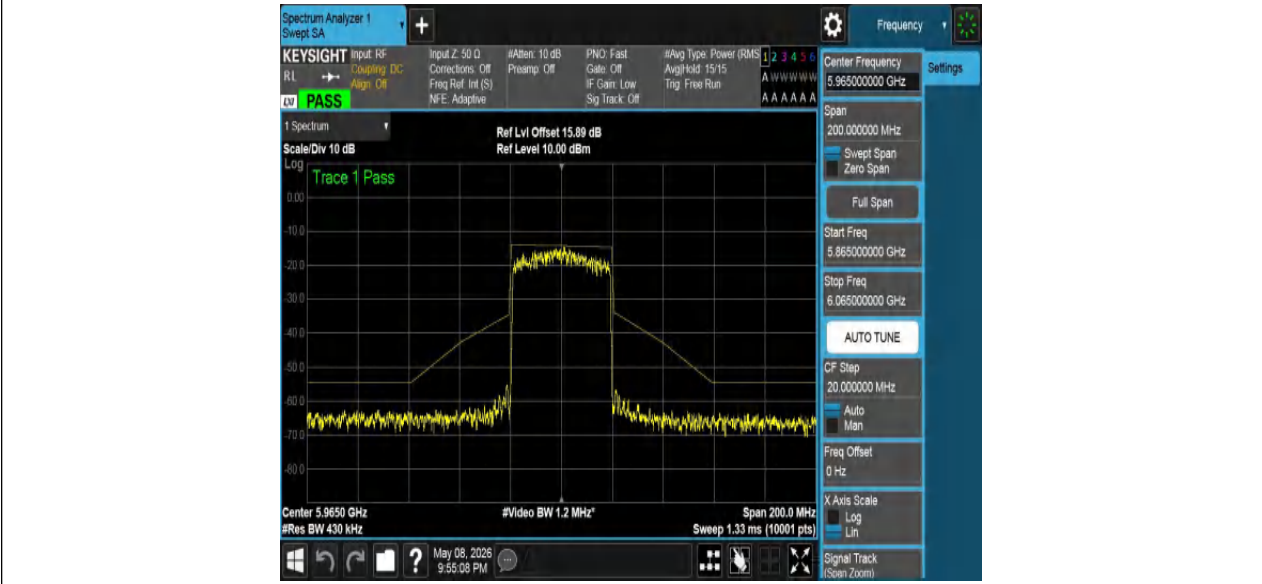
11AX20MIMO_Ant1_7115



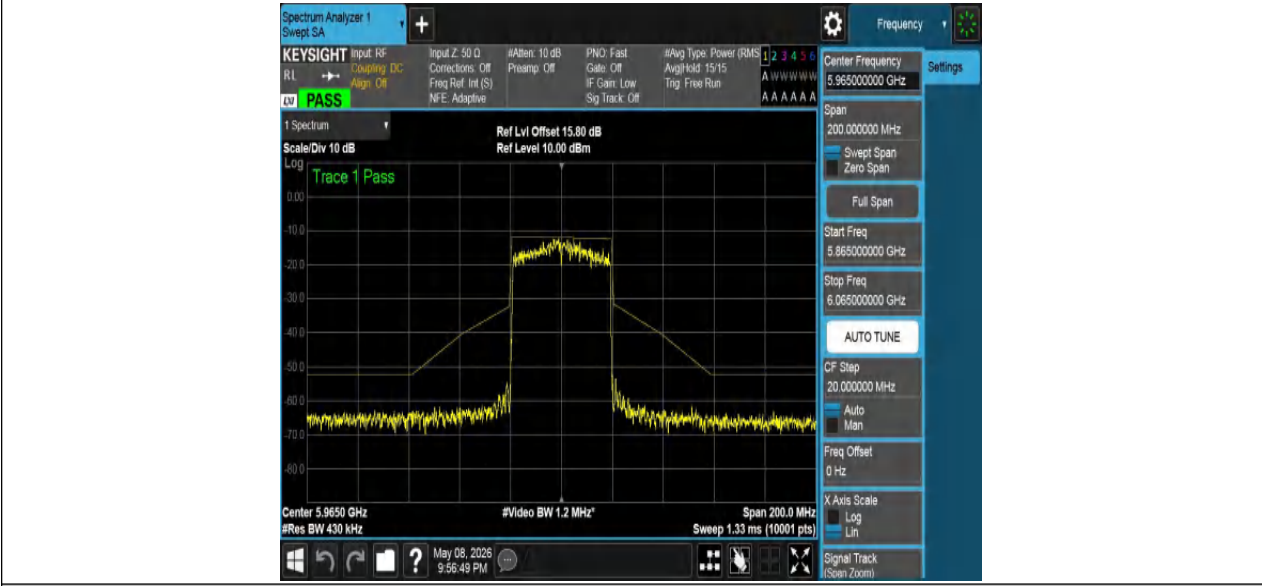
11AX20MIMO_Ant2_7115



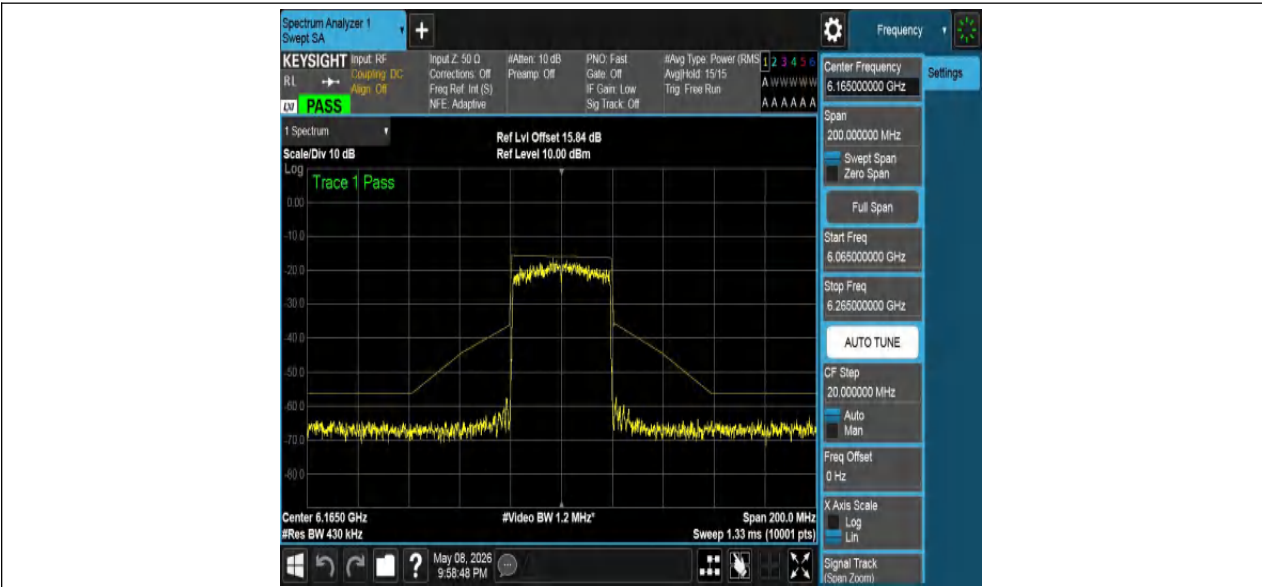
11AX40MIMO_Ant1_5965



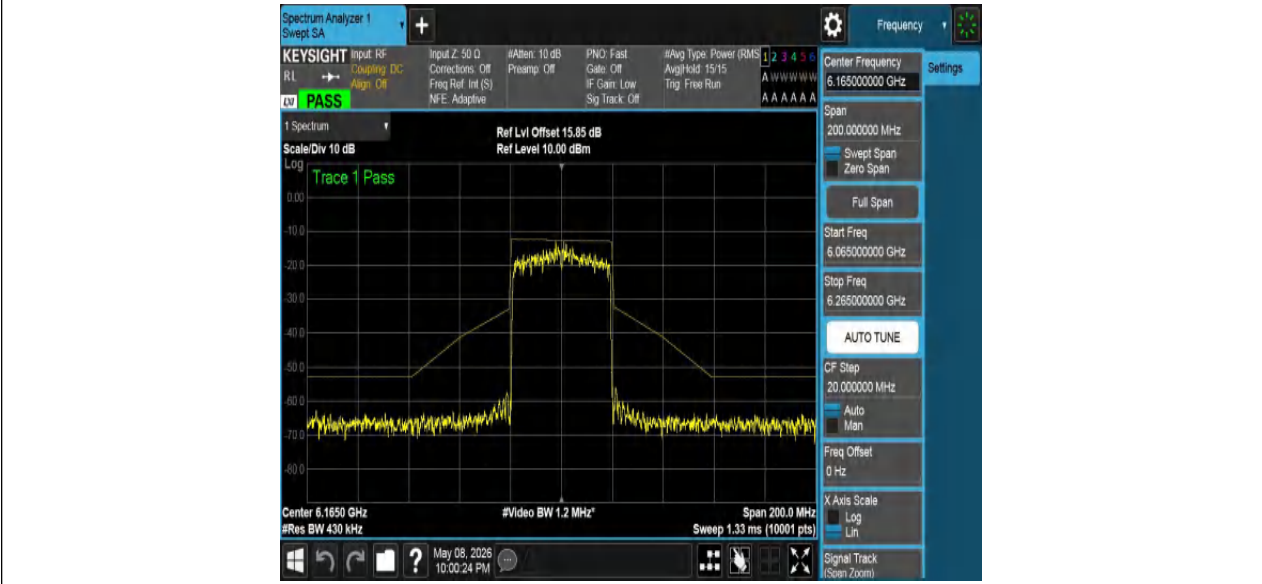
11AX40MIMO_Ant2_5965



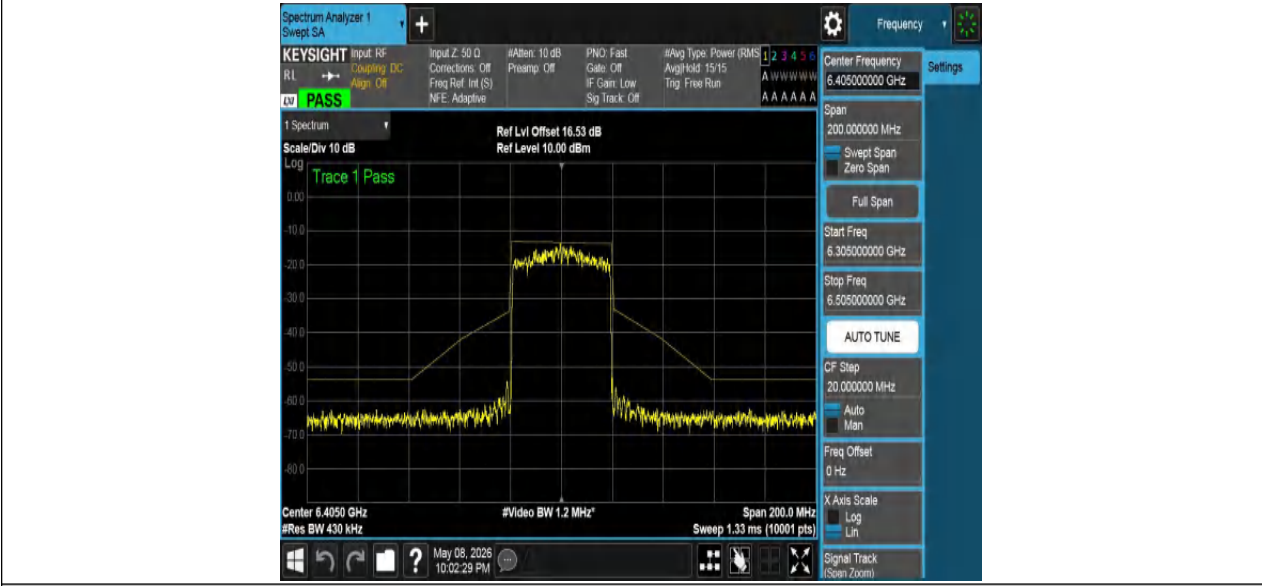
11AX40MIMO_Ant1_6165



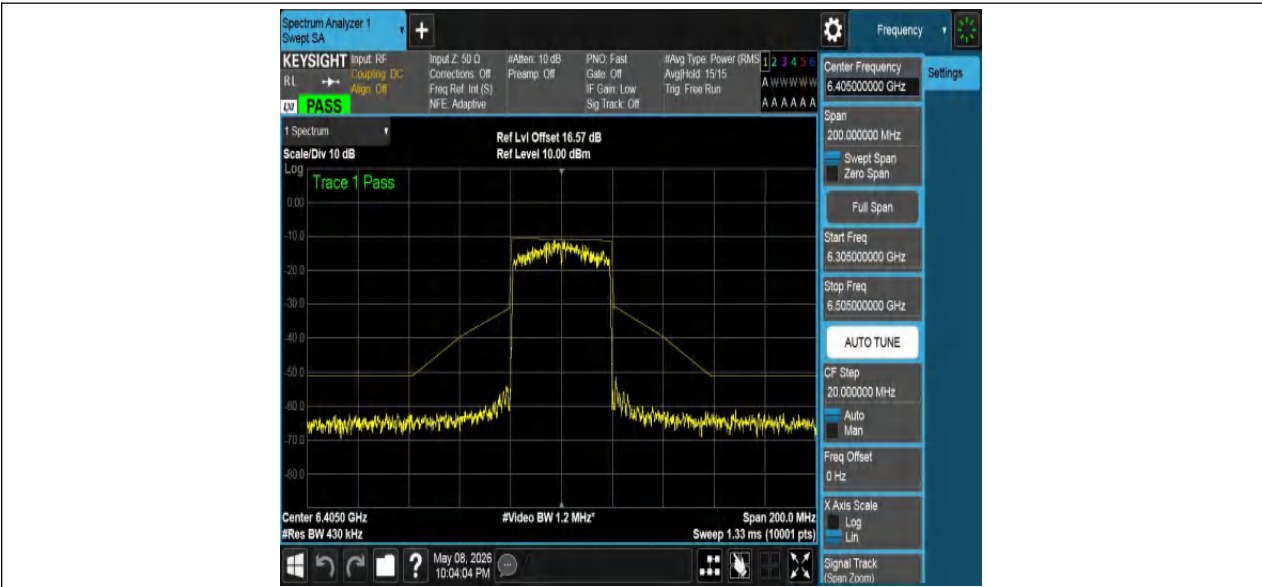
11AX40MIMO_Ant2_6165



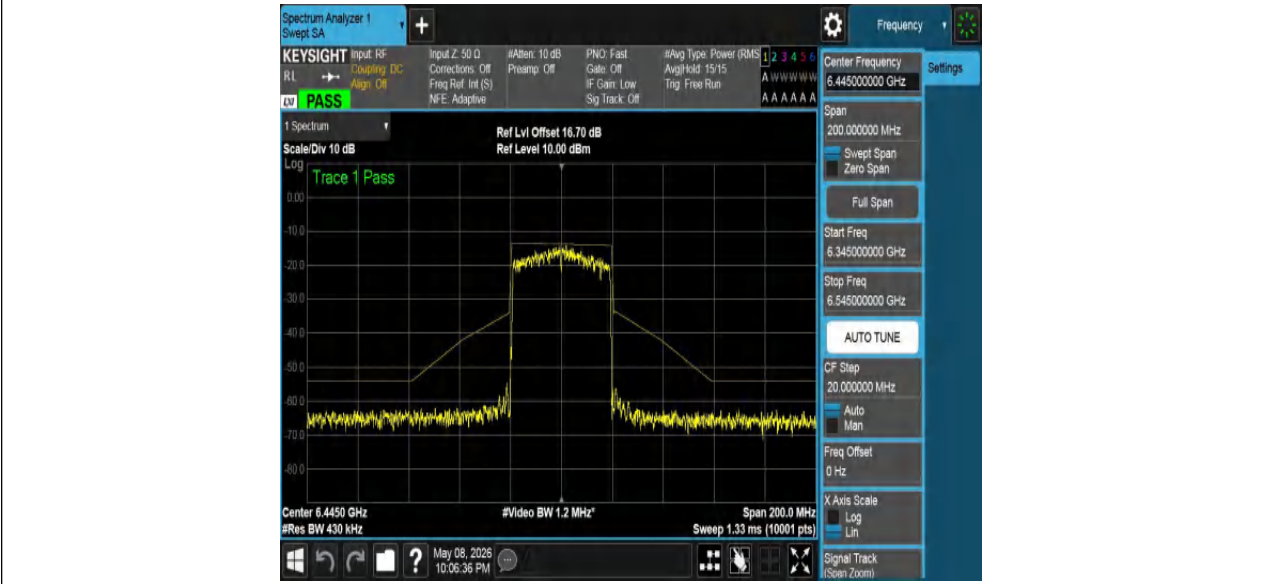
11AX40MIMO_Ant1_6405



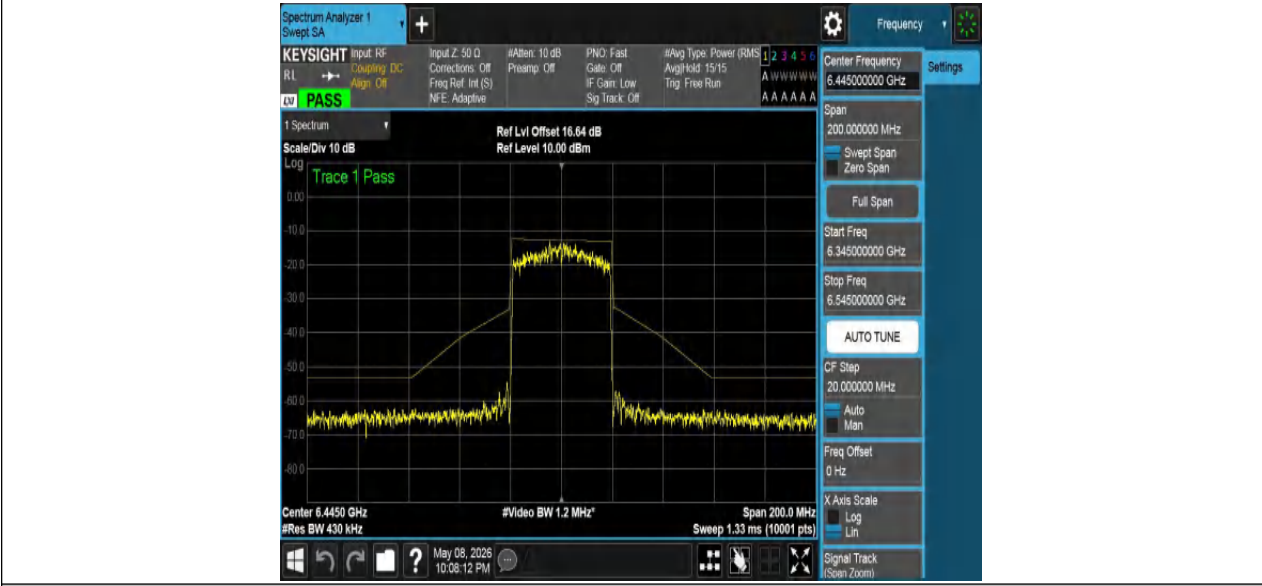
11AX40MIMO_Ant2_6405



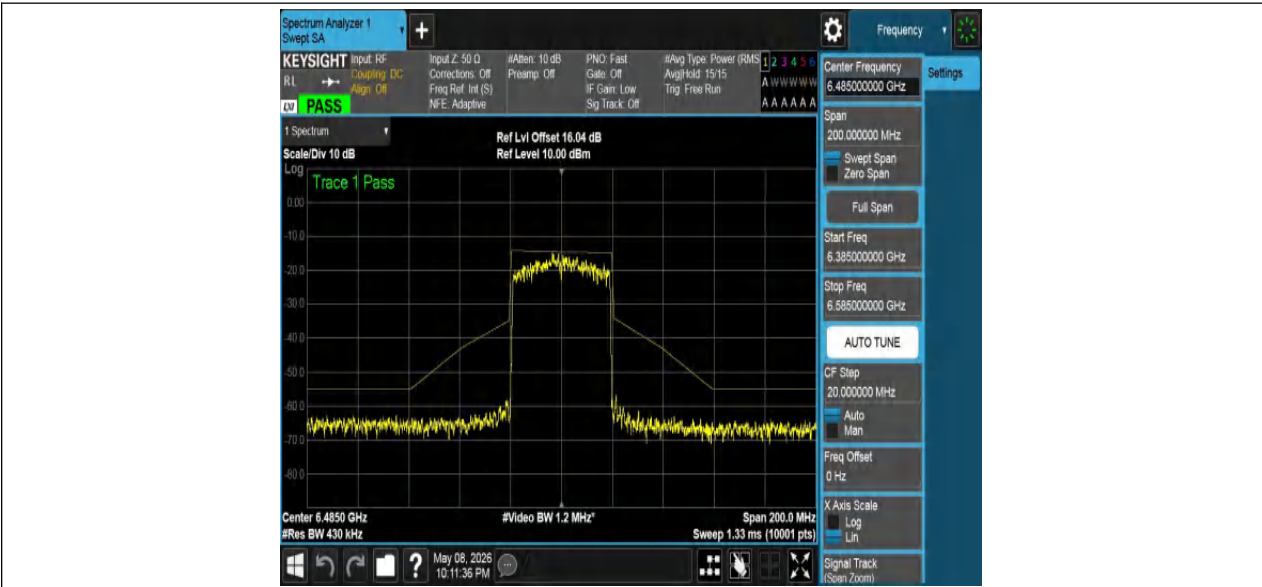
11AX40MIMO_Ant1_6445



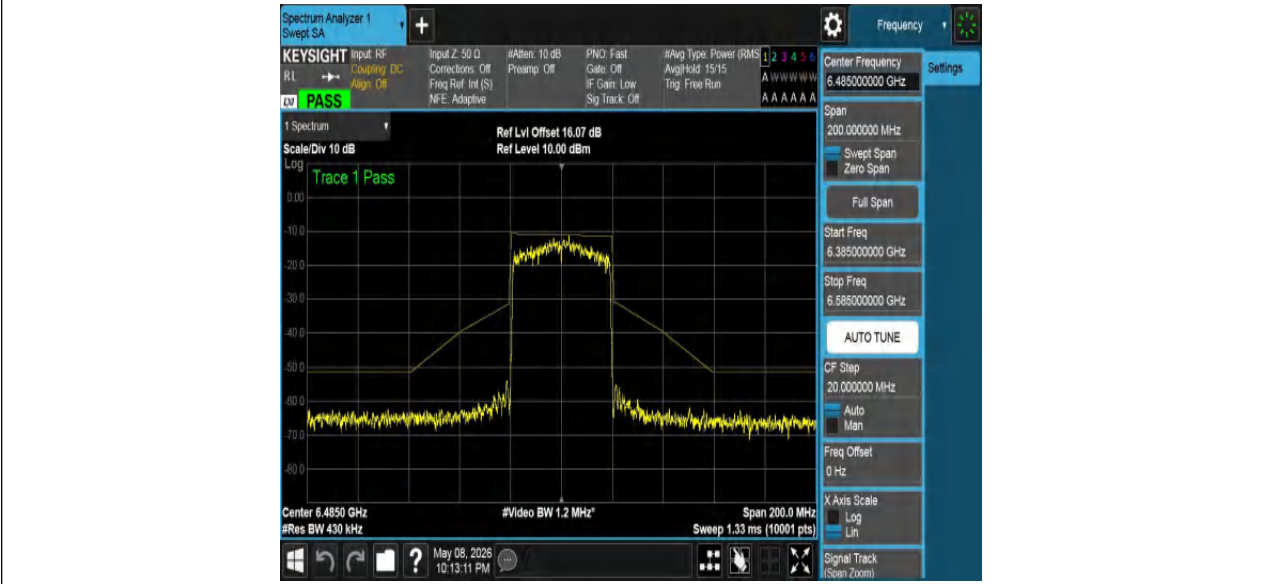
11AX40MIMO_Ant2_6445



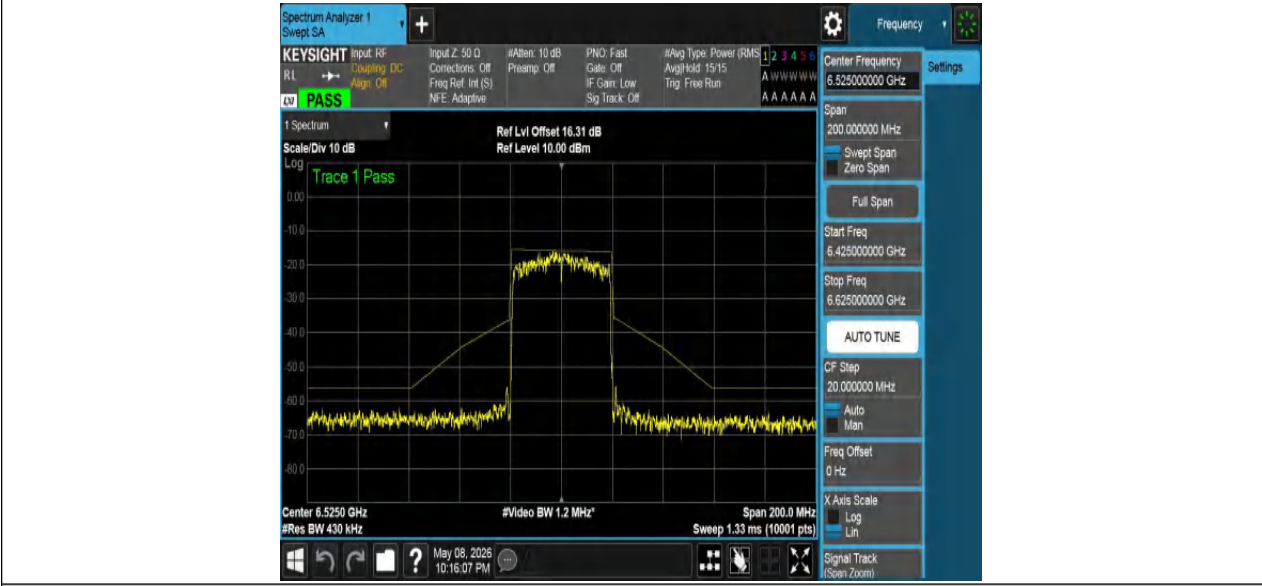
11AX40MIMO_Ant1_6485



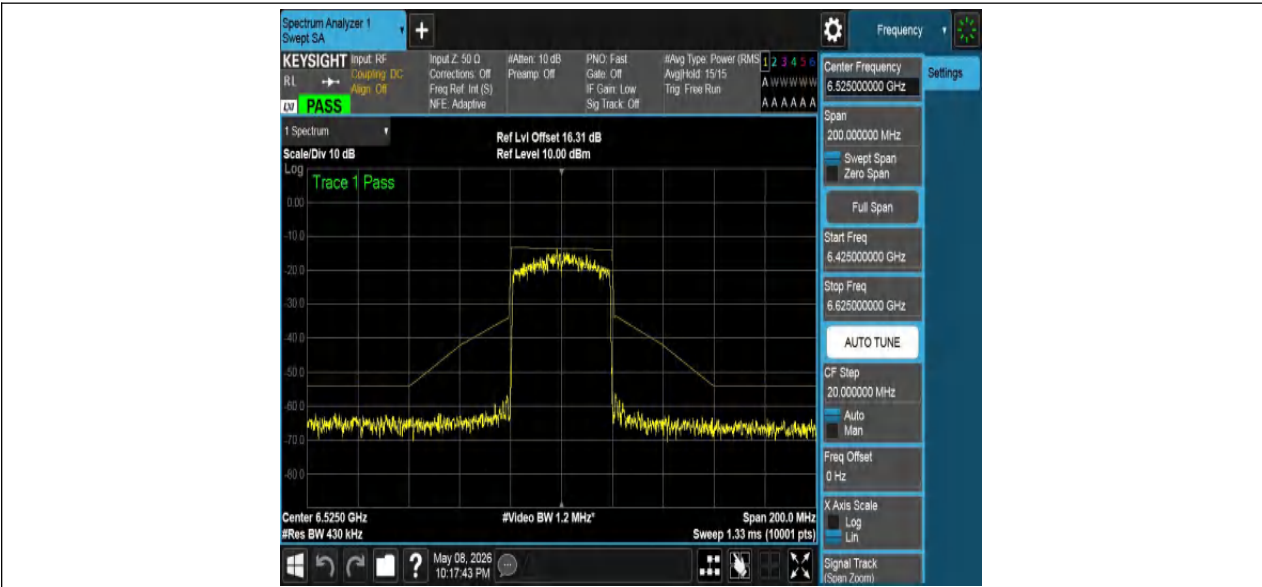
11AX40MIMO_Ant2_6485



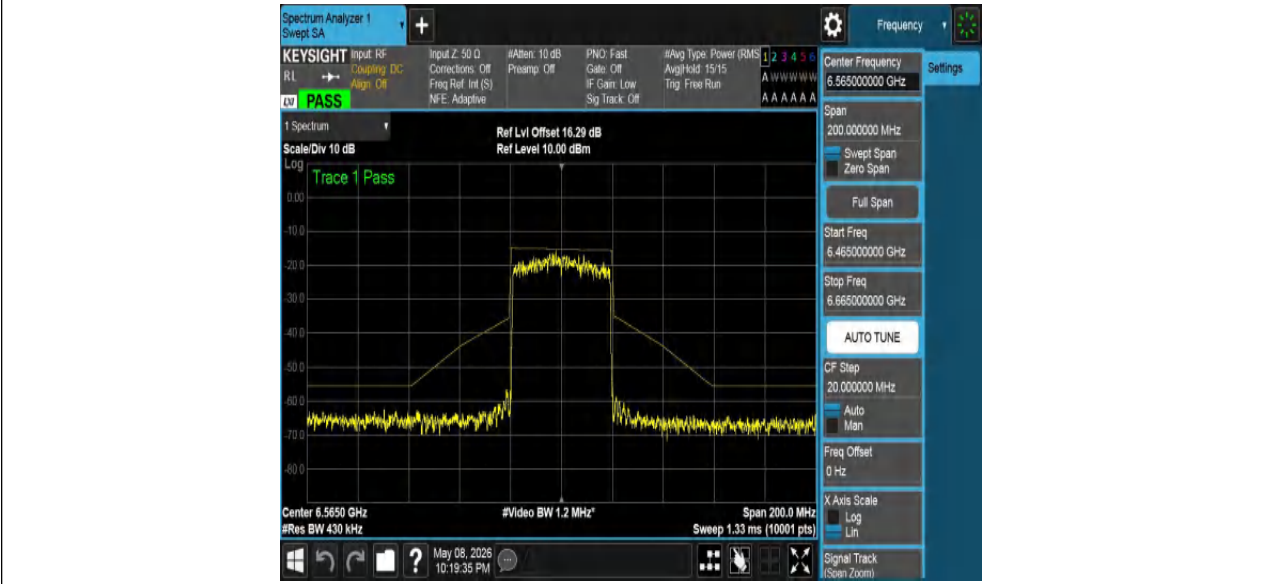
11AX40MIMO_Ant1_6525



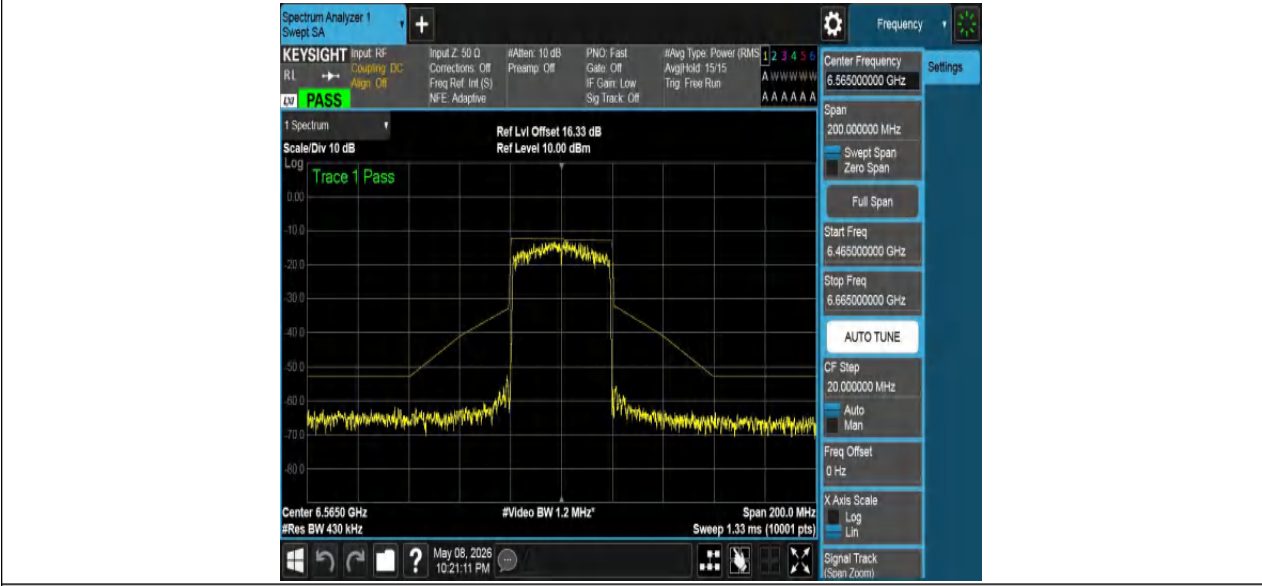
11AX40MIMO_Ant2_6525



11AX40MIMO_Ant1_6565



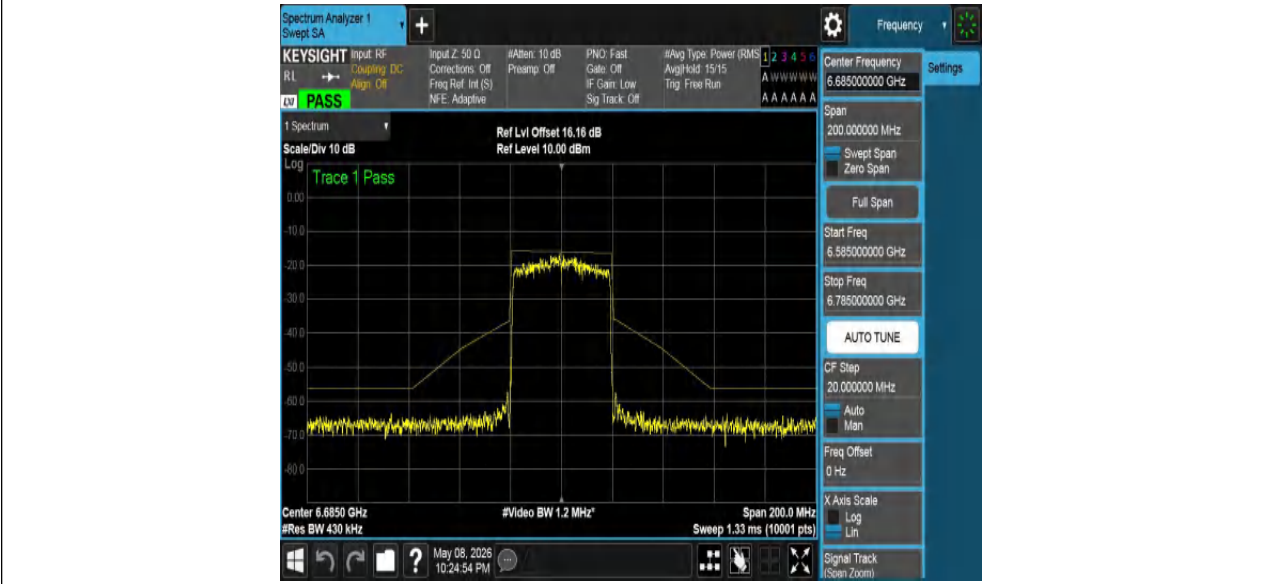
11AX40MIMO_Ant2_6565



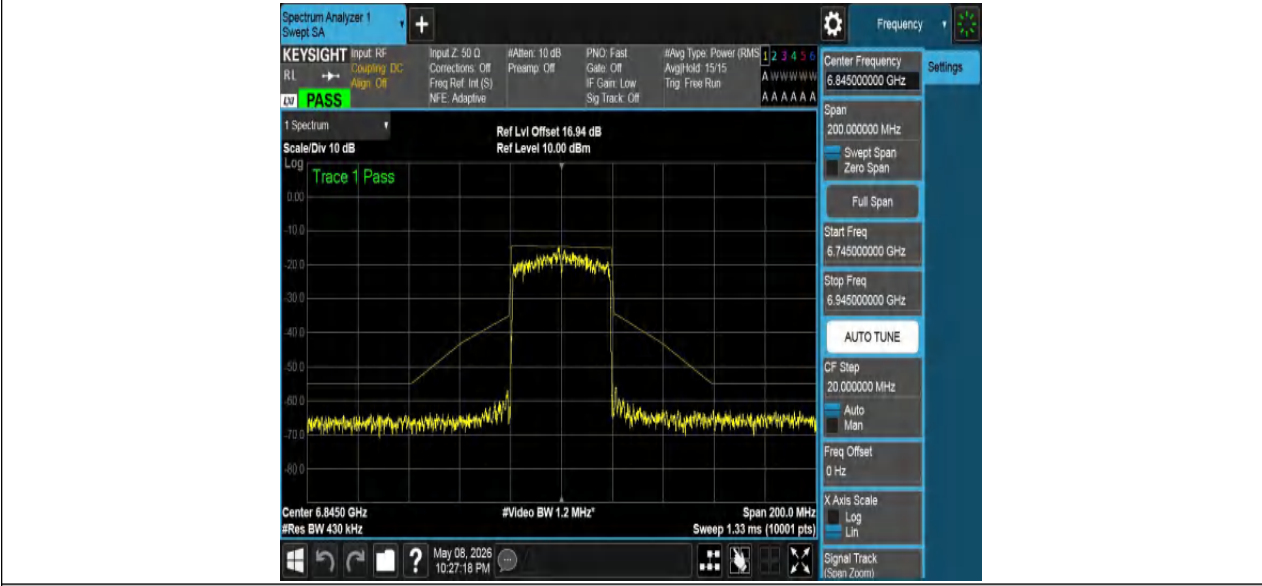
11AX40MIMO_Ant1_6685



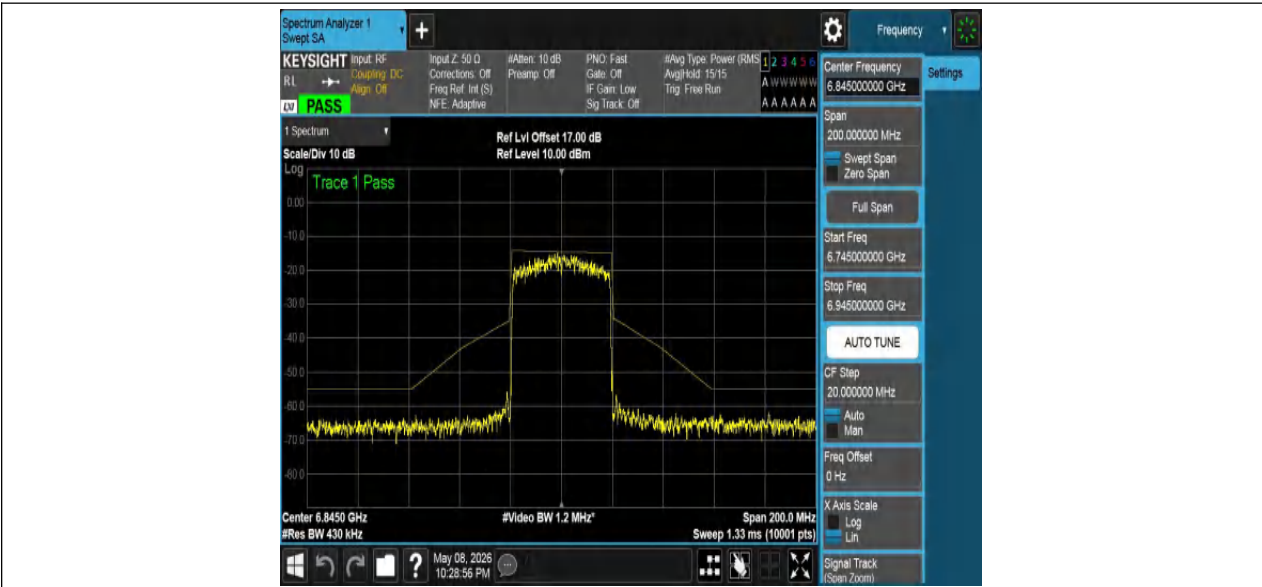
11AX40MIMO_Ant2_6685



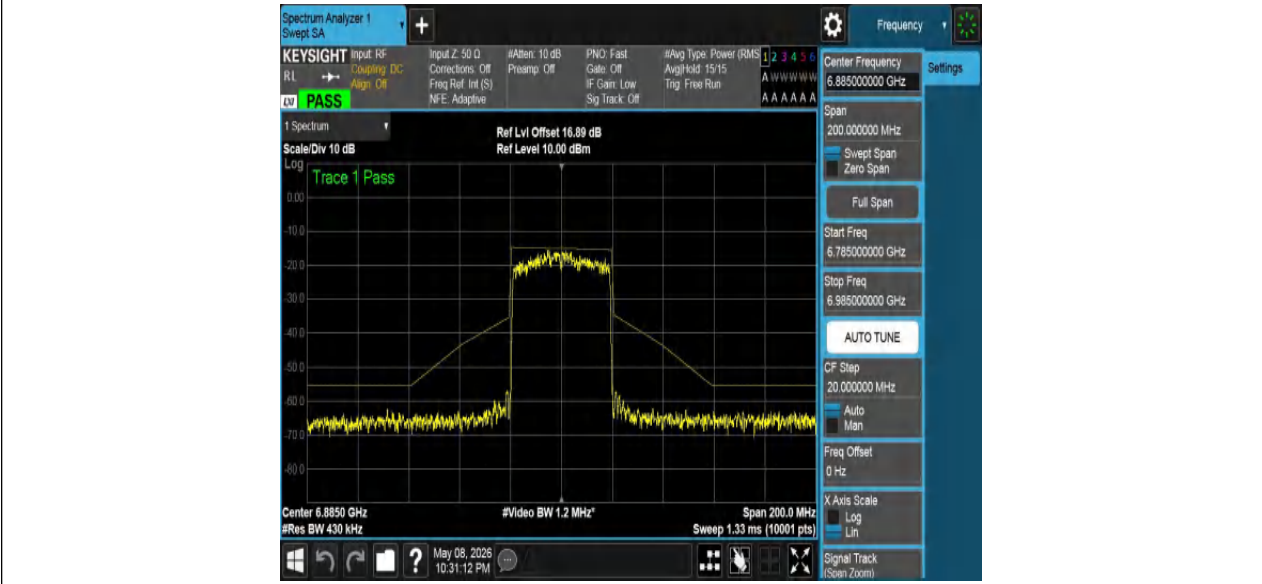
11AX40MIMO_Ant1_6845



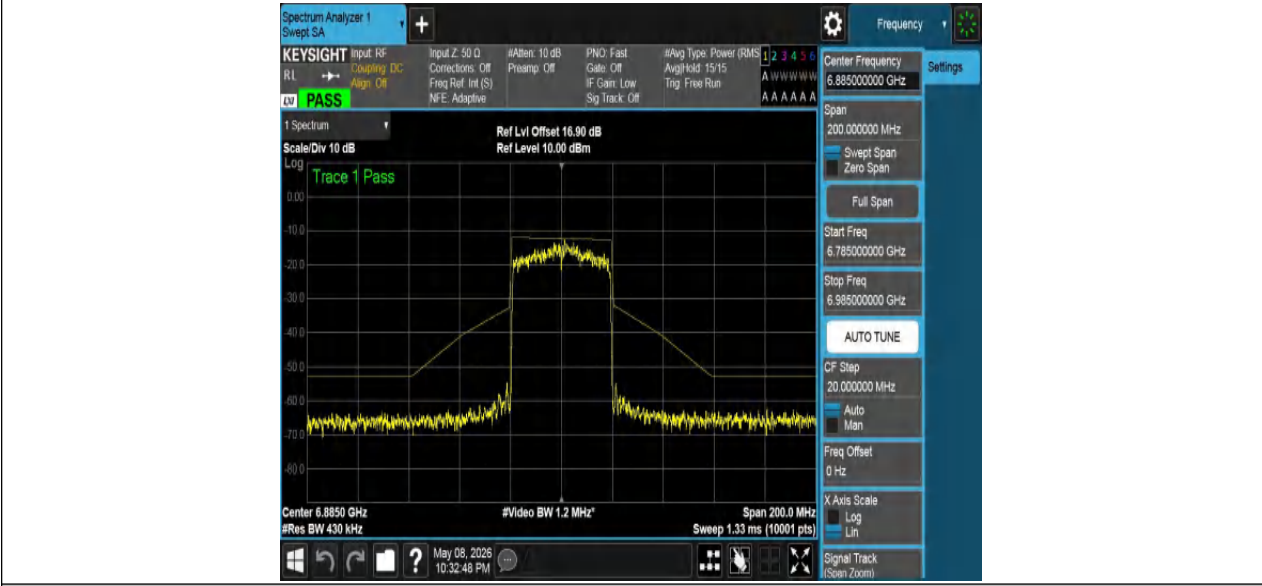
11AX40MIMO_Ant2_6845



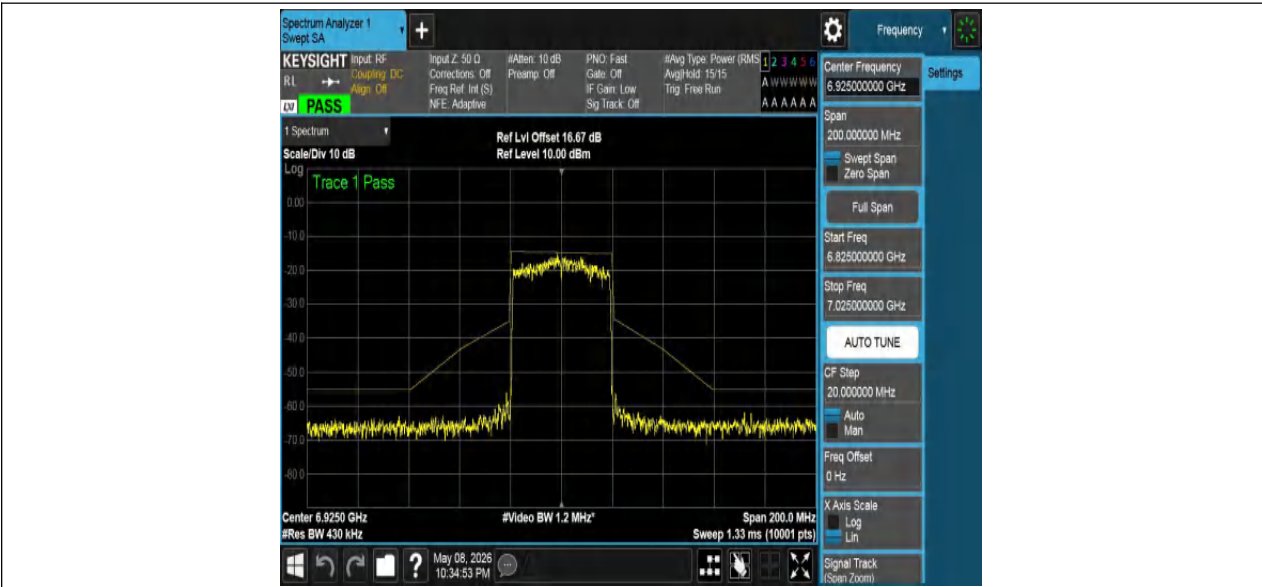
11AX40MIMO_Ant1_6885



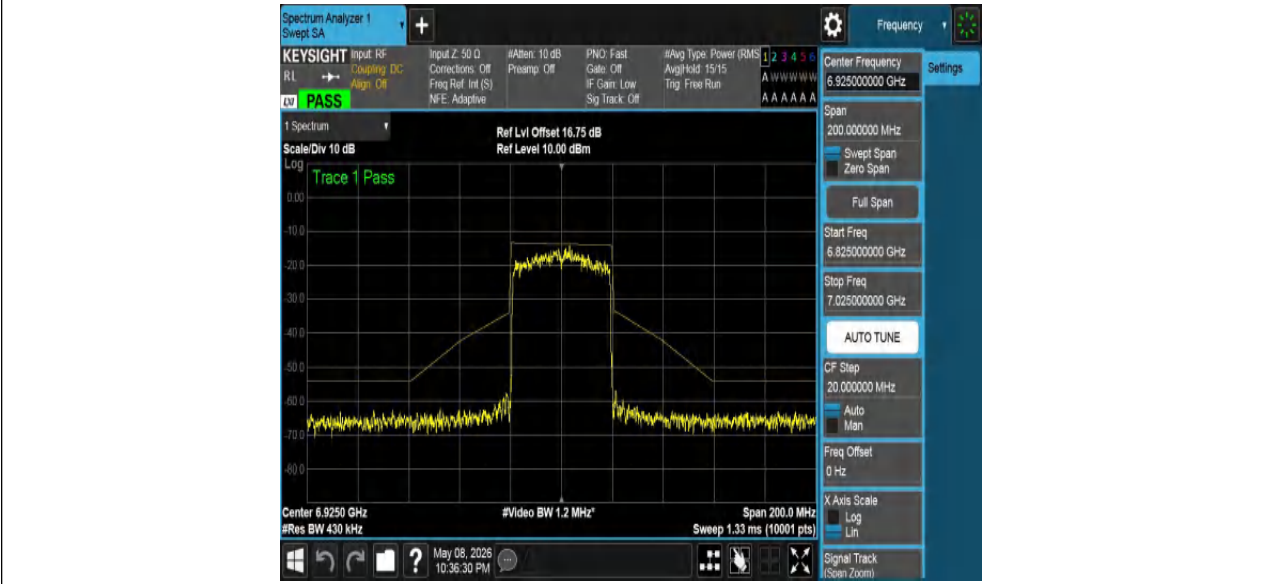
11AX40MIMO_Ant2_6885



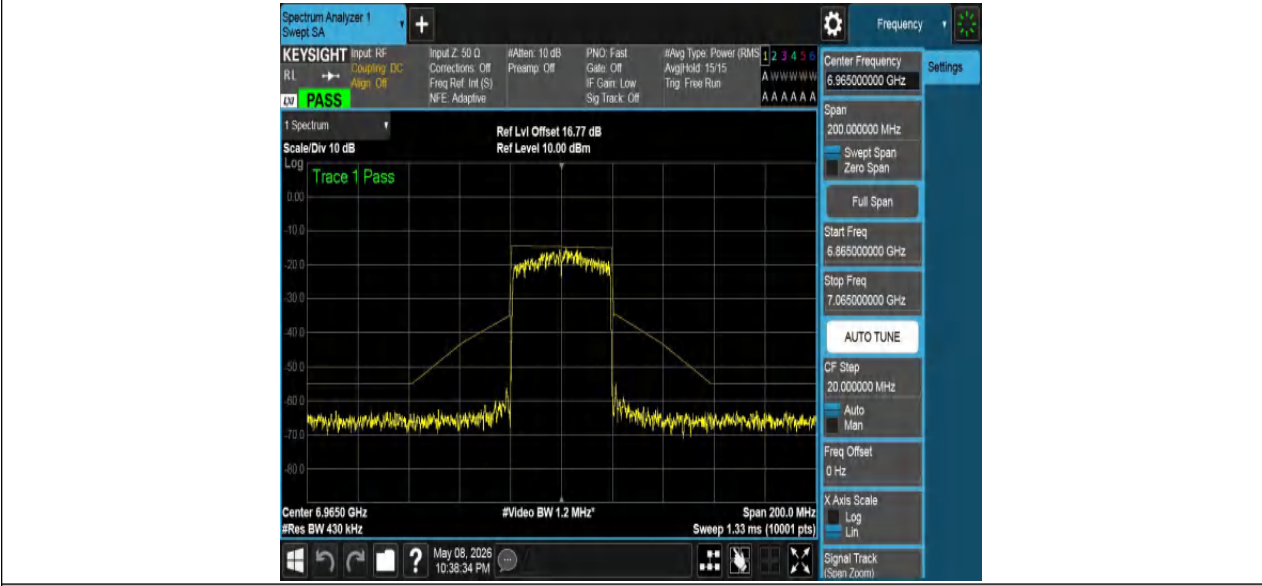
11AX40MIMO_Ant1_6925



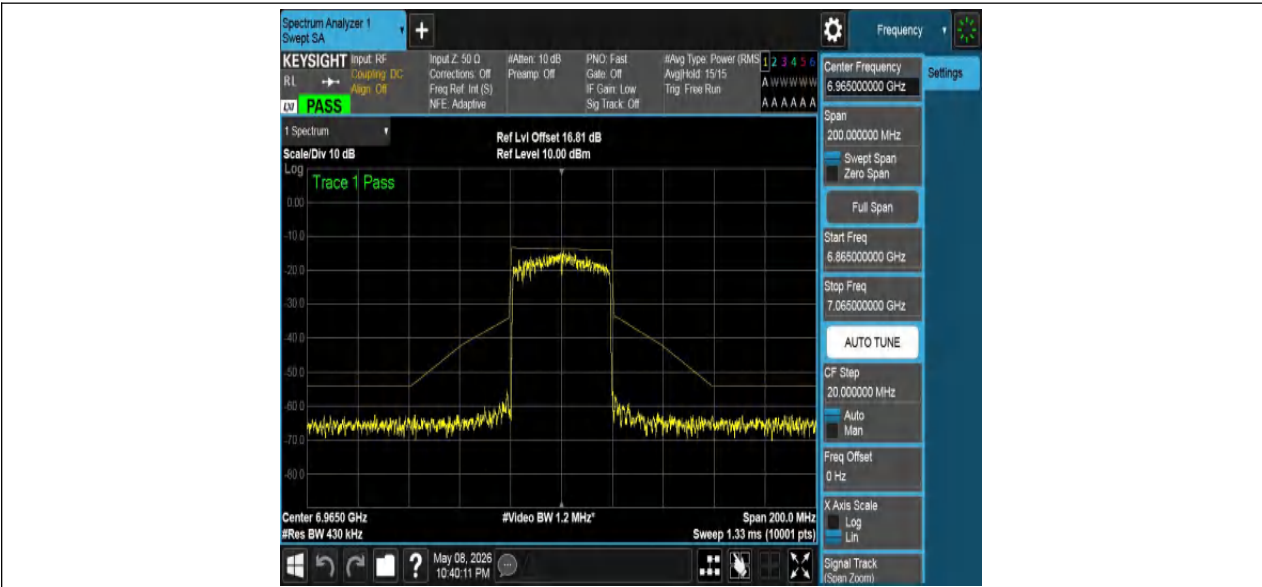
11AX40MIMO_Ant2_6925



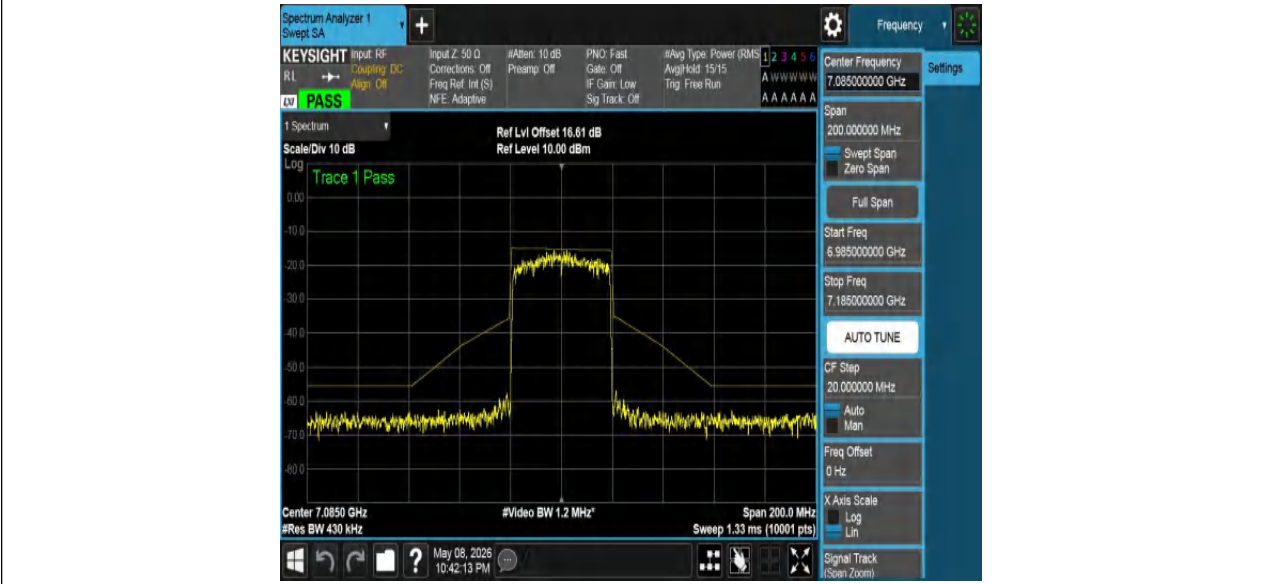
11AX40MIMO_Ant1_6965



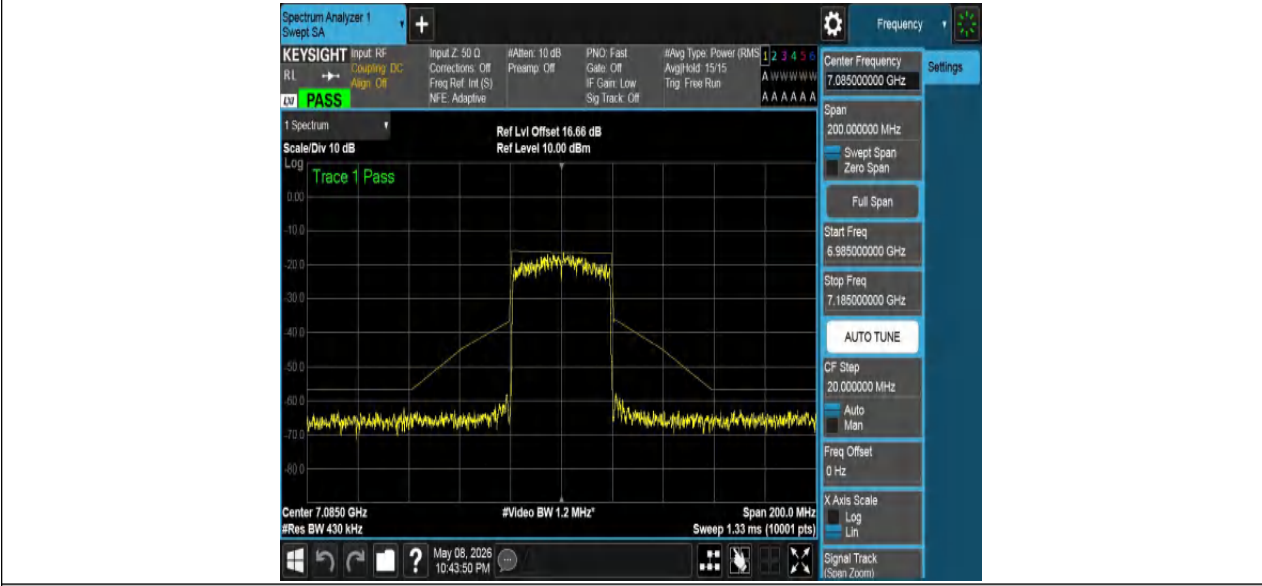
11AX40MIMO_Ant2_6965



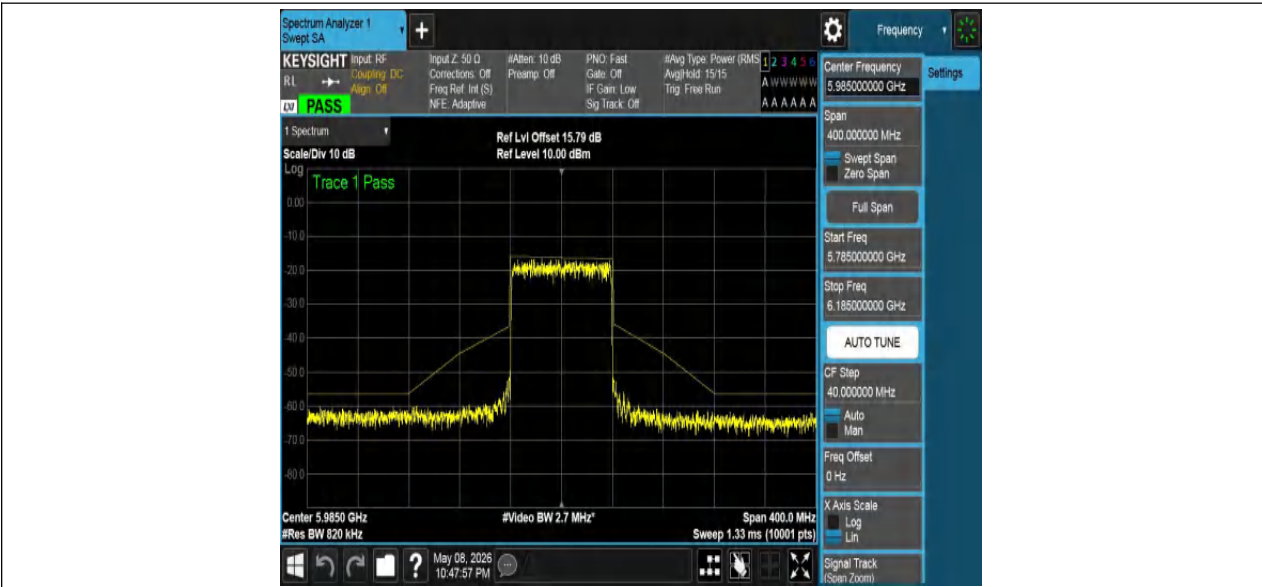
11AX40MIMO_Ant1_7085



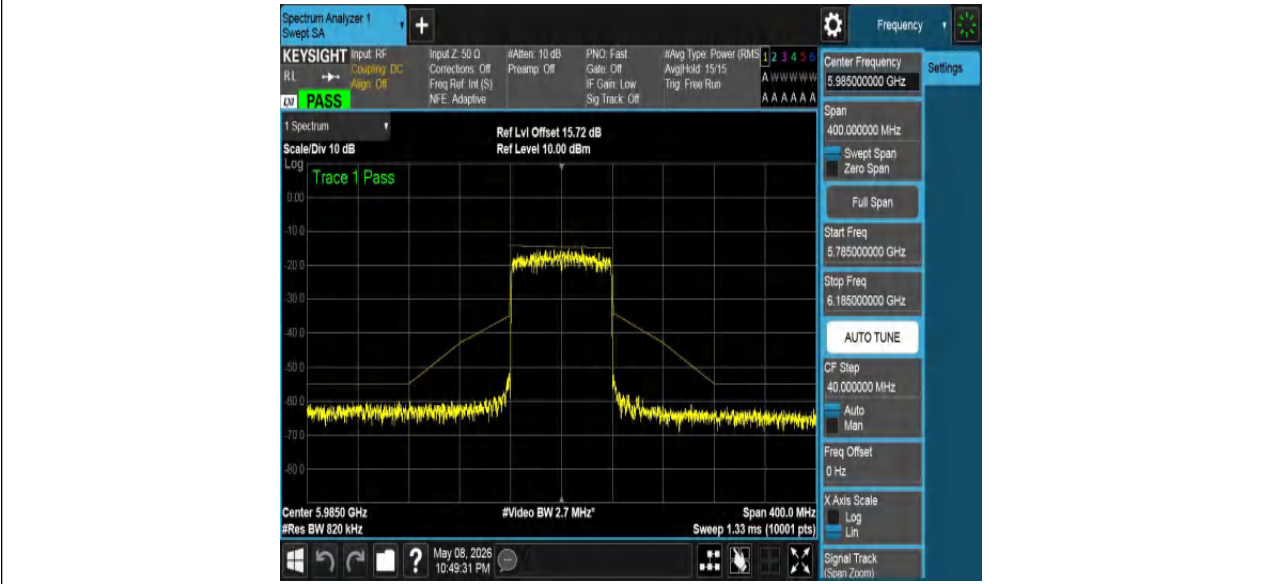
11AX40MIMO_Ant2_7085



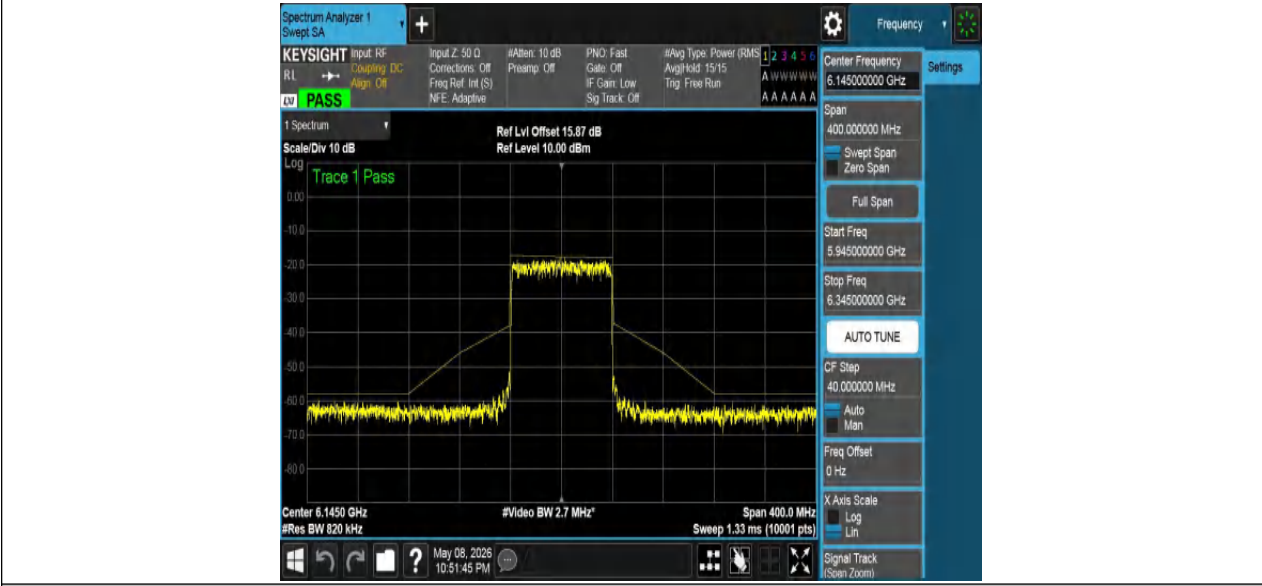
11AX80MIMO_Ant1_5985



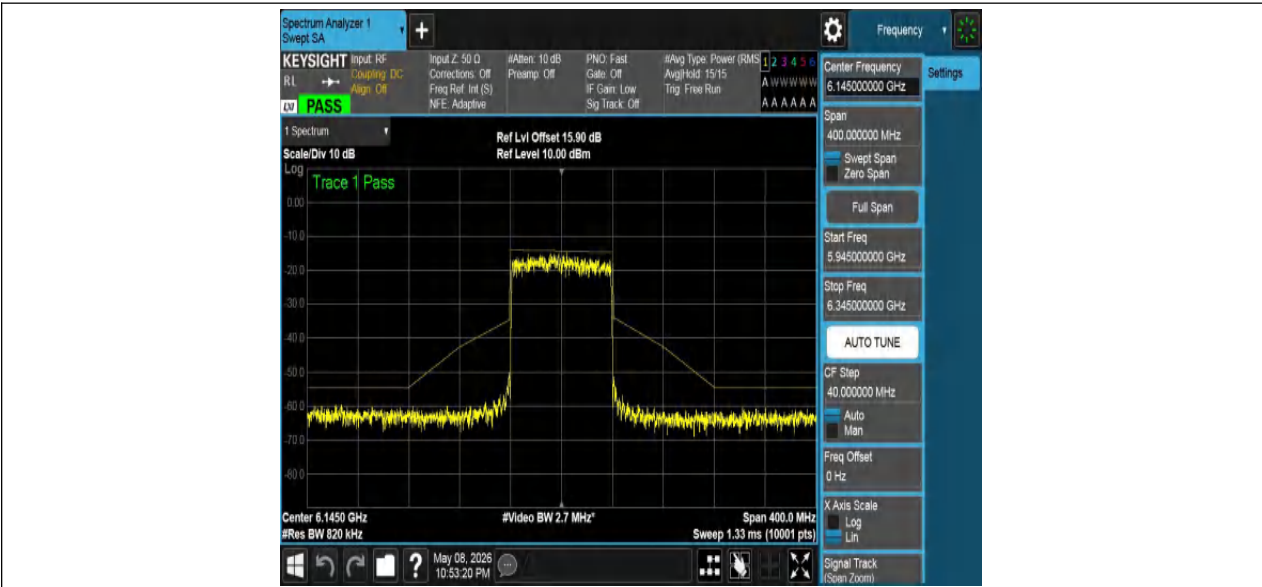
11AX80MIMO_Ant2_5985



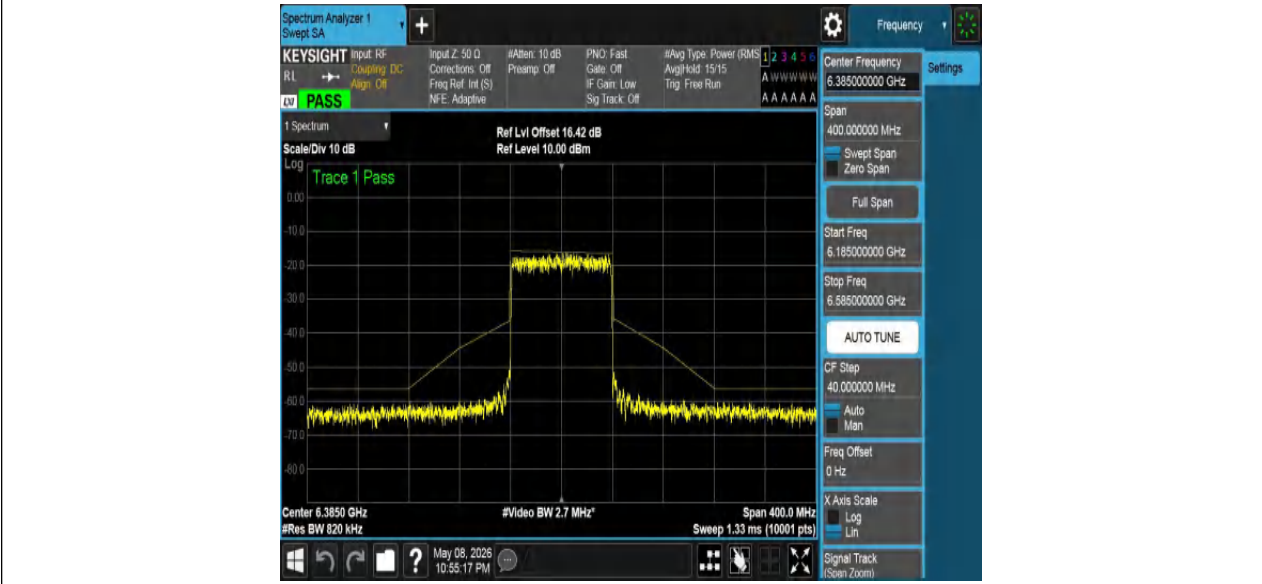
11AX80MIMO_Ant1_6145



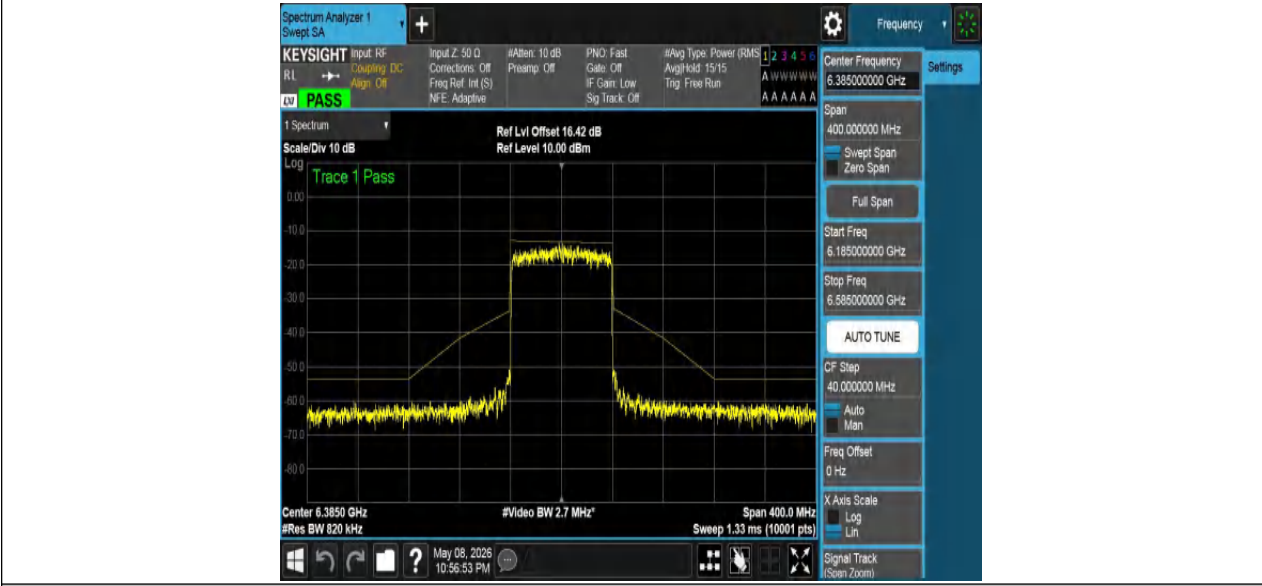
11AX80MIMO_Ant2_6145



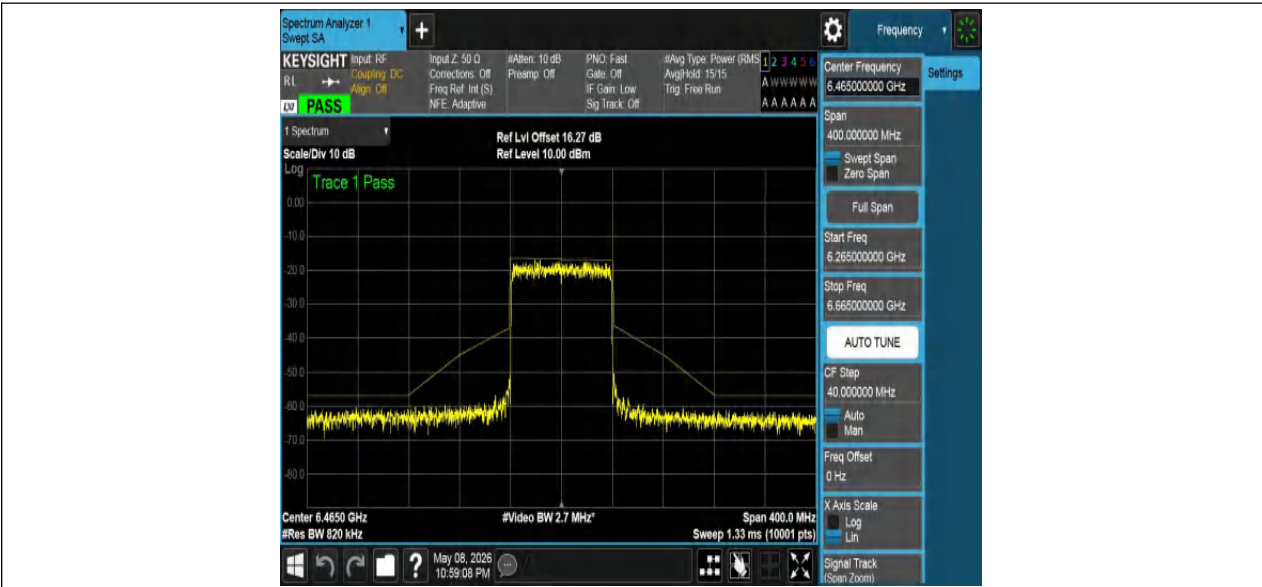
11AX80MIMO_Ant1_6385



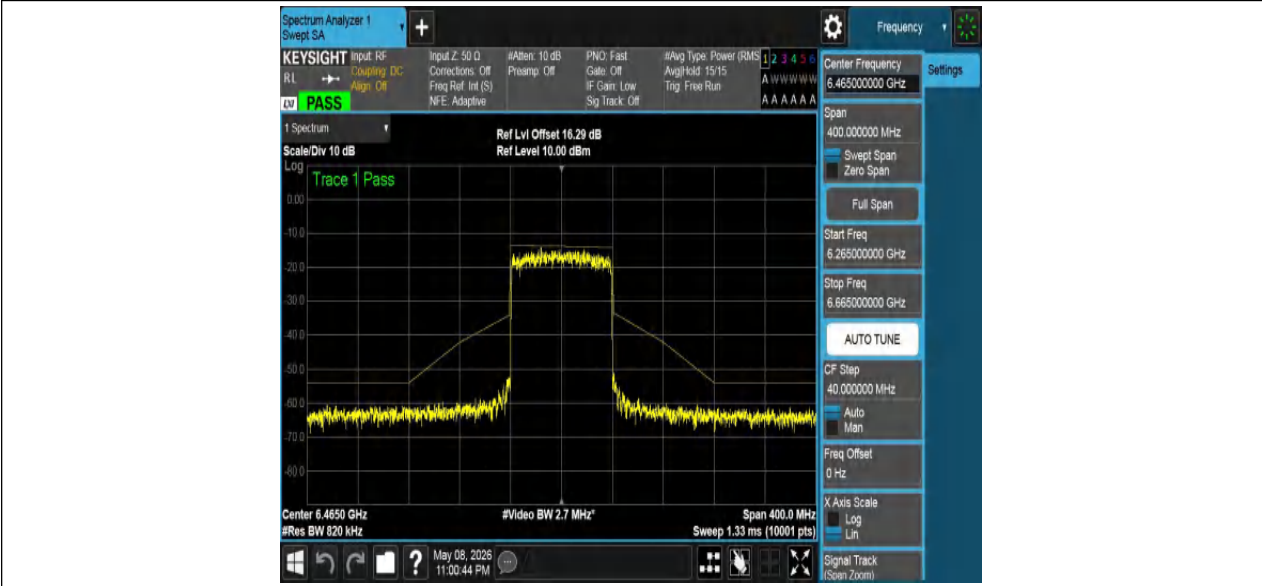
11AX80MIMO_Ant2_6385



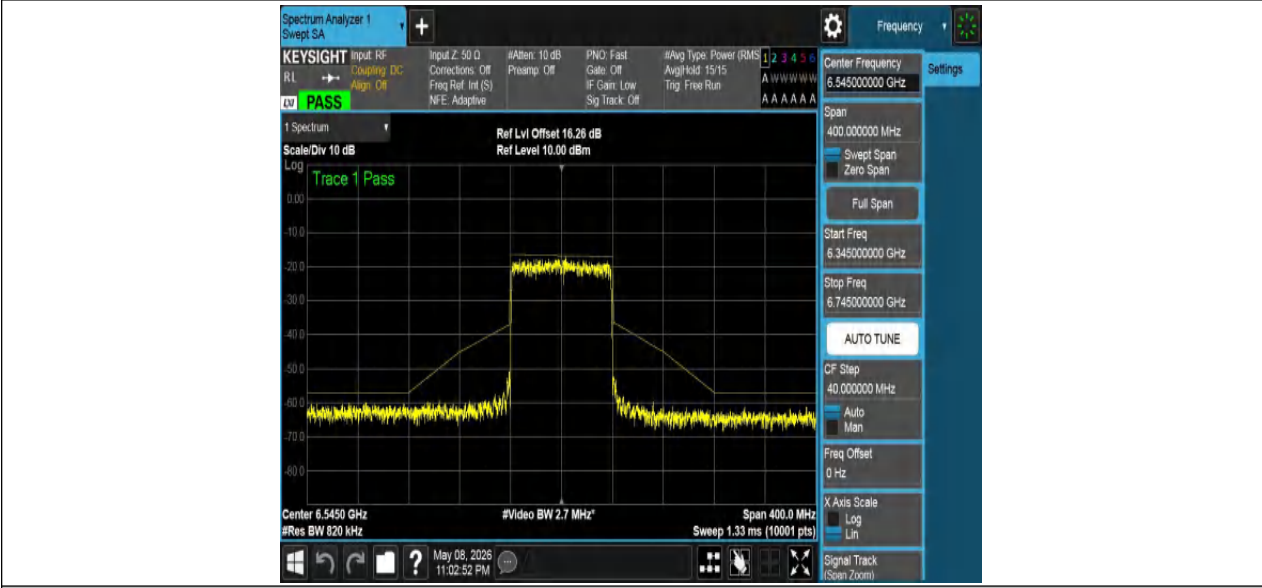
11AX80MIMO_Ant1_6465



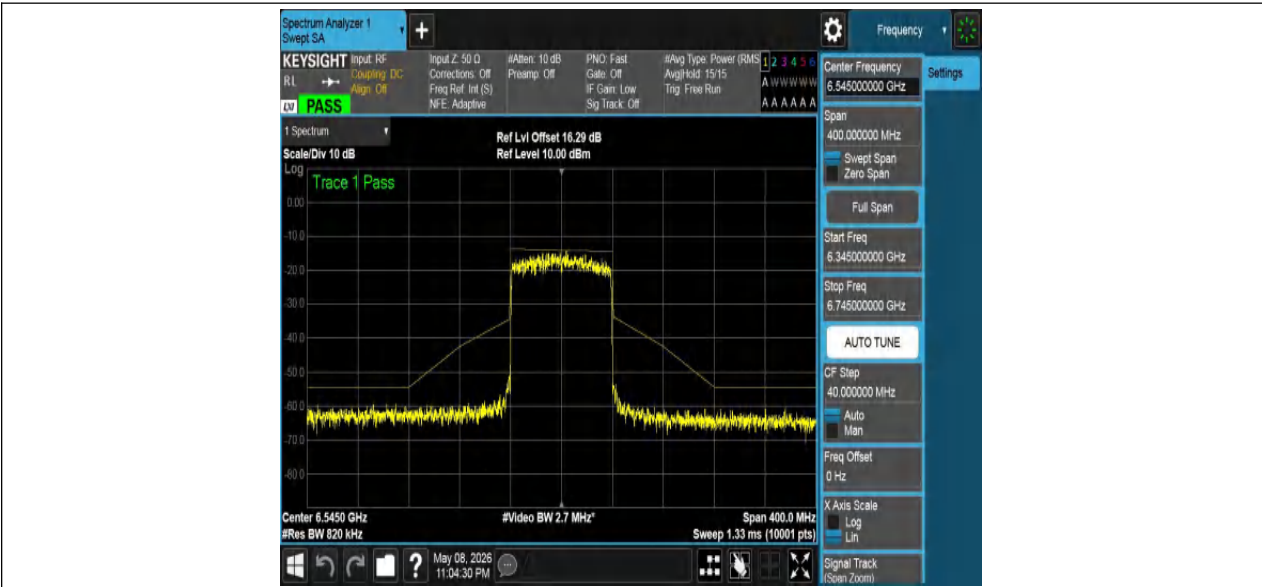
11AX80MIMO_Ant2_6465



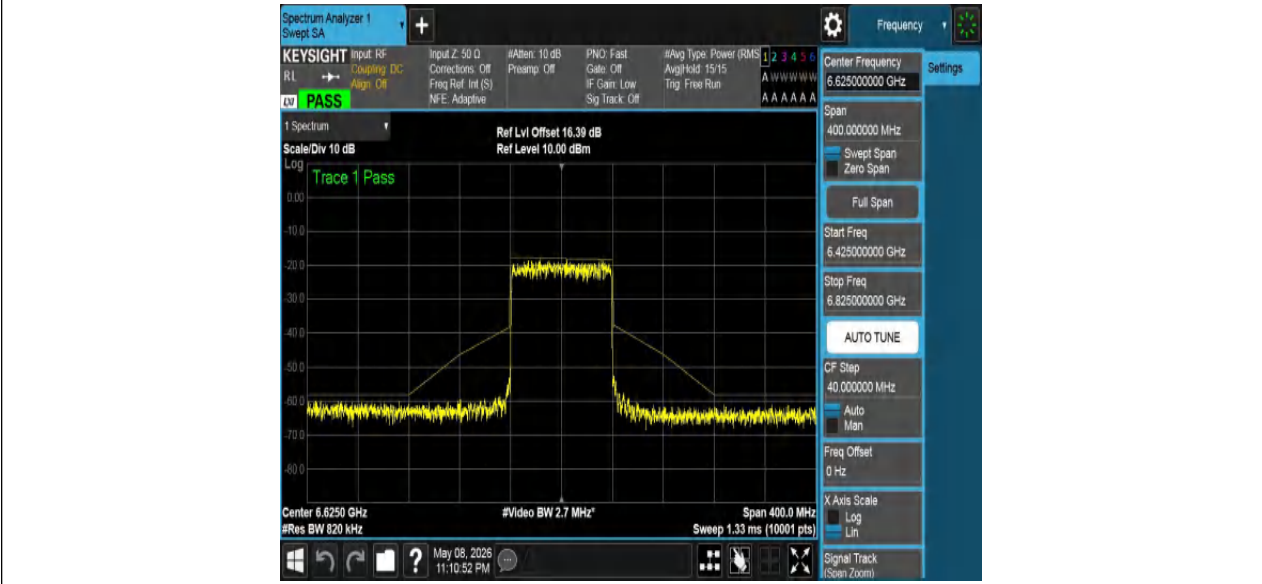
11AX80MIMO_Ant1_6545



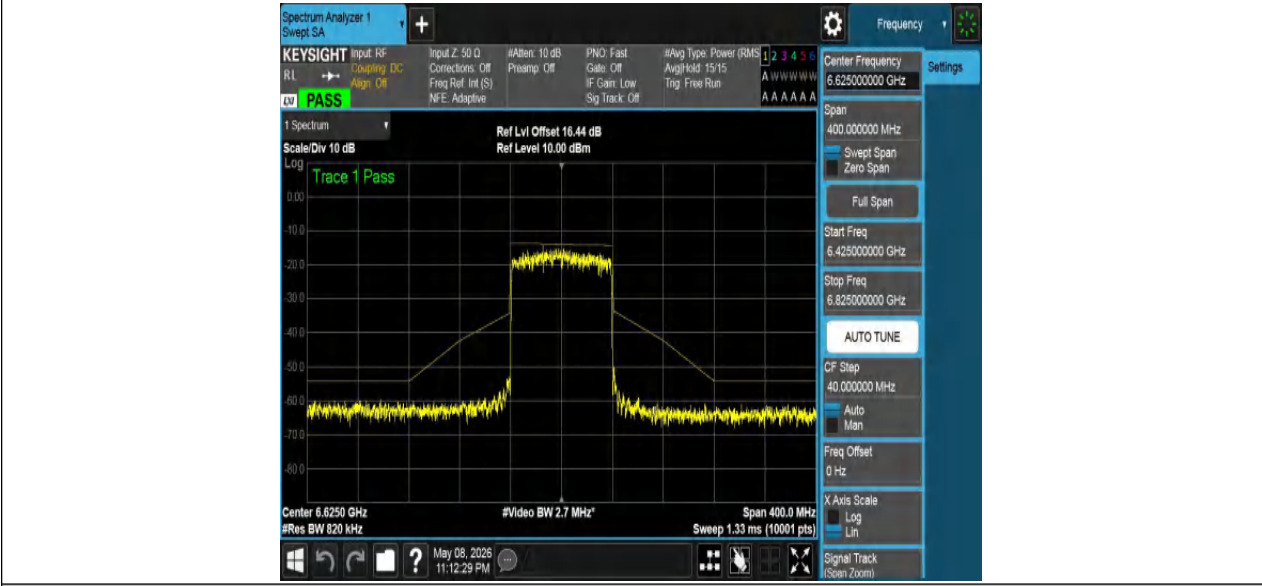
11AX80MIMO_Ant2_6545



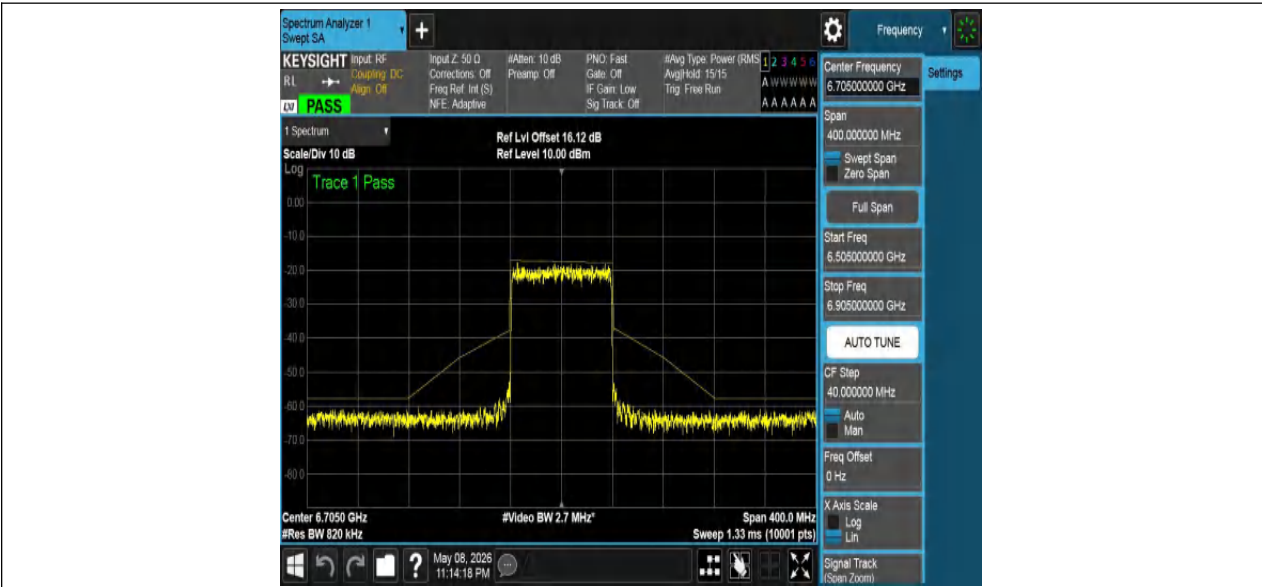
11AX80MIMO_Ant1_6625



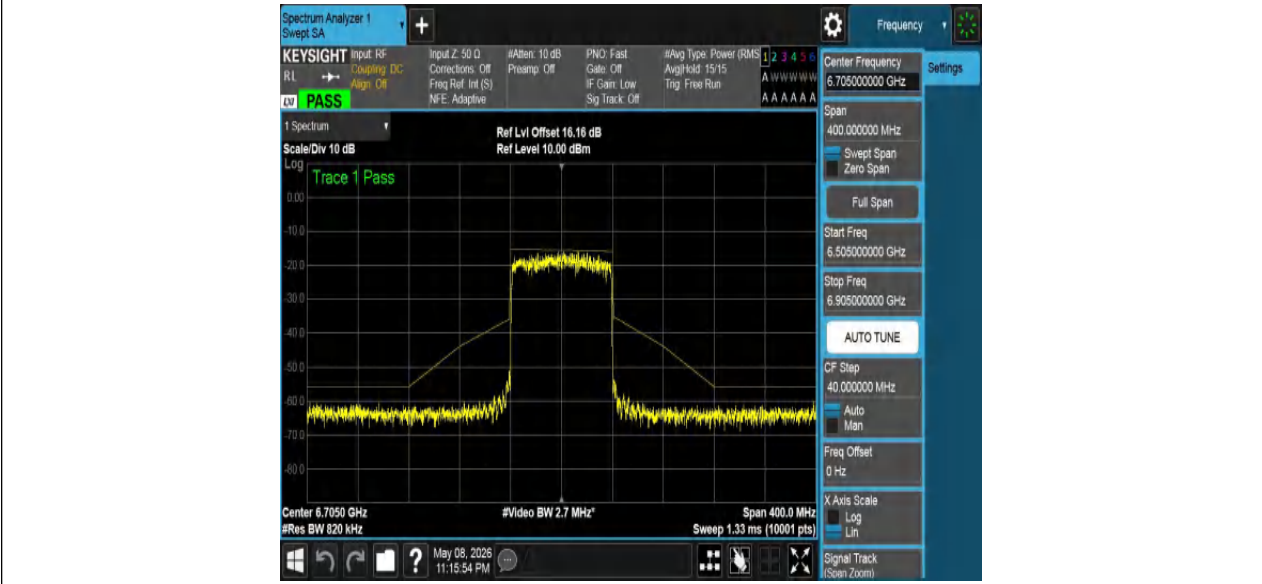
11AX80MIMO_Ant2_6625



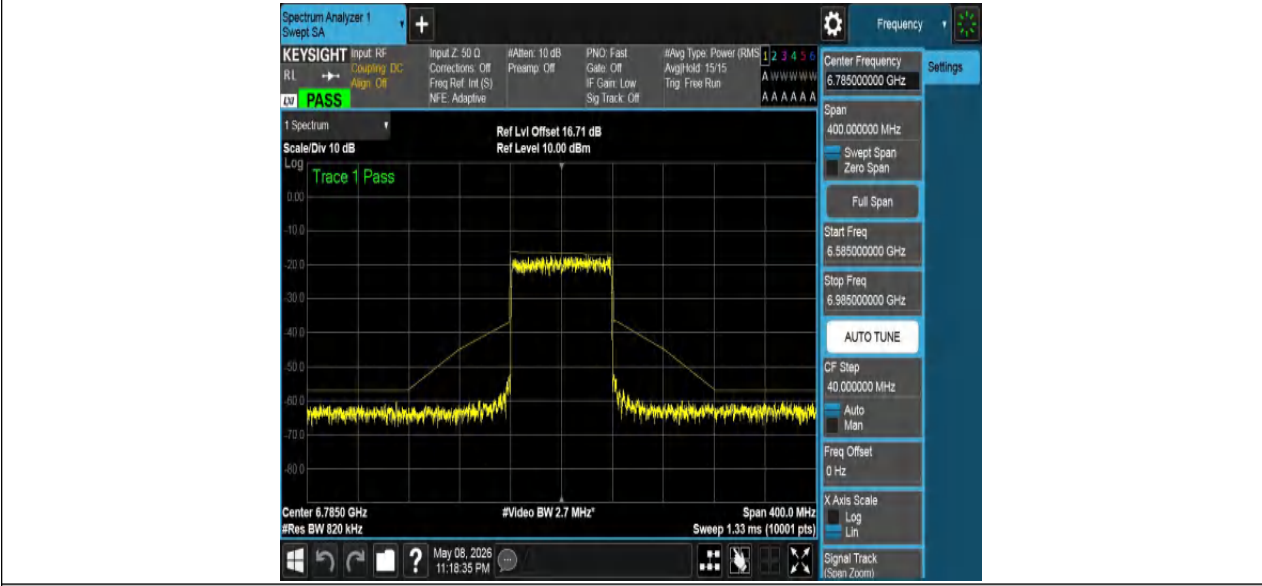
11AX80MIMO_Ant1_6705



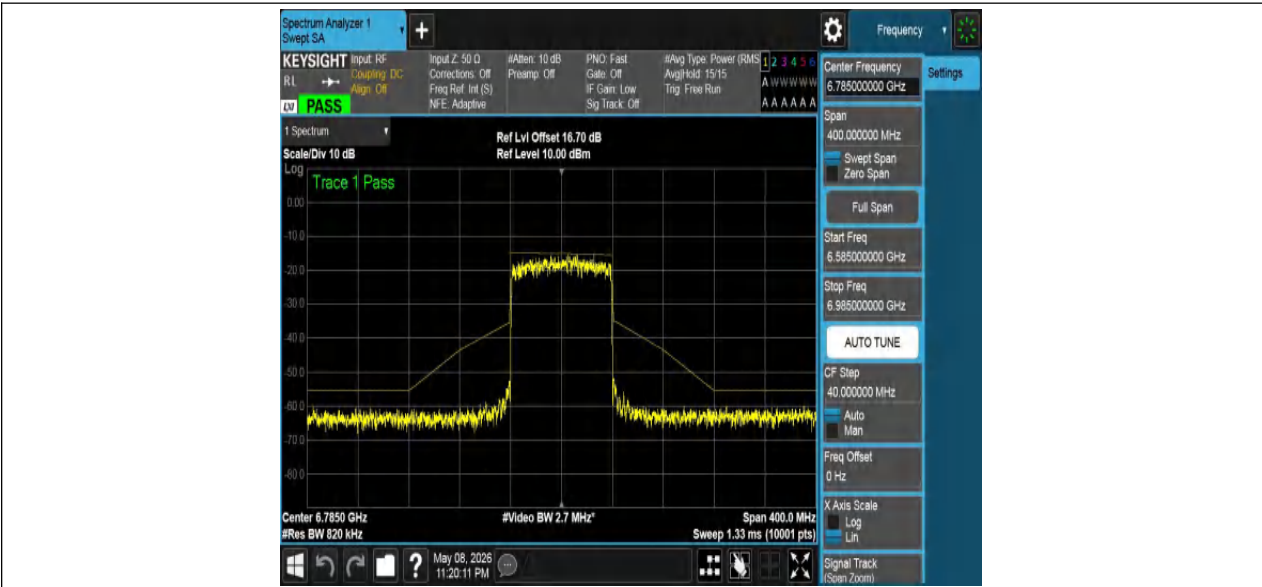
11AX80MIMO_Ant2_6705



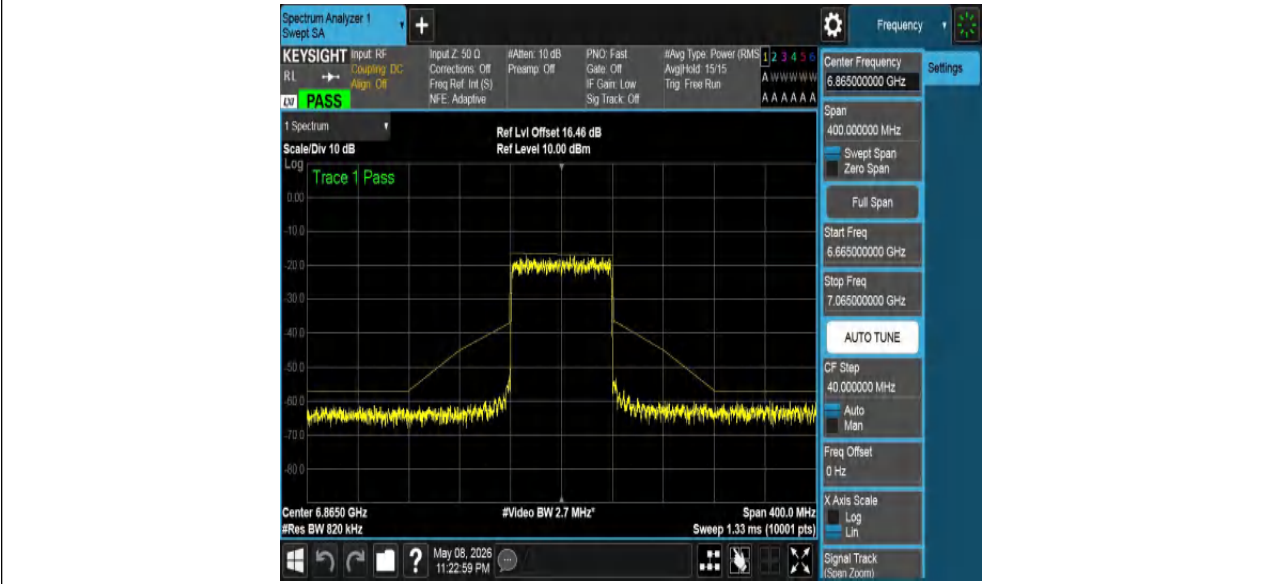
11AX80MIMO_Ant1_6785



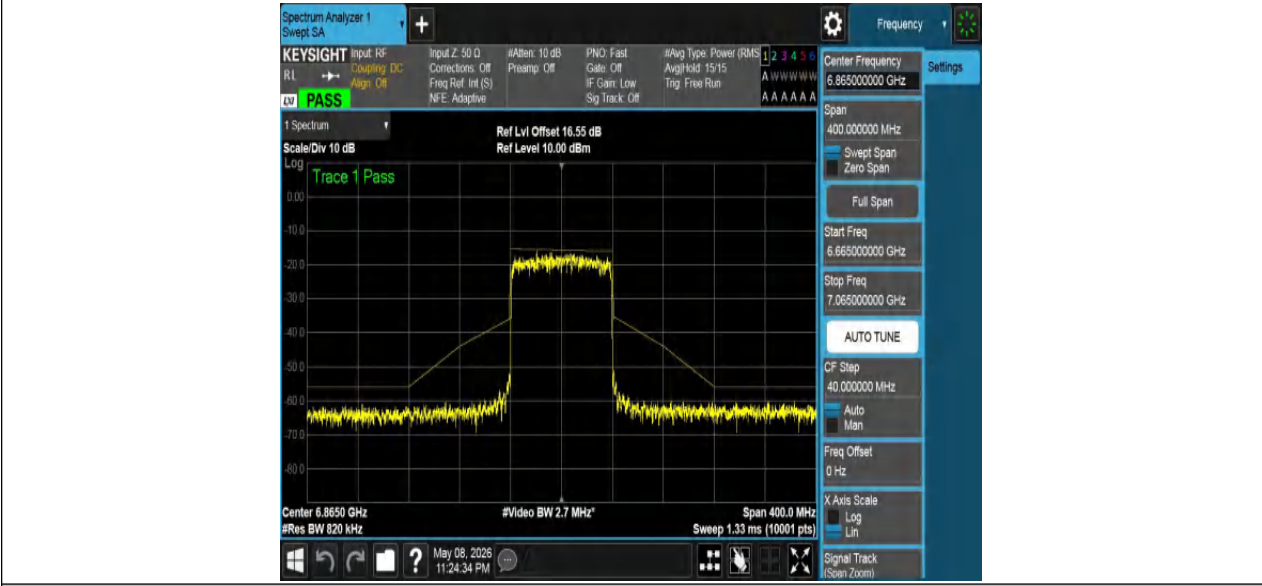
11AX80MIMO_Ant2_6785



11AX80MIMO_Ant1_6865



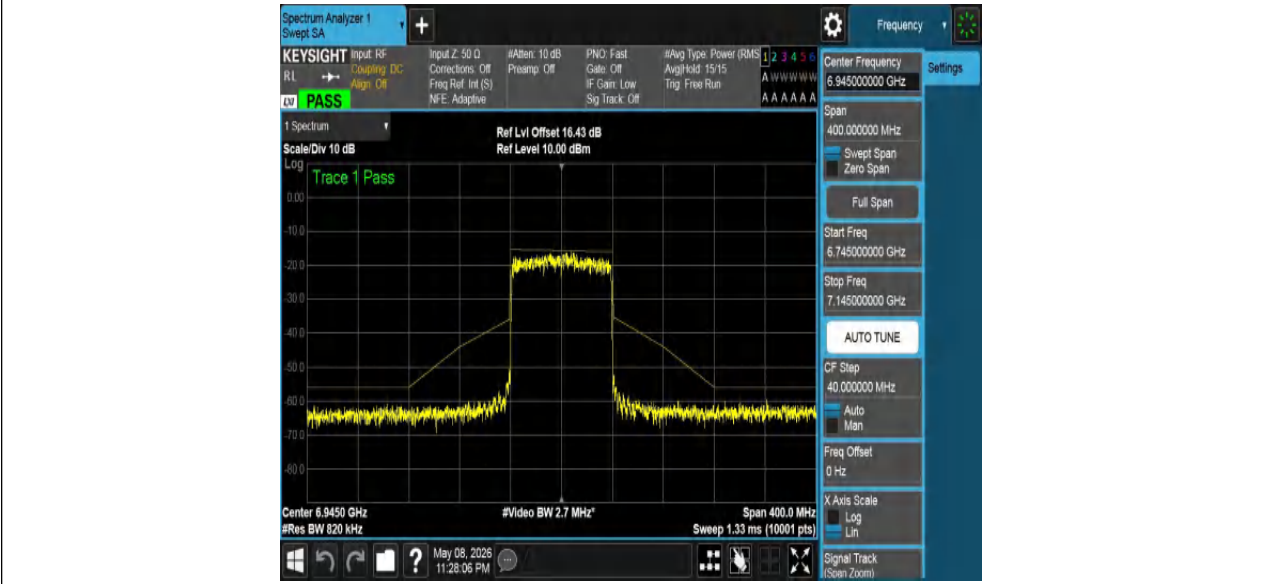
11AX80MIMO_Ant2_6865



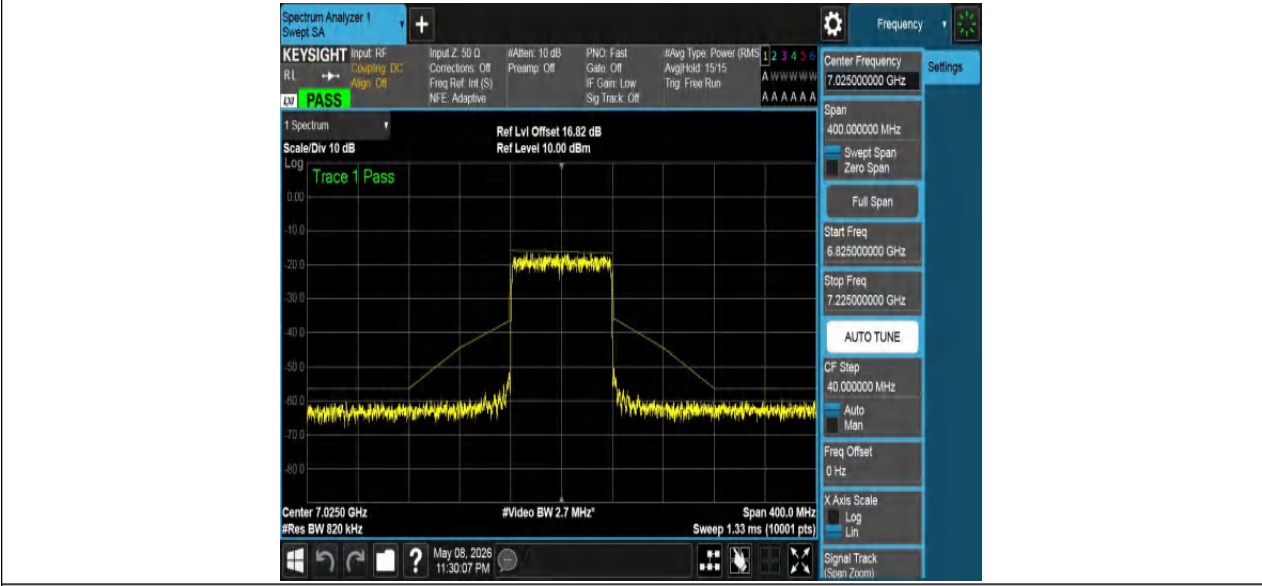
11AX80MIMO_Ant1_6945



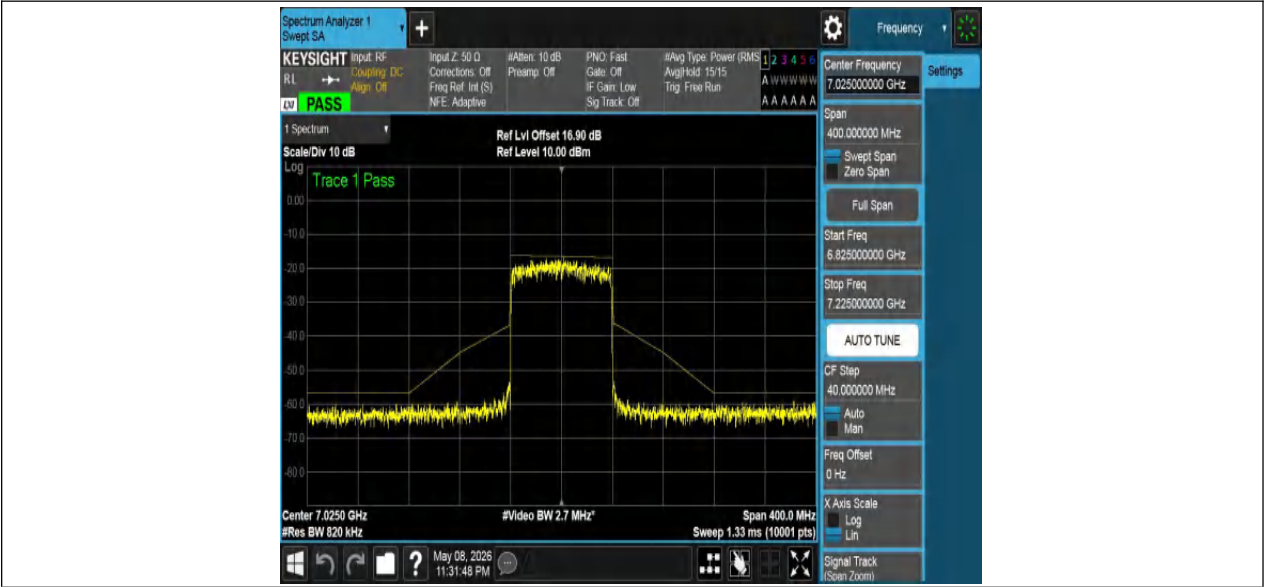
11AX80MIMO_Ant2_6945



11AX80MIMO_Ant1_7025

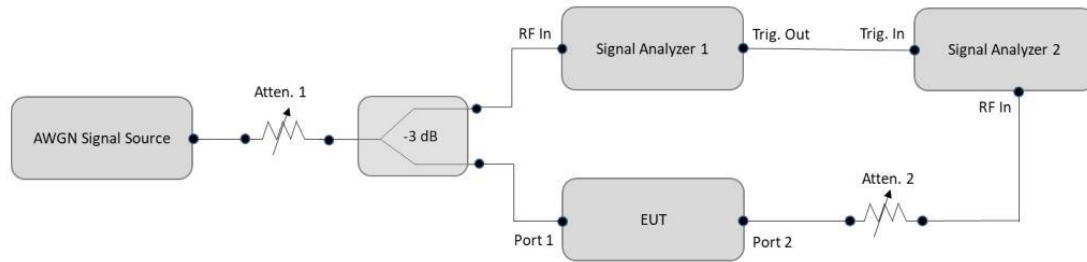


11AX80MIMO_Ant2_7025



13. Contention Based Protocol

13.1. Block diagram of test setup



13.2. Limits

EUT can detect an AWGN signal with 90% (or better) level of certainty.

13.3. Test Procedure

We tested according to Procedure I in KDB 987594 D02.

1. Configure the EUT to transmit with a constant duty cycle.
2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.
3. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2, as shown in Test Configuration. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
4. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
5. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
6. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in Test Configuration.
7. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer.
8. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
9. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
10. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

Sample Calculation Incumbent signal

Power(dBm) = Measured Value(dBm)

Modified Detection Limit(dBm) = Detection Limit(-62 dBm) + Antenna Gain(dBi)

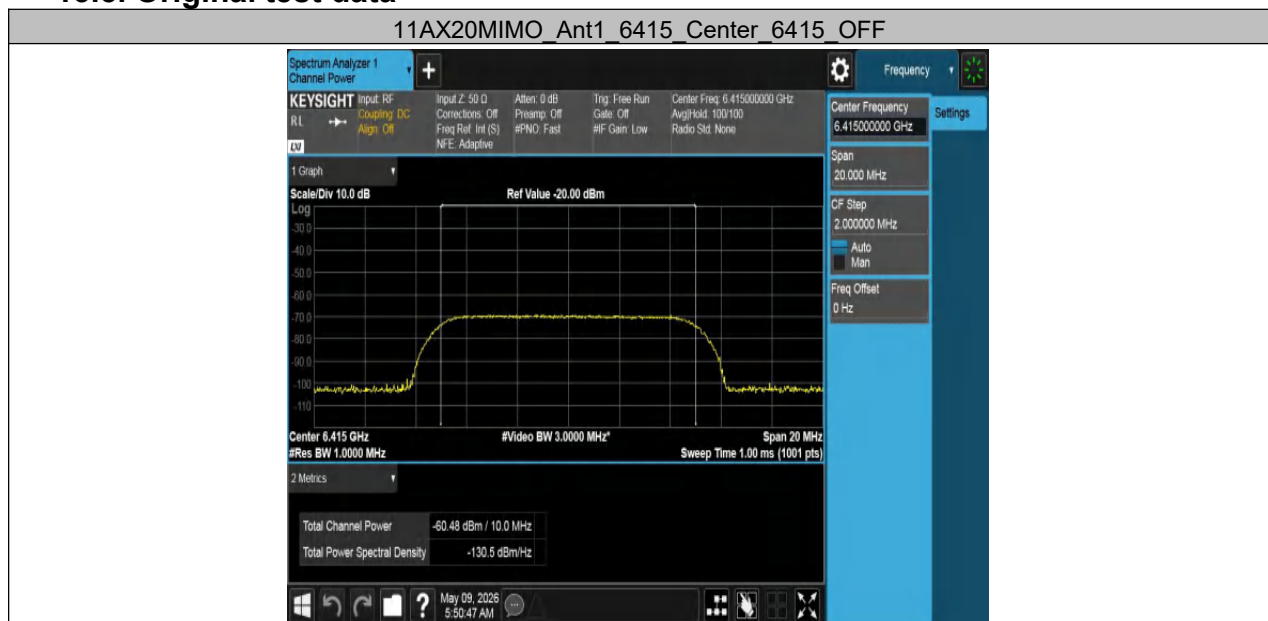
13.4. Test result

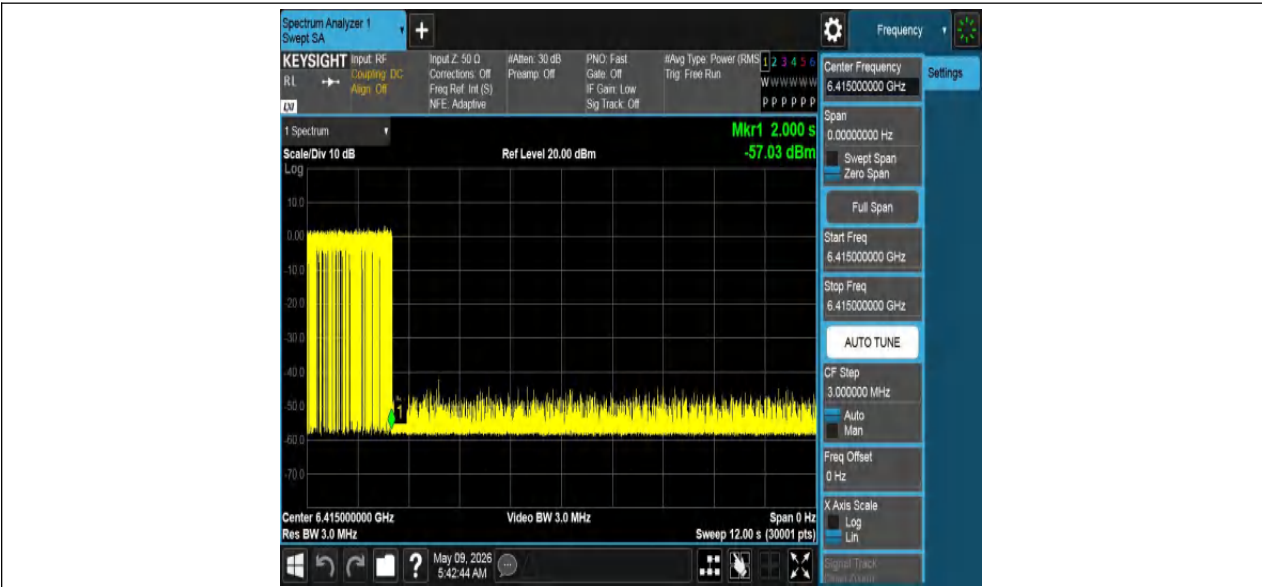
Test Mode	Antenna	Channel	Interference Frequency (MHz)		Status	AWGN Level (dBm)	Adjusted Level (dBm)	Detection Limit (dBm)	Margin (dB)	Detection Rate (%)	Detection Rate Limit (%)	Verdict
11AX20 MIMO	Ant1	6415	Center	6415	OFF	-60.48	-66.53	-62	4.53	90	90	PASS
			Center	6415	Minimal	-61.46	-67.51	-62	---	0	---	---
			Center	6415	ON	-75.95	-82.00	-62	---	---	---	---
		6435	Center	6435	OFF	-62.21	-68.26	-62	6.26	90	90	PASS
			Center	6435	Minimal	-63.22	-69.27	-62	---	10	---	---
			Center	6435	ON	-69.95	-76.00	-62	---	---	---	---
		6535	Center	6535	OFF	-63.14	-69.19	-62	7.19	90	90	PASS
			Center	6535	Minimal	-64.18	-70.23	-62	---	10	---	---
			Center	6535	ON	-80.95	-87.00	-62	---	---	---	---
		6895	Center	6895	OFF	-62.18	-68.23	-62	6.23	90	90	PASS
			Center	6895	Minimal	-63.22	-69.27	-62	---	20	---	---
			Center	6895	ON	-69.95	-76.00	-62	---	---	---	---
11AX80 MIMO	Ant1	6145	Low	6110.9504	OFF	-57.76	-63.81	-62	1.81	100	90	PASS
			Low	6110.9504	Minimal	-58.72	-64.77	-62	---	20	---	---
			Low	6110.9504	ON	-65.95	-72.00	-62	---	---	---	---
			Center	6145	OFF	-58.88	-64.93	-62	2.93	90	90	PASS
			Center	6145	Minimal	-59.89	-65.94	-62	---	30	---	---
			Center	6145	ON	-	-	-62	---	---	---	---

			er			64.9 5	71.0 0					
			High	6179. 0214	OFF	- 64.8 7	- 70.9 2	-62	8.9 2	90	90	PA SS
			High	6179. 0214	Mini mal	- 65.9 1	- 71.9 6	-62	---	20	---	---
			High	6179. 0214	ON	- 64.9 5	- 71.0 0	-62	---	---	---	---
		6465	Low	6430. 7512	OFF	- 67.1 1	- 73.1 6	-62	11. 16	90	90	PA SS
			Low	6430. 7512	Mini mal	- 68.1 1	- 74.1 6	-62	---	10	---	---
			Low	6430. 7512	ON	- 69.9 5	- 76.0 0	-62	---	---	---	---
			Cent er	6465	OFF	- 59.8 2	- 65.8 7	-62	3.8 7	90	90	PA SS
			Cent er	6465	Mini mal	- 60.7 3	- 66.7 8	-62	---	30	---	---
			Cent er	6465	ON	- 70.9 5	- 77.0 0	-62	---	---	---	---
			High	6499. 0092	OFF	- 63.7 8	- 69.8 3	-62	7.8 3	90	90	PA SS
			High	6499. 0092	Mini mal	- 64.7 7	- 70.8 2	-62	---	20	---	---
			High	6499. 0092	ON	- 69.9 5	- 76.0 0	-62	---	---	---	---
		6625	Low	6590. 78	OFF	- 68.0 4	- 74.0 9	-62	12. 09	90	90	PA SS
			Low	6590. 78	Mini mal	- 68.9 9	- 75.0 4	-62	---	20	---	---
			Low	6590. 78	ON	- 69.9 5	- 76.0 0	-62	---	---	---	---
			Cent er	6625	OFF	- 63.0 2	- 69.0 7	-62	7.0 7	100	90	PA SS
			Cent er	6625	Mini mal	-64	- 70.0 5	-62	---	30	---	---
			Cent er	6625	ON	- 70.9 5	- 77.0 0	-62	---	---	---	---
			High	6659. 098	OFF	- 62.8 5	- 68.9 0	-62	6.9 0	100	90	PA SS

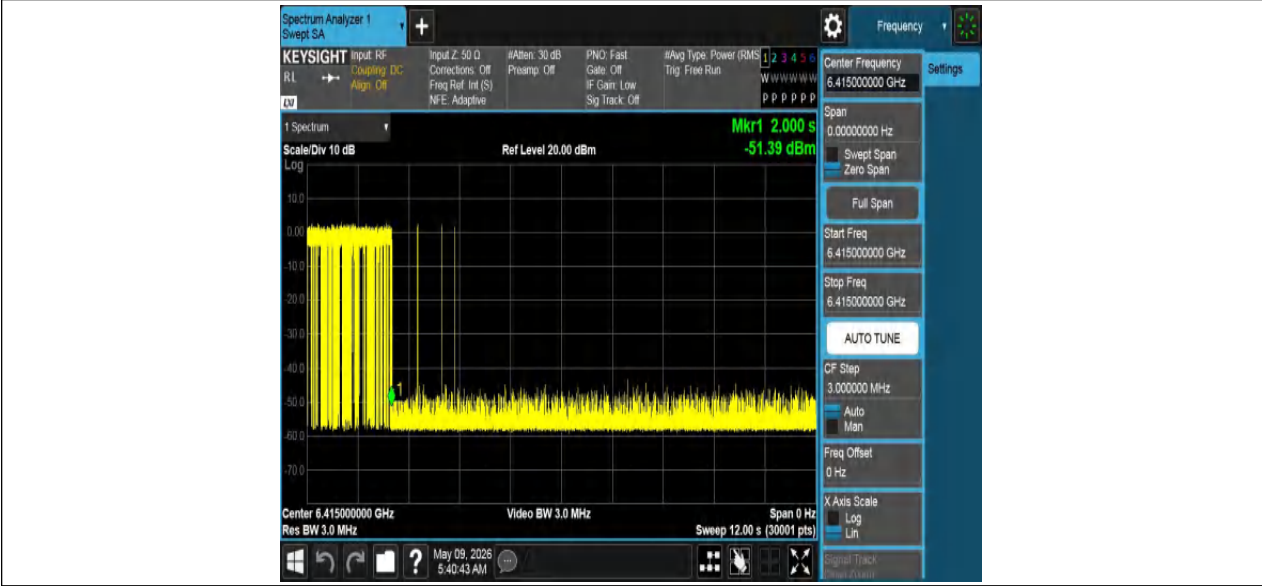
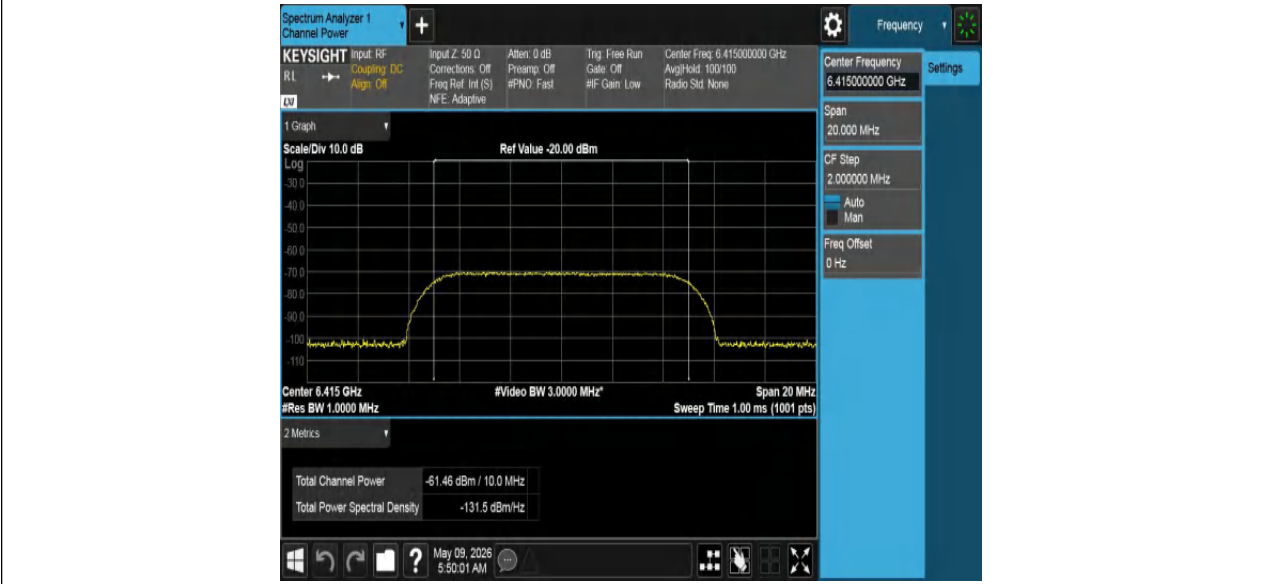
		6865	High	6659.098	Minimal	-63.83	-69.88	-62	---	50	---	---
			High	6659.098	ON	-70.95	-77.00	-62	---	---	---	---
			Low	6831.0123	OFF	-62.8	-68.85	-62	6.85	100	90	PA SS
			Low	6831.0123	Minimal	-63.82	-69.87	-62	---	20	---	---
			Low	6831.0123	ON	-64.95	-71.00	-62	---	---	---	---
			Center	6865	OFF	-63.94	-69.99	-62	7.99	90	90	PA SS
			Center	6865	Minimal	-64.85	-70.90	-62	---	20	---	---
			Center	6865	ON	-64.95	-71.00	-62	---	---	---	---
			High	6899.0773	OFF	-64.14	-70.19	-62	8.19	90	90	PA SS
			High	6899.0773	Minimal	-65.11	-71.16	-62	---	40	---	---
			High	6899.0773	ON	-64.95	-71.00	-62	---	---	---	---

13.5. Original test data

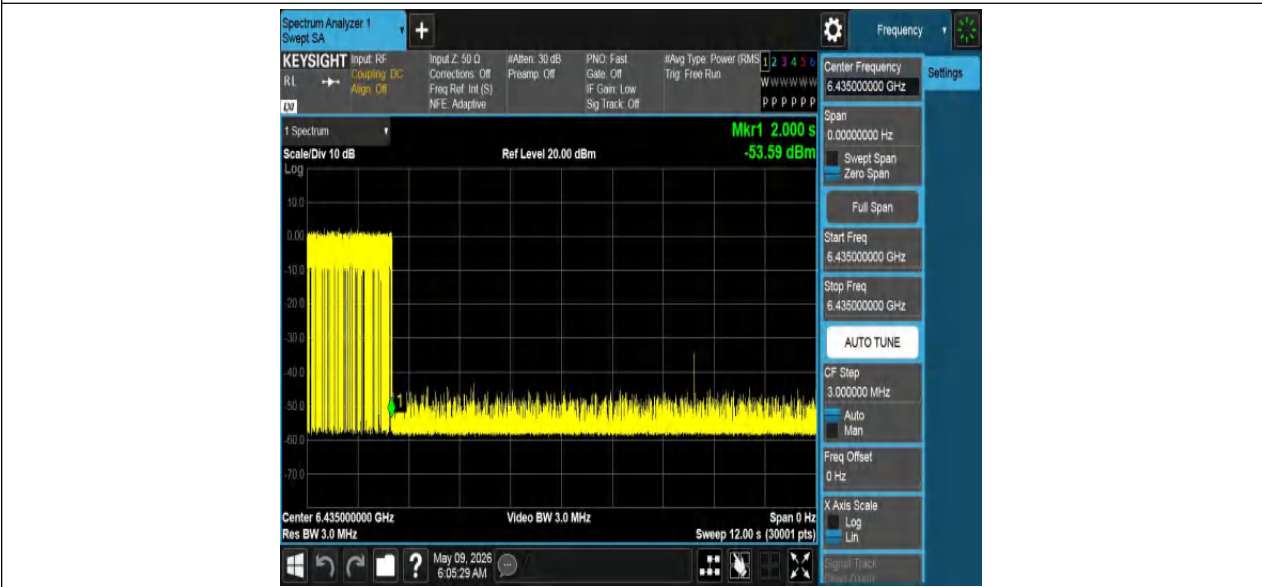
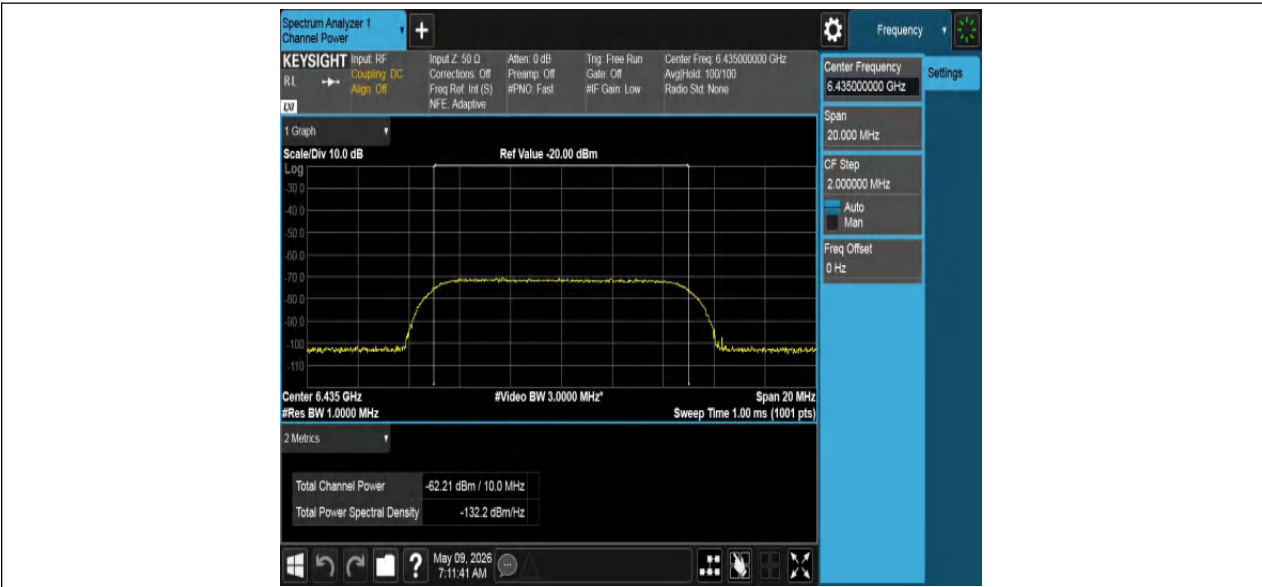




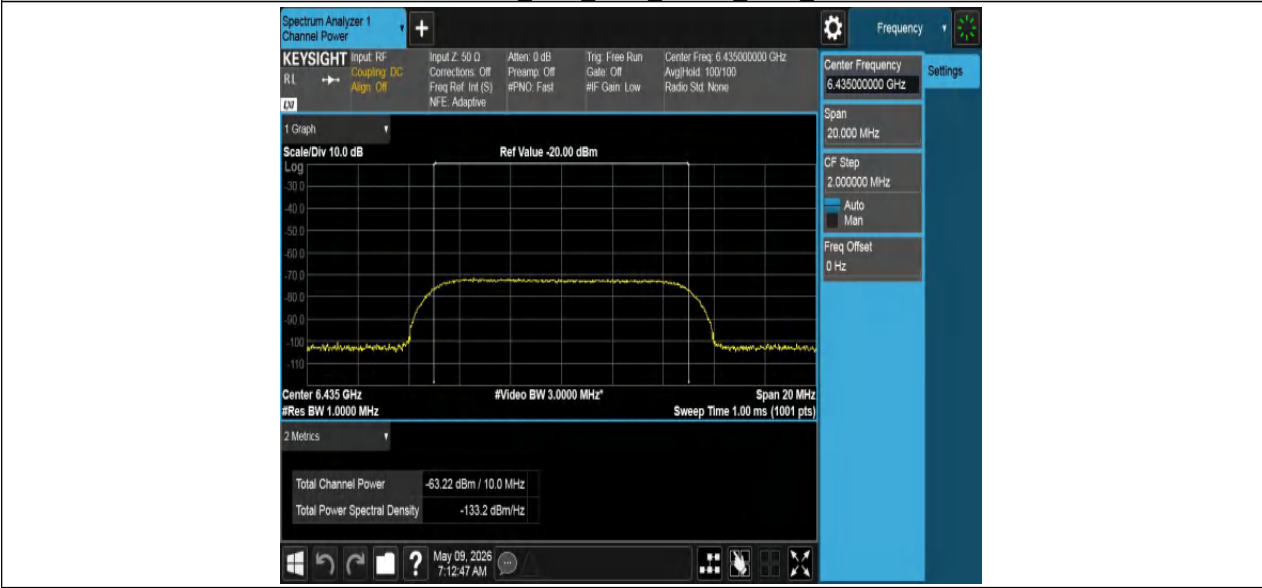
11AX20MIMO_Ant1_6415_Center_6415_Minimal

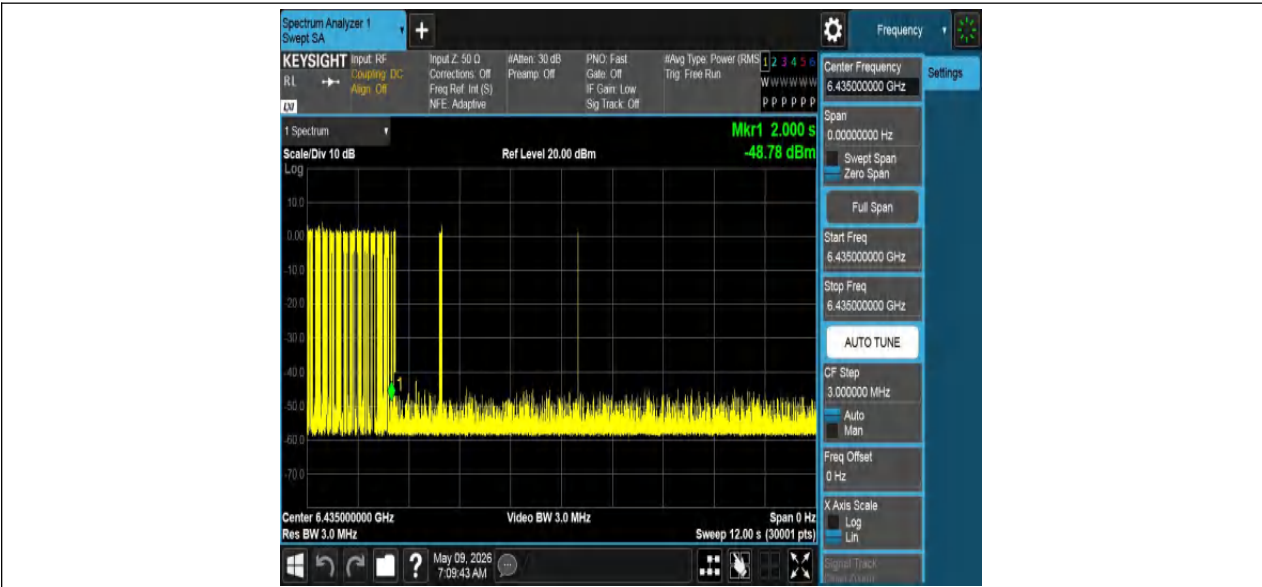


11AX20MIMO_Ant1_6435_Center_6435_OFF

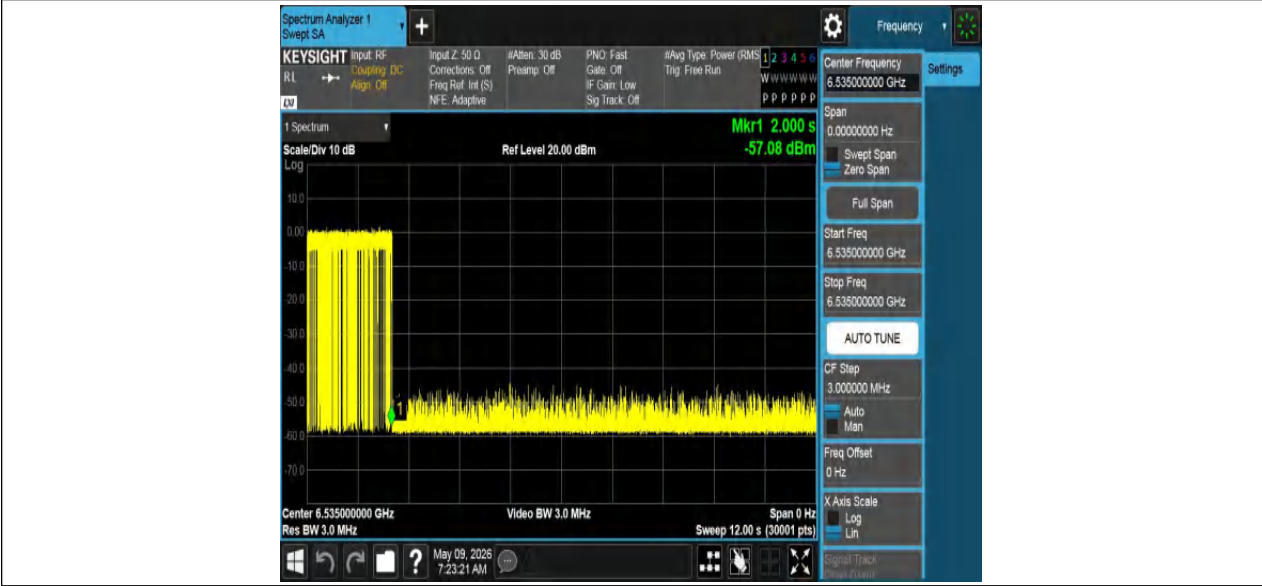
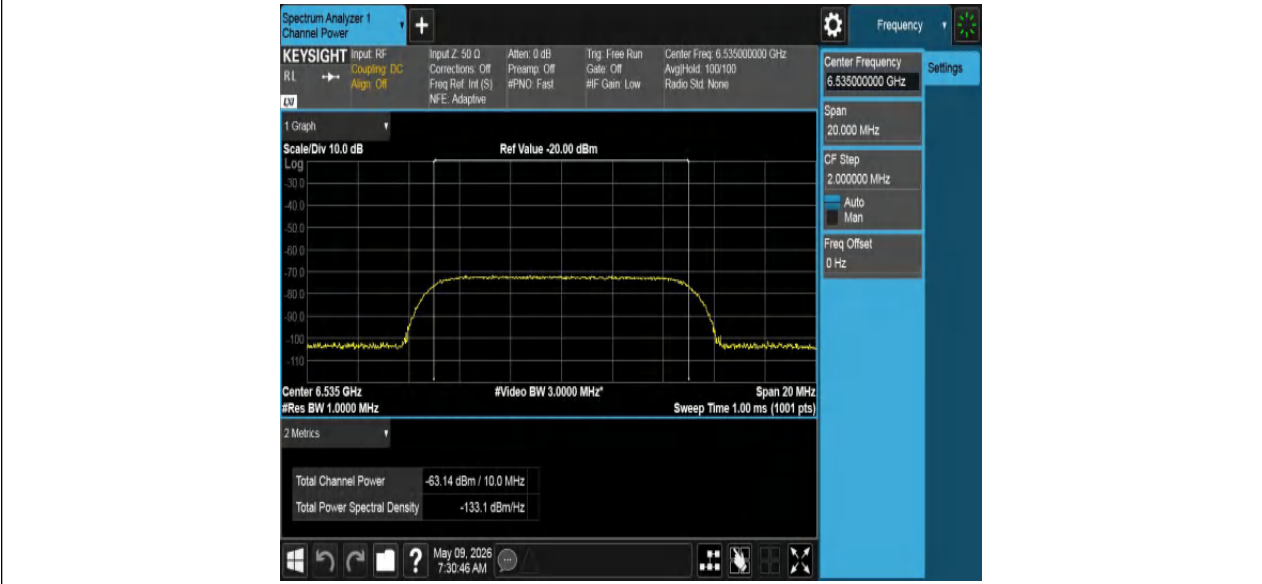


11AX20MIMO_Ant1_6435 Center 6435_Minimal

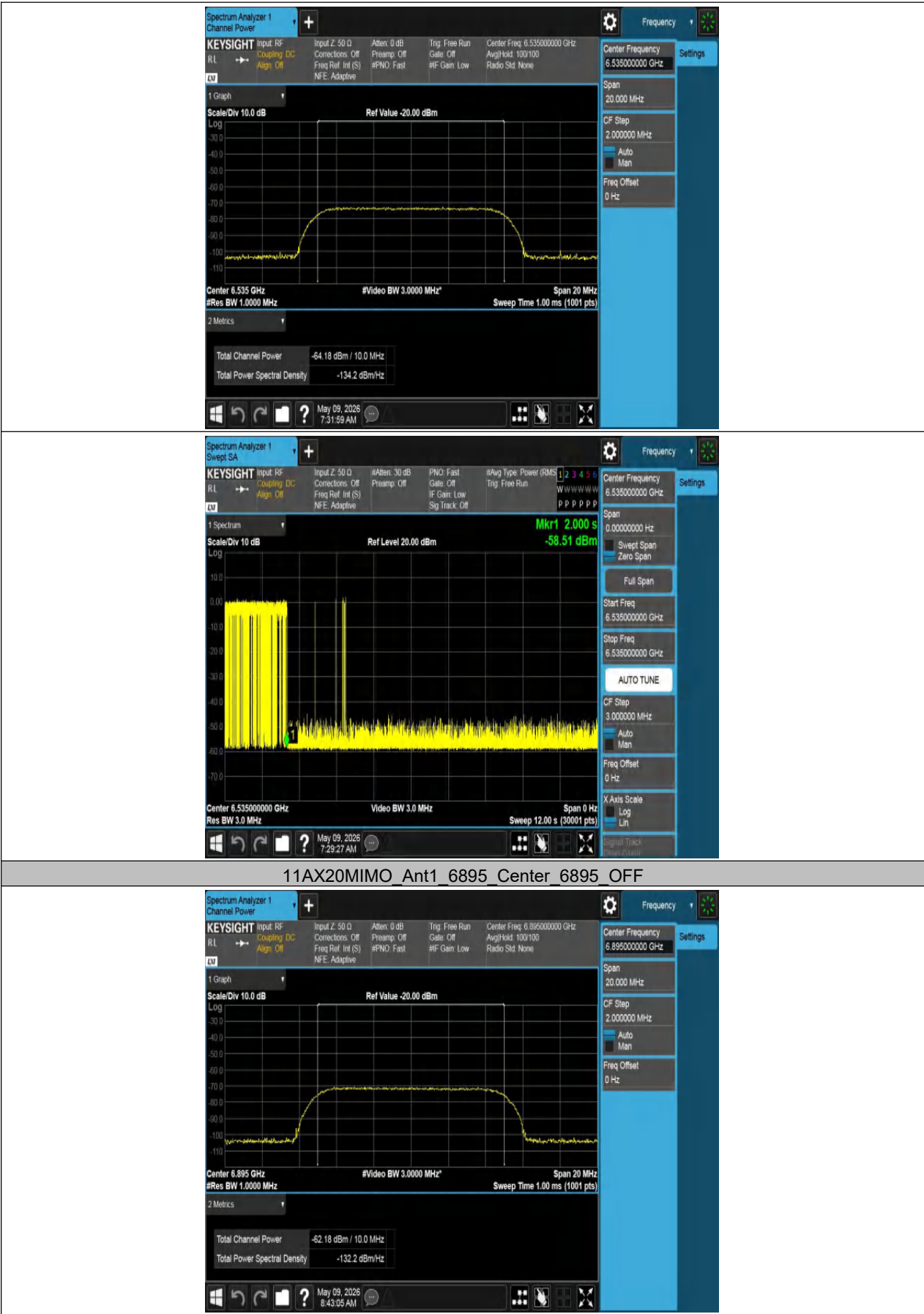




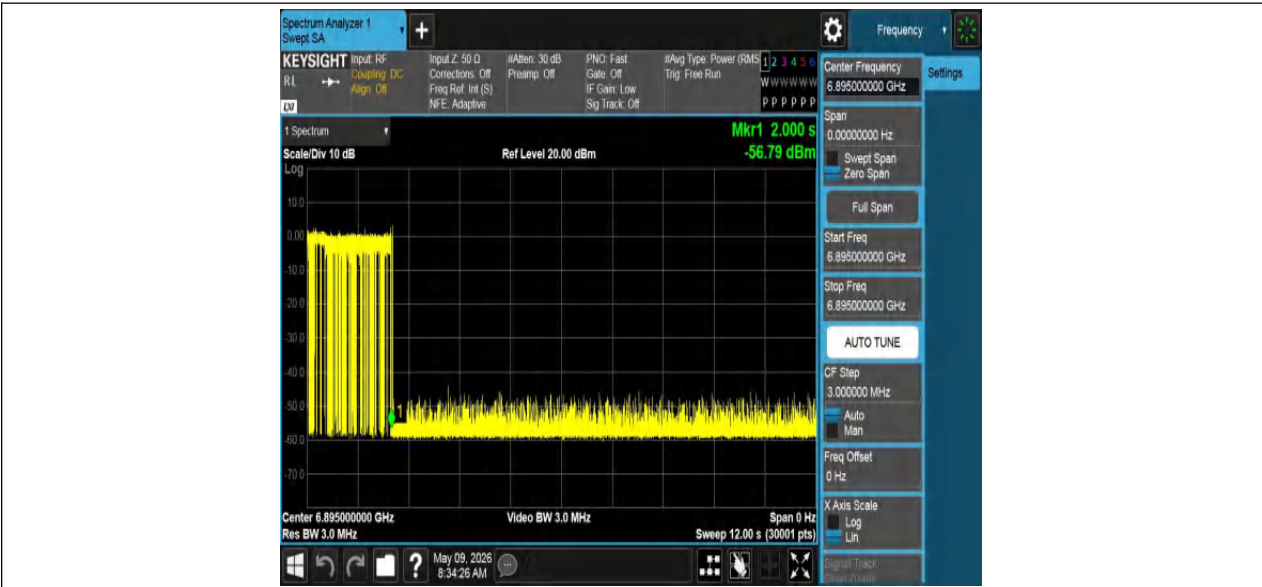
11AX20MIMO_Ant1_6535_Center_6535_OFF



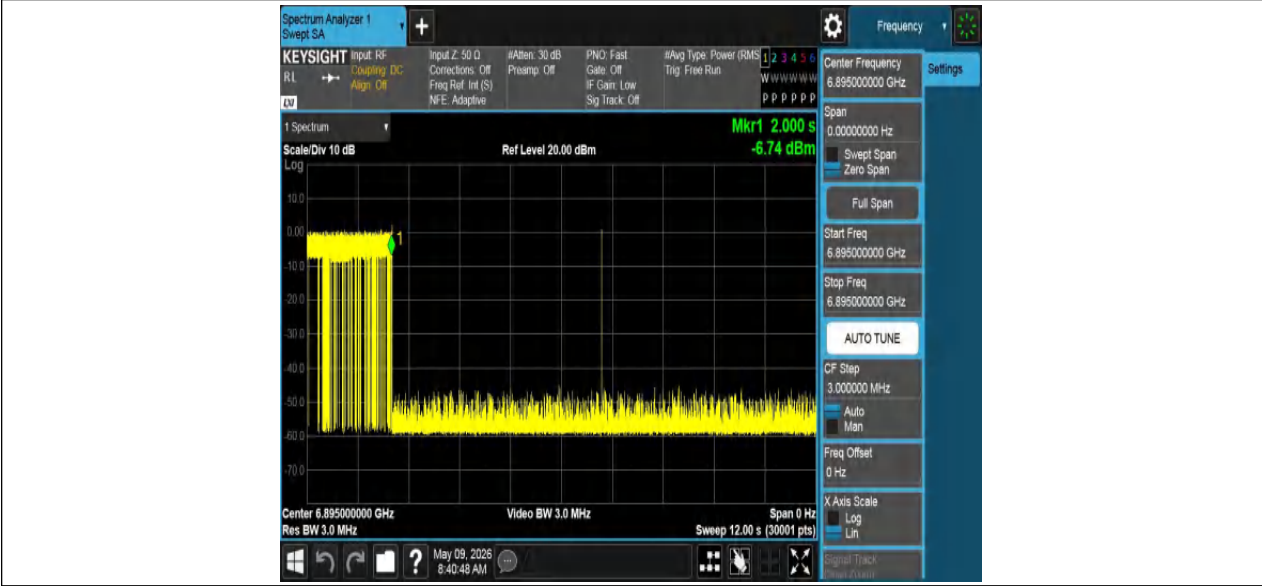
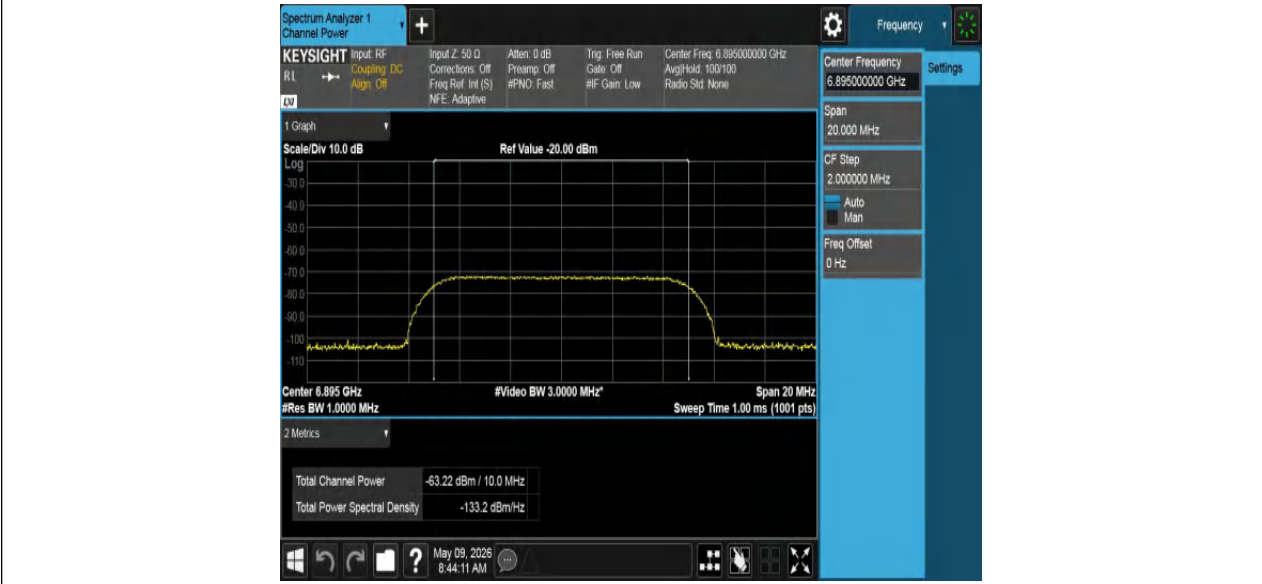
11AX20MIMO_Ant1_6535_Center_6535_Minimal



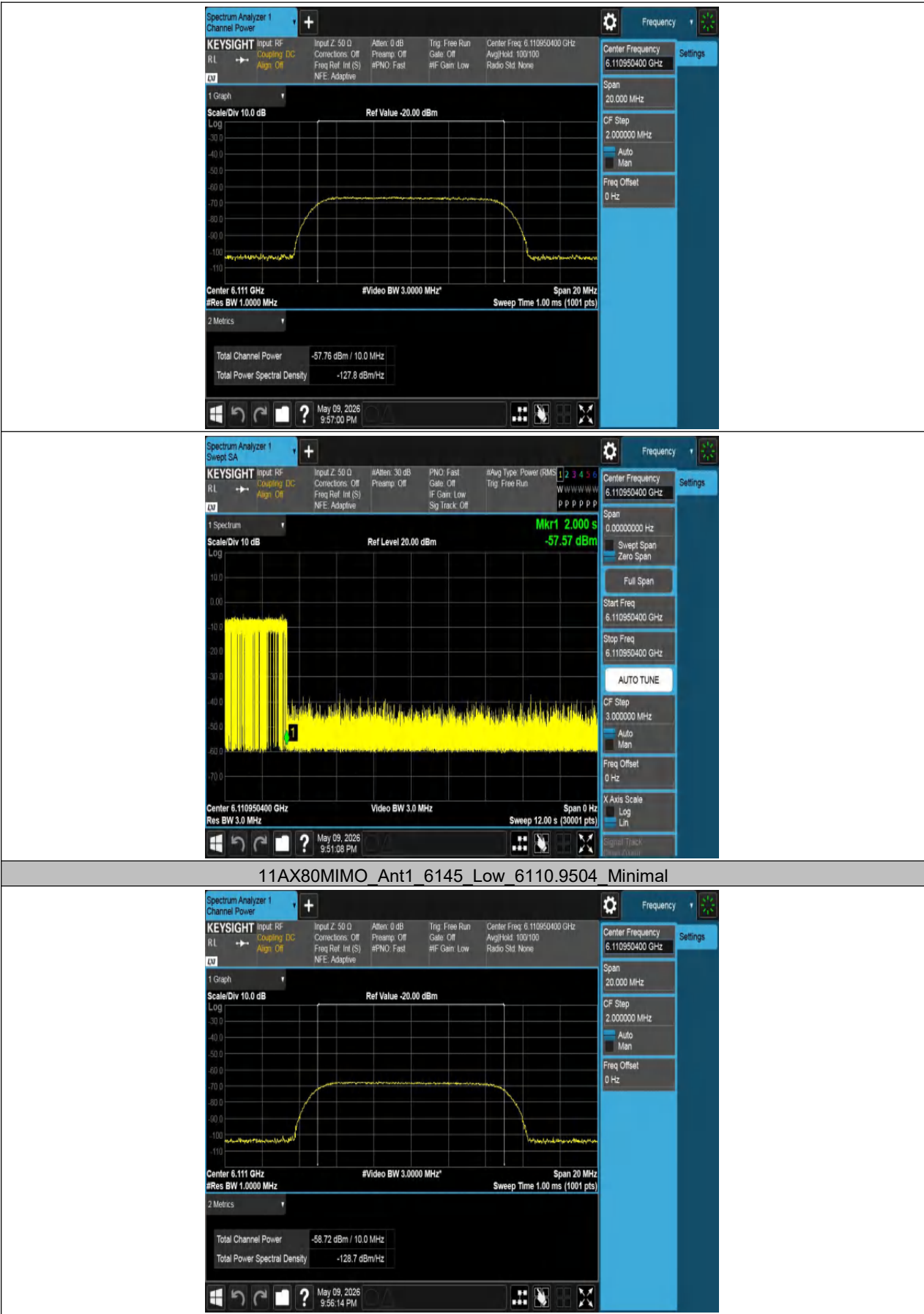
11AX20MIMO_Ant1_6895 Center 6895 OFF



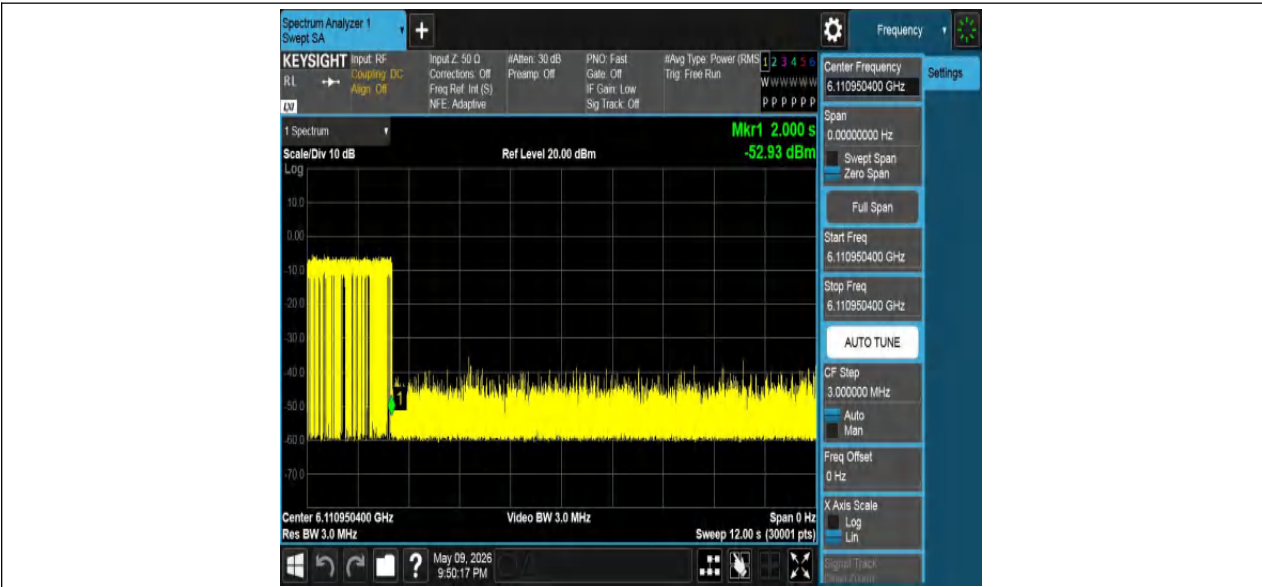
11AX20MIMO_Ant1_6895_Center_6895_Minimal



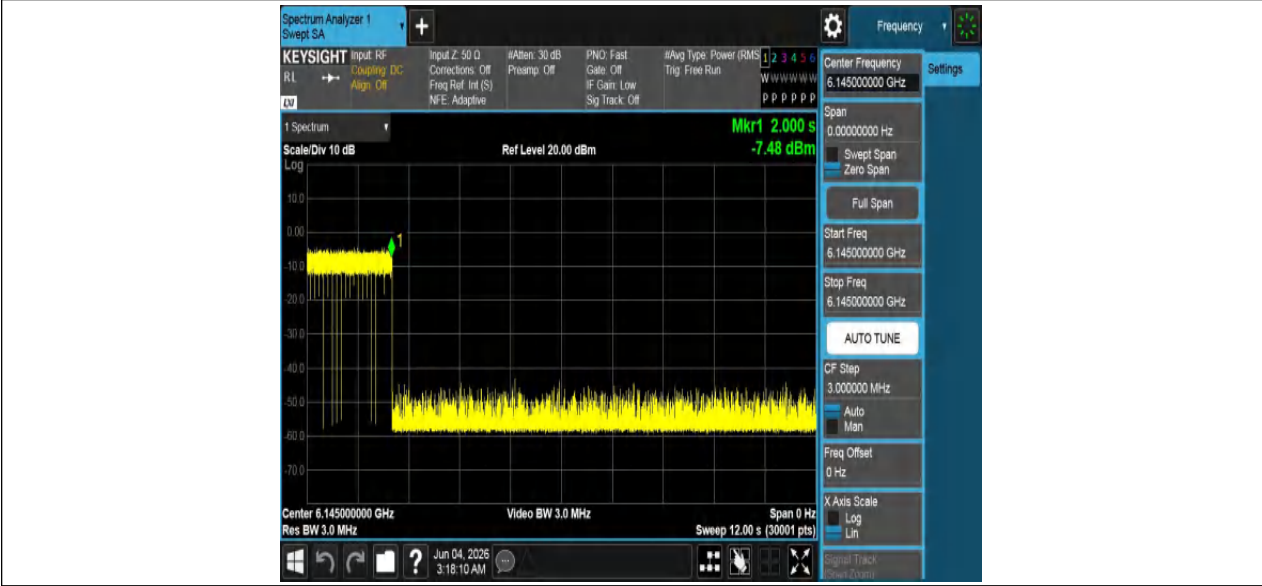
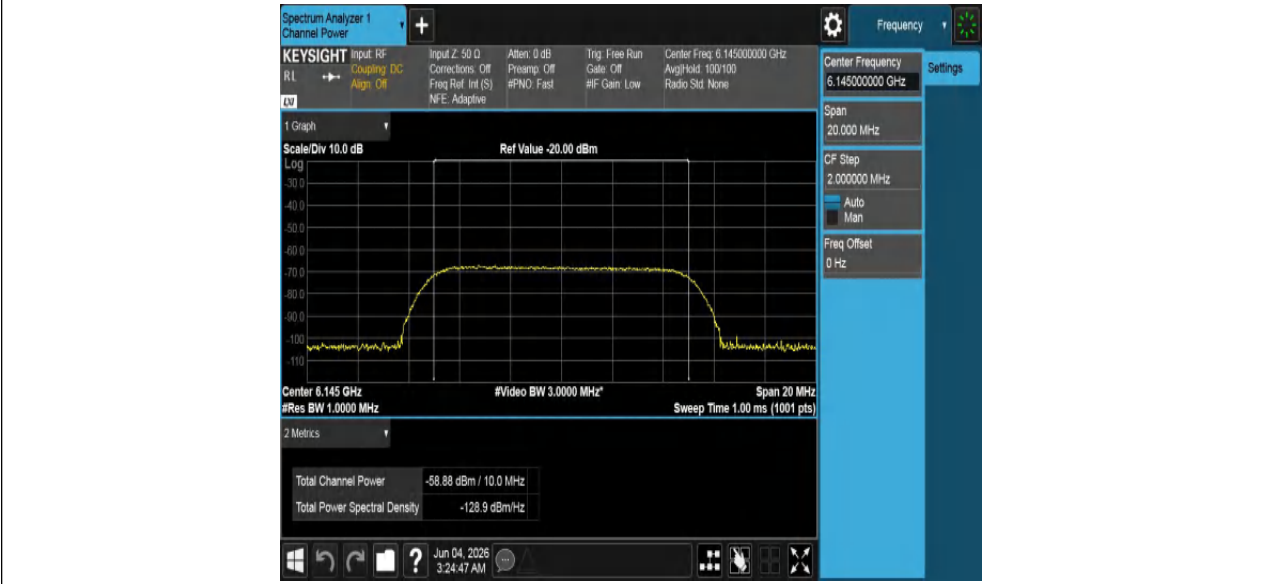
11AX80MIMO_Ant1_6145_Low_6110.9504_OFF



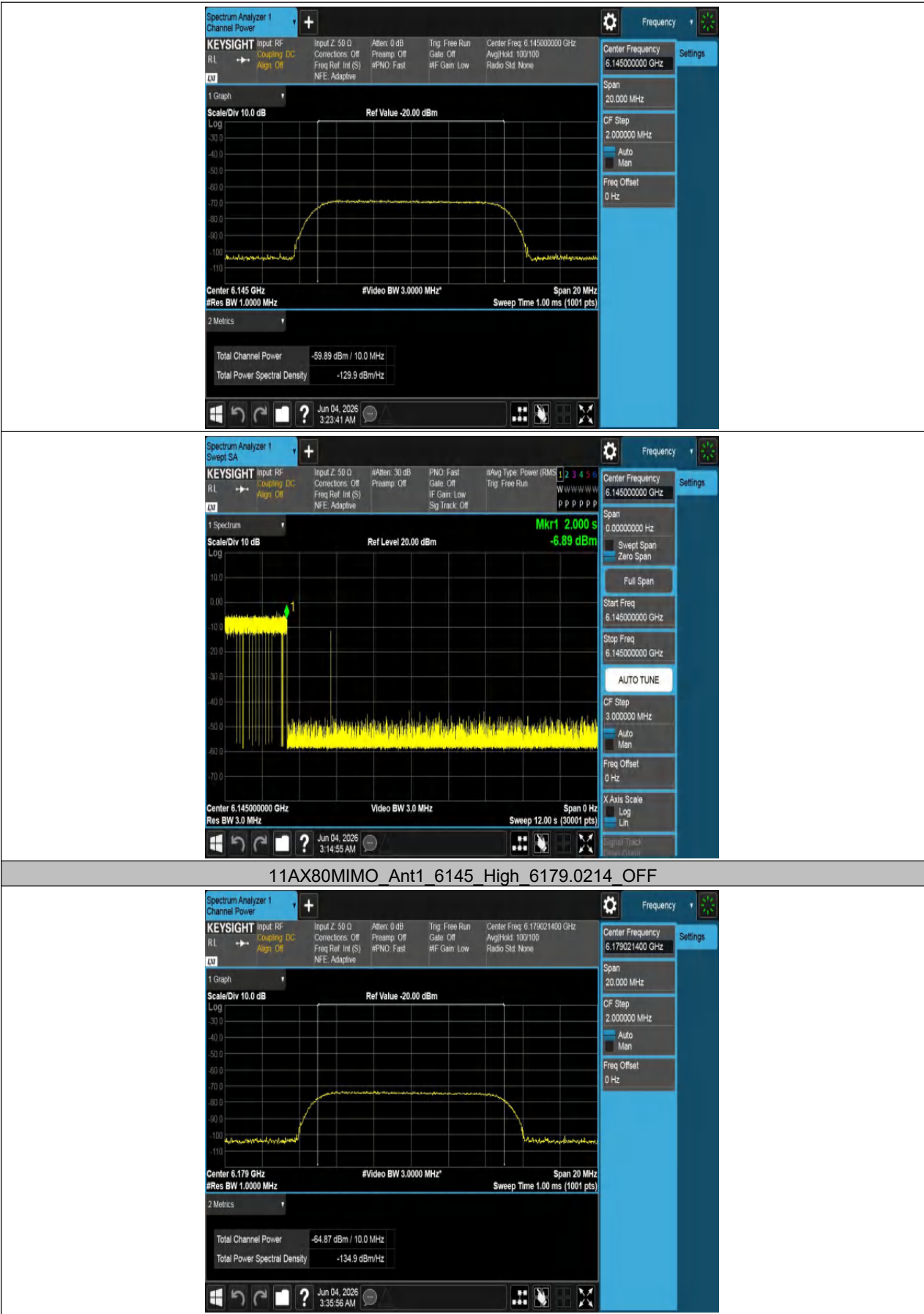
11AX80MIMO_Ant1_6145_Low_6110.9504_Minimal



11AX80MIMO_Ant1_6145_Center_6145_OFF

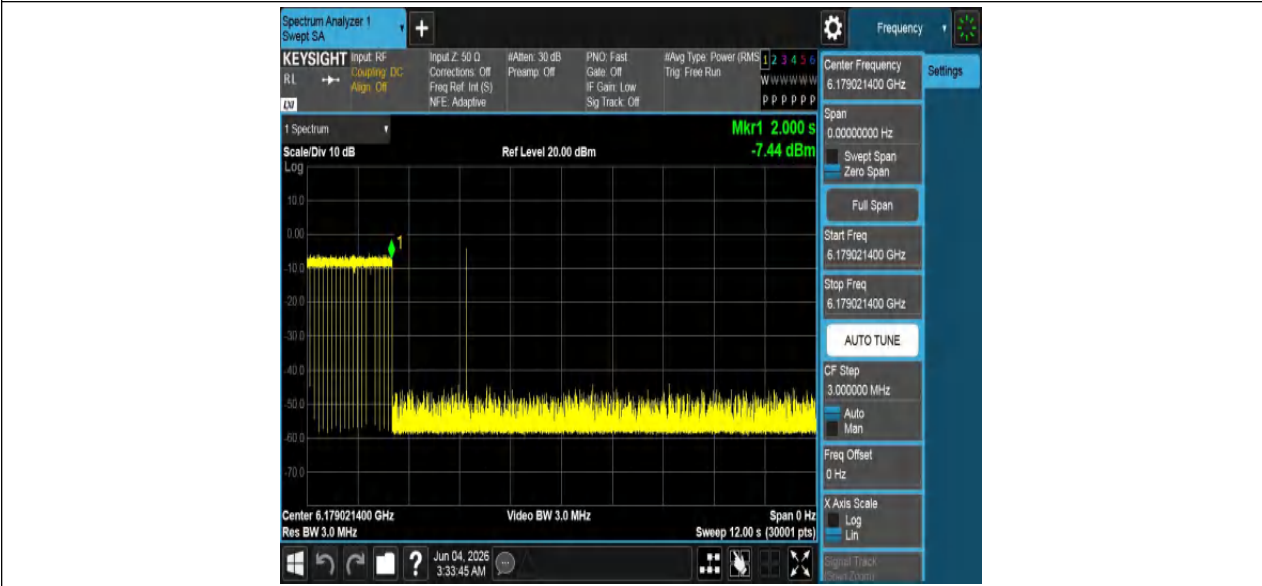
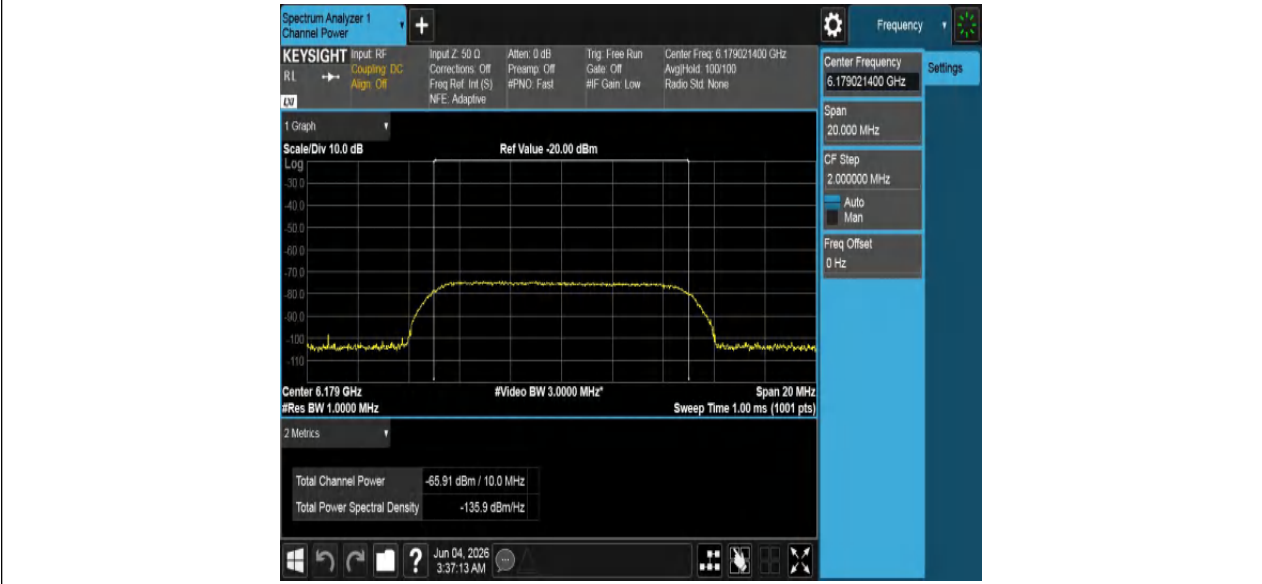


11AX80MIMO_Ant1_6145_Center_6145_Minimal

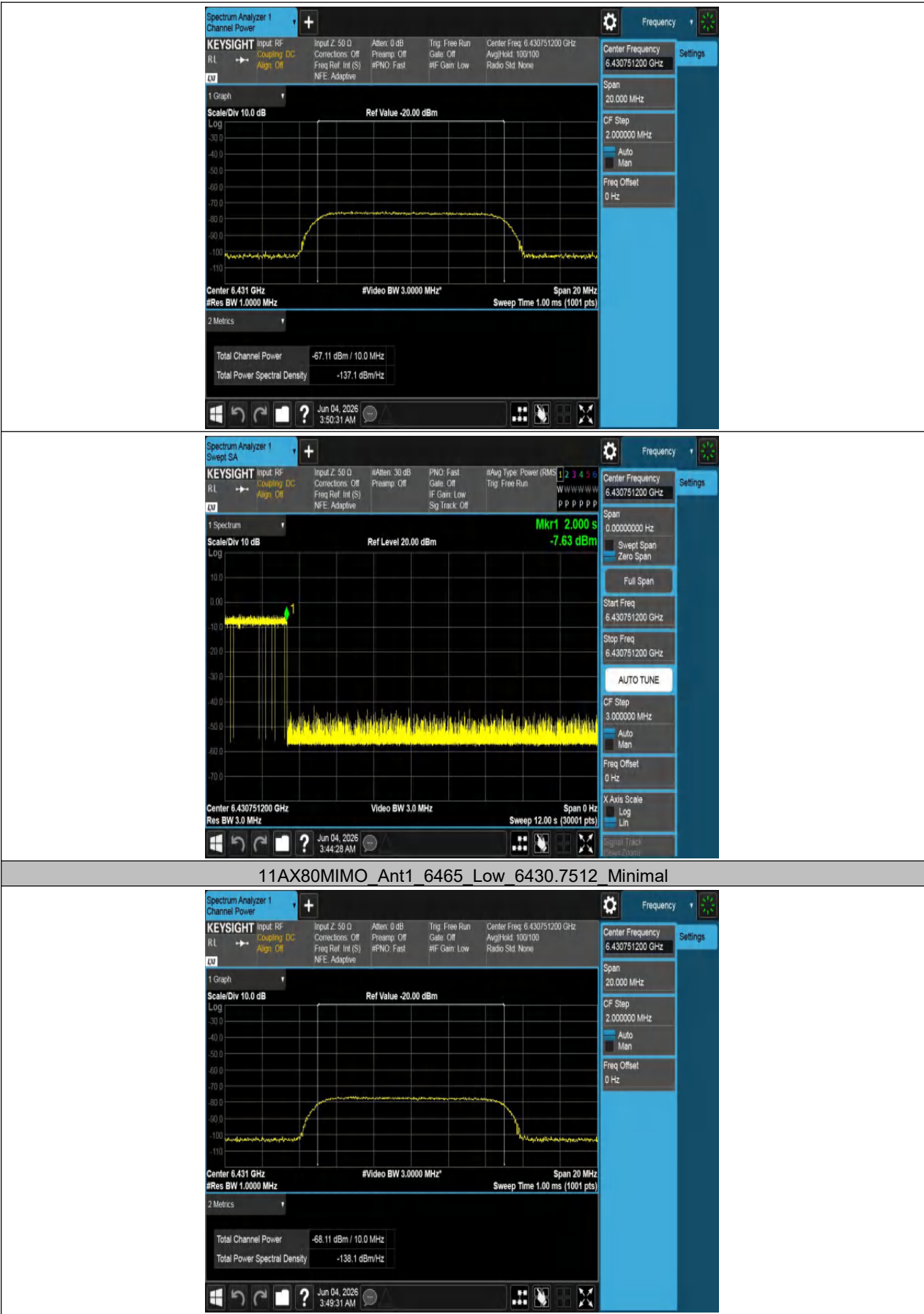




11AX80MIMO_Ant1_6145_High_6179.0214_Minimal



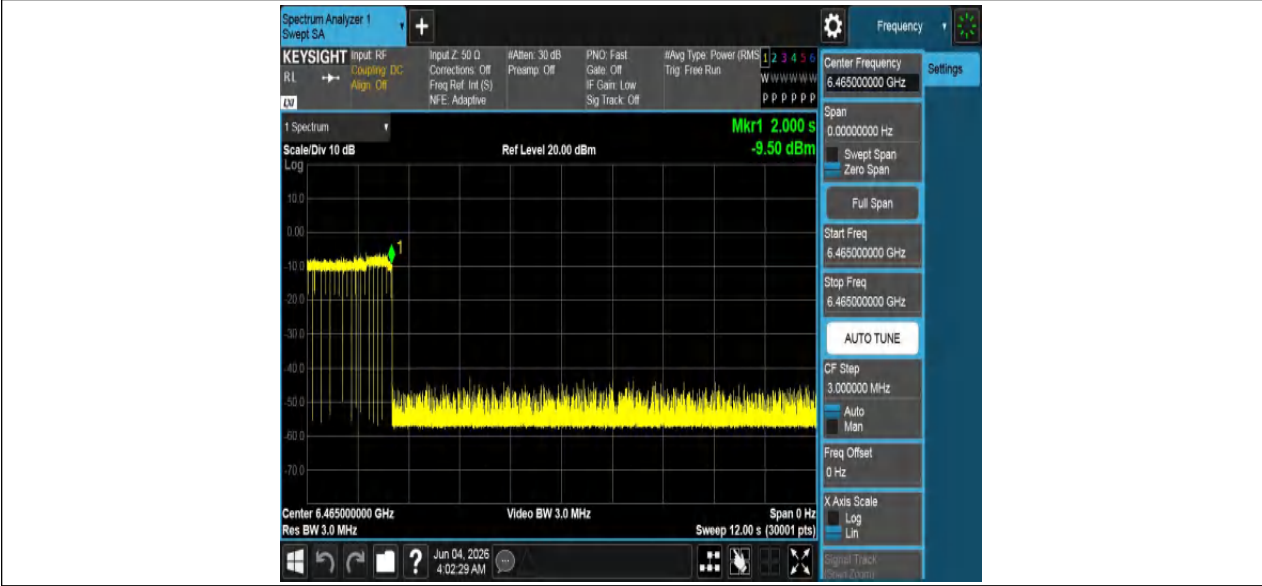
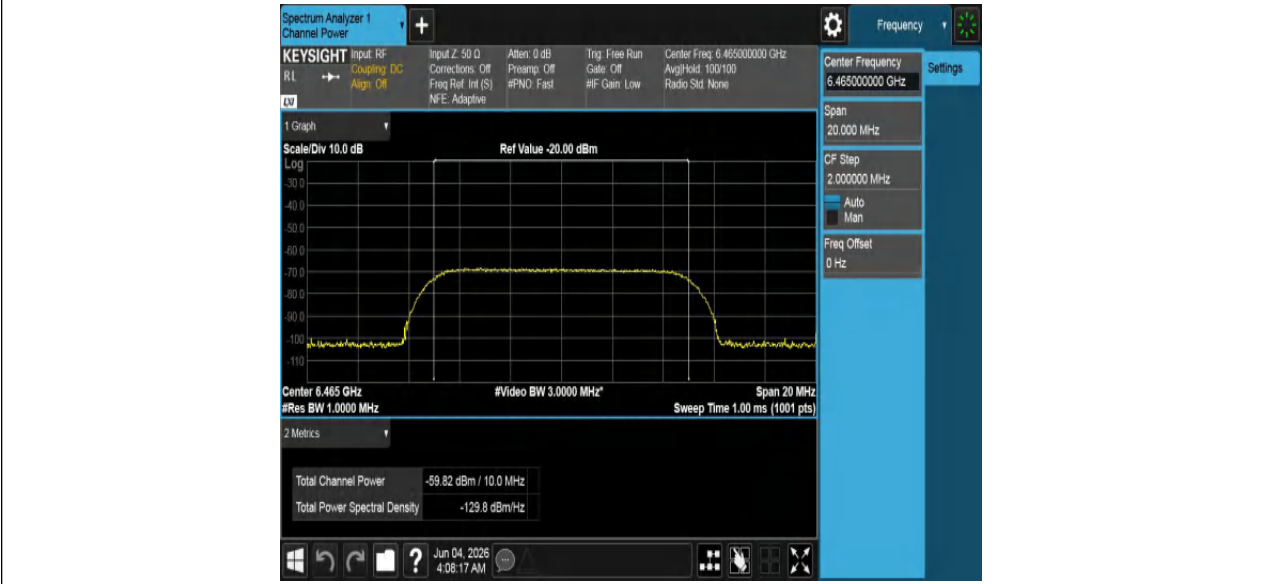
11AX80MIMO_Ant1_6465_Low_6430.7512_OFF



11AX80MIMO_Ant1_6465_Low_6430.7512_Minimal



11AX80MIMO_Ant1_6465_Center_6465_OFF



11AX80MIMO_Ant1_6465_Center_6465_Minimal