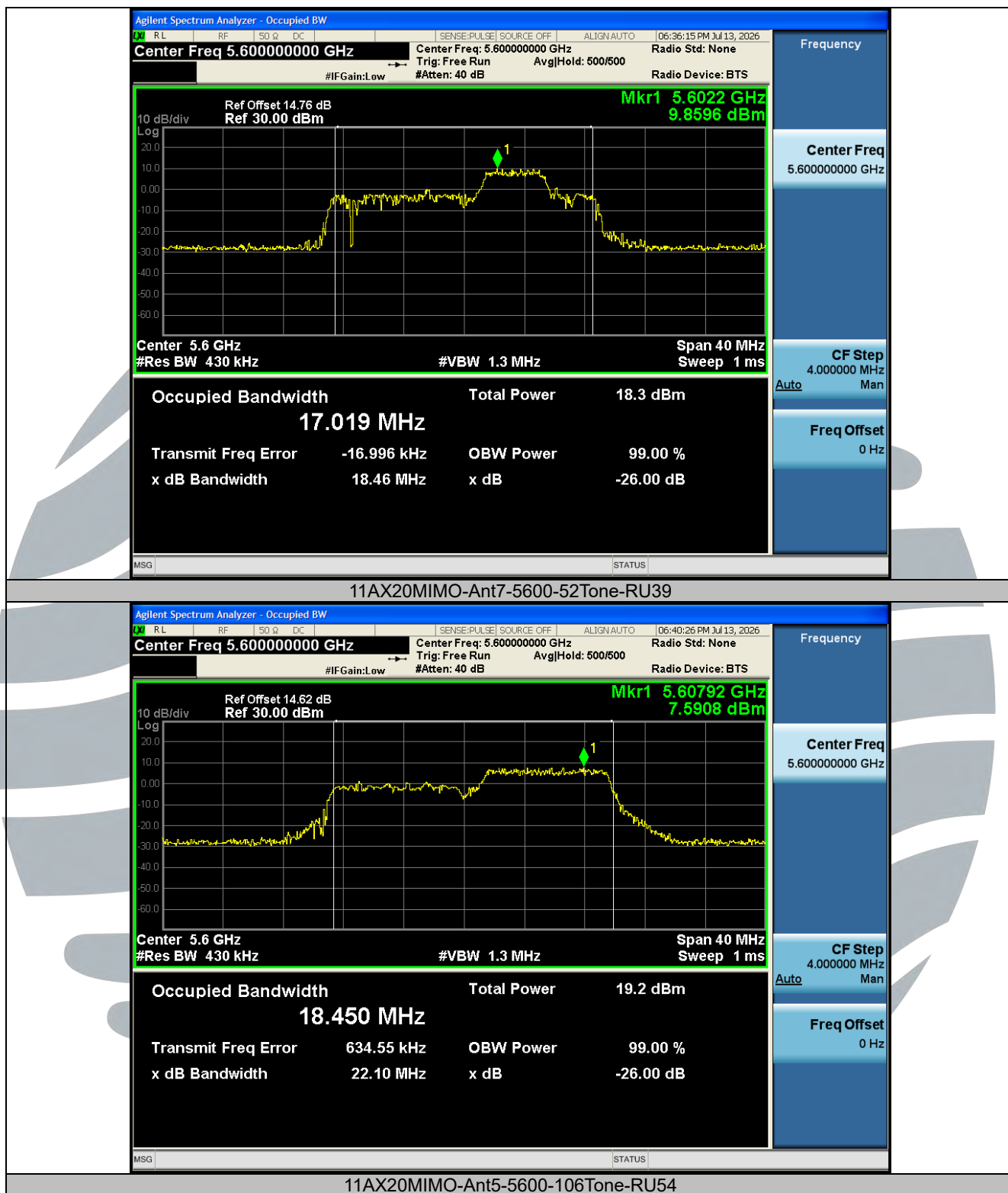


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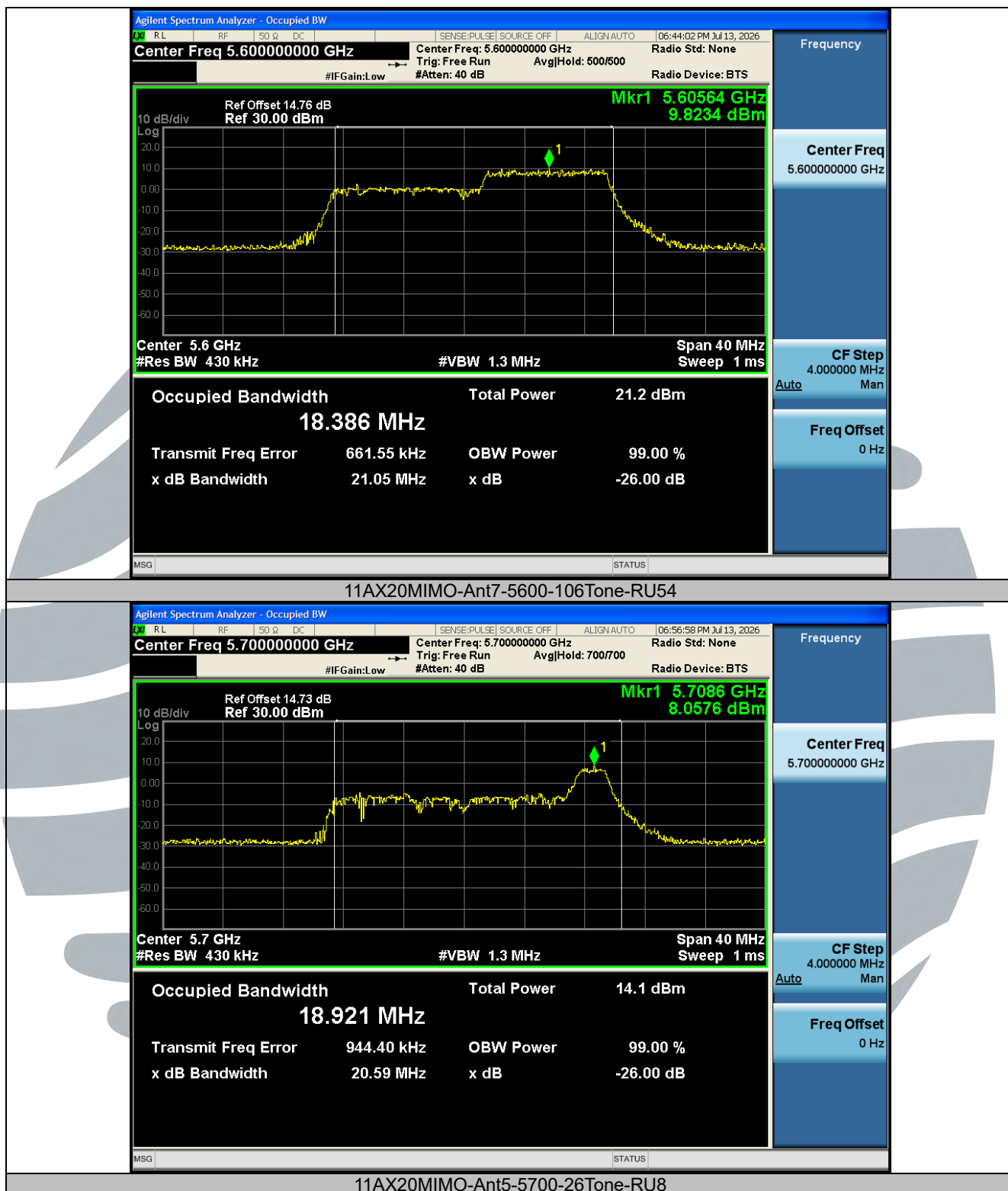
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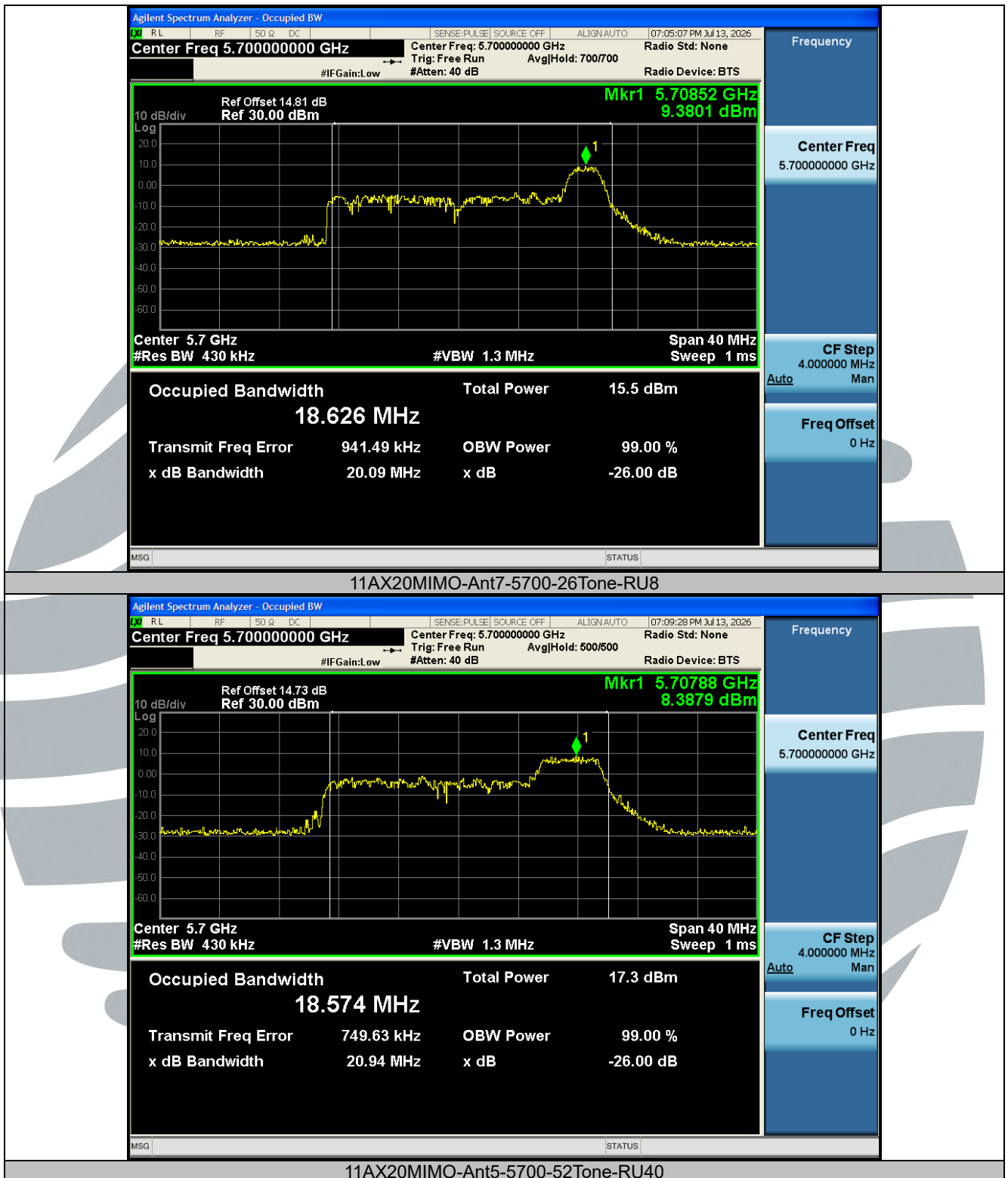
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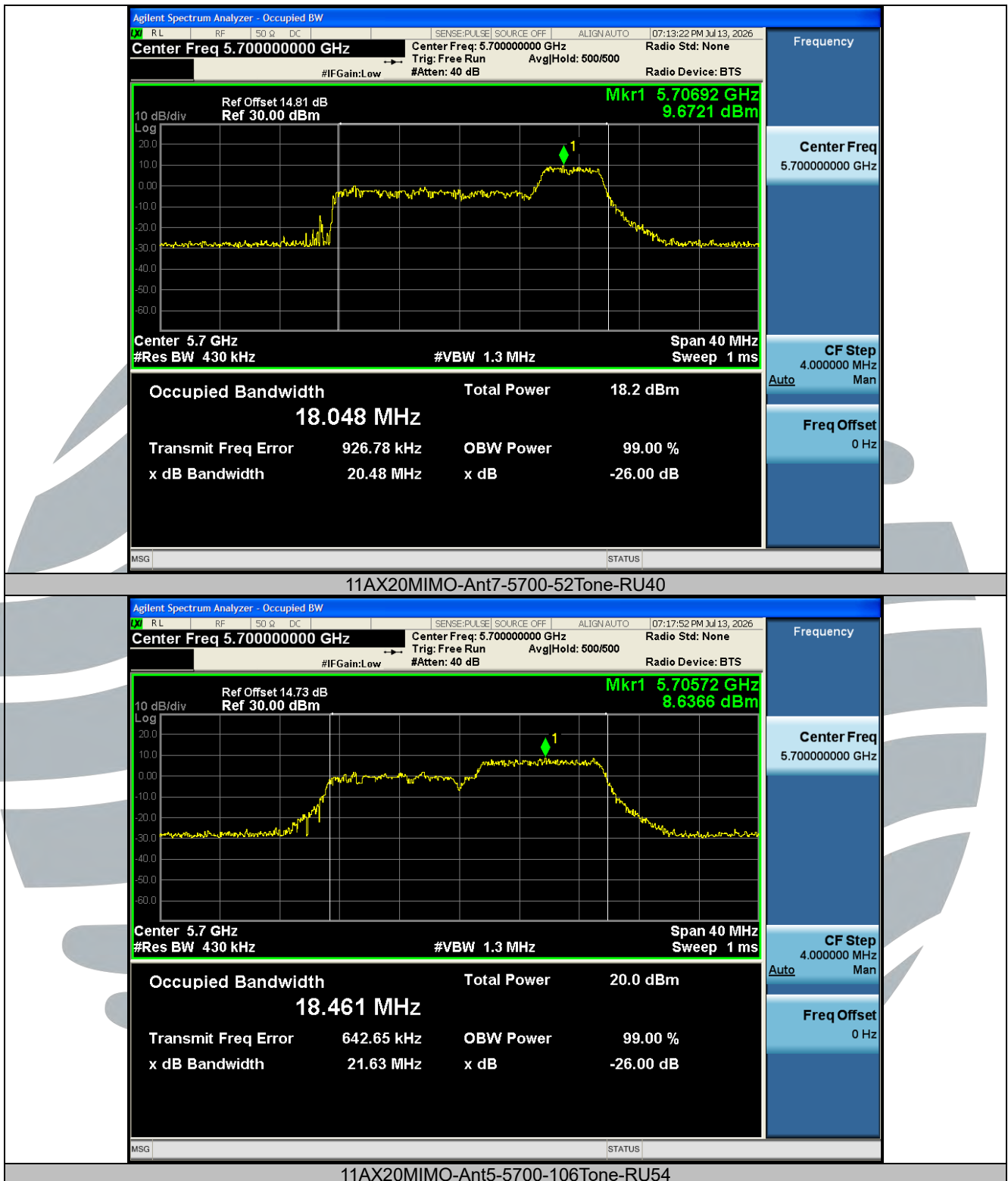
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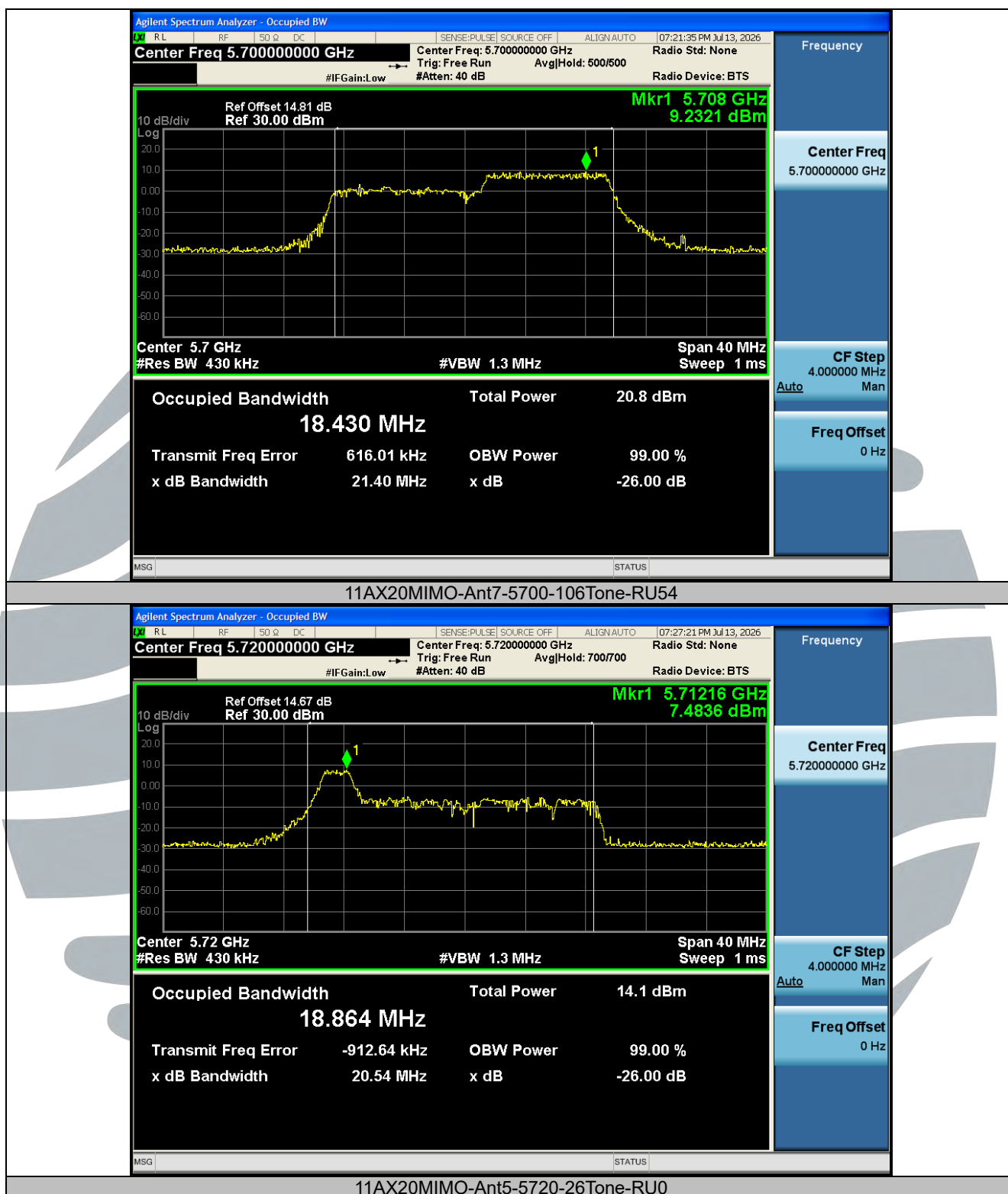
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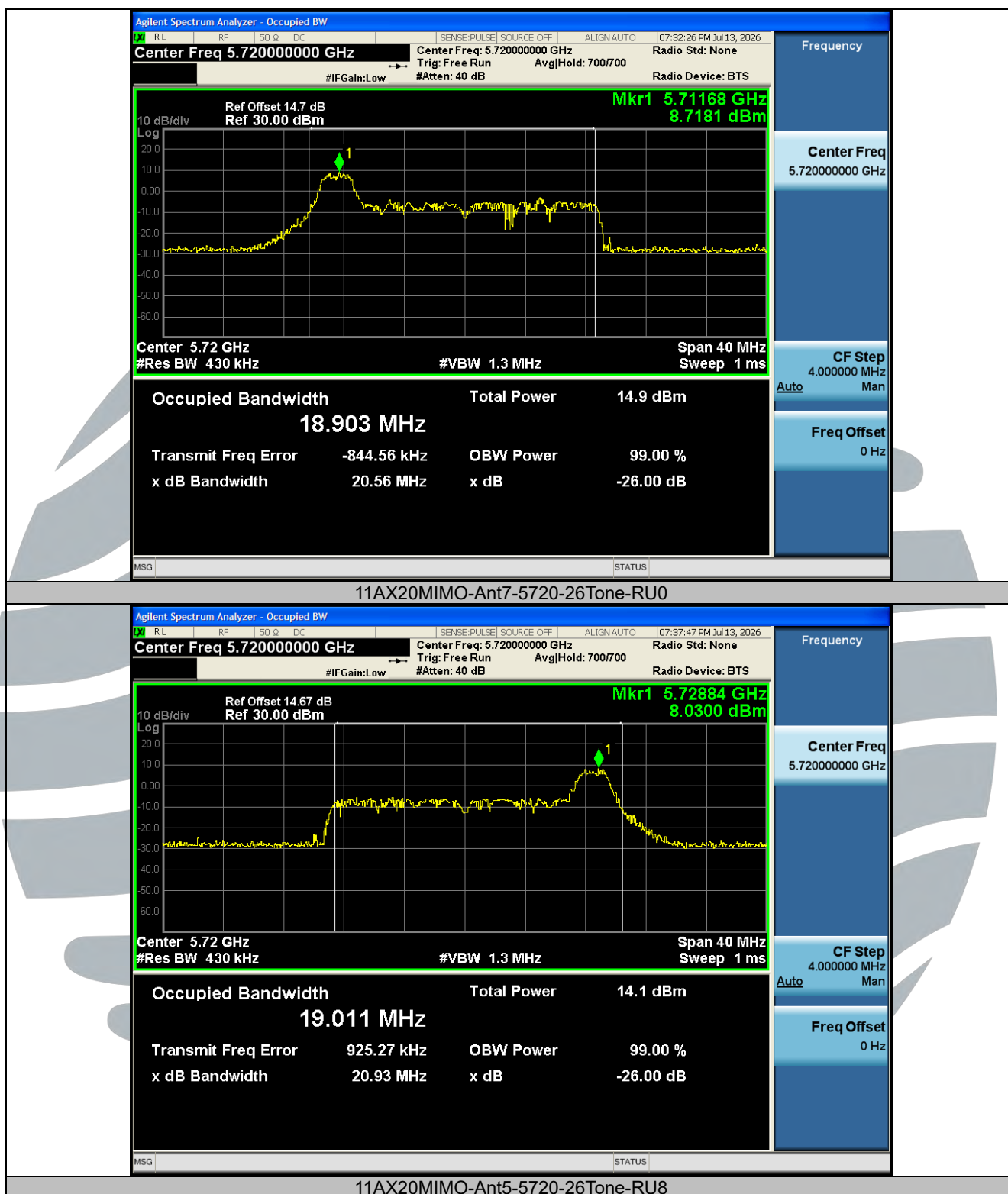
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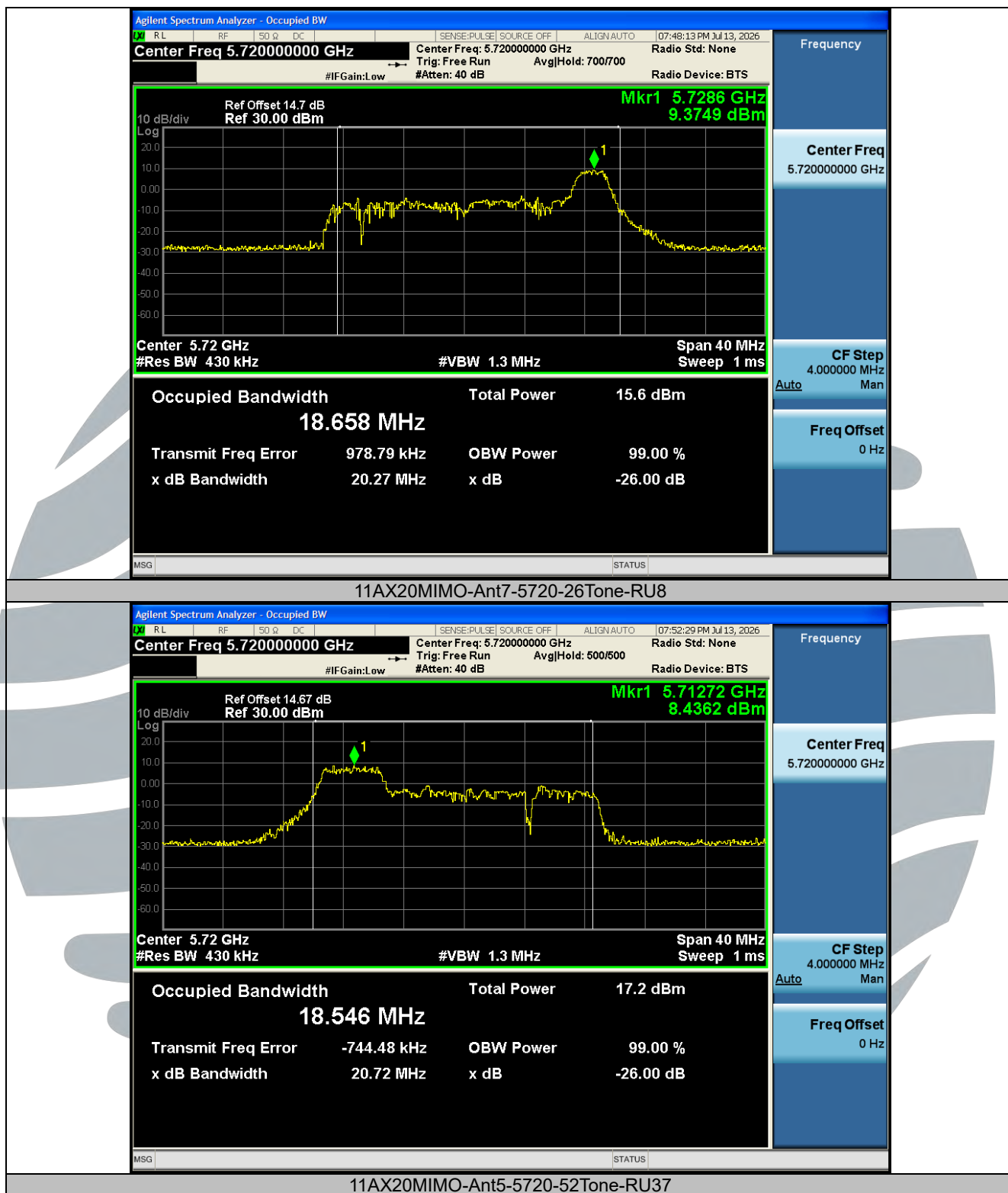
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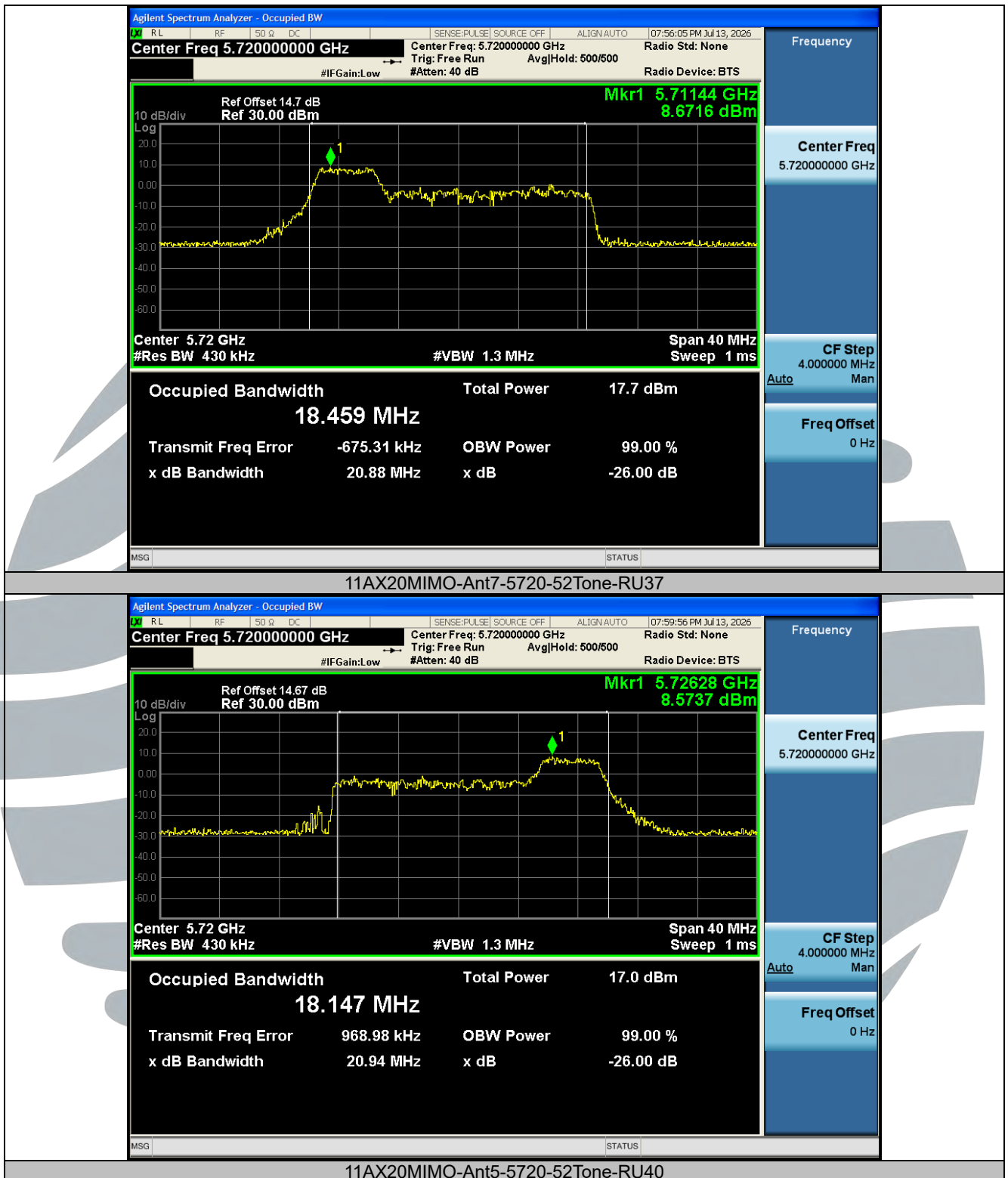
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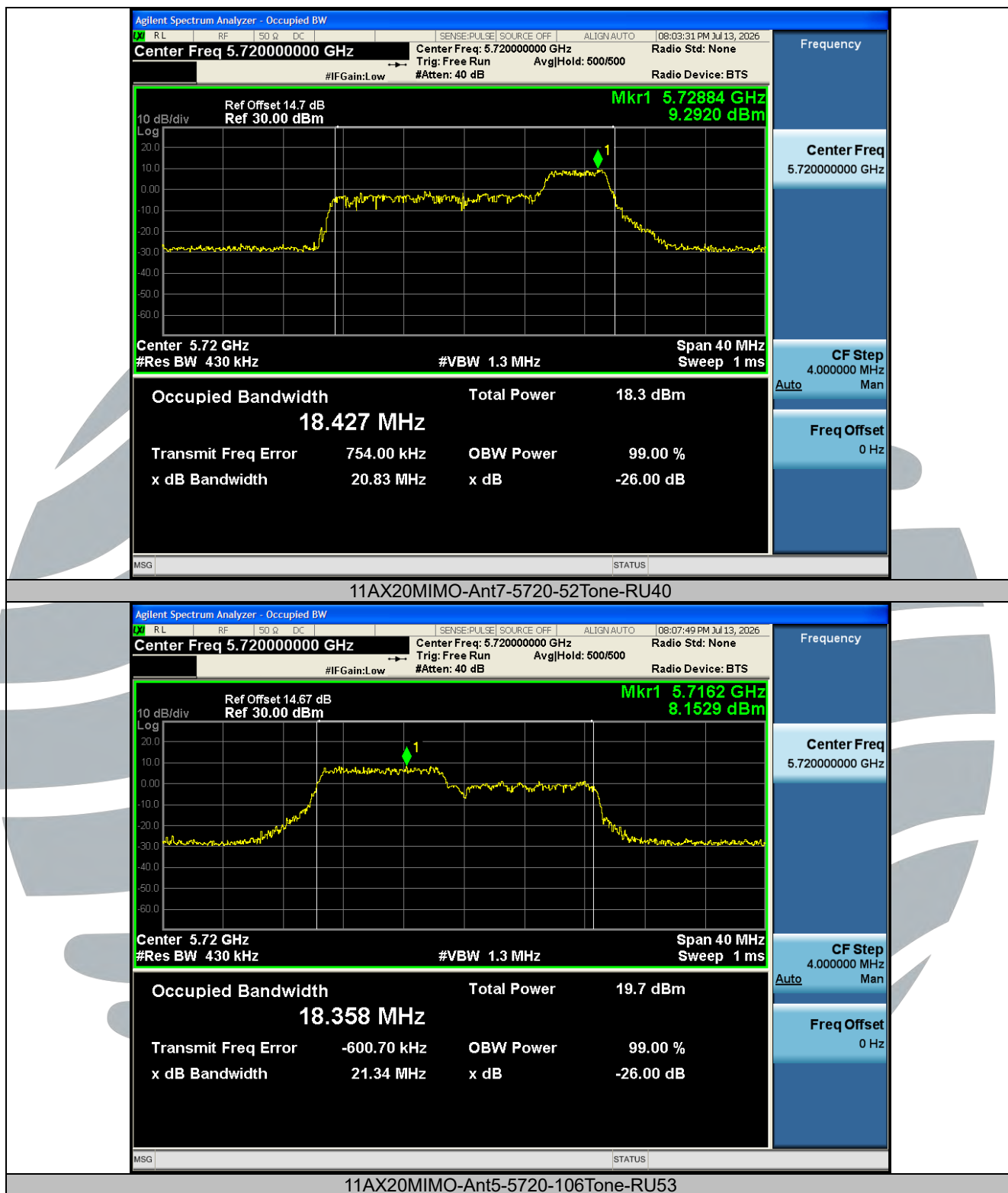
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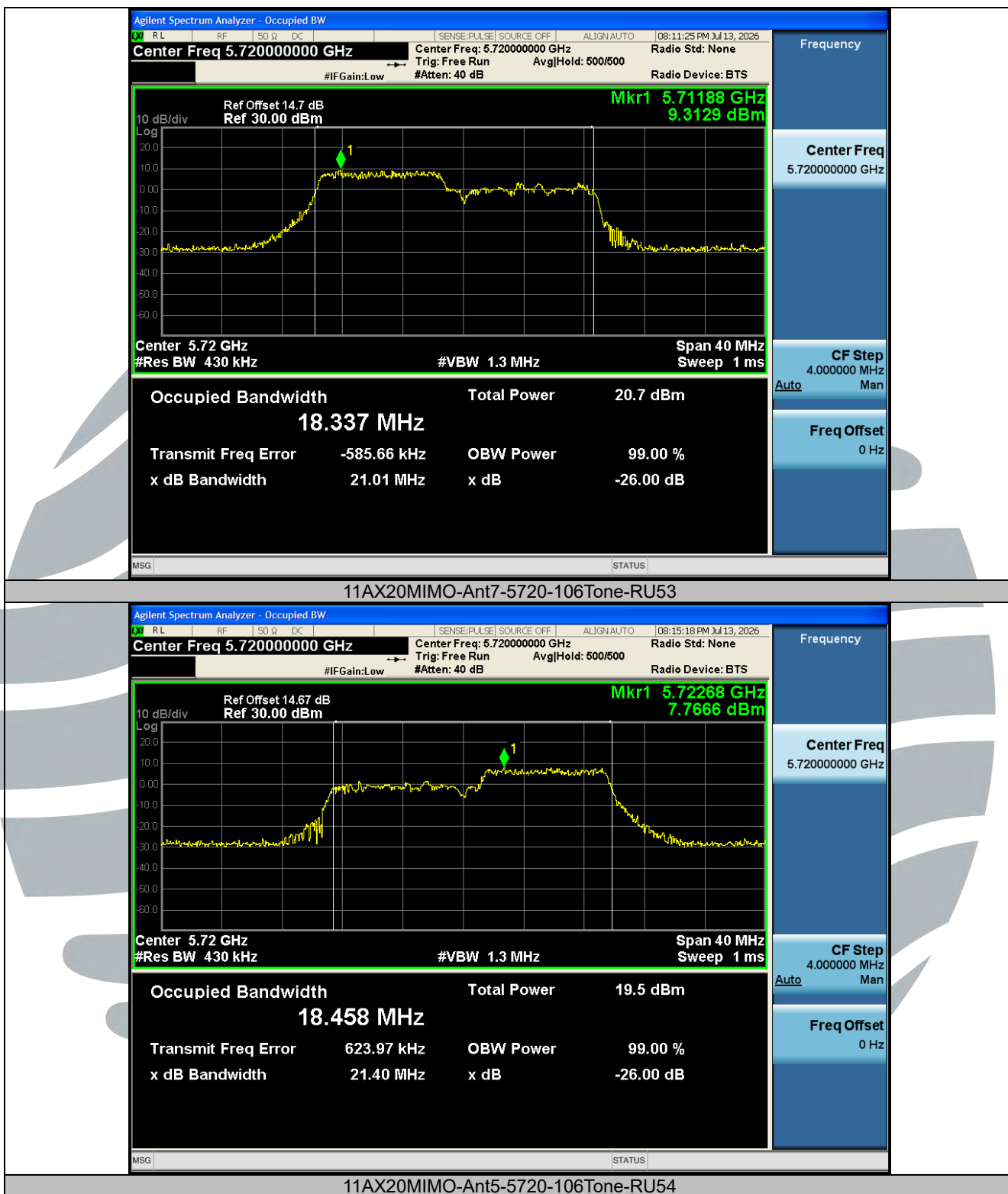
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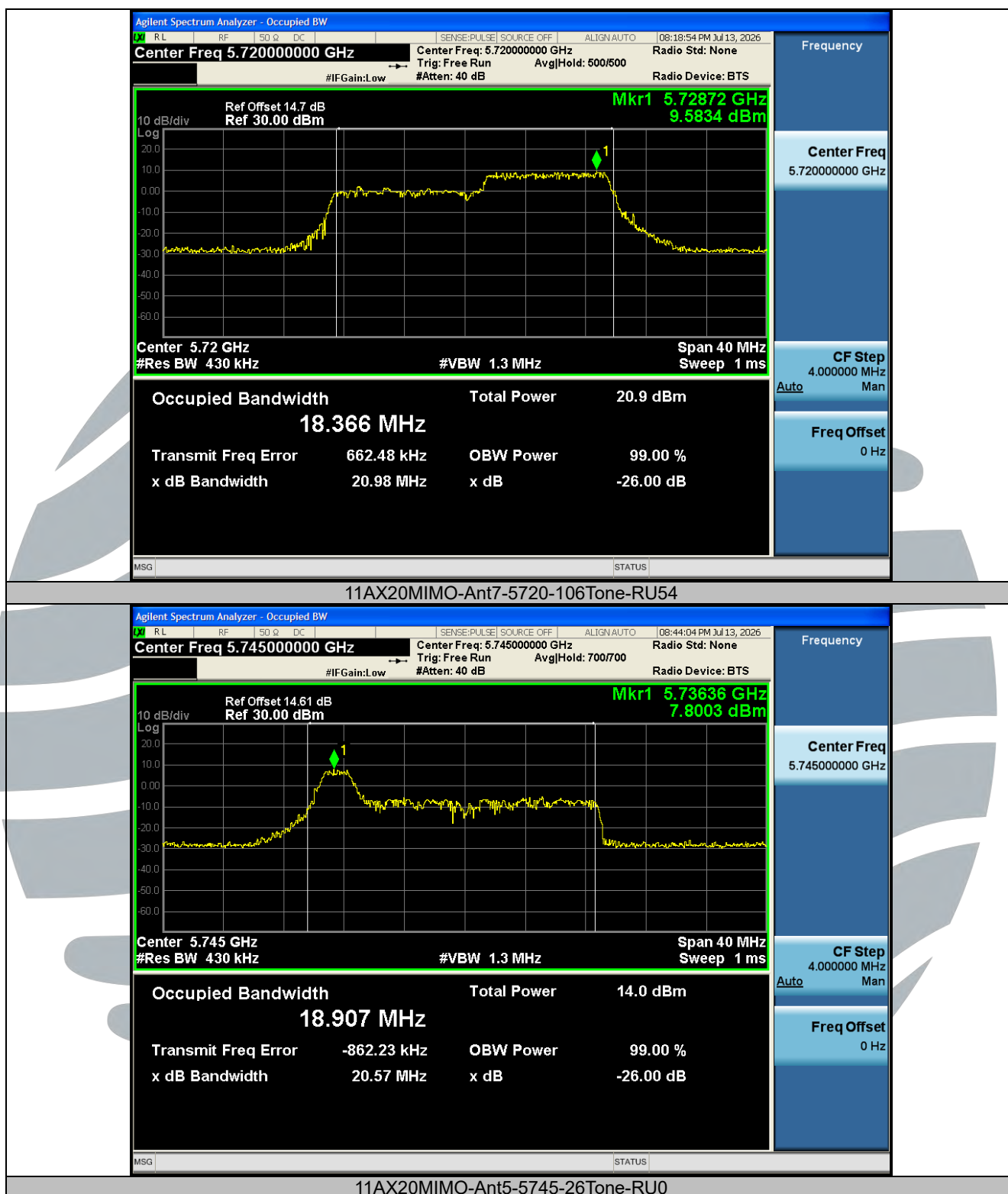
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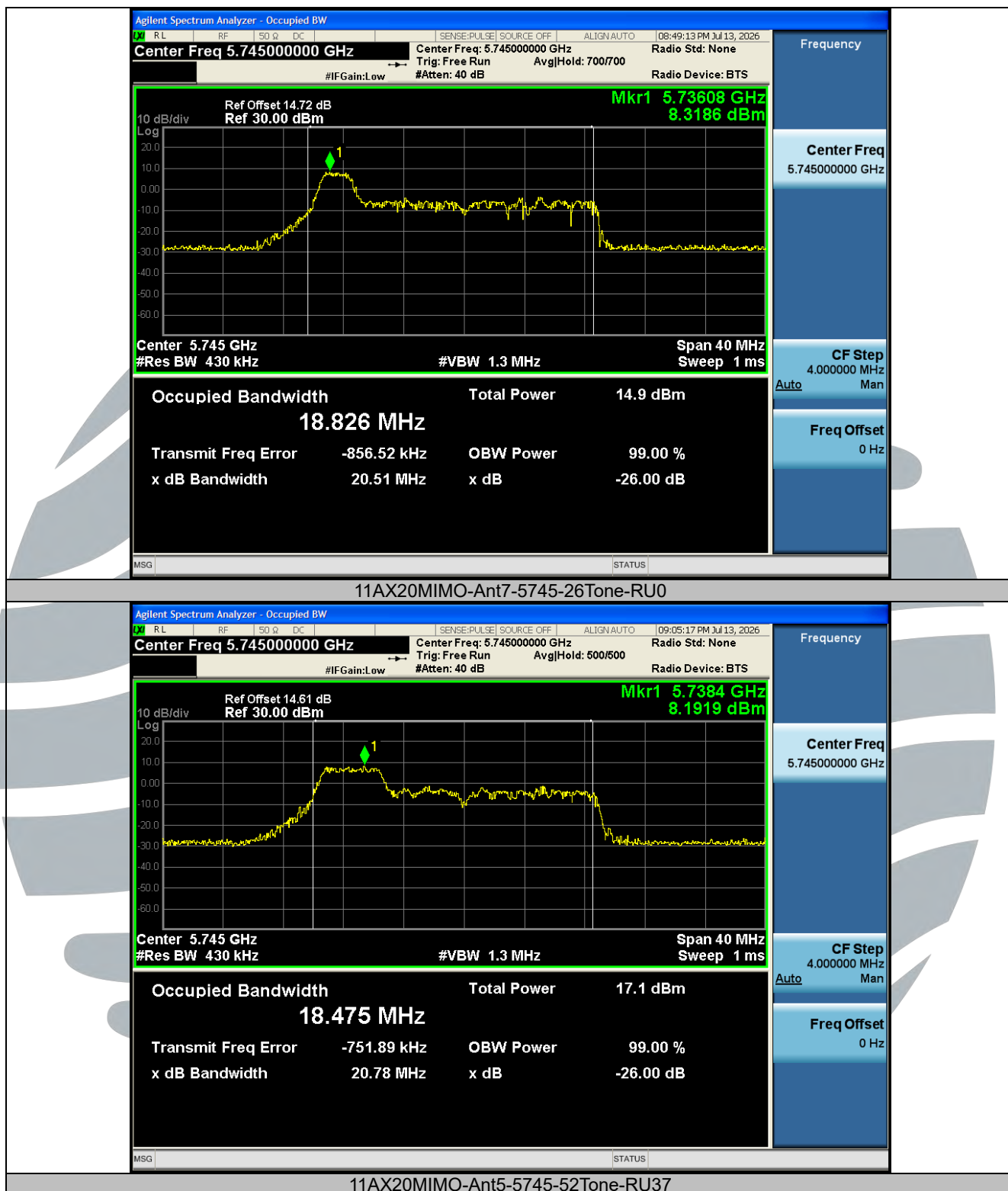
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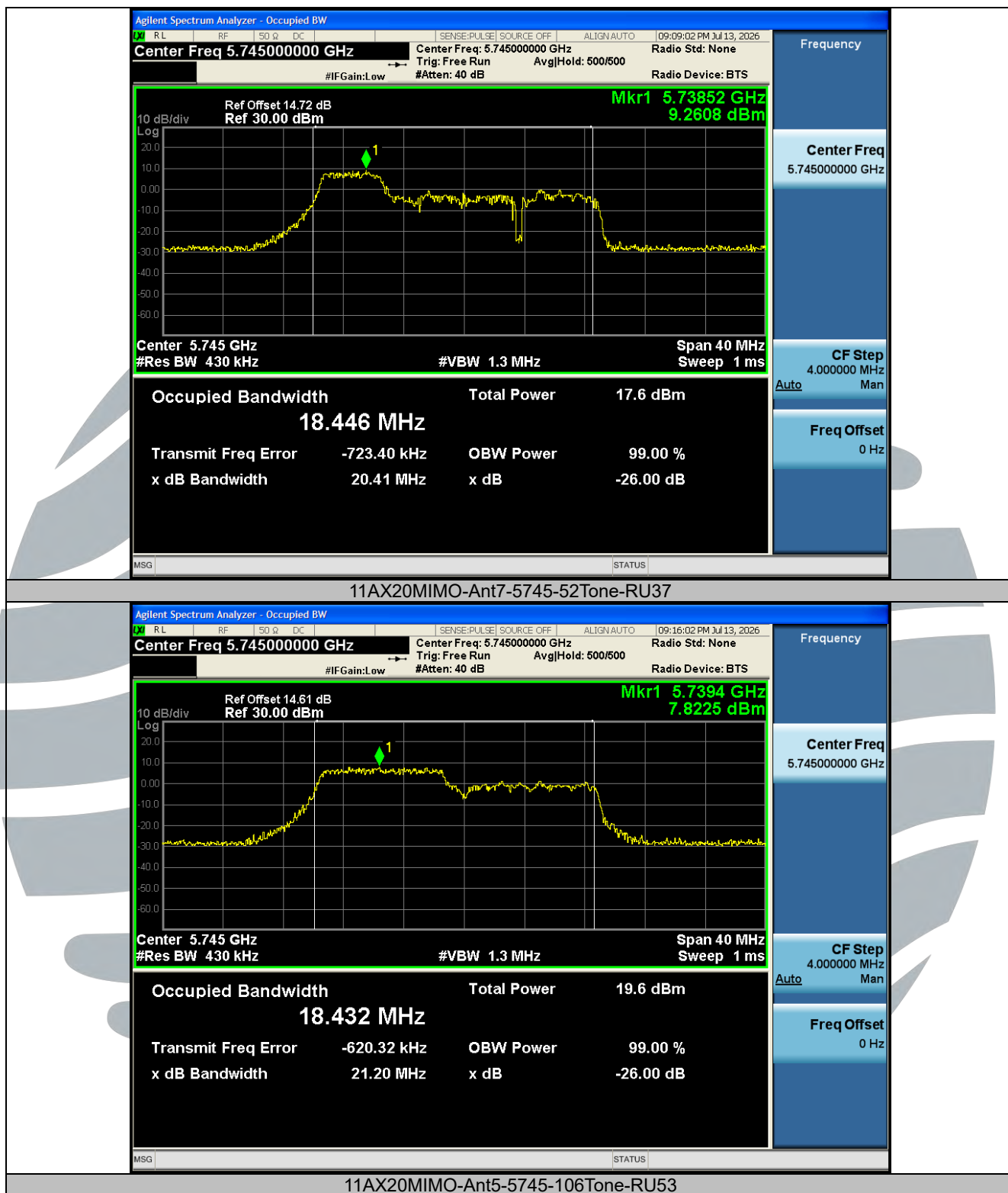
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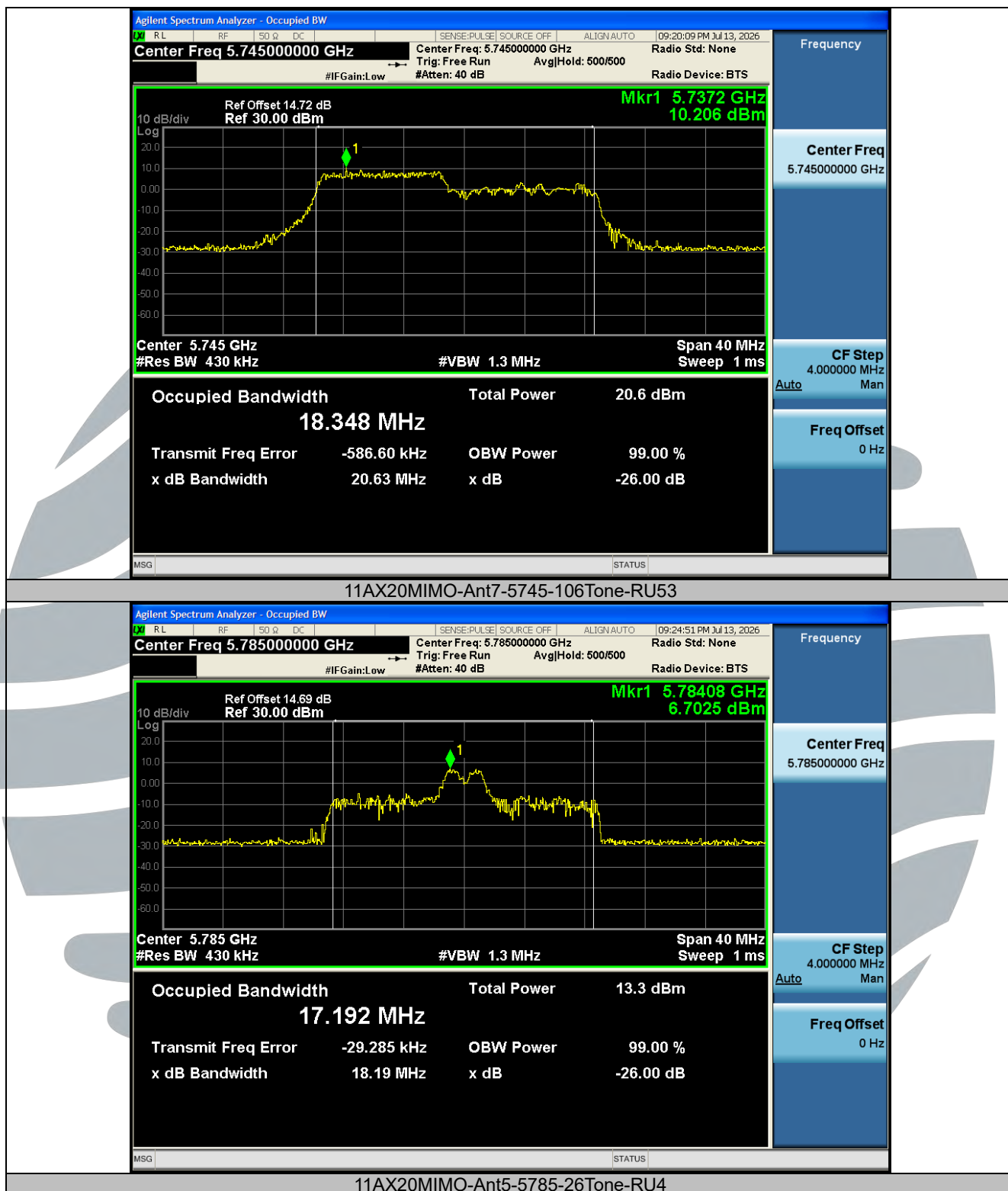
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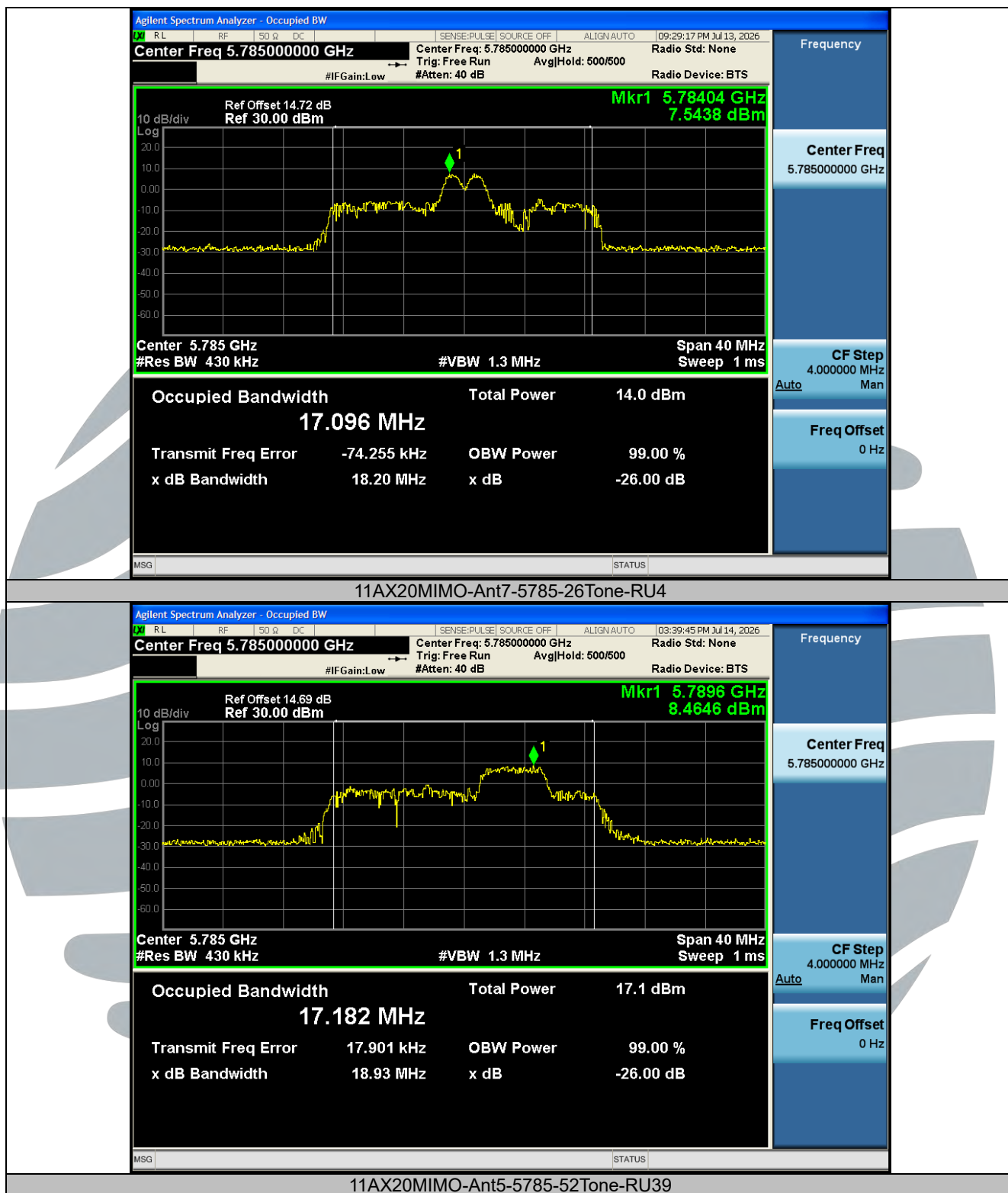
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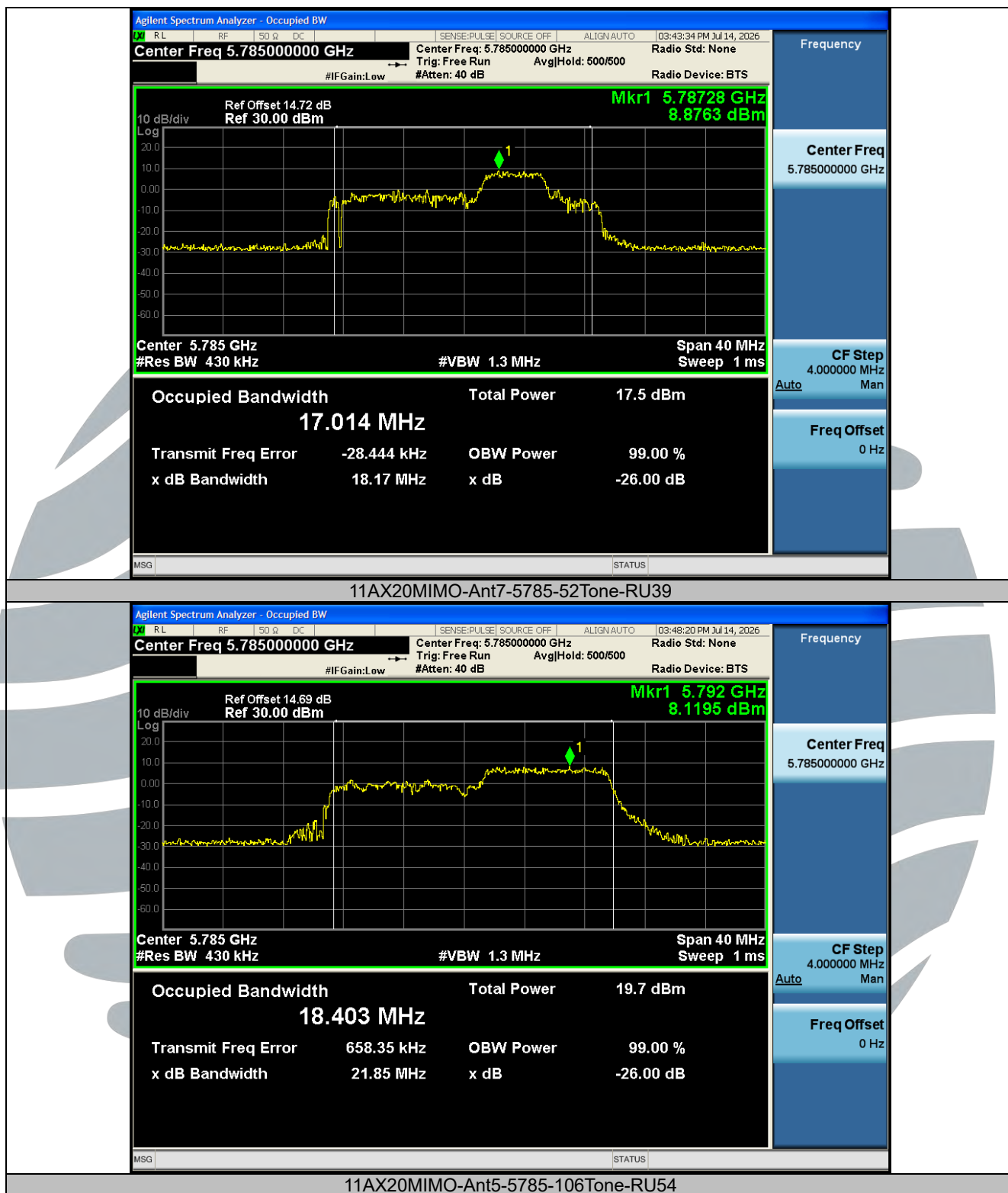
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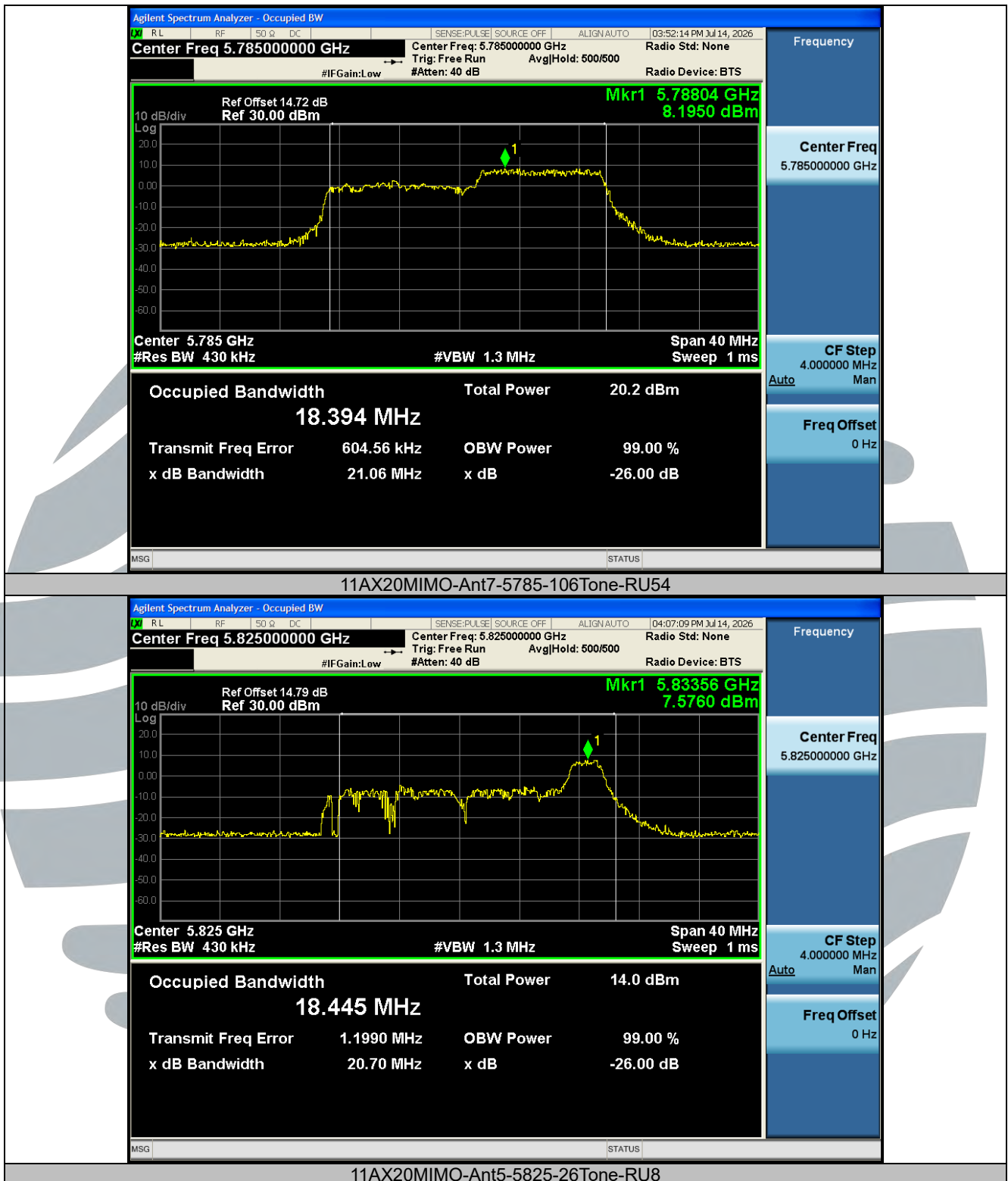
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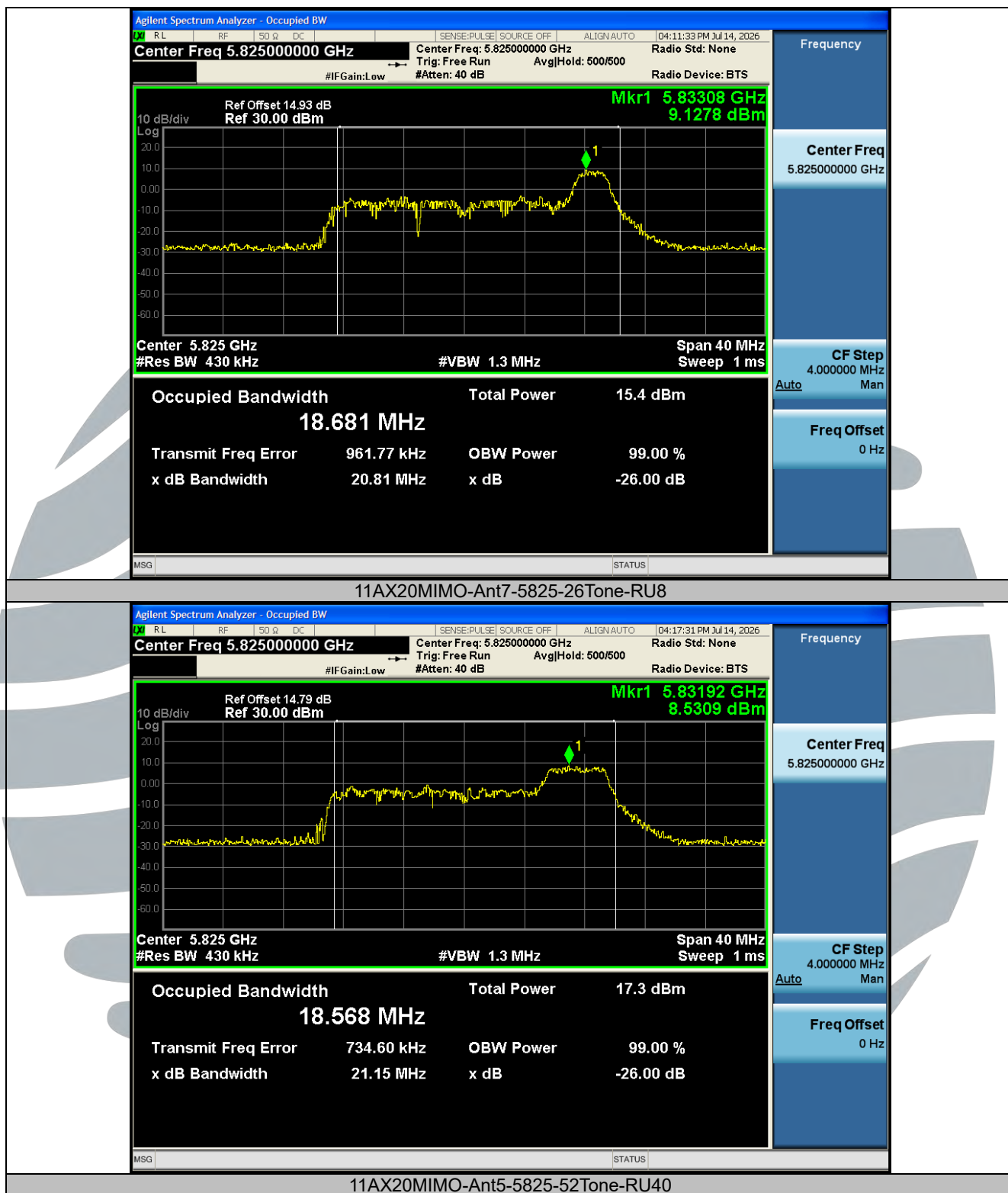
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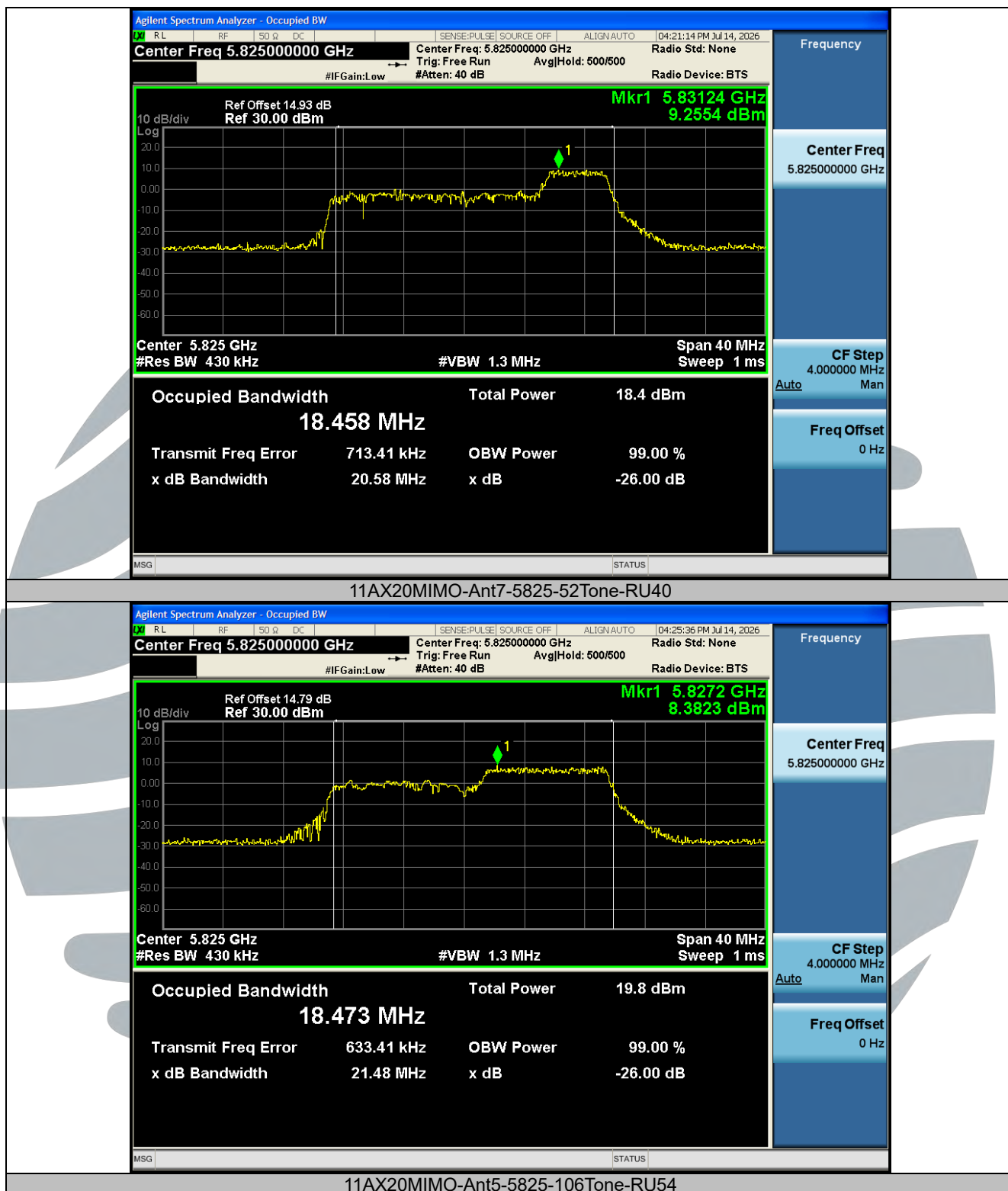
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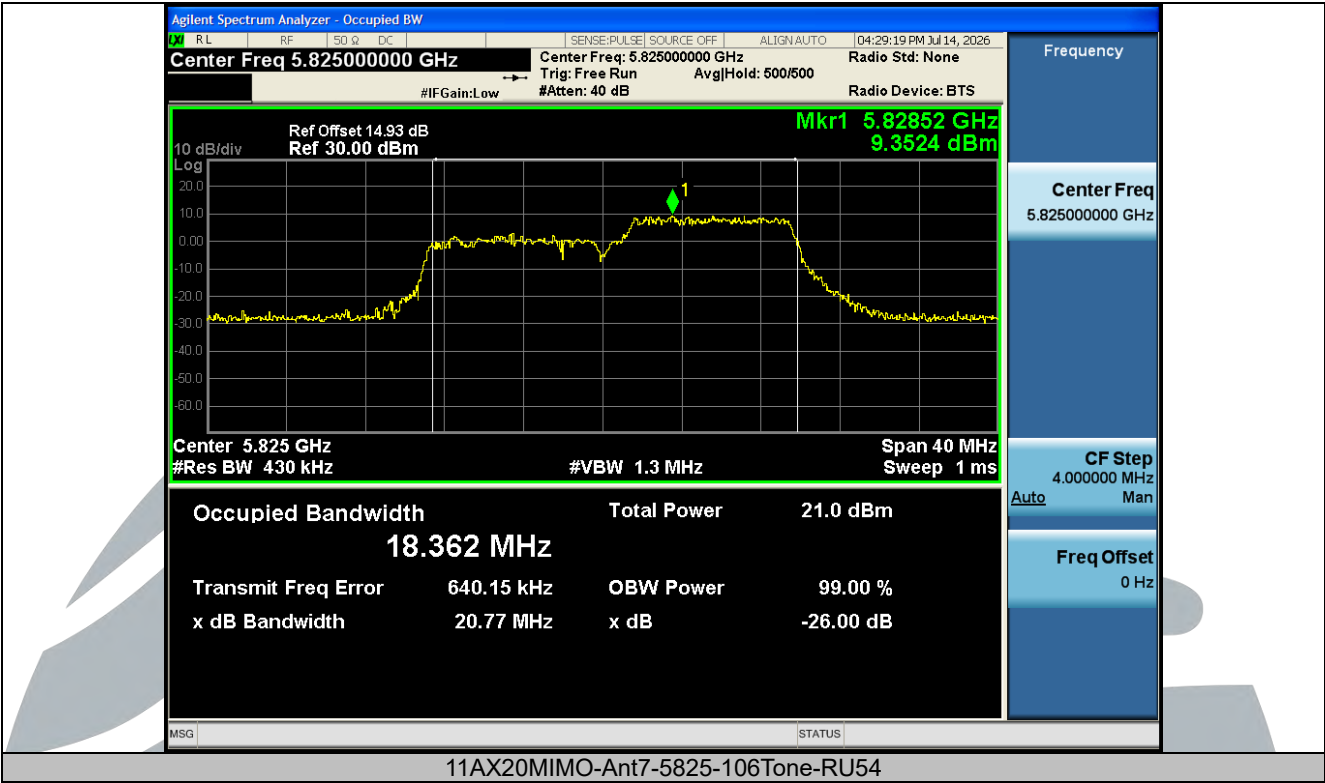
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5.6 MAXIMUM CONDUCTED OUTPUT POWER

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)

Test Method: KDB 789033 D02 v02r01 Section E.3.a(Method PM)

Limits:

1. For the band 5.15-5.25 GHz.
 - (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
 - (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
 - (iv) For 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure:

1. Connected the EUT's antenna port to measure device by 10dB attenuator.
2. Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of Tx on burst.

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

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

Antenna gain and the maximum output power limit.

Frequency Band (MHz)	Antenna Gain (dBi)		Correlated Directional gain (dBi)	Power Limits (dBm)
	Ant. 5 (Chain 0)	Ant. 7(Chain 1)		
U-NII-1	-3.78	-1.47	0.46	23.98
U-NII-2A	-2.17	-1.47	1.20	23.98
U-NII-2C	-0.77	-1.39	1.94	23.98
U-NII-3	-1.07	-0.73	2.11	30.0

Unequal antenna gains, with equal transmit powers. Directional gain is to be computed as follows:
 If transmit signals are correlated, then
 Directional gain = $10 \cdot \log_{10} \left[\frac{(10^{G1/10} + 10^{G2/10} + \dots + 10^{GN/10})^2}{N} \right]$ dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

For U-NII-2A&2C Band:

For IEEE 802.11a/n/ac/ax_SU, the minimum 26 dB emission bandwidth is 20.33 MHz

11 dBm + $10 \log_{10}(20.33)$ = 24.08 dBm > 23.98 dBm (250mW)

So the 23.98 dB limit applicable

For IEEE 802.11ax_RU, the minimum 26 dB emission bandwidth is 17.62 MHz

11 dBm + $10 \log_{10}(17.62)$ = 23.46 dBm < 23.98 dBm (250mW)

So the 23.46 dB limit applicable

Test Mode	RU&Index	Freq. [MHz]	Meas. Value (dBm)		Corr'd Value (dBm)			Limit [dBm]	Verdict
			Ant 5	Ant 7	Ant 5	Ant 7	Total		
11A	---	5180	17.07	17.78	17.07	17.78	---	≤23.98	PASS
11A	---	5200	16.67	17.63	16.67	17.63	---	≤23.98	PASS
11A	---	5240	16.94	17.84	16.94	17.84	---	≤23.98	PASS
11A	---	5260	17.71	17.75	17.71	17.75	---	≤23.98	PASS
11A	---	5280	17.71	17.74	17.71	17.74	---	≤23.98	PASS
11A	---	5320	16.84	17.68	16.84	17.68	---	≤23.98	PASS
11A	---	5500	16.64	17.89	16.64	17.89	---	≤23.98	PASS
11A	---	5600	16.76	17.76	16.76	17.76	---	≤23.98	PASS
11A	---	5700	16.36	17.39	16.36	17.39	---	≤23.98	PASS
11A	---	5720	16.48	17.65	16.48	17.65	---	≤23.99	PASS
11A	---	5745	15.83	17.40	15.83	17.40	---	≤30.00	PASS
11A	---	5785	15.93	17.67	15.93	17.67	---	≤30.00	PASS
11A	---	5825	17.20	17.70	17.20	17.70	---	≤30.00	PASS
11N20MIMO	---	5180	14.22	14.24	14.22	14.24	17.24	≤23.98	PASS
11N20MIMO	---	5200	14.21	15.12	14.21	15.12	17.70	≤23.98	PASS
11N20MIMO	---	5240	14.72	13.16	14.72	13.16	17.02	≤23.98	PASS
11N20MIMO	---	5260	14.71	14.68	14.71	14.68	17.71	≤23.98	PASS
11N20MIMO	---	5280	14.76	14.49	14.76	14.49	17.64	≤23.98	PASS
11N20MIMO	---	5320	14.14	14.11	14.14	14.11	17.14	≤23.98	PASS
11N20MIMO	---	5500	13.96	14.48	13.96	14.48	17.24	≤23.98	PASS
11N20MIMO	---	5600	13.82	15.15	13.82	15.15	17.55	≤23.98	PASS
11N20MIMO	---	5700	14.19	14.58	14.19	14.58	17.40	≤23.98	PASS
11N20MIMO	---	5720	13.98	14.49	13.98	14.49	17.25	≤23.99	PASS
11N20MIMO	---	5745	13.82	14.45	13.82	14.45	17.16	≤30.00	PASS
11N20MIMO	---	5785	14.06	14.44	14.06	14.44	17.26	≤30.00	PASS
11N20MIMO	---	5825	14.23	14.45	14.23	14.45	17.35	≤30.00	PASS
11N40MIMO	---	5190	13.70	13.61	13.70	13.61	16.67	≤23.98	PASS
11N40MIMO	---	5230	14.44	14.01	14.44	14.01	17.24	≤23.98	PASS
11N40MIMO	---	5270	14.34	13.96	14.34	13.96	17.16	≤23.98	PASS
11N40MIMO	---	5310	14.12	13.97	14.12	13.97	17.06	≤23.98	PASS
11N40MIMO	---	5510	13.83	14.92	13.83	14.92	17.42	≤23.98	PASS
11N40MIMO	---	5590	13.77	15.54	13.77	15.54	17.75	≤23.98	PASS
11N40MIMO	---	5670	13.59	14.11	13.59	14.11	16.87	≤23.98	PASS
11N40MIMO	---	5710	13.97	14.25	13.97	14.25	17.12	≤23.99	PASS
11N40MIMO	---	5755	13.22	13.88	13.22	13.88	16.57	≤30.00	PASS
11N40MIMO	---	5795	14.09	14.20	14.09	14.20	17.16	≤30.00	PASS
11AC20MIMO	---	5180	13.46	15.24	13.46	15.24	17.45	≤23.98	PASS
11AC20MIMO	---	5200	13.69	13.90	13.69	13.90	16.81	≤23.98	PASS
11AC20MIMO	---	5240	14.75	13.18	14.75	13.18	17.05	≤23.98	PASS
11AC20MIMO	---	5260	14.61	14.58	14.61	14.58	17.61	≤23.98	PASS
11AC20MIMO	---	5280	14.57	14.31	14.57	14.31	17.45	≤23.98	PASS
11AC20MIMO	---	5320	13.98	14.02	13.98	14.02	17.01	≤23.98	PASS
11AC20MIMO	---	5500	13.94	14.53	13.94	14.53	17.26	≤23.98	PASS
11AC20MIMO	---	5600	13.75	15.21	13.75	15.21	17.55	≤23.98	PASS
11AC20MIMO	---	5700	13.48	13.80	13.48	13.80	16.65	≤23.98	PASS
11AC20MIMO	---	5720	13.92	14.46	13.92	14.46	17.21	≤23.99	PASS
11AC20MIMO	---	5745	13.49	13.99	13.49	13.99	16.76	≤30.00	PASS
11AC20MIMO	---	5785	13.82	14.32	13.82	14.32	17.09	≤30.00	PASS
11AC20MIMO	---	5825	14.05	14.33	14.05	14.33	17.20	≤30.00	PASS
11AC40MIMO	---	5190	13.45	14.98	13.45	14.98	17.29	≤23.98	PASS
11AC40MIMO	---	5230	14.39	14.07	14.39	14.07	17.24	≤23.98	PASS
11AC40MIMO	---	5270	14.57	14.22	14.57	14.22	17.41	≤23.98	PASS
11AC40MIMO	---	5310	14.11	14.00	14.11	14.00	17.07	≤23.98	PASS
11AC40MIMO	---	5510	14.13	14.56	14.13	14.56	17.36	≤23.98	PASS
11AC40MIMO	---	5590	13.61	15.12	13.61	15.12	17.44	≤23.98	PASS
11AC40MIMO	---	5670	13.51	13.98	13.51	13.98	16.76	≤23.98	PASS
11AC40MIMO	---	5710	14.02	14.35	14.02	14.35	17.20	≤23.99	PASS
11AC40MIMO	---	5755	13.37	13.79	13.37	13.79	16.60	≤30.00	PASS
11AC40MIMO	---	5795	13.42	13.81	13.42	13.81	16.63	≤30.00	PASS
11AC80MIMO	---	5210	13.70	13.22	13.70	13.22	16.48	≤23.98	PASS

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Test Mode	RU&Index	Freq. [MHz]	Meas. Value (dBm)		Corr'd Value (dBm)			Limit [dBm]	Verdict
			Ant 5	Ant 7	Ant 5	Ant 7	Total		
11AC80MIMO	---	5290	13.97	13.83	13.97	13.83	16.91	≤23.98	PASS
11AC80MIMO	---	5530	13.70	14.17	13.70	14.17	16.95	≤23.98	PASS
11AC80MIMO	---	5610	13.59	14.78	13.59	14.78	17.24	≤23.98	PASS
11AC80MIMO	---	5690	13.77	14.23	13.77	14.23	17.02	≤23.99	PASS
11AC80MIMO	---	5775	13.59	13.88	13.59	13.88	16.75	≤30.00	PASS
11AX20MIMO	SU	5180	13.29	13.21	13.29	13.21	16.26	≤23.98	PASS
11AX20MIMO	SU	5200	13.32	13.38	13.32	13.38	16.36	≤23.98	PASS
11AX20MIMO	SU	5240	13.73	13.33	13.73	13.33	16.54	≤23.98	PASS
11AX20MIMO	SU	5260	13.45	13.32	13.45	13.32	16.40	≤23.98	PASS
11AX20MIMO	SU	5280	13.77	13.37	13.77	13.37	16.58	≤23.98	PASS
11AX20MIMO	SU	5320	13.61	13.60	13.61	13.60	16.62	≤23.98	PASS
11AX20MIMO	SU	5500	13.22	13.87	13.22	13.87	16.57	≤23.98	PASS
11AX20MIMO	SU	5600	12.69	13.92	12.69	13.92	16.36	≤23.98	PASS
11AX20MIMO	SU	5700	12.97	13.39	12.97	13.39	16.20	≤23.98	PASS
11AX20MIMO	SU	5720	12.88	13.40	12.88	13.40	16.16	≤23.99	PASS
11AX20MIMO	SU	5745	12.81	13.40	12.81	13.40	16.13	≤30.00	PASS
11AX20MIMO	SU	5785	12.88	13.31	12.88	13.31	16.11	≤30.00	PASS
11AX20MIMO	SU	5825	13.21	13.60	13.21	13.60	16.42	≤30.00	PASS
11AX20MIMO	106RU53	5180	10.16	10.44	10.30	10.58	13.45	≤23.46	PASS
11AX20MIMO	106RU54	5200	10.09	10.50	10.23	10.64	13.45	≤23.98	PASS
11AX20MIMO	106RU54	5240	10.11	10.34	10.25	10.48	13.37	≤23.98	PASS
11AX20MIMO	106RU53	5260	10.28	10.56	10.42	10.70	13.57	≤23.46	PASS
11AX20MIMO	106RU54	5280	10.50	10.44	10.64	10.58	13.62	≤23.46	PASS
11AX20MIMO	106RU54	5320	10.40	10.59	10.54	10.73	13.64	≤23.46	PASS
11AX20MIMO	106RU53	5500	10.24	10.88	10.38	11.02	13.72	≤23.46	PASS
11AX20MIMO	106RU54	5600	9.36	10.96	9.50	11.10	13.38	≤23.46	PASS
11AX20MIMO	106RU54	5700	9.63	10.36	9.77	10.50	13.16	≤23.46	PASS
11AX20MIMO	106RU54	5720	9.88	10.10	10.02	10.24	13.14	≤23.46	PASS
11AX20MIMO	106RU53	5745	9.97	10.28	10.11	10.42	13.28	≤30.00	PASS
11AX20MIMO	106RU54	5785	9.82	10.28	9.96	10.42	13.20	≤30.00	PASS
11AX20MIMO	106RU54	5825	10.00	10.39	10.14	10.53	13.35	≤30.00	PASS
11AX20MIMO	52RU37	5180	6.86	6.82	6.86	6.89	9.88	≤23.98	PASS
11AX20MIMO	52RU39	5200	6.93	7.20	6.93	7.27	10.11	≤23.98	PASS
11AX20MIMO	52RU40	5240	7.15	6.71	7.15	6.78	9.98	≤23.98	PASS
11AX20MIMO	52RU37	5260	7.16	7.36	7.16	7.43	10.31	≤23.98	PASS
11AX20MIMO	52RU39	5280	6.76	6.76	6.76	6.83	9.80	≤23.98	PASS
11AX20MIMO	52RU40	5320	7.39	6.98	7.39	7.05	10.23	≤23.98	PASS
11AX20MIMO	52RU37	5500	7.24	6.65	7.24	6.72	10.00	≤23.98	PASS
11AX20MIMO	52RU39	5600	7.32	6.42	7.32	6.49	9.93	≤23.98	PASS
11AX20MIMO	52RU40	5700	7.03	6.57	7.03	6.64	9.85	≤23.98	PASS
11AX20MIMO	52RU40	5720	7.06	6.99	7.06	7.06	10.07	≤23.98	PASS
11AX20MIMO	52RU37	5745	7.12	6.72	7.12	6.79	9.97	≤30.00	PASS
11AX20MIMO	52RU39	5785	6.65	6.88	6.65	6.95	9.81	≤30.00	PASS
11AX20MIMO	52RU40	5825	6.89	6.68	6.89	6.75	9.83	≤30.00	PASS
11AX20MIMO	26RU0	5180	3.22	3.38	3.22	3.38	6.31	≤23.98	PASS
11AX20MIMO	26RU4	5200	2.38	2.57	2.38	2.57	5.49	≤23.98	PASS
11AX20MIMO	26RU8	5240	3.41	3.55	3.41	3.55	6.49	≤23.98	PASS
11AX20MIMO	26RU0	5260	3.26	2.71	3.26	2.71	6.00	≤23.98	PASS
11AX20MIMO	26RU4	5280	3.55	3.54	3.55	3.54	6.56	≤23.98	PASS
11AX20MIMO	26RU8	5320	2.88	3.76	2.88	3.76	6.35	≤23.98	PASS
11AX20MIMO	26RU0	5500	3.02	4.00	3.02	4.00	6.55	≤23.98	PASS
11AX20MIMO	26RU4	5600	2.31	4.19	2.31	4.19	6.36	≤23.98	PASS
11AX20MIMO	26RU8	5700	2.67	3.17	2.67	3.17	5.94	≤23.98	PASS
11AX20MIMO	26RU8	5720	3.21	3.19	3.21	3.19	6.21	≤23.98	PASS
11AX20MIMO	26RU0	5745	3.42	3.56	3.42	3.56	6.50	≤30.00	PASS
11AX20MIMO	26RU4	5785	2.44	3.12	2.44	3.12	5.80	≤30.00	PASS
11AX20MIMO	26RU8	5825	3.22	3.71	3.22	3.71	6.48	≤30.00	PASS
11AX40MIMO	SU	5190	13.08	13.15	13.08	13.15	16.13	≤23.98	PASS
11AX40MIMO	SU	5230	13.73	13.41	13.73	13.41	16.58	≤23.98	PASS
11AX40MIMO	SU	5270	13.61	13.36	13.61	13.36	16.50	≤23.98	PASS

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Test Mode	RU&Index	Freq. [MHz]	Meas. Value (dBm)		Corr'd Value (dBm)			Limit [dBm]	Verdict
			Ant 5	Ant 7	Ant 5	Ant 7	Total		
11AX40MIMO	SU	5310	13.33	13.42	13.33	13.42	16.39	≤23.98	PASS
11AX40MIMO	SU	5510	13.19	13.95	13.19	13.95	16.60	≤23.98	PASS
11AX40MIMO	SU	5590	12.76	14.48	12.76	14.48	16.71	≤23.98	PASS
11AX40MIMO	SU	5670	12.83	13.47	12.83	13.47	16.17	≤23.98	PASS
11AX40MIMO	SU	5710	12.92	13.28	12.92	13.28	16.11	≤23.99	PASS
11AX40MIMO	SU	5755	12.77	13.37	12.77	13.37	16.09	≤30.00	PASS
11AX40MIMO	SU	5795	12.83	13.31	12.83	13.31	16.09	≤30.00	PASS
11AX80MIMO	SU	5210	13.34	13.08	13.34	13.08	16.22	≤23.98	PASS
11AX80MIMO	SU	5290	13.31	13.30	13.31	13.30	16.32	≤23.98	PASS
11AX80MIMO	SU	5530	13.08	13.73	13.08	13.73	16.43	≤23.98	PASS
11AX80MIMO	SU	5610	12.48	13.38	12.48	13.38	15.96	≤23.98	PASS
11AX80MIMO	SU	5690	12.94	13.44	12.94	13.44	16.21	≤23.99	PASS
11AX80MIMO	SU	5775	12.71	13.11	12.71	13.11	15.92	≤30.00	PASS

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5.7 PEAK POWER SPECTRAL DENSITY

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)

Test Method: KDB 789033 D02 v02r01 Section F

Limits:

1. For the band 5.15-5.25 GHz.
 - (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
 - (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
 - (iv) For 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer.

Spectrum analyzer according to the following Settings:

1. For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)

2. For U-NII-3 band:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)

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

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results:

Antenna gain and the maximum output power limit.

Frequency Band (MHz)	Antenna Gain (dBi)		Correlated Directional gain (dBi)	PSD Limits (dBm/MHz or dBm/500kHz)
	Ant. 5 (Chain 0)	Ant. 7(Chain 1)		
U-NII-1	-3.78	-1.47	0.46	11.0
U-NII-2A	-2.17	-1.47	1.20	11.0
U-NII-2C	-0.77	-1.39	1.94	11.0
U-NII-3	-1.07	-0.73	2.11	30.0

Unequal antenna gains, with equal transmit powers. Directional gain is to be computed as follows:

If transmit signals are correlated, then

Directional gain = $10 \cdot \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / NANT]$ dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

Test Mode	RU & Index	Freq. [MHz]	PSD Meas. Value [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]		PSD Corr'd value [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]			Limit [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]	Verdict
			Ant 5	Ant 7	Ant 5	Ant 7	Total		
11A	--	5180	5.90	6.94	5.90	6.94	--	≤11.00	PASS
11A	--	5200	5.59	6.76	5.59	6.76	--	≤11.00	PASS
11A	--	5240	6.01	7.00	6.01	7.00	--	≤11.00	PASS
11A	--	5260	6.76	6.89	6.76	6.89	--	≤11.00	PASS
11A	--	5280	6.88	7.00	6.88	7.00	--	≤11.00	PASS
11A	--	5320	5.63	6.61	5.63	6.61	--	≤11.00	PASS
11A	--	5500	5.46	7.02	5.46	7.02	--	≤11.00	PASS
11A	--	5600	5.77	7.25	5.77	7.25	--	≤11.00	PASS
11A	--	5700	5.75	6.71	5.75	6.71	--	≤11.00	PASS
11A	--	5720 UNII-2C	5.83	7.25	5.83	7.25	--	≤11.00	PASS
11A	--	5720 UNII-3	1.43	2.69	1.43	2.69	--	≤30.00	PASS
11A	--	5745	2.60	4.04	2.60	4.04	--	≤30.00	PASS
11A	--	5785	2.53	3.85	2.53	3.85	--	≤30.00	PASS
11A	--	5825	3.49	4.71	3.49	4.71	--	≤30.00	PASS
11N20MIMO	--	5180	2.24	2.69	2.24	2.69	5.48	≤11.00	PASS
11N20MIMO	--	5200	2.85	3.96	2.85	3.96	6.45	≤11.00	PASS
11N20MIMO	--	5240	3.57	1.85	3.57	1.85	5.80	≤11.00	PASS
11N20MIMO	--	5260	3.18	3.57	3.18	3.57	6.39	≤11.00	PASS
11N20MIMO	--	5280	3.42	3.46	3.42	3.46	6.45	≤11.00	PASS
11N20MIMO	--	5320	2.41	2.99	2.41	2.99	5.72	≤11.00	PASS
11N20MIMO	--	5500	2.19	3.43	2.19	3.43	5.86	≤11.00	PASS
11N20MIMO	--	5600	2.54	4.27	2.54	4.27	6.50	≤11.00	PASS
11N20MIMO	--	5700	3.00	3.78	3.00	3.78	6.42	≤11.00	PASS
11N20MIMO	--	5720 UNII-2C	2.93	3.97	2.93	3.97	6.49	≤11.00	PASS
11N20MIMO	--	5720 UNII-3	-1.47	-0.90	-1.47	-0.90	1.83	≤30.00	PASS
11N20MIMO	--	5745	0.27	1.06	0.27	1.06	3.69	≤30.00	PASS
11N20MIMO	--	5785	0.40	0.71	0.40	0.71	3.57	≤30.00	PASS
11N20MIMO	--	5825	0.13	1.05	0.13	1.05	3.62	≤30.00	PASS
11N40MIMO	--	5190	0.11	0.26	0.11	0.26	3.20	≤11.00	PASS
11N40MIMO	--	5230	0.50	0.58	0.50	0.58	3.55	≤11.00	PASS
11N40MIMO	--	5270	0.50	0.88	0.50	0.88	3.70	≤11.00	PASS
11N40MIMO	--	5310	0.22	0.51	0.22	0.51	3.38	≤11.00	PASS
11N40MIMO	--	5510	-0.86	0.79	-0.86	0.79	3.05	≤11.00	PASS
11N40MIMO	--	5590	-0.27	3.83	-0.27	3.83	5.26	≤11.00	PASS
11N40MIMO	--	5670	-0.05	1.19	-0.05	1.19	3.62	≤11.00	PASS
11N40MIMO	--	5710 UNII-2C	0.42	1.16	0.42	1.16	3.82	≤11.00	PASS
11N40MIMO	--	5710 UNII-3	-5.56	-5.44	-5.56	-5.44	-2.49	≤30.00	PASS
11N40MIMO	--	5755	-2.86	-2.40	-2.86	-2.40	0.39	≤30.00	PASS
11N40MIMO	--	5795	-1.52	-1.86	-1.52	-1.86	1.32	≤30.00	PASS
11AC20MIMO	--	5180	2.15	4.16	2.15	4.16	6.28	≤11.00	PASS
11AC20MIMO	--	5200	2.31	2.89	2.31	2.89	5.62	≤11.00	PASS
11AC20MIMO	--	5240	3.58	2.09	3.58	2.09	5.91	≤11.00	PASS
11AC20MIMO	--	5260	3.05	3.31	3.05	3.31	6.19	≤11.00	PASS
11AC20MIMO	--	5280	3.39	3.34	3.39	3.34	6.38	≤11.00	PASS
11AC20MIMO	--	5320	2.28	3.06	2.28	3.06	5.70	≤11.00	PASS
11AC20MIMO	--	5500	2.19	3.28	2.19	3.28	5.78	≤11.00	PASS
11AC20MIMO	--	5600	2.55	4.31	2.55	4.31	6.53	≤11.00	PASS
11AC20MIMO	--	5700	2.11	3.00	2.11	3.00	5.59	≤11.00	PASS
11AC20MIMO	--	5720 UNII-2C	2.71	3.96	2.71	3.96	6.39	≤11.00	PASS
11AC20MIMO	--	5720 UNII-3	-1.59	-0.87	-1.59	-0.87	1.80	≤30.00	PASS
11AC20MIMO	--	5745	-0.34	0.30	-0.34	0.30	3.00	≤30.00	PASS
11AC20MIMO	--	5785	0.17	0.36	0.17	0.36	3.28	≤30.00	PASS
11AC20MIMO	--	5825	0.02	0.99	0.02	0.99	3.54	≤30.00	PASS
11AC40MIMO	--	5190	0.06	1.90	0.06	1.90	4.09	≤11.00	PASS
11AC40MIMO	--	5230	0.68	0.40	0.68	0.40	3.55	≤11.00	PASS
11AC40MIMO	--	5270	0.83	0.85	0.83	0.85	3.85	≤11.00	PASS
11AC40MIMO	--	5310	0.23	0.36	0.23	0.36	3.31	≤11.00	PASS

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Test Mode	RU & Index	Freq. [MHz]	PSD Meas. Value [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]		PSD Corr'd value [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]			Limit [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]	Verdict
			Ant 5	Ant 7	Ant 5	Ant 7	Total		
11AC40MIMO	--	5510	0.18	1.13	0.18	1.13	3.69	≤11.00	PASS
11AC40MIMO	--	5590	-0.31	1.57	-0.31	1.57	3.74	≤11.00	PASS
11AC40MIMO	--	5670	0.03	0.83	0.03	0.83	3.46	≤11.00	PASS
11AC40MIMO	--	5710 UNII-2C	0.39	1.28	0.39	1.28	3.87	≤11.00	PASS
11AC40MIMO	--	5710 UNII-3	-5.61	-5.59	-5.61	-5.59	-2.59	≤30.00	PASS
11AC40MIMO	--	5755	-2.89	-2.39	-2.89	-2.39	0.38	≤30.00	PASS
11AC40MIMO	--	5795	-2.46	-2.05	-2.46	-2.05	0.76	≤30.00	PASS
11AC80MIMO	--	5210	-4.42	-4.25	-4.42	-4.25	-1.32	≤11.00	PASS
11AC80MIMO	--	5290	-4.38	-3.67	-4.38	-3.67	-1.00	≤11.00	PASS
11AC80MIMO	--	5530	-4.85	-3.63	-4.85	-3.63	-1.19	≤11.00	PASS
11AC80MIMO	--	5610	-4.48	-2.73	-4.48	-2.73	-0.51	≤11.00	PASS
11AC80MIMO	--	5690 UNII-2C	-4.04	-3.08	-4.04	-3.08	-0.52	≤11.00	PASS
11AC80MIMO	--	5690 UNII-3	-7.63	-7.82	-7.63	-7.82	-4.71	≤30.00	PASS
11AC80MIMO	--	5775	-6.98	-6.56	-6.98	-6.56	-3.75	≤30.00	PASS
11AX20MIMO	SU	5180	1.63	3.33	1.63	3.33	5.57	≤11.00	PASS
11AX20MIMO	SU	5200	2.52	3.39	2.52	3.39	5.99	≤11.00	PASS
11AX20MIMO	SU	5240	2.34	0.71	2.34	0.71	4.61	≤11.00	PASS
11AX20MIMO	SU	5260	1.99	2.14	1.99	2.14	5.08	≤11.00	PASS
11AX20MIMO	SU	5280	2.23	3.46	2.23	3.46	5.90	≤11.00	PASS
11AX20MIMO	SU	5320	1.51	2.89	1.51	2.89	5.26	≤11.00	PASS
11AX20MIMO	SU	5500	1.59	2.06	1.59	2.06	4.84	≤11.00	PASS
11AX20MIMO	SU	5600	1.00	1.76	1.00	1.76	4.41	≤11.00	PASS
11AX20MIMO	SU	5700	1.89	1.64	1.89	1.64	4.78	≤11.00	PASS
11AX20MIMO	SU	5720 UNII-2C	1.89	1.63	1.89	1.63	4.77	≤11.00	PASS
11AX20MIMO	SU	5720 UNII-3	-2.34	-2.37	-2.34	-2.37	0.66	≤30.00	PASS
11AX20MIMO	SU	5745	-0.86	-0.29	-0.86	-0.29	2.44	≤30.00	PASS
11AX20MIMO	SU	5785	-1.14	0.70	-1.14	0.70	2.89	≤30.00	PASS
11AX20MIMO	SU	5825	-1.16	-1.52	-1.16	-1.52	1.67	≤30.00	PASS
11AX40MIMO	SU	5190	-0.58	-0.07	-0.58	-0.07	2.69	≤11.00	PASS
11AX40MIMO	SU	5230	-0.40	-0.06	-0.40	-0.06	2.78	≤11.00	PASS
11AX40MIMO	SU	5270	-0.32	-0.12	-0.32	-0.12	2.79	≤11.00	PASS
11AX40MIMO	SU	5310	-0.56	-0.24	-0.56	-0.24	2.61	≤11.00	PASS
11AX40MIMO	SU	5510	-0.80	0.43	-0.80	0.43	2.87	≤11.00	PASS
11AX40MIMO	SU	5590	-1.02	0.95	-1.02	0.95	3.09	≤11.00	PASS
11AX40MIMO	SU	5670	-0.75	0.21	-0.75	0.21	2.77	≤11.00	PASS
11AX40MIMO	SU	5710 UNII-2C	-0.32	0.09	-0.32	0.09	2.90	≤11.00	PASS
11AX40MIMO	SU	5710 UNII-3	-6.91	-6.67	-6.91	-6.67	-3.78	≤30.00	PASS
11AX40MIMO	SU	5755	-3.34	-2.74	-3.34	-2.74	-0.02	≤30.00	PASS
11AX40MIMO	SU	5795	-3.40	-3.07	-3.40	-3.07	-0.22	≤30.00	PASS
11AX80MIMO	SU	5210	-4.83	-4.51	-4.83	-4.51	-1.66	≤11.00	PASS
11AX80MIMO	SU	5290	-5.01	-3.90	-5.01	-3.90	-1.41	≤11.00	PASS
11AX80MIMO	SU	5530	-5.31	-4.03	-5.31	-4.03	-1.61	≤11.00	PASS
11AX80MIMO	SU	5610	-5.68	-4.09	-5.68	-4.09	-1.80	≤11.00	PASS
11AX80MIMO	SU	5690 UNII-2C	-4.95	-3.86	-4.95	-3.86	-1.36	≤11.00	PASS
11AX80MIMO	SU	5690 UNII-3	-8.44	-8.90	-8.44	-8.90	-5.65	≤30.00	PASS
11AX80MIMO	SU	5775	-8.04	-7.44	-8.04	-7.44	-4.72	≤30.00	PASS
11AX20MIMO	26RU0	5180	1.71	1.99	1.71	1.99	4.86	≤11.00	PASS
11AX20MIMO	52RU37	5180	2.34	2.40	2.34	2.40	5.38	≤11.00	PASS
11AX20MIMO	106RU53	5180	1.95	2.51	4.31	4.87	7.61	≤11.00	PASS
11AX20MIMO	26RU4	5200	0.61	0.71	0.61	0.71	3.67	≤11.00	PASS
11AX20MIMO	52RU39	5200	1.78	2.29	1.78	2.29	5.05	≤11.00	PASS
11AX20MIMO	106RU54	5200	1.77	2.39	4.13	4.75	7.46	≤11.00	PASS
11AX20MIMO	26RU8	5240	1.89	1.85	1.89	1.85	4.88	≤11.00	PASS
11AX20MIMO	52RU40	5240	1.70	2.08	1.70	2.08	4.90	≤11.00	PASS
11AX20MIMO	106RU54	5240	2.22	1.93	4.58	4.29	7.45	≤11.00	PASS
11AX20MIMO	26RU0	5260	1.92	1.94	1.92	1.94	4.94	≤11.00	PASS
11AX20MIMO	52RU37	5260	2.11	2.54	2.11	2.54	5.34	≤11.00	PASS

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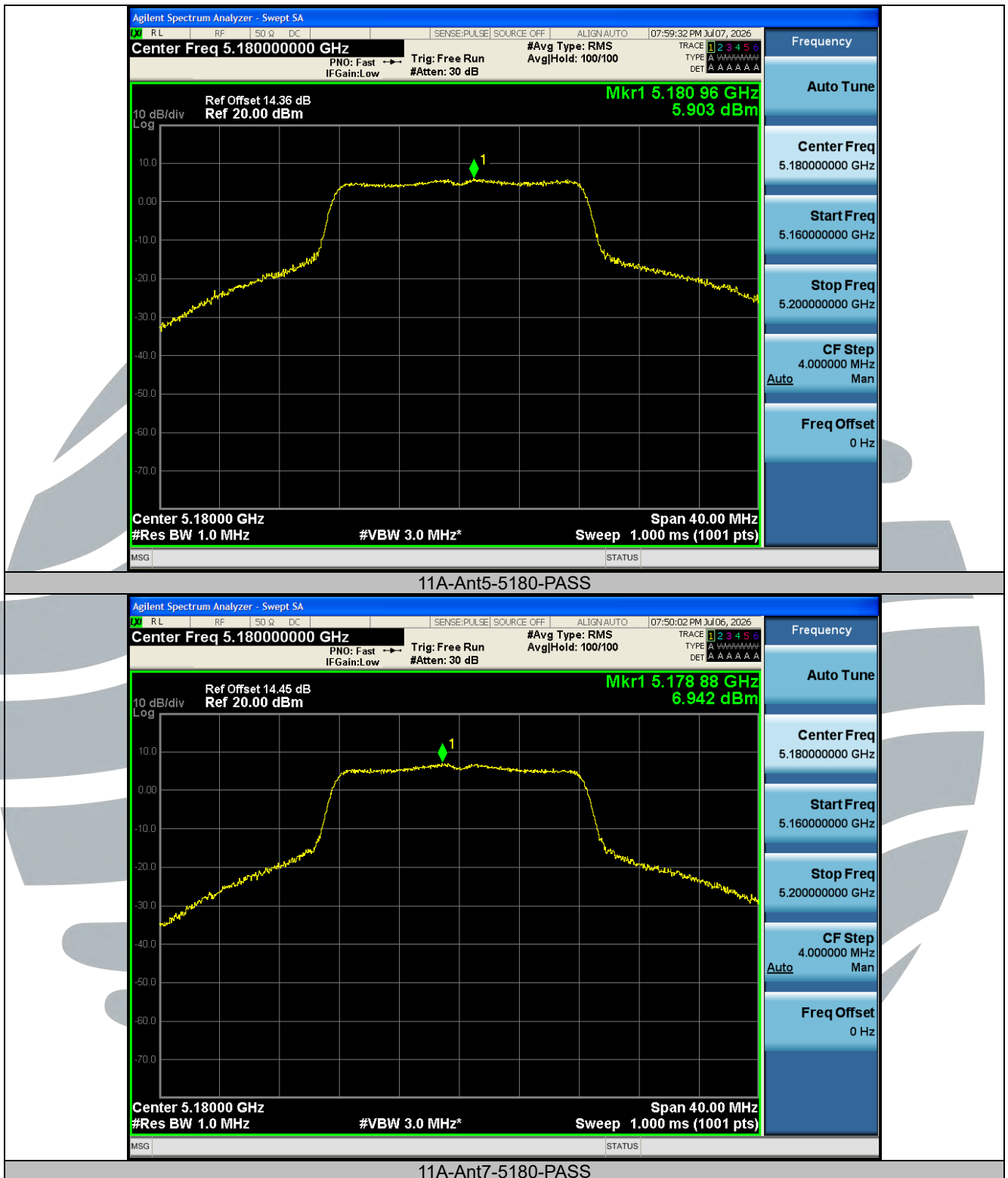
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Test Mode	RU & Index	Freq. [MHz]	PSD Meas. Value [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]		PSD Corr'd value [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]			Limit [U-NII-1/2A/2C: dBm/MHz] [U-NII-3: dBm/500kHz]	Verdict
			Ant 5	Ant 7	Ant 5	Ant 7	Total		
11AX20MIMO	106RU53	5260	2.11	2.47	4.47	4.83	7.66	≤11.00	PASS
11AX20MIMO	26RU4	5280	0.69	0.51	0.69	0.51	3.61	≤11.00	PASS
11AX20MIMO	52RU39	5280	1.79	1.64	1.79	1.64	4.73	≤11.00	PASS
11AX20MIMO	106RU54	5280	1.85	2.04	4.21	4.40	7.31	≤11.00	PASS
11AX20MIMO	26RU8	5320	1.07	1.62	1.07	1.62	4.36	≤11.00	PASS
11AX20MIMO	52RU40	5320	1.99	2.01	1.99	2.01	5.01	≤11.00	PASS
11AX20MIMO	106RU54	5320	1.84	1.95	4.20	4.31	7.26	≤11.00	PASS
11AX20MIMO	26RU0	5500	1.05	2.13	1.05	2.13	4.63	≤11.00	PASS
11AX20MIMO	52RU37	5500	1.83	2.23	1.83	2.23	5.04	≤11.00	PASS
11AX20MIMO	106RU53	5500	1.51	2.52	3.87	4.88	7.41	≤11.00	PASS
11AX20MIMO	26RU4	5600	-0.90	1.35	-0.90	1.35	3.38	≤11.00	PASS
11AX20MIMO	52RU39	5600	0.98	2.44	0.98	2.44	4.78	≤11.00	PASS
11AX20MIMO	106RU54	5600	0.68	3.01	3.04	5.37	7.37	≤11.00	PASS
11AX20MIMO	26RU8	5700	1.37	1.96	1.37	1.96	4.69	≤11.00	PASS
11AX20MIMO	52RU40	5700	1.68	2.55	1.68	2.55	5.15	≤11.00	PASS
11AX20MIMO	106RU54	5700	1.47	2.47	3.83	4.83	7.37	≤11.00	PASS
11AX20MIMO	26RU0	5720 UNII-2C	1.74	1.86	1.74	1.86	4.81	≤11.00	PASS
11AX20MIMO	52RU37	5720 UNII-2C	2.06	2.44	2.06	2.44	5.26	≤11.00	PASS
11AX20MIMO	106RU54	5720 UNII-2C	0.92	1.97	3.28	4.33	6.85	≤11.00	PASS
11AX20MIMO	26RU8	5720 UNII-3	-2.75	-0.48	-2.75	-0.48	1.54	≤30.00	PASS
11AX20MIMO	52RU40	5720 UNII-3	-2.05	-0.41	-2.05	-0.41	1.86	≤30.00	PASS
11AX20MIMO	106RU54	5720 UNII-3	-2.09	-0.70	0.27	1.66	4.03	≤30.00	PASS
11AX20MIMO	26RU0	5745	-0.61	-0.43	-0.61	-0.43	2.49	≤30.00	PASS
11AX20MIMO	52RU37	5745	-0.29	-0.59	-0.29	-0.59	2.57	≤30.00	PASS
11AX20MIMO	106RU53	5745	-0.73	-0.65	1.63	1.71	4.68	≤30.00	PASS
11AX20MIMO	26RU4	5785	-2.30	-1.65	-2.30	-1.65	1.05	≤30.00	PASS
11AX20MIMO	52RU39	5785	-1.11	-0.99	-1.11	-0.99	1.96	≤30.00	PASS
11AX20MIMO	106RU54	5785	-1.16	-1.14	1.20	1.22	4.22	≤30.00	PASS
11AX20MIMO	26RU8	5825	-1.81	-0.34	-1.81	-0.34	2.00	≤30.00	PASS
11AX20MIMO	52RU40	5825	-1.27	-0.28	-1.27	-0.28	2.26	≤30.00	PASS
11AX20MIMO	106RU54	5825	-1.65	-0.17	0.71	2.19	4.52	≤30.00	PASS

Note: 1. Due to measurement RBW of Maximum PSD is specified in 500kHz, so add $10\log(500\text{ kHz}/300\text{ kHz})$ to the measured result in the band 5.725–5.85 GHz.



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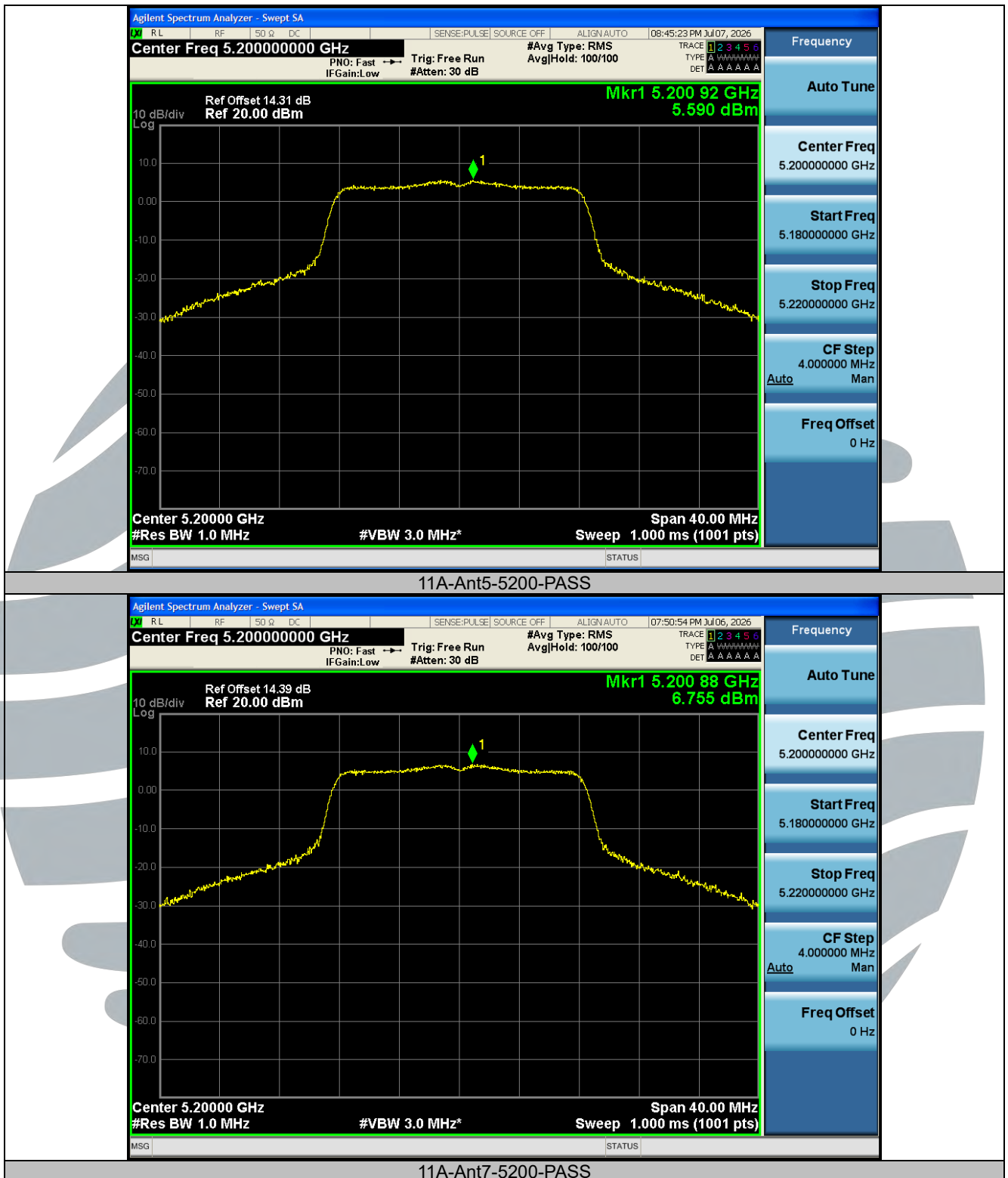
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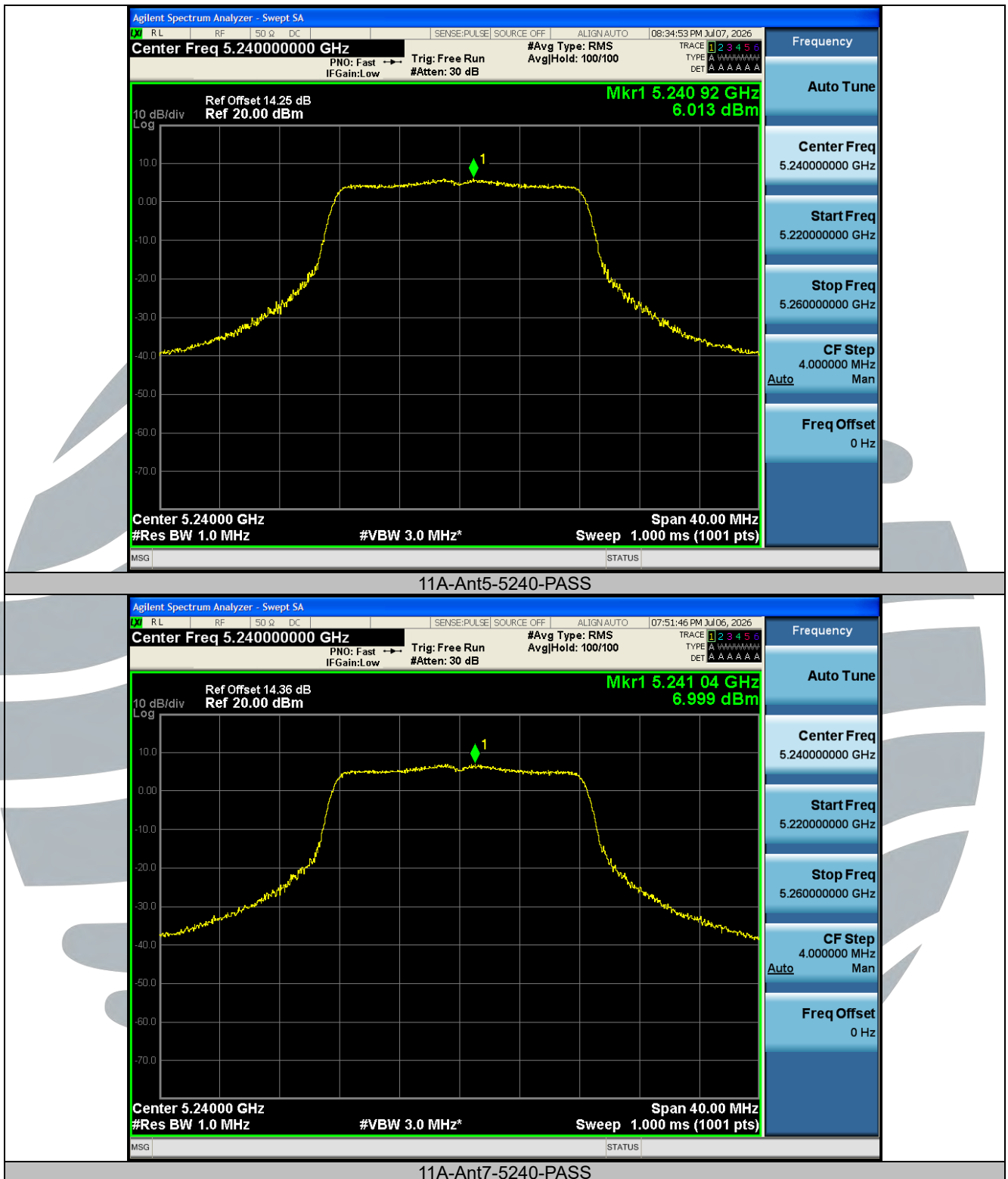
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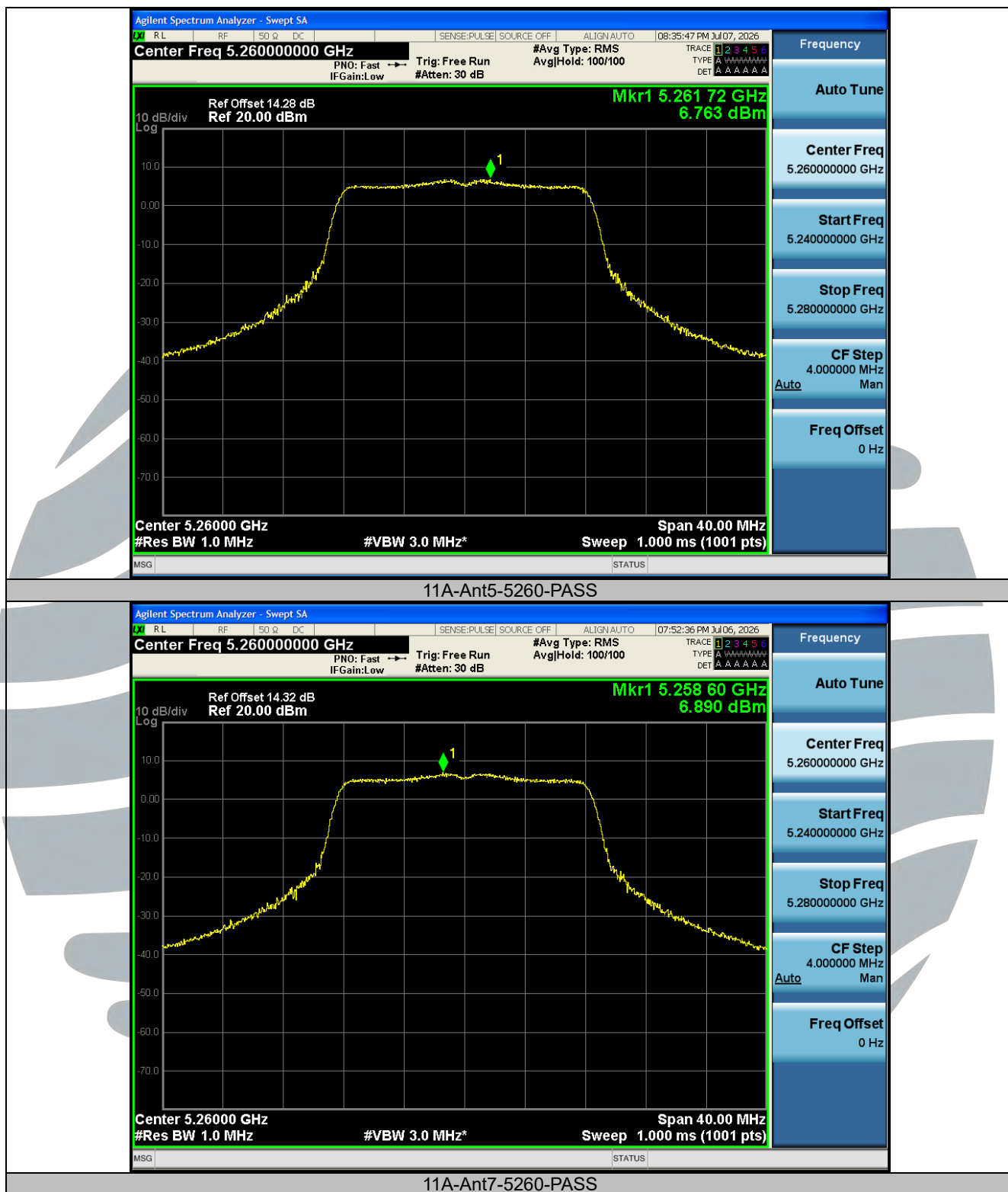
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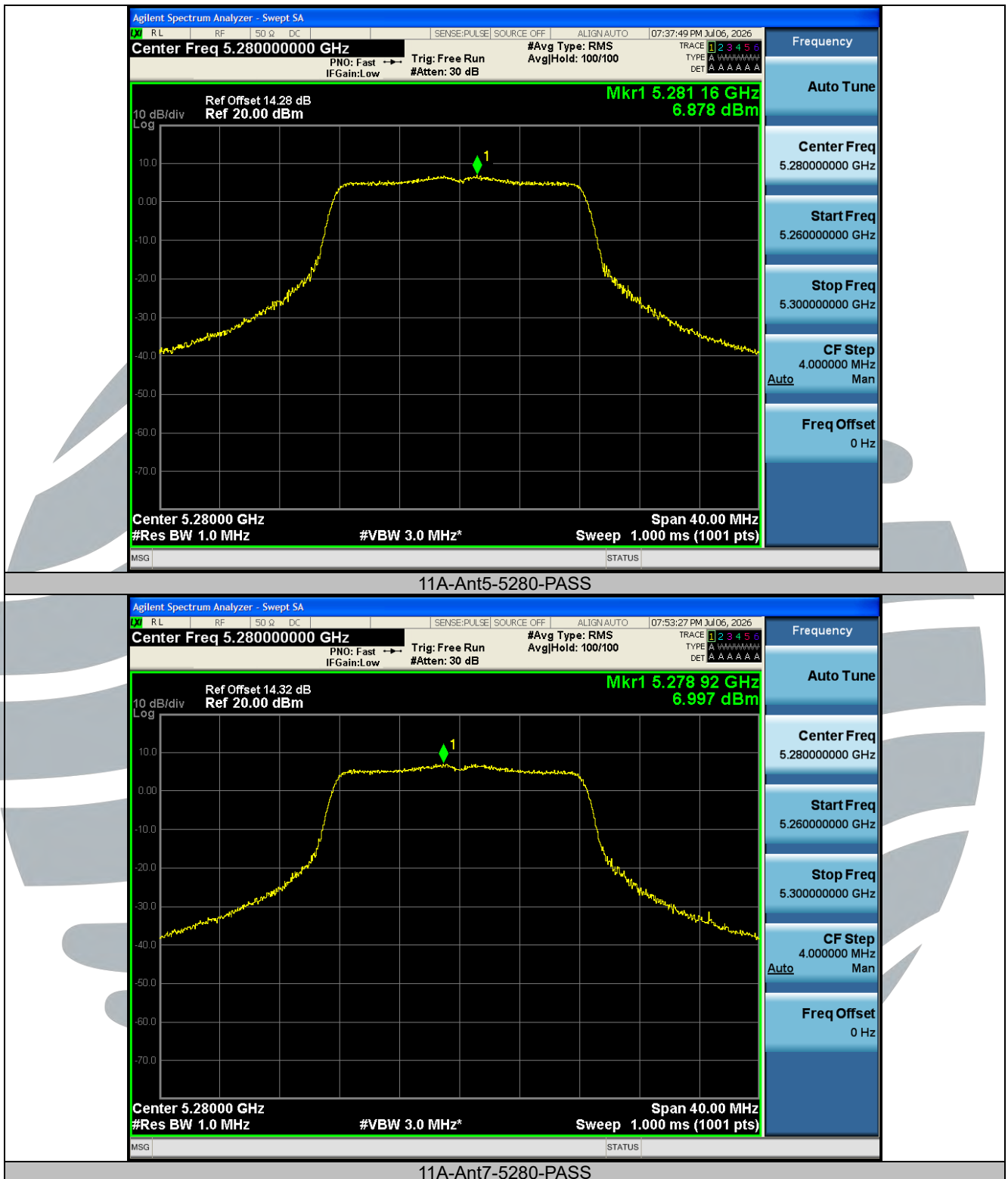
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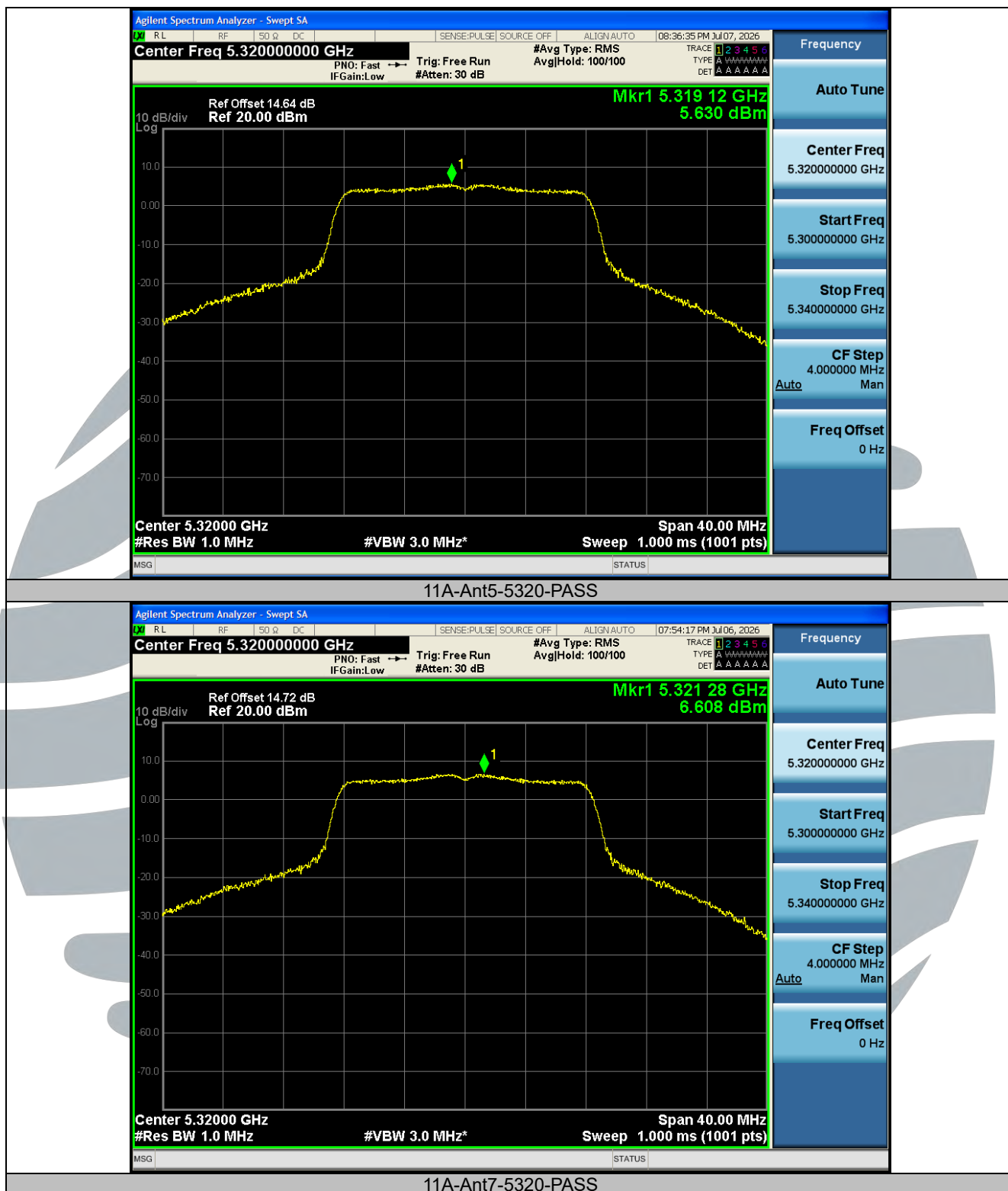
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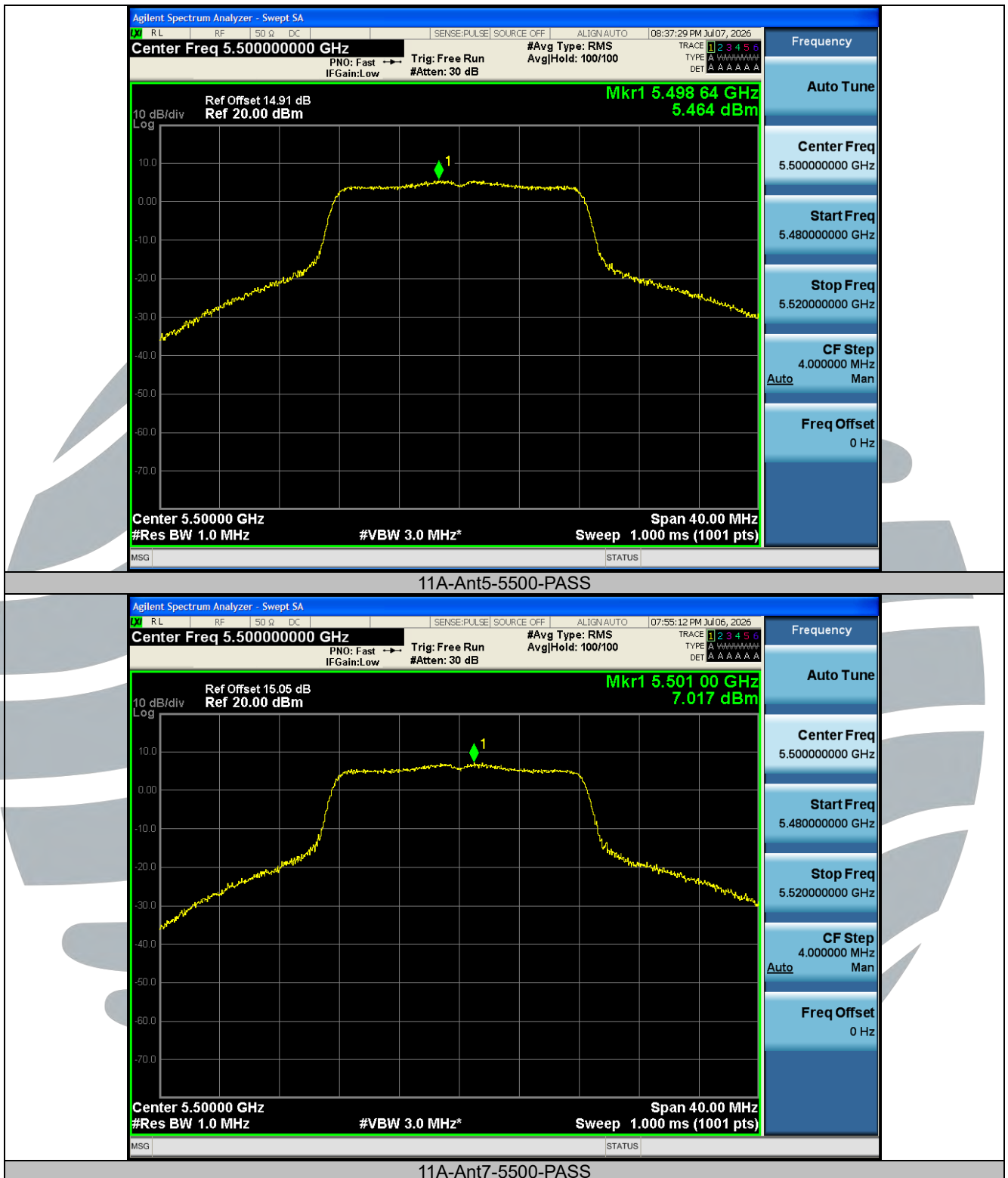
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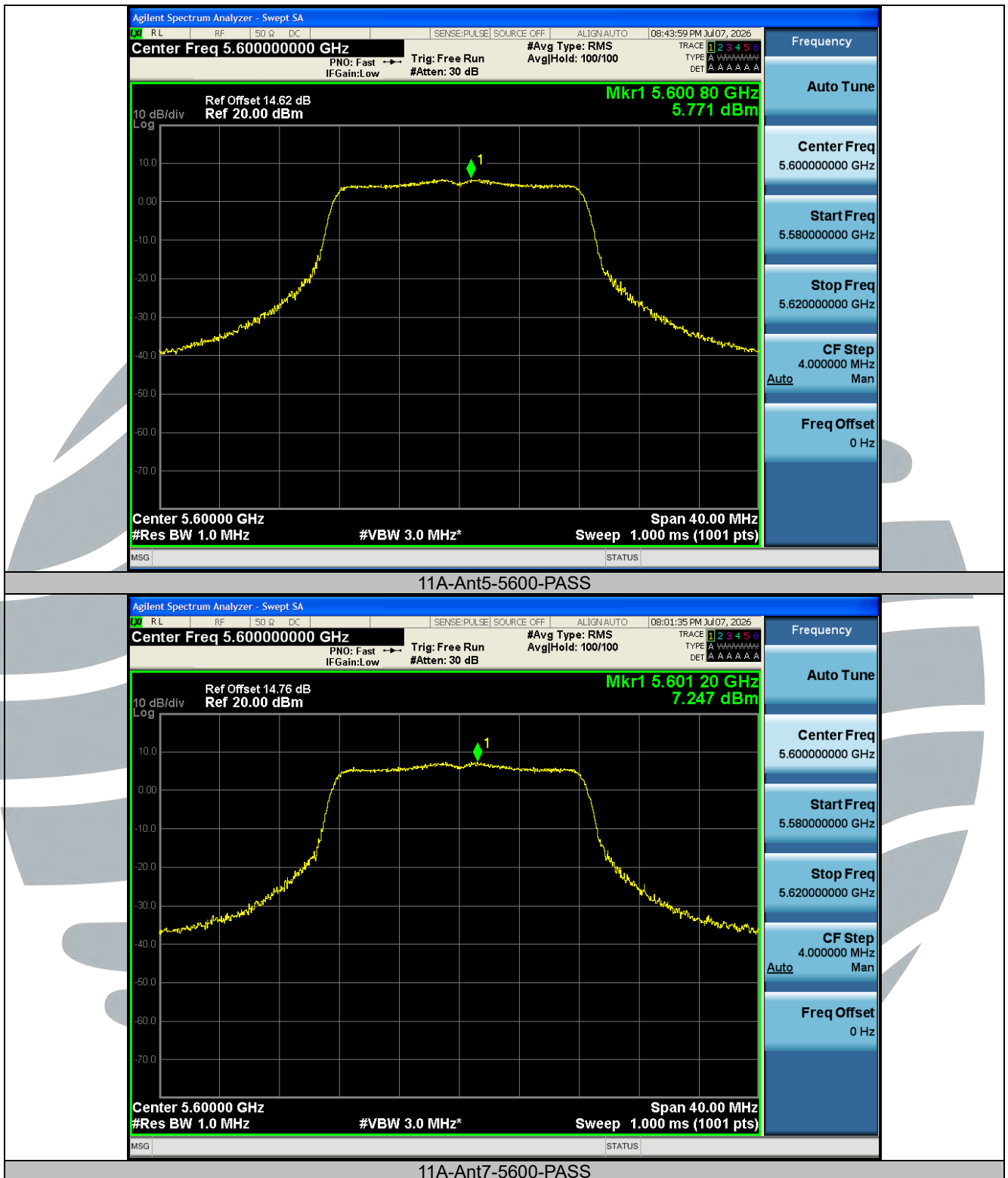
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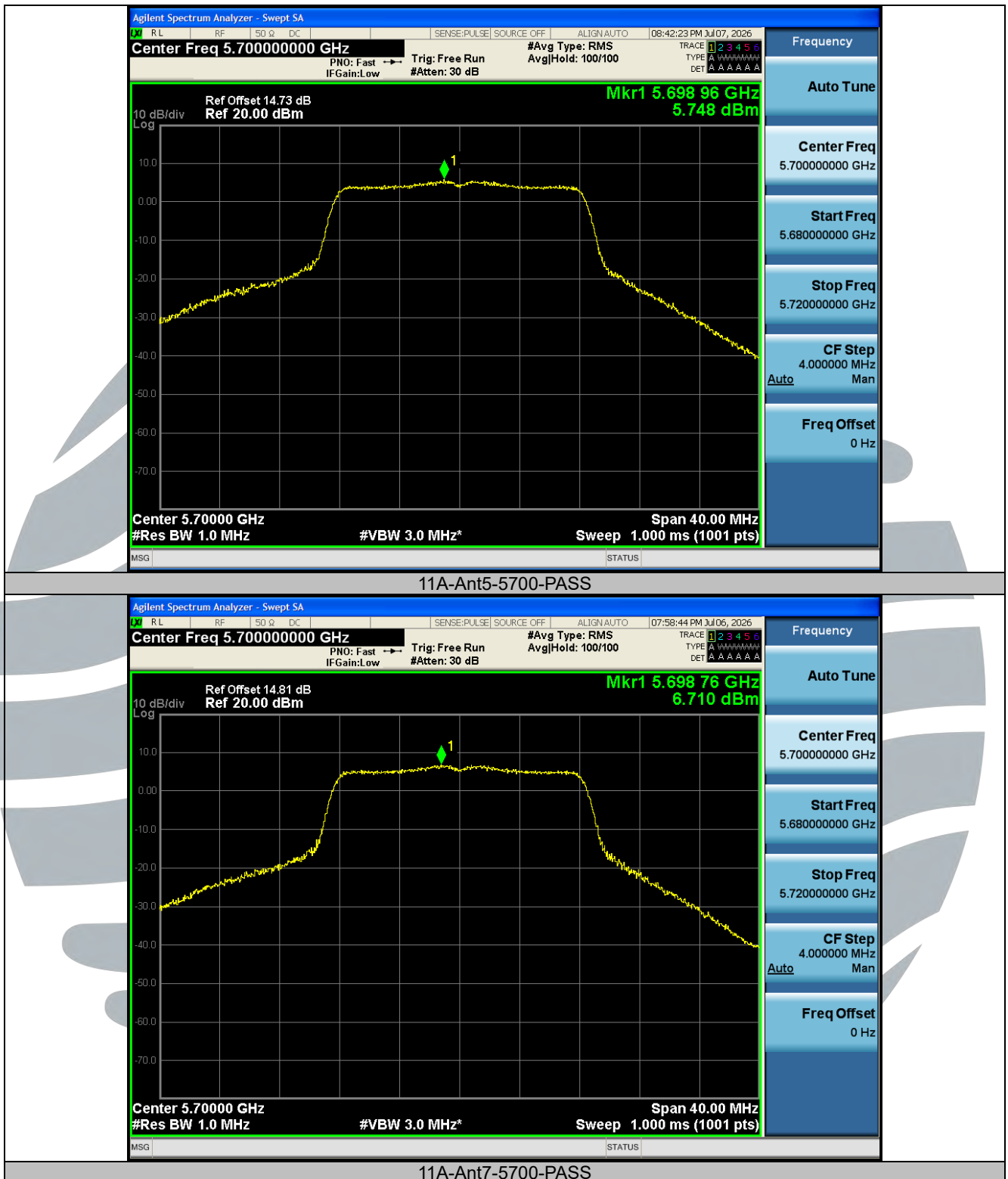
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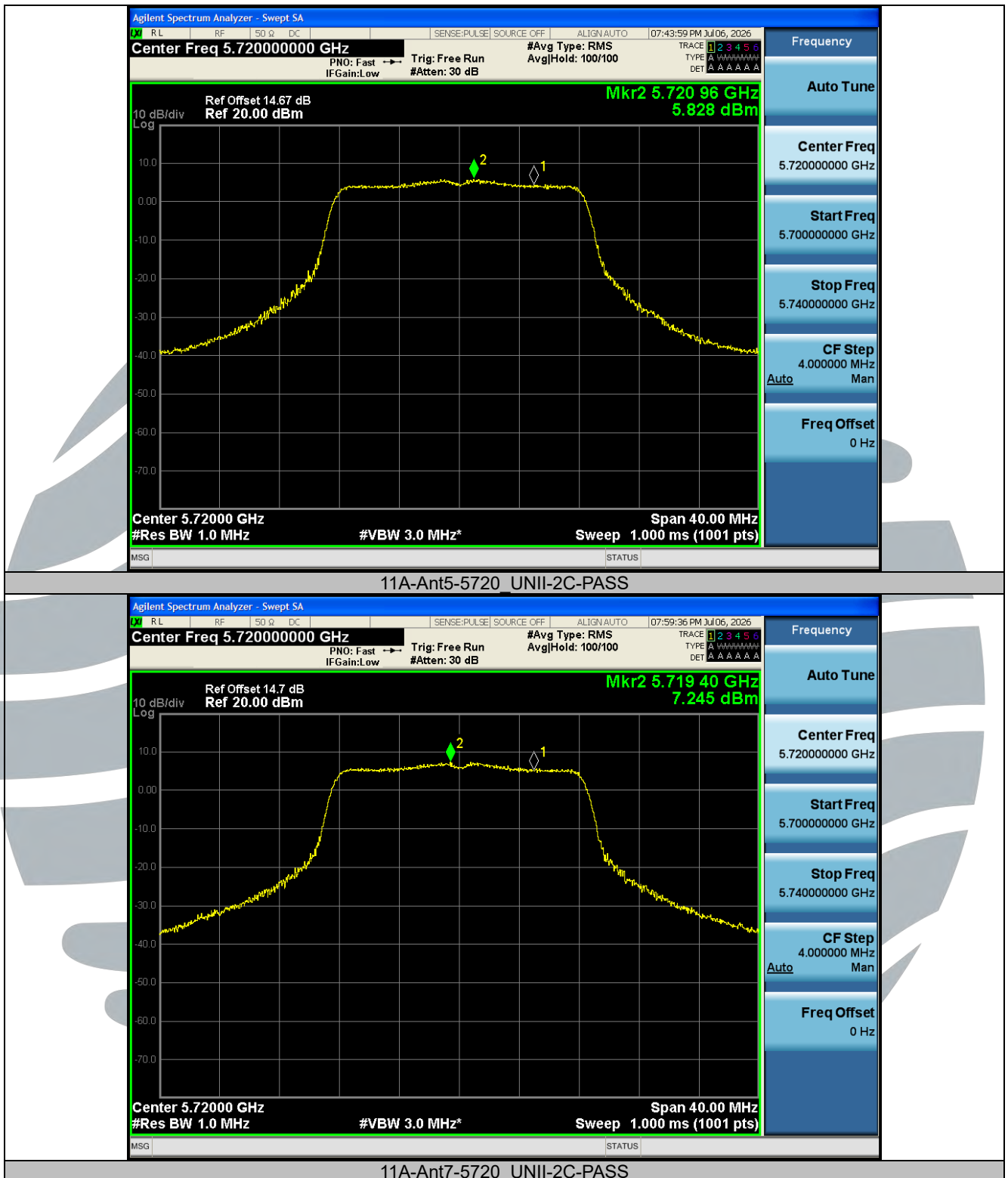
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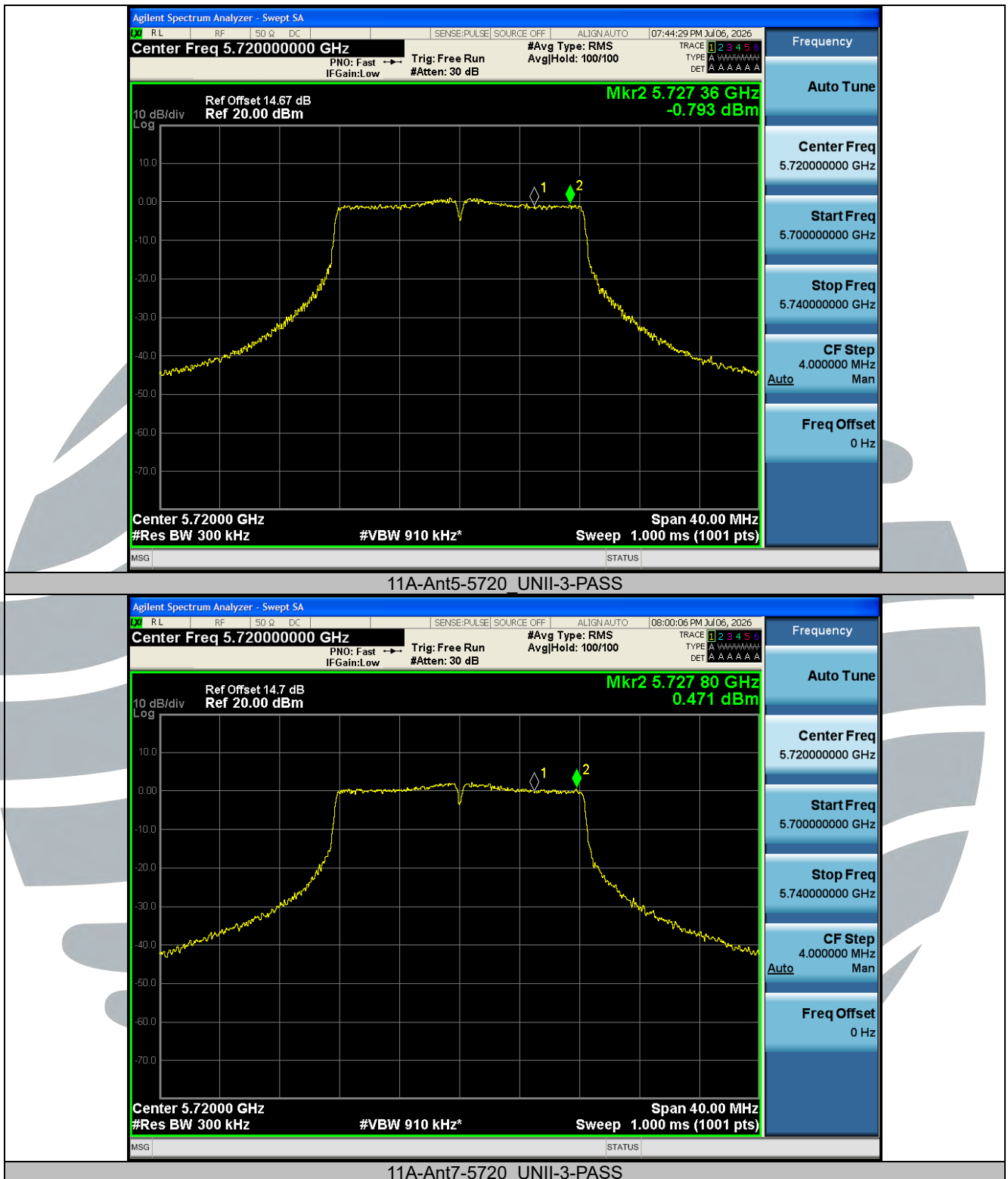
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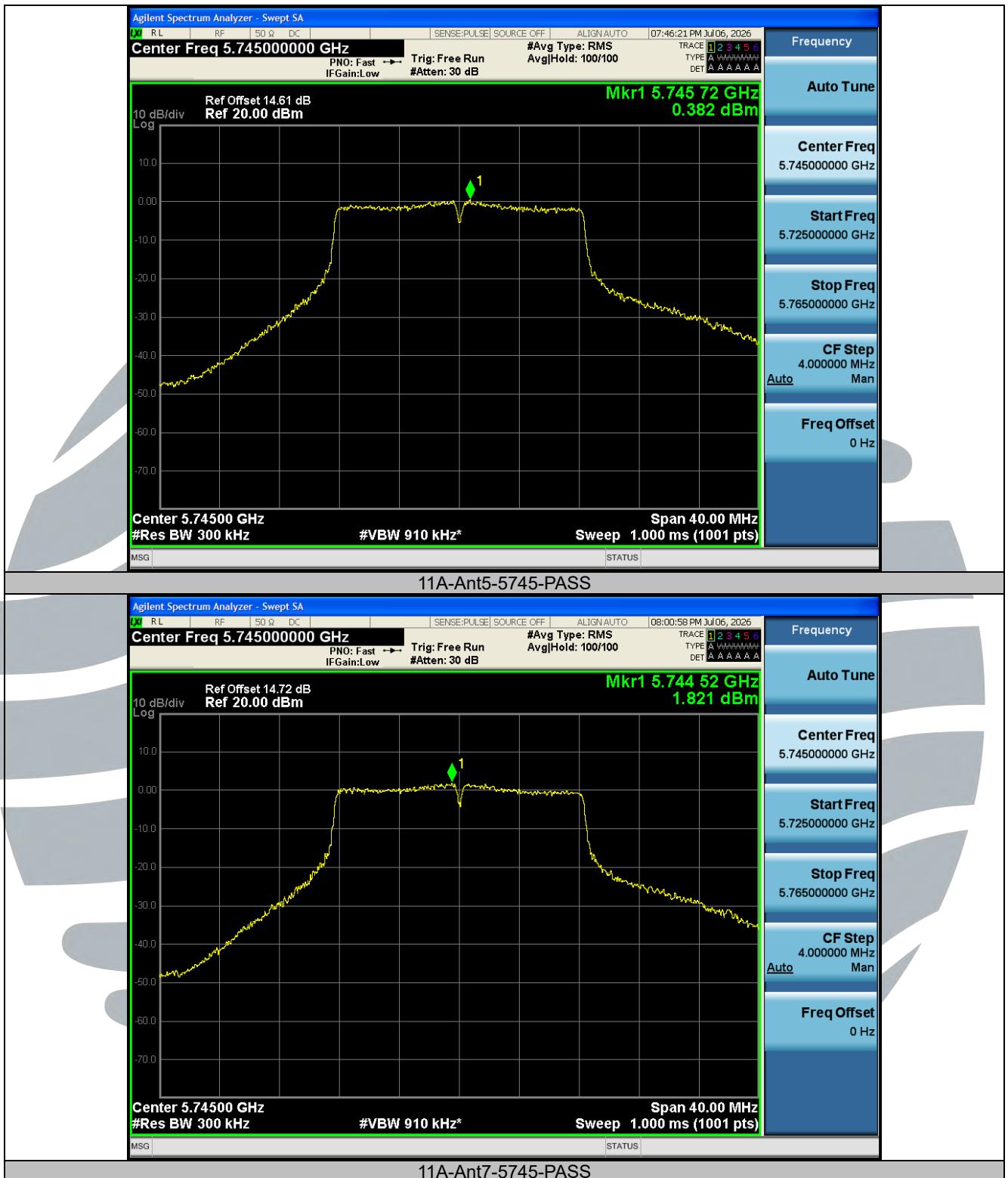
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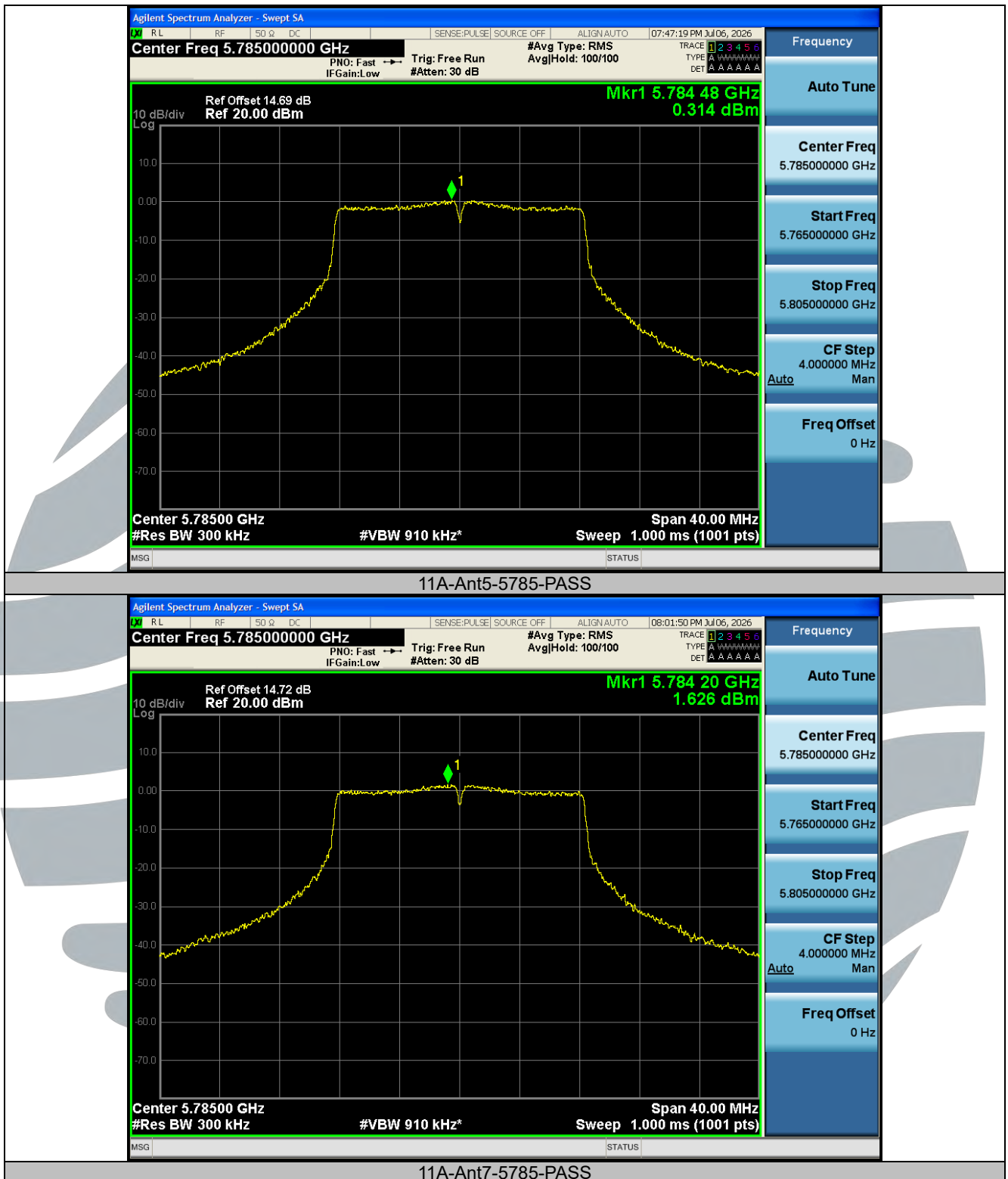
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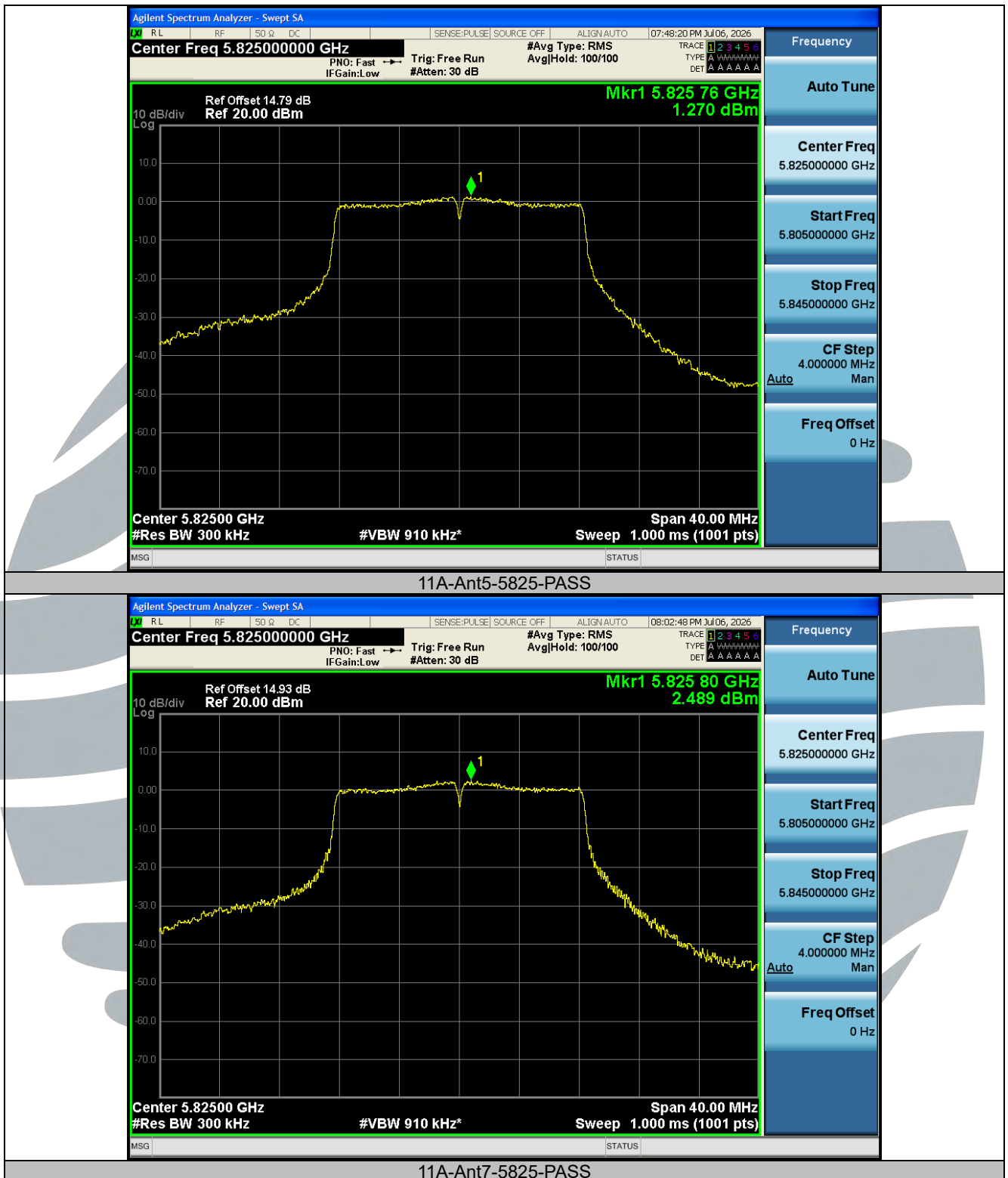
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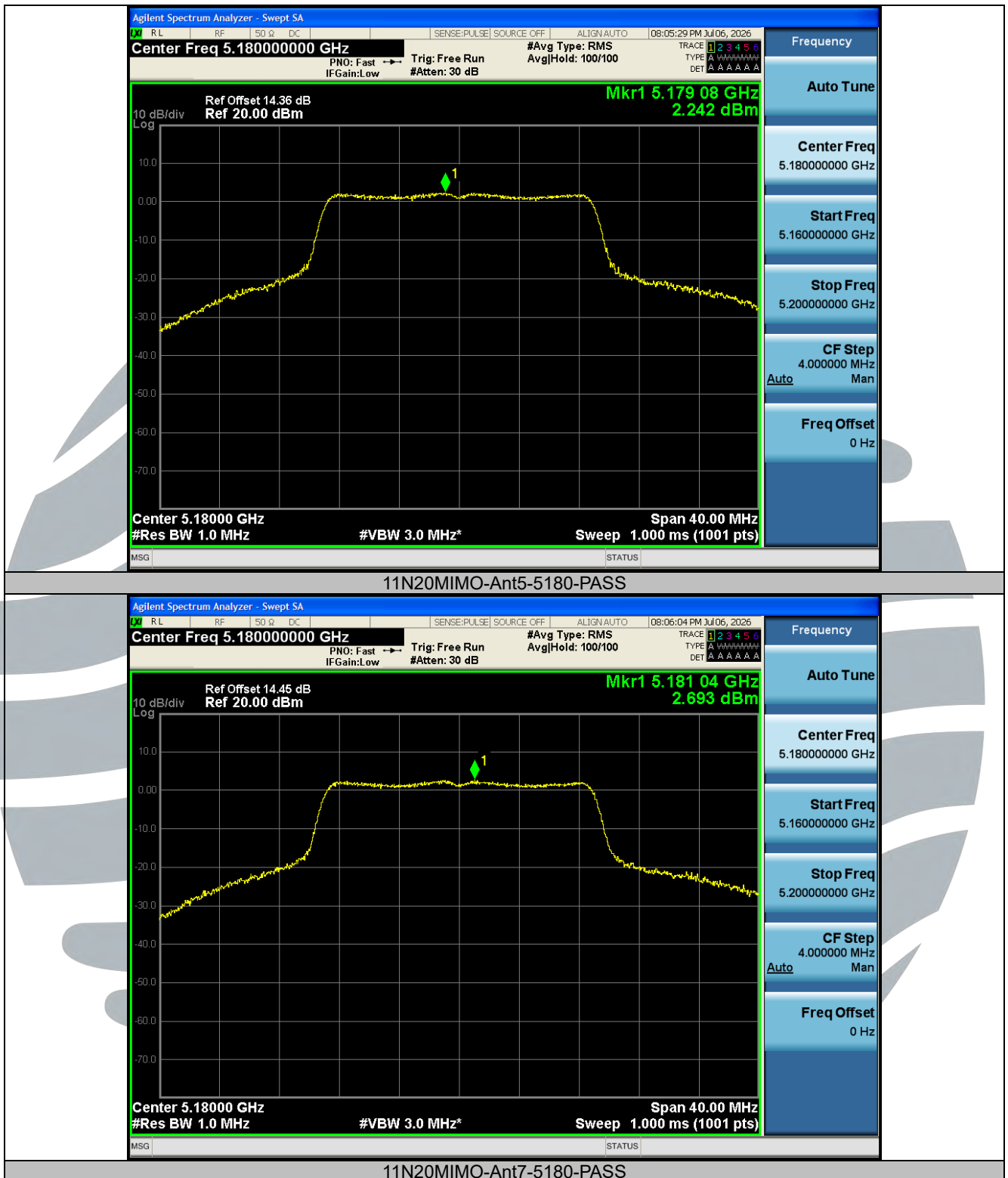
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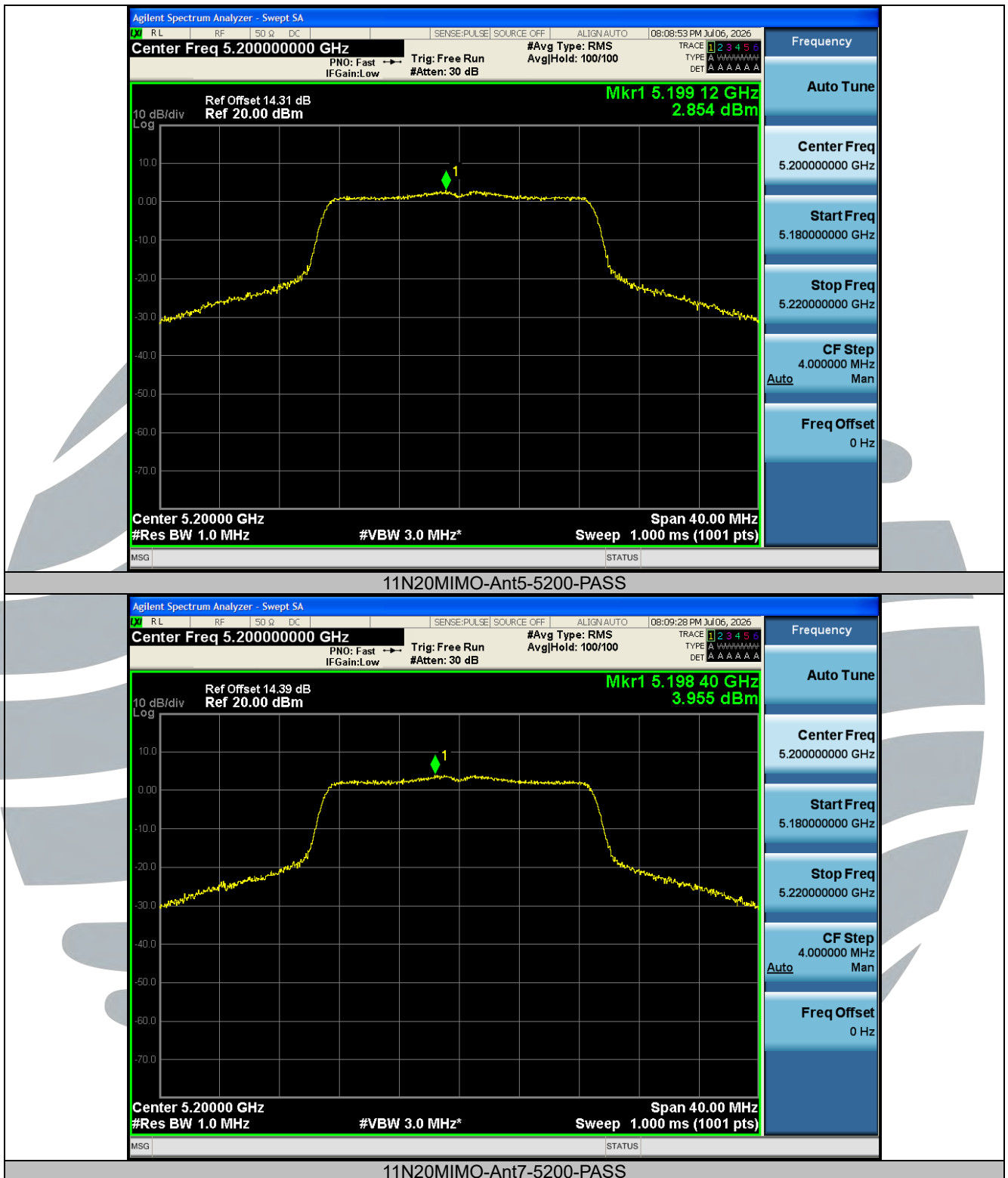
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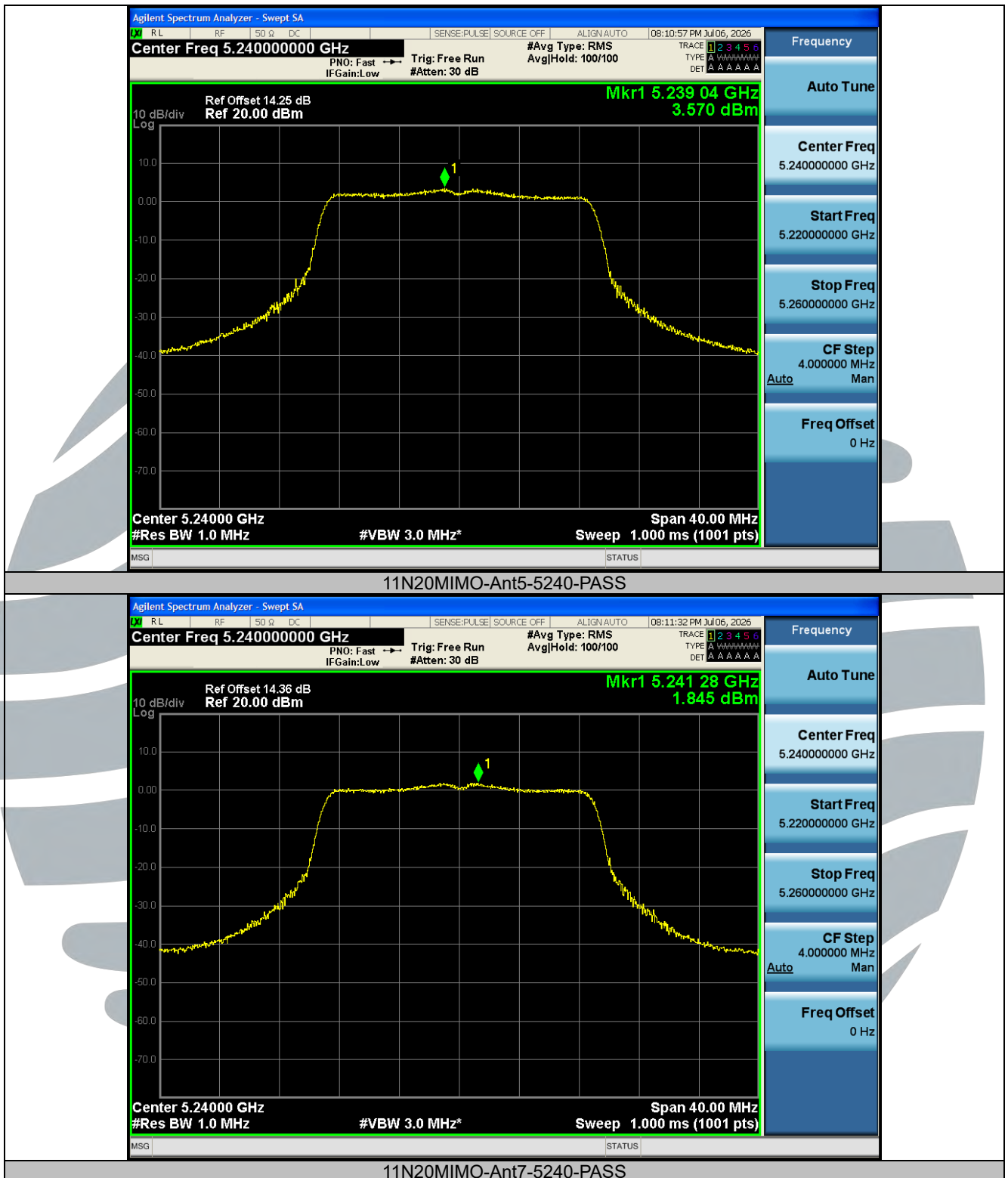
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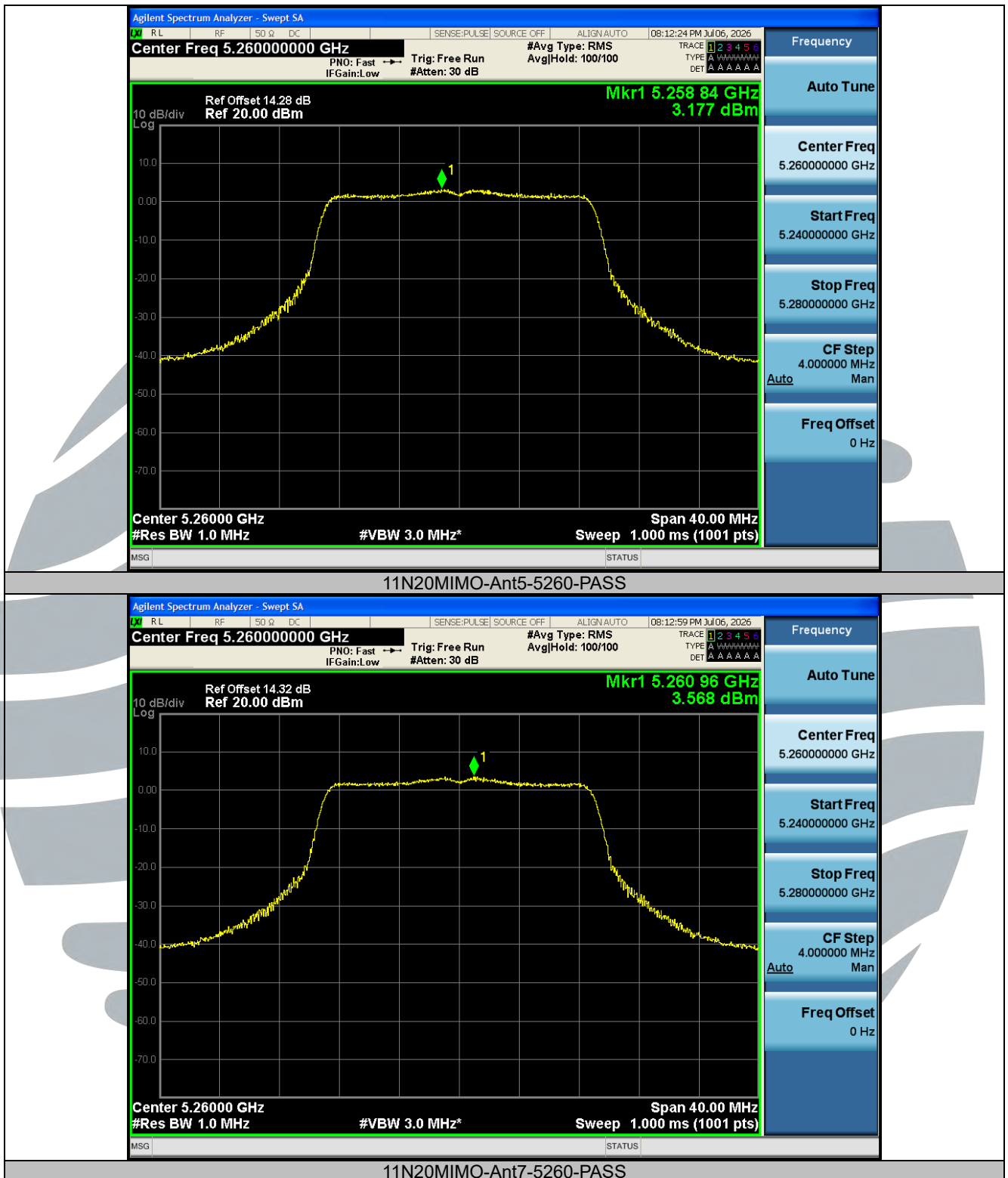
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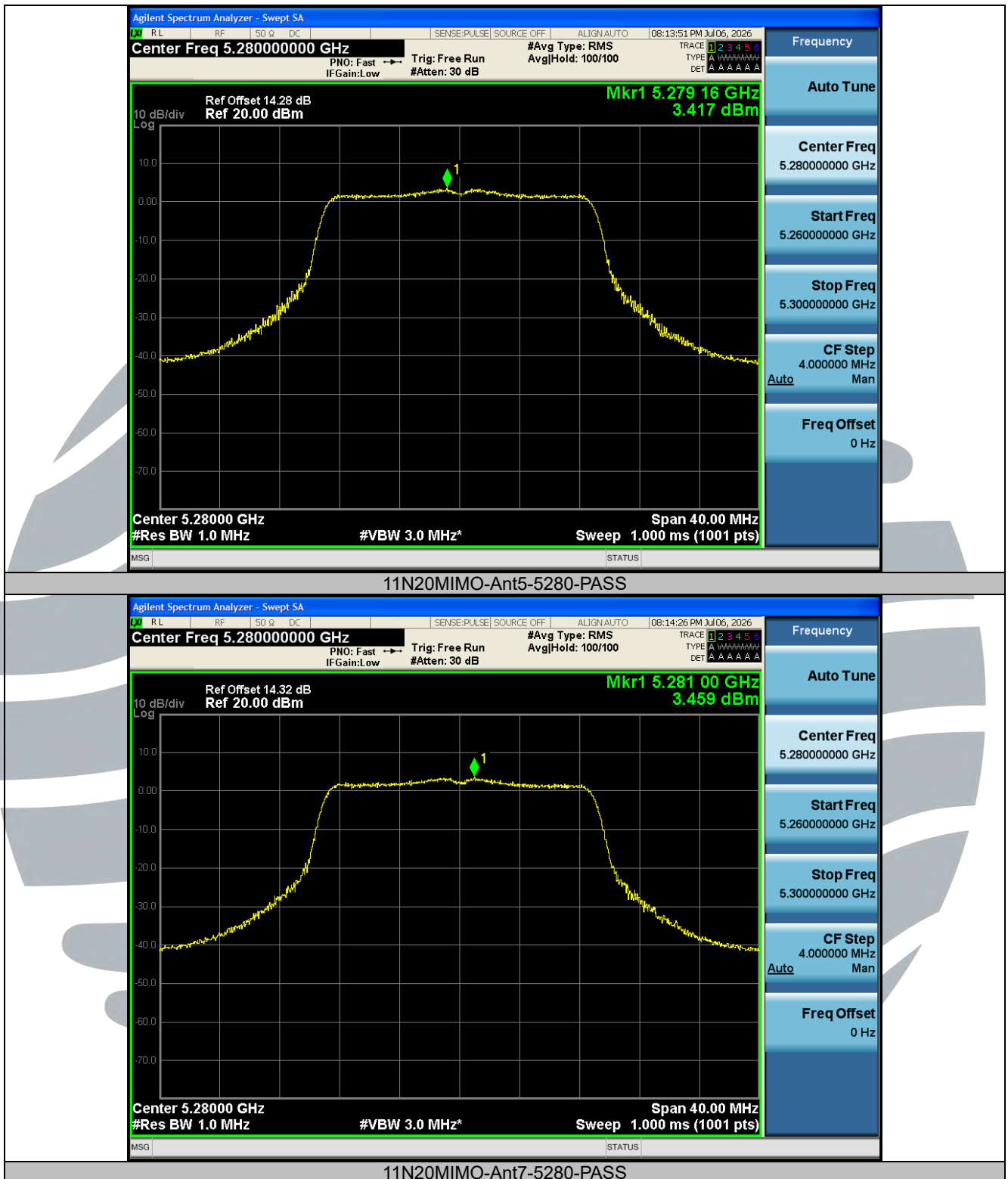
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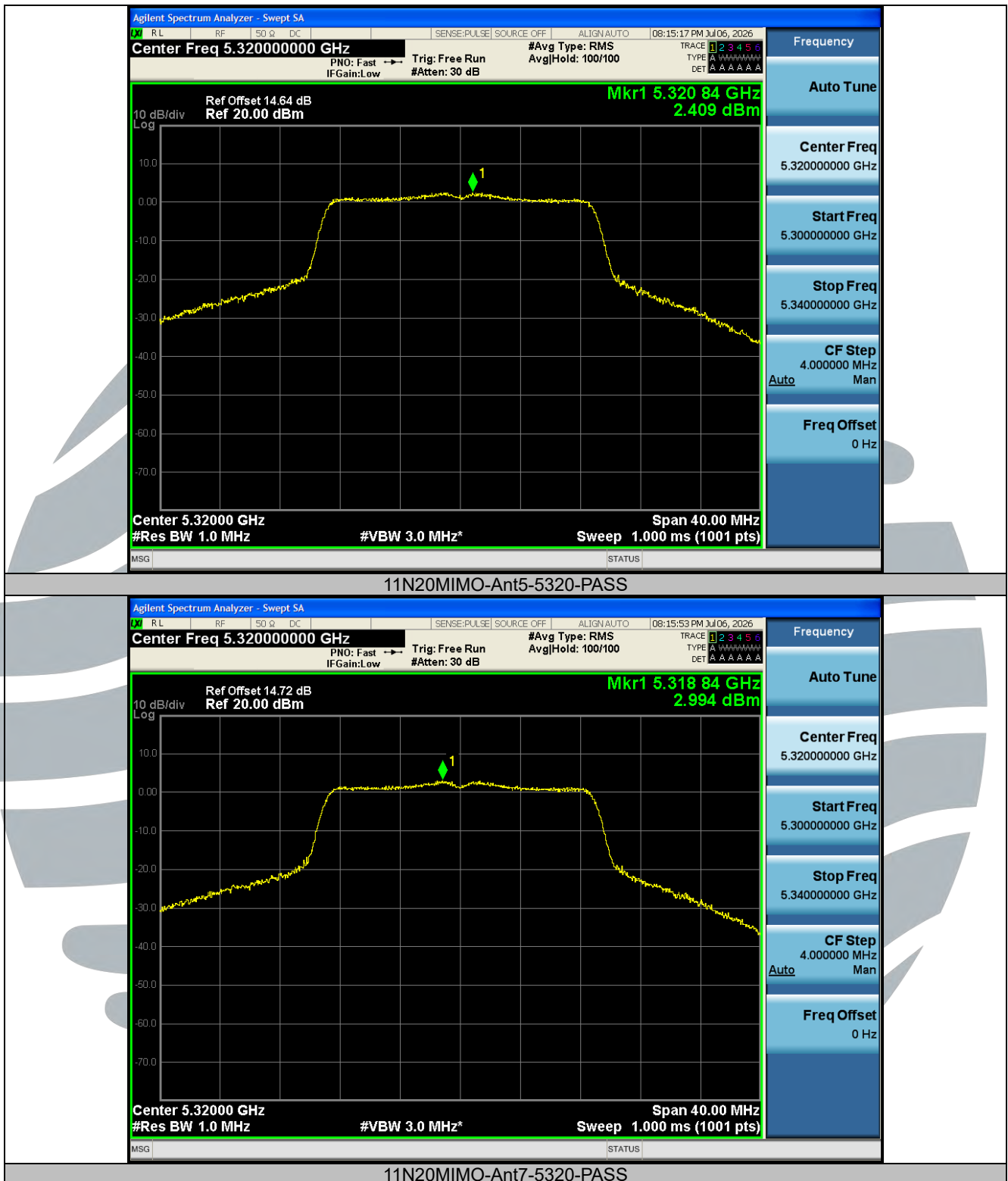
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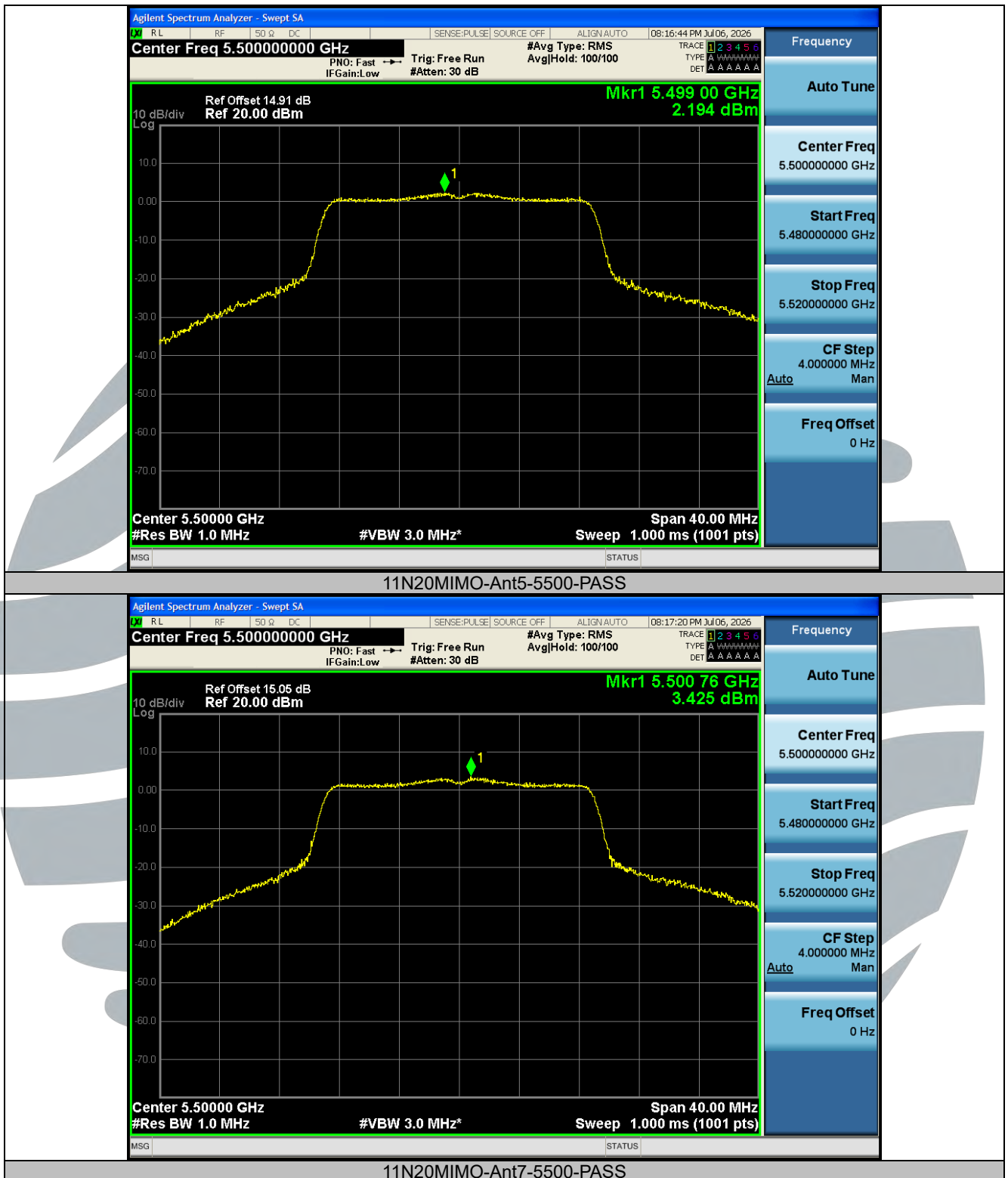
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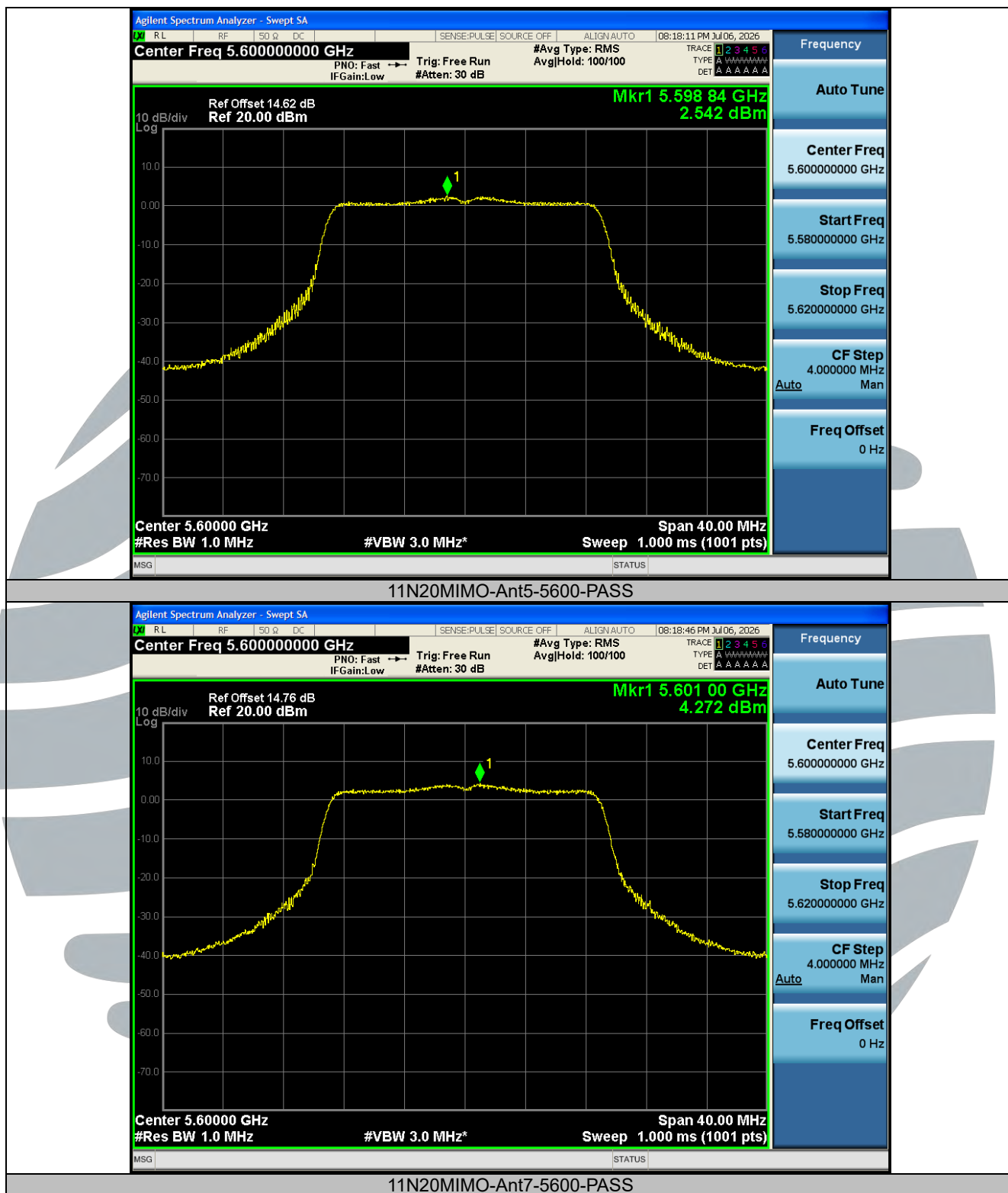
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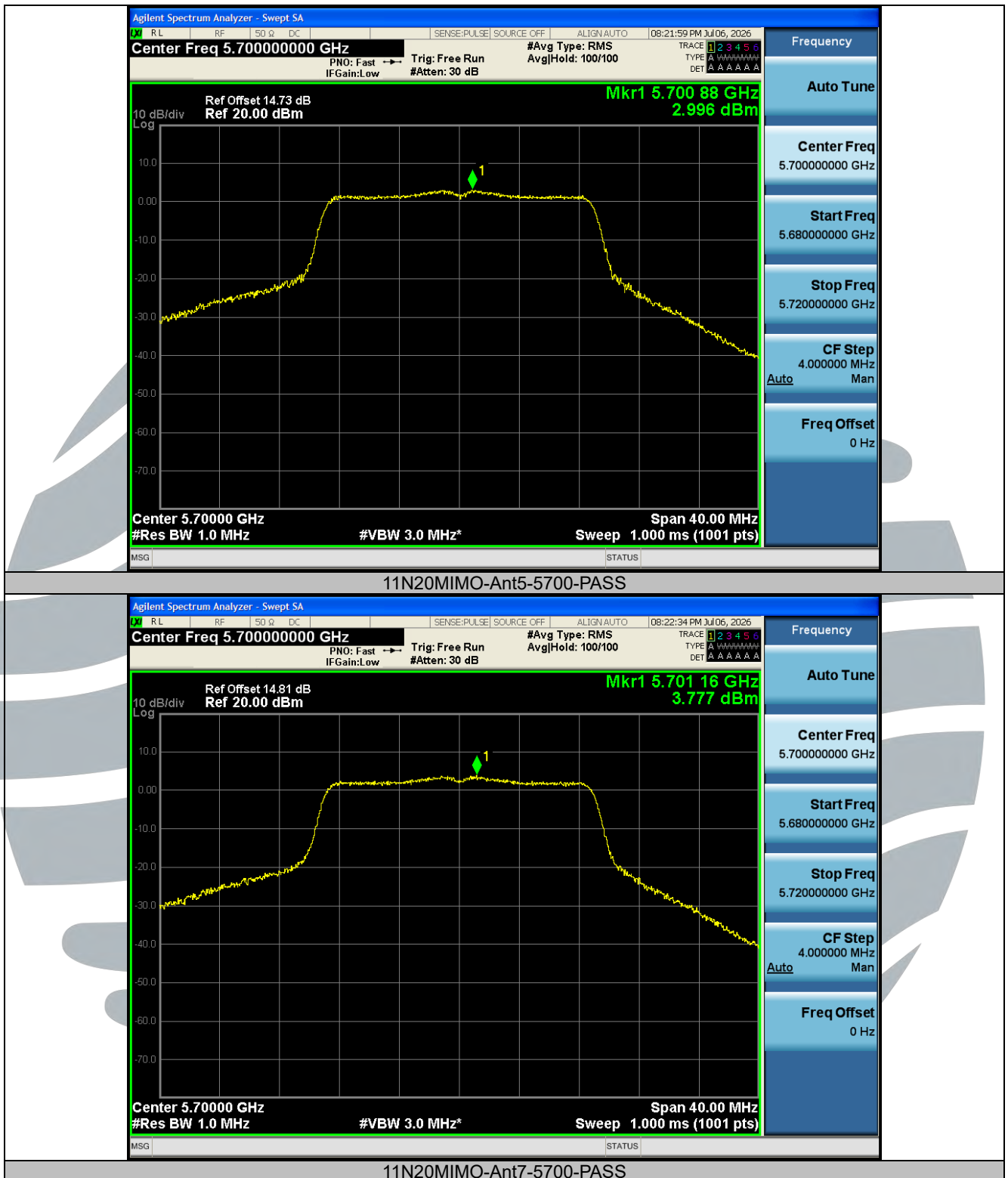
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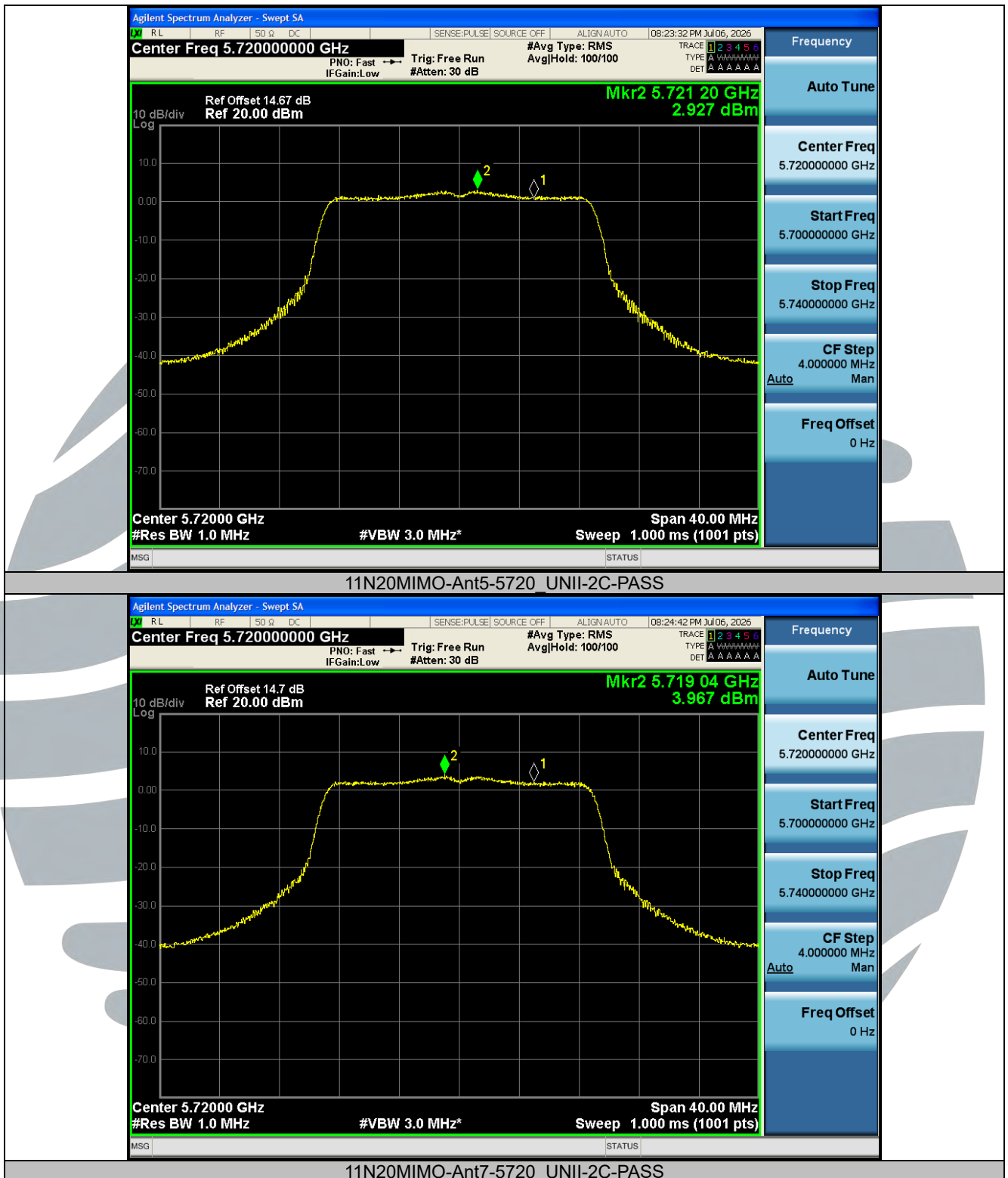
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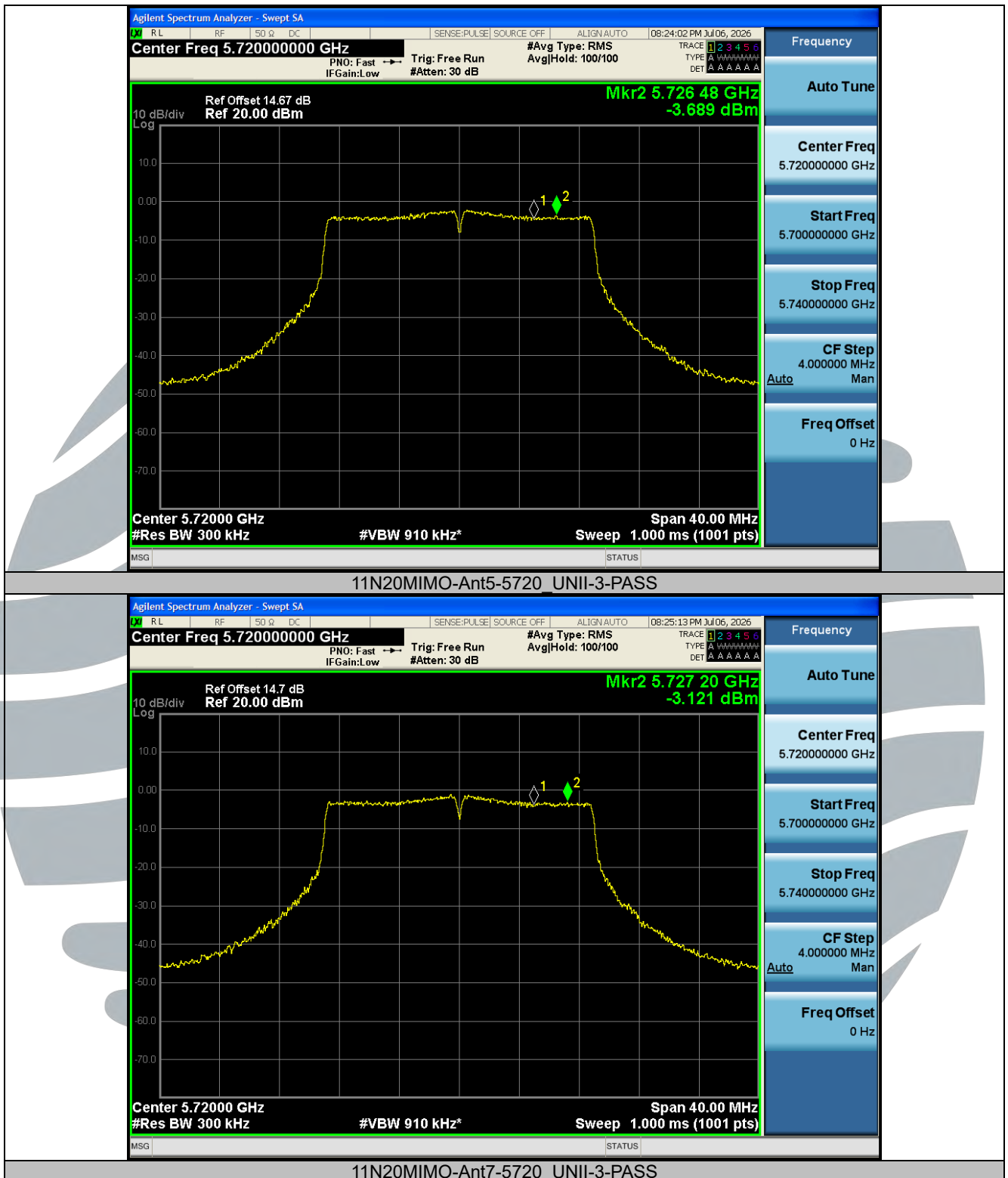
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