









8.2 MAXIMUM CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(E)

8.2.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (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. 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).

(a) (1) (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. 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.

(a) (1) (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. 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.

(a) (1) (iv) 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. 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.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(a) (2) 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.

■ For the band 5.725-5.85 GHz

(a) (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.

8.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.2.4 Test Procedure

The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):

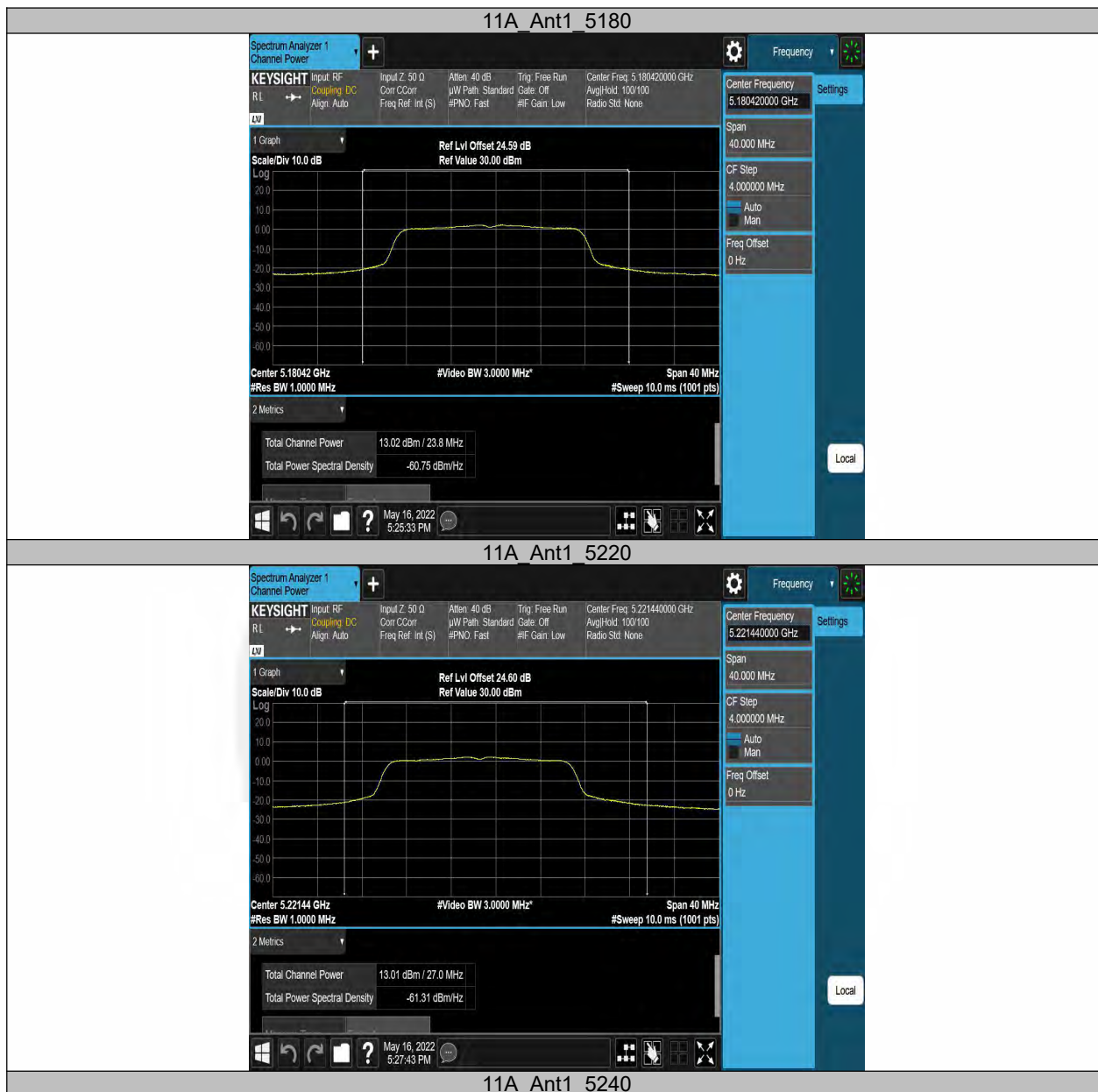
Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

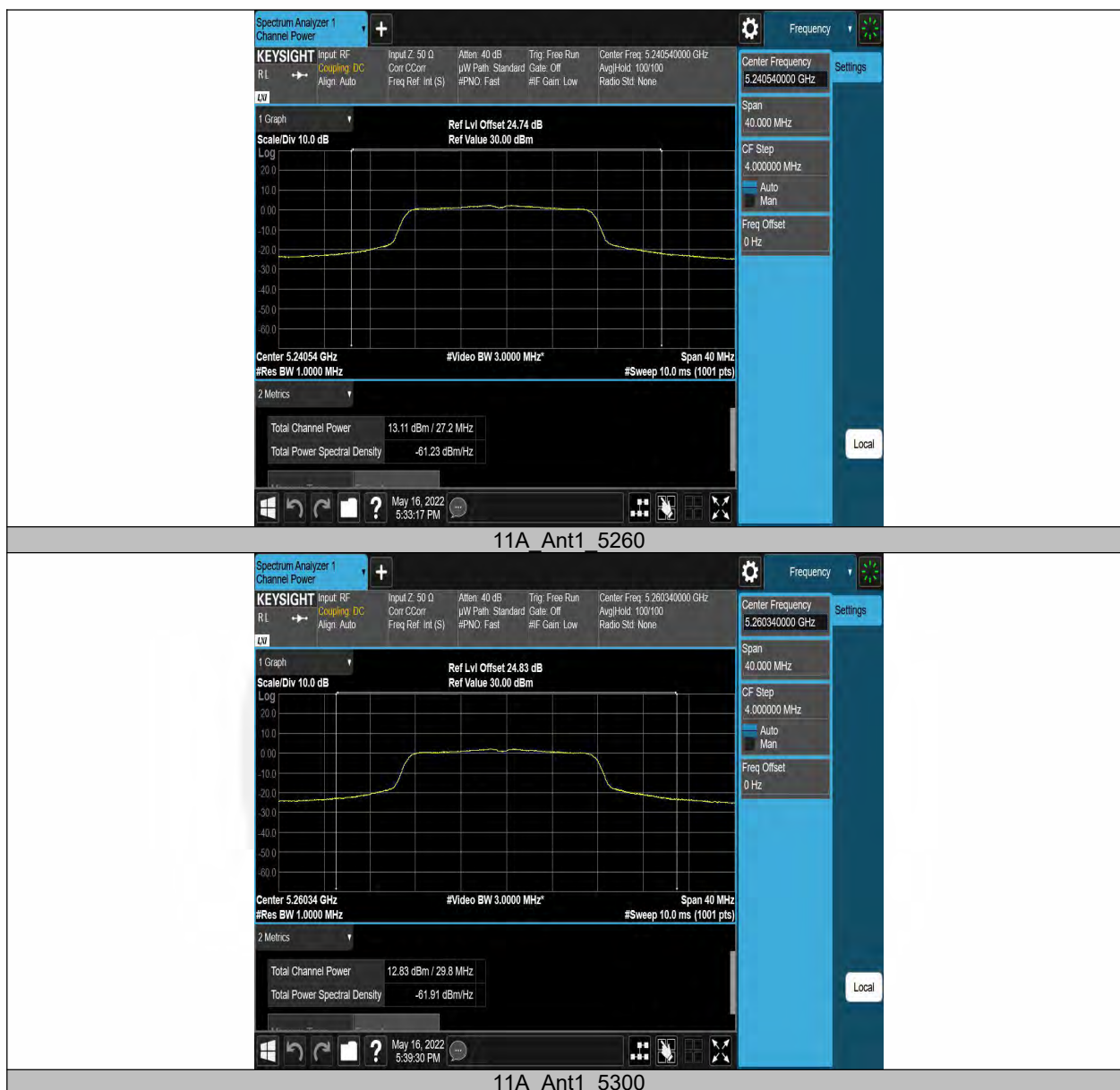
- The Transmitter output (antenna port) was connected to the power meter.
- Turn on the EUT and power meter and then record the power value.
- Repeat above procedures on all channels needed to be tested.

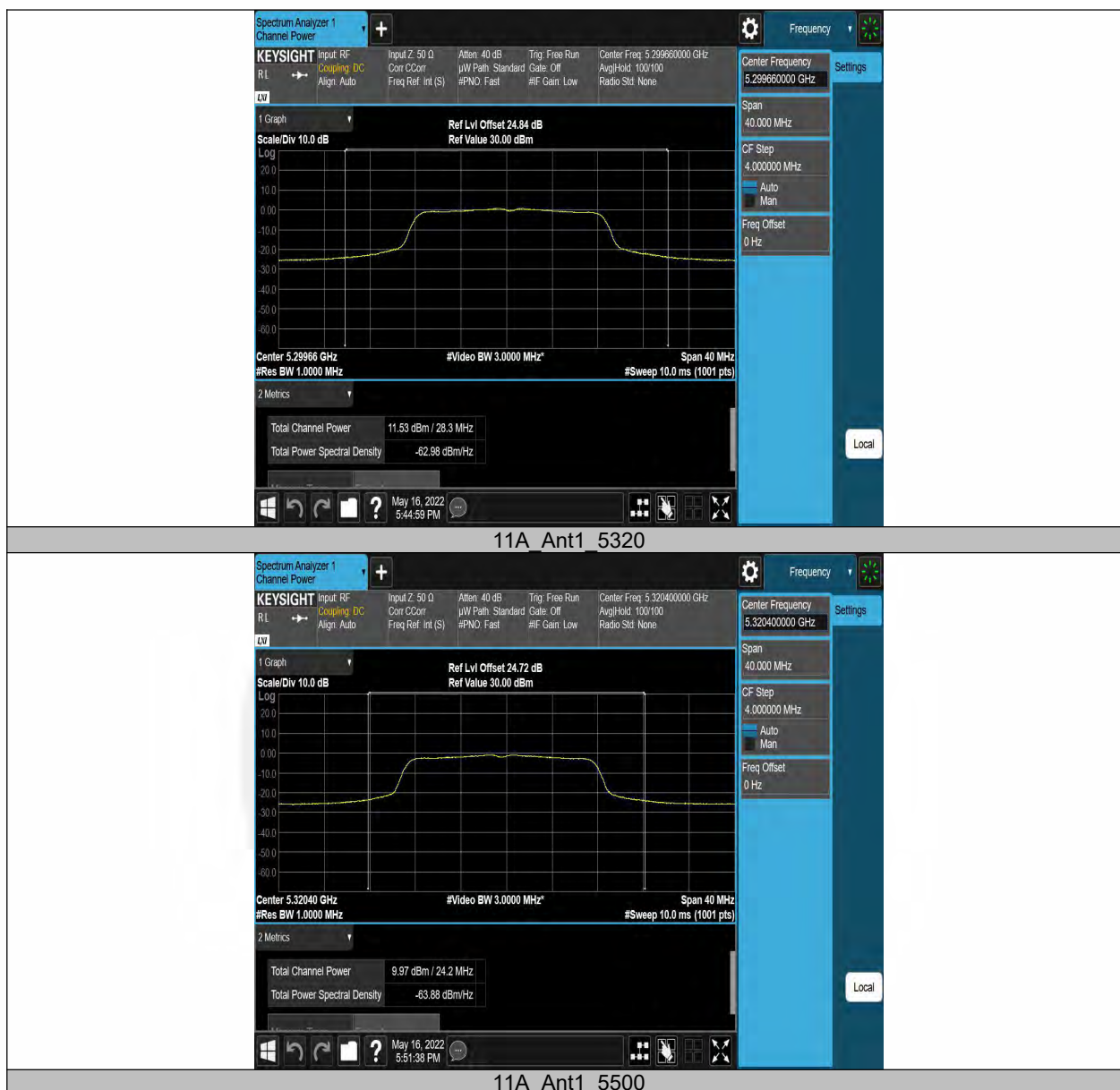
8.2.5 Test Results

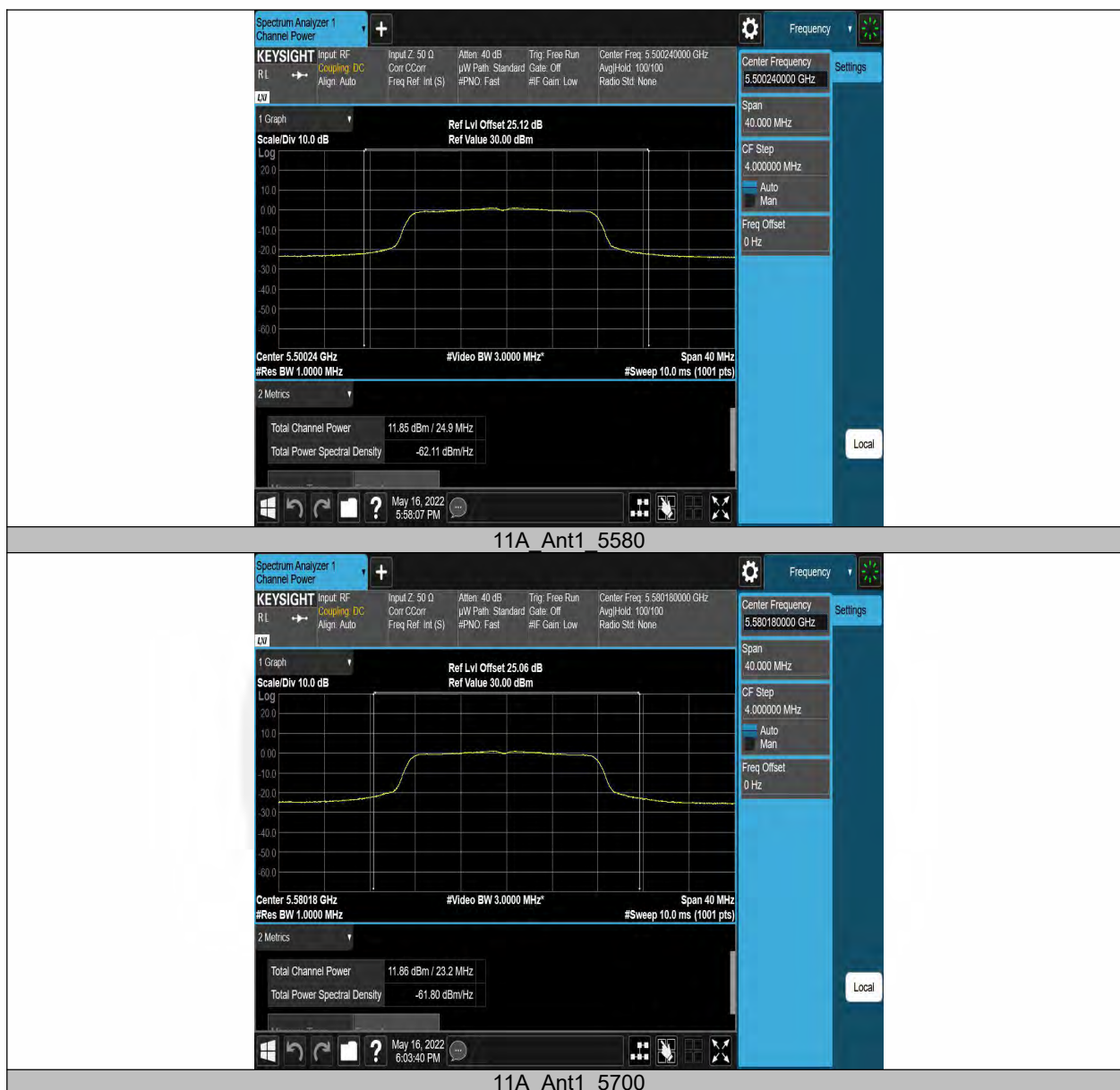
Test Mode	Antenna	Frequency [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11A	Ant1	5180	13.02	≤23.98	2.50	15.52	---	PASS
		5220	13.01	≤23.98	2.50	15.51	---	PASS
		5240	13.11	≤23.98	2.50	15.61	---	PASS
		5260	12.83	≤23.98	2.50	15.33	≤26.99	PASS
		5300	11.53	≤23.98	2.50	14.03	≤26.99	PASS
		5320	9.97	≤23.98	2.50	12.47	≤26.99	PASS
		5500	11.85	≤23.98	2.50	14.35	≤26.99	PASS
		5580	11.86	≤23.98	2.50	14.36	≤26.99	PASS
		5700	12.57	≤23.98	2.50	15.07	≤26.99	PASS
		5745	13.22	≤30.00	2.50	15.72	---	PASS
		5785	12.75	≤30.00	2.50	15.25	---	PASS
11N20SISO	Ant1	5825	12.67	≤30.00	2.50	15.17	---	PASS
		5180	12.95	≤23.98	2.50	15.45	---	PASS
		5220	12.80	≤23.98	2.50	15.30	---	PASS
		5240	12.92	≤23.98	2.50	15.42	---	PASS
		5260	12.66	≤23.98	2.50	15.16	≤26.99	PASS
		5300	11.84	≤23.98	2.50	14.34	≤26.99	PASS
		5320	10.16	≤23.98	2.50	12.66	≤26.99	PASS
		5500	11.82	≤23.98	2.50	14.32	≤26.99	PASS
		5580	11.70	≤23.98	2.50	14.20	≤26.99	PASS
		5700	12.39	≤23.98	2.50	14.89	≤26.99	PASS
11N40SISO	Ant1	5745	13.05	≤30.00	2.50	15.55	---	PASS
		5785	12.77	≤30.00	2.50	15.27	---	PASS
		5825	12.69	≤30.00	2.50	15.19	---	PASS
		5190	13.61	≤23.98	2.50	16.11	---	PASS
		5230	13.33	≤23.98	2.50	15.83	---	PASS
		5270	11.89	≤23.98	2.50	14.39	≤26.99	PASS
		5310	10.13	≤23.98	2.50	12.63	≤26.99	PASS
		5510	12.14	≤23.98	2.50	14.64	≤26.99	PASS
11AC20SISO	Ant1	5550	12.34	≤23.98	2.50	14.84	≤26.99	PASS
		5670	11.05	≤23.98	2.50	13.55	≤26.99	PASS
		5755	12.60	≤30.00	2.50	15.10	---	PASS
		5795	12.44	≤30.00	2.50	14.94	---	PASS
		5180	12.49	≤23.98	2.50	14.99	---	PASS
	Ant1	5220	12.21	≤23.98	2.50	14.71	---	PASS
		5240	12.18	≤23.98	2.50	14.68	---	PASS
		5260	11.84	≤23.98	2.50	14.34	≤26.99	PASS
		5300	10.69	≤23.98	2.50	13.19	≤26.99	PASS

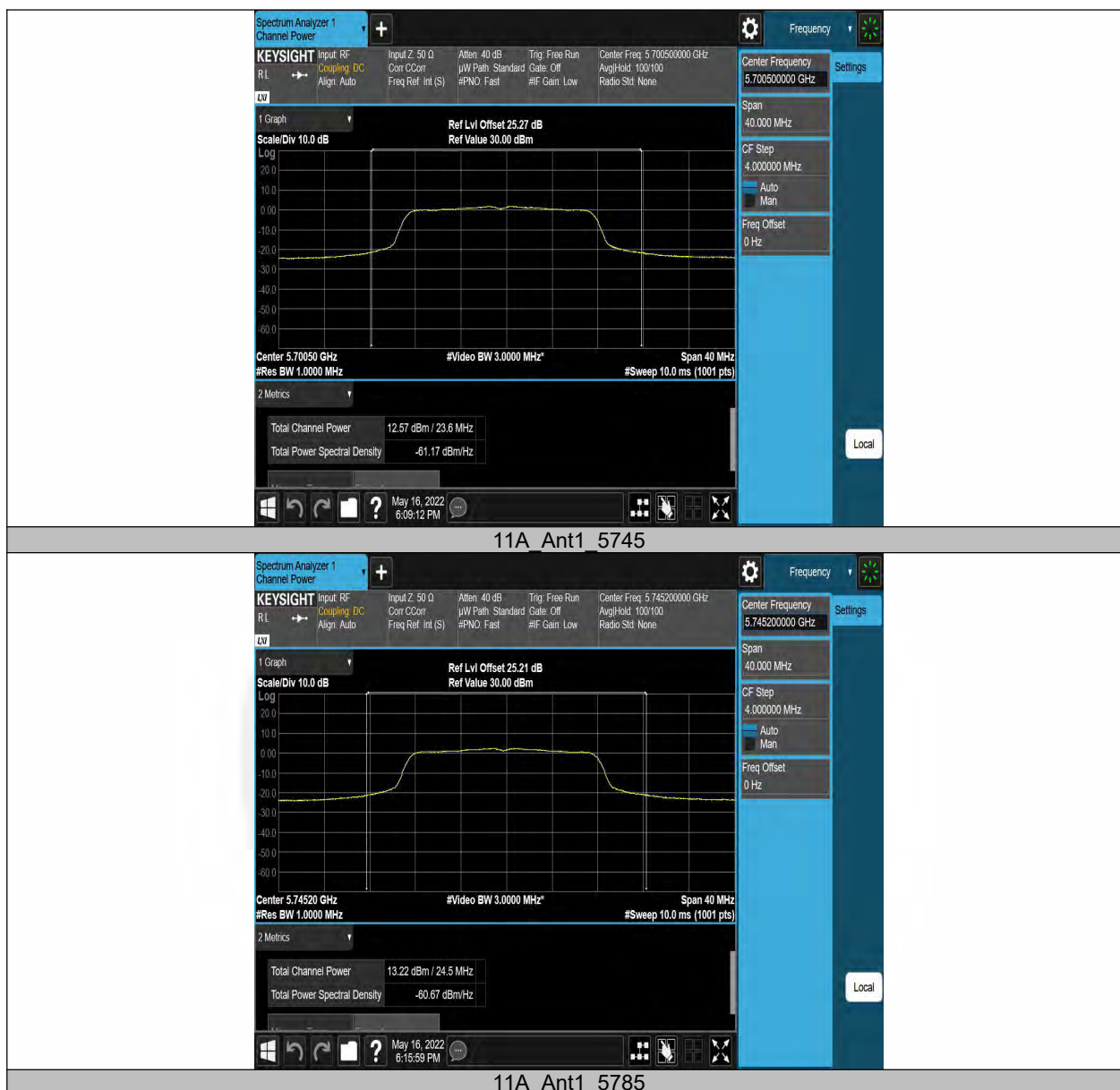
		5320	9.25	≤23.98	2.50	11.75	≤26.99	PASS
		5500	11.34	≤23.98	2.50	13.84	≤26.99	PASS
		5580	10.60	≤23.98	2.50	13.10	≤26.99	PASS
		5700	11.59	≤23.98	2.50	14.09	≤26.99	PASS
		5745	12.37	≤30.00	2.50	14.87	---	PASS
		5785	12.29	≤30.00	2.50	14.79	---	PASS
		5825	12.07	≤30.00	2.50	14.57	---	PASS
11AC40SI SO	Ant1	5190	12.86	≤23.98	2.50	15.36	---	PASS
		5230	12.51	≤23.98	2.50	15.01	---	PASS
		5270	12.21	≤23.98	2.50	14.71	≤26.99	PASS
		5310	10.51	≤23.98	2.50	13.01	≤26.99	PASS
		5510	12.11	≤23.98	2.50	14.61	≤26.99	PASS
		5550	11.88	≤23.98	2.50	14.38	≤26.99	PASS
		5670	11.07	≤23.98	2.50	13.57	≤26.99	PASS
		5755	12.67	≤30.00	2.50	15.17	---	PASS
		5795	12.42	≤30.00	2.50	14.92	---	PASS
11AC80SI SO	Ant1	5210	12.48	≤23.98	2.50	14.98	---	PASS
		5290	11.45	≤23.98	2.50	13.95	≤26.99	PASS
		5530	11.80	≤23.98	2.50	14.30	≤26.99	PASS
		5610	10.13	≤23.98	2.50	12.63	≤26.99	PASS
		5775	12.50	≤30.00	2.50	15.00	---	PASS

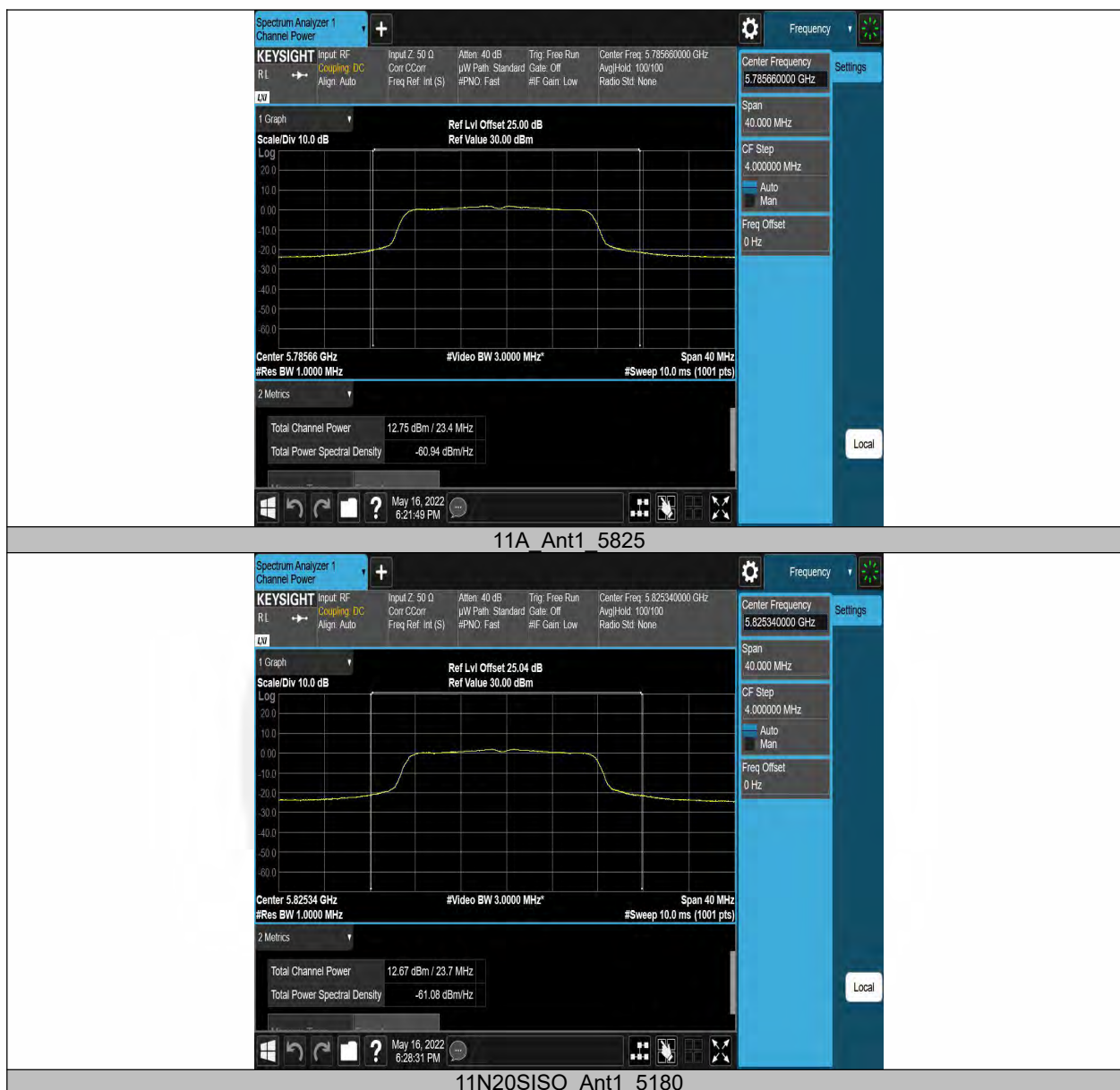


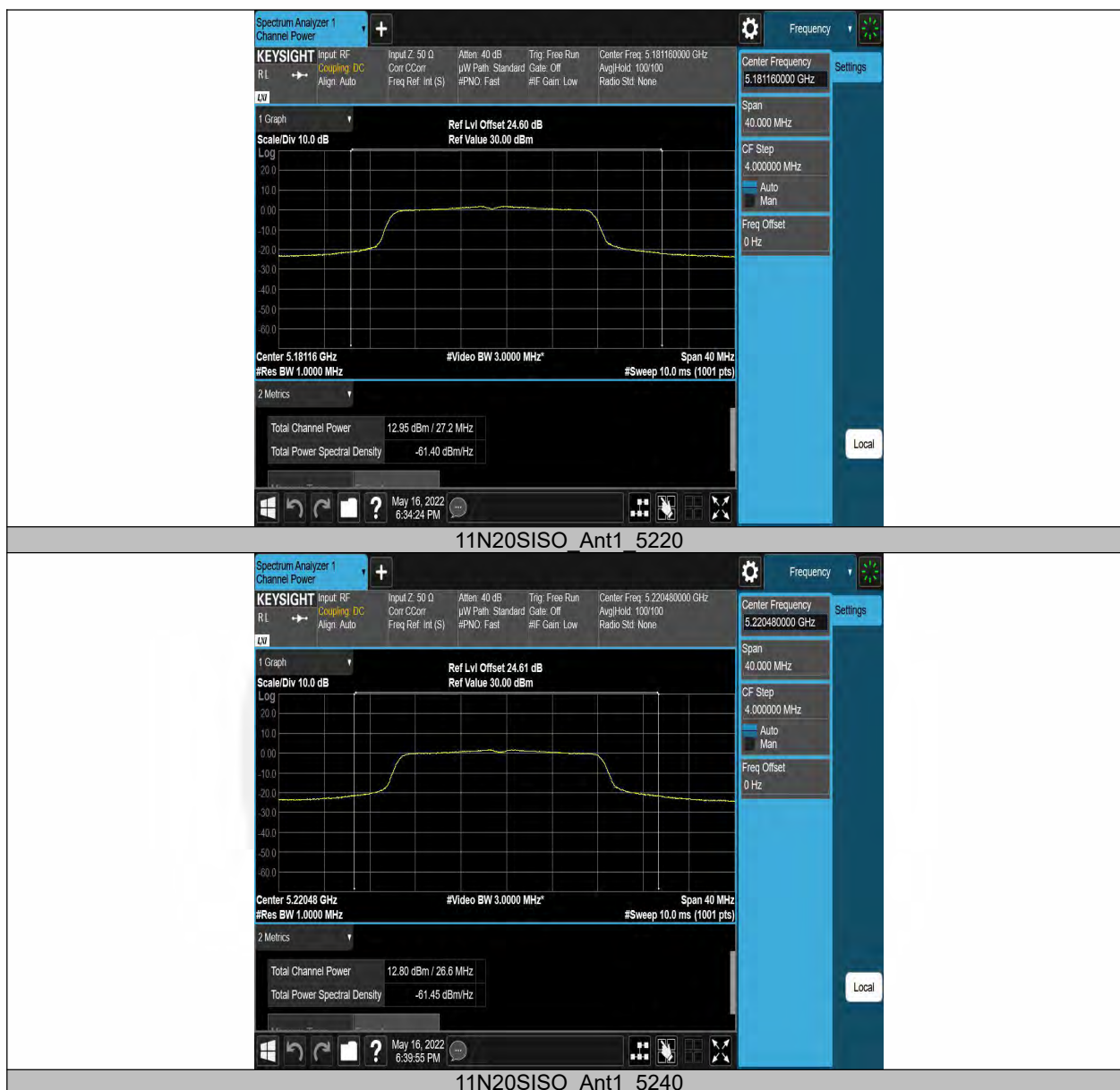


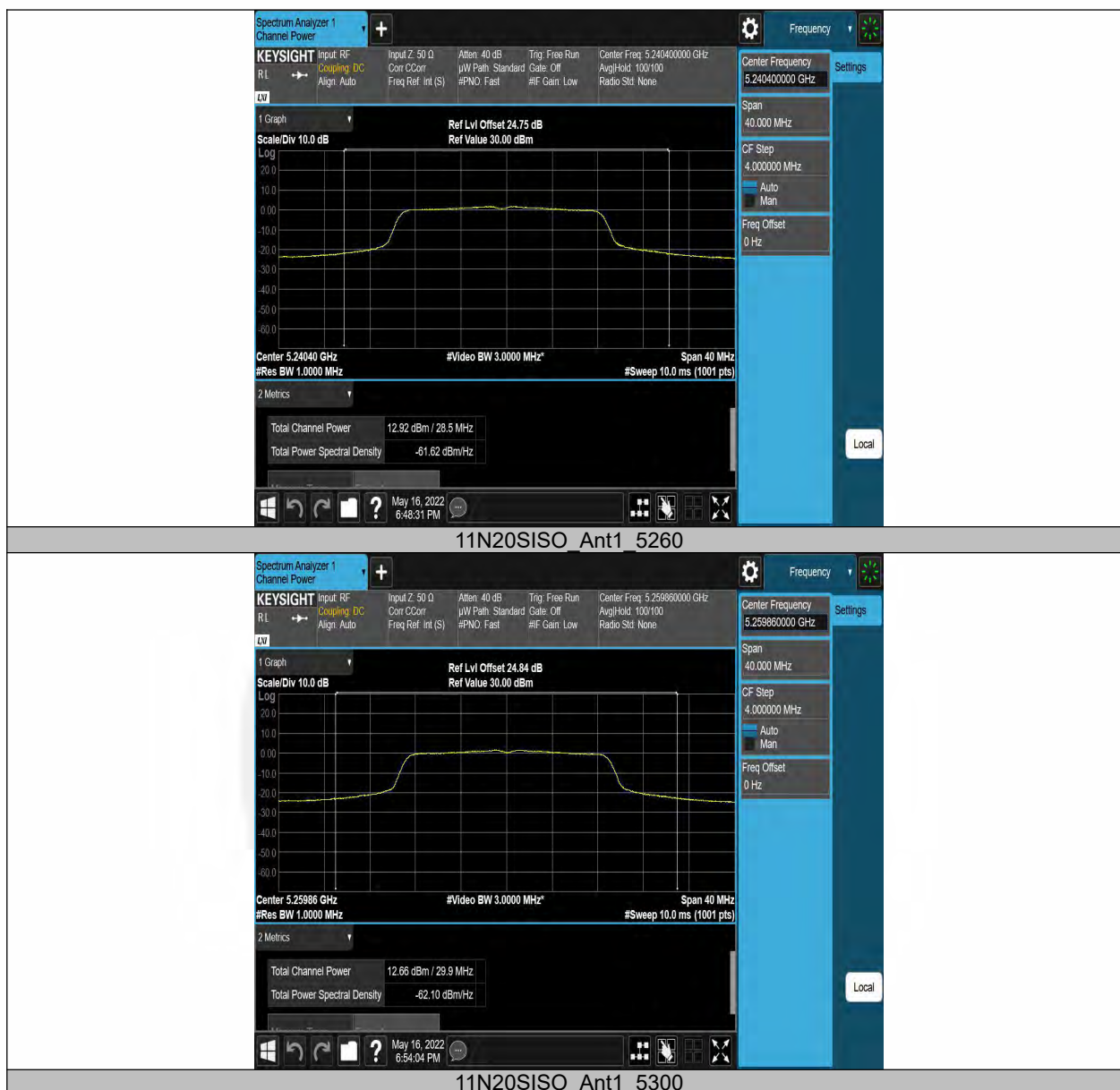


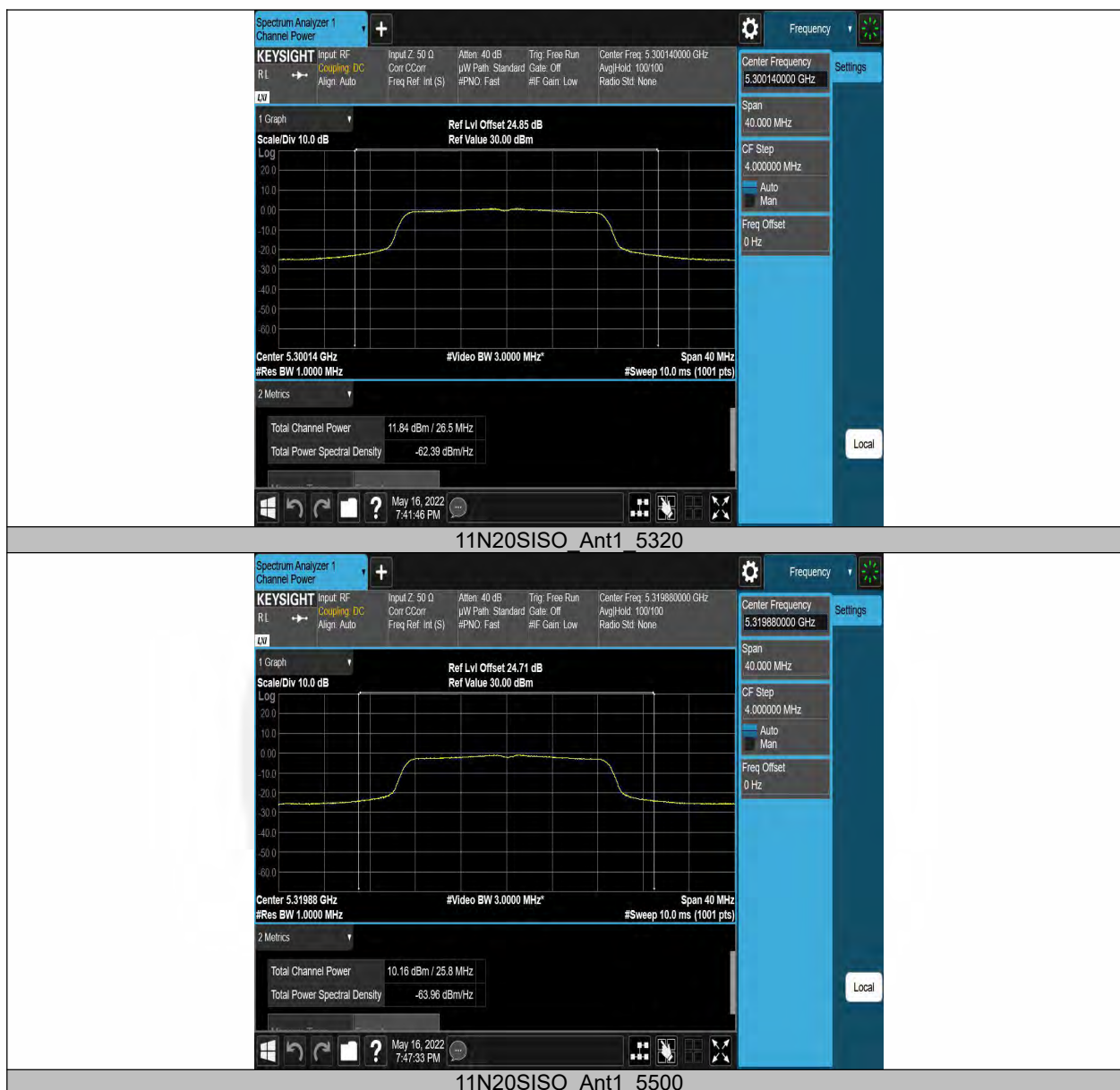


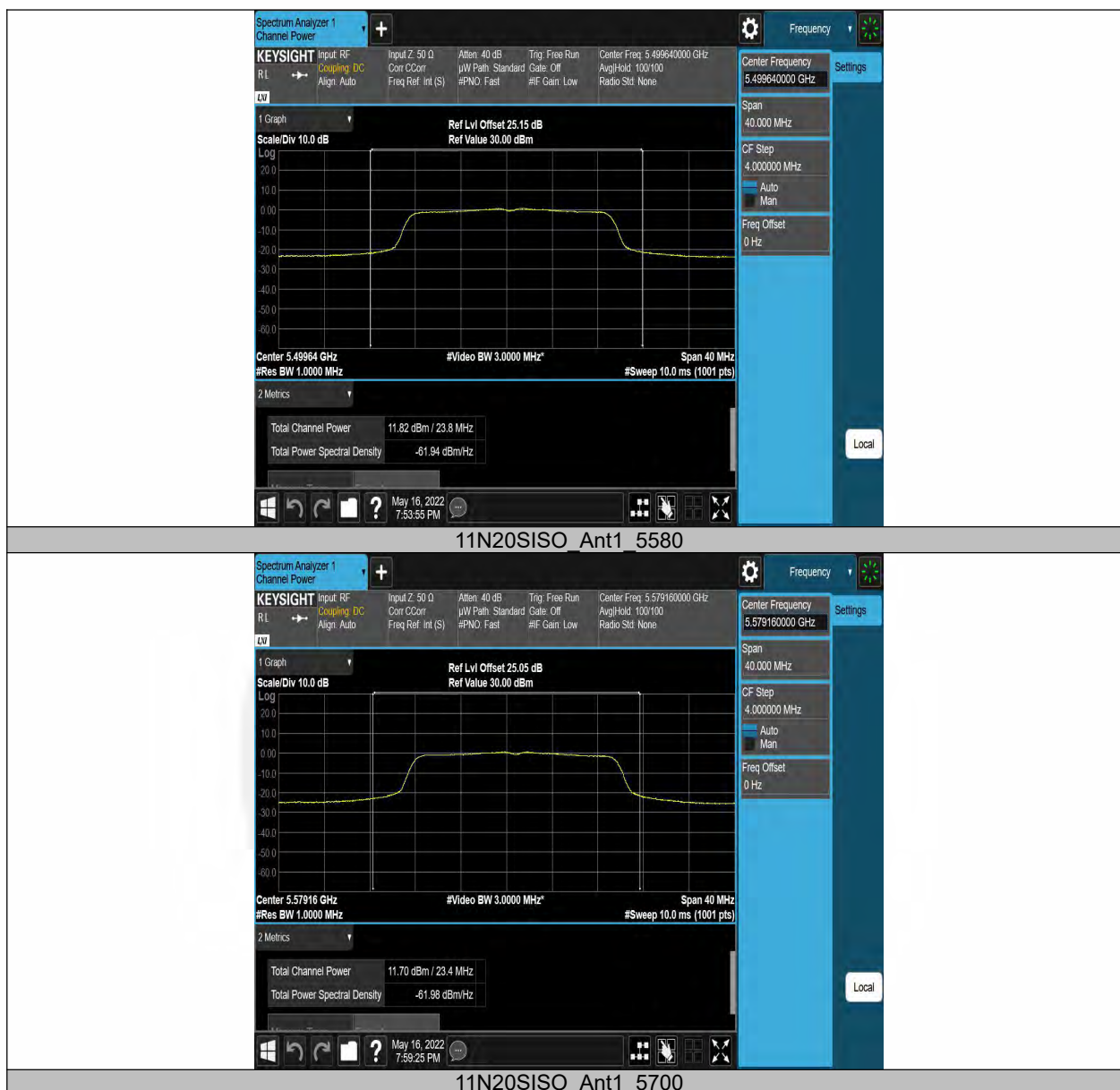


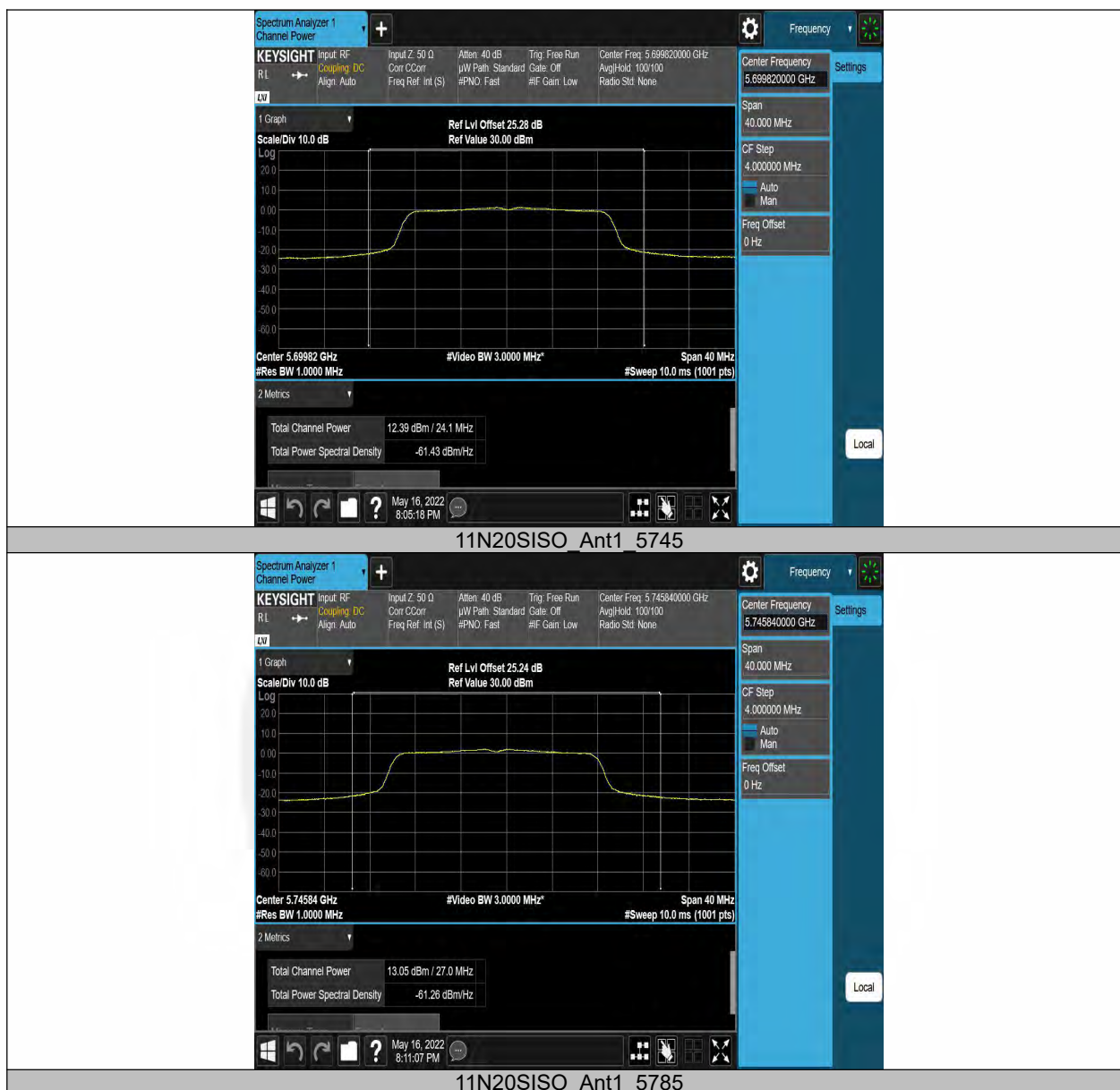


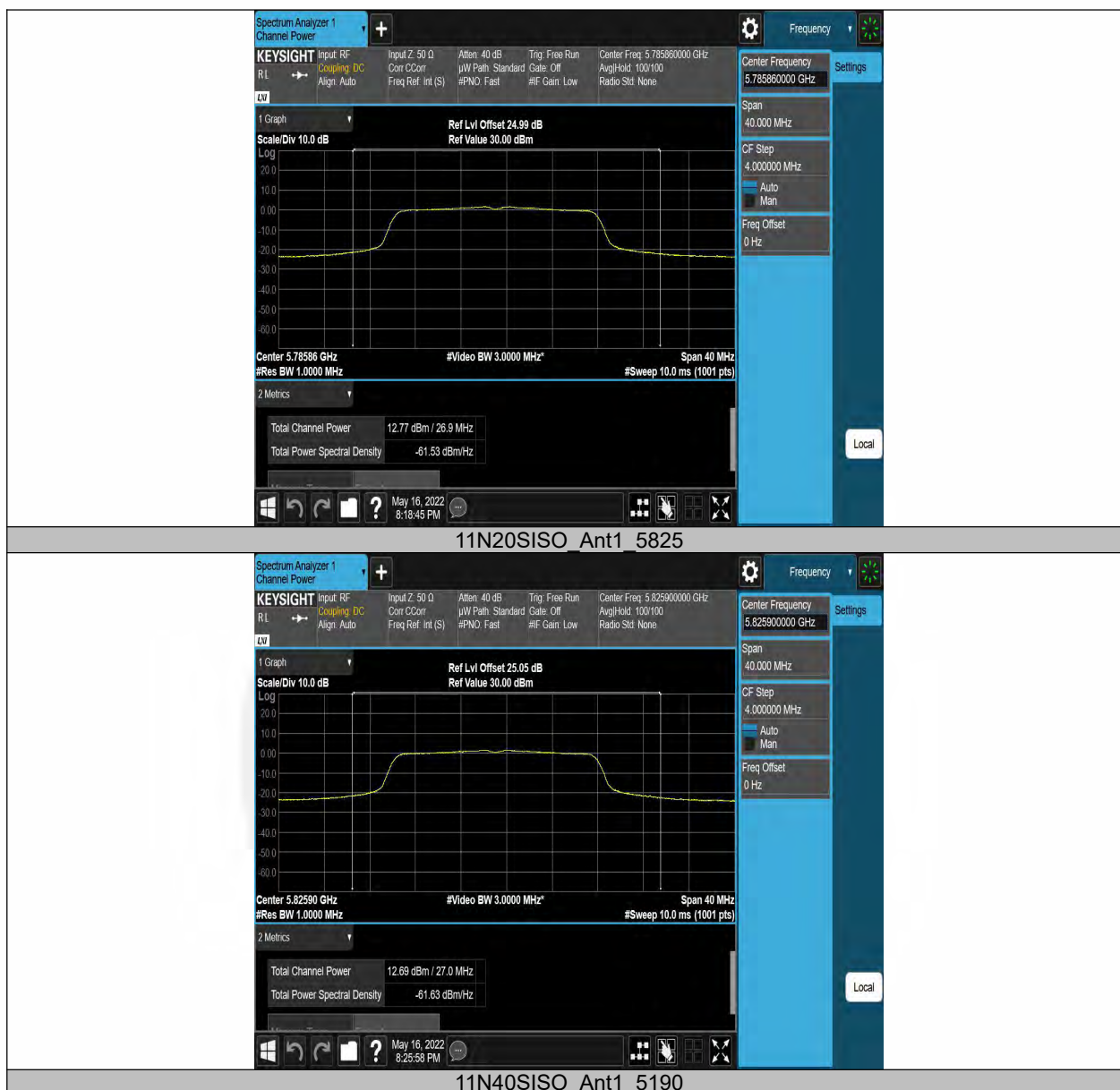


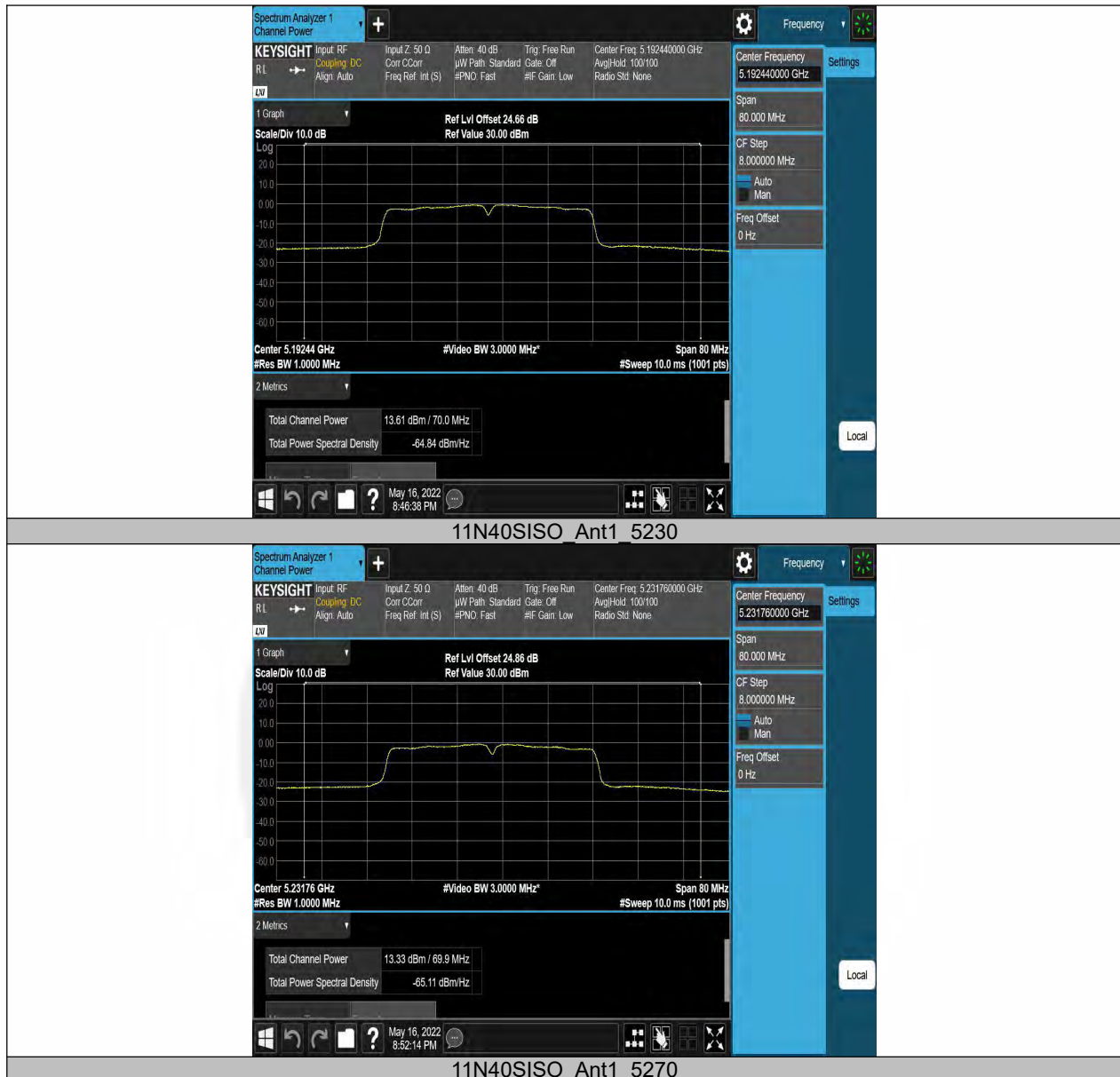


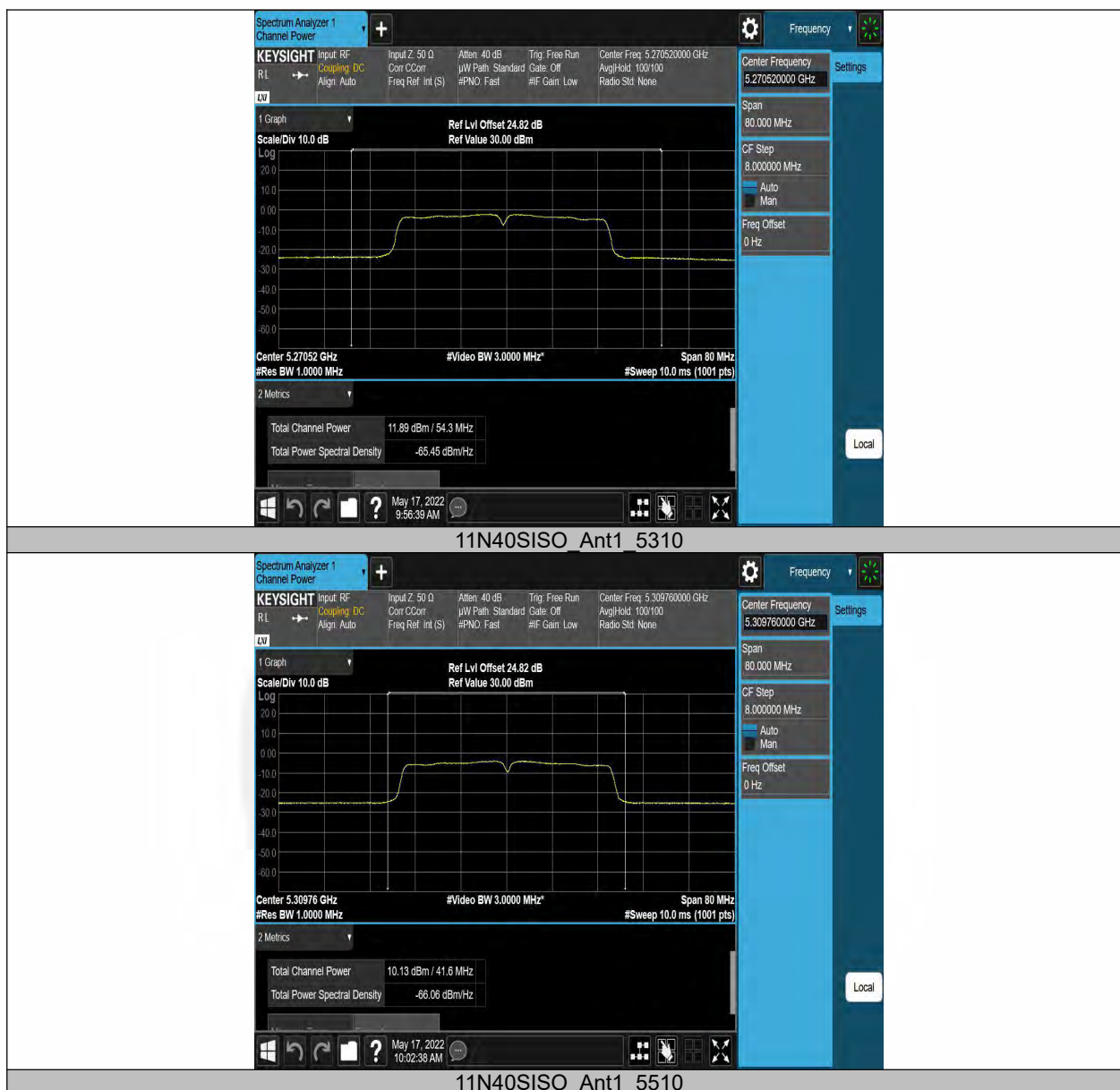


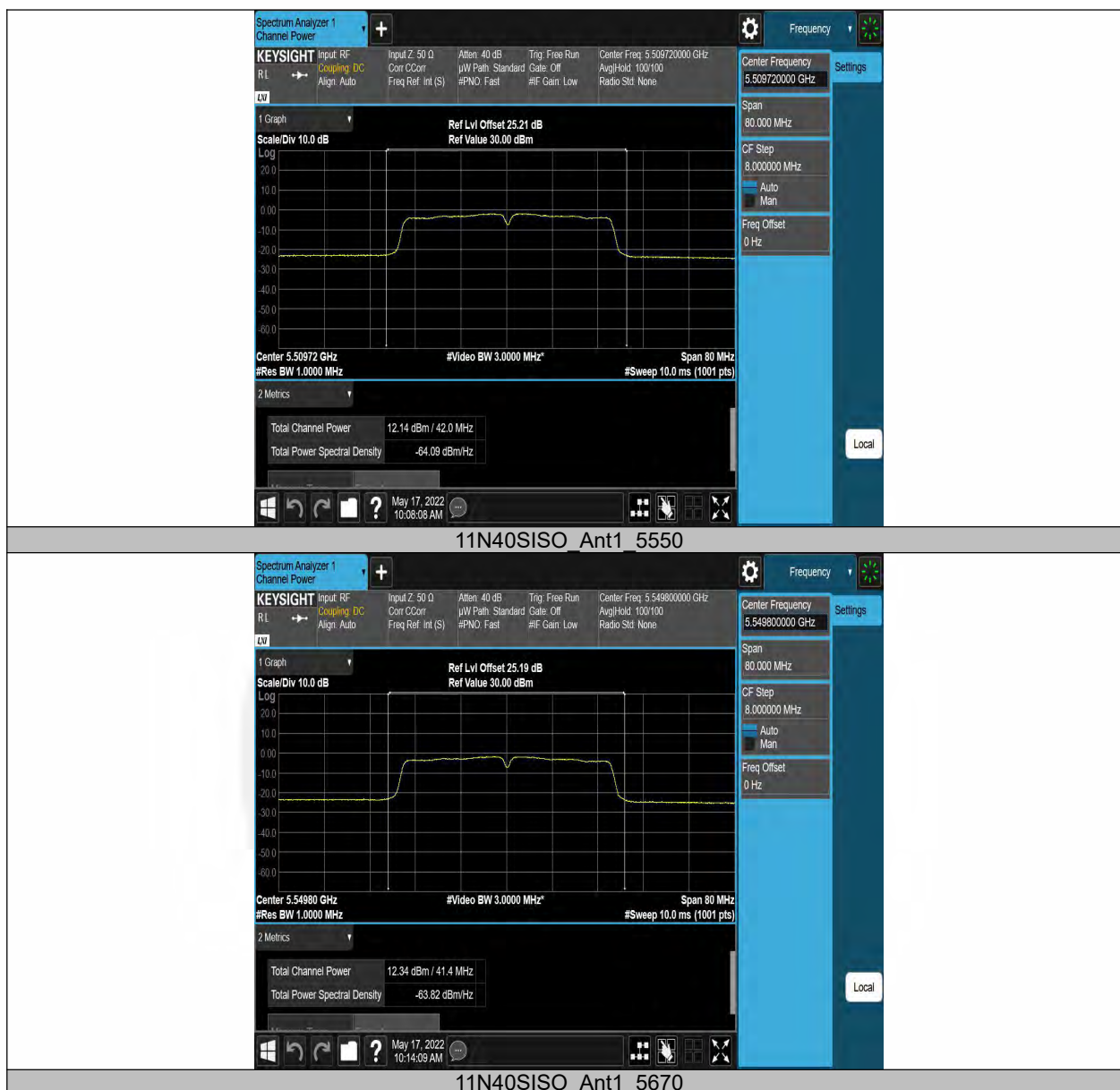


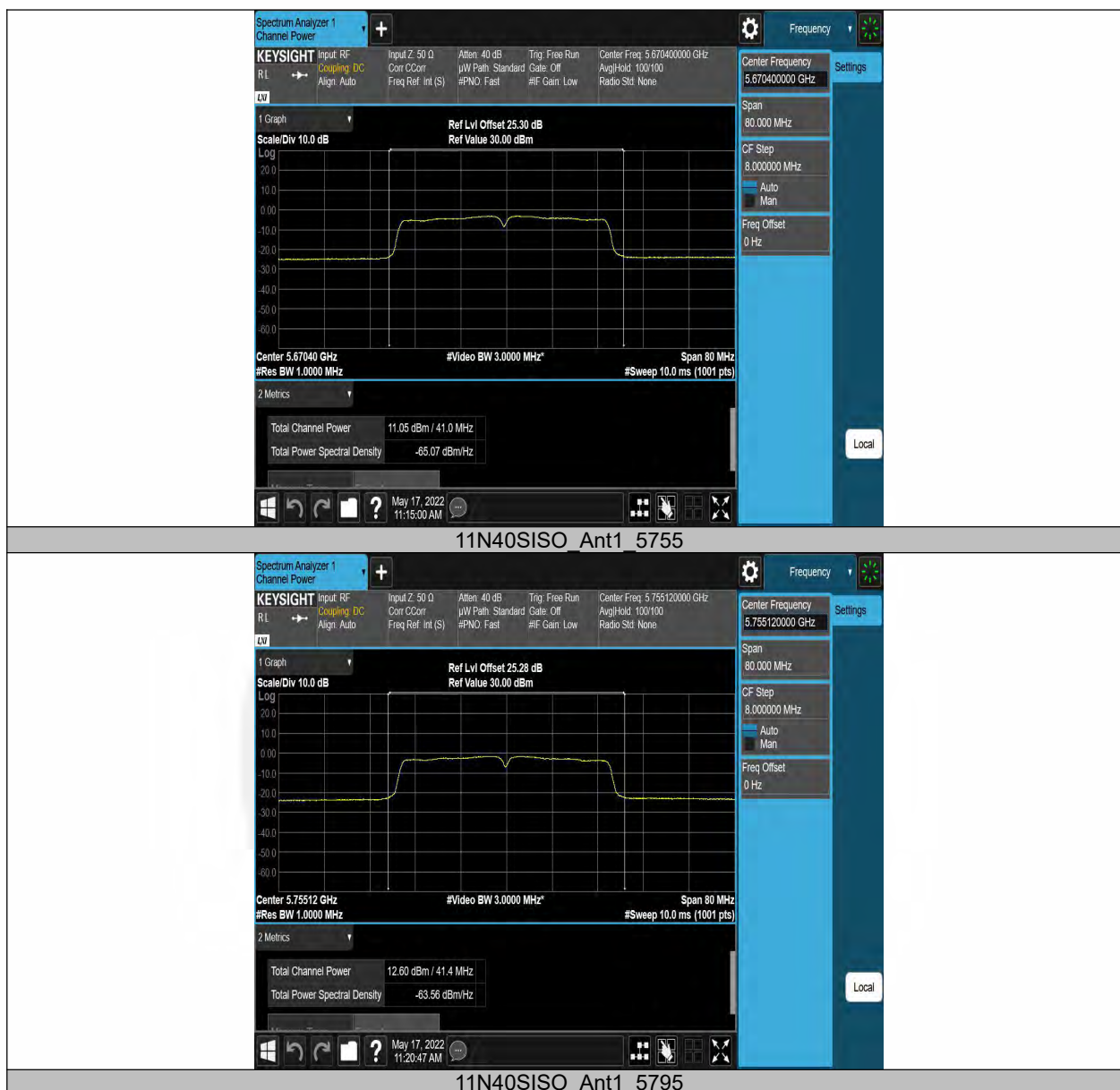


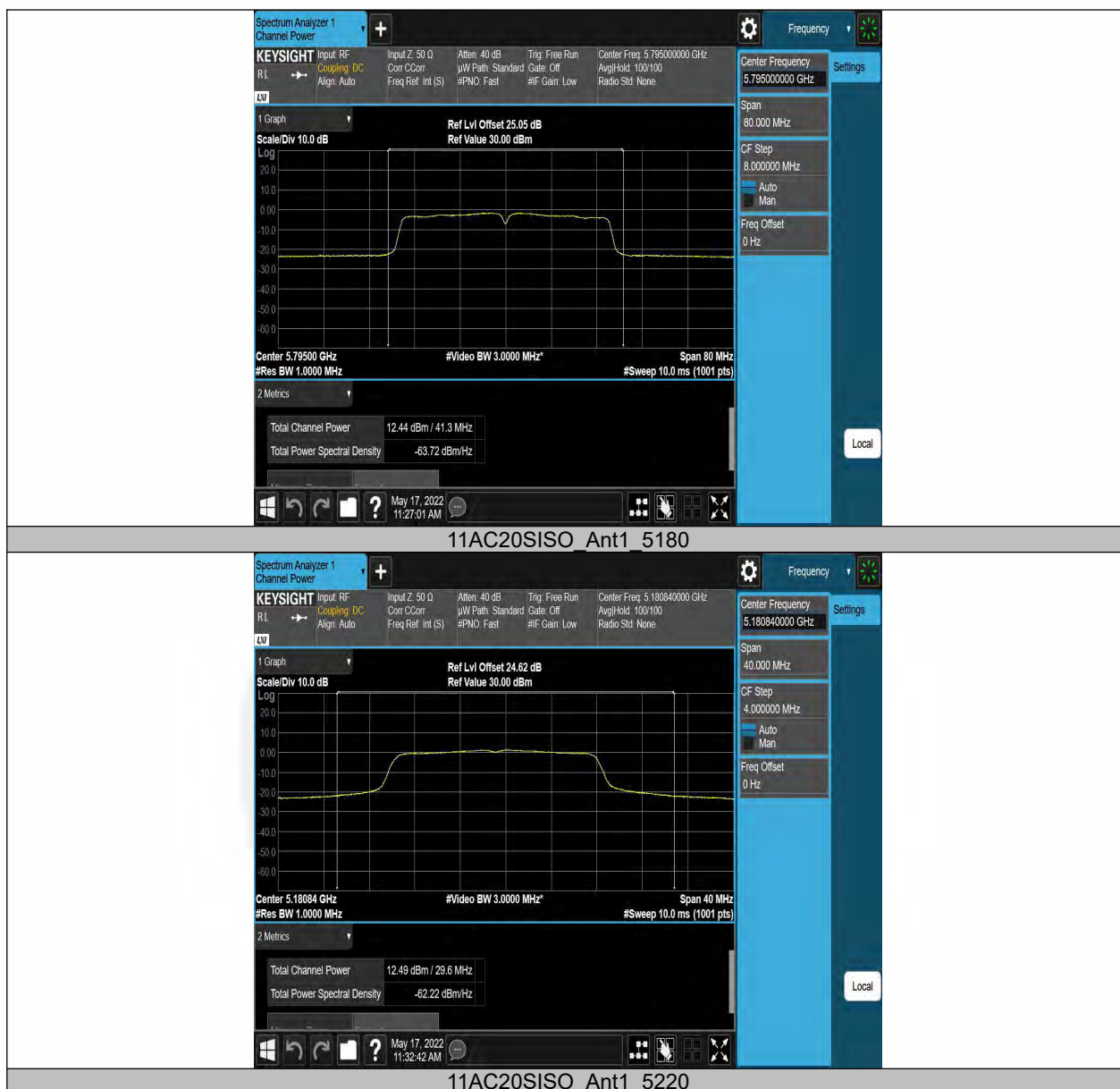


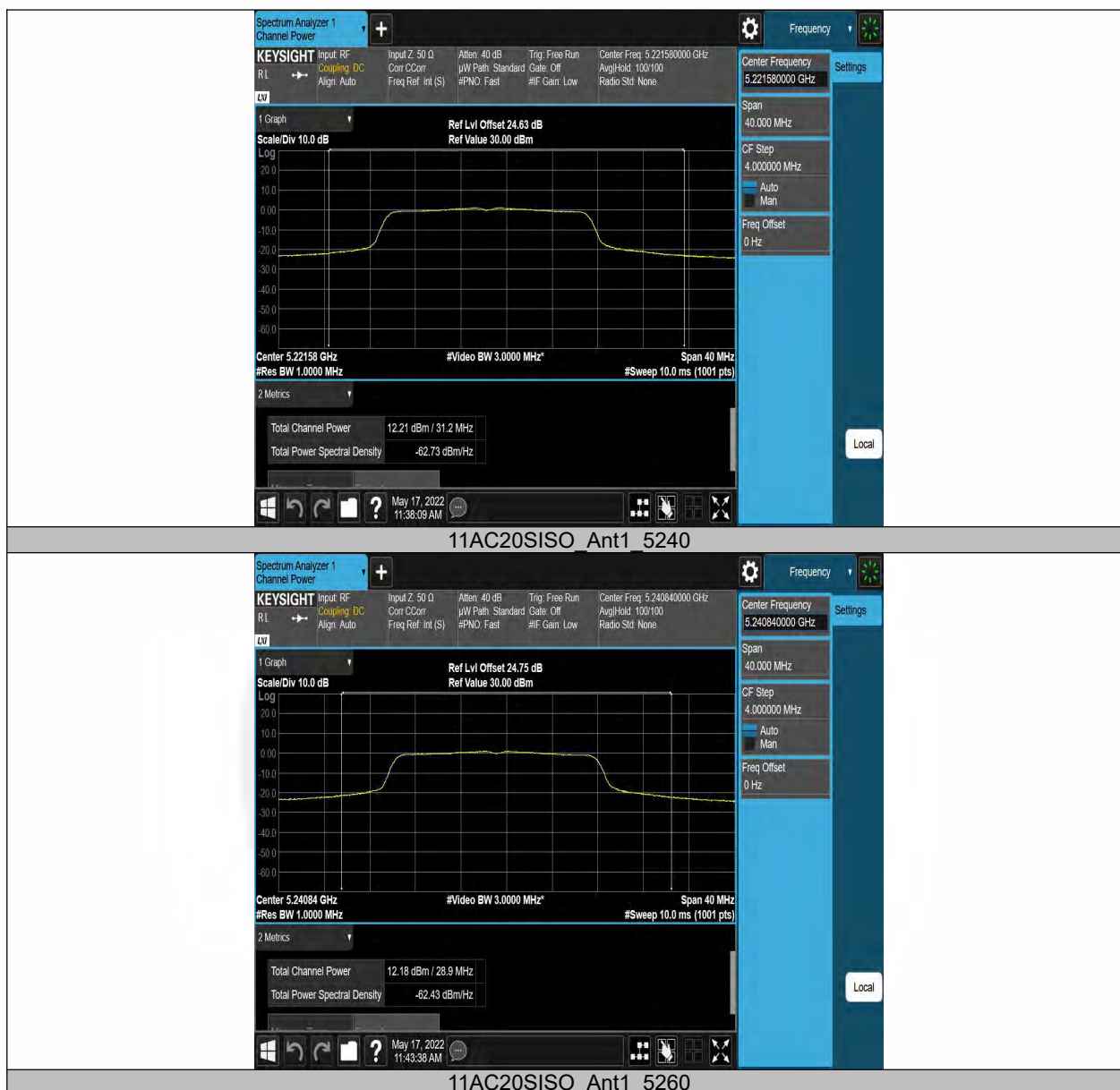


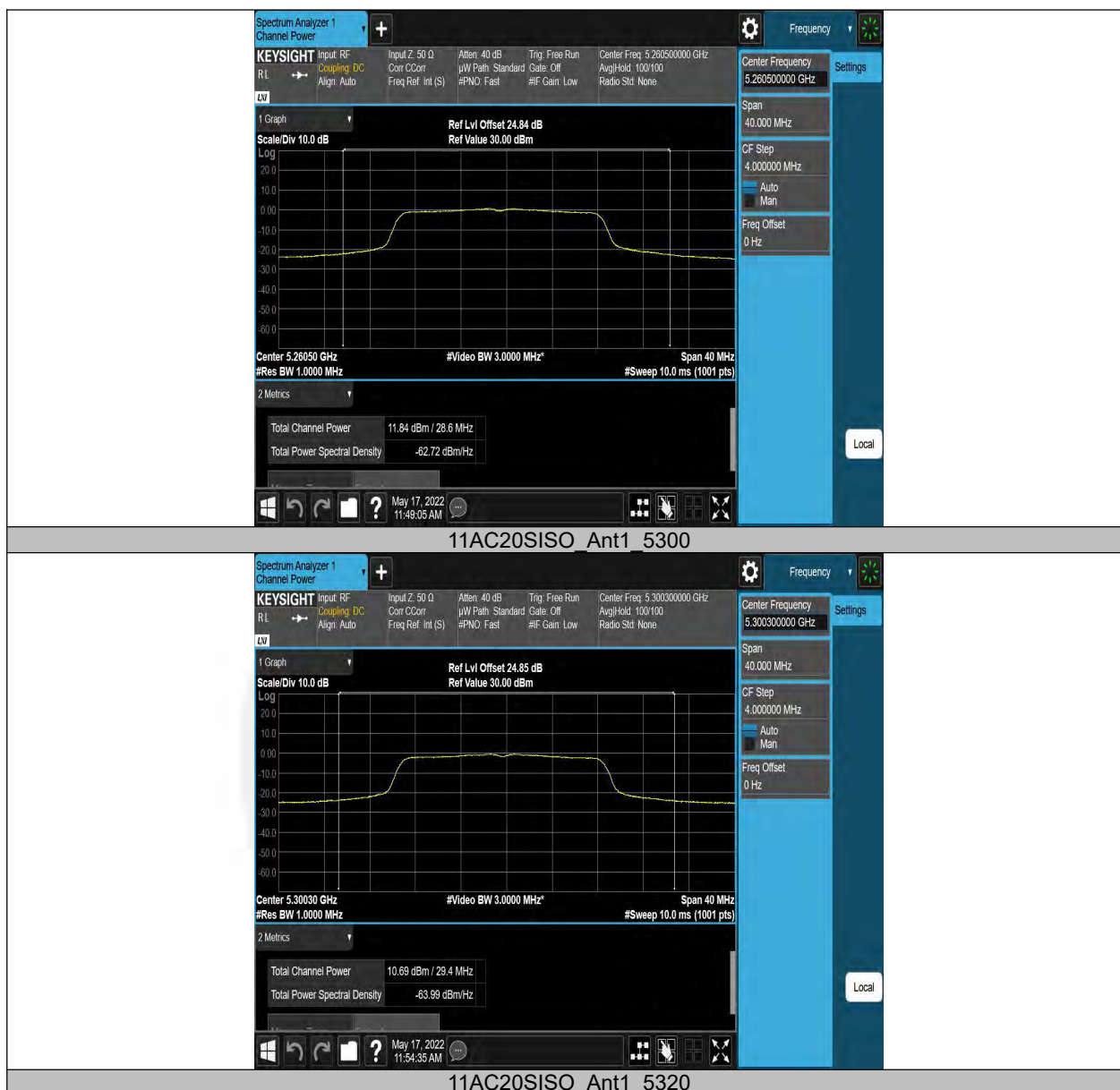


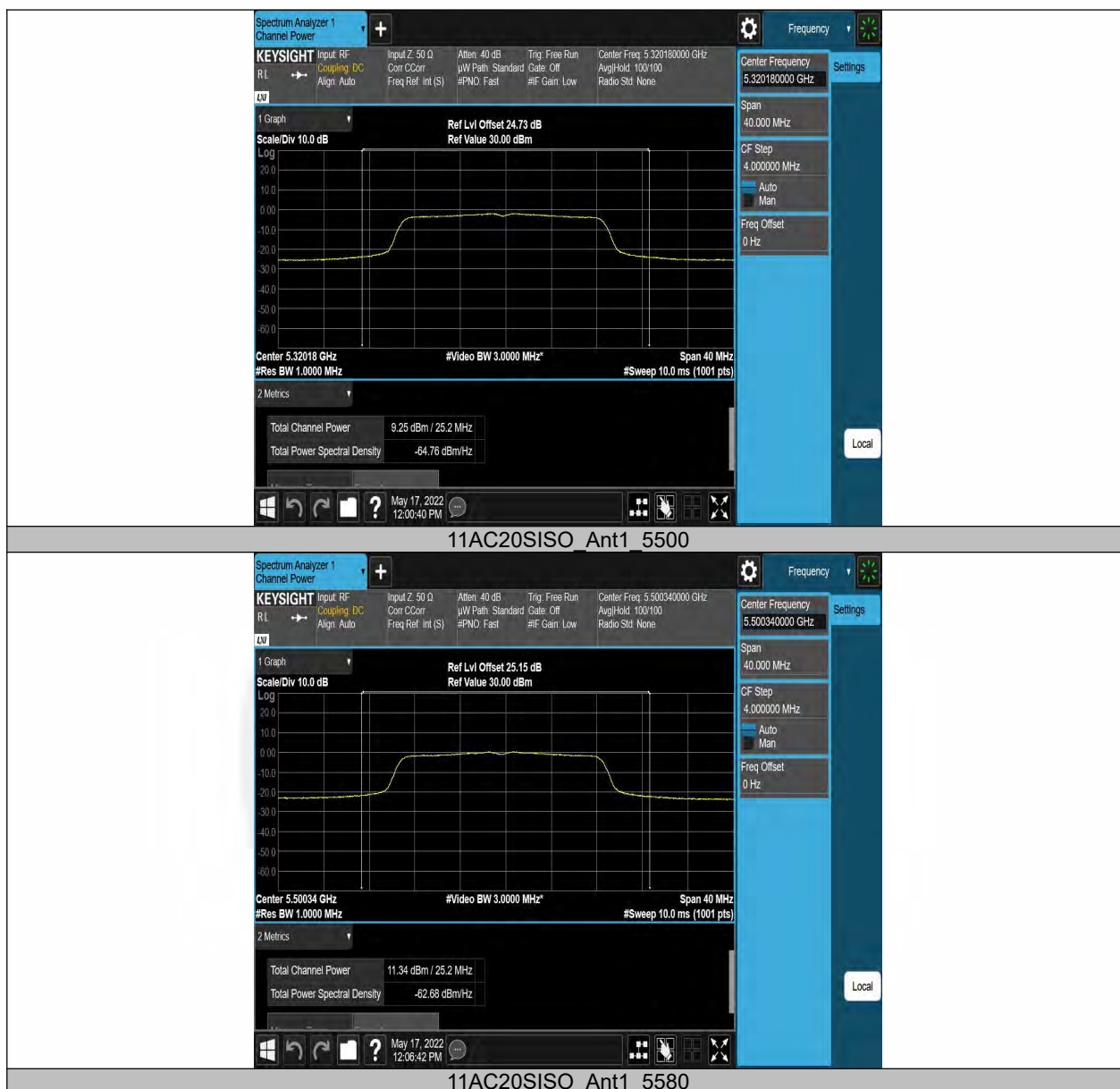


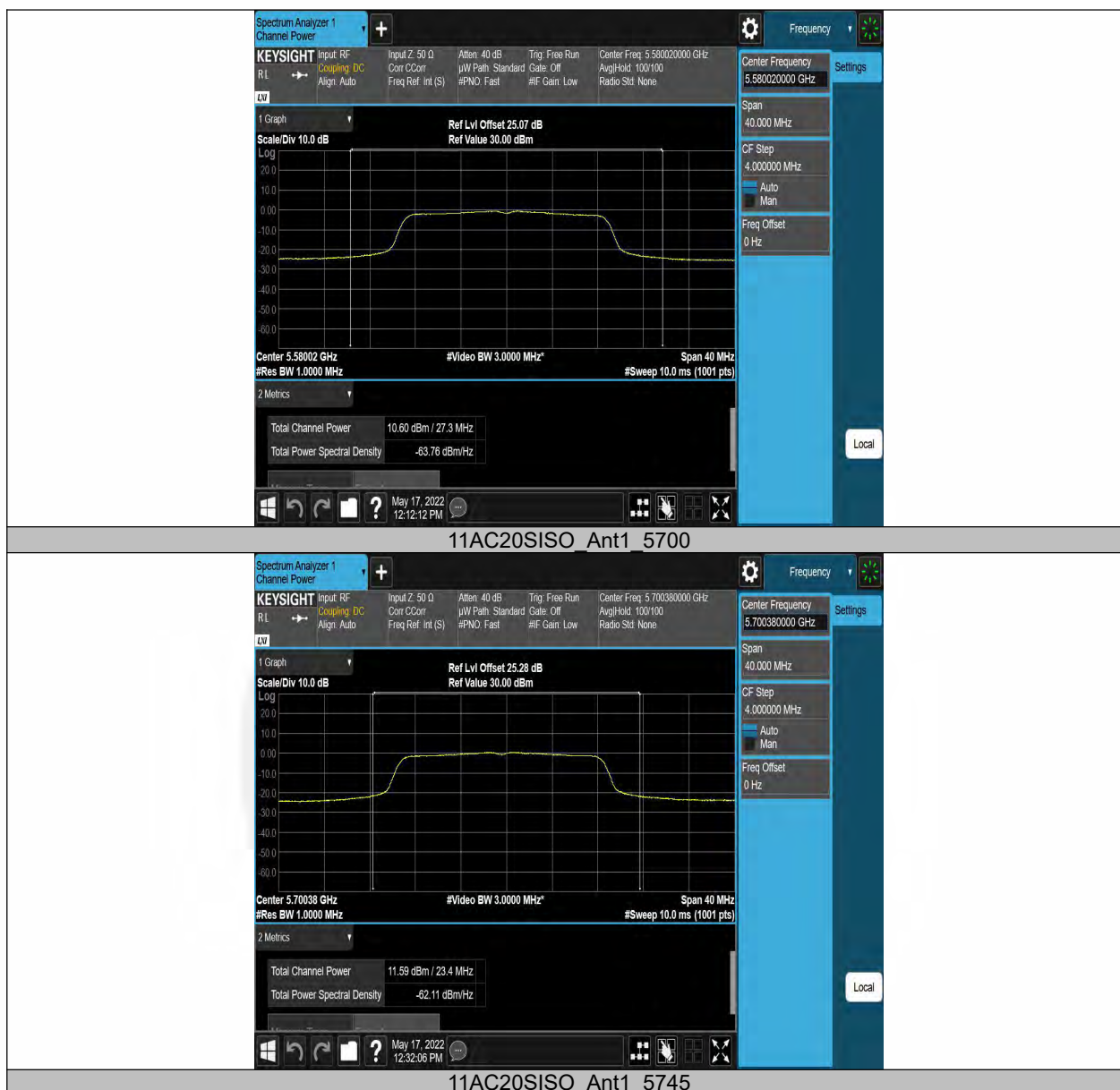


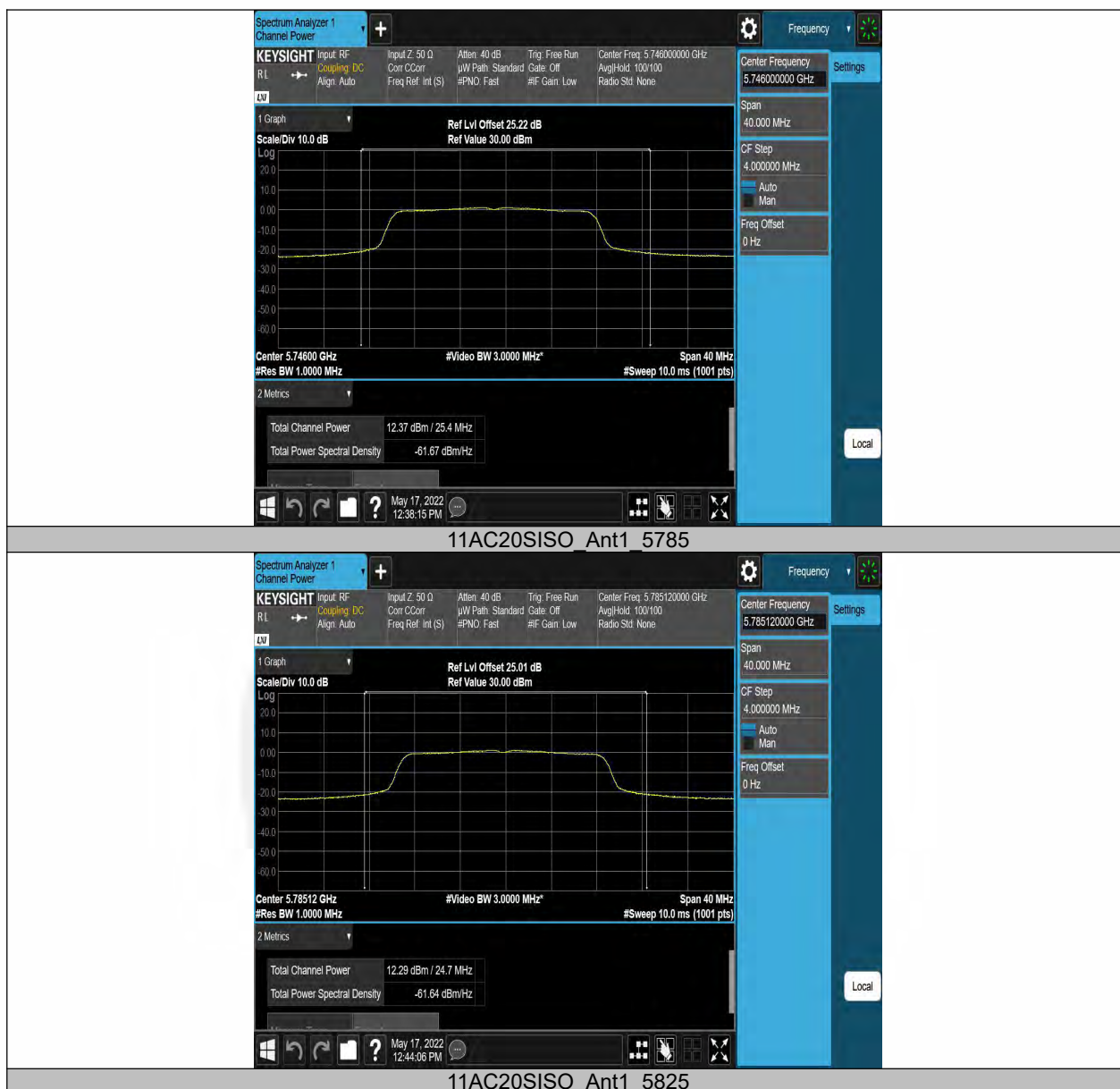


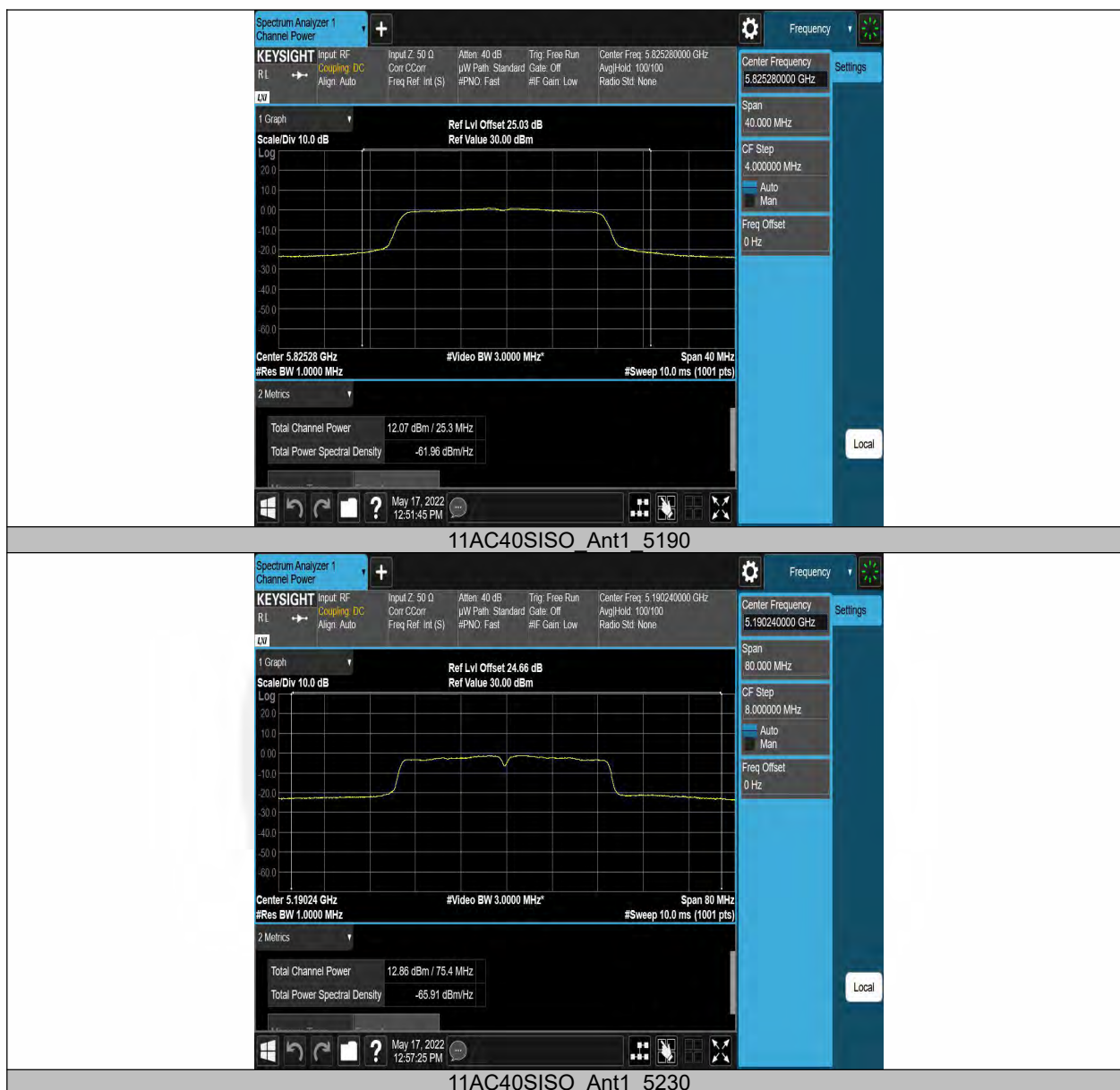


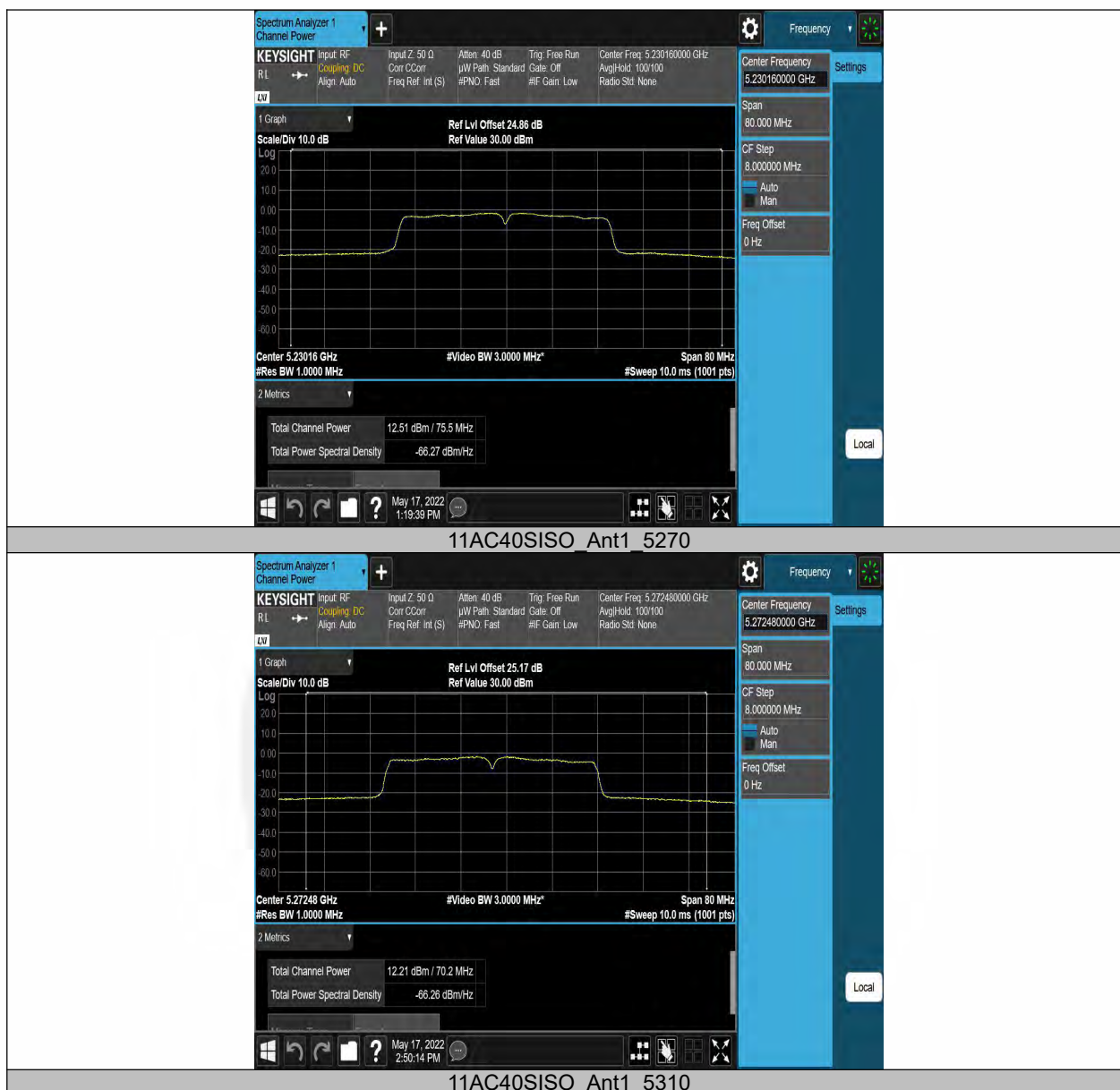


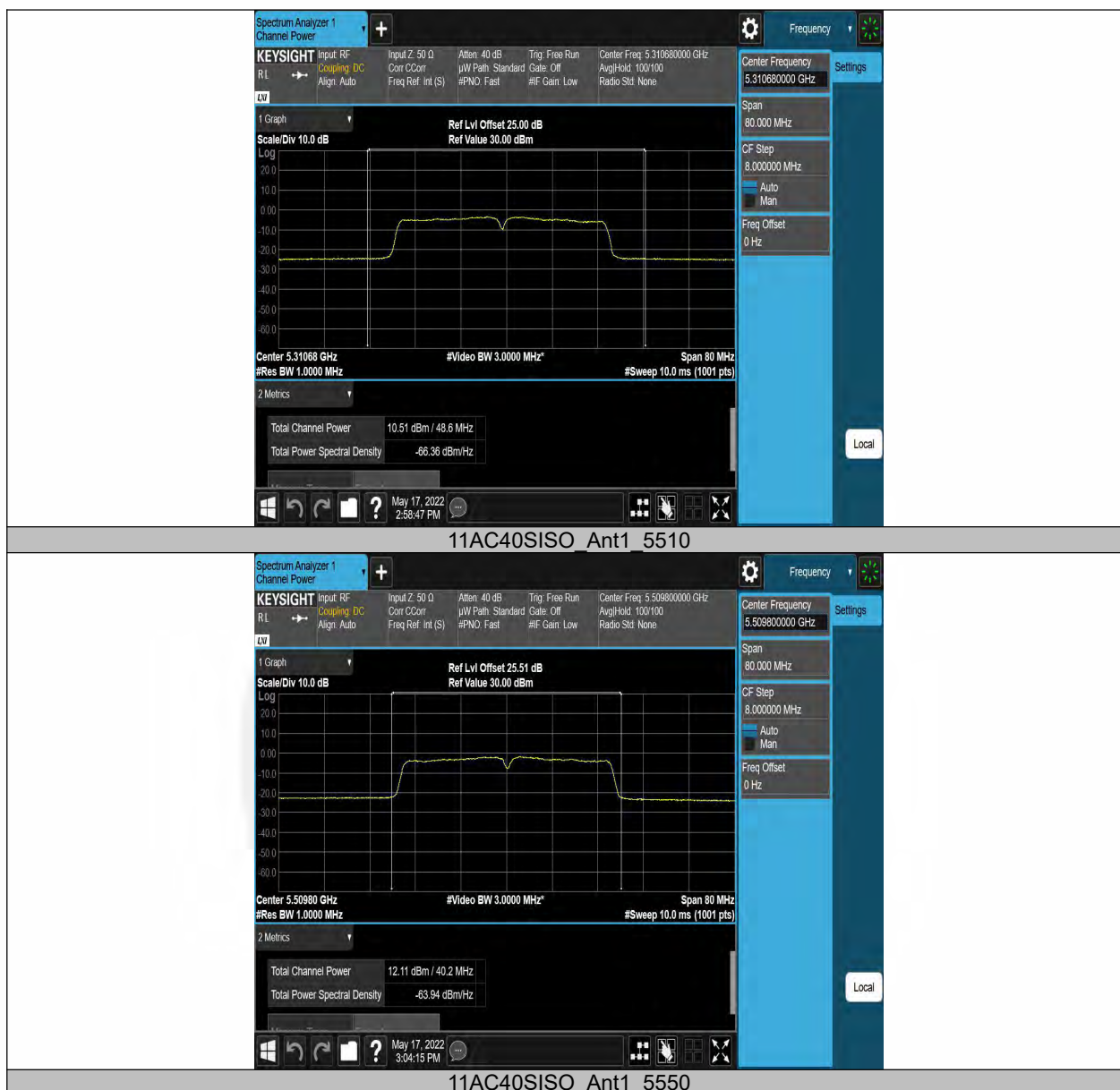


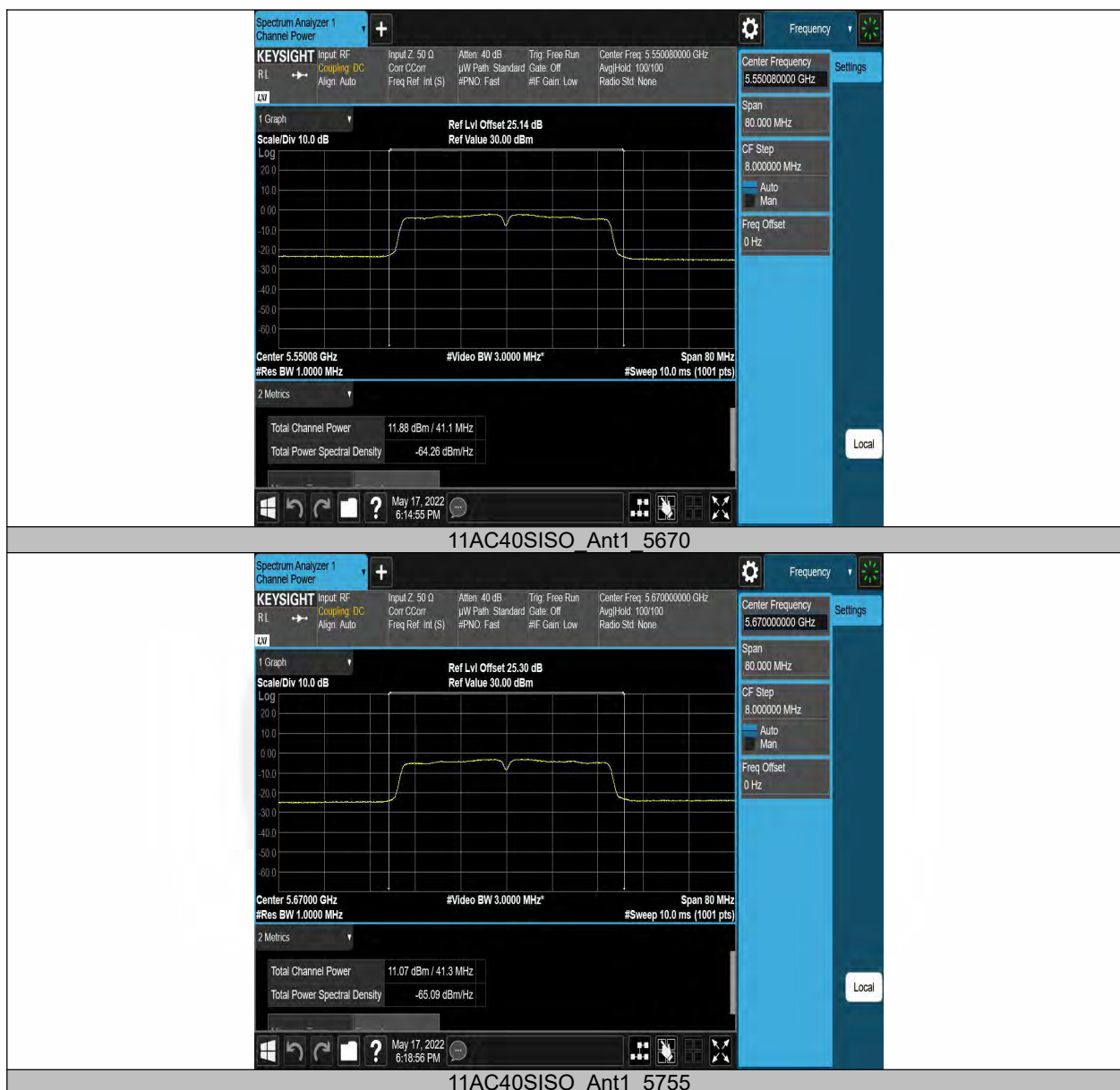


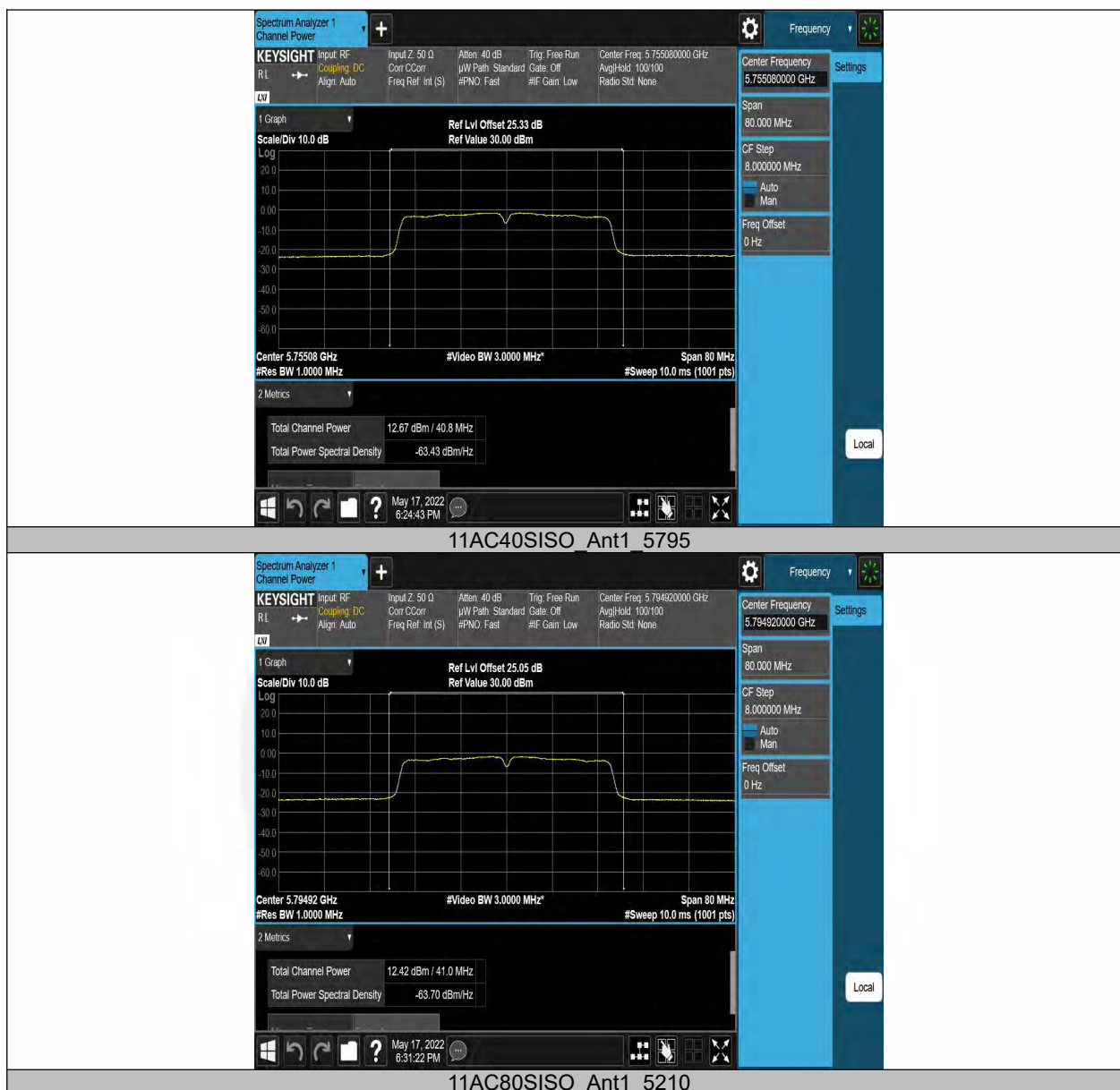


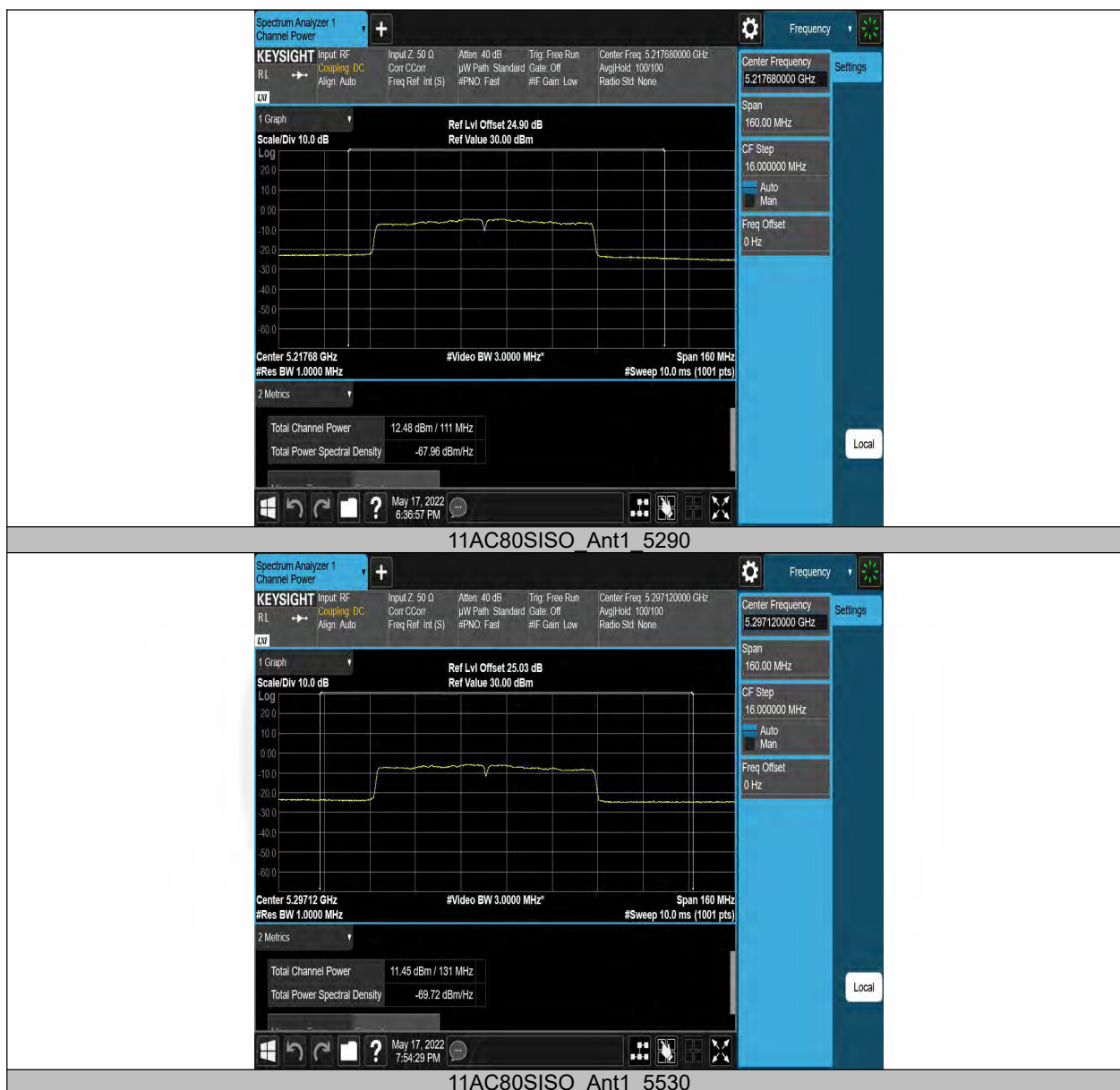


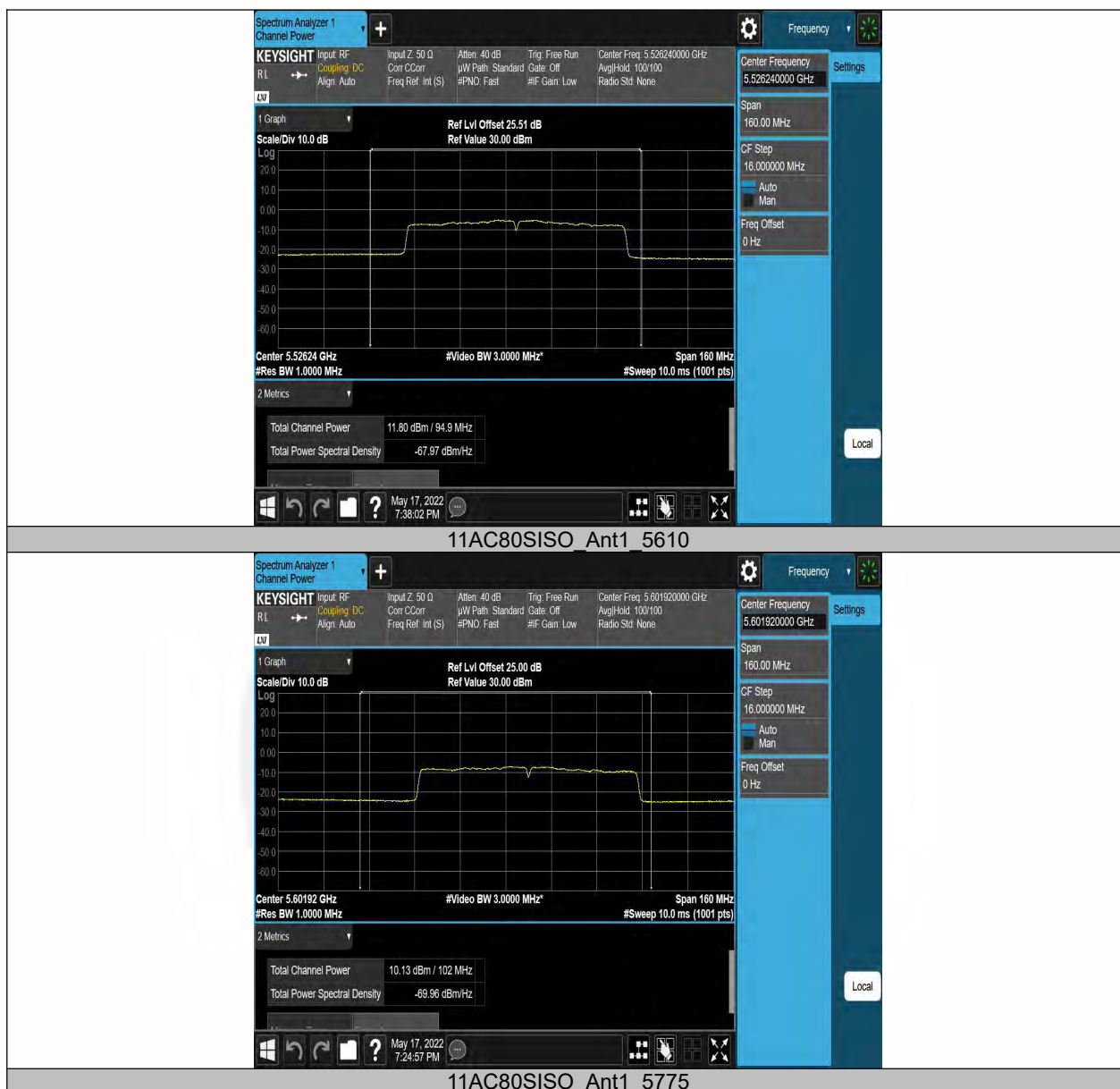


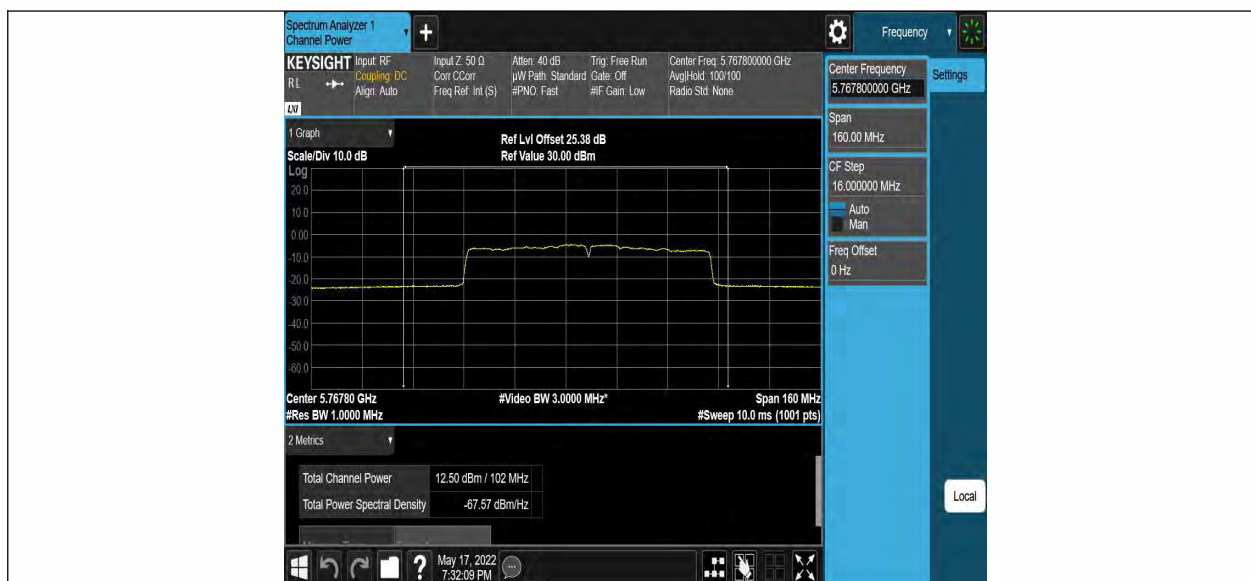












8.3 MAXIMUM PEAK POWER DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(F)

8.3.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (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. 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).

(a) (1) (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. 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.

(a) (1) (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. 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.

(a) (1) (iv) 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. 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.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(b) (2) 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.

■ For the band 5.725-5.85 GHz

(a) (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.

8.3.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.3.4 Test Procedure

Methods refer to FCC KDB 789033

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ KHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHz}$ is available on nearly all spectrum analyzers.

8.3.5 Test Results

TestMode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	2.3	≤11.00	PASS
		5220	2.33	≤11.00	PASS
		5240	2.51	≤11.00	PASS
		5260	2.2	≤11.00	PASS
		5300	0.93	≤11.00	PASS
		5320	-0.67	≤11.00	PASS
		5500	1.06	≤11.00	PASS
		5580	1.23	≤11.00	PASS
		5700	1.85	≤11.00	PASS
		5745	-0.25	≤30.00	PASS
		5785	-0.62	≤30.00	PASS
		5825	-0.75	≤30.00	PASS
11N20SISO	Ant1	5180	1.87	≤11.00	PASS
		5220	1.75	≤11.00	PASS
		5240	1.86	≤11.00	PASS
		5260	1.67	≤11.00	PASS
		5300	0.9	≤11.00	PASS
		5320	-0.92	≤11.00	PASS
		5500	0.73	≤11.00	PASS
		5580	0.67	≤11.00	PASS
		5700	1.35	≤11.00	PASS
		5745	-0.63	≤30.00	PASS
		5785	-0.93	≤30.00	PASS
		5825	-1.19	≤30.00	PASS
11N40SISO	Ant1	5190	-0.38	≤11.00	PASS
		5230	-0.62	≤11.00	PASS
		5270	-2.1	≤11.00	PASS
		5310	-3.76	≤11.00	PASS
		5510	-1.8	≤11.00	PASS
		5550	-6.29	≤11.00	PASS
		5670	-2.79	≤11.00	PASS
		5755	-4.15	≤30.00	PASS
		5795	-4.37	≤30.00	PASS
11AC20SISO	Ant1	5180	1.48	≤11.00	PASS
		5220	1.27	≤11.00	PASS
		5240	1.24	≤11.00	PASS
		5260	0.94	≤11.00	PASS
		5300	-0.22	≤11.00	PASS
		5320	-1.66	≤11.00	PASS
		5500	0.35	≤11.00	PASS
		5580	-0.32	≤11.00	PASS
		5700	0.59	≤11.00	PASS
		5745	-1.07	≤30.00	PASS
		5785	-1.28	≤30.00	PASS
		5825	-1.67	≤30.00	PASS
11AC40SISO	Ant1	5190	-1.14	≤11.00	PASS
		5230	-1.39	≤11.00	PASS
		5270	-1.23	≤11.00	PASS
		5310	-3.18	≤11.00	PASS
		5510	-1.69	≤11.00	PASS

		5550	-1.95	≤11.00	PASS
		5670	-2.87	≤11.00	PASS
		5755	-4.22	≤30.00	PASS
		5795	-4.4	≤30.00	PASS
		5210	-4.3	≤11.00	PASS
11AC80SISO	Ant1	5290	-5.46	≤11.00	PASS
		5530	-5.02	≤11.00	PASS
		5610	-6.83	≤11.00	PASS
		5775	-7.39	≤30.00	PASS



