

Appendix B

RF Test Data for 5.2GWIFI (Conducted Measurement)

Product Name: SkyPortal WiFi Module
Test Model: 93973

Environmental Conditions

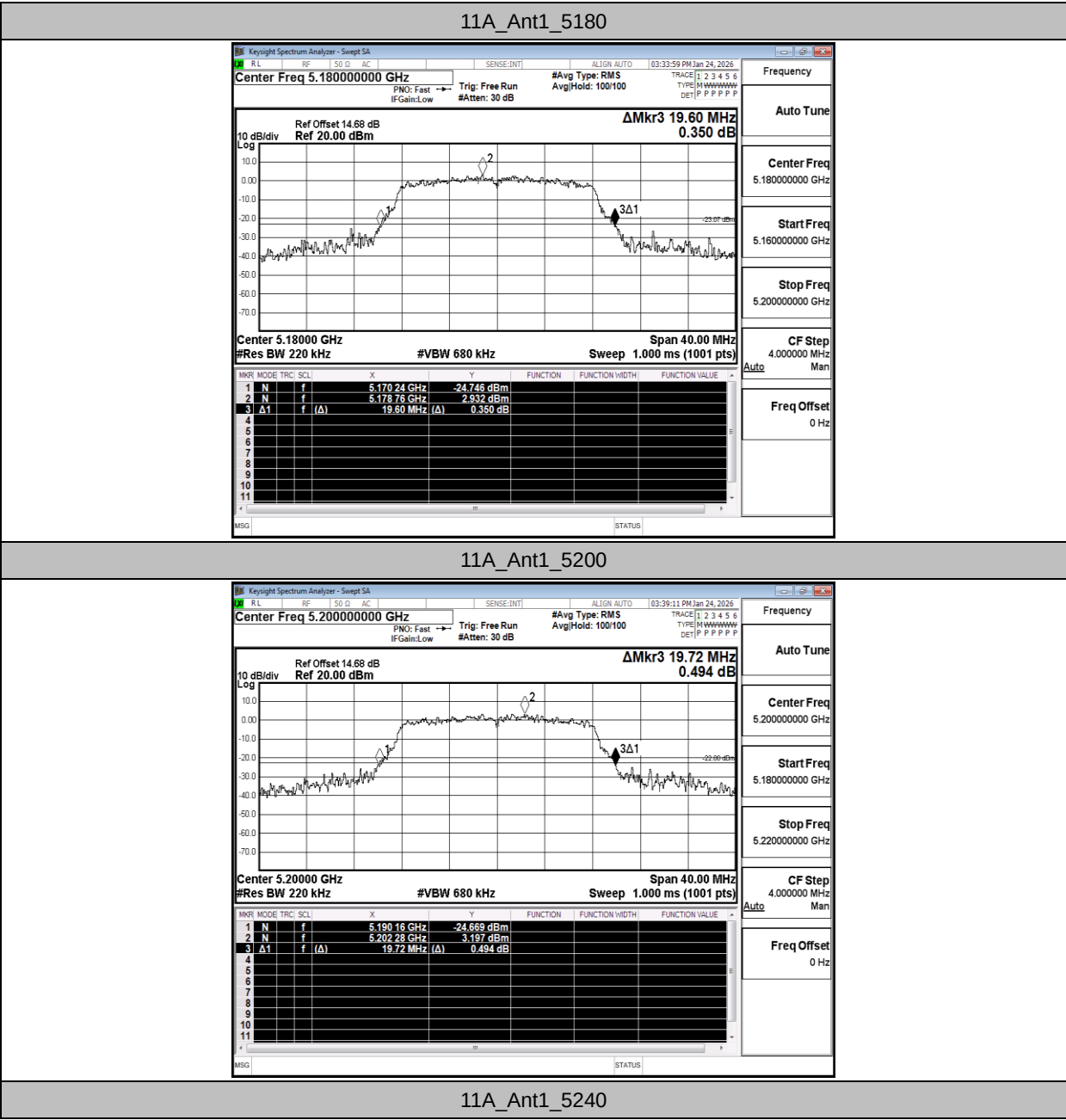
Temperature:	23.4°C
Relative Humidity:	54.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Suichao Lai
Supervised by:	Yan Chen

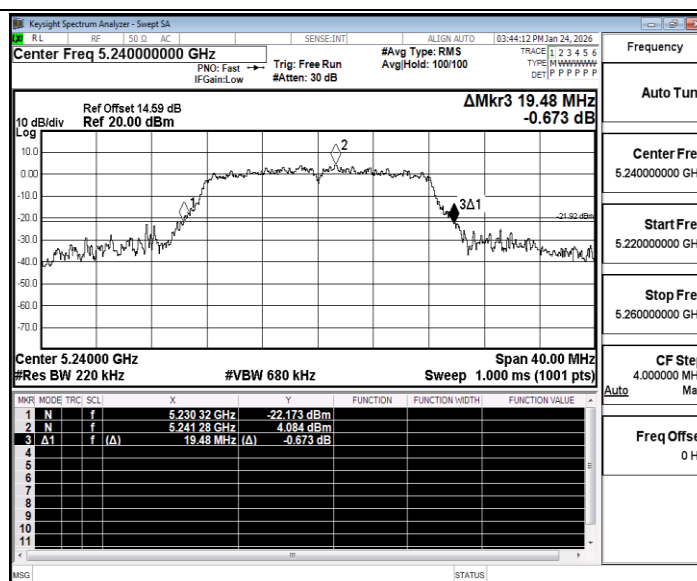
B.1 Emission Bandwidth

Test Result

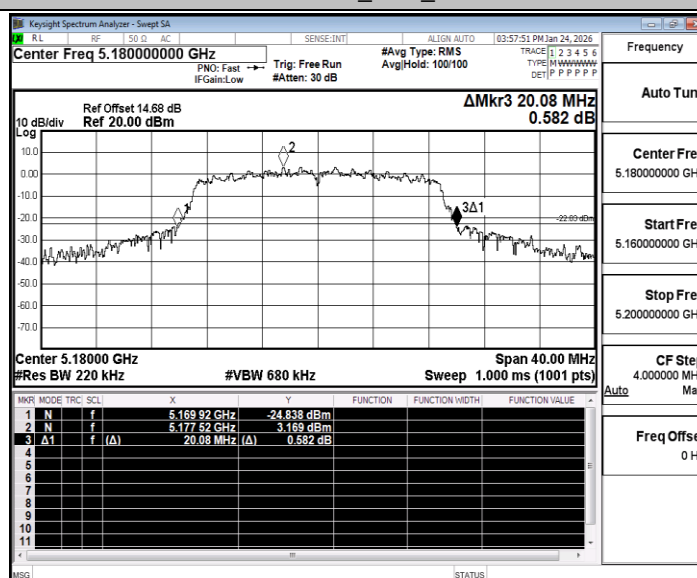
TestMode	Antenna	Freq(MHz)	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.600	5170.240	5189.840	---	---
		5200	19.720	5190.160	5209.880	---	---
		5240	19.480	5230.320	5249.800	---	---
11N20SISO	Ant1	5180	20.080	5169.920	5190.000	---	---
		5200	20.040	5190.000	5210.040	---	---
		5240	20.320	5230.080	5250.400	---	---
11N40SISO	Ant1	5190	40.720	5169.600	5210.320	---	---
		5230	39.840	5210.320	5250.160	---	---

Test Graphs

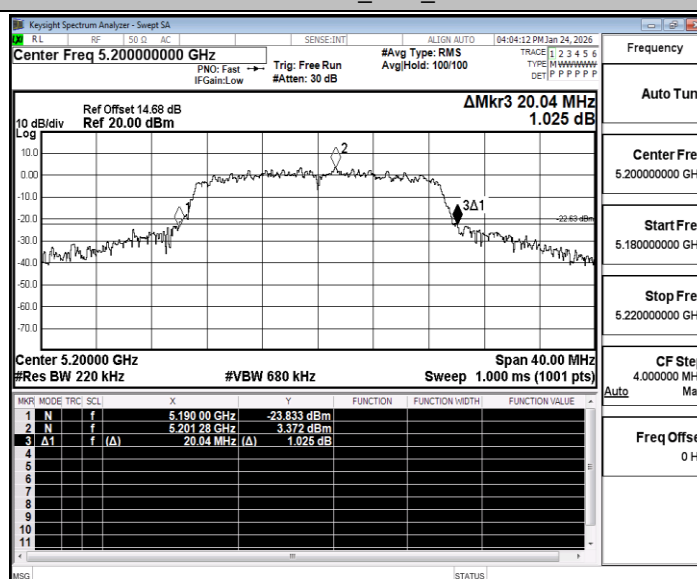




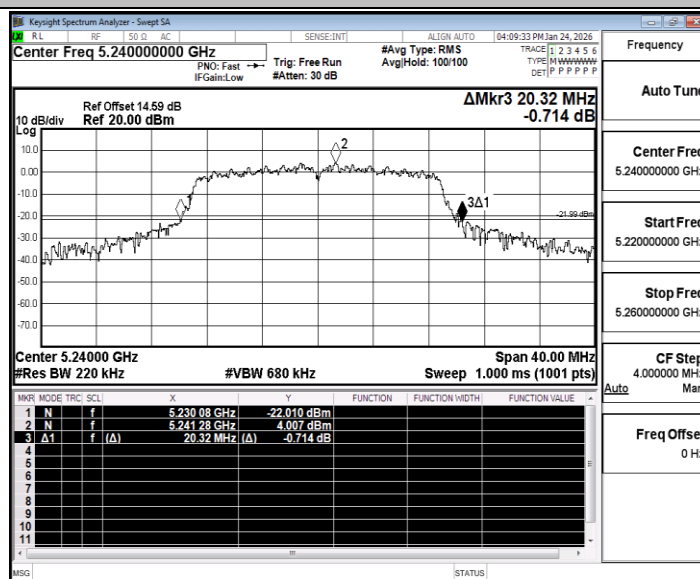
11N20SISO Ant1 5180



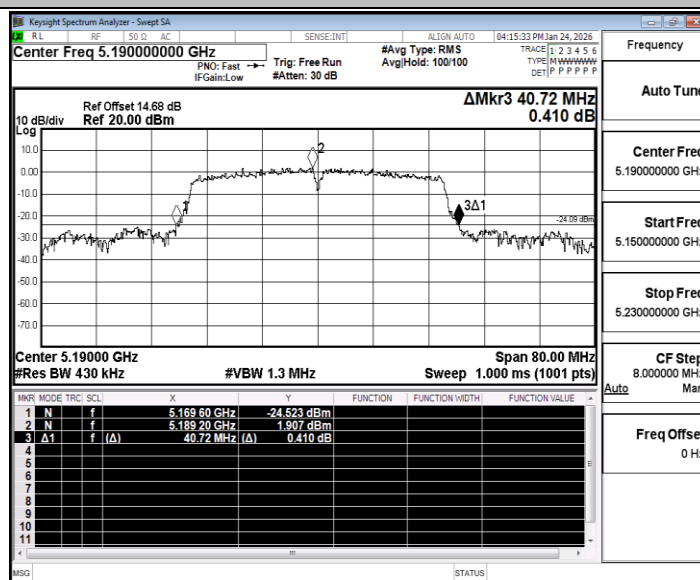
11N20SISO Ant1 5200



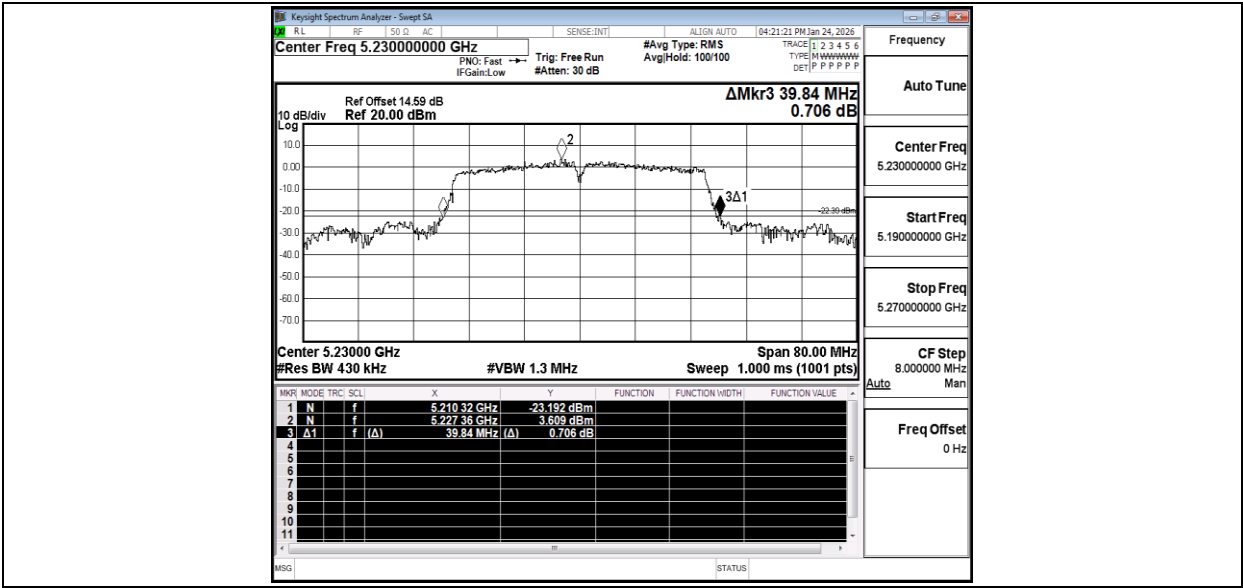
11N20SISO Ant1 5240



11N40SISO Ant1 5190



11N40SISO Ant1 5230



B.2 Maximum conducted output power

Test Mode	Antenna	Freq(MHz)	Measured Power [dBm]	DC Factor [dB]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	15.37	1.35	16.72	24	PASS
		5200	15.37	1.63	17.0	24	PASS
		5240	16.09	1.63	17.72	24	PASS
11N20SISO	Ant1	5180	15.49	1.25	16.74	24	PASS
		5200	15.45	1.51	16.96	24	PASS
		5240	16.44	1.25	17.69	24	PASS
11N40SISO	Ant1	5190	14.99	1.25	16.24	24	PASS
		5230	15.34	1.51	16.85	24	PASS

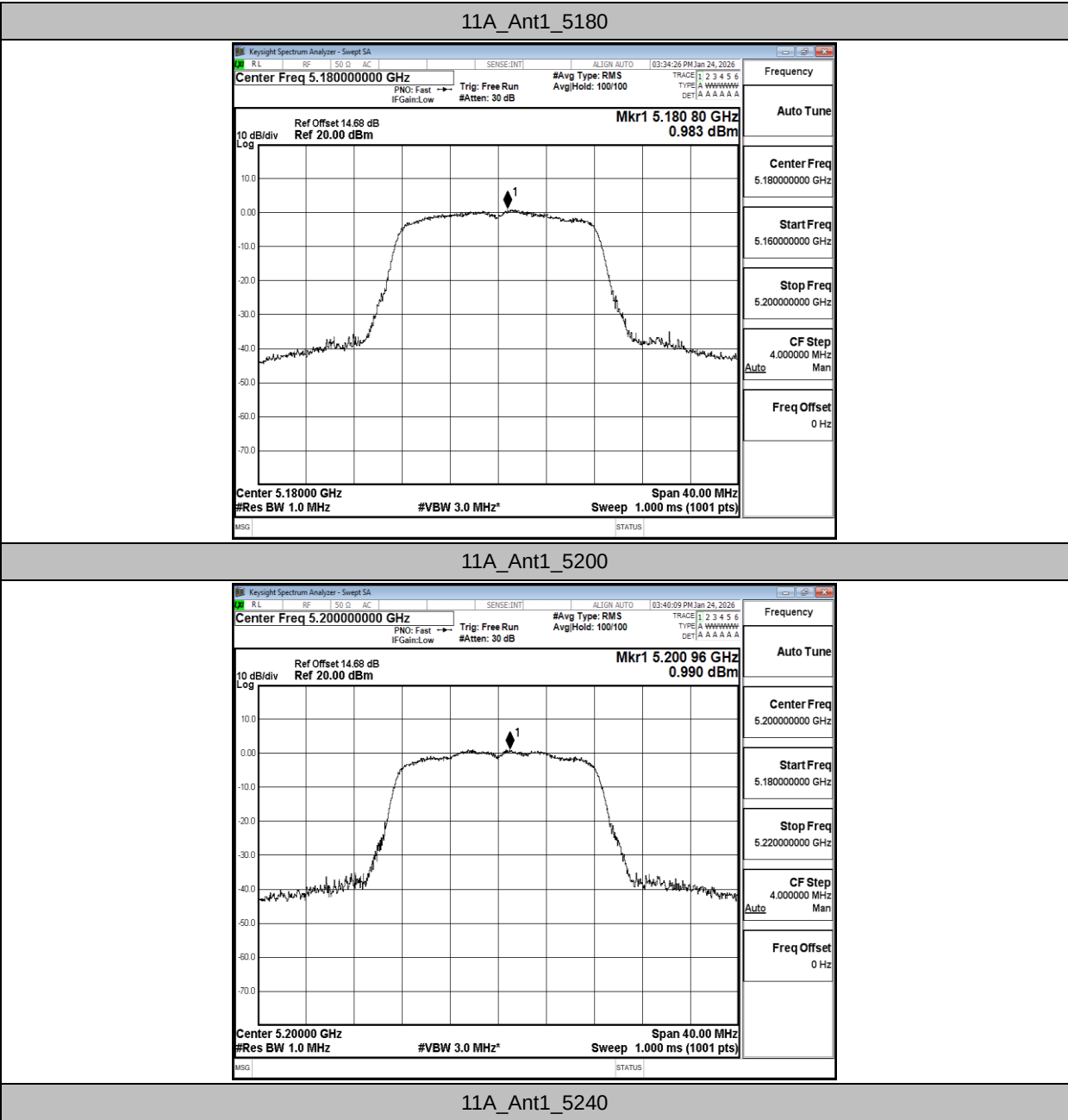
B.3 Maximum power spectral density

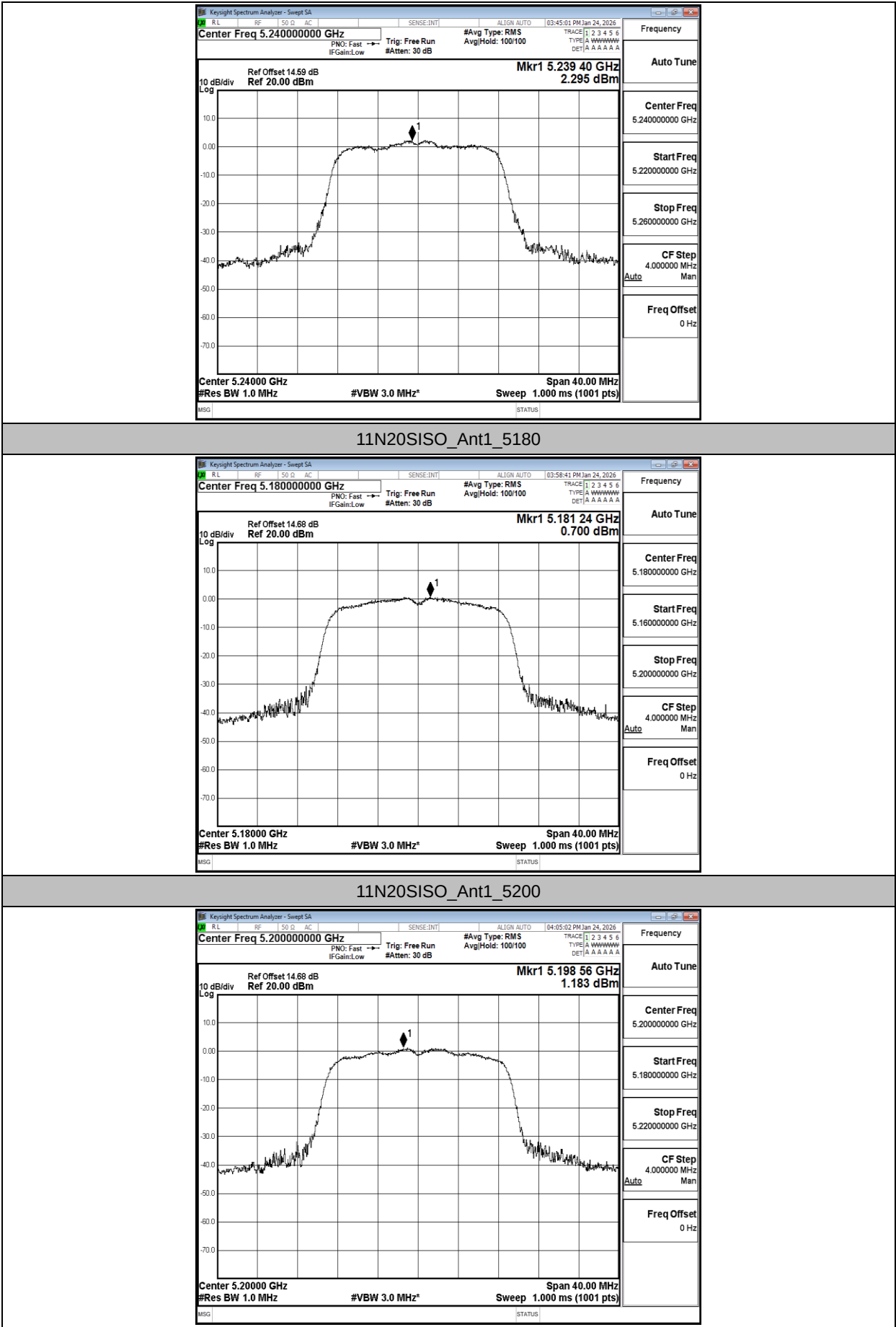
Test Result

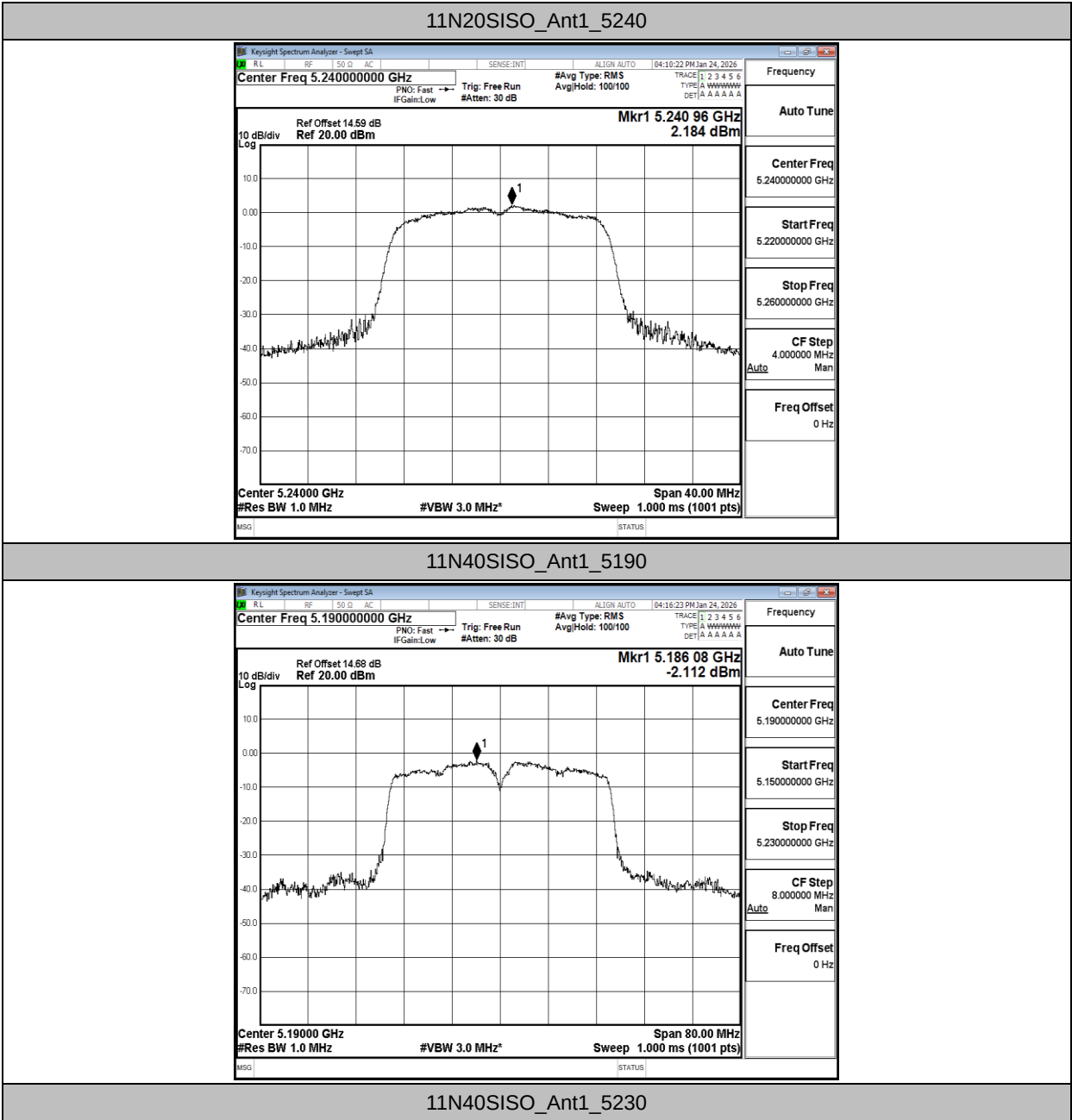
TestMode	Antenna	Freq (MHz)	Raw Data [dBm/MHz]	DC Factor	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	Ant1	5180	0.98	1.35	2.33	≤11.00	PASS
		5200	0.99	1.63	2.62	≤11.00	PASS
		5240	2.3	1.63	3.93	≤11.00	PASS
11N20SIS O	Ant1	5180	0.7	1.25	1.95	≤11.00	PASS
		5200	1.18	1.51	2.69	≤11.00	PASS
		5240	2.18	1.25	3.43	≤11.00	PASS
11N40SIS O	Ant1	5190	-2.11	1.25	-0.86	≤11.00	PASS
		5230	-1.85	1.51	-0.34	≤11.00	PASS

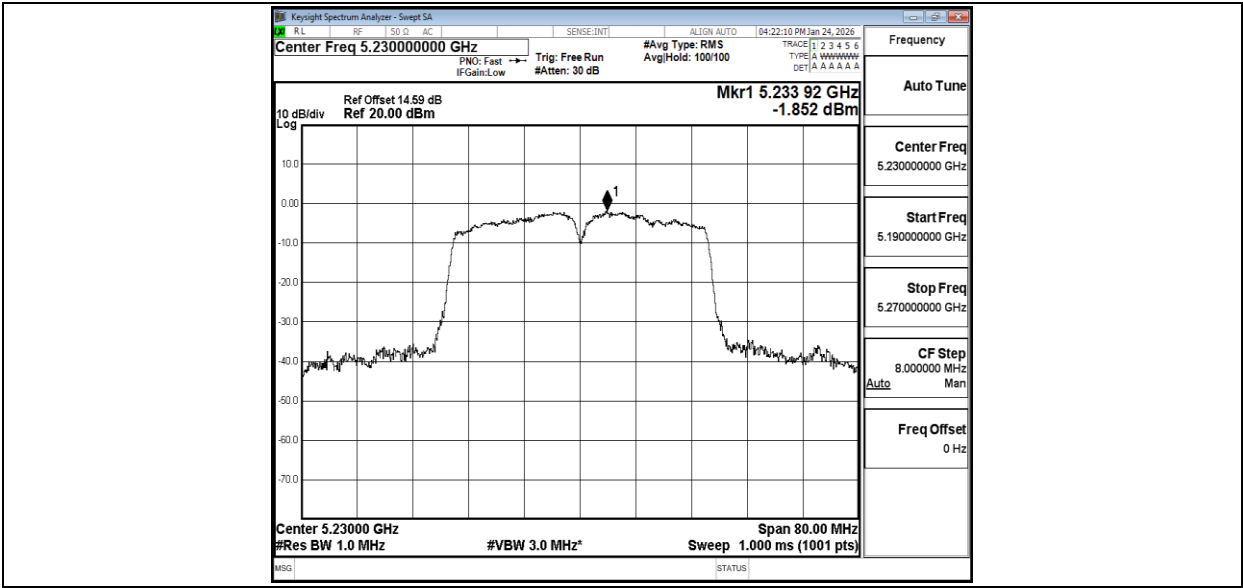
Note: 1.The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.

Test Graphs









B.4 Emissions in Restricted Bands

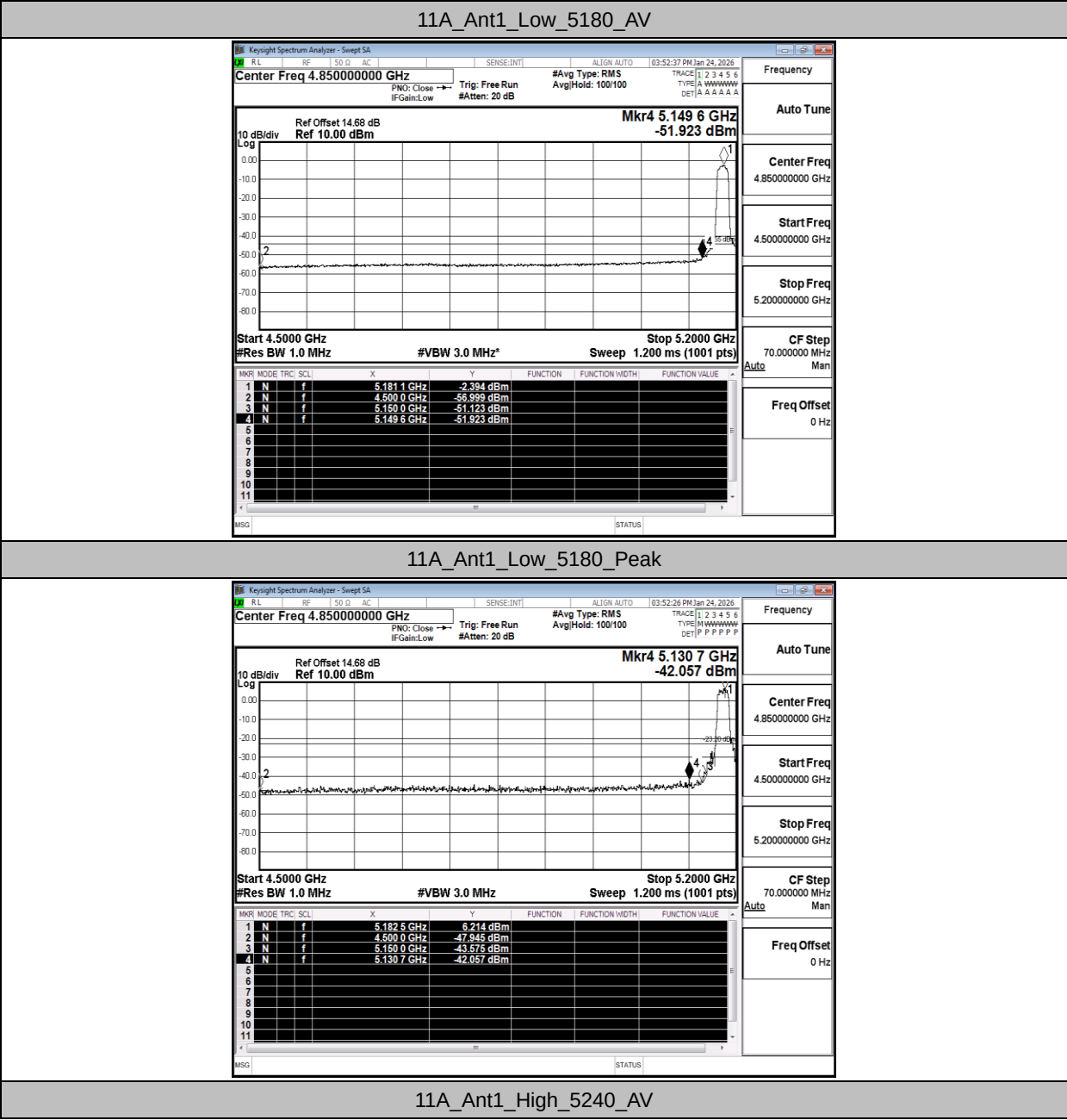
Test Result

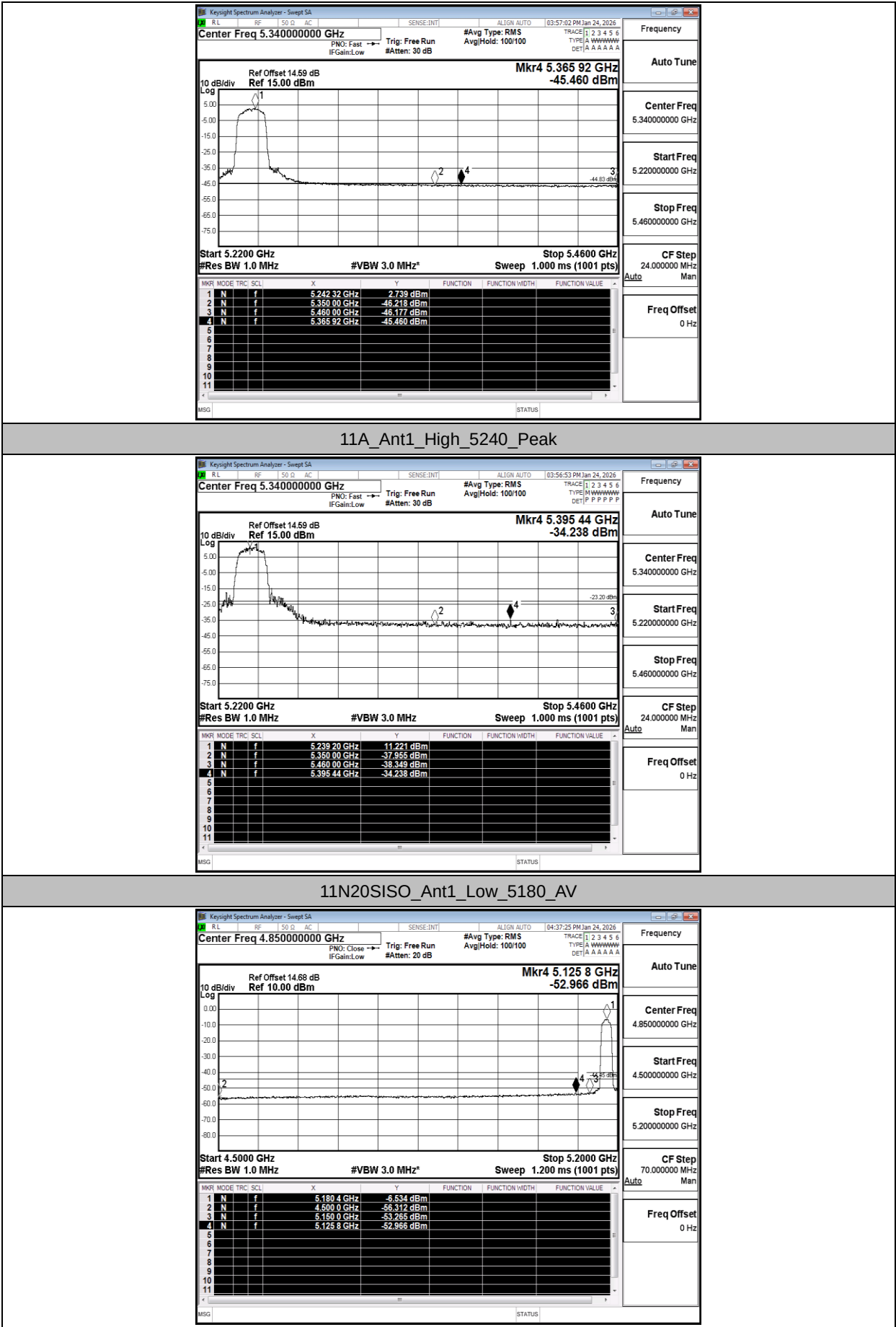
Test Mode	Antenna	Channel Name	Freq (MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11A	Ant1	Low	5180	AV	4500.000	-57	≤-44.55	4.50	1.35	44.08	≤54	PASS
				AV	5149.600	-51.92	≤-44.55	4.50	1.35	49.16	≤54	PASS
				AV	5150.000	-51.12	≤-44.55	4.50	1.35	49.96	≤54	PASS
				Peak	4500.000	-47.95	≤-23.20	4.50	0.00	51.78	≤68.2	PASS
				Peak	5130.700	-42.06	≤-23.20	4.50	0.00	57.67	≤68.2	PASS
				Peak	5150.000	-43.58	≤-23.20	4.50	0.00	56.15	≤68.2	PASS
		High	5240	AV	5350.000	-56.22	≤-44.83	4.50	1.63	45.14	≤54	PASS
				AV	5365.920	-55.46	≤-44.83	4.50	1.63	45.90	≤54	PASS
				AV	5460.000	-56.18	≤-44.83	4.50	1.63	45.18	≤54	PASS
				Peak	5350.000	-37.96	≤-23.20	4.50	0.00	61.77	≤68.2	PASS
				Peak	5395.440	-34.24	≤-23.20	4.50	0.00	65.49	≤68.2	PASS
				Peak	5460.000	-38.35	≤-23.20	4.50	0.00	61.38	≤68.2	PASS
11N2 OSIS O	Ant1	Low	5180	AV	4500.000	-56.31	≤-44.45	4.50	1.25	44.67	≤54	PASS
				AV	5125.800	-52.97	≤-44.45	4.50	1.25	48.01	≤54	PASS
				AV	5150.000	-53.27	≤-44.45	4.50	1.25	47.71	≤54	PASS
				Peak	4500.000	-47.8	≤-23.20	4.50	0.00	51.93	≤68.2	PASS
				Peak	5144.000	-43.65	≤-23.20	4.50	0.00	56.08	≤68.2	PASS
				Peak	5150.000	-45.33	≤-23.20	4.50	0.00	54.40	≤68.2	PASS
		High	5240	AV	5350.000	-55.72	≤-44.45	4.50	1.25	45.26	≤54	PASS
				AV	5381.760	-55.44	≤-44.45	4.50	1.25	45.54	≤54	PASS
				AV	5460.000	-56.64	≤-44.45	4.50	1.25	44.34	≤54	PASS
				Peak	5350.000	-39.13	≤-23.20	4.50	0.00	60.60	≤68.2	PASS
				Peak	5438.640	-35.21	≤-23.20	4.50	0.00	64.52	≤68.2	PASS
				Peak	5460.000	-38.65	≤-23.20	4.50	0.00	61.08	≤68.2	PASS
11N4 OSIS O	Ant1	Low	5190	AV	4500.000	-56.72	≤-44.45	4.50	1.25	44.26	≤54	PASS
				AV	5139.100	-49.14	≤-44.45	4.50	1.25	51.84	≤54	PASS
				AV	5150.000	-49.89	≤-44.45	4.50	1.25	51.09	≤54	PASS
				Peak	4500.000	-48.75	≤-23.20	4.50	0.00	50.98	≤68.2	PASS
				Peak	5140.500	-32.59	≤-23.20	4.50	0.00	67.14	≤68.2	PASS
				Peak	5150.000	-34.45	≤-23.20	4.50	0.00	65.28	≤68.2	PASS
		High	5230	AV	5350.000	-54.61	≤-44.71	4.50	1.51	46.63	≤54	PASS
				AV	5385.120	-53.7	≤-44.71	4.50	1.51	47.54	≤54	PASS
				AV	5460.000	-55.72	≤-44.71	4.50	1.51	45.52	≤54	PASS
				Peak	5350.000	-46.23	≤-23.20	4.50	0.00	53.50	≤68.2	PASS
				Peak	5360.940	-43.44	≤-23.20	4.50	0.00	56.29	≤68.2	PASS
				Peak	5460.000	-47.3	≤-23.20	4.50	0.00	52.43	≤68.2	PASS

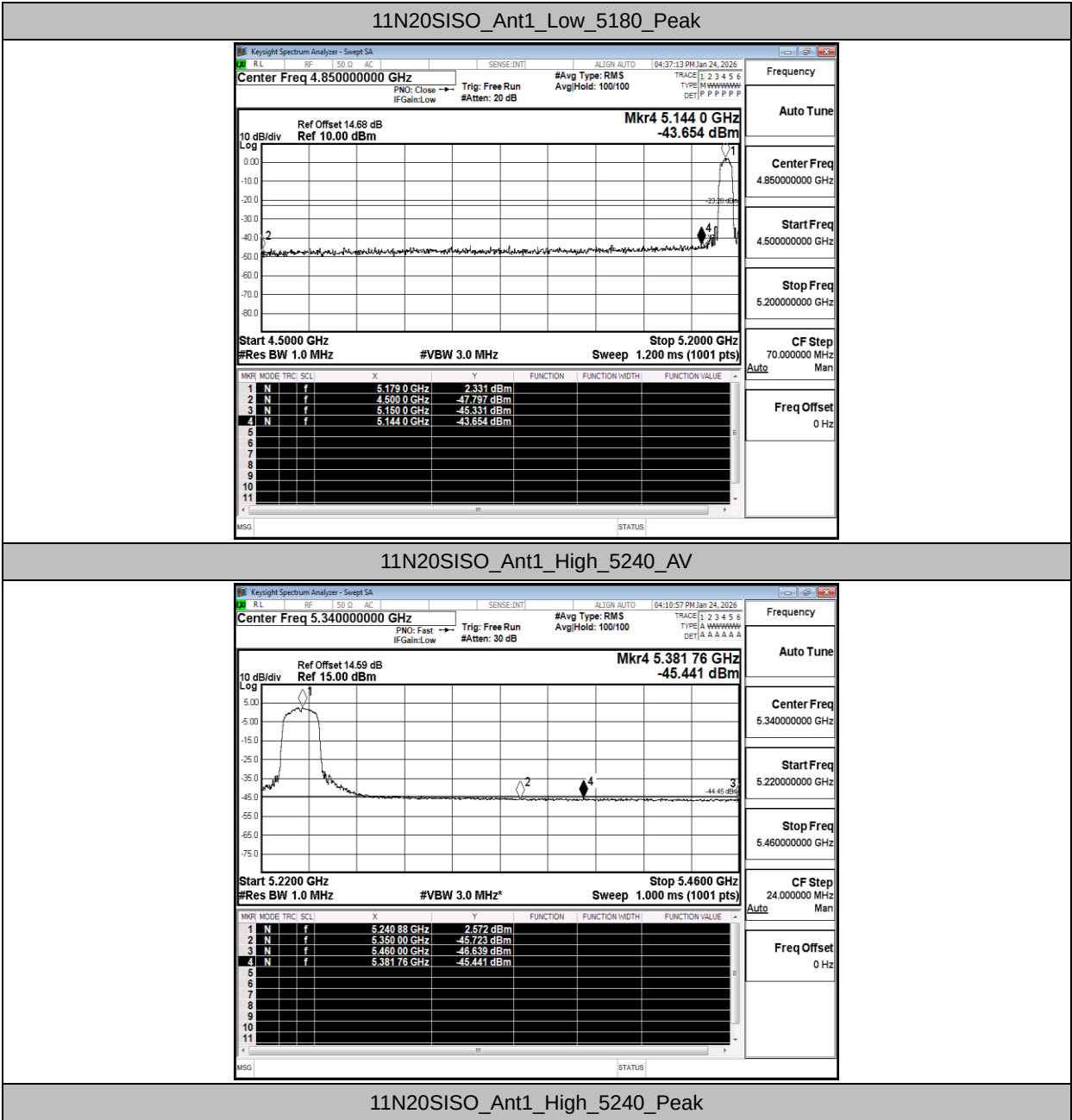
Note:

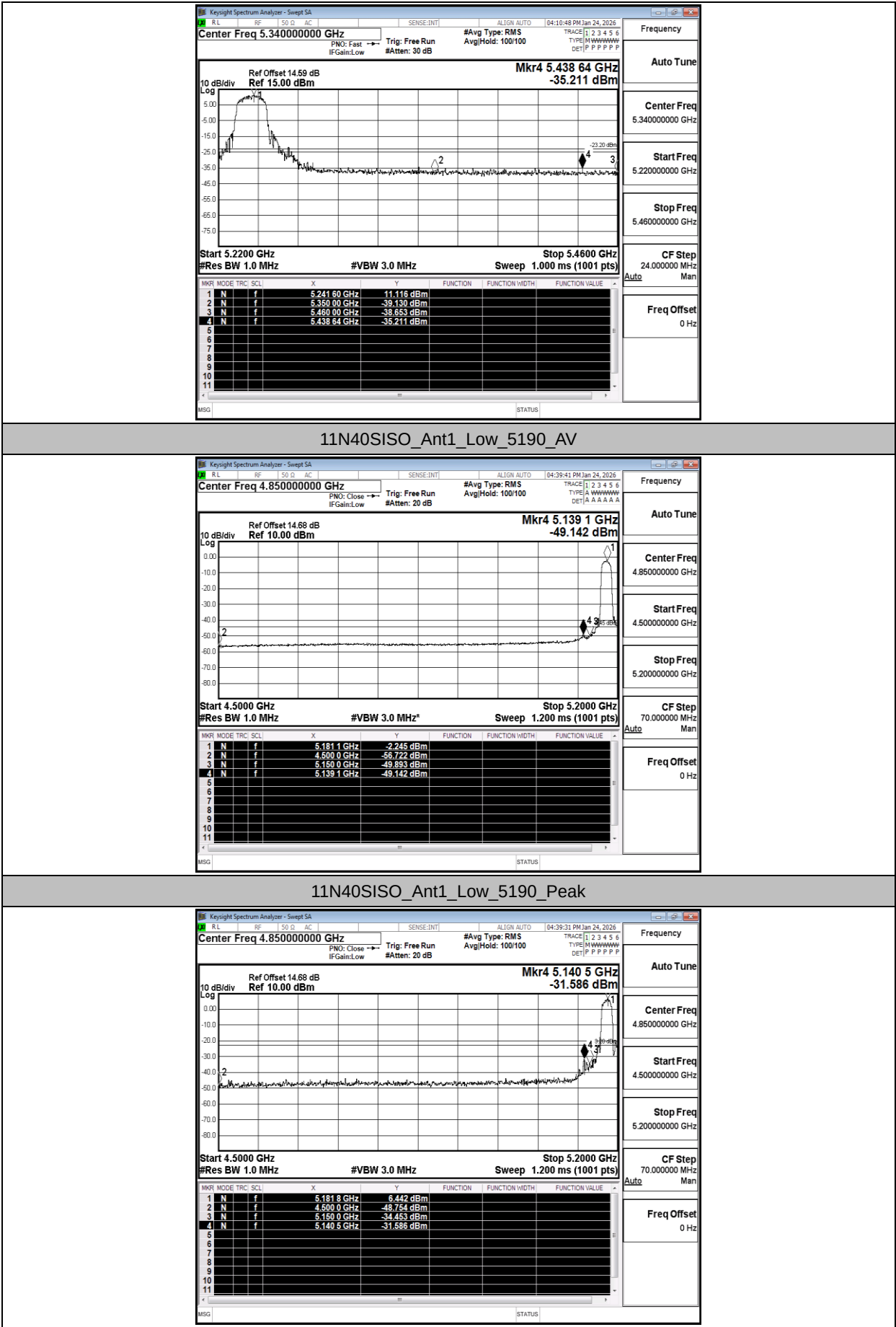
1. The Antenna Gain is compensated in the graph.
2. For transmitters operating in 5150-5350 GHz band and 5470-5725 GHz band: The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

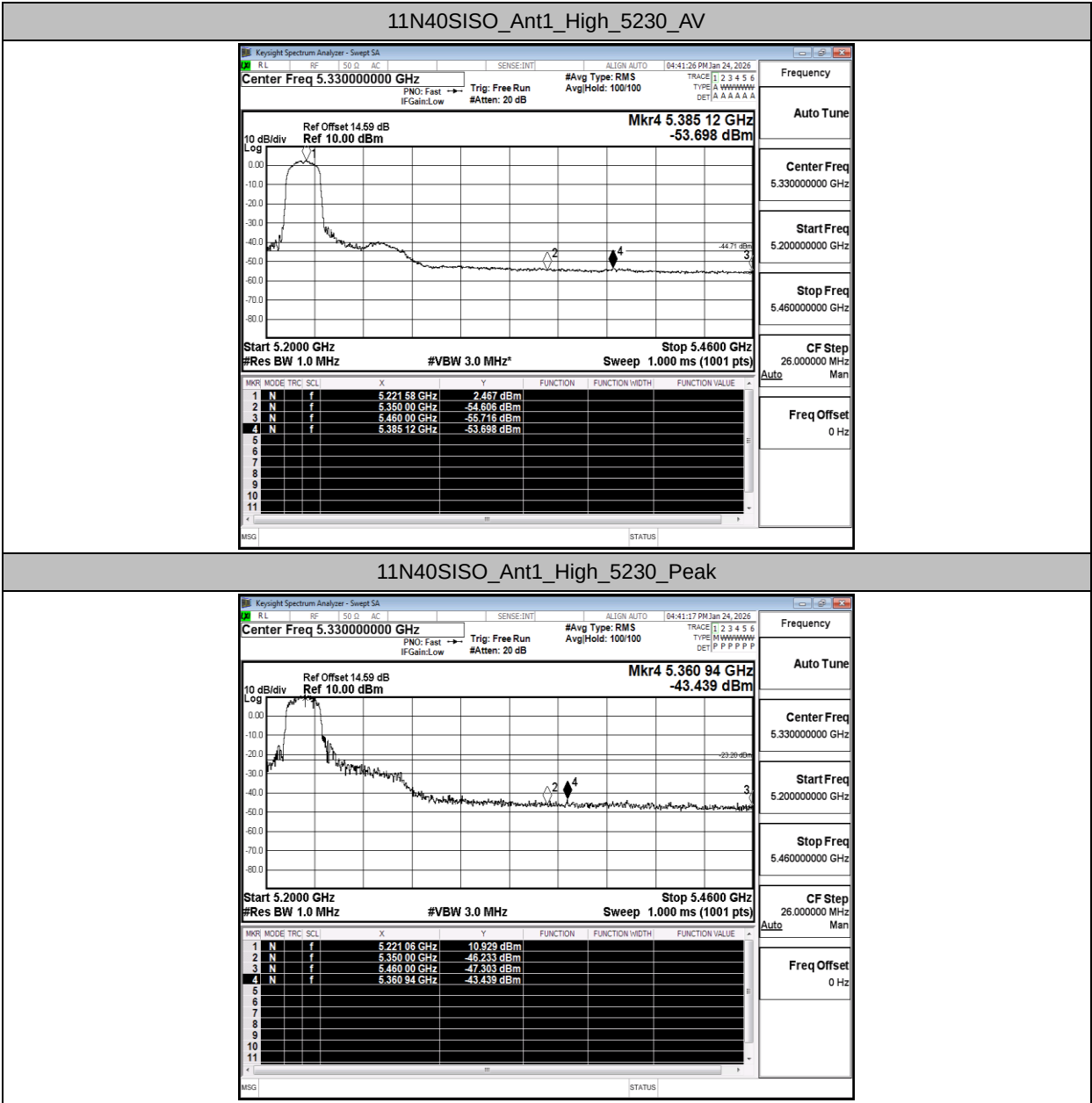
Test Graphs











B.5 Frequency Stability

Test Result

Voltage								
TestMode	Antenna	Freq(MHz)	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	NT	0.00	0.000000	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	0.00	0.000000	20	PASS
		5200	NV	NT	0.00	0.000000	20	PASS
			LV	NT	-20000.00	-3.846154	20	PASS
			HV	NT	-20000.00	-3.846154	20	PASS
		5240	NV	NT	0.00	0.000000	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	-20000.00	-3.816794	20	PASS
11N20SISO	Ant1	5180	NV	NT	-20000.00	-3.861004	20	PASS
			LV	NT	-20000.00	-3.861004	20	PASS
			HV	NT	0.00	0.000000	20	PASS
		5200	NV	NT	40000.00	7.692308	20	PASS
			LV	NT	20000.00	3.846154	20	PASS
			HV	NT	0.00	0.000000	20	PASS
		5240	NV	NT	-20000.00	-3.816794	20	PASS
			LV	NT	-20000.00	-3.816794	20	PASS
			HV	NT	-40000.00	-7.633588	20	PASS
11N40SISO	Ant1	5190	NV	NT	0.00	0.000000	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	40000.00	7.707129	20	PASS
		5230	NV	NT	0.00	0.000000	20	PASS
			LV	NT	40000.00	7.648184	20	PASS
			HV	NT	0.00	0.000000	20	PASS

Temperature								
TestMode	Antenna	Freq(MHz)	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	-30	-20000.00	-3.861004	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	0.00	0.000000	20	PASS
			NV	0	-20000.00	-3.861004	20	PASS
			NV	10	0.00	0.000000	20	PASS
			NV	20	-20000.00	-3.861004	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	0.00	0.000000	20	PASS

			NV	50	0.00	0.000000	20	PASS
		5200	NV	-30	-20000.00	-3.846154	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	0.00	0.000000	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	0.00	0.000000	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	-20000.00	-3.846154	20	PASS
			NV	50	0.00	0.000000	20	PASS
		5240	NV	-30	0.00	0.000000	20	PASS
			NV	-20	-20000.00	-3.816794	20	PASS
			NV	-10	0.00	0.000000	20	PASS
			NV	0	-20000.00	-3.816794	20	PASS
			NV	10	0.00	0.000000	20	PASS
			NV	20	20000.00	3.816794	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	0.00	0.000000	20	PASS
11N20SIS O	Ant1	5180	NV	-30	-20000.00	-3.861004	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	20000.00	3.861004	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	20000.00	3.861004	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	20000.00	3.861004	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	20000.00	3.861004	20	PASS
		5200	NV	-30	0.00	0.000000	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	20000.00	3.846154	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	20000.00	3.846154	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	-20000.00	-3.846154	20	PASS
		5240	NV	-30	-40000.00	-7.633588	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	20000.00	3.816794	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	-20000.00	-3.816794	20	PASS
			NV	20	0.00	0.000000	20	PASS

11N40SIS O	Ant1		NV	30	40000.00	7.633588	20	PASS
			NV	40	-20000.00	-3.816794	20	PASS
			NV	50	-20000.00	-3.816794	20	PASS
		5190	NV	-30	0.00	0.000000	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	-40000.00	-7.707129	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	0.00	0.000000	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	0.00	0.000000	20	PASS
		5230	NV	-30	40000.00	7.648184	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	0.00	0.000000	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	40000.00	7.648184	20	PASS
			NV	20	40000.00	7.648184	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	40000.00	7.648184	20	PASS

B.6 Duty Cycle

Test Result

TestMode	Antenna	Freq(MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	DC Factor	Limit	Verdict
11A	Ant1	5180	0.11	0.15	73.33	1.35	---	---
		5200	0.11	0.16	68.75	1.63	---	---
		5240	0.11	0.16	68.75	1.63	---	---
11N20SISO	Ant1	5180	0.12	0.16	75.00	1.25	---	---
		5200	0.12	0.17	70.59	1.51	---	---
		5240	0.12	0.16	75.00	1.25	---	---
11N40SISO	Ant1	5190	0.12	0.16	75.00	1.25	---	---
		5230	0.12	0.17	70.59	1.51	---	---

Test Graphs

