

Appendix A

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: ata05 Humanized Teleoperated Robot

Test Model: ATA MPM-05

Environmental Conditions

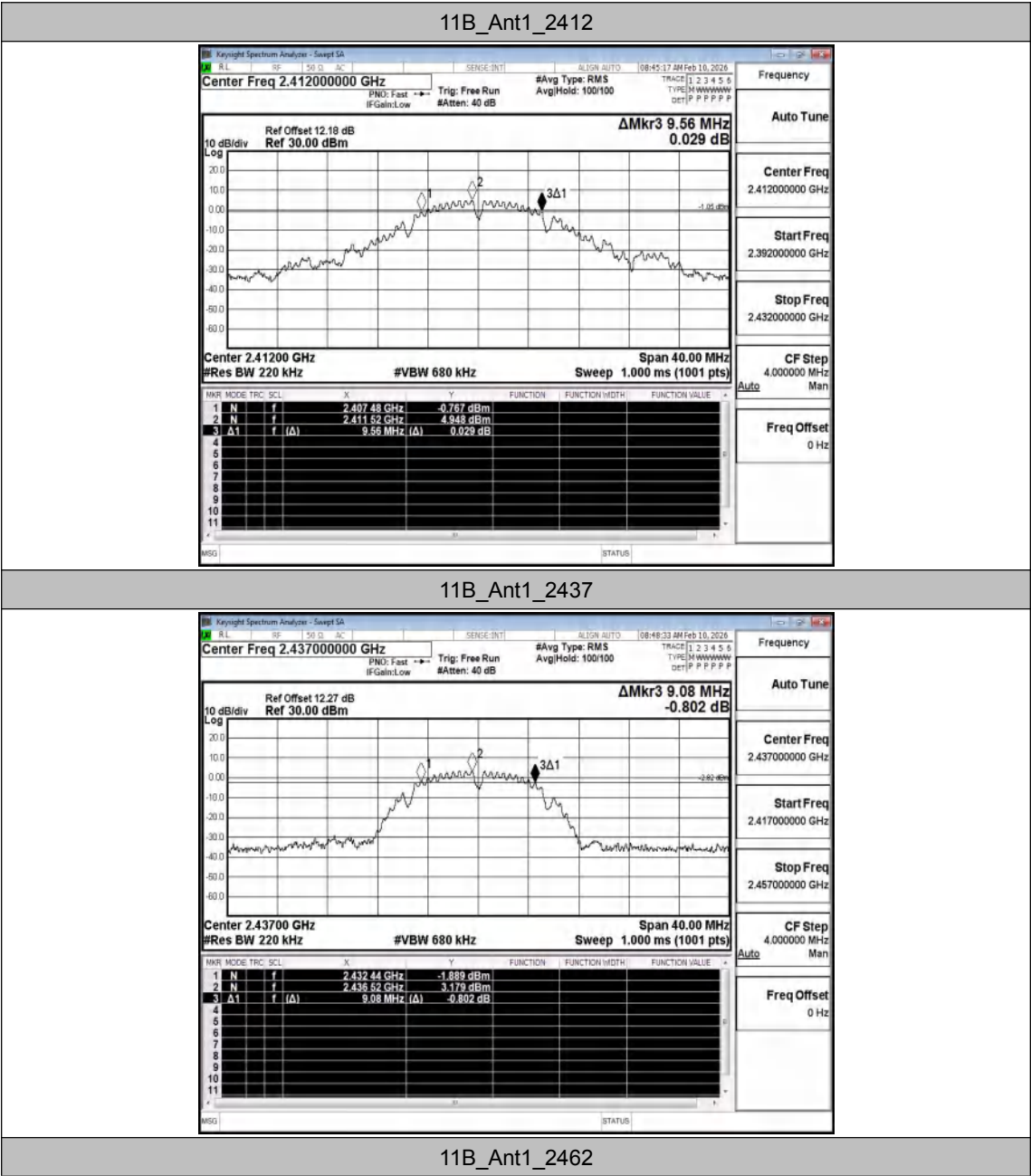
Temperature:	23.5°C
Relative Humidity:	54.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Zhang hai
Supervised by:	Fengliu Tang

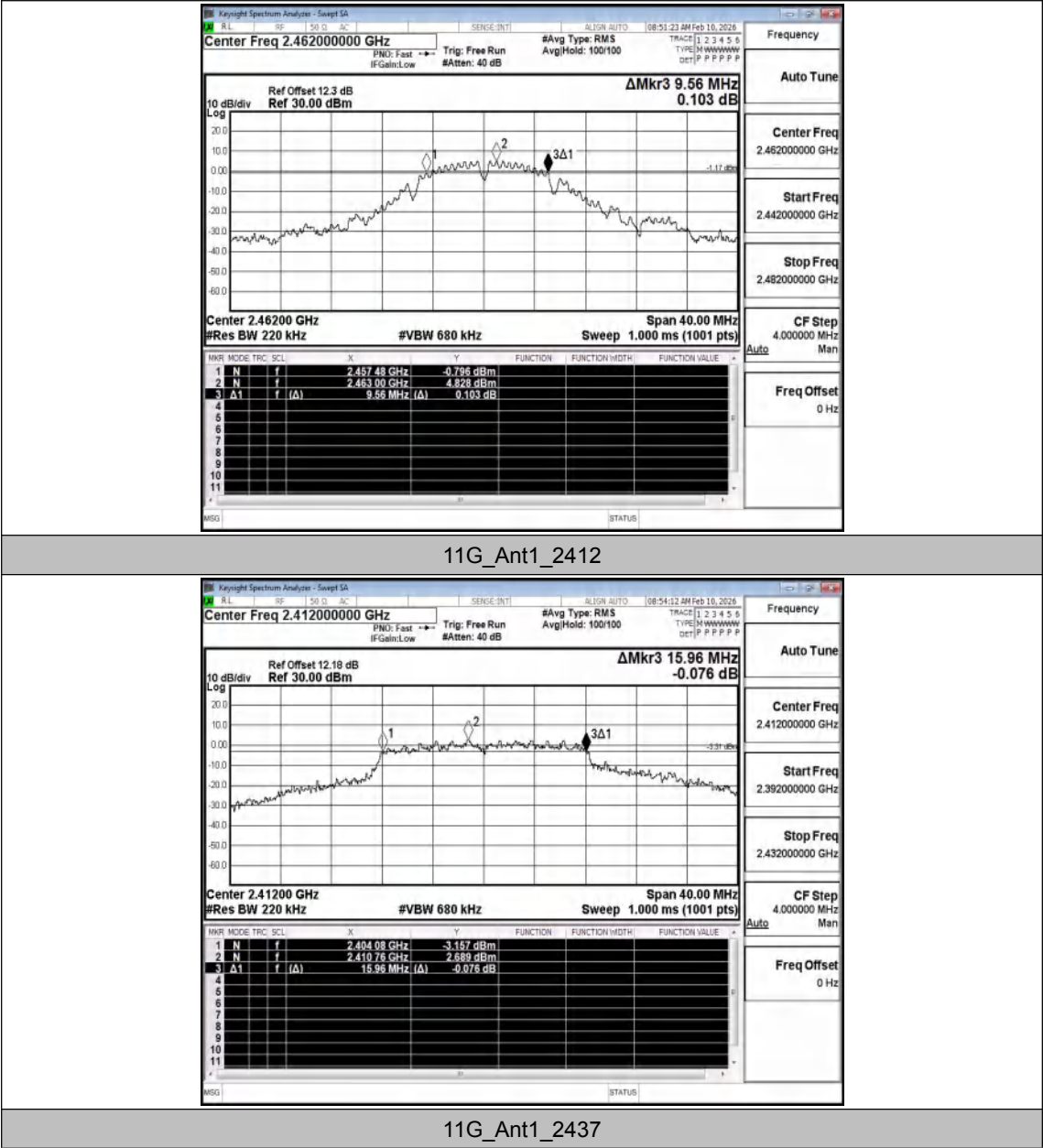
A.1 DTS Bandwidth

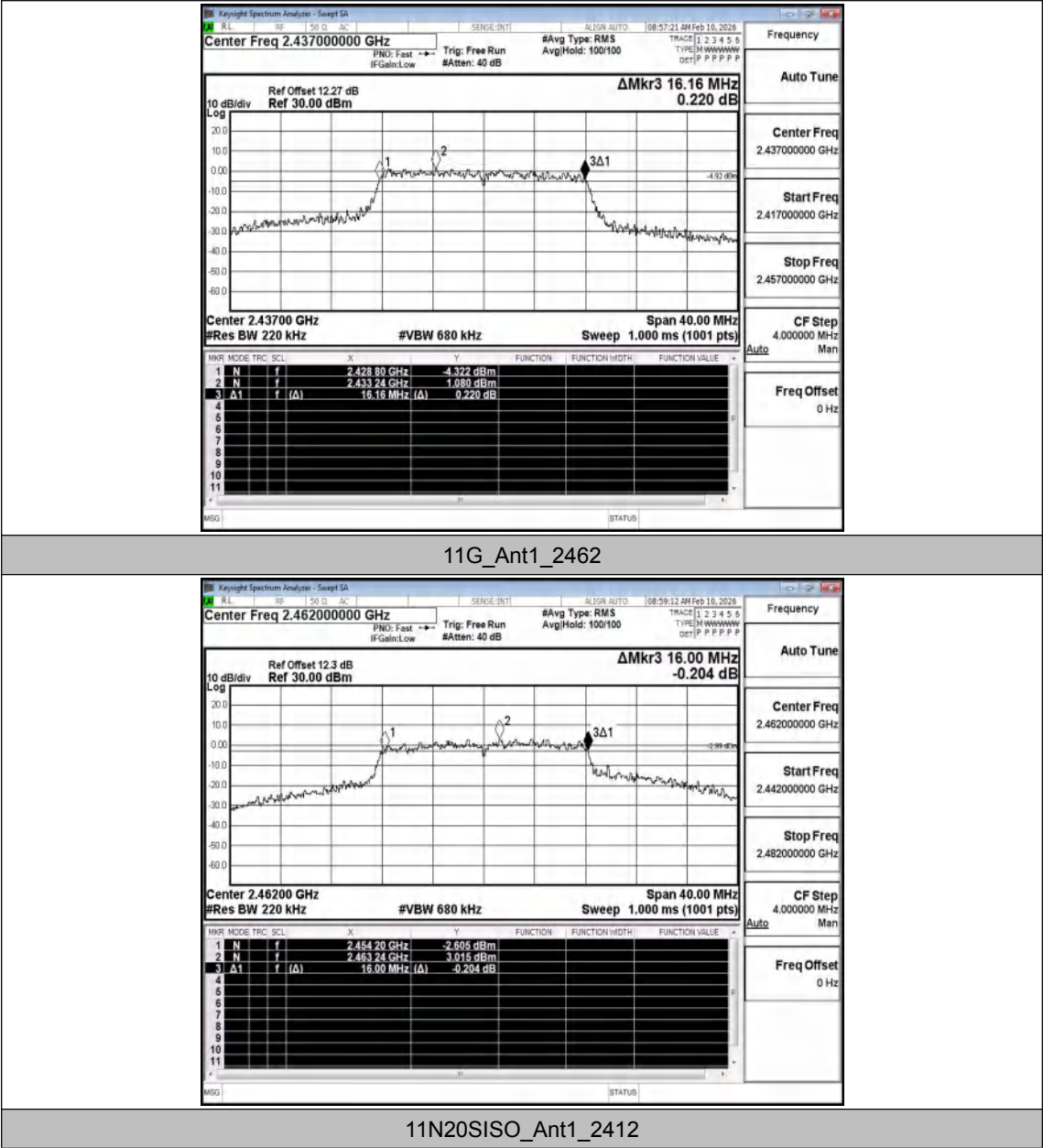
Test Result

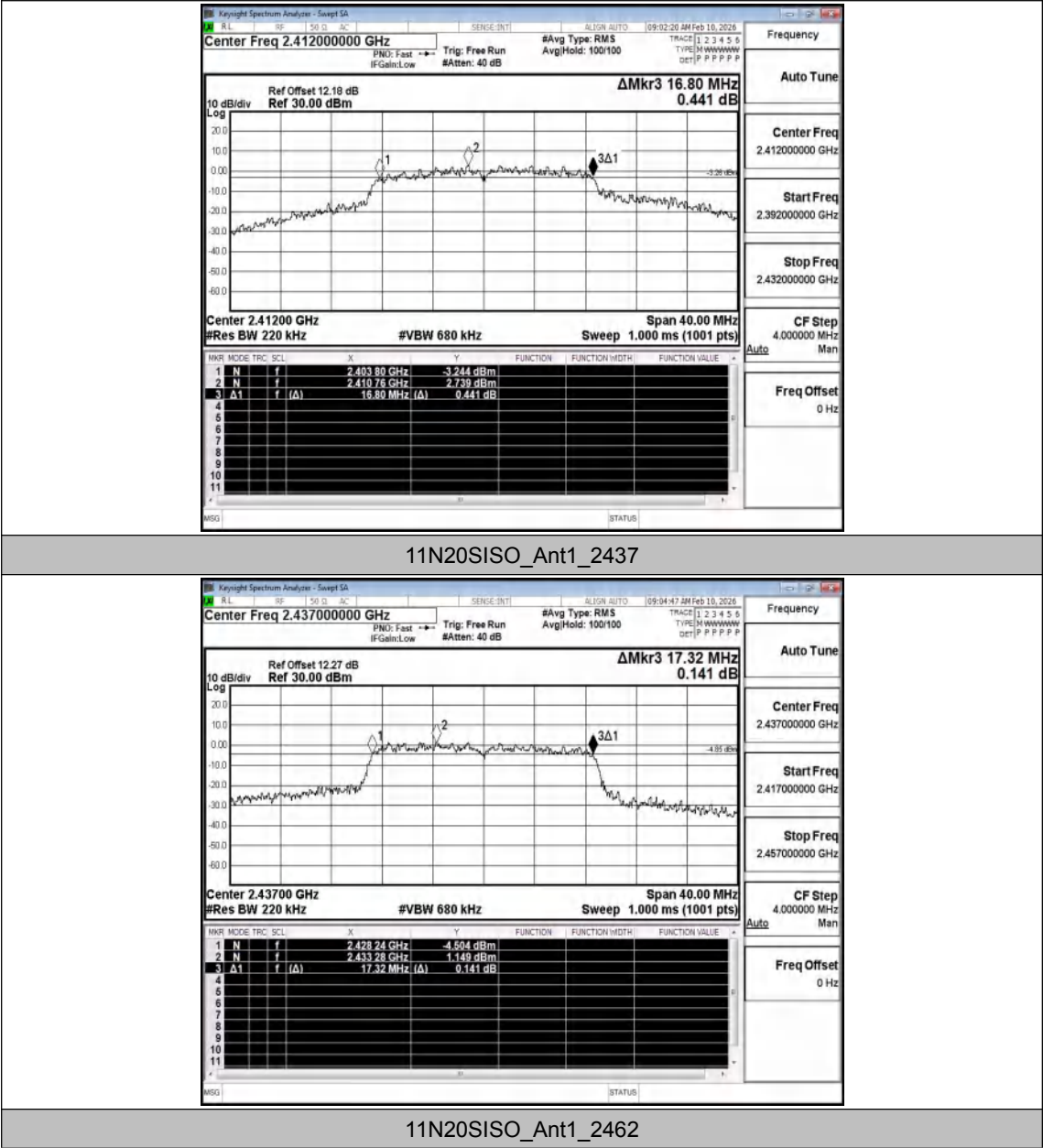
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.560	2407.480	2417.040	0.5	PASS
		2437	9.080	2432.440	2441.520	0.5	PASS
		2462	9.560	2457.480	2467.040	0.5	PASS
11G	Ant1	2412	15.960	2404.080	2420.040	0.5	PASS
		2437	16.160	2428.800	2444.960	0.5	PASS
		2462	16.000	2454.200	2470.200	0.5	PASS
11N20SISO	Ant1	2412	16.800	2403.800	2420.600	0.5	PASS
		2437	17.320	2428.240	2445.560	0.5	PASS
		2462	16.960	2453.720	2470.680	0.5	PASS
11N40SISO	Ant1	2422	34.560	2404.400	2438.960	0.5	PASS
		2437	36.000	2418.920	2454.920	0.5	PASS
		2452	35.920	2434.160	2470.080	0.5	PASS

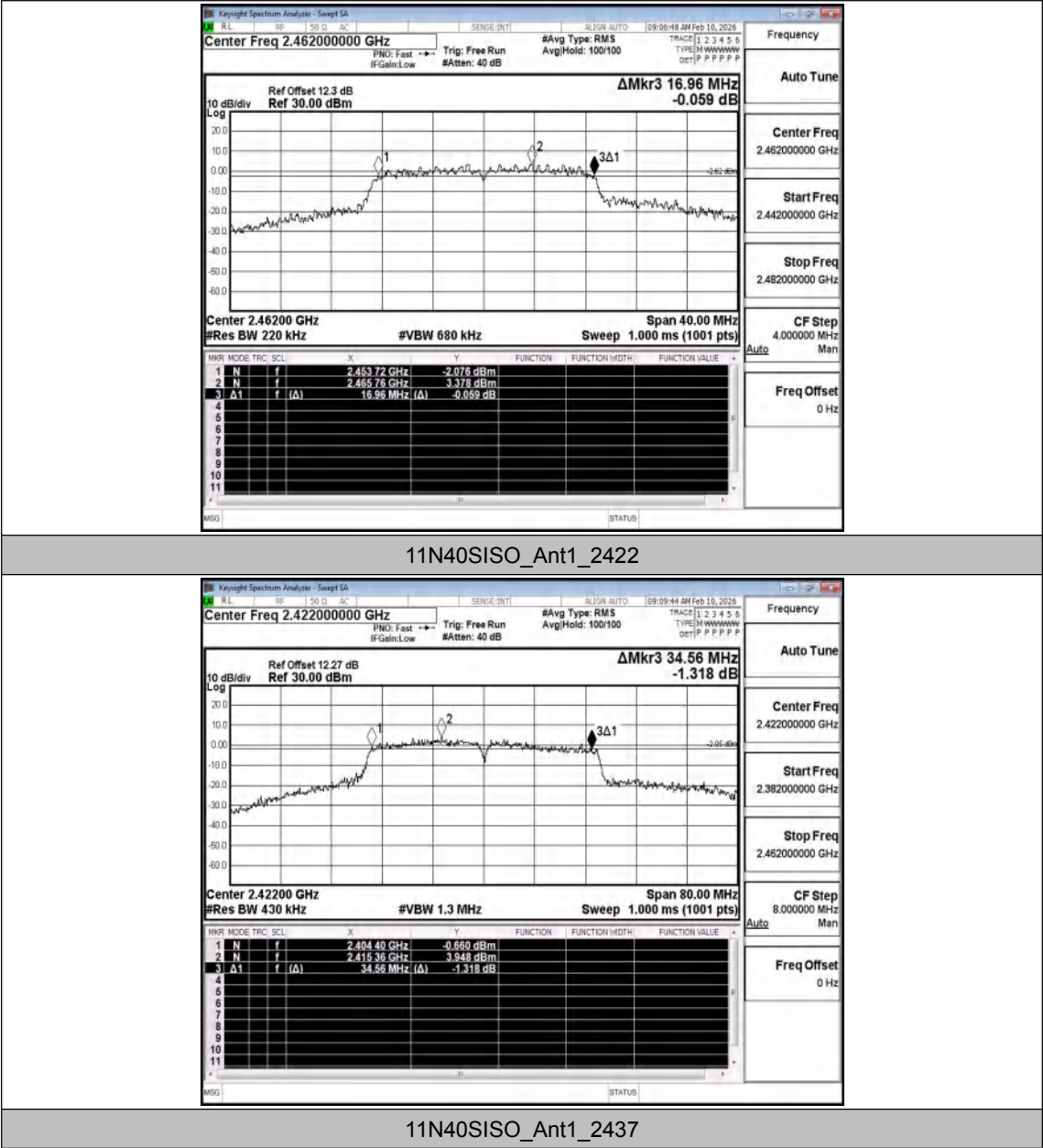
Test Graphs

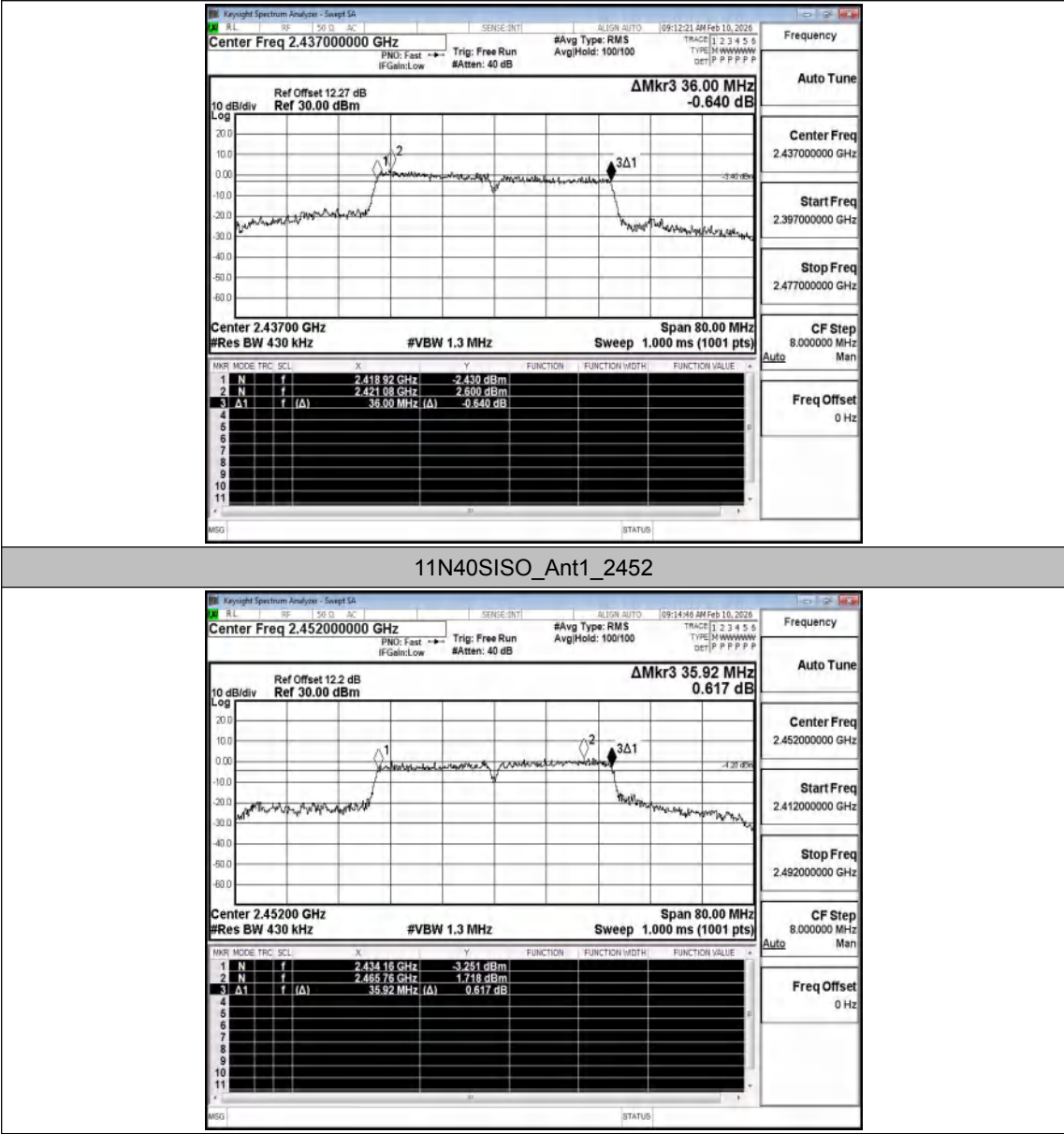












A.2 Maximum Average conducted output power

Test Result Average

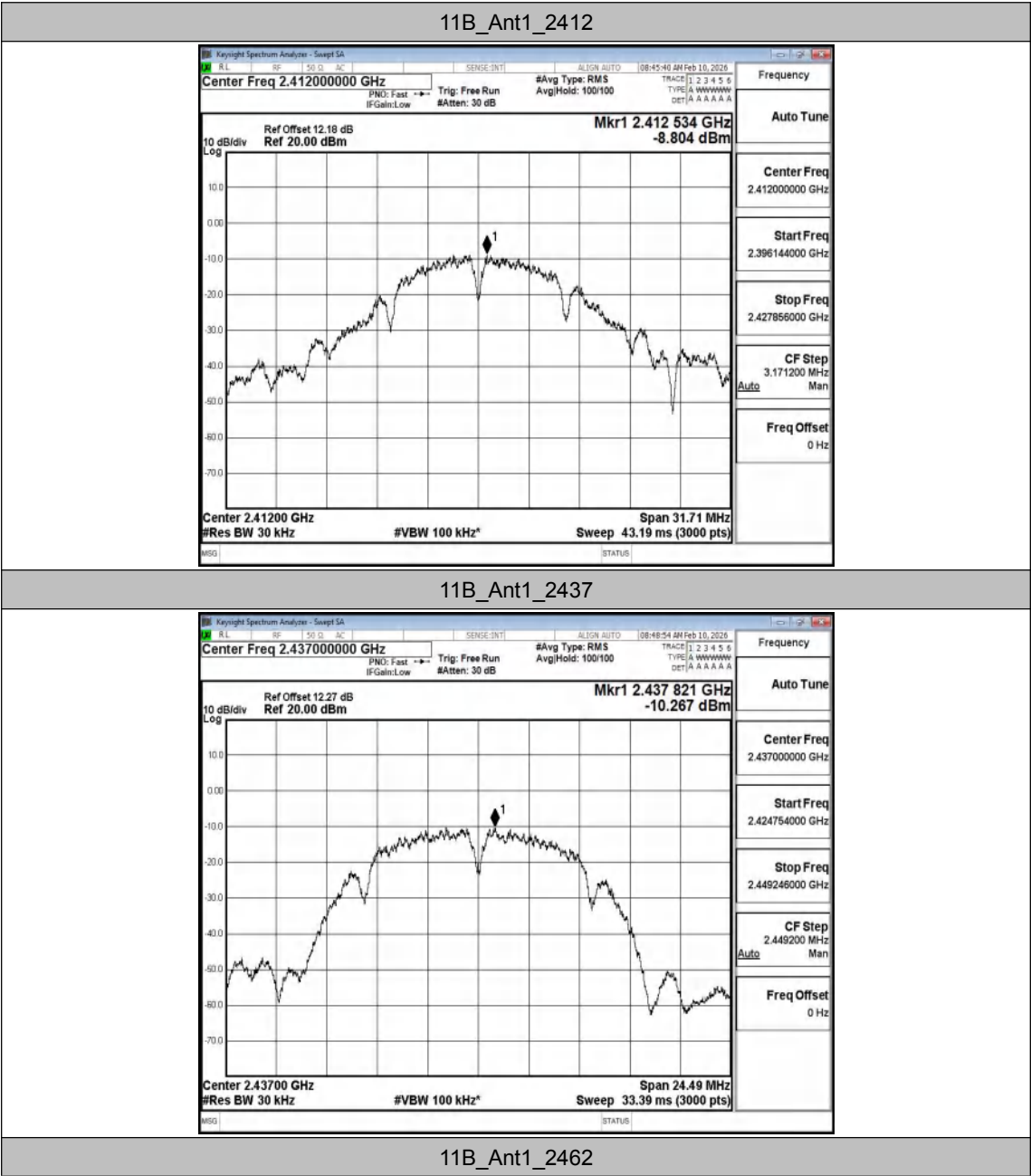
TestMode	Antenna	Frequency [MHz]	Measured Power	DC Factor [dB]	AV Power [dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	13.41	0.34	13.75	≤30.00	PASS
		2437	11.56	0.34	11.90	≤30.00	PASS
		2462	13.46	0.34	13.80	≤30.00	PASS
11G	Ant1	2412	10.14	1.76	11.90	≤30.00	PASS
		2437	9.06	1.76	10.82	≤30.00	PASS
		2462	10.47	2.14	12.61	≤30.00	PASS
11N20SISO	Ant1	2412	11.21	2.14	13.35	≤30.00	PASS
		2437	9.42	1.89	11.31	≤30.00	PASS
		2462	11.11	1.89	13.00	≤30.00	PASS
11N40SISO	Ant1	2422	10.56	2.43	12.99	≤30.00	PASS
		2437	9.34	2.43	11.77	≤30.00	PASS
		2452	8.91	2.69	11.60	≤30.00	PASS

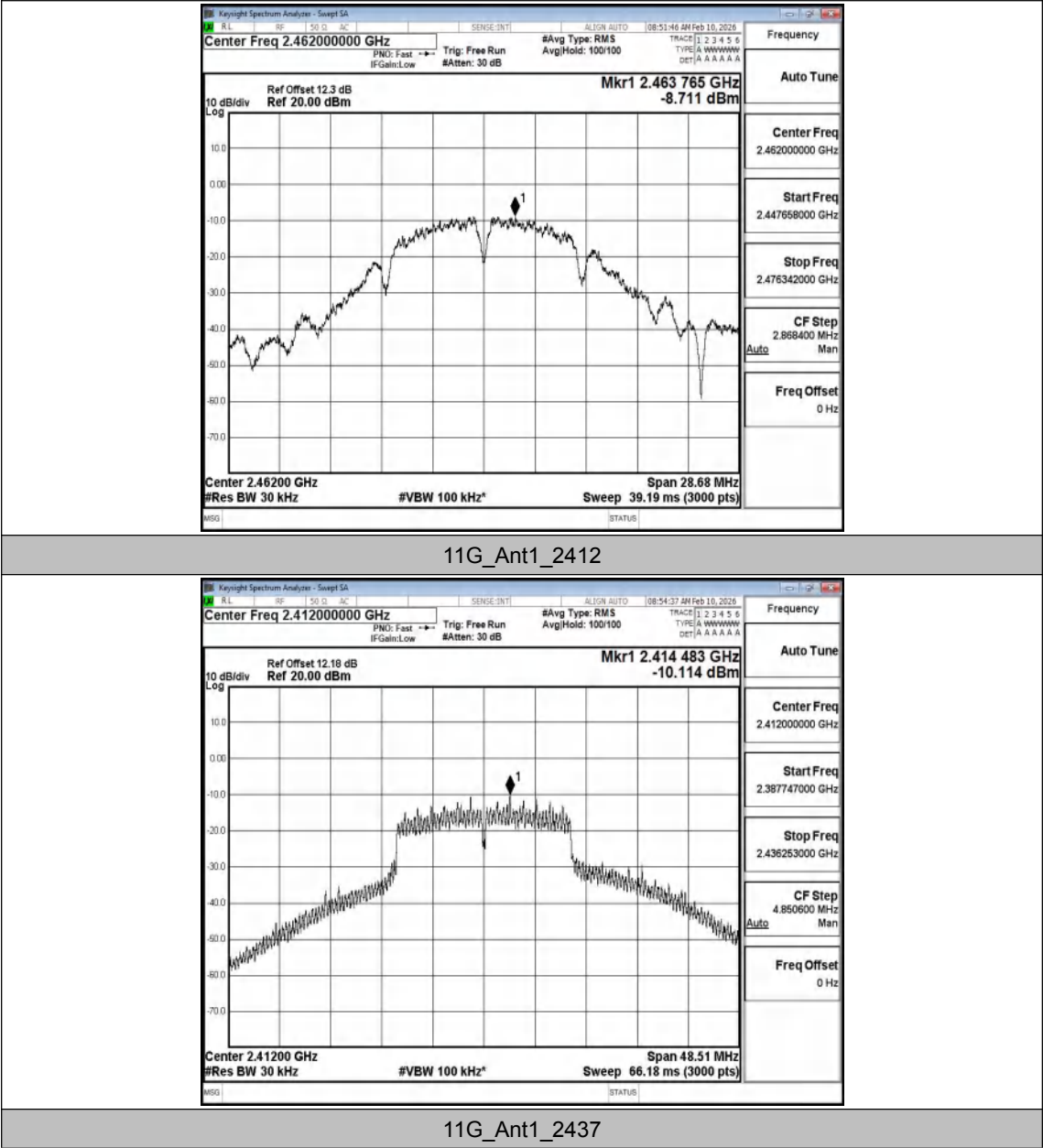
A.3 Maximum power spectral density

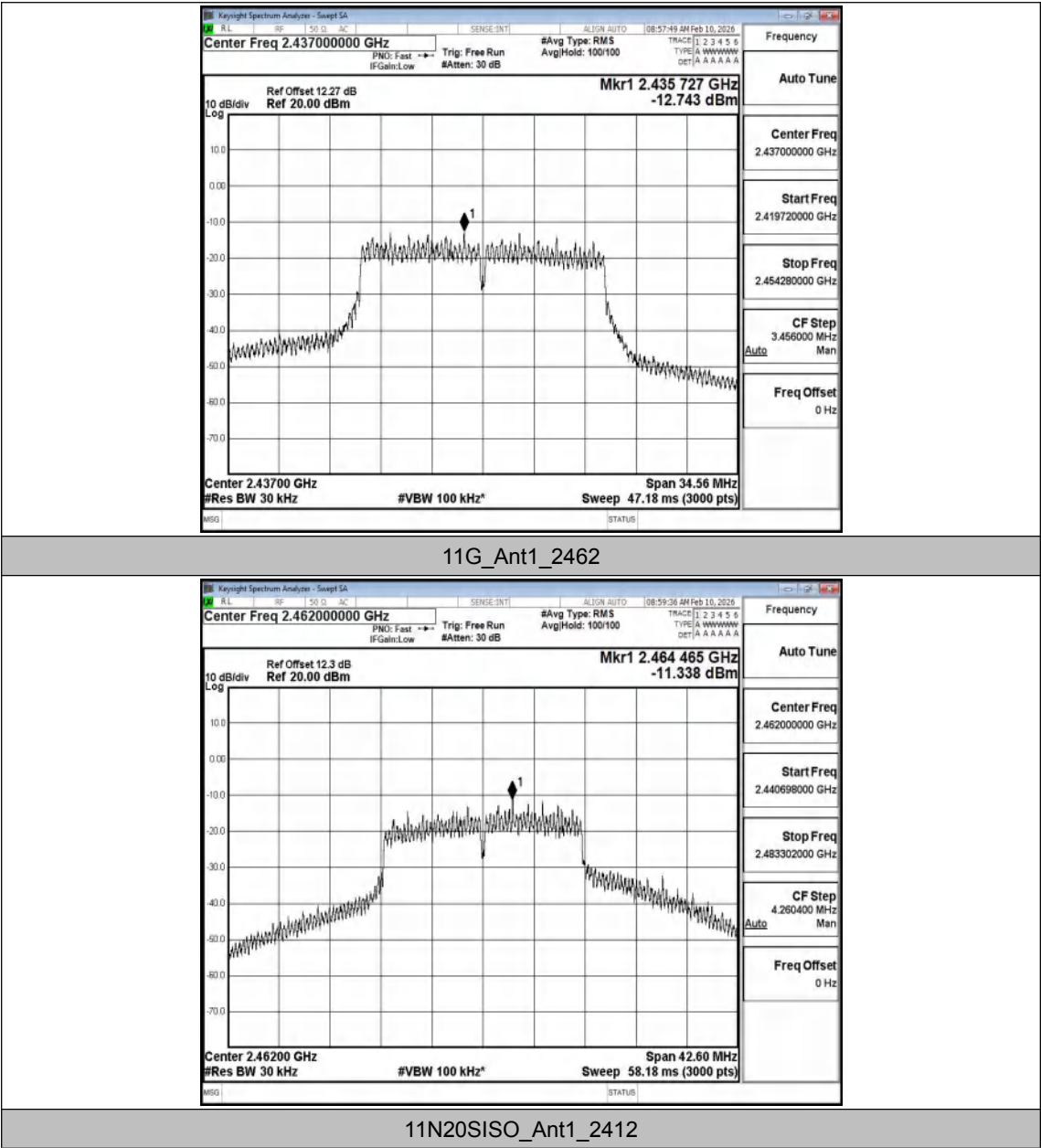
Test Result

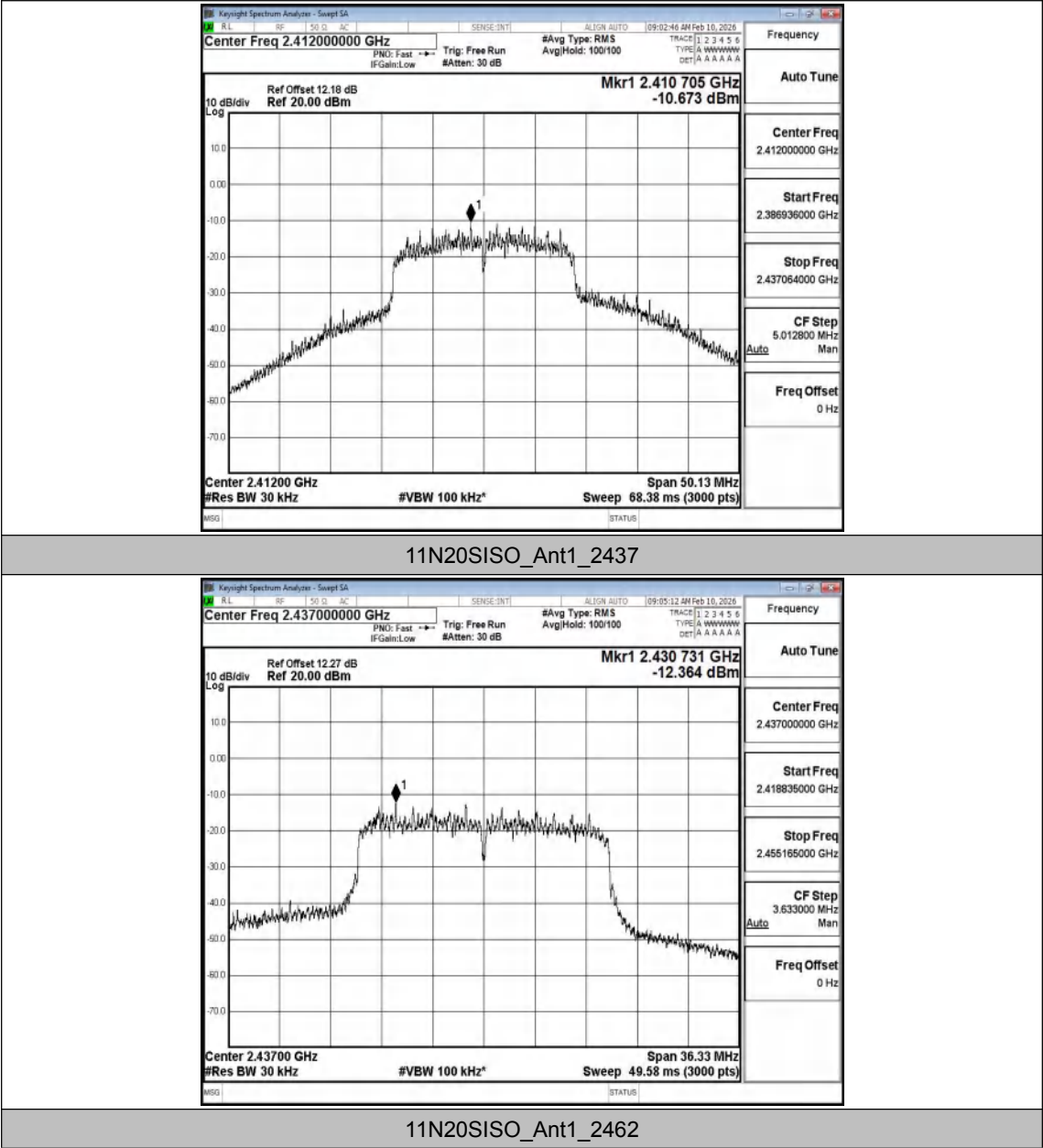
TestMode	Antenna	Frequency[MHz]	Measured PSD [dBm/30kHz]	DC Factor [dB]	Result[dBm/30kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-8.8	0.34	-8.46	≤8.00	PASS
		2437	-10.27	0.34	-9.93	≤8.00	PASS
		2462	-8.71	0.34	-8.37	≤8.00	PASS
11G	Ant1	2412	-10.11	1.76	-8.35	≤8.00	PASS
		2437	-12.74	1.76	-10.98	≤8.00	PASS
		2462	-11.34	2.14	-9.20	≤8.00	PASS
11N20SISO	Ant1	2412	-10.67	2.14	-8.53	≤8.00	PASS
		2437	-12.36	1.89	-10.47	≤8.00	PASS
		2462	-10.59	1.89	-8.70	≤8.00	PASS
11N40SISO	Ant1	2422	-12.32	2.43	-9.89	≤8.00	PASS
		2437	-13.77	2.43	-11.34	≤8.00	PASS
		2452	-14.58	2.69	-11.89	≤8.00	PASS

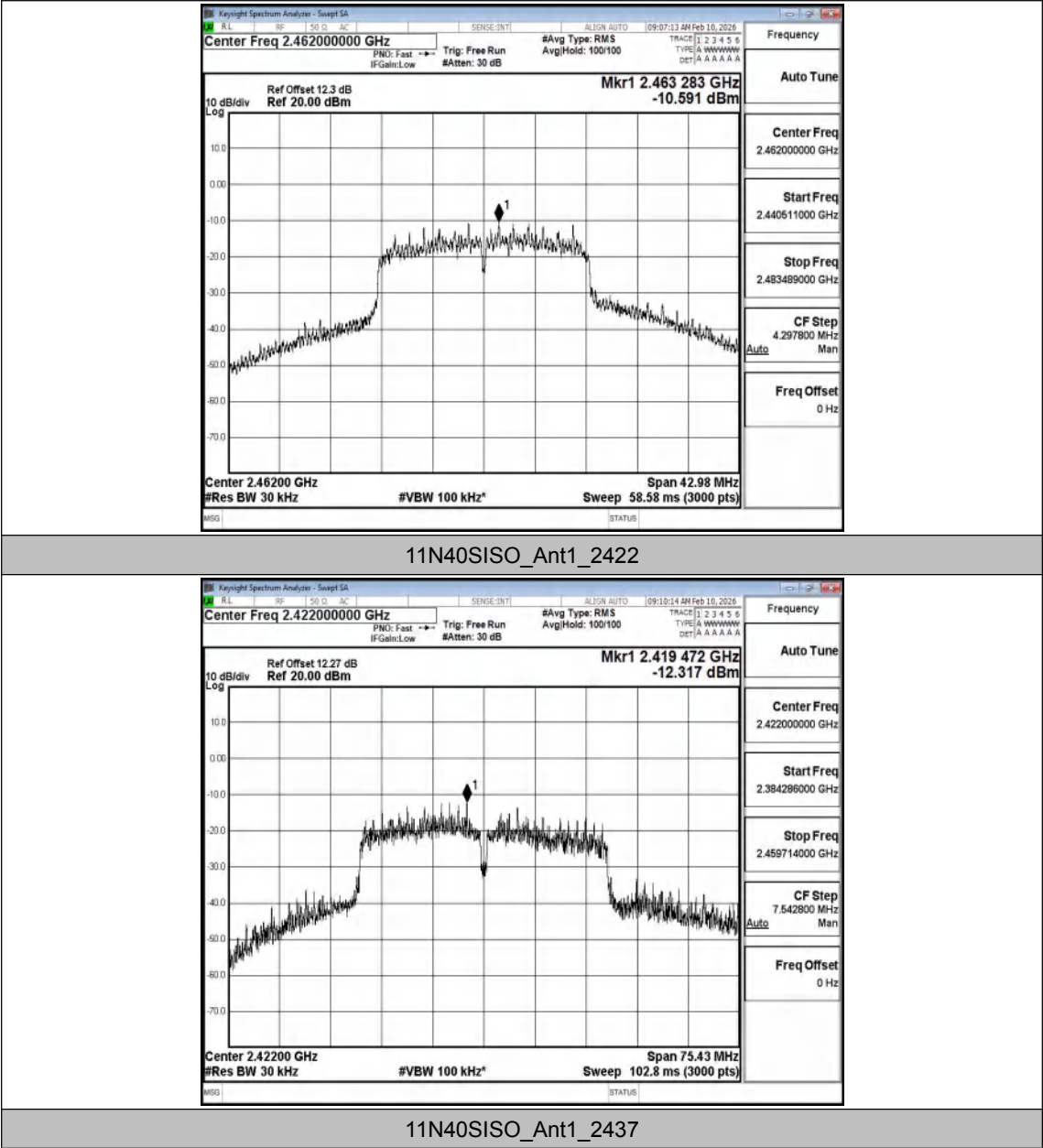
Test Graphs

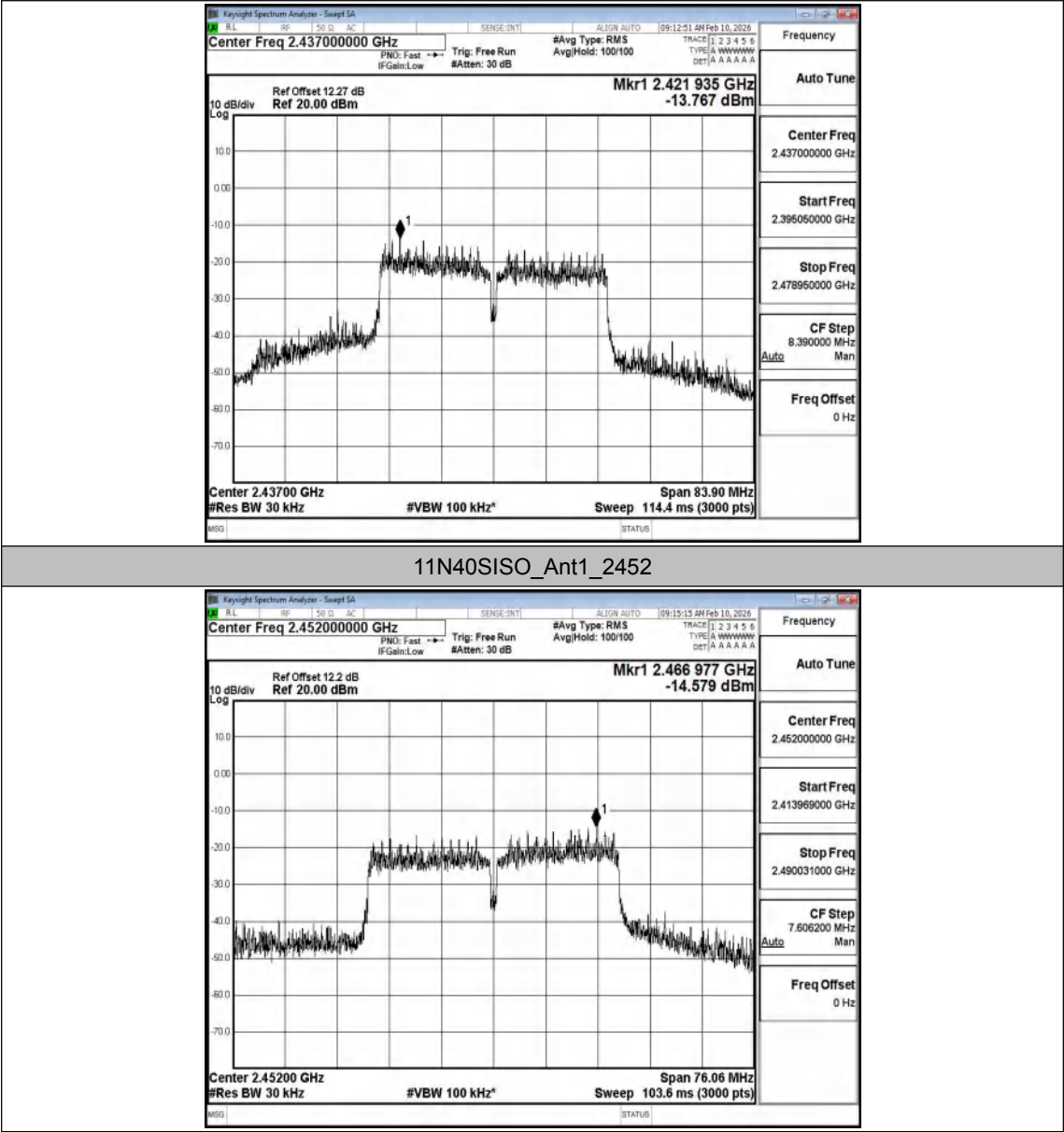










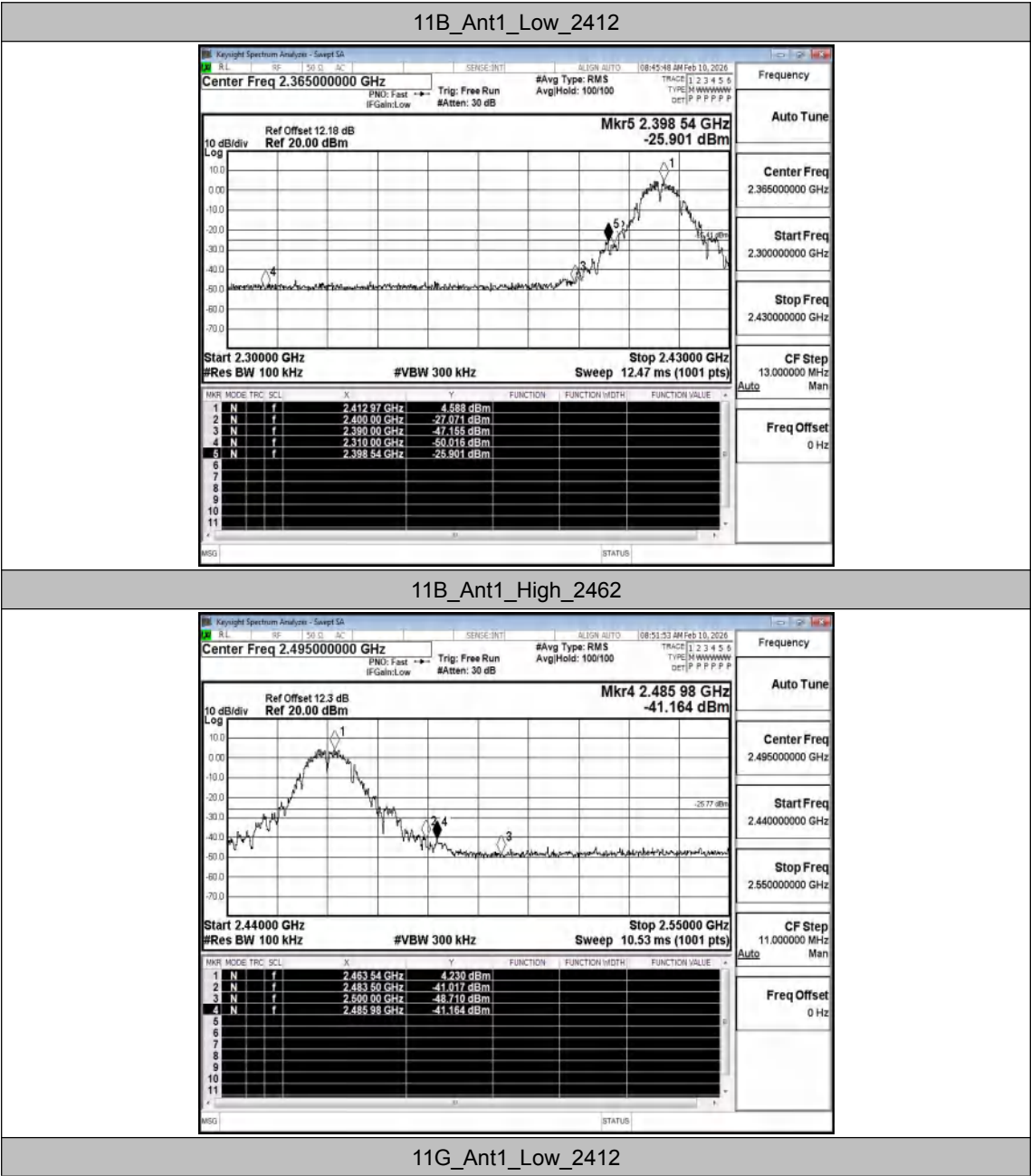


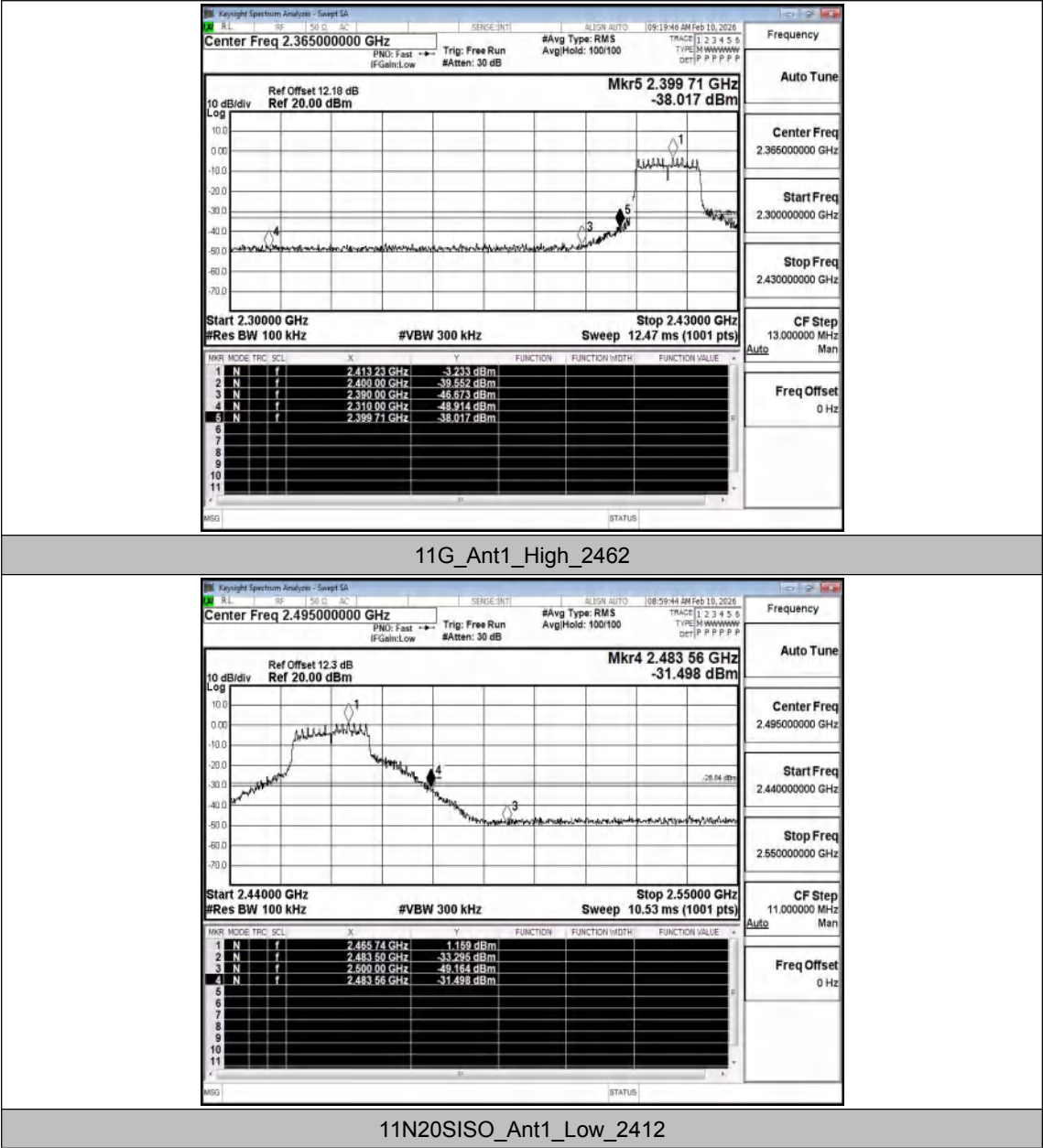
A.4 Band edge measurements

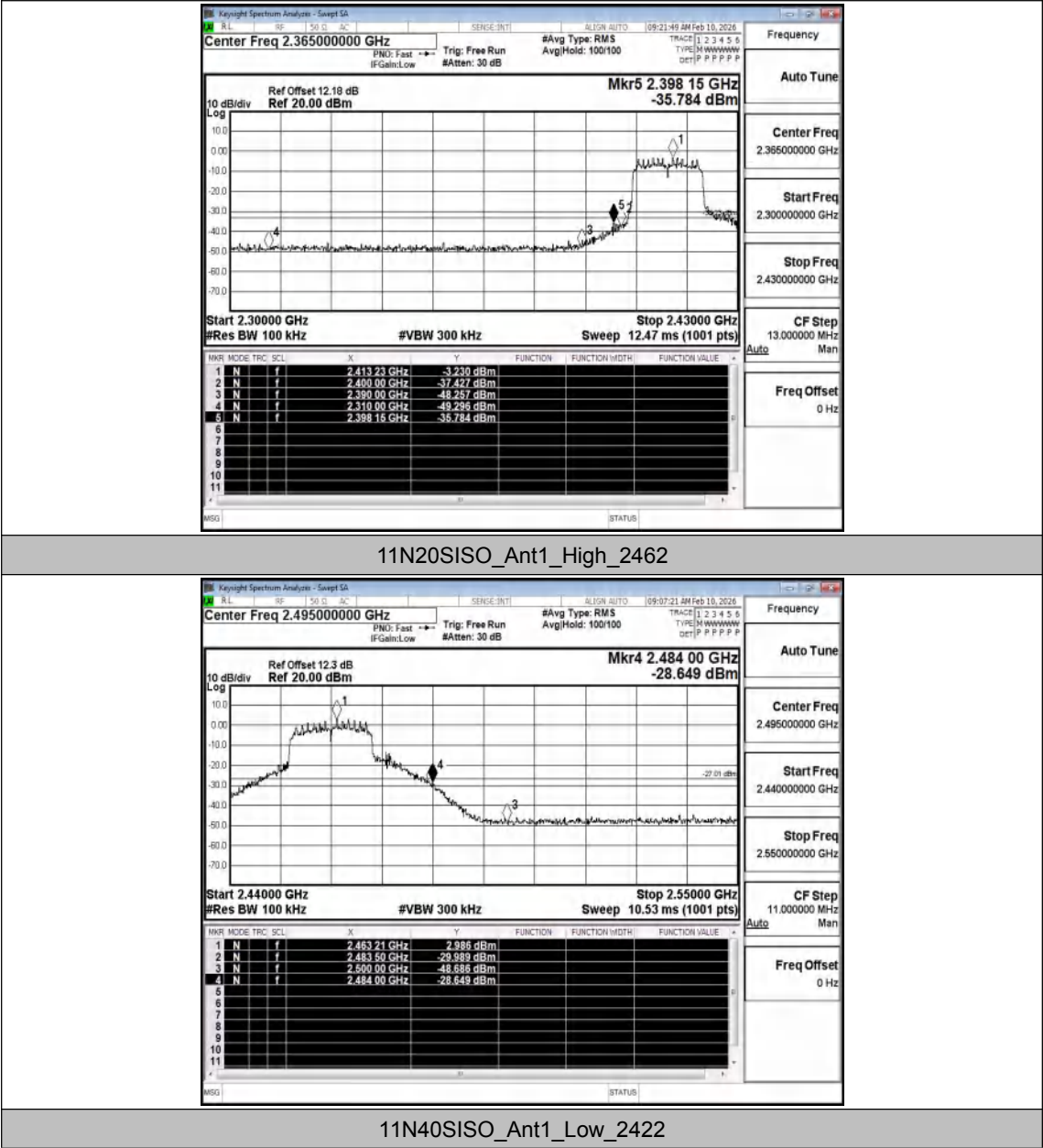
Test Result

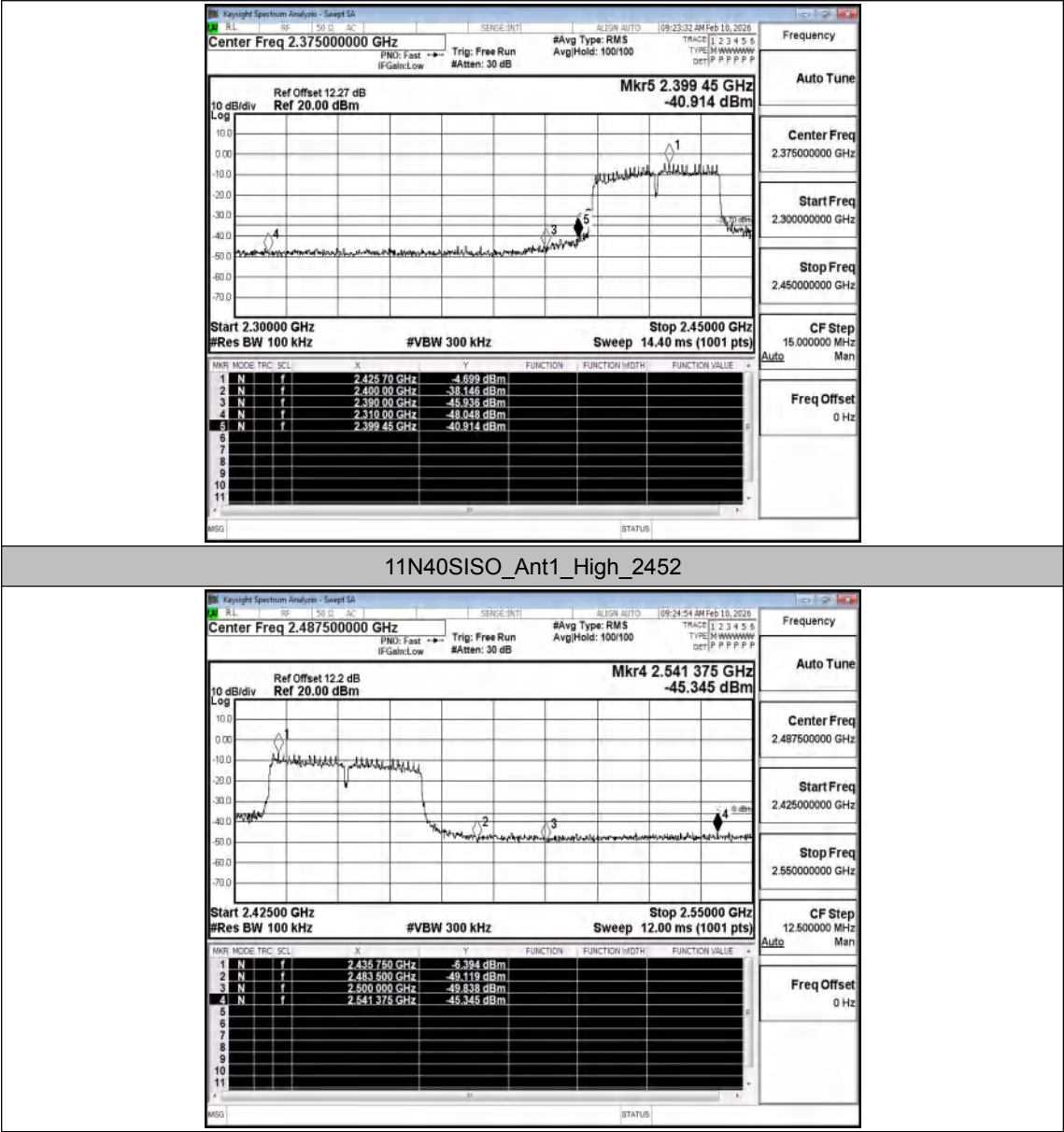
TestMode	Antenna	Channel Name	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	4.59	-25.9	≤-25.41	PASS
		High	2462	4.23	-41.16	≤-25.77	PASS
11G	Ant1	Low	2412	-3.23	-38.02	≤-33.23	PASS
		High	2462	1.16	-31.5	≤-28.84	PASS
11N20SISO	Ant1	Low	2412	-3.23	-35.78	≤-33.23	PASS
		High	2462	2.99	-28.65	≤-27.01	PASS
11N40SISO	Ant1	Low	2422	-4.70	-40.91	≤-34.7	PASS
		High	2452	-6.39	-45.35	≤-36.39	PASS

Test Graphs









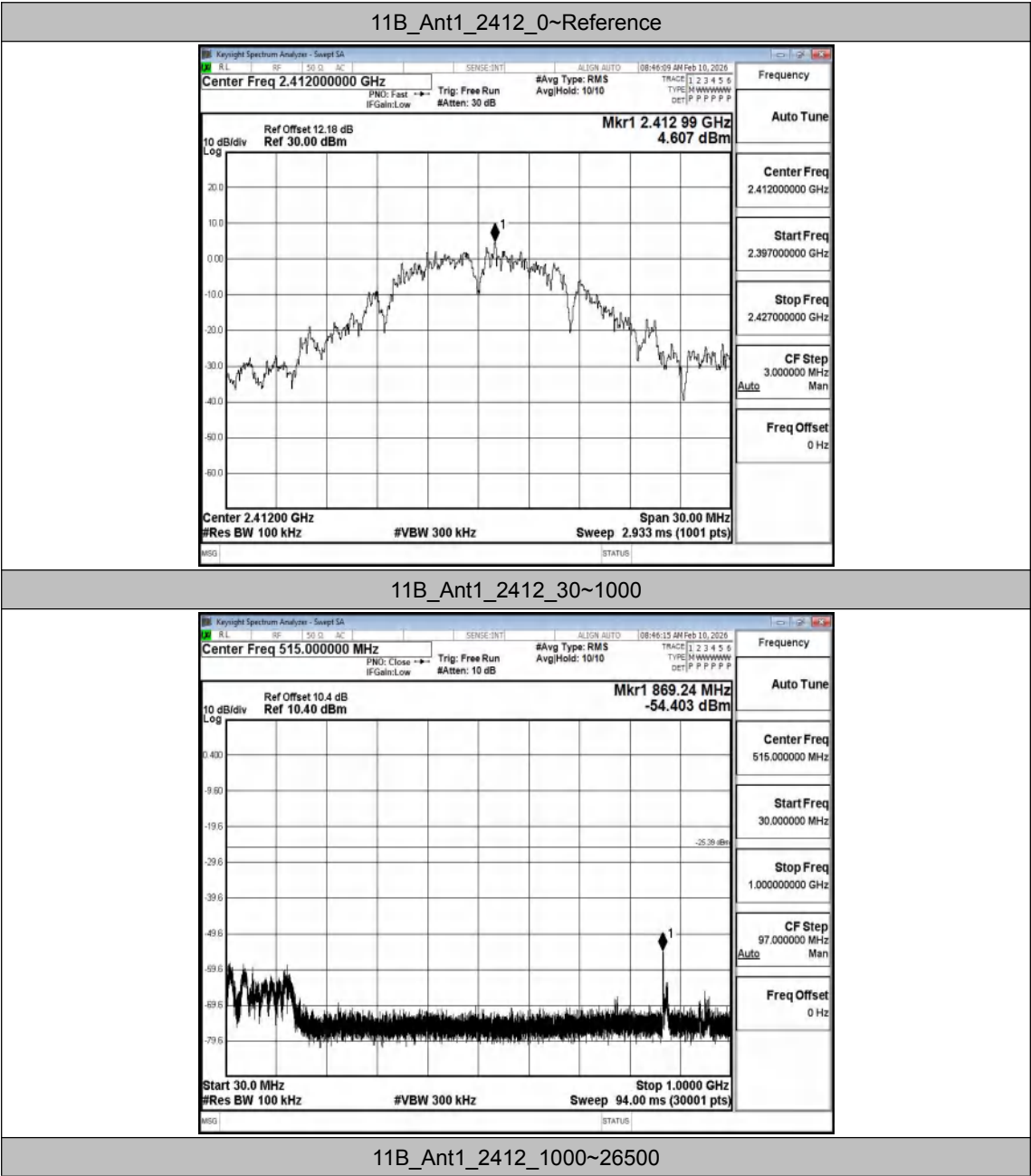
A.5 Conducted Spurious Emission

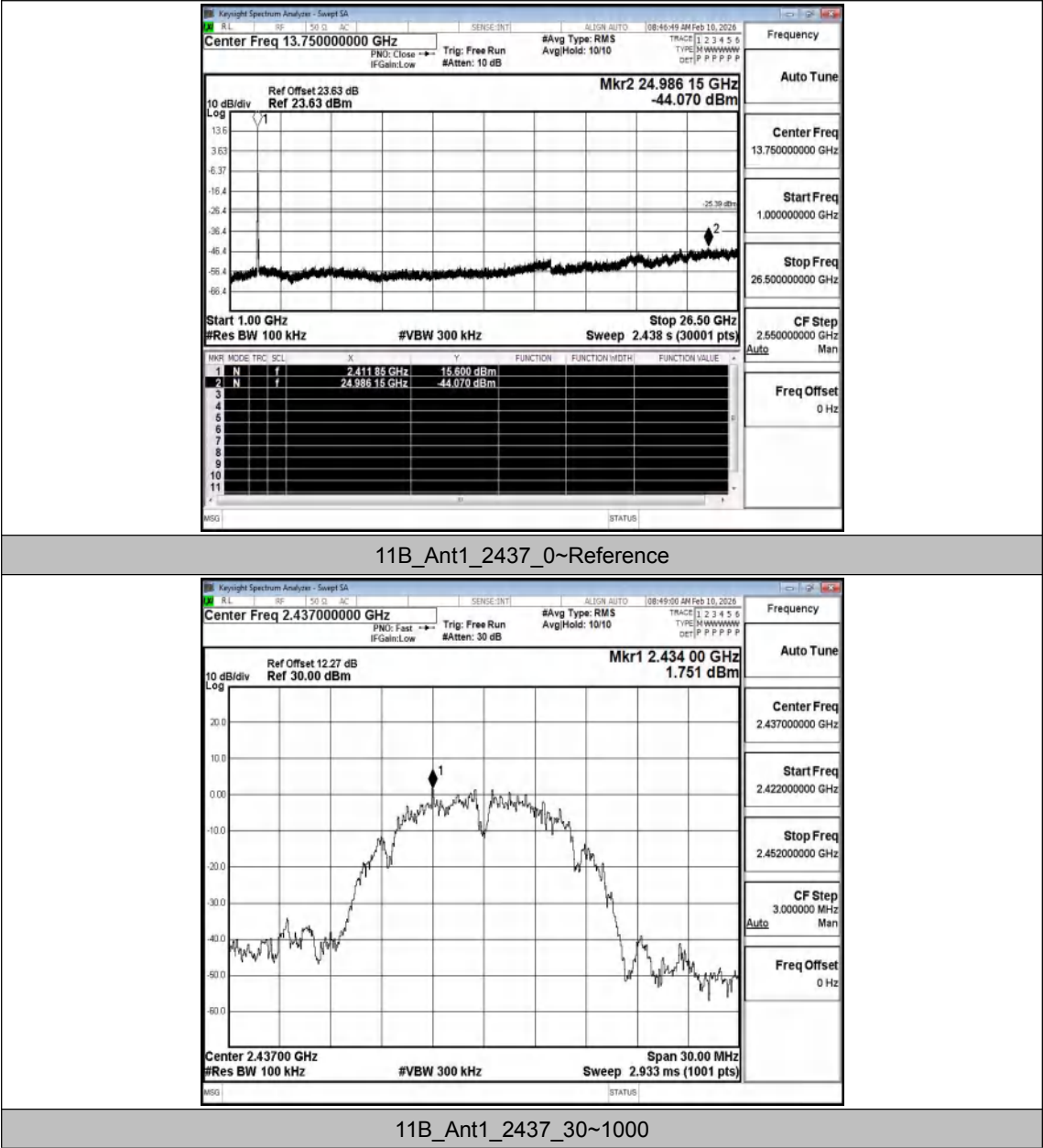
Test Result

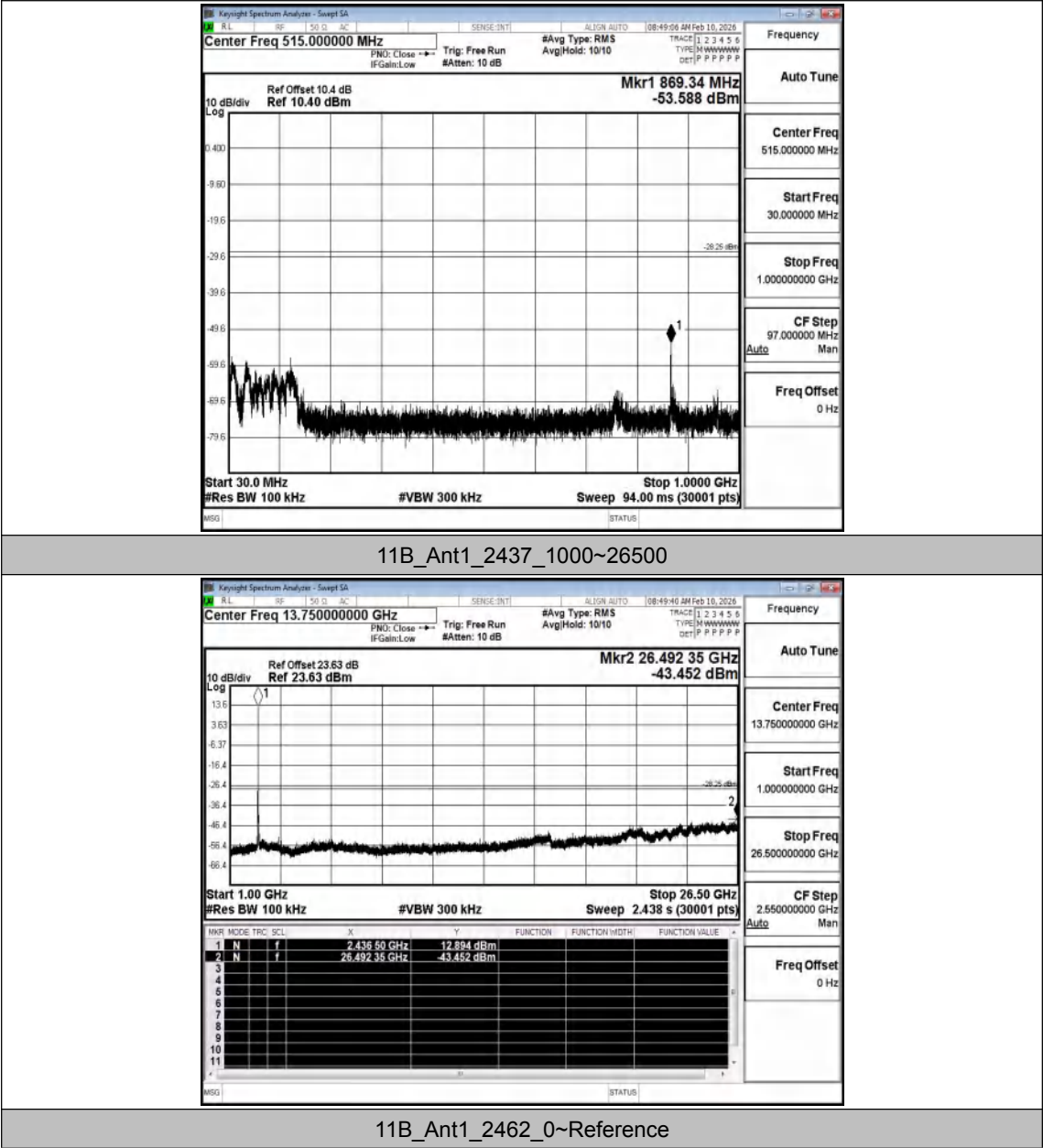
TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	4.61	4.61	---	PASS
			30~1000	4.61	-54.4	≤-25.39	PASS
			1000~26500	4.61	-44.07	≤-25.39	PASS
		2437	Reference	1.75	1.75	---	PASS
			30~1000	1.75	-53.59	≤-28.25	PASS
			1000~26500	1.75	-43.45	≤-28.25	PASS
		2462	Reference	4.36	4.36	---	PASS
			30~1000	4.36	-57.83	≤-25.64	PASS
			1000~26500	4.36	-43.83	≤-25.64	PASS
11G	Ant1	2412	Reference	1.18	1.18	---	PASS
			30~1000	1.18	-55.85	≤-28.82	PASS
			1000~26500	1.18	-43.49	≤-28.82	PASS
		2437	Reference	0.18	0.18	---	PASS
			30~1000	0.18	-55.88	≤-29.82	PASS
			1000~26500	0.18	-43.95	≤-29.82	PASS
		2462	Reference	0.35	0.35	---	PASS
			30~1000	0.35	-55.87	≤-29.65	PASS
			1000~26500	0.35	-43.82	≤-29.65	PASS
11N20SISO	Ant1	2412	Reference	2.46	2.46	---	PASS
			30~1000	2.46	-55.24	≤-27.54	PASS
			1000~26500	2.46	-43.02	≤-27.54	PASS
		2437	Reference	0.28	0.28	---	PASS
			30~1000	0.28	-54.36	≤-29.72	PASS
			1000~26500	0.28	-43.48	≤-29.72	PASS
		2462	Reference	1.94	1.94	---	PASS
			30~1000	1.94	-54.84	≤-28.06	PASS
			1000~26500	1.94	-43.19	≤-28.06	PASS
11N40SISO	Ant1	2422	Reference	0.55	0.55	---	PASS
			30~1000	0.55	-53.7	≤-29.45	PASS
			1000~26500	0.55	-43.38	≤-29.45	PASS
		2437	Reference	-6.07	-6.07	---	PASS
			30~1000	-6.07	-51.12	≤-36.07	PASS
			1000~26500	-6.07	-43.76	≤-36.07	PASS
		2452	Reference	-1.95	-1.95	---	PASS
			30~1000	-1.95	-53.55	≤-31.95	PASS

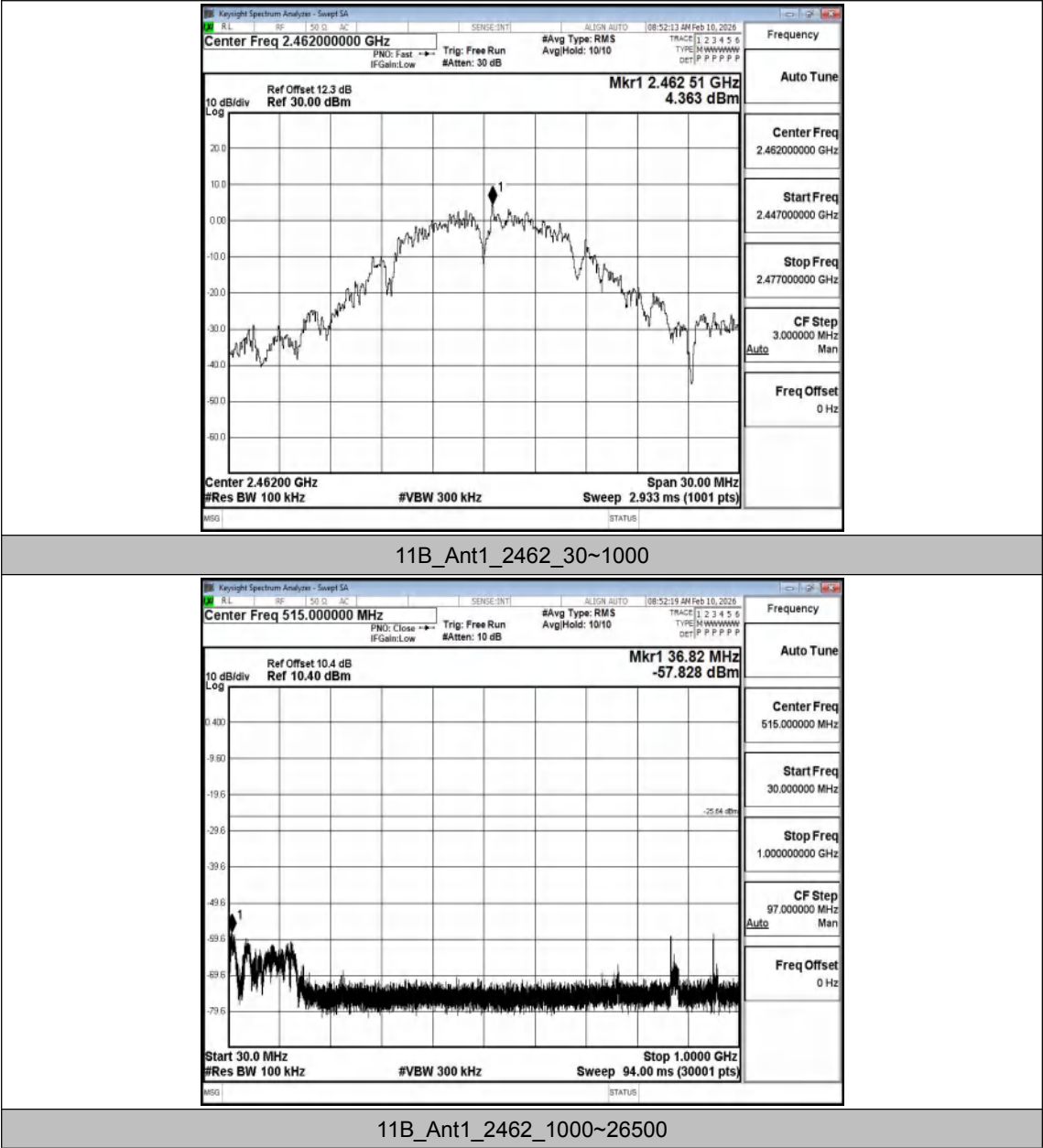
			1000~26500	-1.95	-43.16	≤-31.95	PASS
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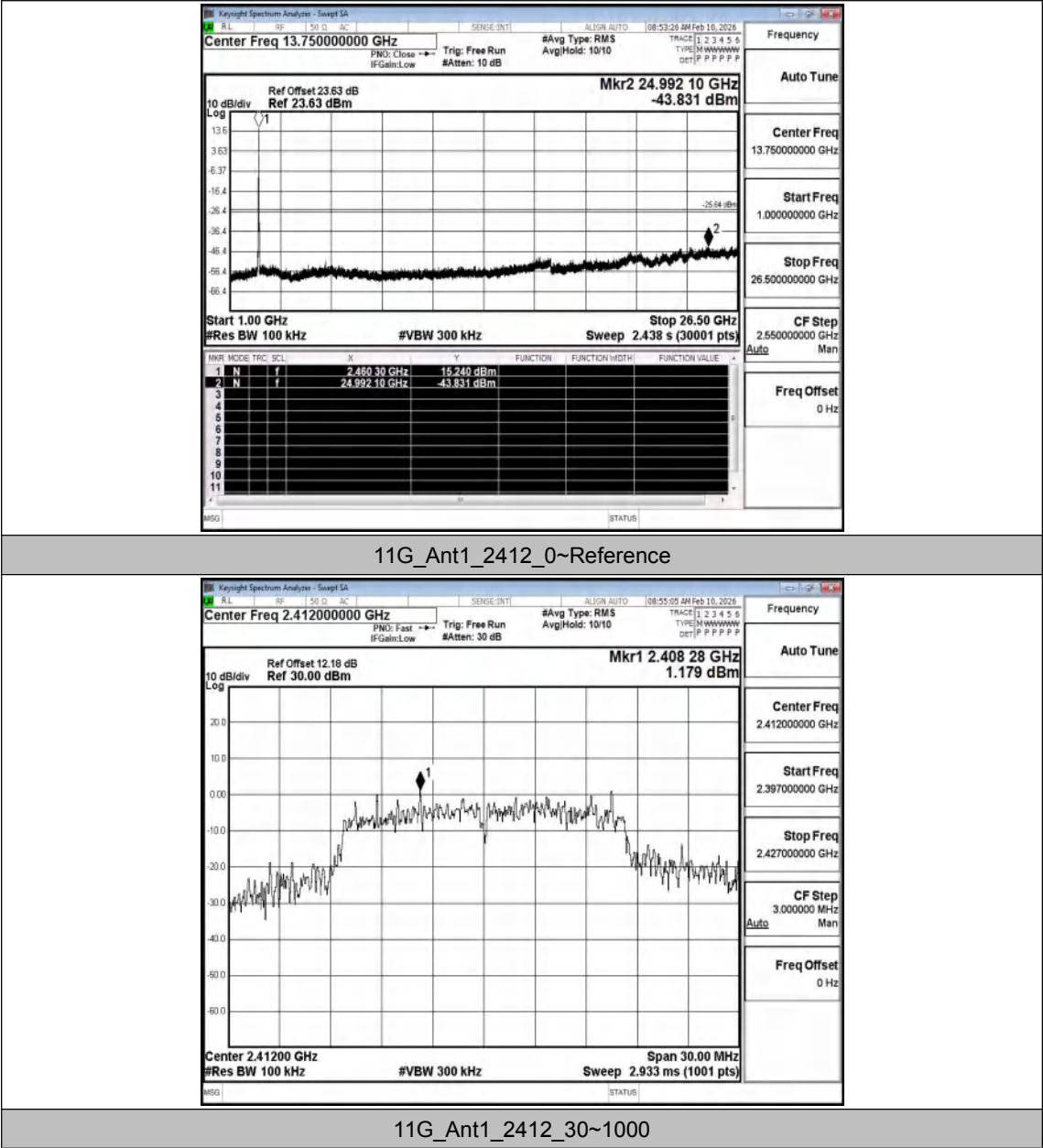
Test Graphs

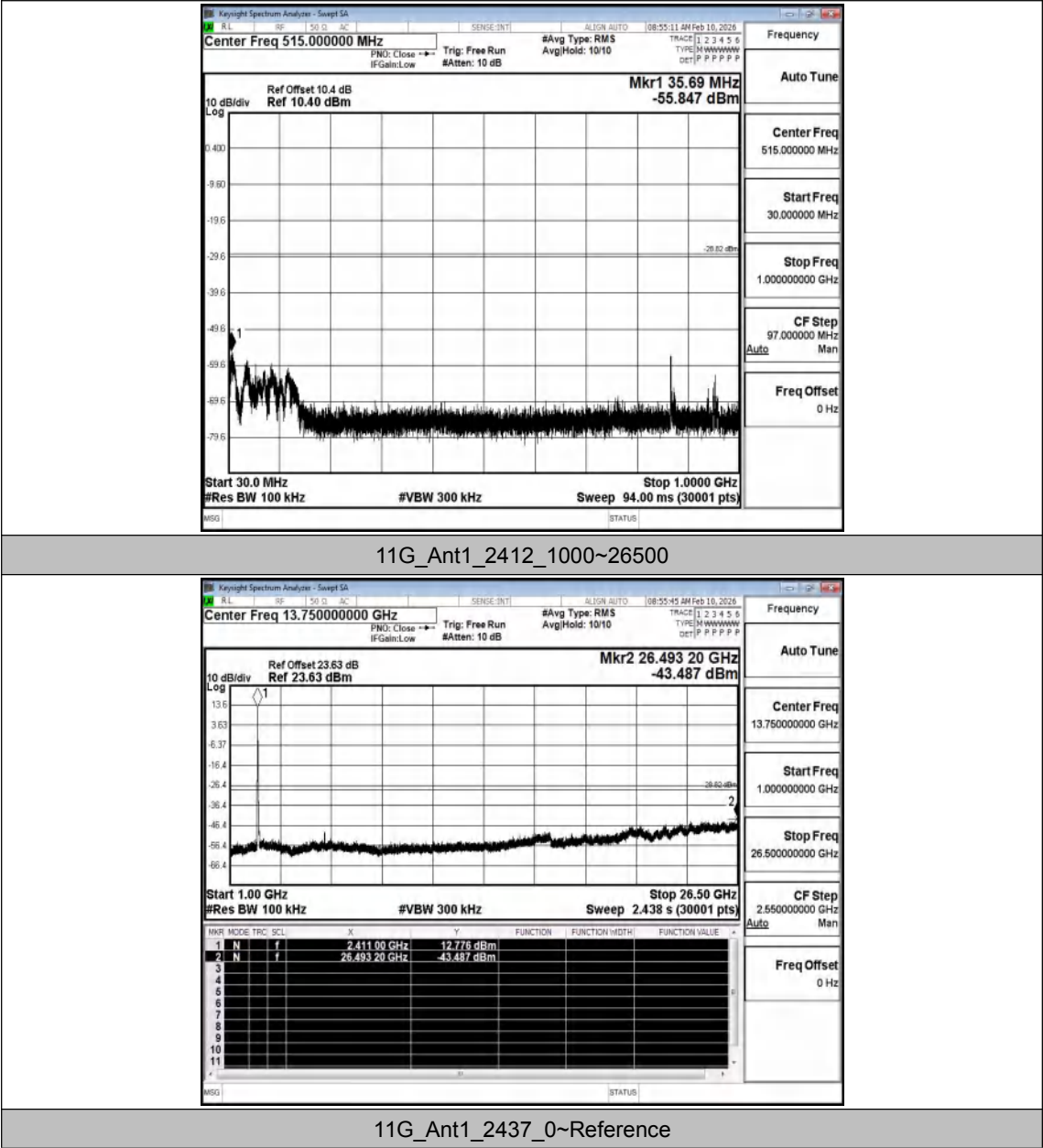


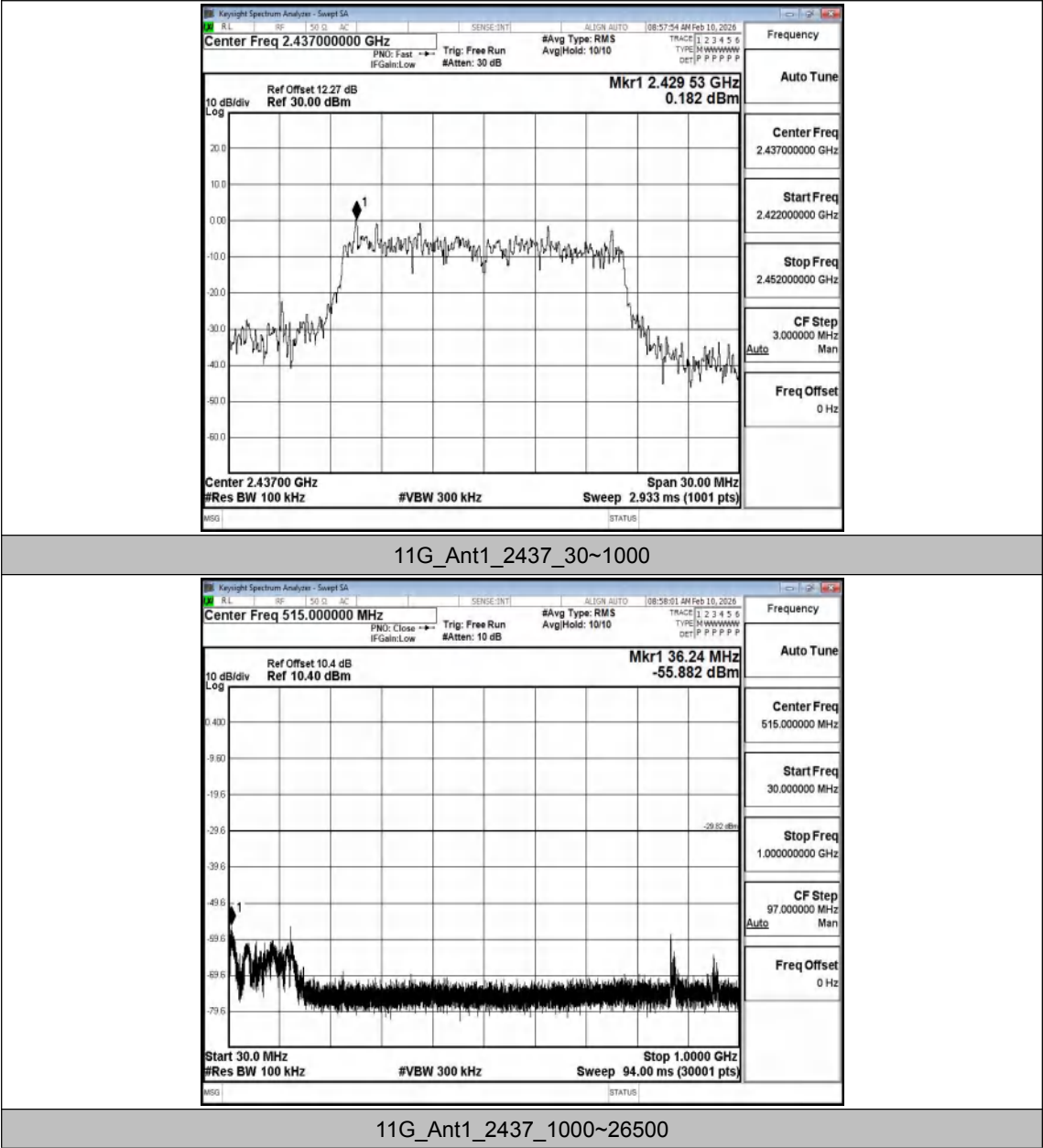


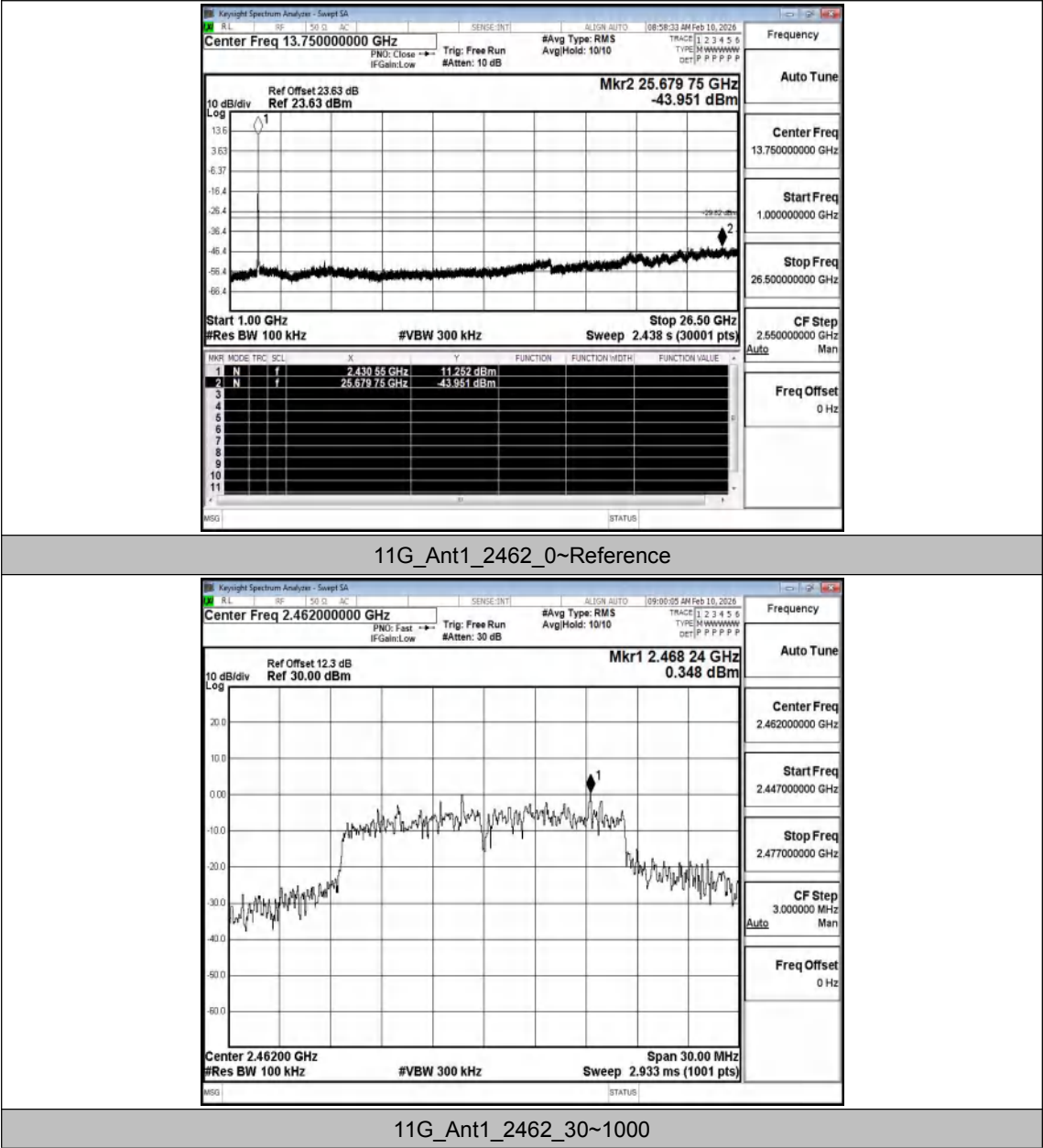


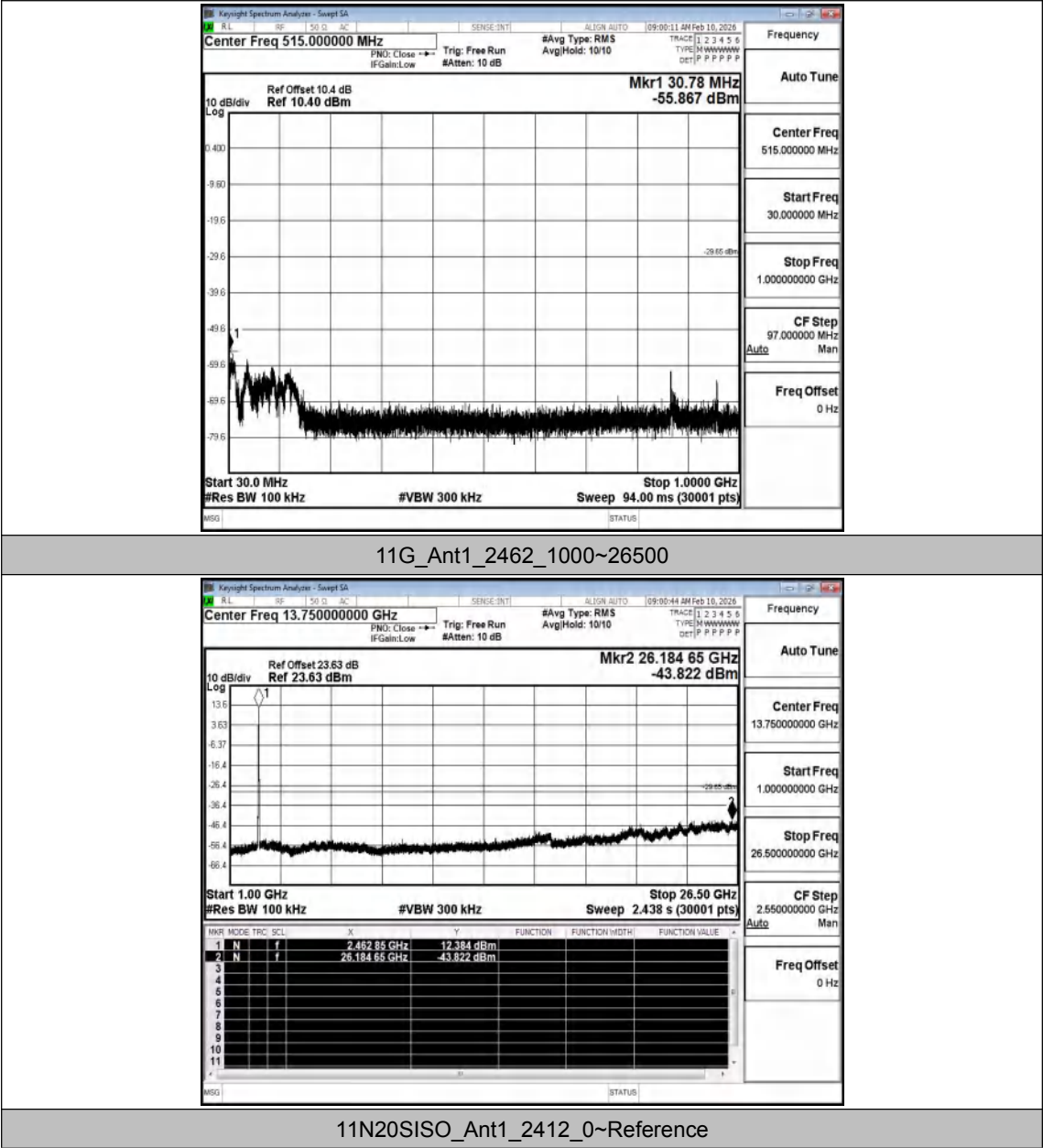


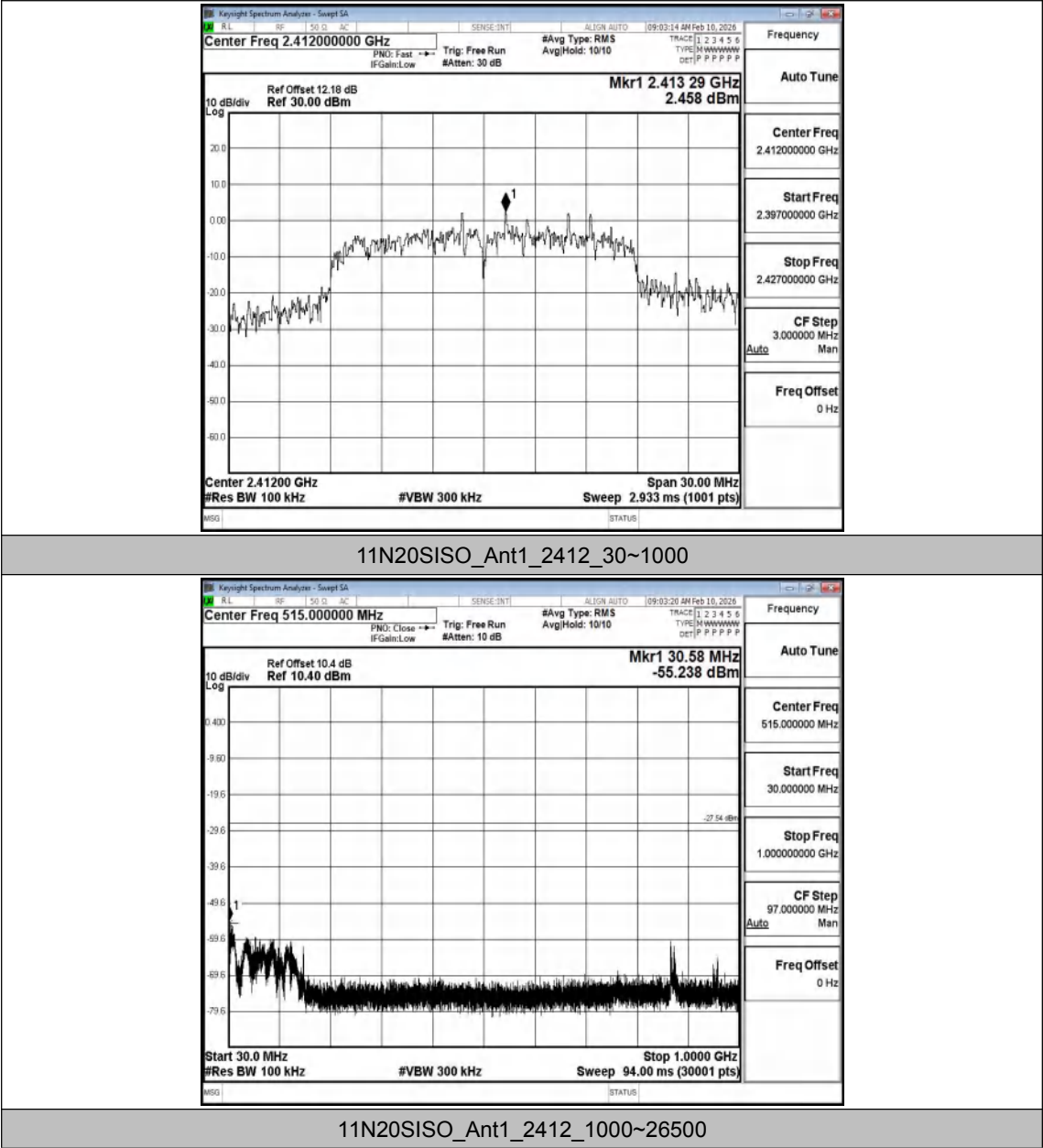


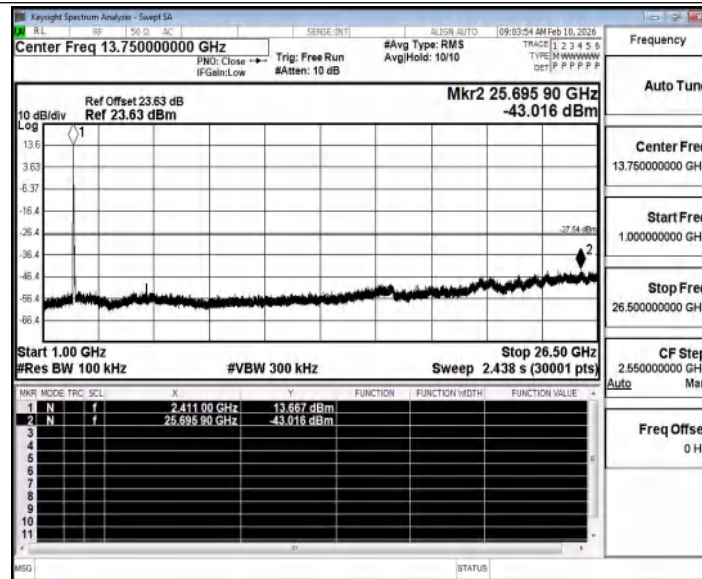




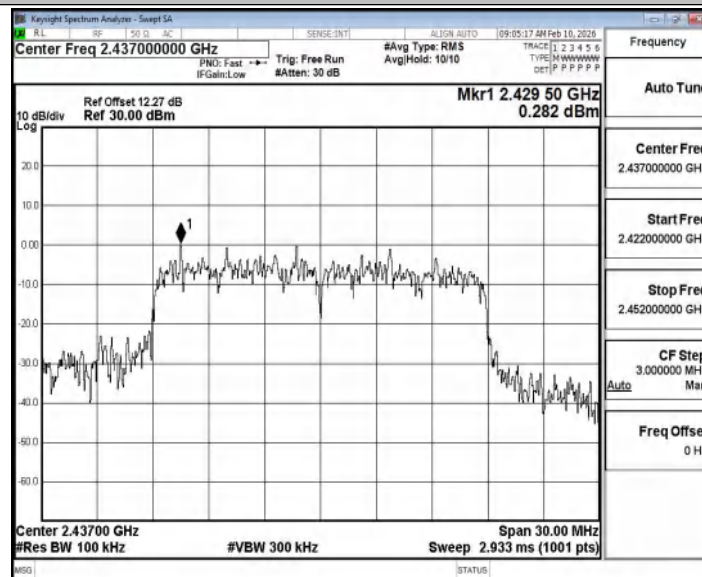




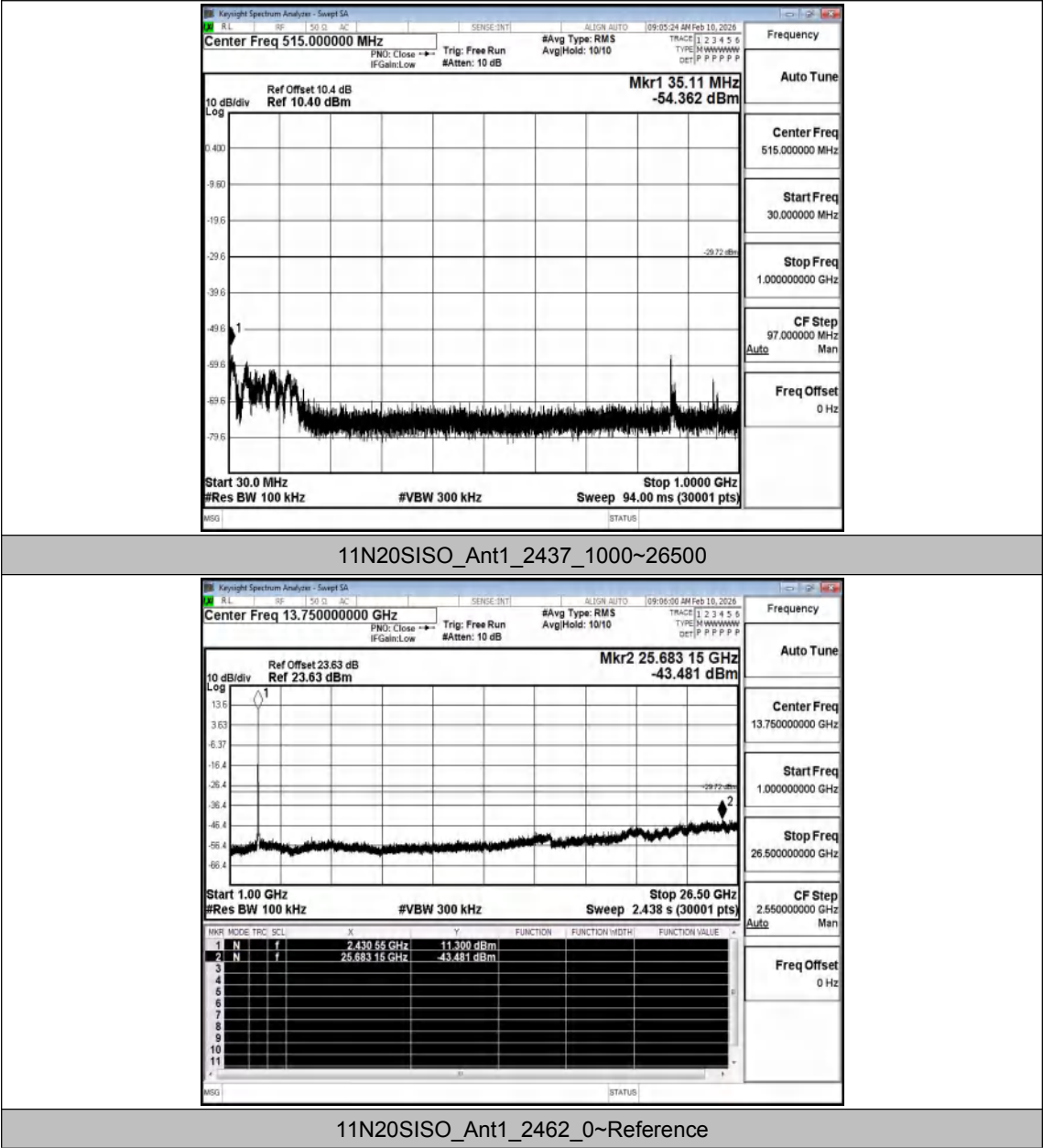


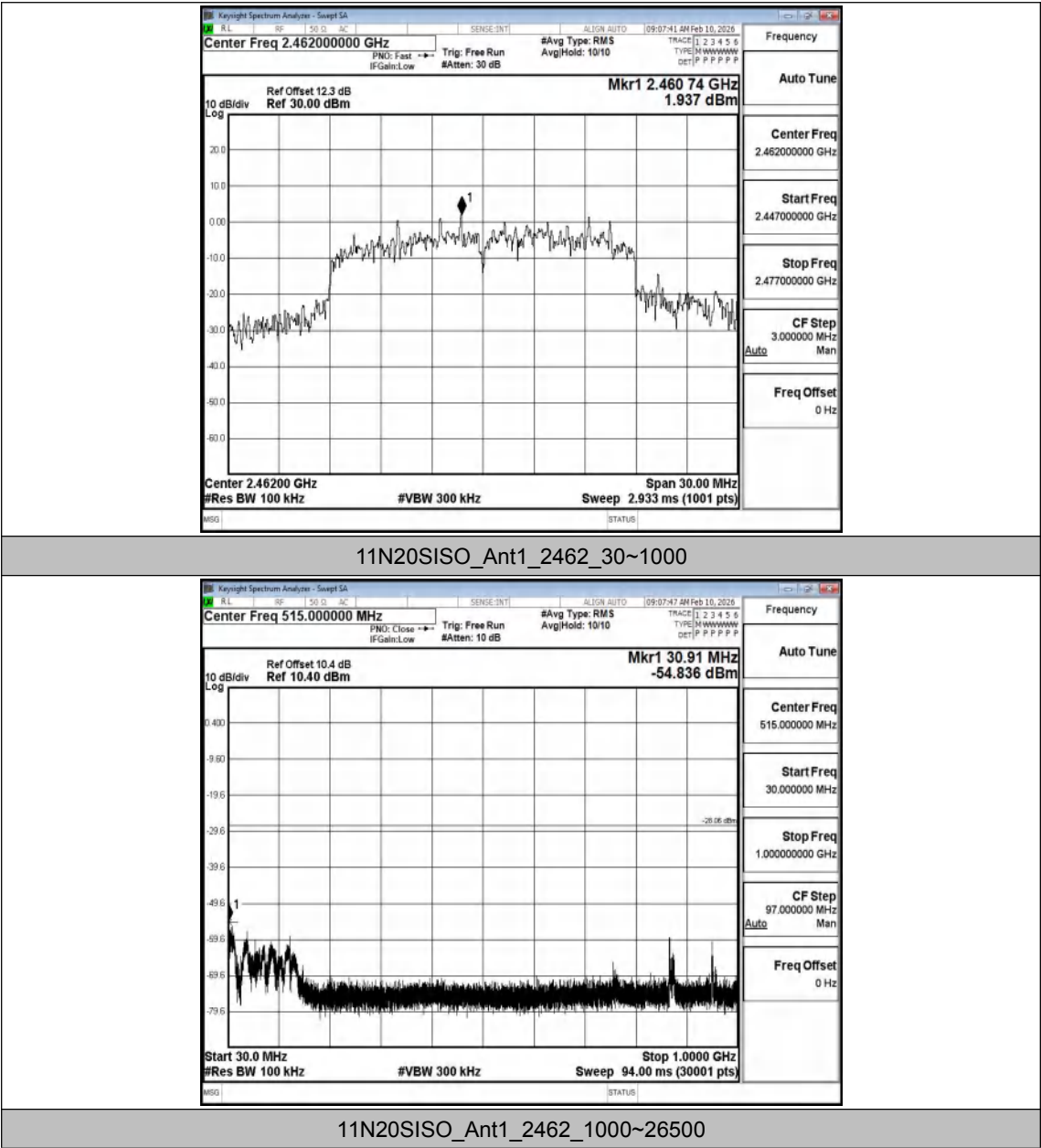


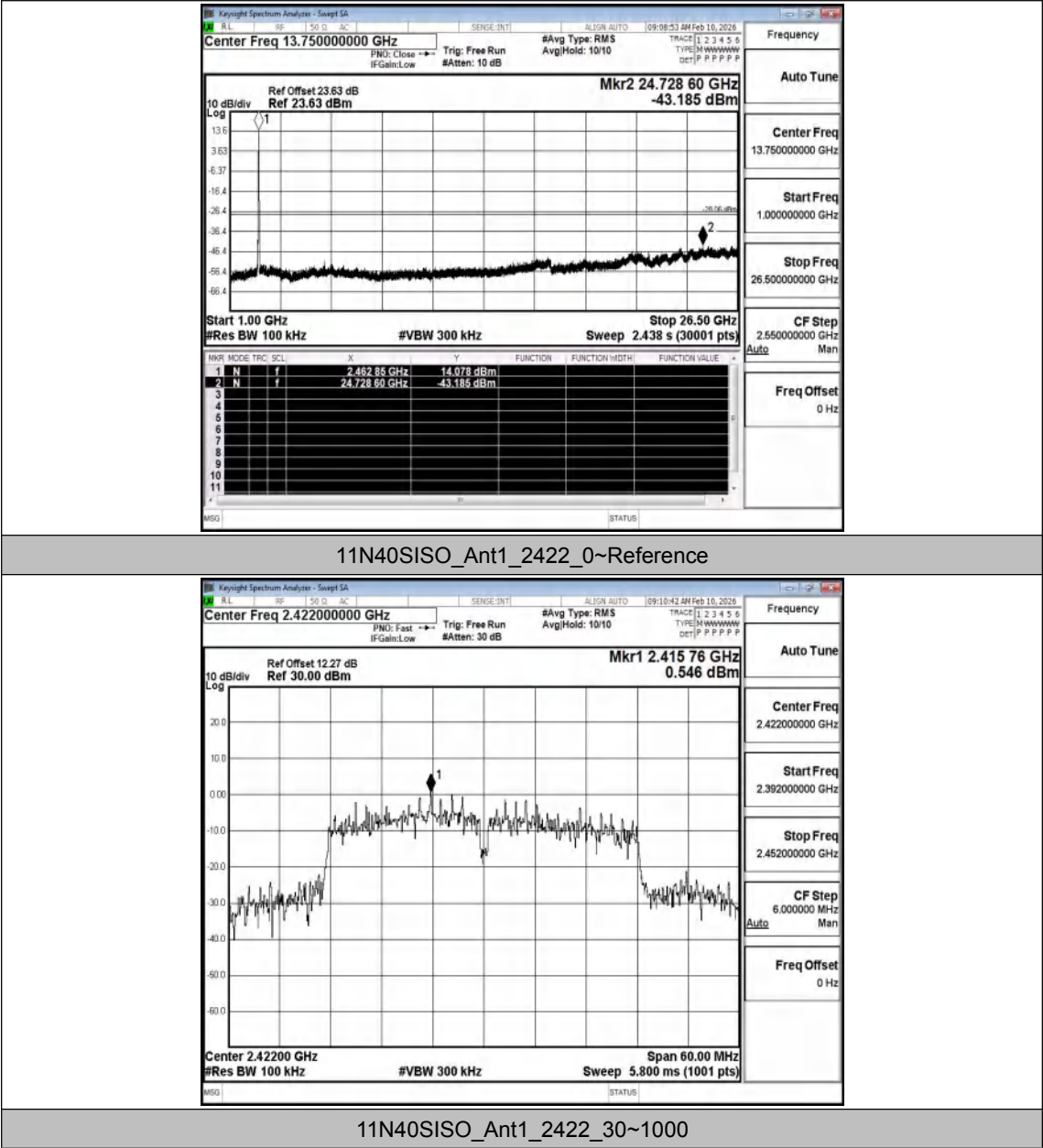
11N20SISO_Ant1_2437_0~Reference

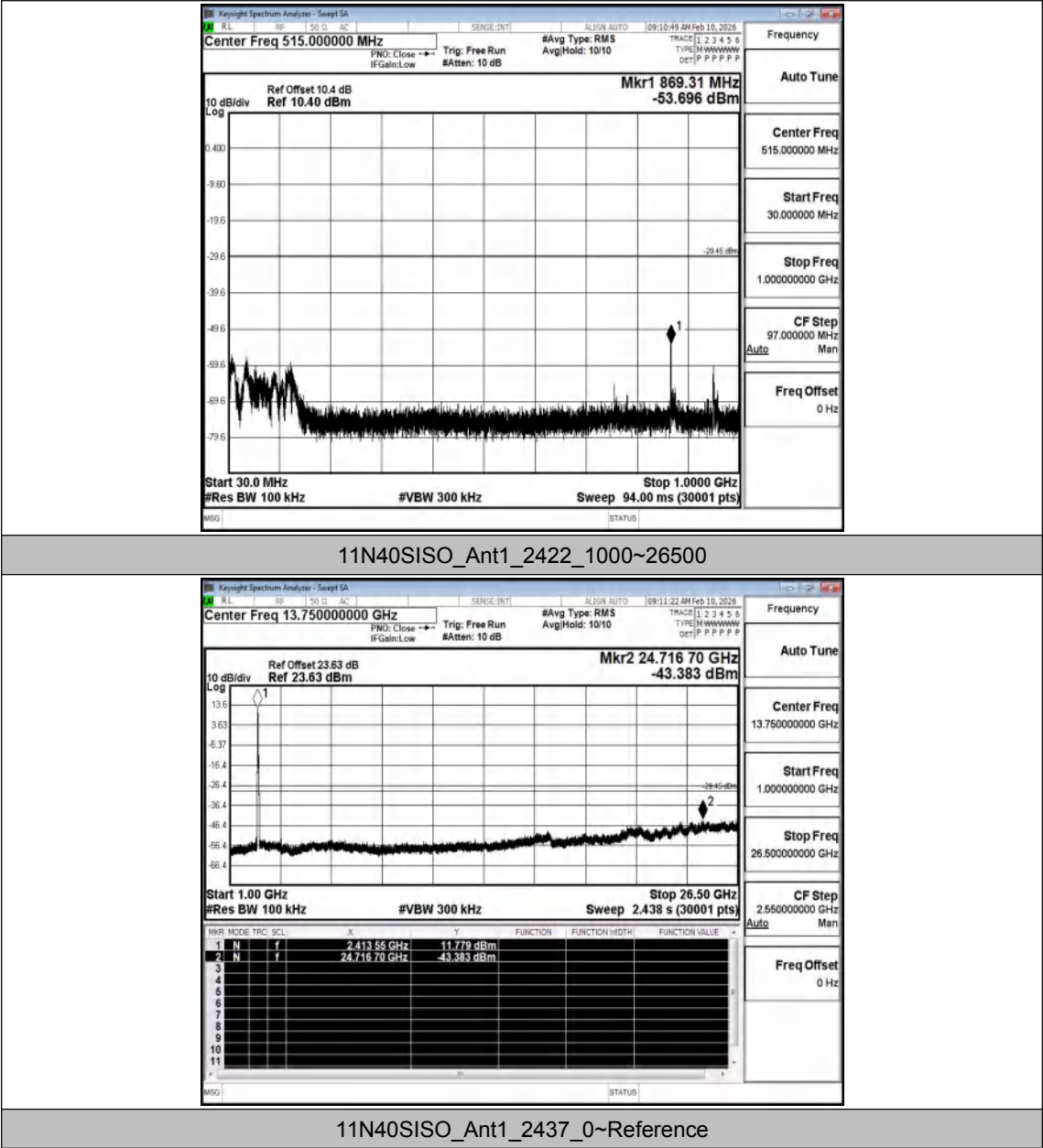


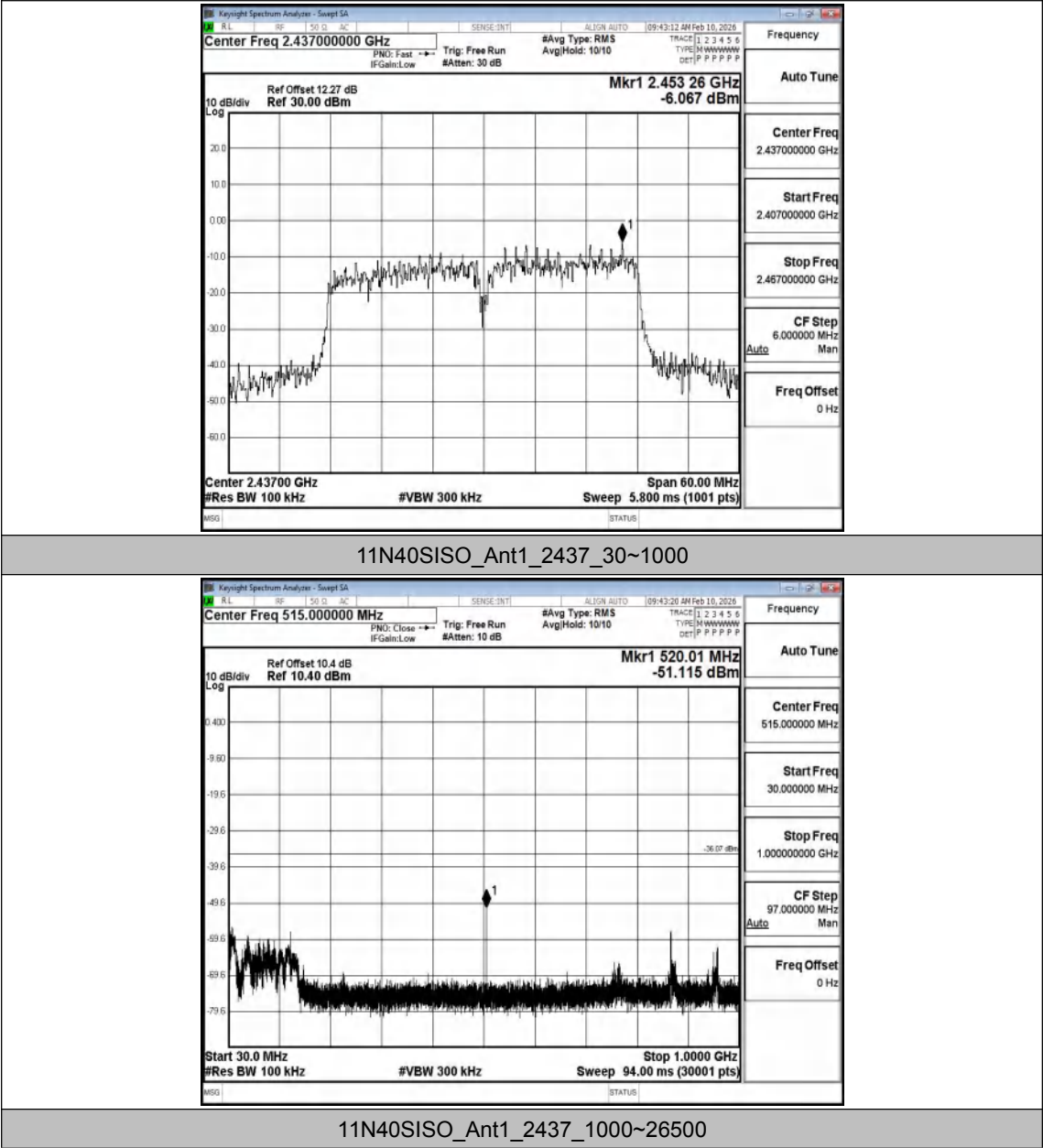
11N20SISO_Ant1_2437_30~1000

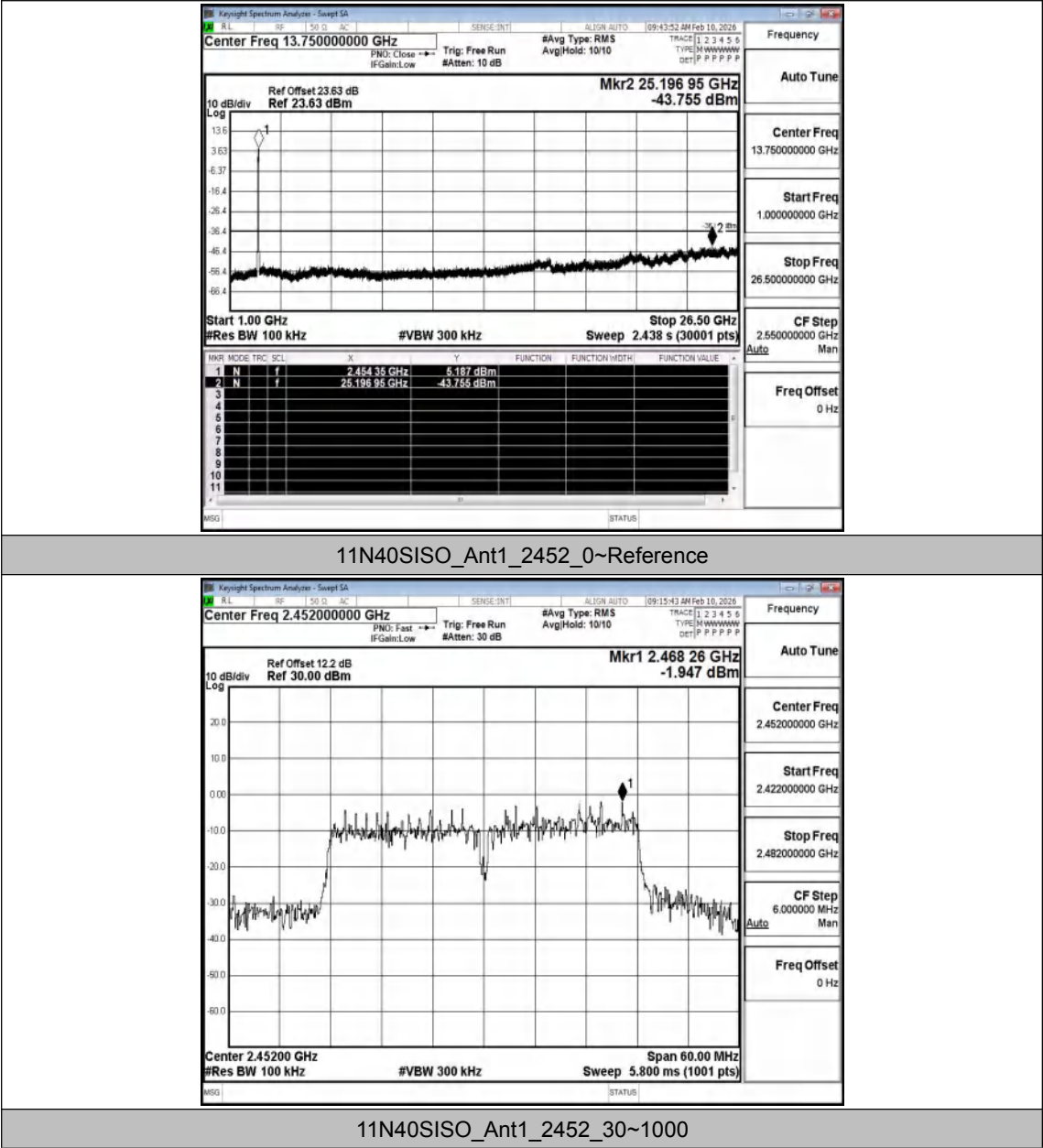


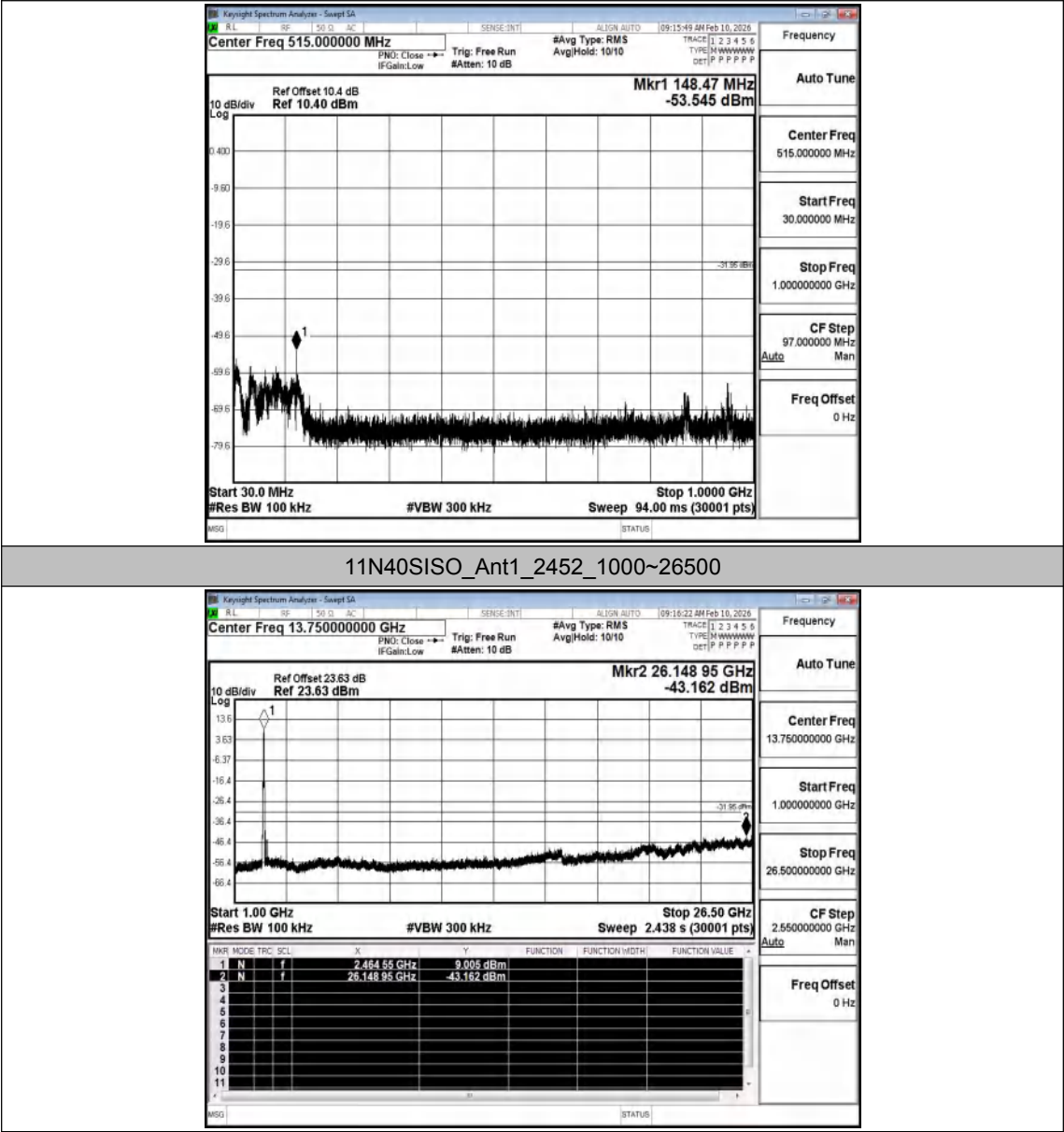










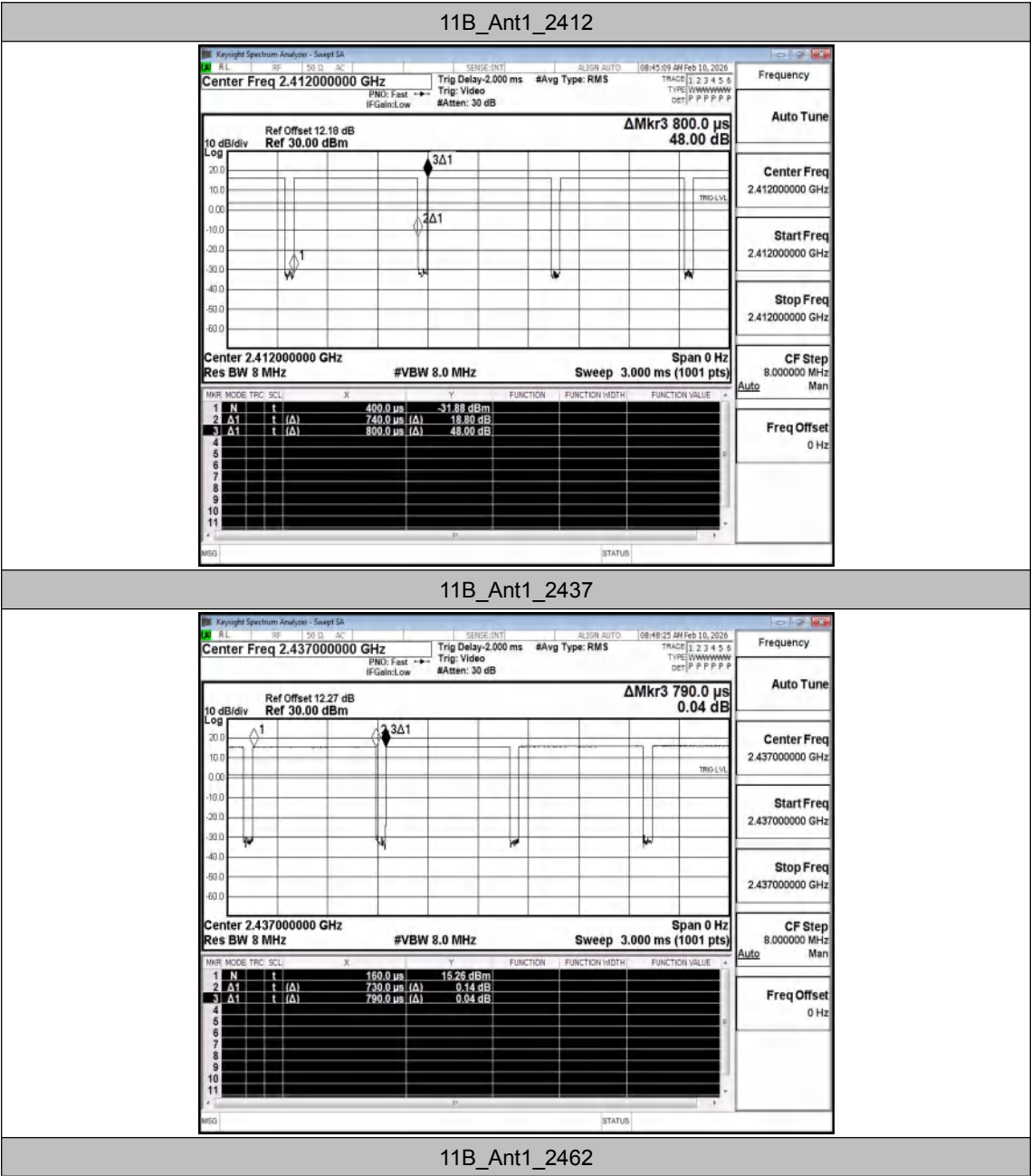


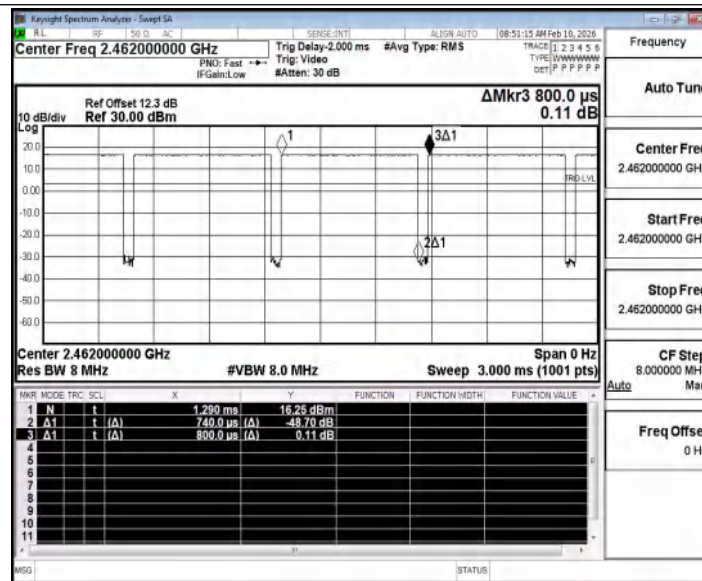
A.6 Duty Cycle

Test Result

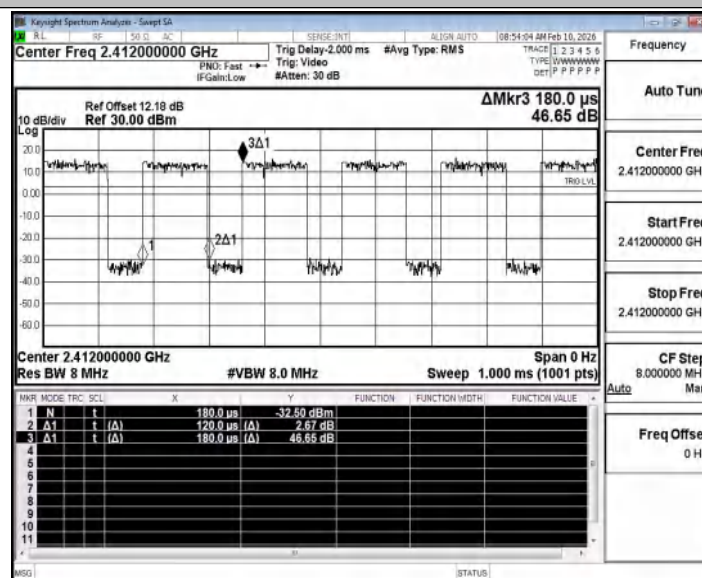
TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	xFactor
11B	Ant1	2412	0.74	0.80	92.50	0.34
		2437	0.73	0.79	92.41	0.34
		2462	0.74	0.80	92.50	0.34
11G	Ant1	2412	0.12	0.18	66.67	1.76
		2437	0.12	0.18	66.67	1.76
		2462	0.11	0.18	61.11	2.14
11N20SISO	Ant1	2412	0.11	0.18	61.11	2.14
		2437	0.11	0.17	64.71	1.89
		2462	0.11	0.17	64.71	1.89
11N40SISO	Ant1	2422	0.08	0.14	57.14	2.43
		2437	0.07	0.14	50.00	3.01
		2452	0.07	0.13	53.85	2.69

Test Graphs

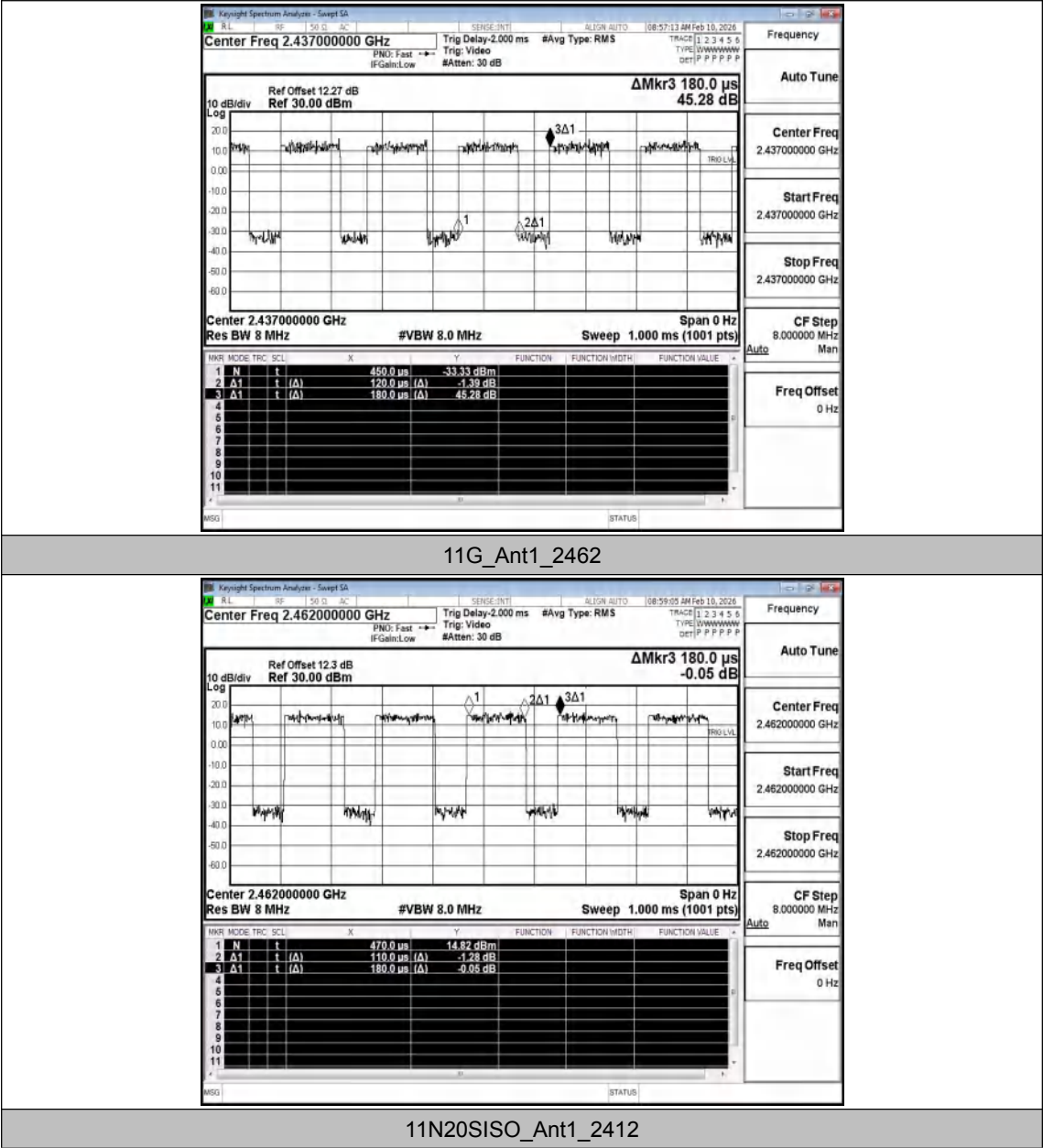


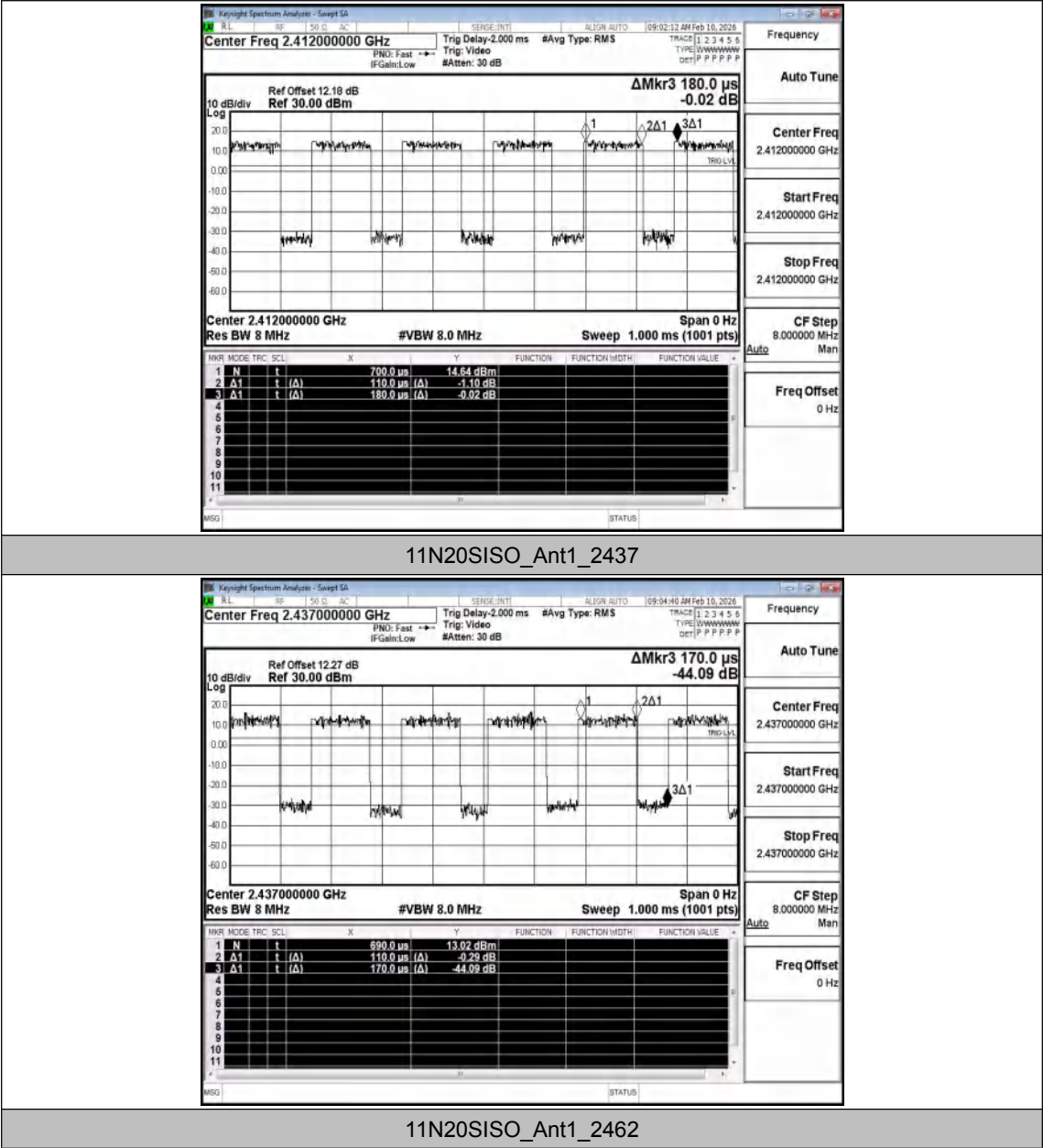


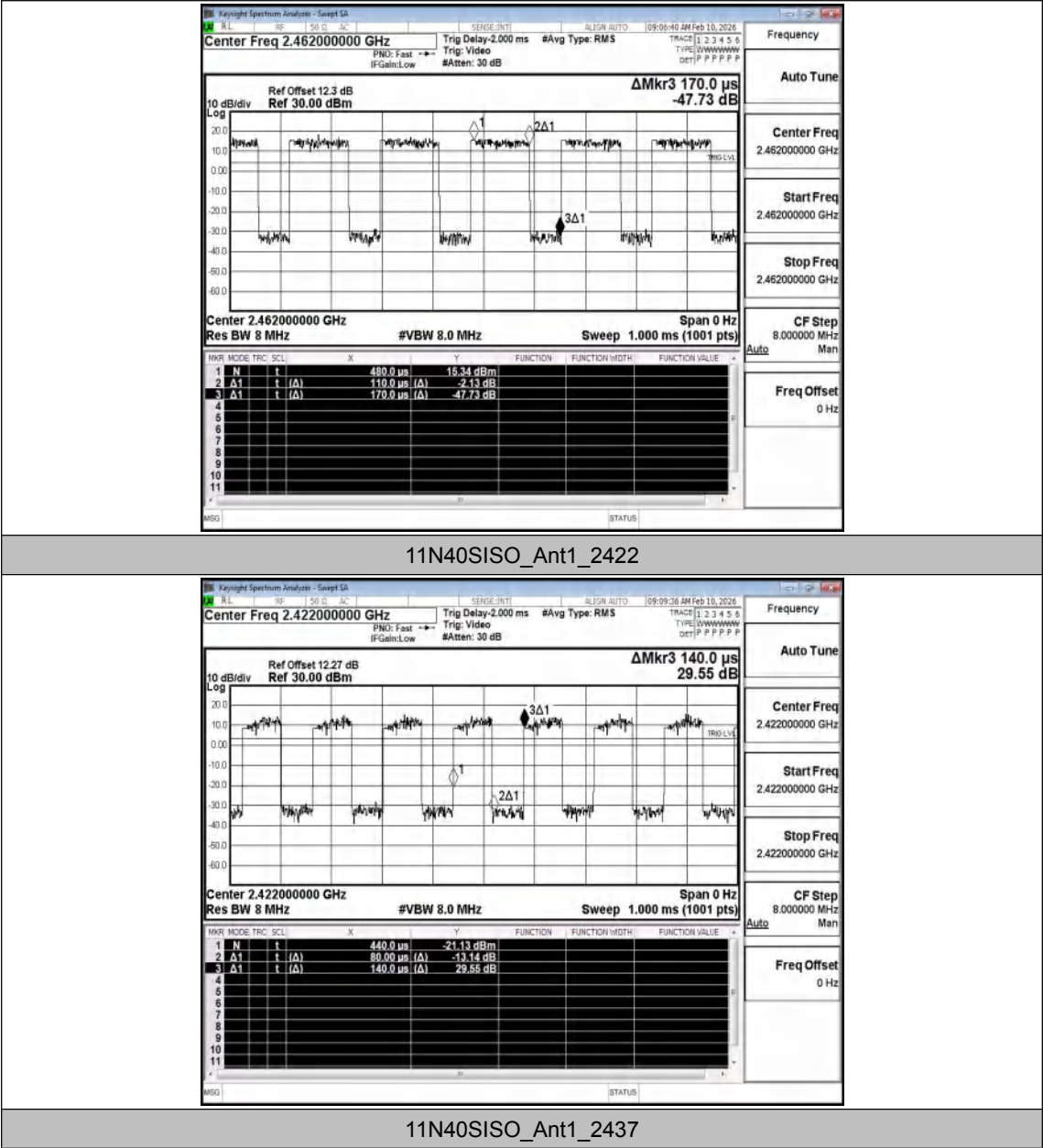
11G_Ant1_2412

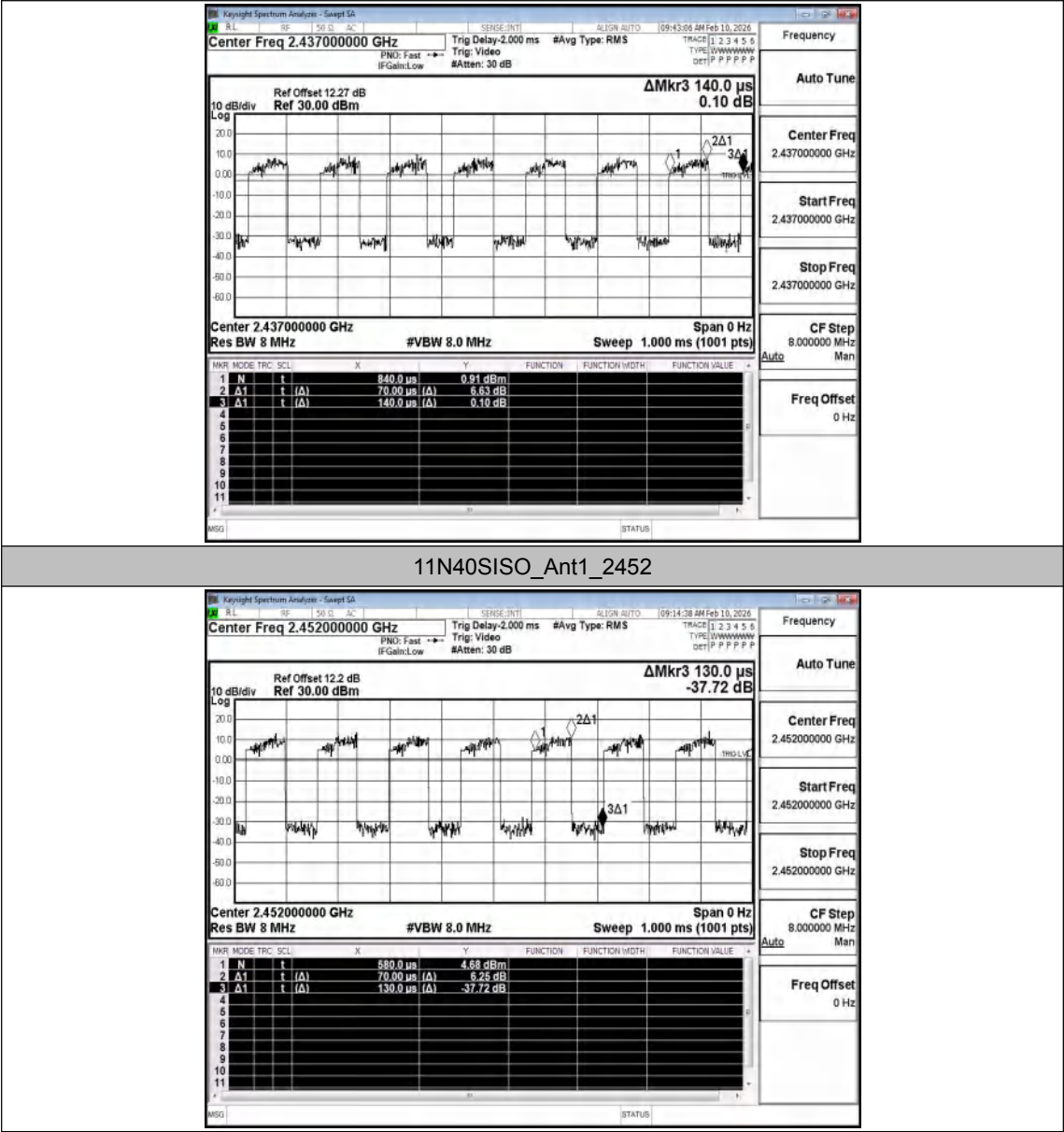


11G Ant1 2437









A.7 Emissions in Restricted Bands

Test Result

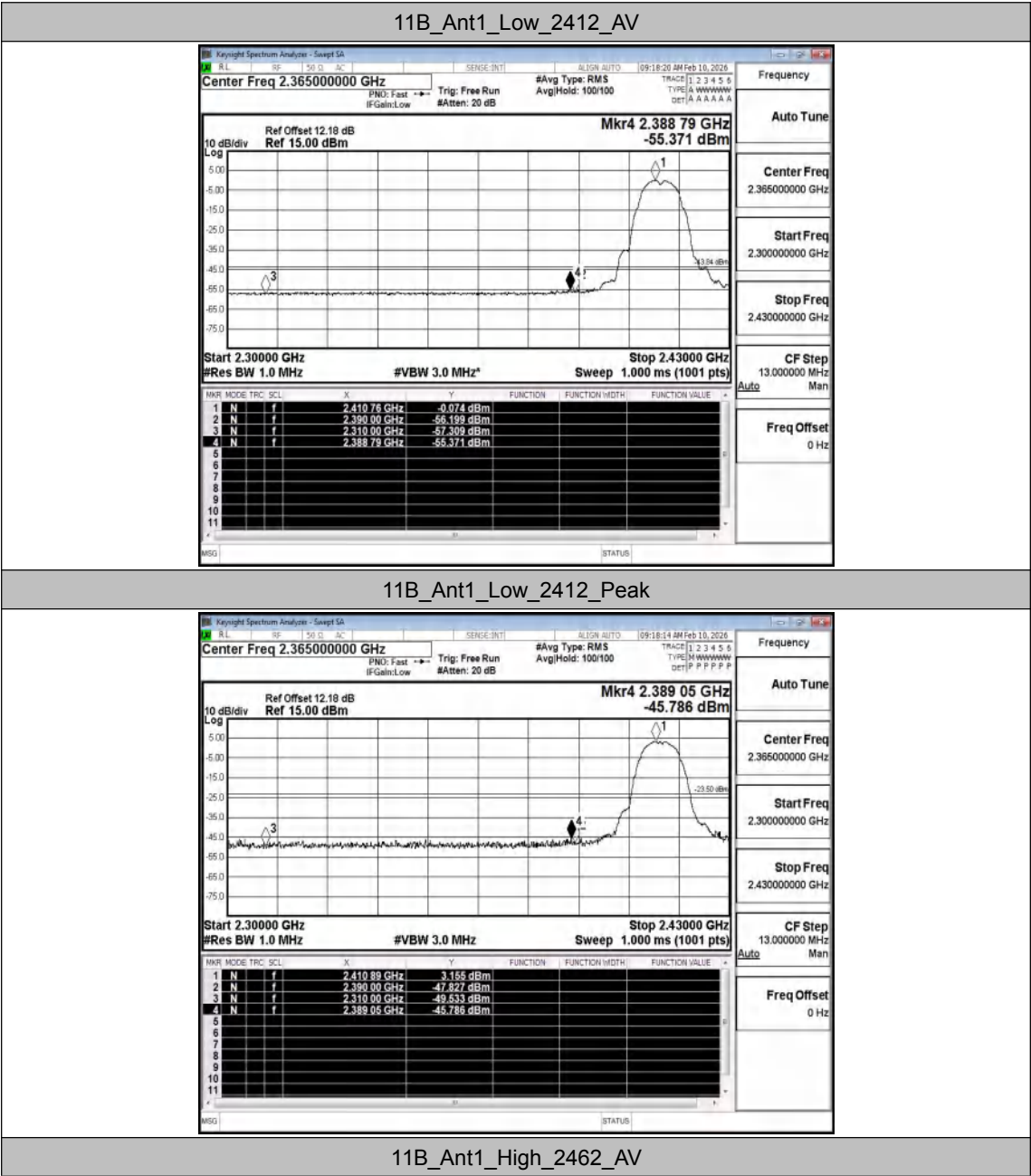
TestMode	Antenna	ChName	Frequency[MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	AV	2310.000	-57.31	≤-43.84	2.00	0.34	40.29	≤54	PASS
				AV	2388.790	-55.37	≤-43.84	2.00	0.34	42.23	≤54	PASS
				AV	2390.000	-56.2	≤-43.84	2.00	0.34	41.40	≤54	PASS
				Peak	2310.000	-49.53	≤-23.50	2.00	0.00	47.73	≤74	PASS
				Peak	2389.050	-45.79	≤-23.50	2.00	0.00	51.47	≤74	PASS
				Peak	2390.000	-47.83	≤-23.50	2.00	0.00	49.43	≤74	PASS
		High	2462	AV	2483.500	-56.23	≤-43.84	2.00	0.34	41.37	≤54	PASS
				AV	2490.270	-55.29	≤-43.84	2.00	0.34	42.31	≤54	PASS
				AV	2500.000	-56.43	≤-43.84	2.00	0.34	41.17	≤54	PASS
				Peak	2483.500	-47.78	≤-23.50	2.00	0.00	49.48	≤74	PASS
				Peak	2490.710	-45.61	≤-23.50	2.00	0.00	51.65	≤74	PASS
				Peak	2500.000	-48.52	≤-23.50	2.00	0.00	48.74	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-56.89	≤-45.26	2.00	1.76	42.13	≤54	PASS
				AV	2389.830	-51.85	≤-45.26	2.00	1.76	47.17	≤54	PASS
				AV	2390.000	-52.42	≤-45.26	2.00	1.76	46.60	≤54	PASS
				Peak	2310.000	-49.97	≤-23.50	2.00	0.00	47.29	≤74	PASS
				Peak	2389.960	-37.93	≤-23.50	2.00	0.00	59.33	≤74	PASS
				Peak	2390.000	-37.93	≤-23.50	2.00	0.00	59.33	≤74	PASS
		High	2462	AV	2483.500	-49.87	≤-45.64	2.00	2.14	49.53	≤54	PASS
				AV	2484.220	-48.86	≤-45.64	2.00	2.14	50.54	≤54	PASS
				AV	2500.000	-56.49	≤-45.64	2.00	2.14	42.91	≤54	PASS
				Peak	2483.500	-33.31	≤-23.50	2.00	0.00	63.95	≤74	PASS
				Peak	2483.670	-34.12	≤-23.50	2.00	0.00	63.14	≤74	PASS
				Peak	2500.000	-48.69	≤-23.50	2.00	0.00	48.57	≤74	PASS
11N20SISO	Ant1	Low	2412	AV	2310.000	-56.68	≤-45.64	2.00	2.14	42.72	≤54	PASS
				AV	2389.830	-51.34	≤-45.64	2.00	2.14	48.06	≤54	PASS
				AV	2390.000	-52.3	≤-45.64	2.00	2.14	47.10	≤54	PASS
				Peak	2310.000	-50.1	≤-23.50	2.00	0.00	47.16	≤74	PASS
				Peak	2388.140	-37.31	≤-23.50	2.00	0.00	59.95	≤74	PASS
				Peak	2390.000	-37.48	≤-23.50	2.00	0.00	59.78	≤74	PASS
		High	2462	AV	2483.500	-47.75	≤-45.39	2.00	1.89	51.40	≤54	PASS
				AV	2483.780	-47.07	≤-45.39	2.00	1.89	52.08	≤54	PASS
				AV	2500.000	-56.59	≤-45.39	2.00	1.89	42.56	≤54	PASS
				Peak	2483.500	-35.01	≤-23.50	2.00	0.00	62.25	≤74	PASS

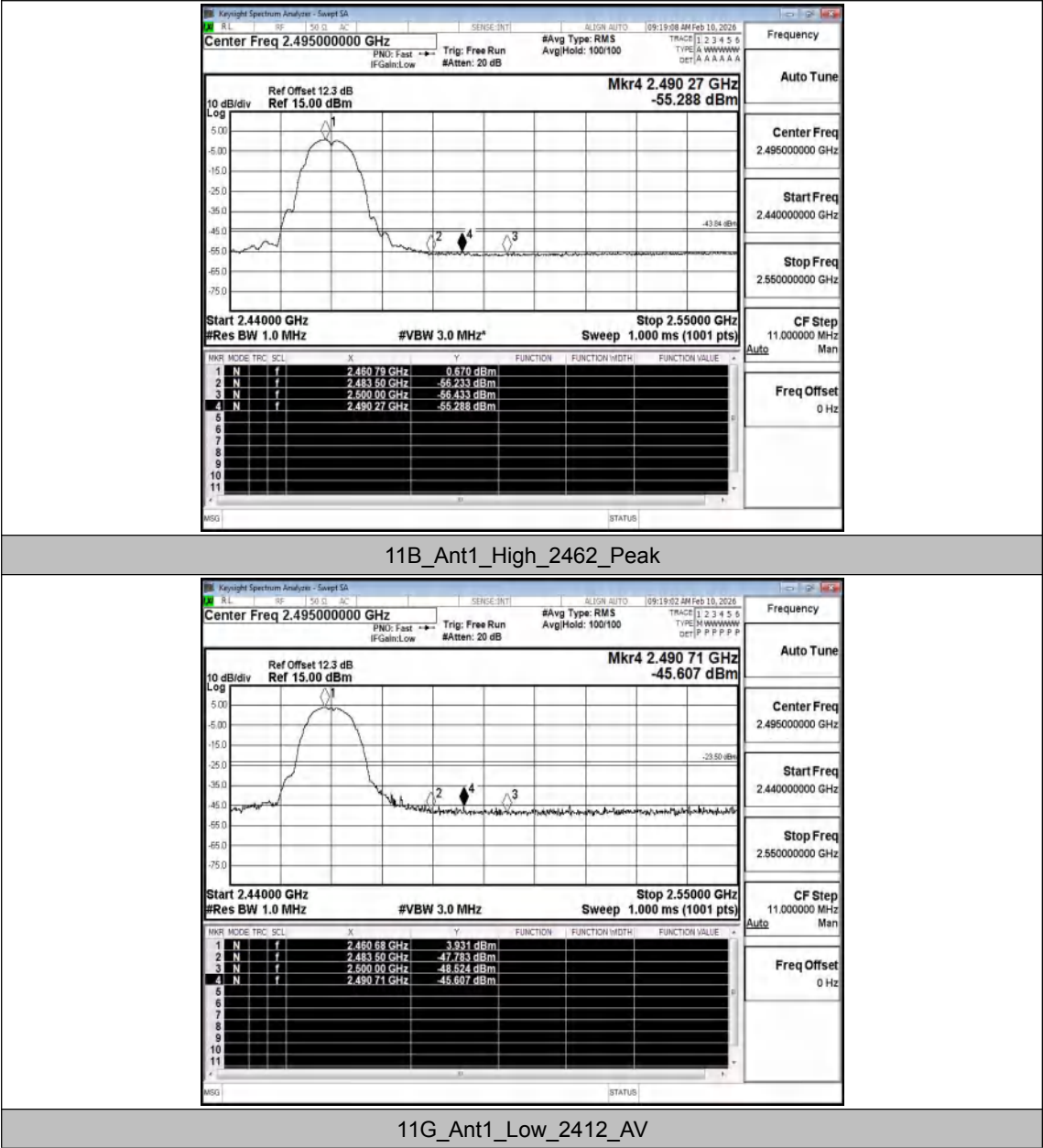
				Peak	2484.990	-32.22	≤-23.50	2.00	0.00	65.04	≤74	PASS
				Peak	2500.000	-48.85	≤-23.50	2.00	0.00	48.41	≤74	PASS
11N40SISO	Ant1	Low	2422	AV	2310.000	-57.18	≤-45.93	2.00	2.43	42.51	≤54	PASS
				AV	2388.200	-48.68	≤-45.93	2.00	2.43	51.01	≤54	PASS
				AV	2390.000	-49.89	≤-45.93	2.00	2.43	49.80	≤54	PASS
				Peak	2310.000	-49.38	≤-23.50	2.00	0.00	47.88	≤74	PASS
				Peak	2386.700	-34.36	≤-23.50	2.00	0.00	62.90	≤74	PASS
				Peak	2390.000	-40.73	≤-23.50	2.00	0.00	56.53	≤74	PASS
		High	2452	AV	2483.500	-52.47	≤-46.19	2.00	2.69	47.48	≤54	PASS
				AV	2484.250	-52.14	≤-46.19	2.00	2.69	47.81	≤54	PASS
				AV	2500.000	-56.83	≤-46.19	2.00	2.69	43.12	≤54	PASS
				Peak	2483.500	-44.08	≤-23.50	2.00	0.00	53.18	≤74	PASS
				Peak	2485.125	-41.44	≤-23.50	2.00	0.00	55.82	≤74	PASS
				Peak	2500.000	-49.1	≤-23.50	2.00	0.00	48.16	≤74	PASS

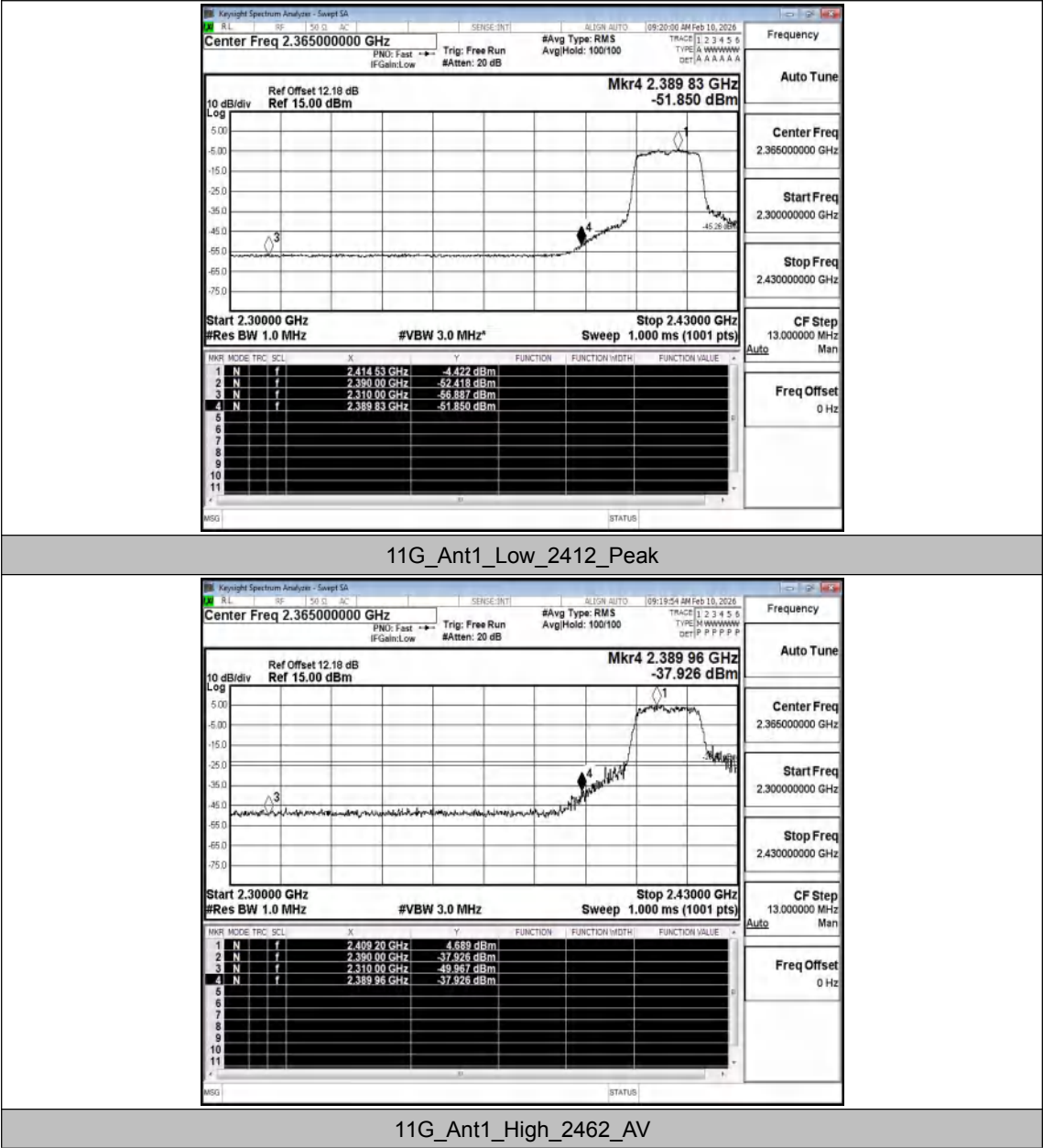
Note:

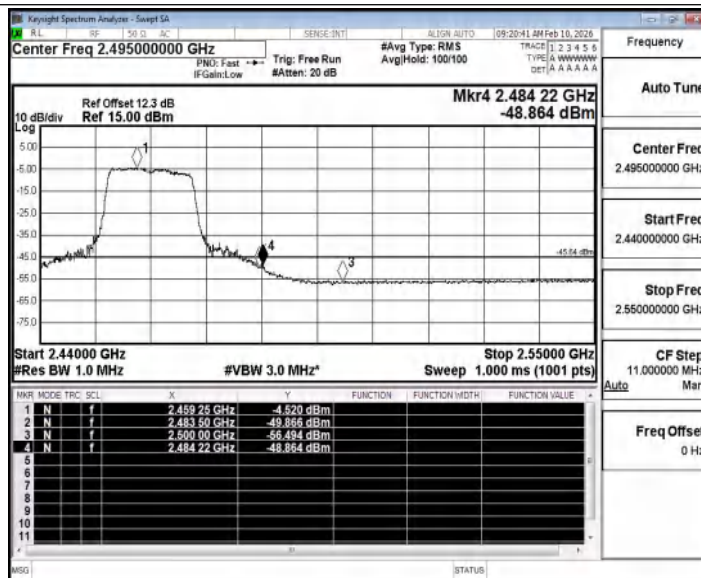
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

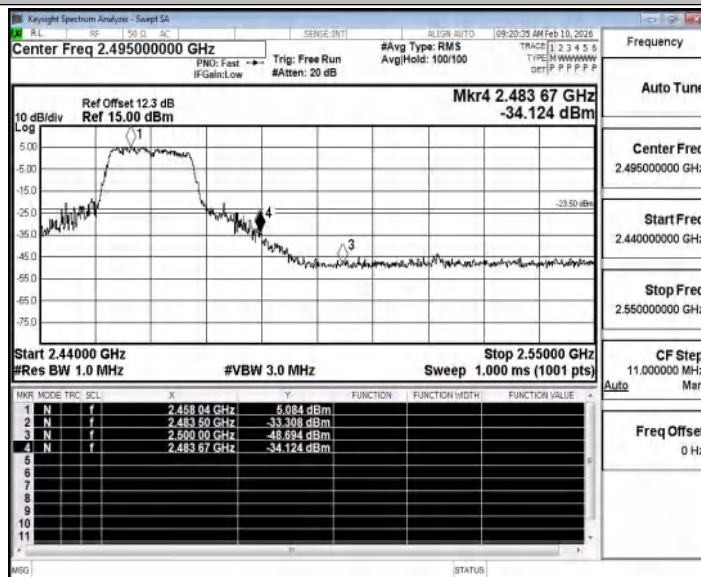




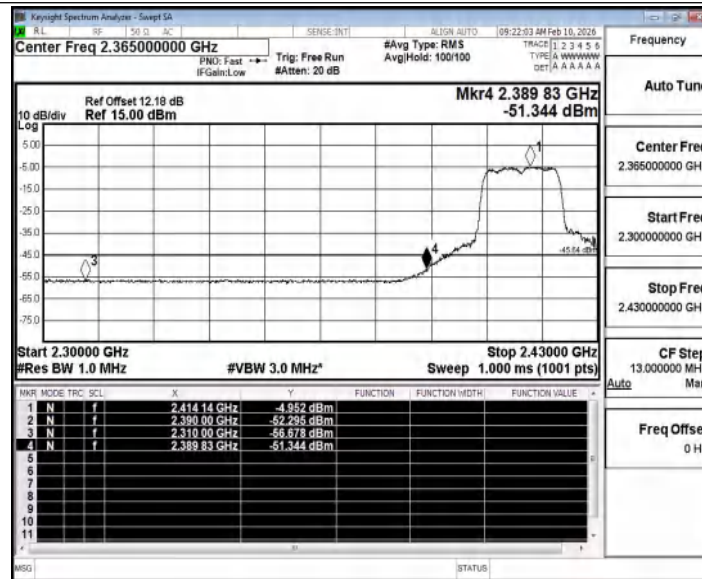




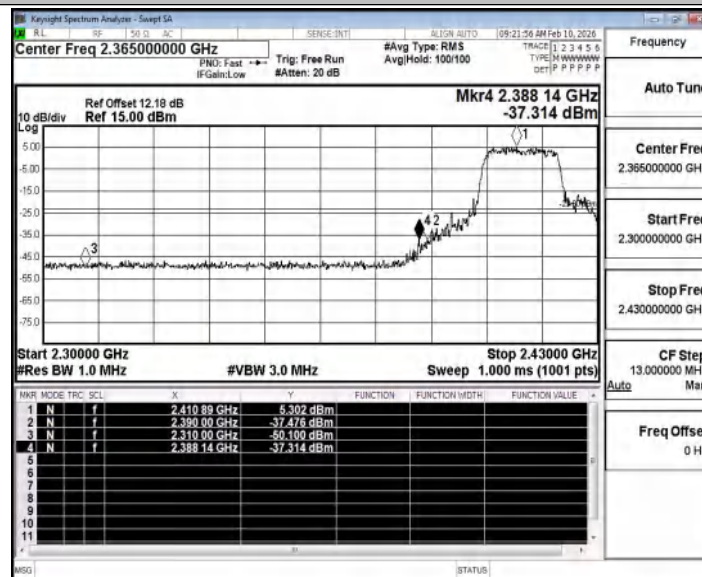
11G Ant1 High 2462 Peak



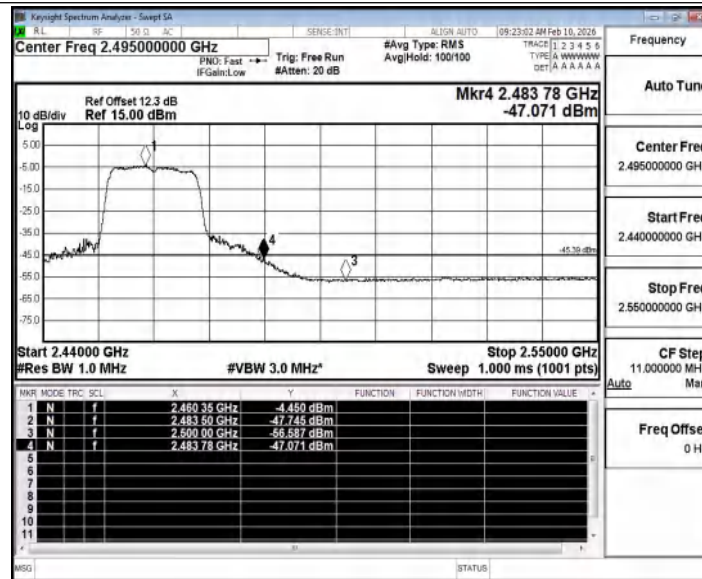
11N20SISO Ant1 Low 2412 AV



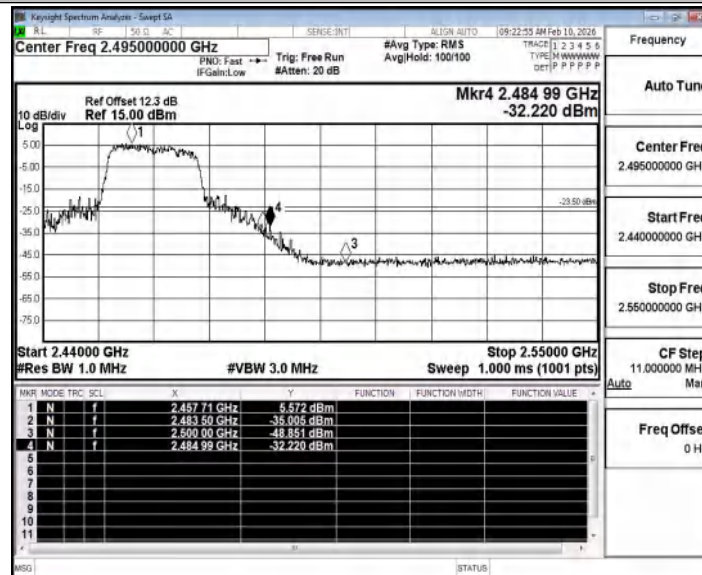
11N20SISO_Ant1_Low_2412_Peak



11N20SISO_Ant1_High_2462_AV



11N20SISO_Ant1_High_2462_Peak



11N40SISO_Ant1_Low_2422_AV

