



Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Smart Camera

Test Model: CX1

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Nick Peng <i>Nick Peng</i>
Supervised by:	Taylor Hu
	<i>Taylor Hu</i>





A.1 DTS Bandwidth

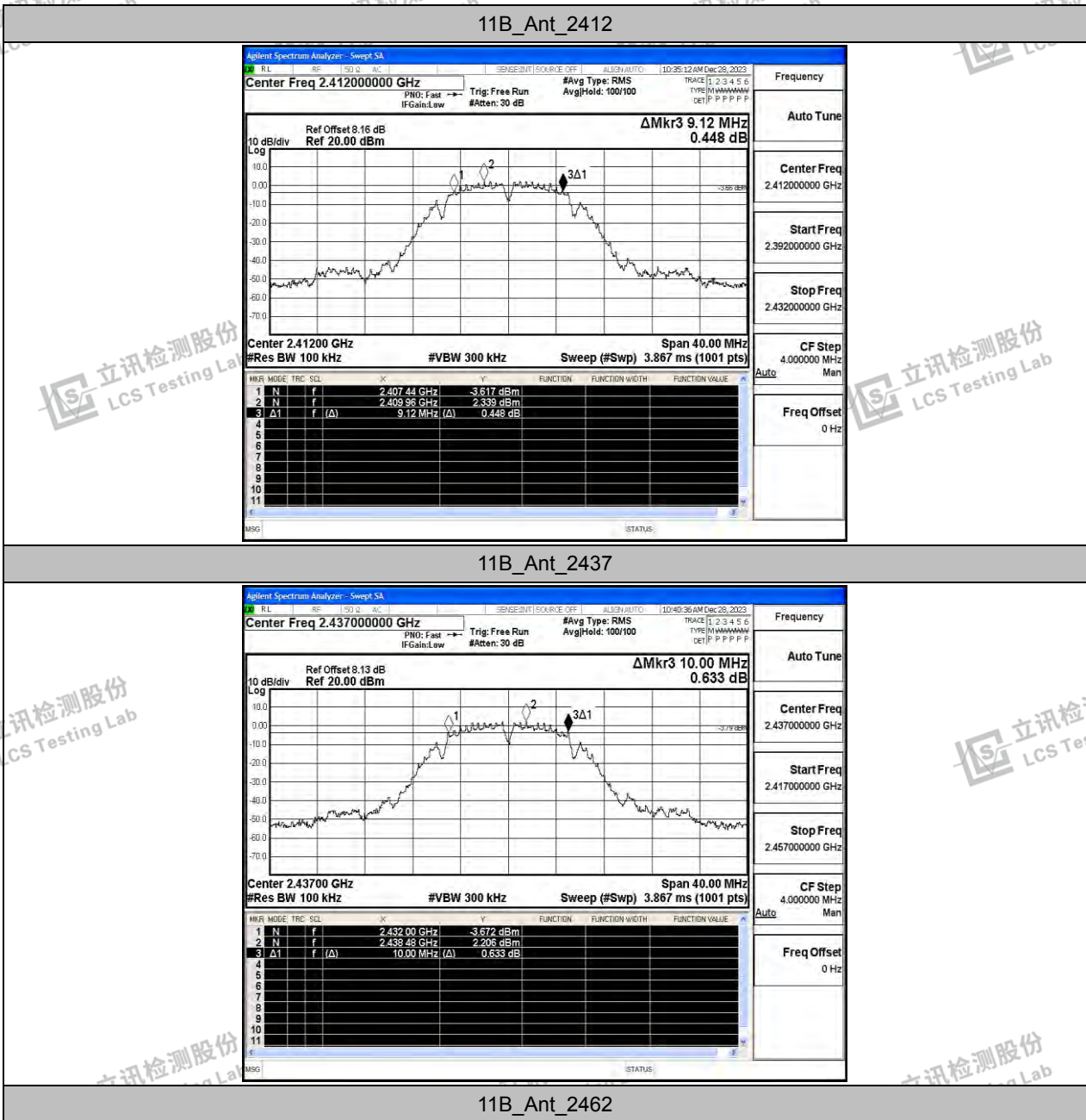
Test Result

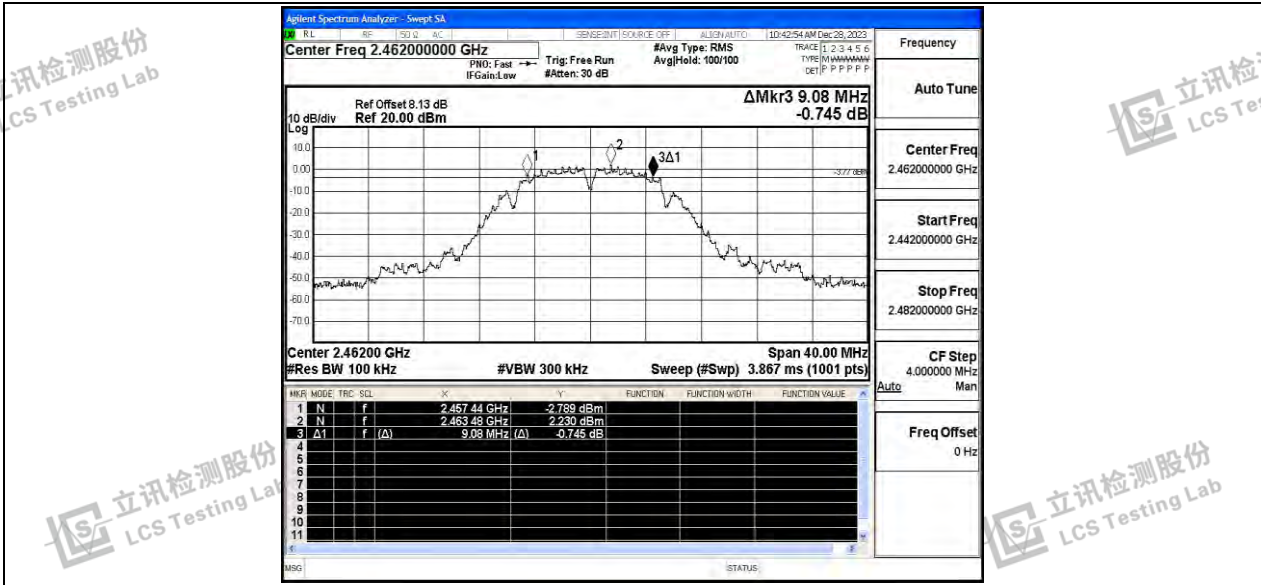
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant	2412	9.120	2407.440	2416.560	0.5	PASS
		2437	10.000	2432.000	2442.000	0.5	PASS
		2462	9.080	2457.440	2466.520	0.5	PASS
11G	Ant	2412	15.680	2404.080	2419.760	0.5	PASS
		2437	15.120	2429.400	2444.520	0.5	PASS
		2462	15.800	2454.320	2470.120	0.5	PASS
11N20SISO	Ant	2412	15.920	2404.440	2420.360	0.5	PASS
		2437	13.920	2430.640	2444.560	0.5	PASS
		2462	17.600	2453.200	2470.800	0.5	PASS
11N40SISO	Ant	2422	35.200	2404.400	2439.600	0.5	PASS
		2437	35.840	2419.080	2454.920	0.5	PASS
		2452	36.080	2434.080	2470.160	0.5	PASS



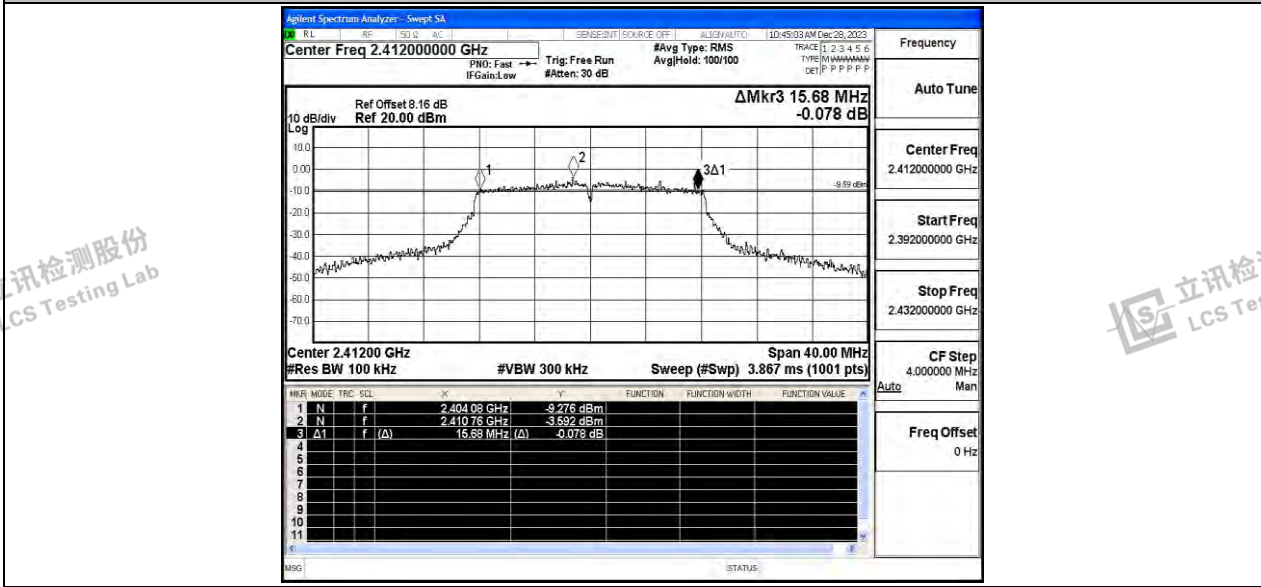


Test Graphs



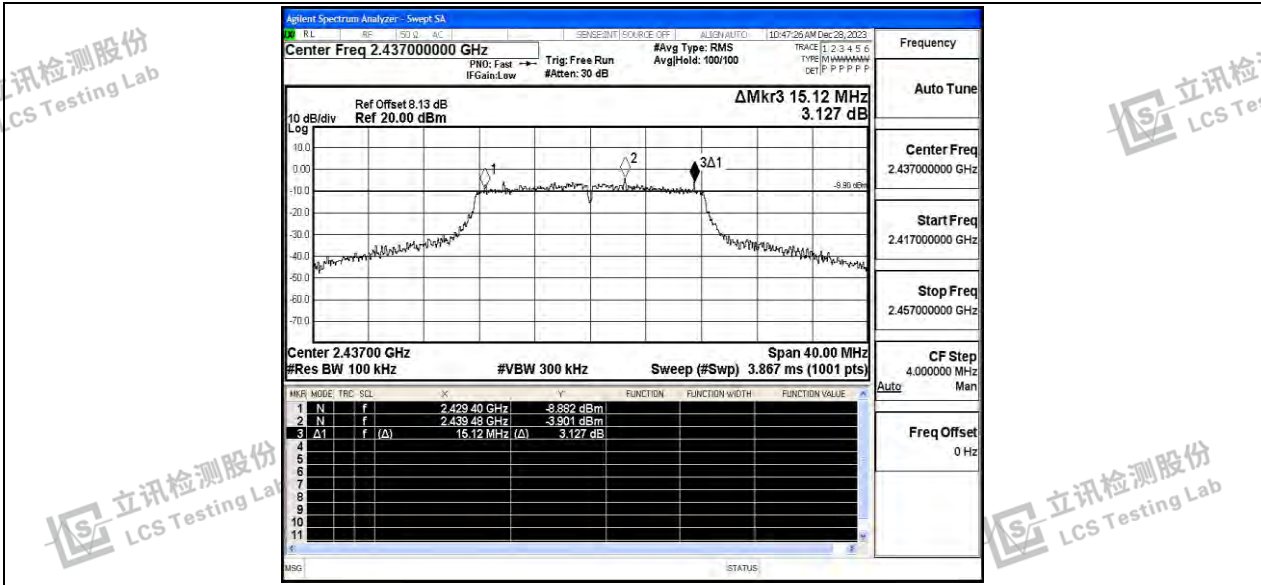


11G_Ant_2412

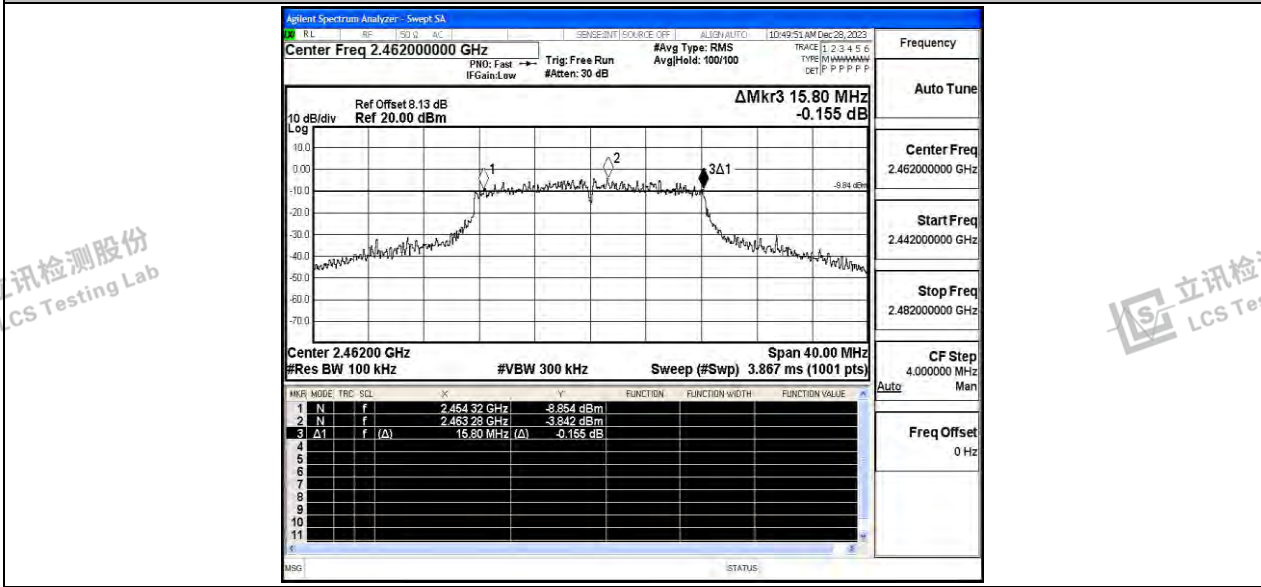


11G_Ant_2437



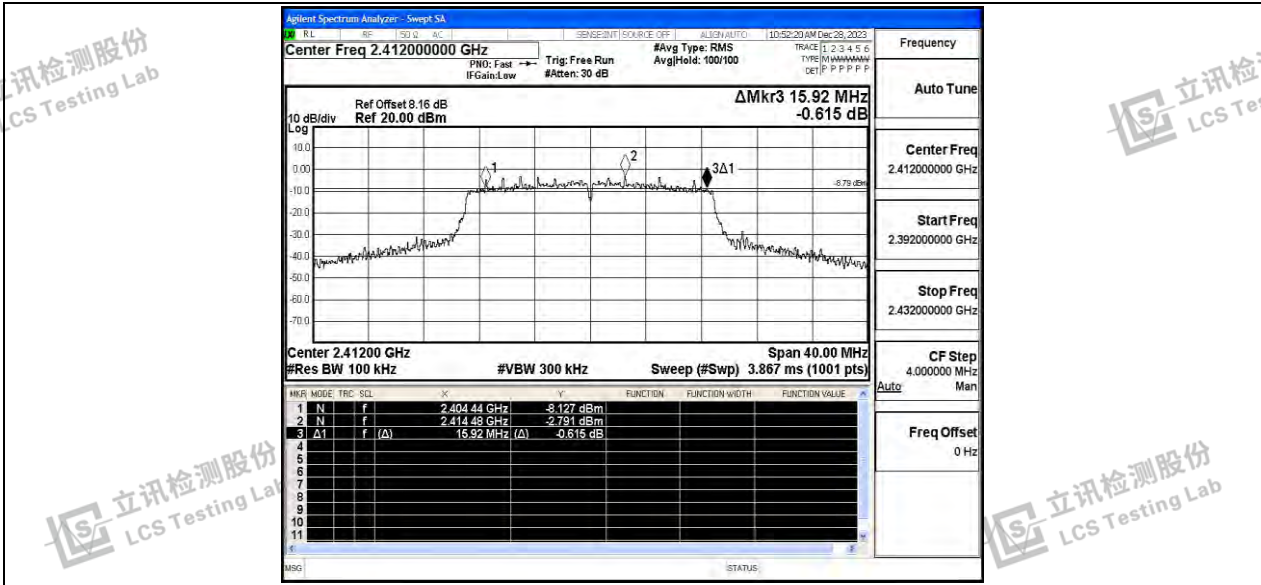


11G_Ant_2462

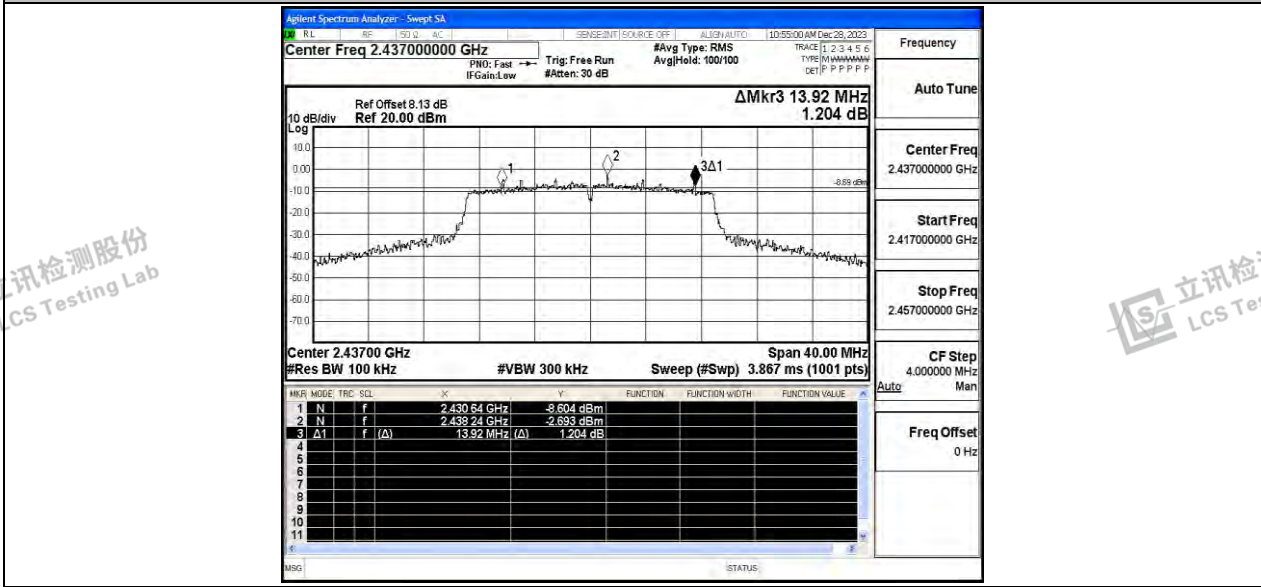


11N20SISO_Ant_2412



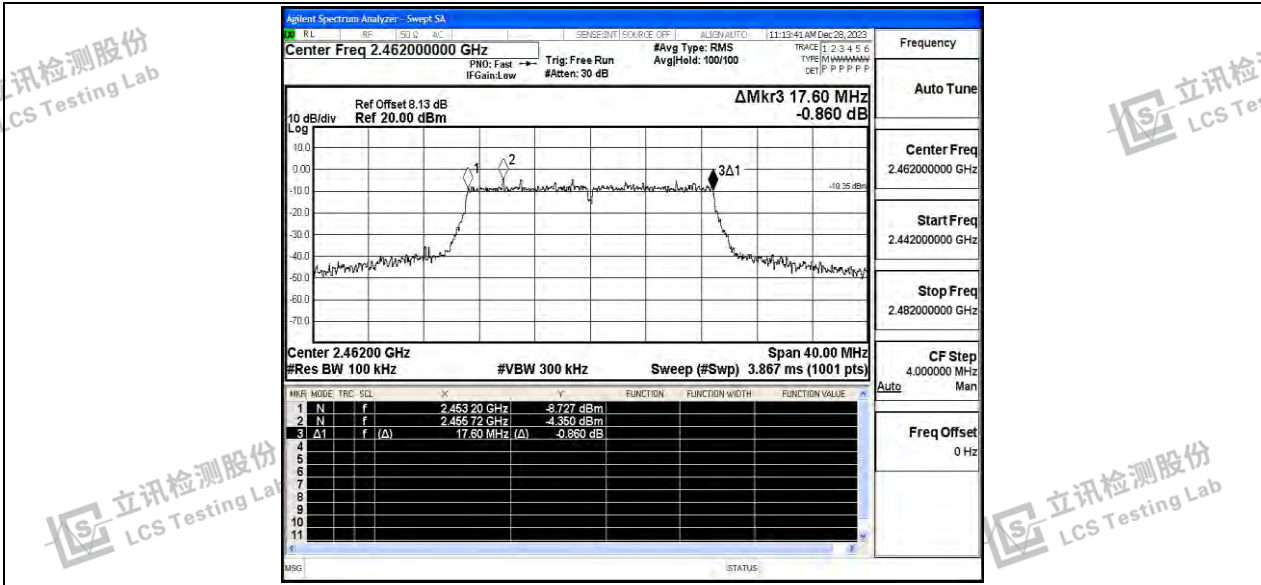


11N20SISO_Ant_2437

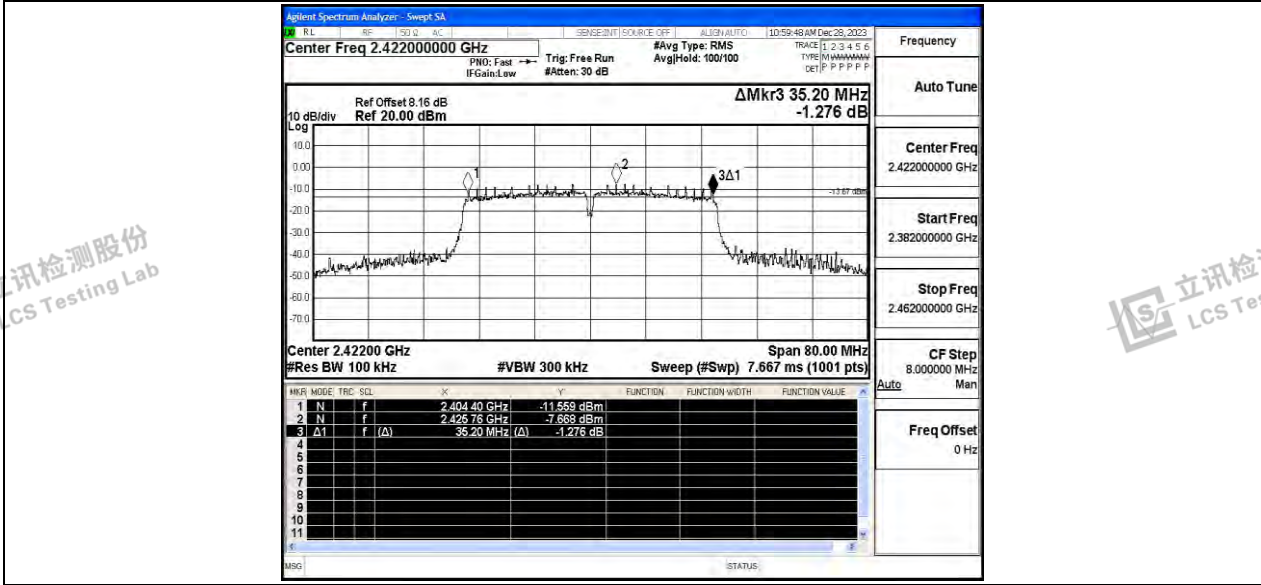


11N20SISO_Ant_2462



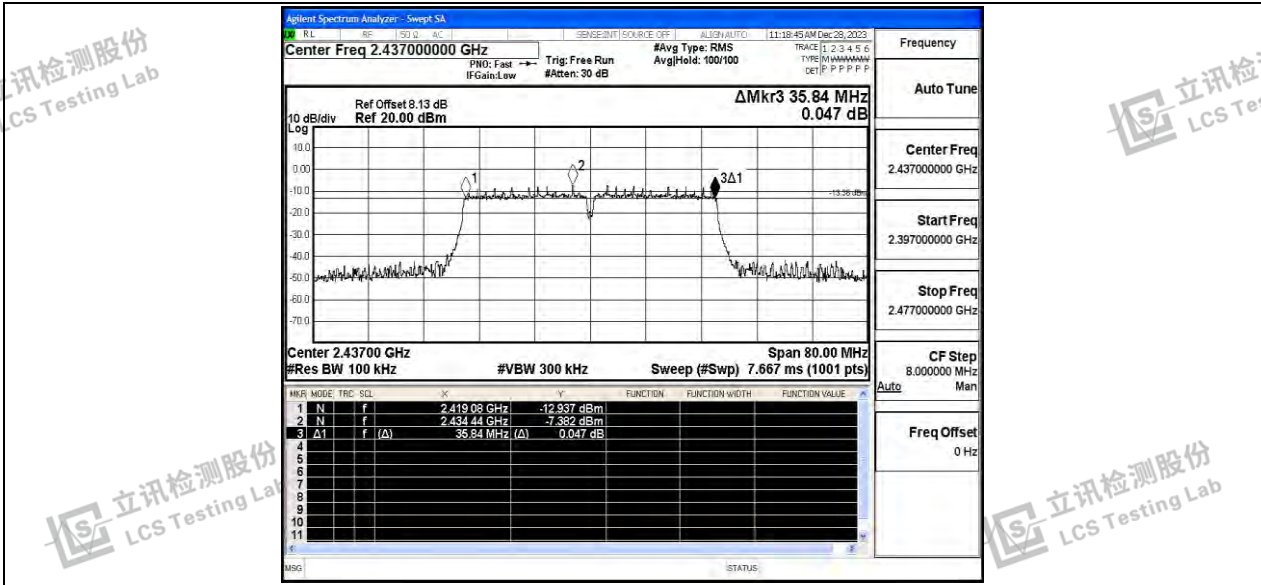


11N40SISO_Ant_2422

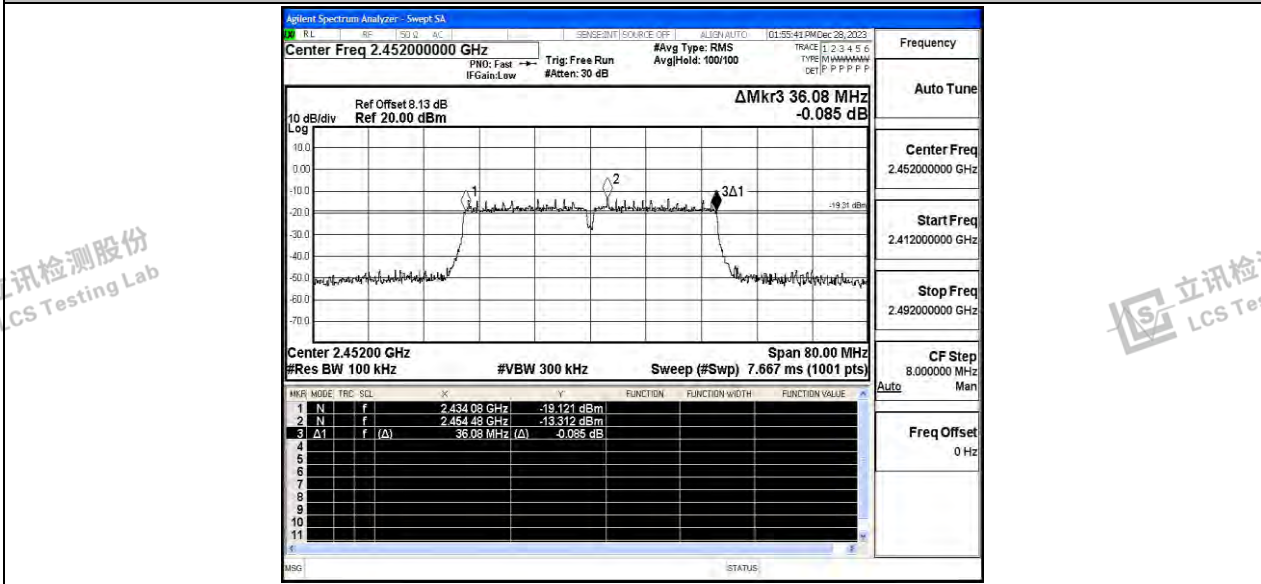


11N40SISO_Ant_2437





11N40SISO_Ant_2452





A.2 Maximum conducted output power

Test Result Peak

TestMode	Antenna	Freq(MHz)	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant	2412	14.83	≤30.00	PASS
		2437	14.48	≤30.00	PASS
		2462	14.14	≤30.00	PASS
11G	Ant	2412	13.73	≤30.00	PASS
		2437	13.43	≤30.00	PASS
		2462	12.42	≤30.00	PASS
11N20SISO	Ant	2412	14.62	≤30.00	PASS
		2437	13.63	≤30.00	PASS
		2462	13.76	≤30.00	PASS
11N40SISO	Ant	2422	12.50	≤30.00	PASS
		2437	13.22	≤30.00	PASS
		2452	12.98	≤30.00	PASS





A.3 Maximum power spectral density

Test Result

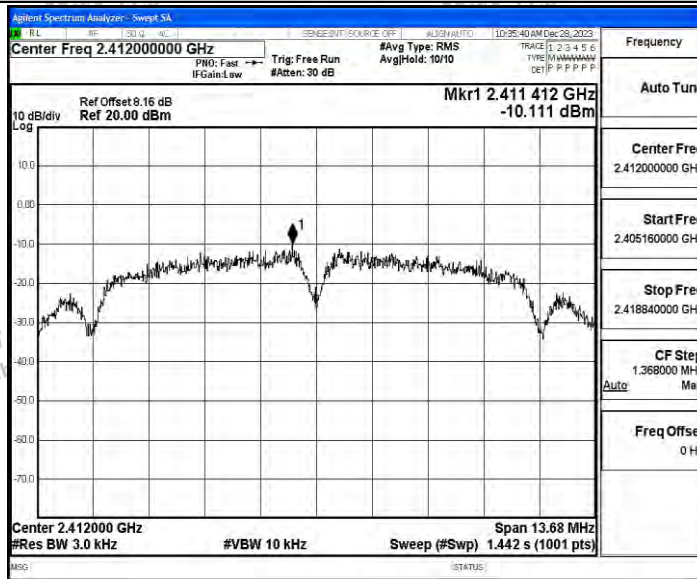
TestMode	Antenna	Freq(MHz)	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant	2412	-10.11	≤8.00	PASS
		2437	-8.98	≤8.00	PASS
		2462	-10.77	≤8.00	PASS
11G	Ant	2412	-15.74	≤8.00	PASS
		2437	-16.09	≤8.00	PASS
		2462	-17.75	≤8.00	PASS
11N20SISO	Ant	2412	-16.06	≤8.00	PASS
		2437	-13.89	≤8.00	PASS
		2462	-17.80	≤8.00	PASS
11N40SISO	Ant	2422	-21.57	≤8.00	PASS
		2437	-21.45	≤8.00	PASS
		2452	-22.09	≤8.00	PASS



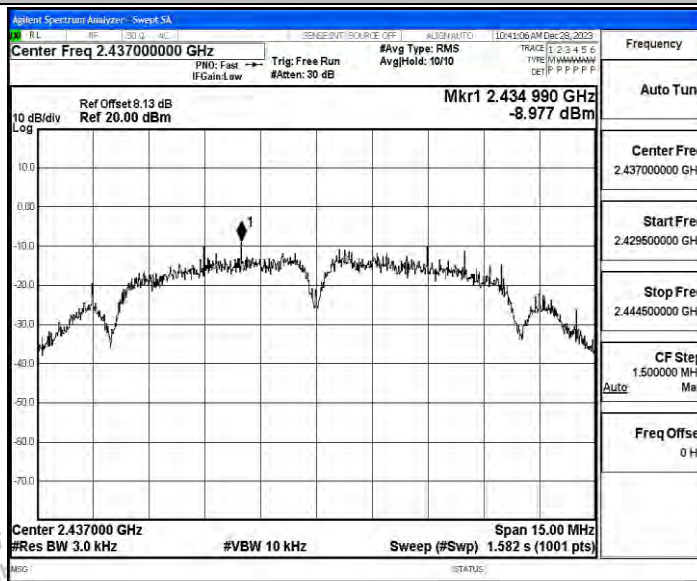


Test Graphs

11B_Ant_2412

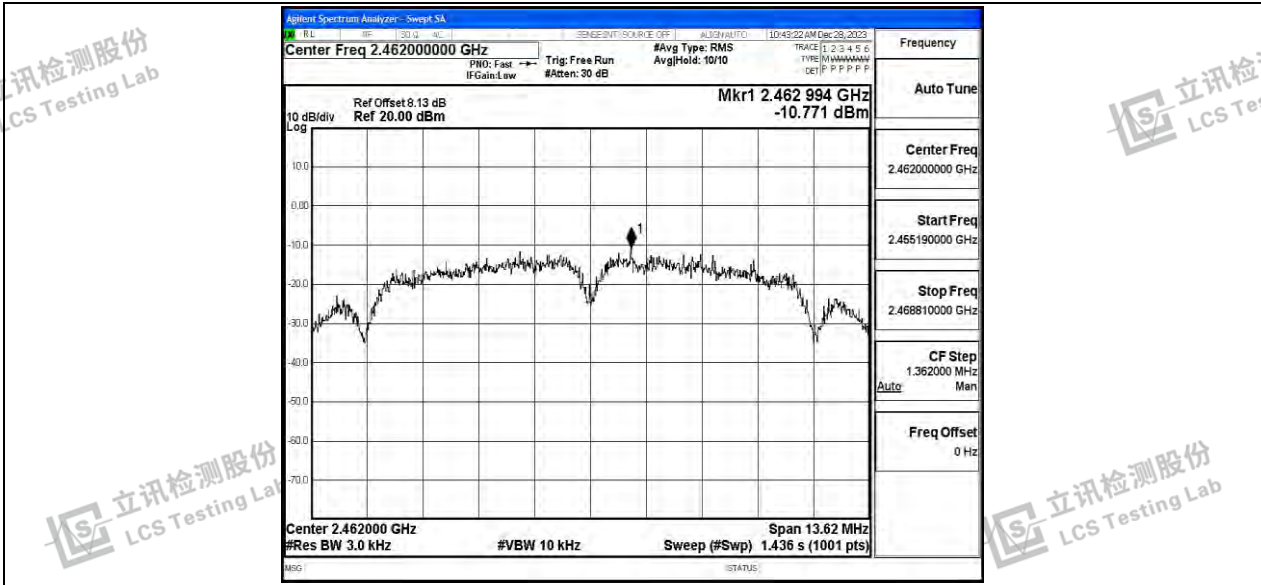


11B_Ant_2437

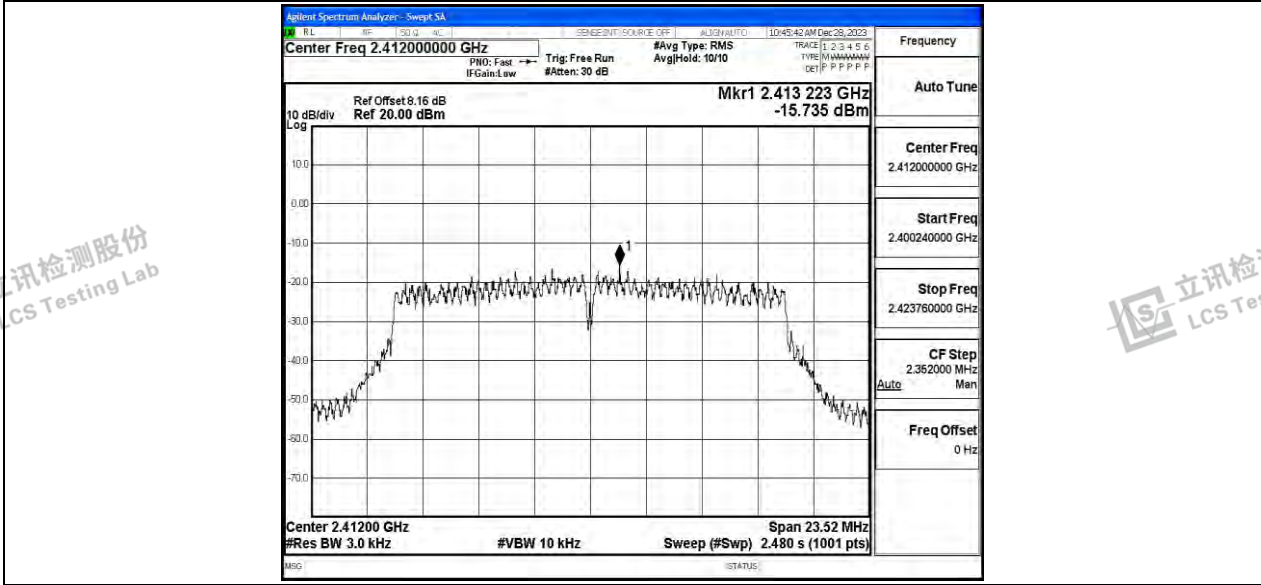


11B_Ant_2462



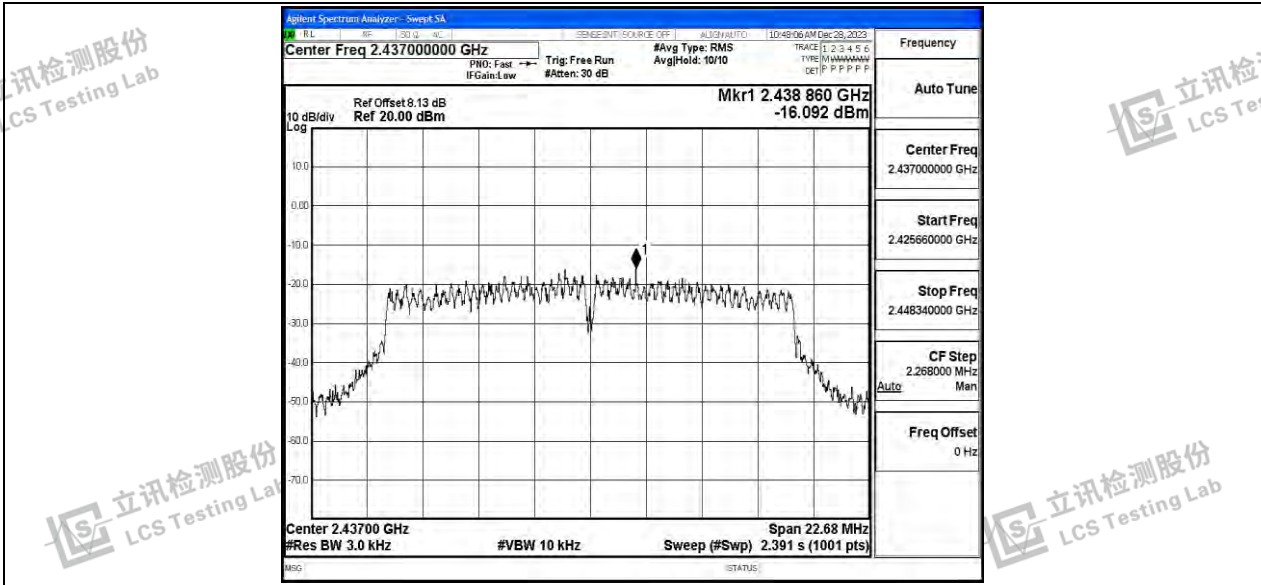


11G_Ant_2412

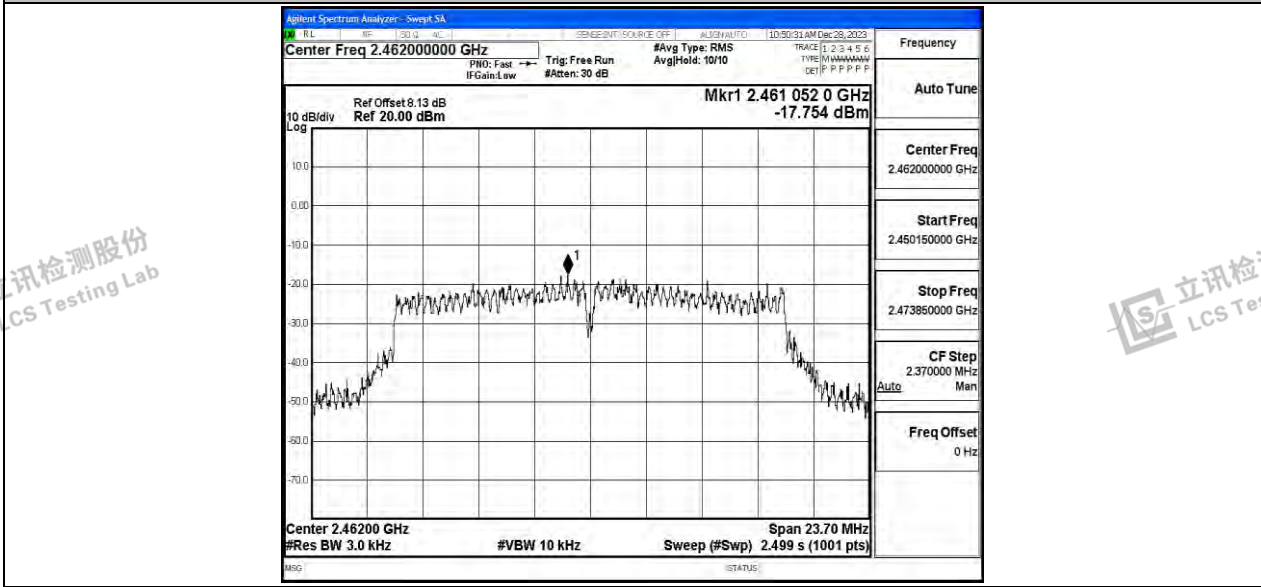


11G_Ant_2437



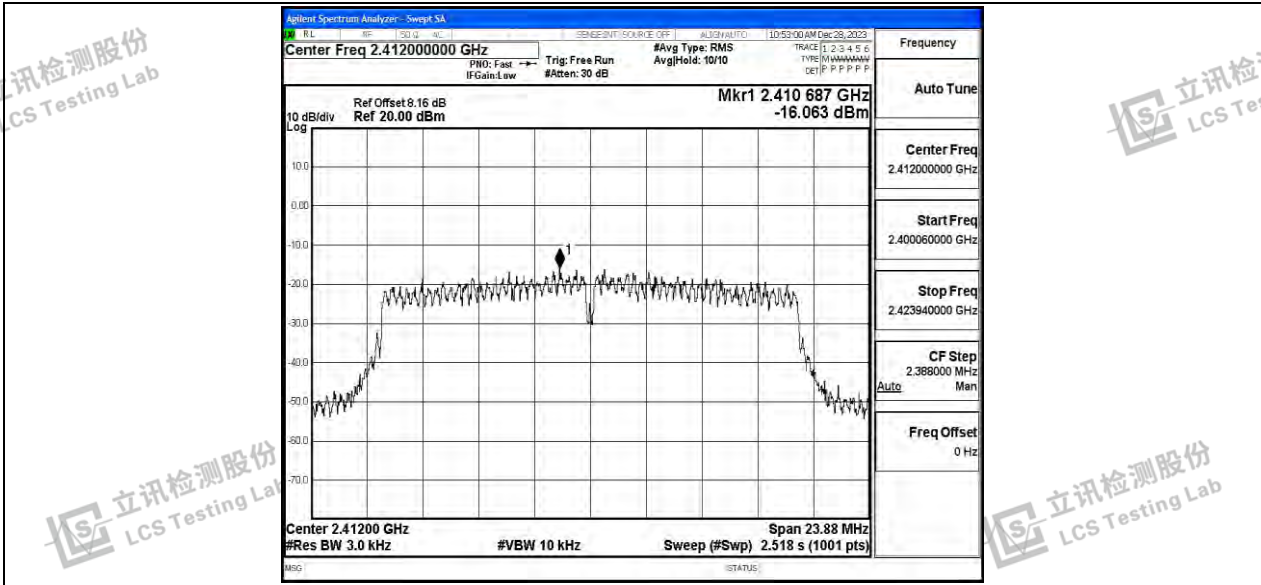


11G_Ant_2462

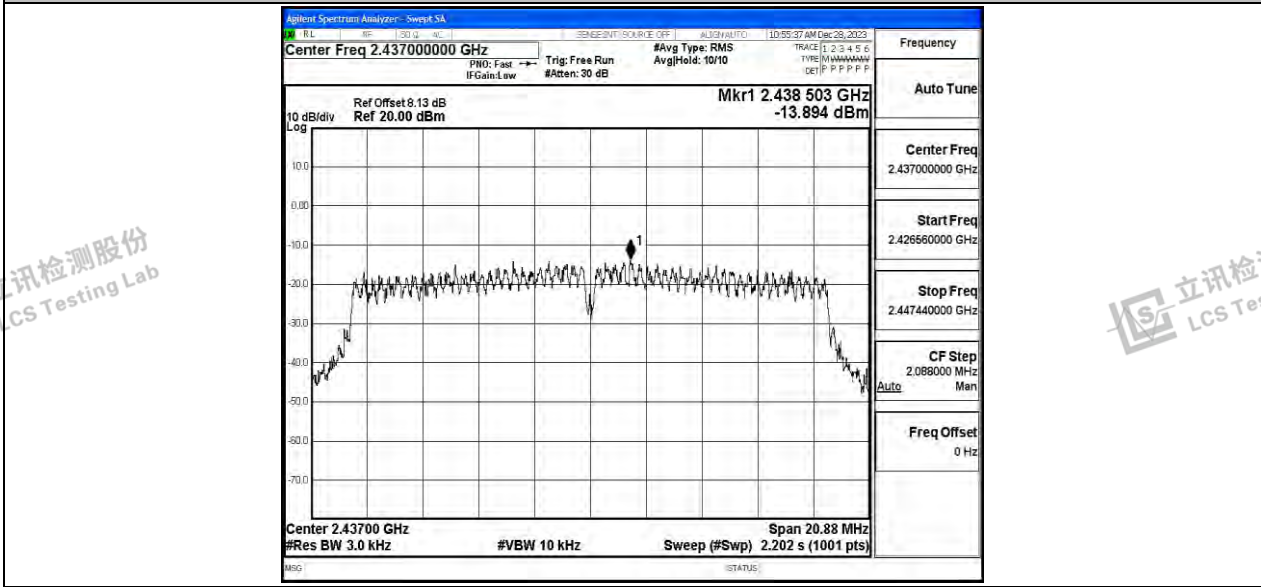


11N20SISO_Ant_2412



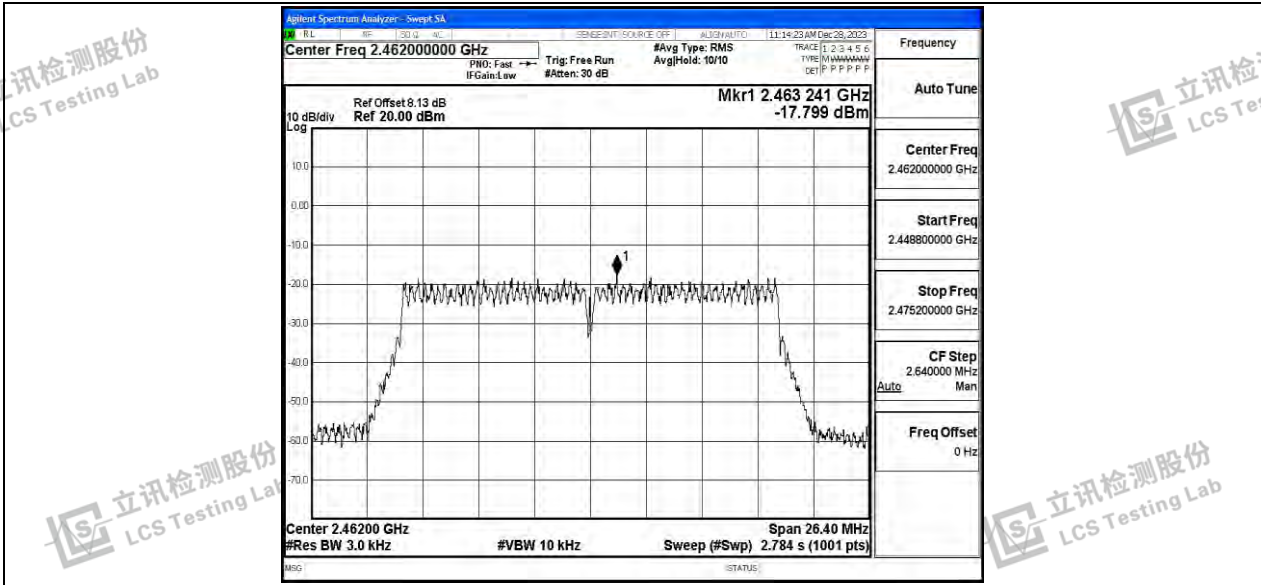


11N20SISO_Ant_2437

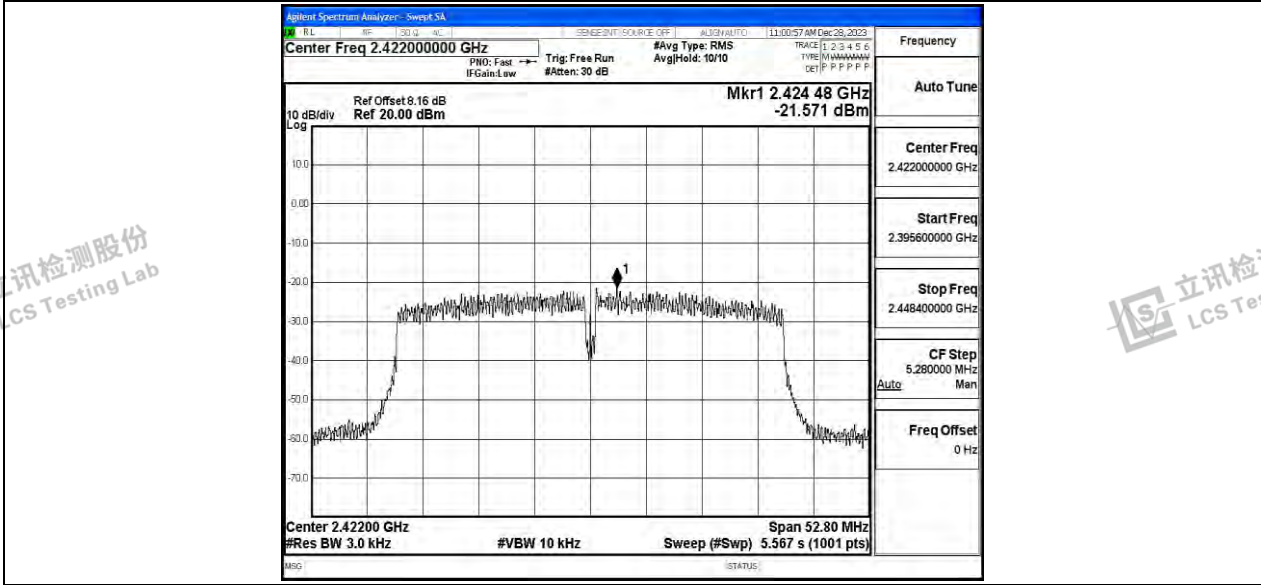


11N20SISO_Ant_2462



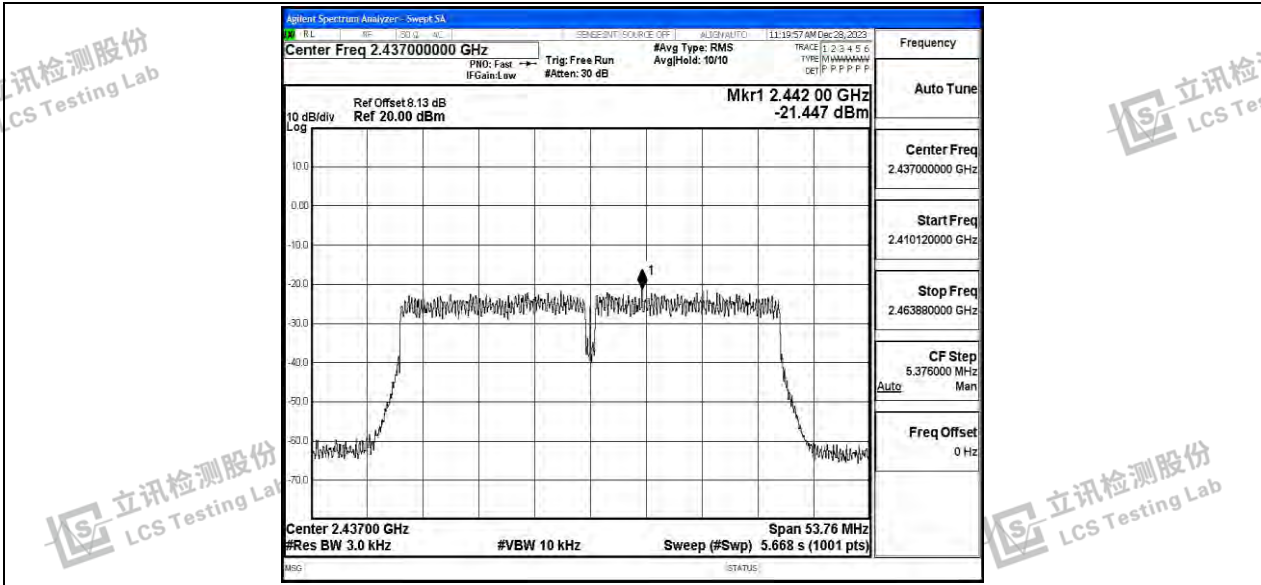


11N40SISO_Ant_2422

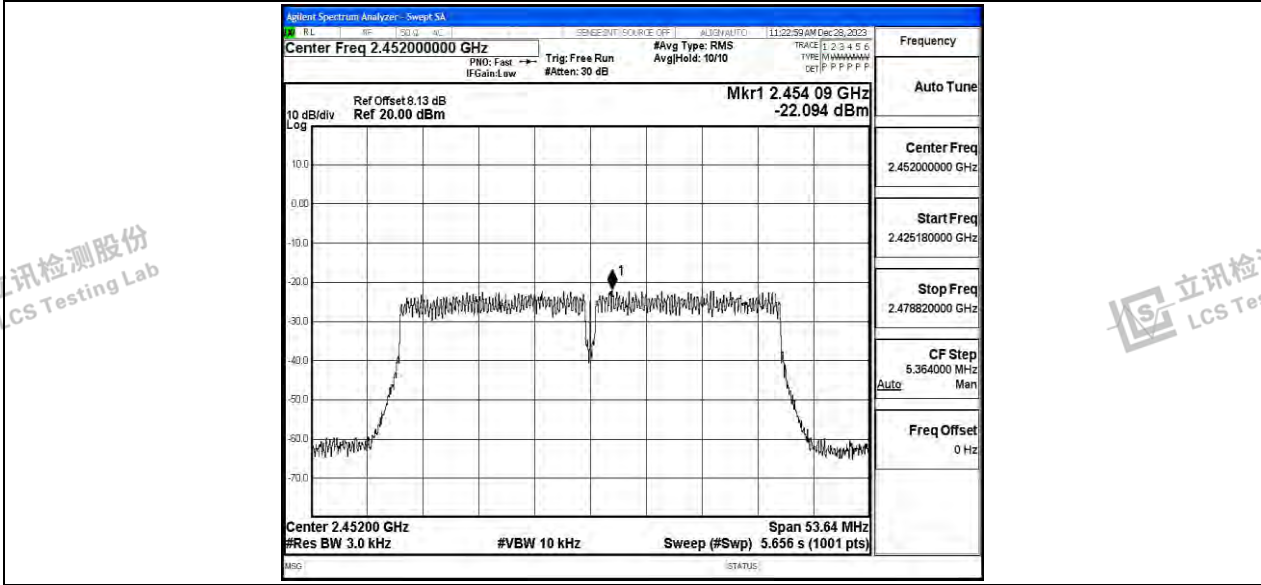


11N40SISO_Ant_2437





11N40SISO_Ant_2452





A.4 Band edge measurements

Test Result

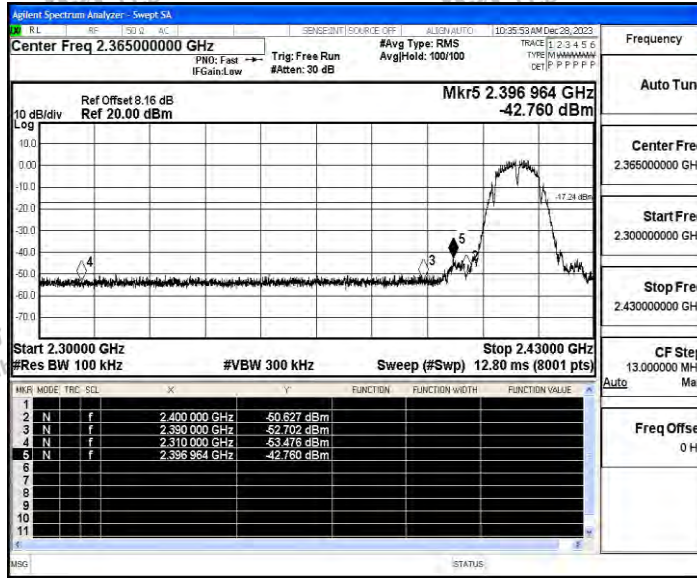
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant	Low	2412	2.76	-42.76	≤-17.24	PASS
		High	2462	1.40	-50.37	≤-18.6	PASS
11G	Ant	Low	2412	-3.42	-34	≤-23.42	PASS
		High	2462	-3.69	-47.38	≤-23.69	PASS
11N20SISO	Ant	Low	2412	-2.08	-32.42	≤-22.08	PASS
		High	2462	-4.01	-47.27	≤-24.01	PASS
11N40SISO	Ant	Low	2422	-7.19	-38.68	≤-27.19	PASS
		High	2452	-7.37	-43.11	≤-27.37	PASS



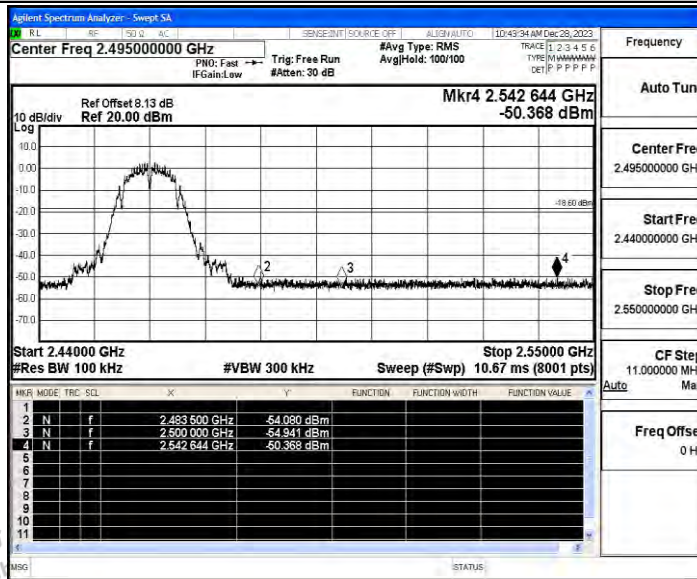


Test Graphs

11B_Ant_Low_2412

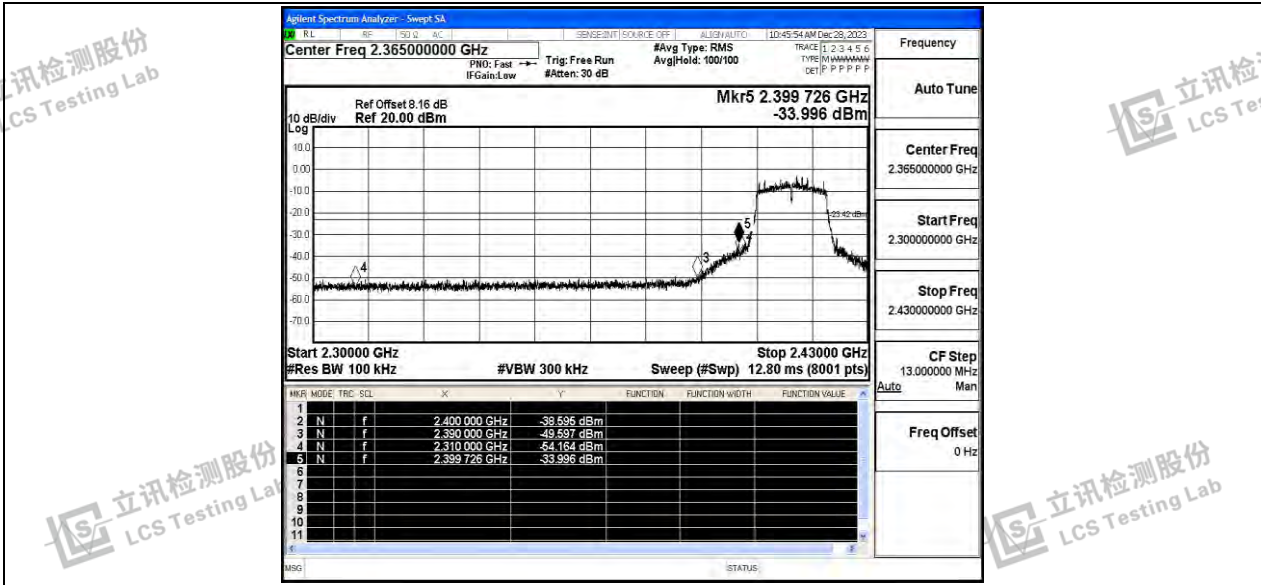


11B_Ant_High_2462

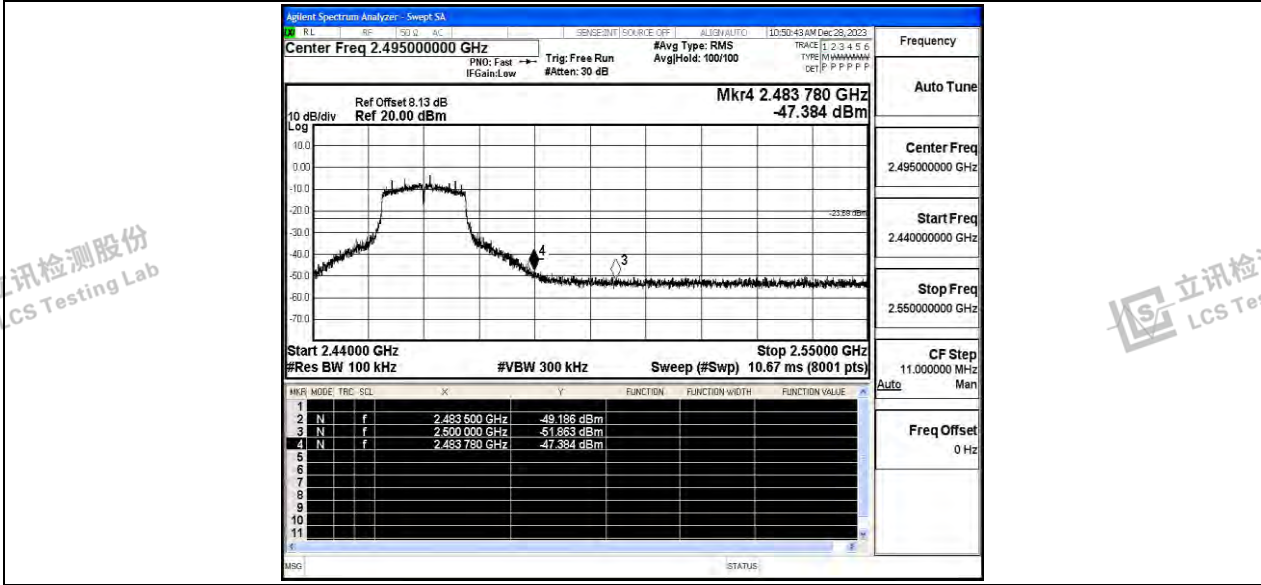


11G_Ant_Low_2412



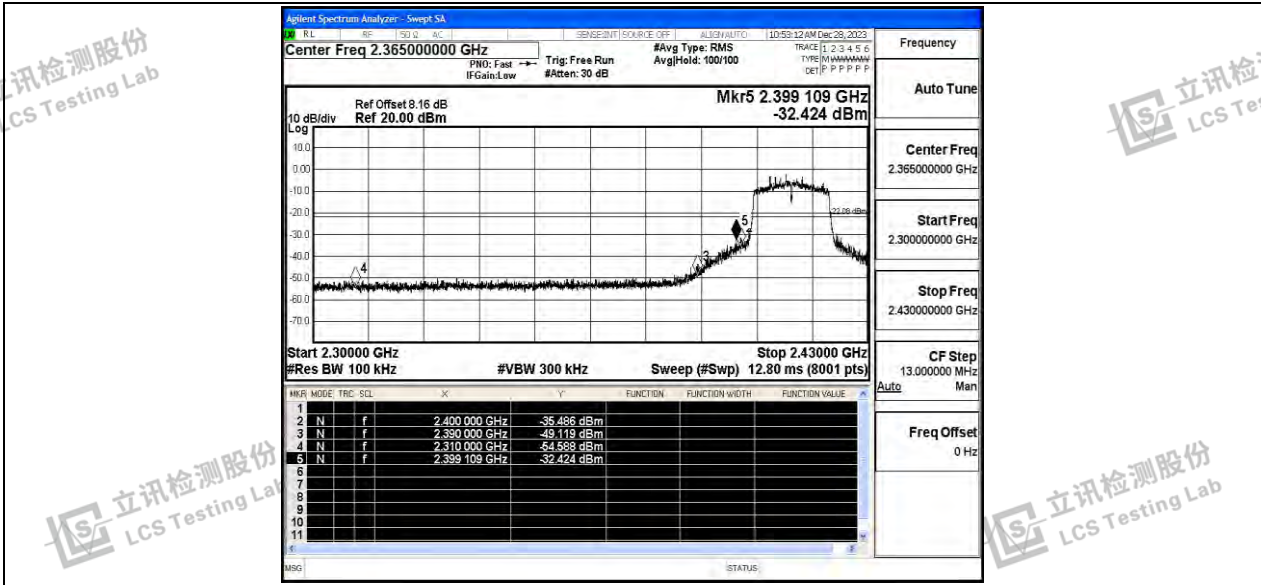


11G_Ant_High_2462

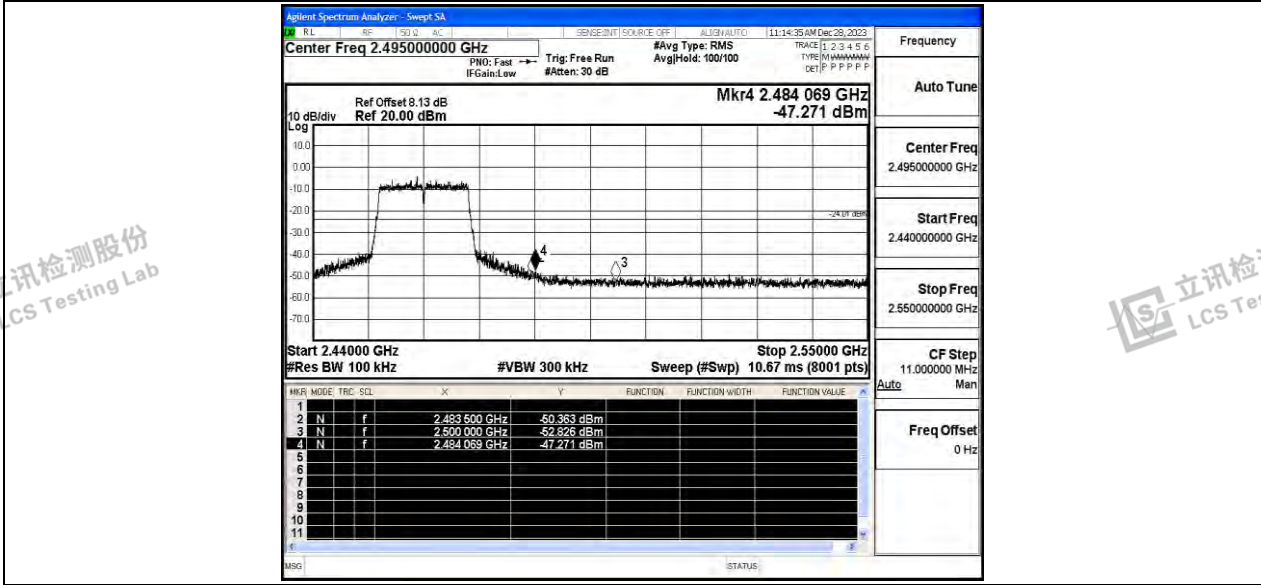


11N20SISO_Ant_Low_2412



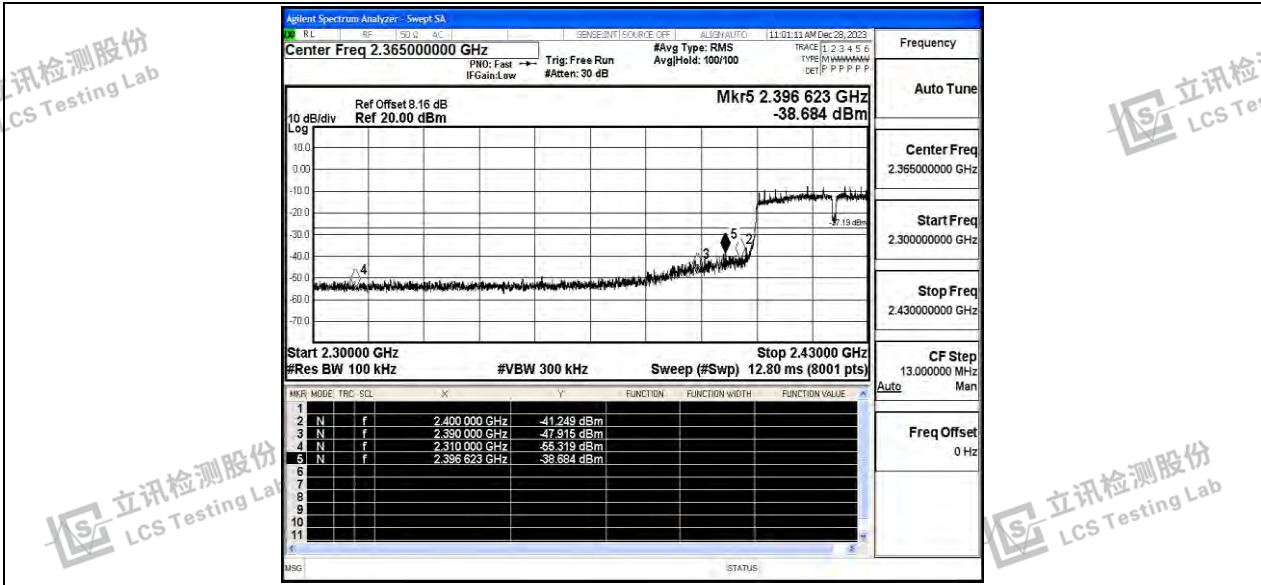


11N20SISO_Ant_High_2462

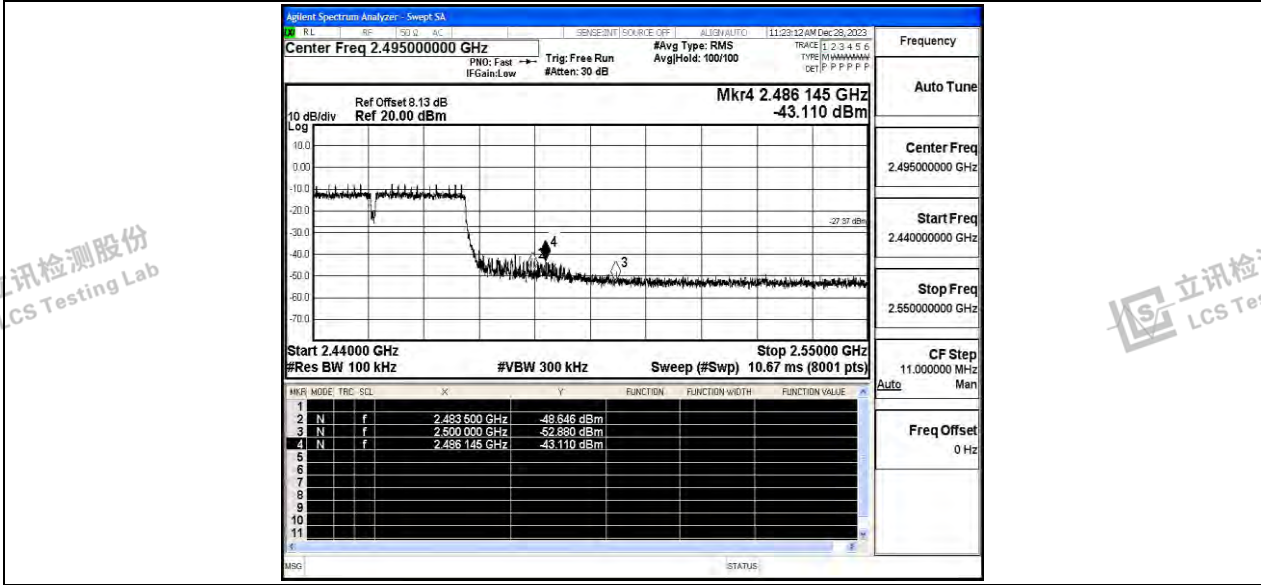


11N40SISO_Ant_Low_2422





11N40SISO_Ant_High_2452





A.5 Conducted Spurious Emission

Test Result

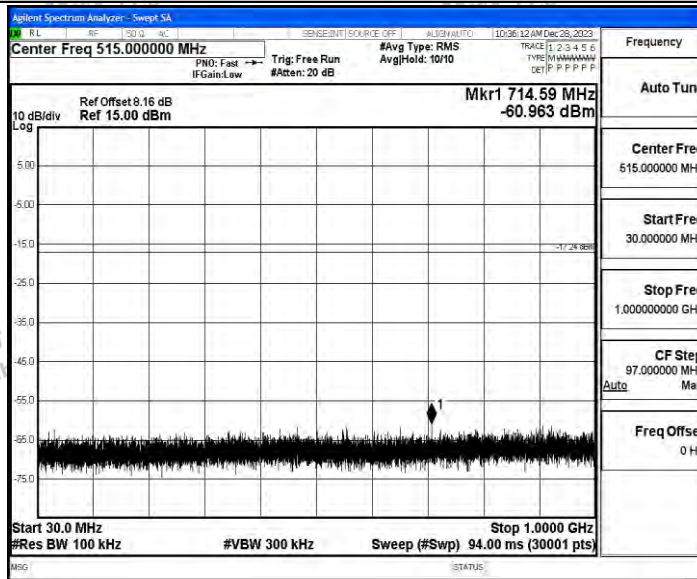
TestMode	Antenna	Freq(MHz)	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant	2412	30~1000	2.76	-60.96	≤-17.24	PASS
			1000~26500	2.76	-48.24	≤-17.24	PASS
		2437	30~1000	2.17	-61.28	≤-17.83	PASS
			1000~26500	2.17	-43.05	≤-17.83	PASS
		2462	30~1000	1.40	-61.59	≤-18.6	PASS
			1000~26500	1.40	-47.66	≤-18.6	PASS
11G	Ant	2412	30~1000	-3.42	-61.74	≤-23.42	PASS
			1000~26500	-3.42	-48.7	≤-23.42	PASS
		2437	30~1000	-3.69	-61.52	≤-23.69	PASS
			1000~26500	-3.69	-28.09	≤-23.69	PASS
		2462	30~1000	-3.69	-61.78	≤-23.69	PASS
			1000~26500	-3.69	-49.29	≤-23.69	PASS
11N20SISO	Ant	2412	30~1000	-2.08	-61.88	≤-22.08	PASS
			1000~26500	-2.08	-48.92	≤-22.08	PASS
		2437	30~1000	0.23	-61.54	≤-19.77	PASS
			1000~26500	0.23	-48.88	≤-19.77	PASS
		2462	30~1000	-4.01	-61.39	≤-24.01	PASS
			1000~26500	-4.01	-48.49	≤-24.01	PASS
11N40SISO	Ant	2422	30~1000	-7.19	-60.65	≤-27.19	PASS
			1000~26500	-7.19	-48.64	≤-27.19	PASS
		2437	30~1000	-7.10	-61.92	≤-27.1	PASS
			1000~26500	-7.10	-49.38	≤-27.1	PASS
		2452	30~1000	-7.37	-61.69	≤-27.37	PASS
			1000~26500	-7.37	-48.7	≤-27.37	PASS



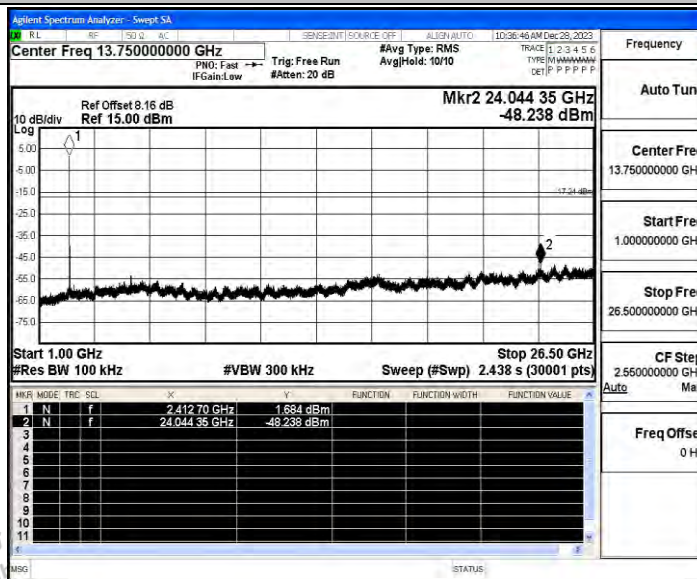


Test Graphs

11B_Ant_2412_30~1000

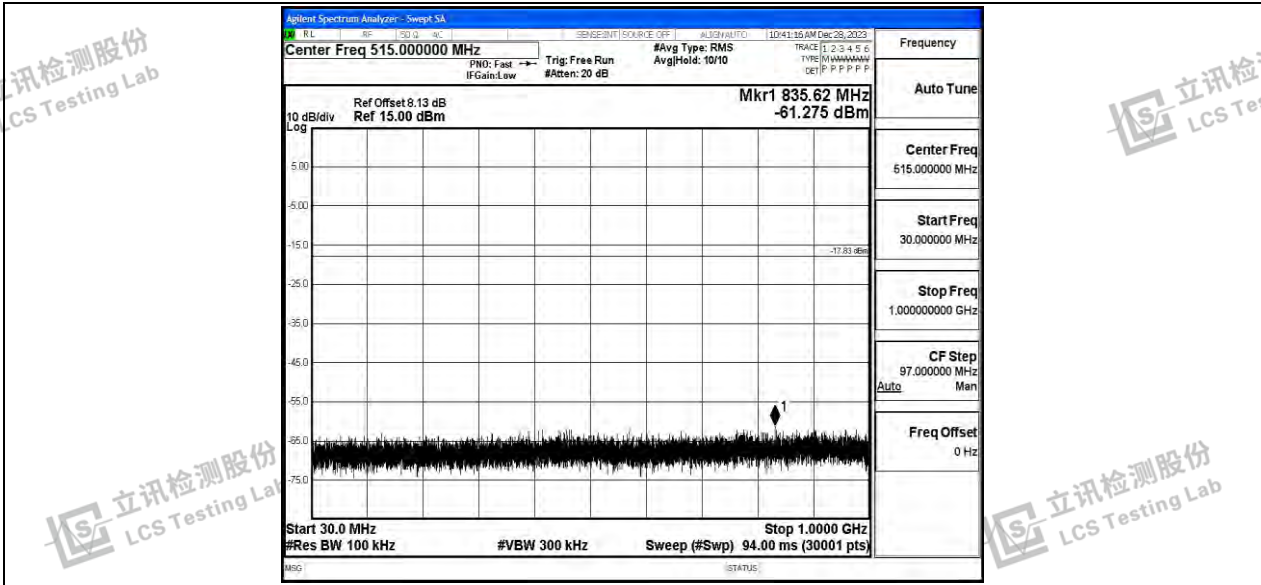


11B_Ant_2412_1000~26500

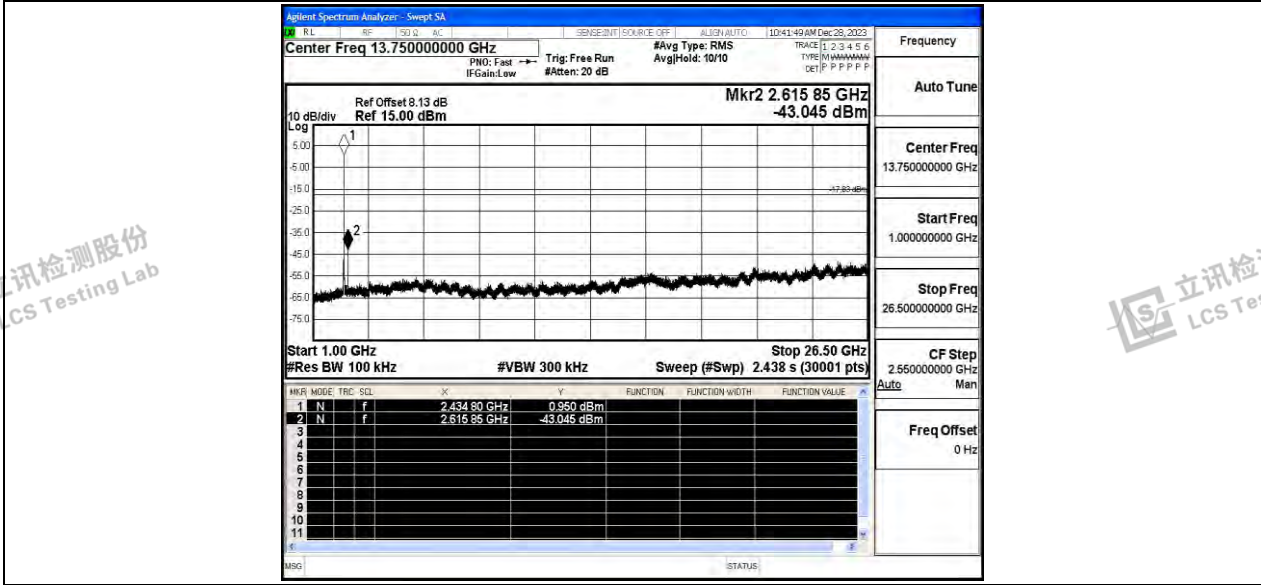


11B_Ant_2437_30~1000



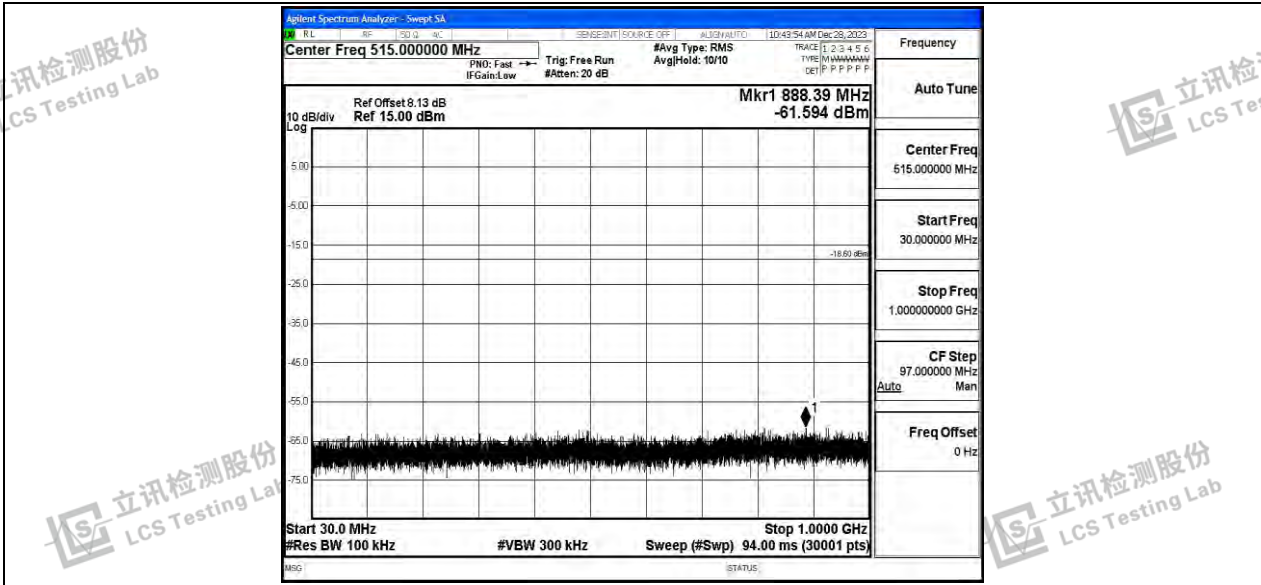


11B_Ant_2437_1000~26500

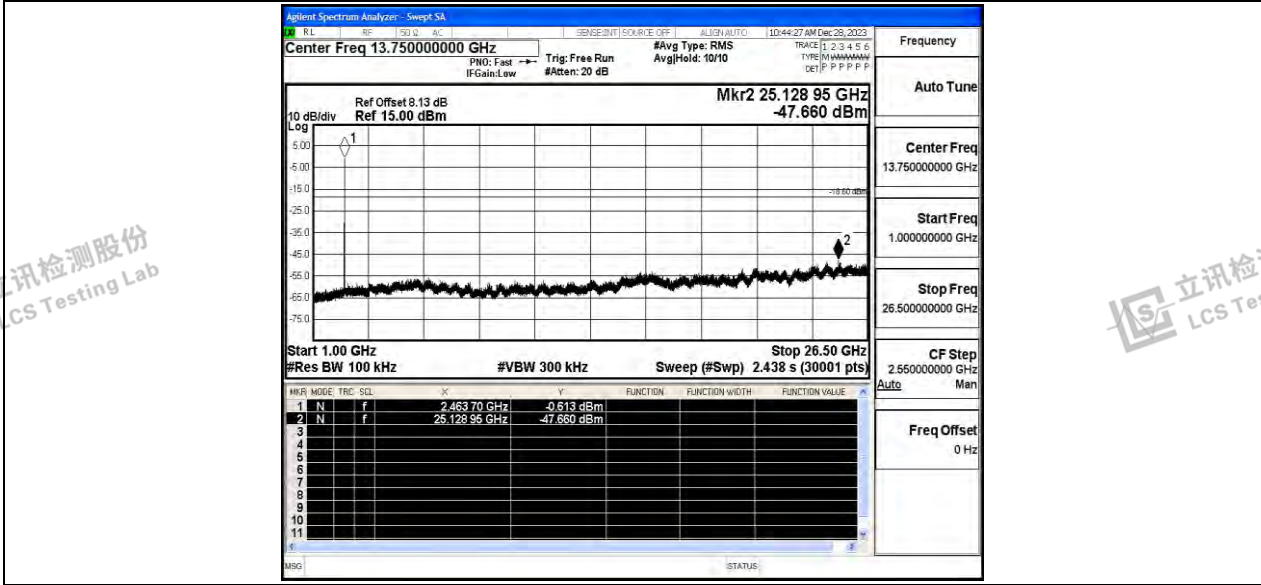


11B_Ant_2462_30~1000



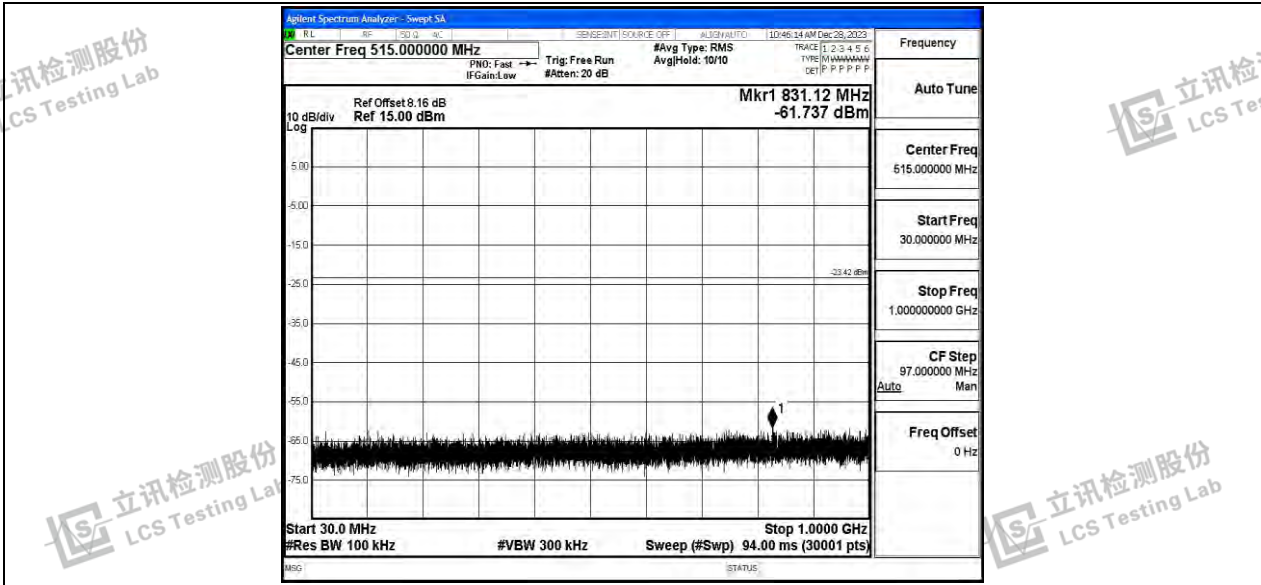


11B_Ant_2462_1000~26500

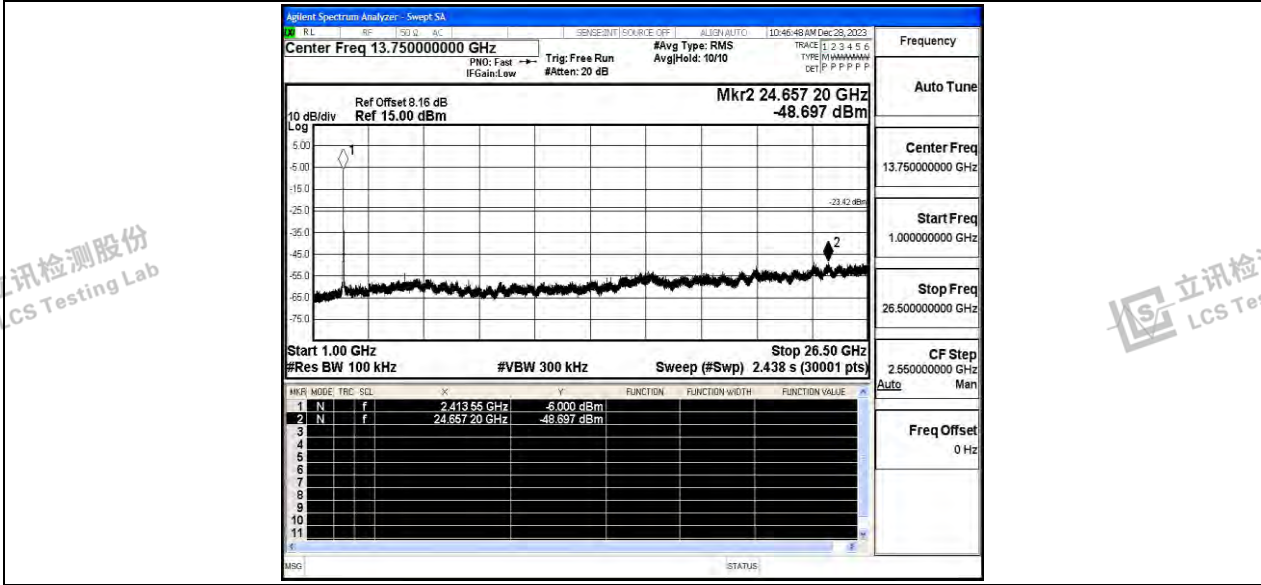


11G_Ant_2412_30~1000



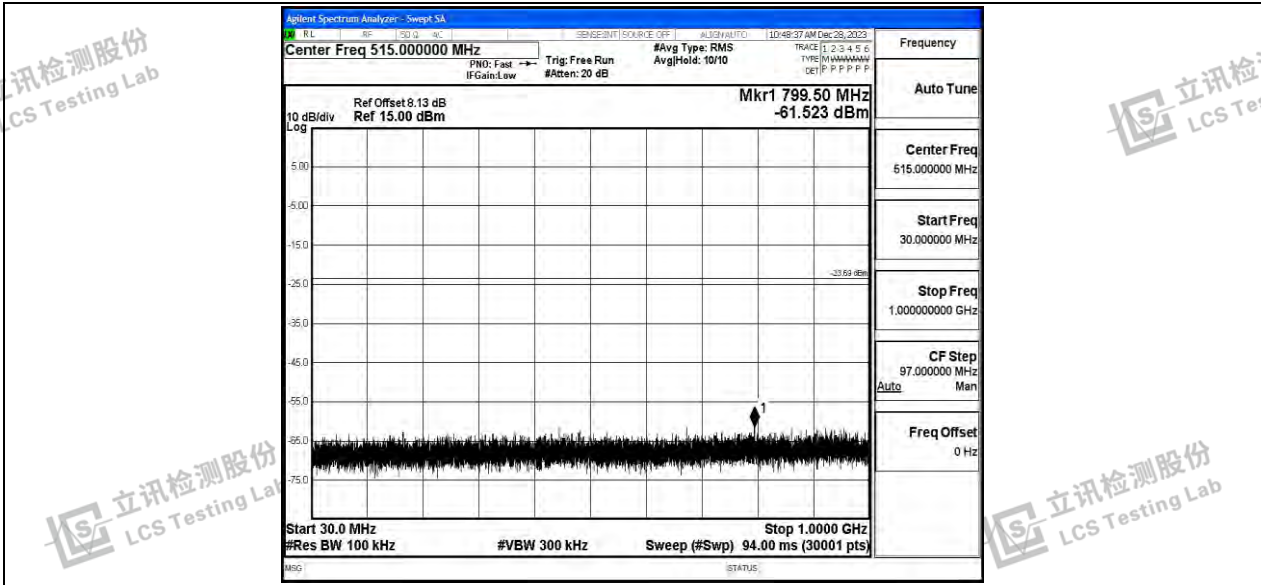


11G_Ant_2412_1000~26500

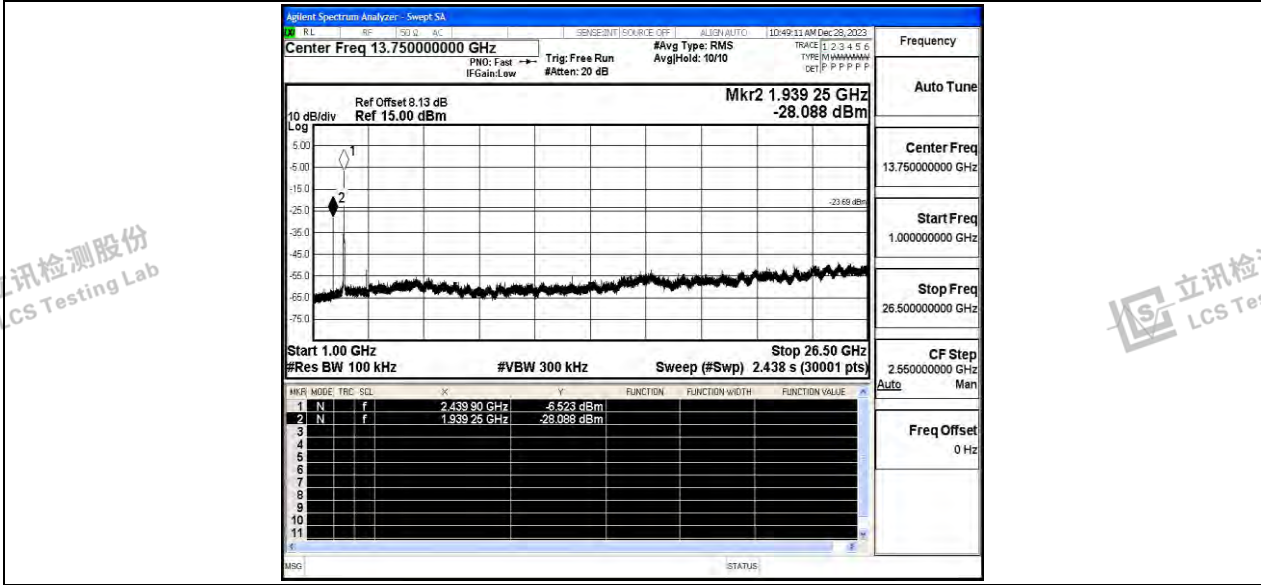


11G_Ant_2437_30~1000



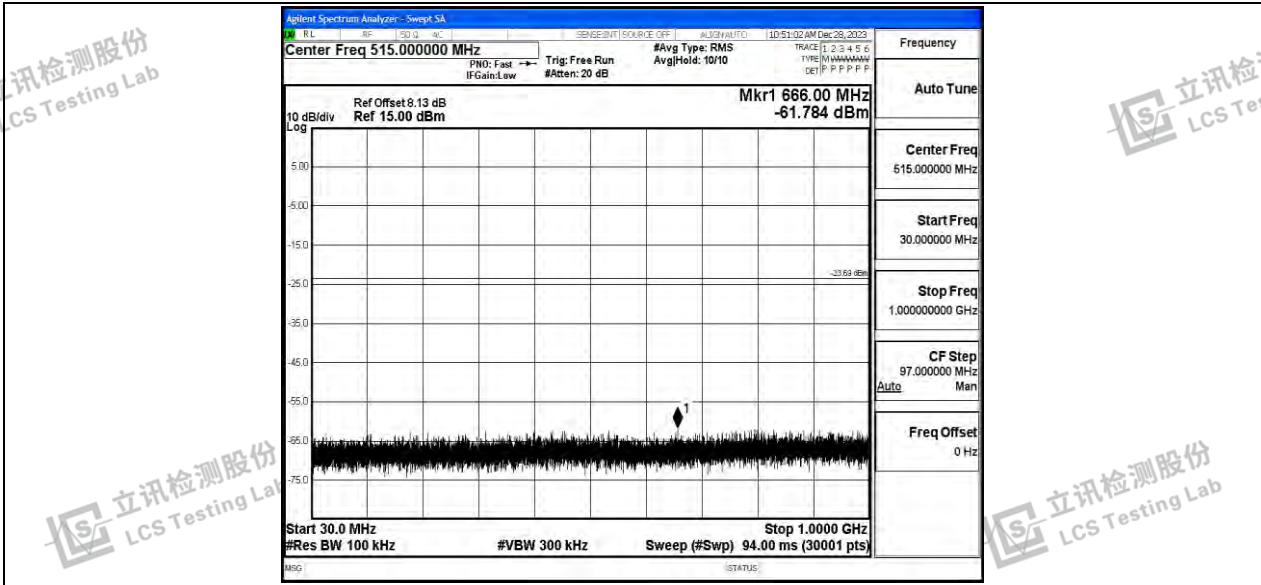


11G_Ant_2437_1000~26500

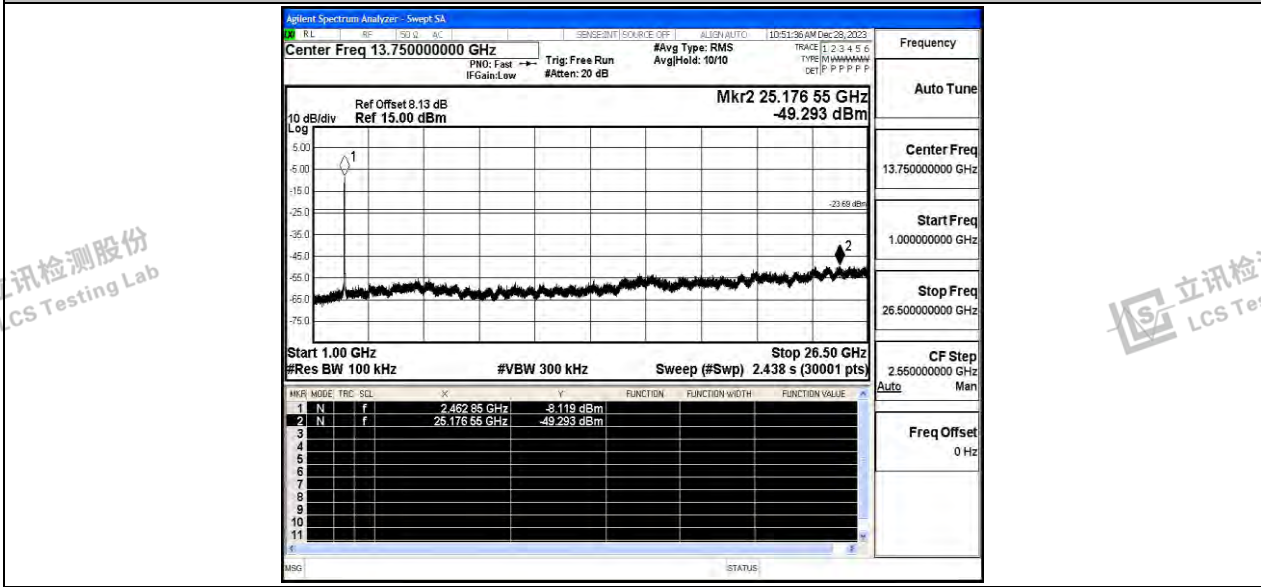


11G_Ant_2462_30~1000



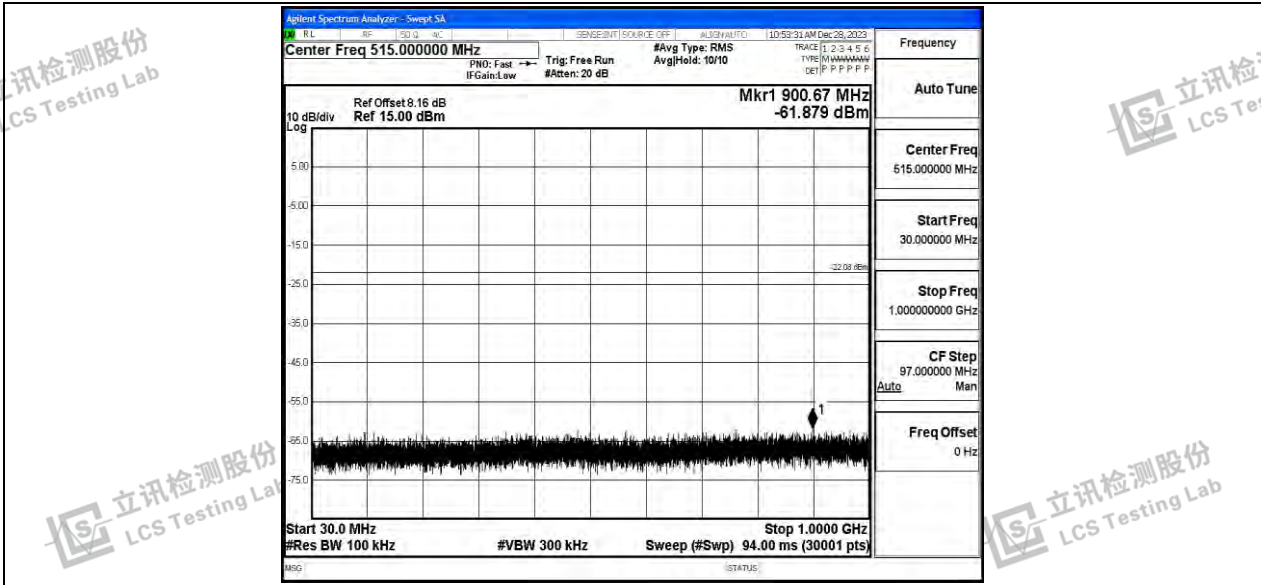


11G_Ant_2462_1000~26500

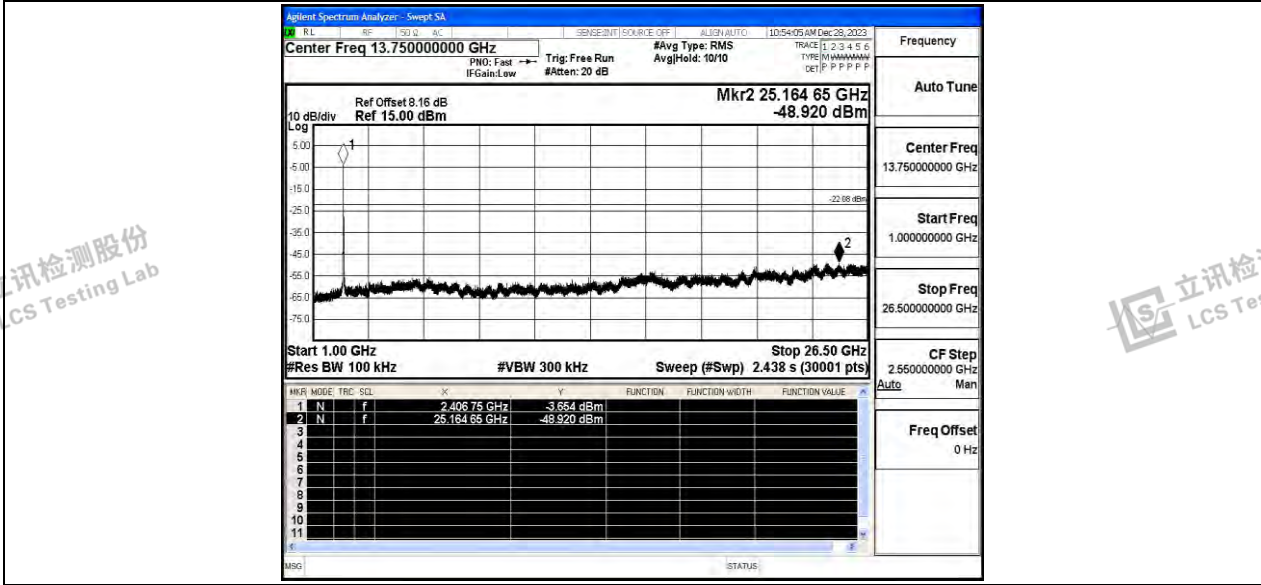


11N20SISO_Ant_2412_30~1000



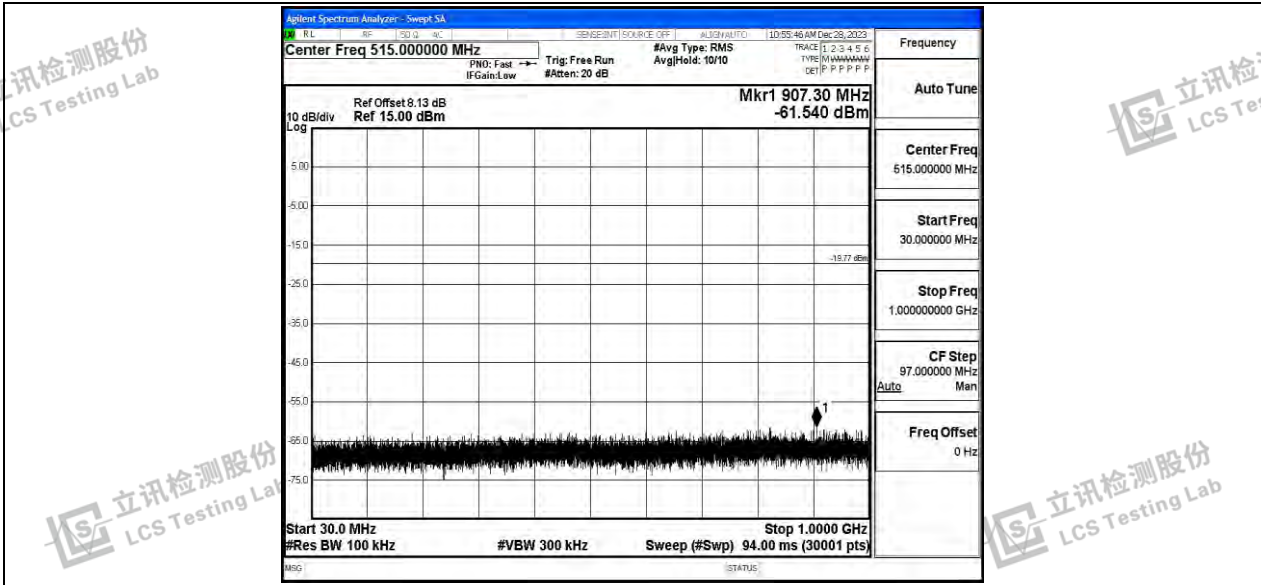


11N20SISO_Ant_2412_1000~26500

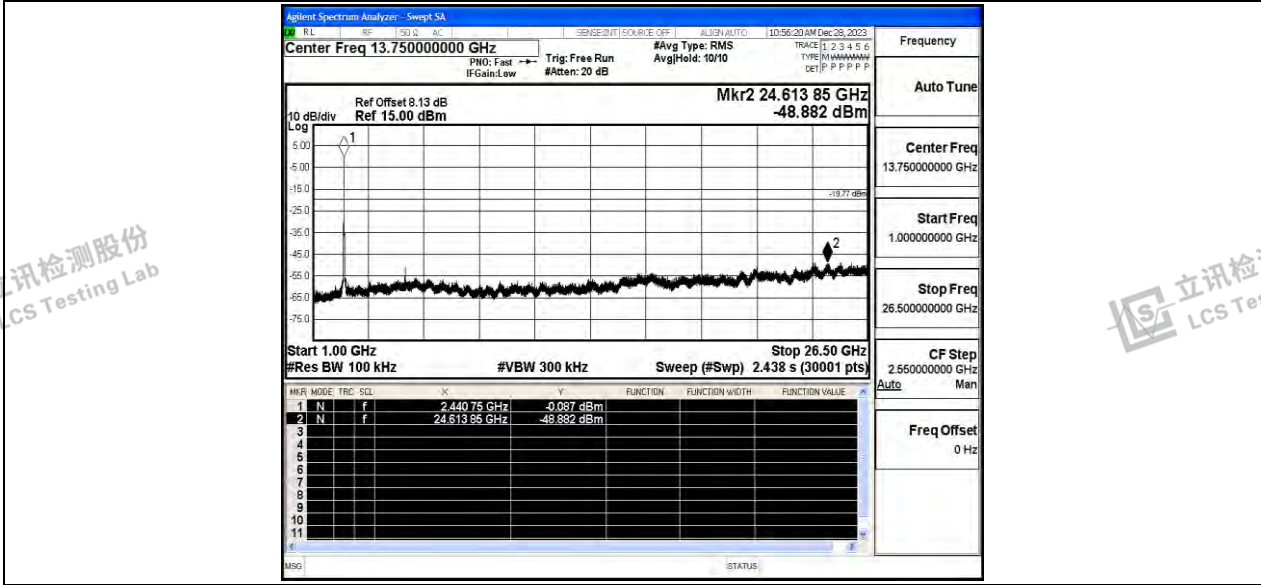


11N20SISO_Ant_2437_30~1000



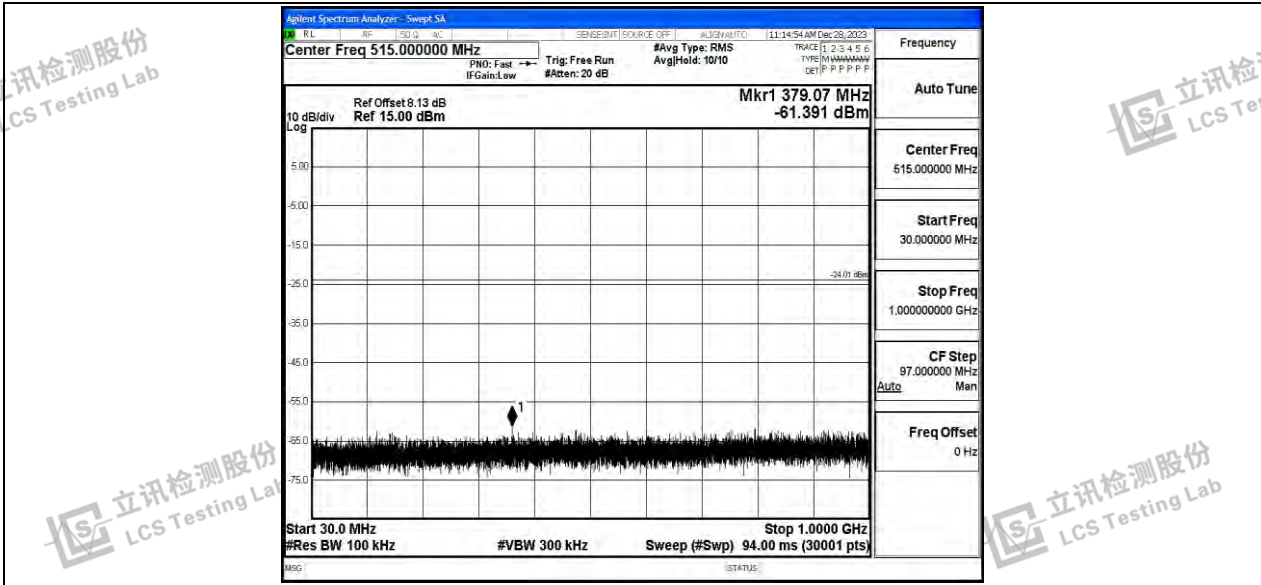


11N20SISO_Ant_2437_1000~26500

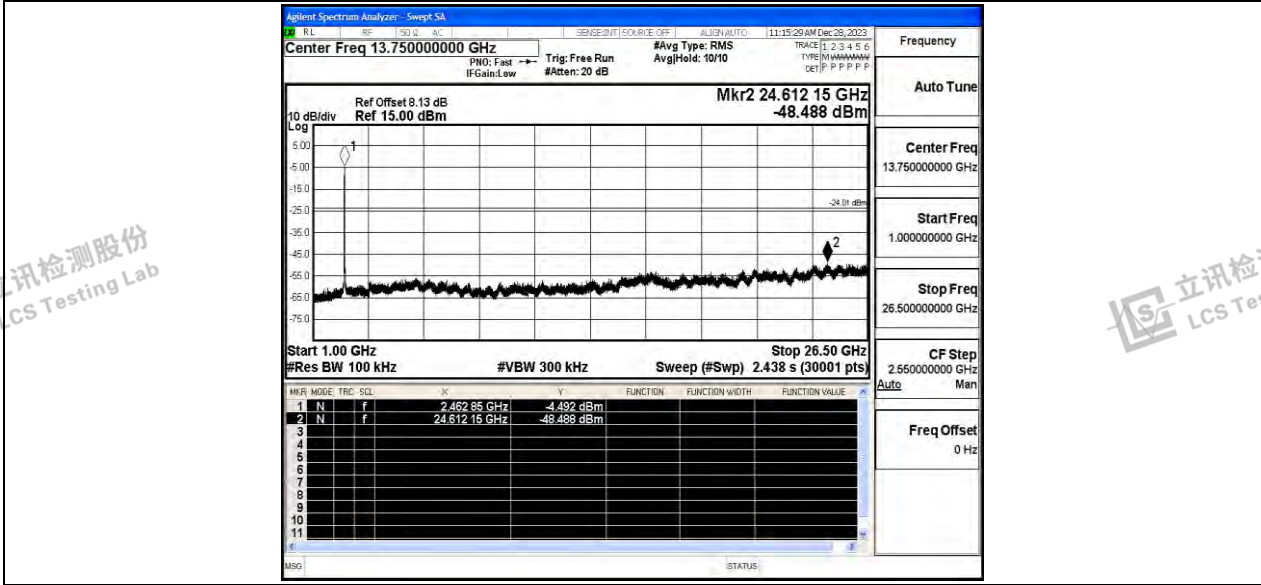


11N20SISO_Ant_2462_30~1000



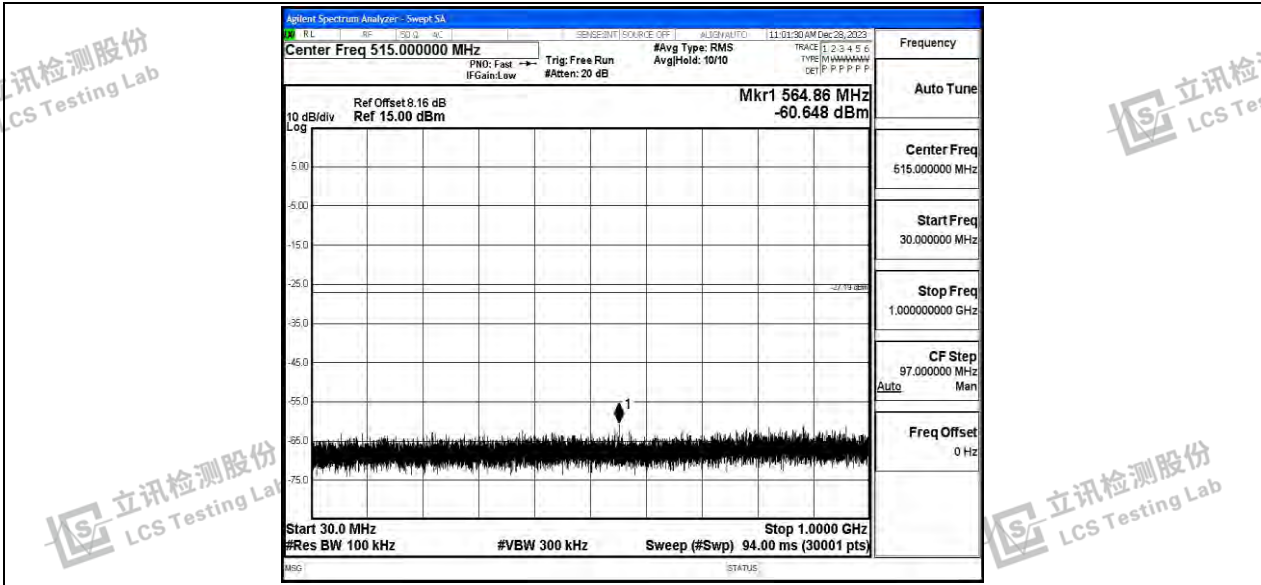


11N20SISO_Ant_2462_1000~26500

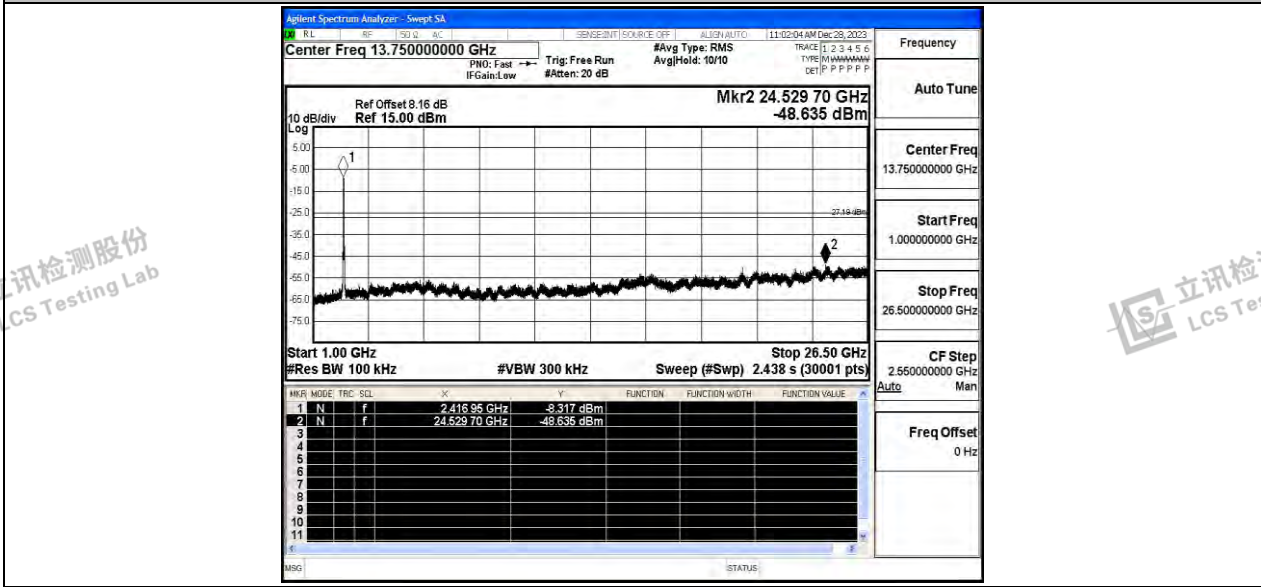


11N40SISO_Ant_2422_30~1000



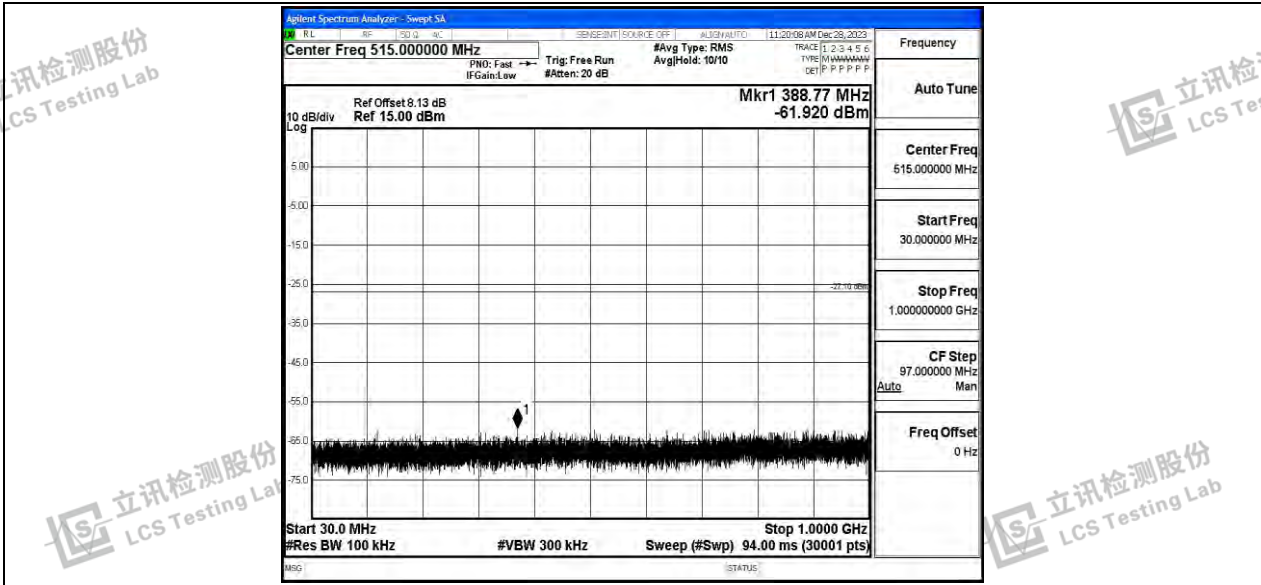


11N40SISO_Ant_2422_1000~26500

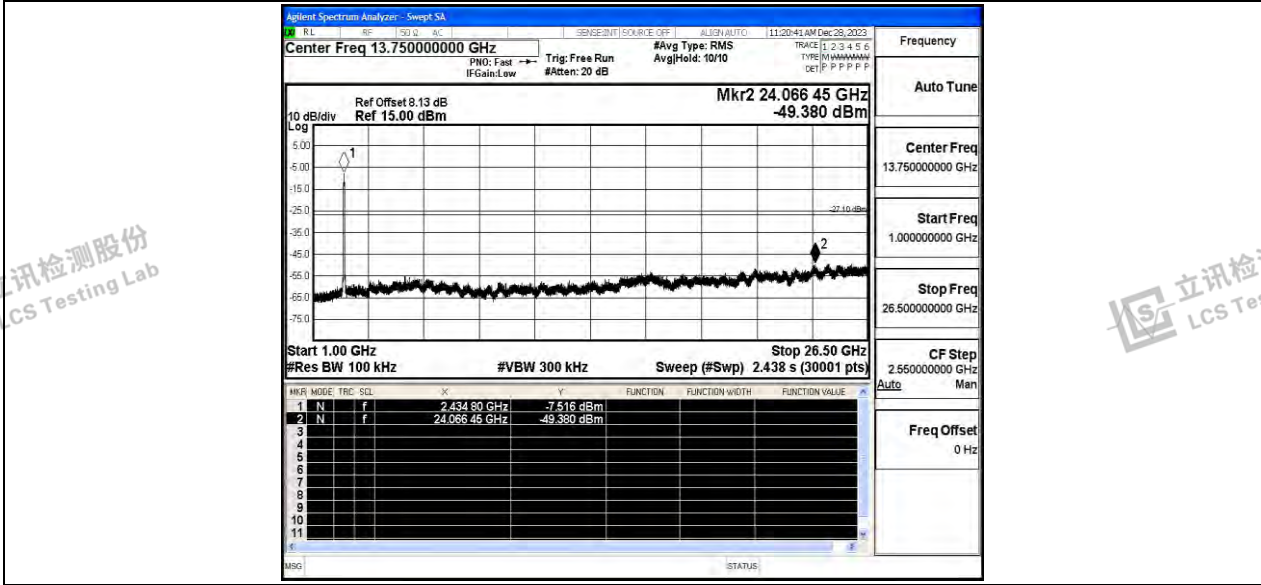


11N40SISO_Ant_2437_30~1000



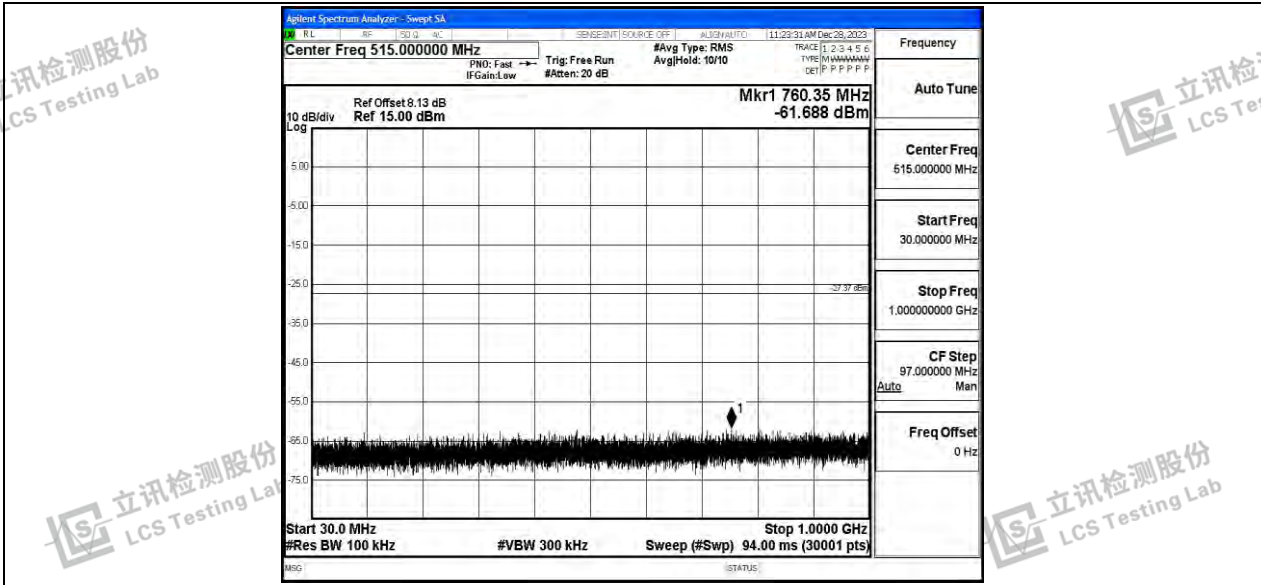


11N40SISO_Ant_2437_1000~26500

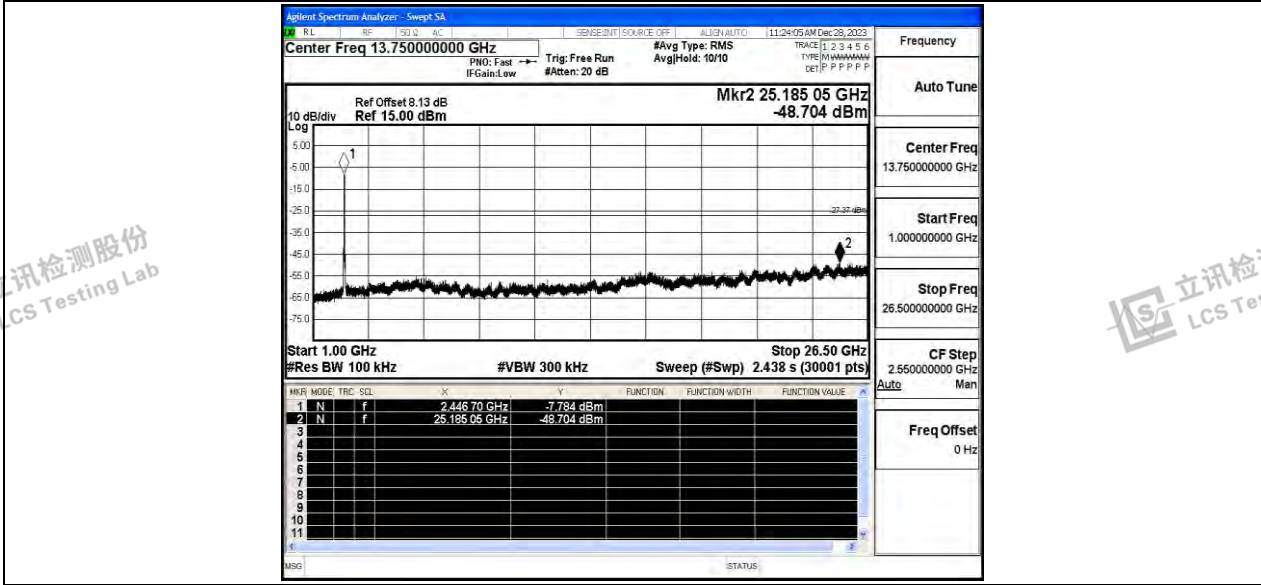


11N40SISO_Ant_2452_30~1000





11N40SISO_Ant_2452_1000~26500





Reference level measurement

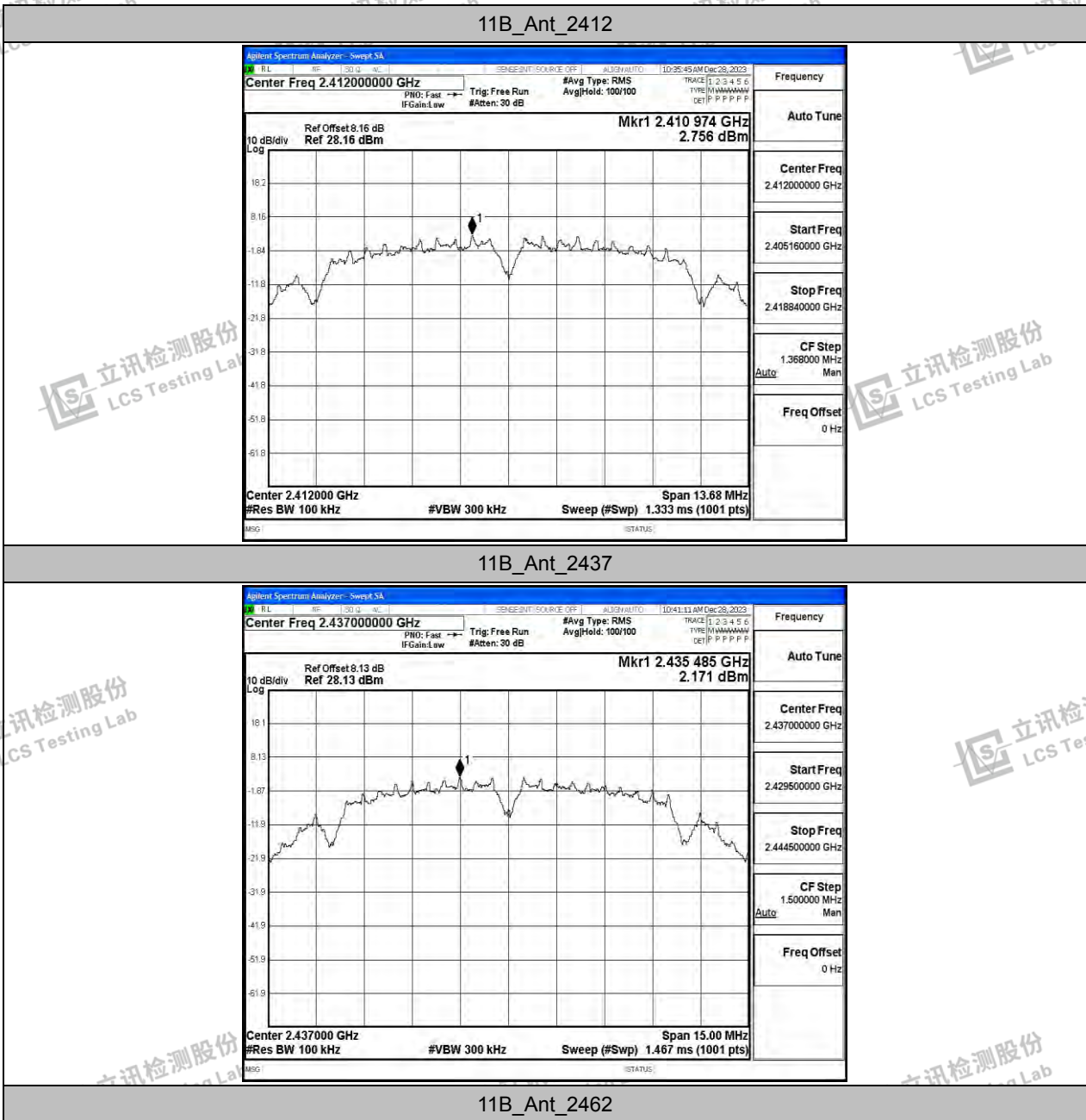
Test Result

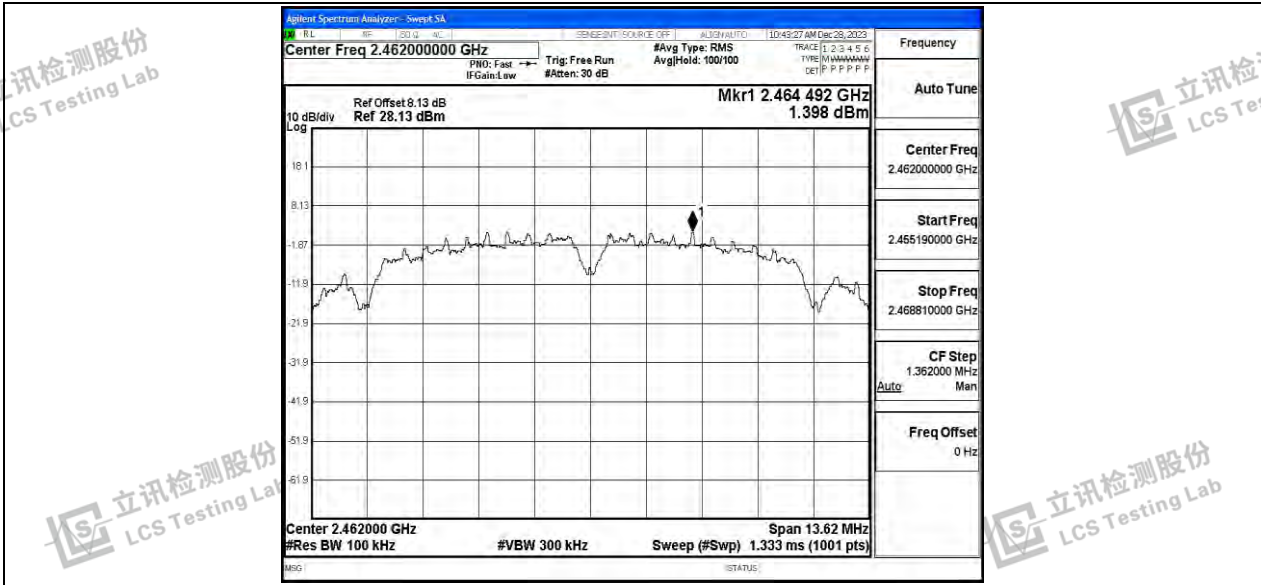
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
11B	Ant	2412	2410.97	2.76
		2437	2435.49	2.17
		2462	2464.49	1.40
11G	Ant	2412	2413.20	-3.42
		2437	2435.75	-3.69
		2462	2463.26	-3.69
11N20SISO	Ant	2412	2410.71	-2.08
		2437	2439.48	0.23
		2462	2464.48	-4.01
11N40SISO	Ant	2422	2424.48	-7.19
		2437	2434.47	-7.10
		2452	2449.48	-7.37



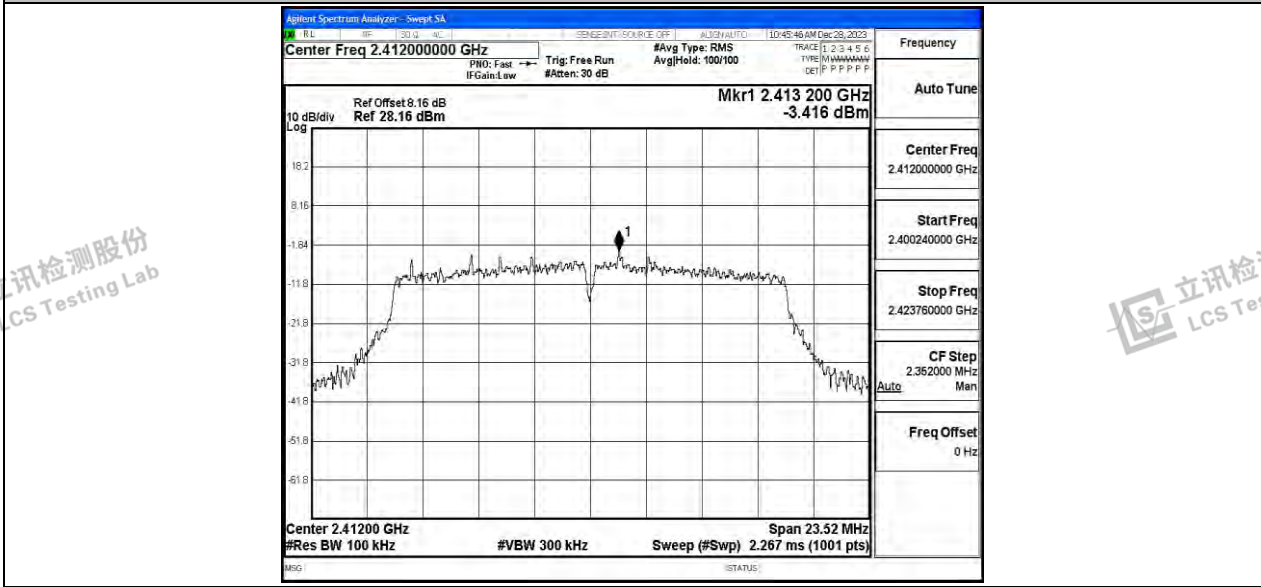


Test Graphs



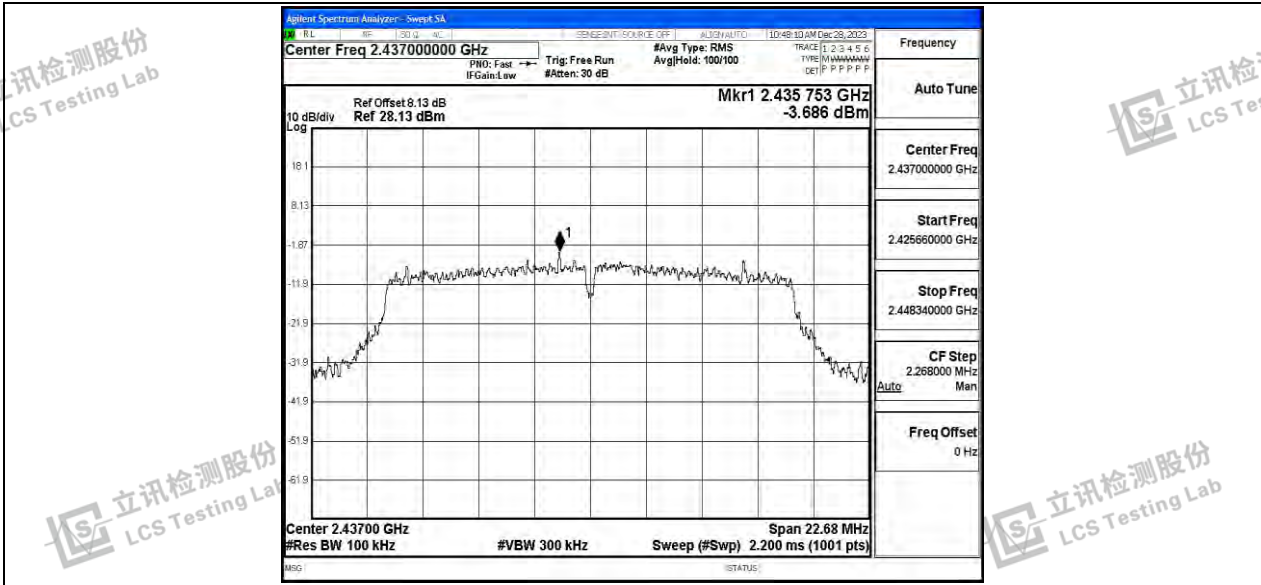


11G_Ant_2412

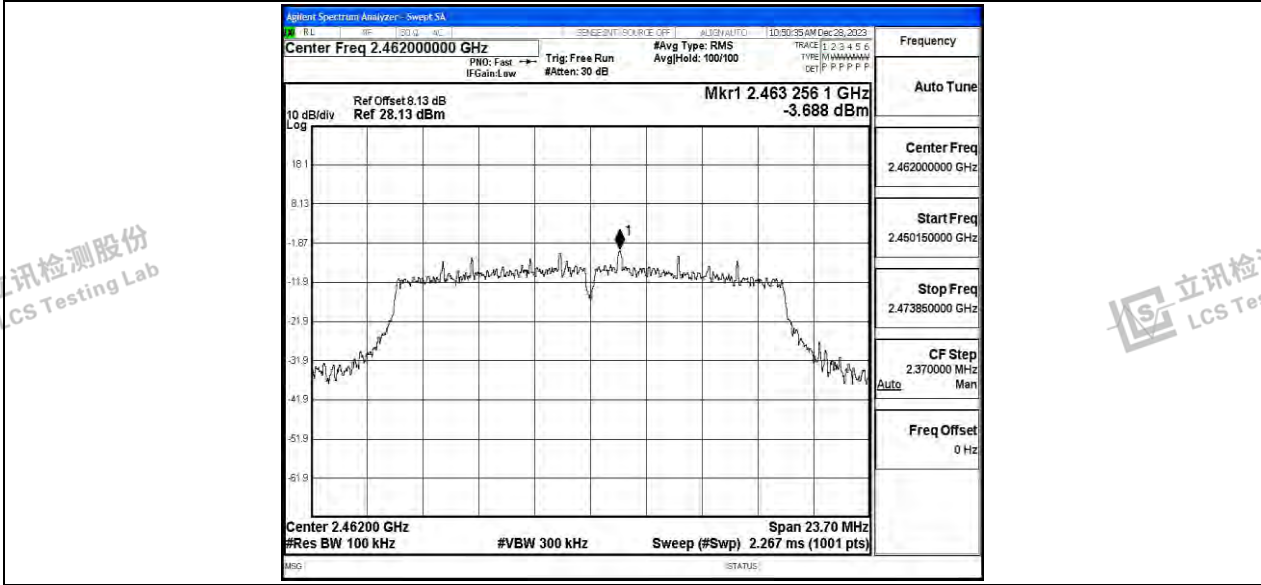


11G_Ant_2437



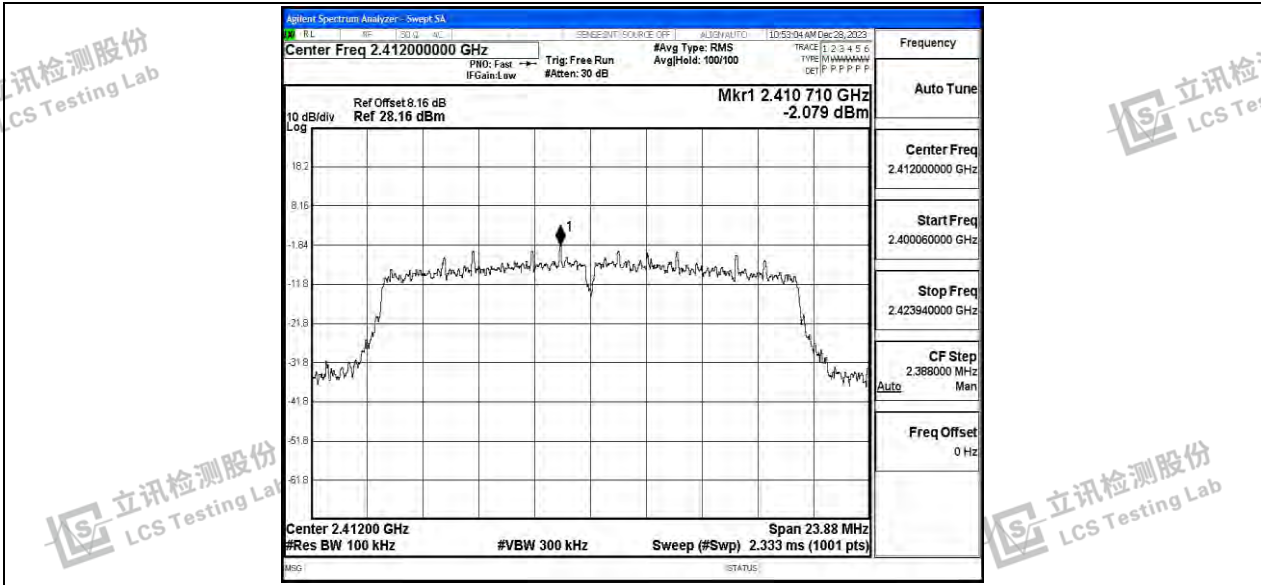


11G_Ant_2462

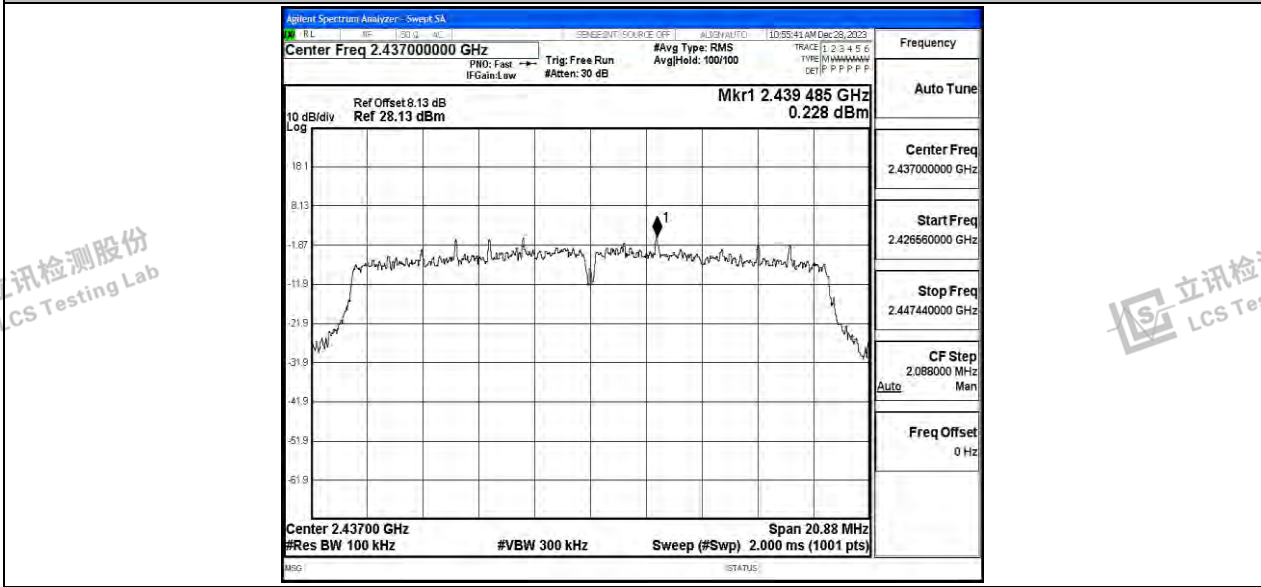


11N20SISO_Ant_2412



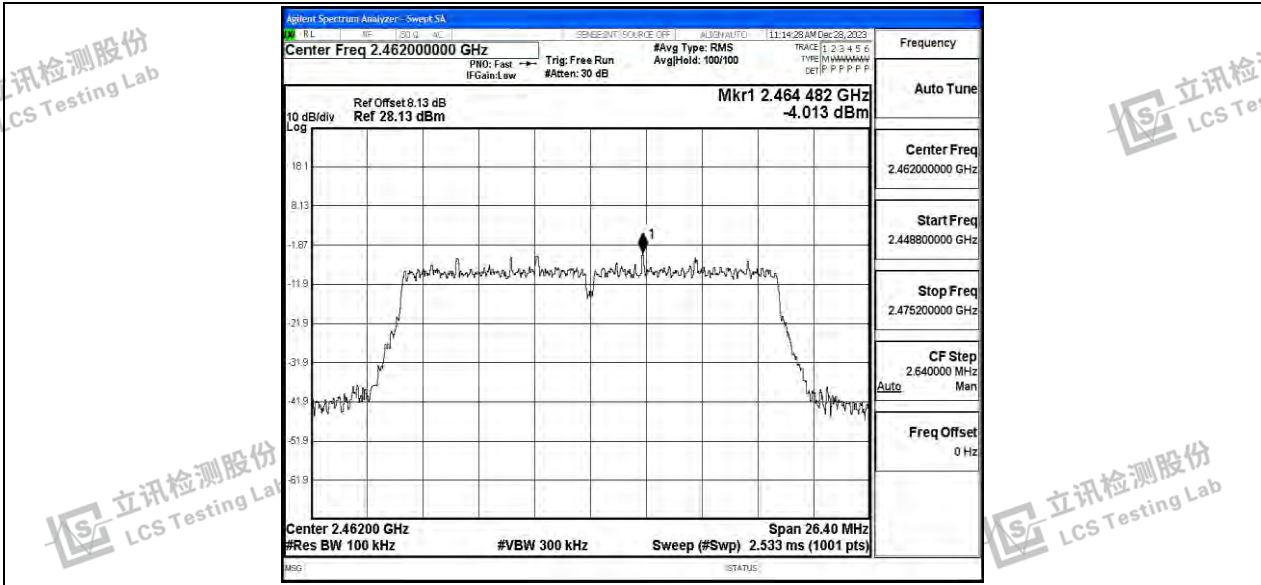


11N20SISO_Ant_2437

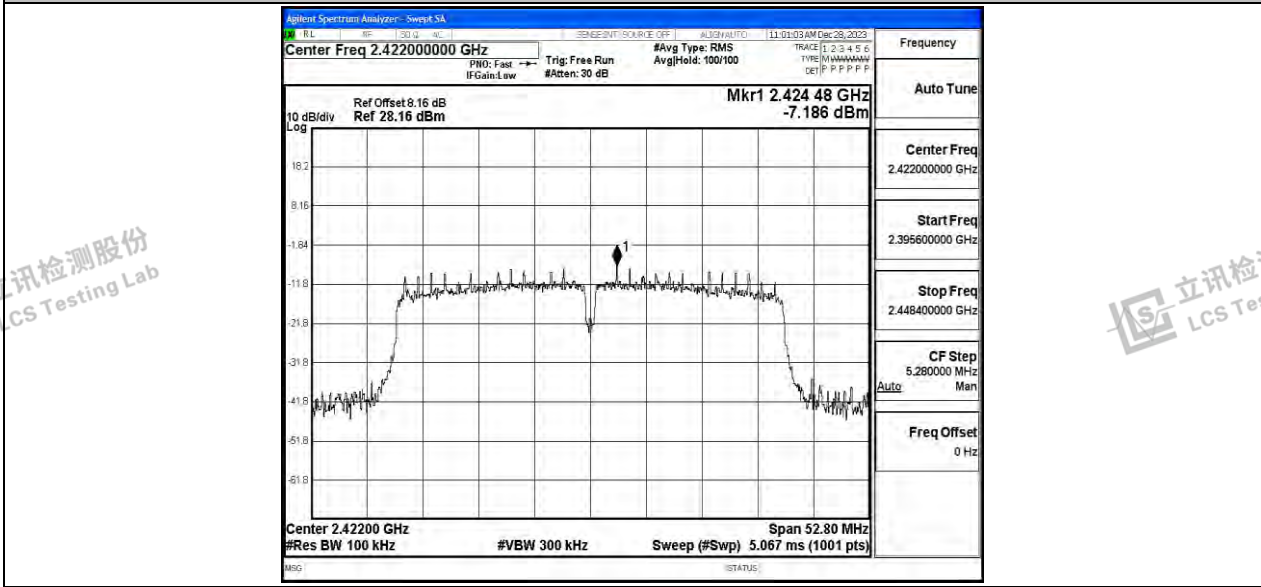


11N20SISO_Ant_2462



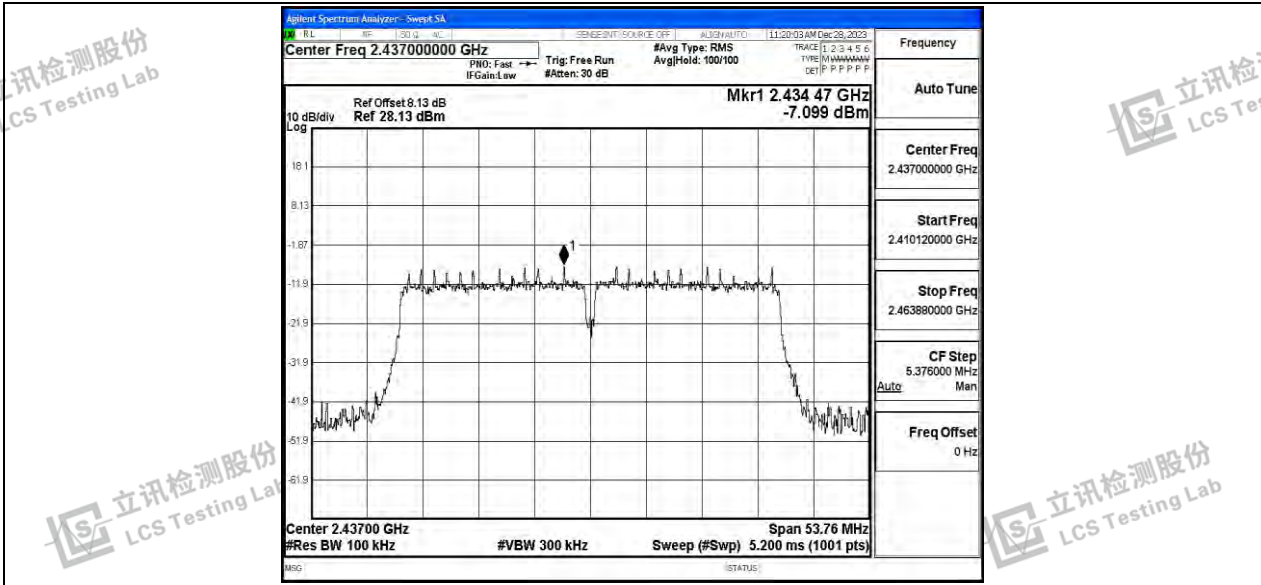


11N40SISO_Ant_2422

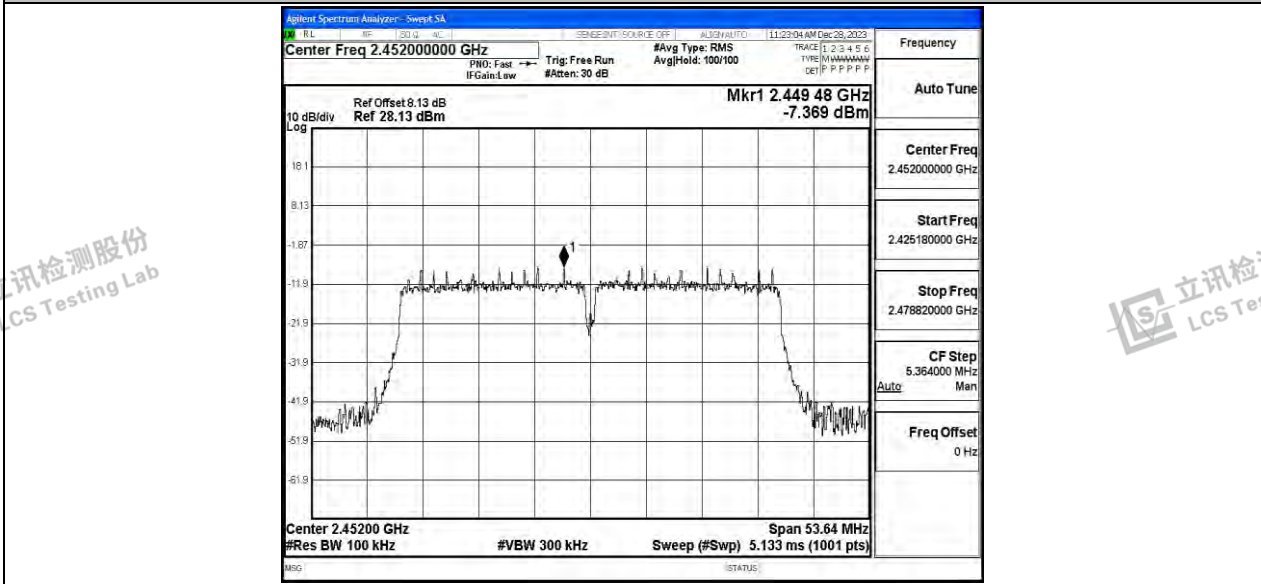


11N40SISO_Ant_2437





11N40SISO_Ant_2452





A.6 Duty Cycle

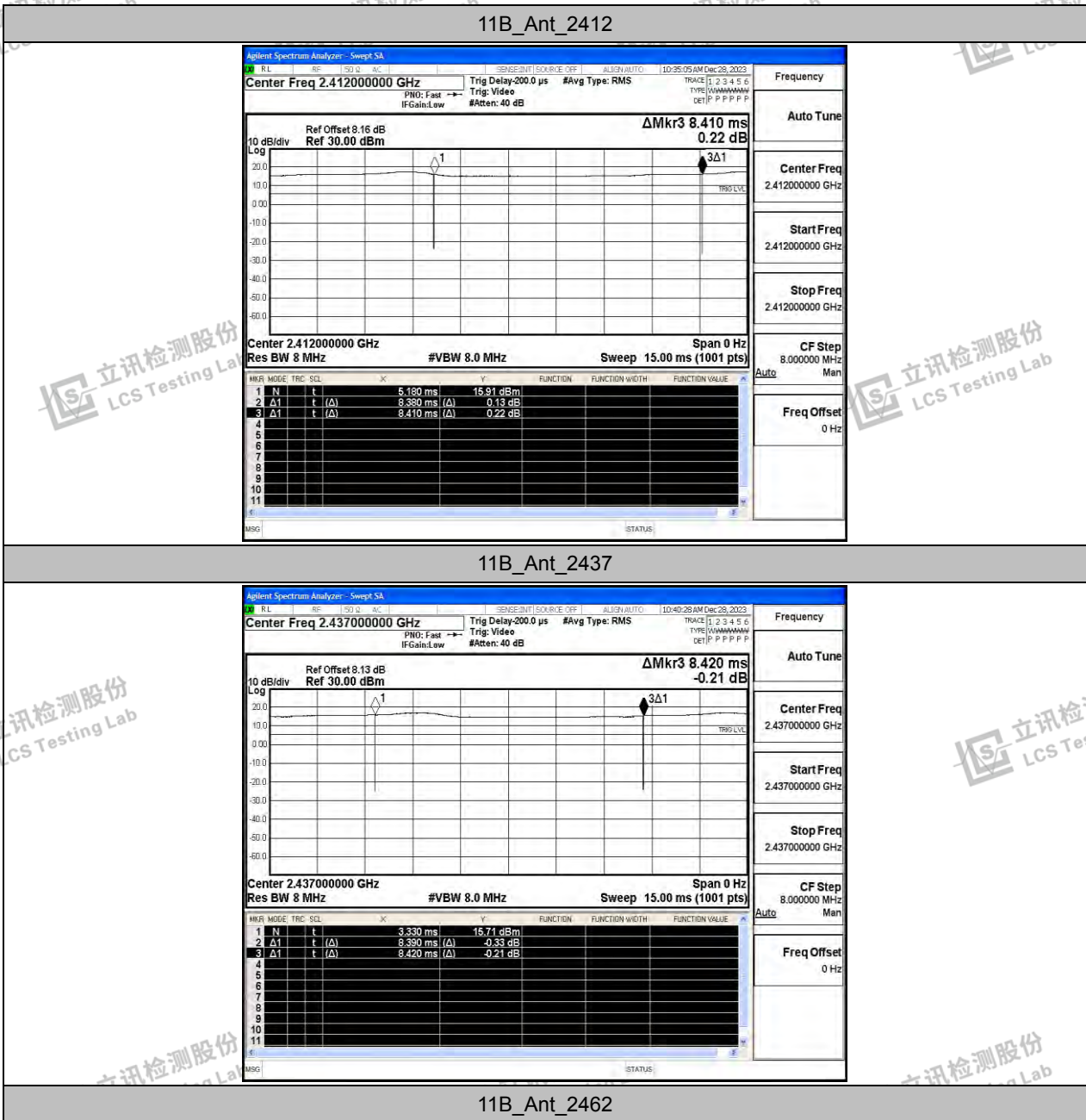
Test Result

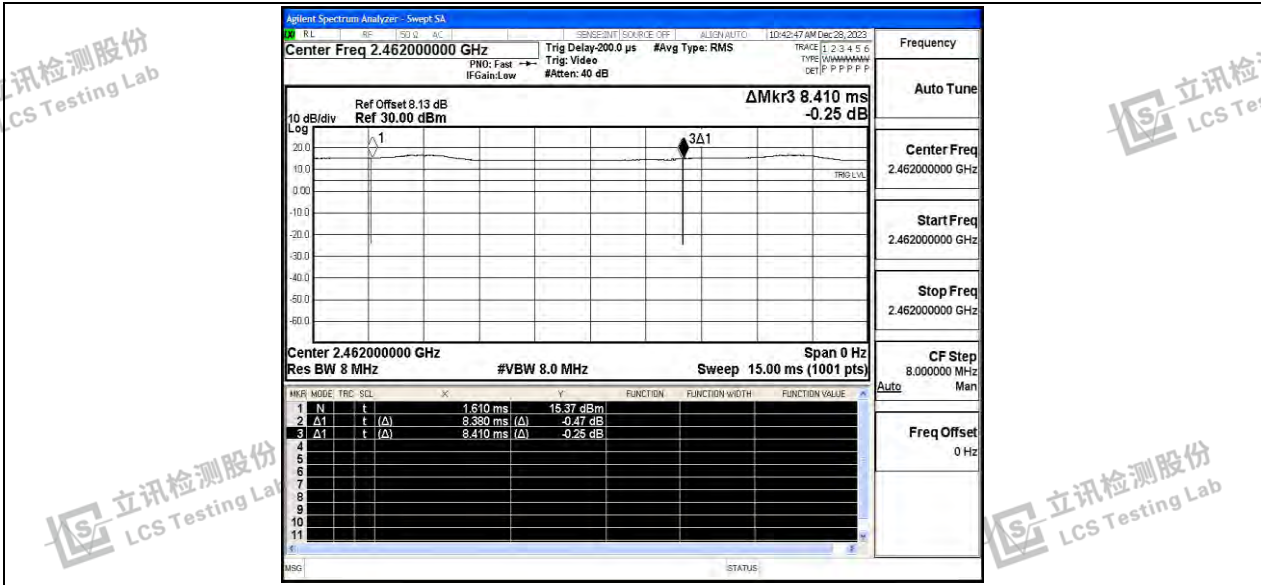
TestMode	Antenna	Freq(MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor	1/T Factor[kHz]	Verdict
11B	Ant	2412	8.38	8.41	99.64	0.02	0.12	---
		2437	8.39	8.42	99.64	0.02	0.12	---
		2462	8.38	8.41	99.64	0.02	0.12	---
11G	Ant	2412	1.39	1.42	97.89	0.09	0.72	---
		2437	1.39	1.42	97.89	0.09	0.72	---
		2462	1.39	1.43	97.20	0.12	0.72	---
11N20SISO	Ant	2412	1.30	1.34	97.01	0.13	0.77	---
		2437	1.30	1.34	97.01	0.13	0.77	---
		2462	1.30	1.34	97.01	0.13	0.77	---
11N40SISO	Ant	2422	0.65	0.68	95.59	0.20	1.54	---
		2437	0.65	0.68	95.59	0.20	1.54	---
		2452	0.64	0.68	94.12	0.26	1.56	---



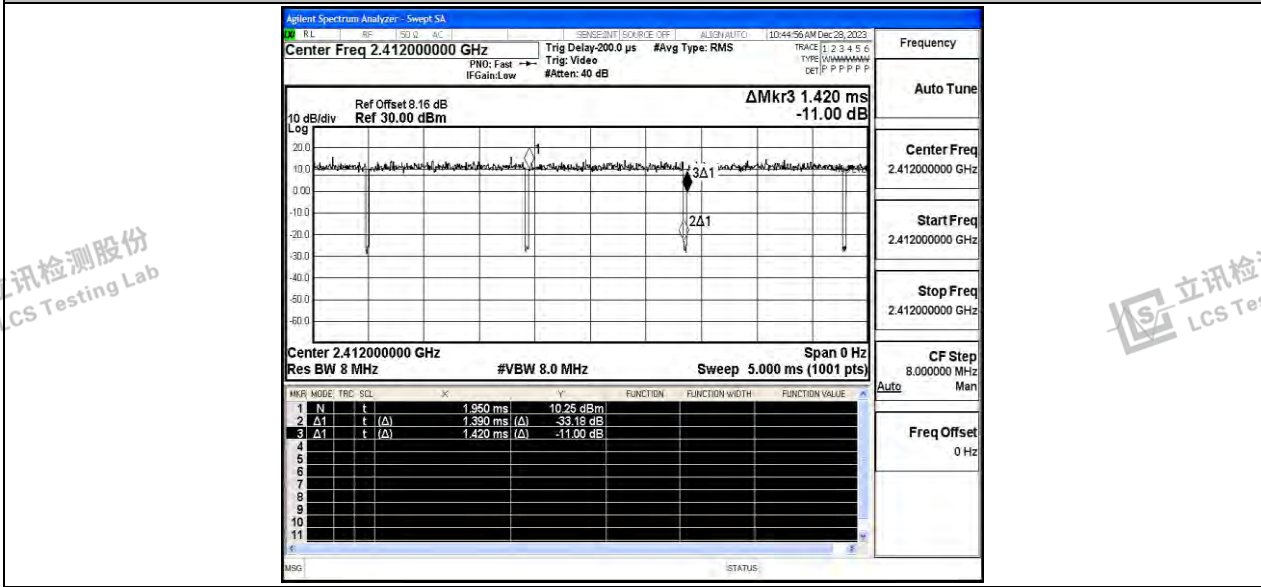


Test Graphs



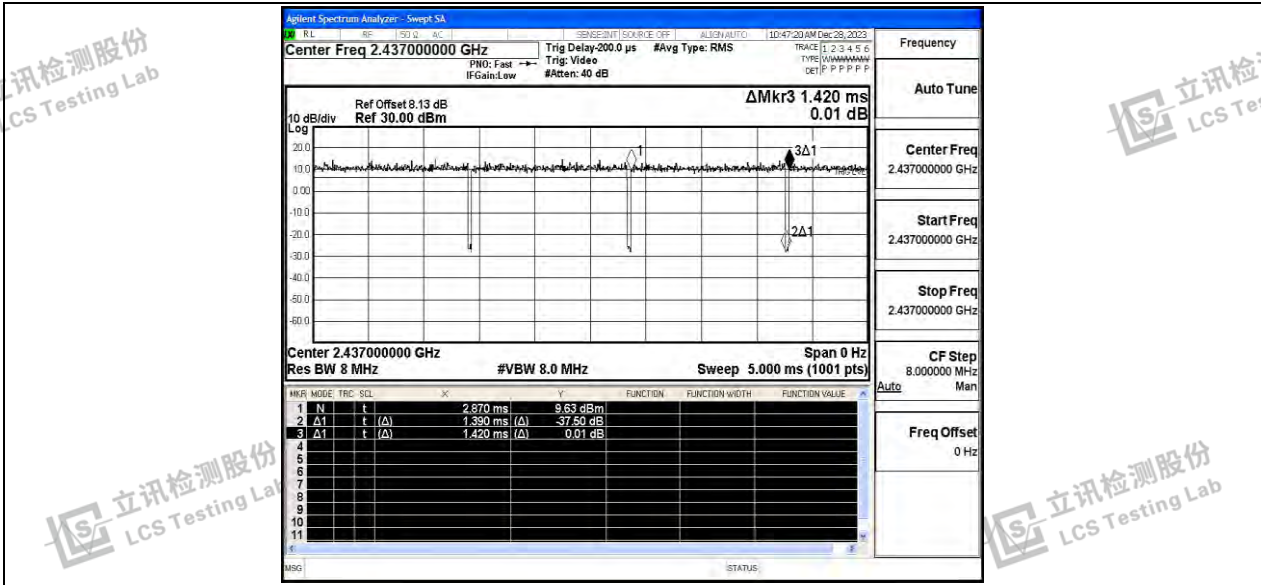


11G_Ant_2412

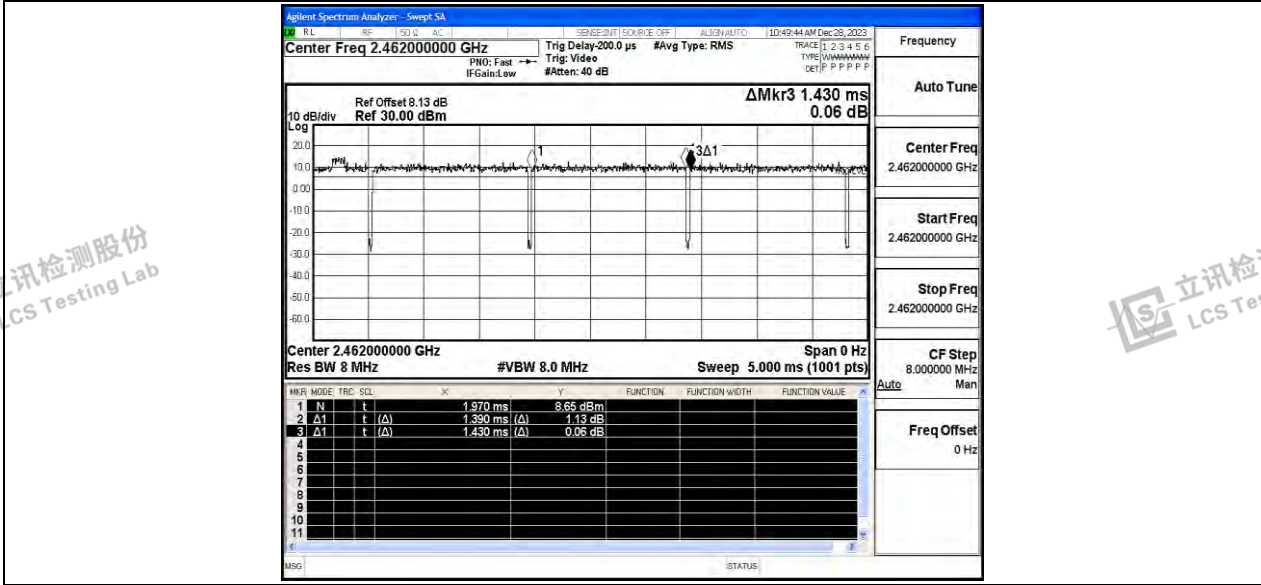


11G_Ant_2437



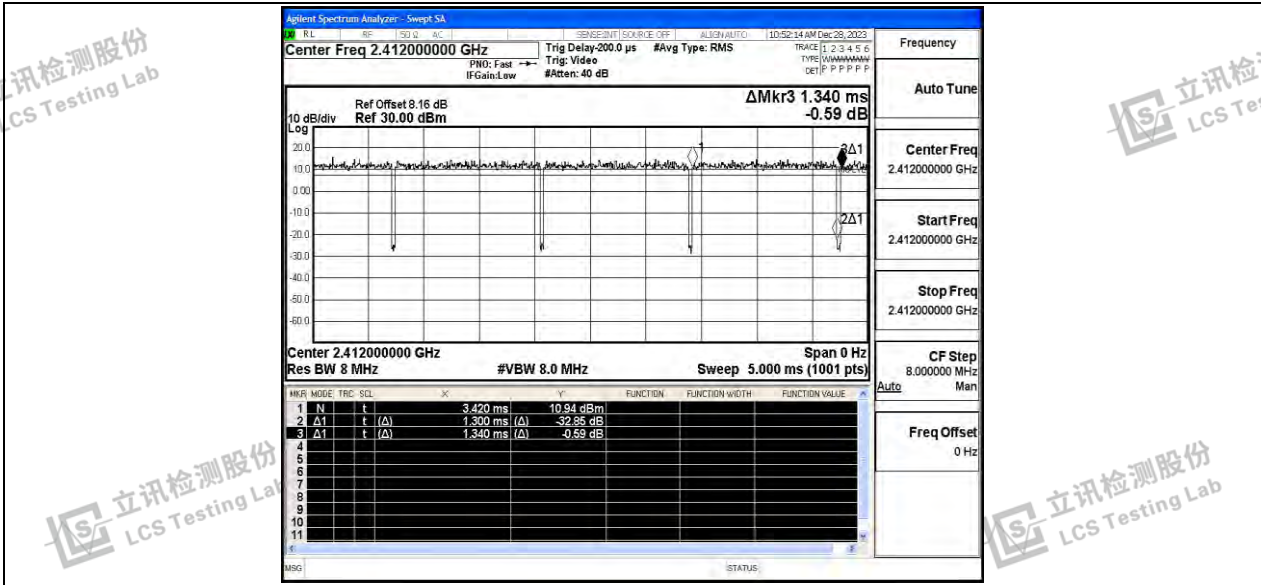


11G_Ant_2462

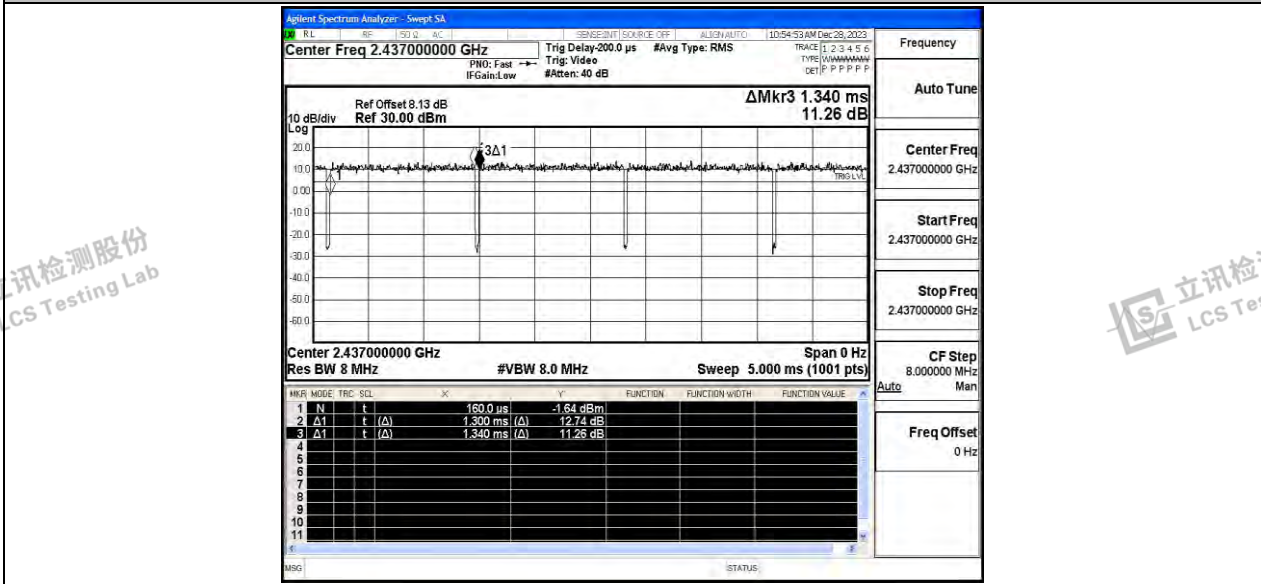


11N20SISO_Ant_2412



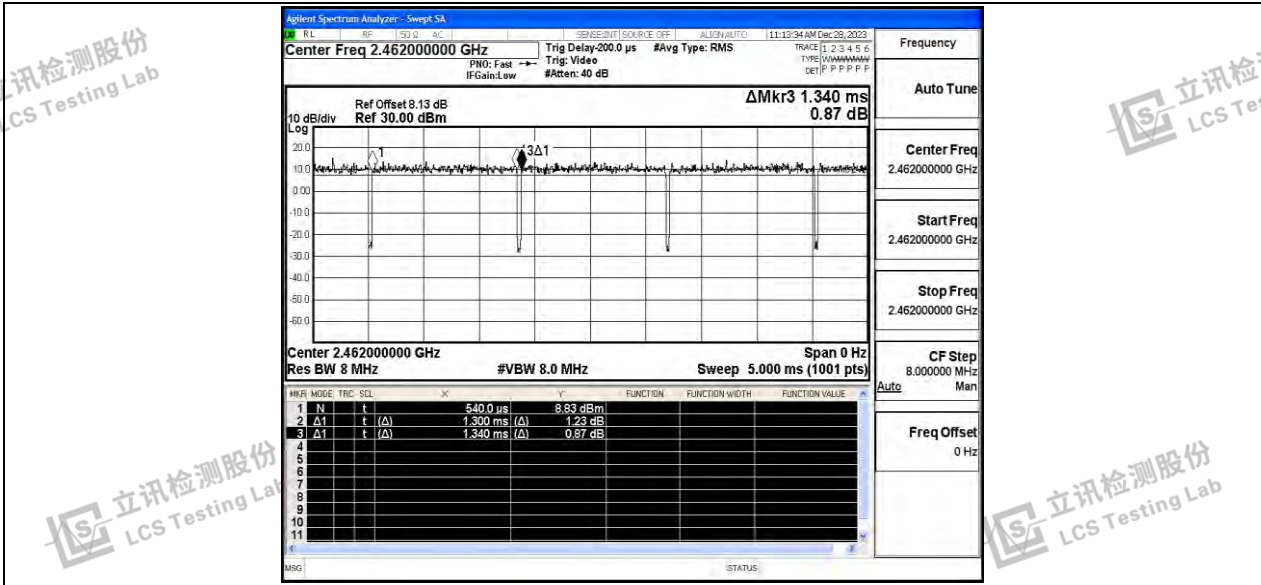


11N20SISO_Ant_2437

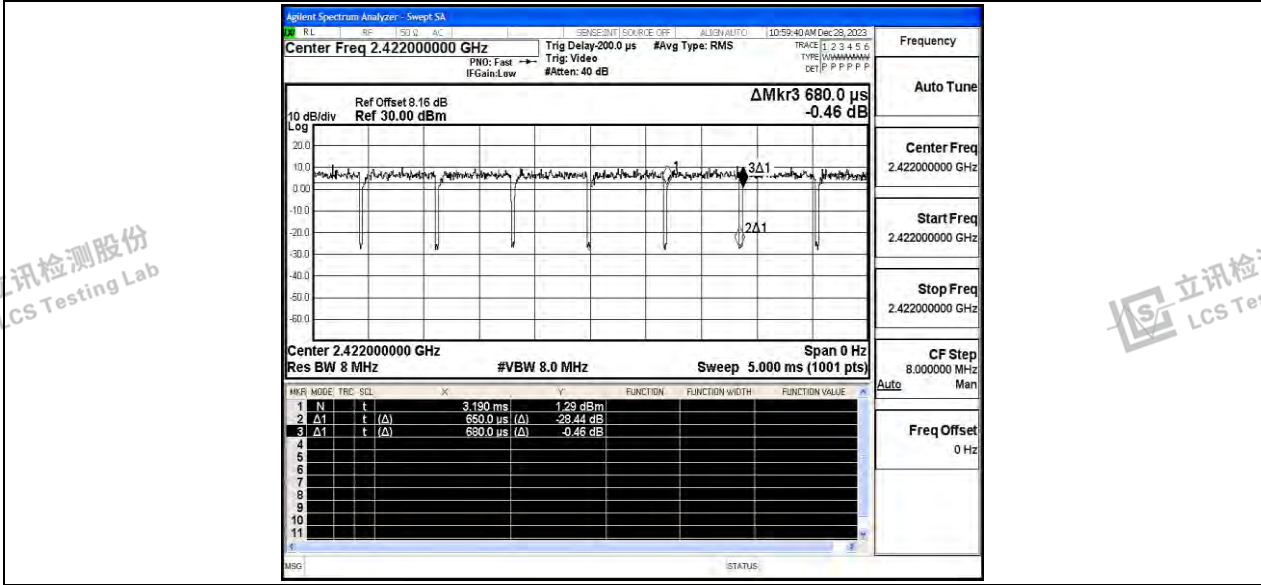


11N20SISO_Ant_2462



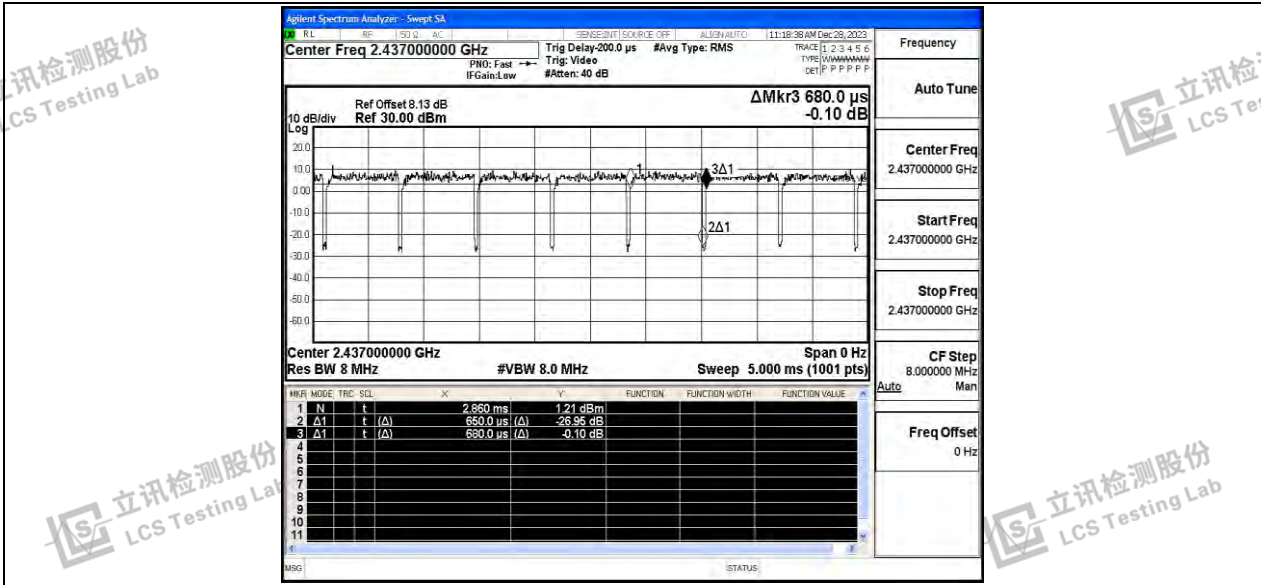


11N40SISO_Ant_2422

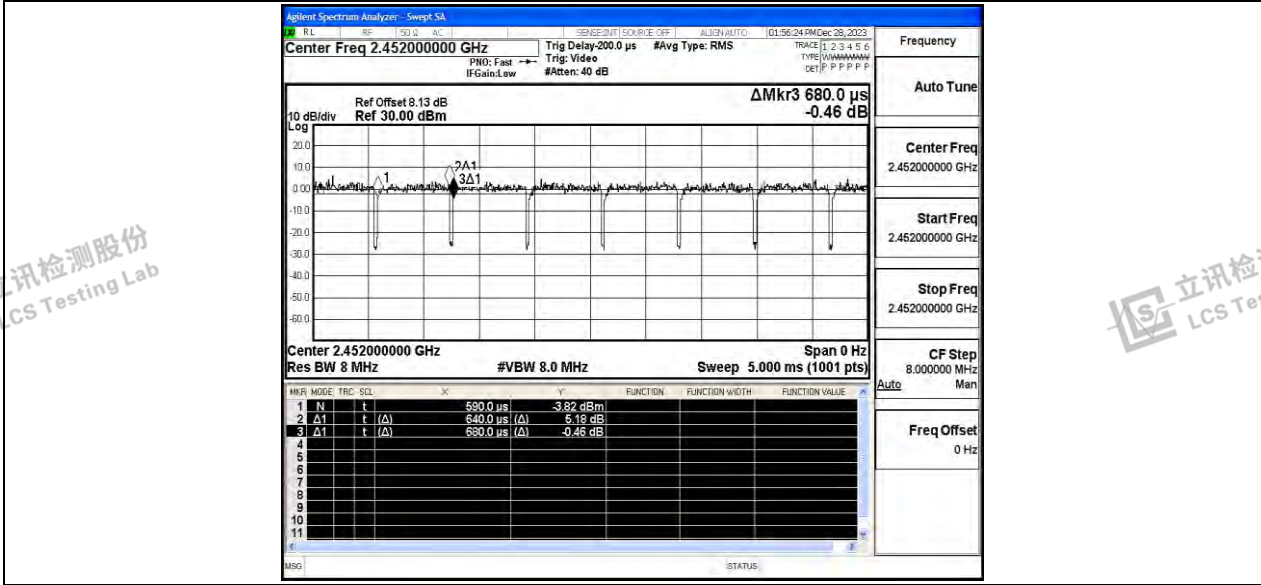


11N40SISO_Ant_2437





11N40SISO_Ant_2452





A.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	Channel Name	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant	Low	2412	AV	2310.000	-49.64	≤-41.20	45.56	≤54	PASS
				AV	2384.760	-48.43	≤-41.20	46.77	≤54	PASS
				AV	2390.000	-48.78	≤-41.20	46.42	≤54	PASS
				Peak	2310.000	-42.35	≤-21.20	52.85	≤74	PASS
				Peak	2389.700	-38.39	≤-21.20	56.81	≤74	PASS
				Peak	2390.000	-42.14	≤-21.20	53.06	≤74	PASS
		High	2462	AV	2483.500	-49.26	≤-41.20	45.94	≤54	PASS
				AV	2498.740	-48.32	≤-41.20	46.88	≤54	PASS
				AV	2500.000	-48.87	≤-41.20	46.33	≤54	PASS
				Peak	2483.500	-41.22	≤-21.20	53.98	≤74	PASS
				Peak	2491.480	-38.58	≤-21.20	56.62	≤74	PASS
				Peak	2500.000	-41.58	≤-21.20	53.62	≤74	PASS
11G	Ant	Low	2412	AV	2310.000	-49.6	≤-41.20	45.60	≤54	PASS
				AV	2389.570	-44.98	≤-41.20	50.22	≤54	PASS
				AV	2390.000	-45.22	≤-41.20	49.98	≤54	PASS
				Peak	2310.000	-40.98	≤-21.20	54.22	≤74	PASS
				Peak	2388.790	-26.26	≤-21.20	68.94	≤74	PASS
				Peak	2390.000	-37.59	≤-21.20	57.61	≤74	PASS
		High	2462	AV	2483.500	-45.14	≤-41.20	50.06	≤54	PASS
				AV	2483.560	-44.54	≤-41.20	50.66	≤54	PASS
				AV	2500.000	-48.2	≤-41.20	47.00	≤54	PASS
				Peak	2483.500	-35.28	≤-21.20	59.92	≤74	PASS
				Peak	2483.560	-32.71	≤-21.20	62.49	≤74	PASS
				Peak	2500.000	-41.02	≤-21.20	54.18	≤74	PASS
11N20SI SO	Ant	Low	2412	AV	2310.000	-49.95	≤-41.20	45.25	≤54	PASS
				AV	2389.570	-43.38	≤-41.20	51.82	≤54	PASS
				AV	2390.000	-44.03	≤-41.20	51.17	≤54	PASS
				Peak	2310.000	-40.56	≤-21.20	54.64	≤74	PASS
				Peak	2385.280	-27.81	≤-21.20	67.39	≤74	PASS
				Peak	2390.000	-35.15	≤-21.20	60.05	≤74	PASS
		High	2462	AV	2483.500	-42.98	≤-41.20	52.22	≤54	PASS
				AV	2483.890	-42.83	≤-41.20	52.37	≤54	PASS
				AV	2500.000	-49.09	≤-41.20	46.11	≤54	PASS
				Peak	2483.500	-33.37	≤-21.20	61.83	≤74	PASS
				Peak	2484.440	-29.98	≤-21.20	65.22	≤74	PASS
				Peak	2500.000	-41.53	≤-21.20	53.67	≤74	PASS
11N40SI	Ant	Low	2422	AV	2310.000	-49.75	≤-41.20	45.45	≤54	PASS





SO			AV	2389.050	-43.69	≤-41.20	51.51	≤54	PASS
			AV	2390.000	-45.99	≤-41.20	49.21	≤54	PASS
			Peak	2310.000	-41.6	≤-21.20	53.60	≤74	PASS
			Peak	2388.010	-26.86	≤-21.20	68.34	≤74	PASS
			Peak	2390.000	-35.87	≤-21.20	59.33	≤74	PASS
	High	2452	AV	2483.500	-43.41	≤-41.20	51.79	≤54	PASS
			AV	2485.430	-42.35	≤-41.20	52.85	≤54	PASS
			AV	2500.000	-48.41	≤-41.20	46.79	≤54	PASS
			Peak	2483.500	-30.61	≤-21.20	64.59	≤74	PASS
			Peak	2483.780	-21.53	≤-21.20	73.67	≤74	PASS
			Peak	2500.000	-41.36	≤-21.20	53.84	≤74	PASS

Note:

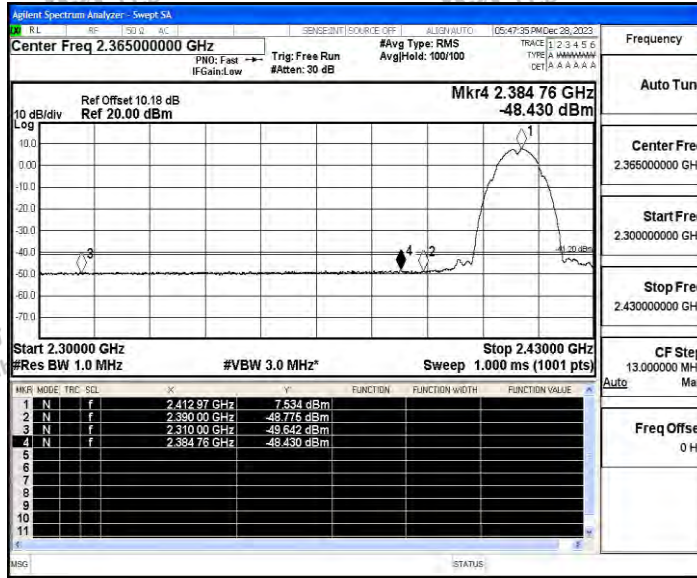
1. The Antenna Gain is compensated in the graph. The Correction Factor is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



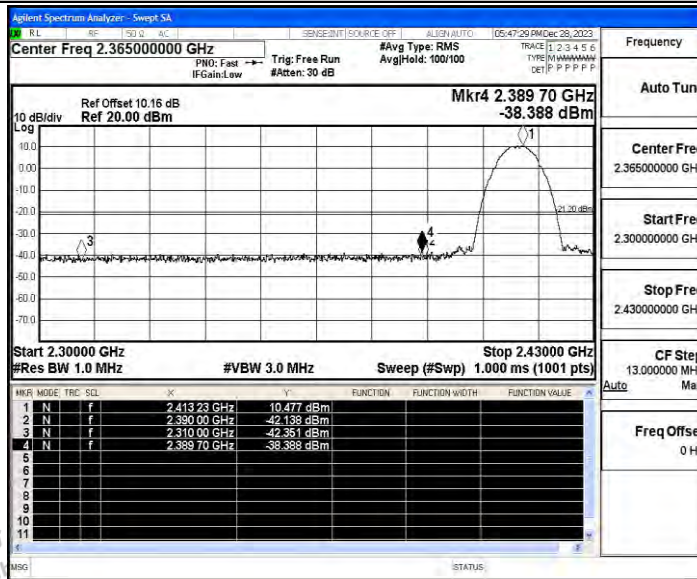


Test Graphs

11B_Ant_Low_2412_AV

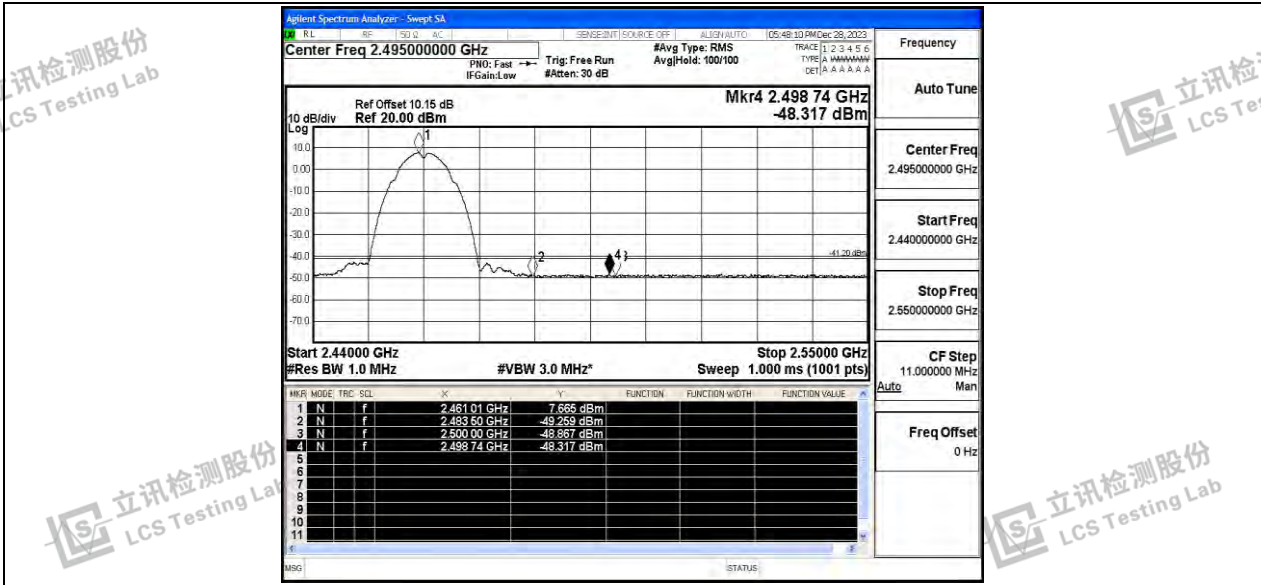


11B_Ant_Low_2412_Peak

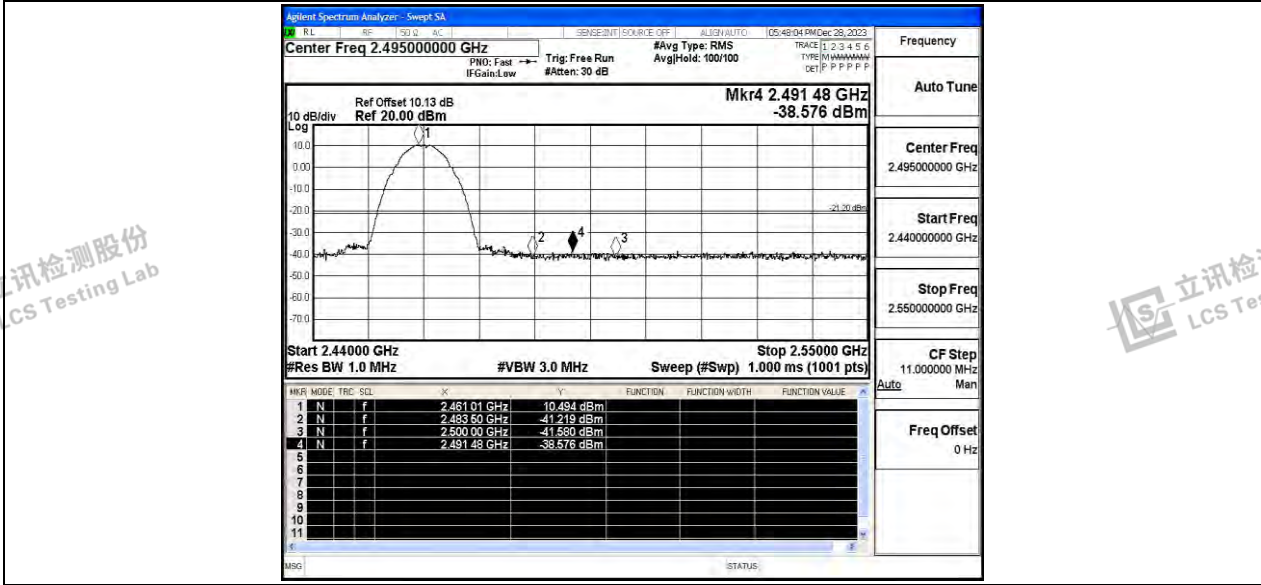


11B_Ant_High_2462_AV



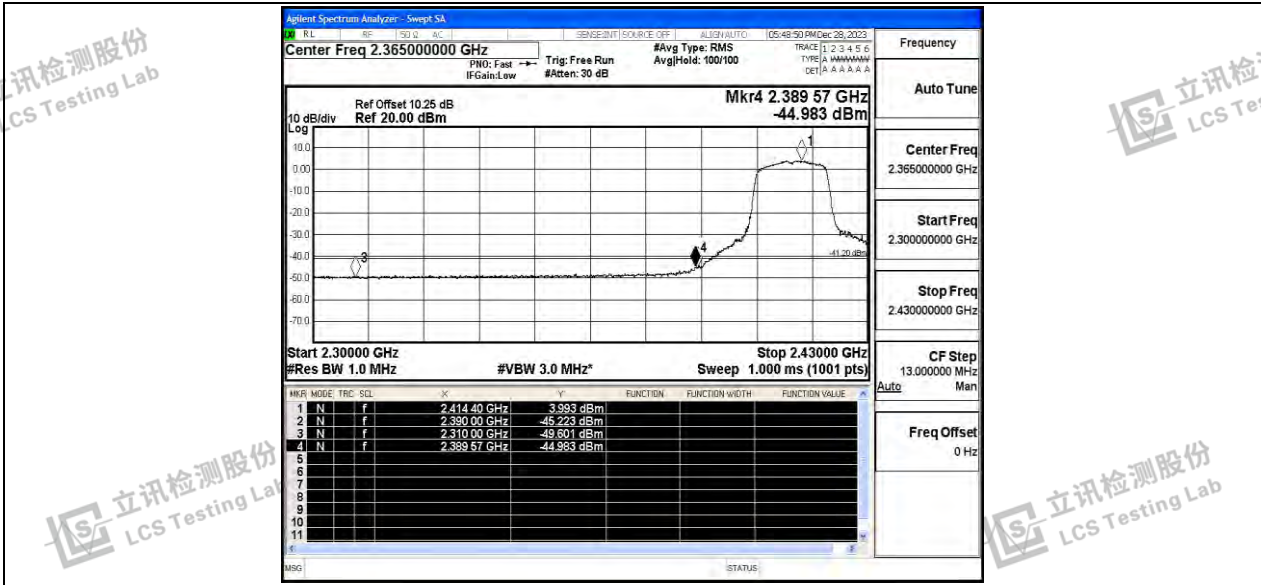


11B_Ant_High_2462_Peak

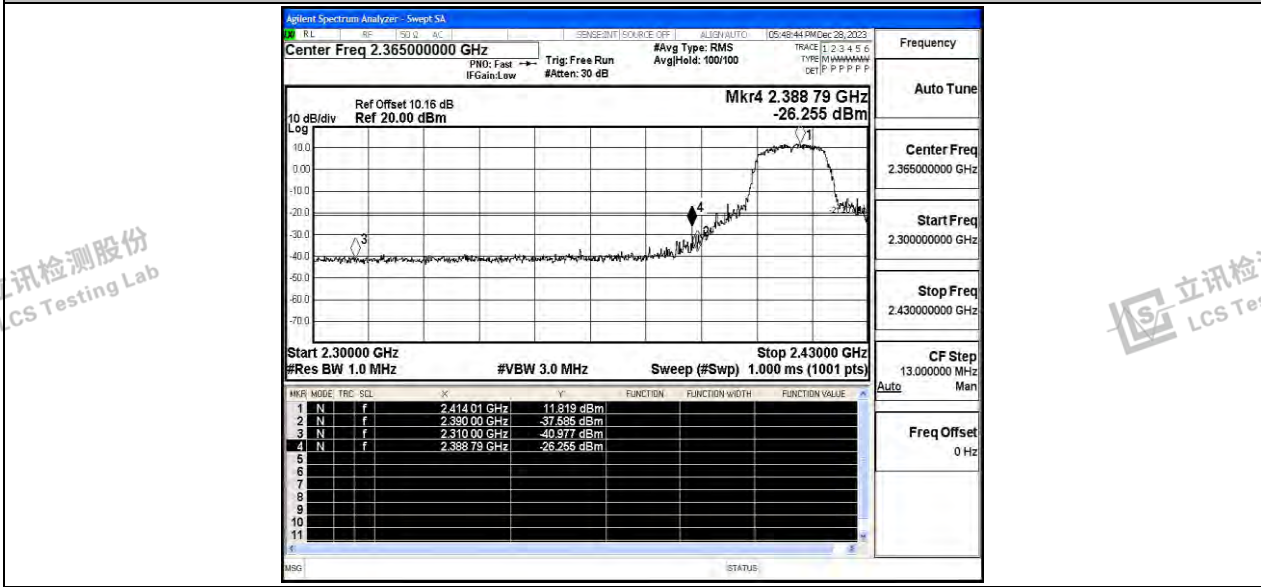


11G_Ant_Low_2412_AV



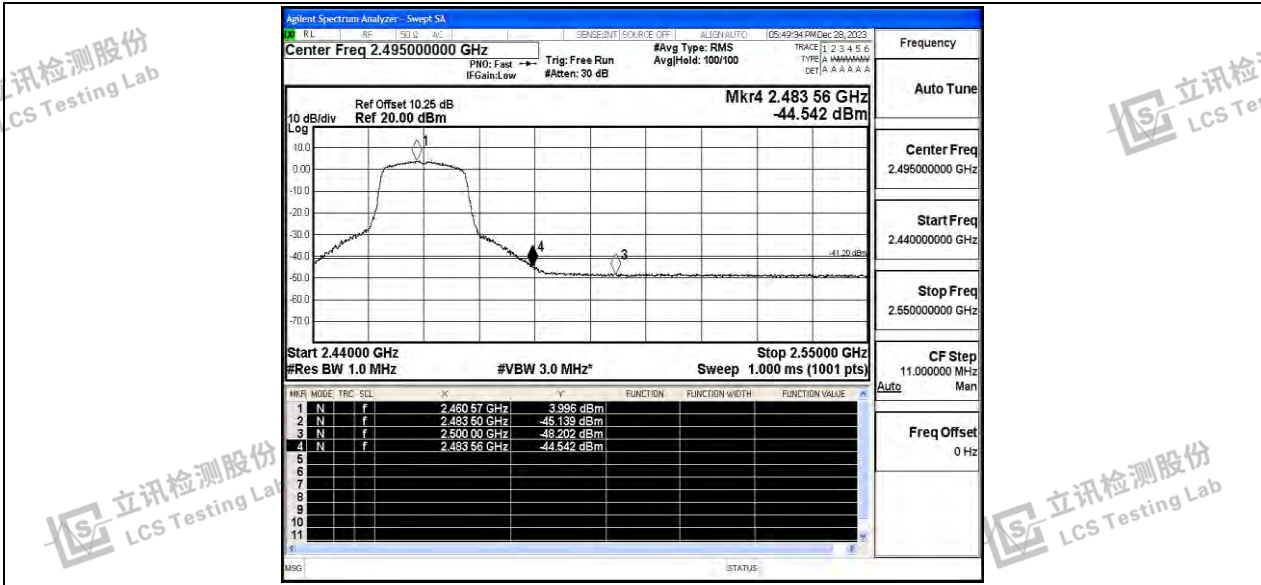


11G_Ant_Low_2412_Peak

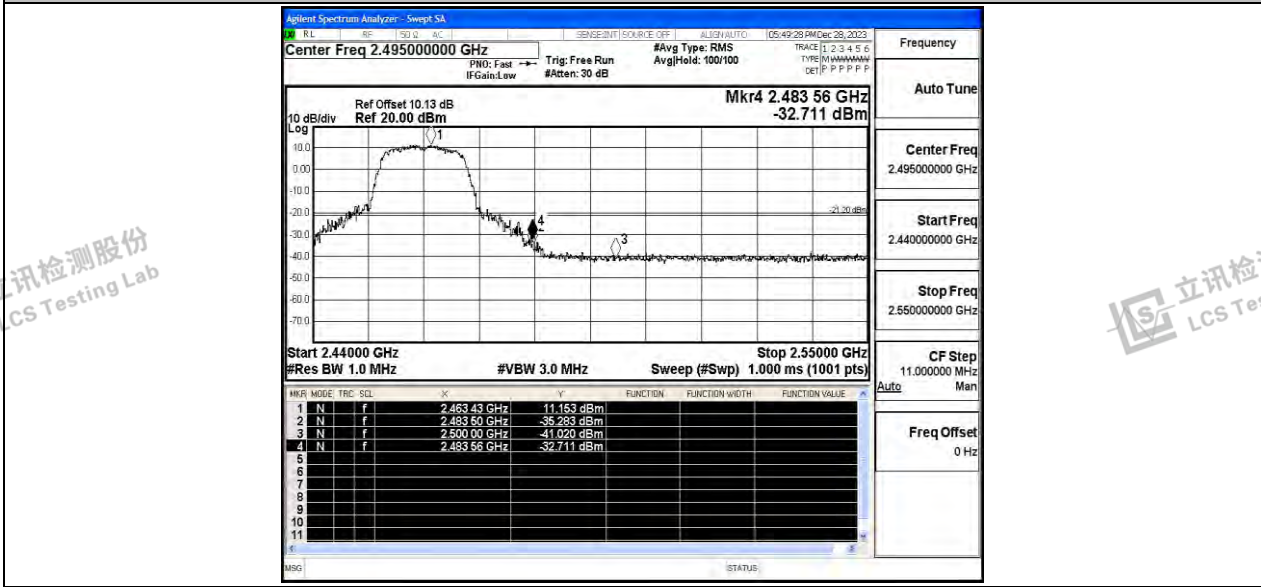


11G_Ant_High_2462_AV



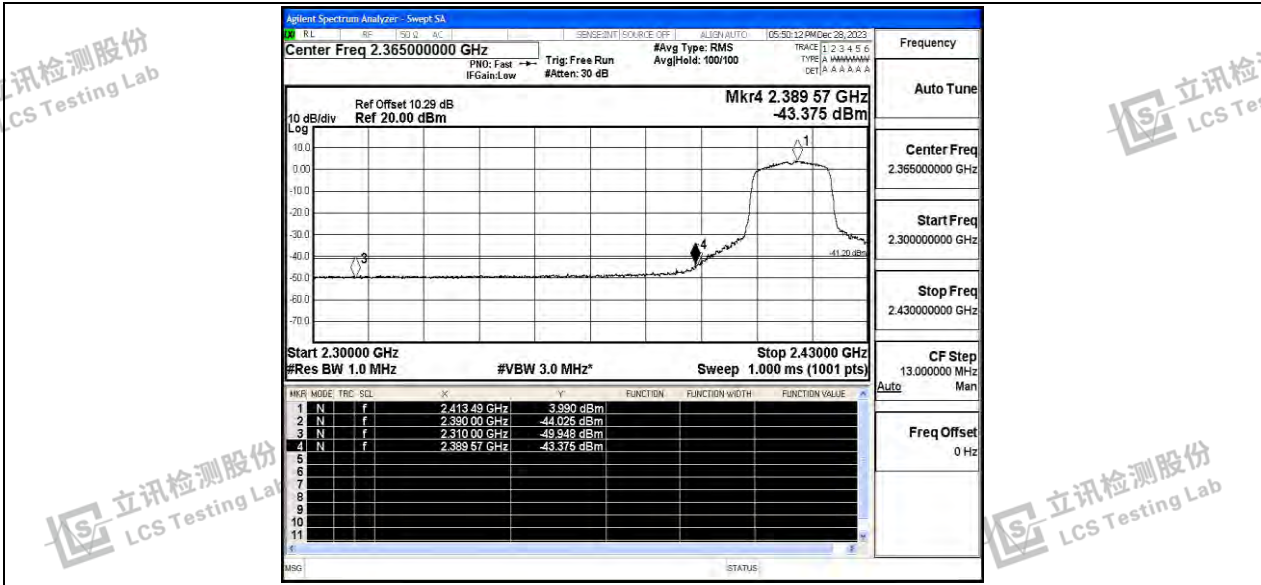


11G_Ant_High_2462_Peak

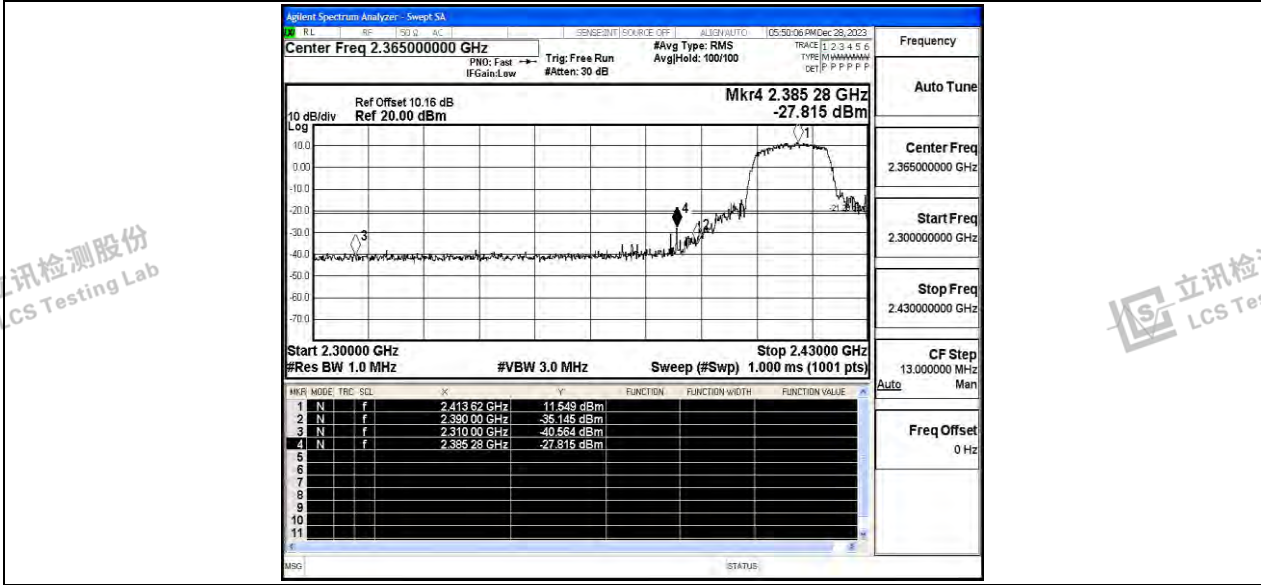


11N20SISO_Ant_Low_2412_AV



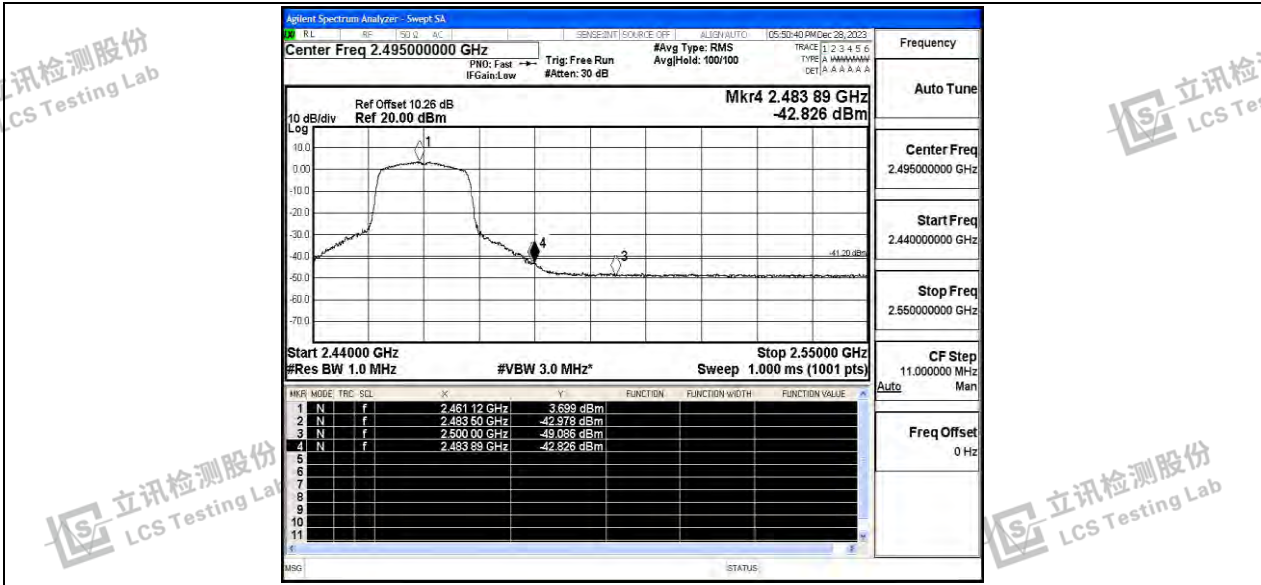


11N20SISO_Ant_Low_2412_Peak

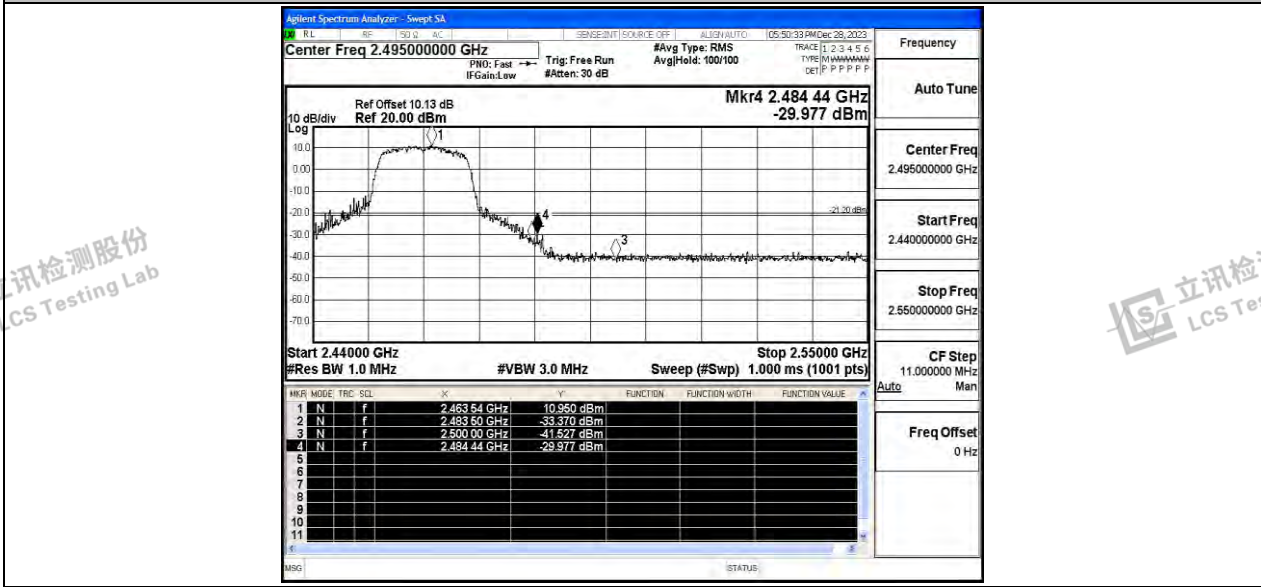


11N20SISO_Ant_High_2462_AV



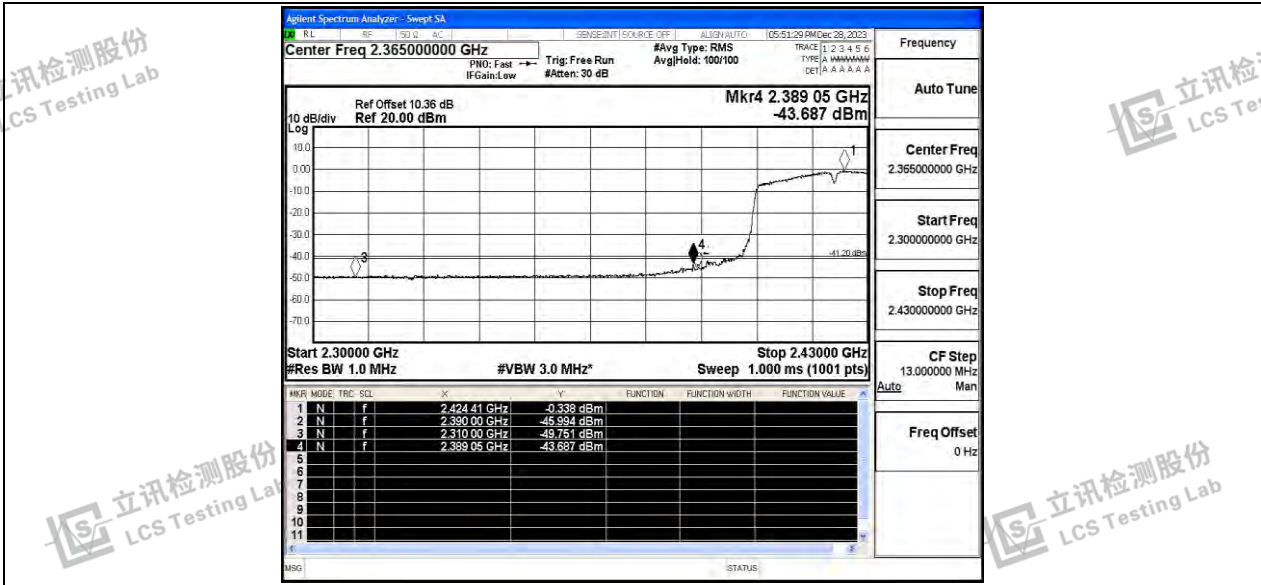


11N20SISO_Ant_High_2462_Peak

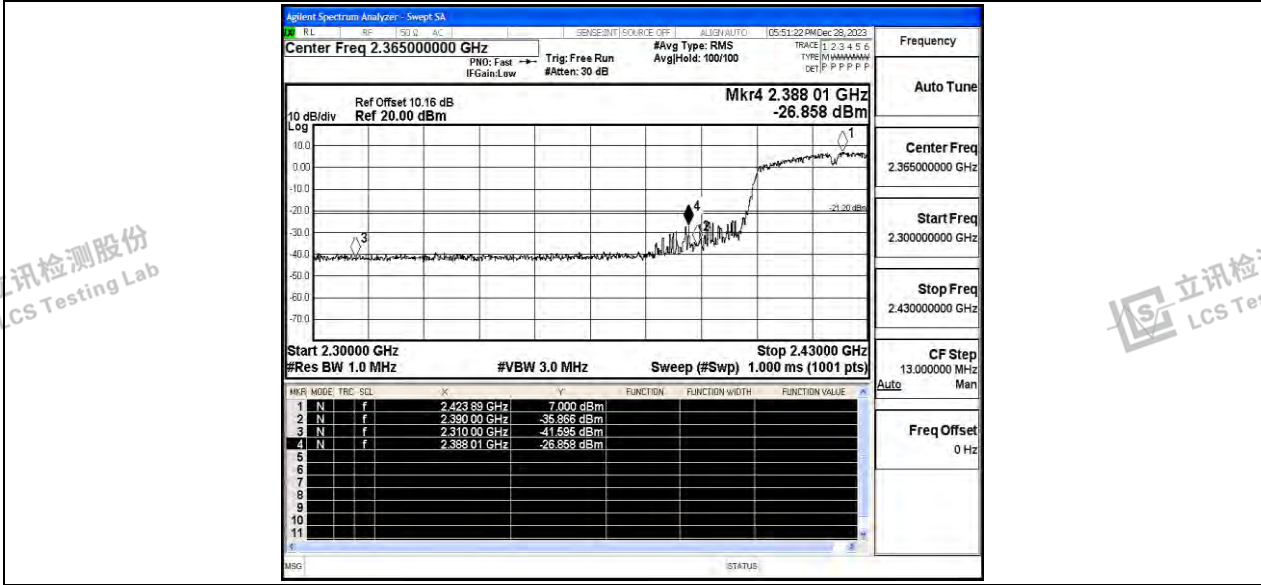


11N40SISO_Ant_Low_2422_AV



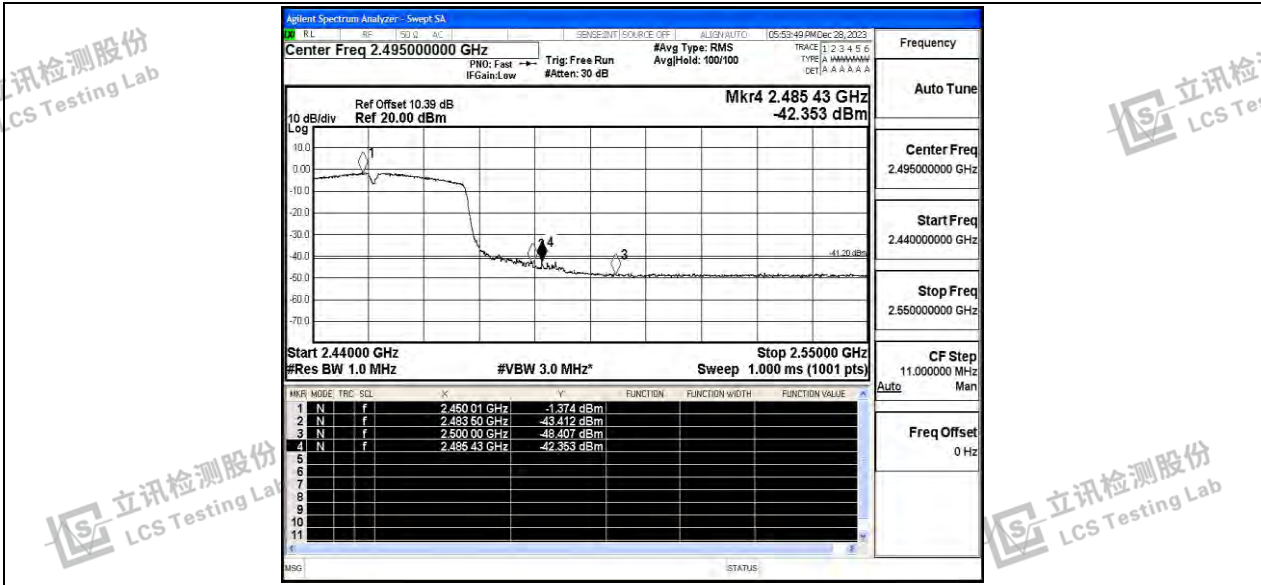


11N40SISO_Ant_Low_2422_Peak



11N40SISO_Ant_High_2452_AV





11N40SISO_Ant_High_2452_Peak

