



Appendix C

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: GNSS Receiver

Test Model: Mars

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Nick Peng
Supervised by:	Ling Zhu



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C.1 DTS Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.600	2406.960	2416.560	0.5	PASS
		2437	9.520	2432.480	2442.000	0.5	PASS
		2462	10.040	2456.960	2467.000	0.5	PASS
11G	Ant1	2412	14.440	2405.120	2419.560	0.5	PASS
		2437	16.360	2428.840	2445.200	0.5	PASS
		2462	16.360	2453.800	2470.160	0.5	PASS
11N20SISO	Ant1	2412	17.600	2403.200	2420.800	0.5	PASS
		2437	17.600	2428.200	2445.800	0.5	PASS
		2462	17.600	2453.200	2470.800	0.5	PASS
11N40SISO	Ant1	2422	35.280	2404.480	2439.760	0.5	PASS
		2437	35.840	2419.240	2455.080	0.5	PASS
		2452	35.680	2434.240	2469.920	0.5	PASS

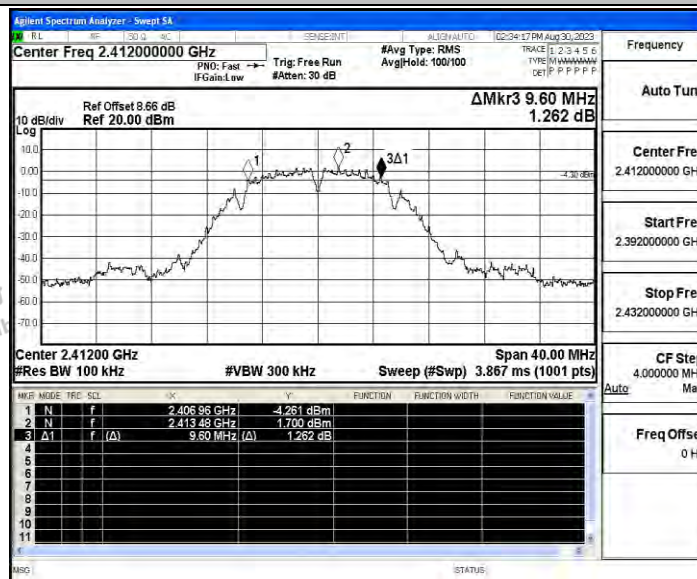


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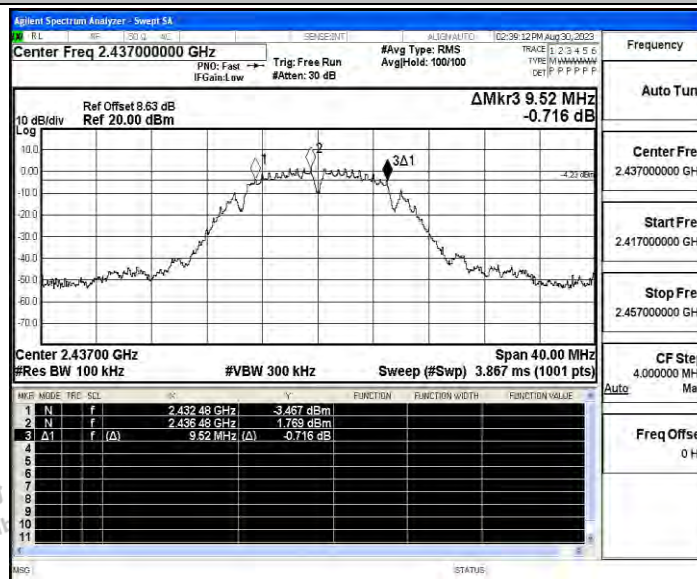


Test Graphs

11B_Ant1_2412

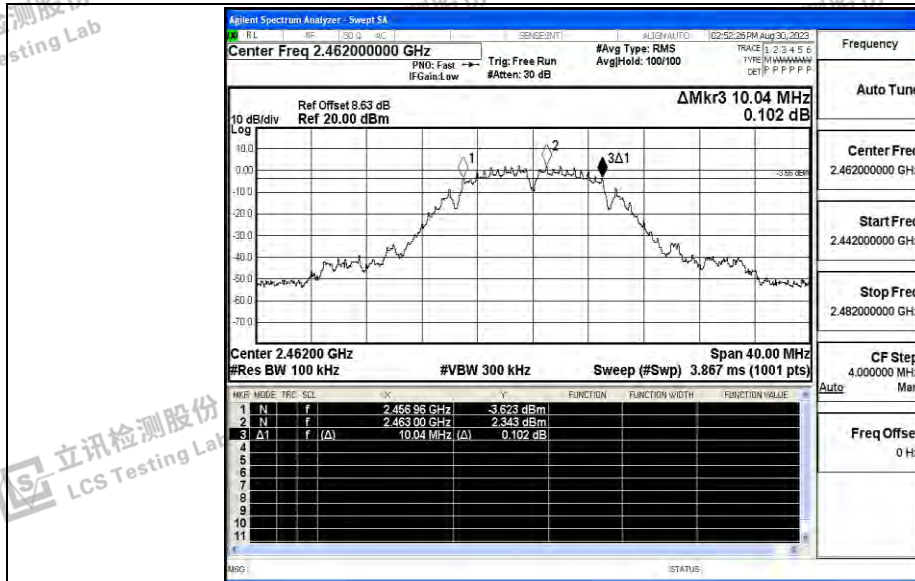


11B_Ant1_2437

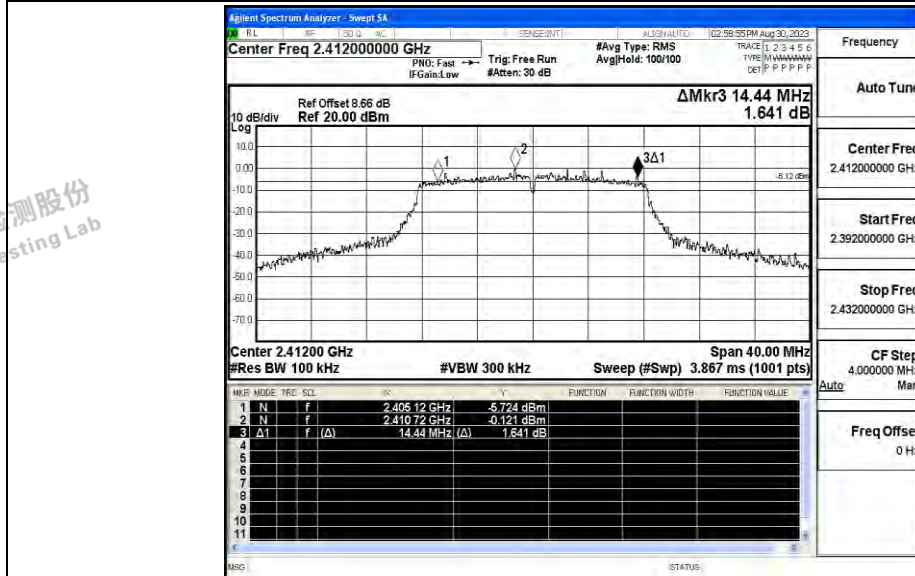


11B_Ant1_2462



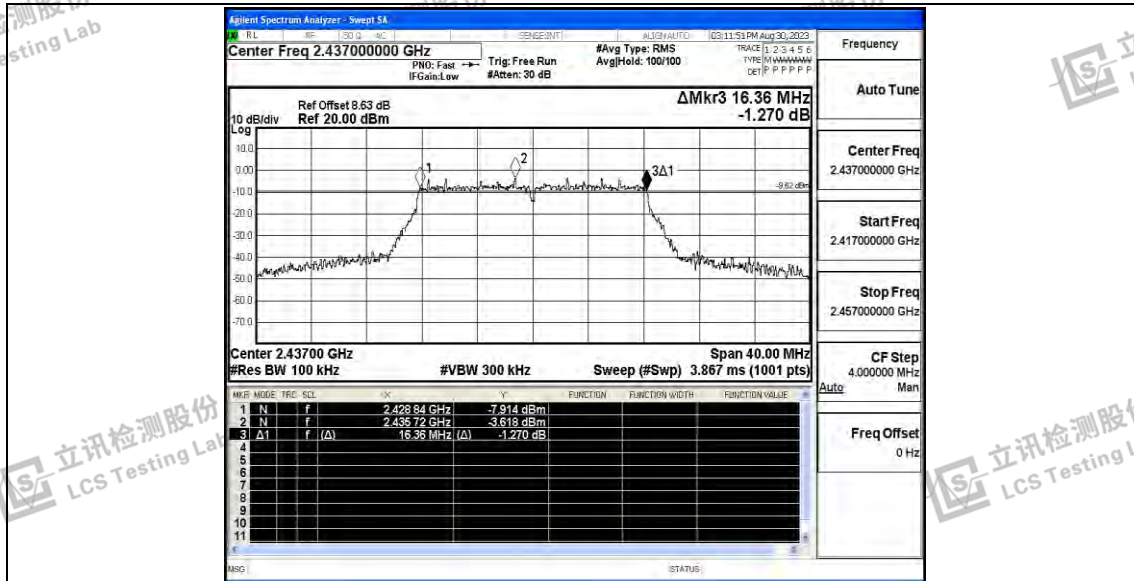


11G_Ant1_2412

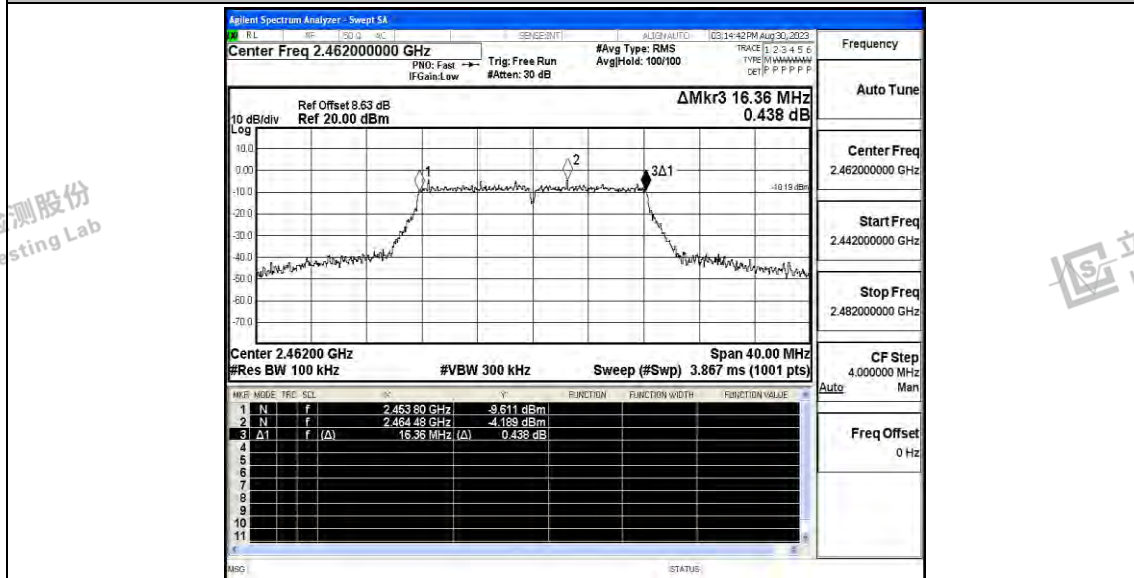


11G_Ant1_2437



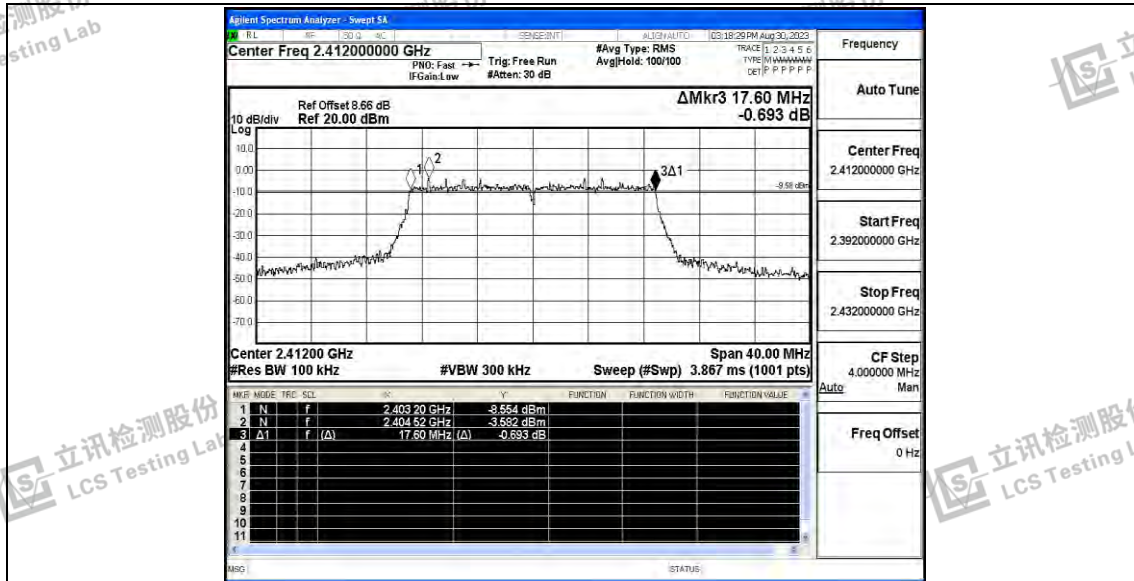


11G_Ant1_2462

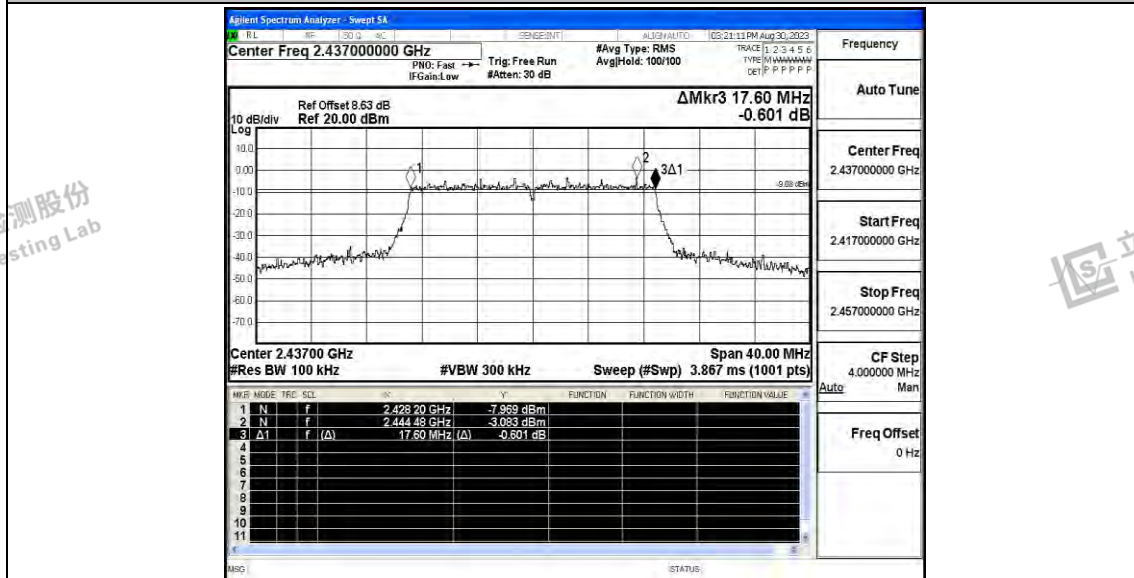


11N20SISO_Ant1_2412



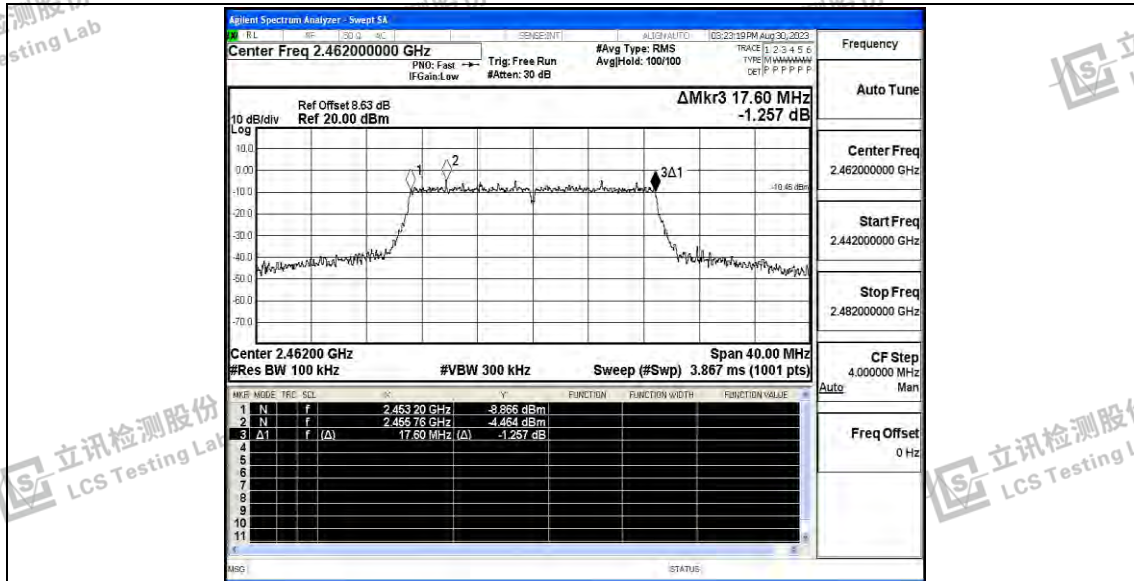


11N20SISO_Ant1_2437

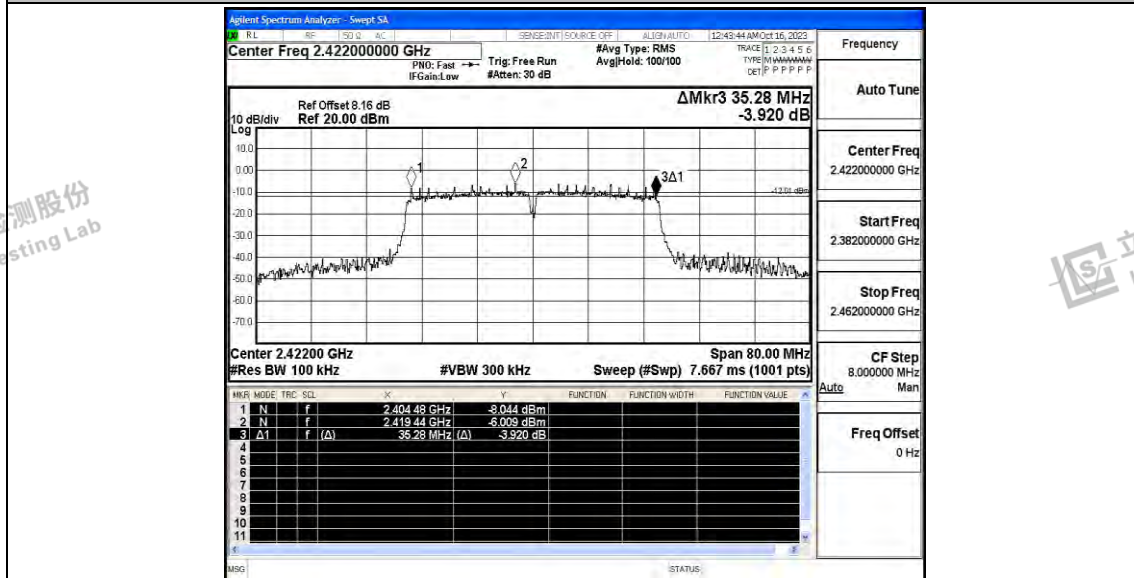


11N20SISO_Ant1_2462



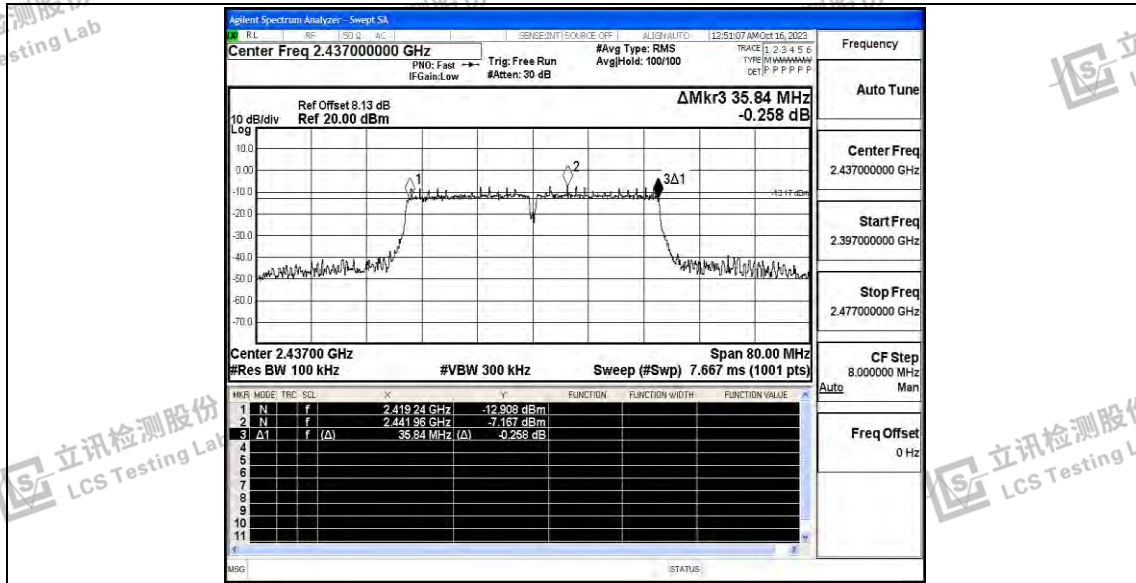


11N40SISO_Ant1_2422

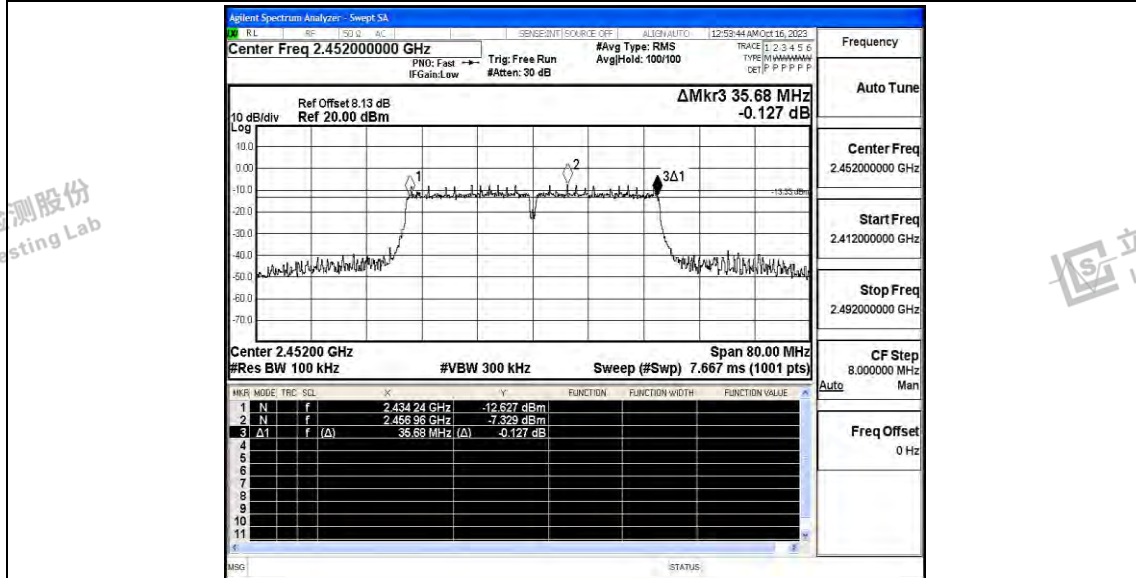


11N40SISO_Ant1_2437





11N40SISO_Ant1_2452





C.2 Maximum conducted output power

Test Result Peak

TestMode	Antenna	Freq(MHz)	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	14.39	≤30.00	PASS
		2437	14.80	≤30.00	PASS
		2462	13.99	≤30.00	PASS
11G	Ant1	2412	14.53	≤30.00	PASS
		2437	14.26	≤30.00	PASS
		2462	13.82	≤30.00	PASS
11N20SISO	Ant1	2412	14.48	≤30.00	PASS
		2437	14.88	≤30.00	PASS
		2462	13.77	≤30.00	PASS
11N40SISO	Ant1	2422	12.88	≤30.00	PASS
		2437	13.28	≤30.00	PASS
		2452	13.01	≤30.00	PASS





C.3 Maximum power spectral density

Test Result

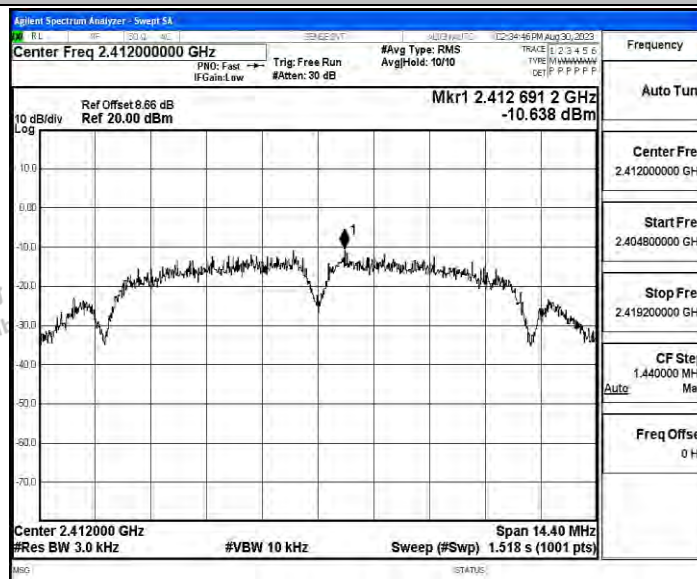
TestMode	Antenna	Freq(MHz)	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-10.64	≤8.00	PASS
		2437	-10.11	≤8.00	PASS
		2462	-10.56	≤8.00	PASS
11G	Ant1	2412	-16.8	≤8.00	PASS
		2437	-17.59	≤8.00	PASS
		2462	-17.4	≤8.00	PASS
11N20SISO	Ant1	2412	-17.31	≤8.00	PASS
		2437	-16.66	≤8.00	PASS
		2462	-15.94	≤8.00	PASS
11N40SISO	Ant1	2422	-21.22	≤8.00	PASS
		2437	-21.32	≤8.00	PASS
		2452	-20.9	≤8.00	PASS



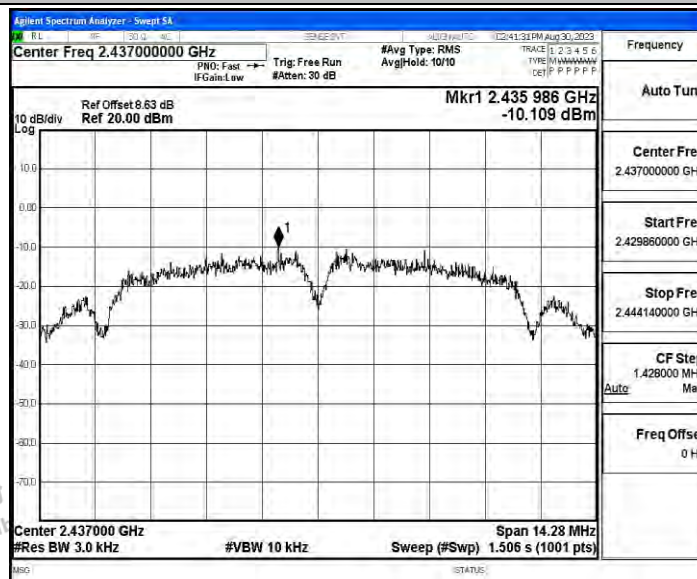


Test Graphs

11B_Ant1_2412

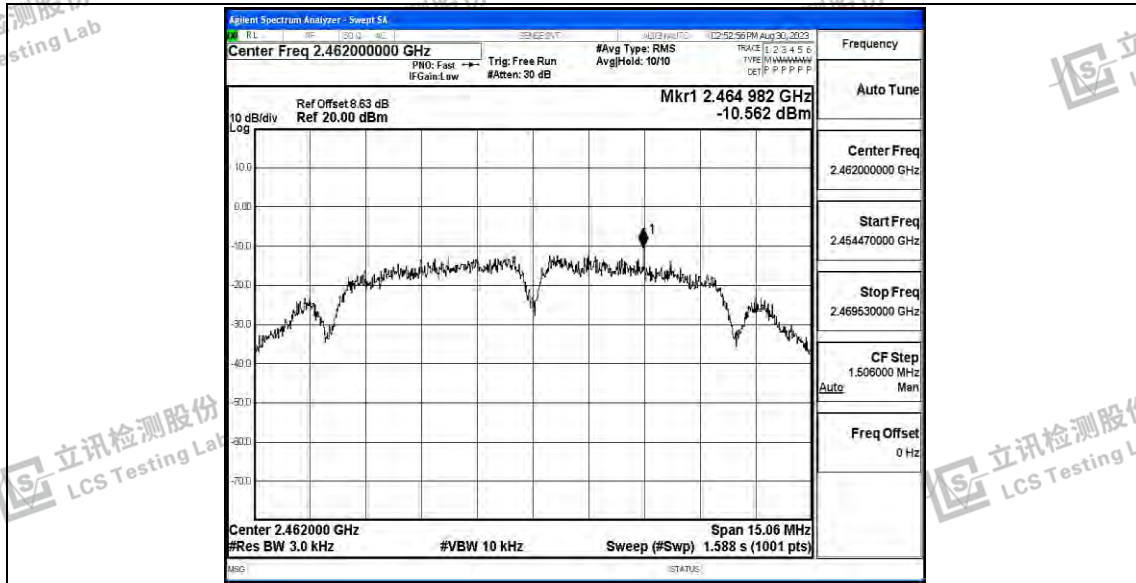


11B_Ant1_2437

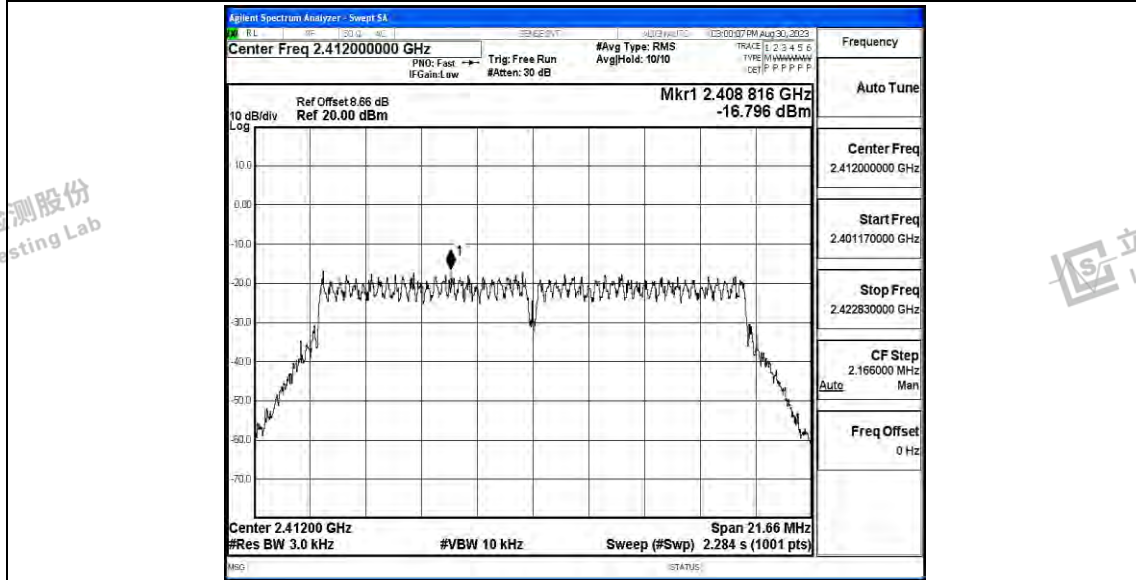


11B_Ant1_2462



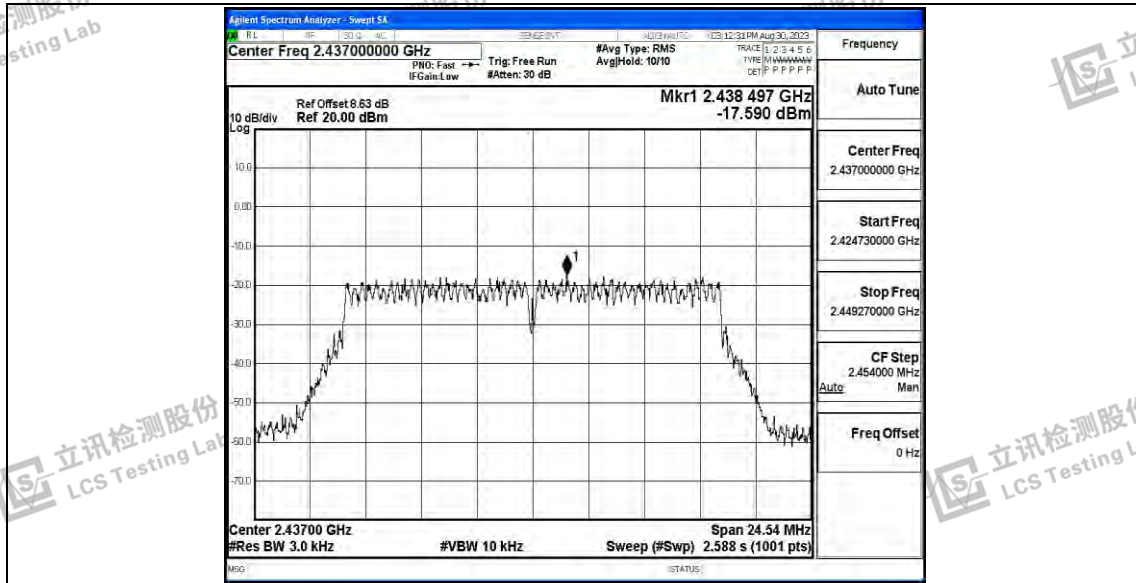


11G_Ant1_2412

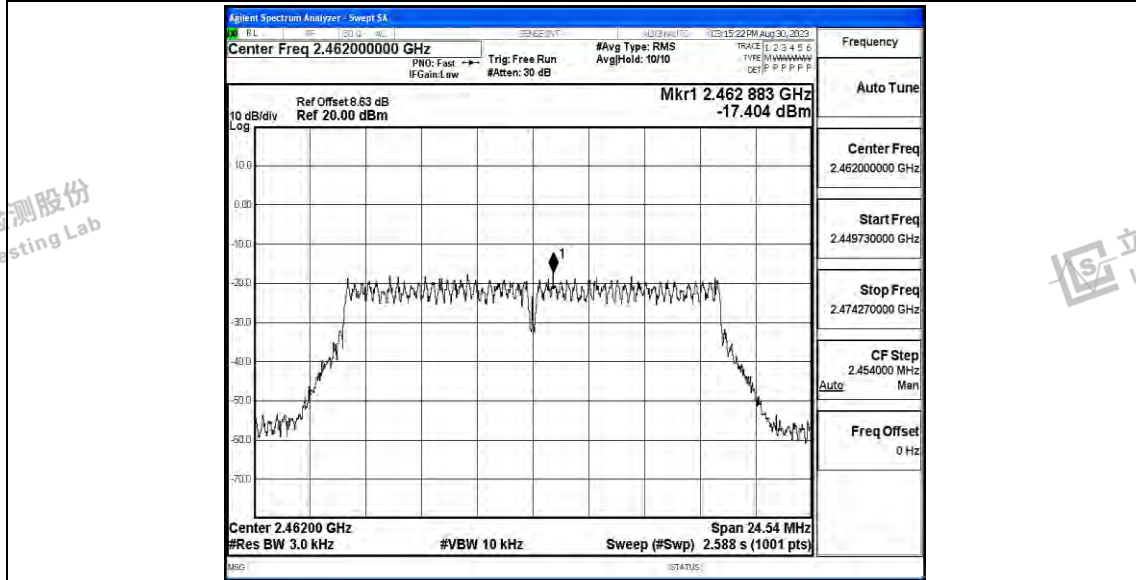


11G_Ant1_2437



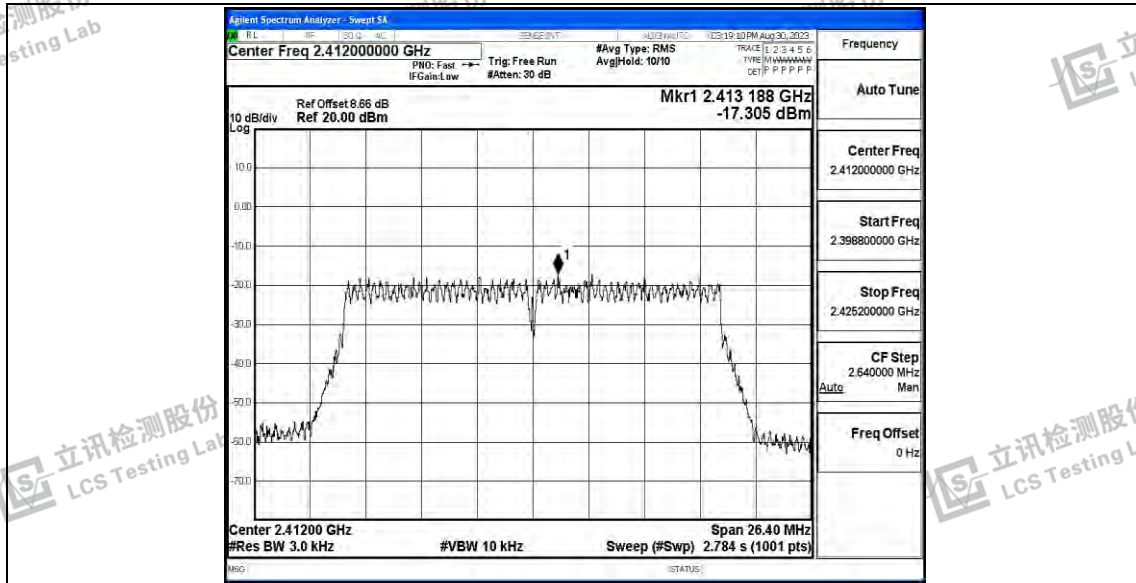


11G_Ant1_2462

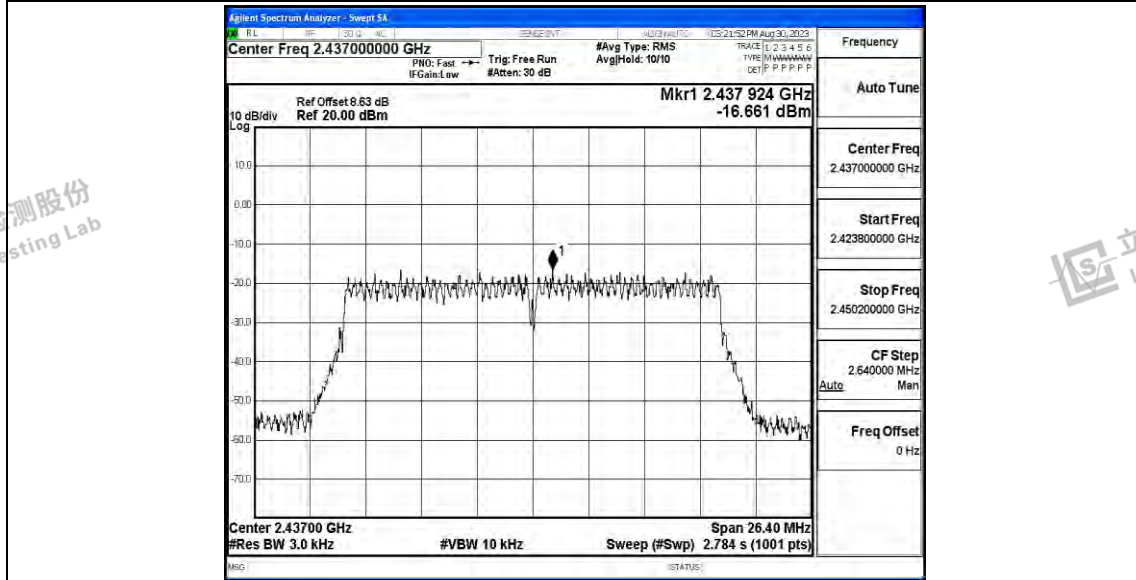


11N20SISO_Ant1_2412



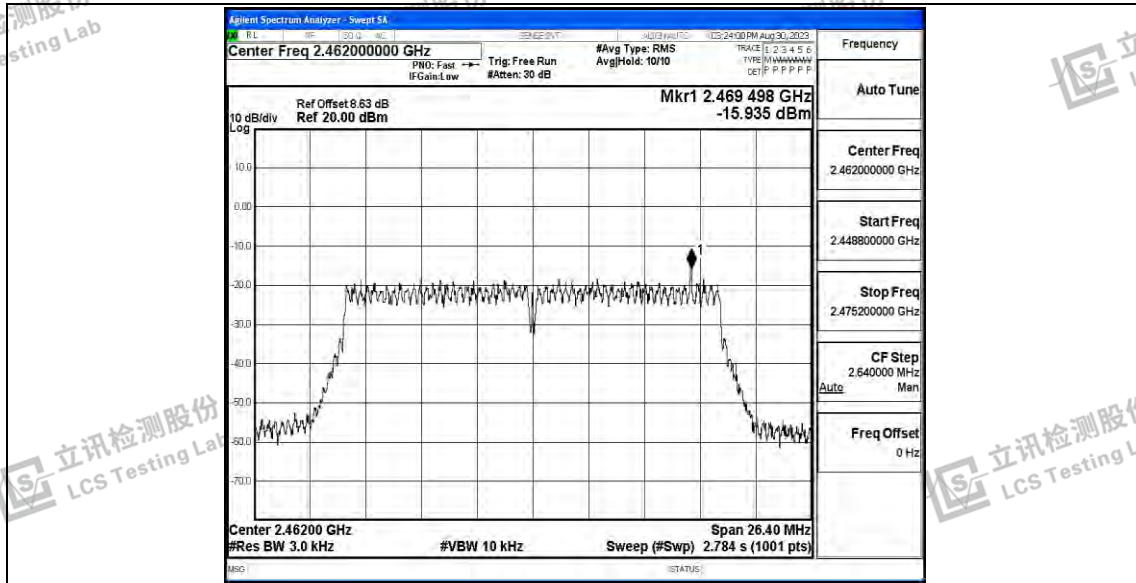


11N20SISO_Ant1_2437

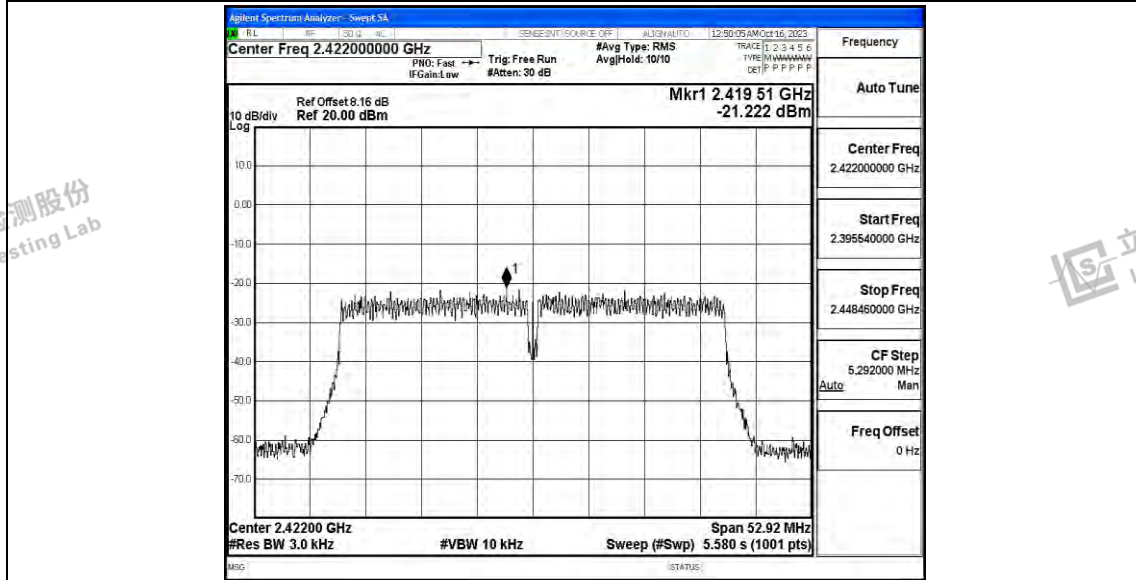


11N20SISO_Ant1_2462



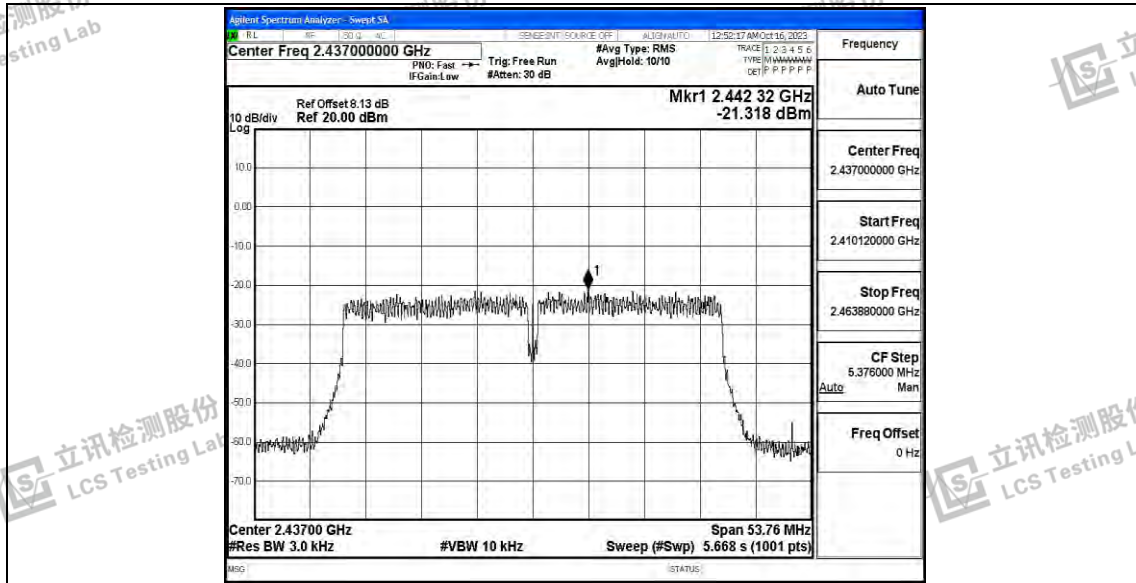


11N40SISO_Ant1_2422

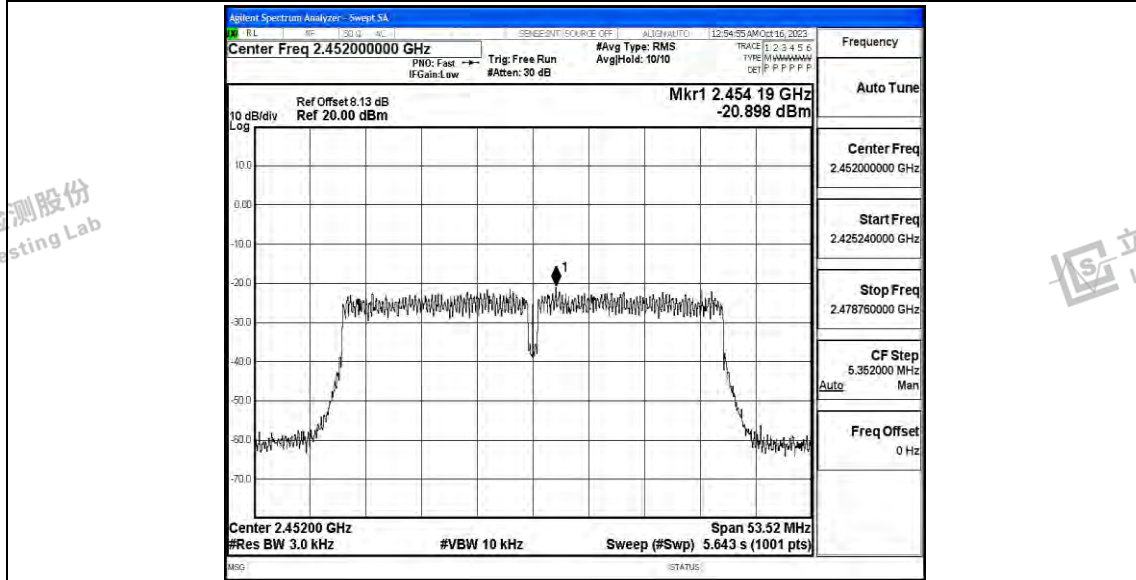


11N40SISO_Ant1_2437





11N40SISO_Ant1_2452





Appendix E: Reference level measurement

Test Result

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
11B	Ant1	2412	2412.50	2.20
		2437	2439.48	2.01
		2462	2463.01	1.90
11G	Ant1	2412	2406.97	-3.32
		2437	2439.48	-3.55
		2462	2468.23	-4.54
11N20SISO	Ant1	2412	2414.48	-3.44
		2437	2441.99	-3.02
		2462	2463.24	-3.60
11N40SISO	Ant1	2422	2424.49	-5.81
		2437	2439.53	-7.06
		2452	2455.75	-7.60

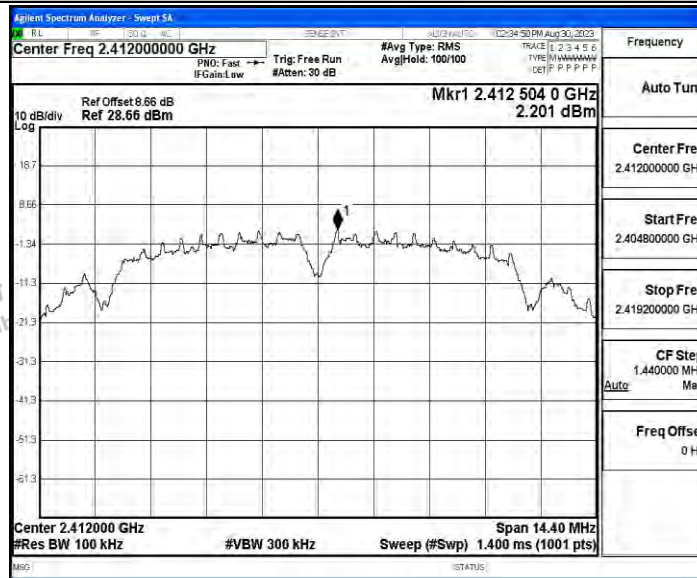


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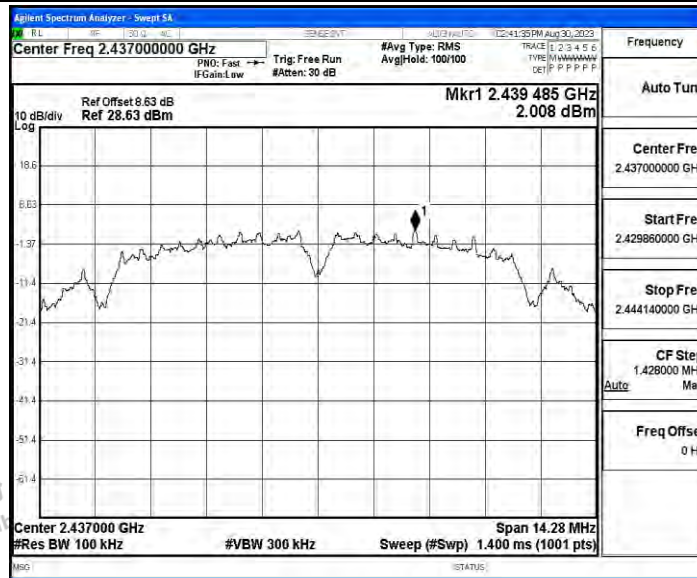


Test Graphs

11B_Ant1_2412



11B_Ant1_2437



11B_Ant1_2462

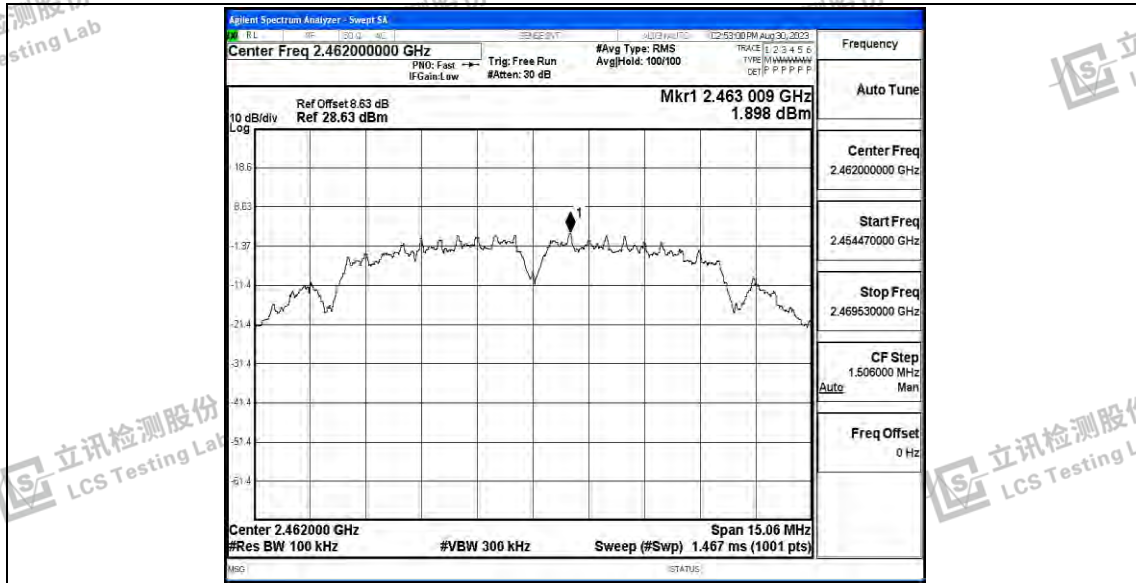


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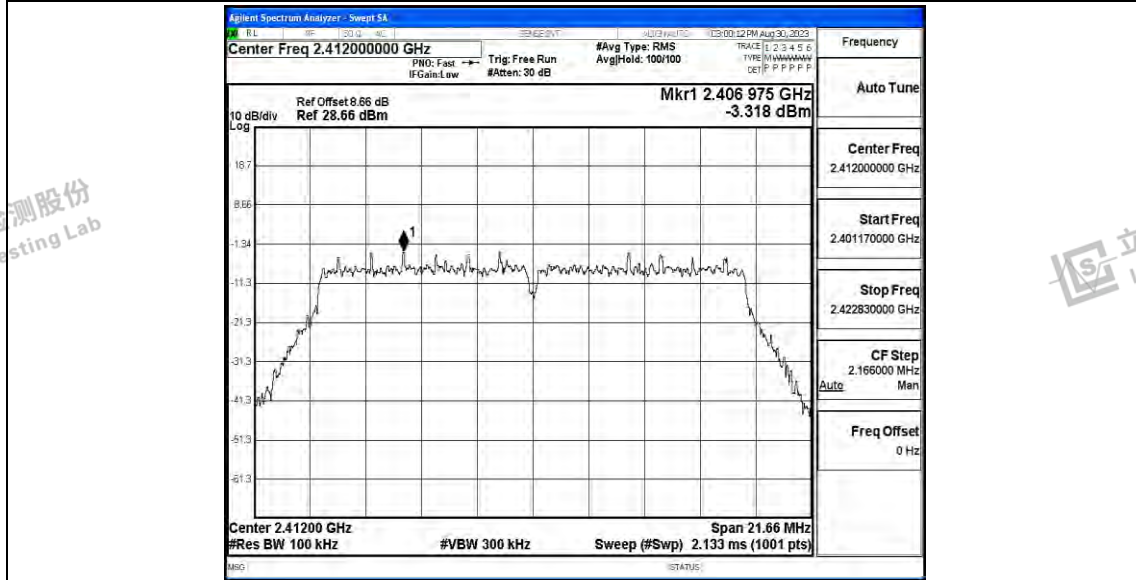
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

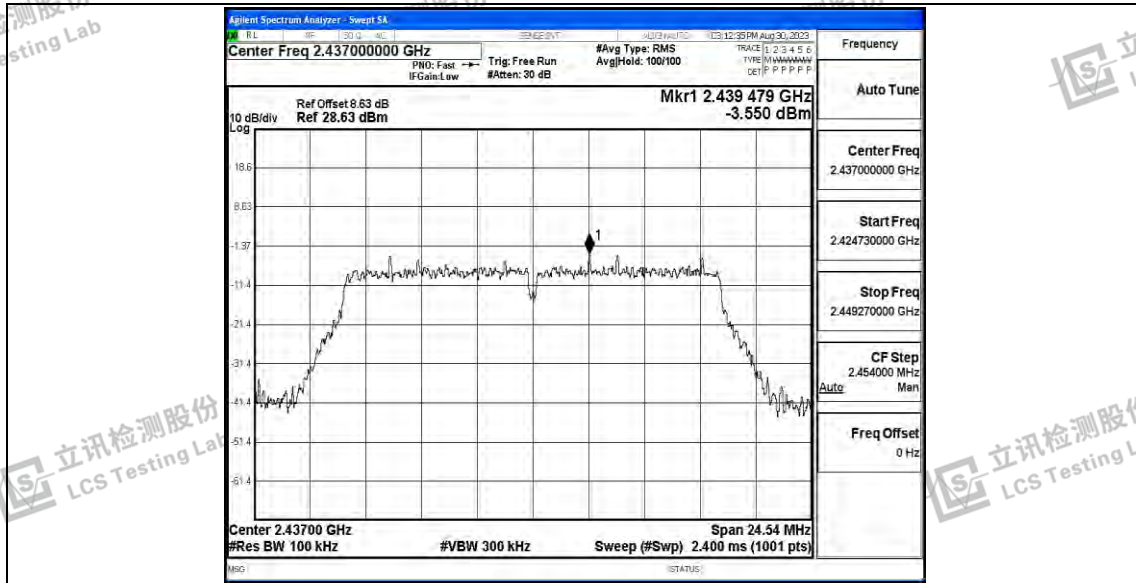


11G_Ant1_2412

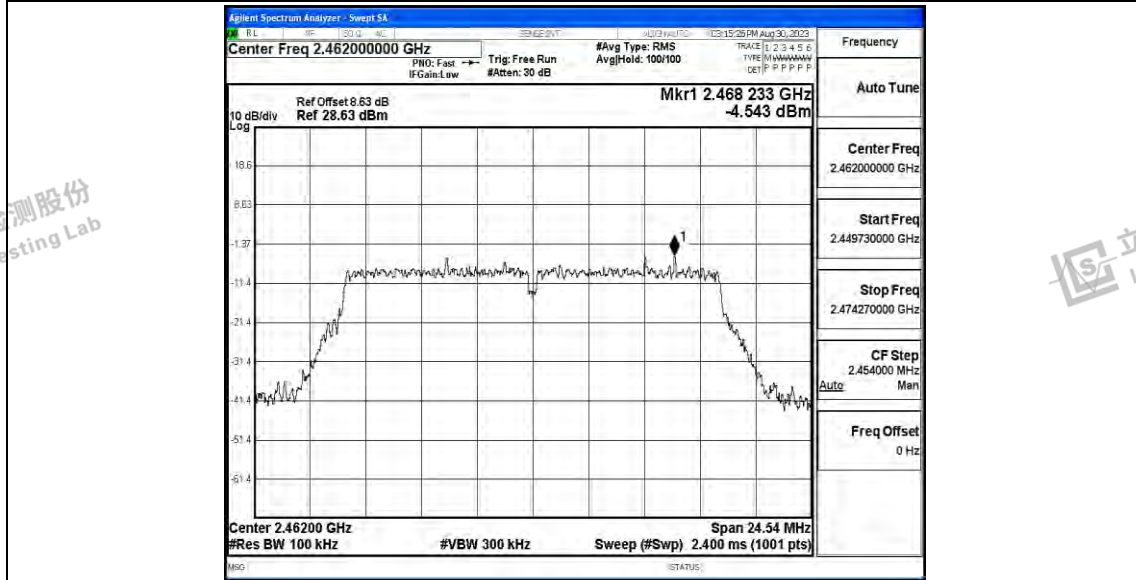


11G_Ant1_2437



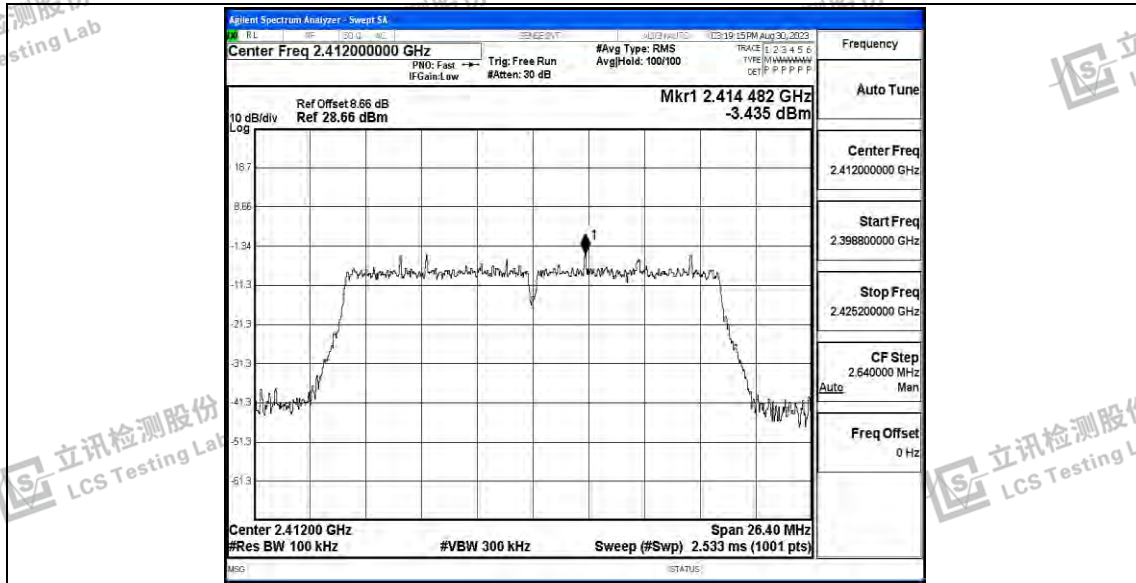


11G_Ant1_2462

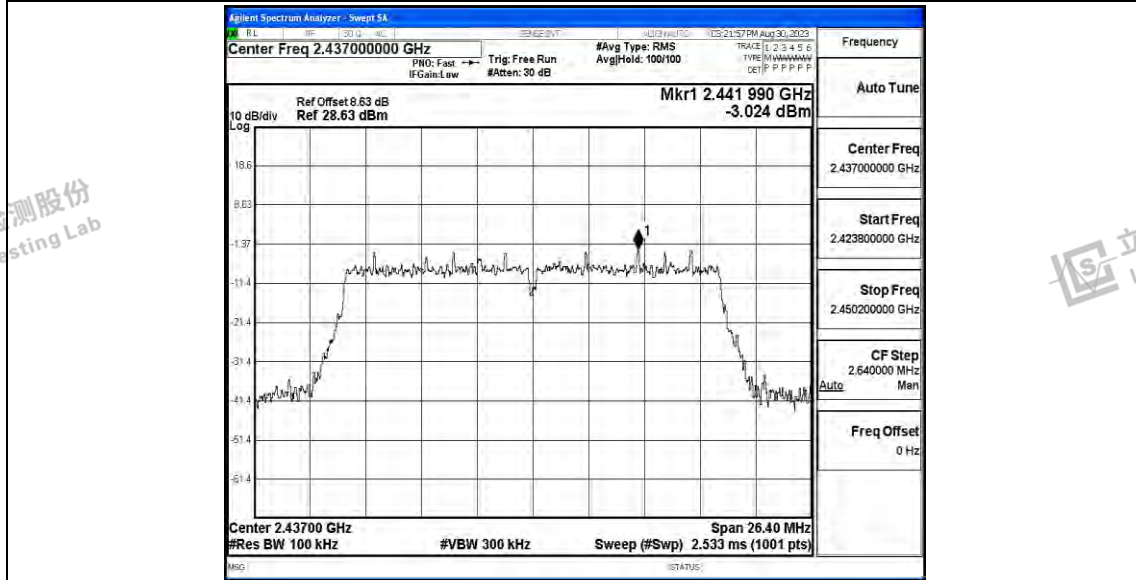


11N20SISO_Ant1_2412



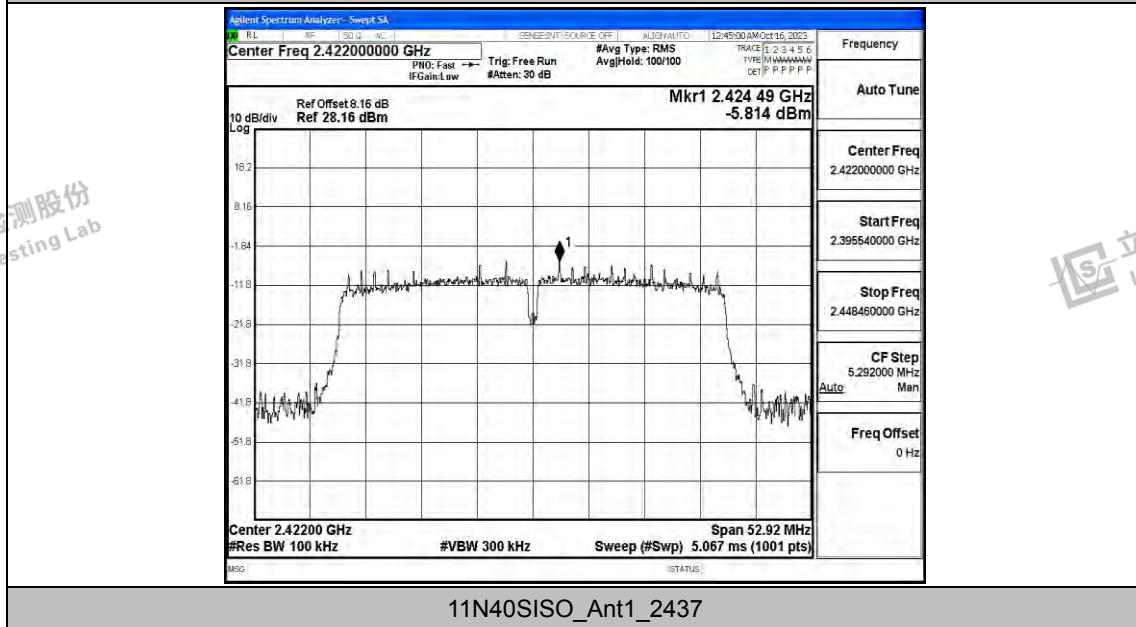
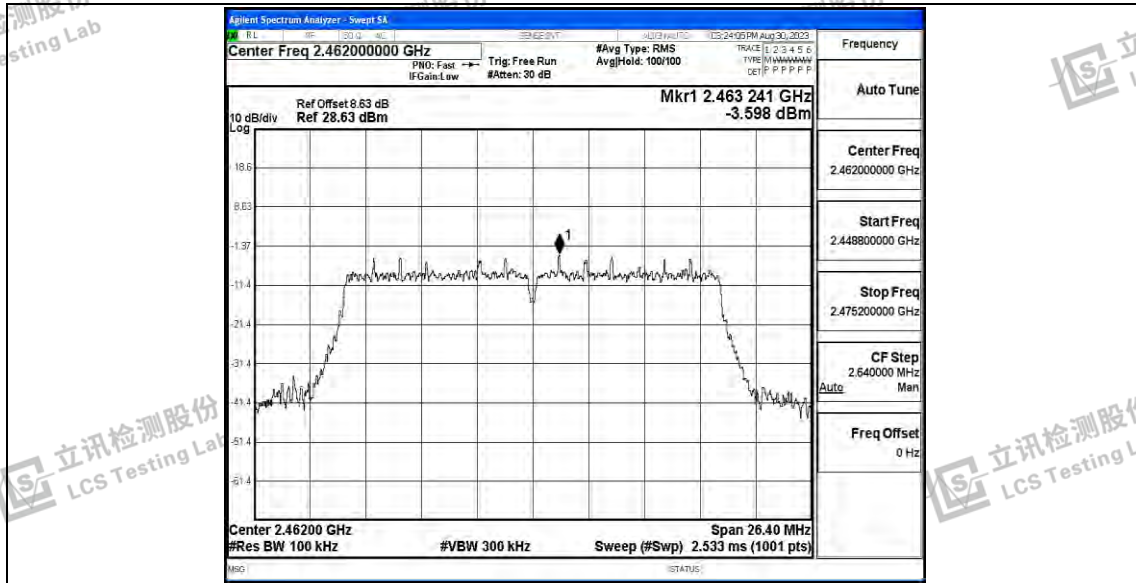


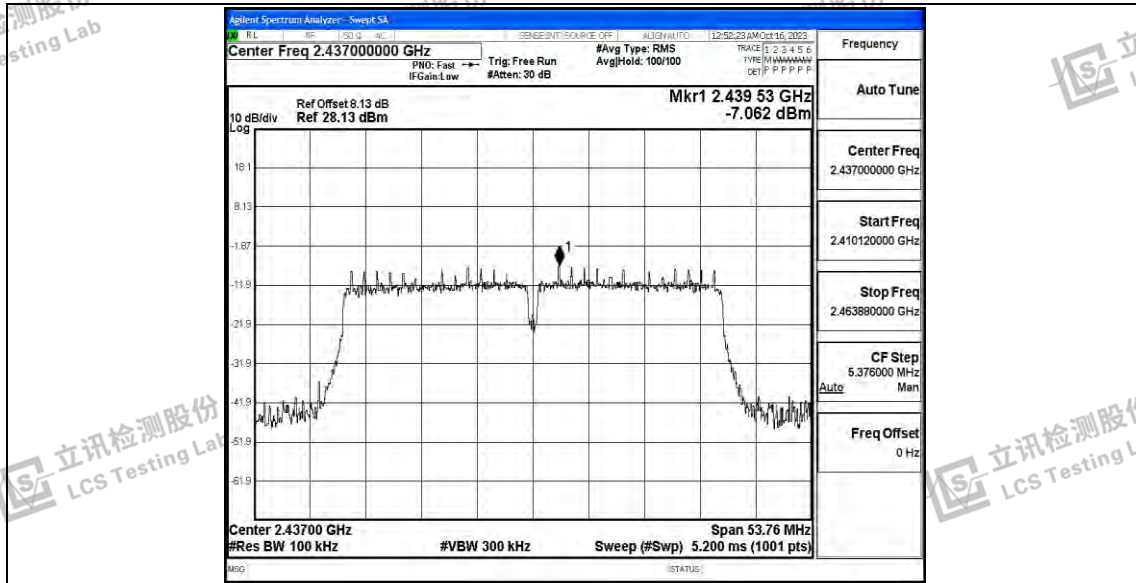
11N20SISO_Ant1_2437



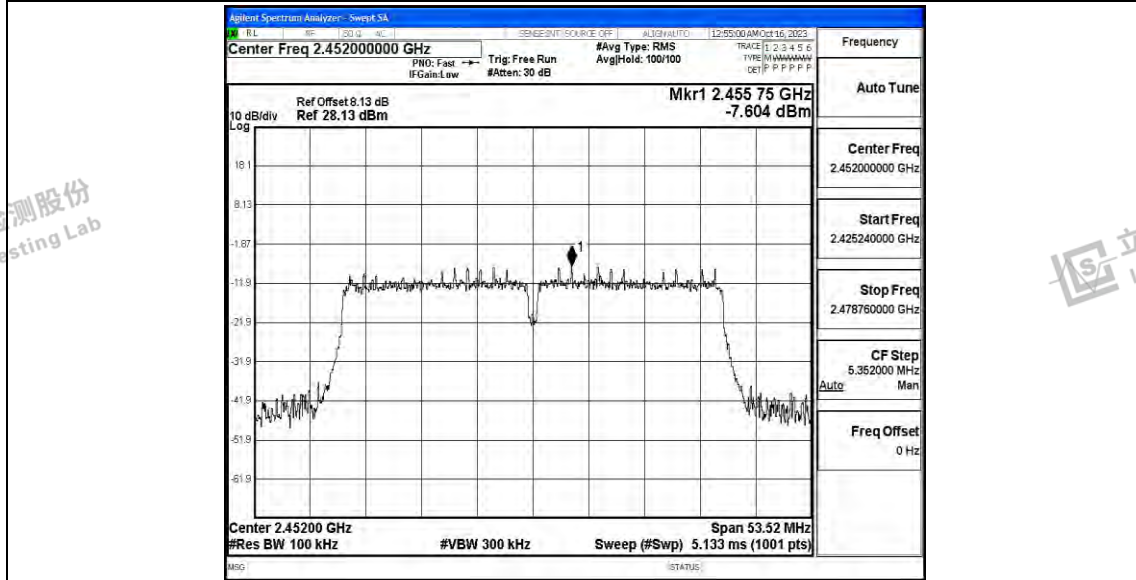
11N20SISO_Ant1_2462







11N40SISO_Ant1_2452





C.4 Band edge measurements

Test Result

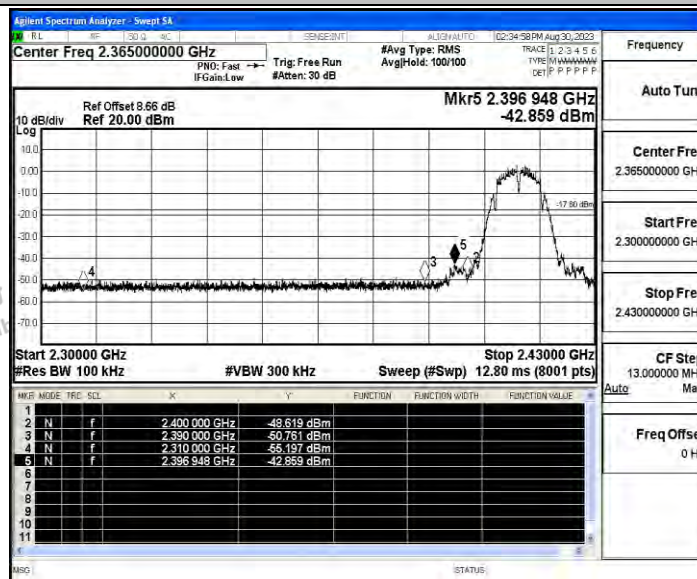
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	2.20	-42.86	≤ -17.8	PASS
		High	2462	1.90	-48.17	≤ -18.1	PASS
11G	Ant1	Low	2412	-3.32	-39.22	≤ -23.32	PASS
		High	2462	-4.54	-47.28	≤ -24.54	PASS
11N20SISO	Ant1	Low	2412	-3.44	-40.07	≤ -23.44	PASS
		High	2462	-3.60	-47.1	≤ -23.6	PASS
11N40SISO	Ant1	Low	2422	-5.81	-39.34	≤ -25.81	PASS
		High	2452	-7.60	-40.46	≤ -27.6	PASS



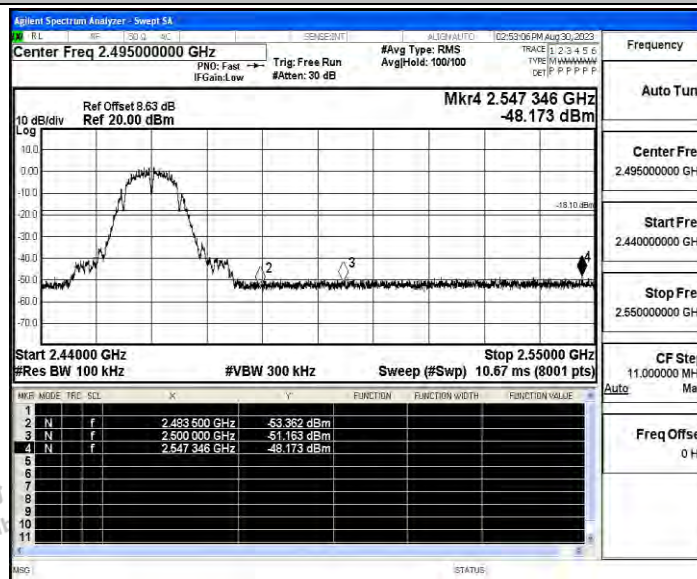


Test Graphs

11B_Ant1_Low_2412



11B_Ant1_High_2462



11G_Ant1_Low_2412

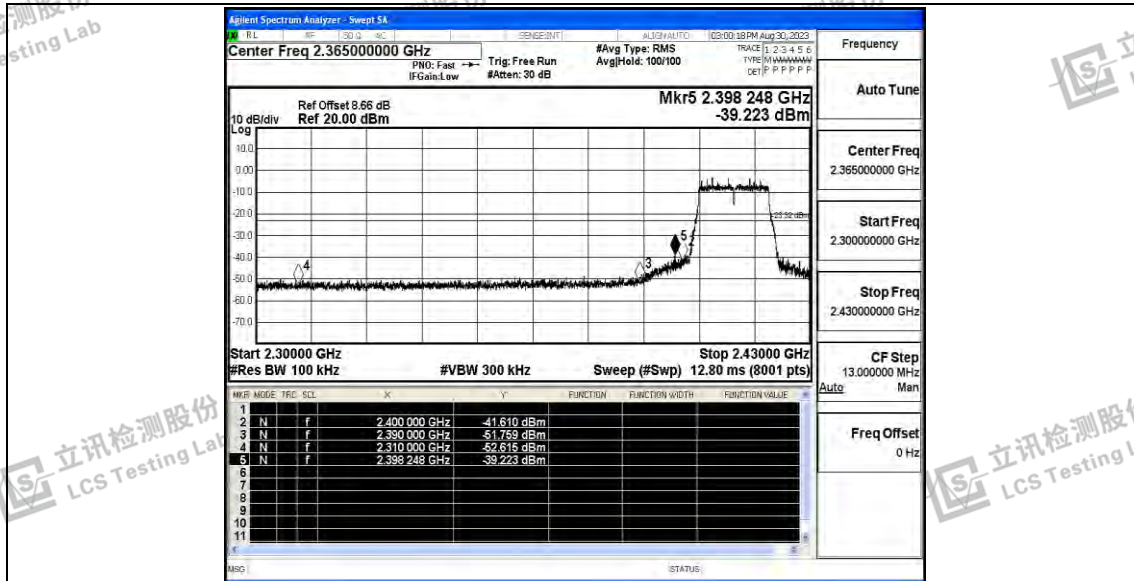


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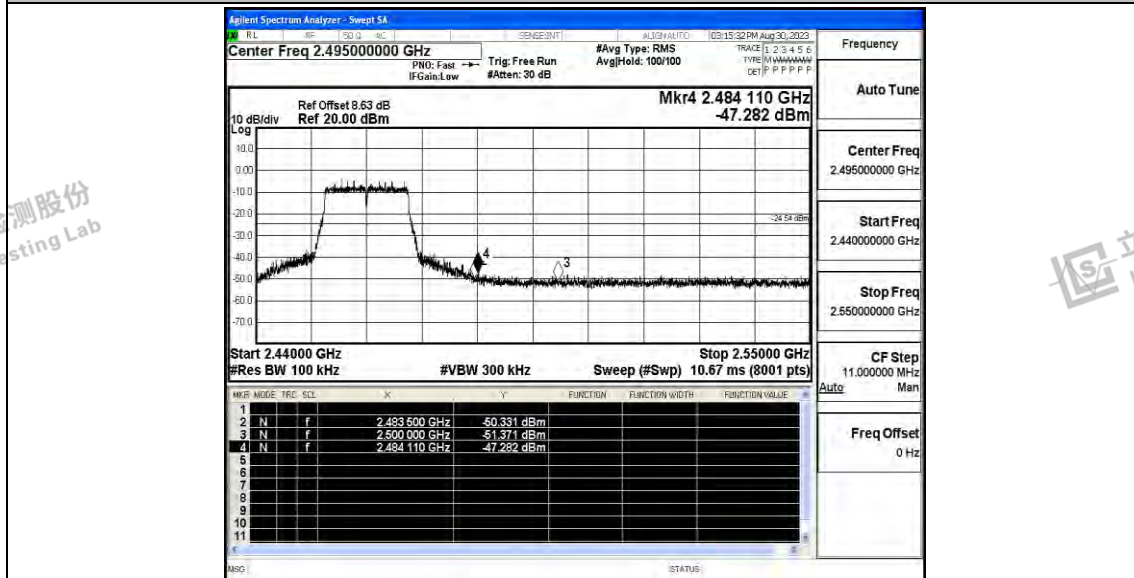
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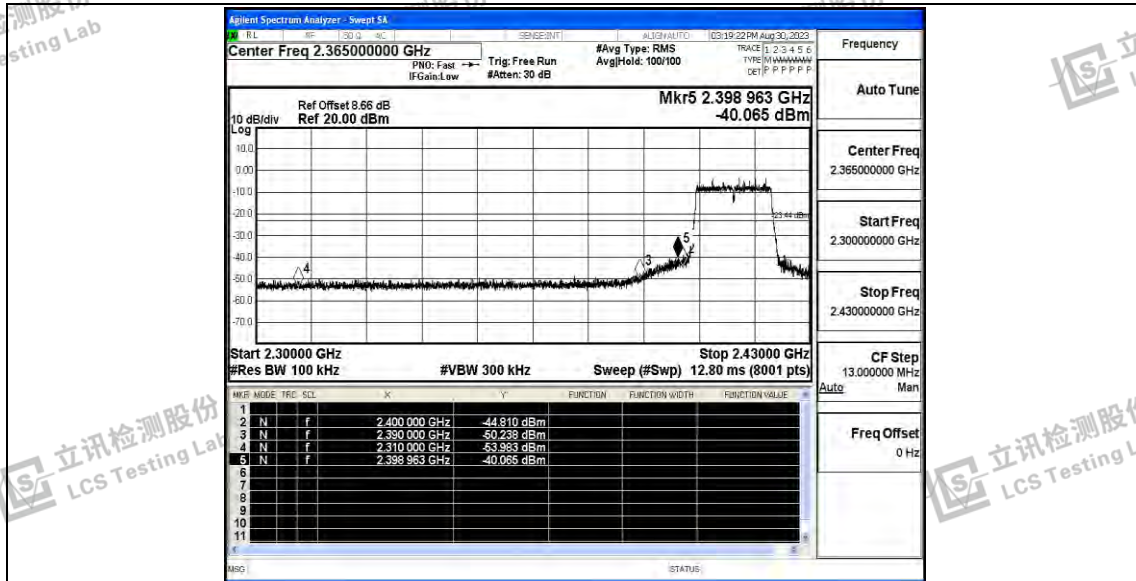


11G_Ant1_High_2462

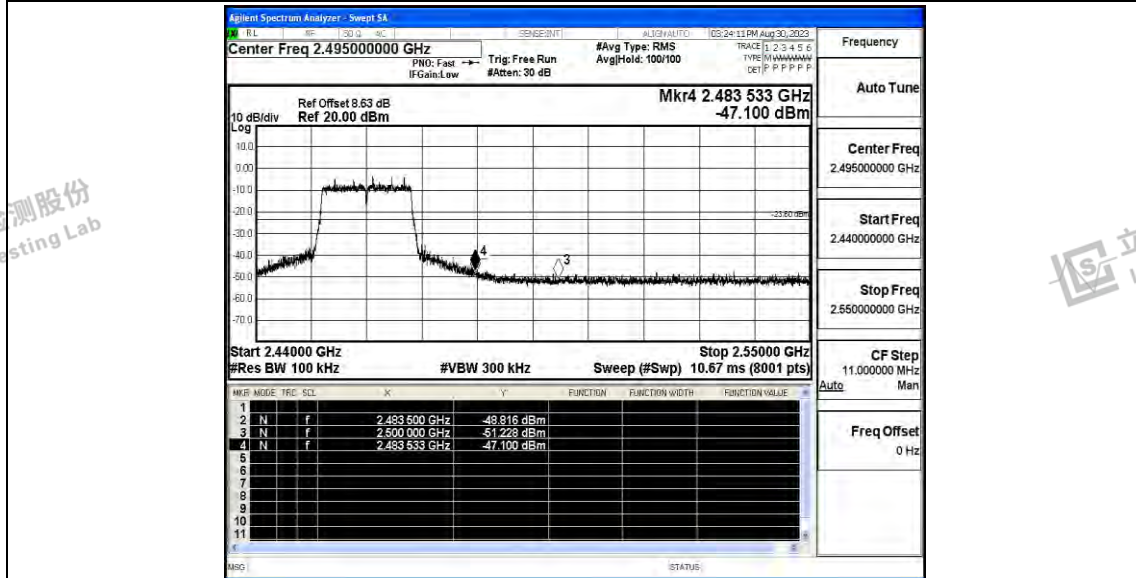


11N20SISO_Ant1_Low_2412



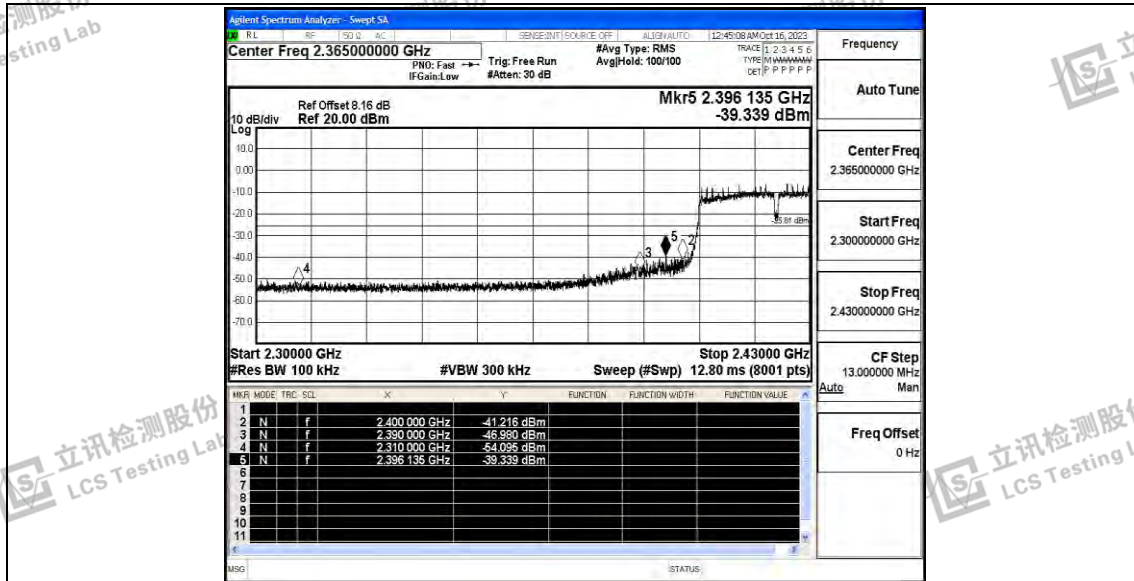


11N20SISO_Ant1_High_2462

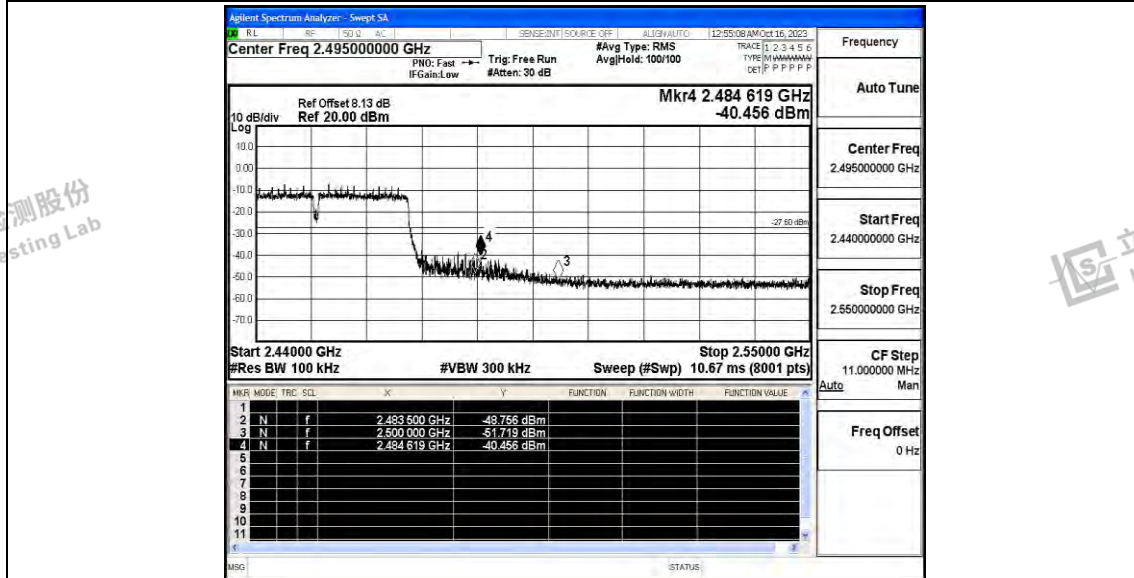


11N40SISO_Ant1_Low_2422





11N40SISO_Ant1_High_2452





C.5 Conducted Spurious Emission

Test Result

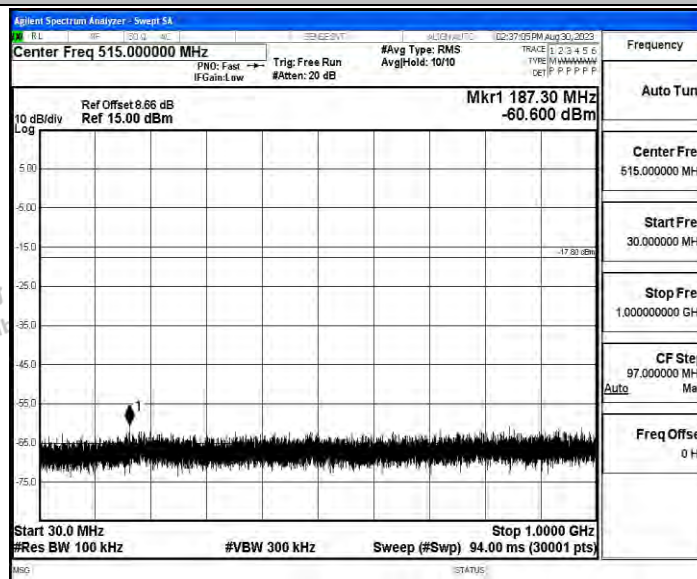
TestMode	Antenna	Freq(MHz)	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	30~1000	2.20	-60.6	≤ -17.8	PASS
			1000~26500	2.20	-46.37	≤ -17.8	PASS
		2437	30~1000	2.01	-61.07	≤ -17.99	PASS
			1000~26500	2.01	-46.49	≤ -17.99	PASS
		2462	30~1000	1.90	-60.41	≤ -18.1	PASS
			1000~26500	1.90	-46.42	≤ -18.1	PASS
11G	Ant1	2412	30~1000	-3.32	-61.35	≤ -23.32	PASS
			1000~26500	-3.32	-45.15	≤ -23.32	PASS
		2437	30~1000	-3.55	-60.55	≤ -23.55	PASS
			1000~26500	-3.55	-46.53	≤ -23.55	PASS
		2462	30~1000	-4.54	-60.48	≤ -24.54	PASS
			1000~26500	-4.54	-45.85	≤ -24.54	PASS
11N20SISO	Ant1	2412	30~1000	-3.44	-60.64	≤ -23.44	PASS
			1000~26500	-3.44	-45.55	≤ -23.44	PASS
		2437	30~1000	-3.02	-60.48	≤ -23.02	PASS
			1000~26500	-3.02	-45.57	≤ -23.02	PASS
		2462	30~1000	-3.60	-60.98	≤ -23.6	PASS
			1000~26500	-3.60	-46.64	≤ -23.6	PASS
11N40SISO	Ant1	2422	30~1000	-5.81	-61.35	≤ -25.81	PASS
			1000~26500	-5.81	-49.7	≤ -25.81	PASS
		2437	30~1000	-7.06	-61.74	≤ -27.06	PASS
			1000~26500	-7.06	-48.42	≤ -27.06	PASS
		2452	30~1000	-7.60	-61.41	≤ -27.6	PASS
			1000~26500	-7.60	-49.3	≤ -27.6	PASS



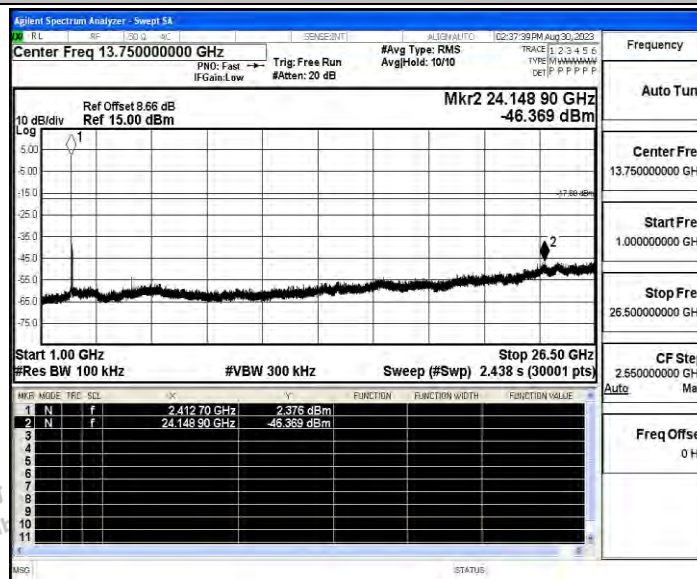


Test Graphs

11B_Ant1_2412_30~1000

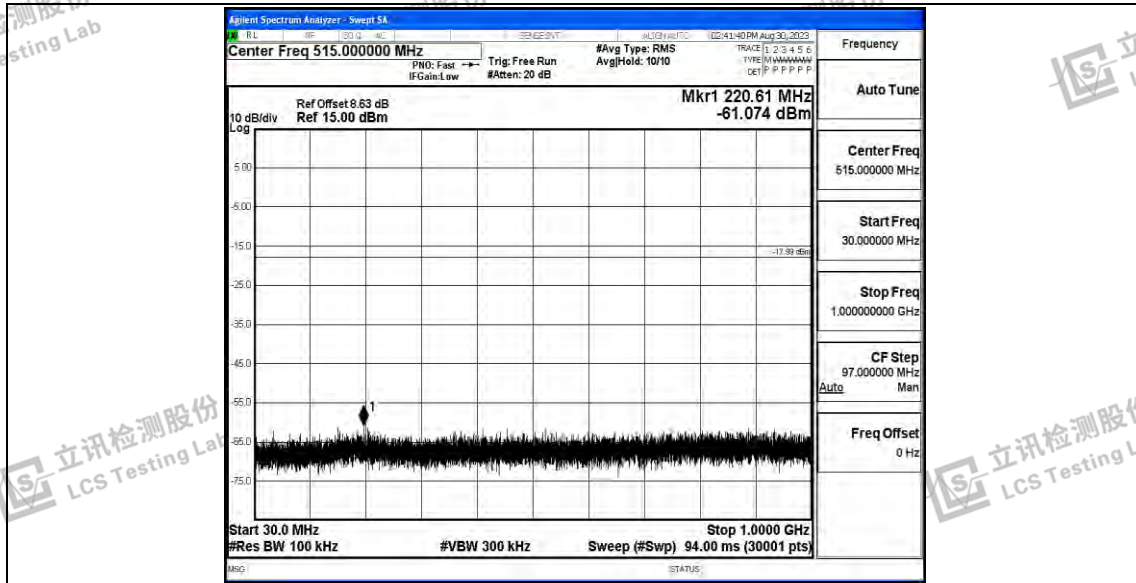


11B_Ant1_2412_1000~26500

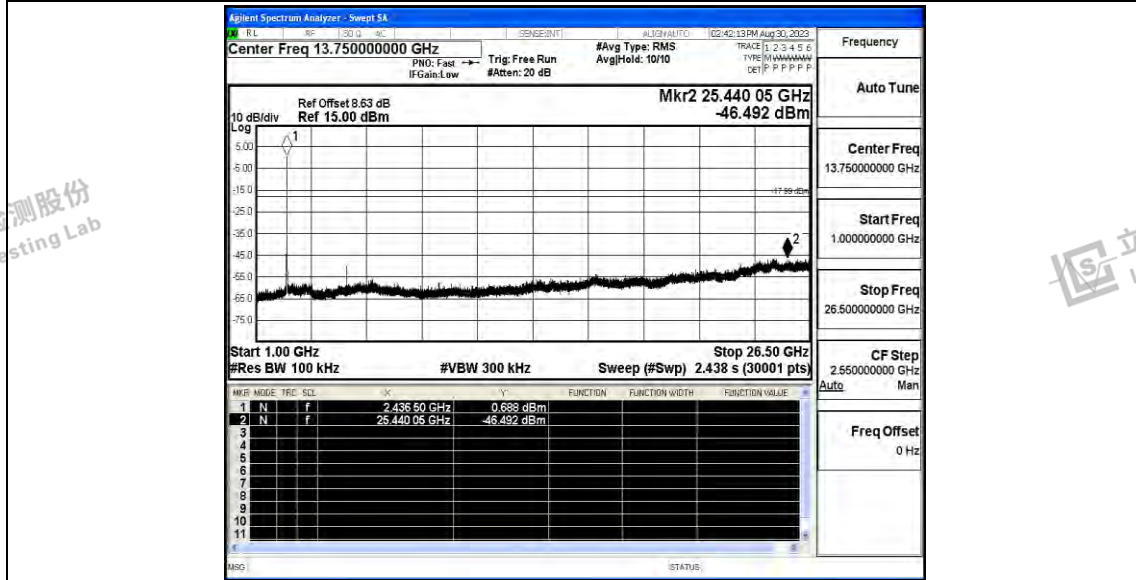


11B_Ant1_2437_30~1000



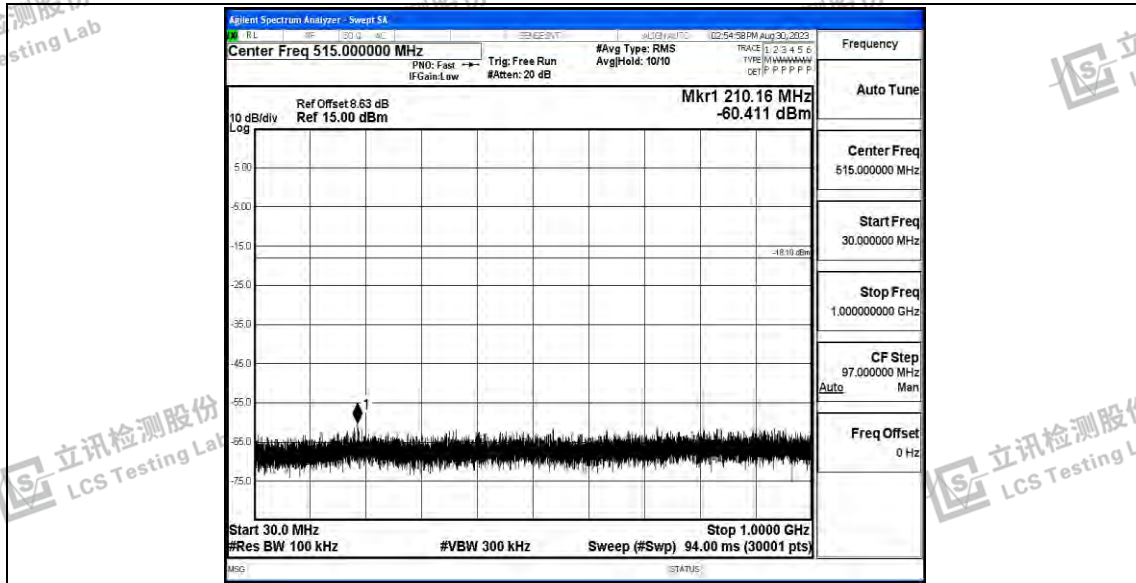


11B_Ant1_2437_1000~26500

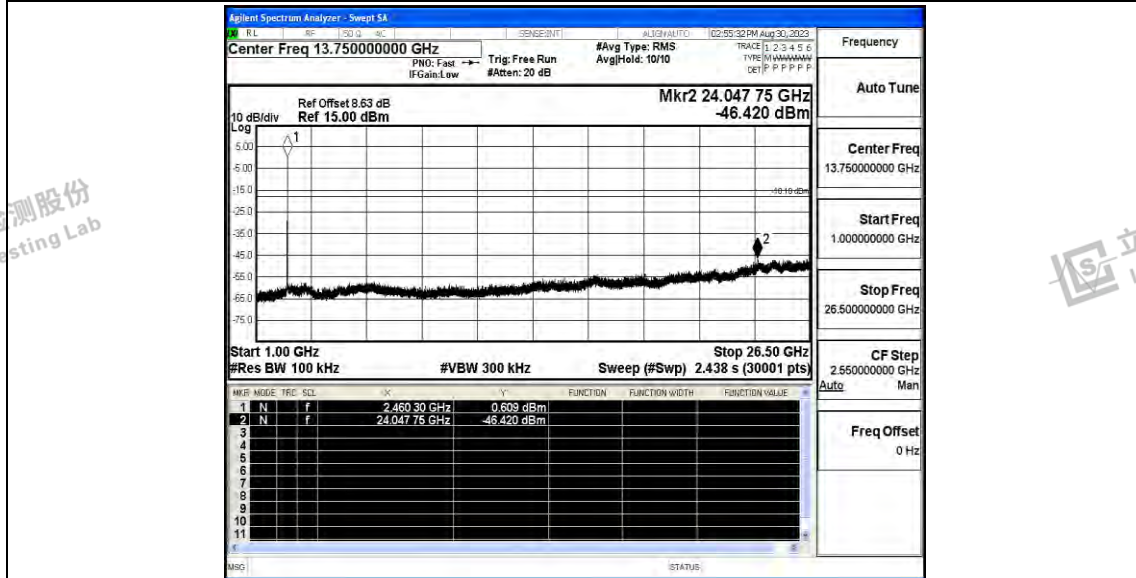


11B_Ant1_2462_30~1000



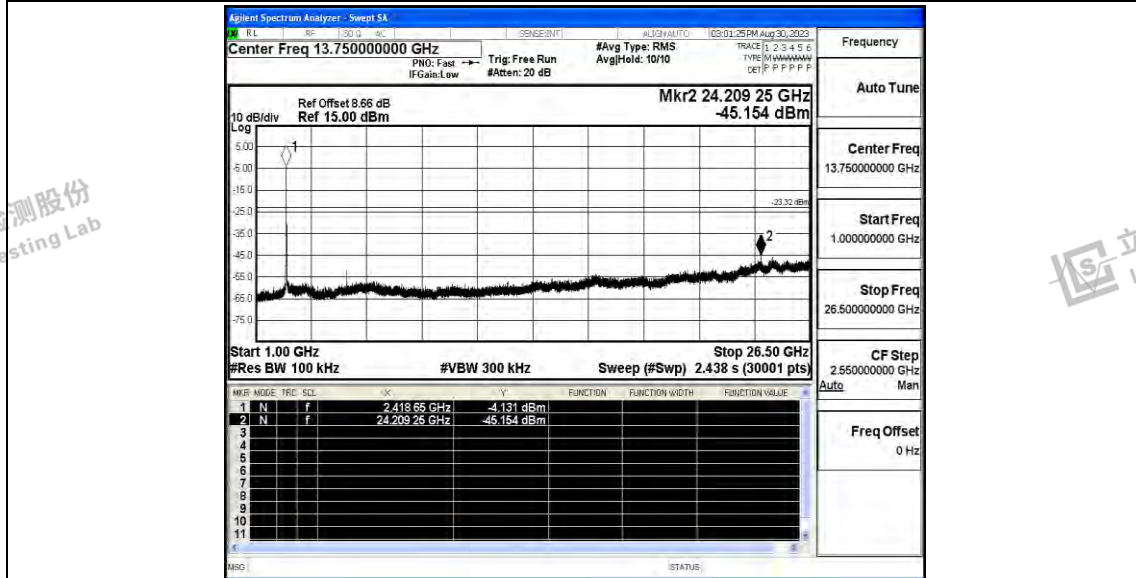
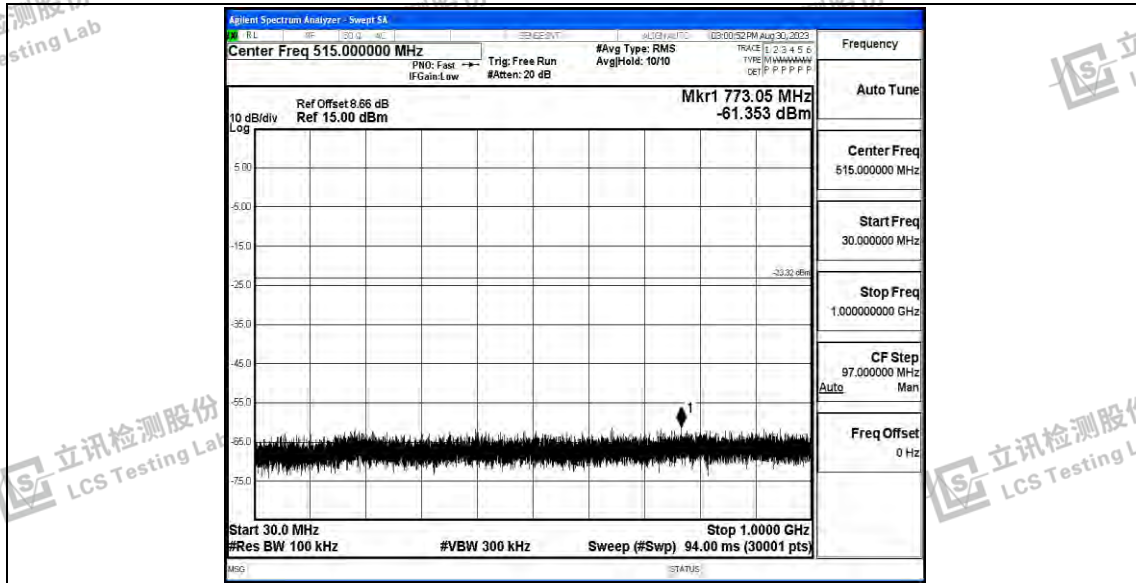


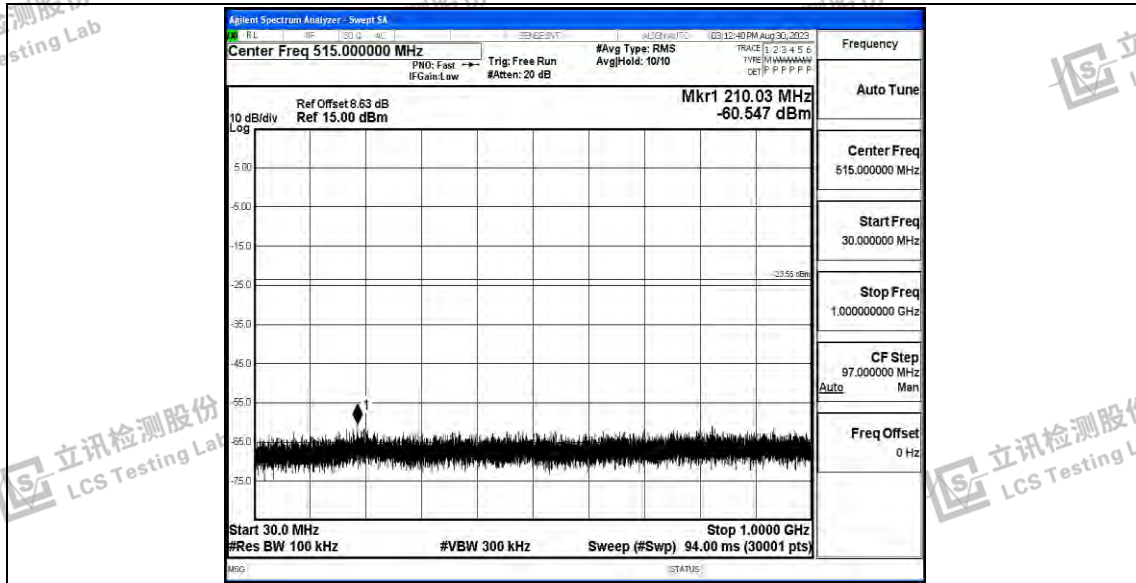
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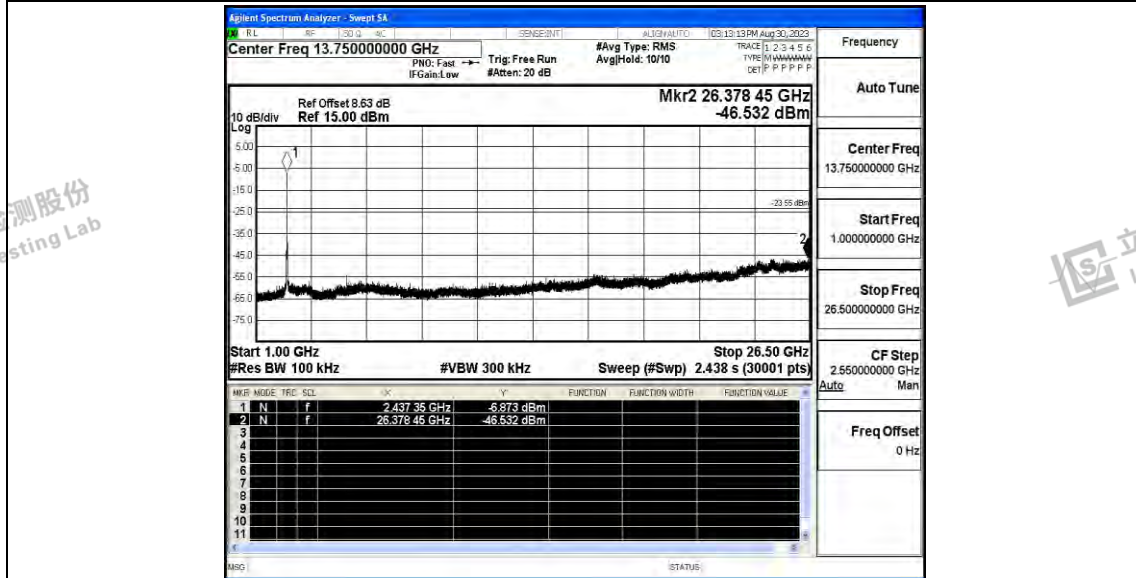
11G_Ant1_2412_30~1000





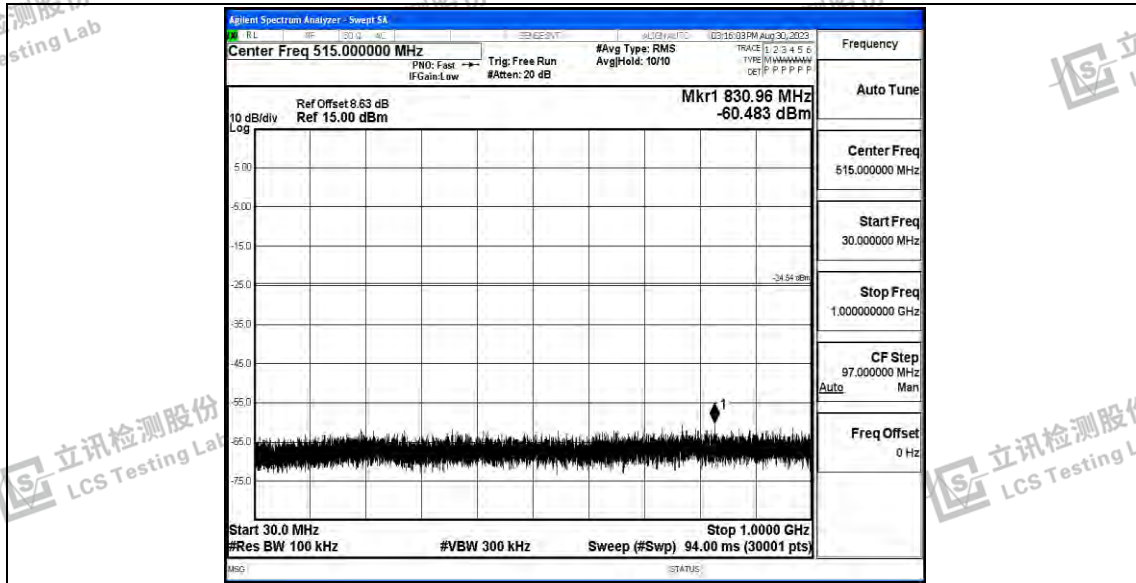


11G_Ant1_2437_1000~26500

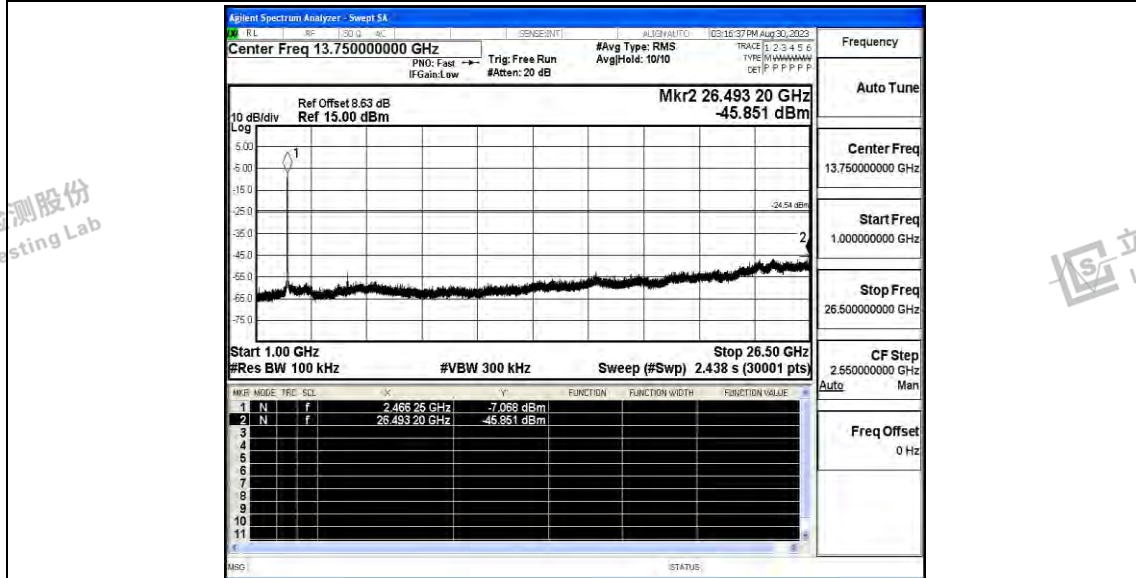


11G_Ant1_2462_30~1000



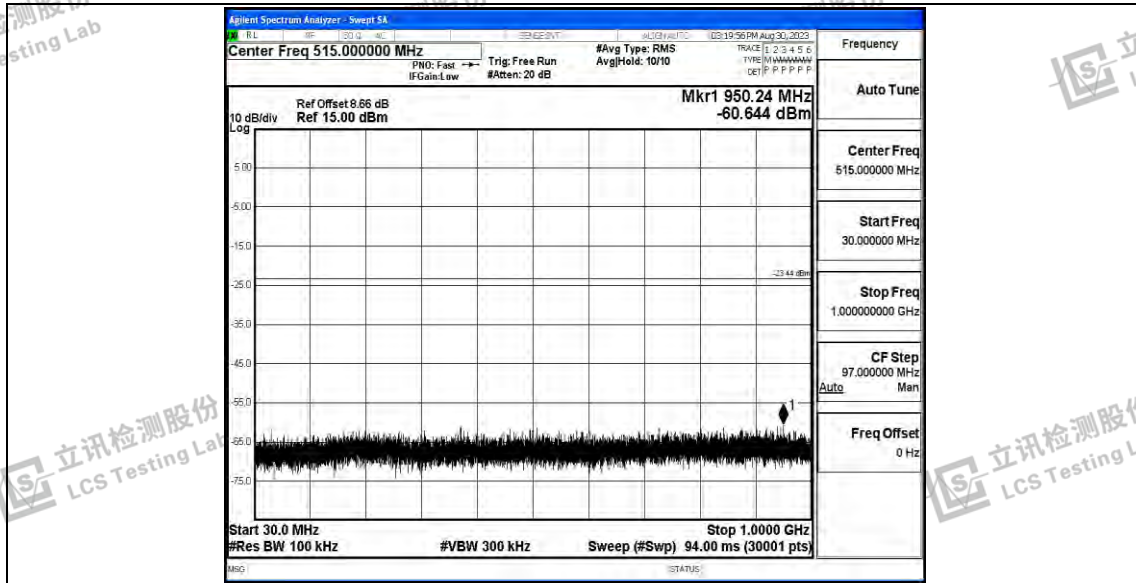


11G_Ant1_2462_1000~26500

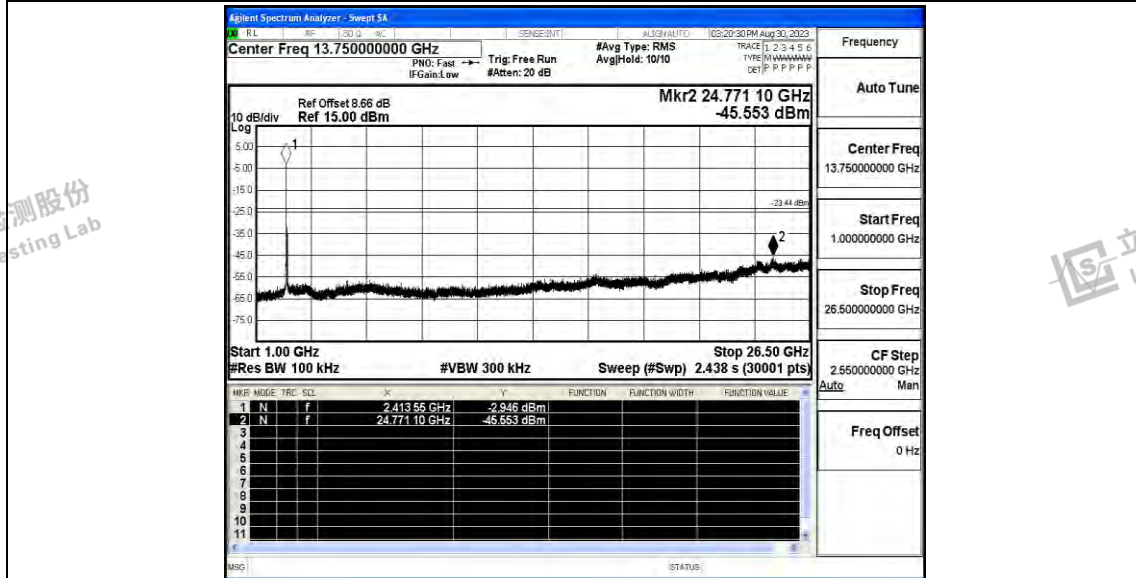


11N20SISO_Ant1_2412_30~1000





11N20SISO_Ant1_2412_1000~26500



11N20SISO_Ant1_2437_30~1000

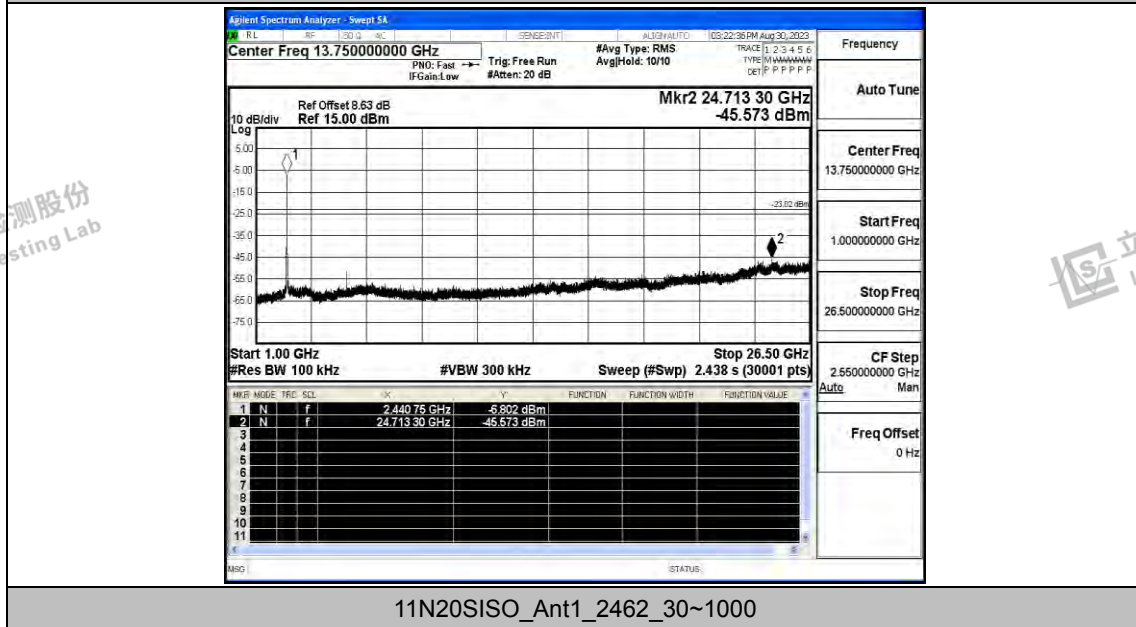
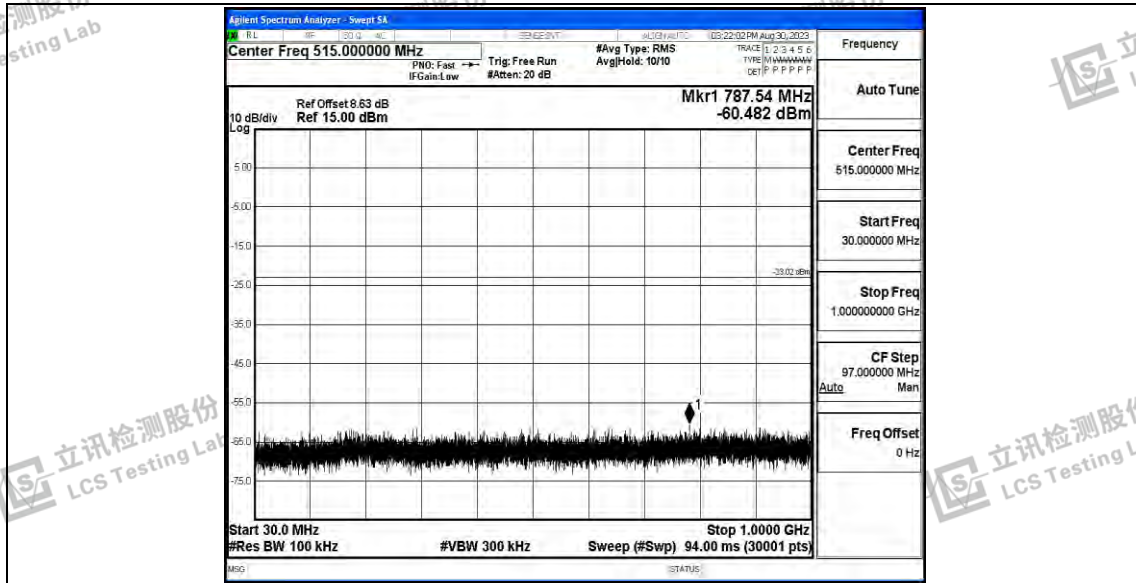


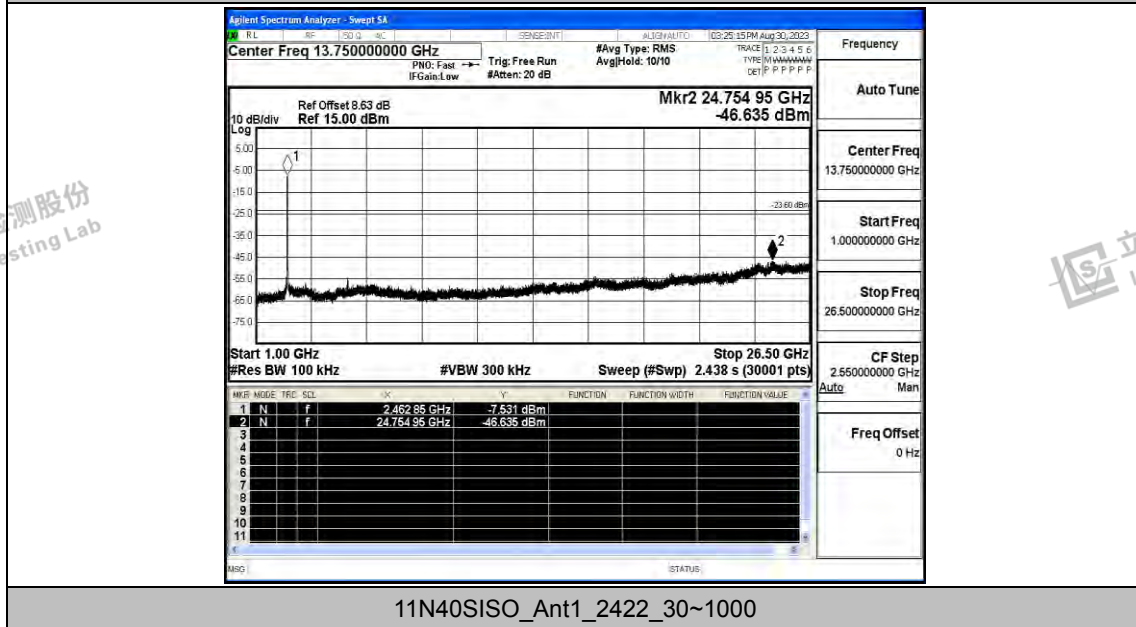
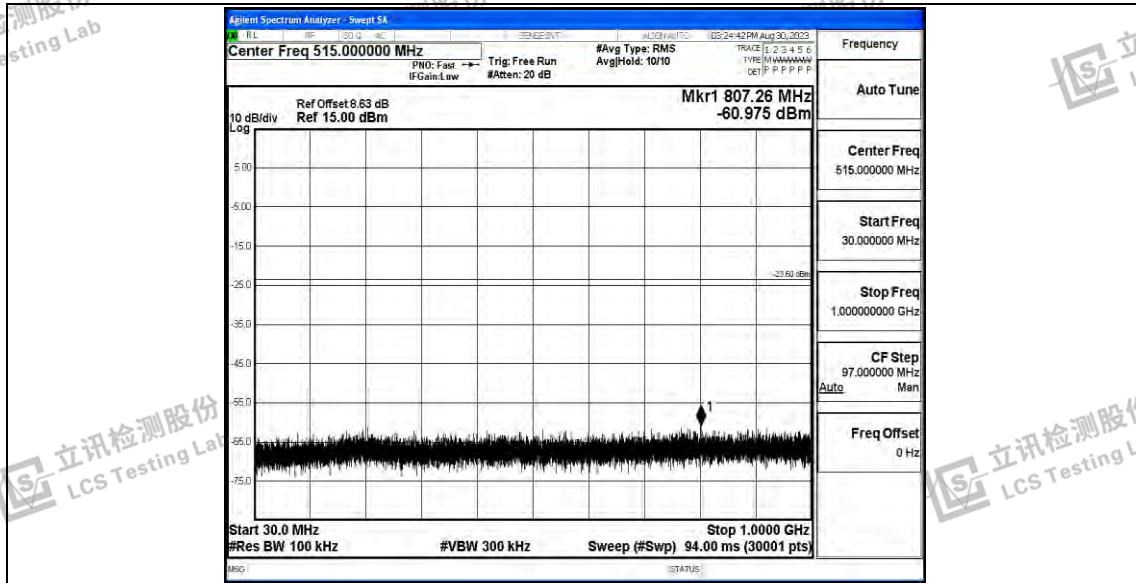
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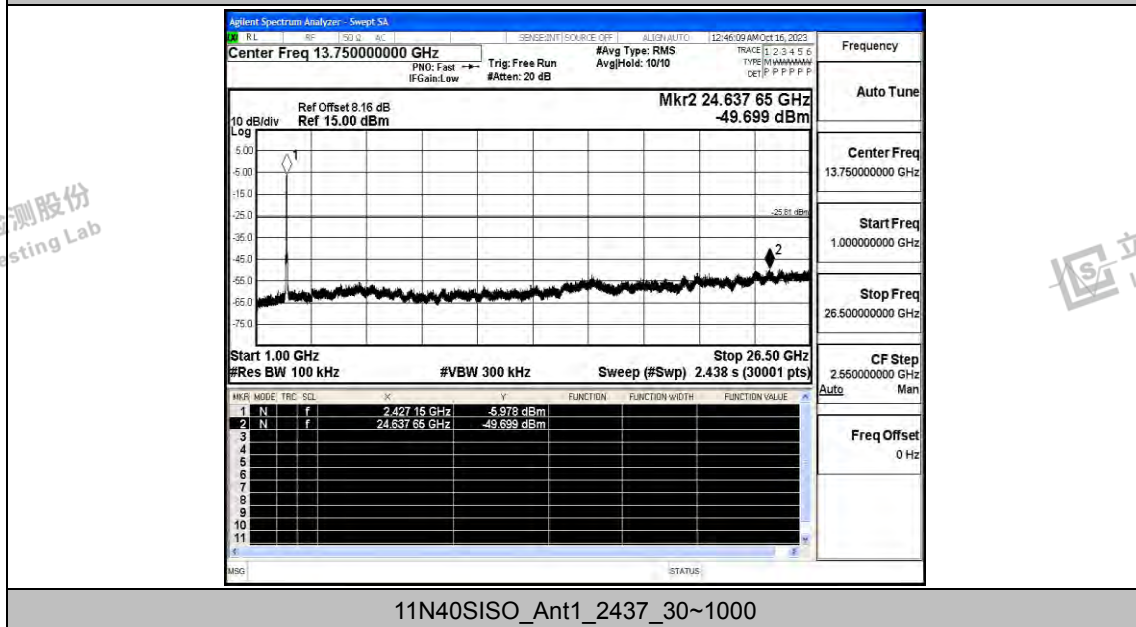
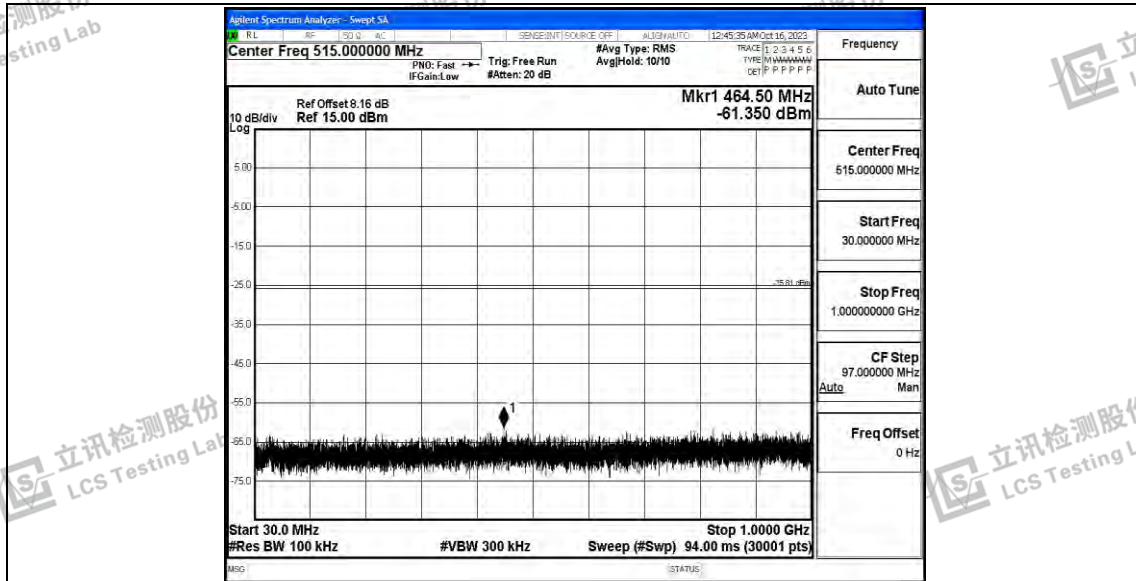
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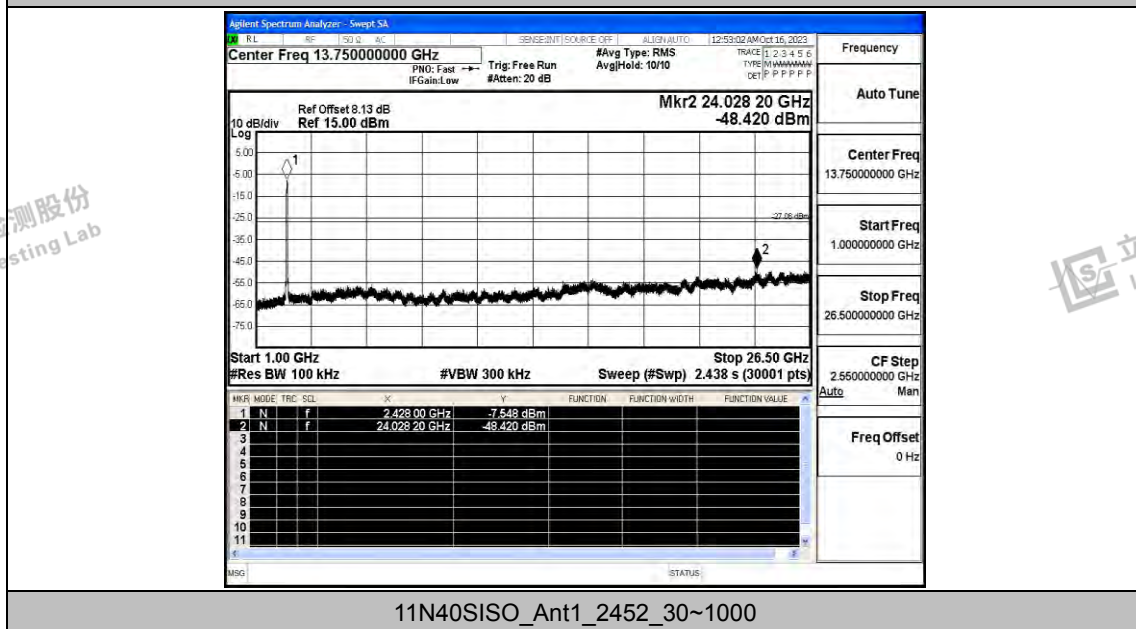
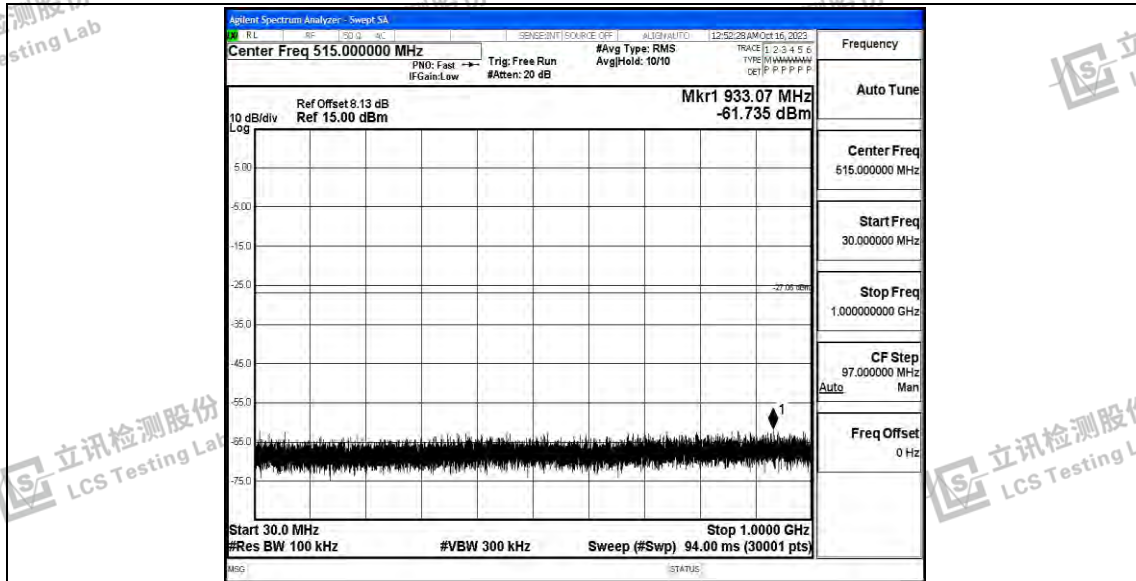


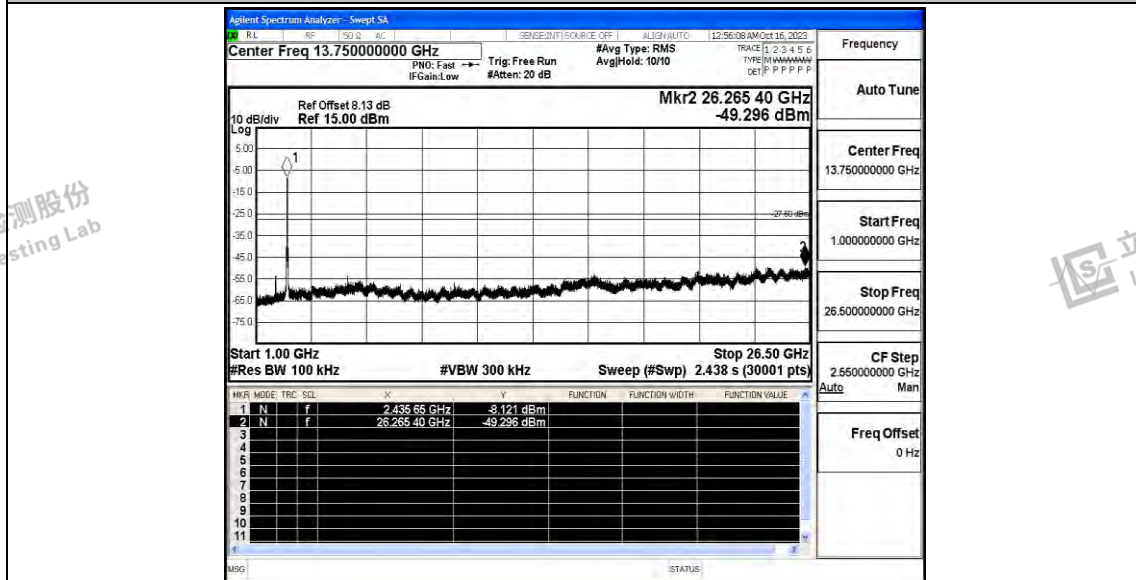
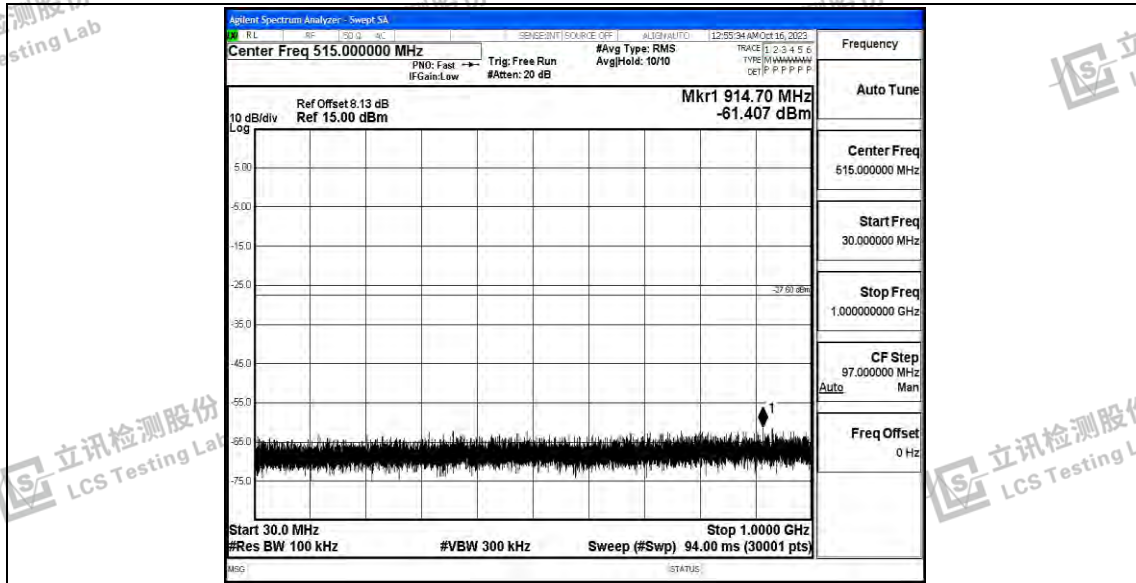
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C.6 Duty Cycle

Test Result

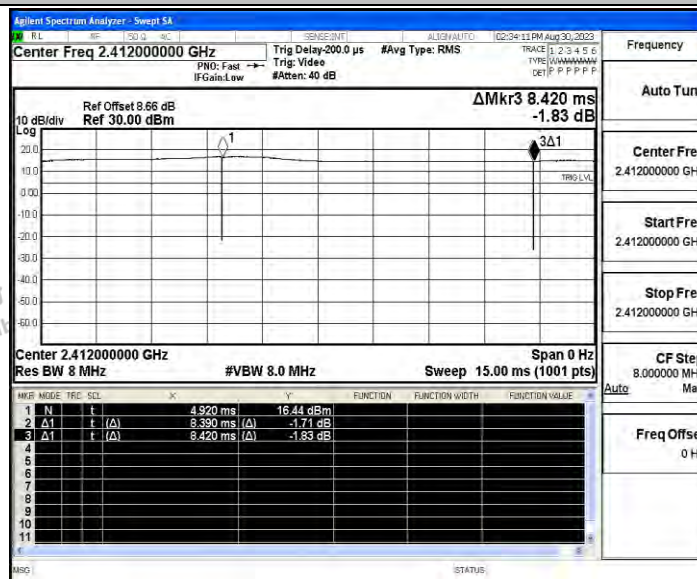
TestMode	Antenna	Freq(MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor	Verdict
11B	Ant1	2412	8.39	8.42	99.64	0.02	---
		2437	8.39	8.42	99.64	0.02	---
		2462	8.39	8.42	99.64	0.02	---
11G	Ant1	2412	1.39	1.42	97.89	0.09	---
		2437	1.39	1.42	97.89	0.09	---
		2462	1.39	1.43	97.20	0.12	---
11N20SISO	Ant1	2412	1.30	1.33	97.74	0.10	---
		2437	1.30	1.33	97.74	0.10	---
		2462	1.30	1.33	97.74	0.10	---
11N40SISO	Ant1	2422	0.64	0.68	94.12	0.26	---
		2437	0.64	0.68	94.12	0.26	---
		2452	0.65	0.68	95.59	0.20	---



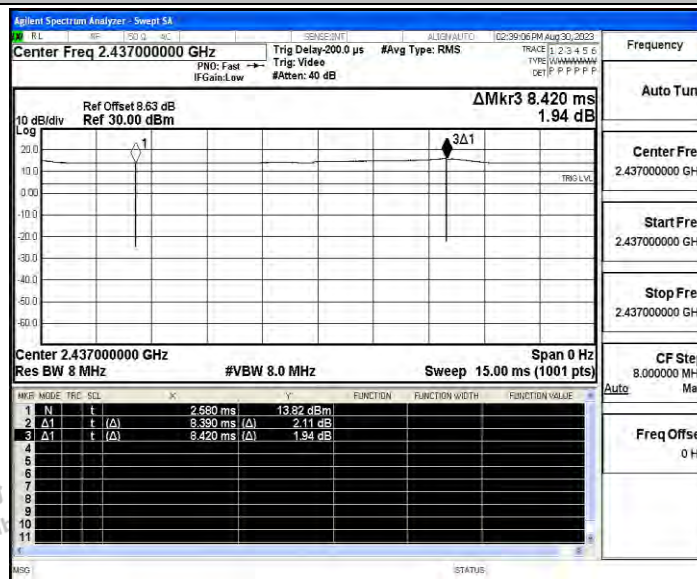


Test Graphs

11B_Ant1_2412

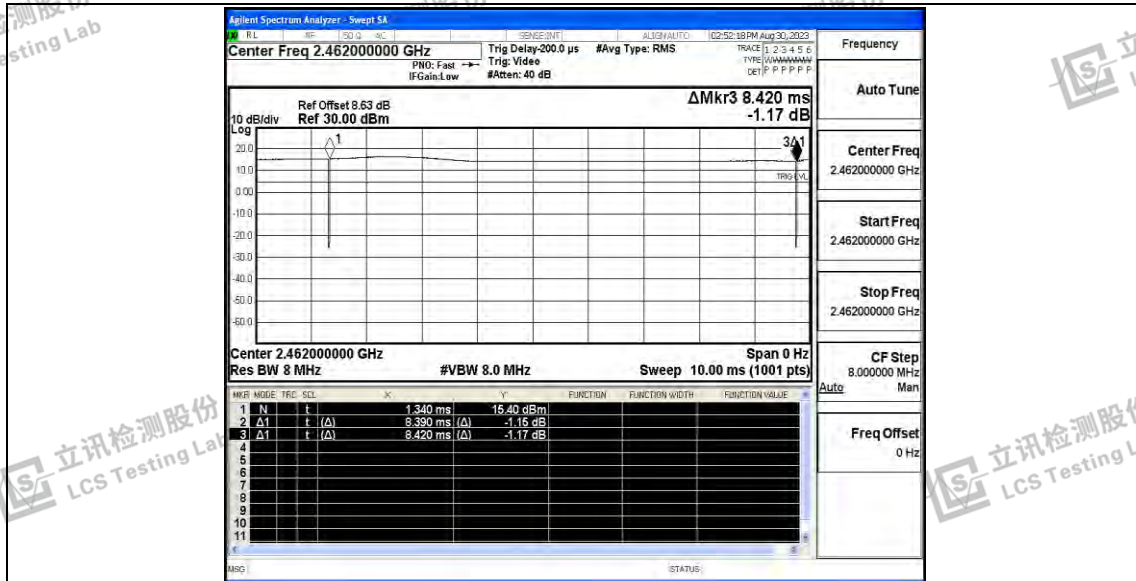


11B_Ant1_2437

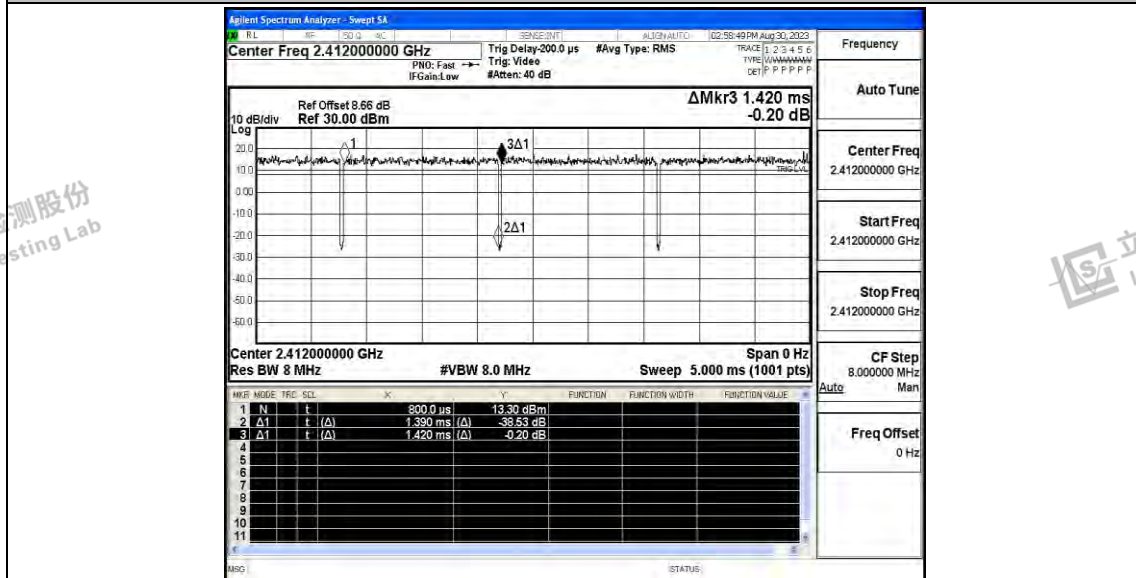


11B_Ant1_2462



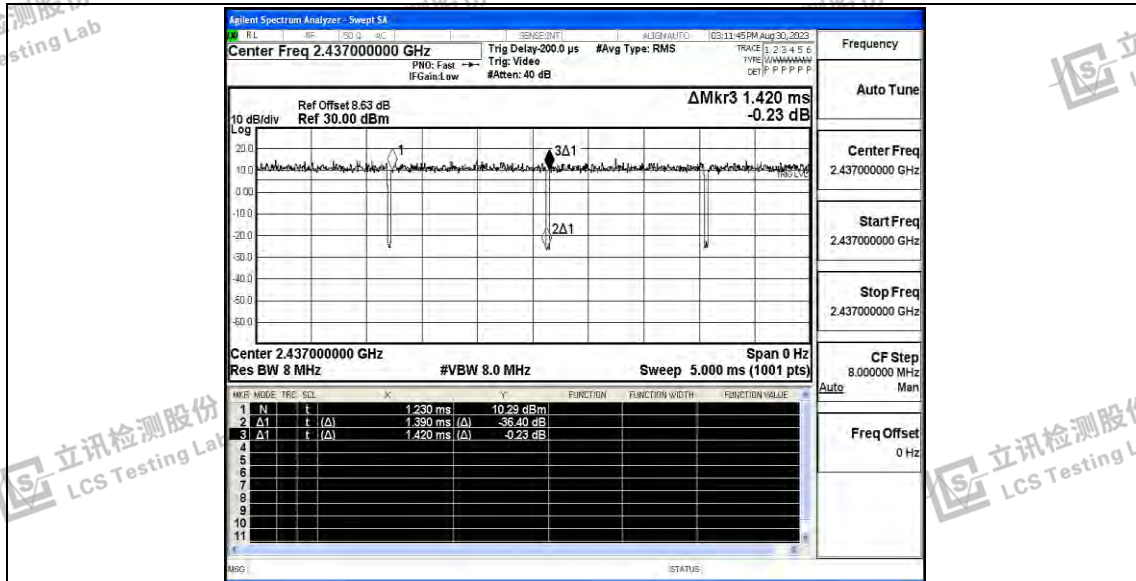


11G_Ant1_2412

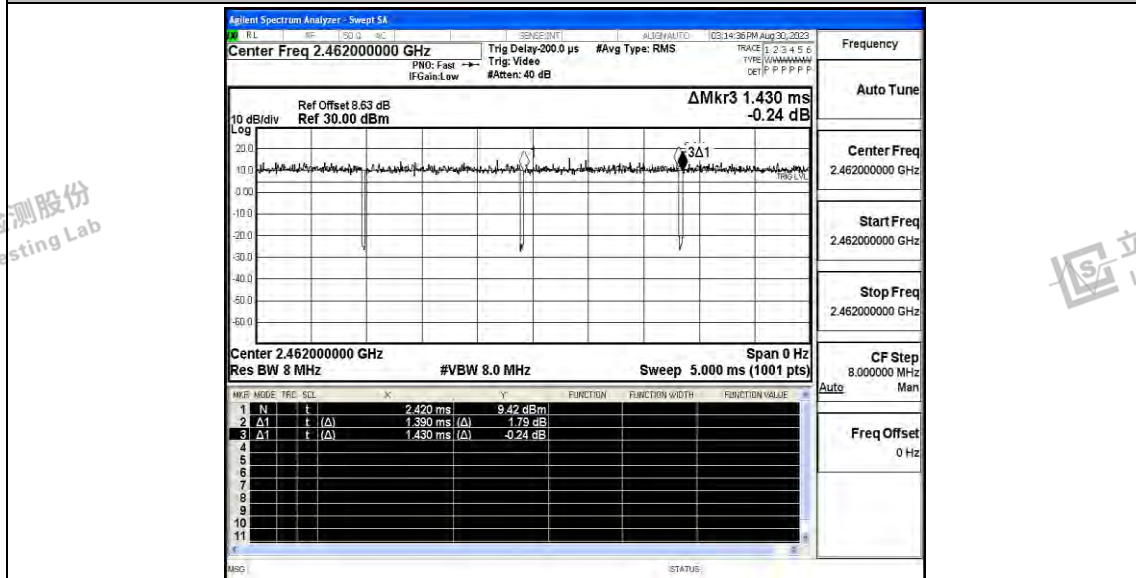


11G_Ant1_2437



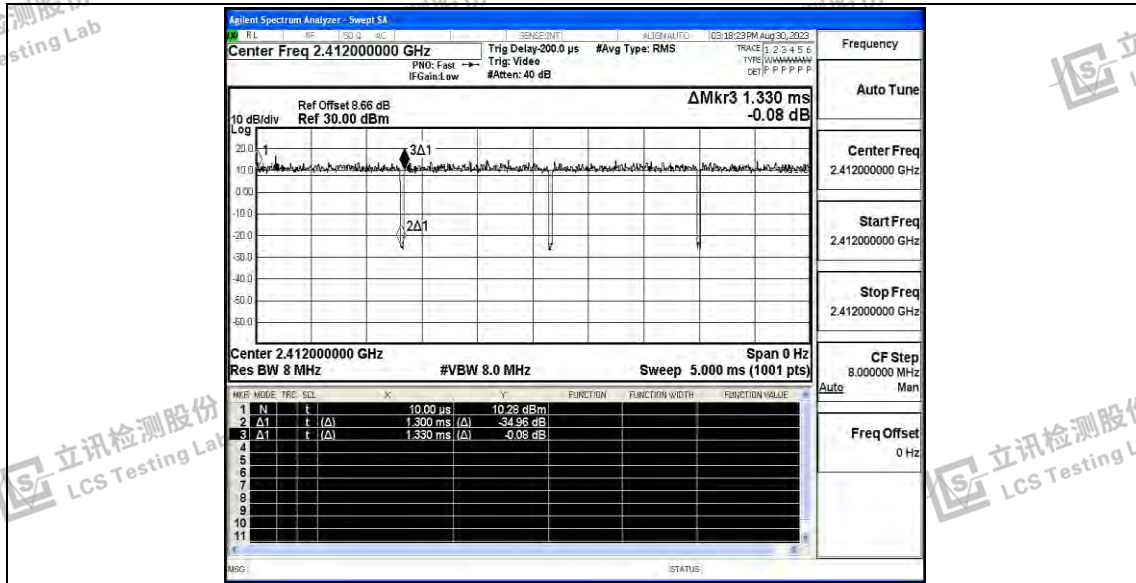


11G_Ant1_2462

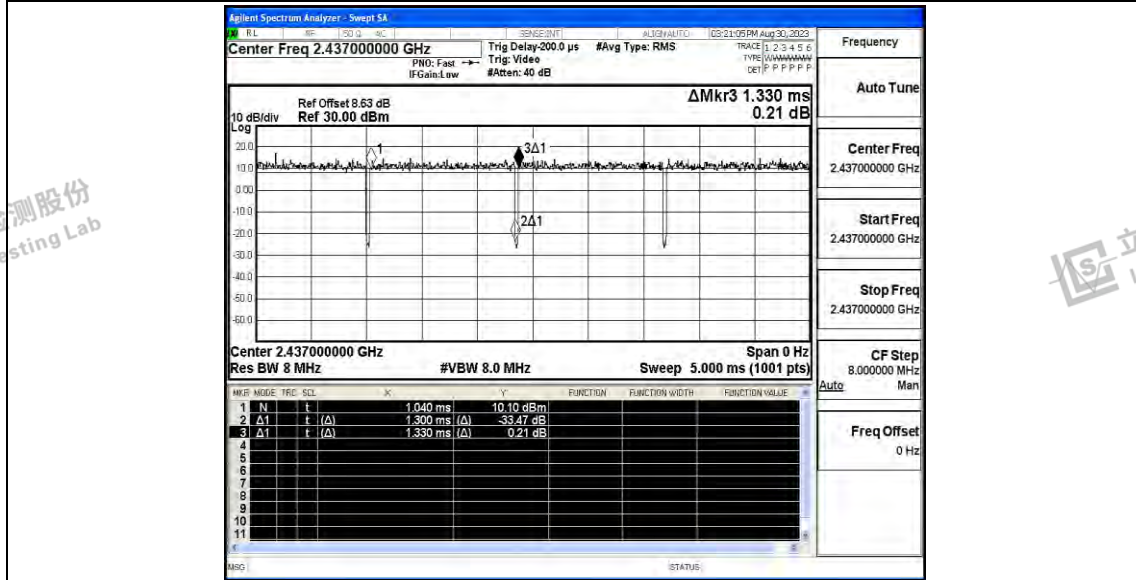


11N20SISO_Ant1_2412



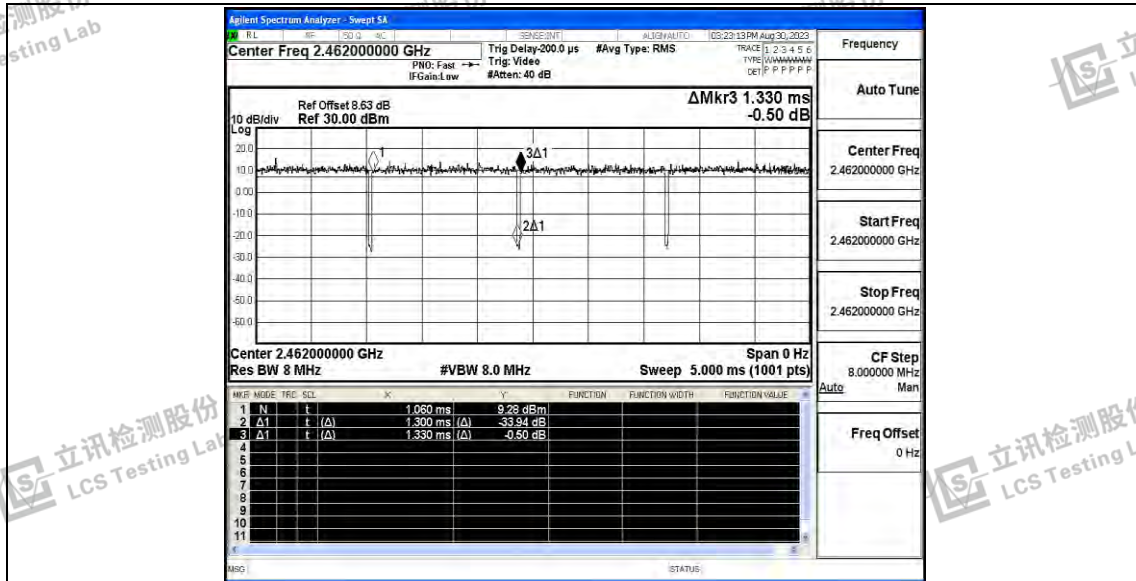


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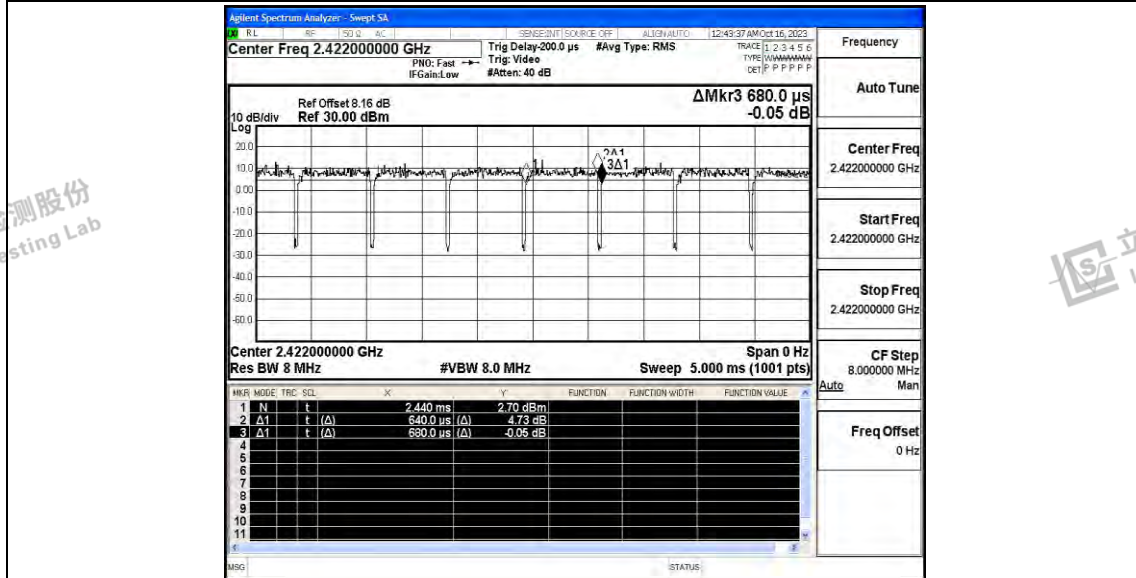


11N20SISO_Ant1_2462



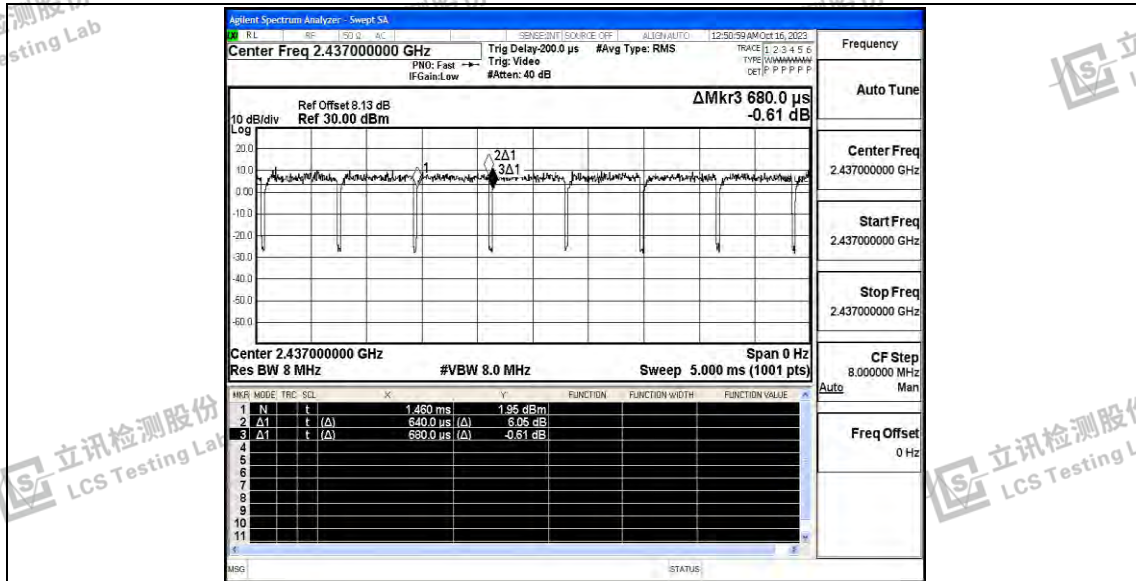


11N40SISO_Ant1_2422

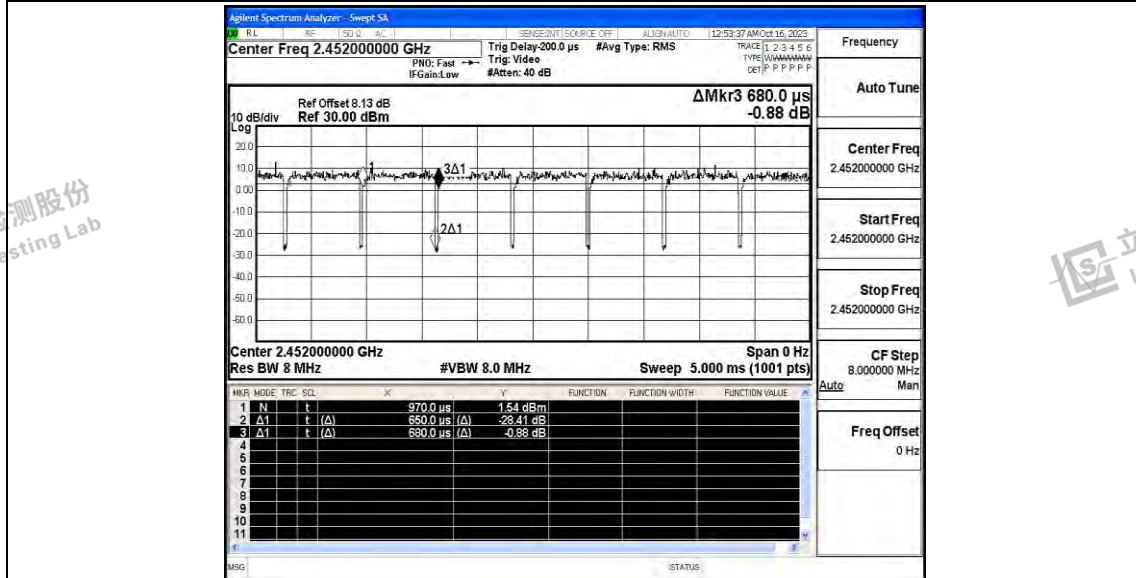


11N40SISO_Ant1_2437





11N40SISO_Ant1_2452





C.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	AV	2310.000	-48.45	≤-41.20	46.75	≤54	PASS
				AV	2388.790	-47.58	≤-41.20	47.62	≤54	PASS
				AV	2390.000	-47.6	≤-41.20	47.60	≤54	PASS
				Peak	2310.000	-40.65	≤-21.20	54.55	≤74	PASS
				Peak	2359.670	-37.68	≤-21.20	57.52	≤74	PASS
				Peak	2390.000	-40.77	≤-21.20	54.43	≤74	PASS
		High	2462	AV	2483.500	-47.45	≤-41.20	47.75	≤54	PASS
				AV	2488.730	-47.32	≤-41.20	47.88	≤54	PASS
				AV	2500.000	-47.41	≤-41.20	47.79	≤54	PASS
				Peak	2483.500	-40	≤-21.20	55.20	≤74	PASS
				Peak	2483.560	-37.97	≤-21.20	57.23	≤74	PASS
				Peak	2500.000	-40.04	≤-21.20	55.16	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-47.84	≤-41.20	47.36	≤54	PASS
				AV	2389.960	-45.45	≤-41.20	49.75	≤54	PASS
				AV	2390.000	-45.45	≤-41.20	49.75	≤54	PASS
				Peak	2310.000	-44.01	≤-21.20	51.19	≤74	PASS
				Peak	2389.960	-36.09	≤-21.20	59.11	≤74	PASS
				Peak	2390.000	-36.1	≤-21.20	59.10	≤74	PASS
		High	2462	AV	2483.500	-43.99	≤-41.20	51.21	≤54	PASS
				AV	2483.780	-44.04	≤-41.20	51.16	≤54	PASS
				AV	2500.000	-46.42	≤-41.20	48.78	≤54	PASS
				Peak	2483.500	-34.18	≤-21.20	61.02	≤74	PASS
				Peak	2484.880	-33.49	≤-21.20	61.71	≤74	PASS
				Peak	2500.000	-43.02	≤-21.20	52.18	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-47.83	≤-41.20	47.37	≤54	PASS
				AV	2389.960	-44.08	≤-41.20	51.12	≤54	PASS
				AV	2390.000	-44.08	≤-41.20	51.12	≤54	PASS
				Peak	2310.000	-42.48	≤-21.20	52.72	≤74	PASS
				Peak	2388.400	-36.2	≤-21.20	59.00	≤74	PASS
				Peak	2390.000	-38.79	≤-21.20	56.41	≤74	PASS
		High	2462	AV	2483.500	-43.3	≤-41.20	51.90	≤54	PASS
				AV	2483.780	-43.32	≤-41.20	51.88	≤54	PASS
				AV	2500.000	-46.26	≤-41.20	48.94	≤54	PASS
				Peak	2483.500	-37.97	≤-21.20	57.23	≤74	PASS





11N40SIS O	Ant1	Low	2422	Peak	2483.670	-33.21	≤ -21.20	61.99	≤ 74	PASS
				Peak	2500.000	-40.19	≤ -21.20	55.01	≤ 74	PASS
				AV	2310.000	-48.53	≤ -41.20	46.67	≤ 54	PASS
				AV	2389.050	-44.52	≤ -41.20	50.68	≤ 54	PASS
				AV	2390.000	-44.66	≤ -41.20	50.54	≤ 54	PASS
				Peak	2310.000	-41.18	≤ -21.20	54.02	≤ 74	PASS
		High	2452	Peak	2389.700	-32.02	≤ -21.20	63.18	≤ 74	PASS
				Peak	2390.000	-40.3	≤ -21.20	54.90	≤ 74	PASS
				AV	2483.500	-42.69	≤ -41.20	52.51	≤ 54	PASS
				AV	2484.440	-42.43	≤ -41.20	52.77	≤ 54	PASS
				AV	2500.000	-46.7	≤ -41.20	48.50	≤ 54	PASS
				Peak	2483.500	-36.11	≤ -21.20	59.09	≤ 74	PASS
				Peak	2485.100	-26.55	≤ -21.20	68.65	≤ 74	PASS
				Peak	2500.000	-40.02	≤ -21.20	55.18	≤ 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.

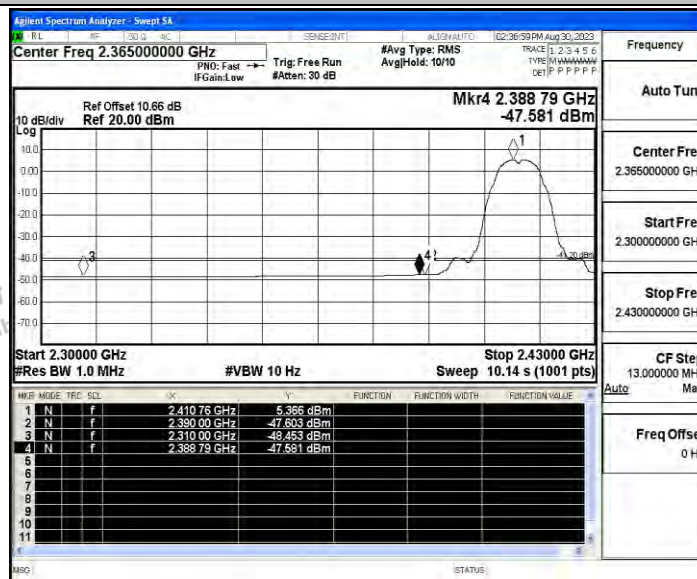


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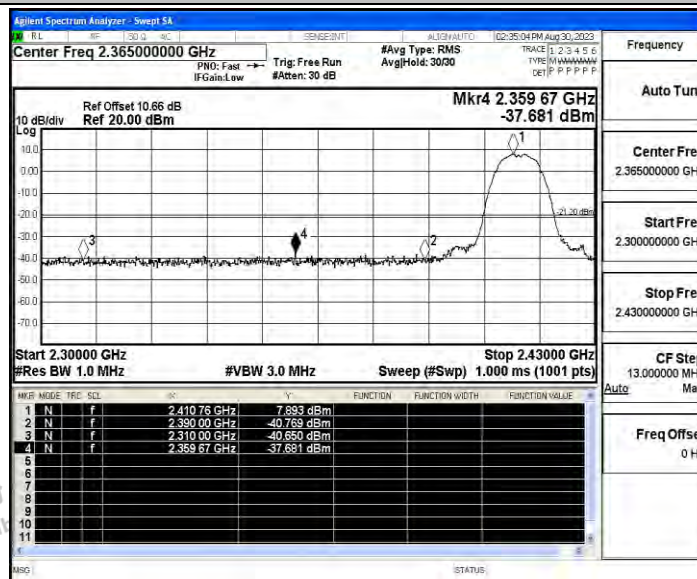


Test Graphs

11B_Ant1_Low_2412_AV



11B_Ant1_Low_2412_Peak



11B_Ant1_High_2462_AV

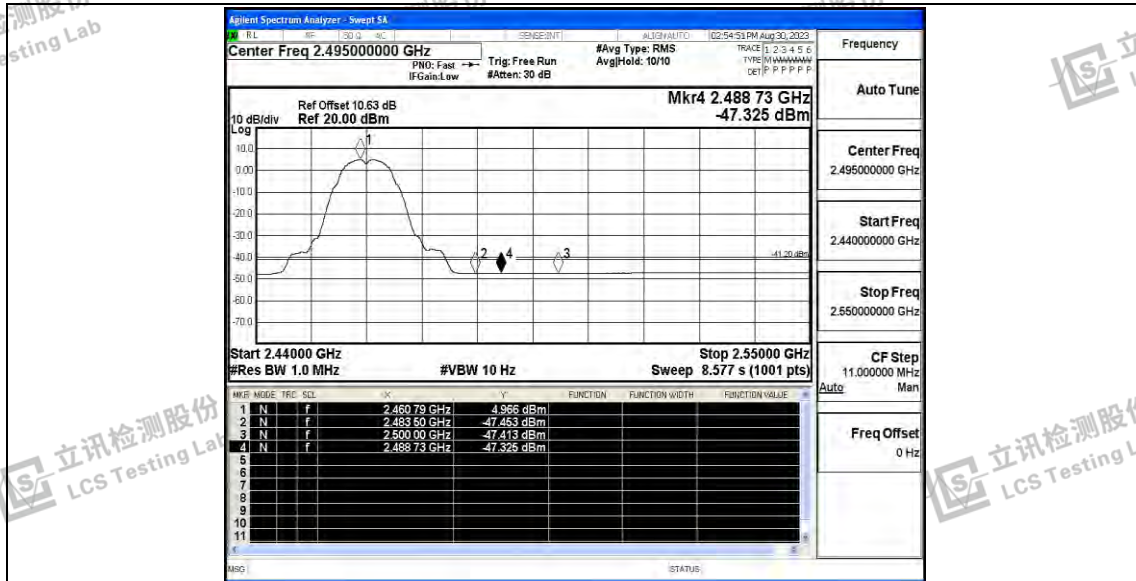


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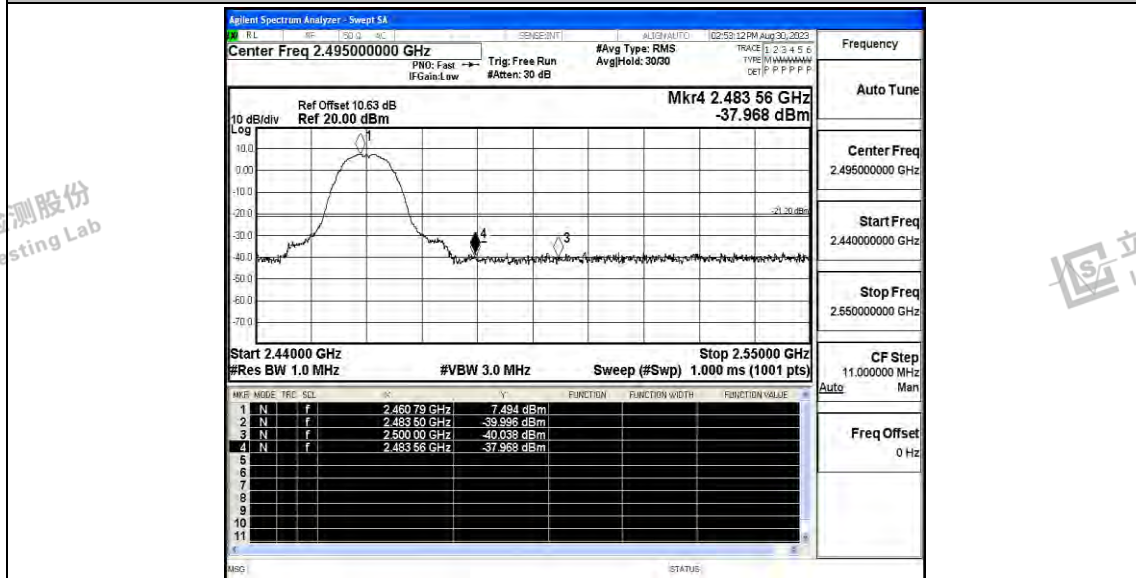
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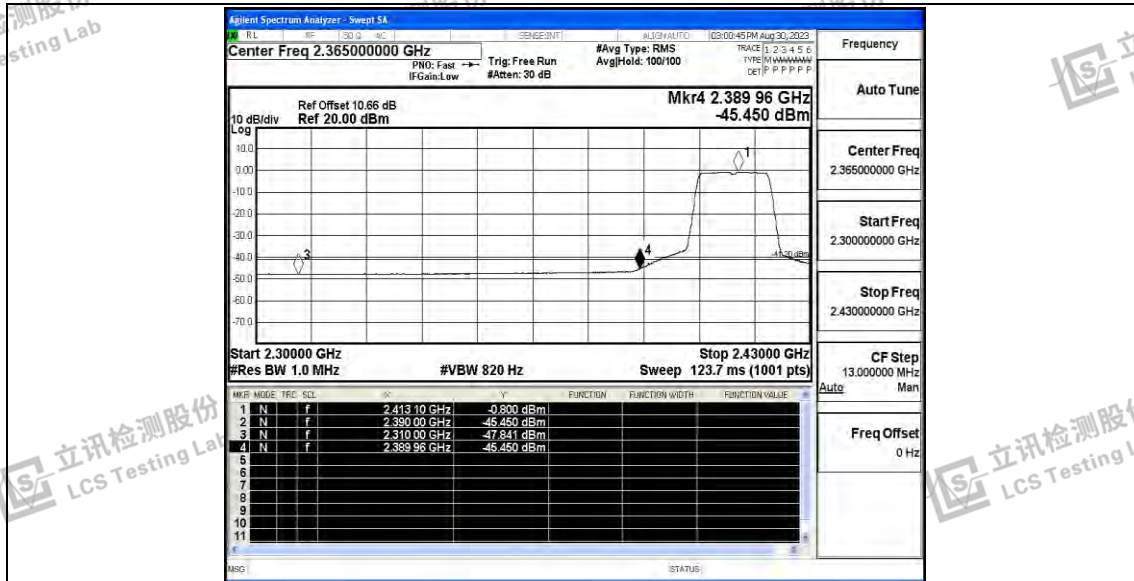


11B_Ant1_High_2462_Peak

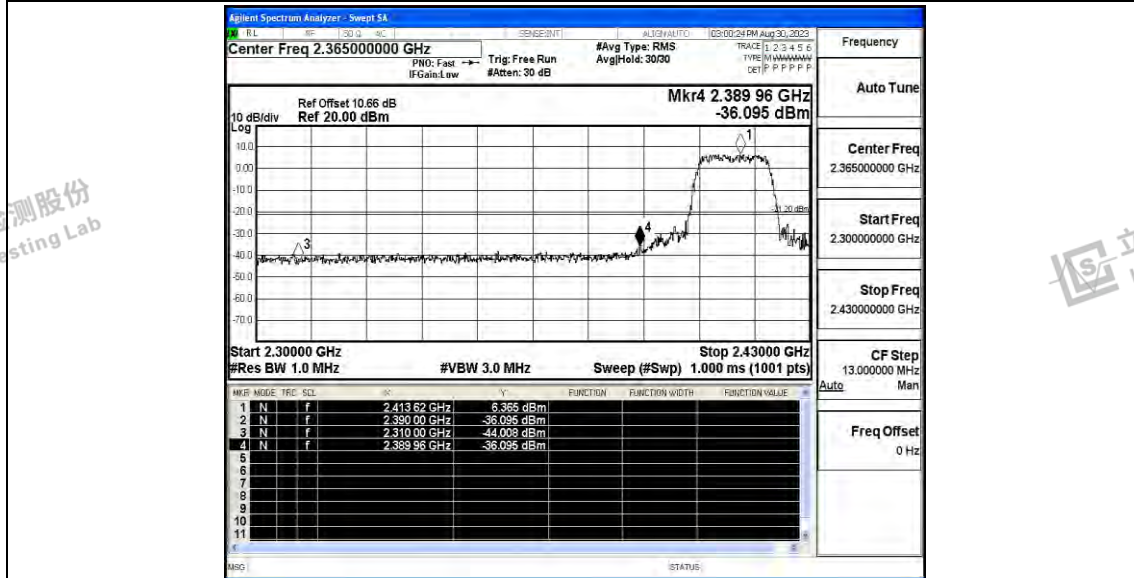


11G_Ant1_Low_2412_AV



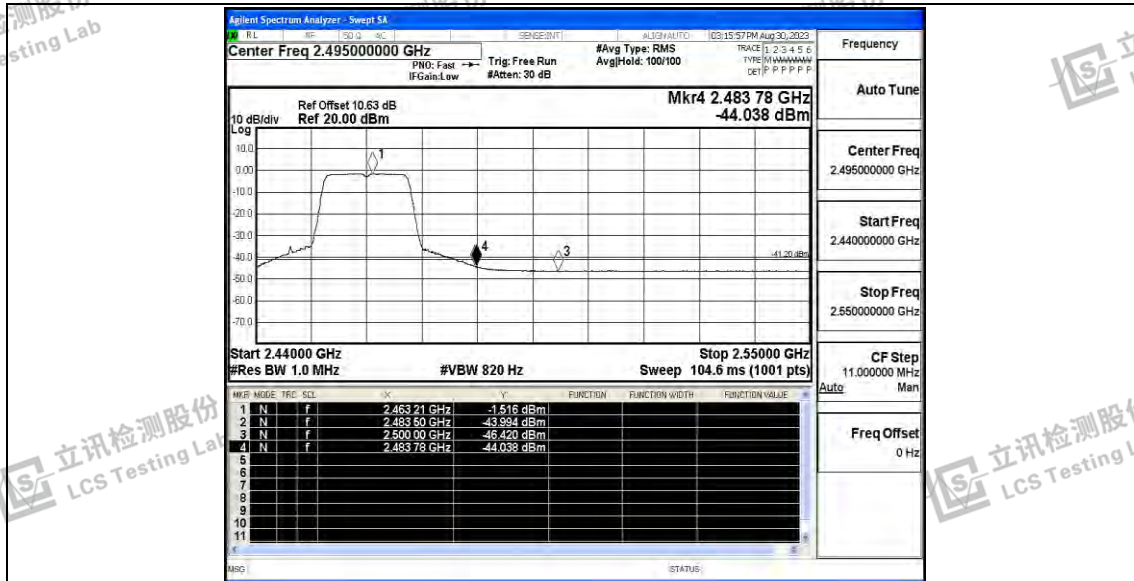


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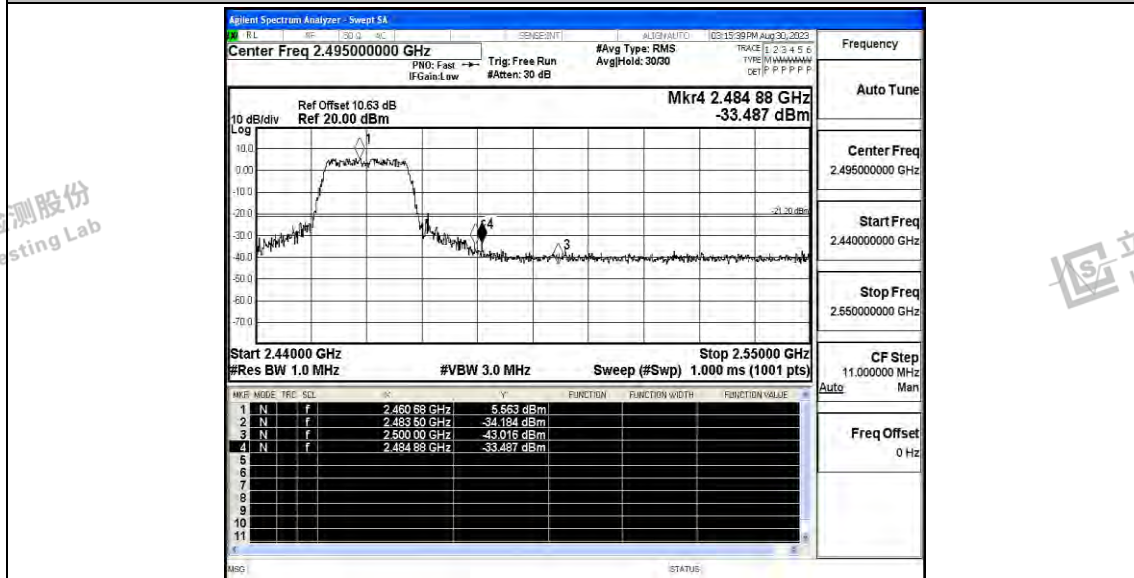


11G_Ant1_High_2462_AV





11G_Ant1_High_2462_Peak



11N20SISO_Ant1_Low_2412_AV

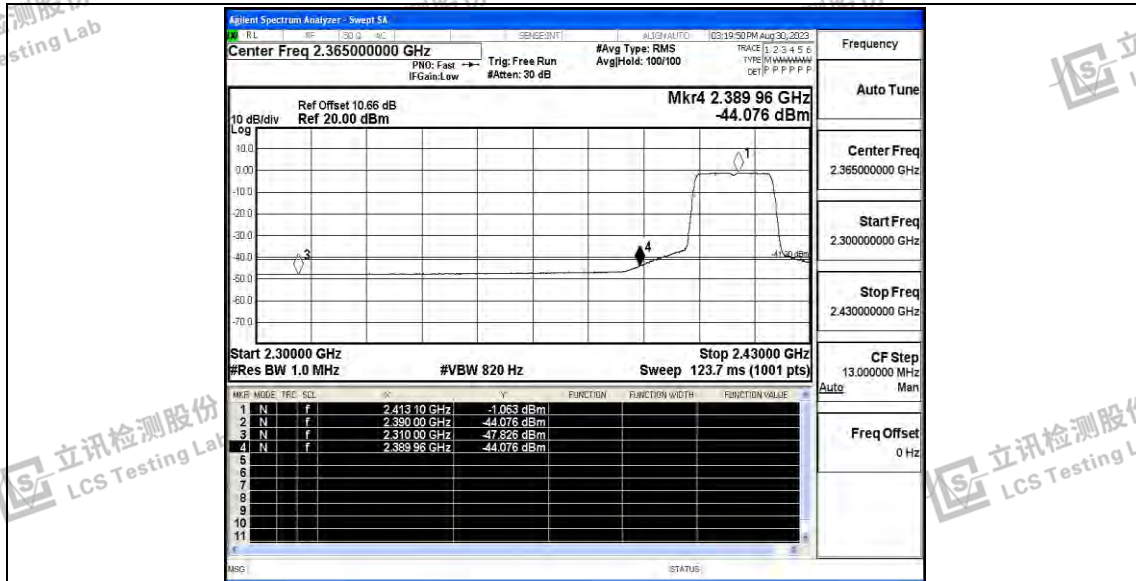


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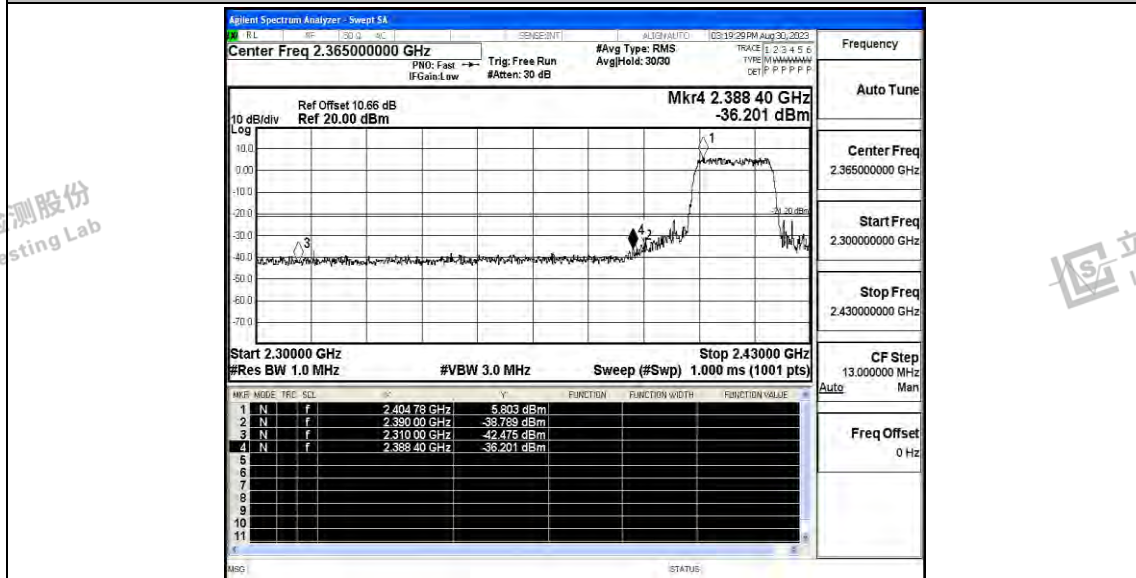
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11N20SISO_Ant1_Low_2412_Peak



11N20SISO_Ant1_High_2462_AV

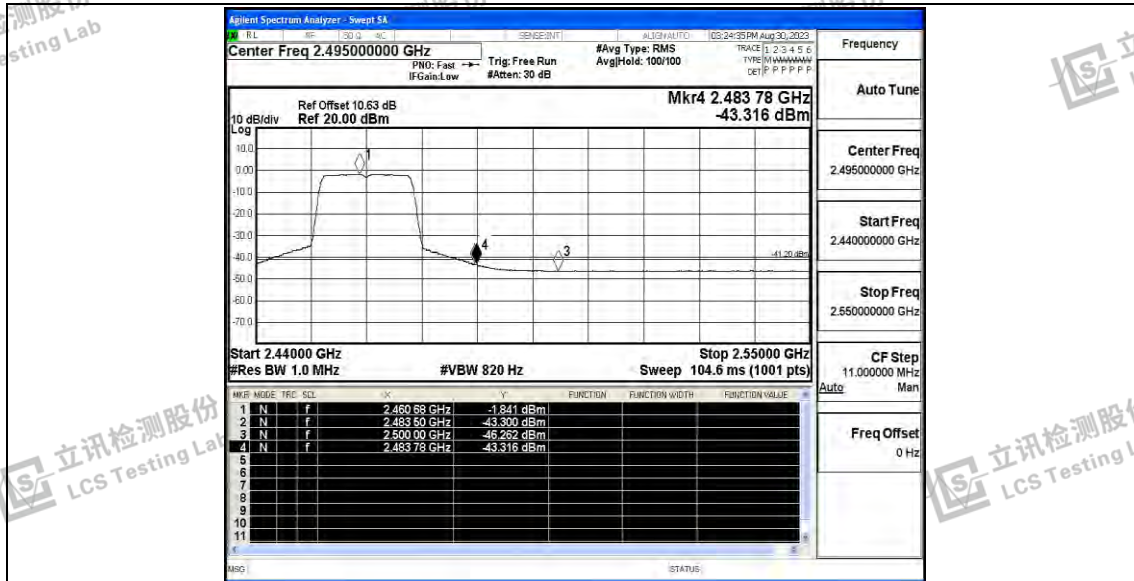


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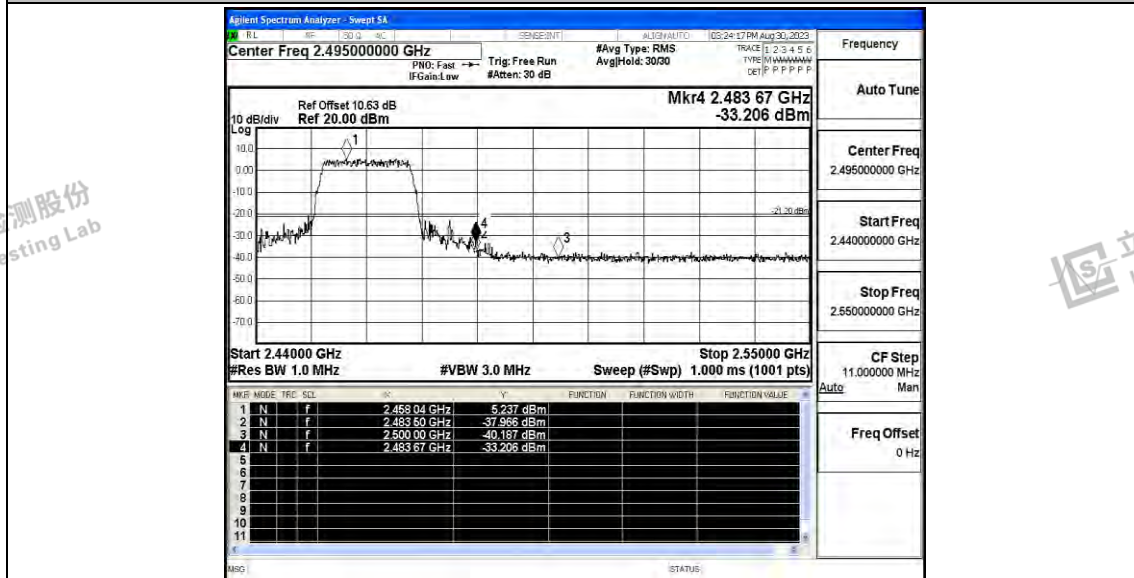
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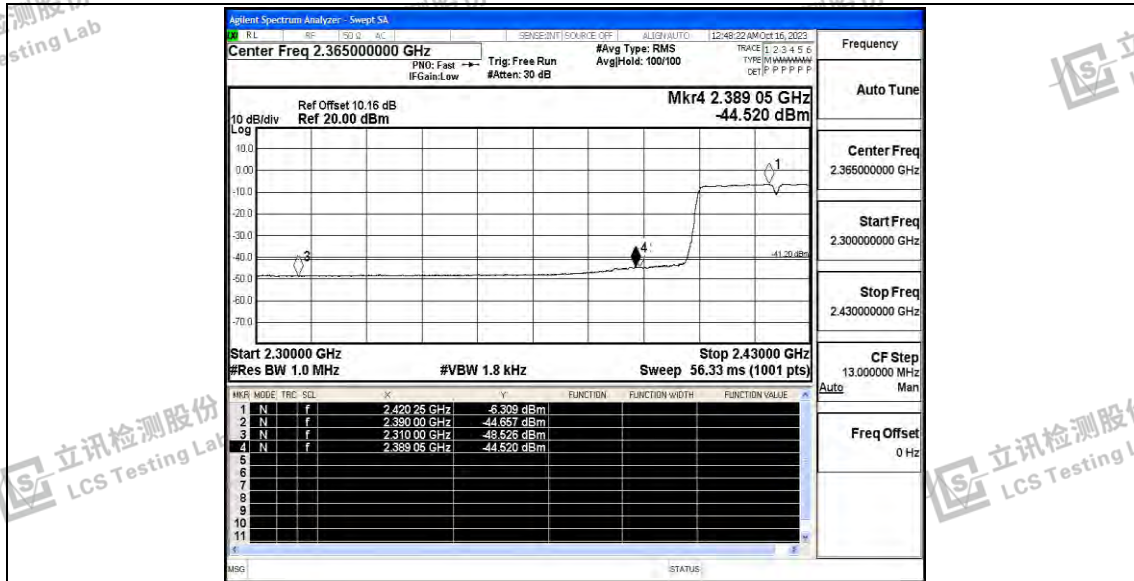


11N20SISO_Ant1_High_2462_Peak

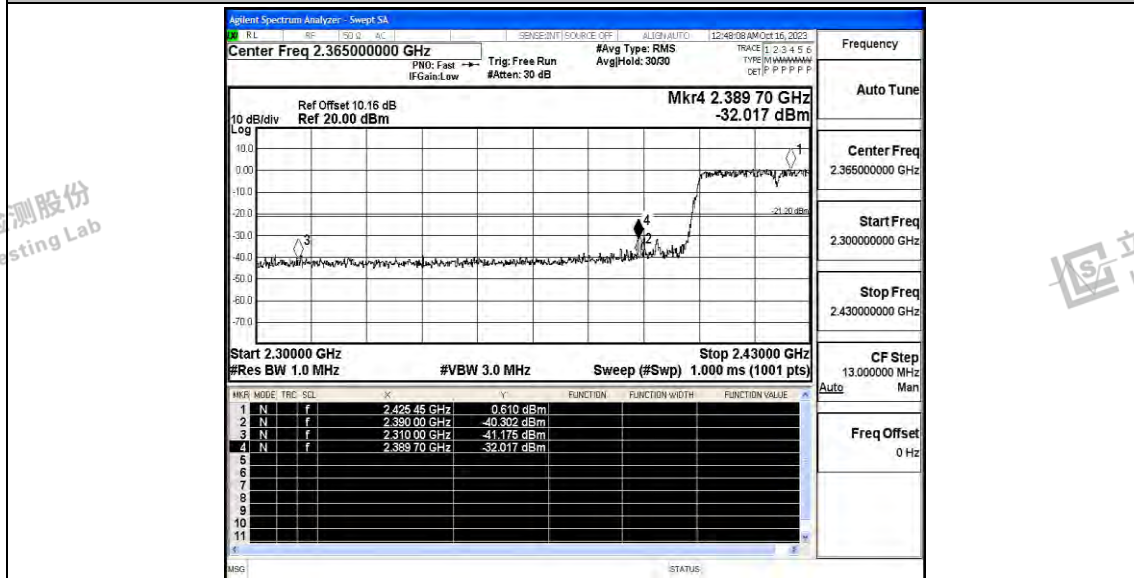


11N40SISO_Ant1_Low_2422_AV





11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV

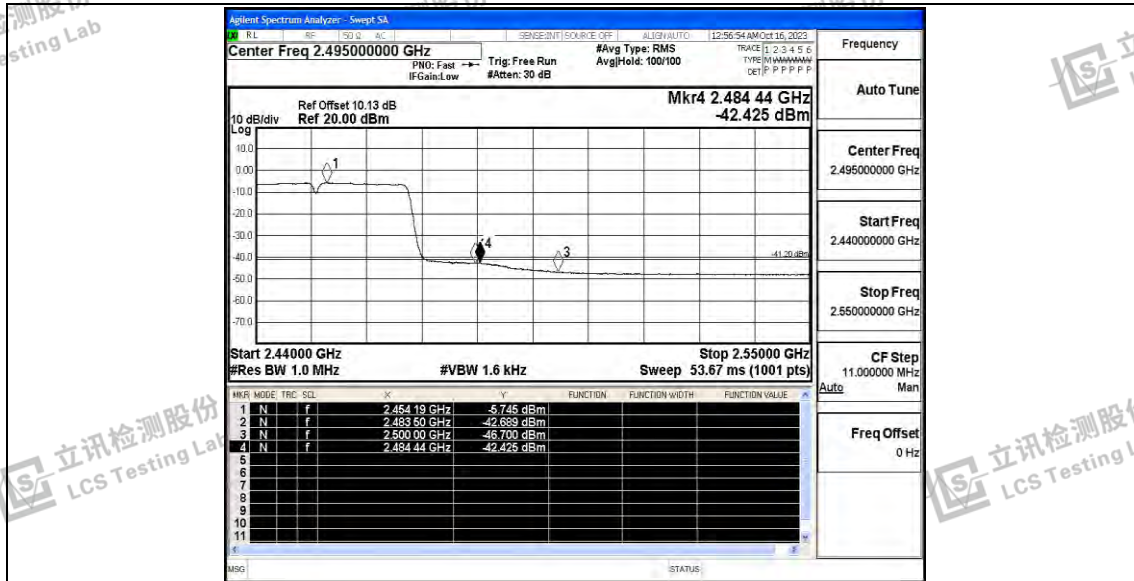


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11N40SISO_Ant1_High_2452_Peak

