



Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: SumUp Pro
Test Model: SumUp 3G+

Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Ling Zhu
Supervised by:	Li Huan





A.1 6dB Bandwidth

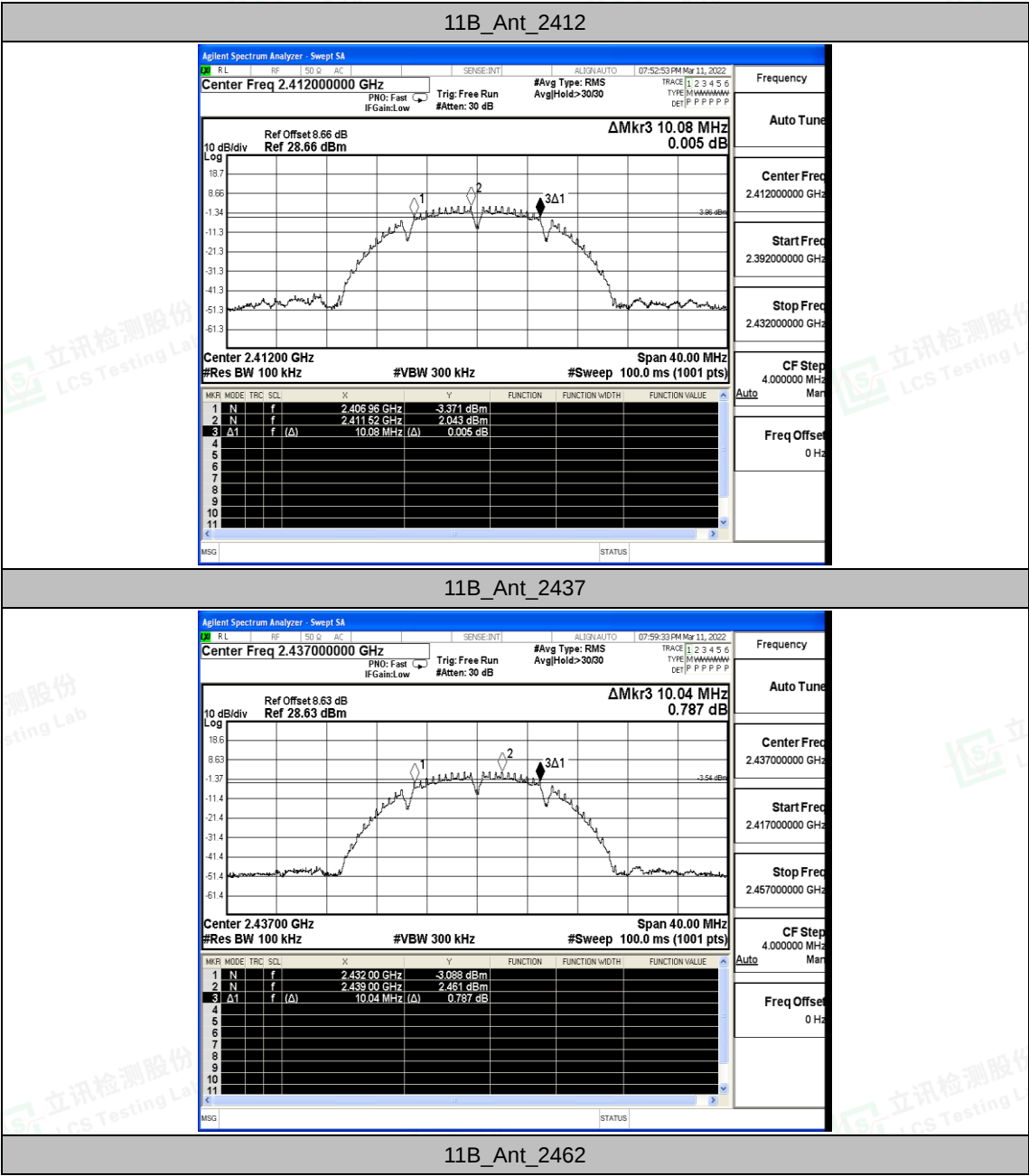
Test Result

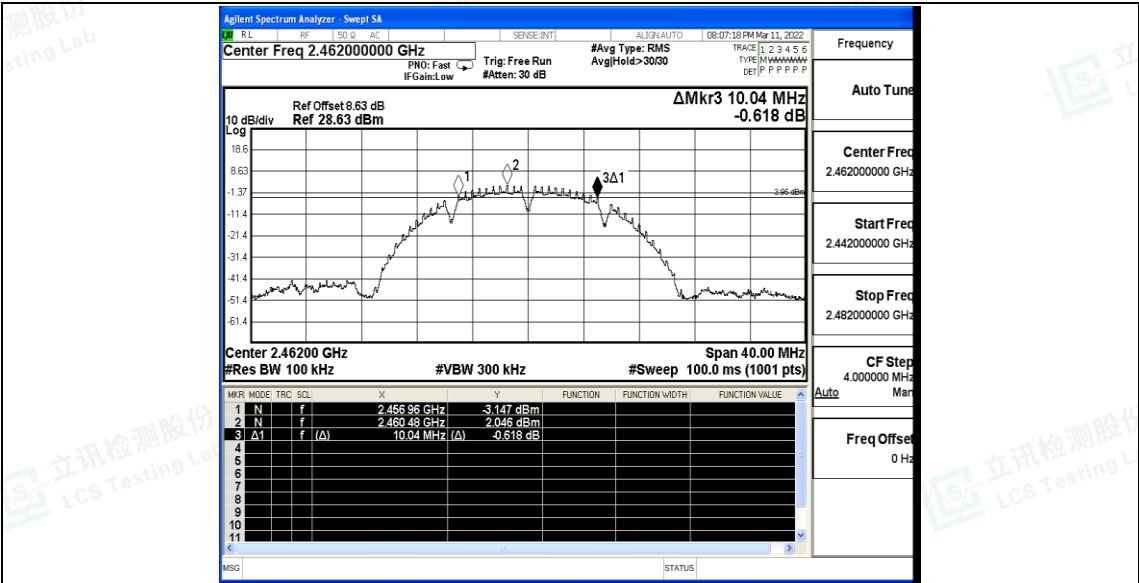
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant	2412	10.080	2406.960	2417.040	0.5	PASS
		2437	10.040	2432.000	2442.040	0.5	PASS
		2462	10.040	2456.960	2467.000	0.5	PASS
11G	Ant	2412	16.360	2403.840	2420.200	0.5	PASS
		2437	16.040	2429.120	2445.160	0.5	PASS
		2462	16.360	2453.760	2470.120	0.5	PASS
11N20SISO	Ant	2412	17.600	2403.200	2420.800	0.5	PASS
		2437	17.200	2428.600	2445.800	0.5	PASS
		2462	17.600	2453.160	2470.760	0.5	PASS



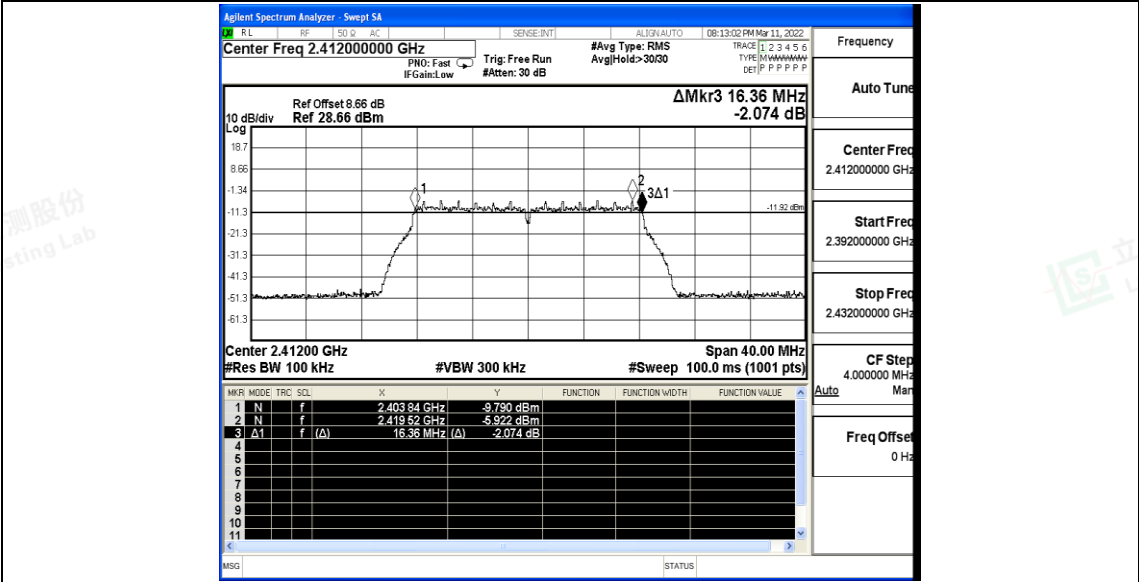


Test Graphs



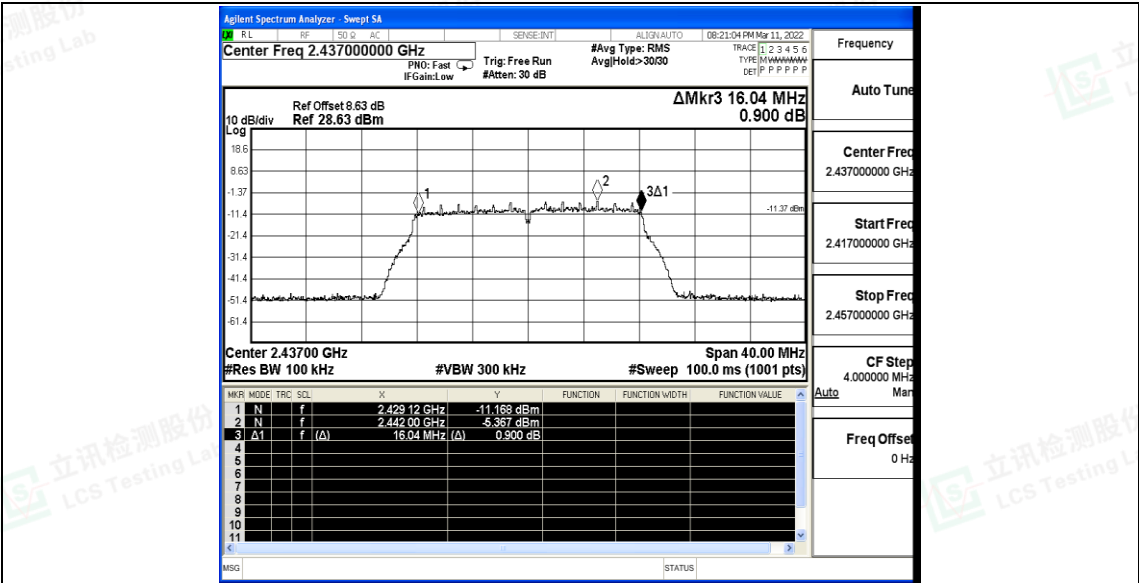


11G_Ant_2412

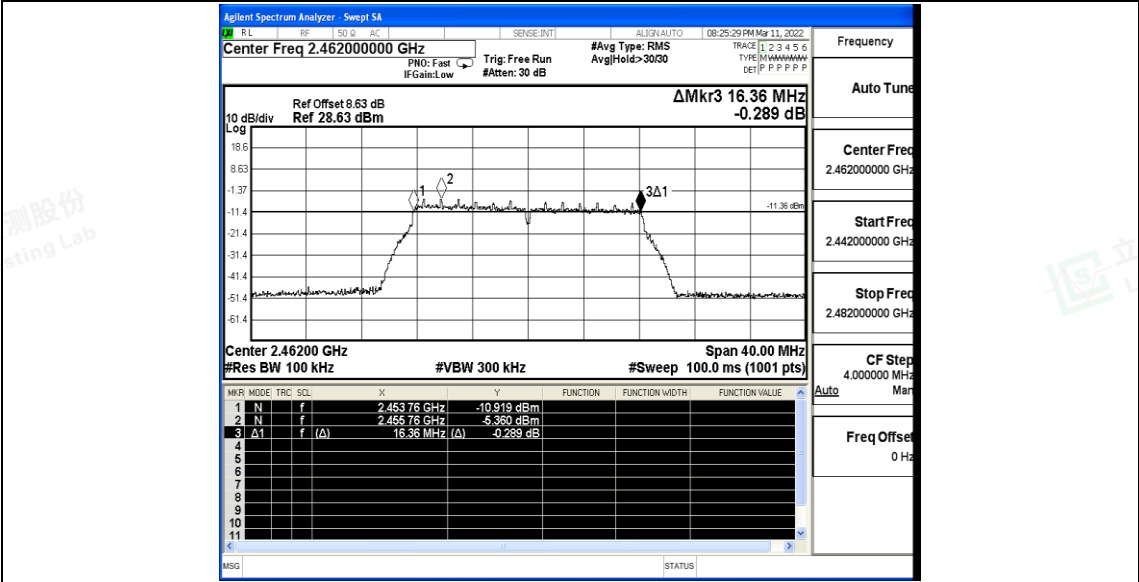


11G_Ant_2437



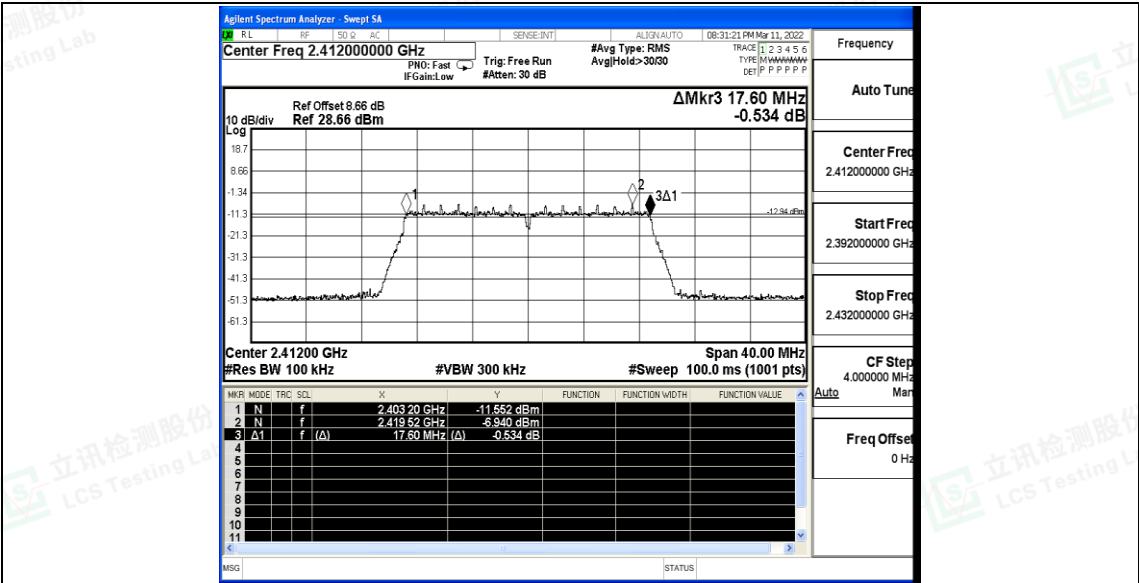


11G_Ant_2462

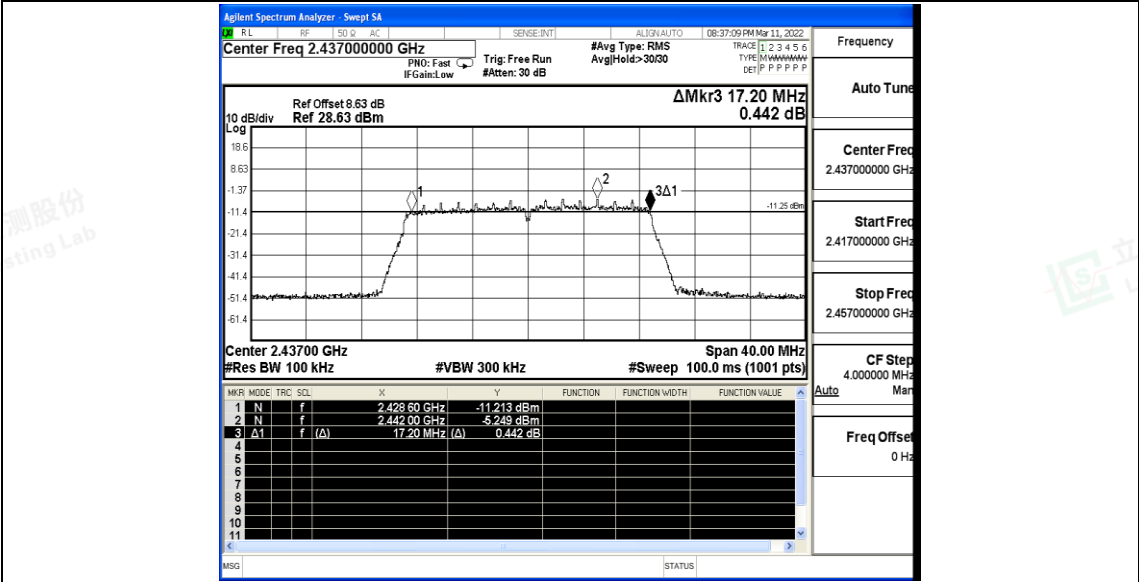


11N20SISO_Ant_2412



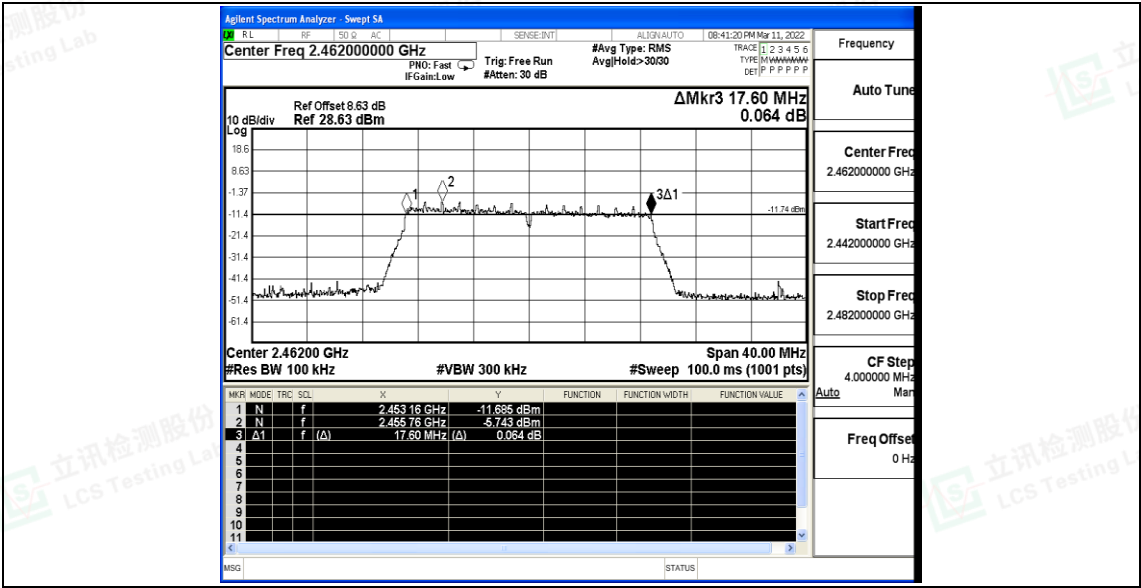


11N20SISO_Ant_2437



11N20SISO_Ant_2462







A.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant	2412	14.46	≤30.00	PASS
		2437	14.52	≤30.00	PASS
		2462	14.00	≤30.00	PASS
11G	Ant	2412	13.54	≤30.00	PASS
		2437	13.59	≤30.00	PASS
		2462	13.46	≤30.00	PASS
11N20SISO	Ant	2412	12.62	≤30.00	PASS
		2437	13.65	≤30.00	PASS
		2462	13.13	≤30.00	PASS





A.3 Maximum power spectral density

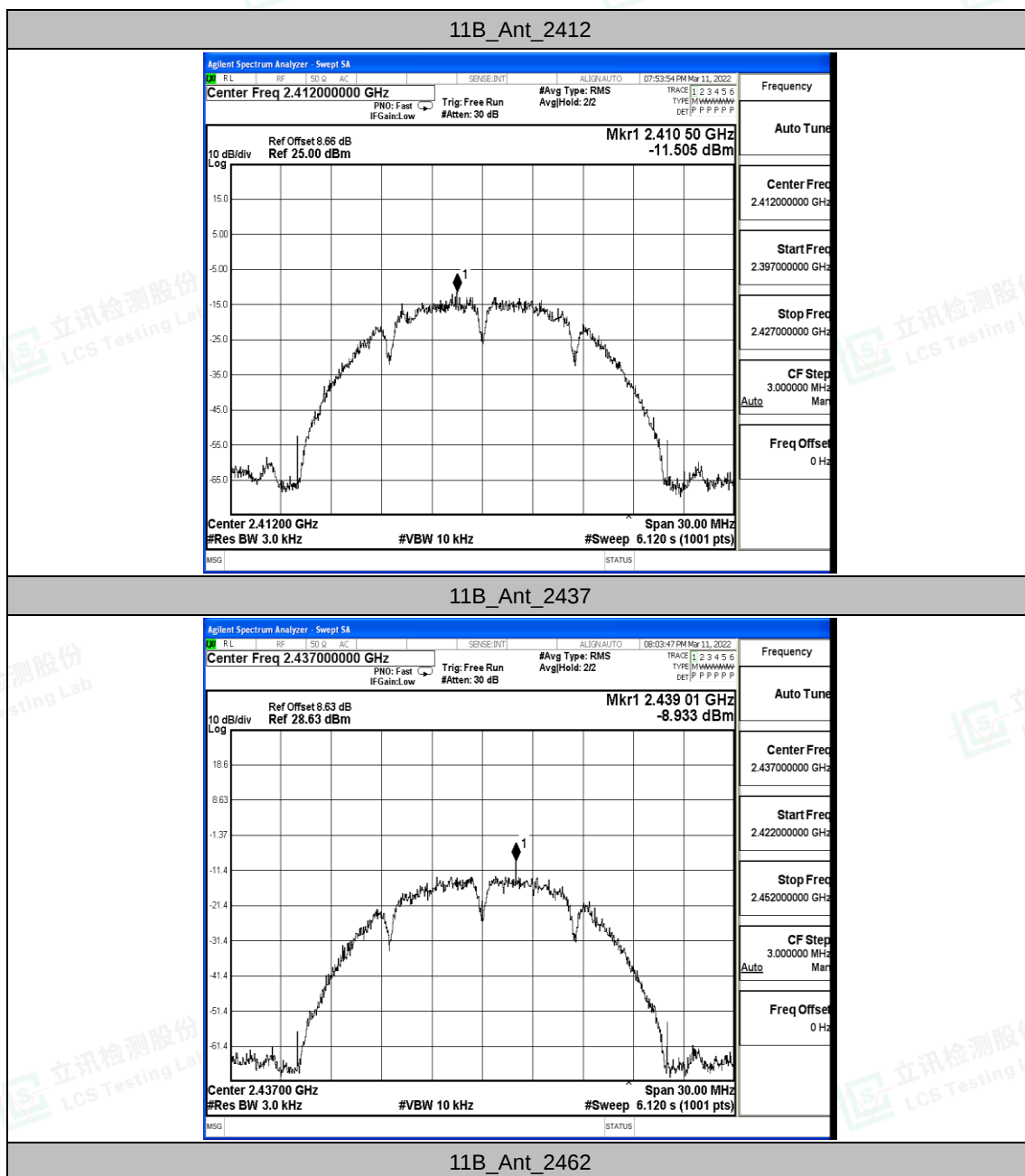
Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant	2412	-11.51	≤8.00	PASS
		2437	-8.93	≤8.00	PASS
		2462	-4.73	≤8.00	PASS
11G	Ant	2412	-19.95	≤8.00	PASS
		2437	-19.88	≤8.00	PASS
		2462	-17.89	≤8.00	PASS
11N20SISO	Ant	2412	-20.12	≤8.00	PASS
		2437	-19.73	≤8.00	PASS
		2462	-19.21	≤8.00	PASS





Test Graphs

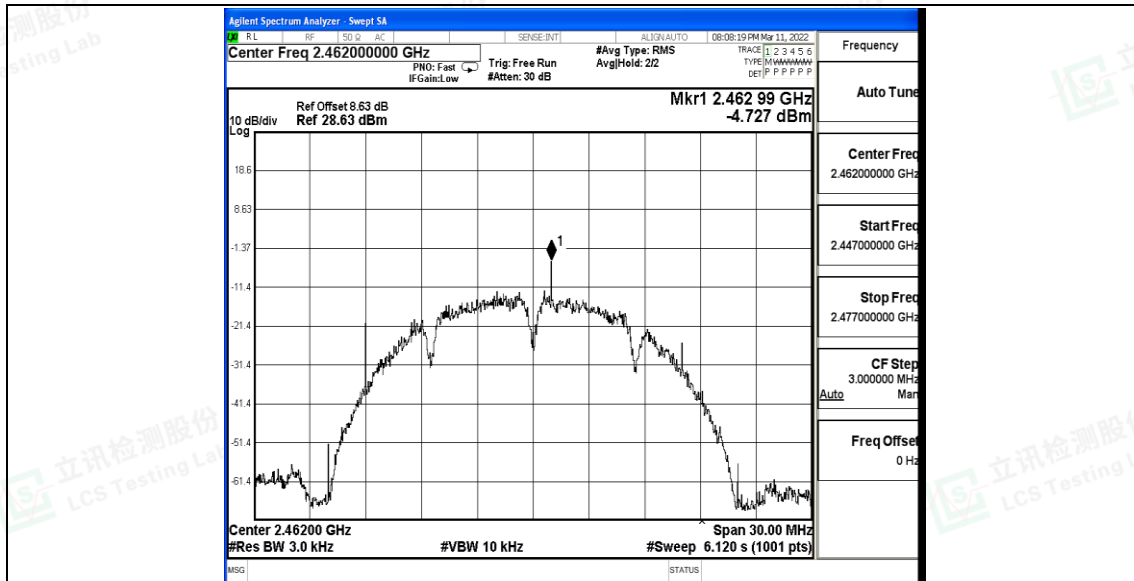


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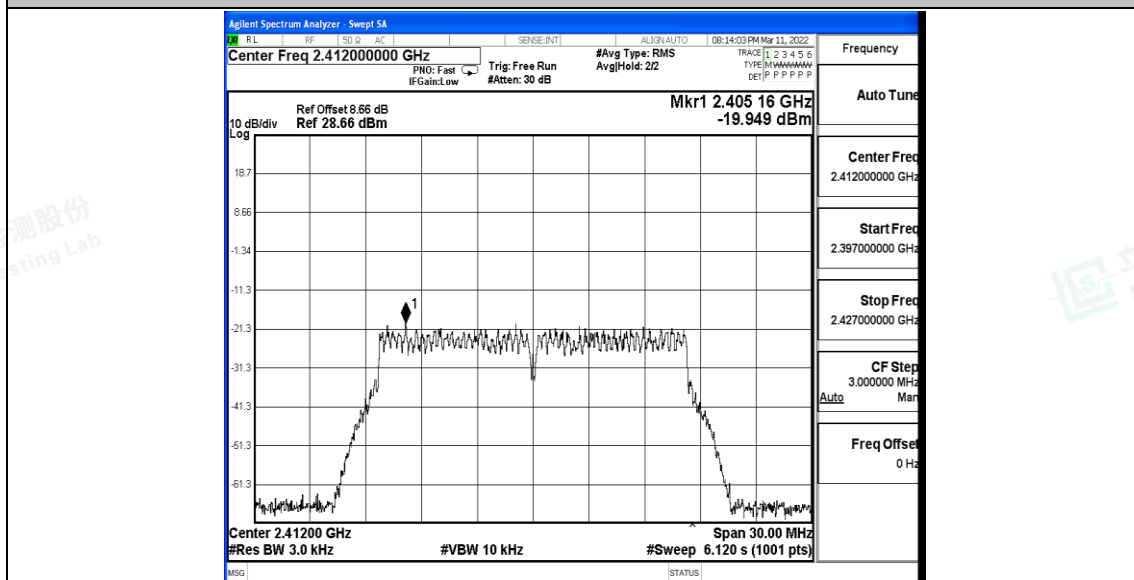
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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11G_Ant_2412



11G_Ant_2437

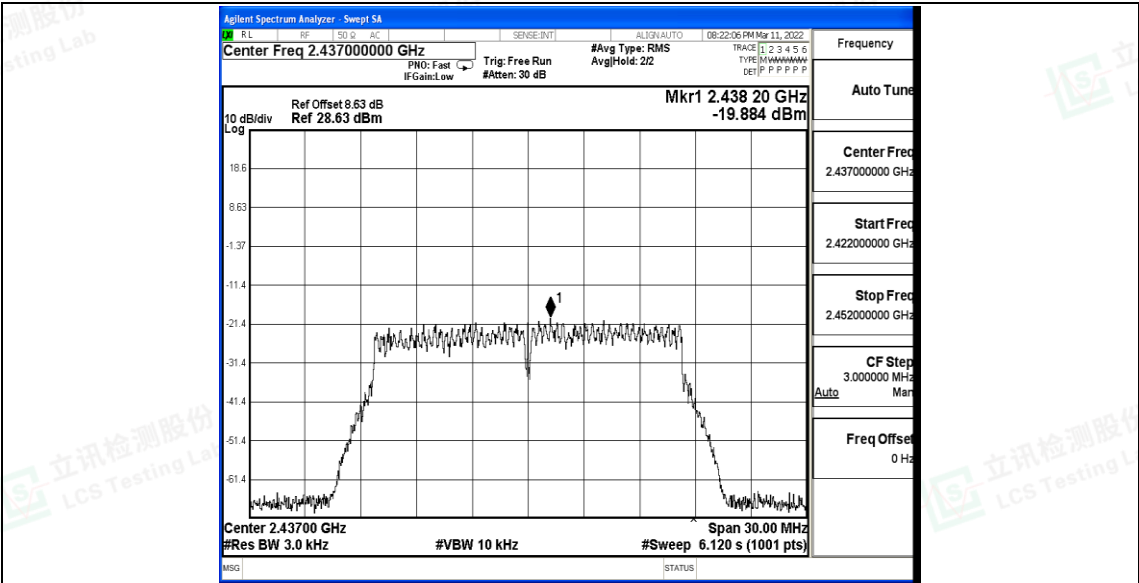


Shenzhen LCS Compliance Testing Laboratory Ltd.

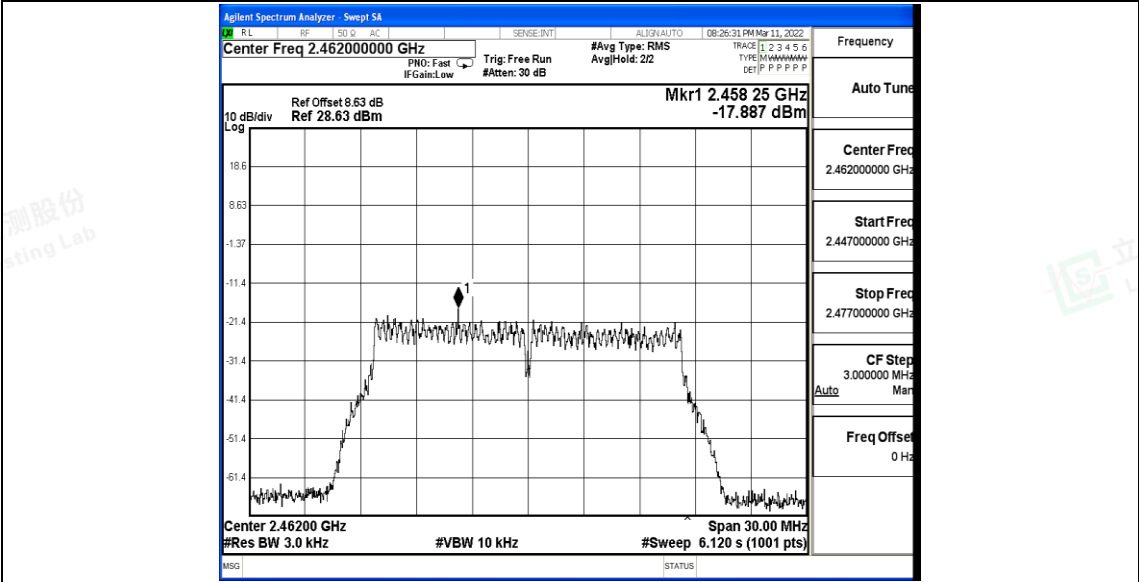
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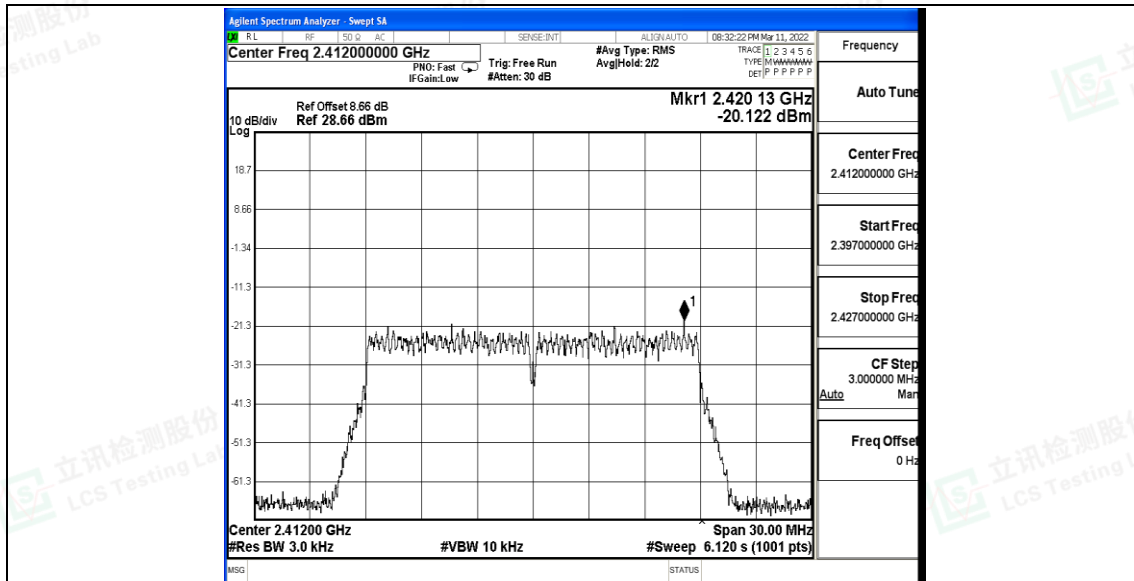


11G_Ant_2462

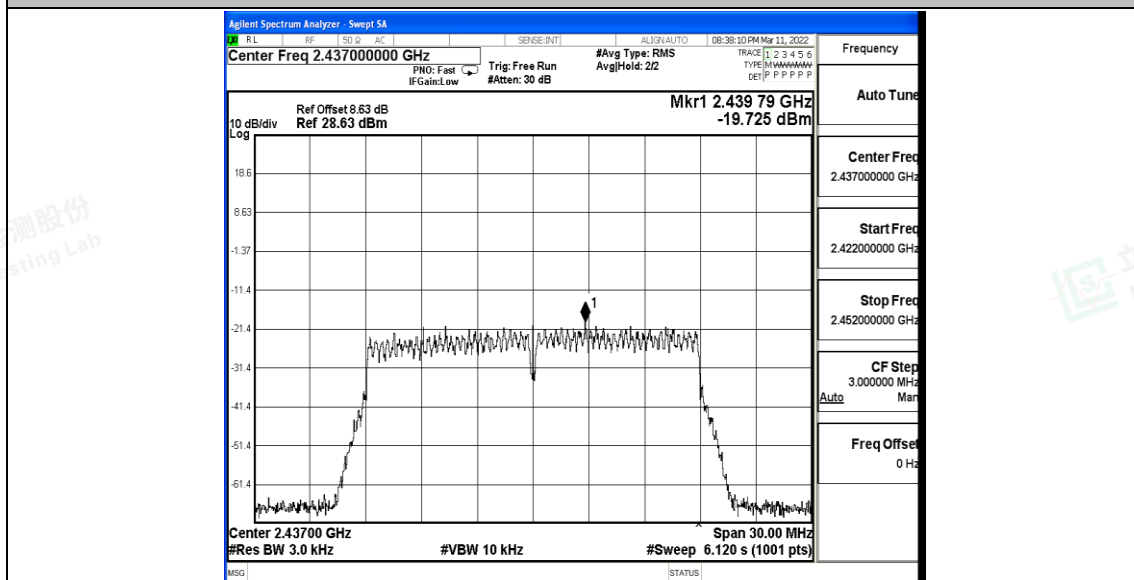


11N20SISO_Ant_2412





11N20SISO_Ant_2437



11N20SISO_Ant_2462

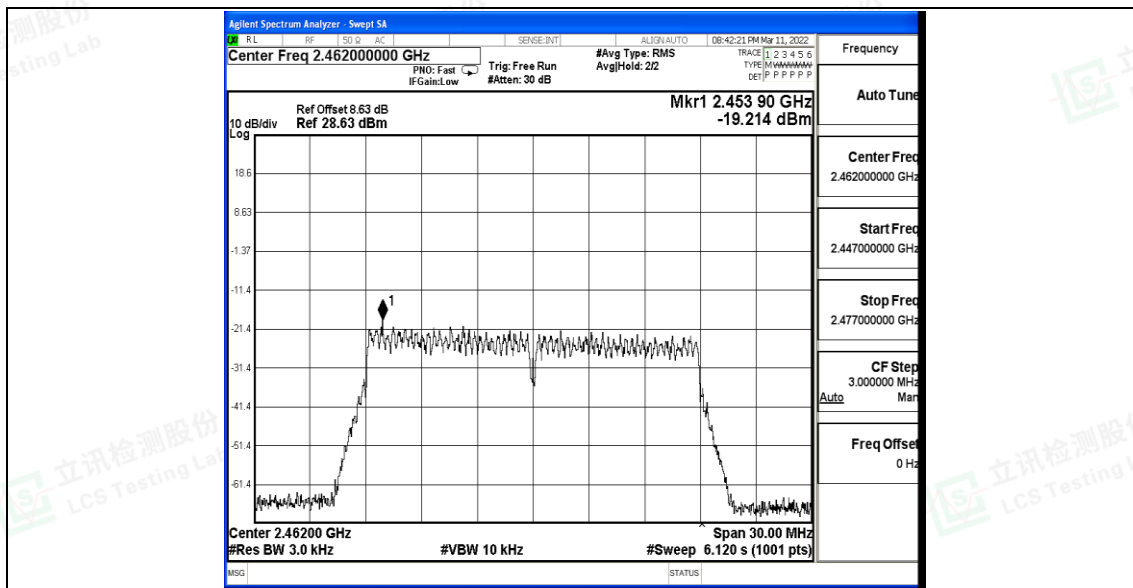


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A.4 Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant	Low	2412	2.16	-43.63	≤ -17.84	PASS
		High	2462	2.07	-47.5	≤ -17.93	PASS
11G	Ant	Low	2412	-5.77	-48.24	≤ -25.77	PASS
		High	2462	-5.12	-47.96	≤ -25.12	PASS
11N20SISO	Ant	Low	2412	-6.67	-47.61	≤ -26.67	PASS
		High	2462	-5.28	-47.7	≤ -25.28	PASS



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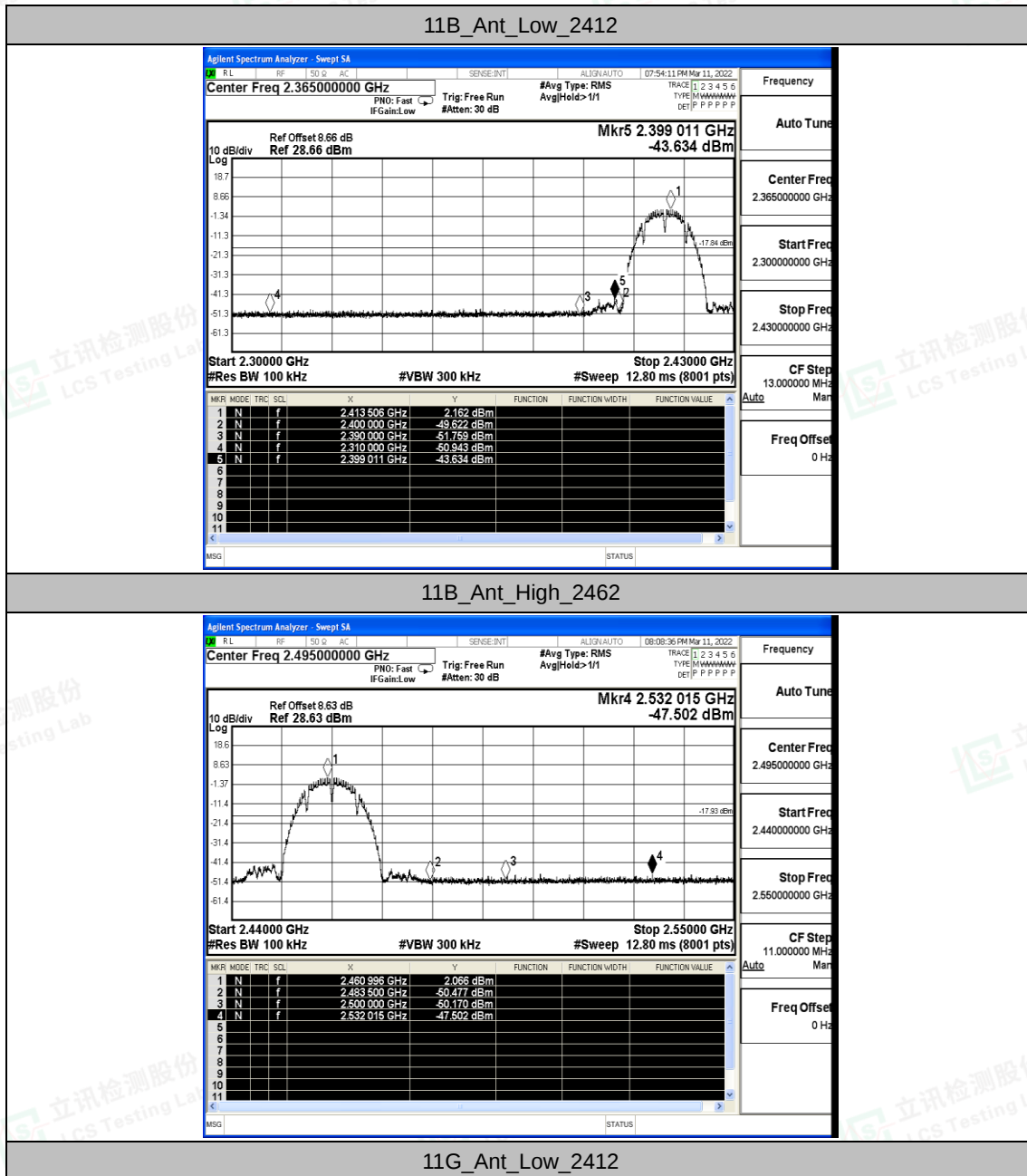
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Test Graphs

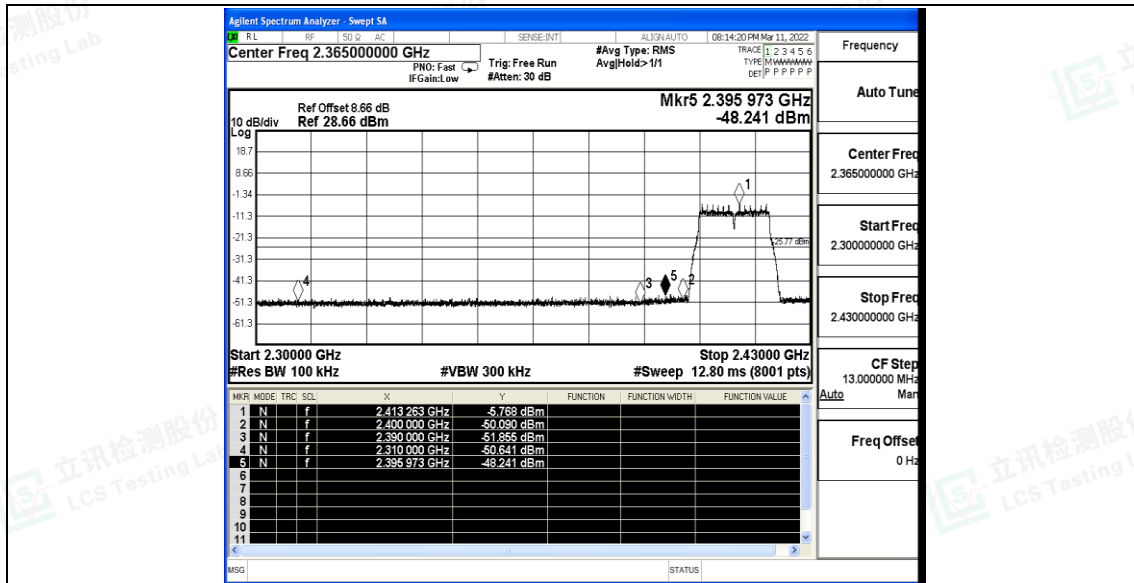


Shenzhen LCS Compliance Testing Laboratory Ltd.

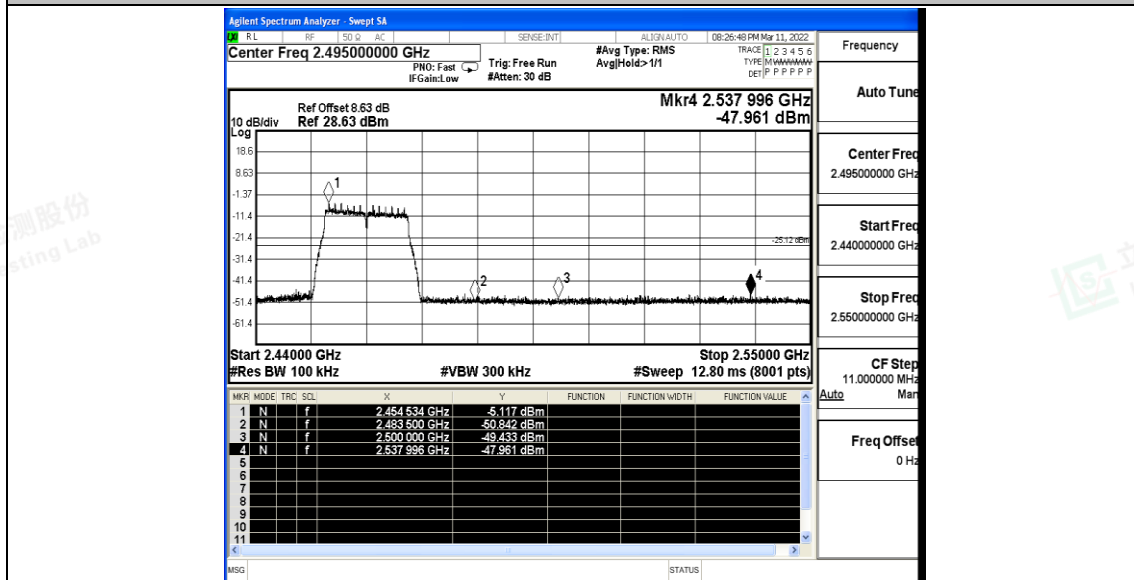
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11G_Ant_High_2462



11N20SISO_Ant_Low_2412

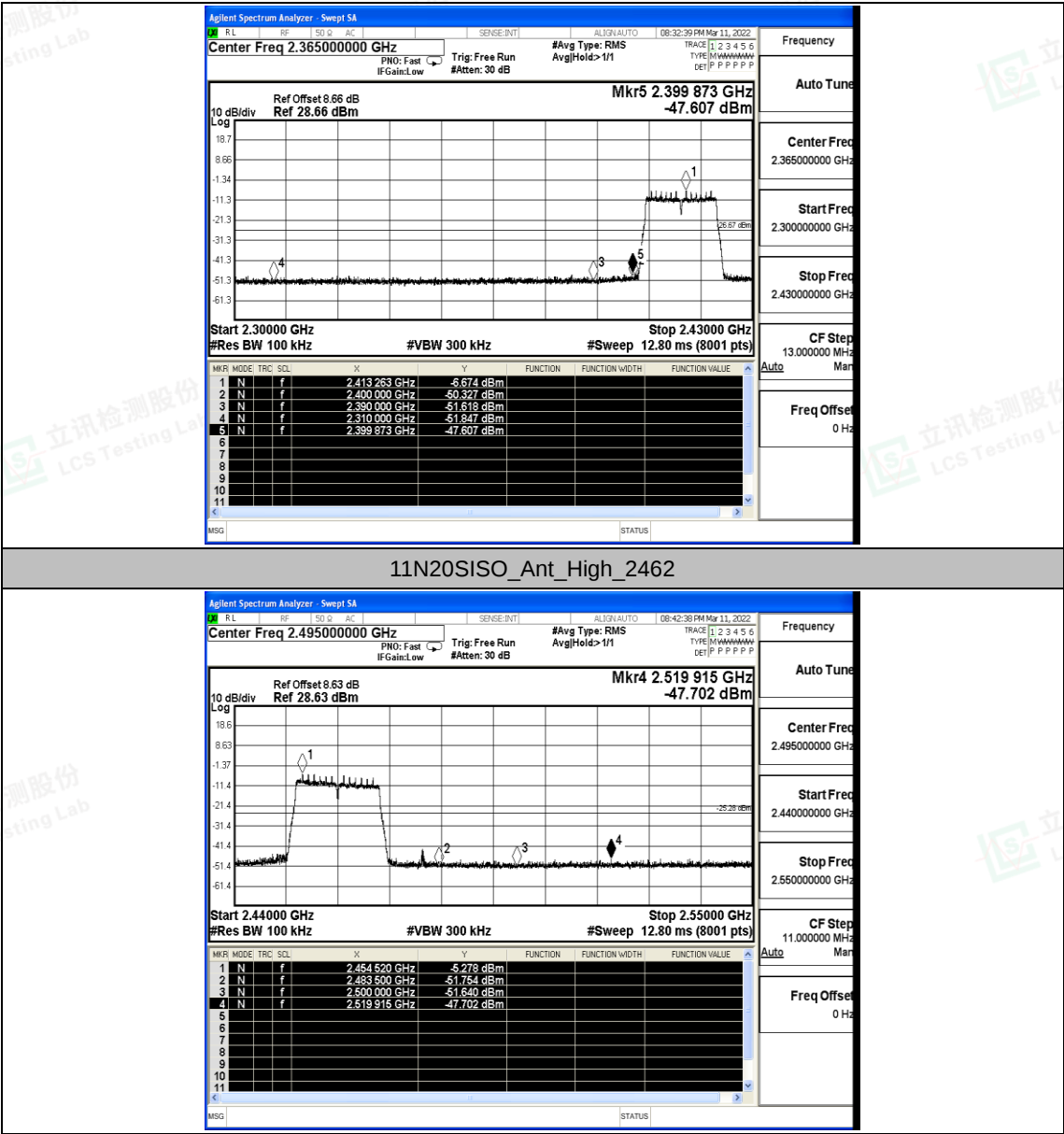


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A.5 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant	2412	Reference	2.40	2.40	---	PASS
			30~1000	2.40	-36.26	≤-17.6	PASS
			1000~26500	2.40	-45.84	≤-17.6	PASS
		2437	Reference	2.66	2.66	---	PASS
			30~1000	2.66	-41.62	≤-17.34	PASS
			1000~26500	2.66	-46.25	≤-17.34	PASS
		2462	Reference	1.81	1.81	---	PASS
			30~1000	1.81	-47.75	≤-18.19	PASS
			1000~26500	1.81	-46.21	≤-18.19	PASS
11G	Ant	2412	Reference	-5.82	-5.82	---	PASS
			30~1000	-5.82	-37.97	≤-25.82	PASS
			1000~26500	-5.82	-45.51	≤-25.82	PASS
		2437	Reference	-5.06	-5.06	---	PASS
			30~1000	-5.06	-40.43	≤-25.06	PASS
			1000~26500	-5.06	-46.29	≤-25.06	PASS
		2462	Reference	-4.85	-4.85	---	PASS
			30~1000	-4.85	-60.26	≤-24.85	PASS
			1000~26500	-4.85	-45.81	≤-24.85	PASS
11N20SISO	Ant	2412	Reference	-6.76	-6.76	---	PASS
			30~1000	-6.76	-60.26	≤-26.76	PASS
			1000~26500	-6.76	-45.68	≤-26.76	PASS
		2437	Reference	-4.86	-4.86	---	PASS
			30~1000	-4.86	-60.43	≤-24.86	PASS
			1000~26500	-4.86	-43.71	≤-24.86	PASS
		2462	Reference	-5.15	-5.15	---	PASS
			30~1000	-5.15	-60.49	≤-25.15	PASS
			1000~26500	-5.15	-38.77	≤-25.15	PASS



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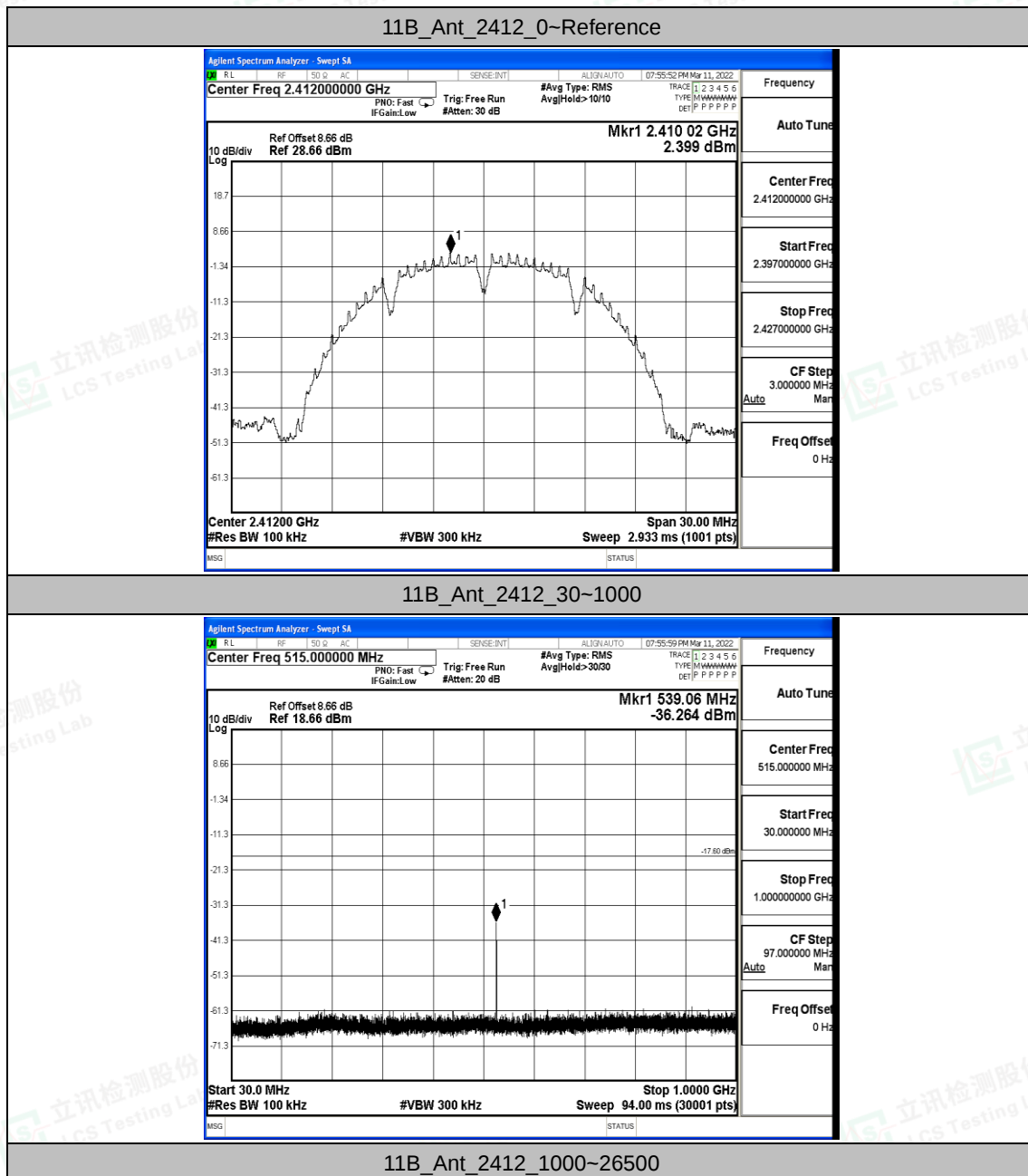
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Test Graphs

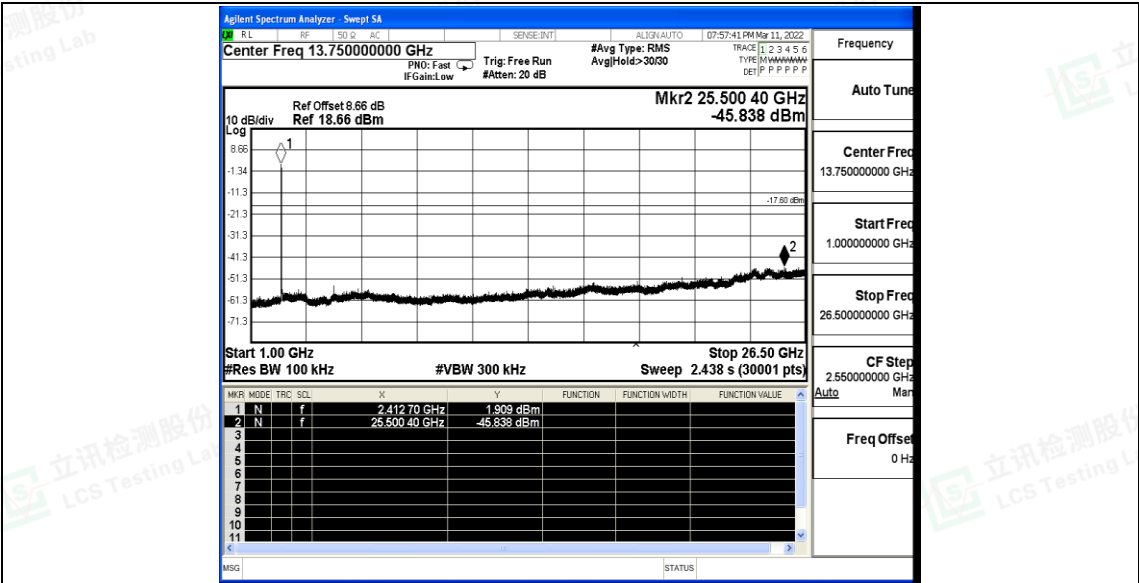


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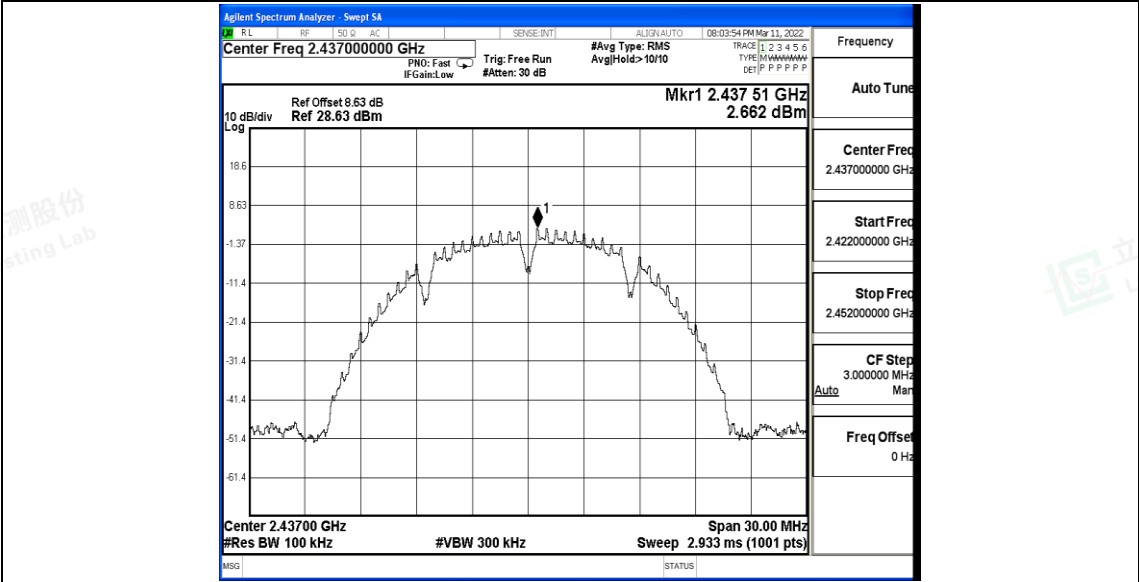
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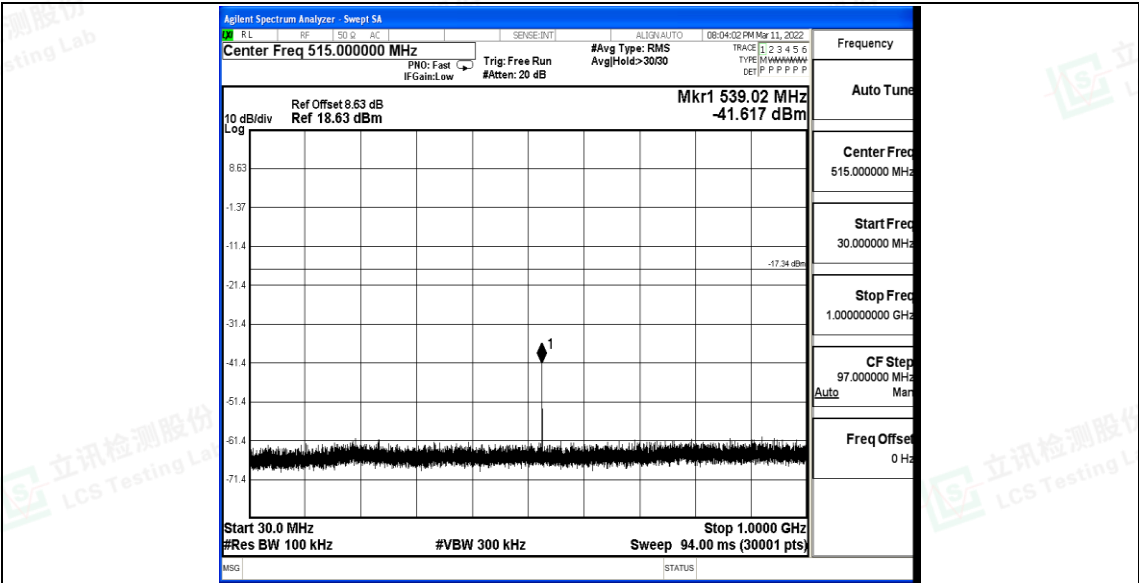


11B_Ant_2437_0~Reference

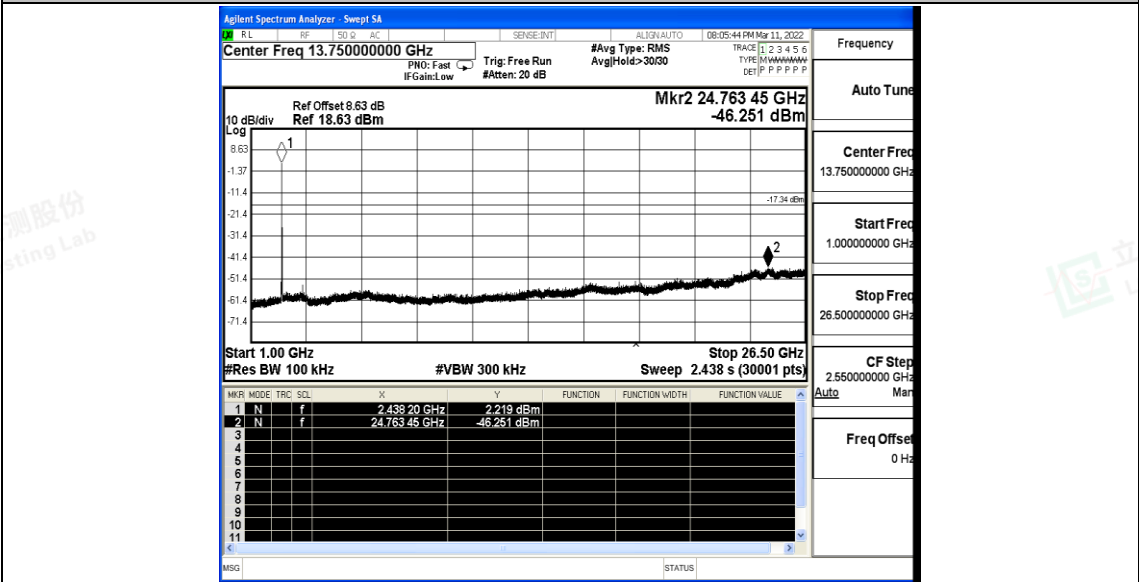


11B_Ant_2437_30~1000



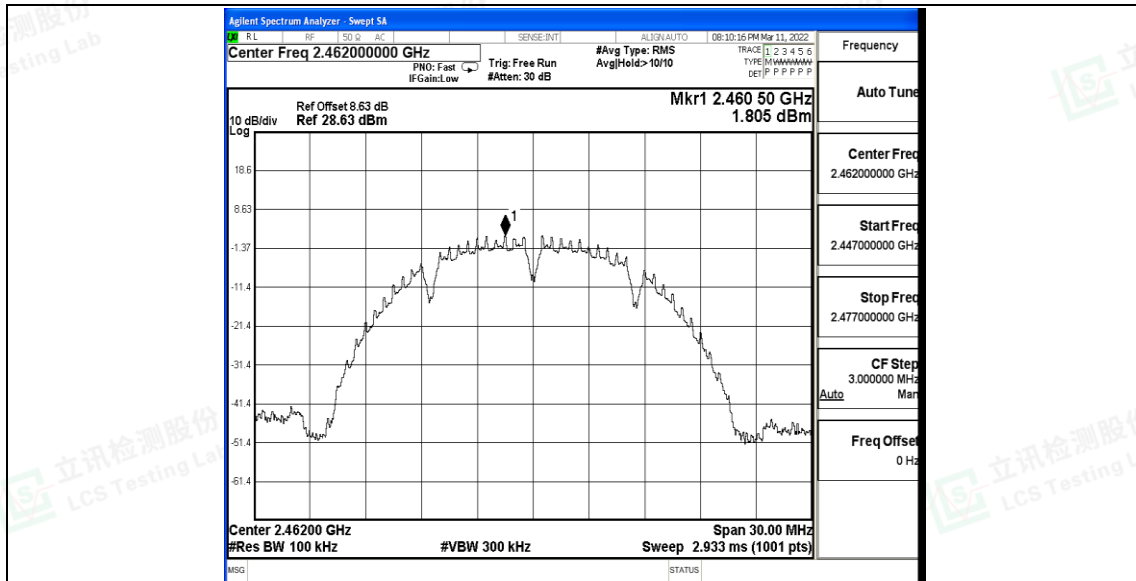


11B_Ant_2437_1000~26500

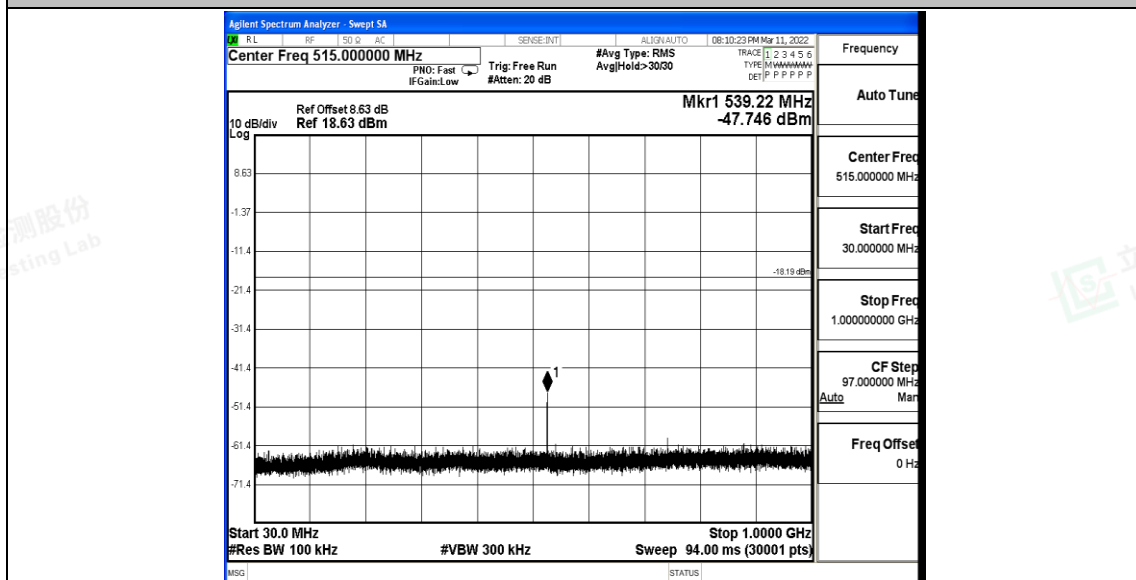


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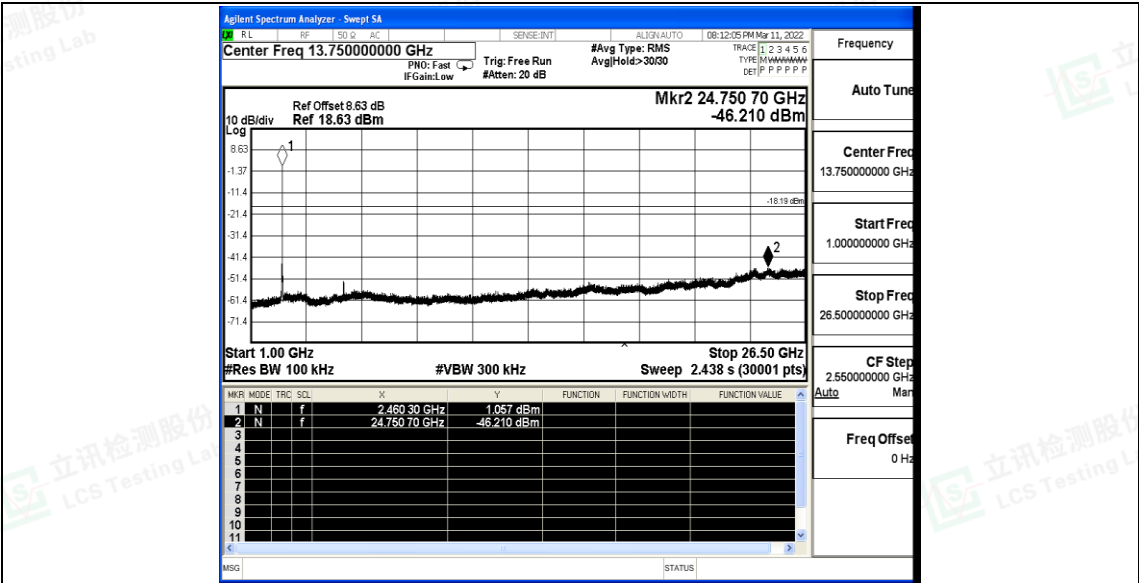


11B_Ant_2462_30~1000

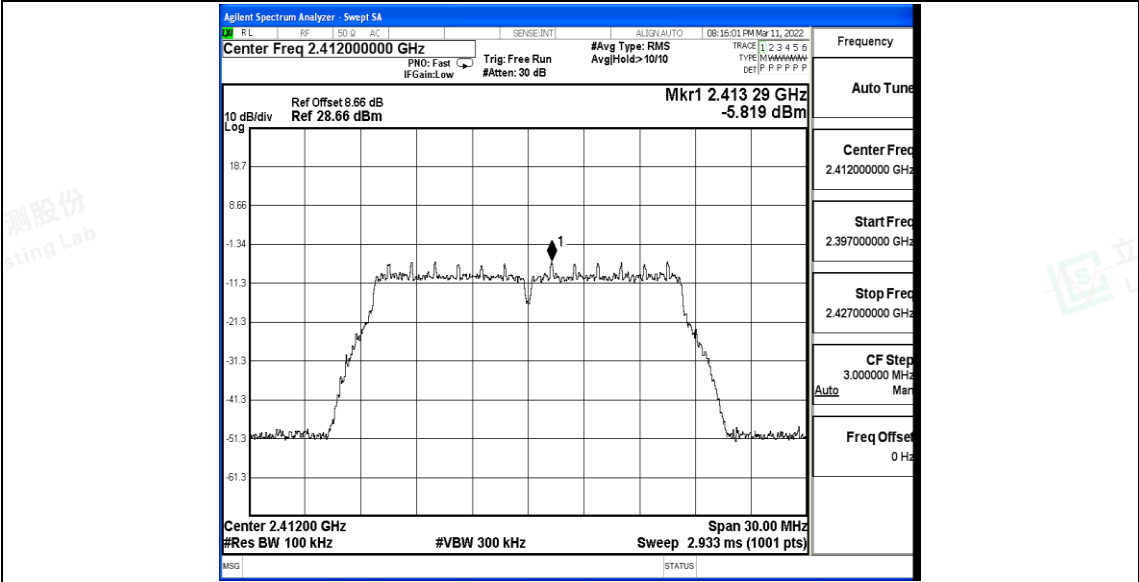


11B_Ant_2462_1000~26500



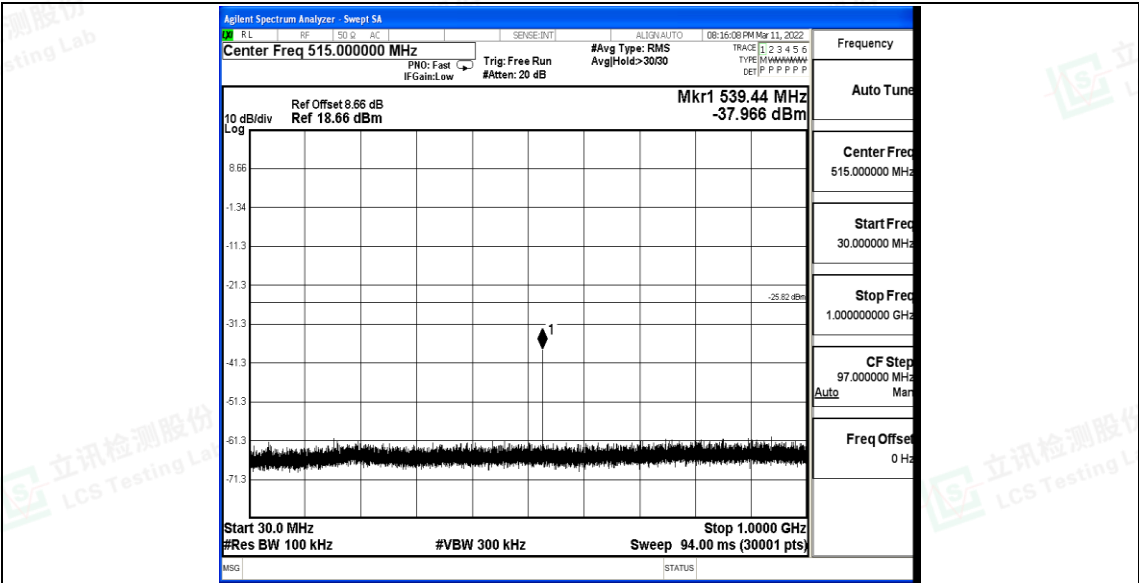


11G_Ant_2412_0~Reference

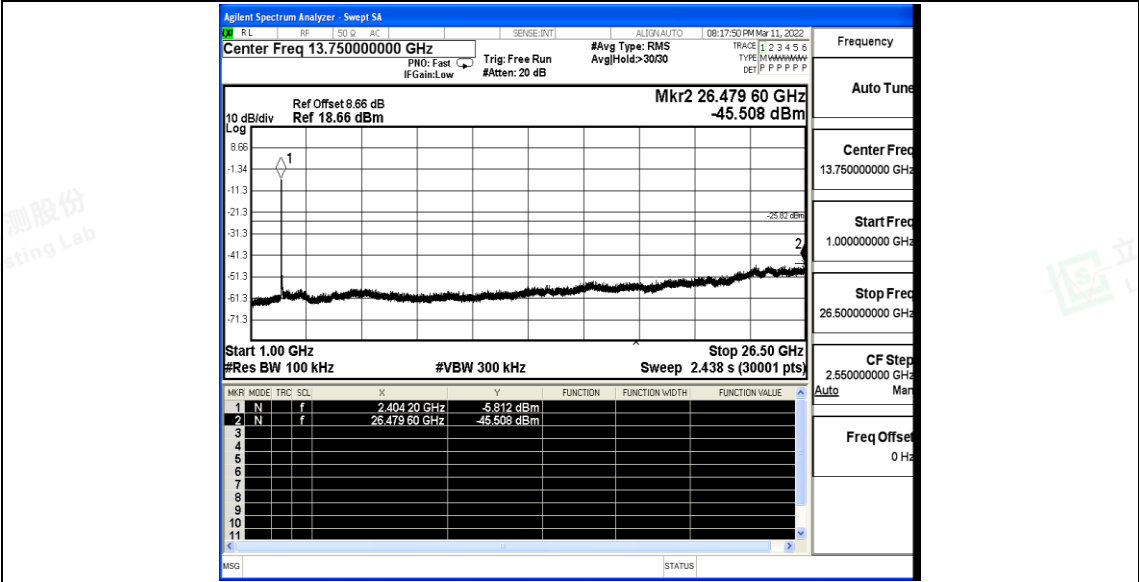


11G_Ant_2412_30~1000



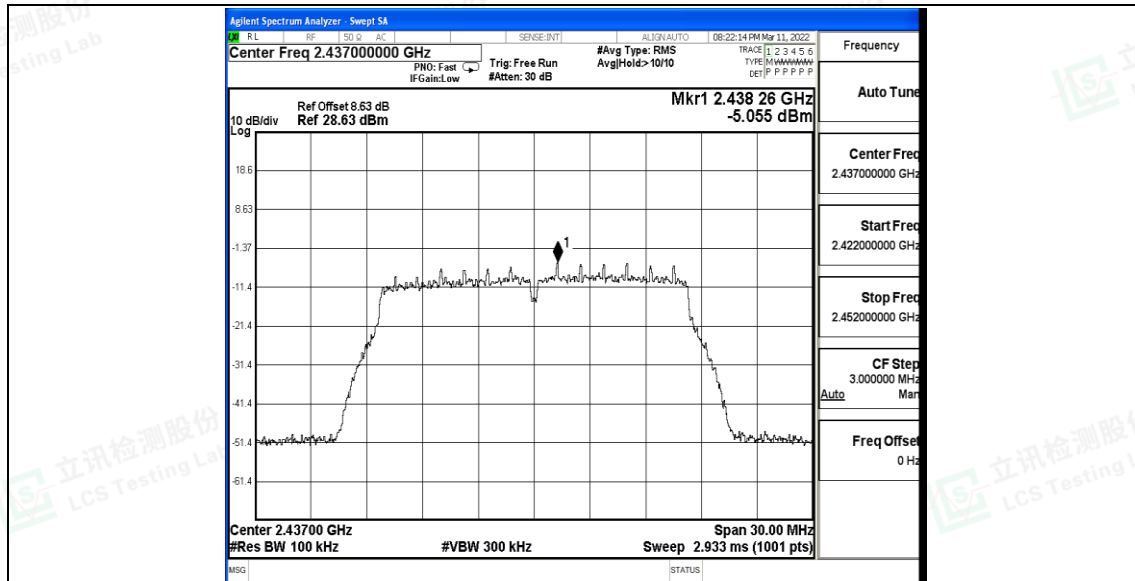


11G_Ant_2412_1000~26500

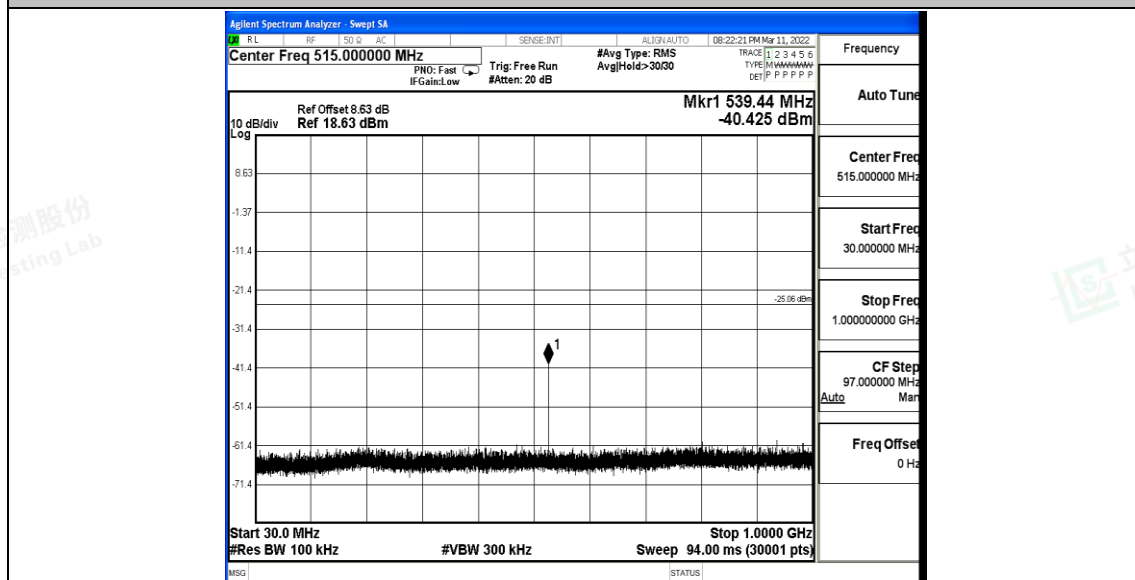


11G_Ant_2437_0~Reference





11G_Ant_2437_30~1000



11G_Ant_2437_1000~26500

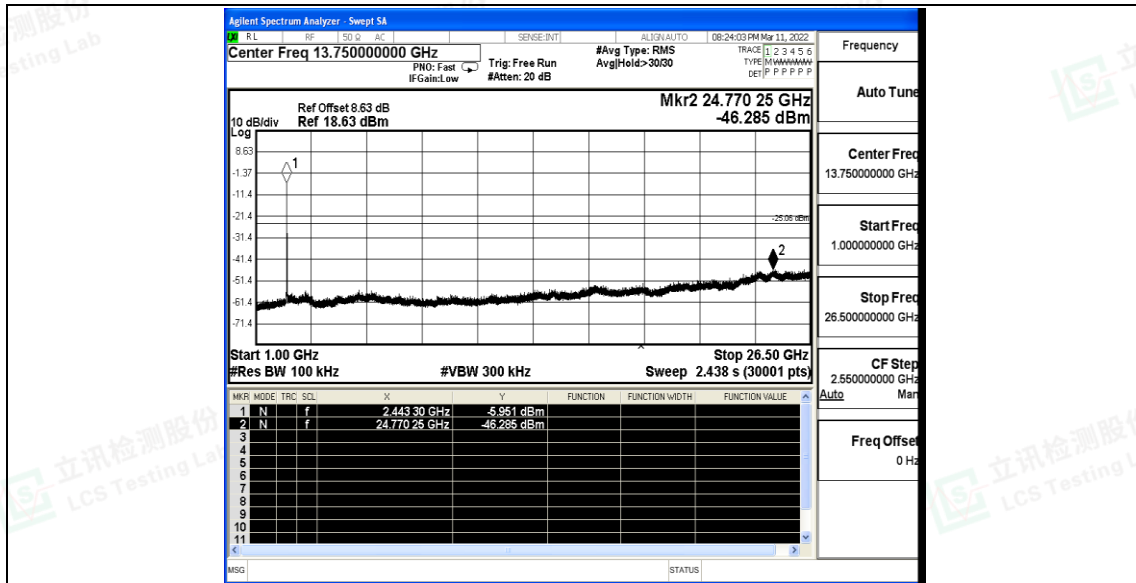


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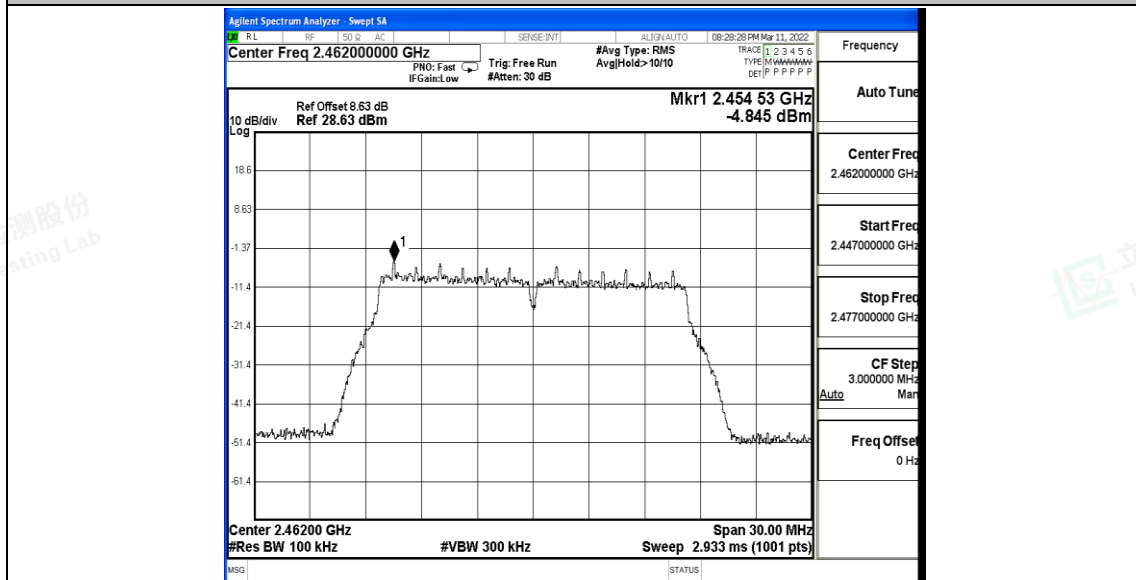
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11G_Ant_2462_0~Reference



11G_Ant_2462_30~1000

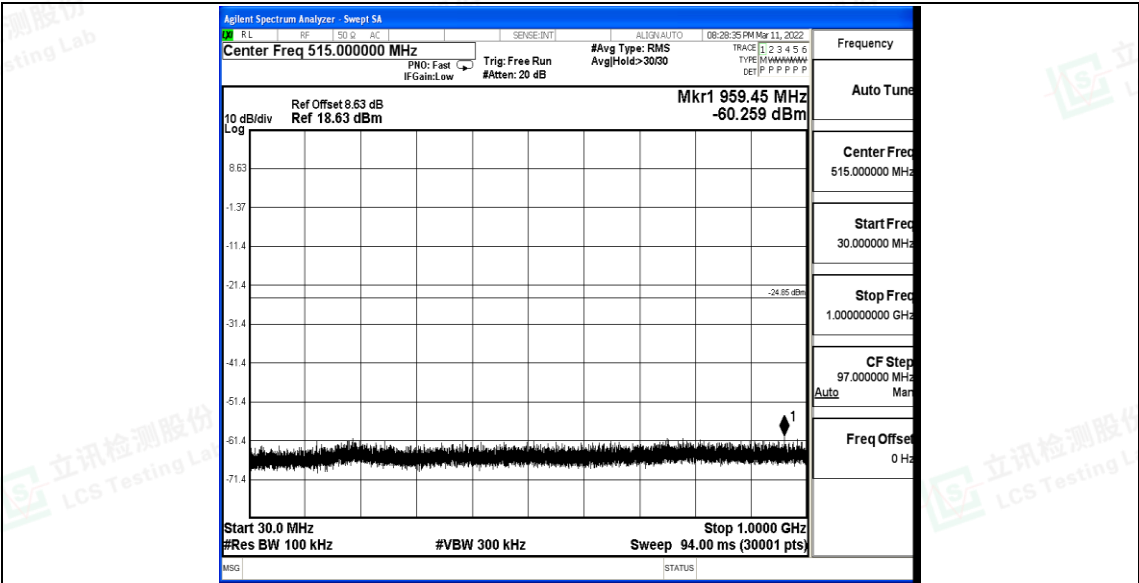


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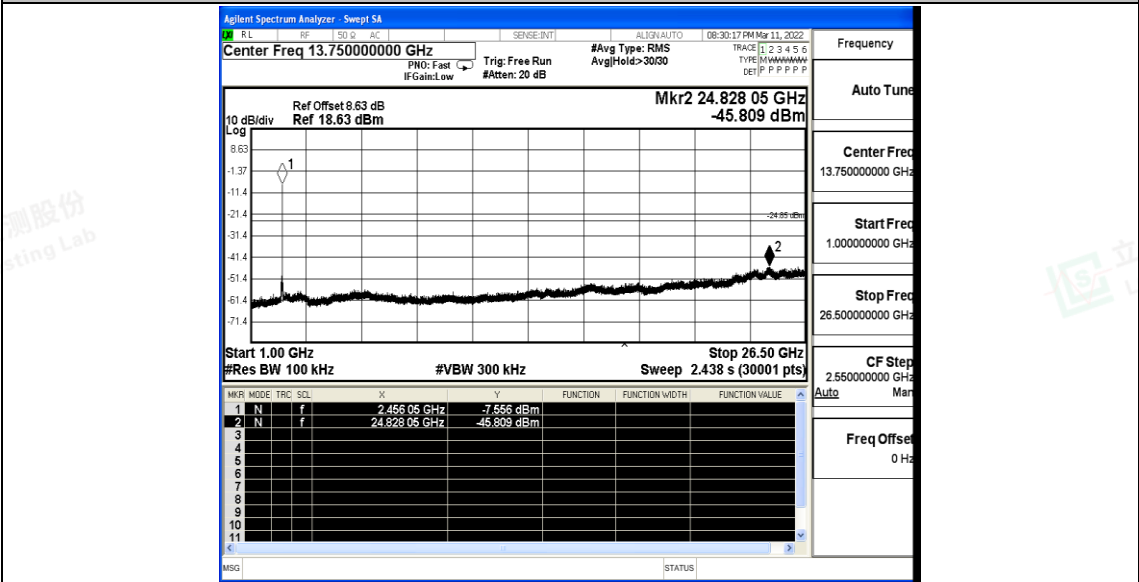
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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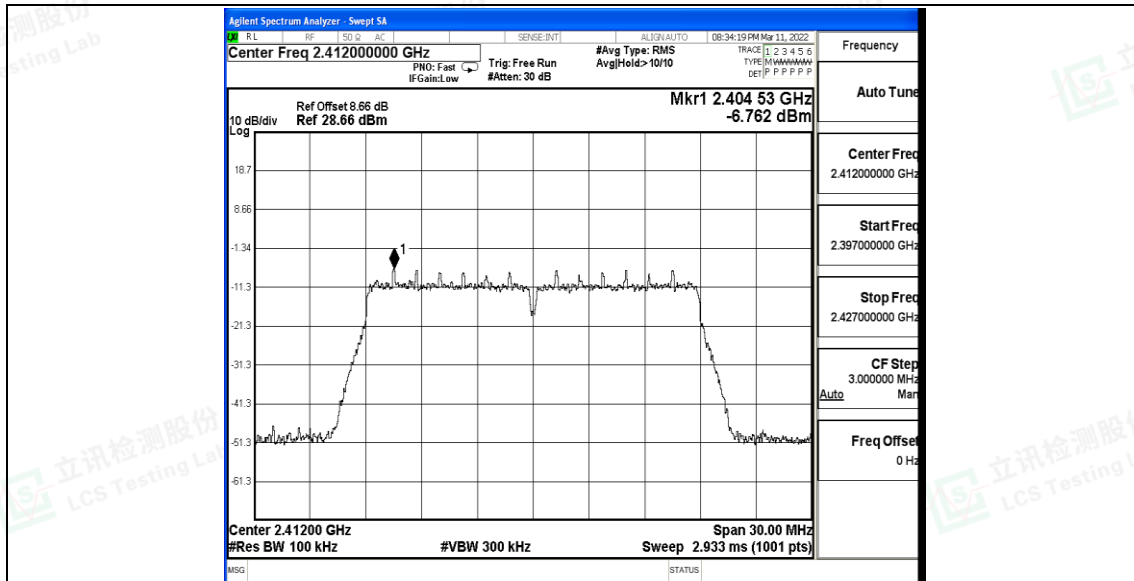


11G_Ant_2462_1000~26500

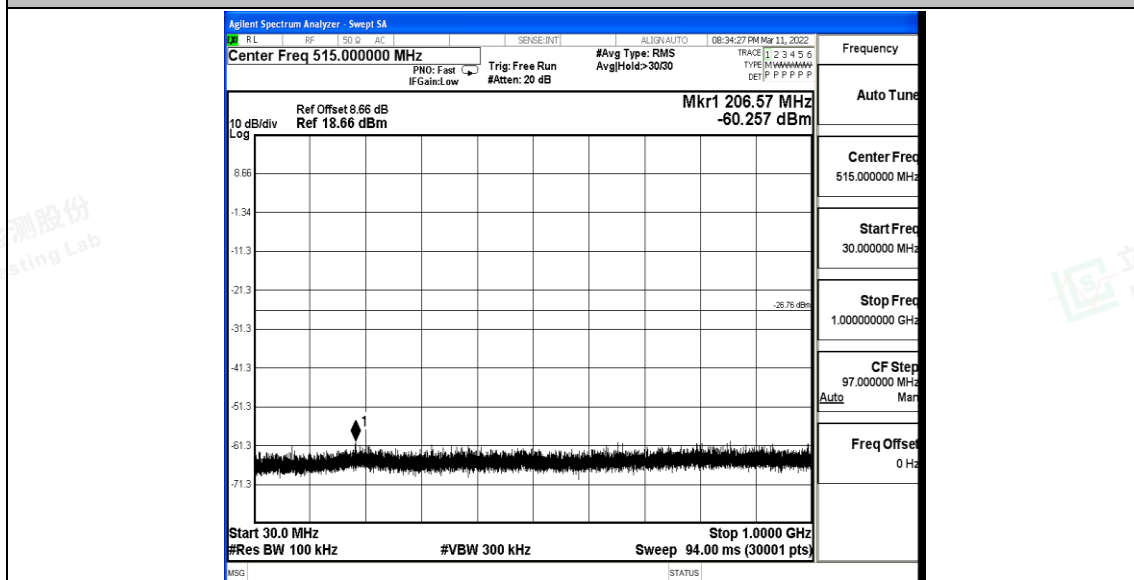


11N20SISO_Ant_2412_0-Reference





11N20SISO_Ant_2412_30~1000



11N20SISO_Ant_2412_1000~26500

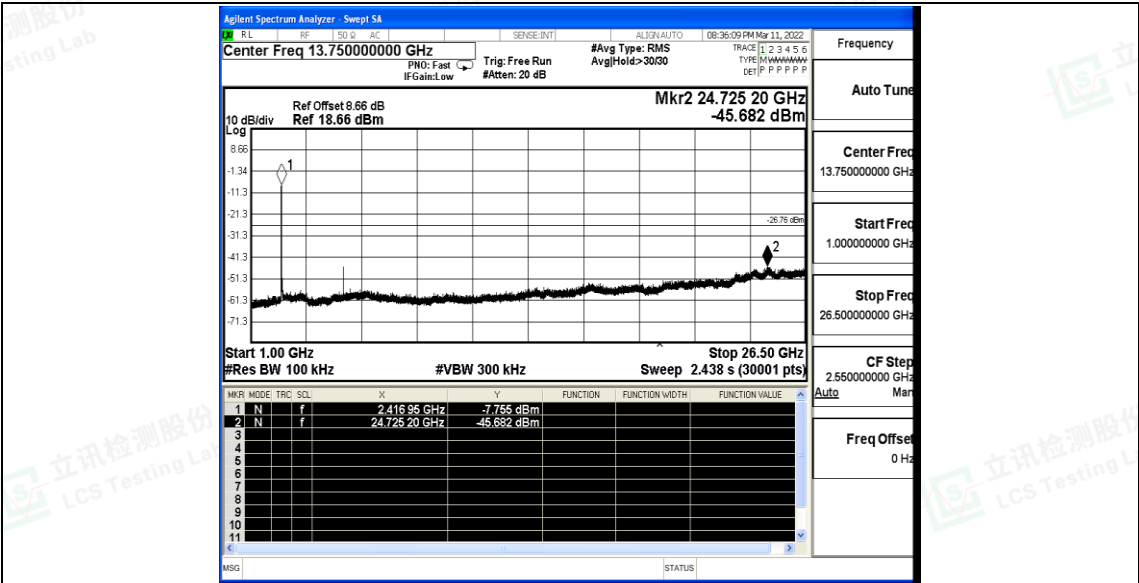


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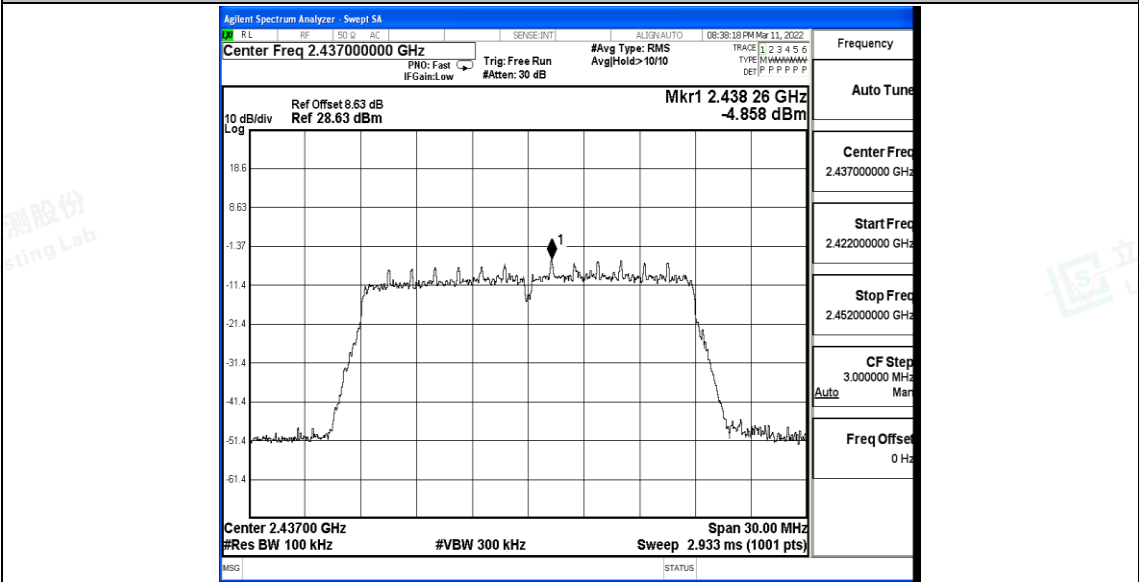
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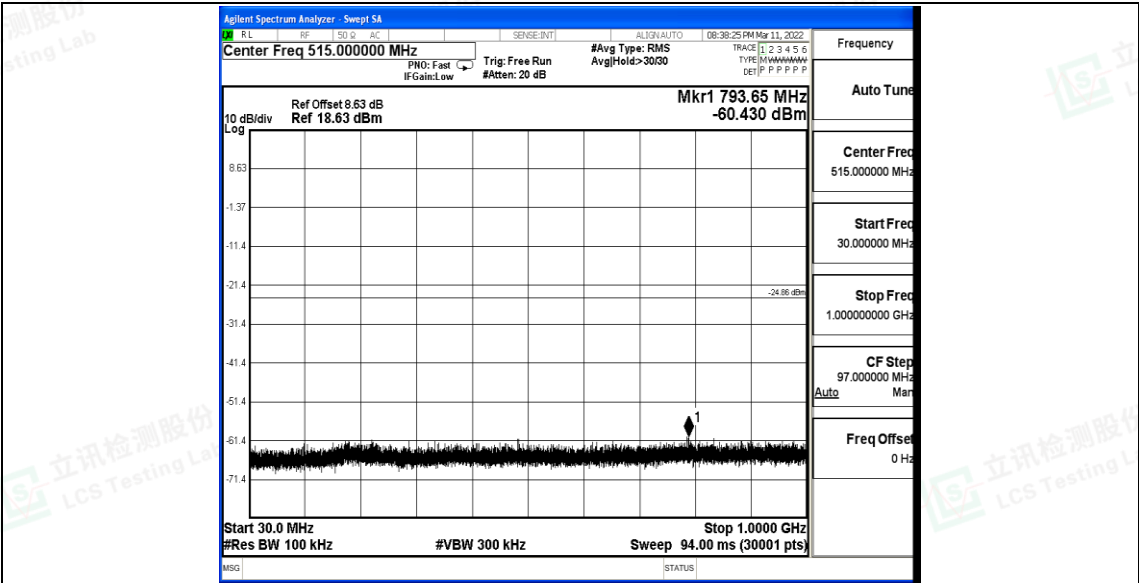


11N20SISO_Ant_2437_0-Reference

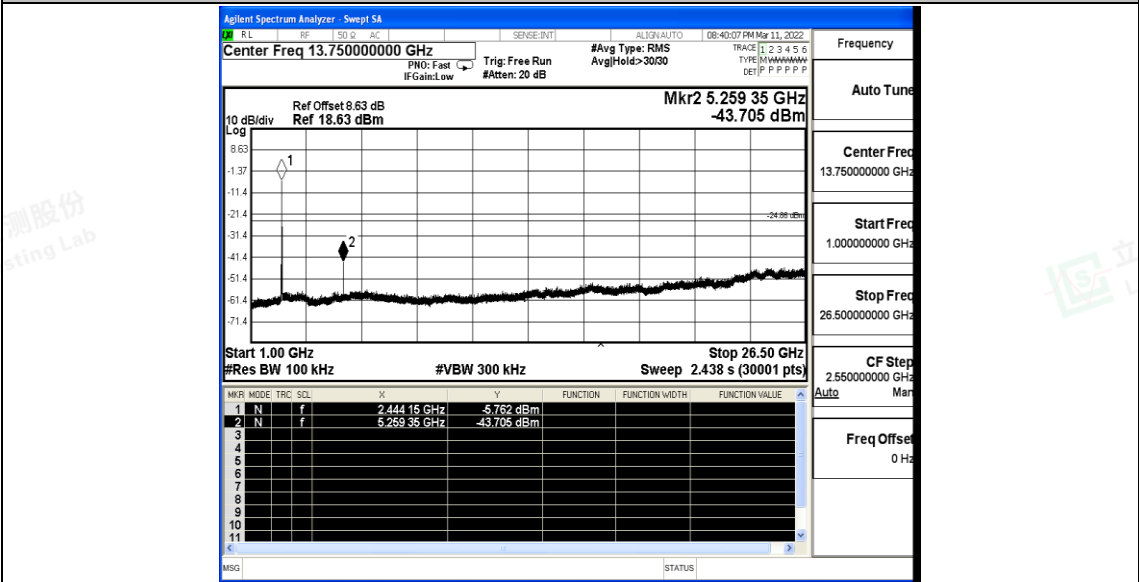


11N20SISO_Ant_2437_30-1000



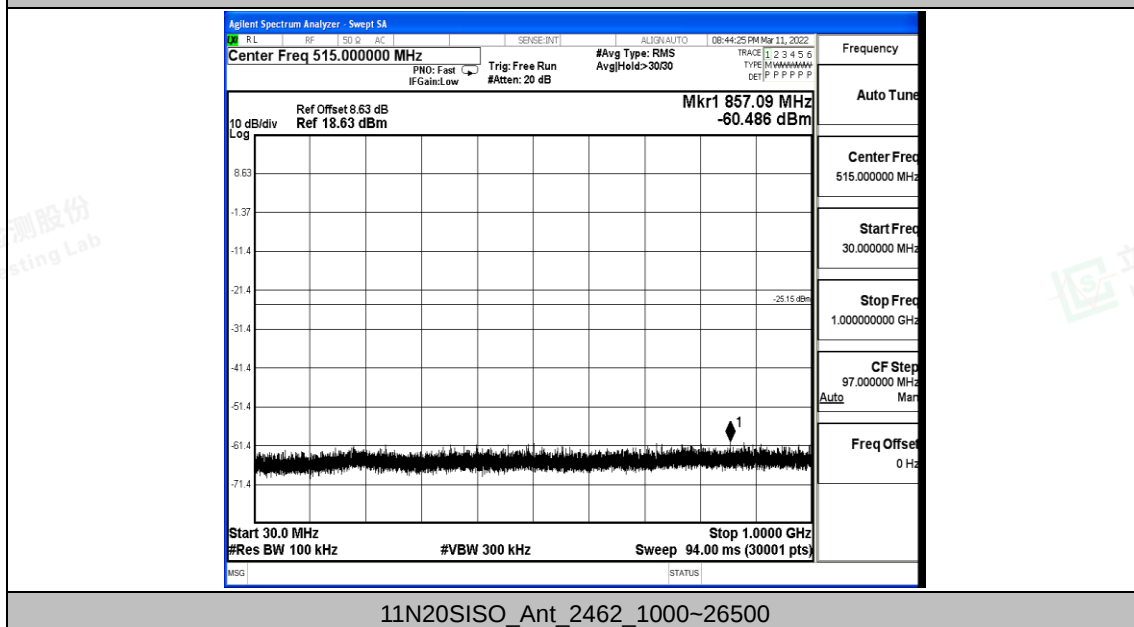
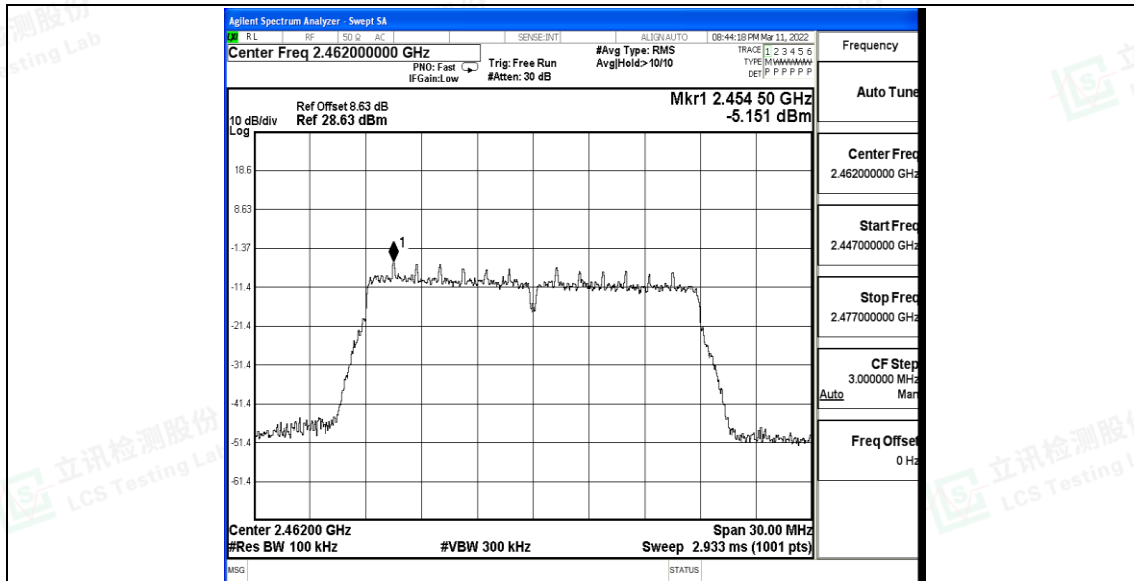


11N20SISO_Ant_2437_1000~26500



11N20SISO_Ant_2462_0~Reference



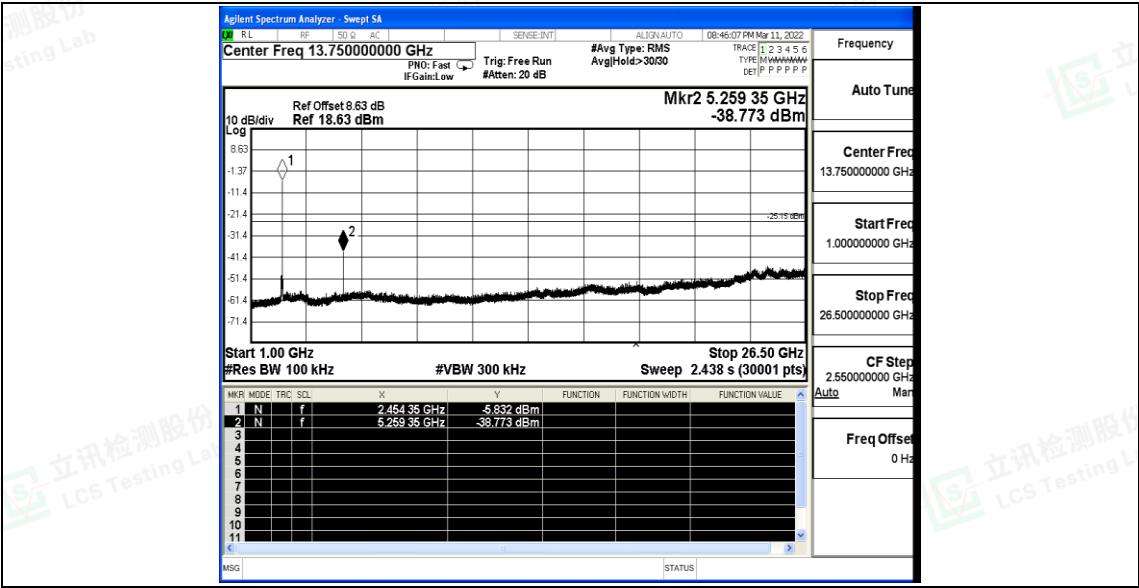


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A.6 Duty Cycle

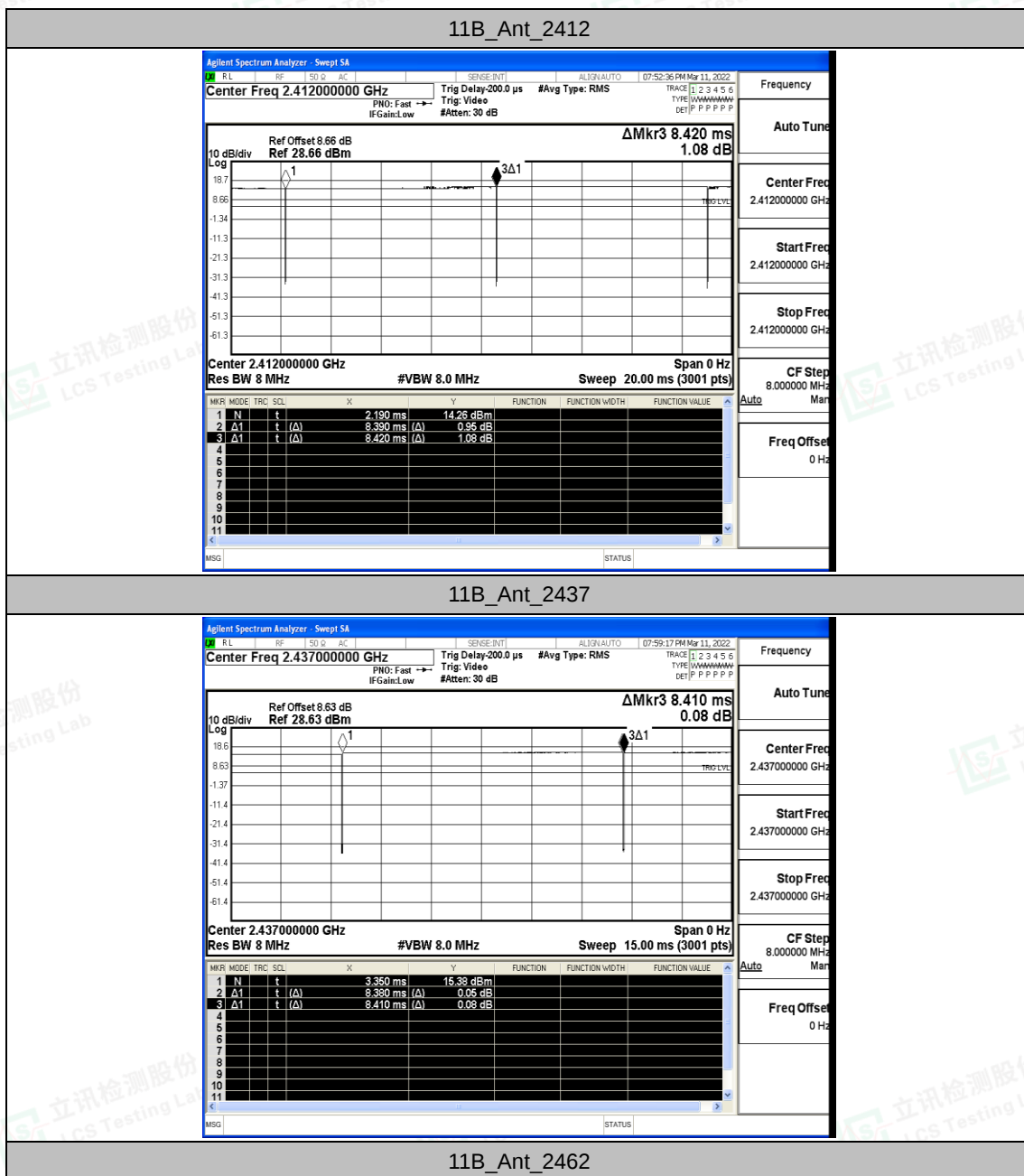
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant	2412	8.39	8.42	99.64	---	---
		2437	8.38	8.41	99.64	---	---
		2462	8.38	8.41	99.64	---	---
11G	Ant	2412	1.40	1.43	97.90	---	---
		2437	1.39	1.43	97.20	---	---
		2462	1.40	1.43	97.90	---	---
11N20SISO	Ant	2412	1.30	1.34	97.01	---	---
		2437	1.30	1.34	97.01	---	---
		2462	1.30	1.33	97.74	---	---





Test Graphs

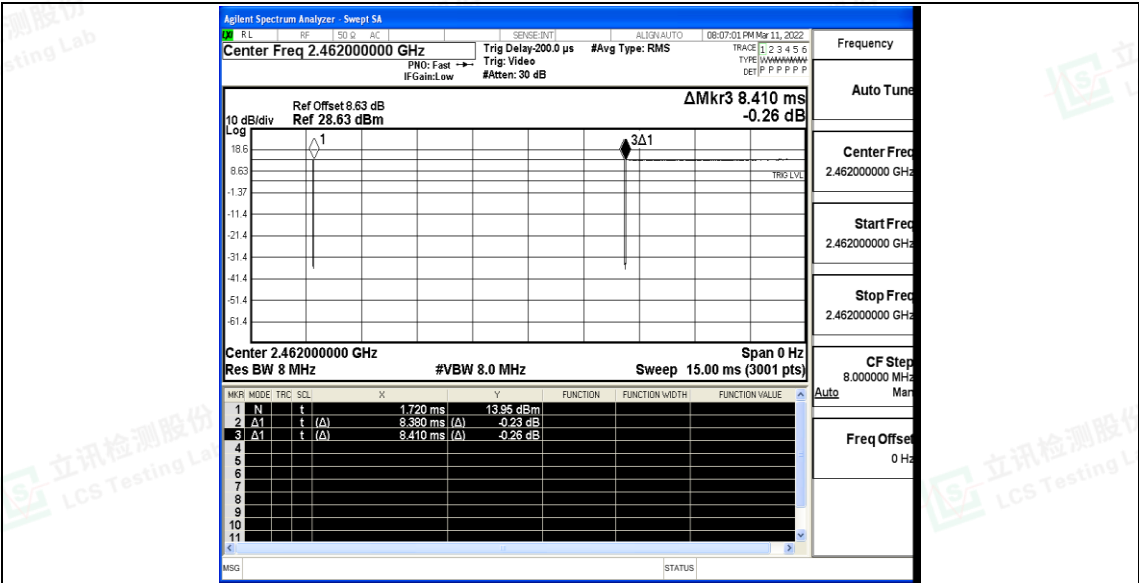


Shenzhen LCS Compliance Testing Laboratory Ltd.

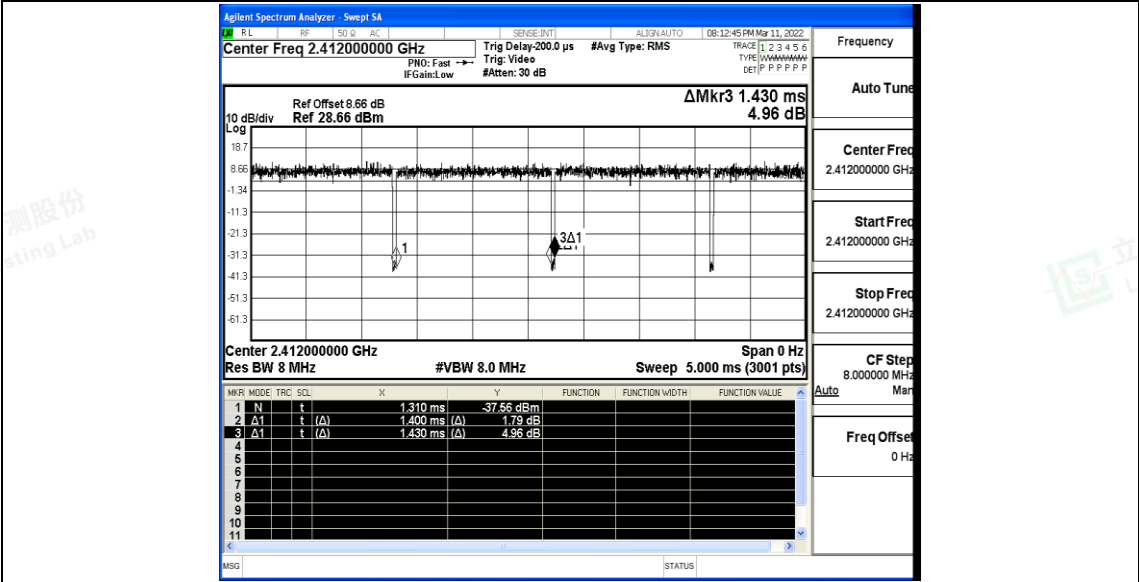
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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

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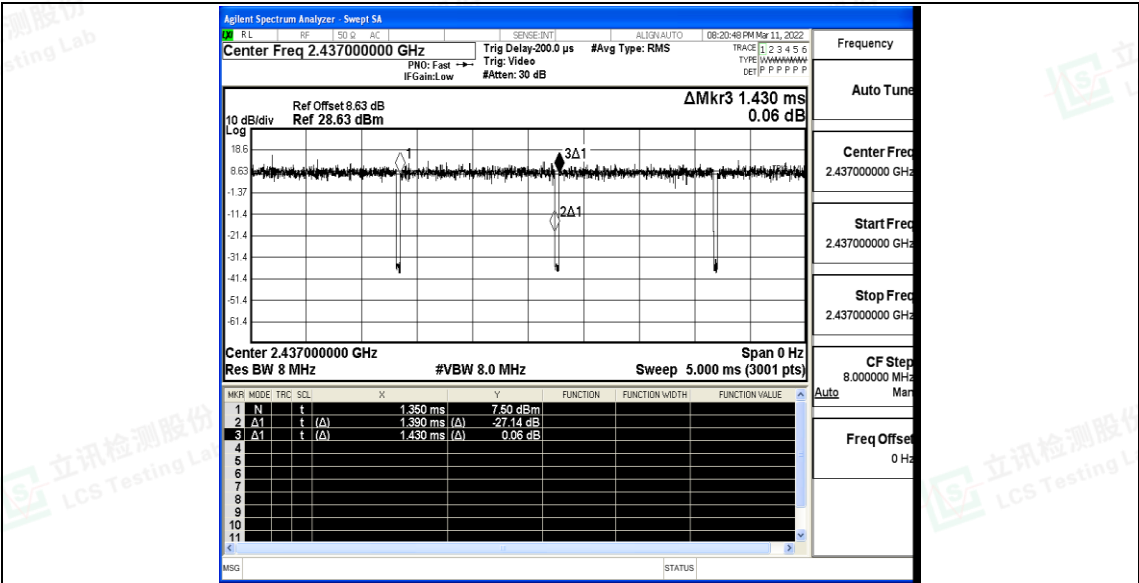


11G_Ant_2412

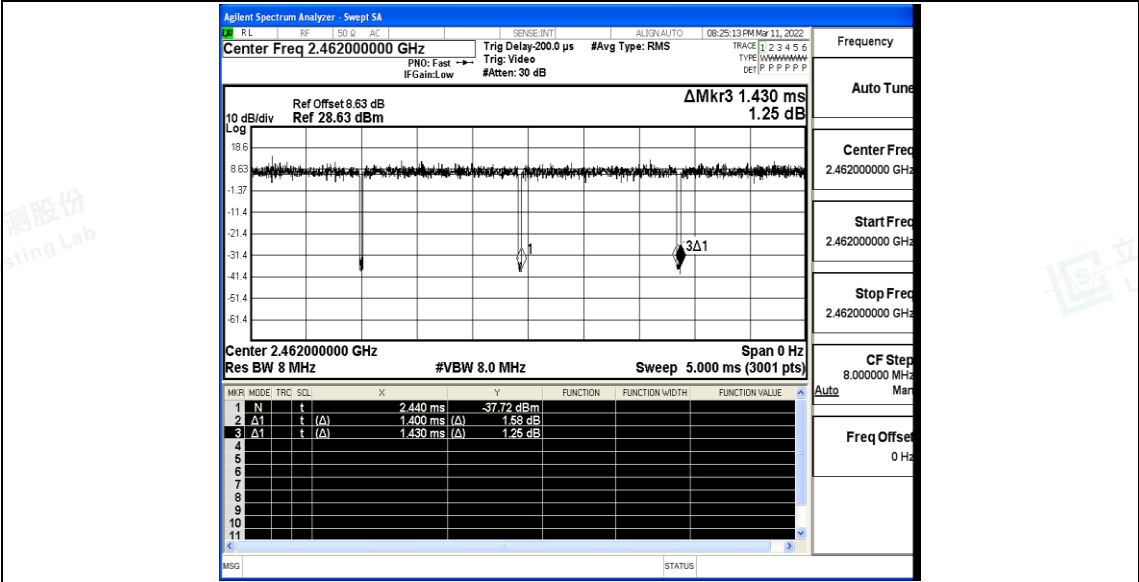


11G_Ant_2437



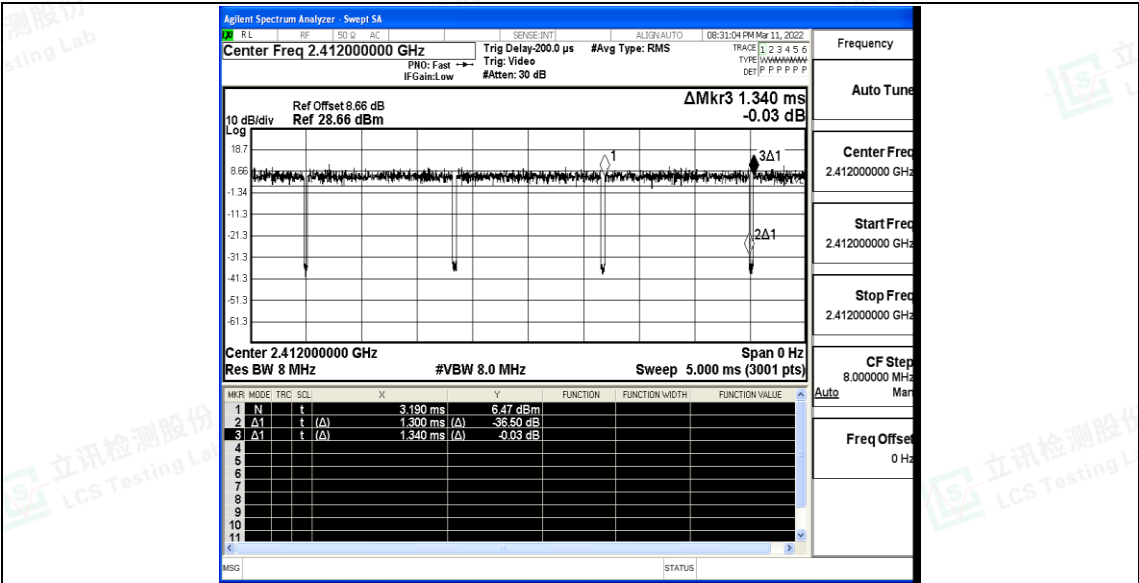


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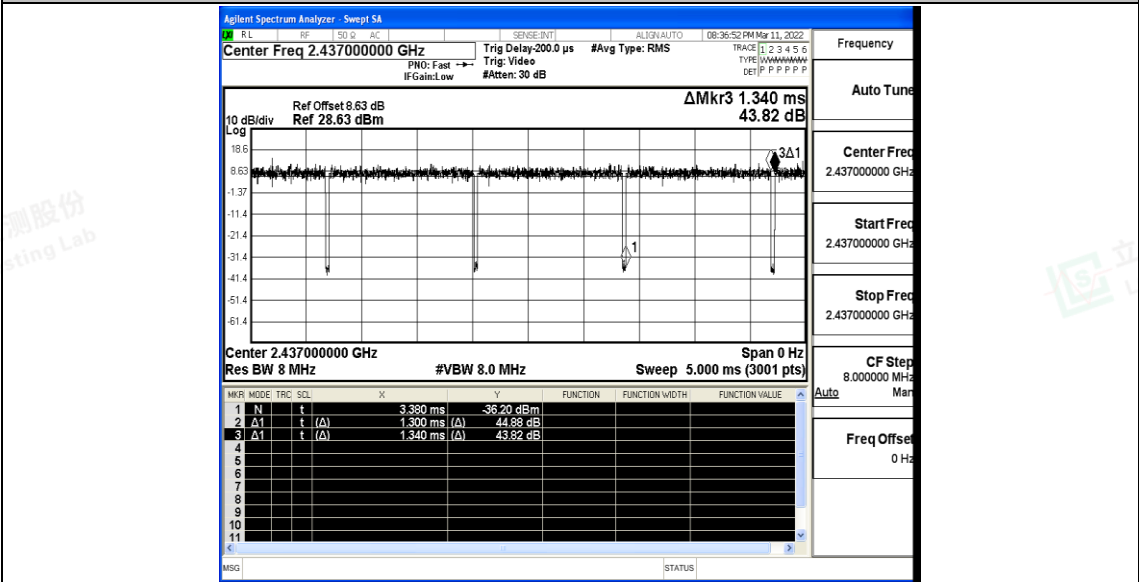


11N20SISO_Ant_2412



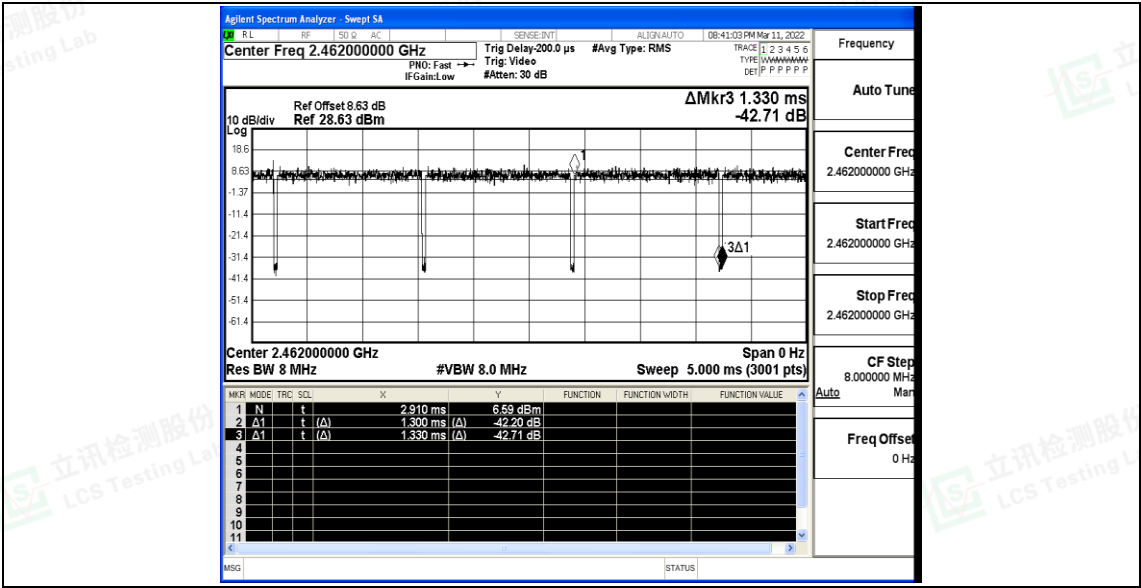


11N20SISO_Ant_2437



11N20SISO_Ant_2462







A.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant	Low	2412	AV	2310.000	-58.62	≤-41.20	36.58	≤54	PASS
				AV	2389.960	-57.26	≤-41.20	37.94	≤54	PASS
				AV	2390.000	-57.27	≤-41.20	37.93	≤54	PASS
				Peak	2310.000	-47.51	≤-21.20	47.69	≤74	PASS
				Peak	2310.920	-45.46	≤-21.20	49.74	≤74	PASS
				Peak	2390.000	-46.35	≤-21.20	48.85	≤74	PASS
		High	2462	AV	2483.500	-55.32	≤-41.20	39.88	≤54	PASS
				AV	2488.070	-53.75	≤-41.20	41.45	≤54	PASS
				AV	2500.000	-57.67	≤-41.20	37.53	≤54	PASS
				Peak	2483.500	-44.36	≤-21.20	50.84	≤74	PASS
				Peak	2487.410	-42.47	≤-21.20	52.73	≤74	PASS
				Peak	2500.000	-46.54	≤-21.20	48.66	≤74	PASS
11G	Ant	Low	2412	AV	2310.000	-58.37	≤-41.20	36.83	≤54	PASS
				AV	2389.960	-56.59	≤-41.20	38.61	≤54	PASS
				AV	2390.000	-56.59	≤-41.20	38.61	≤54	PASS
				Peak	2310.000	-47.9	≤-21.20	47.30	≤74	PASS
				Peak	2388.400	-45.63	≤-21.20	49.57	≤74	PASS
				Peak	2390.000	-46.48	≤-21.20	48.72	≤74	PASS
		High	2462	AV	2483.500	-53.47	≤-41.20	41.73	≤54	PASS
				AV	2487.850	-52.24	≤-41.20	42.96	≤54	PASS
				AV	2500.000	-57.29	≤-41.20	37.91	≤54	PASS
				Peak	2483.500	-42.73	≤-21.20	52.47	≤74	PASS
				Peak	2483.670	-42.2	≤-21.20	53.00	≤74	PASS
				Peak	2500.000	-47.48	≤-21.20	47.72	≤74	PASS
11N20SIS O	Ant	Low	2412	AV	2310.000	-58.24	≤-41.20	36.96	≤54	PASS
				AV	2389.960	-56.71	≤-41.20	38.49	≤54	PASS
				AV	2390.000	-56.71	≤-41.20	38.49	≤54	PASS
				Peak	2310.000	-47.94	≤-21.20	47.26	≤74	PASS
				Peak	2389.570	-45.67	≤-21.20	49.53	≤74	PASS
				Peak	2390.000	-45.98	≤-21.20	49.22	≤74	PASS
		High	2462	AV	2483.500	-53.43	≤-41.20	41.77	≤54	PASS
				AV	2487.960	-51.87	≤-41.20	43.33	≤54	PASS
				AV	2500.000	-57.26	≤-41.20	37.94	≤54	PASS
				Peak	2483.500	-42.53	≤-21.20	52.67	≤74	PASS
				Peak	2487.630	-42.19	≤-21.20	53.01	≤74	PASS



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				Peak	2500.000	-47.08	≤-21.20	48.12	≤74	PASS
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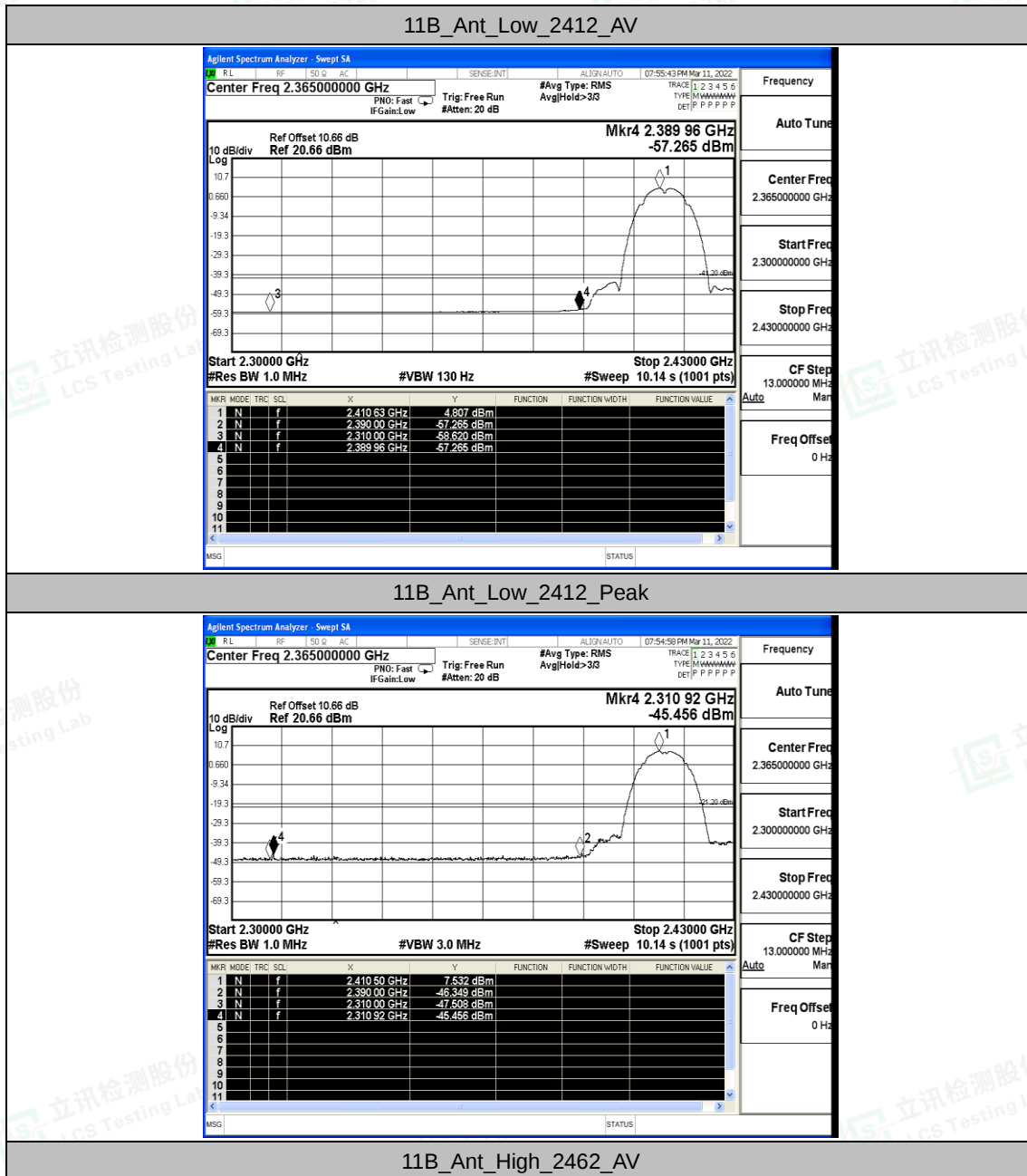
Note:

- 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

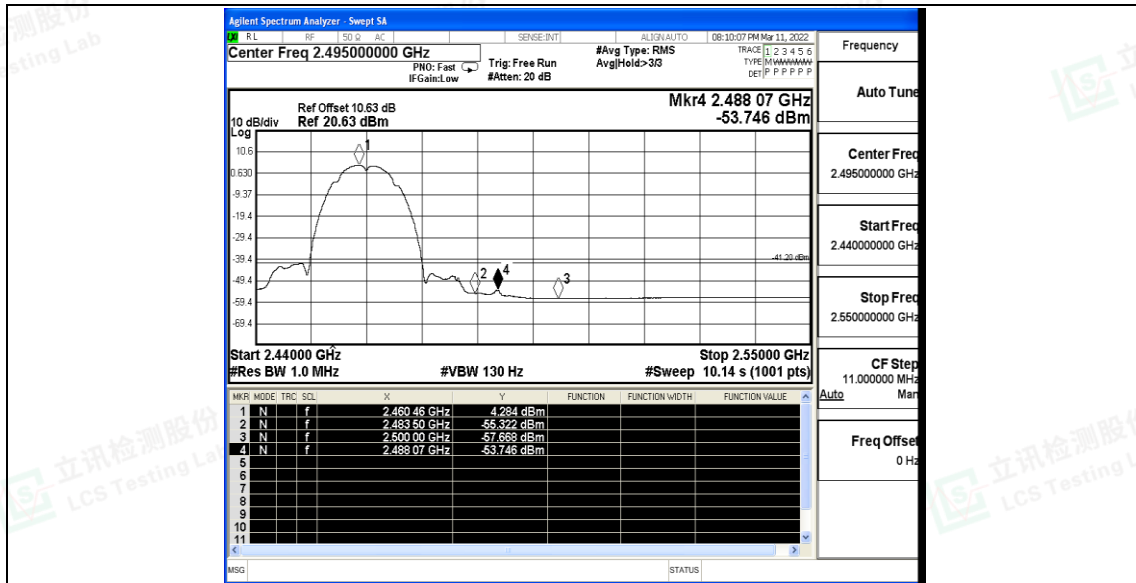


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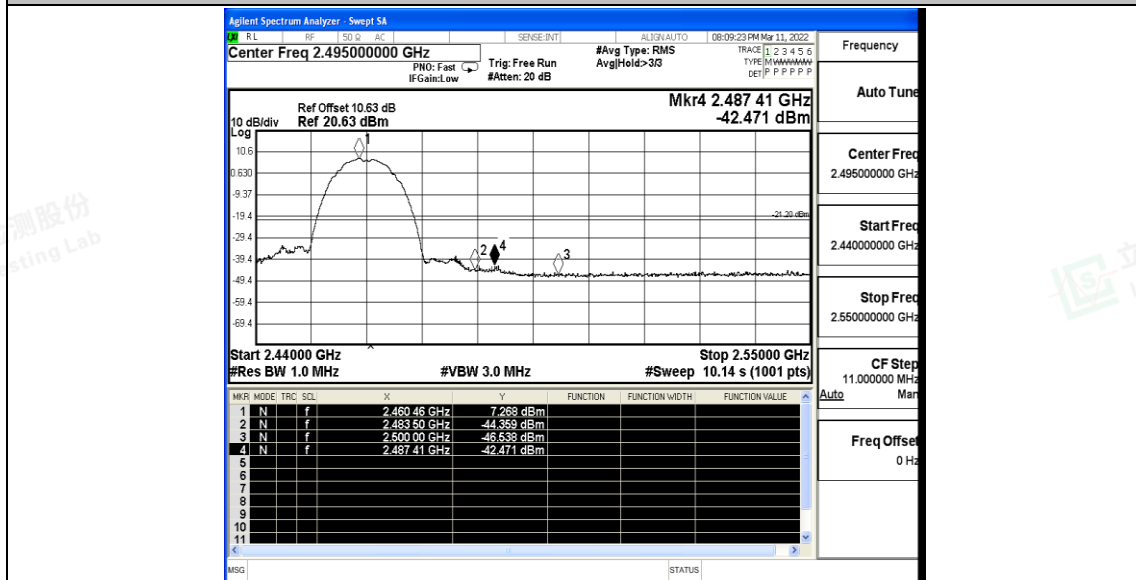
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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11B_Ant_High_2462_Peak



11G_Ant_Low_2412_AV

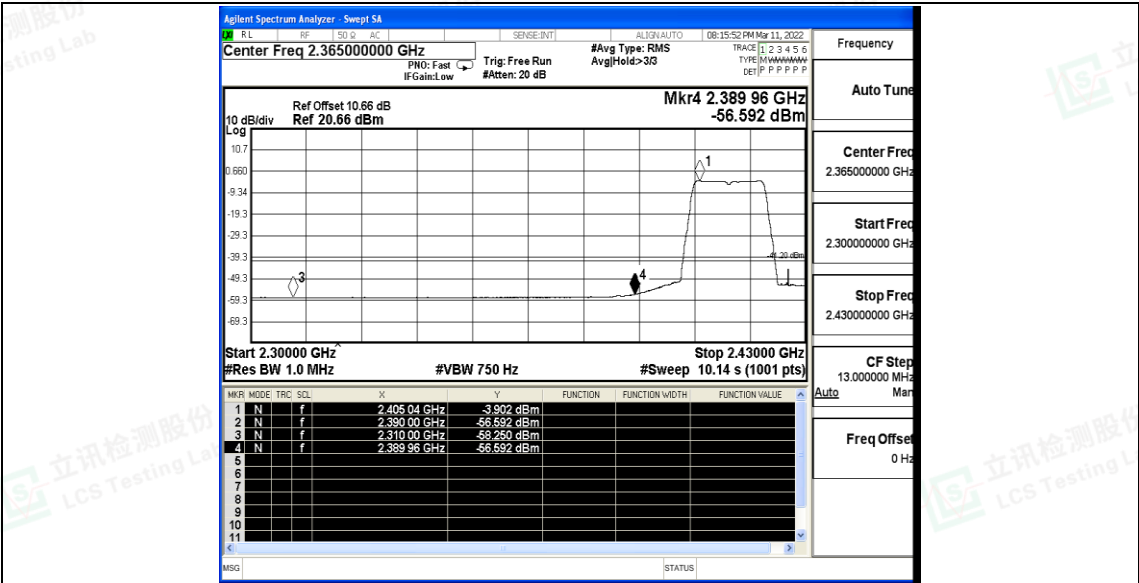


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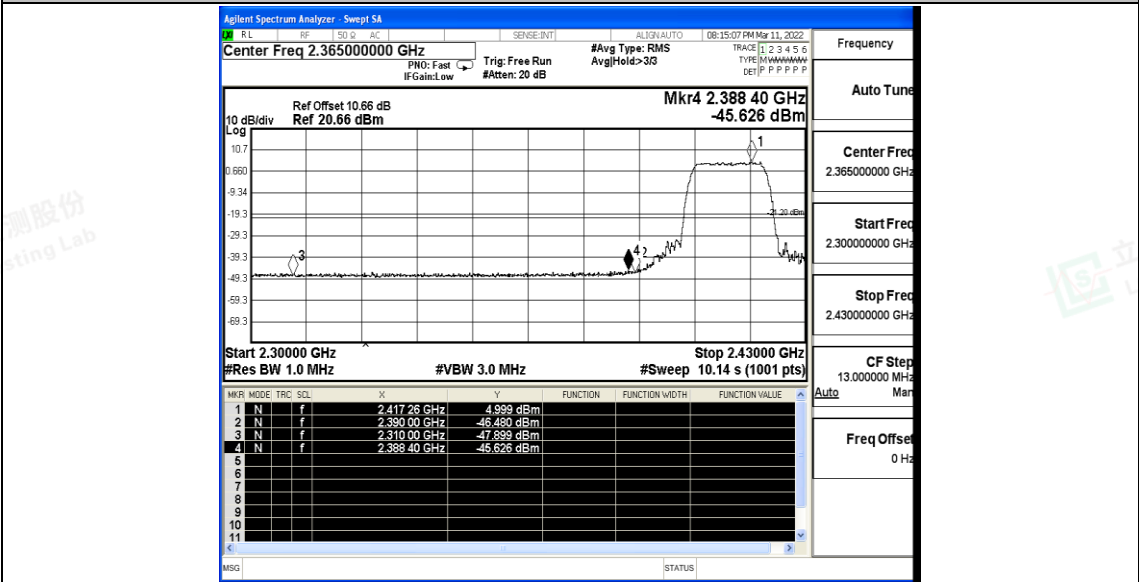
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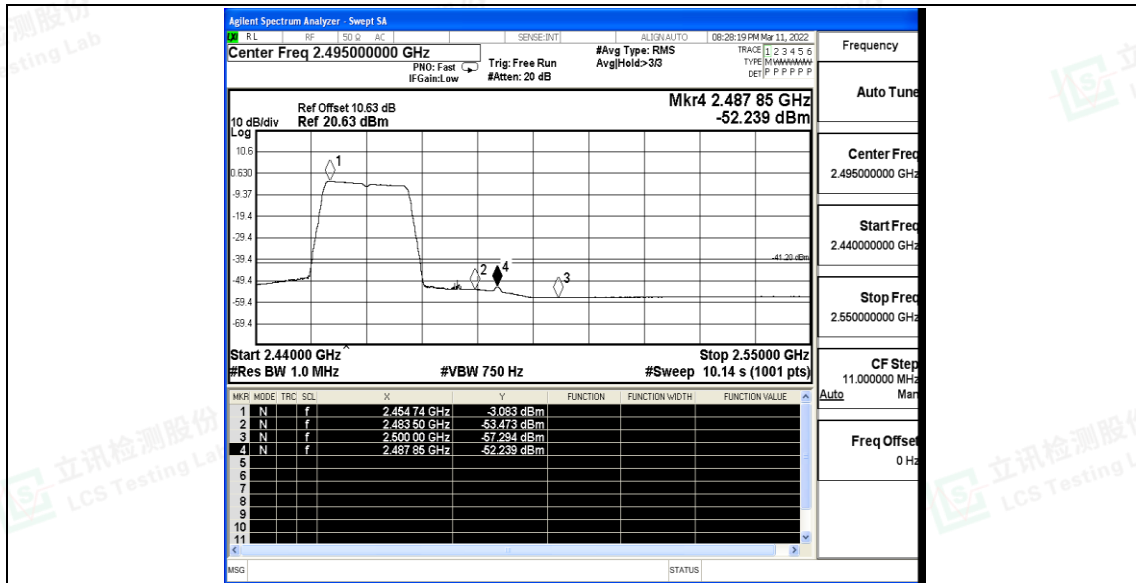


11G_Ant_Low_2412_Peak

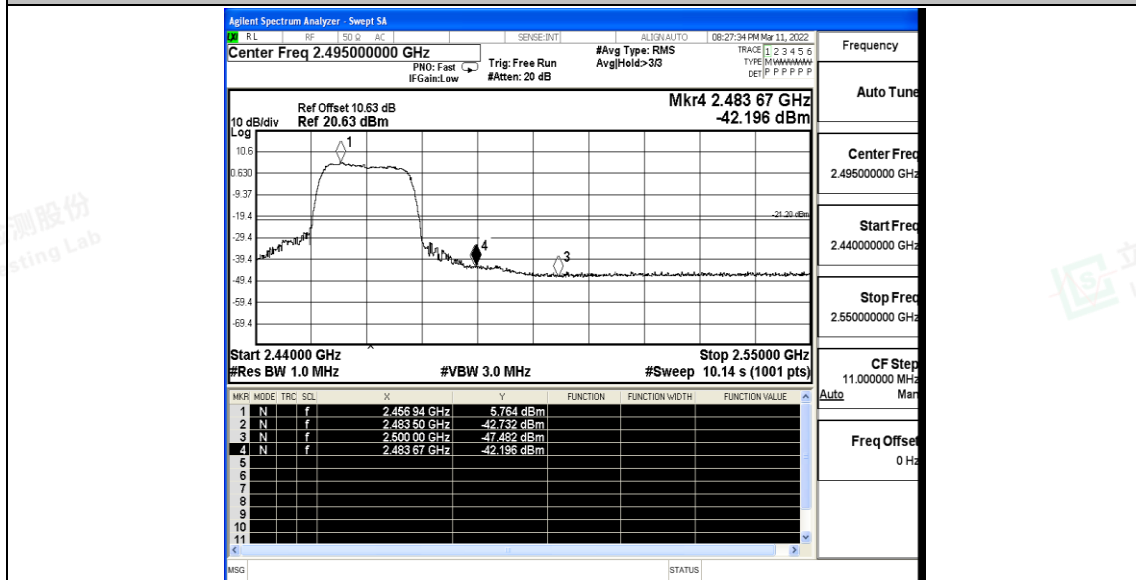


11G_Ant_High_2462_AV





11G_Ant_High_2462_Peak



11N20SISO_Ant_Low_2412_AV

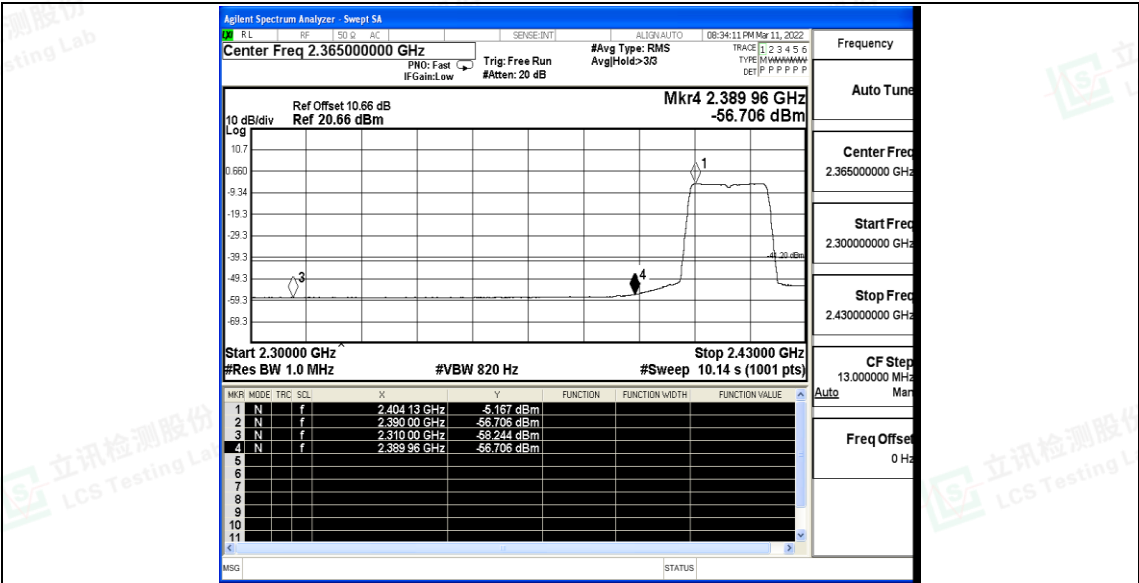


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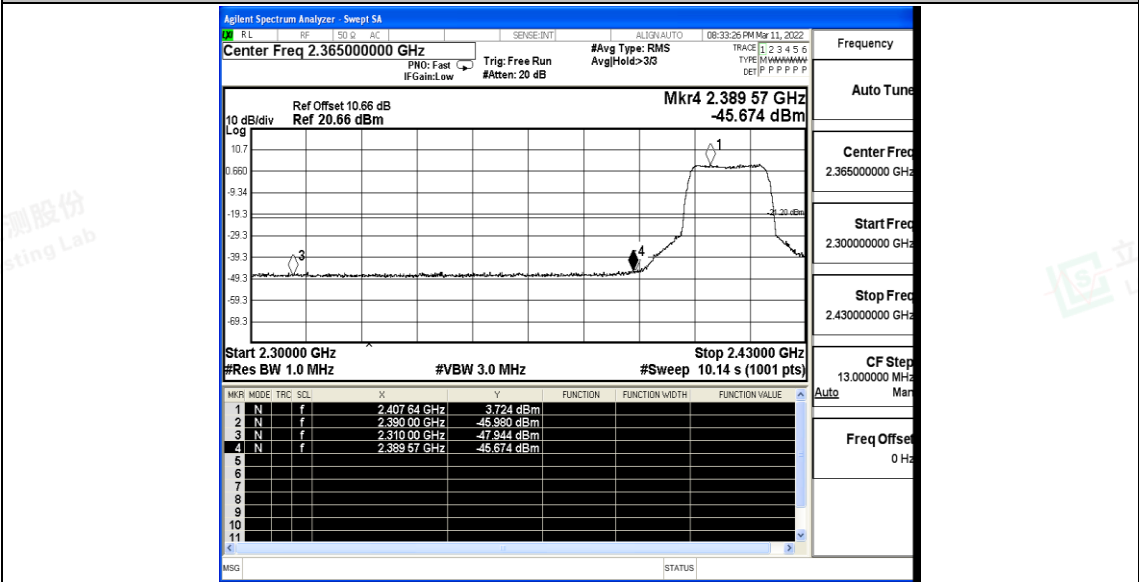
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11N20SISO_Ant_Low_2412_Peak



11N20SISO_Ant_High_2462_AV



