



Appendix A

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: Wi-Fi DoorBell Chime

Test Model: DDA020

Environmental Conditions

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





A.1 DTS Bandwidth

Test Result

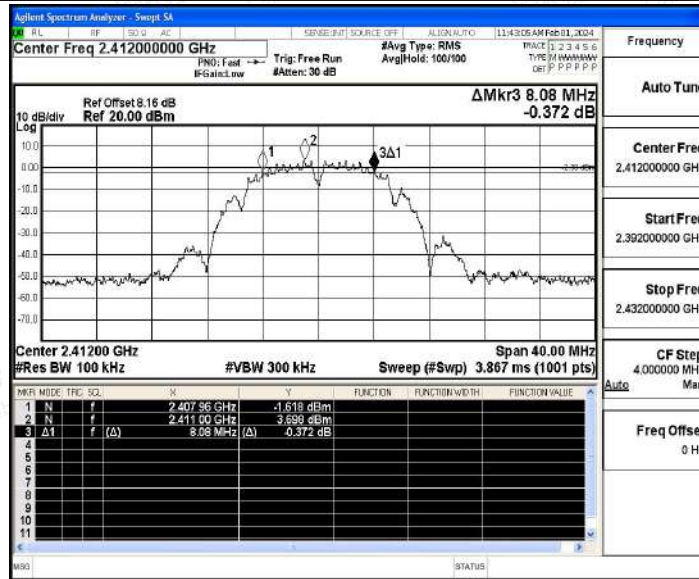
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant0	2412	8.080	2407.960	2416.040	0.5	PASS
		2437	8.560	2432.960	2441.520	0.5	PASS
		2462	8.560	2457.480	2466.040	0.5	PASS
11G	Ant0	2412	16.080	2404.080	2420.160	0.5	PASS
		2437	16.320	2428.840	2445.160	0.5	PASS
		2462	16.320	2453.840	2470.160	0.5	PASS
11N20SISO	Ant0	2412	16.640	2403.960	2420.600	0.5	PASS
		2437	17.080	2428.400	2445.480	0.5	PASS
		2462	17.160	2453.480	2470.640	0.5	PASS
11N40SISO	Ant0	2422	35.680	2404.240	2439.920	0.5	PASS
		2437	35.680	2419.000	2454.680	0.5	PASS
		2452	35.520	2434.080	2469.600	0.5	PASS



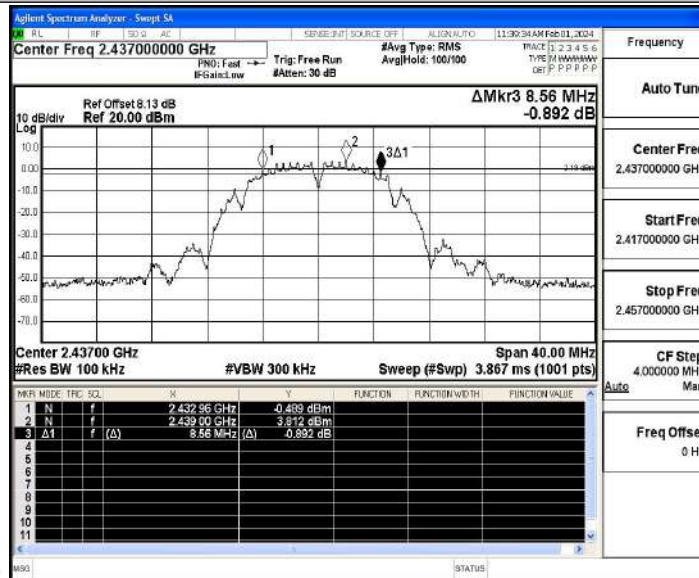


Test Graphs

11B_Ant0_2412

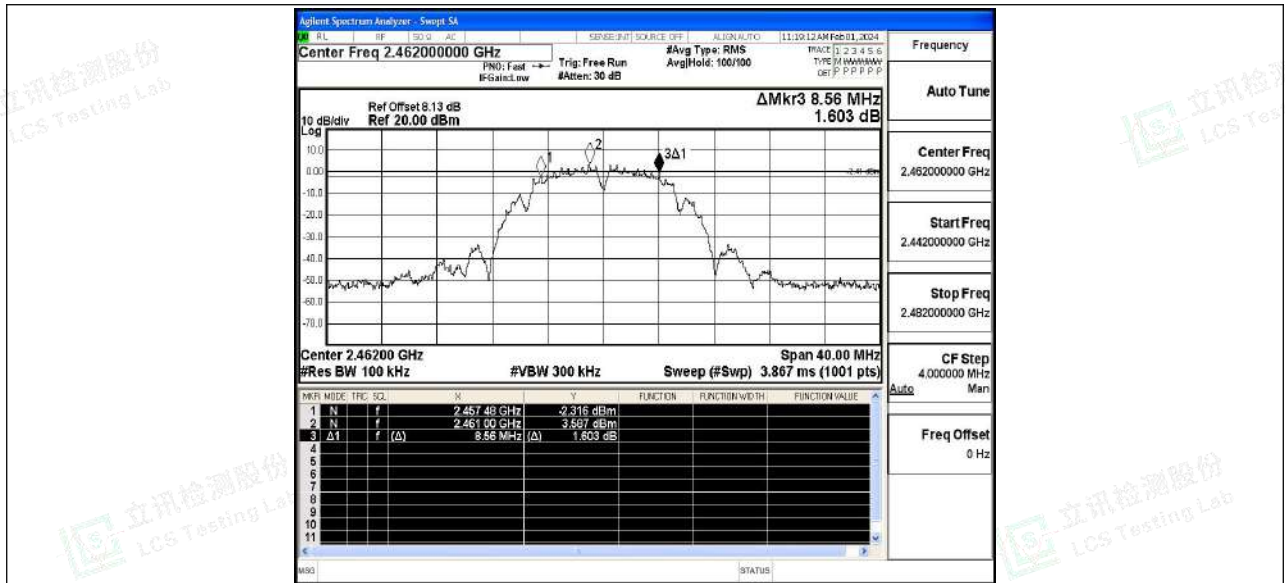


11B_Ant0_2437

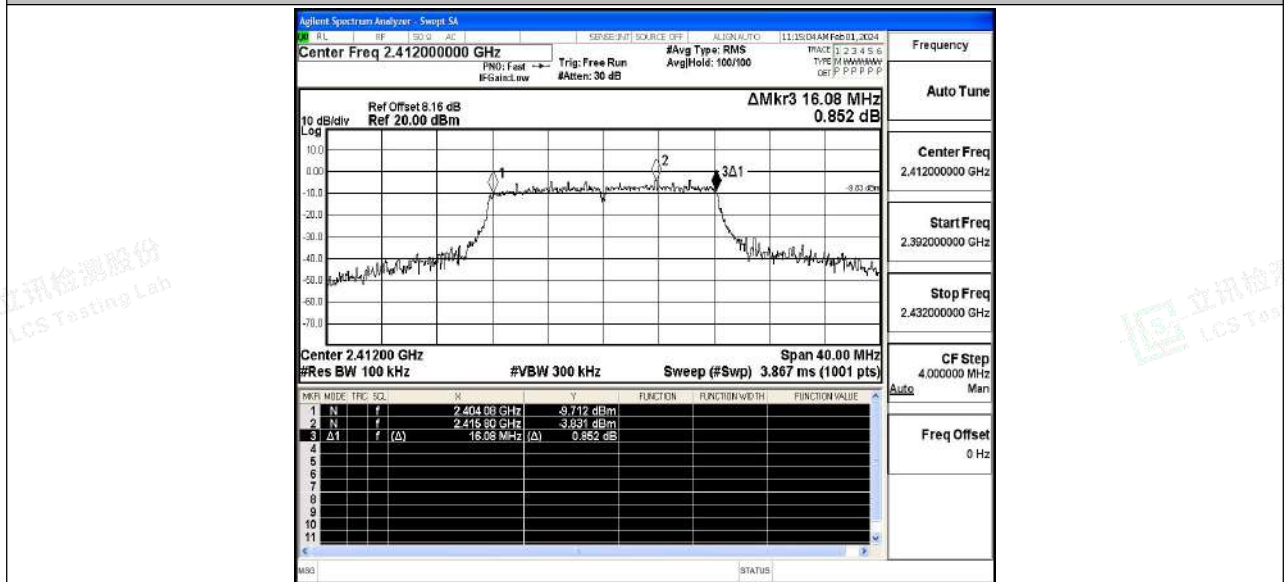


11B_Ant0_2462

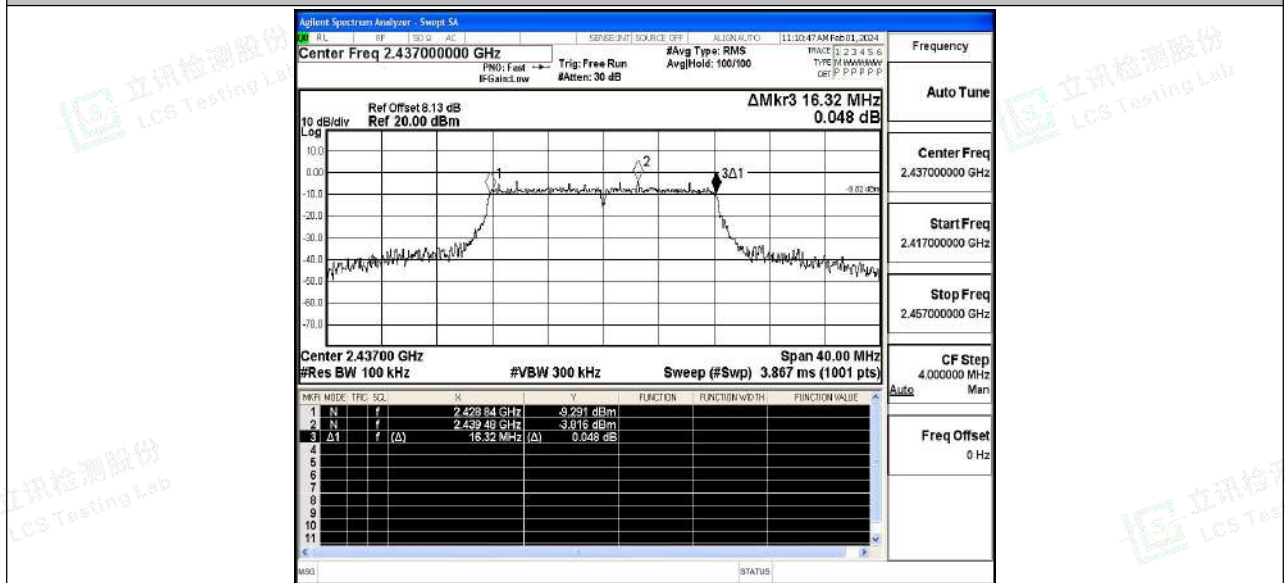




11G_Ant0_2412

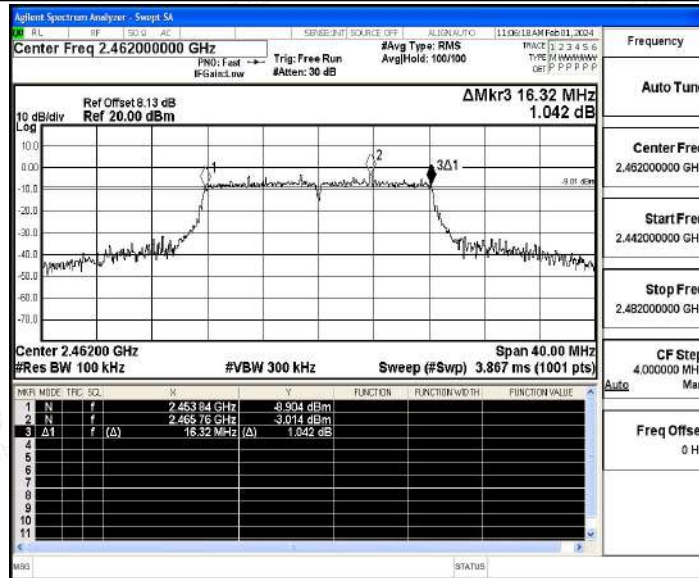


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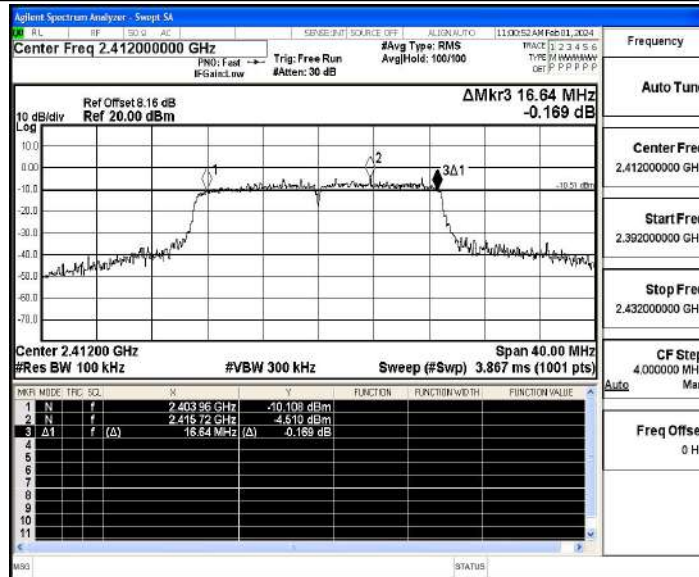




11G_Ant0_2462

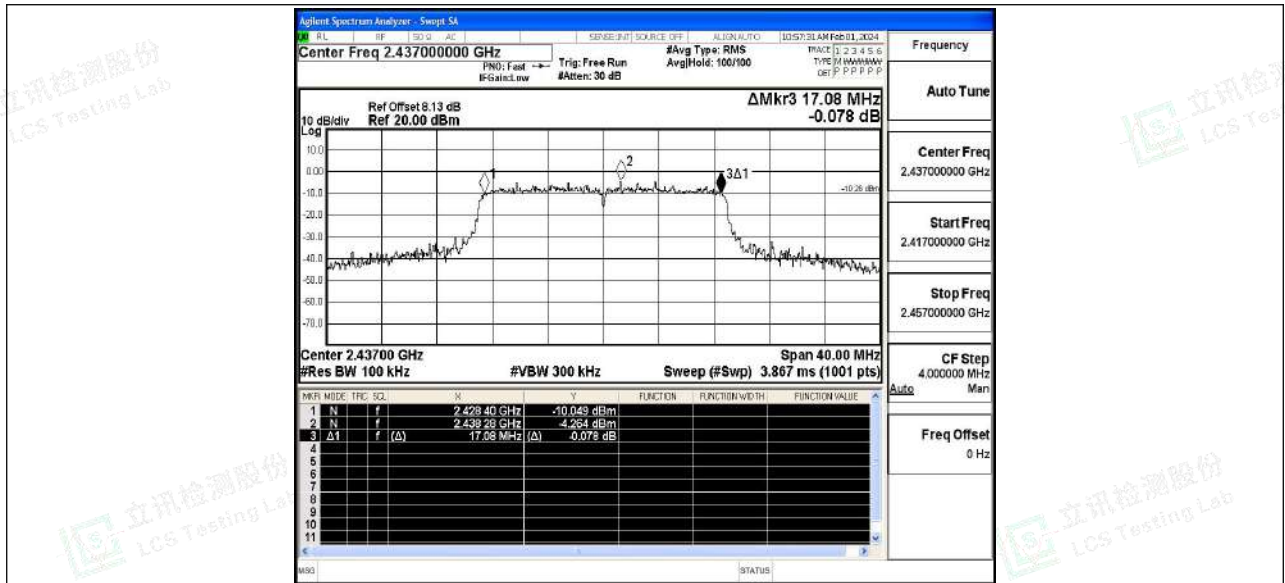


11N20SISO_Ant0_2412

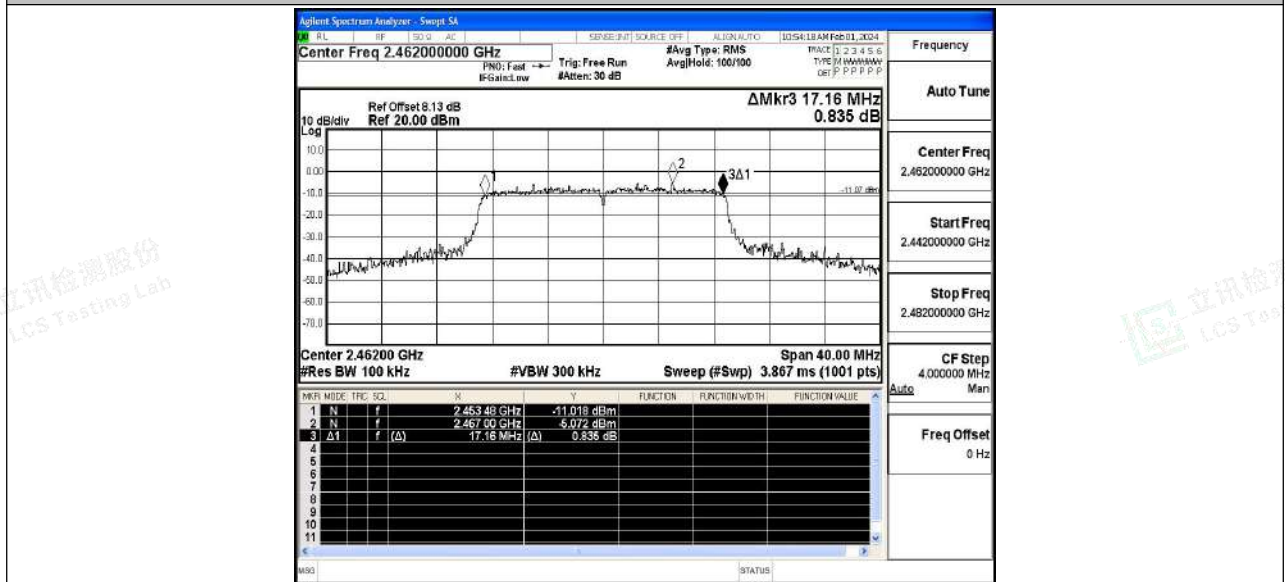


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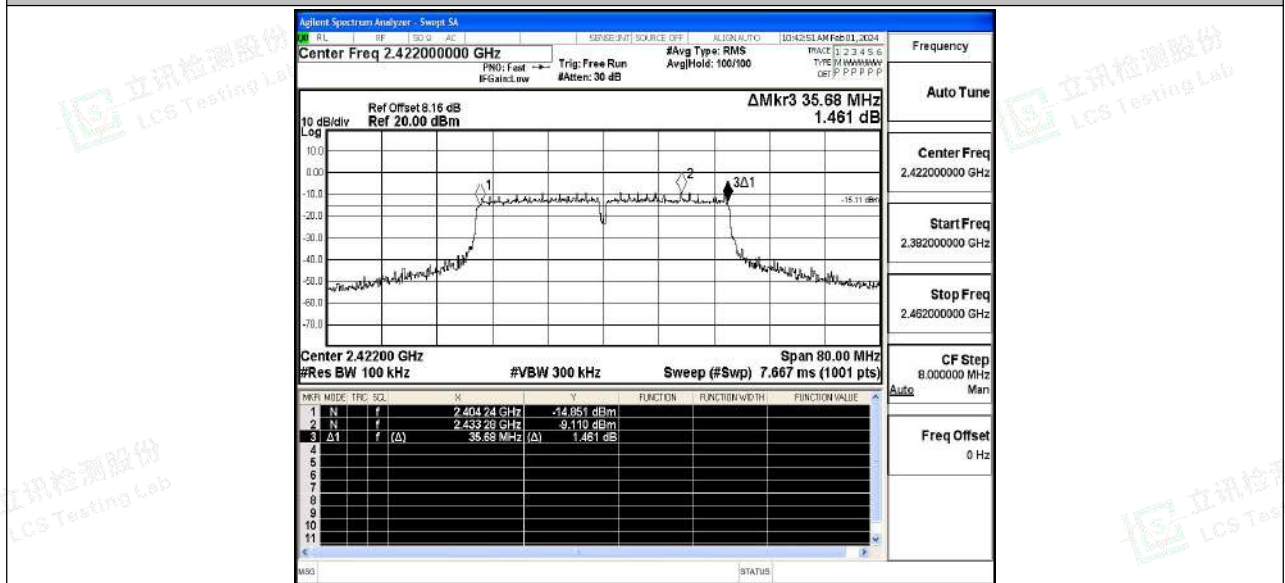




11N20SISO_Ant0_2462

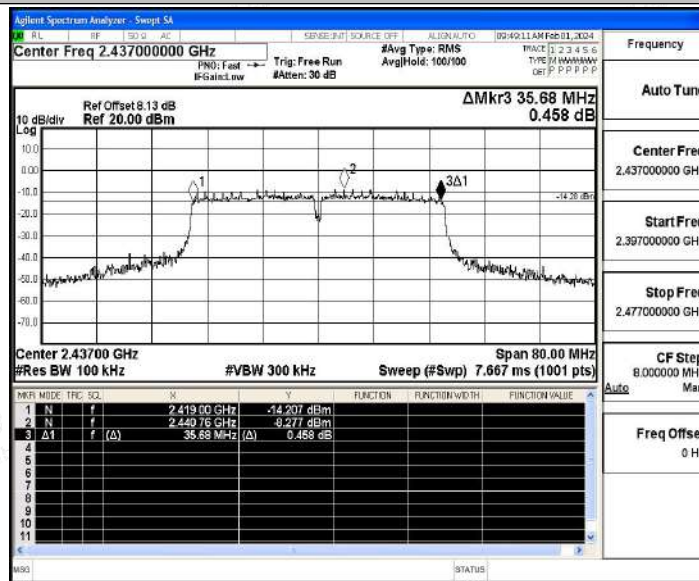


11N40SISO_Ant0_2422

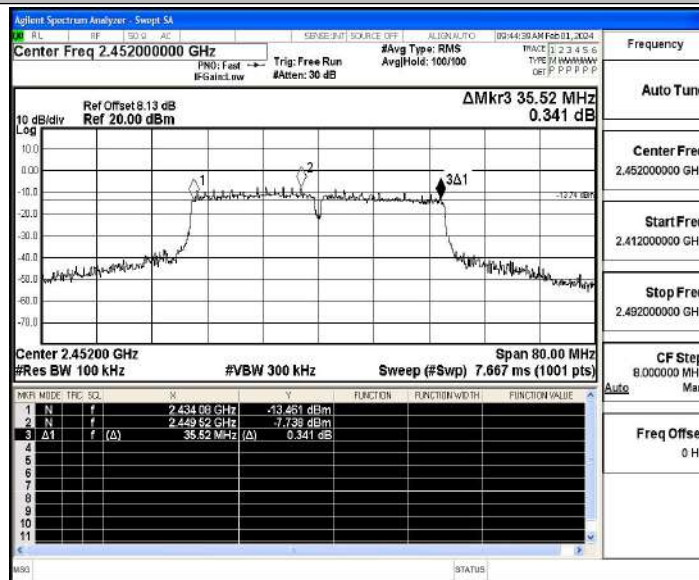




11N40SISO_Ant0_2437



11N40SISO_Ant0_2452





Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.080	2407.960	2417.040	0.5	PASS
		2437	9.000	2432.520	2441.520	0.5	PASS
		2462	8.560	2457.480	2466.040	0.5	PASS
11G	Ant1	2412	16.320	2403.880	2420.200	0.5	PASS
		2437	16.320	2428.840	2445.160	0.5	PASS
		2462	16.280	2453.880	2470.160	0.5	PASS
11N20SISO	Ant1	2412	16.720	2403.960	2420.680	0.5	PASS
		2437	17.120	2428.360	2445.480	0.5	PASS
		2462	16.960	2453.640	2470.600	0.5	PASS
11N40SISO	Ant1	2422	36.000	2404.080	2440.080	0.5	PASS
		2437	36.000	2418.920	2454.920	0.5	PASS
		2452	35.440	2434.080	2469.520	0.5	PASS



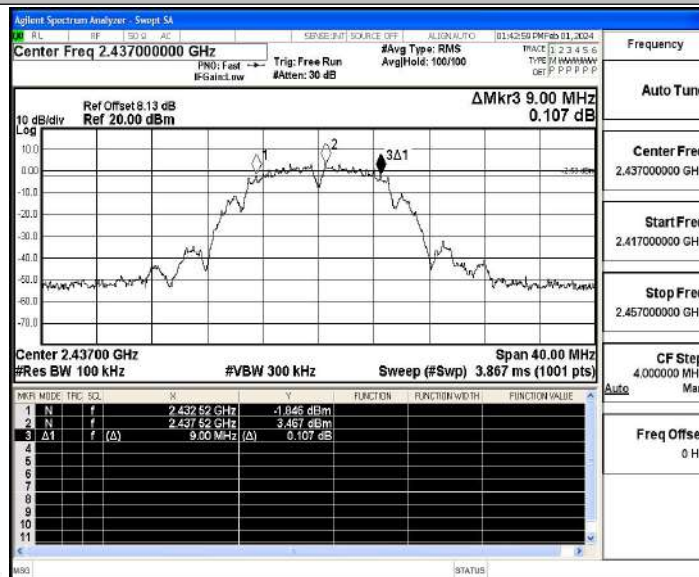


Test Graphs

11B_Ant1_2412

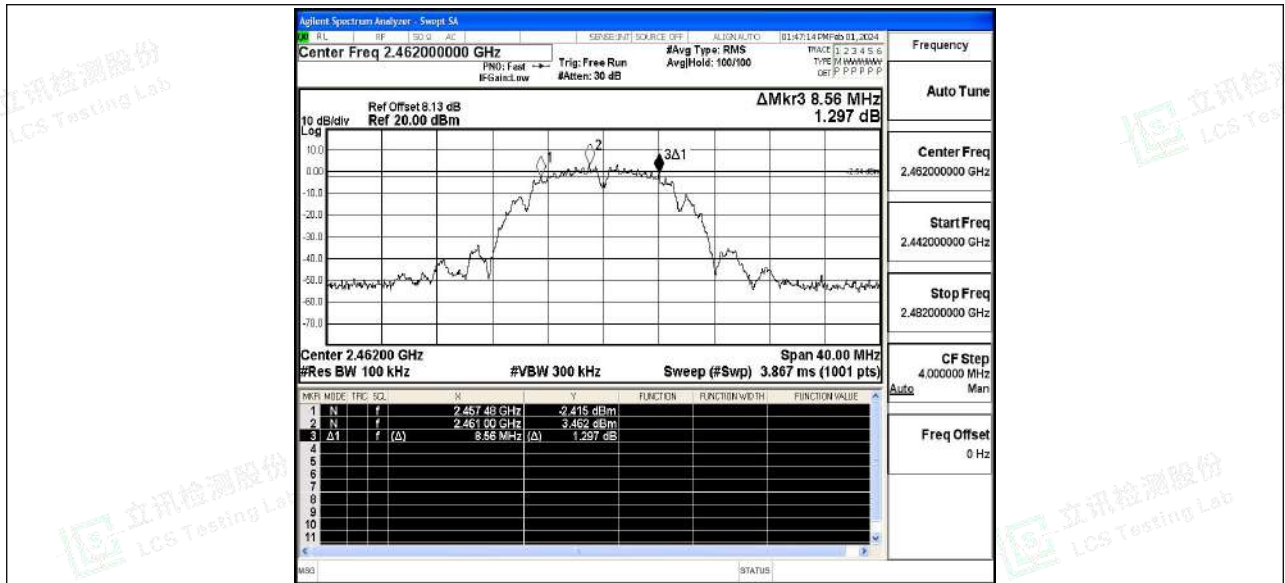


11B_Ant1_2437

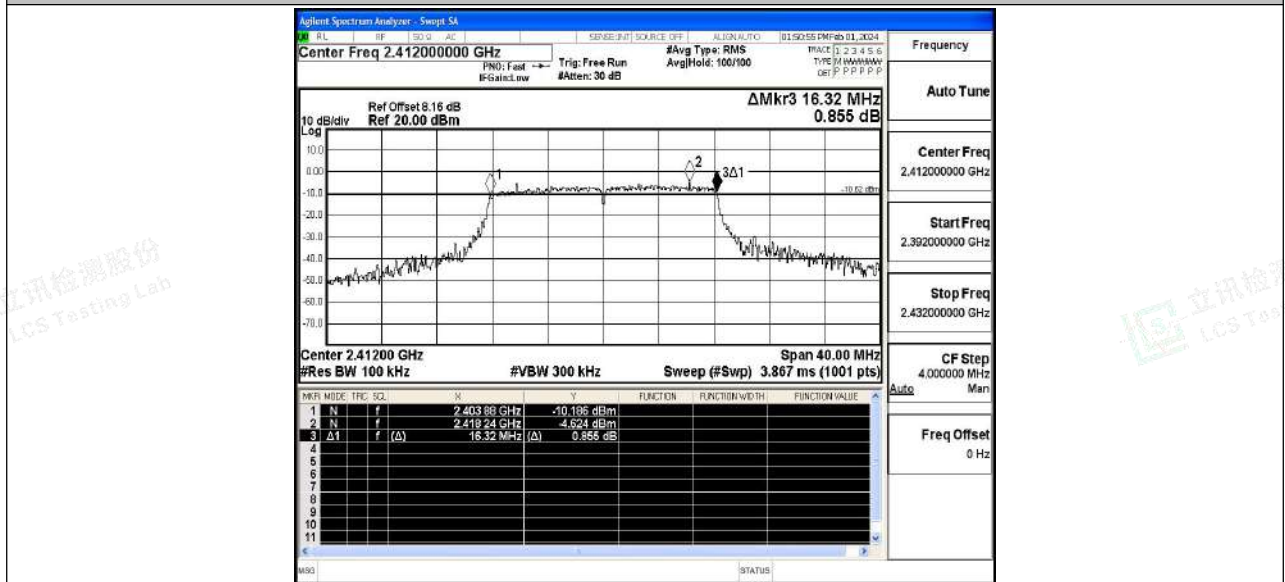


11B_Ant1_2462

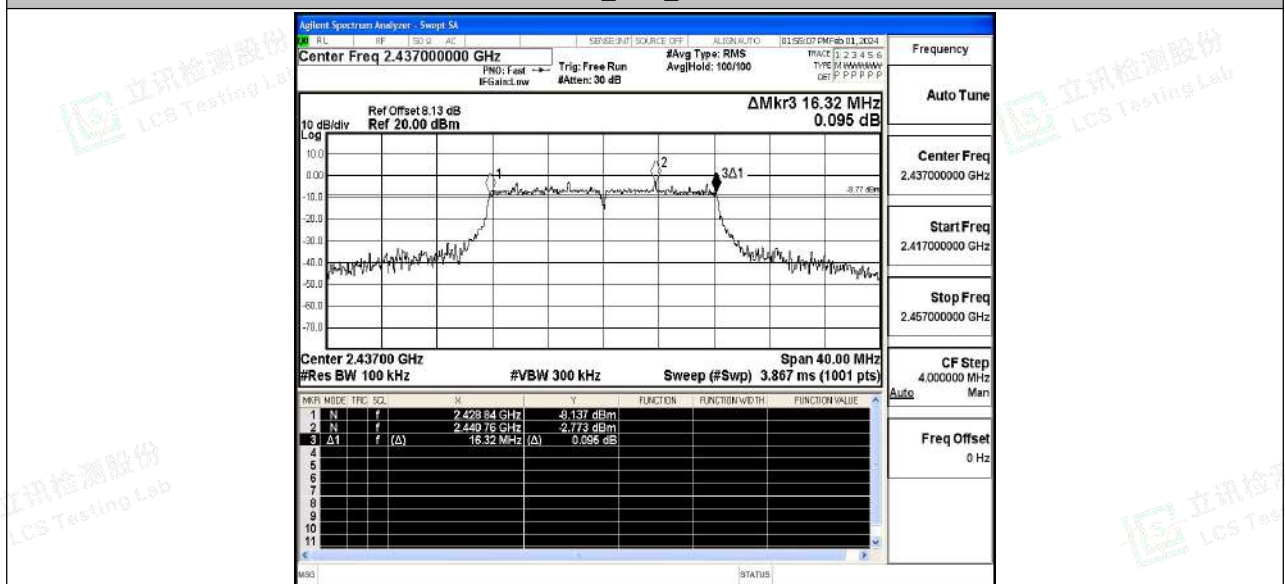




11G_Ant1_2412

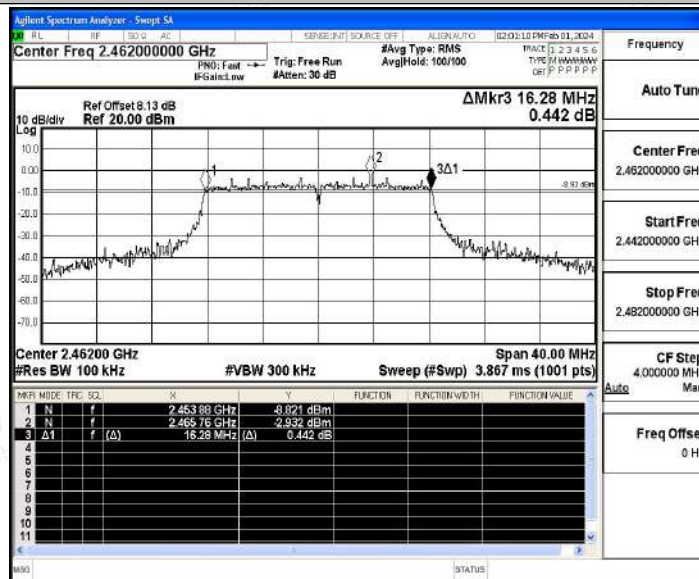


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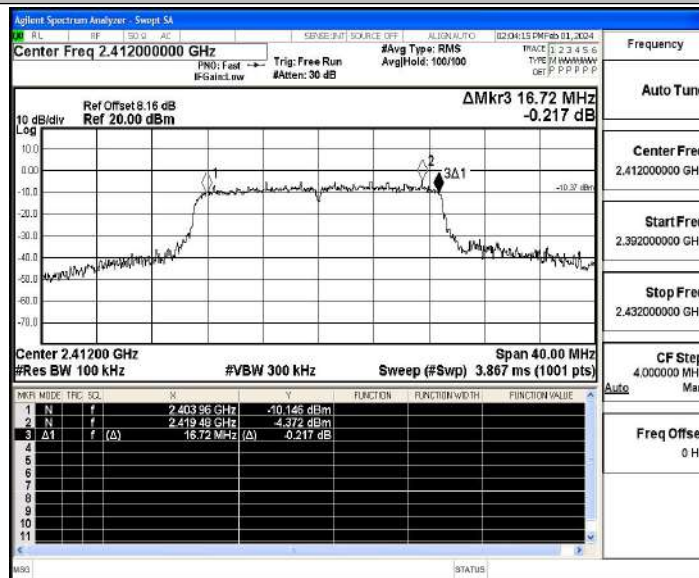




11G_Ant1_2462

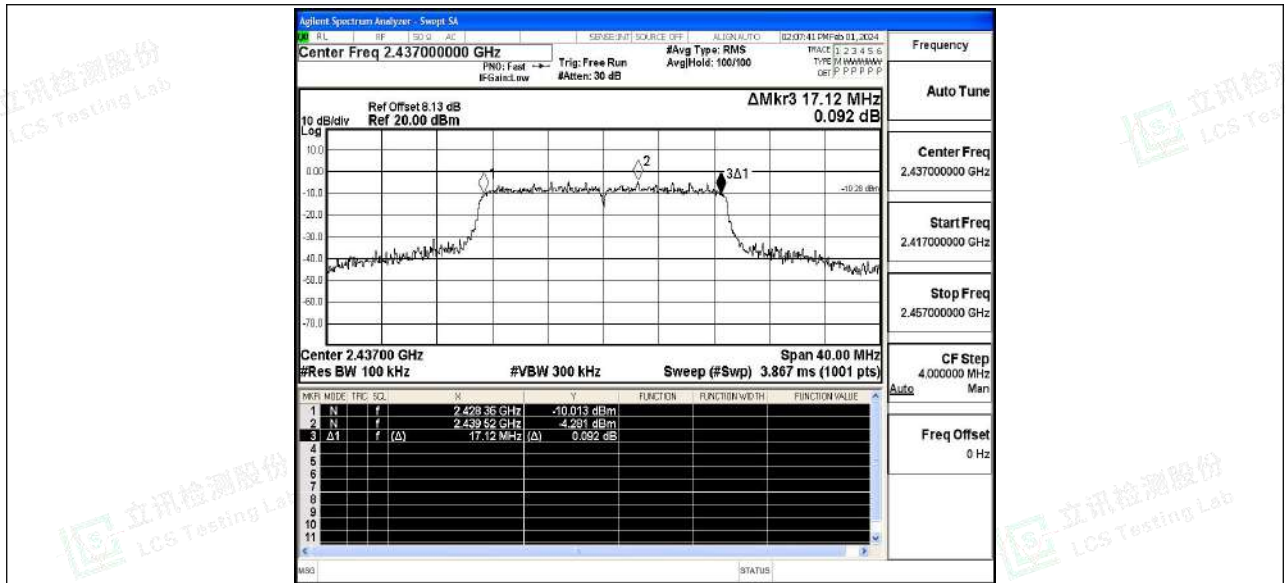


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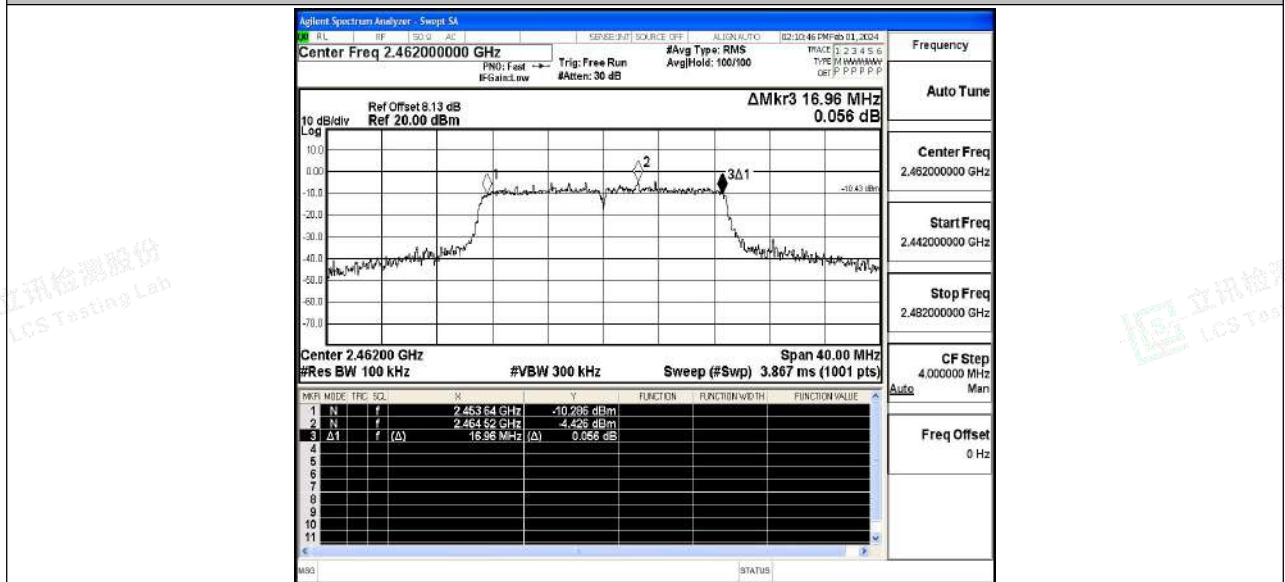


11N20SISO_Ant1_2437

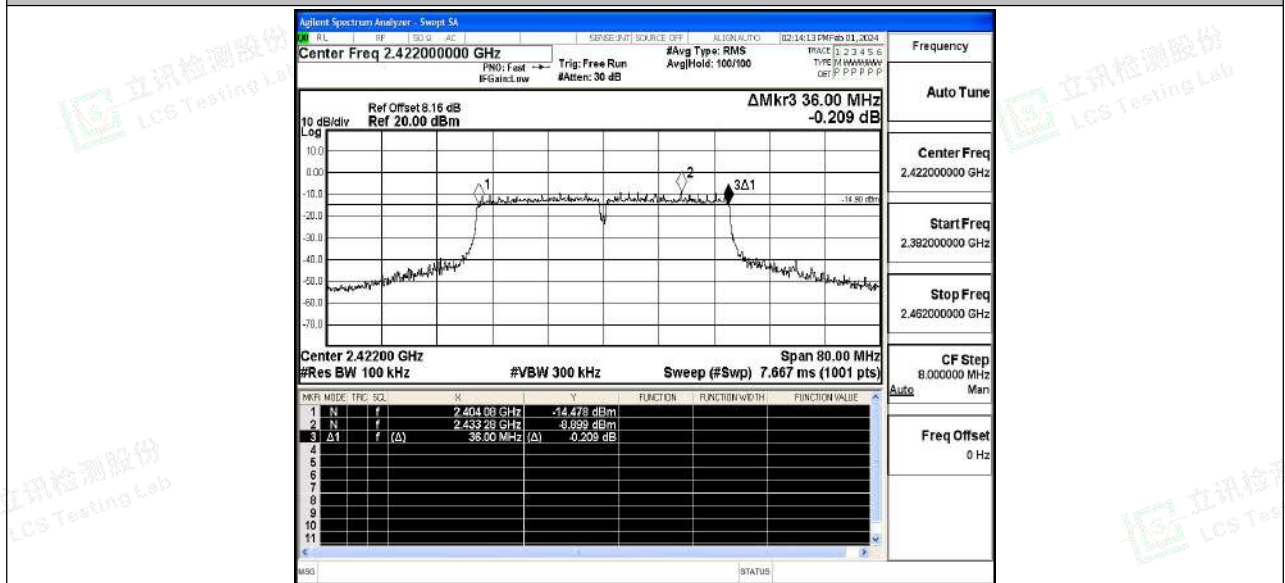




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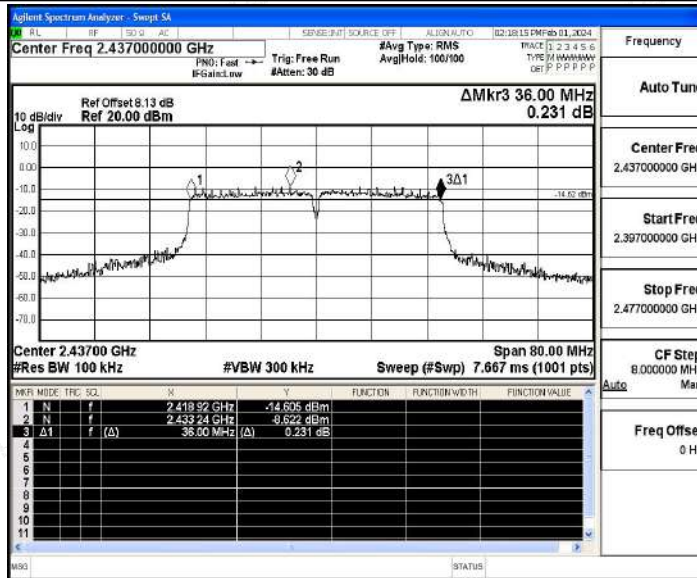


11N40ISO_Ant1_2422

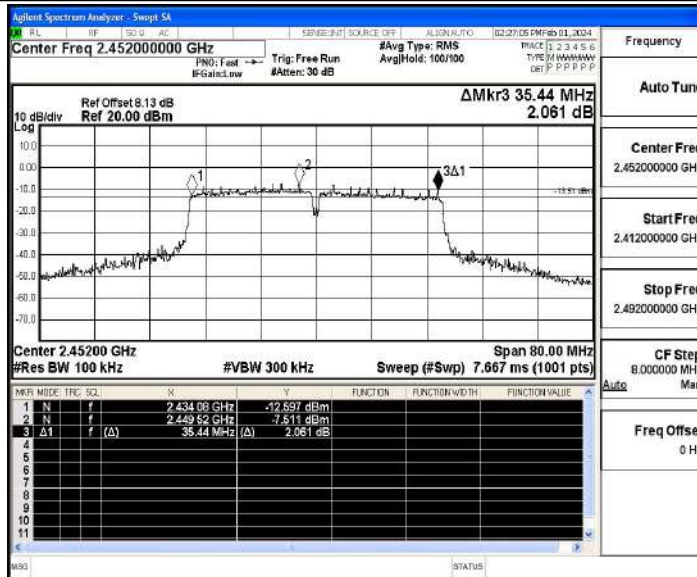




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.2 Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Conducted Power Limit (dBm)	Verdict
NVNT	b	2412	Ant0	15.15	≤30	PASS
NVNT	b	2437	Ant0	15.51	≤30	PASS
NVNT	b	2462	Ant0	14.90	≤30	PASS
NVNT	g	2412	Ant0	14.18	≤30	PASS
NVNT	g	2437	Ant0	14.01	≤30	PASS
NVNT	g	2462	Ant0	14.63	≤30	PASS
NVNT	n20	2412	Ant0	13.19	≤30	PASS
NVNT	n20	2437	Ant0	13.47	≤30	PASS
NVNT	n20	2462	Ant0	13.28	≤30	PASS
NVNT	n40	2422	Ant0	11.98	≤30	PASS
NVNT	n40	2437	Ant0	12.50	≤30	PASS
NVNT	n40	2452	Ant0	12.49	≤30	PASS

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Conducted Power Limit (dBm)	Verdict
NVNT	b	2412	Ant1	15.17	≤30	PASS
NVNT	b	2437	Ant1	15.55	≤30	PASS
NVNT	b	2462	Ant1	14.94	≤30	PASS
NVNT	g	2412	Ant1	14.06	≤30	PASS
NVNT	g	2437	Ant1	15.00	≤30	PASS
NVNT	g	2462	Ant1	14.82	≤30	PASS
NVNT	n20	2412	Ant1	13.58	≤30	PASS
NVNT	n20	2437	Ant1	13.64	≤30	PASS
NVNT	n20	2462	Ant1	13.37	≤30	PASS
NVNT	n40	2422	Ant1	12.21	≤30	PASS
NVNT	n40	2437	Ant1	12.54	≤30	PASS
NVNT	n40	2452	Ant1	12.93	≤30	PASS

MIMO

Condition	Mode	Frequency (MHz)	Total Power (dBm)			Limit (dBm)	Verdict
			ANT0	ANT1	ANT0+ANT1		
NVNT	n20	2412	13.19	13.58	16.40	30	Pass
NVNT	n20	2437	13.47	13.64	16.57	30	Pass
NVNT	n20	2462	13.28	13.37	16.34	30	Pass
NVNT	n40	2422	11.98	12.21	15.11	30	Pass
NVNT	n40	2437	12.50	12.54	15.53	30	Pass
NVNT	n40	2452	12.49	12.93	15.73	30	Pass



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A.3 Maximum power spectral density

Condition	Mode	Frequency (MHz)	Antenna	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant0	-7.64	8	Pass
NVNT	b	2437	Ant0	-9.47	8	Pass
NVNT	b	2462	Ant0	-8.69	8	Pass
NVNT	g	2412	Ant0	-17.97	8	Pass
NVNT	g	2437	Ant0	-18.68	8	Pass
NVNT	g	2462	Ant0	-17.04	8	Pass
NVNT	n20	2412	Ant0	-18.19	8	Pass
NVNT	n20	2437	Ant0	-18.03	8	Pass
NVNT	n20	2462	Ant0	-18.22	8	Pass
NVNT	n40	2422	Ant0	-22.78	8	Pass
NVNT	n40	2437	Ant0	-22.31	8	Pass
NVNT	n40	2452	Ant0	-20.57	8	Pass

Condition	Mode	Frequency (MHz)	Antenna	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant1	-9.56	8	Pass
NVNT	b	2437	Ant1	-7.16	8	Pass
NVNT	b	2462	Ant1	-7.42	8	Pass
NVNT	g	2412	Ant1	-16.85	8	Pass
NVNT	g	2437	Ant1	-16.64	8	Pass
NVNT	g	2462	Ant1	-17.47	8	Pass
NVNT	n20	2412	Ant1	-17.66	8	Pass
NVNT	n20	2437	Ant1	-17.85	8	Pass
NVNT	n20	2462	Ant1	-18.65	8	Pass
NVNT	n40	2422	Ant1	-22.88	8	Pass
NVNT	n40	2437	Ant1	-22.07	8	Pass
NVNT	n40	2452	Ant1	-22.30	8	Pass

MIMO

Condition	Mode	Frequency (MHz)	Total PSD (dBm/3kHz)			Limit (dBm/3kHz)	Verdict
			Ant0	Ant1	Ant0+Ant1		
NVNT	n20	2412	-18.19	-17.66	-14.91	8	Pass
NVNT	n20	2437	-18.03	-17.85	-14.93	8	Pass
NVNT	n20	2462	-18.22	-18.65	-15.42	8	Pass
NVNT	n40	2422	-22.78	-22.88	-19.82	8	Pass
NVNT	n40	2437	-22.31	-22.07	-19.18	8	Pass
NVNT	n40	2452	-20.57	-22.30	-18.34	8	Pass



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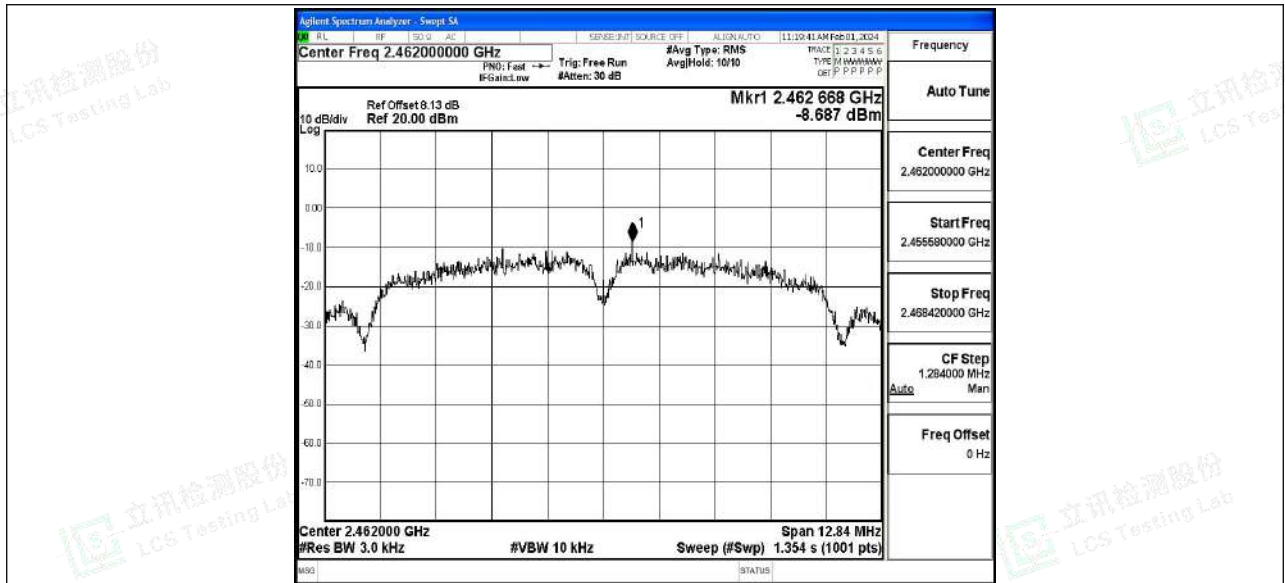
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Scan code to check authenticity

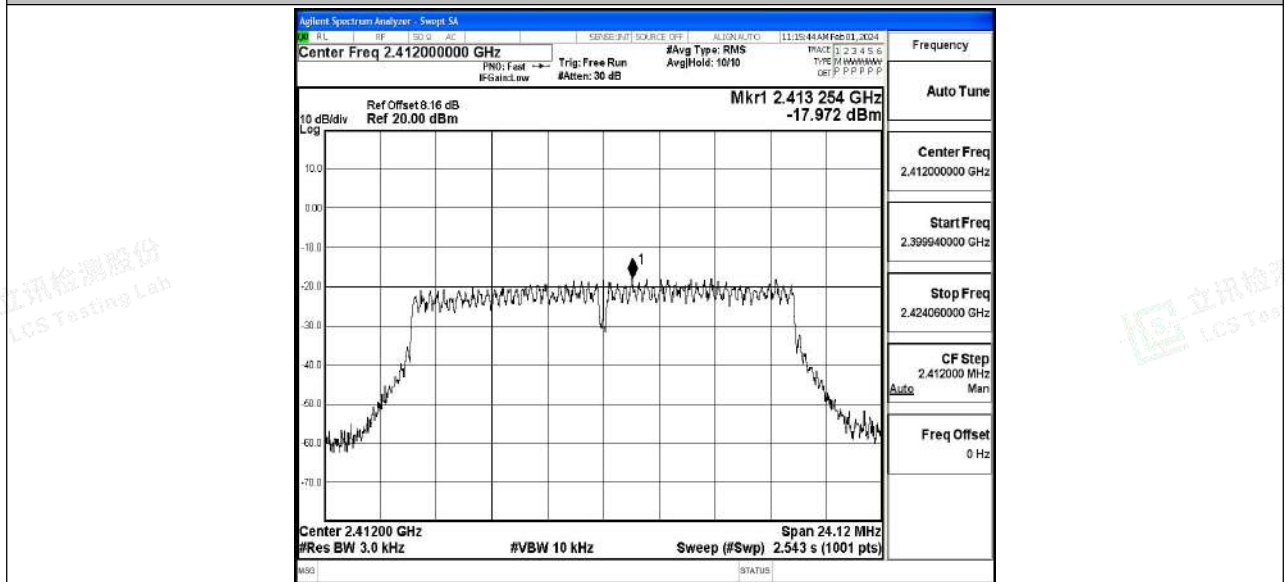


Test Graphs

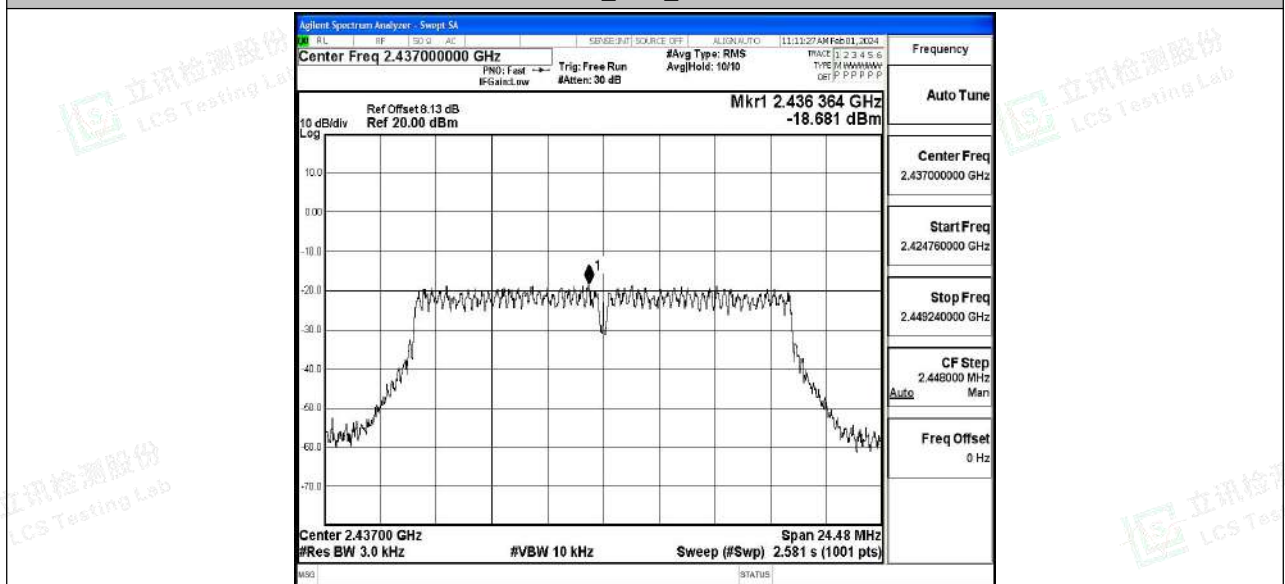




11G_Ant0_2412

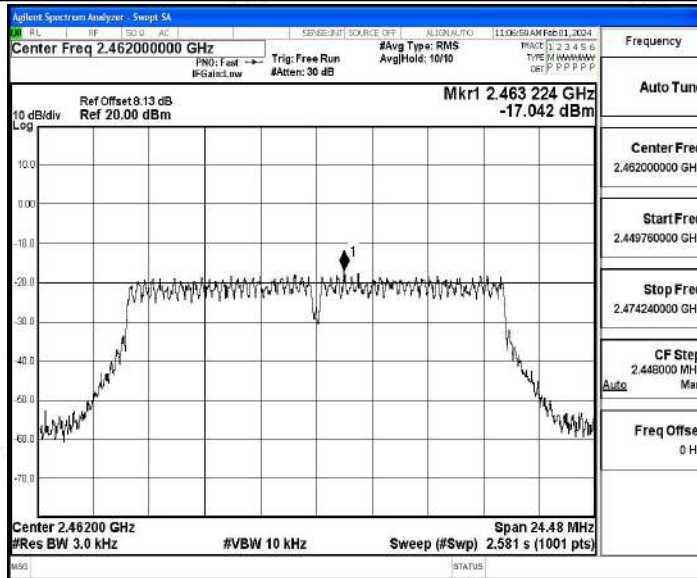


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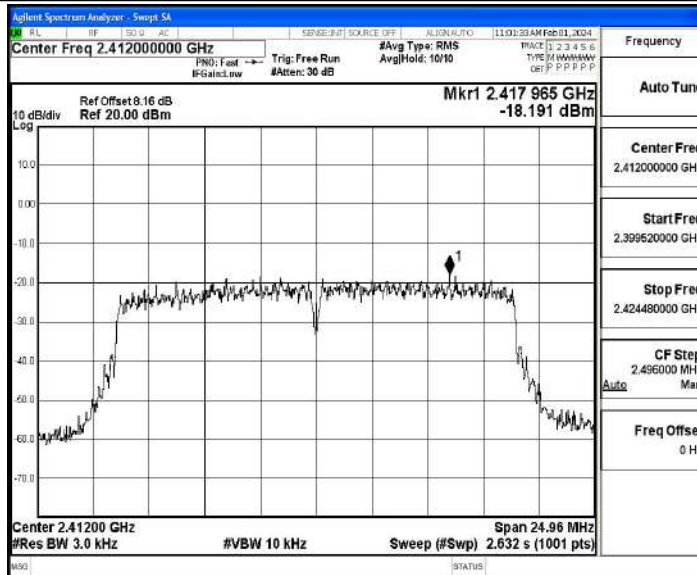




11G_Ant0_2462

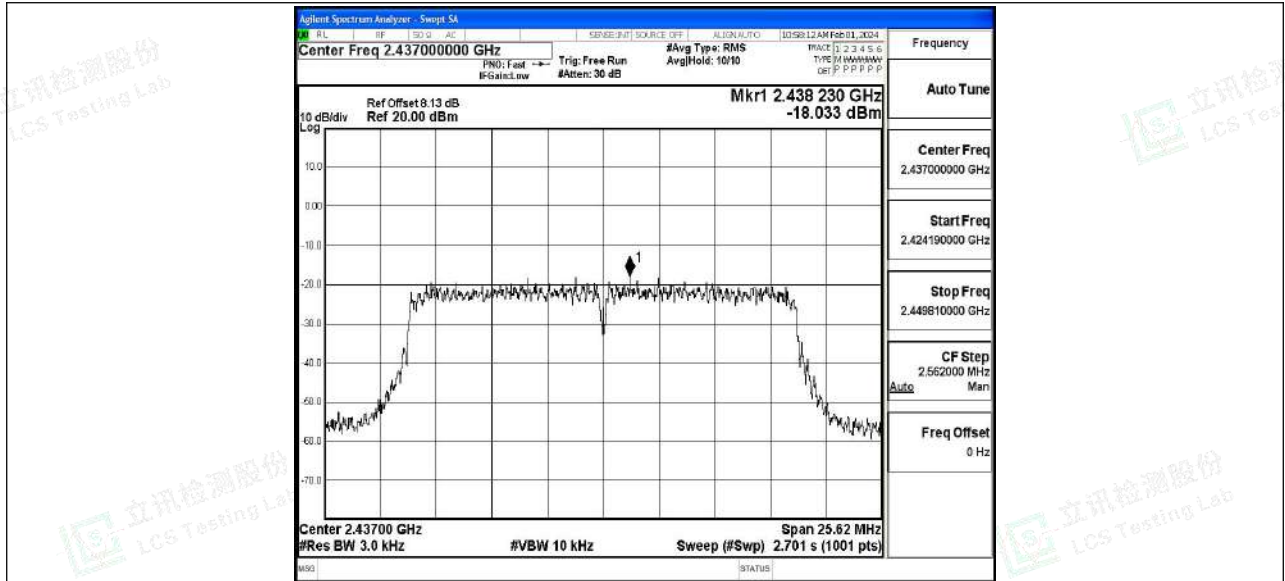


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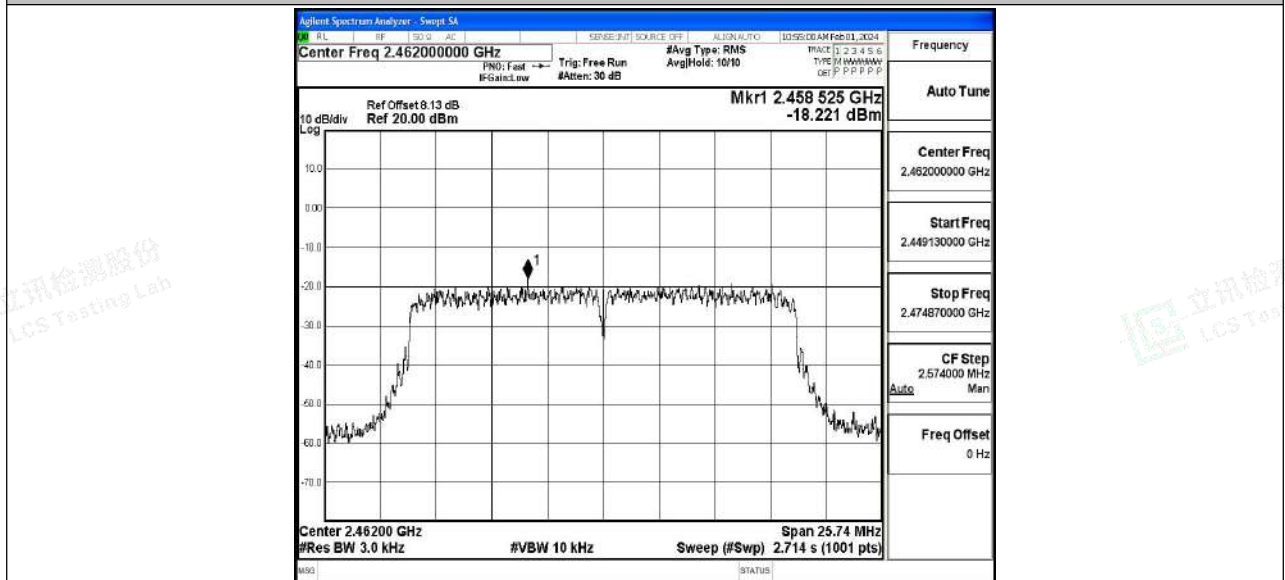


11N20SISO_Ant0_2437

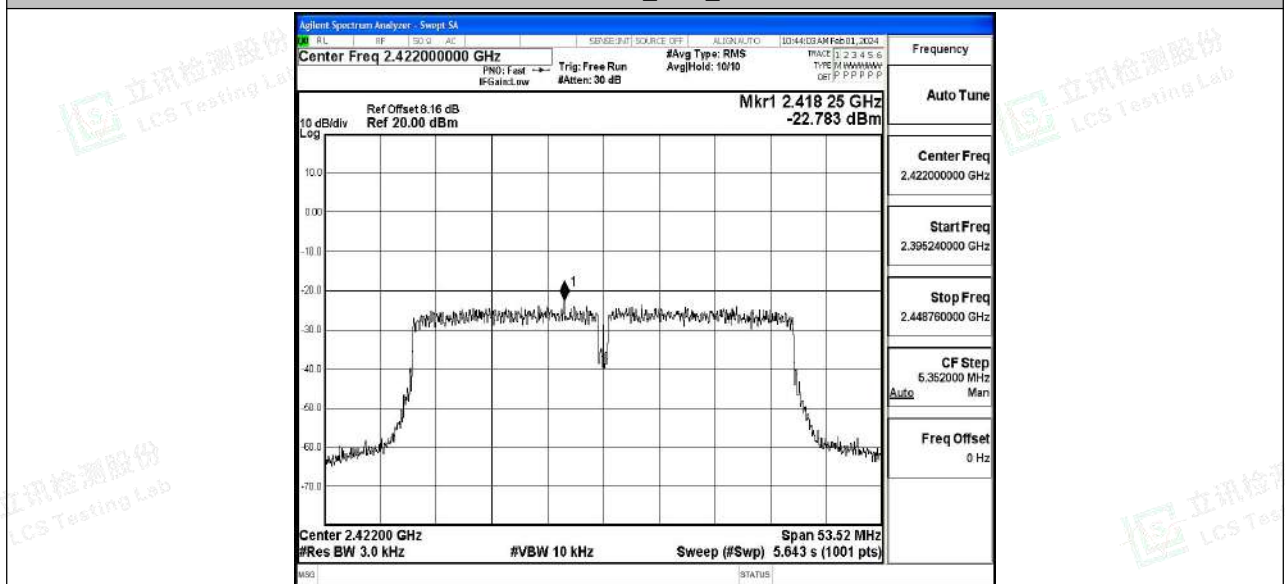




11N20SISO_Ant0_2462

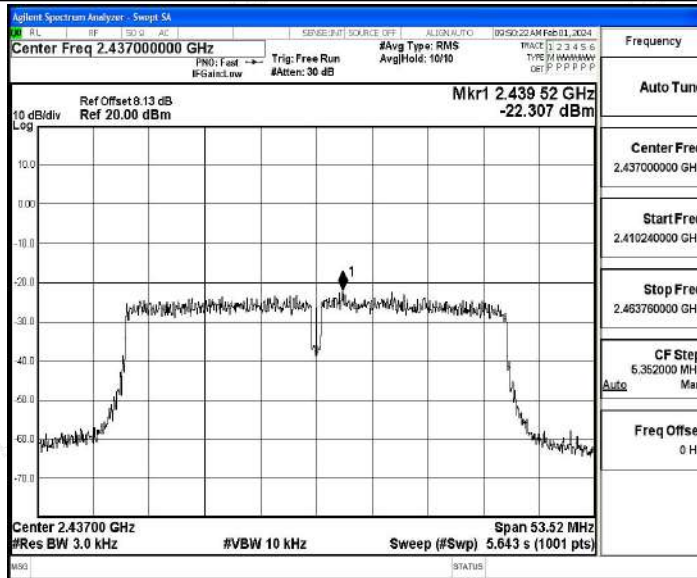


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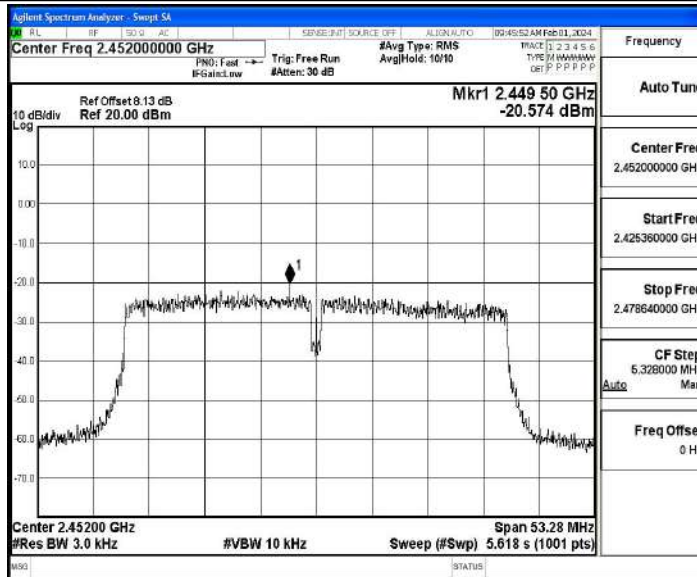




11N40SISO_Ant0_2437

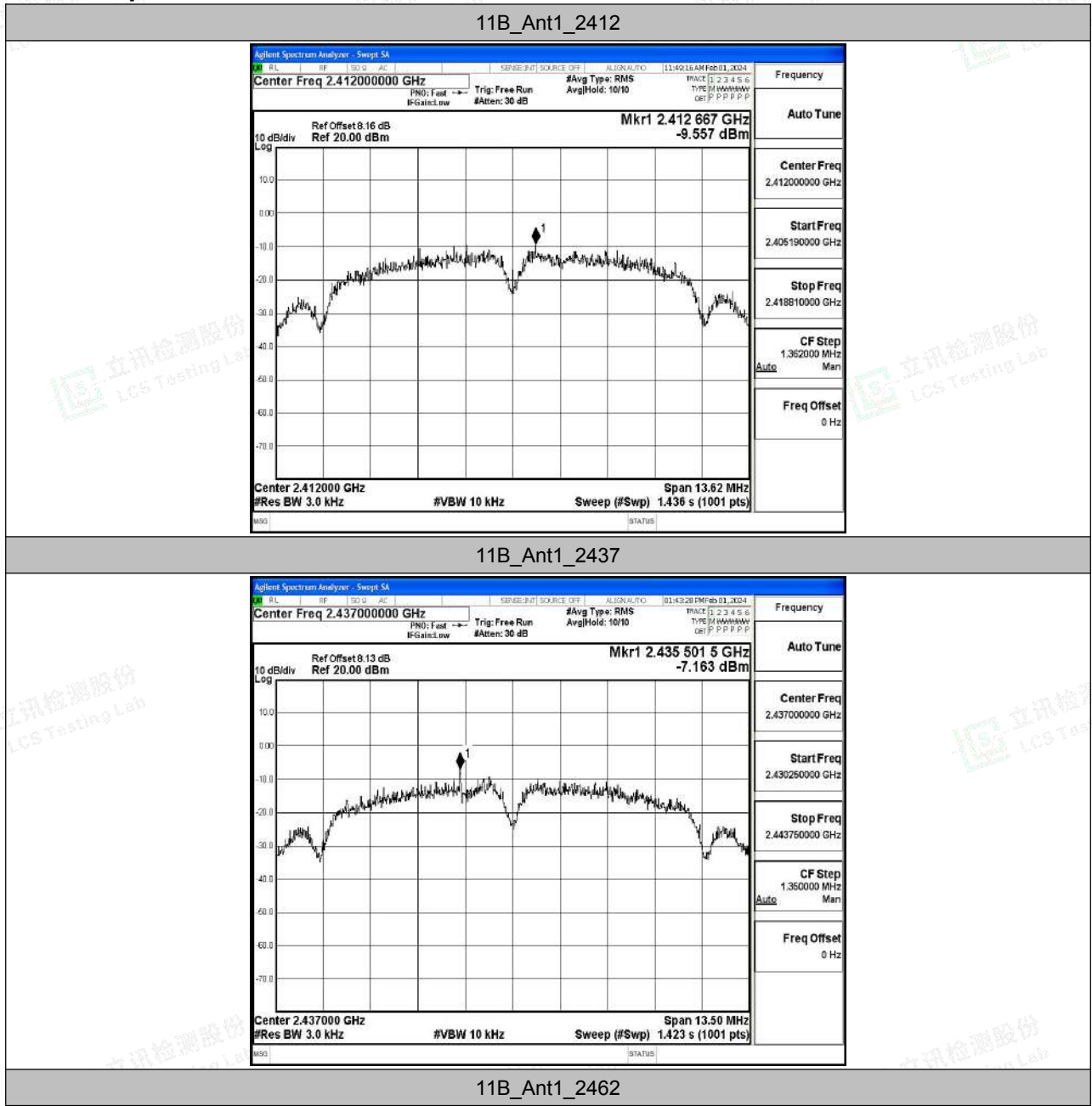


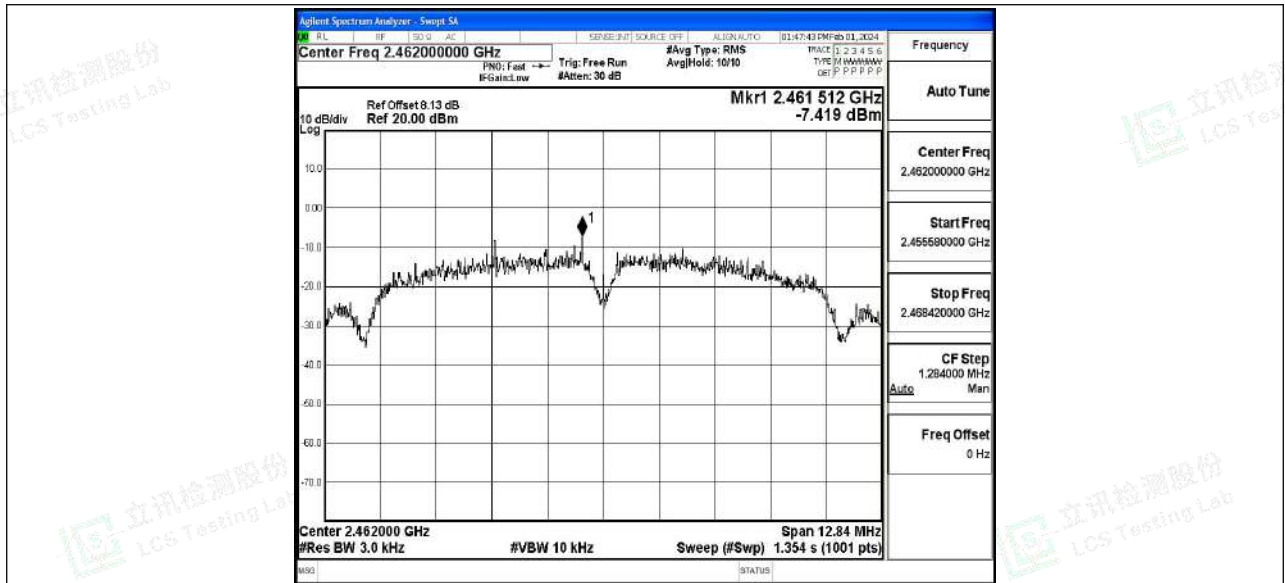
11N40SISO_Ant0_2452



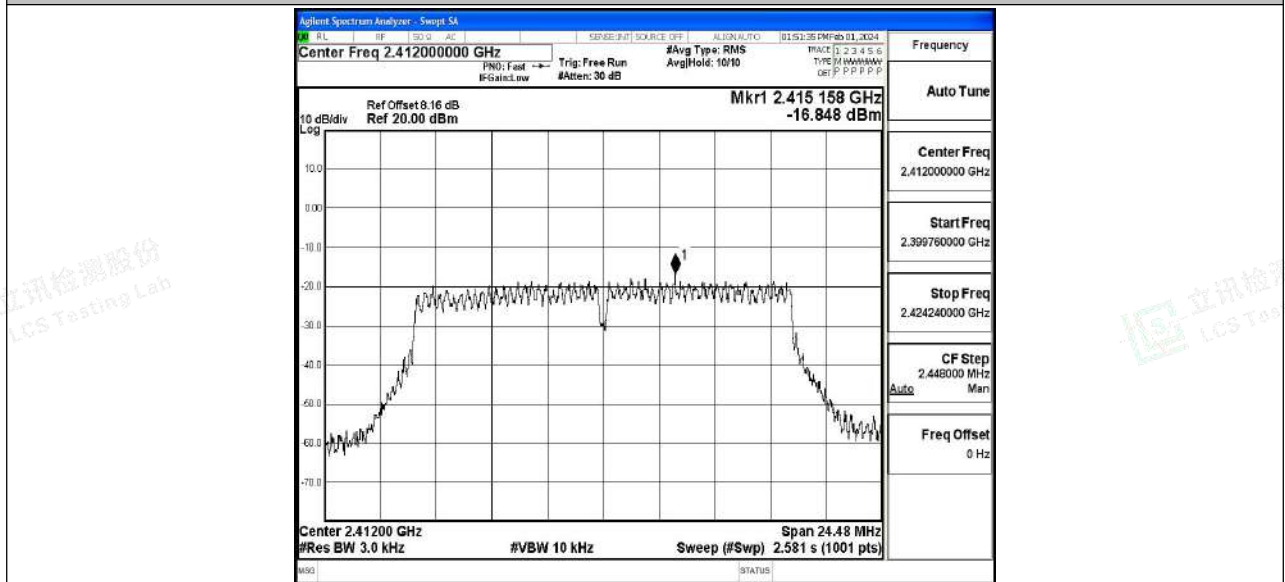


Test Graphs

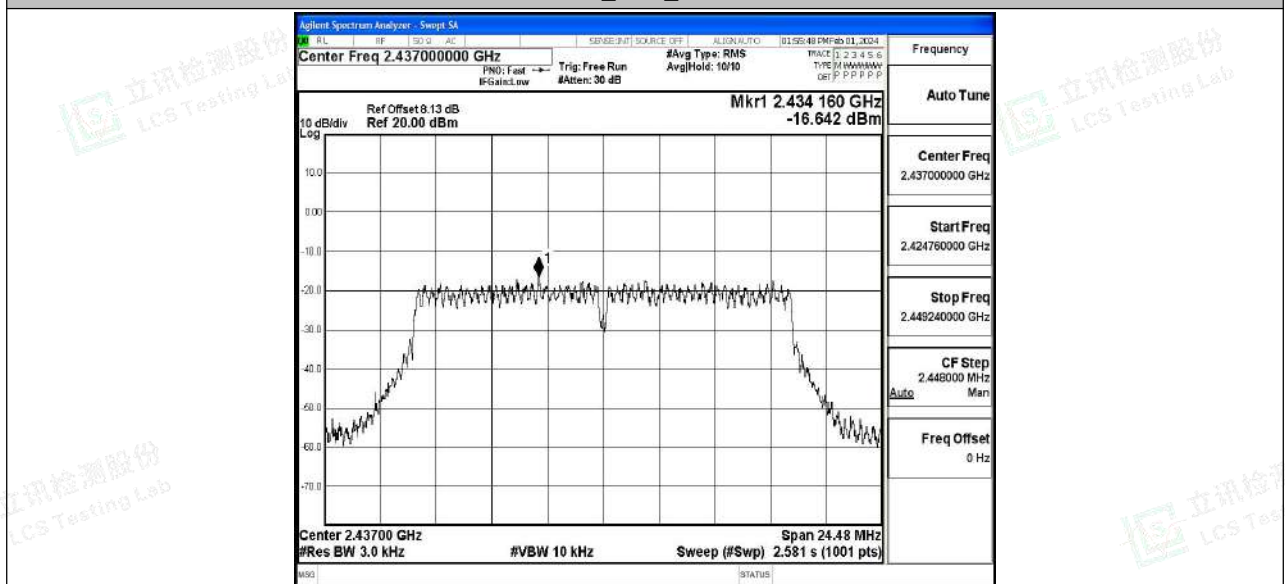




11G_Ant1_2412

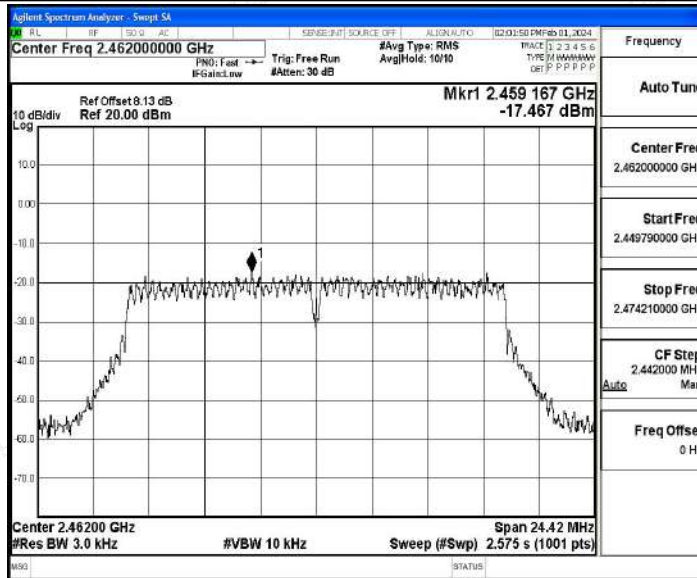


11G_Ant1_2437

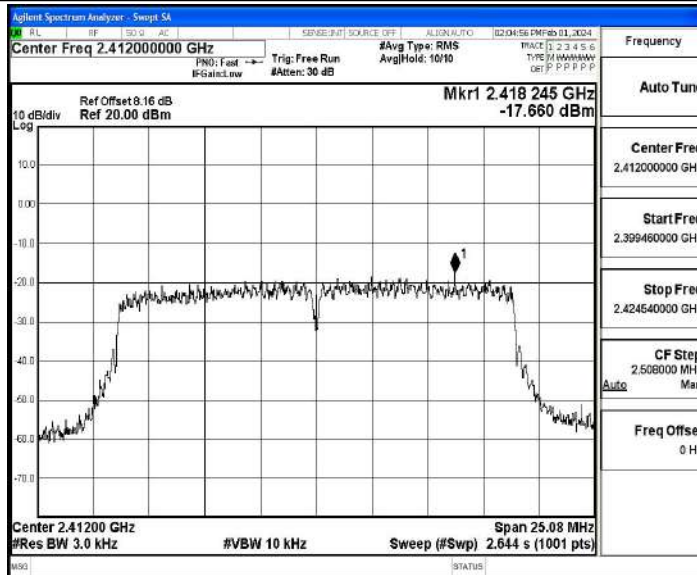




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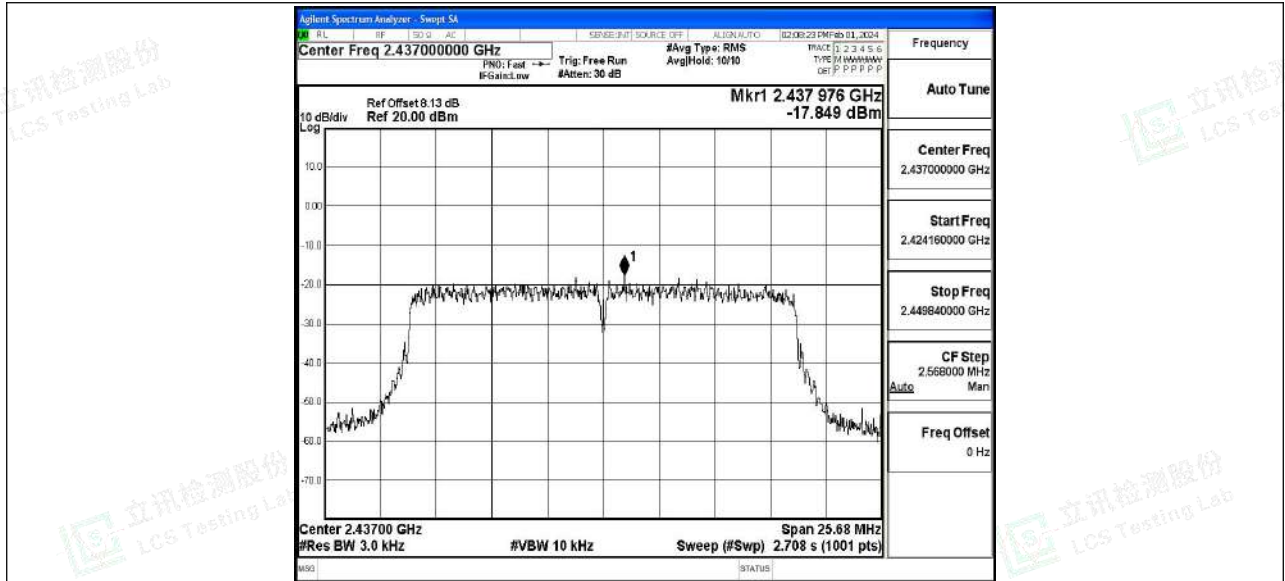


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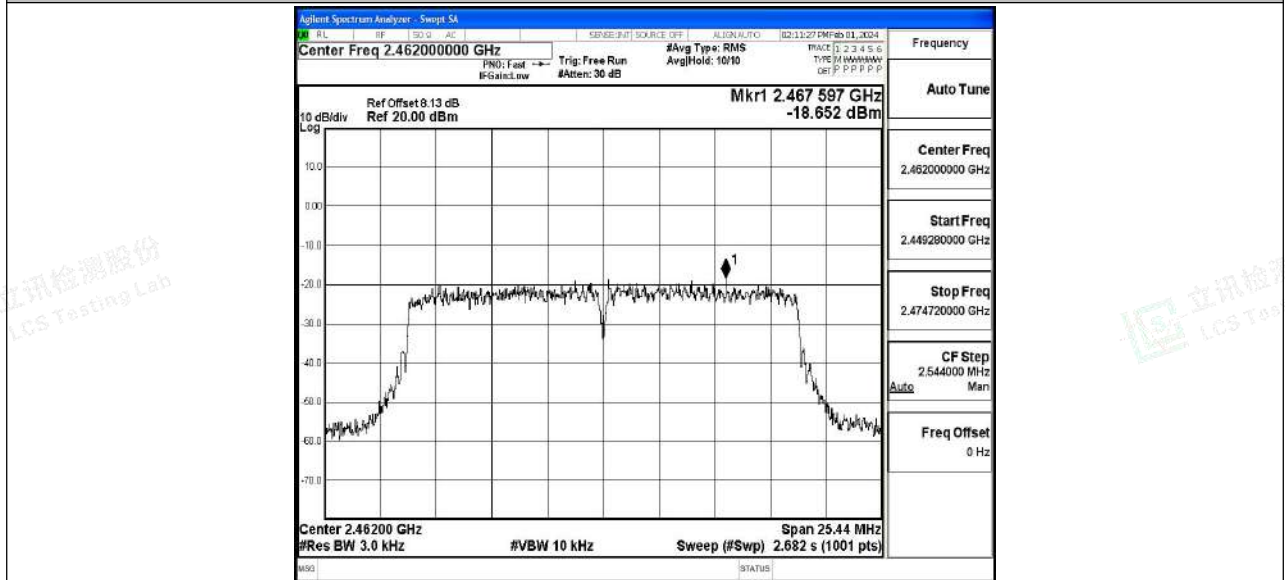


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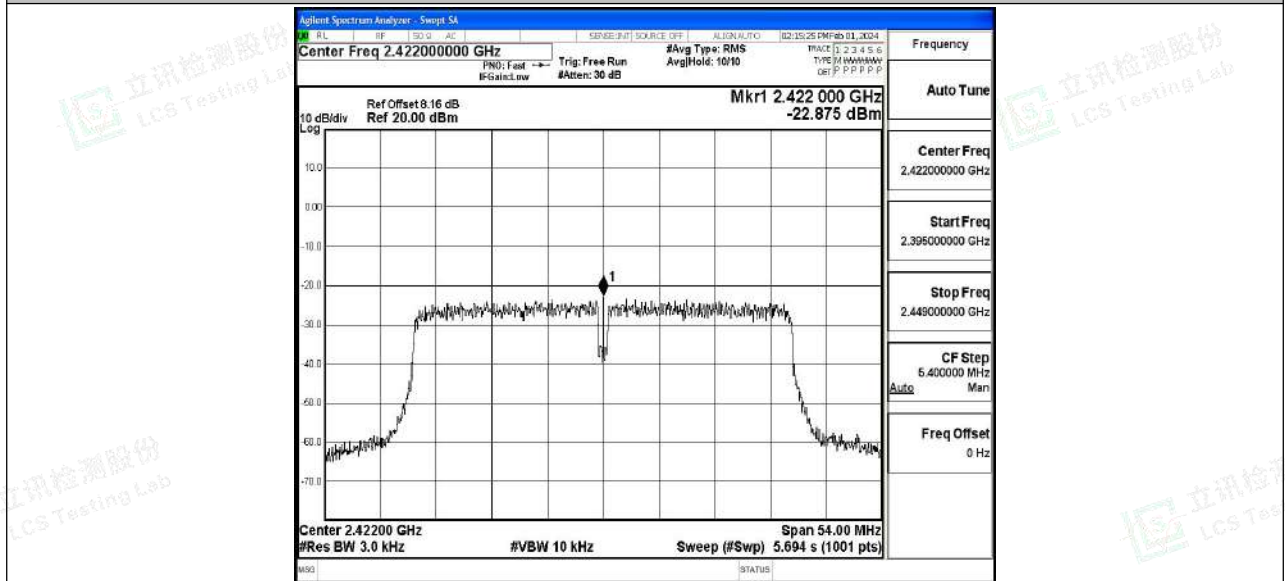




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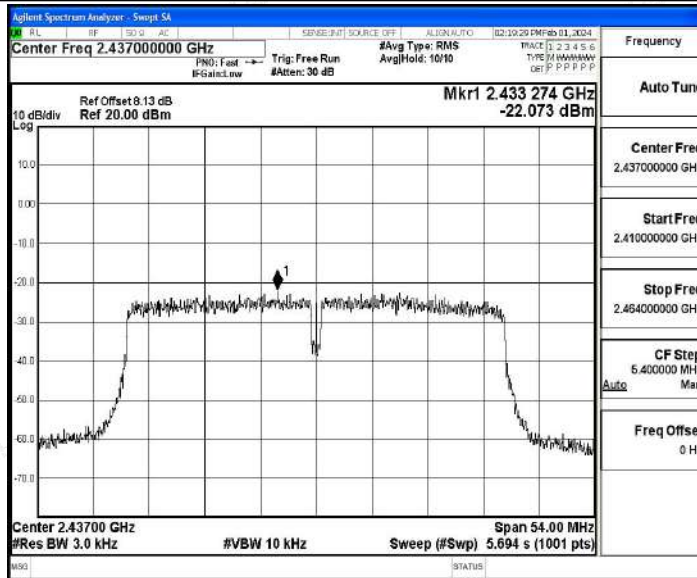


11N40SISO_Ant1_2422

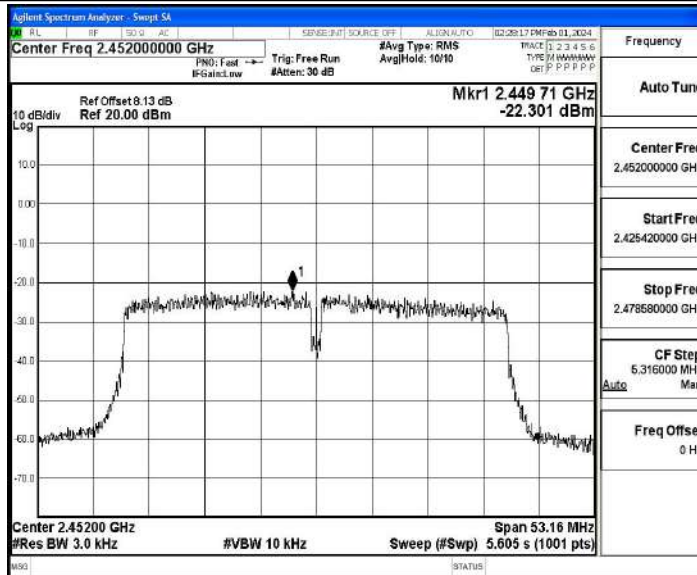




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.4 Band edge measurements

Test Result

TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant0	Low	2412	3.60	-48.7	≤-16.4	PASS
		High	2462	3.50	-49.2	≤-16.5	PASS
11G	Ant0	Low	2412	-3.34	-37.6	≤-23.34	PASS
		High	2462	-2.90	-45.54	≤-22.9	PASS
11N20SISO	Ant0	Low	2412	-4.14	-37.25	≤-24.14	PASS
		High	2462	-4.46	-46.24	≤-24.46	PASS
11N40SISO	Ant0	Low	2422	-8.81	-40.27	≤-28.81	PASS
		High	2452	-7.74	-45.64	≤-27.74	PASS



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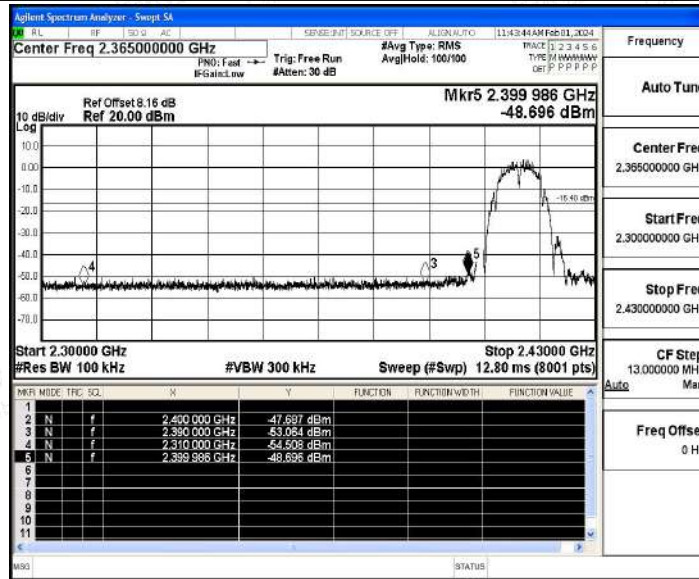
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Scan code to check authenticity

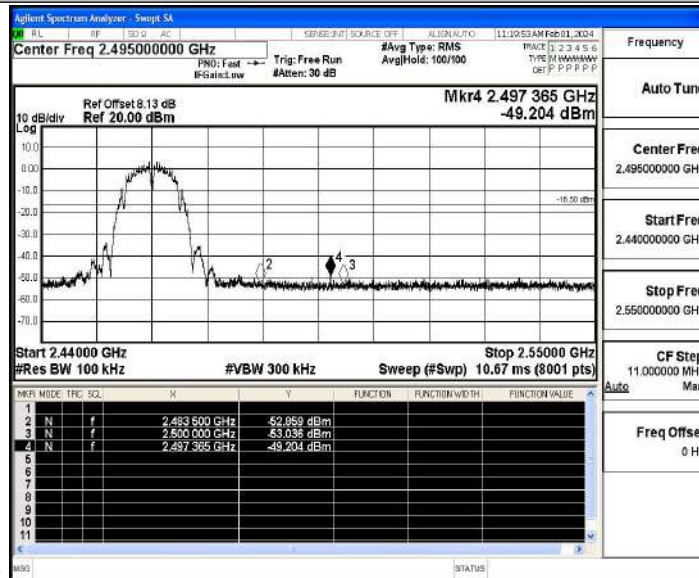


Test Graphs

11B_Ant0_Low_2412

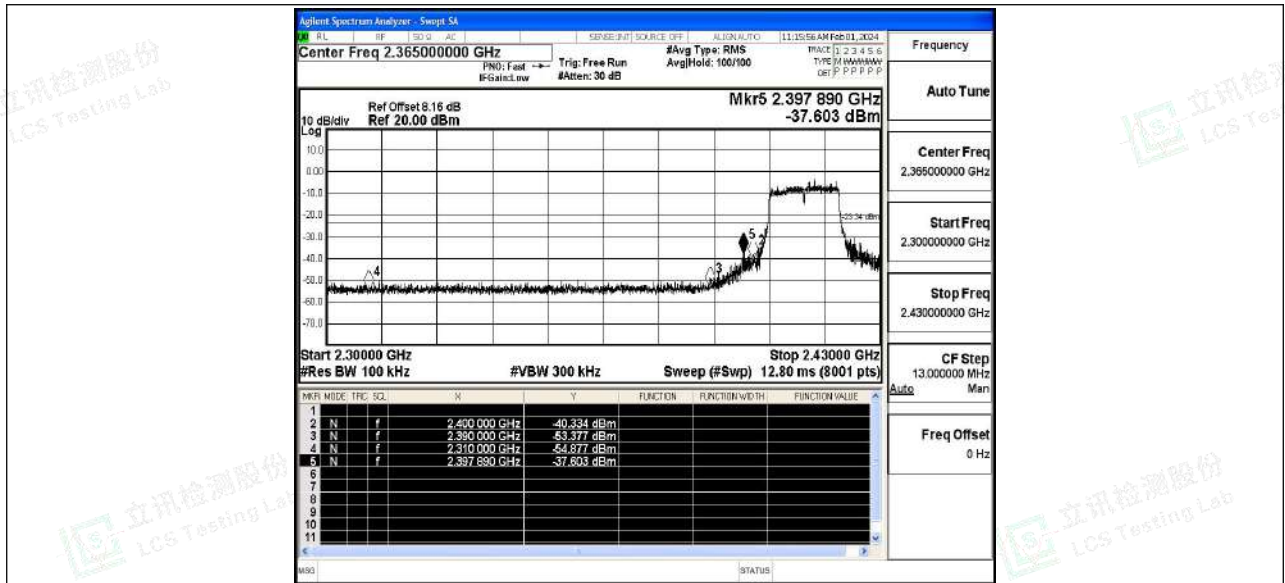


11B_Ant0_High_2462

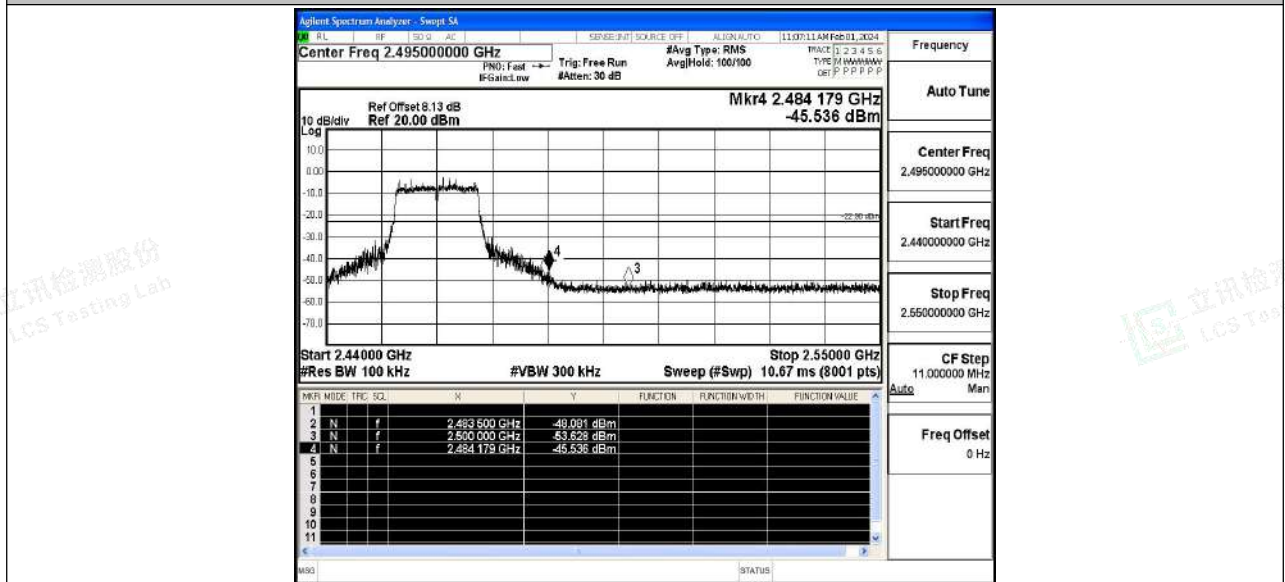


11G_Ant0_Low_2412

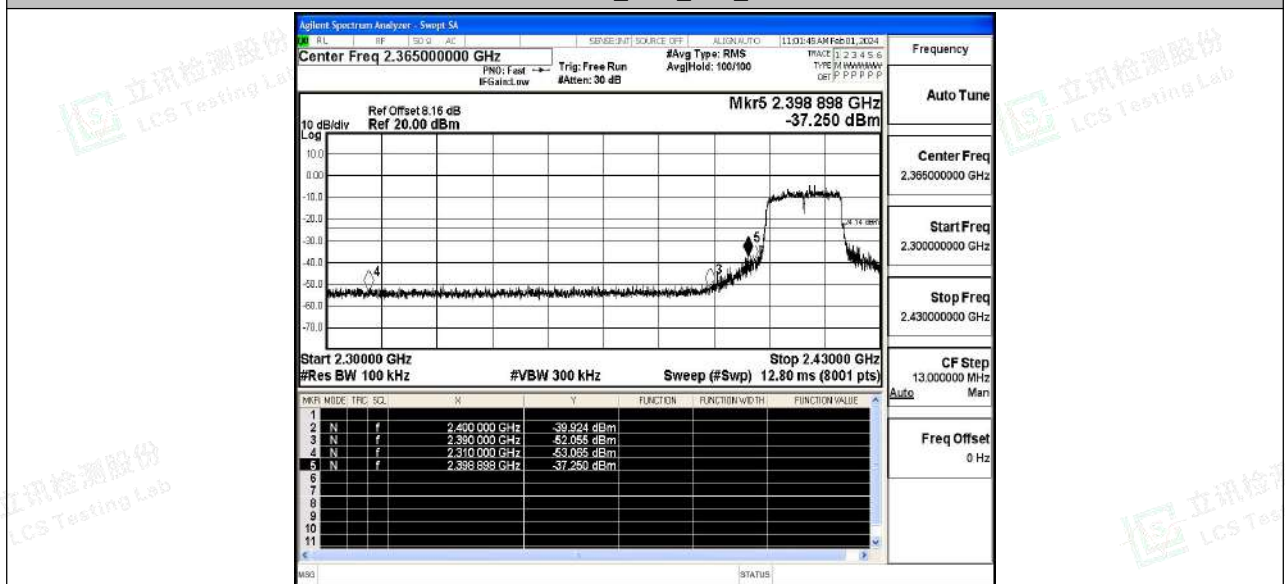




11G_Ant0_High_2462

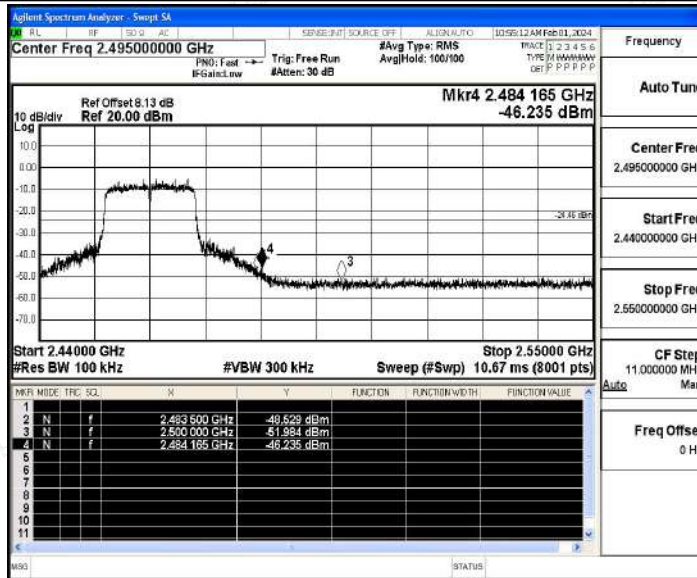


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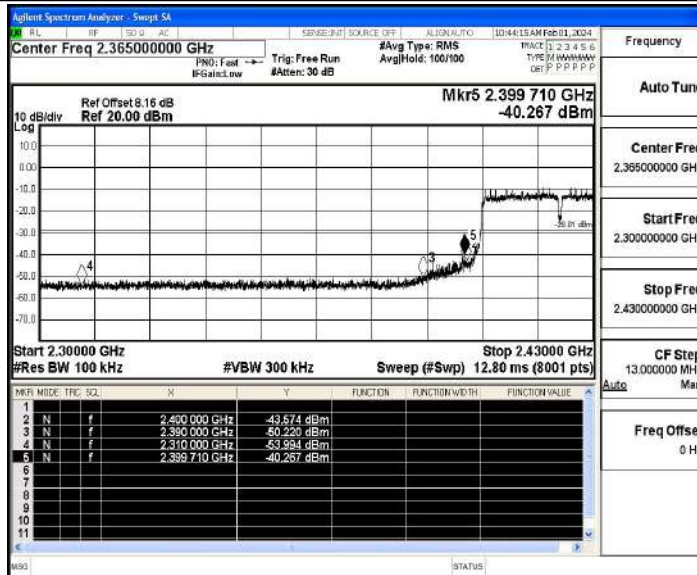




11N20SISO_Ant0_High_2462

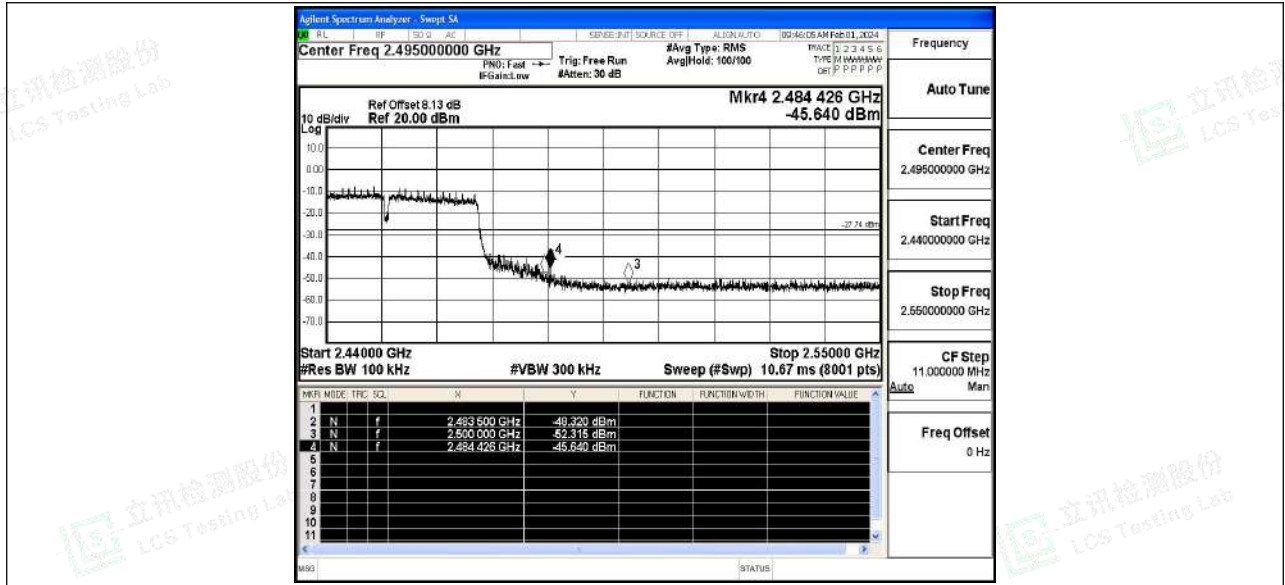


11N40SISO_Ant0_Low_2422



11N40SISO_Ant0_High_2452







Test Result

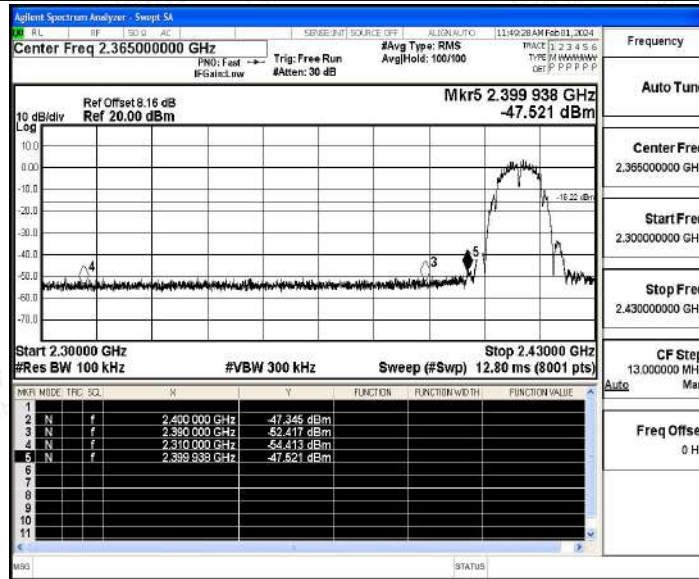
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.78	-47.52	≤-16.22	PASS
		High	2462	2.94	-49.76	≤-17.06	PASS
11G	Ant1	Low	2412	-4.15	-37.06	≤-24.15	PASS
		High	2462	-3.17	-46.22	≤-23.17	PASS
11N20SISO	Ant1	Low	2412	-4.12	-36.44	≤-24.12	PASS
		High	2462	-4.43	-44.8	≤-24.43	PASS
11N40SISO	Ant1	Low	2422	-8.87	-41.34	≤-28.87	PASS
		High	2452	-7.52	-44.09	≤-27.52	PASS



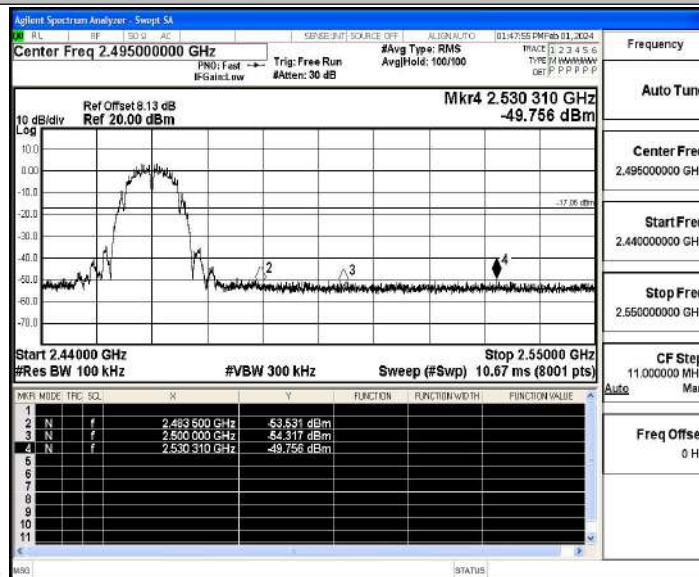


Test Graphs

11B_Ant1_Low_2412

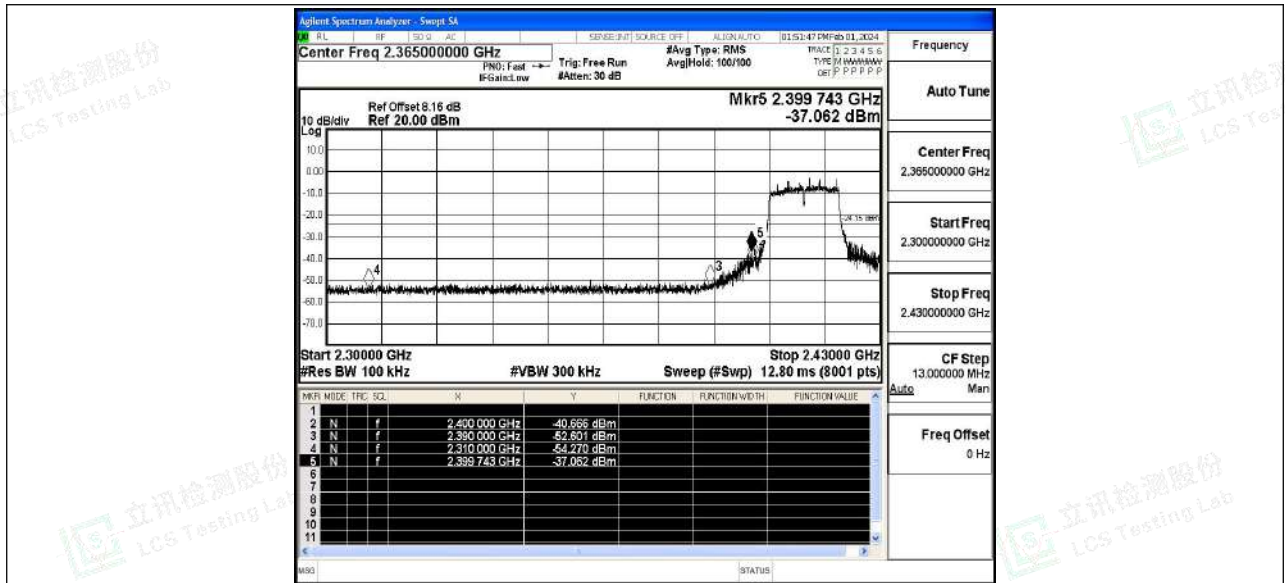


11B_Ant1_High_2462

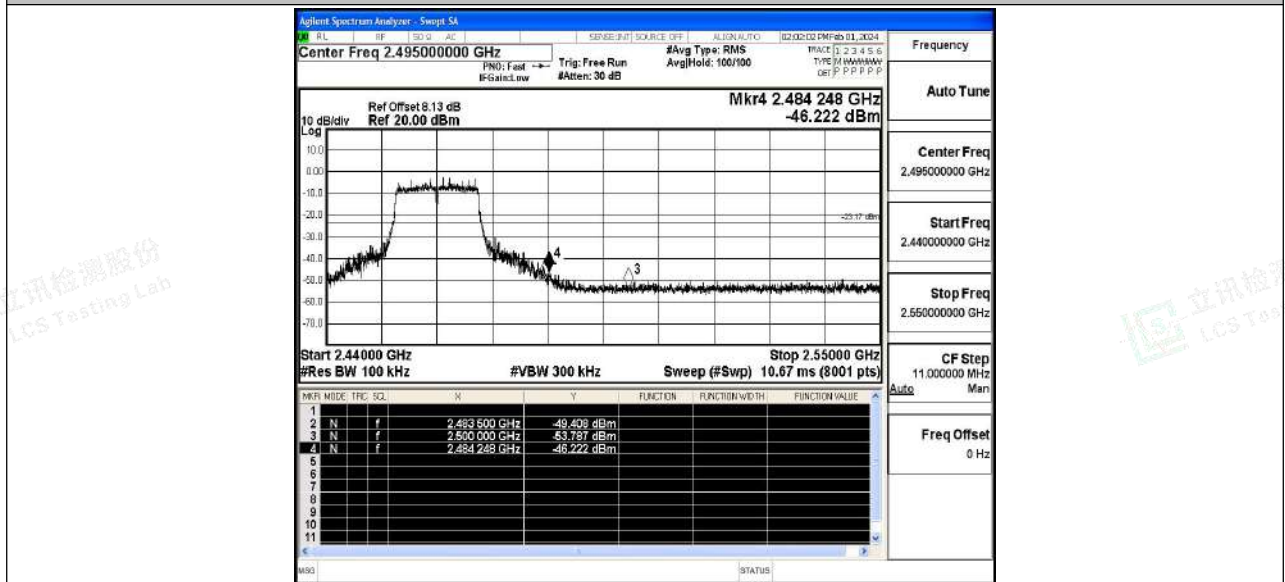


11G_Ant1_Low_2412

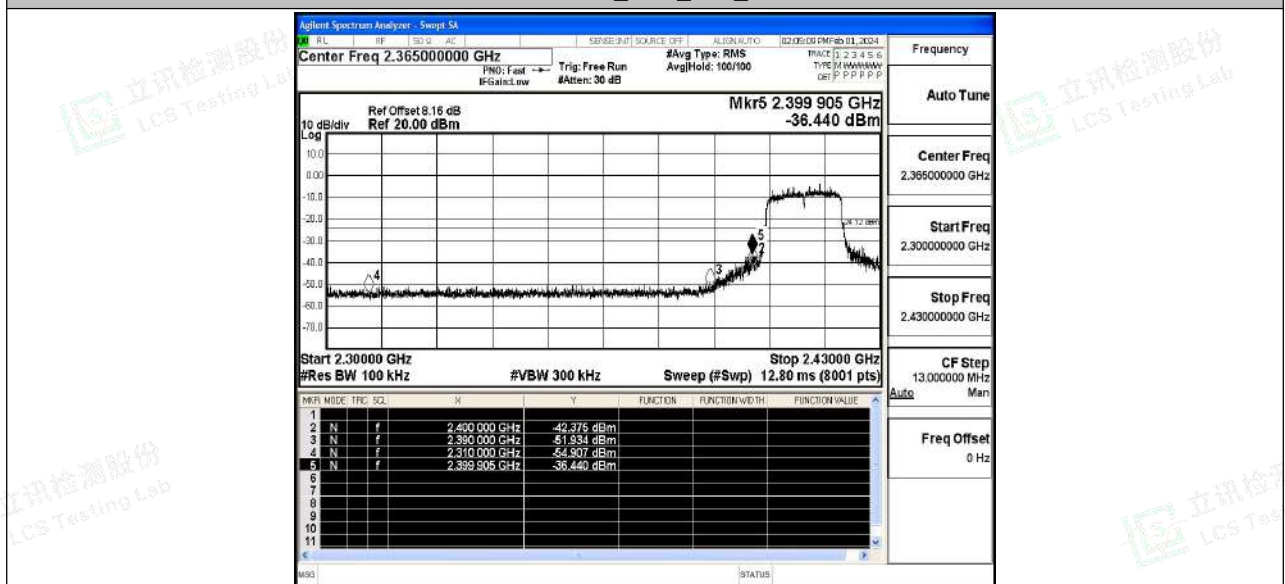




11G_Ant1_High_2462

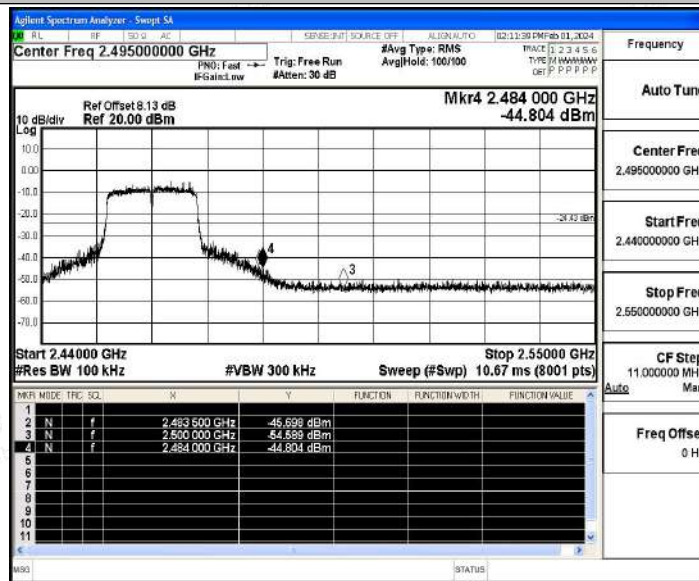


11N20SISO_Ant1_Low_2412

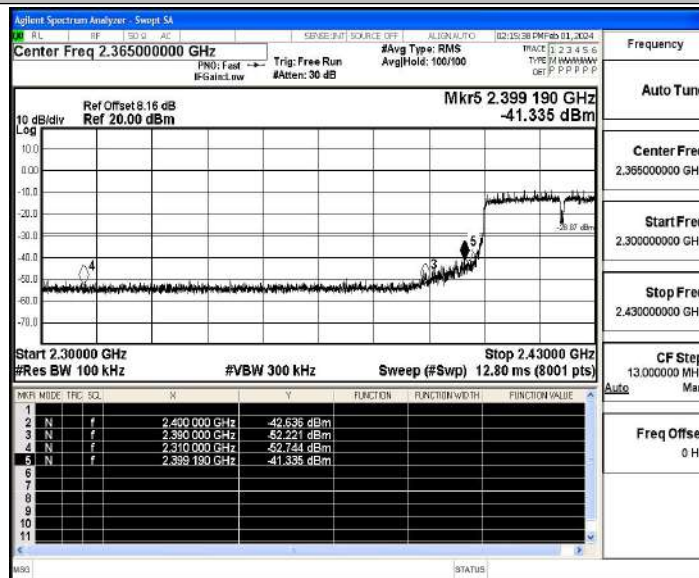




11N20SISO_Ant1_High_2462

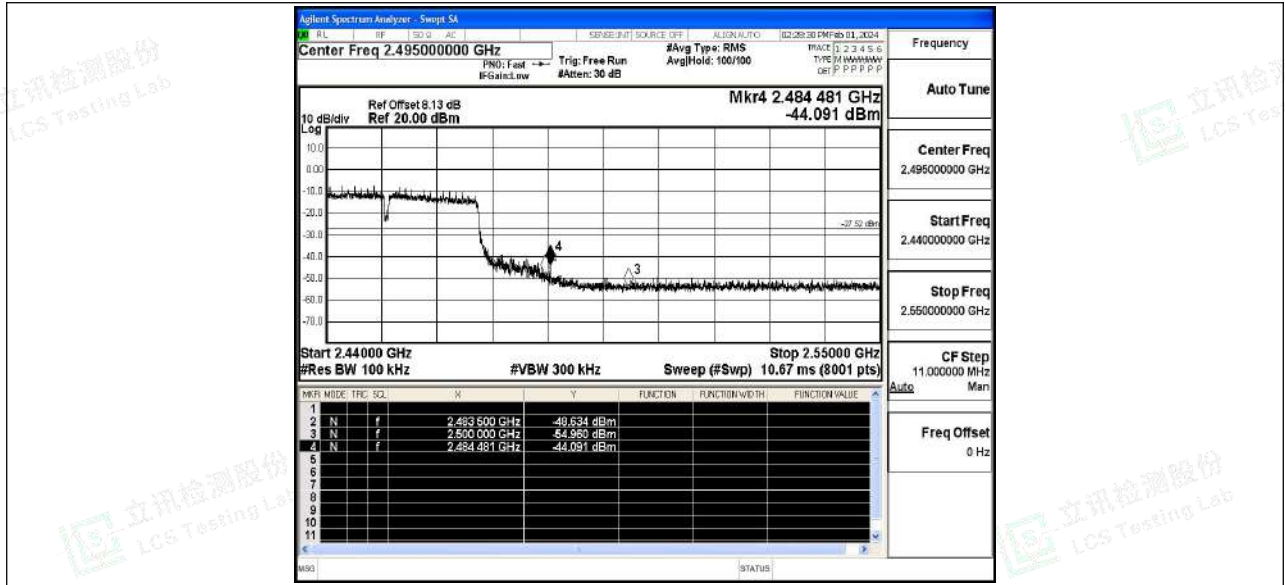


11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452







A.5 Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant0	2412	30~1000	3.60	-61.16	≤-16.4	PASS
			1000~26500	3.60	-48.89	≤-16.4	PASS
		2437	30~1000	4.26	-62.09	≤-15.74	PASS
			1000~26500	4.26	-47.52	≤-15.74	PASS
		2462	30~1000	3.50	-61.84	≤-16.5	PASS
			1000~26500	3.50	-49.35	≤-16.5	PASS
11G	Ant0	2412	30~1000	-3.34	-61.35	≤-23.34	PASS
			1000~26500	-3.34	-49.1	≤-23.34	PASS
		2437	30~1000	-3.98	-62.19	≤-23.98	PASS
			1000~26500	-3.98	-49.41	≤-23.98	PASS
		2462	30~1000	-2.90	-61.23	≤-22.9	PASS
			1000~26500	-2.90	-49.33	≤-22.9	PASS
11N20SISO	Ant0	2412	30~1000	-4.14	-60.63	≤-24.14	PASS
			1000~26500	-4.14	-49.11	≤-24.14	PASS
		2437	30~1000	-4.80	-61.25	≤-24.8	PASS
			1000~26500	-4.80	-49.22	≤-24.8	PASS
		2462	30~1000	-4.46	-61.46	≤-24.46	PASS
			1000~26500	-4.46	-49.09	≤-24.46	PASS
11N40SISO	Ant0	2422	30~1000	-8.81	-61.93	≤-28.81	PASS
			1000~26500	-8.81	-49	≤-28.81	PASS
		2437	30~1000	-8.42	-61.81	≤-28.42	PASS
			1000~26500	-8.42	-49.12	≤-28.42	PASS
		2452	30~1000	-7.74	-61.47	≤-27.74	PASS
			1000~26500	-7.74	-48.33	≤-27.74	PASS



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Building A and 301 Building C, Juji Industrial Park, Yabianxueziwei Shajing Street, Baoan District, Shenzhen, 518000, P.R.C.

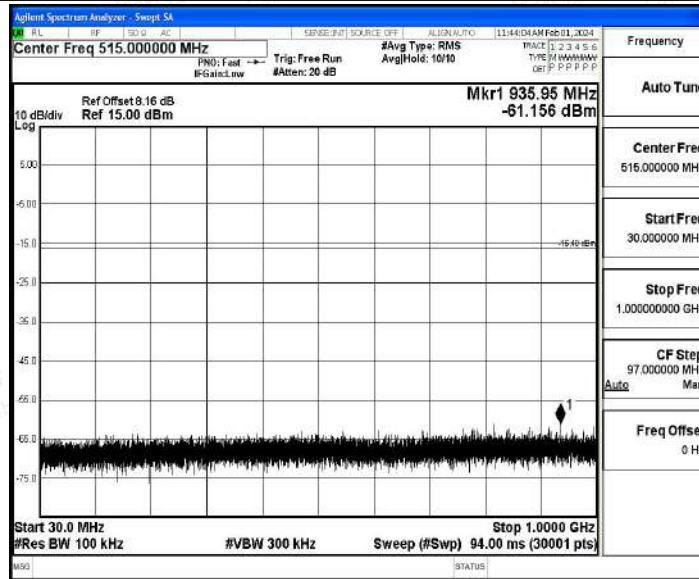
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

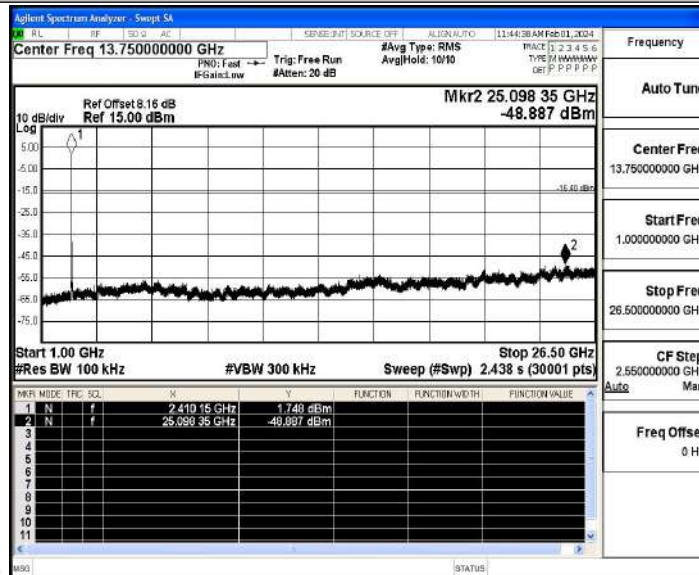


Test Graphs

11B_Ant0_2412_30~1000

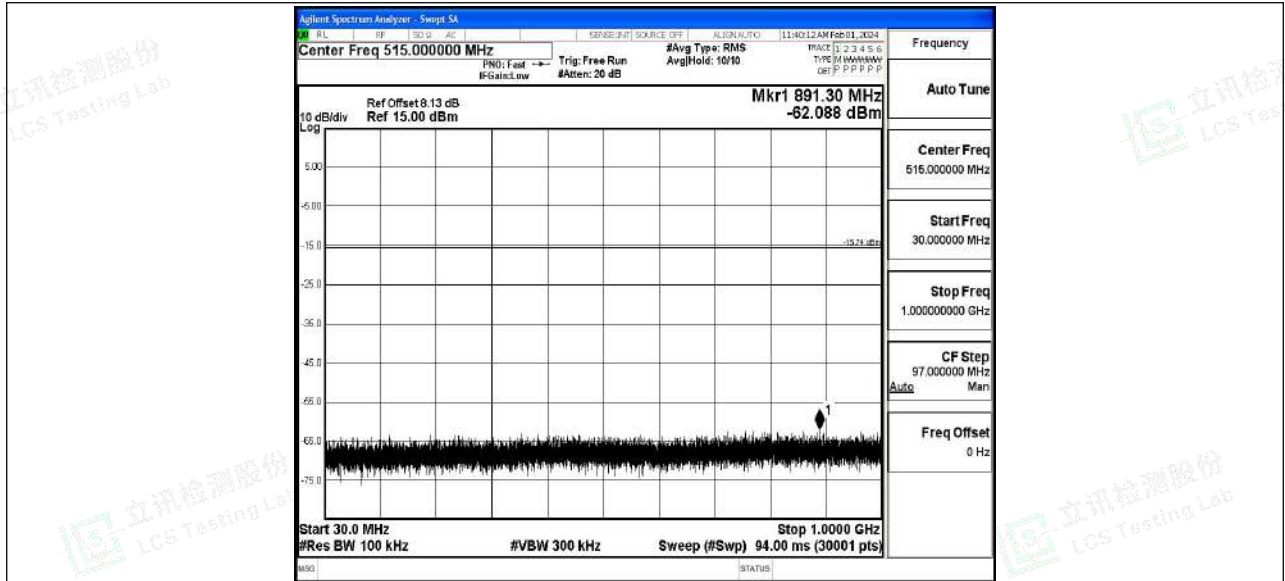


11B_Ant0_2412_1000~26500

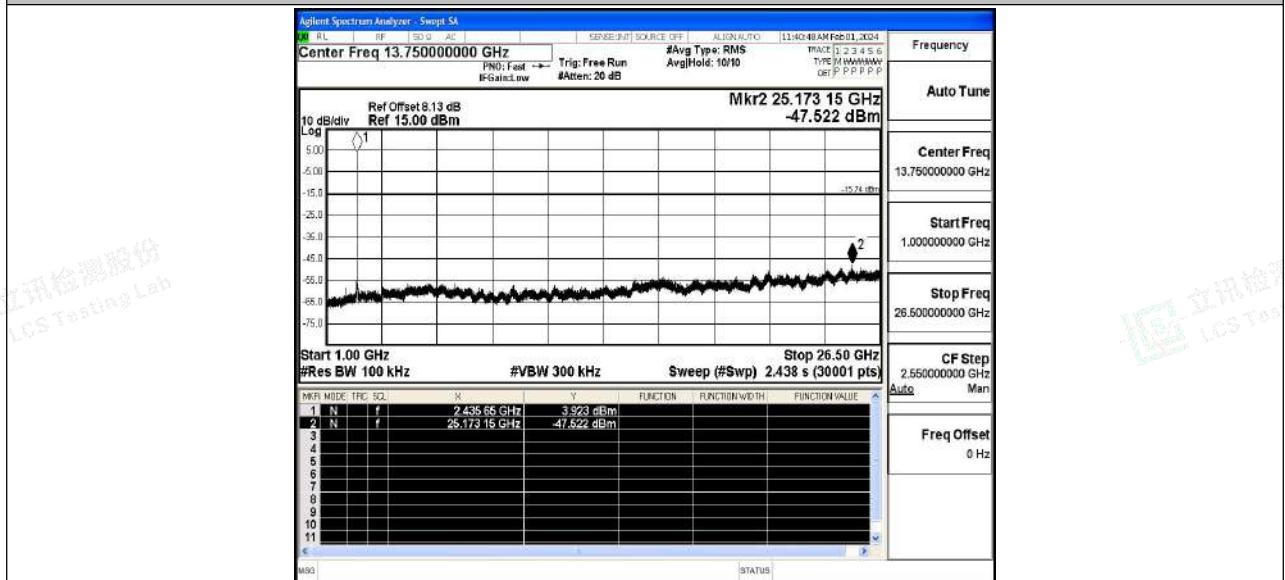


11B_Ant0_2437_30~1000

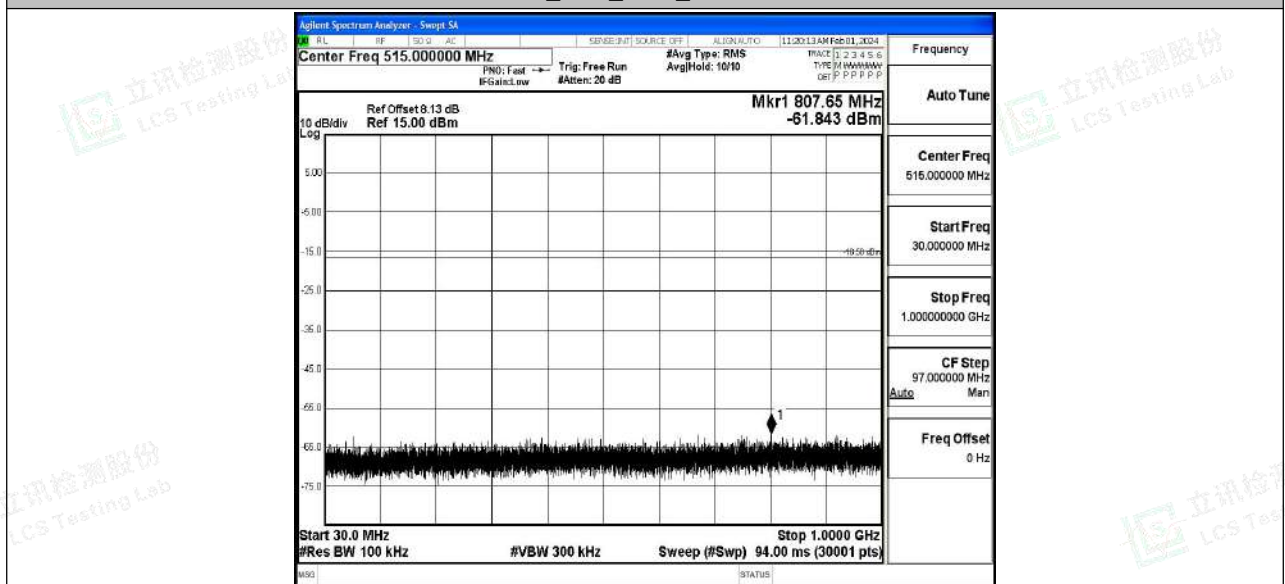




11B_Ant0_2437_1000~26500

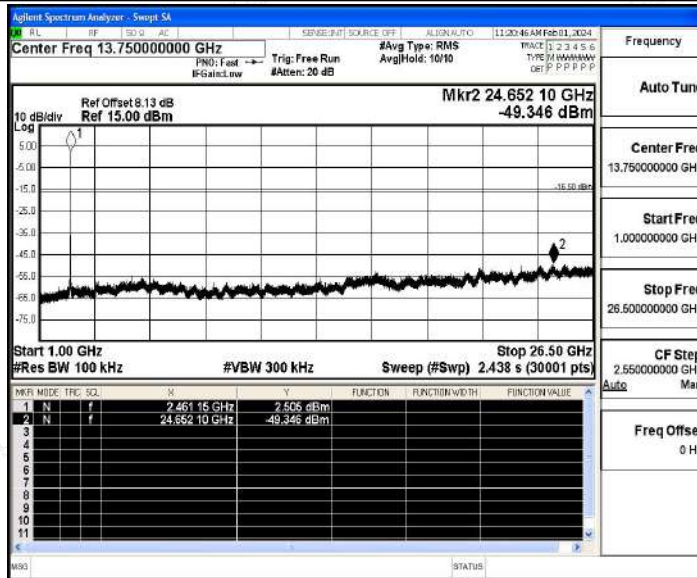


11B_Ant0_2462_30~1000

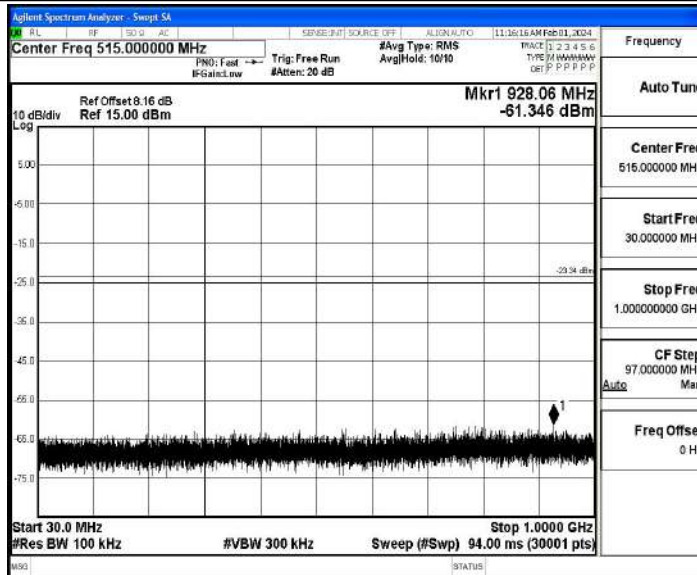




11B_Ant0_2462_1000~26500

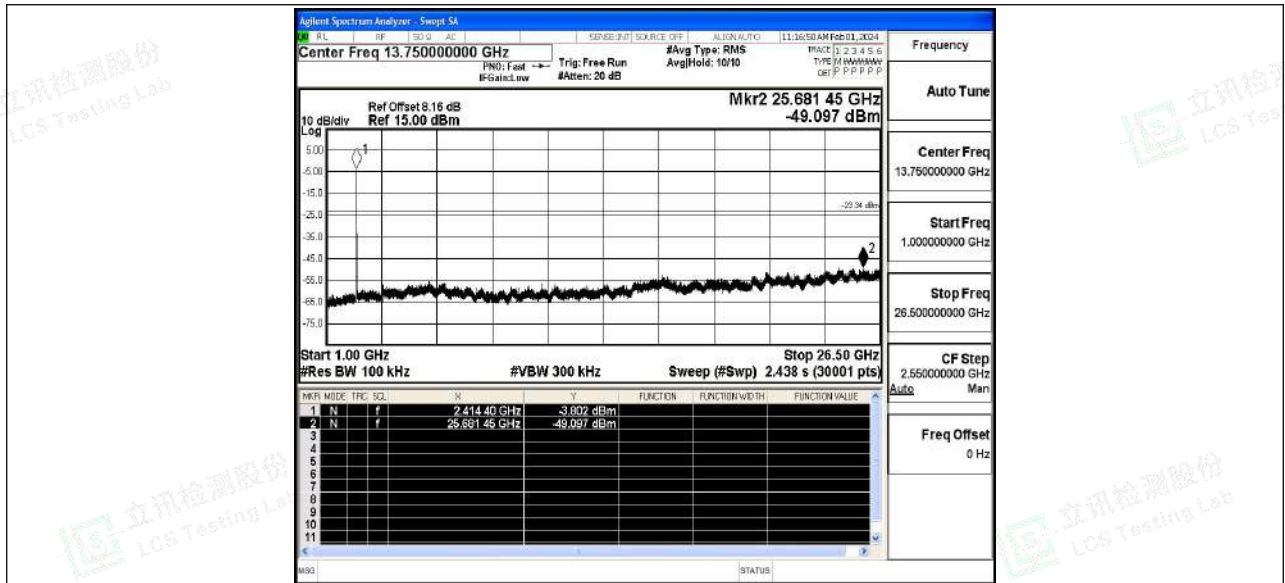


11G_Ant0_2412_30~1000

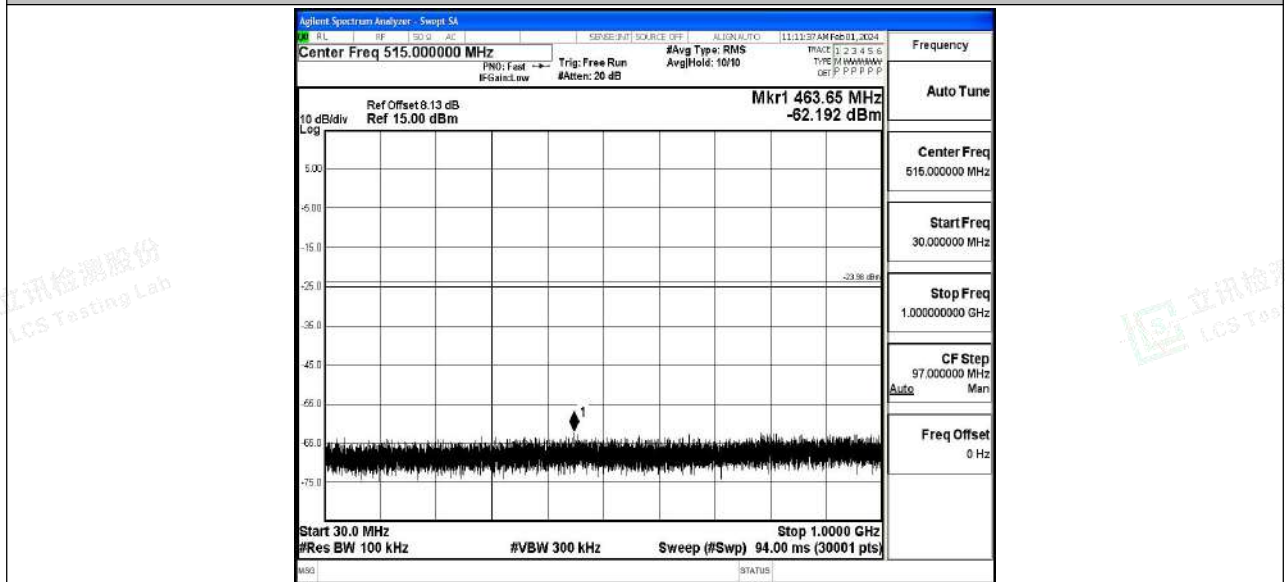


11G_Ant0_2412_1000~26500

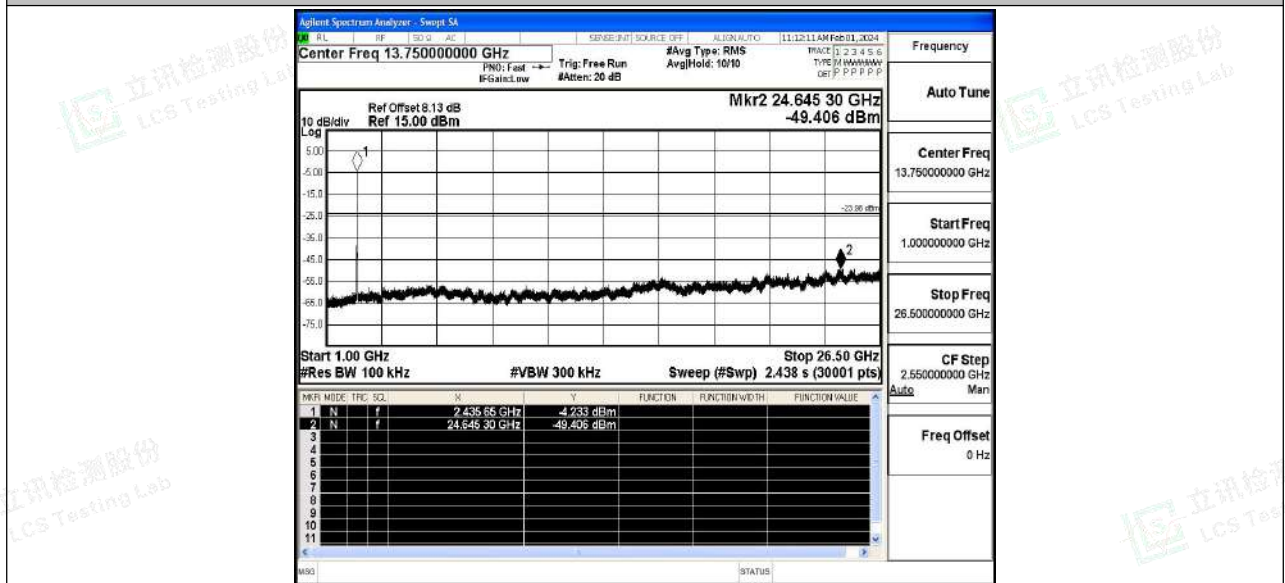




11G_Ant0_2437_30~1000

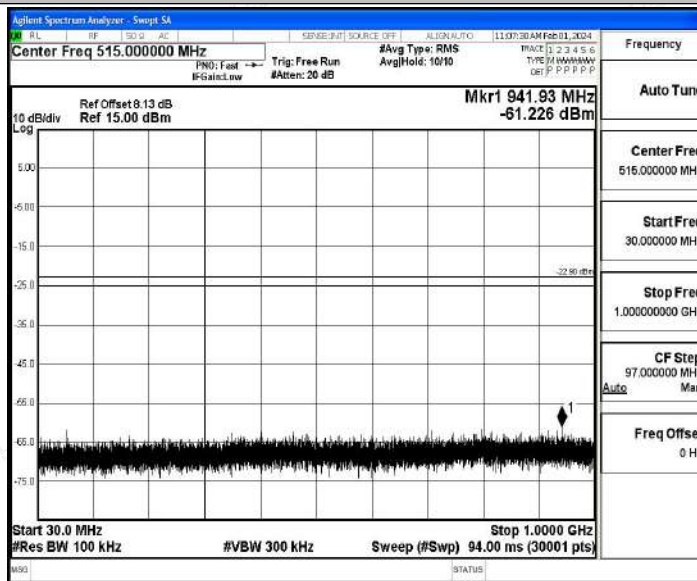


11G_Ant0_2437_1000~26500

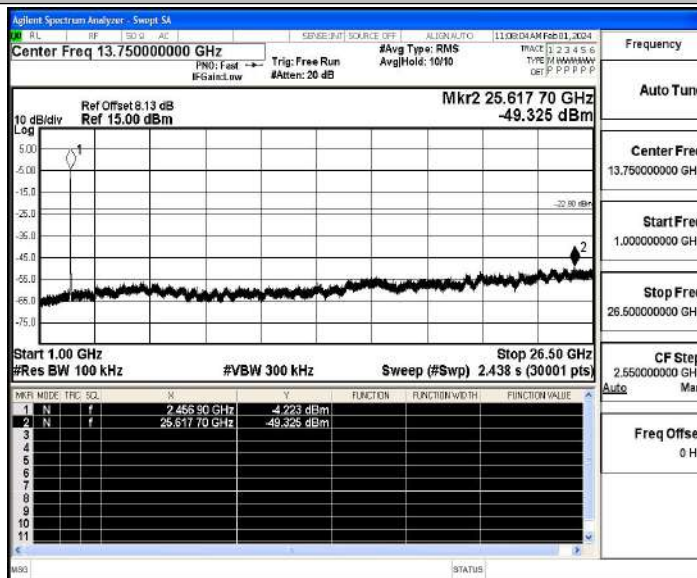




11G_Ant0_2462_30~1000

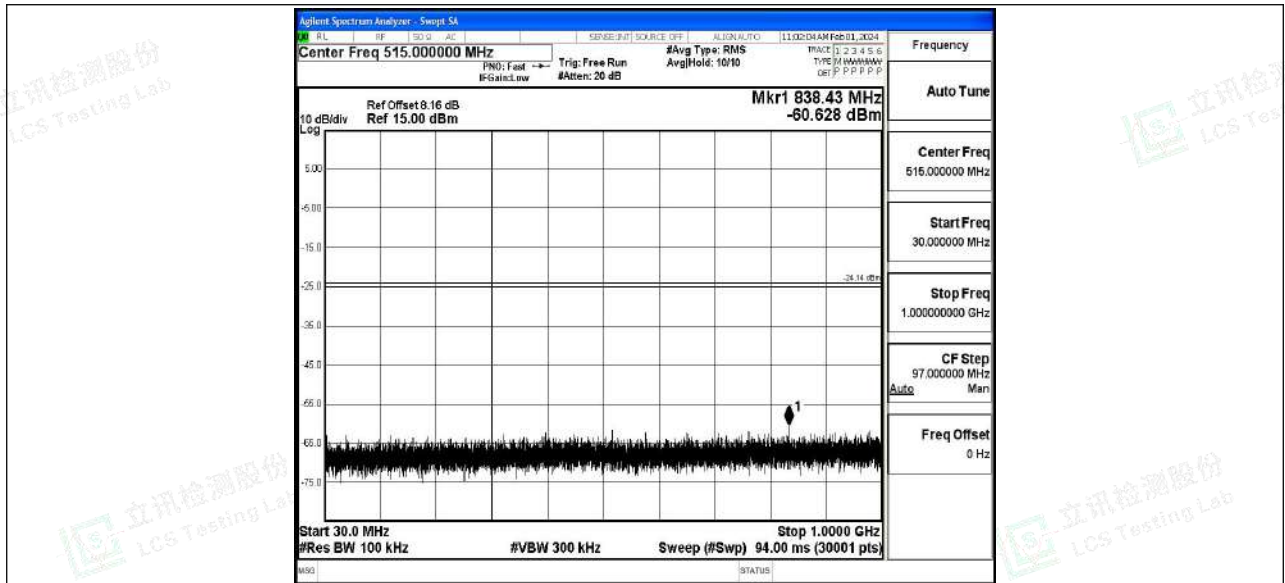


11G_Ant0_2462_1000~26500

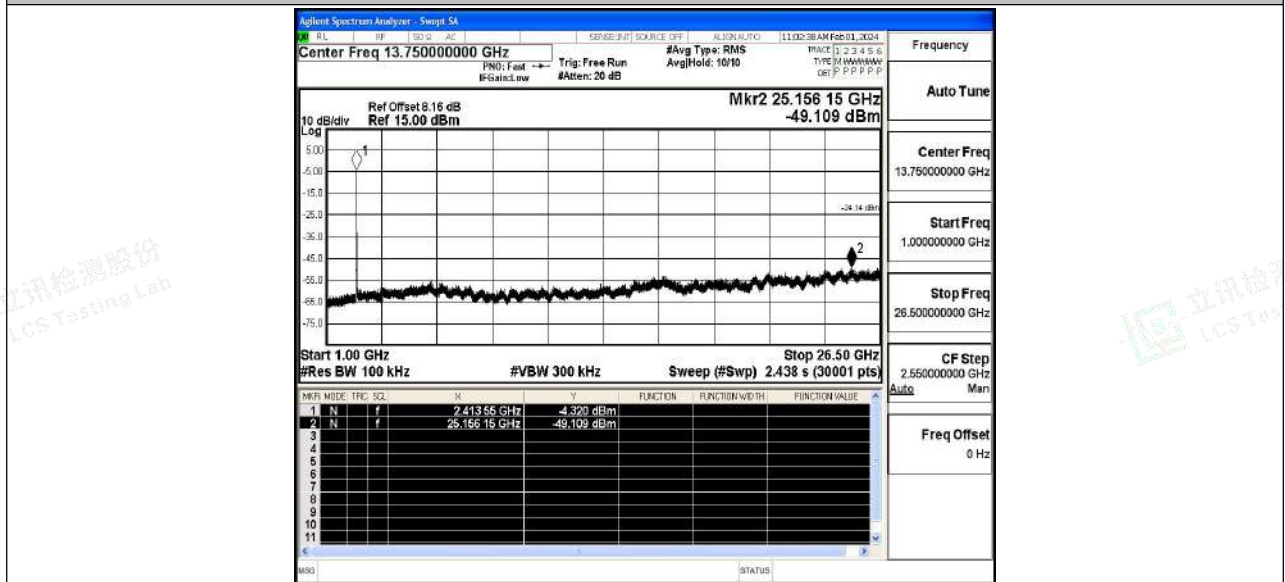


11N20SISO_Ant0_2412_30~1000

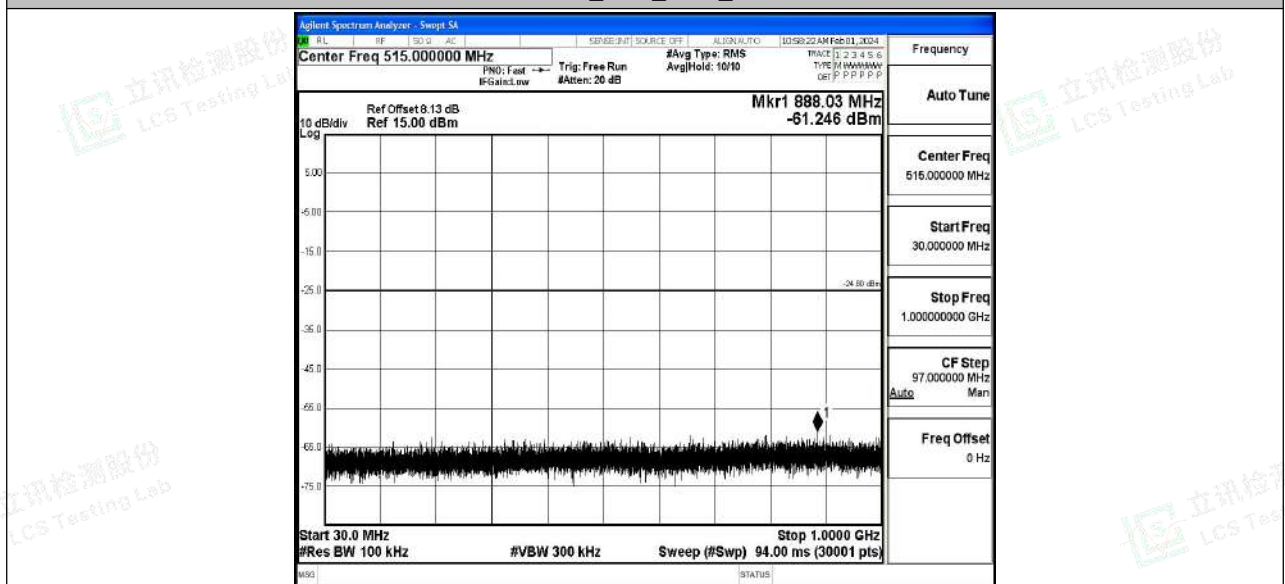




11N20SISO_Ant0_2412_1000~26500

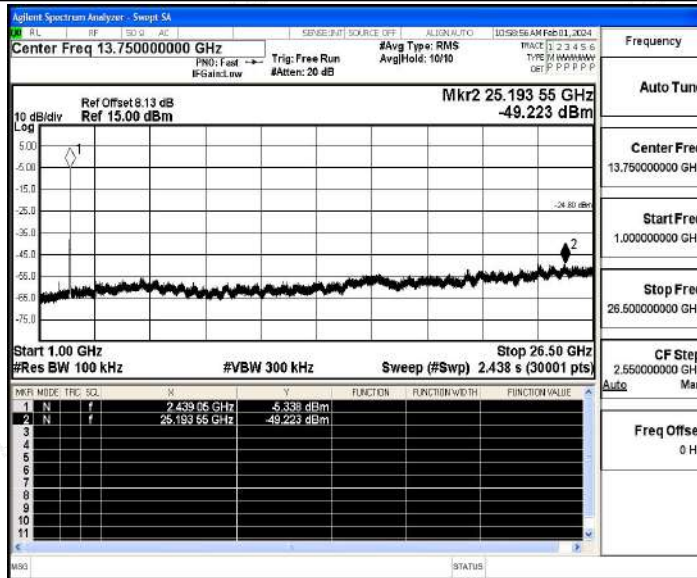


11N20SISO_Ant0_2437_30~1000

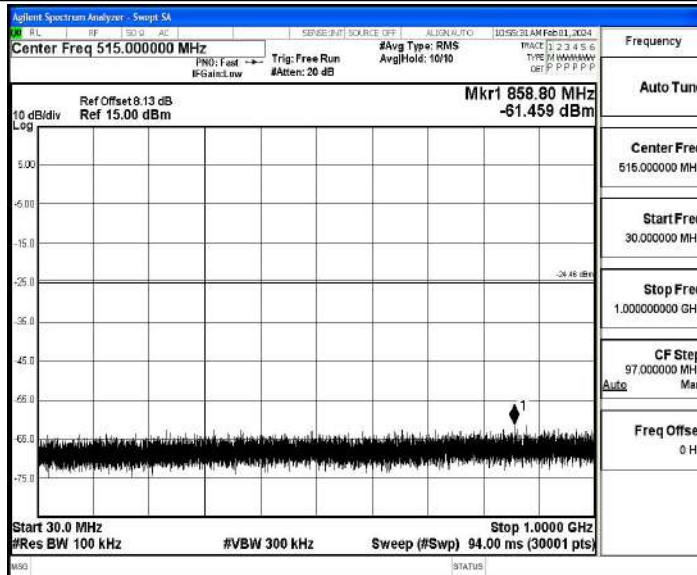




11N20SISO_Ant0_2437_1000~26500

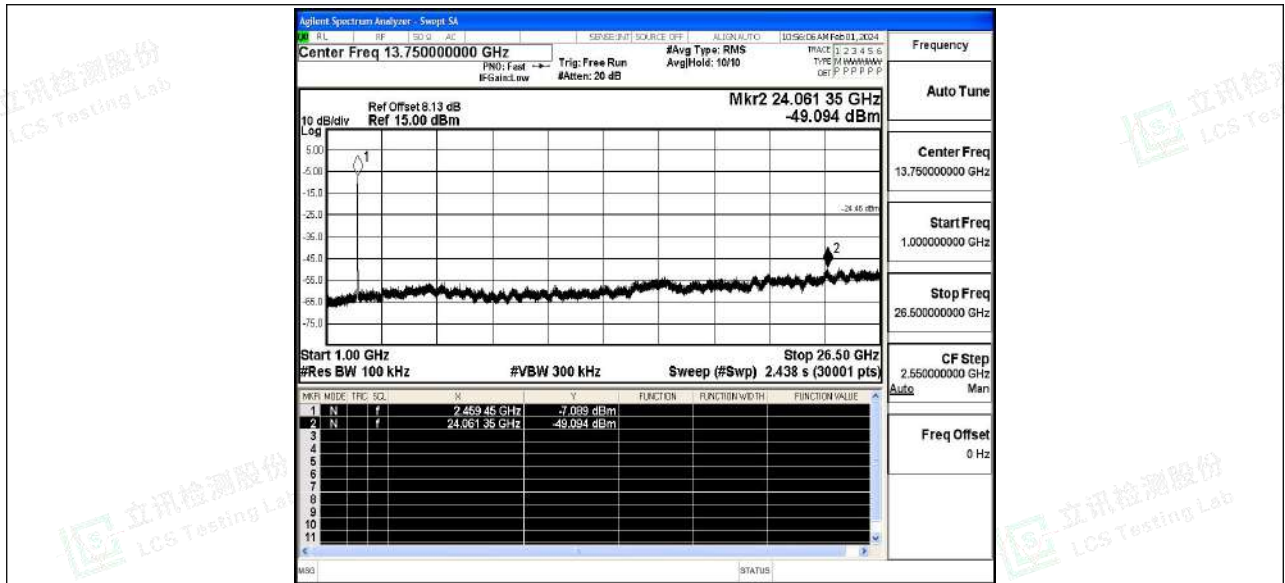


11N20SISO_Ant0_2462_30~1000

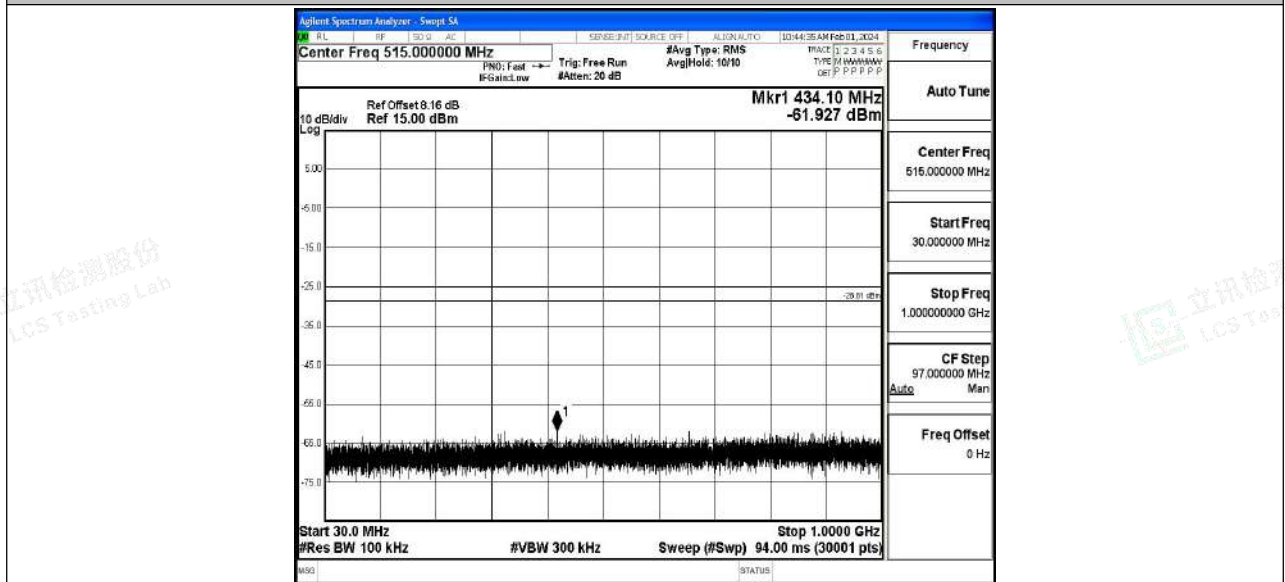


11N20SISO_Ant0_2462_1000~26500

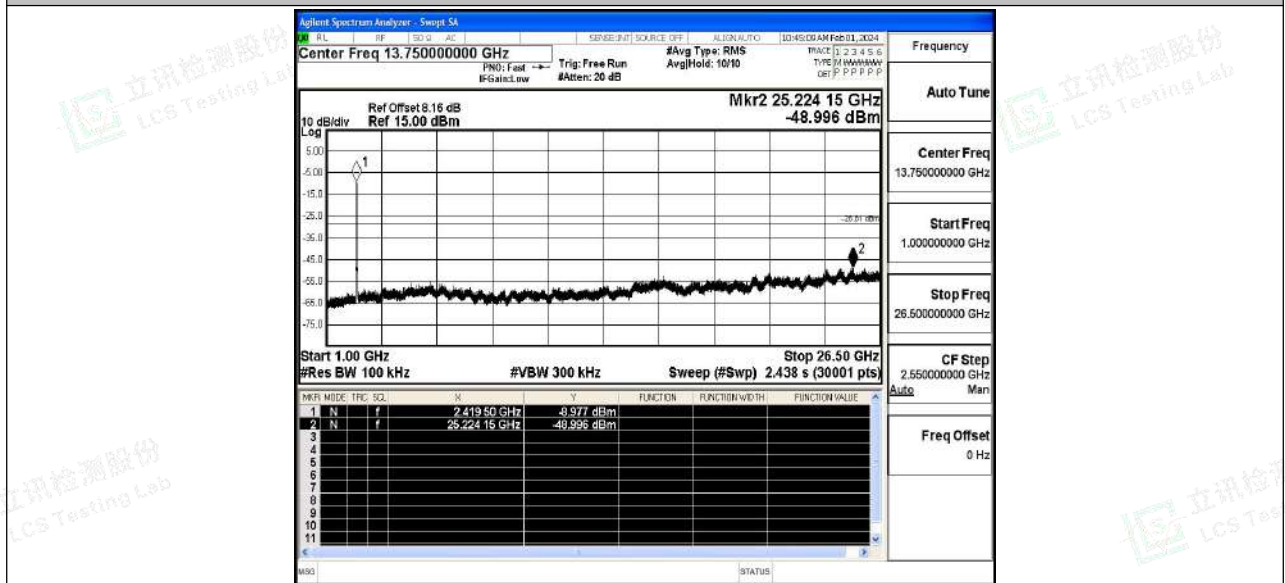




11N40SISO_Ant0_2422_30~1000

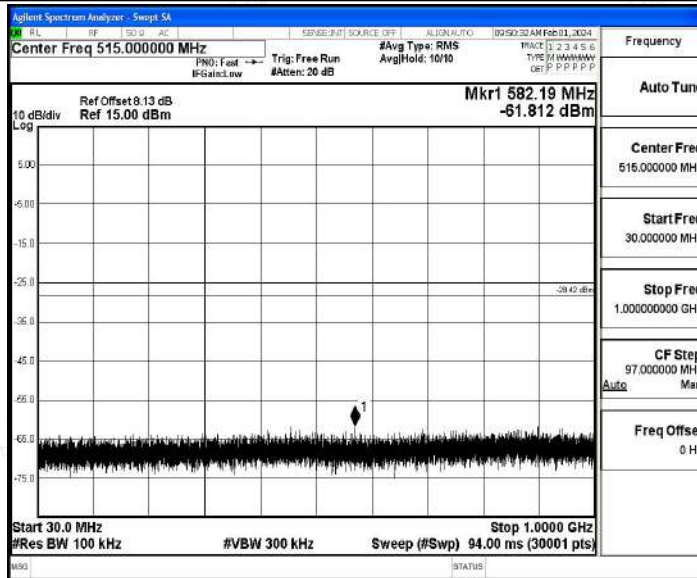


11N40SISO_Ant0_2422_1000~26500

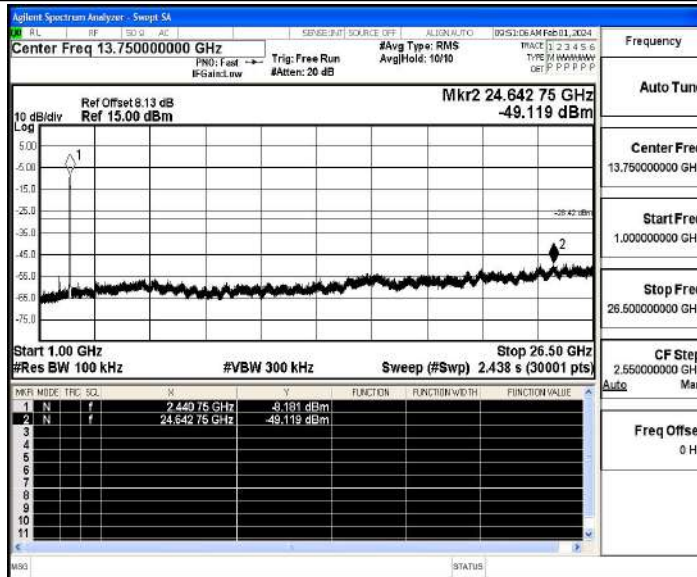




11N40SISO_Ant0_2437_30~1000

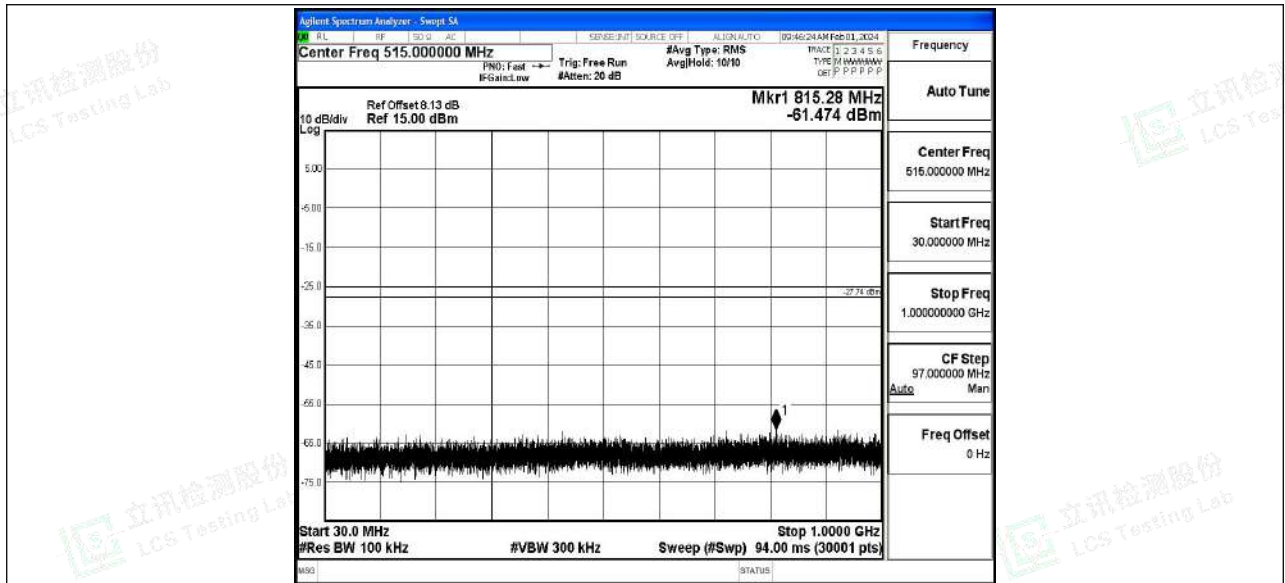


11N40SISO_Ant0_2437_1000~26500

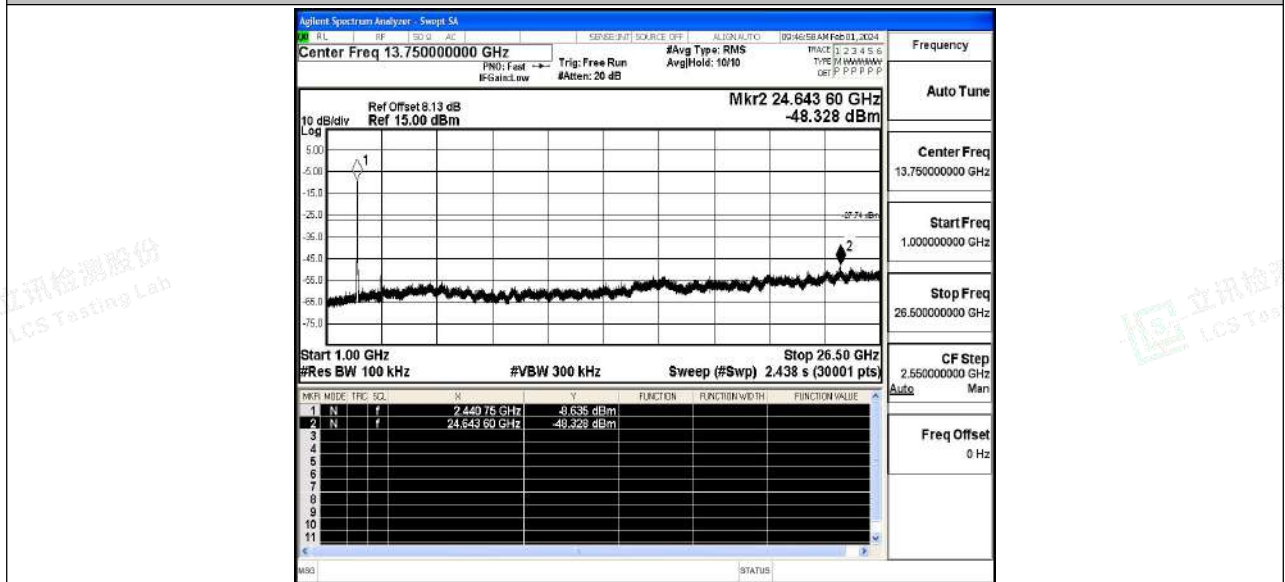


11N40SISO_Ant0_2452_30~1000





11N40SISO_Ant0_2452_1000~26500





Test Result

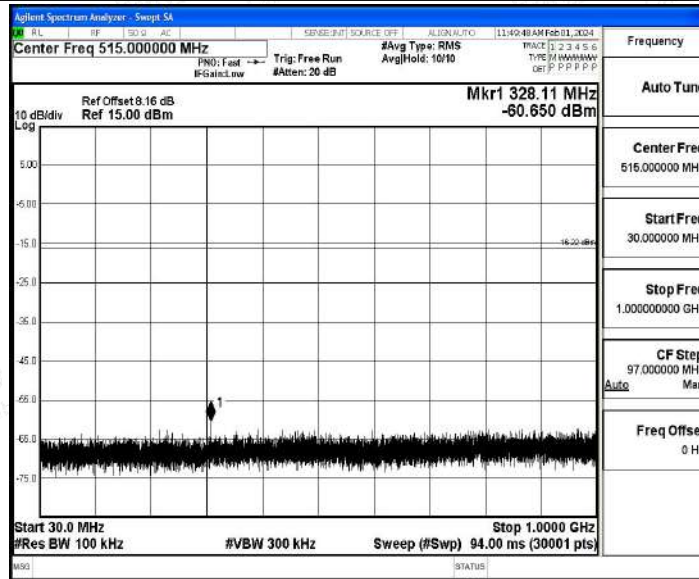
TestMode	Antenna	Freq(MHz)	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	30~1000	3.78	-60.65	≤-16.22	PASS
			1000~26500	3.78	-49.24	≤-16.22	PASS
		2437	30~1000	4.24	-61.47	≤-15.76	PASS
			1000~26500	4.24	-49.69	≤-15.76	PASS
		2462	30~1000	2.94	-61.29	≤-17.06	PASS
			1000~26500	2.94	-48.97	≤-17.06	PASS
11G	Ant1	2412	30~1000	-4.15	-62.02	≤-24.15	PASS
			1000~26500	-4.15	-48.53	≤-24.15	PASS
		2437	30~1000	-2.97	-61.83	≤-22.97	PASS
			1000~26500	-2.97	-48.7	≤-22.97	PASS
		2462	30~1000	-3.17	-61.59	≤-23.17	PASS
			1000~26500	-3.17	-49	≤-23.17	PASS
11N20SISO	Ant1	2412	30~1000	-4.12	-61.28	≤-24.12	PASS
			1000~26500	-4.12	-49.56	≤-24.12	PASS
		2437	30~1000	-4.19	-61.71	≤-24.19	PASS
			1000~26500	-4.19	-49.56	≤-24.19	PASS
		2462	30~1000	-4.43	-61.68	≤-24.43	PASS
			1000~26500	-4.43	-48.72	≤-24.43	PASS
11N40SISO	Ant1	2422	30~1000	-8.87	-61.11	≤-28.87	PASS
			1000~26500	-8.87	-49.18	≤-28.87	PASS
		2437	30~1000	-8.28	-61.09	≤-28.28	PASS
			1000~26500	-8.28	-49.07	≤-28.28	PASS
		2452	30~1000	-7.52	-60.88	≤-27.52	PASS
			1000~26500	-7.52	-49.17	≤-27.52	PASS



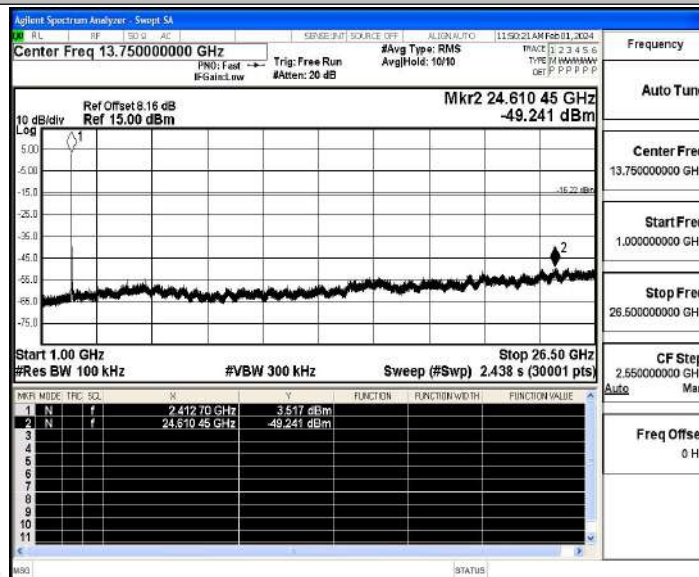


Test Graphs

11B_Ant1_2412_30~1000

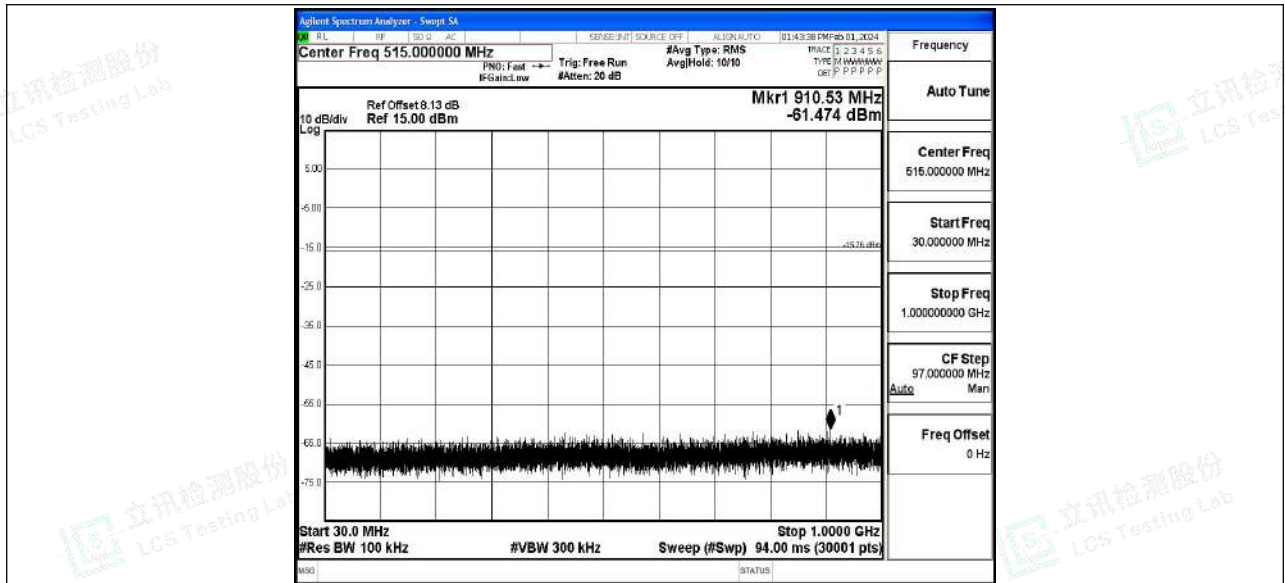


11B_Ant1_2412_1000~26500

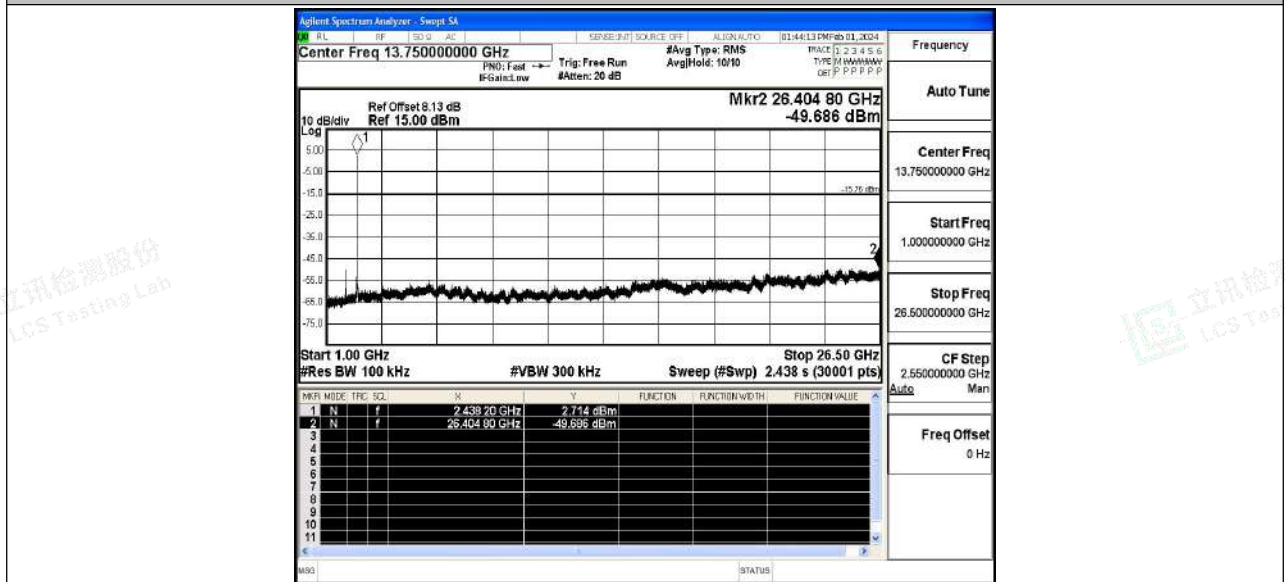


11B_Ant1_2437_30~1000

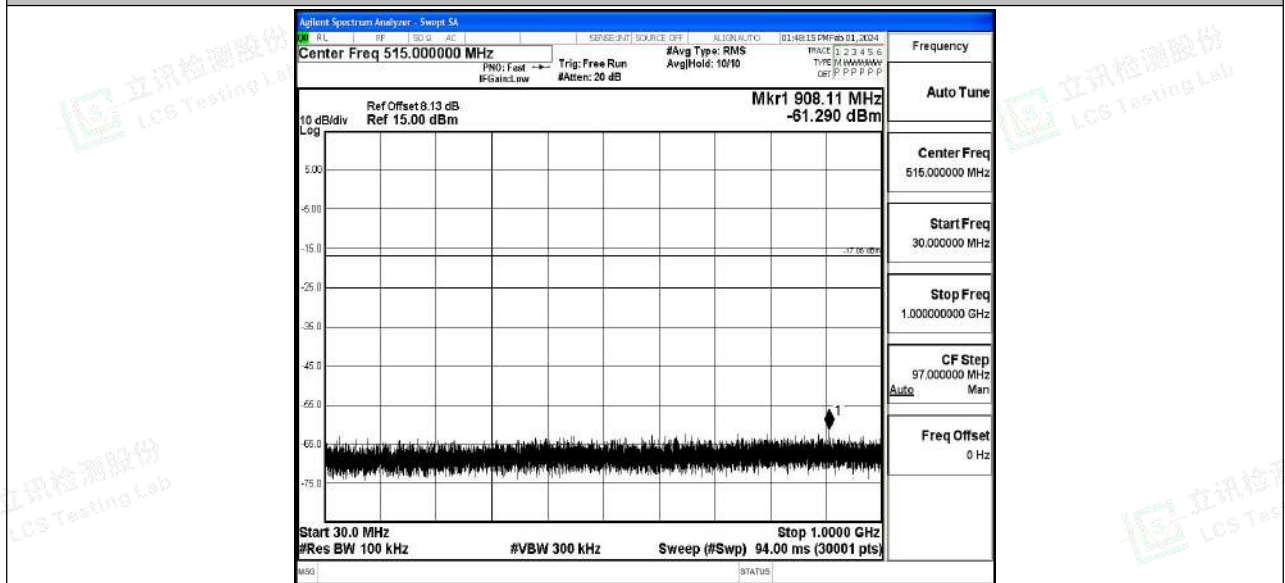




11B_Ant1_2437_1000~26500

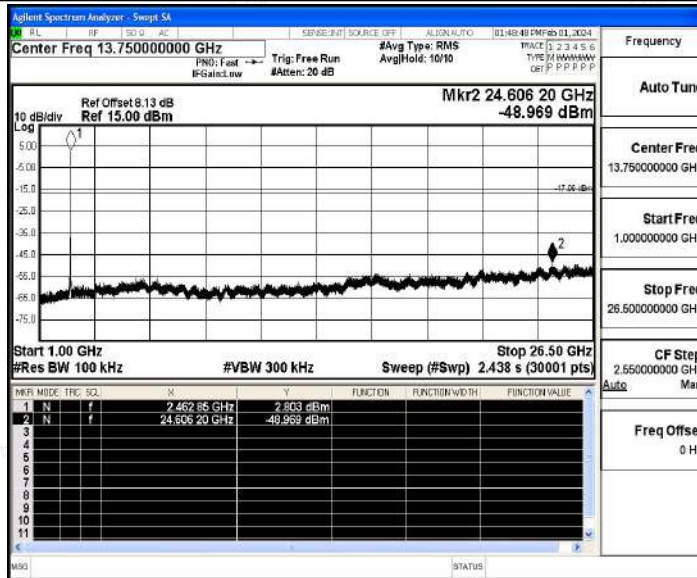


11B_Ant1_2462_30~1000

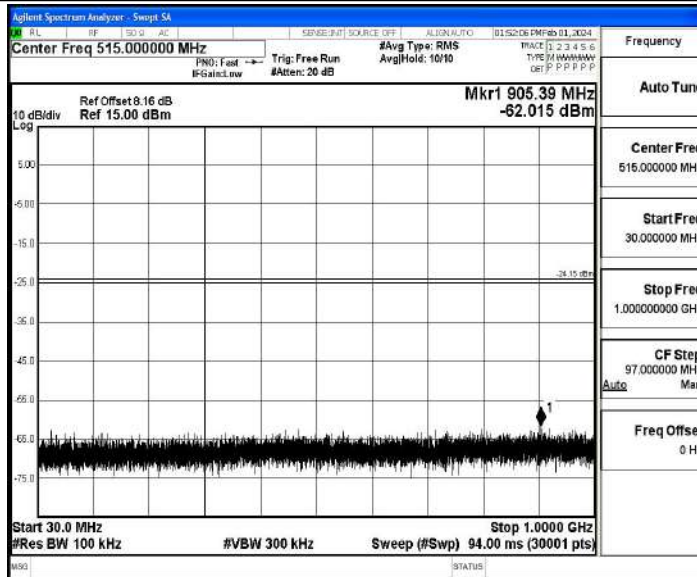




11B_Ant1_2462_1000~26500

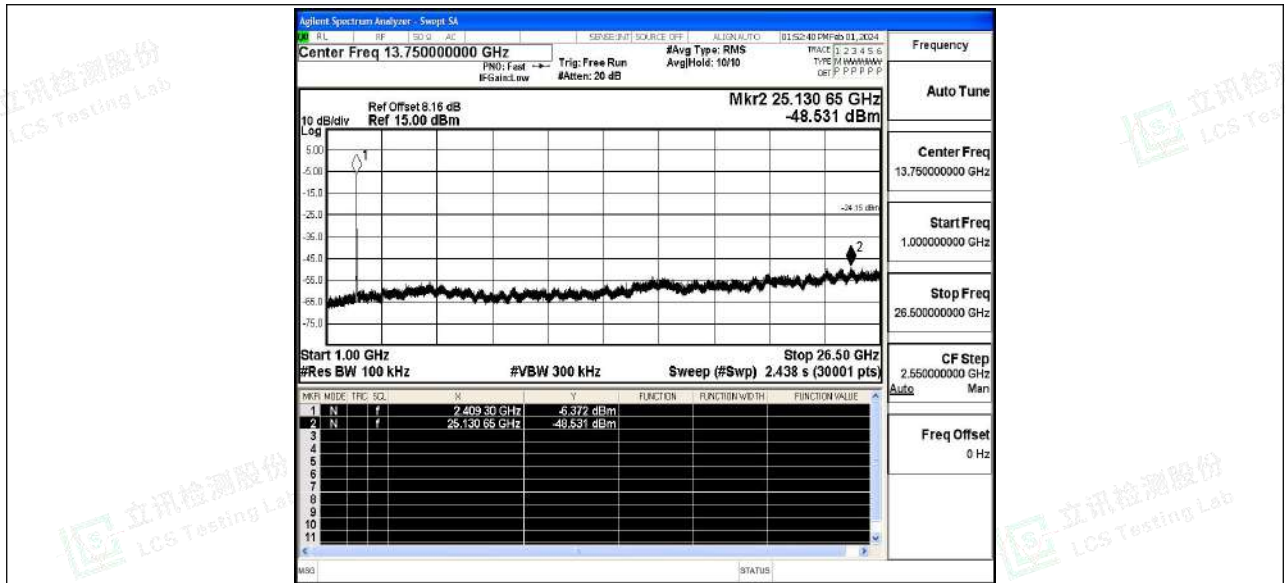


11G_Ant1_2412_30~1000

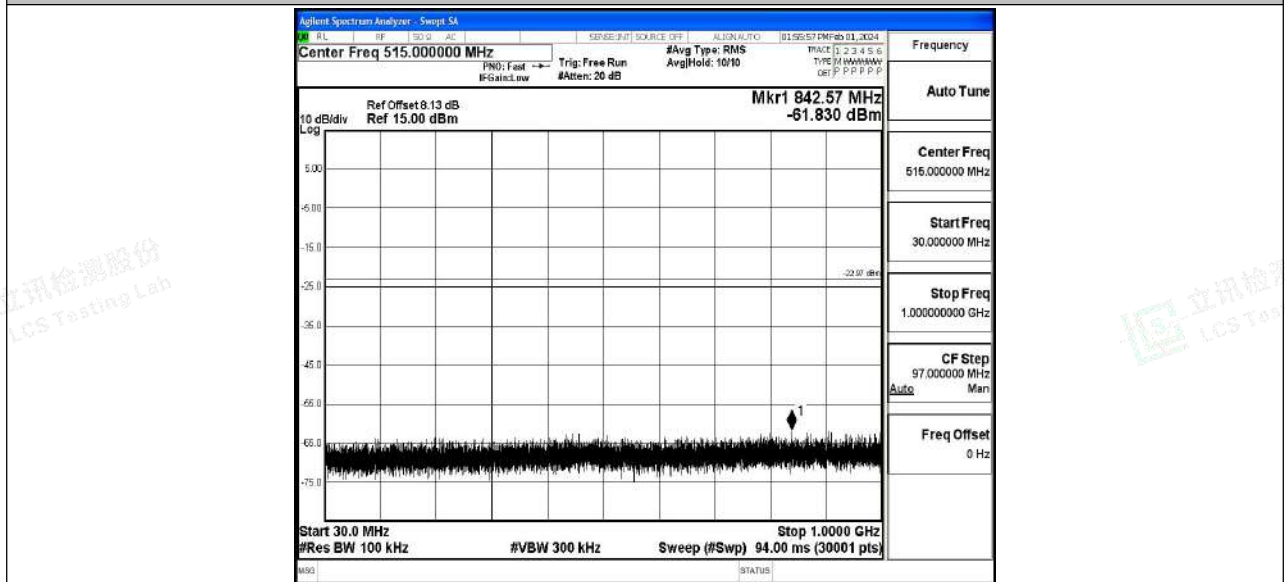


11G_Ant1_2412_1000~26500

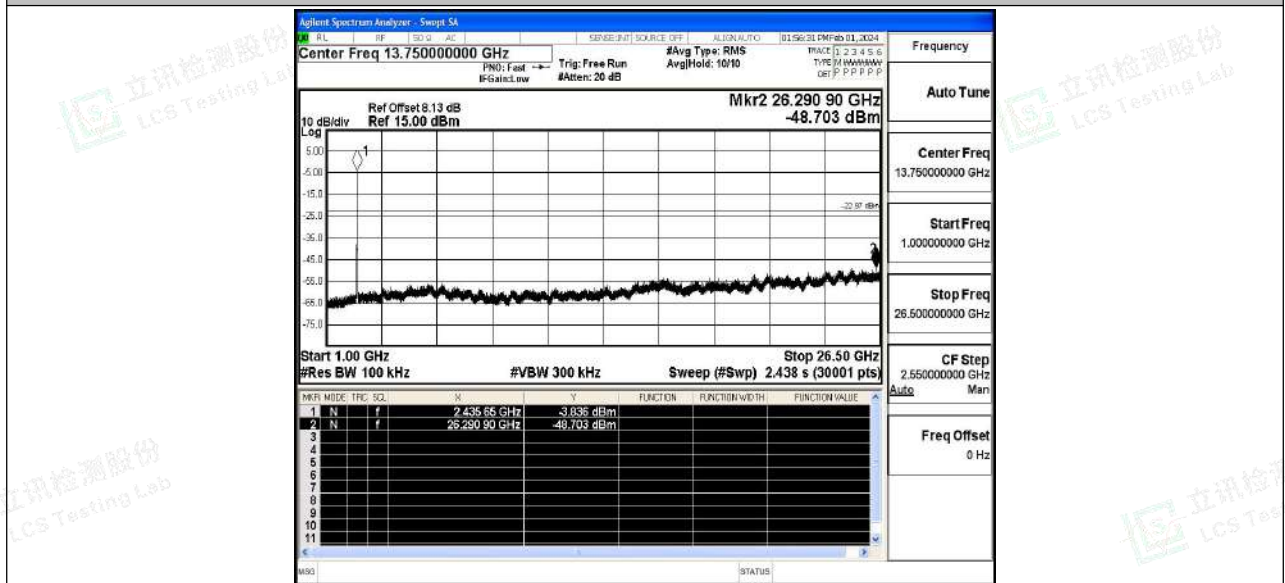




11G_Ant1_2437_30~1000

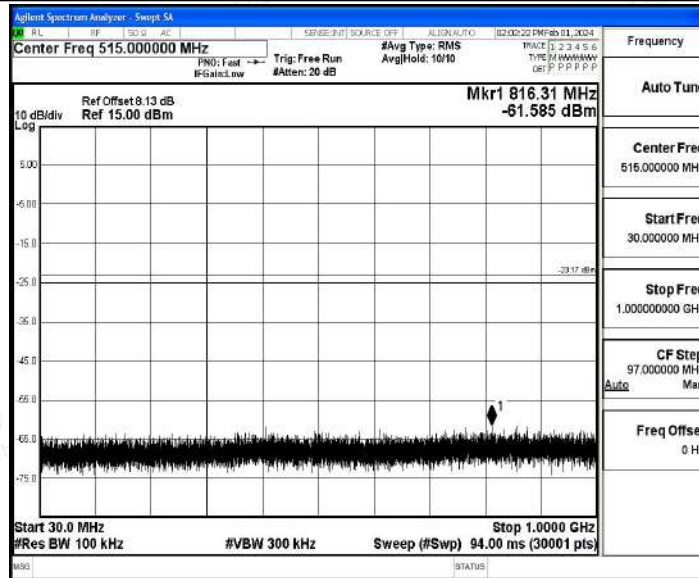


11G_Ant1_2437_1000~26500

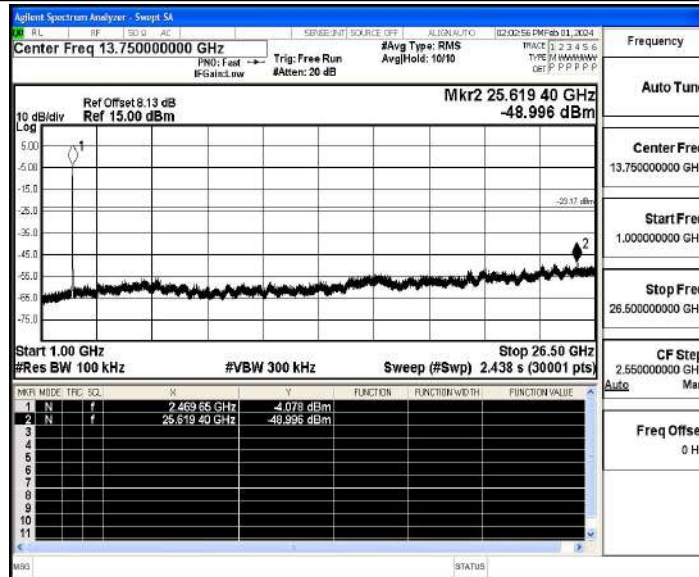




11G_Ant1_2462_30~1000

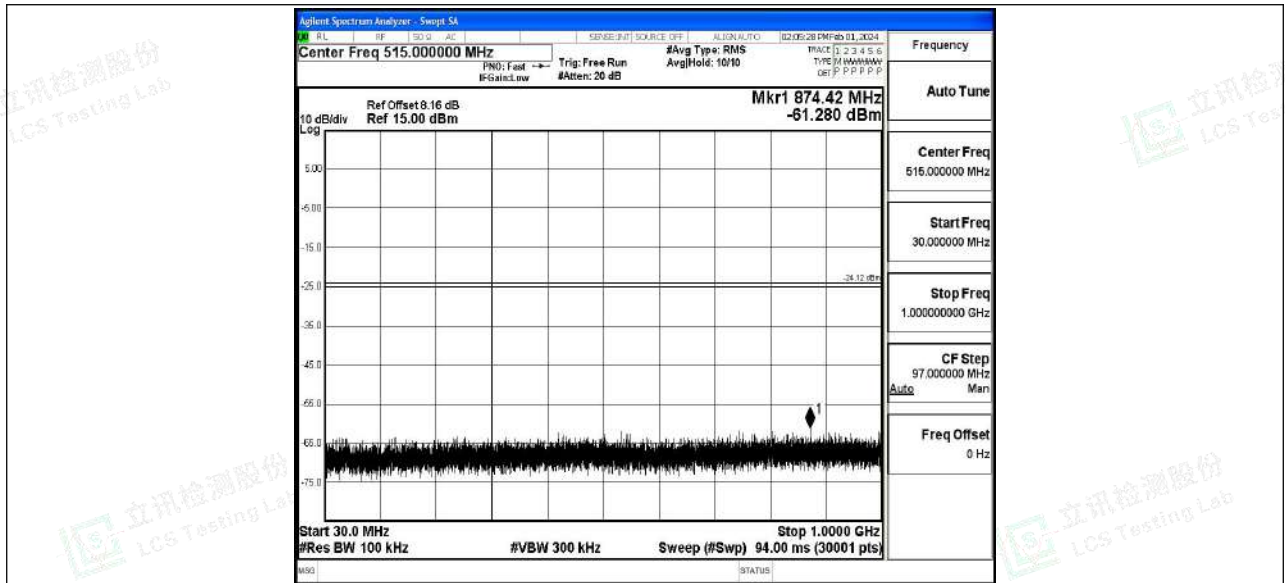


11G_Ant1_2462_1000~26500

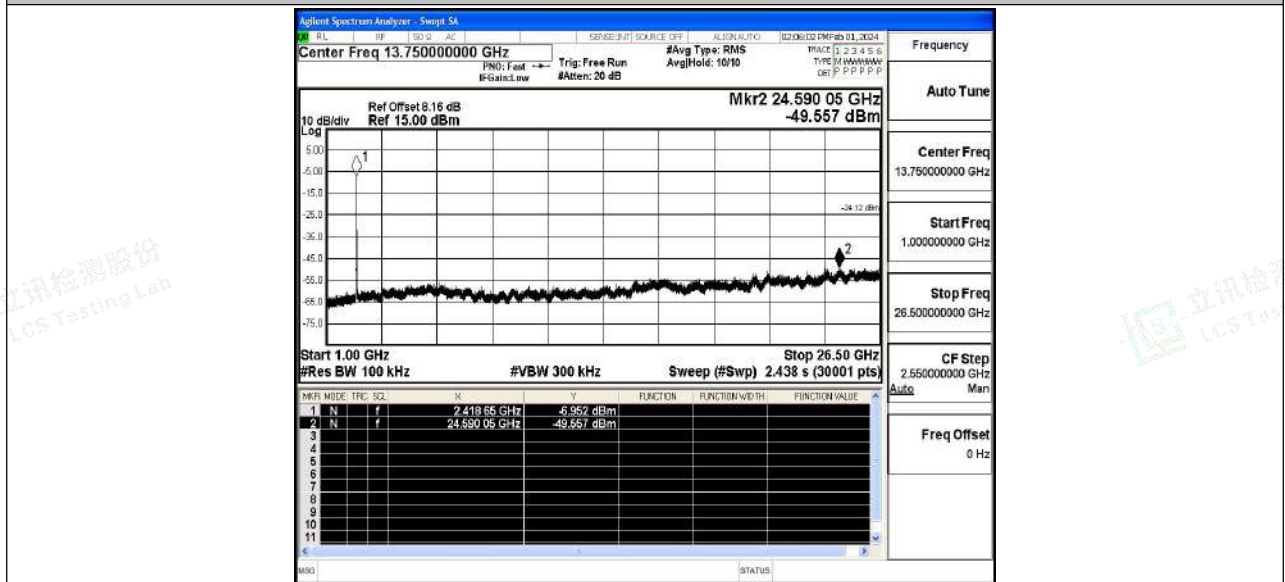


11N20SISO_Ant1_2412_30~1000

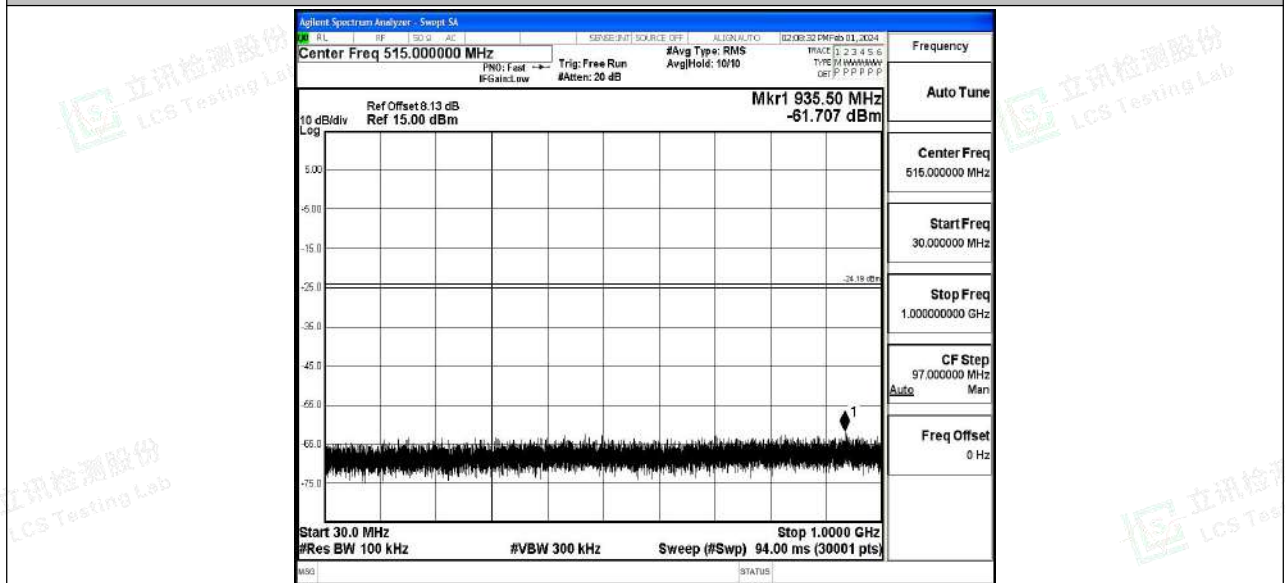




11N20SISO_Ant1_2412_1000~26500

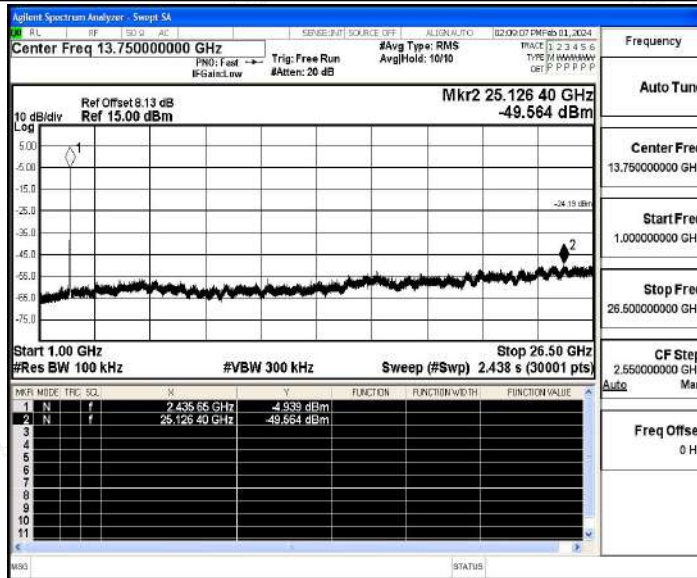


11N20SISO_Ant1_2437_30~1000

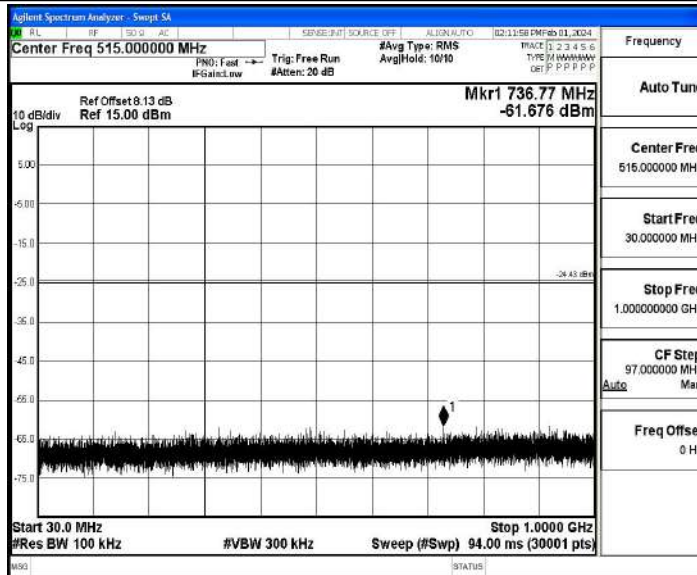




11N20SISO_Ant1_2437_1000~26500

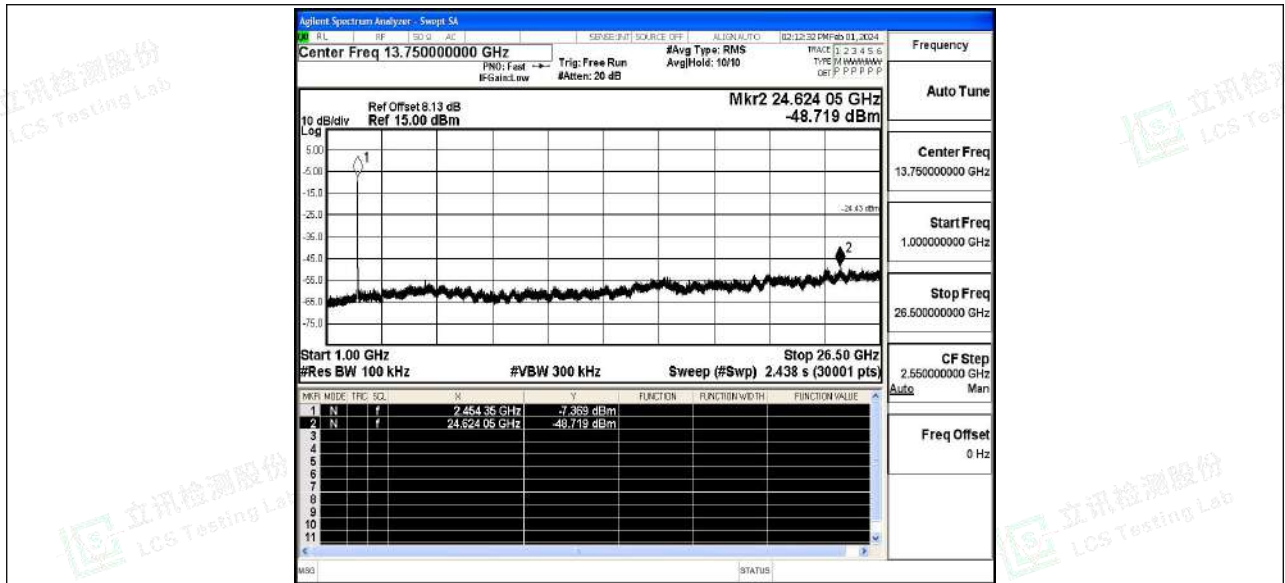


11N20SISO_Ant1_2462_30~1000

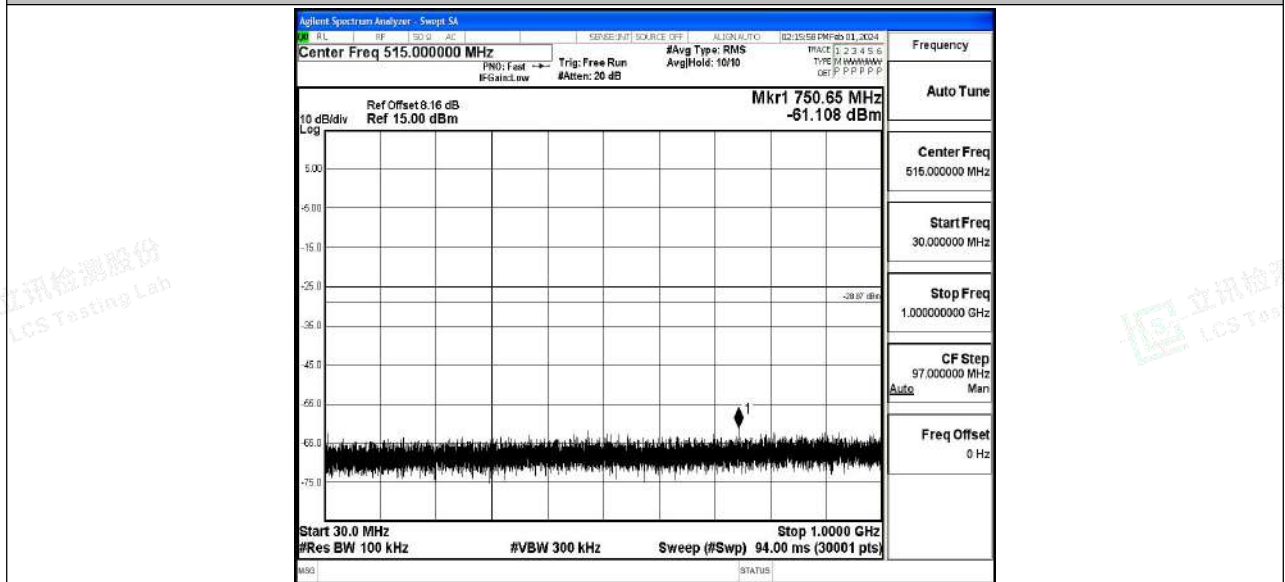


11N20SISO_Ant1_2462_1000~26500

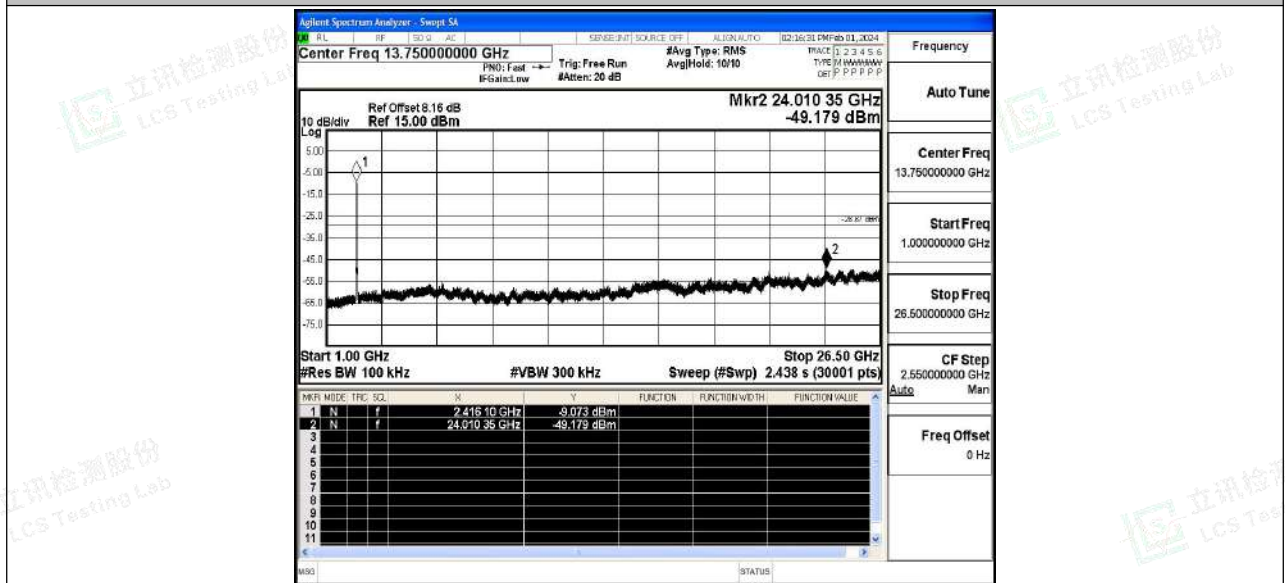




11N40SISO_Ant1_2422_30~1000

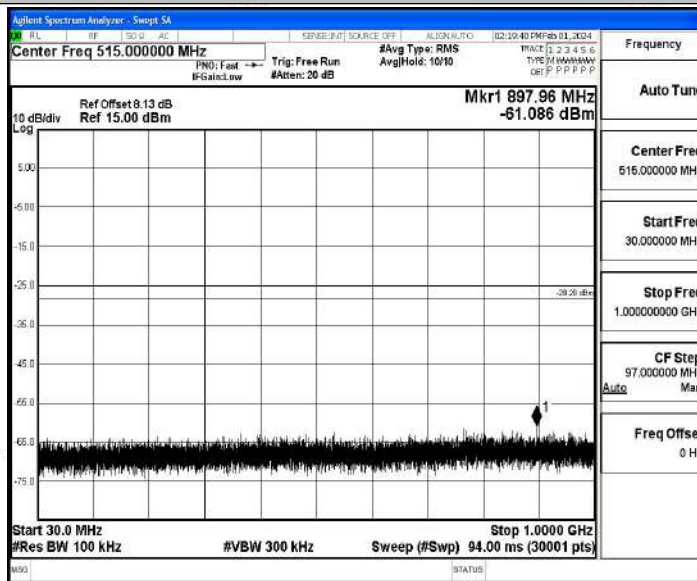


11N40SISO_Ant1_2422_1000~26500

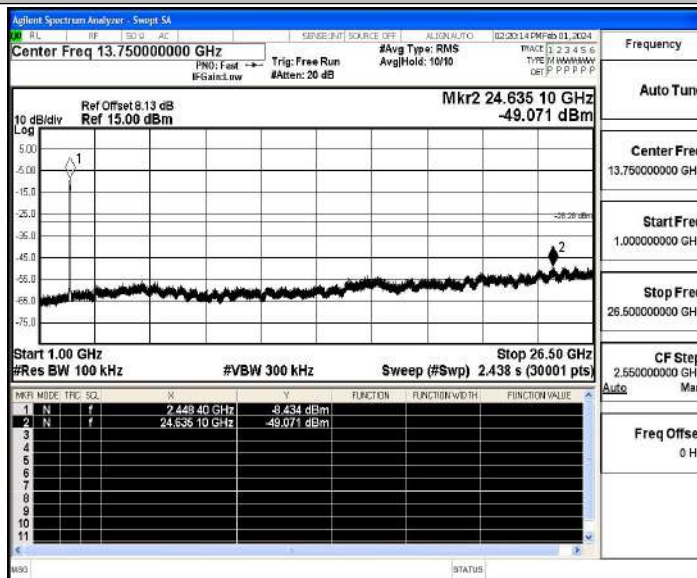




11N40SISO_Ant1_2437_30~1000

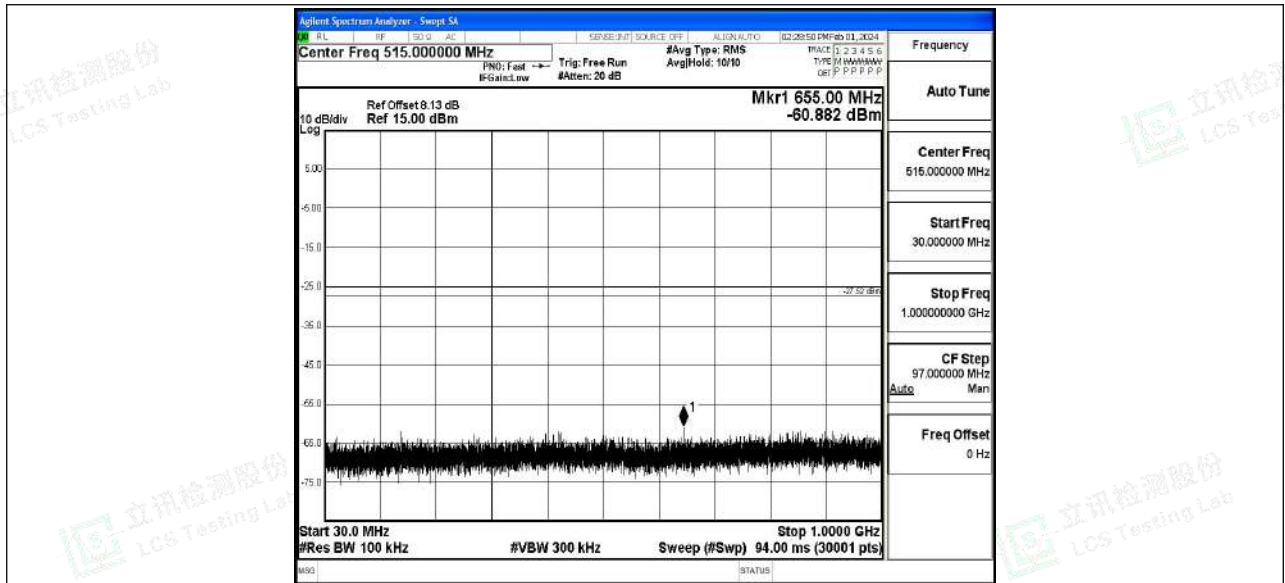


11N40SISO_Ant1_2437_1000~26500

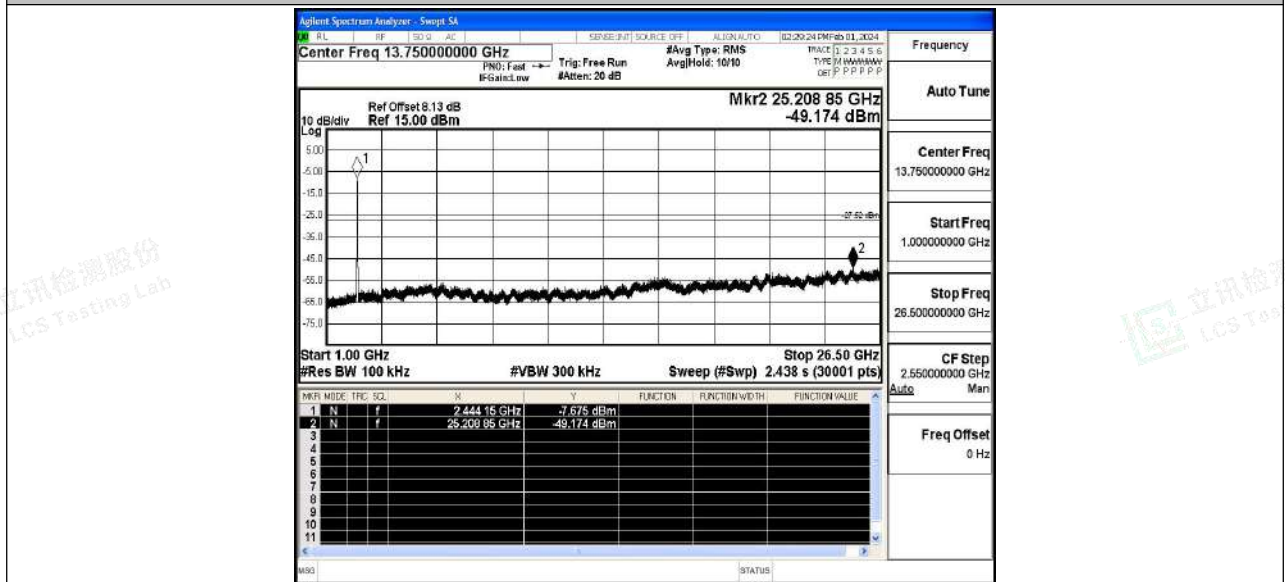


11N40SISO_Ant1_2452_30~1000





11N40SISO_Ant1_2452_1000~26500





Reference level measurement

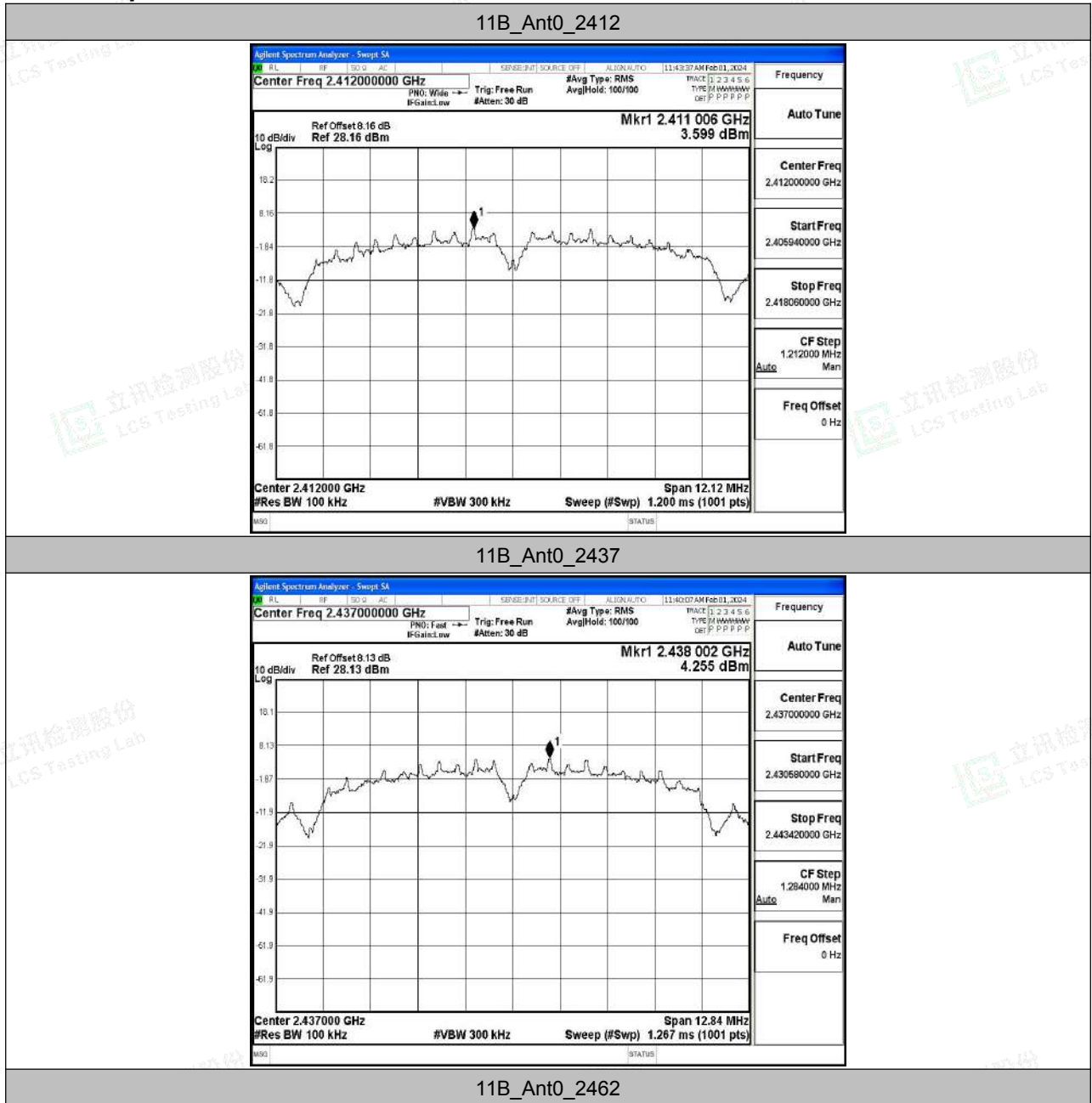
Test Result

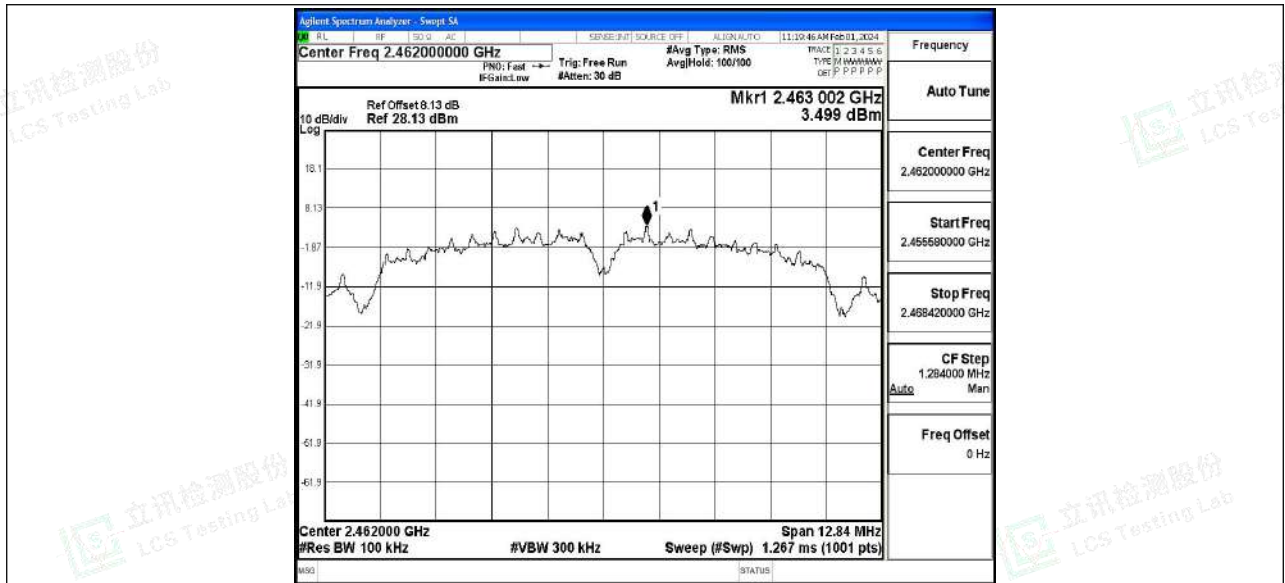
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
11B	Ant0	2412	2411.01	3.60
		2437	2438.00	4.26
		2462	2463.00	3.50
11G	Ant0	2412	2419.50	-3.34
		2437	2440.72	-3.98
		2462	2465.75	-2.90
11N20SISO	Ant0	2412	2413.27	-4.14
		2437	2429.49	-4.80
		2462	2463.26	-4.46
11N40SISO	Ant0	2422	2419.48	-8.81
		2437	2442.03	-8.42
		2452	2443.26	-7.74



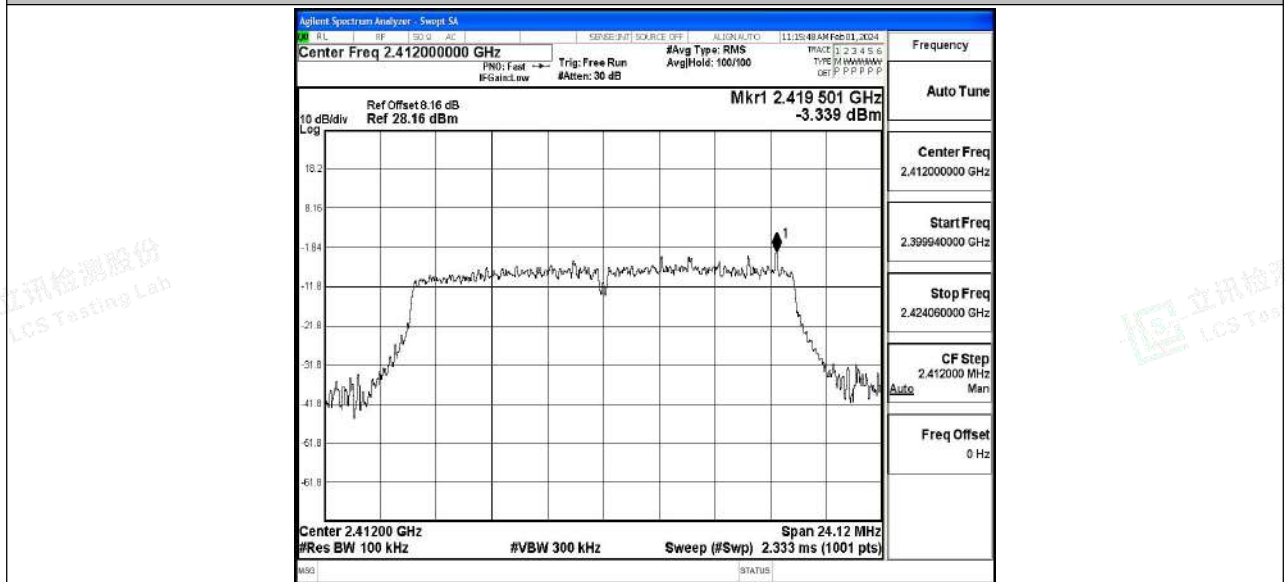


Test Graphs

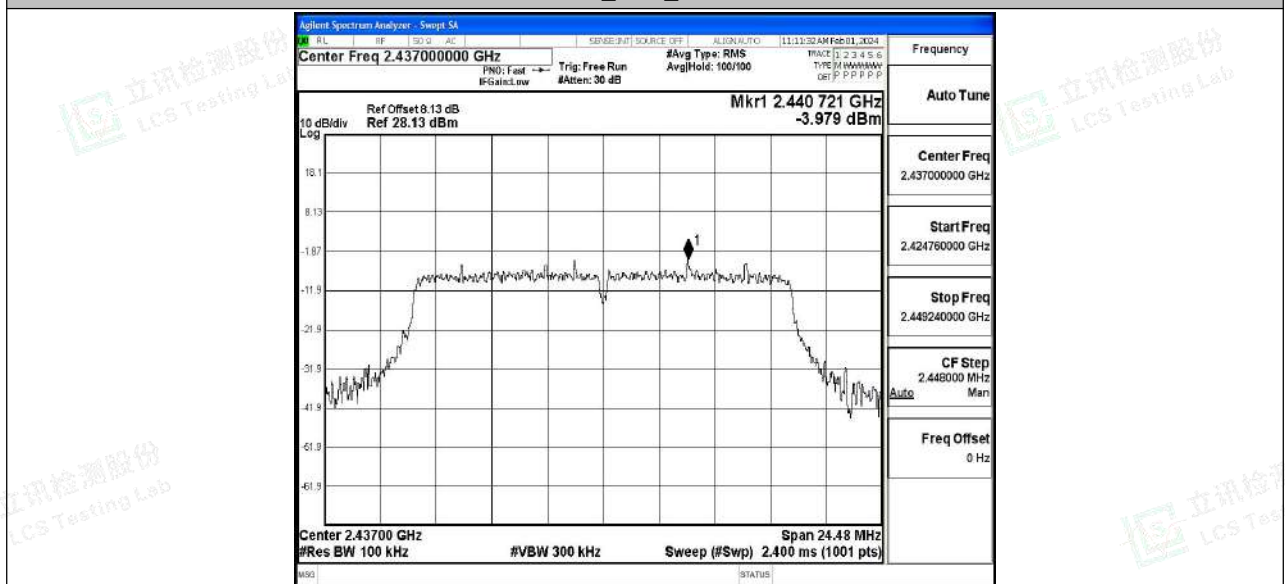




11G_Ant0_2412

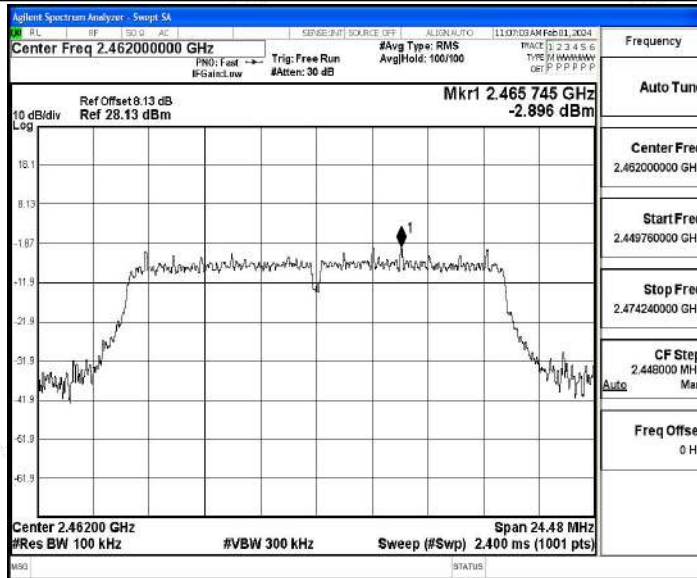


11G_Ant0_2437

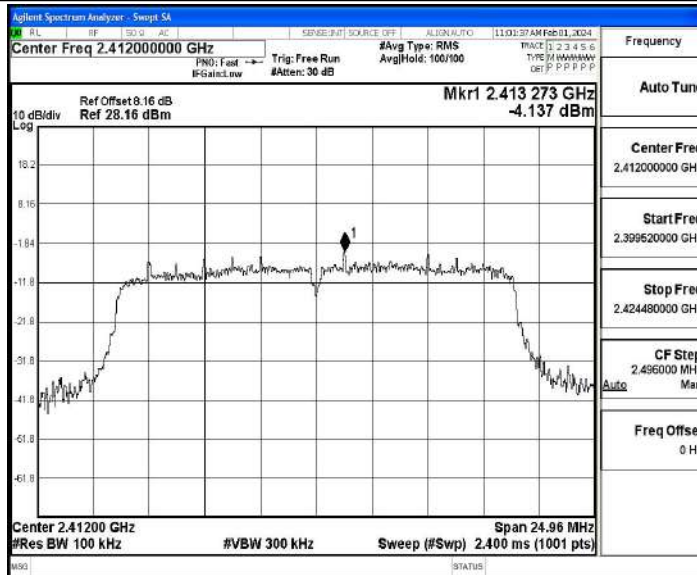




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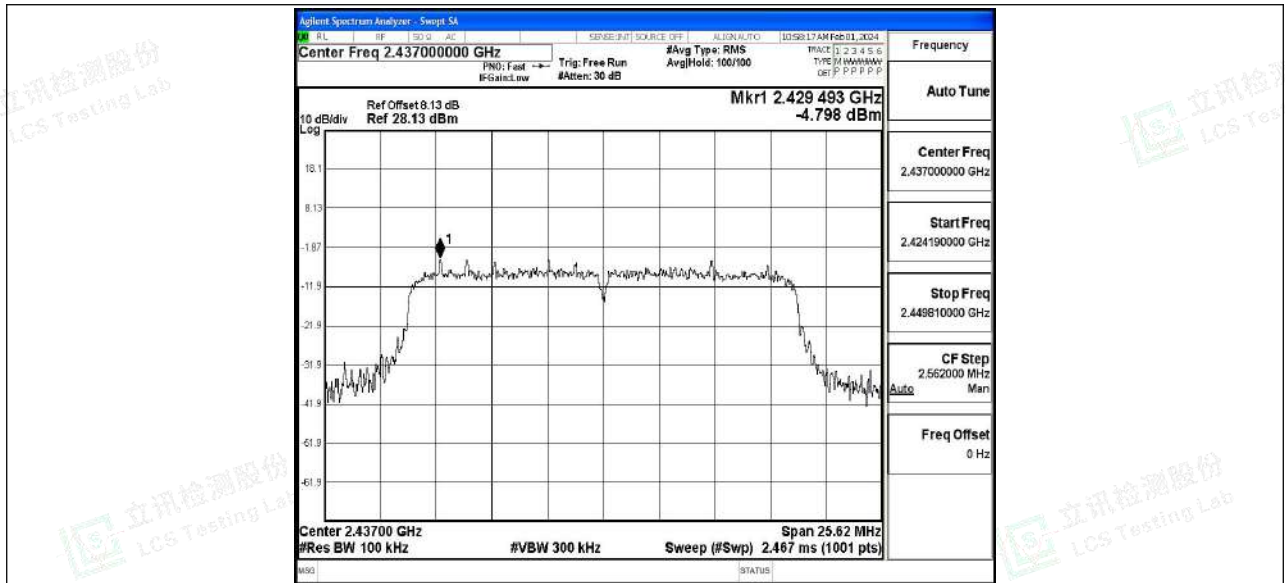


11N20SISO_Ant0_2412

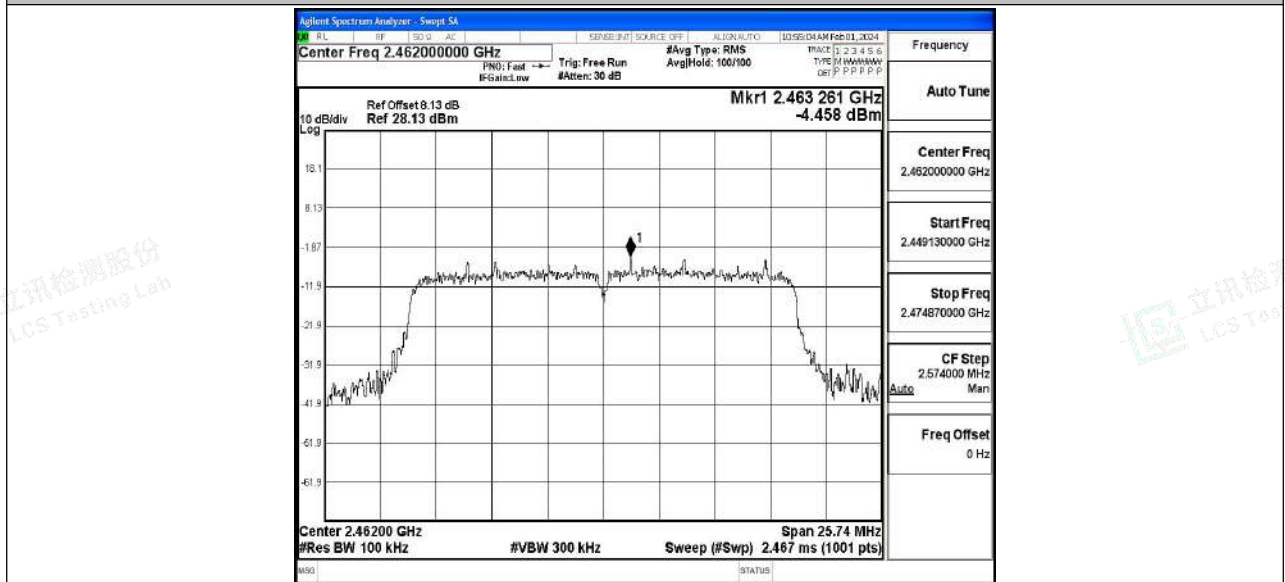


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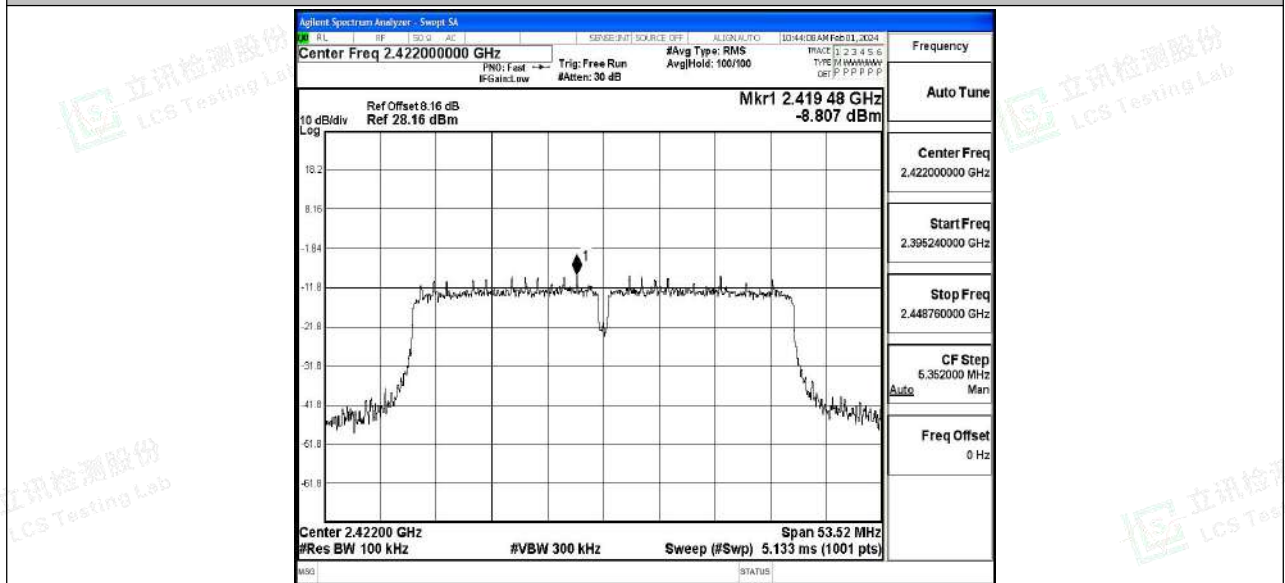




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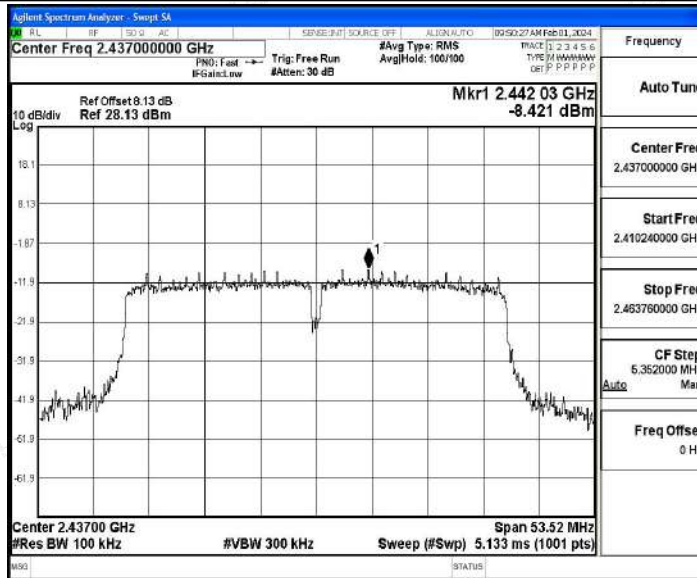


11N40SISO_Ant0_2422





11N40SISO_Ant0_2437



11N40SISO_Ant0_2452

