



Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: TLAMP

Test Model: TLAMP-1

Environmental Conditions

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





B.1 6dB Bandwidth

Test Result

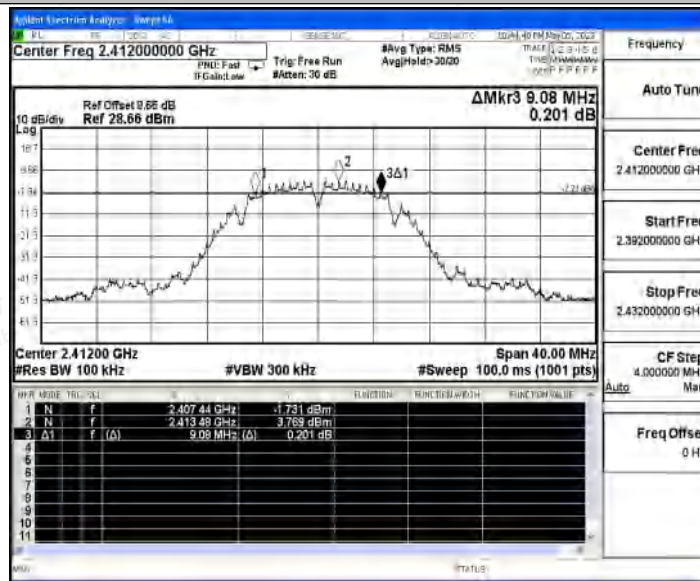
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.080	2407.440	2416.520	0.5	PASS
		2437	9.080	2432.440	2441.520	0.5	PASS
		2462	10.000	2457.000	2467.000	0.5	PASS
11G	Ant1	2412	16.320	2403.840	2420.160	0.5	PASS
		2437	16.360	2428.800	2445.160	0.5	PASS
		2462	16.320	2453.840	2470.160	0.5	PASS
11N20SISO	Ant1	2412	17.600	2403.200	2420.800	0.5	PASS
		2437	17.560	2428.200	2445.760	0.5	PASS
		2462	17.560	2453.200	2470.760	0.5	PASS
11N40SISO	Ant1	2422	36.080	2404.080	2440.160	0.5	PASS
		2437	36.000	2419.080	2455.080	0.5	PASS
		2452	36.000	2434.080	2470.080	0.5	PASS





Test Graphs

11B_Ant1_2412

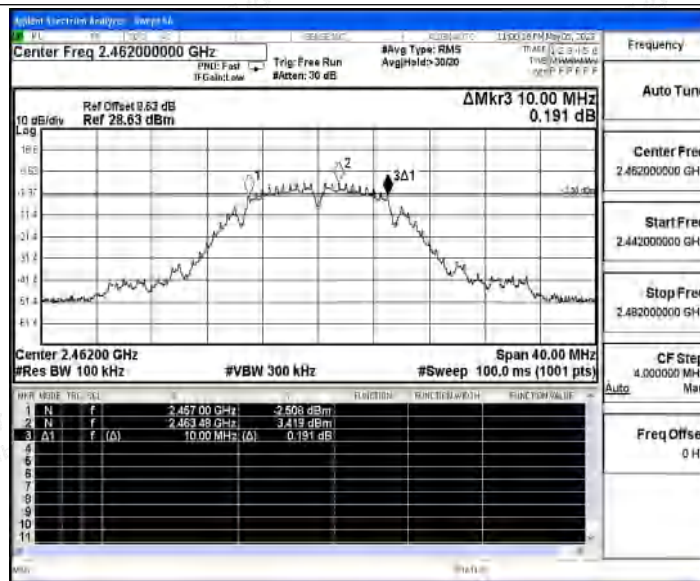


11B_Ant1_2437

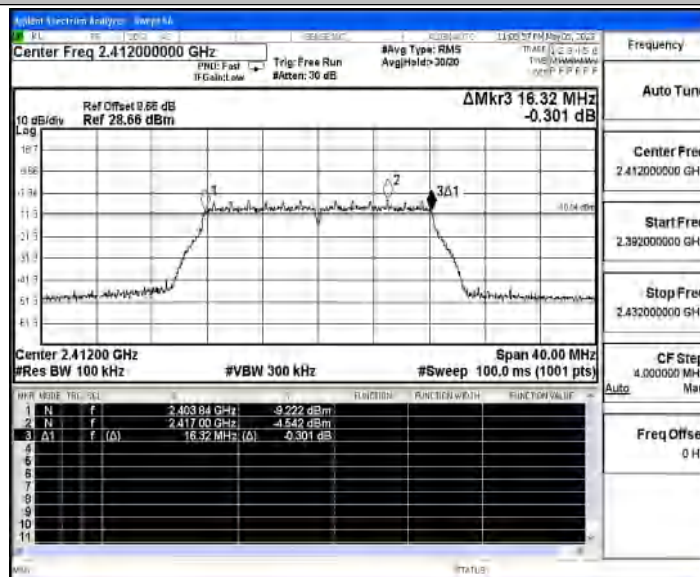


11B_Ant1_2462



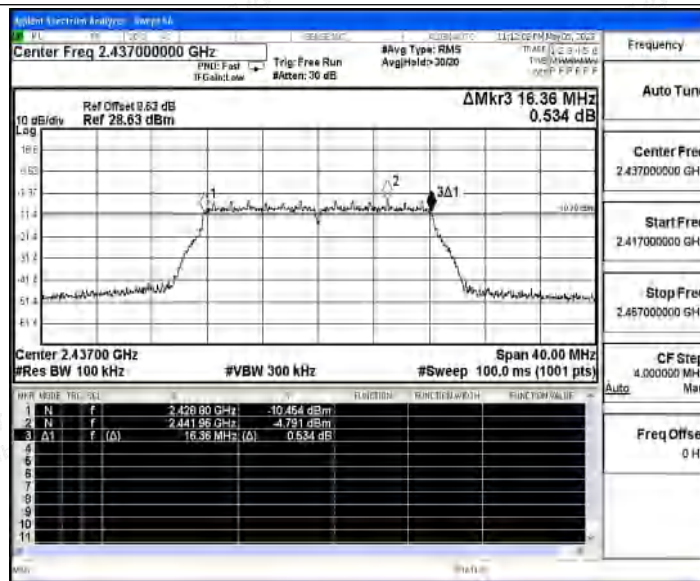


11G_Ant1_2412

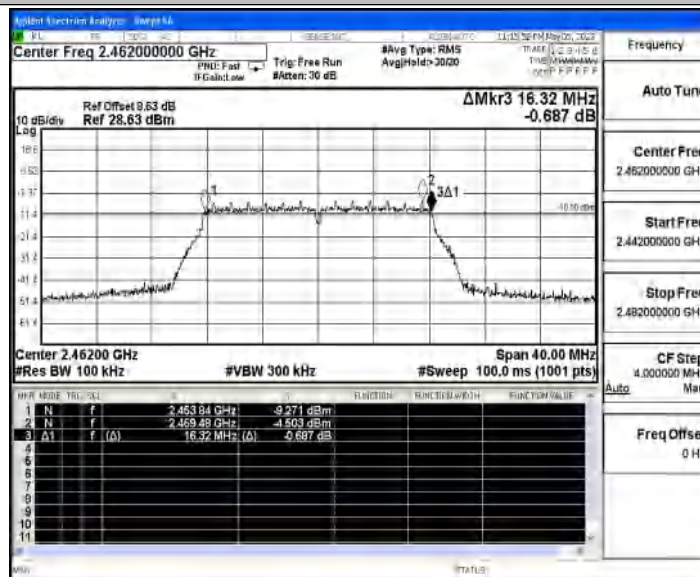


11G_Ant1_2437



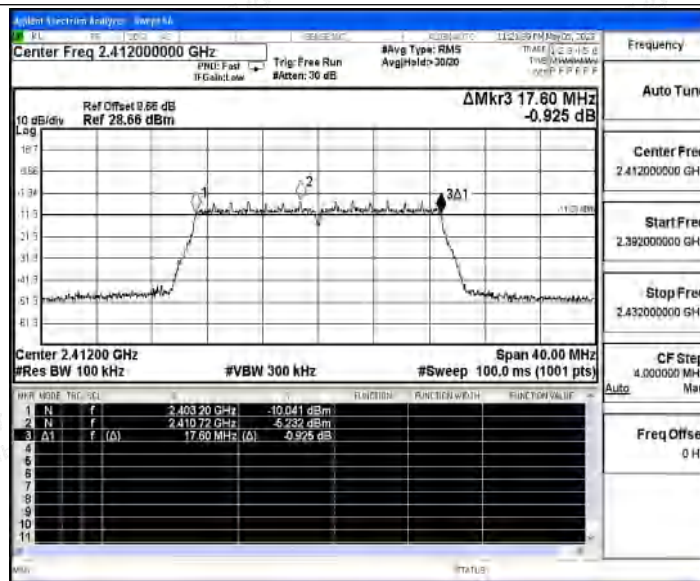


11G_Ant1_2462

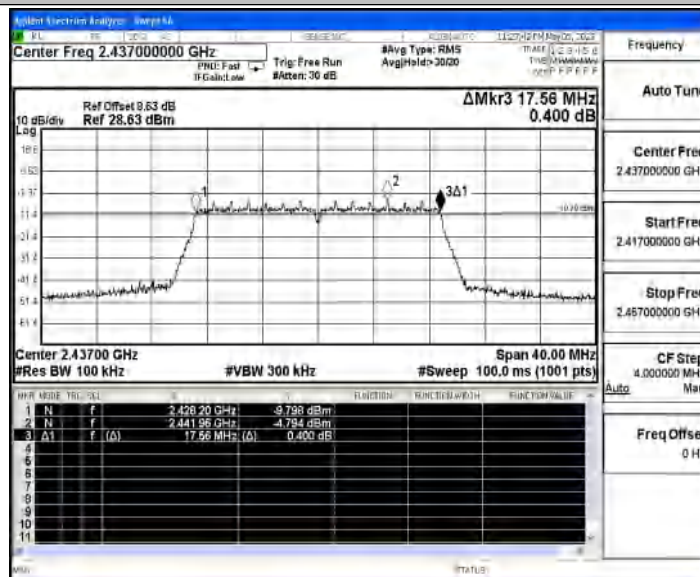


11N20SISO_Ant1_2412



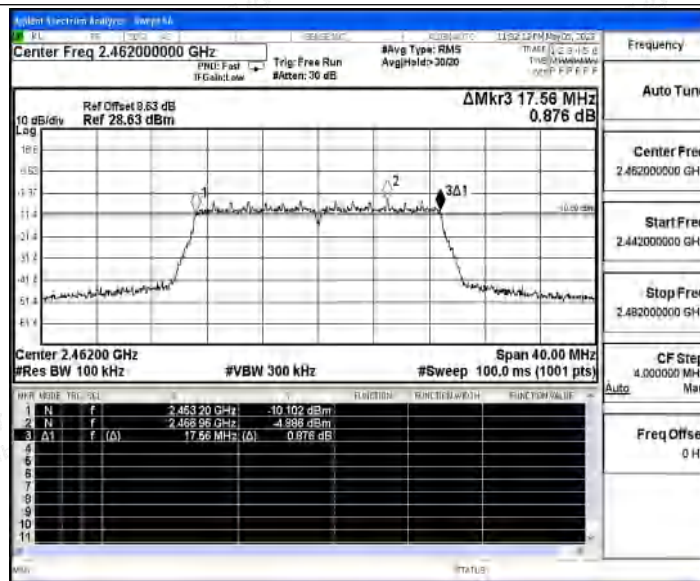


11N20SISO_Ant1_2437

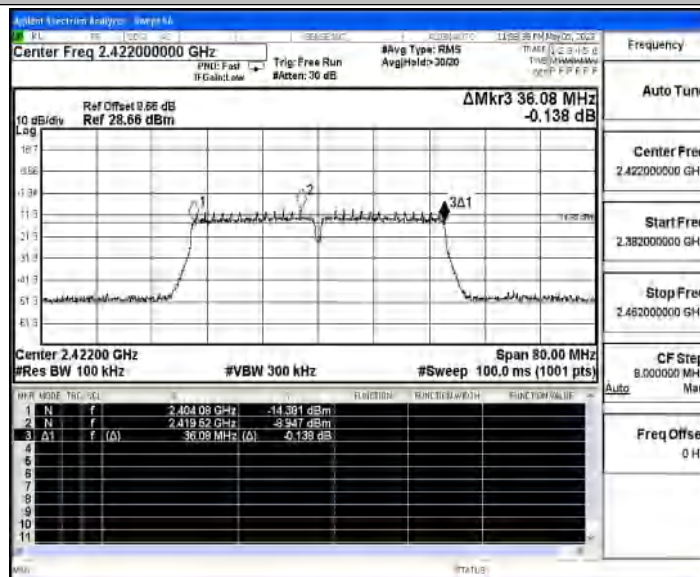


11N20SISO_Ant1_2462



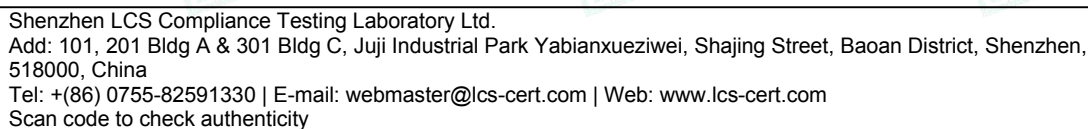
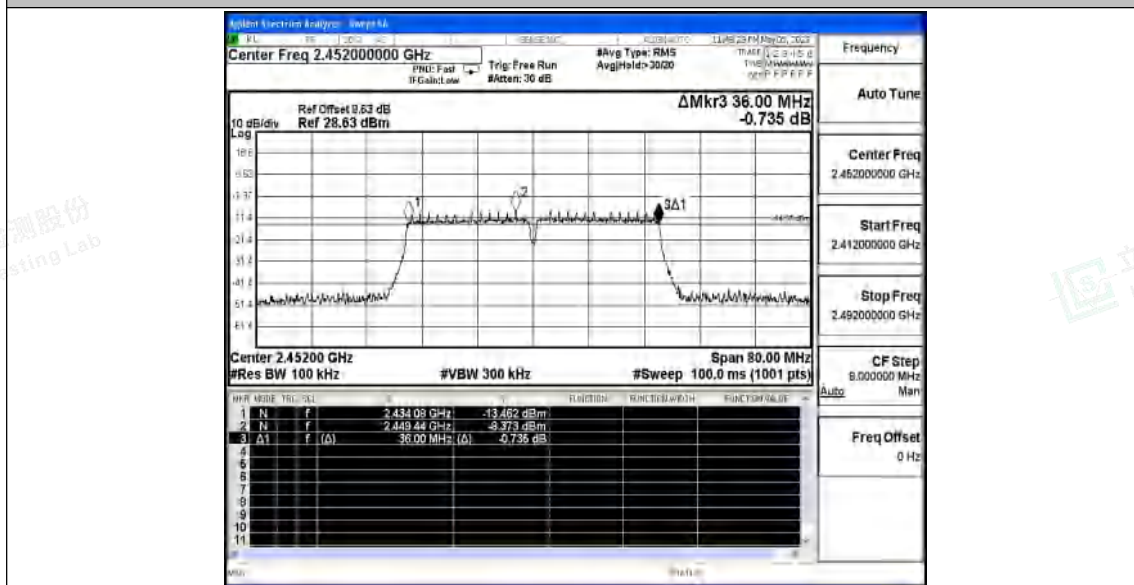


11N40SISO_Ant1_2422



11N40SISO_Ant1_2437







B.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.53	≤30.00	PASS
		2437	15.30	≤30.00	PASS
		2462	15.25	≤30.00	PASS
11G	Ant1	2412	14.93	≤30.00	PASS
		2437	14.73	≤30.00	PASS
		2462	14.59	≤30.00	PASS
11N20SISO	Ant1	2412	14.37	≤30.00	PASS
		2437	14.69	≤30.00	PASS
		2462	14.62	≤30.00	PASS
11N40SISO	Ant1	2422	13.25	≤30.00	PASS
		2437	14.86	≤30.00	PASS
		2452	13.98	≤30.00	PASS





B.3 Maximum power spectral density

Test Result

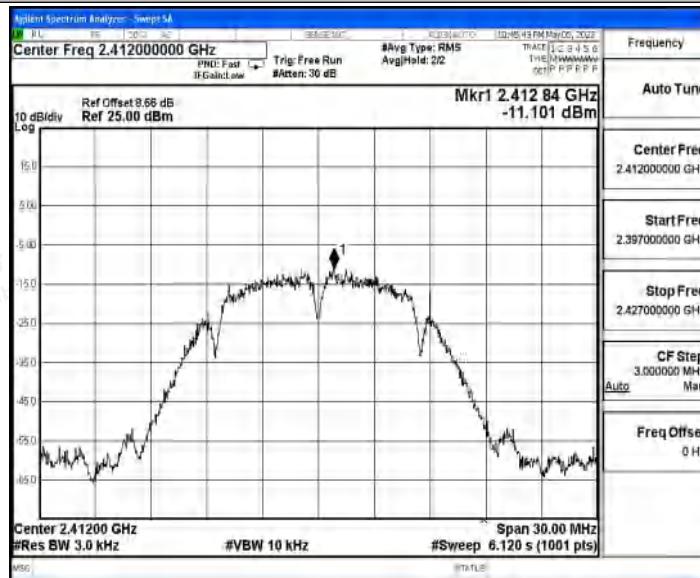
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-11.1	≤8.00	PASS
		2437	-10.91	≤8.00	PASS
		2462	-11.14	≤8.00	PASS
11G	Ant1	2412	-19.39	≤8.00	PASS
		2437	-19.73	≤8.00	PASS
		2462	-19.47	≤8.00	PASS
11N20SISO	Ant1	2412	-19.72	≤8.00	PASS
		2437	-19.6	≤8.00	PASS
		2462	-19.7	≤8.00	PASS
11N40SISO	Ant1	2422	-23.73	≤8.00	PASS
		2437	-21.42	≤8.00	PASS
		2452	-22.57	≤8.00	PASS





Test Graphs

11B_Ant1_2412

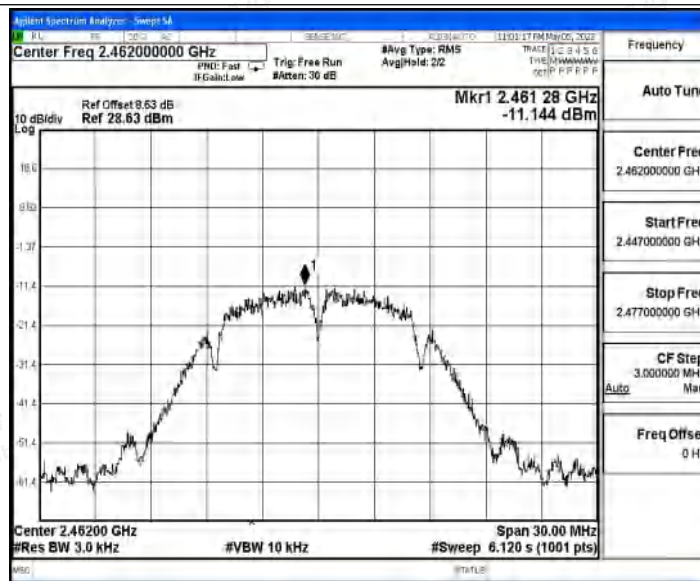


11B_Ant1_2437

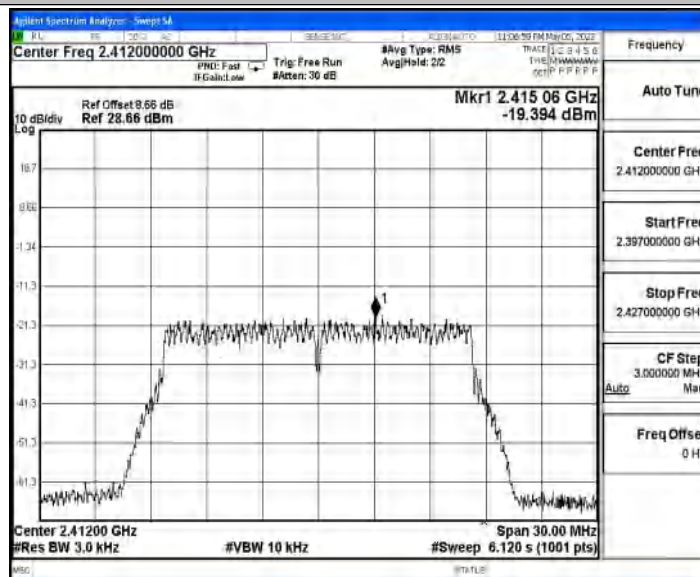


11B_Ant1_2462



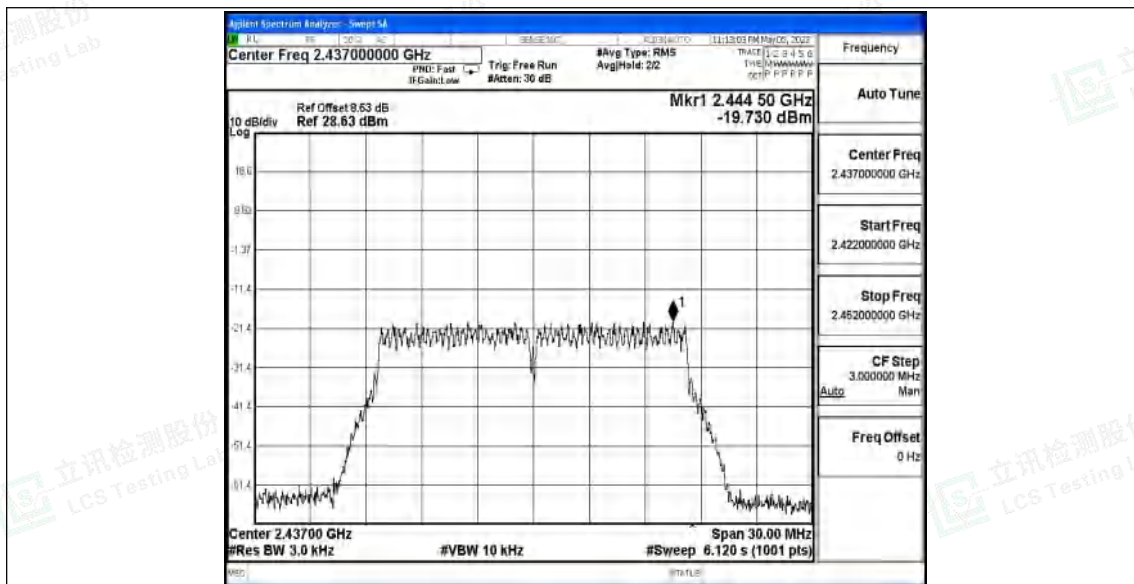


11G_Ant1_2412

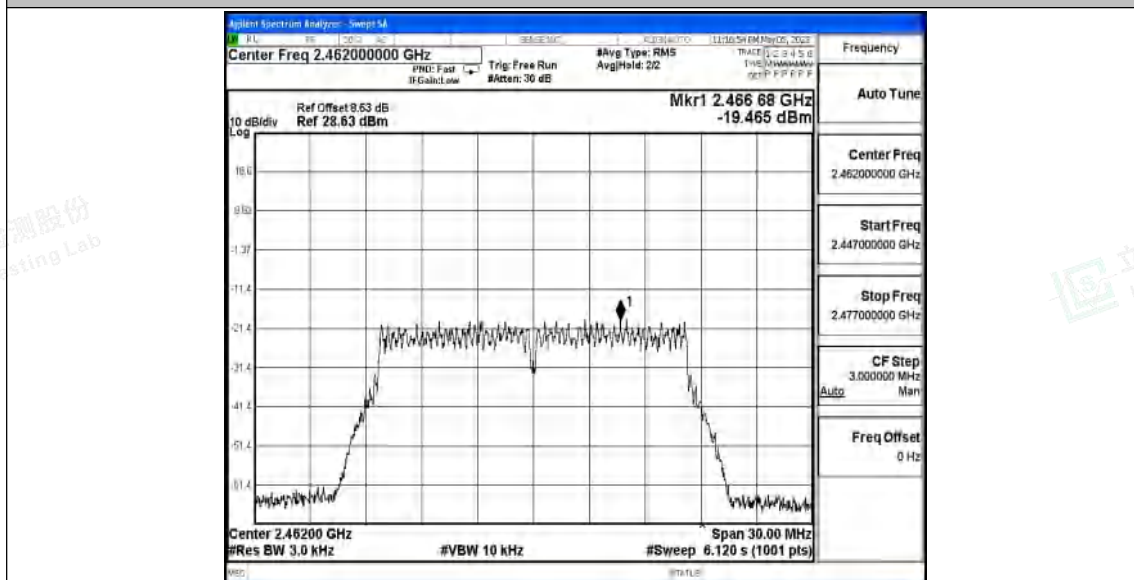


11G_Ant1_2437



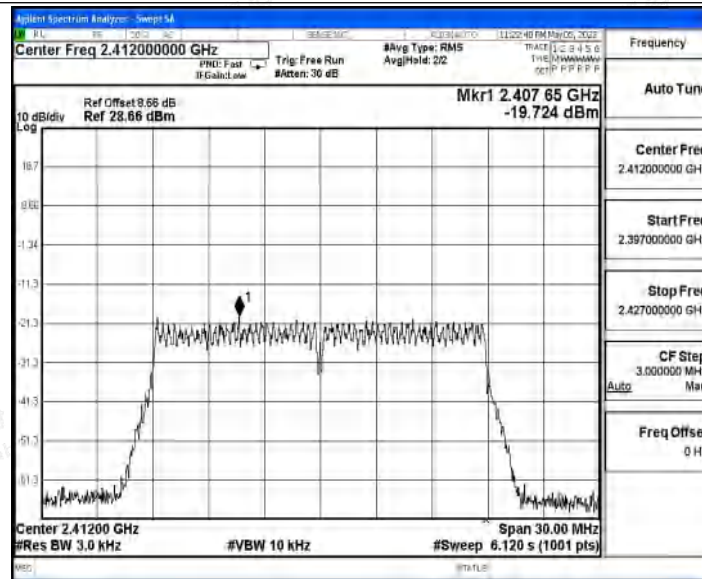


11G_Ant1_2462

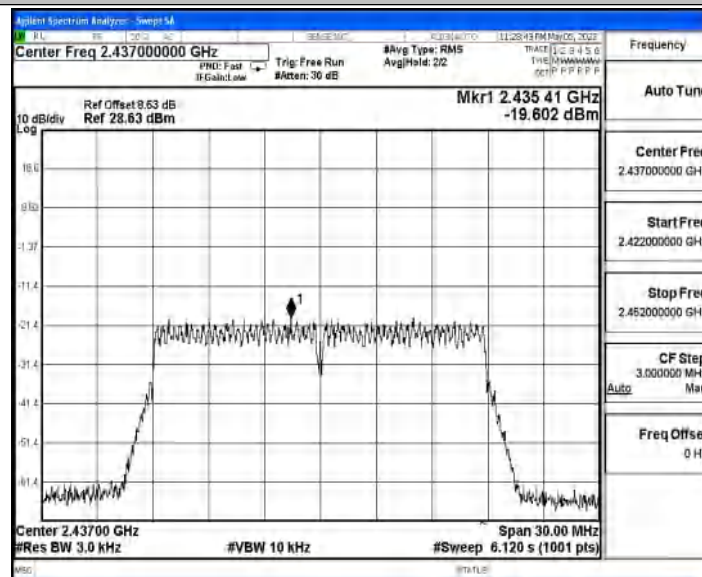


11N20SISO_Ant1_2412



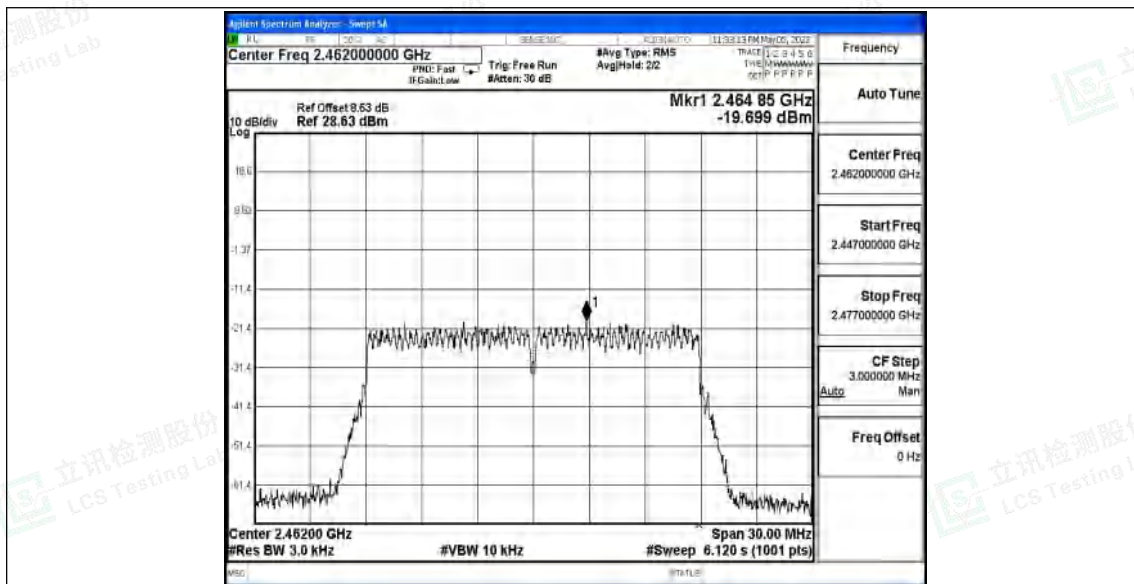


11N20SISO_Ant1_2437

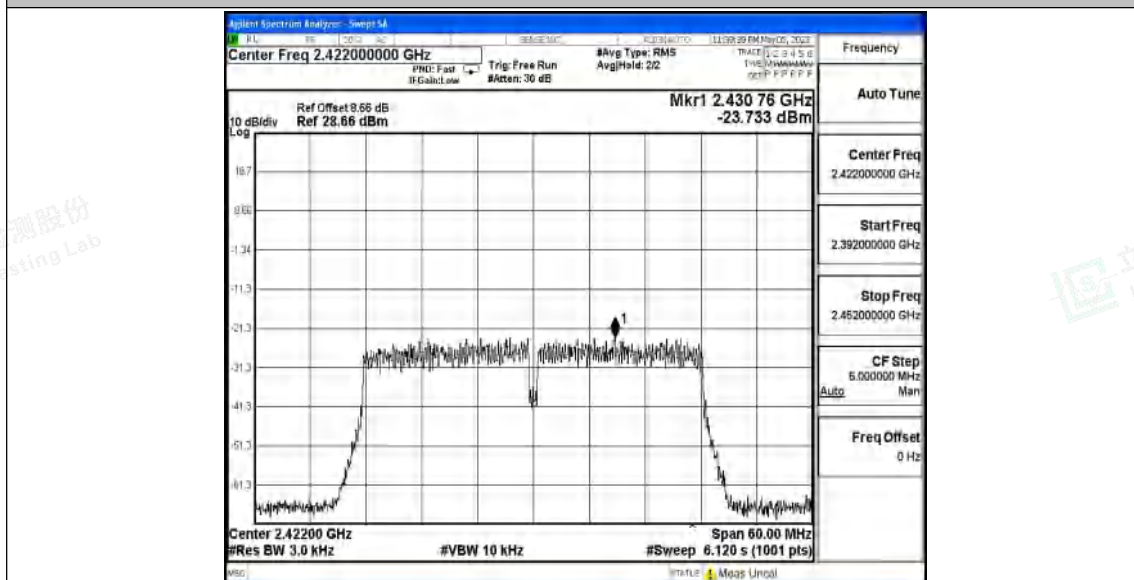


11N20SISO_Ant1_2462



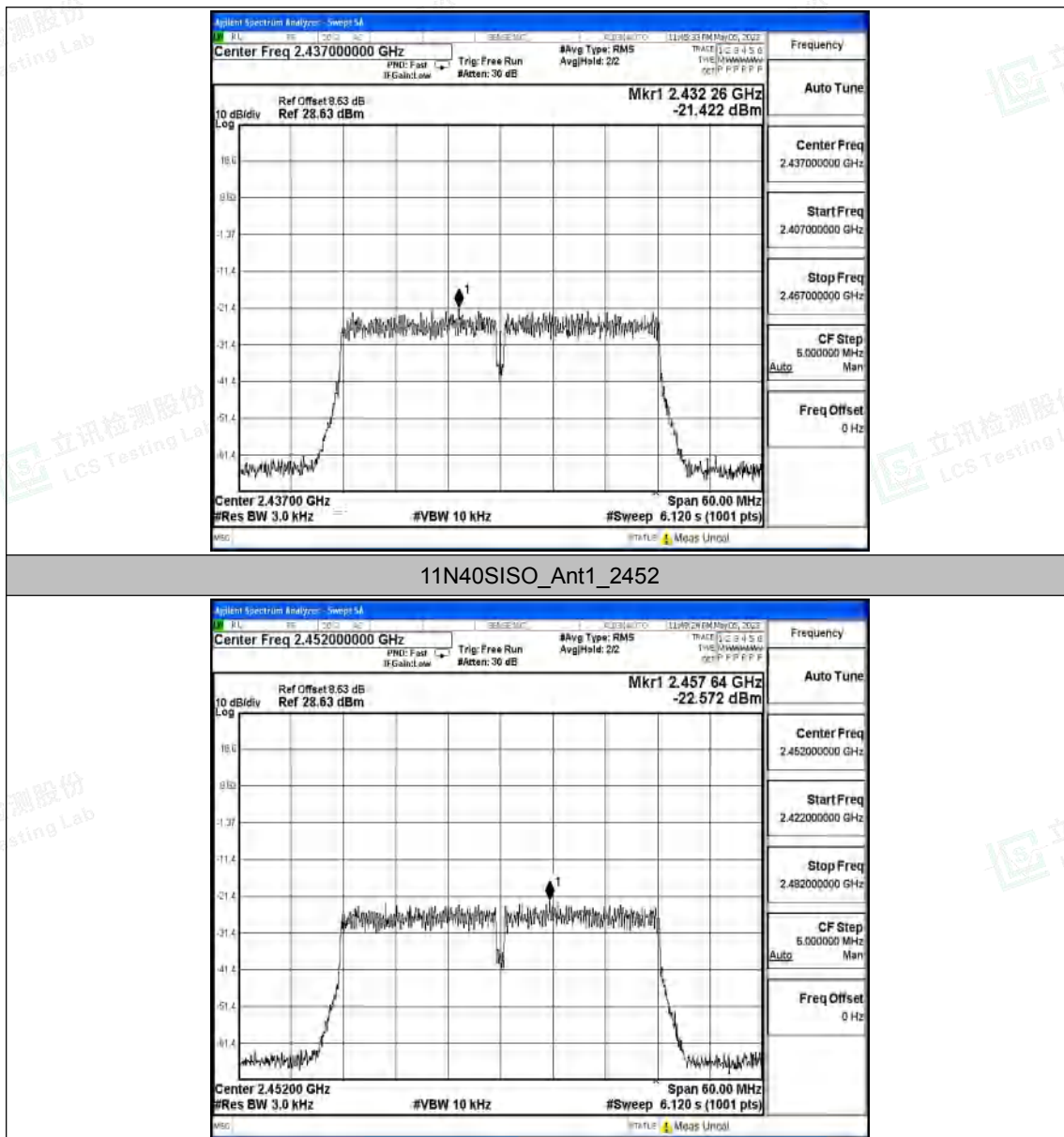


11N40SISO_Ant1_2422



11N40SISO_Ant1_2437







B.4 Band edge measurements

Test Result

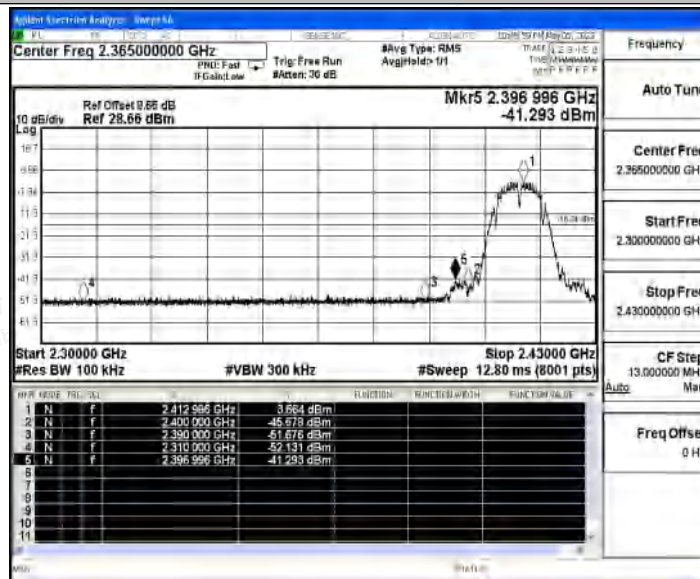
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.66	-41.29	≤-16.34	PASS
		High	2462	3.51	-46.81	≤-16.49	PASS
11G	Ant1	Low	2412	-4.17	-44.88	≤-24.17	PASS
		High	2462	-4.55	-47.82	≤-24.55	PASS
11N20SISO	Ant1	Low	2412	-5.15	-45.23	≤-25.15	PASS
		High	2462	-4.54	-47.61	≤-24.54	PASS
11N40SISO	Ant1	Low	2422	-8.86	-47.56	≤-28.86	PASS
		High	2452	-8.27	-45.68	≤-28.27	PASS



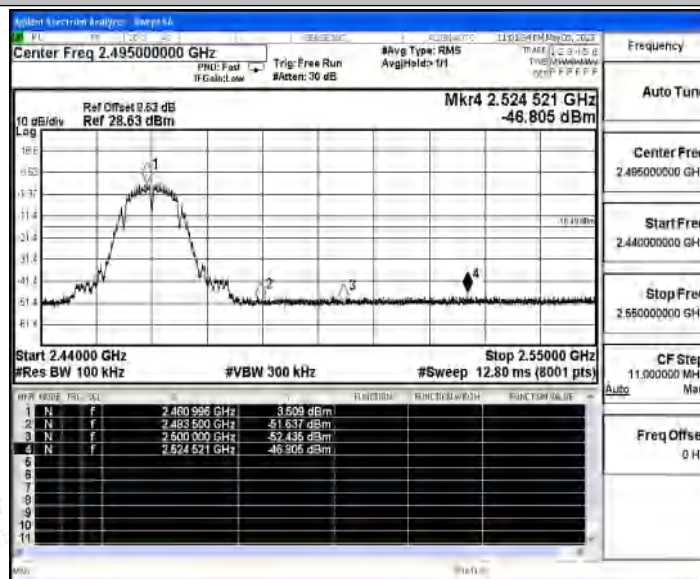


Test Graphs

11B_Ant1_Low_2412

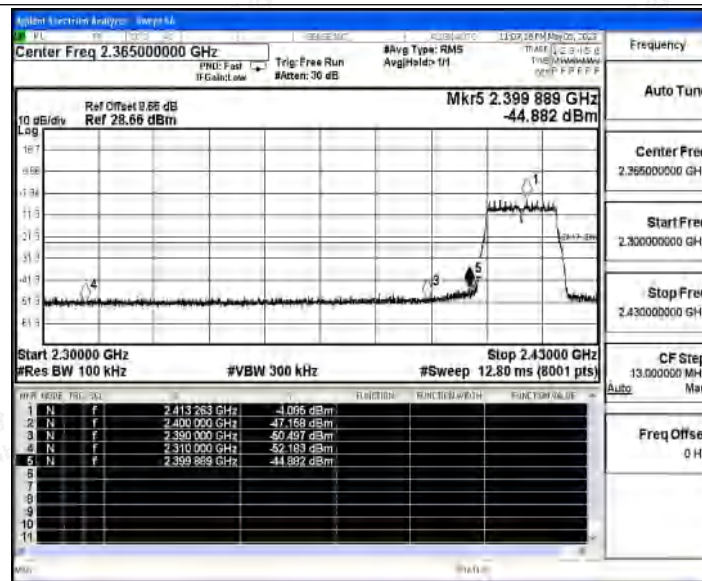


11B_Ant1_High_2462

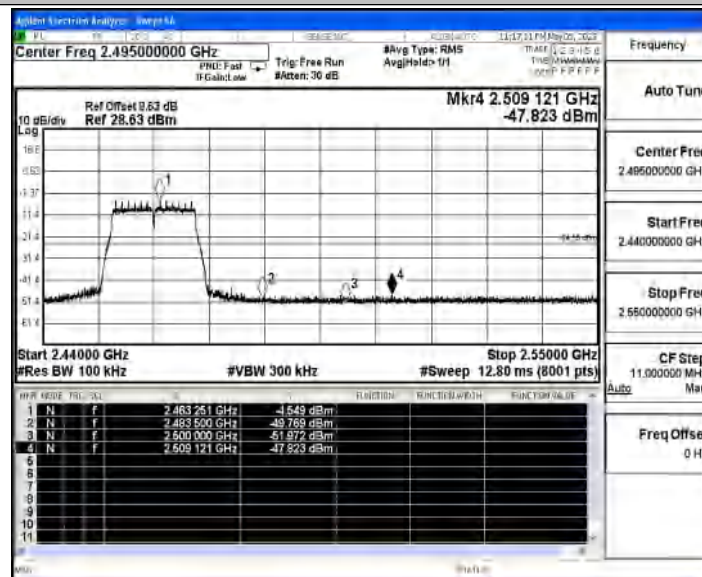


11G_Ant1_Low_2412



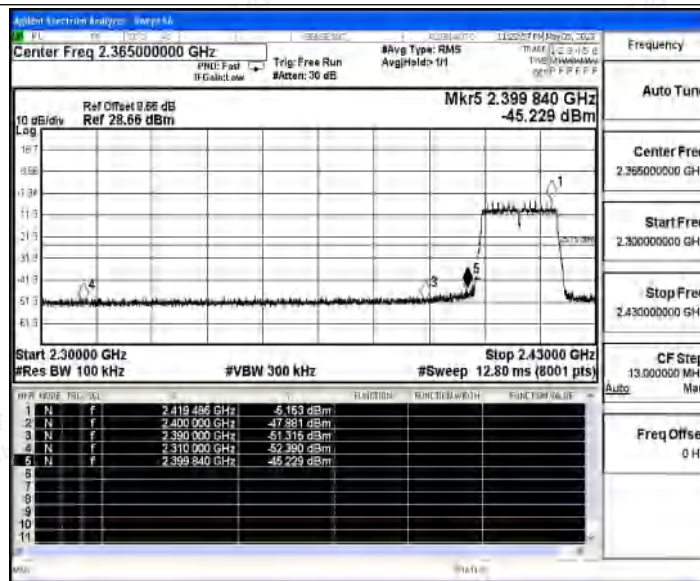


11G_Ant1_High_2462

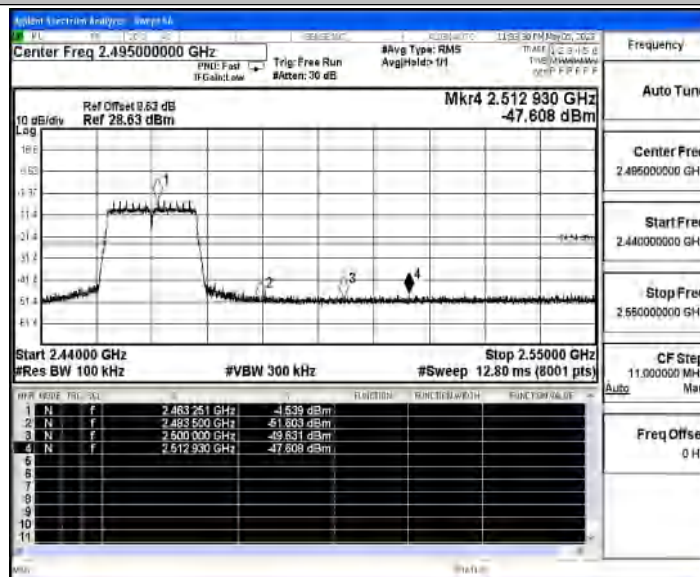


11N20SISO_Ant1_Low_2412



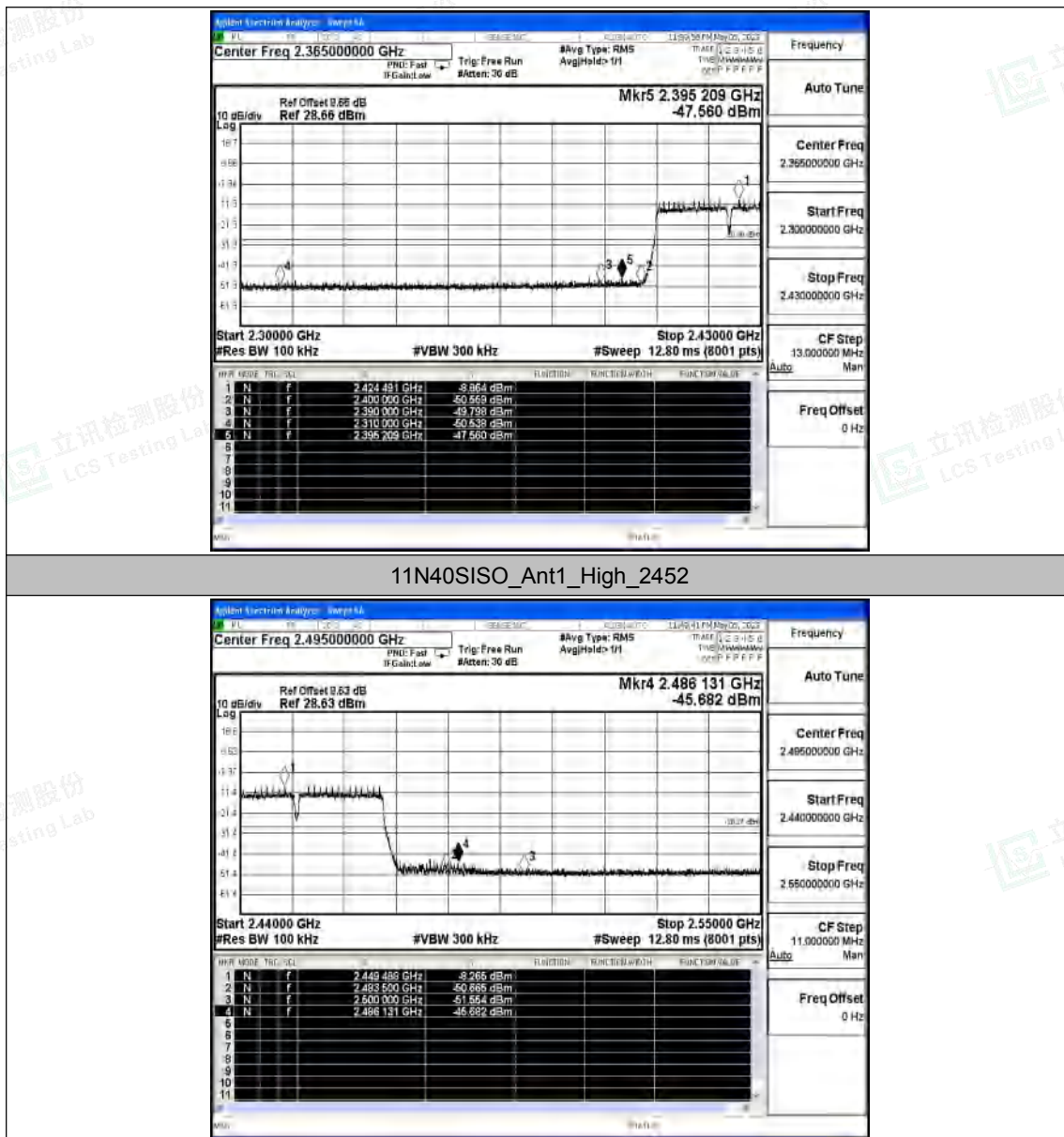


11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422







B.5 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.67	3.67	---	PASS
			30~1000	3.67	-60.11	≤-16.33	PASS
			1000~26500	3.67	-42.68	≤-16.33	PASS
		2437	Reference	3.42	3.42	---	PASS
			30~1000	3.42	-60.51	≤-16.58	PASS
			1000~26500	3.42	-46.28	≤-16.58	PASS
		2462	Reference	3.49	3.49	---	PASS
			30~1000	3.49	-60.6	≤-16.51	PASS
			1000~26500	3.49	-45.71	≤-16.51	PASS
11G	Ant1	2412	Reference	-4.29	-4.29	---	PASS
			30~1000	-4.29	-60.28	≤-24.29	PASS
			1000~26500	-4.29	-46.12	≤-24.29	PASS
		2437	Reference	-4.32	-4.32	---	PASS
			30~1000	-4.32	-59.61	≤-24.32	PASS
			1000~26500	-4.32	-46.47	≤-24.32	PASS
		2462	Reference	-4.70	-4.70	---	PASS
			30~1000	-4.70	-59.53	≤-24.7	PASS
			1000~26500	-4.70	-46.06	≤-24.7	PASS
11N20SISO	Ant1	2412	Reference	-4.96	-4.96	---	PASS
			30~1000	-4.96	-58.93	≤-24.96	PASS
			1000~26500	-4.96	-45.73	≤-24.96	PASS
		2437	Reference	-4.42	-4.42	---	PASS
			30~1000	-4.42	-60.35	≤-24.42	PASS
			1000~26500	-4.42	-44.9	≤-24.42	PASS
		2462	Reference	-4.19	-4.19	---	PASS
			30~1000	-4.19	-60.27	≤-24.19	PASS
			1000~26500	-4.19	-44.95	≤-24.19	PASS
11N40SISO	Ant1	2422	Reference	-8.79	-8.79	---	PASS
			30~1000	-8.79	-59.5	≤-28.79	PASS
			1000~26500	-8.79	-46.04	≤-28.79	PASS
		2437	Reference	-7.31	-7.31	---	PASS
			30~1000	-7.31	-60.47	≤-27.31	PASS
			1000~26500	-7.31	-46.05	≤-27.31	PASS
		2452	Reference	-8.06	-8.06	---	PASS
			30~1000	-8.06	-60.36	≤-28.06	PASS



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			1000~26500	-8.06	-46.47	≤-28.06	PASS
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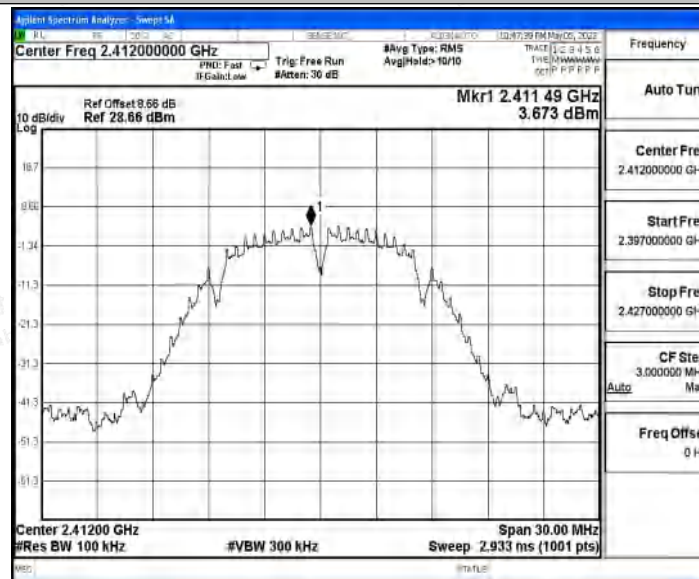


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518000, China
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Scan code to check authenticity

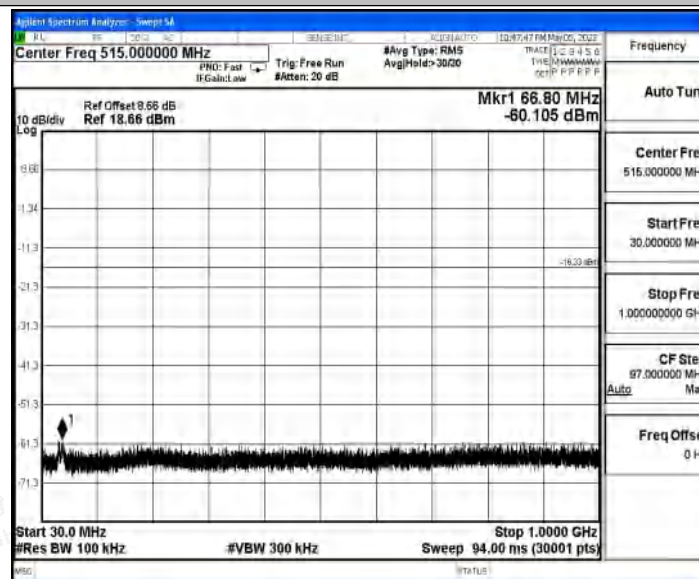


Test Graphs

11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000



11B_Ant1_2412_1000~26500

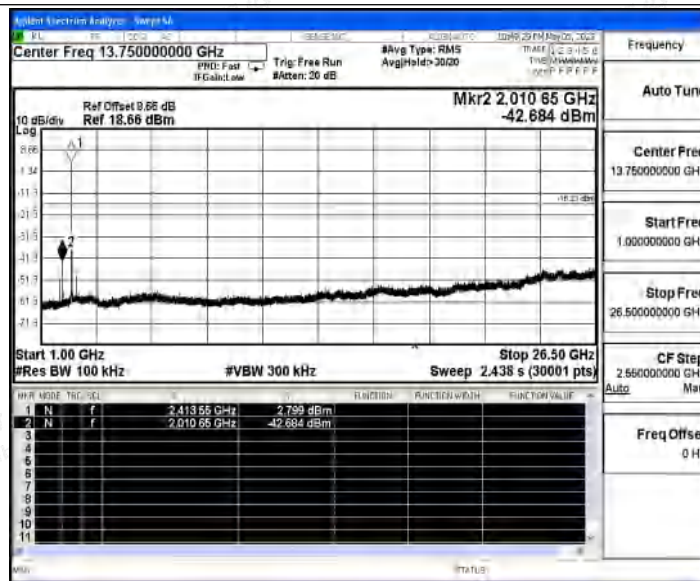


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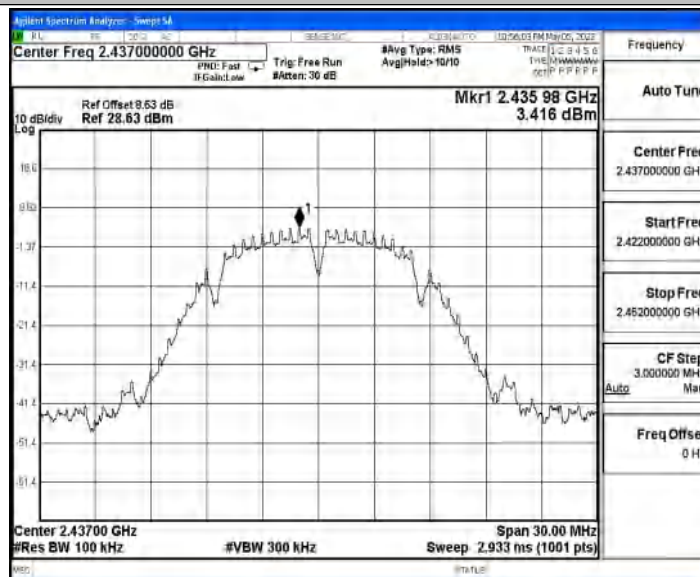
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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

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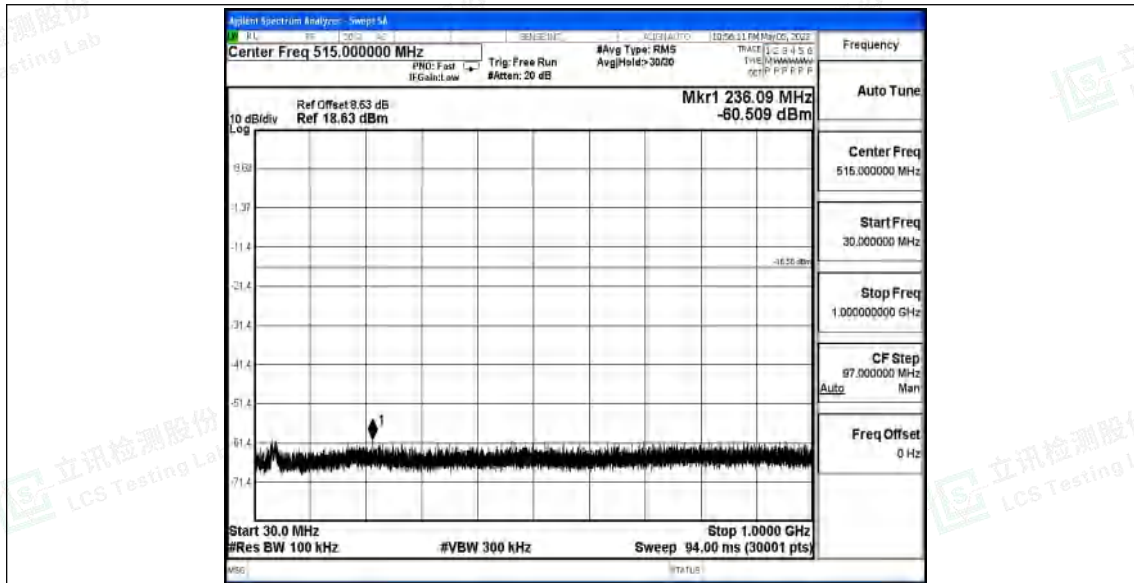


11B_Ant1_2437_0~Reference

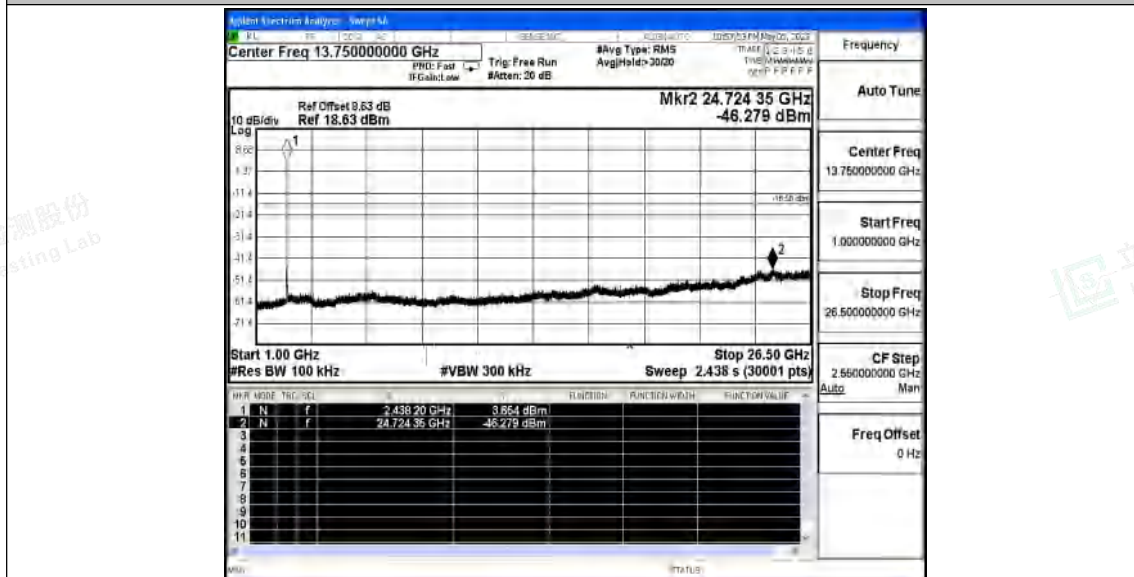


11B_Ant1_2437_30~1000



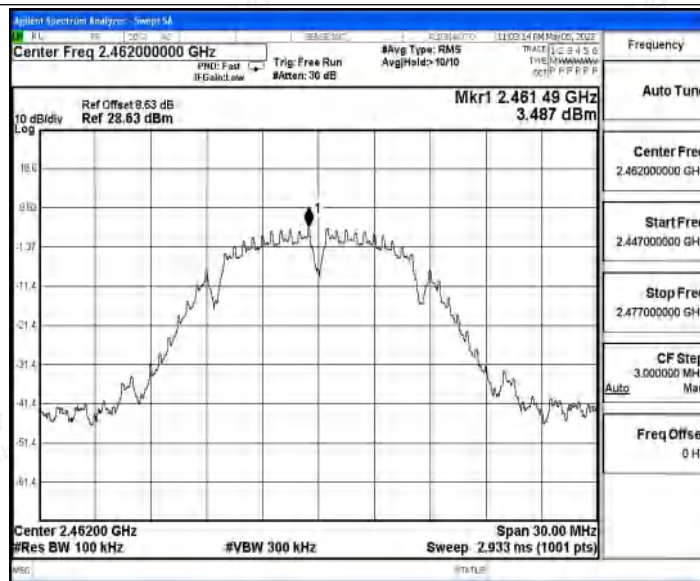


11B_Ant1_2437_1000~26500

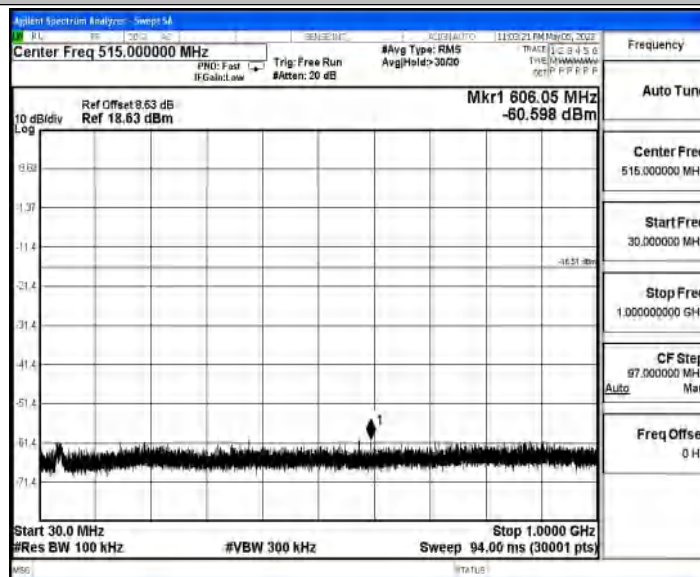


11B_Ant1_2462_0~Reference



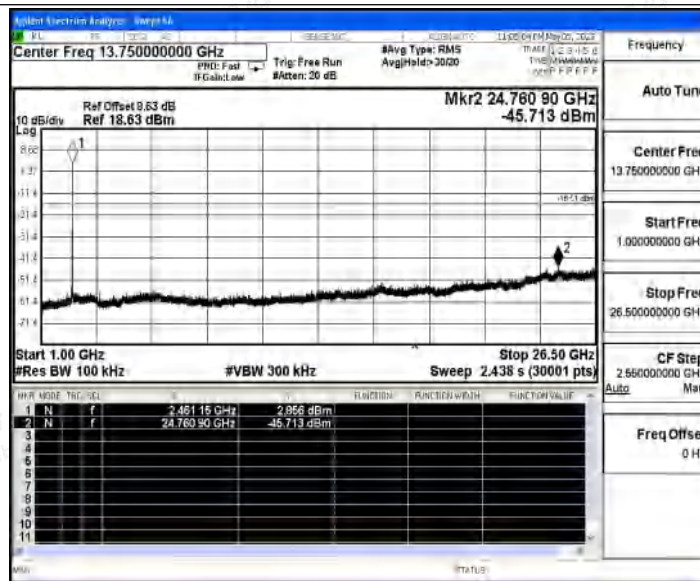


11B_Ant1_2462_30~1000

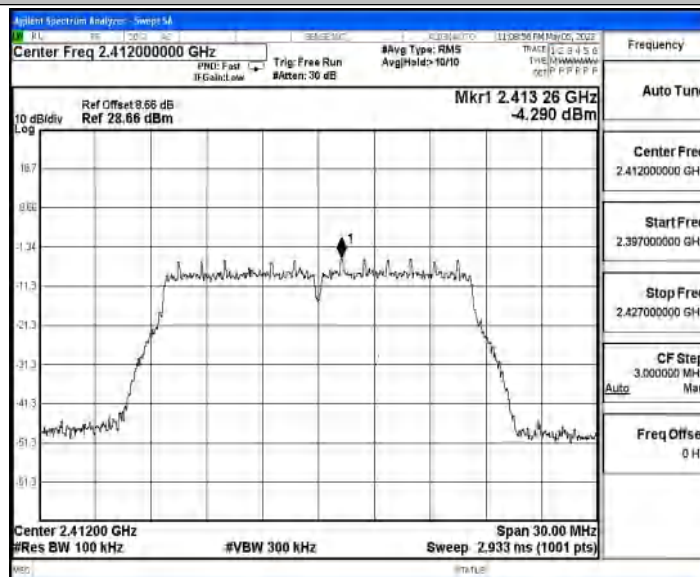


11B_Ant1_2462_1000~26500





11G_Ant1_2412_0~Reference



11G_Ant1_2412_30~1000

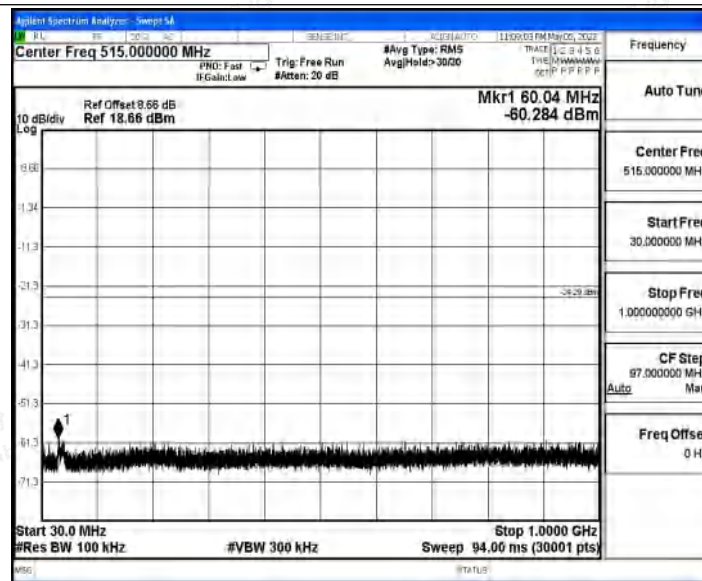


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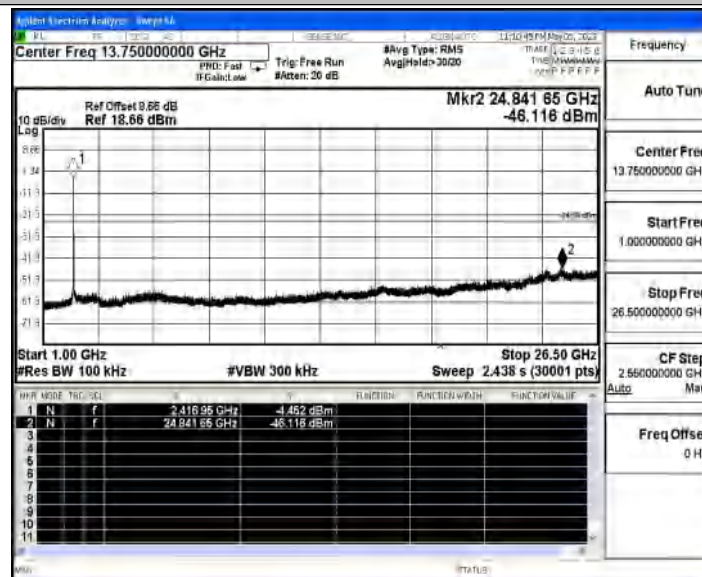
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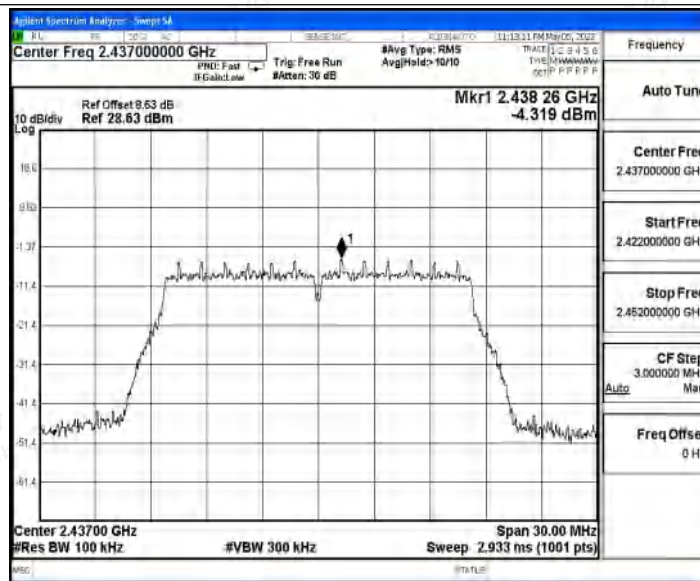


11G_Ant1_2412_1000~26500

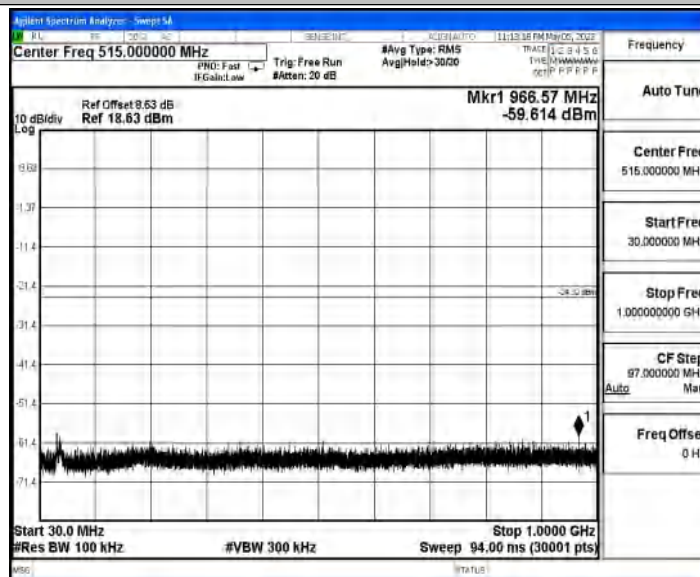


11G_Ant1_2437_0~Reference



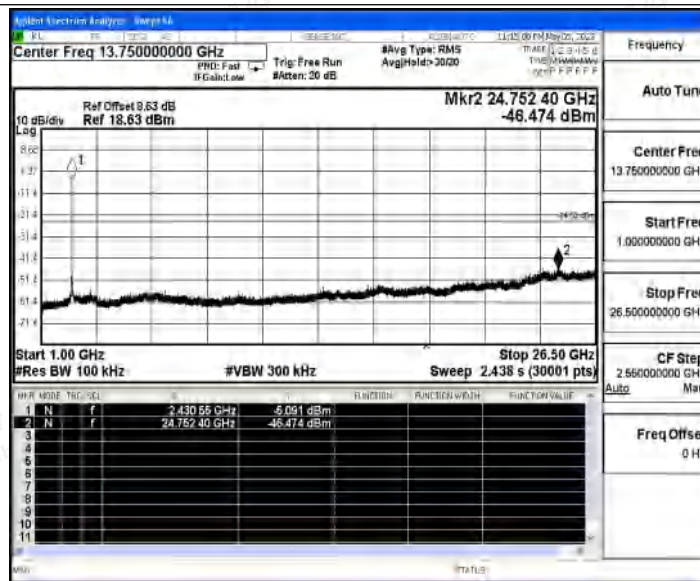


11G_Ant1_2437_30~1000

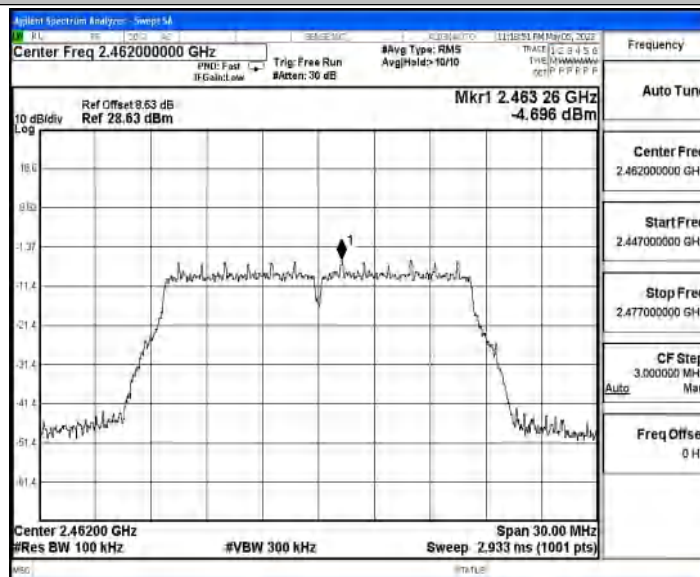


11G_Ant1_2437_1000~26500





11G_Ant1_2462_0~Reference



11G_Ant1_2462_30~1000

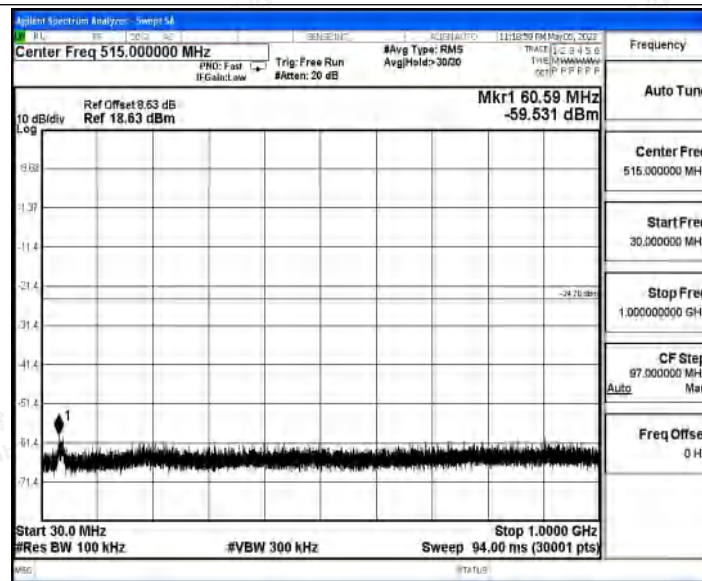


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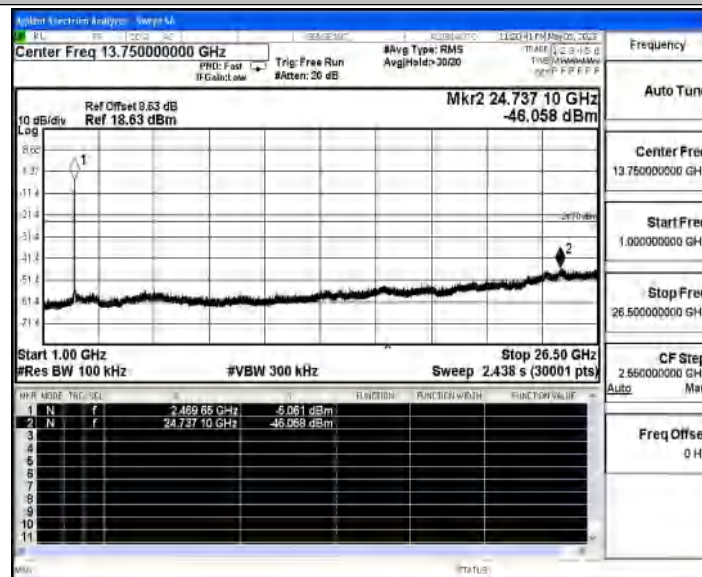
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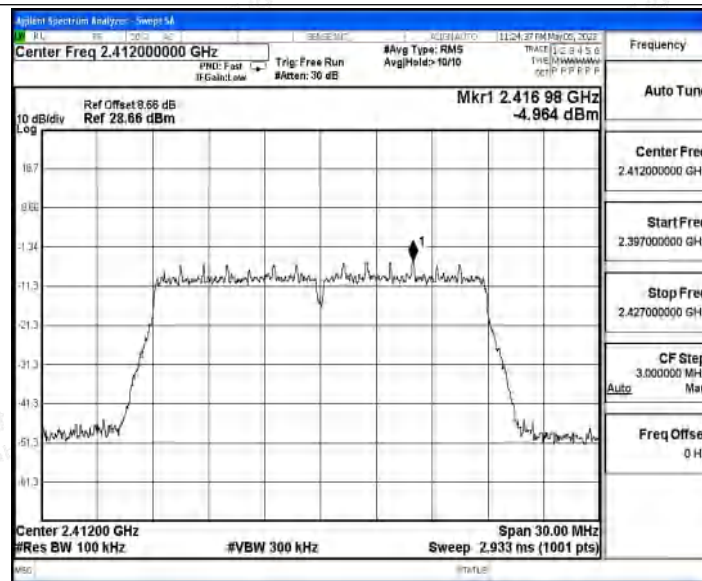


11G_Ant1_2462_1000~26500

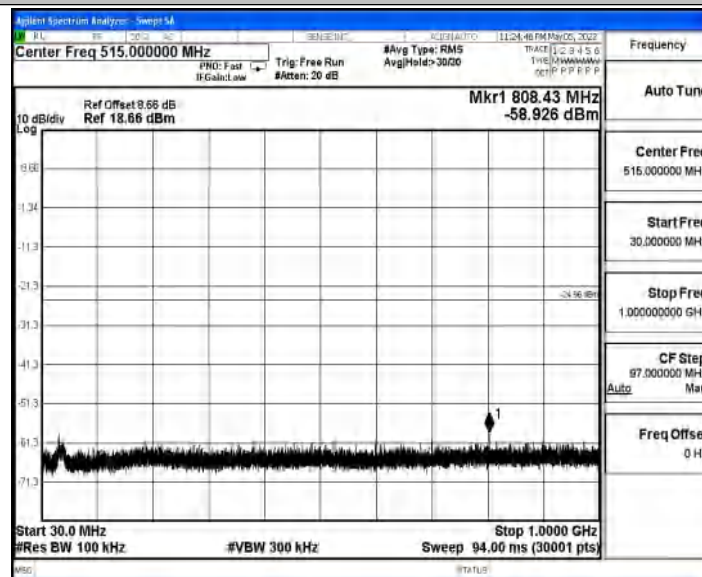


11N20SISO_Ant1_2412_0~Reference



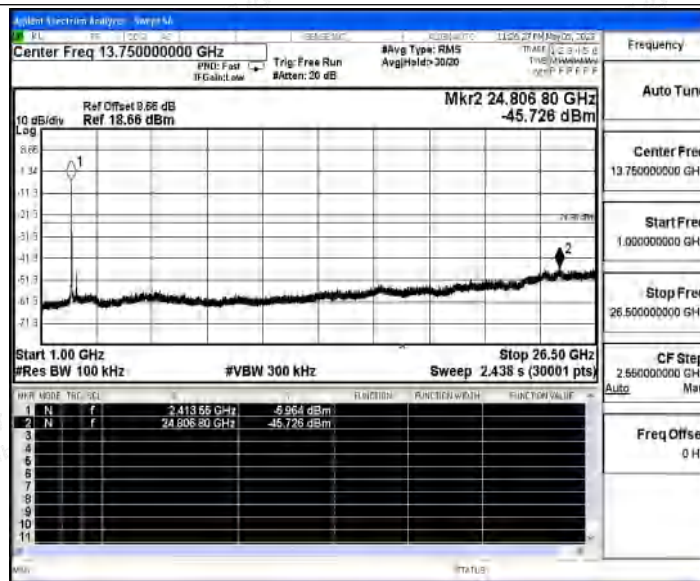


11N20SISO_Ant1_2412_30~1000

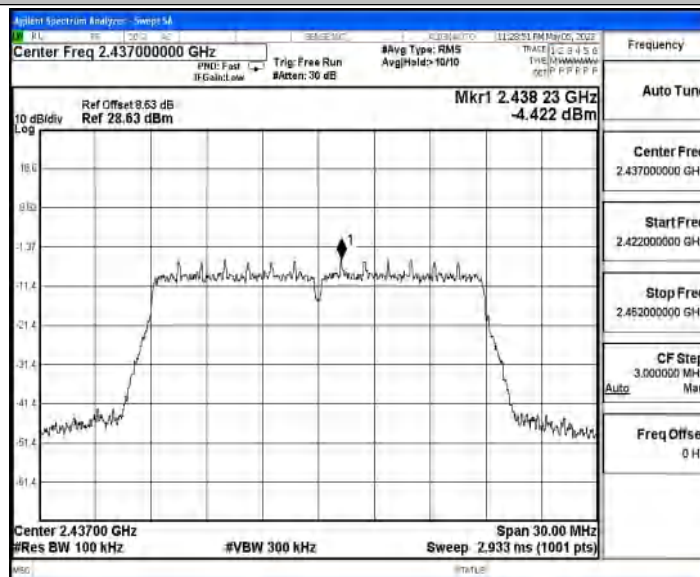


11N20SISO_Ant1_2412_1000~26500



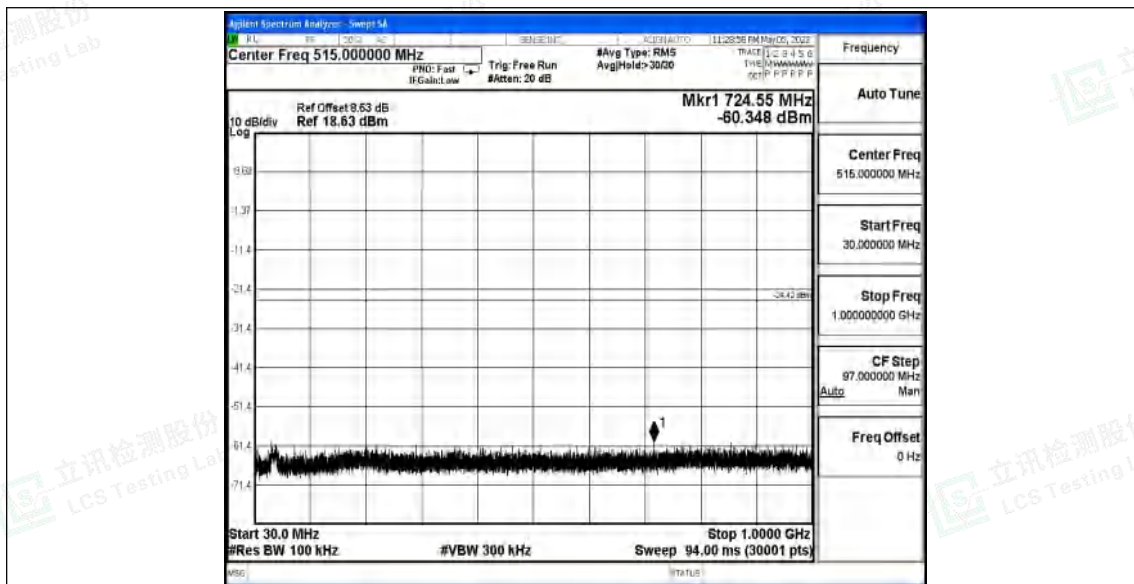


11N20SISO_Ant1_2437_0~Reference

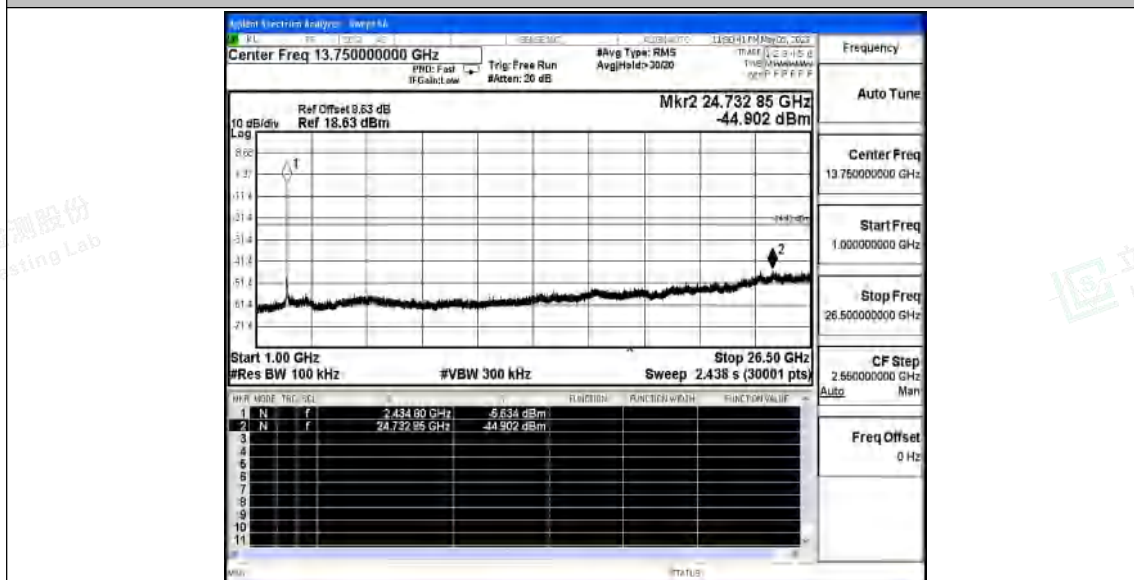


11N20SISO_Ant1_2437_30~1000



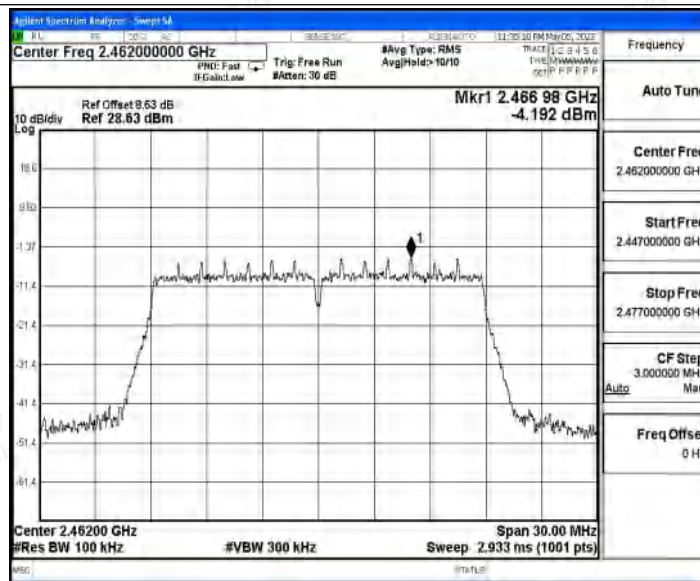


11N20SISO_Ant1_2437_1000~26500

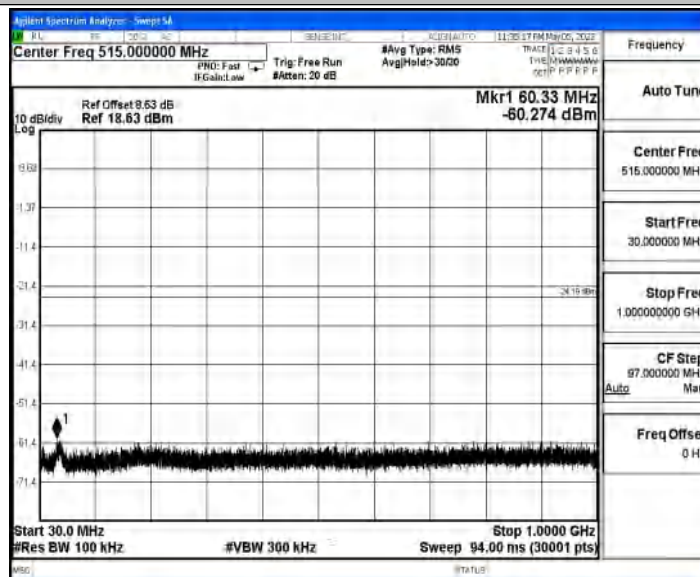


11N20SISO_Ant1_2462_0~Reference



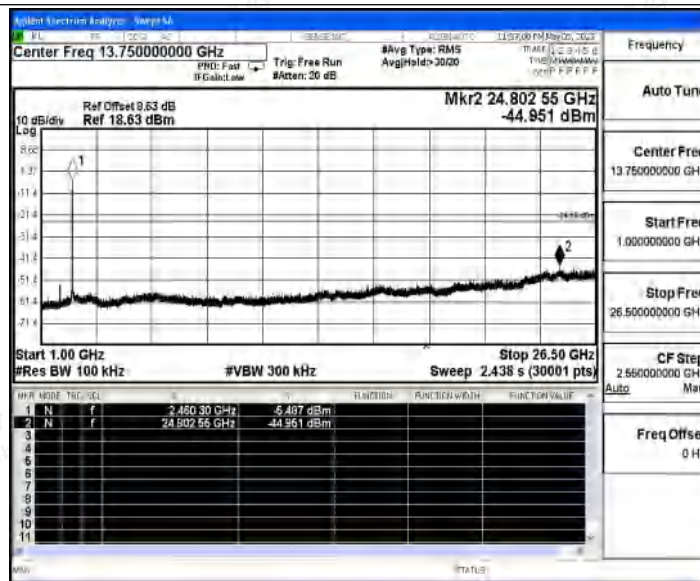


11N20SISO_Ant1_2462_30~1000

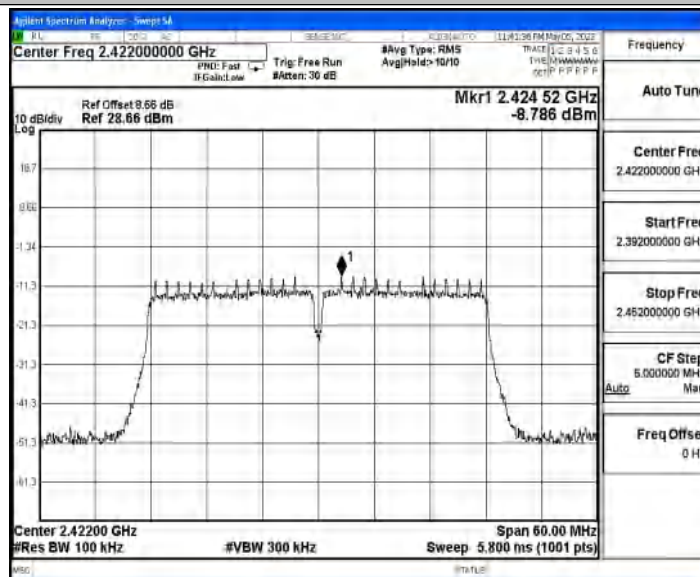


11N20SISO_Ant1_2462_1000~26500



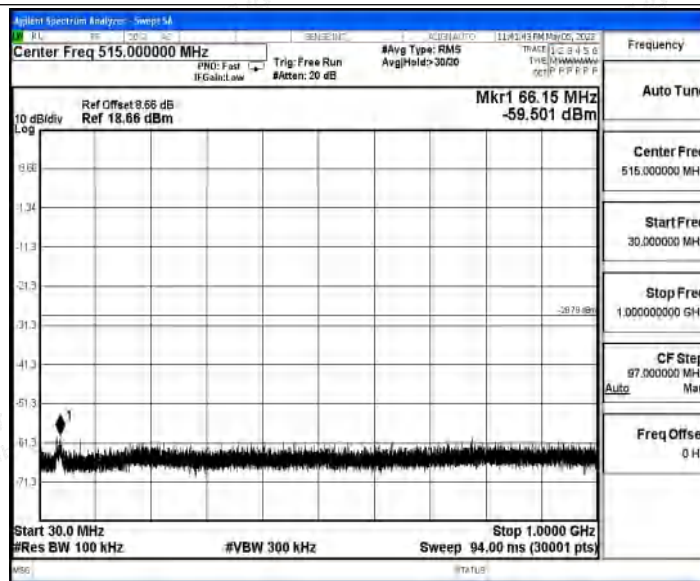


11N40SISO_Ant1_2422_0~Reference

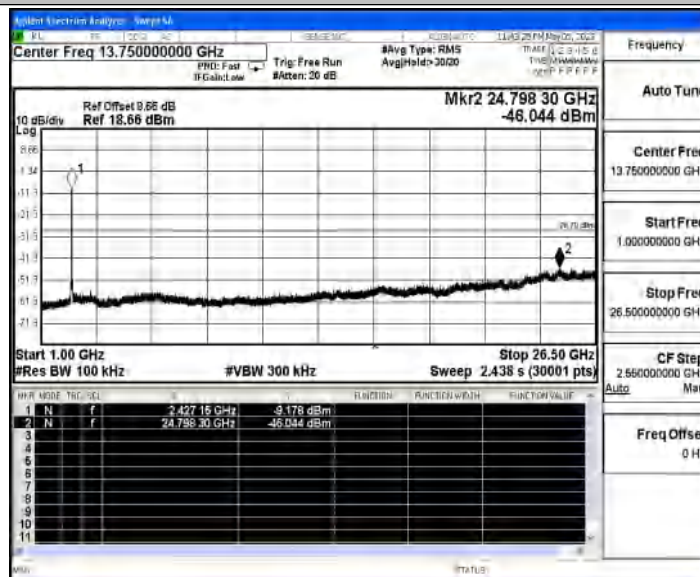


11N40SISO_Ant1_2422_30~1000



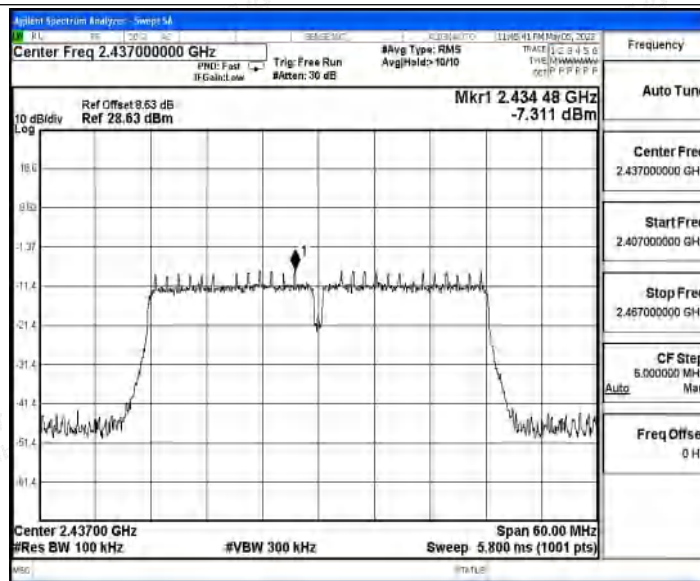


11N40SISO_Ant1_2422_1000~26500

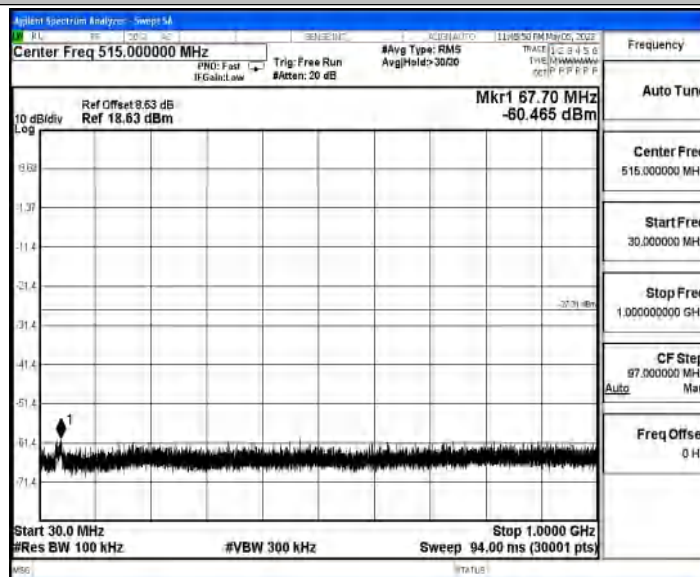


11N40SISO_Ant1_2437_0~Reference



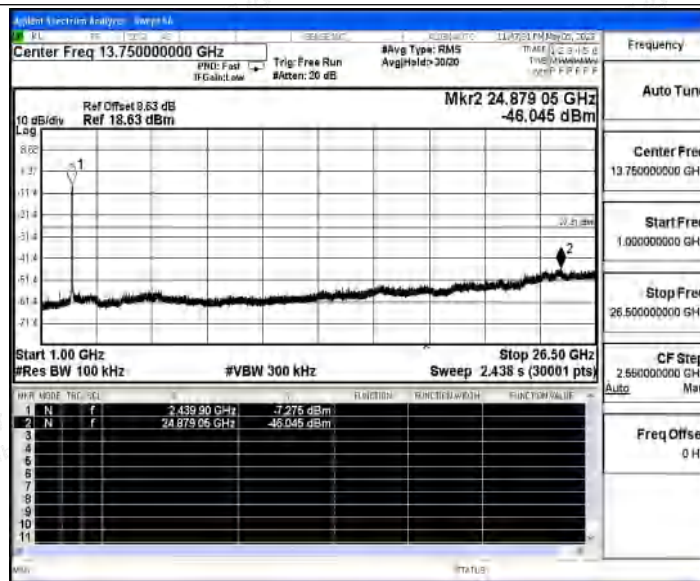


11N40SISO_Ant1_2437_30~1000

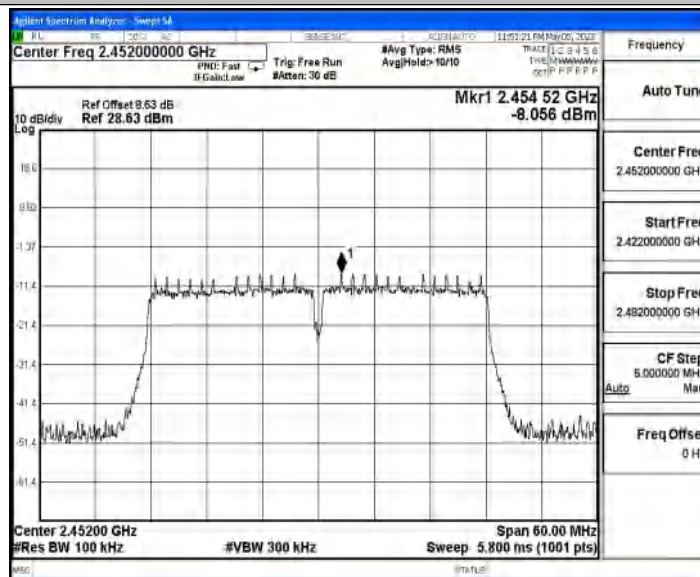


11N40SISO_Ant1_2437_1000~26500



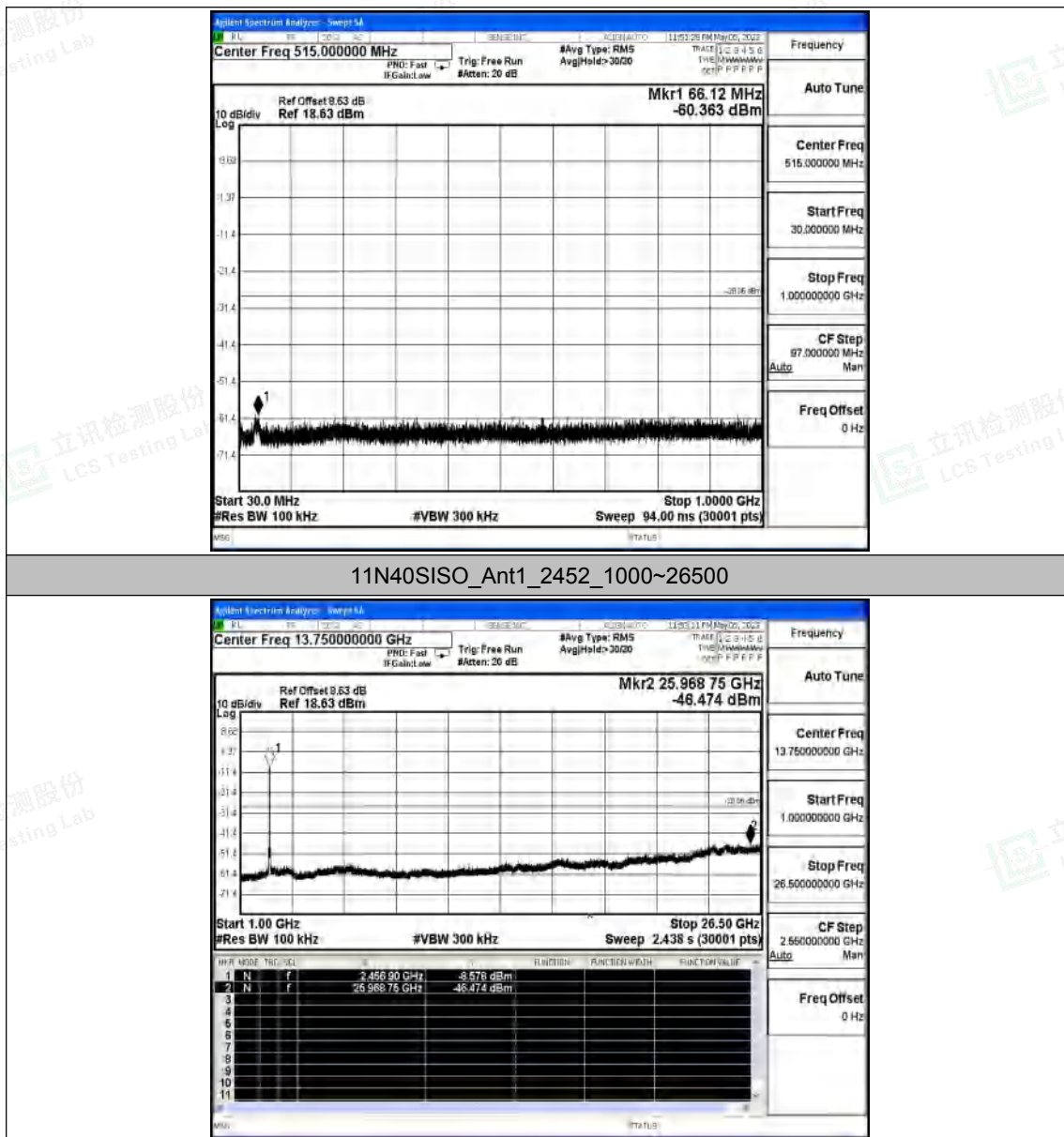


11N40SISO_Ant1_2452_0~Reference



11N40SISO_Ant1_2452_30~1000







B.6 Duty Cycle

Test Result

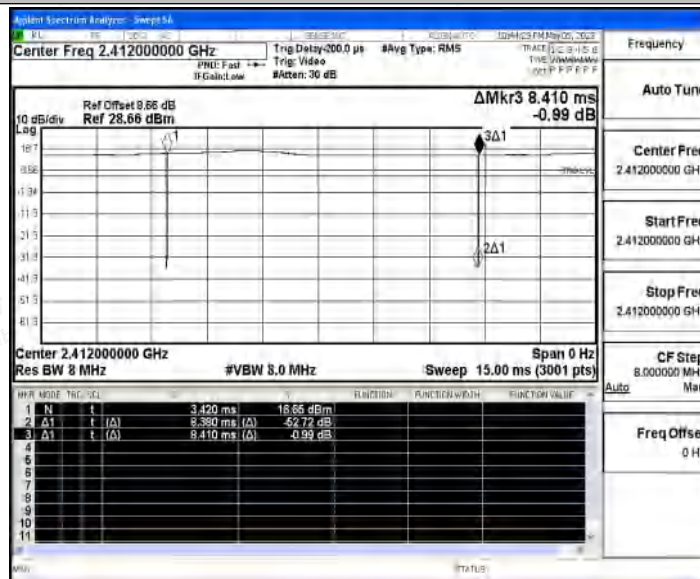
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	8.38	8.41	99.64	---	---
		2437	8.39	8.41	99.76	---	---
		2462	8.39	8.41	99.76	---	---
11G	Ant1	2412	1.39	1.43	97.20	---	---
		2437	1.39	1.43	97.20	---	---
		2462	1.40	1.43	97.90	---	---
11N20SISO	Ant1	2412	1.30	1.33	97.74	---	---
		2437	1.30	1.34	97.01	---	---
		2462	1.30	1.33	97.74	---	---
11N40SISO	Ant1	2422	0.65	0.68	95.59	---	---
		2437	0.64	0.68	94.12	---	---
		2452	0.65	0.68	95.59	---	---



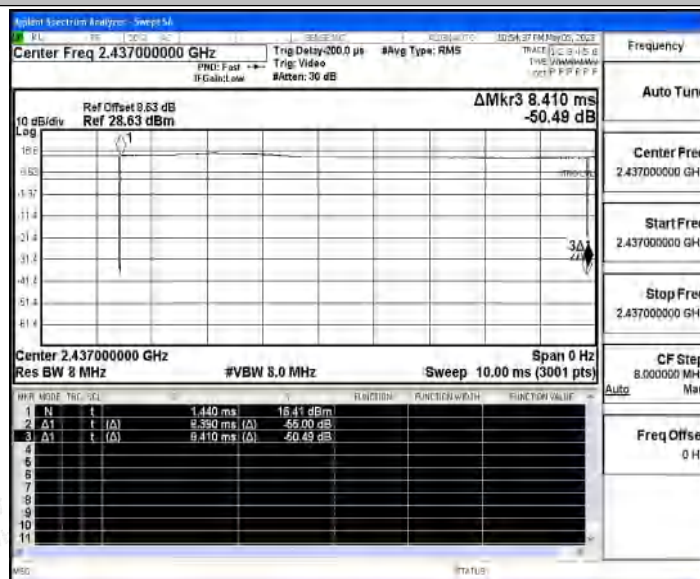


Test Graphs

11B_Ant1_2412



11B_Ant1_2437



11B_Ant1_2462

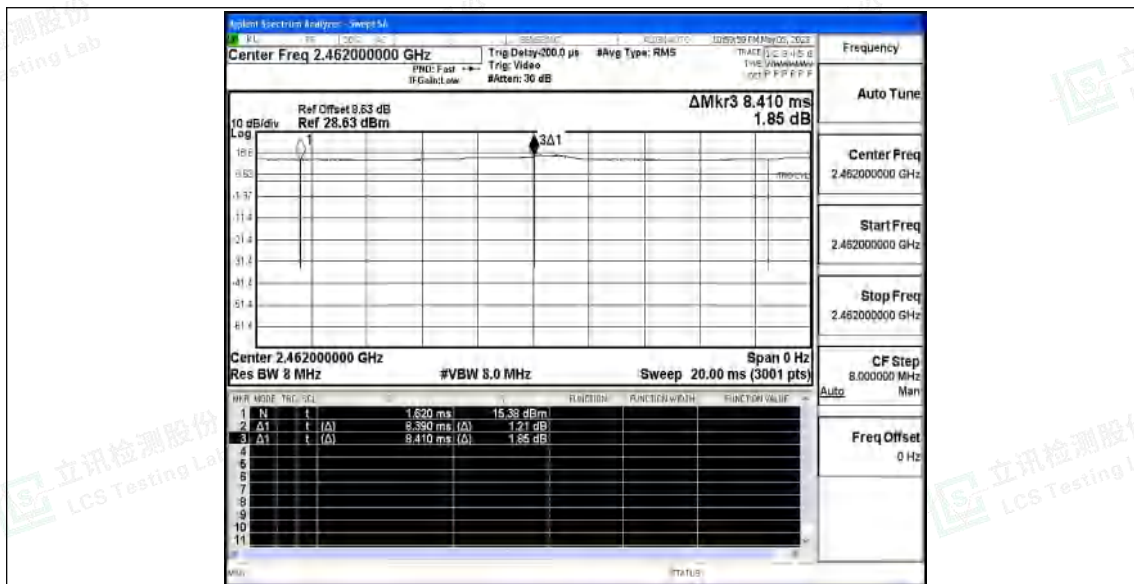


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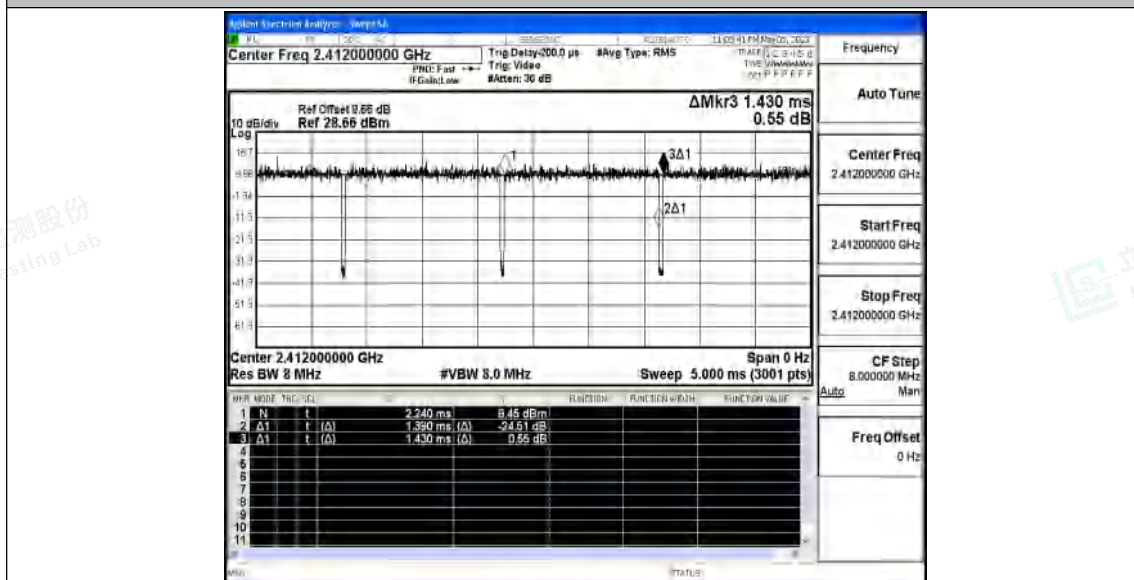
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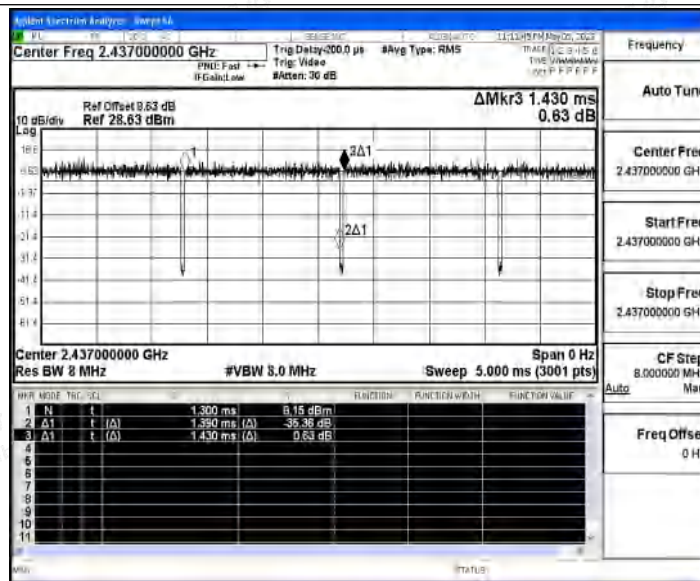


11G_Ant1_2412

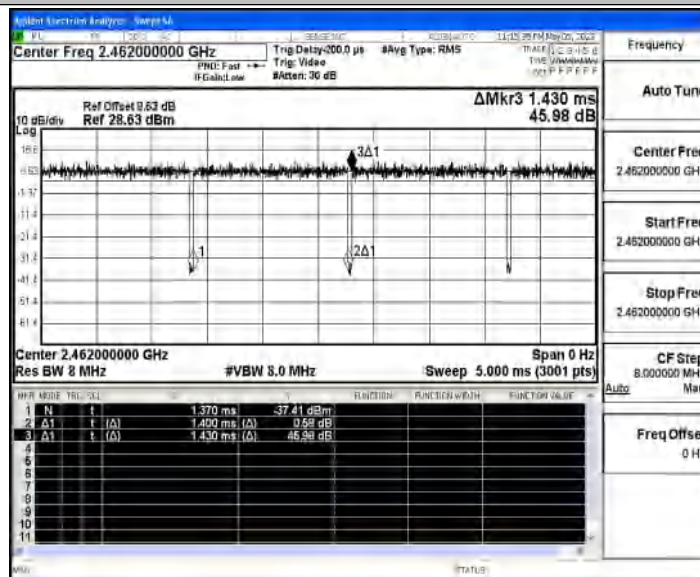


11G_Ant1_2437



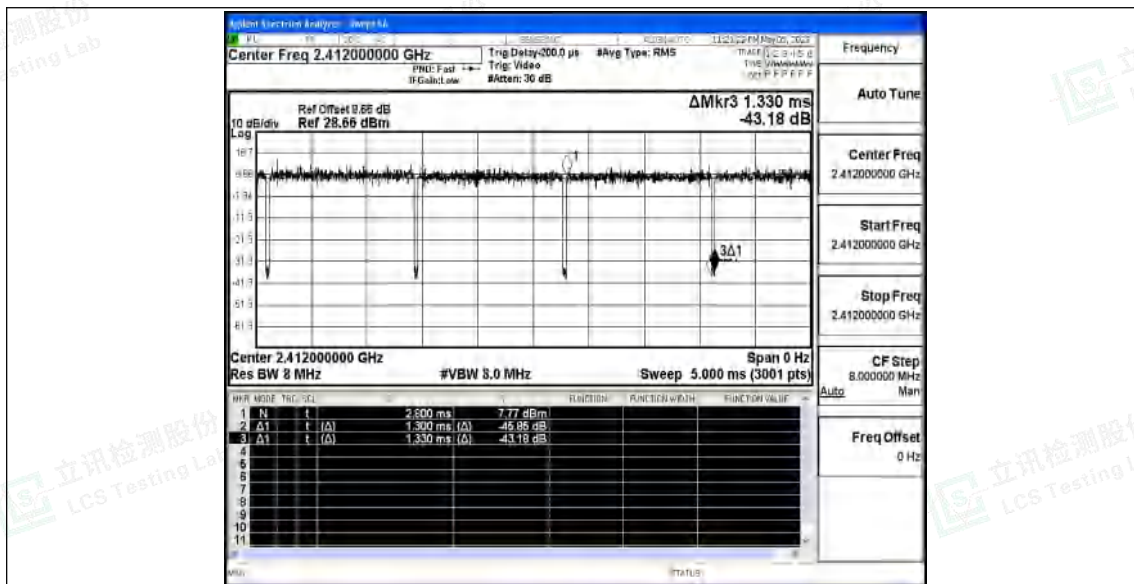


11G_Ant1_2462

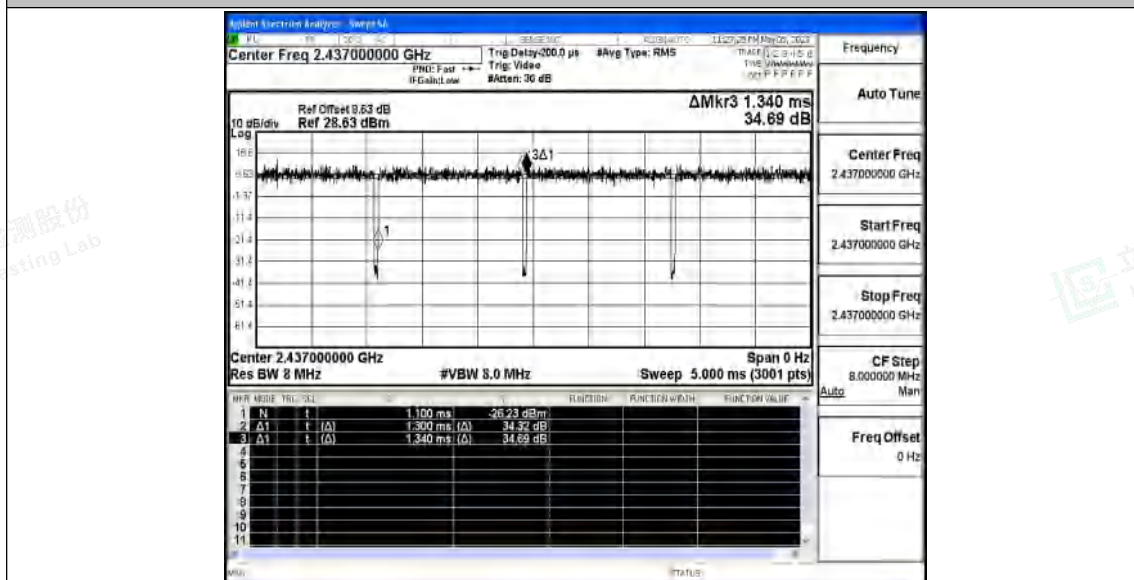


11N20SISO_Ant1_2412



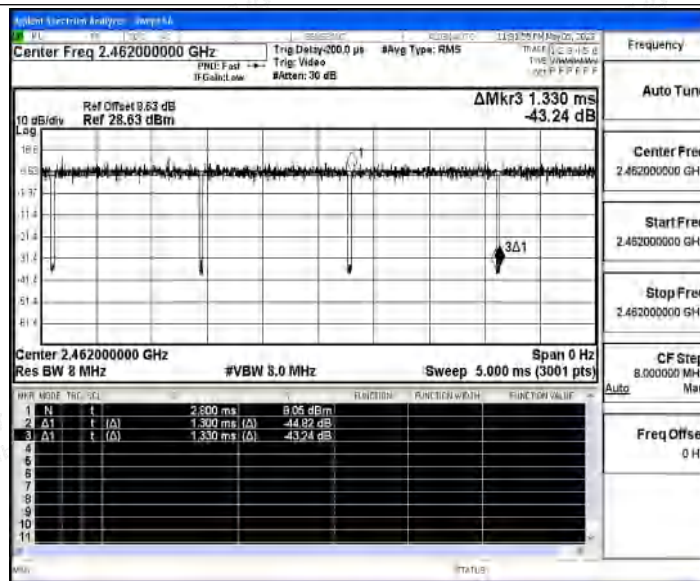


11N20SISO_Ant1_2437

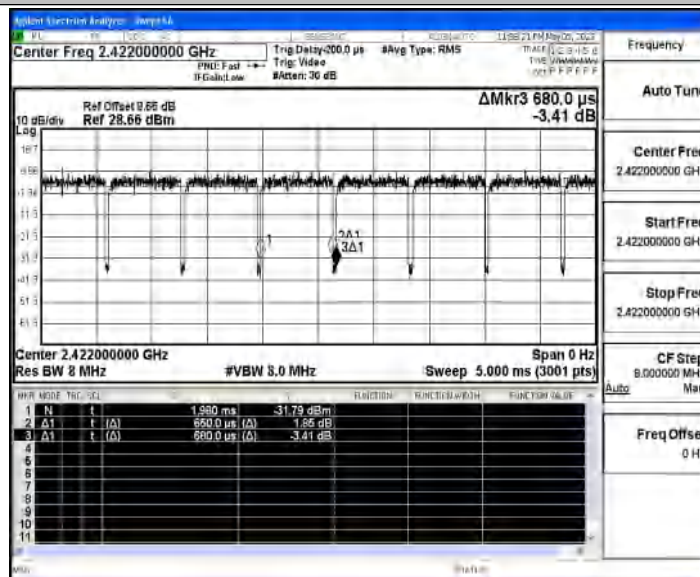


11N20SISO_Ant1_2462



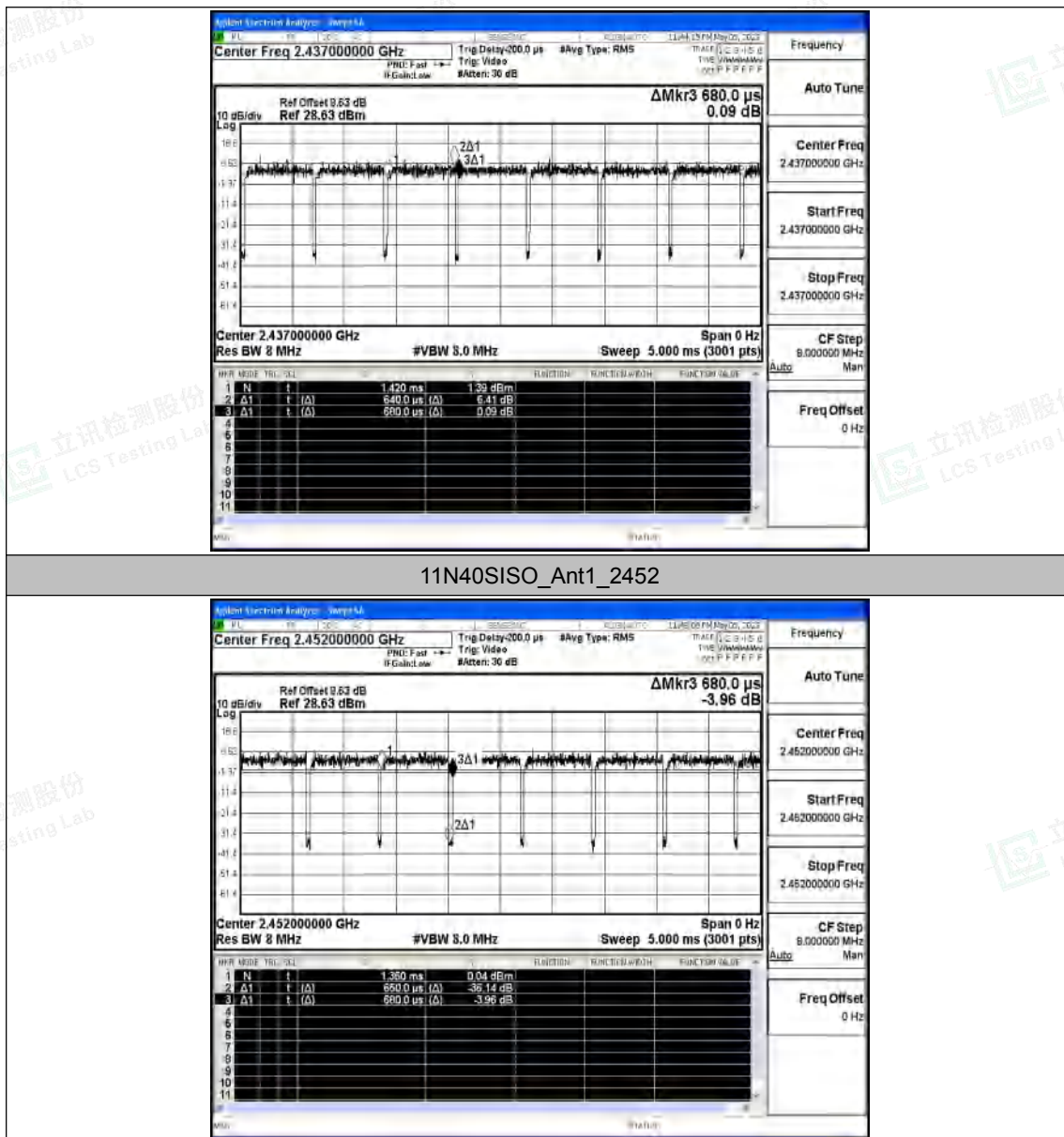


11N40SISO_Ant1_2422



11N40SISO_Ant1_2437







B.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	Ant1	Low	2412	AV	2310.000	-58.46	≤-41.20	36.74	≤54	PASS
				AV	2389.960	-55.06	≤-41.20	40.14	≤54	PASS
				AV	2390.000	-55.06	≤-41.20	40.14	≤54	PASS
				Peak	2310.000	-47.45	≤-21.20	47.75	≤74	PASS
				Peak	2389.960	-44.26	≤-21.20	50.94	≤74	PASS
				Peak	2390.000	-44.26	≤-21.20	50.94	≤74	PASS
		High	2462	AV	2483.500	-54.8	≤-41.20	40.40	≤54	PASS
				AV	2483.560	-54.94	≤-41.20	40.26	≤54	PASS
				AV	2500.000	-56.87	≤-41.20	38.33	≤54	PASS
				Peak	2483.500	-44.64	≤-21.20	50.56	≤74	PASS
				Peak	2491.040	-44.27	≤-21.20	50.93	≤74	PASS
				Peak	2500.000	-45.53	≤-21.20	49.67	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-57.65	≤-41.20	37.55	≤54	PASS
				AV	2389.960	-52.84	≤-41.20	42.36	≤54	PASS
				AV	2390.000	-52.85	≤-41.20	42.35	≤54	PASS
				Peak	2310.000	-47.36	≤-21.20	47.84	≤74	PASS
				Peak	2389.960	-39.07	≤-21.20	56.13	≤74	PASS
				Peak	2390.000	-39.07	≤-21.20	56.13	≤74	PASS
		High	2462	AV	2483.500	-53.3	≤-41.20	41.90	≤54	PASS
				AV	2485.870	-52.2	≤-41.20	43.00	≤54	PASS
				AV	2500.000	-55.23	≤-41.20	39.97	≤54	PASS
				Peak	2483.500	-36.36	≤-21.20	58.84	≤74	PASS
				Peak	2484.880	-37.57	≤-21.20	57.63	≤74	PASS
				Peak	2500.000	-44.22	≤-21.20	50.98	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-57.62	≤-41.20	37.58	≤54	PASS
				AV	2389.830	-52.3	≤-41.20	42.90	≤54	PASS
				AV	2390.000	-52.36	≤-41.20	42.84	≤54	PASS
				Peak	2310.000	-47.52	≤-21.20	47.68	≤74	PASS
				Peak	2389.830	-36.09	≤-21.20	59.11	≤74	PASS
				Peak	2390.000	-39.34	≤-21.20	55.86	≤74	PASS
		High	2462	AV	2483.500	-52.49	≤-41.20	42.71	≤54	PASS
				AV	2484.770	-51.03	≤-41.20	44.17	≤54	PASS
				AV	2500.000	-55.12	≤-41.20	40.08	≤54	PASS
				Peak	2483.500	-36.06	≤-21.20	59.14	≤74	PASS
				Peak	2485.100	-34.69	≤-21.20	60.51	≤74	PASS



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11N40SIS O	Ant1	Low	2422	Peak	2500.000	-45.03	≤ -21.20	50.17	≤ 74	PASS
				AV	2310.000	-57.68	≤ -41.20	37.52	≤ 54	PASS
				AV	2388.400	-51.99	≤ -41.20	43.21	≤ 54	PASS
				AV	2390.000	-52.14	≤ -41.20	43.06	≤ 54	PASS
				Peak	2310.000	-47.9	≤ -21.20	47.30	≤ 74	PASS
				Peak	2389.050	-34.32	≤ -21.20	60.88	≤ 74	PASS
		High	2452	Peak	2390.000	-35.76	≤ -21.20	59.44	≤ 74	PASS
				AV	2483.500	-49.43	≤ -41.20	45.77	≤ 54	PASS
				AV	2484.220	-49.29	≤ -41.20	45.91	≤ 54	PASS
				AV	2500.000	-53.9	≤ -41.20	41.30	≤ 54	PASS
				Peak	2483.500	-32.01	≤ -21.20	63.19	≤ 74	PASS
				Peak	2485.870	-31.15	≤ -21.20	64.05	≤ 74	PASS
				Peak	2500.000	-41.32	≤ -21.20	53.88	≤ 74	PASS

Note:

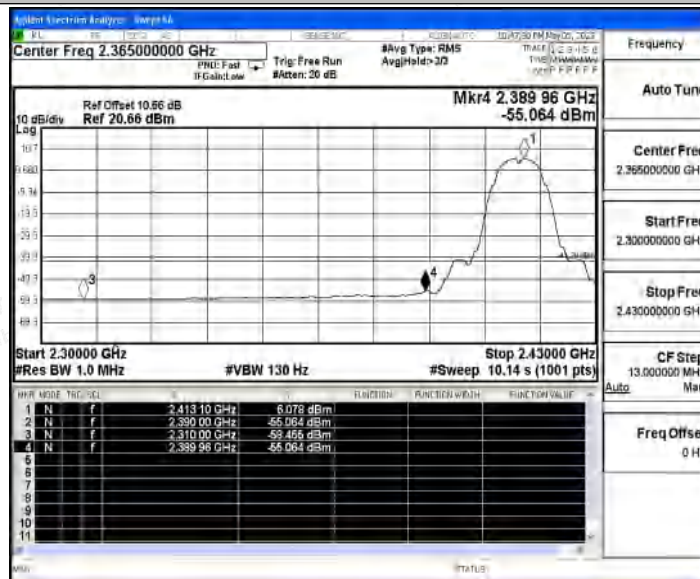
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



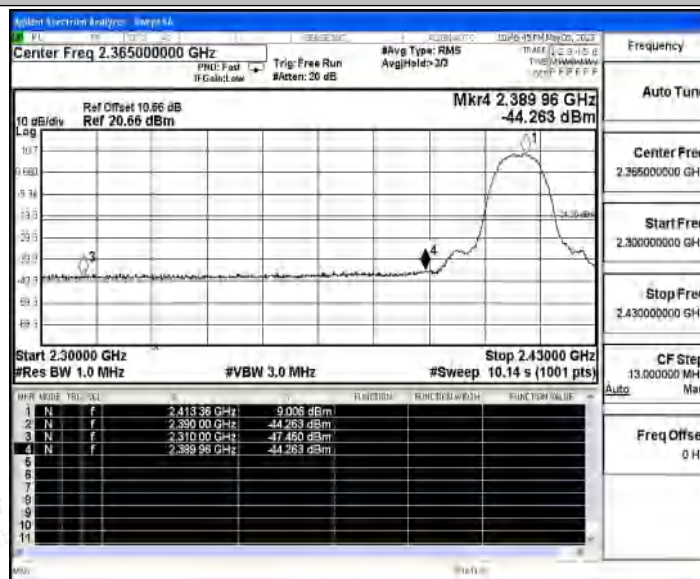


Test Graphs

11B_Ant1_Low_2412_AV



11B_Ant1_Low_2412_Peak



11B_Ant1_High_2462_AV

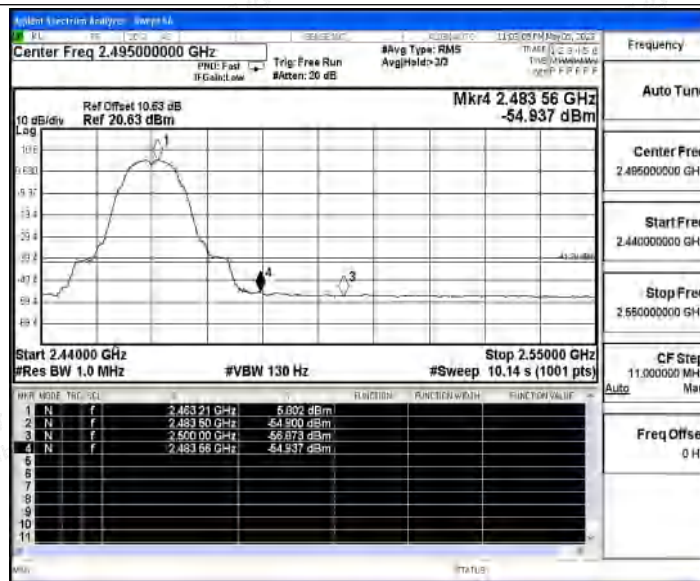


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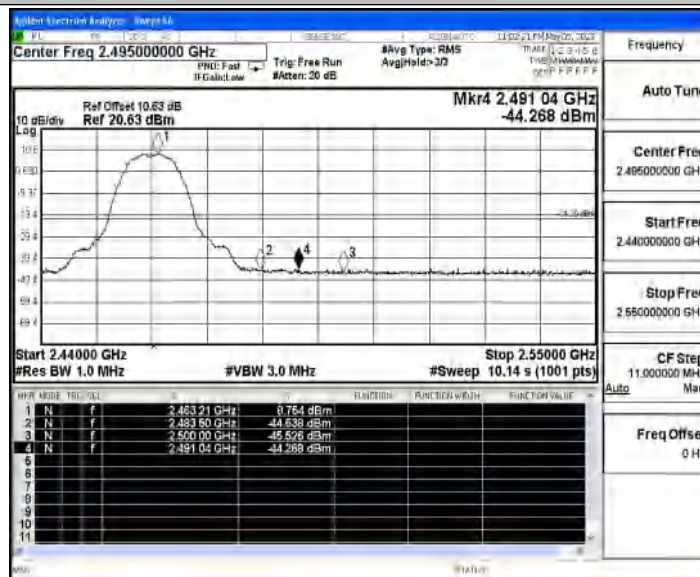
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11B_Ant1_High_2462_Peak



11G_Ant1_Low_2412_AV

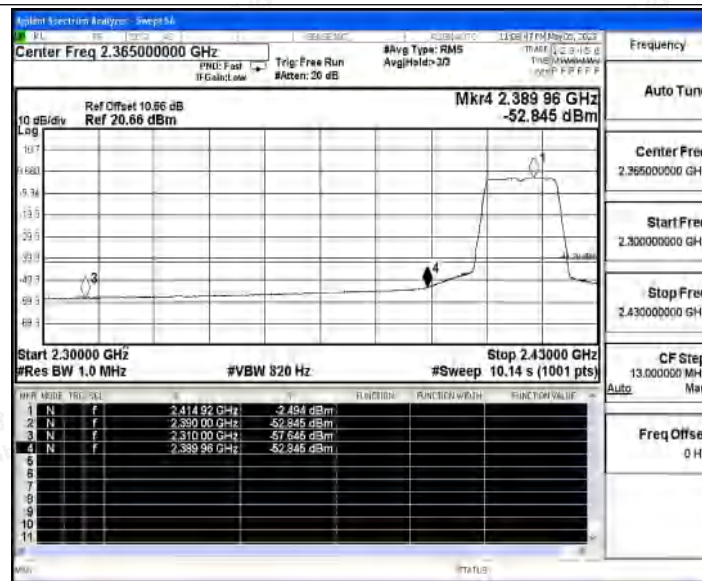


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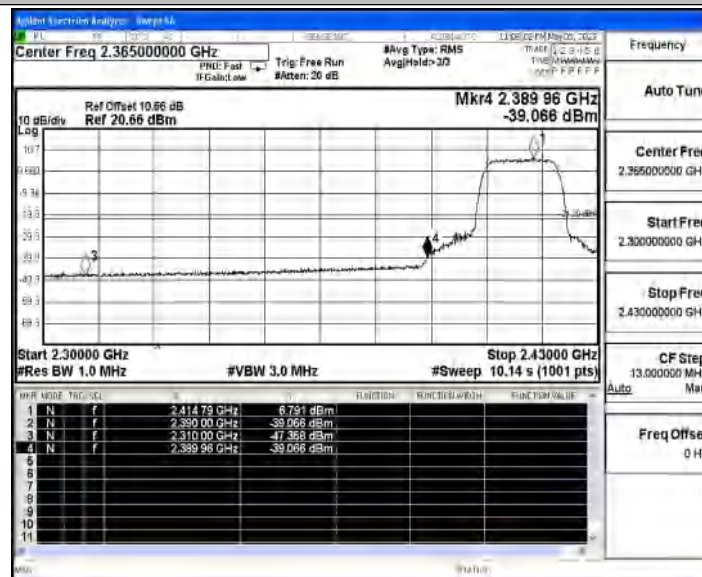
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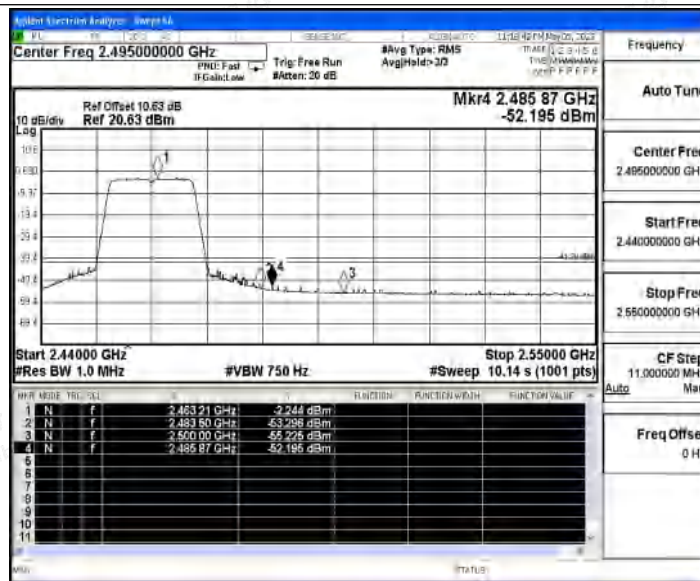


11G_Ant1_Low_2412_Peak

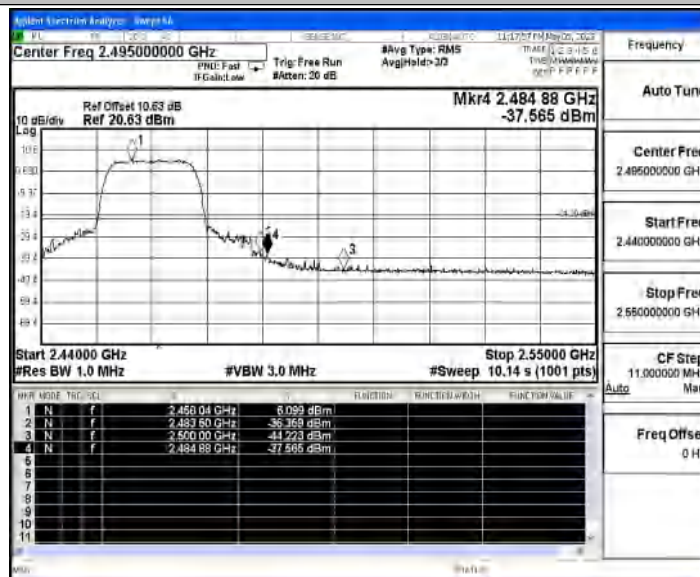


11G_Ant1_High_2462_AV



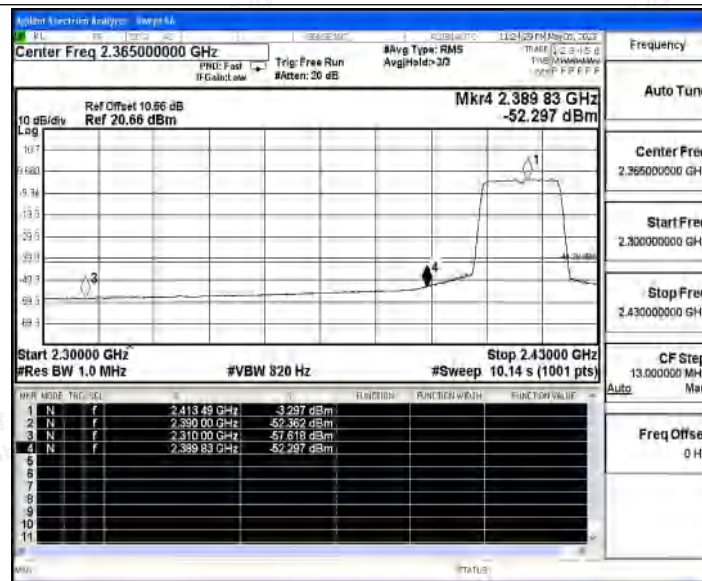


11G_Ant1_High_2462_Peak

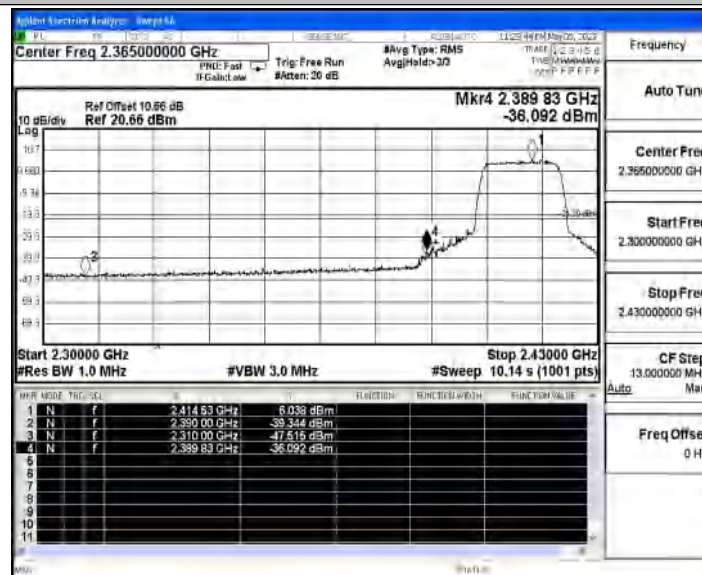


11N20SISO_Ant1_Low_2412_AV



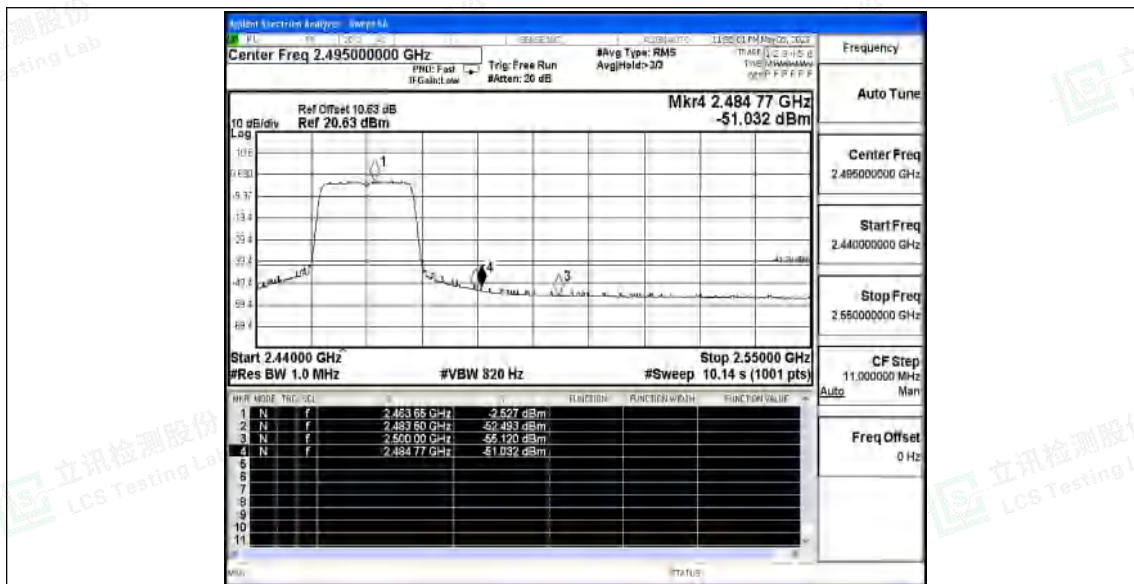


11N20SISO_Ant1_Low_2412_Peak

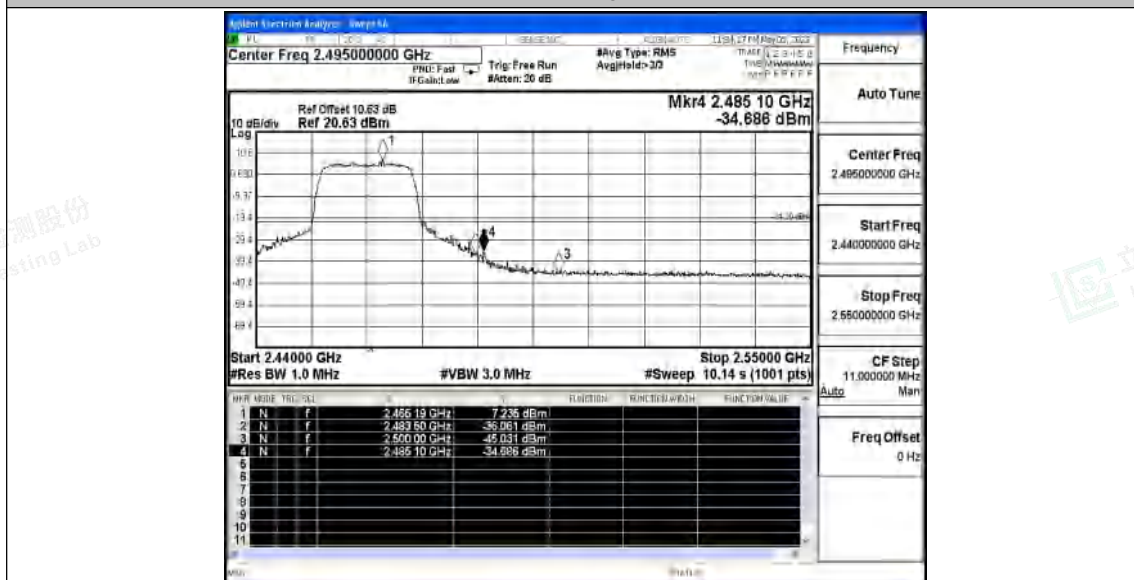


11N20SISO_Ant1_High_2462_AV



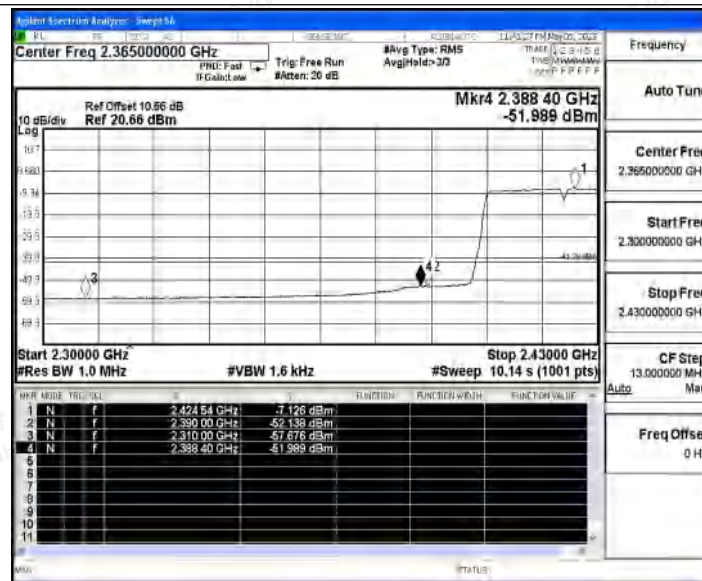


11N20SISO_Ant1_High_2462_Peak

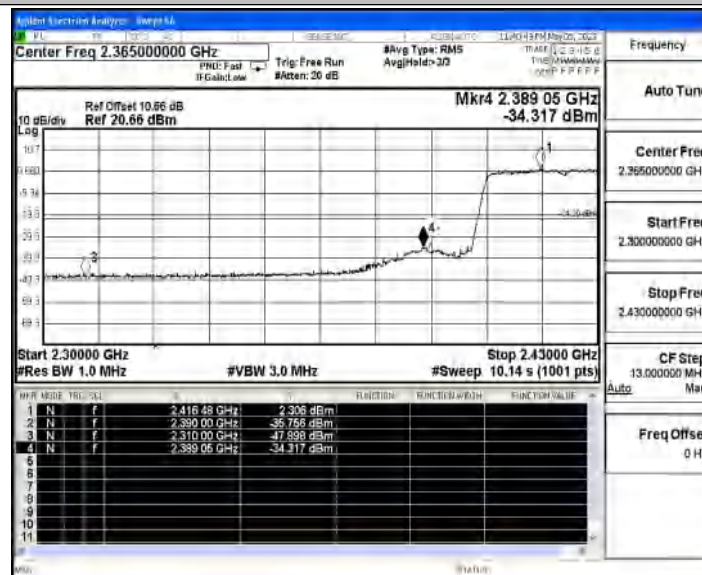


11N40SISO_Ant1_Low_2422_AV



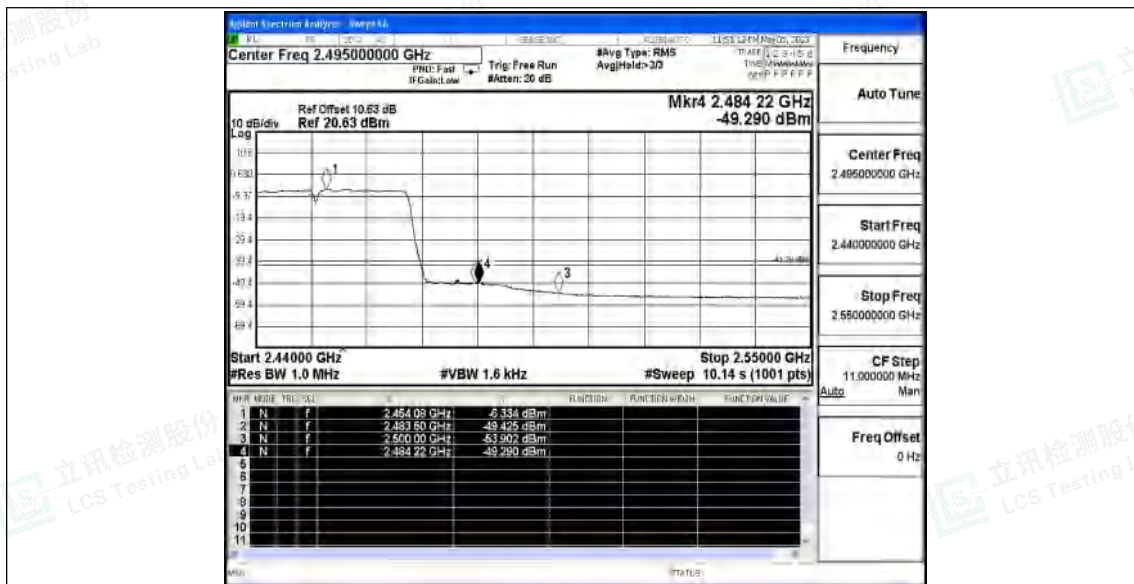


11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV





11N40SISO_Ant1_High_2452_Peak

