Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Pick-up Sticks

Test Model: X2

Environmental Conditions

Temperature:	23.1 ° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Ecsou Zhou
Supervised by:	Ling Zhu

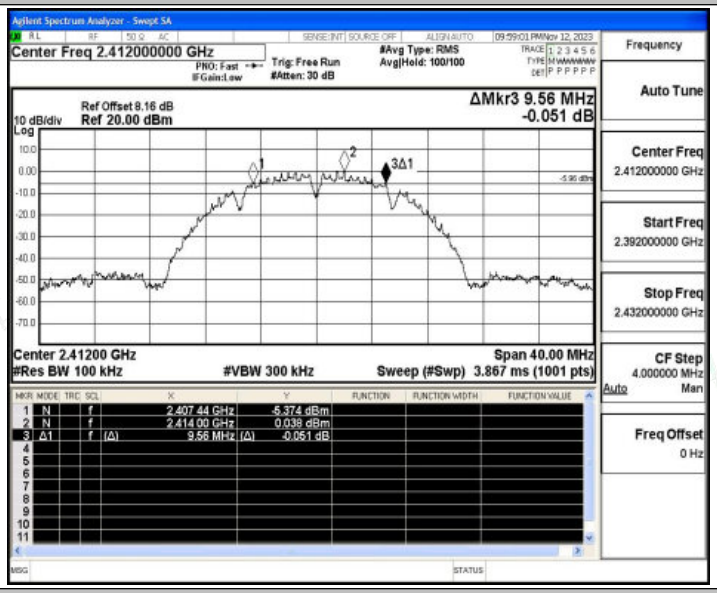
A.1 DTS Bandwidth

Test Result

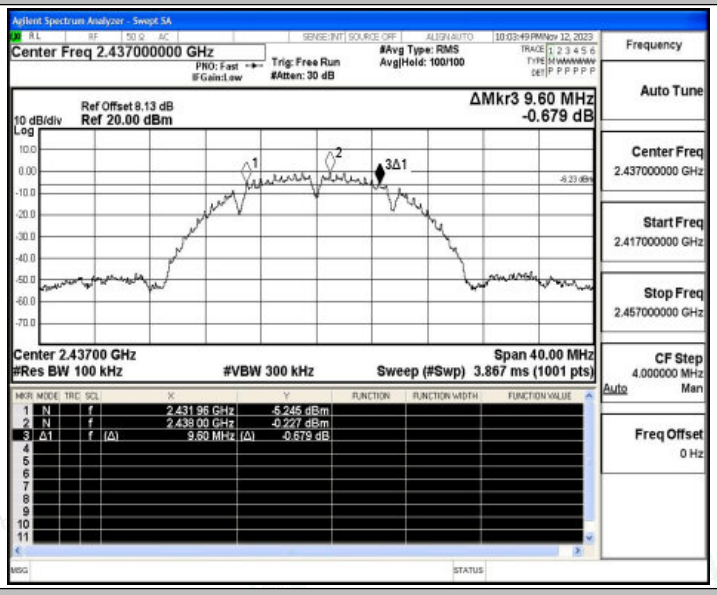
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.560	2407.440	2417.000	0.5	PASS
		2437	9.600	2431.960	2441.560	0.5	PASS
		2462	10.080	2456.960	2467.040	0.5	PASS
11G	Ant1	2412	15.120	2404.440	2419.560	0.5	PASS
		2437	15.680	2429.080	2444.760	0.5	PASS
		2462	16.040	2453.840	2469.880	0.5	PASS
11N20SISO	Ant1	2412	15.040	2404.440	2419.480	0.5	PASS
		2437	15.080	2429.480	2444.560	0.5	PASS
		2462	15.320	2454.440	2469.760	0.5	PASS
11N40SISO	Ant1	2422	34.880	2404.560	2439.440	0.5	PASS
		2437	35.680	2419.080	2454.760	0.5	PASS
		2452	35.840	2434.080	2469.920	0.5	PASS

Test Graphs

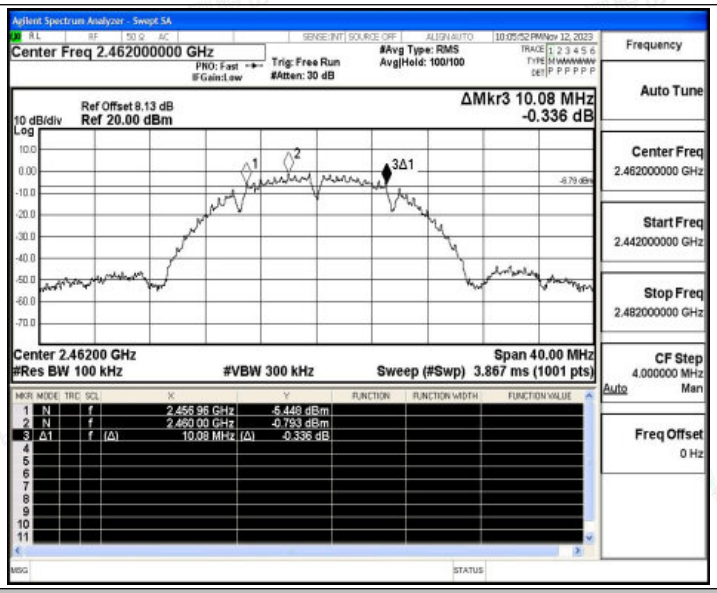
11B_Ant1_2412



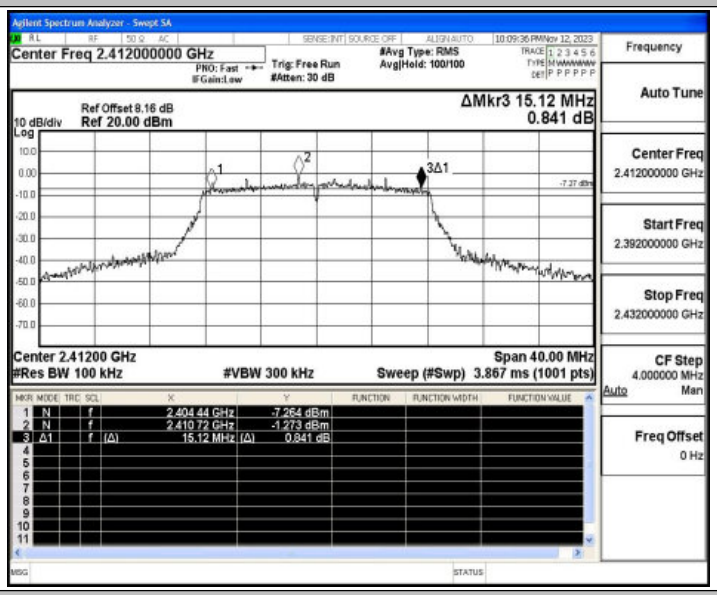
11B_Ant1_2437



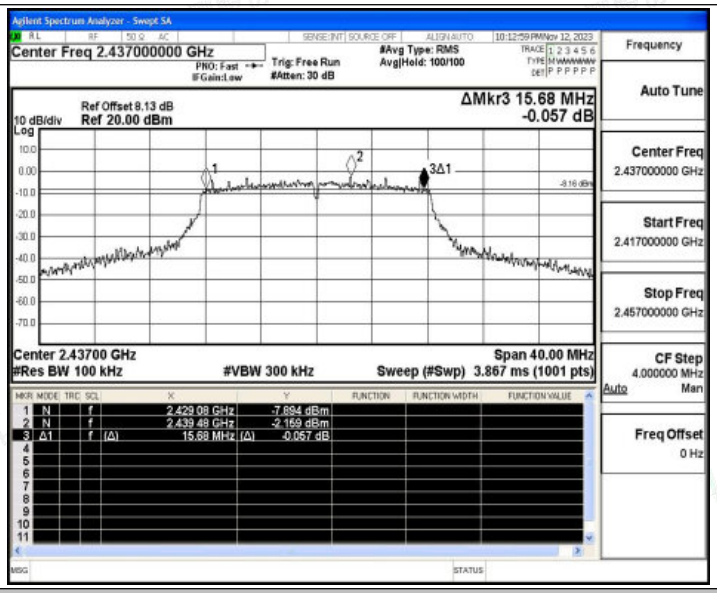
11B_Ant1_2462



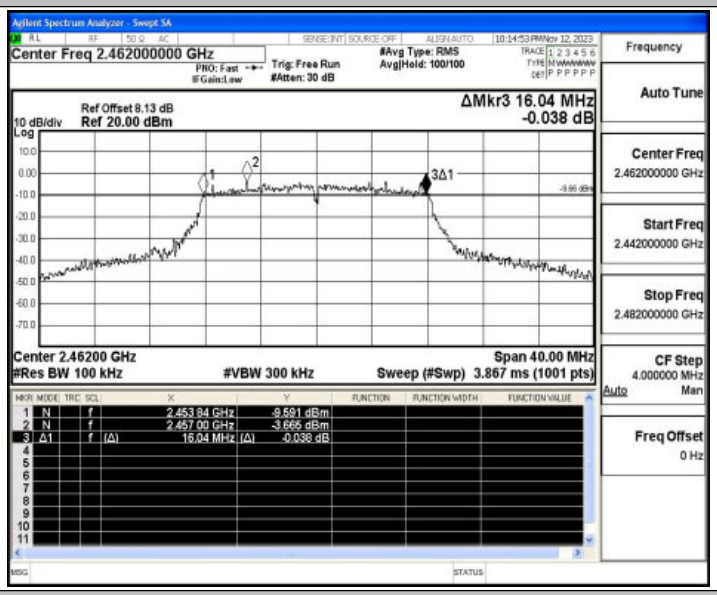
11G_Ant1_2412



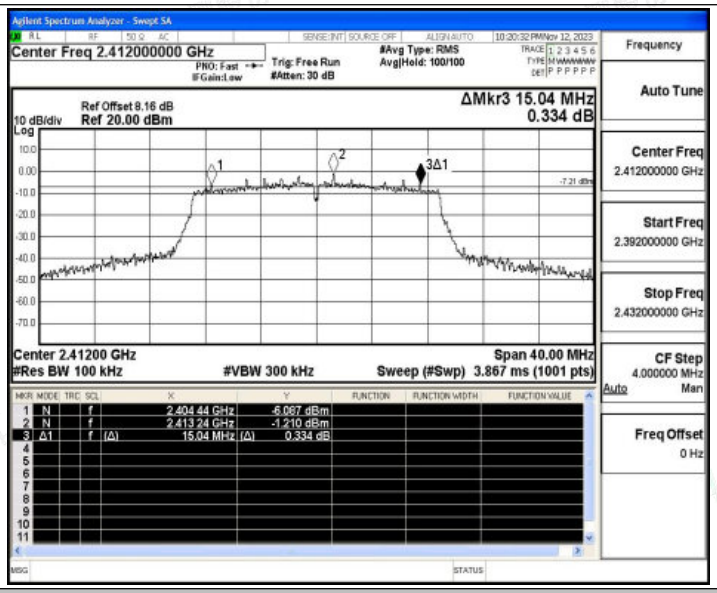
11G_Ant1_2437



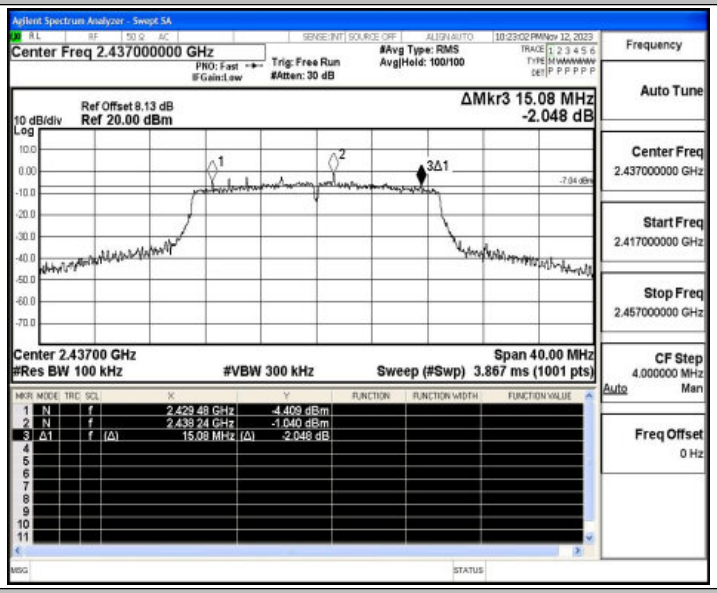
11G_Ant1_2462



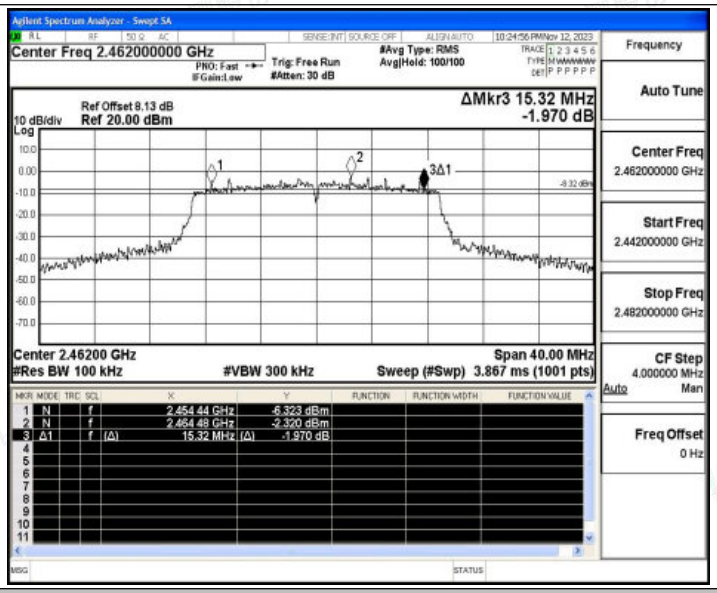
11N20SISO_Ant1_2412



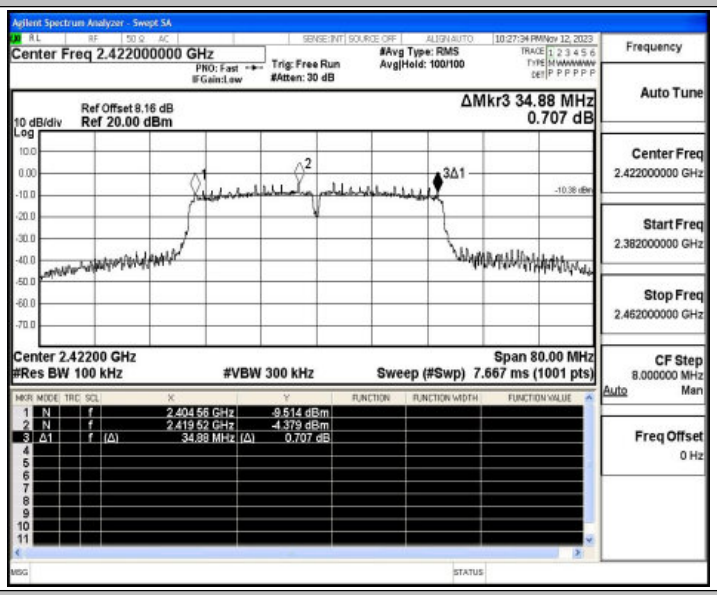
11N20SISO_Ant1_2437



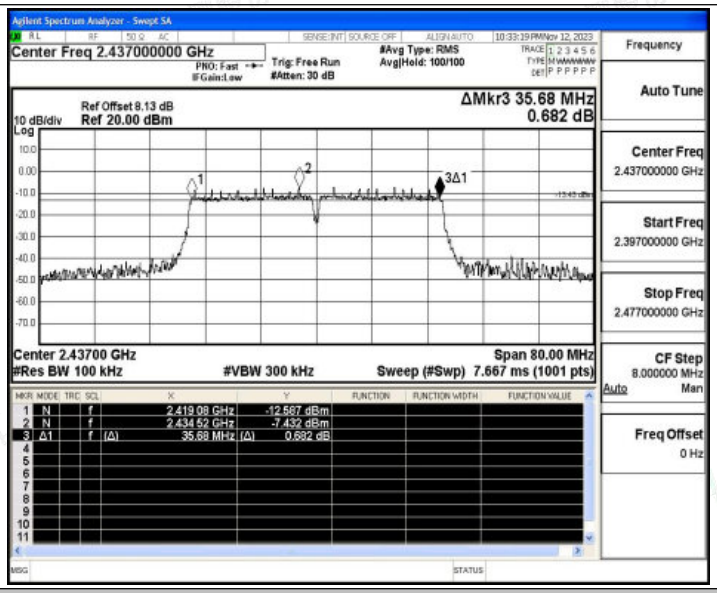
11N20SISO_Ant1_2462



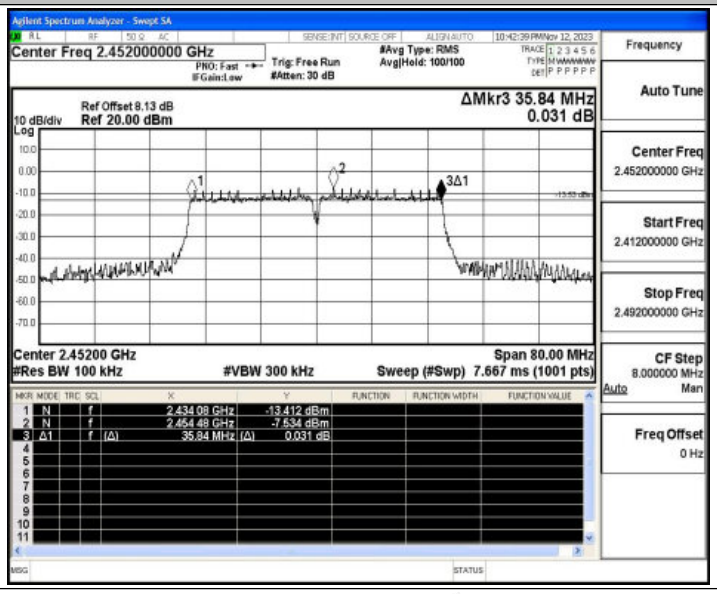
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



A.2 Maximum conducted output power

Test Result Peak

TestMode	Antenna	Freq(MHz)	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	8.15	≤30.00	PASS
		2437	8.25	≤30.00	PASS
		2462	8.62	≤30.00	PASS
11G	Ant1	2412	8.58	≤30.00	PASS
		2437	8.41	≤30.00	PASS
		2462	8.24	≤30.00	PASS
11N20SISO	Ant1	2412	8.32	≤30.00	PASS
		2437	8.14	≤30.00	PASS
		2462	8.11	≤30.00	PASS
11N40SISO	Ant1	2422	8.14	≤30.00	PASS
		2437	8.05	≤30.00	PASS
		2452	8.25	≤30.00	PASS

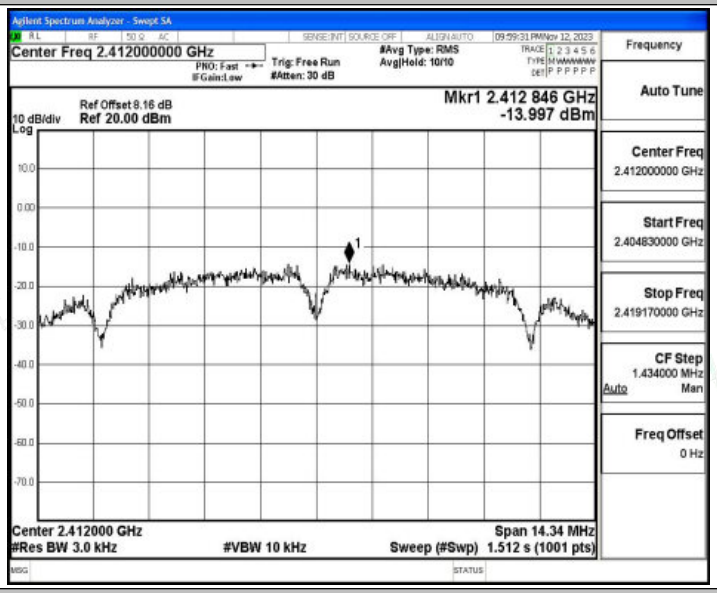
A.3 Maximum power spectral density

Test Result

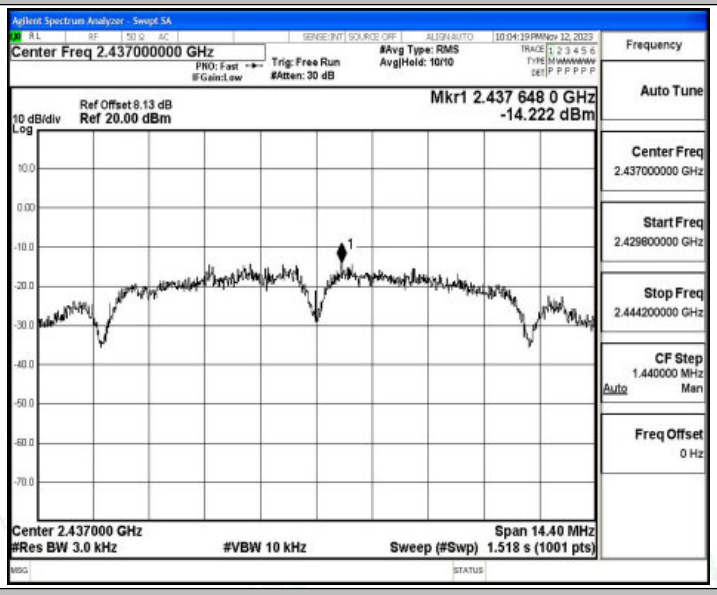
TestMode	Antenna	Freq(MHz)	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-14	≤8.00	PASS
		2437	-14.22	≤8.00	PASS
		2462	-11.42	≤8.00	PASS
11G	Ant1	2412	-13.74	≤8.00	PASS
		2437	-15.39	≤8.00	PASS
		2462	-15.26	≤8.00	PASS
11N20SISO	Ant1	2412	-15.84	≤8.00	PASS
		2437	-15.5	≤8.00	PASS
		2462	-14.3	≤8.00	PASS
11N40SISO	Ant1	2422	-18.86	≤8.00	PASS
		2437	-21.28	≤8.00	PASS
		2452	-22.1	≤8.00	PASS

Test Graphs

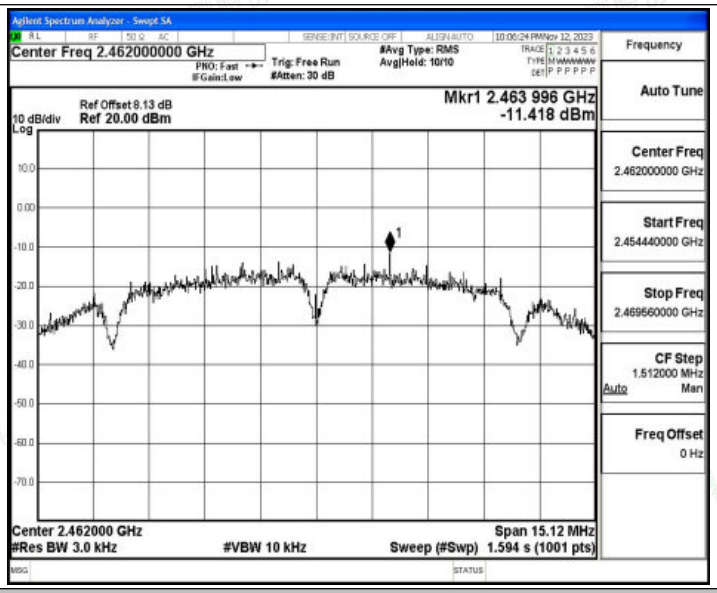
11B_Ant1_2412



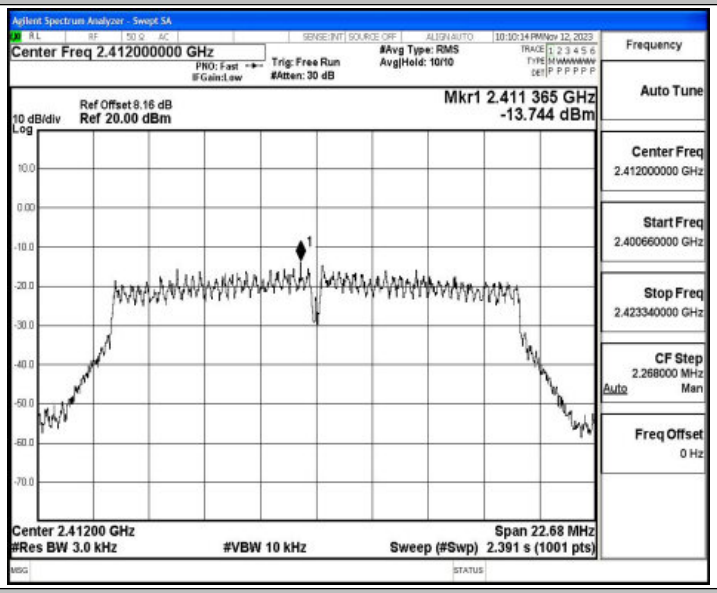
11B_Ant1_2437



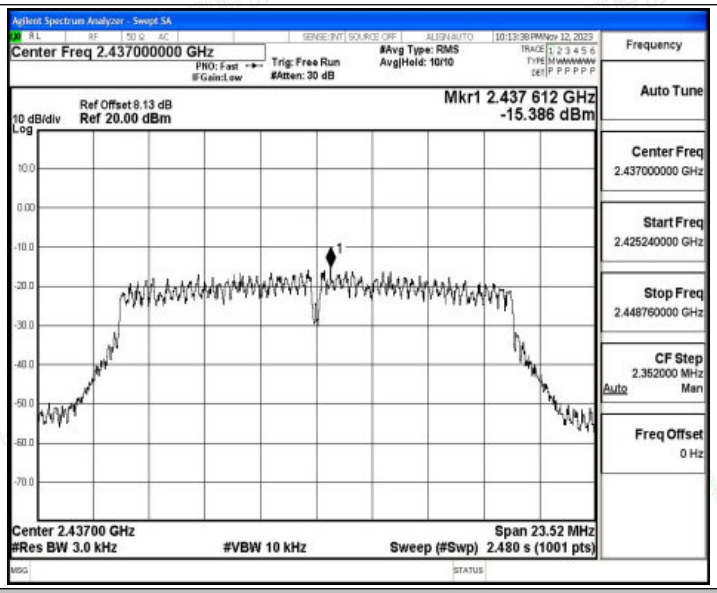
11B_Ant1_2462



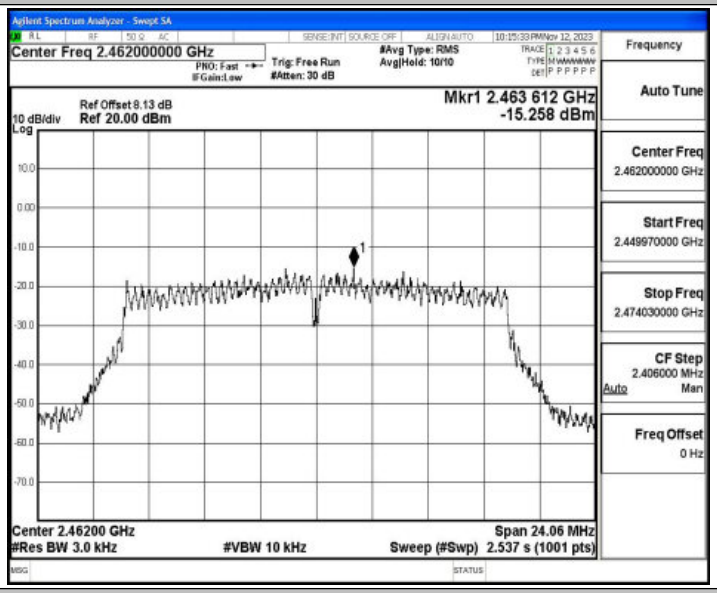
11G_Ant1_2412



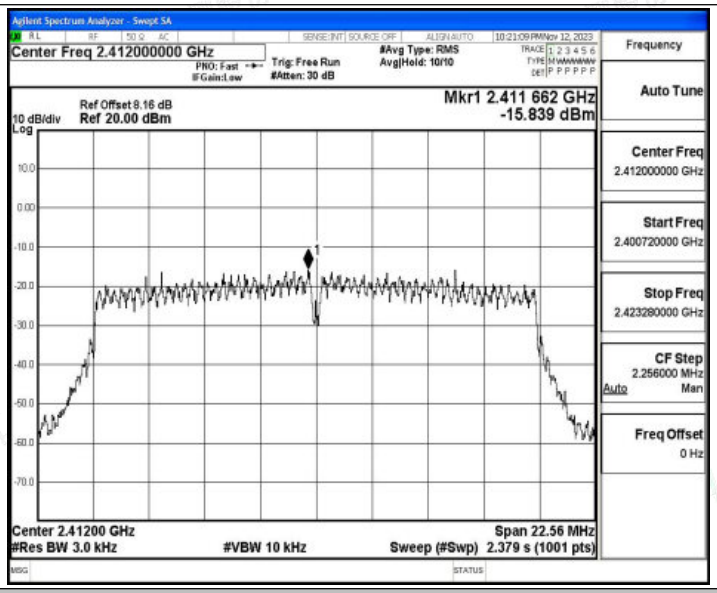
11G_Ant1_2437



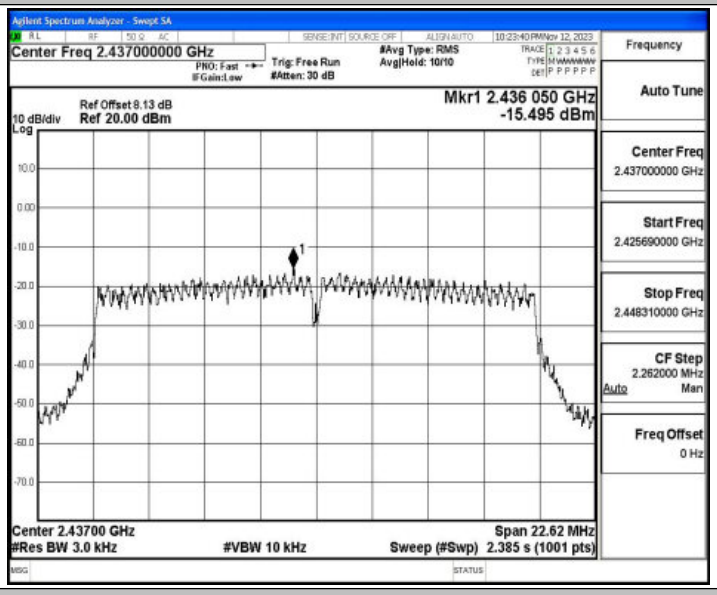
11G_Ant1_2462



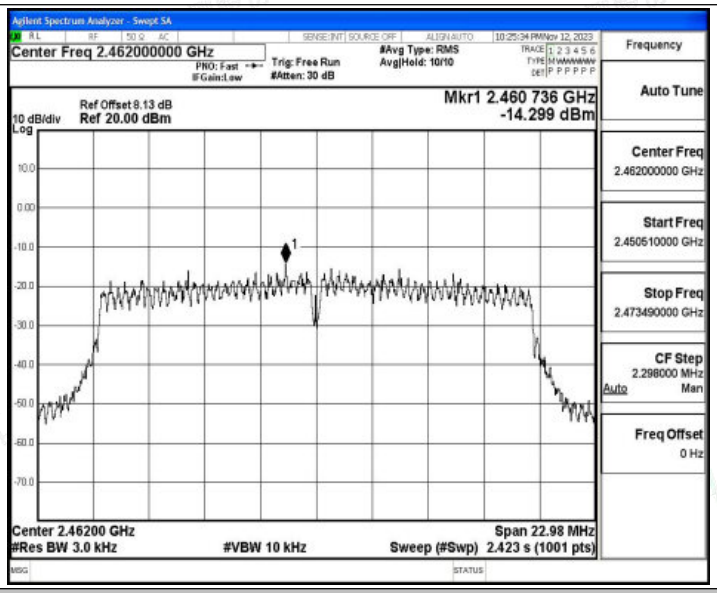
11N20SISO_Ant1_2412



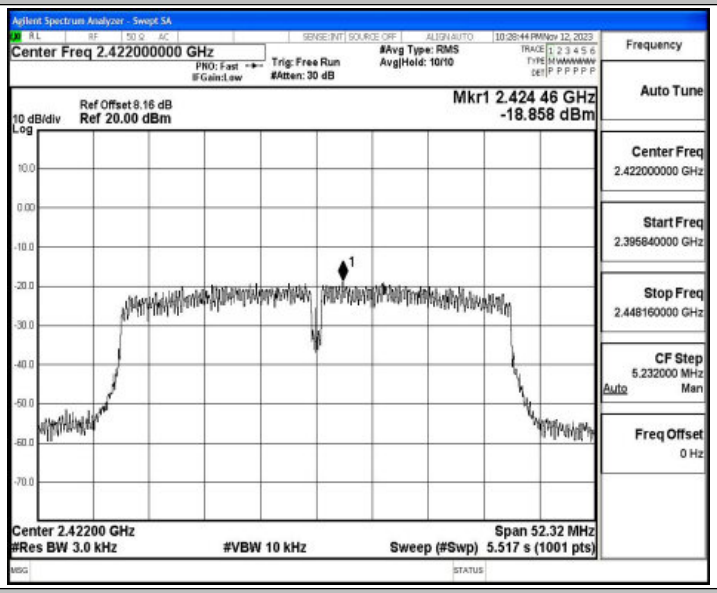
11N20SISO_Ant1_2437



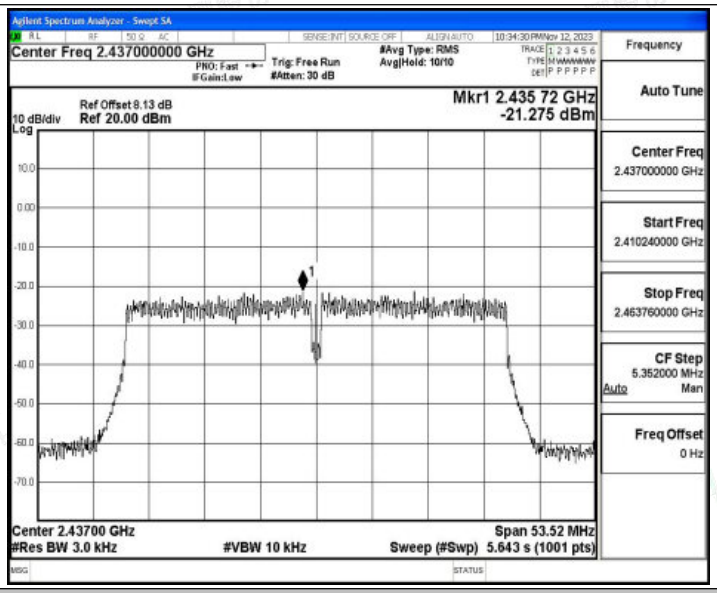
11N20SISO_Ant1_2462



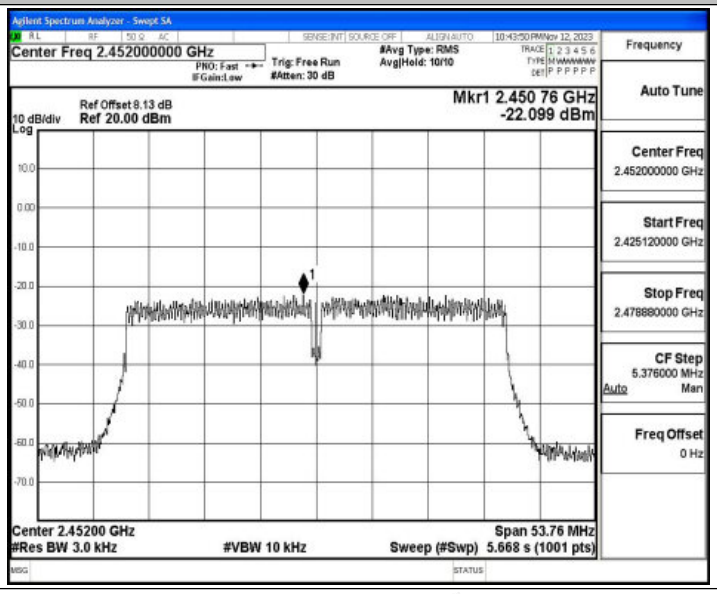
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



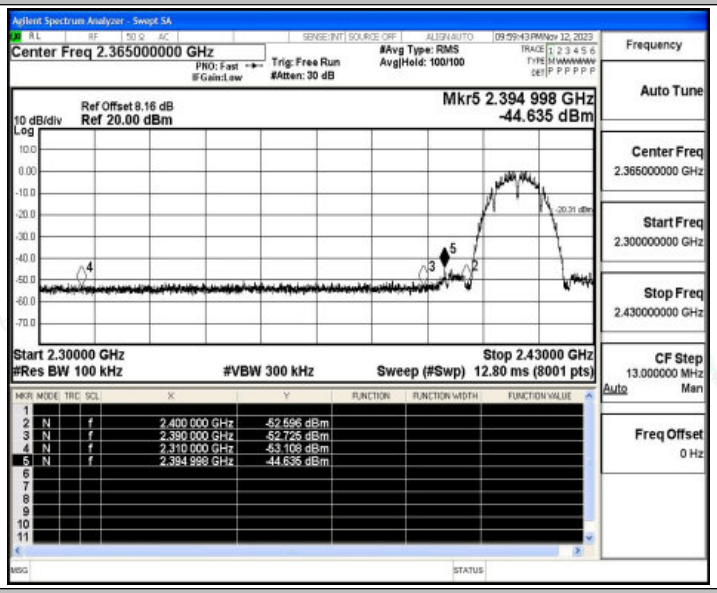
A.4 Band edge measurements

Test Result

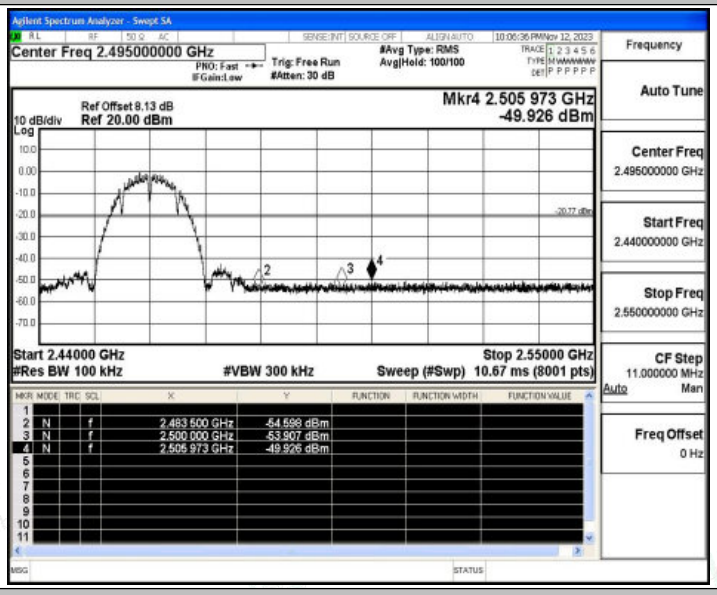
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	-0.31	-44.64	≤-20.31	PASS
		High	2462	-0.77	-49.93	≤-20.77	PASS
11G	Ant1	Low	2412	-2.20	-35.68	≤-22.2	PASS
		High	2462	-3.03	-47.28	≤-23.03	PASS
11N20SISO	Ant1	Low	2412	-2.07	-37.13	≤-22.07	PASS
		High	2462	-1.86	-45.96	≤-21.86	PASS
11N40SISO	Ant1	Low	2422	-4.25	-35.9	≤-24.25	PASS
		High	2452	-7.80	-42.02	≤-27.8	PASS

Test Graphs

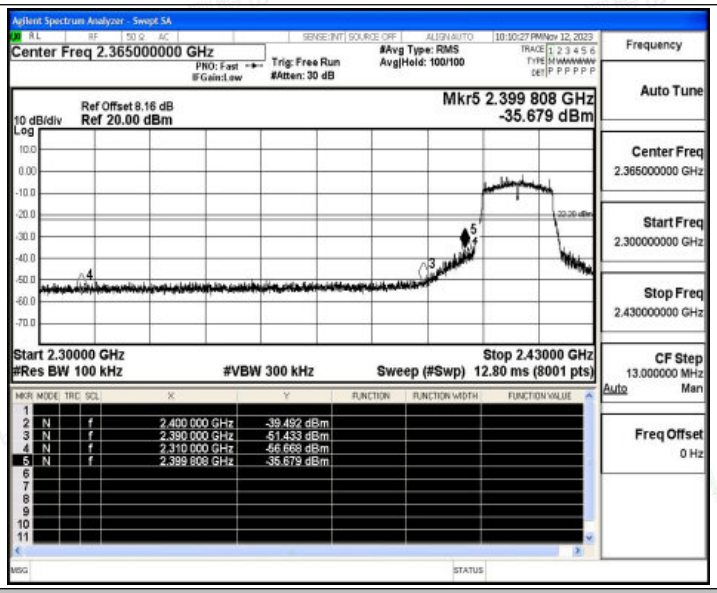
11B_Ant1_Low_2412



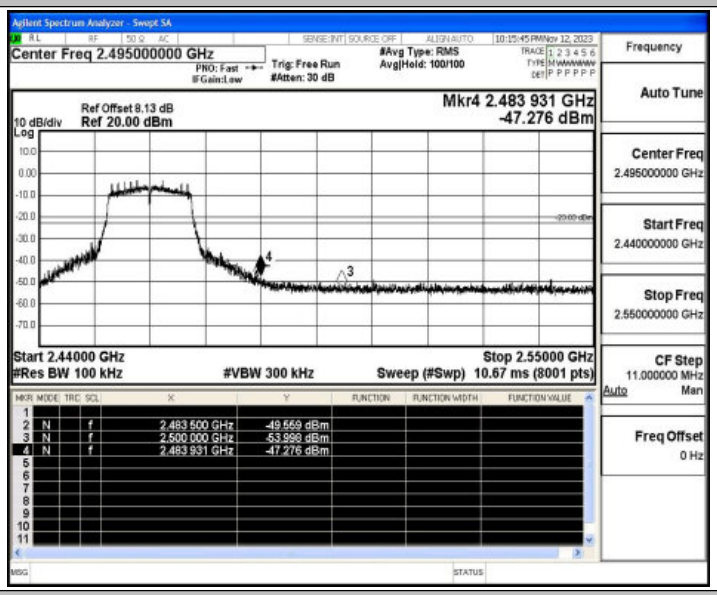
11B_Ant1_High_2462



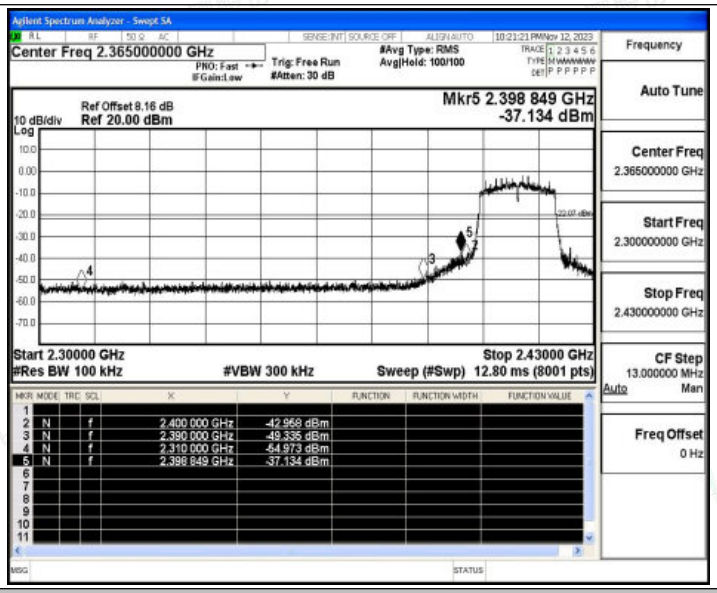
11G_Ant1_Low_2412



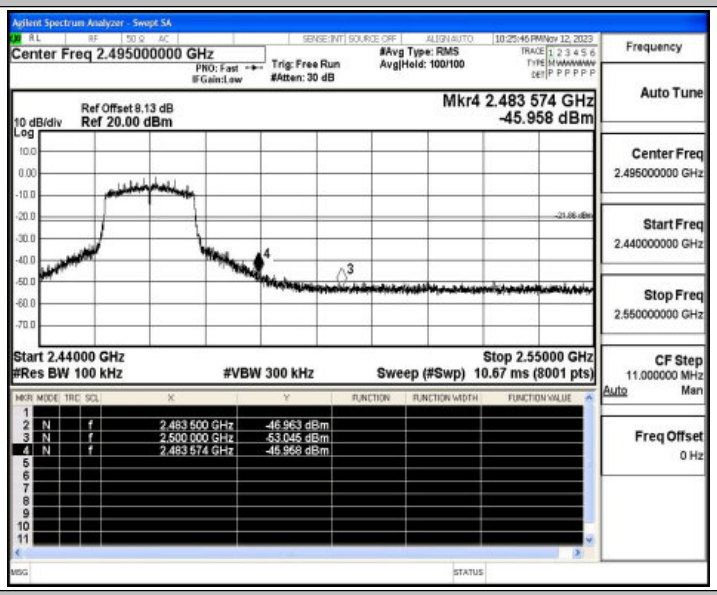
11G_Ant1_High_2462



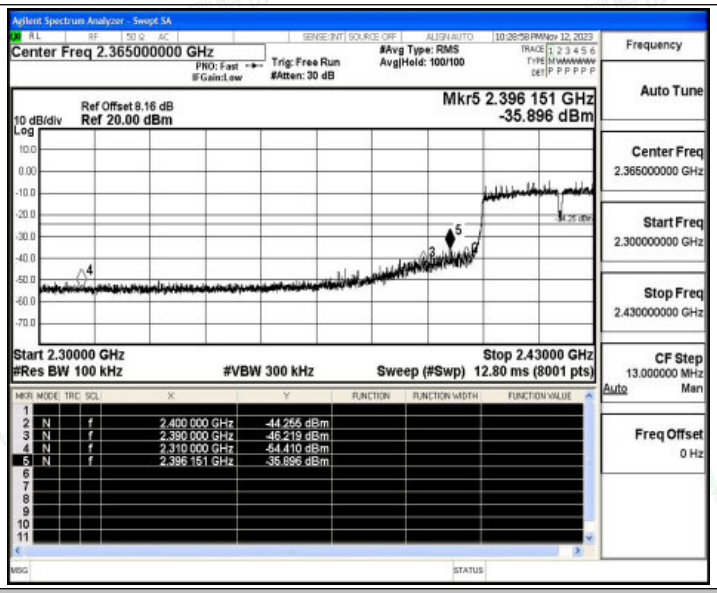
11N20SISO_Ant1_Low_2412



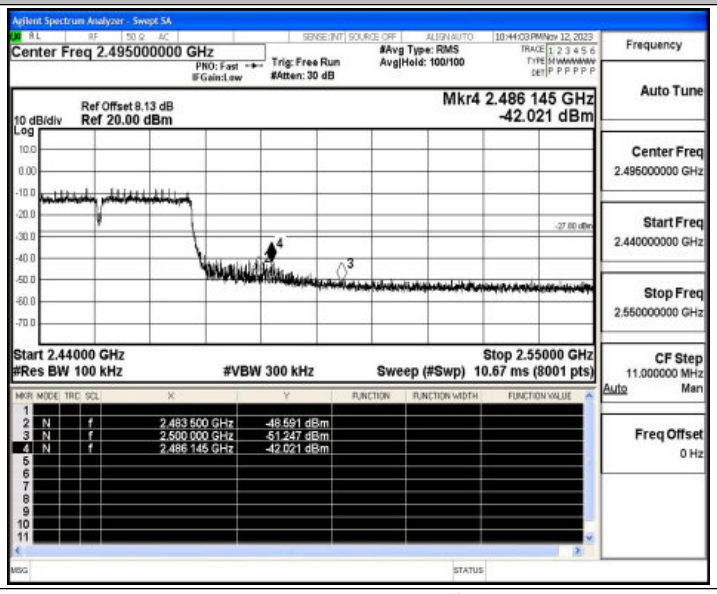
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452



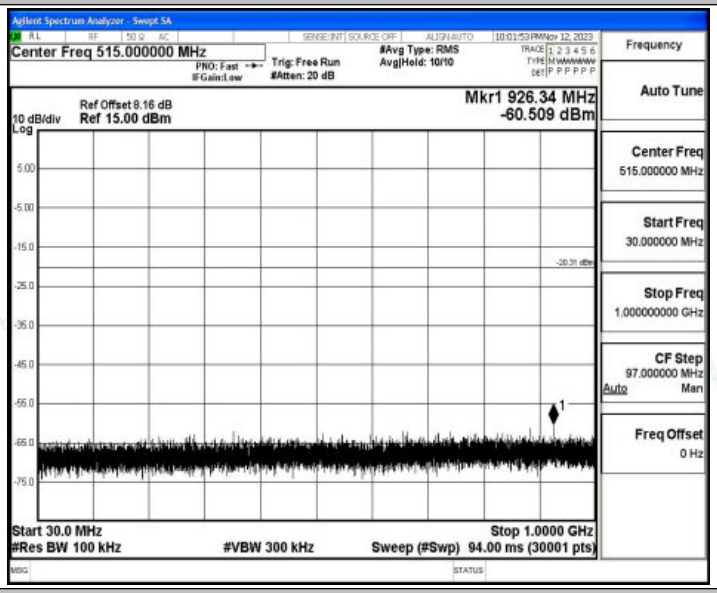
A.5 Conducted Spurious Emission

Test Result

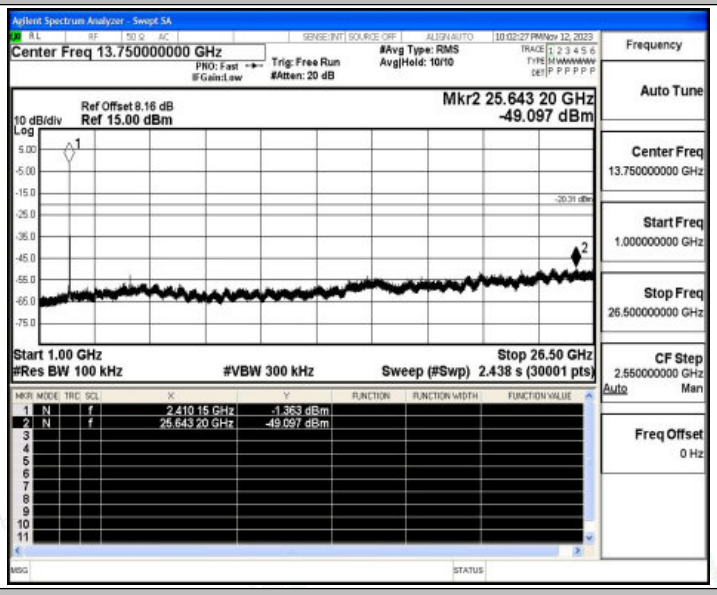
TestMode	Antenna	Freq(MHz)	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	30~1000	-0.31	-60.51	≤-20.31	PASS
			1000~26500	-0.31	-49.1	≤-20.31	PASS
		2437	30~1000	-0.71	-61.7	≤-20.71	PASS
			1000~26500	-0.71	-49.1	≤-20.71	PASS
		2462	30~1000	-0.77	-61.81	≤-20.77	PASS
			1000~26500	-0.77	-48.39	≤-20.77	PASS
11G	Ant1	2412	30~1000	-2.20	-61.93	≤-22.2	PASS
			1000~26500	-2.20	-49.09	≤-22.2	PASS
		2437	30~1000	-1.18	-61.93	≤-21.18	PASS
			1000~26500	-1.18	-48.9	≤-21.18	PASS
		2462	30~1000	-3.03	-61.61	≤-23.03	PASS
			1000~26500	-3.03	-49.61	≤-23.03	PASS
11N20SISO	Ant1	2412	30~1000	-2.07	-62.12	≤-22.07	PASS
			1000~26500	-2.07	-48.09	≤-22.07	PASS
		2437	30~1000	-1.43	-61.14	≤-21.43	PASS
			1000~26500	-1.43	-49.53	≤-21.43	PASS
		2462	30~1000	-1.86	-61.4	≤-21.86	PASS
			1000~26500	-1.86	-49.49	≤-21.86	PASS
11N40SISO	Ant1	2422	30~1000	-4.25	-61.54	≤-24.25	PASS
			1000~26500	-4.25	-49.21	≤-24.25	PASS
		2437	30~1000	-7.26	-61.9	≤-27.26	PASS
			1000~26500	-7.26	-49.07	≤-27.26	PASS
		2452	30~1000	-7.80	-61.35	≤-27.8	PASS
			1000~26500	-7.80	-48.8	≤-27.8	PASS

Test Graphs

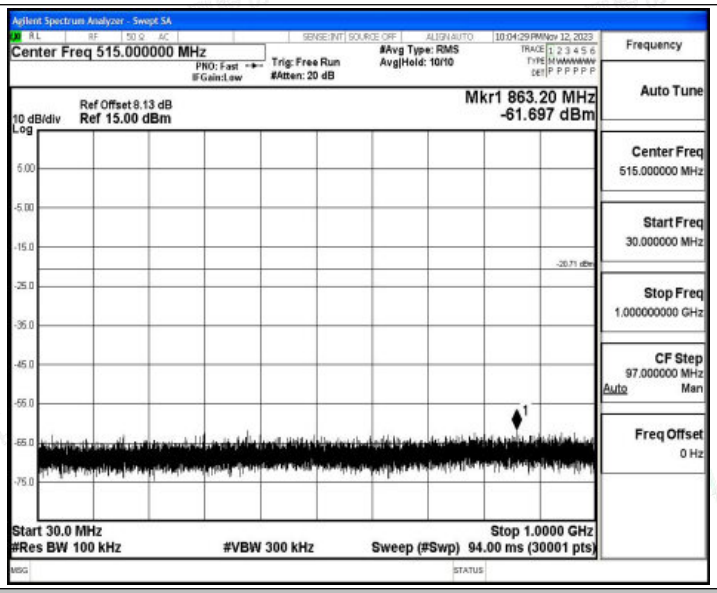
11B_Ant1_2412_30~1000



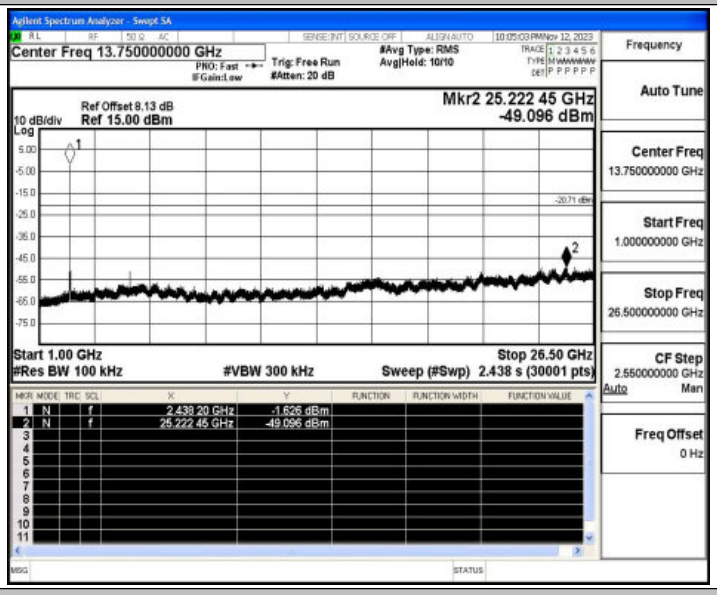
11B_Ant1_2412_1000~26500



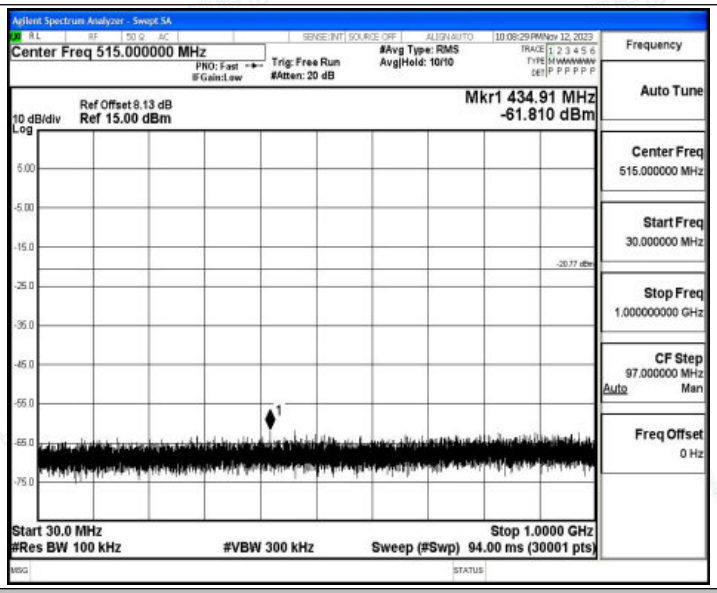
11B_Ant1_2437_30~1000



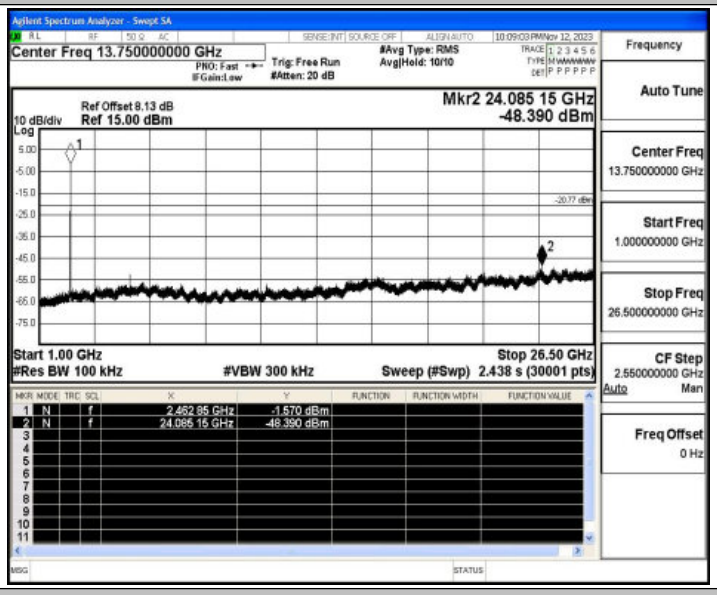
11B_Ant1_2437_1000~26500



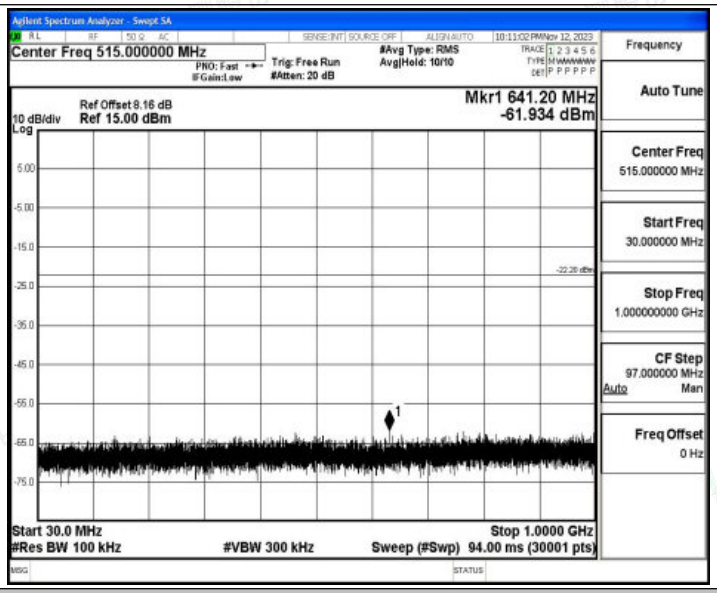
11B_Ant1_2462_30~1000



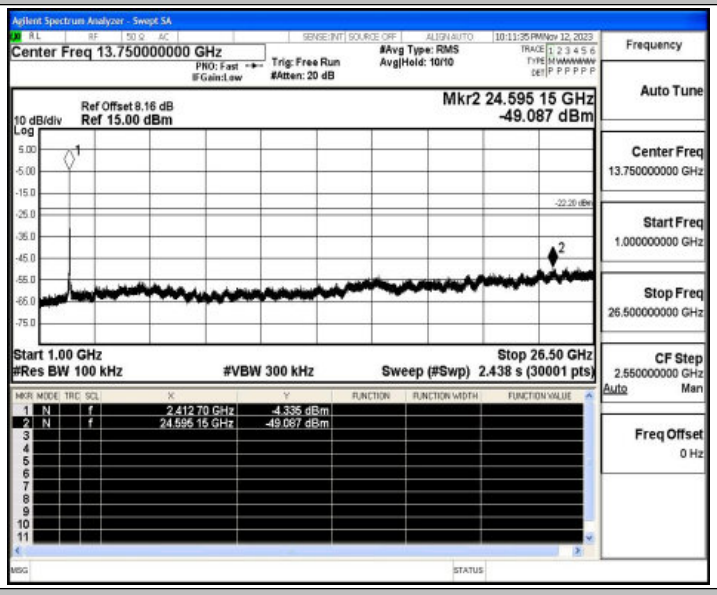
11B_Ant1_2462_1000~26500



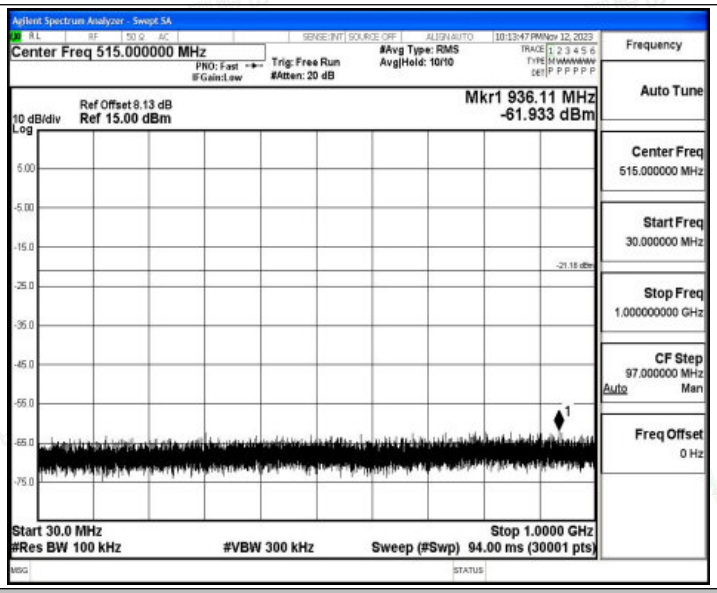
11G_Ant1_2412_30~1000



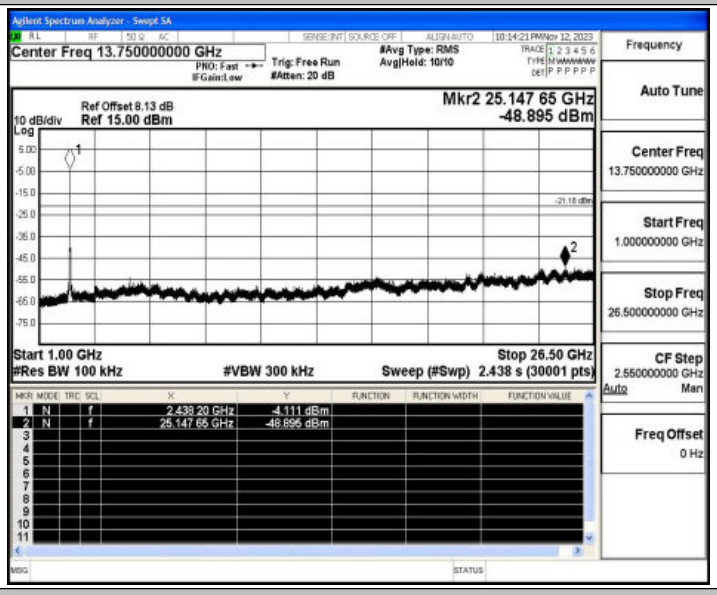
11G_Ant1_2412_1000~26500



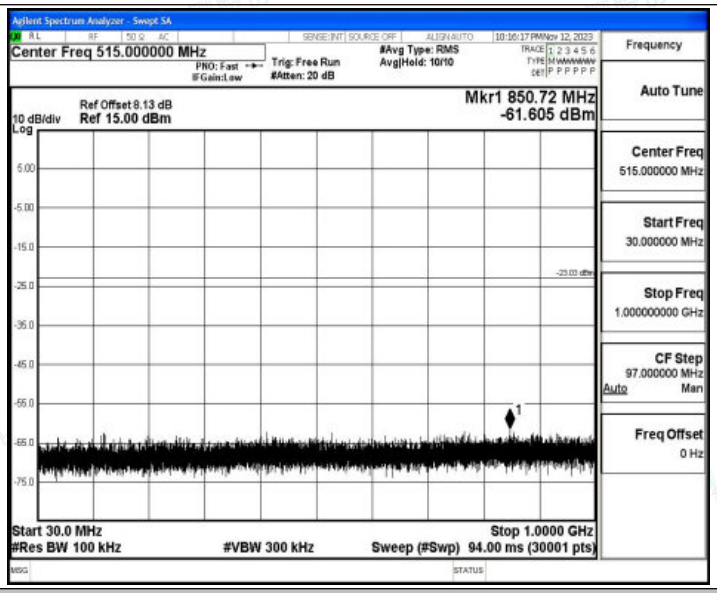
11G_Ant1_2437_30~1000



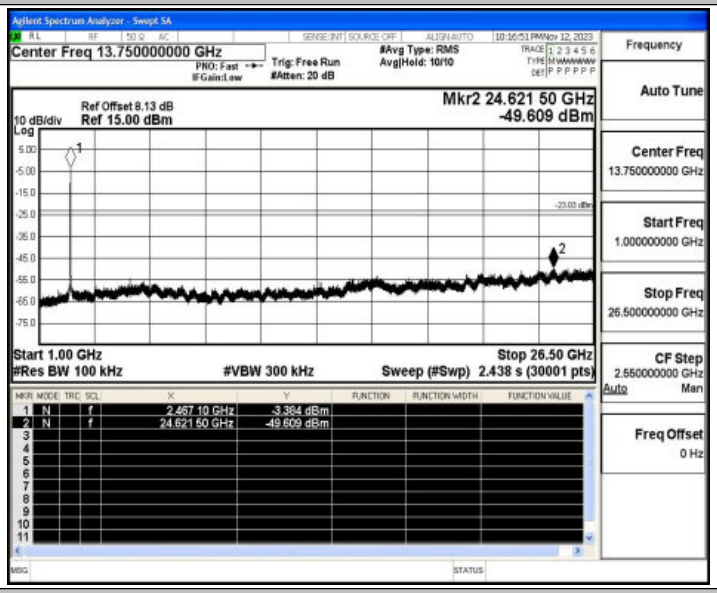
11G_Ant1_2437_1000~26500



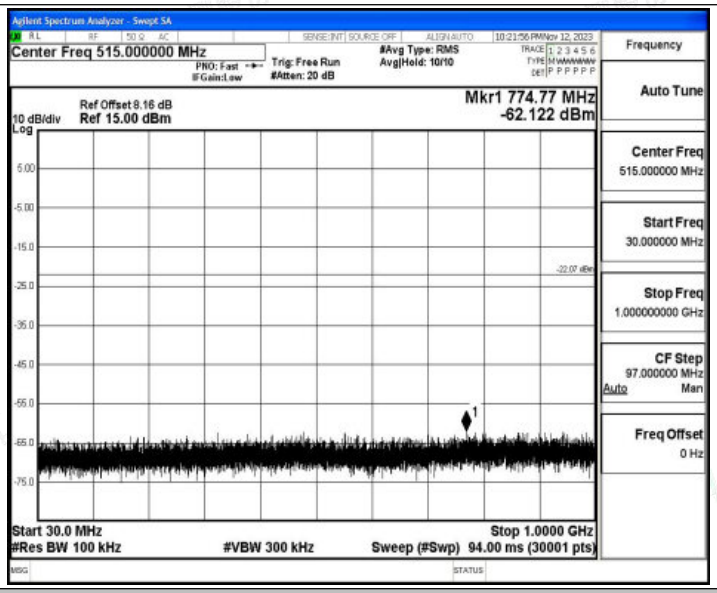
11G_Ant1_2462_30~1000



11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_30~1000



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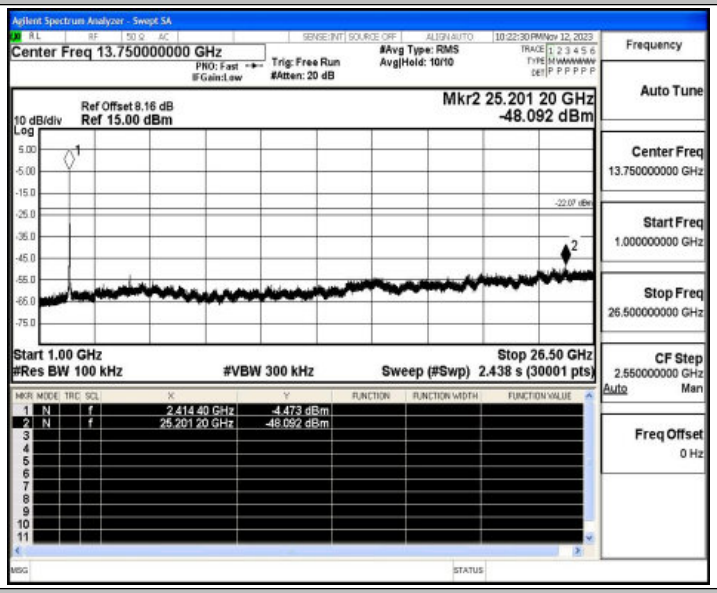
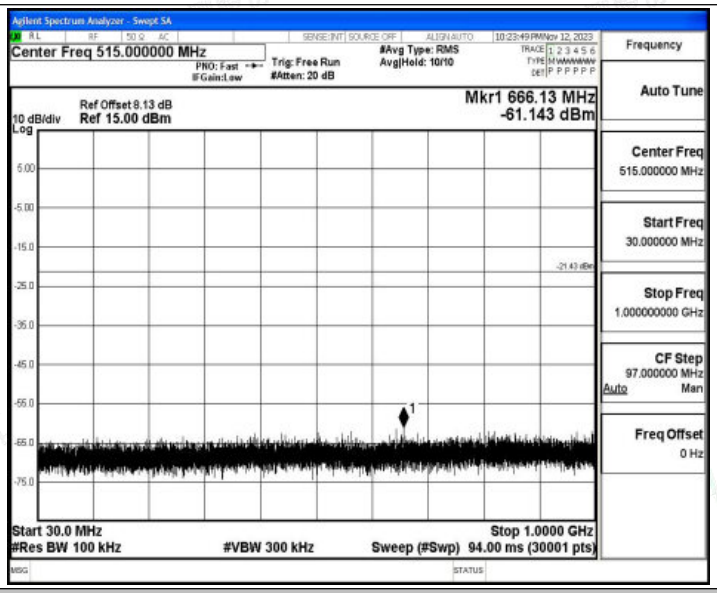


11N20SISO_Ant1_2437_30~1000



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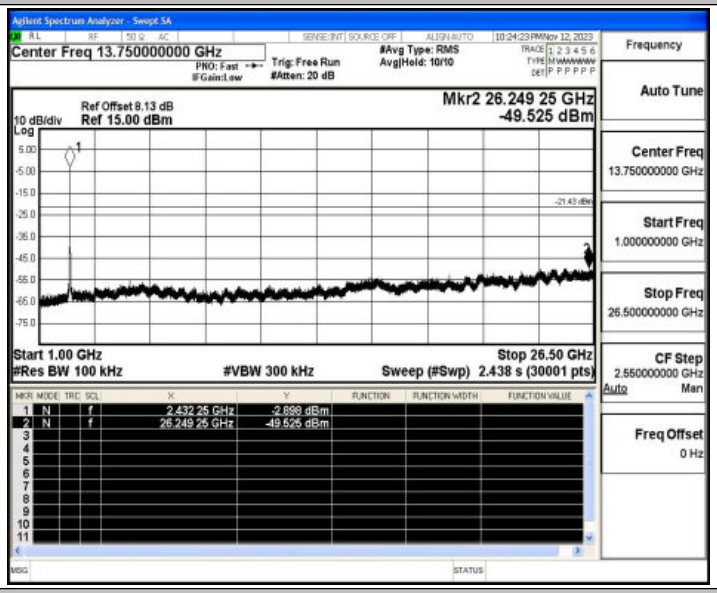
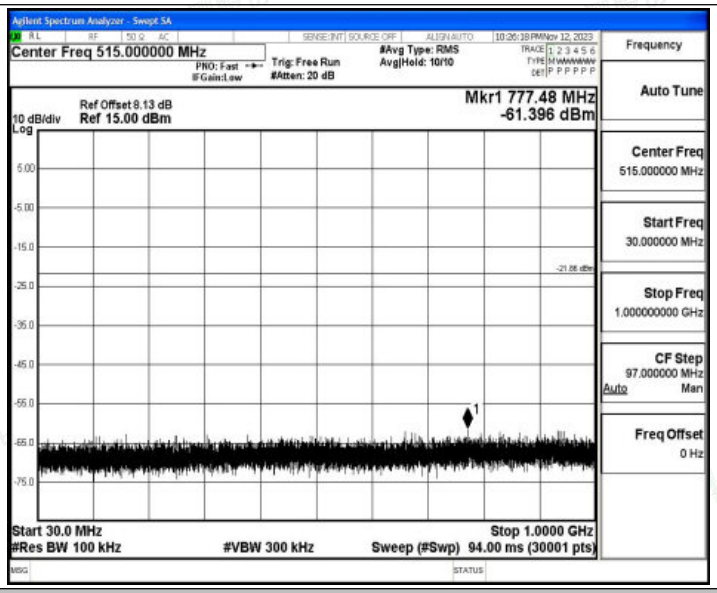
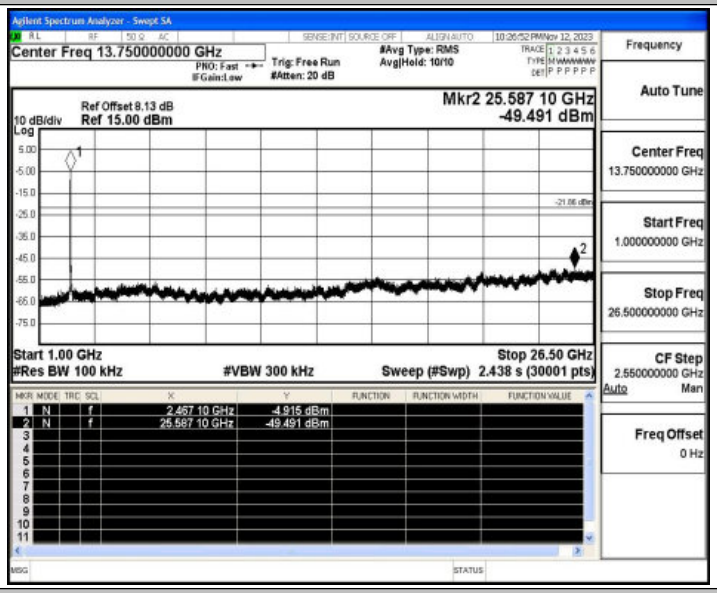


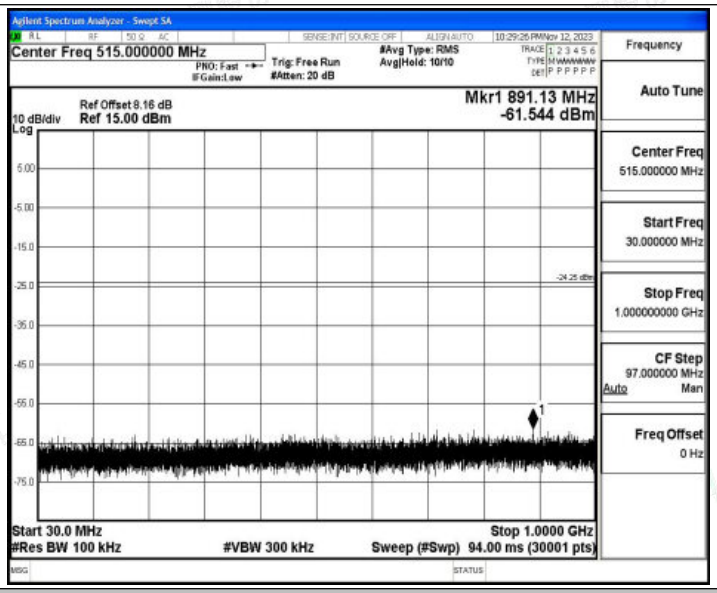
11N20SISO_Ant1_2462_30~1000



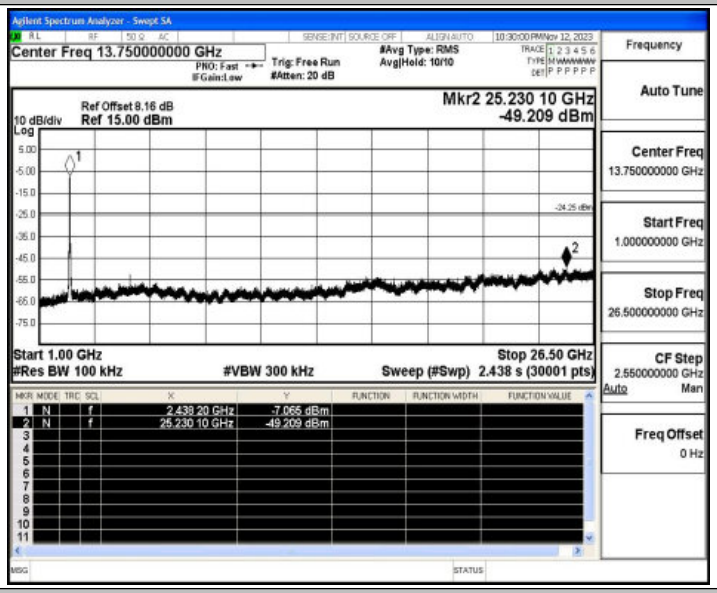
11N20SISO_Ant1_2462_1000~26500



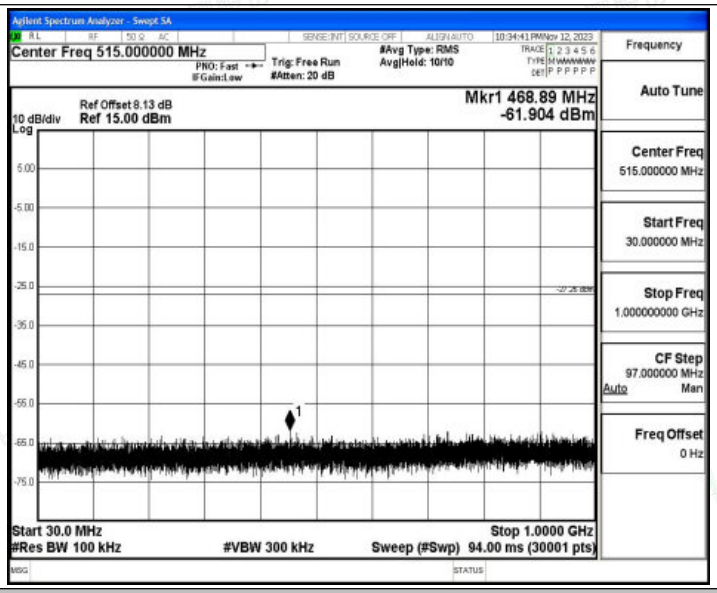
11N40SISO_Ant1_2422_30~1000



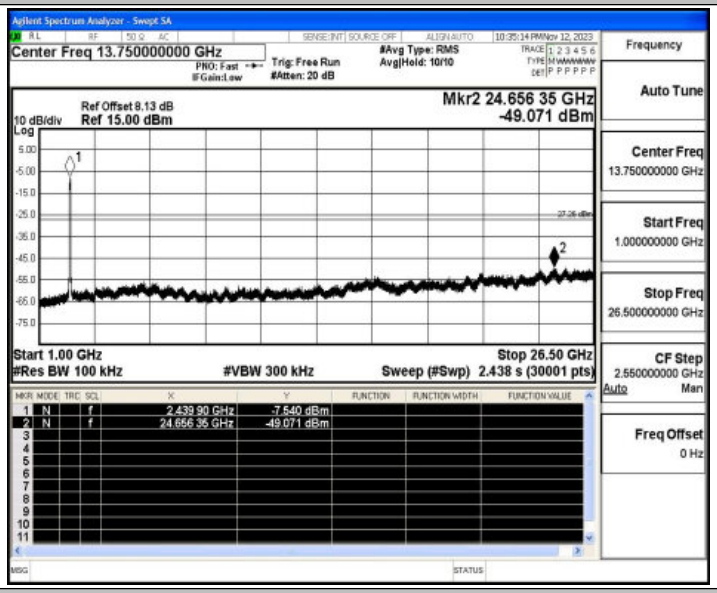
11N40SISO_Ant1_2422_1000~26500



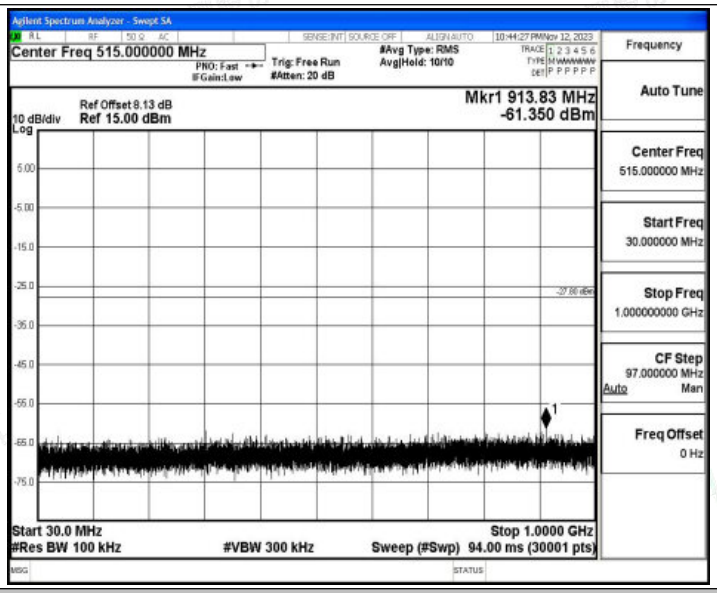
11N40SISO_Ant1_2437_30~1000



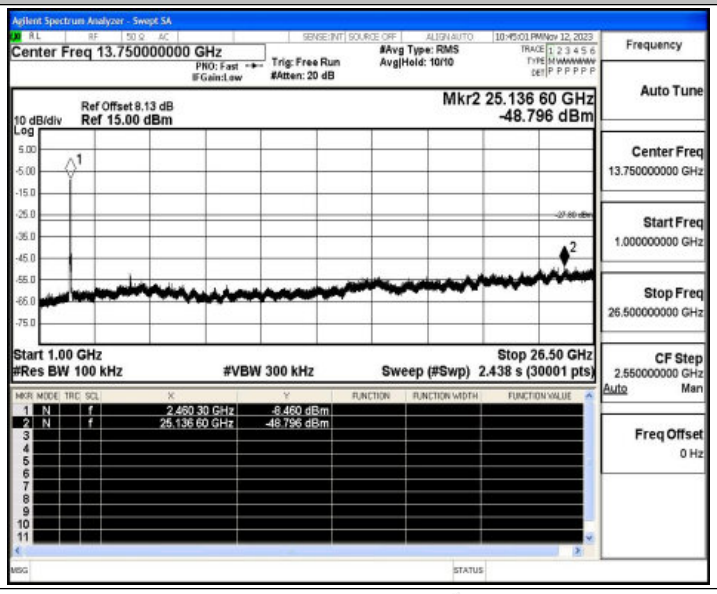
11N40SISO_Ant1_2437_1000~26500



11N40SISO_Ant1_2452_30~1000



11N40SISO_Ant1_2452_1000~26500



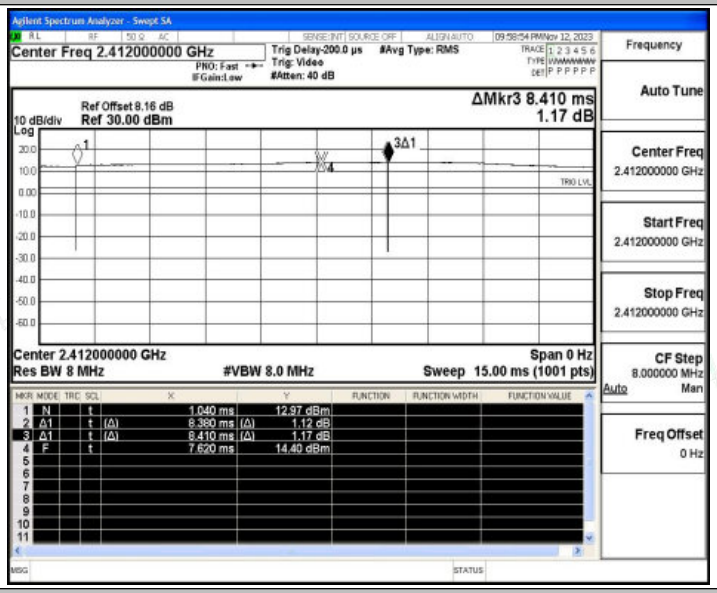
A.6 Duty Cycle

Test Result

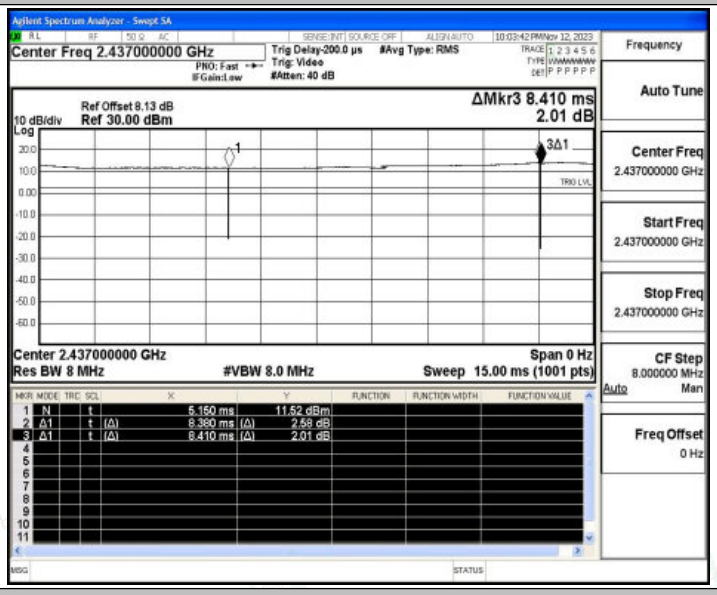
TestMode	Antenna	Freq(MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor	Verdict
11B	Ant1	2412	8.38	8.41	99.64	0.02	PASS
		2437	8.38	8.41	99.64	0.02	PASS
		2462	20.00	20.00	100.00	0.00	PASS
11G	Ant1	2412	1.39	1.43	97.20	0.12	PASS
		2437	1.39	1.43	97.20	0.12	PASS
		2462	1.39	1.43	97.20	0.12	PASS
11N20SISO	Ant1	2412	1.29	1.33	96.99	0.13	PASS
		2437	1.30	1.33	97.74	0.10	PASS
		2462	1.30	1.34	97.01	0.13	PASS
11N40SISO	Ant1	2422	0.64	0.68	94.12	0.26	PASS
		2437	0.64	0.68	94.12	0.26	PASS
		2452	0.64	0.68	94.12	0.26	PASS

Test Graphs

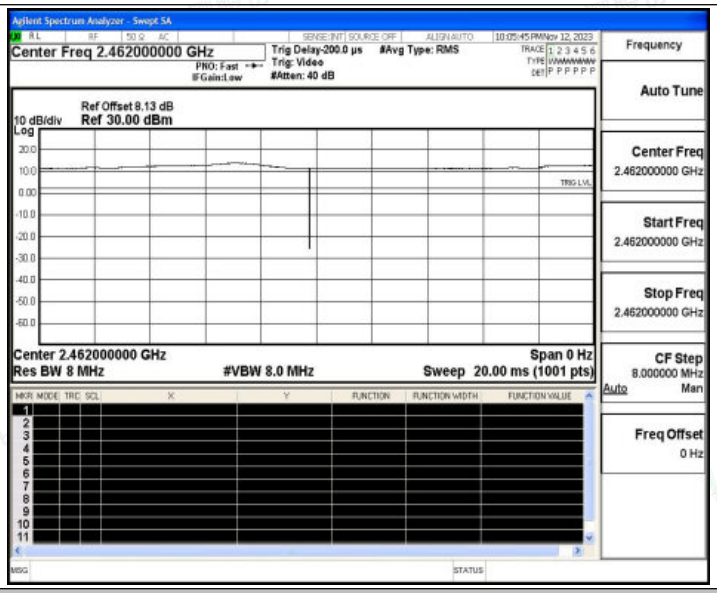
11B_Ant1_2412



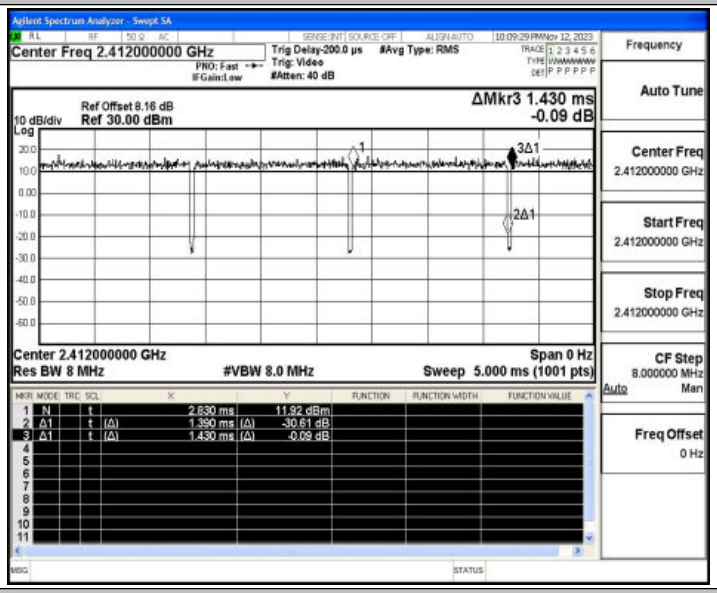
11B_Ant1_2437



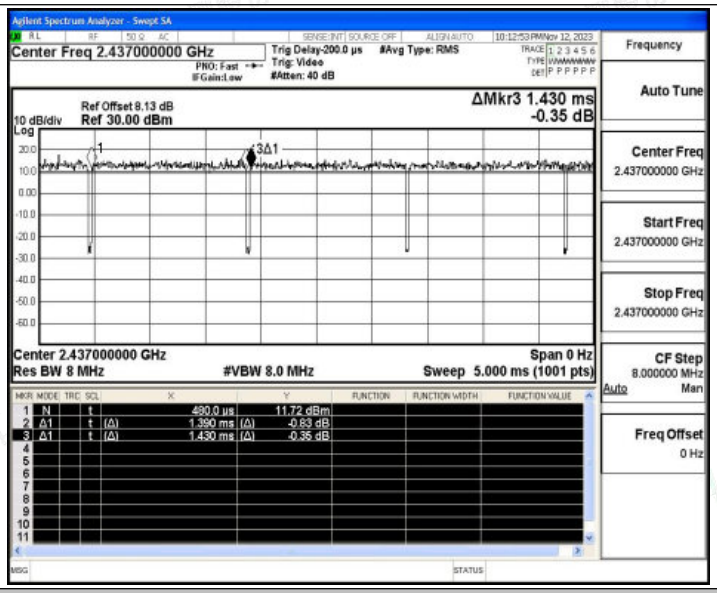
11B_Ant1_2462



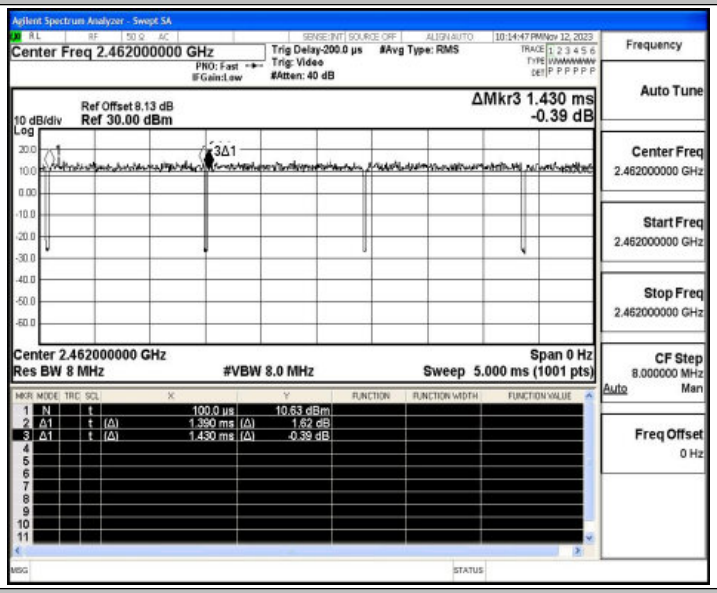
11G_Ant1_2412



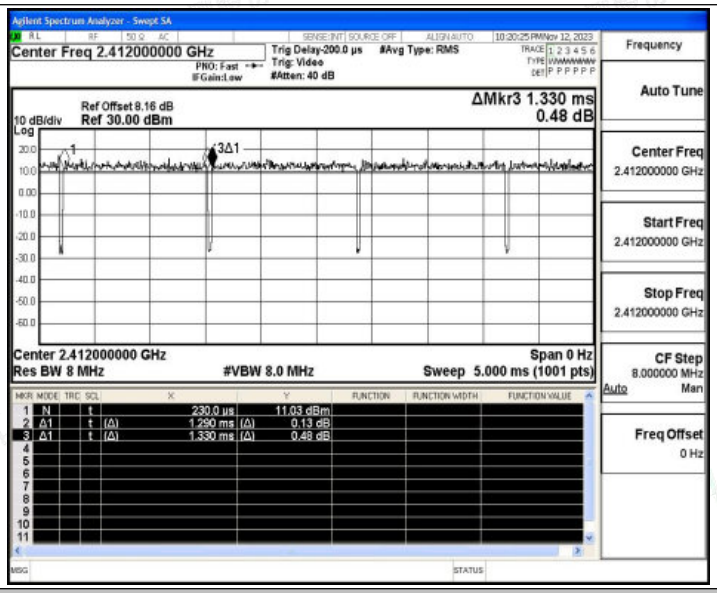
11G_Ant1_2437



11G_Ant1_2462



11N20SISO_Ant1_2412



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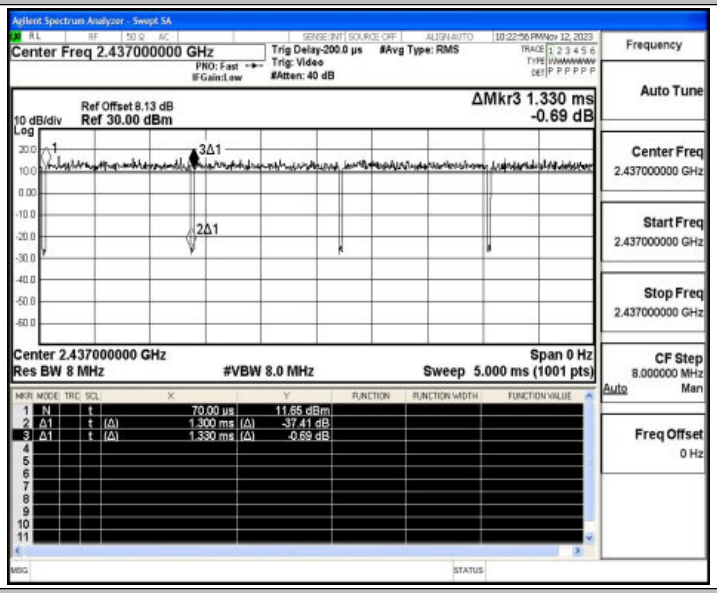
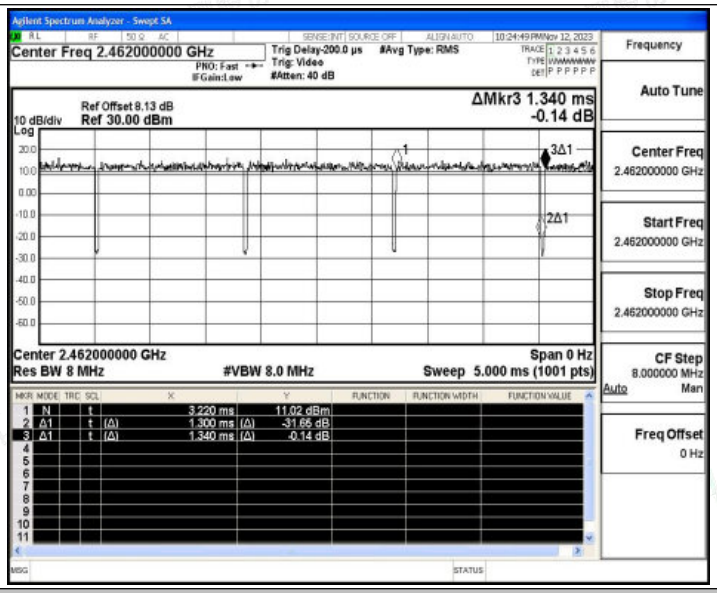
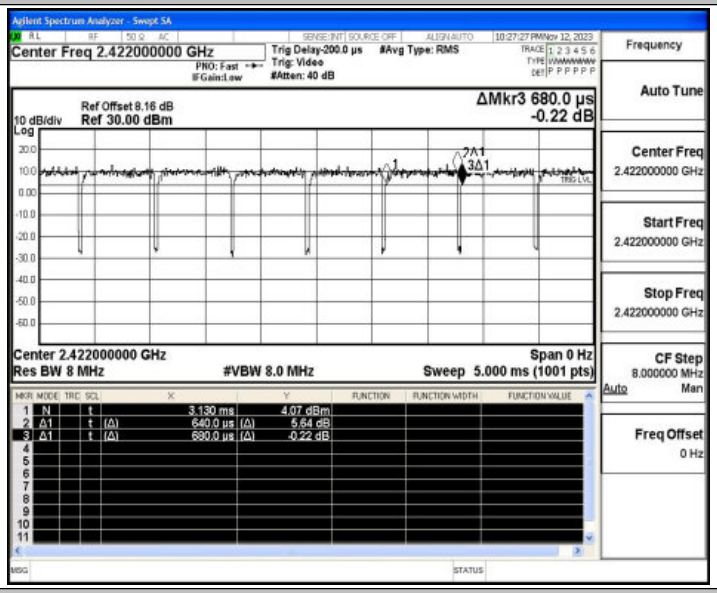


11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



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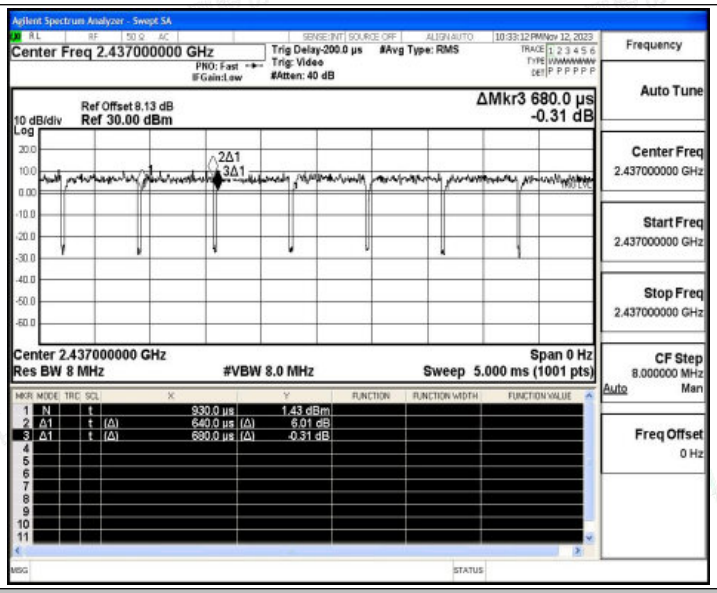
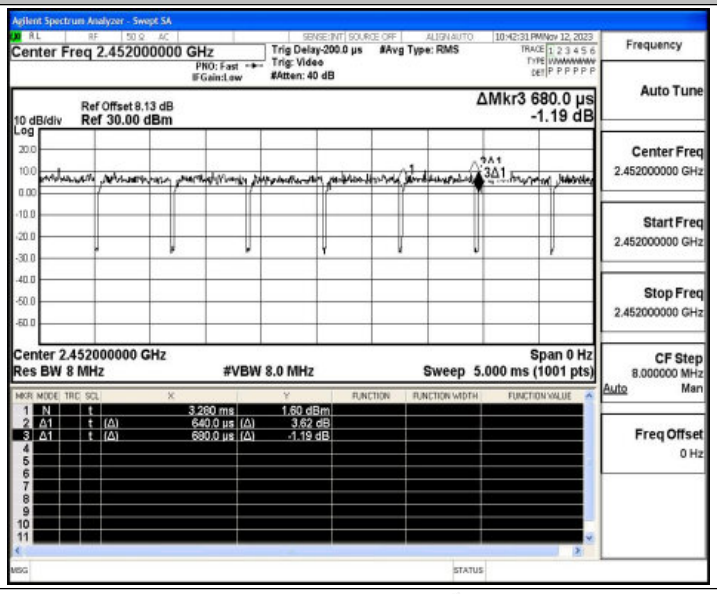


11N40SISO_Ant1_2452



A.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	-49.57	≤-41.20	45.63	≤54	PASS
				AV	2388.010	-48.97	≤-41.20	46.23	≤54	PASS
				AV	2390.000	-49	≤-41.20	46.20	≤54	PASS
				Peak	2310.000	-43.6	≤-21.20	51.60	≤74	PASS
				Peak	2373.710	-39.81	≤-21.20	55.39	≤74	PASS
				Peak	2390.000	-42.38	≤-21.20	52.82	≤74	PASS
		High	2462	AV	2483.500	-48.79	≤-41.20	46.41	≤54	PASS
				AV	2483.670	-48.78	≤-41.20	46.42	≤54	PASS
				AV	2500.000	-49.01	≤-41.20	46.19	≤54	PASS
				Peak	2483.500	-41.73	≤-21.20	53.47	≤74	PASS
				Peak	2487.520	-39.06	≤-21.20	56.14	≤74	PASS
				Peak	2500.000	-42.59	≤-21.20	52.61	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-48.93	≤-41.20	46.27	≤54	PASS
				AV	2389.960	-45.89	≤-41.20	49.31	≤54	PASS
				AV	2390.000	-45.9	≤-41.20	49.30	≤54	PASS
				Peak	2310.000	-44.38	≤-21.20	50.82	≤74	PASS
				Peak	2389.960	-37.83	≤-21.20	57.37	≤74	PASS
				Peak	2390.000	-37.83	≤-21.20	57.37	≤74	PASS
		High	2462	AV	2483.500	-44.22	≤-41.20	50.98	≤54	PASS
				AV	2483.670	-44.36	≤-41.20	50.84	≤54	PASS
				AV	2500.000	-47.72	≤-41.20	47.48	≤54	PASS
				Peak	2483.500	-34.24	≤-21.20	60.96	≤74	PASS
				Peak	2483.560	-34.91	≤-21.20	60.29	≤74	PASS
				Peak	2500.000	-43.71	≤-21.20	51.49	≤74	PASS
11N20SISO	Ant1	Low	2412	AV	2310.000	-48.88	≤-41.20	46.32	≤54	PASS
				AV	2389.960	-44.99	≤-41.20	50.21	≤54	PASS
				AV	2390.000	-44.99	≤-41.20	50.21	≤54	PASS
				Peak	2310.000	-41.68	≤-21.20	53.52	≤74	PASS
				Peak	2389.310	-34.65	≤-21.20	60.55	≤74	PASS
				Peak	2390.000	-35.55	≤-21.20	59.65	≤74	PASS
		High	2462	AV	2483.500	-42.3	≤-41.20	52.90	≤54	PASS
				AV	2483.780	-41.98	≤-41.20	53.22	≤54	PASS
				AV	2500.000	-47.62	≤-41.20	47.58	≤54	PASS
				Peak	2483.500	-35.33	≤-21.20	59.87	≤74	PASS

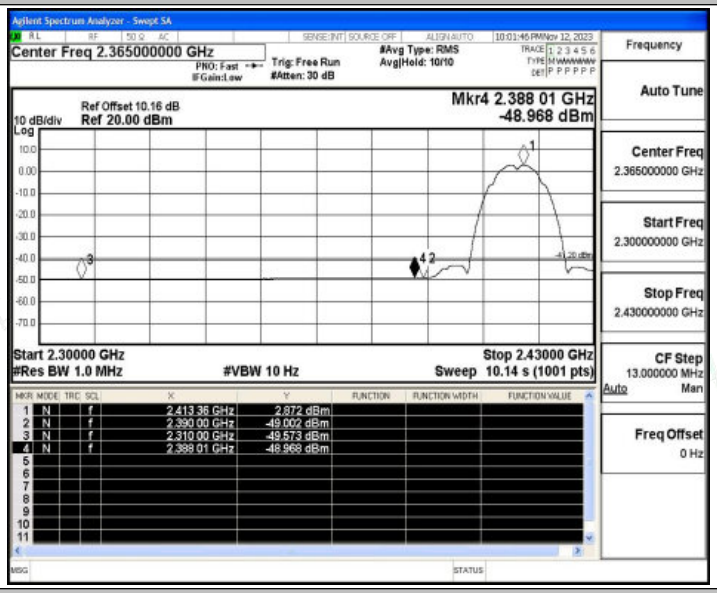
				Peak	2485.430	-33.66	≤-21.20	61.54	≤74	PASS
				Peak	2500.000	-41.66	≤-21.20	53.54	≤74	PASS
11N40SISO	Ant1	Low	2422	AV	2310.000	-48.63	≤-41.20	46.57	≤54	PASS
				AV	2387.880	-44.54	≤-41.20	50.66	≤54	PASS
				AV	2390.000	-44.76	≤-41.20	50.44	≤54	PASS
				Peak	2310.000	-41.45	≤-21.20	53.75	≤74	PASS
				Peak	2385.540	-33.38	≤-21.20	61.82	≤74	PASS
				Peak	2390.000	-40.34	≤-21.20	54.86	≤74	PASS
		High	2452	AV	2483.500	-42.6	≤-41.20	52.60	≤54	PASS
				AV	2484.220	-42.27	≤-41.20	52.93	≤54	PASS
				AV	2500.000	-46.68	≤-41.20	48.52	≤54	PASS
				Peak	2483.500	-36.4	≤-21.20	58.80	≤74	PASS
				Peak	2486.970	-27.42	≤-21.20	67.78	≤74	PASS
				Peak	2500.000	-40.6	≤-21.20	54.60	≤74	PASS

Note:

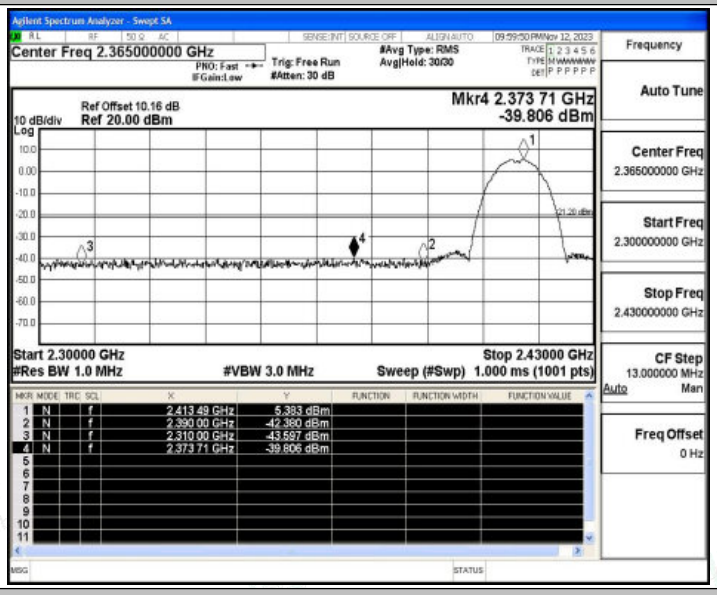
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

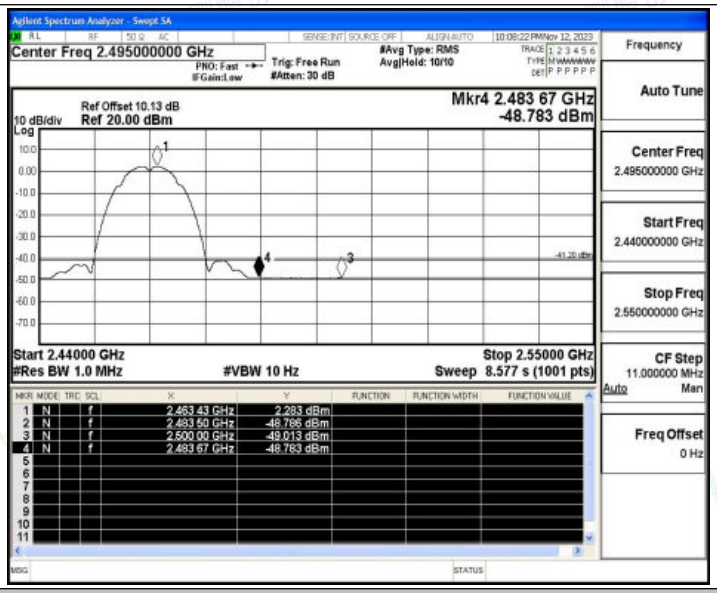
11B_Ant1_Low_2412_AV



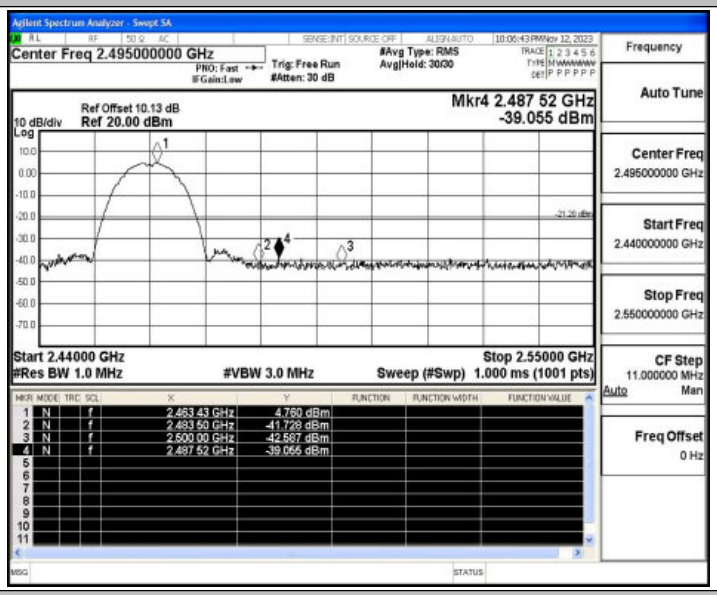
11B_Ant1_Low_2412_Peak



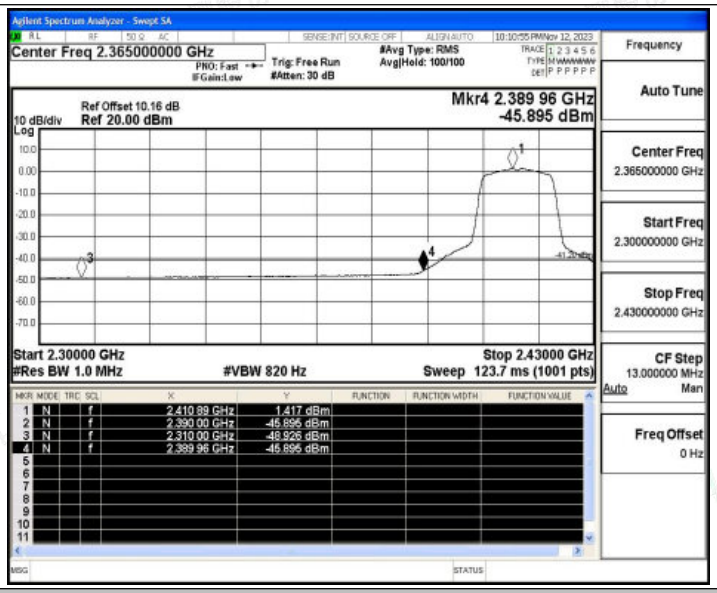
11B_Ant1_High_2462_AV



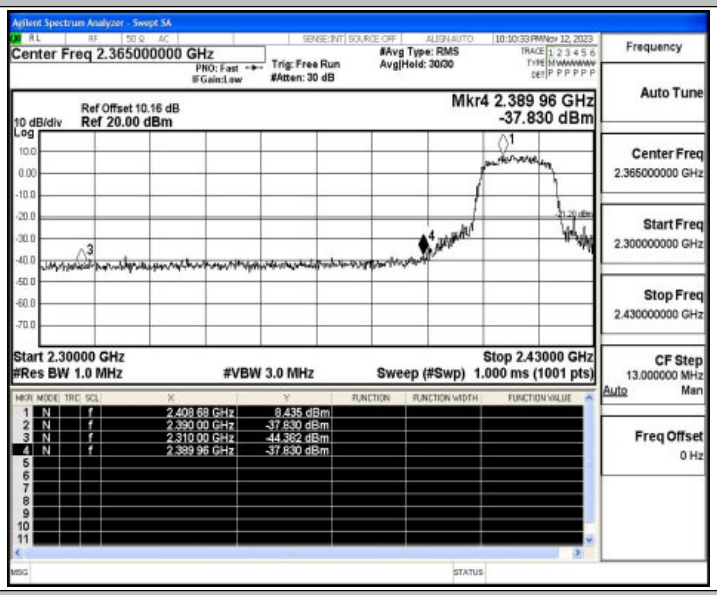
11B_Ant1_High_2462_Peak



11G_Ant1_Low_2412_AV



11G_Ant1_Low_2412_Peak



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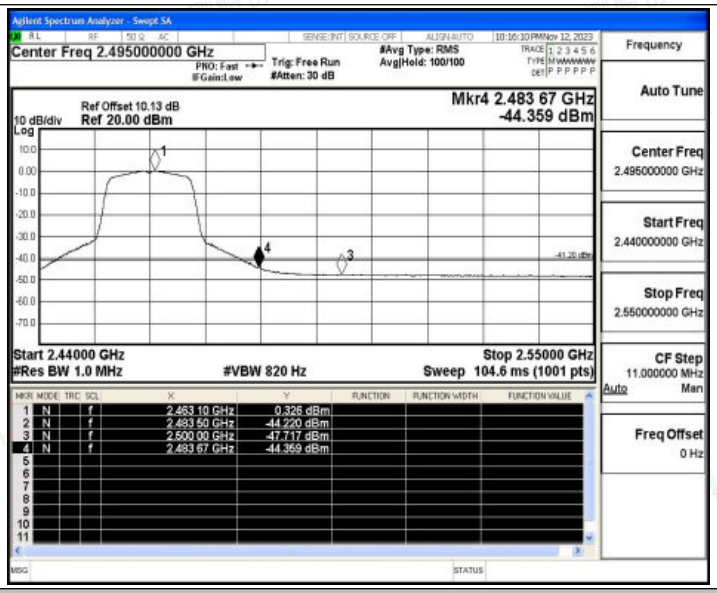
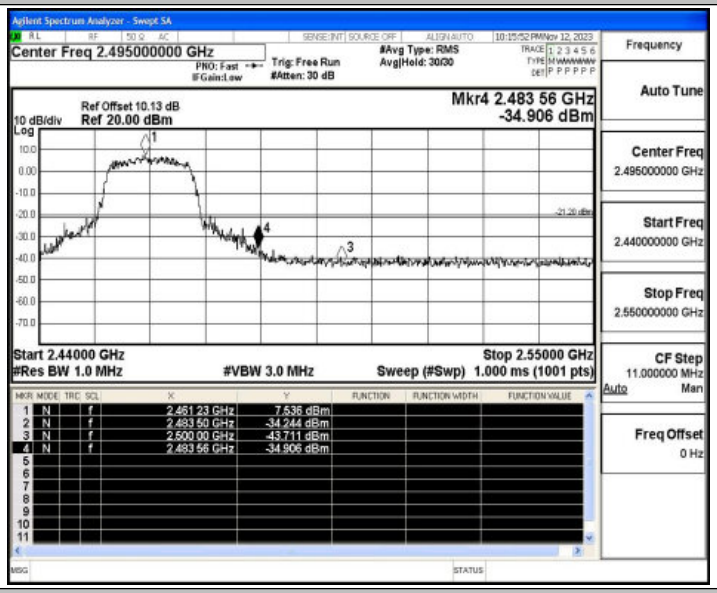
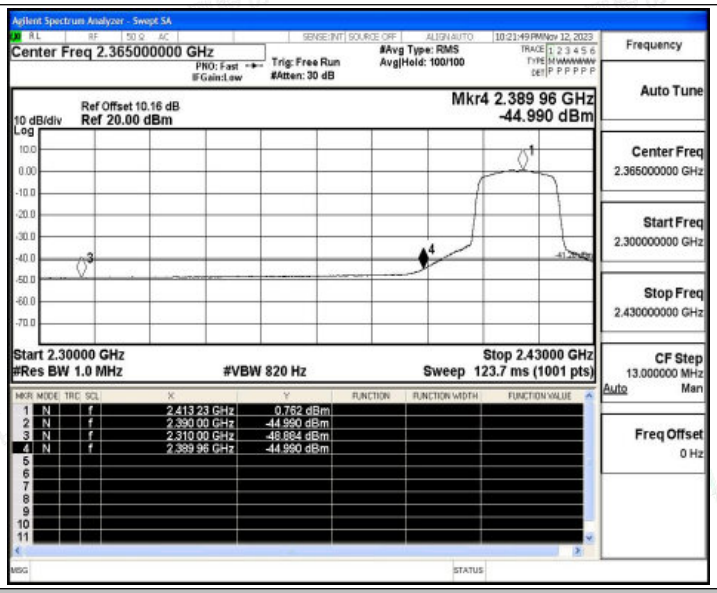


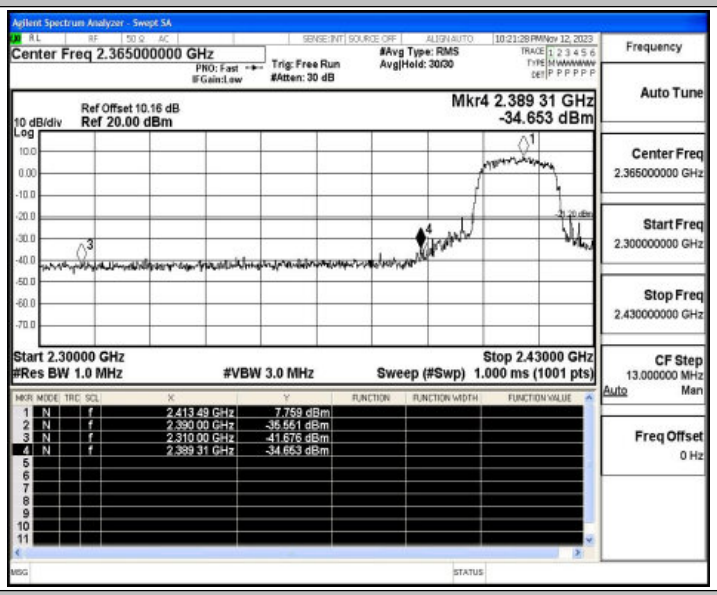
11G_Ant1_High_2462_Peak



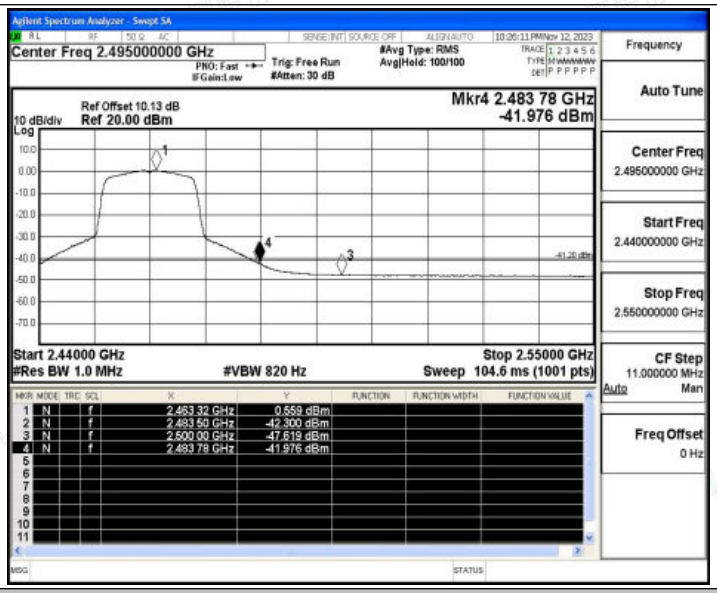
11N20SISO_Ant1_Low_2412_AV



11N20SISO_Ant1_Low_2412_Peak



11N20SISO_Ant1_High_2462_AV



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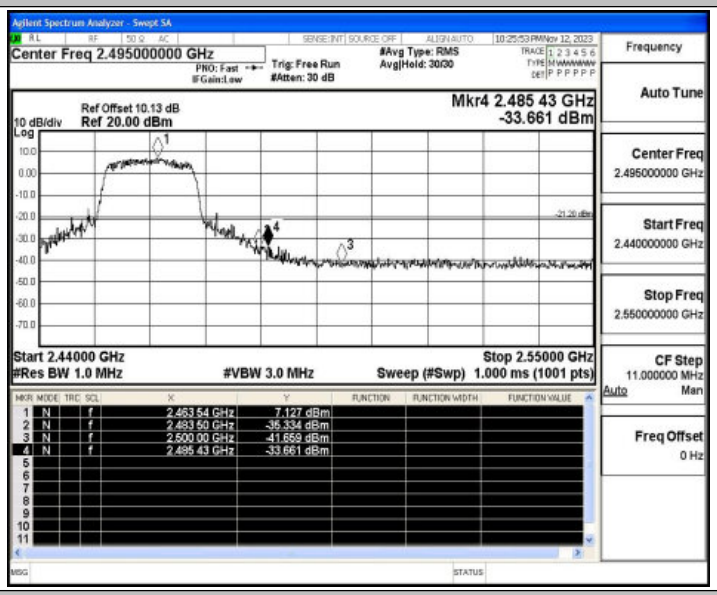

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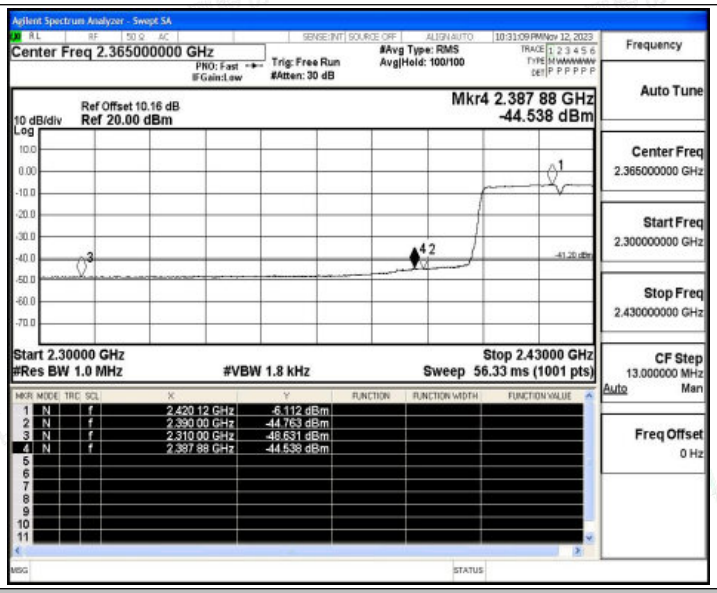
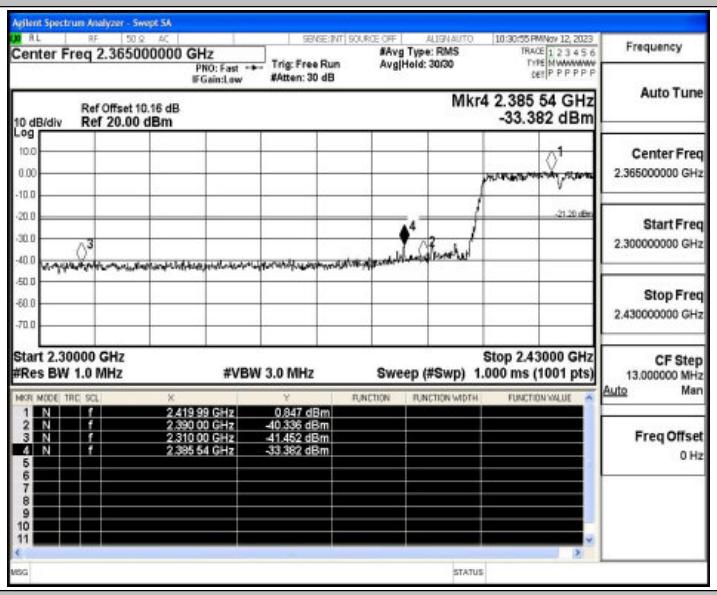


11N40SISO_Ant1_Low_2422_Peak



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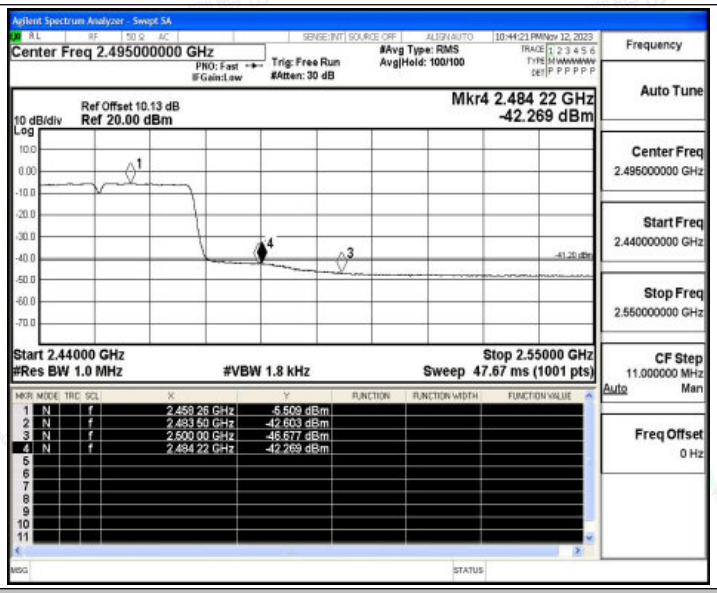
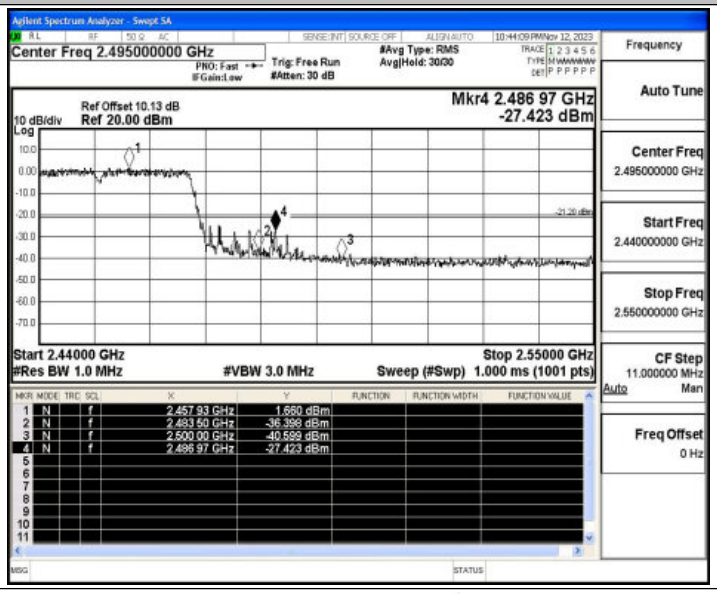
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