



Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Robotic Vacuum Cleaner

Test Model: A91+

Environmental Conditions

Temperature:	21.1° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Mark Chen
Supervised by:	Libin



A.1 6dB Bandwidth

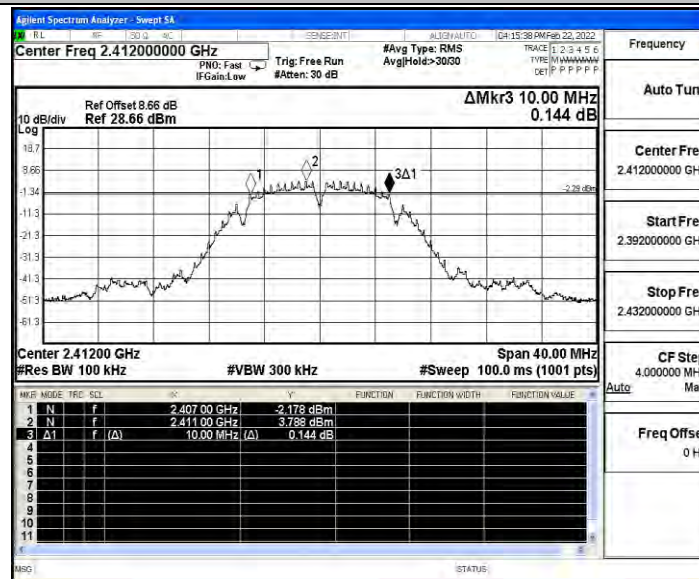
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.000	2407.000	2417.000	0.5	PASS
		2437	9.520	2432.440	2441.960	0.5	PASS
		2462	9.080	2457.440	2466.520	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	16.360	2453.800	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	36.240	2403.920	2440.160	0.5	PASS
		2437	36.080	2419.080	2455.160	0.5	PASS
		2452	35.920	2434.000	2469.920	0.5	PASS

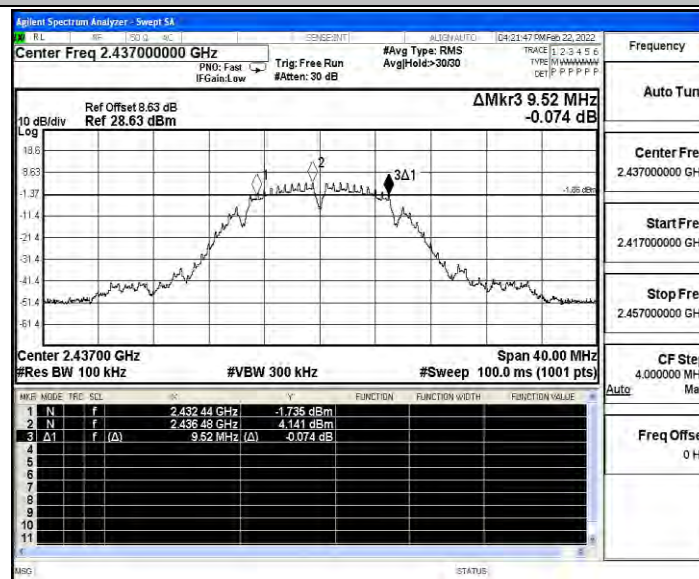


Test Graphs

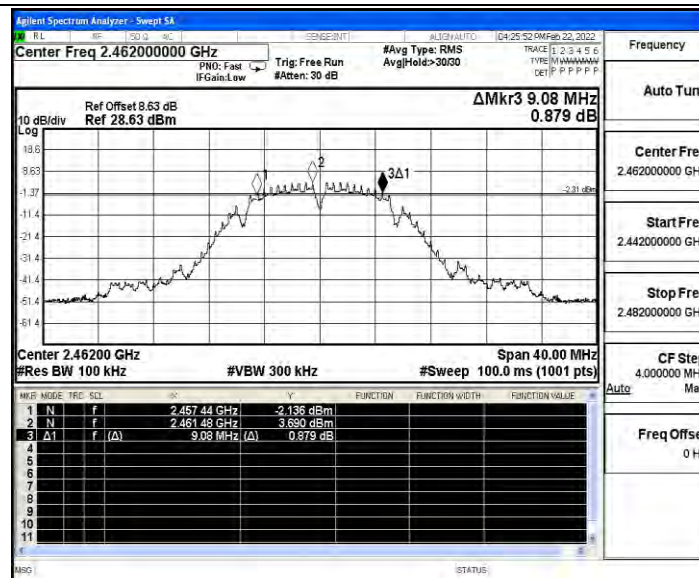
11B_Ant1_2412



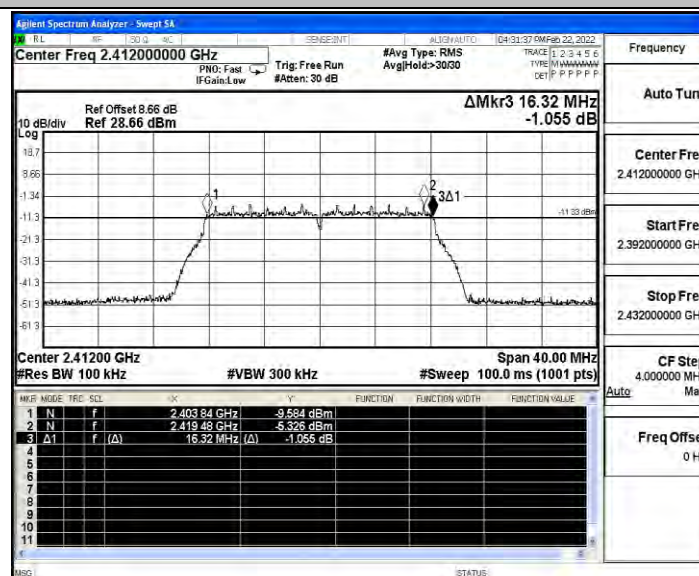
11B_Ant1_2437



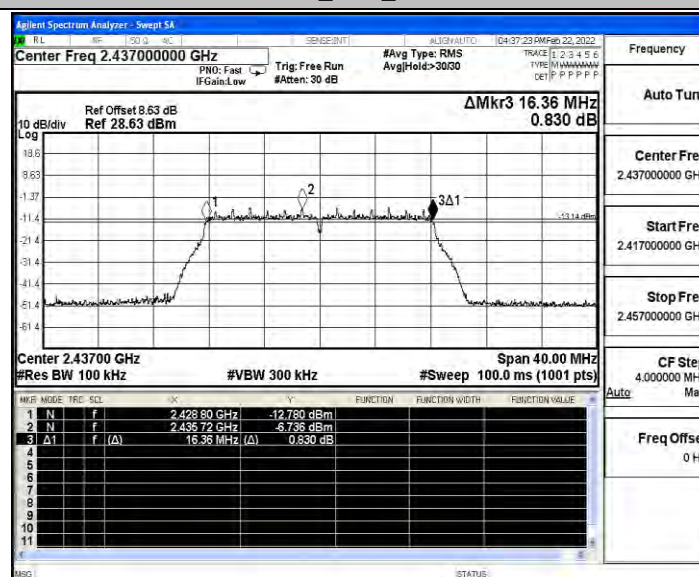
11B_Ant1_2462



11G_Ant1_2412

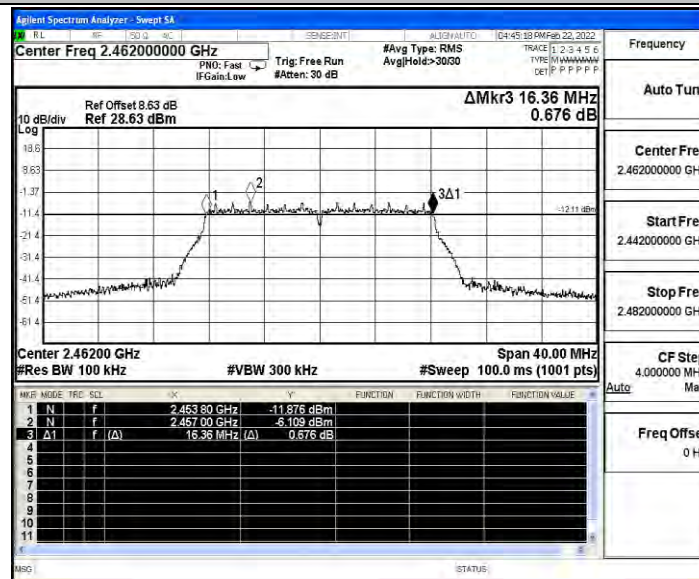


11G_Ant1_2437

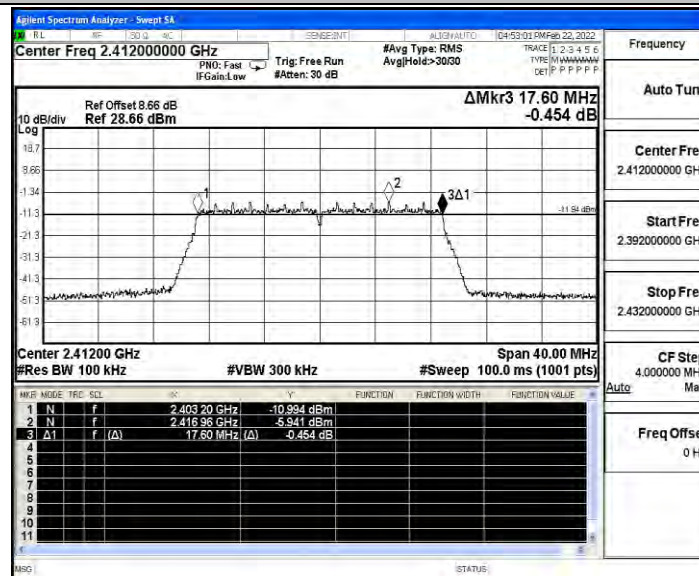




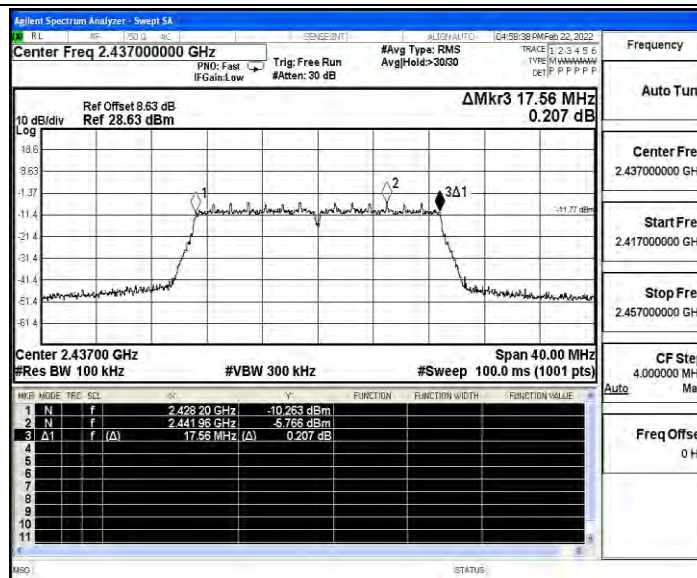
11G_Ant1_2462



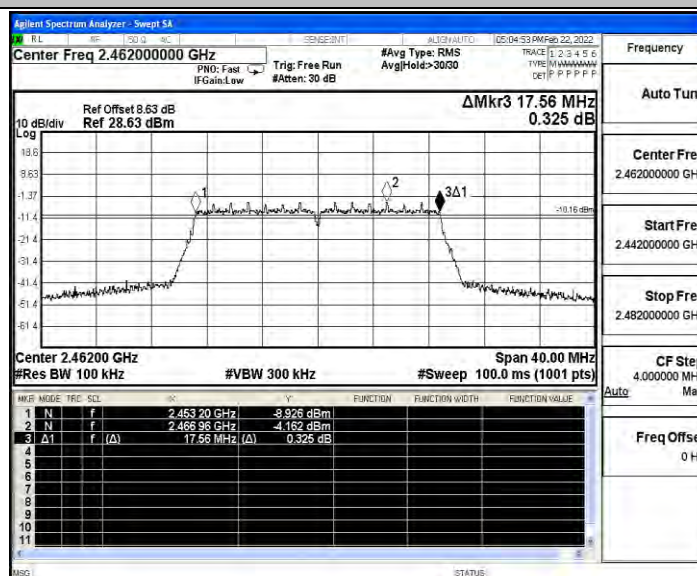
11N20SISO_Ant1_2412



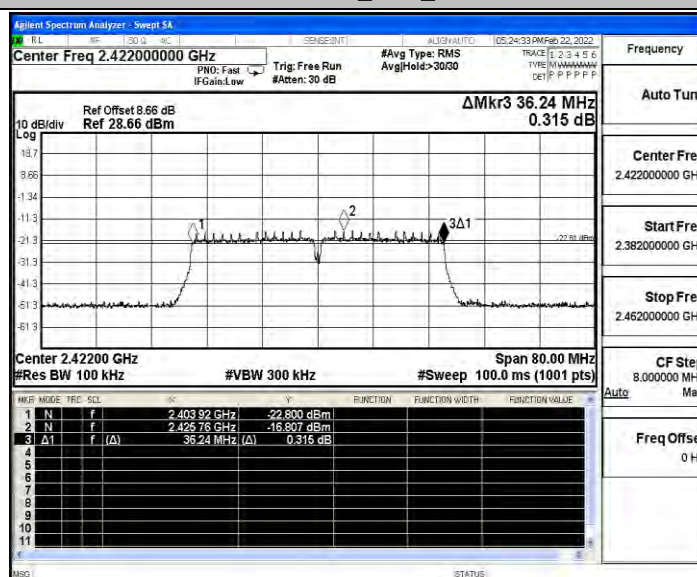
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

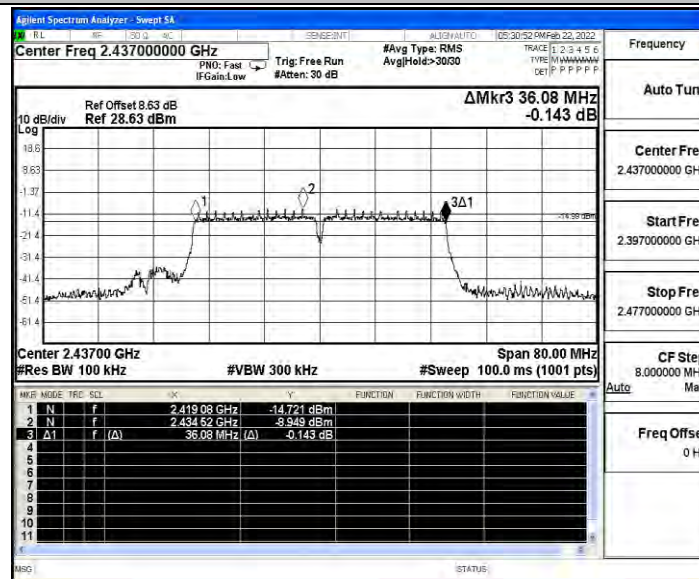


11N40SISO_Ant1_2422

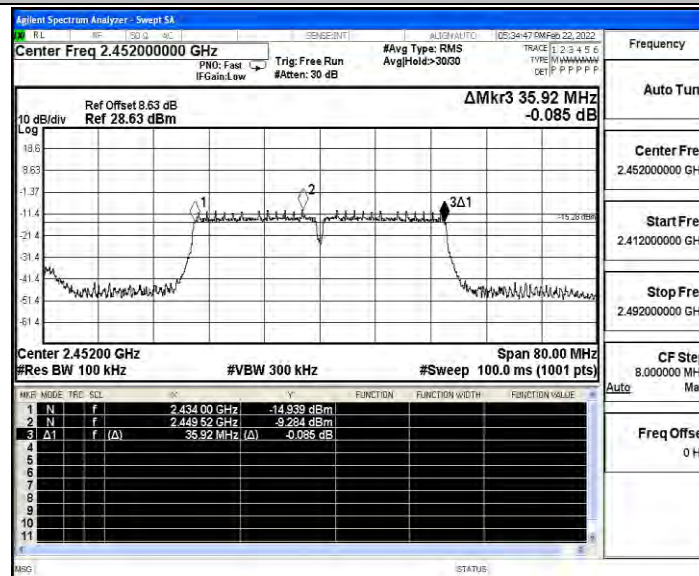




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.67	≤30.00	PASS
		2437	15.77	≤30.00	PASS
		2462	15.21	≤30.00	PASS
11G	Ant1	2412	14.82	≤30.00	PASS
		2437	13.69	≤30.00	PASS
		2462	13.43	≤30.00	PASS
11N20SISO	Ant1	2412	13.66	≤30.00	PASS
		2437	13.85	≤30.00	PASS
		2462	13.93	≤30.00	PASS
11N40SISO	Ant1	2422	13.35	≤30.00	PASS
		2437	13.19	≤30.00	PASS
		2452	12.89	≤30.00	PASS



A.3 Maximum power spectral density

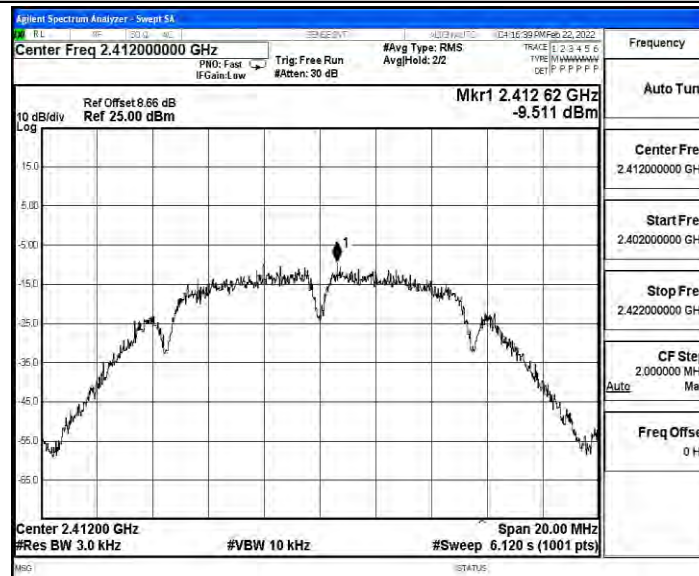
Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-9.51	≤8.00	PASS
		2437	-11	≤8.00	PASS
		2462	-11.38	≤8.00	PASS
11G	Ant1	2412	-18.39	≤8.00	PASS
		2437	-20.12	≤8.00	PASS
		2462	-20.79	≤8.00	PASS
11N20SISO	Ant1	2412	-20.53	≤8.00	PASS
		2437	-19.86	≤8.00	PASS
		2462	-19.86	≤8.00	PASS
11N40SISO	Ant1	2422	-22.76	≤8.00	PASS
		2437	-22.58	≤8.00	PASS
		2452	-23.61	≤8.00	PASS

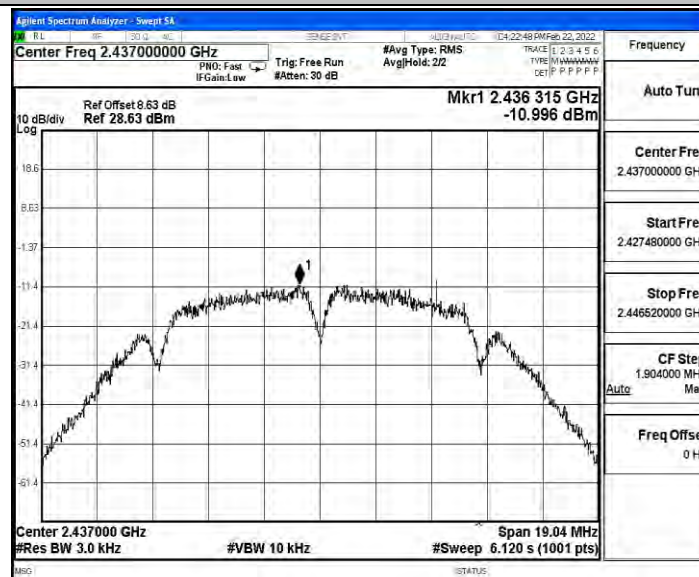


Test Graphs

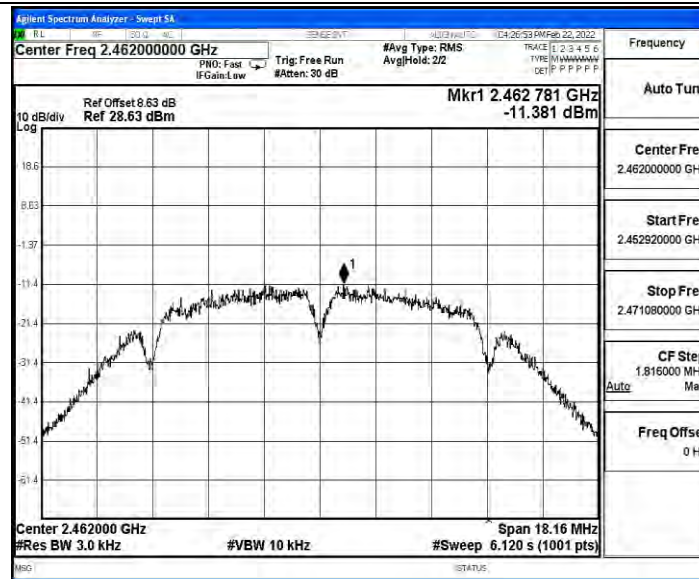
11B_Ant1_2412



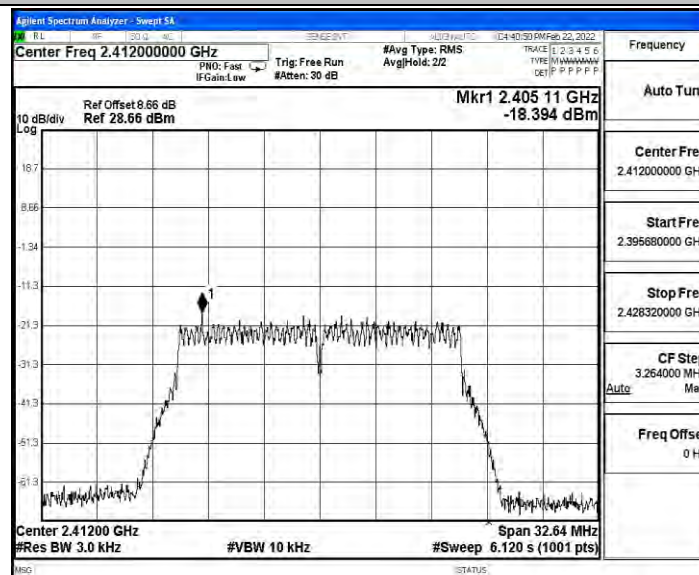
11B_Ant1_2437



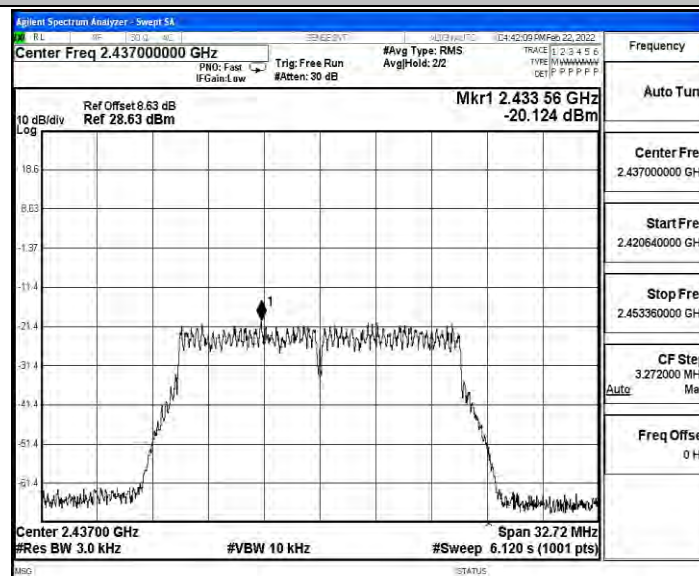
11B_Ant1_2462



11G_Ant1_2412

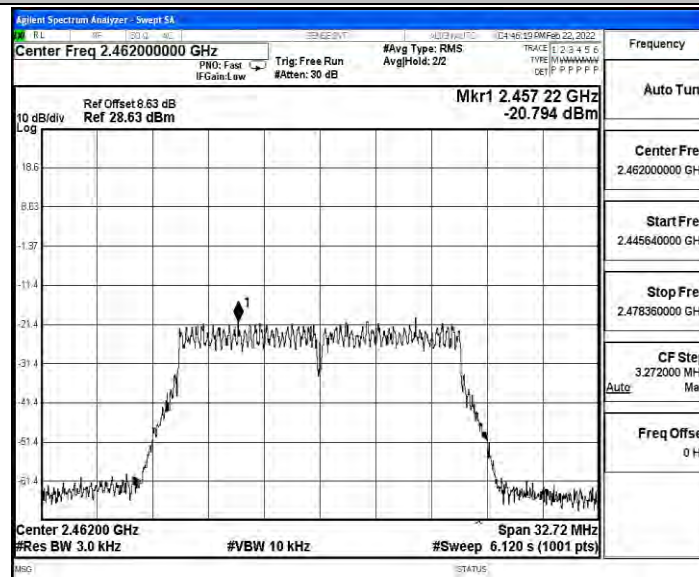


11G_Ant1_2437

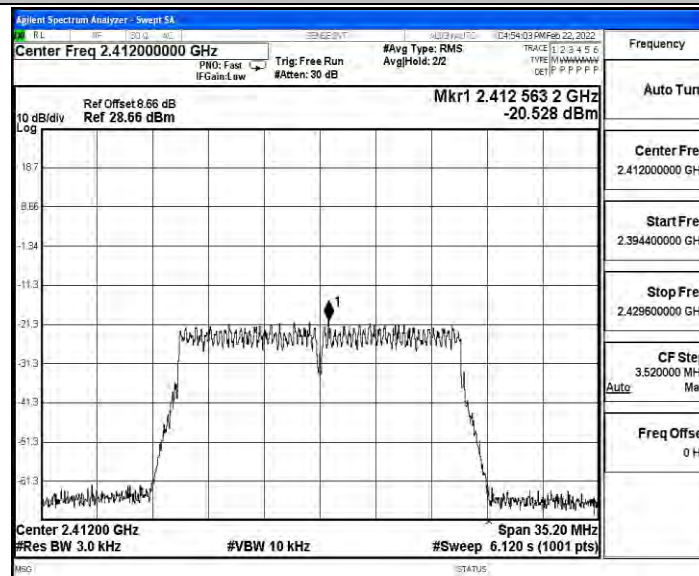




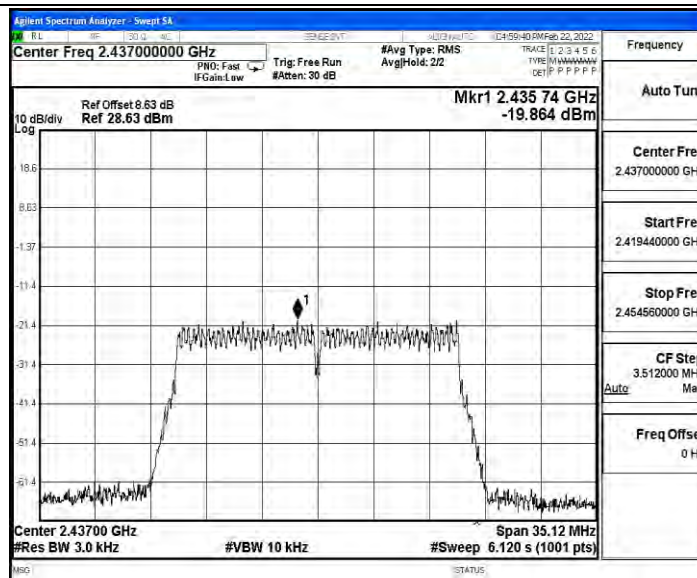
11G_Ant1_2462



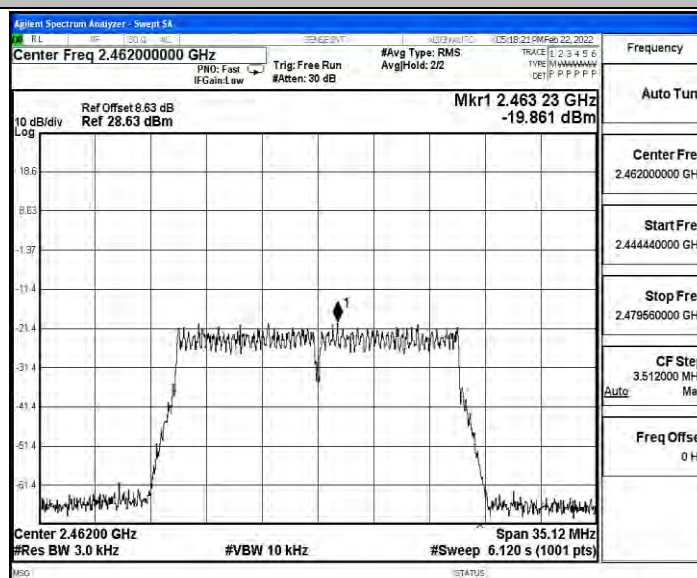
11N20SISO_Ant1_2412



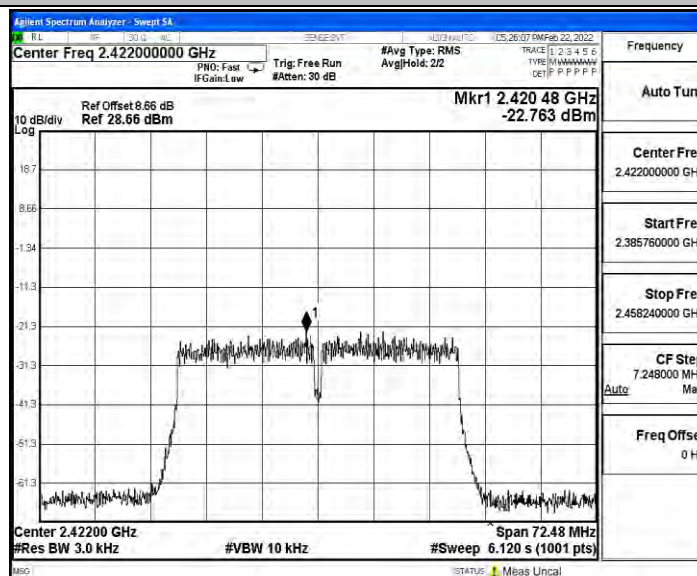
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

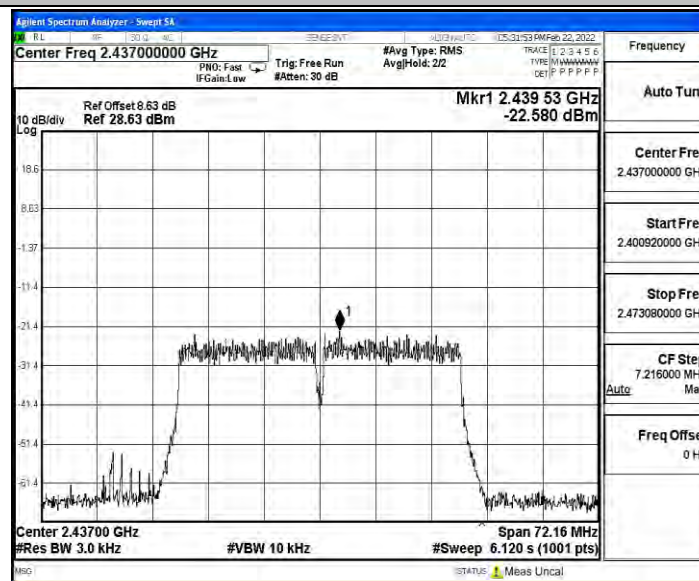


11N40SISO_Ant1_2422

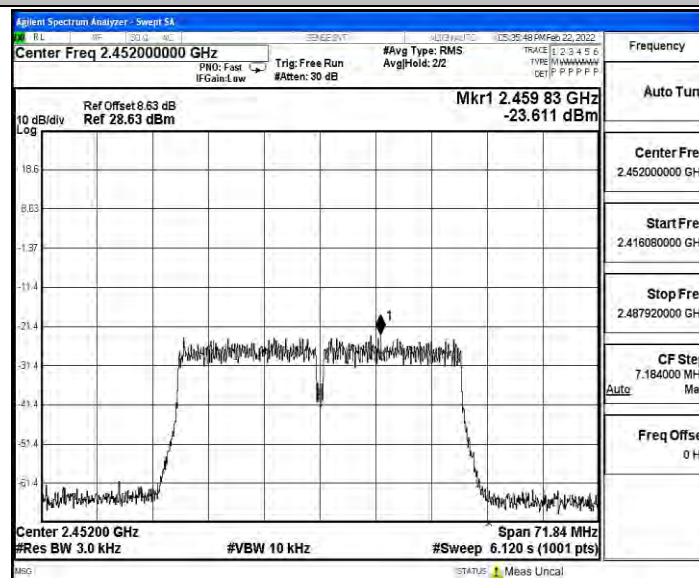




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.4 Band edge measurements

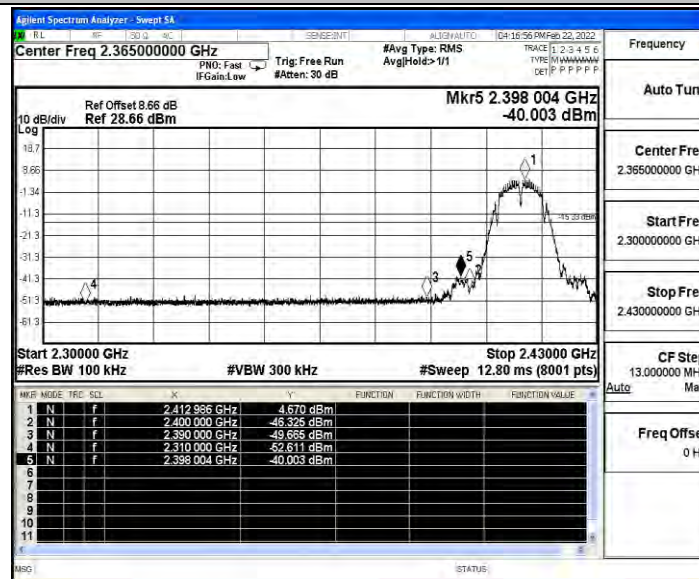
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	4.67	-40	≤ -15.33	PASS
		High	2462	3.61	-47.6	≤ -16.39	PASS
11G	Ant1	Low	2412	-5.39	-48.21	≤ -25.39	PASS
		High	2462	-6.05	-48.12	≤ -26.05	PASS
11N20SISO	Ant1	Low	2412	-5.62	-45.2	≤ -25.62	PASS
		High	2462	-3.81	-47.75	≤ -23.81	PASS
11N40SISO	Ant1	Low	2422	-8.72	-43.99	≤ -28.72	PASS
		High	2452	-9.25	-44.24	≤ -29.25	PASS

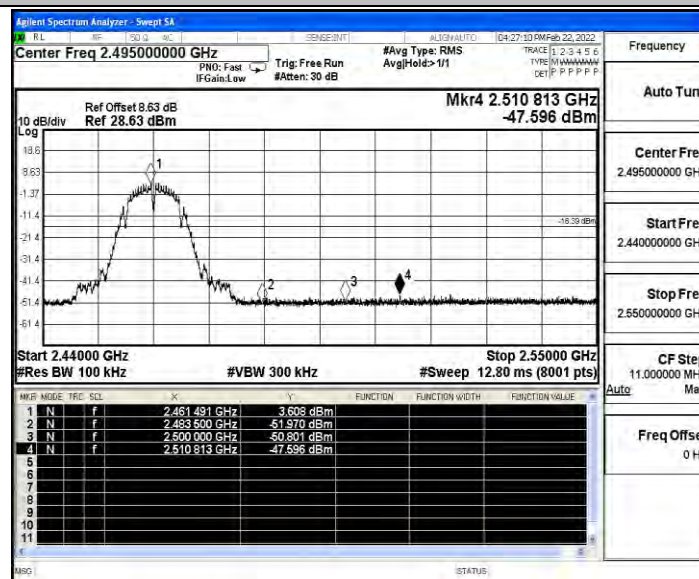


Test Graphs

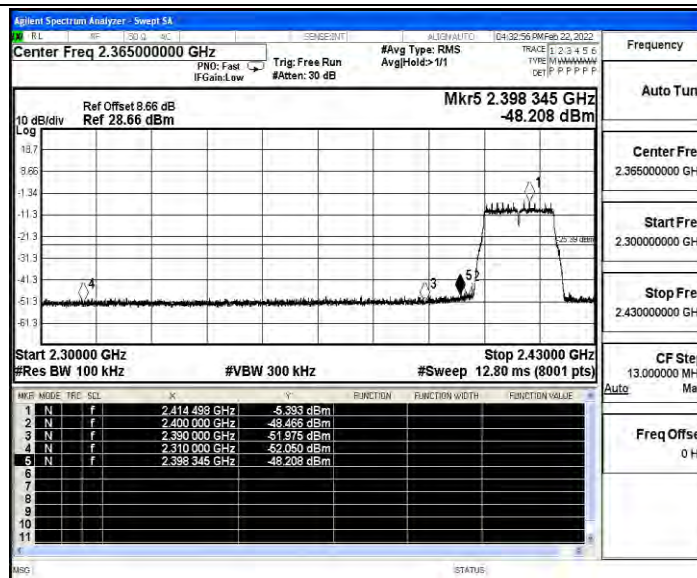
11B_Ant1_Low_2412



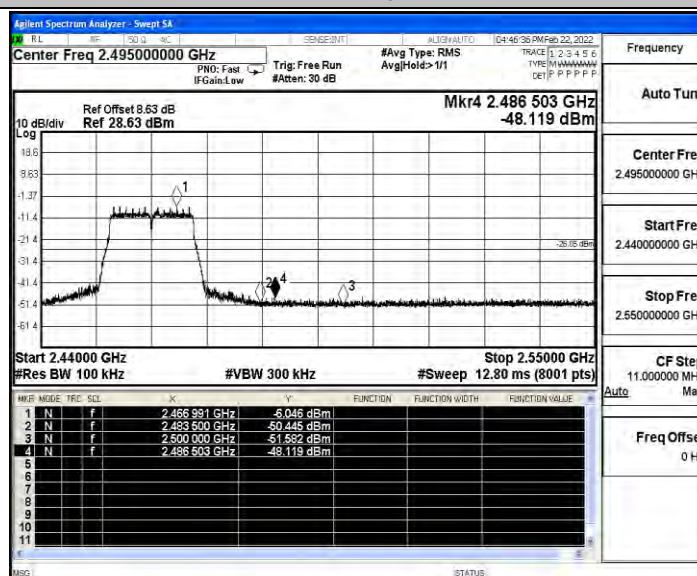
11B_Ant1_High_2462



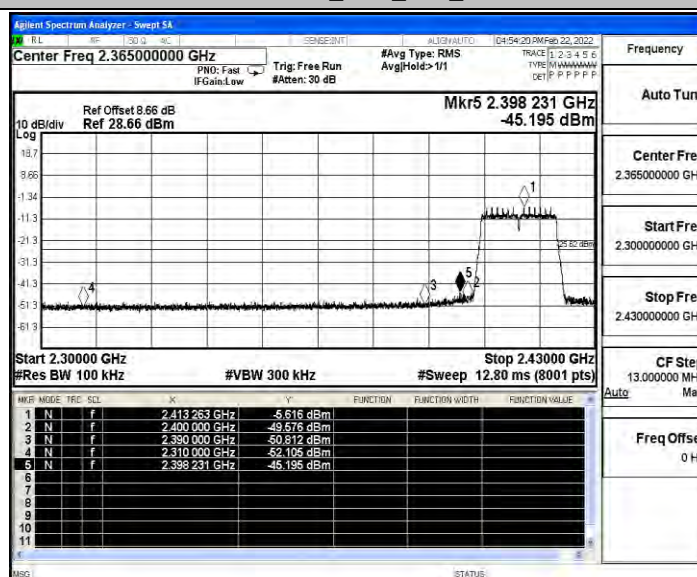
11G_Ant1_Low_2412



11G_Ant1_High_2462

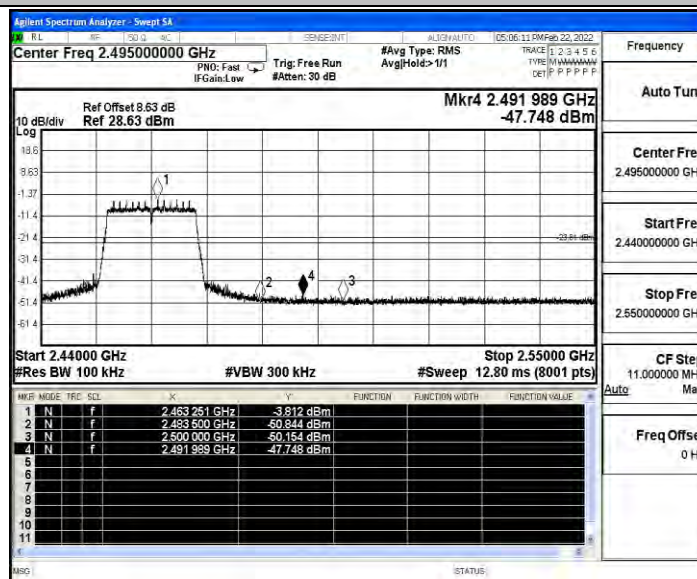


11N20SISO_Ant1_Low_2412

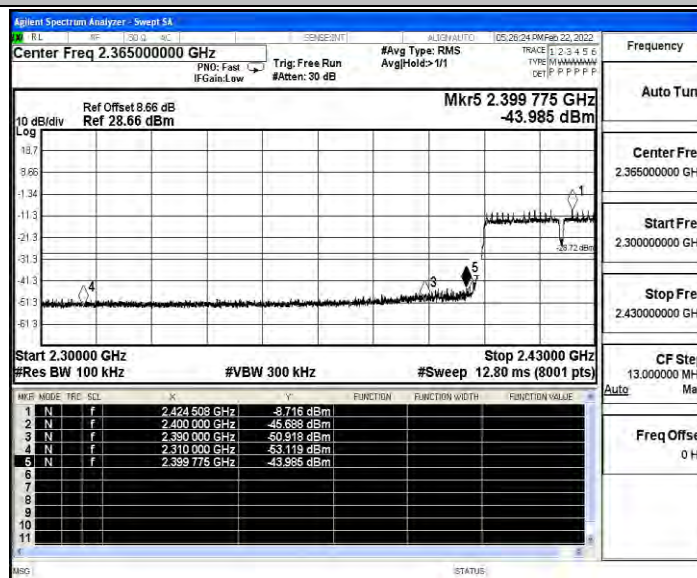




11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452



A.5 Conducted Spurious Emission

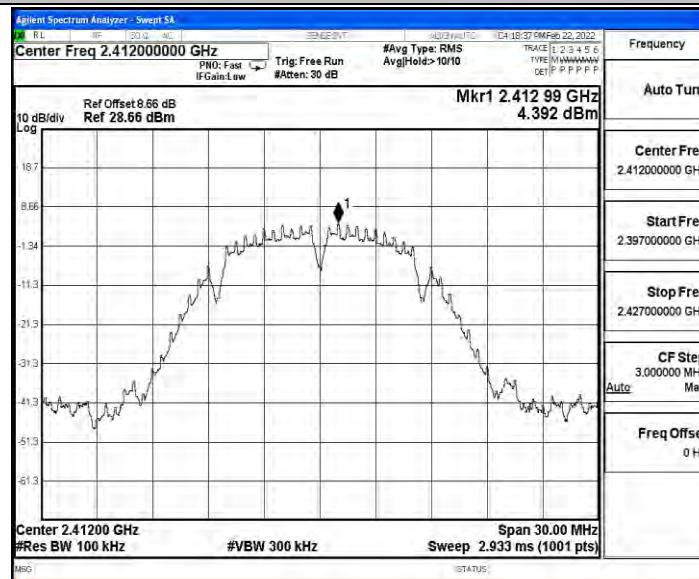
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	4.39	4.39	---	PASS
			30~1000	4.39	-60.65	≤-15.61	PASS
			1000~26500	4.39	-46.58	≤-15.61	PASS
		2437	Reference	3.93	3.93	---	PASS
			30~1000	3.93	-59.46	≤-16.07	PASS
			1000~26500	3.93	-46.26	≤-16.07	PASS
		2462	Reference	3.59	3.59	---	PASS
			30~1000	3.59	-60.57	≤-16.41	PASS
			1000~26500	3.59	-46.32	≤-16.41	PASS
11G	Ant1	2412	Reference	-5.18	-5.18	---	PASS
			30~1000	-5.18	-60.28	≤-25.18	PASS
			1000~26500	-5.18	-46.4	≤-25.18	PASS
		2437	Reference	-5.49	-5.49	---	PASS
			30~1000	-5.49	-59.69	≤-25.49	PASS
			1000~26500	-5.49	-42.92	≤-25.49	PASS
		2462	Reference	-5.63	-5.63	---	PASS
			30~1000	-5.63	-48.34	≤-25.63	PASS
			1000~26500	-5.63	-38.25	≤-25.63	PASS
11N20SISO	Ant1	2412	Reference	-5.43	-5.43	---	PASS
			30~1000	-5.43	-55.34	≤-25.43	PASS
			1000~26500	-5.43	-30.65	≤-25.43	PASS
		2437	Reference	-3.38	-3.38	---	PASS
			30~1000	-3.38	-61.07	≤-23.38	PASS
			1000~26500	-3.38	-39.88	≤-23.38	PASS
		2462	Reference	-3.64	-3.64	---	PASS
			30~1000	-3.64	-60.59	≤-23.64	PASS
			1000~26500	-3.64	-46.29	≤-23.64	PASS
11N40SISO	Ant1	2422	Reference	-8.64	-8.64	---	PASS
			30~1000	-8.64	-61.02	≤-28.64	PASS
			1000~26500	-8.64	-36.68	≤-28.64	PASS
		2437	Reference	-8.84	-8.84	---	PASS
			30~1000	-8.84	-60.71	≤-28.84	PASS
			1000~26500	-8.84	-46.28	≤-28.84	PASS
		2452	Reference	-9.23	-9.23	---	PASS
			30~1000	-9.23	-60.91	≤-29.23	PASS
			1000~26500	-9.23	-46.4	≤-29.23	PASS

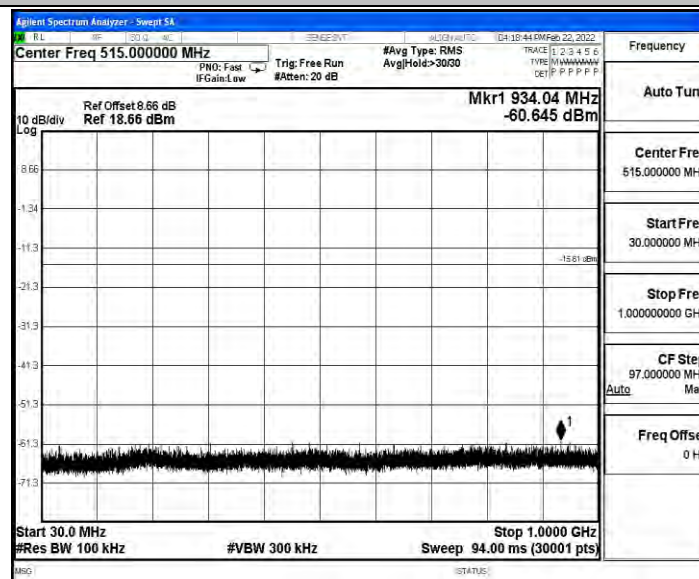


Test Graphs

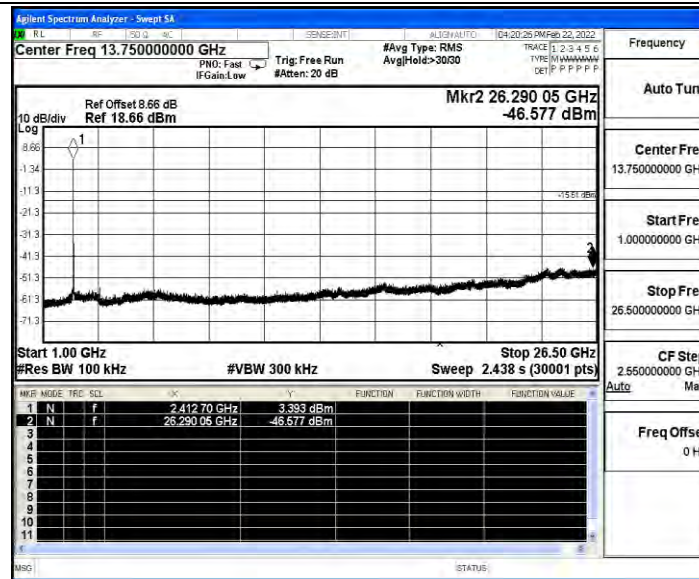
11B_Ant1_2412_0~Reference



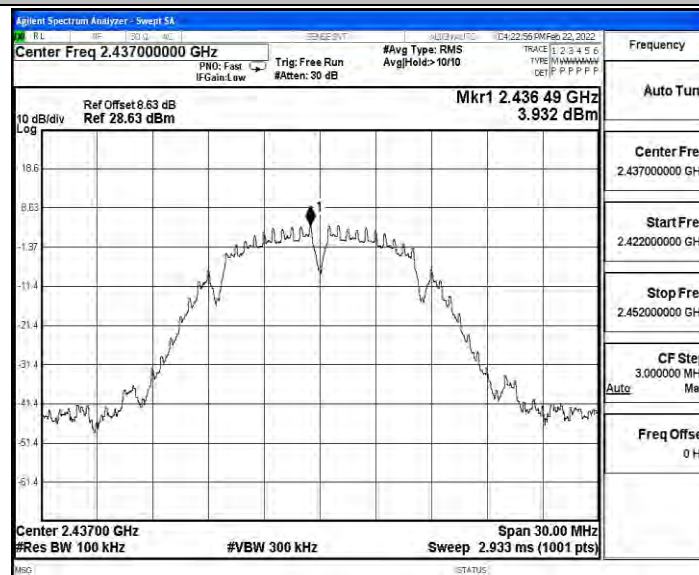
11B_Ant1_2412_30~1000



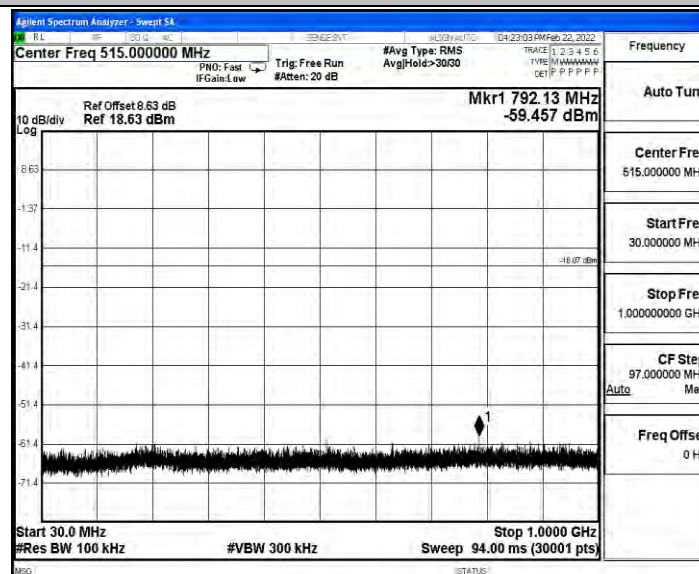
11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference

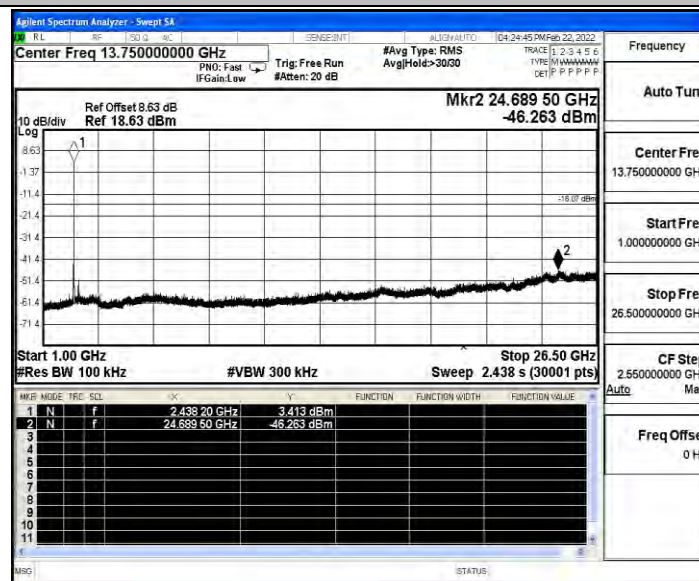


11B_Ant1_2437_30~1000

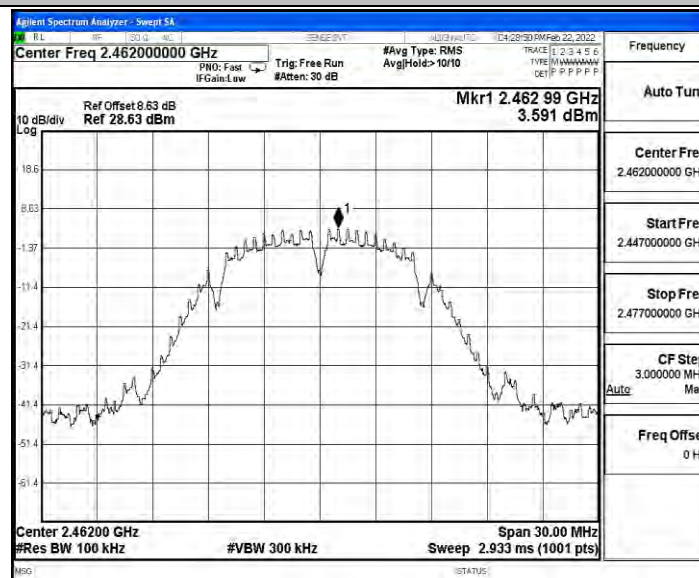




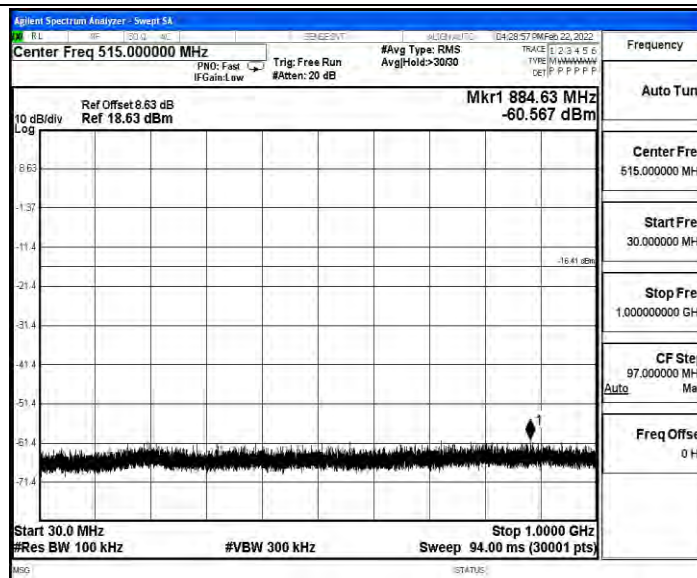
11B_Ant1_2437_1000~26500



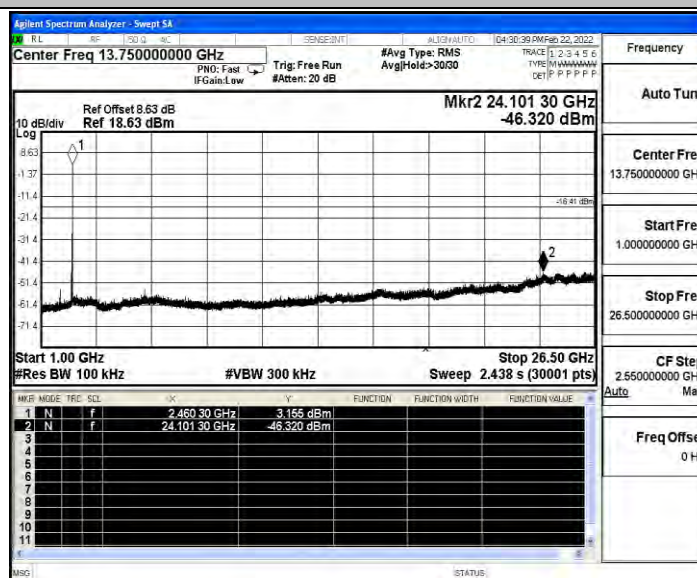
11B_Ant1_2462_0~Reference



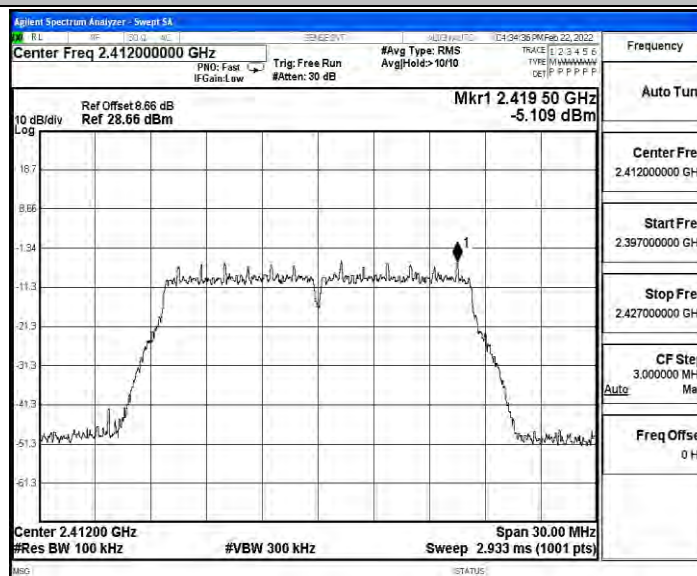
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

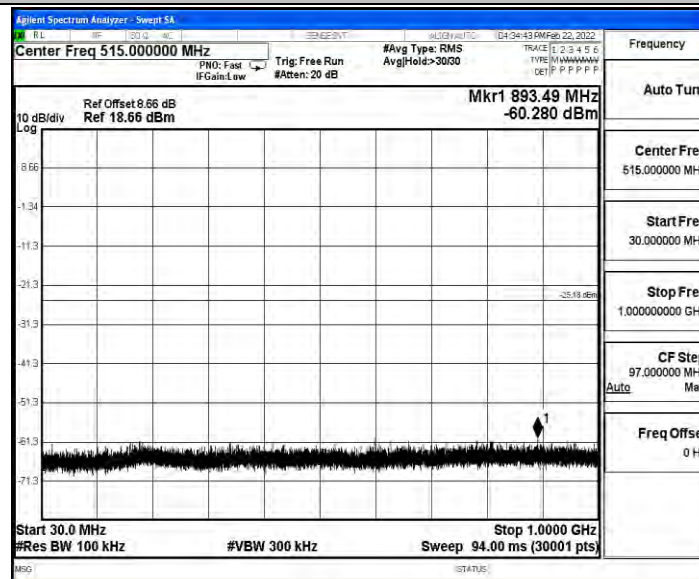


11G_Ant1_2412_0~Reference

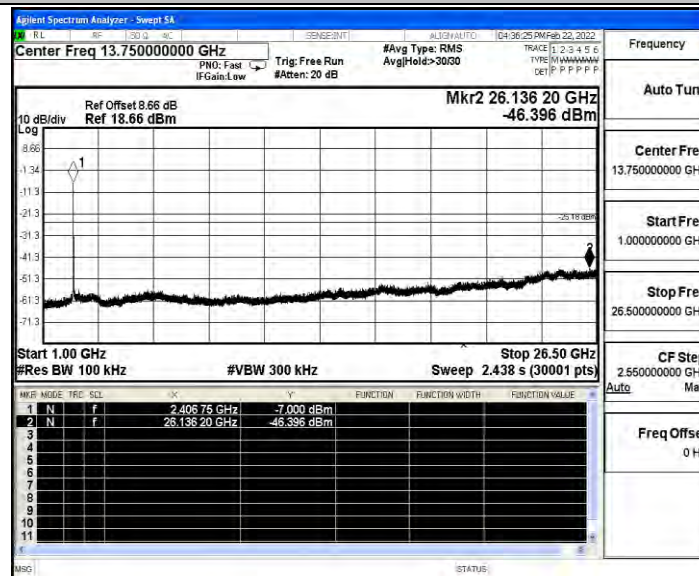




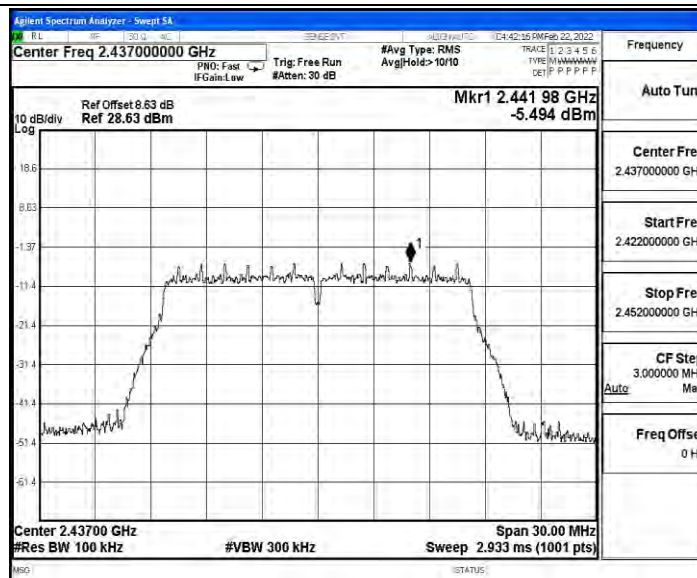
11G_Ant1_2412_30~1000



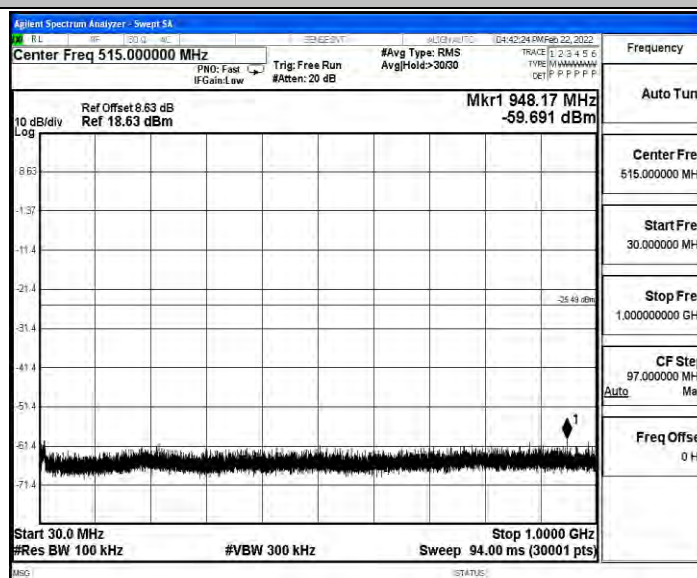
11G_Ant1_2412_1000~26500



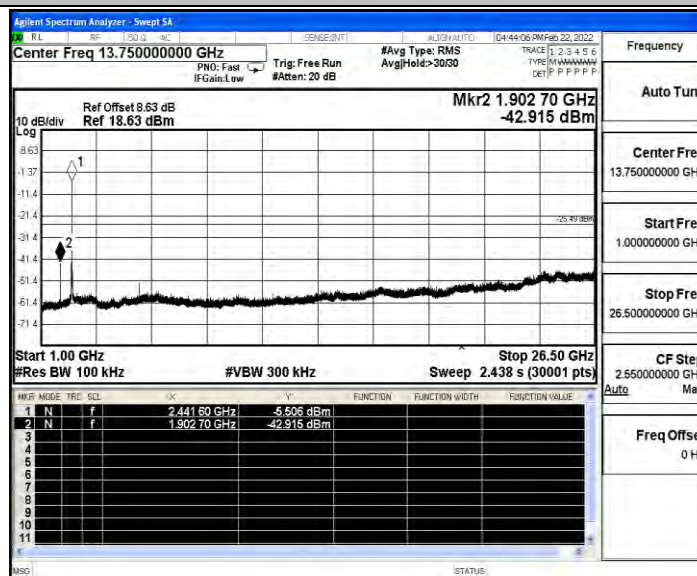
11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000

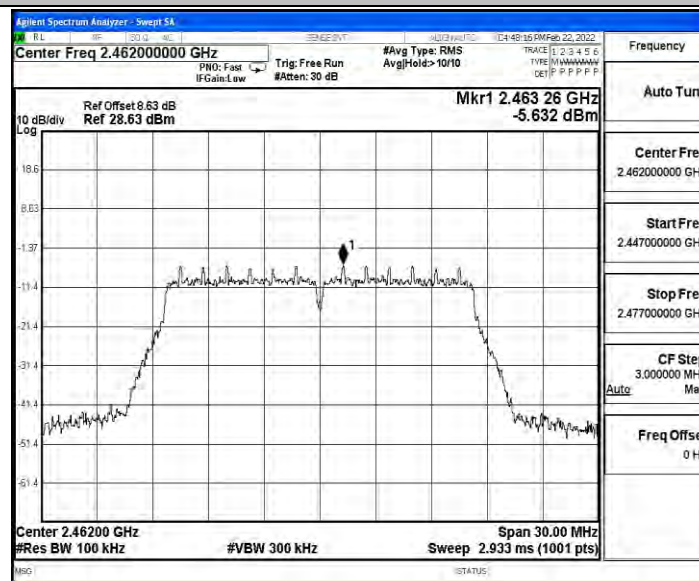


11G_Ant1_2437_1000~26500

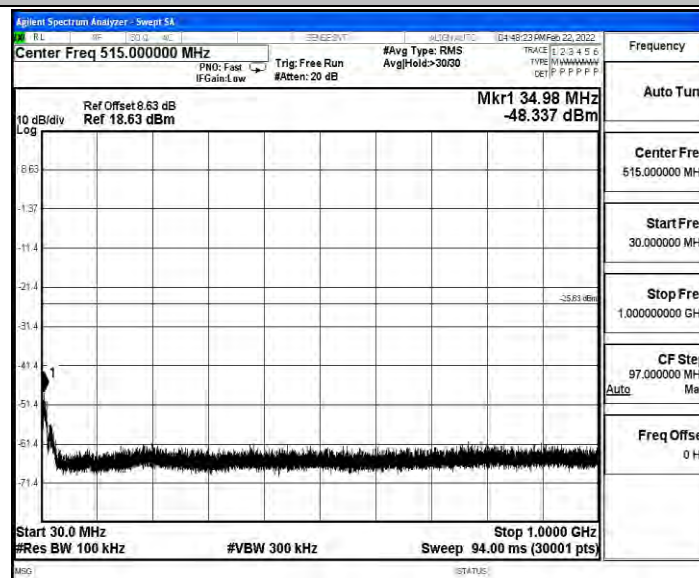




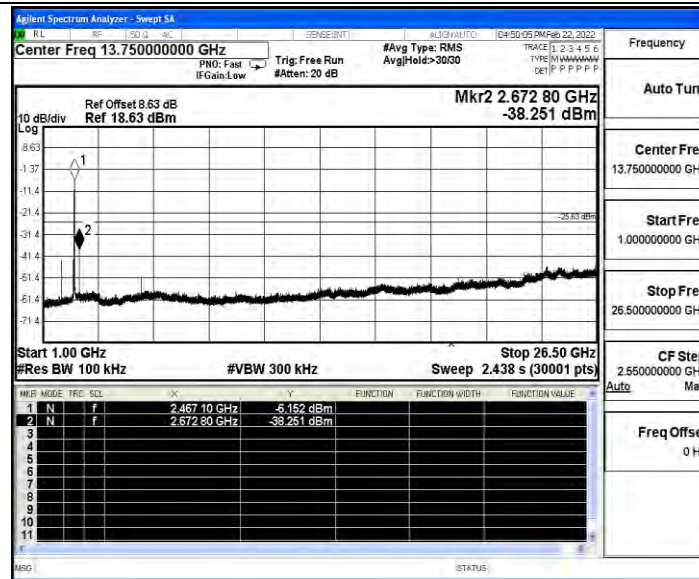
11G_Ant1_2462_0~Reference



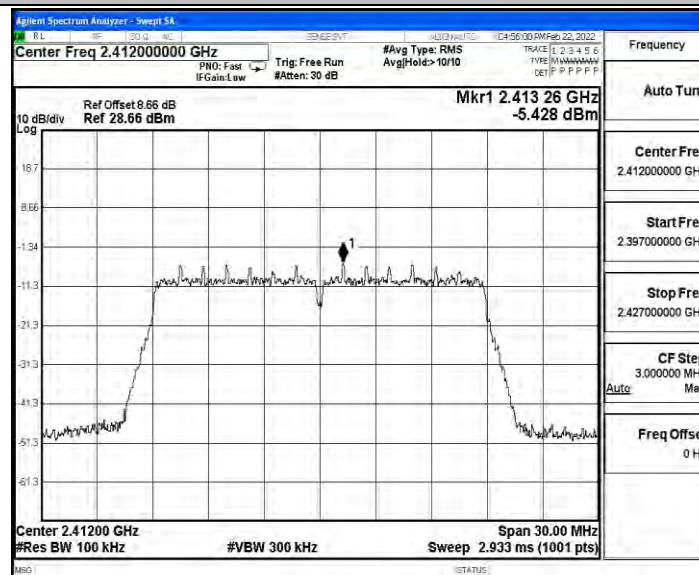
11G_Ant1_2462_30~1000



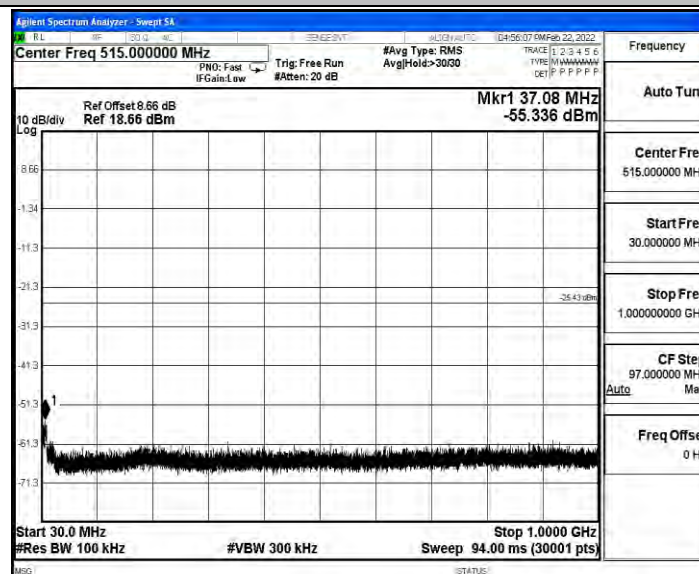
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference

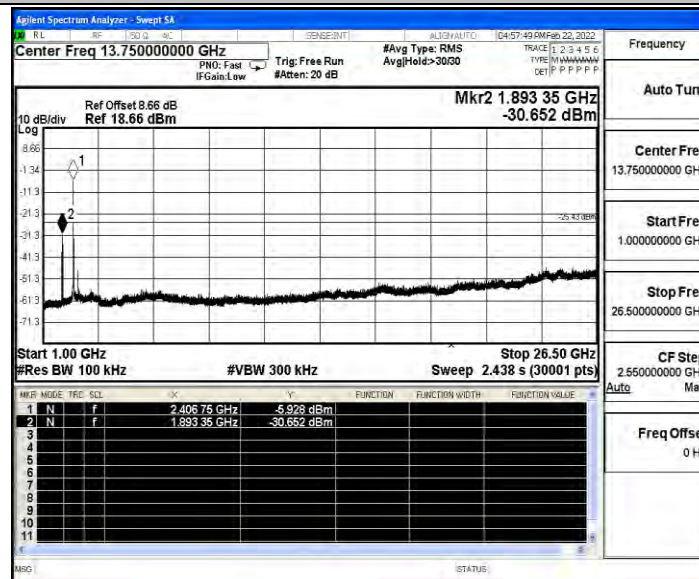


11N20SISO_Ant1_2412_30~1000

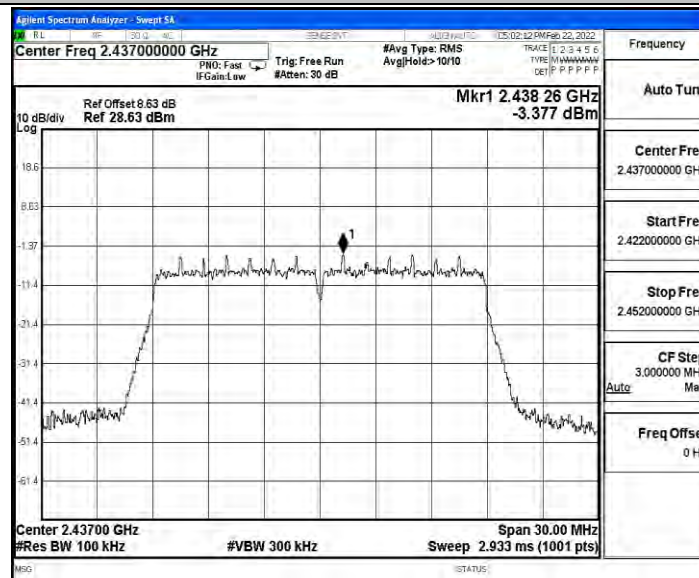




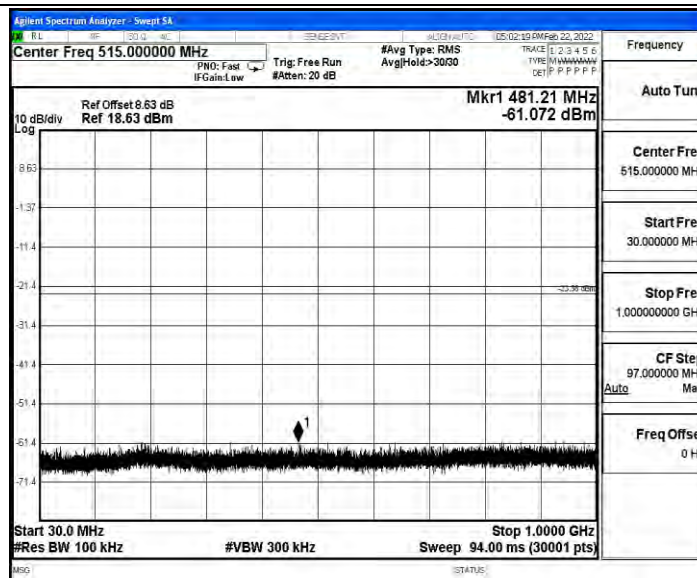
11N20SISO_Ant1_2412_1000~26500



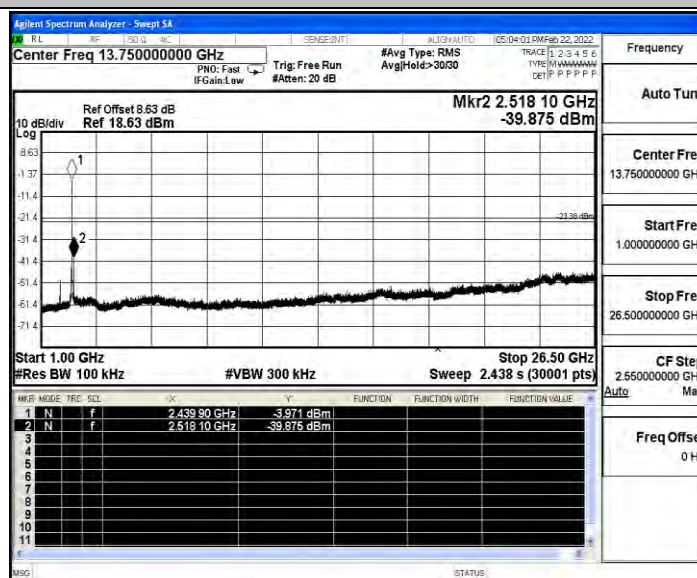
11N20SISO_Ant1_2437_0~Reference



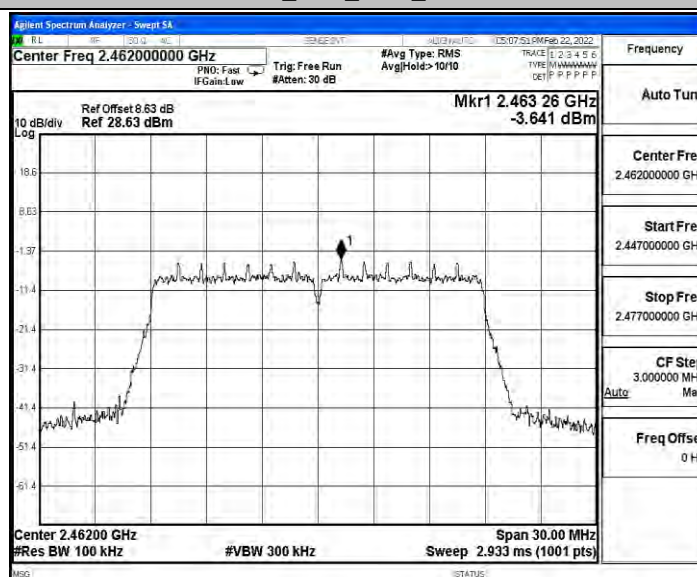
11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

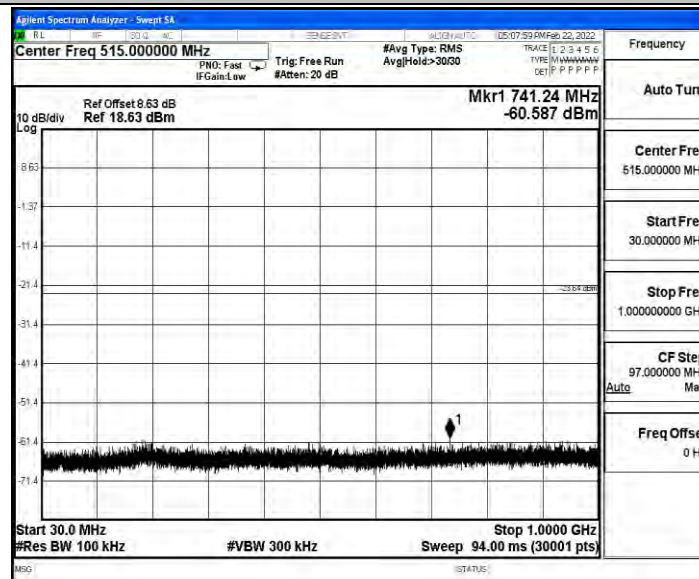


11N20SISO_Ant1_2462_0~Reference

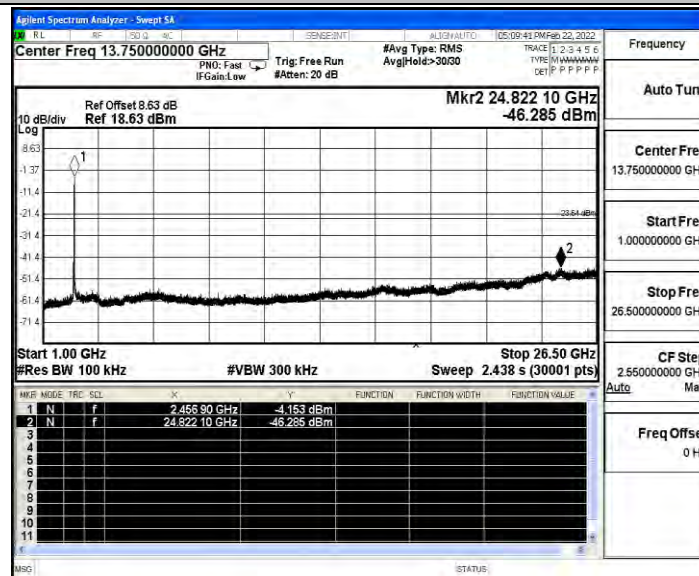




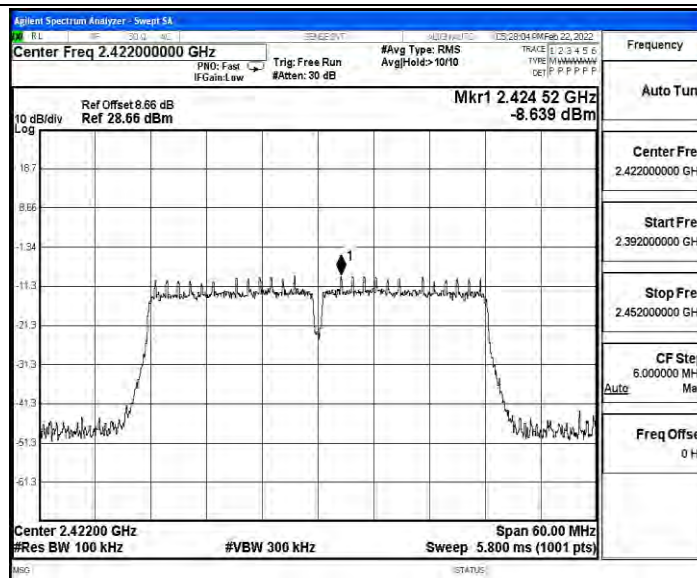
11N20SISO_Ant1_2462_30~1000



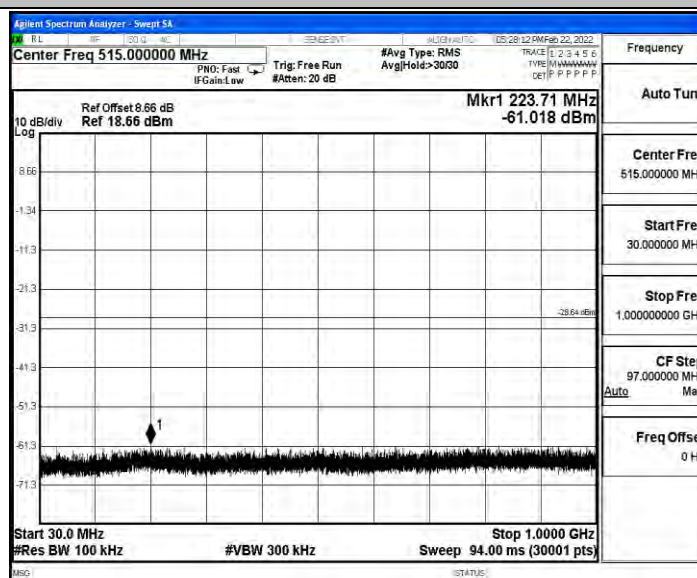
11N20SISO_Ant1_2462_1000~26500



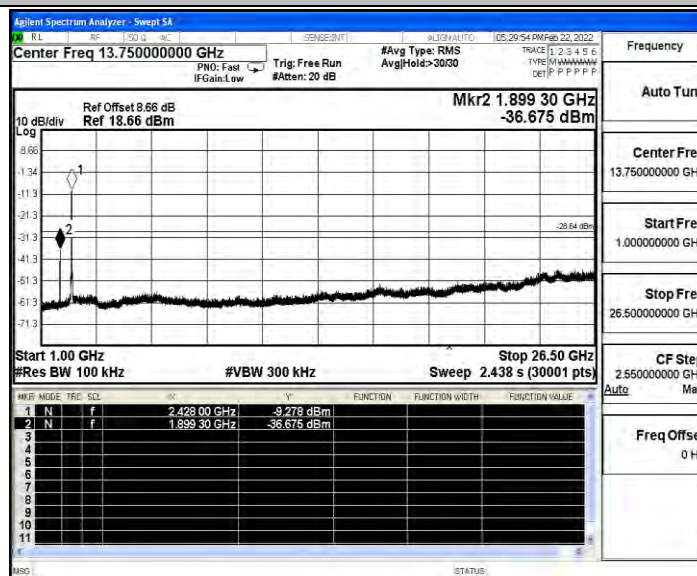
11N40SISO_Ant1_2422_0~Reference



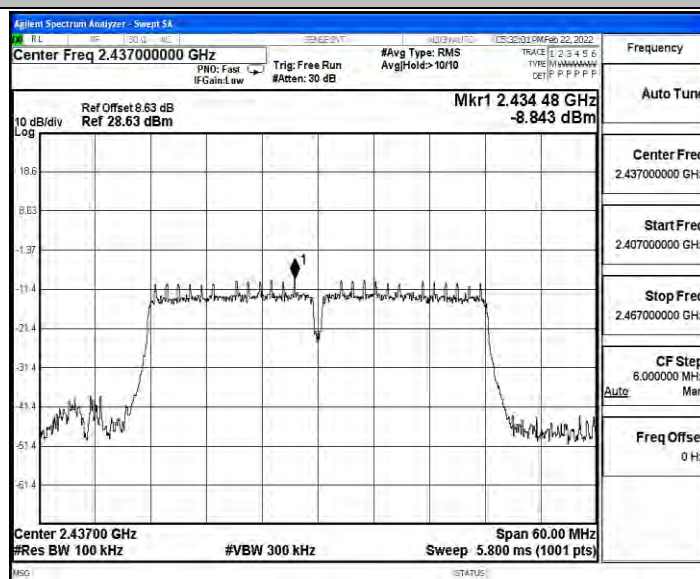
11N40SISO_Ant1_2422_30~1000



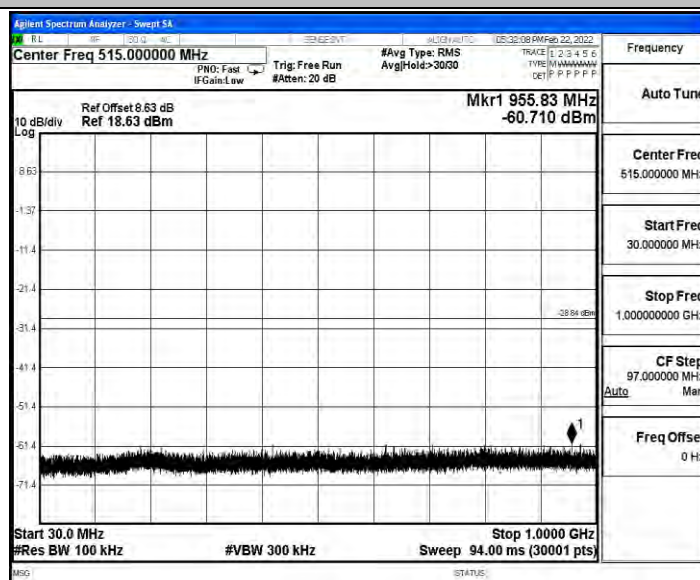
11N40SISO_Ant1_2422_1000~26500



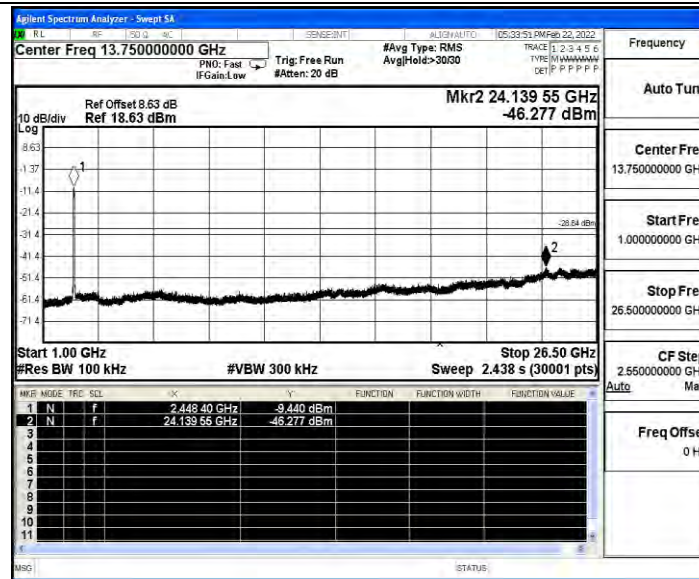
11N40SISO Ant1 2437 0~Reference



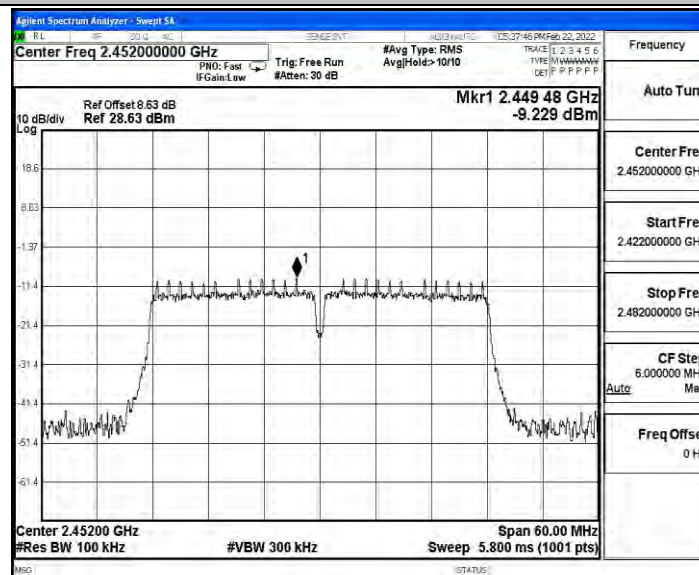
11N40SISO Ant1 2437 30~1000



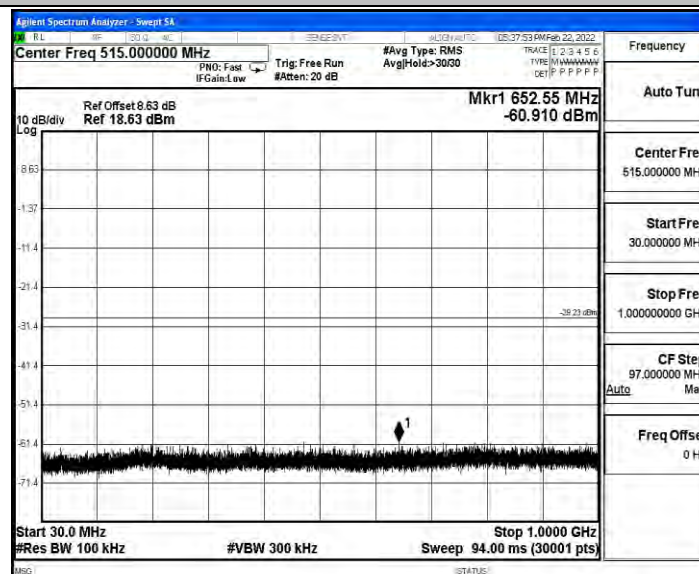
11N40SISO Ant1 2437 1000~26500



11N40ISO_Ant1_2452_0~Reference

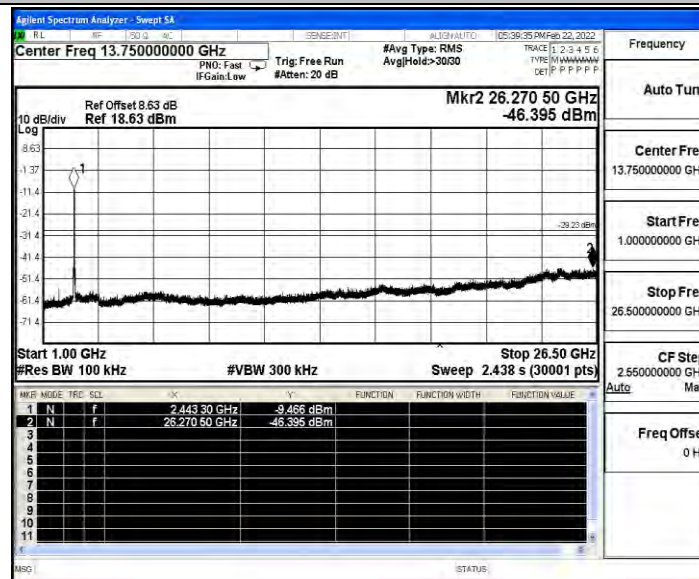


11N40ISO_Ant1_2452_30~1000





11N40SISO_Ant1_2452_1000~26500





A.6 Duty Cycle

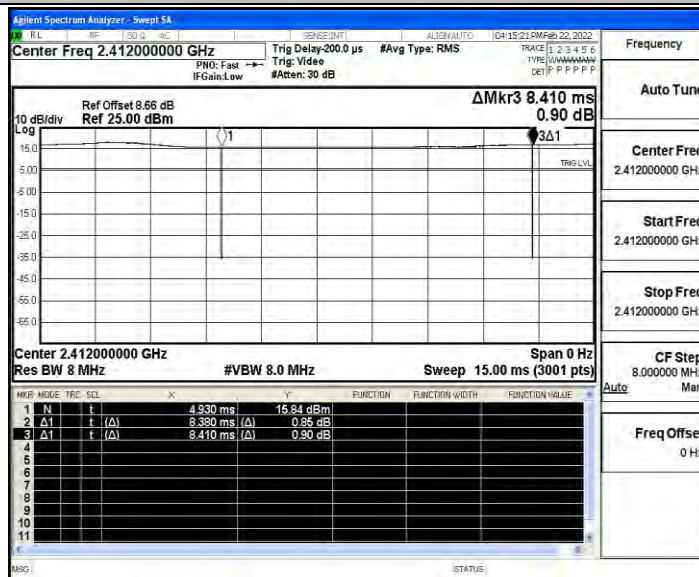
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	8.38	8.41	99.64	---	---
		2437	8.38	8.41	99.64	---	---
		2462	8.38	8.41	99.64	---	---
11G	Ant1	2412	1.39	1.42	97.89	---	---
		2437	1.39	1.43	97.20	---	---
		2462	1.39	1.43	97.20	---	---
11N20SISO	Ant1	2412	1.30	1.34	97.01	---	---
		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	---	---

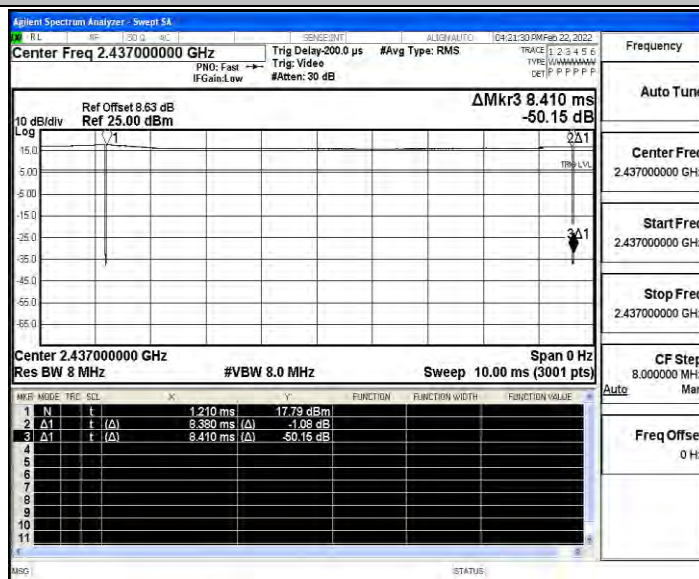


Test Graphs

11B_Ant1_2412



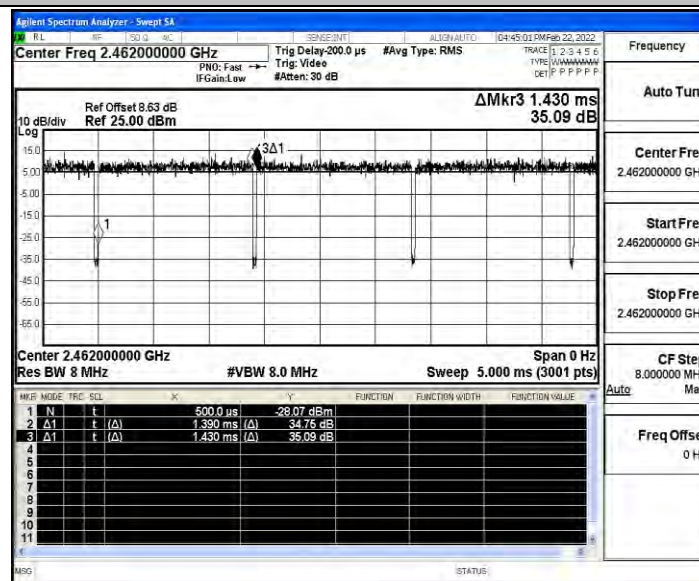
11B_Ant1_2437



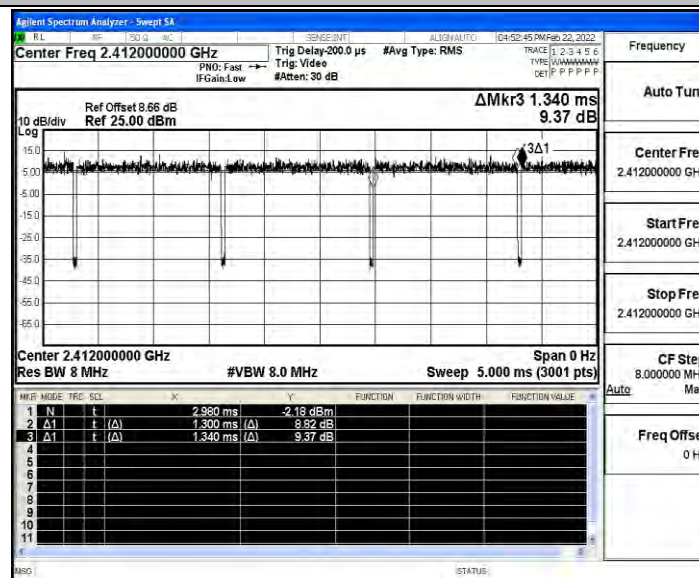
11B_Ant1_2462



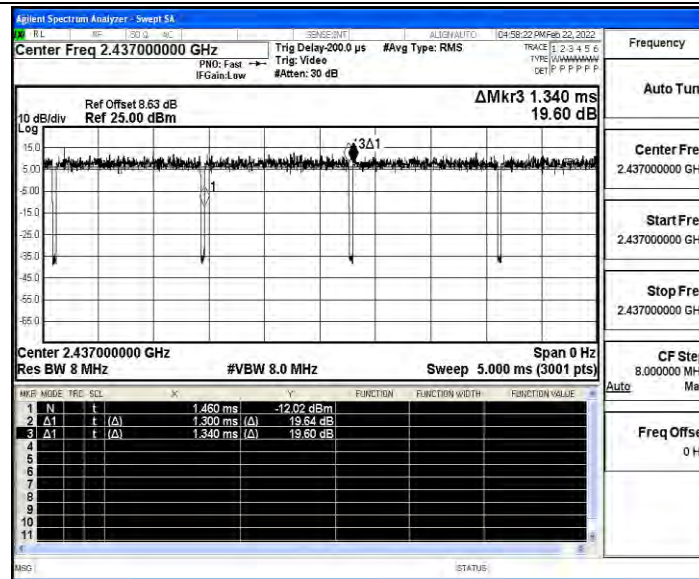
11G_Ant1_2462



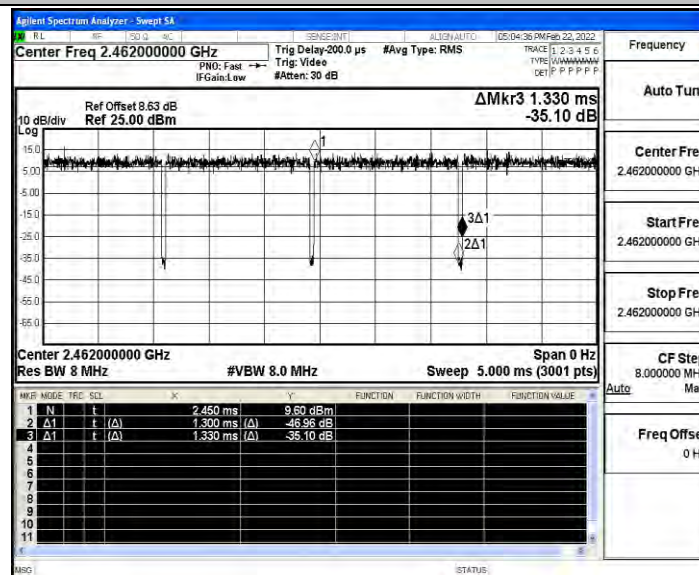
11N20SISO_Ant1_2412



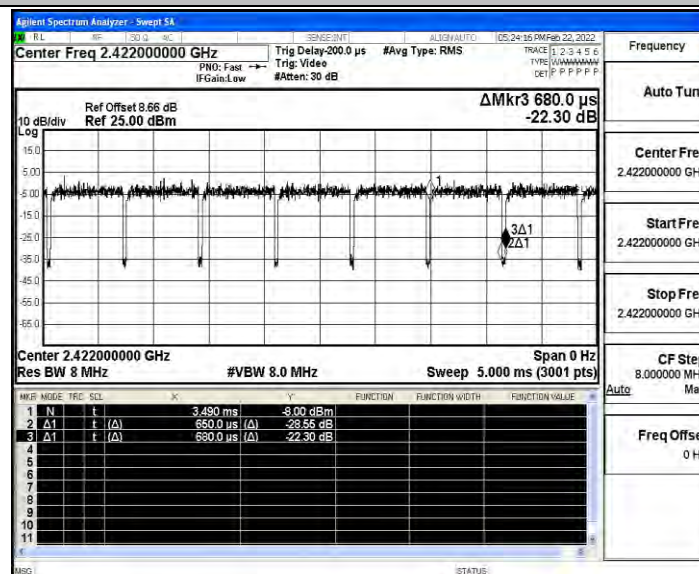
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



11N40SISO_Ant1_2422





A.7 Emissions in Restricted Bands

Test Result

TestMode	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	2412	AV	2310.000	-49	≤-41.20	46.20	≤54	PASS
		AV	2388.920	-47.8	≤-41.20	47.40	≤54	PASS
		AV	2390.000	-47.86	≤-41.20	47.34	≤54	PASS
		Peak	2310.000	-39.05	≤-21.20	56.15	≤74	PASS
		Peak	2381.900	-35.87	≤-21.20	59.33	≤74	PASS
		Peak	2390.000	-37.29	≤-21.20	57.91	≤74	PASS
	2462	AV	2483.500	-47.89	≤-41.20	47.31	≤54	PASS
		AV	2487.300	-47.85	≤-41.20	47.35	≤54	PASS
		AV	2500.000	-47.99	≤-41.20	47.21	≤54	PASS
		Peak	2483.500	-37.53	≤-21.20	57.67	≤74	PASS
		Peak	2498.300	-36.1	≤-21.20	59.10	≤74	PASS
		Peak	2500.000	-36.72	≤-21.20	58.48	≤74	PASS
11G	2412	AV	2310.000	-48.39	≤-41.20	46.81	≤54	PASS
		AV	2389.440	-47.28	≤-41.20	47.92	≤54	PASS
		AV	2390.000	-47.31	≤-41.20	47.89	≤54	PASS
		Peak	2310.000	-37.91	≤-21.20	57.29	≤74	PASS
		Peak	2314.170	-35.86	≤-21.20	59.34	≤74	PASS
		Peak	2390.000	-37.89	≤-21.20	57.31	≤74	PASS
	2462	AV	2483.500	-46.87	≤-41.20	48.33	≤54	PASS
		AV	2483.890	-46.83	≤-41.20	48.37	≤54	PASS
		AV	2500.000	-47.24	≤-41.20	47.96	≤54	PASS
		Peak	2483.500	-36.05	≤-21.20	59.15	≤74	PASS
		Peak	2484.440	-34.62	≤-21.20	60.58	≤74	PASS
		Peak	2500.000	-37.24	≤-21.20	57.96	≤74	PASS
11N20SIS O	2412	AV	2310.000	-48.52	≤-41.20	46.68	≤54	PASS
		AV	2389.830	-47.13	≤-41.20	48.07	≤54	PASS
		AV	2390.000	-47.23	≤-41.20	47.97	≤54	PASS
		Peak	2310.000	-37.75	≤-21.20	57.45	≤74	PASS
		Peak	2389.180	-35.43	≤-21.20	59.77	≤74	PASS
		Peak	2390.000	-36.66	≤-21.20	58.54	≤74	PASS
	2462	AV	2483.500	-46.28	≤-41.20	48.92	≤54	PASS
		AV	2483.670	-46.18	≤-41.20	49.02	≤54	PASS
		AV	2500.000	-46.99	≤-41.20	48.21	≤54	PASS
		Peak	2483.500	-30.1	≤-21.20	65.10	≤74	PASS
		Peak	2484.000	-31.63	≤-21.20	63.57	≤74	PASS
		Peak	2500.000	-36.24	≤-21.20	58.96	≤74	PASS
11N40SIS	2422	AV	2310.000	-48.37	≤-41.20	46.83	≤54	PASS



O		AV	2389.050	-45.16	≤ -41.20	50.04	≤ 54	PASS
		AV	2390.000	-45.45	≤ -41.20	49.75	≤ 54	PASS
		Peak	2310.000	-38.62	≤ -21.20	56.58	≤ 74	PASS
		Peak	2389.050	-29.22	≤ -21.20	65.98	≤ 74	PASS
		Peak	2390.000	-31.44	≤ -21.20	63.76	≤ 74	PASS
	2452	AV	2483.500	-45.05	≤ -41.20	50.15	≤ 54	PASS
		AV	2484.330	-44.85	≤ -41.20	50.35	≤ 54	PASS
		AV	2500.000	-46.71	≤ -41.20	48.49	≤ 54	PASS
		Peak	2483.500	-29	≤ -21.20	66.20	≤ 74	PASS
		Peak	2484.880	-28.13	≤ -21.20	67.07	≤ 74	PASS
		Peak	2500.000	-36.93	≤ -21.20	58.27	≤ 74	PASS

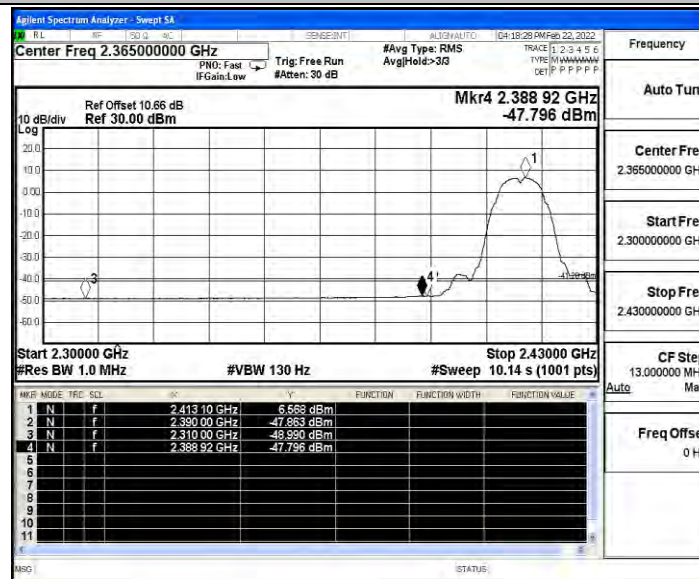
Note:

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.

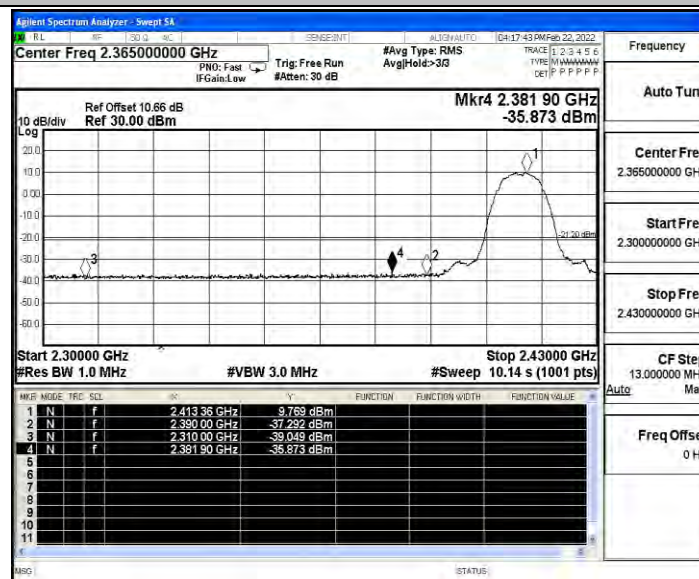


Test Graphs

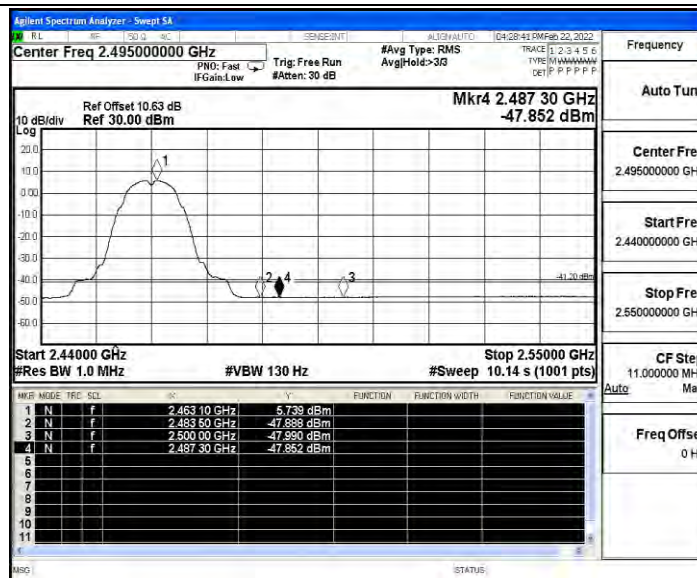
11B_Ant1_Low_2412_AV



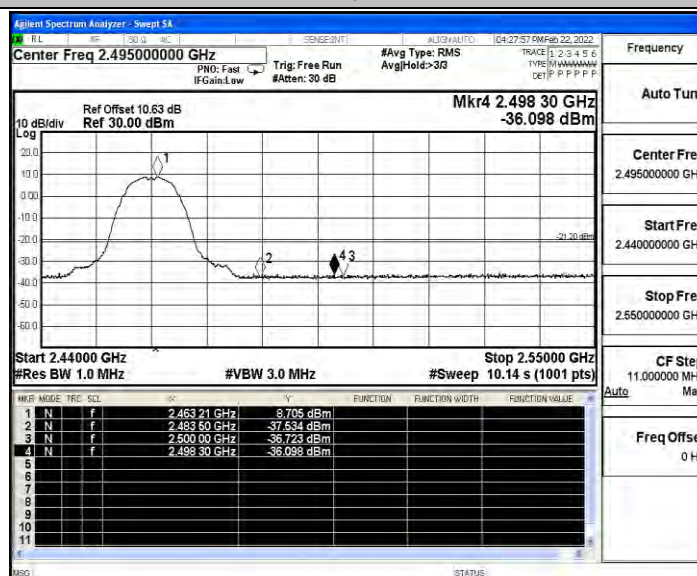
11B_Ant1_Low_2412_Peak



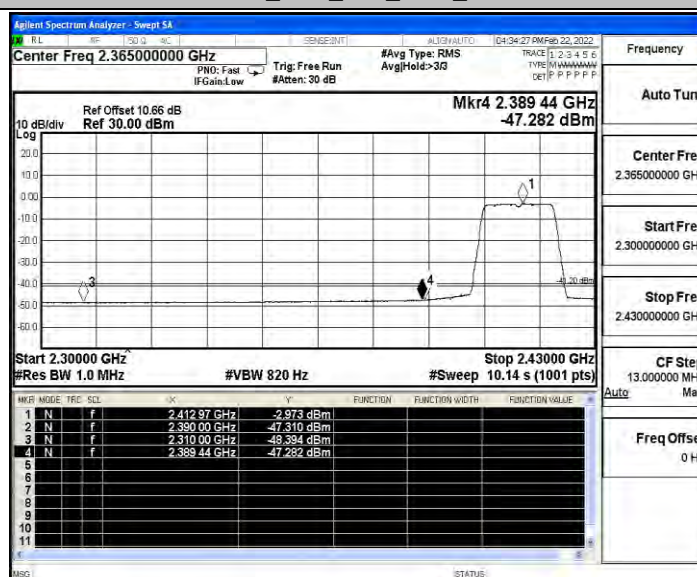
11B_Ant1_High_2462_AV



11B_Ant1_High_2462_Peak

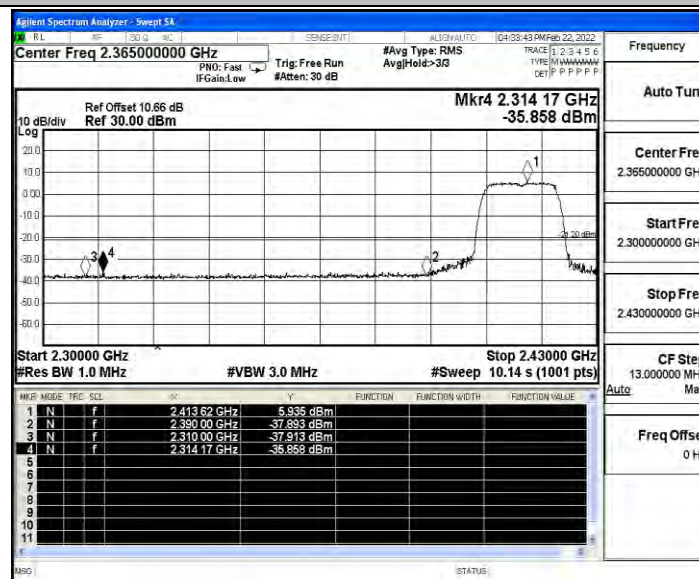


11G_Ant1_Low_2412_AV

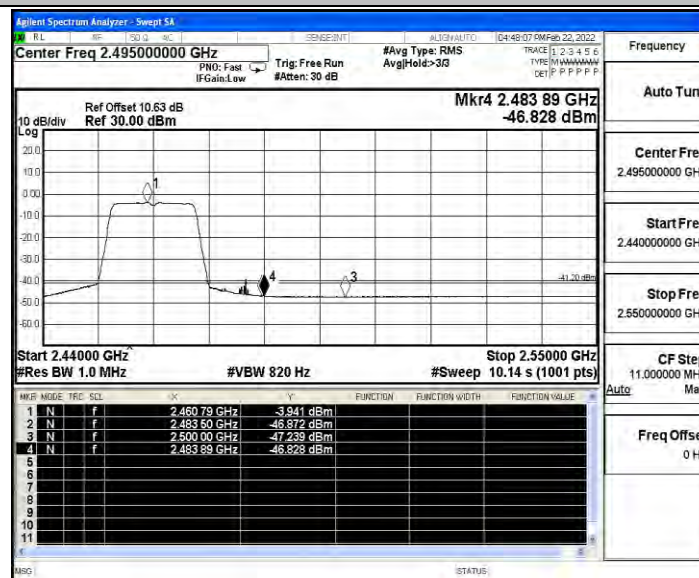




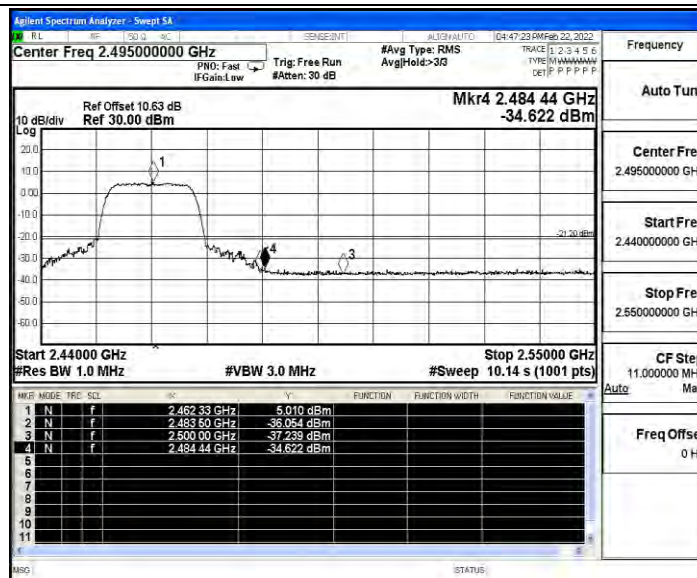
11G_Ant1_Low_2412_Peak



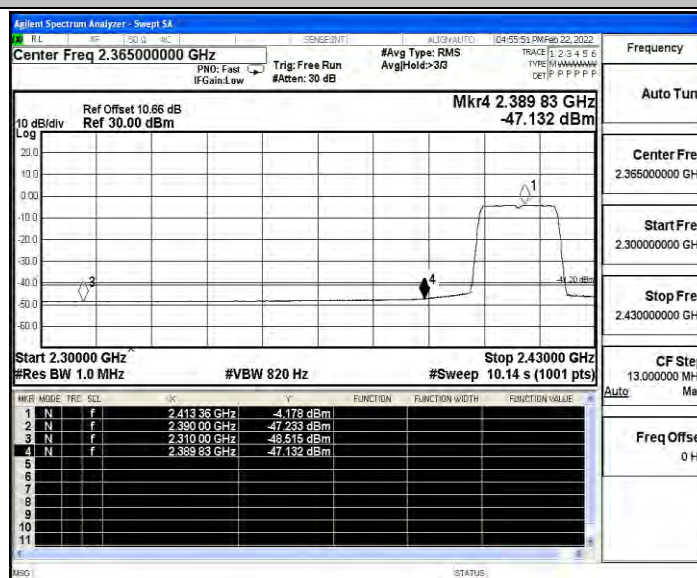
11G_Ant1_High_2462_AV



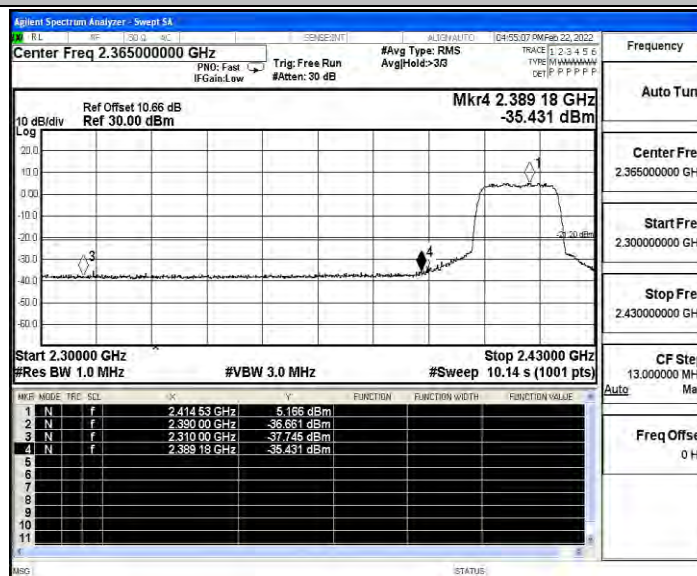
11G_Ant1_High_2462_Peak



11N20SISO_Ant1_Low_2412_AV

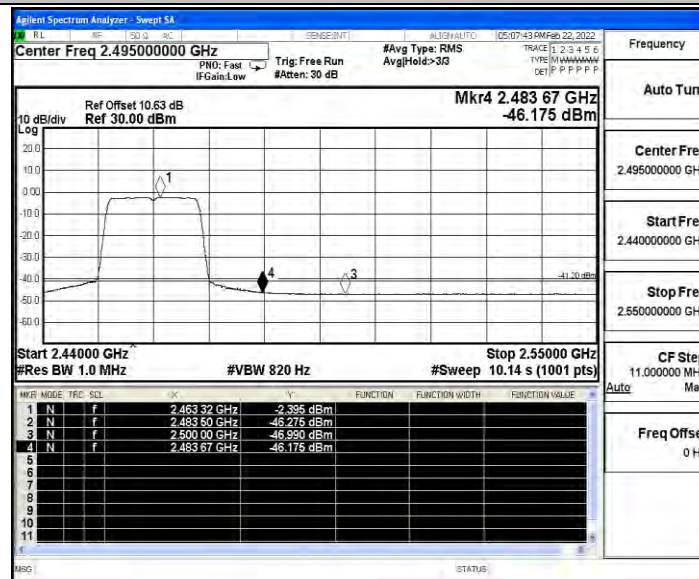


11N20SISO_Ant1_Low_2412_Peak

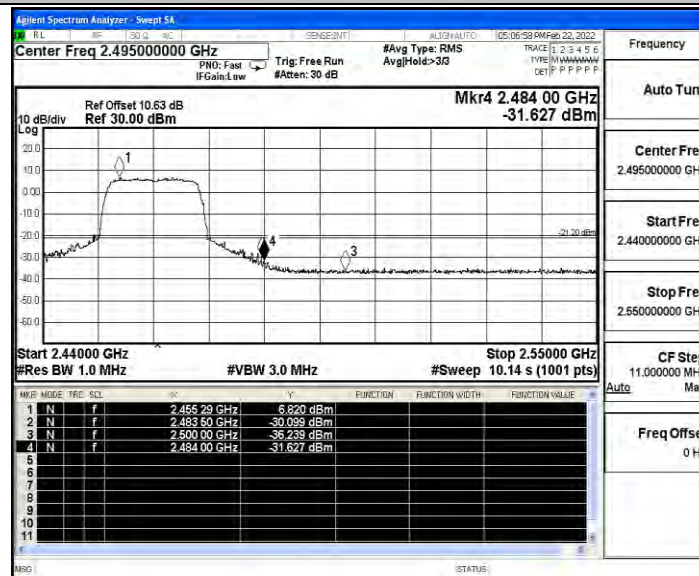




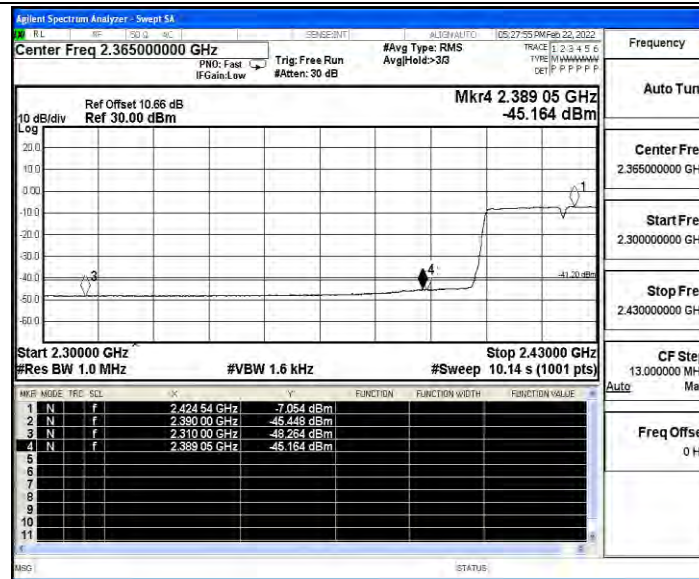
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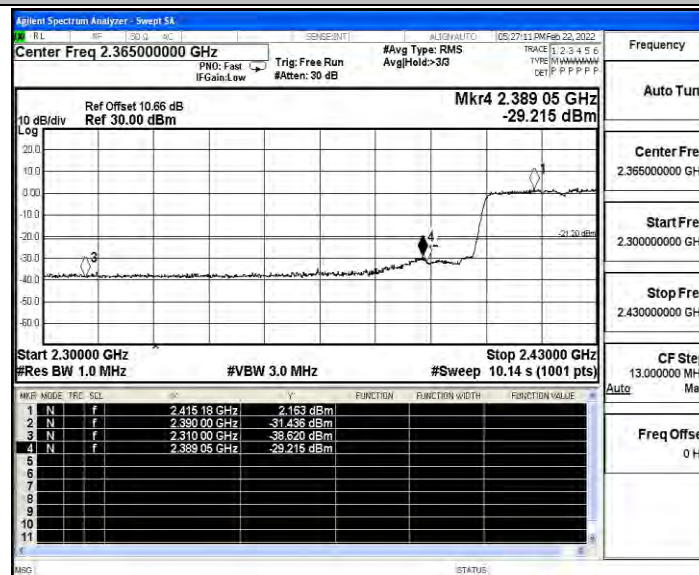
11N20SISO_Ant1_High_2462_Peak



11N40SISO_Ant1_Low_2422_AV



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV

