



Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Key cutting machine

Trade Mark: XTOOL

Test Model: KNC81

Environmental Conditions

Temperature:	21.1° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Monkey Li
Supervised by:	Li Huan



B.1 6dB Bandwidth

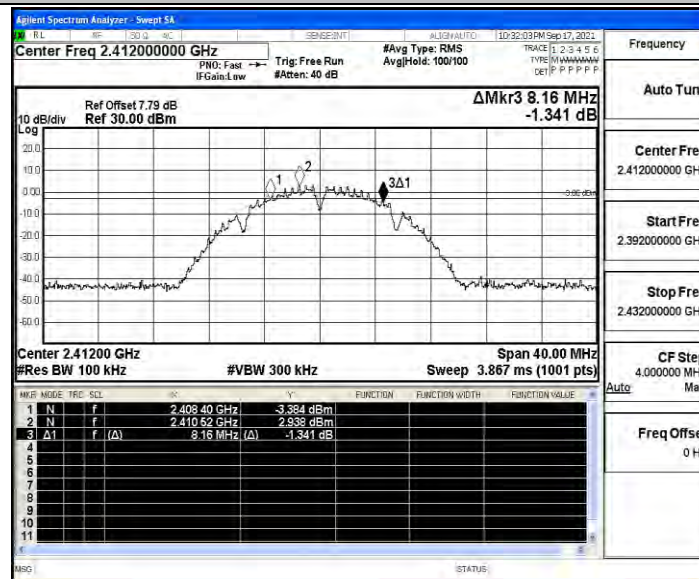
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.160	2408.400	2416.560	0.5	PASS
		2437	7.600	2433.480	2441.080	0.5	PASS
		2462	8.160	2457.440	2465.600	0.5	PASS
11G	Ant1	2412	15.040	2404.760	2419.800	0.5	PASS
		2437	16.000	2429.200	2445.200	0.5	PASS
		2462	14.560	2453.800	2468.360	0.5	PASS
11N20SISO	Ant1	2412	15.080	2404.520	2419.600	0.5	PASS
		2437	16.320	2429.480	2445.800	0.5	PASS
		2462	16.120	2453.440	2469.560	0.5	PASS
11N40SISO	Ant1	2422	35.200	2404.400	2439.600	0.5	PASS
		2437	35.120	2419.480	2454.600	0.5	PASS
		2452	31.360	2435.680	2467.040	0.5	PASS

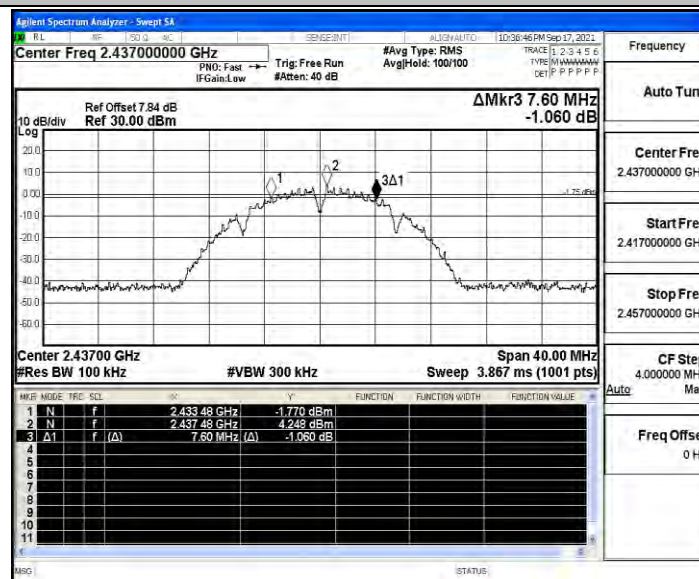


Test Graphs

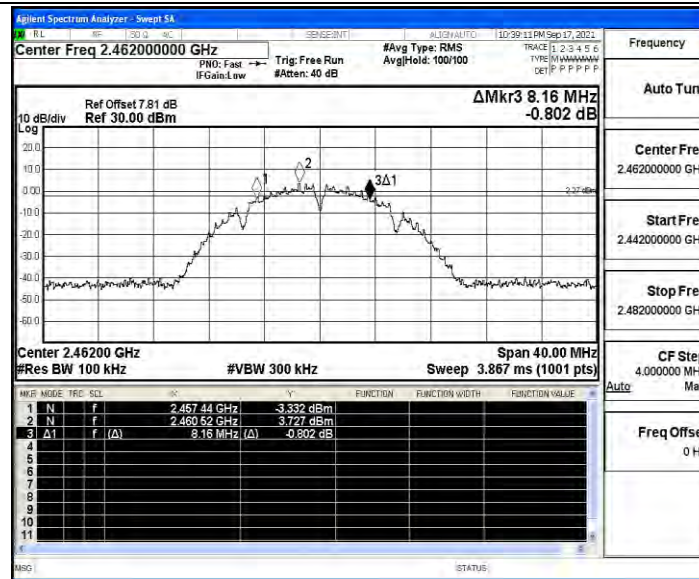
11B_Ant1_2412



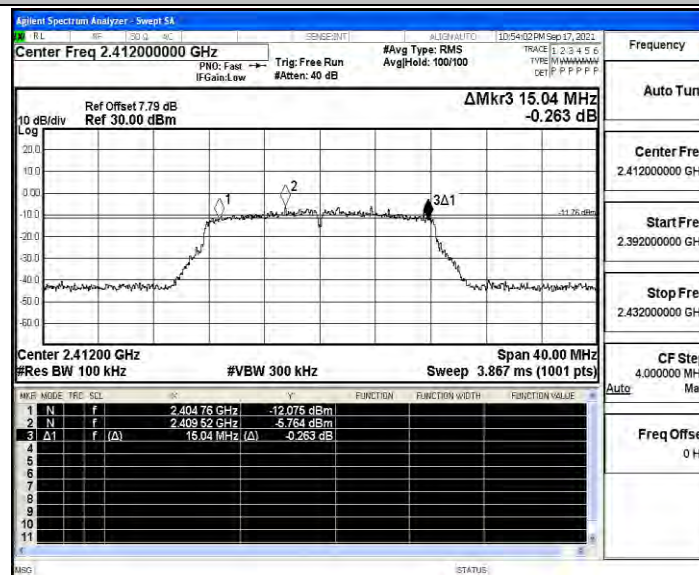
11B_Ant1_2437



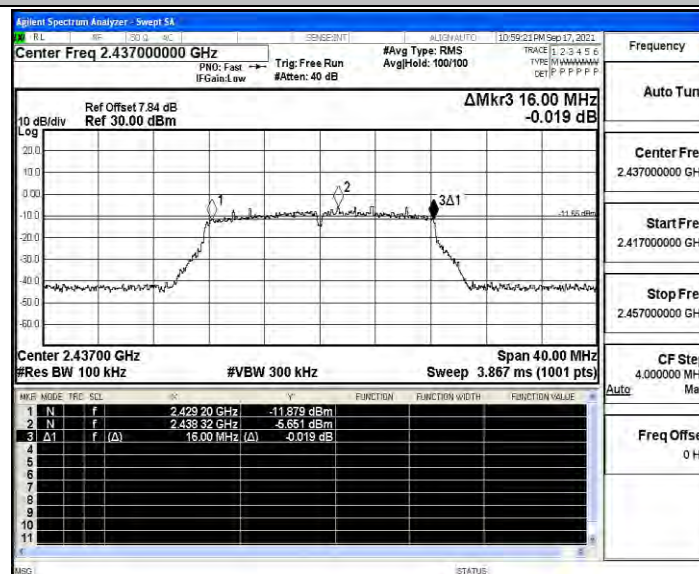
11B_Ant1_2462



11G_Ant1_2412

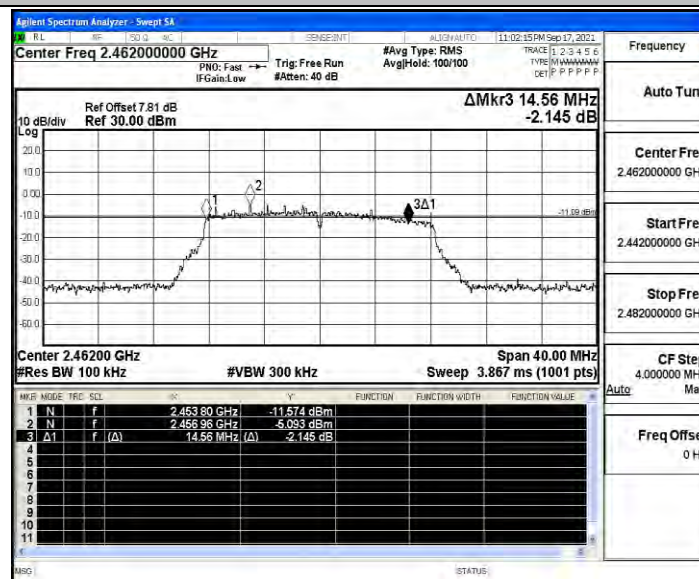


11G_Ant1_2437

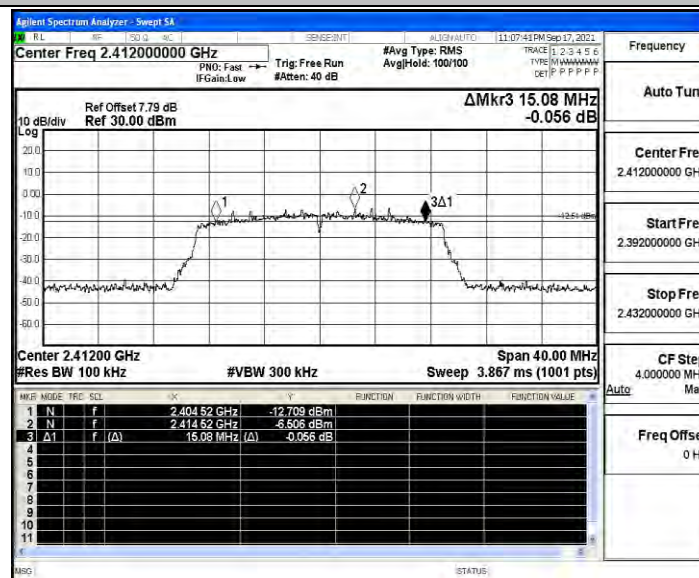




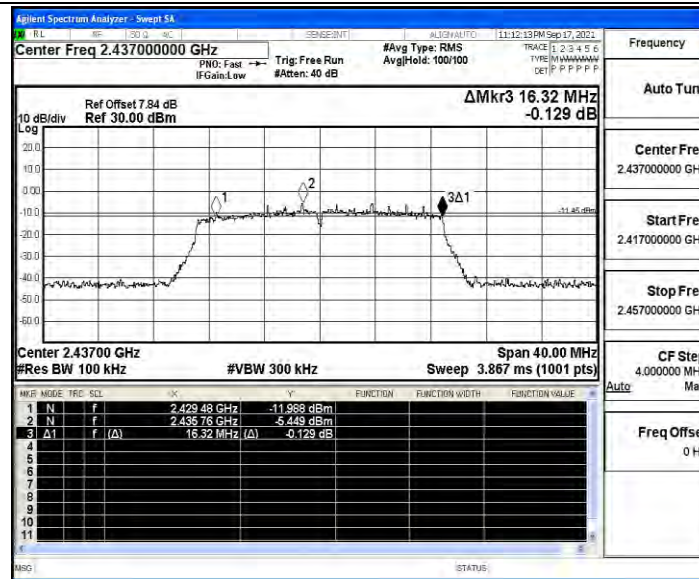
11G_Ant1_2462



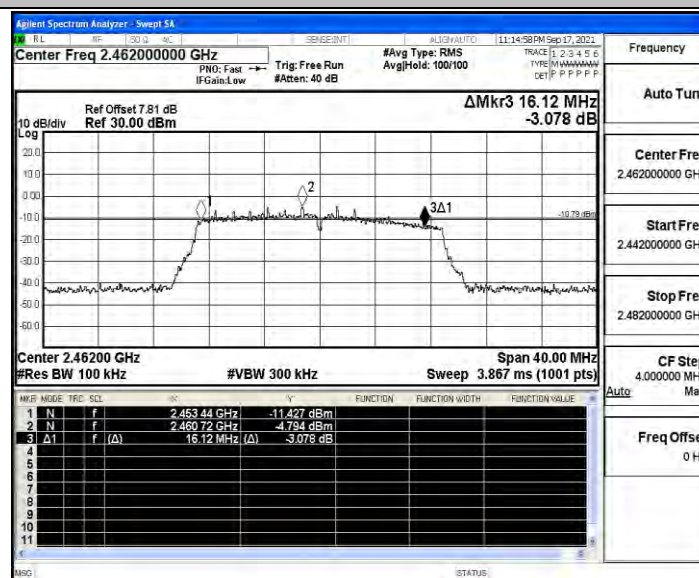
11N20SISO_Ant1_2412



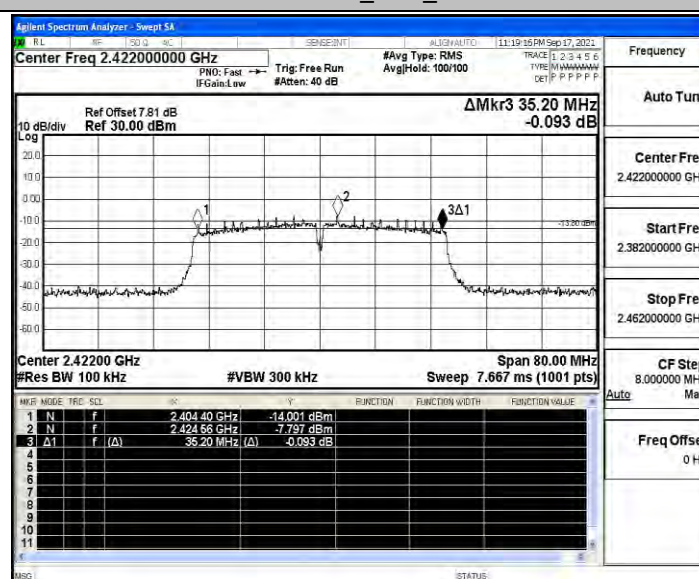
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

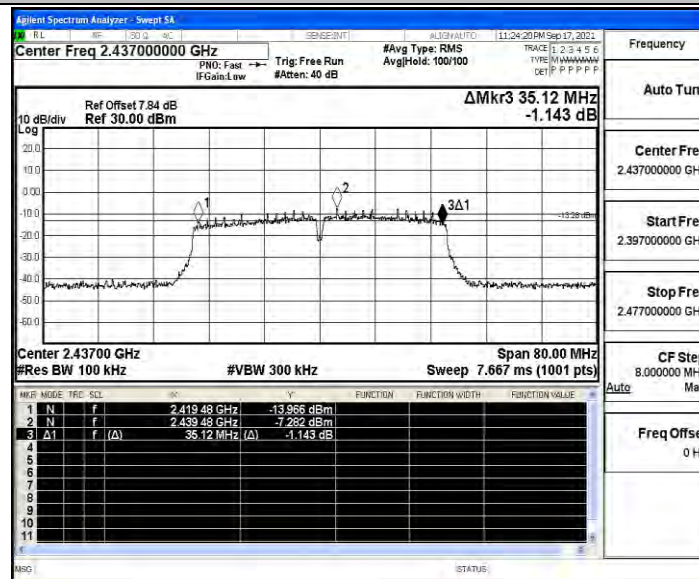


11N40SISO_Ant1_2422

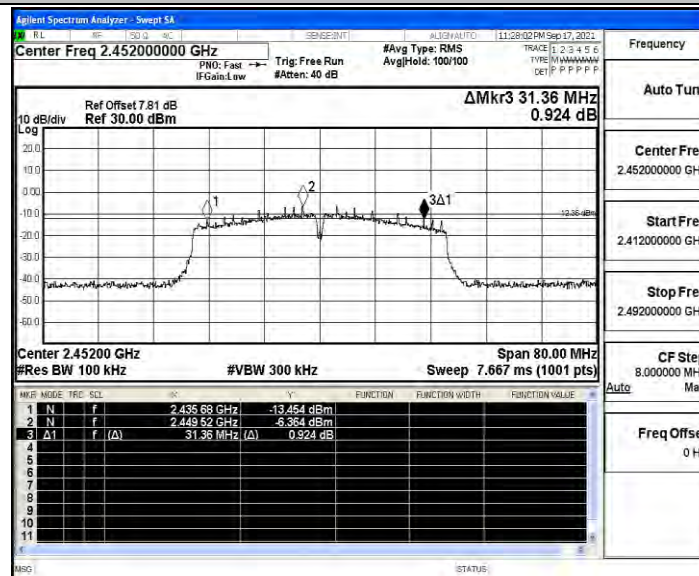




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	14.64	≤30	PASS
		2437	14.86	≤30	PASS
		2462	15.07	≤30	PASS
11G	Ant1	2412	12.92	≤30	PASS
		2437	13.34	≤30	PASS
		2462	13.18	≤30	PASS
11N20SISO	Ant1	2412	12.02	≤30	PASS
		2437	12.82	≤30	PASS
		2462	12.75	≤30	PASS
11N40SISO	Ant1	2422	12.92	≤30	PASS
		2437	13.18	≤30	PASS
		2452	13.06	≤30	PASS



B.3 Maximum power spectral density

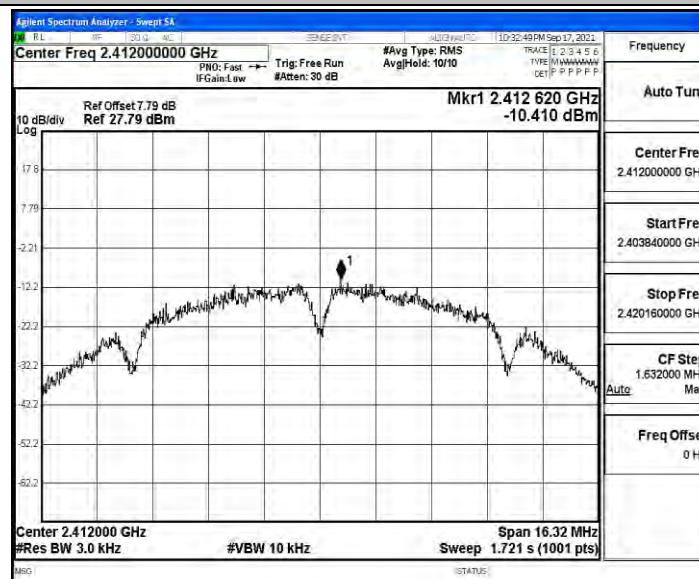
Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-10.41	≤8	PASS
		2437	-10.97	≤8	PASS
		2462	-10.4	≤8	PASS
11G	Ant1	2412	-19.47	≤8	PASS
		2437	-18.48	≤8	PASS
		2462	-18.29	≤8	PASS
11N20SISO	Ant1	2412	-19.69	≤8	PASS
		2437	-19.23	≤8	PASS
		2462	-17.43	≤8	PASS
11N40SISO	Ant1	2422	-22.21	≤8	PASS
		2437	-21.8	≤8	PASS
		2452	-20.12	≤8	PASS

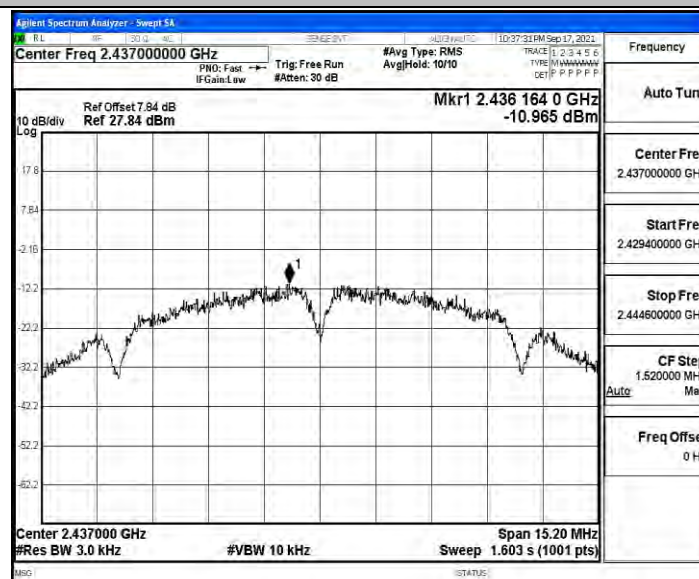


Test Graphs

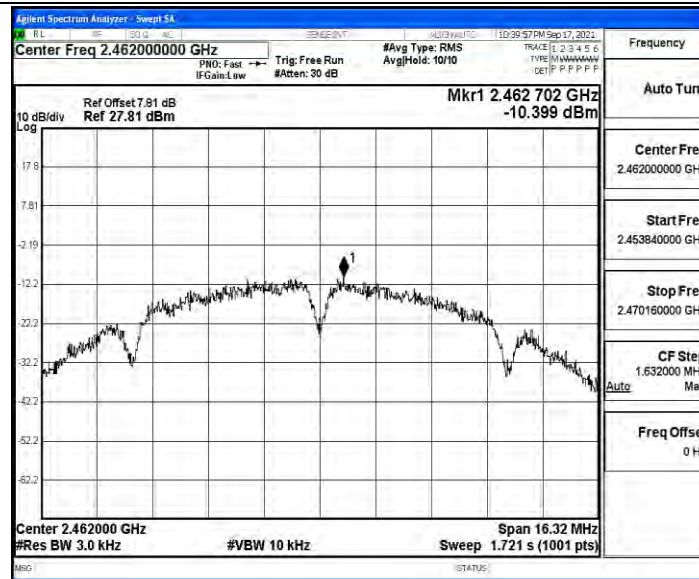
11B_Ant1_2412



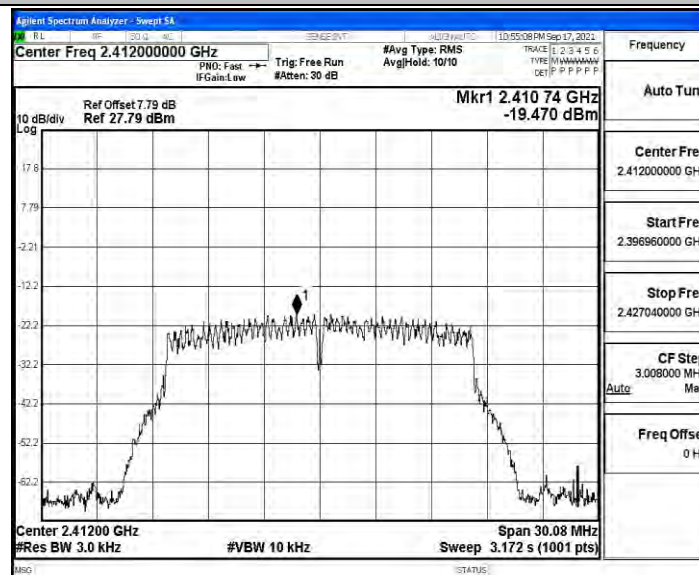
11B_Ant1_2437



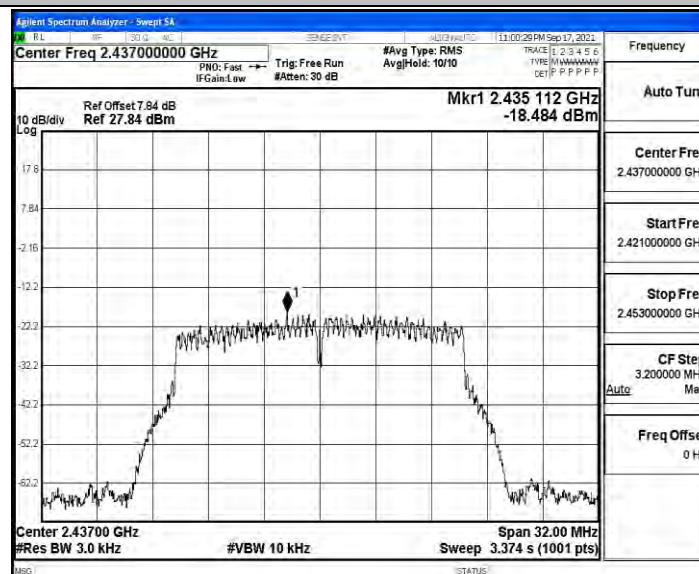
11B_Ant1_2462



11G_Ant1_2412

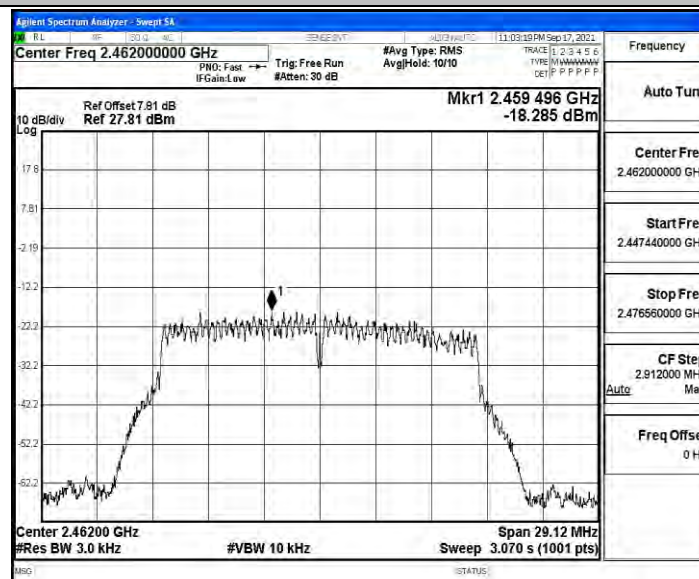


11G_Ant1_2437

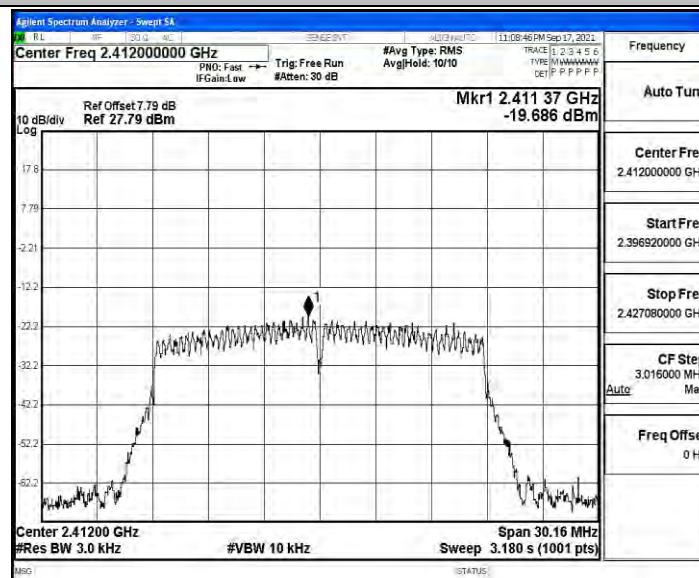




11G_Ant1_2462



11N20SISO_Ant1_2412

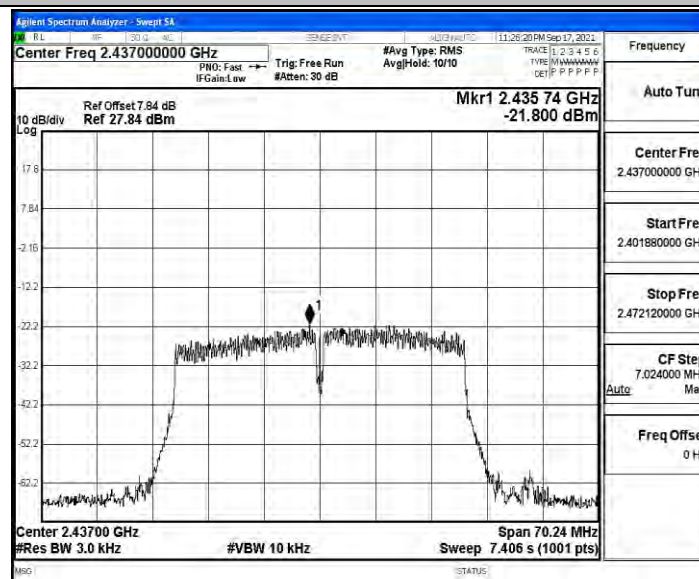


11N20SISO_Ant1_2437

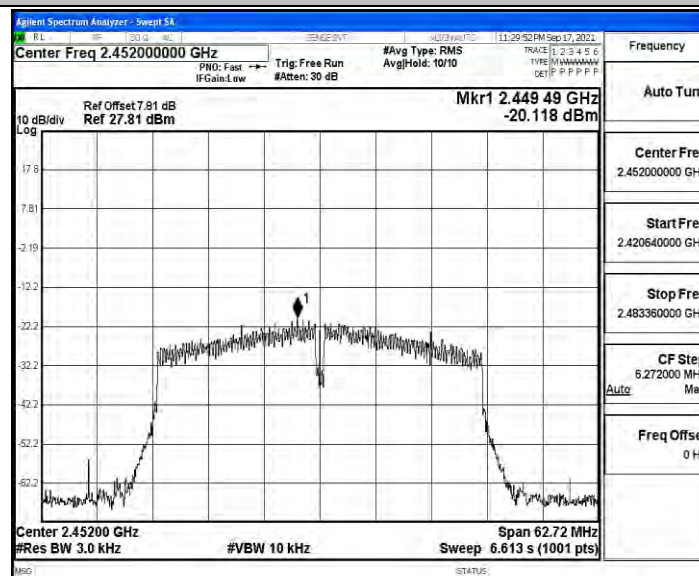




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



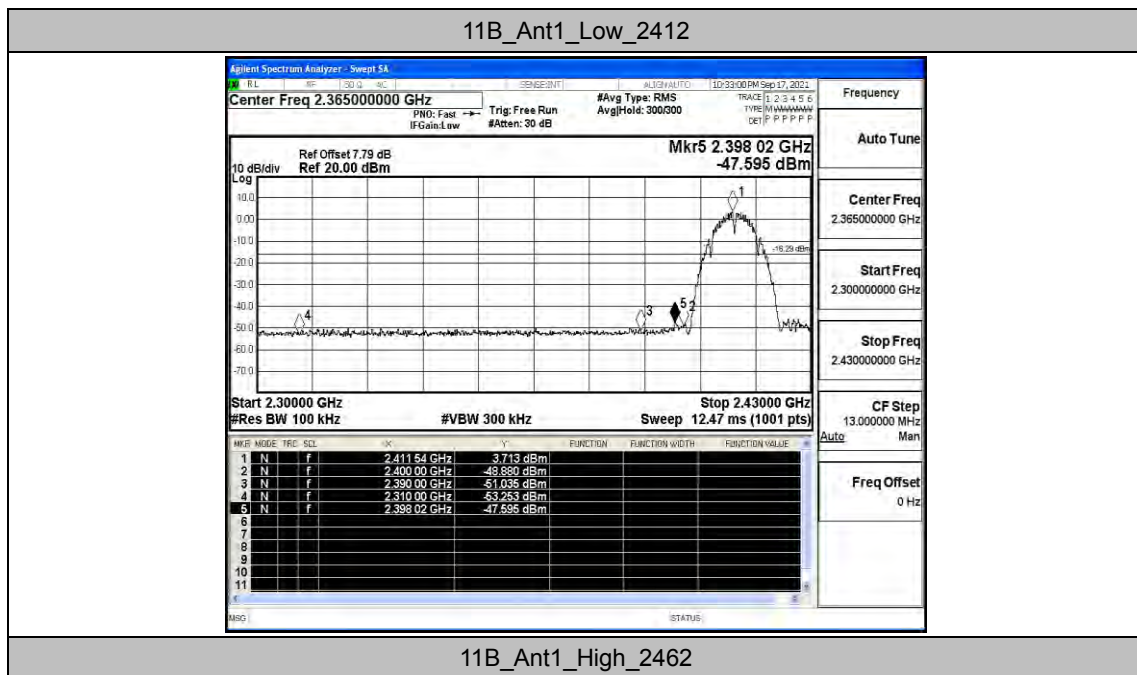


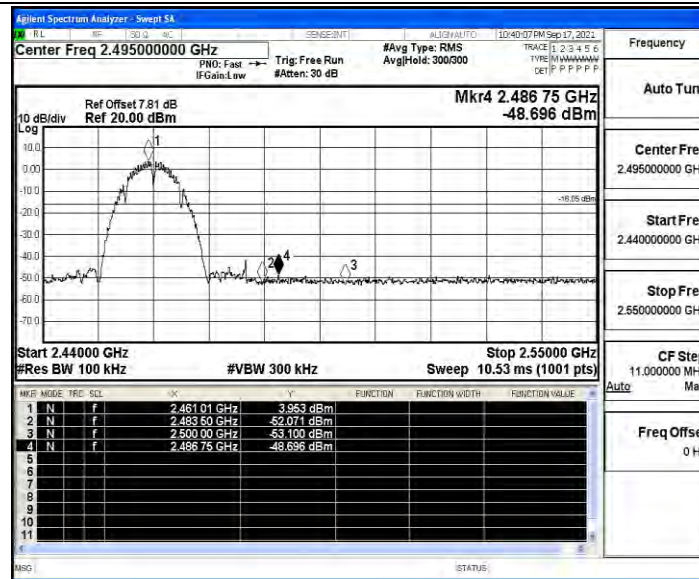
B.4 Band edge measurements

Test Result

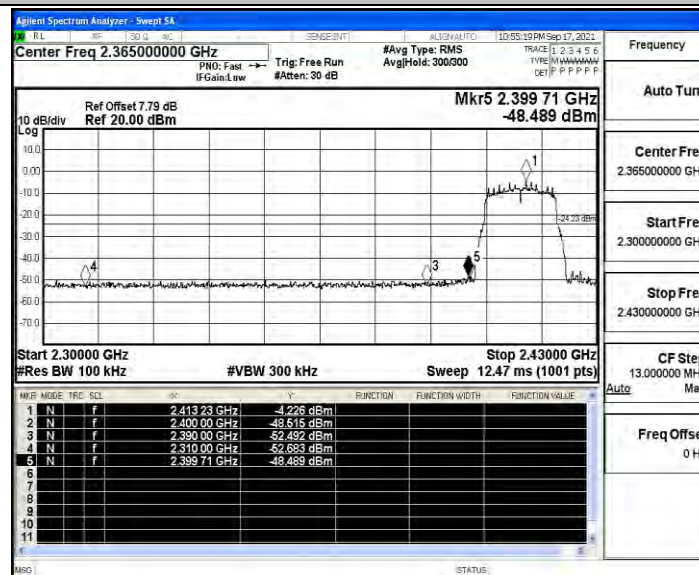
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.71	-47.6	≤-16.29	PASS
		High	2462	3.95	-48.7	≤-16.05	PASS
11G	Ant1	Low	2412	-4.23	-48.49	≤-24.23	PASS
		High	2462	-4.33	-49.33	≤-24.33	PASS
11N20SISO	Ant1	Low	2412	-5.66	-48.14	≤-25.66	PASS
		High	2462	-4.80	-47.91	≤-24.8	PASS
11N40SISO	Ant1	Low	2422	-7.29	-47.98	≤-27.29	PASS
		High	2452	-6.44	-48.28	≤-26.44	PASS

Test Graphs

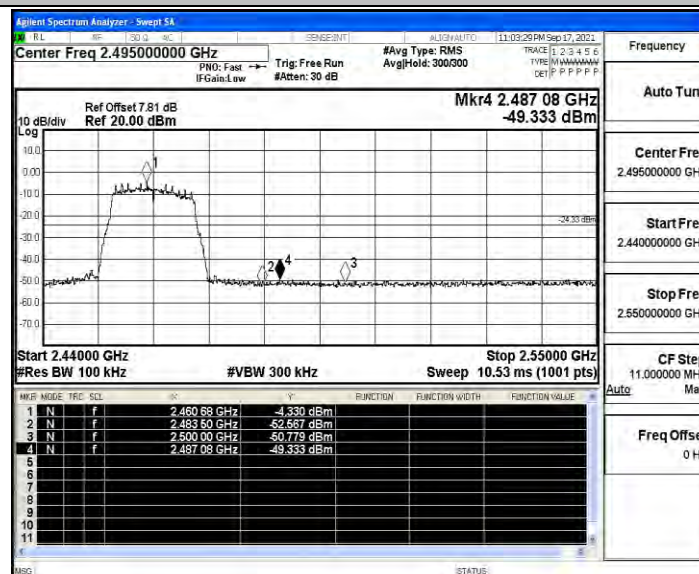




11G_Ant1_Low_2412

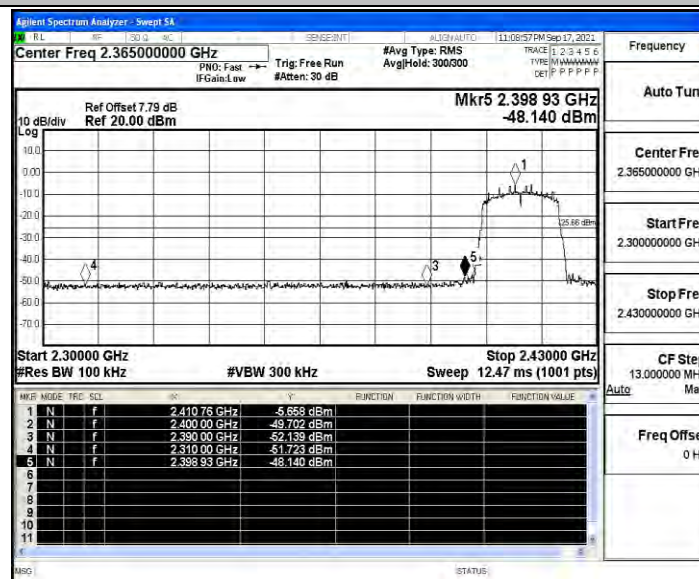


11G_Ant1_High_2462

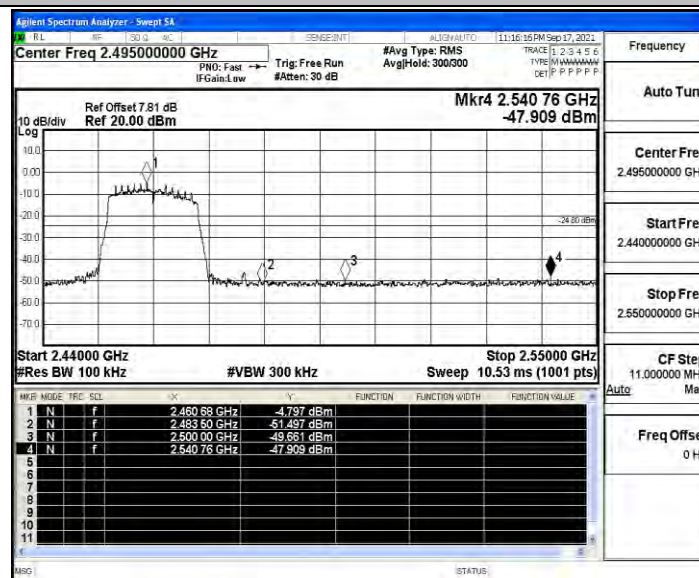




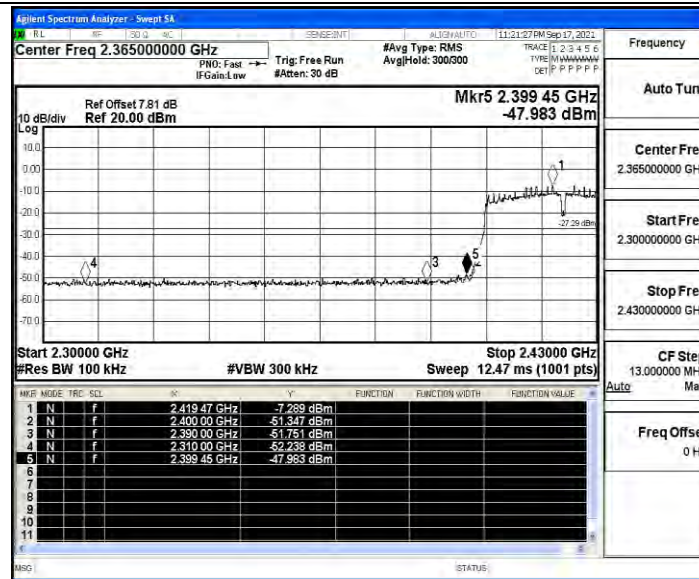
11N20SISO_Ant1_Low_2412



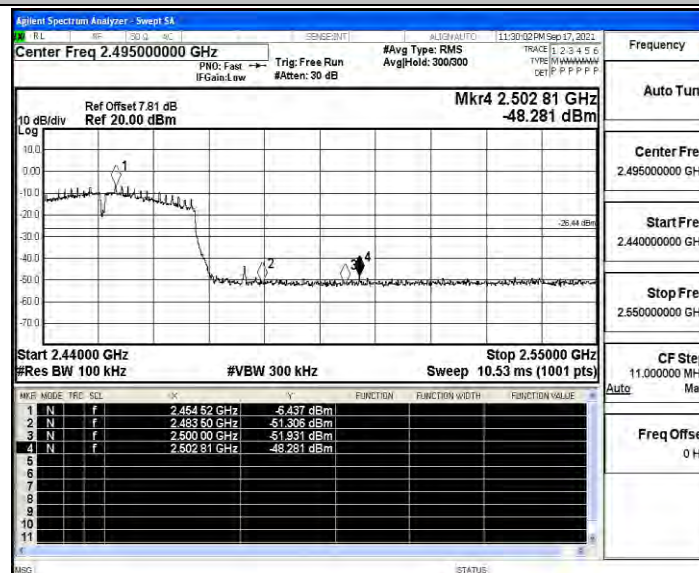
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452





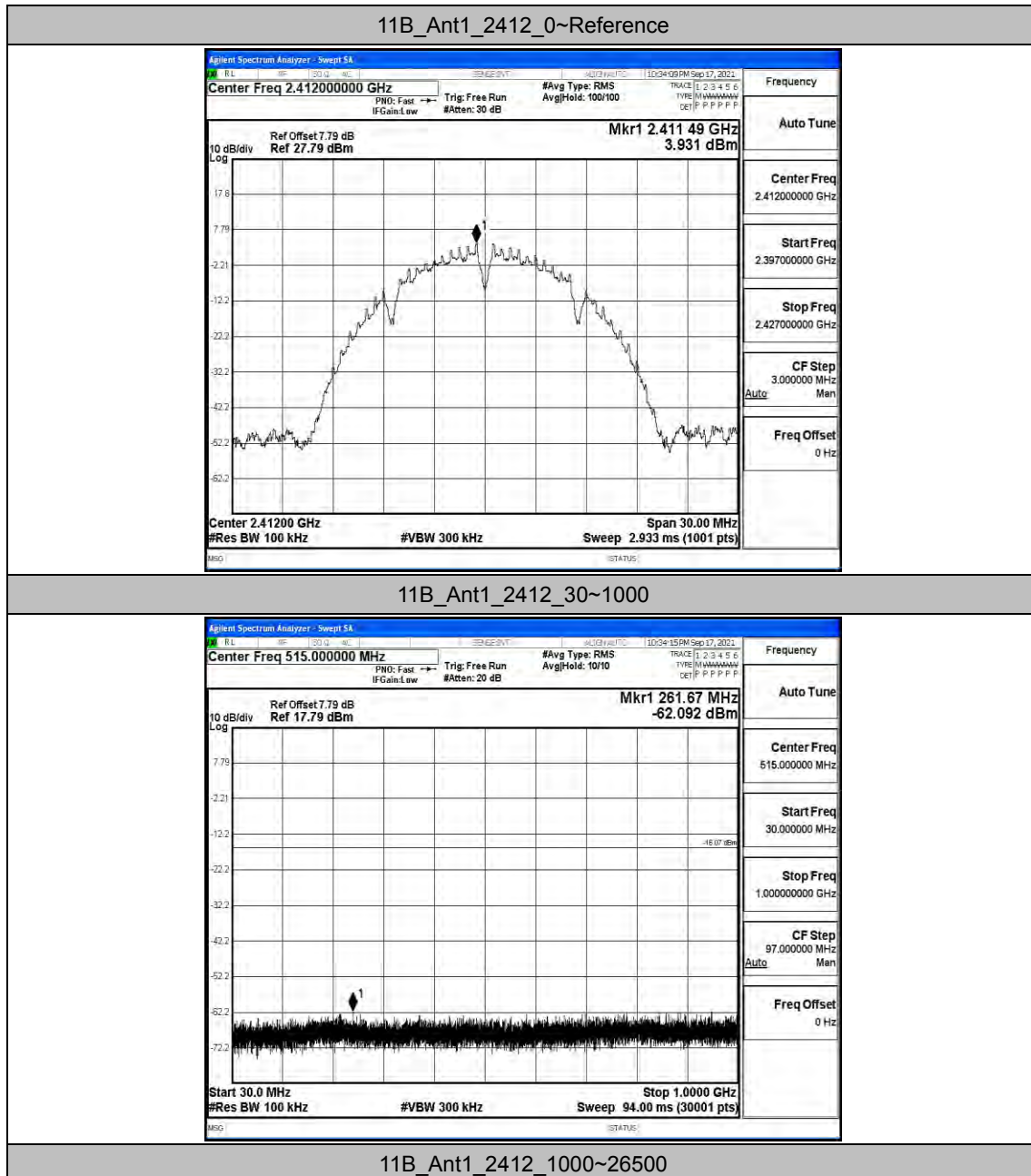
B.5 Conducted Spurious Emission

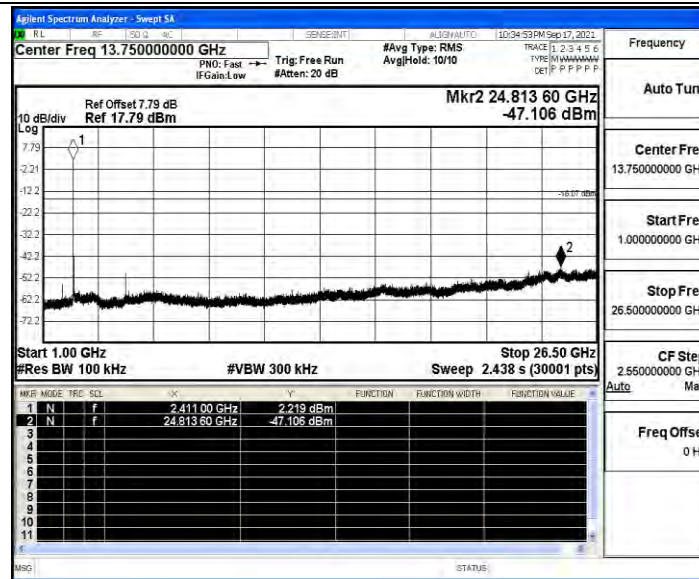
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.93	3.93	---	PASS
			30~1000	3.93	-62.09	≤-16.07	PASS
			1000~26500	3.93	-47.11	≤-16.07	PASS
		2437	Reference	3.70	3.70	---	PASS
			30~1000	3.70	-61.15	≤-16.3	PASS
			1000~26500	3.70	-46.96	≤-16.3	PASS
		2462	Reference	3.69	3.69	---	PASS
			30~1000	3.69	-61.59	≤-16.31	PASS
			1000~26500	3.69	-47.39	≤-16.31	PASS
11G	Ant1	2412	Reference	-5.01	-5.01	---	PASS
			30~1000	-5.01	-61.32	≤-25.01	PASS
			1000~26500	-5.01	-47.13	≤-25.01	PASS
		2437	Reference	-5.32	-5.32	---	PASS
			30~1000	-5.32	-61.25	≤-25.32	PASS
			1000~26500	-5.32	-47.54	≤-25.32	PASS
		2462	Reference	-4.86	-4.86	---	PASS
			30~1000	-4.86	-61.34	≤-24.86	PASS
			1000~26500	-4.86	-47.46	≤-24.86	PASS
11N20SISO	Ant1	2412	Reference	-5.90	-5.90	---	PASS
			30~1000	-5.90	-61.72	≤-25.9	PASS
			1000~26500	-5.90	-46.88	≤-25.9	PASS
		2437	Reference	-4.52	-4.52	---	PASS
			30~1000	-4.52	-60.65	≤-24.52	PASS
			1000~26500	-4.52	-47.75	≤-24.52	PASS
		2462	Reference	-5.18	-5.18	---	PASS
			30~1000	-5.18	-61.62	≤-25.18	PASS
			1000~26500	-5.18	-47.55	≤-25.18	PASS
11N40SISO	Ant1	2422	Reference	-7.71	-7.71	---	PASS
			30~1000	-7.71	-62.09	≤-27.71	PASS
			1000~26500	-7.71	-47.2	≤-27.71	PASS
		2437	Reference	-7.30	-7.30	---	PASS
			30~1000	-7.30	-61.42	≤-27.3	PASS
			1000~26500	-7.30	-47.79	≤-27.3	PASS
		2452	Reference	-6.48	-6.48	---	PASS
			30~1000	-6.48	-61.85	≤-26.48	PASS
			1000~26500	-6.48	-47.25	≤-26.48	PASS

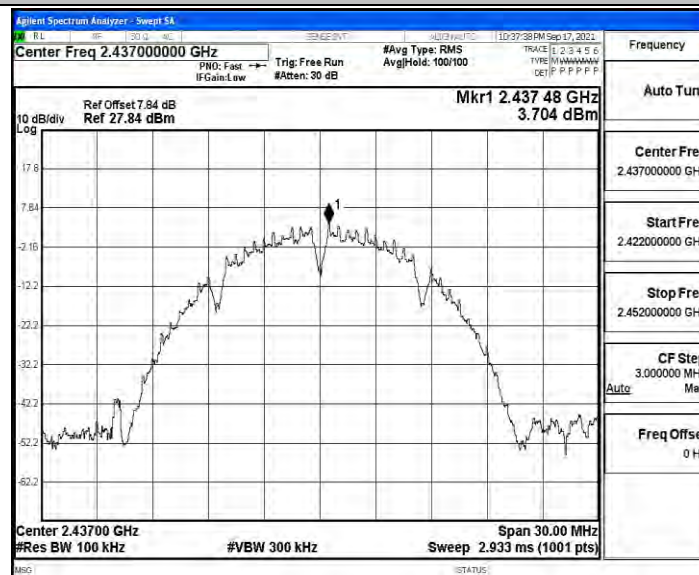


Test Graphs

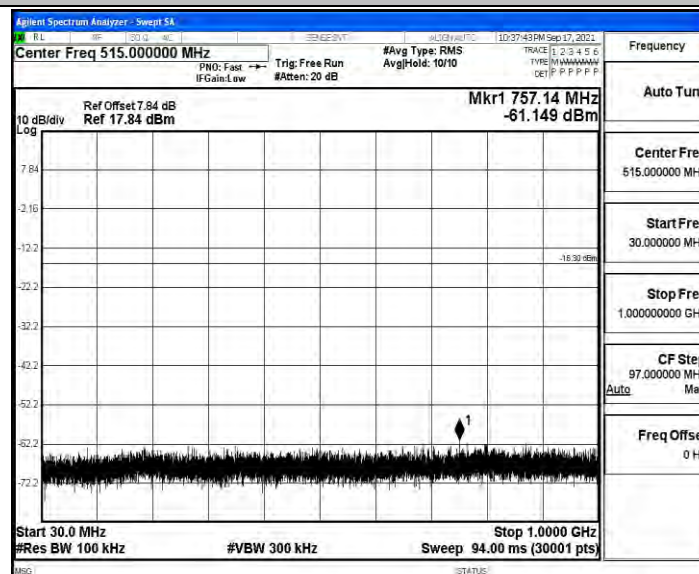




11B_Ant1_2437_0~Reference

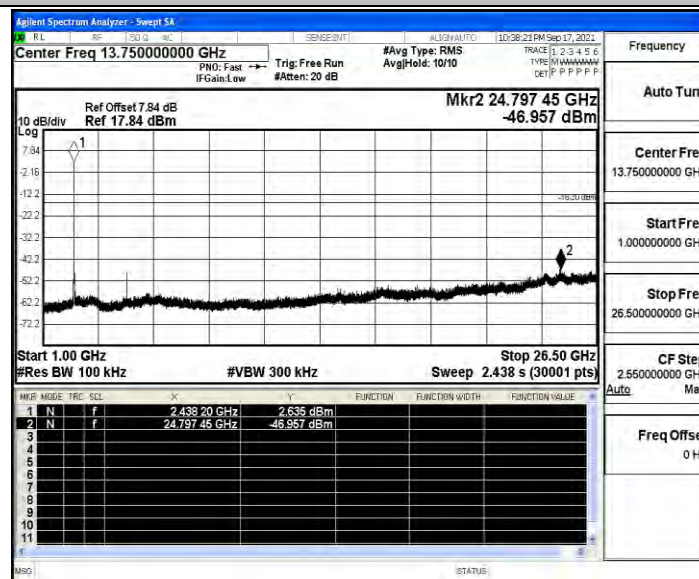


11B_Ant1_2437_30~1000

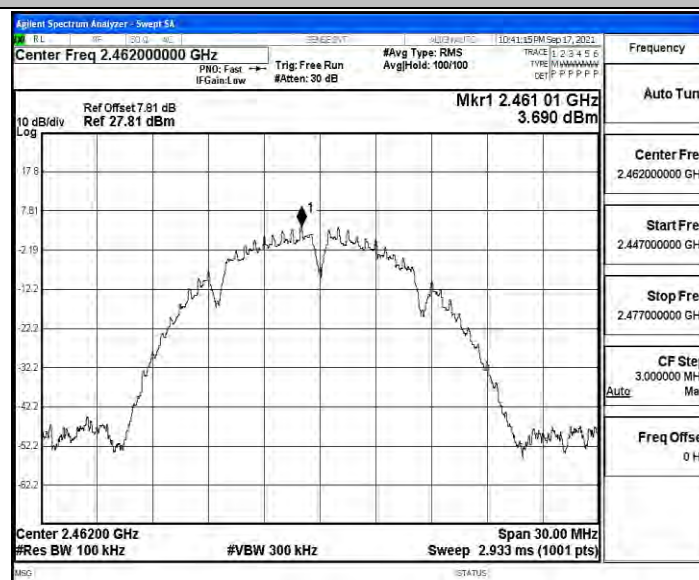




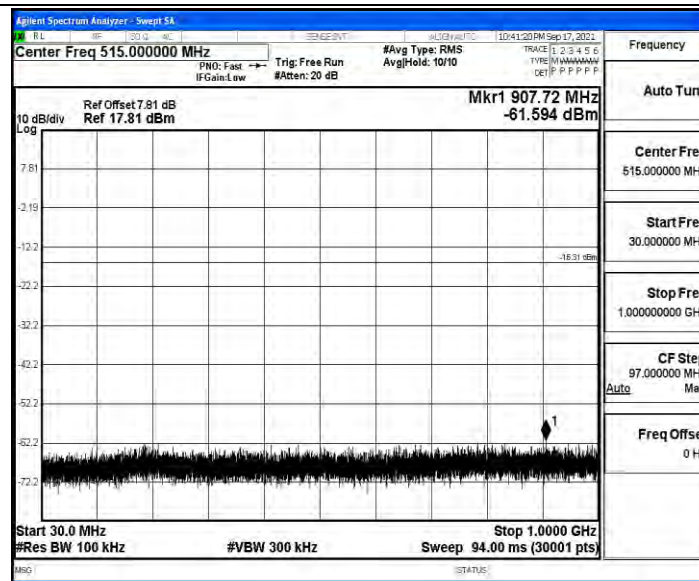
11B_Ant1_2437_1000~26500



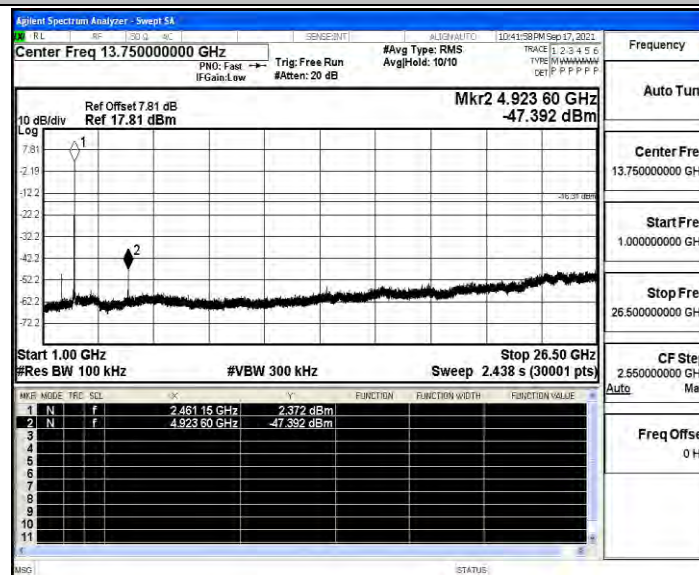
11B_Ant1_2462_0~Reference



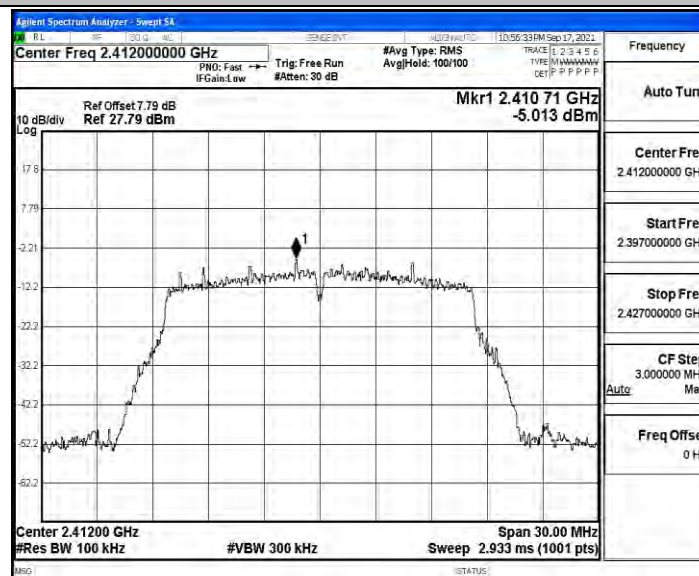
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

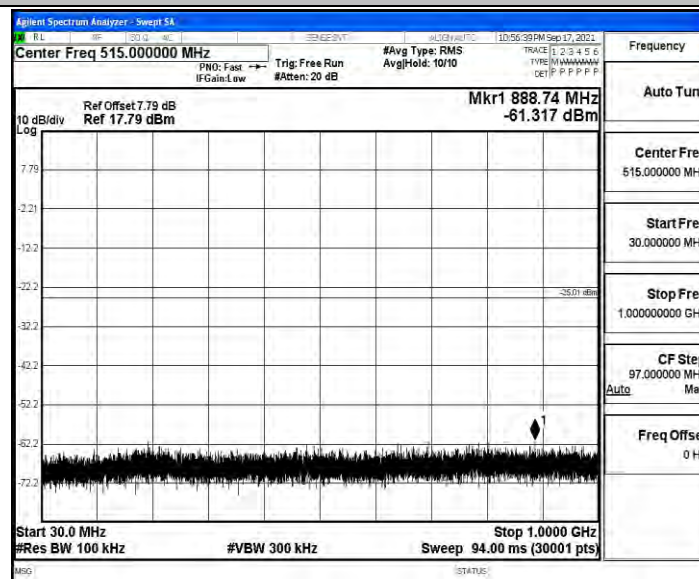


11G_Ant1_2412_0~Reference

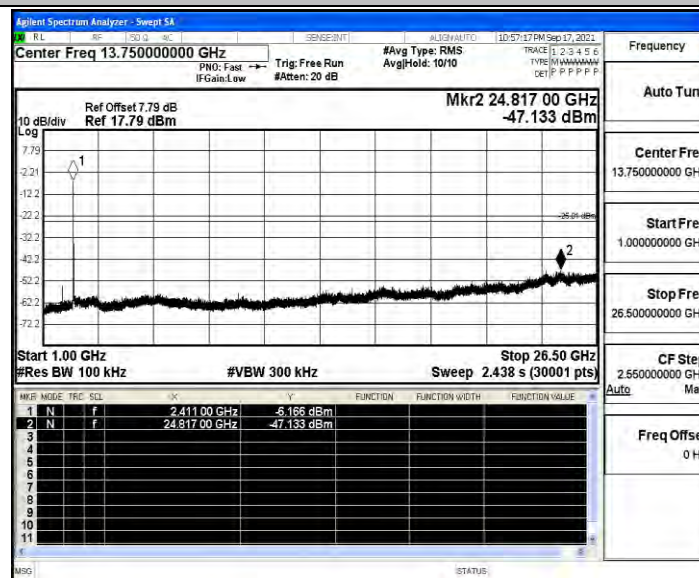




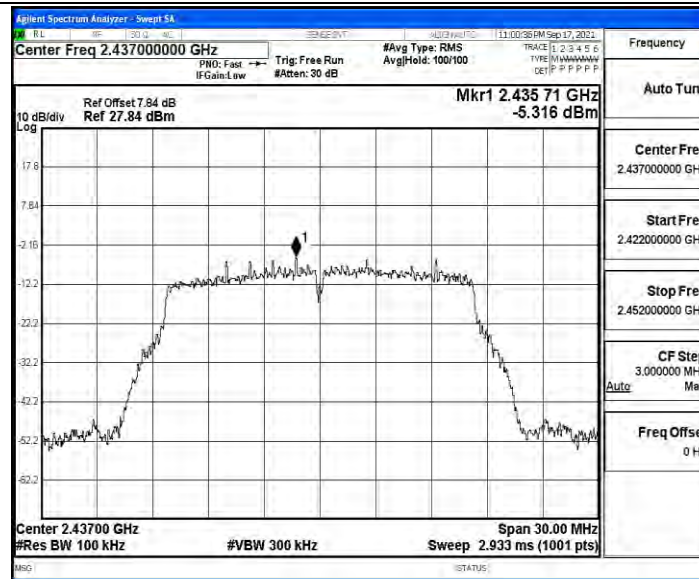
11G_Ant1_2412_30~1000



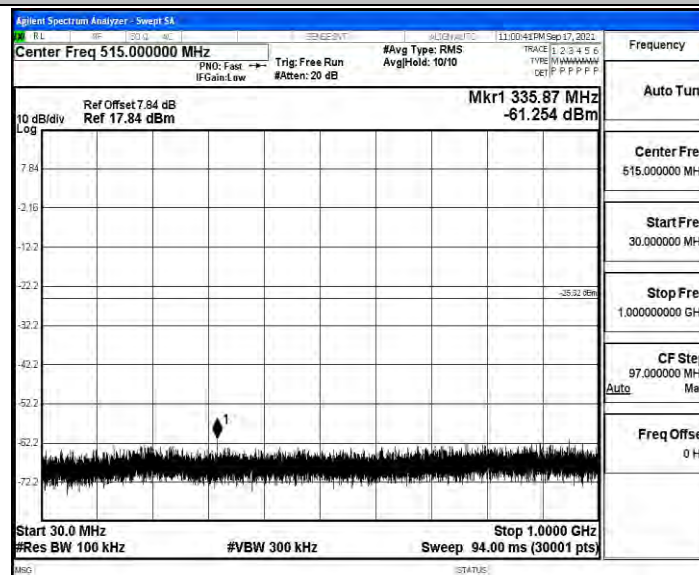
11G_Ant1_2412_1000~26500



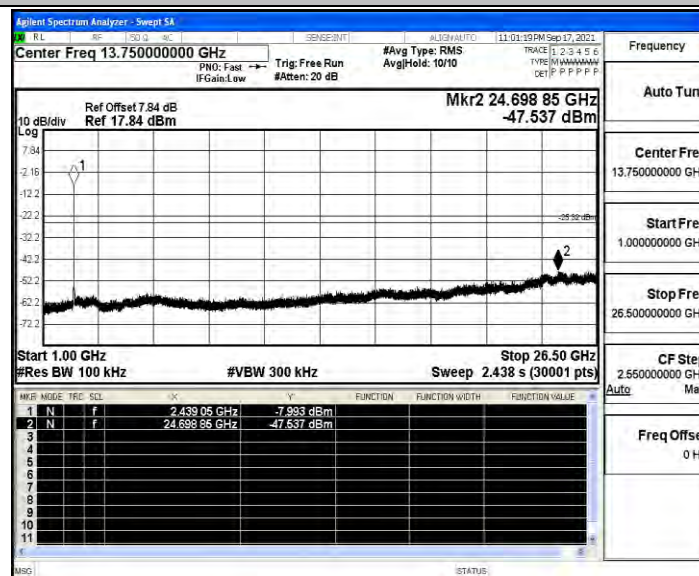
11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000

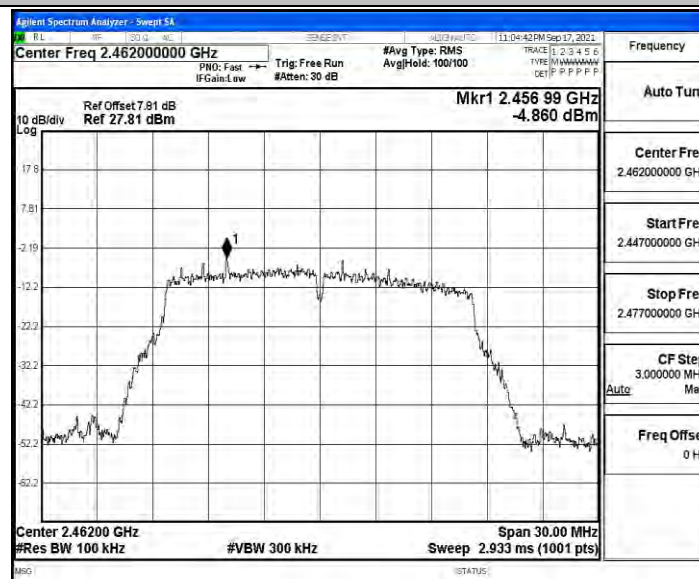


11G_Ant1_2437_1000~26500

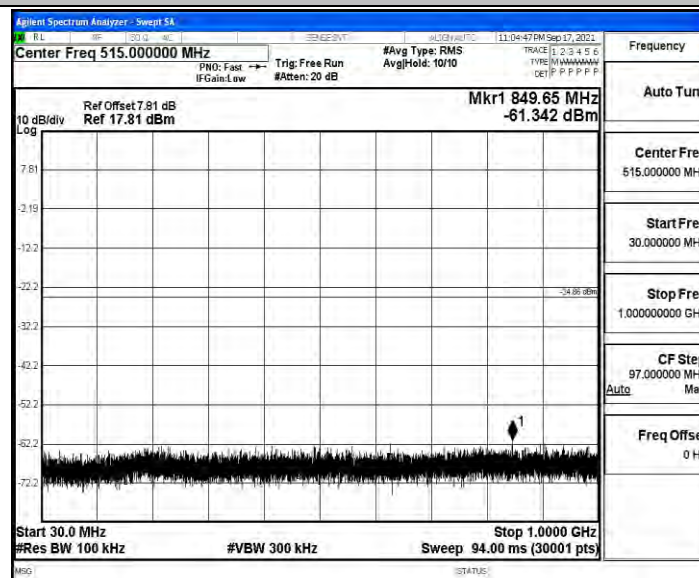




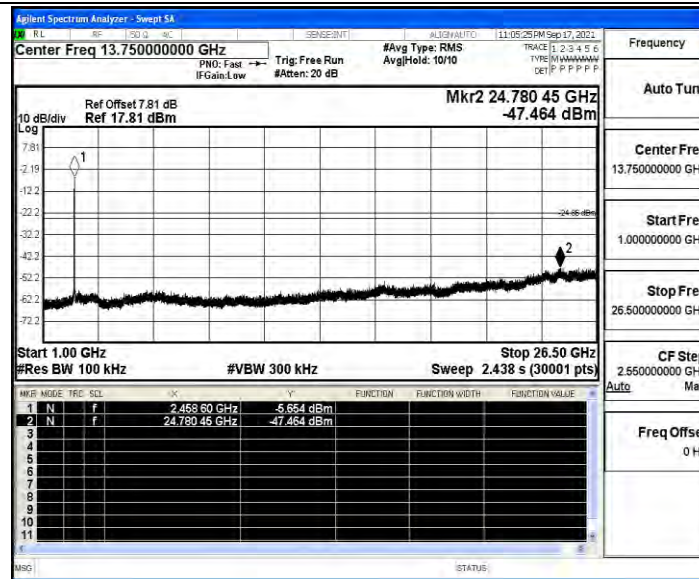
11G_Ant1_2462_0~Reference



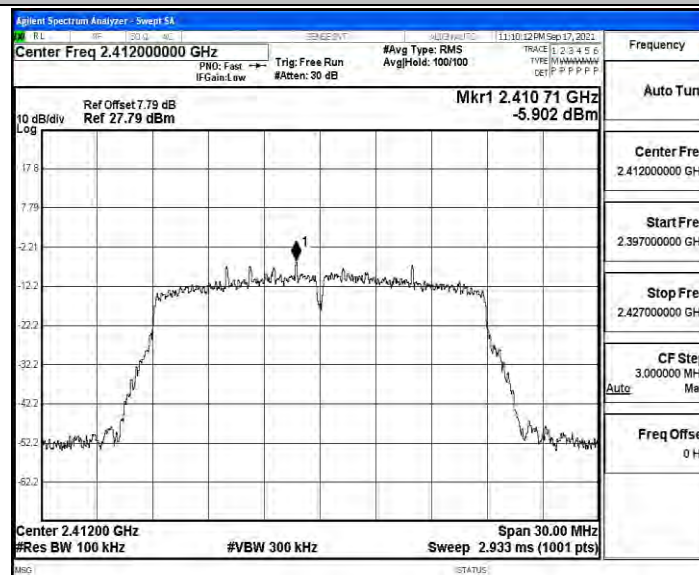
11G_Ant1_2462_30~1000



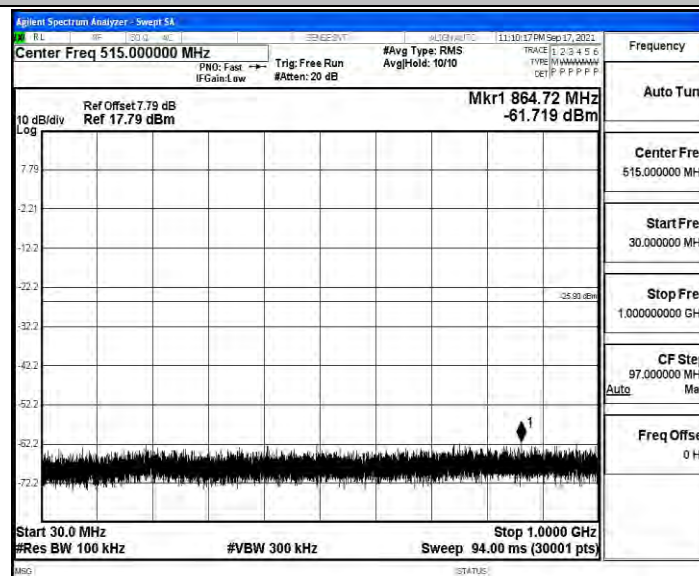
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference

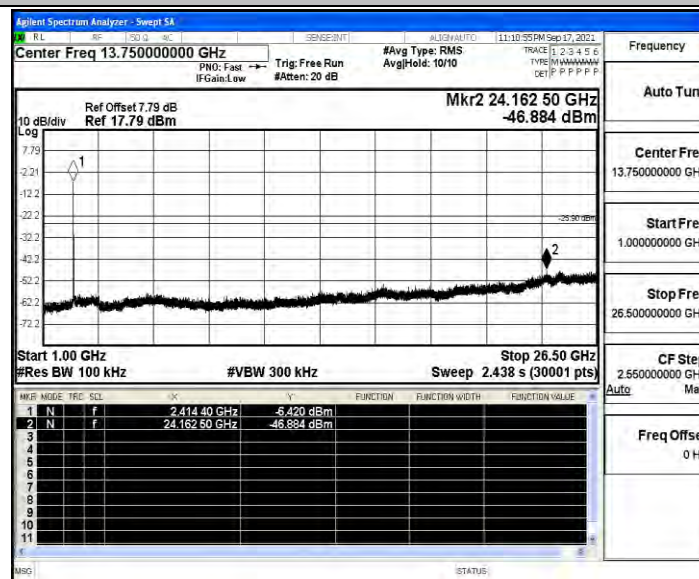


11N20SISO_Ant1_2412_30~1000

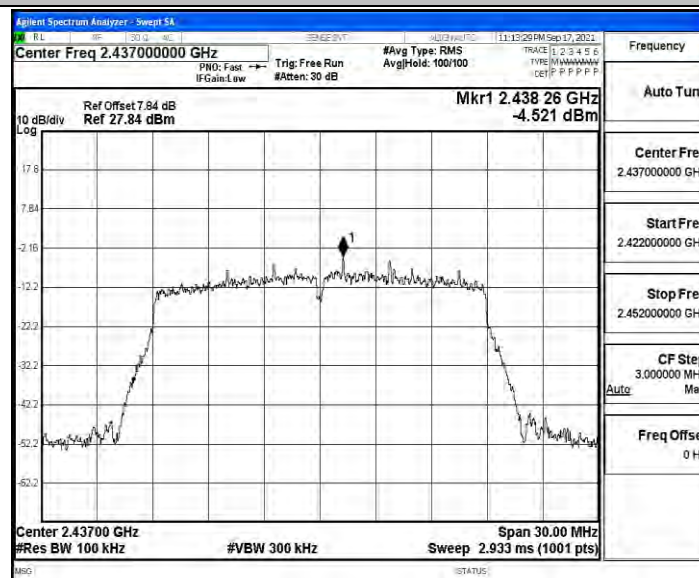




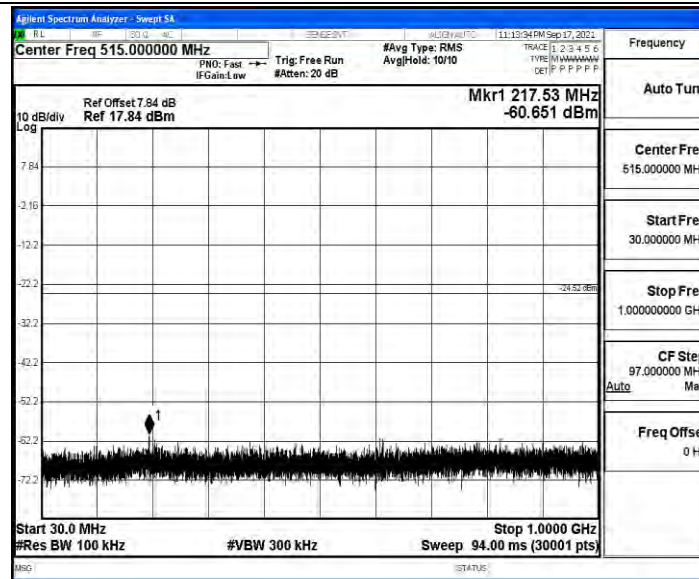
11N20SISO_Ant1_2412_1000~26500



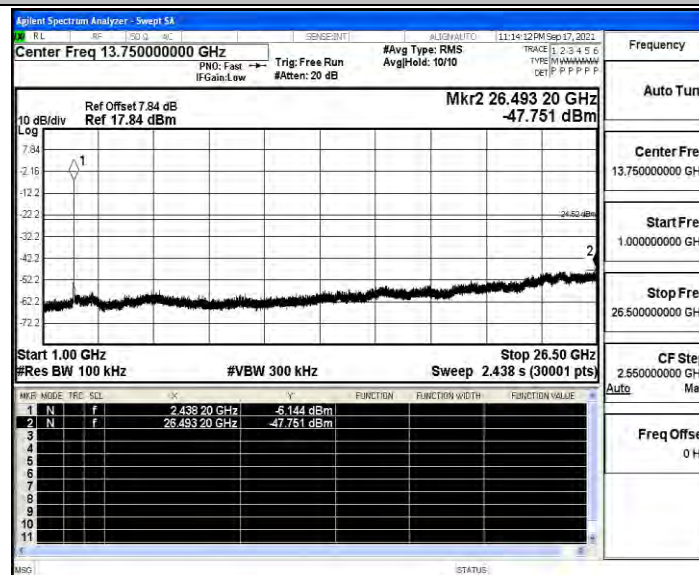
11N20SISO_Ant1_2437_0~Reference



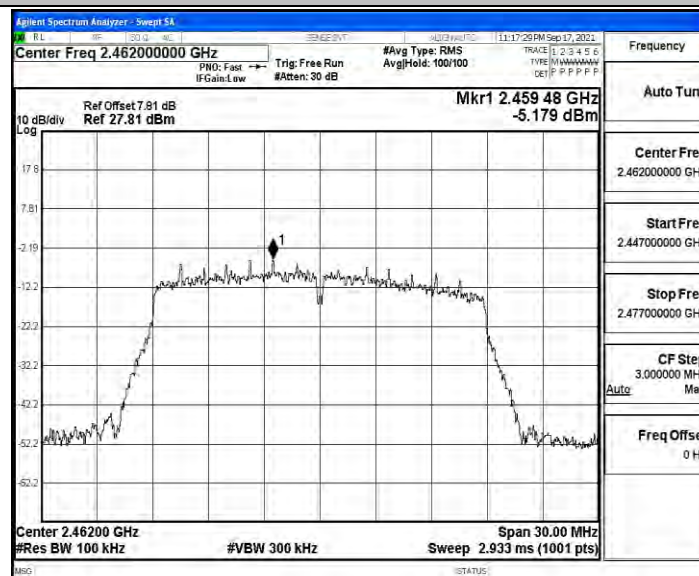
11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

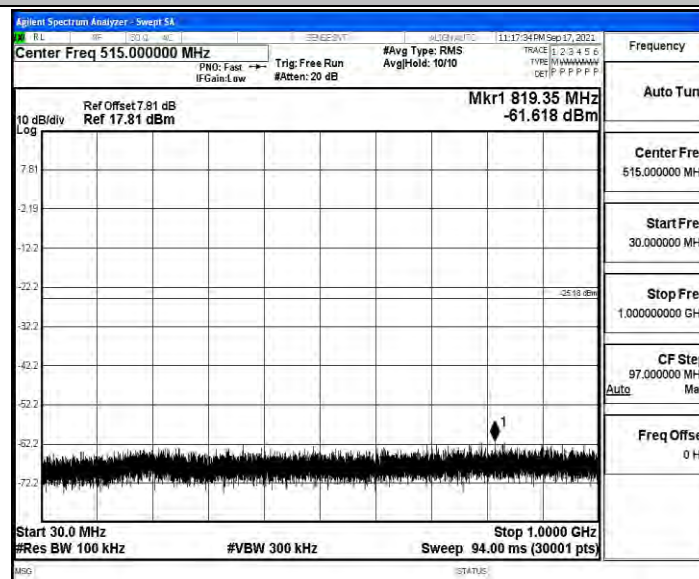


11N20SISO_Ant1_2462_0~Reference

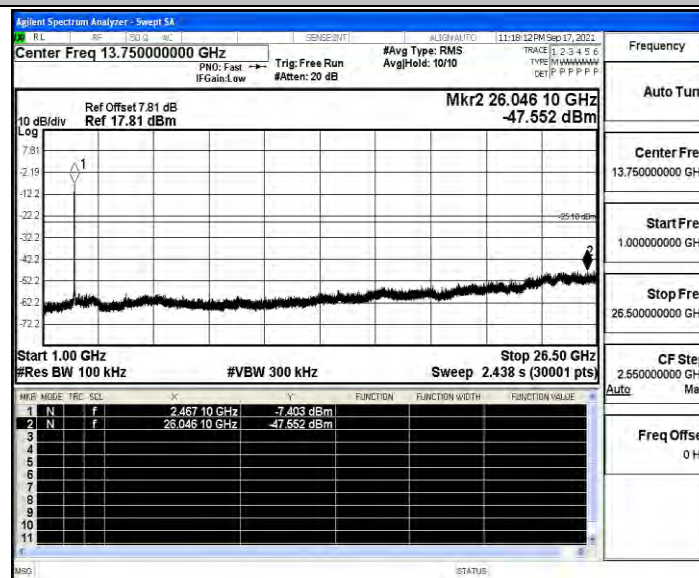




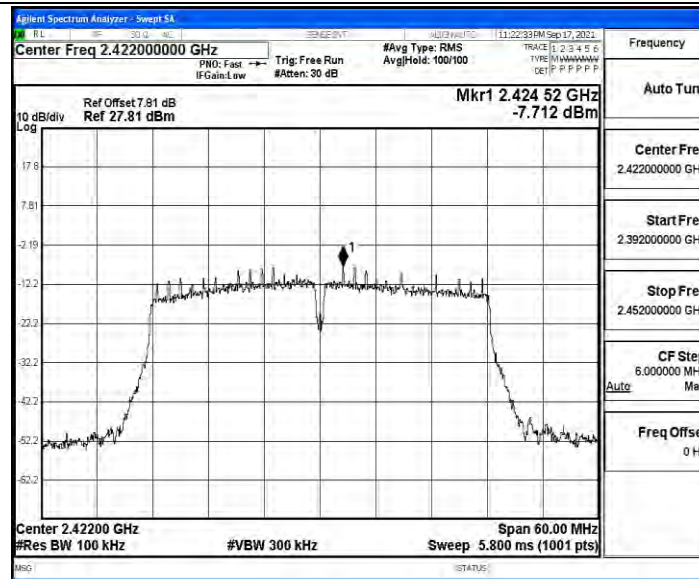
11N20SISO_Ant1_2462_30~1000



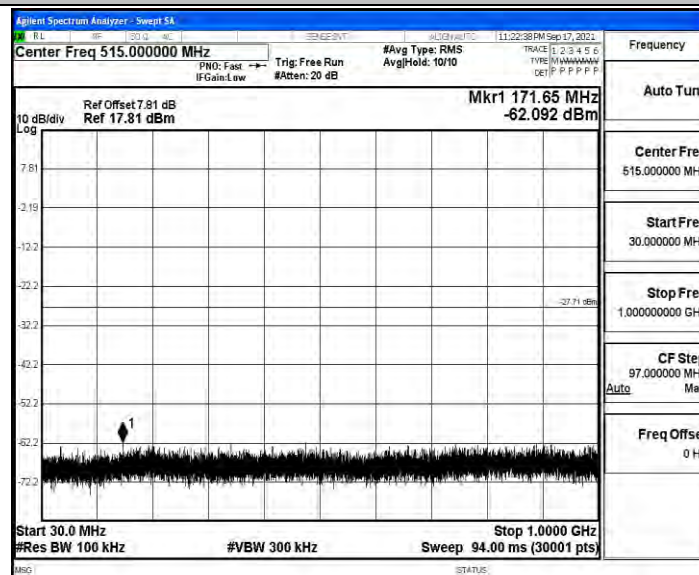
11N20SISO_Ant1_2462_1000~26500



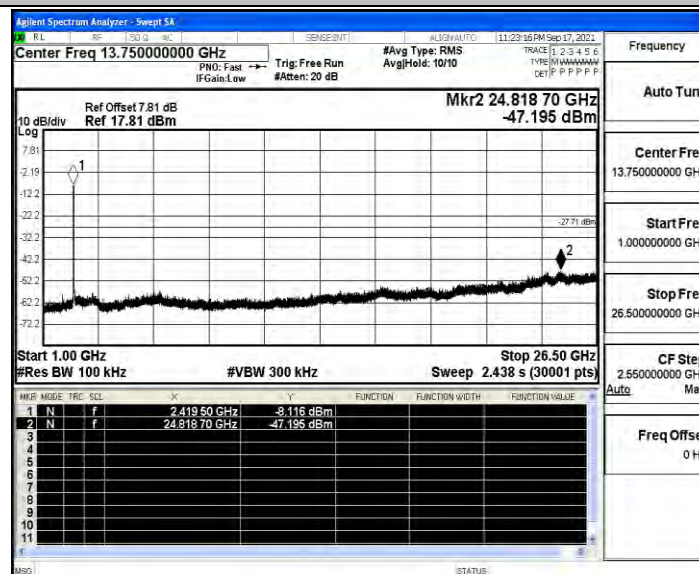
11N40SISO_Ant1_2422_0~Reference



11N40SISO_Ant1_2422_30~1000

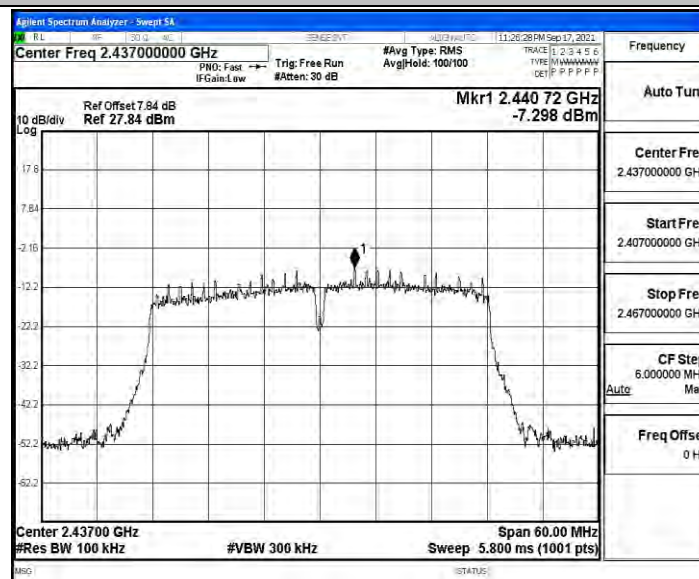


11N40SISO_Ant1_2422_1000~26500

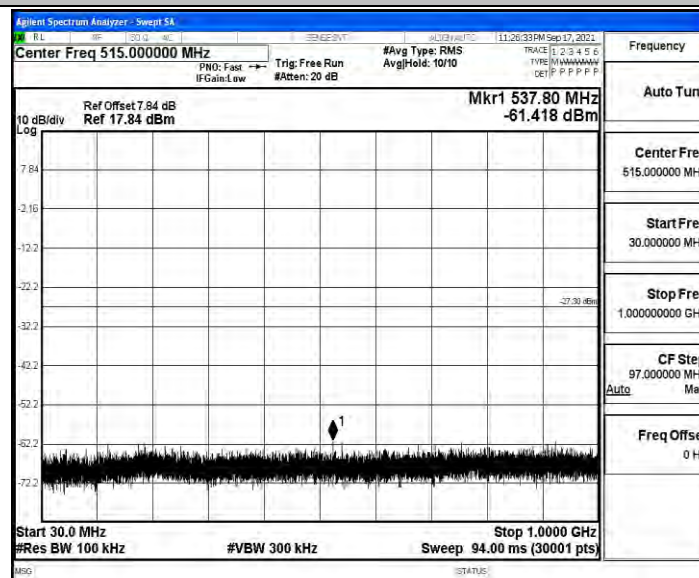




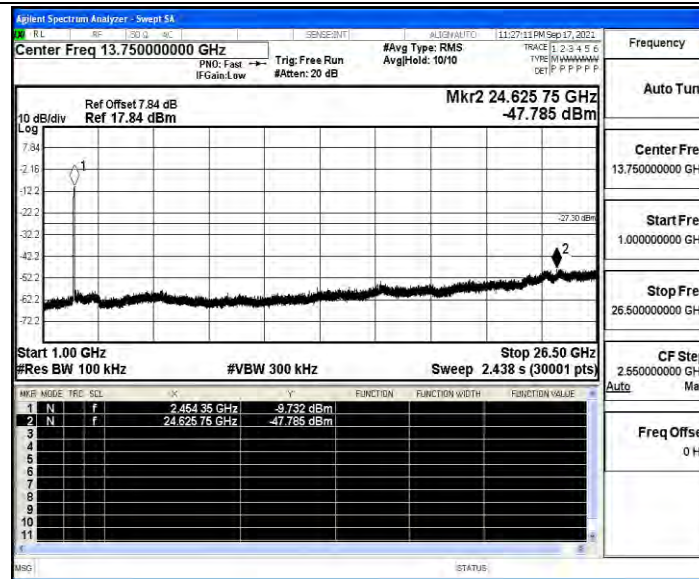
11N40SISO_Ant1_2437_0~Reference



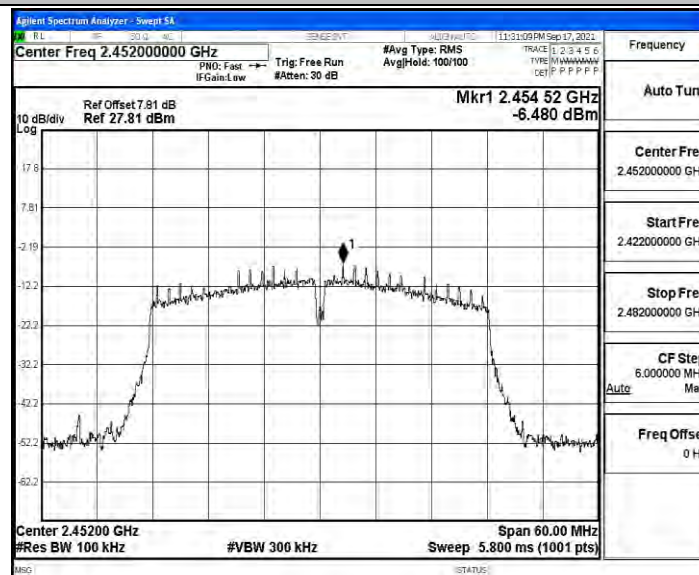
11N40SISO_Ant1_2437_30~1000



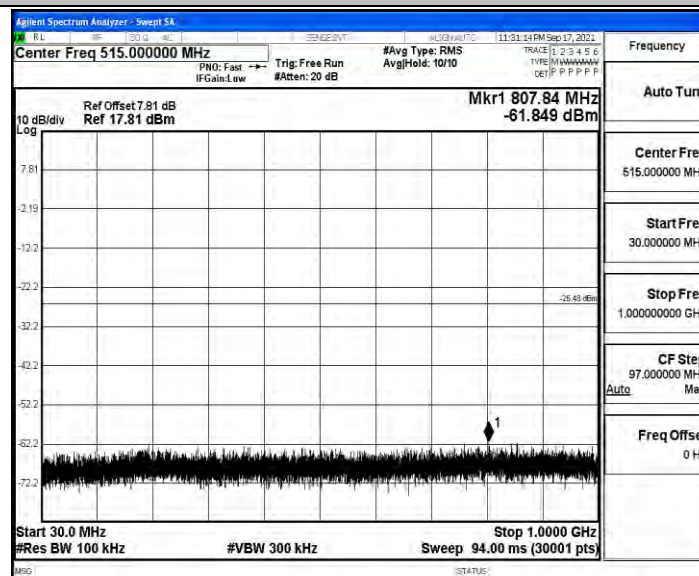
11N40SISO_Ant1_2437_1000~26500



11N40SISO_Ant1_2452_0~Reference

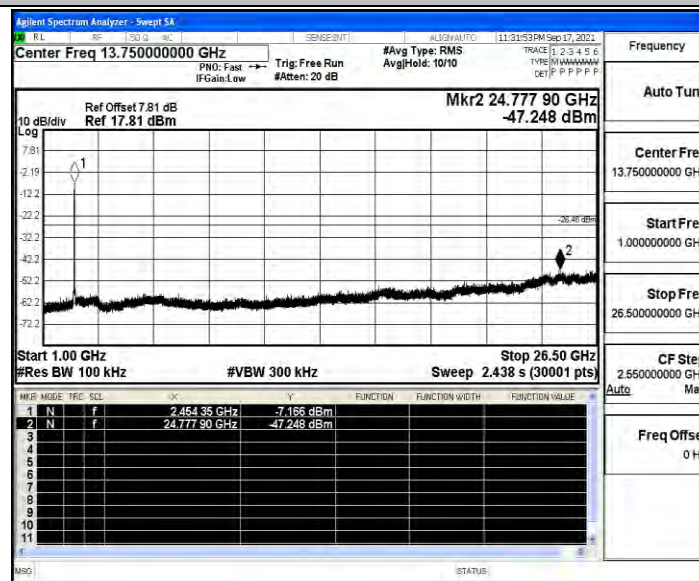


11N40SISO_Ant1_2452_30~1000





11N40SISO_Ant1_2452_1000~26500





B.6 Duty Cycle

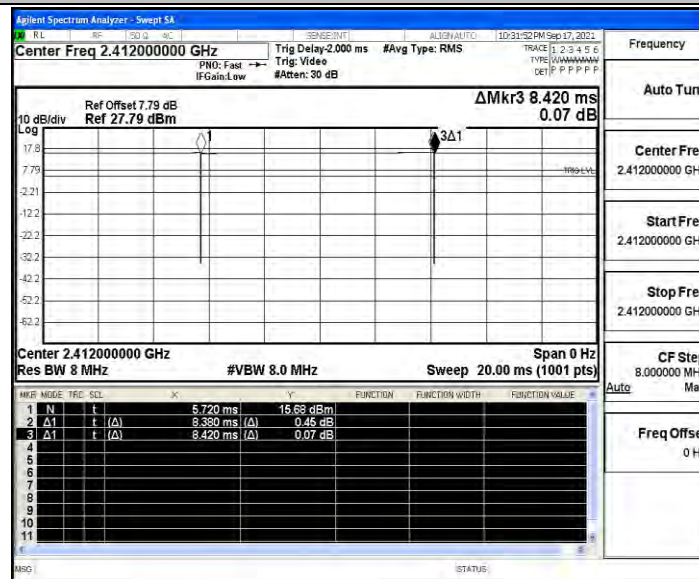
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	8.38	8.42	99.52	---	PASS
		2437	8.37	8.42	99.41	---	PASS
		2462	8.38	8.42	99.52	---	PASS
11G	Ant1	2412	1.39	1.44	96.53	---	PASS
		2437	1.39	1.44	96.53	---	PASS
		2462	1.39	1.44	96.53	---	PASS
11N20SISO	Ant1	2412	1.30	1.35	96.30	---	PASS
		2437	1.30	1.35	96.30	---	PASS
		2462	1.30	1.35	96.30	---	PASS
11N40SISO	Ant1	2422	0.64	0.69	92.75	---	PASS
		2437	0.64	0.69	92.75	---	PASS
		2452	0.64	0.69	92.75	---	PASS

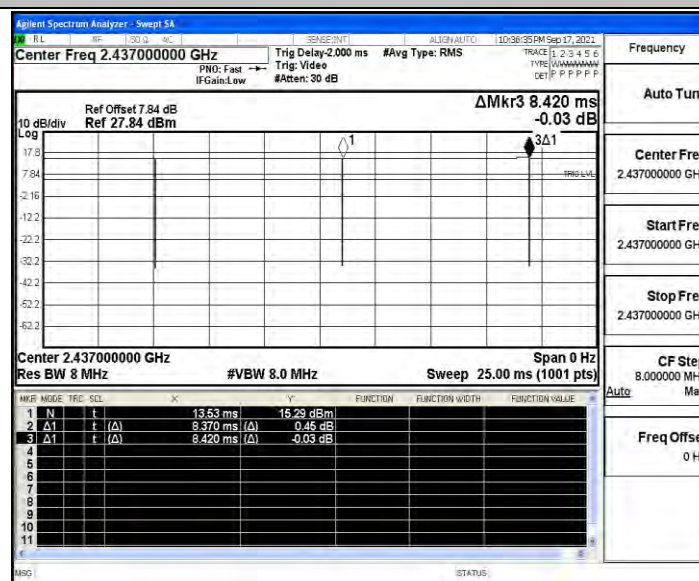


Test Graphs

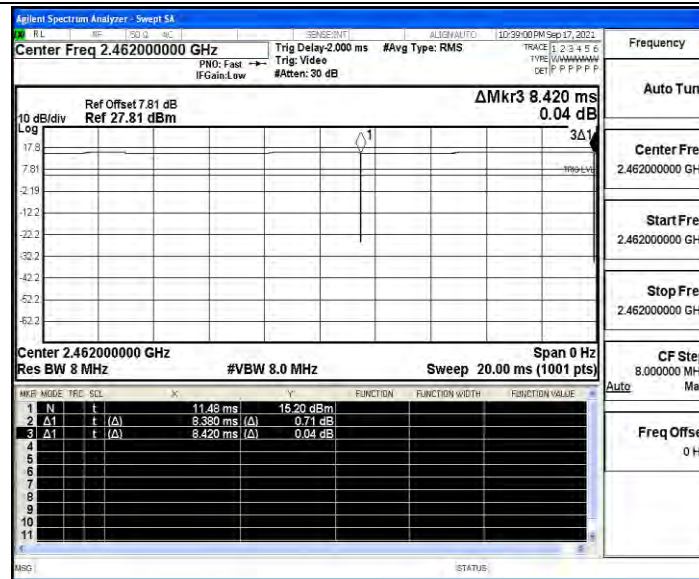
11B_Ant1_2412



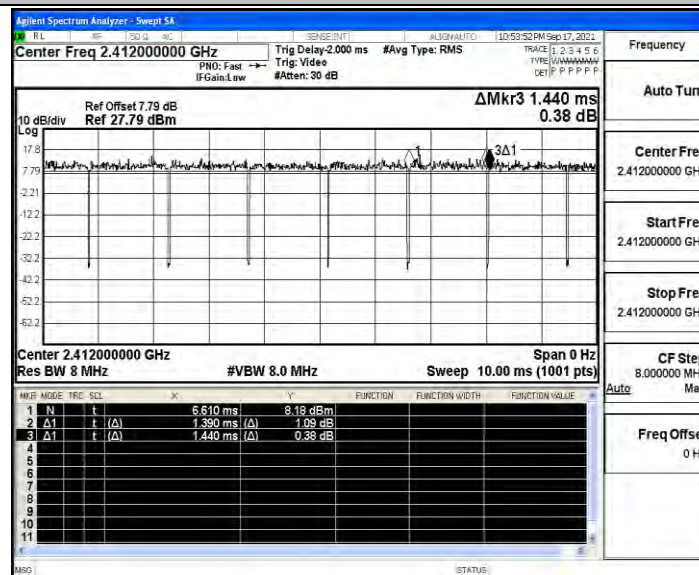
11B_Ant1_2437



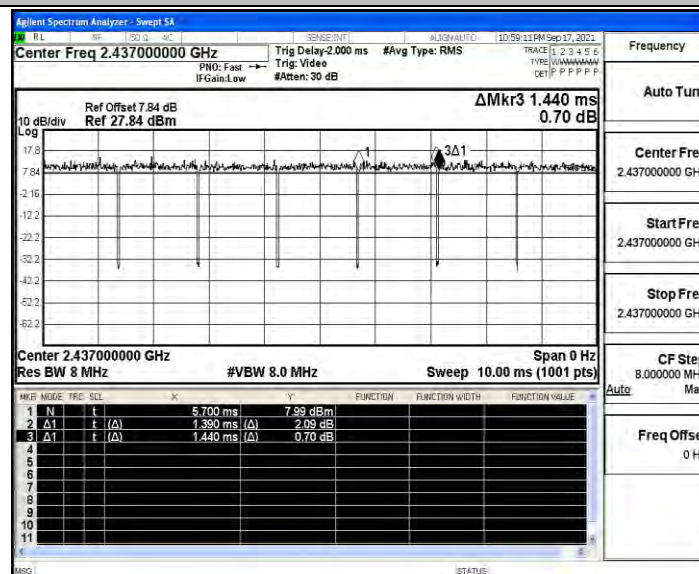
11B_Ant1_2462



11G_Ant1_2412

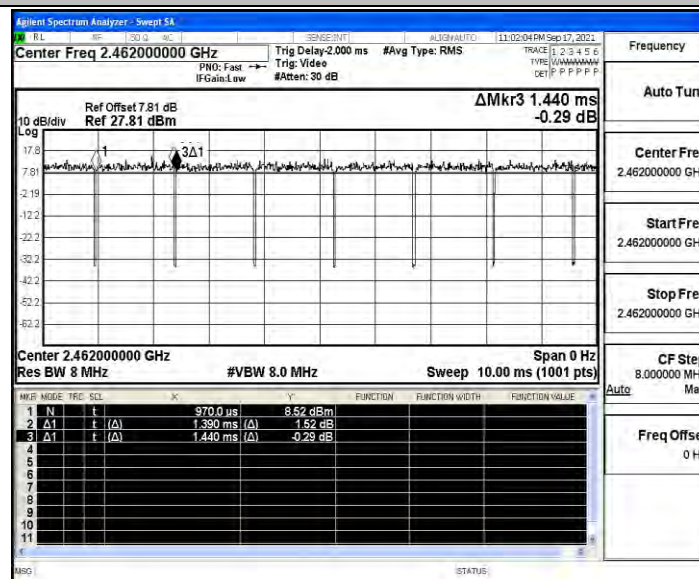


11G_Ant1_2437

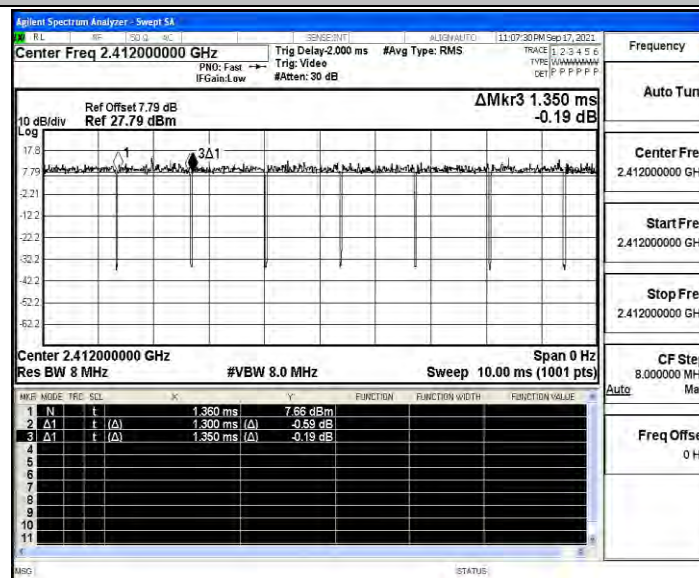




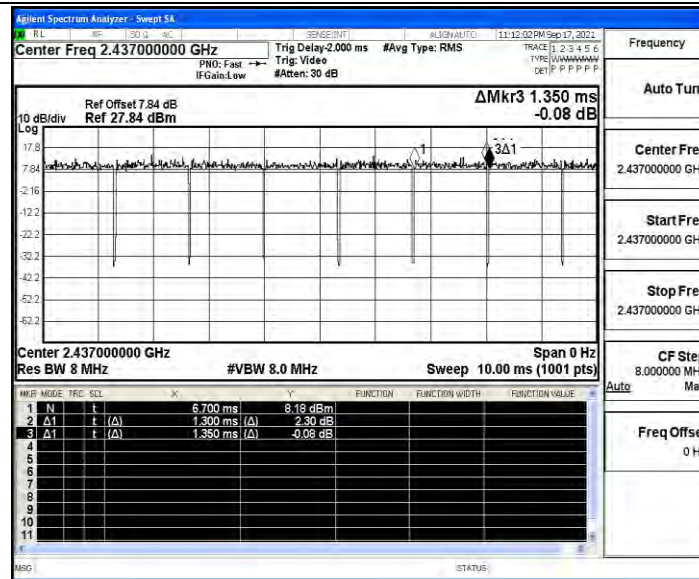
11G_Ant1_2462



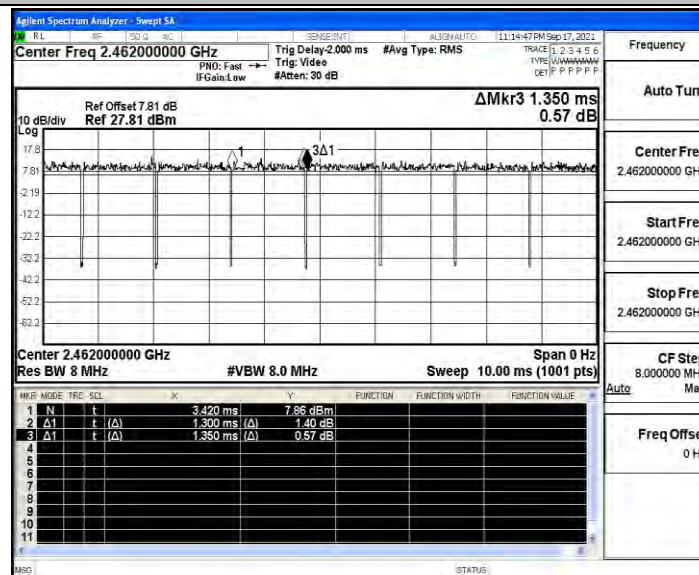
11N20SISO_Ant1_2412



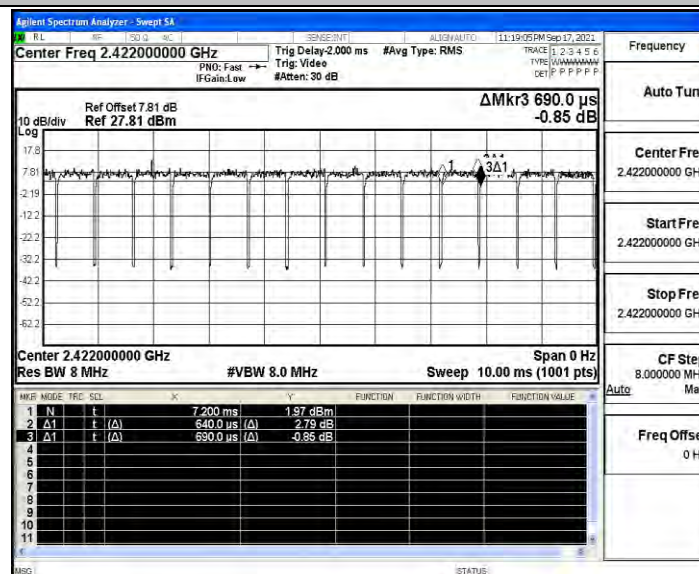
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

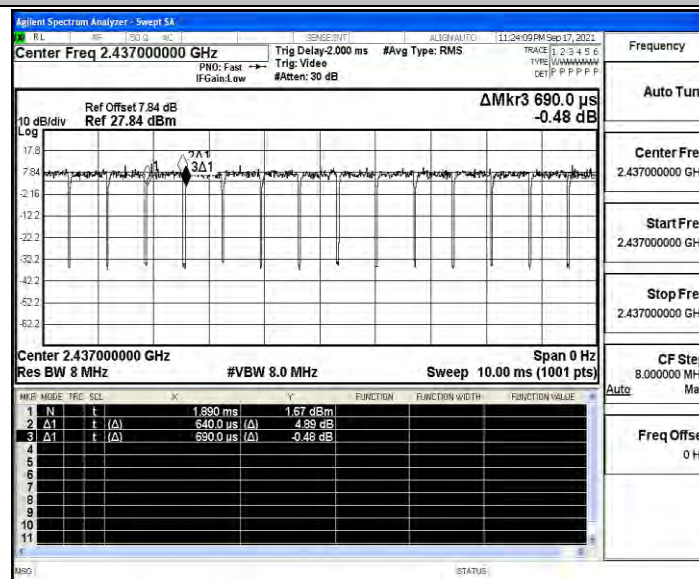


11N40SISO_Ant1_2422

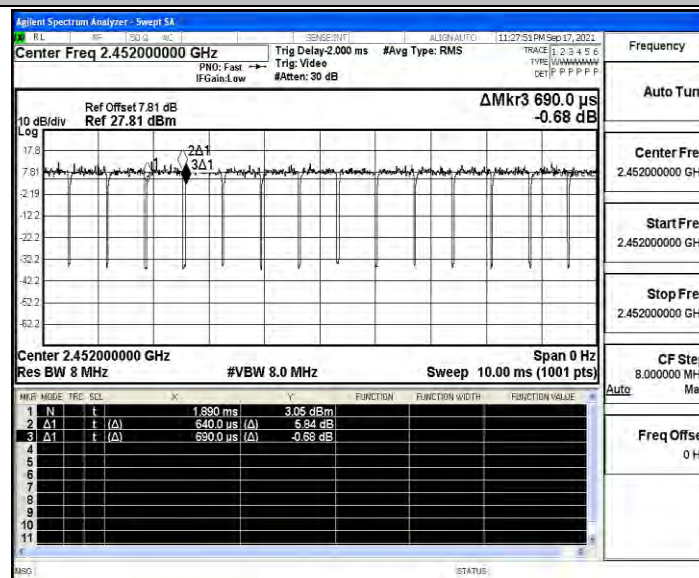




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.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	-49.28	≤-41.20	45.92	≤54	PASS
		AV	2389.050	-48.83	≤-41.20	46.37	≤54	PASS
		AV	2390.000	-48.87	≤-41.20	46.33	≤54	PASS
		Peak	2310.000	-43.12	≤-21.20	52.08	≤74	PASS
		Peak	2339.520	-39.52	≤-21.20	55.68	≤74	PASS
		Peak	2390.000	-44.84	≤-21.20	50.36	≤74	PASS
	2462	AV	2483.500	-48.08	≤-41.20	47.12	≤54	PASS
		AV	2488.400	-47.76	≤-41.20	47.44	≤54	PASS
		AV	2500.000	-48.26	≤-41.20	46.94	≤54	PASS
		Peak	2483.500	-42.35	≤-21.20	52.85	≤74	PASS
		Peak	2499.840	-39.45	≤-21.20	55.75	≤74	PASS
		Peak	2500.000	-42.98	≤-21.20	52.22	≤74	PASS
11G	2412	AV	2310.000	-48.73	≤-41.20	46.47	≤54	PASS
		AV	2382.810	-48.23	≤-41.20	46.97	≤54	PASS
		AV	2390.000	-48.3	≤-41.20	46.90	≤54	PASS
		Peak	2310.000	-42.35	≤-21.20	52.85	≤74	PASS
		Peak	2314.300	-38.58	≤-21.20	56.62	≤74	PASS
		Peak	2390.000	-41.75	≤-21.20	53.45	≤74	PASS
	2462	AV	2483.500	-47.47	≤-41.20	47.73	≤54	PASS
		AV	2485.870	-47.24	≤-41.20	47.96	≤54	PASS
		AV	2500.000	-47.8	≤-41.20	47.40	≤54	PASS
		Peak	2483.500	-42.65	≤-21.20	52.55	≤74	PASS
		Peak	2486.090	-38.32	≤-21.20	56.88	≤74	PASS
		Peak	2500.000	-40.59	≤-21.20	54.61	≤74	PASS
11N20SIS O	2412	AV	2310.000	-48.79	≤-41.20	46.41	≤54	PASS
		AV	2389.830	-48.22	≤-41.20	46.98	≤54	PASS
		AV	2390.000	-48.26	≤-41.20	46.94	≤54	PASS
		Peak	2310.000	-41.86	≤-21.20	53.34	≤74	PASS
		Peak	2384.110	-39.05	≤-21.20	56.15	≤74	PASS
		Peak	2390.000	-41.24	≤-21.20	53.96	≤74	PASS
	2462	AV	2483.500	-47.53	≤-41.20	47.67	≤54	PASS
		AV	2487.850	-47.23	≤-41.20	47.97	≤54	PASS
		AV	2500.000	-47.86	≤-41.20	47.34	≤54	PASS
		Peak	2483.500	-40.4	≤-21.20	54.80	≤74	PASS
		Peak	2489.720	-37.45	≤-21.20	57.75	≤74	PASS
		Peak	2500.000	-40.61	≤-21.20	54.59	≤74	PASS
11N40SIS	2422	AV	2310.000	-48.46	≤-41.20	46.74	≤54	PASS



O		AV	2377.220	-47.87	≤ -41.20	47.33	≤ 54	PASS
		AV	2390.000	-48.07	≤ -41.20	47.13	≤ 54	PASS
		Peak	2310.000	-41.92	≤ -21.20	53.28	≤ 74	PASS
		Peak	2382.940	-38.05	≤ -21.20	57.15	≤ 74	PASS
		Peak	2390.000	-42.19	≤ -21.20	53.01	≤ 74	PASS
	2452	AV	2483.500	-47.13	≤ -41.20	48.07	≤ 54	PASS
		AV	2488.510	-46.87	≤ -41.20	48.33	≤ 54	PASS
		AV	2500.000	-47.63	≤ -41.20	47.57	≤ 54	PASS
		Peak	2483.500	-40.81	≤ -21.20	54.39	≤ 74	PASS
		Peak	2492.910	-38.05	≤ -21.20	57.15	≤ 74	PASS
		Peak	2500.000	-41.06	≤ -21.20	54.14	≤ 74	PASS

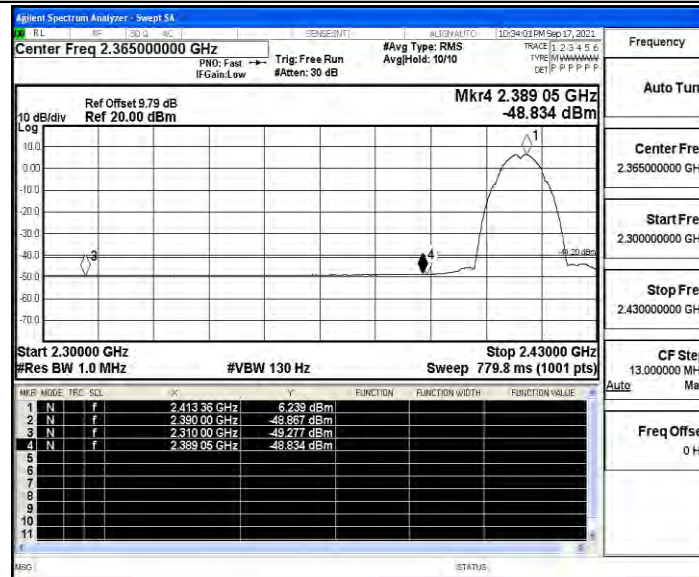
Note:

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.

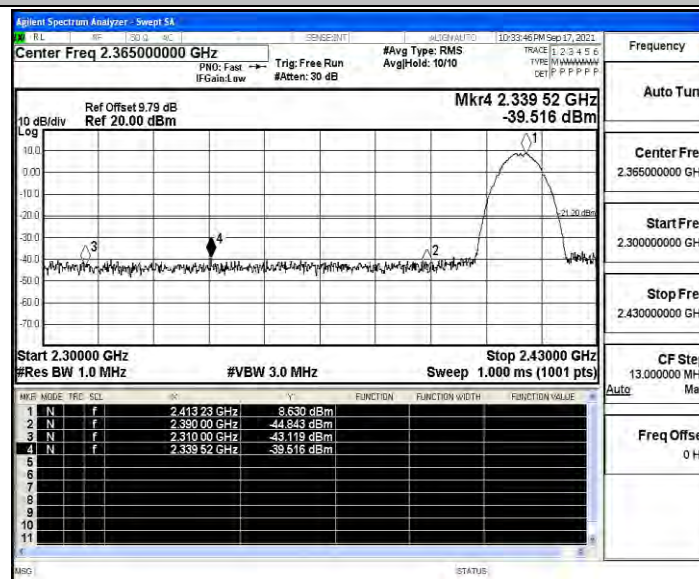


Test Graphs

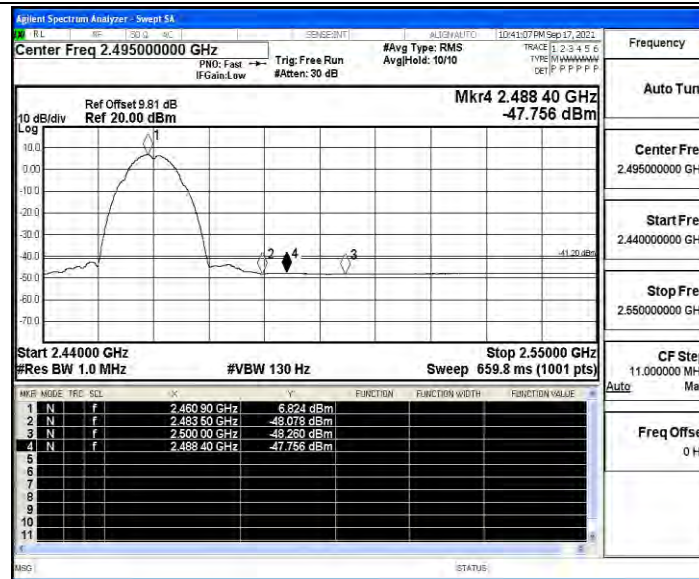
11B_Ant1_Low_2412_AV



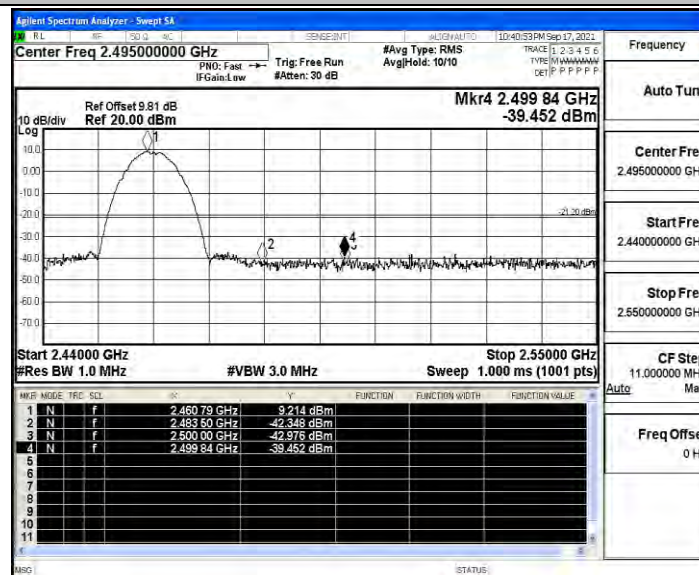
11B_Ant1_Low_2412_Peak



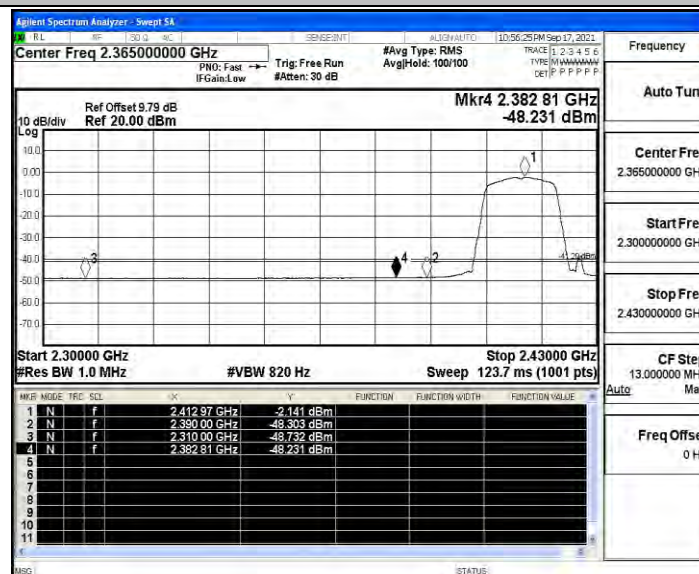
11B_Ant1_High_2462_AV



11B_Ant1_High_2462_Peak

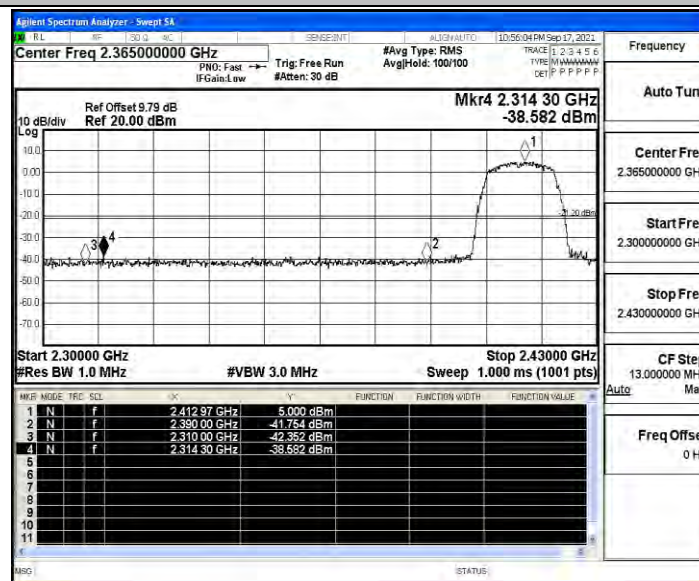


11G_Ant1_Low_2412_AV

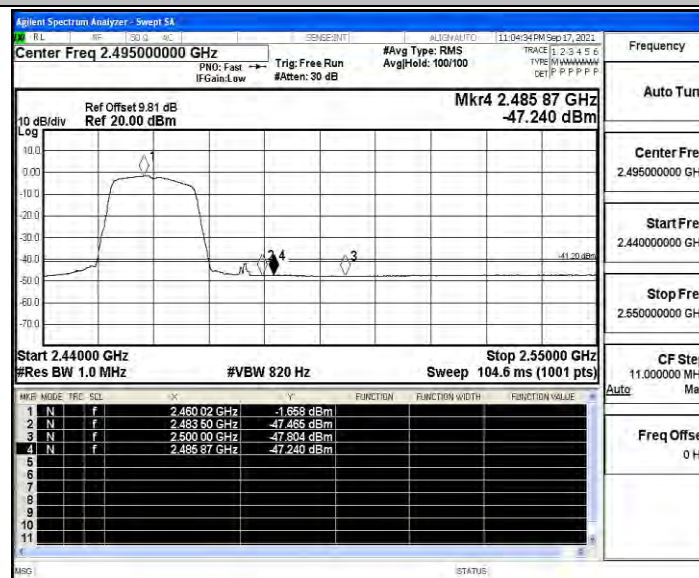




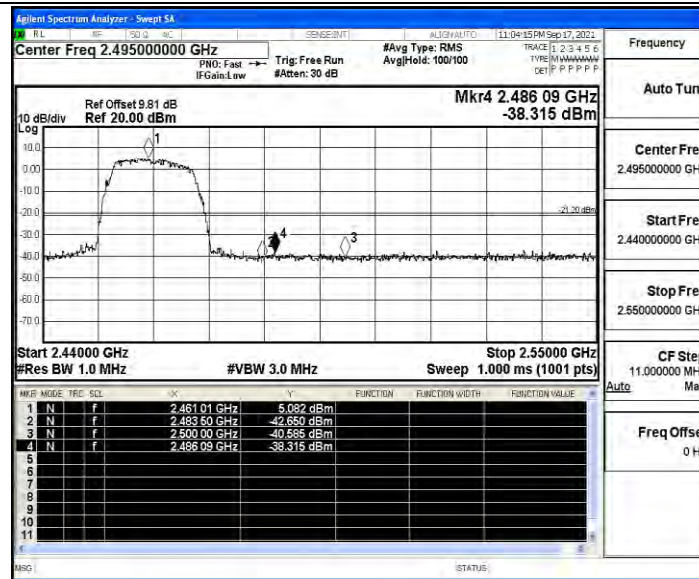
11G_Ant1_Low_2412_Peak



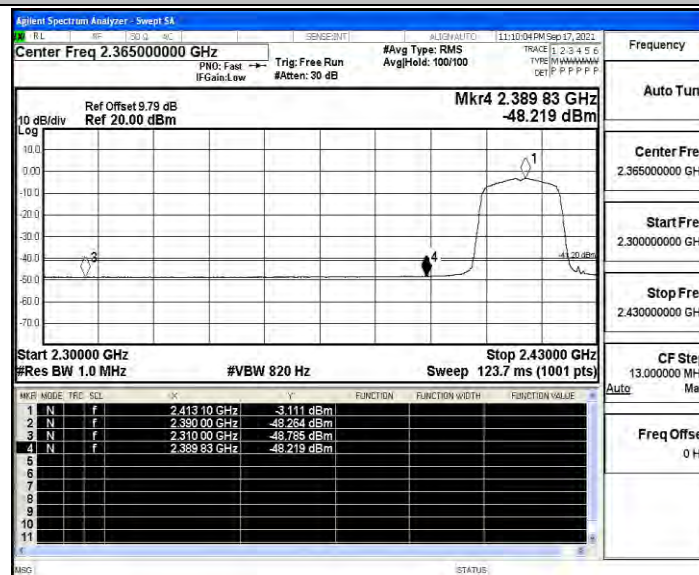
11G_Ant1_High_2462_AV



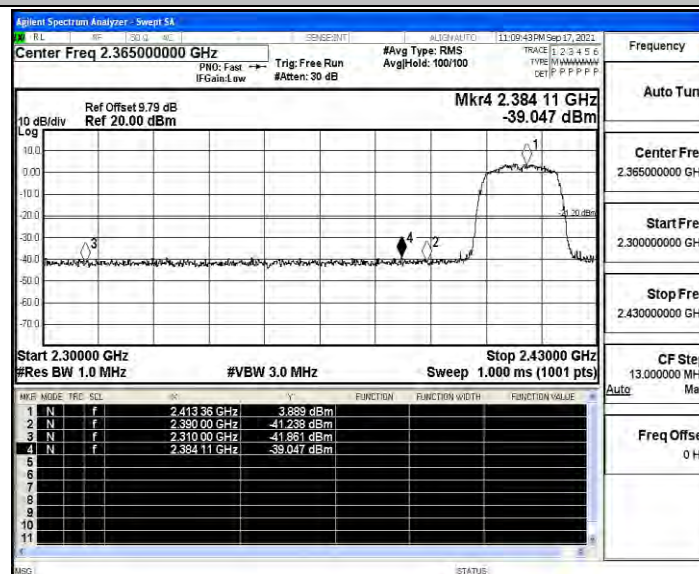
11G_Ant1_High_2462_Peak



11N20SISO_Ant1_Low_2412_AV

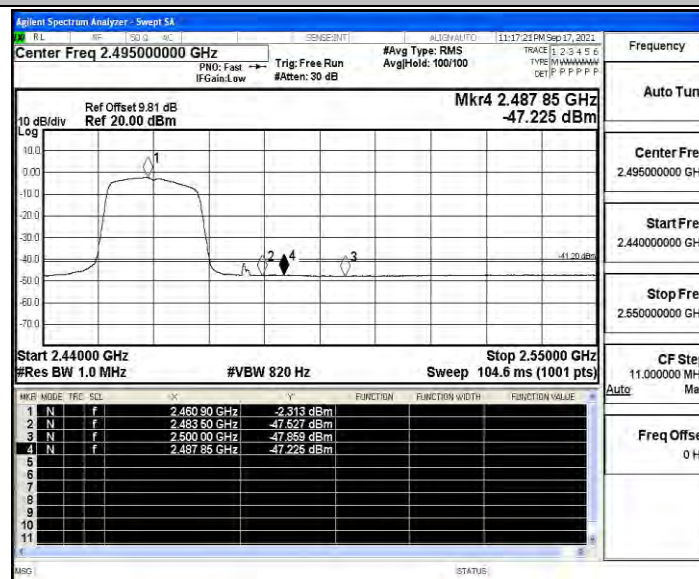


11N20SISO_Ant1_Low_2412_Peak

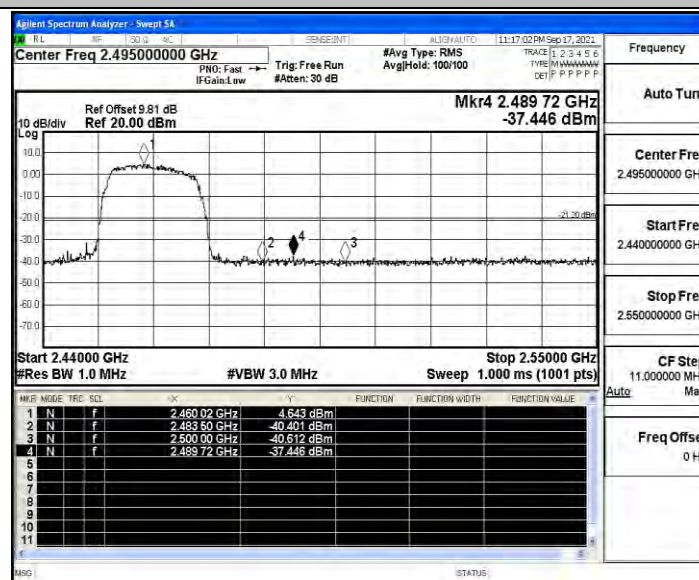




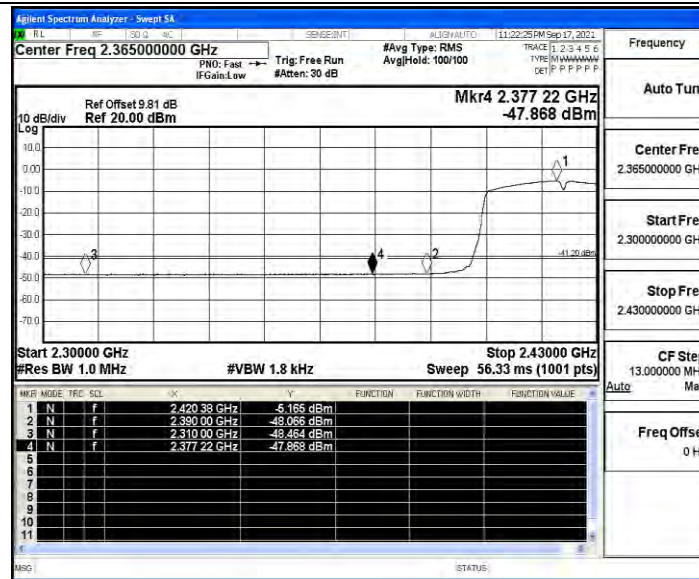
11N20SISO_Ant1_High_2462_AV



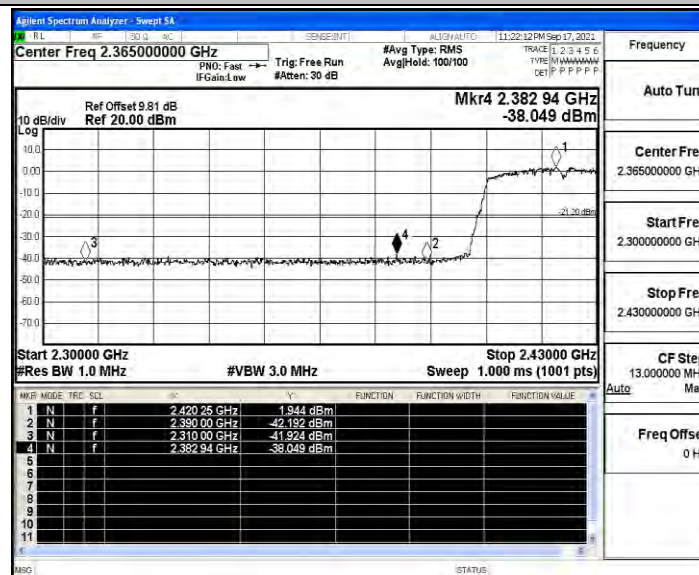
11N20SISO_Ant1_High_2462_Peak



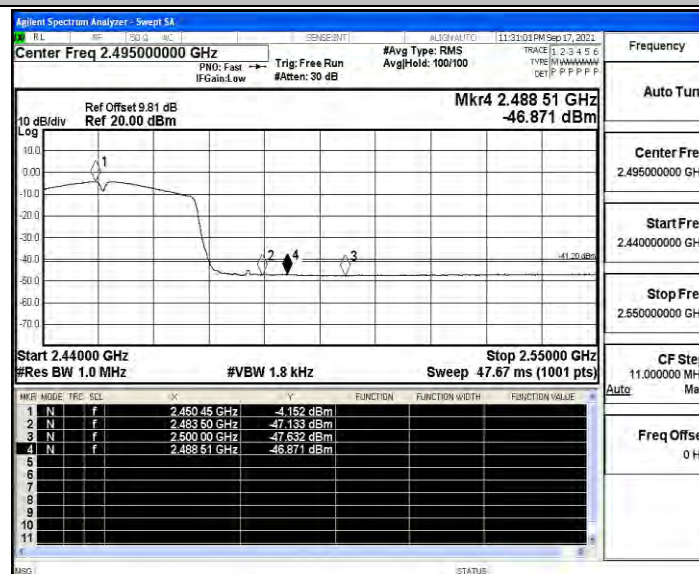
11N40SISO_Ant1_Low_2422_AV



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV





11N40SISO_Ant1_High_2452_Peak

