



Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: smart RGBIC Ambient Light

Test Model: FWWSA1-1302

Environmental Conditions

Temperature:	21.2° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan



B.1 6dB Bandwidth

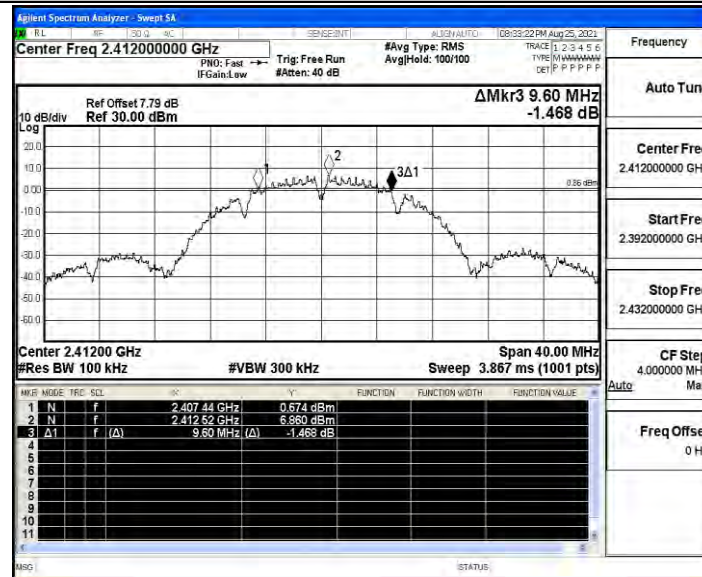
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.600	2407.440	2417.040	0.5	PASS
		2437	9.640	2431.960	2441.600	0.5	PASS
		2462	9.600	2457.440	2467.040	0.5	PASS
11G	Ant1	2412	15.080	2404.480	2419.560	0.5	PASS
		2437	12.000	2432.560	2444.560	0.5	PASS
		2462	12.320	2454.480	2466.800	0.5	PASS
11N20SISO	Ant1	2412	13.840	2405.720	2419.560	0.5	PASS
		2437	12.600	2430.680	2443.280	0.5	PASS
		2462	11.360	2455.680	2467.040	0.5	PASS
11N40SISO	Ant1	2422	33.920	2405.680	2439.600	0.5	PASS
		2437	33.920	2420.680	2454.600	0.5	PASS
		2452	34.000	2435.600	2469.600	0.5	PASS

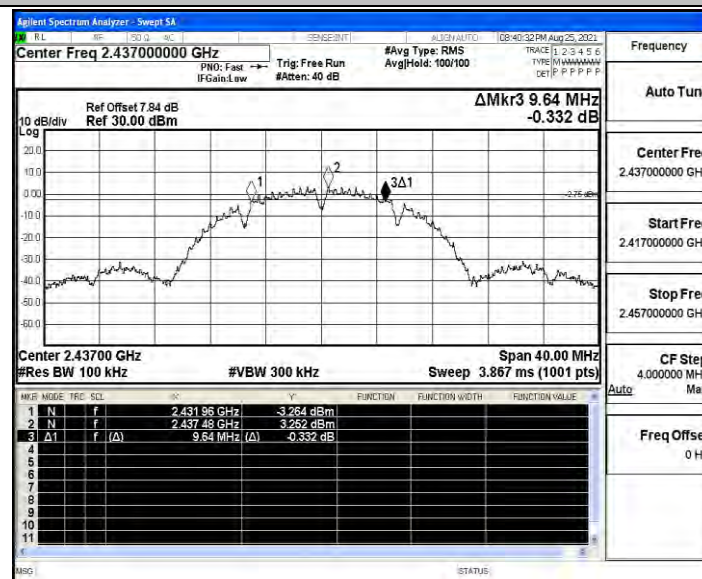


Test Graphs

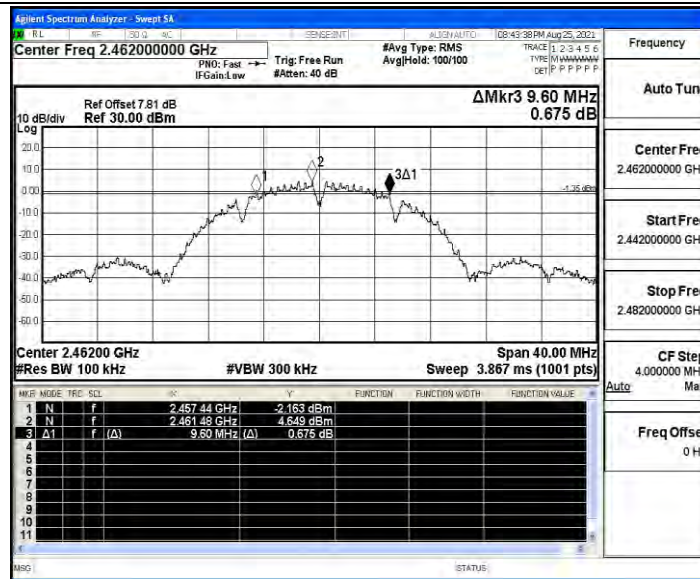
11B_Ant1_2412



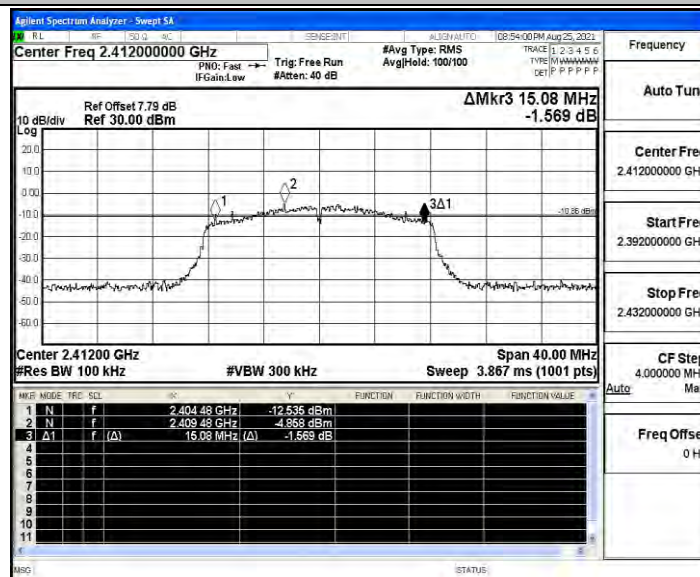
11B_Ant1_2437



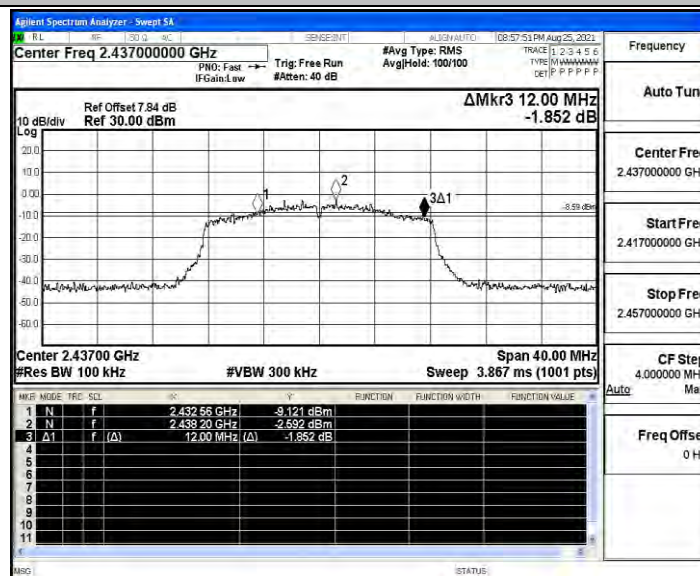
11B_Ant1_2462



11G_Ant1_2412

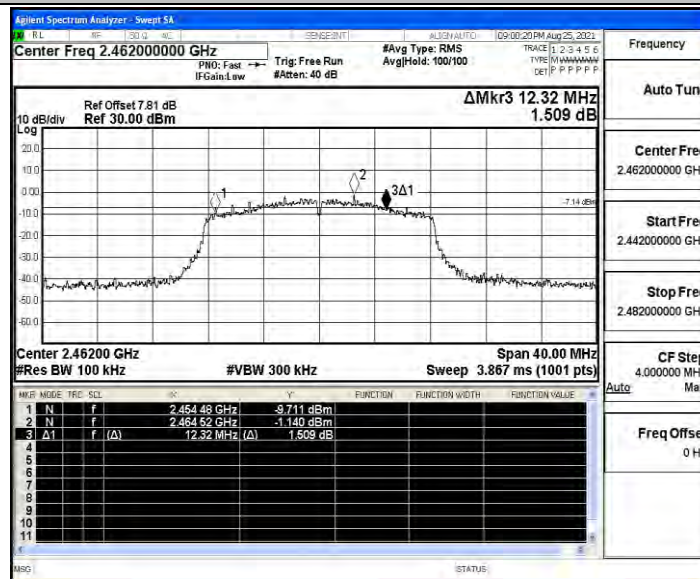


11G_Ant1_2437

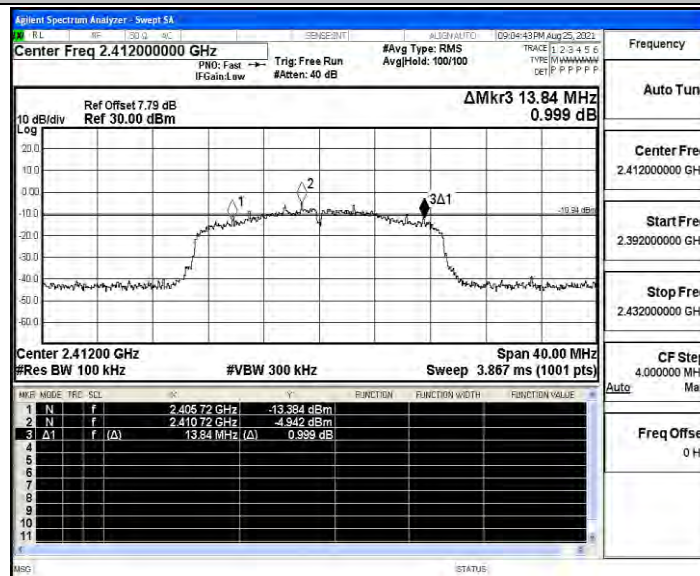




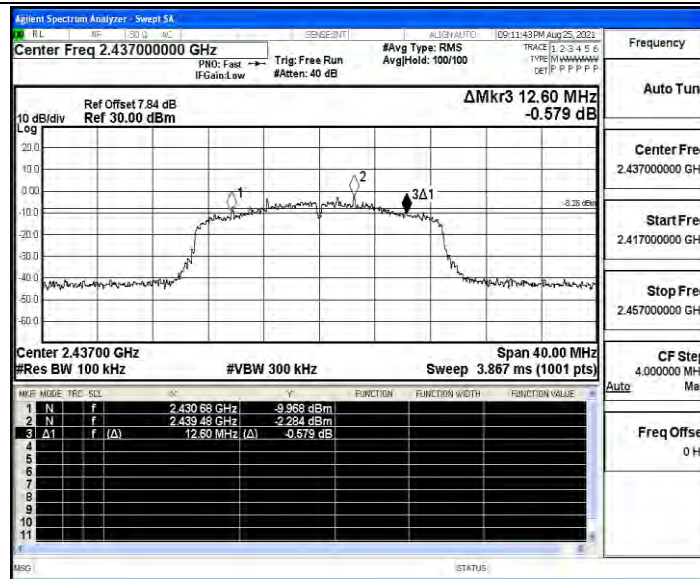
11G_Ant1_2462



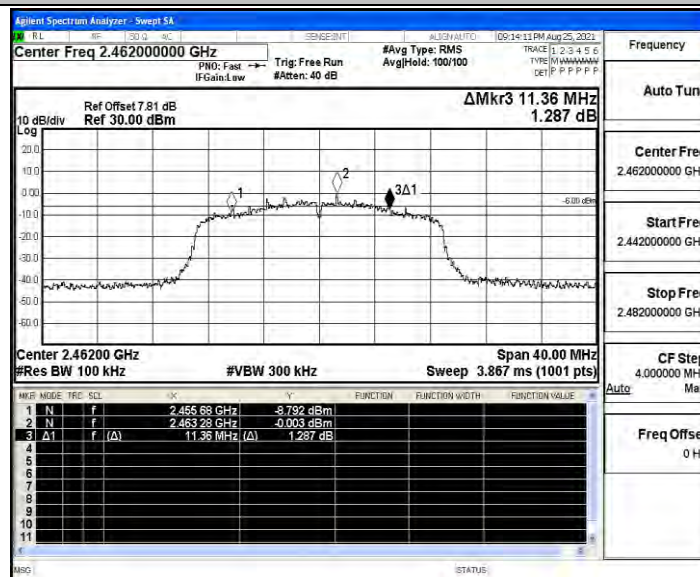
11N20SISO_Ant1_2412



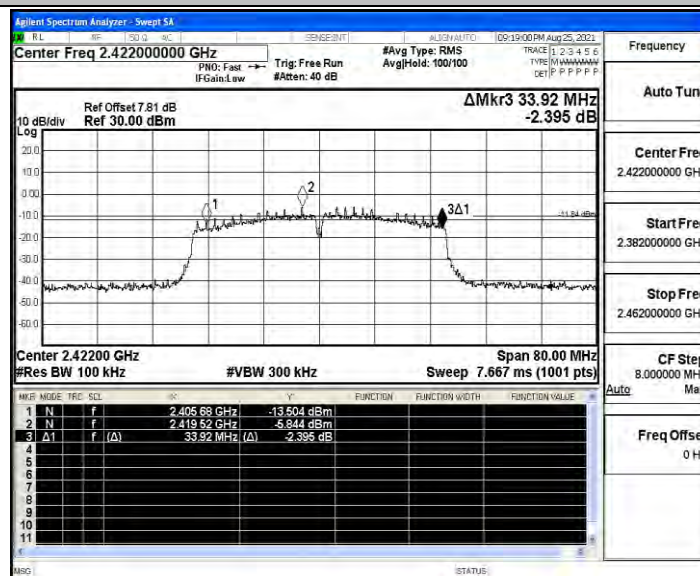
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

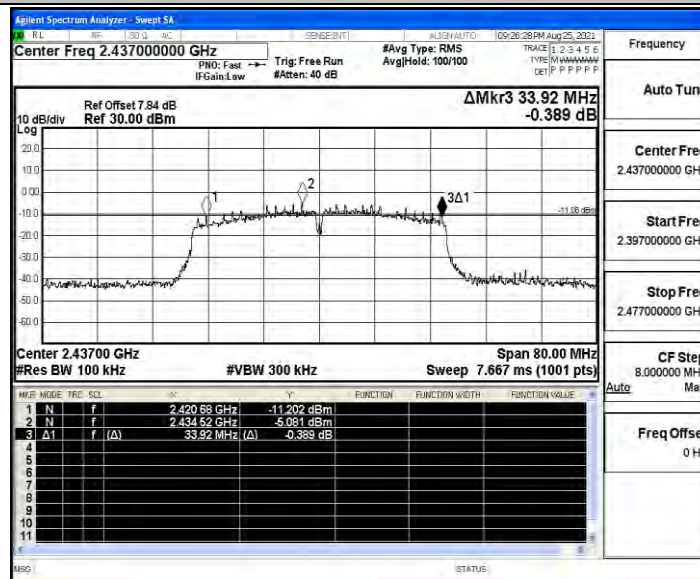


11N40SISO_Ant1_2422

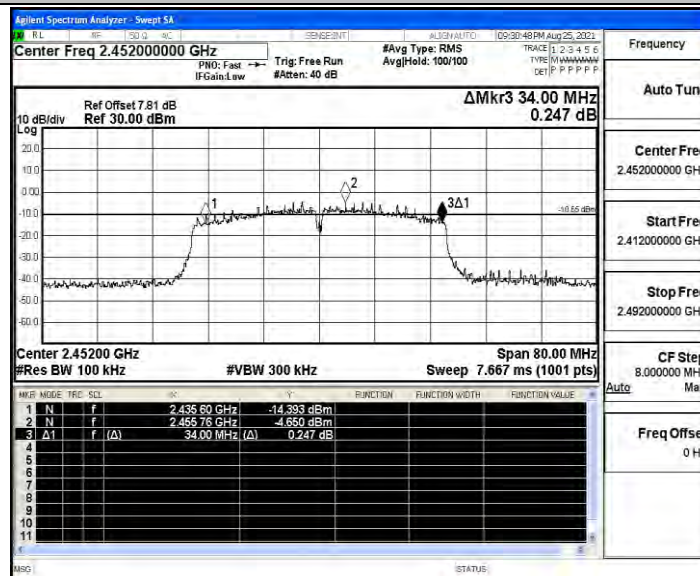




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.31	≤30	PASS
		2437	15.95	≤30	PASS
		2462	15.82	≤30	PASS
11G	Ant1	2412	13.89	≤30	PASS
		2437	15.18	≤30	PASS
		2462	14.91	≤30	PASS
11N20SISO	Ant1	2412	13.42	≤30	PASS
		2437	14.84	≤30	PASS
		2462	16.02	≤30	PASS
11N40SISO	Ant1	2422	14.25	≤30	PASS
		2437	15.16	≤30	PASS
		2452	15.91	≤30	PASS



B.3 Maximum power spectral density

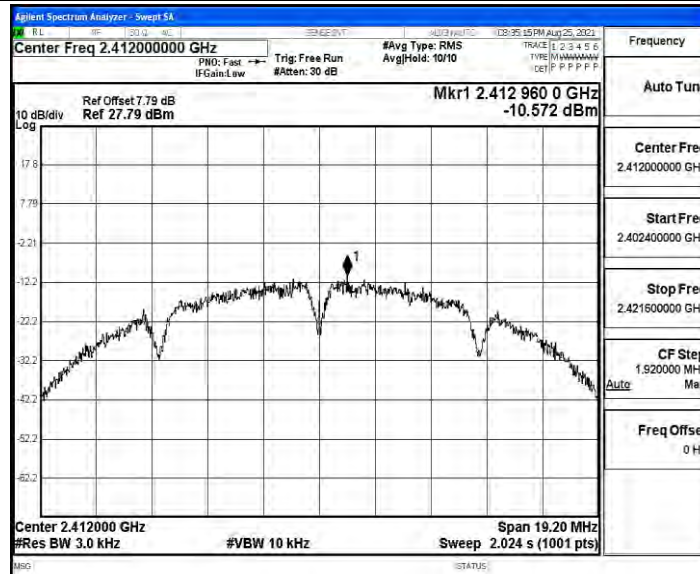
Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-10.57	≤8	PASS
		2437	-10.39	≤8	PASS
		2462	-10.18	≤8	PASS
11G	Ant1	2412	-18.45	≤8	PASS
		2437	-17.05	≤8	PASS
		2462	-17.29	≤8	PASS
11N20SISO	Ant1	2412	-17.53	≤8	PASS
		2437	-16.01	≤8	PASS
		2462	-14.76	≤8	PASS
11N40SISO	Ant1	2422	-18.83	≤8	PASS
		2437	-18.19	≤8	PASS
		2452	-17.29	≤8	PASS

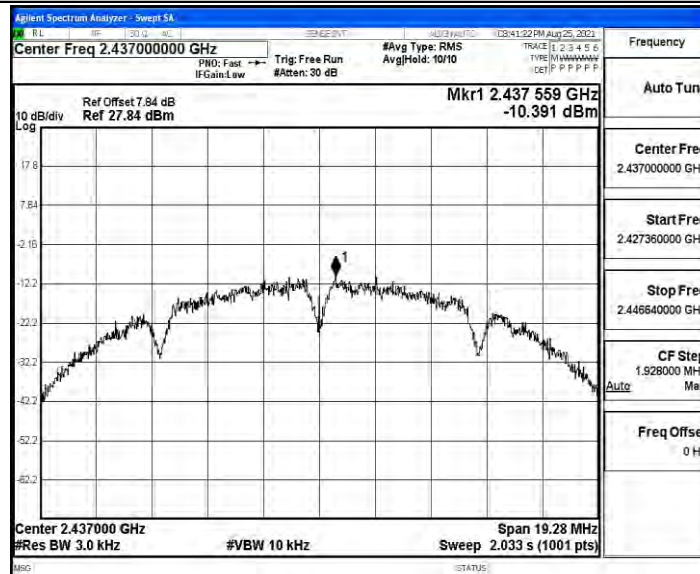


Test Graphs

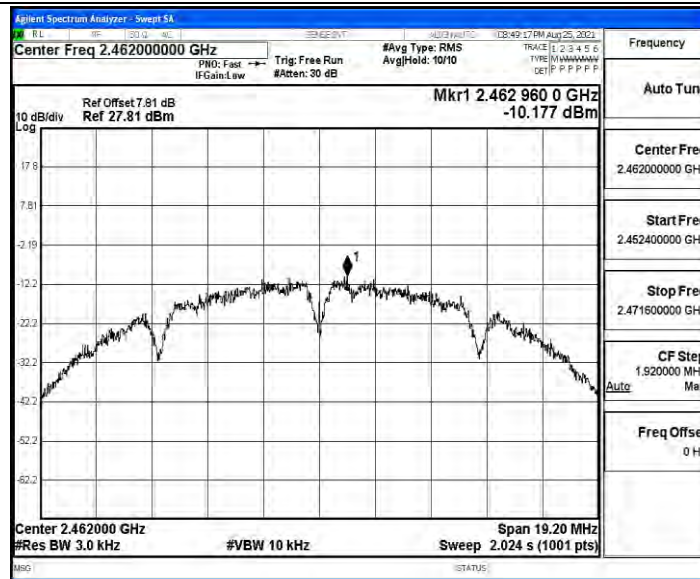
11B_Ant1_2412



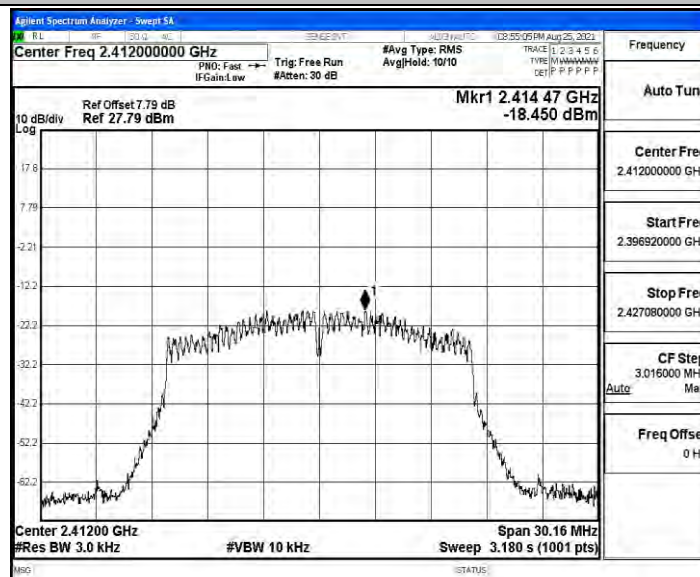
11B_Ant1_2437



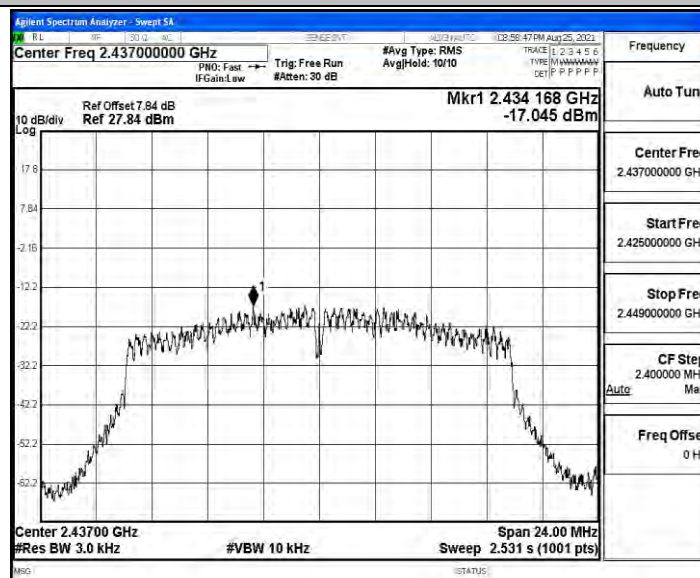
11B_Ant1_2462



11G_Ant1_2412

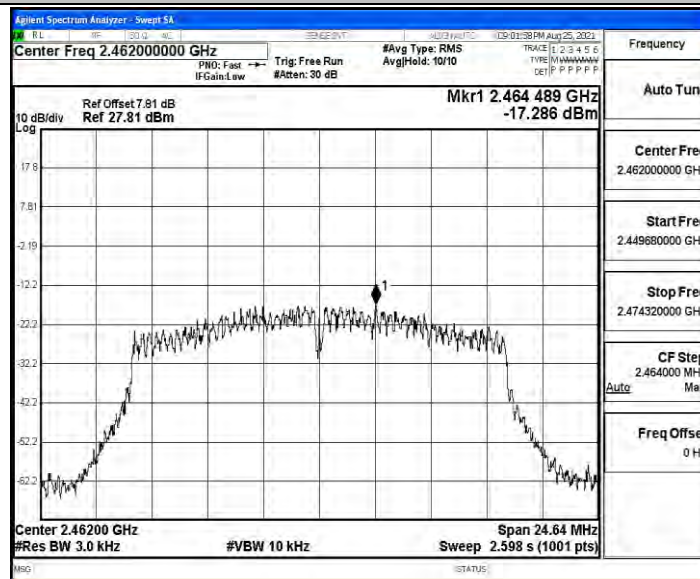


11G_Ant1_2437

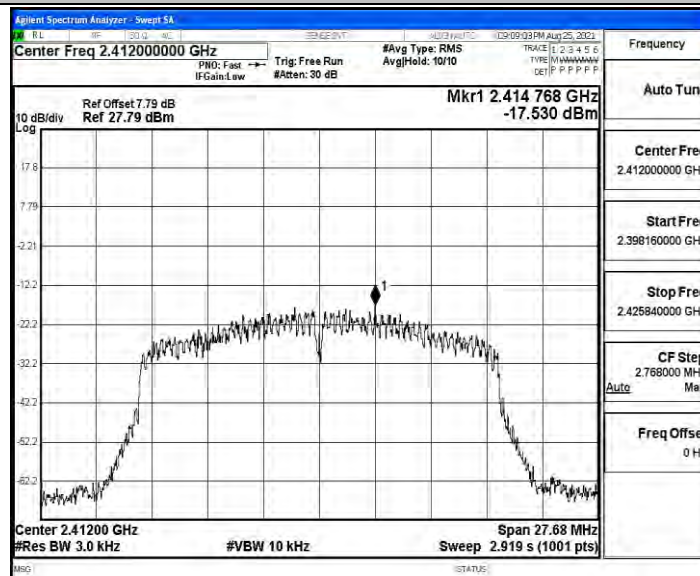




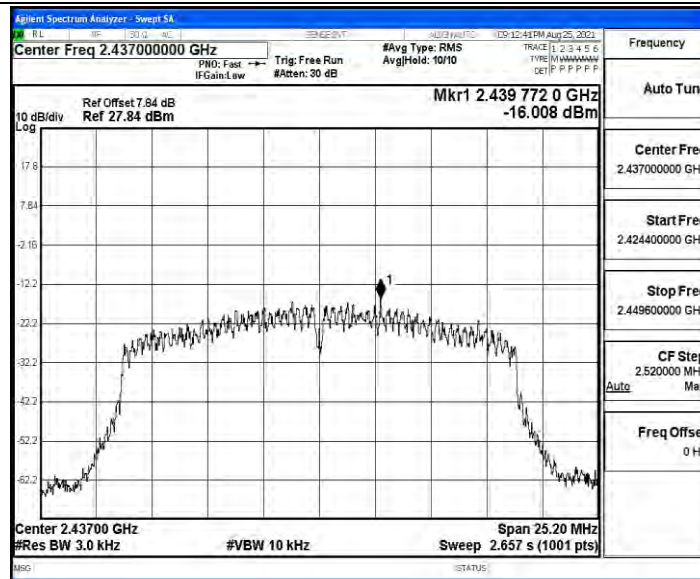
11G_Ant1_2462



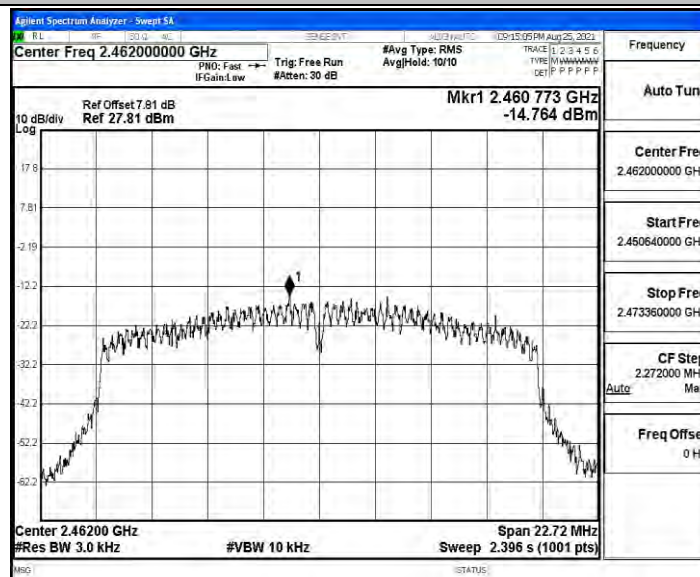
11N20SISO_Ant1_2412



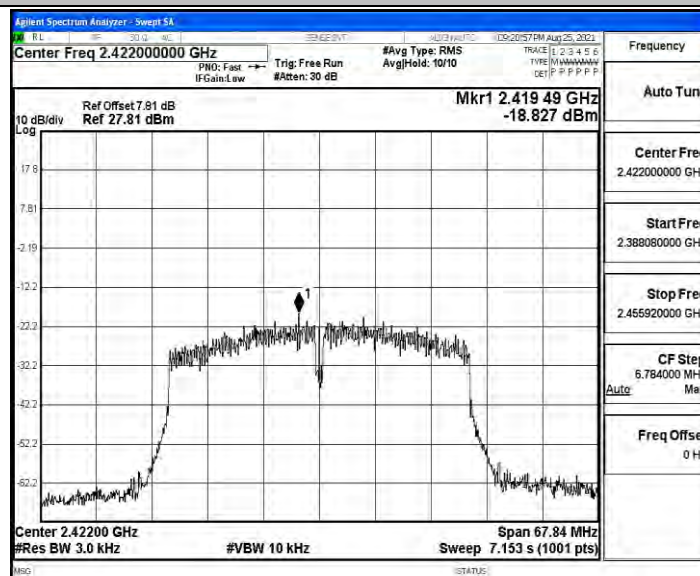
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

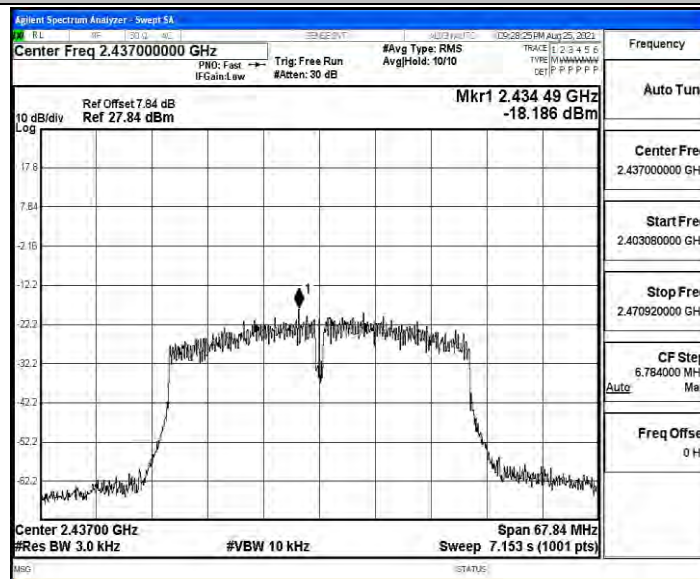


11N40SISO_Ant1_2422

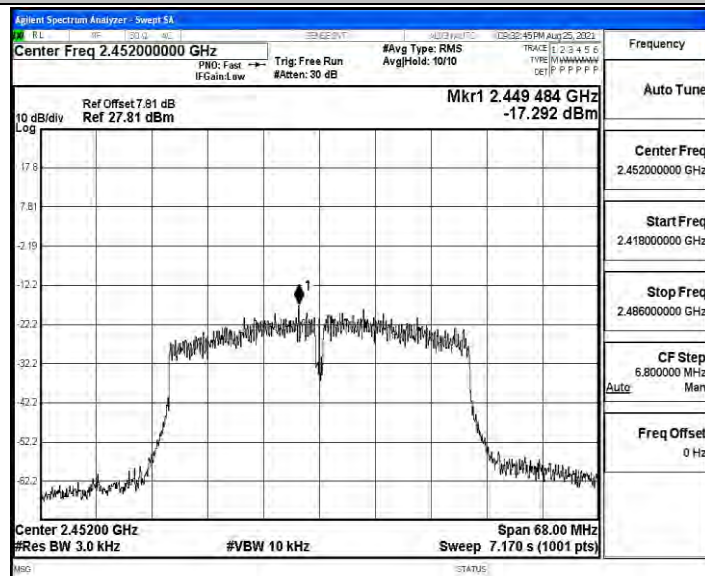




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.4 Band edge measurements

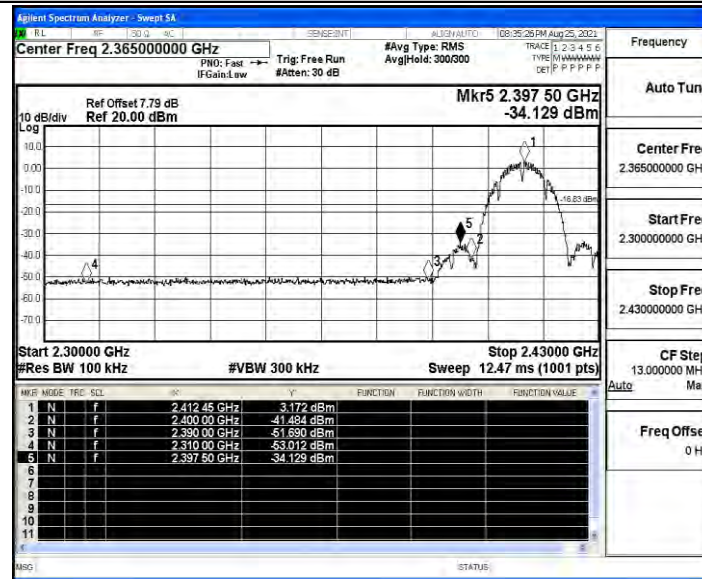
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.17	-34.13	≤ -16.83	PASS
		High	2462	3.33	-47.99	≤ -16.67	PASS
11G	Ant1	Low	2412	-3.09	-48.31	≤ -23.09	PASS
		High	2462	-2.74	-47.76	≤ -22.74	PASS
11N20SISO	Ant1	Low	2412	-3.63	-48.54	≤ -23.63	PASS
		High	2462	-0.95	-48.09	≤ -20.95	PASS
11N40SISO	Ant1	Low	2422	-5.65	-46.87	≤ -25.65	PASS
		High	2452	-4.02	-39.52	≤ -24.02	PASS

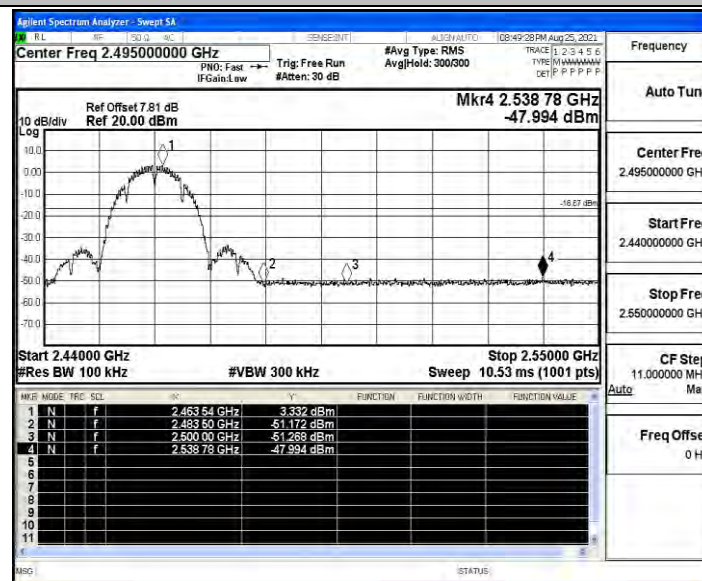


Test Graphs

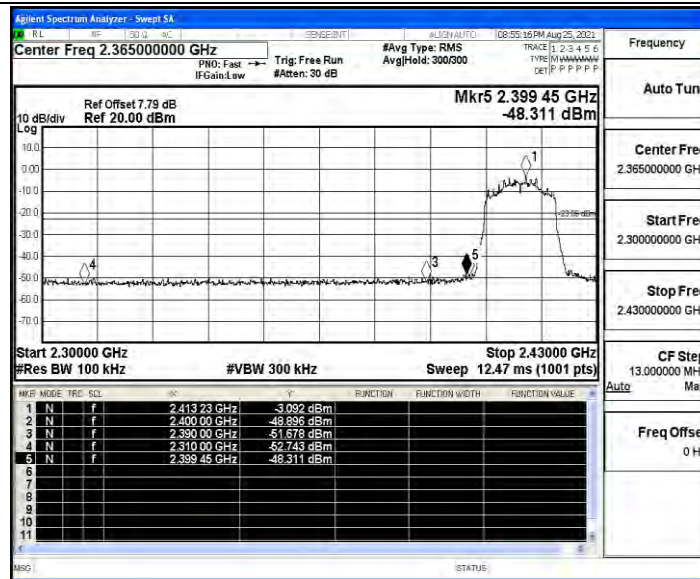
11B_Ant1_Low_2412



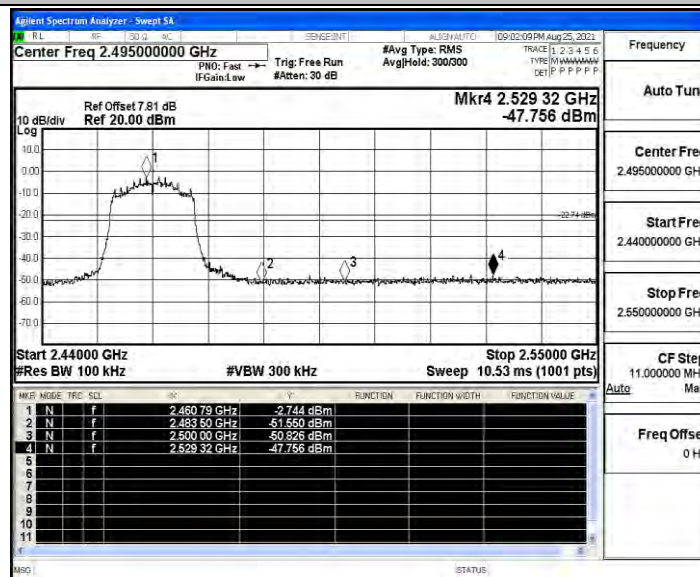
11B_Ant1_High_2462



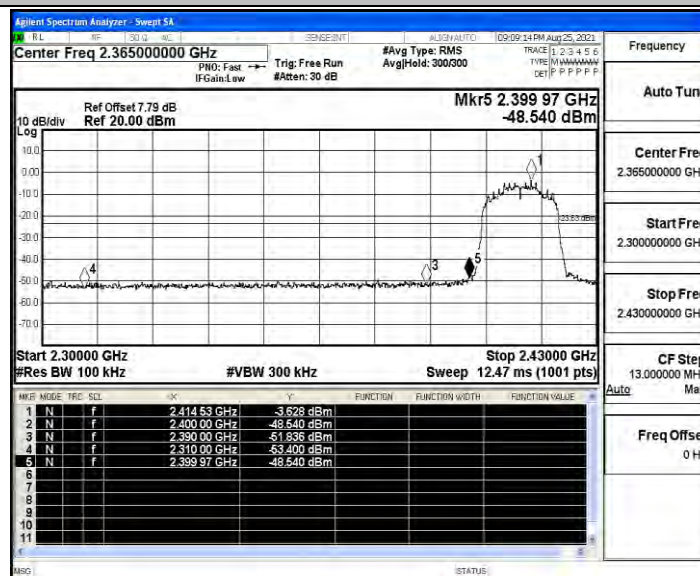
11G_Ant1_Low_2412



11G_Ant1_High_2462

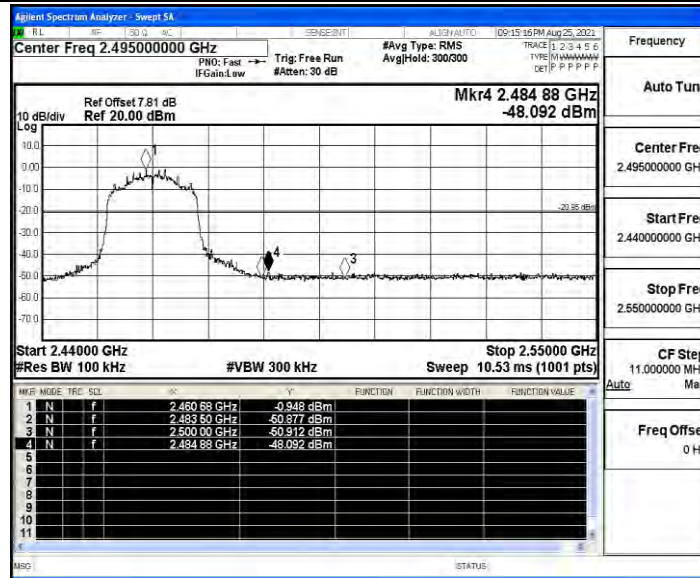


11N20SISO_Ant1_Low_2412

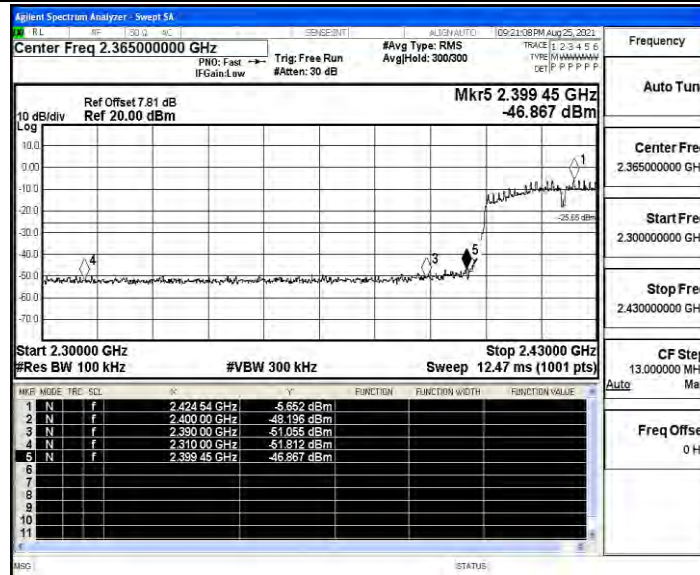




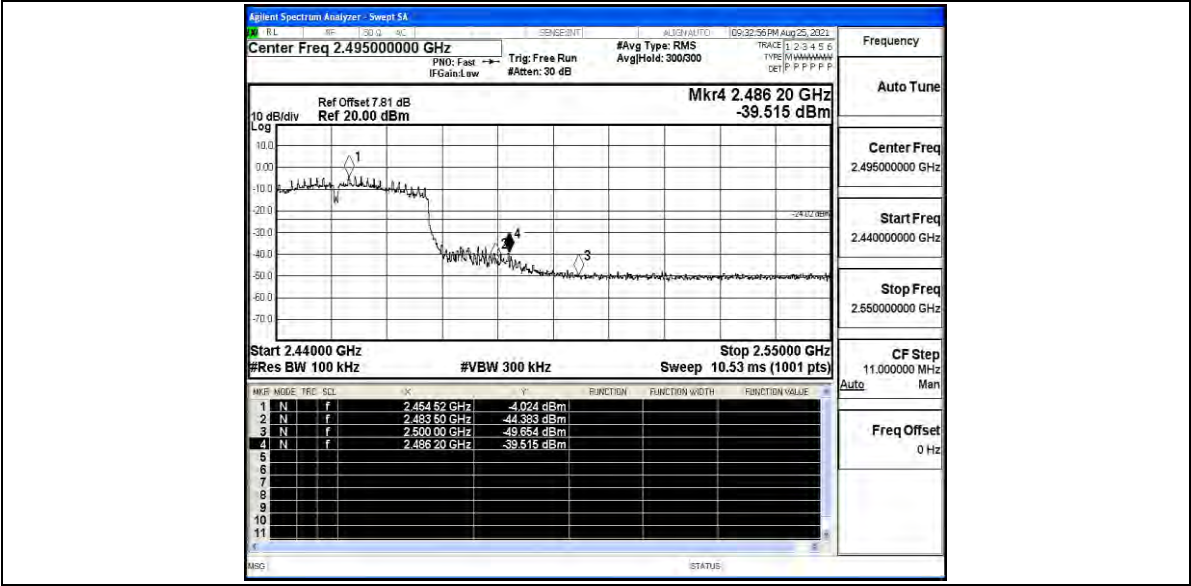
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452





B.5 Conducted Spurious Emission

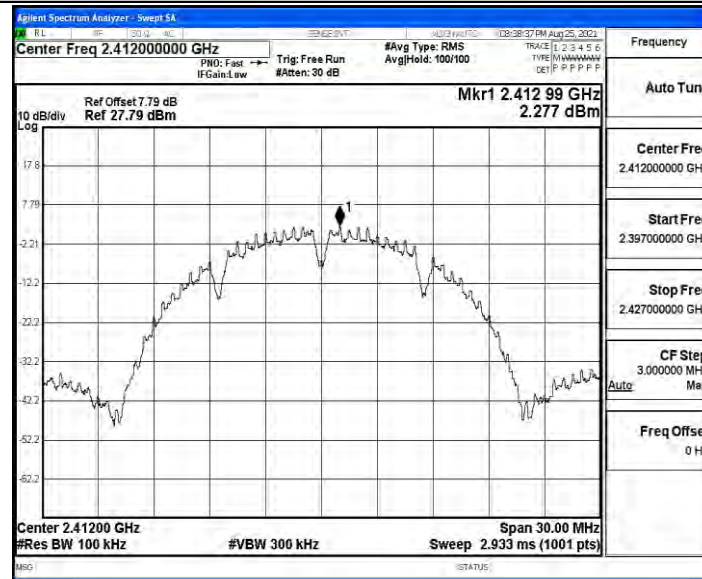
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	2.28	2.28	---	PASS
			30~1000	2.28	-54.35	≤ -17.72	PASS
			1000~26500	2.28	-47.41	≤ -17.72	PASS
		2437	Reference	3.17	3.17	---	PASS
			30~1000	3.17	-54.31	≤ -16.83	PASS
			1000~26500	3.17	-47.72	≤ -16.83	PASS
		2462	Reference	3.19	3.19	---	PASS
			30~1000	3.19	-54.45	≤ -16.81	PASS
			1000~26500	3.19	-47.44	≤ -16.81	PASS
11G	Ant1	2412	Reference	-3.38	-3.38	---	PASS
			30~1000	-3.38	-53.71	≤ -23.38	PASS
			1000~26500	-3.38	-46.8	≤ -23.38	PASS
		2437	Reference	-1.39	-1.39	---	PASS
			30~1000	-1.39	-53.59	≤ -21.39	PASS
			1000~26500	-1.39	-47.26	≤ -21.39	PASS
		2462	Reference	-1.70	-1.70	---	PASS
			30~1000	-1.70	-54.15	≤ -21.7	PASS
			1000~26500	-1.70	-47.55	≤ -21.7	PASS
11N20SISO	Ant1	2412	Reference	-3.55	-3.55	---	PASS
			30~1000	-3.55	-54.57	≤ -23.55	PASS
			1000~26500	-3.55	-47.05	≤ -23.55	PASS
		2437	Reference	-3.49	-3.49	---	PASS
			30~1000	-3.49	-53.66	≤ -23.49	PASS
			1000~26500	-3.49	-47.24	≤ -23.49	PASS
		2462	Reference	-0.86	-0.86	---	PASS
			30~1000	-0.86	-55.24	≤ -20.86	PASS
			1000~26500	-0.86	-47.84	≤ -20.86	PASS
11N40SISO	Ant1	2422	Reference	-5.63	-5.63	---	PASS
			30~1000	-5.63	-54.77	≤ -25.63	PASS
			1000~26500	-5.63	-47.37	≤ -25.63	PASS
		2437	Reference	-5.06	-5.06	---	PASS
			30~1000	-5.06	-53.77	≤ -25.06	PASS
			1000~26500	-5.06	-46.51	≤ -25.06	PASS
		2452	Reference	-4.26	-4.26	---	PASS
			30~1000	-4.26	-54.68	≤ -24.26	PASS
			1000~26500	-4.26	-45.81	≤ -24.26	PASS

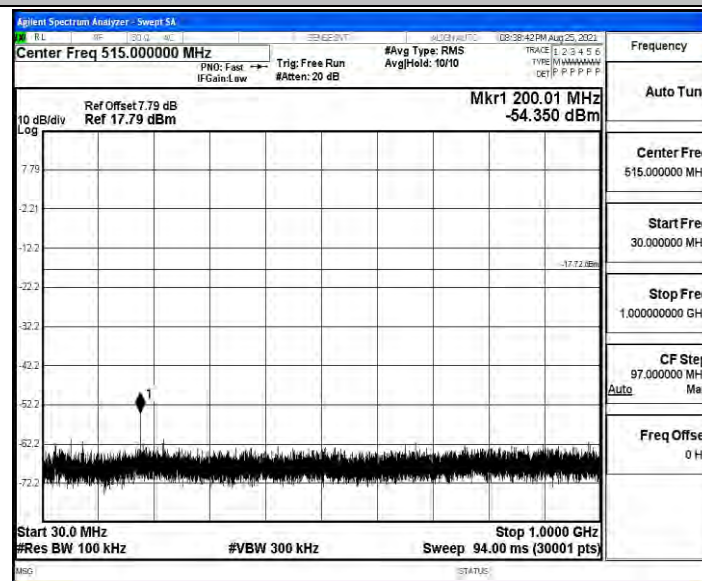


Test Graphs

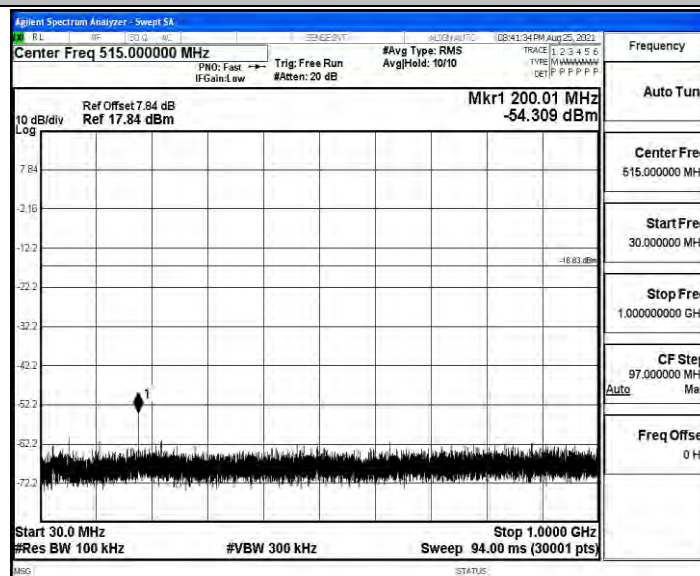
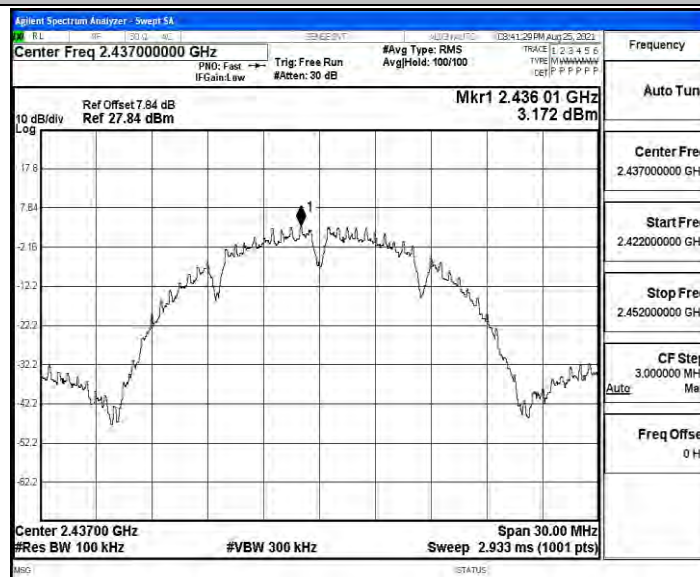
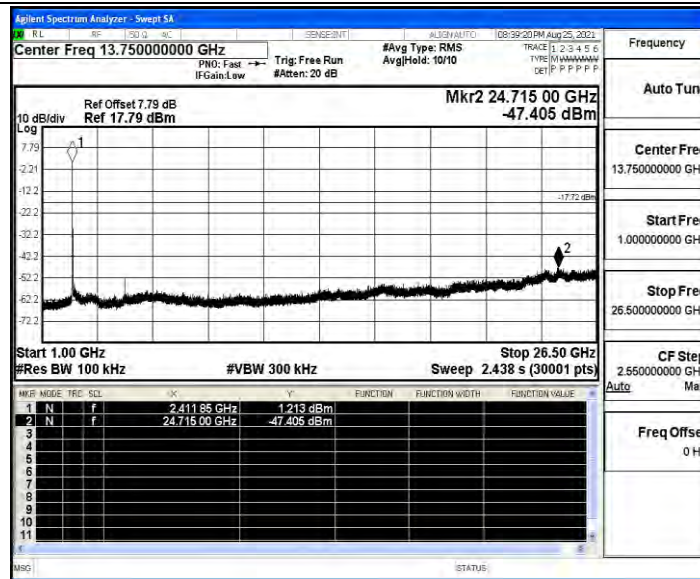
11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000

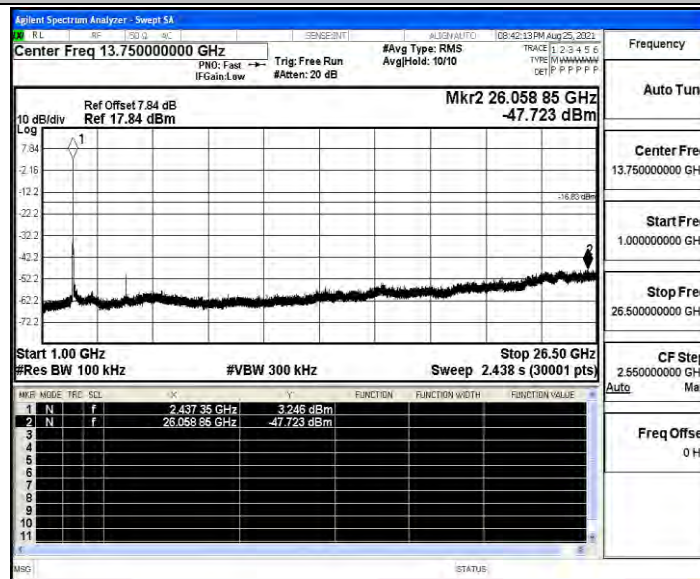


11B_Ant1_2412_1000~26500

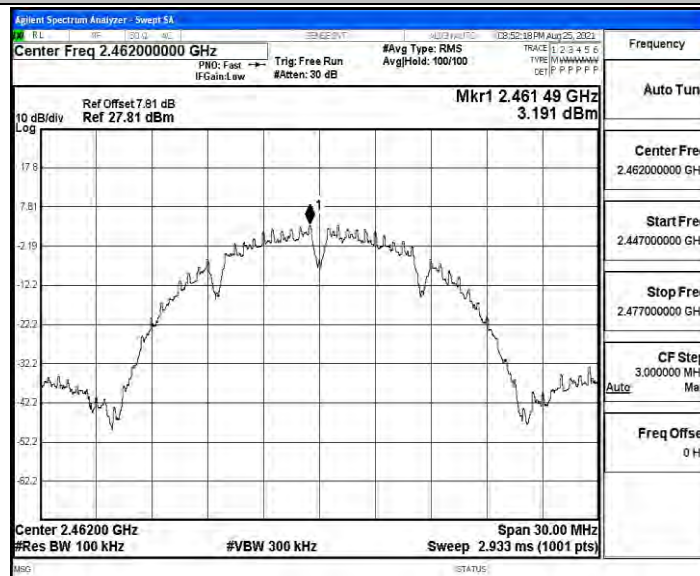




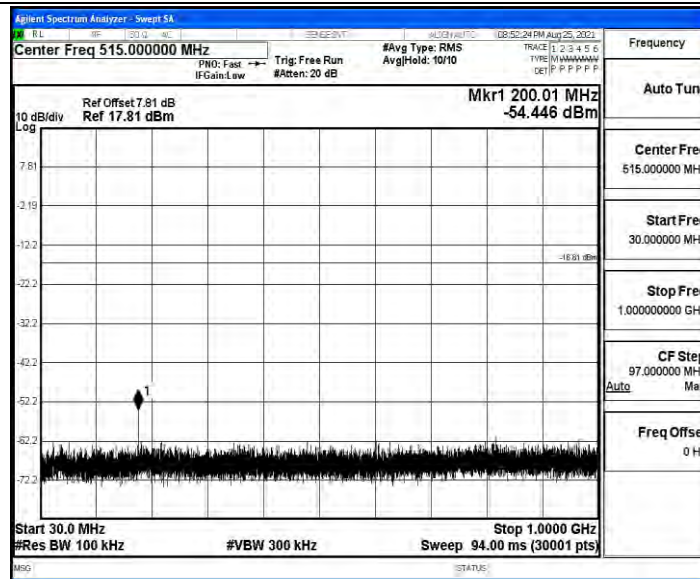
11B_Ant1_2437_1000~26500



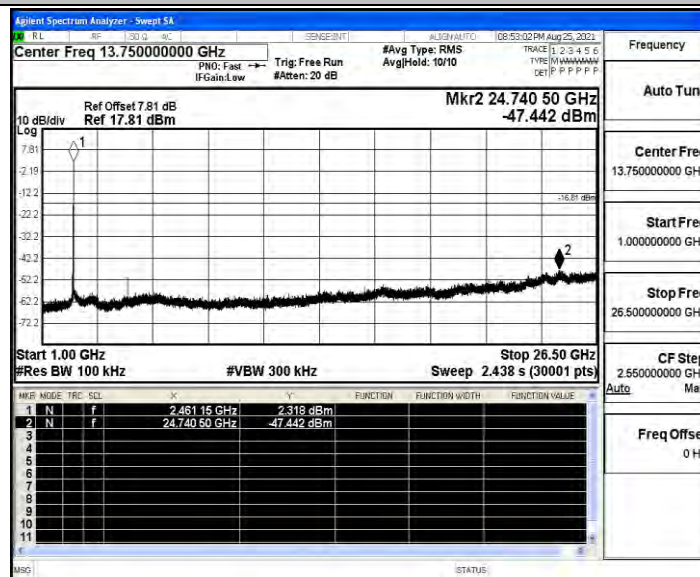
11B_Ant1_2462_0~Reference



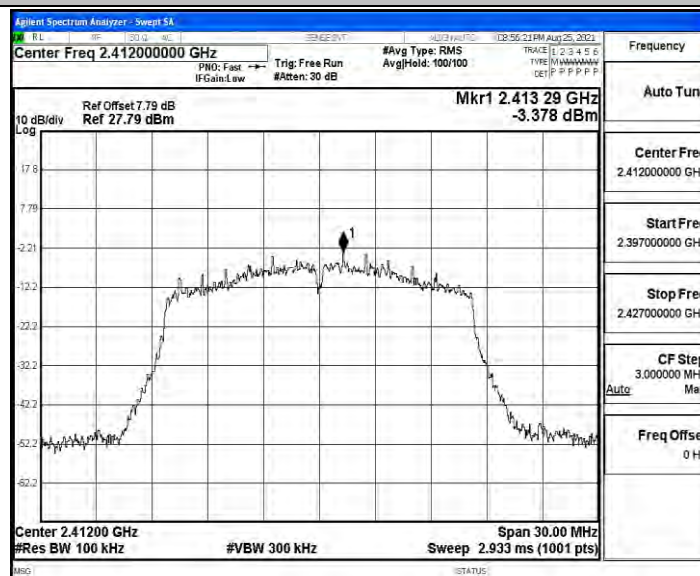
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

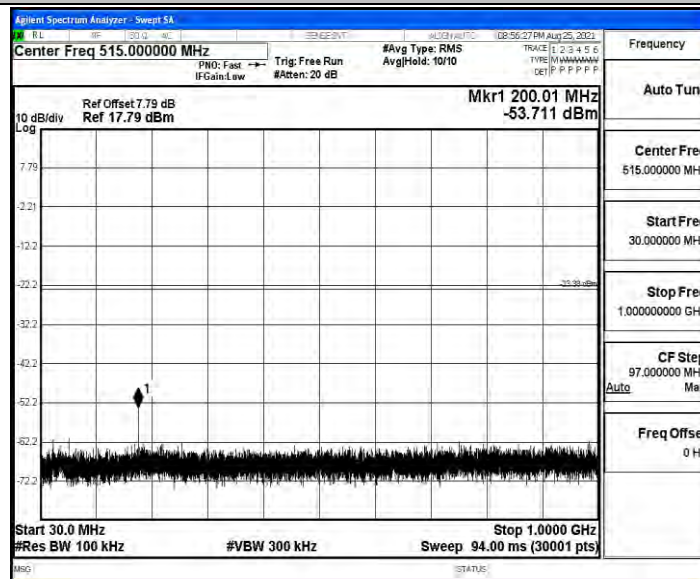


11G_Ant1_2412_0~Reference

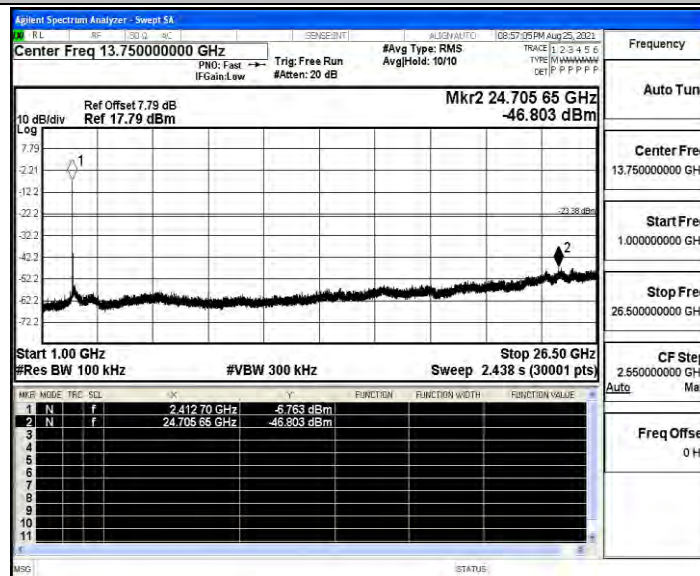




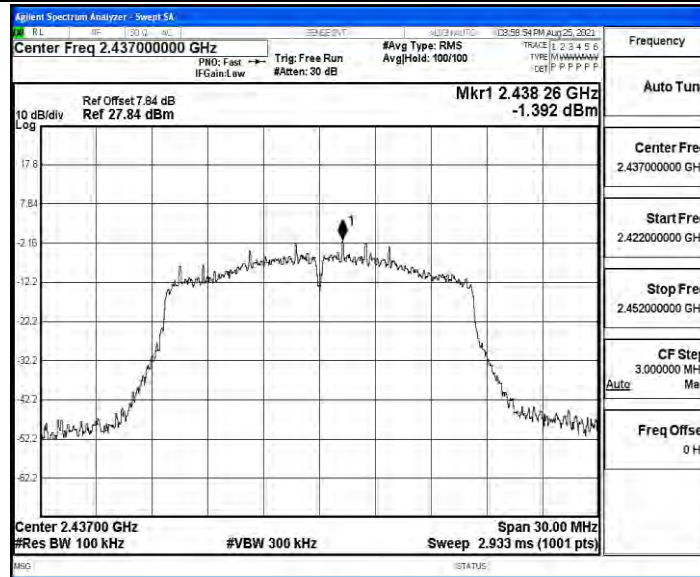
11G_Ant1_2412_30~1000



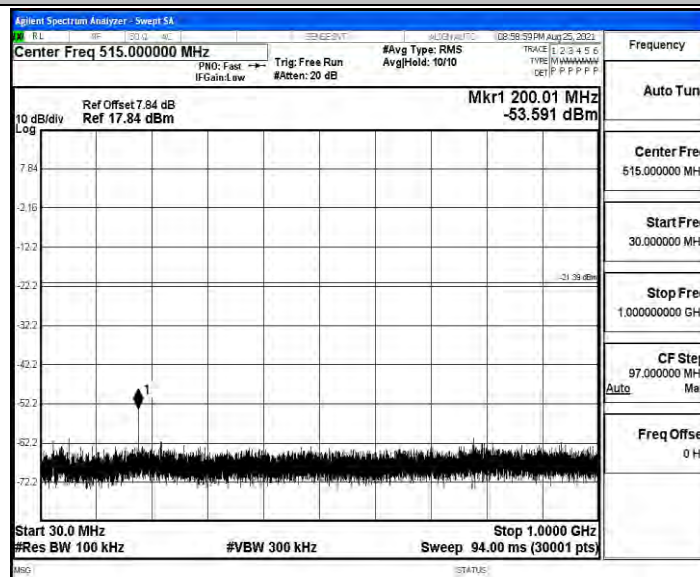
11G_Ant1_2412_1000~26500



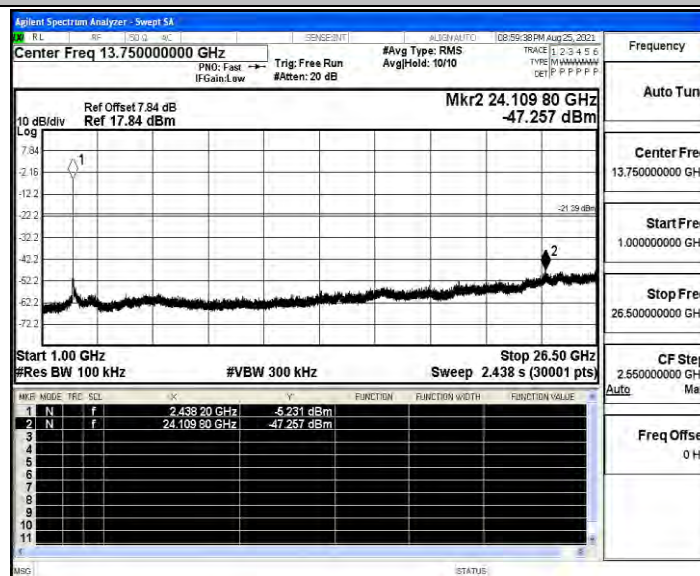
11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000

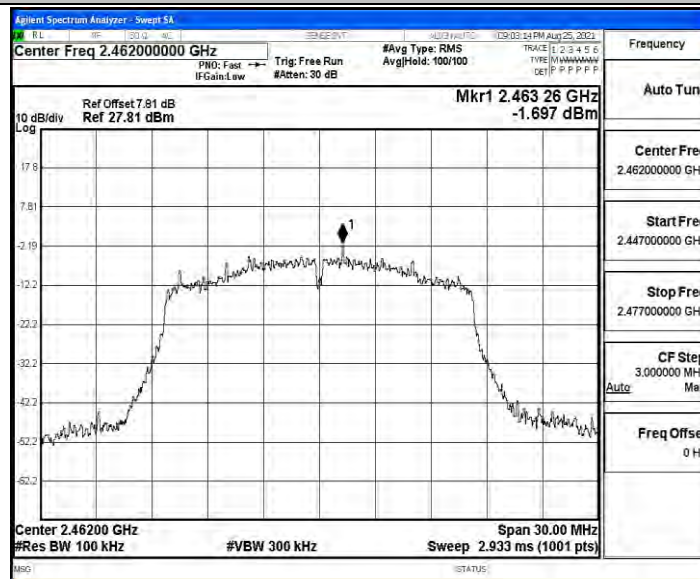


11G_Ant1_2437_1000~26500

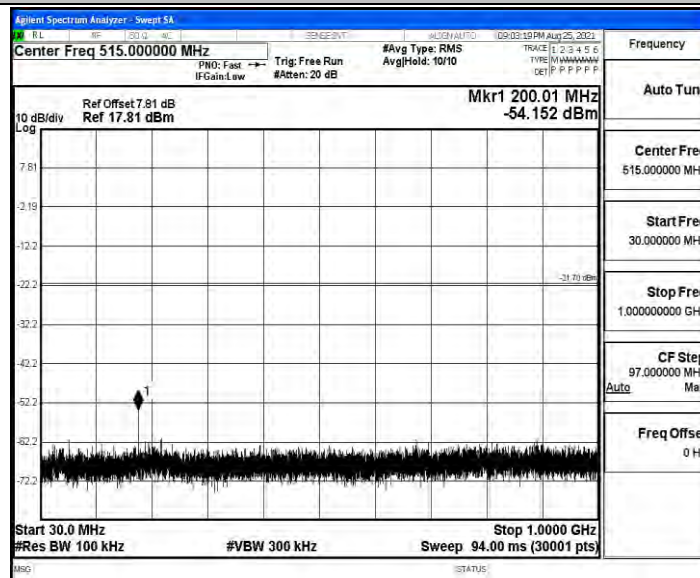




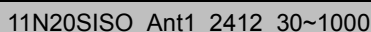
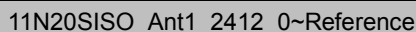
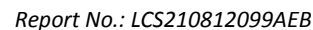
11G_Ant1_2462_0~Reference

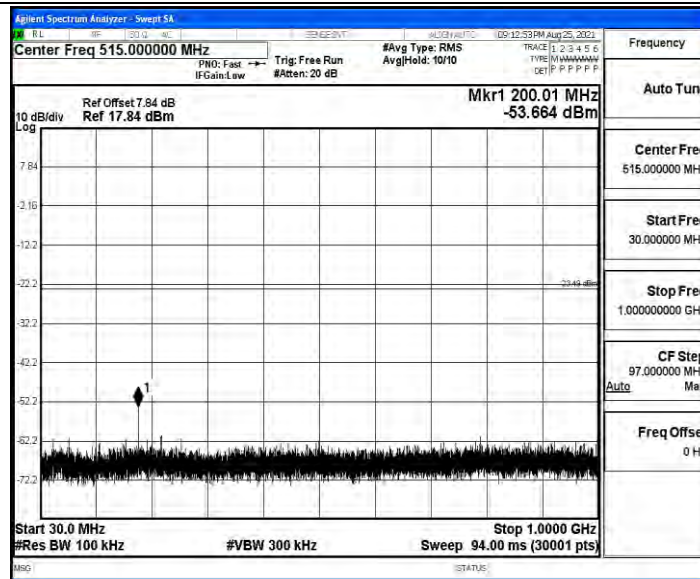


11G_Ant1_2462_30~1000

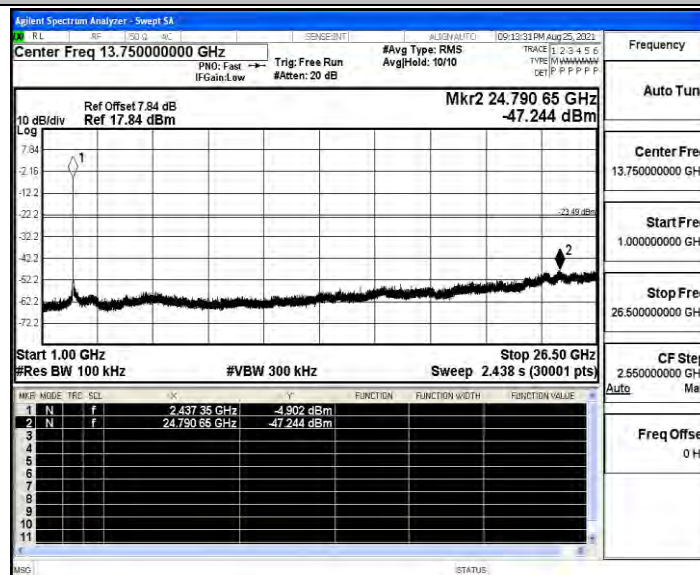


11G_Ant1_2462_1000~26500

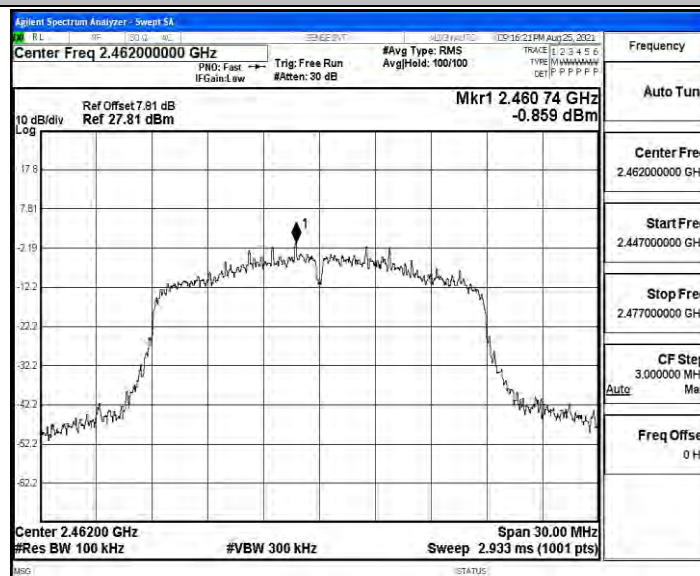




11N20SISO_Ant1_2437_1000~26500

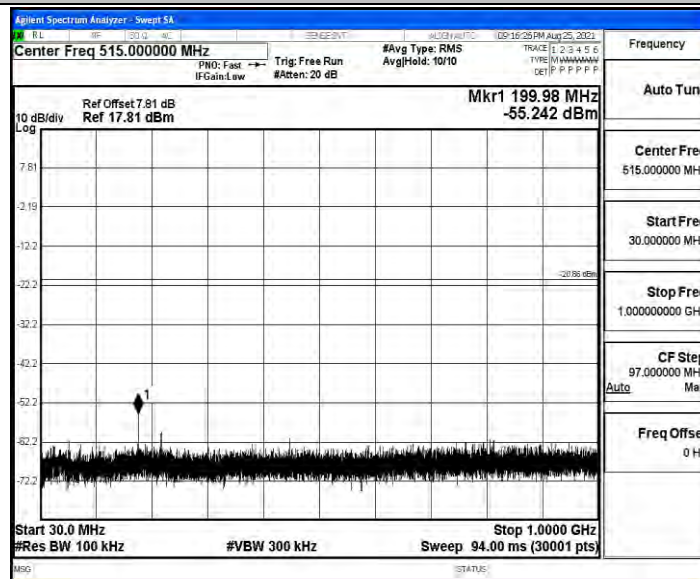


11N20SISO_Ant1_2462_0~Reference

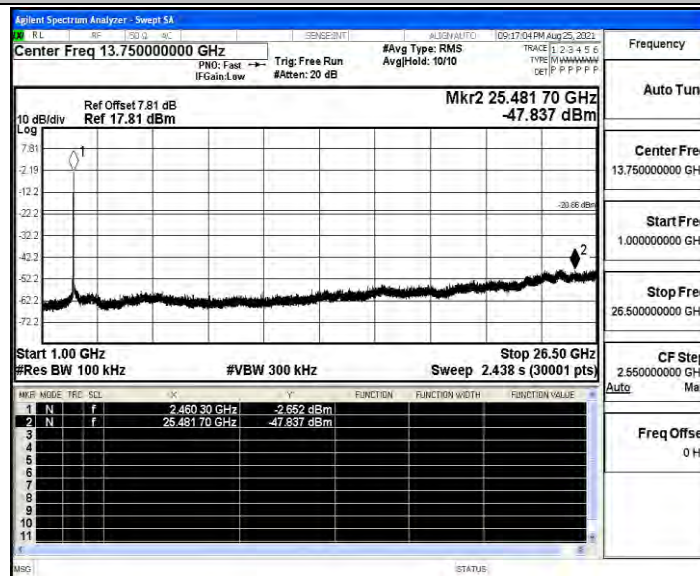




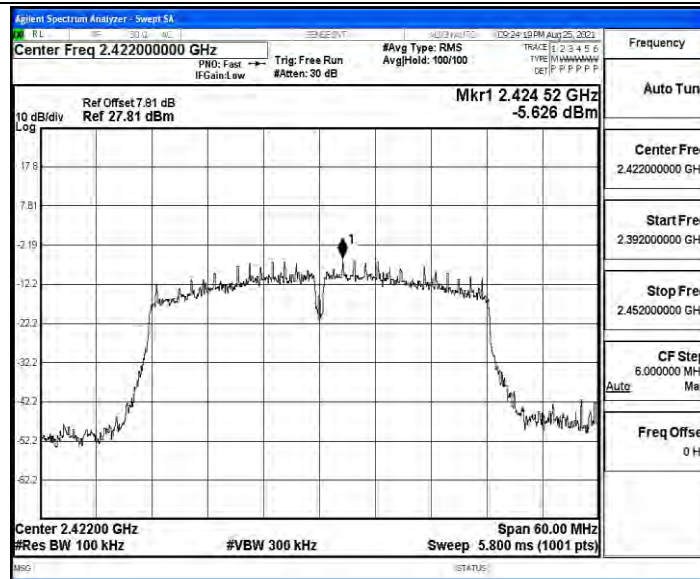
11N20SISO_Ant1_2462_30~1000



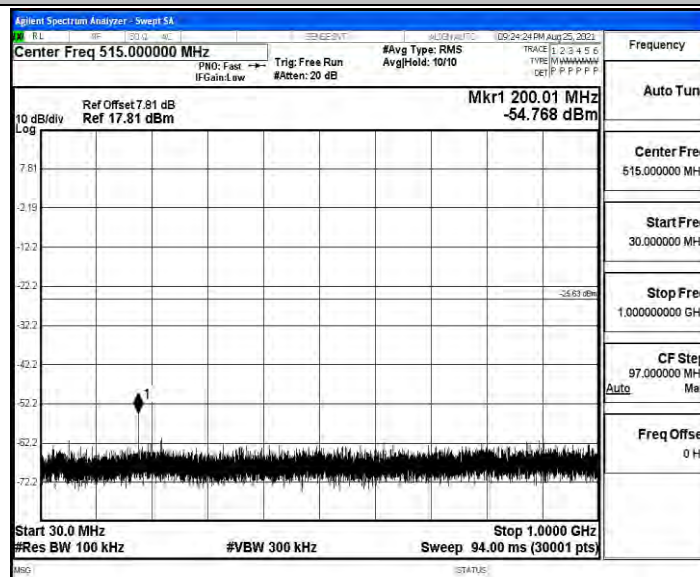
11N20SISO_Ant1_2462_1000~26500



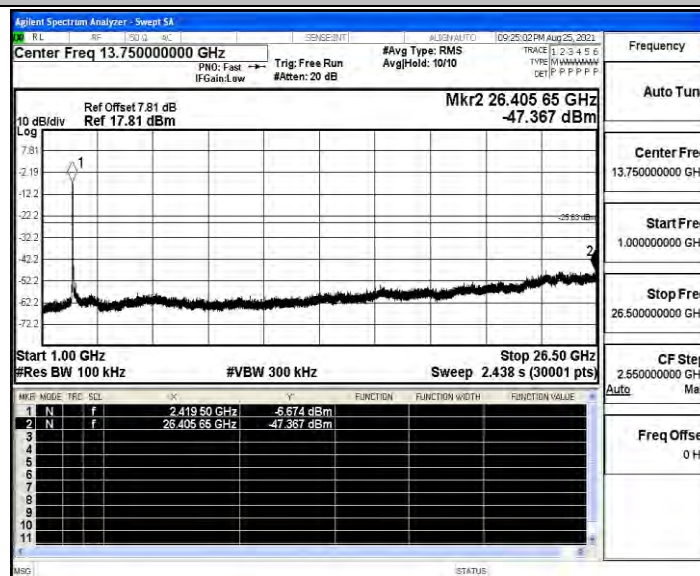
11N40SISO_Ant1_2422_0~Reference



11N40SISO_Ant1_2422_30~1000

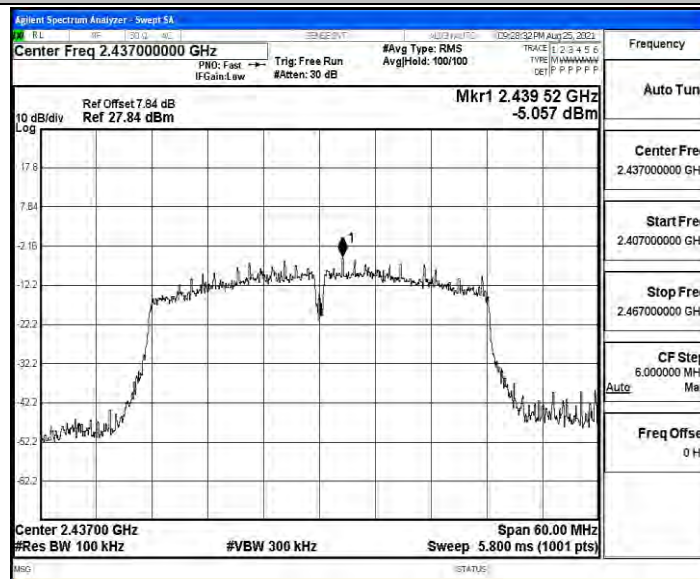


11N40SISO_Ant1_2422_1000~26500

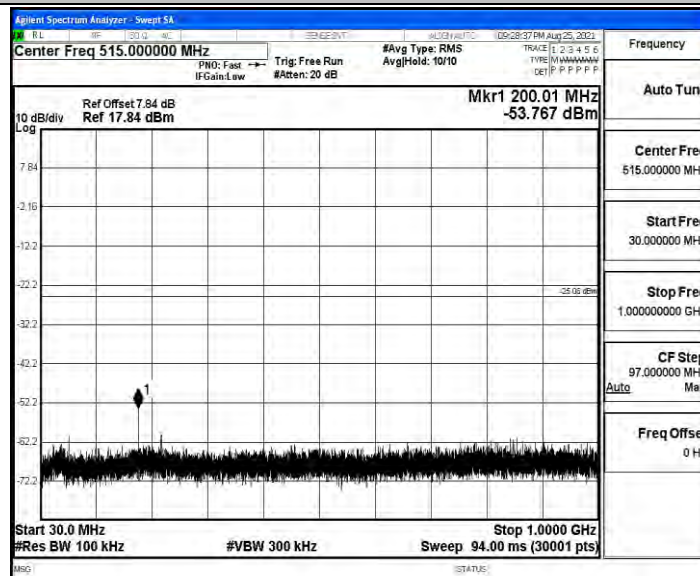




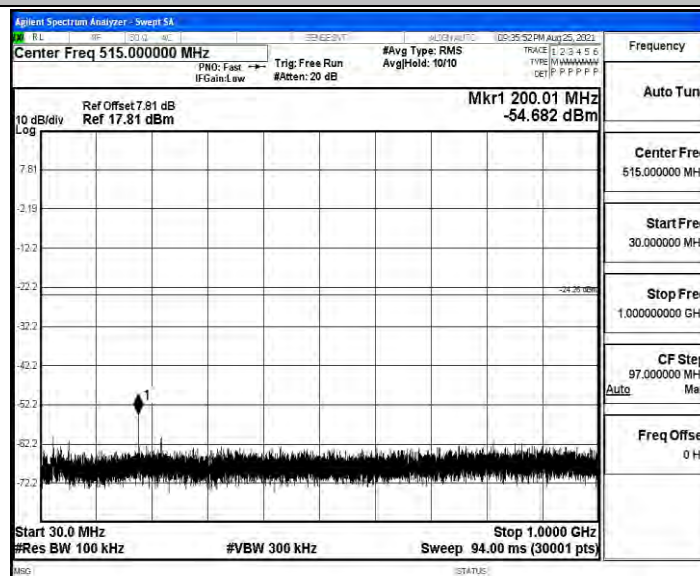
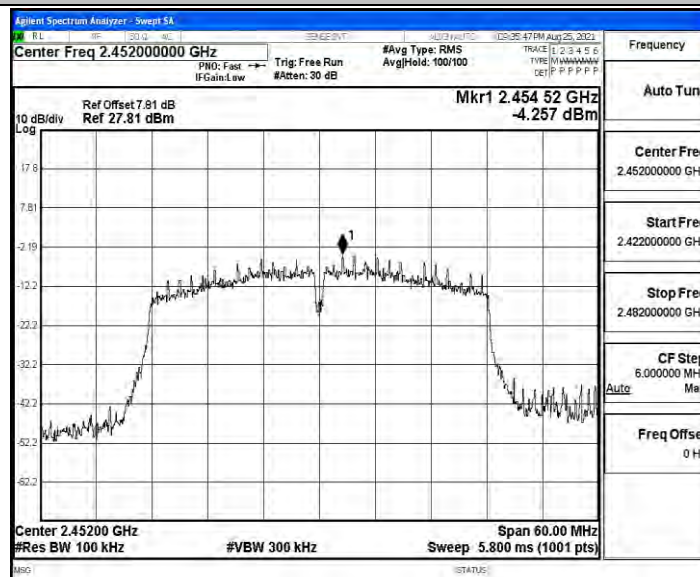
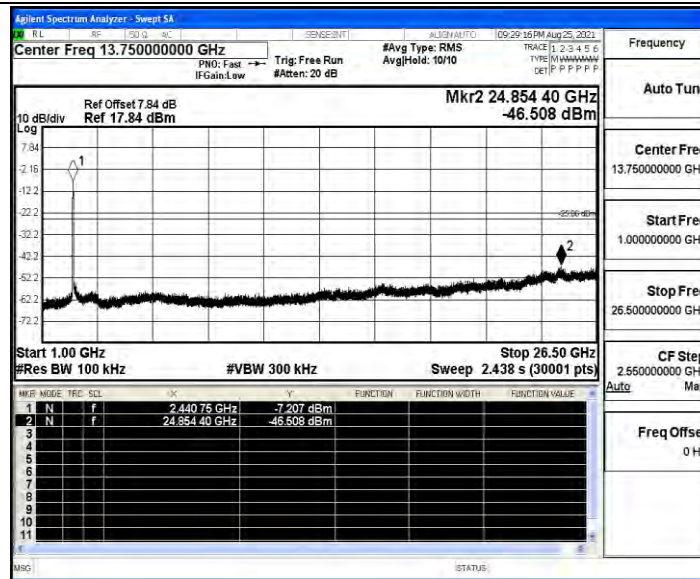
11N40SISO_Ant1_2437_0~Reference

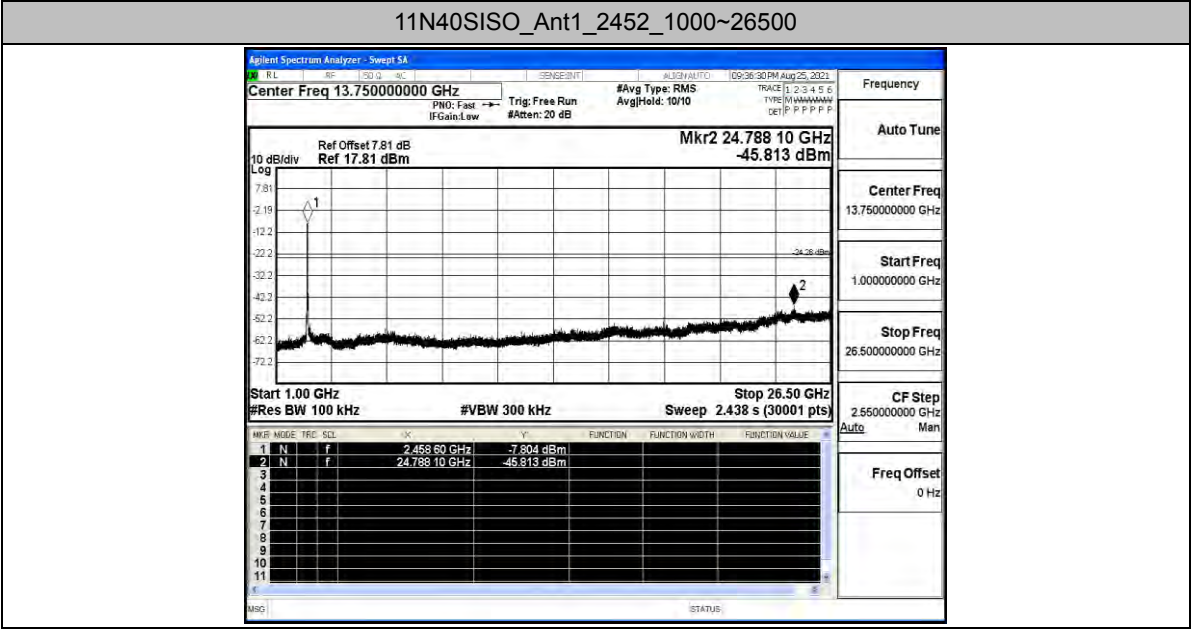


11N40SISO_Ant1_2437_30~1000



11N40SISO_Ant1_2437_1000~26500







B.6 Duty Cycle

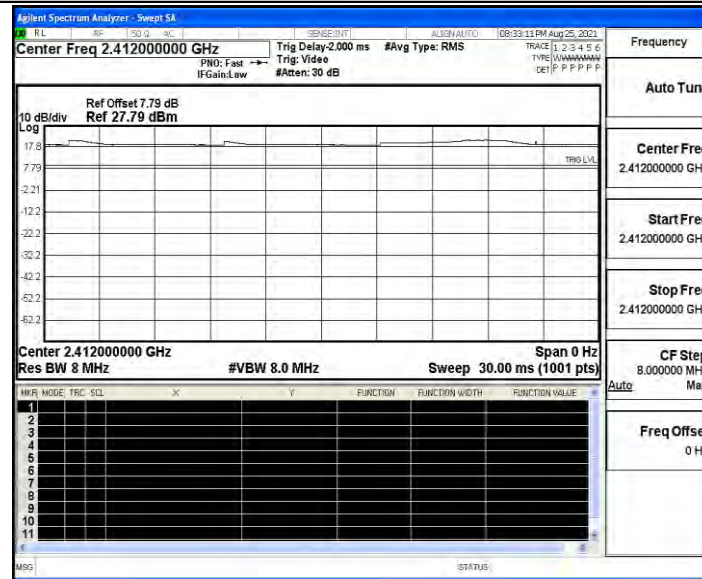
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	30.00	30.00	100.00	---	PASS
		2437	30.00	30.00	100.00	---	PASS
		2462	30.00	30.00	100.00	---	PASS
11G	Ant1	2412	2.79	2.81	99.29	---	PASS
		2437	2.79	2.81	99.29	---	PASS
		2462	2.79	2.81	99.29	---	PASS
11N20SISO	Ant1	2412	2.61	2.63	99.24	---	PASS
		2437	2.61	2.63	99.24	---	PASS
		2462	3.92	3.94	99.49	---	PASS
11N40SISO	Ant1	2422	30.00	30.00	100.00	---	PASS
		2437	30.00	30.00	100.00	---	PASS
		2452	30.00	30.00	100.00	---	PASS

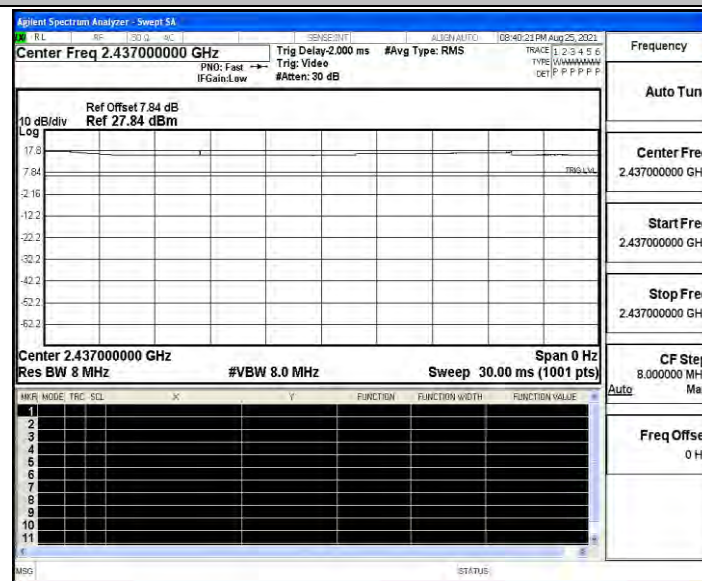


Test Graphs

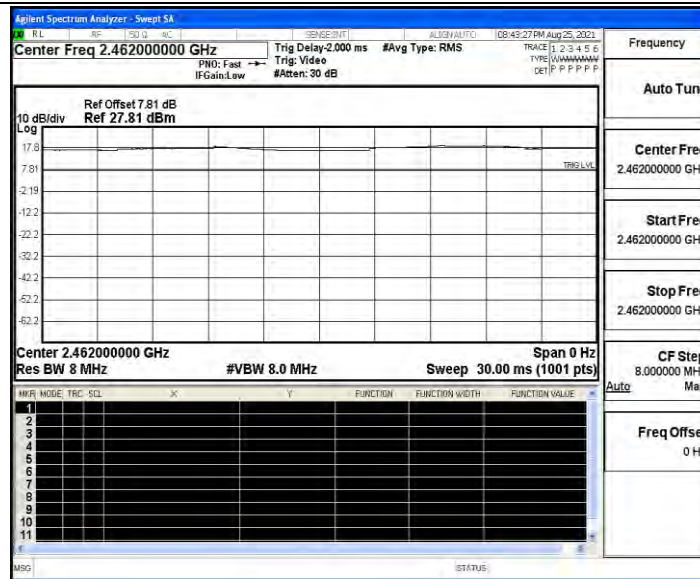
11B_Ant1_2412



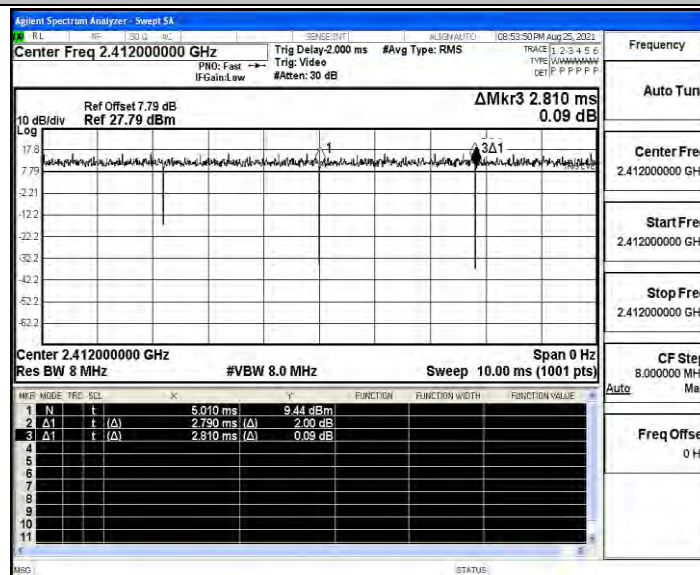
11B_Ant1_2437



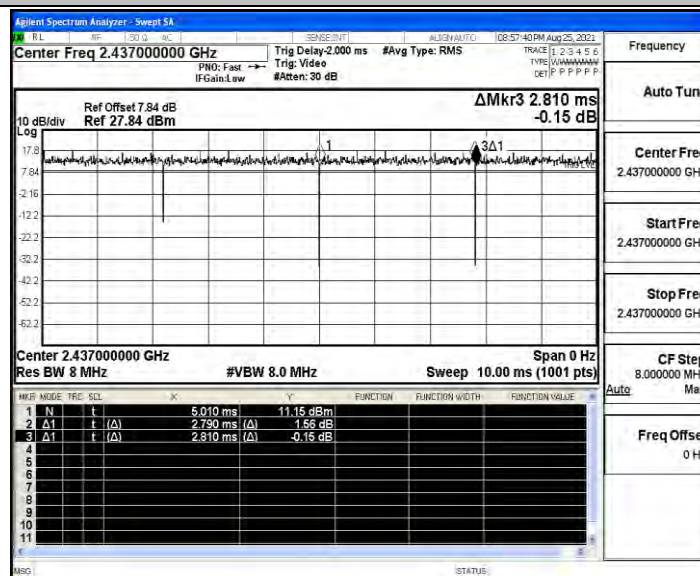
11B_Ant1_2462



11G_Ant1_2412

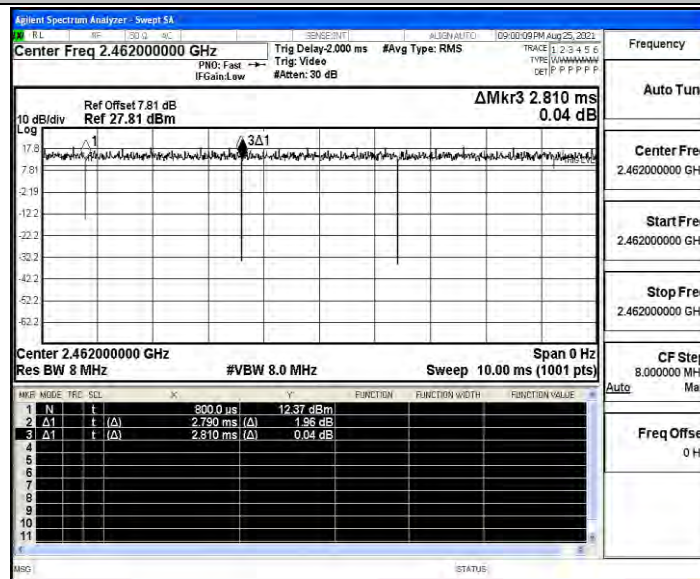


11G_Ant1_2437

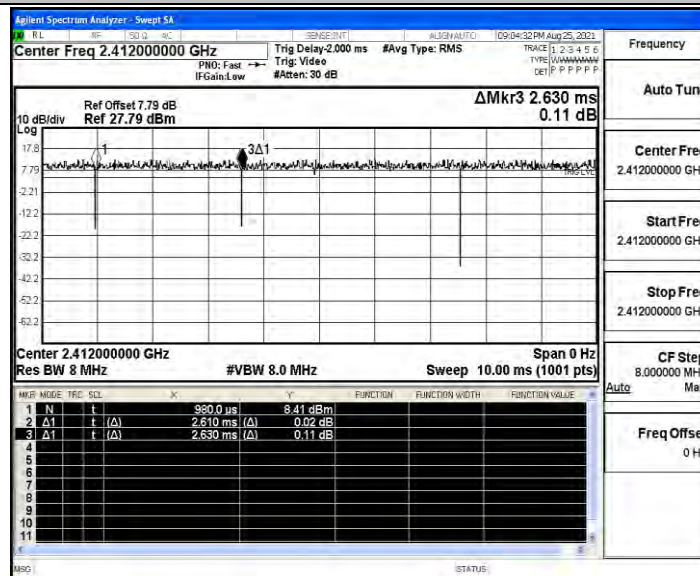




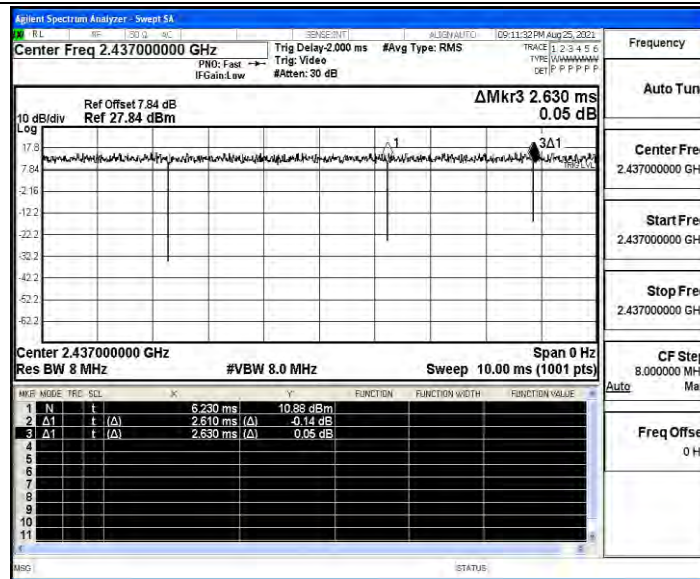
11G_Ant1_2462



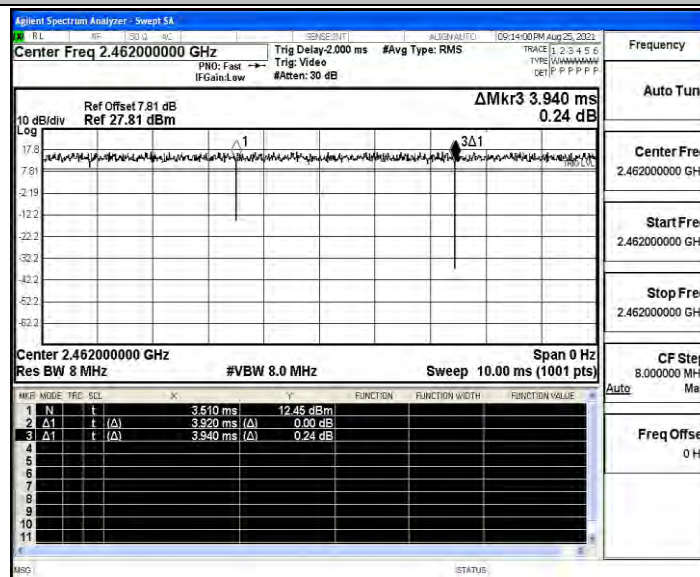
11N20SISO_Ant1_2412



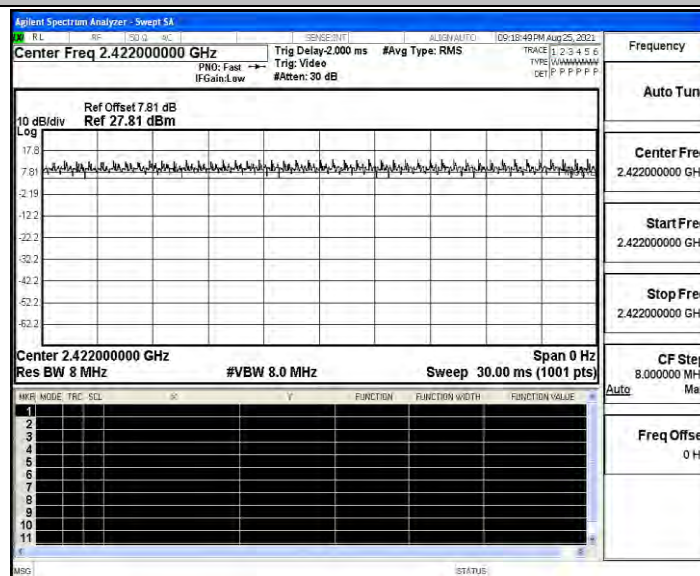
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

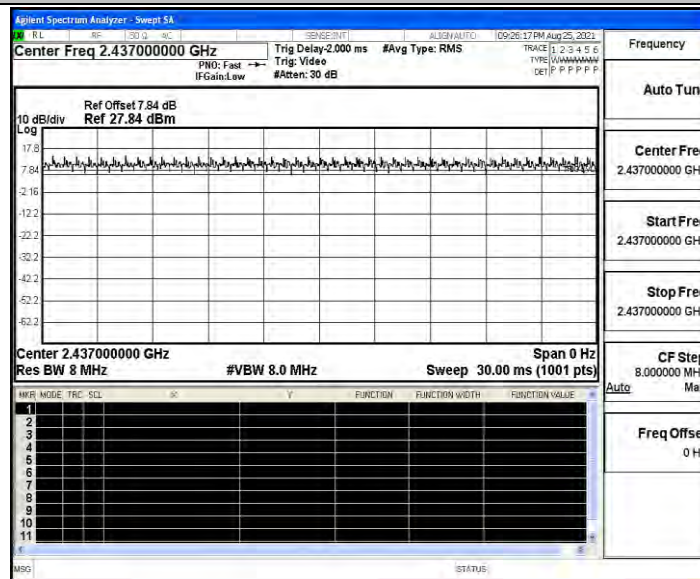


11N40SISO_Ant1_2422

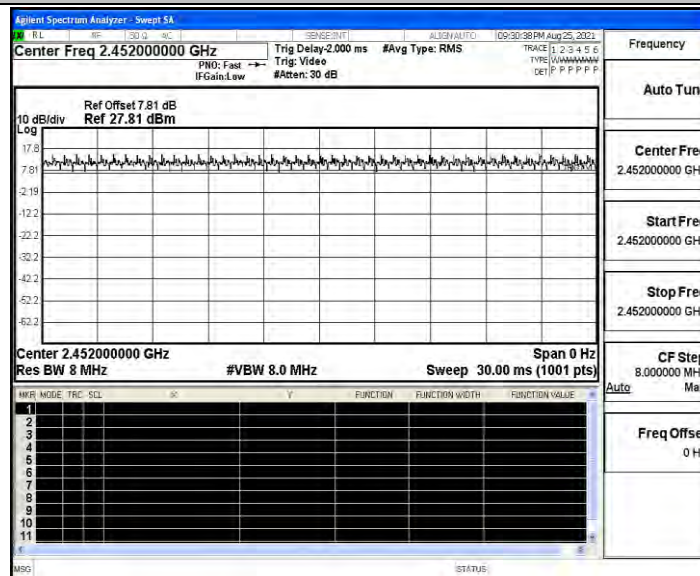




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





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	-49.28	≤-41.20	45.92	≤54	PASS
				AV	2386.970	-48.25	≤-41.20	46.95	≤54	PASS
				AV	2390.000	-48.29	≤-41.20	46.91	≤54	PASS
				Peak	2310.000	-43.63	≤-21.20	51.57	≤74	PASS
				Peak	2344.200	-38.84	≤-21.20	56.36	≤74	PASS
				Peak	2390.000	-41.73	≤-21.20	53.47	≤74	PASS
		High	2462	AV	2483.500	-47.72	≤-41.20	47.48	≤54	PASS
				AV	2486.750	-47.35	≤-41.20	47.85	≤54	PASS
				AV	2500.000	-47.73	≤-41.20	47.47	≤54	PASS
				Peak	2483.500	-43.95	≤-21.20	51.25	≤74	PASS
				Peak	2486.640	-39.04	≤-21.20	56.16	≤74	PASS
				Peak	2500.000	-43.44	≤-21.20	51.76	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-48.97	≤-41.20	46.23	≤54	PASS
				AV	2388.660	-48.27	≤-41.20	46.93	≤54	PASS
				AV	2390.000	-48.5	≤-41.20	46.70	≤54	PASS
				Peak	2310.000	-42.93	≤-21.20	52.27	≤74	PASS
				Peak	2387.100	-38.7	≤-21.20	56.50	≤74	PASS
				Peak	2390.000	-41.28	≤-21.20	53.92	≤74	PASS
		High	2462	AV	2483.500	-47.44	≤-41.20	47.76	≤54	PASS
				AV	2499.730	-47.2	≤-41.20	48.00	≤54	PASS
				AV	2500.000	-47.45	≤-41.20	47.75	≤54	PASS
				Peak	2483.500	-43.72	≤-21.20	51.48	≤74	PASS
				Peak	2499.840	-38.86	≤-21.20	56.34	≤74	PASS
				Peak	2500.000	-41.81	≤-21.20	53.39	≤74	PASS
11N20SI SO	Ant1	Low	2412	AV	2310.000	-48.98	≤-41.20	46.22	≤54	PASS
				AV	2386.970	-48.21	≤-41.20	46.99	≤54	PASS
				AV	2390.000	-48.35	≤-41.20	46.85	≤54	PASS
				Peak	2310.000	-43.76	≤-21.20	51.44	≤74	PASS
				Peak	2384.370	-39.36	≤-21.20	55.84	≤74	PASS
				Peak	2390.000	-44.51	≤-21.20	50.69	≤74	PASS
		High	2462	AV	2483.500	-46.91	≤-41.20	48.29	≤54	PASS
				AV	2483.780	-46.94	≤-41.20	48.26	≤54	PASS
				AV	2500.000	-47.23	≤-41.20	47.97	≤54	PASS
				Peak	2483.500	-37.56	≤-21.20	57.64	≤74	PASS
				Peak	2487.960	-37.41	≤-21.20	57.79	≤74	PASS
				Peak	2500.000	-42.78	≤-21.20	52.42	≤74	PASS



11N40SI SO	Ant1	Low	2422	AV	2310.000	-49.14	≤ -41.20	46.06	≤ 54	PASS
				AV	2389.830	-47.47	≤ -41.20	47.73	≤ 54	PASS
				AV	2390.000	-47.48	≤ -41.20	47.72	≤ 54	PASS
				Peak	2310.000	-45.06	≤ -21.20	50.14	≤ 74	PASS
				Peak	2312.220	-39.28	≤ -21.20	55.92	≤ 74	PASS
				Peak	2390.000	-40.41	≤ -21.20	54.79	≤ 74	PASS
		High	2452	AV	2483.500	-42.01	≤ -41.20	53.19	≤ 54	PASS
				AV	2483.780	-41.97	≤ -41.20	53.23	≤ 54	PASS
				AV	2500.000	-47.01	≤ -41.20	48.19	≤ 54	PASS
				Peak	2483.500	-34.3	≤ -21.20	60.90	≤ 74	PASS
				Peak	2486.640	-31.54	≤ -21.20	63.66	≤ 74	PASS
				Peak	2500.000	-39.69	≤ -21.20	55.51	≤ 74	PASS

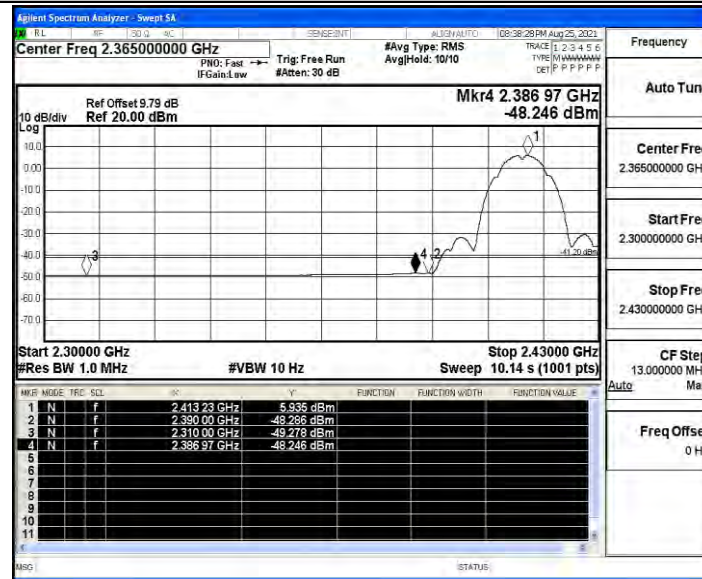
Note:

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.

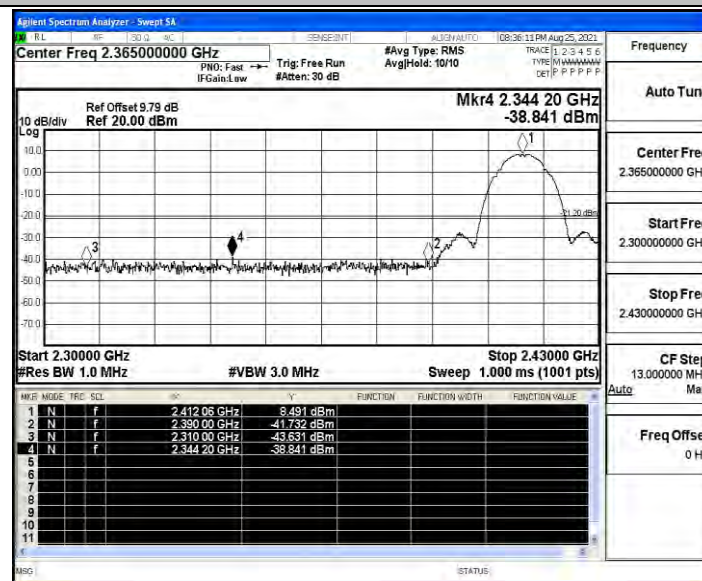


Test Graphs

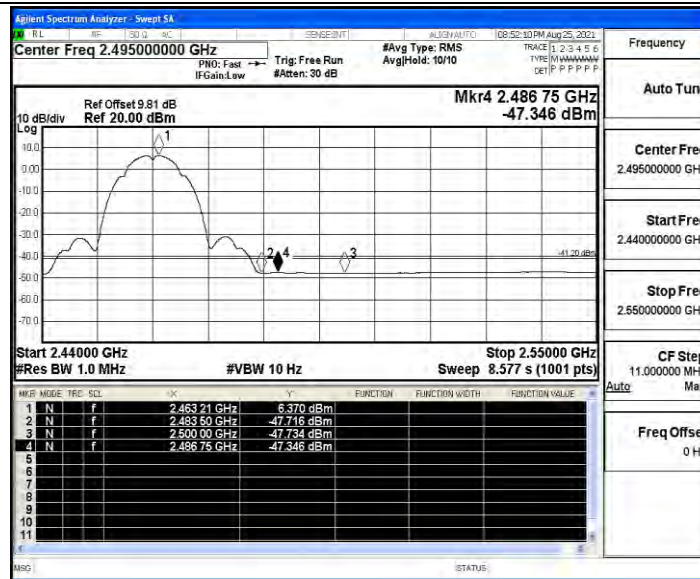
11B_Ant1_Low_2412_AV



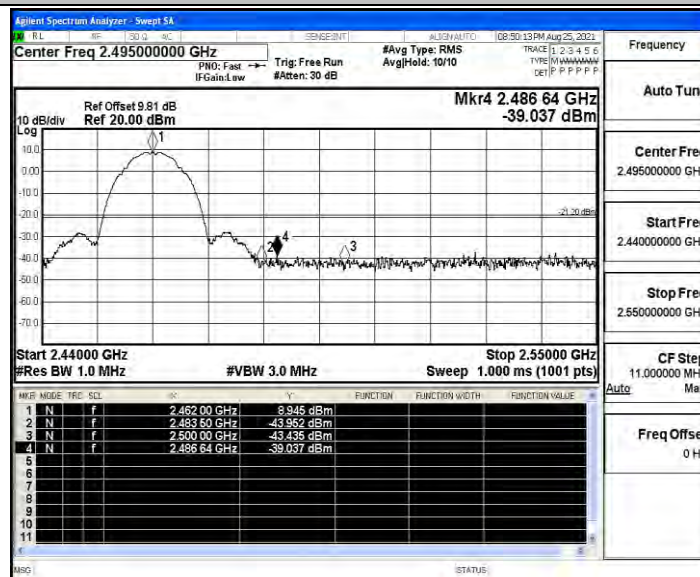
11B_Ant1_Low_2412_Peak



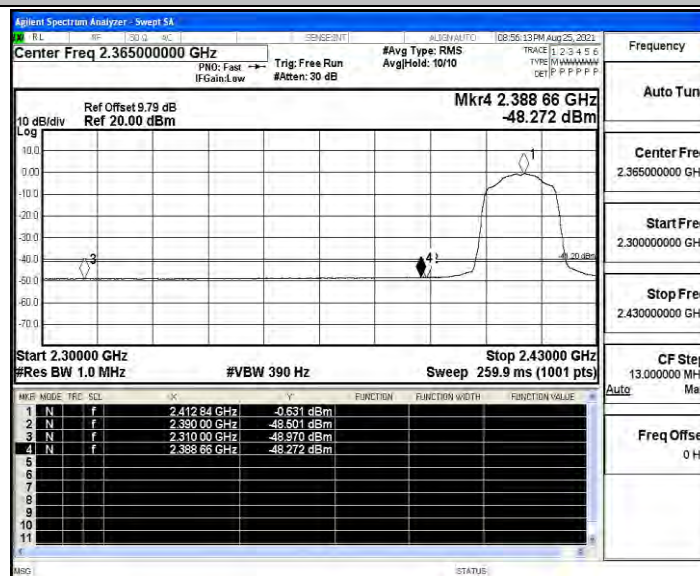
11B_Ant1_High_2462_AV



11B_Ant1_High_2462_Peak

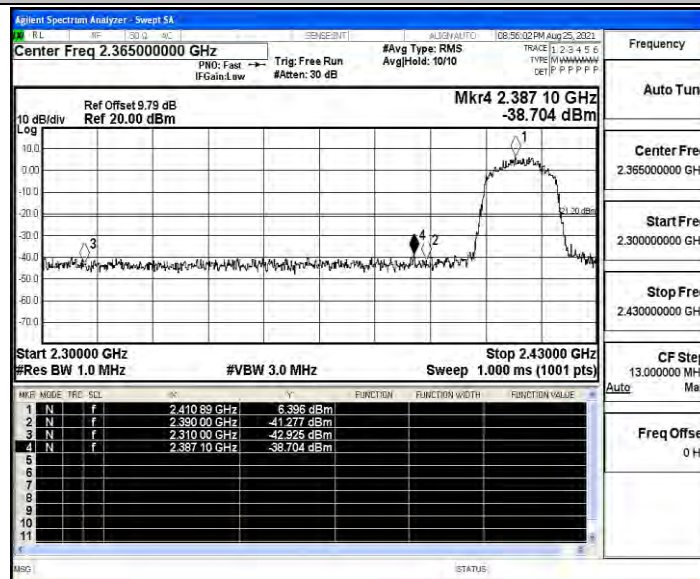


11G_Ant1_Low_2412_AV

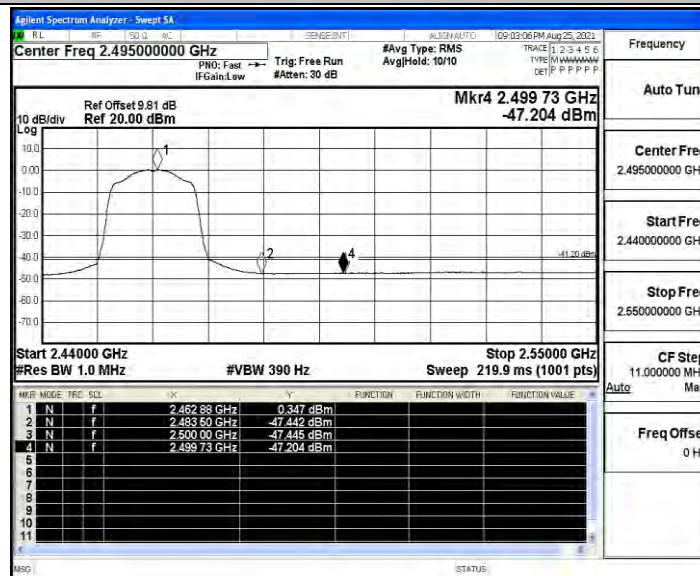




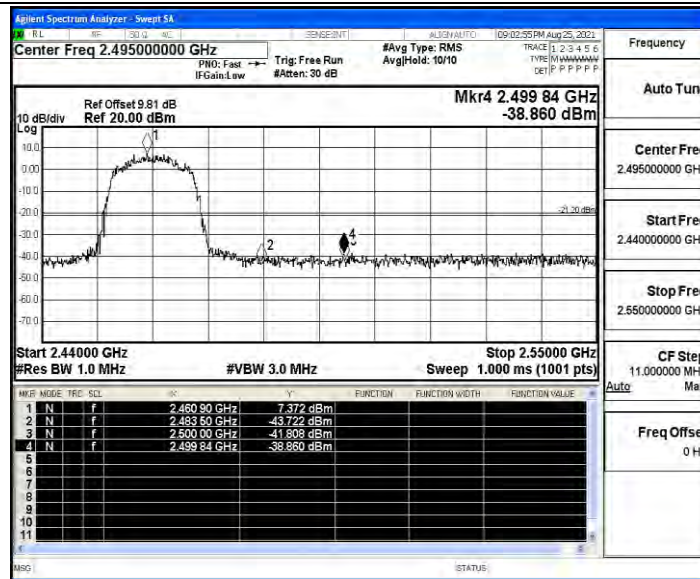
11G_Ant1_Low_2412_Peak



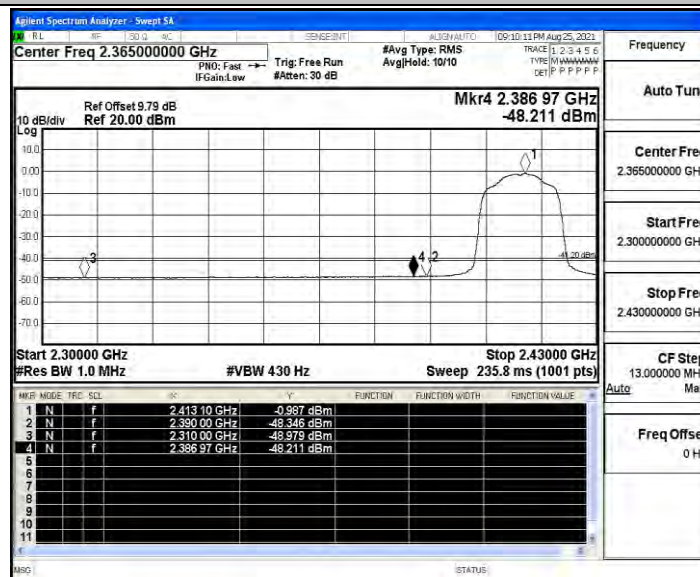
11G_Ant1_High_2462_AV



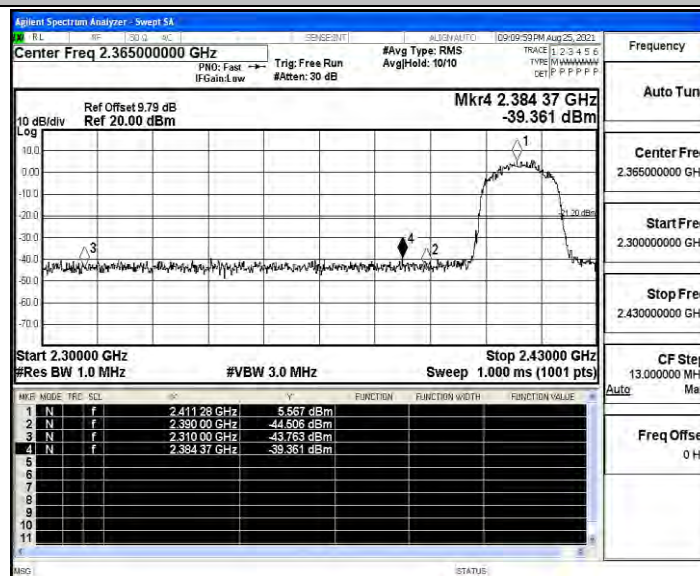
11G_Ant1_High_2462_Peak



11N20SISO_Ant1_Low_2412_AV

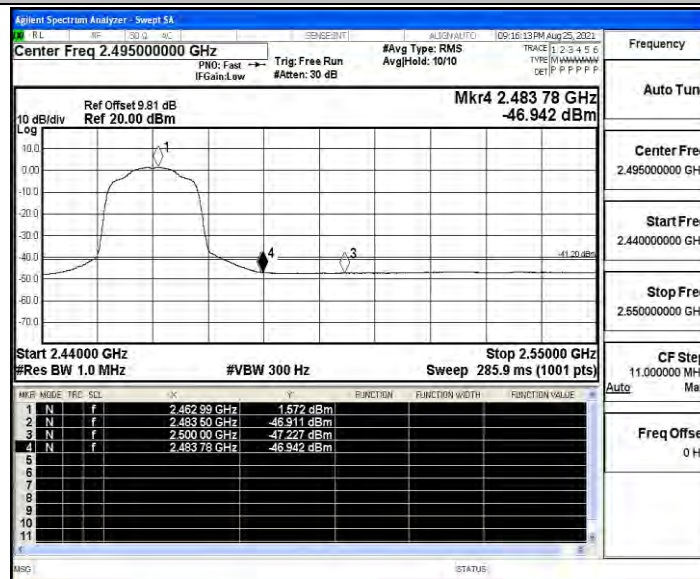


11N20SISO_Ant1_Low_2412_Peak

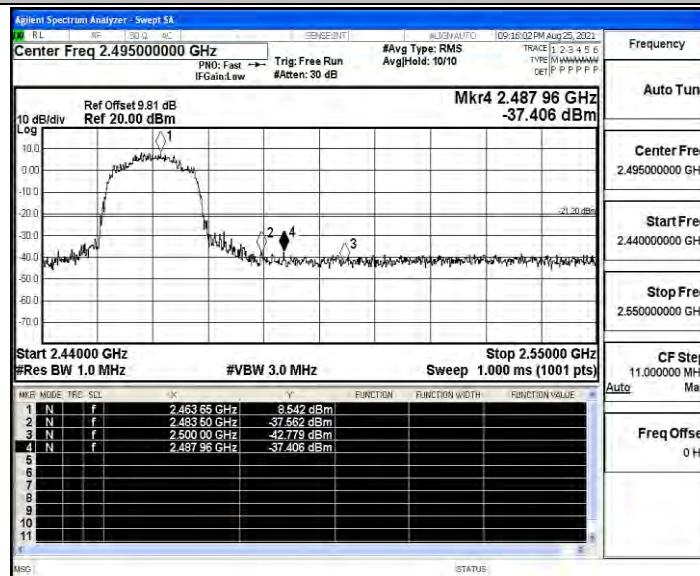




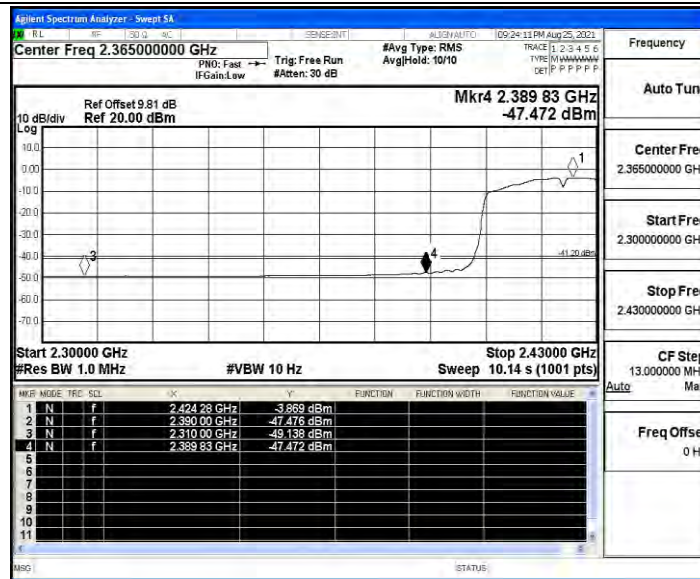
11N20SISO_Ant1_High_2462_AV



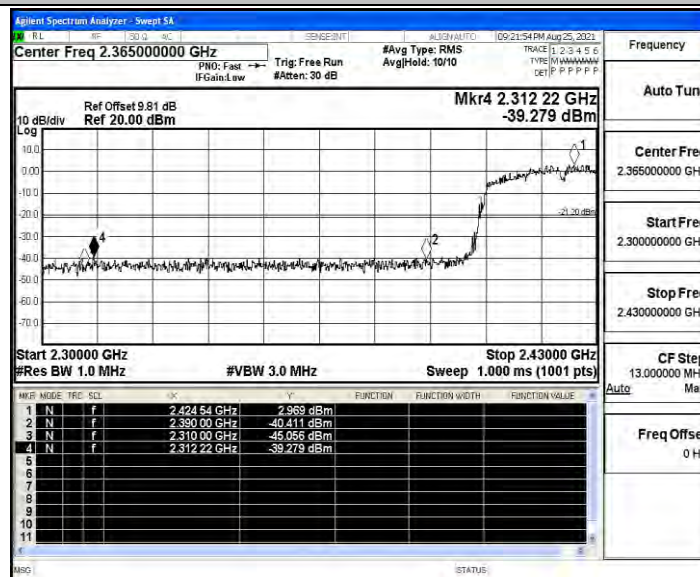
11N20SISO_Ant1_High_2462_Peak



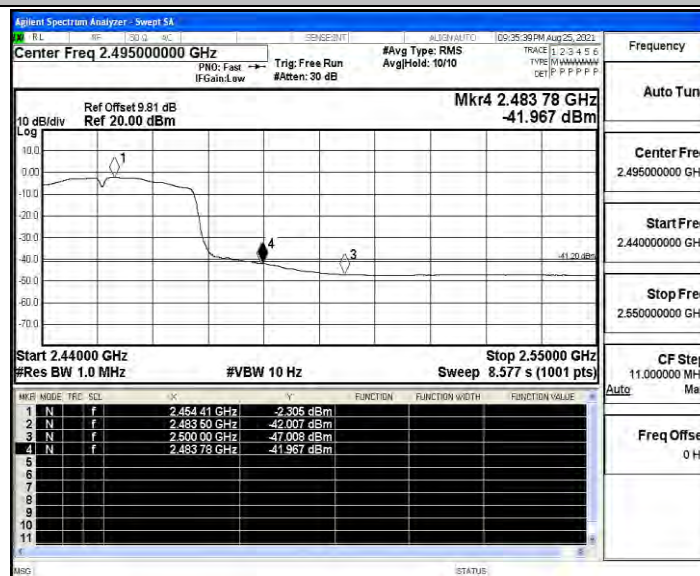
11N40SISO_Ant1_Low_2422_AV



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV





11N40SISO_Ant1_High_2452_Peak

