



Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Smart String Light (WiFi)

Test Model: HY-S14-10030-W01

Environmental Conditions

Temperature:	21.1° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	monkey.Li
Supervised by:	Lihm



A.1 DTS Bandwidth

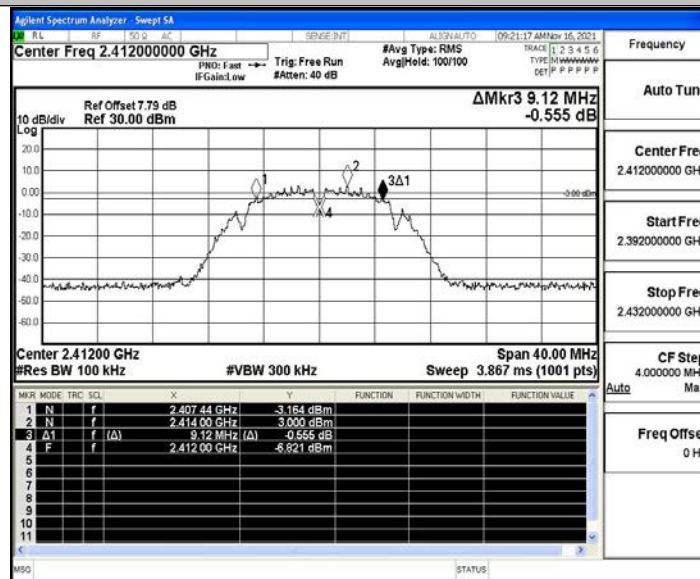
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.120	2407.440	2416.560	0.5	PASS
		2437	9.640	2432.440	2442.080	0.5	PASS
		2462	9.120	2456.960	2466.080	0.5	PASS
11G	Ant1	2412	16.480	2403.760	2420.240	0.5	PASS
		2437	16.160	2429.040	2445.200	0.5	PASS
		2462	14.560	2453.760	2468.320	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	0.5	PASS
		2437	17.400	2428.440	2445.840	0.5	PASS
		2462	17.240	2453.160	2470.400	0.5	PASS
11N40SISO	Ant1	2422	35.840	2404.400	2440.240	0.5	PASS
		2437	35.440	2419.400	2454.840	0.5	PASS
		2452	35.440	2434.160	2469.600	0.5	PASS

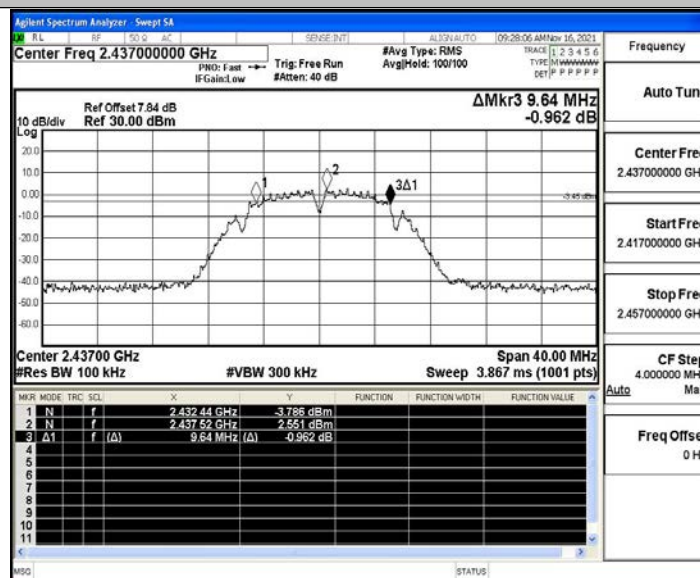


Test Graphs

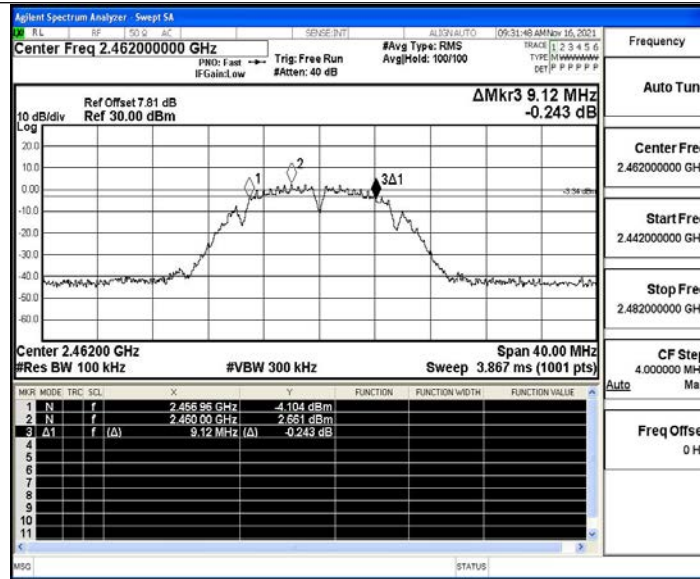
11B_Ant1_2412



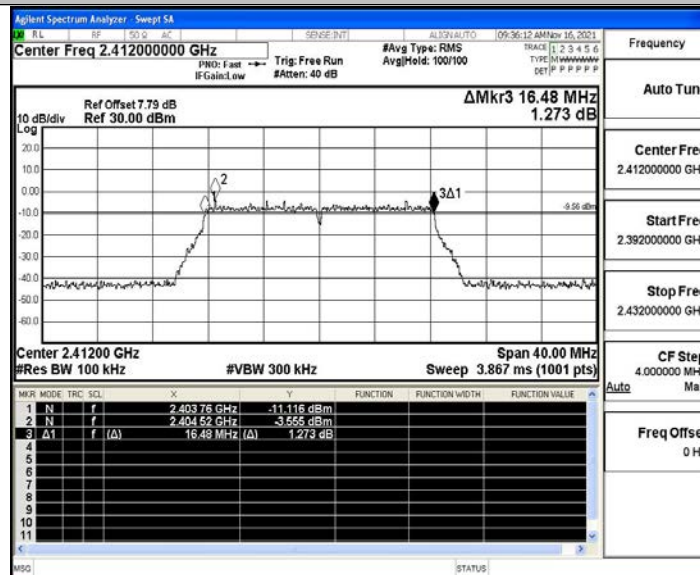
11B_Ant1_2437



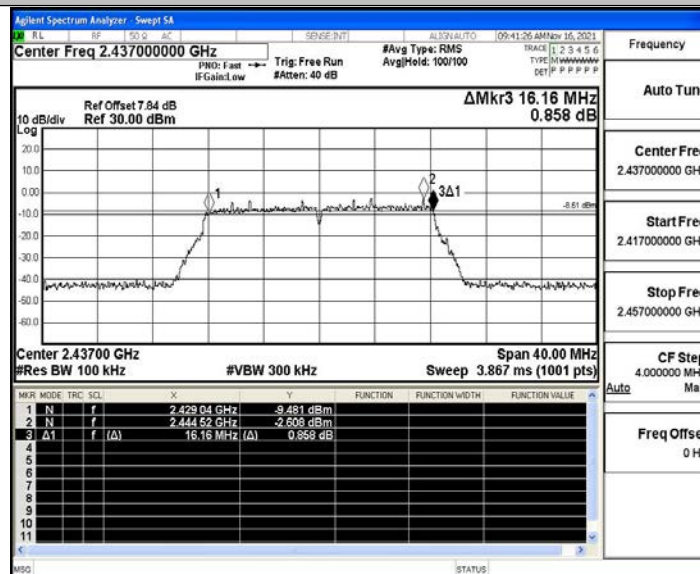
11B_Ant1_2462



11G_Ant1_2412

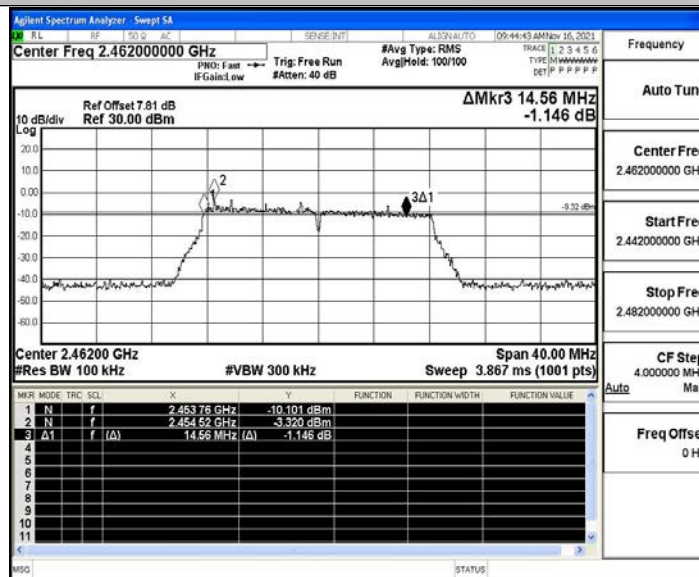


11G_Ant1_2437

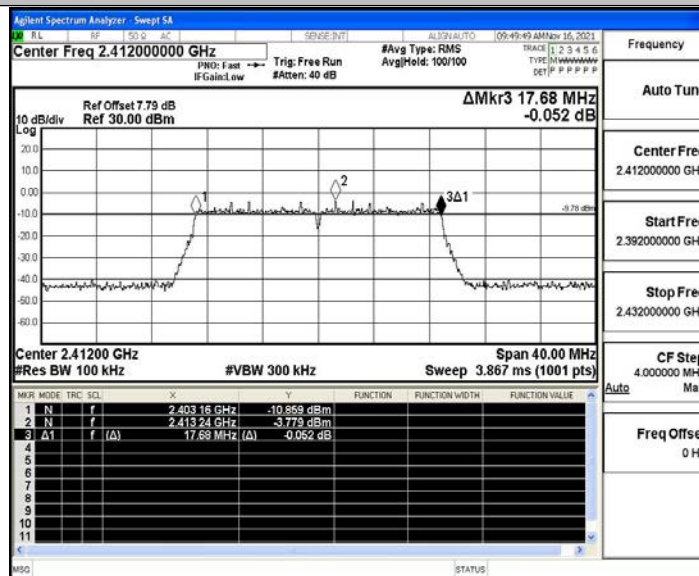




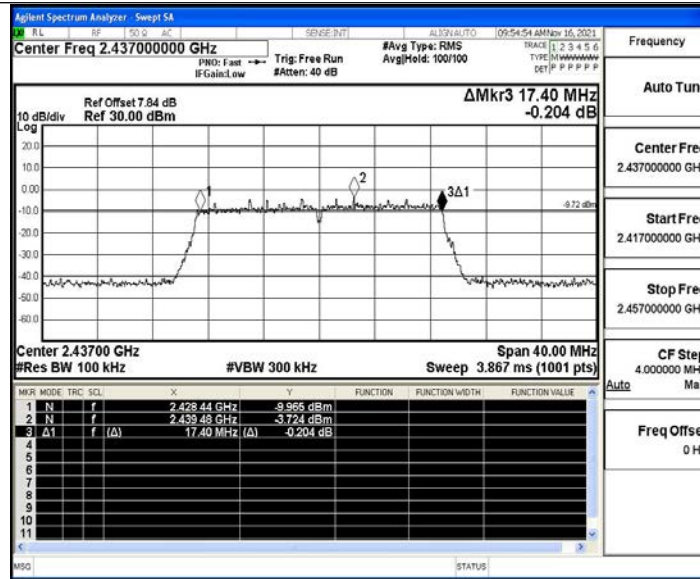
11G_Ant1_2462



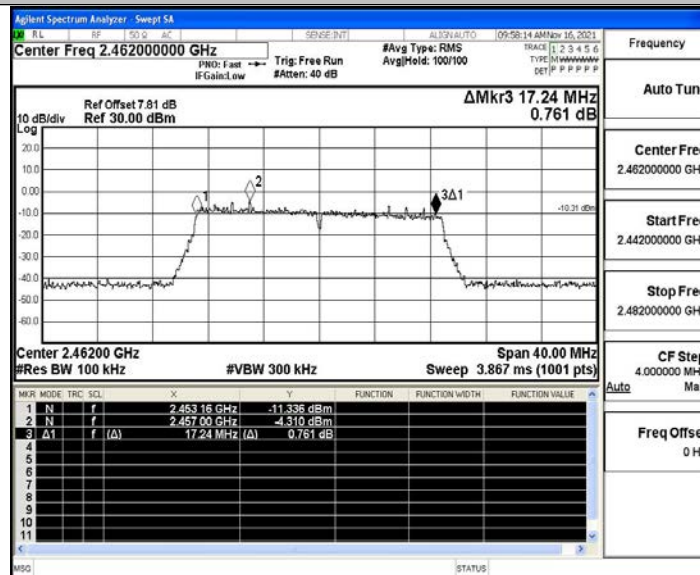
11N20SISO_Ant1_2412



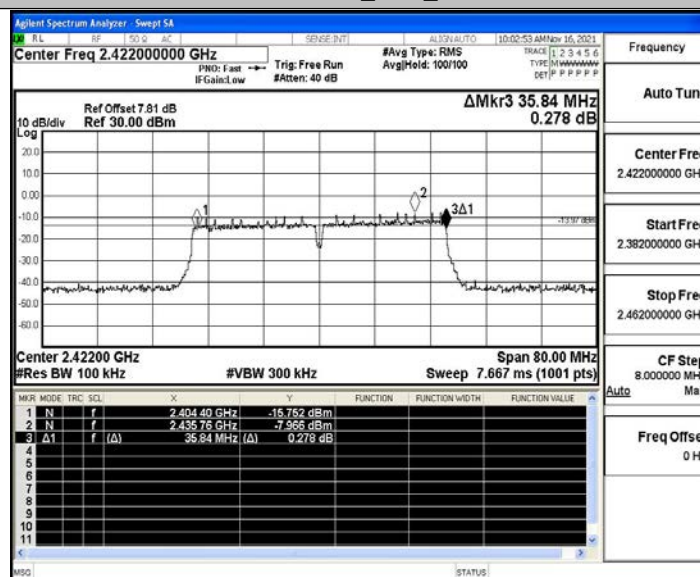
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

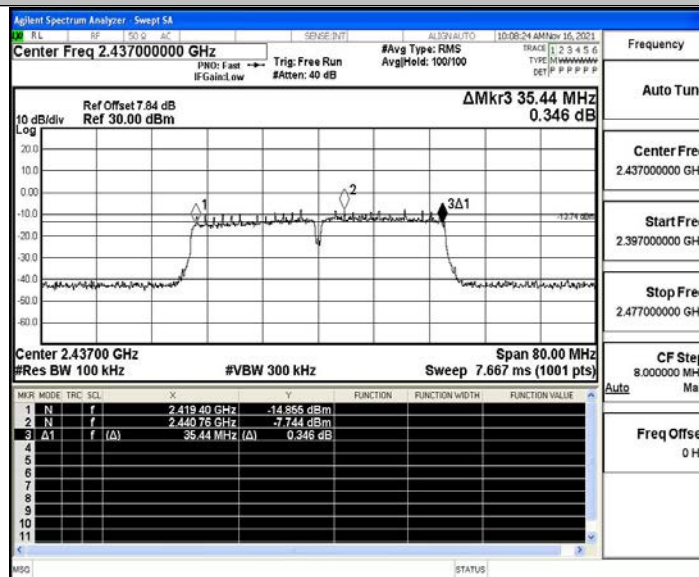


11N40SISO_Ant1_2422

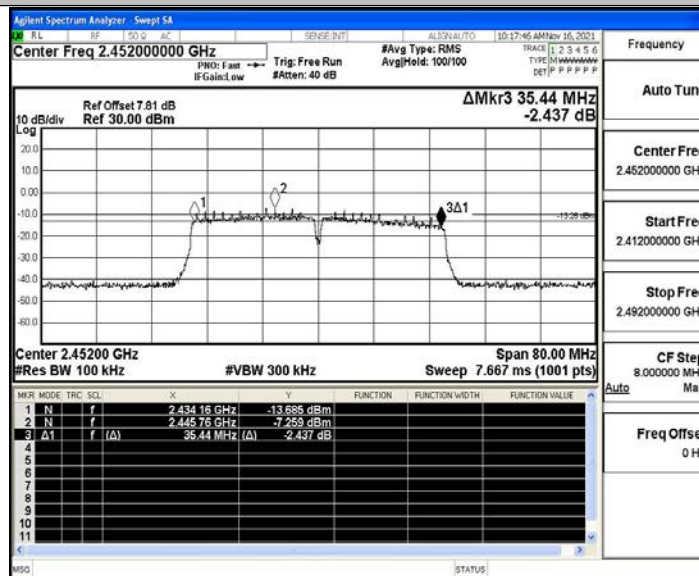




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.2 Maximum Peak conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.98	≤30	PASS
		2437	15.73	≤30	PASS
		2462	15.71	≤30	PASS
11G	Ant1	2412	14.18	≤30	PASS
		2437	14.61	≤30	PASS
		2462	14.09	≤30	PASS
11N20SISO	Ant1	2412	12.68	≤30	PASS
		2437	12.93	≤30	PASS
		2462	12.14	≤30	PASS
11N40SISO	Ant1	2422	12.62	≤30	PASS
		2437	12.76	≤30	PASS
		2452	12.74	≤30	PASS



A.3 Maximum power spectral density

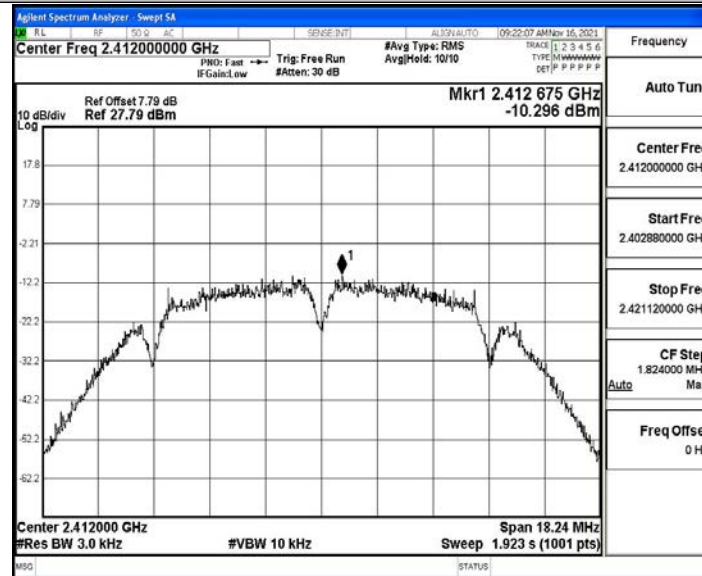
Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-10.3	≤8	PASS
		2437	-4.78	≤8	PASS
		2462	-10.11	≤8	PASS
11G	Ant1	2412	-17.35	≤8	PASS
		2437	-16.14	≤8	PASS
		2462	-17.78	≤8	PASS
11N20SISO	Ant1	2412	-18.13	≤8	PASS
		2437	-17.38	≤8	PASS
		2462	-18.5	≤8	PASS
11N40SISO	Ant1	2422	-20.93	≤8	PASS
		2437	-21.97	≤8	PASS
		2452	-21.42	≤8	PASS

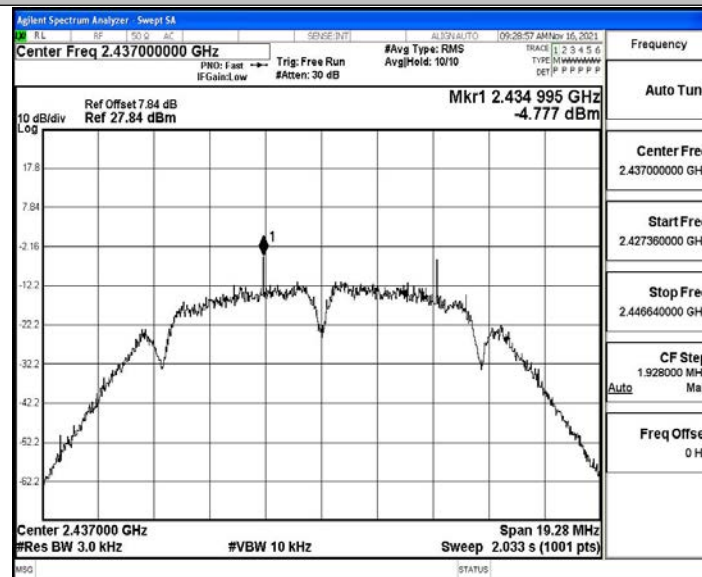


Test Graphs

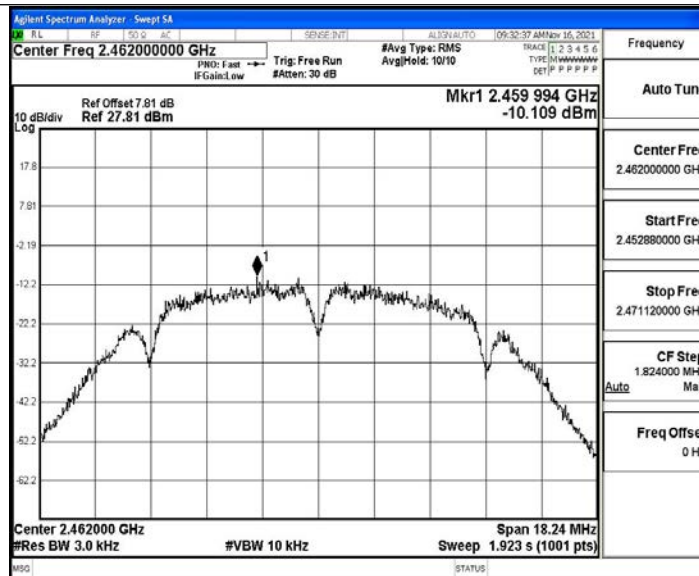
11B_Ant1_2412



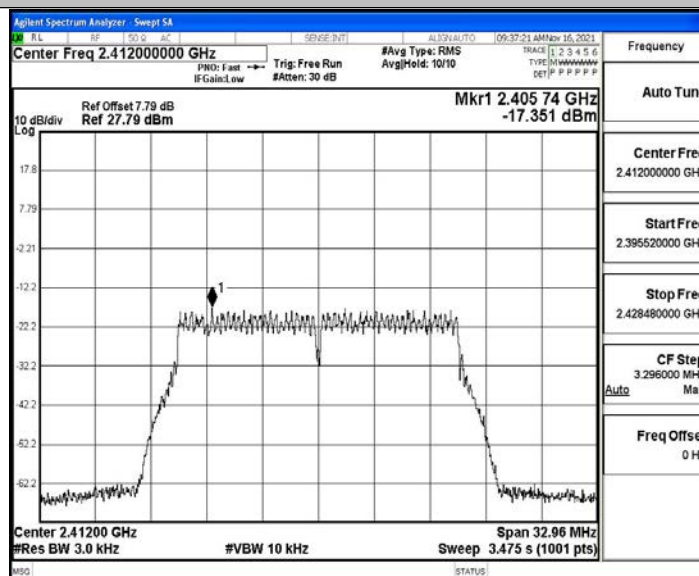
11B_Ant1_2437



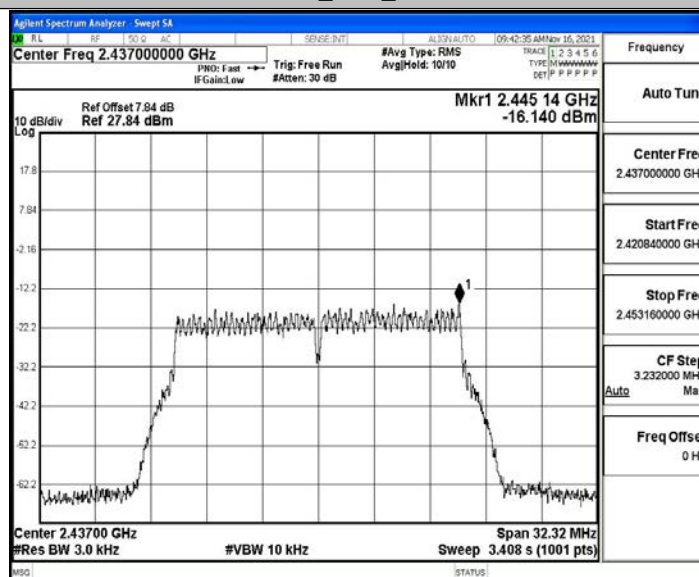
11B_Ant1_2462



11G_Ant1_2412

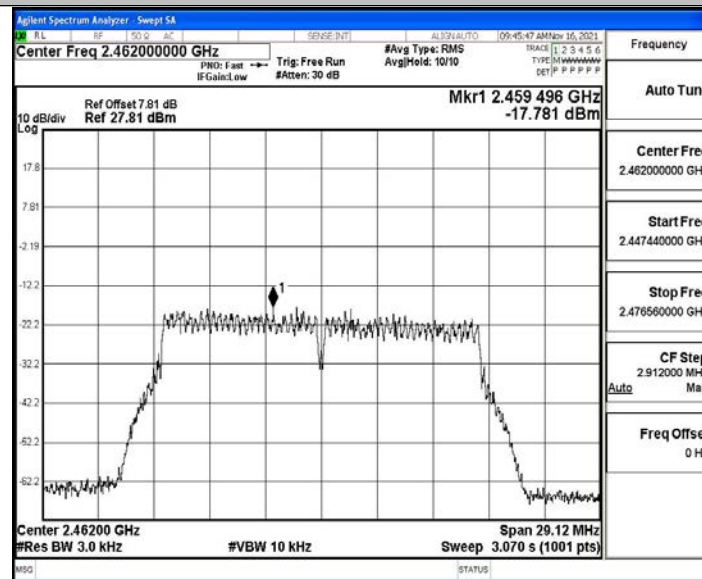


11G_Ant1_2437

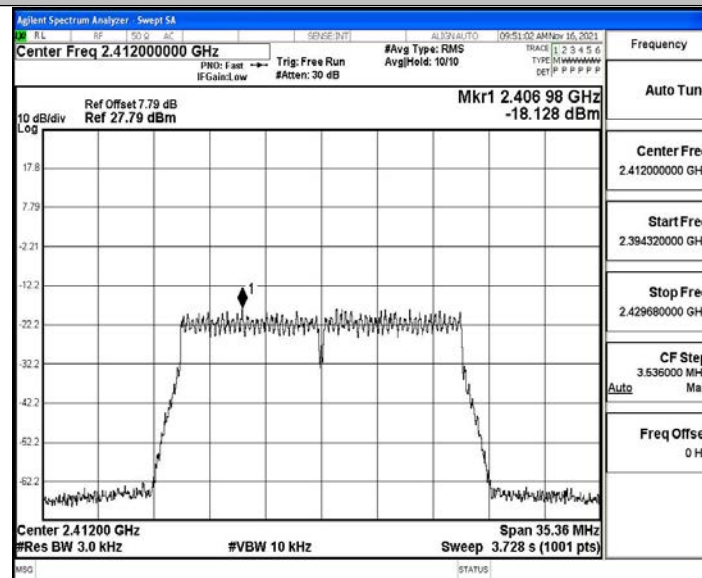




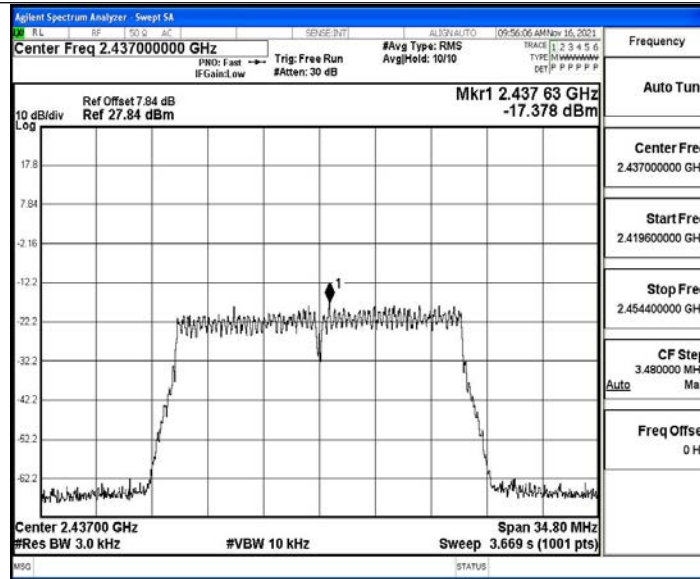
11G_Ant1_2462



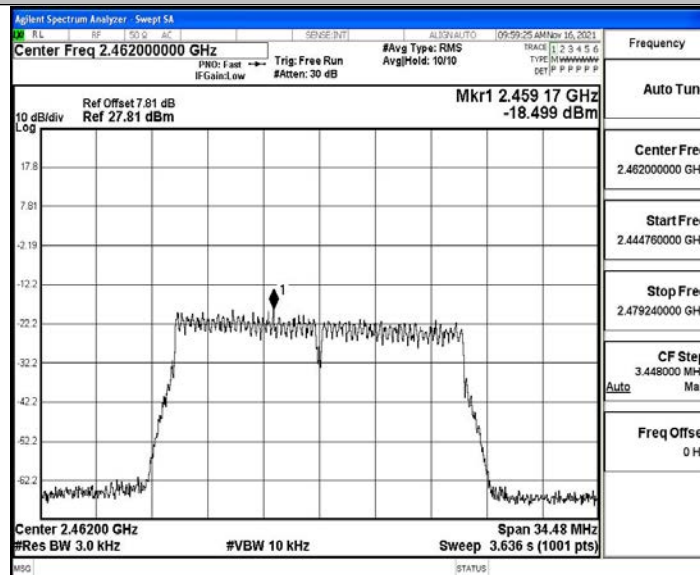
11N20SISO_Ant1_2412



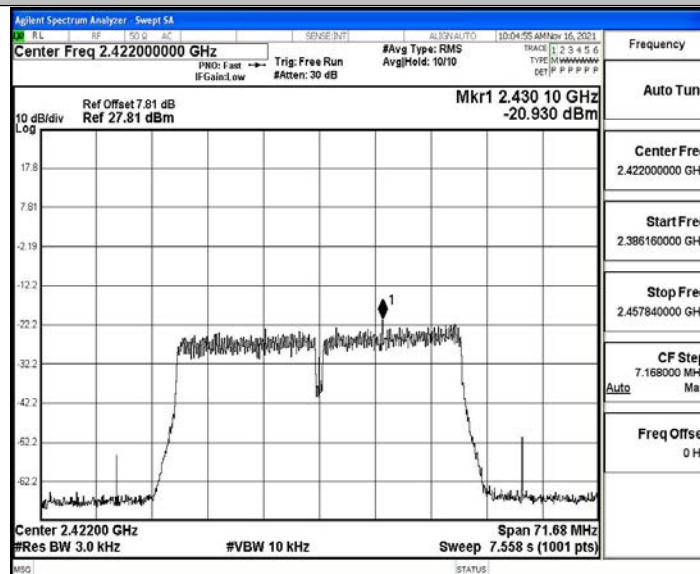
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

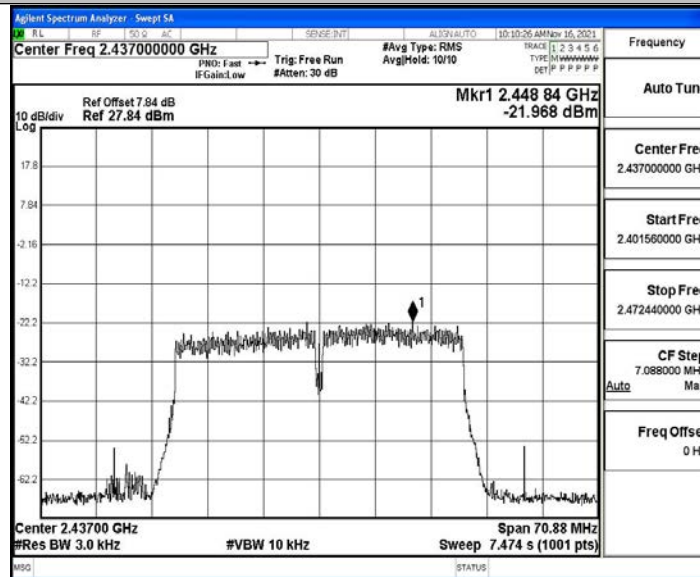


11N40SISO_Ant1_2422

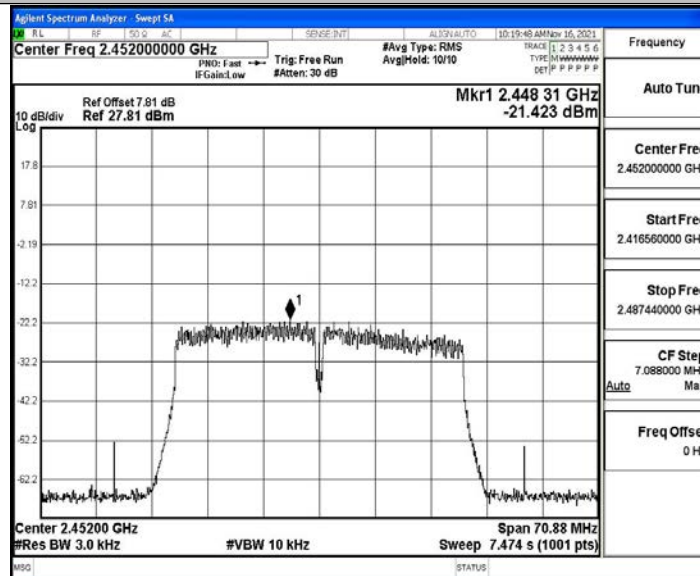




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.4 Band edge measurements

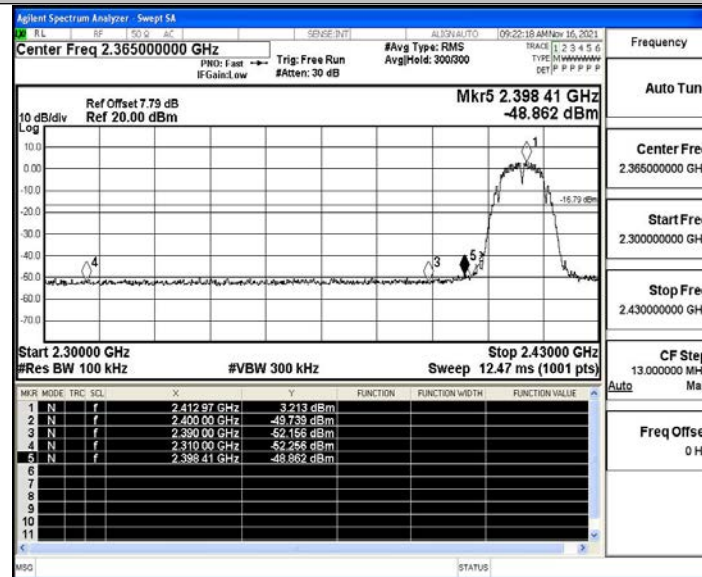
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.21	-48.86	≤ -16.79	PASS
		High	2462	3.12	-48.27	≤ -16.88	PASS
11G	Ant1	Low	2412	-3.54	-43.59	≤ -23.54	PASS
		High	2462	-3.61	-45.77	≤ -23.61	PASS
11N20SISO	Ant1	Low	2412	-3.95	-45.56	≤ -23.95	PASS
		High	2462	-4.52	-47.29	≤ -24.52	PASS
11N40SISO	Ant1	Low	2422	-8.89	-47.85	≤ -28.89	PASS
		High	2452	-7.10	-48.59	≤ -27.1	PASS

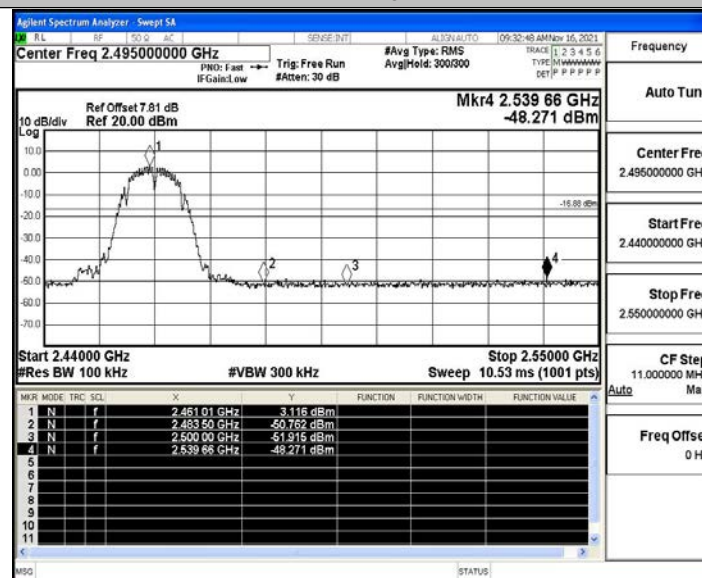


Test Graphs

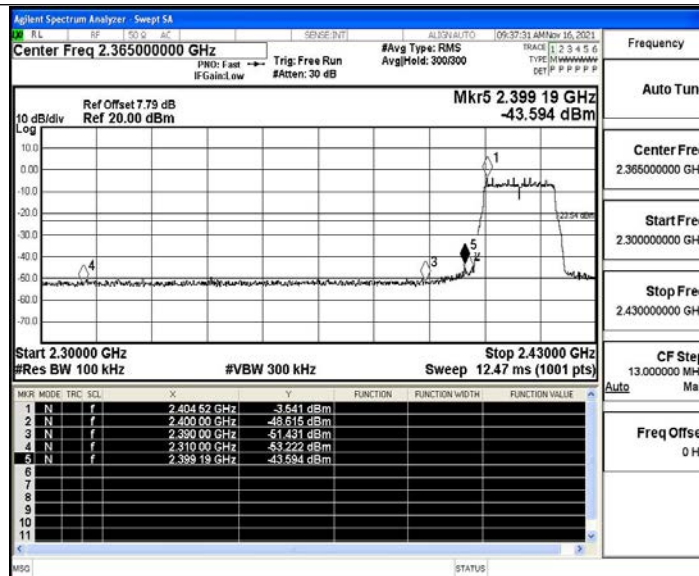
11B_Ant1_Low_2412



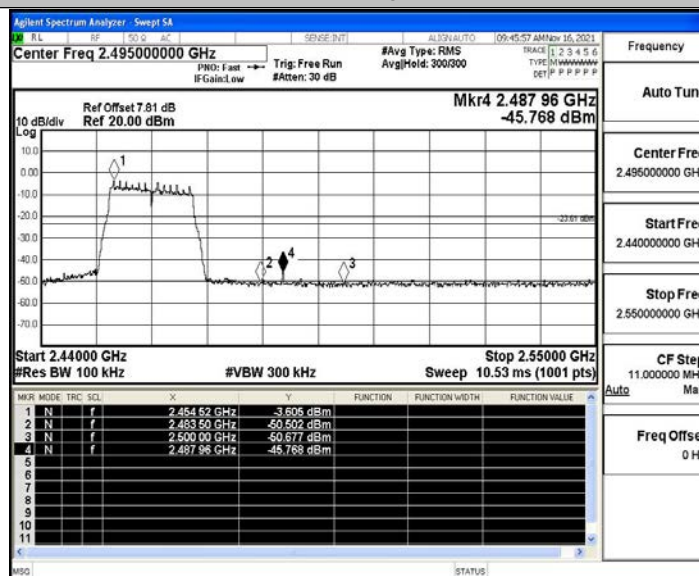
11B_Ant1_High_2462



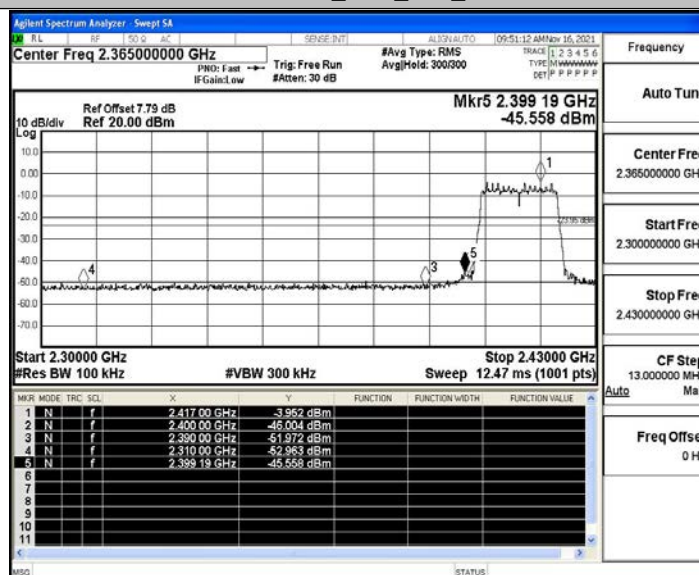
11G_Ant1_Low_2412



11G_Ant1_High_2462

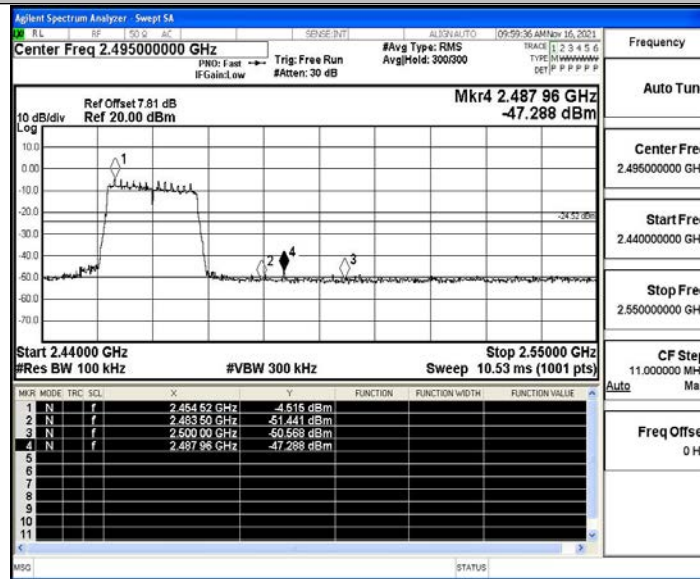


11N20SISO_Ant1_Low_2412

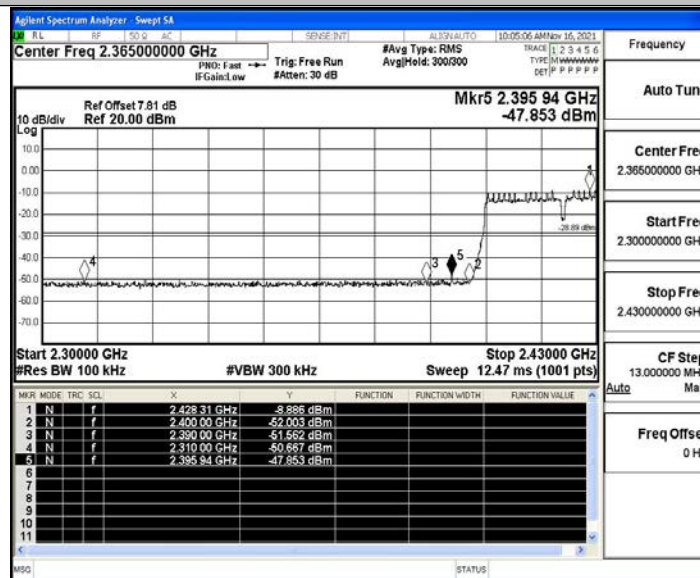




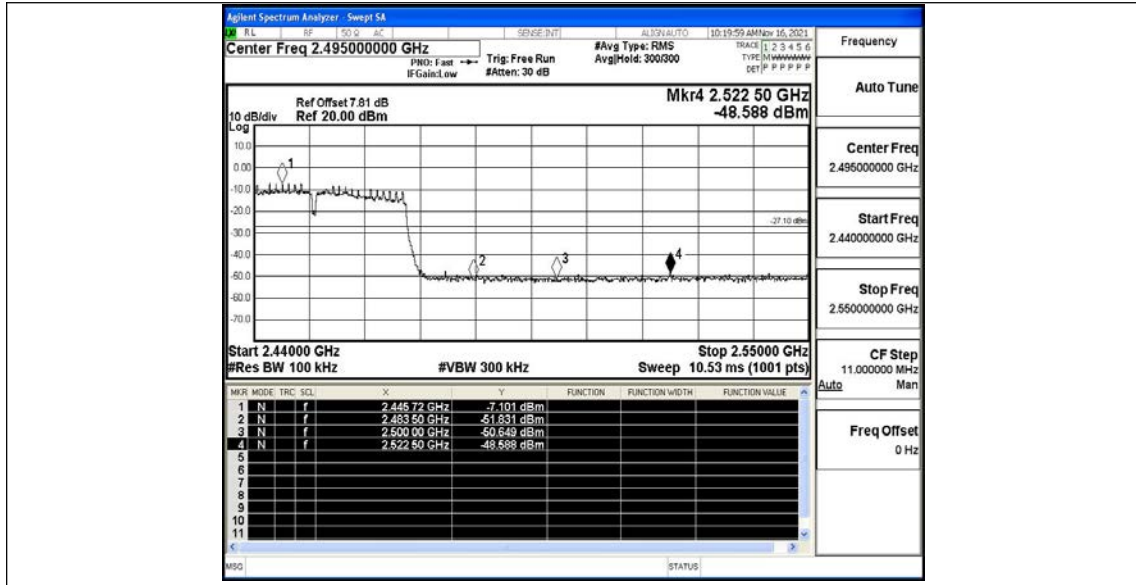
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452





A.5 Conducted Spurious Emission

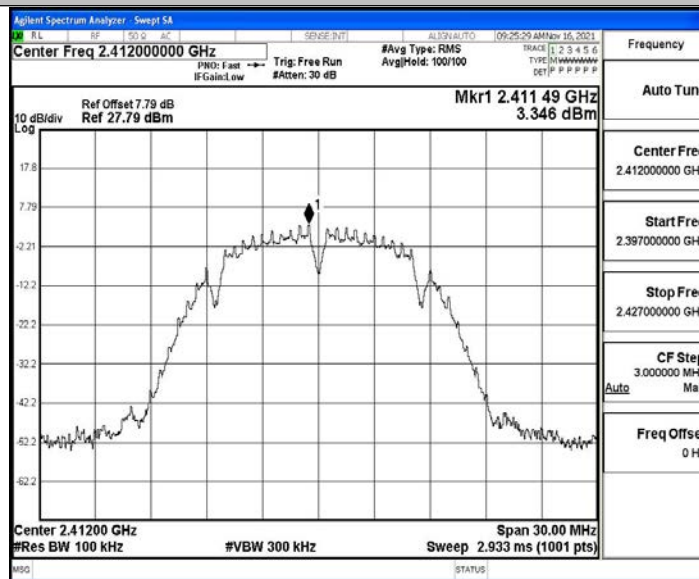
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.35	3.35	---	PASS
			30~1000	3.35	-61.71	≤-16.65	PASS
			1000~26500	3.35	-46.56	≤-16.65	PASS
		2437	Reference	3.47	3.47	---	PASS
			30~1000	3.47	-60.94	≤-16.53	PASS
			1000~26500	3.47	-46.78	≤-16.53	PASS
		2462	Reference	2.83	2.83	---	PASS
			30~1000	2.83	-60.69	≤-17.17	PASS
			1000~26500	2.83	-47.33	≤-17.17	PASS
11G	Ant1	2412	Reference	-3.38	-3.38	---	PASS
			30~1000	-3.38	-62.06	≤-23.38	PASS
			1000~26500	-3.38	-46.26	≤-23.38	PASS
		2437	Reference	-2.36	-2.36	---	PASS
			30~1000	-2.36	-61.48	≤-22.36	PASS
			1000~26500	-2.36	-46.88	≤-22.36	PASS
		2462	Reference	-3.21	-3.21	---	PASS
			30~1000	-3.21	-60.7	≤-23.21	PASS
			1000~26500	-3.21	-46.81	≤-23.21	PASS
11N20SISO	Ant1	2412	Reference	-4.32	-4.32	---	PASS
			30~1000	-4.32	-60.74	≤-24.32	PASS
			1000~26500	-4.32	-47.23	≤-24.32	PASS
		2437	Reference	-4.02	-4.02	---	PASS
			30~1000	-4.02	-60.36	≤-24.02	PASS
			1000~26500	-4.02	-47.19	≤-24.02	PASS
		2462	Reference	-5.18	-5.18	---	PASS
			30~1000	-5.18	-60.86	≤-25.18	PASS
			1000~26500	-5.18	-46.55	≤-25.18	PASS
11N40SISO	Ant1	2422	Reference	-7.68	-7.68	---	PASS
			30~1000	-7.68	-61.63	≤-27.68	PASS
			1000~26500	-7.68	-47.07	≤-27.68	PASS
		2437	Reference	-7.61	-7.61	---	PASS
			30~1000	-7.61	-61.44	≤-27.61	PASS
			1000~26500	-7.61	-46.08	≤-27.61	PASS
		2452	Reference	-7.14	-7.14	---	PASS
			30~1000	-7.14	-61.36	≤-27.14	PASS
			1000~26500	-7.14	-47.26	≤-27.14	PASS

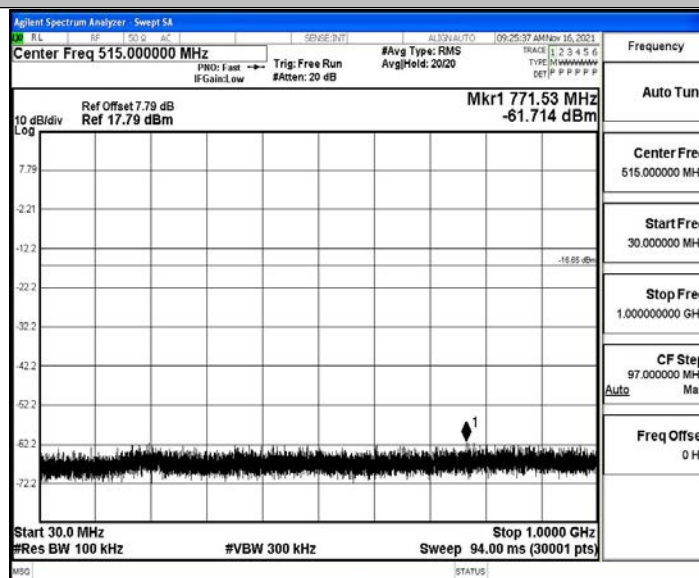


Test Graphs

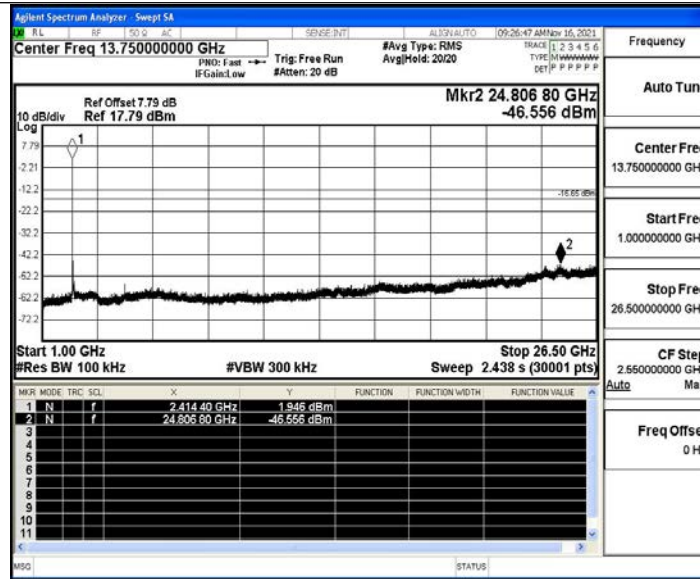
11B_Ant1_2412_0~Reference



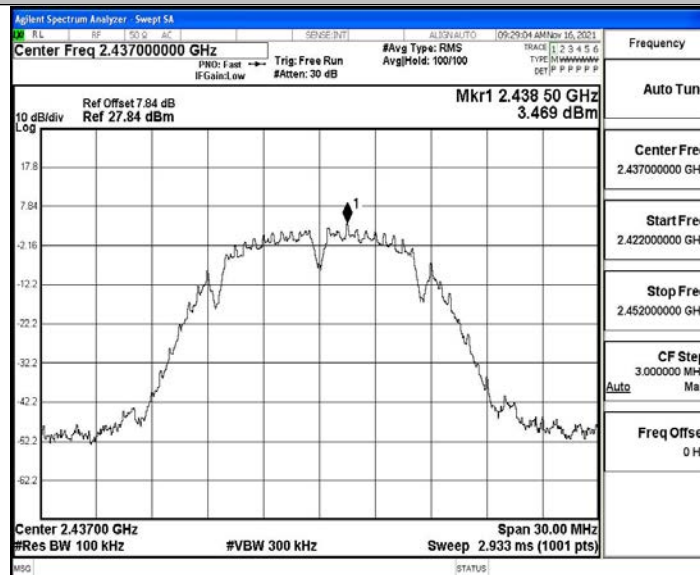
11B_Ant1_2412_30~1000



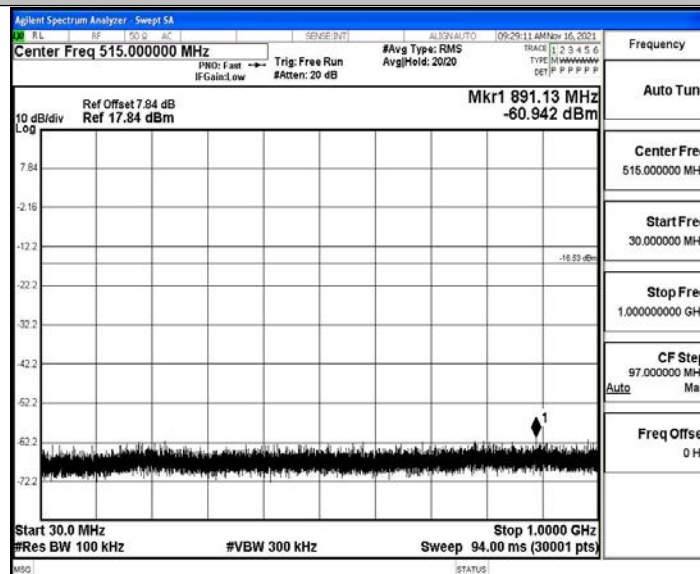
11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference

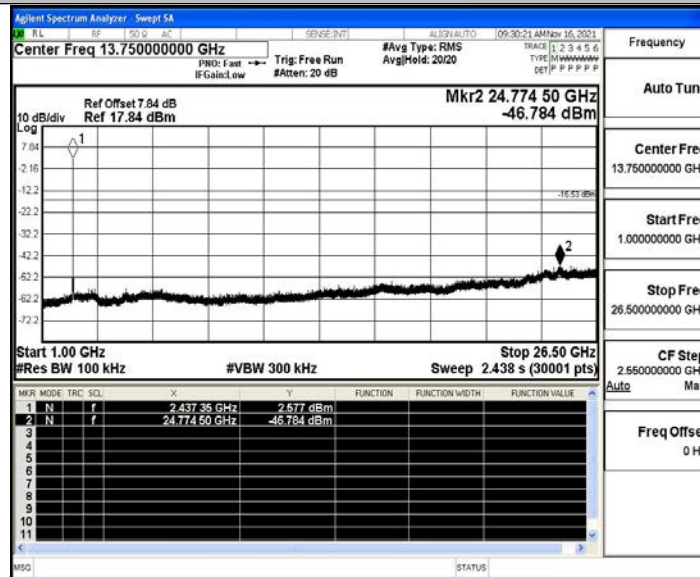


11B_Ant1_2437_30~1000

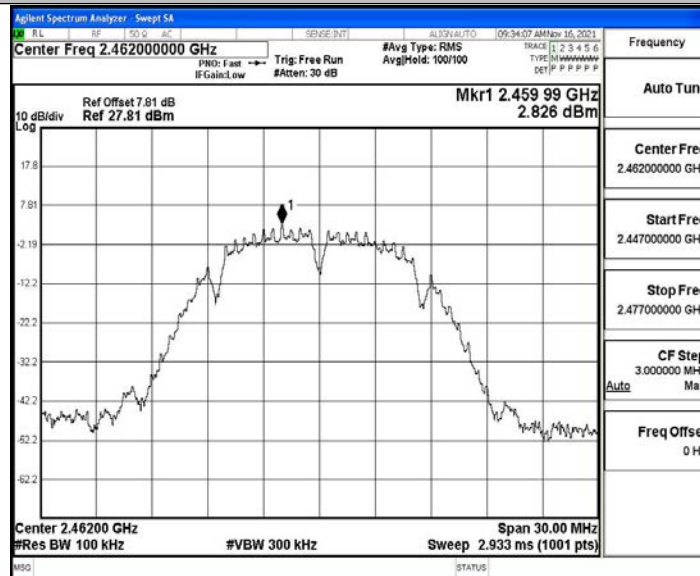




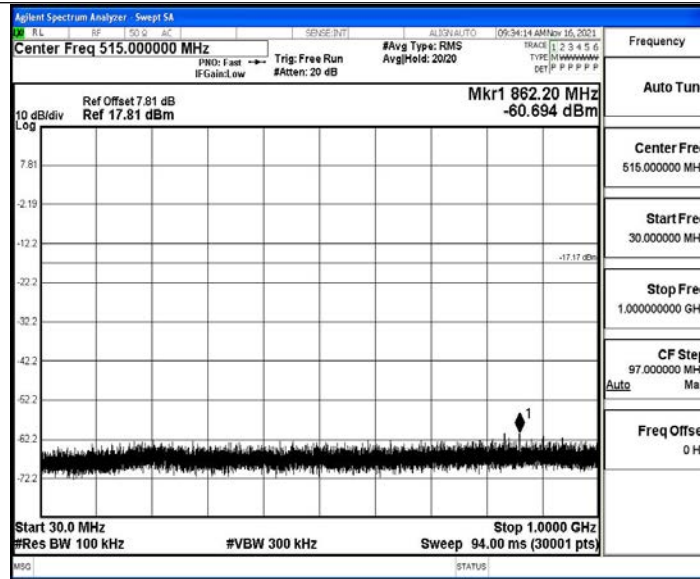
11B_Ant1_2437_1000~26500



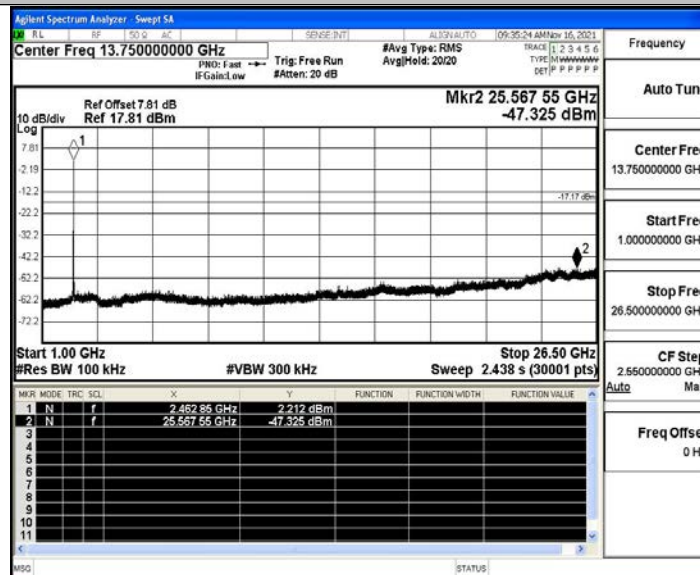
11B_Ant1_2462_0~Reference



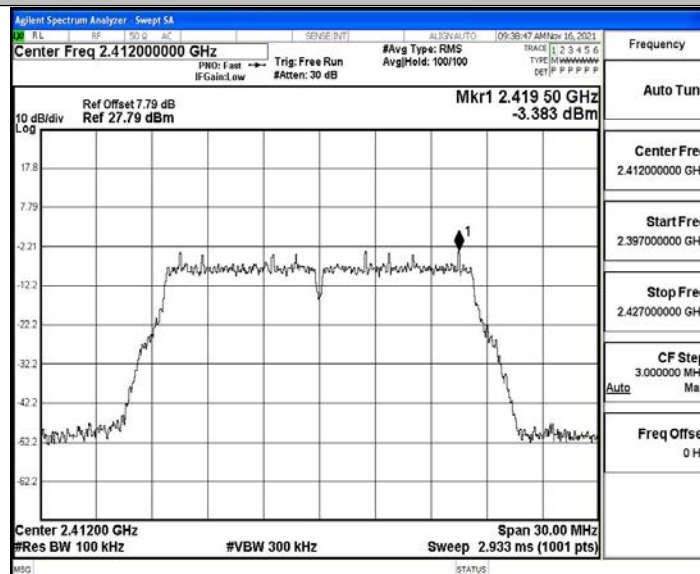
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

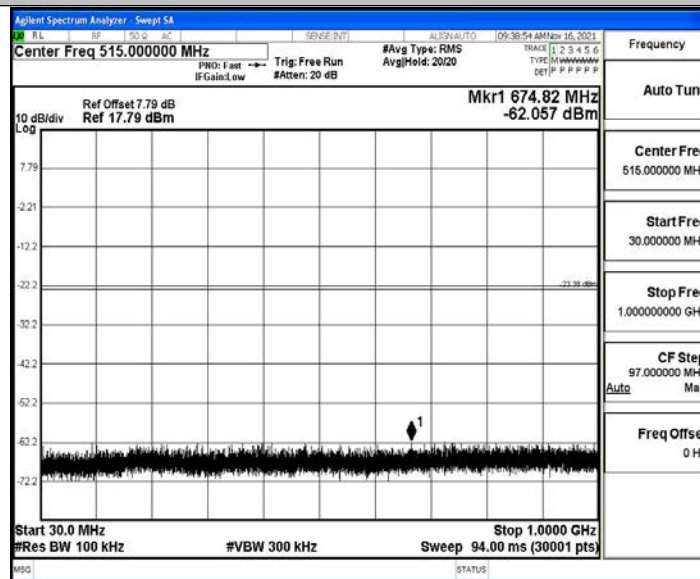


11G_Ant1_2412_0~Reference

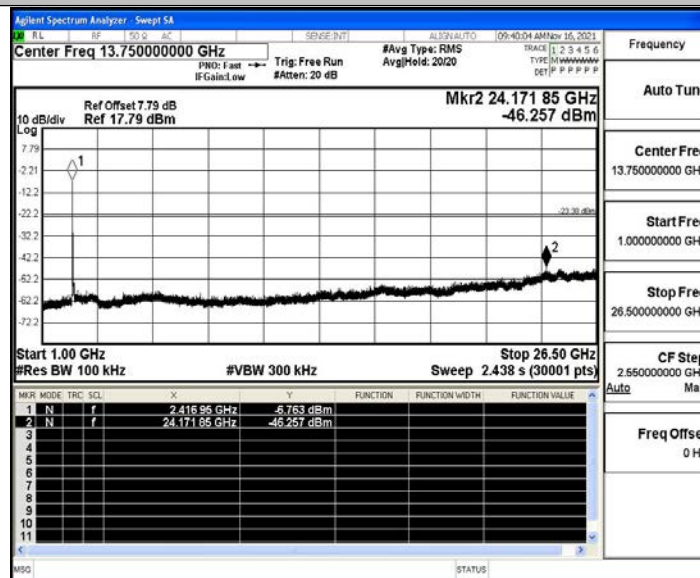




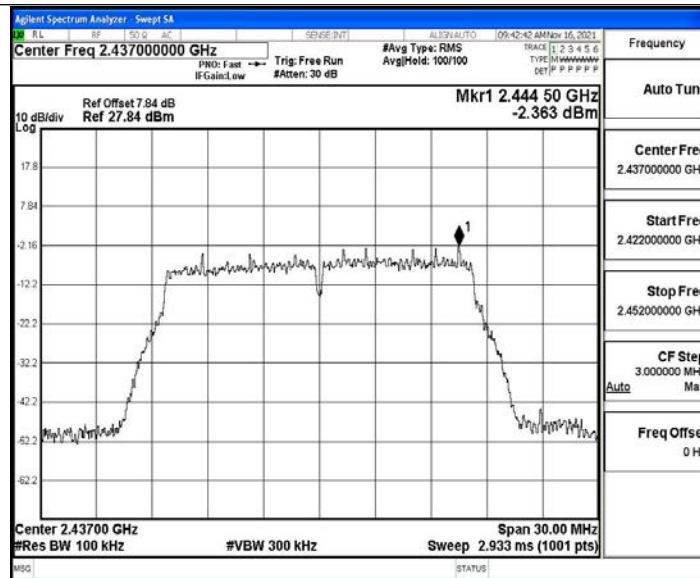
11G_Ant1_2412_30~1000



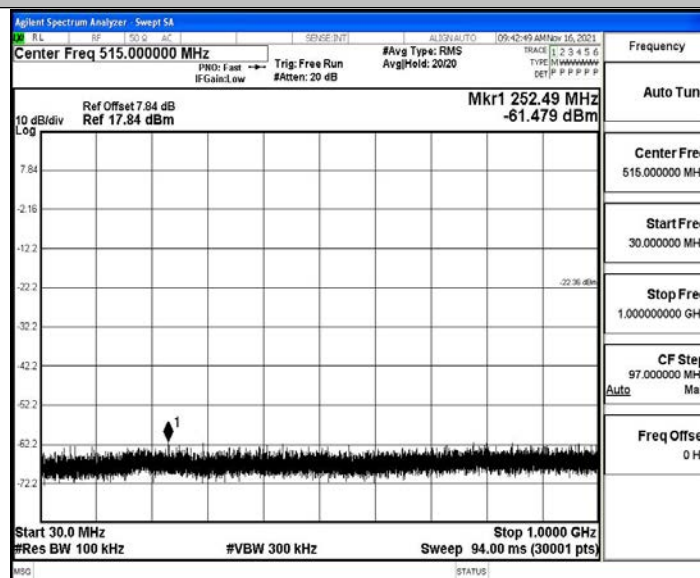
11G_Ant1_2412_1000~26500



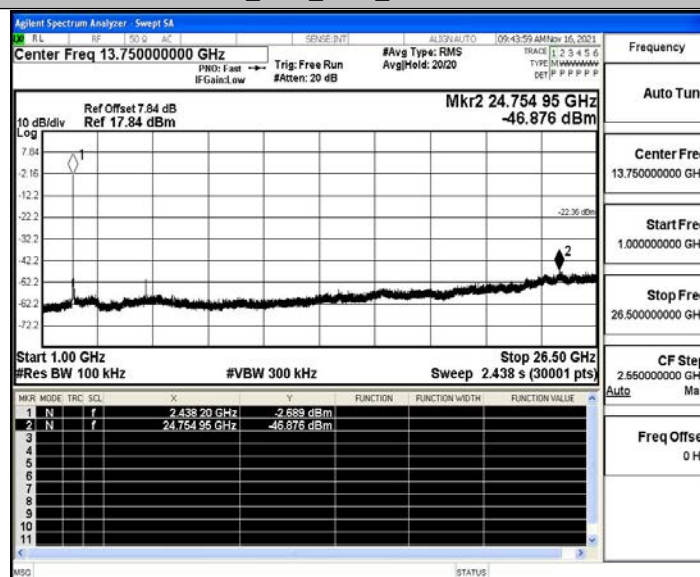
11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000

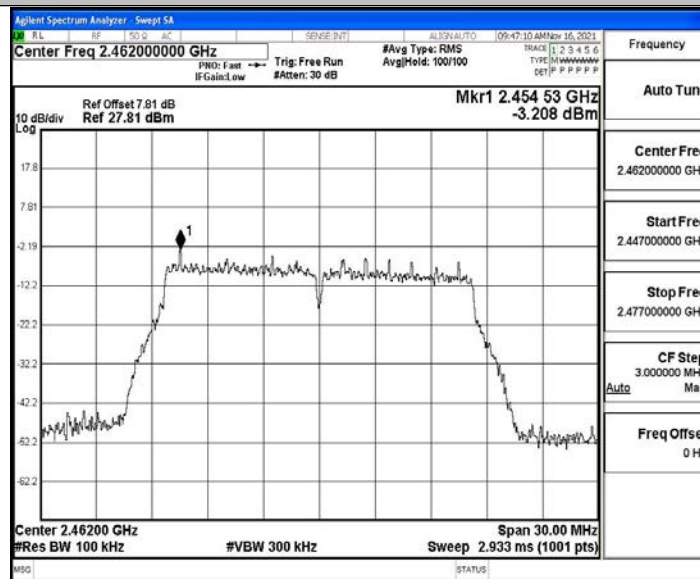


11G_Ant1_2437_1000~26500

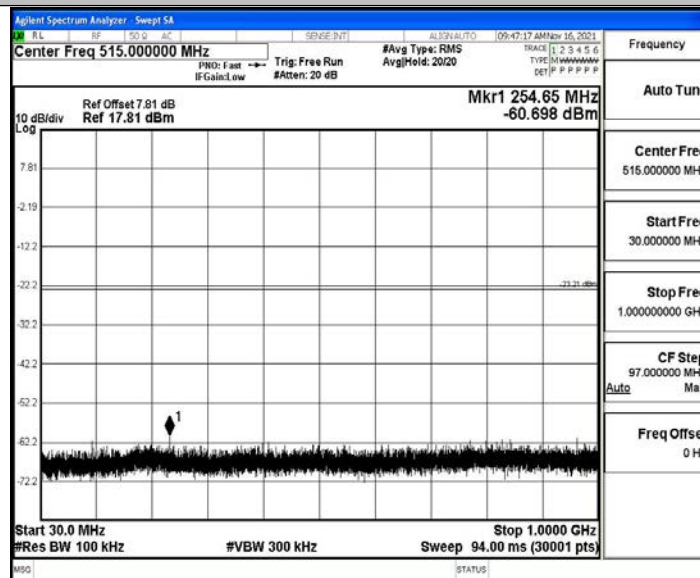




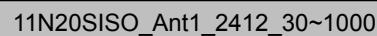
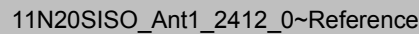
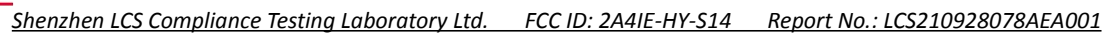
11G_Ant1_2462_0~Reference



11G_Ant1_2462_30~1000

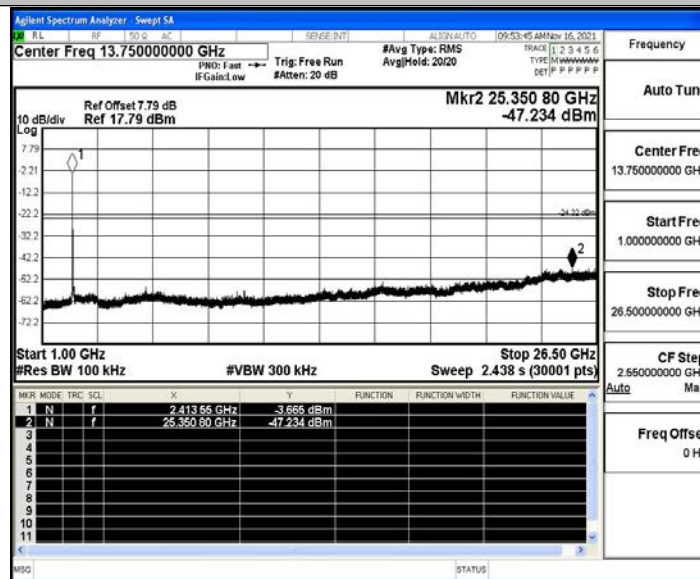


11G_Ant1_2462_1000~26500

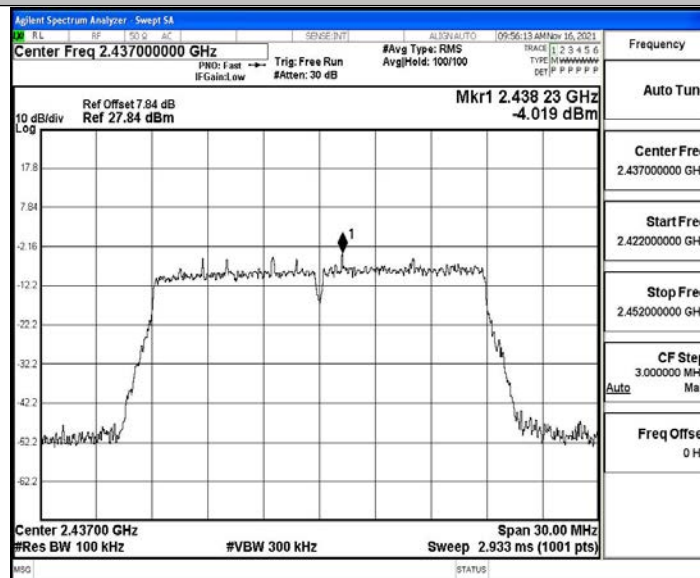




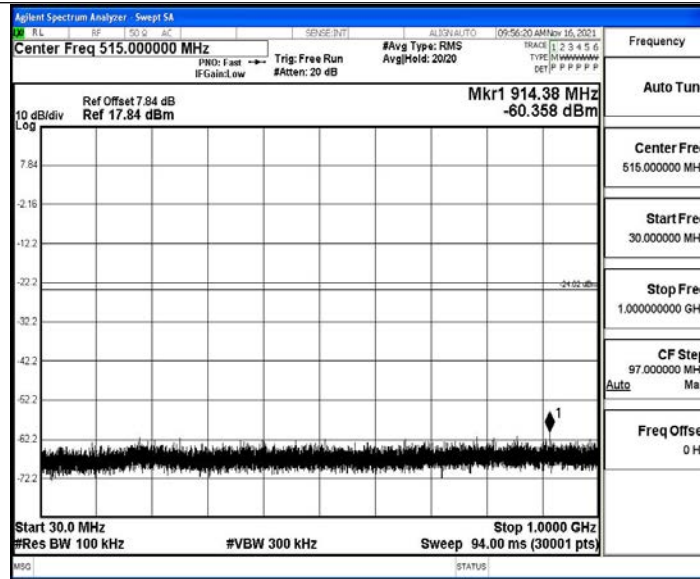
11N20SISO_Ant1_2412_1000~26500



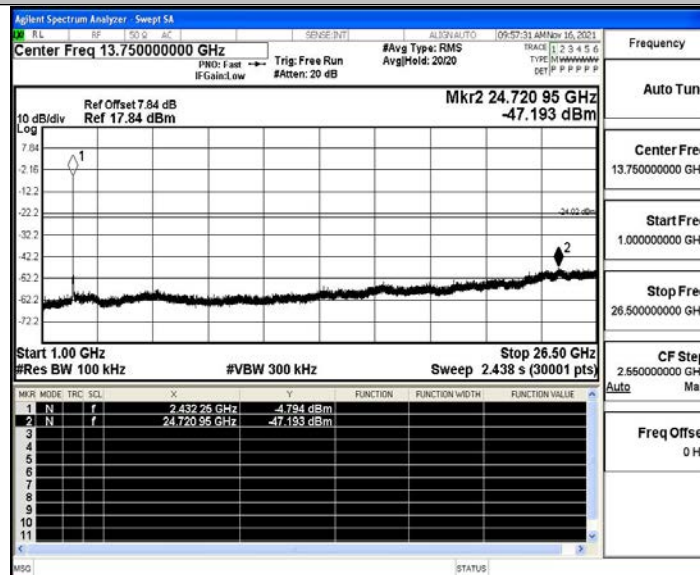
11N20SISO_Ant1_2437_0~Reference



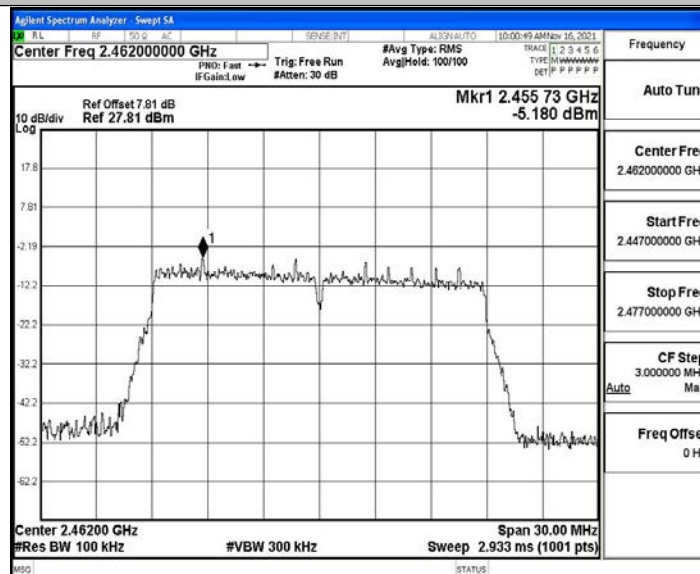
11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

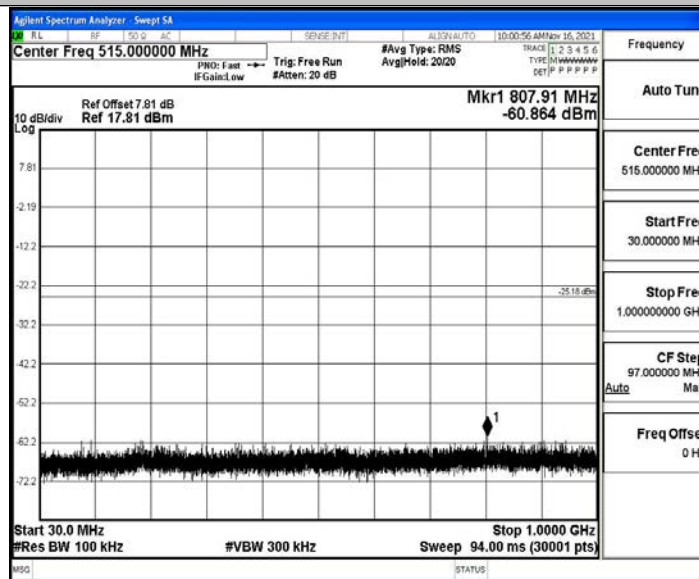


11N20SISO_Ant1_2462_0~Reference

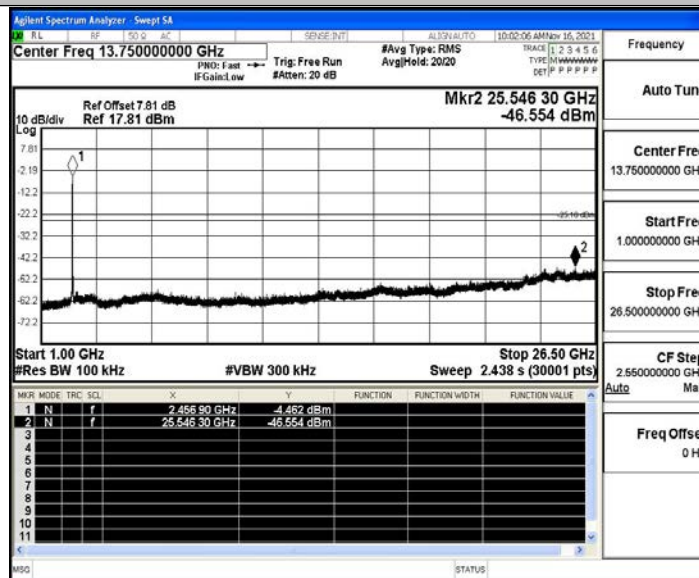




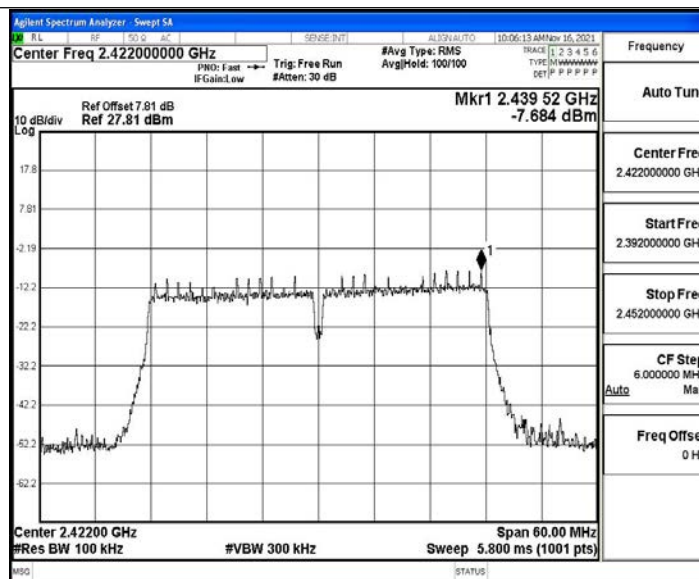
11N20SISO_Ant1_2462_30~1000



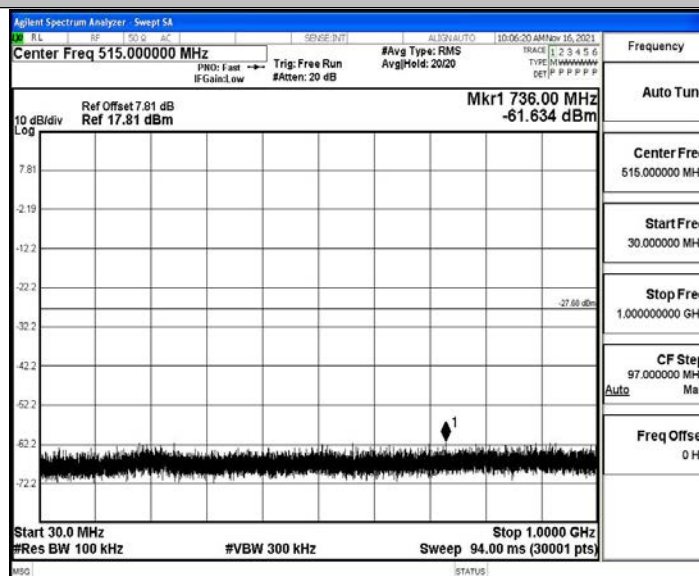
11N20SISO_Ant1_2462_1000~26500



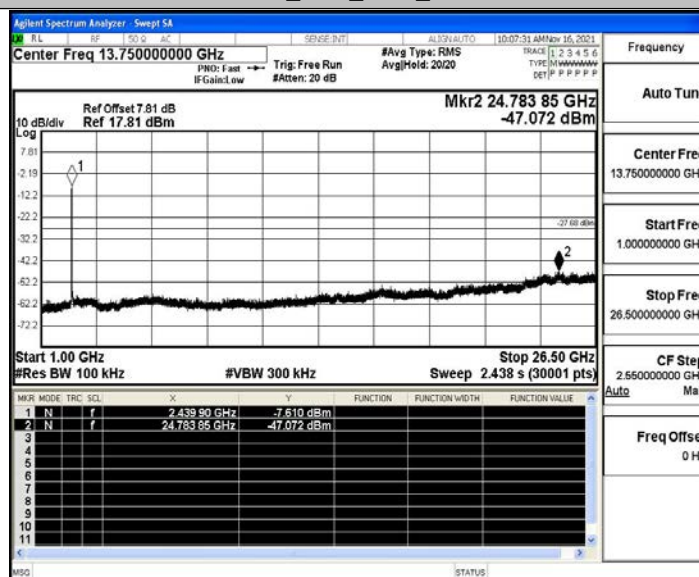
11N40SISO_Ant1_2422_0~Reference



11N40SISO_Ant1_2422_30~1000

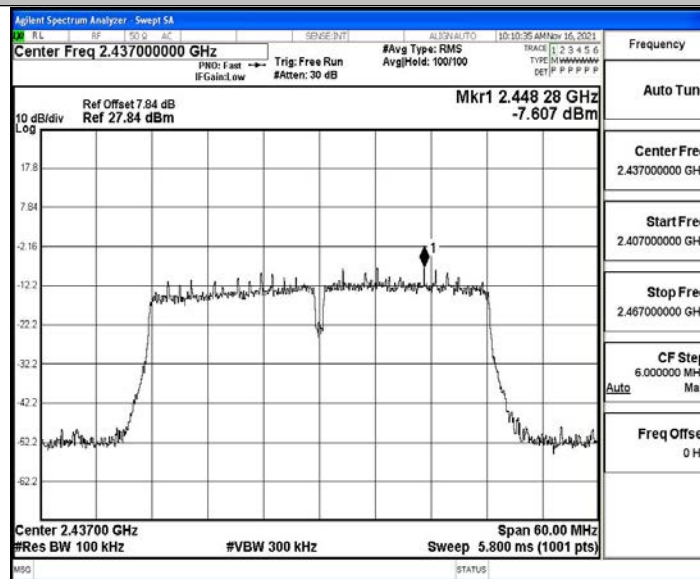


11N40SISO_Ant1_2422_1000~26500

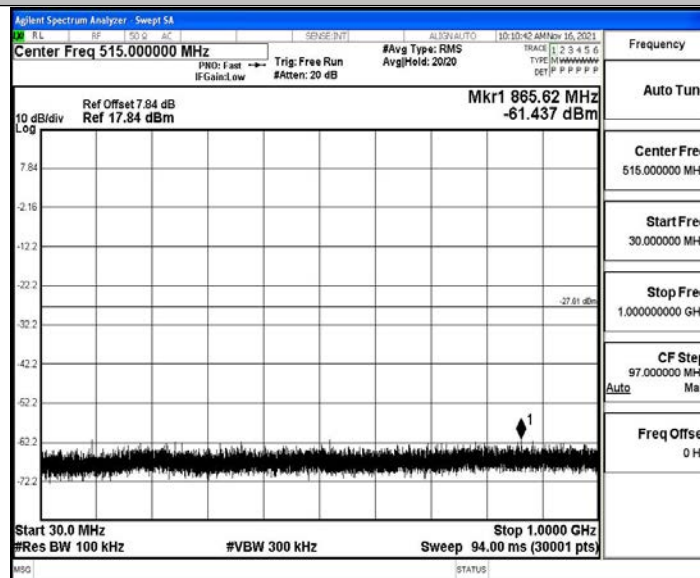




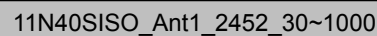
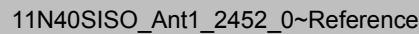
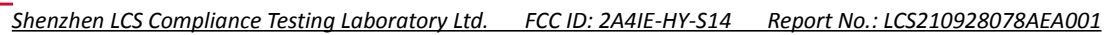
11N40SISO_Ant1_2437_0~Reference



11N40SISO_Ant1_2437_30~1000

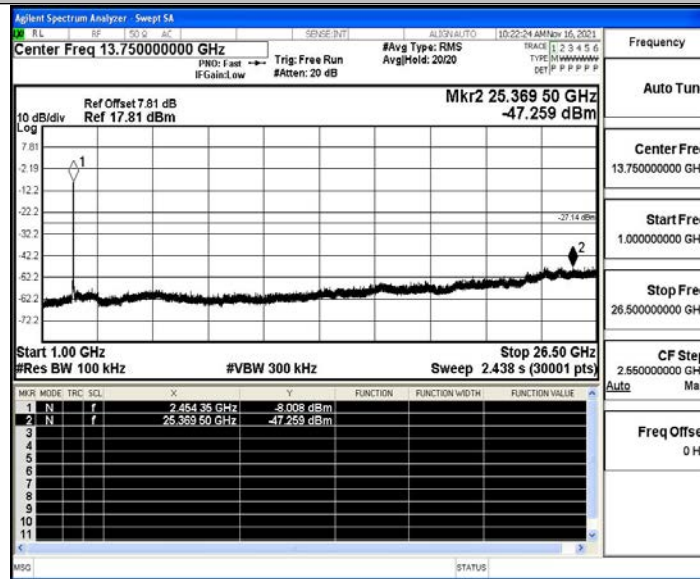


11N40SISO_Ant1_2437_1000~26500





11N40SISO_Ant1_2452_1000~26500





A.6 Duty Cycle

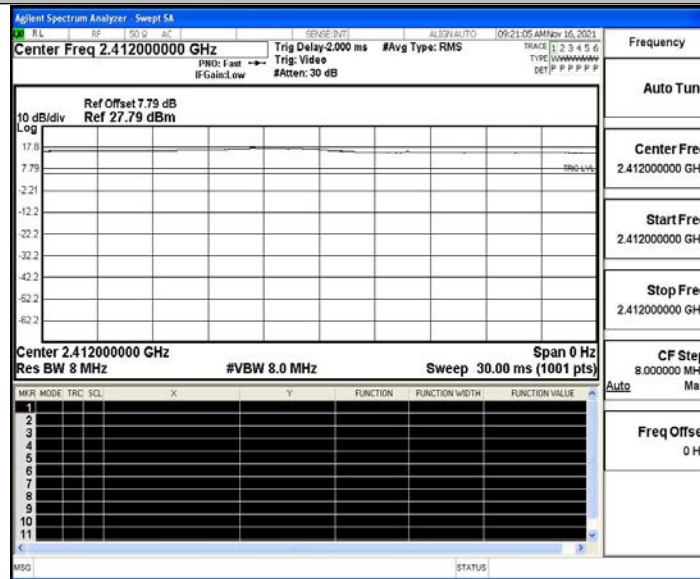
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T[KHz]
11B	Ant1	2412	30.00	30.00	100.00	---
		2437	30.00	30.00	100.00	---
		2462	16.77	16.82	99.70	---
11G	Ant1	2412	1.39	1.43	97.20	0.72
		2437	1.39	1.43	97.20	0.72
		2462	1.39	1.43	97.20	0.72
11N20SISO	Ant1	2412	1.30	1.34	97.01	0.77
		2437	1.30	1.34	97.01	0.77
		2462	1.30	1.34	97.01	0.77
11N40SISO	Ant1	2422	0.64	0.68	94.12	1.59
		2437	0.64	0.68	94.12	1.59
		2452	0.64	0.68	94.12	1.59

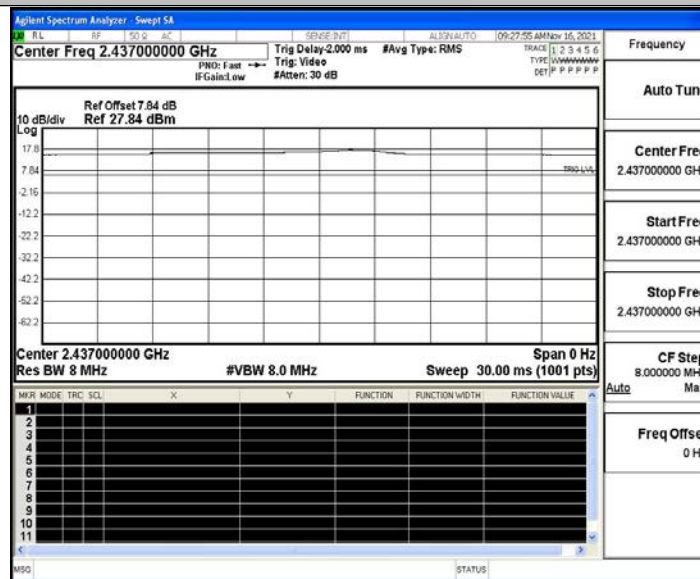


Test Graphs

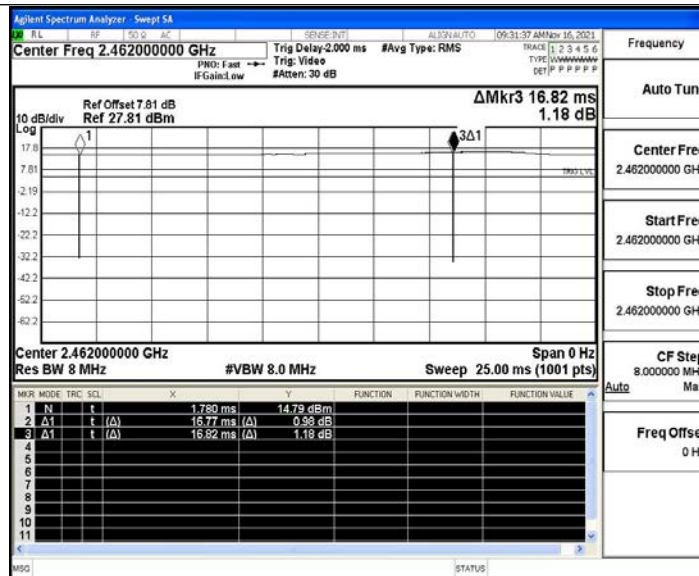
11B_Ant1_2412



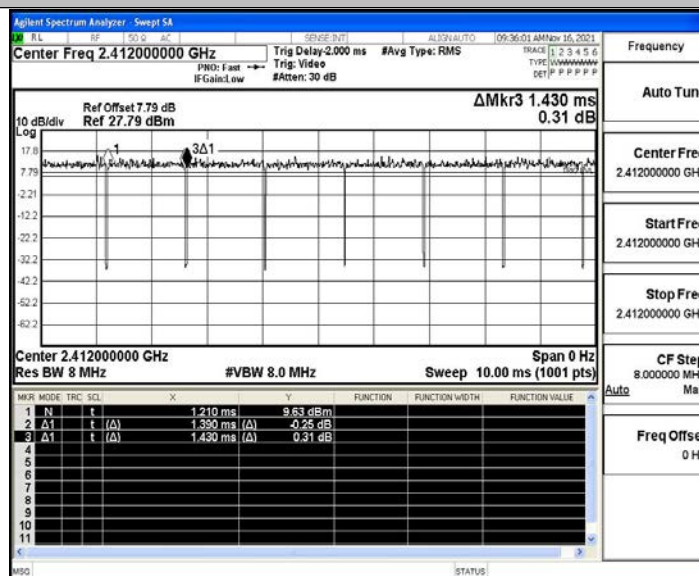
11B_Ant1_2437



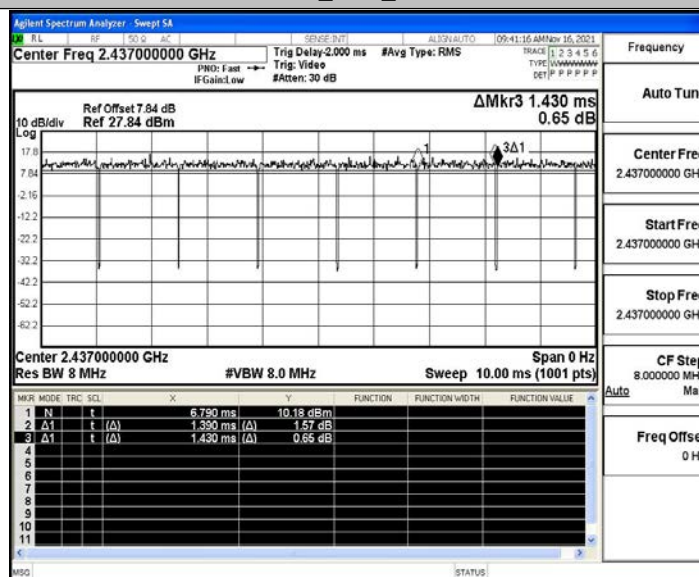
11B_Ant1_2462



11G_Ant1_2412

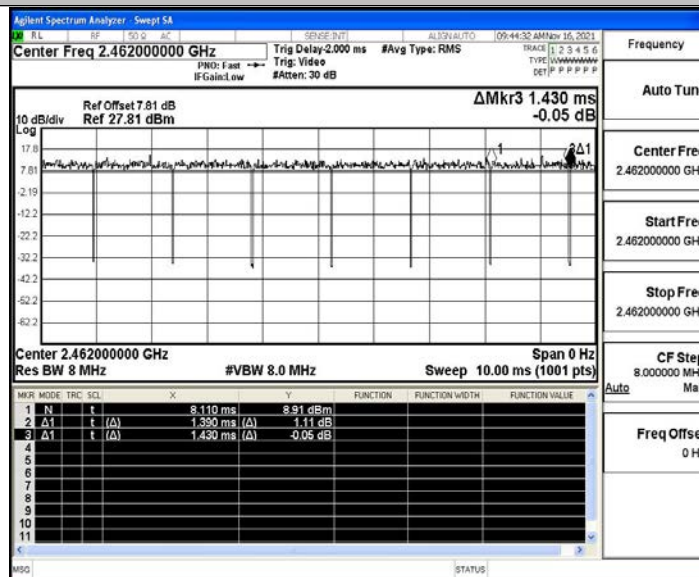


11G_Ant1_2437

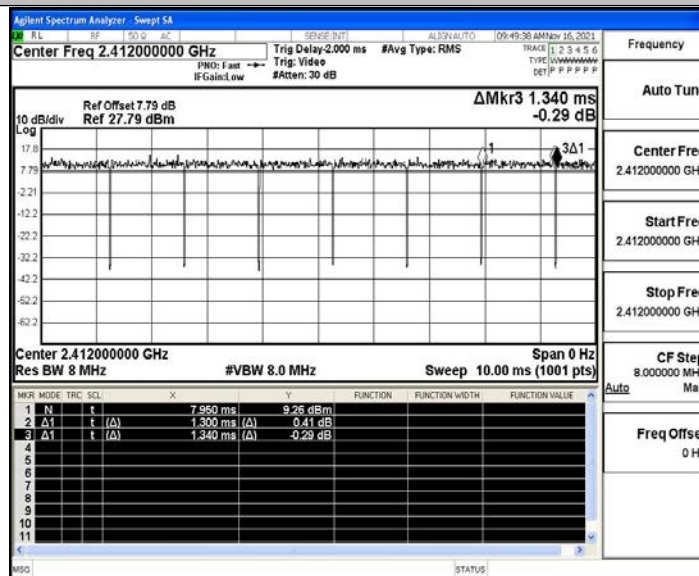




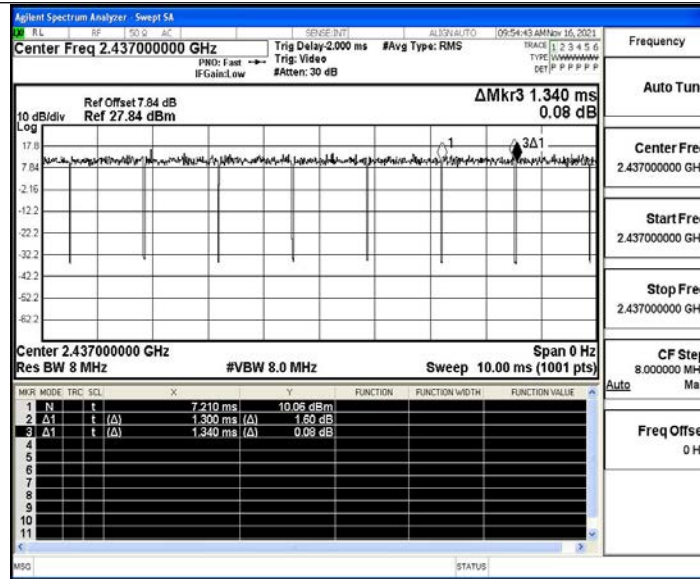
11G_Ant1_2462



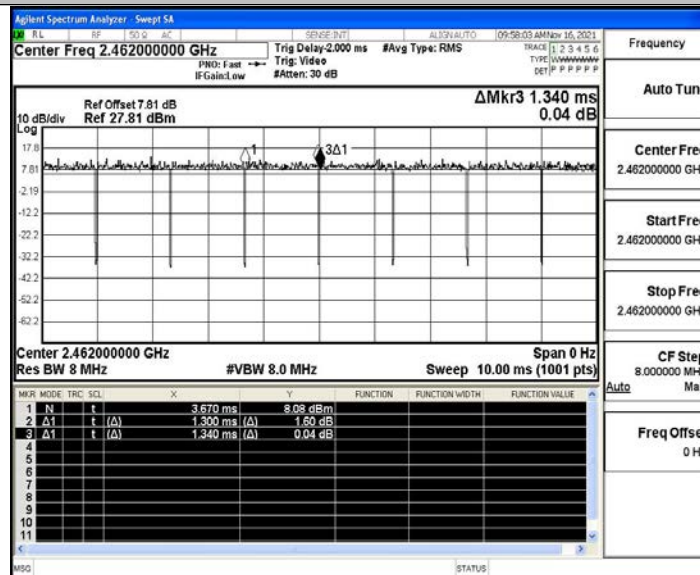
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

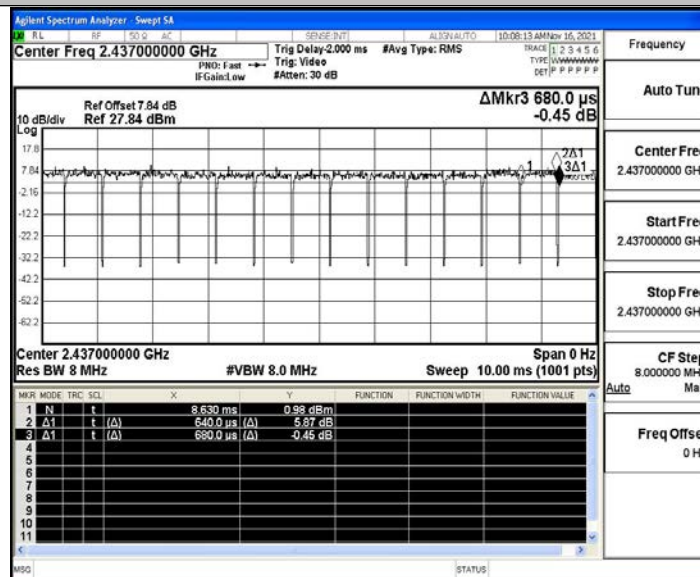


11N40SISO_Ant1_2422

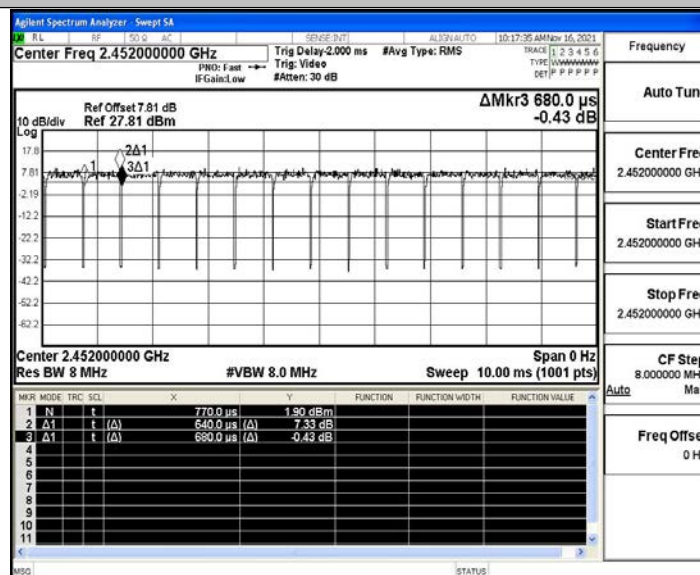




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.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	-49.32	≤-41.20	45.88	≤54	PASS
				AV	2389.830	-48.86	≤-41.20	46.34	≤54	PASS
				AV	2390.000	-48.87	≤-41.20	46.33	≤54	PASS
				Peak	2310.000	-42.76	≤-21.20	52.44	≤74	PASS
				Peak	2322.620	-40.17	≤-21.20	55.03	≤74	PASS
				Peak	2390.000	-45.46	≤-21.20	49.74	≤74	PASS
		High	2462	AV	2483.500	-48.08	≤-41.20	47.12	≤54	PASS
				AV	2488.070	-47.05	≤-41.20	48.15	≤54	PASS
				AV	2500.000	-48.24	≤-41.20	46.96	≤54	PASS
				Peak	2483.500	-42.46	≤-21.20	52.74	≤74	PASS
				Peak	2484.440	-37.35	≤-21.20	57.85	≤74	PASS
				Peak	2500.000	-43.04	≤-21.20	52.16	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-48.75	≤-41.20	46.45	≤54	PASS
				AV	2389.830	-48.12	≤-41.20	47.08	≤54	PASS
				AV	2390.000	-48.12	≤-41.20	47.08	≤54	PASS
				Peak	2310.000	-42.87	≤-21.20	52.33	≤74	PASS
				Peak	2350.700	-38.96	≤-21.20	56.24	≤74	PASS
				Peak	2390.000	-40.71	≤-21.20	54.49	≤74	PASS
		High	2462	AV	2483.500	-47.07	≤-41.20	48.13	≤54	PASS
				AV	2487.960	-44.83	≤-41.20	50.37	≤54	PASS
				AV	2500.000	-47.75	≤-41.20	47.45	≤54	PASS
				Peak	2483.500	-40.11	≤-21.20	55.09	≤74	PASS
				Peak	2487.960	-37.84	≤-21.20	57.36	≤74	PASS
				Peak	2500.000	-41.12	≤-21.20	54.08	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-48.7	≤-41.20	46.50	≤54	PASS
				AV	2389.960	-48.13	≤-41.20	47.07	≤54	PASS
				AV	2390.000	-48.13	≤-41.20	47.07	≤54	PASS
				Peak	2310.000	-42.62	≤-21.20	52.58	≤74	PASS
				Peak	2361.750	-39.31	≤-21.20	55.89	≤74	PASS
				Peak	2390.000	-42.26	≤-21.20	52.94	≤74	PASS
		High	2462	AV	2483.500	-47.31	≤-41.20	47.89	≤54	PASS
				AV	2487.960	-45.79	≤-41.20	49.41	≤54	PASS
				AV	2500.000	-47.79	≤-41.20	47.41	≤54	PASS
				Peak	2483.500	-39.66	≤-21.20	55.54	≤74	PASS
				Peak	2488.180	-37.97	≤-21.20	57.23	≤74	PASS
				Peak	2500.000	-38.99	≤-21.20	56.21	≤74	PASS
11N40SIS	Ant1	Low	2422	AV	2310.000	-48.48	≤-41.20	46.72	≤54	PASS



O				AV	2389.180	-47.74	≤ -41.20	47.46	≤ 54	PASS
				AV	2390.000	-47.99	≤ -41.20	47.21	≤ 54	PASS
				Peak	2310.000	-42.65	≤ -21.20	52.55	≤ 74	PASS
				Peak	2382.030	-38.54	≤ -21.20	56.66	≤ 74	PASS
				Peak	2390.000	-41.56	≤ -21.20	53.64	≤ 74	PASS
		High	2452	AV	2483.500	-47.04	≤ -41.20	48.16	≤ 54	PASS
				AV	2487.080	-46.79	≤ -41.20	48.41	≤ 54	PASS
				AV	2500.000	-47.33	≤ -41.20	47.87	≤ 54	PASS
				Peak	2483.500	-41.04	≤ -21.20	54.16	≤ 74	PASS
				Peak	2490.600	-36.67	≤ -21.20	58.53	≤ 74	PASS
				Peak	2500.000	-40.51	≤ -21.20	54.69	≤ 74	PASS

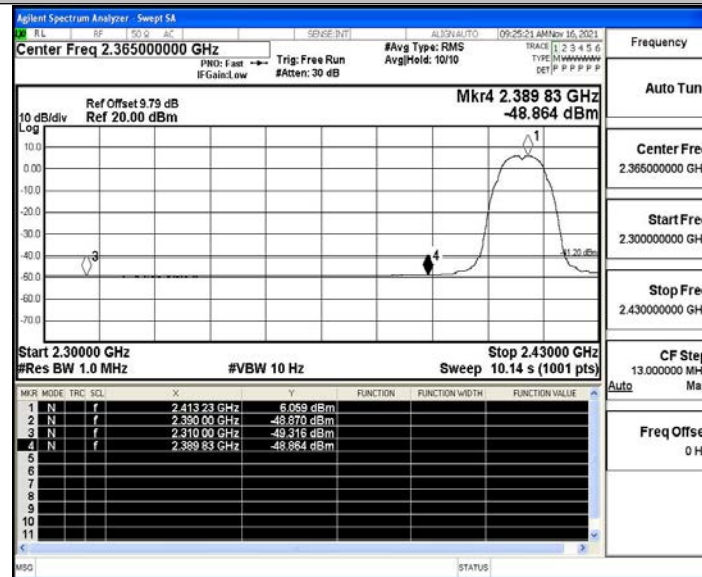
Note:

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.

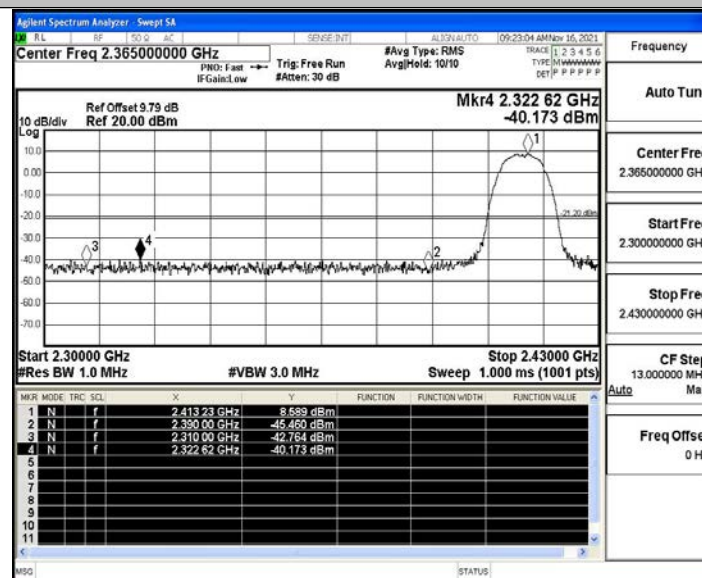


Test Graphs

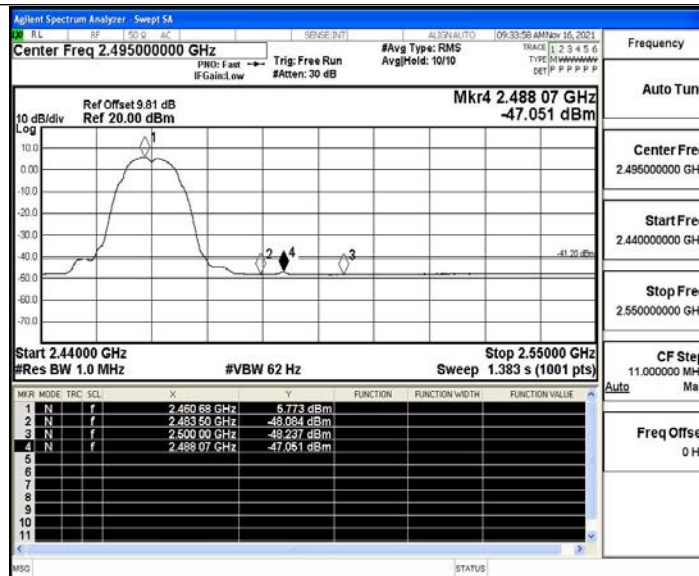
11B_Ant1_Low_2412_AV



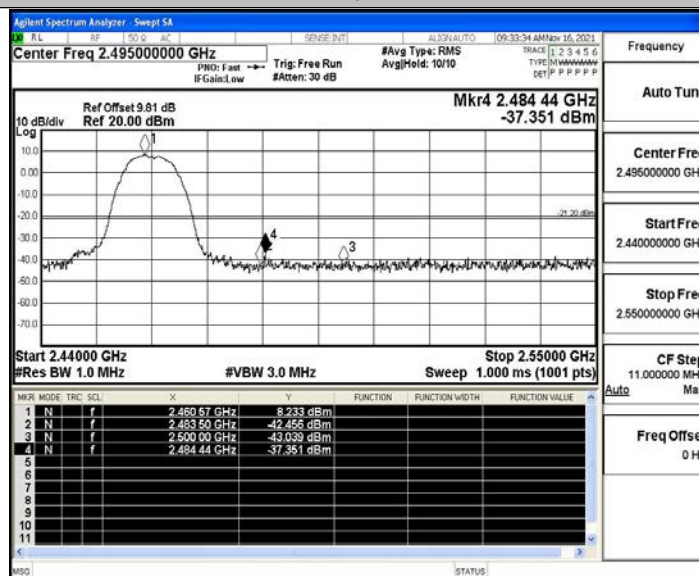
11B_Ant1_Low_2412_Peak



11B_Ant1_High_2462_AV



11B_Ant1_High_2462_Peak

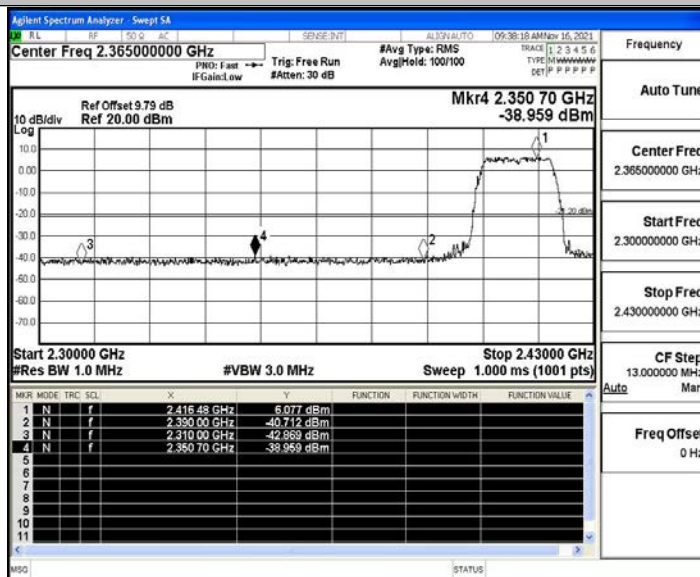


11G_Ant1_Low_2412_AV

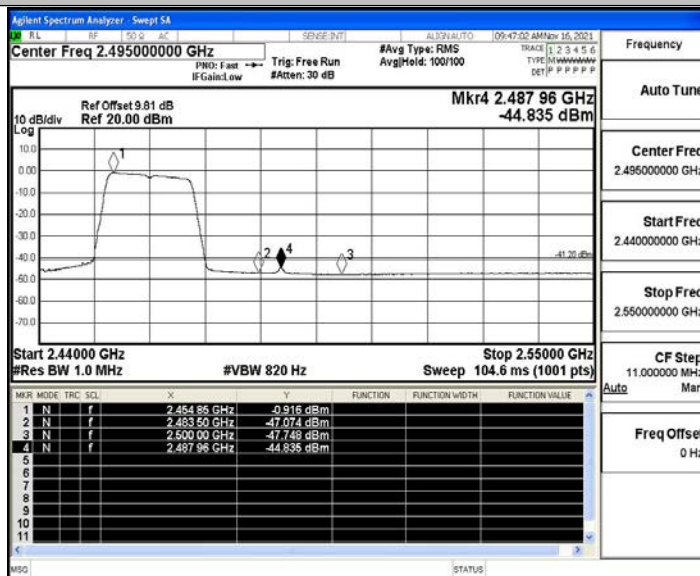




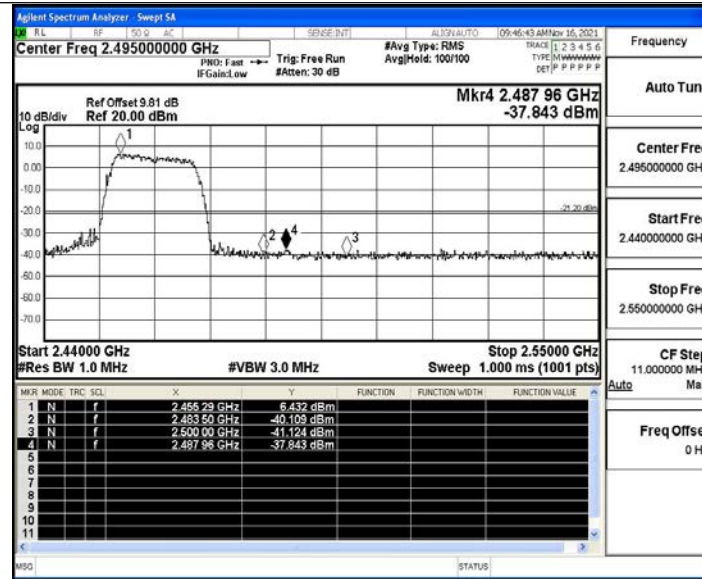
11G_Ant1_Low_2412_Peak



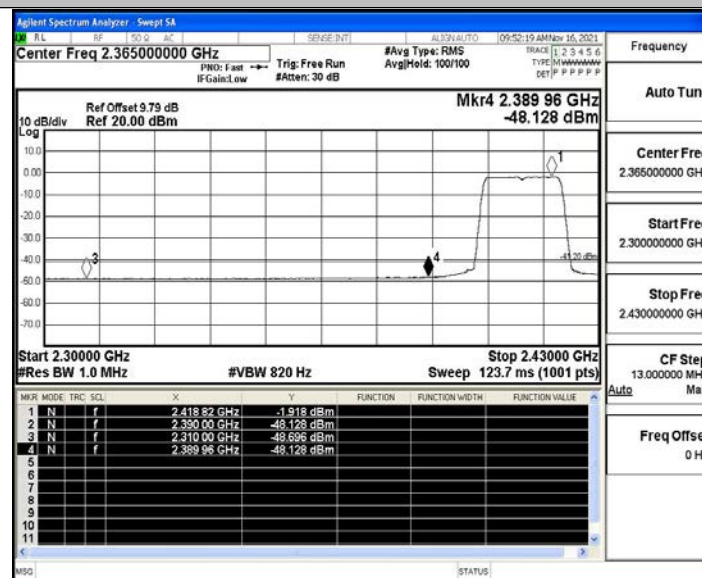
11G_Ant1_High_2462_AV



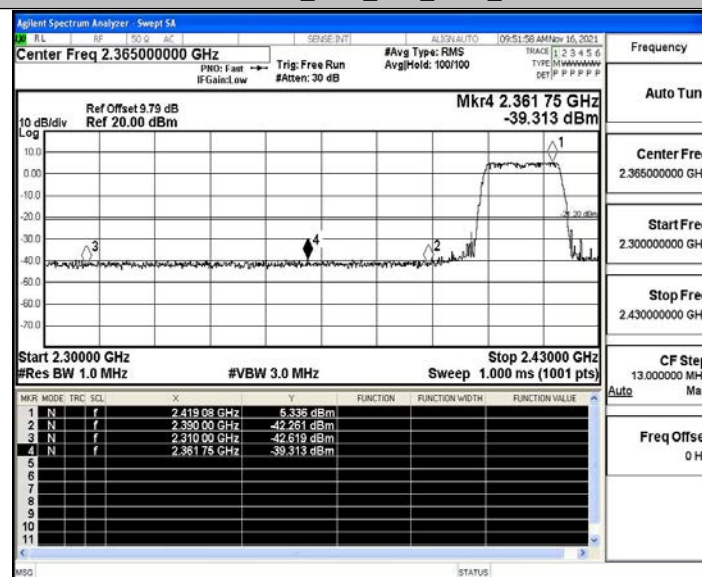
11G_Ant1_High_2462_Peak



11N20SISO_Ant1_Low_2412_AV

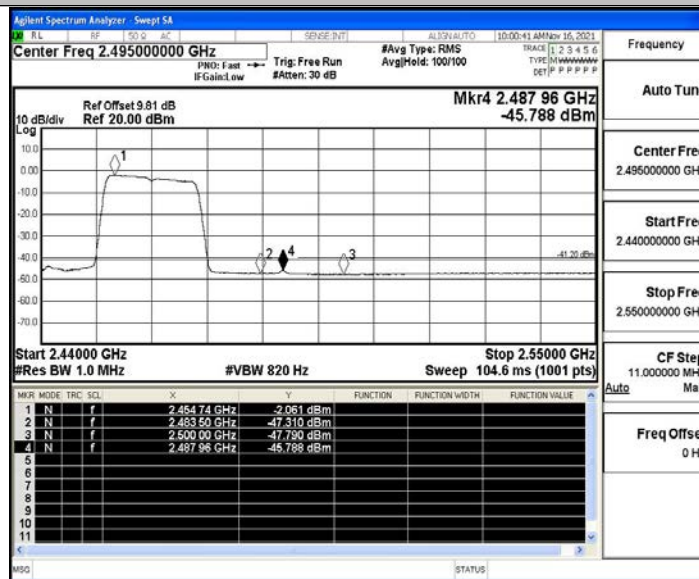


11N20SISO_Ant1_Low_2412_Peak

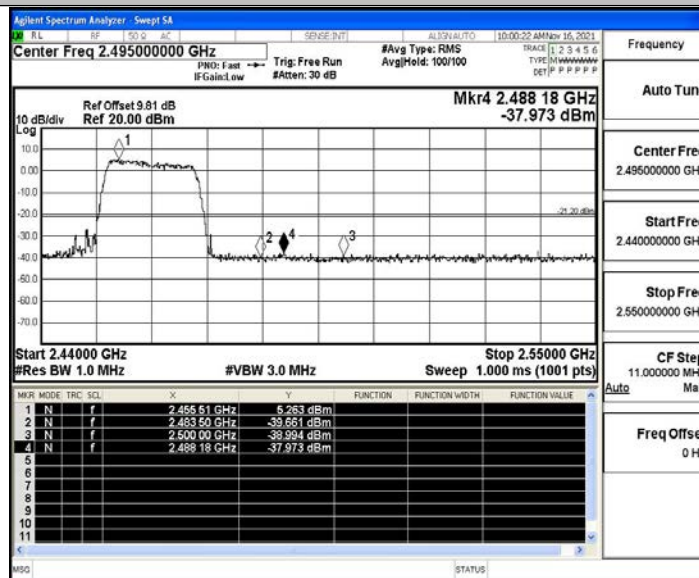




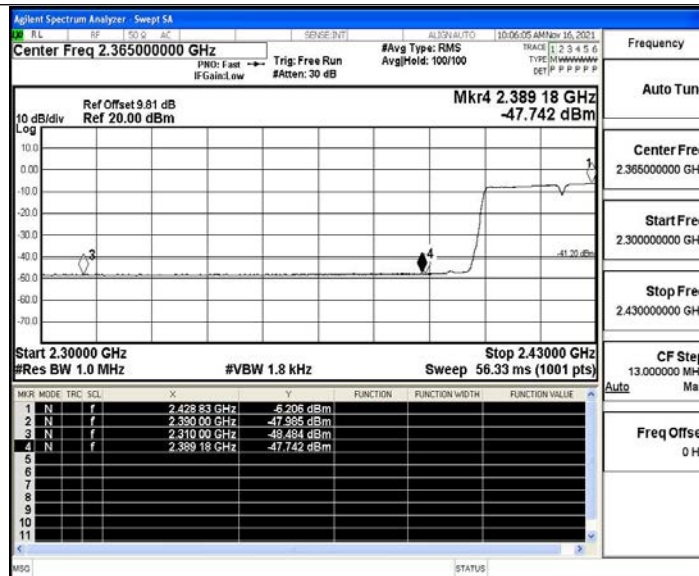
11N20SISO_Ant1_High_2462_AV



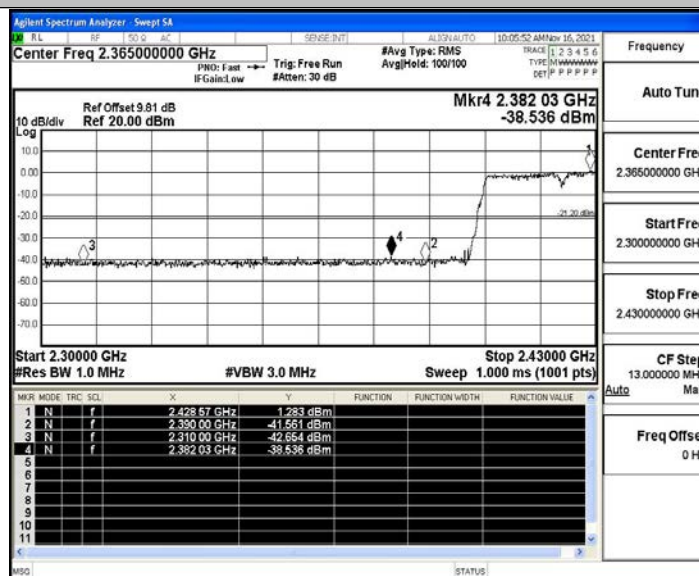
11N20SISO_Ant1_High_2462_Peak



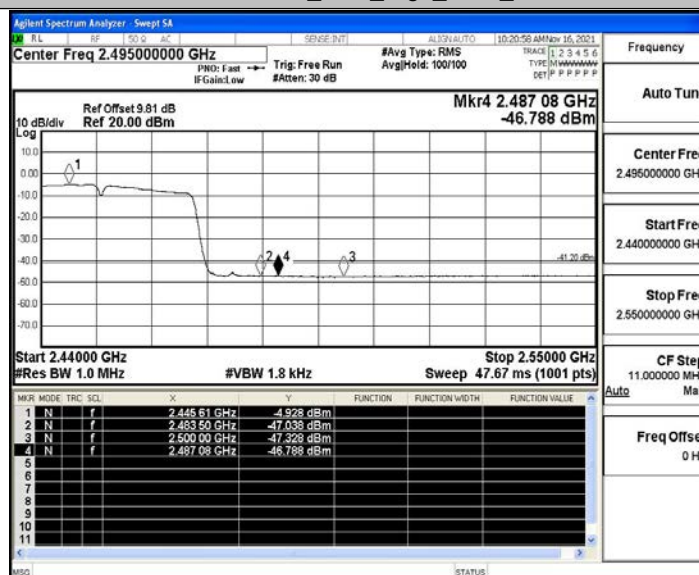
11N40SISO_Ant1_Low_2422_AV



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV





11N40SISO_Ant1_High_2452_Peak

